MINI-LINK 6600 and MINI-LINK 6366

Release 1.17

Product Specification

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Contents

1 Introduction

MINI-LINK 6600 and MINI-LINK 6366 product family covers microwave nodes tailor made for different site needs spanning from simplest outdoor tail site to advanced split mounted aggregation site.

The following products are available:

— MINI-LINK 6651

— MINI-LINK 6691 with NPU 1002 or NPU1003 or NPU 1005

— MINI-LINK 6692 with NPU 1002 or NPU 1005

— MINI-LINK 6693 with NPU 1002 or NPU 1003 or NPU 1005

— MINI-LINK 6694 with NPU 1002 or NPU 1003 or NPU 1005

— MINI-LINK 6654 with PNM 1001 or PNM 1002

— MINI-LINK 6655 with PNM 1002

— MINI-LINK 6366

— MINI-LINK 6371

MINI-LINK 6651 is a compact 1RU node for tail sites.

MINI-LINK 6651/1 has a switch capacity of 14.5 Gbps and can connect one or two split mount radio links in one direction. It has 1 Gbps and 2.5 Gbps Ethernet interfaces on the front. It has forced cooling (fan unit).

MINI-LINK 6651/2 has a switch capacity of 14.5 Gbps and can connect one or two split mount radio links in two directions. It has 1 Gbps and 2.5 Gbps Ethernet interfaces on the front. It has forced cooling (fan unit).

MINI-LINK 6651/3 has a switch capacity of 14.5 Gbps and can connect one split mount radio link in one direction. It has 1 Gbps and 2.5 Gbps Ethernet interfaces on the front. It has convectional cooling (no fan).

MINI-LINK 6651/4 has a switch capacity of 47 Gbps and can connect one or two split mount radio links in two directions. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. Hierarchical Radio Link Bonding is supported. It has forced cooling (fan unit).

In this document, the notation MINI LINK 6651 will be used for generic specifications and parameters. The explicit notation MINI-LINK 6651/1, MINI-LINK 6651/2, MINI-LINK 6651/3 and MINI-LINK 6651/4 will be used where there are differences in the product versions.

MINI-LINK 6691 with NPU 1002 is a small flexible 1RU node for small aggregation hubs up to 4 radio links in a maximum of 4 radio directions. It has a switch capacity of 88 Gbps, where 38 Gbps can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front.

MINI-LINK 6691 with NPU 1003 is a small flexible 1RU node for small aggregation hubs up to 4 radio links in a maximum of 4 radio directions. It has a switch capacity of 45.5 Gbps, where 38 Gbps can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front.

MINI-LINK 6691 with NPU 1005 is a small flexible 1RU node for small aggregation hubs up to 4 radio links in a maximum of 4 radio directions. It has a switch capacity of 65.5 Gbps, where 43 Gbps can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. Hierarchical Radio Link Bonding is supported.

MINI-LINK 6692 with NPU 1002 is a flexible 3RU node for large aggregation hubs up to 16 radio links in a maximum of 15 radio directions. It has a switch capacity of 88 Gbps, where 7.5 Gbps is reserved for future use. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. MINI-LINK 6692 supports redundant NPUs and PFUs.

MINI-LINK 6692 with NPU 1005 is a flexible 3RU node for large aggregation hubs up to 16 radio links in a maximum of 11 radio directions. It has a switch capacity of 65.5 Gbps, where the full capacity can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. MINI-LINK 6692 supports redundant NPUs and PFUs. Hierarchical Radio Link Bonding is supported.

MINI-LINK 6693 with NPU 1002 is a flexible 1.5RU node for medium aggregation hubs up to 8 radio links in a maximum of 8 radio directions. It has a switch capacity of 88 Gbps, where 46.5 Gbps can be used in this enclosure and has 1 Gbps and 10 Gbps Ethernet interfaces on the front.

MINI-LINK 6693 with NPU 1003 is a flexible 1.5RU node for medium aggregation hubs up to 8 radio links in a maximum of 7 radio directions. It has a switch capacity of 45.5 Gbps, and the full capacity can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front.

MINI-LINK 6693 with NPU 1005 is a flexible 1.5RU node for medium aggregation hubs up to 8 radio links in a maximum of 7 radio directions. It has a switch capacity of 65.5 Gbps, where 55.5 Gbps can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. Hierarchical Radio Link Bonding is supported.

MINI-LINK 6694 with NPU 1002 is a flexible 2RU node for medium aggregation hubs up to 8 radio links in a maximum of 8 radio directions. It has a switch capacity of 88 Gbps where 59.5 Gbps can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. MINI-LINK 6694 supports redundant NPUs and PFUs.

MINI-LINK 6694 with NPU 1003 is a flexible 2RU node for medium aggregation hubs up to 8 radio links in a maximum of 7 radio directions. It has a switch capacity of 45.5 Gbps and the full capacity can be used in this enclosure. It has 1

Gbps and 10 Gbps Ethernet interfaces on the front. MINI-LINK 6694 supports redundant PFUs. Redundant NPU with NPU 1003 is not possible.

MINI-LINK 6694 with NPU 1005 is a flexible 2RU node for medium aggregation hubs up to 8 radio links in a maximum of 7 radio directions. It has a switch capacity of 65.5 Gbps where 55.5 can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. MINI-LINK 6694 supports redundant NPUs and PFUs. Hierarchical Radio Link Bonding is supported.

MINI-LINK 6654 with PNM 1001 is a small flexible 1RU node for medium aggregation hubs up to 5 radio links in a maximum of 5 radio directions. It has a switch capacity of 36.5 Gbps, and the full capacity can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front.

MINI-LINK 6654 with PNM 1002 is a small flexible 1RU node for medium aggregation hubs up to 6 radio links in a maximum of 6 radio directions. It has a switch capacity of 39 Gbps, and the full capacity can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front.

MINI-LINK 6655 with PNM 1002 is a small flexible 1.5RU node for medium aggregation hubs up to 10 radio links in a maximum of 8 radio directions. It has a switch capacity of 44 Gbps, and the full capacity can be used in this enclosure. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front.

MINI-LINK 6366 is an all-outdoor compact node. It has a switch capacity of 9.5 Gbps and can connect one or two radio units. It has 1 Gbps and 2.5 Gbps Ethernet interfaces on the front. In this document, the notation MINI LINK 6366 will be used for generic specifications and parameters. The explicit notation MINI-LINK 6366/1 and MINI-LINK 6366/4 will be used where there are differences in the product versions.

MINI-LINK 6371 is an all-outdoor compact node. It has a switch capacity of 36 Gbps and can connect one or two radio units, in two directions. It has 1 Gbps and 10 Gbps Ethernet interfaces on the front. Hierarchical Radio Link Bonding is supported.

1.1 Scope

This product specification defines the basic conditions, characteristics and performance of the MINI-LINK 6600, MINI-LINK 6366, and MINI-LINK 6371 Network Elements.

For more information about supported features please see

47/221 02-HRA 901 20/11 Technical Description MINI-LINK 6600,

49/221 02-HRA 901 20/13 Technical Description MINI-LINK 6366, and

4/221 02-HRA 901 20/18 Technical Description MINI-LINK 6300.

2 Ethernet Characteristics

For more information about supported features please see

47/221 02-HRA 901 20/11 Technical Description MINI-LINK 6600 and 49/221 02-HRA 901 20/13 Technical Description MINI-LINK 6366.

For relations between Frame ID and corresponding Channel Separation support, see also Channel Separation to Frame ID Relation on page 73.

2.1 Traffic Capacity

Capacity characteristics for Ethernet depend on hardware configuration, selected physical mode and assigned Ethernet traffic capacity. Measured values are typical, not guaranteed.

Measurements are done according to RFC 2544.

2.1.1 Layer 1 Line Interface Capacity for ETSI

Data for standard Frame ID's (256, 257, 258, 259, 260, 261, and 303) can be found in revision BT of this document.

Table 1 Layer 1 Line Interface Capacity for ETSI

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] (Frame ID)	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
7 (356)	4QAM S	8	10.8	9.8	8.9	8.8	8.8	8.8	8.8	8.8
	4QAM	10	12.7	11.5	10.1	10.3	10.4	10.3	10.3	10.3
	16QAM S	18	22.6	19.9	18.4	18.2	17.9	17.6	17.6	17.7
	16QAM	21	26.4	23.2	20.4	21.3	21	21	20.9	20.7
	32QAM	26	33.1	29.6	27.8	26.9	26.4	26.3	26.2	26.1
	64QAM	33	41.6	37.1	34.9	33.7	33.1	33	33	32.7
	128QAM	39	49.2	44	41.3	40	39.2	39.1	39	38.7
	256QAM	45	56.8	50.8	47.6	46.1	45.3	45.1	45	44.7
	512QAM	51	64.4	57.5	54	52.3	51.3	51.2	51	50.6
	1024QAM	56	71.2	63.7	59.8	57.8	56.8	56.6	56.5	56

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] (Frame ID)	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
13.75 14 (357)	4QAM S	19	23.3	20.8	19.5	18.9	18.6	18.5	18.4	18.3
	4QAM	22	27.2	24.3	22.9	22.1	2.7	21.6	21.6	21.4
	16QAM S	37	47	42	39.4	38.1	37.5	37.3	37.2	37
	16QAM	43	54.3	49.1	46.1	44.6	43.8	43.6	43.5	43.2
	32QAM	54	69	61.7	58	56	55	54.8	54.7	54.3
	64QAM	68	86.4	77.3	72.7	70.2	69	68.7	68.6	68
	128QAM	81	102.3	91.5	86	83	81.6	81.3	81.1	80.5
	256QAM	93	118.1	105.6	99.2	95.9	94.2	93.9	93.7	92.9
	512QAM	105	133.8	119.7	112.5	108.7	106.8	106.4	106.2	105.3
	1024QAM	117	148.2	132.5	124.5	120.3	118.2	117.8	117.5	116.6
	2048QAM	121	154	137.8	129.5	125.3	123	122.6	122.4	121.2
	2048QAM L	127	161.9	144.8	136.1	131.5	129.2	128.7	128.5	127.4
27.5 28 (358)	4QAM S	37	47.1	42.1	39.5	38.3	37.6	37.5	37.4	37.1
	4QAM	44	55	49.2	46.2	44.7	43.9	43.7	43.7	43.3
	16QAM S	75	94.6	84.7	79.4	76.8	75.5	75.2	75.1	74.5
	16QAM	87	110.4	98.8	92.9	89.7	88.1	87.8	87.6	86.9
	32QAM	109	138.7	124.1	116.6	112.8	110.8	110.4	110.2	109.1
	64QAM	137	173.8	155.5	146.1	141.2	138.6	138.2	137.9	136.8
	128QAM	162	205.4	183.8	172.8	167.1	164	163.4	163	161.7
	256QAM	186	237.2	212.2	199.4	192.9	189.5	188.8	188.4	186.7
	512QAM	211	268.9	240.5	226	218.6	214.8	214.1	213.6	211.6
	1024QAM	234	297.5	266.2	250.1	242	237.6	236.9	236.4	234.2
	2048QAM	243	309.4	276.7	260	251.6	247.1	246.3	245.8	243.5
	2048QAM L	256	325.2	290.9	273.4	264.5	259.7	258.9	258.4	255.9
	4096QAM	264	336	300.6	282.4	273.3	268.4	267.5	267	264.3
	4096QAM L	276	351.9	314.8	295.8	286.1	281	280.1	279.5	276.9
	8192QAM	284	361.1	323	303.5	293.7	288.7	287.7	287.1	284.4

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] (Frame ID)	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
40 (359)	4QAM S	53	67.5	60.4	56.7	54.9	53.9	53.7	53.6	53.1
	4QAM	62	78.8	70.5	66.2	64.1	62.9	62.7	62.6	62
	16QAM S	107	135.4	121.1	113.8	110.1	108.1	107.8	107.6	106.5
	16QAM	124	158	141.4	132.8	128.5	126.2	125.8	125.5	124.4
	32QAM	156	198.3	177.4	166.7	161.3	158.4	157.9	157.5	156.1
	64QAM	196	248.6	222.4	208.9	202.1	198.5	197.9	197.5	195.6
	128QAM	231	293.8	262.9	247	239	234.7	233.9	233.5	231.3
	256QAM	267	339.1	303.4	285.1	275.8	270.9	270	269.4	266.9
	512QAM	302	384.4	343.9	323.1	312.6	307	306	305.4	302.5
	1024QAM	335	425.4	380.4	357.6	345.9	339.8	338.6	338	334.8
	2048QAM	348	441.8	395.2	371.3	359.3	352.9	351.7	351	347.7
	2048QAM L	366	464.9	415.9	390.8	378.1	371.3	370.1	369.4	365.9
	4096QAM	378	480.3	429.7	403.7	390.6	383.7	382.4	381.6	378
	4096QAM L	395	499.9	450	422.8	409	401.7	400.4	399.6	395.8
	8192QAM	406	516.6	462.1	434.3	420.2	413.1	411.7	410.8	406.6
55 56 62.5 (360)	4QAM S	75	95.7	85.6	80.4	77.8	76.4	76.2	76	75.3
	4QAM	88	111.7	99.9	93.9	90.8	89.2	88.9	88.7	87.9
	16QAM S	151	191.8	171.6	161.2	156	153.2	152.7	152.1	150.9
	16QAM	176	223.8	199.7	188.1	182	178.6	177.9	177.6	176.1
	32QAM	221	280.8	251.2	236	228.3	224.3	223.5	223.1	221
	64QAM	277	351.9	314.8	295.8	286.2	281.1	280.2	279.6	277
	128QAM	327	416	372.1	349.7	338.3	332.3	331.2	330.5	327.4
	256QAM	377	480	429.4	403.5	390.4	383.4	382.2	381.4	377.8
	512QAM	427	544	486.6	457.3	442.4	434.5	433.1	432.2	428.1
	1024QAM	473	601.8	538.4	505.9	489.5	480.7	479.2	478.2	473.7
	2048QAM	492	625.7	559.8	526	508.9	499.8	498.2	497.2	492.5
	2048QAM L	517	657.7	588.4	552.9	534.9	525.3	523.6	522.6	517.6
	4096QAM	534	679.5	607.9	571.2	552.6	542.8	541	539.9	534.8
	4096QAM L	559	711.5	636.5	598.1	578.7	568.3	566.5	565.3	560

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] (Frame ID)	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
80 (403)	4QAM S	108	137.5	123	115.6	111.8	109.8	109.5	109.2	108.2
	4QAM	126	160.5	143.6	134.9	130.5	128.2	127.8	127.5	126.3
	16QAM S	217	275.4	246.4	231.5	224	220	219.3	218.8	216.7
	16QAM	253	321.4	287.5	270.2	261.4	256.7	255.9	255.3	252.9
	32QAM	317	403.1	360.7	338.9	327.9	322	321	320.3	317.3
	64QAM	397	504.4	451.2	423.9	410.1	402.8	401.5	400.7	396.9
	128QAM	469	597.2	534.3	502	485.7	477	475.5	474.5	470.1
	256QAM	542	689.2	616.5	579.4	560.5	550.5	548.7	547.6	542.4
	512QAM	614	781.1	698.8	656.7	635.3	623.9	621.9	620.6	614.8
	1024QAM	679	863.4	772.2	725.8	702.1	689.6	687.3	685.9	679.5
	2048QAM	706	898.6	803.6	755.4	730.8	717.8	715.5	714	707.2
	2048QAM L	742	943.2	843.8	792.9	767.1	753.4	750.9	749.4	742.3
	4096QAM	767	973.5	870.8	818.3	791.6	777.5	774.9	773.4	766.1
	4096QAM L	803	1020.9	913.2	858.2	830.3	816.3	813.5	811.7	803.9
110 112 125 (361 404)	4QAM S	151	191.6	171.4	161	155.8	153	152.5	152.2	150.8
	4QAM	176	223.6	200	187.9	181.8	178.6	178	177.6	175.9
	16QAM S	302	383.5	343.1	322.4	311.9	306.4	305.4	304.7	301.8
	16QAM	352	447.5	400.4	376.2	364	357.5	356.3	355.6	352.2
	32QAM	441	561.3	502.2	471.9	456.5	448.4	446.9	446	441.8
	64QAM	553	703.5	629.4	591.4	572.1	561.9	560.1	559	553.7
	128QAM	654	831.5	743.8	699	676.2	664.2	662	660.7	654.4
	256QAM	754	956.7	855.9	804.3	778	764.2	761.7	760	753
	512QAM	855	1085	966.5	908.2	878.7	862.9	860	858.5	850.3
	1024QAM	946	1201	1068	1009	974.8	957.7	952.6	952.2	943.3
	2048QAM	983	1248	1110	1048	1012	994.8	990.8	990.1	980.2
	2048QAM L	1033	1311	1167	1102	1063	1043	1041	1040	1030
	4096QAM	1068	1356	1206	1139	1100	1078	1076	1075	1065

2.1.2 Layer 1 Line Interface Capacity ANSI

Data for standard Frame ID's (262, 263, 264, 265, 266, 267, and 268) can be found in revision BT of this document.

Table 2 Layer 1 Line Interface Capacity ANSI

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] Frame ID	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
10 (362)	4QAM S	13	16	14.1	13.2	12.8	12.6	12.5	12.5	12.4
	4QAM	15	18.4	16.5	15.5	15	14.7	14.7	14.6	14.5
	16QAM S	25	31.8	28.4	26.7	25.8	25.4	25.3	25.2	25
	16QAM	29	37.1	33.2	31.2	30.2	29.7	29.6	29.5	29.2
	32QAM	37	46.7	41.7	39.2	37.9	37.3	37.1	37.1	36.7
	64QAM	46	58.5	52.4	49.2	47.6	46.7	46.6	46.5	46.1
	128QAM	55	69.2	61.9	58.2	56.3	55.3	55.1	55	54.5
	256QAM	63	79.9	71.5	67.2	65	63.8	63.6	63.5	62.9
	512QAM	71	90.6	81.1	76.2	73.7	72.4	72.2	72	71.3
	1024QAM	79	110.3	89.7	84.3	81.6	80.1	79.9	79.7	78.9
20 (363)	4QAM S	26	33.1	29.6	27.8	26.9	26.4	26.4	26.3	26.1
	4QAM	31	38.7	34.6	32.5	31.5	30.9	30.8	30.7	30.4
	16QAM S	53	66.6	59.6	56	54.2	53.2	53	52.9	52.4
	16QAM	61	77.8	69.6	65.4	63.3	62.1	61.9	61.8	61.2
	32QAM	77	97.7	87.4	82.1	79.4	78	77.8	77.6	76.9
	64QAM	97	122.5	109.6	103	99.6	97.8	97.5	97.3	96.4
	128QAM	114	144.8	129.6	121.7	117.8	115.7	115.3	115.1	114
	256QAM	132	176.2	149.6	140.5	136	133.5	133.1	132.8	131.6
	512QAM	149	189.5	169.5	159.3	154.1	151.4	150.9	150.6	149.2
	1024QAM	165	209.7	187.6	176.3	170.6	167.5	167	166.6	165.1
	2048QAM	172	218.1	195.1	183.3	177.3	174.2	173.6	173.3	171.6
	2048QAM L	180	229.3	205.1	192.7	186.4	183.1	182.5	182.1	180.4

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] Frame ID	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
28 (371)	4QAM S	37	47.1	42.1	39.5	38.3	37.6	37.5	37.4	37.1
	4QAM	44	55	49.2	46.2	44.7	43.9	43.7	43.7	43.3
	16QAM S	75	94.6	84.7	79.4	76.8	75.5	75.2	75.1	74.5
	16QAM	87	110.4	98.8	92.9	89.7	88.1	87.8	87.6	86.9
	32QAM	109	138.7	124.1	116.6	112.8	110.8	110.4	110.2	109.1
	64QAM	137	173.8	155.5	146.1	141.2	138.6	138.2	137.9	136.8
	128QAM	162	205.4	183.8	172.8	167.1	164	163.4	163	161.7
	256QAM	186	237.2	212.2	199.4	192.9	189.5	188.8	188.4	186.7
	512QAM	211	268.9	240.5	226	218.6	214.8	214.1	213.6	211.6
	1024QAM	234	297.5	266.2	250.1	242	237.6	236.9	236.4	234.2
	2048QAM	243	309.4	276.7	260	251.6	247.1	246.3	245.8	243.5
	2048QAM L	256	325.2	290.9	273.4	264.5	259.7	258.9	258.4	255.9
	4096QAM	264	336	300.6	282.4	273.3	268.4	267.5	267	264.3
	4096QAM L	276	351.9	314.8	295.8	286.1	281	280.1	279.5	276.9
30 (364)	4QAM S	40	50.4	45.1	42.4	41	40.3	40.1	40.1	39.7
	4QAM	47	58.9	52.7	49.5	47.9	47	46.9	46.8	46.4
	16QAM S	80	101.3	90.6	85.1	82.4	80.9	80.6	80.5	79.7
	16QAM	93	118.3	105.8	99.4	96.2	94.4	94.1	94	93.1
	32QAM	117	148.4	132.8	124.8	120.7	118.6	118.2	117.9	116.8
	64QAM	147	186.1	166.5	156.4	151.3	148.6	148.1	147.8	146.4
	128QAM	173	220	196.8	184.9	178.9	175.7	175.1	174.8	173.1
	256QAM	200	251	224.6	211	204.1	200.5	199.8	199.4	197.6
	512QAM	226	287.8	257.5	241.9	234.1	229.9	229.1	228.7	226.5
	1024QAM	251	318.5	284.9	267.7	259	254.4	253.6	253.1	250.7
	2048QAM	261	331.2	296.2	278.4	269.3	264.5	263.6	263.1	260.6
	2048QAM L	274	348.1	311.4	292.6	283.1	278.1	277.1	276.6	274
	4096QAM	283	359.7	321.8	302.4	292.5	287.3	286.4	285.8	283.1
	4096QAM L	296	376.6	336.9	316.6	306.3	300.8	299.9	299.3	296.4
	8192QAM	304	387	346.1	325.3	314.7	309.4	308.3	307.7	304.7

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] Frame ID	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
40 (365)	4QAM S	54	68	60.9	57.2	55.3	54.3	54.2	54	53.5
	4QAM	63	79.4	71.1	66.8	64.6	63.4	63.2	63.1	62.5
	16QAM S	108	136.5	122.1	114.7	111	109	108.7	108.4	107.4
	16QAM	126	159.3	142.5	133.9	129.6	127.3	126.8	126.6	125.4
	32QAM	157	199.9	178.8	168.1	162.5	159.7	159.2	158.8	157.3
	64QAM	197	250.6	224.2	210.7	203.8	200.2	199.5	199.1	197.2
	128QAM	233	296.2	265	249	240.9	236.6	235.9	235.4	233.2
	256QAM	269	341.9	305.9	287.4	278.1	273.1	272.2	271.6	269.1
	512QAM	305	387.6	346.7	325.8	315.2	309.6	308.5	307.9	305
	1024QAM	337	428.9	383.6	360.5	348.8	342.5	341.4	340.7	337.5
	2048QAM	351	445.9	398.9	374.8	362.6	356.1	355	354.3	350.9
	2048QAM L	369	468.7	419.3	394	381.2	374.4	373.2	372.4	368.9
	4096QAM	381	484.3	433.2	407.1	393.8	386.8	385.6	384.8	381.1
	4096QAM L	399	504.4	451.2	423.9	410.1	402.8	401.5	400.7	396.9
	8192QAM	409	520.9	465.9	437.9	423.6	416.5	415.1	414.2	410
50 (366)	4QAM S	68	85.5	76.5	71.8	69.6	68.3	68.1	68	67.3
	4QAM	79	99.9	89.3	83.9	81.2	79.8	79.5	79.3	78.6
	16QAM S	135	171.5	153.4	144.1	139.4	137	136.5	136.2	134.9
	16QAM	158	200	179	168.2	162.7	159.8	159.3	159	157.5
	32QAM	198	251	224.6	211	204.1	200.5	199.8	199.4	197.6
	64QAM	248	314.7	281.5	264.5	255.9	251.3	250.5	250	247.7
	128QAM	293	372	332.8	312.7	302.5	297.1	296.1	295.5	292.7
	256QAM	338	429.2	384	360.8	349.1	342.9	341.7	341	337.8
	512QAM	383	486.5	435.2	409	395.7	388.6	387.3	386.6	382.9
	1024QAM	423	538.4	481.6	452.6	437.8	430	428.6	427.6	423.7
	2048QAM	440	559.7	500.7	470.5	455.2	447.1	445.6	444.7	440.5
	2048QAM L	463	588.4	526.3	494.6	478.5	470	468.4	467.5	463.1
	4096QAM	478	607.9	543.8	511	494.4	485.6	484	483	478.4
	4096QAM L	500	636.4	569.5	535.1	517.7	508.5	506.8	505.8	501

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] Frame ID	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
56 (373)	4QAM S	75	95.7	85.6	80.4	77.8	76.4	76.2	76.0	75.3
	4QAM	88	111.7	99.9	93.9	90.8	89.2	88.9	88.7	87.9
	16QAM S	151	191.8	171.6	161.2	156	153.2	152.7	152.1	150.9
	16QAM	176	223.8	199.7	188.1	182	178.6	177.9	177.6	176.1
	32QAM	221	280.8	251.2	236	228.3	224.3	223.5	223.1	221
	64QAM	277	351.9	314.8	295.8	286.2	281.1	280.2	279.6	277
	128QAM	327	416	372.1	349.7	338.3	332.3	331.2	330.5	327.4
	256QAM	377	480	429.4	403.5	390.4	383.4	382.2	381.4	377.8
	512QAM	427	544	486.6	457.3	442.4	434.5	433.1	432.2	428.1
	1024QAM	473	601.8	538.4	505.9	489.5	480.7	479.2	478.2	473.7
	2048QAM	492	625.7	559.8	526	508.9	499.8	498.2	497.2	492.5
	2048QAM L	517	657.7	588.4	552.9	534.9	525.3	523.6	522.6	517.6
	4096QAM	534	679.5	607.9	571.2	552.6	542.8	541	539.9	534.8
	4096QAM L	559	711.5	636.5	598.1	578.7	568.3	566.5	565.3	560
60 (367)	4QAM S	81	102.8	92	86.4	83.6	82.1	81.8	81.7	80.9
	4QAM	95	120	107.4	100.9	97.6	95.9	95.5	95.4	94.5
	16QAM S	162	206.1	184.4	173.2	167.6	164.6	164.1	163.7	162.2
	16QAM	189	240.5	215.1	202.2	195.6	192.1	191.5	191.1	189.3
	32QAM	237	301.7	269.9	253.6	245.4	241	240.2	239.7	237.5
	64QAM	297	378.2	338.3	317.9	307.6	302.1	301.1	300.5	297.6
	128QAM	352	447	399.9	375.8	363.5	357.1	355.9	355.2	351.8
	256QAM	406	515.8	461.5	433.6	419.5	412	410.7	409.9	406
	512QAM	460	584.7	523.1	491.5	475.5	467	465.5	464.6	460.2
	1024QAM	509	647	578.8	543.9	526.2	516.8	515.1	514	509.2
	2048QAM	529	672.7	601.8	565.4	547	537.3	535.5	534.5	529.4
	2048QAM L	556	707.1	632.1	594.4	575	564.8	562.9	561.8	556.5
	4096QAM	574	730.6	653.6	614.1	594.1	583.5	581.6	580.5	575
	4096QAM L	601	759.2	679.1	638.1	617.4	606.4	604.4	603.2	597.5

Physical mode			Layer 1 Line Interface Capacity [Mbps]							
CS [MHz] Frame ID	Modulation	Frame size [bytes] / Air Interface Capacity [Mbps]	64	128	256	512	1024	1280	1518	9216
80 (368)	4QAM S	108	137.5	123	115.6	111.8	109.8	109.5	109.2	108.2
	4QAM	126	160.5	143.6	134.9	130.5	128.2	127.8	127.5	126.3
	16QAM S	217	275.4	246.4	231.5	224	220	219.3	218.8	216.7
	16QAM	253	321.4	287.5	270.2	261.4	256.7	255.9	255.3	252.9
	32QAM	317	403.1	360.7	338.9	327.9	322	321	320.3	317.3
	64QAM	397	504.4	451.2	423.9	410.1	402.8	401.5	400.7	396.9
	128QAM	469	597.2	534.3	502	485.7	477	475.5	474.5	470.1
	256QAM	542	689.2	616.5	579.4	560.5	550.5	548.7	547.6	542.4
	512QAM	614	781.1	698.8	656.7	635.3	623.9	621.9	620.6	614.8
	1024QAM	679	863.4	772.2	725.8	702.1	689.6	687.3	685.9	679.5
	2048QAM	706	898.6	803.6	755.4	730.8	717.8	715.5	714	707.2
	2048QAM L	742	943.2	843.8	792.9	767.1	753.4	750.9	749.4	742.3
	4096QAM	767	973.5	870.8	818.3	791.6	777.5	774.9	773.4	766.1
	4096QAM L	803	1020	913.2	858.2	830.3	816.3	813.5	811.7	804
112 (374)	4QAM S	151	191.6	171.4	161	155.8	153	152.5	152.2	150.8
	4QAM	176	223.6	200	187.9	181.8	178.6	178	177.6	175.9
	16QAM S	302	383.5	343.1	322.4	311.9	306.4	305.4	304.7	301.8
	16QAM	352	447.5	400.4	376.2	364	357.5	356.3	355.6	352.2
	32QAM	441	561.3	502.2	471.9	456.5	448.4	446.9	446	441.8
	64QAM	553	703.5	629.4	591.4	572.1	561.9	560.1	559	553.7
	128QAM	654	831.5	743.8	699	676.2	664.2	662	660.7	654.4
	256QAM	754	956.7	855.9	804.3	778	764.2	761.7	760	753
	512QAM	855	1085	966.5	908.2	878.7	862.9	860	858.5	850.3
	1024QAM	946	1201	1068	1009	974.8	957.7	945.9	945.3	943.3
	2048QAM	983	1248	1110	1048	1012	994.8	990.8	990.1	980.2
	2048QAM L	1033	1311	1167	1102	1063	1043	1041	1040	1030
	4096QAM	1068	1356	1206	1139	1100	1078	1076	1075	1065

2.1.3 Layer 2 Line Interface Capacity

L2 = L1 x (packet size) / (packet size +20)

2.2 Traffic Latency

Latency characteristics for Ethernet depend on hardware configuration, selected physical mode and assigned Ethernet traffic capacity. Measured values are typical, not guaranteed.

Measurements are done according to RFC 2544.

2.2.1 Traffic Latency for ETSI

The table below shows latency values for low latency Frame ID's.

Values for standard Frame ID's (256, 257, 258, 259, 260, 261 and 303) can be found in revision BT of this document.

Table 3 Traffic Latency for ETSI

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
7 (356)	4QAM S	64	766	750	840
		128	825	810	860
		256	946	930	980
		512	1204	1170	1210
		1024	1639	1630	1670
		1280	1896	1860	1900
		1518	2115	2080	2120
		9216	9185	9160	9200
7 (356)	4QAM	64	752	730	920
		128	799	780	840
		256	896	880	930
		512	1101	1090	1120
		1024	1510	1480	1520
		1280	1716	1680	1720
		1518	1904	1880	1910
		9216	7917	7910	7940

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
7 (356)	16QAM S	64	709	698	725
		128	736	728	754
		256	795	788	816
		512	917	900	980
		1024	1152	1140	1170
		1280	1272	1260	1290
		1518	1388	1370	1390
		9216	4914	4900	4980
7 (356)	16QAM	64	698	690	713
		128	722	716	738
		256	776	770	790
		512	875	870	890
		1024	1081	1070	1090
		1280	1180	1170	1190
		1518	1279	1273	1290
		9216	4314	4290	4360
7 (356)	32QAM	64	686	681	700
		128	707	702	720
		256	751	745	762
		512	832	827	840
		1024	994	990	1002
		1280	1076	1070	1080
		1518	1157	1148	1163
		9216	3580	3570	3630
7 (356)	64QAM	64	680	673	688
		128	694	690	705
		256	730	720	740
		512	796	793	803
		1024	924	922	933
		1280	992	980	1000
		1518	1054	1051	1062
		9216	3013	3000	3030

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
7 (356)	128QAM	64	673	669	682
		128	686	683	696
		256	716	713	724
		512	773	770	780
		1024	886	881	891
		1280	941	939	949
		1518	995	992	1001
		9216	2652	2640	2680
7 (356)	256QAM	64	669	665	676
		128	681	678	689
		256	707	700	720
		512	757	750	760
		1024	853	852	859
		1280	902	900	920
		1518	951	947	956
		9216	2395	2380	2420
7 (356)	512QAM	64	665	662	672
		128	678	674	684
		256	696	690	701
		512	745	740	750
		1024	829	828	836
		1280	874	872	880
		1518	917	915	922
		9216	2198	2190	2220
7 (356)	1024QAM	64	664	661	670
		128	674	671	680
		256	695	692	701
		512	737	735	741
		1024	815	813	820
		1280	854	852	859
		1518	891	889	896
		9216	2056	2051	2059

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
13.75 14 (357)	4QAM S	64	391	384	413
		128	423	410	480
		256	482	470	550
		512	597	580	660
		1024	821	810	890
		1280	940	920	1000
		1518	1043	1030	1050
		9216	4482	4460	4540
13.75 14 (357)	4QAM	64	391	370	460
		128	411	400	429
		256	460	450	510
		512	559	550	610
		1024	752	740	800
		1280	848	840	910
		1518	943	930	950
		9216	3869	3860	3930
13.75 14 (357)	16QAM S	64	366	350	410
		128	379	373	402
		256	407	400	440
		512	466	460	500
		1024	581	570	610
		1280	642	630	670
		1518	699	690	704
		9216	2428	2420	2460
13.75 14 (357)	16QAM	64	358	353	382
		128	371	367	396
		256	398	390	420
		512	448	440	470
		1024	548	540	570
		1280	600	590	620
		1518	648	642	655
		9216	2140	2130	2160

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
13.75 14 (357)	32QAM	64	353	349	378
		128	364	360	386
		256	384	380	400
		512	426	420	450
		1024	506	505	515
		1280	549	547	554
		1518	588	585	593
		9216	1791	1780	1810
13.75 14 (357)	64QAM	64	349	345	374
		128	357	354	373
		256	376	374	380
		512	409	407	424
		1024	475	472	493
		1280	508	506	528
		1518	539	536	544
		9216	1510	1508	1514
13.75 14 (357)	128QAM	64	346	343	367
		128	354	350	370
		256	369	368	374
		512	398	397	414
		1024	454	452	467
		1280	485	482	490
		1518	510	508	515
		9216	1342	1337	1343
13.75 14 (357)	256QAM	64	355	340	370
		128	353	349	358
		256	365	360	370
		512	391	389	393
		1024	440	439	443
		1280	467	464	469
		1518	490	488	492
		9216	1218	1214	1230

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
13.75 14 (357)	512QAM	64	354	346	357
		128	349	347	355
		256	362	360	392
		512	385	384	388
		1024	428	427	431
		1280	454	451	455
		1518	473	471	475
		9216	1123	1120	1134
13.75 14 (357)	1024QAM	64	352	346	357
		128	347	345	355
		256	363	362	380
		512	381	379	383
		1024	420	419	423
		1280	443	442	445
		1518	459	458	461
		9216	1054	1052	1065
13.75 14 (357)	2048QAM	64	350	345	354
		128	348	345	354
		256	361	360	378
		512	379	377	383
		1024	418	417	420
		1280	439	437	441
		1518	457	456	460
		9216	1030	1027	1035
13.75 14 (357)	2048QAM L	64	349	344	359
		128	346	344	351
		256	358	356	360
		512	378	376	380
		1024	415	413	417
		1280	435	433	437
		1518	452	450	454
		9216	1000	998	1010

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
27.5 28 (358)	4QAM S	64	217	213	240
		128	232	228	255
		256	262	258	284
		512	322	318	345
		1024	437	432	456
		1280	498	492	518
		1518	553	549	567
		9216	2292	2289	2312
27.5 28 (358)	4QAM	64	213	209	236
		128	225	222	249
		256	252	248	275
		512	303	300	327
		1024	403	398	424
		1280	455	450	477
		1518	502	498	519
		9216	1995	1992	2014
27.5 28 (358)	16QAM S	64	202	200	226
		128	210	208	226
		256	228	225	243
		512	259	257	274
		1024	319	318	335
		1280	351	348	367
		1518	380	378	392
		9216	1285	1283	1301
27.5 28 (358)	16QAM	64	201	198	221
		128	208	205	232
		256	222	220	235
		512	250	249	263
		1024	303	301	316
		1280	331	328	344
		1518	356	355	367
		9216	1141	1139	1155

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
27.5 28 (358)	32QAM	64	198	196	220
		128	204	202	223
		256	224	210	240
		512	239	238	265
		1024	282	281	293
		1280	305	303	316
		1518	326	325	334
		9216	967	966	979
27.5 28 (358)	64QAM	64	195	193	211
		128	201	199	217
		256	216	214	237
		512	231	229	252
		1024	266	265	274
		1280	286	284	294
		1518	303	301	309
		9216	829	828	838
27.5 28 (358)	128QAM	64	202	196	220
		128	199	198	213
		256	221	207	226
		512	225	224	242
		1024	256	255	263
		1280	273	272	280
		1518	288	287	294
		9216	745	744	752
27.5 28 (358)	256QAM	64	205	196	217
		128	198	196	210
		256	216	204	222
		512	221	220	236
		1024	249	248	254
		1280	265	263	270
		1518	278	276	282
		9216	684	682	691

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
27.5 28 (358)	512QAM	64	204	199	213
		128	197	196	208
		256	214	203	219
		512	219	218	231
		1024	244	242	248
		1280	258	256	262
		1518	271	269	275
		9216	637	636	643
27.5 28 (358)	1024QAM	64	202	198	211
		128	203	198	213
		256	211	202	215
		512	216	215	228
		1024	239	238	243
		1280	253	251	256
		1518	264	262	267
		9216	603	602	608
27.5 28 (358)	2048QAM	64	202	198	210
		128	202	198	212
		256	211	202	215
		512	216	215	227
		1024	238	237	242
		1280	251	250	255
		1518	262	261	265
		9216	591	589	596
27.5 28 (358)	2048QAM L	64	201	197	209
		128	202	198	211
		256	211	201	214
		512	215	214	225
		1024	236	235	240
		1280	249	248	253
		1518	259	258	260
		9216	576	575	581

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
27.5 28 (358)	4096QAM	64	201	197	208
		128	203	197	210
		256	210	201	213
		512	214	213	224
		1024	235	234	238
		1280	247	246	251
		1518	258	256	260
		9216	566	565	571
27.5 28 (358)	4096QAM L	64	200	197	208
		128	204	197	209
		256	208	202	212
		512	213	212	223
		1024	234	233	237
		1280	246	245	249
		1518	256	254	258
		9216	554	553	559
27.5 28 (358)	81926QAM	64	200	197	208
		128	203	198	210
		256	210	202	214
		512	214	213	223
		1024	234	233	237
		1280	245	244	249
		1518	255	254	257
		9216	548	546	552
40 (359)	4QAM S	64	162	159	186
		128	173	170	195
		256	195	192	217
		512	234	235	260
		1024	320	318	343
		1280	363	360	385
		1518	403	400	420
		9216	1630	1628	1653

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (359)	4QAM	64	159	156	183
		128	168	166	187
		256	187	185	206
		512	225	223	243
		1024	296	293	314
		1280	333	330	352
		1518	367	365	383
		9216	1433	1432	1454
40 (359)	16QAM S	64	152	150	177
		128	158	156	178
		256	171	168	195
		512	194	192	204
		1024	238	236	248
		1280	261	259	271
		1518	283	281	290
		9216	939	936	948
40 (359)	16QAM	64	159	152	177
		128	156	154	174
		256	179	165	191
		512	187	186	211
		1024	226	225	235
		1280	247	245	256
		1518	265	264	272
		9216	838	835	847
40 (359)	32QAM	64	156	151	176
		128	153	151	167
		256	175	161	181
		512	180	179	198
		1024	212	210	218
		1280	229	228	236
		1518	247	243	250
		9216	715	714	724

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (359)	64QAM	64	158	152	169
		128	151	150	167
		256	169	158	174
		512	174	173	188
		1024	200	199	205
		1280	215	214	220
		1518	228	227	232
		9216	619	618	626
40 (359)	128QAM	64	156	152	165
		128	157	152	167
		256	166	156	170
		512	170	169	182
		1024	194	193	198
		1280	207	206	211
		1518	218	217	221
		9216	560	559	566
40 (359)	256QAM	64	154	151	162
		128	157	151	164
		256	163	155	166
		512	168	167	178
		1024	189	187	192
		1280	201	199	204
		1518	211	210	213
		9216	517	516	522
40 (359)	512QAM	64	153	150	159
		128	155	150	161
		256	161	155	166
		512	165	164	174
		1024	184	183	187
		1280	196	195	199
		1518	205	204	207
		9216	484	483	489

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (359)	1024QAM	64	152	149	158
		128	156	149	159
		256	160	154	163
		512	164	163	171
		1024	182	181	184
		1280	192	191	195
		1518	201	200	203
		9216	461	460	465
40 (359)	2048QAM	64	153	150	158
		128	155	149	159
		256	159	154	163
		512	164	162	171
		1024	181	180	183
		1280	191	190	194
		1518	200	199	201
		9216	453	451	456
40 (359)	2048QAM L	64	152	149	157
		128	155	149	158
		256	159	153	163
		512	163	162	170
		1024	180	179	182
		1280	190	189	192
		1518	198	197	200
		9216	442	441	446
40 (359)	4096QAM	64	153	149	157
		128	154	149	157
		256	158	153	162
		512	163	162	169
		1024	179	178	181
		1280	189	188	191
		1518	197	196	198
		9216	436	435	439

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (359)	4096QAM L	64	152	149	156
		128	154	149	157
		256	158	153	161
		512	162	161	168
		1024	178	177	180
		1280	188	186	190
		1518	195	194	196
		9216	427	426	430
40 (359)	8192QAM	64	152	149	155
		128	153	148	156
		256	157	152	161
		512	162	161	168
		1024	177	176	179
		1280	187	186	189
		1518	195	194	195
		9216	422	421	425
55 56 62.5 (360)	4QAM S	64	122	119	144
		128	130	127	144
		256	146	144	149
		512	177	175	187
		1024	236	234	251
		1280	269	266	283
		1518	296	294	299
		9216	1185	1181	1189
55 56 62.5 (360)	4QAM	64	120	117	146
		128	127	124	140
		256	141	139	153
		512	168	166	181
		1024	219	217	232
		1280	247	244	260
		1518	272	269	274
		9216	1035	1034	1041

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
55 56 62.5 (360)	16QAM S	64	130	120	142
		128	119	117	127
		256	131	127	147
		512	146	145	153
		1024	178	177	186
		1280	196	195	203
		1518	211	210	217
		9216	684	683	688
55 56 62.5 (360)	16QAM	64	126	119	138
		128	118	116	125
		256	131	124	143
		512	142	140	147
		1024	170	169	176
		1280	187	185	192
		1518	199	198	204
		9216	613	612	617
55 56 62.5 (360)	32QAM	64	123	118	131
		128	124	118	133
		256	132	122	136
		512	136	135	141
		1024	160	159	164
		1280	174	172	178
		1518	185	183	188
		9216	527	526	533
55 56 62.5 (360)	64QAM	64	119	116	127
		128	122	116	128
		256	128	119	129
		512	132	131	136
		1024	152	151	175
		1280	164	162	167
		1518	173	172	176
		9216	459	458	464

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
55 56 62.5 (360)	128QAM	64	115	110	121
		128	121	116	124
		256	121	115	125
		512	125	118	129
		1024	130	128	133
		1280	147	146	150
		1518	158	156	160
		9216	166	164	168
55 56 62.5 (360)	256QAM	64	119	115	122
		128	120	114	123
		256	124	118	128
		512	128	126	135
		1024	144	142	146
		1280	153	152	155
		1518	161	159	162
		9216	388	386	391
55 56 62.5 (360)	512QAM	64	119	114	122
		128	120	114	122
		256	123	118	126
		512	127	126	129
		1024	141	140	143
		1280	150	149	152
		1518	156	155	158
		9216	365	363	368
55 56 62.5 (360)	1024QAM	64	117	114	120
		128	118	114	121
		256	121	117	125
		512	129	124	131
		1024	139	138	141
		1280	148	146	149
		1518	154	152	155
		9216	349	347	351

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
55 56 62.5 (360)	2048QAM	64	117	114	120
		128	118	114	121
		256	121	117	124
		512	127	123	130
		1024	138	137	140
		1280	147	146	148
		1518	153	151	154
		9216	342	341	345
55 56 62.5 (360)	2048QAM L	64	116	113	119
		128	117	113	120
		256	120	117	124
		512	128	123	129
		1024	138	136	139
		1280	146	145	147
		1518	152	150	153
		9216	335	333	338
55 56 62.5 (360)	4096QAM	64	116	113	119
		128	117	113	120
		256	121	117	124
		512	125	123	129
		1024	137	136	138
		1280	145	144	146
		1518	151	149	152
		9216	331	329	333
55 56 62.5 (360)	4096QAM L	64	117	114	119
		128	117	114	120
		256	120	117	123
		512	128	123	129
		1024	137	136	138
		1280	145	143	146
		1518	150	149	151
		9216	325	323	327

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (403)	4QAM S	64	98	96	119
		128	103	102	123
		256	120	110	140
		512	145	135	155
		1024	183	181	193
		1280	206	204	216
		1518	227	225	235
		9216	875	874	887
80 (403)	4QAM	64	105	98	123
		128	101	100	119
		256	120	110	136
		512	133	131	156
		1024	171	169	179
		1280	191	190	200
		1518	210	208	214
		9216	773	771	783
80 (403)	16QAM S	64	103	97	112
		128	97	95	111
		256	110	102	117
		512	118	116	130
		1024	142	141	146
		1280	156	155	160
		1518	168	166	171
		9216	529	527	535
80 (403)	16QAM	64	101	97	109
		128	101	97	111
		256	111	101	113
		512	114	113	125
		1024	136	135	140
		1280	149	148	153
		1518	159	158	161
		9216	479	478	484

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (403)	32QAM	64	98	95	105
		128	101	95	106
		256	106	100	111
		512	111	110	119
		1024	129	128	132
		1280	140	139	143
		1518	149	148	151
		9216	419	418	424
80 (403)	64QAM	64	98	95	102
		128	100	95	102
		256	103	99	107
		512	108	106	114
		1024	124	123	126
		1280	133	132	135
		1518	141	140	142
		9216	372	371	375
80 (403)	128QAM	64	97	94	100
		128	98	94	101
		256	102	98	104
		512	107	105	111
		1024	120	119	122
		1280	129	128	131
		1518	136	135	137
		9216	343	342	346
80 (403)	256QAM	64	96	94	98
		128	97	93	100
		256	100	97	103
		512	108	104	109
		1024	118	117	119
		1280	126	125	127
		1518	132	131	133
		9216	322	321	324

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (403)	512QAM	64	95	93	97
		128	96	94	98
		256	99	96	101
		512	107	103	108
		1024	116	115	117
		1280	124	123	125
		1518	131	130	132
		9216	306	305	308
80 (403)	1024QAM	64	95	92	96
		128	96	93	98
		256	98	96	100
		512	106	102	107
		1024	115	114	118
		1280	122	121	123
		1518	128	127	128
		9216	295	294	296
80 (403)	2048QAM	64	94	93	96
		128	95	93	97
		256	98	96	100
		512	105	102	106
		1024	114	113	115
		1280	121	120	122
		1518	127	126	127
		9216	291	289	292
80 (403)	2048QAM L	64	94	92	95
		128	95	93	97
		256	98	96	99
		512	105	102	106
		1024	114	113	116
		1280	120	120	121
		1518	126	125	127
		9216	286	284	287

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (403)	4096QAM	64	94	92	95
		128	95	93	96
		256	97	95	99
		512	105	102	106
		1024	113	112	116
		1280	120	119	123
		1518	125	124	126
		9216	282	281	284
80 (403)	4096QAM L	64	94	92	95
		128	95	93	96
		256	97	95	99
		512	104	102	453
		1024	113	112	116
		1280	120	119	122
		1518	125	124	125
		9216	278	277	279
110 112 125 (361 404)	4QAM S	64	92	80	105
		128	82	80	96
		256	96	89	111
		512	109	107	116
		1024	141	139	149
		1280	159	157	166
		1518	174	172	180
		9216	649	648	653
110 112 125 (361 404)	4QAM	64	88	81	101
		128	88	83	102
		256	98	87	105
		512	105	103	110
		1024	133	131	138
		1280	149	147	154
		1518	162	160	167
		9216	575	574	578

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
110 112 125 (361 404)	16QAM S	64	83	78	89
		128	83	78	89
		256	90	81	93
		512	93	92	96
		1024	112	111	115
		1280	123	122	126
		1518	132	130	134
		9216	400	399	404
110 112 125 (361 404)	16QAM	64	82	78	86
		128	82	78	87
		256	87	80	90
		512	92	90	94
		1024	108	107	110
		1280	118	117	120
		1518	126	125	128
		9216	364	363	368
110 112 125 (361 404)	32QAM	64	80	77	83
		128	81	77	84
		256	84	80	88
		512	90	87	95
		1024	103	102	105
		1280	112	111	114
		1518	118	117	120
		9216	322	321	325
110 112 125 (361 404)	64QAM	64	78	75	81
		128	80	76	82
		256	82	79	85
		512	89	85	91
		1024	99	98	100
		1280	107	106	108
		1518	112	111	114
		9216	288	287	290

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
110 112 125 (361 404)	128QAM	64	77	75	79
		128	78	75	80
		256	81	78	83
		512	88	84	89
		1024	97	96	100
		1280	104	103	105
		1518	109	108	110
		9216	268	266	269
110 112 125 (361 404)	256QAM	64	76	75	78
		128	77	75	78
		256	80	78	82
		512	86	83	88
		1024	95	94	98
		1280	102	100	103
		1518	106	105	107
		9216	253	251	254
110 112 125 (361 404)	512QAM	64	76	74	77
		128	76	75	78
		256	79	77	81
		512	86	84	87
		1024	93	92	96
		1280	100	99	103
		1518	104	103	105
		9216	241	240	242
110 112 125 (361 404)	1024QAM	64	75	74	77
		128	76	74	77
		256	78	77	80
		512	85	82	86
		1024	92	91	95
		1280	99	98	102
		1518	103	102	104
		9216	233	231	234

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
110 112 125 (361)	2048QAM	64	75	74	76
		128	76	74	77
		256	79	77	80
		512	85	83	86
		1024	92	91	95
		1280	98	97	101
		1518	103	101	103
		9216	230	228	231
110 112 125 (361)	2048QAM L	64	75	74	76
		128	76	74	77
		256	78	77	80
		512	85	83	85
		1024	92	91	94
		1280	98	97	100
		1518	102	101	102
		9216	226	225	227
110 112 125 (361)	4096QAM	64	75	74	76
		128	75	74	76
		256	78	77	80
		512	84	82	85
		1024	91	90	94
		1280	97	96	98
		1518	101	100	102
		9216	224	222	225

2.2.2 Traffic Latency for ANSI

The table below shows the latency values for low latency Frame ID's.

Values for standard Frame ID's (262, 263, 264, 265, 266, 267 and 268) can be found in revision BT of this document.

Table 4 Traffic Latency for ANSI

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
10 (362)	4QAM S	64	567	540	730
		128	609	580	730
		256	730	700	830
		512	936	900	1030
		1024	1341	1260	1380
		1280	1512	1440	1560
		1518	1532	1490	1570
		9216	6665	6640	6700
10 (362)	4QAM	64	556	530	670
		128	584	570	690
		256	684	650	770
		512	859	830	930
		1024	1202	1170	1240
		1280	1363	1340	1400
		1518	1367	1340	1410
		9216	5757	5730	5790
10 (362)	16QAM S	64	521	500	540
		128	541	520	590
		256	590	570	610
		512	687	672	701
		1024	876	840	920
		1280	967	930	990
		1518	1002	992	1020
		9216	3590	3570	3600
10 (362)	16QAM	64	514	500	580
		128	532	521	550
		256	570	558	587
		512	651	630	700
		1024	818	790	850
		1280	894	860	930
		1518	930	920	980
		9216	3148	3136	3163

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
10 (362)	32QAM	64	504	496	525
		128	519	511	540
		256	547	542	571
		512	613	600	650
		1024	728	717	746
		1280	791	776	805
		1518	840	830	870
		9216	2619	2612	2635
10 (362)	64QAM	64	496	491	520
		128	509	503	532
		256	536	520	560
		512	585	570	610
		1024	682	670	710
		1280	737	720	760
		1518	769	760	790
		9216	2201	2197	2214
10 (362)	128QAM	64	493	487	516
		128	506	498	526
		256	524	510	570
		512	567	560	590
		1024	651	640	670
		1280	695	680	720
		1518	725	721	741
		9216	1948	1941	1955
10 (362)	256QAM	64	490	485	514
		128	498	490	530
		256	517	510	560
		512	554	540	570
		1024	628	622	642
		1280	667	660	680
		1518	693	691	707
		9216	1761	1756	1768

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
10 (362)	512QAM	64	488	483	512
		128	497	490	520
		256	514	500	550
		512	547	542	553
		1024	611	604	615
		1280	645	642	654
		1518	669	667	681
		9216	1619	1615	1625
10 (362)	1024QAM	64	487	482	511
		128	494	480	520
		256	509	495	530
		512	537	532	552
		1024	598	592	613
		1280	629	623	642
		1518	653	650	663
		9216	1514	1511	1521
20 (363)	4QAM S	64	287	279	308
		128	315	300	360
		256	356	340	410
		512	452	420	500
		1024	626	590	670
		1280	720	680	760
		1518	764	740	810
		9216	3238	3228	3256
20 (363)	4QAM	64	283	274	303
		128	300	292	321
		256	339	327	356
		512	415	400	460
		1024	571	550	600
		1280	647	620	660
		1518	684	670	730
		9216	2804	2798	2822

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
20 (363)	16QAM S	64	267	261	279
		128	279	270	320
		256	299	290	350
		512	346	330	370
		1024	433	423	442
		1280	480	460	500
		1518	508	503	524
		9216	1775	1771	1784
20 (363)	16QAM	64	263	259	288
		128	272	268	293
		256	290	287	300
		512	330	325	338
		1024	405	398	415
		1280	447	439	454
		1518	474	469	485
		9216	1568	1563	1574
20 (363)	32QAM	64	258	256	284
		128	267	260	290
		256	283	280	300
		512	315	310	321
		1024	371	368	378
		1280	404	399	411
		1518	430	427	436
		9216	1315	1312	1321
20 (363)	64QAM	64	266	258	287
		128	262	260	287
		256	276	270	300
		512	302	298	316
		1024	351	346	365
		1280	376	371	390
		1518	397	394	401
		9216	1115	1113	1120

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
20 (363)	128QAM	64	265	257	285
		128	259	257	281
		256	271	269	283
		512	294	291	305
		1024	337	332	348
		1280	358	354	369
		1518	376	373	379
		9216	994	991	997
20 (363)	256QAM	64	262	255	272
		128	258	256	276
		256	269	266	278
		512	288	286	298
		1024	325	322	335
		1280	344	341	355
		1518	361	359	364
		9216	905	903	908
20 (363)	512QAM	64	266	258	282
		128	259	256	275
		256	269	266	284
		512	286	283	295
		1024	319	316	322
		1280	337	334	341
		1518	351	349	357
		9216	839	835	840
20 (363)	1024QAM	64	267	258	280
		128	258	255	277
		256	271	264	285
		512	283	281	291
		1024	313	311	321
		1280	329	327	338
		1518	343	341	347
		9216	789	786	791

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
20 (363)	2048QAM	64	266	258	279
		128	260	255	277
		256	266	264	283
		512	281	279	289
		1024	311	309	318
		1280	327	325	335
		1518	340	338	344
		9216	773	769	774
20 (363)	2048QAM L	64	265	257	277
		128	262	259	278
		256	267	263	282
		512	280	279	287
		1024	309	307	316
		1280	324	322	331
		1518	337	335	339
		9216	750	747	752
28 (371)	4QAM S	64	217	213	240
		128	232	228	255
		256	262	258	284
		512	322	318	345
		1024	437	432	456
		1280	498	492	518
		1518	553	549	567
		9216	2292	2289	2312
28 (371)	4QAM	64	213	209	236
		128	225	222	249
		256	252	248	275
		512	303	300	327
		1024	403	398	424
		1280	455	450	477
		1518	502	498	519
		9216	1995	1992	2014

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
28 (371)	16QAM S	64	202	200	226
		128	210	208	226
		256	228	225	243
		512	259	257	274
		1024	319	318	335
		1280	351	348	367
		1518	380	378	392
		9216	1285	1283	1301
28 (371)	16QAM	64	201	198	221
		128	208	205	232
		256	222	220	235
		512	250	249	263
		1024	303	301	316
		1280	331	328	344
		1518	356	355	367
		9216	1141	1139	1155
28 (371)	32QAM	64	198	196	220
		128	204	202	223
		256	224	210	240
		512	239	238	265
		1024	282	281	293
		1280	305	303	316
		1518	326	325	334
		9216	967	966	979
28 (371)	64QAM	64	195	193	211
		128	201	199	217
		256	216	214	237
		512	231	229	252
		1024	266	265	274
		1280	286	284	294
		1518	303	301	309
		9216	829	828	838

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
28 (371)	128QAM	64	202	196	220
		128	199	198	213
		256	221	207	226
		512	225	224	242
		1024	256	255	263
		1280	273	272	280
		1518	288	287	294
		9216	745	744	752
28 (371)	256QAM	64	205	196	217
		128	198	196	210
		256	216	204	222
		512	221	220	236
		1024	249	248	254
		1280	265	263	270
		1518	278	276	282
		9216	684	682	691
28 (371)	512QAM	64	204	199	213
		128	197	196	208
		256	214	203	219
		512	219	218	231
		1024	244	242	248
		1280	258	256	262
		1518	271	269	275
		9216	637	636	643
28 (371)	1024QAM	64	202	198	211
		128	203	198	213
		256	211	202	215
		512	216	215	228
		1024	239	238	243
		1280	253	251	256
		1518	264	262	267
		9216	603	602	608

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
28 (371)	2048QAM	64	202	198	210
		128	202	198	212
		256	211	202	215
		512	216	215	227
		1024	238	237	242
		1280	251	250	255
		1518	262	261	265
		9216	591	589	596
28 (371)	2048QAM L	64	201	197	209
		128	202	198	211
		256	211	201	214
		512	215	214	225
		1024	236	235	240
		1280	249	248	253
		1518	259	258	260
		9216	576	575	581
28 (371)	4096QAM	64	201	197	208
		128	203	197	210
		256	210	201	213
		512	214	213	224
		1024	235	234	238
		1280	247	246	251
		1518	258	256	260
		9216	566	565	571
28 (371)	4096QAM L	64	200	197	208
		128	204	197	209
		256	208	202	212
		512	213	212	223
		1024	234	233	237
		1280	246	245	249
		1518	256	254	258
		9216	554	553	559

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
30 (364)	4QAM S	64	204	200	226
		128	219	214	241
		256	247	243	266
		512	302	299	322
		1024	411	406	428
		1280	467	462	485
		1518	519	515	534
		9216	2147	2144	2166
30 (364)	4QAM	64	200	197	224
		128	212	209	236
		256	237	234	253
		512	288	280	310
		1024	378	375	397
		1280	427	420	450
		1518	471	467	475
		9216	1869	1867	1874
30 (364)	16QAM S	64	190	188	212
		128	198	196	212
		256	214	211	228
		512	244	241	258
		1024	300	299	315
		1280	331	329	345
		1518	258	356	360
		9216	1207	1205	1209
30 (364)	16QAM	64	188	186	200
		128	195	193	207
		256	213	200	240
		512	235	233	240
		1024	285	283	290
		1280	311	310	317
		1518	335	333	337
		9216	1073	1071	1079

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
30 (364)	32QAM	64	196	189	214
		128	192	190	201
		256	211	202	228
		512	225	224	234
		1024	266	265	270
		1280	288	286	297
		1518	307	306	309
		9216	911	909	916
30 (364)	64QAM	64	192	187	207
		128	189	187	203
		256	213	197	219
		512	217	216	224
		1024	250	249	258
		1280	269	267	276
		1518	285	284	290
		9216	782	781	790
30 (364)	128QAM	64	189	186	207
		128	187	186	200
		256	206	195	213
		512	212	211	218
		1024	241	240	247
		1280	258	256	264
		1518	272	271	274
		9216	703	702	296
30 (364)	256QAM	64	194	187	203
		128	186	185	205
		256	204	193	209
		512	208	207	222
		1024	235	234	240
		1280	249	248	255
		1518	262	261	266
		9216	646	644	652

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
30 (364)	512QAM	64	192	186	201
		128	192	188	203
		256	200	191	120
		512	206	205	218
		1024	230	229	234
		1280	243	242	248
		1518	255	254	258
		9216	602	601	608
30 (364)	1024QAM	64	190	186	198
		128	191	187	200
		256	200	190	203
		512	208	198	211
		1024	226	225	230
		1280	238	237	242
		1518	249	248	251
		9216	570	569	575
30 (364)	2048QAM	64	190	186	198
		128	192	186	199
		256	199	190	202
		512	203	202	213
		1024	225	223	228
		1280	237	236	240
		1518	247	246	249
		9216	559	558	564
30 (364)	2048QAM L	64	189	185	197
		128	191	186	198
		256	198	189	202
		512	202	201	212
		1024	223	222	226
		1280	235	234	238
		1518	245	244	247
		9216	545	544	550

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
30 (364)	4096QAM	64	189	185	196
		128	191	186	197
		256	197	189	202
		512	201	200	211
		1024	222	221	225
		1280	233	232	237
		1518	243	242	245
		9216	536	535	541
30 (364)	4096QAM L	64	189	185	195
		128	192	186	197
		256	196	189	200
		512	201	200	210
		1024	221	219	223
		1280	232	231	235
		1518	241	240	243
		9216	525	523	529
30 (364)	8192QAM	64	188	185	195
		128	191	185	196
		256	196	189	200
		512	200	199	209
		1024	220	218	222
		1280	231	230	321
		1518	240	239	242
		9216	518	517	522
40 (365)	4QAM S	64	161	158	185
		128	172	169	194
		256	194	191	216
		512	237	235	258
		1024	319	316	340
		1280	362	358	383
		1518	401	398	404
		9216	1630	1628	1653

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (365)	4QAM	64	158	155	182
		128	168	165	1186
		256	186	184	205
		512	223	221	242
		1024	294	292	313
		1280	331	329	350
		1518	365	362	380
		9216	1423	1421	1443
40 (365)	16QAM S	64	151	149	176
		128	157	155	178
		256	173	160	190
		512	193	192	203
		1024	237	235	247
		1280	260	258	271
		1518	281	280	290
		9216	931	930	943
40 (365)	16QAM	64	158	152	176
		128	155	153	172
		256	172	164	190
		512	186	185	209
		1024	225	223	233
		1280	246	244	254
		1518	264	263	271
		9216	832	830	841
40 (365)	32QAM	64	155	151	169
		128	152	151	167
		256	171	160	181
		512	179	178	198
		1024	211	209	217
		1280	228	227	235
		1518	243	242	249
		9216	711	710	719

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (365)	64QAM	64	158	151	168
		128	151	149	167
		256	168	157	173
		512	178	164	180
		1024	199	198	205
		1280	214	213	219
		1518	227	226	231
		9216	615	614	622
40 (365)	128QAM	64	155	151	164
		128	156	152	166
		256	164	155	169
		512	169	168	181
		1024	193	192	197
		1280	206	205	126
		1518	217	216	220
		9216	557	556	563
40 (365)	256QAM	64	153	150	161
		128	155	150	163
		256	162	154	167
		512	167	166	177
		1024	188	187	198
		1280	200	199	203
		1518	210	209	212
		9216	514	513	520
40 (365)	512QAM	64	153	150	160
		128	155	150	161
		256	161	153	165
		512	165	164	174
		1024	184	183	187
		1280	195	194	198
		1518	204	203	207
		9216	482	481	486

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (365)	1024QAM	64	151	149	157
		128	155	149	158
		256	159	153	163
		512	163	162	171
		1024	181	180	184
		1280	192	191	194
		1518	200	199	202
		9216	459	457	337
40 (365)	2048QAM	64	152	149	157
		128	154	149	158
		256	159	153	162
		512	163	162	170
		1024	180	179	183
		1280	191	190	193
		1518	199	198	201
		9216	450	449	454
40 (365)	2048QAM L	64	152	149	157
		128	153	149	158
		256	158	153	162
		512	162	161	169
		1024	179	178	181
		1280	189	188	192
		1518	197	196	198
		9216	440	439	444
40 (365)	4096QAM	64	152	149	156
		128	154	149	157
		256	158	153	161
		512	162	161	169
		1024	179	177	181
		1280	188	187	190
		1518	196	195	197
		9216	434	432	189

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
40 (365)	4096QAM L	64	152	148	155
		128	153	149	156
		256	157	152	161
		512	162	160	168
		1024	178	176	179
		1280	187	186	121
		1518	195	194	196
		9216	425	424	428
40 (365)	8192QAM	64	152	148	155
		128	152	149	156
		256	157	152	160
		512	161	160	167
		1024	177	176	179
		1280	186	185	188
		1518	194	193	195
		9216	420	419	423
50 (366)	4QAM S	64	133	129	158
		128	142	138	161
		256	160	150	200
		512	195	190	215
		1024	264	256	281
		1280	300	292	315
		1518	327	322	336
		9216	1331	1327	1337
50 (366)	4QAM	64	131	127	156
		128	138	130	160
		256	153	140	175
		512	184	180	201
		1024	242	237	252
		1280	272	267	283
		1518	298	294	305
		9216	1163	1161	1168

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
50 (366)	16QAM S	64	133	127	150
		128	129	127	147
		256	139	137	142
		512	158	156	168
		1024	194	192	204
		1280	215	211	224
		1518	230	227	232
		9216	763	761	766
50 (366)	16QAM	64	136	127	143
		128	128	125	148
		256	139	137	156
		512	153	151	161
		1024	185	183	187
		1280	203	200	210
		1518	216	214	218
		9216	682	678	684
50 (366)	32QAM	64	133	126	144
		128	130	127	142
		256	139	131	145
		512	147	146	149
		1024	173	171	176
		1280	188	186	195
		1518	200	198	202
		9216	582	579	584
50 (366)	64QAM	64	130	125	138
		128	131	125	139
		256	137	129	140
		512	142	141	144
		1024	164	163	166
		1280	177	175	182
		1518	187	185	189
		9216	504	502	506

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
50 (366)	128QAM	64	128	125	135
		128	130	124	135
		256	136	127	139
		512	140	138	144
		1024	159	158	163
		1280	170	169	174
		1518	180	177	182
		9216	456	453	459
50 (366)	256QAM	64	128	124	133
		128	128	123	133
		256	134	126	137
		512	138	136	146
		1024	155	154	158
		1280	165	164	169
		1518	173	172	175
		9216	422	419	425
50 (366)	512QAM	64	127	123	130
		128	128	123	131
		256	132	127	135
		512	136	135	143
		1024	152	151	156
		1280	161	160	164
		1518	168	167	170
		9216	395	393	398
50 (366)	1024QAM	64	127	123	129
		128	127	123	131
		256	131	126	135
		512	135	133	141
		1024	150	148	152
		1280	158	157	161
		1518	165	164	167
		9216	376	374	379

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
50 (366)	2048QAM	64	126	123	129
		128	127	122	130
		256	130	126	134
		512	135	133	141
		1024	149	148	151
		1280	158	156	160
		1518	164	163	165
		9216	369	368	372
50 (366)	2048QAM L	64	126	123	128
		128	127	122	130
		256	130	126	133
		512	137	133	140
		1024	148	147	150
		1280	157	155	159
		1518	163	161	164
		9216	361	359	364
50 (366)	4096QAM	64	125	122	128
		128	126	122	129
		256	130	126	133
		512	136	132	139
		1024	147	146	149
		1280	156	155	158
		1518	162	161	163
		9216	356	354	358
50 (366)	4096QAM L	64	125	122	127
		128	126	122	129
		256	129	125	132
		512	136	132	138
		1024	147	145	149
		1280	155	154	157
		1518	161	159	162
		9216	348	347	351

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
56 (373)	4QAM S	64	122	119	144
		128	130	127	144
		256	146	144	149
		512	177	175	187
		1024	236	234	251
		1280	269	266	283
		1518	296	294	299
		9216	1185	1181	1189
56 (373)	4QAM	64	120	117	146
		128	127	124	140
		256	141	139	153
		512	168	166	181
		1024	219	217	232
		1280	247	244	260
		1518	272	269	274
		9216	1035	1034	1041
56 (373)	16QAM S	64	130	120	142
		128	119	117	127
		256	131	127	147
		512	146	145	153
		1024	178	177	186
		1280	196	195	203
		1518	211	210	217
		9216	684	683	688
56 (373)	16QAM	64	126	119	138
		128	118	116	125
		256	131	124	143
		512	142	140	147
		1024	170	169	176
		1280	187	185	192
		1518	199	198	204
		9216	613	612	617

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
56 (373)	32QAM	64	123	118	131
		128	124	118	133
		256	132	122	136
		512	136	135	141
		1024	160	159	164
		1280	174	172	178
		1518	185	183	188
		9216	527	526	533
56 (373)	64QAM	64	119	116	127
		128	122	116	128
		256	128	119	129
		512	132	131	136
		1024	152	151	175
		1280	164	162	167
		1518	173	172	176
		9216	459	458	464
56 (373)	128QAM	64	115	110	121
		128	121	116	124
		256	121	115	125
		512	125	118	129
		1024	130	128	133
		1280	147	146	150
		1518	158	156	160
		9216	166	164	168
56 (373)	256QAM	64	119	115	122
		128	120	114	123
		256	124	118	128
		512	128	126	135
		1024	144	142	146
		1280	153	152	155
		1518	161	159	162
		9216	388	386	391

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
56 (373)	512QAM	64	119	114	122
		128	120	114	122
		256	123	118	126
		512	127	126	129
		1024	141	140	143
		1280	150	149	152
		1518	156	155	158
		9216	365	363	368
56 (373)	1024QAM	64	117	114	120
		128	118	114	121
		256	121	117	125
		512	129	124	131
		1024	139	138	141
		1280	148	146	149
		1518	154	152	155
		9216	349	347	351
56 (373)	2048QAM	64	117	114	120
		128	118	114	121
		256	121	117	124
		512	127	123	130
		1024	138	137	140
		1280	147	146	148
		1518	153	151	154
		9216	342	341	345
56 (373)	2048QAM L	64	116	113	119
		128	117	113	120
		256	120	117	124
		512	128	123	129
		1024	138	136	139
		1280	146	145	147
		1518	152	150	153
		9216	335	333	338

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
56 (373)	4096QAM	64	116	113	119
		128	117	113	120
		256	121	117	124
		512	125	123	129
		1024	137	136	138
		1280	145	144	146
		1518	151	149	152
		9216	331	329	333
56 (373)	4096QAM L	64	117	114	119
		128	117	114	120
		256	120	117	123
		512	128	123	129
		1024	137	136	138
		1280	145	143	146
		1518	150	149	151
		9216	325	323	327
60 (367)	4QAM S	64	115	112	140
		128	125	120	150
		256	139	130	159
		512	169	164	180
		1024	225	220	242
		1280	257	252	271
		1518	281	276	288
		9216	1127	1124	1132
60 (367)	4QAM	64	123	116	144
		128	120	117	145
		256	134	130	160
		512	160	156	174
		1024	209	204	223
		1280	236	230	248
		1518	256	253	264
		9216	988	985	991

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
60 (367)	16QAM S	64	123	113	132
		128	114	111	127
		256	124	120	130
		512	139	137	147
		1024	169	167	177
		1280	186	184	194
		1518	200	198	202
		9216	654	651	656
60 (367)	16QAM	64	120	112	129
		128	118	114	132
		256	126	118	133
		512	135	133	141
		1024	161	159	168
		1280	176	174	183
		1518	188	187	190
		9216	585	584	588
60 (367)	32QAM	64	115	111	125
		128	117	112	126
		256	119	115	130
		512	129	128	141
		1024	152	150	157
		1280	164	163	170
		1518	175	173	180
		9216	503	501	506
60)367)	64QAM	64	114	110	121
		128	116	110	122
		256	120	113	125
		512	125	124	129
		1024	144	143	148
		1280	155	144	160
		1518	164	162	168
		9216	438	435	441

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
60 (367)	128QAM	64	113	109	118
		128	114	109	118
		256	119	113	123
		512	123	122	131
		1024	139	138	143
		1280	150	148	153
		1518	157	156	160
		9216	398	396	401
60 (367)	256QAM	64	113	109	116
		128	114	109	117
		256	117	112	121
		512	123	120	128
		1024	137	135	140
		1280	146	144	148
		1518	153	151	155
		9216	370	368	373
60 (367)	512QAM	64	112	108	115
		128	113	108	116
		256	116	112	119
		512	122	119	126
		1024	134	133	137
		1280	142	141	145
		1518	149	147	151
		9216	348	346	351
60 (367)	1024QAM	64	111	108	113
		128	112	108	114
		256	115	111	118
		512	120	118	124
		1024	132	131	134
		1280	140	139	142
		1518	146	145	148
		9216	332	331	335

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
60 (367)	2048QAM	64	111	108	113
		128	111	108	114
		256	114	111	118
		512	120	117	124
		1024	131	130	133
		1280	139	138	141
		1518	145	144	147
		9216	326	325	329
60 (367)	2048QAM L	64	110	107	113
		128	111	107	113
		256	114	111	117
		512	121	117	123
		1024	131	129	135
		1280	139	137	141
		1518	144	143	145
		9216	320	318	323
60 (367)	4096QAM	64	110	108	112
		128	111	107	113
		256	114	111	117
		512	119	117	123
		1024	130	129	132
		1280	138	137	140
		1518	143	142	144
		9216	315	314	318
60 (367)	4096QAM L	64	110	107	112
		128	110	107	113
		256	113	110	116
		512	119	116	122
		1024	130	128	134
		1280	137	136	139
		1518	142	141	143
		9216	310	308	312

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (368)	4QAM S	64	105	96	125
		128	101	98	123
		256	113	110	122
		512	136	133	149
		1024	180	176	192
		1280	203	199	211
		1518	223	219	231
		9216	872	870	877
80 (368)	4QAM	64	103	95	121
		128	98	96	118
		256	109	100	120
		512	130	127	140
		1024	168	164	178
		1280	188	184	199
		1518	205	204	213
		9216	768	767	772
80 (368)	16QAM S	64	100	95	110
		128	101	95	111
		256	109	99	115
		512	114	112	120
		1024	138	136	144
		1280	151	150	158
		1518	163	161	168
		9216	516	514	520
80 (368)	16QAM	64	98	94	107
		128	100	93	107
		256	106	97	111
		512	111	109	116
		1024	132	131	137
		1280	144	143	149
		1518	154	153	157
		9216	466	464	469

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (368)	32QAM	64	98	93	103
		128	99	92	103
		256	102	95	106
		512	107	106	116
		1024	125	124	129
		1280	136	134	139
		1518	144	142	147
		9216	404	402	408
80 (368)	64QAM	64	98	94	100
		128	99	94	102
		256	103	98	106
		512	107	105	113
		1024	122	121	123
		1280	132	130	134
		1518	138	137	139
		9216	358	357	362
80 (368)	128QAM	64	94	91	97
		128	95	91	98
		256	98	94	101
		512	103	101	108
		1024	116	115	119
		1280	125	123	126
		1518	131	130	133
		9216	327	325	329
80 (368)	256QAM	64	95	93	97
		128	96	93	98
		256	99	96	103
		512	105	102	108
		1024	116	115	118
		1280	124	123	126
		1518	130	129	131
		9216	308	316	311

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (368)	512QAM	64	95	92	96
		128	95	93	98
		256	98	96	101
		512	105	102	107
		1024	115	113	116
		1280	122	121	123
		1518	127	126	128
		9216	292	291	294
80 (368)	1024QAM	64	94	92	95
		128	95	92	96
		256	98	95	100
		512	105	101	106
		1024	113	112	117
		1280	120	119	122
		1518	125	124	126
		9216	281	279	283
80 (368)	2048QAM	64	94	92	95
		128	94	93	96
		256	98	95	100
		512	104	101	105
		1024	113	111	116
		1280	120	119	121
		1518	124	123	125
		9216	276	275	277
80 (368)	2048QAM L	64	91	89	92
		128	91	89	93
		256	94	92	96
		512	101	98	103
		1024	110	108	113
		1280	116	115	117
		1518	121	120	122
		9216	269	267	270

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
80 (368)	4096QAM	64	93	92	94
		128	94	92	95
		256	97	95	99
		512	104	100	105
		1024	112	110	115
		1280	119	118	120
		1518	123	122	124
		9216	268	267	270
80 (368)	4096QAM L	64	94	92	95
		128	95	93	96
		256	97	95	99
		512	104	102	453
		1024	113	112	116
		1280	120	119	122
		1518	125	124	125
		9216	278	277	279
112 (374)	4QAM S	64	92	80	105
		128	82	80	96
		256	96	89	111
		512	109	107	116
		1024	141	139	149
		1280	159	157	166
		1518	174	172	180
		9216	649	648	653
112 (374)	4QAM	64	88	81	101
		128	88	83	102
		256	98	87	105
		512	105	103	110
		1024	133	131	138
		1280	149	147	154
		1518	162	160	167
		9216	575	574	578

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
112 (374)	16QAM S	64	83	78	89
		128	83	78	89
		256	90	81	93
		512	93	92	96
		1024	112	111	115
		1280	123	122	126
		1518	132	130	134
		9216	400	399	404
112 (374)	16QAM	64	82	78	86
		128	82	78	87
		256	87	80	90
		512	92	90	94
		1024	108	107	110
		1280	118	117	120
		1518	126	125	128
		9216	364	363	368
112 (374)	32QAM	64	80	77	83
		128	81	77	84
		256	84	80	88
		512	90	87	95
		1024	103	102	105
		1280	112	111	114
		1518	118	117	120
		9216	322	321	325
112 (374)	64QAM	64	78	75	81
		128	80	76	82
		256	82	79	85
		512	89	85	91
		1024	99	98	100
		1280	107	106	108
		1518	112	111	114
		9216	288	287	290

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
112 (374)	128QAM	64	77	75	79
		128	78	75	80
		256	81	78	83
		512	88	84	89
		1024	97	96	100
		1280	104	103	105
		1518	109	108	110
		9216	268	266	269
112 (374)	256QAM	64	76	75	78
		128	77	75	78
		256	80	78	82
		512	86	83	88
		1024	95	94	98
		1280	102	100	103
		1518	106	105	107
		9216	253	251	254
112 (374)	512QAM	64	76	74	77
		128	76	75	78
		256	79	77	81
		512	86	84	87
		1024	93	92	96
		1280	100	99	103
		1518	104	103	105
		9216	241	240	242
112 (374)	1024QAM	64	75	74	77
		128	76	74	77
		256	78	77	80
		512	85	82	86
		1024	92	91	95
		1280	99	98	102
		1518	103	102	104
		9216	233	231	234

Physical mode		Frame size [bytes]	Latency [µs]		
CS [MHz] (Frame ID)	Modulation		Average	Minimum	Maximum
112 (374)	2048QAM	64	75	74	76
		128	76	74	77
		256	79	77	80
		512	85	83	86
		1024	92	91	95
		1280	98	97	101
		1518	103	101	103
		9216	230	228	231
112 (374)	2048QAM L	64	75	74	76
		128	76	74	77
		256	78	77	80
		512	85	83	85
		1024	92	91	94
		1280	98	97	100
		1518	102	101	102
		9216	226	225	227
112 (374)	4096QAM	64	75	74	76
		128	75	74	76
		256	78	77	80
		512	84	82	85
		1024	91	90	94
		1280	97	96	98
		1518	101	100	102
		9216	224	222	225

2.3 Radio Link Bonding

Radio Link Bonding enables transparent transport of Ethernet frames over a number of parallel Packet Links.

Table 5 Radio Link Bonding

Radio Link bonding	MMU 1002 MMU 1004	MMU 1001	MINI-LINK 6651(1)	MINI-LINK 6366 MINI-LINK 6371	PNM 1002
Max number of bonded links	4	2	2	2	2
Max capacity for bonded links	2.5 Gbit/s	2.5 Gbit/s	2.5 Gbit/s	2.5 Gbit/s	2.5 Gbit/s

(1) Not applicable for MINI-LINK 6651/3

Protection and bonding do not add additional overhead, nor any latency compared to a 1+0 configuration.

The latency for a bonded hop will be determined by the slowest member in the bonding group.

2.4 Hierarchical Radio Link Bonding

With Hierarchical Radio Link Bonding (hRLB) there is a possibility to increase both the number of bonded links and the aggregated capacity for bonded links. hRLB is supported with NPU 1005 and MMU 1002 or MMU 1004. MINI-LINK 6651/4 and MINI-LINK 6371 also support hRLB.

Table 6 hRLB capacity

	NPU 1005	MINI-LINK 6651/4 and MINI-LINK 6371
hRLB capacity in total	10 Gbps	17 Gbps
Maximum hRLB group capacity	10 Gbps	10 Gbps
Maximum number of hRLB groups	2	2
Maximum number of hRLB members in total, per group	4	2
Maximum number of carriers in total	16	6(1)

(1) Figure includes 2 AOD carriers per group. hRLB is only possible together with AOD.

2.4.1 Link Efficiency and Capacity

The hRLB capacity is 7.5 Mpps. Considering RFC2544 throughput test with 64, 128 bytes frames the 10Gbps capacity should not be expected.

If two hRLB groups are configured the hRLB capacity is 4 Mpps per group. Considering RFC2544 throughput test with 64, 128, 256 bytes frames the 10Gbps capacity should not be expected

The utilization of an hRLB link compared to an ordinary link depends on the Ethernet frame size, and it is around 99%. In a typical mobile backhaul or Internet traffic (IMIX 7/4/1) it is recommended to plan with the hRLB group interface capacity value.

2.4.2 Latency

The latency on an hRLB link depends on the latency of all its members, that is the latency of the configured Radio Links. It is recommended to plan with worst case latency which is the value for the link with highest latency and an additional delay. This additional delay is typically in the range of 30 µsec depending on the configuration.

In a steady state the hRLB algorithm ensures that traffic flows are distributed among the hRLB members in a way to optimize the average latency of the traffic flows. This means that the link with highest latency will not determine the latency of all flows.

3 Radio Link

For relations between Frame ID and corresponding Channel Separation support, see Channel Separation to Frame ID Relation on page 73.

3.1 Channel Separation to Frame ID Relation

The tables below show the relationship between Channel Separation and corresponding Frame ID.

Data for standard Frame ID's (256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 303, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, and 1303) can be found in revision BT of this document.

Table 7 Channel Separation to Frame ID Relation - ETSI

ETSI	Frame ID	Frame ID	Frame ID	Frame ID	Frame ID
Channel Separation	Single Carrier	Carrier Aggregation	XPIC	2x2 MIMO	4x4 MIMO
7 MHz	356		1356		
13.75 MHz	357		1357		
14 MHz	357		1357		
27.5 MHz	358	358	1358	2358	2358
28 MHz	358	358	1358	2358	2358
40 MHz	359	359	1359		
55 MHz	360	360	1360	2360	2360
56 MHz	360	360	1360	2360	2360
62.5 MHz	360		1360		
80 MHz	403		1403		
110 MHz	361	361	1361		
112 MHz	361	361	1361		
125 MHz	361		1361		
220 MHz(1)		404			
224 MHz(2)		404			

(1) For CS 220 MHz, Carrier Aggregation with 2x110 MHz shall be configured and FFID 404 shall be used to fulfill CS 220 MHz requirements.

(2) For CS 224 MHz, Carrier Aggregation with 2x112 MHz shall be configured and FFID 404 shall be used to fulfill CS 224 MHz requirements.

Table 8 Channel Separation to Frame ID Relation - ANSI

ANSI Channel Separation	Frame ID Single Carrier	Frame ID Carrier Aggregation	Frame ID XPIC	Frame ID 2x2 MIMO	Frame ID 4x4 MIMO
10 MHz	362		1362		
20 MHz	363		1363		
28 MHz	371		1371		
30 MHz	364	364	1364	2364	2364
40 MHz	365	365	1365	2365	2365
50 MHz	366	366	1366		
56 MHz	373		1373		
60 MHz	367	367	1367		
80 MHz	368	368	1368		
112 MHz	374		1374		

3.2 Radio Frequencies

3.2.1 Radio Frequencies

Within the restrictions of channel arrangement and sub-band ranging imposed by the different Radio Unit the channel frequency can be selected from the O&M system.

Frequency band and sub range, as well as lowest, highest and selected center frequency is readable from the O&M system.

The operating center frequency can be set in steps of 0.005, 0.010, 0.025, or 0.250 MHz depending on sub-band, frequency band and Radio Unit.

For Radio Units with SW configurable duplex distance, the distance between transmitter and receiver shall always comply with regulatory requirements. The most common duplex distances can be found after each sub-band table.

The Radio Units are produced for frequency bands, sub ranges and channel plans according to the tables in the following chapters.

Note: For the MINI-LINK 6364 product family, a limitation of a maximum of 1000 frequency shifts applies for full performance and capacity fulfillment.

3.2.2 CS Dependence

Lower and upper frequencies in below tables state the edges for respective sub-band. The given frequency edge shall therefore be compensated for actual CS according below. (CS= 7, 14, 28, 40, 56, 80, and 112 MHz for ETSI and 5, 10, 20, 30, 40, 50, 60, and 80 MHz for ANSI)

Lowest user frequency = Tx or Rx Lower edge + CS/2

Highest user frequency = Tx or Rx Higher edge – CS/2

3.2.3 RAU2 X

3.2.3.1 RAU2 X 5 GHz Band

Table 9 RAU2 X 5 HP

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	300	4400.00	4570.00	170.00	4700.00	4870.00	170.00	ETSI
15	300	4700.00	4870.00	170.00	4400.00	4570.00	170.00	ETSI
12	300	4530.00	4700.00	170.00	4830.00	5000.00	170.00	ETSI
16	300	4830.00	5000.00	170.00	4530.00	4700.00	170.00	ETSI
A11		4400.00	4570.00	170.00	4700.00	4870.00	170.00	ETSI
A15		4700.00	4870.00	170.00	4400.00	4570.00	170.00	ETSI
A12		4530.00	4700.00	170.00	4830.00	5000.00	170.00	ETSI
A16		4830.00	5000.00	170.00	4530.00	4700.00	170.00	ETSI

Sub-band 1x is valid for CS 7, 14, 28, 40, and 56 MHz.

Sub-band A1x (Duplex 300 and 312 MHz) is valid for CS 7, 14, 28, 40, and 56 MHz.

3.2.3.2 RAU2 X 6 GHz Lower Band

Table 10 RAU2 X 6L [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	252.04	5925.000	6020.250	95.25	6177.050	6272.300	95.25	ETSI/ANSI
15	252.04	6177.050	6272.300	95.25	5925.000	6020.250	95.25	ETSI/ANSI
12	252.04	6018.000	6110.250	92.25	6270.050	6362.300	92.25	ETSI/ANSI
16	252.04	6270.050	6362.300	92.25	6018.000	6110.250	92.25	ETSI/ANSI
13	252.04	6078.500	6173.250	94.75	6330.550	6425.300	94.75	ETSI/ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
17	252.04	6330.550	6425.300	94.75	6078.500	6173.250	94.75	ETSI/ANSI
14	252.04	5989.675	6048.975	59.30	6241.725	6301.025	59.30	ETSI/ANSI
18	252.04	6241.725	6301.025	59.30	5989.675	6048.975	59.30	ETSI/ANSI
A11		5925.000	6020.250	95.250	6177.050	6277.000	99.950	ETSI/ANSI
A15		6177.050	6277.000	99.950	5925.000	6020.250	95.250	ETSI/ANSI
A12		6018.000	6110.250	92.250	6270.050	6362.300	92.250	ETSI/ANSI
A16		6270.050	6362.300	92.250	6018.000	6110.250	92.250	ETSI/ANSI
A13		6078.500	6173.250	94.750	6330.550	6425.300	94.750	ETSI/ANSI
A17		6330.550	6425.300	94.750	6078.500	6173.250	94.750	ETSI/ANSI
A14		5989.675	6048.975	59.300	6241.725	6301.025	59.300	ETSI/ANSI
A18		6241.725	6301.025	59.300	5989.675	6048.975	59.300	ETSI/ANSI
A51		5925.000	6020.250	95.250	6177.050	6277.000	99.950	ANSI
A55		6177.050	6277.000	99.950	5925.000	6020.250	95.250	ANSI
A52		6011.000	6110.250	99.250	6270.050	6362.300	92.250	ANSI
A56		6270.050	6362.300	92.250	6011.000	6110.250	99.250	ANSI
A53		6078.500	6173.250	94.750	6330.550	6425.300	94.750	ANSI
A57		6330.550	6425.300	94.750	6078.500	6173.250	94.750	ANSI
A54		5989.675	6048.975	59.300	6241.725	6301.025	59.300	ANSI
A58		6241.725	6301.025	59.300	5989.675	6048.975	59.300	ANSI

Sub-band 1x is valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band 1x is valid for CS 9.88/10, 20, 29.65/30, 40, 50, and 59.3/60 MHz.

Sub-band A1x (Duplex 240, 252.04, 260, and 266 MHz) is valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band A1x (Duplex 252.04 MHz) are valid for CS 9.88/10, 20, 29.65/30, 40, 50, and 59.3/60 MHz.

Sub-band A5x (Duplex 252.04 MHz) are valid for CS 9.88/10, 20, 29.65/30, 40, 50, and 59.3/60 MHz.

3.2.3.3 RAU2 X 6 GHz Upper Band

Table 11 RAU2 X 6U [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
21	340	6430.00	6565.00	135.00	6770.00	6905.00	135.00	ETSI/ANSI
25	340	6770.00	6905.00	135.00	6430.00	6565.00	135.00	ETSI/ANSI
22	340	6550.00	6685.00	135.00	6890.00	7025.00	135.00	ETSI/ANSI
26	340	6890.00	7025.00	135.00	6550.00	6685.00	135.00	ETSI/ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
23	340	6635.00	6765.00	130.00	6975.00	7105.00	130.00	ETSI/ANSI
27	340	6975.00	7105.00	130.00	6635.00	6765.00	130.00	ETSI/ANSI
24	340	6520.00	6600.00	80.00	6860.00	6940.00	80.00	ETSI/ANSI
28	340	6860.00	6940.00	80.00	6520.00	6600.00	80.00	ETSI/ANSI
A21		6430.000	6565.000	135.000	6770.000	6905.000	135.000	ETSI/ANSI
A25		6770.000	6905.000	135.000	6430.000	6565.000	135.000	ETSI/ANSI
A22		6550.000	6685.000	135.000	6890.000	7025.000	135.000	ETSI/ANSI
A26		6890.000	7025.000	135.000	6550.000	6685.000	135.000	ETSI/ANSI
A23		6635.000	6765.000	130.000	6975.000	7105.000	130.000	ETSI/ANSI
A27		6975.000	7105.000	130.000	6635.000	6765.000	130.000	ETSI/ANSI
A24		6520.000	6600.000	80.000	6860.000	6940.000	80.000	ETSI/ANSI
A28		6860.000	6940.000	80.000	6520.000	6600.000	80.000	ETSI/ANSI
31	160	6540.00	6602.50	62.50	6700.00	6762.50	62.50	ANSI
35	160	6700.00	6762.50	62.50	6540.00	6602.50	62.50	ANSI
32	160	6597.50	6657.50	60.00	6757.50	6817.50	60.00	ANSI
36	160	6757.50	6817.50	60.00	6597.50	6657.50	60.00	ANSI
33	160	6650.00	6710.00	60.00	6810.00	6870.00	60.00	ANSI
37	160	6810.00	6870.00	60.00	6650.00	6710.00	60.00	ANSI
A31		6540.000	6610.000	70.000	6700.000	6770.000	70.000	ANSI
A35		6700.000	6770.000	70.000	6540.000	6610.000	70.000	ANSI
A32		6597.500	6657.500	60.000	6757.500	6817.500	60.000	ANSI
A36		6757.500	6817.500	60.000	6597.500	6657.500	60.000	ANSI
A33		6640.000	6710.000	70.000	6800.000	6870.000	70.000	ANSI
A37		6800.000	6870.000	70.000	6640.000	6710.000	70.000	ANSI
A41		6523.750	6626.250	102.500	6773.750	6876.250	102.500	ANSI
A45		6773.750	6876.250	102.500	6523.750	6626.250	102.500	ANSI

Sub-band 2x is valid for 7, 14, 28/30, 40, and 56/60 MHz.

Sub-band 2x is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A2x (Duplex 340 MHz) is valid for CS 7, 14, 28/30, 40, and 56/60 MHz.

Sub-band A2x (Duplex 340 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band 3x is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A3x (Duplex 160 and 170 MHz) are valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.4 RAU2 X 7 GHz Band

Table 12 RAU2 X 7 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01	196	7107.00	7163.00	56.00	7303.00	7359.00	56.00	ETSI
05	196	7303.00	7359.00	56.00	7107.00	7163.00	56.00	ETSI
02	196	7163.00	7219.00	56.00	7359.00	7415.00	56.00	ETSI
06	196	7359.00	7415.00	56.00	7163.00	7219.00	56.00	ETSI
03	196	7191.00	7247.00	56.00	7387.00	7443.00	56.00	ETSI
07	196	7387.00	7443.00	56.00	7191.00	7247.00	56.00	ETSI
11	154	7428.00	7484.00	56.00	7582.00	7638.00	56.00	ETSI
15	154	7582.00	7638.00	56.00	7428.00	7484.00	56.00	ETSI
12	154	7456.00	7512.00	56.00	7610.00	7666.00	56.00	ETSI
16	154	7610.00	7666.00	56.00	7456.00	7512.00	56.00	ETSI
13	154	7484.00	7540.00	56.00	7638.00	7694.00	56.00	ETSI
17	154	7638.00	7694.00	56.00	7484.00	7540.00	56.00	ETSI
14	154	7512.00	7568.00	56.00	7666.00	7722.00	56.00	ETSI
18	154	7666.00	7722.00	56.00	7512.00	7568.00	56.00	ETSI
21	245	7426.50	7513.75	87.25	7671.50	7758.75	87.25	ETSI
25	245	7671.50	7758.75	87.25	7426.50	7513.75	87.25	ETSI
22	245	7482.25	7569.75	87.50	7727.25	7814.75	87.50	ETSI
26	245	7727.25	7814.75	87.50	7482.25	7569.75	87.50	ETSI
23	245	7510.25	7597.75	87.50	7755.25	7842.75	87.50	ETSI
27	245	7755.25	7842.75	87.50	7510.25	7597.75	87.50	ETSI
24	245	7566.25	7653.75	87.50	7566.25	7653.75	87.50	ETSI
28	245	7811.25	7898.75	87.50	7566.25	7653.75	87.50	ETSI
31	161	7124.50	7184.00	59.50	7285.50	7345.00	59.50	ETSI
35	161	7285.50	7345.00	59.50	7124.50	7184.00	59.50	ETSI
32	161	7152.50	7212.00	59.50	7313.50	7373.00	59.50	ETSI
36	161	7313.50	7373.00	59.50	7152.50	7212.00	59.50	ETSI
33	161	7180.50	7240.00	59.50	7341.50	7401.00	59.50	ETSI
37	161	7341.50	7401.00	59.50	7180.50	7240.00	59.50	ETSI
34	161	7208.50	7268.00	59.50	7369.50	7429.00	59.50	ETSI
38	161	7369.50	7429.00	59.50	7208.50	7268.00	59.50	ETSI
41	161	7424.50	7484.00	59.50	7585.50	7645.00	59.50	ETSI
45	161	7585.50	7645.00	59.50	7424.50	7484.00	59.50	ETSI
42	161	7449.50	7512.00	62.50	7610.50	7673.00	62.50	ETSI
46	161	7610.50	7673.00	62.50	7449.50	7512.00	62.50	ETSI
43	161	7477.50	7540.00	62.50	7638.50	7701.00	62.50	ETSI
47	161	7638.50	7701.00	62.50	7477.50	7540.00	62.50	ETSI
44	161	7505.50	7568.00	62.50	7666.50	7729.00	62.50	ETSI
48	161	7666.50	7729.00	62.50	7505.50	7568.00	62.50	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
51	168	7107.00	7163.00	56.00	7275.00	7331.00	56.00	ETSI
55	168	7275.00	7331.00	56.00	7107.00	7163.00	56.00	ETSI
52	168	7135.00	7191.00	56.00	7303.00	7359.00	56.00	ETSI
56	168	7303.00	7359.00	56.00	7135.00	7191.00	56.00	ETSI
53	168	7163.00	7219.00	56.00	7331.00	7387.00	56.00	ETSI
57	168	7331.00	7387.00	56.00	7163.00	7219.00	56.00	ETSI
54	168	7191.00	7247.00	56.00	7359.00	7415.00	56.00	ETSI
58	168	7359.00	7415.00	56.00	7191.00	7247.00	56.00	ETSI
61	168	7414.00	7470.00	56.00	7582.00	7638.00	56.00	ETSI
65	168	7582.00	7638.00	56.00	7414.00	7470.00	56.00	ETSI
62	168	7442.00	7498.00	56.00	7610.00	7666.00	56.00	ETSI
66	168	7610.00	7666.00	56.00	7442.00	7498.00	56.00	ETSI
63	168	7470.00	7526.00	56.00	7638.00	7694.00	56.00	ETSI
67	168	7638.00	7694.00	56.00	7470.00	7526.00	56.00	ETSI
64	168	7498.00	7554.00	56.00	7666.00	7722.00	56.00	ETSI
68	168	7666.00	7722.00	56.00	7498.00	7554.00	56.00	ETSI
71	154	7128.00	7184.00	56.00	7282.00	7338.00	56.00	ETSI
75	154	7282.00	7338.00	56.00	7128.00	7184.00	56.00	ETSI
72	154	7156.00	7212.00	56.00	7310.00	7366.00	56.00	ETSI
76	154	7310.00	7366.00	56.00	7156.00	7212.00	56.00	ETSI
73	154	7184.00	7240.00	56.00	7338.00	7394.00	56.00	ETSI
77	154	7338.00	7394.00	56.00	7184.00	7240.00	56.00	ETSI
74	154	7212.00	7268.00	56.00	7366.00	7422.00	56.00	ETSI
78	154	7366.00	7422.00	56.00	7212.00	7268.00	56.00	ETSI
81	161	7249.50	7309.00	59.50	7410.50	7470.00	59.50	ETSI
85	161	7410.50	7470.00	59.50	7249.50	7309.00	59.50	ETSI
82	161	7277.50	7337.00	59.50	7438.50	7498.00	59.50	ETSI
86	161	7438.50	7498.00	59.50	7277.50	7337.00	59.50	ETSI
83	161	7305.50	7365.00	59.50	7466.50	7526.00	59.50	ETSI
87	161	7466.50	7526.00	59.50	7305.50	7365.00	59.50	ETSI
84	161	7333.50	7393.00	59.50	7494.50	7554.00	59.50	ETSI
88	161	7494.50	7554.00	59.50	7333.50	7393.00	59.50	ETSI
91	168	7443.00	7499.00	56.00	7611.00	7667.00	56.00	ETSI
95	168	7611.00	7667.00	56.00	7443.00	7499.00	56.00	ETSI
92	168	7471.00	7527.00	56.00	7639.00	7695.00	56.00	ETSI
96	168	7639.00	7695.00	56.00	7471.00	7527.00	56.00	ETSI
93	168	7499.00	7555.00	56.00	7667.00	7723.00	56.00	ETSI
97	168	7667.00	7723.00	56.00	7499.00	7555.00	56.00	ETSI
94	168	7527.00	7583.00	56.00	7695.00	7751.00	56.00	ETSI
98	168	7695.00	7751.00	56.00	7527.00	7583.00	56.00	ETSI
101	175	7125.00	7170.00	45.00	7300.00	7345.00	45.00	ANSI
105	175	7300.00	7345.00	45.00	7125.00	7170.00	45.00	ANSI
102	175	7155.00	7195.00	40.00	7330.00	7370.00	40.00	ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
106	175	7330.00	7370.00	40.00	7155.00	7195.00	40.00	ANSI
103	175	7180.00	7225.00	45.00	7355.00	7400.00	45.00	ANSI
107	175	7355.00	7400.00	45.00	7180.00	7225.00	45.00	ANSI
104	175	7210.00	7250.00	40.00	7385.00	7425.00	40.00	ANSI
108	175	7385.00	7425.00	40.00	7210.00	7250.00	40.00	ANSI
111	150	7425.00	7480.00	55.00	7575.00	7630.00	55.00	ANSI
115	150	7575.00	7630.00	55.00	7425.00	7480.00	55.00	ANSI
112	150	7460.00	7515.00	55.00	7610.00	7665.00	55.00	ANSI
116	150	7610.00	7665.00	55.00	7460.00	7515.00	55.00	ANSI
113	150	7515.00	7555.00	40.00	7665.00	7705.00	40.00	ANSI
117	150	7665.00	7705.00	40.00	7515.00	7555.00	40.00	ANSI
114	150	7545.00	7575.00	30.00	7695.00	7725.00	30.00	ANSI
118	150	7695.00	7725.00	30.00	7545.00	7575.00	30.00	ANSI
132	269	7505.00	7533.00	28.00	7774.00	7802.00	28.00	ETSI
136	269	7774.00	7802.00	28.00	7505.00	7533.00	28.00	ETSI
A01		7107.000	7163.000	56.00	7303.000	7359.000	56.00	ETSI
A05		7303.000	7359.000	56.00	7107.000	7163.000	56.00	ETSI
A02		7163.000	7219.000	56.00	7359.000	7415.000	56.00	ETSI
A06		7359.000	7415.000	56.00	7163.000	7219.000	56.00	ETSI
A03		7191.000	7247.000	56.00	7387.000	7443.000	56.00	ETSI
A07		7387.000	7443.000	56.00	7191.000	7247.000	56.00	ETSI
A11		7414.000	7485.000	71.00	7575.000	7645.000	70.00	ETSI/ANSI
A15		7575.000	7645.000	70.00	7414.000	7485.000	71.00	ETSI/ANSI
A12		7442.000	7515.000	73.00	7610.000	7673.000	63.00	ETSI/ANSI
A16		7610.000	7673.000	63.00	7442.000	7515.000	73.00	ETSI/ANSI
A13		7470.000	7540.000	70.00	7638.000	7701.000	63.00	ETSI/ANSI
A17		7638.000	7701.000	63.00	7470.000	7540.000	70.00	ETSI/ANSI
A14		7498.000	7568.000	70.00	7665.000	7729.000	64.00	ETSI/ANSI
A18		7665.000	7729.000	64.00	7498.000	7568.000	70.00	ETSI/ANSI
A21		7426.500	7513.750	87.25	7671.500	7758.750	87.25	ETSI
A25		7671.500	7758.750	87.25	7426.500	7513.750	87.25	ETSI
A22		7482.250	7569.750	87.50	7727.250	7814.750	87.50	ETSI
A26		7727.250	7814.750	87.50	7482.250	7569.750	87.50	ETSI
A23		7510.250	7597.750	87.50	7755.250	7842.750	87.50	ETSI
A27		7755.250	7842.750	87.50	7510.250	7597.750	87.50	ETSI
A24		7566.250	7653.750	87.50	7811.250	7898.750	87.50	ETSI
A28		7811.250	7898.750	87.50	7566.250	7653.750	87.50	ETSI
A31		7107.000	7184.000	77.00	7275.000	7345.000	70.00	ETSI/ANSI
A35		7275.000	7345.000	70.00	7107.000	7184.000	77.00	ETSI/ANSI
A32		7135.000	7212.000	77.00	7303.000	7373.000	70.00	ETSI/ANSI
A36		7303.000	7373.000	70.00	7135.000	7212.000	77.00	ETSI/ANSI
A33		7163.000	7240.000	77.00	7331.000	7401.000	70.00	ETSI/ANSI
A37		7331.000	7401.000	70.00	7163.000	7240.000	77.00	ETSI/ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A34		7191.000	7268.000	77.00	7359.000	7429.000	70.00	ETSI/ANSI
A38		7359.000	7429.000	70.00	7191.000	7268.000	77.00	ETSI/ANSI
A81		7249.500	7309.000	59.50	7410.500	7470.000	59.50	ETSI
A85		7410.500	7470.000	59.50	7249.500	7309.000	59.50	ETSI
A82		7277.500	7337.000	59.50	7438.500	7498.000	59.50	ETSI
A86		7438.500	7498.000	59.50	7277.500	7337.000	59.50	ETSI
A83		7305.500	7365.000	59.50	7466.500	7526.000	59.50	ETSI
A87		7466.500	7526.000	59.50	7305.500	7365.000	59.50	ETSI
A84		7333.500	7393.000	59.50	7494.500	7554.000	59.50	ETSI
A88		7494.500	7554.000	59.50	7333.500	7393.000	59.50	ETSI
A94		7527.000	7583.000	56.00	7695.000	7751.000	56.00	ETSI/ANSI
A98		7695.000	7751.000	56.00	7527.000	7583.000	56.00	ETSI/ANSI

Sub-band 0x, 1x, 2x, 3x, 4x, 5x, 6x, 7x, 8x, 9x, and 13x are valid for CS 7, 14, 28, and 56 MHz.

Sub-band 10x is valid for CS 10, 20, 30, and 40 MHz.

Sub-band 111, 112, 115, and 116 are valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band 114 and 118 are valid for CS 10, 20, and 30 MHz.

Sub-band A0x (Duplex 196 MHz), A2x (Duplex 245 and 269 MHz), and A8x (Duplex 161 MHz) are valid for CS 7, 14, 28, and 56 MHz.

Sub-band A1x (Duplex 154, 161, and 168 MHz), A3x (Duplex 154, 161, and 168 MHz), and A9x (Duplex 168 MHz) are valid for CS 7, 14, 28, and 56 MHz.

Sub-band A1x (Duplex 150 MHz), A3x (Duplex 175 MHz), and A9x (Duplex 150 MHz) are valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.5 RAU2 X 8 GHz Band

Table 13 RAU2 X 8 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	311.32	7718.050	7807.000	88.950	8029.375	8118.325	88.950	ETSI
15	311.32	8029.375	8118.325	88.950	7718.050	7807.000	88.950	ETSI
12	311.32	7777.350	7866.300	88.950	8088.675	8177.625	88.950	ETSI
16	311.32	8088.675	8177.625	88.950	7777.350	7866.300	88.950	ETSI
13	311.32	7821.825	7910.775	88.950	8133.150	8222.100	88.950	ETSI
17	311.32	8133.150	8222.100	88.950	7821.825	7910.775	88.950	ETSI
14	311.32	7881.125	7970.075	88.950	8192.450	8281.400	88.950	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
18	311.32	8192.450	8281.400	88.950	7881.125	7970.075	88.950	ETSI
21	126	8282.50	8324.50	42.00	8408.50	8450.50	42.00	ETSI
25	126	8408.50	8450.50	42.00	8282.50	8324.50	42.00	ETSI
23	126	8324.50	8366.50	42.00	8450.50	8492.50	42.00	ETSI
27	126	8450.50	8492.50	42.00	8324.50	8366.50	42.00	ETSI
31	119	8286.00	8328.00	42.00	8405.00	8447.00	42.00	ETSI
35	119	8405.00	8447.00	42.00	8286.00	8328.00	42.00	ETSI
33	119	8328.00	8370.00	42.00	8447.00	8489.00	42.00	ETSI
37	119	8447.00	8489.00	42.00	8328.00	8370.00	42.00	ETSI
41	119	8279.00	8321.00	42.00	8398.00	8440.00	42.00	ETSI
45	119	8398.00	8440.00	42.00	8279.00	8321.00	42.00	ETSI
42	119	8307.00	8349.00	42.00	8426.00	8468.00	42.00	ETSI
46	119	8426.00	8468.00	42.00	8307.00	8349.00	42.00	ETSI
43	119	8335.00	8377.00	42.00	8454.00	8496.00	42.00	ETSI
47	119	8454.00	8496.00	42.00	8335.00	8377.00	42.00	ETSI
51	126	8279.00	8321.00	42.00	8405.00	8447.00	42.00	ETSI
55	126	8405.00	8447.00	42.00	8279.00	8321.00	42.00	ETSI
52	126	8307.00	8349.00	42.00	8433.00	8475.00	42.00	ETSI
56	126	8433.00	8475.00	42.00	8307.00	8349.00	42.00	ETSI
53	126	8328.00	8370.00	42.00	8454.00	8496.00	42.00	ETSI
57	126	8454.00	8496.00	42.00	8328.00	8370.00	42.00	ETSI
61	266	7905.00	8010.00	105.00	8171.00	8276.00	105.00	ETSI
65	266	8171.00	8276.00	105.00	7905.00	8010.00	105.00	ETSI
62	266	7968.00	8073.00	105.00	8234.00	8339.00	105.00	ETSI
66	266	8234.00	8339.00	105.00	7968.00	8073.00	105.00	ETSI
63	266	8031.00	8136.00	105.00	8297.00	8402.00	105.00	ETSI
67	266	8297.00	8402.00	105.00	8031.00	8136.00	105.00	ETSI
71	311.32	7718.050	7836.650	118.600	8029.375	8147.975	118.600	ETSI
75	311.32	8029.375	8147.975	118.600	7718.050	7836.650	118.600	ETSI
72	311.32	7777.350	7881.125	103.775	8088.675	8192.450	103.775	ETSI
76	311.32	8088.675	8192.450	103.775	7777.350	7881.125	103.775	ETSI
73	311.32	7851.475	7970.075	118.600	8162.800	8281.400	118.600	ETSI
77	311.32	8162.800	8281.400	118.600	7851.475	7970.075	118.600	ETSI
81	300	7725.00	7805.00	80.00	8025.00	8105.00	80.00	ANSI
85	300	8025.00	8105.00	80.00	7725.00	7805.00	80.00	ANSI
82	300	7785.00	7865.00	80.00	8085.00	8165.00	80.00	ANSI
86	300	8085.00	8165.00	80.00	7785.00	7865.00	80.00	ANSI
83	300	7835.00	7910.00	75.00	8135.00	8210.00	75.00	ANSI
87	300	8135.00	8210.00	75.00	7835.00	7910.00	75.00	ANSI
84	300	7895.00	7965.00	70.00	8195.00	8265.00	70.00	ANSI
88	300	8195.00	8265.00	70.00	7895.00	7965.00	70.00	ANSI
91	208	8050.00	8134.00	84.00	8258.00	8342.00	84.00	ETSI
95	208	8258.00	8342.00	84.00	8050.00	8134.00	84.00	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
92	208	8106.00	8190.00	84.00	8314.00	8398.00	84.00	ETSI
96	208	8314.00	8398.00	84.00	8106.00	8190.00	84.00	ETSI
93	208	8162.00	8246.00	84.00	8370.00	8454.00	84.00	ETSI
97	208	8370.00	8454.00	84.00	8162.00	8246.00	84.00	ETSI
101	310	7905.00	8017.00	112.00	8215.00	8327.00	112.00	ETSI
105	310	8215.00	8327.00	112.00	7905.00	8017.00	112.00	ETSI
102	310	7989.00	8101.00	112.00	8299.00	8411.00	112.00	ETSI
106	310	8299.00	8411.00	112.00	7989.00	8101.00	112.00	ETSI
103	310	8073.00	8185.00	112.00	8383.00	8495.00	112.00	ETSI
107	310	8383.00	8495.00	112.00	8073.00	8185.00	112.00	ETSI
111	310	7725.00	7837.00	112.00	8035.00	8147.00	112.00	ETSI
115	310	8035.00	8147.00	112.00	7725.00	7837.00	112.00	ETSI
112	310	7777.00	7881.00	104.00	8087.00	8191.00	104.00	ETSI
116	310	8087.00	8191.00	104.00	7777.00	7881.00	104.00	ETSI
113	310	7851.00	7965.00	114.00	8161.00	8275.00	114.00	ETSI
117	310	8161.00	8275.00	114.00	7851.00	7965.00	114.00	ETSI
121	148.5	7744.75	7793.75	49.00	7893.25	7942.25	49.00	ETSI
125	148.5	7893.25	7942.25	49.00	7744.75	7793.75	49.00	ETSI
122	148.5	7779.75	7828.75	49.00	7928.25	7977.25	49.00	ETSI
126	148.5	7928.25	7977.25	49.00	7779.75	7828.75	49.00	ETSI
131	148.25	7744.75	7793.75	49.00	7893.00	7942.00	49.00	ETSI
135	148.25	7893.00	7942.00	49.00	7744.75	7793.75	49.00	ETSI
132	148.25	7779.75	7828.75	49.00	7928.00	7977.00	49.00	ETSI
136	148.25	7928.00	7977.00	49.00	7779.75	7828.75	49.00	ETSI
A01		7744.750	7793.750	49.000	7893.000	7942.250	49.250	ETSI
A05		7893.000	7942.250	49.250	7744.750	7793.750	49.000	ETSI
A02		7779.750	7828.750	49.000	7928.000	7977.250	49.250	ETSI
A06		7928.000	7977.250	49.250	7779.750	7828.750	49.000	ETSI
A11		7718.050	7837.000	118.950	8025.000	8147.975	122.975	ETSI/ANSI
A15		8025.000	8147.975	122.975	7718.050	7837.000	118.950	ETSI/ANSI
A12		7777.000	7910.775	133.775	8085.000	8222.100	137.100	ETSI/ANSI
A16		8085.000	8222.100	137.100	7777.000	7910.775	133.775	ETSI/ANSI
A14		7835.000	7970.075	135.075	8135.000	8281.400	146.400	ETSI/ANSI
A18		8135.000	8281.400	146.400	7835.000	7970.075	135.075	ETSI/ANSI
A21		8279.000	8328.000	49.000	8405.000	8450.500	45.500	ETSI
A25		8405.000	8450.500	45.500	8279.000	8328.000	49.000	ETSI
A23		8324.500	8370.000	45.500	8447.000	8492.500	45.500	ETSI
A27		8447.000	8492.500	45.500	8324.500	8370.000	45.500	ETSI
A41		8279.000	8321.000	42.000	8398.000	8440.000	42.000	ETSI
A45		8398.000	8440.000	42.000	8279.000	8321.000	42.000	ETSI
A42		8307.000	8349.000	42.000	8426.000	8475.000	49.000	ETSI
A46		8426.000	8475.000	49.000	8307.000	8349.000	42.000	ETSI
A43		8328.000	8377.000	49.000	8454.000	8496.000	42.000	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A47		8454.000	8496.000	42.000	8328.000	8377.000	49.000	ETSI
A61		7905.000	8017.000	112.000	8171.000	8327.000	156.000	ETSI
A65		8171.000	8327.000	156.000	7905.000	8017.000	112.000	ETSI
A62		7968.000	8073.000	105.000	8234.000	8339.000	105.000	ETSI
A66		8234.000	8339.000	105.000	7968.000	8073.000	105.000	ETSI
A63		7989.000	8136.000	147.000	8297.000	8411.000	114.000	ETSI
A67		8297.000	8411.000	114.000	7989.000	8136.000	147.000	ETSI
A64		8073.000	8185.000	112.000	8383.000	8495.000	112.000	ETSI
A68		8383.000	8495.000	112.000	8073.000	8185.000	112.000	ETSI
A91		8050.000	8134.000	84.000	8258.000	8342.000	84.000	ETSI
A95		8258.000	8342.000	84.000	8050.000	8134.000	84.000	ETSI
A92		8106.000	8190.000	84.000	8314.000	8398.000	84.000	ETSI
A96		8314.000	8398.000	84.000	8106.000	8190.000	84.000	ETSI
A93		8162.000	8246.000	84.000	8370.000	8454.000	84.000	ETSI
A97		8370.000	8454.000	84.000	8162.000	8246.000	84.000	ETSI

Sub-band 1x is valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band 2x, 3x, 12x, and 13x are valid for 7, 14, and 28/29.65 MHz.

Sub-band 4x and 5x, are valid for CS 7, 14, and 28/29.65 MHz.

Sub-band 6x, 7x, 9x, 10x, and 11x are valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band 8x is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A0x (Duplex 148.25 and 148.5 MHz), A2x and A4x (Duplex 119 and 126 MHz) are valid for CS 7, 14, and 28/29.65 MHz.

Sub-band A1x (Duplex 283.5, 310, and 311.32 MHz), A6x (Duplex 266 and 310 MHz), and A9x (Duplex 208 MHz) are valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band A1x (Duplex 300 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.6 RAU2 X 10 GHz Band

Table 14 RAU2 X 10 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	65	10550.00	10570.00	20.00	10615.00	10635.00	20.00	ANSI
15	65	10615.00	10635.00	20.00	10550.00	10570.00	20.00	ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
12	65	10565.00	10585.00	20.00	10630.00	10650.00	20.00	ANSI
16	65	10630.00	10650.00	20.00	10565.00	10585.00	20.00	ANSI
13	65	10580.00	10600.00	20.00	10645.00	10665.00	20.00	ANSI
17	65	10645.00	10665.00	20.00	10580.00	10600.00	20.00	ANSI
14	65	10595.00	10615.00	20.00	10660.00	10680.00	20.00	ANSI
18	65	10660.00	10680.00	20.00	10595.00	10615.00	20.00	ANSI
21	91	10500.50	10528.50	28.00	10591.50	10619.50	28.00	ETSI
25	91	10591.50	10619.50	28.00	10500.50	10528.50	28.00	ETSI
22	91	10528.50	10556.50	28.00	10619.50	10647.50	28.00	ETSI
26	91	10619.50	10647.50	28.00	10528.50	10556.50	28.00	ETSI
23	91	10556.50	10584.50	28.00	10647.50	10675.50	28.00	ETSI
27	91	10647.50	10675.50	28.00	10556.50	10584.50	28.00	ETSI
31	350	10125.00	10300.00	175.00	10475.00	10650.00	175.00	ETSI
35	350	10475.00	10650.00	175.00	10125.00	10300.00	175.00	ETSI
41	168	10308.00	10420.00	112.00	10476.00	10588.00	112.00	ETSI
45	168	10476.00	10588.00	112.00	10308.00	10420.00	112.00	ETSI
51	350	10130.00	10186.00	56.00	10480.00	10536.00	56.00	ETSI
55	350	10480.00	10536.00	56.00	10130.00	10186.00	56.00	ETSI
52	350	10144.00	10200.00	56.00	10494.00	10550.00	56.00	ETSI
56	350	10494.00	10550.00	56.00	10144.00	10200.00	56.00	ETSI
71	350	10000.00	10189.00	189.00	10350.00	10539.00	189.00	ETSI
75	350	10350.00	10539.00	189.00	10000.00	10189.00	189.00	ETSI
72	350	10125.00	10330.00	205.00	10475.00	10680.00	205.00	ETSI
76	350	10475.00	10680.00	205.00	10125.00	10330.00	205.00	ETSI
A11		10550.00	10570.00	20.00	10615.00	10635.00	20.00	ANSI
A15		10615.00	10635.00	20.00	10550.00	10570.00	20.00	ANSI
A12		10565.00	10585.00	20.00	10630.00	10650.00	20.00	ANSI
A16		10630.00	10650.00	20.00	10565.00	10585.00	20.00	ANSI
A13		10580.00	10600.00	20.00	10645.00	10665.00	20.00	ANSI
A17		10645.00	10665.00	20.00	10580.00	10600.00	20.00	ANSI
A14		10595.00	10615.00	20.00	10660.00	10680.00	20.00	ANSI
A18		10660.00	10680.00	20.00	10595.00	10615.00	20.00	ANSI
A21		10500.50	10528.50	28.00	10591.50	10619.50	28.00	ETSI
A25		10591.50	10619.50	28.00	10500.50	10528.50	28.00	ETSI
A22		10528.50	10556.50	28.00	10619.50	10647.50	28.00	ETSI
A26		10619.50	10647.50	28.00	10528.50	10556.50	28.00	ETSI
A23		10556.50	10584.50	28.00	10647.50	10675.50	28.00	ETSI
A27		10647.50	10675.50	28.00	10556.50	10584.50	28.00	ETSI
A41		10308.00	10420.00	112.00	10476.00	10588.00	112.00	ETSI
A45		10476.00	10588.00	112.00	10308.00	10420.00	112.00	ETSI
A51		10130.00	10186.00	56.00	10480.00	10536.00	56.00	ETSI
A55		10480.00	10536.00	56.00	10130.00	10186.00	56.00	ETSI
A52		10144.00	10200.00	56.00	10494.00	10550.00	56.00	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A56		10494.00	10550.00	56.00	10144.00	10200.00	56.00	ETSI
A71		10000.00	10189.00	189.00	10350.00	10539.00	189.00	ETSI
A75		10350.00	10539.00	189.00	10000.00	10189.00	189.00	ETSI
A72		10125.00	10330.00	205.00	10475.00	10680.00	205.00	ETSI
A76		10475.00	10680.00	205.00	10125.00	10330.00	205.00	ETSI

Sub-band 1x is valid for CS 10 and 20 MHz.

Sub-band 2x is valid for 7, 14, and 28 MHz.

Sub-band 3x, 4x, and 5x are valid for 7, 14, 28, and 56 MHz.

Sub-band A1x (Duplex 65 MHz) is valid for CS 10 and 20 MHz.

Sub-band A2x (Duplex 91 MHz) is valid for CS 7, 14, and 28 MHz.

Sub-band A4x (Duplex 168 MHz), A5x and A7x (Duplex 350 MHz) are valid for CS 7, 14, 28, and 56 MHz.

3.2.3.7 RAU2 X 11 GHz Band

Table 15 RAU2 X 11 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	530	10695.00	10855.00	160.00	11225.00	11385.00	160.00	ETSI
15	530	11225.00	11385.00	160.00	10695.00	10855.00	160.00	ETSI
12	530	10835.00	11035.00	200.00	11365.00	11565.00	200.00	ETSI
16	530	11365.00	11565.00	200.00	10835.00	11035.00	200.00	ETSI
13	530	11015.00	11175.00	160.00	11545.00	11705.00	160.00	ETSI
17	530	11545.00	11705.00	160.00	11015.00	11175.00	160.00	ETSI
21	490	10695.00	10875.00	180.00	11185.00	11365.00	180.00	ETSI/ANSI
25	490	11185.00	11365.00	180.00	10695.00	10875.00	180.00	ETSI/ANSI
22	490	10855.00	11055.00	200.00	11345.00	11545.00	200.00	ETSI/ANSI
26	490	11345.00	11545.00	200.00	10855.00	11055.00	200.00	ETSI/ANSI
23	490	11035.00	11195.00	160.00	11525.00	11685.00	160.00	ETSI/ANSI
27	490	11525.00	11685.00	160.00	11035.00	11195.00	160.00	ETSI/ANSI
A01		10695.00	10875.00	180.00	11185.00	11385.00	200.00	ETSI/ANSI
A05		11185.00	11385.00	200.00	10695.00	10875.00	180.00	ETSI/ANSI
A02		10835.00	11055.00	220.00	11345.00	11565.00	220.00	ETSI/ANSI
A06		11345.00	11565.00	220.00	10835.00	11055.00	220.00	ETSI/ANSI
A03		11015.00	11200.00	185.00	11525.00	11705.00	180.00	ETSI/ANSI
A07		11525.00	11705.00	180.00	11015.00	11200.00	185.00	ETSI/ANSI

Sub-band 1x and 2x are valid for 7, 14, 28, 40, and 56 MHz.

Sub-band 2x is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A0x (Duplex 490 and 530 MHz) is valid for CS 7, 14, 28, 40, and 56 MHz.

Sub-band A0x (Duplex 490 and 500 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.8 RAU2 X 13 GHz Band

Table 16 RAU2 X 13 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	266	12751.00	12835.00	84.00	13017.00	13101.00	84.00	ETSI/ANSI
15	266	13017.00	13101.00	84.00	12751.00	12835.00	84.00	ETSI/ANSI
12	266	12821.00	12905.00	84.00	13087.00	13171.00	84.00	ETSI/ANSI
16	266	13087.00	13171.00	84.00	12821.00	12905.00	84.00	ETSI/ANSI
13	266	12891.00	12975.00	84.00	13157.00	13241.00	84.00	ETSI/ANSI
17	266	13157.00	13241.00	84.00	12891.00	12975.00	84.00	ETSI/ANSI
14	266	12863.00	12919.00	56.00	13129.00	13185.00	56.00	ETSI/ANSI
18	266	13129.00	13185.00	56.00	12863.00	12919.00	56.00	ETSI/ANSI
42	266	12807.00	12891.00	84.00	13073.00	13157.00	84.00	ETSI/ANSI
46	266	13073.00	13157.00	84.00	12807.00	12891.00	84.00	ETSI/ANSI
A01		12751.00	12863.00	112.00	13017.00	13129.00	112.00	ETSI/ANSI
A05		13017.00	13129.00	112.00	12751.00	12863.00	112.00	ETSI/ANSI
A02		12807.00	12905.00	98.00	13073.00	13171.00	98.00	ETSI/ANSI
A06		13073.00	13171.00	98.00	12807.00	12905.00	98.00	ETSI/ANSI
A03		12863.00	12975.00	112.00	13129.00	13241.00	112.00	ETSI/ANSI
A07		13129.00	13241.00	112.00	12863.00	12975.00	112.00	ETSI/ANSI

Note: FCC part 101.147(p)(2) frequency range begins at 12700.00 MHz.

Sub-band 1x and 4x are valid for 7, 14, 28, and 56 MHz.

Sub-band 1x and 4x are valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A0x (Duplex 266 MHz) is valid for 7, 14, 28, and 56 MHz.

Sub-band A0x (Duplex 225 and 266 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

For RAU2 X/Xu 13 [HP] CS=12.5 MHz and 25 MHz (10 MHz in a 12.5 MHz CS and 20 MHz in a 25 MHz CS) are supported.

3.2.3.9 RAU2 X 15 GHz Band

Table 17 RAU2 X 15 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	735	14499.25	14613.00	113.75	15234.25	15348.00	113.75	ETSI
18	735	15234.25	15348.00	113.75	14499.25	14613.00	113.75	ETSI
12	315	14604.25	14732.00	127.75	14919.25	15047.00	127.75	ETSI
15	315	14919.25	15047.00	127.75	14604.25	14732.00	127.75	ETSI
13	315	14709.25	14828.50	119.25	15024.25	15143.50	119.25	ETSI
16	315	15024.25	15143.50	119.25	14709.25	14828.50	119.25	ETSI
14	315	14814.25	14933.50	119.25	15129.25	15248.50	119.25	ETSI
17	315	15129.25	15248.50	119.25	14814.25	14933.50	119.25	ETSI
21	420	14495.75	14620.00	124.25	14915.75	15040.00	124.25	ETSI
25	420	14915.75	15040.00	124.25	14495.75	14620.00	124.25	ETSI
22	420	14607.75	14732.00	124.25	15027.75	15152.00	124.25	ETSI
26	420	15027.75	15152.00	124.25	14607.75	14732.00	124.25	ETSI
23	420	14719.75	14837.00	117.25	15139.75	15257.00	117.25	ETSI
27	420	15139.75	15257.00	117.25	14719.75	14837.00	117.25	ETSI
24	420	14817.75	14928.00	110.25	15237.75	15348.00	110.25	ETSI
28	420	15237.75	15348.00	110.25	14817.75	14928.00	110.25	ETSI
43	644	14495.75	14700.50	204.75	15139.75	15344.50	204.75	ETSI
49	644	15139.75	15344.50	204.75	14495.75	14700.50	204.75	ETSI
51	475	14700.00	14800.00	100.00	15175.00	15275.00	100.00	ANSI
53	475	15175.00	15275.00	100.00	14700.00	14800.00	100.00	ANSI
52	475	14775.00	14875.00	100.00	15250.00	15350.00	100.00	ANSI
54	475	15250.00	15350.00	100.00	14775.00	14875.00	100.00	ANSI
55	475	14500.00	14620.00	120.00	14975.00	15095.00	120.00	ANSI
57	475	14975.00	15095.00	120.00	14500.00	14620.00	120.00	ANSI
56	475	14600.00	14720.00	120.00	15075.00	15195.00	120.00	ANSI
58	475	15075.00	15195.00	120.00	14600.00	14720.00	120.00	ANSI
61	728	14495.75	14620.00	124.25	15223.75	15348.00	124.25	ETSI
68	728	15223.75	15348.00	124.25	14495.75	14620.00	124.25	ETSI
62	308	14614.75	14735.50	120.75	14922.75	15043.50	120.75	ETSI
65	308	14922.75	15043.50	120.75	14614.75	14735.50	120.75	ETSI
63	308	14698.75	14819.50	120.75	15006.75	15127.50	120.75	ETSI
66	308	15006.75	15127.50	120.75	14698.75	14819.50	120.75	ETSI
64	308	14810.75	14931.50	120.75	15118.75	15239.50	120.75	ETSI
67	308	15118.75	15239.50	120.75	14810.75	14931.50	120.75	ETSI
80	490	14397.75	14522.00	124.25	14887.75	15012.00	124.25	ETSI
85	490	14887.75	15012.00	124.25	14397.75	14522.00	124.25	ETSI
81	490	14481.75	14606.00	124.25	14971.75	15096.00	124.25	ETSI
86	490	14971.75	15096.00	124.25	14481.75	14606.00	124.25	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
82	490	14565.75	14690.00	124.25	15055.75	15180.00	124.25	ETSI
87	490	15055.75	15180.00	124.25	14565.75	14690.00	124.25	ETSI
83	490	14649.75	14774.00	124.25	15139.75	15264.00	124.25	ETSI
88	490	15139.75	15264.00	124.25	14649.75	14774.00	124.25	ETSI
84	490	14733.75	14858.00	124.25	15223.75	15348.00	124.25	ETSI
89	490	15223.75	15348.00	124.25	14733.75	14858.00	124.25	ETSI
92	322	14627.00	14739.00	112.00	14949.00	15061.00	112.00	ETSI
95	322	14949.00	15061.00	112.00	14627.00	14739.00	112.00	ETSI
93	322	14711.00	14823.00	112.00	15033.00	15145.00	112.00	ETSI
96	322	15033.00	15145.00	112.00	14711.00	14823.00	112.00	ETSI
94	322	14795.00	14907.00	112.00	15117.00	15229.00	112.00	ETSI
97	322	15117.00	15229.00	112.00	14795.00	14907.00	112.00	ETSI
A01		14495.75	14774.00	278.25	15055.75	15348.00	292.25	ETSI
A05		15055.75	15348.00	292.25	14495.75	14774.00	278.25	ETSI
A02		14604.25	14739.00	134.75	14919.25	15061.00	141.75	ETSI
A06		14919.25	15061.00	141.75	14604.25	14739.00	134.75	ETSI
A03		14698.75	14828.50	129.75	15006.75	15145.00	138.25	ETSI
A07		15006.75	15145.00	138.25	14698.75	14828.50	129.75	ETSI
A04		14795.00	14933.50	138.50	15117.00	15248.50	131.50	ETSI
A08		15117.00	15248.50	131.50	14795.00	14933.50	138.50	ETSI
A11		14397.75	14660.00	262.25	14887.75	15130.00	242.25	ETSI/ANSI
A15		14887.75	15130.00	242.25	14397.75	14660.00	262.25	ETSI/ANSI
A12		14600.00	14732.00	132.00	15027.75	15195.00	167.25	ETSI/ANSI
A16		15027.75	15195.00	167.25	14600.00	14732.00	132.00	ETSI/ANSI
A13		14700.00	14928.00	228.00	15139.75	15350.00	210.25	ETSI/ANSI
A17		15139.75	15350.00	210.25	14700.00	14928.00	228.00	ETSI/ANSI

Sub-band 1x, 2x, 6x, 8x, and 9x are valid for CS 7, 14, 28, and 56 MHz.

Sub-band 5x are valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A0x (Duplex 308, 315, 322, 490, 644, 728, and 735 MHz) and A1x (Duplex 420, 470, and 490 MHz) are valid for CS 7, 14, 28, and 56 MHz.

Sub-band A1x (Duplex 420, 470, and 490 MHz) are valid for CS 7, 14, 28, and 56 MHz.

Sub-band A1x (Duplex 475 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.10 RAU2 X 18 GHz Band

Table 18 RAU2 X 18 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	1010	17706.50	18009.50	303.00	18716.50	19019.50	303.00	ETSI
15	1010	18716.50	19019.50	303.00	17706.50	18009.50	303.00	ETSI
12	1010	17933.50	18236.50	303.00	18943.50	19246.50	303.00	ETSI
16	1010	18943.50	19246.50	303.00	17933.50	18236.50	303.00	ETSI
13	1010	18153.50	18456.50	303.00	19163.50	19466.50	303.00	ETSI
17	1010	19163.50	19466.50	303.00	18153.50	18456.50	303.00	ETSI
14	1010	18373.50	18676.50	303.00	19383.50	19686.50	303.00	ETSI
18	1010	19383.50	19686.50	303.00	18373.50	18676.50	303.00	ETSI
21	340	18580.00	18670.00	90.00	18920.00	19010.00	90.00	ANSI
25	340	18920.00	19010.00	90.00	18580.00	18670.00	90.00	ANSI
22	340	18655.00	18745.00	90.00	18995.00	19085.00	90.00	ANSI
26	340	18995.00	19085.00	90.00	18655.00	18745.00	90.00	ANSI
23	340	18730.00	18830.00	100.00	19070.00	19170.00	100.00	ANSI
27	340	19070.00	19170.00	100.00	18730.00	18830.00	100.00	ANSI
24	340	18820.00	18920.00	100.00	19160.00	19260.00	100.00	ANSI
28	340	19160.00	19260.00	100.00	18820.00	18920.00	100.00	ANSI
31	1560	17700.00	18003.00	303.00	19260.00	19563.00	303.00	ANSI
35	1560	19260.00	19563.00	303.00	17700.00	18003.00	303.00	ANSI
32	1560	17837.00	18140.00	303.00	19397.00	19700.00	303.00	ANSI
36	1560	19397.00	19700.00	303.00	17837.00	18140.00	303.00	ANSI
41	1008	17720.50	18009.50	289.00	18728.50	19017.50	289.00	ETSI
45	1008	18728.50	19017.50	289.00	17720.50	18009.50	289.00	ETSI
42	1008	17935.50	18236.50	301.00	18943.50	19244.50	301.00	ETSI
46	1008	18943.50	19244.50	301.00	17935.50	18236.50	301.00	ETSI
43	1008	18155.50	18456.50	301.00	19163.50	19464.50	301.00	ETSI
47	1008	19163.50	19464.50	301.00	18155.50	18456.50	301.00	ETSI
44	1008	18375.50	18672.50	297.00	19383.50	19680.50	297.00	ETSI
48	1008	19383.50	19680.50	297.00	18375.50	18672.50	297.00	ETSI
71	1010	17706.50	18009.50	303.00	18716.50	19019.50	303.00	ETSI
75	1010	18716.50	19019.50	303.00	17706.50	18009.50	303.00	ETSI
72	1010	17933.50	18236.50	303.00	18943.50	19246.50	303.00	ETSI
76	1010	18943.50	19246.50	303.00	17933.50	18236.50	303.00	ETSI
73	1010	18153.50	18456.50	303.00	19163.50	19466.50	303.00	ETSI
77	1010	19163.50	19466.50	303.00	18153.50	18456.50	303.00	ETSI
74	1010	18373.50	18676.50	303.00	19383.50	19686.50	303.00	ETSI
78	1010	19383.50	19686.50	303.00	18373.50	18676.50	303.00	ETSI
A11		17706.50	18236.50	530.00	18600.00	19246.50	646.50	ANSI
A15		18600.00	19246.50	646.50	17706.50	18236.50	530.00	ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A13		18002.25	18676.50	674.25	19094.75	19686.50	591.75	ANSI
A17		19094.75	19686.50	591.75	18002.25	18676.50	674.25	ANSI
A21		18580.00	18670.00	90.00	18920.00	19010.00	90.00	ANSI
A25		18920.00	19010.00	90.00	18580.00	18670.00	90.00	ANSI
A22		18655.00	18745.00	90.00	18995.00	19085.00	90.00	ANSI
A26		18995.00	19085.00	90.00	18655.00	18745.00	90.00	ANSI
A23		18730.00	18830.00	100.00	19070.00	19170.00	100.00	ANSI
A27		19070.00	19170.00	100.00	18730.00	18830.00	100.00	ANSI
A24		18820.00	18920.00	100.00	19160.00	19260.00	100.00	ANSI
A28		19160.00	19260.00	100.00	18820.00	18920.00	100.00	ANSI
A31		17700.00	18140.00	440.00	19260.00	19700.00	440.00	ANSI
A35		19260.00	19700.00	440.00	17700.00	18140.00	440.00	ANSI

Sub-band 1x, 4x, and 7x are valid for CS 7, 13.75/14, 27.5/28, and 55/56 MHz.

Sub-band 2x and 3x are valid for CS 7, 13.75/14, 27.5/28, and 55/56 MHz.

Sub-band 2x and 3x are valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A1x (Duplex 1008 and 1010 MHz), A2x (Duplex 340 MHz), and A3x (Duplex 1560 MHz) are valid for CS 7, 13.75/14, 27.5/28, and 55/56 MHz.

Sub-band A1x (Duplex 1160 MHz), A2x (Duplex 340 MHz), and A3x (Duplex 1560 MHz) are valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.11 RAU2 X 23 GHz Band

Table 19 RAU2 X 23 [HP]

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
72	1008	22100.00	22400.00	300.00	23108.00	23408.00	300.00	ETSI
73	1008	23108.00	23408.00	300.00	22100.00	22400.00	300.00	ETSI
74	1008	22217.75	22540.25	322.50	23225.75	23548.25	322.50	ETSI
75	1008	23225.75	23548.25	322.50	22217.75	22540.25	322.50	ETSI
76	1008	22002.75	22316.25	313.50	23010.75	23324.25	313.50	ETSI
78	1008	23010.75	23324.25	313.50	22002.75	22316.25	313.50	ETSI
77	1008	22274.00	22590.75	316.75	23282.00	23598.75	316.75	ETSI
79	1008	23282.00	23598.75	316.75	22274.00	22590.75	316.75	ETSI
81	1200	21218.25	21523.25	305.00	22418.25	22723.25	305.00	ETSI/ANSI
85	1200	22418.25	22723.25	305.00	21218.25	21523.25	305.00	ETSI/ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
82	1200	21494.75	21824.75	330.00	22694.75	23024.75	330.00	ETSI/ANSI
86	1200	22694.75	23024.75	330.00	21494.75	21824.75	330.00	ETSI/ANSI
83	1200	21796.25	22145.25	349.00	22996.25	23345.25	349.00	ETSI/ANSI
87	1200	22996.25	23345.25	349.00	21796.25	22145.25	349.00	ETSI/ANSI
84	1200	22094.75	22400.00	305.25	23294.75	23600.00	305.25	ETSI/ANSI
88	1200	23294.75	23600.00	305.25	22094.75	22400.00	305.25	ETSI/ANSI
91	1232	21224.00	21532.25	308.25	22456.00	22764.25	308.25	ETSI/ANSI
95	1232	22456.00	22764.25	308.25	21224.00	21532.25	308.25	ETSI/ANSI
92	1232	21503.75	21812.25	308.50	22735.75	23044.25	308.50	ETSI/ANSI
96	1232	22735.75	23044.25	308.50	21503.75	21812.25	308.50	ETSI/ANSI
93	1232	21784.00	22092.25	308.25	23016.00	23324.25	308.25	ETSI/ANSI
97	1232	23016.00	23324.25	308.25	21784.00	22092.25	308.25	ETSI/ANSI
94	1232	22049.75	22363.25	313.50	23281.75	23595.25	313.50	ETSI/ANSI
98	1232	23281.75	23595.25	313.50	22049.75	22363.25	313.50	ETSI/ANSI
101	1050	21950.25	22263.75	313.50	23000.25	23313.75	313.50	ETSI
103	1050	23000.25	23313.75	313.50	21950.25	22263.75	313.50	ETSI
102	1050	22235.25	22538.25	303.00	23285.25	23588.25	303.00	ETSI
104	1050	23285.25	23588.25	303.00	22235.25	22538.25	303.00	ETSI
111	1200	21200.00	21523.25	323.25	22400.00	22723.25	323.25	ETSI
115	1200	22400.00	22723.25	323.25	21200.00	21523.25	323.25	ETSI
A01		21200.00	21824.75	624.75	22400.00	23044.25	644.25	ETSI/ANSI
A05		22400.00	23044.25	644.25	21200.00	21824.75	624.75	ETSI/ANSI
A02		21784.00	22600.00	816.00	22996.25	23600.00	603.75	ETSI/ANSI
A06		22996.25	23600.00	603.75	21784.00	22600.00	816.00	ETSI/ANSI

Sub-band 7x, 8x, 9x, 10x, and 11x are valid for CS 7, 14, 28, and 56 MHz.

Sub-band 8x and 9x are valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A0x (Duplex 1008, 1050, 1200, and 1232 MHz) is valid for CS 7, 14, 28, and 56 MHz.

Sub-band A0x (Duplex 1200 and 1232 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.12 RAU2 X 24 GHz Band

Table 20 RAU2 X 24

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
41	800	24250.00	24450.00	200.00	25050.00	25250.00	200.00	ANSI
45	800	25050.00	25250.00	200.00	24250.00	24450.00	200.00	ANSI
A41		24250.00	24450.00	200.00	25050,00	25250,00	200.00	ANSI
A45		25050.00	25250.00	200.00	24250,00	24450,00	200.00	ANSI

Sub-band 4x is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band A4x (Duplex 800 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.13 RAU2 X 26 GHz Band

Table 21 RAU2 X 26

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
51	1008	24549.00	24885.00	336.00	25557.00	25893.00	336.00	ETSI
55	1008	25557.00	25893.00	336.00	24549.00	24885.00	336.00	ETSI
52	1008	24829.00	25165.00	336.00	25837.00	26173.00	336.00	ETSI
56	1008	25837.00	26173.00	336.00	24829.00	25165.00	336.00	ETSI
53	1008	25109.00	25445.00	336.00	26117.00	26453.00	336.00	ETSI
57	1008	26117.00	26453.00	336.00	25109.00	25445.00	336.00	ETSI
A01		24549.00	25165.00	616.00	25557.00	26173.00	616.00	ETSI
A05		25557.00	26173.00	616.00	24549.00	25165.00	616.00	ETSI
A02		24883.25	25469.00	585.75	25891.25	26477.00	585.75	ETSI
A06		25891.25	26477.00	585.75	24883.25	25469.00	585.75	ETSI

Sub-band 5x is valid for CS 7, 14, 28, and 56 MHz.

Sub-band A0x (Duplex 1008 MHz) is valid for CS 7, 14, 28, and 56 MHz.

3.2.3.14 RAU2 X 28 GHz Band

Table 22 RAU2 X 28

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
31	420	27505.00	27701.00	196.00	27925.00	28121.00	196.00	ANSI
33	420	27925.00	28121.00	196.00	27505.00	27701.00	196.00	ANSI
32	420	27701.00	27925.00	224.00	28121.00	28345.00	224.00	ANSI
34	420	28121.00	28345.00	224.00	27701.00	27925.00	224.00	ANSI
41	1008	27548.50	27884.50	336.00	28556.50	28892.50	336.00	ETSI
45	1008	28556.50	28892.50	336.00	27548.50	27884.50	336.00	ETSI
42	1008	27828.50	28164.50	336.00	28836.50	29172.50	336.00	ETSI
46	1008	28836.50	29172.50	336.00	27828.50	28164.50	336.00	ETSI
43	1008	28108.50	28444.50	336.00	29116.50	29452.50	336.00	ETSI
47	1008	29116.50	29452.50	336.00	28108.50	28444.50	336.00	ETSI
51	450	27500.00	27700.00	200.00	27950.00	28150.00	200.00	ANSI
53	450	27950.00	28150.00	200.00	27500.00	27700.00	200.00	ANSI
52	450	27700.00	27900.00	200.00	28150.00	28350.00	200.00	ANSI
54	450	28150.00	28350.00	200.00	27700.00	27900.00	200.00	ANSI
A01		27548.50	27996.50	448.00	28556.50	29004.50	448.00	ETSI
A05		28556.50	29004.50	448.00	27548.50	27996.50	448.00	ETSI
A02		27996.50	28444.50	448.00	29004.50	29452.50	448.00	ETSI
A06		29004.50	29452.50	448.00	27996.50	28444.50	448.00	ETSI
A03		27828.50	28276.50	448.00	28836.50	29284.50	448.00	ETSI
A07		28836.50	29284.50	448.00	27828.50	28276.50	448.00	ETSI
A11		27500.00	27701.00	201.00	27925.00	28150.00	225.00	ANSI
A15		27925.00	28150.00	225.00	27500.00	27701.00	201.00	ANSI
A12		27700.00	27925.00	225.00	28121.00	28350.00	229.00	ANSI
A16		28121.00	28350.00	229.00	27700.00	27925.00	225.00	ANSI

Sub-band 3x and 5x are valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band 4x is valid for CS 7, 14, 28, and 56 MHz.

Sub-band A0x (Duplex 1008 MHz) is valid for CS 7, 14, 28, and 56 MHz.

Sub-band A1x (Duplex 420 and 450 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.15 RAU2 X 32 GHz Band

Table 23 RAU2 X 32

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	812	31815.00	32095.00	280.00	32627.00	32907.00	280.00	ETSI
15	812	32627.00	32907.00	280.00	31815.00	32095.00	280.00	ETSI
12	812	32053.00	32333.00	280.00	32865.00	33145.00	280.00	ETSI
16	812	32865.00	33145.00	280.00	32053.00	32333.00	280.00	ETSI
13	812	32291.00	32599.00	308.00	33103.00	33411.00	308.00	ETSI
17	812	33103.00	33411.00	308.00	32291.00	32599.00	308.00	ETSI
A11		31815.00	32207.00	392.00	32627.00	33019.00	392.00	ETSI
A15		32627.00	33019.00	392.00	31815.00	32207.00	392.00	ETSI
A12		32053.00	32333.00	280.00	32865.00	33145.00	280.00	ETSI
A16		32865.00	33145.00	280.00	32053.00	32333.00	280.00	ETSI
A13		32207.00	32599.00	392.00	33019.00	33411.00	392.00	ETSI
A17		33019.00	33411.00	392.00	32207.00	32599.00	392.00	ETSI

Sub-band 1x is valid for CS 7, 14, 28, and 56 MHz.

Sub-band A1x (Duplex 812 MHz) is valid for CS 7, 14, 28, and 56 MHz.

3.2.3.16 RAU2 X 38 GHz Band

Table 24 RAU2 X 38

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	1260	37058.00	37339.75	281.75	38318.00	38599.75	281.75	ETSI
15	1260	38318.00	38599.75	281.75	37058.00	37339.75	281.75	ETSI
12	1260	37338.00	37619.75	281.75	38598.00	38879.75	281.75	ETSI
16	1260	38598.00	38879.75	281.75	37338.00	37619.75	281.75	ETSI
13	1260	37618.00	37899.75	281.75	38878.00	39159.75	281.75	ETSI
17	1260	38878.00	39159.75	281.75	37618.00	37899.75	281.75	ETSI
14	1260	37898.00	38179.75	281.75	39158.00	39439.75	281.75	ETSI
18	1260	39158.00	39439.75	281.75	37898.00	38179.75	281.75	ETSI
23	1260	37758.00	38039.75	281.75	39018.00	39299.75	281.75	ETSI
27	1260	39018.00	39299.75	281.75	37758.00	38039.75	281.75	ETSI
31	700	38600.00	38800.00	200.00	39300.00	39500.00	200.00	ANSI
35	700	39300.00	39500.00	200.00	38600.00	38800.00	200.00	ANSI
32	700	38770.00	38970.00	200.00	39470.00	39670.00	200.00	ANSI
36	700	39470.00	39670.00	200.00	38770.00	38970.00	200.00	ANSI
33	700	38930.00	39130.00	200.00	39630.00	39830.00	200.00	ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
37	700	39630.00	39830.00	200.00	38930.00	39130.00	200.00	ANSI
34	700	39100.00	39300.00	200.00	39800.00	40000.00	200.00	ANSI
38	700	39800.00	40000.00	200.00	39100.00	39300.00	200.00	ANSI
A11		37058.00	37619.75	561.75	38318.00	38879.75	561.75	ETSI
A15		38318.00	38879.75	561.75	37058.00	37619.75	561.75	ETSI
A12		37618.00	38179.75	561.75	38878.00	39439.75	561.75	ETSI
A16		38878.00	39439.75	561.75	37618.00	38179.75	561.75	ETSI
A31		38600.00	38800.00	200.00	39300.00	39500.00	200.00	ANSI
A35		39300.00	39500.00	200.00	38600.00	38800.00	200.00	ANSI
A32		38770.00	38970.00	200.00	39470.00	39670.00	200.00	ANSI
A36		39470.00	39670.00	200.00	38770.00	38970.00	200.00	ANSI
A33		38930.00	39130.00	200.00	39630.00	39830.00	200.00	ANSI
A37		39630.00	39830.00	200.00	38930.00	39130.00	200.00	ANSI
A34		39100.00	39300.00	200.00	39800.00	40000.00	200.00	ANSI
A38		39800.00	40000.00	200.00	39100.00	39300.00	200.00	ANSI

Sub-band 1x and 2x are valid for CS 7, 14, 28, and 56 MHz.

Sub-band 3x is valid for CS 10, 20, 30, 40, and 50 MHz for ANSI.

Sub-band A1x (Duplex 1260 MHz) is valid for CS 7, 14, 2, and 56 MHz.

Sub-band A3x (Duplex 700 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.3.17 RAU2 X 42 GHz Band

Table 25 RAU2 X 42

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11	1500	40522.00	40830.00	308.00	42022.00	42330.00	308.00	ETSI
15	1500	42022.00	42330.00	308.00	40522.00	40830.00	308.00	ETSI
12	1500	40774.00	41054.00	280.00	42274.00	42554.00	280.00	ETSI
16	1500	42274.00	42554.00	280.00	40774.00	41054.00	280.00	ETSI
21	1500	40998.00	41278.00	280.00	42498.00	42778.00	280.00	ETSI
25	1500	42498.00	42778.00	280.00	40998.00	41278.00	280.00	ETSI
22	1500	41222.00	41502.00	280.00	42722.00	43002.00	280.00	ETSI
26	1500	42722.00	43002.00	280.00	41222.00	41502.00	280.00	ETSI
31	1500	41446.00	41726.00	280.00	42946.00	43226.00	280.00	ETSI
35	1500	42946.00	43226.00	280.00	41446.00	41726.00	280.00	ETSI
32	1500	41670.00	41964.00	294.00	43170.00	43464.00	294.00	ETSI
36	1500	43170.00	43464.00	294.00	41670.00	41964.00	294.00	ETSI
A01		40522.00	41054.00	532.00	42022.00	42554.00	532.00	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A05		42022.00	42554.00	532.00	40522.00	41054.00	532.00	ETSI
A02		40998.00	41502.00	504.00	42498.00	43002.00	504.00	ETSI
A06		42498.00	43002.00	504.00	40998.00	41502.00	504.00	ETSI
A03		41446.00	41964.00	518.00	42946.00	43464.00	518.00	ETSI
A07		42946.00	43464.00	518.00	41446.00	41964.00	518.00	ETSI

Sub-band 1x, 2x, and 3x are valid for CS 7, 14, 28, and 56 MHz.

Sub-band A0x (Duplex 1500 MHz) is valid for CS 7, 14, 28, and 56 MHz.

3.2.4 MINI-LINK 6363

3.2.4.1 MINI-LINK 6363 6 GHz Lower Band

Table 26 MINI-LINK 6363 6L

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11L		5925.000	6020.250	95.250	6177.050	6277.000	99.950	ETSI/ANSI
11H		6177.050	6277.000	99.950	5925.000	6020.250	95.250	ETSI/ANSI
12L		6011.000	6110.250	99.250	6270.050	6362.300	92.250	ETSI/ANSI
12H		6270.050	6362.300	92.250	6011.000	6110.250	99.250	ETSI/ANSI
13L		6078.500	6173.250	94.750	6330.550	6425.300	94.750	ETSI/ANSI
13H		6330.550	6425.300	94.750	6078.500	6173.250	94.750	ETSI/ANSI
14L		5989.325	6049.350	60.025	6241.350	6301.375	60.025	ETSI/ANSI
14H		6241.350	6301.375	60.025	5989.325	6049.350	60.025	ETSI/ANSI
51L		5925.000	6020.250	95.250	6177.050	6277.000	99.950	ANSI
51H		6177.050	6277.000	99.950	5925.000	6020.250	95.250	ANSI
52L		6011.000	6110.250	99.250	6270.050	6362.300	92.250	ANSI
52H		6270.050	6362.300	92.250	6011.000	6110.250	99.250	ANSI
53L		6078.500	6173.250	94.750	6330.550	6425.300	94.750	ANSI
53H		6330.550	6425.300	94.750	6078.500	6173.250	94.750	ANSI
54L		5989.330	6049.330	60.000	6241.370	6301.370	60.000	ANSI
54H		6241.370	6301.370	60.000	5989.330	6049.330	60.000	ANSI

Sub-band 1xL/H (Duplex 240, 252.04, 260, and 266 MHz) is valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band 1xL/H (Duplex 252.04 MHz) are valid for CS 9.88/10, 20, 29.65/30, 40, 50, and 59.3/60 MHz.

Sub-band 5xL/H (Duplex 252.04 MHz) are valid for CS 9.88/10, 20, 29.65/30, 40, 50, and 59.3/60 MHz.

3.2.4.2 MINI-LINK 6363 6 GHz Upper Band

Table 27 MINI-LINK 6363 6U

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
21L		6430.000	6565.000	135.000	6770.000	6905.000	135.000	ETSI/ANSI
21H		6770.000	6905.000	135.000	6430.000	6565.000	135.000	ETSI/ANSI
22L		6550.000	6685.000	135.000	6890.000	7025.000	135.000	ETSI/ANSI
22H		6890.000	7025.000	135.000	6550.000	6685.000	135.000	ETSI/ANSI
23L		6635.000	6765.000	130.000	6975.000	7105.000	130.000	ETSI/ANSI
23H		6975.000	7105.000	130.000	6635.000	6765.000	130.000	ETSI/ANSI
24L		6520.000	6600.000	80.000	6860.000	6940.000	80.000	ETSI/ANSI
24H		6860.000	6940.000	80.000	6520.000	6600.000	80.000	ETSI/ANSI
31L		6540.000	6610.000	70.000	6700.000	6770.000	70.000	ANSI
31H		6700.000	6770.000	70.000	6540.000	6610.000	70.000	ANSI
32L		6597.500	6657.500	60.000	6757.500	6817.500	60.000	ANSI
32H		6757.500	6817.500	60.000	6597.500	6657.500	60.000	ANSI
33L		6640.000	6710.000	70.000	6800.000	6870.000	70.000	ANSI
33H		6800.000	6870.000	70.000	6640.000	6710.000	70.000	ANSI

Sub-band 2xL/H (Duplex 340 MHz) is valid for CS 7, 14, 28/30, 40, and 56/60 MHz.

Sub-band 2xL/H (Duplex 340 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band 3xL/H (Duplex 160 and 170 MHz) are valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.3 MINI-LINK 6363 7 GHz Band

Table 28 MINI-LINK 6363 7

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		7107.000	7163.000	56.00	7303.000	7359.000	56.00	ETSI
01H		7303.000	7359.000	56.00	7107.000	7163.000	56.00	ETSI
02L		7163.000	7219.000	56.00	7359.000	7415.000	56.00	ETSI
02H		7359.000	7415.000	56.00	7163.000	7219.000	56.00	ETSI
03L		7191.000	7247.000	56.00	7387.000	7443.000	56.00	ETSI
03H		7387.000	7443.000	56.00	7191.000	7247.000	56.00	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11L		7414.000	7485.000	71.00	7575.000	7645.000	70.00	ETSI/ANSI
11H		7575.000	7645.000	70.00	7414.000	7485.000	71.00	ETSI/ANSI
12L		7442.000	7515.000	73.00	7610.000	7673.000	63.00	ETSI/ANSI
12H		7610.000	7673.000	63.00	7442.000	7515.000	73.00	ETSI/ANSI
13L		7470.000	7540.000	70.00	7638.000	7701.000	63.00	ETSI/ANSI
13H		7638.000	7701.000	63.00	7470.000	7540.000	70.00	ETSI/ANSI
14L		7498.000	7568.000	70.00	7665.000	7729.000	64.00	ETSI/ANSI
14H		7665.000	7729.000	64.00	7498.000	7568.000	70.00	ETSI/ANSI
21L		7426.500	7513.750	87.250	7671.500	7758.750	87.250	ETSI
21H		7671.500	7758.750	87.250	7426.500	7513.750	87.250	ETSI
22L		7482.250	7569.750	87.500	7727.250	7814.750	87.500	ETSI
22H		7727.250	7814.750	87.500	7482.250	7569.750	87.500	ETSI
23L		7510.250	7597.750	87.500	7755.250	7842.750	87.500	ETSI
23H		7755.250	7842.750	87.500	7510.250	7597.750	87.500	ETSI
24L		7566.250	7653.750	87.500	7811.250	7898.750	87.500	ETSI
24H		7811.250	7898.750	87.500	7566.250	7653.750	87.500	ETSI
31L		7107.000	7184.000	77.00	7275.000	7345.000	70.00	ETSI/ANSI
31H		7275.000	7345.000	70.00	7107.000	7184.000	77.00	ETSI/ANSI
32L		7135.000	7212.000	77.00	7303.000	7373.000	70.00	ETSI/ANSI
32H		7303.000	7373.000	70.00	7135.000	7212.000	77.00	ETSI/ANSI
33L		7163.000	7240.000	77.00	7331.000	7401.000	70.00	ETSI/ANSI
33H		7331.000	7401.000	70.00	7163.000	7240.000	77.00	ETSI/ANSI
34L		7191.000	7268.000	77.00	7359.000	7429.000	70.00	ETSI/ANSI
34H		7359.000	7429.000	70.00	7191.000	7268.000	77.00	ETSI/ANSI
81L		7249.500	7309.000	59.50	7410.500	7470.000	59.50	ETSI
81H		7410.500	7470.000	59.50	7249.500	7309.000	59.50	ETSI
82L		7277.500	7337.000	59.50	7438.500	7498.000	59.50	ETSI
82H		7438.500	7498.000	59.50	7277.500	7337.000	59.50	ETSI
83L		7305.500	7365.000	59.50	7466.500	7526.000	59.50	ETSI
83H		7466.500	7526.000	59.50	7305.500	7365.000	59.50	ETSI
84L		7333.500	7393.000	59.50	7494.500	7554.000	59.50	ETSI
84H		7494.500	7554.000	59.50	7333.500	7393.000	59.50	ETSI
94L		7527.000	7583.000	56.00	7695.000	7751.000	56.00	ETSI/ANSI
94H		7695.000	7751.000	56.00	7527.000	7583.000	56.00	ETSI/ANSI

Sub-band 0xL/H (Duplex 196 MHz), 2xL/H (Duplex 245 and 269 MHz), 8xL/H (Duplex 161 MHz) are valid for CS 7, 14, 28, and 56 MHz.

Sub-band 1xL/H (Duplex 154, 161, and 168 MHz), 3xL/H (Duplex 154, 161, and 168 MHz), 9xL/H (Duplex 168 MHz) are valid for CS 7, 14, 28, and 56 MHz.

Sub-band 1xL/H (Duplex 150 MHz), 3xL/H (Duplex 175 MHz), and 9xL/H (Duplex 150 MHz) are valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.4 MINI-LINK 6363 8 GHz Band

Table 29 MINI-LINK 6363 8

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		7744.750	7793.750	49.000	7893.000	7942.250	49.250	ETSI
01H		7893.000	7942.250	49.250	7744.750	7793.750	49.000	ETSI
02L		7779.750	7828.750	49.000	7928.000	7977.250	49.250	ETSI
02H		7928.000	7977.250	49.250	7779.750	7828.750	49.000	ETSI
11L		7718.050	7837.250	119.200	8016.500	8147.975	131.475	ETSI/ANSI
11H		8016.500	8147.975	131.475	7718.050	7837.250	119.200	ETSI/ANSI
12L		7777.000	7910.775	133.775	8085.000	8222.100	137.100	ETSI/ANSI
12H		8085.000	8222.100	137.100	7777.000	7910.775	133.775	ETSI/ANSI
14L		7835.000	7970.075	135.075	8135.000	8281.400	146.400	ETSI/ANSI
14H		8135.000	8281.400	146.400	7835.000	7970.075	135.075	ETSI/ANSI
21L		8279.000	8328.000	49.000	8405.000	8450.500	45.500	ETSI
21H		8405.000	8450.500	45.500	8279.000	8328.000	49.000	ETSI
23L		8324.500	8370.000	45.500	8447.000	8492.500	45.500	ETSI
23H		8447.000	8492.500	45.500	8324.500	8370.000	45.500	ETSI
41L		8279.000	8321.000	42.000	8398.000	8440.000	42.000	ETSI
41H		8398.000	8440.000	42.000	8279.000	8321.000	42.000	ETSI
42L		8307.000	8349.000	42.000	8426.000	8475.000	49.000	ETSI
42H		8426.000	8475.000	49.000	8307.000	8349.000	42.000	ETSI
43L		8328.000	8377.000	49.000	8454.000	8496.000	42.000	ETSI
43H		8454.000	8496.000	42.000	8328.000	8377.000	49.000	ETSI
61L		7905.000	8017.000	112.000	8171.000	8327.000	156.000	ETSI
61H		8171.000	8327.000	156.000	7905.000	8017.000	112.000	ETSI
62L		7968.000	8073.000	105.000	8234.000	8339.000	105.000	ETSI
62H		8234.000	8339.000	105.000	7968.000	8073.000	105.000	ETSI
63L		7989.000	8136.000	147.000	8290.000	8411.000	121.000	ETSI
63H		8290.000	8411.000	121.000	7989.000	8136.000	147.000	ETSI
64L		8073.000	8185.000	112.000	8383.000	8495.000	112.000	ETSI
64H		8383.000	8495.000	112.000	8073.000	8185.000	112.000	ETSI
91L		8050.000	8134.000	84.000	8258.000	8342.000	84.000	ETSI
91H		8258.000	8342.000	84.000	8050.000	8134.000	84.000	ETSI
92L		8106.000	8190.000	84.000	8314.000	8398.000	84.000	ETSI
92H		8314.000	8398.000	84.000	8106.000	8190.000	84.000	ETSI
93L		8162.000	8246.000	84.000	8370.000	8454.000	84.000	ETSI
93H		8370.000	8454.000	84.000	8162.000	8246.000	84.000	ETSI

Sub-band 0xL/H (Duplex 148.25 and 148.5 MHz), 2xL/H and 4xL/H (Duplex 119 and 126 MHz) are valid for CS 7, 14, and 28/29.65 MHz.

Sub-band 1xL/H (Duplex 283.5, 310, and 311.32 MHz), 6xL/H (Duplex 266 and 310 MHz), and 9xL/H (Duplex 208 MHz) are valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band 1xL/H (Duplex 300 and 310 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.5 MINI-LINK 6363 10 GHz Band

Table 30 MINI-LINK 6363 10

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
21L		10500.50	10528.50	28.00	10591.50	10619.50	28.00	ETSI
21H		10591.50	10619.50	28.00	10500.50	10528.50	28.00	ETSI
22L		10528.50	10556.50	28.00	10619.50	10647.50	28.00	ETSI
22H		10619.50	10647.50	28.00	10528.50	10556.50	28.00	ETSI
23L		10556.50	10584.50	28.00	10647.50	10675.50	28.00	ETSI
23H		10647.50	10675.50	28.00	10556.50	10584.50	28.00	ETSI
41L		10308.00	10420.00	112.00	10476.00	10588.00	112.00	ETSI
41H		10476.00	10588.00	112.00	10308.00	10420.00	112.00	ETSI
71L		10000.00	10189.00	189.00	10350.00	10539.00	189.00	ETSI
71H		10350.00	10539.00	189.00	10000.00	10189.00	189.00	ETSI
72L		10125.00	10330.00	205.00	10475.00	10680.00	205.00	ETSI
72H		10475.00	10680.00	205.00	10125.00	10330.00	205.00	ETSI

Sub-band 2xL/H (Duplex 91 MHz) is valid for CS 7, 14, and 28 MHz.

Sub-band 4xL/H (Duplex 168 MHz) and 7xL/H (Duplex 350 MHz) are valid for CS 7, 14, 28, and 56 MHz.

3.2.4.6 MINI-LINK 6363 11 GHz Band

Table 31 MINI-LINK 6363 11

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		10695.00	10877.00	182.00	11185.00	11385.00	200.00	ETSI/ANSI
01H		11185.00	11385.00	200.00	10695.00	10877.00	182.00	ETSI/ANSI
02L		10835.00	11055.00	220.00	11339.00	11575.00	236.00	ETSI/ANSI
02H		11339.00	11575.00	236.00	10835.00	11055.00	220.00	ETSI/ANSI
03L		11015.00	11200.00	185.00	11507.00	11705.00	198.00	ETSI/ANSI
03H		11507.00	11705.00	198.00	11015.00	11200.00	185.00	ETSI/ANSI

Sub-band 0xL/H (Duplex 490 and 530 MHz) is valid for CS 7, 14, 28, 40, and 56 MHz.

Sub-band 0xL/H (Duplex 490 and 500 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.7 MINI-LINK 6363 13 GHz Band

Table 32 MINI-LINK 6363 13; MINI-LINK 6363/2 13

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		12751.00	12900.00	149.00	13017.00	13157.00	140.00	ETSI/ANSI
01H		13017.00	13157.00	140.00	12751.00	12900.00	149.00	ETSI/ANSI
03L		12863.00	12975.00	112.00	13129.00	13241.00	112.00	ETSI/ANSI
03H		13129.00	13241.00	112.00	12863.00	12975.00	112.00	ETSI/ANSI

Note: FCC part 101.147(p)(2) frequency range begins at 12700.00 MHz.

Sub-band 0xL/H (Duplex 266 MHz) is valid for 7, 14, 28, and 56 MHz.

Sub-band 0xL/H (Duplex 225 and 266 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.8 MINI-LINK 6363 15 GHz Band

Table 33 MINI-LINK 6363 15

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		14495.75	14774.00	278.25	15055.75	15348.00	292.25	ETSI
01H		15055.75	15348.00	292.25	14495.75	14774.00	278.25	ETSI
02L		14604.25	14739.00	134.75	14919.25	15061.00	141.75	ETSI
02H		14919.25	15061.00	141.75	14604.25	14739.00	134.75	ETSI
03L		14698.75	14828.50	129.75	15006.75	15145.00	138.25	ETSI
03H		15006.75	15145.00	138.25	14698.75	14828.50	129.75	ETSI
04L		14795.00	14933.50	138.50	15117.00	15248.50	131.50	ETSI
04H		15117.00	15248.50	131.50	14795.00	14933.50	138.50	ETSI
11L		14397.75	14660.00	262.25	14887.75	15130.00	242.25	ETSI/ANSI
11H		14887.75	15130.00	242.25	14397.75	14660.00	262.25	ETSI/ANSI
12L		14501.00	14732.00	231.00	14921.00	15195.00	274.00	ETSI/ANSI
12H		14921.00	15195.00	274.00	14501.00	14732.00	231.00	ETSI/ANSI
13L		14700.00	14928.00	228.00	15139.75	15350.00	210.25	ETSI/ANSI
13H		15139.75	15350.00	210.25	14700.00	14928.00	228.00	ETSI/ANSI

Sub-band 0xL/H (Duplex 308, 315, 322, 490, 644, 728, and 735 MHz) is valid for CS 7, 14, 28, and 56 MHz.

Sub-band 1xL/H (Duplex 420, 470, and 490 MHz) is valid for CS 7, 14, 28, and 56 MHz.

Sub-band 1xL/H (Duplex 475 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

Table 34 MINI-LINK 6363/2 15

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		14495.75	14774.00	278.25	15055.75	15348.00	292.25	ETSI
01H		15055.75	15348.00	292.25	14495.75	14774.00	278.25	ETSI
02L		14604.25	14739.00	134.75	14919.25	15061.00	141.75	ETSI
02H		14919.25	15061.00	141.75	14604.25	14739.00	134.75	ETSI
03L		14698.75	14828.50	129.75	15006.75	15145.00	138.25	ETSI
03H		15006.75	15145.00	138.25	14698.75	14828.50	129.75	ETSI
04L		14795.00	14933.50	138.50	15117.00	15248.50	131.50	ETSI
04H		15117.00	15248.50	131.50	14795.00	14933.50	138.50	ETSI
11L		14397.75	14660.00	262.25	14887.75	15130.00	242.25	ETSI/ANSI
11H		14887.75	15130.00	242.25	14397.75	14660.00	262.25	ETSI/ANSI
12L		14600.00	14732.00	132.00	15027.75	15195.00	167.25	ETSI/ANSI
12H		15027.75	15195.00	167.25	14600.00	14732.00	132.00	ETSI/ANSI
13L		14700.00	14928.00	228.00	15139.75	15350.00	210.25	ETSI/ANSI
13H		15139.75	15350.00	210.25	14700.00	14928.00	228.00	ETSI/ANSI

Sub-band 0xL/H (Duplex 308, 315, 322, 490, 644, 728, and 735 MHz) is valid for CS 7, 14, 28, and 56 MHz.

Sub-band 1xL/H (Duplex 420, 470, and 490 MHz) is valid for CS 7, 14, 28, and 56 MHz.

Sub-band 1xL/H (Duplex 475 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.9 MINI-LINK 6363 18 GHz Band

Table 35 MINI-LINK 6363 18; MINI-LINK 6363/2 18

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11L		17706.50	18236.50	530.00	18600.00	19246.50	646.50	ETSI/ANSI
11H		18600.00	19246.50	646.50	17706.50	18236.50	530.00	ETSI/ANSI
13L		18002.25	18676.50	674.25	19094.75	19686.50	591.75	ETSI/ANSI
13H		19094.75	19686.50	591.75	18002.25	18676.50	674.25	ETSI/ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
21L		18580.00	18670.00	90.00	18920.00	19010.00	90.00	ETSI/ANSI
21H		18920.00	19010.00	90.00	18580.00	18670.00	90.00	ETSI/ANSI
22L		18655.00	18745.00	90.00	18995.00	19085.00	90.00	ETSI/ANSI
22H		18995.00	19085.00	90.00	18655.00	18745.00	90.00	ETSI/ANSI
23L		18730.00	18830.00	100.00	19070.00	19170.00	100.00	ETSI/ANSI
23H		19070.00	19170.00	100.00	18730.00	18830.00	100.00	ETSI/ANSI
24L		18820.00	18920.00	100.00	19160.00	19260.00	100.00	ETSI/ANSI
24H		19160.00	19260.00	100.00	18820.00	18920.00	100.00	ETSI/ANSI
31L		17700.00	18140.00	440.00	19260.00	19700.00	440.00	ETSI/ANSI
31H		19260.00	19700.00	440.00	17700.00	18140.00	440.00	ETSI/ANSI

Sub-band 1xL/H (Duplex 1008 and 1010 MHz), 2xL/H (Duplex 340 MHz), and 3xL/H (Duplex 1560 MHz) are valid for CS 7, 13.75/14, 27.5/28, 55/56, and 110/112 MHz.

Sub-band 1xL/H (Duplex 1160 MHz), 2xL/H (Duplex 340 MHz), and 3xL/H (Duplex 1560 MHz) are valid for CS 10, 20, 30, 40, 50, 60, and 80 MHz.

3.2.4.10 MINI-LINK 6363 23 GHz Band

Table 36 MINI-LINK 6363 23; MINI-LINK 6363/2 23

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		21200.00	21824.75	624.75	22400.00	23044.25	644.25	ETSI/ANSI
01H		22400.00	23044.25	644.25	21200.00	21824.75	624.75	ETSI/ANSI
02L		21784.00	22600.00	816.00	22996.25	23600.00	603.75	ETSI/ANSI
02H		22996.25	23600.00	603.75	21784.00	22600.00	816.00	ETSI/ANSI

Sub-band 0xL/H (Duplex 1008, 1050, 1200, and 1232 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

Sub-band 0xL/H (Duplex 1200 and 1232 MHz) is valid for CS 10, 20, 30, 40, 50, 60, and 80 MHz.

3.2.4.11 MINI-LINK 6363 24 GHz Band

Table 37 MINI-LINK 6363 24

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
41L		24250.00	24450.00	200.00	25050.00	25250.00	200.00	ANSI
41H		25050.00	25250.00	200.00	24250.00	24450.00	200.00	ANSI

Sub-band 4xL/H (Duplex 800 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.12 MINI-LINK 6363 26 GHz Band

Table 38 MINI-LINK 6363 26

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		24549.00	25165.00	616.00	25557.00	26173.00	616.00	ETSI
01H		25557.00	26173.00	616.00	24549.00	25165.00	616.00	ETSI
02L		24883.25	25473.00	589.75	25891.25	26481.00	589.75	ETSI
02H		25891.25	26481.00	589.75	24883.25	25473.00	589.75	ETSI

Sub-band 0xL/H (Duplex 1008 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

3.2.4.13 MINI-LINK 6363 28 GHz Band

Table 39 MINI-LINK 6363 28

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		27548.50	27996.50	448.00	28556.50	29004.50	448.00	ETSI
01H		28556.50	29004.50	448.00	27548.50	27996.50	448.00	ETSI
02L		27996.50	28444.50	448.00	29004.50	29452.50	448.00	ETSI
02H		29004.50	29452.50	448.00	27996.50	28444.50	448.00	ETSI
11L		27500.00	27701.00	201.00	27925.00	28150.00	225.00	ANSI
11H		27925.00	28150.00	225.00	27500.00	27701.00	201.00	ANSI
12L		27700.00	27925.00	225.00	28121.00	28350.00	229.00	ANSI
12H		28121.00	28350.00	229.00	27700.00	27925.00	225.00	ANSI

Sub-band 0xL/H (Duplex 1008 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

Sub-band 1xL/H (Duplex 420 and 450 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.14 MINI-LINK 6363 32 GHz Band

Table 40 MINI-LINK 6363 32

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11L		31815.00	32207.00	392.00	32627.00	33019.00	392.00	ETSI/ANSI
11H		32627.00	33019.00	392.00	31815.00	32207.00	392.00	ETSI/ANSI
13L		32207.00	32599.00	392.00	33019.00	33411.00	392.00	ETSI/ANSI
13H		33019.00	33411.00	392.00	32207.00	32599.00	392.00	ETSI/ANSI

Sub-band 1xL/H (Duplex 812 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

3.2.4.15 MINI-LINK 6363 38 GHz Band

Table 41 MINI-LINK 6363 38; MINI-LINK 6363/2 38

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
11L		37058.00	37619.75	561.75	38318.00	38879.75	561.75	ETSI
11H		38318.00	38879.75	561.75	37058.00	37619.75	561.75	ETSI
12L		37618.00	38179.75	561.75	38878.00	39439.75	561.75	ETSI
12H		38878.00	39439.75	561.75	37618.00	38179.75	561.75	ETSI
31L		38600.00	38800.00	200.00	39300.00	39500.00	200.00	ANSI
31H		39300.00	39500.00	200.00	38600.00	38800.00	200.00	ANSI
32L		38770.00	38970.00	200.00	39470.00	39670.00	200.00	ANSI
32H		39470.00	39670.00	200.00	38770.00	38970.00	200.00	ANSI
33L		38930.00	39130.00	200.00	39630.00	39830.00	200.00	ANSI
33H		39630.00	39830.00	200.00	38930.00	39130.00	200.00	ANSI
34L		39100.00	39300.00	200.00	39800.00	40000.00	200.00	ANSI
34H		39800.00	40000.00	200.00	39100.00	39300.00	200.00	ANSI

Sub-band 1xL/H (Duplex 1260 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

Sub-band 3xL/H (Duplex 700 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.4.16 MINI-LINK 6363 42 GHz Band

Table 42 MINI-LINK 6363 42

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		40522.00	41054.00	532.00	42022.00	42554.00	532.00	ETSI
05H		42022.00	42554.00	532.00	40522.00	41054.00	532.00	ETSI
02L		40998.00	41502.00	504.00	42498.00	43002.00	504.00	ETSI
02H		42498.00	43002.00	504.00	40998.00	41502.00	504.00	ETSI
03L		41446.00	41964.00	518.00	42946.00	43464.00	518.00	ETSI
03H		42946.00	43464.00	518.00	41446.00	41964.00	518.00	ETSI

Sub-band 0xL/H (Duplex 1500 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

3.2.4.17 MINI-LINK 6363 80 GHz Band

Table 43 MINI-LINK 6363 80

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
01L		71125.00	72250.00	1125.00	81125.00	82250.00	1125.00	ETSI/ANSI
01H		81125.00	82250.00	1125.00	71125.00	72250.00	1125.00	ETSI/ANSI
02L		72250.00	73500.00	1250.00	82250.00	83500.00	1250.00	ETSI/ANSI
02H		82250.00	83500.00	1250.00	72250.00	73500.00	1250.00	ETSI/ANSI
03L		73500.00	74750.00	1250.00	83500.00	84750.00	1250.00	ETSI/ANSI
03H		83500.00	84750.00	1250.00	73500.00	74750.00	1250.00	ETSI/ANSI
04L		74750.00	75875.00	1125.00	84750.00	85875.00	1125.00	ETSI/ANSI
04H		84750.00	85875.00	1125.00	74750.00	75875.00	1125.00	ETSI/ANSI

Sub-band 0xL/H is valid for CS 62.5 and 125 MHz (with CS 56, 60, 80, and 112 MHz physical modes).

3.2.5 MINI-LINK 6364

3.2.5.1 MINI-LINK 6364 13 GHz Band

Table 44 MINI-LINK 6364 13

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
W01L		12751.00	12975.00	224.00	13017.00	13241.00	224.00	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
W01H		13017.00	13241.00	224.00	12751.00	12975.00	224.00	ETSI

Sub-band W01L/H (Duplex 266 MHz) is valid for 7, 14, 28, 56, and 112 MHz.

3.2.5.2 MINI-LINK 6364 15 GHz Band

Table 45 MINI-LINK 6364 15

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
W01L		14397.75	14933.50	535.75	14865.00	15375.00	510.00	ETSI
W01H		14865.00	15375.00	510.00	14397.75	14933.50	535.75	ETSI

Sub-band W01L/H (Duplex 420, 470, 490, and 735 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

3.2.5.3 MINI-LINK 6364 18 GHz Band

Table 46 MINI-LINK 6364 18

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
W01L		17700.00	18690.00	990.00	18590.00	19700.00	1110.00	ETSI
W01H		18590.00	19700.00	1110.00	17700.00	18690.00	990.00	ETSI

Sub-band W01L/H (Duplex 1010 and 1560 MHz) are valid for CS 7, 13.75/14, 27.5/28, 55/56, 110/112, and 220/224 MHz.

3.2.6 MINI-LINK 6365

3.2.6.1 MINI-LINK 6365 6 GHz Band

Table 47 MINI-LINK 6365 6

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A41L		5925.000	6020.250	95.250	6175.000	6277.000	102.000	ETSI/ANSI
A41H		6175.000	6277.000	102.000	5925.000	6020.250	95.250	ETSI/ANSI
A42L		6005.000	6110.250	105.250	6255.000	6362.300	107.300	ETSI/ANSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A42H		6255.000	6362.300	107.300	6005.000	6110.250	105.250	ETSI/ANSI
A43L		6078.500	6175.000	96.500	6330.550	6425.300	94.750	ETSI/ANSI
A43H		6330.550	6425.300	94.750	6078.500	6175.000	96.500	ETSI/ANSI
A44L		5983.000	6055.000	72.000	6241.350	6305.000	63.650	ETSI/ANSI
A44H		6241.350	6305.000	63.650	5983.000	6055.000	72.000	ETSI/ANSI
B21L		6430.000	6565.000	135.000	6770.000	6905.000	135.000	ETSI/ANSI
B21H		6770.000	6905.000	135.000	6430.000	6565.000	135.000	ETSI/ANSI
B22L		6540.000	6700.000	160.000	6880.000	7040.000	160.000	ETSI/ANSI
B22H		6880.000	7040.000	160.000	6540.000	6700.000	160.000	ETSI/ANSI
B23L		6620.000	6780.000	160.000	6960.000	7120.000	160.000	ETSI/ANSI
B23H		6960.000	7120.000	160.000	6620.000	6780.000	160.000	ETSI/ANSI
B24L		6500.000	6620.000	120.000	6840.000	6960.000	120.000	ETSI/ANSI
B24H		6840.000	6960.000	120.000	6500.000	6620.000	120.000	ETSI/ANSI
B31L		6540.000	6610.000	70.000	6700.000	6770.000	70.000	ANSI
B31H		6700.000	6770.000	70.000	6540.000	6610.000	70.000	ANSI
B32L		6597.500	6670.000	72.500	6740.000	6830.000	90.000	ANSI
B32H		6740.000	6830.000	90.000	6597.500	6670.000	72.500	ANSI
B33L		6640.000	6710.000	70.000	6800.000	6870.000	70.000	ANSI
B33H		6800.000	6870.000	70.000	6640.000	6710.000	70.000	ANSI

Sub-band A4xL/H (Duplex 240, 252.04, 260, and 266 MHz) is valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band A4xL/H (Duplex 252.04 MHz) are valid for CS 9.88/10, 20, 29.65/30, 40, 50, and 59.3/60 MHz.

Sub-band B2xL/H (Duplex 340 MHz) is valid for CS 7, 14, 28/30, 40, 56/60 and 80 MHz.

Sub-band B2xL/H (Duplex 340 MHz) is valid for CS 10, 20, 30, 40, 50 and 60 MHz.

Sub-band B3xL/H (Duplex 160 and 170 MHz) are valid for CS 10, 20, 30, 40, 50 and 60 MHz.

3.2.6.2 MINI-LINK 6365 7/8 GHz Band

Table 48 MINI-LINK 6365 7/8

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A01L		7107.000	7219.000	112.000	7303.000	7415.000	112.000	ETSI
A01H		7303.000	7415.000	112.000	7107.000	7219.000	112.000	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A03L		7163.000	7247.000	84.000	7359.000	7443.000	84.000	ETSI
A03H		7359.000	7443.000	84.000	7163.000	7247.000	84.000	ETSI
A11L		7414.000	7515.000	101.00	7575.000	7673.000	98.00	ETSI/ANSI
A11H		7575.000	7673.000	98.00	7414.000	7515.000	101.00	ETSI/ANSI
A13L		7470.000	7568.000	98.00	7635.000	7729.000	94.00	ETSI/ANSI
A13H		7635.000	7729.000	94.00	7470.000	7568.000	98.00	ETSI/ANSI
A21L		7426.500	7569.750	143.250	7671.500	7814.750	143.250	ETSI
A21H		7671.500	7814.750	143.250	7426.500	7569.750	143.250	ETSI
A23L		7510.250	7653.750	143.500	7755.250	7898.750	143.500	ETSI
A23H		7755.250	7898.750	143.500	7510.250	7653.750	143.500	ETSI
A31L		7107.000	7212.000	105.00	7275.000	7373.000	98.00	ETSI/ANSI
A31H		7275.000	7373.000	98.00	7107.000	7212.000	105.00	ETSI/ANSI
A33L		7163.000	7268.000	105.00	7331.000	7429.000	98.00	ETSI/ANSI
A33H		7331.000	7429.000	98.00	7163.000	7268.000	105.00	ETSI/ANSI
A81L		7249.50	7337.00	87.50	7410.50	7498.00	87.50	ETSI
A81H		7410.50	7498.00	87.50	7249.50	7337.00	87.50	ETSI
A83L		7305.50	7393.00	87.50	7466.50	7554.00	87.50	ETSI
A83H		7466.50	7554.00	87.50	7305.50	7393.00	87.50	ETSI
A94L		7527.000	7583.000	56.00	7695.000	7751.000	56.00	ETSI/ANSI
A94H		7695.000	7751.000	56.00	7527.000	7583.000	56.00	ETSI/ANSI
B01L		7744.750	7793.750	49.000	7893.000	7942.250	49.250	ETSI
B01H		7893.000	7942.250	49.250	7744.750	7793.750	49.000	ETSI
B02L		7779.750	7828.750	49.000	7928.000	7977.250	49.250	ETSI
B02H		7928.000	7977.250	49.250	7779.750	7828.750	49.000	ETSI
B11L		7718.050	7851.500	133.450	8016.500	8162.800	146.300	ETSI/ANSI
B11H		8016.500	8162.800	146.300	7718.050	7851.500	133.450	ETSI/ANSI
B12L		7777.000	7911.000	134.000	8073.000	8222.250	149.250	ETSI/ANSI
B12H		8073.000	8222.250	149.250	7777.000	7911.000	134.000	ETSI/ANSI
B14L		7835.000	7985.000	150.000	8128.500	8281.500	153.000	ETSI/ANSI
B14H		8128.500	8281.500	153.000	7835.000	7985.000	150.000	ETSI/ANSI
B21L		8279.000	8328.000	49.000	8398.000	8450.500	52.500	ETSI
B21H		8398.000	8450.500	52.500	8279.000	8328.000	49.000	ETSI
B23L		8324.500	8377.000	52.500	8447.000	8496.000	49.000	ETSI
B23H		8447.000	8496.000	49.000	8324.500	8377.000	52.500	ETSI
B42L		8307.000	8349.000	42.000	8426.000	8475.000	49.000	ETSI
B42H		8426.000	8475.000	49.000	8307.000	8349.000	42.000	ETSI
B61L		7905.000	8024.000	119.000	8171.000	8327.000	156.000	ETSI
B61H		8171.000	8327.000	156.000	7905.000	8024.000	119.000	ETSI
B62L		7961.000	8073.000	112.000	8234.000	8383.000	149.000	ETSI
B62H		8234.000	8383.000	149.000	7961.000	8073.000	112.000	ETSI
B63L		7989.000	8136.000	147.000	8290.000	8439.000	149.000	ETSI
B63H		8290.000	8439.000	149.000	7989.000	8136.000	147.000	ETSI
B64L		8073.000	8185.000	112.000	8383.000	8495.000	112.000	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
B64H		8383.000	8495.000	112.000	8073.000	8185.000	112.000	ETSI
B91L		8050.000	8134.000	84.000	8258.000	8342.000	84.000	ETSI
B91H		8258.000	8342.000	84.000	8050.000	8134.000	84.000	ETSI
B92L		8106.000	8190.000	84.000	8314.000	8398.000	84.000	ETSI
B92H		8314.000	8398.000	84.000	8106.000	8190.000	84.000	ETSI
B93L		8162.000	8246.000	84.000	8370.000	8454.000	84.000	ETSI
B93H		8370.000	8454.000	84.000	8162.000	8246.000	84.000	ETSI

Sub-band A0xL/H (Duplex 196 MHz) and A2xL/H (Duplex 245 MHz) are valid for CS 7, 14, 28, 56, and 112 MHz.

Sub-band A1xL/H (Duplex 154 and 161 MHz) and A3xL/H and A8xL/H (Duplex 161 MHz) are valid for CS 7, 14, 28, and 56 MHz.

Sub-band A1xL/H (Duplex 150 MHz), A3xL/H (Duplex 175 MHz), and A9xL/H (Duplex 150 MHz) are valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band B2xL/H and B4xL/H (Duplex 119 and 126 MHz) are valid for CS 7, 14, and 28/29.65 MHz.

Sub-band B1xL/H (Duplex 283.5, 310, and 311.32 MHz) and B6xL/H (Duplex 266 and 310 MHz) are valid for CS 7, 14, 28/29.65, 56/59.3, and 112 MHz.

Sub-band B9xL/H (Duplex 208 MHz) is valid for CS 7, 14, 28/29.65, and 56/59.3 MHz.

Sub-band B1xL/H (Duplex 300 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

Sub-band B1xL/H (Duplex 310 MHz) is valid for CS 10, 20, and 40 MHz.

3.2.6.3 MINI-LINK 6365 10/11 GHz Band

Table 49 MINI-LINK 6365 10/11

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A21L		10500.50	10528.50	28.00	10591.50	10619.50	28.00	ETSI
A21H		10591.50	10619.50	28.00	10500.50	10528.50	28.00	ETSI
A22L		10528.50	10556.50	28.00	10619.50	10647.50	28.00	ETSI
A22H		10619.50	10647.50	28.00	10528.50	10556.50	28.00	ETSI
A23L		10556.50	10584.50	28.00	10647.50	10675.50	28.00	ETSI
A23H		10647.50	10675.50	28.00	10556.50	10584.50	28.00	ETSI
A41L		10308.00	10420.00	112.00	10476.00	10588.00	112.00	ETSI
A41H		10476.00	10588.00	112.00	10308.00	10420.00	112.00	ETSI
A71L		10000.00	10189.00	189.00	10350.00	10539.00	189.00	ETSI

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A71H		10350.00	10539.00	189.00	10000.00	10189.00	189.00	ETSI
A72L		10125.00	10330.00	205.00	10475.00	10680.00	205.00	ETSI
A72H		10475.00	10680.00	205.00	10125.00	10330.00	205.00	ETSI
B01L		10695.00	10905.00	210.00	11185.00	11425.00	240.00	ETSI/ANSI
B01H		11185.00	11425.00	240.00	10695.00	10905.00	210.00	ETSI/ANSI
B02L		10793.00	11075.00	282.00	11311.00	11605.00	294.00	ETSI/ANSI
B02H		11311.00	11605.00	294.00	10793.00	11075.00	282.00	ETSI/ANSI
B03L		10989.00	11200.00	211.00	11479.00	11705.00	226.00	ETSI/ANSI
B03H		11479.00	11705.00	226.00	10989.00	11200.00	211.00	ETSI/ANSI

Sub-band A2xL/H (Duplex 91 MHz) is valid for CS 7, 14, and 28 MHz.

Sub-band A4xL/H (Duplex 168 MHz) and 7xL/H (Duplex 350 MHz) are valid for CS 7, 14, 28, 56, and 112 MHz.

Sub-band B0xL/H (Duplex 490 and 530 MHz) is valid for CS 7, 14, 28, 40, 56, 80, and 112 MHz.

Sub-band B0xL/H (Duplex 520 MHz) is valid for CS 60 MHz.

Sub-band B0xL/H (Duplex 490 and 500 MHz) is valid for CS 10, 20, 30, 40, 60, and 80 MHz.

3.2.6.4 MINI-LINK 6365 13 GHz Band

Table 50 MINI-LINK 6365 13

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A01L		12751.00	12919.00	168.00	13017.00	13185.00	168.00	ETSI/ANSI
A01H		13017.00	13185.00	168.00	12751.00	12919.00	168.00	ETSI/ANSI
A03L		12863.00	12975.00	112.00	13125.00	13241.00	116.00	ETSI/ANSI
A03H		13125.00	13241.00	116.00	12863.00	12975.00	112.00	ETSI/ANSI

Note: FCC part 101.147(p)(2) frequency range begins at 12700.00 MHz.

Sub-band A0xL/H (Duplex 266 MHz) is valid for 7, 14, 28, 56, and 112 MHz.

Sub-band A0xL/H (Duplex 225 and 266 MHz) is valid for CS 10, 20, 30, 40, and 50 MHz.

3.2.6.5 MINI-LINK 6365 15 GHz Band

Table 51 MINI-LINK 6365 15

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A01L		14495.75	14781.00	285.25	15055.75	15348.00	292.25	ETSI
A01H		15055.75	15348.00	292.25	14495.75	14781.00	285.25	ETSI
A11L		14397.75	14669.00	271.25	14865.00	15135.00	270.00	ETSI/ANSI
A11H		14865.00	15135.00	270.00	14397.75	14669.00	271.25	ETSI/ANSI
A12L		14501.00	14739.00	238.00	14919.25	15229.00	309.75	ETSI/ANSI
A12H		14919.25	15229.00	309.75	14501.00	14739.00	238.00	ETSI/ANSI
A13L		14700.00	14933.50	233.50	15117.00	15350.00	233.00	ETSI/ANSI
A13H		15117.00	15350.00	233.00	14700.00	14933.50	233.50	ETSI/ANSI
A21L		14698.75	14828.50	129.75	15006.75	15145.00	138.25	ETSI
A21H		15006.75	15145.00	138.25	14698.75	14828.50	129.75	ETSI

Sub-band A0xL/H and A1xL/H (Duplex 420, 490, and 728 MHz) is valid for CS 7, 14, 28, 56, and 112 MHz.

Sub-band A1xL/H (Duplex 475 MHz) is valid for CS 10, 20, 30, 40, 50, 60, and 80 MHz.

3.2.6.6 MINI-LINK 6365 18 GHz Band

Table 52 MINI-LINK 6365 18

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A11L		17700.00	18236.50	536.50	18590.00	19260.00	670.00	ETSI/ANSI
A11H		18590.00	19260.00	670.00	17700.00	18236.50	536.50	ETSI/ANSI
A13L		18002.25	18690.00	687.75	19081.25	19700.00	618.75	ETSI/ANSI
A13H		19081.25	19700.00	618.75	18002.25	18690.00	687.75	ETSI/ANSI
A21L		18580.00	18745.00	165.00	18920.00	19085.00	165.00	ETSI/ANSI
A21H		18920.00	19085.00	165.00	18580.00	18745.00	165.00	ETSI/ANSI
A23L		18730.00	18920.00	190.00	19070.00	19260.00	190.00	ETSI/ANSI
A23H		19070.00	19260.00	190.00	18730.00	18920.00	190.00	ETSI/ANSI
A31L		17700.00	18140.00	440.00	19260.00	19700.00	440.00	ETSI/ANSI
A31H		19260.00	19700.00	440.00	17700.00	18140.00	440.00	ETSI/ANSI

Sub-band A1xL/H (Duplex 1010 MHz) and A3xL/H (Duplex 1560 MHz) are valid for CS 7, 13.75/14, 27.5/28, 55/56, 110/112, and 220/224 MHz.

Sub-band A1xL/H (Duplex 1160 MHz) and A3xL/H (Duplex 1560MHz) are valid for CS 10, 20, 30, 40, 50, 60, and 80 MHz.

3.2.6.7 MINI-LINK 6365 23 GHz Band

Table 53 MINI-LINK 6365 23

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A01L		21200.00	21896.00	696.00	22400.00	23128.00	728.00	ETSI/ANSI
A01H		22400.00	23128.00	728.00	21200.00	21896.00	696.00	ETSI/ANSI
A02L		21784.00	22600.00	816.00	22996.00	23600.00	604.00	ETSI/ANSI
A02H		22996.00	23600.00	604.00	21784.00	22600.00	816.00	ETSI/ANSI

Sub-band A0xL/H (Duplex 1008, 1050, 1200, and 1232 MHz) is valid for CS 7, 14, 28, 56, 112, and 224 MHz.

Sub-band A0xL/H (Duplex 1200 and 1232 MHz) is valid for CS 10, 20, 30, 40, 50, 60, and 80 MHz.

3.2.6.8 MINI-LINK 6365 32 GHz Band

Table 54 MINI-LINK 6365 32

Sub-band / Duplex (MHz)		Transmitter frequency information			Receiver frequency information			Telecom Standard
		Tx Lower edge	Tx Upper edge	Tx Bw (MHz)	Rx Lower edge	Rx Upper edge	Rx Bw (MHz)	
A11L		31815.00	32319.00	504.00	32627.00	33131.00	504.00	ETSI/ANSI
A11H		32627.00	33131.00	504.00	31815.00	32319.00	504.00	ETSI/ANSI
A13L		32095.00	32599.00	504.00	32907.00	33411.00	504.00	ETSI/ANSI
A13H		32907.00	33411.00	504.00	32095.00	32599.00	504.00	ETSI/ANSI

Sub-band A1xL/H (Duplex 812 MHz) is valid for CS 7, 14, 28, 56, 112, and 224 MHz

3.3 Carrier Aggregation

Carrier Aggregation (CA) is supported by the following MMUs and radio units:

— MMU 1002

— MMU 1004

— MINI-LINK 6364

— MINI-LINK 6365

Detailed information about physical modes supported with CA can be found in Supported Physical Modes on page 138.

3.3.1 Maximum frequency separation

The figures below shows the maximum allowed frequency separation, in terms of empty channels, for the supported channels in Carrier Aggregation. Both channels must be within the radio sub-band.

ETSI	2x 28 MHz	≤2 empty gaps	
	2x 56 MHz	Adjacent	

Figure 1 Maximum frequency separation for MINI-LINK 6364 13, 15

ETSI	2x 28 MHz	≤4 empty gaps	
	2x 56 MHz	≤1 empty gaps	
	2x 112 MHz	Adjacent	

Figure 2 Maximum frequency separation for MINI-LINK 6364 18

ETSI	2x 28 MHz	≤4 empty gaps	
	2x 40 MHz	≤2 empty gaps	
	2x 56 MHz	≤1 empty gaps	
	2x 80 MHz	Adjacent	
	2x 112 MHz	Adjacent	
ANSI	2x 30 MHz	≤4 empty gaps	
	2x 40 MHz	≤2 empty gaps	
	2x 50 MHz	≤2 empty gaps	
	2x 60 MHz	≤1 empty gaps	
	2x 80 MHz	Adjacent	

Figure 3 Maximum frequency separation for MINI-LINK 6365

3.3.2 Configuration limitations

— The channel separation (CS) must be the same on the two channels

— The duplex configuration must be the same on the two channels

— Both sides of the link (near end and far end) must be configured with Carrier Aggregation

3.4 Transmitter Performance

See Supported Physical Modes on page 138 for supported physical modes and traffic capacity.

3.4.1 Frequency Tolerance

The transmitter carrier frequency does not deviate more than ±10 ppm from nominal frequency. During the first year of operation the deviation is less than ±3 ppm.

3.4.2 Output Power Tolerance

Table 55 Output Power Tolerance

Radio Type	Output Power Tolerance (dB)	Output Power Tolerance at Pmax (dB)
RAU2 X	±2	-1/+2
MINI-LINK 6363 6-42	±2	-1/+2
MINI-LINK 6363 80	±2.5	±2
MINI-LINK 6363/2	±2	±2
MINI-LINK 6364	±2	-1/+2
MINI-LINK 6365	±2	-1/+2
MINI-LINK 6364 CA mode	±2	±2
MINI-LINK 6365 CA mode	±2	±2

3.4.3 Output Power for QAM, Static Modulation

MINI-LINK 6363, MINI-LINK 6364, and MINI-LINK 6365 Output power including high power license (+4 dB).

Note that 8192QAM is not supported as static modulation.

The output power is set in 1 dB steps in ranges:

Table 56 RAU2 X Output Power for QAM

Radio Type	Pmax (dBm) versus Modulation (QAM)										P_{min} (dBm)
	4	16	32	64	128	256	512	1024	2048	4096	
RAU2 X 5 HP	30	30	30	30	30	29	29	28	27(1)	26(1)	-10
RAU2 X 6L	29	27	27	26	26	25	25	24	23(1)	22(1)	-10
RAU2 X 6L HP	30	30	30	30	30	29	29	28	27(1)	26(1)	-10
RAU2 X 6U	29	27	27	26	26	25	25	24	23(1)	22(1)	-10
RAU2 X 6U HP	30	30	30	30	30	29	29	28	27(1)	26(1)	-10
RAU2 X 7	29	27	27	26	26	25	25	24	23(1)	22(1)	-10
RAU2 X 7 HP	30	30	30	30	30	29	29	28	27(1)	26(1)	-10
RAU2 X 8	29	27	27	26	26	25	25	24	23(1)	22(1)	-10
RAU2 X 8 HP	30	30	30	30	30	29	29	28	27(1)	26(1)	-10
RAU2 X 10(2)	28	26	26	25	25	24	24	23	22(1)	21(1)	-10
RAU2 X 10 HP(2)	30	30	30	29	29	28	28	27	26(1)	25(1)	-10
RAU2 X 11	28	26	26	25	25	24	24	23	22(1)	21(1)	-10
RAU2 X 11 HP	30	30	30	29	29	28	28	27	26(1)	25(1)	-10
RAU2 X 13	24	22	22	21	21	20	20	19	18(1)	17(1)	-10
RAU2 X 13 HP	28	26	26	25	25	24	24	23	22(1)	21(1)	-10
RAU2 X 15	24	22	22	21	21	20	20	19	18(1)	17(1)	-10
RAU2 X 15 HP	28	26	26	25	25	24	24	23	22(1)	21(1)	-10
RAU2 X 18	21	19	19	18	18	17	17	16	15(1)	14(1)	-10
RAU2 X 18 HP	26	24	24	23	23	22	22	21	20(1)	19(1)	-10
RAU2 X 23	21	19	19	18	18	17	17	16	15(1)	14(1)	-10
RAU2 X 23 HP	25	23	23	22	22	21	21	20	19(1)	18(1)	-10
RAU2 X 24	23	21	21	20	20	19	19	18	17(1)	16(1)	-10
RAU2 X 26	23	21	21	20	20	19	19	18	17(1)	16(1)	-10
RAU2 X 28	22	20	20	19	19	18	18	17	16(1)	15(1)	-10
RAU2 X 32	20	18	18	17	17	16	16	15	14(1)	13(1)	-10
RAU2 X 38	20	18	18	17	17	16	16	15	14(1)	13(1)	-10
RAU2 X 42	18	16	16	15	15	14	14	13	12(1)	11(1)	-10

(1) With RAU2 X R-state ≥ R6A

(2) With duplex ≤ 168 MHz; Pmax 1 dB lower

Table 57 MINI-LINK 6363 and MINI-LINK 6363/2 Output Power for QAM

Radio Type	Pmax (dBm) versus Modulation (QAM)										P_{min} (dBm)
	4	16	32	64	128	256	512	1024	2048	4096	
MINI-LINK 6363 6L	30	30	30	30	30	29	29	28	28	27	-10

Radio Type	Pmax (dBm) versus Modulation (QAM)										P_{min} (dBm)
	4	16	32	64	128	256	512	1024	2048	4096	
MINI-LINK 6363 6U	30	30	30	30	30	29	29	28	28	27	-10
MINI-LINK 6363 7	30	30	30	30	30	29	29	28	28	27	-10
MINI-LINK 6363 8	30	30	30	29	29	28	28	27	27	27	-10
MINI-LINK 6363 10	30	30	30	29	29	28	28	27	27	26	-10
MINI-LINK 6363 11	30	30	30	29	29	28	28	27	27	26	-10
MINI-LINK 6363 13	27	26	26	25	25	24	24	23	23	22	-10
MINI-LINK 6363 15	27	26	26	25	25	24	24	23	23	22	-10
MINI-LINK 6363 18	25	24	24	23	23	22	22	21	21	20	-10
MINI-LINK 6363 23	24	23	23	22	22	21	21	20	20	19	-10
MINI-LINK 6363 24	25	24	24	23	23	22	22	21	21	20	-10
MINI-LINK 6363 26	25	24	24	23	23	22	22	21	21	20	-10
MINI-LINK 6363 28	23	22	22	21	21	20	20	19	19	18	-10
MINI-LINK 6363 32	22	21	21	20	20	19	19	18	18	17	-10
MINI-LINK 6363 38	22	21	21	20	20	19	19	18	18	17	-10
MINI-LINK 6363 42	18	17	17	16	16	15	15	14	14	13	-10
MINI-LINK 6363 80	17	16	16	15	15	14	14	13	13(1)	12(1)	-10
MINI-LINK 6363/2 13	19	18	18	17	17	16	16	15	15	14	-10
MINI-LINK 6363/2 15	19	18	18	17	17	16	16	15	15	14	-10
MINI-LINK 6363/2 18	17	16	16	15	15	14	14	13	13	12	-10
MINI-LINK 6363/2 23	16	15	15	14	14	13	13	12	12	11	-10
MINI-LINK 6363/2 38	14	13	13	12	12	11	11	10	10	9	-10

(1) Modulations ≥2048QAM is not supported. Specified values shall be used as Pmax reference in Admod.

Table 58 MINI-LINK 6364 Output Power for QAM

Radio Type	Pmax (dBm) versus Modulation (QAM)										P_{min} (dBm)
	4	16	32	64	128	256	512	1024	2048	4096	
MINI-LINK 6364 13	27	26	26	25	25	24	24	23	23	22	-10
MINI-LINK 6364 15	27	26	26	25	25	24	24	23	23	22	-10
MINI-LINK 6364 18(1)	26	25	25	24	24	23	23	22	22	21	-10
MINI-LINK 6364 13 CA mode	21	20	20	19	19	18	18	17	17	16	+3
MINI-LINK 6364 15 CA mode	21	20	20	19	19	18	18	17	17	16	+3
MINI-LINK 6364 18 CA mode	19	18	18	18	18	17	17	16	16	15	0

(1) For CS 220 MHz, maximum output power is 3 dB lower and P_{min} is 3 dBm.

Table 59 MINI-LINK 6365 Output Power for QAM

Radio Type	Pmax (dBm) versus Modulation (QAM)										P_{min} (dBm)
	4	16	32	64	128	256	512	1024	2048	4096	
MINI-LINK 6365 6	30	30	30	30	30	29	29	28	28	27	-10
MINI-LINK 6365 7/8	30	30	30	30	30	29	29	28	28	27	-10

Radio Type	Pmax (dBm) versus Modulation (QAM)										P_{min} (dBm)
	4	16	32	64	128	256	512	1024	2048	4096	
MINI-LINK 6365 10/11	30	30	30	29	29	28	28	27	27	26	-10
MINI-LINK 6365 13	27	26	26	25	25	24	24	23	23	22	-10
MINI-LINK 6365 15	27	26	26	25	25	24	24	23	23	22	-10
MINI-LINK 6365 18(1)	26	25	25	24	24	23	23	22	22	21	-10
MINI-LINK 6365 23(2)	25	24	24	23	23	22	22	21	21	20	-10
MINI-LINK 6365 32(2)	22	21	21	20	20	19	19	18	18	17	-10
MINI-LINK 6365 6 CA mode	21	21	21	21	21	21	21	21	21	21	+3
MINI-LINK 6365 7/8 CA mode	21	21	21	21	21	21	21	21	21	21	+3
MINI-LINK 6365 10/11 CA mode	21	21	21	21	21	21	21	21	21	20	+3
MINI-LINK 6365 13 CA mode	21	20	20	19	19	18	18	17	17	16	+3
MINI-LINK 6365 15 CA mode	21	20	20	19	19	18	18	17	17	16	+3
MINI-LINK 6365 18 CA mode	19	19	19	18	18	17	17	16	16	15	0
MINI-LINK 6365 23 CA mode	19	18	18	17	17	16	16	15	15	14	-5
MINI-LINK 6365 32 CA mode	16	15	15	14	14	13	13	12	12	11	-5

(1) For CS 220 MHz, maximum output power is 3 dB lower and P_{min} is 3 dBm.

(2) For CS 224 MHz, maximum output power is 3 dB lower and P_{min} is -2 dBm.

3.4.4 Output Power for QAM, Adaptive Modulation

3.4.4.1 ETSI

Maximum output power values (Pmax) are according to Output Power for QAM, Static Modulation on page 116 with the following limitations:

MINI-LINK 6363, MINI-LINK 6364, MINI-LINK 6365, MINI-LINK 6363/2, and RAU2 X Max output power is relative to 4096QAM (dB).

Table 60 Output Power for QAM, Adaptive Modulation - ETSI

RSEC Modulation	Pmax (dBm) relative 4096QAM			P_{min} (dBm)
	2	4L 4H	5LB/5HB 6LB/6HB 7B	
4QAM	5	4	3	-10
16QAM	4	4	3	-10
32QAM	4	4	3	-10
64QAM	3	3	3	-10
128QAM	3	3	3	-10
256QAM	2	2	2	-10

RSEC Modulation	Pmax (dBm) relative 4096QAM			P_{min} (dBm)
	2	4L 4H	5LB/5HB 6LB/6HB 7B	
512QAM	1	1	1	-10
1024QAM	1	1	1	-10
2048QAM	0	0	0	-10
4096QAM	0/-1(1)	0/-1(1)	0/-1(1)	-10
8192QAM	-1	-1	-1	0

(1) Offset is -1 dB for MINI-LINK 6363 R-state ≥ R4A, MINI-LINK 6364, and MINI-LINK 6365 for frame ID 358 and 359. That is frame IDs with support for 8192QAM.

3.4.4.2 ANSI

Maximum output power values (Pmax) are according to Output Power for QAM, Static Modulation on page 116 with the following limitations:

MINI-LINK 6363, MINI-LINK 6365, MINI-LINK 6363/2 and RAU2 X/Xu Max output power is relative to 4096QAM (dB).

Table 61 Output Power for QAM, Adaptive Modulation - ANSI

Modulation	Pmax (dBm) relative 4096QAM	Pmin (dBm)
4QAM	5	-10
16QAM	4	-10
32QAM	4	-10
64QAM	3	-10
128QAM	3	-10
256QAM	2	-10
512QAM	1	-10
1024QAM	1	-10
2048QAM	0	-10
4096QAM	0/-1(1)	-10
8192QAM	-1	0

(1) Offset is -1 dB for MINI-LINK 6363 R-state ≥ R4A, MINI-LINK 6364, and MINI-LINK 6365 for frame ID 364 and 365. That is frame IDs with support for 8192QAM.

3.5 Emission Designator

3.5.1 Adaptive Modulation

Table 62 Adaptive Modulation - ETSI

Channel separation (MHz)	Emission Designator
7	6M30D7W
14/13.75	12M8D7W
28/27.5	25M6D7W
40	36M0D7W
56/55/62.5	51M5D7W
80	74M0D7W
112/110/125	103MD7W
224/220	212MD7W

Table 63 Adaptive Modulation - ANSI

Channel separation (MHz)	Emission Designator
10	8M75D7W
20	18M1D7W
28	25M6D7W
30	27M4D7W
40	36M8D7W
50	46M1D7W
56	51M5D7W
60	55M4D7W
80	74MD7W
112	103MD7W

3.5.2 Transmitter off

RF output power in Tx off mode: -50 dBm.

3.5.3 Transmitter Spurious Levels for QAM

Transmitter spurious levels are below:

— -50 dBm in the band 30 MHz-21.2 GHz

  - -50 dBm in any 100 kHz band from 30 MHz to 1 GHz
  - -50 dBm in any 1 MHz band from 1 GHz to 21.2 GHz

— -30 dBm in the band 21.2 – 110 GHz

  - -30 dBm in any 100 kHz band for channel separation ≤7 MHz, and in the range from ± 2.5 times of channel separation to ± 56 MHz
  - -30 dBm in any 1 MHz band in all other cases

The above excludes a frequency band ± 2.5 times the channel separation from the nominal transmitter frequency.

3.6 Receiver Performance

See Supported Physical Modes on page 138 for supported physical modes, traffic capacity, and XPIC or MIMO support.

3.6.1 Threshold Definition

Guarantee Guaranteed value for all temperatures.

Planning Ericsson recommendation for path planning.

Planning threshold = 1 dB below guarantee threshold.

Planning threshold is used by path planning programs.

Typical Average value in room temperature.

3.6.2 Detection Performance for QAM, Adaptive Modulation

3.6.2.1 Detection Performance, ETSI

The receiver complies with detection performance listed below.

Data for standard Frame ID's (256, 257, 258, 259, 260, 261, 303, 1256, 1257, 1258, 1259, 1260, 1261, and 1303) can be found in revision BT of this document.

Table 64 Detection Performance, ETSI

The detection performance is applicable to the following radio types:

— RAU2 X 5, 6L, 6U, 7, 8, 10 (Dupl. > 168MHz), 11, 13, 15

- MINI-LINK 6363 6L, 6U, 7, 8, 10 (Dupl. > 168MHz), 11, 13, 15
- MINI-LINK 6363/2 13, 15
- MINI-LINK 6364 13, 15
- MINI-LINK 6365 6, 7/8, 10/11, 13, 15

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
7 (356 1356)	4QAM S	-95.5
	4QAM	-94
	16QAM S	-89
	16QAM	-87.5
	32QAM	-84
	64QAM	-81.5
	128QAM	-78.5
	256QAM	-75.5
	512QAM	-71
	1024QAM	-68
13.75 14 (357 1357)	4QAM S	-92.5
	4QAM	-91
	16QAM S	-86
	16 QAM	-84.5
	32QAM	-81
	64QAM	-78.5
	128QAM	-75.5
	256QAM	-72.5
	512QAM	-68
	1024QAM	-65
	2048QAM	-63
	2048QAM L	-61.5
27.5 28 (358 1358)	4QAM S	-89.5
	4QAM	-88
	16QAM S	-83
	16 QAM	-81.5
	32QAM	-78
	64QAM	-75.5
	128QAM	-72.5
	256QAM	-69.5
	512QAM	-65
	1024QAM	-62
	2048QAM	-60
	2048QAM L	-58.5
	4096QAM	-56.5
	4096QAM L	-55
	8192QAM	-52

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
27.5 28 (2358)	4QAM S	-89
	4QAM	-87.5
	16QAM S	-82.5
	16 QAM	-81
	32QAM	-77.5
	64QAM	-75
	128QAM	-72
	256QAM	-69
	512QAM	-66
	512QAM L	-64.5
40 (359 1359)	4QAM S	-88
	4QAM	-86.5
	16QAM S	-81.5
	16 QAM	-80
	32QAM	-76.5
	64QAM	-74
	128QAM	-71
	256QAM	-68
	512QAM	-63.5
	1024QAM	-60.5
	2048QAM	-58.5
	2048QAM L	-57
	4096QAM	-55
	4096QAM L	-53.5
	8192 QAM	-50.5
55 56 62.5 (360 1360)	4QAM S	-86.5
	4QAM	-85
	16QAM S	-80
	16 QAM	-78.5
	32QAM	-75
	64QAM	-72.5
	128QAM	-69.5
	256QAM	-66.5
	512QAM	-62
	1024QAM	-59
	2048 QAM	-57
	2048 QAM L	-55.5
	4096QAM	-53.5
	4096QAM L	-52

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
55 56 (2360)	4QAM S	-86
	4QAM	-84.5
	16QAM S	-79.5
	16 QAM	-78
	32QAM	-74.5
	64QAM	-72
	128QAM	-69
	256QAM	-66
	512QAM	-63
	512QAM L	-61.5
	1024QAM	-60
	1024QAM L	-58.5
80 (403 1403)	4QAM S	-85
	4QAM	-83.5
	16QAM S	-78.5
	16 QAM	-77
	32QAM	-73.5
	64QAM	-71
	128QAM	-68
	256QAM	-65
	512QAM	-60.5
	1024QAM	-57.5
	2048QAM	-55.5
	2048QAM L	-54
	4096QAM	-52
	4096QAM L	-49.5
110 112 125 (361 1361)	4QAM S	-83.5
	4QAM	-82
	16QAM S	-77
	16 QAM	-75.5
	32QAM	-72
	64QAM	-69.5
	128QAM	-66.5
	256QAM	-63.5
	512QAM	-59
	1024QAM	-56
	2048QAM	-54
	2048QAM L	-52.5
	4096QAM	-50.5

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
220(1) 224(2) (404)	4QAM S	-80.5
	4QAM	-79
	16QAM S	-74
	16 QAM	-72.5
	32QAM	-69
	64QAM	-66.5
	128QAM	-63.5
	256QAM	-60.5
	512QAM	-56
	1024QAM	-53

(1) Carrier Aggregation with 2x110 (Frame ID 404) is used in CS 220 but thresholds are related to total input power.

(2) Carrier Aggregation with 2x112 (Frame ID 404) is used in CS 224 but thresholds are related to total input power.

Table 65 Detection Performance, ETSI

The detection performance is applicable to the following radio types:

- RAU2 X 10(1) (Dupl. ≤ 168 MHz), 18, 23, 26
- MINI-LINK 6363 10(1) (Dupl. ≤ 168 MHz), 18, 23, 26
- MINI-LINK 6363/2 18, 23
- MINI-LINK 6364 18
- MINI-LINK 6365 18, 23

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
All	All	Add 1 dB to figures in Table 64 above.

(1) Max CS = 28 MHz

Table 66 DetectionPerformance, ETSI

The detection performance is applicable to the following radio types:

- RAU2 X 28, 32, 38
- MINI-LINK 6363 28, 32, 38
- MINI-LINK 6363/2 38

- MINI-LINK 6365 32

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
All	All	Add 2 dB to figures in Table 64 above.

Table 67 Detection Performance, ETSI

The detection performance is applicable to the following radio types:

- RAU2 X 42
- MINI-LINK 6363 42

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
All	All	Add 3 dB to figures in Table 64 above.

Table 68 Detection Performance, ETSI

The detection performance is applicable to the following radio type:

- MINI-LINK 6363 80

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
55 56 62.5 (360 1360)	All	Add 7 dB to figures in Table 64 above
110 112 125 (361 1361)	All	Add 7 dB to figures in Table 64 above

3.6.2.2 Detection Performance, ANSI

The receiver complies with detection performance listed below.

Data for standard Frame ID's (262, 263, 264, 265, 266, 267, 268, 1262, 1263, 1264, 1265, 1266, 1267, and 1268) can be found in revision BT of this document.

Table 69 Detection Performance, ANSI

The detection performance is applicable to the following radio types:

- RAU2 X 5, 6L, 6U, 7, 8, 10 (Dupl. > 168MHz), 11, 13, 15

- MINI-LINK 6363 6L, 6U, 7, 8, 10 (Dupl. > 168MHz), 11, 13, 15
- MINI-LINK 6363/2 13, 15
- MINI-LINK 6365 6, 7/8, 10/11, 13, 15

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
10 (362 1362)	4QAM S	-94
	4QAM	-92.5
	16QAM S	-87.5
	16QAM	-86
	32QAM	-82.5
	64QAM	-80
	128QAM	-77
	256QAM	-74
	512QAM	-69.5
	1024QAM	-66.5
20 (363 1363)	4QAM S	-91
	4QAM	-89.5
	16QAM S	-84.5
	16 QAM	-83
	32QAM	-79.5
	64QAM	-77
	128QAM	-74
	256QAM	-71
	512QAM	-66.5
	1024QAM	-63.5
	2048QAM	-61.5
	2048QAM L	-60
28 (371 1371)	4QAM S	-89.5
	4QAM	-88
	16QAM S	-83
	16 QAM	-81.5
	32QAM	-78
	64QAM	-75.5
	128QAM	-72.5
	256QAM	-69.5
	512QAM	-65
	1024QAM	-62
	2048QAM	-60
	2048QAM L	-58.5
	4096QAM	-56.5
	4096QAM L	-55

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
30 (364 1364)	4QAM S	-89.5
	4QAM	-88
	16QAM S	-83
	16 QAM	-81.5
	32QAM	-78
	64QAM	-75.5
	128QAM	-72.5
	256QAM	-69.5
	512QAM	-65
	1024QAM	-62
	2048QAM	-60
	2048QAM L	-58.5
	4096QAM	-56.5
	4096QAM L	-55
	8192QAM	-52
30 (2364)	4QAM S	-89
	4QAM	-87.5
	16QAM S	-82.5
	16 QAM	-81
	32QAM	-77.5
	64QAM	-75
	128QAM	-72
	256QAM	-69
	512QAM	-66
	512QAM L	-64.5
40 (365 1365)	4QAM S	-88
	4QAM	-86.5
	16QAM S	-81.5
	16 QAM	-80
	32QAM	-76.5
	64QAM	-74
	128QAM	-71
	256QAM	-68
	512QAM	-63.5
	1024QAM	-60.5
	2048QAM	-58.5
	2048QAM L	-57
	4096QAM	-55
	4096QAM L	-53.5
	8192QAM	-50.5

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
40 (2365)	4QAM S	-87.5
	4QAM	-86
	16QAM S	-81
	16 QAM	-79.5
	32QAM	-76
	64QAM	-73.5
	128QAM	-70.5
	256QAM	-67.5
	512QAM	-64.5
	512QAM L	-63
50 (366 1366)	4QAM S	-87
	4QAM	-85.5
	16QAM S	-80.5
	16 QAM	-79
	32QAM	-75.5
	64QAM	-73
	128QAM	-70
	256QAM	-67
	512QAM	-62.5
	1024QAM	-59.5
	2048QAM	-57.5
	2048QAM L	-56
	4096QAM	-54
	4096QAM L	-52.5
56 (373 1373)	4QAM S	-86.5
	4QAM	-85
	16QAM S	-80
	16 QAM	-78.5
	32QAM	-75
	64QAM	-72.5
	128QAM	-69.5
	256QAM	-66.5
	512QAM	-62
	1024QAM	-59
	2048 QAM	-57
	2048 QAM L	-55.5
	4096QAM	-53.5
	4096QAM L	-52

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
60 (367 1367)	4QAM S	-86
	4QAM	-84.5
	16QAM S	-79.5
	16 QAM	-78
	32QAM	-74.5
	64QAM	-72
	128QAM	-69
	256QAM	-66
	512QAM	-61.5
	1024QAM	-58.5
	2048QAM	-56.5
	2048QAM L	-55
	4096QAM	-53
	4096QAM L	-51.5
80 (368 1368)	4QAM S	-85
	4QAM	-83.5
	16QAM S	-78.5
	16 QAM	-77
	32QAM	-73.5
	64QAM	-71
	128QAM	-68
	256QAM	-65
	512QAM	-60.5
	1024QAM	-57.5
	2048QAM	-55.5
	2048QAM L	-54
	4096QAM	-52
	4096QAM L	-49.5
112 (374 1374)	4QAM S	-83.5
	4QAM	-82
	16QAM S	-77
	16 QAM	-75.5
	32QAM	-72
	64QAM	-69.5
	128QAM	-66.5
	256QAM	-63.5
	512QAM	-59
	1024QAM	-56
	2048QAM	-54
	2048QAM L	-52.5
	4096QAM	-50.5

Table 70 Detection Performance, ANSI

The detection performance is applicable to the following radio types:

- RAU2 X 10(1) (Dupl. ≤ 168 MHz), 18, 23, 24
- MINI-LINK 10(1)(Dupl. ≤ 168 MHz), 18, 23, 26
- MINI-LINK 6363/2 18, 23
- MINI-LINK 6365 18, 23

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
All	All	Add 1 dB to figures in Table 69 above

(1) Max CS=20 MHz

Table 71 Detection Performance, ANSI

The detection performance is applicable to the following radio types:

- RAU2 X 28, 32, 38
- MINI-LINK 6363 28, 32, 38
- MINI-LINK 6363/2 38
- MINI-LINK 6365 32

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
All	All	Add 2 dB to figures in Table 69 above

Table 72 Detection Performance, ANSI

The detection performance is applicable to the following radio types:

- RAU2 X 42
- MINI-LINK 6363 42

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
All	All	Add 3 dB to figures in Table 69 above

Table 73 Detection Performance, ANSI

The detection performance is applicable to the following radio type:

MINI-LINK 6363 80

CS (Frame ID)	Modulation	BER 10^{-6} threshold (dBm)
		Typ.
60 (367)	All	Add 7 dB to figures in Table 69 above
80 (368)		

3.6.3 Switching Level, Adaptive Modulation

Typical switching levels between different physical modes are at Residual BER thresholds and are based on a measurement of the SNIR in the received signal.

For path planning usage this RBER level for down switching can be approximated to 4 dB above the typical 10^{-6} BER threshold for the currently used modulation scheme and CS.

For Frame ID 2358, 2360, 2364 and 2365 the RBER level for down switching can be approximated to 6 dB above the typical 10^{-6} BER threshold for the currently used modulation scheme and CS.

3.6.4 Co-channel Interference for QAM

The limits of co-channel interference are as given in table below, giving C/I values for 1 dB and 3 dB increase of the 10^{-6} BER thresholds, specified in chapter Detection Performance for QAM, Adaptive Modulation on page 122.

Table 74 Limits of Co-channel Interference

Co-channel	C/I values for 1 dB & 3 dB	
Modulation	1dB	3dB
4QAM S	13	9
4QAM	14	10
16QAM S	19	15
16QAM	21	17
32QAM	24	20
64QAM	27	23
128QAM	30	26
256QAM	34	30
512QAM	36.5	32.5
1024QAM	40	36
2048QAM	42	38

Co-channel	C/I values for 1 dB & 3 dB	
Modulation	1dB	3dB
2048QAM L	43	39
4096QAM	45	41
4096QAM L	48	44
8192QAM	51	47

3.6.5 Adjacent Channel Interference for QAM

3.6.5.1 ETSI

The limits of first adjacent-channel interference are as given in table below, giving C/I values for 1 dB and 3 dB increase of the 10^{-6} BER thresholds, specified in Detection Performance, ETSI on page 122.

Table 75 RAU2 X and MINI-LINK 6363

Modulation	RSEC	C/I values for 1 dB and 3 dB	
		1 dB	3dB
4QAM	2	-16	-20
	4L/4H	-20	-24
	5B/6B	-23	-27
16QAM	2/4L/4H	-20	-24
	5B/6B	-23	-27
32QAM	2/4L/4H	-20	-24
	5B/6B	-23	-27
64QAM	2/4L/4H	-20	-24
	5B/6B	-22	-26
128QAM	All	-19	-23
256QAM	All	-16	-20
512QAM	All	-14	-14
1024QAM	All	-10(1)	-10
2048QAM	All	-7	-7
4096QAM	All	1	1
8192 QAM	All	1	1

(1) Add 4 dB for MINI-LINK 6363 80GHz.

Table 76 MINI-LINK 6364 and MINI-LINK 6365

Modulation	RSEC	C/I values for 1 dB and 3 dB	
		1 dB	3dB
4QAM	2	-16	-20
	4L/4H	-20	-24
	5B/6B	-23	-27
16QAM	2/4L/4H	-20	-24
	5B/6B	-23	-27
32QAM	2/4L/4H	-20	-24
	5B/6B	-23	-27
64QAM	2/4L/4H	-20	-24
	5B/6B	-22	-26
128QAM	All	-19	-23
256QAM	All	-16	-20
512QAM	All	-12	-16
1024QAM	All	-8	-12
2048QAM	All	-6	-10
4096QAM	All	-3	-7
8192QAM	All	0	-4

3.6.5.2 ANSI

The limits of first adjacent-channel interference are as given in table below, giving C/I values for 1 dB and 3 dB increase of the 10^{-6} BER thresholds, specified in Detection Performance, ANSI on page 127.

Table 77 RAU2 X and MINI-LINK 6363

Modulation	C/I values for 1 dB and 3 dB	
	1 dB	3dB
4QAM	-23	-27
16QAM	-23	-27
32QAM	-23	-27
64QAM	-23	-27
128QAM	-19	-23
256QAM	-16	-20
512QAM	-14	-14

Modulation	C/I values for 1 dB and 3 dB	
	1 dB	3dB
1024QAM	-10	-10
2048QAM	-7	-7
4096QAM	1	1
8192QAM	1	1

Table 78 MINI-LINK 6365

Modulation	C/I values for 1 dB and 3 dB	
	1 dB	3dB
4QAM	-23	-27
16QAM	-23	-27
32QAM	-23	-27
64QAM	-23	-27
128QAM	-19	-23
256QAM	-16	-20
512QAM	-12	-16
1024QAM	-8	-12
2048QAM	-6	-10
4096QAM	-3	-7
8192QAM	0	-4

3.6.6 CW Interference

For a receiver operating at the specified 10^{-6} threshold, the introduction of a CW interferer with C/I of -30 dB at any frequency up to 80 GHz, excluding a frequency 2.5 times the channel separation on either side of the wanted frequency, does not result in a BER greater than 10^{-5}.

3.6.7 Signature for QAM

Reference delay: 6.3 ns.

Minimum phase and non-minimum phase.

The table below states the Notch depth (dB) at BER 10^{-6}, as specified in Detection Performance for QAM, Adaptive Modulation on page 122.

The Notch depth of BER 10^{-3} is 1 dB higher than the BER 10^{-6} value.

Table 79 ETSI/ANSI

BER 10-6 Notch depth (dB)													
Modulation	Signature width (MHz)												
	7.5	11	15	22	31	33	44	55	61	66	88	123	246
	Channel Separation (MHz)												
	7	10	14	20	28	30	40	50	56	60	80	112	224
4QAM	40	40	40	40	40	40	40	40	40	40	40	40	40
16QAM	40	40	40	40	40	40	38	36	35	34	32	29	29
32QAM	40	40	40	38	36	34	32	30	29	28	26	23	23
64QAM	40	40	39	36	34	32	30	28	27	26	24	20	20
128QAM	40	40	37	34	31	30	28	26	25	24	22	18	18
256QAM	40	38	35	32	30	28	26	24	23	22	20	17	17
512QAM	40	37	34	31	29	27	25	23	22	21	19	16	16
1024QAM	39	36	33	30	27	26	24	22	21	20	18	15	15
2048QAM			32	29	26	25	23	21	20	19	17	14	14
4096QAM					25	23	21	19	18	17	15	13	13
8192QAM					21	20	18						

When the notch frequency is swept across the defined bandwidth with a rate up to 100 MHz/s, the notch depth for BER=10^{-6} will not degrade by more than 1 dB with respect to the values listed in the table above.

3.6.8 Receiver Overload

Maximum input level where normal operation is guaranteed: -20 dBm

3.6.9 Receiver Resistibility

Maximum tolerable input power without permanent degradation is 0 dBm.

3.6.10 Received Signal Indication

3.6.10.1 For Path Acceptance

When measured in steady state condition, an RF-input level measure is given with an accuracy of:

— for RF-input levels -30 dBm to -60 dBm: ± 2 dB

— for RF-input levels -60 dBm to -80 dBm: ± 3 dB

3.6.10.2 For Antenna Alignment

This detector presents on an external standard voltmeter a voltage corresponding to RF-input level.

The RF input level referred to the antenna port in dBm can be calculated from the measured voltage using the following formula: Rfin(dBm) = 40*measured_voltage(V) − 120

When measured at the Antenna Alignment Port, the accuracy of the measured voltage converted to RF-input level using the formula above shall be:

— for RF-input levels -30 dBm to -60 dBm: ± 2.5 dB

— for RF-input levels -60 dBm to -80 dBm: ± 3 dB

3.7 Supported Physical Modes

A physical mode is supported when both the radio unit and the MMU supports it. For readability purpose, the radio unit never show a higher physical mode than what is supported by the most capable MMU.

3.7.1 Radio Units

3.7.1.1 MINI-LINK RAU2 X HW

MINI-LINK RAU2 X HW supports physical modes according to the tables below. The physical modes supported are denoted by an X. See Radio Frequencies on page 74 for supported frequencies and channel separation for a specific RAU2 X.

Table 80 Supported Physical Modes ETSI

Telecom Standard: ETSI					
Products: RAU2 X 5-42 ≥ R6A					
CS / **Mod.**	**7 MHz**	**14/13.75 MHz**	**28/27.5 MHz**	**40 MHz**	**56/55 MHz**
4QAM S	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)	X(1)	X(1)

Telecom Standard: ETSI					
Products: RAU2 X 5-42 ≥ R6A					
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/55 MHz
512QAM	X(1)	X(1)	X(1)	X(1)	X(1)
1024QAM	X	X(1)	X(1)	X(1)	X(1)
2048QAM		X(2)	X(1)(2)	X(1)(2)	X(1)(2)
2048QAM L		X(2)	X(1)(2)	X(1)(2)	X(1)(2)
4096QAM			X(1)(2)	X(1)(2)	X(1)(2)
4096QAM L			X(1)(2)	X(1)(2)	X(1)(2)

(1) Supports XPIC

(2) Requires RAU SW CXP 901 2878 R5A or later

Table 81 Supported Physical Modes ETSI

Telecom Standard: ETSI					
Products: RAU2 X 5–11 < R6A, RAU2 X 13&15 ≥ R3A & < R6A, RAU2 X 18&23 ≥ R5A & < R6A					
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/55 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM	X	X(1)	X(1)	X(1)	X(1)
1024QAM		X(2)	X(1)(2)	X(1)(2)	X(1)(2)

(1) Supports XPIC

(2) Requires RAU SW CXP 901 2878 R-state R4D or later (RAU2 X/Xu 10/11/18/23 R-state R1A use RAU SW CXC 113 500 and hence cannot support 1024 QAM.)

Table 82 Supported Physical Modes ETSI

Telecom Standard: ETSI					
Products: RAU2 X 13&15 < R3A, RAU2 X 18&23 < R5A, RAU2 X 26–42 < R6A					
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/55 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)	X(1)

Telecom Standard: ETSI					
Products: RAU2 X 13&15 < R3A, RAU2 X 18&23 < R5A, RAU2 X 26–42 < R6A					
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/55 MHz
16QAM S	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X	X(1)	X(1)	X(1)	X(1)
128QAM	X	X	X(1)	X(1)	X(1)
256QAM	X	X	X(1)	X(1)	X(1)
512QAM	X	X	X	X	X(1)
1024QAM		X(2)	X(2)	X(2)	X(2)

(1) Supports XPIC

(2) Requires RAU SW CXP 901 2878 R-state R4D or later (RAU2 X/Xu 10/11/18/23 R-state R1A use RAU SW CXC 113 500 and hence cannot support 1024 QAM.)

Table 83 Supported Physical Modes ANSI

Telecom Standard: ANSI							
Products: RAU2 X 5-42 ≥ R6A							
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
1024QAM	X	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM		X(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)
2048QAM L		X(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)
4096QAM			X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)
4096QAM L			X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)

(1) Supports XPIC

(2) Requires RAU SW CXP 901 2878 R5A or later

Table 84 Supported Physical Modes ANSI

Telecom Standard: ANSI							
Products: RAU2 X 6L–11 < R6A, RAU2 X 13&15 ≥ R3A & < R6A, RAU2 X 18&23 ≥ R5A & < R6A							
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM	X	X	X(1)	X(1)	X(1)	X(1)	X(1)
1024QAM		X(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)	X(1)(2)

(1) Supports XPIC

(2) Requires RAU SW CXP 901 2878 R-state R4D or later (RAU2 X/Xu 10/11/18/23 R-state R1A use RAU SW CXC 113 500 and hence cannot support 1024 QAM.)

Table 85 Supported Physical Modes ANSI

Telecom Standard: ANSI							
Products: RAU2 X 13 & 15 < R3A, RAU2 X 18 & 23 < R5A, RAU2 X 24 – 38 < R6A							
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X	X	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X	X	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM	X	X	X	X	X	X(1)	X (1)
1024QAM		X(2)	X(2)	X(2)	X(2)	X(2)	X(2)

(1) Supports XPIC

(2) Requires RAU SW CXP 901 2878 R-state R4D or later (RAU2 X/Xu 10/11/18/23 R-state R1A use RAU SW CXC 113 500 and hence cannot support 1024 QAM.)

3.7.1.2 MINI-LINK 6363, MINI-LINK 6363/2 HW

MINI-LINK 6363 and MINI-LINK 6363/2 HW supports physical modes according to the tables below. The physical modes supported are denoted by an X, and M in those cases where only MIMO is supported. See Radio Frequencies on page 74 for supported frequencies and channel separations for a specific frequency band.

Table 86 Supported Physical Modes ETSI

Telecom Standard: ETSI							
Products: MINI-LINK 6363 6L- 42 < R4A, MINI-LINK 6363/2 13 – 38 ≥ R1A							
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55/62.5 MHz	80 MHz	112/ 110/125 MHz
4QAM S	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
512QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
512QAM L			M(2)		M(2)		
1024QAM	X	X(1)	X(1)	X(1)	X(1)(2)	X(1)	X(1)
1024QAM L					M(2)		
2048QAM		X	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM L		X	X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM			X(1)	X(1)	X(1)	X	X
4096QAM L			X(1)	X(1)	X(1)	X	
8192QAM							

(1) Supports XPIC

(2) Supports MIMO

Table 87 Supported Physical Modes ETSI

Telecom Standard: ETSI							
Products: MINI-LINK 6363 10 – 26 ≥ R4A, MINI-LINK 6363 38 ≥ R4A							
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55/62.5 MHz	80 MHz	112/ 110/125 MHz
4QAM S	X(1)	X(1)	X(1) (2)	X(1)	X(1)(2)	X(1)	X(1)

Telecom Standard: ETSI							
Products: MINI-LINK 6363 10 – 26 ≥ R4A, MINI-LINK 6363 38 ≥ R4A							
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55/62.5 MHz	80 MHz	112/ 110/125 MHz
4QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
512QAM	X(1)	X(1)	X(1)(2)	X(1)	X(1)(2)	X(1)	X(1)
512QAM L			M(2)		M(2)		
1024QAM	X	X(1)	X(1)	X(1)	X(1)(2)	X(1)	X(1)
1024QAM L					M(2)		
2048QAM		X	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM L		X	X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM			X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM L			X(1)	X(1)	X(1)	X(1)	
8192QAM			X(3)	X(3)			

(1) Supports XPIC
(2) Supports MIMO
(3) Note that static modulation is not supported for 8192QAM

Table 88 Supported Physical Modes ETSI

Telecom Standard: ETSI							
Products: MINI-LINK 6363 80 ≥ R1A							
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55/62.5 MHz	80 MHz	112/ 110/125 MHz
4QAM S					X(1)		X(1)
4QAM					X(1)		X(1)
16QAM S					X(1)		X(1)
16QAM					X(1)		X(1)
32QAM					X(1)		X(1)
64QAM					X(1)		X(1)
128QAM					X(1)		X(1)
256QAM					X(1)		X(1)
512QAM					X(1)		X(1)
1024QAM					X		X

Telecom Standard: ETSI							
Products: MINI-LINK 6363 80 ≥ R1A							
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55/62.5 MHz	80 MHz	112/ 110/125 MHz
2048QAM							
2048QAM L							
4096QAM							
4096QAM L							
8192QAM							

(1) Supports XPIC

Table 89 Supported Physical Modes ANSI

Telecom Standard: ANSI										
Products: MINI-LINK 6363 6L – 42 < R4A, MINI-LINK 6363/2 13 – 38 ≥ R1A										
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz	60 MHz	80 MHz	112 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM L				M(2)	M(2)					
1024QAM	X	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM		X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM L		X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM			X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X	X
4096QAM L			X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X	
8192QAM										

(1) Supports XPIC
(2) Supports MIMO

Table 90 Supported Physical Modes ANSI

Telecom Standard: ANSI										
Products: MINI-LINK 6363 10 – 26 ≥ R4A, MINI-LINK 6363 38 ≥ R4A										
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz	60 MHz	80 MHz	112 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM L				M(2)	M(2)					
1024QAM	X	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM		X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM L		X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM			X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM L			X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	
8192QAM				X(3)	X(3)					

(1) Supports XPIC
(2) Supports MIMO
(3) Note that static modulation is not supported for 8192QAM

Table 91 Supported Physical Modes ANSI

Telecom Standard: ANSI										
Products MINI-LINK 6363 80 ≥ R1A										
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz	60 MHz	80 MHz	112 MHz
4QAM S							X(1)	X(1)	X(1)	X(1)
4QAM							X(1)	X(1)	X(1)	X(1)
16QAM S							X(1)	X(1)	X(1)	X(1)
16QAM							X(1)	X(1)	X(1)	X(1)
32QAM							X(1)	X(1)	X(1)	X(1)
64QAM							X(1)	X(1)	X(1)	X(1)
128QAM							X(1)	X(1)	X(1)	X(1)
256QAM							X(1)	X(1)	X(1)	X(1)

Telecom Standard: ANSI										
Products MINI-LINK 6363 80 ≥ R1A										
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz	60 MHz	80 MHz	112 MHz
512QAM							X(1)	X(1)	X(1)	X(1)
1024QAM							X	X	X	X
2048QAM										
2048QAM L										
4096QAM										
4096QAM L										
8192QAM										

(1) Supports XPIC

3.7.1.3 MINI-LINK 6364 HW

MINI-LINK 6364 HW supports physical modes according to the tables below. The physical modes supported are denoted by an X, and M in those cases where only MIMO is supported. See Radio Frequencies on page 74 for supported frequencies and channel separations for a specific frequency band.

Table 92 Supported Physical Modes ETSI

Telecom Standard: ETSI							
Products: MINI-LINK 6364 13, 15 ≥ R1A(1)							
CS Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
4QAM S	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
4QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
16QAM S	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
16QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
32QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
64QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
128QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
256QAM	X(2)	X(2)	X(2) (3)	X(2)	X(2)(3)	X(2)	X(2)
512QAM	X(2)	X(2)	X(2) (3)	X(2)	X(2)(3)	X(2)	X(2)
512QAM L			M(3)		M(3)		
1024QAM	X	X(2)	X(2)	X(2)	X(2)(3)	X(2)	X(2)
1024QAM L					M(3)		
2048QAM		X	X(2)	X(2)	X(2)	X(2)	X(2)
2048QAM L		X	X(2)	X(2)	X(2)	X(2)	X(2)
4096QAM			X(2)	X(2)	X(2)	X(2)	X(2)
4096QAM L			X(2)	X(2)	X(2)	X(2)	

Telecom Standard: ETSI							
Products: MINI-LINK 6364 13, 15 ≥ R1A(1)							
CS / Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
8192QAM			X(4)	X(4)			

(1) The minimum modulation shall be set to 512 QAM or lower, for both static and adaptive modulation, when using MINI-LINK 6364 radio units. This is applicable for countries complying to ETSI EN 302 217.

(2) Supports XPIC

(3) Supports MIMO

(4) Note that static modulation is not supported for 8192QAM. See also (1).

Table 93 Supported Physical Modes ETSI

Telecom Standard: ETSI								
Products: MINI-LINK 6364 18 ≥ R1A(1)								
CS / Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz	220(2) MHz
4QAM S	X (3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
4QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
16QAM S	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
16QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
32QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
64QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
128QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
256QAM	X(3)	X(3)	X(3) (4)	X(3)	X(3)(4)	X(3)	X(3)	X
512QAM	X(3)	X(3)	X(3) (4)	X(3)	X(3)(4)	X(3)	X(3)	X
512QAM L			M(4)		M(4)			
1024QAM	X	X(3)	X(3)	X(3)	X(3)(4)	X(3)	X(3)	X
1024QAM L					M(4)			
2048QAM		X	X(3)	X(3)	X(3)	X(3)	X(3)	
2048QAM L		X	X(3)	X(3)	X(3)	X(3)	X(3)	
4096QAM			X(3)	X(3)	X(3)	X(3)	X(3)	
4096QAM L			X(3)	X(3)	X(3)	X(3)		
8192QAM			X(5)	X(5)				

(1) The minimum modulation shall be set to 512 QAM or lower, for both static and adaptive modulation, when using MINI-LINK 6364 radio units. This is applicable for countries complying to ETSI EN 302 217.

(2) For CS 220 MHz, Carrier Aggregation with 2x110 MHz is configured (Frame ID 404).

(3) Supports XPIC

(4) Supports MIMO

(5) Note that static modulation is not supported for 8192QAM. See also (1).

Table 94 Supported Physical Modes ETSI with Carrier Aggregation

Telecom Standard: ETSI with Carrier Aggregation					
Products: MINI-LINK 6364 13, 15 ≥ R1A(1)					
CS Mod.	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
4QAM S	X		X		
4QAM	X		X		
16QAM S	X		X		
16QAM	X		X		
32QAM	X		X		
64QAM	X		X		
128QAM	X		X		
256QAM	X		X		
512QAM	X		X		
1024QAM	X		X		
2048QAM	X		X		
2048QAM L	X				
4096QAM	X				
4096QAM L					
8192QAM					

(1) The minimum modulation shall be set to 512 QAM or lower, for both static and adaptive modulation, when using MINI-LINK 6364 radio units. This is applicable for countries complying to ETSI EN 302 217.

Table 95 Supported Physical Modes ETSI with Carrier Aggregation

Telecom Standard: ETSI with Carrier Aggregation					
Products: MINI-LINK 6364 18 ≥ R1A(1)					
CS Mod.	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
4QAM S	X		X		X
4QAM	X		X		X
16QAM S	X		X		X
16QAM	X		X		X
32QAM	X		X		X
64QAM	X		X		X
128QAM	X		X		X
256QAM	X		X		X
512QAM	X		X		X
1024QAM	X		X		X
2048QAM	X		X		
2048QAM L	X				
4096QAM	X				
4096QAM L					

Telecom Standard: ETSI with Carrier Aggregation					
Products: MINI-LINK 6364 18 ≥ R1A[1]					
CS / Mod.	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
8192QAM					

(1) The minimum modulation shall be set to 512 QAM or lower, for both static and adaptive modulation, when using MINI-LINK 6364 radio units. This is applicable for countries complying to ETSI EN 302 217.

3.7.1.4 MINI-LINK 6365 HW

MINI-LINK 6365 HW supports physical modes according to the tables below. The physical modes supported are denoted by an X, and M in those cases where only MIMO is supported. See Radio Frequencies on page 74 for supported frequencies and channel separations for a specific frequency band.

Table 96 Supported Physical Modes ETSI

Telecom Standard: ETSI							
Products: MINI-LINK 6365 6 - 15 ≥ R1A[1]							
CS / Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
4QAM S	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
4QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
16QAM S	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
16QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
32QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
64QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
128QAM	X(2)	X(2)	X(2)(3)	X(2)	X(2)(3)	X(2)	X(2)
256QAM	X(2)	X(2)	X(2) (3)	X(2)	X(2)(3)	X(2)	X(2)
512QAM	X(2)	X(2)	X(2) (3)	X(2)	X(2)(3)	X(2)	X(2)
512QAM L			M(3)		M(3)		
1024QAM	X	X(2)	X(2)	X(2)	X(2)(3)	X(2)	X(2)
1024QAM L					M(3)		
2048QAM		X	X(2)	X(2)	X(2)	X(2)	X(2)
2048QAM L		X	X(2)	X(2)	X(2)	X(2)	X(2)
4096QAM			X(2)	X(2)	X(2)	X(2)	X(2)
4096QAM L			X(2)	X(2)	X(2)	X(2)	
8192QAM			X(4)	X(4)			

(1) The minimum modulation shall be set to 512 QAM or lower, for both static and adaptive modulation, when using MINI-LINK 6365 radio units. This is applicable for countries complying to ETSI EN 302 217.

(2) Supports XPIC

(3) Supports MIMO

(4) Note that static modulation is not supported for 8192QAM. See also (1).

Table 97 Supported Physical Modes ETSI

Telecom Standard: ETSI								
Products: MINI-LINK 6365 18, 23, 32 ≥ R1A(1)								
CS / Mod.	7 MHz	14/13.75 MHz	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz	224/ 220(2) MHz
4QAM S	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
4QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
16QAM S	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
16QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
32QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
64QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
128QAM	X(3)	X(3)	X(3)(4)	X(3)	X(3)(4)	X(3)	X(3)	X
256QAM	X(3)	X(3)	X(3) (4)	X(3)	X(3)(4)	X(3)	X(3)	X
512QAM	X(3)	X(3)	X(3) (4)	X(3)	X(3)(4)	X(3)	X(3)	X
512QAM L			M(4)		M(4)			
1024QAM	X	X(3)	X(3)	X(3)	X(3)(4)	X(3)	X(3)	X
1024QAM L					M(4)			
2048QAM		X	X(3)	X(3)	X(3)	X(3)	X(3)	
2048QAM L		X	X(3)	X(3)	X(3)	X(3)	X(3)	
4096QAM			X(3)	X(3)	X(3)	X(3)	X(3)	
4096QAM L			X(3)	X(3)	X(3)	X(3)		
8192QAM			X(5)(6)	X(5)(6)				

(1) The minimum modulation shall be set to 512 QAM or lower, for both static and adaptive modulation, when using MINI-LINK 6365 radio units. This is applicable for countries complying to ETSI EN 302 217.

(2) For MINI-LINK 6365 23 and 32 at CS 224 MHz, Carrier Aggregation with 2x112 MHz is configured (Frame ID 404).

For MINI-LINK 6365 18 and CS 220 MHz, Carrier Aggregation with 2x110 MHz is configured (Frame ID 404).

(3) Supports XPIC

(4) Supports MIMO

(5) Note that static modulation is not supported for 8192QAM. See also (1).

(6) Note that 8192QAM is currently not supported on MINI-LINK 6365 32. The HW is prepared.

Table 98 Supported Physical Modes ETSI with Carrier Aggregation

Telecom Standard: ETSI with Carrier Aggregation					
Products: MINI-LINK 6365 6, 7/8, 10/11, 13, 15, 18, 23, 32 ≥ R1A(1)					
CS / Mod.	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
4QAM S	X	X	X	X	X

Telecom Standard: ETSI with Carrier Aggregation					
Products: MINI-LINK 6365 6, 7/8, 10/11, 13, 15, 18, 23, 32 ≥ R1A(1)					
CS / Mod.	28/27.5 MHz	40 MHz	56/ 55 MHz	80 MHz	112/ 110 MHz
4QAM	X	X	X	X	X
16QAM S	X	X	X	X	X
16QAM	X	X	X	X	X
32QAM	X	X	X	X	X
64QAM	X	X	X	X	X
128QAM	X	X	X	X	X
256QAM	X	X	X	X	X
512QAM	X	X	X	X	X
1024QAM	X	X	X	X	X
2048QAM	X	X	X		
2048QAM L	X	X			
4096QAM	X				
4096QAM L					
8192QAM					

(1) The minimum modulation shall be set to 512 QAM or lower, for both static and adaptive modulation, when using MINI-LINK 6365 radio units. This is applicable for countries complying to ETSI EN 302 217.

Table 99 Supported Physical Modes ANSI

Telecom Standard: ANSI										
Products MINI-LINK 6365 6 - 32 ≥ R1A										
CS / Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz	60 MHz	80 MHz	112 MHz
4QAM S	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
4QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM S	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
16QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
32QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
64QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
128QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
256QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM	X(1)	X(1)	X(1)	X(1)(2)	X(1)(2)	X(1)	X(1)	X(1)	X(1)	X(1)
512QAM L				M(2)	M(2)					
1024QAM	X	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM		X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
2048QAM L		X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM			X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)
4096QAM L			X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	X(1)	

Telecom Standard: ANSI										
Products MINI-LINK 6365 6 - 32 ≥ R1A										
CS Mod.	10 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz	60 MHz	80 MHz	112 MHz
8192QAM				X(3) (4)	X(3)(4)					

(1) Supports XPIC
(2) Supports MIMO
(3) Note that static modulation is not supported for 8192QAM
(4) Note that 8192QAM is currently not supported on MINI-LINK 6365 32. The HW is prepared.

Table 100 Supported Physical Modes ANSI with Carrier Aggregation

Telecom Standard: ANSI with Carrier Aggregation								
Products MINI-LINK 6365 6, 7/8, 10/11, 13, 15, 18, 23, 32 ≥ R1A								
CS Mod.	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz	60 MHz	80 MHz	112 MHz
4QAM S		X	X	X		X	X	
4QAM		X	X	X		X	X	
16QAM S		X	X	X		X	X	
16QAM		X	X	X		X	X	
32QAM		X	X	X		X	X	
64QAM		X	X	X		X	X	
128QAM		X	X	X		X	X	
256QAM		X	X	X		X	X	
512QAM		X	X	X		X	X	
1024QAM		X	X	X		X	X	
2048QAM		X	X	X		X		
2048QAM L		X	X					
4096QAM		X						
4096QAM L								
8192QAM								

3.7.2 MMU

This chapter describes the traffic capacities of each MMU per carrier, depending on channel separation and modulation. Note that the support may require a certain SW.

Data for standard Frame ID's (256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, and 303) can be found in revision BT of this document.

— Static physical modes are supported up to 4096QAM Light, by setting Adaptive Coding and Modulation (ACM) Max Capacity—Modulation equal to Min Capacity—Modulation.

— S= Strong coding and L= Light coding

— The figures in the tables related to maximum E1/DS1 are valid when TDM is used in a single direction. When TDM in 2 directions is enabled, the maximum number of E1/DS1 is limited to 40 per direction.

Note: TDM is not supported by MINI-LINK 6366 and MINI-LINK 6371, therefore the maximum number of E1/DS1 in the following tables are not applicable to these network elements.

ETSI

Table 101 MMU 1001, PNM 1001, MINI-LINK 6651/1, MINI-LINK 6651/3 and MINI-LINK 6366

Modulation	CS 7 Frame ID 356	CS 13.75, 14 Frame ID 357	CS 27.7, 28 Frame ID 358	CS 40 Frame ID 359	CS 55, 56, 62.5 Frame ID 360	CS 80 Frame ID 403	CS 110, 112, 125 Frame ID 361
4QAM S	8 Mbps 2XE1(1)	19 Mbps 6xE1(1)	37 Mbps 15xE1(1)	53 Mbps 23xE1(1)	75 Mbps 34xE1(1)	108 Mbps 49xE1(1)	151 Mbps 70xE1(1)
4QAM	10 Mbps 3XE1(1)	22 Mbps 8xE1(1)	44 Mbps 18xE1(1)	62 Mbps 28xE1(1)	88 Mbps 40xE1(1)	126 Mbps 58xE1(1)	176 Mbps 80xE1(1)
16QAM S	18 Mbps 6xE1(1)	37 Mbps 15xE1(1)	75 Mbps 34xE1(1)	107 Mbps 49xE1(1)	151 Mbps 70xE1(1)	217 Mbps 80xE1(1)	302 Mbps 80xE1(1)
16QAM	21 Mbps 7xE1(1)	43 Mbps 18xE1(1)	87 Mbps 33xE1(1)	124 Mbps 57xE1(1)	176 Mbps 71xE1(1)	253 Mbps 80xE1(1)	352 Mbps 80xE1(1)
32QAM	26 Mbps 10xE1(1)	54 Mbps 24xE1(1)	109 Mbps 50xE1(1)	156 Mbps 73xE1(1)	221 Mbps 80xE1(1)	317 Mbps 80xE1(1)	441 Mbps 80xE1(1)
64QAM	33 Mbps 13xE1(1)	68 Mbps 30xE1(1)	137 Mbps 63xE1(1)	196 Mbps 80xE1(1)	277 Mbps 80xE1(1)	397 Mbps 80xE1(1)	553 Mbps 80xE1(1)
128QAM	39 Mbps 16xE1(1)	81 Mbps 36xE1(1)	162 Mbps 75xE1(1)	231 Mbps 80xE1(1)	327 Mbps 80xE1(1)	470 Mbps 80xE1(1)	654 Mbps 80xE1(1)
256QAM	45 Mbps 19xE1(1)	93 Mbps 42xE1(1)	186 Mbps 80xE1(1)	267 Mbps 80xE1(1)	377 Mbps 80xE1(1)	542 Mbps 80xE1(1)	754 Mbps 80xE1(1)
512QAM	51 Mbps 22xE1(1)	105 Mbps 48xE1(1)	211 Mbps 80xE1(1)	302 Mbps 80xE1(1)	427 Mbps 80xE1(1)	614 Mbps 80xE1(1)	855 Mbps 80xE1(1)
1024QAM	56 Mbps 25xE1	117 Mbps 54xE1(1)	234 Mbps 80xE1(1)	335 Mbps 80xE1(1)	473 Mbps 80xE1(1)	679 Mbps 80xE1(1)	946 Mbps 80xE1(1)
2048QAM	-	121 Mbps 56xE1	243 Mbps 80xE1(1)	348 Mbps 80xE1(1)	492 Mbps 80xE1(1)	706 Mbps 80xE1(1)	983 Mbps 80xE1(1)
2048QAM L	-	127 Mbps 59xE1	256 Mbps 80xE1(1)	366 Mbps 80xE1(1)	517 Mbps 80xE1(1)	742 Mbps 80xE1(1)	1033 Mbps 80xE1(1)
4096QAM	-	-	264 Mbps 80xE1(1)	378 Mbps 80xE1(1)	534 Mbps 80xE1(1)	767 Mbps 80xE1	1068 Mbps 80xE1
4096QAM L	-	-	276 Mbps 80xE1(1)	395 Mbps 80xE1(1)	559 Mbps 80xE1(1)	-	-
8192QAM	-	-	-	-	-	-	-

(1) Supports XPIC

Table 102 MMU 1004, MMU 1002, PNM 1002, MINI-LINK 6651/4, MINI-LINK 6651/2, and MINI-LINK 6371

Modulation	CS 7 Frame ID 356	CS 13.75, 14 Frame ID 357	CS 27.5, 28 Frame ID 358	CS 40 Frame ID 359	CS 55, 56, 62.5 Frame ID 360	CS 80 Frame ID 403	CS 110, 112, 125 Frame ID 361	CS 220, 224(1)(2) Frame ID 404
4QAM S	8 Mbps 2XE1(3)	19 Mbps 6xE1(3)	37 Mbps 15xE1(3)	53 Mbps 23xE1(3)	75 Mbps 34xE1(3)	108 Mbps 49xE1(3)	151 Mbps 70xE1(3)	302 Mbps 70xE1
4QAM	10 Mbps 3XE1(3)	22 Mbps 8xE1(3)	44 Mbps 18xE1(3)	62 Mbps 28xE1(3)	88 Mbps 40xE1(3)	126 Mbps 58xE1(3)	176 Mbps 80xE1(3)	352 Mbps 80xE1
16QAM S	18 Mbps 6xE1(3)	37 Mbps 15xE1(3)	75 Mbps 34xE1(3)	107 Mbps 49xE1(3)	151 Mbps 70xE1(3)	217 Mbps 80xE1(3)	302 Mbps 80xE1(3)	604 Mbps 80xE1
16QAM	21 Mbps 7xE1(3)	43 Mbps 18xE1(3)	87 Mbps 33xE1(3)	124 Mbps 57xE1(3)	176 Mbps 71xE1(3)	253 Mbps 80xE1(3)	352 Mbps 80xE1(3)	704 Mbps 80xE1
32QAM	26 Mbps 10xE1(3)	54 Mbps 24xE1(3)	109 Mbps 50xE1(3)	156 Mbps 73xE1(3)	221 Mbps 80xE1(3)	317 Mbps 80xE1(3)	441 Mbps 80xE1(3)	882 Mbps 80xE1
64QAM	33 Mbps 13xE1(3)	68 Mbps 30xE1(3)	137 Mbps 63xE1(3)	196 Mbps 80xE1(3)	277 Mbps 80xE1(3)	397 Mbps 80xE1(3)	553 Mbps 80xE1(3)	1106 Mbps 80xE1
128QAM	39 Mbps 16xE1(3)	81 Mbps 36xE1(3)	162 Mbps 75xE1(3)	231 Mbps 80xE1(3)	327 Mbps 80xE1(3)	470 Mbps 80xE1(3)	654 Mbps 80xE1(3)	1308 Mbps 80xE1
256QAM	45 Mbps 19xE1(3)	93 Mbps 42xE1(3)	186 Mbps 80xE1(3)	267 Mbps 80xE1(3)	377 Mbps 80xE1(3)	542 Mbps 80xE1(3)	754 Mbps 80xE1(3)	1508 Mbps 80xE1
512QAM	51 Mbps 22xE1(3)	105 Mbps 48xE1(3)	211 Mbps 80xE1(3)	302 Mbps 80xE1(3)	427 Mbps 80xE1(3)	614 Mbps 80xE1(3)	855 Mbps 80xE1(3)	1710 Mbps 80xE1
1024QAM	56 Mbps 25xE1	117 Mbps 54xE1(3)	234 Mbps 80xE1(3)	335 Mbps 80xE1(3)	473 Mbps 80xE1(3)	679 Mbps 80xE1(3)	946 Mbps 80xE1(3)	1892 Mbps 80xE1
2048QAM	-	121 Mbps 56xE1	243 Mbps 80xE1(3)	348 Mbps 80xE1(3)	492 Mbps 80xE1(3)	706 Mbps 80xE1(3)	983 Mbps 80xE1(3)	
2048QAM L	-	127 Mbps 59xE1	256 Mbps 80xE1(3)	366 Mbps 80xE1(3)	517 Mbps 80xE1(3)	742 Mbps 80xE1(3)	1033 Mbps 80xE1(3)	
4096QAM	-	-	264 Mbps 80xE1(3)	378 Mbps 80xE1(3)	534 Mbps 80xE1(3)	767 Mbps 80xE1(3)	1068 Mbps 80xE1(3)	
4096QAM L	-	-	276 Mbps 80xE1(3)	395 Mbps 80xE1(3)	559 Mbps 80xE1(3)	803 Mbps 80xE1(3)	-	
8192QAM	-	-	284 Mbps 80xE1	406 Mbps 80xE1	-	-	-	

(1) Only applicable for MMU 1004

(2) For CS 220 MHz and 224 MHz, Carrier Aggregation with 2x110 MHz or 2x112 MHz is configured.

(3) Supports XPIC

Table 103 MMU 1004, MMU 1002 MIMO

Modulation	CS 27.5, 28 Frame ID 2358	CS 55, 56 Frame ID 2360
4QAM S	36 Mbps 15xE1	73 Mbps 33xE1

Modulation	CS 27.5, 28 Frame ID 2358	CS 55, 56 Frame ID 2360
4QAM	42 Mbps 18xE1	86 Mbps 39xE1
16QAM S	72 Mbps 33xE1	146 Mbps 68xE1
16QAM	85 Mbps 38xE1	171 Mbps 80xE1
32QAM	109 Mbps 50xE1	219 Mbps 80xE1
64QAM	133 Mbps 62xE1	268 Mbps 80xE1
128QAM	157 Mbps 74xE1	317 Mbps 80xE1
256QAM	182 Mbps 80xE1	366 Mbps 80xE1
512QAM	194 Mbps 80xE1	390 Mbps 80xE1
512QAM L	206 Mbps 80xE1	415 Mbps 80xE1
1024QAM	-	435 Mbps 80xE1
1024QAM L	-	459 Mbps 80xE1

Table 104 MMU 1004, MMU 1002 Carrier Aggregation

Modulation	CS 27.5, 28 Frame ID 358	CS 40 Frame ID 359	CS 55, 56 Frame ID 360	CS 80 Frame ID 403	CS 110, 112[1] Frame ID 361
4QAM S	37 Mbps 15xE1	53 Mbps 23xE1	75 Mbps 34xE1	108 Mbps 49xE1	151 Mbps 70xE1
4QAM	44 Mbps 18xE1	62 Mbps 28xE1	88 Mbps 40xE1	126 Mbps 58xE1	176 Mbps 80xE1
16QAM S	75 Mbps 34xE1	107 Mbps 49xE1	151 Mbps 70xE1	217 Mbps 80xE1	302 Mbps 80xE1
16QAM	87 Mbps 33xE1	124 Mbps 57xE1	176 Mbps 71xE1	253 Mbps 80xE1	352 Mbps 80xE1
32QAM	109 Mbps 50xE1	156 Mbps 73xE1	221 Mbps 80xE1	317 Mbps 80xE1	441 Mbps 80xE1
64QAM	137 Mbps 63xE1	196 Mbps 80xE1	277 Mbps 80xE1	397 Mbps 80xE1	553 Mbps 80xE1
128QAM	162 Mbps 75xE1	231 Mbps 80xE1	327 Mbps 80xE1	470 Mbps 80xE1	654 Mbps 80xE1
256QAM	186 Mbps 80xE1	267 Mbps 80xE1	377 Mbps 80xE1	542 Mbps 80xE1	754 Mbps 80xE1
512QAM	211 Mbps 80xE1	302 Mbps 80xE1	427 Mbps 80xE1	614 Mbps 80xE1	855 Mbps 80xE1
1024QAM	234 Mbps 80xE1	335 Mbps 80xE1	473 Mbps 80xE1	679 Mbps 80xE1	946 Mbps 80xE1
2048QAM	243 Mbps 80xE1	348 Mbps 80xE1	492 Mbps 80xE1	-	-

Modulation	CS 27.5, 28 Frame ID 358	CS 40 Frame ID 359	CS 55, 56 Frame ID 360	CS 80 Frame ID 403	CS 110, 112(1) Frame ID 361
2048QAM L	256 Mbps 80xE1	366 Mbps 80xE1	-	-	-
4096QAM	264 Mbps 80xE1	-	-	-	-
4096QAM L	-	-	-	-	-
8192QAM	-	-	-	-	-

(1) Only applicable for MMU 1004

ANSI

Table 105 MMU 1001, PNM 1001, MINI-LINK 6651/1, MINI-LINK 6651/3 and MINI-LINK 6366

Modulation	CS 10 Frame ID 362	CS 20 Frame ID 363	CS 28 Frame ID 371	CS 30 Frame ID 364	CS 40 Frame ID 365	CS 50 Frame ID 366	CS 56 Frame ID 373	CS 60 Frame ID 367	CS 80 Frame ID 368	CS 112 Frame ID 374
4QAM S	13 Mbps 5xDS1 (1)	26 Mbps 14xDS1 (1)	37 Mbps 21xDS1 (1)	40 Mbps 23xDS1 (1)	54 Mbps 32xDS1 (1)	68 Mbps 40xDS1 (1)	75 Mbps 45xDS1 (1)	81 Mbps 49xDS1 (1)	108 Mbps 66xDS1 (1)	151 Mbps 80xDS1 (1)
4QAM	15 Mbps 7xDS1 (1)	31 Mbps 17xDS1 (1)	44 Mbps 25xDS1 (1)	47 Mbps 27xDS1 (1)	63 Mbps 37xDS1 (1)	79 Mbps 47xDS1 (1)	88 Mbps 54xDS1 (1)	95 Mbps 58xDS1 (1)	126 Mbps 78xDS1 (1)	177 Mbps 80xDS1 (1)
16QAM S	25 Mbps 13xDS1 (1)	53 Mbps 31xDS1 (1)	75 Mbps 45xDS1 (1)	80 Mbps 48xDS1 (1)	108 Mbps 66xDS1 (1)	135 Mbps 80xDS1 (1)	151 Mbps 80xDS1 (1)	162 Mbps 80xDS1 (1)	217 Mbps 80xDS1 (1)	302 Mbps 80xDS1 (1)
16QAM	29 Mbps 16xDS1 (1)	61 Mbps 36xDS1 (1)	87 Mbps 53xDS1 (1)	93 Mbps 57xDS1 (1)	126 Mbps 77xDS1 (1)	158 Mbps 80xDS1 (1)	176 Mbps 80xDS1 (1)	189 Mbps 80xDS1 (1)	253 Mbps 80xDS1 (1)	352 Mbps 80xDS1 (1)
32QAM	37 Mbps 21xDS1 (1)	77 Mbps 46xDS1 (1)	109 Mbps 67xDS1 (1)	117 Mbps 72xDS1 (1)	157 Mbps 80xDS1 (1)	198 Mbps 80xDS1 (1)	221 Mbps 80xDS1 (1)	237 Mbps 80xDS1 (1)	317 Mbps 80xDS1 (1)	441 Mbps 80xDS1 (1)
64QAM	46 Mbps 27xDS1 (1)	97 Mbps 59xDS1 (1)	137 Mbps 80xDS1 (1)	147 Mbps 80xDS1 (1)	197 Mbps 80xDS1 (1)	248 Mbps 80xDS1 (1)	277 Mbps 80xDS1 (1)	297 Mbps 80xDS1 (1)	397 Mbps 80xDS1 (1)	553 Mbps 80xDS1 (1)
128QAM	55 Mbps 32xDS1 (1)	114 Mbps 70xDS1 (1)	162 Mbps 80xDS1 (1)	173 Mbps 80xDS1 (1)	233 Mbps 80xDS1 (1)	293 Mbps 80xDS1 (1)	327 Mbps 80xDS1 (1)	352 Mbps 80xDS1 (1)	470 Mbps 80xDS1 (1)	654 Mbps 80xDS1 (1)
256QAM	63 Mbps 37xDS1 (1)	132 Mbps 80xDS1 (1)	186 Mbps 80xDS1 (1)	200 Mbps 80xDS1 (1)	269 Mbps 80xDS1 (1)	338 Mbps 80xDS1 (1)	377 Mbps 80xDS1 (1)	406 Mbps 80xDS1 (1)	542 Mbps 80xDS1 (1)	754 Mbps 80xDS1 (1)
512QAM	71 Mbps 43xDS1 (1)	149 Mbps 80xDS1 (1)	211 Mbps 80xDS1 (1)	226 Mbps 80xDS1 (1)	305 Mbps 80xDS1 (1)	383 Mbps 80xDS1 (1)	427 Mbps 80xDS1 (1)	460 Mbps 80xDS1 (1)	614 Mbps 80xDS1 (1)	855 Mbps 80xDS1 (1)

Modulation	CS 10 Frame ID 362	CS 20 Frame ID 363	CS 28 Frame ID 371	CS 30 Frame ID 364	CS 40 Frame ID 365	CS 50 Frame ID 366	CS 56 Frame ID 373	CS 60 Frame ID 367	CS 80 Frame ID 368	CS 112 Frame ID 374
1024QAM	79 Mbps 48xDS1	165 Mbps 80xDS1 (1)	234 Mbps 80xDS1 (1)	251 Mbps 80xDS1 (1)	337 Mbps 80xDS1 (1)	423 Mbps 80xDS1 (1)	473 Mbps 80xDS1 (1)	509 Mbps 80xDS1 (1)	679 Mbps 80xDS1 (1)	946 Mbps 80xDS1 (1)
2048QAM	-	172 Mbps 80xDS1 (1)	243 Mbps 80xDS1 (1)	260 Mbps 80xDS1 (1)	351 Mbps 80xDS1 (1)	440 Mbps 80xDS1 (1)	492 Mbps 80xDS1 (1)	529 Mbps 80xDS1 (1)	706 Mbps 80xDS1 (1)	983 Mbps 80xDS1 (1)
2048QAM L	-	180 Mbps 80xDS1 (1)	256 Mbps 80xDS1 (1)	274 Mbps 80xDS1 (1)	369 Mbps 80xDS1 (1)	463 Mbps 80xDS1 (1)	517 Mbps 80xDS1 (1)	556 Mbps 80xDS1 (1)	742 Mbps 80xDS1 (1)	1033 Mbps 80xDS1 (1)
4096QAM	-	-	264 Mbps 80xDS1	283 Mbps 80xDS1 (1)	381 Mbps 80xDS1 (1)	478 Mbps 80xDS1 (1)	534 Mbps 80xDS1 (1)	574 Mbps 80xDS1 (1)	767 Mbps 80xDS1	1068 Mbps 80xDS1
4096QAM L	-	-	276 Mbps 80xDS1	296 Mbps 80xDS1 (1)	399 Mbps 80xDS1 (1)	500 Mbps 80xDS1 (1)	559 Mbps 80xDS1 (1)	601 Mbps 80xDS1 (1)	-	-
8192QAM	-	-	-	-	-	-	-	-	-	-

(1) Supports XPIC

Table 106 MMU 1004, MMU 1002, PNM 1002, MINI-LINK 6651/4, MINI-LINK 6651/2, and MINI-LINK 6371

Modulation	CS 10 Frame ID 362	CS 20 Frame ID 363	CS 28 Frame ID 371	CS 30 Frame ID 364	CS 40 Frame ID 365	CS 50 Frame ID 366	CS 56 Frame ID 373	CS 60 Frame ID 367	CS 80 Frame ID 368	CS 112 Frame ID 374
4QAM S	13 Mbps 5xDS1(1)	26 Mbps 14xDS1 (1)	37 Mbps 21xDS1 (1)	40 Mbps 23xDS1 (1)	54 Mbps 32xDS1 (1)	68 Mbps 40xDS1 (1)	75 Mbps 45xDS1 (1)	81 Mbps 49xDS1 (1)	108 Mbps 66xDS1 (1)	151 Mbps 80xDS1 (1)
4QAM	15 Mbps 7xDS1 (1)	31 Mbps 17xDS1 (1)	44 Mbps 25xDS1 (1)	47 Mbps 27xDS1 (1)	63 Mbps 37xDS1 (1)	79 Mbps 47xDS1 (1)	88 Mbps 54xDS1 (1)	95 Mbps 58xDS1 (1)	126 Mbps 78xDS1 (1)	177 Mbps 80xDS1 (1)
16QAM S	25 Mbps 13xDS1 (1)	53 Mbps 31xDS1 (1)	75 Mbps 45xDS1 (1)	80 Mbps 48xDS1 (1)	108 Mbps 66xDS1 (1)	135 Mbps 80xDS1 (1)	151 Mbps 80xDS1 (1)	162 Mbps 80xDS1 (1)	217 Mbps 80xDS1 (1)	302 Mbps 80xDS1 (1)
16QAM	29 Mbps 16xDS1 (1)	61 Mbps 36xDS1 (1)	87 Mbps 53xDS1 (1)	93 Mbps 57xDS1 (1)	126 Mbps 77xDS1 (1)	158 Mbps 80xDS1 (1)	176 Mbps 80xDS1 (1)	189 Mbps 80xDS1 (1)	253 Mbps 80xDS1 (1)	352 Mbps 80xDS1 (1)
32QAM	37 Mbps 21xDS1 (1)	77 Mbps 46xDS1 (1)	109 Mbps 67xDS1 (1)	117 Mbps 72xDS1 (1)	157 Mbps 80xDS1 (1)	198 Mbps 80xDS1 (1)	221 Mbps 80xDS1 (1)	237 Mbps 80xDS1 (1)	317 Mbps 80xDS1 (1)	441 Mbps 80xDS1 (1)
64QAM	46 Mbps 27xDS1 (1)	97 Mbps 59xDS1 (1)	137 Mbps 80xDS1 (1)	147 Mbps 80xDS1 (1)	197 Mbps 80xDS1 (1)	248 Mbps 80xDS1 (1)	277 Mbps 80xDS1 (1)	297 Mbps 80xDS1 (1)	397 Mbps 80xDS1 (1)	553 Mbps 80xDS1 (1)

Modulation	CS 10 Frame ID 362	CS 20 Frame ID 363	CS 28 Frame ID 371	CS 30 Frame ID 364	CS 40 Frame ID 365	CS 50 Frame ID 366	CS 56 Frame ID 373	CS 60 Frame ID 367	CS 80 Frame ID 368	CS 112 Frame ID 374
128QAM	55 Mbps 32xDS1 (1)	114 Mbps 70xDS1 (1)	162 Mbps 80xDS1 (1)	173 Mbps 80xDS1 (1)	233 Mbps 80xDS1 (1)	293 Mbps 80xDS1 (1)	327 Mbps 80xDS1 (1)	352 Mbps 80xDS1 (1)	470 Mbps 80xDS1 (1)	654 Mbps 80xDS1 (1)
256QAM	63 Mbps 37xDS1 (1)	132 Mbps 80xDS1 (1)	186 Mbps 80xDS1 (1)	200 Mbps 80xDS1 (1)	269 Mbps 80xDS1 (1)	338 Mbps 80xDS1 (1)	377 Mbps 80xDS1 (1)	406 Mbps 80xDS1 (1)	542 Mbps 80xDS1 (1)	754 Mbps 80xDS1 (1)
512QAM	71 Mbps 43xDS1 (1)	149 Mbps 80xDS1 (1)	211 Mbps 80xDS1 (1)	226 Mbps 80xDS1 (1)	305 Mbps 80xDS1 (1)	383 Mbps 80xDS1 (1)	427 Mbps 80xDS1 (1)	460 Mbps 80xDS1 (1)	614 Mbps 80xDS1 (1)	855 Mbps 80xDS1 (1)
1024QAM	79 Mbps 48xDS1	165 Mbps 80xDS1 (1)	234 Mbps 80xDS1 (1)	251 Mbps 80xDS1 (1)	337 Mbps 80xDS1 (1)	423 Mbps 80xDS1 (1)	473 Mbps 80xDS1 (1)	509 Mbps 80xDS1 (1)	679 Mbps 80xDS1 (1)	946 Mbps 80xDS1 (1)
2048QAM	-	172 Mbps 80xDS1 (1)	243 Mbps 80xDS1 (1)	260 Mbps 80xDS1 (1)	351 Mbps 80xDS1 (1)	440 Mbps 80xDS1 (1)	492 Mbps 80xDS1 (1)	529 Mbps 80xDS1 (1)	706 Mbps 80xDS1 (1)	983 Mbps 80xDS1 (1)
2048QAM L	-	180 Mbps 80xDS1 (1)	256 Mbps 80xDS1 (1)	274 Mbps 80xDS1 (1)	369 Mbps 80xDS1 (1)	463 Mbps 80xDS1 (1)	517 Mbps 80xDS1 (1)	556 Mbps 80xDS1 (1)	742 Mbps 80xDS1 (1)	1033 Mbps 80xDS1 (1)
4096QAM	-	-	264 Mbps 80xDS1	283 Mbps 80xDS1 (1)	381 Mbps 80xDS1 (1)	478 Mbps 80xDS1 (1)	534 Mbps 80xDS1 (1)	574 Mbps 80xDS1 (1)	767 Mbps 80xDS1 (1)	1068 Mbps 80xDS1 (1)
4096QAM L	-	-	276 Mbps 80xDS1	296 Mbps 80xDS1 (1)	399 Mbps 80xDS1 (1)	500 Mbps 80xDS1 (1)	559 Mbps 80xDS1 (1)	601 Mbps 80xDS1 (1)	803 Mbps 80xDS1 (1)	-
8192QAM	-	-	-	304 Mbps 80xDS1	409 Mbps 80xDS1	-	-	-	-	-

(1) Supports XPIC

Table 107 MMU 1004, MMU 1002 MIMO

Modulation	CS 30 Frame ID 2364	CS 40 Frame ID 2365
4QAM S	39 Mbps 22xDS1	52 Mbps 31xDS1
4QAM	46 Mbps 26xDS1	61 Mbps 36xDS1
16QAM S	78 Mbps 47xDS1	105 Mbps 64xDS1
16QAM	91 Mbps 55xDS1	122 Mbps 75xDS1
32QAM	117 Mbps 72xDS1	157 Mbps 80xDS1

Modulation	CS 30 Frame ID 2364	CS 40 Frame ID 2365
64QAM	143 Mbps 80xDS1	192 Mbps 80xDS1
128QAM	169 Mbps 80xDS1	227 Mbps 80xDS1
256QAM	195 Mbps 80xDS1	262 Mbps 80xDS1
512QAM	208 Mbps 80xDS1	279 Mbps 80xDS1
512QAM L	221 Mbps 80xDS1	297 Mbps 80xDS1

Table 108 MMU 1004, MMU 1002, Carrier Aggregation

Modulation	CS 30 Frame ID 364	CS 40 Frame ID 365	CS 50 Frame ID 366	CS 60(1) Frame ID 367	CS 80(1) Frame ID 368
4QAM S	40 Mbps 23xDS1	54 Mbps 32xDS1	68 Mbps 40xDS1	81 Mbps 49xDS1	108Mbps 66xDS1
4QAM	47 Mbps 27xDS1	63 Mbps 37xDS1	79 Mbps 47xDS1	95 Mbps 58xDS1	126Mbps 78xDS1
16QAM S	80 Mbps 48xDS1	108 Mbps 66xDS1	135 Mbps 80xDS1	162Mbps 80xDS1	217Mbps 80xDS1
16QAM	93 Mbps 57xDS1	126 Mbps 77xDS1	158 Mbps 80xDS1	189Mbps 80xDS1	253Mbps 80xDS1
32QAM	117 Mbps 72xDS1	157 Mbps 80xDS1	198 Mbps 80xDS1	237Mbps 80xDS1	317Mbps 80xDS1
64QAM	147 Mbps 80xDS1	197 Mbps 80xDS1	248 Mbps 80xDS1	297Mbps 80xDS1	397Mbps 80xDS1
128QAM	173 Mbps 80xDS1	233 Mbps 80xDS1	293 Mbps 80xDS1	352Mbps 80xDS1	470Mbps 80xDS1
256QAM	200 Mbps 80xDS1	269 Mbps 80xDS1	338 Mbps 80xDS1	406Mbps 80xDS1	542Mbps 80xDS1
512QAM	226 Mbps 80xDS1	305 Mbps 80xDS1	383 Mbps 80xDS1	460Mbps 80xDS1	614Mbps 80xDS1
1024QAM	251 Mbps 80xDS1	337 Mbps 80xDS1	423 Mbps 80xDS1	509Mbps 80xDS1	679Mbps 80xDS1
2048QAM	260 Mbps 80xDS1	351 Mbps 80xDS1	440 Mbps 80xDS1	529Mbps 80xDS1	-
2048QAM L	274 Mbps 80xDS1	369 Mbps 80xDS1	-	-	-
4096QAM	283 Mbps 80xDS1	-	-	-	-
4096QAM L	-	-	-	-	-
8192QAM	-	-	-	-	-

(1) Only applicable for MMU 1004

4 Physical Interfaces

4.1 Ethernet Traffic Interfaces

4.1.1 Interface Types

10BASE-T	IEEE802.3i ncl.. In 802.3-2005
100BASE-TX	IEEE802.3u ncl.. In 802.3-2005
1000BASE-T	IEEE802.3ab incl. In 802.3-2005
1000BASE-SX	IEEE 802.3z incl. In 802.3-2005
1000BASE-LX	IEEE 802.3z incl. In 802.3-2005
1000BASE-ZX	IEEE 802.3z incl. In 802.3-2005
1000BASE-BX10	IEEE 802.3(58) incl. In 802.3-2005
1000BASE-X	CWDM (1470-1610 nm)
10GBASE-LR	IEEE 802.3ae (49)
10GBASE-ER	IEEE 802.3ae (49)
10GBASE-ZR	Single Mode 1550 nm

4.1.2 Interfaces per Application

Table 109 Interfaces per Application

Application	Connector type	Rate (Mbit/s)	# of ports
NPU 1002	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+	See Ethernet SFP on page 162.	3 (max 2 SFP+)
NPU 1003	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+	See Ethernet SFP on page 162.	3 (max 2 SFP+)
NPU 1005	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+	See Ethernet SFP on page 162.	3 (max 2 SFP+)
ETU 1001	Shielded RJ45 jack	10/100/1000	Up to 4(1)

Application	Connector type	Rate (Mbit/s)	# of ports
ETU 1002	SFP	1000	Up to 4(2)
	SFP+	10G	1(3)
PNM 1001	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+ (≤ 2.5G)	See Ethernet SFP on page 162.	4 (max 2 SFP+)
PNM 1002	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+ (≤ 2.5G)	See Ethernet SFP on page 162.	4 (max 2 SFP+)
MINI-LINK 6651/1	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+ (≤ 2.5G)	See Ethernet SFP on page 162.	4
MINI-LINK 6651/2	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+ (≤ 2.5G)	See Ethernet SFP on page 162.	3
MINI-LINK 6651/3	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+ (≤ 2.5G)	See Ethernet SFP on page 162.	4
MINI-LINK 6651/4	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+	See Ethernet SFP on page 162.	4 (max 4 SFP+)
MINI-LINK 6366	Shielded RJ45 jack	10/100/1000	2
	SFP/SFP+ (≤ 2.5G)	See Ethernet SFP on page 162.	2
MINI-LINK 6371	Shielded RJ45 jack	10/100/1000	1
	SFP/SFP+	See Ethernet SFP on page 162.	3 (max 3 SFP+)

(1) Number of usable ports depends on the slot used, and the NPU type. .
(2) The ports can be configured for up to 4×1G or 1×10G Base-X, but not at the same time.
(3) 10G only available when the ETU 1002 is installed in specific slots. .

All interfaces support Auto negotiation and set-up.

4.1.3 Ethernet SFP

The "SFP" (Small Form-factor Pluggable) enables the customer to choose between optical and electrical interfaces. The SFPs are not locked to a certain brand.

Note: Non-Ericsson SFPs will be activated by the node if it is possible, but Ericsson can then not guarantee interoperability between the node and the SFP.

Table 110 Ethernet SFP Interface Capability

Interface	Capability
Electrical, shielded RJ45 jack	10/100/1000BASE-T
Optical, LC connector	1000BASE-SX Multi mode 850 nm
Optical, LC connector	1000BASE-LX Single mode 1310 nm
Optical, LC connector	1000BASE-LX Single/Multi mode 1310 nm
Optical, LC connector	1000BASE-ZX Single mode 1550 nm
Optical, LC connector	1000BASE-BX10-U Single mode Tx 1310 Rx 1490 nm
Optical, LC connector	1000BASE-BX10-D Single mode Tx 1490 Rx 1310 nm
Optical, LC connector	1000BASE-BX40-U Single mode Tx 1310 Rx 1490 nm
Optical, LC connector	1000BASE-BX40-D Single mode Tx 1490 Rx 1310 nm
Optical, LC connector	10GBASE-LR Single mode 1310nm
Optical, LC connector	1000BASE-X CWDM Single mode 1470-1610 nm
Optical, LC connector	10GBASE-ER Single Mode 1550 nm
Optical, LC connector	10GBASE-ZR Single Mode 1550 nm
Optical, LC connector	10GBASE-X DWDM Single mode 1528-1566 nm
Optical, LC connector	10GBASE-BX20-U Single mode Tx 1270 Rx 1330 nm

Interface	Capability
Optical, LC connector	10GBASE-BX20-D Single mode Tx 1330 Rx 1270 nm
Optical, LC connector	10GBASE-BX30-U Single mode Tx 1270 Rx 1330 nm
Optical, LC connector	10GBASE-BX30-D Single mode Tx 1330 Rx 1270 nm

4.1.3.1 Ethernet DAC Cable

The DAC (Direct Attach Copper) cable enables the customer to connect two collocated nodes at 10Gbps rate. DAC is a cost-effective alternative for Ethernet SFP+ modules and cables. The DACs are not locked to a certain brand.

Note: Non-Ericsson DACs will be activated by the node if it is possible but Ericsson can then not guarantee interoperability between the nodes.

Table 111 Connector Type Capacity

Connector type	Rate
SFP+	10Gbps

4.2 PDH Interfaces

4.2.1 ETSI

E1 electrical interface is according to G.703 for 75 Ω and 120 Ω. (See ETSI on page 164.)

Output pulse mask in resistive load is according to ITU-T Rec. G.703.

4.2.2 ANSI

DS1 electrical interface is according to T1.403-1999 with line build out for 0-655 ft.

Output mask complies with T1.403-1999 Figure 2.

Line code is AMI/B8Z5.

4.3 SDH Interfaces

4.3.1 SDH SFP

The SFP (Small Form-factor Pluggable) enables the customer to choose between optical and electrical interfaces. The SFPs are not locked to a certain brand. Non-Ericsson SFPs will be activated by the node if it is possible, but Ericsson can then not guarantee interoperability between the node and the SFP.

The SDH SFP will be used as STM-1.

Table 112 SDH SFP Interface Capability

Interface	Capability
Electrical, DIN 1.0/2.3 75 Ohm, female	S-1.E
Optical, LC connector	S-1.1 1310nm
Optical, LC connector	L-1.1 1310nm
Optical, LC connector	L-1.2 1550nm
Optical, LC connector	BiDi 1310/1550nm
Optical, LC connector	BiDi 1550/1310nm
Optical, LC connector	L-1/4/16.2C CWDM 1470-1610nm

4.4 PDH Traffic Connectors

4.4.1 ETSI

For NPU 1003, PNM 1001, PNM 1002, LTU 1001 and LTU 1002, the E1 connector is a male SOFIX 24 pin connector with 4xE1 120 Ω balanced and 75 Ω unbalanced short haul (6 dB) terminations. The impedance is selectable between 75 Ω and 120 Ω.

For MINI-LINK 6651, the E1 connector on is an RJ45 connector. Only 120 Ω impedance is supported.

4.4.2 ANSI

For NPU 1003, PNM 1001, PNM 1002, LTU 1001 and LTU 1002, the DS1 connector is a male SOFIX 24-pin connector, with 4xDS1 terminations.

4.5 Local O&M

4.5.1 Site LAN Port

One of the fixed Ethernet ports on NPU 1002, NPU 1003, NPU 1005, PNM 1001, PNM 1002, MINI-LINK 6651, MINI-LINK 6366, and MINI-LINK 6371 can be configured as a site LAN port.

— The Ethernet connection is a shielded 8 pin RJ45 modular jack (DTE).

— The interface supports 10/100/1000 Mbit/s full duplex Ethernet with auto-negotiate

— The green LED on NPUs shows “Link up” connectivity.

4.5.2 USB Interface

There is a mini USB device port on NPU 1002, NPU 1003, NPU 1005, PNM 1001, PNM 1002, MINI-LINK 6651, MINI-LINK 6366, and MINI-LINK 6371.

— The interface is a 5 pin USB2 connector. (Mini-B USB connector)

— The bit rate is up to 480 Mbit

4.5.3 User I/O Interface

The User I/O interface includes a number of output and input signals.

— The output signals can be used to export alarms from the MINI-LINK 6600 to other equipment’s supervision systems.

— The input signals can be used to transfer alarm and status information from on-site equipment to central management systems.

Table 113 Plug-in Units with User I/O Interface

Board Type	# of input signals	# of output signals	Connector Type
NPU 1002	6	3	Male 24 pin SOFIX connector
NPU 1003	2	1	Male 24 pin SOFIX connector
NPU 1005	6	3	Male 24 pin SOFIX connector
PNM 1001	2	1	Male 24 pin SOFIX connector

Board Type	# of input signals	# of output signals	Connector Type
PNM 1002	2	1	Male 24 pin SOFIX connector

4.5.3.1 Input Signals

The input signals are opto-coupled and have a reference that is floating with respect to each other and station ground. All signals are positive to the reference and shall read as follows:

— logical "0" when the Voltage < 1.0 V DC

— logical "1" when the Voltage > 2.4 V DC

These signals can be connected directly to a "Normaly Open" (NO) or Normally Closed (NC) equipment like a relay or a mechanical switch, since they have week internal drivers (2.5 Volt driver with ~4 Kohm serial resistors).

An input Voltage less than 15 V DC will not damage the equipment.

4.5.3.2 Output Signals

The output signals are performed with relay settings.

The output signals consist of three pins:

— NCL (Normally Closed)

— RTN (ReTurN)

— NOP (Normally Open)

At start-up the default position is the following:

— NCL-RTN is "normally closed" (impedance < 1Ω)

— NOP-RTN is "normally open" (impedance > 1 MΩ)

The relays used to switch the settings have the contact rating:

— 100 V DC, 1 A

— 125 V AC, 1 A

The outputs are reset to default temporarily upon cold restart but are not affected by a warm restart of the board.

4.5.3.3 LED Indications

For Information about functionality and behavior please see CPI document, 35/1551-HRA 901 20/11 LED Descriptions.

4.6 Antenna Interface

Table 114 Antenna Interface

Frequency band(s)	Waveguide interface, flange types
5 GHz	154 IEC-UDR 48
6 GHz Lower and Upper	154 IEC-UDR 70
7, 8, 7/8 GHz	154 IEC-UBR 84
10, 11, 10/11, 13 GHz	154 IEC-UBR 120
15 GHz	154 IEC-UBR 140
18, 23 GHz	154 IEC-UBR 220
24, 26, 28 GHz	154 IEC-UBR 260
32, 38 GHz	154 IEC-UBR 320
42 GHz	Ericsson proprietary flange (waveguide R500)
80 GHz	Integrated installation only (waveguide R740)

4.7 Indoor-Outdoor Interconnection

RAU connector type: N

MMU connector type: TNC

ETSI

Maximum cable length for performance as specified above:

Table 115 ETSI Maximum Cable Length

	RAU2 X	MINI-LINK 6363		MINI-LINK 6364 MINI-LINK 6365		
Radio cable diameter	**CS 7-56 MHz**	**CS 7-56 MHz**	**CS 80-112 MHz**	**Single Carrier CS 7-112 MHz**	**Carrier Aggregation CS 2x 28-56 MHz**	**Carrier Aggregation CS 2x 80-112 MHz**
TZC 500 97 (7.6 mm)	100 m	100 m	85 m	100 m	100 m	85 m
TZC 500 32 (10 mm)	200 m	200 m	160 m	200 m	200 m	160 m
TZC 501 26 (16 mm)	400 m	400 m	300 m	400 m	400 m	350 m

ANSI

Maximum cable length for performance as specified above:

Table 116 ANSI Maximum Cable Length

	RAU2 X	MINI-LINK 6363		MINI-LINK 6365		
Radio cable diameter	**CS 10-56 MHz**	**CS 10-60 MHz**	**CS 80-112 MHz**	**Single Carrier CS 10-112 MHz**	**Carrier Aggregation CS 2x 28-56 MHz**	**Carrier Aggregation CS 2x 60-112 MHz**
TZC 500 95 (3/8 in)	656 ft (200 m)	656 ft (200 m)	524 ft (160 m)	656 ft (200 m)	656 ft (200 m)	524 ft (160 m)
TZC 500 80 (1/2 in)	1312 ft (400 m)	1312 ft (400 m)	984 ft (300 m)	1312 ft (400 m)	1312 ft (400 m)	1148 ft (350 m)

5 Power

5.1 Power Supply

MINI-LINK 6691 has two DC inputs located on the PFU 1101.

MINI-LINK 6692 has one DC input located on each PFU 1201.

MINI-LINK 6693 has two DC inputs located on the PFU 1301.

MINI-LINK 6694 has one DC input located on each PFU 1601.

MINI-LINK 6654 has two DC inputs located on PNM 1001/1002.

MINI-LINK 6655 has two DC inputs located on PNM 1002.

MINI-LINK 6651 has two DC inputs.

MINI-LINK 6366 has one DC input.

MINI-LINK 6371 has one DC input.

5.1.1 DC Supply Interface

— The power is floating, i.e. not connected to station ground.

— The PFU provides surge protection.

5.1.2 DC Supply Voltage

Service Voltage Ranges

Table 117 Service Voltage Ranges

Nominal Voltage	**-48 VDC**			
Product	**6691, 6692, 6693 and 6694**	**6654 and 6655**	**6651**	**6366 and 6371**
Normal service voltage range	-58.8 V to -40 V	58.8 V to -40 V	-58.8 V to -40 V	-58.8 V to -38 V
Abnormal service voltage range	-60 V to -58.8 V	-60 V to -58.8 V	-60 V to -58.8 V	-60 V to -58.8 V
	-40 V to 0 V	-40 V to 0 V	-40 V to 0 V	-38 V to 0 V
Typical startup voltage	-39 V to -43 V	-41 V to -43 V	-44 V to -46 V	-44 V to -46 V
Typical shutdown voltage	–33.5 V to -37.5 V	–33.5 V to -37.5 V	–37.5 V to -39.5 V	–35.5 V to -37.5 V

Normal Service Voltage Range

The system is able to run at full operation in this range.

Abnormal Service Voltage Range

No function is guaranteed, but it will not result in any permanent damage, when operated in this range.

The system will restore to full operation when returning to normal service voltage range.

5.1.2.1 Clarification of Input Voltage Behavior for MINI-LINK 6691, 6692, 6693 and 6694

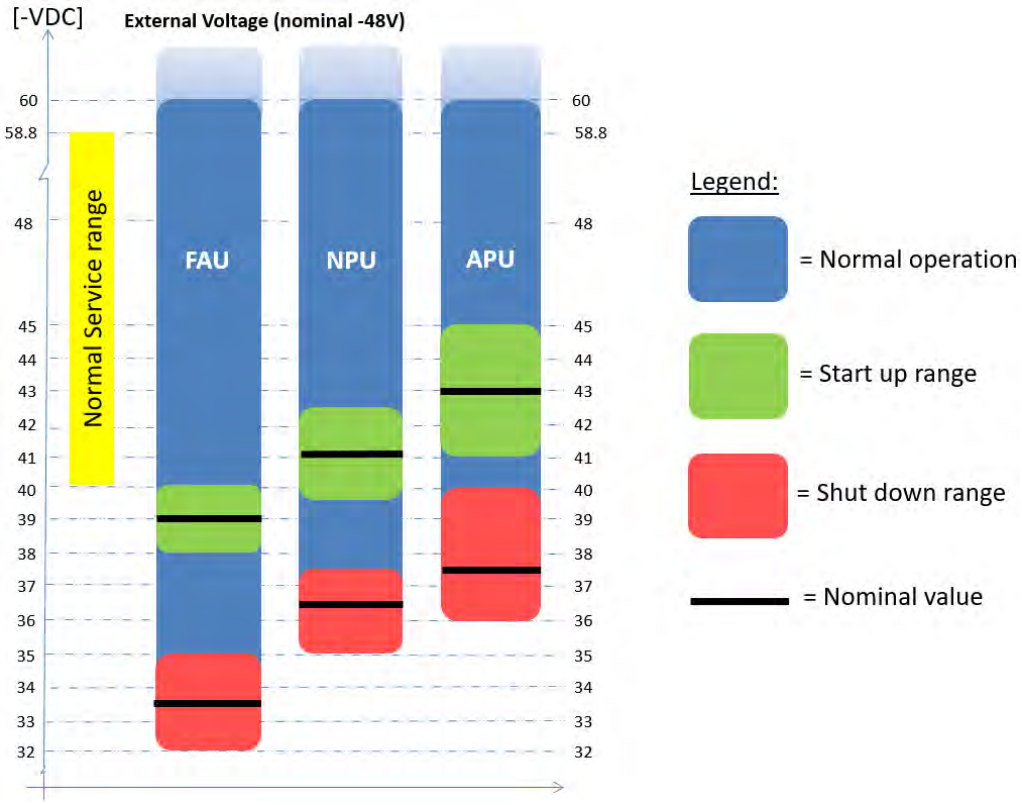

Figure 4 Input Voltage Behavior for MINI-LINK 6691, 6692, 6693 and 6694

Figure 4 shows the Input voltage behavior for MINI-LINK 6691, 6692, 6693 and 6694. The different units within MINI-LINK 6691, 6692, 6693 and 6694 will be turned on and off at different voltages.

There is a hysteresis for all units to prevent power flapping (turning on/off repeatedly around a threshold).

5.1.2.2 Clarification of Input Voltage Behavior for MINI-LINK 6654 and 6655

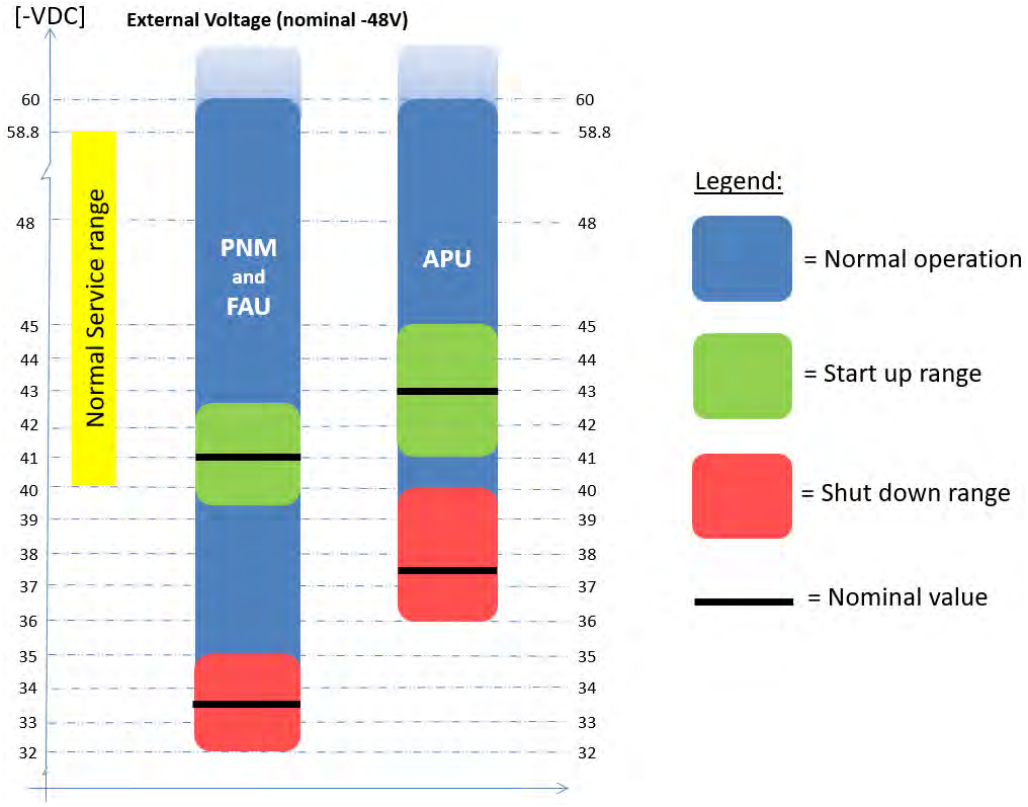

Figure 5 Input Voltage Behavior for MINI-LINK 6654 and MINI-LINK 6655

Figure 5 shows the Input voltage behavior for MINI-LINK 6654 and 6655. PNM and APU's will be turned on and off at different voltages.

There is a hysteresis for all units to prevent power flapping (turning on/off repeatedly around a threshold).

5.1.3 Power Supply Protection

PFU 1101, PFU 1301, PNM 1001, PNM 1002, and MINI-LINK 6651 have an external redundant power supply.

The same is applicable for PFU 1201 and PFU 1601 but these PFUs also support a redundant PFU solution.

If the input voltages to the PFU are lost, an alarm is sent.

MINI-LINK 6366 and MINI-LINK 6371 does not support redundant power supply.

5.1.4 Soft Start (all Plug-in Units)

The soft start function limits inrush current at start up or in case of a short circuit accordingly to EN 300 132-2.

5.1.5 Power Connector

Table 118 Power Connector

PFU 1101	Male 2-pin bus bar
PFU 1201	Male 3-pin bus bar
PFU 1301	Male 2-pin bus bar
PFU 1601	Male 2-pin bus bar
PNM 1001	Male 2-pin bus bar
PNM 1002	Male 2-pin bus bar
MINI-LINK 6651	Male 2-pin bus bar
MINI-LINK 6366/1	2-pole power terminal with connection for shield
MINI-LINK 6366/4	Male 2-pin with shield, Octis type
MINI-LINK 6371	Male 2-pin with shield, Octis type

5.2 Power Line Disturbance

MINI-LINK 6691, 6692, 6693, 6694, PNM 1001, and PNM 1002 support Power Line Disturbance according to ATIS-0600315.2007 §5.5 (10 ms Fuse Blowing Transient) without restart.

APU, Application Plug-in Units are dimensioned to handle up to 0.1 ms transients.

5.3 Power Consumption

Power consumptions to be used for dimensioning of site power supply are 33% higher than the typical values. For OPEX calculation regarding power consumption the typical values give the best estimate.

5.3.1 Maximum Power Level for Fuse and Power Dimensioning

The supply voltage is specified in DC Supply Voltage on page 169.

The figures below are to be used for fuse and power dimensioning only.

For MINI-LINK 6200 installations other fuse values might be applicable. See 1/1301-HRA 901 20/14 MINI-LINK 6200 Product Specification.

Fuse Type Requirements

DC voltage of minimum 80 V, a breaking capacity of 5000 A or more, and one of the following types:

— Thermo-electromagnetic over-current release certified according to IEC 60947-2, according to curve C (IEC 60898).

— Hydraulic-magnetic over-current release according to Eaton/Heinemann curve 3 or equivalent.

Circuit Breaker and Cable Dimensioning

Table 119 Circuit Breaker (CB) and Cable Dimensioning

	CB and Cable Dimensioning	
Product	**Max CB value**	**Cable**
MINI-LINK 6691	10 A	RPM 517 560 or NTM 20372 up to 20m
MINI-LINK 6692	40 A	RPM 777 551 up to 10m
MINI-LINK 6693	16 A	RPM 517 560 or NTM 20372 up to 10m
MINI-LINK 6694	20 A	RPM 517 560 or NTM 20372 up to 10m
MINI-LINK 6654	16 A	RPM 517 560 or NTM 20372 up to 10m
MINI-LINK 6655	20 A	RPM 517 560 or NTM 20372 up to 10m
MINI-LINK 6651	10 A	RPM 517 560 or NTM 20372 up to 20m
MINI-LINK 6366	See Fuse and Power Dimensioning for Outdoor Products on page 173.	
MINI-LINK 6371	See Fuse and Power Dimensioning for Outdoor Products on page 173.	

5.3.1.1 Fuse and Power Dimensioning for Outdoor Products

Cable to be used:

— TFL 252 504/2 (2x4 mm^2)

— NTM 203 72 (2x2.5 mm^2)

Table 120 Recommended Hydraulic Magnetic Circuit Breaker Values

The following circuit breaker values are applicable to TFL 252 504/2 (2x4 mm^2).

Power Rating of Product	Length							
	10 m	20 m	50 m	70 m	100 m	120 m	150 m	180 m
50 W	4 A	4 A	4 A	4 A	4 A	4 A	4 A	X
75 W	4 A	4 A	4 A	4 A	4 A	4 A	4 A (1)	X
100 W	4 A	4 A	4 A	4 A	4 A(1)	4 A(1)	4 A(1)	X
125 W	6 A	6 A	6 A	6 A	6 A(1)	X	X	X
150 W	6 A	6 A	6 A	6 A(1)	6 A(1)	X	X	X
200 W	10 A	10 A	10 A(1)	X	X	X	X	X

(1) Acceptable from safety point of view but will lead to a higher voltage drop.

Table 121 Recommended Hydraulic Magnetic Circuit Breaker Values

The following circuit breaker values are applicable to NTM 203 72 (2x2.5 mm^2).

Power Rating of Product	Length					
	10 m	20 m	50 m	70 m	100 m	120 m
50 W	4 A	4 A	4 A	4 A(1)	4 A(1)	X
75 W	4A	4 A	4 A	4 A(1)	4 A(1)	X
100 W	4 A	4 A	4 A	4 A(1)	4 A(1)	X
125 W	6 A	6 A	6 A(1)	X	X	X
150 W	6 A	6 A	6 A(1)	X	X	X
200 W	10 A	10 A	X	X	X	X

(1) Acceptable from safety point of view but will lead to a higher voltage drop.

Table 122 Recommended Thermoelectric Magnetic Circuit Breaker

The following circuit breaker values are applicable to NTM 203 72 (2x2.5 mm^2).

Power rating of product	Length					
	10 m	20 m	50 m	70 m	100 m	120 m
50 W	4 A	4 A	4 A	4 A(1)	4 A(1)	X
75 W	4 A	4 A	4 A	4 A(1)	4 A(1)	X
100 W	6 A	6 A	6 A	X	X	X
125 W	6 A	6 A	6A(1)	X	X	X
150 W	10 A	10 A	X	X	X	X
200 W	10 A	10 A	X	X	X	X

(1) Acceptable from safety point of view but will lead to a higher voltage drop.

5.3.2 Power Consumption and Heat Dissipation

Preconditions: 25 °C ambient temperature, -48V DC supply

Table 123 Typical Power Consumption and Heat Dissipation

Unit	Typical Power Consumption and Heat Dissipation
NPU 1002(1) (2)	30 W
NPU 1003(1) (2)	23 W
NPU 1005(1) (2)	41 W
PNM 1001(1) (2) (3)	44 W
PNM 1002(2) (3)	48 W
PFU 1101(3) (4)	2 W (4 W)
PFU 1201(3) (5)	2 W (8 W)
PFU 1301(3) (6)	2 W (5 W)
PFU 1601(3) (6)	2 W (5 W)
FAU 1101(7)	6 W (20 W)
FAU 1201(7)	8 W (15 W)
FAU 1301(7)	2.5 W (10.5 W)
FAU 1401(7)	1.7 W (12 W)
FAU 1501(7)	2.5 W (10.5 W)

Unit	Typical Power Consumption and Heat Dissipation
FAU 1601(7)	2.5 W (10.5 W)
LTU 1001	5 W
LTU 1002(1)	20 W
ETU 1001	7 W
ETU 1002(1)	18 W
MINI-LINK 6651/1(1) (2) (7)	40 W (57 W)
MINI-LINK 6651/2(1) (2) (7)	40 W (57 W)
MINI-LINK 6651/3(1) (2)	27 W
MINI-LINK 6651/4(1) (2) (7)	63 W (80 W)
MINI-LINK 6366(1) (2)	37 W
MINI-LINK 6371(1) (2)	63 W

(1) Each SFP adds 1 W and each SFP+ adds 1.5 W to the consumption value.

(2) Additional power consumption per connected radio unit. See Typical MMU Power Consumption and Indoor Heat Dissipation on page 176. The specified value is applicable when no radio units are connected.

(3) FAU DC loss included.

(4) Enclosure equipped with 1 MMU 1002 or MMU 1004 and 2 radio units consuming 42 W each. Number within brackets represents PFU power consumption for enclosure equipped with 2 MMU 1002 or MMU 1004 and 4 radio units consuming 42 W each. Value within brackets includes fan-unit (FAU) running at full speed.

(5) Enclosure equipped with 2 MMU 1002 or MMU 1004 and 4 radio units consuming 42W each. Number within brackets represents PFU power consumption for enclosure equipped with 8 MMU 1002 or MMU 1004 and 16 radio units consuming 42 W each. Value within brackets includes fan-unit (FAU) running at full speed.

(6) Enclosure equipped with 2 MMU 1002 or MMU 1004 and 4 radio units consuming 42W each. Number within brackets represents PFU power consumption for enclosure equipped with 4 MMU 1002 or MMU 1004 and 8 radio units consuming 42 W each. Value within brackets includes fan-unit (FAU) running at full speed.

(7) Nominal value at room temperature. Value within brackets is when the fan-unit (FAU) is running at full speed (high temperature).

5.3.3 Radio Terminal Power Consumption

5.3.3.1 Typical MMU Power Consumption and Indoor Heat Dissipation

Preconditions: 25 °C ambient temperature, -48V DC supply

Table 124 Typical MMU Power Consumption and Indoor Heat Dissipation

Unit	Typical Power Consumption and Heat Dissipation
MMU 1001(1)	21 W
MMU 1002(1)	25 W
MMU 1004(1)	25 W
Additional power consumption in MMU 1001, MMU 1002, MMU 1004, PNM 1001, PNM 1002, MINI-LINK 6651, MINI-LINK 6366 or MINI-LINK 6371 per connected radio unit	10% of the radio unit's power consumption

(1) Applicable when no radio units are connected.

5.3.3.2 RAU2 X Power Consumption and Outdoor Heat Dissipation

Typical power consumption and heat dissipation (W) at different RAU output power levels.

Table 125 Typical Power Consumption and Outdoor Heat Dissipation of RAU2 X

RAU Type	Nominal cons.	Eco Mode		
		P_{max} (1)	$P_{max-10dB}$	P_{min}
RAU2 X 5 HP	42	37	23	15
RAU2 X 6L	30	27	24	17
RAU2 X 6L HP	42	37	28	15
RAU2 X 6U	28	25	22	15
RAU2 X 6U HP	42	37	28	15
RAU2 X 7	29	26	23	16
RAU2 X 7 HP	42	37	28	15
RAU2 X 8	30	27	24	16
RAU2 X 8 HP	42	42	26	16
RAU2 X 10	32	32	24	17
RAU2 X 10 HP	38	38	28	18
RAU2 X 11	27	27	20	16
RAU2 X 11 HP	39	39	28	17

RAU Type	Nominal cons.	Eco Mode		
		P_{max} (1)	$P_{max-10dB}$	P_{min}
RAU2 X 13	23	20	19	15
RAU2 X 13 HP	26	22	20	15
RAU2 X 15	24	19	19	15
RAU2 X 15 HP	26	21	20	15
RAU2 X 18	22	20	19	16
RAU2 X 18 HP	27	24	24	16
RAU2 X 23	22	20	19	16
RAU2 X 23 HP	28	25	24	16
RAU2 X 24	25	22	18	16
RAU2 X 26	25	22	18	16
RAU2 X 28	26	23	19	17
RAU2 X 32	24	22	22	15
RAU2 X 38	27	24	24	20
RAU2 X 42	25	23	21	19

(1) Requires RAU2 X HW ≥ R6A.

5.3.3.3 MINI-LINK 6363 Power Consumption and Outdoor Heat Dissipation

Typical power consumption and heat dissipation (W) at P_{max} (Including HP License), $P_{max-10dB}$ and P_{min}.

Table 126 Typical Power Consumption and Outdoor Heat Dissipation of MINI-LINK 6363

Radio Type	P_{max}	$P_{max-10dB}$	P_{min}
MINI-LINK 6363 6L	33	27	17
MINI-LINK 6363 6U	33	27	17
MINI-LINK 6363 7	32	26	16
MINI-LINK 6363 8	32	26	16
MINI-LINK 6363 10	31	22	19
MINI-LINK 6363 11	31	24	19

Radio Type	P_{max}	$P_{max-10dB}$	P_{min}
MINI-LINK 6363 13	23	18	15
MINI-LINK 6363 15	25	20	16
MINI-LINK 6363 18	23	21	19
MINI-LINK 6363 23	23	21	19
MINI-LINK 6363 24	24	21	19
MINI-LINK 6363 26	24	21	19
MINI-LINK 6363 28	23	20	19
MINI-LINK 6363 32	23	20	19
MINI-LINK 6363 38	23	22	20
MINI-LINK 6363 42	23	22	20
MINI-LINK 6363 80	24	23	19

Typical power consumption and heat dissipation (W) at P_{max}, $P_{max-10dB}$ and P_{min}.

Table 127 Typical Power Consumption and Outdoor Heat Dissipation of MINI-LINK 6363/2

Radio Type	P_{max}	$P_{max-10dB}$	P_{min}
MINI-LINK 6363/2 13	16	15	14
MINI-LINK 6363/2 15	16	15	14
MINI-LINK 6363/2 18	14	13	12
MINI-LINK 6363/2 23	14	13	12
MINI-LINK 6363/2 38	20	20	19

5.3.3.4 MINI-LINK 6364 Power Consumption and Outdoor Heat Dissipation

Typical power consumption and heat dissipation (W) at P_{max} (Including HP License), $P_{max-10dB}$ and P_{min}.

Table 128 Typical Power Consumption and Outdoor Heat Dissipation of MINI-LINK 6364

Radio Type	P_{max}	$P_{max-10dB}$	P_{min}
MINI-LINK 6364 13	26	22	18
MINI-LINK 6364 15	26	22	18

Radio Type	P_{max}	$P_{max-10dB}$	P_{min}
MINI-LINK 6364 18	25	22	20
MINI-LINK 6364 13 CA mode	26	22	21
MINI-LINK 6364 15 CA mode	26	22	21
MINI-LINK 6364 18 CA mode	27	23	22

5.3.3.5 MINI-LINK 6365 Power Consumption and Outdoor Heat Dissipation

Typical power consumption and heat dissipation (W) at P_{max} (Including HP License), $P_{max-10dB}$ and P_{min}.

Table 129 Typical Power Consumption and Outdoor Heat Dissipation of MINI-LINK 6365

Radio Type	P_{max}	$P_{max-10dB}$	P_{min}
MINI-LINK 6365 6	35	29	19
MINI-LINK 6365 7/8	35	29	19
MINI-LINK 6365 10/11	35	29	19
MINI-LINK 6365 13	26	22	18
MINI-LINK 6365 15	26	22	18
MINI-LINK 6365 18	25	22	20
MINI-LINK 6365 23	25	22	20
MINI-LINK 6365 32	23	20	19
MINI-LINK 6365 6 CA mode	37	31	22
MINI-LINK 6365 7/8 CA mode	35	29	24
MINI-LINK 6365 10/11 CA mode	36	30	21
MINI-LINK 6365 13 CA mode	26	22	21
MINI-LINK 6365 15 CA mode	26	22	21
MINI-LINK 6365 18 CA mode	27	23	22
MINI-LINK 6365 23 CA mode	26	23	22
MINI-LINK 6365 32 CA mode	24	21	21

6 Environment

6.1 Environmental Conditions

Continuous Conditions (Normal Operation)
Environmental conditions in which all units are able to function as specified.

Exceptional Conditions (Safe Function)
Environmental stress outside the limits for normal operation in which all units continue to function, but performance or capacity may be reduced, e.g. slightly increased bit error rates.

6.1.1 Indoor Equipment

Ambient Temperature Range:

Continuous Conditions (Normal Operation)
-5 to +60° C (+23 to +131° F)

Exceptional Conditions (Safe Function – except for MINI-LINK 6651/3)
-25 to +65° C (-13 to +140° F)

Exceptional Conditions (Safe Function – for MINI-LINK 6651/3)
-25 to +60° C (-13 to +131° F)

Relative Humidity Range:

Relative Humidity Range
5-95%

6.1.2 Outdoor Equipment

Ambient Temperature Range:

Continuous Conditions (Normal Operation)
-33 to +55° C (-27 to +131° F)

Note: Outdoor temperature is measured in an open unshielded area preferably close to the radio. Sensor has to be protected from the sun. Minimum distance to other objects is 50 cm.

Exceptional Conditions (Safe Function)
-45 to +60° C (-49 to +140° F)

Note: Outdoor temperature is measured in an open unshielded area preferably close to the radio. Sensor has to be protected from the sun. Minimum distance to other objects is 50 cm.

Relative Humidity Range:

Relative Humidity Range
8-100 %

7 Mechanical Data

7.1 Outdoor Units

7.1.1 Weight (antennas not included)

Table 130 RAU2 X

Frequency	Typical		Max(1)	
	(kg)	(lb)	(kg)	(lb)
5–8 GHz	4.8	10.6	5.5	12.1
10–23 GHz	4.0	8.8	4.5	9.9
24–42 GHz	3.7	8.2	4.0	8.8

(1) Maximum weight varies due to different sub-bands' diplexers.

Table 131 MINI-LINK 6363, MINI-LINK 6363/2, MINI-LINK 6364, and MINI-LINK 6365

Frequency	Typical		Max(1)	
	(kg)	(lb)	(kg)	(lb)
6 – 15 GHz	2.7	6.0	3.2	7.1
18 – 80 GHz	2.3	5.1	2.7	6.0

(1) Maximum weight varies due to different sub-bands' diplexers.

Table 132 MINI-LINK 6366/1 and MINI-LINK 6366/4

	(kg)	(lb)
Without mounting bracket	4.0	8.8
With mounting bracket for integrated mount	5.2	11.5
With two brackets for split-mount	4.2	9.3

Table 133 MINI-LINK 6371

	(kg)	(lb)
Without mounting bracket	5.6	12.2
With mounting bracket for integrated mount	6.7	14.8
With two brackets for split-mount	5.8	12.7
With mounting bracket for rail-mount	6.4	14.1

7.1.2 Nominal Dimensions

Table 134 Outdoor Unit Dimensions

Product	DxWxH	
	(mm)	(inch)
RAU2 X	97 x 260 x 321	3 3/4 x 10 1/4 x 12 1/2
MINI-LINK 6363, MINI-LINK 6363/2, MINI-LINK 6364, and MINI-LINK 6365	79 x 197 x 179	3 7/64 x 7 3/4 x 7 3/64
MINI-LINK 6366/1 without mounting bracket	43 x 462 x 303	1 11/16 x 20 17/64 x 11 59/64
MINI-LINK 6366/1 with mounting bracket for integrated mount	158 x 462 x 303	6 7/32 x 20 17/64 x 11 59/64
MINI-LINK 6366/4 without mounting bracket	70 x 310 x 291	2 3/4 x 12 1/5 x 11 5/11
MINI-LINK 6366/4 with mounting bracket for integrated mount	188 x 335 x 291	7 2/5 x 13 1/5 x 11 5/11
MINI-LINK 6371 without mounting bracket	86 x 310 x 294	3 25/64 x 12 1/5 x 11 37/64
MINI-LINK 6371 with mounting bracket for integrated mount	204 x 335 x 294	8 1/32 x 13 1/5 x 11 37/64

7.2 Indoor Units

7.2.1 Weight

Table 135 Weight of units

	(kg)	(lb)
Enclosure 1101	2.9	6.4
Enclosure 1201	6.2	13.7
Enclosure 1301	3.6	7.9
Enclosure 1401	2.9	6.4
Enclosure 1501	3.5	7.7

	(kg)	(lb)
Enclosure 1601	4.8	10.6
PFU 1101	0.2	0.4
PFU 1201	0.2	0.4
PFU 1301	0.2	0.4
PFU 1401	0.2	0.4
FAU 1101	0.3	0.7
FAU 1201	0.6	1.3
FAU 1301	0.3	0.7
FAU 1401	0.2	0.4
FAU 1501	0.3	0.7
FAU 1601	0.4	0.9
FAU 1101	0.3	0.7
FAU 1201	0.6	1.3
FAU 1301	0.3	0.7
FAU 1401	0.2	0.4
FAU 1501	0.3	0.7
FAU 1601	0.4	0.9
NPU 1002	0.9	2.0
NPU 1003	0.7	1.5
NPU 1005	0.9	2.0
PNM 1001	1.0	2.2
PNM 1001	1.2	2.6
LTU 1001	0.4	0.9
LTU 1002	0.4	0.9
ETU 1001	0.4	0.9
ETU 1002	0.4	0.9
MMU 1001	0.6	1.4
MMU 1002	0.7	1.5
MMU 1004	0.7	1.5
APU Dummy unit	0.3	0.6
NPU Dummy unit	0.5	1.1
PFU Dummy unit	0.05	0.11
MINI-LINK 6651/1, /2 and /4 (incl. fan)	4.2	9.3

	(kg)	(lb)
MINI-LINK 6651/3	3.0	6.6

7.2.1.1 Full Configurations

Table 136 Weight of full configurations

	(kg)	(lb)
MINI-LINK 6691 (Incl. NPU 1002, PFU 1101, FAU 1101, 2 x MMU 1002)	5.6	12.3
MINI-LINK 6692 (Incl. NPU 1002, PFU 1201, FAU 1201, 8 x MMU 1002)	13.5	29.8
MINI-LINK 6693 (Incl. NPU 1003, PFU 1301, FAU 1301, 4 x MMU 1002)	7.3	16.1
MINI-LINK 6694 (Incl. NPU 1002, PFU 1601, FAU 1601, 4 x MMU 1002)	9.5	20.9
MINI-LINK 6654 (Incl. PNM 1001, FAU 1401, 2 x MMU 1002)	5.5	12.1
MINI-LINK 6655 (Incl. PNM 1002, FAU 1501, 4 x MMU 1002)	7.7	17.0

7.2.2 Nominal Dimensions

The sub-racks fit into standard IEC 297-3 19” cabinets or into cabinets following metric standard IEC 917-2-2.

Table 137 MINI-LINK 6691 and MINI-LINK 6654

	(mm)	(inch)
Depth (total; with connectors):	259	10 13/64
Depth (behind mounting brackets):	240	9 29/64
Width (total):	483	19 1/64
Width (without mounting brackets):	446	17 9/16
Height:	44	1 3/4

Table 138 MINI-LINK 6692

	(mm)	(inch)
Depth (total; with connectors):	259	10 13/64
Depth (behind mounting brackets):	240	9 29/64
Width (total):	483	19 1/64
Width (without mounting brackets):	446	17 9/16
Height:	132.7	5 7/32

Table 139 MINI-LINK 6693 and MINI-LINK 6655

	(mm)	(inch)
Depth (total; with connectors):	259	10 13/64
Depth (behind mounting brackets):	240	9 29/64
Width (total):	483	19 1/64
Width (without mounting brackets):	446	17 9/16
Height:	66	2 19/32

Table 140 MINI-LINK 6694

	(mm)	(inch)
Depth (total; with connectors):	259	10 13/64
Depth (behind mounting brackets):	240	9 29/64
Width (total):	483	19 1/64
Width (without mounting brackets):	446	17 9/16
Height:	89	3 1/2

Table 141 MINI-LINK 6651/1, /2 and /4

	(mm)	(inch)
Depth (total; with connectors):	261	10 9/32
Depth (behind mounting brackets):	240	9 29/64
Width (total):	483	19 1/64
Width (without mounting brackets):	444	17 31/64
Height:	44	1 3/4

Table 142 MINI-LINK 6651/3

	(mm)	(inch)
Depth (total; with connectors):	194	7 41/64
Depth (behind mounting brackets):	171	6 47/64
Width (total):	483	19 1/64
Width (without mounting brackets):	444	17 31/64
Height:	44	1 3/4

8 Standards

Compliance with relevant parts of the listed standards.

8.1 Radio Equipment Directive (RED)

Essential requirements of Directive 2014/53/EU (Radio Equipment Directive, RED)

8.2 ATEX Directive

Applicable for MINI-LINK 6363, MINI-LINK 6364, and MINI-LINK 6365.

Essential requirements of Directive 2014/34/EU (Equipment for potentially explosive atmospheres)

8.3 RoHS Directive

Directive 2011/65/EU CE	Of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

8.4 Council Recommendation

Council Recommendation 1999/519/EC (10 W/m2 – Public)	Of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

8.5 RoHS

EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

8.6 Normative References

Code of Federal Regulations Title 21 Volume 8	Food and Drugs Chapter 1 – Food and Drugs Administration Department of Health and Human Services Subchapter J – Radiological Health
Code of Federal Regulations Title 47 Volume 1 & 5	Telecommunication Chapter I – Federal Communications Commission Chapter I
Interference-Causing Equipment Standards (ICES)	Spectrum Management and Telecommunication Official Publications, Standards, Interference-Causing Equipment Standards (ICES)
Radio Standards Specification (RSS)	Spectrum Management and Telecommunication Official Publications, Standards, Radio Equipment Standards, Radio Standards Specifications (RSS)
Spectrum Utilization Policy (SP)	Spectrum Management and Telecommunication Official Publications, Policies, Spectrum Utilization Policies (SP)
Standard Radio System Plan (SRSP)	Spectrum Management and Telecommunication Official Publications, Standards, Standard Radio System Plan (SRSP)
Telecommunications Regulation Circulars (TRC)	Spectrum Management and Telecommunication Official Publications, Information, Telecommunications Regulation Circulars (TRC)

8.7 Mechanics

IEC 60297-3-100	Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482.6 mm (19 in) series Part 3-100: Basic dimensions of front panels, sub racks, chassis, racks and cabinets
IEC 60297-3-101	Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482.6 mm (19 in) series Part 3-101: Sub-racks and associated plug-in units
IEC 60297-3-105	Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482.6 mm (19 in) series Part 3-105: Dimensions and design aspects for 1U high chassis
ETSI EN 300 119-3	Environmental Engineering: European telecommunication standard for equipment practice; Part 3: Engineering requirements for miscellaneous racks and cabinets

ETSI EN 300 119-4	Environmental Engineering: European telecommunication standard for equipment practice; Part 4: Engineering requirements for sub racks in miscellaneous racks and cabinets
IEC 60917-2-2	Modular order for the development of mechanical structures for electronic equipment practices – Part 2: Sectional specification – Interface co-ordination dimensions for the 25 mm equipment practice – Section 2: Detail specification – Dimensions for sub racks, chassis, back planes, front panels and plug-in units

8.8 Power

EN 300 132-2	Environment Engineering (EE); Power supply interface at the input to telecommunications equipment and atacom (ICT); Part 2: Operated by -48 V direct current (dc)
ATIS-0600315	Voltage Levels for DC-powered Equipment Used in the Telecommunications Environment

8.9 EMC

ETSI EN 301 489-4 (CE DC – Table 6)	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electro-Magnetic Compatibility (EMC) standard for radio equipment and services; Part 4: Specific conditions for fixed radio links and ancillary equipment
ETSI EN 301 489-1 (Emission – Class B Immunity – Level 2)	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electro-Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
FCC 47 CFR part 15	Code of Federal Regulations Title 47: Telecommunication Part 15 – Radio frequency devices
ICES-003	Information Technology Equipment (ITE) – Limits and methods of measurement
GR-1089-CORE	Telcordia Technologies Generic Requirements Electromagnetic Compatibility (EMC) and Electrical Safety – Generic Criteria for Network Telecommunications Equipment

8.10 Safety/Health

IEC/EN 60215	Safety requirements for radio transmitting equipment

(100 W/m2)	
IEC/EN 60 950-1 (Class III Equipment)	Information technology equipment – Safety, Part1: General requirements
IEC/EN 60 950-22	Information technology equipment – Safety – Part 22: Equipment installed outdoors
IEC/EN 60 825-1 (Class 1 Laser)	Safety of laser products – Part 1: Equipment classification, requirements and user's guide
IEC/EN 60529 — IP 66 – Outdoor MINI-LINK 6363 — IP 55 – Outdoor RAU2 with Ingress Protection Cover — IP 20 – Indoor	Degrees of protection provided by enclosures (IP Code)
IEC/EN 62311 (10 W/m2 – Public)	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz-300 GHz)
EN 50385 (10 W/m2 – Public)	Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110 MHz – 40 GHz) – General public
ETSI TR 102 457 — 10 W/m2 – Public — 50 W/m2 – Workers	Transmission and Multiplexing I; Study on the electromagnetic radiated field in fixed radio systems for environmental issues
ICNIRP Health Physics (Table 7) — 10 W/m2 – Public — 50 W/m2 – Workers	Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (Up to 300 GHz)
ANSI/UL 60950-1 (Listed/Recognized)	Information Technology Equipment – Safety – Part 1: General Requirements
CSA-C22.2 No. 60950-1 (Listed/Recognized)	Information Technology Equipment – Safety – Part 1: General Requirements (Bi-National standard, with UL 60950-1)

ANSI/UL 60950-22 (RAU2)	Information Technology Equipment – Safety – Part 22: Equipment to be Installed Outdoors
CSA-C22.2 No. 60950-22 (RAU2)	Information Technology Equipment – Safety – Part 22: Equipment to be Installed Outdoors (Bi-National standard, with UL 60950-22)
UL 50E (Type 3R Enclosure)	Enclosures for Electrical Equipment, Environmental Considerations
CSA-C22.2 No.94 (Type 3R Enclosure)	Enclosures for Electrical Equipment, Environmental Considerations (Tri-National Standard, with NMX-J-235/2-ANCE-2007 and UL 50E)
FCC 21 CFR part 1040, § Sec. 1040.10 (Class 1 Laser)	Code of Federal Regulations Title 21 Volume 8 – Food and Drugs Chapter 1 – Food and Drugs Administration Department of Health and Human Services Subchapter J – Radiological Health – Performance Standards for Light-Emitting Products – Laser Products
REDR C1370	Radiation Emitting Devices Regulations
FCC OET Bulletin 65 — 10 W/m2 – Public — 100 W/m2 – Workers	Evaluating Compliance with FCC Guidelines Human Exposure to Radiofrequency Electromagnetic Fields
IEEE Std C95.1 — 10 W/m2 – Public — 100 W/m2 – Workers	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
Safety Code 6 — 10 W/m2 – Public — 50 W/m2 – Workers	Limits of Human Exposure to radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz

8.11 Environmental and Climatic

ETSI EN 300 132-2	Environment Engineering (EE); Power supply interface at the input to telecommunications equipment and atacom (ICT); Part 2: Operated by -48 V direct current (dc)
ETSI EN 300 019-1-1 (Class 1.2)	Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-1: Classification of environmental conditions; Storage
ETSI EN 300 019-1-2 (Class 2.3)	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-2: Classification of environmental conditions; Transportation
ETSI EN 300 019-1-3 (Class 3.1E – Normal Operation, Class 3.3 – Safe Function)	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-3: Classification of environmental conditions; Stationary use at weather protected locations
ETSI EN 300 019-1-4 (Class 4.1 & 4.2H – Normal Operation, Class 4.1E & 4.2H – Safe Function)	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-4: Classification of environmental conditions; Stationary use at non-weather protected locations
ETSI EN 300 019-2-1	Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-1: Specification of environmental tests; Storage
ETSI EN 300 019-2-2	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-2: Specification of environmental tests; Transportation

ETSI EN 300 019-2-3	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-3: Specification of environmental tests; Stationary use at weather protected locations
ETSI EN 300 019-2-4	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-4: Specification of environmental tests; Stationary use at non-weather protected locations
GR-63-CORE	Telcordia Technologies Generic Requirements NEBSTM Requirements: Physical Protection
FCC 47 CFR part 2	Code of Federal Regulations Title 47: Telecommunication Part 2 – Frequency allocations and radio treaty matters; general rules and regulations.
CENELEC EN 60079-0:2012 (MINI-LINK 6363, MINI-LINK 6364, and MINI-LINK 6365)	Explosive atmospheres – Part 0: Equipment – General requirements
CENELEC EN 60079-7:2015 (MINI-LINK 6364 and MINI-LINK 6365)	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
CENELEC EN 60079-15:2012 (MINI-LINK 6363)	Explosive atmospheres – Part 15: Equipment protection by type of protection “n”

8.12 PDH

ITU-T O.151 10/92	Error performance measuring equipment operating at the primary rate and above
ITU-T G.703 10/98	Physical/electrical characteristics of hierarchical digital interfaces
ITU-T G.823 03/00	The control of jitter and wander within digital networks which are based on

	the 2048 Kbit/s hierarchy; Jitter and wander
ITU-T G.826 12/02	Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate. (Definition of parameters)
ITU-T G.921	Digital sections based on the 2048 kbit/s hierarchy
ITU-T G.775 10/98	Loss of Signal (LOS), Alarm Indication Signal (AIS) and Remote Defect Indication (RDI) defect detection and clearance criteria for PDH signals
G.742-88	Second order digital multiplex operating at 8.448 Mbit/s.
G.751-88	Third order digital multiplex operating at 34.368 Mbit/s.
ANSI T1.403-1999	Network to customer installation interface-DS1 electrical interface.
ANSI T1.102-1993	Digital Hierarchy, electrical interfaces
ANSI T1.231-1997	Digital Hierarchy-Layer 1 in-Service Digital Transmission Performance Monitoring.
ANSI T1.404-1994	DS3 and Metallic Interface Specification
Bellcore GR-499 –CORE	Transport Systems Generic Requirements (TSGR).

8.13 SDH

ITU-T G.703 10/98	Physical/electrical characteristics of hierarchical digital interfaces
ITU-T G.707 12/03	Network Element interface for the synchronous digital hierarchy (SDH)
ITU-T G.783 02/04	Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks
ITU-T G.826 12/02	Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate.

ITU-T G.828 02/00	Error performance parameters and objectives for international, constant bit rate synchronous digital paths
ITU-T G.841 10/98	Types and characteristics of SDH network protection architecture
ITU-T G.957 07/99	Optical interfaces for equipments and systems relating to the synchronous digital hierarchy
ITU-T M.2120 02/00	PDH path, section and transmission system and SDH path and multiplex section fault detection and localization procedures
ITU-T G.664	Optical safety procedures and requirements for optical transport systems
SFF-8472	Diagnostic Monitoring Interface for Optical Xcvrs
ETSI 301 167	Transmission and Multiplex II; Management of Synchronous Digital Hierarchy (SDH) transmission equipment; Fault management and performance monitoring; Functional description

8.14 Ethernet

IEEE 802.3/802.3u/ 802.3ab (Ethernet Interface)	CSMA/CD Access Method and Physical Layer Specifications
IEEE 802.3ac	Frame Extensions for Virtual Bridged Local Area Network (VLAN) Tagging on IEEE 802.3 Networks
IEEE 802.1ad	IEEE Standard for Local and metropolitan area networks Virtual Bridged Local Area Networks Amendment 4: Provider Bridges
IEEE 802.3ah	Media Access Control Parameters, Physical layers, and Management Parameters for Subscriber Access Networks
IEEE 802.3as-2006 (Frame size)	Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications

IEEE 802.1	Working group for 802 LAN/MAN architecture, internetworking among 802 LANs, MANs and other wide area networks, 802 Security, 802 overall network management, and protocol layers above the MAC & LLC layers.
IEEE 802.1p (Priority)	Traffic Class Expediting and Dynamic Multicast Filtering (published in 802.1D-1998)
IEEE 802.1D	IEEE Standard for Local and metropolitan area networks: Media Access Control (MAC) Bridges
IEEE 802.1Q	IEEE Standard for Local and Metropolitan Area Networks---Virtual Bridged Local Area Networks
IEEE 802.3x (Flow control)	IEEE Standards for Local and Metropolitan Area Networks: Specification for 802.3 Full Duplex Operation
IEEE 802.1AX	IEEE Standard for Local and metropolitan area networks— Link Aggregation
IETF RFC 1242	Benchmarking Terminology for Network Interconnection Devices: Performance measurements
RFC 2309	Recommendations on Queue Management and Congestion Avoidance in the Internet
IETF RFC 2544	Benchmarking Methodology for Network Interconnect Devices: Measurement of latency for SDH
RFC 4188	Definitions of Managed Objects for Bridges
MEF 2	Requirements and Framework for Ethernet Service Protection in Metro Ethernet Networks
MEF 9	Abstract Test Suite for Ethernet Services at the UNI
MEF 10	Ethernet Services Attributes Phase I
MEF 14	Abstract Test Suite for Ethernet Services at the UNI
IEEE 802.1ag/ITU-T Y.1731	Ethernet Service OAM CFM
ITU-T Y.1731	Ethernet Service OAM PM

8.15 Synchronization

ITU-T G.781 07/99	Synchronization layer functions
ITU-T G.813 03/03	Timing characteristics of SDH equipment slave clocks (SEC)
ITU-T G.823 03/00	The control of jitter and wander within digital networks which are based on the 2048 Kbit/s hierarchy; Jitter and wander
ITU-T G.8261/Y.1361	Timing and synchronization aspects in packet network
ITU-T G.8262/Y.1362	Timing characteristics of a synchronous Ethernet equipment slave clock
ITU-T G.8264/Y.1364	Distribution of timing information through packet networks
G.8265.1	Precision time protocol telecom profile for frequency synchronization
ITU-T G.8273.2	Timing characteristics of telecom boundary clocks and telecom time slave clocks
ITU-T G.8271.1	Network limits for time synchronization in packet networks
ITU-T G.8275.1	Precision time protocol telecom profile for phase/time synchronization with full timing support from the network
IEEE 1588-2008	Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems

8.16 Digital Radio Transmission

ETSI EN 302 217-2-2 (Radio equipment Class II)	Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-2: Digital systems operating in frequency bands where frequency co-ordination is applied; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
ETSI EN 302 217-2-1	Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-1: System-dependent requirements for digital systems operating in frequency bands where frequency coordination is applied
ETSI EN 302 217-1	Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 1: Overview and system independent common characteristics
ETSI EN 301 126-1	Fixed Radio Systems; Conformance testing; Part 1: Point-to-Point equipment – Definitions, general requirements and test procedures
ETSI EN 301 390	Fixed Radio Systems; Point-to-point and Multipoint Systems; Unwanted emissions in the spurious domain and receiver immunity limits at equipment/antenna port of Digital Fixed Radio Systems
CEPT ERC/DEC/(00) 07	Shared use of the band 17.7-19.7 GHz by the fixed service and Earth stations of the fixed-satellite service.
CEPT/ERC/REC 74-01E	Unwanted Emissions in the Spurious Domain

Rec. ITU-R F.1099	Radio-frequency channel arrangements for high- and medium-capacity digital fixed wireless systems in the upper 4 GHz (4 400-5 000 MHz) band
Rec. ITU-R F.383	Radio-frequency channel arrangements for high-capacity fixed wireless systems operating in the lower 6 GHz (5 925 to 6 425 MHz) band
Rec. ITU-R F.384	Radio-frequency channel arrangements for medium- and high-capacity digital fixed wireless systems operating in the 6 425-7 125 MHz band
Rec. ITU-R F.385	Radio-frequency channel arrangements for fixed wireless systems operating in the 7 110-7 900 MHz band
Rec. ITU-R F.386	Radio-frequency channel arrangements for fixed wireless systems operating in the 8 GHz (7 725 to 8 500 MHz) band
Rec. ITU-R F.747	Radio-frequency channel arrangements for fixed wireless systems operating in the 10.0-10.68 GHz band
Rec. ITU-R F.1568	Radio-frequency block arrangements for fixed wireless access systems in the range 10.15-10.3/10.5-10.65 GHz
Rec. ITU-R F.387	Radio-frequency channel arrangements for fixed wireless systems operating in the 10.7-11.7 GHz band
Rec. ITU-R F.497	Radio-frequency channel arrangements for fixed wireless systems operating in the 13 GHz (12.75-13.25 GHz) frequency band
Rec. ITU-R F.636	Radio-frequency channel arrangements for fixed wireless systems operating in the 14.4-15.35 GHz band
Rec. ITU-R F.595	Radio-frequency channel arrangements for fixed wireless systems operating in the 17.7-19.7 GHz frequency band

Rec. ITU-R F.637	Radio-frequency channel arrangements for fixed wireless systems operating in the 21.2-23.6 GHz band
Rec. ITU-R F.748	Radio-frequency arrangements for systems of the fixed service operating in the 25, 26 and 28 GHz bands
Rec. ITU-R F.1520	Radio-frequency arrangements for systems in the fixed service operating in the band 31.8-33.4 GHz
Rec. ITU-R F.749	Radio-frequency arrangements for systems of the fixed service operating in the 36-40.5 GHz band
Rec. ITU-R F.2005	Radio-frequency channel and block arrangements for fixed wireless systems operating in the 42 GHz (40.5 to 43.5 GHz) band
CEPT/ERC/REC 14-01 E	Radio-frequency channel arrangements for high capacity analogue and digital radio-relay systems operating in the band 5925 MHz – 6425 MHz
CEPT/ERC/REC 14-02 E	Radio-frequency channel arrangements for medium and high capacity analogue or high capacity digital radio-relay systems operating in the band 6425 MHz-7125 MHz
ECC/REC/(02)06	Preferred channel arrangements for digital Fixed Service Systems operating in the frequency range 7125-8500 MHz
CEPT/ERC/REC 12-05 E	Harmonized radio frequency channel arrangements for digital terrestrial fixed systems operating in the band 10.0 – 10.68 GHz
CEPT/ERC/REC 12-06 E	Preferred channel arrangements for fixed service systems operating in the frequency band 10.7 – 11.7 GHz
CEPT/ERC/REC 12-02 E	Harmonized radio frequency channel arrangements for analogue and digital terrestrial fixed systems operating in the bands 12.75 GHz to 13.25 GHz

CEPT/ERC/REC 12-07 E	Harmonized radio frequency channel arrangements for analogue and digital terrestrial fixed systems operating in the bands 14.5 – 14.62 GHz paired with 15.23 -15.35 GHz
CEPT/ERC/REC 12-03 E	Harmonized radio frequency channel arrangements for analogue and digital terrestrial fixed systems operating in the bands 17.7 GHz to 19.7 GHz
T/R 13-02	Preferred channel arrangements for fixed services in the range 22.0-29.5 GHz
ERC/REC/(01)02	Preferred channel arrangements for digital fixed service systems operating in the frequency band 31.8 – 33.4 GHz
T/R 12-01 E	Harmonized radio frequency channel arrangements for analogue and digital terrestrial fixed systems operating in the bands 37-39.5 GHz
ECC/REC/(01)04	Recommended guidelines for the accommodation and assignment of multimedia wireless systems (MWS) and point-to-point (P-P) fixed wireless systems in the frequency band 40.5 – 43.5 GHz
FCC 47 CFR part 2 (§ 2.902 Verification)	Code of Federal Regulations Title 47: Telecommunication Part 2 – Frequency allocations and radio treaty matters; general rules and regulations.
FCC 47 CFR part 101	Code of Federal Regulations Title 47: Telecommunication Part 101 – Fixed microwave services
RSS-191	Local Multipoint Communication Systems in the Band 25.35-28.35 GHz; Point-to-Point and Point-to-Multipoint Broadband Communication Systems in the Bands 24.25-24.45 GHz and 25.05-25.25 GHz; and Point-to-Multipoint Broadband Communications in the Band 38.6-40.0 GHz
SP Gen	General Information Related to Spectrum Utilization and Radio Systems Policies
SP 1-20 GHz	Revisions to Microwave Spectrum Utilization Policies in the Range of 1-20 GHz

SP 3-30 GHz	Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range and Further Consultation
SRSP-305.9	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Band 5925 – 6425 MHz
SRSP-306.4	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Band 6425 – 6930 MHz
SRSP-306.5	Technical Requirements for Radio Systems Operating in the Fixed Service and Providing Television Auxiliary Services in the Bands 6590 – 6770 MHz and 6930 – 7125 MHz
SRSP-307.1	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Band 7125 – 7725 MHz
SRSP-307.7	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Band 7725 – 8275 MHz
SRSP-310.5	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Band 10.55-10.68 GHz
SRSP-310.7	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Band 10.7 – 11.7 GHz
SRSP-314.5	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Band 14.5 – 15.35 GHz
SRSP-317.8	Technical Requirements for Fixed Line-of-Sight Radio Systems Operating in the Bands, 17.8-18.3 GHz and 19.3-19.7 GHz
SRSP-321.8	Technical Requirements for the Fixed Line-of-Sight Radio Systems Operating in the Bands 21.8 – 22.4 GHz and 23.0 – 23.6 GHz

SRSP-324.25	Technical requirements for Fixed Radio Systems Operating in the Bands 24.25 – 24.45 GHz and 25.05 – 25.25 GHz
SRSP-325.25	Technical Requirements for Fixed Radio Systems Operating in the Bands 25.25-26.5 GHz and 27.5-28.35 GHz
SRSP-338.6	Technical Requirements for Fixed Radio Systems Operating in the Band 38.6 – 40.0 GHz
TRC-43	Designation of Emissions (Including Necessary Bandwidth and Classification), Class of Station and Nature of Service

8.17 Operation & Maintenance Interfaces

8.17.1 DCN

IEEE 802.3	10 BASE-T Ethernet
IEEE 802.2	Local and metropolitan area networks-Specific requirements; Part 2: Logical Link Control
IETF RFC 768	User Datagram Protocol
IETF RFC 791	Internet protocol DARPA internet program protocol specification
IETF RFC 792	Internet control message protocol DARPA internet program protocol specification
IETF RFC 793	Transmission control protocol DARPA internet program protocol specification
IETF RFC 826	Address Resolution Protocol for SiteLAN and local access port
IETF RFC 854	Telnet protocol specification
IETF RFC 894	Transmission of IP datagrams over Ethernet Networks on SiteLAN Access and the local access port.
IETF RFC 951	Bootstrap protocol (bootp)
IETF RFC 959	File transfer protocol (ftp)
IETF RFC 1035	Domain names – implementation and specification
IETF RFC 1042	Transmission of IP Datagrams over IEEE 802 Networks on SiteLAN Access and the local access port.

IETF RFC 1144	PPP TCP/IP header compression
IETF RFC 1305	Network Time Protocol (Version 3) Specification, Implementation and Analysis
IETF RFC 1519	Classless Inter-Domain Routing (CIDR): an Address Assignment and Aggregation Strategy
IETF RFC 1542	Clarifications and Extensions for the Bootstrap Protocol
IETF RFC 1631	The IP Network Address Translator (NAT) for the local access port.
IETF RFC 1700	Assigned Numbers (Telnet)
IETF RFC 1812	Requirements for IP Version 4 Routers
IETF RFC 2096	IP Forwarding Table MIB
IETF RFC 2131	Dynamic Host Configuration Protocol for the Local Access Port.
IETF RFC 2328	OSPF Version 2
IETF RFC 2474	Definition of the Differentiated Services Field (DS Field) in the Ipv4 and Ipv6 Headers
IETF RFC 2508	Compressing IP/UDP/RTP Headers for Low-Speed Serial Links
IETF RFC 2509	IP Header Compression over PPP
IETF RFC 2780	IANA Allocation Guidelines for values in the Internet Protocol and Related Headers
IETF RFC 4251	The Secure Shell (SSH) Protocol Architecture
IETF RFC 5426	Transmission of Syslog Messages over UDP

8.17.2 SNMP

The list below shows all IETF RFCs, which the MINI-LINK 6600, MINI-LINK 6366, and MINI-LINK 6371 complies with in applicable parts. None of the IETF specified notification types are supported.

IETF RFC 1157	A Simple Network Management Protocol (SNMP)
IETF RFC 1212	Concise MIB Definitions
IETF RFC 1213	Management Information Base for Network Management of TCP/IP-based internets: MIB-II
IETF RFC 1850	OSPF Version 2 Management Information Base
IETF RFC 1901	Introduction to Community-Based SNMPv2
IETF RFC 2011	SNMPv2 Management Information Base for the Internet Protocol using SMIv2

IETF RFC 2012	SNMPv2 Management Information Base for the Transmission Control Protocol using SMIv2
IETF RFC 2013	SNMPv2 Management Information Base for the User Datagram Protocol using SMIv2
IETF RFC 2558	Definitions of Managed Objects for the SONET/SDH Interface Type
IETF RFC 2571	An Architecture for Describing SNMP Management Frameworks
IETF RFC 2578/STD58	Structure of Management Information Version 2 (SMIv2)
IETF RFC 2579/STD58	Textual Conventions for SMIv2
IETF RFC 2580/STD58	Conformance Statements for SMIv2
IETF RFC 2737	Entity MIB
IETF RFC 2863	The Interfaces Group MIB for SiteLAN
IETF RFC 2864	The Inverted Stack Table Extension to the Interfaces Group MIB
IETF RFC 3410	Introduction and Applicability Statements for Internet-standard Network Management Framework
IETF RFC 3411/STD62	An architecture for Describing SNMP Management Frameworks
IETF RFC 3412/STD62	Message Processing and Dispatching for the SNMP
IETF RFC 3413/STD62	SNMP Applications
IETF RFC 3414/STD62	User-based Security Model (USM) for SNMPv3
IETF RFC 3415/STD62	View-based Access Control Model (VACM) for SNMP
IETF RFC 3416/STD62	Version 2 of the Protocol Operations for SNMP
IETF RFC 3417/STD62	Transport Mappings for SNMP
IETF RFC 3418/STD62	Management Information Base for SNMP
IETF RFC 3584	Co-existence Between Version 1, Version 2,and Version 3 of the Internet-Standard Network Management Framework
IETF RFC 3593	Textual Conventions for MIB Modules Using Performance History Based on 15 Minute Intervals
IETF RFC 4133	Entity MIB (Version 3)
IETF RFC 4188	Definition of Managed Objects for Bridges
IETF RFC 4001	Textual conventions for Internet network addresses
IETF RFC 4805	Definitions of Managed Objects for the DS1, J1, E1, DS2, and E2 Interface Types

8.18 Security

ITU-T X.800	Security Architecture for open system interconnection for CCIT applications
ITU-T X.805	Security Architecture for systems providing end-to-end communications
IETF RFC 2865	RADIUS
IETF draft-grant-tacacs-02.txt	TACACS+ v 1.78
IETF RFC 4251, RFC 4252, RFC 4253	SSH
IETF RFC 3414/STD62	User-based Security Model (USM) for SNMPv3
IETF RFC 3826	The Advanced Encryption Standard (AES) Cipher Algorithm in the SNMP User-based Security Model
IETF RFC 7630	HMAC-SHA-2 Authentication Protocols in the User-based Security Model (USM) for SNMPv3

9 Definitions/Abbreviations

ACAP	Adjacent Channel Alternate Polarization
ACCP	Adjacent Channel Co-Polarization
AIS	Alarm Indicating Signal
APU	Application Plug-in Unit
ATPC	Automatic Transmit Power Control
AU-n	Administrative Unit-n
BER	Bit Error Rate
BERT	Bit error Ratio Test
CBS	Committed Burst Size
CCDP	Co-Channel Dual-Polarization
CESoPSN	Structure-aware TDM Circuit Emulation Service over Packet Switched Network
CIR	Committed Information Rate
CW	Continuous Wave
DCN	Data Communication Network
DTE	Data Terminal Equipment
EBS	Excess Burst Size
ECID	Emulated Circuit Identifier
EIR	Excess Information Rate
EM	Electro Magnetic
EMC	Electro Magnetic Compatibility
ETU	Ethernet Termination Unit

FAU	Fan Unit
FTP	File Transfer Protocol
IEC	International Electro technical Commission
IETF	Internet Engineering Task Force
IME	Inverse Multiplexing
LAG	Link Aggregation Group
LAN	Local Area Network
LED	Light Emitting Diode
LTU	Line Termination Unit
MEF	Metro Ethernet Forum
MIB	Management Information Base
MMU	Modem Unit
MSP	Multiplexer Section Protection
NNI	Network-Network Interface
NPU	Node Processor Unit
OSPF	Open Shortest Path First
PEP	Provider Edge Port
PFU	Power Filtering Unit
PL	Packet Link
PPP	Point to Point Protocol
PRT	Product Ready for Tender
PSU	Power Supply Unit
PTP	Precision Timing Protocol

PW	Pseudowire
QAM	Quadrature Amplitude Modulation
QL	Quality Level
RADIUS	Remote Authentication Dial In User Service
RAU	Radio Unit
RBER	Residual Bit Error Rate
RFC	Request For Comments
RLB	Radio Link Bonding
RLP	Radio Link Protection
RSEC	Reference Spectral Efficiency Class
RTPC	Remote Transmit Power Control
SAToP	Structure-Agnostic TDM over Packet
SFP	Small Form-factor Pluggable
SFPe	SFP electrical
SFPo	SFP optical
SI	Single Interface
SMI	Structure of Management Information
SNCP	Sub-Network Connection Protection
SNMP	Simple Network Management Protocol
SPQ	Strict Priority Queuing
SSM	Synchronization Status Message
STM-n	Synchronous Transport Module-n
TACACS+	Terminal Access Control, Access Control Server

TBD	To Be Determined
TC	Traffic Class
TCP/IP	Transmission Control Protocol/Internet Protocol
TDM	Time Division Multiplexing
TOS	Type Of Service
TUG	Tributary Unit Group
U	Measure used in mechanical constructions (1U = 44.45 mm)
UDP	User Datagram Protocol
UNI	User-Network Interface
USM	User-based Security Model
VACM	View-based Access Model
VCAT	Virtual Concatenation
VC-n	Virtual Container
VCC	Virtual Channel Connection
VID	VLAN ID
VPC	Virtual Path Connection
WAN	Wide Area Network
WDPR	Weighted Deficit Round Robin
WFQ	Weighted Fair Queuing
WRED	Weighted Random Early Detection
XPIC	Cross-Polarization Interference Canceller