

APPLICATION CERTIFICATION
On Behalf of
Shen Zhen Lianhua Electronics Co., Ltd

Power bank and Bluetooth speakers
Model No.: M1

FCC ID: QOG-M1

Prepared for : Shen Zhen Lianhua Electronics Co., Ltd
Address : 3F/11 Tanglang A Industry Zone, Xili Town, Nanshan
District, Shenzhen, China
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Report Number : ATE20122290
Date of Test : Sep 28-Oct 18, 2012
Date of Report : Oct18, 2012

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Test Report Certification

Applicant : Shen Zhen Lianhua Electronics Co., Ltd.
 Manufacturer : Shen Zhen Lianhua Electronics Co., Ltd
 EUT Description : Power bank and bluetooth speakers
 (A) MODEL NO.: M1
 (B) SERIAL NO.: N/A
 (C) POWER SUPPLY: DC 3.7V (Li-polymer battery) & AC
 120V/60Hz (Adapter input)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
 ANSI C63.4: 2009
 ANSI C63.10: 2009

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Sep 28-Oct 18, 2012

Prepared by : Terry. Yang
 (Engineer)

Approved & Authorized Signer : Seam(-)
 (Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	Power bank and bluetooth speakers
Model Number	:	M1
Frequency Band	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain	:	2.5dBi
Power Supply	:	DC 3.7V (Li-polymer battery) & AC 120V/60Hz (Adapter input)
Adapter	:	Model: HNB05100U Input: AC 100-240V ~ 50/60Hz 0.2A MAX Output: 5.0V 1.0A
Applicant	:	Shen Zhen Lianhua Electronics Co., Ltd
Address	:	3F/11 Tanglang A Industry Zone, Xili Town, Nanshan District, Shenzhen, China
Manufacturer	:	Shen Zhen Lianhua Electronics Co., Ltd
Address	:	3F/11 Tanglang A Industry Zone, Xili Town, Nanshan District, Shenzhen, China
Date of sample received	:	Sep 28, 2012
Date of Test	:	Sep 28-Oct 18, 2012

1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC
The Registration Number is 752051

Listed by Industry Canada
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee
for Laboratories
The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

1.3. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2
(Above 1GHz)

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated date	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 7, 2012	Jan. 7, 2013
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 7, 2012	Jan. 7, 2013
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 7, 2012	Jan. 7, 2013
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 7, 2012	Jan. 7, 2013
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 7, 2012	Jan. 7, 2013
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 7, 2012	Jan. 7, 2013
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 7, 2012	Jan. 7, 2013
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 7, 2012	Jan. 7, 2013
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 7, 2012	Jan. 7, 2013
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 7, 2012	Jan. 7, 2013

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode

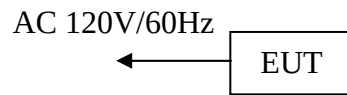
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2.Configuration and peripherals



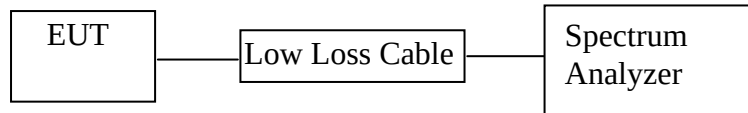
(EUT: Power bank and bluetooth speakers)

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	Compliant
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



(EUT: Power bank and bluetooth speakers)

5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1. Power bank and bluetooth speakers (EUT)

Model Number	:	M1
Serial Number	:	N/A
Manufacturer	:	Shen Zhen Lianhua Electronics Co., Ltd

5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz.

5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.6. Test Result

PASS.

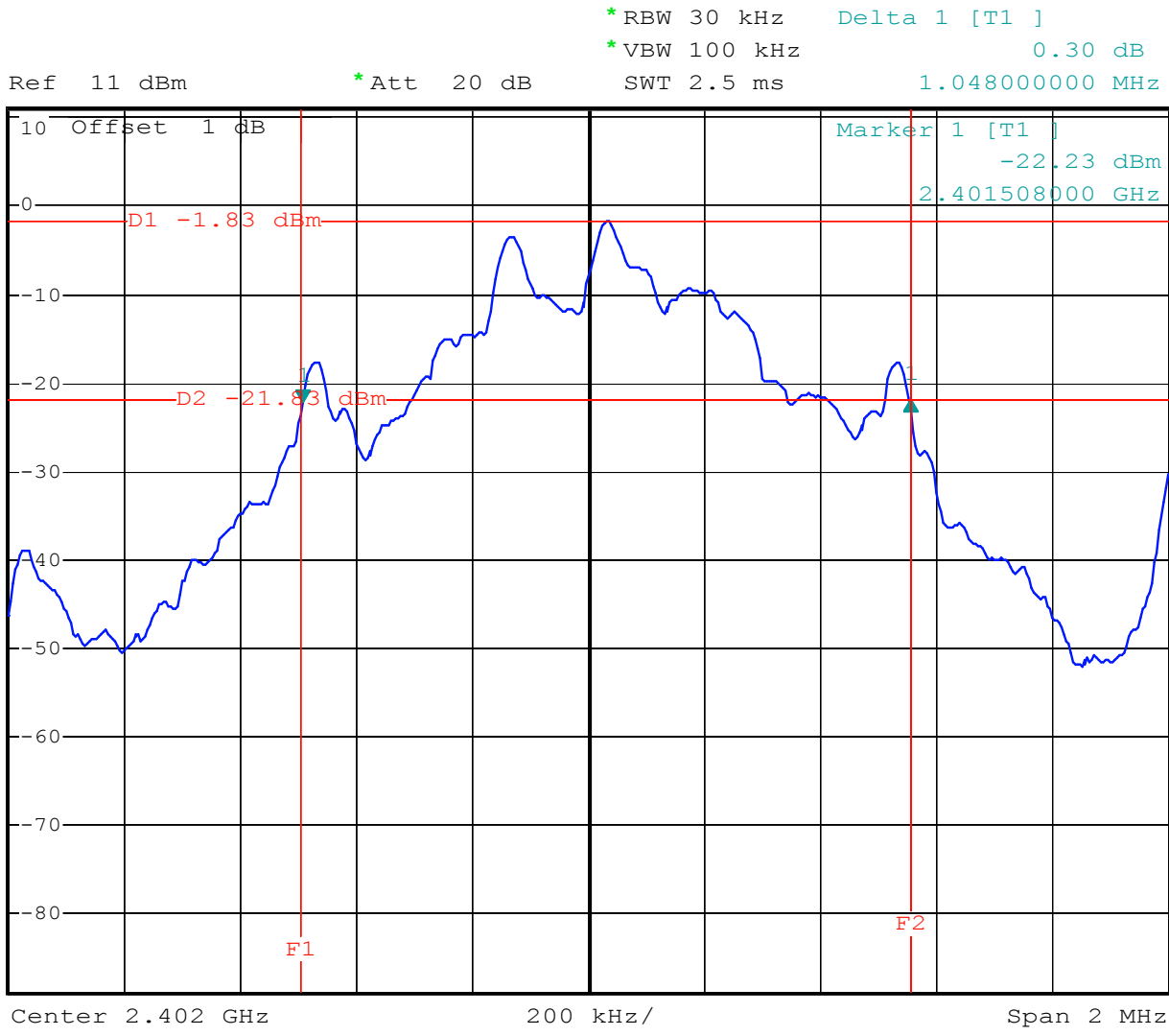
Date of Test:	<u>Oct 17, 2012</u>	Temperature:	<u>25°C</u>
EUT:	<u>Power bank and bluetooth speakers</u>	Humidity:	<u>50%</u>
Model No.:	<u>M1</u>	Power Supply:	<u>AC 120V/60Hz</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>TOM</u>

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
Low	2402	1.048	---
Middle	2441	1.048	---
High	2480	1.052	---

The spectrum analyzer plots are attached as below.



1 PK
MAXH

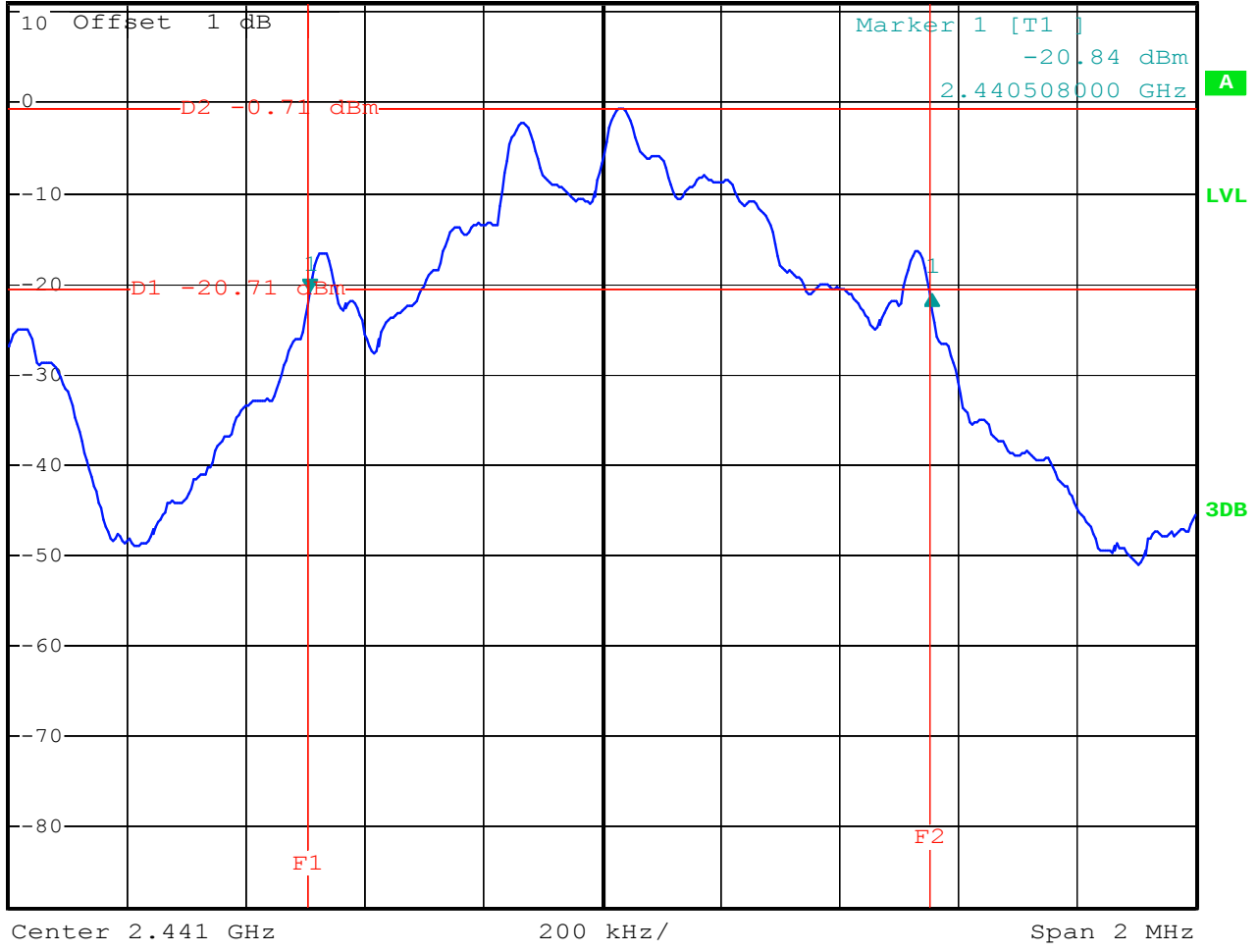


Date: 17.OCT.2012 09:48:15



1 PK
MAXH

Ref 11 dBm * Att 20 dB * RBW 30 kHz Delta 1 [T1]
* VBW 100 kHz -0.29 dB
SWT 2.5 ms 1.048000000 MHz

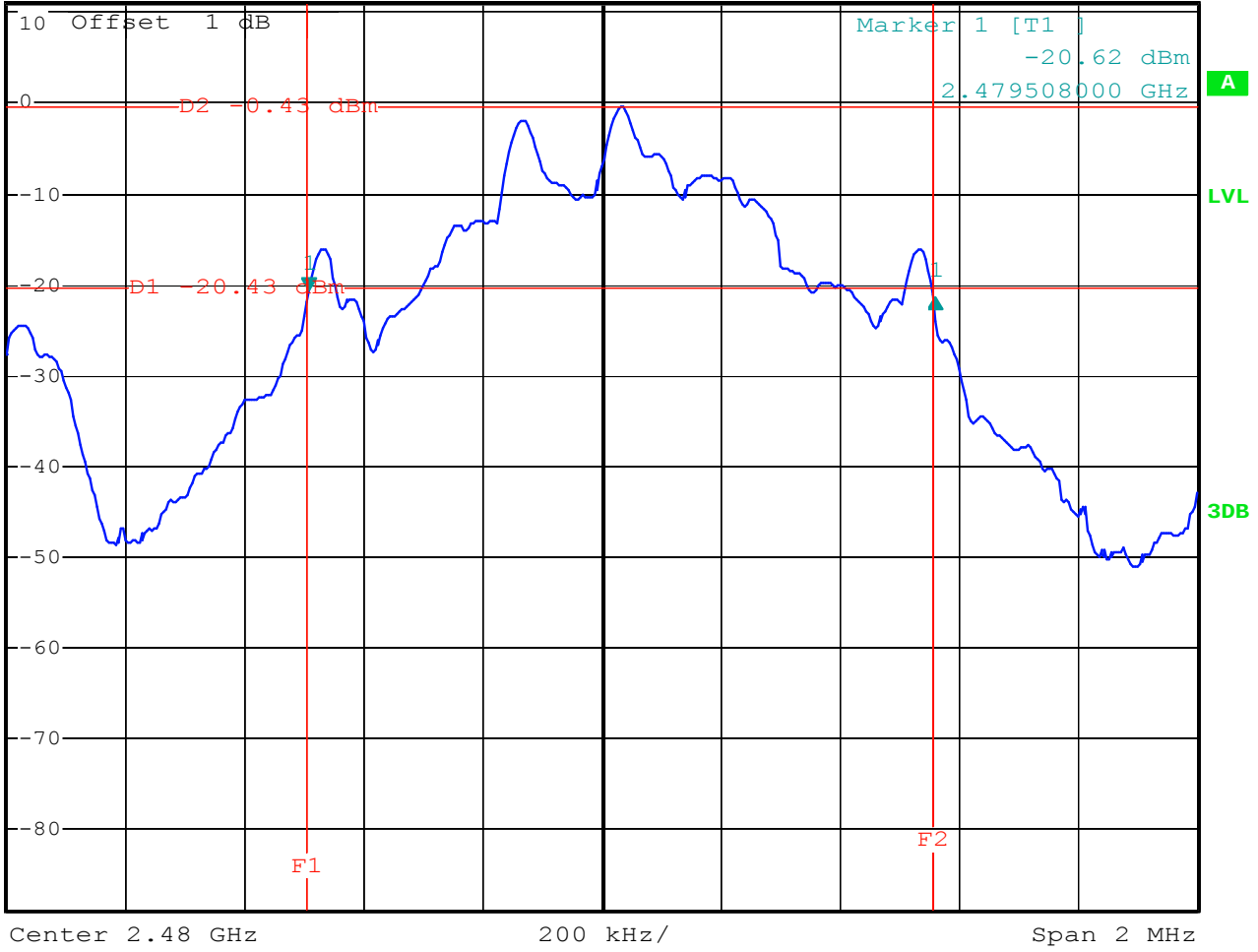


Date: 17.OCT.2012 10:06:42



1 PK
MAXH

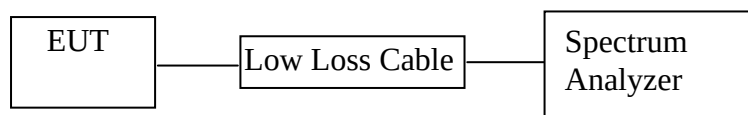
Ref 11 dBm * Att 20 dB * RBW 30 kHz Delta 1 [T1]
* VBW 100 kHz -0.74 dB
SWT 2.5 ms 1.052000000 MHz



Date: 17.OCT.2012 10:22:30

6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: Power bank and bluetooth speakers)

6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.3.1. Power bank and bluetooth speakers (EUT)

Model Number	:	M1
Serial Number	:	N/A
Manufacturer	:	Shen Zhen Lianhua Electronics Co., Ltd

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

6.5. Test Procedure

- 6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 6.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz. Adjust Span to 3 MHz.
- 6.5.3. Set the adjacent channel of the EUT maxhold another trace.
- 6.5.4. Measurement the channel separation

6.6. Test Result

PASS.

Date of Test:	Oct 17, 2012	Temperature:	25°C
EUT:	Power bank and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	TX	Test Engineer:	TOM

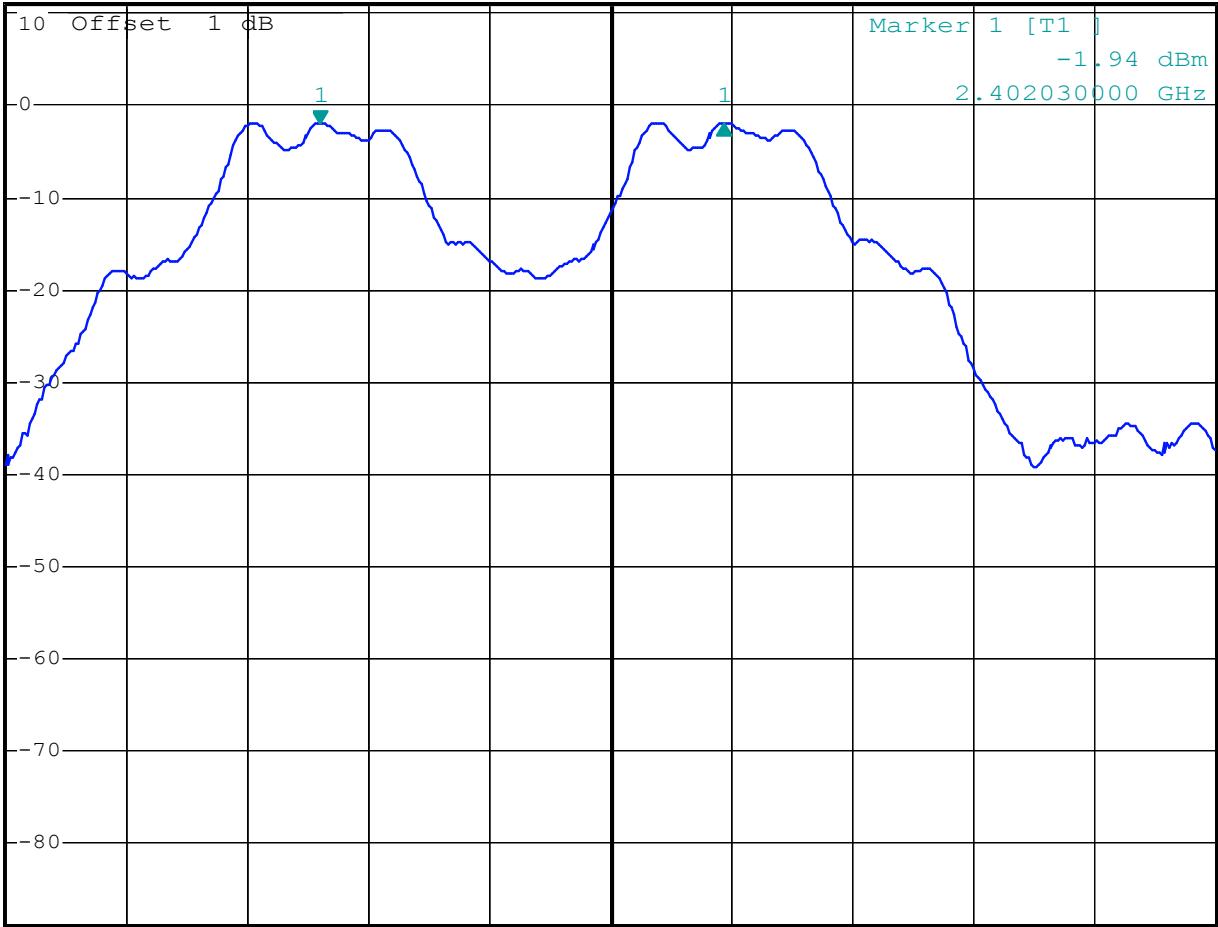
Channel	Channel Frequency (MHz)	Channel separation (MHz)	Limit (MHz)
Low	2402	1.002	0.6987
Middle	2441	1.008	0.6987
High	2480	1.002	0.7013

The spectrum analyzer plots are attached as below.



1 PK
MAXH

* RBW 100 kHz Delta 1 [T1]
* VBW 300 kHz 0.01 dB
Ref 11 dBm * Att 20 dB SWT 2.5 ms 1.002000000 MHz



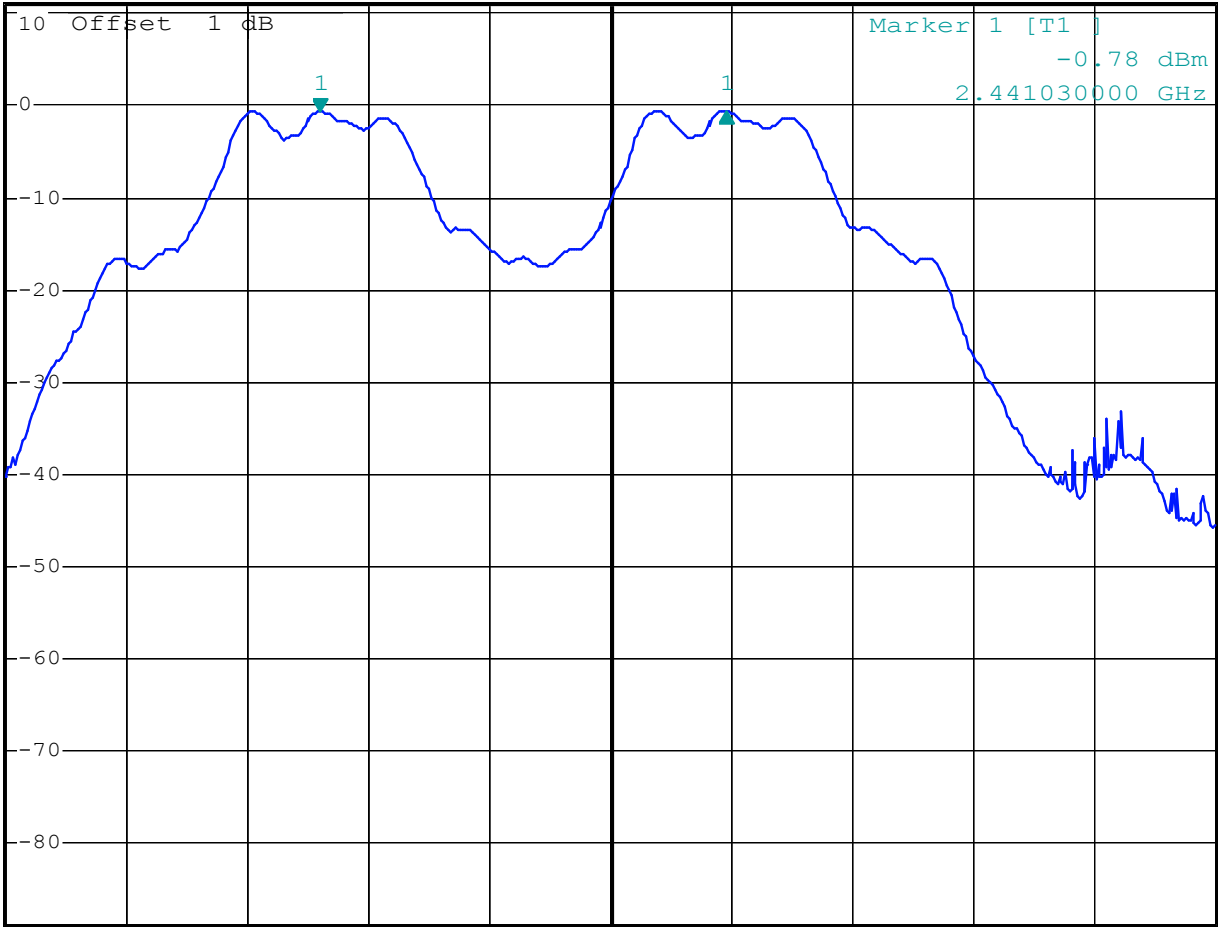
Center 2.40275 GHz 300 kHz/ Span 3 MHz

Date: 17.OCT.2012 09:55:44



1 PK
MAXH

* RBW 100 kHz Delta 1 [T1]
* VBW 300 kHz 0.02 dB
Ref 11 dBm * Att 20 dB SWT 2.5 ms 1.008000000 MHz



Center 2.44175 GHz 300 kHz/ Span 3 MHz

Date: 17.OCT.2012 10:14:44

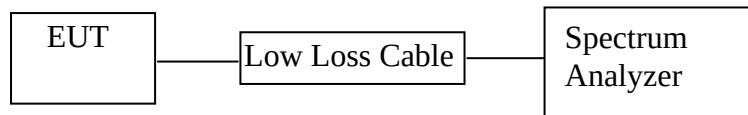


FCC ID: QOG-M1

ACCURATE TECHNOLOGY CO. LTD **REPORT NO. ATE2012290**

7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: Power bank and bluetooth speakers)

7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.3.1. Power bank and bluetooth speakers (EUT)

Model Number	:	M1
Serial Number	:	N/A
Manufacturer	:	Shen Zhen Lianhua Electronics Co., Ltd

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2. Set the spectrum analyzer as Span=90MHz, RBW=100 kHz, VBW=300 kHz.

7.5.3. Max hold, view and count how many channel in the band.

7.6. Test Result

PASS.

Date of Test:	<u>Oct 17, 2012</u>	Temperature:	<u>25°C</u>
EUT:	<u>Power bank and bluetooth speakers</u>	Humidity:	<u>50%</u>
Model No.:	<u>M1</u>	Power Supply:	<u>AC 120V/60Hz</u>
Test Mode:	<u>Hopping</u>	Test Engineer:	<u>TOM</u>

Total number of hopping channel	Measurement result (CH)	Limit (CH)
	79	>15

The spectrum analyzer plots are attached as below.



```
*RBW 100 kHz      Delta 1 [T1 ]
```

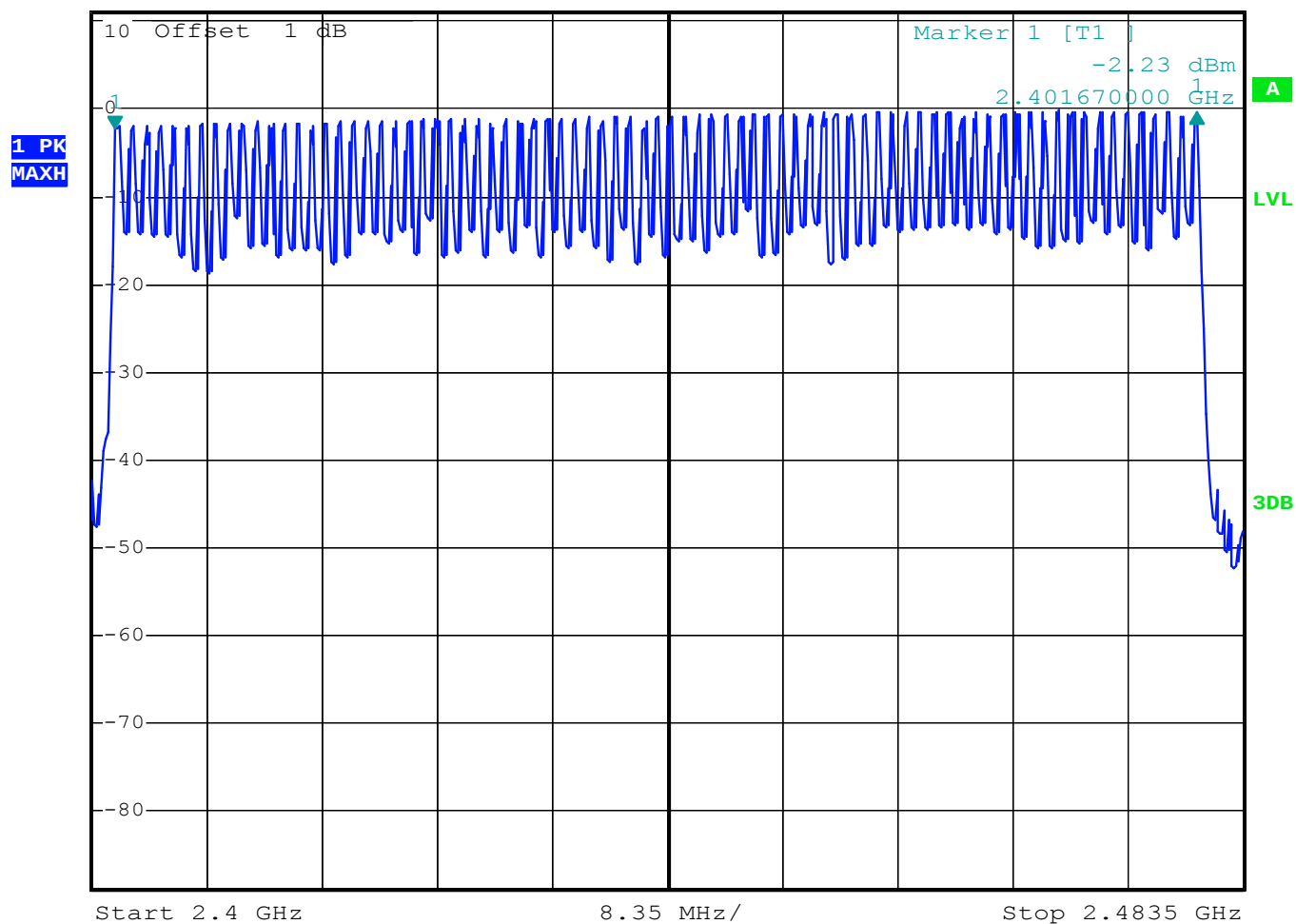
```
* VBW 300 kHz 1.87 dB
```

Ref 11 dBm

* Att 20 dB

SWT 10 ms

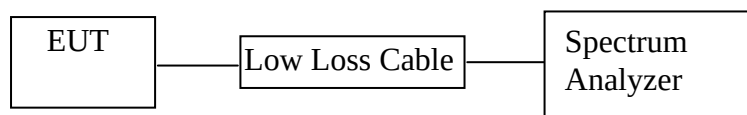
78.490000000 MHz



Date: 17.OCT.2012 09:42:58

8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: Power bank and bluetooth speakers)

8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.3.1. Power bank and bluetooth speakers (EUT)

Model Number	:	M1
Serial Number	:	N/A
Manufacturer	:	Shen Zhen Lianhua Electronics Co., Ltd

8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

8.5. Test Procedure

- 8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 8.5.2. Set center frequency of spectrum analyzer = operating frequency.
- 8.5.3. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Span=0Hz, Adjust Sweep=1s. Get the burst (in 1 sec.).
- 8.5.4. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=2ms. Get the pulse time.
- 8.5.5. Repeat above procedures until all frequency measured were complete.

8.6. Test Result

PASS.

Date of Test:	<u>Aug 16, 2012</u>	Temperature:	<u>25°C</u>
	<u>Power bank and bluetooth</u>		
EUT:	<u>speakers</u>	Humidity:	<u>50%</u>
Model No.:	<u>M1</u>	Power Supply:	<u>AC 120V</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>TOM</u>

DH1:

A period transmit time = $0.4 \times 79 = 31.6$

Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$

Channel	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
Low	2402	0.537	171.840	400
Middle	2441	0.537	171.840	400
High	2480	0.537	171.840	400

DH3:

A period transmit time = $0.4 \times 79 = 31.6$

Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$

Channel	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
Low	2402	1.820	291.200	400
Middle	2441	1.850	296.000	400
High	2480	1.830	292.800	400

DH5:

A period transmit time = $0.4 \times 79 = 31.6$

Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$

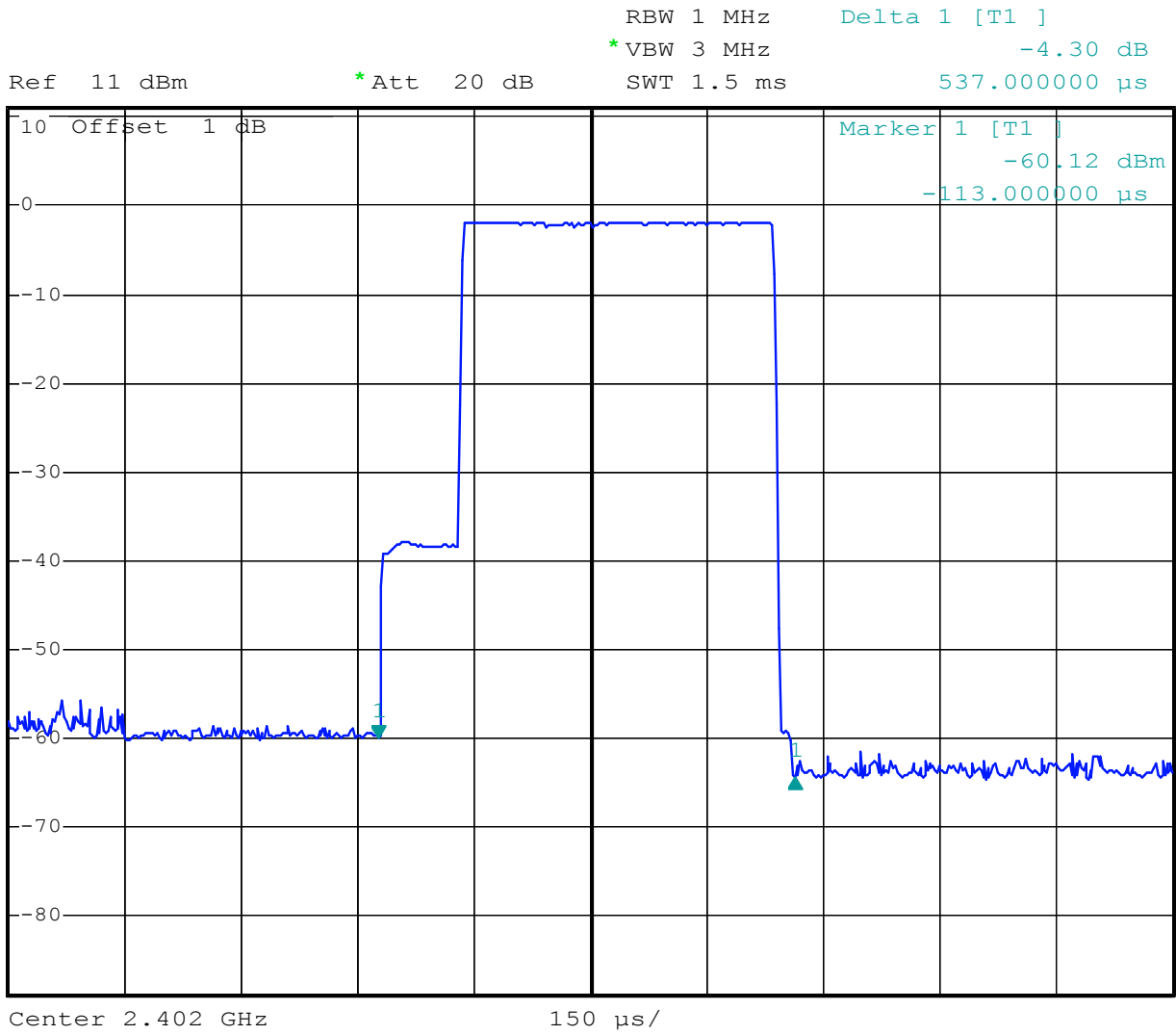
Channel	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
Low	2402	3.104	331.093	400
Middle	2441	3.104	331.093	400
High	2480	3.104	331.093	400

The spectrum analyzer plots are attached as below.

DH1:



1 PK
MAXH



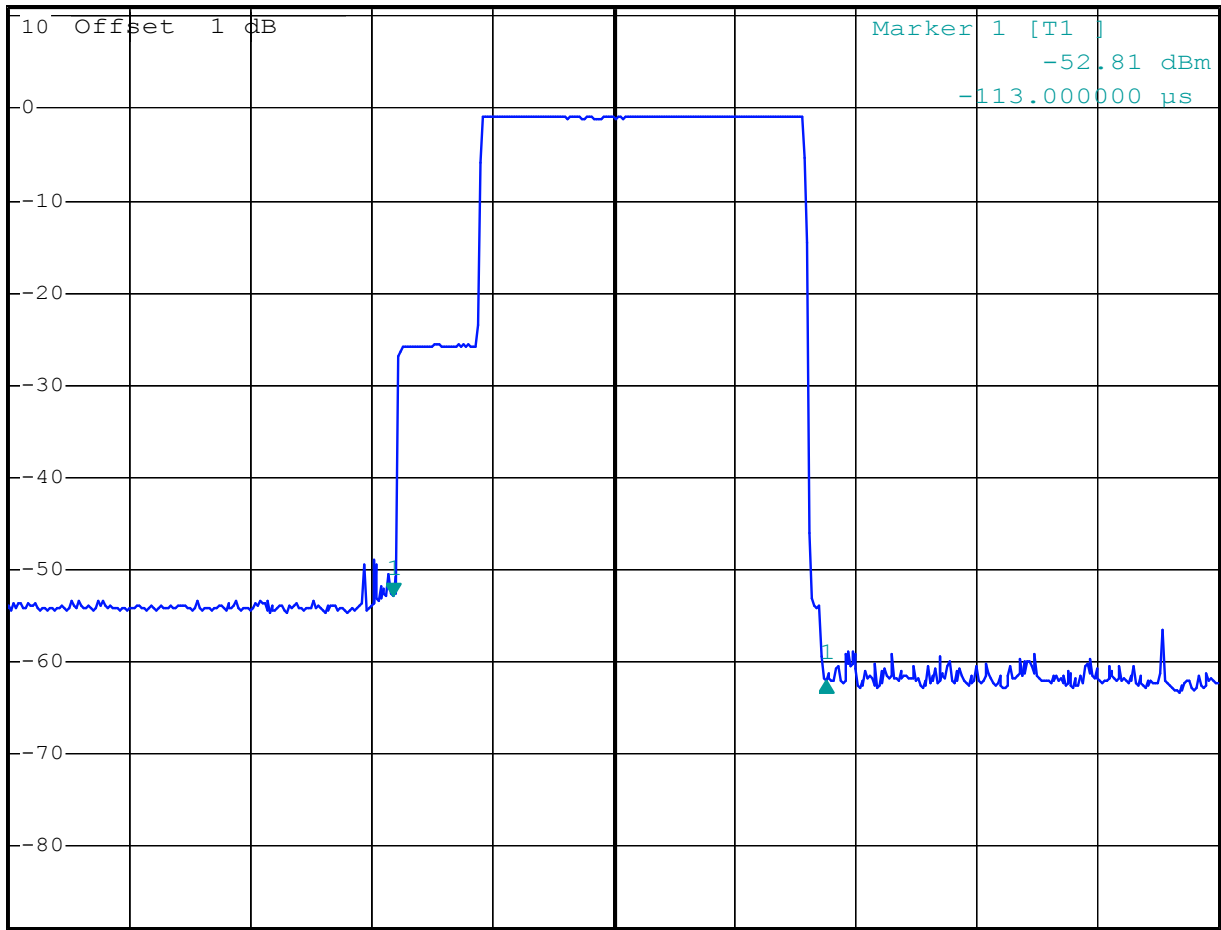
Date: 17.OCT.2012 10:38:04

DH1:



1 PK
MAXH

Ref 11 dBm *Att 20 dB RBW 1 MHz Delta 1 [T1]
*VBW 3 MHz -9.20 dB
SWT 1.5 ms 537.000000 μ s

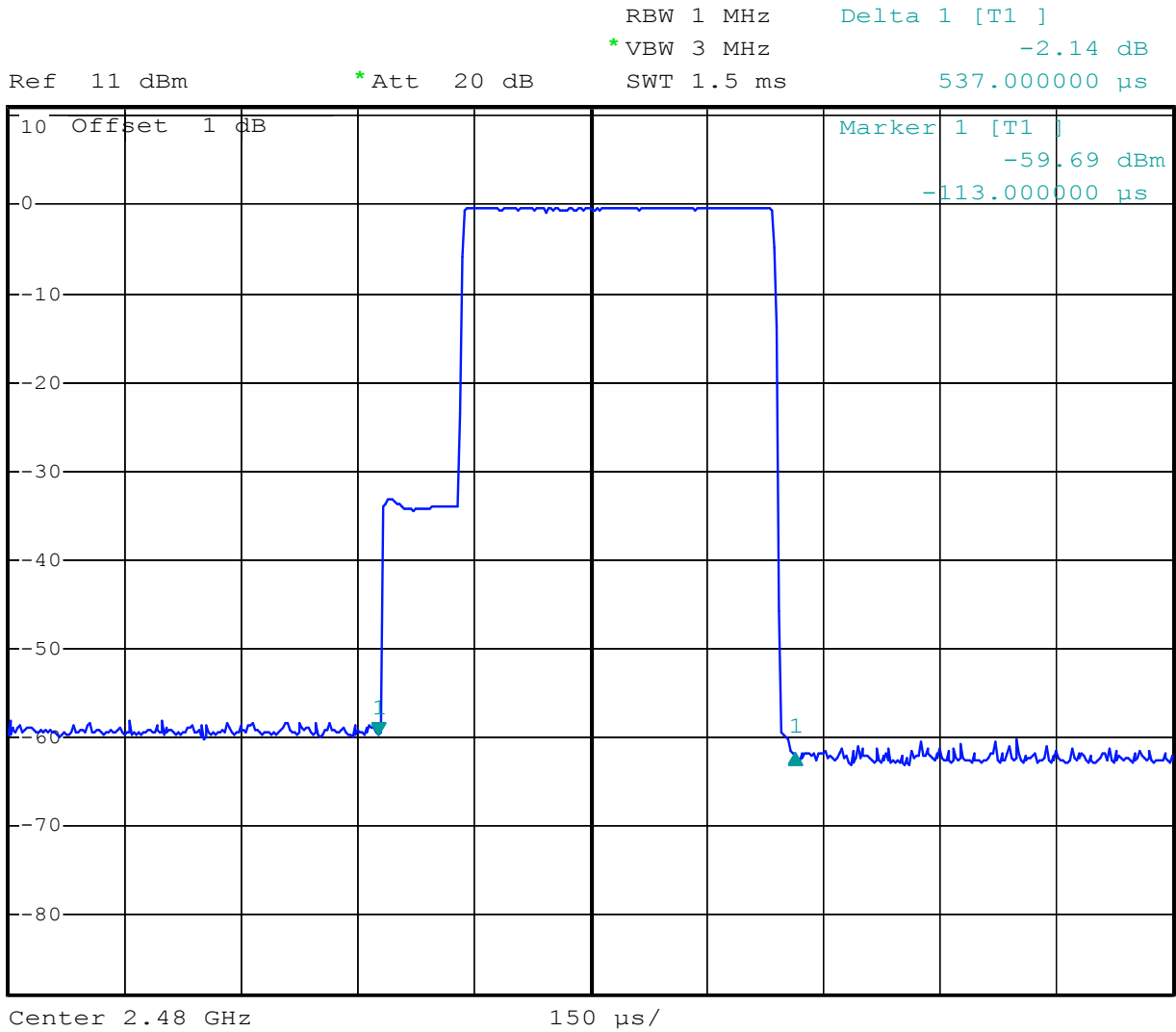


Date: 17.OCT.2012 10:37:17

DH1:



1 PK
MAXH

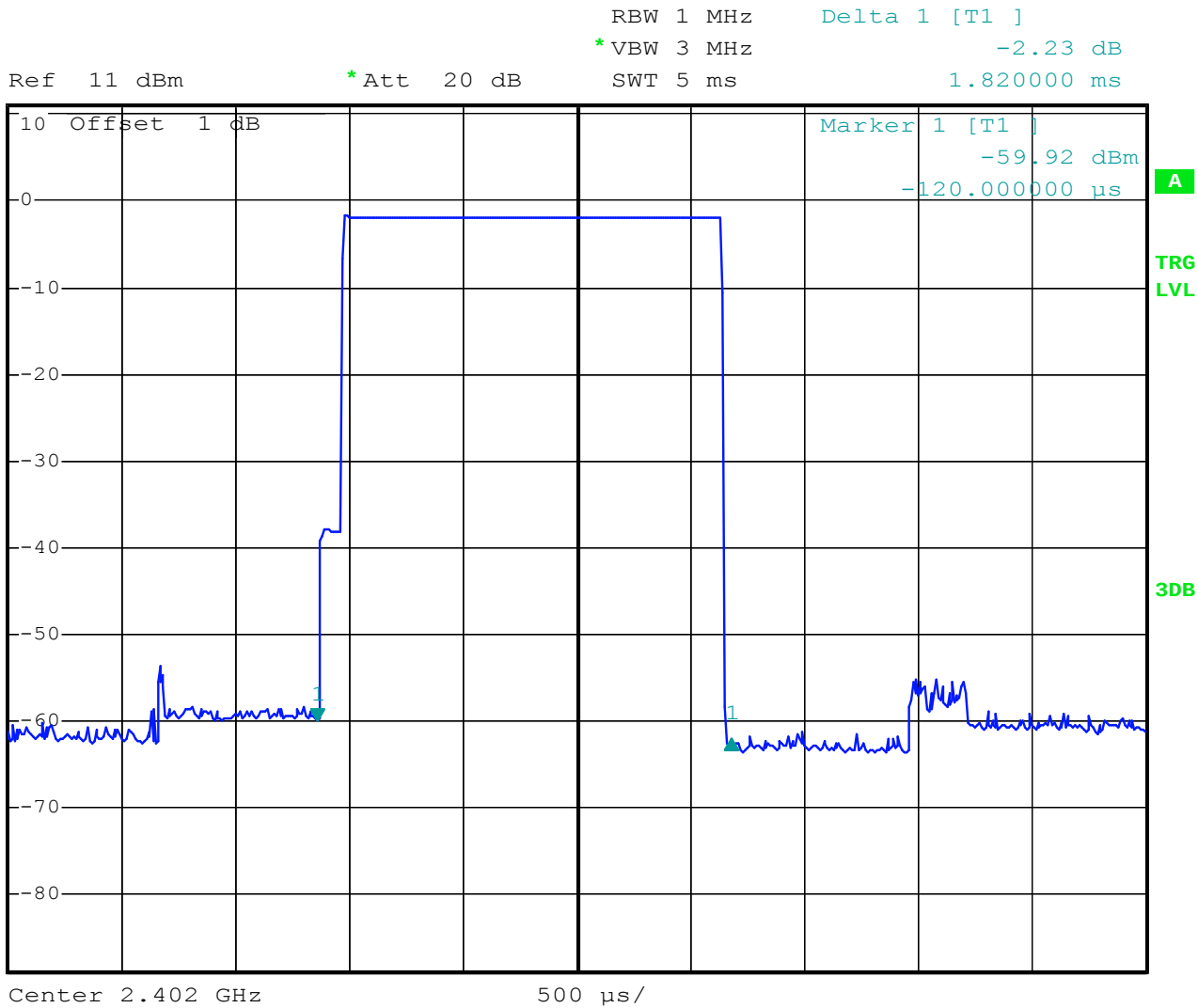


Date: 17.OCT.2012 10:37:42

DH3:



1 PK
MAXH

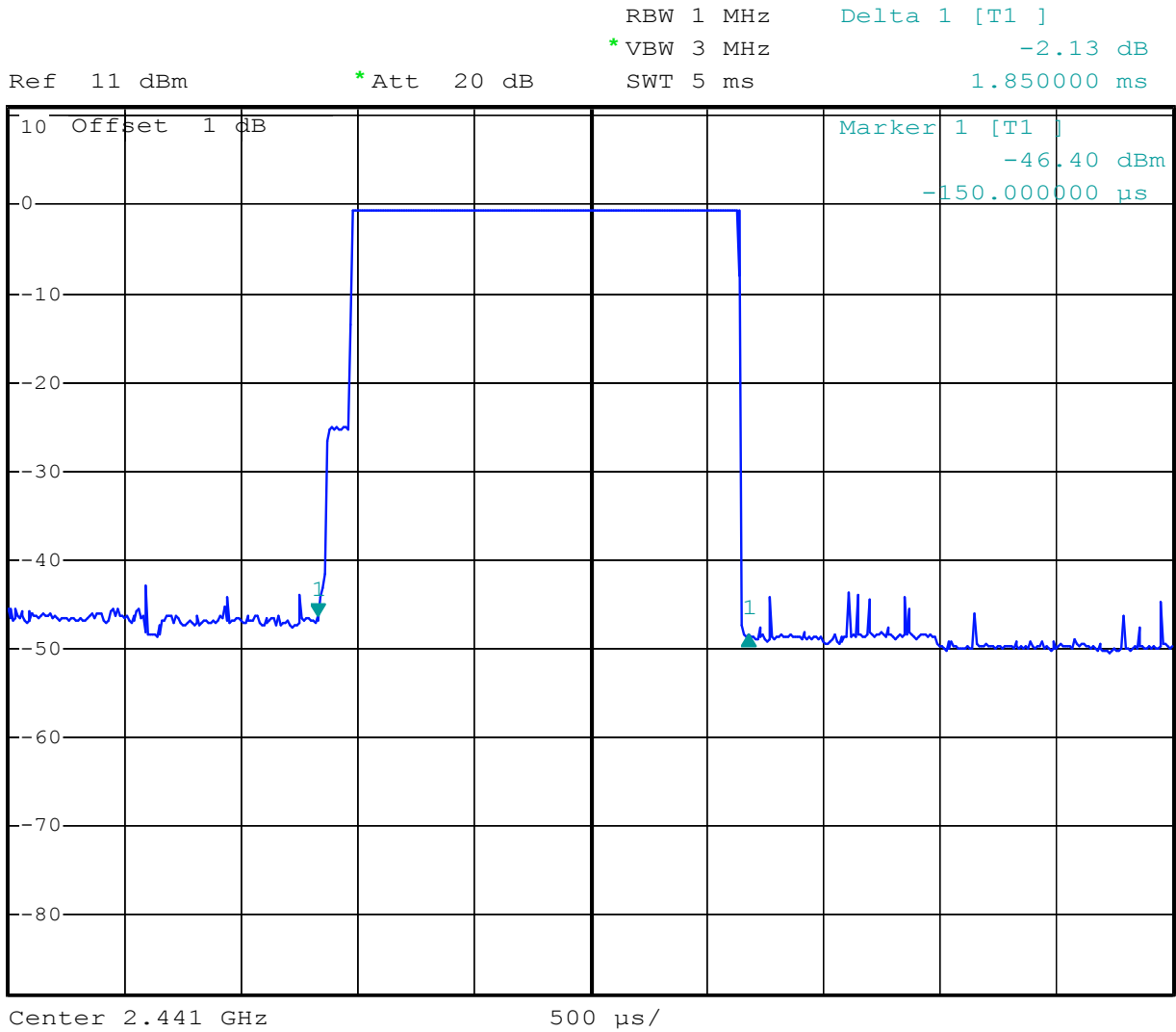


Date: 17.OCT.2012 11:18:05

DH3:



1 PK
MAXH

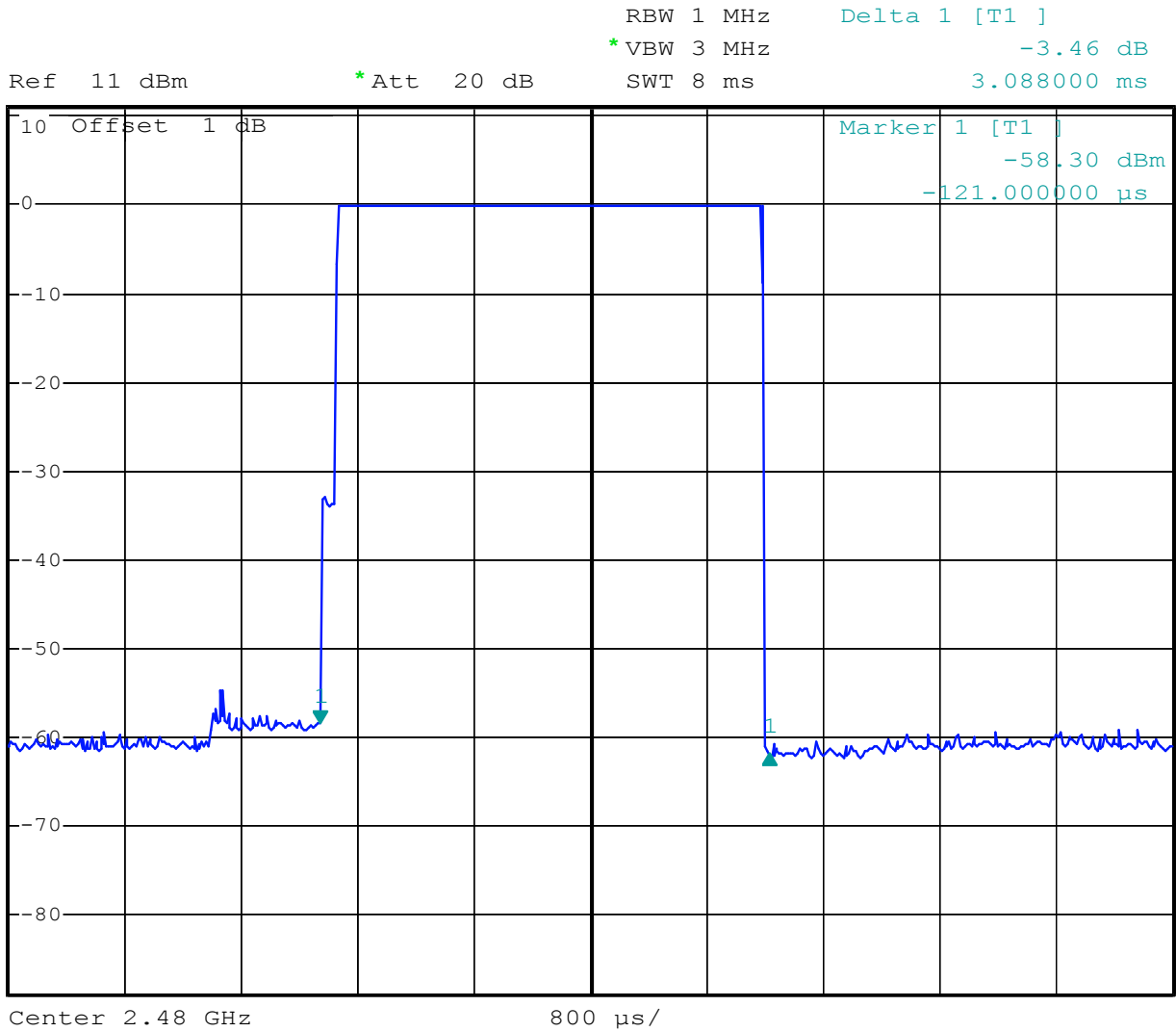


Date: 17.OCT.2012 11:21:25

DH3:



1 PK
MAXH

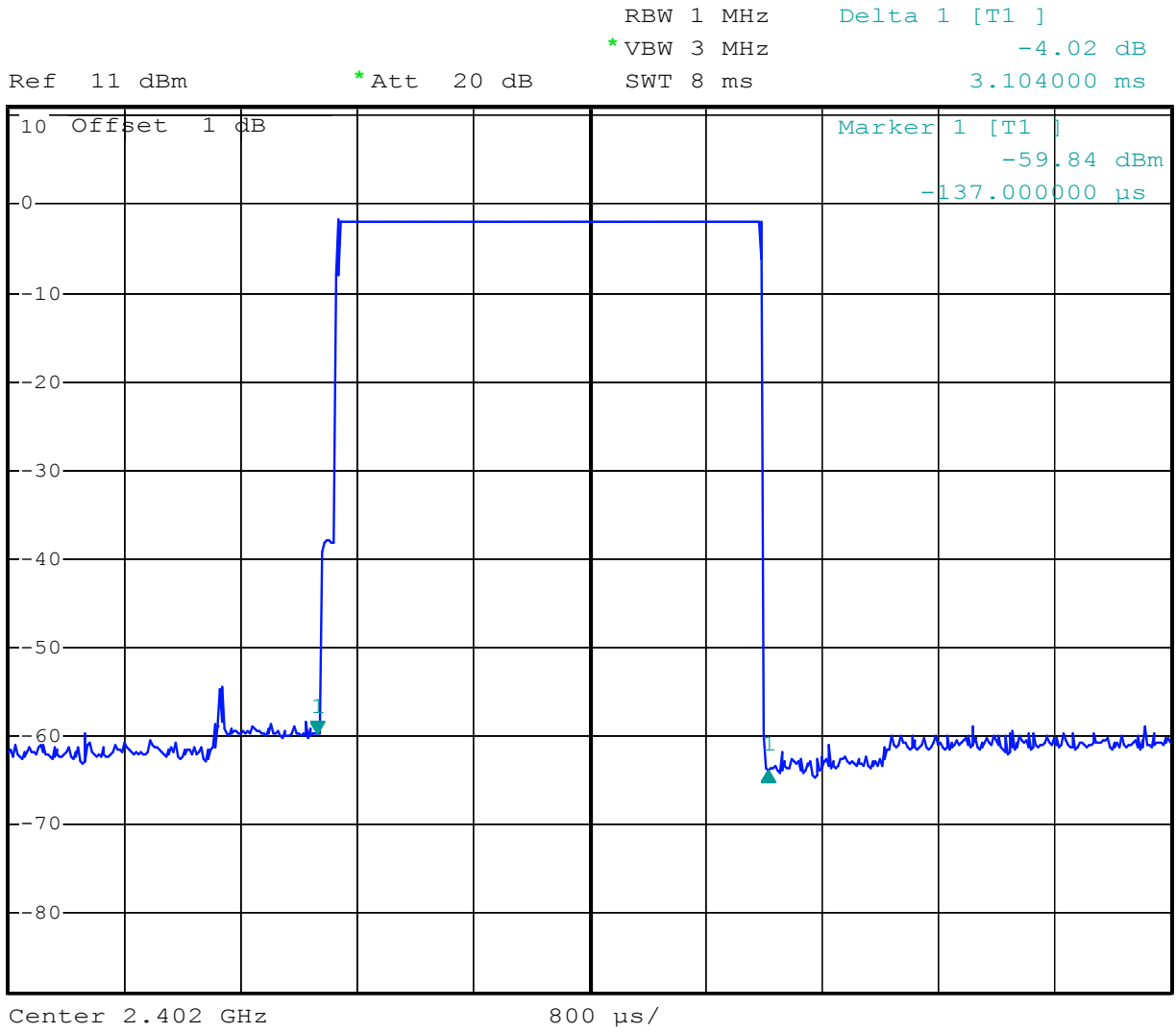


Date: 17.OCT.2012 11:27:26

DH5:



1 PK
MAXH

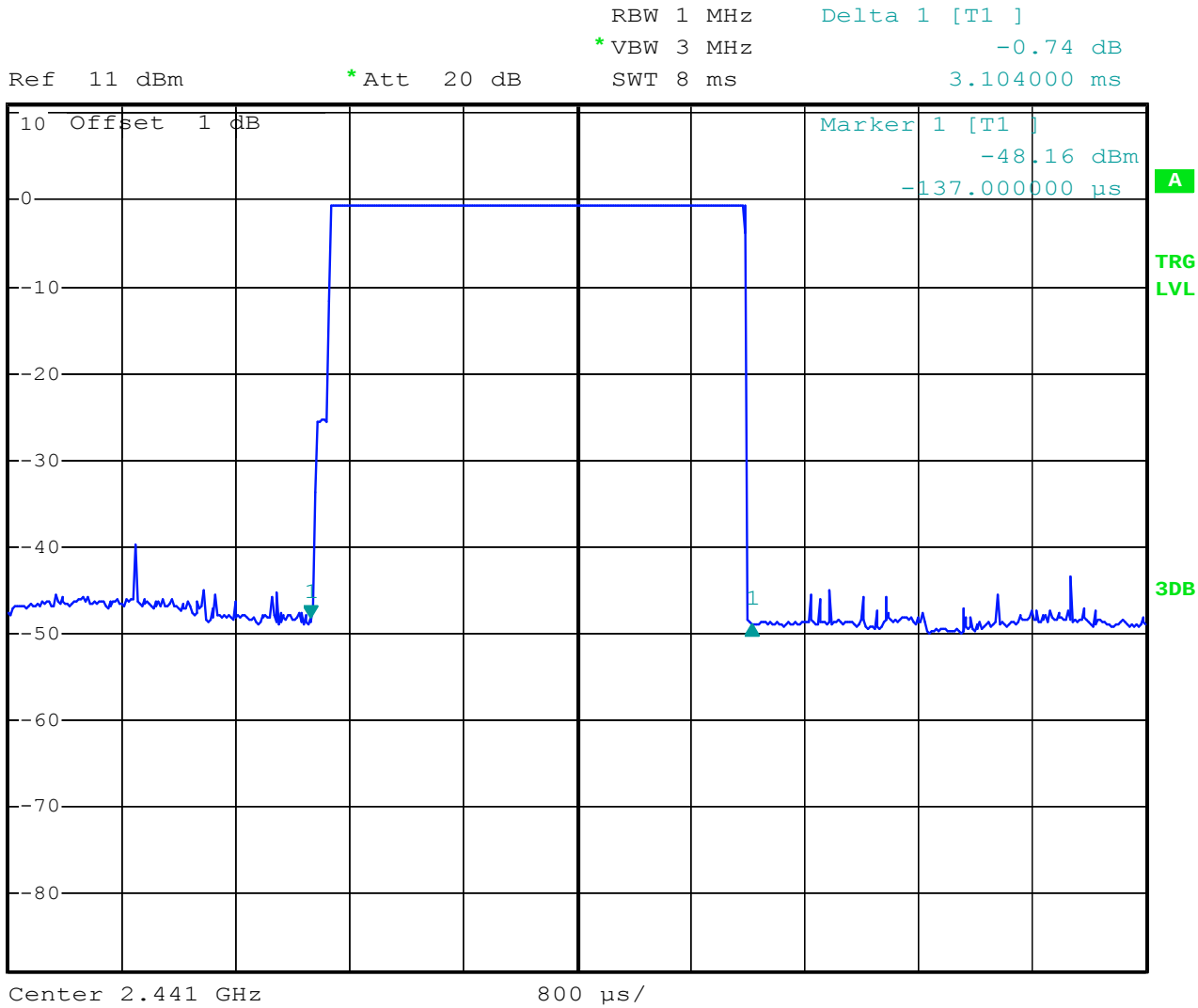


Date: 17.OCT.2012 11:25:31

DH5:

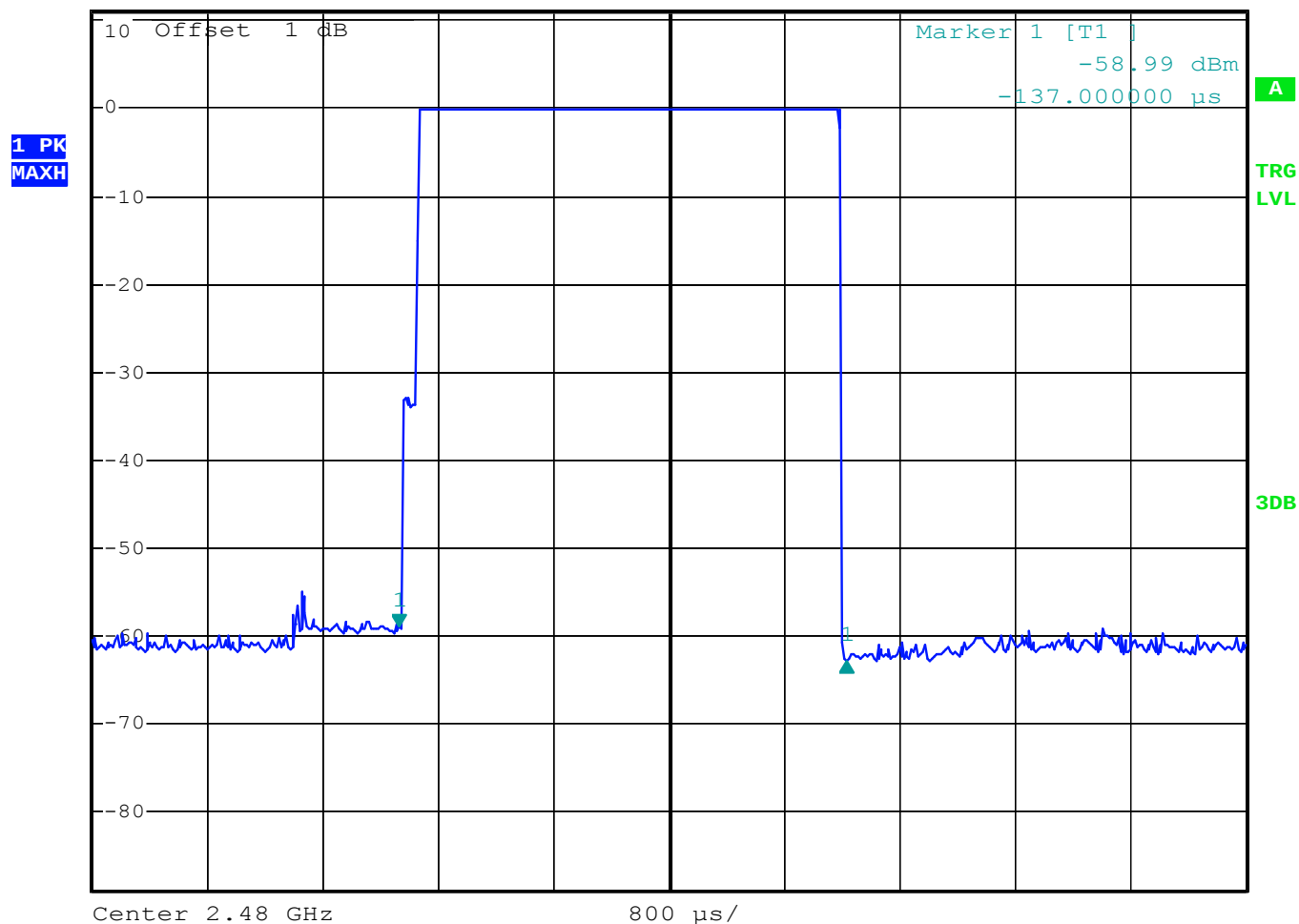


1 PK
MAXH



Date: 17.OCT.2012 11:25:12

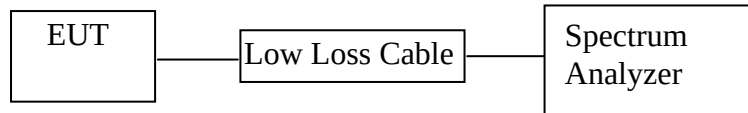
				RBW 1 MHz	Delta 1 [T1]
				* VBW 3 MHz	-3.83 dB
Ref 11 dBm		* Att 20 dB		SWT 8 ms	3.104000 ms



Date: 17.OCT.2012 11:24:53

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: Power bank and bluetooth speakers)

9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.3. EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.3.1. Power bank and bluetooth speakers (EUT)

Model Number	:	M1
Serial Number	:	N/A
Manufacturer	:	Shen Zhen Lianhua Electronics Co., Ltd

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz.

9.5.3. Measurement the maximum peak output power.

9.6. Test Result

PASS.

Date of Test:	Oct 17, 2012	Temperature:	25°C
EUT:	Power bank and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	TX	Test Engineer:	TOM

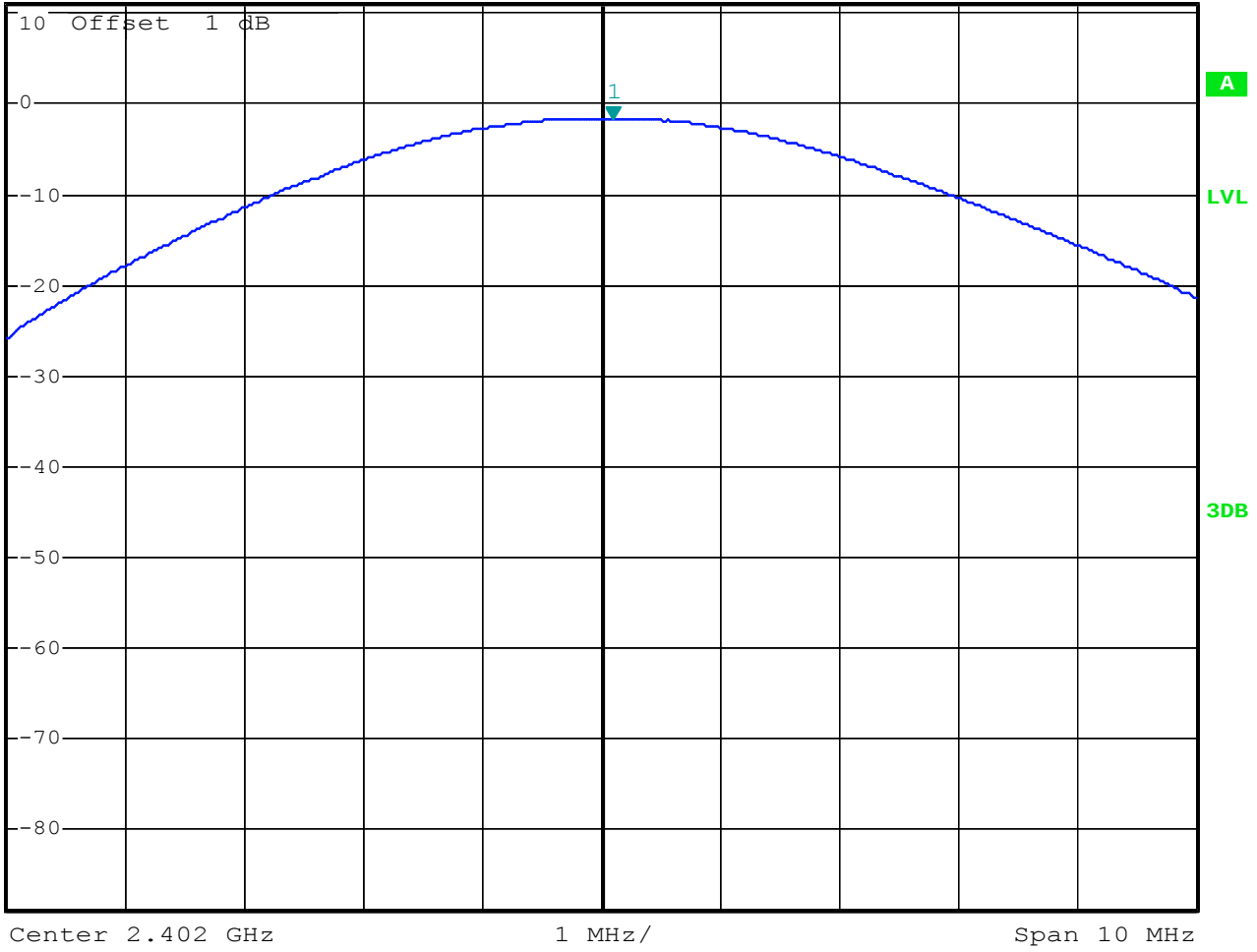
Channel	Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mW)	Limits dBm / W
Low	2402	-1.61	0.690	21/ 0.125
Middle	2441	-0.60	0.871	21/ 0.125
High	2480	-0.29	0.935	21/ 0.125

The spectrum analyzer plots are attached as below.



1 PK
MAXH

Ref 11 dBm * Att 20 dB * RBW 3 MHz Marker 1 [T1]
* VBW 3 MHz -1.61 dBm
SWT 2.5 ms 2.402100000 GHz

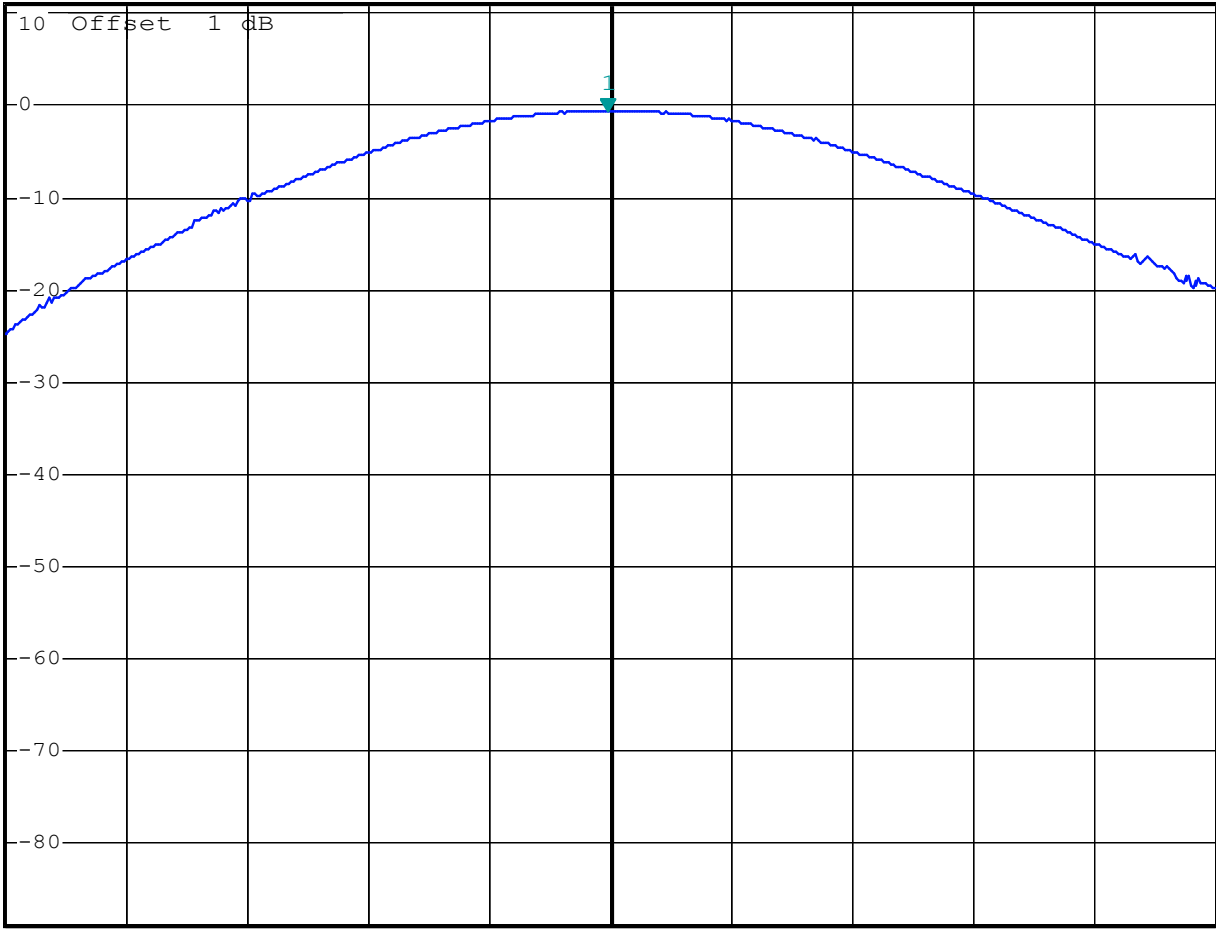


Date: 17.OCT.2012 09:50:25



1 PK
MAXH

* RBW 3 MHz Marker 1 [T1]
* VBW 3 MHz -0.60 dBm
Ref 11 dBm * Att 20 dB SWT 2.5 ms 2.440980000 GHz

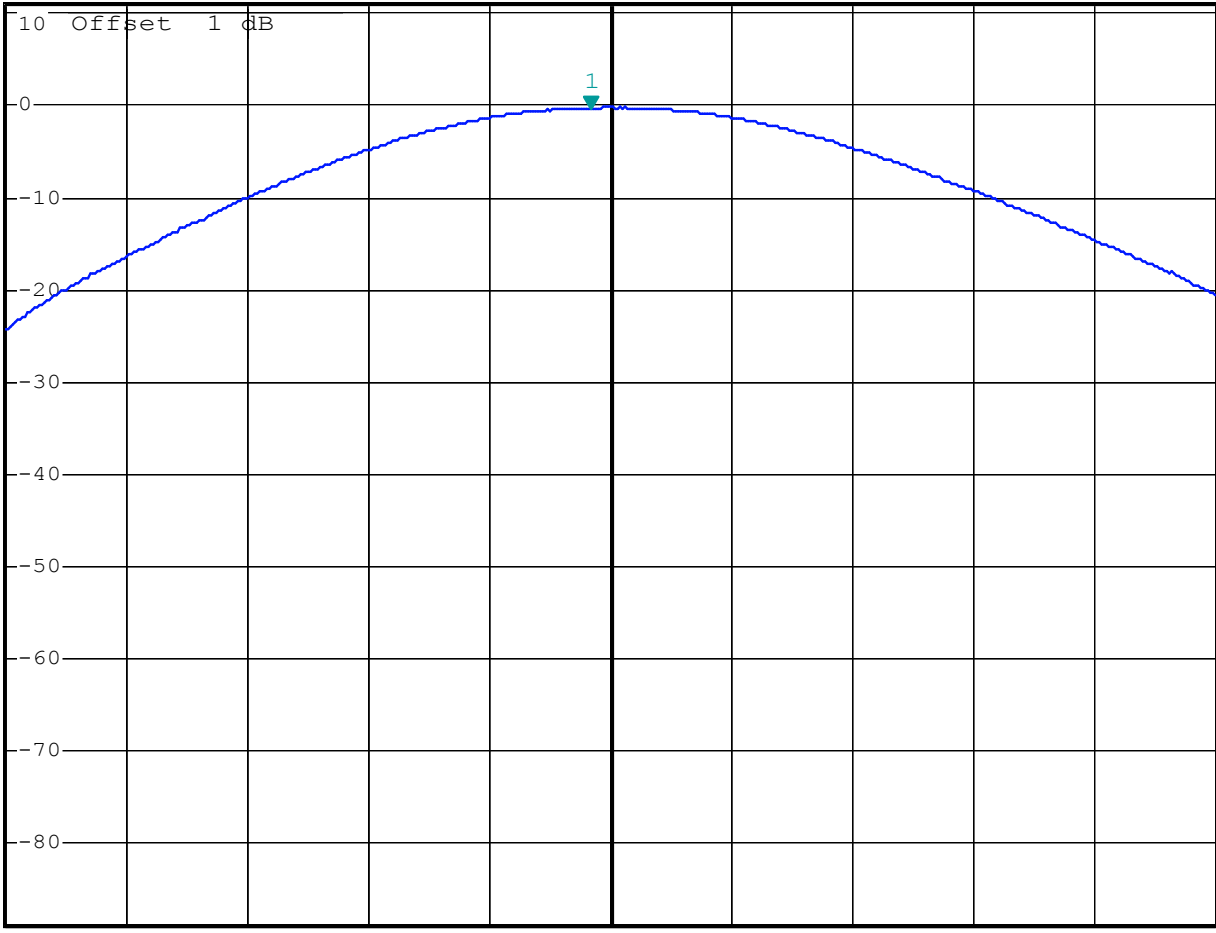


Date: 17.OCT.2012 10:09:29



1 PK
MAXH

* RBW 3 MHz Marker 1 [T1]
* VBW 3 MHz -0.29 dBm
Ref 11 dBm * Att 20 dB SWT 2.5 ms 2.479840000 GHz



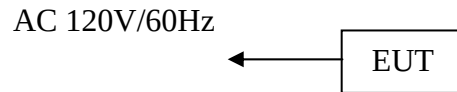
Center 2.48 GHz 1 MHz/ Span 10 MHz

Date: 17.OCT.2012 10:25:30

10.RADIATED EMISSION TEST

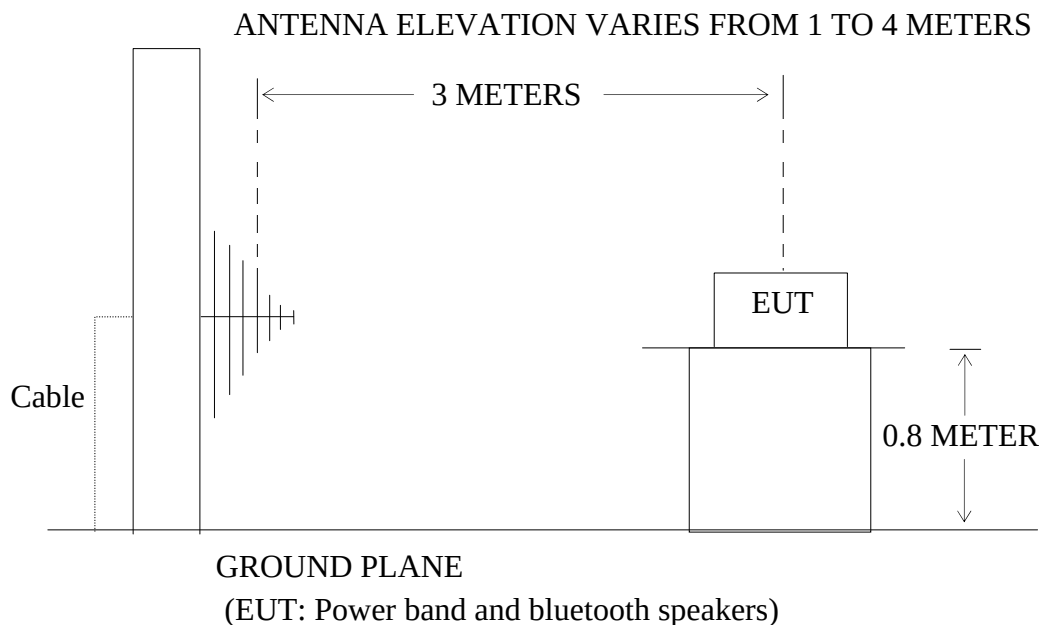
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and simulators



(EUT: Power bank and bluetooth speakers)

10.1.2.Anechoic Chamber Test Setup Diagram



10.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.4.1.Power bank and bluetooth speakers (EUT)

Model Number : M1
 Serial Number : N/A
 Manufacturer : Shen Zhen Lianhua Electronics Co., Ltd

10.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2009 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120 KHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

10.6.The Field Strength of Radiation Emission Measurement Results

PASS.

Date of Test:	Oct 17, 2012	Temperature:	25°C
EUT:	Power bank and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	TX (2402MHz)	Test Engineer:	TOM

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m)	Factor Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
36.2678	21.48	15.40	36.88	40.00	-3.12	Vertical
78.2888	13.17	12.03	25.20	40.00	-14.80	Vertical
97.9788	12.23	14.10	26.33	43.50	-17.17	Vertical
36.1405	14.26	15.43	29.69	40.00	-10.31	Horizontal
99.0690	6.79	14.00	20.79	43.50	-22.71	Horizontal
114.8224	9.76	13.69	23.45	43.50	-20.05	Horizontal

For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading(dBμV/m)		Factor Corr. (dB)	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
1053.790	60.05	66.15	-12.69	47.36	53.46	54	74	-6.64	-20.54	Vertical
1405.731	56.23	63.30	-11.78	44.45	51.52	54	74	-9.55	-22.48	Vertical
4731.957	48.74	53.83	-0.71	48.03	53.12	54	74	-5.97	-20.88	Vertical
1081.761	56.32	62.83	-12.64	43.68	50.19	54	74	-10.32	-23.81	Horizontal
1451.468	53.45	60.21	-11.60	41.85	48.61	54	74	-12.15	-25.39	Horizontal
4731.957	40.73	48.89	-0.71	40.02	48.18	54	74	-13.98	-25.82	Horizontal

Note: 1.The emission emitted by the EUT is too low to be measured except the emission listed above.

2. *: Denotes restricted band of operation.

Date of Test:	Oct 17, 2012	Temperature:	25°C
EUT:	Power bank and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	TX (2441MHz)	Test Engineer:	TOM

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m)	Factor Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
37.0405	21.70	15.23	36.93	40.00	-3.07	Vertical
59.7314	14.46	12.15	26.61	40.00	-13.39	Vertical
78.2888	13.37	12.03	25.40	40.00	-14.60	Vertical
36.6521	13.96	15.31	29.27	40.00	-10.73	Horizontal
115.2266	8.54	13.68	22.22	43.50	-21.28	Horizontal
255.8226	4.82	17.99	22.81	46.00	-23.19	Horizontal

For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading(dBμV/m)		Factor Corr. (dB)	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
1059.943	60.41	66.33	-12.68	47.73	53.65	54	74	-6.27	-20.35	Vertical
1438.849	57.79	64.86	-11.64	46.15	53.22	54	74	-7.85	-20.78	Vertical
4815.324	40.67	49.45	-0.23	40.44	49.22	54	74	-13.56	-24.78	Vertical
1078.617	53.36	61.34	-12.64	40.72	48.70	54	74	-13.28	-25.30	Horizontal
1451.468	52.75	60.84	-11.60	41.15	49.24	54	74	-12.85	-24.76	Horizontal
2944.347	43.09	51.13	-5.59	37.50	45.54	54	74	-16.50	-28.46	Horizontal

Note: 1.The emission emitted by the EUT is too low to be measured except the emission listed above.**2. *: Denotes restricted band of operation.**

Date of Test:	Oct 17, 2012	Temperature:	25°C
EUT:	Power bank and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	TX (2480MHz)	Test Engineer:	TOM

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m)	Factor Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
36.1406	21.44	15.43	36.87	40.00	-3.13	Vertical
61.6506	14.88	11.82	26.70	40.00	-13.30	Vertical
95.6485	9.57	14.09	23.66	43.50	-19.84	Vertical
36.5236	13.60	15.35	28.95	40.00	-11.05	Horizontal
97.3437	6.21	14.05	20.26	43.50	-23.24	Horizontal
114.4197	8.78	13.71	22.49	43.50	-21.01	Horizontal

For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading(dBμV/m)		Factor Corr. (dB)	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
1078.617	60.54	66.26	-12.64	47.90	53.62	54	74	-6.10	-20.38	Vertical
1401.645	58.13	64.05	-11.80	46.33	52.25	54	74	-7.67	-21.75	Vertical
4914.444	43.58	50.70	0.30	43.88	51.00	54	74	-10.12	-23.00	Vertical
1053.790	55.27	61.20	-12.69	42.58	48.51	54	74	-11.42	-25.49	Horizontal
1418.060	50.46	58.38	-11.72	36.74	46.66	54	74	-15.26	-27.34	Horizontal
4914.444	41.32	47.37	0.30	41.62	47.67	54	74	-12.38	-26.33	Horizontal

Note: 1.The emission emitted by the EUT is too low to be measured except the emission listed above.**2. *: Denotes restricted band of operation.**



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Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: TOM #575

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2402MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

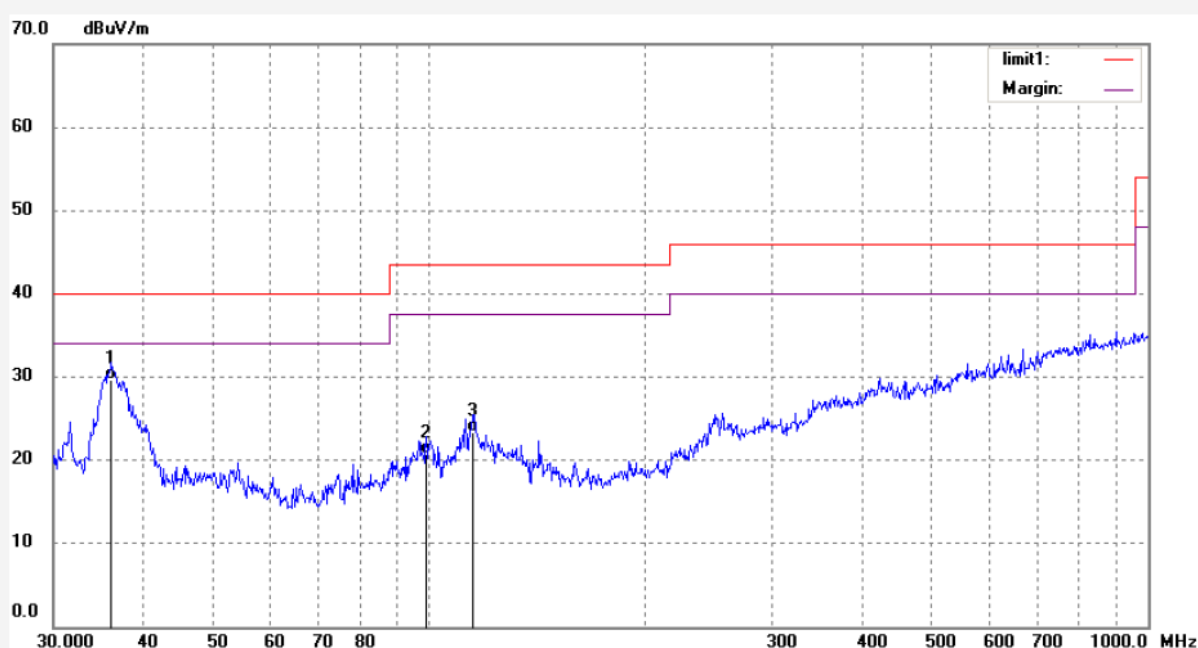
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Time: 20:26:02

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	36.1405	14.26	15.43	29.69	40.00	-10.31	QP			
2	99.0690	6.79	14.00	20.79	43.50	-22.71	QP			
3	114.8224	9.76	13.69	23.45	43.50	-20.05	QP			



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Job No.: TOM #576

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2402MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

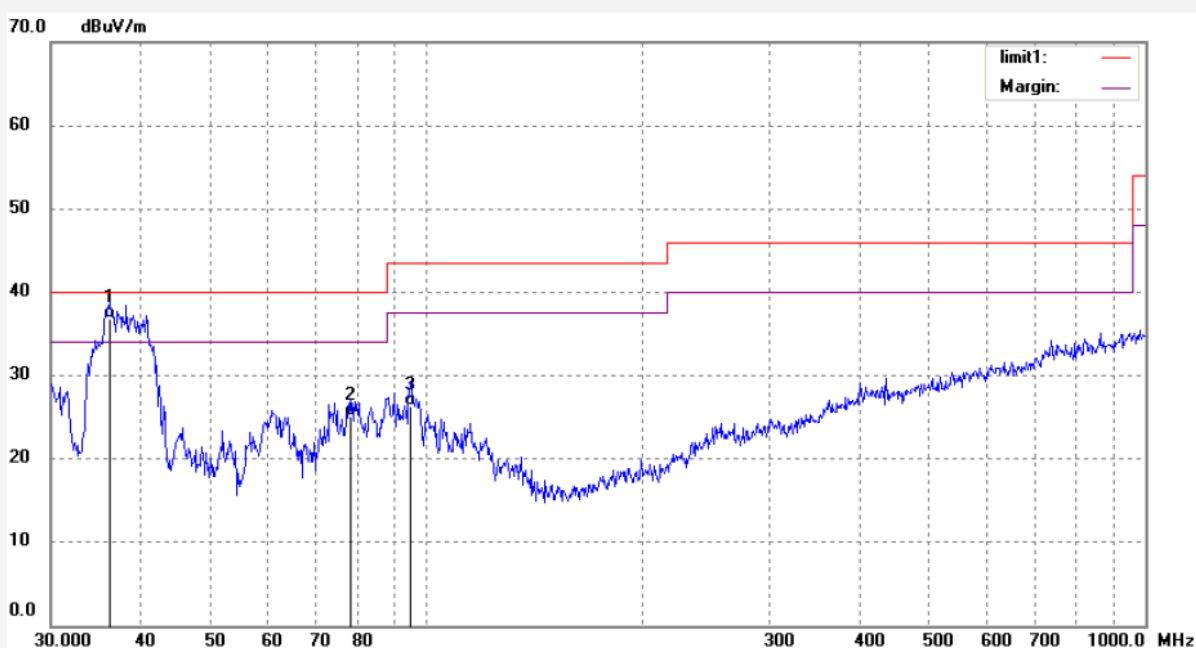
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Time: 20:27:21

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	36.2678	21.48	15.40	36.88	40.00	-3.12	QP			
2	78.2888	13.17	12.03	25.20	40.00	-14.80	QP			
3	94.9788	12.23	14.10	26.33	43.50	-17.17	QP			



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Job No.: TOM #577

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2441MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

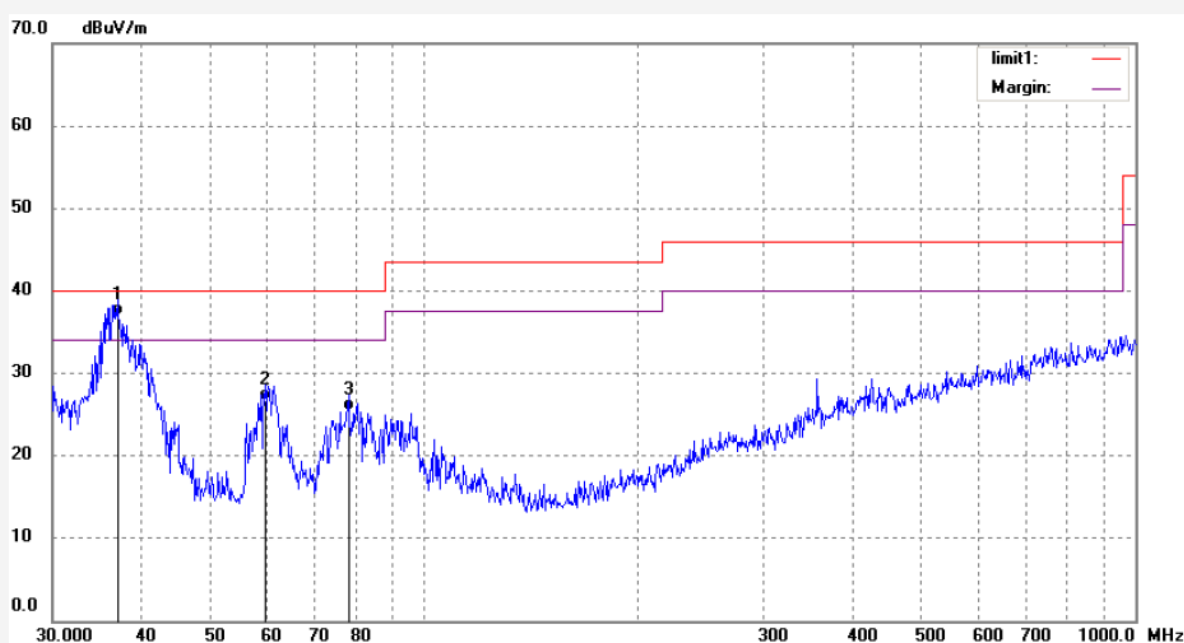
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Time: 20:32:02

Engineer Signature:

Distance: 3m

Note: Report No.: ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	37.0405	21.70	15.23	36.93	40.00	-3.07	QP			
2	59.7314	14.46	12.15	26.61	40.00	-13.39	QP			
3	78.2888	13.37	12.03	25.40	40.00	-14.60	QP			



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Job No.: TOM #578

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2441MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

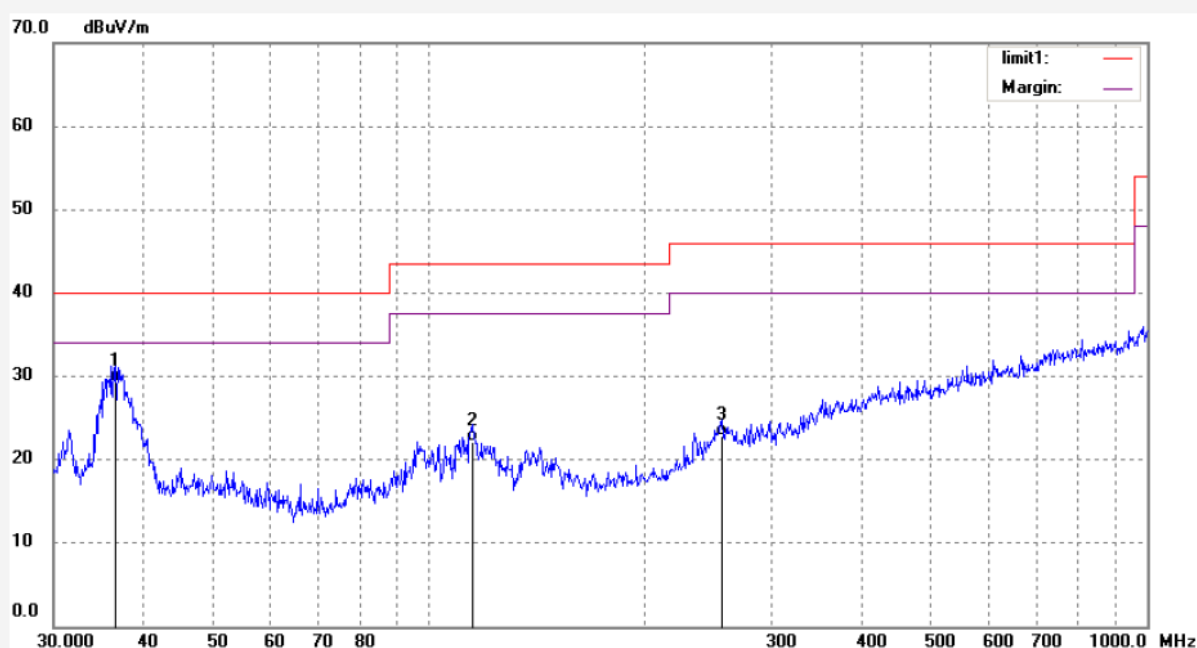
Date: 2012/10/17

Time: 20:33:05

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	36.6521	13.96	15.31	29.27	40.00	-10.73	QP			
2	115.2266	8.54	13.68	22.22	43.50	-21.28	QP			
3	255.8226	4.82	17.99	22.81	46.00	-23.19	QP			



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Site: 966 chamber

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Job No.: TOM #579

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2480MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

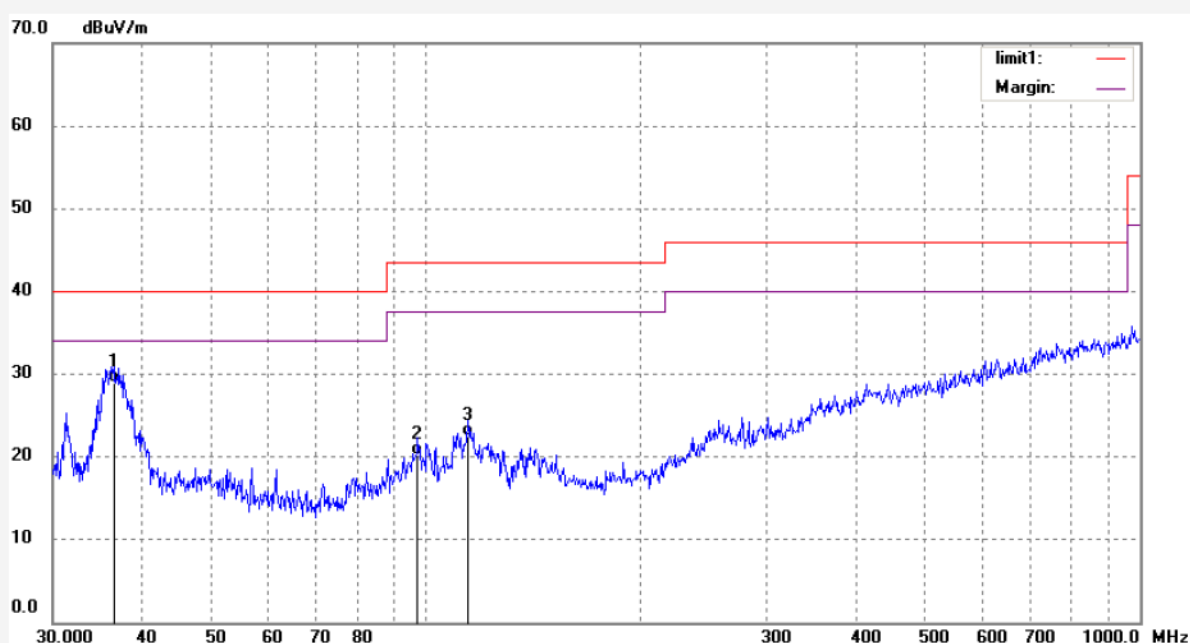
Date: 2012/10/17

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Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	36.5236	13.60	15.35	28.95	40.00	-11.05	QP			
2	97.3437	6.21	14.05	20.26	43.50	-23.24	QP			
3	114.4197	8.78	13.71	22.49	43.50	-21.01	QP			



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Job No.: TOM #580

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2480MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

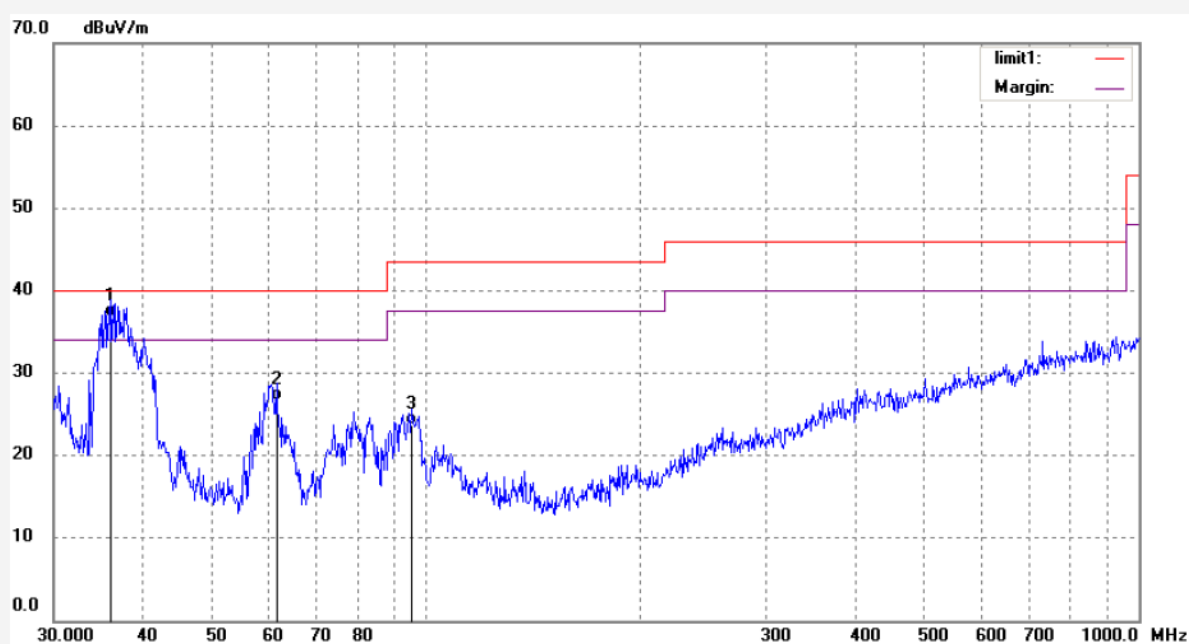
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Time: 20:34:03

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	36.1406	21.44	15.43	36.87	40.00	-3.13	QP			
2	61.6506	14.88	11.82	26.70	40.00	-13.30	QP			
3	95.6485	9.57	14.09	23.66	43.50	-19.84	QP			



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Job No.: TOM #593

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2402MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

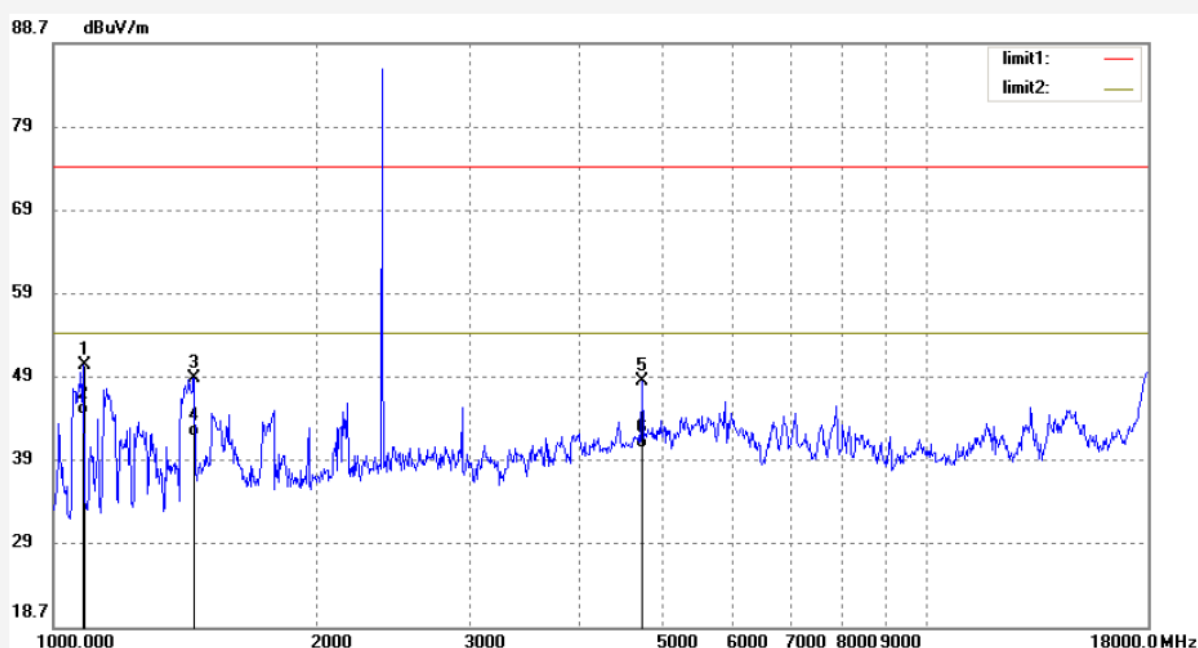
Date: 2012/10/17

Time: 21:02:40

Engineer Signature:

Distance: 3m

Note: Report No.: ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1081.761	62.83	-12.64	50.19	74.00	-23.81	peak			
2	1081.761	56.32	-12.64	43.68	54.00	-10.32	AVG			
3	1451.468	60.21	-11.60	48.61	74.00	-25.39	peak			
4	1451.468	53.45	-11.60	41.85	54.00	-12.15	AVG			
5	4731.957	48.89	-0.71	48.18	74.00	-25.82	peak			
6	4731.957	40.73	-0.71	40.02	54.00	-13.98	AVG			



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Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: TOM #595

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2402MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

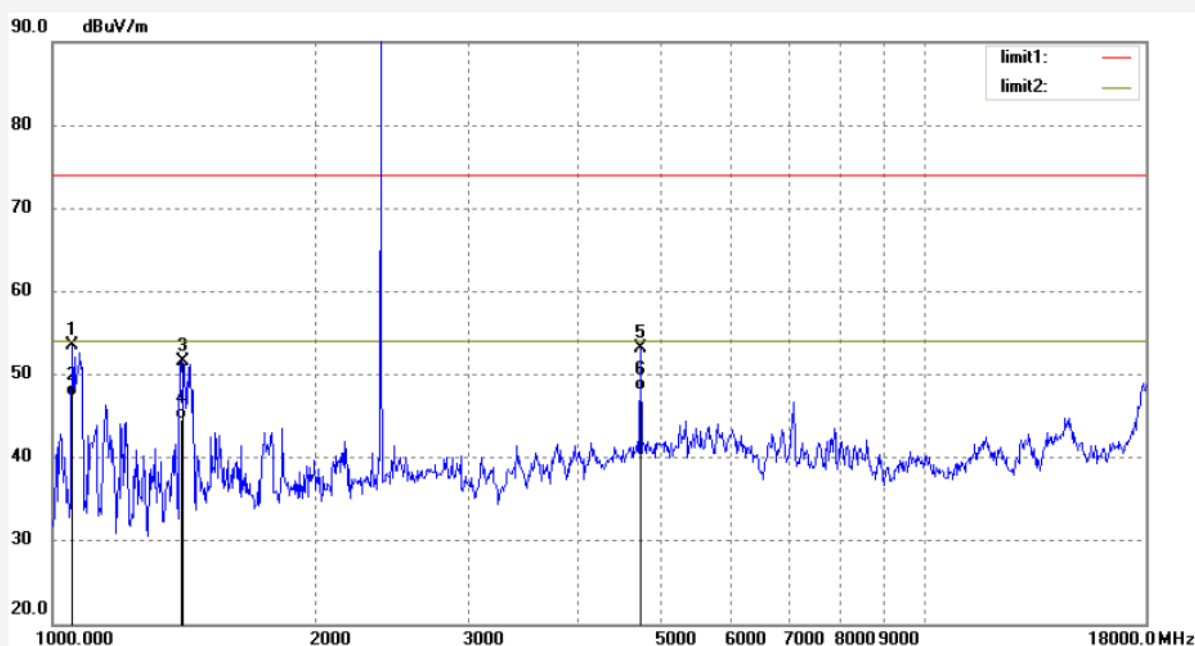
Date: 2012/10/17

Time: 21:08:09

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1053.790	66.15	-12.69	53.46	74.00	-20.54	peak			
2	1053.790	60.05	-12.69	47.36	54.00	-6.64	AVG			
3	1405.731	63.30	-11.78	51.52	74.00	-22.48	peak			
4	1405.731	56.23	-11.78	44.45	54.00	-9.55	AVG			
5	4731.957	53.83	-0.71	53.12	74.00	-20.88	peak			
6	4731.957	48.74	-0.71	48.03	54.00	-5.97	AVG			



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Site: 966 chamber
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Fax:+86-0755-26503396

Job No.: TOM #596

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2441MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

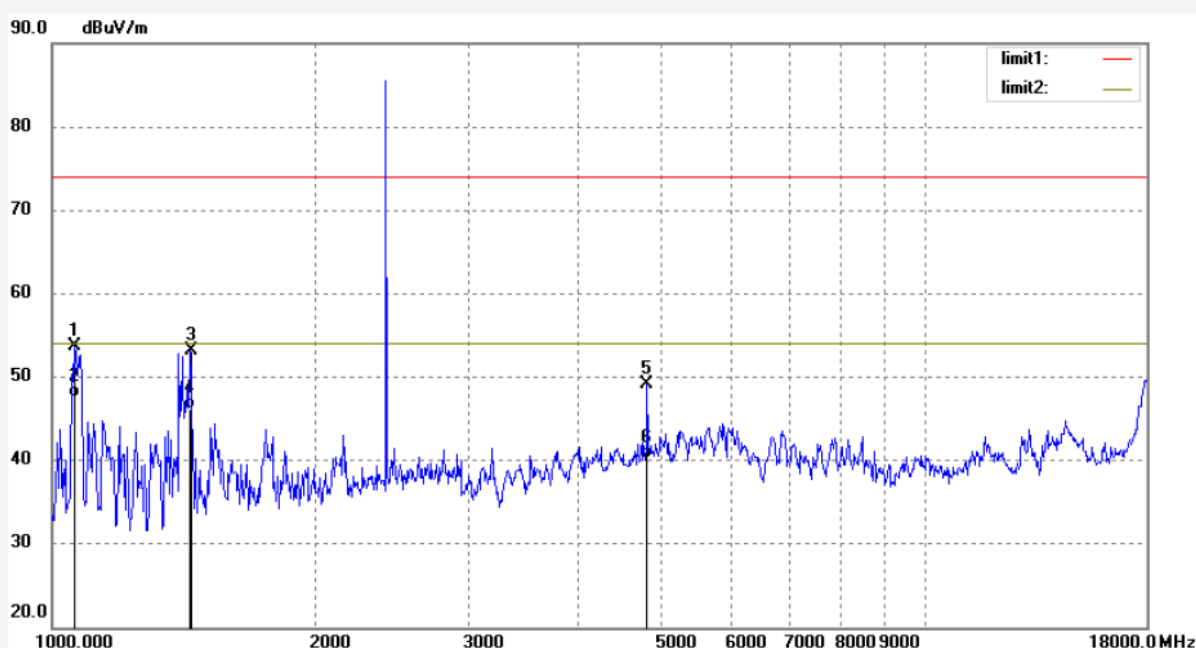
Date: 2012/10/17

Time: 21:10:21

Engineer Signature:

Distance: 3m

Note: Report No.: ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1059.943	66.33	-12.68	53.65	74.00	-20.35	peak			
2	1059.943	60.41	-12.68	47.73	54.00	-6.27	AVG			
3	1438.849	64.86	-11.64	53.22	74.00	-20.78	peak			
4	1438.849	57.79	-11.64	46.15	54.00	-7.85	AVG			
5	4815.324	49.45	-0.23	49.22	74.00	-24.78	peak			
6	4815.324	40.67	-0.23	40.44	54.00	-13.56	AVG			



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Fax:+86-0755-26503396

Job No.: TOM #597

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2441MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

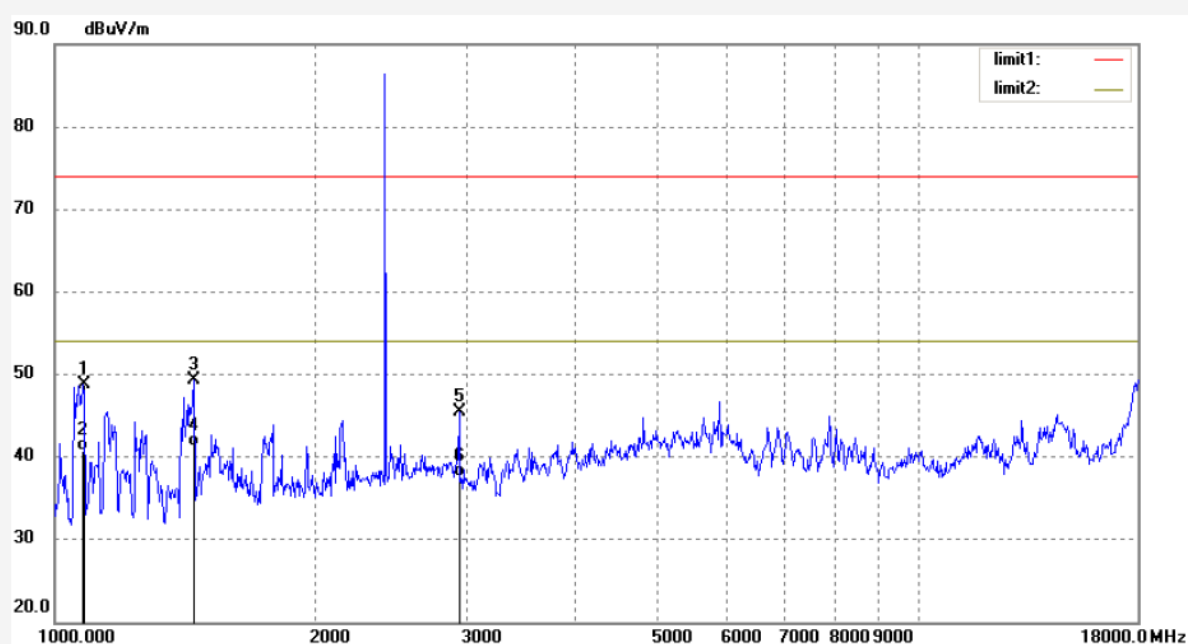
Date: 2012/10/17

Time: 21:12:26

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1078.617	61.34	-12.64	48.70	74.00	-25.30	peak			
2	1078.617	53.36	-12.64	40.72	54.00	-13.28	AVG			
3	1451.468	60.84	-11.60	49.24	74.00	-24.76	peak			
4	1451.468	52.75	-11.60	41.15	54.00	-12.85	AVG			
5	2944.347	51.13	-5.59	45.54	74.00	-28.46	peak			
6	2944.347	43.09	-5.59	37.50	54.00	-16.50	AVG			



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Fax:+86-0755-26503396

Job No.: TOM #598

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2480MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

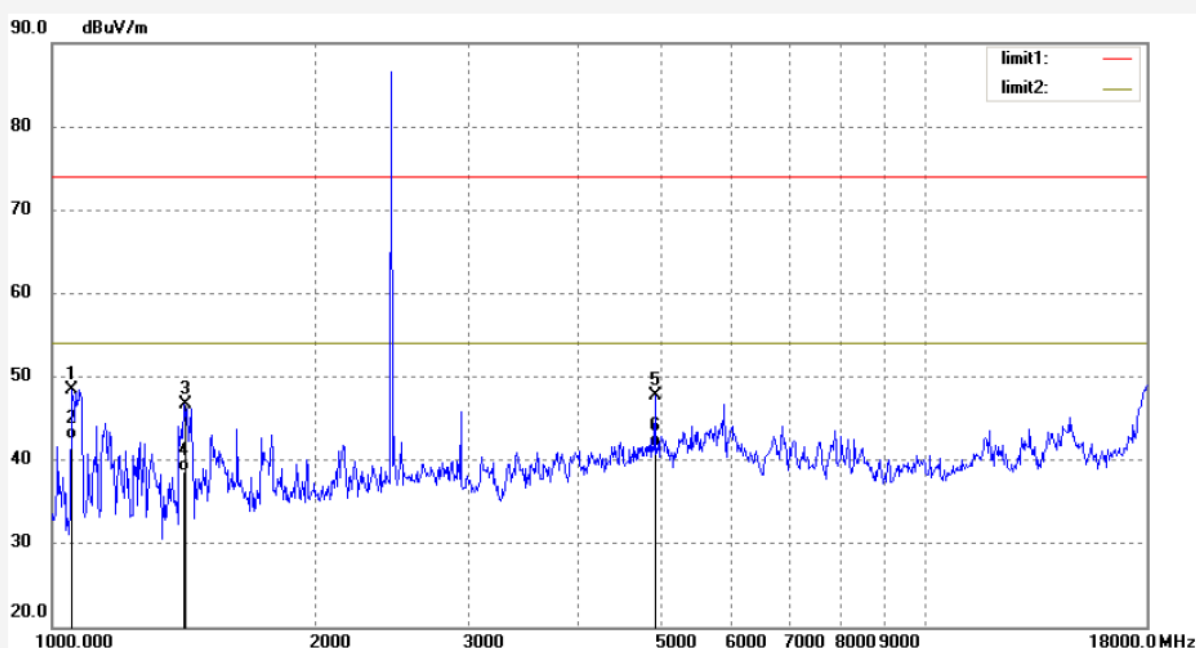
Date: 2012/10/17

Time: 21:14:08

Engineer Signature:

Distance: 3m

Note: Report No.: ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1053.790	61.20	-12.69	48.51	74.00	-25.49	peak			
2	1053.790	55.27	-12.69	42.58	54.00	-11.42	AVG			
3	1418.060	58.38	-11.72	46.66	74.00	-27.34	peak			
4	1418.060	50.46	-11.72	36.74	54.00	-15.26	AVG			
5	4914.444	47.37	0.30	47.67	74.00	-26.33	peak			
6	4914.444	41.32	0.30	41.62	54.00	-12.38	AVG			



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Job No.: TOM #599

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2480MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

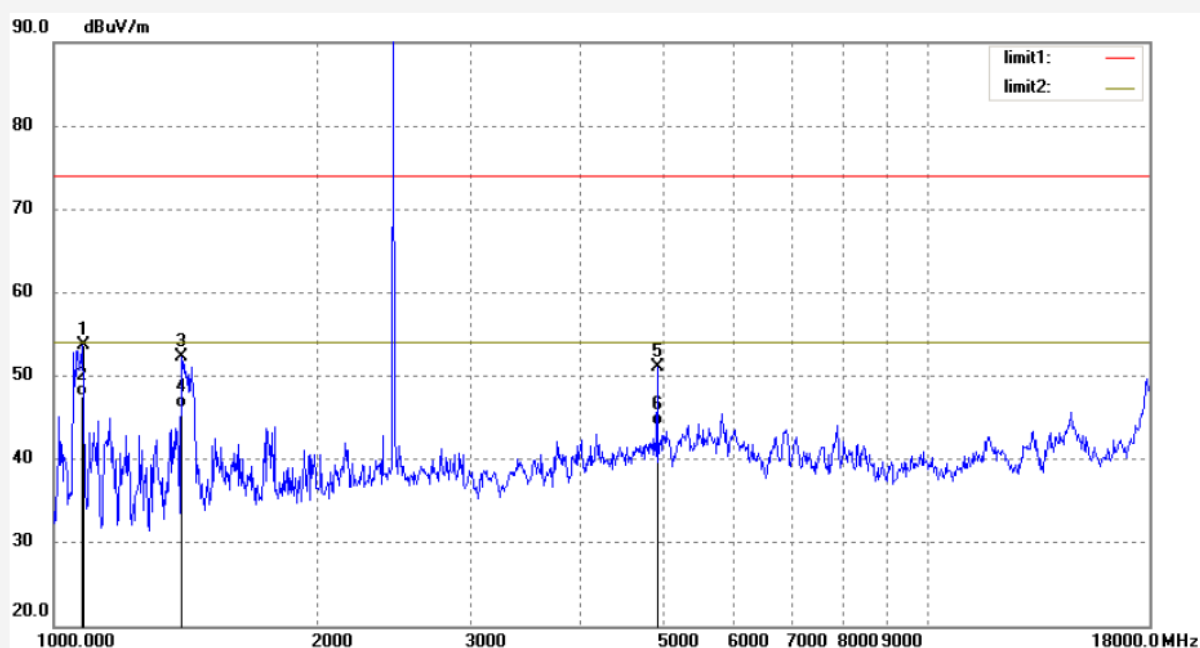
Date: 2012/10/17

Time: 21:15:59

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1078.617	66.26	-12.64	53.62	74.00	-20.38	peak			
2	1078.617	60.54	-12.64	47.90	54.00	-6.10	AVG			
3	1401.645	64.05	-11.80	52.25	74.00	-21.75	peak			
4	1401.645	58.13	-11.80	46.33	54.00	-7.67	AVG			
5	4914.444	50.70	0.30	51.00	74.00	-23.00	peak			
6	4914.444	43.58	0.30	43.88	54.00	-10.12	AVG			

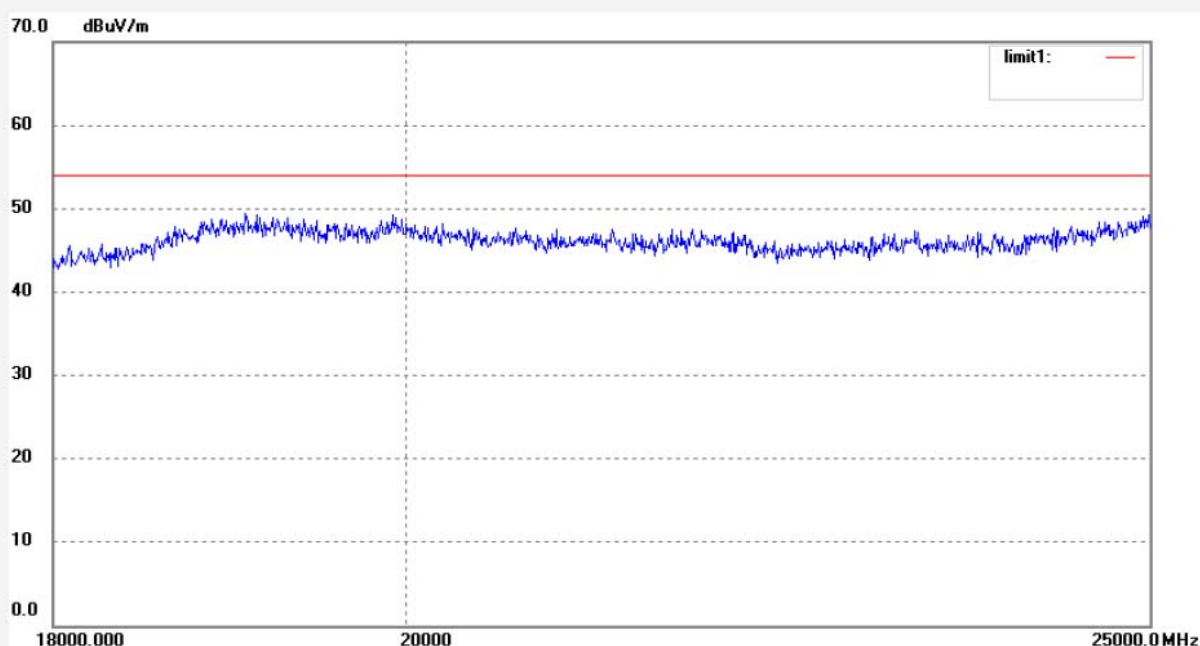

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Job No.: TOM #1601	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2012/10/17
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 10:05:15
EUT: Power bank and bluetooth speakers	Engineer Signature: TOM
Mode: TX 2402MHz	Distance: 3m
Model: M1	
Manufacturer: Lianhua	

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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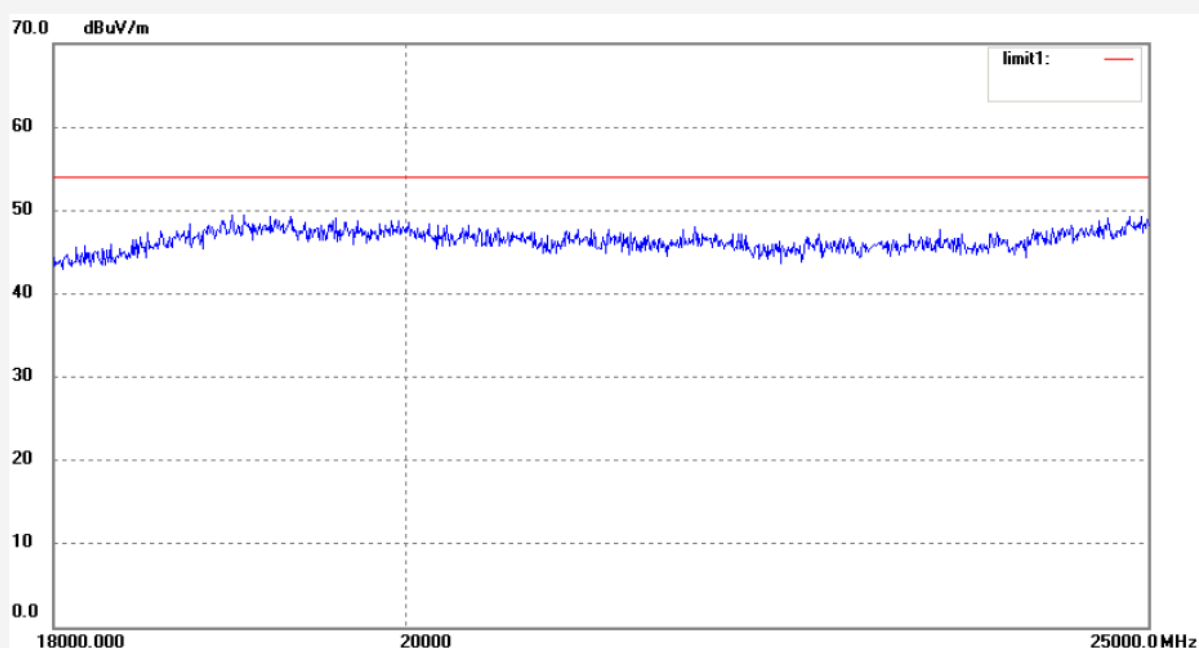
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Site: 966 chamber
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Job No.: TOM #1602	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2012/10/17
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 10:09:22
EUT: Power bank and bluetooth speakers	Engineer Signature: TOM
Mode: TX 2402MHz	Distance: 3m
Model: M1	
Manufacturer: Lianhua	

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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Job No.: TOM #1603

Standard: FCC Class C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 50 %

EUT: Power bank and bluetooth speakers

Mode: TX 2441MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

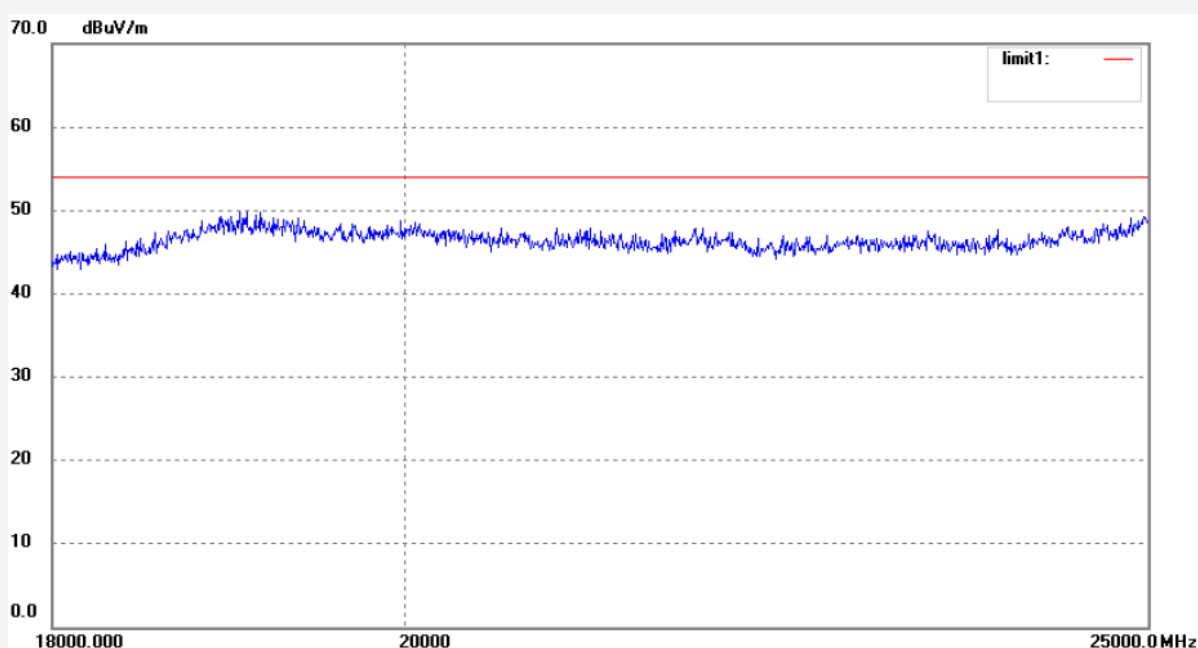
Date: 2012/10/17

Time: 10:14:45

Engineer Signature: TOM

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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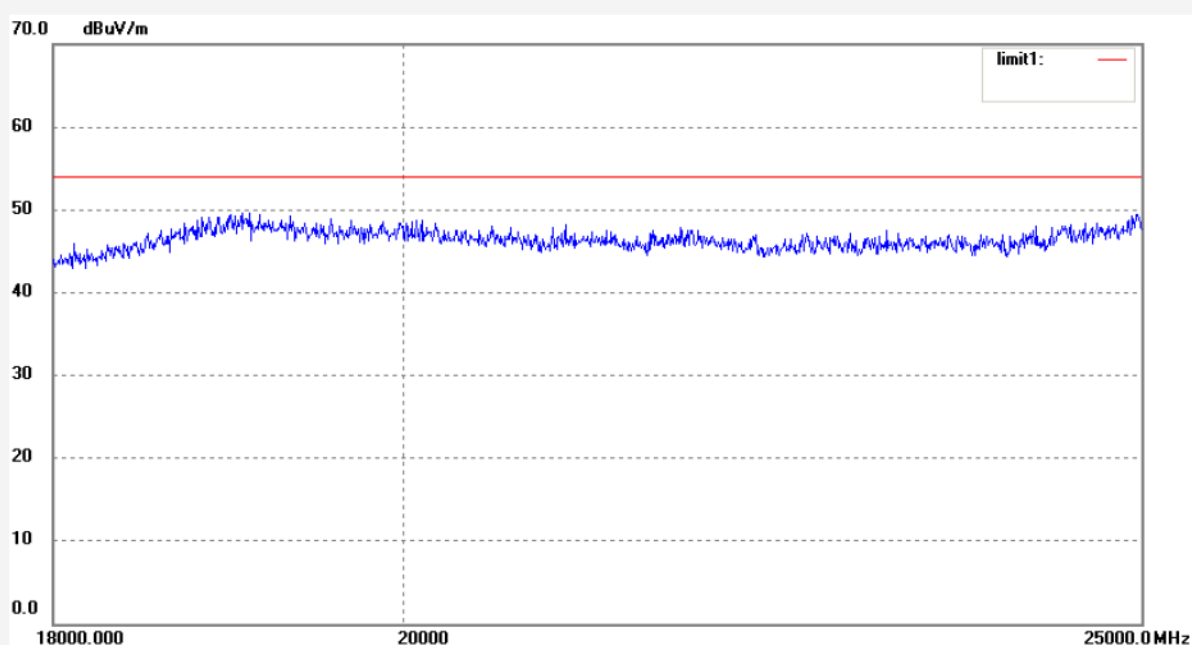
Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: TOM #1604	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2012/10/17
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 10:18:36
EUT: Power bank and bluetooth speakers	Engineer Signature: TOM
Mode: TX 2441MHz	Distance: 3m
Model: M1	
Manufacturer: Lianhua	

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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Site: 966 chamber

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Job No.: TOM #1605

Standard: FCC Class C 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 50 %

EUT: Power bank and bluetooth speakers

Mode: TX 2480MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

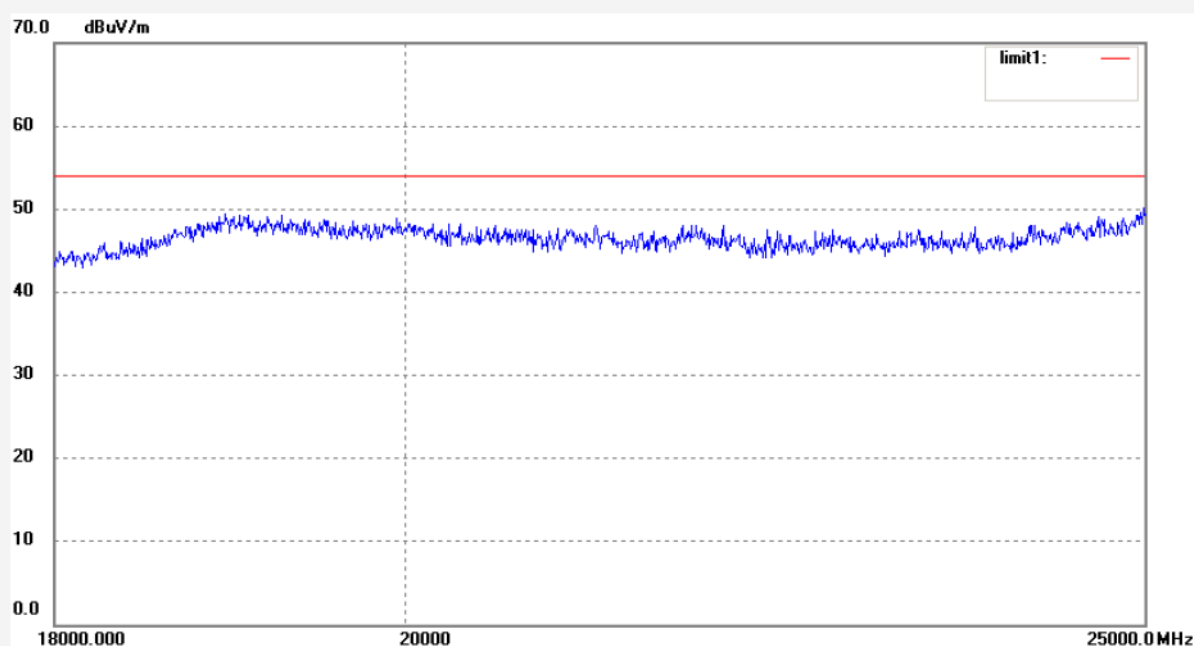
Date: 2012/10/17

Time: 10:23:55

Engineer Signature: TOM

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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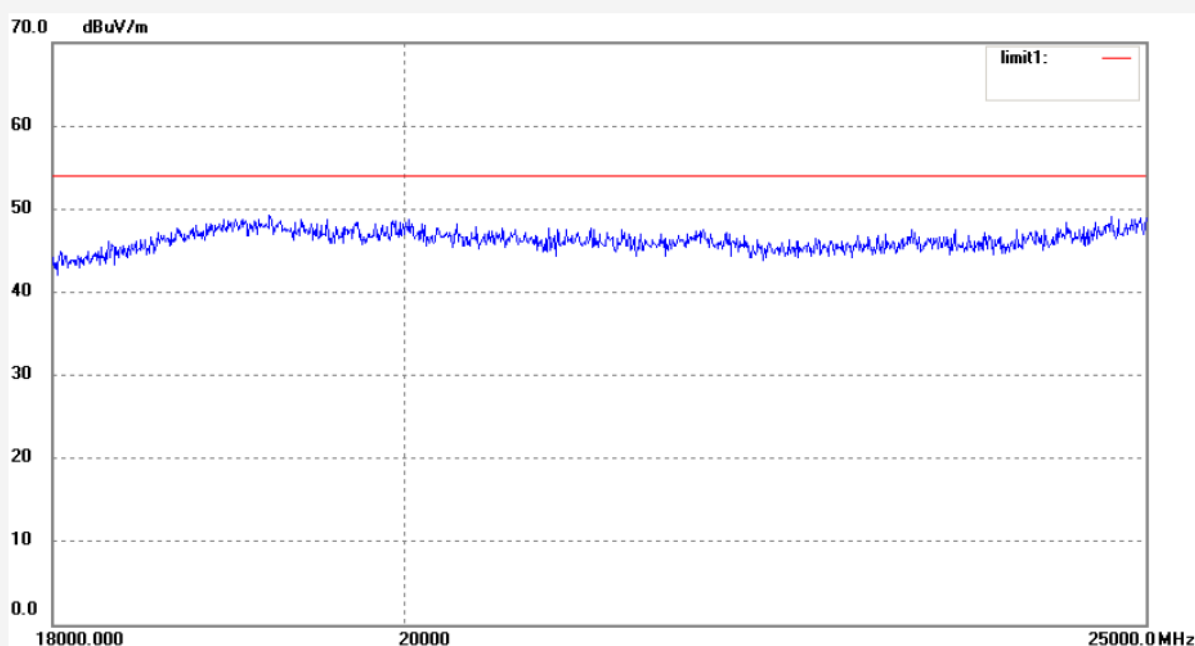
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Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: TOM #1606	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2012/10/17
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 10:27:11
EUT: Power bank and bluetooth speakers	Engineer Signature: TOM
Mode: TX 2480MHz	Distance: 3m
Model: M1	
Manufacturer: Lianhua	

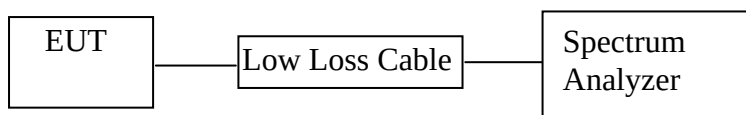
Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Power bank and bluetooth speakers)

11.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

11.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.3.1.Power bank and bluetooth speakers (EUT)

Model Number	:	M1
Serial Number	:	N/A
Manufacturer	:	Shen Zhen Lianhua Electronics Co.,Ltd

11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

11.5.Test Procedure

11.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.

11.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3.The band edges was measured and recorded.

11.6. Test Result

Pass

Date of Test:	<u>Oct 17, 2012</u>	Temperature:	<u>25°C</u>
EUT:	<u>Power bank and bluetooth speakers</u>	Humidity:	<u>50%</u>
Model No.:	<u>M1</u>	Power Supply:	<u>AC 120V/60Hz</u>
Test Mode:	<u>TX 2402MHz</u>	Test Engineer:	<u>TOM</u>

Conducted test

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2399.864	38.66	> 20dBc

Date of Test:	<u>Oct 17, 2012</u>	Temperature:	<u>25°C</u>
EUT:	<u>Power bank and bluetooth speakers</u>	Humidity:	<u>50%</u>
Model No.:	<u>M1</u>	Power Supply:	<u>AC 120V/60Hz</u>
Test Mode:	<u>TX 2480MHz</u>	Test Engineer:	<u>Ricky</u>

Conducted test

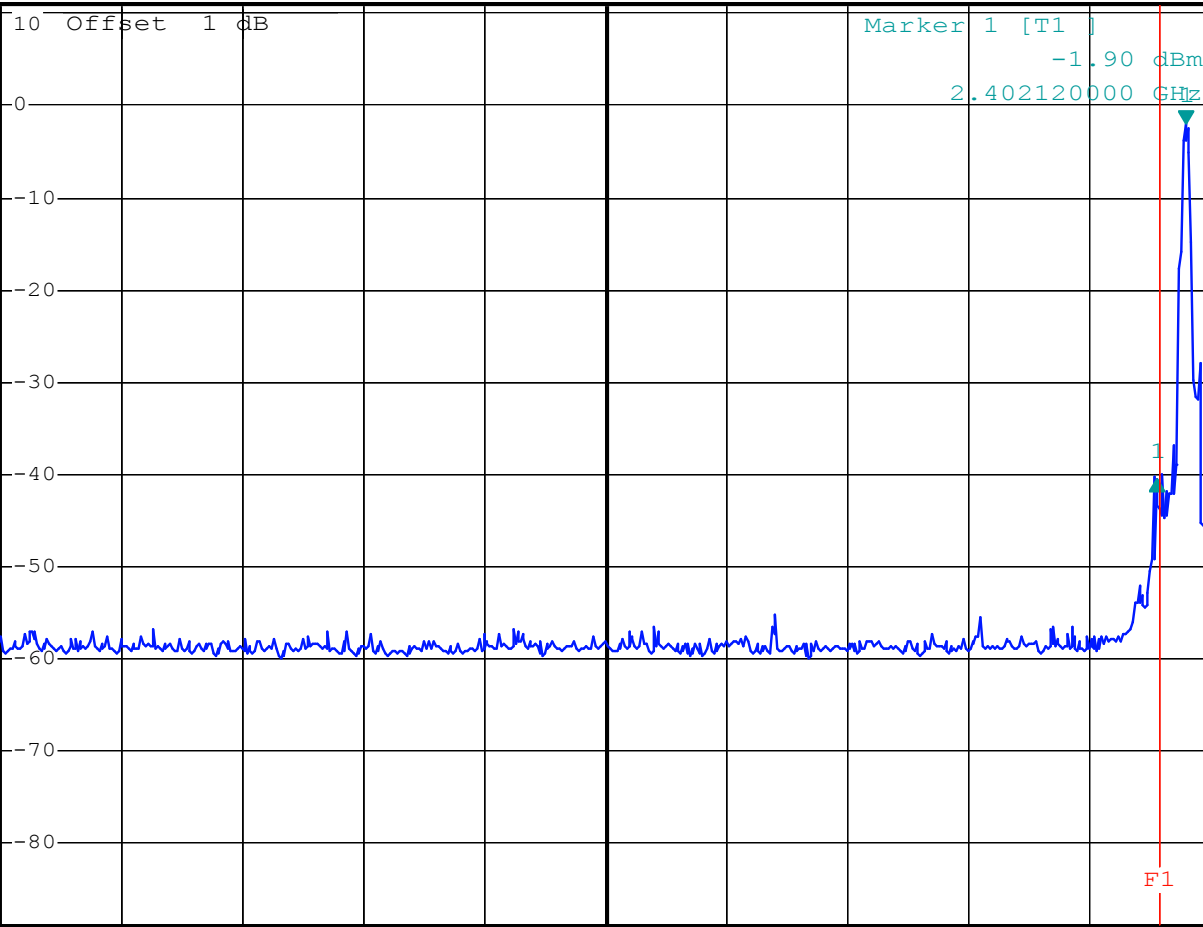
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2483.536	51.38	> 20dBc



* RBW 100 kHz Delta 1 [T1]
* VBW 300 kHz -38.66 dB
SWT 10 ms -2.256000000 MHz

Ref 11 dBm * Att 20 dB

1 PK
MAXH



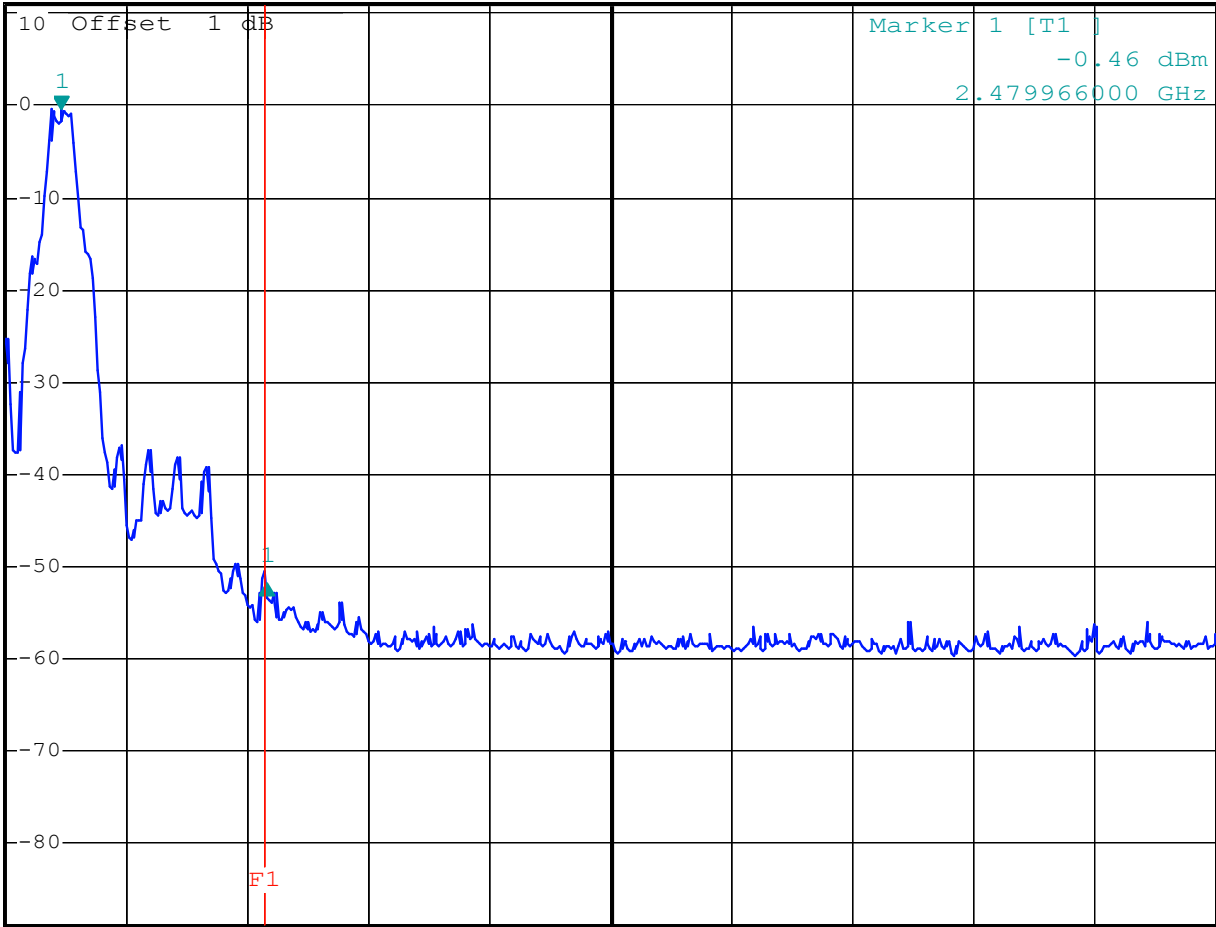
Start 2.31 GHz 9.4 MHz/ Stop 2.404 GHz

Date: 17.OCT.2012 09:51:57



1 PK
MAXH

* RBW 100 kHz Delta 1 [T1]
* VBW 300 kHz -51.38 dB
Ref 11 dBm * Att 20 dB SWT 2.5 ms 3.570000000 MHz



Start 2.479 GHz 2.1 MHz/ Stop 2.5 GHz

Date: 17.OCT.2012 10:32:11

Radiated Band Edge Result

Date of Test:	Oct 17, 2012	Temperature:	25°C
EUT:	Power bank and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	TX (2402MHz)	Test Engineer:	TOM

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2390.052	37.21	46.16	-7.53	29.68	38.63	54.00	74.00	-24.32	-35.37	Vertical
2395.715	41.36	49.30	-7.49	33.87	41.81	54.00	74.00	-20.13	-32.19	Vertical
2400.000	50.12	59.01	-7.46	42.66	51.55	54.00	74.00	-11.34	-22.45	Vertical
2385.084	40.74	47.90	-7.56	33.18	40.34	54.00	74.00	-20.38	-33.66	Horizontal
2390.052	38.69	45.88	-7.53	31.16	38.35	54.00	74.00	-22.84	-35.65	Horizontal
2400.000	50.25	57.19	-7.46	42.79	49.73	54.00	74.00	-11.21	-24.27	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$
3. Display the measurement of peak values.

Date of Test:	Oct 17, 2012	Temperature:	25°C
EUT:	Power bank and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	TX (2480MHz)	Test Engineer:	TOM

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2483.500	40.31	48.16	-7.37	32.94	40.79	54.00	74.00	-21.06	-33.21	Vertical
2483.500	40.45	48.38	-7.37	33.08	41.01	54.00	74.00	-20.92	-32.99	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.



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Site: 966 chamber
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Job No.: TOM #600

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2402MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

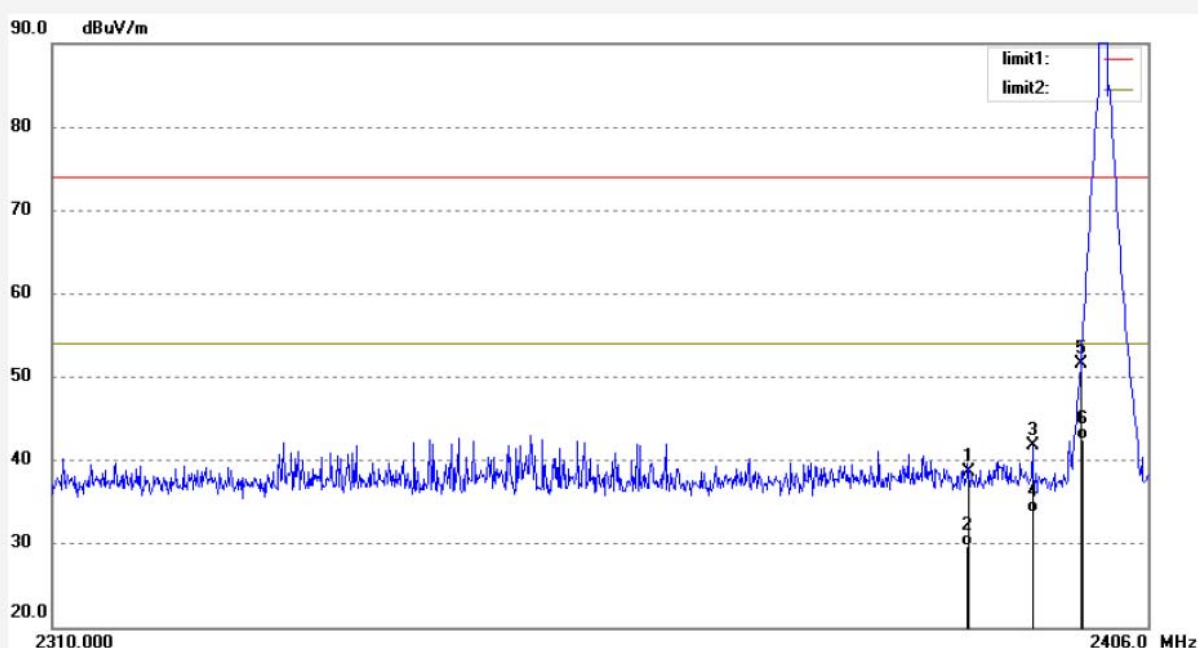
Date: 2012/10/17

Time: 21:19:12

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.052	46.16	-7.53	38.63	74.00	-35.37	peak			
2	2390.052	37.21	-7.53	29.68	54.00	-24.32	AVG			
3	2395.715	49.30	-7.49	41.81	74.00	-32.19	peak			
4	2395.715	41.36	-7.49	33.87	54.00	-20.13	AVG			
5	2400.000	59.01	-7.46	51.55	74.00	-22.45	peak			
6	2400.000	50.12	-7.46	42.66	54.00	-11.34	AVG			



ACCURATE TECHNOLOGY CO., LTD.

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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: TOM #601

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2402MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

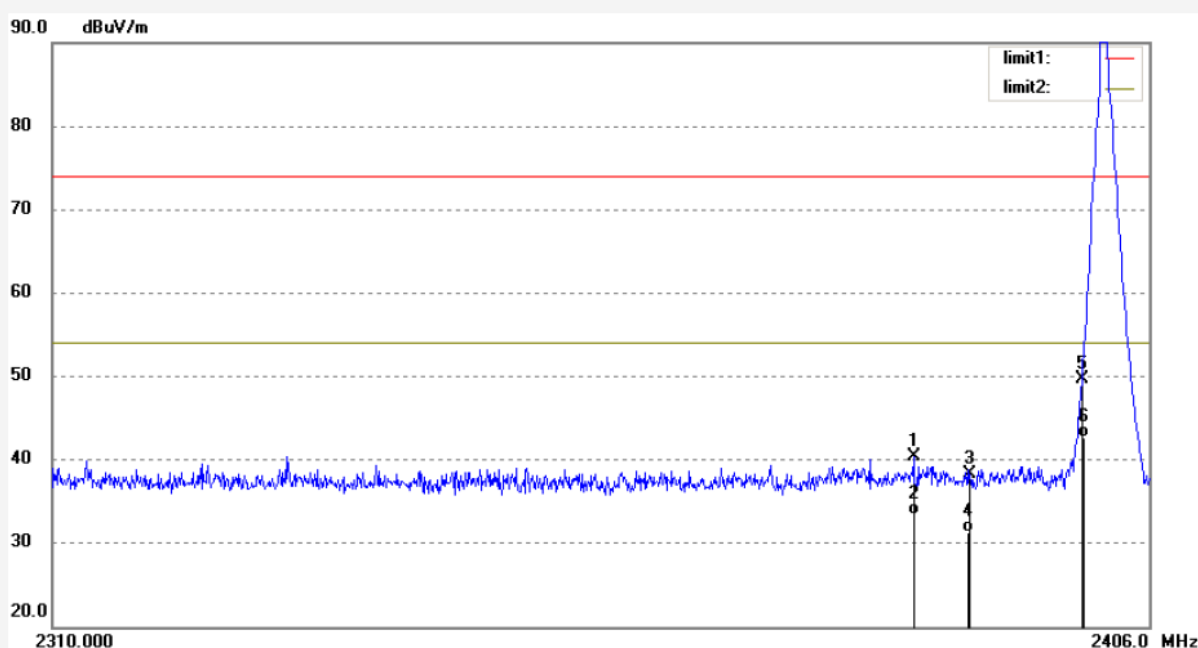
Date: 2012/10/17

Time: 21:21:38

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2385.084	47.90	-7.56	40.34	74.00	-33.66	peak			
2	2385.084	40.74	-7.56	33.18	54.00	-20.38	AVG			
3	2390.052	45.88	-7.53	38.35	74.00	-35.65	peak			
4	2390.052	38.69	-7.53	31.16	54.00	-22.84	AVG			
5	2400.000	57.19	-7.46	49.73	74.00	-24.27	peak			
6	2400.000	50.25	-7.46	42.79	54.00	-11.21	AVG			



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Site: 966 chamber
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Fax:+86-0755-26503396

Job No.: TOM #602

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2480MHz

Model: M1

Manufacturer: Lianhua

Polarization: Horizontal

Power Source: AC 120V/60Hz

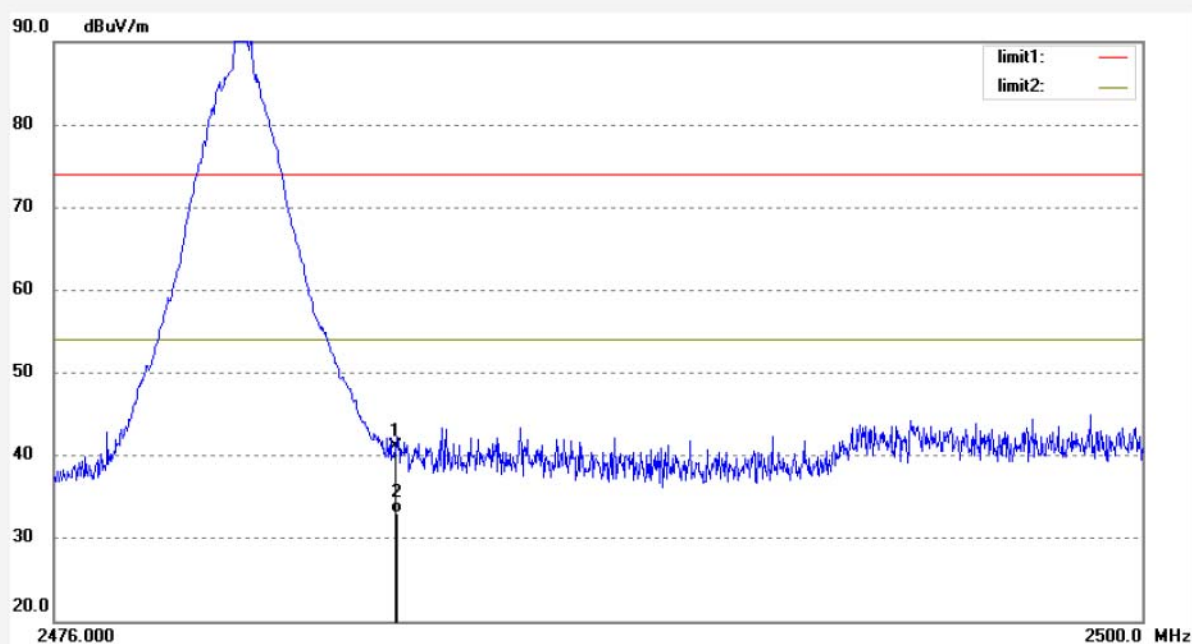
Date: 2012/10/17

Time: 21:24:00

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.38	-7.37	41.01	74.00	-32.99	peak			
2	2483.500	40.45	-7.37	33.08	54.00	-20.92	AVG			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: TOM #603

Standard: FCC 15C PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 49 %

EUT: Power bank and bluetooth speakers

Mode: TX 2480MHz

Model: M1

Manufacturer: Lianhua

Polarization: Vertical

Power Source: AC 120V/60Hz

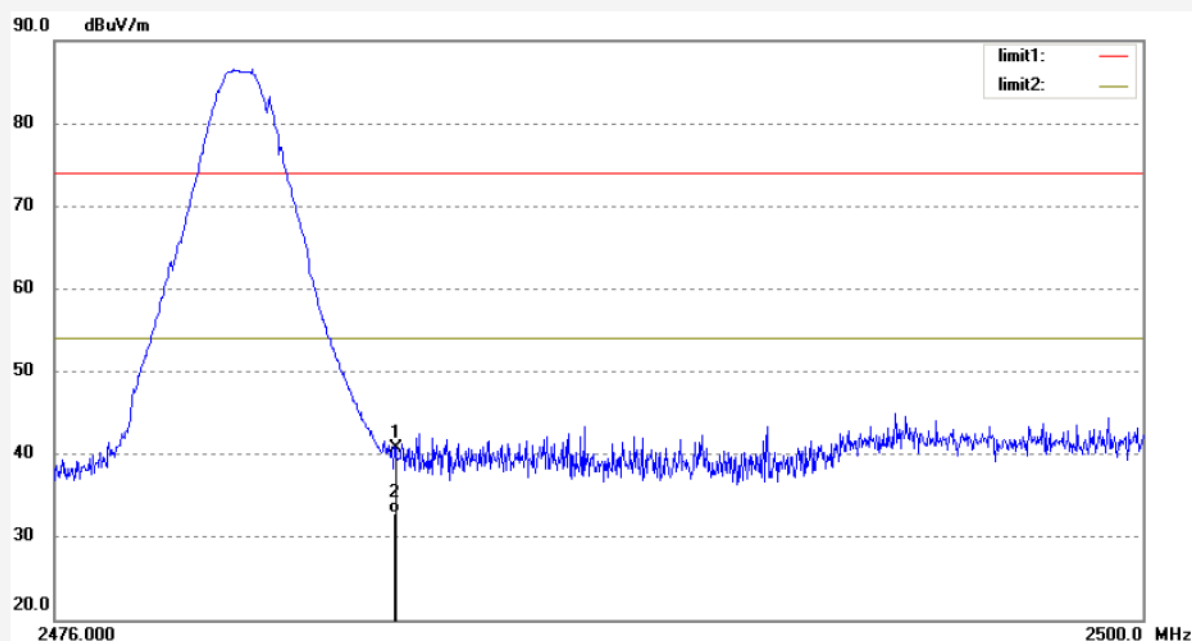
Date: 2012/10/17

Time: 21:26:06

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20122290



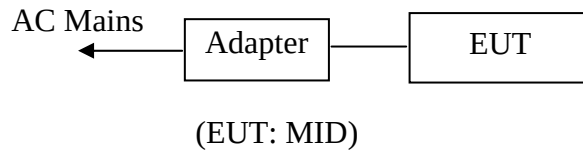
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.16	-7.37	40.79	74.00	-33.21	peak			
2	2483.500	40.31	-7.37	32.94	54.00	-21.06	AVG			

12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

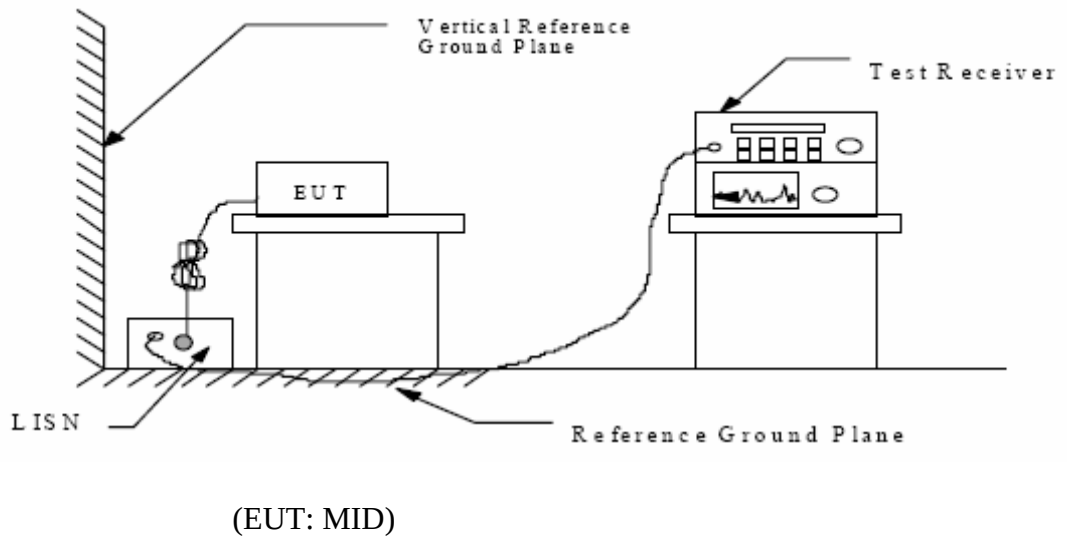
15 SECTION 15.207(A)

12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators



12.1.2.Shielding Room Test Setup Diagram



12.2.The Emission Limit

12.2.1.Conducted Emission Measurement Limits According to Section 15.207(a)

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

* Decreases with the logarithm of the frequency.

12.3.Configuration of EUT on Measurement

The following equipment are installed on the Conducted Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

12.3.1. Power band and bluetooth speakers (EUT)

Model Number : M1
Serial Number : N/A
Manufacturer : Shen Zhen Lianhua Electronics Co., Ltd

12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 11.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in TX (Operation) mode measure it.

12.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

The frequency range from 150 kHz to 30MHz is checked.

12.6.Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150 kHz to 30MHz is checked.

Date of Test:	Oct 18, 2012	Temperature:	25°C
EUT:	Power band and bluetooth speakers	Humidity:	50%
Model No.:	M1	Power Supply:	AC 120V/60Hz
Test Mode:	operation	Test Engineer:	TOM

Frequency (MHz)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector	Line
0.299645	34.30	60	25.7	QP	Neutral
0.495637	29.40	56	26.7	QP	
2.684663	27.70	56	28.3	QP	
----	----	-----	----	AV	
----	----	-----	----	AV	
----	----	-----	----	AV	
0.298749	41.10	60	19.2	QP	Live
0.462676	36.60	56	19.5	QP	
2.676633	36.40	56	19.6	QP	
----	----	-----	----	AV	
----	----	-----	----	AV	
----	----	-----	----	AV	

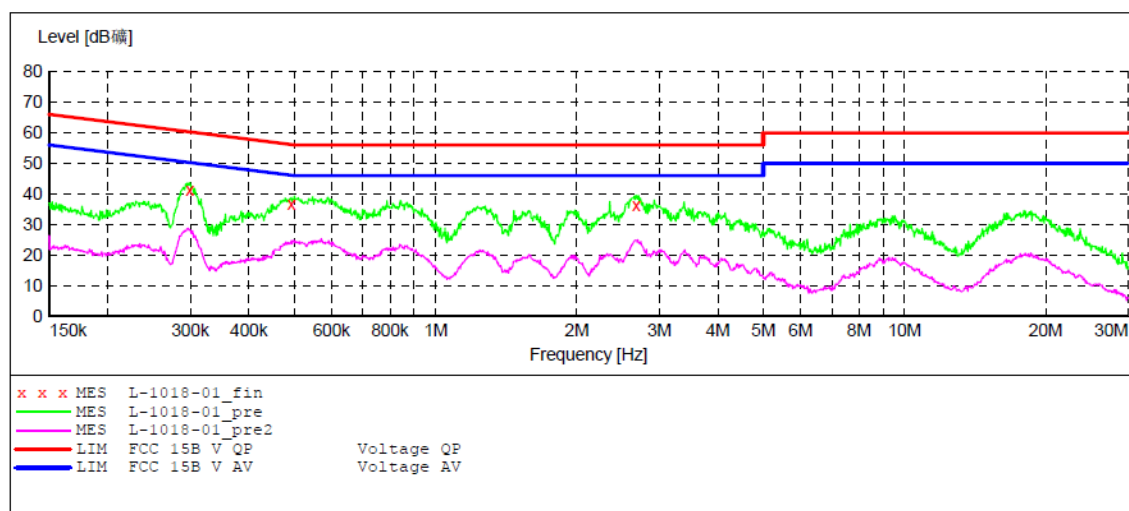
Emissions attenuated more than 20 dB below the permissible value are not reported.
The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD**CONDUCTED EMISSION STANDARD FCC PART15 B**

EUT: Power bank and bluetooth speakers M/N:M1
 Manufacturer: Lianhua
 Operating Condition: Operation
 Test Site: 1#Shielding Room
 Operator: TOM
 Test Specification: L 120V/60Hz
 Comment: Report No:ATE20122290
 Start of Test: 2012-10-18 / 5:14:06

SCAN TABLE: "V 150K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 0.4 % QuasiPeak 1.0 s 9 kHz LISN(ESH3-Z5)
 Average

**MEASUREMENT RESULT: "L-1018-01_fin"**

2012-10-18 5:15

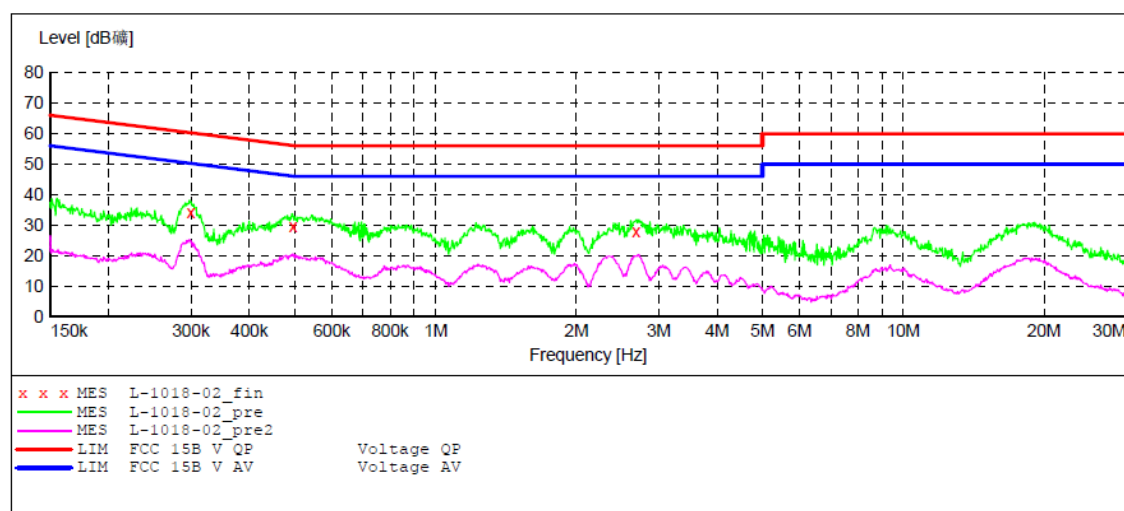
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.298749	41.10	12.0	60	19.2	QP	L1	GND
0.492676	36.60	12.0	56	19.5	QP	L1	GND
2.676633	36.40	11.9	56	19.6	QP	L1	GND

ACCURATE TECHNOLOGY CO.,LTD**CONDUCTED EMISSION STANDARD FCC PART15 B**

EUT: Power bank and bluetooth speakers M/N:M1
 Manufacturer: Lianhua
 Operating Condition: ON
 Test Site: 1#Shielding Room
 Operator: TOM
 Test Specification: N 120V/60Hz
 Comment: Report No:ATE20122290
 Start of Test: 2012-10-18 / 5:16:18

SCAN TABLE: "V 150K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 0.4 % QuasiPeak 1.0 s 9 kHz LISN(ESH3-Z5)
 Average

**MEASUREMENT RESULT: "L-1018-02_fin"**

2012-10-18 5:17

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.299645	34.30	12.0	60	26.0	QP	N	GND
0.495637	29.40	12.0	56	26.7	QP	N	GND
2.684663	27.70	11.9	56	28.3	QP	N	GND

13.ANTENNA REQUIREMENT

13.1.The Requirement

According to 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.

13.2.Antenna Construction

The antenna is PCB Layout antenna, no consideration of replacement. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna