

FCC TEST REPORT

Product : Harmonize Music Control Box
Trade mark : N/A
Model/Type reference : GV-MUSIC
Serial Number : N/A
Ratings : AC 120V/60Hz, 600W
FCC ID : 2ACO2-GV-MUSIC
Report Number : EESZG05140001-2
Date : Jul. 18, 2014
Regulations : See below

Test Standards	Results
☒ 47 CFR FCC Part 15 Subpart B:2013	PASS

Prepared for:

Golden Vessel Electronic & Lighting Inc
Industrial District, ZhongHan Town, ChaoHun City, AnHui, China

Prepared by:

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Date: Jul. 18, 2014

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Check No.: 1702028131



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(Note: N/A means not applicable)

1. GENERAL INFORMATION

Applicant: Golden Vessel Electronic & Lighting Inc
Industrial District, ZhongHan Town, ChaoHun City, AnHui, China

Manufacturer: Golden Vessel Electronic & Lighting Inc
Industrial District, ZhongHan Town, ChaoHun City, AnHui, China

Equipment Authorization: Certification

FCC ID: 2ACO2-GV-MUSIC

Product: Harmonize Music Control Box

Model/Type reference: GV-MUSIC

Trade mark: N/A

Serial Number: N/A

Report Number: EESZG05140001-1

Sample Received Date: Jun. 28, 2014

Sample tested Date: Jun. 28, 2014 to Jul. 18, 2014

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	Test Item	Test
FCC 15.107	Conducted Emission	Yes
FCC 15.109	Radiated Emission	Yes

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted disturbance	3.0
Radiated disturbance (30MHz to 1GHz)	4.9
Radiated disturbance (1GHz to 6GHz)	4.7

4. PRODUCT INFORMATION AND TEST SETUP

4.1. PRODUCT INFORMATION

Ratings: AC 120V/60Hz, 600W

4.2. TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between Product and support equipment.

4.3. SUPPORT EQUIPMENT

Device Type	Brand	Model	Series No.	Data Cable	Remark
Notebook	DELL	Vostro 3400	GYQTVP1	N/A	FCC DOC
Mouse	L.Selectron	M004	02284699	Un-shielded 1.2M	FCC DOC
Printer	HP	1020	CNC-JM43467	Un-shielded 1.2M	FCC DOC

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5. FACILITIES AND ACCREDITATIONS

5.1 TEST FACILITY

All test facilities used to collect the test data are located at Hongwei Industrial Zone, 70 Area, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

5.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

Equipment used during the tests:

Shielding Room No. 1 - Conducted Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	R&S	ESCI	100009	07/19/2014
LISN	R&S	ENV216	100098	07/19/2014

3M Semi-anechoic Chamber (1)- Radiated disturbance Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/12/2016
Spectrum Analyzer	Agilent	E4443A	MY45300910	01/15/2015
Receiver	R&S	ESCI	100435	07/19/2014
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	618	06/25/2015
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/19/2014
Microwave Preamplifier	Agilent	8449B	3008A02425	03/19/2015

6. SYSTEM TEST CONFIGURATION

6.1.JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it), The Product was placed on a turn table, which enabled the engineer to maximize emissions through its placement as outlined in ANSI C63.4 (2009).

The Product was powered by 120VAC/ 60Hz during test.

For maximizing emissions, the Product was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The rear of unit shall be flushed with the rear of the table.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

6.2.PRODUCT EXERCISING SOFTWARE

No Software was used during testing.

7. CONDUCTED EMISSION TEST

7.1. LIMITS

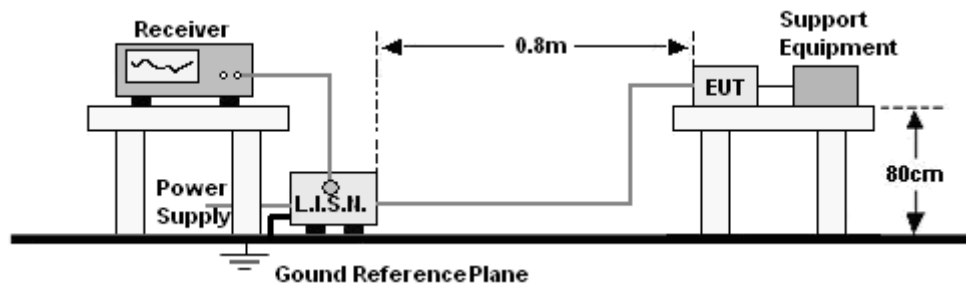
Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

7.2. BLOCK DIAGRAM OF TEST SETUP



7.3. PROCEDURE OF CONDUCTED EMISSION TEST

- The Product was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

7.4. WORST CASE TEST GRAPHS AND TEST DATA

Product : Harmonize Music Control Box **Model/Type reference** : GV-MUSIC

Power : AC 120V/60Hz

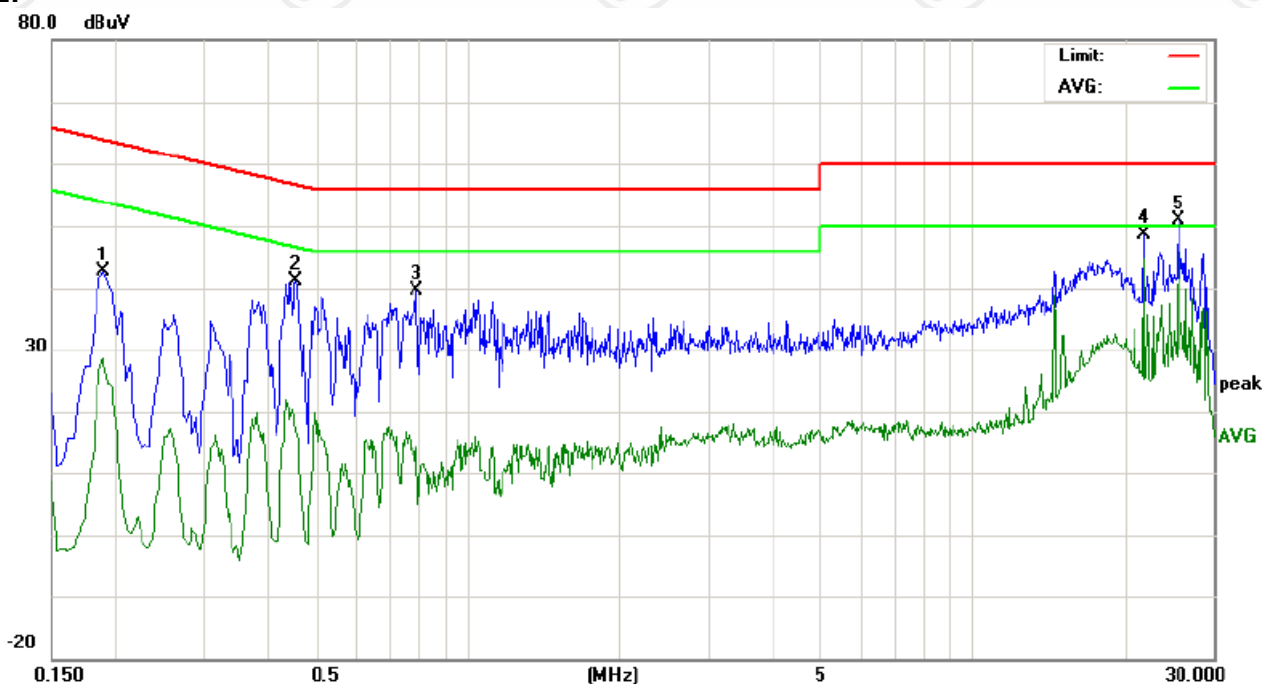
Temperature : 23°C

Mode : Data exchange

Humidity : 52%

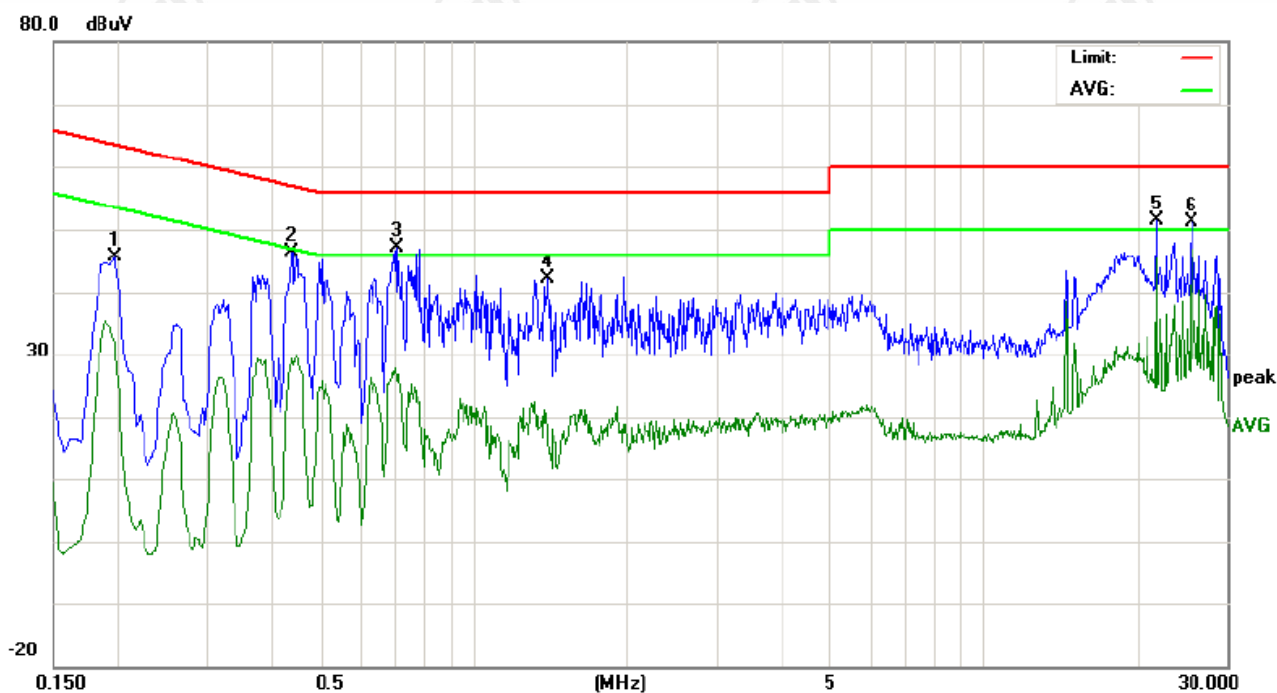
EUT power port:

L:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1900	32.95		18.96	9.79	42.74		28.75	64.03	54.03	-21.29	-25.28	P	
2	0.4580	31.42		7.26	9.80	41.22		17.06	56.73	46.73	-15.51	-29.67	P	
3	0.7940	29.88		4.58	9.80	39.68		14.38	56.00	46.00	-16.32	-31.62	P	
4	21.8900	38.17		34.18	10.38	48.55		44.56	60.00	50.00	-11.45	-5.44	P	
5	25.6780	40.57		35.63	10.34	50.91		45.97	60.00	50.00	-9.09	-4.03	P	

N:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1980	35.82		22.29	9.80	45.62		32.09	63.69	53.69	-18.07	-21.60	P	
2	0.4420	36.59		19.69	9.80	46.39		29.49	57.02	47.02	-10.63	-17.53	P	
3	0.7100	37.26		16.19	9.80	47.06		25.99	56.00	46.00	-8.94	-20.01	P	
4	1.3980	32.20		7.41	9.84	42.04		17.25	56.00	46.00	-13.96	-28.75	P	
5	21.8900	40.87		34.94	10.38	51.25		45.32	60.00	50.00	-8.75	-4.68	P	
6	25.6740	40.86		36.59	10.34	51.20		46.93	60.00	50.00	-8.80	-3.07	P	

8. RADIATED EMISSION TEST

8.1. LIMITS

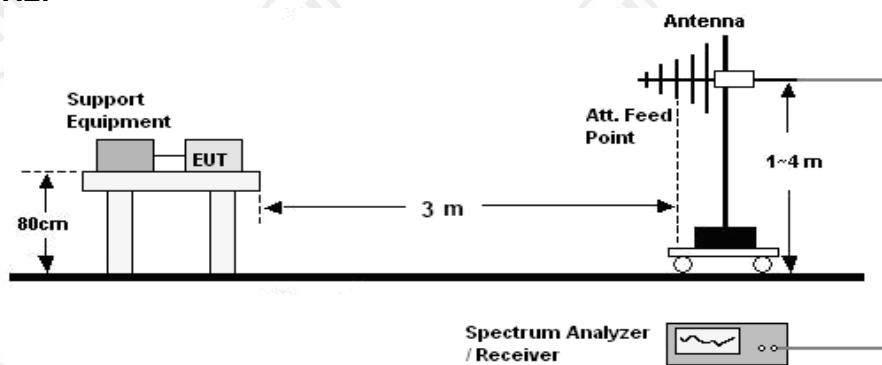
Limits for Class B digital devices

Frequency (MHz)	limits at 3m dB(μ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

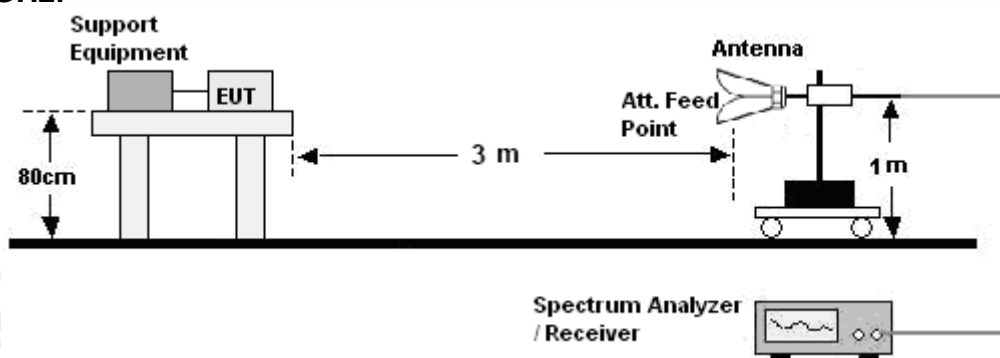
- NOTE:**
1. The lower limit shall apply at the transition frequency.
 2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
 3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

8.2. BLOCK DIAGRAM OF TEST SETUP

30MHz ~ 1GHz:



Above 1GHz:



8.3. PROCEDURE OF RADIATED EMISSION TEST

30MHz ~ 1GHz:

- a. The Product was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 100 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value (120 kHz RBW): vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

- a. The EUT was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

8.4. WORST CASE TEST GRAPHS AND TEST DATA

Product : Harmonize Music Control Box **Model/Type reference** : GV-MUSIC

Power : AC 120V/60Hz

Temperature : 23℃

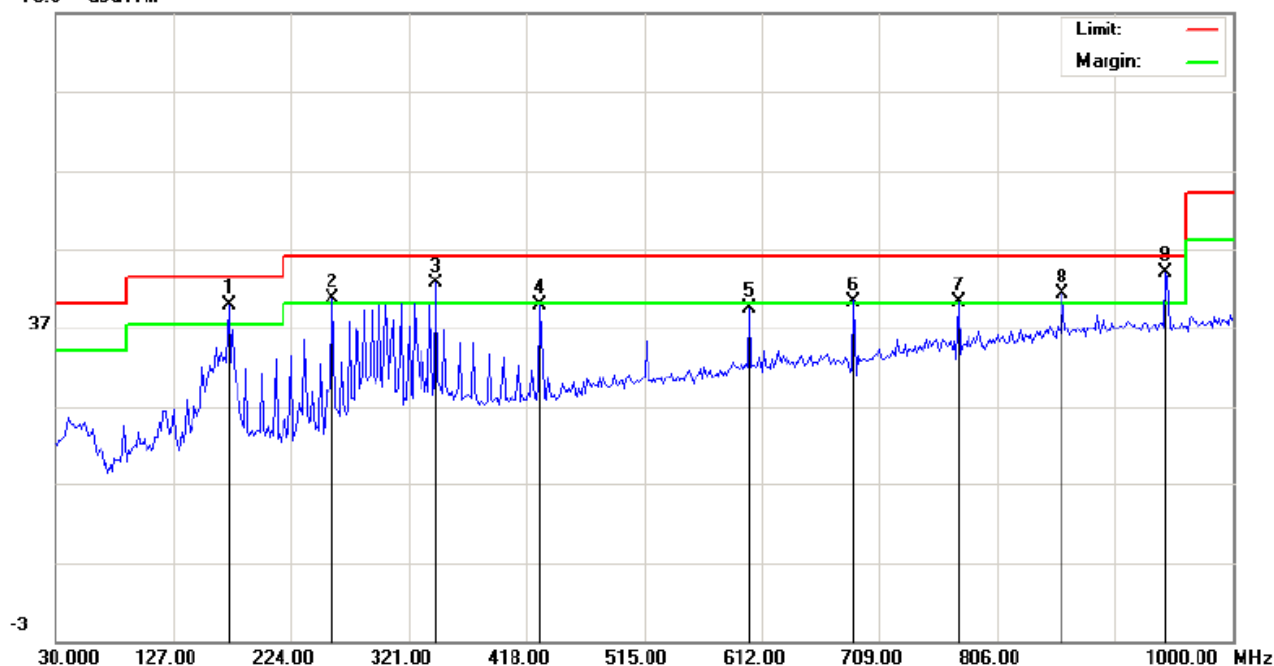
Mode : Data exchange

Humidity : 52%

30MHz~1GHz:

H:

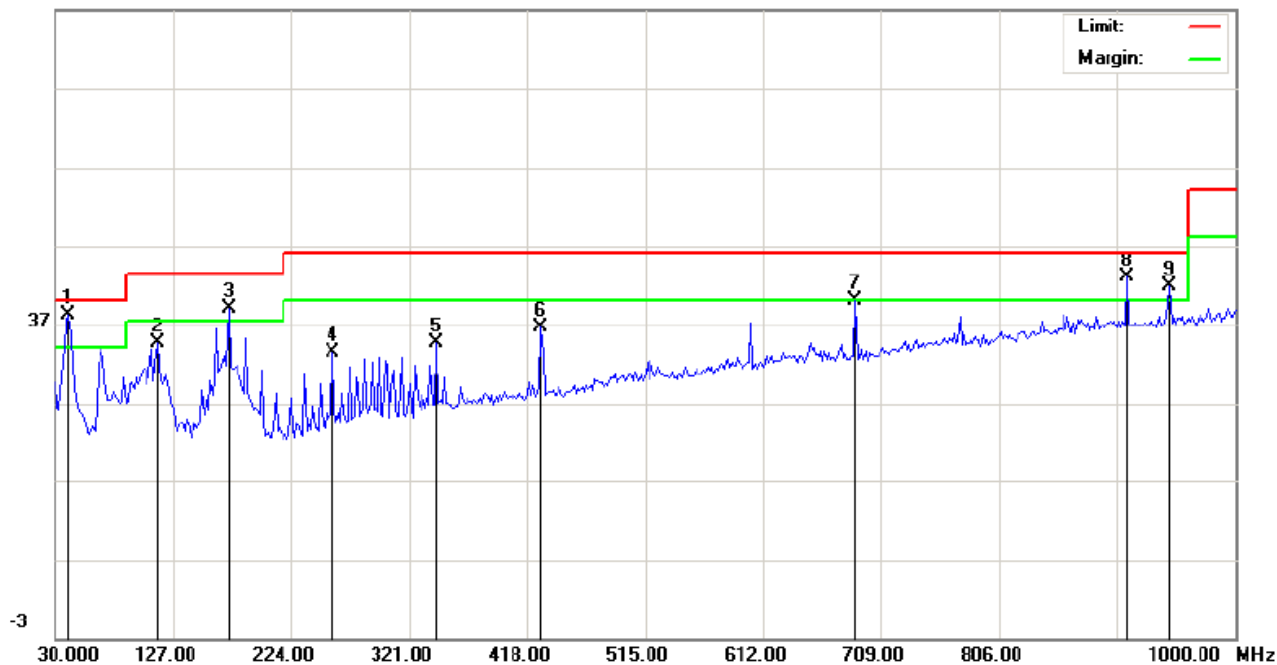
76.9 dBuV/m



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	172.2666	27.90	26.36		11.84	39.74	38.20		43.50		-5.30		P	
2	257.9499	24.94			15.69	40.63			46.00		-5.37		P	
3	343.6333	24.51	23.02		18.01	42.52	41.03		46.00		-4.97		P	
4	429.3167	20.14			19.69	39.83			46.00		-6.17		P	
5	602.2999	15.95			23.53	39.48			46.00		-6.52		P	
6	687.9832	15.87			24.43	40.30			46.00		-5.70		P	
7	773.6666	14.28			25.99	40.27			46.00		-5.73		P	
8	859.3500	13.68	12.01		27.43	41.11	39.44		46.00		-6.56		P	
9	945.0333	16.00	14.68		28.09	44.09	42.77		46.00		-3.23		P	

V:

76.9 dBuV/m

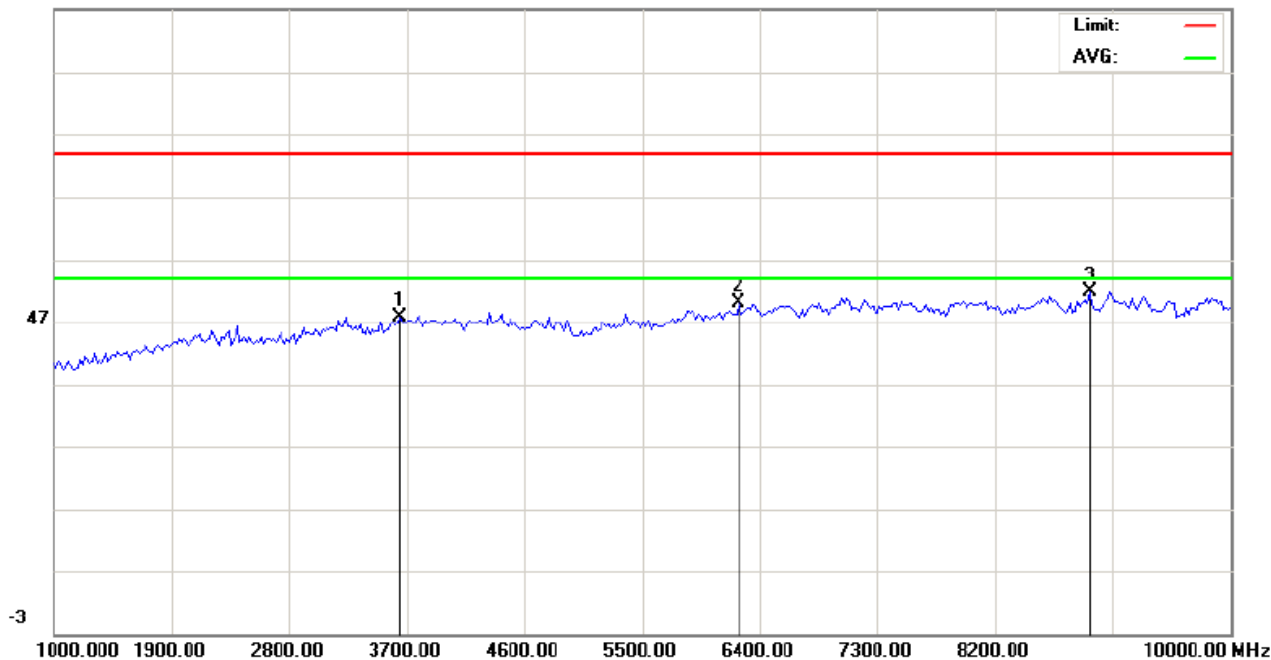


No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	41.3166	21.68	20.02		16.43	38.11	36.45		40.00		-3.55		P	
2	114.0666	21.41			13.16	34.57			43.50		-8.93		P	
3	172.2666	27.26	16.36		11.84	39.10	28.20		43.50		-15.30		P	
4	257.9499	17.62			15.69	33.31			46.00		-12.69		P	
5	343.6333	16.58			18.01	34.59			46.00		-11.41		P	
6	429.3167	16.95			19.69	36.64			46.00		-9.36		P	
7	687.9832	15.62			24.43	40.05			46.00		-5.95		P	
8	911.0833	14.94	12.96		28.02	42.96	40.98		46.00		-5.02		P	
9	946.6499	13.75	12.69		28.09	41.84	40.78		46.00		-5.22		P	

Above 1GHz:

H:

97.0 dBuV/m

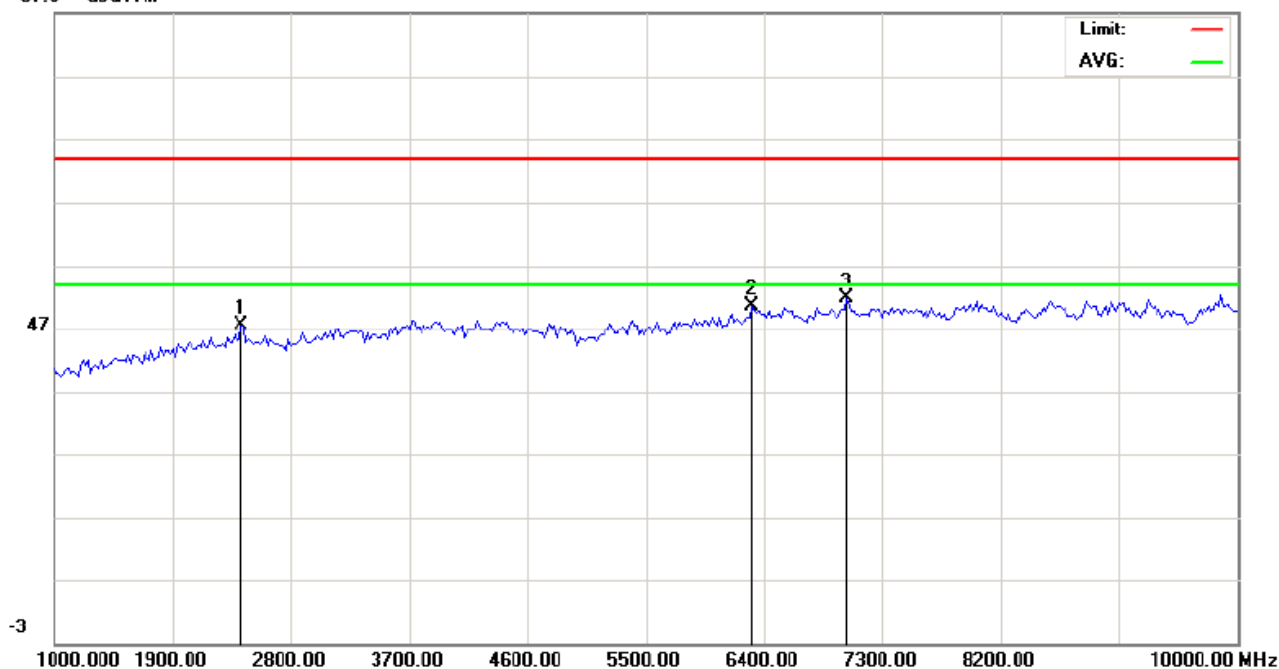


No.	Freq. MHz	Reading_Level (dBuV)		Correct Factor dB	Measurement (dBuV/m)		Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	AVG		peak	AVG	peak	AVG	peak	AVG		
1	3646.000	42.23	22.69	5.60	47.83	28.29	74.00	54.00	-26.17	-25.71	P	
2	6238.000	39.07	20.30	11.05	50.12	31.35	74.00	54.00	-23.88	-22.65	P	
3	8920.000	38.79	19.03	13.19	51.98	32.22	74.00	54.00	-22.02	-21.78	P	

Remark : RBW 1MHz VBW 3MHz peak detector for PK value ; RBW 1MHz VBW 10Hz peak detector for AV value

V:

97.0 dBuV/m



No.	Freq. MHz	Reading_Level (dBuV)		Correct Factor		Measurement (dBuV/m)		Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	AVG	dB		peak	AVG	peak	AVG	peak	AVG		
1	2422.000	45.65	25.96	2.05		47.70	28.01	74.00	54.00	-26.30	-25.99	P	
2	6310.000	39.40	20.22	11.18		50.58	31.40	74.00	54.00	-23.42	-22.60	P	
3	7030.000	39.44	18.09	12.37		51.81	30.46	74.00	54.00	-22.19	-23.54	P	

Remark : RBW 1MHz VBW 3MHz peak detector for PK value ; RBW 1MHz VBW 10Hz peak detector for AV value

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



CONDUCTED EMISSION TEST SETUP



RADIATED EMISSION TEST SETUP-1



RADIATED EMISSION TEST SETUP-2

APPENDIX 2 EXTERNAL PHOTOGRAPHS OF PRODUCT



Fig.1- General View



Fig.2- General View



Fig.3- General View



Fig.4- General View

APPENDIX 3 INTERNAL PHOTOGRAPHS OF PRODUCT



Fig.1- Terminal View

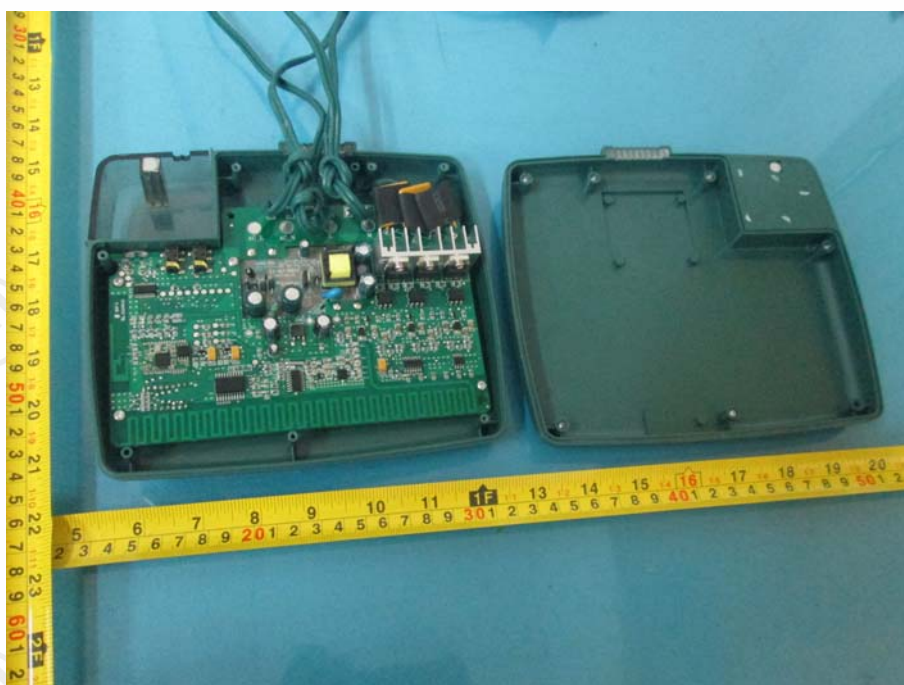


Fig.2- Inner View

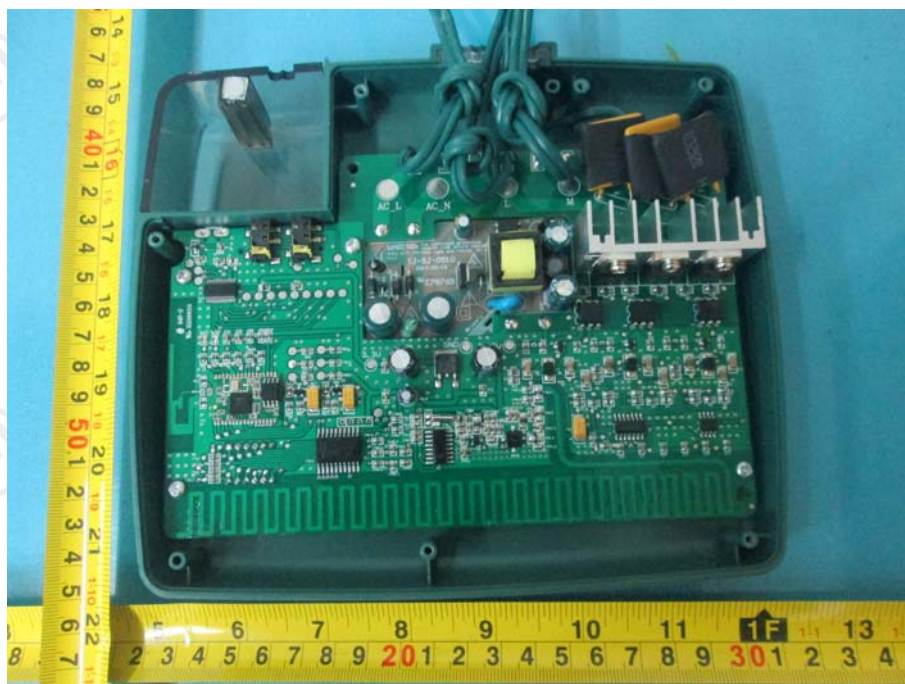


Fig.3- Inner View



Fig.4- Inner View

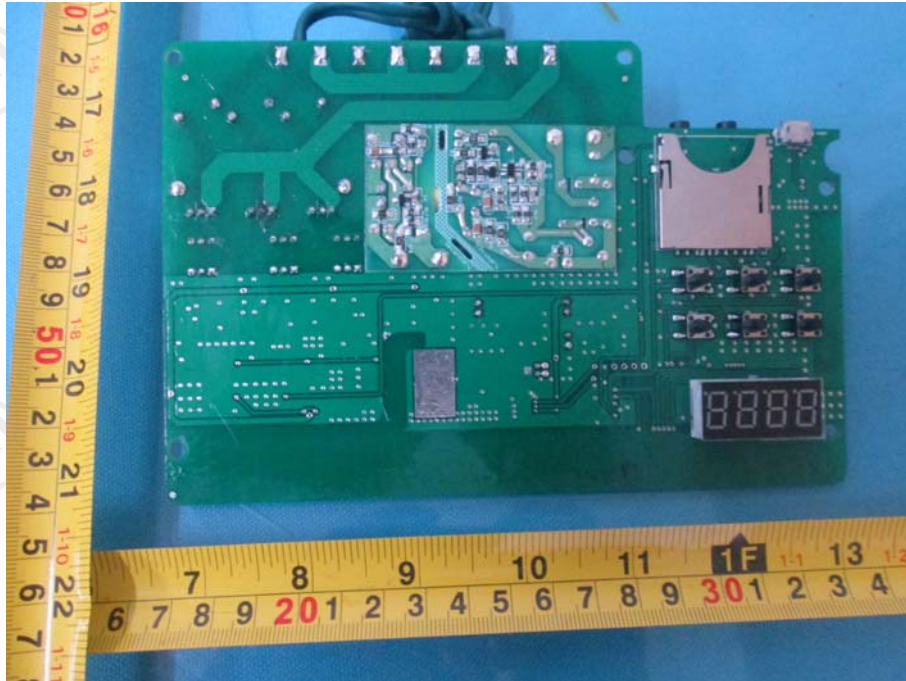


Fig.5- PCB View

*** End of Report ***

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