

IES LM-79-08

MEASUREMENT AND TEST REPORT

For

MESTER LED LIMITED

3rd F, Building A, Sunshine Industrial Park, Hezhou, Xixiang, Bao'an District, Shenzhen China

Test Model: PL09G2427KBQH

Report Type:	Electrical and Photometric tests including: Luminous Flux, Color, Luminous Intensity Distribution
Test Engineer:	Daniel Duan
Report Number:	RSZ160108502-10
Test Date:	2016-01-14 to 2016-01-18
Report Date:	2016-01-22
Reviewed By:	Jeanne Han/Safety Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008
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.

1. Product Description

General Information:

One sample was received on 2016-01-08 and used for testing.

Model Tested: PL09G2427KBQH
 Manufacturer: MESTER LED LIMITED
 Brand Name: MESTER
 Product Designation: Plugin light
 Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: AC120-277V/60Hz
 Rated Power: 9 W
 Nominal CCT: 2700K
 Nominal Lumen Output: 700 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
Integrating Sphere	SENSING	SPR-600	S09008	25~50℃	2015-03-25	2016-03-24
Spectral photometer	SENSING	SPR3000	90902027	350nm~800nm	2015-03-25	2016-03-24
Power Meter	YOKOGAWA	WT-210	91j926132	15/30/60/150/300/600 V	2015-03-05	2016-03-04
AC Power Supply	ALL Power	APW-105N	970663	220V±10% 50HZ	2015-03-05	2016-03-04
Standard Light Source	EVERFINE	D204	01331191	24V/100W	2015-08-27	2016-08-26
Thermal Meter	SENSING	N/A	N/A	25、50℃	2015-03-05	2016-03-04
DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2015-03-05	2016-03-04
AC Power Supply	EVERFINE	VPS1030 PWM	1012017	0-150V, 0-300V	2015-03-05	2016-03-04
DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2015-03-05	2016-03-04
Power Meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600 V	2015-03-05	2016-03-04
Goniophotometer	EVERFINE	GO- R5000	YG108492N10120001	1600mm,3000W/10A	2015-03-20	2016-03-19
Wireless Remote Sensor	N/A	433MHz	N/A	0℃~50℃;-20℃~60℃	2015-03-24	2016-03-23

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
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.

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.20\%$ ($K=2$), 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 $U=2.82\%$ ($K=2$), 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
120.04	60	0.083	8.86	0.893

Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
704.263	2.180	79.488	2635	0.0011

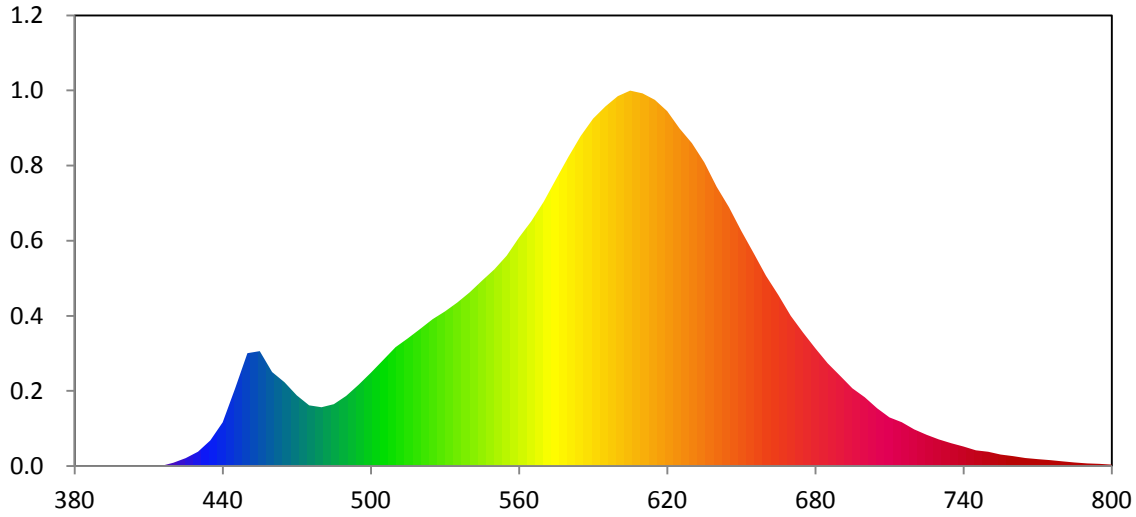
Chromaticity Coordinate

x	y	u	v	u'	v'
0.4672	0.4151	0.2652	0.3534	0.2652	0.5302

Color Rendering Index

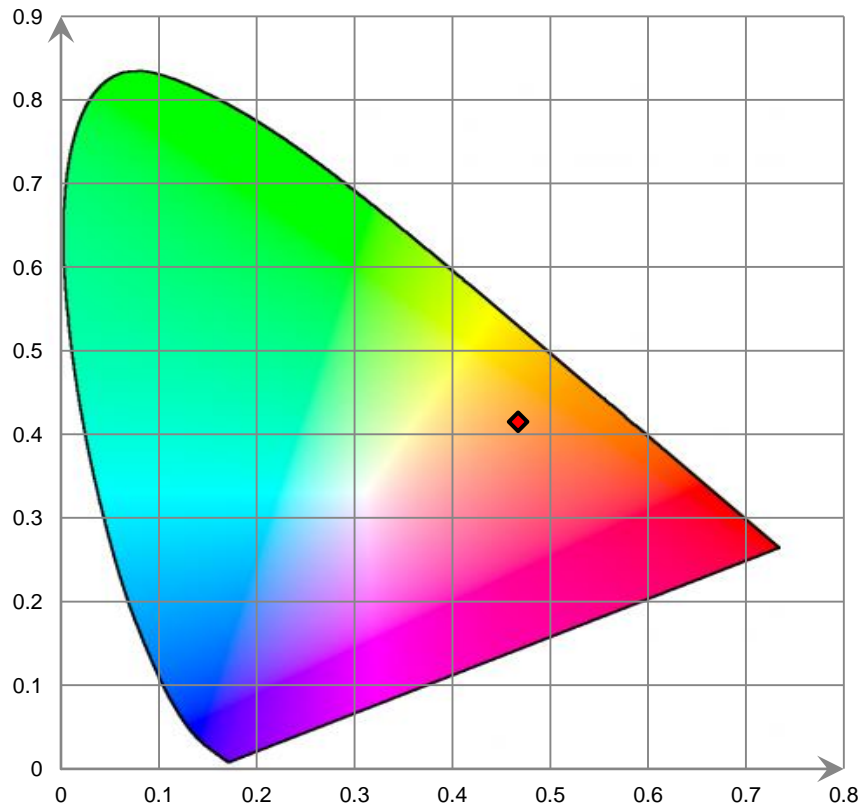
Ra			
81.2			
R1 79	R2 91	R3 95	R4 78
R5 79	R6 90	R7 81	R8 55
R9 4	R10 80	R11 77	R12 73
R13 83	R14 98	R15 71	

Relative Spectral Power Distribution

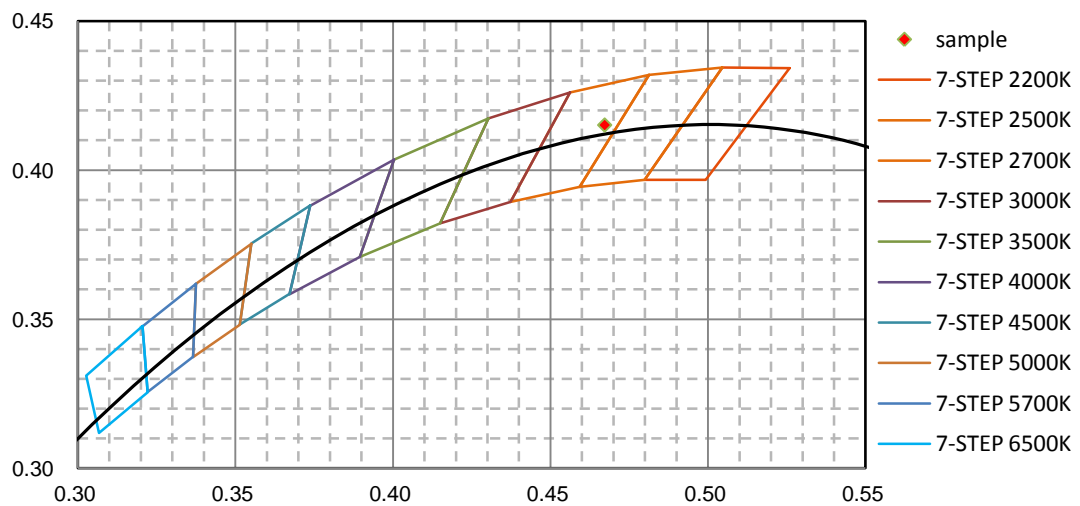


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.000E+00	465	1.735E-02	550	4.067E-02	635	6.281E-02	720	7.607E-03
385	0.000E+00	470	1.463E-02	555	4.351E-02	640	5.776E-02	725	6.491E-03
390	0.000E+00	475	1.257E-02	560	4.727E-02	645	5.352E-02	730	5.528E-03
395	0.000E+00	480	1.218E-02	565	5.066E-02	650	4.862E-02	735	4.745E-03
400	0.000E+00	485	1.282E-02	570	5.467E-02	655	4.403E-02	740	4.053E-03
405	0.000E+00	490	1.452E-02	575	5.934E-02	660	3.935E-02	745	3.272E-03
410	0.000E+00	495	1.682E-02	580	6.394E-02	665	3.537E-02	750	2.977E-03
415	3.571E-05	500	1.931E-02	585	6.825E-02	670	3.109E-02	755	2.402E-03
420	7.020E-04	505	2.194E-02	590	7.183E-02	675	2.762E-02	760	2.078E-03
425	1.656E-03	510	2.460E-02	595	7.436E-02	680	2.435E-02	765	1.687E-03
430	2.986E-03	515	2.643E-02	600	7.648E-02	685	2.125E-02	770	1.454E-03
435	5.329E-03	520	2.838E-02	605	7.762E-02	690	1.869E-02	775	1.252E-03
440	9.068E-03	525	3.038E-02	610	7.705E-02	695	1.608E-02	780	9.954E-04
445	1.602E-02	530	3.198E-02	615	7.571E-02	700	1.424E-02		
450	2.335E-02	535	3.382E-02	620	7.337E-02	705	1.196E-02		
455	2.378E-02	540	3.592E-02	625	6.980E-02	710	1.008E-02		
460	1.946E-02	545	3.834E-02	630	6.676E-02	715	9.077E-03		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Downward**

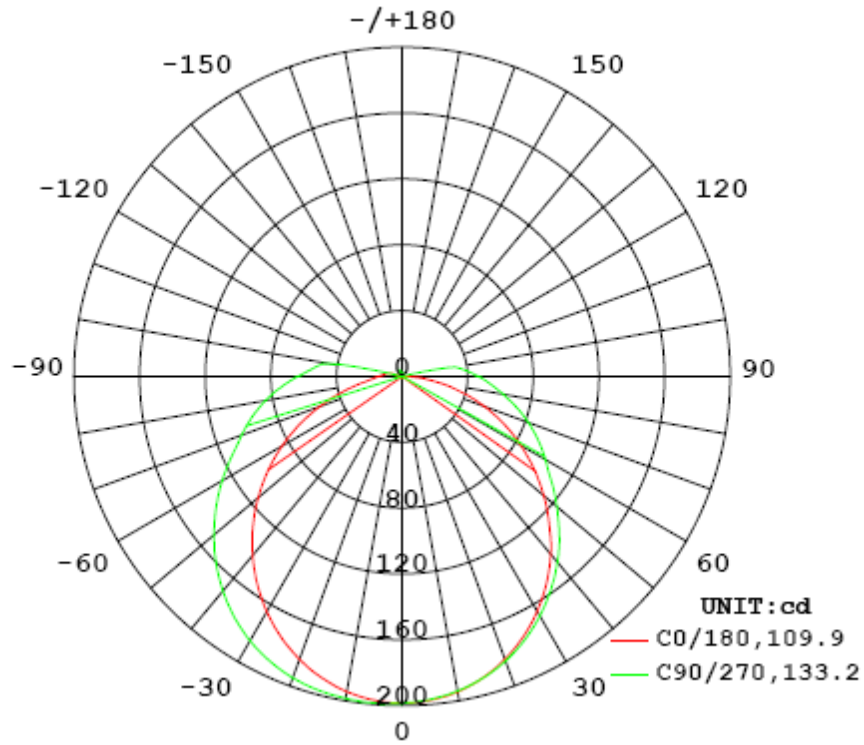
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.11	60	0.0818	8.69	0.8845

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
710.205	81.73	199.0	1.24	1.26

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	109.9	120.7	133.2	122.0	121.5
Field Angle (10% I _{max}):	165.3	201.1	204.9	201.0	193.1

Luminous Intensity (cd) Distribution Data

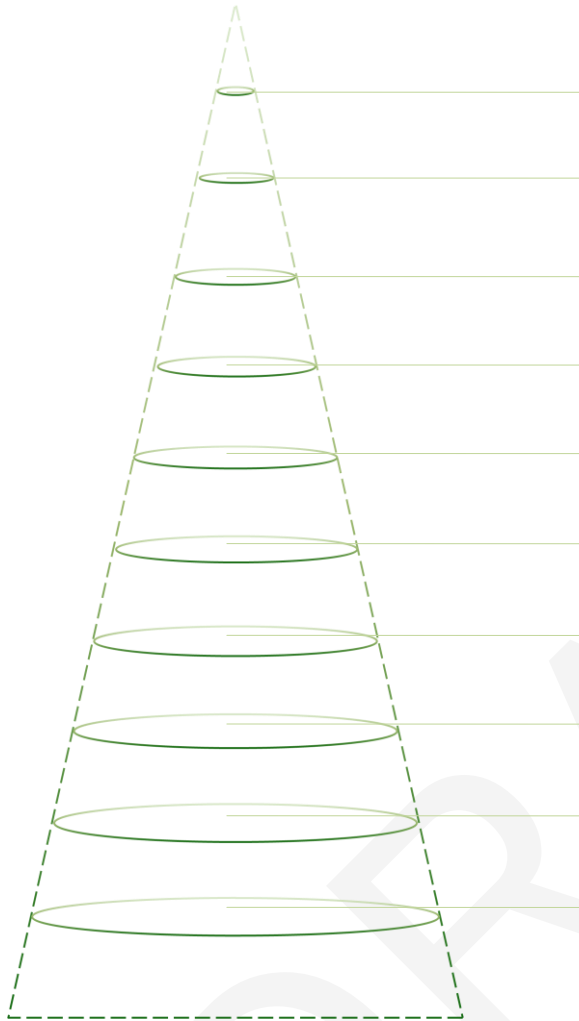
C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	198	198	198	198	198	198	198	198
5.0°	197	198	198	199	199	199	198	198
10.0°	194	195	197	198	199	198	197	196
15.0°	189	191	194	196	197	197	194	192
20.0°	183	186	190	193	195	194	190	186
25.0°	175	178	184	189	191	189	185	179
30.0°	165	169	177	183	185	184	178	170
35.0°	154	159	168	175	179	176	169	160
40.0°	142	148	158	166	170	168	160	149
45.0°	129	136	147	156	160	158	149	137
50.0°	115	123	135	145	150	147	137	124
55.0°	100	109	123	134	139	135	125	110
60.0°	85	95	110	122	127	123	112	96
65.0°	69	81	97	109	115	111	99	83
70.0°	53	66	84	98	104	99	86	69
75.0°	39	53	73	89	95	89	74	55
80.0°	27	42	63	79	85	80	65	42
85.0°	18	33	53	68	74	70	55	32
90.0°	14	26	44	58	64	61	46	23
95.0°	12	20	37	49	55	52	38	17
100.0°	10	15	27	39	46	42	27	8
105.0°	8	9	9	6	3	3	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	1	0	0	0	0	0	1
130.0°	0	1	1	0	0	0	0	2
135.0°	0	1	2	0	0	0	1	3
140.0°	0	1	3	2	0	1	4	3
145.0°	0	1	3	4	3	4	5	2
150.0°	0	1	3	4	5	5	4	2
155.0°	0	1	3	4	5	5	4	1
160.0°	0	0	2	3	4	4	3	1
165.0°	0	0	1	1	2	2	1	0
170.0°	0	0	0	1	1	1	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°	198	198	198	198	198	198	198	198
5.0°	197	197	197	197	197	197	197	197
10.0°	195	194	194	194	194	194	194	194
15.0°	190	189	189	190	190	190	189	189
20.0°	183	182	183	184	184	184	183	182
25.0°	175	174	175	176	177	176	175	174
30.0°	165	164	166	167	168	167	166	165
35.0°	153	153	155	157	158	157	155	154
40.0°	141	141	144	146	147	146	144	142
45.0°	127	127	130	134	136	134	131	128
50.0°	113	113	117	122	123	122	118	115
55.0°	98	99	104	109	111	109	105	101
60.0°	83	85	91	97	101	99	92	86
65.0°	69	71	78	87	92	89	81	72
70.0°	53	57	67	78	82	79	71	59
75.0°	38	44	57	69	72	70	61	48
80.0°	24	31	48	60	63	60	51	38
85.0°	11	22	39	51	54	51	43	30
90.0°	2	14	31	43	46	43	35	23
95.0°	0	9	25	36	40	36	28	18
100.0°	0	5	16	30	33	28	20	14
105.0°	0	0	0	0	0	4	5	7
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	1	0	0	0	0	0	1
135.0°	0	0	1	0	0	0	1	0
140.0°	0	0	2	0	0	0	1	0
145.0°	0	0	2	2	1	2	1	0
150.0°	0	0	1	2	2	2	1	0
155.0°	0	0	0	1	2	2	1	0
160.0°	0	0	0	0	1	1	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:121.5°. Flux out:474.5lm



Height (m)	Diameter (cm)	E _{avg} (lx)	E _{max} (lx)
0.5	178.56	185.6	794.9
1.0	357.13	46.4	198.7
1.5	535.69	20.6	88.3
2.0	714.25	11.6	49.7
2.5	892.81	7.4	31.8
3.0	1071.38	5.2	22.1
3.5	1249.94	3.8	16.2
4.0	1428.50	2.9	12.4
4.5	1607.07	2.3	9.8
5.0	1785.63	1.9	7.9

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	4.7	0.67
5-10	14.1	1.98
10-15	23.0	3.23
15-20	31.1	4.38
20-25	38.4	5.41
25-30	44.4	6.24
30-35	49.0	6.90
35-40	52.1	7.33
40-45	53.6	7.55
45-50	53.5	7.53
50-55	52.0	7.33
55-60	49.3	6.93
60-65	45.6	6.42
65-70	41.2	5.80
70-75	36.4	5.13
75-80	31.4	4.42
80-85	26.5	3.72
85-90	21.8	3.08
90-95	17.8	2.51
95-100	14.5	2.03
100-105	6.4	0.91
105-110	0.6	0.08
110-115	0.0	0.01
115-120	0.1	0.00
120-125	0.1	0.02
125-130	0.2	0.02
130-135	0.2	0.03
135-140	0.3	0.04
140-145	0.5	0.07
145-150	0.6	0.09
150-155	0.5	0.07
155-160	0.3	0.04
160-165	0.1	0.02
165-170	0.1	0.01
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	4.7	0.67
0-10	18.8	2.65
0-15	41.8	5.88
0-20	72.9	10.26
0-25	111.3	15.67
0-30	155.6	21.91
0-35	204.6	28.81
0-40	256.7	36.14
0-45	310.3	43.69
0-50	363.8	51.22
0-55	415.8	58.55
0-60	465.1	65.48
0-65	510.7	71.90
0-70	551.9	77.70
0-75	588.2	82.83
0-80	619.6	87.25
0-85	646.1	90.97
0-90	667.9	94.05
0-95	685.7	96.56
0-100	700.2	98.59
0-105	706.6	99.50
0-110	707.2	99.58
0-115	707.3	99.59
0-120	707.3	99.59
0-125	707.4	99.61
0-130	707.6	99.63
0-135	707.8	99.66
0-140	708.1	99.70
0-145	708.6	99.77
0-150	709.2	99.86
0-155	709.7	99.93
0-160	710.0	99.97
0-165	710.1	99.99
0-170	710.2	100.00
0-175	710.2	100.00
0-180	710.2	100.00

[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Power Factor:	277.0	60	0.9465
Total Harmonic Distortion:	277.0	60	52.62%
Total Harmonic Distortion:	120.0	60	43.21%

6. Product Photo



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