



**Spectrum Research &
Testing Lab., Inc.**
No. 101-10, Ling 8,
Shan-Tong Li, Chung-Li
City, Taoyuan, Taiwan

TEST REPORT

Reference No.: A13071001
Report No.: FCCA13071001
FCC ID : XJ8-BT-232B-E
Page: 1 of 71
Date: Sep. 25, 2013

Product Name: Bluetooth RS-232 adapter
Model No.: BT-232B-E
Applicant: UConnect International Co.,Ltd.
11F.-5, No.88, Zhongshan Rd., Zhongli City,
Taoyuan County 32014, Taiwan, R.O.C.
Date of Receipt: JUL. 05, 2013
Finished date of Test: Sep. 25, 2013
Applicable Standards: 47 CFR Part 15, Subpart C
47 CFR Part 15, Subpart B
ANSI C63.4: 2003
FCC Public Notice DA 00-705(March 2000)

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By :

Michael Hsu

(Michael Hsu)

Date:

9/25/2013

Approved By :

Johnson Ho

(Johnson Ho, Director)

Date:

9/25/2013

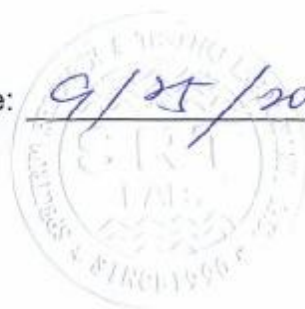




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1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source, 5V PC USB Port, was used during the test.

Frequency hopping systems between 2400 and 2483.5 MHz band use at least 75 nonoverlapping channels, except that as few as 15 nonoverlapping channels may be used for systems that intelligently modify their hopsets in accordance with Section 15.247(g)(h). Hopsets modified in this manner must be redetermined at least once every 30 seconds. 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.

hopping channel sample :(From left to right, up to down)

18 58 16 76 29 61 69 59 74 51 75 41 09 49 68 66 21 43 61 16 37
14 17 28 10 27 06 62 59 70 65 32 51 73 69 67 22 43 62 17 57 38
52 36 30 49 27 46 06 67 05 26 41 58 54 31 59 71 69 28 58 39 16
78 75 74 29 47 69 62 45 62 02 40 17 38 16 57 37 56 11 76 32 50
27 26 05 46 24 17 15 38

1.3 EUT MODIFICATION

- No modification in SRT Lab.



2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

Product	Bluetooth RS-232 adapter
Model No.	BT-232B-E
Power Supply	PC USB Port, DC 5.0V
Frequency Band	2400-2483.5 MHz
Number of Channel	79
Channel Spacing	1 MHz
Rated RF Output Power	119.91 dBuV/m@2441MHz
Modulation Type	GFSK
Mode of Operation	Duplex.
Antenna Gain	2 dBi
Channel Bandwidth	1 MHz
Antenna Type	Omni Antenna
Carrier Frequency	2402-2480 MHz

NOTE : For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

N/A

2.3 EUT OPERATING CONDITION

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. For Bluetooth function, execute the RF utility "[BlueTest 3](#)" to provide channel selection, power level and data rate for transmitting and receiving signals continuously.
4. The EUT was set to the highest available power level and data rate 1Mbps.

2.4 DESCRIPTION OF SYSTEM RECEIVER INPUT BANDWIDTH

Required setting (e.g. RBW) of Spectrum Analyzer (System Receiver) be decrypted into Test Procedure of each test item in Test Report .

2.5 DESCRIPTION OF SYSTEM RECEIVER HOPPING CAPABILITY

For Bluetooth function, the EUT execute the RF utility which from the BT module supplier to provide channel selection, power level and data rate for transmitting and receiving signals continuously, therefore the Spectrum Analyzer(System Receiver) be set to measure these signals directly without synchronization.



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2.6 USED CHANNEL AND FREQUENCY TABLE

頻道	頻率	頻道	頻率	頻道	頻率	頻道	頻率
CH00	2402MHz	CH20	2422MHz	CH40	2442MHz	CH60	2462MHz
CH01	2403MHz	CH21	2423MHz	CH41	2443MHz	CH61	2463MHz
CH02	2404MHz	CH22	2424MHz	CH42	2444MHz	CH62	2464MHz
CH03	2405MHz	CH23	2425MHz	CH43	2445MHz	CH63	2465MHz
CH04	2406MHz	CH24	2426MHz	CH44	2446MHz	CH64	2466MHz
CH05	2407MHz	CH25	2427MHz	CH45	2447MHz	CH65	2467MHz
CH06	2408MHz	CH26	2428MHz	CH46	2448MHz	CH66	2468MHz
CH07	2409MHz	CH27	2429MHz	CH47	2449MHz	CH67	2469MHz
CH08	2410MHz	CH28	2430MHz	CH48	2450MHz	CH68	2470MHz
CH09	2411MHz	CH29	2431MHz	CH49	2451MHz	CH69	2471MHz
CH10	2412MHz	CH30	2432MHz	CH50	2452MHz	CH70	2472MHz
CH11	2413MHz	CH31	2433MHz	CH51	2453MHz	CH71	2473MHz
CH12	2414MHz	CH32	2434MHz	CH52	2454MHz	CH72	2474MHz
CH13	2415MHz	CH33	2435MHz	CH53	2455MHz	CH73	2475MHz
CH14	2416MHz	CH34	2436MHz	CH54	2456MHz	CH74	2476MHz
CH15	2417MHz	CH35	2437MHz	CH55	2457MHz	CH75	2477MHz
CH16	2418MHz	CH36	2438MHz	CH56	2458MHz	CH76	2478MHz
CH17	2419MHz	CH37	2439MHz	CH57	2459MHz	CH77	2479MHz
CH18	2420MHz	CH38	2440MHz	CH58	2460MHz	CH78	2480MHz
CH19	2421MHz	CH39	2441MHz	CH59	2461MHz		

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2.7 DESCRIPTION OF TEST MODE

79 channels are provided by EUT. Three channels of lower, medium and higher were chosen for test.

Channel	Frequency (MHz)
00	2402
39	2441
78	2480

NOTE : The axis X,Y and Z we evaluate in chamber, the X axis is worst case.

X axis:



Y axis:



Z axis:



2.8 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003 and CISRP 22. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID/DoC	CABLE
1	PC	Acer	Acer Power F6	DoC	1.8m unshielded power cable
2	Mouse	Wintek	WSS30	DoC	1.2m unshielded data cable
3	Keyboard	DELL	SK-8110	DoC	1.2m unshielded data cable
4	Printer	EPSON	STYLUS S20SX	N/A	1.5m unshielded power cable 1.2m shielded data cable
5	Monitor	Dell	U2410	R43002	1.8m unshielded power cable 1.5m shielded data cable
6	Dongle	ASUS	WL-BTD202	DOC	NA



3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C

47 CFR Part 15, Subpart B

ANSI C63.4: 2003

All tests have been performed and recorded as the above standards.

3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications :

STANDARD SECTION	TEST TYPE AND LIMIT RESULTS	RESULTS
15.247(a)	Channel separation test Limit : minimum of 25 kHz or the 20 dB bandwidth	PASS
15.247(a)	20dB Bandwidth	PASS
15.247(a)(b)	Quantity of hopping channel test Limit : 75 non-overlapping hopping channels	PASS
15.247(a)	Time of occupancy (Dwell Time) Limit : greater than 0.4 seconds	PASS
15.247(b)	Peak power test Limit : 1 watt	PASS
15.247(d)	Band Edge Measurement Limit : 20dB less than the peak value of fundamental frequency	PASS
15.33(a) 15.249	Transmitter Radiated Emissions Limit : Table 15.209	PASS
15.203	Antenna requirement Limit : max. 6dBi	PASS
15.207	AC Power Conducted Emission	PASS

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4. TECHNICAL CHARACTERISTICS TEST

4.1 CHANNEL SEPARATION TEST

4.1.1 LIMIT

FCC Part15, Subpart C 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.

Frequency Range (MHz)	Limit(kHz)
902-928	>25kHz
2400-2483.5	>25kHz
5725-5850	>25kHz

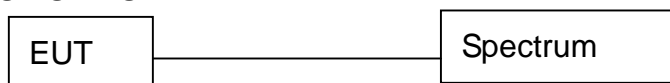
4.1.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test :

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMITEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2014 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.1.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.1.4 TEST PROCEDURE

- 1.The EUT was operating in hopping mode or could be controlled its channel.
2. Use the following spectrum analyzer settings according to DA 00-705 guidance:
 - Span = the frequency band of operation; $RBW \geq 1\%$ of the span; $VBW \geq RBW$;
 - Sweep = auto; Detector function = peak; Trace = max hold.
- 3.Printed out the test result from the spectrum by hard copy function.



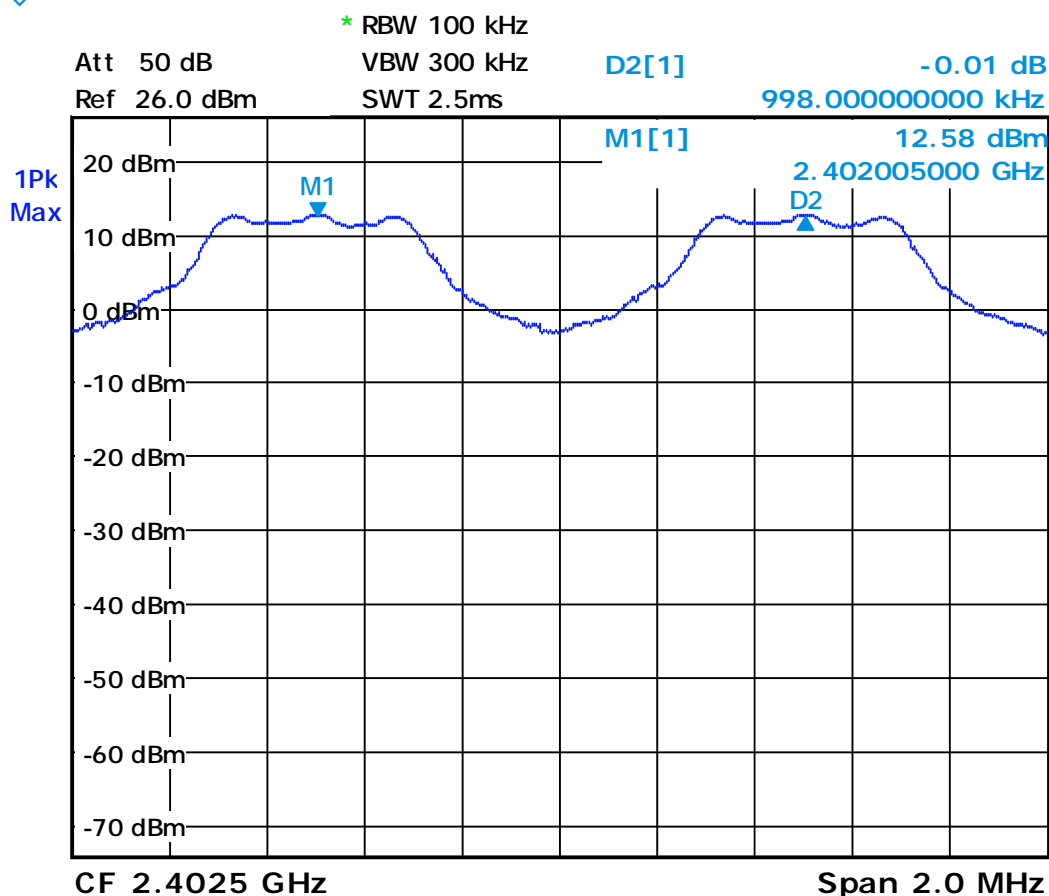
4.1.5 TEST RESULT

Temperature : 25°C
Spectrum Detector : PK
Test Result : PASS

Humidity : 61%RH
Tested by : Michael Hsu
Tested Date : Aug. 27, 2013

Channel Number	Channel Frequency (MHz)	Separation Read Value (kHz)	Minimum Limit(20dB Bandwidth) (kHz)
0	2402	998	25
39	2441	1002	25
78	2480	1002	25

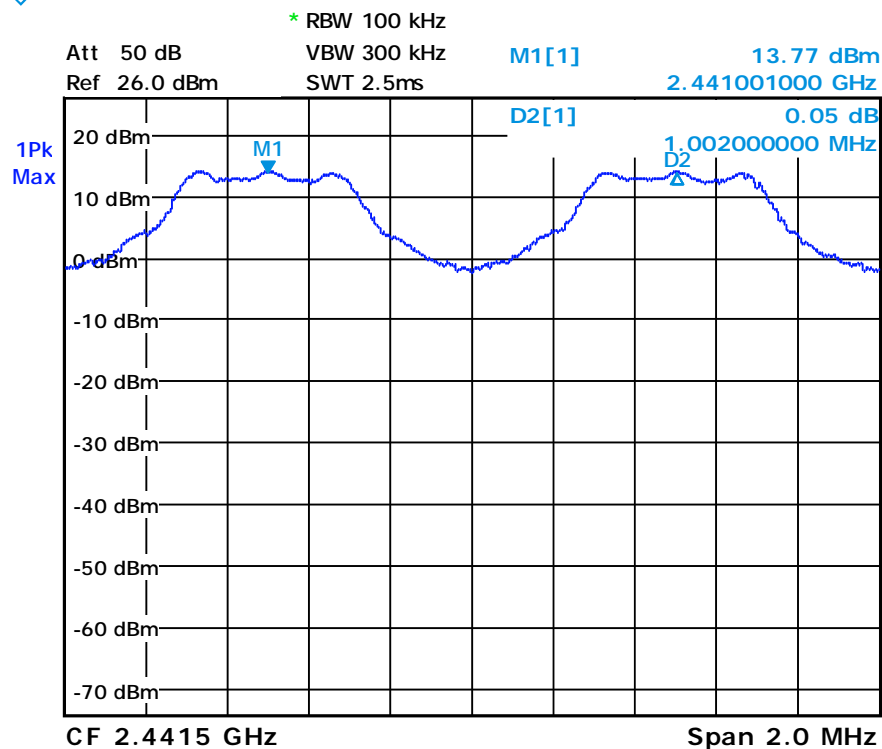
CH00 :



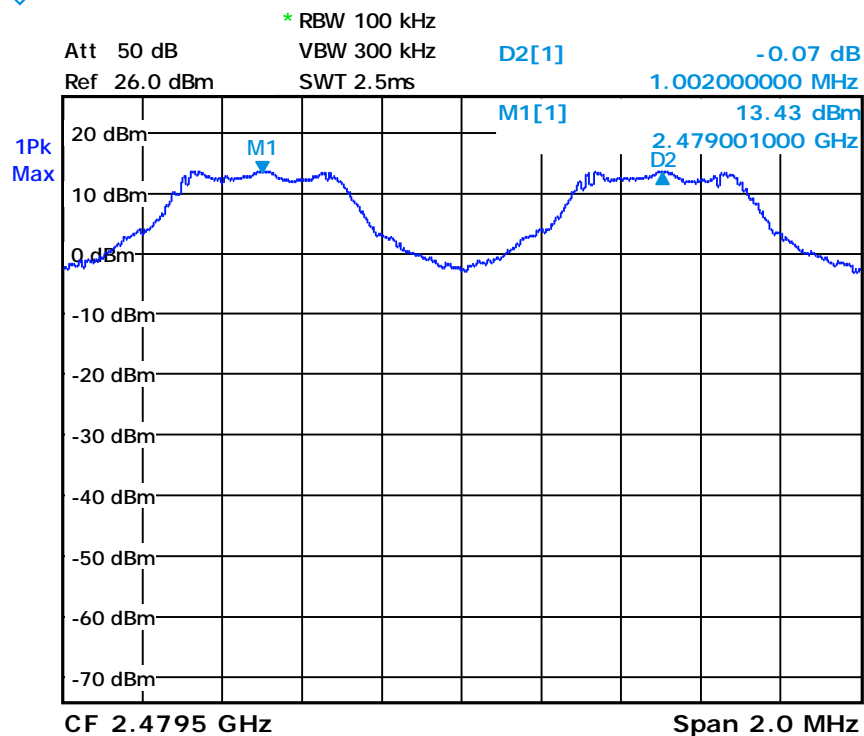
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CH39 :



CH78 :





4.2 20dB Bandwidth

4.2.1 LIMIT

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.

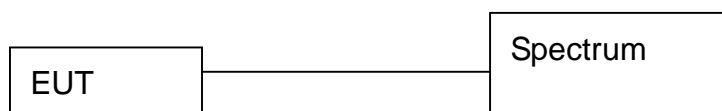
4.2.2 TEST EQUIPMENT

The following test equipment was used during the test :

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMITEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2014 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.2.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.2.4 TEST PROCEDURE

- 1.The EUT is programmed to transmit signals continuously for all testing.
2. Use the following spectrum analyzer settings according to DA 00-705 guidance:
Span =2 to 3 times the 20 dB bandwidth; RBW \geq 1% of 20 dB bandwidth; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
- 3.Printed out the test result from the spectrum by hard copy function.



4.2.5 TEST RESULT

Temperature: 25°C

Humidity: 61%RH

Spectrum Detector: PK

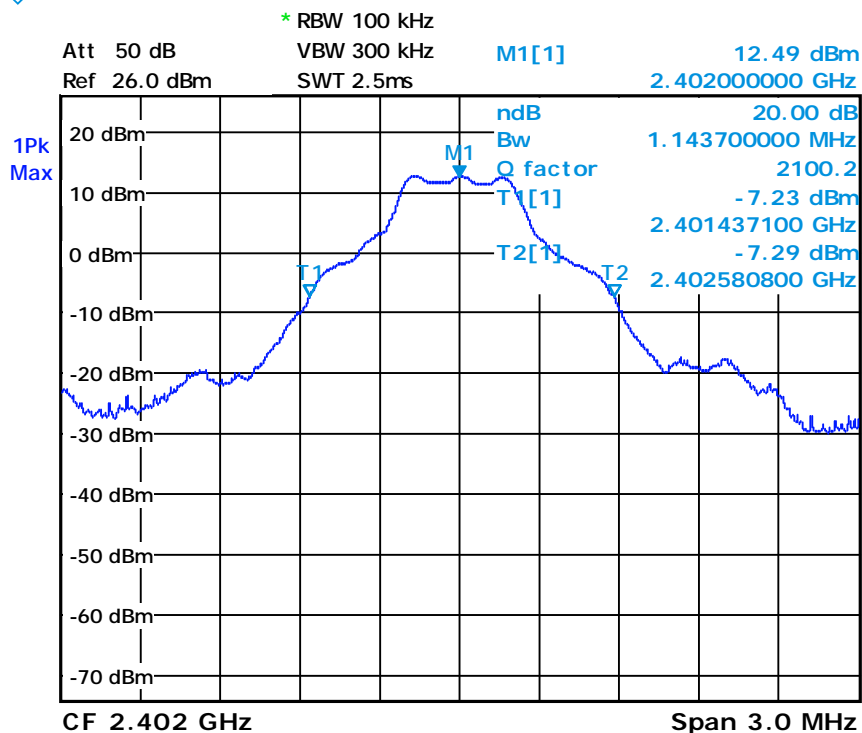
Tested by: Michael Hsu

Test Result: PASS

Tested Date: Aug. 27, 2013

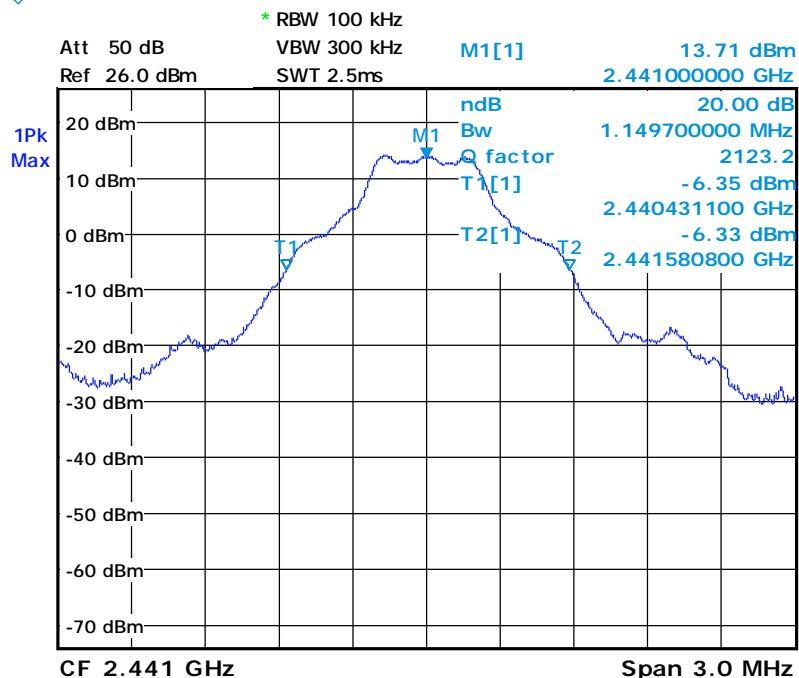
Channel Number	Channel Frequency (MHz)	20dB Down Bandwidth (KHz)
0	2402	1143.7
39	2441	1149.7
78	2480	1137.7

CH0 :

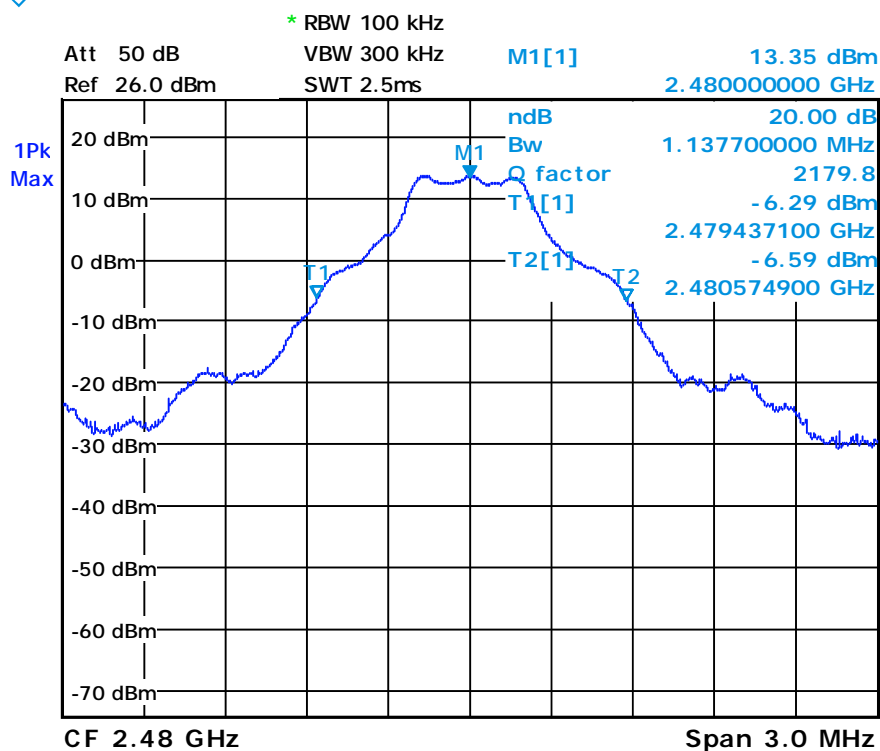




CH39 :



CH78 :





4.3 QUANTITY OF HOPPING CHANNEL TEST

4.3.1 LIMIT

FCC Part15, Subpart C Section 15.247(a)(b).

Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels.

Frequency Range (MHz)	Limit (Quantity of Hopping Channel)			
	20dB Bandwidth <250kHz	20dB Bandwidth >250kHz	20dB Bandwidth <1MHz	20dB Bandwidth >1MHz
902-928	50	25	N/A	N/A
2400-2483.5	N/A	N/A	75	15
5725-5850	N/A	N/A	75	N/A

4.3.2 TEST EQUIPMENT

The following test equipment was used during the test :

EQUIPMENT/FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMITEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2014 ETC

NOTE : The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.3.4 TEST PROCEDURE

- 1.The EUT was operating in hopping mode or could be controlled its channel.
2. Use the following spectrum analyzer settings according to DA 00-705 guidance:
Span = the frequency band of operation; RBW \geq 1% of the SPAN; VBW \geq RBW;



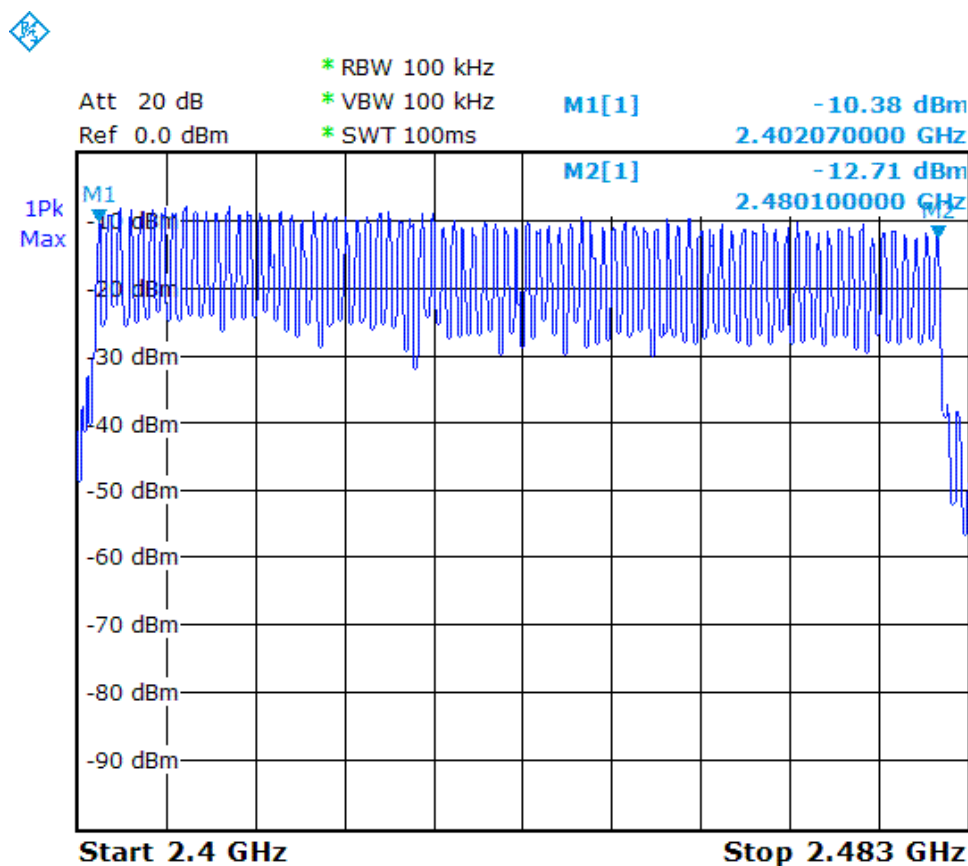
Sweep = auto; Detector function = peak; Trace = max hold.
3. Printed out the test result from the spectrum by hard copy function.

4.3.5 TEST RESULT

Temperature:	25°C	Humidity:	61%RH
Spectrum Detector:	PK	Tested by:	Michael Hsu
Test Result	PASS	Tested Date:	Sep. 18, 2013

Hopping Channel Frequency Range(MHz)	Quantity of Hopping Channel Read Value	Quantity of Hopping Channel Limit
2402~2480	79	75

CH0 ~ CH78 :



Note: Frequency is used equally on the average by each transmitter.



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4.4 TIME OF OCCUPANCY (Dwell Time)

4.4.1 LIMIT

FCC Part15, Subpart C Section 15.247(a).

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 Range (MHz)	Limit (ms)		
	20dB Bandwidth <250kHz(50Channel)	20dB Bandwidth >250kHz(25Channel)	20dB Bandwidth <1MHz(75Channel)
902-928	400(20s)	400(10s)	NA
2400-2483.5	NA	NA	400(30s)
5725-5850	NA	NA	400(30s)

NOTE : The “()” is all channel's average time of occupancy.

4.4.2 TEST EQUIPMENT

The following test equipment was used during the test :

EQUIPMENT/FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMITEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2014 ETC

NOTE : The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.4.4 TEST PROCEDURE

- 1.The EUT is programmed to transmit signals continuously for all testing.
2. Use the following spectrum analyzer settings according to DA 00-705 guidance:
 Span = zero SPAN, centered on a hopping channel; RBW = 1MHz; VBW ≥ RBW;



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Sweep = as necessary to capture the entire dwell time per hopping channel;

Detector function = peak; Trace = max hold.

3. Printed out the test result from the spectrum by hard copy function.

4.4.5 TEST RESULT

Temperature: 25°C

Humidity: 61%RH

Spectrum Detector: PK

Tested by: Michael Hsu

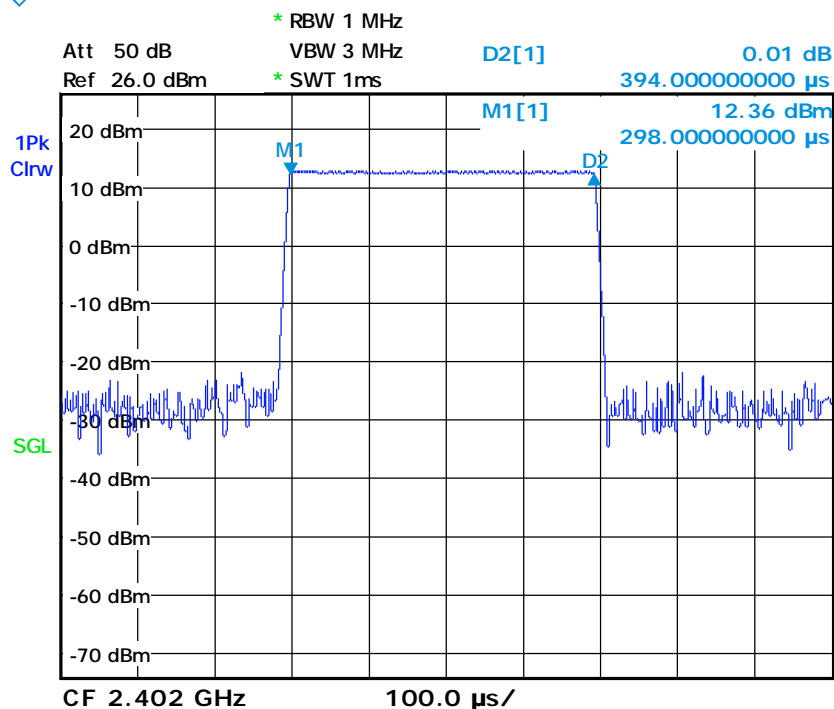
Test Result: PASS

Tested Date: Aug. 27, 2013

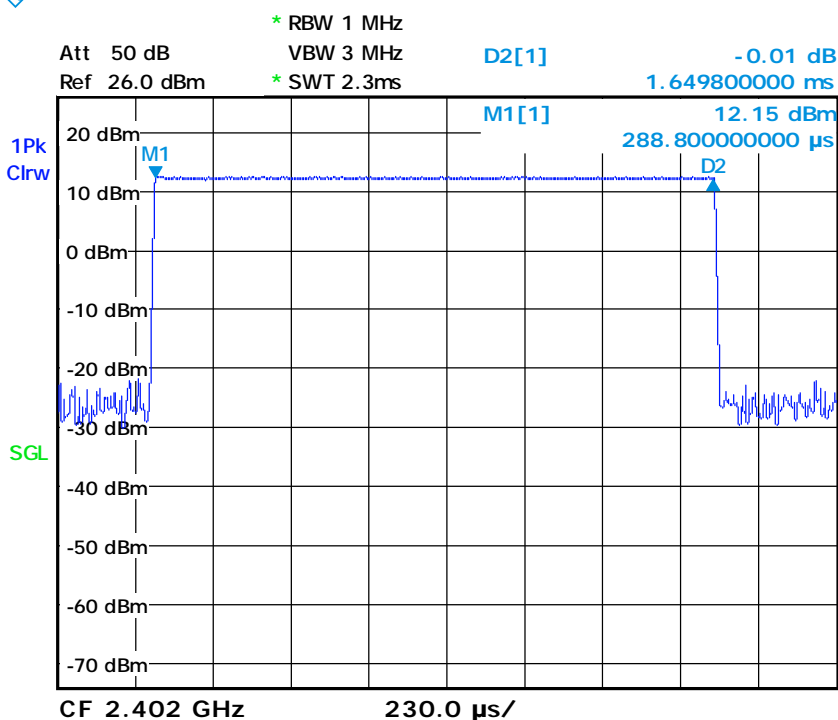
Channel Number	Channel Frequency (MHz)	Pulse Time (ms)	Period Time (s)	Time of Occupancy (Dwell Time) (ms)	Average Time of Occupancy Limit (ms)
CH0 DH1	2402.00	0.394	31.6	127.696	400
CH0 DH3	2402.00	1.6498	31.6	267.352	400
CH0 DH5	2402.00	2.8978	31.6	313.061	400
CH39 DH1	2441.00	0.3919	31.6	127.016	400
CH39 DH3	2441.00	1.6414	31.6	265.991	400
CH39 DH5	2441.00	2.9056	31.6	303.904	400
CH78 DH1	2480.00	0.3944	31.6	127.826	400
CH78 DH3	2480.00	1.6474	31.6	266.963	400
CH78 DH5	2480.00	2.8978	31.6	313.061	400



CH0 DH1 :

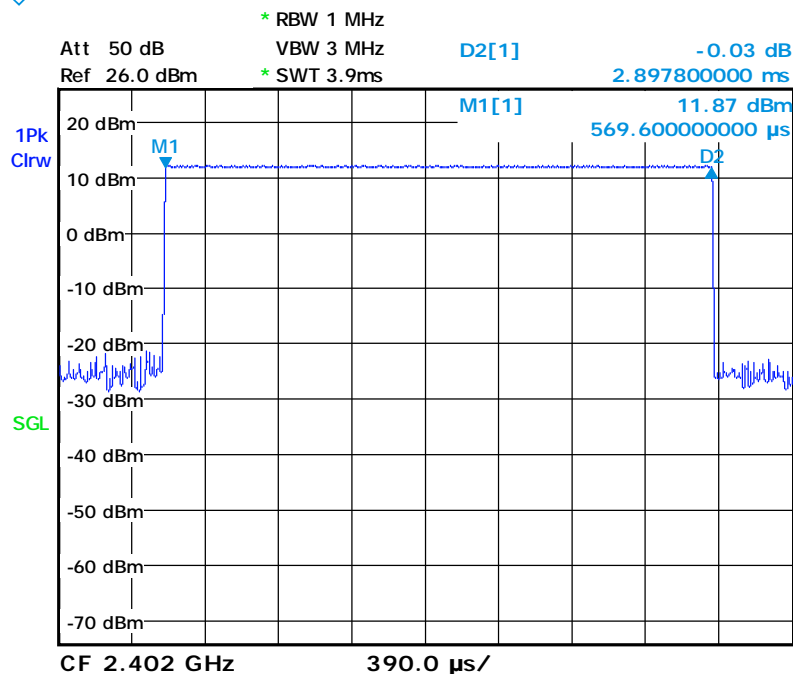


CH0 DH3 :

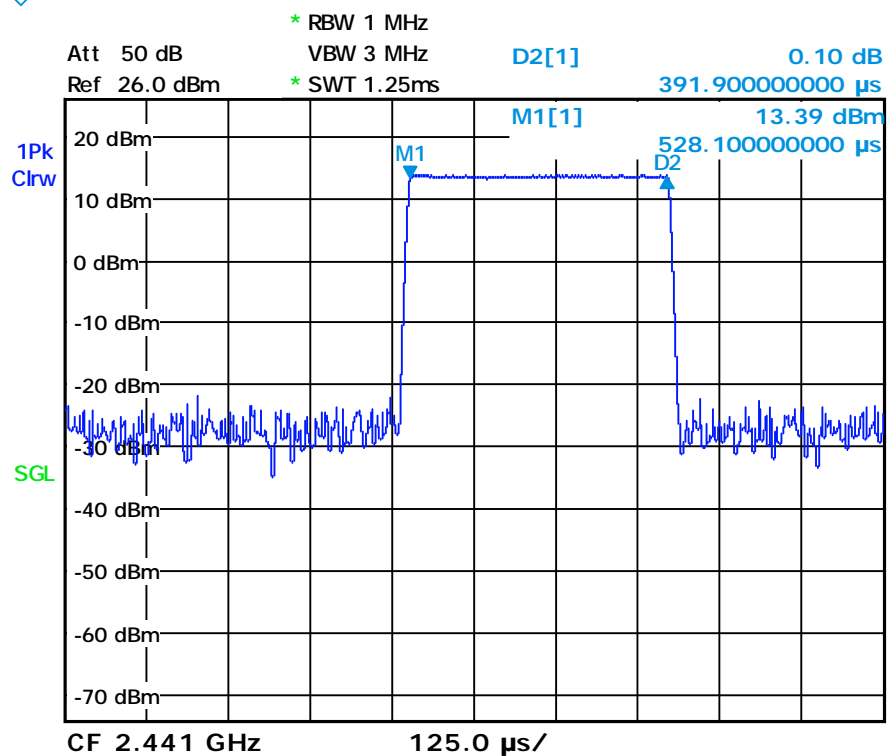




CH0 DH5 :

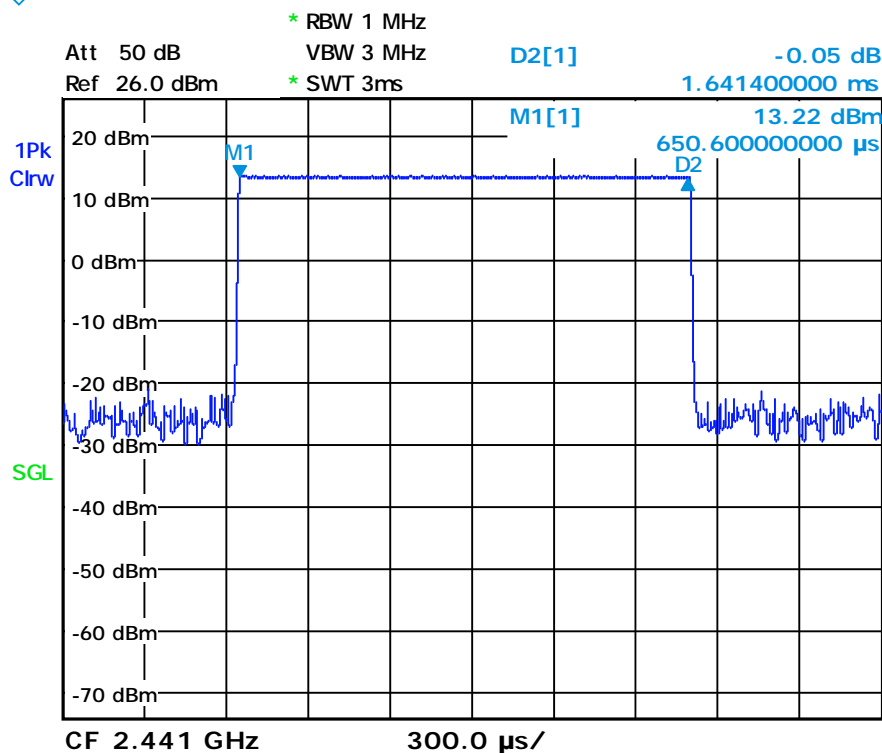


CH39 DH1 :

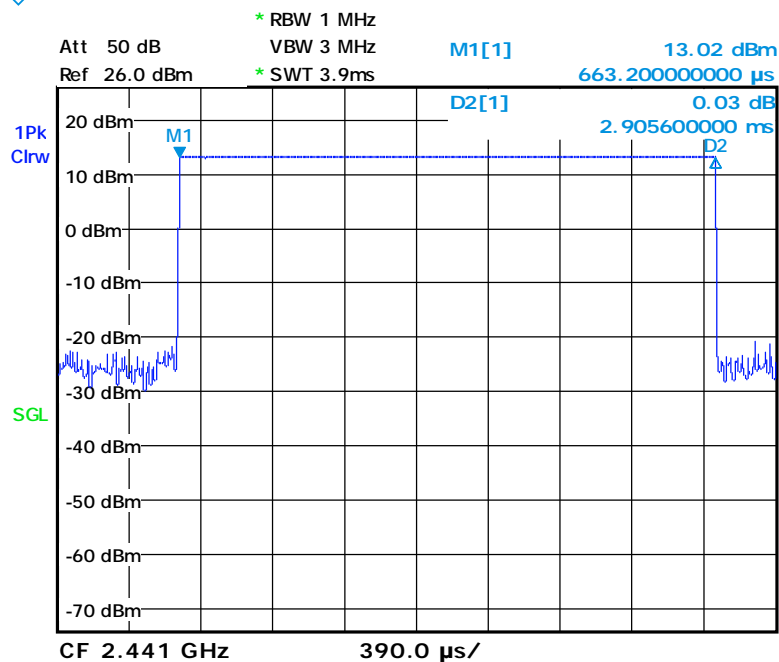




CH39 DH3:

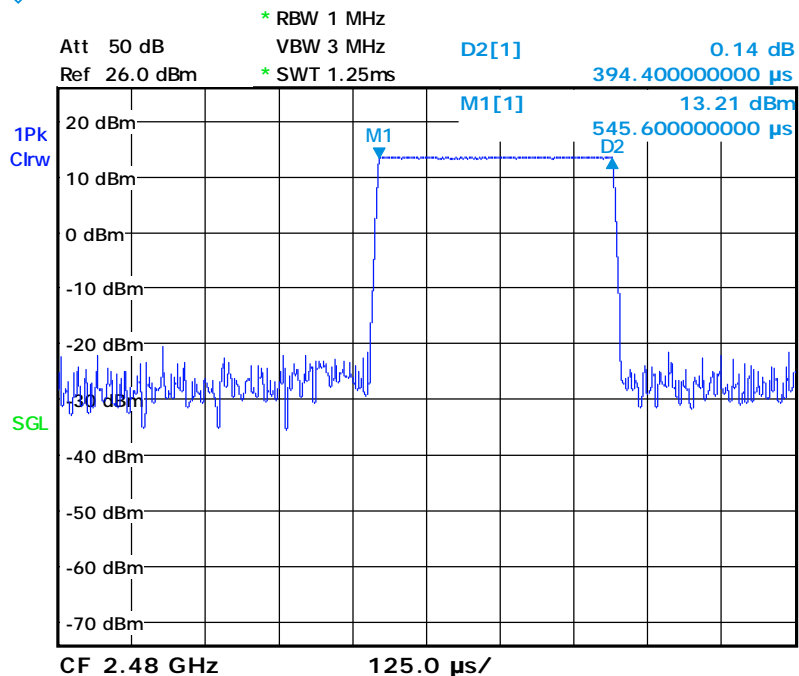


CH39 DH5:

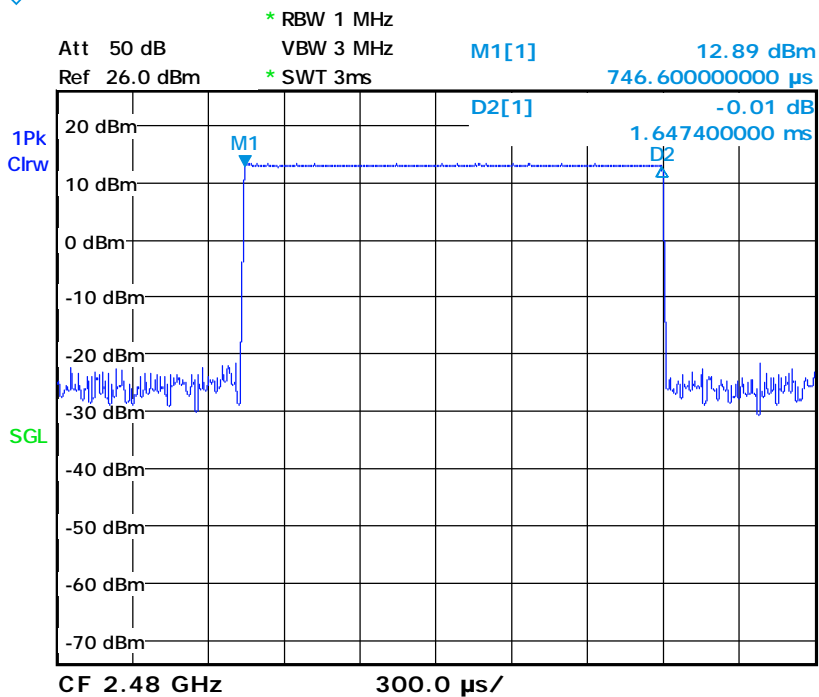




CH78 DH1:

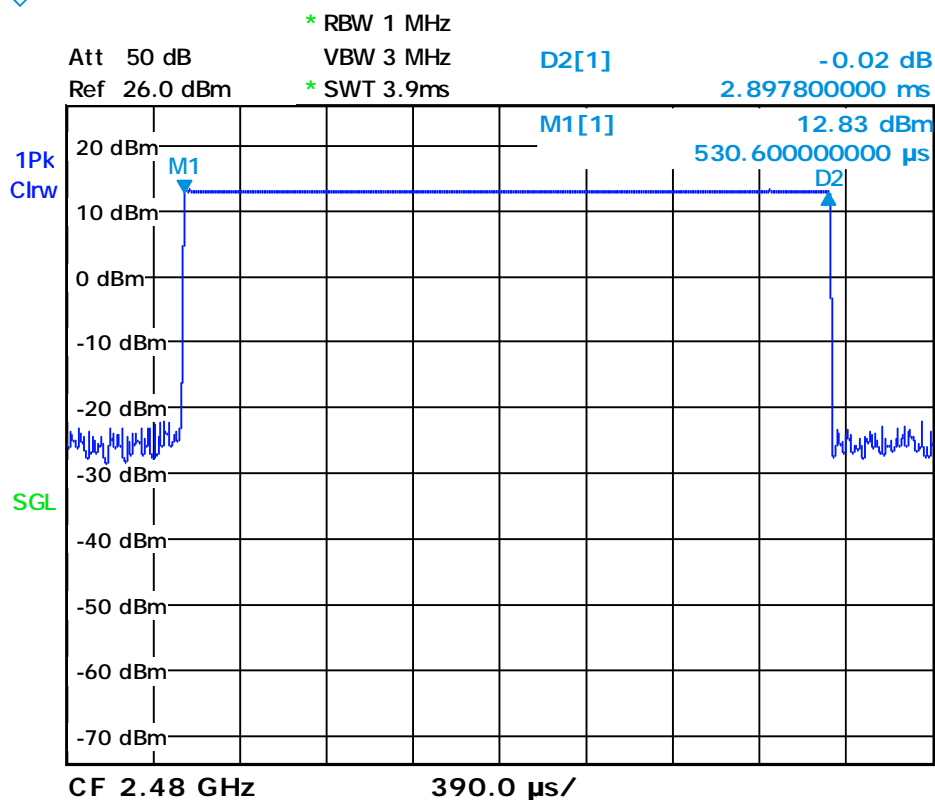


CH78 DH3:





CH78 DH5:



 Spectrum Research & Testing Lab., Inc. No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan	<h1>TEST REPORT</h1>	Reference No.: A13071001 Report No.: FCCA13071001 FCC ID : XJ8-BT-232B-E Page: 25 of 71 Date: Sep. 25, 2013
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4.5 PEAK POWER TEST

4.5.1 LIMIT

FCC Part15, Subpart C Section 15.247.

Frequency Range (MHz)	Limit(W)				
	Quantity of Hopping Channel	50	25	15	75
902-928		1(30dBm)	0.125(21dBm)	NA	NA
2400-2483.5		NA	NA	0.125(21dBm)	1(30dBm)
5725-5850		NA	NA	NA	1(30dBm)

4.5.2 TEST EQUIPMENT

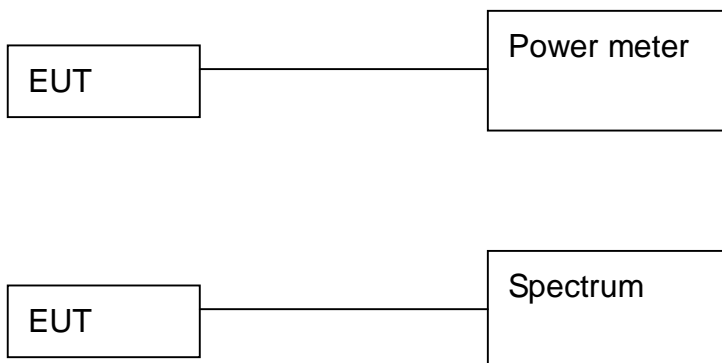
The following test equipment was used during the test :

Equipment/Facilities	Specifications	Manufacturer	Model#/Serial#	Due Date of Cal. & Cal. Center
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2014 ETC
POWER METER	N/A	BOONTON	4232A / 105302	NOV. 04, 2013 ETC
POWER SENSOR	N/A	BOONTON	51011-EMC / 31181	NOV. 04, 2013 ETC

NOTE : The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



4.5.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.5.4 TEST PROCEDURE

1. The EUT is programmed to transmit signals continuously for all testing.
2. Use the following spectrum analyzer settings according to DA 00-705 guidance:
Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel;
RBW > the 20 dB bandwidth of the emission being measured;
VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
3. Printed out the test result from the spectrum by hard copy function.
4. Recorded the read value of the power meter.



4.5.5 TEST RESULT

Temperature: 25°C

Humidity: 61%RH

Spectrum Detector: PK

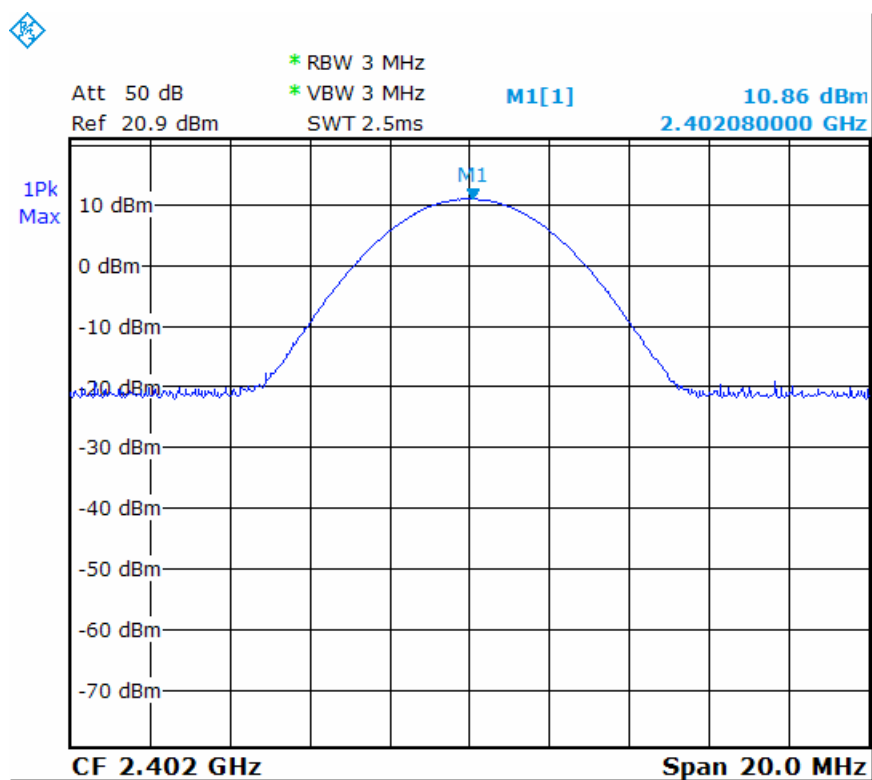
Tested by: Michael Hsu

Test Result: PASS

Tested Date: Aug. 27, 2013

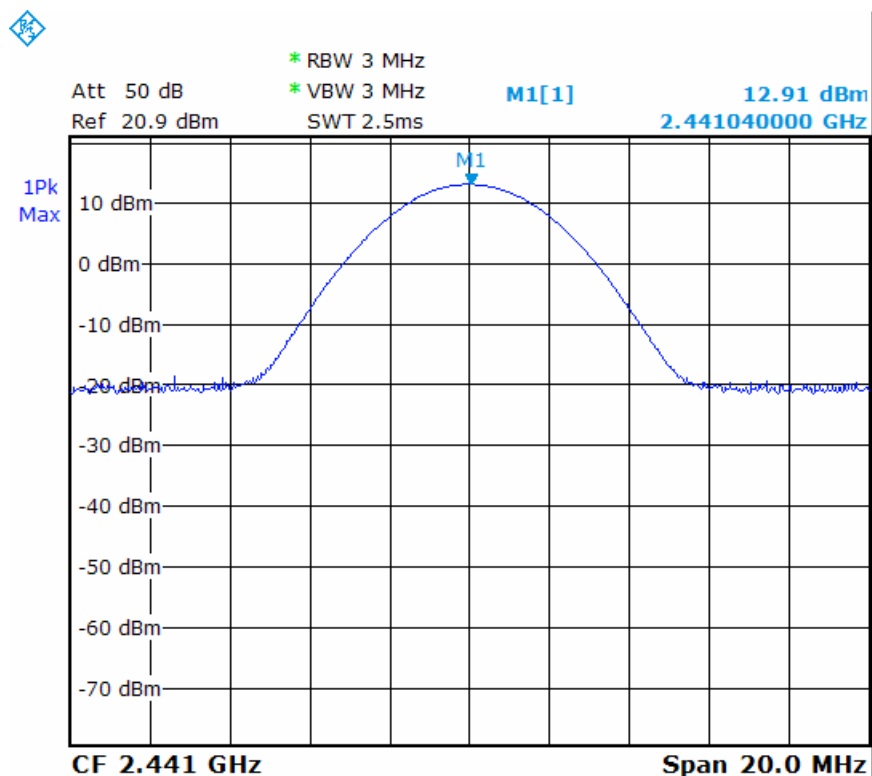
Channel Number	Channel Frequency (MHz)	Peak Output Power (dBm)	Peak Power Limit (dBm)
0	2402	10.86	30
39	2441	12.91	30
78	2480	12.36	30

CH0 :

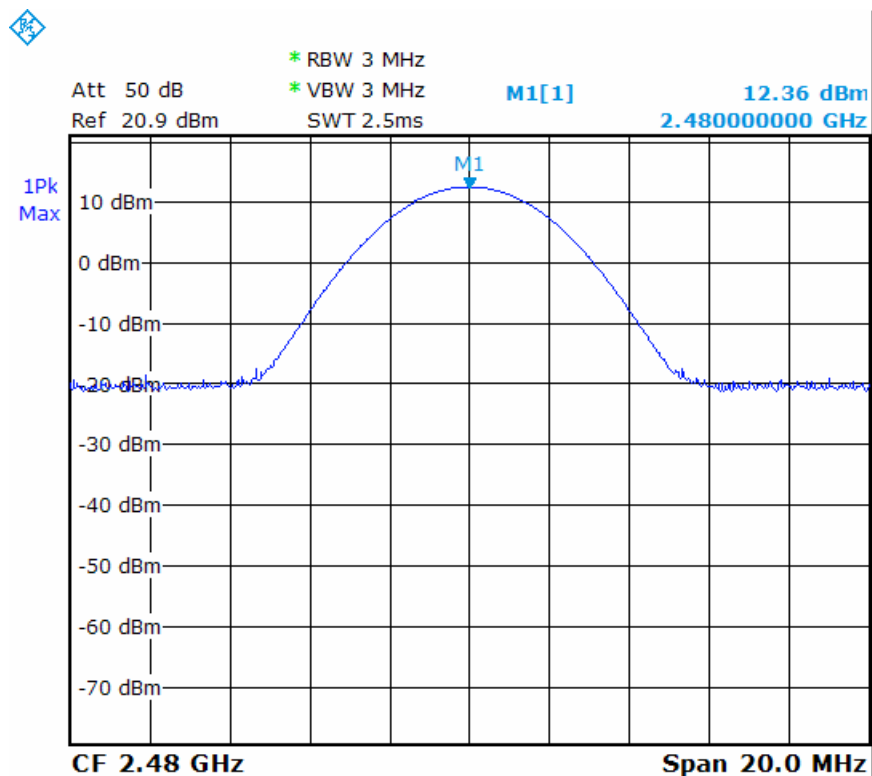




CH39 :



CH78 :





4.6 BAND EDGE TEST

4.6.1 LIMIT

FCC Part15, Subpart C Section 15.247. 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.

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) (see Section 15.205(c)).

OPERATING FREQUENCY RANGE (MHz)	SPURIOUS EMISSION FREQUENCY (MHz)	LIMIT	
		Peak power ration to emission(dBc)	Emission level(dBuV/m)
902 - 928	<902	>20	NA
	>928	>20	NA
	960-1240	NA	54
2400 - 2483.5	<2400	>20	NA
	>2483.5-2500	NA	54
5725 - 5850	<5350-5460	NA	54
	<5725	>20	NA
	>5850	>20	NA

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4.6.2 TEST EQUIPMENT

The following test equipment was used during the test:

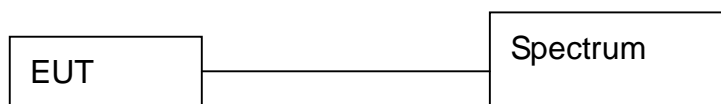
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2014 ETC
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC 12, 2013 ETC
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	DEC. 21, 2013 ETC
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 18, 2013 ETC
K-TYPE CABLE	UP TO 40 GHz, 3m	HUBER+SUHNE R	SF102-46/2*11SK 252 /MY2611/2	MAR. 07, 2014 ETC
K-TYPE CABLE	UP TO 40 GHz, 1m	HUBER+SUHNE R	SF 102-40/2*11 /23934/2	OCT. 24, 2013 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



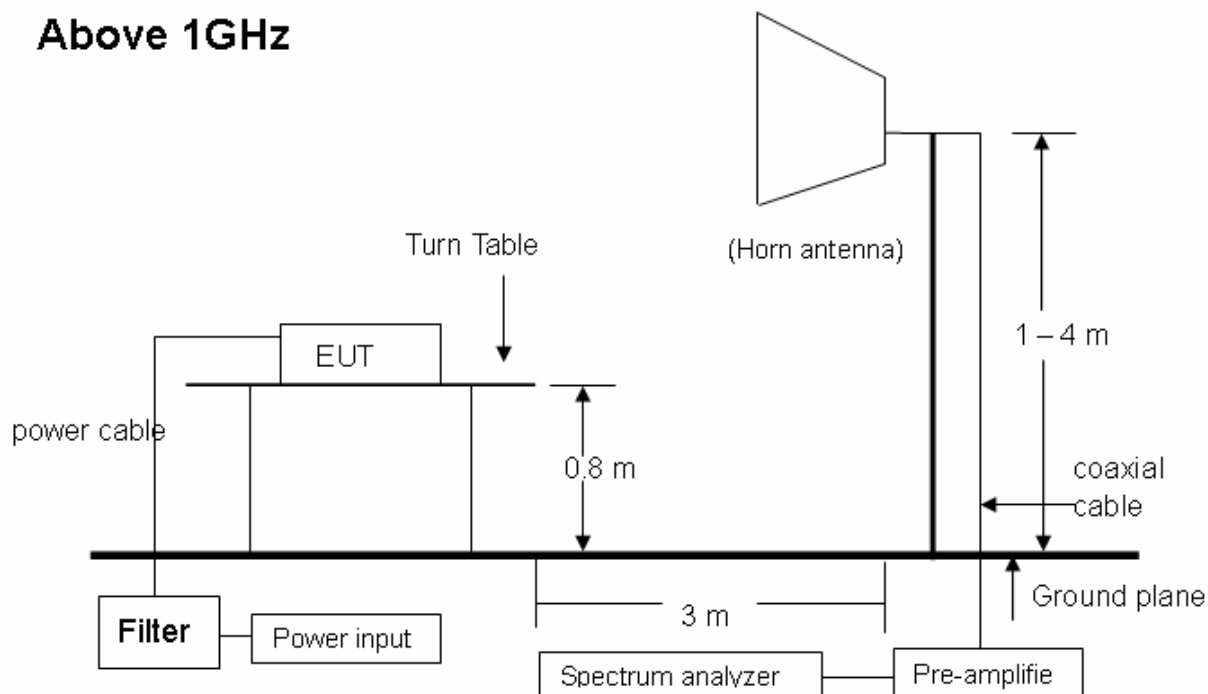
4.6.3 TEST SETUP

FOR RF Conducted test (dBc)



The EUT was connected to a spectrum through a 50Ω RF cable.

Above 1GHz



NOTE : The EUT system was put on a wooden table with 0.8m heights above a ground plane.

For the actual test configuration, please refer to the photos of testing.



4.6.4 TEST PROCEDURE

1. Conducted Test:

The EUT was operating in continuous transmission mode or could be controlled its channel.

Use the following spectrum analyzer settings according to DA 00-705 guidance:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation; $RBW \geq 1\%$ of the SPAN; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold.

Printed out the test result from the spectrum by hard copy function.

2. Radiated emission test:

The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22.

The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.



4.6.5 TEST RESULT

Temperature: 25°C

Humidity: 61%RH

Spectrum Detector: PK. and AV.

Tested Mode: TX

Modulation Type: GFSK

Tested By: Michael Hsu

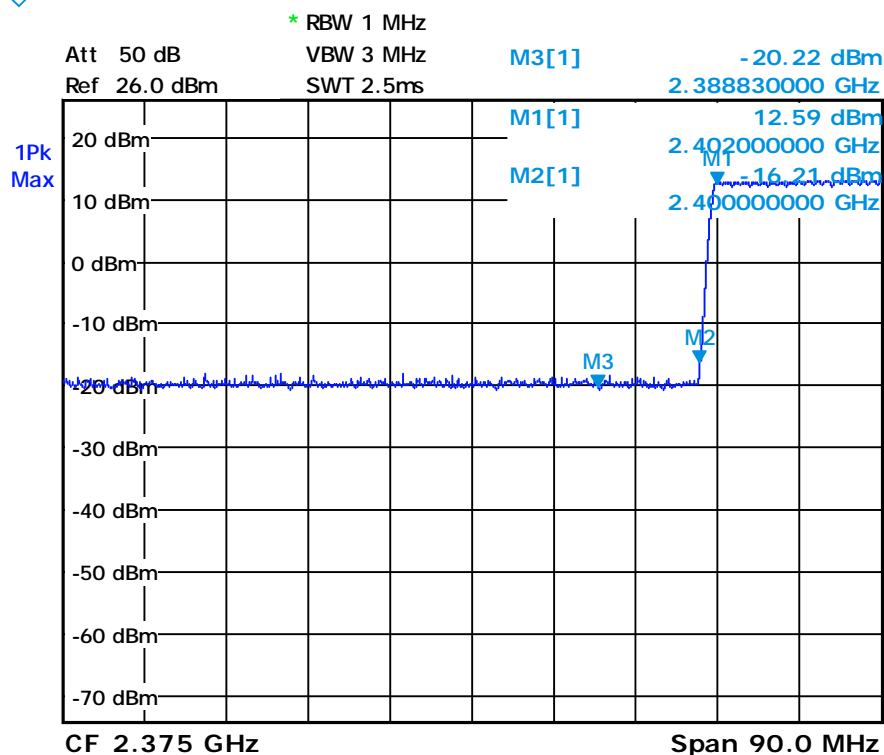
Radiated emission test:

Tested Date: Aug. 27, 2013

1. Conducted test

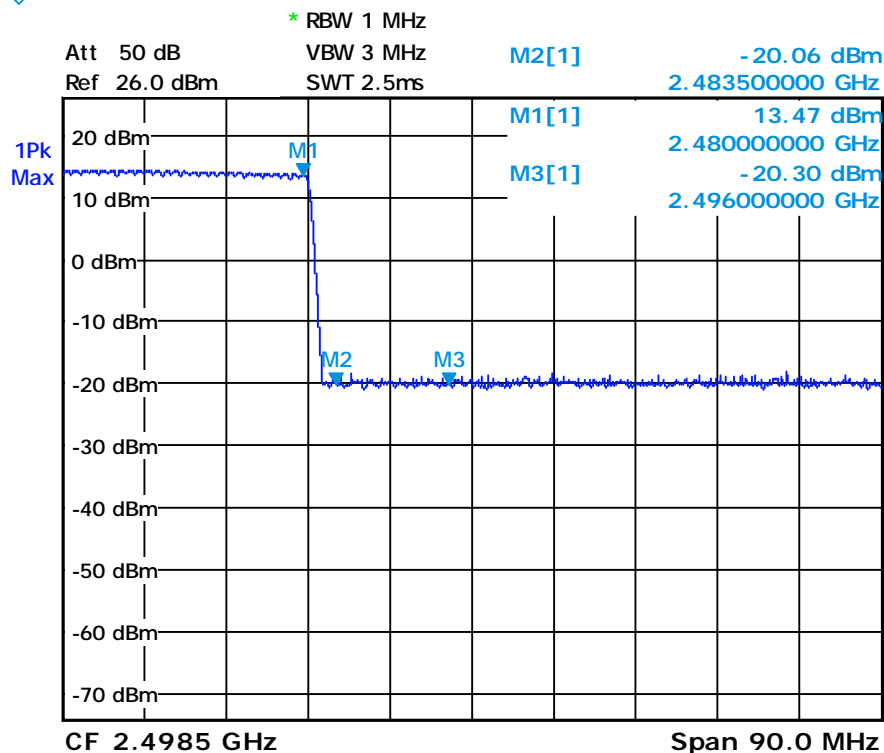
Frequency (MHz)	PEAK POWER OUTPUT (dBm)	Emission read Value(dBm)	Result of Band edge (dBc)	Band edge LIMIT (dBc)
<2400	12.59	-20.22	32.81	>20dBc
>2483.5	13.47	--20.30	33.77	>20dBc

Below 2400MHz :





Above 2483.5 MHz :





TEST REPORT

2. Radiated emission test :

Below 2400MHz (mode 1 of 2402MHz emission)

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dB)	
				PK	AV	PK	AV	PK	AV	PK	AV
2402.00	-31.15	28.33	H	84.23	73.89	81.41	71.07	114.0	94.0	-32.59	-22.93
2402.00	-31.15	28.33	V	84.23	73.79	81.41	70.97	114.0	94.0	-32.59	-23.03
2400.00	-31.15	28.32	H	68.26	54.74	67.71	53.25	74.0	54.0	-6.29	-0.75
2400.00	-31.15	28.32	V	60.8	49.6	65.43	51.97	74.0	54.0	-8.57	-2.09
2398.67	-31.15	28.31	H	60.15	49.72	57.31	46.88	74.0	54.0	-16.69	-7.12
2398.67	-31.15	28.31	V	57.9	46.58	55.06	43.74	74.0	54.0	-18.94	-10.26

About 2483.5MHz (mode 3 of 2480MHz emission)

Frequency (MHz)	Correct Factor (dB)	Ant. Fac. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Over Limit (dBuV/m)	
				PK	AV	PK	AV	PK	AV	PK	AV
2480.00	-31.05	28.54	H	83.96	72.15	81.45	69.64	114.0	94.0	-32.55	-24.36
2480.00	-31.05	28.54	V	83.98	71.57	81.47	69.06	114.0	94.0	-32.53	-24.94
2483.00	-31.05	28.55	H	65.07	54.87	62.57	52.37	74.0	54.0	-11.43	-1.63
2483.00	-31.05	28.55	V	53.1	45.86	50.6	43.36	74.0	54.0	-23.4	-10.64
2483.60	-31.05	28.55	H	59.44	50.12	56.94	47.62	74.0	54.0	-17.06	-6.38
2483.60	-31.05	28.55	V	51.87	43.75	49.37	41.25	74.0	54.0	-24.69	-12.75



4.7 RADIATED EMISSION TEST

4.7.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dBmV/m)
0.009 - 0.490	300	2400/F(KHz)
0.490 - 1.705	30	24000/F(KHz)
1.705 - 30	30	30
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

Note : 1. 30 dBuV (in 30m) = 70 dBuV (in 3m).

2. Transmitters that require Crystal Controlled Oscillators with values below 30 MHz requires the Test Report to show "Spurious Radiated Emissions" results below 30 MHz per FCC Part 15.33(a).

FCC Part15, Subpart C Section 15.249 limit of radiated emission for frequency below1000MHz (Average).

FREQUENCY (MHz)	FIELD STRENGTH OF FUNDAMENTAL (millivolts/meter)	FIELD STRENGTH OF HARMONICS (millivolts/meter)
902 - 928	50	500
2400 - 2483.5	50	500
5725 - 5875	50	500
24000 - 24250	250	2500

NOTE :

1. In the emission tables above , the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.
3. 50mV = 94dBuV

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

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4.7.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test :

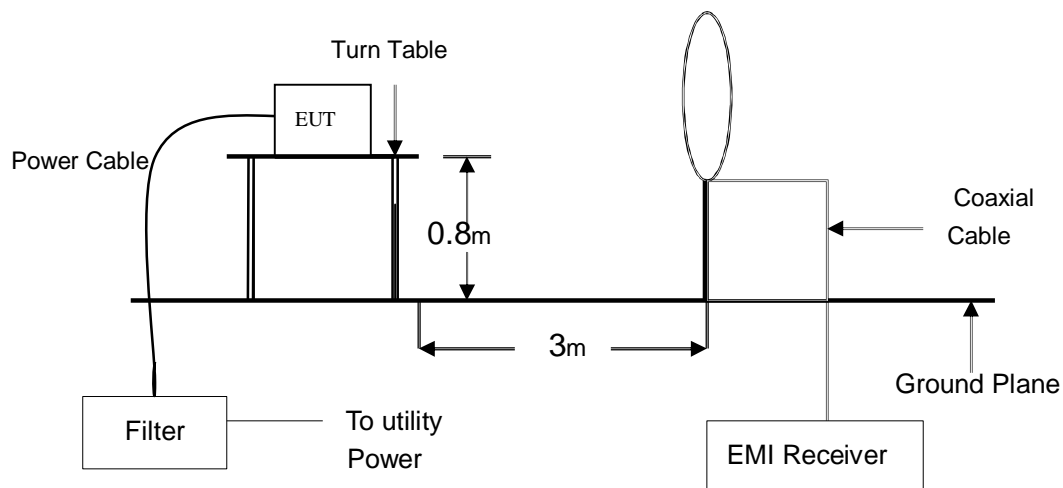
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	DEC. 16, 2013 ETC
EMI TEST RECEIVER	20 MHz ~ 1000 MHz	ROHDE & SCHWARZ	ESVS30 / 841977/003	DEC. 02, 2013 ETC
SPECTRUM ANALYZER	9 kHz ~ 7GHz	ROHDE & SCHWARZ	FSP7 / 100289	APR. 12, 2014 ETC
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC 12, 2013 ETC
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2014 ETC
BI-LOG ANTENNA	30 MHz ~ 2 GHz	SCHAFFNER	CBL6141A / 4181	JUN. 25, 2014 ETC
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	DEC. 21, 2013 ETC
HORN ANTENNA	18 ~ 40 GHZ	ETS-LINDGREN	3116 /00032255	JAN. 07, 2014 ETC
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 18, 2013 ETC
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	MAR. 09, 2014 SRT
ANECHOIC CHAMBER	3 M MEASUREMENT	SRT	A01 / SRT001	MAY. 13, 2014 SRT
COAXIAL CABLE	30 M	TIMES	LMR-400 / #30M	MAY. 21, 2014 ETC
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 869	NCR
K-TYPE CABLE	UP TO 40 GHz, 3 m	HUBER+SUHNER	SF102-46/2*11SK 252 /MY2611/2	MAR. 07, 2014 ETC
K-TYPE CABLE	UP TO 40 GHz, 1 m	HUBER+SUHNER	SF 102-40/2*11 /23934/2	OCT. 24, 2013 ETC
CDN	0.15 MHz ~ 300 MHz	LUTHI	CDN L-801 M2/M3 / 2790	MAY. 24, 2014 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

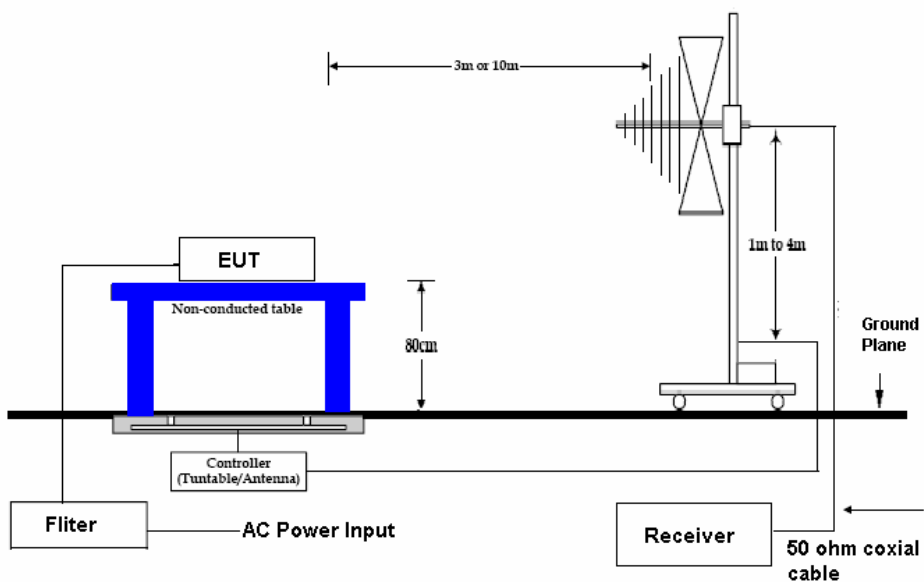


4.7.3 TEST SET-UP

9KHz ~ 30MHz

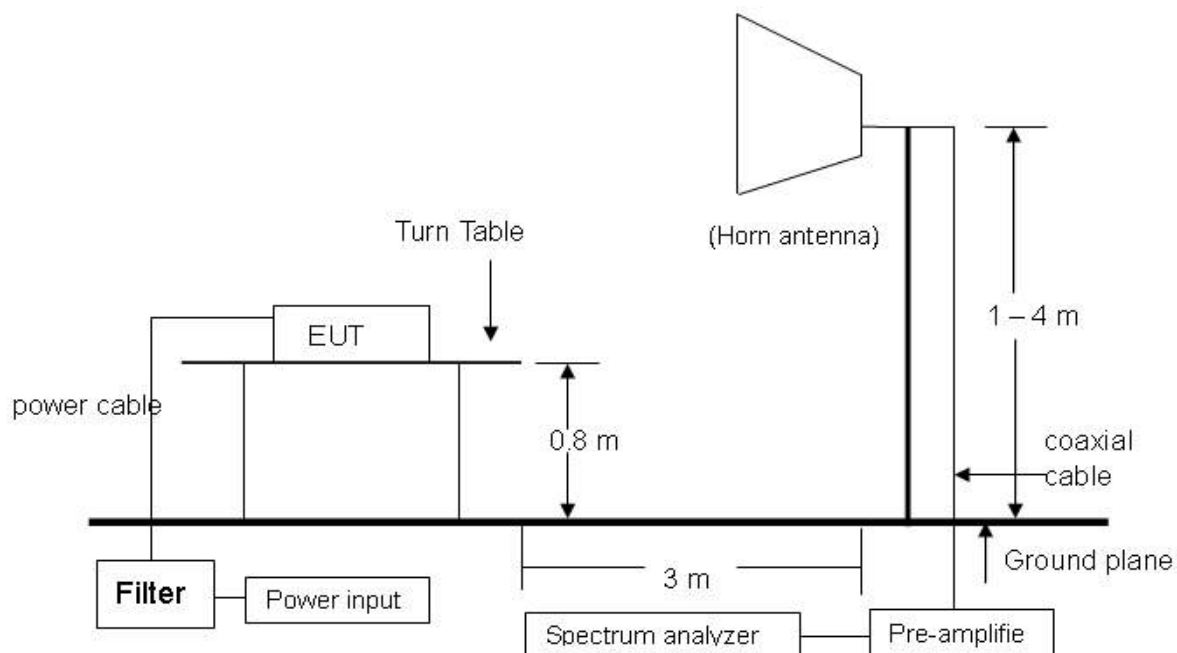


30MHz ~ 1GHz





Above 1GHz



NOTE : The EUT system was put on a wooden table with 0.8m heights above a ground plane.

For the actual test configuration, please refer to the photos of testing.

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4.7.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003.

The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz.

The frequency spectrum measured started from 30 MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver.

Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver.

The EUT system was operated in all typical methods by users.

The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data.

The procedure is referred on the test procedure of SRT LAB.



TEST REPORT

4.7.5 TEST RESULT

Temperature:	24 °C	Humidity:	59 %RH
Frequency Range:	9KHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	TX1 2412MHz
Tested By:	Michael Hsu	Tested Date:	Sep. 23, 2013

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
8.17	0.50	20.43	25.98	46.91	70.00	-23.09
10.45	0.57	20.52	19.57	40.66	70.00	-29.34
12.25	0.61	20.61	11.56	32.78	70.00	-37.22
24.66	0.84	21.23	10.33	32.41	70.00	-37.59
27.30	0.89	21.36	8.88	31.13	70.00	-38.87
28.71	0.91	21.44	10.47	32.81	70.00	-37.19

Temperature:	24 °C	Humidity:	59 %RH
Frequency Range:	9KHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	TX2 2441MHz
Tested By:	Michael Hsu	Tested Date:	Sep. 23, 2013

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
2.35	0.27	20.20	26.74	47.21	70.00	-22.79
6.88	0.46	20.38	15.57	36.41	70.00	-33.59
10.39	0.57	20.52	19.29	40.38	70.00	-29.62
15.66	0.68	20.78	11.61	33.07	70.00	-36.93
22.44	0.81	21.12	13.52	35.45	70.00	-34.55
25.50	0.86	21.27	10.79	32.92	70.00	-37.08



TEST REPORT

Temperature:	24 °C	Humidity:	59 %RH
Frequency Range:	9KHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	TX3 2480MHz
Tested By:	Michael Hsu	Tested Date:	Sep. 23, 2013

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
2.38	0.27	20.20	26.15	46.62	70.00	-23.38
5.53	0.42	20.32	14.38	35.12	70.00	-34.88
8.35	0.51	20.43	16.69	37.63	70.00	-32.37
10.51	0.57	20.53	18.61	39.71	70.00	-30.29
21.24	0.79	21.06	24.70	46.55	70.00	-23.45
26.04	0.87	21.30	14.37	36.54	70.00	-33.46

Temperature:	24 °C	Humidity:	59 %RH
Frequency Range:	9KHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	Standby
Tested By:	Michael Hsu	Tested Date:	Sep. 23, 2013

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
2.35	0.27	20.20	26.90	47.37	70.00	-22.63
6.88	0.46	20.38	15.82	36.66	70.00	-33.34
8.47	0.51	20.44	33.13	36.87	70.00	-33.13
10.45	0.57	20.52	28.62	41.38	70.00	-28.62
23.34	0.82	21.17	34.70	35.30	70.00	-34.70
29.88	0.93	21.49	38.16	31.84	70.00	-38.16



**Spectrum Research &
Testing Lab., Inc.**
No. 101-10, Ling 8,
Shan-Tong Li, Chung-Li
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Temperature:	24 °C	Humidity:	59 %RH
Frequency Range:	9KHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	Q.P.	Tested Mode:	Link
Tested By:	Michael Hsu	Tested Date:	Sep. 23, 2013

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
2.35	0.27	20.20	26.11	46.58	70.00	-23.42
6.24	0.44	20.35	15.39	36.18	70.00	-33.82
8.53	0.51	20.44	16.06	37.01	70.00	-32.99
10.57	0.57	20.53	19.18	40.28	70.00	-29.72
22.86	0.82	21.14	20.01	41.97	70.00	-28.03
26.88	0.88	21.34	10.72	32.94	70.00	-37.06



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Tested By:	Michael Hsu	Tested Mode:	TX1(2402MHz)
Receiver Detector:	Q.P. or AV.	Modulation Type:	GFSK
Frequency Range:	30M – 1GHz	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
77.53	1.35	8.24	-85.0	-75.4	-36.0	-39.4	148	3.84
166.77	1.94	11.60	-83.4	-69.9	-36.0	-33.9	224	3.68
217.21	2.23	12.83	-81.8	-66.8	-36.0	-30.8	191	3.05
625.58	4.25	20.10	-94.3	-69.9	-36.0	-33.9	265	2.66
743.92	4.75	21.75	-98.7	-72.2	-36.0	-36.2	71	2.17
878.75	5.26	23.26	-104.1	-75.6	-36.0	-39.6	96	1.48

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
78.50	1.36	8.26	-80.5	-70.9	-36.0	-34.9	48	1.47
216.24	2.23	12.74	-87.6	-72.7	-36.0	-36.7	175	1.82
366.59	3.06	15.62	-95.8	-77.1	-36.0	-41.1	237	1.87
603.27	4.14	19.84	-98.2	-74.2	-36.0	-38.2	309	2.03
669.45	4.43	20.55	-98.8	-73.8	-36.0	-37.8	65	2.68
878.48	5.26	23.26	-104.3	-75.8	-36.0	-39.8	252	3.87

1NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "**": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Tested By:	Michael Hsu	Tested Mode:	TX2(2441MHz)
Receiver Detector:	Q.P. or AV.	Modulation Type:	GFSK
Frequency Range:	30M – 1GHz	Tested Date:	Aug. 30, 2013

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
156.1	1.88	12.4	20.8	35.08	43.5	-8.42	92	1.98
191.99	2.09	10.99	24.76	37.84	43.5	-5.67	105	1.95
207.51	2.17	12.08	22.06	36.31	43.5	-7.19	204	1.9
312.27	2.78	14.21	21.96	38.95	46	-7.05	210	1.81
752.65	4.79	21.92	10.05	36.75	46	-9.25	276	1.54
771.08	4.87	22.07	7.63	34.57	46	-11.43	326	1.42

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
37.76	0.99	20.77	11.47	33.23	40	-6.77	318	1.89
127.97	1.69	12.56	20.02	34.27	43.5	-9.23	254	1.81
516.94	3.79	18.42	10.34	32.55	46	-13.45	231	1.74
752.65	4.79	21.92	10.71	37.41	46	-8.59	219	1.67
771.08	4.87	22.07	10.51	37.45	46	-8.55	164	1.58
788.54	4.94	22.2	8.99	36.13	46	-9.87	137	1.55

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Tested By:	Michael Hsu	Tested Mode:	TX3(2480MHz)
Receiver Detector:	Q.P. or AV.	Modulation Type:	GFSK
Frequency Range:	30M – 1GHz	Tested Date:	Aug. 30, 2013

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
103.72	1.54	10.23	23.94	35.71	43.5	-7.79	247	2.15
143.49	1.8	12.84	23.21	37.85	43.5	-5.65	211	2.08
175.5	1.99	10.95	22.4	35.34	43.5	-8.16	103	2.01
696.39	4.53	20.77	6.25	31.55	46	-14.45	310	1.45
752.65	4.79	21.92	6.82	33.52	46	-12.48	59	1.23
788.54	4.94	22.2	9.28	36.42	46	-9.58	156	1.2

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
48.43	1.11	15.38	21.31	37.8	40	-2.2	87	2.29
103.72	1.54	10.23	23.26	35.03	43.5	-8.47	42	2.14
143.49	1.8	12.84	20.81	35.45	43.5	-8.05	224	2.04
752.65	4.79	21.92	8.49	35.19	46	-10.81	109	1.48
789.49	4.94	22.21	7.27	34.43	46	-11.57	318	1.34
905.79	5.35	23.41	3.35	32.11	46	-13.89	209	1.07

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Tested By:	Michael Hsu	Tested Mode:	Standby
Receiver Detector:	Q.P. or AV.	Modulation Type:	GFSK
Frequency Range:	30M – 1GHz	Tested Date:	Aug. 30, 2013

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
64.92	1.25	9.18	20.13	30.56	40	-9.44	250	2.24
154.16	1.86	12.5	19.08	33.44	43.5	-10.06	238	2.08
191.99	2.09	10.99	22.71	35.79	43.5	-7.72	114	2.01
744.89	4.75	21.77	5.75	32.27	46	-13.73	232	1.45
771.08	4.87	22.07	5.87	32.81	46	-13.19	60	1.38
789.51	4.94	22.21	7.64	34.8	46	-11.2	117	1.29

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
35.82	0.97	21.75	12.06	34.78	40	-5.22	263	2.34
112.45	1.6	11.2	24.66	37.46	43.5	-6.04	58	2.19
197.81	2.12	11.53	17.75	31.4	43.5	-12.11	97	2.03
752.65	4.79	21.92	7.7	34.4	46	-11.6	88	1.49
789.51	4.94	22.21	6.73	33.89	46	-12.11	106	1.37
914.64	5.39	23.61	5.21	34.2	46	-11.8	64	1.06

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Tested By:	Michael Hsu	Tested Mode:	link
Receiver Detector:	Q.P. or AV.	Modulation Type:	GFSK
Frequency Range:	30M – 1GHz	Tested Date:	Aug. 30, 2013

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
61.06	1.23	9.72	18.68	29.63	40	-10.37	238	2.23
156.17	1.88	12.4	18.76	33.04	43.5	-10.46	358	2.15
192.04	2.09	11.08	22.75	35.92	43.5	-7.58	108	2.03
601.57	4.13	19.81	9.83	33.78	46	-12.22	3	1.58
744.59	4.75	21.77	6.23	32.75	46	-13.25	162	1.43
755.23	4.8	21.94	7.7	34.44	46	-11.56	195	1.34

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBm)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	AZ(°)	EL(m)
33.85	0.95	22.73	10.11	33.79	40	-6.21	232	2.37
117.39	1.63	11.7	23.93	37.26	43.5	-6.24	221	2.18
193.87	2.1	11.17	19.42	32.69	43.5	-10.82	37	2.05
493.85	3.68	18.07	14.97	36.72	46	-9.28	303	1.75
752.24	4.79	21.92	9.46	36.16	46	-9.84	34	1.42
789.75	4.94	22.21	7.49	34.65	46	-11.35	321	1.29

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	TX1
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1593.26	-32.25	25.73	55.77	44.89	49.26	38.38	74	54	-24.74	-15.62	257	3.21
1864.38	-31.84	26.71	71.78	55.25	66.65	50.12	74	54	-7.35	-3.88	101	3.04
2656.13	-30.92	29.22	50.96	41.52	49.26	39.82	74	54	-24.74	-14.18	348	2.52
3057.12	-30.58	30.71	44.21	33.54	44.34	33.67	74	54	-29.66	-20.33	252	2.5
3596.84	-29.67	31.83	42.98	34.97	45.14	37.13	74	54	-28.86	-16.87	277	2.24
4703.45	-28.56	33.29	43.22	32.58	47.95	37.31	74	54	-26.05	-16.69	325	1.57

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB μ V)		Emission Level (dB μ V/m)		Limit (dB μ V/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1374.54	-32.84	25.2	54.35	45.78	46.71	38.14	74	54	-27.29	-15.86	14	3.23
1603.75	-32.23	25.77	51.85	43.21	45.39	36.75	74	54	-28.61	-17.25	344	3.06
1864.21	-31.84	26.71	65.21	54.23	60.08	49.1	74	54	-13.92	-4.9	151	2.85
3837.76	-29.45	32.41	43.28	32.98	46.24	35.94	74	54	-27.76	-18.06	329	2.28
4632.54	-28.61	33.12	44.26	35.68	48.76	40.18	74	54	-25.24	-13.82	319	1.85
5448.29	-26.97	34.63	40.85	31.54	48.51	39.2	74	54	-25.49	-14.8	141	1.24

NOTE :

1. Measurement uncertainty is +/- 3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13071001
Report No.: FCCA13071001
FCC ID : XJ8-BT-232B-E
Page: 50 of 71
Date: Sep. 25, 2013

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	TX1(Fundamental)
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2402	-31.15	28.33	84	73.54	81.18	70.72	114.0	94.0	-32.82	-23.28	82	2.33
4804	-28.48	33.53	60.28	43.13	65.33	48.18	74.0	54.00	-8.67	-5.82	99	2.00
7206	-27.05	36.59	54.23	39.26	63.77	48.80	74.00	54.00	-10.23	-5.20	284	1.72
9608	-25.66	38.21	42.12	29.24	54.66	41.78	74.00	54.00	-19.34	-12.22	135	1.47
12010	-23.89	39.30	37.21	25.84	52.62	41.25	74.00	54.00	-21.38	-12.75	77	1.36
14412	-21.16	40.91	31.58	22.36	51.33	42.11	74.00	54.00	-22.67	-11.89	299	1.29

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2402	-31.15	28.33	84	72.24	81.18	69.42	114.00	94.00	-32.82	-24.58	148	1.15
4804	-28.48	33.53	56.23	44.28	61.28	49.33	74.00	54.00	-12.72	-4.67	230	1.41
7206	-27.05	36.59	51.64	40.25	61.18	49.79	74.00	54.00	-12.82	-4.21	2	1.89
9608	-25.66	38.21	37.54	28.11	50.08	40.65	74.00	54.00	-23.92	-13.35	144	2.01
12010	-23.89	39.30	35.75	25.42	51.16	40.83	74.00	54.00	-22.84	-13.17	75	2.23
14412	-21.16	40.91	31.57	22.99	51.32	42.74	74.00	54.00	-22.68	-11.26	359	2.37

NOTE :

1. Measurement uncertainty is +/- 3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	TX2
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1054.55	-33.98	24.69	63.13	52.12	53.84	42.83	74.00	54.00	-20.16	-11.17	82	2.33
1627.68	-32.2	25.86	55.82	43.21	49.48	36.87	74.00	54.00	-24.52	-17.13	99	2.00
1753.53	-32.01	26.31	69.42	55.21	63.72	49.51	74.00	54.00	-10.28	-4.49	284	1.72
1923.75	-31.75	26.92	70.02	55.69	65.19	50.86	74.00	54.00	-8.81	-3.14	135	1.47
2104.33	-31.51	27.49	55.48	45.29	51.46	41.27	74.00	54.00	-22.54	-12.73	77	1.36
2273.28	-31.3	27.96	53.83	43.27	50.49	39.93	74.00	54.00	-23.51	-14.07	299	1.29

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1624.35	-32.2	25.85	51.54	40.28	45.19	33.93	74.00	54.00	-28.81	-20.07	148	1.15
1926.73	-31.74	26.93	63.84	51.28	59.03	46.47	74.00	54.00	-14.97	-7.53	230	1.41
2808.65	-30.82	29.83	44.85	36.29	43.86	35.30	74.00	54.00	-30.14	-18.70	2	1.89
3278.26	-30.17	31.16	44.54	35.87	45.53	36.86	74.00	54.00	-28.47	-17.14	144	2.01
3743.05	-29.54	32.18	42.65	33.24	45.29	35.88	74.00	54.00	-28.71	-18.12	75	2.23
4106.24	-29.18	32.8	42.32	34.47	45.94	38.09	74.00	54.00	-28.06	-15.91	359	2.37

NOTE :

1. Measurement uncertainty is +/- 3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13071001
Report No.: FCCA13071001
FCC ID : XJ8-BT-232B-E
Page: 52 of 71
Date: Sep. 25, 2013

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	TX2(Fundamental)
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2441	-31.1	28.43	81.5	72.65	78.83	69.98	114.00	94.00	-35.17	-24.02	82	2.33
4882	-28.41	33.72	59.12	45.24	64.43	50.55	74.00	54.00	-9.57	-3.45	99	2.00
7323	-26.98	36.88	51.23	40.14	61.13	50.04	74.00	54.00	-12.87	-3.96	284	1.72
9764	-25.42	38.36	37.52	27.8	50.46	40.74	74.00	54.00	-23.54	-13.26	135	1.47
12205	-23.37	39.3	31.97	23.39	47.90	39.32	74.00	54.00	-26.10	-14.68	77	1.36
14646	-21.27	40.35	33.24	21.28	52.32	40.36	74.00	54.00	-21.68	-13.64	299	1.29

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2441	-31.1	28.43	81.5	72.53	78.83	69.86	114.00	94.00	-35.17	-24.14	148	1.15
4882	-28.41	33.72	59.64	45.37	64.95	50.68	74.00	54.00	-9.05	-3.32	230	1.41
7323	-26.98	36.88	45.28	36.56	55.18	46.46	74.00	54.00	-18.82	-7.54	2	1.89
9764	-25.42	38.36	40.56	28.17	53.50	41.11	74.00	54.00	-20.50	-12.89	144	2.01
12205	-23.37	39.3	34.73	23.8	50.66	39.73	74.00	54.00	-23.34	-14.27	75	2.23
14646	-21.27	40.35	33.27	21.64	52.35	40.72	74.00	54.00	-21.65	-13.28	359	2.37

NOTE :

1. Measurement uncertainty is +/-3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	TX3
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1111.23	-33.77	24.78	59.58	47.41	50.59	38.42	74.00	54.00	-23.41	-15.58	75	2.85
1731.52	-32.04	26.23	57.48	47.87	51.67	42.06	74.00	54.00	-22.33	-11.94	107	2.53
1814.2	-31.91	26.53	55.27	46.21	49.89	40.83	74.00	54.00	-24.11	-13.17	111	2.47
1983.1	-31.66	27.14	68.22	55.24	63.70	50.72	74.00	54.00	-10.30	-3.28	136	2.38
2223.75	-31.36	27.82	54.28	43.21	50.74	39.67	74.00	54.00	-23.26	-14.33	108	2.15
2964.35	-30.71	30.46	64.89	50.14	64.64	49.89	74.00	54.00	-9.36	-4.11	51	2.01

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1931.26	-31.73	26.95	57.22	45.96	52.44	41.18	74.00	54.00	-21.56	-12.82	5	2.21
1979.65	-31.66	27.12	64.17	54.27	59.63	49.73	74.00	54.00	-14.37	-4.27	198	2.18
2223.47	-31.36	27.82	51.65	43.97	48.11	40.43	74.00	54.00	-25.89	-13.57	309	2.03
2971.37	-30.71	30.48	49.23	38.78	49.00	38.55	74.00	54.00	-25.00	-15.45	232	1.98
4961.21	-28.35	33.91	59.47	44.55	65.03	50.11	74.00	54.00	-8.97	-3.89	44	1.32
5468.43	-26.91	34.66	41.65	30.57	49.40	38.32	74.00	54.00	-24.60	-15.68	204	1.09

NOTE :

1. Measurement uncertainty is +/-3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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No. 101-10, Ling 8,
Shan-Tong Li, Chung-Li
City, Taoyuan, Taiwan

TEST REPORT

Reference No.: A13071001
Report No.: FCCA13071001
FCC ID : XJ8-BT-232B-E
Page: 54 of 71
Date: Sep. 25, 2013

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	TX3(Fundamental)
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2480	-31.1	28.43	84	72.12	81.33	69.45	114.00	94.00	-32.67	-24.55	82	2.33
4960	-28.41	33.72	61.01	45.21	66.32	50.52	74.00	54.00	-7.68	-3.48	99	2.00
7440	-26.98	36.88	47.67	38.2	57.57	48.10	74.00	54.00	-16.43	-5.90	284	1.72
9920	-25.42	38.36	38.51	28.39	51.45	41.33	74.00	54.00	-22.55	-12.67	135	1.47
12400	-23.37	39.3	36.93	24.92	52.86	40.85	74.00	54.00	-21.14	-13.15	77	1.36
14880	-21.27	40.35	32.47	22.32	51.55	41.40	74.00	54.00	-22.45	-12.60	299	1.29

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2480	-31.1	28.43	84	71.27	81.33	68.60	114.00	94.00	-32.67	-25.40	148	1.15
4960	-28.41	33.72	59.24	45.35	64.55	50.66	74.00	54.00	-9.45	-3.34	230	1.41
7440	-26.98	36.88	45.35	34.5	55.25	44.40	74.00	54.00	-18.75	-9.60	2	1.89
9920	-25.42	38.36	37.17	27.38	50.11	40.32	74.00	54.00	-23.89	-13.68	144	2.01
12400	-23.37	39.3	35.21	24.84	51.14	40.77	74.00	54.00	-22.86	-13.23	75	2.23
14880	-21.27	40.35	31.27	22.13	50.35	41.21	74.00	54.00	-23.65	-12.79	359	2.37

NOTE :

1. Measurement uncertainty is +/-3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



TEST REPORT

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	standby
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1192.35	-33.77	24.78	50.12	41.27	41.13	32.28	74.00	54.00	-32.87	-21.72	75	2.85
1752.11	-32.04	26.23	46.28	36.47	40.47	30.66	74.00	54.00	-33.53	-23.34	107	2.53
2733.15	-31.91	26.53	43.28	35.13	37.90	29.75	74.00	54.00	-36.10	-24.25	111	2.47
3279.65	-31.66	27.14	42.67	34.57	38.15	30.05	74.00	54.00	-35.85	-23.95	136	2.38
4321.13	-31.36	27.82	42.17	34.28	38.63	30.74	74.00	54.00	-35.37	-23.26	108	2.15
1094.26	-30.71	30.46	49.23	38.75	48.98	38.50	74.00	54.00	-25.02	-15.50	51	2.01

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1459.36	-31.73	26.95	50.57	41.28	45.79	36.50	74.00	54.00	-28.21	-17.50	5	2.21
3048.25	-31.66	27.12	45.21	37.24	40.67	32.70	74.00	54.00	-33.33	-21.30	198	2.18
3501.27	-31.36	27.82	42.87	34.27	39.33	30.73	74.00	54.00	-34.67	-23.27	309	2.03
3957.22	-30.71	30.48	44.25	34.98	44.02	34.75	74.00	54.00	-29.98	-19.25	232	1.98
4651.25	-28.35	33.91	42.17	31.28	47.73	36.84	74.00	54.00	-26.27	-17.16	44	1.32
5348.22	-26.91	34.66	41.26	33.79	49.01	41.54	74.00	54.00	-24.99	-12.46	204	1.09

NOTE :

1. Measurement uncertainty is +/-3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



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TEST REPORT

Reference No.: A13071001
Report No.: FCCA13071001
FCC ID : XJ8-BT-232B-E
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Date: Sep. 25, 2013

Temperature:	26 °C	Humidity:	66 %RH
Receiver Detector:	PK. or AV.	Tested Mode:	link
Frequency Range:	1 – 25GHz	Modulation Type:	GFSK
Tested By:	Michael Hsu	Tested Date:	Aug. 30, 2013

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1041.22	-33.77	24.78	72.09	60.14	63.10	51.15	74.00	54.00	-10.90	-2.85	75	2.85
1114.68	-32.04	26.23	57.84	47.52	52.03	41.71	74.00	54.00	-21.97	-12.29	107	2.53
1924.39	-31.91	26.53	62.17	50.24	56.79	44.86	74.00	54.00	-17.21	-9.14	111	2.47
1957.68	-31.66	27.14	70.45	55.23	65.93	53.02	74.00	54.00	-8.07	-2.98	136	2.38
2742.69	-31.36	27.82	50.78	41.87	47.24	38.33	74.00	54.00	-26.76	-15.67	108	2.15
4934.34	-30.71	30.46	45.68	34.17	45.43	33.92	74.00	54.00	-28.57	-20.08	51	1.53

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1604.54	-31.73	26.95	51.48	43.47	46.70	38.69	74.00	54.00	-27.30	-15.31	5	2.21
1931.35	-31.66	27.12	65.04	52.74	60.50	48.20	74.00	54.00	-13.50	-5.80	198	2.18
1955.24	-31.36	27.82	58.12	46.84	54.58	43.30	74.00	54.00	-19.42	-10.70	309	2.03
3195.68	-30.71	30.48	44.18	34.25	43.95	34.02	74.00	54.00	-30.05	-19.98	232	1.98
4946.25	-28.35	33.91	48.25	40.22	53.81	45.78	74.00	54.00	-20.19	-8.22	44	1.32
5215.2	-26.91	34.66	42.78	34.98	50.53	42.73	74.00	54.00	-23.47	-11.27	204	1.09

NOTE :

1. Measurement uncertainty is +/-3.92dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.

 Spectrum Research & Testing Lab., Inc. No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan	<h1>TEST REPORT</h1>	Reference No.: A13071001 Report No.: FCCA13071001 FCC ID : XJ8-BT-232B-E Page: 57 of 71 Date: Sep. 25, 2013
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5. CONDUCTED EMISSION TEST FOR POWER PORT

5.1 LIMIT

Frequency (MHz)	Class A (dB μ V)		Class B (dB μ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE :

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	DEC. 16, 2013 ETC
EMI TEST RECEIVER	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	ESHS30 / 826003/008	JAN. 22, 2014 ETC
LISN	50 μ H, 50 ohm	FCC	FCC-LISN-50-25-2 / 01017	JUN. 16, 2014 ETC
LISN	50 μ H, 50 ohm	SOLAR	9252-50-R-24-BNC/ 951315	OCT. 21, 2013 ETC
LISN	50 μ H, 50 ohm	EMCO	3825/2/ 9204-1952	MAY 30, 2014 ETC
50 Ω BNC TYPE TERMINATOR	50 ohm	N/A	11593A/ L1TEQU005	DEC. 24, 2013 ETC
50 Ω BNC TYPE TERMINATOR	50 ohm	N/A	B00-CD-357/ L1TEQU009	JUN. 17, 2014 ETC
COAXIAL CABLE	5 m	HUBER+SUHNER	RG214/U / #5M(L1TCAB013)	MAY. 21, 2014 ETC

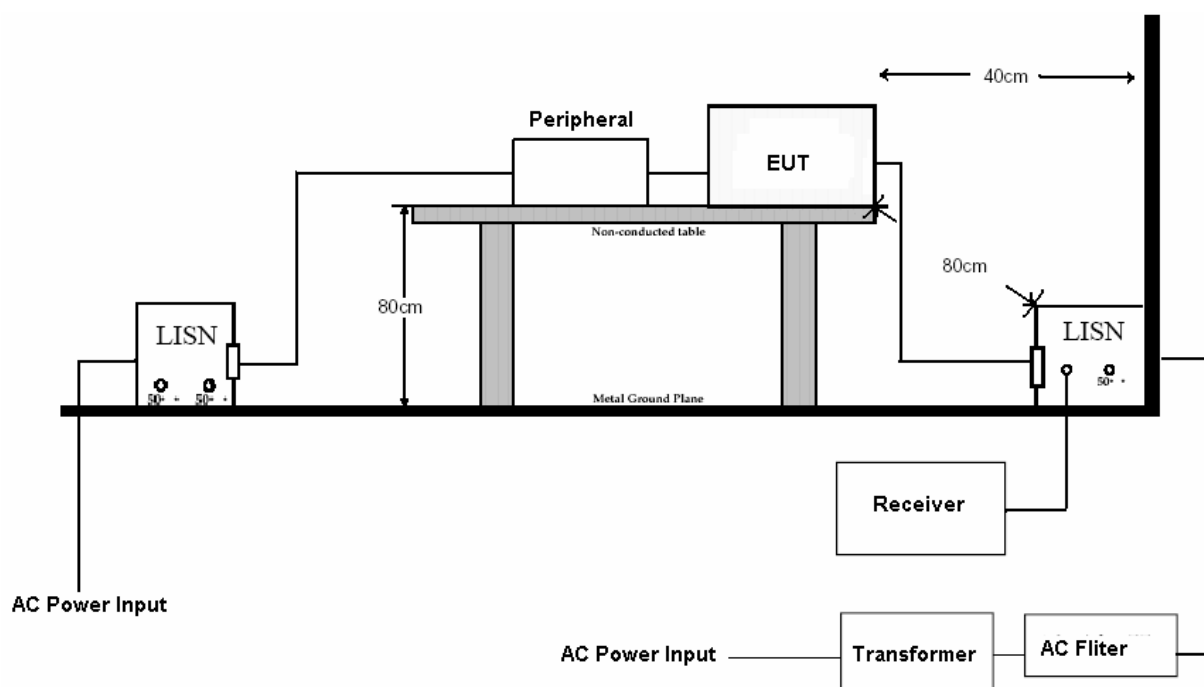
NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



5.3 TEST PROCEDURE

According to FCC Part15, Subpart C

5.4 TEST SETUP



NOTE:

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.
3. The serial no. of the LISN connected to EUT is 01017.
4. The serial no. of the LISN connected to support units is 01018.



5.5 TEST RESULT

Temperature:	24 °C	Humidity:	60 %RH
Receiver Detector:	Q.P. and AV.	Tested Mode:	STANDBY
Frequency Range:	0.15 – 30 MHz	Modulation Type:	N/A
Tested By:	Michael Hsu	Tested Date:	Aug. 22, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBmV)		Emission Level (dBmV)		Limit (dBmV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.15	0.12	47.09	36.8	47.21	36.92	66.00	56.00	-18.79	-19.08
0.348	-0.01	38.41	37.1	38.40	37.09	59.01	49.01	-20.61	-11.92
0.634	-0.05	29.21	26.22	29.16	26.17	56.00	46.00	-26.84	-19.83
2.467	-0.01	22.28	16.63	22.27	16.62	56.00	46.00	-33.73	-29.38
12.958	0.20	32.56	19.64	32.76	19.84	60.00	50.00	-27.24	-30.16
15.215	0.23	31.32	24.89	31.55	25.12	60.00	50.00	-28.45	-24.88

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBmV)		Emission Level (dBmV)		Limit (dBmV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.15	0.12	44.03	36.09	44.15	36.21	66.00	56.00	-21.85	-19.79
0.348	0.02	34.19	33.06	34.21	33.08	59.01	49.01	-24.80	-15.93
1.378	0.00	16.79	13.15	16.79	13.15	56.00	46.00	-39.21	-32.85
2.616	0.02	16.71	12.34	16.73	12.36	56.00	46.00	-39.27	-33.64
12.968	0.25	28.45	17.34	28.70	17.59	60.00	50.00	-31.30	-32.41
29.217	0.64	34.26	17.5	34.90	18.14	60.00	50.00	-25.10	-31.86

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



TEST REPORT

Temperature:	24 °C	Humidity:	60 %RH
Receiver Detector:	Q.P. and AV.	Tested Mode:	Link
Frequency Range:	0.15 – 30 MHz	Modulation Type:	N/A
Tested By:	Michael Hsu	Tested Date:	Aug. 22, 2013

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBmV)		Emission Level (dBmV)		Limit (dBmV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.15	0.12	41.22	32.61	41.34	32.73	66	56	-24.66	-23.27
0.153	0.12	34.77	23.72	34.89	23.84	65.84	55.84	-30.95	-32
2.606	-0.01	26.42	18.45	26.41	18.44	56	46	-29.59	-27.56
12.958	0.2	41.16	29.13	41.36	29.33	60	50	-18.64	-20.67
13.008	0.2	46.7	34.1	46.9	34.3	60	50	-13.1	-15.7
24.891	0.41	31	25.58	31.41	25.99	60	50	-28.59	-24.01

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBmV)		Emission Level (dBmV)		Limit (dBmV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.15	0.12	42.14	33.54	42.26	33.66	66	56	-23.74	-22.34
0.153	0.12	34.53	23.17	34.65	23.29	65.84	55.84	-31.19	-32.55
0.634	-0.01	21.19	16.9	21.18	16.89	56	46	-34.82	-29.11
13.019	0.25	35.61	25.49	35.86	25.74	60	50	-24.14	-24.26
13.059	0.25	41.6	29.8	41.85	30.05	60	50	-18.15	-19.95
25.572	0.53	30.17	19.12	30.7	19.65	60	50	-29.3	-30.35

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

 Spectrum Research & Testing Lab., Inc. No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan	<h1>TEST REPORT</h1>	Reference No.: A13071001 Report No.: FCCA13071001 FCC ID : XJ8-BT-232B-E Page: 61 of 71 Date: Sep. 25, 2013
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6. Antenna application

6.1 Antenna requirement

The EUT's antenna met the requirement of FCC part15C section15.203 and 15.204.

6.2 Result

The EUT's antenna used a Omni Antenna, The antenna's gain is 2 dBi that meets the requirement.

6.3 Description of RF Exposure

SAR compliance has been evaluated in the product(s) with RS232 configurations, and can be used in host product(s) with substantially similar physical dimensions, construction, and electrical and RF characteristics. End-users must be provided with specific information required to satisfy RF exposure compliance for all final host devices. Compliance of this device in all final host configurations is the responsibility of the Grantee.

- I The separation distance -20 cm must be clearly stated in the operating and/or installation manual that is supplied to the User.
- I This application is being made on behalf of the "Grantee".



7. PHOTOS OF TESTING

- Radiated test (below 1G)





TEST REPORT

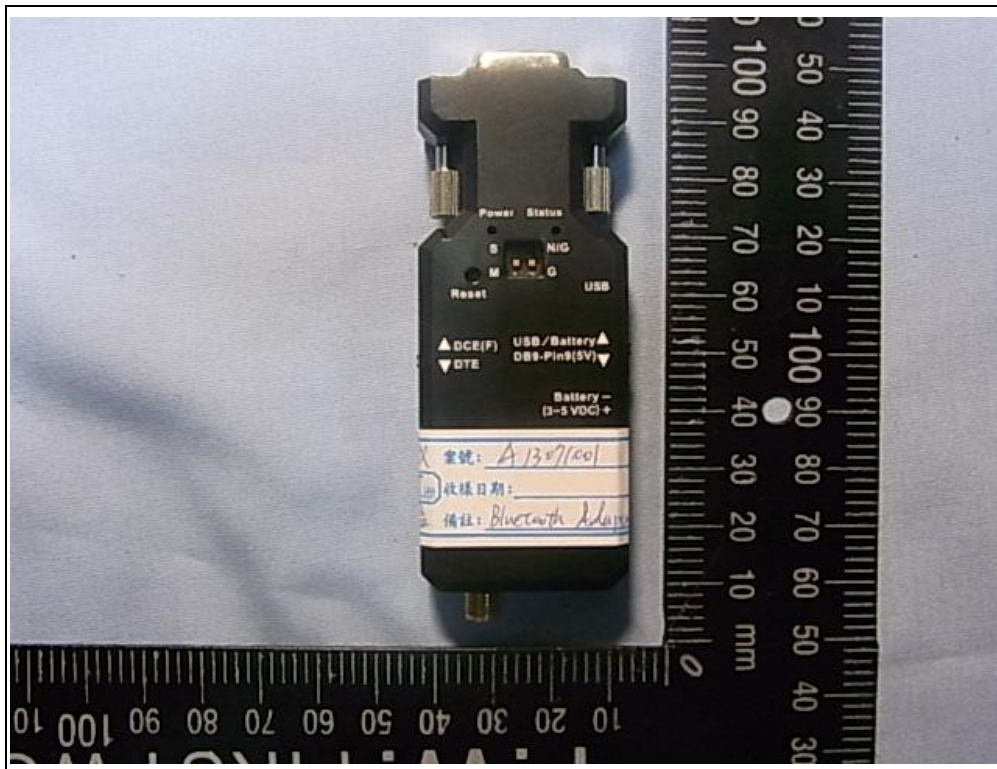
- Radiated test (above 1G)



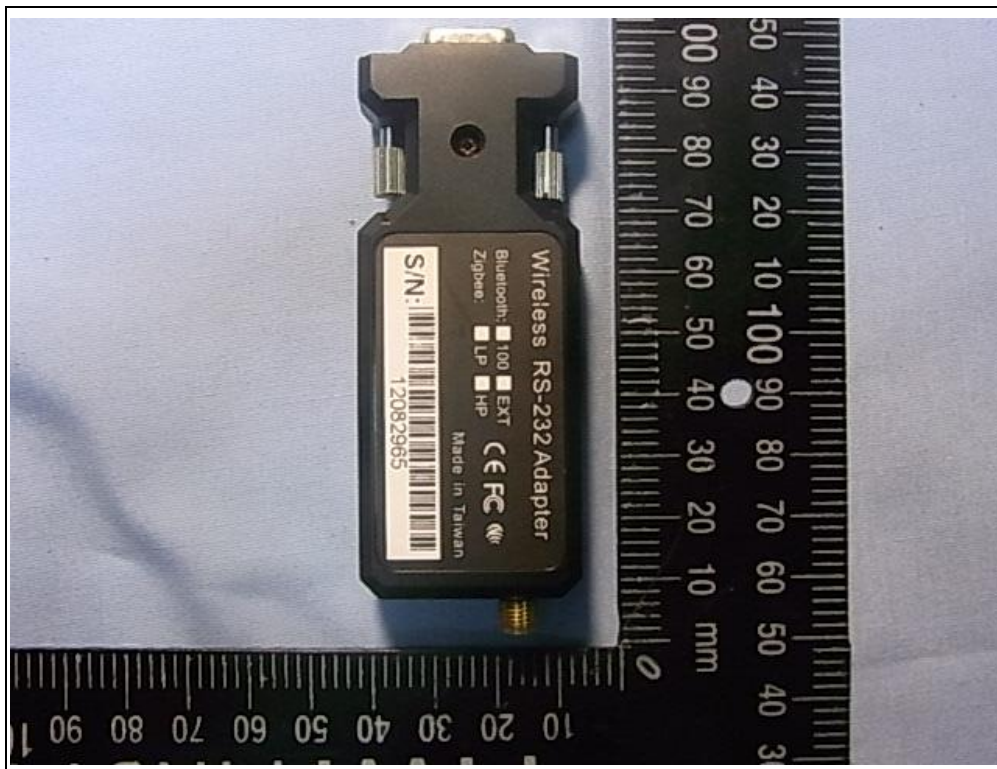


8. PHOTOS OF EUT

Exterior 1



Exterior 2

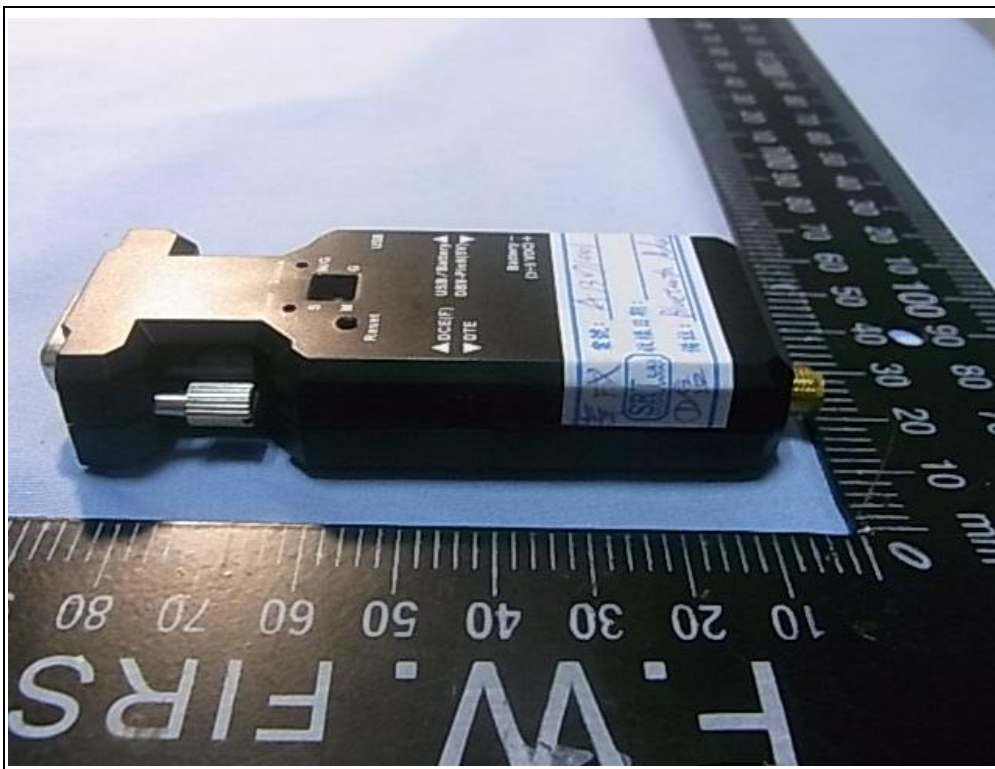




Exterior 3

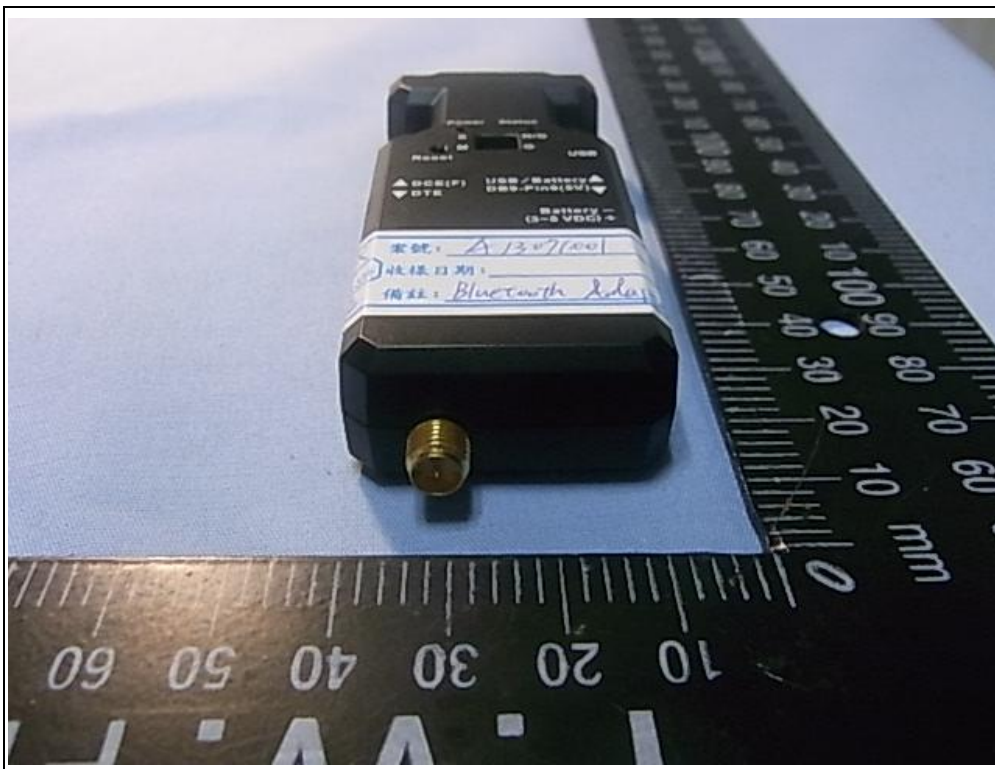


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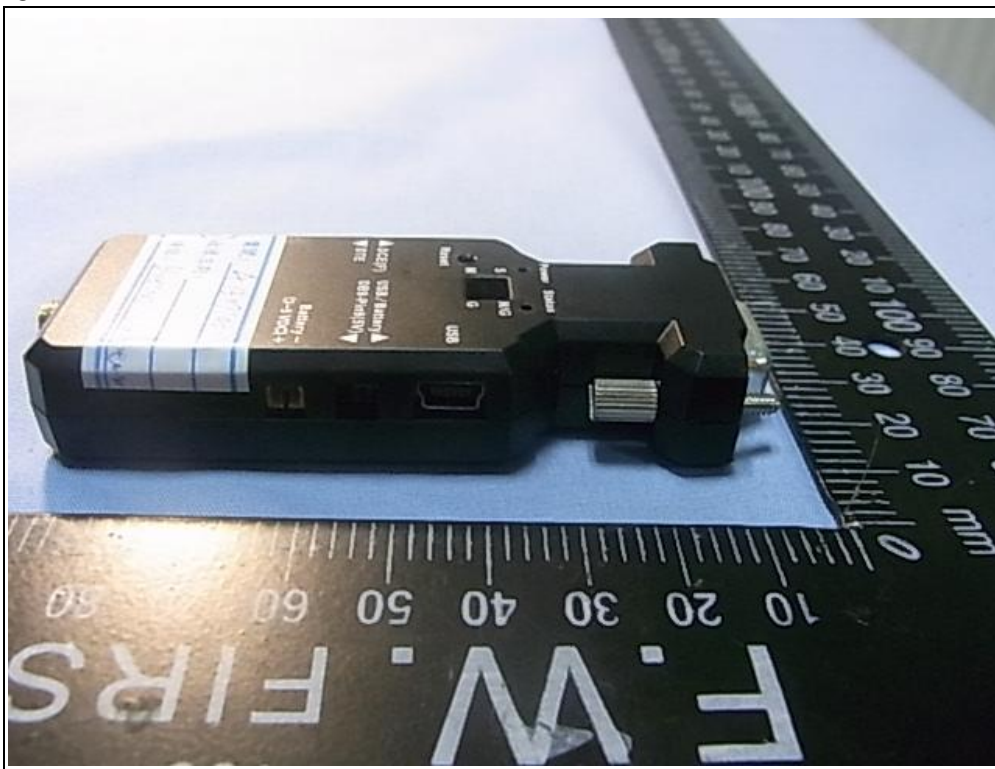




Exterior 5



Exterior 6





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TEST REPORT

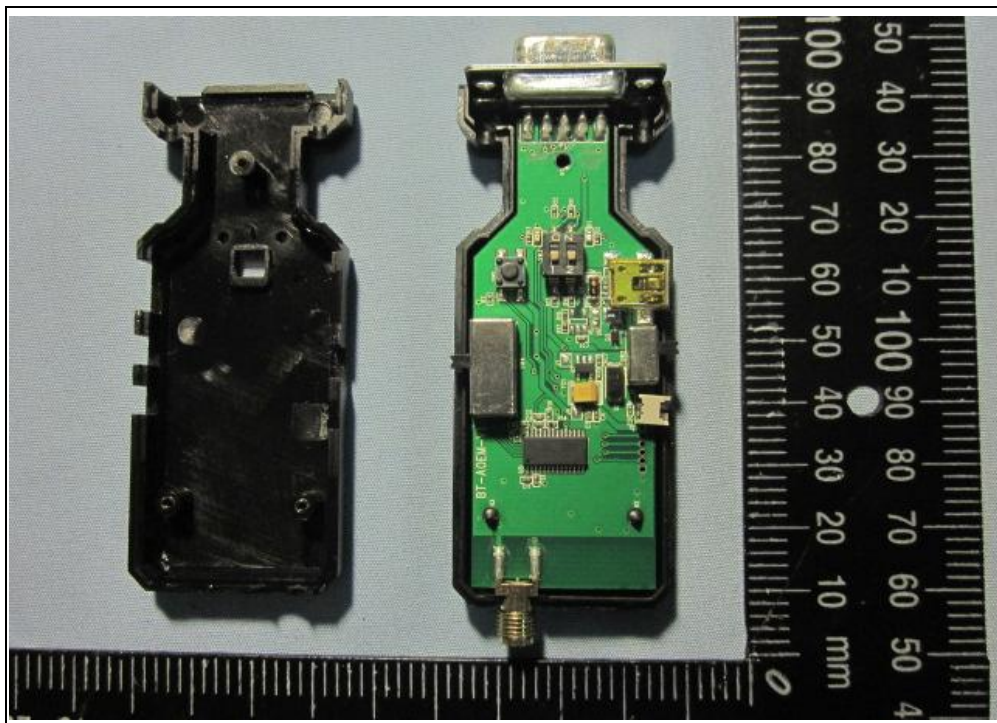
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Antenna

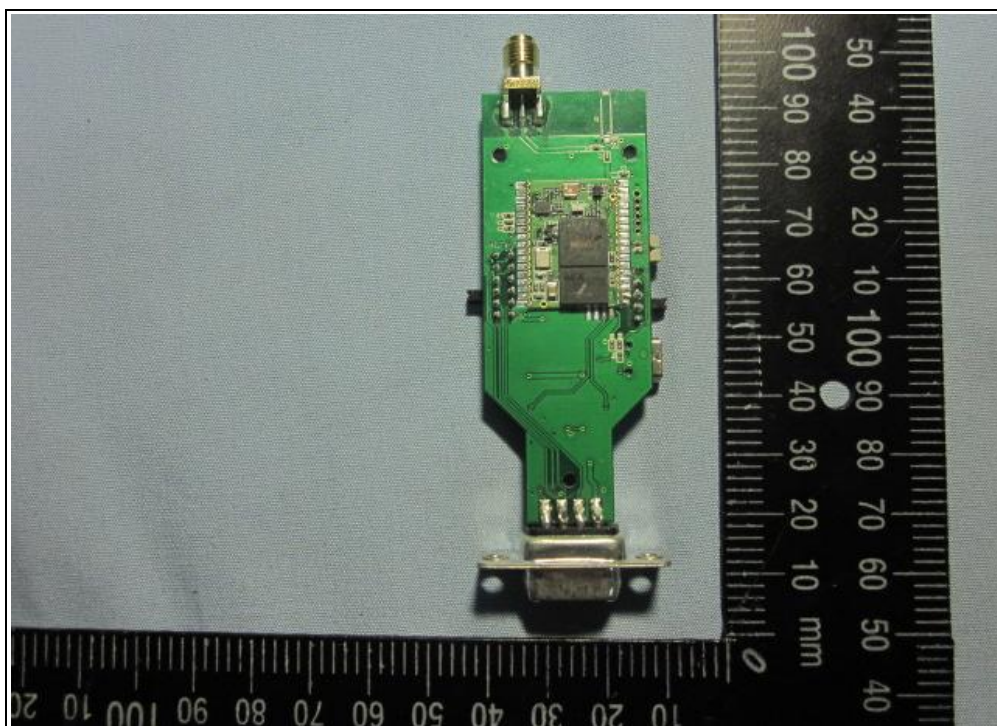




Internal structure



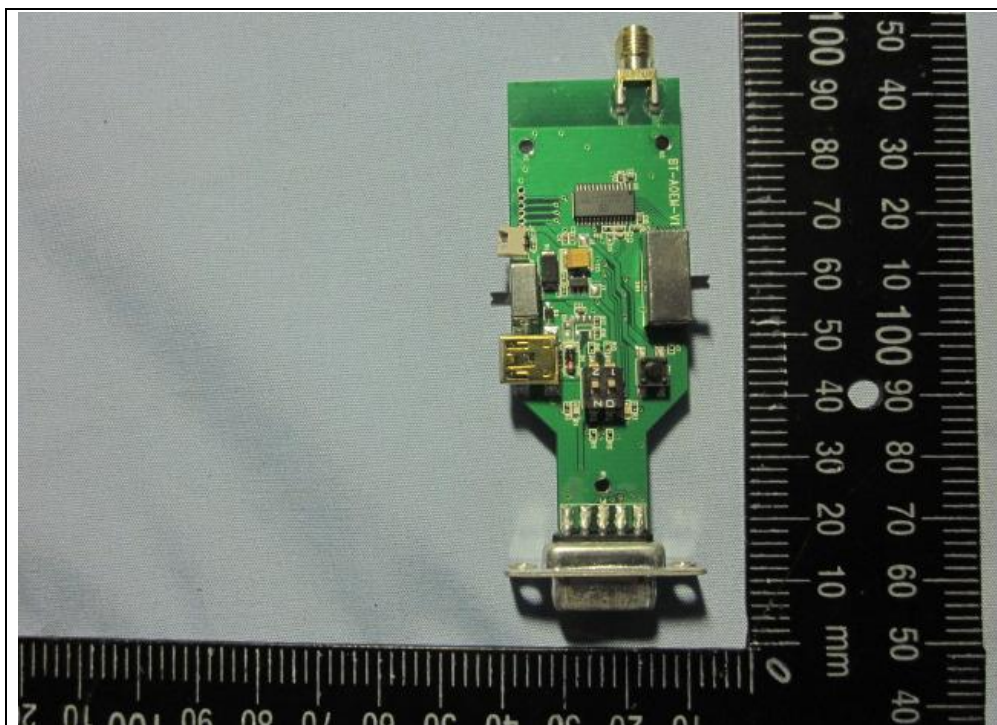
PCB-F





TEST REPORT

PCB-B



Antenna Port



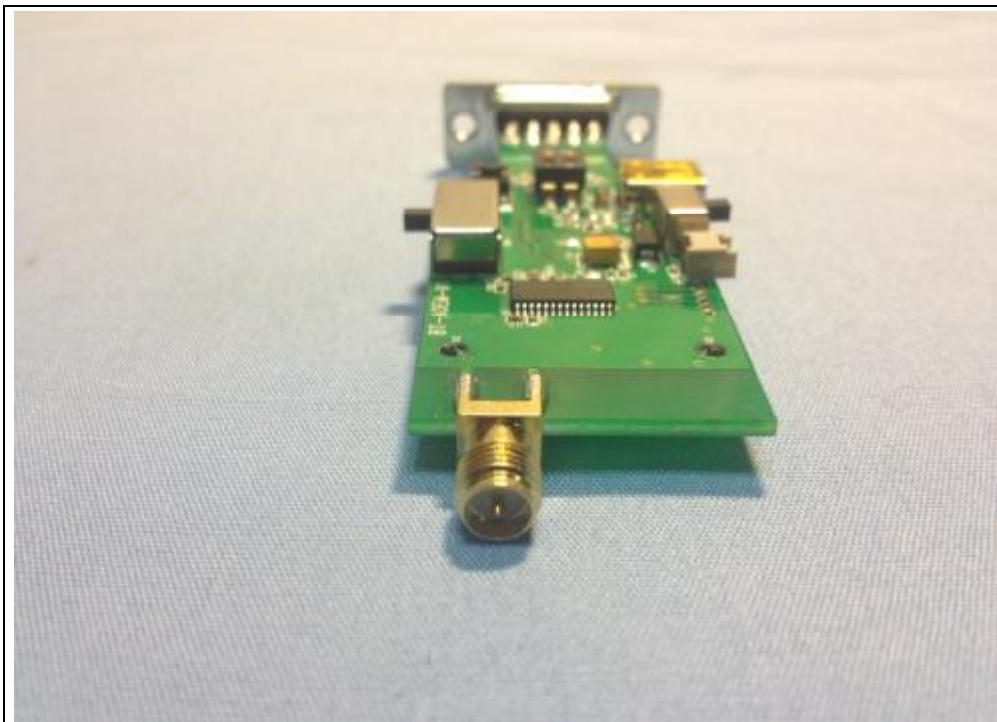


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EUT Antenna Port





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9. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction