



NVLAP LAB CODE:201045-0



Shenzhen Anbotek Compliance Laboratory Limited

IES LM-79-08 TEST REPORT

For
LIGHT AND GREEN LLC

Product Type: RONDO

Date of Receipt: 2016-03-23

Date of Test: 2016-03-23 to 2016-03-30

Date of Report: 2016-03-31

Product Model: RM-D95

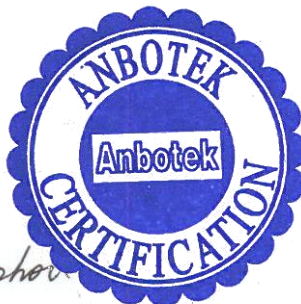
Product Description: AC 100-240V 50/60Hz 120W 3000K

Product Criteria: IES LM-79-08: Electrical and Photometric Measurements of Solid-State Lighting Products

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1 – GENERAL

1.1 Product description

General Information

Applicant	LIGHT AND GREEN LLC
Applicant Address	5222 VENILE BLVD LOSAN & ELES CA 90019
Manufacturer	CHINA
Manufacturer Address	Minzhong Town, Zhongshan City, China
Brand name	LIGHT AND GREEN
Test Model Number	RM-D95
Burning time before test	0 Hours (For new products)

Rated Values

Rated Inputs	AC 100-240V 50/60Hz
Rated Power	120W
Nominal CCT	3000K

1.2 Standard of method

- ANSI C78.377-2011: Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits-Related Power Quality Requirements for Lighting Equipment
- CIE Publication No.13.3-1995: Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products

1.3 Test Facility

The test facility used by Shenzhen Anbotek Compliance Laboratory Limited is located at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China.

2 – Test Equipment List and Details

Device	Manufacture	Model No	Serial No	Test Range	Calibration date
Goniophotometric System	SENSING	GMS-3000	-	-	2016-03-15
AC Power Source	Ainuo	AN97001W	-	0-300V, 1000VA	2016-03-15
Digital Power Meter	YOKOGAWA	WT310		0-600V/0-10A/0-100Hz	2016-03-15
Temperature & Humidity meter	XINIXI	CTH-608	-	0℃~50℃, 10% to 90%RH	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	220V/500W	S135009	220V/500W	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	220V/500W	S1350014	220V/500W	2016-03-15
1.5m Integral Sphere	SENSING	SPR-600M	-	380nm-780nm, 0.011m~6.00×10 ⁵ lm	2016-03-15
Spectrum analyzer	SENSING	SPR-3000	-	380nm-780nm, 0.011m~6.00×10 ⁵ lm	2016-03-15
AC Power Source	ALL POWER	APW-110N	997079	0-300V, 0-1000VA	2015-07-15
Digital Power Meter	YOKOGAWA	WT210	-	0-600V/0-10A/0-100Hz	2016-03-15
DC Power Supply	Linkcolor	Linkcolor	-	DC 30V, 5A	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	110 V / 100 W	S13100190	Refer specification	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	110 V / 100 W	S1310034	Refer specification	2016-03-15
Temperature & Humidity meter	XINIXI	CTH-608	-	0℃~50℃, 10% to 90%RH	2016-03-15

Statement of Traceability: Shenzhen Anbotek Compliance Laboratory Limited attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).

3 – Test Method

3.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the air flow around the sample(s) being tested did not affect the performance.

3.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within ± 0.2 percent under load.

3.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

3.4 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.

3.5 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. The method according to IESNA LM-79-08 following chapter.

4 – Test Result

4.1 Photometric test with Integrating Sphere System

4.1.1 Model: RM-D95

Electrical data

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
230.03	50	0.5325	118.07	0.964

Photometric data

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
8889.962	25.445	75.294	3024	-0.00028

Chromaticity Coordinate

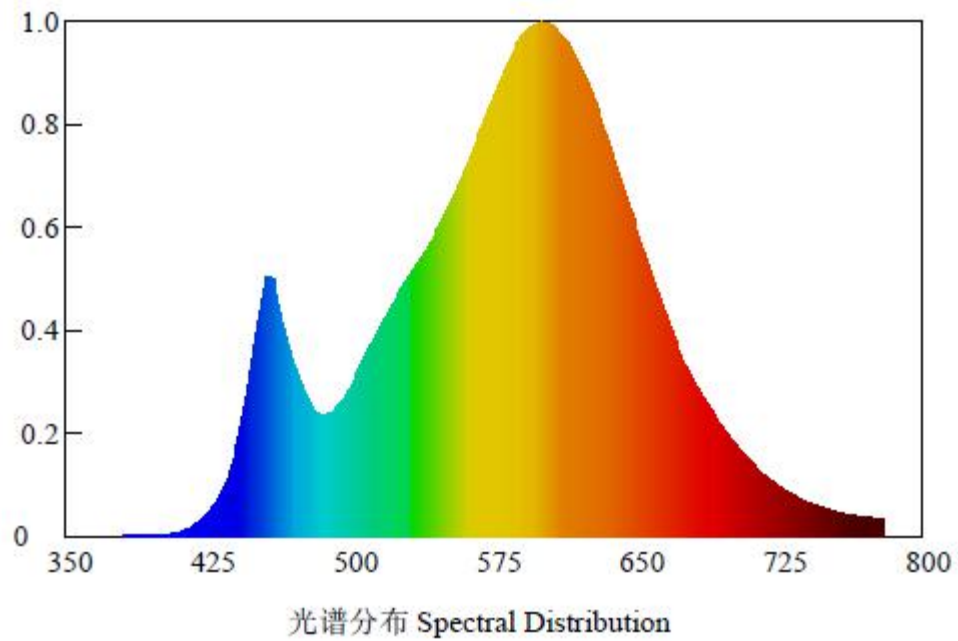
x	y	u	v	u'	v'
0.4348	0.4027	0.2498	0.3470	0.2498	0.5205

Color Rendering Details

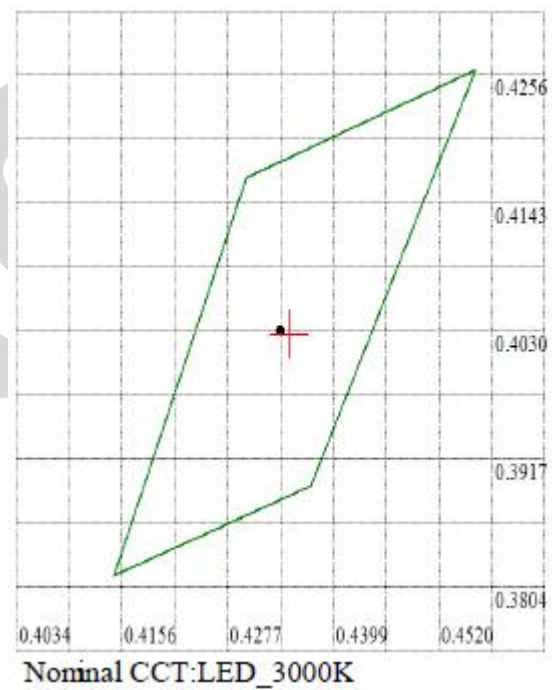
Ra
81.3

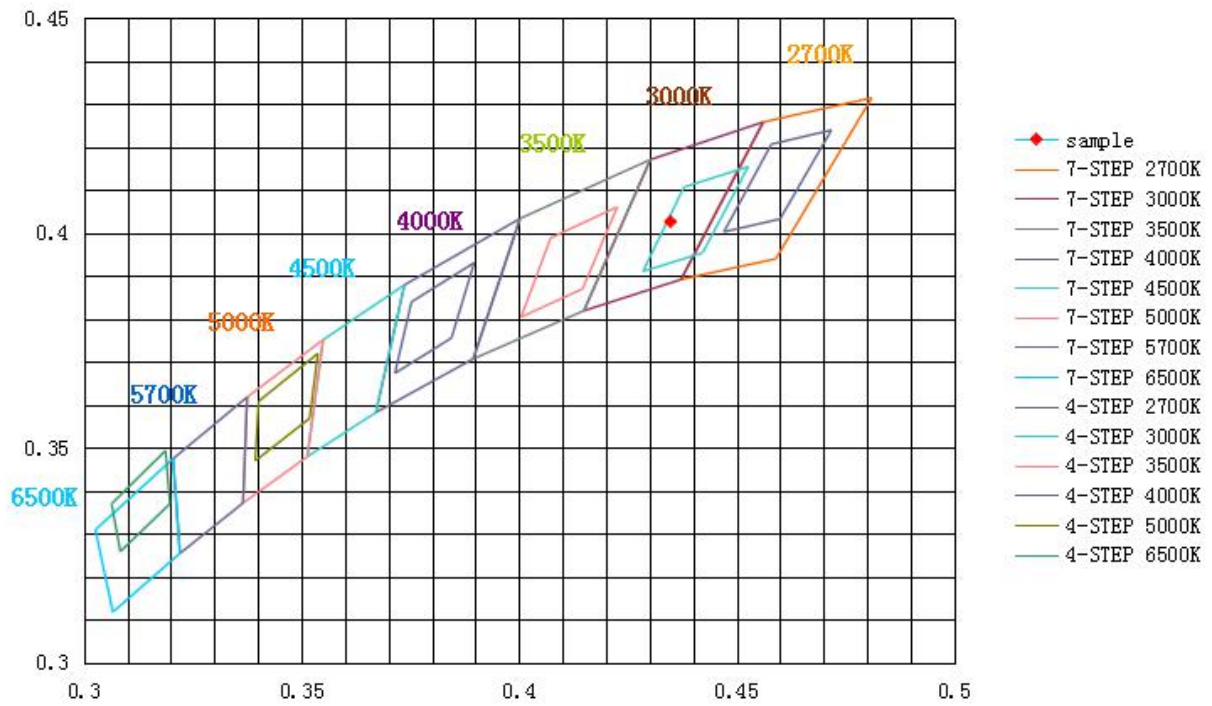
R1	R2	R3	R4	R5
80	91	95	77	79
R6	R7	R8	R9	R10
88	82	58	7	79
R11	R12	R13	R14	R15
74	69	83	98	73

Spectral Distribution



Chromaticity Diagram (CIE 1931)



ANSI Chromaticity Quadrangles Diagram

4.2 Photometric test with Goniophotometer System

4.2.1 Model: RM-D95

Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
229.91	50	0.5330	118.04	0.9642

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	CBCP (cd)	Zonal Lumen Density(0~90°)
9014.16	76.37	3199.595	99.754%

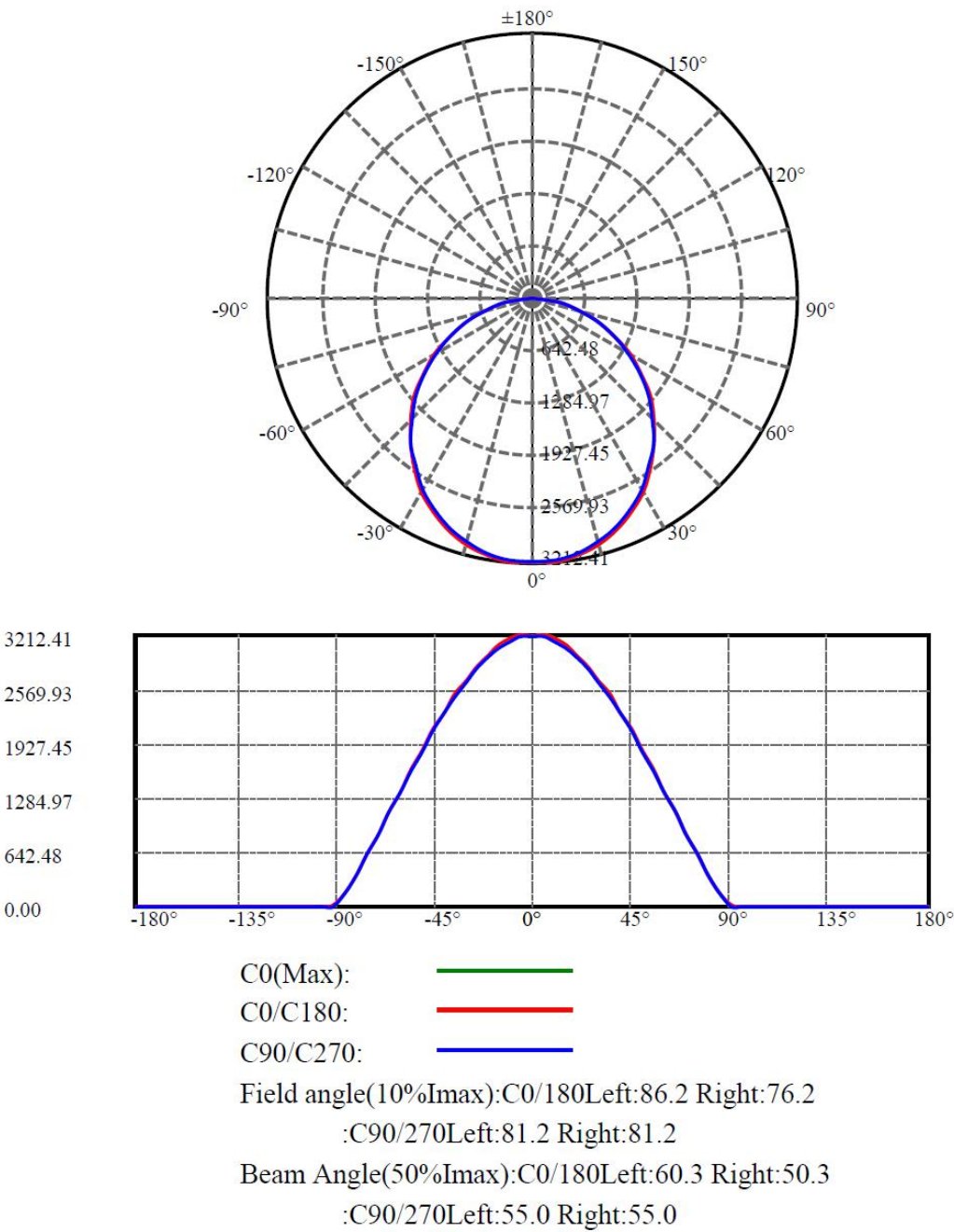
Zonal Lumen Summary**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Fixt
0-30	2467.55	27.37%
0-40	4022.65	44.63%
0-60	7056.98	78.29%
0-90	8991.97	99.75%
0-120	9001.10	99.86%
0-180	9014.16	100.00%
60-90	2620.37	29.07%
90-120	55.44	0.61%
90-130	58.40	0.65%
90-150	64.31	0.71%
90-180	68.38	0.76%
0-61.29	7211.33	80.00%

ZONAL LUMEN SUMMARY

0-10	302.90
10-20	864.30
20-30	1300.35
30-40	1555.10
40-50	1598.41
50-60	1435.92
60-70	1097.13
70-80	647.41
80-90	190.45
90-100	4.64
100-110	1.99
110-120	2.49
120-130	2.97
130-140	3.07
140-150	2.84
150-160	2.29
160-170	1.42
170-180	0.36

Light Distribution Curve [Unit: cd]



Luminous Intensity (cd) Distribution Data

C/γ(°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
0.0	3199.60	3212.41	3165.72	3084.82	2979.02	2840.81	2682.60	2505.86	2301.45
22.5	3199.11	3189.15	3141.76	3063.80	2957.26	2822.52	2663.17	2486.15	2289.53
45.0	3199.27	3186.62	3138.08	3059.14	2954.36	2815.67	2661.25	2486.11	2283.73
67.5	3199.76	3184.00	3136.41	3058.12	2953.38	2818.81	2659.99	2481.98	2285.94
90.0	3200.25	3183.51	3137.06	3060.16	2950.77	2818.28	2661.79	2478.27	2285.04
112.5	3200.74	3184.00	3136.41	3058.12	2953.38	2818.81	2659.99	2481.98	2285.94
135.0	3205.64	3186.62	3138.08	3059.14	2954.36	2815.67	2661.25	2486.11	2283.73
157.5	3212.00	3189.15	3141.76	3063.80	2957.26	2822.52	2663.17	2486.15	2289.53
180.0	3199.60	3212.41	3165.72	3084.82	2979.02	2840.81	2682.60	2505.86	2301.45
202.5	3199.11	3189.15	3141.76	3063.80	2957.26	2822.52	2663.17	2486.15	2289.53
225.0	3199.27	3186.62	3138.08	3059.14	2954.36	2815.67	2661.25	2486.11	2283.73
247.5	3199.76	3184.00	3136.41	3058.12	2953.38	2818.81	2659.99	2481.98	2285.94
270.0	3200.25	3183.51	3137.06	3060.16	2950.77	2818.28	2661.79	2478.27	2285.04
292.5	3200.74	3184.00	3136.41	3058.12	2953.38	2818.81	2659.99	2481.98	2285.94
315.0	3205.64	3186.62	3138.08	3059.14	2954.36	2815.67	2661.25	2486.11	2283.73
337.5	3212.00	3189.15	3141.76	3063.80	2957.26	2822.52	2663.17	2486.15	2289.53
360.0	3199.60	3212.41	3165.72	3084.82	2979.02	2840.81	2682.60	2505.86	2301.45
C/γ(°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
0.0	2087.16	1858.99	1623.47	1364.61	1117.09	857.66	614.71	375.28	155.19
22.5	2070.06	1846.05	1606.25	1357.71	1106.56	857.08	612.67	372.13	156.78
45.0	2068.99	1844.58	1601.59	1360.61	1105.54	854.47	611.89	373.97	158.45
67.5	2067.08	1840.99	1603.68	1358.65	1107.87	857.08	610.38	374.25	156.45
90.0	2065.61	1843.31	1602.41	1353.67	1108.93	852.10	611.28	373.48	155.68
112.5	2067.08	1840.99	1603.68	1358.65	1107.87	857.08	610.38	374.25	156.45
135.0	2068.99	1844.58	1601.59	1360.61	1105.54	854.47	611.89	373.97	158.45
157.5	2070.06	1846.05	1606.25	1357.71	1106.56	857.08	612.67	372.13	156.78
180.0	2087.16	1858.99	1623.47	1364.61	1117.09	857.66	614.71	375.28	155.19
202.5	2070.06	1846.05	1606.25	1357.71	1106.56	857.08	612.67	372.13	156.78
225.0	2068.99	1844.58	1601.59	1360.61	1105.54	854.47	611.89	373.97	158.45
247.5	2067.08	1840.99	1603.68	1358.65	1107.87	857.08	610.38	374.25	156.45
270.0	2065.61	1843.31	1602.41	1353.67	1108.93	852.10	611.28	373.48	155.68
292.5	2067.08	1840.99	1603.68	1358.65	1107.87	857.08	610.38	374.25	156.45
315.0	2068.99	1844.58	1601.59	1360.61	1105.54	854.47	611.89	373.97	158.45
337.5	2070.06	1846.05	1606.25	1357.71	1106.56	857.08	612.67	372.13	156.78
360.0	2087.16	1858.99	1623.47	1364.61	1117.09	857.66	614.71	375.28	155.19
C/γ(°)	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0
0.0	18.69	1.47	1.63	1.80	2.12	2.53	3.02	3.51	3.84
22.5	20.00	1.47	1.63	1.88	2.16	2.45	2.86	3.27	3.55
45.0	12.53	1.51	1.63	1.88	2.20	2.45	2.78	3.35	3.59
67.5	5.92	1.55	1.59	1.88	2.20	2.53	2.98	3.31	3.67
90.0	3.18	1.47	1.71	1.88	2.12	2.53	3.02	3.43	3.67
112.5	5.92	1.55	1.59	1.88	2.20	2.53	2.98	3.31	3.67
135.0	12.53	1.51	1.63	1.88	2.20	2.45	2.78	3.35	3.59
157.5	20.00	1.47	1.63	1.88	2.16	2.45	2.86	3.27	3.55
180.0	18.69	1.47	1.63	1.80	2.12	2.53	3.02	3.51	3.84
202.5	20.00	1.47	1.63	1.88	2.16	2.45	2.86	3.27	3.55
225.0	12.53	1.51	1.63	1.88	2.20	2.45	2.78	3.35	3.59
247.5	5.92	1.55	1.59	1.88	2.20	2.53	2.98	3.31	3.67
270.0	3.18	1.47	1.71	1.88	2.12	2.53	3.02	3.43	3.67
292.5	5.92	1.55	1.59	1.88	2.20	2.53	2.98	3.31	3.67
315.0	12.53	1.51	1.63	1.88	2.20	2.45	2.78	3.35	3.59
337.5	20.00	1.47	1.63	1.88	2.16	2.45	2.86	3.27	3.55
360.0	18.69	1.47	1.63	1.80	2.12	2.53	3.02	3.51	3.84

C/ γ (°)	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0
0.0	4.08	4.41	4.65	4.98	5.14	4.98	4.82	5.06	5.14
22.5	3.80	4.16	4.45	4.57	5.10	4.94	4.86	5.10	5.10
45.0	3.88	4.29	4.33	4.78	4.82	5.22	4.94	4.90	5.18
67.5	4.12	4.41	4.73	4.86	5.06	5.14	5.18	4.94	5.10
90.0	4.08	4.33	4.49	4.65	4.82	5.06	4.90	4.82	4.90
112.5	4.12	4.41	4.73	4.86	5.06	5.14	5.18	4.94	5.10
135.0	3.88	4.29	4.33	4.78	4.82	5.22	4.94	4.90	5.18
157.5	3.80	4.16	4.45	4.57	5.10	4.94	4.86	5.10	5.10
180.0	4.08	4.41	4.65	4.98	5.14	4.98	4.82	5.06	5.14
202.5	3.80	4.16	4.45	4.57	5.10	4.94	4.86	5.10	5.10
225.0	3.88	4.29	4.33	4.78	4.82	5.22	4.94	4.90	5.18
247.5	4.12	4.41	4.73	4.86	5.06	5.14	5.18	4.94	5.10
270.0	4.08	4.33	4.49	4.65	4.82	5.06	4.90	4.82	4.90
292.5	4.12	4.41	4.73	4.86	5.06	5.14	5.18	4.94	5.10
315.0	3.88	4.29	4.33	4.78	4.82	5.22	4.94	4.90	5.18
337.5	3.80	4.16	4.45	4.57	5.10	4.94	4.86	5.10	5.10
360.0	4.08	4.41	4.65	4.98	5.14	4.98	4.82	5.06	5.14

C/ γ (°)	180.0
0.0	5.06
22.5	5.06
45.0	4.98
67.5	4.98
90.0	5.22
112.5	4.98
135.0	4.98
157.5	5.06
180.0	5.06
202.5	5.06
225.0	4.98
247.5	4.98
270.0	5.22
292.5	4.98
315.0	4.98
337.5	5.06
360.0	5.06

5 – Additional Test

Test item	Test Voltage (V)	Frequency(Hz)	Test Result
Total harmonic Distortion	230	50	9.56%

The test data was only good for the test sample. It may have deviation for other test sample.

Attachment A – Product PHOTO

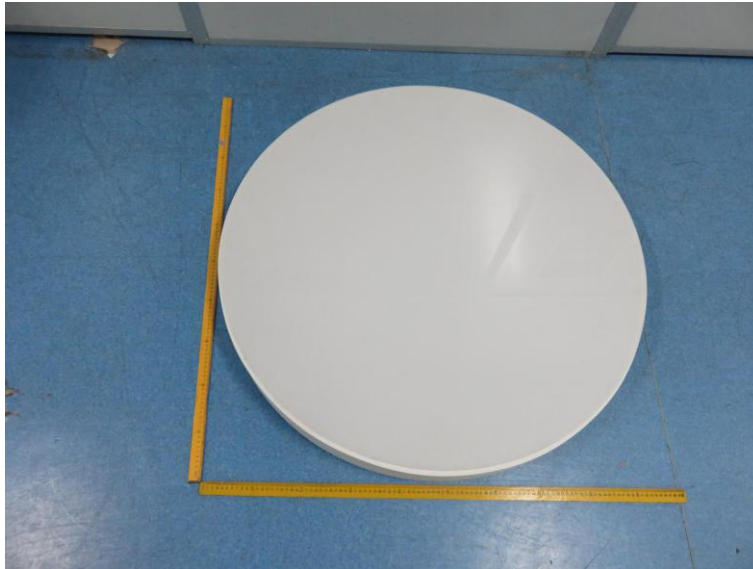


PHOTO 1



PHOTO 2

-----End of Report-----