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OSCONIQ® S 3030 White (CCT 2700 K – 6500 K)

ANSI/IES LM-80-15 Test Report

Test Documentation No.: 190151W8 (Document no. OSRM040-1-A2-180) - 18th Mar 2020





LM80 13000 Hour Interval Test Report

IES LM-80-15 Approved Method for Measuring Lumen
Maintenance of LED Light Sources

CSA Group Report: OSRM040-1-A2-180

February 14, 2020

Manufacturer: **OSRAM**

Models tested: **GW QSLR31.EM**
OSCONIQ S 3030

Test conditions: 24 devices @ 55.0 C, 0.150 A
24 devices @ 85.0 C, 0.150 A
24 devices @ 105.0 C, 0.150 A

Prepared for:
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1.0 Statement of test conditions, summary of results, and reporting requirements:

Part number: GW QSLR31.EM					
Life test conditions				Summary of results	
Test condition	Drive current (A)	Case temperature (°C)	Elapsed life test time (hrs)	Average lumen maintenance (%)	Average chromaticity shift ($\Delta u'v'$)
TC1	0.150	55	13000	98.9	0.0005
TC2	0.150	85	13000	96.4	0.0012
TC3	0.150	105	13000	91.8	0.0029
LM80-15 Reporting requirements					
1. Number of samples tested:			24 per test condition		
2. Description of LED light sources			LED Package ¹		
3. Description of auxiliary equipment			see section 6.1 below		
4. Operating cycle			LED packages are driven at constant current for life test and are pulsed for photometric test.		
5. Ambient conditions, airflow, relative humidity			LED's are operated on controlled thermal plates in an environment that complies with the requirements given in Section 4.4 of LM80-15. Case temperature (Ts): controlled to within -2°C, Surrounding air temp: controlled to within -5°C of Ts, Humidity: < 65 RH, No forced air flow		
6. Case temperature (test point temperature)			See summary table above for test conditions. The temperature measurement point is shown in Sec. 6.3.		
7. Drive current during life test			see summary table above		
8. Initial luminous flux and forward voltage			see data tables for individual test conditions		
9. Lumen maintenance data for each individual LED light source			see data tables for individual test conditions		
10. Observation of LED light source failures			see data tables for individual test conditions		
11. LED light source monitoring intervals			see data tables for individual test conditions		
12. Photometric measurement uncertainty			k=2 expanded measurement uncertainty for relative luminous flux measurements is $\pm 2.0\%$		
13. Chromaticity shift reported over the measurement time			see data tables for individual test conditions		
14. Test start date			August 14, 2018		
15. ANSI target and calculated CCT values			see data tables		

Notes:

- per ANSI/IESNA RP-16-05 Addendum b, *Nomenclature and Definitions for Illuminating Engineering*

TABLE 1.1 - Initial ANSI Target & Calculated CCT Results

GW QSLR31.EM

Load board ID	Device number	Zero hour measurements		Load board ID	Device number	Zero hour measurements		Load board ID	Device number	Zero hour measurements	
		ANSI Target* CCT (K)	Initial Calculated CCT (K)			ANSI Target* CCT (K)	Initial Calculated CCT (K)			ANSI Target* CCT (K)	Initial Calculated CCT (K)
6A00001067F5031C	D1	3465±245	3598	4A0000105087031C	D1	3465±245	3609	62000010698E031C	D1	3465±245	3541
	D2	3465±245	3666		D2	3465±245	3602		D2	3465±245	3634
	D3	3465±245	3618		D3	3465±245	3594		D3	3465±245	3586
	D4	3465±245	3604		D4	3465±245	3620		D4	3465±245	3548
	D5	3465±245	3606		D5	3465±245	3602		D5	3465±245	3625
	D6	3465±245	3615		D6	3465±245	3614		D6	3465±245	3617
	D7	3465±245	3648		D7	3465±245	3602		D7	3465±245	3613
	D8	3465±245	3650		D8	3465±245	3591		D8	3465±245	3543
	D9	3465±245	3653		D9	3465±245	3606		D9	3465±245	3528
	D10	3465±245	3661		D10	3465±245	3646		D10	3465±245	3561
	D11	3465±245	3662		D11	3465±245	3617		D11	3465±245	3546
	D12	3465±245	3650		D12	3465±245	3600		D12	3465±245	3572
8500001057B6031C	D1	3465±245	3609	BA00001064A4031C	D1	3465±245	3607	F00000105877031C	D1	3465±245	3614
	D2	3465±245	3614		D2	3465±245	3614		D2	3465±245	3611
	D3	3465±245	3608		D3	3465±245	3606		D3	3465±245	3613
	D4	3465±245	3606		D4	3465±245	3637		D4	3465±245	3511
	D5	3465±245	3587		D5	3465±245	3596		D5	3465±245	3617
	D6	3465±245	3597		D6	3465±245	3608		D6	3465±245	3610
	D7	3465±245	3594		D7	3465±245	3619		D7	3465±245	3627
	D8	3465±245	3635		D8	3465±245	3609		D8	3465±245	3585
	D9	3465±245	3601		D9	3465±245	3607		D9	3465±245	3645
	D10	3465±245	3607		D10	3465±245	3612		D10	3465±245	3603
	D11	3465±245	3644		D11	3465±245	3604		D11	3465±245	3543
	D12	3465±245	3616		D12	3465±245	3615		D12	3465±245	3593

* target CCT as defined in ANSI C78.377-2008

Test Condition 1 55 °C 0.150 A														
TABLE 2.0 - LUMEN MAINTENANCE RESULTS														
Test Condition 1 55 °C 0.150 A														
Load board ID	Device number	Zero hour measurements		Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		Flux (lm)	Vf (V)	Lumen Maintenance (%)										
				3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
6A00001067F5031C	D1	144.35	6.23	99.9	99.7	99.9	99.6	99.4	99.3	99.1	99.1	99.0	98.7	98.8
	D2	140.81	6.24	100.4	100.3	100.4	100.1	99.9	99.8	99.5	99.7	99.6	99.2	99.2
	D3	143.95	6.23	100.0	99.9	100.1	99.8	99.7	99.6	99.3	99.5	99.3	99.0	99.1
	D4	144.22	6.28	99.9	99.8	100.0	99.7	99.5	99.4	99.1	99.2	99.0	98.7	98.7
	D5	143.93	6.21	99.9	99.7	99.9	99.7	99.5	99.5	99.2	99.3	99.1	98.8	98.8
	D6	144.09	6.23	99.8	99.8	99.9	99.7	99.6	99.5	99.2	99.3	99.2	98.9	98.9
	D7	143.17	6.25	99.9	99.7	99.9	99.6	99.4	99.3	99.0	99.2	99.1	98.7	98.7
	D8	142.86	6.24	99.9	99.8	99.9	99.7	99.5	99.4	99.1	99.3	99.2	98.8	98.9
	D9	143.42	6.25	100.2	100.1	100.2	100.1	100.0	100.0	99.7	99.9	99.7	99.4	99.4
	D10	143.56	6.24	99.8	99.7	99.9	99.5	99.4	99.3	99.1	99.2	99.1	98.8	98.8
	D11	142.42	6.28	99.9	99.8	100.0	99.7	99.4	99.4	99.1	99.3	99.1	98.8	98.9
	D12	142.89	6.25	99.9	99.7	99.8	99.5	99.3	99.2	98.9	99.0	98.9	98.5	98.5
8500001057B6031C	D1	142.49	6.24	100.0	99.9	100.0	99.7	99.6	99.4	99.2	99.3	99.2	98.8	98.8
	D2	143.26	6.23	99.9	99.8	99.9	99.7	99.5	99.3	99.0	99.2	99.0	98.6	98.7
	D3	143.75	6.24	99.9	99.8	99.9	99.7	99.5	99.4	99.0	99.2	99.1	98.7	98.7
	D4	142.92	6.23	99.9	99.9	100.0	99.7	99.5	99.3	99.0	99.1	99.0	98.6	98.5
	D5	143.53	6.24	100.0	99.9	100.0	99.8	99.6	99.5	99.2	99.4	99.2	98.9	98.9
	D6	143.46	6.25	100.1	100.1	100.2	100.0	99.9	99.8	99.6	99.8	99.7	99.4	99.4
	D7	142.98	6.23	100.1	100.0	100.2	100.0	99.8	99.8	99.5	99.7	99.6	99.3	99.3
	D8	142.28	6.25	99.9	99.9	100.0	99.8	99.6	99.5	99.2	99.3	99.2	98.8	98.9
	D9	144.76	6.27	99.9	99.8	99.9	99.6	99.4	99.3	99.0	99.1	99.0	98.6	98.7
	D10	144.25	6.24	99.9	99.8	99.9	99.6	99.4	99.2	98.9	99.1	99.0	98.6	98.6
	D11	144.76	6.25	99.9	99.9	99.9	99.7	99.4	99.3	99.0	99.2	99.1	98.7	98.7
	D12	145.12	6.23	99.8	99.8	99.9	99.6	99.4	99.3	99.1	99.3	99.1	98.8	98.8
n mean median std. dev. min max				24	24	24	24	24	24	24	24	24	24	24
				100.0	99.9	100.0	99.7	99.5	99.5	99.2	99.3	99.2	98.8	98.9
				99.9	99.8	99.9	99.7	99.5	99.4	99.1	99.3	99.1	98.8	98.8
				0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
				99.8	99.7	99.8	99.5	99.3	99.2	98.9	99.0	98.9	98.5	98.5
				100.4	100.3	100.4	100.1	100.0	100.0	99.7	99.9	99.7	99.4	99.4

Test Condition 1 55 °C 0.150 A															
TABLE 2.1 - CHROMATICITY SHIFT RESULTS															
Test Condition 1 55 °C 0.150 A															
Load board ID	Device number	Zero hour measurements			Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		u'	v'		Chromaticity shift ($\Delta u'v'$)										
					3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
6A00001067F5031C	D1	0.2328	0.5109		0.0002	0.0002	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0004	0.0004	0.0005
	D2	0.2323	0.5066		0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	D3	0.2325	0.5101		0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	D4	0.2328	0.5103		0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005
	D5	0.2325	0.5110		0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0003	0.0004	0.0005
	D6	0.2322	0.5109		0.0003	0.0002	0.0002	0.0002	0.0003	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004
	D7	0.2328	0.5069		0.0003	0.0002	0.0002	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006
	D8	0.2328	0.5067		0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	D9	0.2320	0.5085		0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0003	0.0004	0.0004	0.0003	0.0004
	D10	0.2321	0.5076		0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0005	0.0004	0.0005	0.0005
	D11	0.2328	0.5056		0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005
	D12	0.2328	0.5065		0.0002	0.0002	0.0002	0.0003	0.0004	0.0005	0.0005	0.0006	0.0005	0.0006	0.0006
8500001057B6031C	D1	0.2339	0.5070		0.0003	0.0002	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006
	D2	0.2334	0.5080		0.0002	0.0002	0.0003	0.0003	0.0004	0.0005	0.0004	0.0004	0.0004	0.0004	0.0005
	D3	0.2330	0.5093		0.0002	0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006
	D4	0.2336	0.5081		0.0002	0.0002	0.0002	0.0003	0.0004	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006
	D5	0.2339	0.5088		0.0002	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0004	0.0004	0.0005
	D6	0.2333	0.5094		0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004
	D7	0.2338	0.5085		0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004
	D8	0.2336	0.5058		0.0002	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005
	D9	0.2330	0.5099		0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0006
	D10	0.2331	0.5092		0.0002	0.0002	0.0002	0.0003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0004	0.0005
	D11	0.2322	0.5086		0.0002	0.0002	0.0003	0.0003	0.0004	0.0005	0.0004	0.0005	0.0005	0.0004	0.0005
	D12	0.2327	0.5096		0.0002	0.0002	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
n					24	24	24	24	24	24	24	24	24	24	24
mean					0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0004	0.0005	0.0005
median					0.0002	0.0002	0.0002	0.0003	0.0004	0.0004	0.0004	0.0005	0.0004	0.0004	0.0005
std. dev.					0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001
min					0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0003	0.0003	0.0004
max					0.0003	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0006	0.0005	0.0006	0.0006

Test Condition 1				55 °C		0.150 A								
TABLE 2.2 - FORWARD VOLTAGE MAINTENANCE RESULTS													GW QSLR31.EM	
Test Condition 1				55 °C		0.150 A								
Load board ID	Device number	Zero hour measurements		Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		Vf (V)		Forward Voltage Maintainence (%)										
				3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
6A00001067F5031C	D1		6.23	99.68	99.67	99.73	99.71	99.80	99.76	99.74	99.78	99.78	99.79	99.80
	D2		6.24	99.68	99.67	99.69	99.72	99.75	99.74	99.76	99.77	99.79	99.82	99.83
	D3		6.23	99.64	99.67	99.70	99.73	99.73	99.74	99.76	99.78	99.77	99.81	99.81
	D4		6.28	99.59	99.61	99.63	99.64	99.69	99.69	99.73	99.72	99.74	99.77	99.78
	D5		6.21	99.75	99.75	99.77	99.78	99.80	99.79	99.82	99.82	99.81	99.82	99.84
	D6		6.23	99.56	99.59	99.62	99.64	99.67	99.68	99.73	99.76	99.76	99.77	99.78
	D7		6.25	99.68	99.71	99.70	99.73	99.75	99.75	99.79	99.81	99.80	99.82	99.86
	D8		6.24	99.66	99.66	99.70	99.69	99.70	99.71	99.72	99.78	99.78	99.79	99.82
	D9		6.25	99.67	99.69	99.71	99.71	99.75	99.74	99.76	99.78	99.78	99.81	99.82
	D10		6.24	99.64	99.65	99.69	99.73	99.73	99.74	99.75	99.75	99.79	99.79	99.83
	D11		6.28	99.60	99.62	99.63	99.67	99.68	99.71	99.72	99.75	99.78	99.77	99.80
	D12		6.25	99.66	99.68	99.70	99.73	99.74	99.76	99.75	99.80	99.79	99.81	99.85
8500001057B6031C	D1		6.24	99.69	99.70	99.71	99.73	99.78	99.71	99.77	99.81	99.80	99.79	99.83
	D2		6.23	99.70	99.74	99.78	99.80	99.78	99.79	99.82	99.84	99.84	99.86	99.87
	D3		6.24	99.75	99.76	99.78	99.80	99.84	99.83	99.87	99.86	99.89	99.89	99.91
	D4		6.23	99.63	99.64	99.69	99.67	99.69	99.71	99.72	99.77	99.78	99.76	99.81
	D5		6.24	99.59	99.64	99.62	99.65	99.66	99.69	99.72	99.72	99.73	99.74	99.78
	D6		6.25	99.70	99.72	99.75	99.76	99.79	99.79	99.80	99.84	99.84	99.84	99.86
	D7		6.23	99.73	99.75	99.76	99.77	99.81	99.80	99.82	99.84	99.86	99.85	99.89
	D8		6.25	99.71	99.76	99.73	99.77	99.81	99.79	99.85	99.84	99.86	99.87	99.89
	D9		6.27	99.72	99.76	99.79	99.79	99.83	99.84	99.83	99.87	99.89	99.89	99.92
	D10		6.24	99.62	99.63	99.65	99.69	99.69	99.71	99.71	99.75	99.76	99.74	99.77
	D11		6.25	99.49	99.54	99.56	99.59	99.61	99.60	99.65	99.67	99.67	99.71	99.73
	D12		6.23	99.76	99.75	99.76	99.79	99.82	99.79	99.83	99.84	99.85	99.85	99.87
n				24	24	24	24	24	24	24	24	24	24	
mean				99.7	99.7	99.7	99.7	99.7	99.7	99.8	99.8	99.8	99.8	
median				99.7	99.7	99.7	99.7	99.7	99.7	99.8	99.8	99.8	99.8	
std. dev.				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	
min				99.5	99.5	99.6	99.6	99.6	99.6	99.7	99.7	99.7	99.7	
max				99.8	99.8	99.8	99.8	99.8	99.8	99.9	99.9	99.9	99.9	

Test Condition 2 85 °C 0.150 A														
TABLE 3.0 - LUMEN MAINTENANCE RESULTS														GW QSLR31.EM
Test Condition 2 85 °C 0.150 A														
Load board ID	Device number	Zero hour measurements		Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		Flux (lm)	Vf (V)	Lumen Maintenance (%)										
				3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
4A0000105087031C	D1	143.51	6.27	99.2	98.6	98.4	97.8	97.5	97.4	97.1	96.9	96.6	96.2	96.1
	D2	142.15	6.26	99.1	98.7	98.5	98.1	98.0	98.1	98.0	98.1	97.9	97.6	97.4
	D3	143.36	6.25	99.2	98.8	98.7	98.4	98.2	98.2	98.1	98.0	97.9	97.6	97.4
	D4	143.62	6.24	98.8	98.4	98.2	97.7	97.5	97.4	97.3	97.1	97.0	96.6	96.5
	D5	143.86	6.26	98.9	98.5	98.3	97.9	97.7	97.6	97.4	97.3	97.2	96.8	96.8
	D6	143.09	6.24	99.1	98.6	98.4	98.1	97.9	97.9	97.7	97.6	97.4	97.1	96.9
	D7	142.85	6.25	98.9	98.4	98.2	97.9	97.7	97.7	97.6	97.7	97.6	97.3	97.2
	D8	143.02	6.24	98.9	98.4	98.2	97.9	97.7	97.6	97.5	97.4	97.3	96.9	96.9
	D9	143.76	6.26	98.7	98.0	97.5	96.8	96.4	96.0	95.5	95.0	94.6	94.1	93.8
	D10	144.13	6.23	98.8	98.3	98.1	97.6	97.4	97.2	96.8	96.4	96.0	95.4	95.2
	D11	143.36	6.23	98.9	98.5	98.3	97.9	97.7	97.7	97.4	97.2	96.9	96.4	96.0
	D12	144.26	6.25	98.9	98.5	98.3	98.0	97.8	97.7	97.6	97.7	97.5	97.3	97.1
BA00001064A4031C	D1	143.77	6.26	98.9	98.4	98.1	97.7	97.4	97.3	97.0	96.9	96.6	96.2	96.0
	D2	143.20	6.23	98.8	98.3	98.1	97.6	97.3	97.1	96.7	96.4	96.0	95.6	95.4
	D3	145.66	6.23	98.5	98.2	98.1	97.8	97.7	97.6	97.3	97.2	96.8	96.4	96.0
	D4	143.47	6.25	99.3	98.9	98.5	98.2	98.0	97.8	97.5	97.4	97.0	96.7	96.5
	D5	144.39	6.25	98.8	98.4	98.2	97.8	97.7	97.6	97.3	97.2	96.9	96.4	96.1
	D6	143.57	6.22	99.0	98.7	98.4	98.0	97.8	97.7	97.4	97.2	96.9	96.4	96.2
	D7	144.80	6.22	99.1	98.8	98.5	98.1	98.0	97.8	97.4	97.3	97.1	96.7	96.5
	D8	144.79	6.24	98.7	98.3	98.0	97.6	97.4	97.4	97.2	97.3	97.2	97.0	96.9
	D9	144.82	6.26	99.1	98.7	98.4	97.8	97.6	97.4	97.1	97.0	97.0	96.6	96.5
	D10	144.64	6.23	98.9	98.5	98.3	98.0	97.8	97.7	97.5	97.4	97.2	96.7	96.6
	D11	145.38	6.23	99.1	98.8	98.6	98.3	98.2	98.2	98.0	98.2	98.2	98.0	97.9
	D12	145.33	6.23	98.5	98.2	98.0	97.6	97.5	97.4	97.2	97.3	97.1	96.9	96.8
n mean median std. dev. min max				24	24	24	24	24	24	24	24	24	24	24
				98.9	98.5	98.3	97.9	97.7	97.6	97.3	97.2	97.0	96.6	96.4
				98.9	98.5	98.3	97.9	97.7	97.6	97.4	97.3	97.0	96.7	96.5
				0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.8
				98.5	98.0	97.5	96.8	96.4	96.0	95.5	95.0	94.6	94.1	93.8
				99.3	98.9	98.7	98.4	98.2	98.2	98.1	98.2	98.2	98.0	97.9

Test Condition 2 85 °C 0.150 A															
TABLE 3.1 - CHROMATICITY SHIFT RESULTS															
Test Condition 2 85 °C 0.150 A															
Load board ID	Device number	Zero hour measurements			Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		u'	v'		Chromaticity shift ($\Delta u'v'$)										
					3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
4A0000105087031C	D1	0.2331	0.5092		0.0003	0.0005	0.0006	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0015	0.0015
	D2	0.2339	0.5074		0.0003	0.0004	0.0005	0.0006	0.0006	0.0006	0.0007	0.0007	0.0007	0.0008	0.0009
	D3	0.2333	0.5097		0.0003	0.0004	0.0005	0.0005	0.0006	0.0006	0.0006	0.0007	0.0007	0.0008	0.0009
	D4	0.2333	0.5076		0.0005	0.0006	0.0008	0.0009	0.0011	0.0011	0.0011	0.0012	0.0013	0.0014	0.0014
	D5	0.2330	0.5099		0.0003	0.0004	0.0005	0.0006	0.0007	0.0007	0.0008	0.0009	0.0009	0.0011	0.0011
	D6	0.2331	0.5087		0.0002	0.0003	0.0005	0.0005	0.0006	0.0007	0.0007	0.0007	0.0008	0.0009	0.0010
	D7	0.2337	0.5081		0.0004	0.0005	0.0007	0.0008	0.0009	0.0009	0.0009	0.0010	0.0010	0.0010	0.0011
	D8	0.2341	0.5081		0.0004	0.0004	0.0006	0.0007	0.0008	0.0009	0.0009	0.0009	0.0010	0.0011	0.0011
	D9	0.2331	0.5093		0.0003	0.0005	0.0007	0.0010	0.0012	0.0014	0.0015	0.0018	0.0019	0.0021	0.0022
	D10	0.2326	0.5075		0.0004	0.0005	0.0007	0.0008	0.0009	0.0010	0.0012	0.0014	0.0015	0.0017	0.0018
	D11	0.2334	0.5077		0.0003	0.0004	0.0006	0.0007	0.0007	0.0008	0.0009	0.0010	0.0010	0.0012	0.0014
	D12	0.2331	0.5099		0.0003	0.0004	0.0005	0.0006	0.0007	0.0007	0.0007	0.0007	0.0008	0.0009	0.0009
BA00001064A4031C	D1	0.2326	0.5105		0.0004	0.0005	0.0006	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0014	0.0015
	D2	0.2324	0.5106		0.0003	0.0004	0.0006	0.0007	0.0009	0.0010	0.0011	0.0013	0.0014	0.0015	0.0016
	D3	0.2326	0.5106		0.0004	0.0005	0.0006	0.0007	0.0008	0.0008	0.0009	0.0010	0.0011	0.0012	0.0014
	D4	0.2314	0.5114		0.0002	0.0002	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012
	D5	0.2327	0.5112		0.0003	0.0004	0.0005	0.0006	0.0007	0.0007	0.0008	0.0008	0.0010	0.0011	0.0013
	D6	0.2326	0.5106		0.0003	0.0004	0.0004	0.0005	0.0007	0.0007	0.0008	0.0009	0.0010	0.0011	0.0013
	D7	0.2319	0.5116		0.0003	0.0003	0.0004	0.0005	0.0006	0.0007	0.0007	0.0008	0.0009	0.0010	0.0010
	D8	0.2327	0.5102		0.0004	0.0005	0.0006	0.0008	0.0009	0.0009	0.0010	0.0009	0.0010	0.0010	0.0011
	D9	0.2325	0.5107		0.0003	0.0004	0.0005	0.0007	0.0008	0.0008	0.0009	0.0010	0.0010	0.0010	0.0011
	D10	0.2327	0.5100		0.0004	0.0005	0.0006	0.0007	0.0008	0.0008	0.0008	0.0009	0.0010	0.0011	0.0012
	D11	0.2325	0.5109		0.0003	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006
	D12	0.2325	0.5100		0.0002	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007
n					24	24	24	24	24	24	24	24	24	24	24
mean					0.0003	0.0004	0.0005	0.0007	0.0008	0.0008	0.0009	0.0009	0.0010	0.0011	0.0012
median					0.0003	0.0004	0.0005	0.0007	0.0007	0.0008	0.0009	0.0009	0.0010	0.0011	0.0012
std. dev.					0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004
min					0.0002	0.0002	0.0003	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006
max					0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0015	0.0018	0.0019	0.0021	0.0022

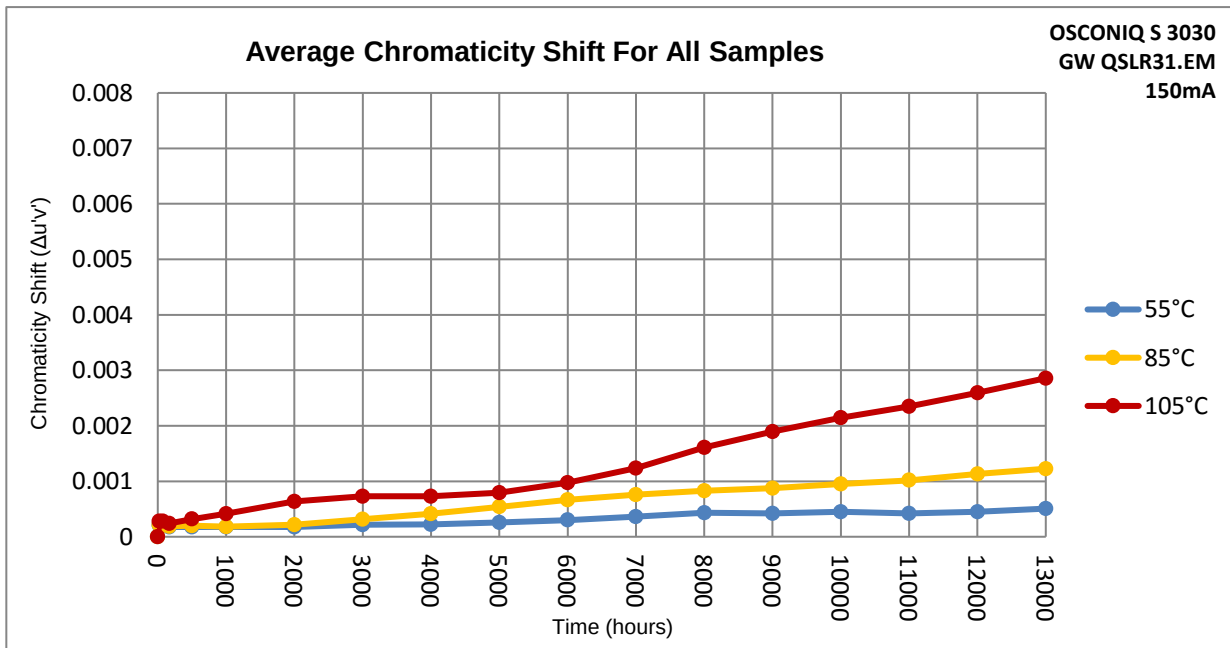
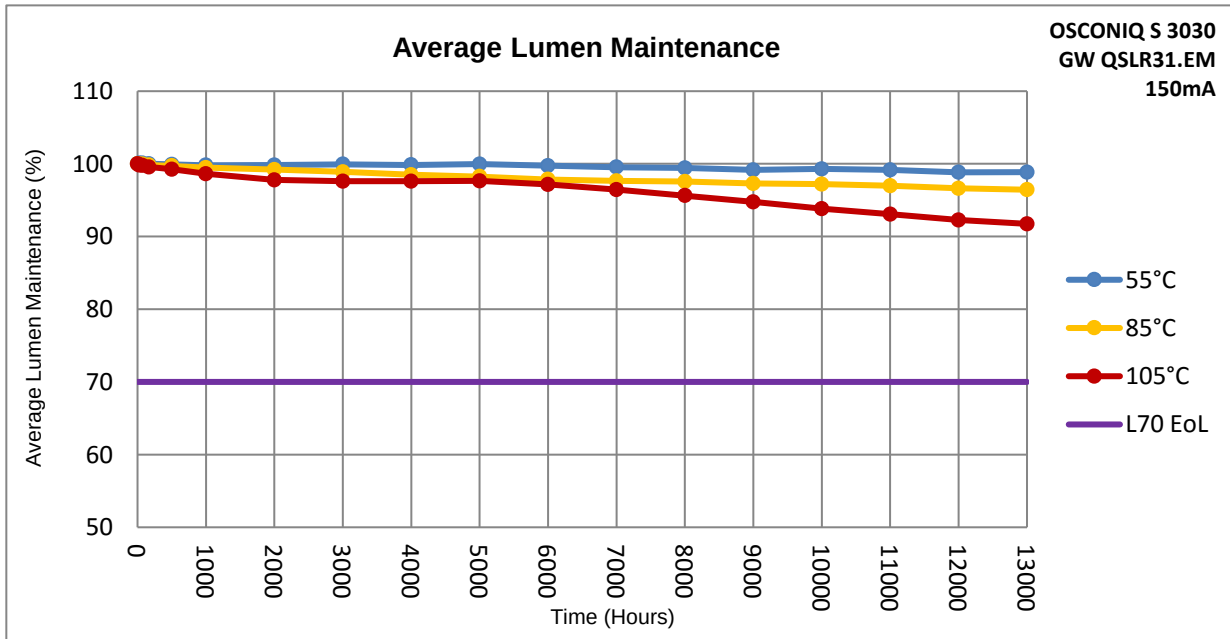
Test Condition 2 85 °C 0.150 A														
TABLE 3.2 - FORWARD VOLTAGE MAINTENANCE RESULTS														GW QSLR31.EM
Test Condition 2 85 °C 0.150 A														
Load board ID	Device number	Zero hour measurements		Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		Vf (V)		Forward Voltage Maintainence (%)										
				3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
4A0000105087031C	D1		6.27	99.73	99.79	99.87	99.93	99.95	99.93	100.05	100.08	100.09	100.11	100.15
	D2		6.26	99.89	99.93	100.00	100.04	100.08	100.07	100.13	100.18	100.19	100.21	100.21
	D3		6.25	99.96	99.99	100.03	100.11	100.14	100.13	100.20	100.21	100.21	100.22	100.30
	D4		6.24	99.89	99.92	99.97	100.02	100.05	100.04	100.10	100.11	100.14	100.13	100.17
	D5		6.26	100.07	100.17	100.24	100.32	100.36	100.45	100.51	100.61	100.64	100.68	100.77
	D6		6.24	99.86	99.88	99.94	99.99	100.05	100.07	100.09	100.10	100.15	100.14	100.20
	D7		6.25	99.90	99.93	100.00	100.04	100.08	100.09	100.11	100.15	100.16	100.22	100.22
	D8		6.24	99.80	99.84	99.88	99.95	100.01	100.03	100.07	100.06	100.10	100.14	100.16
	D9		6.26	99.85	99.92	99.97	100.00	100.01	100.08	100.12	100.12	100.16	100.18	100.19
	D10		6.23	99.87	99.91	99.95	99.99	100.04	100.07	100.12	100.09	100.16	100.16	100.17
	D11		6.23	99.87	99.92	99.97	99.98	100.03	100.06	100.09	100.13	100.07	100.15	100.17
	D12		6.25	99.90	99.94	100.00	100.04	100.10	100.11	100.16	100.18	100.19	100.21	100.23
BA00001064A4031C	D1		6.26	99.93	99.92	100.01	100.06	100.07	99.99	100.12	100.19	100.19	100.23	100.20
	D2		6.23	99.82	99.85	99.97	100.02	100.04	100.05	100.14	100.17	100.18	100.21	100.21
	D3		6.23	99.94	99.97	100.06	100.10	100.10	100.09	100.16	100.17	100.18	100.21	100.21
	D4		6.25	99.75	99.81	99.86	99.91	99.95	100.00	100.04	100.09	100.06	100.07	100.11
	D5		6.25	99.88	99.93	100.01	100.06	100.09	100.13	100.13	100.15	100.18	100.23	100.24
	D6		6.22	99.91	99.96	99.99	100.04	100.04	100.04	100.09	100.10	100.13	100.14	100.17
	D7		6.22	99.85	99.91	99.95	99.99	100.01	100.01	100.06	100.08	100.10	100.11	100.10
	D8		6.24	99.84	99.88	99.94	99.99	100.00	100.05	100.06	100.08	100.09	100.13	100.12
	D9		6.26	99.76	99.84	99.89	99.93	99.97	100.04	100.04	100.09	100.13	100.14	100.16
	D10		6.23	99.76	99.81	99.85	99.90	99.94	99.95	100.00	100.03	100.05	100.07	100.08
	D11		6.23	99.86	99.93	99.95	99.98	100.02	100.03	100.06	100.08	100.11	100.14	100.19
	D12		6.23	99.78	99.81	99.90	99.90	99.97	100.00	100.01	100.04	100.05	100.10	100.12
n mean median std. dev. min max				24	24	24	24	24	24	24	24	24	24	24
				99.9	99.9	100.0	100.0	100.0	100.1	100.1	100.1	100.2	100.2	100.2
				99.9	99.9	100.0	100.0	100.0	100.1	100.1	100.1	100.1	100.1	100.2
				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
				99.7	99.8	99.9	99.9	99.9	99.9	100.0	100.0	100.1	100.1	100.1
				100.1	100.2	100.2	100.3	100.4	100.5	100.5	100.6	100.6	100.7	100.8

Test Condition 3 105 °C 0.150 A														
TABLE 4.0 - LUMEN MAINTENANCE RESULTS														GW QSLR31.EM
Test Condition 3 105 °C 0.150 A														
Load board ID	Device number	Zero hour measurements		Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		Flux (lm)	Vf (V)	Lumen Maintenance (%)										
				3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
62000010698E031C	D1	143.15	6.22	97.4	97.1	97.0	96.3	95.3	94.3	93.2	92.3	91.5	90.6	90.1
	D2	142.20	6.22	97.8	98.0	98.0	97.4	96.5	95.4	94.2	93.5	92.7	91.9	91.3
	D3	142.02	6.24	97.7	97.7	97.5	96.7	95.6	94.3	93.0	92.2	91.4	90.6	90.2
	D4	143.36	6.23	97.6	97.2	97.0	96.4	95.4	94.5	93.7	92.9	92.2	91.5	91.1
	D5	143.30	6.23	97.3	97.2	97.1	96.3	95.4	94.4	93.4	92.7	92.0	91.3	90.6
	D6	142.68	6.24	97.9	98.0	98.1	97.6	96.8	95.7	94.5	93.2	92.4	91.5	91.0
	D7	144.03	6.24	97.4	97.5	97.7	97.3	96.5	95.5	94.4	93.2	92.5	91.7	91.2
	D8	142.77	6.26	97.6	97.4	97.4	96.9	96.1	95.1	94.0	93.1	92.3	91.5	90.9
	D9	143.06	6.24	97.8	97.5	97.4	96.8	96.0	95.4	94.7	94.0	93.3	92.5	92.1
	D10	143.72	6.24	97.7	97.9	98.2	98.0	97.6	96.9	96.0	95.0	94.3	93.5	92.9
	D11	142.32	6.24	97.8	97.7	97.8	97.4	96.7	95.8	94.7	93.8	93.0	92.2	91.7
	D12	143.06	6.26	97.4	97.4	97.7	97.5	97.0	96.3	95.1	94.2	93.3	92.3	91.6
F00000105877031C	D1	143.86	6.24	97.5	97.6	97.6	97.2	96.6	96.0	95.4	94.3	93.5	92.7	92.1
	D2	140.32	6.25	97.9	98.2	98.5	98.3	97.8	97.2	96.6	95.5	94.8	94.0	93.5
	D3	143.55	6.25	97.7	97.9	98.0	97.7	97.2	96.6	96.0	95.2	94.4	93.7	93.2
	D4	145.19	6.23	97.9	97.9	97.9	97.5	96.8	96.2	95.6	94.7	94.0	93.2	92.7
	D5	142.18	6.27	97.5	97.2	96.9	96.1	95.2	94.5	93.8	93.4	92.9	92.3	91.9
	D6	142.88	6.26	97.9	98.2	98.4	98.0	97.4	96.5	95.6	94.1	93.1	92.1	91.4
	D7	141.72	6.24	98.1	98.4	98.5	98.3	97.8	97.4	96.7	95.6	94.8	93.9	93.2
	D8	142.36	6.27	97.5	97.6	97.7	97.2	96.7	96.0	95.4	94.6	93.9	93.2	92.8
	D9	142.60	6.24	97.4	97.5	97.3	96.6	95.7	94.7	93.9	93.3	92.6	91.9	91.5
	D10	144.68	6.28	97.4	97.4	97.5	97.1	96.5	95.8	95.1	94.1	93.3	92.4	91.9
	D11	144.10	6.23	97.7	97.7	97.7	97.3	96.8	96.2	95.6	94.5	93.7	92.7	92.1
	D12	142.86	6.26	97.0	96.9	96.7	96.0	95.2	94.5	93.8	93.0	92.3	91.6	91.0
n mean median std. dev. min max				24	24	24	24	24	24	24	24	24	24	24
				97.6	97.6	97.6	97.2	96.4	95.6	94.8	93.8	93.1	92.3	91.8
				97.7	97.6	97.7	97.3	96.6	95.7	94.7	93.9	93.1	92.3	91.7
				0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.0	1.0	0.9	0.9
				97.0	96.9	96.7	96.0	95.2	94.3	93.0	92.2	91.4	90.6	90.1
				98.1	98.4	98.5	98.3	97.8	97.4	96.7	95.6	94.8	94.0	93.5

Test Condition 3 105 °C 0.150 A															
TABLE 4.1 - CHROMATICITY SHIFT RESULTS															GW QSLR31.EM
Test Condition 3 105 °C 0.150 A															
Load board ID	Device number	Zero hour measurements			Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		u'	v'		Chromaticity shift ($\Delta u'v'$)										
					3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000
62000010698E031C	D1	0.2341	0.5120		0.0006	0.0007	0.0008	0.0011	0.0015	0.0019	0.0022	0.0023	0.0026	0.0028	0.0031
	D2	0.2325	0.5088		0.0008	0.0007	0.0008	0.0010	0.0013	0.0018	0.0021	0.0022	0.0023	0.0025	0.0030
	D3	0.2344	0.5074		0.0009	0.0009	0.0010	0.0014	0.0019	0.0025	0.0030	0.0032	0.0033	0.0035	0.0036
	D4	0.2344	0.5106		0.0008	0.0009	0.0011	0.0014	0.0018	0.0021	0.0023	0.0025	0.0026	0.0028	0.0030
	D5	0.2330	0.5081		0.0009	0.0009	0.0011	0.0014	0.0018	0.0023	0.0026	0.0026	0.0027	0.0029	0.0034
	D6	0.2330	0.5087		0.0006	0.0005	0.0006	0.0007	0.0011	0.0015	0.0020	0.0023	0.0025	0.0027	0.0029
	D7	0.2329	0.5094		0.0007	0.0006	0.0006	0.0007	0.0010	0.0014	0.0018	0.0021	0.0023	0.0025	0.0027
	D8	0.2347	0.5104		0.0007	0.0008	0.0009	0.0011	0.0014	0.0019	0.0022	0.0023	0.0025	0.0027	0.0029
	D9	0.2350	0.5108		0.0007	0.0007	0.0008	0.0011	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026
	D10	0.2342	0.5102		0.0007	0.0006	0.0005	0.0005	0.0007	0.0010	0.0012	0.0015	0.0017	0.0019	0.0021
	D11	0.2344	0.5108		0.0006	0.0005	0.0006	0.0007	0.0010	0.0013	0.0017	0.0019	0.0021	0.0023	0.0025
	D12	0.2341	0.5096		0.0008	0.0007	0.0006	0.0007	0.0008	0.0012	0.0016	0.0018	0.0020	0.0023	0.0026
F00000105877031C	D1	0.2328	0.5096		0.0007	0.0007	0.0007	0.0009	0.0011	0.0014	0.0017	0.0021	0.0023	0.0026	0.0030
	D2	0.2334	0.5081		0.0009	0.0008	0.0008	0.0008	0.0010	0.0013	0.0015	0.0019	0.0021	0.0024	0.0027
	D3	0.2329	0.5094		0.0008	0.0008	0.0008	0.0009	0.0011	0.0014	0.0015	0.0019	0.0022	0.0025	0.0028
	D4	0.2344	0.5140		0.0004	0.0005	0.0005	0.0006	0.0008	0.0011	0.0013	0.0017	0.0019	0.0021	0.0024
	D5	0.2333	0.5081		0.0008	0.0010	0.0012	0.0015	0.0018	0.0022	0.0025	0.0025	0.0026	0.0027	0.0028
	D6	0.2333	0.5085		0.0007	0.0006	0.0006	0.0007	0.0010	0.0014	0.0017	0.0024	0.0027	0.0031	0.0035
	D7	0.2331	0.5077		0.0007	0.0006	0.0006	0.0007	0.0008	0.0011	0.0013	0.0017	0.0021	0.0024	0.0028
	D8	0.2341	0.5083		0.0007	0.0007	0.0007	0.0009	0.0011	0.0014	0.0017	0.0019	0.0021	0.0024	0.0025
	D9	0.2330	0.5065		0.0009	0.0011	0.0011	0.0015	0.0019	0.0023	0.0027	0.0027	0.0029	0.0031	0.0033
	D10	0.2329	0.5101		0.0007	0.0008	0.0008	0.0009	0.0010	0.0014	0.0017	0.0021	0.0024	0.0027	0.0028
	D11	0.2339	0.5124		0.0004	0.0005	0.0005	0.0006	0.0008	0.0010	0.0012	0.0016	0.0019	0.0021	0.0024
	D12	0.2343	0.5072		0.0010	0.0011	0.0012	0.0015	0.0017	0.0021	0.0022	0.0024	0.0026	0.0028	0.0032
n					24	24	24	24	24	24	24	24	24	24	24
mean					0.0007	0.0007	0.0008	0.0010	0.0012	0.0016	0.0019	0.0021	0.0024	0.0026	0.0029
median					0.0007	0.0007	0.0008	0.0009	0.0011	0.0014	0.0017	0.0021	0.0023	0.0026	0.0028
std. dev.					0.0001	0.0002	0.0002	0.0003	0.0004	0.0005	0.0005	0.0004	0.0004	0.0003	0.0004
min					0.0004	0.0005	0.0005	0.0005	0.0007	0.0010	0.0012	0.0015	0.0017	0.0019	0.0021
max					0.0010	0.0011	0.0012	0.0015	0.0019	0.0025	0.0030	0.0032	0.0033	0.0035	0.0036

Test Condition 3				105 °C		0.150 A								
TABLE 4.2 - FORWARD VOLTAGE MAINTENANCE RESULTS													GW QSLR31.EM	
Test Condition 3				105 °C		0.150 A								
Load board ID	Device number	Zero hour measurements		Photometric test drive current: 0.150 A Photometric test ambient temperature: 25 ± 2 °C Failures observed: none										
		Vf (V)	Forward Voltage Maintainence (%)											
			3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	
62000010698E031C	D1		6.22	100.04	100.09	100.12	100.15	100.15	100.12	100.20	100.23	100.22	100.43	100.58
	D2		6.22	100.03	100.09	100.14	100.17	100.18	100.17	100.23	100.27	100.25	100.30	100.30
	D3		6.24	100.07	100.14	100.17	100.24	100.24	100.25	100.30	100.29	100.30	100.35	100.33
	D4		6.23	100.06	100.14	100.20	100.24	100.23	100.28	100.31	100.31	100.33	100.36	100.37
	D5		6.23	100.02	100.07	100.12	100.18	100.17	100.23	100.28	100.25	100.29	100.33	100.33
	D6		6.24	100.08	100.16	100.20	100.24	100.25	100.29	100.32	100.34	100.35	100.36	100.40
	D7		6.24	100.08	100.16	100.22	100.26	100.27	100.31	100.34	100.36	100.38	100.39	100.42
	D8		6.26	100.50	100.73	100.97	101.20	101.38	101.52	101.63	101.76	101.84	101.91	101.99
	D9		6.24	100.07	100.16	100.19	100.25	100.27	100.30	100.29	100.35	100.33	100.37	100.41
	D10		6.24	100.22	100.31	100.39	100.47	100.50	100.55	100.61	100.64	100.62	100.71	100.73
	D11		6.24	100.15	100.23	100.28	100.33	100.38	100.38	100.42	100.42	100.43	100.47	100.45
	D12		6.26	100.13	100.18	100.24	100.31	100.33	100.37	100.39	100.42	100.43	100.46	100.51
F00000105877031C	D1		6.24	99.99	100.06	100.15	100.16	100.22	100.21	100.23	100.25	100.28	100.30	100.30
	D2		6.25	100.12	100.18	100.23	100.28	100.30	100.34	100.36	100.40	100.40	100.41	100.45
	D3		6.25	100.06	100.12	100.17	100.24	100.23	100.30	100.32	100.33	100.34	100.36	100.40
	D4		6.23	100.22	100.30	100.40	100.48	100.51	100.59	100.63	100.69	100.73	100.76	100.82
	D5		6.27	100.01	100.09	100.16	100.22	100.25	100.27	100.31	100.34	100.36	100.38	100.40
	D6		6.26	100.01	100.11	100.18	100.23	100.27	100.30	100.35	100.35	100.39	100.43	100.43
	D7		6.24	100.11	100.15	100.22	100.23	100.26	100.28	100.30	100.33	100.37	100.37	100.39
	D8		6.27	100.09	100.17	100.23	100.29	100.36	100.35	100.39	100.43	100.46	100.49	100.52
	D9		6.24	100.08	100.13	100.17	100.21	100.23	100.26	100.29	100.29	100.29	100.33	100.35
	D10		6.28	101.12	101.45	101.73	101.94	102.10	102.22	102.34	102.46	102.54	102.64	102.76
	D11		6.23	100.12	100.17	100.23	100.27	100.27	100.28	100.29	100.34	100.43	100.54	100.71
	D12		6.26	100.01	100.12	100.17	100.20	100.26	100.29	100.31	100.38	100.38	100.38	100.43
n				24	24	24	24	24	24	24	24	24	24	24
mean				100.1	100.2	100.3	100.4	100.4	100.4	100.5	100.5	100.5	100.6	100.6
median				100.1	100.2	100.2	100.2	100.3	100.3	100.3	100.3	100.4	100.4	100.4
std. dev.				0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6
min				100.0	100.1	100.1	100.1	100.1	100.1	100.2	100.2	100.2	100.3	100.3
max				101.1	101.4	101.7	101.9	102.1	102.2	102.3	102.5	102.5	102.6	102.8

5.0 Charts:



6.0 Additional Information

6.1 Auxilliary Equipment

Lifetest thermal chamber:	Orb Optronix Thermal Platform - resistive heating, liquid cooling, no forced air flow
Lifetest current source:	Orb Optronix 12-Channel Driver
Photometric test current source:	Keithley 2425
Photometric test thermal control:	Orb Optronix TEC-100
Spectrometer:	Instrument Systems, CAS 140CT
Integrating Sphere:	Gamma Scientific 20"
Photometric reference standards:	LabSphere SCL-50

6.2 Additional Test Information

6.3 Photographs

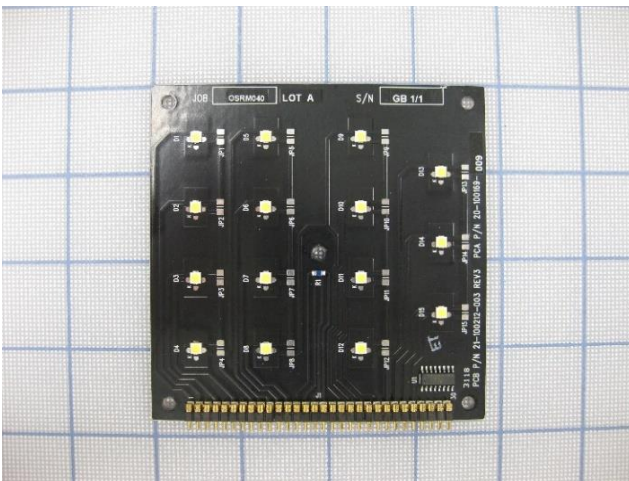


Fig. 1 Example load board populated with the OSCONIQ S 3030 type LED.

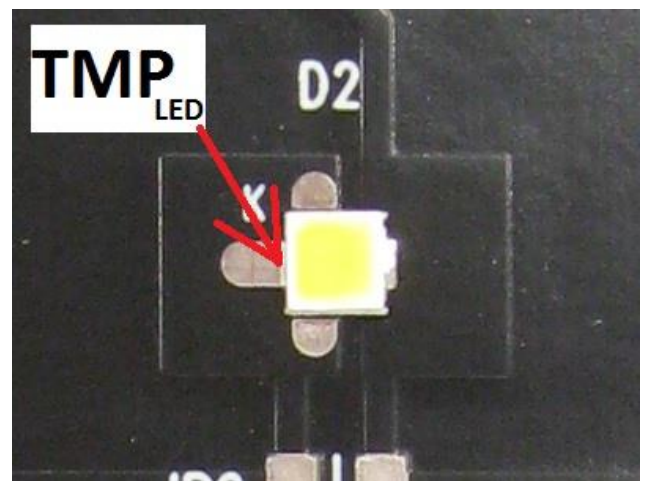


Fig. 2 OSCONIQ S 3030 type LED model GW QSLR31.EM and temperature measurement point.

6.4 Dimensional Drawing*

* all dimension in millimeters

This report alone may not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- END OF REPORT -

Appendix A: Energy Star® LM-80 Application

ENERGY STAR® LM-80 Cover Page

Administrative Information

Tested subcomponent series	OSCONIQ® S 3030
Tested subcomponent model number	GW QSLR31.EM
Report issue date	2020-03-18
Report revision date (if applicable)	Not Applicable
Testing start date	2018-08-14
Testing completion date	2020-02-14
DUT sampling method	According to ANSI/IES LM-80 Test Method

DUT Identification

DUT manufacturer's name	OSRAM Opto Semiconductors (Malaysia) Sdn. Bhd.
DUT identification	GW QSLR31.EM
Description of DUT	LED Package

DUT Characteristics

Total input power (W)	0.91
Average current density per LED die (mA/mm ²)	300
Average power density per LED package (W/mm ²)	0.10
Representative CRI (Ra) of the tested sample set	CRI80
Minimum die edge to die edge spacing (mm)	0.20

Appendix B: Lumen Maintenance Projection (IES TM-21-11)

For Information Only!

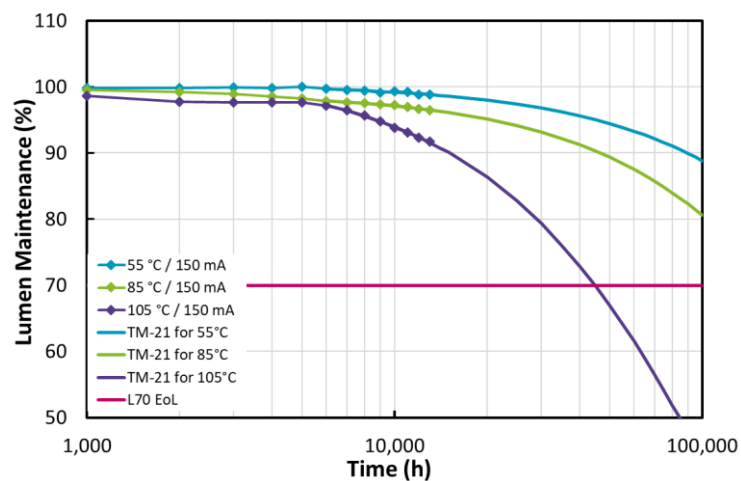
1. General Information

Description of LED light source tested	OSCONIQ® S 3030 GW QSLR31.EM
Sample size per temperature	24
LED drive current used in the test	150 mA
Test duration	13,000 hours
Test duration used for projection	6,000 hours to 13,000 hours

2. Projection Data

	I	II	III
Case temperature (solder point)	$T_s = 55\text{ °C}$	$T_s = 85\text{ °C}$	$T_s = 105\text{ °C}$
α	1.227E-06	2.072E-06	8.472E-06
B	1.004E+00	9.914E-01	1.023E+00
Reported L70	>78,000 hours	>78,000 hours	44,742 hours
Reported L90	>78,000 hours	46,681 hours	15,077 hours

3. Graphic chart



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Appendix C: Additional Models Covered By Testing

The 28 September 2017 *ENERGY STAR® Requirements for the Use of LM-80 Data* defines conditions for which a LM-80 report is applied to cover models that have not been directly tested.

The test results in this report applies to the following list of models:

- OSCONIQ® S 3030 GW QSLR31.EM with CCT 2700 K – 6500 K up to 150mA
- OSCONIQ® S 3030 GW QSLR31.PM with CCT 2700 K – 6500 K up to 150mA
- OSCONIQ® S 3030 GW QSLR31.CM with CCT 2700 K – 6500 K up to 150mA
- OSCONIQ® S 3030 GW QSLM31.EM with CCT 2700 K – 6500 K up to 300mA

Note: The devices are stressed and tested at average current density per LED die of 300mA/mm². This report can be referenced when the current employed in application is lower than the specified current of the respective devices as stated above.

Disclaimer

Please carefully read the below terms and conditions before using the Information.
If you do not agree with any of these terms and conditions, do not use the Information.

The Information contained in this document does not constitute an independent warranty. The committed behavior is described in the Product data sheet.

Further explanations:

Data: The Data used in this Document consider the reliability test results under the mentioned driving conditions only. For Product information on the maximum operating conditions please refer to the Product data sheet or contact your local sales partner.

Conditions: The conditions for the generation of the data are as follows:

1. The Data and curves shown in this Document are based on experiments carried out under laboratory conditions on a random sample size of LED with readouts at discrete readout times (where applicable). Thus, the Data above represent a limited number of production lots only and may differ between different assembly lots over time (including chip or package changes). Thus, the behavior of the LED in the final application may differ from the Data. The behavior of the LED at conditions or readout times deviating from those stated above may not be deduced from the Data.
2. For long term operation additional failure modes of the chip or package can occur which are not shown in this Document.
3. Possible differences in the thermal management of OSRAM OS and customer's setup may lead to a different aging behavior.
4. The lifetime projection data presented in this Document has been evaluated in accordance with the lifetime extrapolation method described and defined in IES TM-21-11. The lifetime projection is based on the Data shown in this Document. The Data had been collected and assembled according to IES LM-80-15.

END OF DOCUMENT

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