Great One Global Certification Co., Ltd.
9F-2, No. 120, Qiaohe Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)
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Lumen Maintenance of LED Light Source Test Report

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

Standard used :	IESNA LM-80 Approved Method for Measuring Lumen Maintenance of LED Light Sources
Date of test :	June 8, 2015 to October 10, 2016
Date of issue :	October 20, 2016
Report number :	GO1604210101-2

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Joint IAF-ILAC-ISO Communiqué on the Management Systems Requirements of ISO/IEC 17025:2005, General requirements for the competence of testing and calibration laboratories

A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid test results and calibrations. The **management system requirements** in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 **Quality Management Systems — Requirements** and are aligned with its pertinent requirements.

IAF Chair	ILAC Chair	ISO Secretary General

January 2009

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Joint ISO-ILAC-IAF Communiqué **8 January 2009**

ILAC members will be aware that many of their accredited laboratories have been experiencing difficulty convincing their customers they should be asking laboratories to be accredited to ISO/IEC 17025, (prior to 1999 ISO Guide 25) rather than be certified (registered) to ISO 9001. The situation became more acute with the publication of ISO 9001:2008, as some customers continually asked laboratories to be certified, when they really meant accredited. The confusion is caused by the perception that accredited laboratories do not operate a recognised quality management system.

To address this problem the ILAC Laboratory Committee asked that a statement be put on accreditation (attestation) certificates, issued by their accreditation body, stating that an accredited laboratory's management system meets the principles of ISO 9001:2008. The same statement could also be used by accredited laboratories on their calibration certificates and test reports.

Working through the ISO-ILAC-IAF Joint Working Group (JWG), ILAC is pleased to be able to advise it's member accreditation bodies that the problem raised by the Laboratory Committee may now be addressed as follows:-

On accreditation (attestation) certificates, accreditation bodies may add the following:

"This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)"

Accreditation Bodies choosing to use the above statement on their accreditation certificates should either supply, or provide access to (via a website), the Joint ISO-ILAC-IAF Communiqué as part of the package. (It may be convenient for accreditation bodies to do this when they issue new accreditation certificates for ISO/IEC 17025:2005 to their accredited laboratories.)

Accredited laboratories choosing to use the above statement on their test reports and calibration certificates should also either supply, or provide access to (via a website), the Joint ISO-ILAC-IAF Communiqué as part of the package for their laboratory customers.

The Joint Communiqué is available on the ILAC website at www.ilac.org on the publications and resources page.

The ILAC Laboratory Committee thanks the members of the ILAC and IAF Executive Committees and the ISO-ILAC-IAF JWG, for developing a solution to a critical market issue facing some accredited laboratories.

Daniel Pierre, ILAC Chair

www.GO-SAFETY.com.tw

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ACCREDITED Testing Laboratory

TEST REPORT
Lumen Maintenance of LED Light Sources

Report number. .....:	GO1604210101-2	
Date of issue .....:	October 20, 2016	
Tested by (printed name and signature).....:	Donald Chang	*Donald Chang*
Reported by (printed name and signature).....:	Donald Chang	*Donald Chang*
Approved by (printed name and signature) .....:	David Yuan	*David Yuan*
Testing laboratory.....:	Great One Global Certification Co., Ltd.	
Address.....:	9F-2, No. 120, Qiaohe Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)	
Applicant's name.....:	Bridgelux Inc.	
Address.....:	101 Portola Avenue, Livermore, CA 94551 USA	
Standard used.....:	IESNA LM-80-15 Approved Method for Measuring Lumen Maintenance of LED Light Sources	
Brand name.....:	bridgelux.	
Test item description ..... :		
Product Name .....:	LED Package	
Model/Type reference .....:	BXEN-27E-13H-9A	
Classification.....:	Package	
Ratings.....:	9 Vdc, 100 mA, 1 W	

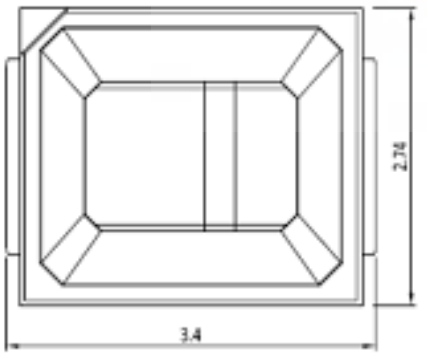
1. The test results of this report relate only to the tested sample identified in this report.
2. This report shall not be reproduced, in full or in portion, except for having written approval from Great One Global Certification Co., Ltd.
3. The data in report cannot be used for advertisement, publication and promotion.

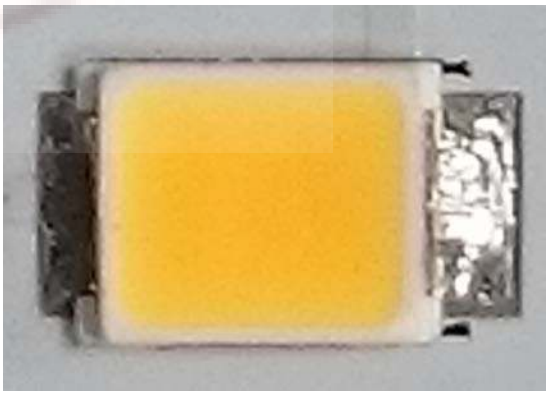
Summary of testing:

Tests performed	**Testing location:**
The test samples were configured for continuous emission and powered by 100 mA constant current. The LED input power was measured under normal conditions noted in details of measurement procedure and measurement results. Measurement results: **See Appendix A.**	Great One Global Certification Co., Ltd. **Address:** 9F-2, No.120, Qiaohe Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)

Testing.....:	
Date of receipt of test item.....:	June 8, 2015
Date(s) of performance of tests.....:	June 8, 2015 to October 10, 2016
Number of LED light sources tested .....:	25 pcs per case temperature
Test duration.....:	10,000 hrs
Operating cycle.....:	Constant direct current
Air flow.....:	< 0.1 m/s
Relative humidity .....:	< 45%
Photometric measurement uncertainty	
Flux measurement .....:	2.2 % (k=2)
CCT measurement.....:	0.48 % (k=2)

General product information:





Description of model series:

Tests conducted on Model: BXEN-27E-13H-9A series are considered representative of two model series BXEN- (A)(B)–13H-9A and BXEN- (A)(B)–13H-9B, see Appendix C for details.
.

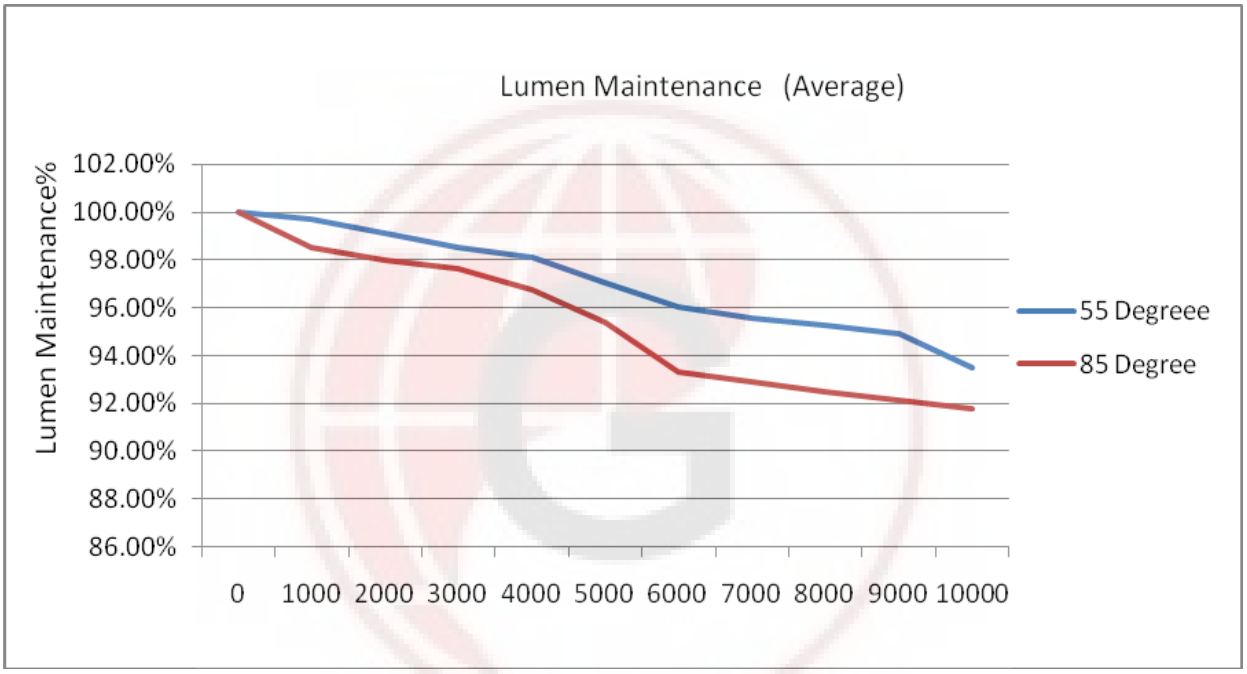
BXEN - (A) (B) – 13 H- 9 (C)

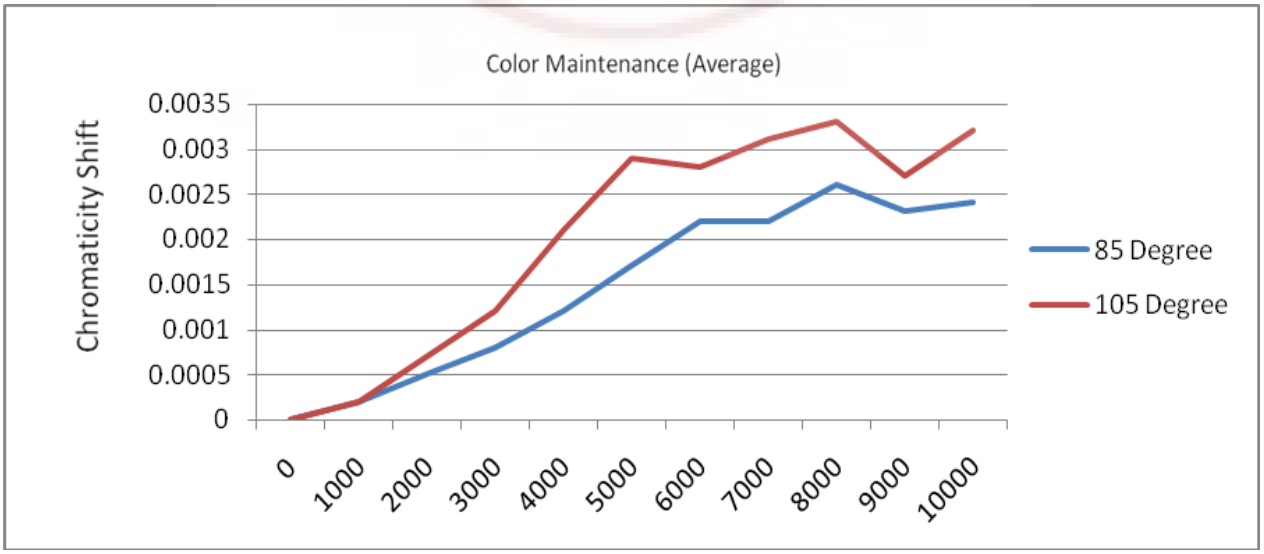
(A): CCT variation, can be 27 for 2700 K, 30 for 3000 K, 35 for 3500 K, 40 for 4000 K, 45 for 4500K, 50 for 5000K, 57 for 5700K, 65 for 6500 K.
(B): CRI variation, can be C for 70, E for 80, G for 90.
(C): Lead frame structure dimension variation, can be A~Z.

Device under test is LED package with model number: BXEN-27E-13H-9A, Nominal CCT 2700K CRI 80.

Summary of results

Data Set	Case Temperature[Ts]℃	Ambient Temperature [TA]℃	Drive Current [IF] mA	Lumen Maintenance at 9000 hrs	Chromaticity Shift (Δu'v') at 10,000 hrs	TM-21 Projection L70 (10,000 hrs)
1	85	>80	100	93.5 %	0.0024	56,000 hrs
2	105	>100	100	91.8 %	0.0032	50,000 hrs





Observation of LED light sources failures, including the failure conditions and time of failure: No failure observed

~ End of Report ~

Appendix A

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

Report No. :	GO1604210101-2	Test Initiation Date :	2015-06-08
Model No. :	BXEN-27E-13H-9A	Test Completion Date :	2016-10-10
Tested By : Donald Chang			
Manufacturer's Name: Bridgelux Inc.			
Rated Voltage :	9 V	Temperature Selected by manufacturer:	105 ℃
Rated Current :	100 mA	Number of LED Light Sources tested:	25
Rated CCT	2700 K		

EQUIPMENT USED:

Inst. ID No.	Instrument Type	Function /Range	Pre Cal. Date	Cal. Date	Due Date
L401	LED current source 1(16 channel)	0~48 V dc, 0~5 A	2015/03/13	2016/03/28	2017/03/27
L402	LED current source 2(8 channel)	0~48 V dc, 0~5 A	2015/03/13	2016/03/28	2017/03/27
L403	Thermal Plate Controller	0℃ to 95℃	-	-	-
L404	Environment Oven	-	-	-	-
L405	PC Controller	-	-	-	-
L406 to L411	Temperature Data Recorder	0℃ to 300℃	2015/02/26	2016/02/23	2017/02/22
L412 to L418	Temperature Controller	0℃ to 300℃	2015/02/26	2016/02/23	2017/02/22
L419 to L420	Auxiliary Thermal Plate Controller 1 to 2	0℃ to 95℃	-	-	-
L238	Thermal Plate Cooler	0℃ to 95℃	-	-	-
L240	Integrating Sphere	0.5 M	-	-	-
L244	Standard Lamp	-	2015/01/02	2016/01/03	2017/01/02
L247	Digital CC & CV DC Power Supply	0~150Vdc,0~5A	2014/12/11	2015/11/27	2016/11/26

TEST SAMPLE IDENTIFICATION

Date Received	Data Set No.	Sample No.
2015-06-08	1	15060102-1 to 15060102-25
2015-06-08	2	15060102-26 to 15060102-50

Appendix A

TEST METHOD

The samples were tested according to the IES LM-80-2015. Lumen maintenance data for each individual LED light source along with median value, standard deviation, minimum and maximum lumen maintenance value for all of the LED light sources were recorded in the following table.

Temperature and Humidity

The two case temperatures, Ts, was 85 °C with a temperatures 105 °C selected by the manufacturer. The case temperature and drive current selected by the manufacturer represented their expectation for customers applications and was within their recommended operating temperature range. Case temperature was controlled to -2 °C during life testing. The temperature of the surrounding air was maintained to within -5 °C of the case temperature during testing.

Humidity was maintained to less the 65 RH throughout the life test.

Airflow was minimized (Air flow : < 0.1m/s) for proper light source starting and operation.

Photometry Measurement

For information on the photometry of the LED light source, see Reference 2.1.2, LM-79.

A Spectroradiometer and Integrating Sphere were used to measure correlated color temperature, chromaticity coordinates, and the luminous flux for each LED light sources. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 5 nm intervals over the range of 380 to 780 nm.

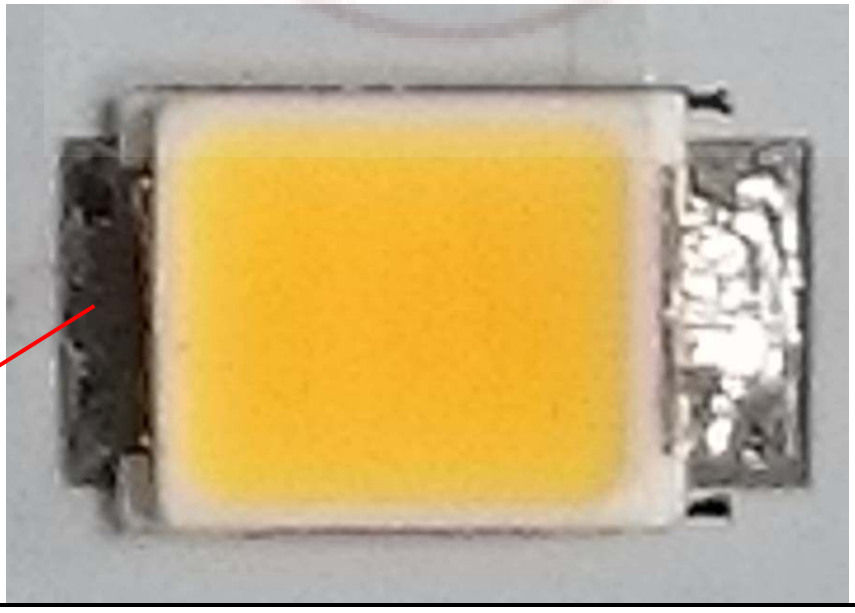
Luminous flux was measured at the drive current used during life testing.

The ambient temperature during lumen and chromaticity measurements was set to 25 °C +/- 2 °C.

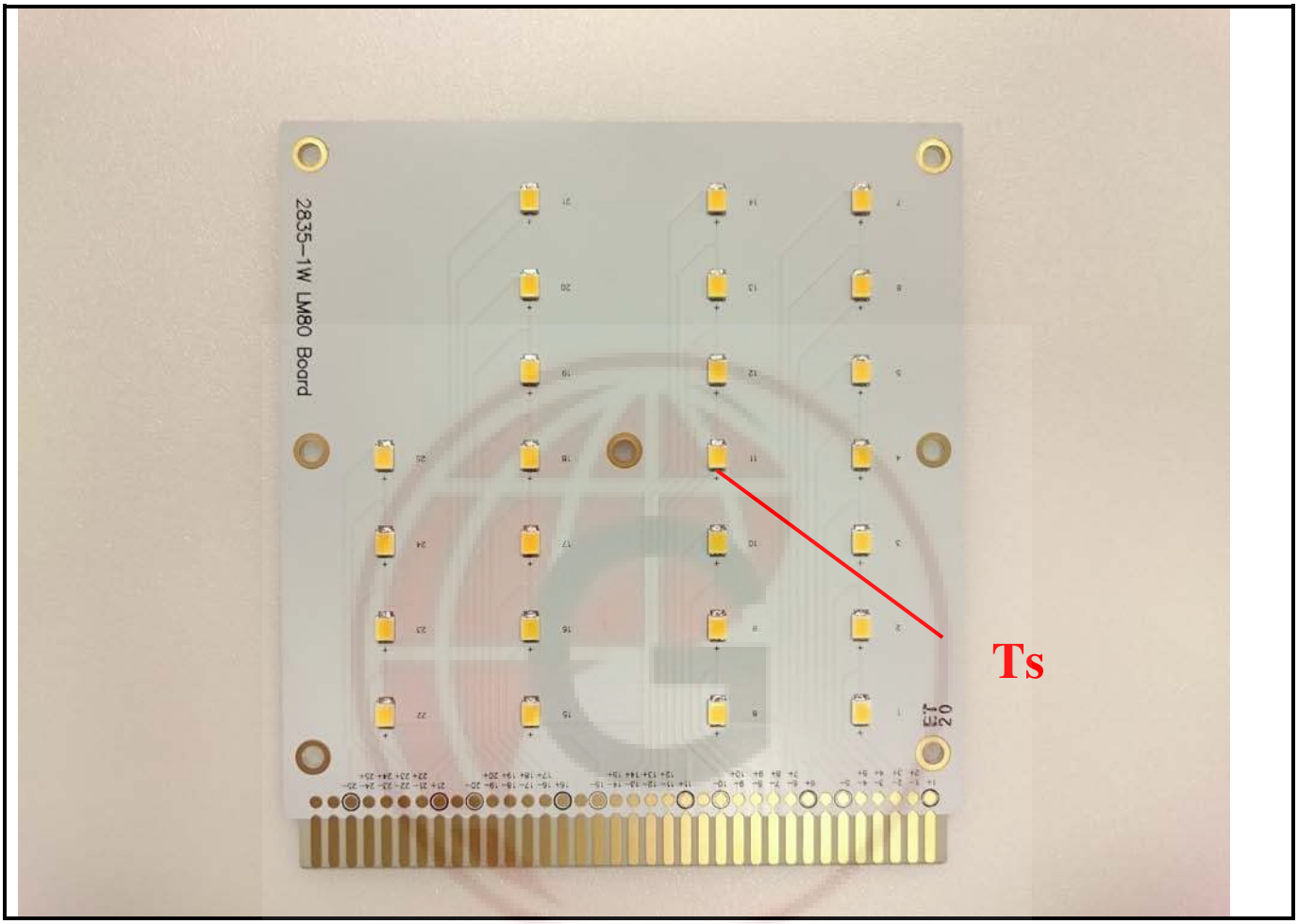
Recording failures

Checking for LED light source failures either by visual observation or automatic monitoring was done at every measurement interval.

CASE TEMPERATURE,(Ts) ATTACMENT POINT, CASE SIZE



Appendix A



Appendix A

Data Set 1	
Case Temperature	85 ℃
Measurement Current	100 mA

Table 1-1
Initial Characteristics

Sample No.	Luminous Flux (lm)	Forward Voltage	CCT(K)	CIE-1931		CIE-1976	
15060102-1	109.2	9.66	2713	0.4626	0.4171	0.2613	0.5302
15060102-2	109.0	9.60	2659	0.4662	0.4165	0.2639	0.5305
15060102-3	108.7	9.65	2723	0.4595	0.4130	0.2612	0.5282
15060102-4	109.2	9.69	2708	0.4610	0.4137	0.2618	0.5287
15060102-5	109.5	9.70	2712	0.4602	0.4127	0.2618	0.5282
15060102-6	108.9	9.61	2702	0.4616	0.4140	0.2621	0.5289
15060102-7	109.2	9.67	2692	0.4624	0.4140	0.2626	0.5290
15060102-8	108.9	9.64	2673	0.4661	0.4182	0.2631	0.5312
15060102-9	109.1	9.64	2666	0.4653	0.4157	0.2637	0.5301
15060102-10	108.5	9.58	2664	0.4659	0.4167	0.2636	0.5305
15060102-11	110.5	9.63	2702	0.4630	0.4165	0.2619	0.5301
15060102-12	112.8	9.72	2706	0.4624	0.4159	0.2617	0.5297
15060102-13	110.1	9.71	2706	0.4624	0.4159	0.2618	0.5297
15060102-14	108.2	9.70	2709	0.4622	0.4161	0.2616	0.5298
15060102-15	108.2	9.70	2708	0.4623	0.4161	0.2616	0.5298
15060102-16	106.9	9.65	2713	0.4626	0.4173	0.2613	0.5303
15060102-17	106.9	9.64	2713	0.4626	0.4173	0.2613	0.5303
15060102-18	106.6	9.59	2661	0.4664	0.4170	0.2638	0.5308
15060102-19	106.3	9.58	2660	0.4664	0.4171	0.2638	0.5308
15060102-20	107.0	9.69	2708	0.4613	0.4142	0.2618	0.5289
15060102-21	107.0	9.69	2708	0.4613	0.4142	0.2618	0.5289
15060102-22	106.9	9.65	2725	0.4596	0.4133	0.2611	0.5283
15060102-23	106.8	9.64	2725	0.4595	0.4133	0.2611	0.5283
15060102-24	106.7	9.61	2702	0.4618	0.4144	0.2621	0.5291
15060102-25	106.7	9.63	2672	0.4664	0.4186	0.2631	0.5313
Avg.	108.38	9.65	2698	0.4627	0.4154	0.2622	0.5296
Med.	108.60	9.65	2707	0.4624	0.4159	0.2618	0.5298
σ	1.26	0.04	20.17	0.0020	0.0016	0.0009	0.0009
Min.	106.30	9.58	2659	0.4595	0.4127	0.2611	0.5282
Max.	112.80	9.72	2725	0.4664	0.4182	0.2639	0.5312

Appendix A

Table 1-2
Lumen Maintenance

	Lumen Maintenance% (Normalized to 100% at Initial)										
Sample No.	**0 h**	**1000 h**	**2000 h**	**3000 h**	**4000 h**	**5000 h**	**6000 h**	**7000 h**	**8000 h**	**9000 h**	**10,000 h**
15060102-1	100.0%	99.8%	99.5%	98.8%	98.4%	97.0%	95.8%	95.2%	95.0%	94.6%	93.1%
15060102-2	100.0%	99.9%	99.4%	98.7%	98.4%	97.0%	96.4%	96.1%	95.9%	95.5%	94.2%
15060102-3	100.0%	99.9%	99.4%	98.7%	98.6%	97.6%	96.8%	96.2%	95.8%	95.6%	94.3%
15060102-4	100.0%	99.5%	98.8%	98.3%	97.9%	97.0%	96.2%	95.6%	95.3%	95.0%	93.6%
15060102-5	100.0%	99.9%	99.3%	98.7%	98.4%	97.1%	95.7%	95.2%	95.1%	94.6%	93.1%
15060102-6	100.0%	99.6%	99.0%	98.4%	97.7%	96.3%	95.2%	94.8%	94.6%	94.0%	92.6%
15060102-7	100.0%	99.9%	99.1%	98.4%	97.9%	96.7%	95.6%	95.2%	94.8%	94.5%	93.2%
15060102-8	100.0%	99.5%	98.8%	98.3%	97.9%	97.2%	96.5%	96.1%	95.9%	95.3%	93.9%
15060102-9	100.0%	99.8%	99.4%	98.9%	98.7%	97.7%	97.0%	96.6%	96.3%	95.9%	94.7%
15060102-10	100.0%	99.8%	99.2%	98.4%	97.9%	96.9%	96.0%	95.5%	95.3%	94.8%	93.5%
15060102-11	100.0%	99.8%	99.4%	98.8%	98.4%	97.1%	95.8%	95.5%	95.2%	94.8%	93.5%
15060102-12	100.0%	99.9%	99.5%	98.8%	98.2%	97.4%	96.9%	96.3%	96.0%	95.6%	94.1%
15060102-13	100.0%	99.9%	99.1%	98.5%	98.1%	97.5%	96.4%	95.9%	95.7%	95.1%	94.0%
15060102-14	100.0%	99.6%	98.9%	98.2%	97.9%	96.6%	95.5%	95.0%	94.8%	94.6%	93.4%
15060102-15	100.0%	100.0%	99.2%	98.5%	98.2%	97.2%	95.9%	95.4%	95.1%	94.8%	93.3%
15060102-16	100.0%	99.7%	99.3%	98.6%	98.5%	97.7%	96.5%	96.1%	95.8%	95.4%	94.0%
15060102-17	100.0%	99.5%	99.1%	98.3%	97.8%	97.1%	95.9%	95.4%	95.1%	94.8%	93.4%
15060102-18	100.0%	99.5%	99.0%	98.3%	97.9%	96.4%	95.0%	94.6%	94.3%	94.0%	92.5%
15060102-19	100.0%	99.7%	99.3%	98.7%	98.0%	96.8%	95.8%	95.3%	95.0%	94.6%	93.1%
15060102-20	100.0%	99.6%	99.2%	98.5%	98.0%	97.4%	96.0%	95.6%	95.4%	94.8%	93.2%
15060102-21	100.0%	99.6%	99.1%	98.4%	97.9%	96.8%	95.9%	95.4%	95.1%	94.7%	93.3%
15060102-22	100.0%	99.5%	98.9%	98.4%	98.2%	97.6%	96.3%	95.8%	95.5%	95.0%	93.7%
15060102-23	100.0%	99.5%	98.9%	98.1%	97.8%	96.7%	95.7%	95.1%	94.9%	94.4%	93.0%
15060102-24	100.0%	99.8%	99.1%	98.5%	98.0%	97.1%	96.4%	96.0%	95.6%	95.5%	94.1%
15060102-25	100.0%	99.5%	98.9%	98.3%	97.6%	96.8%	95.8%	95.3%	95.0%	94.6%	93.2%
Avg.	100.00%	99.71%	99.15%	98.50%	98.09%	97.07%	96.04%	95.57%	95.30%	94.90%	93.52%
Med.	100.00%	99.70%	99.10%	98.50%	98.00%	97.10%	95.90%	95.50%	95.20%	94.80%	93.40%
σ	0.0000	0.0017	0.0022	0.0021	0.0029	0.0039	0.0050	0.0050	0.0048	0.0049	0.0054
Min.	100.00%	99.50%	98.80%	98.10%	97.60%	96.30%	95.00%	94.60%	94.30%	94.00%	92.50%
Max.	100.00%	100.00%	99.50%	98.90%	98.70%	97.70%	97.00%	96.60%	96.30%	95.90%	94.70%

TM-21 Projection

Time	**0 h**	**1000 h**	**2000 h**	**3000 h**	**4000 h**	**5000 h**	**6000 h**	**7000 h**	**8000 h**	**9000 h**	**10,000 h**
ln (Avg.)	0.0000	-0.0029	-0.0085	-0.0151	-0.0193	-0.0298	-0.0404	-0.0453	-0.0481	-0.0523	-0.0670

Test duration used	10,000 hrs	Calculated L70 (10,000 hrs)	56,000 hrs
B	1.001	Report L70 (10,000 hrs)	56,000 hrs
α	6.414E-06		

Appendix A

Table 1-3
Forward Voltage

	Relative Forward Voltage % (Normalized to 100% at Initial)										
Sample No.	**0 h**	**1000 h**	**2000 h**	**3000 h**	**4000 h**	**5000 h**	**6000 h**	**7000 h**	**8000 h**	**9000 h**	**10,000 h**
15060102-1	100.00%	100.0%	100.1%	100.6%	99.8%	100.7%	100.1%	100.4%	100.5%	100.8%	101.0%
15060102-2	100.00%	100.3%	100.6%	101.1%	100.8%	102.2%	102.0%	102.1%	102.1%	102.2%	102.6%
15060102-3	100.00%	100.3%	100.7%	101.3%	101.1%	101.9%	101.1%	101.2%	101.5%	101.6%	101.6%
15060102-4	100.00%	100.7%	101.4%	102.0%	101.2%	103.0%	102.4%	102.8%	102.8%	103.0%	103.1%
15060102-5	100.00%	100.3%	100.6%	101.4%	101.0%	101.3%	101.2%	101.3%	101.4%	101.9%	102.2%
15060102-6	100.00%	100.0%	100.6%	101.5%	101.4%	102.2%	101.9%	101.9%	102.0%	102.3%	102.5%
15060102-7	100.00%	100.7%	101.7%	101.9%	101.3%	101.8%	101.4%	101.9%	102.2%	102.4%	102.6%
15060102-8	100.00%	100.6%	101.0%	101.1%	100.8%	101.9%	101.5%	101.5%	101.6%	101.7%	102.0%
15060102-9	100.00%	100.8%	101.2%	102.1%	101.2%	103.0%	102.6%	102.7%	103.0%	103.0%	103.1%
15060102-10	100.00%	100.7%	100.7%	101.6%	100.8%	100.9%	100.6%	100.7%	101.1%	101.4%	101.7%
15060102-11	100.00%	100.2%	101.1%	101.3%	101.2%	103.0%	102.7%	103.1%	103.3%	103.3%	103.7%
15060102-12	100.00%	100.6%	101.3%	102.2%	102.0%	102.4%	102.2%	102.2%	102.6%	102.7%	103.1%
15060102-13	100.00%	100.3%	100.4%	100.9%	100.3%	100.6%	100.0%	100.1%	100.2%	100.5%	100.6%
15060102-14	100.00%	100.2%	100.6%	100.7%	100.4%	100.5%	99.8%	100.0%	100.3%	100.5%	100.8%
15060102-15	100.00%	100.7%	101.5%	101.8%	101.2%	101.3%	101.2%	101.3%	101.6%	101.8%	101.8%
15060102-16	100.00%	100.5%	100.6%	101.3%	101.2%	102.8%	102.3%	102.3%	102.4%	102.4%	102.6%
15060102-17	100.00%	100.1%	100.2%	100.3%	99.7%	101.5%	100.6%	100.6%	100.9%	101.0%	101.1%
15060102-18	100.00%	100.6%	100.8%	100.9%	100.7%	101.1%	100.6%	100.7%	100.9%	101.3%	101.5%
15060102-19	100.00%	100.1%	100.4%	100.6%	100.2%	101.5%	101.0%	101.0%	101.3%	101.3%	101.5%
15060102-20	100.00%	100.4%	100.6%	101.4%	100.8%	102.4%	101.5%	101.8%	101.9%	102.0%	102.3%
15060102-21	100.00%	100.7%	101.1%	101.7%	101.5%	102.2%	101.8%	101.9%	102.0%	102.2%	102.3%
15060102-22	100.00%	100.0%	100.5%	100.8%	100.3%	100.7%	100.3%	100.6%	100.7%	100.7%	101.1%
15060102-23	100.00%	100.2%	100.3%	100.9%	100.6%	102.3%	102.1%	102.3%	102.5%	102.8%	102.8%
15060102-24	100.00%	100.1%	100.9%	101.8%	101.7%	102.3%	102.2%	102.4%	102.6%	102.9%	103.0%
15060102-25	100.00%	100.7%	101.3%	101.8%	100.8%	102.1%	101.8%	101.8%	102.0%	102.2%	102.4%
Avg.	100.00%	100.39%	100.81%	101.32%	100.88%	101.82%	101.40%	101.54%	101.74%	101.92%	101.90%
Med.	100.00%	100.30%	100.70%	101.30%	100.80%	101.90%	101.50%	101.80%	101.90%	102.00%	101.90%
σ	0.0000	0.0027	0.0042	0.0052	0.0056	0.0078	0.0085	0.0087	0.0085	0.0082	0.0000
Min.	100.00%	100.00%	100.10%	100.30%	99.70%	100.50%	99.80%	100.00%	100.20%	100.50%	101.90%
Max.	100.00%	100.80%	101.70%	102.20%	102.00%	103.00%	102.70%	103.10%	103.30%	103.30%	101.90%

Appendix A

Table 1-4
Chromaticity Shift

	Chromaticity Shift Δu'v'										
Sample No.	**0 h**	**1000 h**	**2000 h**	**3000 h**	**4000 h**	**5000 h**	**6000 h**	**7000 h**	**8000 h**	**9000 h**	**10,000 h**
15060102-1	0.0000	0.0001	0.0003	0.0008	0.0010	0.0014	0.0014	0.0017	0.0018	0.0018	0.0021
15060102-2	0.0000	0.0006	0.0009	0.0010	0.0014	0.0021	0.0022	0.0024	0.0027	0.0026	0.0023
15060102-3	0.0000	0.0003	0.0005	0.0010	0.0013	0.0019	0.0022	0.0026	0.0033	0.0036	0.0035
15060102-4	0.0000	0.0001	0.0003	0.0007	0.0011	0.0014	0.0016	0.0016	0.0019	0.0014	0.0016
15060102-5	0.0000	0.0003	0.0006	0.0012	0.0017	0.0022	0.0027	0.0025	0.0027	0.0024	0.0029
15060102-6	0.0000	0.0002	0.0004	0.0004	0.0009	0.0014	0.0023	0.0026	0.0029	0.0029	0.0027
15060102-7	0.0000	0.0001	0.0003	0.0006	0.0009	0.0013	0.0017	0.0014	0.0021	0.0025	0.0012
15060102-8	0.0000	0.0002	0.0005	0.0007	0.0009	0.0012	0.0017	0.0015	0.0020	0.0019	0.0016
15060102-9	0.0000	0.0002	0.0005	0.0011	0.0013	0.0017	0.0019	0.0019	0.0024	0.0019	0.0019
15060102-10	0.0000	0.0003	0.0007	0.0013	0.0016	0.0021	0.0025	0.0021	0.0024	0.0019	0.0022
15060102-11	0.0000	0.0003	0.0006	0.0009	0.0012	0.0020	0.0023	0.0021	0.0020	0.0017	0.0022
15060102-12	0.0000	0.0001	0.0004	0.0010	0.0012	0.0017	0.0023	0.0021	0.0027	0.0029	0.0026
15060102-13	0.0000	0.0002	0.0004	0.0007	0.0011	0.0016	0.0021	0.0018	0.0024	0.0021	0.0022
15060102-14	0.0000	0.0003	0.0007	0.0011	0.0012	0.0020	0.0026	0.0026	0.0029	0.0027	0.0034
15060102-15	0.0000	0.0002	0.0003	0.0007	0.0011	0.0019	0.0026	0.0030	0.0037	0.0033	0.0037
15060102-16	0.0000	0.0001	0.0005	0.0009	0.0015	0.0020	0.0025	0.0022	0.0026	0.0022	0.0031
15060102-17	0.0000	0.0003	0.0006	0.0007	0.0011	0.0014	0.0016	0.0017	0.0022	0.0023	0.0025
15060102-18	0.0000	0.0003	0.0005	0.0010	0.0016	0.0020	0.0028	0.0026	0.0031	0.0030	0.0032
15060102-19	0.0000	0.0002	0.0004	0.0006	0.0011	0.0015	0.0018	0.0018	0.0023	0.0025	0.0020
15060102-20	0.0000	0.0001	0.0004	0.0006	0.0008	0.0011	0.0020	0.0019	0.0025	0.0018	0.0016
15060102-21	0.0000	0.0002	0.0004	0.0006	0.0009	0.0015	0.0027	0.0028	0.0030	0.0023	0.0025
15060102-22	0.0000	0.0001	0.0003	0.0006	0.0008	0.0013	0.0019	0.0019	0.0022	0.0017	0.0022
15060102-23	0.0000	0.0004	0.0007	0.0009	0.0011	0.0016	0.0020	0.0023	0.0029	0.0019	0.0022
15060102-24	0.0000	0.0002	0.0003	0.0007	0.0011	0.0018	0.0026	0.0030	0.0035	0.0028	0.0028
15060102-25	0.0000	0.0001	0.0005	0.0011	0.0017	0.0024	0.0026	0.0030	0.0030	0.0026	0.0027
Avg.	0.0000	0.0002	0.0005	0.0008	0.0012	0.0017	0.0022	0.0022	0.0026	0.0023	0.0024
Med.	0.0000	0.0002	0.0005	0.0008	0.0011	0.0017	0.0022	0.0021	0.0026	0.0023	0.0023
σ	0.0000	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0006
Min.	0.0000	0.0001	0.0003	0.0004	0.0008	0.0011	0.0014	0.0014	0.0018	0.0014	0.0012
Max.	0.0000	0.0006	0.0009	0.0013	0.0017	0.0024	0.0028	0.0030	0.0037	0.0036	0.0037

Appendix A

Data Set 2	
Case Temperature	105 ℃
Measurement Current	100 mA

Table 2-1
Initial Characteristics

Sample No.	Luminous Flux (lm)	Forward Voltage	CCT(K)	CIE-1931		CIE-1976	
15060102-26	106.7	9.63	2673	0.4663	0.4186	0.2631	0.5313
15060102-27	107.1	9.66	2691	0.4626	0.4145	0.2626	0.5292
15060102-28	107.0	9.66	2692	0.4626	0.4145	0.2625	0.5292
15060102-29	107.0	9.63	2665	0.4655	0.4160	0.2637	0.5302
15060102-30	106.9	9.62	2665	0.4654	0.4159	0.2637	0.5302
15060102-31	106.3	9.57	2665	0.4660	0.4169	0.2636	0.5307
15060102-32	108.1	9.70	2708	0.4623	0.4161	0.2616	0.5298
15060102-33	108.1	9.70	2709	0.4623	0.4161	0.2616	0.5298
15060102-34	106.7	9.64	2727	0.4595	0.4133	0.2610	0.5283
15060102-35	106.9	9.66	2693	0.4625	0.4145	0.2625	0.5292
15060102-36	106.6	9.63	2672	0.4664	0.4186	0.2631	0.5313
15060102-37	106.6	9.62	2673	0.4663	0.4185	0.2631	0.5313
15060102-38	106.4	9.58	2660	0.4663	0.4169	0.2638	0.5307
15060102-39	106.4	9.58	2661	0.4663	0.4170	0.2638	0.5307
15060102-40	107.0	9.62	2665	0.4655	0.4160	0.2637	0.5302
15060102-41	106.9	9.62	2666	0.4654	0.4160	0.2636	0.5302
15060102-42	106.9	9.62	2667	0.4653	0.4160	0.2636	0.5302
15060102-43	107.4	9.68	2712	0.4603	0.4129	0.2617	0.5283
15060102-44	107.4	9.67	2712	0.4602	0.4128	0.2617	0.5283
15060102-45	107.3	9.67	2713	0.4602	0.4129	0.2617	0.5283
15060102-46	106.9	9.65	2692	0.4626	0.4145	0.2625	0.5292
15060102-47	106.9	9.65	2692	0.4626	0.4144	0.2625	0.5292
15060102-48	106.4	9.58	2661	0.4664	0.4170	0.2638	0.5308
15060102-49	106.3	9.58	2661	0.4663	0.4170	0.2638	0.5307
15060102-50	106.3	9.58	2661	0.4663	0.4170	0.2638	0.5307
Avg.	106.93	9.63	2683	0.4640	0.4157	0.2628	0.5299
Med.	106.90	9.63	2673	0.4654	0.4160	0.2631	0.5302
σ	0.48	0.04	21.23	0.0024	0.0018	0.0009	0.0010
Min.	106.30	9.57	2660	0.4595	0.4128	0.2610	0.5283
Max.	108.10	9.70	2727	0.4664	0.4186	0.2638	0.5313

Appendix A

Table 2-2
Lumen Maintenance

	Lumen Maintenance% (Normalized to 100% at Initial)										
Sample No.	**0 h**	**1000 h**	**2000 h**	**3000 h**	**4000 h**	**5000 h**	**6000 h**	**7000 h**	**8000 h**	**9000 h**	**10,000 h**
15060102-26	100.0%	98.8%	98.7%	98.1%	97.1%	95.7%	93.6%	93.3%	92.9%	92.4%	92.2%
15060102-27	100.0%	98.1%	97.7%	96.7%	95.9%	94.4%	92.2%	91.9%	91.5%	91.3%	90.4%
15060102-28	100.0%	98.9%	98.3%	97.7%	96.6%	94.9%	93.1%	92.6%	92.3%	91.9%	91.4%
15060102-29	100.0%	97.9%	97.4%	96.6%	95.8%	94.0%	92.0%	91.6%	91.1%	90.8%	90.7%
15060102-30	100.0%	99.0%	98.7%	98.1%	97.2%	95.6%	93.5%	93.0%	92.6%	92.1%	92.0%
15060102-31	100.0%	97.9%	97.3%	97.1%	96.1%	94.4%	92.5%	92.1%	91.7%	91.4%	91.2%
15060102-32	100.0%	98.5%	97.9%	97.1%	96.2%	94.8%	92.7%	92.2%	91.7%	91.2%	91.1%
15060102-33	100.0%	98.1%	98.0%	97.1%	96.4%	94.8%	92.5%	92.3%	91.8%	91.4%	91.2%
15060102-34	100.0%	98.8%	98.4%	98.4%	97.4%	96.3%	94.0%	93.6%	93.3%	92.8%	92.8%
15060102-35	100.0%	98.3%	97.8%	97.5%	96.6%	94.9%	93.0%	92.5%	92.2%	91.7%	91.5%
15060102-36	100.0%	98.0%	97.5%	97.3%	96.2%	95.1%	93.2%	92.9%	92.6%	92.2%	91.5%
15060102-37	100.0%	97.8%	97.6%	97.5%	96.7%	95.3%	93.3%	93.0%	92.6%	92.2%	92.1%
15060102-38	100.0%	97.9%	97.4%	97.0%	96.1%	94.8%	92.7%	92.3%	91.9%	91.5%	90.6%
15060102-39	100.0%	98.5%	98.0%	97.8%	97.0%	96.0%	93.7%	93.4%	93.0%	92.7%	92.5%
15060102-40	100.0%	98.5%	97.8%	97.0%	96.1%	95.1%	93.3%	92.9%	92.4%	92.2%	92.1%
15060102-41	100.0%	98.1%	97.8%	97.8%	96.9%	95.7%	93.7%	93.3%	93.0%	92.5%	92.2%
15060102-42	100.0%	98.8%	98.6%	98.5%	97.8%	96.7%	94.4%	94.1%	93.7%	93.2%	92.1%
15060102-43	100.0%	98.8%	98.0%	97.7%	96.7%	95.0%	92.8%	92.4%	92.0%	91.6%	91.4%
15060102-44	100.0%	98.0%	97.2%	97.2%	96.3%	95.2%	93.0%	92.7%	92.3%	92.0%	91.9%
15060102-45	100.0%	98.6%	97.7%	97.7%	96.8%	95.5%	93.3%	92.8%	92.4%	92.0%	91.6%
15060102-46	100.0%	99.7%	99.2%	98.4%	97.7%	96.5%	94.6%	94.2%	93.8%	93.4%	92.5%
15060102-47	100.0%	98.9%	98.6%	98.3%	97.5%	95.8%	93.6%	93.3%	93.0%	92.5%	92.4%
15060102-48	100.0%	99.1%	98.5%	98.1%	97.2%	95.7%	93.7%	93.3%	92.7%	92.3%	92.3%
15060102-49	100.0%	98.7%	98.1%	97.7%	96.9%	95.5%	93.1%	92.8%	92.3%	91.9%	91.2%
15060102-50	100.0%	99.1%	98.2%	98.2%	97.3%	96.2%	94.4%	94.1%	93.7%	93.2%	93.1%
Avg.	100.00%	98.51%	98.01%	97.63%	96.74%	95.36%	93.28%	92.90%	92.50%	92.10%	91.75%
Med.	100.00%	98.52%	97.96%	97.67%	96.74%	95.31%	93.27%	92.90%	92.40%	92.10%	91.91%
σ	0.0000	0.0047	0.0052	0.0055	0.0056	0.0068	0.0068	0.0068	0.0070	0.0066	0.0069
Min.	100.00%	97.84%	97.21%	96.64%	95.79%	94.02%	91.96%	91.60%	91.10%	90.80%	90.45%
Max.	100.00%	99.72%	99.16%	98.50%	97.75%	96.73%	94.57%	94.20%	93.80%	93.40%	93.12%

TM-21 Projection

Time	0 h	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h	10,000 h
ln (Avg.)	0.0000	-0.0150	-0.0200	-0.0240	-0.0256	-0.0300	-0.0333	-0.0736	-0.0780	-0.0823	-0.0861

Test duration used	10,000 hrs	Calculated L70 (10,000 hrs)	50,000 hrs
B	0.978	Report L70 (10,000 hrs)	50,000 hrs
α	6.728E-06		

Appendix A

Table 2-3
Forward Voltage

	Relative Forward Voltage % (Normalized to 100% at Initial)										
Sample No.	**0 h**	**1000 h**	**2000 h**	**3000 h**	**4000 h**	**5000 h**	**6000 h**	**7000 h**	**8000 h**	**9000 h**	**10,000 h**
15060102-26	100.0%	100.1%	100.7%	101.6%	102.4%	103.5%	103.5%	103.7%	103.8%	103.9%	104.0%
15060102-27	100.0%	100.5%	100.8%	101.1%	101.6%	102.3%	101.8%	102.2%	102.3%	102.6%	102.6%
15060102-28	100.0%	100.8%	101.2%	102.0%	102.1%	103.6%	103.0%	103.3%	103.4%	103.6%	103.6%
15060102-29	100.0%	100.6%	101.3%	102.0%	102.8%	104.3%	103.9%	103.9%	104.3%	104.3%	104.5%
15060102-30	100.0%	100.8%	101.8%	102.1%	102.6%	103.7%	103.0%	103.0%	103.2%	103.5%	103.8%
15060102-31	100.0%	100.4%	101.0%	101.3%	101.4%	102.6%	101.9%	102.0%	102.2%	102.2%	102.6%
15060102-32	100.0%	100.6%	101.2%	101.9%	102.3%	103.4%	102.6%	102.6%	103.0%	103.2%	103.4%
15060102-33	100.0%	100.5%	101.2%	101.9%	102.8%	103.1%	103.0%	103.2%	103.3%	103.5%	103.8%
15060102-34	100.0%	100.3%	100.6%	101.2%	101.3%	103.0%	102.4%	102.5%	102.6%	102.6%	103.0%
15060102-35	100.0%	100.8%	100.9%	101.3%	101.7%	102.9%	102.1%	102.1%	102.3%	102.7%	103.0%
15060102-36	100.0%	100.5%	100.7%	100.8%	101.6%	102.9%	102.1%	102.2%	102.5%	102.9%	102.9%
15060102-37	100.0%	100.6%	101.2%	101.9%	101.9%	103.8%	103.1%	103.5%	103.7%	103.8%	104.1%
15060102-38	100.0%	100.6%	101.5%	102.0%	102.8%	104.1%	103.8%	104.1%	104.4%	104.5%	104.8%
15060102-39	100.0%	100.2%	100.4%	101.0%	101.6%	101.8%	101.5%	101.8%	101.8%	102.2%	102.2%
15060102-40	100.0%	100.7%	101.1%	101.8%	101.8%	103.7%	102.9%	103.0%	103.3%	103.5%	103.7%
15060102-41	100.0%	100.1%	100.9%	101.5%	101.6%	102.0%	101.9%	101.9%	102.1%	102.3%	102.6%
15060102-42	100.0%	100.6%	101.5%	101.8%	102.2%	102.4%	101.9%	102.3%	102.4%	102.5%	102.8%
15060102-43	100.0%	100.6%	101.3%	102.1%	102.6%	104.1%	103.9%	104.2%	104.3%	104.3%	104.6%
15060102-44	100.0%	100.0%	100.5%	101.3%	101.3%	102.7%	102.5%	102.9%	103.1%	103.4%	103.6%
15060102-45	100.0%	100.8%	101.2%	101.3%	102.1%	103.6%	102.8%	103.0%	103.3%	103.3%	103.5%
15060102-46	100.0%	100.0%	100.2%	100.8%	101.0%	102.5%	102.3%	102.6%	102.8%	103.0%	103.3%
15060102-47	100.0%	100.1%	100.7%	101.2%	101.7%	103.2%	102.8%	103.0%	103.3%	103.3%	103.7%
15060102-48	100.0%	100.6%	100.9%	101.9%	102.0%	102.7%	102.7%	102.7%	103.0%	103.1%	103.5%
15060102-49	100.0%	100.6%	100.8%	101.0%	101.8%	103.2%	102.4%	102.5%	102.5%	102.8%	102.8%
15060102-50	100.0%	100.1%	100.8%	100.9%	101.7%	102.5%	102.3%	102.4%	102.4%	102.6%	102.9%
Avg.	100.00%	100.46%	100.98%	101.51%	101.95%	103.10%	102.64%	102.82%	103.01%	103.18%	103.41%
Med.	100.00%	100.60%	100.90%	101.50%	101.80%	103.10%	102.60%	102.70%	103.00%	103.20%	103.50%
σ	0.0000	0.0027	0.0037	0.0044	0.0051	0.0067	0.0066	0.0068	0.0072	0.0066	0.0068
Min.	100.00%	100.00%	100.20%	100.80%	101.00%	101.80%	101.50%	101.80%	101.80%	102.20%	102.20%
Max.	100.00%	100.80%	101.80%	102.10%	102.80%	104.30%	103.90%	104.20%	104.40%	104.50%	104.80%

Appendix A

Table 2-4
Chromaticity Shift

	Chromaticity Shift Δu'v'										
Sample No.	**0 h**	**1000 h**	**2000 h**	**3000 h**	**4000 h**	**5000 h**	**6000 h**	**7000 h**	**8000 h**	**9000 h**	**10,000 h**
15060102-26	0.0000	0.0002	0.0007	0.0014	0.0026	0.0033	0.0033	0.0035	0.0035	0.0032	0.0035
15060102-27	0.0000	0.0004	0.0009	0.0015	0.0023	0.0033	0.0028	0.0037	0.0034	0.0033	0.0036
15060102-28	0.0000	0.0004	0.0009	0.0013	0.0023	0.0037	0.0038	0.0037	0.0044	0.0043	0.0054
15060102-29	0.0000	0.0004	0.0011	0.0014	0.0029	0.0036	0.0041	0.0041	0.0045	0.0043	0.0045
15060102-30	0.0000	0.0002	0.0005	0.0013	0.0016	0.0022	0.0032	0.0036	0.0038	0.0032	0.0040
15060102-31	0.0000	0.0002	0.0006	0.0011	0.0023	0.0032	0.0026	0.0025	0.0026	0.0024	0.0027
15060102-32	0.0000	0.0001	0.0005	0.0011	0.0023	0.0031	0.0026	0.0026	0.0024	0.0022	0.0026
15060102-33	0.0000	0.0001	0.0008	0.0012	0.0023	0.0035	0.0030	0.0034	0.0040	0.0043	0.0054
15060102-34	0.0000	0.0001	0.0007	0.0014	0.0021	0.0031	0.0023	0.0027	0.0036	0.0030	0.0034
15060102-35	0.0000	0.0003	0.0008	0.0015	0.0028	0.0036	0.0035	0.0038	0.0039	0.0030	0.0035
15060102-36	0.0000	0.0003	0.0007	0.0014	0.0016	0.0023	0.0019	0.0026	0.0022	0.0019	0.0020
15060102-37	0.0000	0.0003	0.0006	0.0008	0.0016	0.0021	0.0023	0.0023	0.0023	0.0028	0.0036
15060102-38	0.0000	0.0002	0.0007	0.0011	0.0017	0.0022	0.0019	0.0025	0.0027	0.0022	0.0030
15060102-39	0.0000	0.0002	0.0007	0.0011	0.0019	0.0022	0.0018	0.0027	0.0027	0.0023	0.0028
15060102-40	0.0000	0.0004	0.0011	0.0020	0.0032	0.0043	0.0047	0.0052	0.0052	0.0049	0.0051
15060102-41	0.0000	0.0003	0.0007	0.0014	0.0018	0.0028	0.0036	0.0038	0.0044	0.0046	0.0055
15060102-42	0.0000	0.0002	0.0008	0.0015	0.0025	0.0027	0.0030	0.0032	0.0035	0.0041	0.0044
15060102-43	0.0000	0.0003	0.0006	0.0008	0.0016	0.0018	0.0024	0.0022	0.0023	0.0018	0.0026
15060102-44	0.0000	0.0002	0.0006	0.0011	0.0024	0.0026	0.0031	0.0030	0.0032	0.0029	0.0040
15060102-45	0.0000	0.0002	0.0007	0.0009	0.0019	0.0024	0.0024	0.0026	0.0026	0.0010	0.0012
15060102-46	0.0000	0.0001	0.0004	0.0009	0.0018	0.0022	0.0019	0.0027	0.0024	0.0009	0.0003
15060102-47	0.0000	0.0003	0.0005	0.0009	0.0016	0.0025	0.0032	0.0035	0.0038	0.0019	0.0018
15060102-48	0.0000	0.0001	0.0006	0.0010	0.0022	0.0029	0.0025	0.0026	0.0030	0.0015	0.0019
15060102-49	0.0000	0.0001	0.0004	0.0010	0.0020	0.0029	0.0024	0.0025	0.0027	0.0008	0.0006
15060102-50	0.0000	0.0004	0.0008	0.0010	0.0018	0.0028	0.0024	0.0032	0.0029	0.0010	0.0015
Avg.	0.0000	0.0002	0.0007	0.0012	0.0021	0.0029	0.0028	0.0031	0.0033	0.0027	0.0032
Med.	0.0000	0.0002	0.0007	0.0011	0.0021	0.0028	0.0026	0.0030	0.0032	0.0028	0.0034
σ	0.0000	0.0001	0.0002	0.0003	0.0004	0.0006	0.0007	0.0007	0.0008	0.0012	0.0015
Min.	0.0000	0.0001	0.0004	0.0008	0.0016	0.0018	0.0018	0.0022	0.0022	0.0008	0.0003
Max.	0.0000	0.0004	0.0011	0.0020	0.0032	0.0043	0.0047	0.0052	0.0052	0.0049	0.0055

Appendix B

INTERNATIONAL ACCREDITATION SERVICE®

CERTIFICATE OF ACCREDITATION

This is to attest that

GREAT ONE GLOBAL CERTIFICATION CO., LTD.

9F-2, NO. 120, QIAOHE ROAD, ZHONGHE DISTRICT
NEW TAIPEI CITY 23584
TAIWAN, REPUBLIC OF CHINA

Testing Laboratory TL-531

has met the requirements of the IAS Accreditation Criteria for Testing Laboratories (AC89), has demonstrated compliance with ISO/IEC Standard 17025:2005, *General requirements for the competence of testing and calibration laboratories*, and has been accredited, commencing January 13, 2016, for the test methods listed in the approved scope of accreditation.

(see laboratory's scope of accreditation for fields of testing and accredited test methods)

This accreditation certificate supersedes any IAS accreditation bearing an earlier effective date. The certificate becomes invalid upon suspension, cancellation or revocation of accreditation. See http://iasonline.org/More/search.html for current accreditation information, or contact IAS at 562-364-8201.

ilac-MRA

ACCREDITED

C.P. Ramani, P.E., C.B.O
President

Appendix B

INTERNATIONAL ACCREDITATION SERVICE®

SCOPE OF ACCREDITATION

FIELDS OF TESTING	ACCREDITED TEST METHODS
ENERGY STAR Program Requirements for Lighting (except Electromagnetic and Radio Frequency Interference, Air Tight for Restricted Air Flow, and Mercury Content) (continued)	IES LM-49-2001: Approved Method of Life Testing for Incandescent Filament Lamps IES LM-49-2011: Approved Method of Life Testing for Incandescent Filament Lamps IES LM-49-12: Life Testing of Incandescent Filament Lamps IES LM-51-00: Approved Method for the Electrical and Photometric Measurements of High Intensity Discharge Lamps IES LM-54-99 /12: IESNA Guide to Lamp Seasoning IES LM-58-94: Guide to Spectroradiometric Measurements IES LM-65-01: Approved Method for Life Testing of Single-Ended Compact Fluorescent Lamps IES LM-65-10: Approved Method for Life Testing of Single-Ended Compact Fluorescent Lamps IES LM-65-14: Approved Method for Life Testing of Single-Ended Compact Fluorescent Lamps IES LM-66-00: Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps IES LM-66-11: Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps IES LM-66-14: Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps IES LM-79-08: Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products, Sections 9, 10 and 12 IES LM-80-08: Measuring Lumen Maintenance of LED Light Sources IES LM-80-15: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules IES LM-82-12: Characterization of LED Light Engines and LED Lamps for Electrical and Photometric Properties as a Function of Temperature IES LM-84-14: Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires

Appendix B

On behalf of UL LLC,

Underwriters Laboratories Taiwan Co., Ltd.
is pleased to present this plaque to:

GREAT ONE GLOBAL CERTIFICATION CO., LTD.

9F-2, No.120, Qiaohe Rd., Zhonghe Dist., New Taipei City 235, Taiwan

to congratulate the company for having been assessed
and found eligible to participate in the

-Witness Test Data Program-

For

US EPA(Environmental Protection Agency) Energy Star Program

Ralph Tang
General Manager

Appendix B

On behalf of UL LLC,
Underwriters Laboratories Taiwan Co., Ltd.
is pleased to present this plaque to:
GREAT ONE GLOBAL CERTIFICATION CO., LTD.
9F-2, No.120, Qiaohe Rd., Zhonghe Dist., New Taipei City 235, Taiwan
to congratulate the company for having been assessed
and found eligible to participate in the
-Witness Test Data Program-
For
US DOE-Lighting Facts Program & US Designlights consortium-DLC Certification Program
Ralph Tang
General Manager

Appendix C

Description of model series:

The BXEN-(A)(B)–13H-9(C) part number covers all the BXEN part numbers in the following list.

Model Series List			
	CRI Variation		
CCT Variation	CRI70	CRI80	CRI90
2700 K	BXEN-27C-13H-9A	BXEN-27E-13H-9A	BXEN-27G-13H-9A
3000 K	BXEN-30C-13H-9A	BXEN-30E-13H-9A	BXEN-30G-13H-9A
3500 K	BXEN-35C-13H-9A	BXEN-35E-13H-9A	BXEN-35G-13H-9A
4000 K	BXEN-40C-13H-9A	BXEN-40E-13H-9A	BXEN-40G-13H-9A
4500 K	BXEN-45C-13H-9A	BXEN-45E-13H-9A	BXEN-45G-13H-9A
5000 K	BXEN-50C-13H-9A	BXEN-50E-13H-9A	BXEN-50G-13H-9A
5700 K	BXEN-57C-13H-9A	BXEN-57E-13H-9A	BXEN-57G-13H-9A
6500 K	BXEN-65C-13H-9A	BXEN-65E-13H-9A	BXEN-65G-13H-9A

Model Series List			
	CRI Variation		
CCT Variation	CRI70	CRI80	CRI90
2700 K	BXEN-27C-13H-9B	BXEN-27E-13H-9B	BXEN-27G-13H-9B
3000 K	BXEN-30C-13H-9B	BXEN-30E-13H-9B	BXEN-30G-13H-9B
3500 K	BXEN-35C-13H-9B	BXEN-35E-13H-9B	BXEN-35G-13H-9B
4000 K	BXEN-40C-13H-9B	BXEN-40E-13H-9B	BXEN-40G-13H-9B
4500 K	BXEN-45C-13H-9B	BXEN-45E-13H-9B	BXEN-45G-13H-9B
5000 K	BXEN-50C-13H-9B	BXEN-50E-13H-9B	BXEN-50G-13H-9B
5700 K	BXEN-57C-13H-9B	BXEN-57E-13H-9B	BXEN-57G-13H-9B
6500 K	BXEN-65C-13H-9B	BXEN-65E-13H-9B	BXEN-65G-13H-9B