

EMC TEST REPORT

Type of equipment: VIZULO Micro Martin LED Street Luminaire with
Tridonic driver LCA 75W 250-750mA one4all C PRE OTD

Model: MRU 075 740 V04 F032 CBNT DH1

Sub model: N/A

Article no.: 55200005

Applicant: SIA "VIZULO"

Manufacturer: SIA "VIZULO"

Test standards: **LVS EN 55014-1:2017**
*Electromagnetic compatibility - Requirements for household appliances,
electric tools and similar apparatus - Part 1: Emission*
LVS EN 55015:2013+A1:2015
*Limits and methods of measurement of radio disturbance characteristics of
electrical lighting and similar equipment*
LVS EN 61547:2010
*Equipment for general lighting purposes - EMC immunity requirements
(IEC 61547:2009)*
LVS EN 61000-3-2:2015
*Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for
harmonic current emissions (equipment input current ≤ 16 A per phase)
(IEC 61000-3-2:2014)*
LVS EN 61000-3-3:2013
*Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of
voltage changes, voltage fluctuations and flicker in public low-voltage
supply systems, for equipment with rated current 16 A per phase and not
subject to conditional connection (IEC 61000-3-3:2013)*

Test report no.: LEITC-TR-18-134

Identification no.: ID_503

Testing laboratory: LEITC

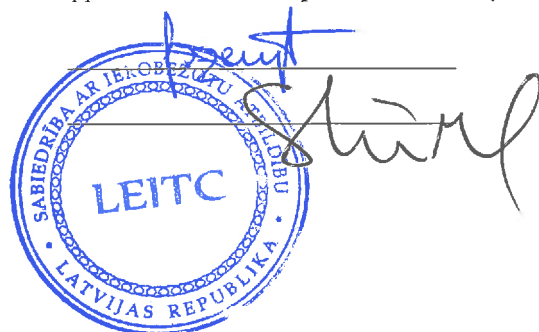
Test result: Pass

The result (pass/fail) applies only to the sample tested, according to the carried tests, which are included in this test report. This report shall not be reproduced except in full, without the written approval of EMC compliance Laboratory.

Test responsible: Andris Dzenis

Laboratory responsible: Uldis Stūre

Date of issue: 30.08.2018



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1. REVISION HISTORY

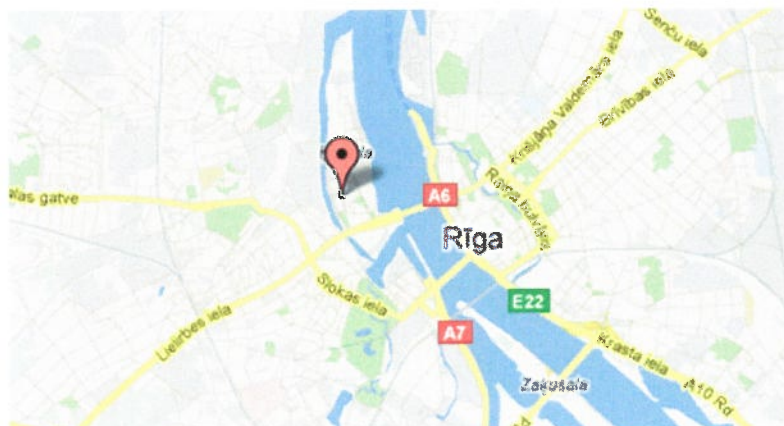
Revision No.	Description	Date	File name	Pages revised
00	None	-	-	-

2. LABORATORY INFORMATION



Latvian Electronic Equipment Testing Centre

Address: Azenes 12, Riga, Latvia, LV-1048
Telephone number: +371 22001023
Contact Person: Uldis Stūre
E-mail: uldis.sture@leipc.lv
andris.dzenis@leipc.lv
Web: www.leipc.lv



Accredited by: State agency Latvian National accreditation bureau (LATAK)
Address: Kr.Valdemara str. 157, Riga, LV-1013, Latvia
Web: <http://www.latak.lv>
E-mail: latak@latak.lv
Accreditation No: LATAK-T-397-08-2009

3. CLIENT INFORMATION

Applicant: SIA "VIZULO"
Address: Starta iela 1, Riga, LV-1026
Telephone number: +371 28230842
Contact Person: Sergejs Burtovojš
E-mail: sergey.burtovoy@vizulo.com
Web-page: <http://www.vizulo.com>

Manufacturer: SIA "VIZULO"
Address: Starta iela 1, Riga, LV-1026
Telephone number: +371 28230842
Contact Person: Sergejs Burtovojš
E-mail: sergey.burtovoy@vizulo.com
Web-page: <http://www.vizulo.com>

4. SUMMARY OF TEST RESULTS

Standard:	LVS EN 55015:2013+A1:2015			
Title:	<i>Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment</i>			
Reference standard:	LVS EN 55014-1:2017			
Title:	<i>Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission</i>			
Emissions				
	Measurement type	Reference standard	Applicability	Result
1.	Radiated emissions (9kHz to 30MHz)	LVS EN 55015:2013+A1:2015	Y	Pass
2.	Radiated emissions (30MHz to 1GHz)	LVS EN 55015:2013+A1:2015 LVS EN 55014-1:2017	Y	Pass
3.	Conducted emissions (AC port)	LVS EN 55015:2013+A1:2015 LVS EN 55014-1:2017	Y	Pass
<i>Notes:</i> Y- applied				
Deviations from standard specification				

Standard:	LVS EN 61547:2010			
Title:	<i>Equipment for general lighting purposes - EMC immunity requirements (IEC 61547:2009)</i>			
Immunity				
	Measurement type	Reference standard	Applicability	Result
1.	Radio frequency radiated electromagnetic field immunity	LVS EN 61000-4-3:2006+A1:2008+A2:2010	Y	Pass
2.	Radio frequency common mode immunity	LVS EN 61000-4-6:2014	Y	Pass
3.	Electric fast transients/Burst	LVS EN 61000-4-4:2013	Y	Pass
4.	Voltage dips/ interruptions	LVS EN 61000-4-11:2004	Y	Pass
5.	Surge	LVS EN 61000-4-5:20014	Y	Pass
6.	Electrostatic discharge	LVS EN 61000-4-2:2009	Y	Pass
7.	Power frequency magnetic fields	LVS EN 61000-4-8:2010	N/A	N/A
<i>Notes: Y- applied; N/A- not applicable</i>				
Deviations from standard specification				

Standard:	LVS EN 61000-3-2:2015			
Title:	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase) (IEC 61000-3-2:2014)			
Emissions				
	Measurement type	Reference standard	Applicability	Result
1.	Harmonic	LVS EN 61000-3-2:2015	Y	Pass
Notes: Y- applied				
Deviations from standard specification				

Standard:	LVS EN 61000-3-3:2013			
Title:	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection (IEC 61000-3-3:2013)			
Emissions				
	Measurement type	Reference standard	Applicability	Result
1.	Flicker	LVS EN 61000-3-3:2013	Y	Pass
Notes: Y- applied				
Deviations from standard specification				

Evaluation of immunity test results	
The test results are classified in terms of loss of the function or degradation of performance of the EUT:	
A	normal performance within limits specified by manufacturer, requestor or purchaser
B	temporary loss of function or degradation of performance, which ceases after the disturbance ceases, and from which the EUT recovers its normal performance, without operator intervention
C	temporary loss of function or degradation of performance, the correction which requires operator intervention
D	temporary loss of function or degradation of performance which is not recoverable, owing damage to hardware or software, or loss of data

5. DESCRIPTION OF EQUIPMENT UNDER TEST

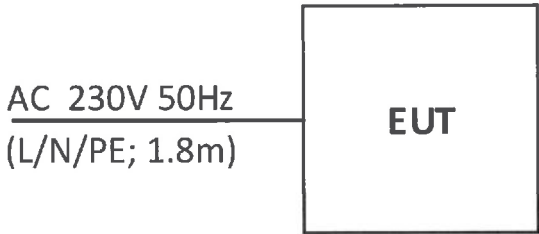
5.1 Description of EUT

VIZULO Micro Martin LED Street Luminaire with Tridonic driver LCA 75W 250-750mA one4all C PRE OTD

No.	Description	Model	Article No.	Manufacturer
1.	LED Luminaire	MRU 075 740 V04 F032 CBNT DH1	55200005	SIA "VIZULO"

	MRU						
Power [W]	005 ... 075						
Color rendering index	≥70 - 7 ≥80 - 8						
Color temperature [K]	2700 ... 6500						
Standard values:	3000 K - 30 4000 K - 40						
Lens	standard - L01 ... L99 custom configuration - M01 ... Z99						
LED module type	8 LEDs, type 2x2 lens - A 16 LEDs, type 8 lens - F						
LED quantity	001 ... 032						
Color*	silver (RAL 9006) - CS asphalt (DB 703) - CA *other colors available on request						
Console	post top / side-entry, ±15°, 60 mm - N post top / side-entry, ±90°, 60 mm - R post top / side-entry, ±90°, 76 mm - P flood light - F						
Opening	four screws - S toolless latch - T						
Dimming	non dimmable - N DALI - D 1-10V - A midnight dimming - M wireless - W						
Surge protection	6 kV ... 10 kV integrated in driver - G separate built-in 10 kV/10 kA SPD - H						
Insulation	class I - 1 class II - 2						

The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

5.2 Peripherals and associated equipment						
No.	Description	Model	Serial No.	Manufacturer		
1.	N/A	N/A	N/A	N/A		
5.4 Cables used during the testing						
No.	Cable type	Shield	Ferrite	Length	Connection1	Connection2
1.	AC power cable	no	no	1.8m	EUT	AC mains
5.5 EUT configuration						
The equipment under test (EUT) was functioning correctly during all tests, according to user's manual. The EUT was installed within the test site and was configured to simulate a typical user installation.						
5.5.1 Operating modes/load						
1.	Turned ON in full power.					
5.5.2 Modification state						
1.	No modification.					
Block diagram:						
 <pre> graph LR AC[AC 230V 50Hz (L/N/PE; 1.8m)] --- EUT[EUT] </pre>						

6. INSTRUMENTATION AND CALIBRATION

Equipment and EUT during the tests are operated in temperature range of 21⁰ to 25⁰C, humidity range of 40% to 60%, if not mentioned more precisely next to measurement data.

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with manufacturer's recommendations or quality manager deliverance and it is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

The following list contains measurement equipment used for testing. The equipment conforms to the requirements of CISPR 16-1 and other standard requirements.

Radiated emissions				
Device	Manufacturer	Model	Serial number	Notes
Antenna	R&S	HL562	4041.3000.02	Certificate of calibration No. 201404738.00; 06.01.2015
Antenna	R&S	HF906	100448	Certificate of calibration No. 201404739.00; 18.12.2014
Preamplifier	Bonn	BLMA 0118-1M	066396D	Test report No. 160701; 01.07.2016
Receiver	R&S	ESIB26	1088.7490K26	Certificate of calibration No.201801814.00; 28.06.2018
Antenna mast	Franconia	FCTAM03	-	-
Turntable	Franconia	FCTAM01	-	-
Test site	Franconia	SAC3	-	-
Software for EMC measurements EMC32	R&S	Version 8.53.0	-	-

Conducted emissions				
Device	Manufacturer	Model	Serial number	Notes
LISN	R&S	ESH2Z5	100163	Certificate of calibration No. 201802157.00; 03.07.2018
AMN	R&S	ENV216	100266	Certificate of calibration No. 201801811.00; 02.07.2018
ISN	R&S	ENY81	100066	Certificate of calibration No. 0001-300458444; 16.03.2018
Receiver	R&S	ESIB26	1088.7490K26	Certificate of calibration No.201801814.00; 28.06.2018
Test site	Franconia	SAC3	-	-
Software for EMC measurements EMC32	R&S	Version 8.53.0	-	-

Radio frequency radiated electromagnetic field immunity				
Device	Manufacturer	Model	Serial number	Notes
Generator	R&S	IMS	1502.0009.02	Certificate of calibration No. 0378 / D-K-15195-01-00; 26.11.2015
Amplifier	Bonn	BLMA 1040-60/3D	066396C	Field uniformity calibration No. 160703; 01.07.2016
Amplifier	Bonn	BSA 0125-25I	066396B	Field uniformity calibration No. 160703; 01.07.2016
Antenna	R&S	HL046E	4065.5960.02	Field uniformity calibration No. 160703; 01.07.2016
Power meter	R&S	NRP-Z91	1000015	Certificate of calibration No.201801813.00; 27.06.2018
Field Sensor	ETS-LINDGREN	HI 6005	00074579	Certificate of calibration No. 201801812.00; 26.06.2018
Test site	Franconia	SAC3	-	-
Software for EMC measurements EMC32	R&S	Version 5.20.2	-	-

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Radio frequency common mode immunity				
Device	Manufacturer	Model	Serial number	Notes
Generator	R&S	IMS	1502.0009.02	Certificate of calibration No. 0378 / D-K-15195-01-00; 26.11.2015
Amplifier	Bonn	BSA 0125-150	066396A	Test report No. 160704; 01.07.2016
Power meter	R&S	NRP-Z91	1000015	Certificate of calibration No.201801813.00; 27.06.2018
CDN	Liithi	L-801 M2/3	2241	Certificate of calibration No. SCS-2241-BYEMAIL-CDNL-801-M2M3; 29.06.2018
CDN	Liithi	L-801 T8	2248	Certificate of calibration No. SCS-2248-BYEMAIL-CDNL-801-T8; 29.06.2018
CDN	Liithi	L-801 S1	2242	Certificate of calibration No. SCS-2242-BYEMAIL-CDNL-801-S1; 29.06.2018
BCI probe	FCC	F-120-9A	474	Certificate of calibration No. 420640-D-K-15012-01-00; 05.05.2017
Test site	Franconia	SAC3	-	-
Software for EMC measurements EMC32	R&S	Version 5.20.2	-	-

Electric fast transients EFT/Burst				
Device	Manufacturer	Model	Serial number	Notes
Burst/Surge generator	EM TEST	UCS500-M	V0629101638	Certificate of calibration No. SCS-0629101638-UCS500M4; 10.07.2018
Motor variac	EM TEST	MV 2616	V0629101639	-
Capacitive coupling clamp	EM TEST	HFK	0906-06	Certificate of calibration No. CE-D19702-UCS500M4-170410; 10.04.2017
ISMIEC for Windows software	EM TEST	Version 4.08	-	-

Voltage dips/interruptions				
Device	Manufacturer	Model	Serial number	Notes
Burst/Surge generator	EM TEST	UCS500-M	V0629101638	Certificate of calibration No. SCS-0629101638-UCS500M4; 10.07.2018
ISMIEC for Windows software	EM TEST	Version 4.08	-	-

Surge				
Device	Manufacturer	Model	Serial number	Notes
Burst/Surge generator	EM TEST	UCS500-M	V0629101638	Certificate of calibration No. SCS-0629101638-UCS500M4; 10.07.2018
Motor variac	EM TEST	MV 2616	V0629101639	-
CDN	EM TEST	CNV 504A	V0629101640	Certificate of calibration No. CE-D19702-CNV504A-170410; 10.04.2017
Surge Generator	AMETEK CTS	Compact NX5 s-1-300-16	P1833222427	Certificate of calibration No. SCS-1833222427-SLO-CH301205-compactNX5s-1-300-16; 15.08.2018
Surge protection network	AMETEK CTS	SPN 508N1	P1745207951	Certificate of calibration No. CE-1745207951-SLO-CH100771-SPN508N1; 03.11.2017
High Speed Coupling / Decoupling Network for Burst and Surge	AMETEK CTS	CNI 508N2	P1745207952	Certificate of calibration No. CE-1745207952-SLO-CH100771-CNI508N2; 03.11.2017
ISMIEC for Windows software	EM TEST	Version 4.08	-	-

Electrostatic discharge				
Device	Manufacturer	Model	Serial number	Notes
ESD simulator	EM TEST	DITO	V0629101637	Certificate of calibration No.SCS-0629101637-by E-Mail-Dito; 06.07.2018
Vertical coupling plane	EM TEST	DITO	-	Certificate of calibration No.SCS-0629101637-by E-Mail-Dito; 06.07.2018

The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

Harmonic current emissions and voltage fluctuation/flicker measurements				
Device	Manufacturer	Model	Serial number	Notes
Harmonic and flicker analyzer	EM TEST	DPA 500	V0629101635	Certificate of calibration No. SCS 23263; 31.07.2018
Single phase AC voltage	EM TEST	ACS 500	V0629101636	-
ISMDPA for Windows software	EM TEST	Version 3.30	-	-

7. STATEMENT OF THE MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainties were calculated according to guidelines given in EN 55016-4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4 Uncertainty in EMC Measurements" and LAB 34, and is documented in the SIA "LEITC" quality system according to ISO/IEC 17025. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective manuals.

Measurement uncertainty			
Procedure	Designation	Uncertainty	Device
Conducted emissions 9kHz to 30MHz	U _{lab}	2.35dB	LISN: ESH2-Z5
Harmonic current emissions	I	According to EN 61000-3-2	DPA 500N
Flicker	P _{st}	According to EN 61000-3-3	DPA 500N
Radiated emissions 9kHz to 30MHz	U _{lab}	4.71dB	Antenna: HM020
Radiated emissions 30MHz to 1GHz	U _{lab}	4.71dB	Antenna: HL562
RF radiated electromagnetic field immunity 80MHz to 3GHz	U _{lab}	2.01dB	Antenna: HL046E
RF common mode immunity 150kHz to 80MHz	U _{lab}	1.83dB	CDNs: CDN L-801 M2/M3; CDN L-801 T8; CDN L-801 S1
Electrostatic discharge immunity	U _{lab}	According to EN 61000-4-2	Dito
Electric fast transients/Burst immunity	U _{lab}	According to EN 61000-4-4	UCS 500 M4
Surge immunity	U _{lab}	According to EN 61000-4-5	UCS 500 M4; Compact NX5 s-1-300-16
Voltage dips/ interruptions immunity	U _{lab}	According to EN 61000-4-11	UCS 500 M4

8. TEST PROCEDURES

Radiated emissions

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is a table top equipment, a wooden turntable with a height of 0,8m is used which is placed on the ground plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation support.

Auxiliary equipment and/or support equipment, if needed was placed as per EN 55015 and EN 55014-1 recommendations.

All input/output cables were positioned to simulate typical usage as per EN 55015 and EN 55014-1.

The EUT was connected to AC mains 230V/50Hz under the turntable shucko type socket, all other equipment was connected to the other shucko type socket under the turntable.

The antenna was placed at 3m away from EUT. Antenna height was changed in range 1-4m and EUT rotation angle in range of -180° to 180° maximize measured emissions.

Conducted emissions

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is a table top equipment, a wooden turntable with a height of 0,8m is used which is placed in a distance of 0,4m from vertical conductive plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation support in a distance of 0,4m from vertical conductive plane.

Auxiliary equipment and/or support equipment, if needed was placed as per EN 55015 and EN 55014-1 recommendations.

All input/output cables were positioned to simulate typical usage as per EN 55015 and EN 55014-1.

EUT mains power port was connected to LISN/AMN which is placed in a distance of 0,8m. Each EUT power lead, except ground (safety), was connected through a LISN/AMN to power source. All lines and neutral of power cord where measured.

All telecommunication and signal cables are connected through ISN which is located in distance of 0,8m. Each cable lead is measured according to used connection type.

Radio frequency radiated electromagnetic field immunity

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is a table top equipment, a wooden table with a height of 0,8m is used. When EUT is floor standing equipment, it is placed on the 0,1m insulation support.

Radio frequency common mode immunity

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is table top equipment, it is placed on table 0,1m above ground reference plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation above the ground reference plane.

Coupling decoupling devices specified in test results.

The frequency range is swept, using the signal levels defined in test data with in disturbance signal 80% amplitude modulation within a 1kHz sine wave, pausing to adjust the RF signal level or to switch coupling devices as necessary. The rate of sweep shall not exceed $1,5e-3$ decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value. The dwell time at each frequency is not less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequencies and harmonics or frequencies of dominant interest shall be analyzed separately.

Electric fast transients EFT/Burst immunity

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is table top equipment, it is placed on table 0,1m above ground reference plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation above the ground reference plane.

On AC mains power ports built-in coupling decoupling network is used to couple EFT/Burst disturbance voltage. For DC/telecommunication/signal ports capacitive clamp is used. Polarity of EFT/Burst disturbance voltage is changed during the test. Duration of test is not less than 1min, however, to avoid synchronization, the test time may be broken down into six 10s burst separated by a 10s pause. It is not intended that the burst is synchronized with EUT signals.

Voltage dips/interruptions immunity

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is table top equipment, it is placed on table 0,1m above ground reference plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation above the ground reference plane.

The EUT for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10s minimum time between each event. Each representative mode of operation is tested. The angle of applied dips/interruptions is defined 0° if not specified in test results. For EUT with more than one power cord, each power cord is tested individually.

Surge immunity

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is table top equipment, it is placed on table 0,1m above ground reference plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation above the ground reference plane.

Surge generator was connected to reference ground plane via low impedance connection. If not mentioned, for DC power ports and interconnection lines and signal/telecommunication lines five positive and five negative surge pulses applied, for AC power line ports five negative and five positive pulses applied each at 0°, 90°, 180°, 270° phase angle. Time between successive pulses was 1min or less if not otherwise specified.

Electrostatic discharge immunity

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is table top equipment, it is placed on table 0,5mm above ground reference plane. When EUT is floor standing equipment, it is placed on the 0,5mm insulation above the ground reference plane.

Electrostatic discharges are applied as contact discharge and air discharge, discharge to vertical and horizontal coupling plane. The discharges are applied only to such points and surfaces of the EUT which are accessible to personnel during normal usage.

Test is performed as single discharges on preselected points at least ten single discharges on both polarities. Between successive discharges a time interval of 1s is used. In case of contact discharge the tip of discharge electrode touch the EUT before the discharge switch is operated. In case of air discharge, the round tip of the discharge electrode is approached as fast as possible (without causing mechanical damage) to touch the EUT discharge switch is operated before the tip is approached.

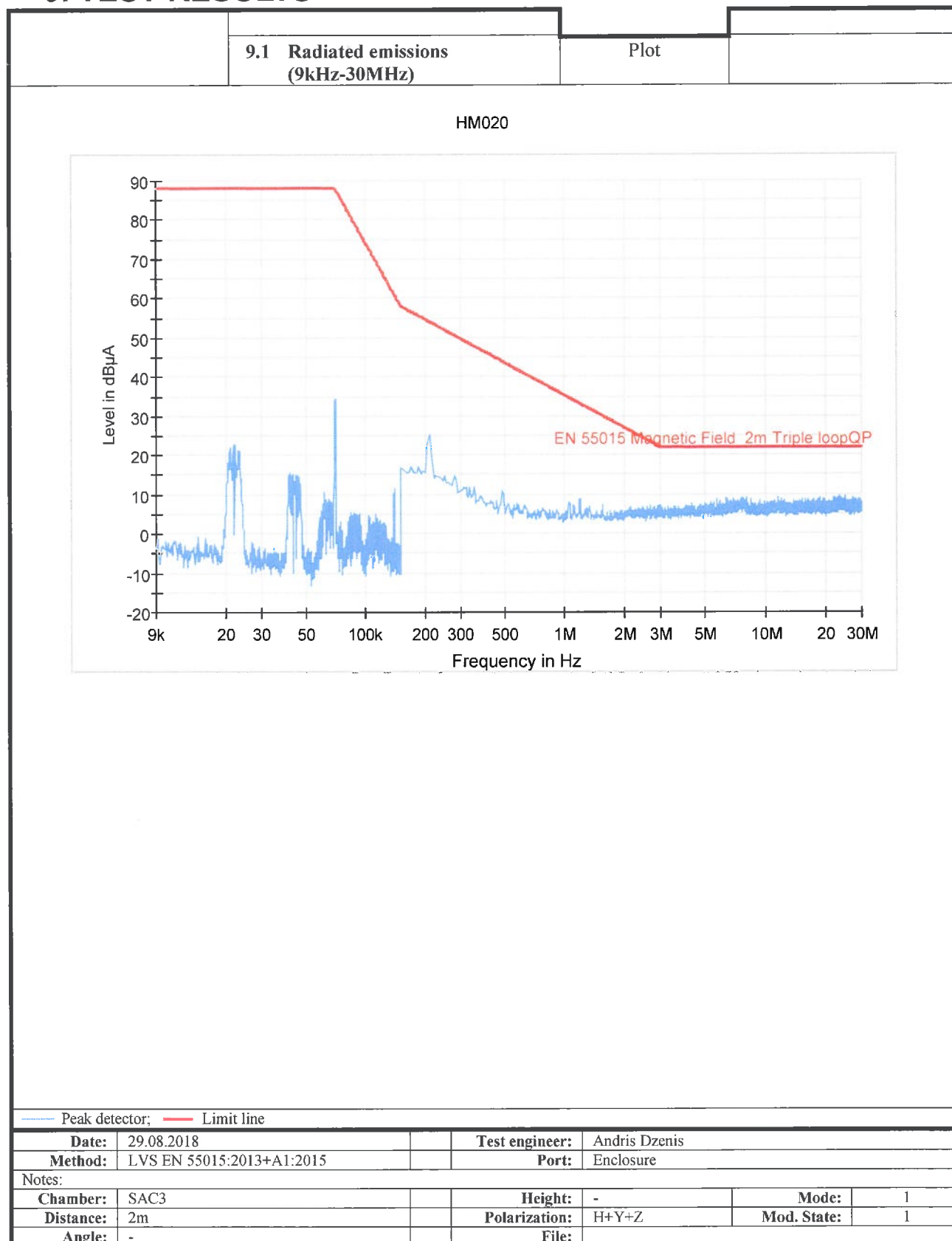
At least ten single contact discharges are applied to horizontal and vertical coupling plate.

Harmonic current emissions and voltage fluctuation/flicker measurements

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is table top equipment, it is placed on table 0,1m above ground reference plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation above the ground reference plane.

The equipment is supplied in series with shunts resistance from a source having the same nominal voltage and frequency as the rated supply voltage, and frequency of the equipment.

9. TEST RESULTS

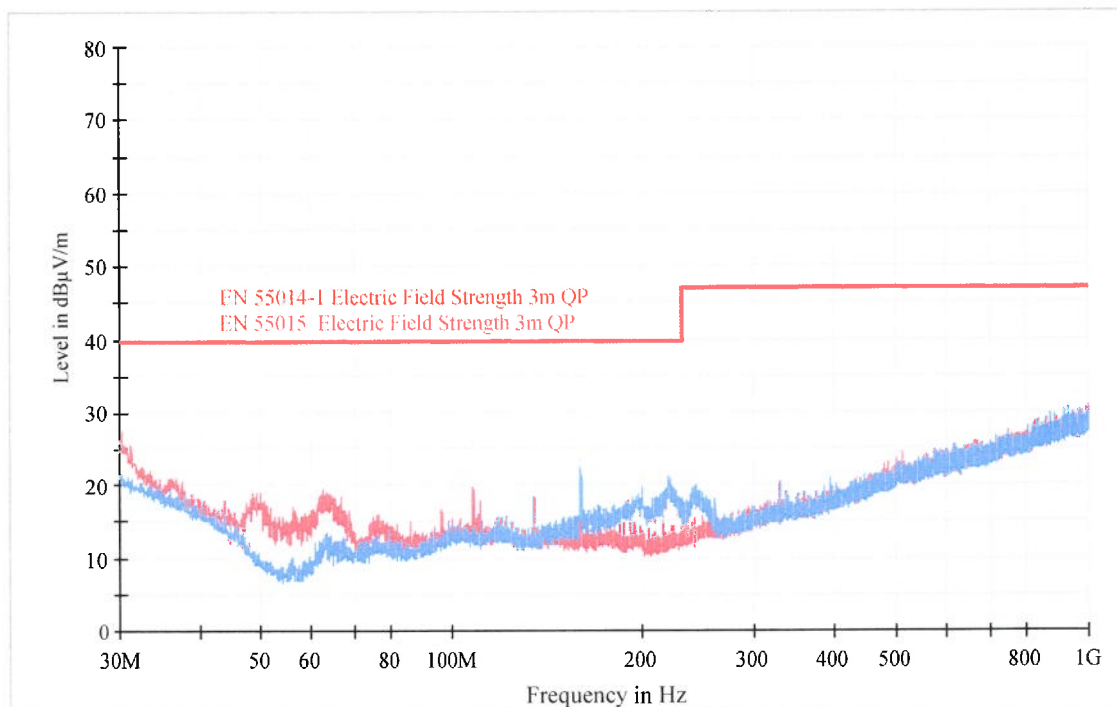


The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

**9.2 Radiated emissions
(30MHz to 1GHz)**

Plot

HL562



— Peak detector (H); ◆ QP detector; — Peak detector (V); — Limit line

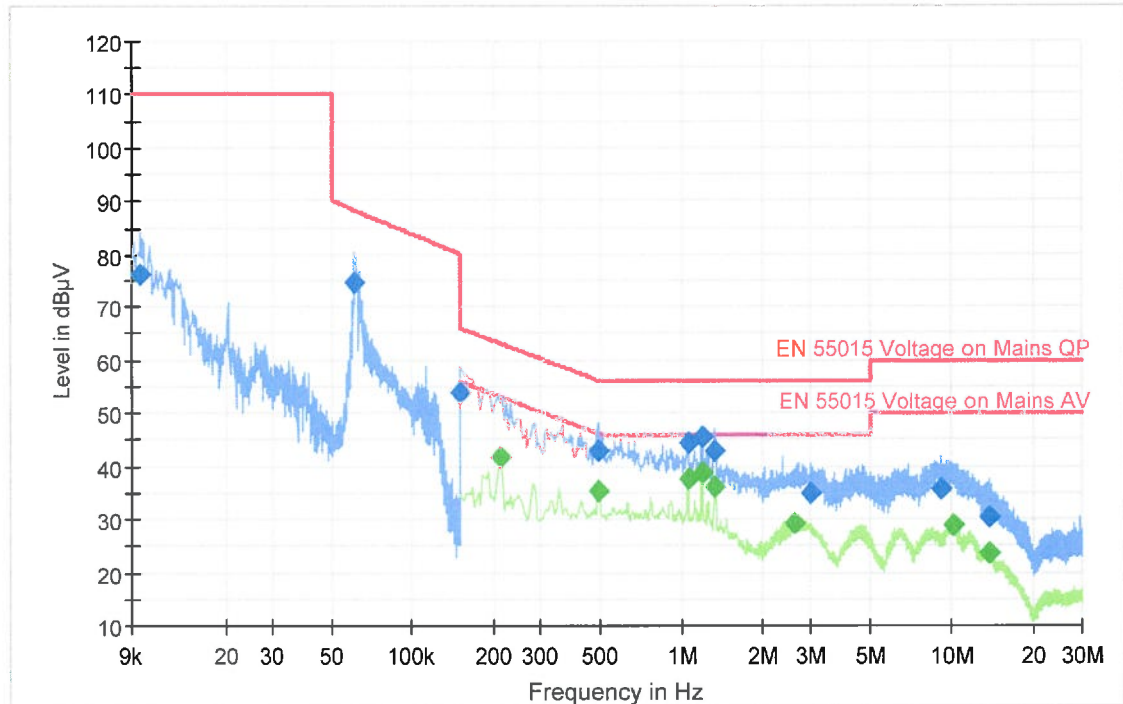
Date:	29.08.2018	Test engineer:	Andris Dzenis
Method:	LVS EN 55015:2013+A1:2015 LVS EN 55014-1:2017	Port:	Enclosure
Notes:			
Chamber:	SAC3	Height:	1-4m
Distance:	3m	Polarization:	V+H
Angle:	-180° to +180°	Mod. State:	1
		File:	

The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

9.3 Conducted emissions

Plot

ESH2-Z5_SAC(2line)



Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.009640	76.1	5000.0	0.200	GND	L1	11.1	33.9	110.0	
0.060760	74.8	5000.0	0.200	GND	L1	10.5	13.4	88.2	
0.150000	54.0	10000.0	9.000	GND	N	10.5	12.0	66.0	
0.486000	42.7	10000.0	9.000	GND	N	10.5	13.5	56.2	
1.054000	44.3	10000.0	9.000	GND	L1	10.5	11.7	56.0	
1.194000	45.7	10000.0	9.000	GND	N	10.5	10.3	56.0	
1.326000	43.1	10000.0	9.000	GND	N	10.5	12.9	56.0	
2.998000	35.0	10000.0	9.000	GND	N	10.6	21.0	56.0	
9.190000	35.7	10000.0	9.000	GND	N	10.9	24.3	60.0	
13.650000	30.3	10000.0	9.000	GND	N	11.2	29.7	60.0	

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.210000	41.7	10000.0	9.000	GND	L1	10.4	11.5	53.2	
0.486000	35.4	10000.0	9.000	GND	N	10.5	10.9	46.2	
1.050000	37.7	10000.0	9.000	GND	N	10.5	8.3	46.0	
1.190000	38.8	10000.0	9.000	GND	N	10.5	7.2	46.0	
1.318000	36.0	10000.0	9.000	GND	N	10.5	10.0	46.0	
2.638000	29.1	10000.0	9.000	GND	N	10.6	16.9	46.0	
10.250000	28.9	10000.0	9.000	GND	N	11.0	21.1	50.0	
13.578000	23.7	10000.0	9.000	GND	N	11.2	26.3	50.0	

— Peak detector; ◆ QP detector; — AV detector; ◆ AV detector; — QP Limit line; — AV Limit line; L- Live, N-Neutral; PE- Earth

Date:	29.08.2018	Test engineer:	Andris Dzenis
Method:	LVS EN 55015:2013+A1:2015 LVS EN 55014-1:2017	Port:	AC power port
Notes:			
Chamber:	SAC3	Attenuator:	0dB
LISN:	ESH2-Z5	Mod. State:	1
		File:	

The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

[illegible]

The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

[illegible]

[illegible]

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[illegible]

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[illegible]

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[illegible]

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		9.10 Harmonic current emissions					
Date:		29.08.2018					
Ports:		AC power					
Method:		LVS EN 61000-3-2:2015					
Power:		72.49W					
Oper. mode	Mod. State	H _n	I _{rms} (A)	I _{rms} (%)	Limit I _{rms} (A)	Result	
1	1	1	318.036E-3	99.865			
		2	499.181E-6	0.157		PASS	
		3	13.949E-3	4.380	29.59	PASS	
		4	1.918E-3	0.602		PASS	
		5	5.805E-3	1.823	10.00	PASS	
		6	723.647E-6	0.227		PASS	
		7	2.709E-3	0.851		PASS	
		8	709.586E-6	0.223		PASS	
		9	3.765E-3	1.182		PASS	
		10	700.611E-6	0.220		PASS	
		11	2.850E-3	0.895		PASS	
		12	774.818E-6	0.243		PASS	
		13	3.716E-3	1.167		PASS	
		14	711.377E-6	0.223		PASS	
		15	3.608E-3	1.133		PASS	
		16	677.766E-6	0.213		PASS	
		17	3.442E-3	1.081		PASS	
		18	992.941E-6	0.312		PASS	
		19	2.469E-3	0.775		PASS	
		20	667.960E-6	0.210		PASS	
		21	3.068E-3	0.963		PASS	
		22	942.071E-6	0.296		PASS	
		23	1.783E-3	0.560		PASS	
		24	724.117E-6	0.227		PASS	
		25	1.506E-3	0.473		PASS	
		26	703.467E-6	0.221		PASS	
		27	1.264E-3	0.397		PASS	
		28	670.970E-6	0.211		PASS	
		29	1.061E-3	0.333		PASS	
		30	715.396E-6	0.225		PASS	
		31	2.192E-3	0.688		PASS	
		32	721.820E-6	0.227		PASS	
		33	1.545E-3	0.485		PASS	
		34	710.851E-6	0.223		PASS	
		35	1.704E-3	0.535		PASS	
		36	832.471E-6	0.261		PASS	
		37	783.151E-6	0.246		PASS	
		38	695.676E-6	0.218		PASS	
		39	1.088E-3	0.342		PASS	
		40	804.529E-6	0.253		PASS	

Note: Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

Note: Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

		9.11 Flicker	
Date:	29.08.2018		
Ports:	AC power		
Method:	LVS EN 61000-3-3:2013		

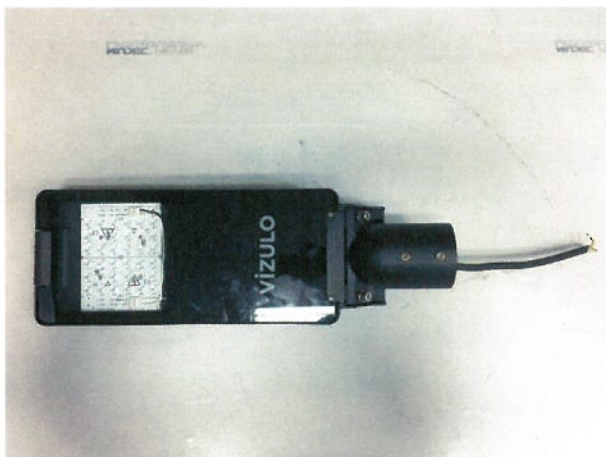
<u>Mode 1.</u>	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.015	4.00	PASS
dt [s]	0.000	0.50	PASS

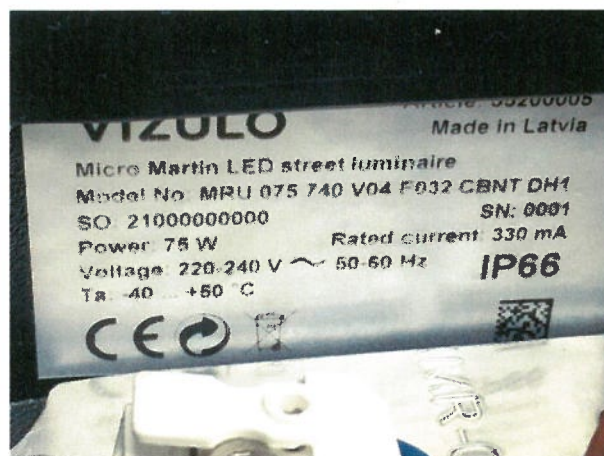
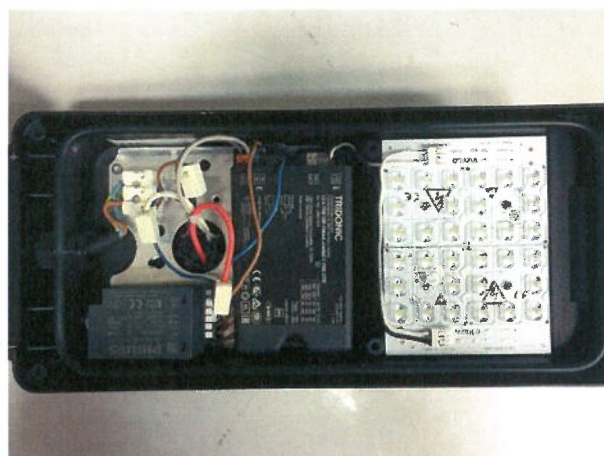
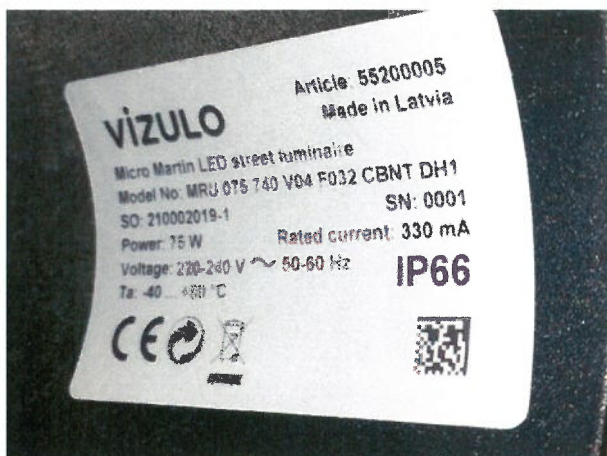
[illegible]

The test results correspond to sample only This test report shall not be reproduced except in full without the written approval.

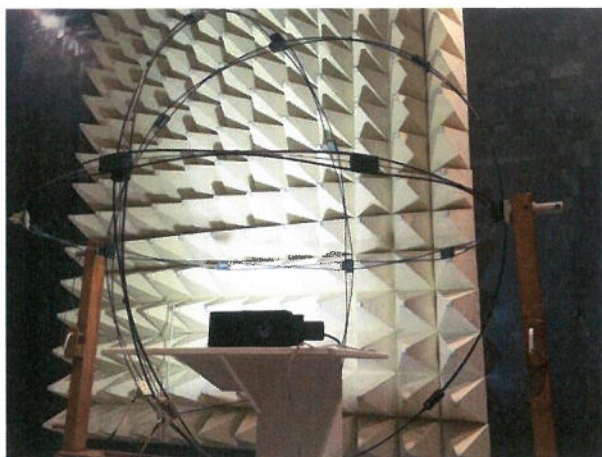
10. TEST PHOTOGRAPHS

EUT-equipment under test:





Radiated emissions (9kHz-30MHz):



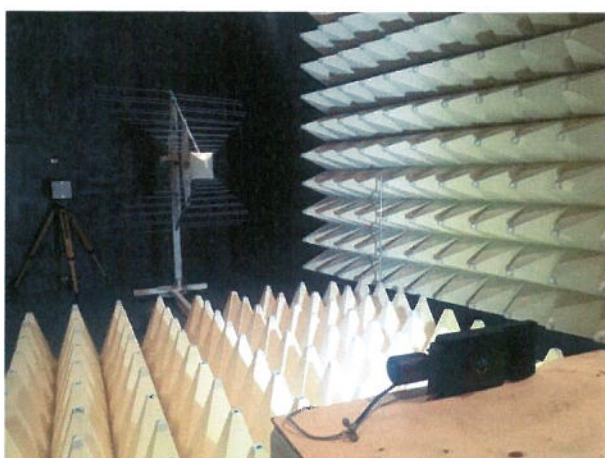
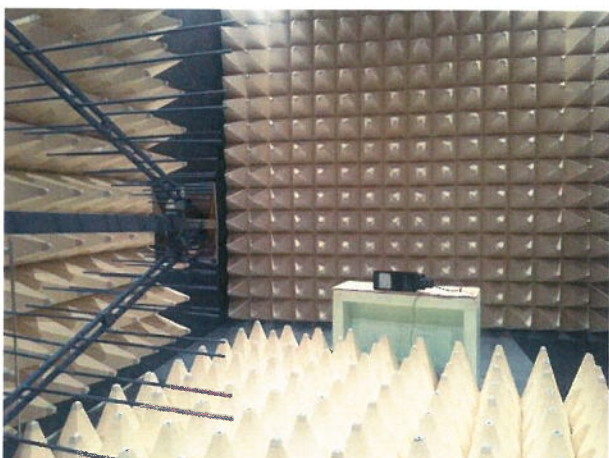
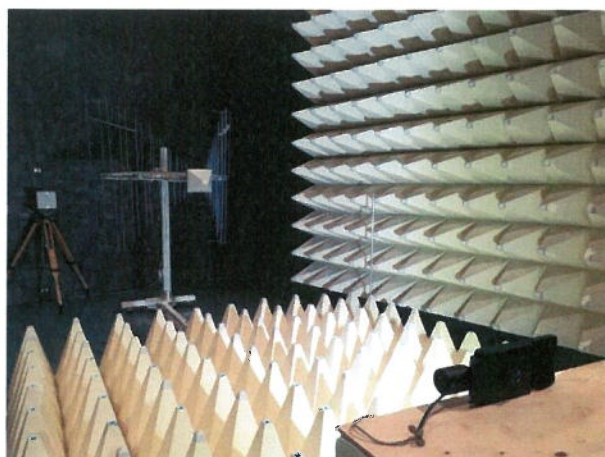
Radiated emissions (30MHz-1GHz):



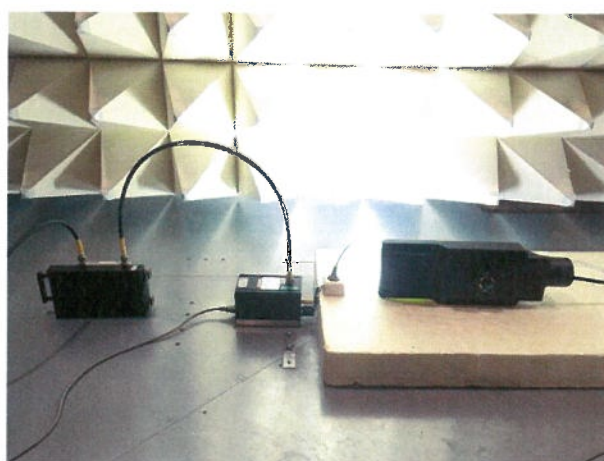
Conducted emissions:



Radio frequency radiated electromagnetic field immunity:



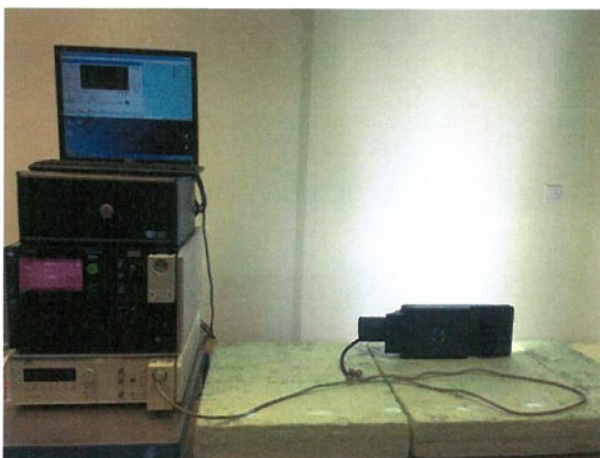
Radio frequency common mode immunity:



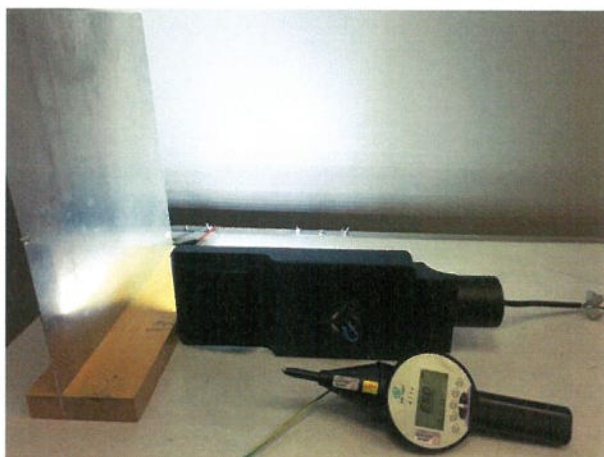
EFT/Burst immunity, voltage dips/interruptions immunity:

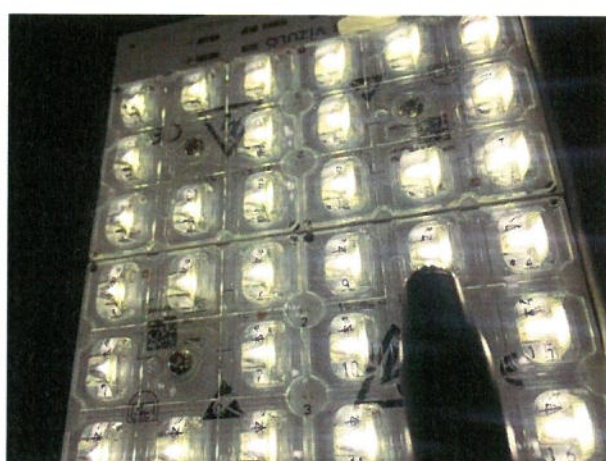
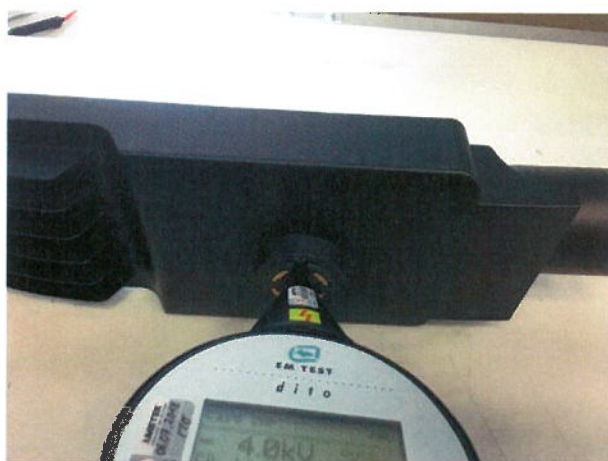


Surge:



ESD:





Harmonic current emissions/ Flicker:



Power frequency magnetic field immunity:

