

IES LM-79-08

MEASUREMENT AND TEST REPORT For

Overdrive Electronics Pvt.ltd

SDF No. E24A&B, NSEZ, Phase 2, Noida 201305 UP India

Test Model: L6A19DIM/30K

Report Type:	Electrical and Photometric tests including: Luminous Flux, Color, Luminous Intensity Distribution, Spatial Non-uniformity of Chromaticity, THD, Off-state Power
Test Engineer:	Daniel Duan <i>Daniel Duan</i>
Report Number:	RSZ130925501-10
Test Date:	2013-09-25
Report Date:	2013-09-26
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Accreditation:	The NVLAP Lab Code is 200707-0.

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1. Product Description

General Information:

One sample was received on 2013-09-25 and used for testing.

Model Tested: L6A19DIM/30K
 Manufacturer: Overdrive Electronics Pvt.ltd
 Product Designation: 6W LED DIMMABLE A BULB DIMMABLE 3000K
 Burning Time Before Test: 0 hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 120 V 60Hz
 Rated Power: 6W
 Nominal CCT: 3000K

2. Standards Used

- IESNA LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date
1.5m temperature integrating sphere	SENSING	SPR-600	S09008	25~50℃	2013-03-08
Spectral radiation analyzer	SENSING	SPR3000	90902027	350nm~800nm	2013-03-08
Digital power meter	YOKOGAWA	WT-210	91j926132	15/30/60/150/300/600 V	2013-03-25
Precision frequency power supply	ALL Power	APW-105N	970613	0V-300V 50-400Hz	2013-03-25
Standard Light Source	SENSING	N/A	LSD090808	N/A	2013-05-13
Temperature/humidity/clock	Victor	VC230	EE209	0~40℃0~90%	2013-04-01
Programmable Precision DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~60V	2013-03-25
AC POWER SUPPLY	EVERFINE	VPS1060 PWM	1101006	0-150V, 0-300V	2013-03-26
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2013-03-25
Electrical parameter tester	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600 V	2013-03-26
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N1 0120001	1600mm,3000W/10A	2013-03-08
Temperature/humidity/clock	Victor	VC230	EE091	0~40℃0~90%	2013-04-01
Standard Light Source	EVERFINE	D908	1012001	N/A	2013-05-28

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report.

Additional Test

The Additional Test item may not be covered by IESNA LM-79-2008. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$. Test voltage for THD and power factor test would be equal to rated voltage or, in case of a voltage range, maximum value of that range.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.5 hours**

Test orientation: **Base up**

Electrical Measurement

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.03	60.0	0.0719	6.3	0.73

Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
495.668	1.524	78.677	3148	-1.21E-03

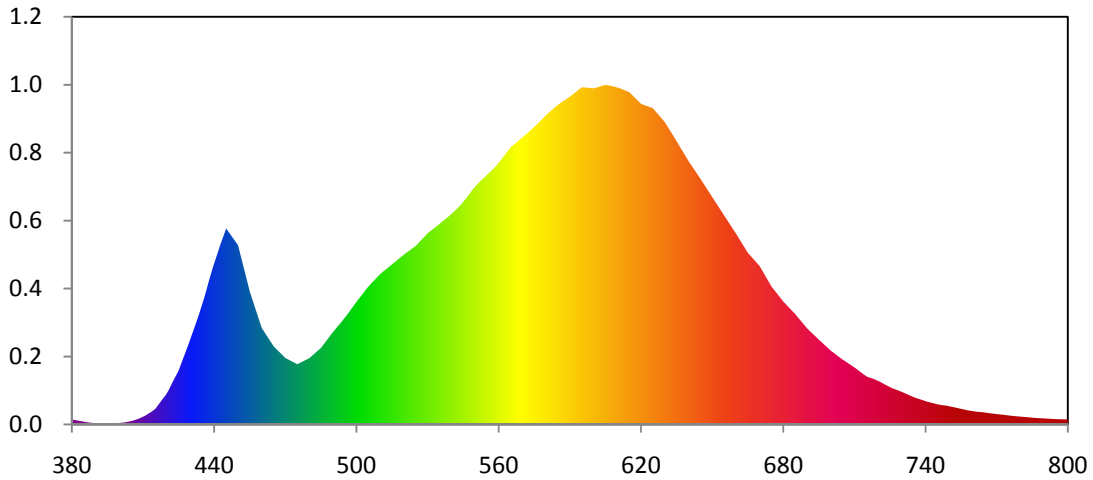
Chromaticity Coordinate

x	y	u	v	u'	v'
0.4252	0.3968	0.2461	0.3445	0.2461	0.5167

Color Rendering Index

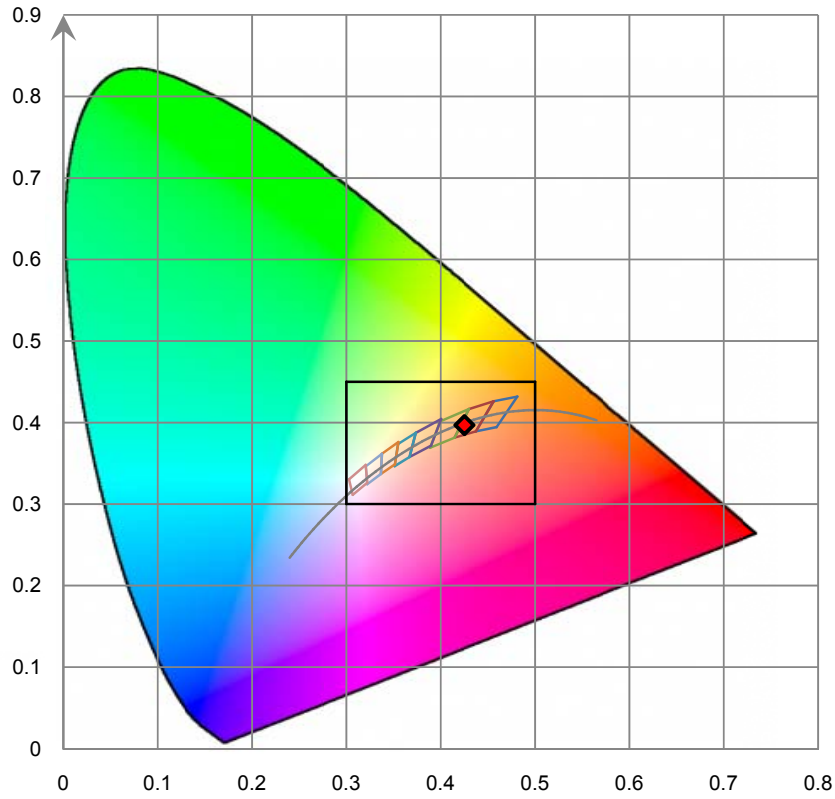
Ra 83.4			
R1 82	R2 89	R3 95	R4 82
R5 82	R6 86	R7 86	R8 66
R9 20	R10 75	R11 81	R12 73
R13 83	R14 97	R15 77	

Relative Spectral Power Distribution

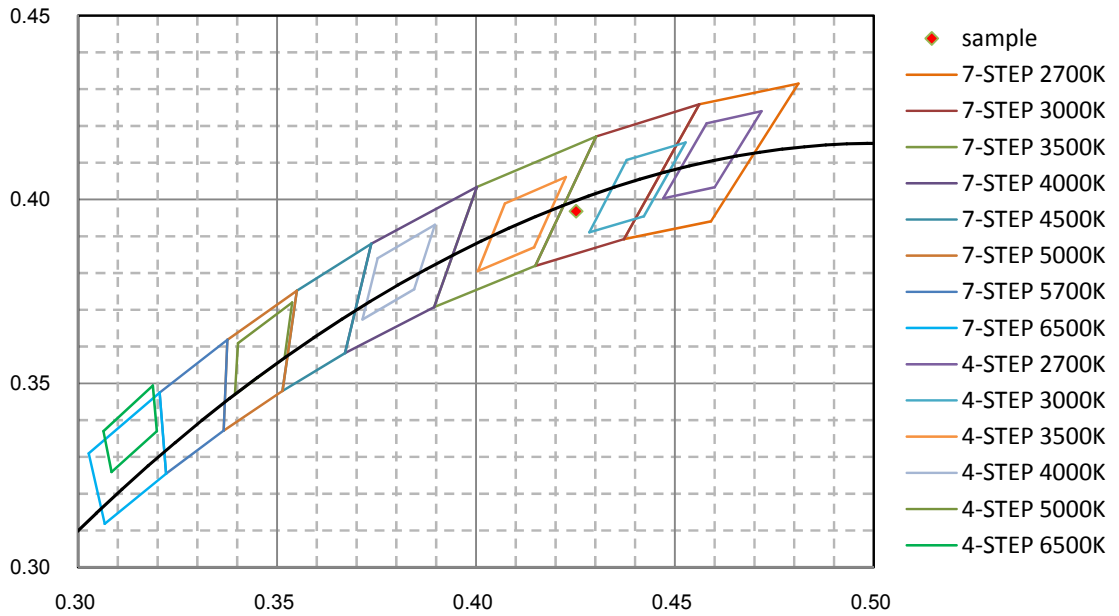


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	6.948E-04	465	1.044E-02	550	3.173E-02	635	3.773E-02	720	5.833E-03
385	3.534E-04	470	8.873E-03	555	3.322E-02	640	3.512E-02	725	4.969E-03
390	1.793E-04	475	8.040E-03	560	3.489E-02	645	3.275E-02	730	4.338E-03
395	1.687E-04	480	8.820E-03	565	3.693E-02	650	3.030E-02	735	3.631E-03
400	2.079E-04	485	1.020E-02	570	3.826E-02	655	2.789E-02	740	3.098E-03
405	4.208E-04	490	1.230E-02	575	3.964E-02	660	2.543E-02	745	2.690E-03
410	1.003E-03	495	1.419E-02	580	4.126E-02	665	2.287E-02	750	2.460E-03
415	2.044E-03	500	1.634E-02	585	4.264E-02	670	2.110E-02	755	2.061E-03
420	4.139E-03	505	1.839E-02	590	4.370E-02	675	1.836E-02	760	1.765E-03
425	7.202E-03	510	2.007E-02	595	4.494E-02	680	1.637E-02	765	1.608E-03
430	1.141E-02	515	2.135E-02	600	4.478E-02	685	1.471E-02	770	1.395E-03
435	1.607E-02	520	2.265E-02	605	4.526E-02	690	1.280E-02	775	1.198E-03
440	2.163E-02	525	2.381E-02	610	4.491E-02	695	1.130E-02	780	1.045E-03
445	2.610E-02	530	2.549E-02	615	4.428E-02	700	9.844E-03	785	9.299E-04
450	2.389E-02	535	2.674E-02	620	4.272E-02	705	8.642E-03	790	8.052E-04
455	1.768E-02	540	2.804E-02	625	4.212E-02	710	7.598E-03	795	7.222E-04
460	1.287E-02	545	2.965E-02	630	4.030E-02	715	6.402E-03	800	6.661E-04

CIE 1931 x y Chromaticity Diagram



7-Step & 4-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **1.5 hours**

Test orientation: **base up**

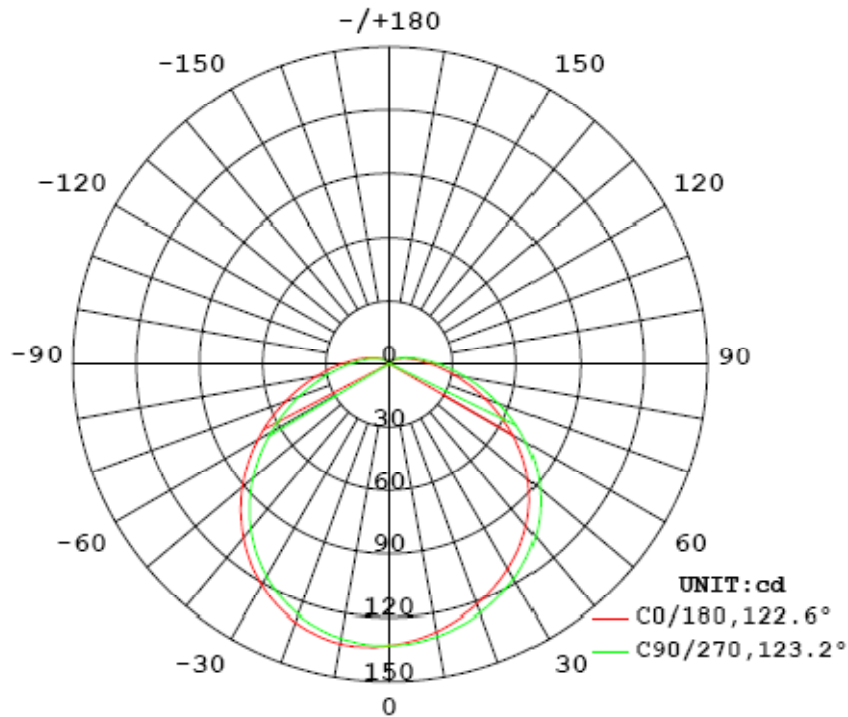
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60.0	0.0722	6.26	0.7223

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	CBCP (cd)	S/MH (C0/180)	S/MH (C90/270)
494.399	78.98	133	1.34	1.30

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% Imax):	122.5	123.0	123.2	123.7	123.1
Field Angle (10% Imax):	198.0	198.5	197.9	198.5	198.2

Luminous Intensity (cd) Distribution Data

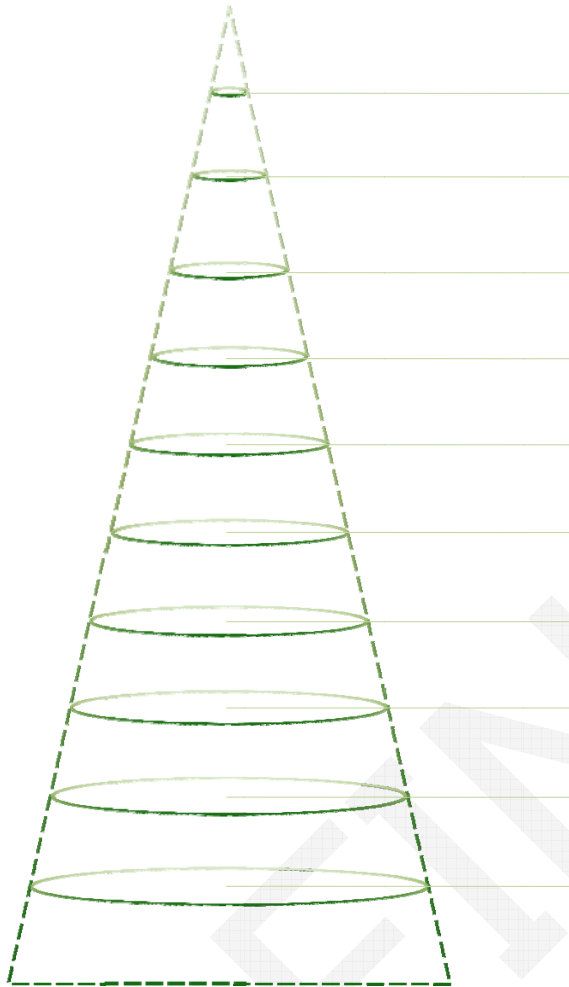
C \ Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	133	133	133	133	133	133	133	133
5.0°	134	134	134	133	133	133	132	132
10.0°	134	133	133	132	132	131	131	131
15.0°	133	131	131	130	130	129	128	128
20.0°	130	128	128	127	126	126	125	125
25.0°	126	124	124	123	122	121	121	121
30.0°	121	119	118	117	116	116	115	116
35.0°	115	113	112	111	110	109	109	110
40.0°	108	105	104	103	102	102	102	103
45.0°	100	97	96	95	94	94	94	95
50.0°	91	89	87	86	84	84	85	86
55.0°	82	79	78	76	75	75	75	77
60.0°	72	70	68	66	65	64	65	67
65.0°	62	60	58	57	55	54	55	57
70.0°	53	51	49	48	46	45	46	47
75.0°	44	42	40	39	37	36	37	38
80.0°	35	34	33	31	30	29	30	31
85.0°	28	27	26	25	24	23	24	24
90.0°	22	22	21	20	19	18	18	19
95.0°	18	17	16	16	15	14	14	15
100.0°	14	13	13	12	12	11	11	12
105.0°	11	10	10	10	9	9	9	9
110.0°	8	8	8	8	7	7	7	7
115.0°	7	6	6	6	6	5	6	6
120.0°	5	5	5	5	4	4	4	4
125.0°	4	4	4	4	3	3	3	3
130.0°	3	3	3	3	3	3	3	3
135.0°	2	2	2	2	2	2	2	2
140.0°	2	2	2	1	1	1	1	1
145.0°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

C \ Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	133	133	133	133	133	133	133	133
5.0°	131	131	132	132	132	133	133	133
10.0°	129	129	129	130	131	131	132	132
15.0°	125	126	126	127	128	129	130	130
20.0°	121	122	123	124	126	126	127	127
25.0°	117	118	119	120	122	123	123	123
30.0°	112	113	115	116	118	118	119	119
35.0°	107	108	109	111	113	113	114	114
40.0°	101	102	104	105	107	108	108	107
45.0°	94	95	97	98	100	101	101	100
50.0°	86	87	89	91	93	93	93	92
55.0°	77	79	81	82	84	84	84	84
60.0°	67	69	71	73	75	75	75	74
65.0°	58	59	62	63	65	65	65	64
70.0°	48	50	52	54	55	55	56	55
75.0°	39	41	43	44	46	46	46	46
80.0°	31	32	34	36	37	38	38	37
85.0°	25	26	27	28	29	30	30	30
90.0°	19	20	21	22	23	24	24	23
95.0°	15	16	17	17	18	19	18	18
100.0°	12	12	13	13	14	14	15	14
105.0°	9	10	10	11	11	11	11	11
110.0°	7	8	8	8	9	9	9	9
115.0°	6	6	6	6	7	7	7	7
120.0°	4	5	5	5	5	5	5	5
125.0°	3	4	4	4	4	4	4	4
130.0°	3	3	3	3	3	3	3	3
135.0°	2	2	2	2	2	2	2	2
140.0°	1	2	2	2	2	2	2	2
145.0°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	0	0	0	1	1	1	1	1
160.0°	0	0	0	0	0	0	0	0
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Average Area Illumination Figure

Angle: 123.1°. Flux out: 333.4 lm.



Height (m)	Diameter (cm)	E _{avg} (lx)	E _{max} (lx)
0.5	184.6	120.0	536.2
1.0	369.1	30.0	134.0
1.5	553.7	13.3	59.6
2.0	738.2	7.5	33.5
2.5	922.8	4.8	21.5
3.0	1107.4	3.3	14.9
3.5	1291.9	2.4	10.9
4.0	1476.5	1.9	8.4
4.5	1661.1	1.5	6.6
5.0	1845.6	1.2	5.4

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	3.2	0.64
5-10	9.4	1.91
10-15	15.4	3.12
15-20	21.0	4.25
20-25	25.9	5.24
25-30	30.2	6.11
30-35	33.5	6.78
35-40	35.9	7.27
40-45	37.3	7.54
45-50	37.5	7.58
50-55	36.5	7.38
55-60	34.5	6.97
60-65	31.6	6.39
65-70	28.0	5.65
70-75	24.0	4.86
75-80	20.0	4.05
80-85	16.3	3.29
85-90	12.9	2.62
90-95	10.2	2.05
95-100	7.9	1.60
100-105	6.1	1.24
105-110	4.7	0.95
110-115	3.6	0.72
115-120	2.7	0.54
120-125	2.0	0.41
125-130	1.5	0.29
130-135	1.0	0.21
135-140	0.7	0.14
140-145	0.5	0.09
145-150	0.3	0.06
150-155	0.2	0.03
155-160	0.1	0.01
160-165	0.0	0.01
165-170	0.0	0.00
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	3.2	0.64
0-10	12.6	2.55
0-15	28.0	5.67
0-20	49.0	9.92
0-25	75.0	15.16
0-30	105.1	21.27
0-35	138.7	28.05
0-40	174.6	35.32
0-45	211.9	42.86
0-50	249.4	50.44
0-55	285.9	57.82
0-60	320.3	64.79
0-65	351.9	71.18
0-70	379.9	76.83
0-75	403.9	81.69
0-80	423.9	85.74
0-85	440.2	89.03
0-90	453.1	91.65
0-95	463.3	93.70
0-100	471.2	95.30
0-105	477.3	96.54
0-110	482.0	97.49
0-115	485.5	98.21
0-120	488.2	98.75
0-125	490.2	99.16
0-130	491.7	99.45
0-135	492.7	99.66
0-140	493.4	99.80
0-145	493.9	99.89
0-150	494.1	99.95
0-155	494.3	99.98
0-160	494.4	99.99
0-165	494.4	100.00
0-170	494.4	100.00
0-175	494.4	100.00
0-180	494.4	100.00

Color Spatial Uniformity

Average Weighted
u':0.2473, v': 0.5180

$\gamma \setminus C0-180$	u'	v'	$Du'v'$	$\gamma \setminus C90-270$	u'	v'	$Du'v'$
-70	0.2466	0.5189	0.0012	-70	0.2465	0.5186	0.0011
-65	0.2470	0.5190	0.0011	-65	0.2469	0.5188	0.0009
-60	0.2473	0.5190	0.0011	-60	0.2472	0.5188	0.0009
-55	0.2474	0.5189	0.0010	-55	0.2473	0.5186	0.0007
-50	0.2475	0.5187	0.0007	-50	0.2475	0.5184	0.0005
-45	0.2476	0.5184	0.0005	-45	0.2475	0.5182	0.0003
-40	0.2474	0.5181	0.0002	-40	0.2474	0.5179	0.0001
-35	0.2474	0.5177	0.0002	-35	0.2474	0.5175	0.0004
-30	0.2474	0.5174	0.0005	-30	0.2474	0.5172	0.0007
-25	0.2474	0.5172	0.0008	-25	0.2474	0.5169	0.0010
-20	0.2473	0.5169	0.0010	-20	0.2473	0.5167	0.0012
-15	0.2473	0.5167	0.0012	-15	0.2473	0.5166	0.0014
-10	0.2473	0.5166	0.0014	-10	0.2472	0.5165	0.0015
-5	0.2472	0.5165	0.0015	-5	0.2472	0.5164	0.0016
0	0.2472	0.5165	0.0015	0	0.2472	0.5163	0.0016
5	0.2473	0.5165	0.0015	5	0.2472	0.5164	0.0016
10	0.2472	0.5165	0.0014	10	0.2472	0.5165	0.0015
15	0.2472	0.5167	0.0013	15	0.2472	0.5166	0.0013
20	0.2473	0.5169	0.0011	20	0.2472	0.5168	0.0012
25	0.2473	0.5171	0.0009	25	0.2473	0.5171	0.0009
30	0.2473	0.5173	0.0006	30	0.2474	0.5173	0.0006
35	0.2474	0.5177	0.0003	35	0.2475	0.5176	0.0004
40	0.2474	0.5180	0.0001	40	0.2475	0.5180	0.0002
45	0.2474	0.5182	0.0003	45	0.2476	0.5183	0.0005
50	0.2473	0.5184	0.0005	50	0.2476	0.5187	0.0008
55	0.2473	0.5187	0.0007	55	0.2475	0.5189	0.0009
60	0.2471	0.5189	0.0009	60	0.2474	0.5190	0.0010
65	0.2469	0.5189	0.0010	65	0.2471	0.5191	0.0011
70	0.2464	0.5186	0.0011	70	0.2467	0.5189	0.0011

[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Total Harmonic Distortion:	120	60	76.0%
Off State Power (W):	120	60	0.0

6. Product Photo



*****END OF REPORT*****