



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

Overdrive Electronics Pvt. Ltd

C-121, Hosiery Complex, Phase 2 Extn. Noida 201305 UP India

Test Model: L14EH80-W/HB/50K

Report Type:	Electrical and Photometric tests including: Luminous Flux, Color, Luminous Intensity Distribution
Test Engineer:	Daniel Duan <i>Daniel Duan</i>
Report Number:	RSZ160421501-10A1-M2
Test Date:	2016-04-21 to 2016-05-27
Report Date:	2016-08-01
Reviewed By:	Jeanne Han/Safety Manager <i>Jeanne Han</i>
Revised Note:	The previous report RSZ160421501-10A1-M1 is replaced by this report on 2016-08-01
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Test Facility:	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.
Accreditation:	The NVLAP Lab Code is 200707-0.

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1. Product Description

General Information:

One sample was received on 2016-04-21 and used for testing.

Model Tested: L14EH80-W/HB/50K
 Manufacturer: Overdrive Electronics Pvt. Ltd
 Brand Name: OVERDRIVE
 Product Designation: LED EH80 Luminaire
 Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 120 V AC 60Hz
 Rated Power: 14 W
 Nominal CCT: 5000K
 Nominal Lumen Output: 1440 lm

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	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2015-11-09	2016-11-08
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2016-03-10	2017-03-09
DC Power Supply	EVERFINE	WY305-V1	1101047	30V/5A	2015-07-27	2016-07-26
Thermal Meter	Anymetre	JR900A	N/A	25°C	2016-01-12	2017-01-11
Standard Light Source	SENSING	N/A	LSD090808	N/A	2015-09-25	2016-09-24
AC Power Supply	EVERFINE	DPS1010-YF	1011001T	30V/5A	2016-03-04	2017-03-03
AC Power Supply	EVERFINE	VPS1030 PWM	1012017	0-150V, 0-300V	2016-03-04	2017-03-03
DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2016-03-04	2017-03-03
Power Meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/ 300/600 V	2016-03-04	2017-03-03
Goniophotometer	EVERFINE	GO-R5000	YG108492N101 20001	1600mm,3000 W/10A	2016-03-10	2017-03-09
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C; -20°C~60°C	2016-03-21	2017-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2015-09-08	2016-09-07

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

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.

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

The uncertainty of the light output (luminous flux) measurements is $U=2.1\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=32\text{K}$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.1$ ($K=2$), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

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.

The uncertainty of the luminous intensity is $U=1.6\%$ ($K=2$), at the 95% confidence level.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

Electrical Measurement

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	59.99	0.1233	14.4	0.973

Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
1492.6	4.610	103.67	4829	0.00524

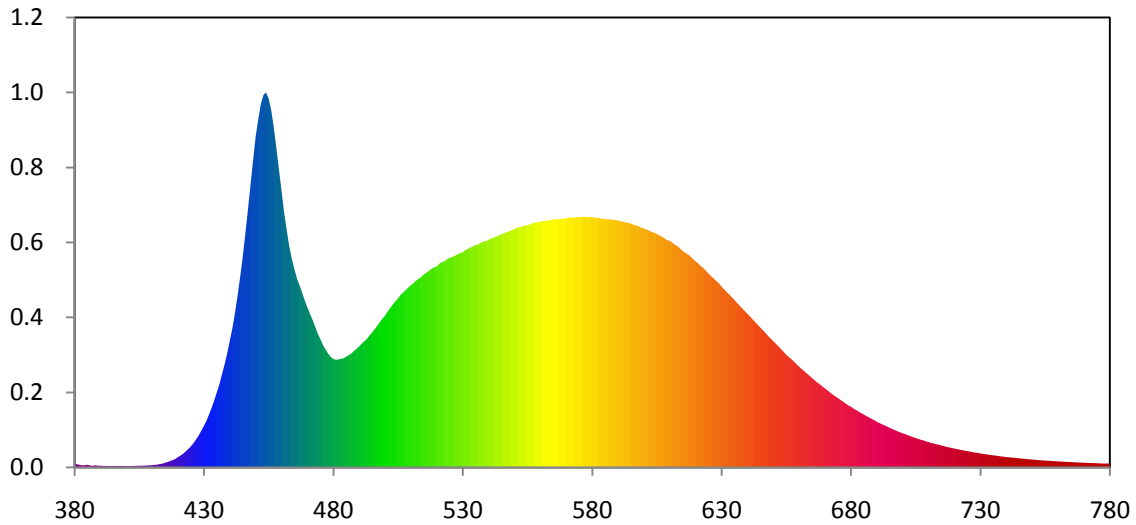
Chromaticity Coordinate

x	y	u	v	u'	v'
0.3515	0.3674	0.2097	0.3287	0.2097	0.4931

Color Rendering Index

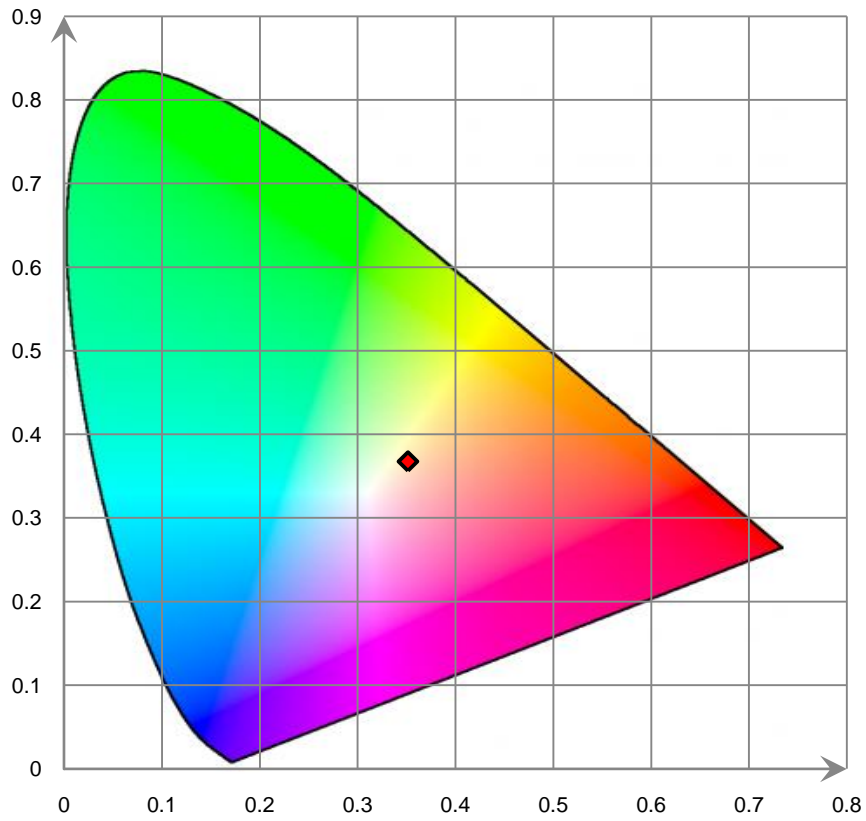
Ra 83.1			
R1 81	R2 89	R3 95	R4 80
R5 80	R6 84	R7 88	R8 68
R9 11	R10 73	R11 78	R12 55
R13 83	R14 97	R15 75	

Relative Spectral Power Distribution

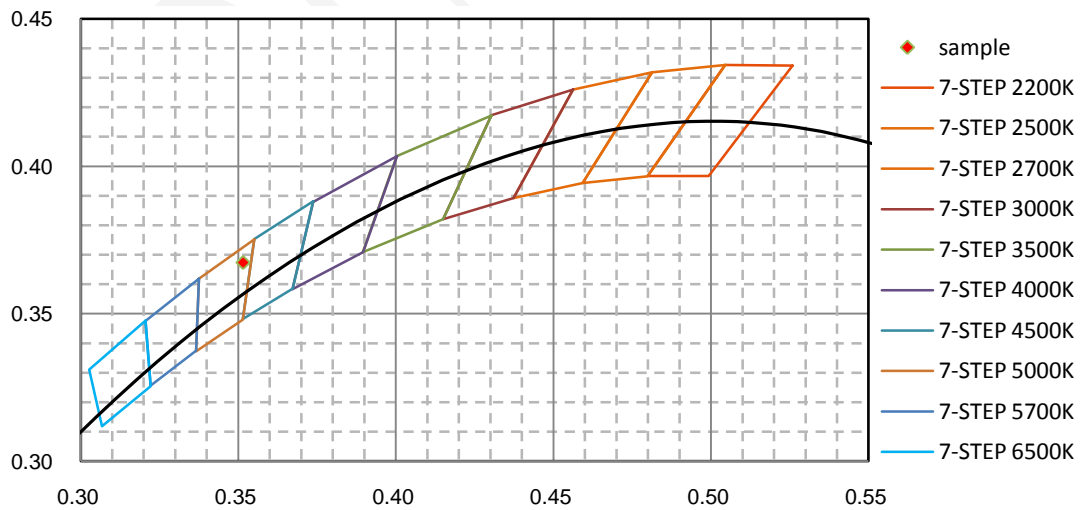


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.815E-01	465	1.829E+01	550	2.203E+01	635	1.548E+01	720	1.747E+00
385	2.523E-01	470	1.479E+01	555	2.242E+01	640	1.420E+01	725	1.511E+00
390	1.685E-01	475	1.186E+01	560	2.272E+01	645	1.292E+01	730	1.297E+00
395	1.498E-01	480	1.003E+01	565	2.292E+01	650	1.167E+01	735	1.122E+00
400	1.243E-01	485	1.025E+01	570	2.303E+01	655	1.042E+01	740	9.631E-01
405	1.563E-01	490	1.120E+01	575	2.315E+01	660	9.320E+00	745	8.443E-01
410	2.162E-01	495	1.247E+01	580	2.316E+01	665	8.260E+00	750	7.337E-01
415	4.386E-01	500	1.403E+01	585	2.296E+01	670	7.313E+00	755	6.384E-01
420	9.637E-01	505	1.561E+01	590	2.283E+01	675	6.415E+00	760	5.567E-01
425	1.974E+00	510	1.685E+01	595	2.255E+01	680	5.619E+00	765	5.042E-01
430	3.854E+00	515	1.784E+01	600	2.208E+01	685	4.892E+00	770	4.349E-01
435	6.954E+00	520	1.859E+01	605	2.157E+01	690	4.222E+00	775	3.917E-01
440	1.172E+01	525	1.938E+01	610	2.096E+01	695	3.652E+00	780	3.707E-01
445	1.950E+01	530	1.989E+01	615	2.000E+01	700	3.164E+00		
450	3.060E+01	535	2.056E+01	620	1.905E+01	705	2.722E+00		
455	3.411E+01	540	2.106E+01	625	1.791E+01	710	2.344E+00		
460	2.556E+01	545	2.157E+01	630	1.671E+01	715	2.028E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **1.0 hour**

Test orientation: **Downward**

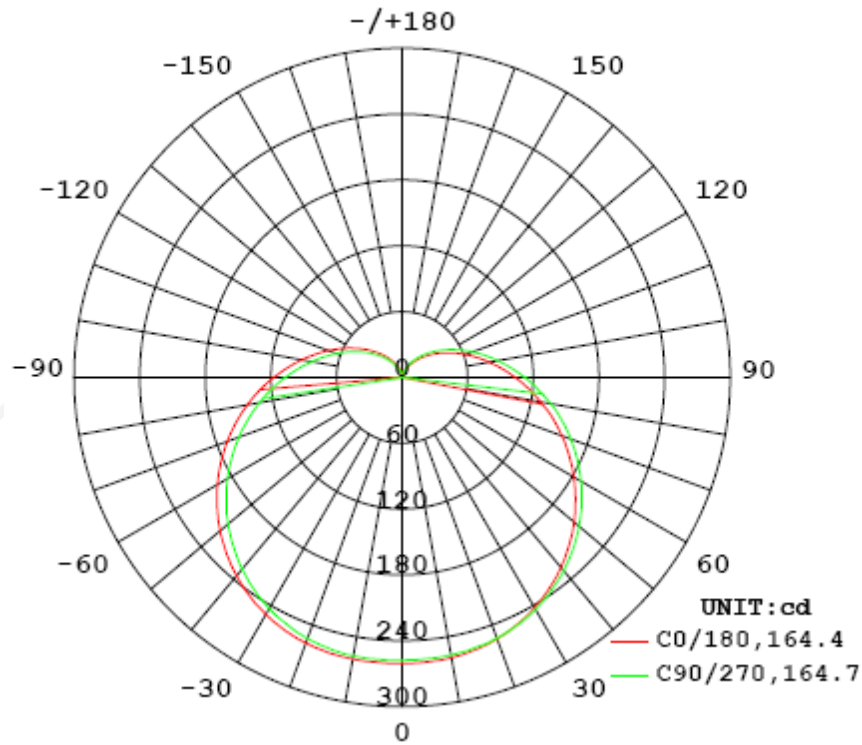
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.08	60	0.1259	14.38	0.9870

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
1494.6	103.94	260.6	1.39	1.42

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	164.4	164.4	164.7	164.7	164.6
Field Angle (10% I _{max}):	275.2	275.4	275.5	275.2	275.3

Luminous Intensity (cd) Distribution Data

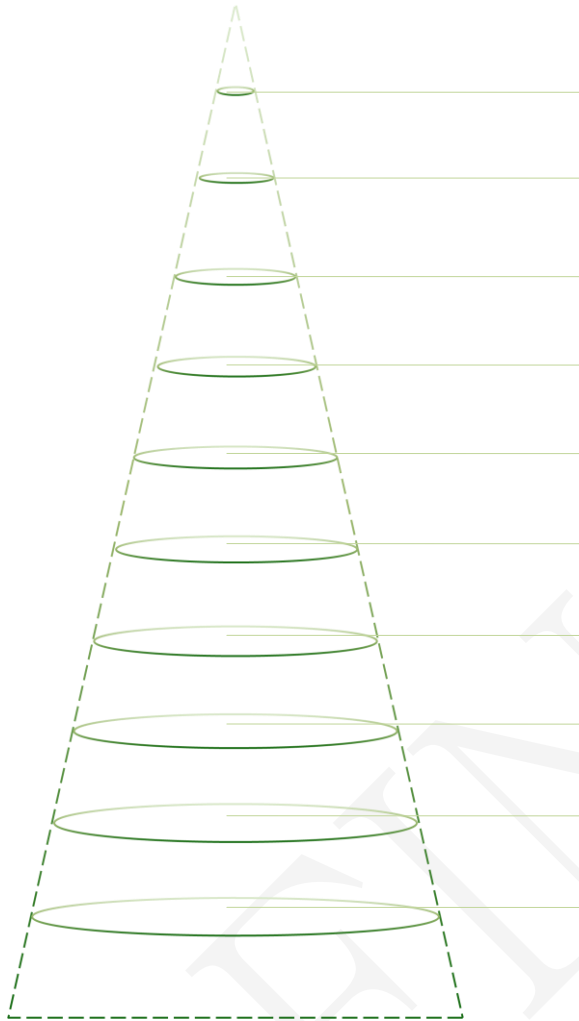
C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	260	260	259	258	258	257	257	256
5.0°	260	260	259	259	258	257	257	256
10.0°	260	260	259	258	257	257	256	255
15.0°	260	259	258	257	256	255	254	253
20.0°	258	257	256	254	253	252	250	249
25.0°	254	253	252	251	249	247	246	244
30.0°	249	248	247	245	243	241	239	238
35.0°	243	242	241	238	236	234	232	231
40.0°	236	235	232	230	228	226	223	222
45.0°	227	226	223	221	218	216	214	212
50.0°	217	216	213	211	208	205	203	201
55.0°	207	205	203	200	197	194	191	190
60.0°	195	194	191	188	185	182	179	178
65.0°	183	181	178	175	172	169	167	165
70.0°	170	168	166	162	159	156	154	152
75.0°	157	155	152	149	146	143	140	139
80.0°	144	142	139	136	133	130	127	126
85.0°	131	129	126	123	120	117	115	113
90.0°	118	116	113	110	107	104	102	101
95.0°	105	103	101	98	95	93	91	90
100.0°	93	92	89	87	84	82	80	79
105.0°	82	81	79	76	74	71	70	69
110.0°	72	71	69	66	64	62	61	60
115.0°	62	61	59	57	55	53	52	51
120.0°	53	52	51	49	47	45	44	44
125.0°	46	45	43	41	40	38	37	37
130.0°	38	38	36	35	33	32	31	31
135.0°	32	31	30	29	27	26	25	25
140.0°	26	25	24	23	22	21	20	20
145.0°	21	20	19	18	17	16	16	16
150.0°	16	16	15	14	13	12	12	12
155.0°	12	12	11	10	10	9	8	8
160.0°	9	8	8	7	6	5	5	5
165.0°	5	5	5	4	2	2	2	2
170.0°	3	2	2	1	1	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°	260	260	259	258	258	257	257	256
5.0°	260	259	259	258	257	257	257	256
10.0°	259	258	258	257	257	256	256	256
15.0°	257	256	256	256	255	255	255	255
20.0°	254	253	253	253	253	253	253	253
25.0°	248	248	248	249	249	249	250	250
30.0°	242	242	242	243	244	245	245	246
35.0°	235	235	235	236	237	238	239	240
40.0°	226	226	227	228	230	231	232	233
45.0°	216	216	217	219	221	222	224	224
50.0°	205	205	207	209	211	213	214	215
55.0°	193	194	196	198	200	202	204	205
60.0°	181	182	184	186	189	191	192	193
65.0°	168	169	171	174	177	179	181	181
70.0°	155	156	159	161	164	166	168	169
75.0°	142	143	146	148	151	154	155	156
80.0°	129	130	132	135	138	141	142	143
85.0°	116	117	119	122	125	127	129	129
90.0°	103	105	107	110	112	115	116	117
95.0°	92	93	95	98	100	102	104	104
100.0°	81	82	84	86	89	91	92	93
105.0°	71	72	74	76	78	80	81	82
110.0°	62	63	64	66	68	70	71	72
115.0°	53	54	56	57	59	61	62	62
120.0°	45	46	48	49	51	52	53	54
125.0°	38	39	40	42	43	45	46	46
130.0°	32	33	34	35	37	38	38	39
135.0°	26	27	28	29	30	31	32	32
140.0°	21	22	23	24	25	26	26	26
145.0°	16	17	18	19	20	21	21	21
150.0°	12	13	13	14	15	16	16	17
155.0°	9	9	10	10	11	12	12	12
160.0°	6	6	6	7	8	8	9	9
165.0°	3	3	3	4	5	5	5	6
170.0°	0	0	0	1	2	2	3	3
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:164.6°. Flux out:1081.0lm



Height (m)	Diameter (cm)	E _{avg} (lx)	E _{max} (lx)
0.5	739.62	2075.0	1042.0
1.0	1479.23	5.2	260.5
1.5	2218.85	2.3	115.8
2.0	2958.46	1.3	65.1
2.5	3698.08	0.8	41.7
3.0	4437.70	0.6	28.8
3.5	5177.31	0.4	21.3
4.0	5916.93	0.3	16.3
4.5	6656.54	0.3	12.9
5.0	7396.16	0.2	10.4

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	6.2	0.41
5-10	18.4	1.24
10-15	30.5	2.04
15-20	42.0	2.81
20-25	52.7	3.52
25-30	62.4	4.18
30-35	70.8	4.74
35-40	77.8	5.20
40-45	83.1	5.56
45-50	86.8	5.81
50-55	88.8	5.94
55-60	89.1	5.96
60-65	87.8	5.87
65-70	85.1	5.69
70-75	81.1	5.43
75-80	76.0	5.08
80-85	70.0	4.68
85-90	63.5	4.25
90-95	56.8	3.80
95-100	50.1	3.35
100-105	43.5	2.90
105-110	37.2	2.49
110-115	31.2	2.09
115-120	25.8	1.73
120-125	20.9	1.40
125-130	16.6	1.11
130-135	12.9	0.87
135-140	9.7	0.64
140-145	7.0	0.47
145-150	4.8	0.33
150-155	3.1	0.20
155-160	1.8	0.13
160-165	0.9	0.06
165-170	0.3	0.02
170-175	0.1	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	6.2	0.41
0-10	24.6	1.65
0-15	55.1	3.69
0-20	97.1	6.50
0-25	149.8	10.02
0-30	212.2	14.20
0-35	283.0	18.94
0-40	360.8	24.14
0-45	443.9	29.70
0-50	530.7	35.51
0-55	619.5	41.45
0-60	708.5	47.41
0-65	796.3	53.28
0-70	881.4	58.97
0-75	962.5	64.40
0-80	1038.4	69.48
0-85	1108.4	74.16
0-90	1171.9	78.41
0-95	1228.7	82.21
0-100	1278.7	85.56
0-105	1322.2	88.46
0-110	1359.3	90.95
0-115	1390.6	93.04
0-120	1416.4	94.77
0-125	1437.4	96.17
0-130	1454.0	97.28
0-135	1466.9	98.15
0-140	1476.6	98.79
0-145	1483.6	99.26
0-150	1488.4	99.59
0-155	1491.5	99.79
0-160	1493.3	99.92
0-165	1494.2	99.98
0-170	1494.5	100.00
0-175	1494.6	100.00
0-180	1494.6	100.00

6. Product Photo



Report Revision

Report Number	Report Date	Contents
RSZ160421501-10A1	2016-06-07	Original report.
RSZ160421501-10A1-M1	2016-07-25	Revise the Nominal Lumen Output in page 2.
RSZ160421501-10A1-M2	2016-08-01	Revise the test model number.

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