FCC TEST REPORT

for

POLYGROUP LIMITED(MACAO COMMERCIAL OFFSHORE)

Digital light

Model Number: DLABCDEF(A= Series designation, “CW1” for Basic, “CW2” for Lamplock; B="I" for indoor use; C= Indicates the type of LED lamp is RGB; D= Indicates the total number of LED lamps per series; E= Indicates No. of circuits per output is 1.; F= Cat. No. of non-removable cover. Shall be provided with strings employing for CW1 Style lampholder. Blank for CW2 Style lampholder without cover.)

FCC ID: 2AABTRGB105

Prepared for : POLYGROUP LIMITED(MACAO COMMERCIAL OFFSHORE)
Address : Avenida Xian Xing Hai,
Centro Golden Dragon 11 Andar M,Macau

Prepared by : Keyway Testing Technology Co., Ltd.
Address : Baishun Industrial Zone, Zhangmutou Town,
Dongguan, Guangdong, China

Tel: 86-769-8718 2258
Fax: 86-769-8718 1058

Report No. : 15KWE032381F
Date of Test : Mar. 22, 2015
Date of Report : Mar. 23, 2015

TABLE OF CONTENTS

Test Report Declaration Page
1. TEST SUMMARY 4
2. GENERAL PRODUCT INFORMATION 4
2.1. Product Function 4
2.2. Description of Device (EUT) 4
2.3. Independent Operation Mode 5
2.4. Difference between Model Numbers 5
2.5. Test Supporting System 5
3. TEST SITES 6
3.1. Test Facilities 6
3.2. List of Test and Measurement Instruments 7
4. TEST SET-UP AND OPERATION MODES 8
4.1. Principle of Configuration Selection 8
4.2. Block Diagram of Test Set-up 8
4.3. Test Operation Mode and Test Software 8
4.4. Special Accessories and Auxiliary Equipment 8
4.5. Countermeasures to Achieve EMC Compliance 8
5. EMISSION TEST RESULTS 9
5.1. Conducted Emission at the Mains Terminals Test 9
5.2. Radiated Emission Test 12
6. PHOTOGRAPHS OF TEST SET-UP 18
7. PHOTOGRAPHS OF THE EUT 20

Keyway Testing Technology Co., Ltd.

Applicant: **Address:**	POLYGROUP LIMITED(MACAO COMMERCIAL OFFSHORE) Avenida Xian Xing Hai,Centro Golden Dragon 11 Andar M,Macau
Manufacturer1: **Address:**	Crownwell (He Yuan) CO., Ltd. No 11, Meizi Road, Xian Tang Industrial Park, Xian Tang Town, Dong Yuan County, Heyuan City, Guangdong Province, China
Manufacturer2: **Address:**	Nixan(He Yuan) CO.,LTD Xiantang Industrial zone, Xiantang Town, Dongyuan County, Heyuan City, Guangdong Province, China
Manufacturer3: **Address:**	Glenealy Plastic Crafts (Dongguan) Company Ltd. Kiu Lik Village, Changping Town, Dongguan City, Guangdong Province, China
E.U.T:	Digital light
Model Number:	DLABCDEF(A= Series designation, “CW1” for Basic, “CW2” for Lamplock; B="I" for indoor use; C= Indicates the type of LED lamp is RGB; D= Indicates the total number of LED lamps per series; E= Indicates No. of circuits per output is 1.; F= Cat. No. of non-removable cover. Shall be provided with strings employing for CW1 Style lampholder. Blank for CW2 Style lampholder without cover.)
Trade Name:	------ **Serial No.:** ------
Date of Receipt:	Mar. 22, 2015 **Date of Test:** Mar. 22, 2015
Test Specification:	FCC Part 15, Subpart B: 2014 ANSI C63.4:2014
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied. **Issue Date: Mar. 23, 2015**

Tested by:	Reviewed by:	Approved by:
Cissy	Andy	Jade Yang
Cissy Song / Engineer	Andy Gao / Supervisor	Jade Yang / Supervisor

Other Aspects:

None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Keyway Testing Technology Co., Ltd.

1. TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.107	PASS
Radiated Emissions	15.109	PASS

2. GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Description : Digital light

Model No. : DLABCDEF(A= Series designation, “CW1” for Basic, “CW2” for Lamplock; B="I" for indoor use; C= Indicates the type of LED lamp is RGB; D= Indicates the total number of LED lamps per series; E= Indicates No. of circuits per output is 1.; F= Cat. No. of non-removable cover. Shall be provided with strings employing for CW1 Style lampholder. Blank for CW2 Style lampholder without cover.)

Power Input : AC 120V/60Hz

Operation Frequency : 433.92MHz(RX)

Remark: DLCW2IRGB105/1 were selected as the test model and its data have been recorded in this report.

Model list:

Model : DLABCDEF Where:	A =	Series designation, “CW1” for Basic, “CW2” for Lamplock;
	B =	"I" for indoor use.
	C =	Indicates the type of LED lamp is RGB.
	D =	Indicates the total number of LED lamps per series: 105 –the total number of lighting string is 105（3×35）; 90 - the total number of lighting string is 90（3×30）; 75 - the total number of lighting string is 75（3×25）; 60 - the total number of lighting string is 60（3×30）; 45 - the total number of lighting string is 45（3×15）.
	E =	Indicates No. of circuits per output is 1.
	F =	Cat. No. of non-removable cover. Shall be provided with strings employing for CW1 Style lampholder. Blank for CW2 Style lampholder without cover.

TABLE 1 – DLCW1I, DLCW2I SERIES

Catalog No.	No. of Circuits per Output	No. of Lamps	Controller Cat. No.	Total Input Ratings	
				Current, A	Power, W
DLCW2IRGB105/1	1	105	DLC-001	0.5	60
DLCW1IRGB105/1C7-1	1	105	DLC-001	0.5	60
DLCW2IRGB90/1	1	90	DLC-002	0.5	60
DLCW1IRGB90/1C7-1	1	90	DLC-002	0.5	60
DLCW2IRGB75/1	1	75	DLC-003	0.5	60
DLCW1IRGB75/1C7-1	1	75	DLC-003	0.5	60
DLCW2IRGB60/1	1	60	DLC-004	0.5	60
DLCW1IRGB60/1C7-1	1	60	DLC-004	0.5	60
DLCW2IRGB45/1	1	45	DLC-005	0.5	60
DLCW1IRGB45/1C7-1	1	45	DLC-005	0.5	60

TABLE 2 – COVER CAT. NOS. FOR CW1 Style lampholder.

Cover Cat. No.	Description	Ill. No.	Cover Cat. No.	Description	Ill. No.
C7-1	PP-2722	-	C7-2	PP-2723	-
C12-1	PP-2154	-	C12-2	PP-2153	-
C12-3	PP-2152	-	C9-2	PP-1757	-
C9-1	PP-2060	-	C7-3	PP-2176	-

2.3. Independent Operation Mode

The basic operation mode is:

2.3.1. ON(RX Mode)

2.4. Difference between Model Numbers

Please see model list.

2.5. Test Supporting System

None.

3. TEST SITES

3.1. Test Facilities

Lab Qualifications : 944 Shielded Room built by ETS-Lindgren, USA
Date of completion: March 28, 2011

966 Chamber built by ETS-Lindgren, USA
Date of completion: March 28, 2011

Certificated by TUV Rheinland, Germany.
Registration No.: UA 50207153
Date of registration: July 13, 2011

Certificated by UL, USA
Registration No.: 100567237
Date of registration: September 5, 2012

Certificated by Intertek
Registration No.: 2011-RTL-L1-31
Date of registration: October 11, 2011

Certificated by Industry Canada
Registration No.: 9868A
Date of registration: December 8, 2011

Certificated by FCC, USA
Registration No.: 370994
Date of registration: February 21, 2012

Certificated by CNAS China
Registration No.: CNAS L5783
Date of registration: August 8, 2012

Name of Firm : Keyway Testing Technology Co., Ltd.

Site Location : Baishun Industrial Zone, Zhangmutou Town, Dongguan, Guangdong, China

3.2. List of Test and Measurement Instruments

3.2.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 27,14	Apr. 27,15
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	Apr. 27,14	Apr. 27,15
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	Apr. 27,14	Apr. 27,15
RF Cable	FUJIKURA	3D-2W	944 Cable	Apr. 27,14	Apr. 27,15

3.2.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr 27,14	Apr 27,15
Bilog Antenna	ETS-LINDGREN	3142D	00135452	Apr 27,14	Apr 27,15
Horn Antenna	DAZE	ZN30701	11003	Apr 27,14	Apr 27,15
Spectrum Analyzer	Agilent	8593E	3911A04271	Apr 27,14	Apr 27,15
3m Semi-anechoic Chamber	ETS-LINDGREN	966	KW01	Apr 27,14	Apr 27,15
Signal Amplifier	SONOMA	310	187303	Apr 27,14	Apr 27,15
Signal Amplifier	DAZE	ZN3380C	11001	Apr 27,14	Apr 27,15
RF Cable	IMRO	IMRO-400	966 Cable 1#	Apr 27,14	Apr 27,15
MULTI-DEVICE Controller	ETS-LINDGREN	2090	126913	N/A	N/A
Antenna Holder	ETS-LINDGREN	2070B	00109601	N/A	N/A

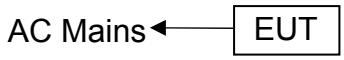
4. TEST SET-UP AND OPERATION MODES

4.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

4.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: Digital light)

4.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4.

4.4. Special Accessories and Auxiliary Equipment

None.

4.5. Countermeasures to Achieve EMC Compliance

None.

5. EMISSION TEST RESULTS

5.1. Conducted Emission at the Mains Terminals Test

Result	**:**	**Pass**
Test Procedure	:	ANSI C63.4:2014
Frequency Range	:	0.15 to 30 MHz
Test Site	:	944 Shielded Room
Limits	:	FCC Part 15, Subpart B: 2014

Test Setup

M/N	:	DLCW2IRGB105/1
Input Voltage	:	AC 120V/60Hz
Operation Mode	:	ON(RX Mode)

The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 1 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.

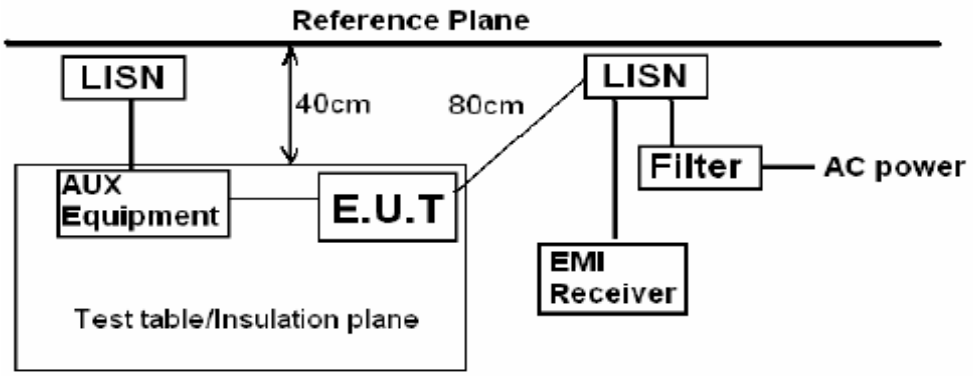
The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.

The frequency range from 150 kHz to 30 MHz was investigated.

The bandwidth of the test receiver was set at 9 kHz.

All the test data were reported on the following page.

Note: Measurement Uncertainty: ± 2.6 dB at a level of confidence of 95%.

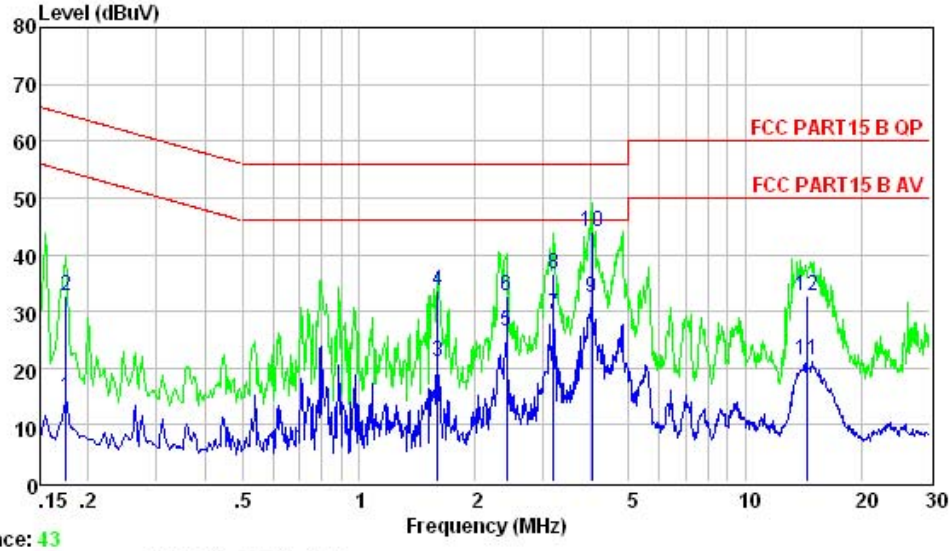


Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

Keyway Testing

Keyway Testing Technology Co.,Ltd.
Baishun Industrial Zone,Zhangmutou
Town,Dongguan,Guangdong,China
Tel: 0769-87182258
Fax: 0769-87181058
Mail: kwtest@keywaytest.com

Data: 44 File: F:\944 Data\conduction\15Report\15KW020501ZSM.EM6 (46)



Trace: 43

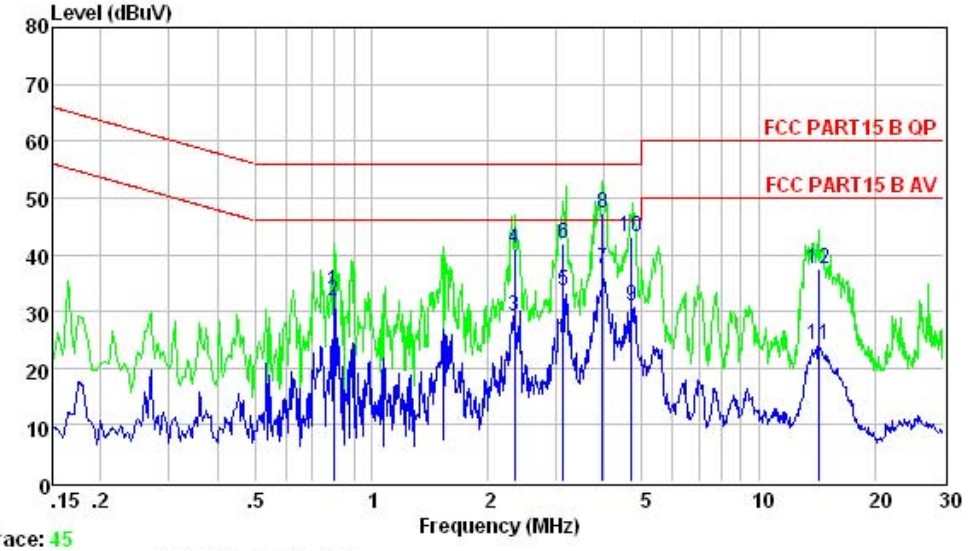
Site : 944 Shielded Room
Condition : FCC PART15 B QP NEUTRAL
EUT : Digital light
POWER : AC 120V/60Hz
M/N : DLCW2IRGB105/1
Test Engineer: William
Comment : Temp:24.9';Humi:56%;Press;101.52kPa
Test Mode : ON(RX Mode)

	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.175	14.76	54.72	-39.96	Average
2	0.175	32.60	64.72	-32.12	QP
3	1.602	21.23	46.00	-24.77	Average
4	1.602	33.60	56.00	-22.40	QP
5	2.409	26.48	46.00	-19.52	Average
6	2.409	32.80	56.00	-23.20	QP
7	3.190	29.47	46.00	-16.53	Average
8	3.190	36.70	56.00	-19.30	QP
9	4.006	32.52	46.00	-13.48	Average
10	4.006	44.15	56.00	-11.85	QP
11	14.440	21.35	50.00	-28.65	Average
12	14.440	32.80	60.00	-27.20	QP

Keyway Testing

Keyway Testing Technology Co.,Ltd.
Baishun Industrial Zone,Zhangmutou
Town,Dongguan,Guangdong,China
Tel: 0769-87182258
Fax: 0769-87181058
Mail: kwtest@keywaytest.com

Data: 46 File: F:\944 Data\conduction\15Report\15KW020501ZSM.EM6 (46)



Trace: 45

Site : 944 Shielded Room
Condition : FCC PART15 B QP LINE
EUT : Digital light
POWER : AC 120V/60Hz
M/N : DLCW2IRGB105/1
Test Engineer: William
Comment : Temp:24.9';Humi:56%;Press;101.52kPa
Test Mode : ON(RX Mode)

	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.800	33.52	46.00	-12.48	Average
2	0.800	31.70	56.00	-24.30	QP
3	2.346	29.20	46.00	-16.80	Average
4	2.346	41.10	56.00	-14.90	QP
5	3.123	33.65	46.00	-12.35	Average
6	3.123	41.90	56.00	-14.10	QP
7	3.943	37.39	46.00	-8.61	Average
8	3.943	47.26	56.00	-8.74	QP
9	4.696	30.82	46.00	-15.18	Average
10	4.696	43.20	56.00	-12.80	QP
11	14.364	24.09	50.00	-25.91	Average
12	14.364	37.40	60.00	-22.60	QP

5.2. Radiated Emission Test

5.2.1. Limit 15.109 limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

5.2.1. Test setup

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz, Both PK and AV measure, PK detector is used.

The frequency range from 30MHz to 5th harmonic (3GHz) are checked.

Notes: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.

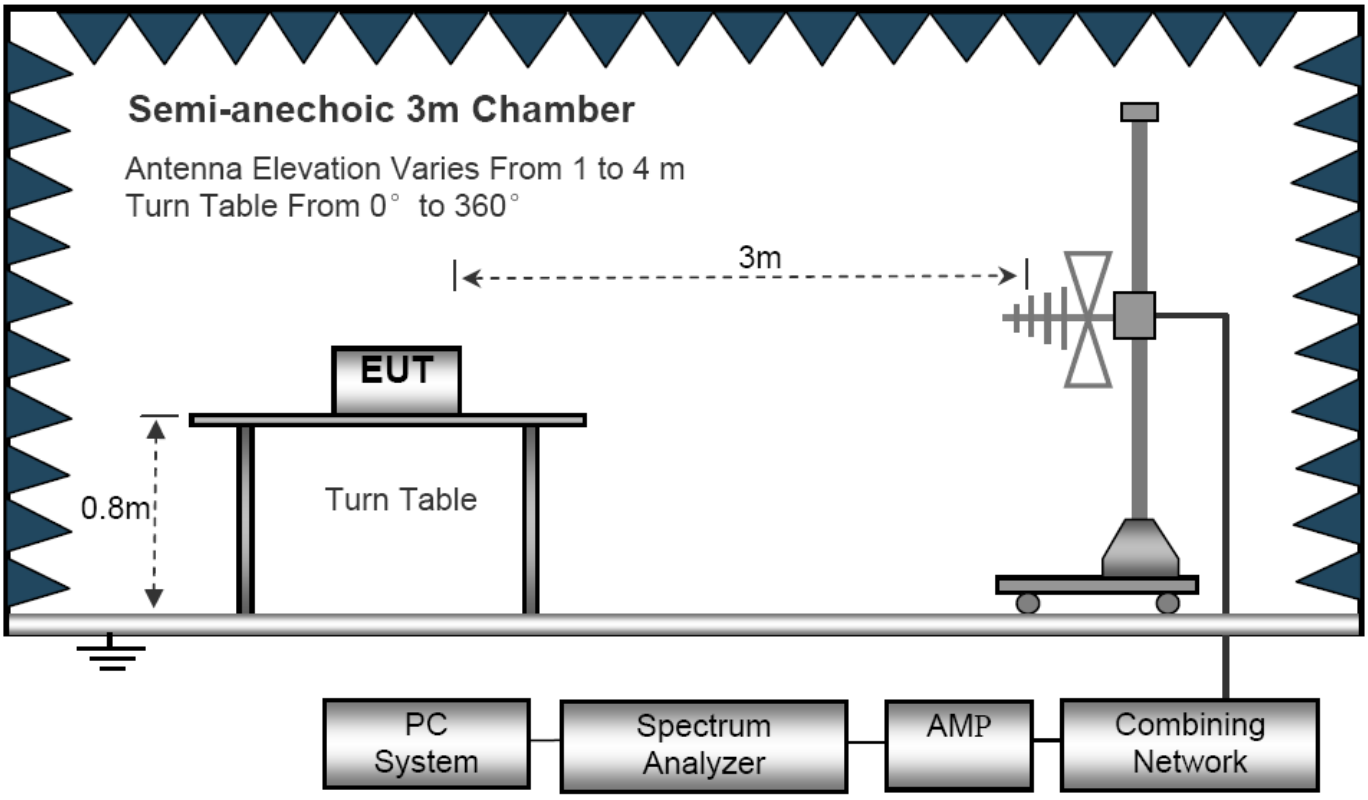
2. Measurement Uncertainty: ±3.2 dB at a level of confidence of 95%.

3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

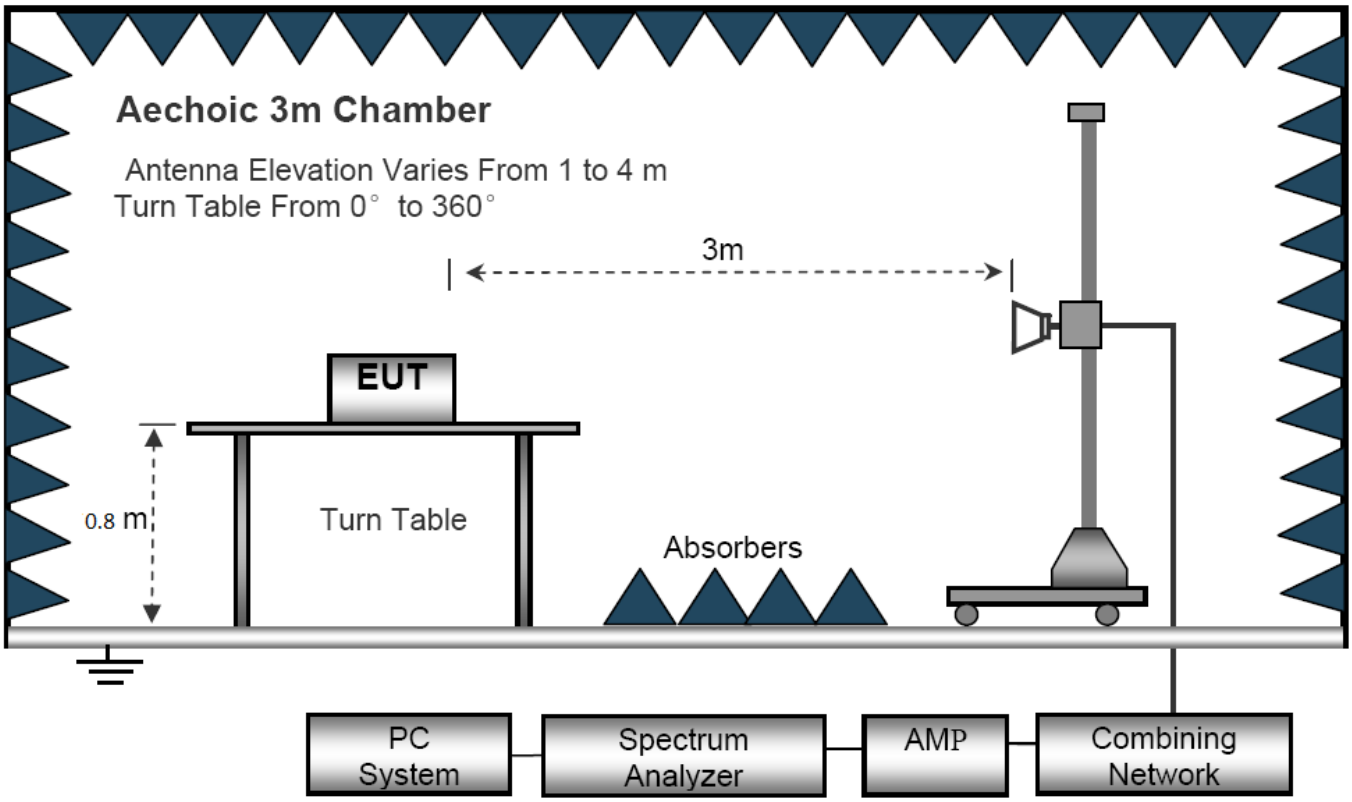
4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.

5. For Both PK and AV value above 1GHz, PK detector is used.

Below 1GHz



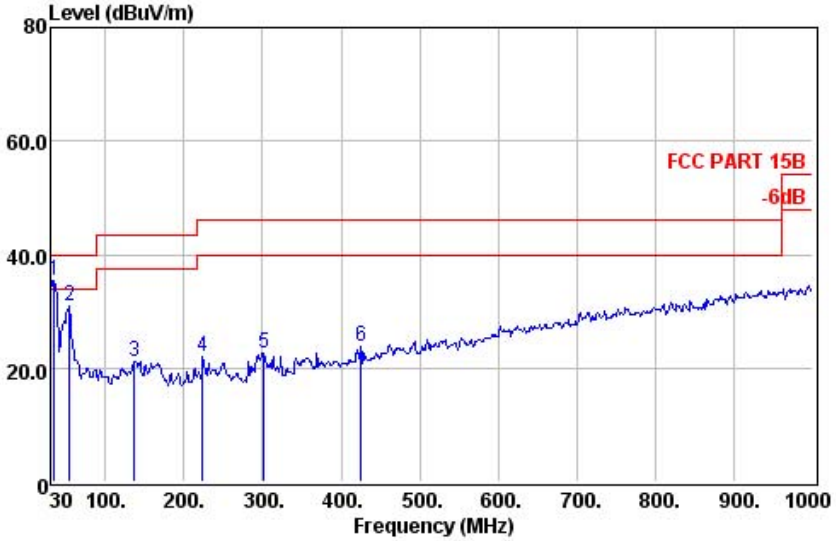
Above 1GHz



Keyway Testing

Keyway Testing Technology Co.,Ltd.
Baishun Industrial Zone,Zhangmutou
Town,Dongguan,Guangdong,China
Tel: 0769-87182258
Fax: 0769-87181058
Mail: kwtest@keywaytest.com

Data: 16 File: D:\966 data\15Report\15KW020501ZSM.EM6 (30)



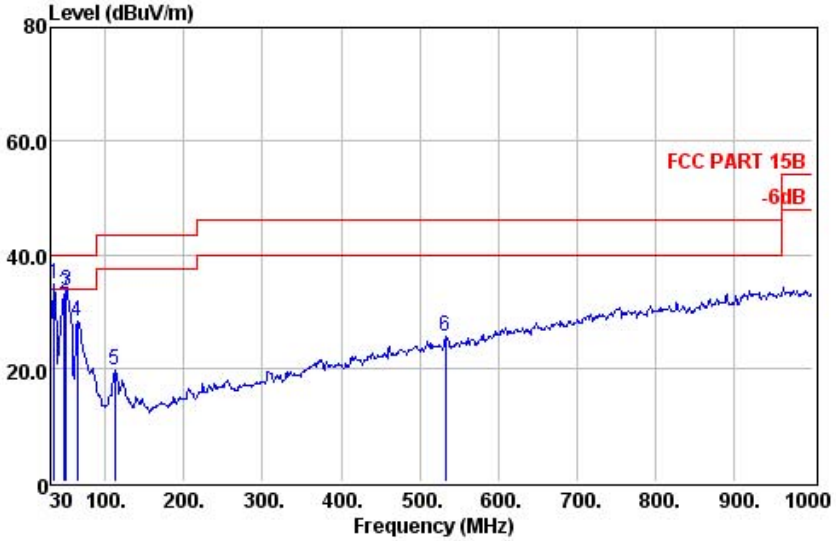
Site : 966 Chamber
Condition: FCC PART 15B 3m 3142D HORIZONTAL
EUT : Digital light
M/N : DLCW2IRGB105/1
Power : AC 120V/60Hz
Test By : William
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: ON(RX Mode)

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1 !	34.85	31.38	50.22	0.56	15.94	35.34	40.00	-4.66	QP
2	54.25	31.37	53.27	0.75	8.16	30.81	40.00	-9.19	QP
3	136.70	31.20	42.94	1.12	8.37	21.23	43.50	-22.27	QP
4	224.00	30.95	39.15	1.53	12.15	21.88	46.00	-24.12	QP
5	301.60	30.92	37.73	1.94	13.84	22.59	46.00	-23.41	QP
6	425.76	30.63	34.66	2.55	17.12	23.70	46.00	-22.30	QP

Keyway Testing

Keyway Testing Technology Co.,Ltd.
Baishun Industrial Zone,Zhangmutou
Town,Dongguan,Guangdong,China
Tel: 0769-87182258
Fax: 0769-87181058
Mail: kwtest@keywaytest.com

Data: 15 File: D:\966 data\15Report\15KW020501ZSM.EM6 (30)



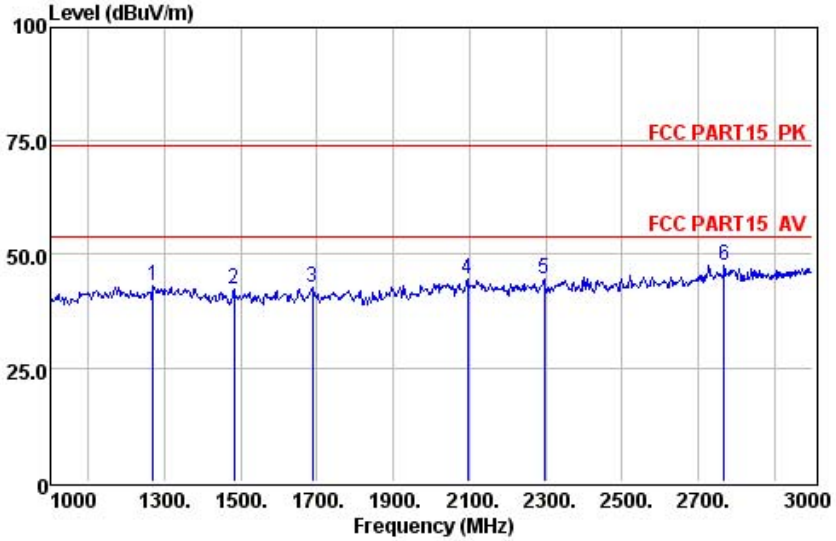
Site : 966 Chamber
Condition: FCC PART 15B 3m 3142D VERTICAL
EUT : Digital light
M/N : DLCW2IRGB105/1
Power : AC 120V/60Hz
Test By : William
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: ON(RX Mode)

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1 !	34.85	31.38	49.79	0.56	15.94	34.91	40.00	-5.09	QP
2	47.46	31.39	53.68	0.75	9.84	32.88	40.00	-7.12	QP
3	50.37	31.38	55.53	0.75	8.74	33.64	40.00	-6.36	QP
4	63.95	31.32	51.31	0.75	7.38	28.12	40.00	-11.88	QP
5	112.45	31.29	40.88	1.03	9.10	19.72	43.50	-23.78	QP
6	532.46	30.76	33.92	3.03	19.29	25.48	46.00	-20.52	QP

Keyway Testing

Keyway Testing Technology Co.,Ltd.
Baishun Industrial Zone,Zhangmutou
Town,Dongguan,Guangdong,China
Tel: 0769-87182258
Fax: 0769-87181058
Mail: kwtest@keywaytest.com

Data: 18 File: D:\966 data\15Report\15KW020501ZSM.EM6 (30)



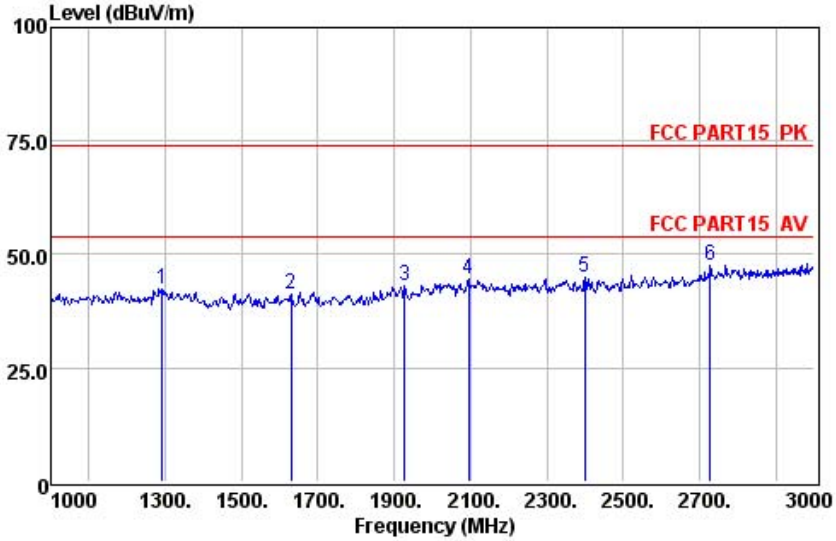
Site : 966 Chamber
Condition: FCC PART15 PK 3m ZN30701 VERTICAL
EUT : Digital light
M/N : DLCW2IRGB105/1
Power : AC 120V/60Hz
Test By : William
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: ON(RX Mode)

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	1270.00	26.05	39.22	5.14	24.76	43.07	74.00	-30.93	Peak
2	1482.00	26.09	37.94	5.33	25.26	42.44	74.00	-31.56	Peak
3	1688.00	26.14	36.53	5.77	26.44	42.60	74.00	-31.40	Peak
4	2094.00	26.23	35.82	6.59	28.47	44.65	74.00	-29.35	Peak
5	2296.00	26.29	34.97	7.12	28.63	44.43	74.00	-29.57	Peak
6	2768.00	26.43	35.88	8.84	29.44	47.73	74.00	-26.27	Peak

Keyway Testing

Keyway Testing Technology Co.,Ltd.
Baishun Industrial Zone,Zhangmutou
Town,Dongguan,Guangdong,China
Tel: 0769-87182258
Fax: 0769-87181058
Mail: kwtest@keywaytest.com

Data: 17 File: D:\966 data\15Report\15KW020501ZSM.EM6 (30)

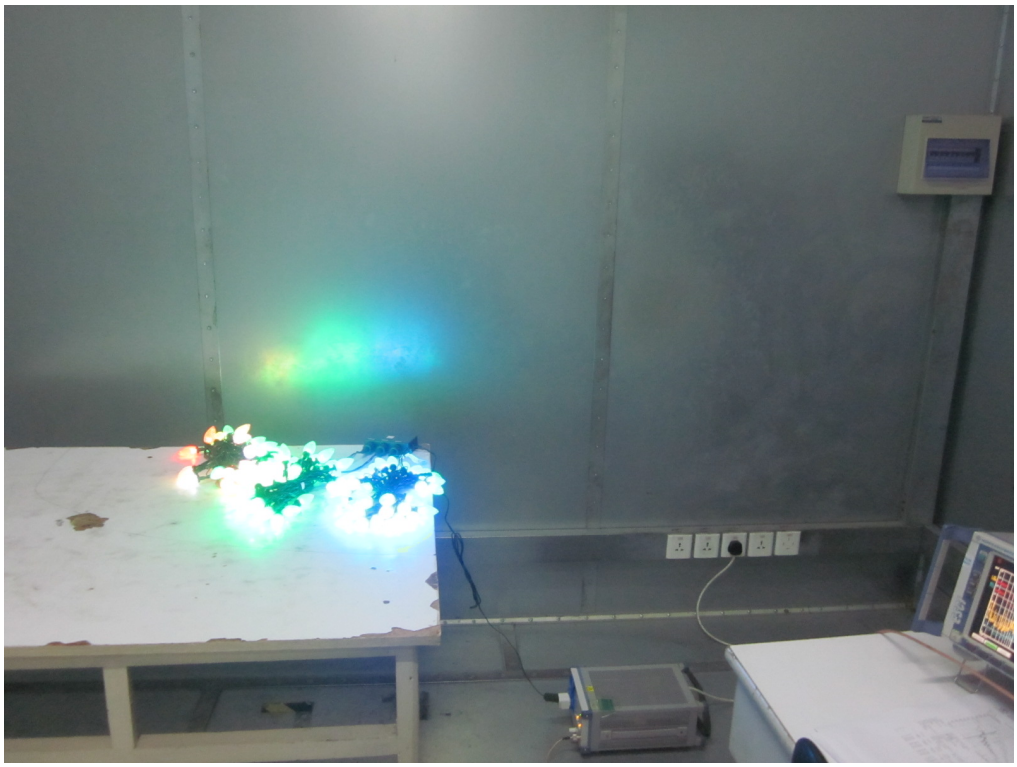


Site : 966 Chamber
Condition: FCC PART15 PK 3m ZN30701 HORIZONTAL
EUT : Digital light
M/N : DLCW2IRGB105/1
Power : AC 120V/60Hz
Test By : William
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: ON(RX Mode)

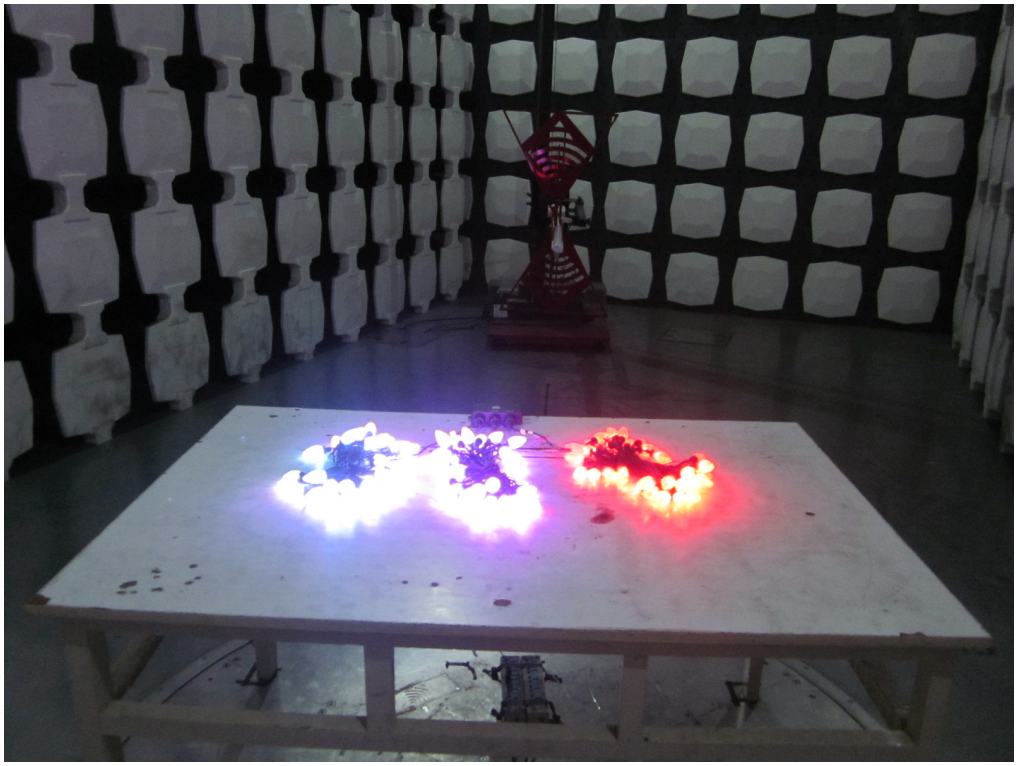
	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	1292.00	26.06	38.49	5.15	24.80	42.38	74.00	-31.62	Peak
2	1630.00	26.13	35.64	5.65	26.13	41.29	74.00	-32.71	Peak
3	1928.00	26.19	35.01	6.26	27.99	43.07	74.00	-30.93	Peak
4	2094.00	26.23	35.82	6.59	28.47	44.65	74.00	-29.35	Peak
5	2400.00	26.32	35.24	7.34	28.72	44.98	74.00	-29.02	Peak
6	2728.00	26.42	36.05	8.66	29.36	47.65	74.00	-26.35	Peak

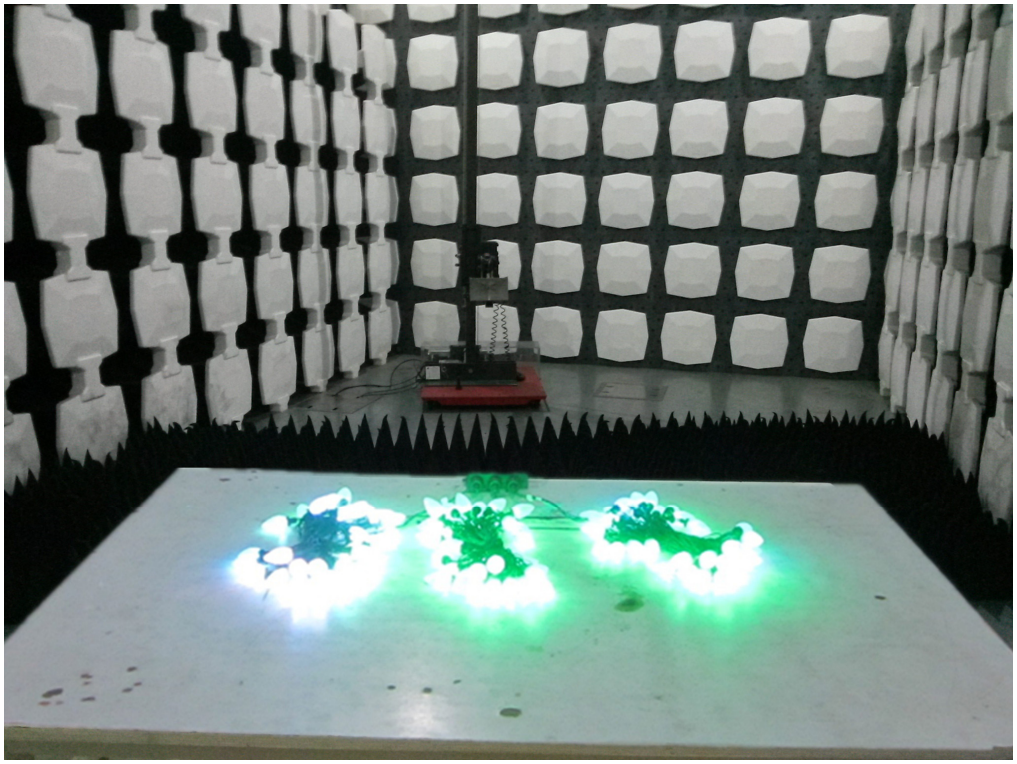
6. PHOTOGRAPHS OF TEST SET-UP

Conducted Emission Test



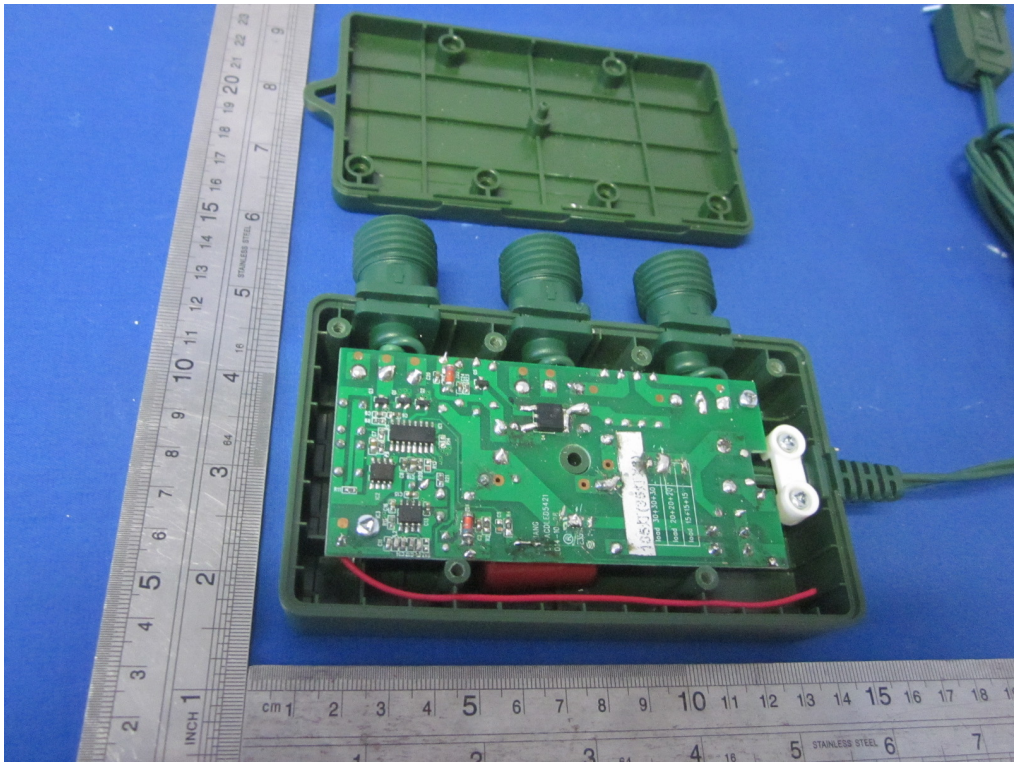
Radiated Emission Test





7. PHOTOGRAPHS OF THE EUT

105L
3 上节
2 中节
1 下节



END.