

FCC TEST REPORT

**Test report
On Behalf of
Ellusionist.com, INC
For
CHESS GUESS
Model No.: CHESS-3387
FCC ID: 2AMHR-CH3387**

Prepared for : Ellusionist.com, INC
524 Bret Harte Rd San Rafael, CA 94901-5139 United States

Prepared By : Laboratory of Shenzhen United Testing Technology Co., Ltd
Room 316-319, Block B, Honghualing Industrial Park of the Fifth Zone, Taoyuan
Street, Nanshan District, Shenzhen, Guangdong, China

Date of Test: Jun. 02, 2017 ~ Jun. 08, 2017
Date of Report: Jun. 08, 2017
Report Number: UNI170601004E

TEST RESULT CERTIFICATION

Applicant's name : Ellusionist.com, INC

Address : 524 Bret Harte Rd San Rafael, CA 94901-5139 United States

Manufacture's Name : AudioTronic Tech. Co., Ltd.

Address : 6F, No. 59-2, Chien Kuo 1st Rd., Hsin Chuang City, Taipei Hsien,
24257, Taiwan

Product description

Trade Mark: /

Product name : CHESS GUESS

Model and/or type reference : CHESS-3387

Standards : FCC Rules and Regulations Part 15 Subpart C Section 15.227
ANSI C63.10: 2013

This publication may be reproduced in whole or in part for non-commercial purposes as long as the **Laboratory of Shenzhen United Testing Technology Co., Ltd** is acknowledged as copyright owner and source of the material. **Laboratory of Shenzhen United Testing Technology Co., Ltd** takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Date of Test :

Date (s) of performance of tests : Jun. 02, 2017 ~ Jun. 08, 2017

Date of Issue : Jun. 08, 2017

Test Result : Pass

Testing Engineer :



(Eric Xie)

Technical Manager :



(Dora Qin)

Authorized Signatory :



(Kait Chen)

Table of Contents	Page
1 . TEST SUMMARY	4
2 . GENERAL INFORMATION	5
2.1 General Description of EUT	5
Operation of EUT during testing	6
2.2 Description of Test Setup	6
2.3 MEASUREMENT INSTRUMENTS LIST	7
3 . CONDUCTED EMISSIONS TEST	8
3.1 Conducted Power Line Emission Limit	8
3.2 Test Setup	8
3.3 Test Procedure	8
3.4 Test Result	8
4 RADIATED EMISSION TEST	11
4.1 Radiation Limit	11
4.2 Test Setup	12
4.4 Test Result	13
5 20 BANDWIDTH MEASUREMENT	16
5.1 Limit	16
5.2 Test Procedure	16
5.4 Test Result	17
6 ANTENNA REQUIREMENT	18
7 PHOTOGRAPH OF TEST	19
7.2 Conducted Emission	20

1. TEST SUMMARY

1.1 Test Procedures And Results

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	COMPLIANT
RADIATED EMISSION TEST	COMPLIANT
20 BANDWIDTH MEASUREMENT	COMPLIANT
ANTENNA REQUIREMENT	COMPLIANT

1.2 Test Facility

Test Firm : QTC Certification & Testing Co., Ltd.
Certificated by FCC, Registration No.: 588523
Address 2nd Floor,B1 Building,Fengyeyuan Industrial Plant, Liuxian 2st. Road,
Xin'an Street, Bao'an District, Shenzhen, China

1.3 Measurement Uncertainty

Measurement Uncertainty	
Conducted Emission Expanded Uncertainty	= 2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	= 3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	= 4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	= 4.06dB, k=2

2. GENERAL INFORMATION

2.1 General Description of EUT

Equipment	CHESS GUESS
Model Name	CHESS-3387
FCC ID	2AMHR-CH3387
Model Difference	/
Antenna Type	Internal Antenna
Antenna gain	1dBi
Operation frequency	27.145MHz
Number of Channels	1CH
Modulation Type	ASK
Power Source	DC voltage
Power Rating	DC 3.7V
Adapter Model	/

2.1.1 Carrier Frequency of Channels

Channel	Frequency(MHz)
01	27.145

Operation of EUT during testing

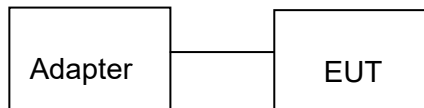
Operating Mode

The mode is used: Transmitting mode

CH: 27.145MHz

2.2 Description of Test Setup

Operation of EUT during conducted and Radiation testing:



2.3 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
2.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2017	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
5.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
6.	Trilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Feb. 19, 2017	1 Year
7.	Pre-amplifier	Compliance Direction	PAP-0203	22008	Feb. 19, 2017	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
9.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
10.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2017	1 Year
11.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2017	1 Year
12.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
13.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
14.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
15.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2017	1 Year
16.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2017	1 Year
17.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
18.	Power Meter	R&S	NRVD	SEL0069	Feb. 19, 2017	1 Year
19.	Power Sensor	R&S	URV5-Z2	SEL0071	Feb. 19, 2017	1 Year
20.	Power Sensor	R&S	URV5-Z2	SEL0072	Feb. 19, 2017	1 Year
21.	Software EMC32	R&S	EMC32-S	SEL0082	N/A	N/A
22.	Log-periodic Antenna	Amplifier Reasearch	ADF-28080	SEL0073	N/A	1 Year
23.	Antenna Tripod	Amplifier Reasearch	TP1000A	SEL0074	N/A	N/A
24.	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEL0075	Feb. 20, 2017	1 Year
25.	Loop Antenna	ARA	PLA-2030/B	1029	Feb. 20, 2017	1 Year
26.	Spectrum analyzer	Agilent	N9020A	MY499110 048	Feb. 19, 2017	1 Year
27.	Spectrum analyzer	R&S	FSU	1166.1660. 26	Feb. 19, 2017	1 Year
28.	Spectrum analyzer	Agilent	N9030A	MY499221 036	Feb. 19, 2017	1 Year
29.	RF Cable	Micable	C10-01-01-1	100309	Feb. 18, 2017	1 Year

3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

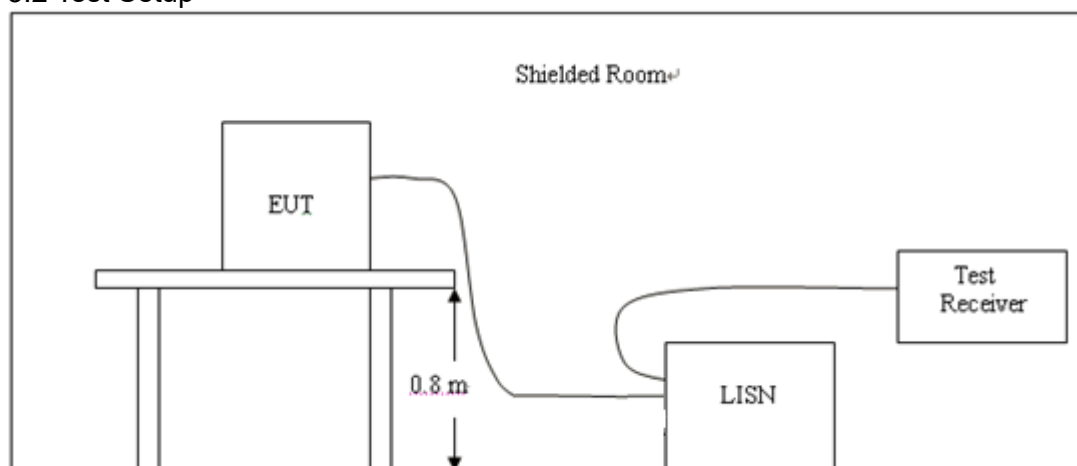
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



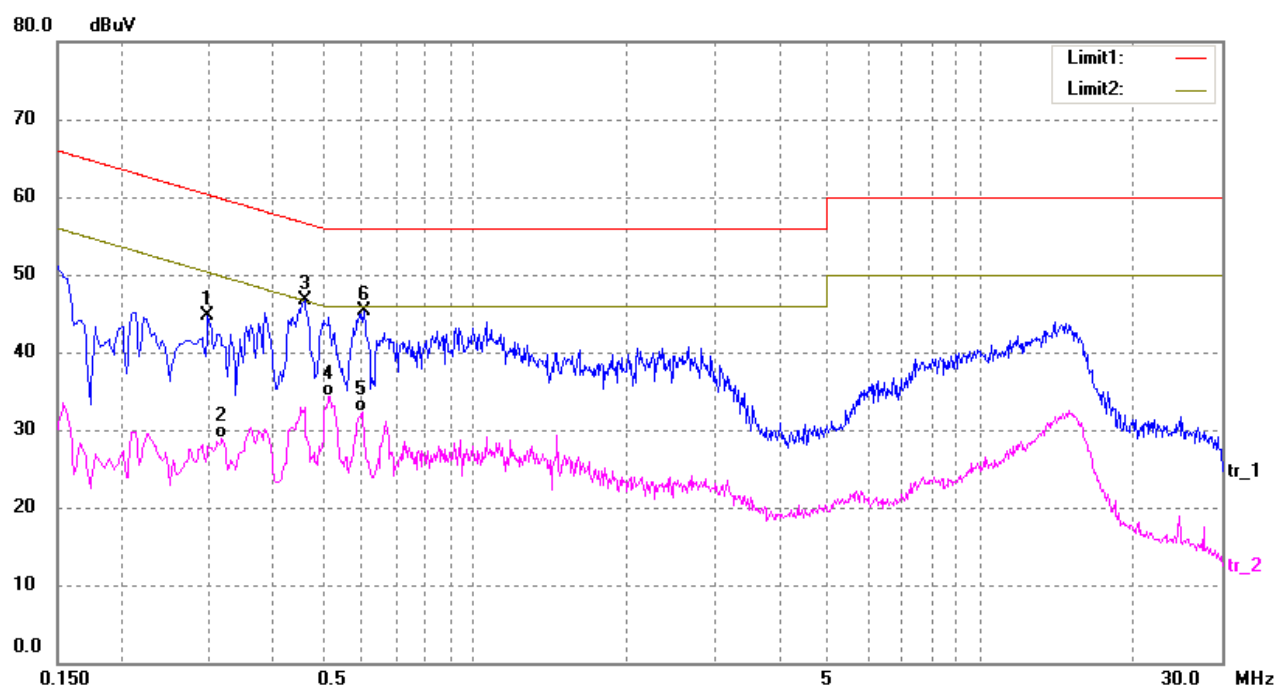
3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.1 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

3.4 Test Result

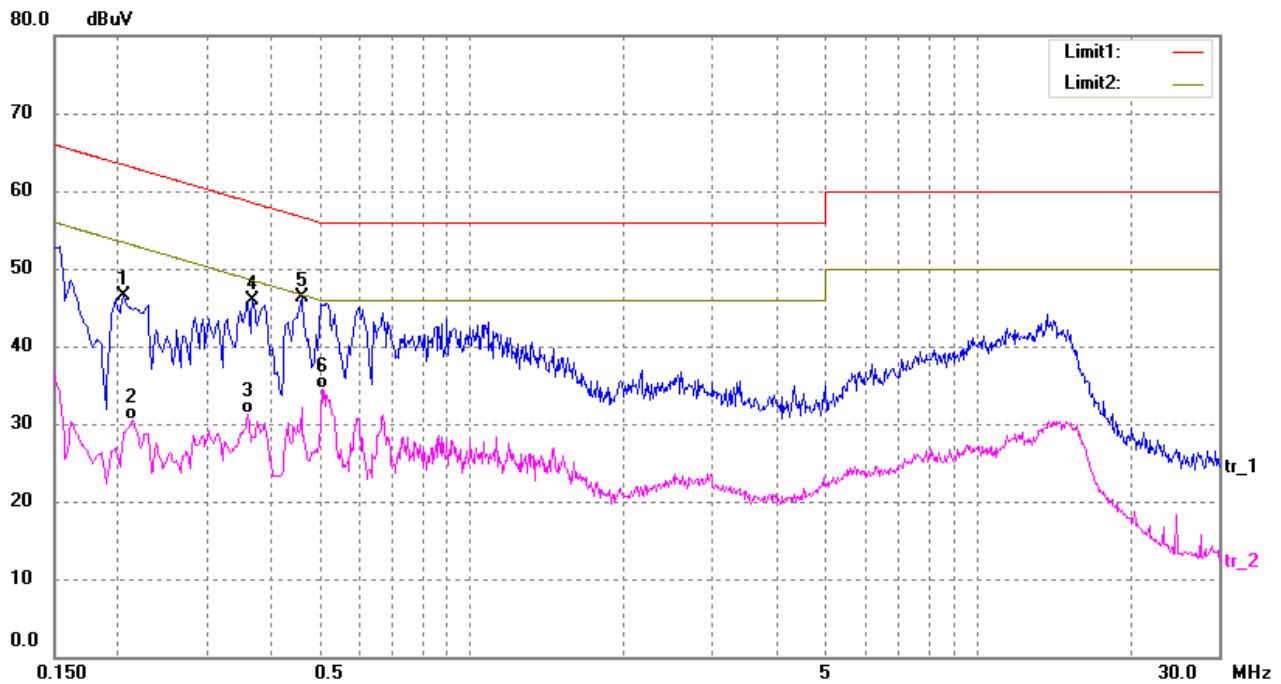
PASS

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2980	34.85	9.80	44.65	60.30	-15.65	peak
2	0.3180	19.01	9.80	28.81	49.76	-20.95	AVG
3*	0.4620	36.97	9.80	46.77	56.66	-9.89	peak
4	0.5180	24.56	9.80	34.36	46.00	-11.64	AVG
5	0.6020	22.44	9.79	32.23	46.00	-13.77	AVG
6	0.6060	35.48	9.79	45.27	56.00	-10.73	peak

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2060	36.62	9.80	46.42	63.37	-16.95	peak
2	0.2140	20.62	9.80	30.42	53.05	-22.63	AVG
3	0.3620	21.58	9.80	31.38	48.68	-17.30	AVG
4	0.3700	36.14	9.80	45.94	58.50	-12.56	peak
5*	0.4620	36.44	9.80	46.24	56.66	-10.42	peak
6	0.5100	24.62	9.80	34.42	46.00	-11.58	AVG

4 RADIATED EMISSION TEST

4.1 Radiation Limit

the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

15.227(a):The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

15.227(b) :The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

Test Procedure

1) 9 kHz to 30 MHz emissions: For testing performed with the loop antenna. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specied distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2) 30 MHz to 1 GHz emissions: For testing performed with the bi-log type antenna. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	/

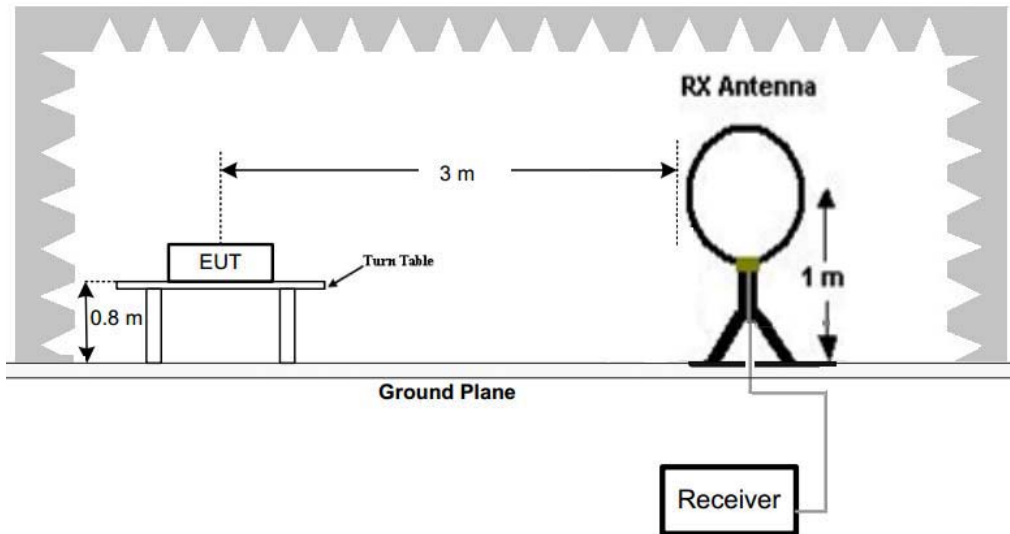
For example

Frequency (MHz)	FS (dBuV/m)	RA (dBuV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
150.00	40	58.1	12.2	1.6	31.90	-18.1

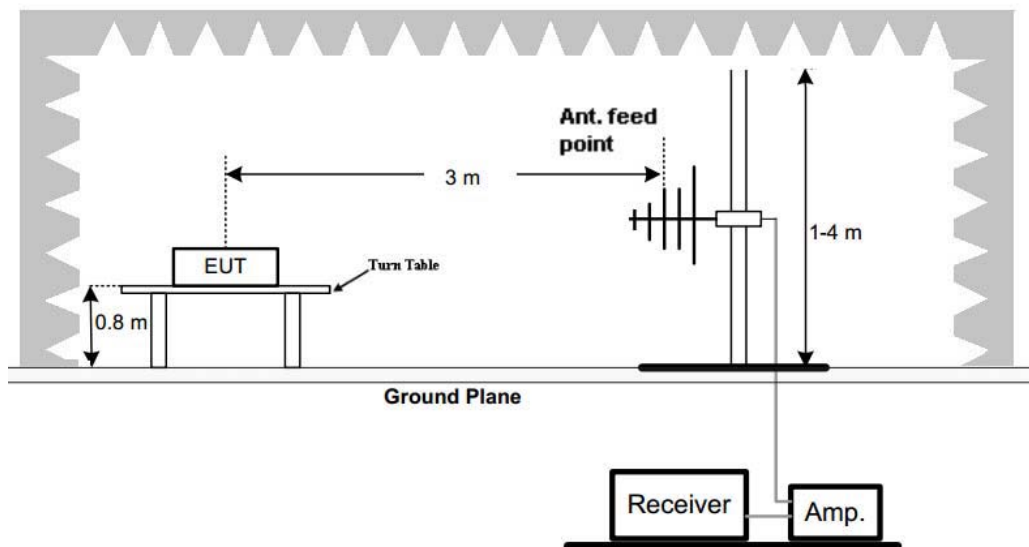
$$\text{Transd} = \text{AF} + \text{CL} - \text{AG}$$

4.2 Test Setup

(1) Radiated Emission Test-Up Frequency Below 30MHz



(2) Radiated Emission Test-Up Frequency 30MHz~1GHz



4.4 Test Result

PASS

Fundamental emission:

Frequency (MHz)	Polarization	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
27.145	H	66.20	9.48	0.66	76.34	100.00	-23.66	PK
27.145	H	60.94	9.48	0.66	71.08	80.00	-8.92	AV
26.96	H	47.41	9.46	0.65	57.52	69.50	-11.98	QP
27.28	H	46.95	9.48	0.66	57.09	69.50	-12.41	QP

Frequency (MHz)	Polarization	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
27.145	V	61.57	9.48	0.66	71.71	100.00	-28.29	PK
27.145	V	57.42	9.48	0.66	67.56	80.00	-12.44	AV
26.96	V	47.88	9.46	0.65	57.99	69.50	-11.51	QP
27.28	V	47.16	9.48	0.66	57.30	69.50	-12.20	QP

Test Level =Receiver Reading + Antenna Factor + Cable Loss.

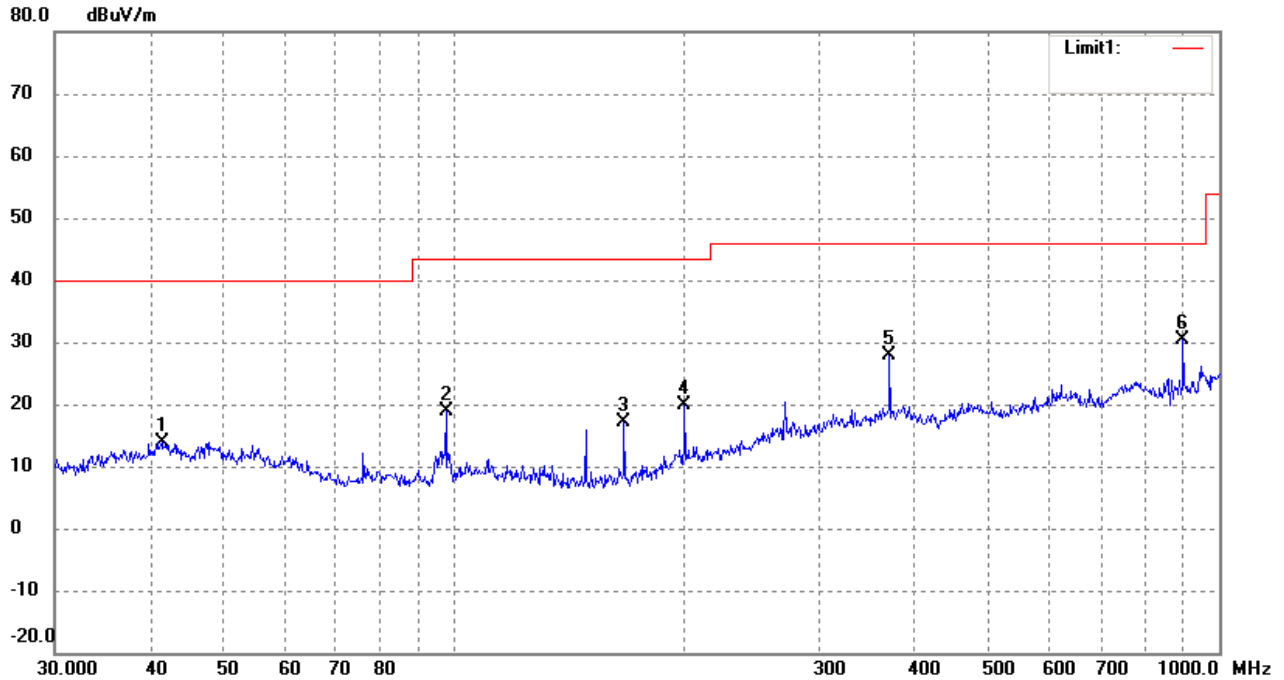
2) Other Emissions:**9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement:**

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement:

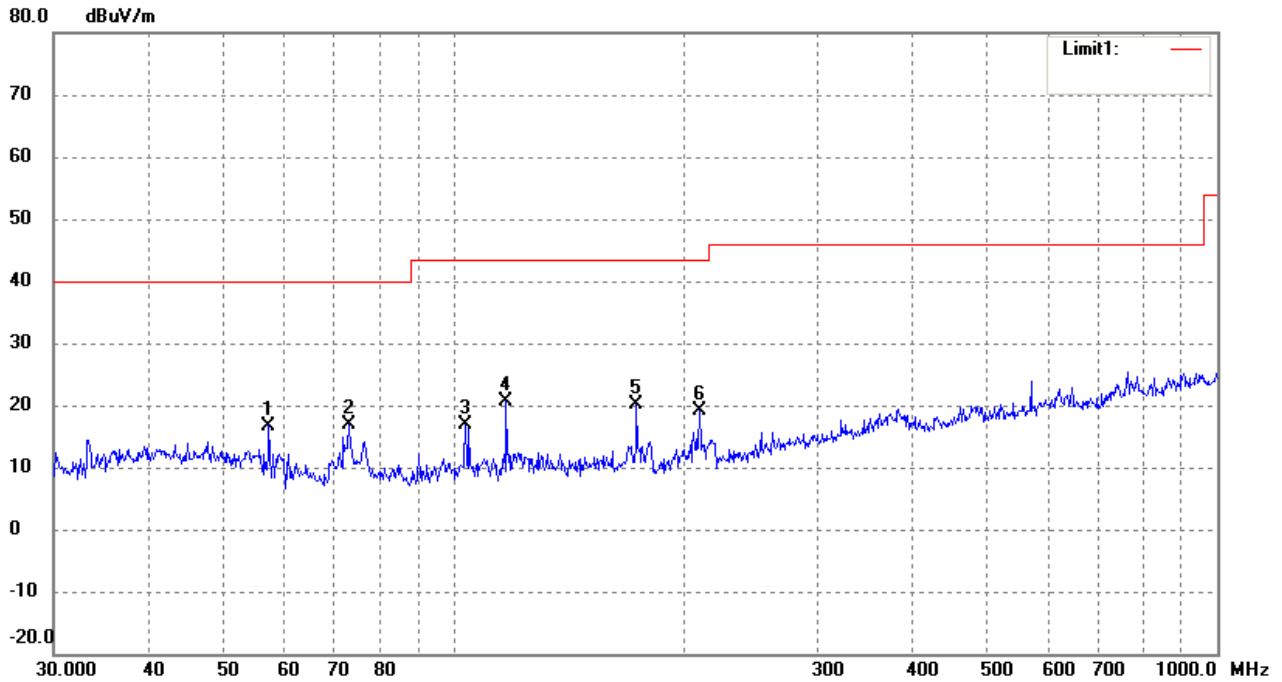
30MHz-1GHz Test Results:

H:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.4215	21.73	-7.76	13.97	40.00	-26.03	0	100	peak
2	97.4560	30.19	-11.42	18.77	43.50	-24.73	0	100	peak
3	166.6514	29.11	-11.97	17.14	43.50	-26.36	0	100	peak
4	199.9856	28.43	-8.65	19.78	43.50	-23.72	0	100	peak
5	370.7023	30.55	-2.63	27.92	46.00	-18.08	0	100	peak
6	896.9965	27.27	3.15	30.42	46.00	-15.58	0	100	peak

V:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	57.3923	26.00	-9.25	16.75	40.00	-23.25	0	100	peak
2	73.1025	29.43	-12.57	16.86	40.00	-23.14	0	100	peak
3	103.8055	27.78	-11.00	16.78	43.50	-26.72	0	100	peak
4	117.3603	31.98	-11.37	20.61	43.50	-22.89	0	100	peak
5	173.8135	31.68	-11.63	20.05	43.50	-23.45	0	100	peak
6	210.0482	27.89	-8.74	19.15	43.50	-24.35	0	100	peak

Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was test.
- (2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

5 20 BANDWIDTH MEASUREMENT

5.1 Limit

15.215(c), Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation. Operation within the band: 26.96 – 27.28 MHz.

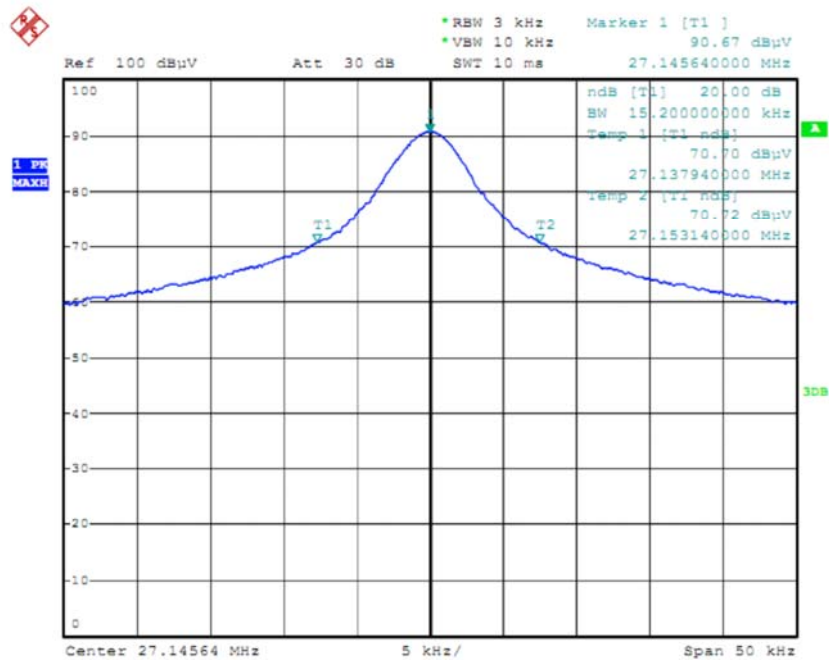
5.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. RBW= 3KHz. VBW= 10 KHz, Span=1MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

Test Configuration



5.4 Test Result

PASS

6 ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

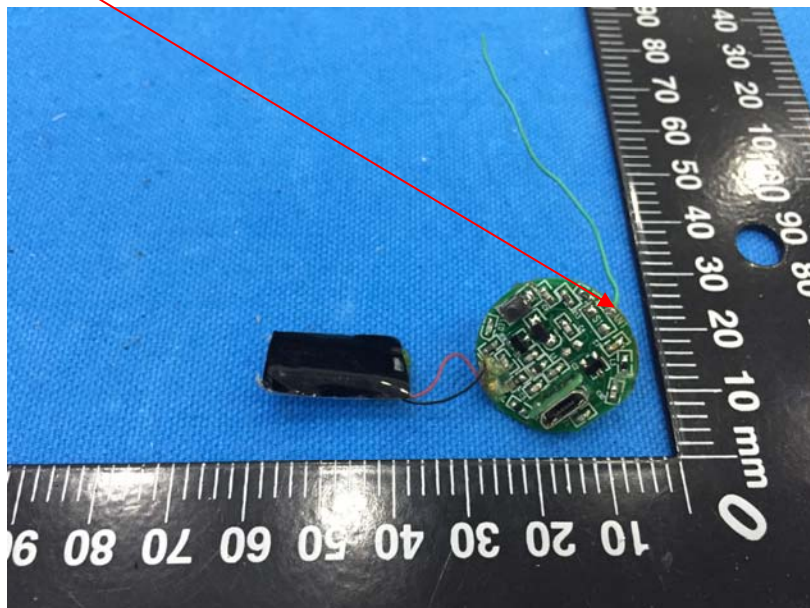
Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

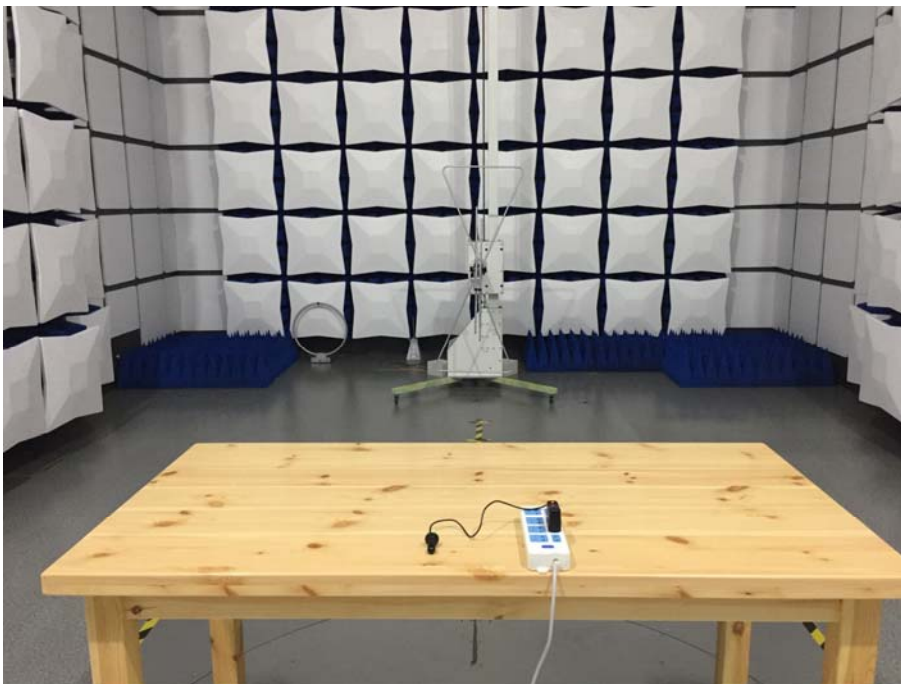
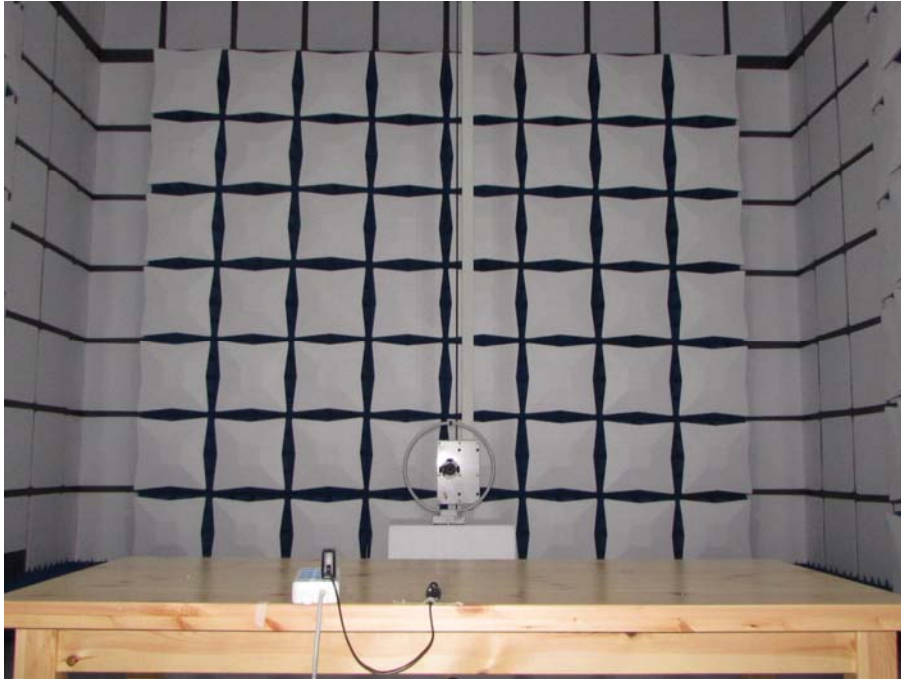
The antenna used in this product is a Internal Antenna, The directional gains of antenna used for transmitting is 1dBi.

ANTENNA



7 PHOTOGRAPH OF TEST

7.1 Radiated Emission



7.2 Conducted Emission

