



Shenzhen TCT Testing Technology Co., Ltd.

FCC ID TEST REPORT

for

Bluetooth Keyboard

Model: LY08

FCC ID: PI6 LY08

Prepared for : Shenzhen good product technology Co., LTD
3/F., Block 49, Cuigang 5th Industrial Zone, Huaide Nan Road,
Fuyong, Baoan District, Shenzhen, China

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Report Number: TCS1209006-1
Date of Test: September 16~21, 2012
Date of Report: September 21, 2012

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Shenzhen TCT Testing Technology Co., Ltd.

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-01.

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Shenzhen TCT Testing Technology Co., Ltd.

1.0 General Details

1.1 Test Lab Details

Name : Shenzhen TCT Testing Technology Co.,Ltd
Address: 1F, Building 1, Yibaolai Industrial Park, Qiaotou Village, Fuyong Town, Baoan District, Shenzhen, Guangdong, China
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Shenzhen Timeway Technology Consulting Co., Ltd.

Site on File with the Federal Communications Commission – United States

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-01

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Shenzhen good product technology Co., LTD
Address: 3/F., Block 49, Cuigang 5th Industrial Zone, Huaide Nan Road, Fuyong, Baoan District, Shenzhen, China
Telephone: 0755-27835995 Fax: 0755-29405936

1.3 Description of EUT

Product: Bluetooth Keyboard
Manufacturer: Shenzhen good product technology Co., LTD
Brand Name: 
Model No.: LY08
Additional Model No. LY01, LY02, LY03, LY04, LY05, LY06, LY07, LY09, LY10
Additional Trade Name N/A
Rating: DC 3.7V (lithium battery)
Modulation Type: FHSS
Channel number: 79
Channel spacing 1 MHz
Operation Frequency 2402~2480MHz
Antenna Designation A PCB printed antenna and the maximum gain is 2dBi

1.4 Statement: All modes above are deferent in the shape only.

1.5 Test Duration

2012-09-16 to 2012-09-21

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.7dB

Radiated Emissions Uncertainty =4.5dB

1.7 Test Engineer

The sample tested by



Printed name: Jack Kang

Test Equipments					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2011-12-04	2012-12-03
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2011-12-04	2012-12-03
System Controller	CT	SC100	-	2012-02-17	2013-02-16
Spectrum Analyzer	ROHDE&SCHWARZ	FSU	-	2012-02-17	2013-02-16
Pre-amplifier	Agilent	8447D	83153007374	2012-02-17	2013-02-16
Pre-amplifier	Agilent	8449B	3008A01738	2012-02-17	2013-02-16
Triple-loop antenna	ROHDE&SCHWARZ	HM020	843885/002	2012-02-17	2013-02-16
Horn Antenna	ETS LINDGREN	3117	--	2012-02-17	2013-02-16

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Requirement	CFR 47 Section	Result	Notes
Power Line Conducted Emission Test	15.207(a)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1), 15.215 (c)	PASS	Complies
Maximum Peak Output Power	15.247(b)(1)	PASS	Complies
Carrier Frequency Separation	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Band age Measurement, Spurious Emission Test	15.247 (d), 15.205 (a), 15.209 (a)	PASS	Complies
Antenna Requirement	15.203	PASS	Complies
RF Exposure	15.247(b), 1.1307(b)	PASS	Complies

3.2 Test Standards

FCC Part 15:2011 Subpart C, Paragraph 15.247

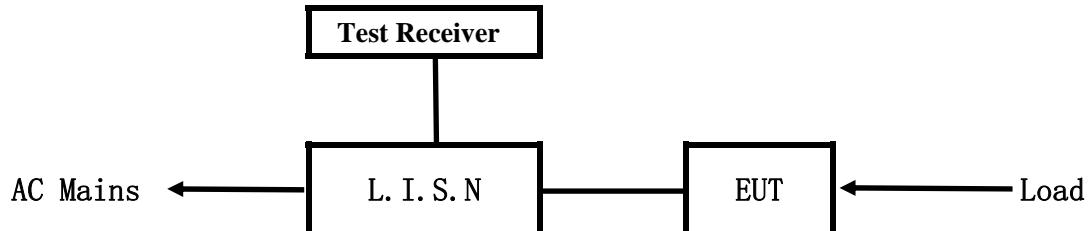
4.0 EUT Modification

No modification by Shenzhen TCT Testing Technology Co., Ltd

Note: 1. Measurements are conducted with some modes (different data rate, modulation, power consumption), but the worst (the fastest data rate, a combination of GFSK and PSK) case is submitted in the report only.
2. N/A=Not Applicable

5.0 Power Line Conducted Emission Test

5.1 Schematics of the test



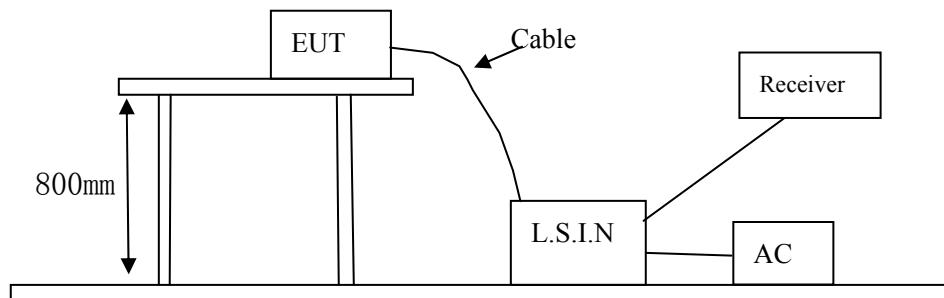
EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2009. The Frequency spectrum From 0.15MHz to 30MHz was investigated.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



5.3 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009

- A Setup the EUT and simulators as shown on the following
- B Enable AF signal and confirm EUT active to normal condition

5.4 Test Equipment

Please refer to the Section 2

5.5 Conducted Emission Limit

Frequency(MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The tighter limit shall apply at the transition frequencies

5.6 Photo documentation of the test set-up

Please refer to the Section 17

5.7 Test specification:

Environmental conditions: Temperature: 24° C Humidity: 50% Atmospheric pressure: 103kPa

Frequency range: 0.15 MHz – 30 MHz

The test was carried out in the following operation mode(s):

- Normal wireless communication

5.8 Test result

Min. limit margin 6.38 dB at 1.316 MHz

The requirements are FULFILLED

Remarks: _____

A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

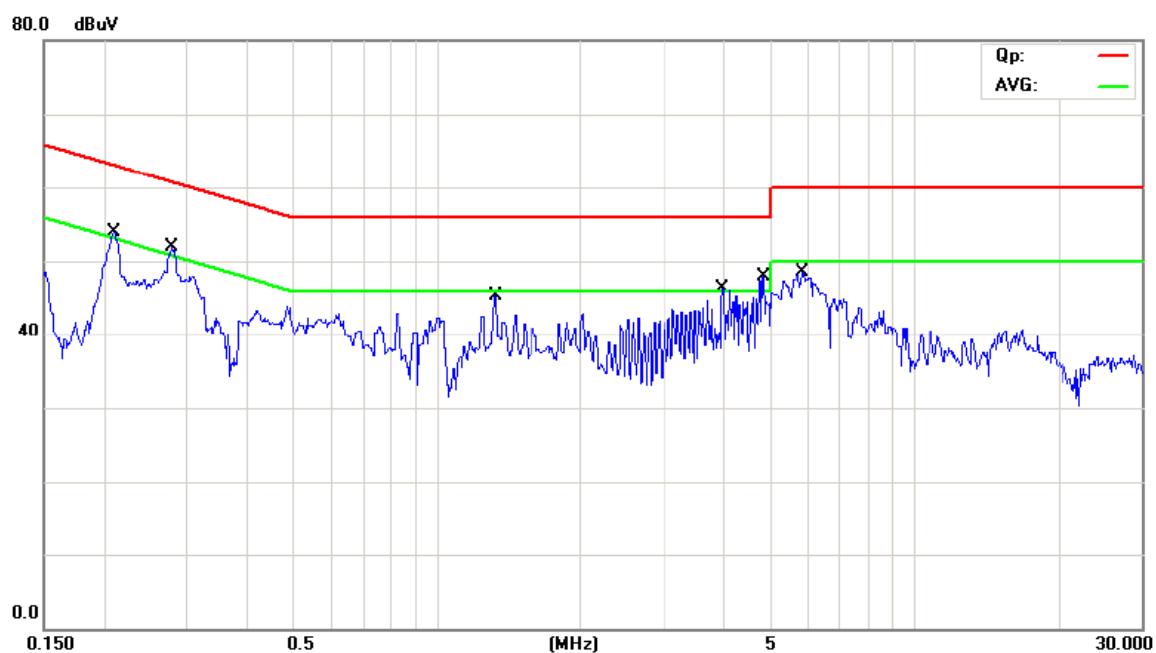
EUT Description: Bluetooth Keyboard

Operation Mode: Charging mode

Tested By: Charlle Lai

Test date: October 12, 2012

Start Frequency 0.15MHz	Stop Frequency 30MHz	Step 4.5KHz	IF BW 10KHz	Detector QP+AV	Final M-Time 1s
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Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Line		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.209	51.45	45.91	--	--	63.23	53.23
0.278	49.97	42.75	--	--	60.85	50.85
1.316	43.40	39.62	--	--	56.00	46.00
3.964	44.41	38.39	--	--	56.00	46.00
4.822	45.84	39.36	--	--	56.00	46.00
5.835	46.32	39.49	--	--	60.00	50.00

B Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)

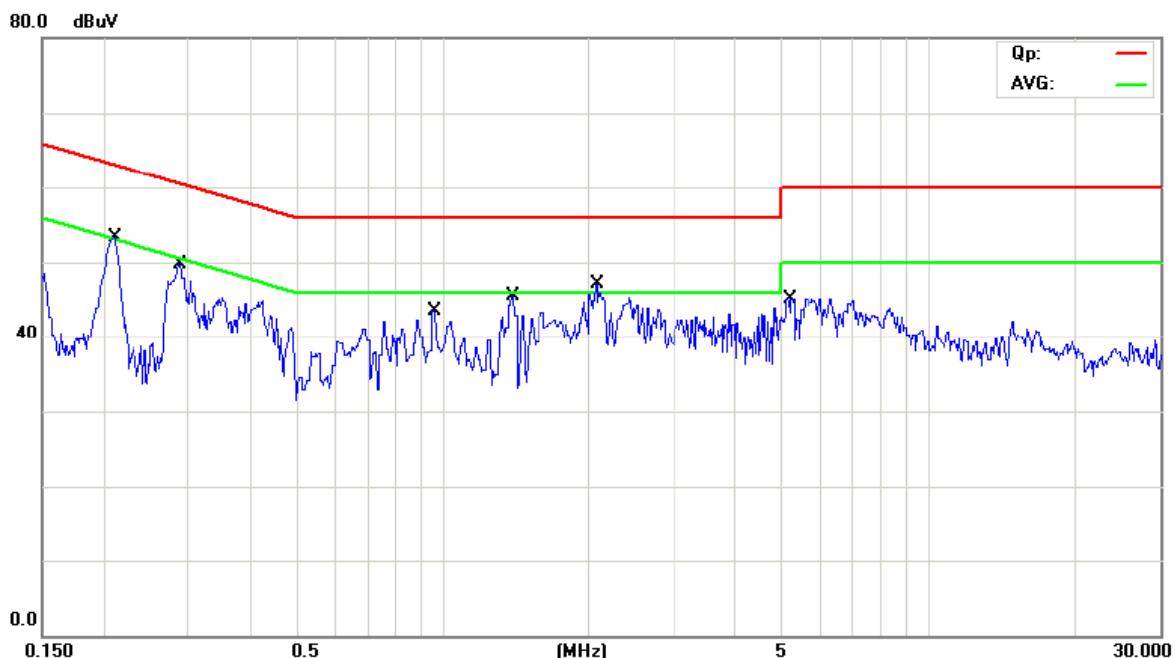
EUT Description: Bluetooth Keyboard

Operation Mode: Charging mode

Tested By: Charlle Lai

Test Data: October 12, 2012

Start Frequency	Stop Frequency	Step	IF BW	Detector	Final M-Time
0.15MHz	30MHz	4.5KHz	10KHz	QP+AV	1s



Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.210	--	--	52.24	41.15	63.21	53.21
0.287	--	--	47.68	39.61	60.60	50.60
0.961	--	--	43.03	37.98	56.00	46.00
1.388	--	--	44.34	33.86	56.00	46.00
2.074	--	--	37.50	34.38	56.00	46.00
5.208	--	--	44.88	32.31	60.00	50.00

Note: 1. The EUT is charged via a NOTEBOOK, which is powered by an adaptor AC 120V/60Hz.

2. The measurements are conducted in charging mode, with EUT switch being ON state.

6.0 20dB Bandwidth Measurement

6.1 Test Equipment

Please refer to the Section 2

6.2 Test Specification:

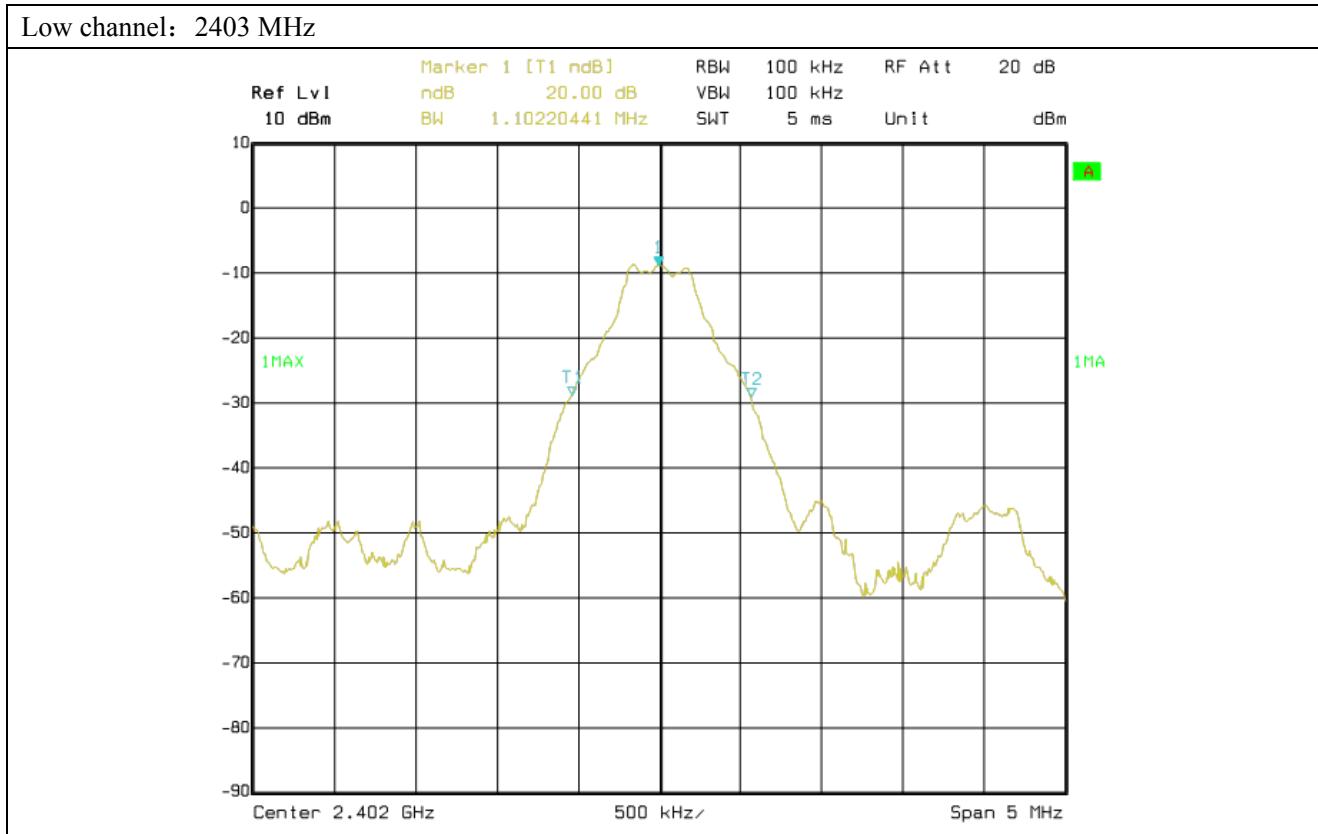
Environmental conditions: Temperature 22° C Humidity: 51% Atmospheric pressure: 103kPa

6.3 Limit

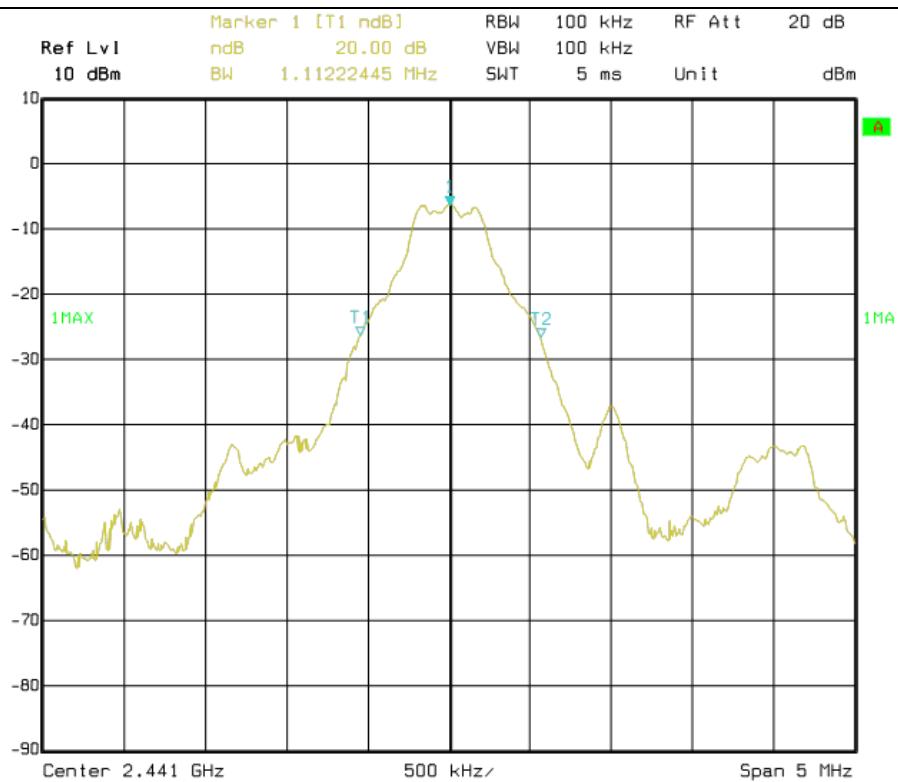
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

6.4 Test Result:

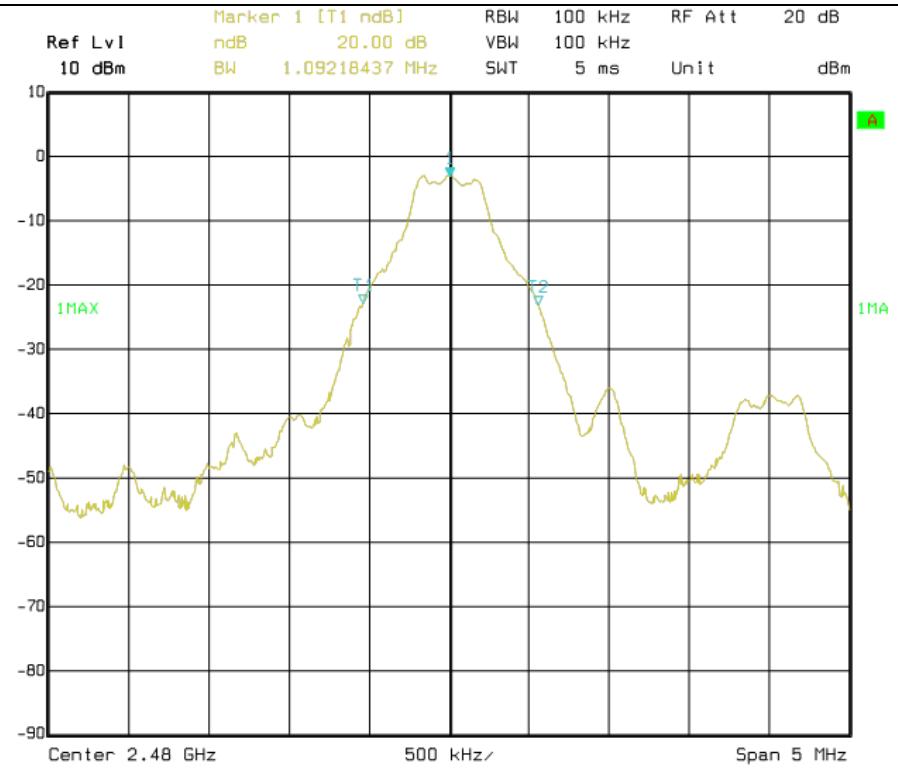
Channel number	20dB Bandwidth (kHz)	Limit (kHz)	Conclusion
(Low)	1102.2	---	PASS
(Middle)	1112.2	---	PASS
(High)	1092.2	---	PASS



Middle channel



High channel



7.0 Maximum Peak Output Power

7.1 Test Equipment

Please refer to the Section 2

7.2 Test specification:

Environmental conditions: Temperature 23° C Humidity: 53% Atmospheric pressure: 103kPa

7.3 Test Procedure

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: 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. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
4. Repeat above procedures until all frequencies measured were complete.

7.4 Limits

According to §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 2400-2483.5MHz band: 0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.5 Test Result

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2402	-8.14	30	Pass
Middle	2441	-5.72	30	Pass
High	2480	-2.49	30	Pass

Note: Peak Power Output = Peak Power Reading + Cable loss + Attenuator

8.0 Carrier Frequency Separation

8.1 Test Equipment

Please refer to the Section 2

8.2 Test specification:

Environmental conditions: Temperature 23° C Humidity: 53% Atmospheric pressure: 103kPa

8.3 Test Procedure

1. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels; Resolution (or IF) Bandwidth (RBW) \geq 1% of the span; Video (or Average) Bandwidth (VBW) \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold

2. Measure the separation between the peaks of the adjacent channels using the marker-delta function.

3. Repeat above procedures until all frequencies measured were complete.

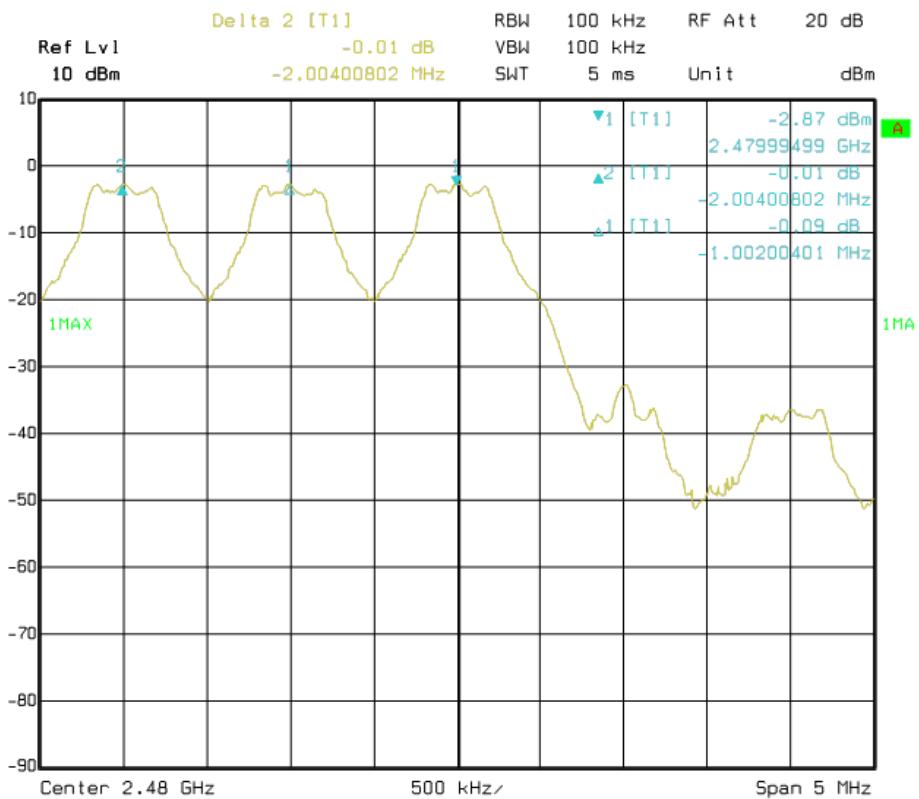
8.4 Limits

According to §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.

8.5 Test Result

Carrier Frequency Separation	Limit	Pass/ Fail
1.002MHz	\geq 25 kHz or two-thirds 20 dB bandwidth	Pass

Test plot



9.0 Number of Hopping Channels

9.1 Test Equipment

Please refer to the Section 2

9.2 Test specification:

Environmental conditions: Temperature 23° C Humidity: 53% Atmospheric pressure: 103kPa

9.3 Test Procedure

Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW \geq 1% of the span; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold

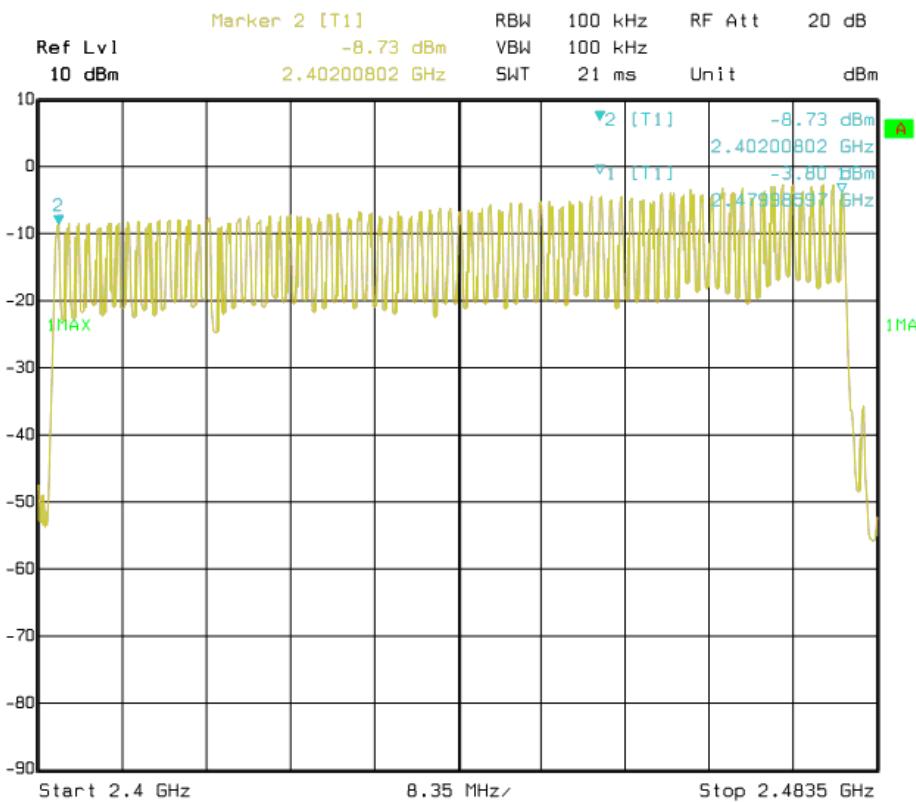
9.4 Limits

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

9.5 Test Result

Operating Frequency	Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz	79	≥ 15	Pass

Test Plot:



10.0 Time of Occupancy (Dwell Time)

10.1 Test Equipment

Please refer to the Section 2

10.2 Test specification:

Environmental conditions: Temperature 23° C Humidity: 53% Atmospheric pressure: 103kPa

10.3 Test Procedure

Span = zero span, centred on a hopping channel; RBW = 1 MHz; VBW \geq RBW; Detector function = peak;

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

Measure the dwell time using the marker-delta function.

Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

10.4 Limits

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

10.5 Test Result

Channel	Reading (ms)	Hopping Rate	Actual (s)	Limit (s)
Low	2.934	266.667hop/s	0.313	0.4
Middle	2.952	266.667hop/s	0.315	0.4
High	2.934	266.667hop/s	0.313	0.4

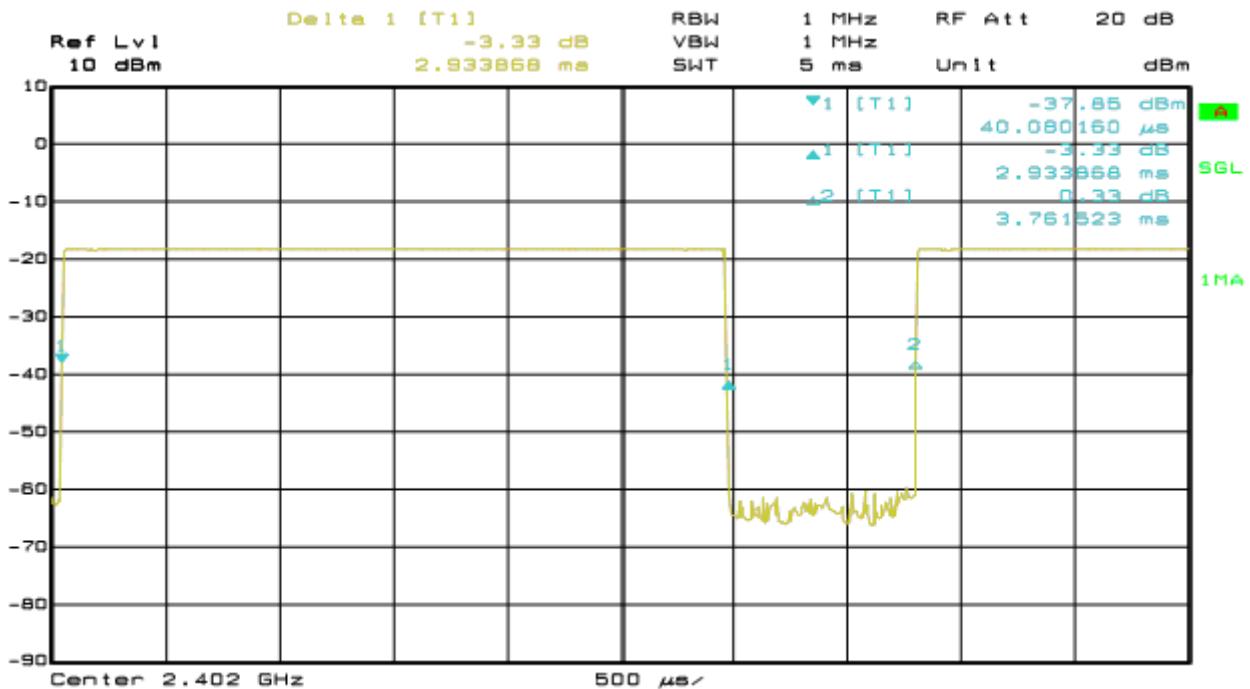
Note: 1) Actual = Reading \times (Hopping rate / Number of channels) \times Test period

2) The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 μ s with 79 channels.

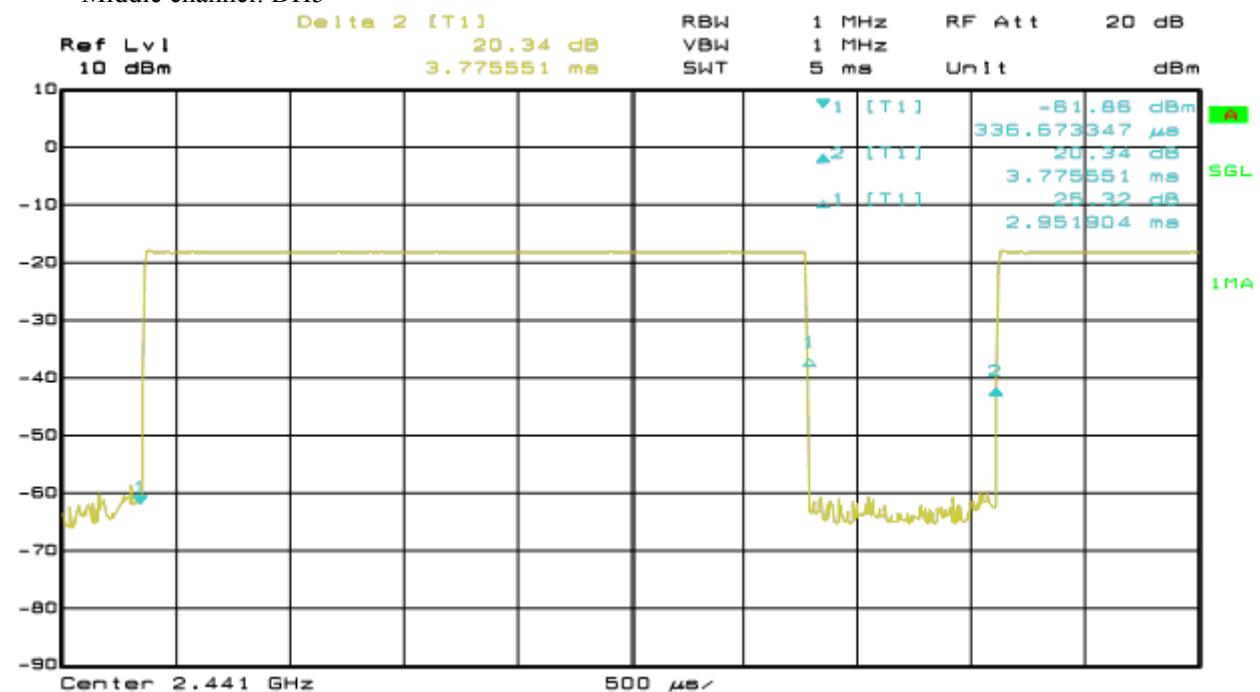
A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. So the EUT makes worst case 266.667 hops per second with 79 channels, and the DH5 is the worst case.

Test Plot:

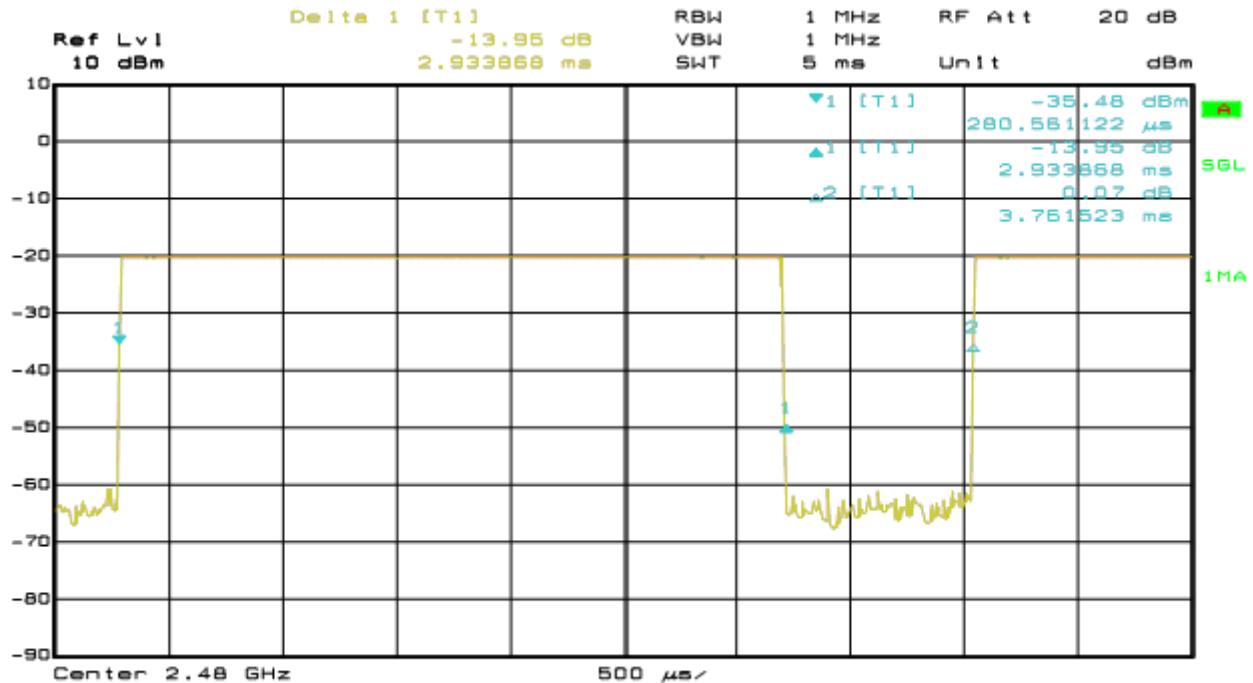
Low channel: DH5



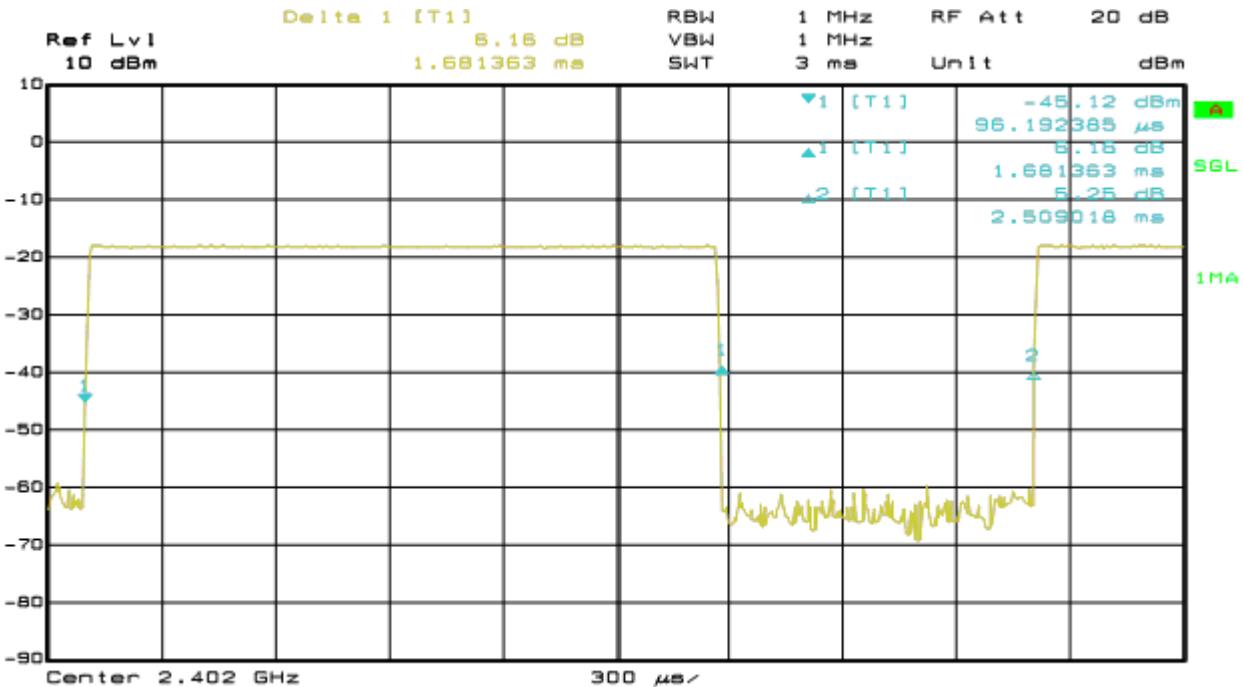
Middle channel: DH5



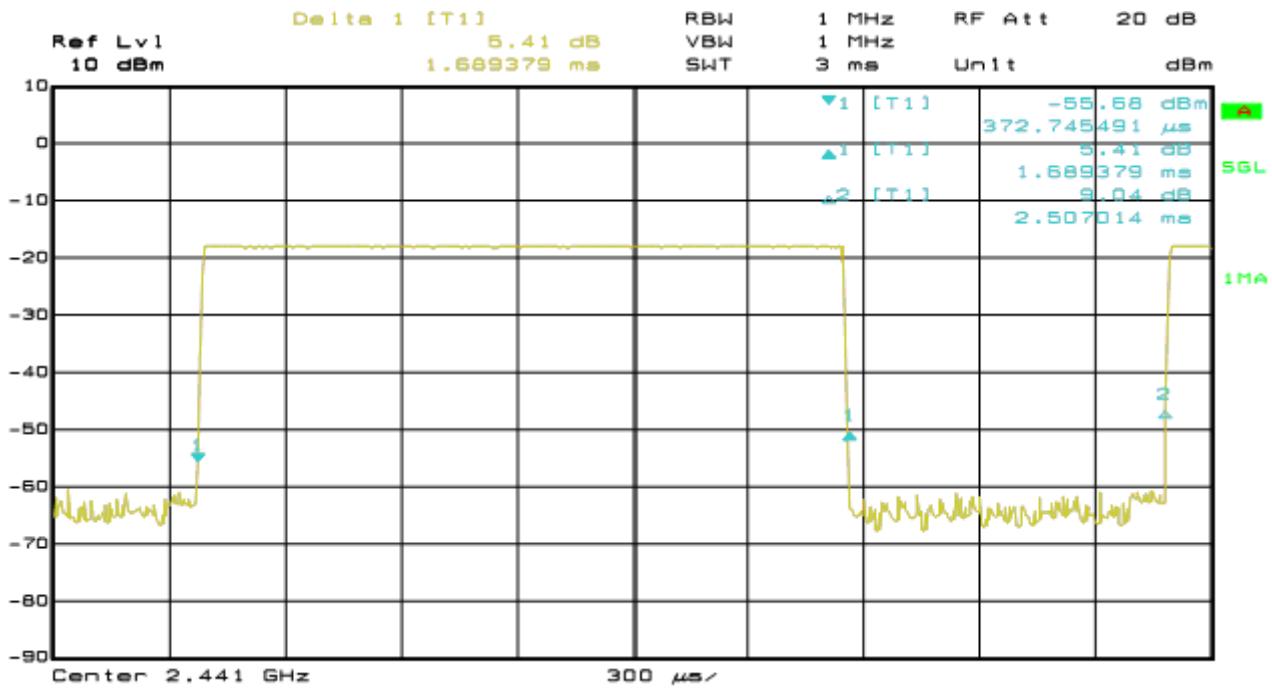
High channel: DH5



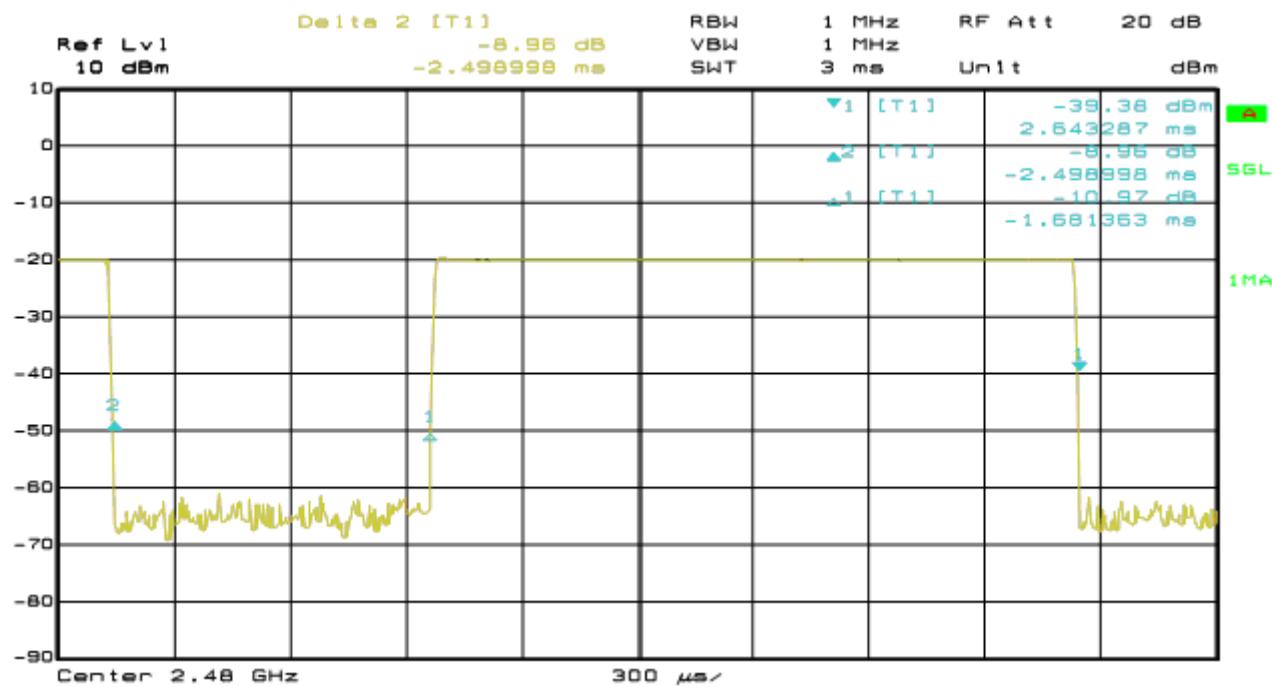
Low channel: DH3



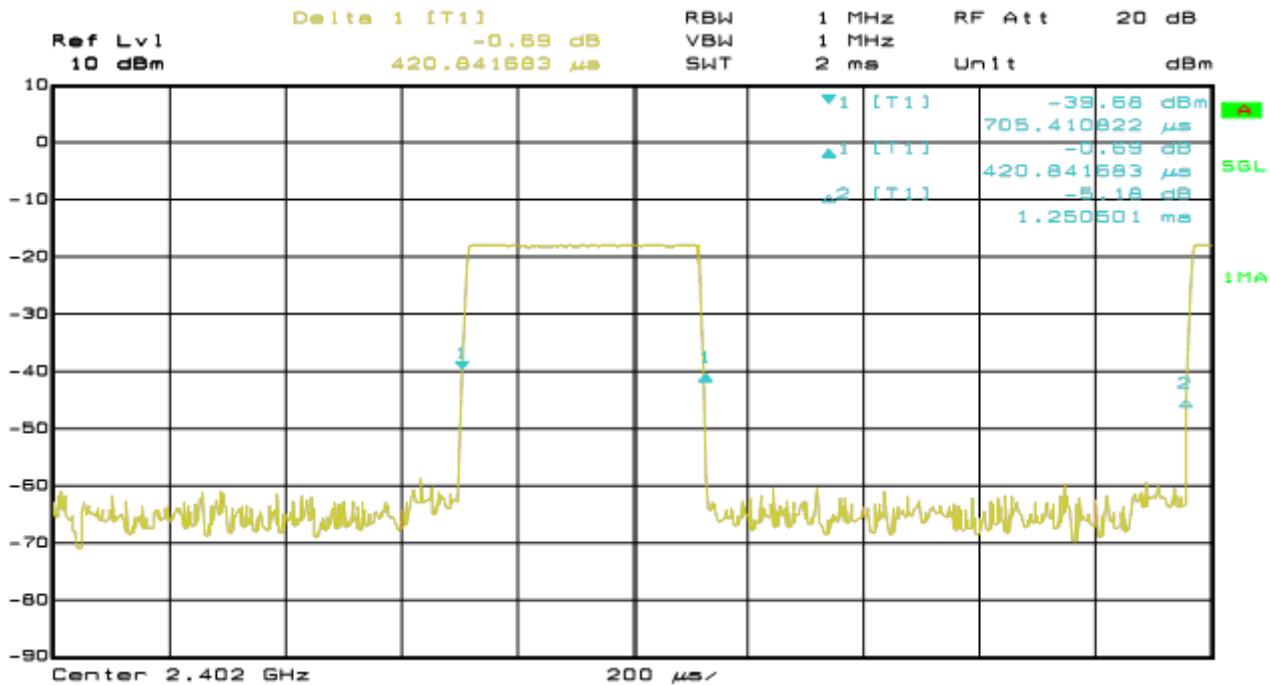
Middle channel: DH3



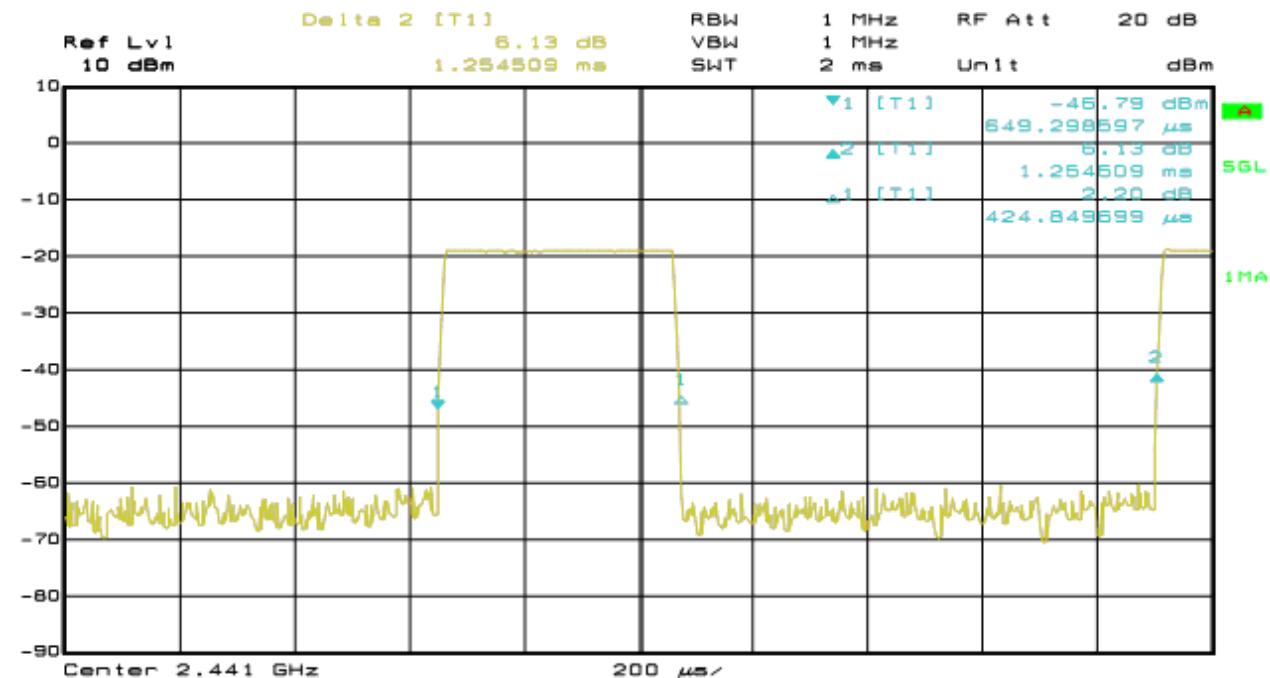
High channel: DH3



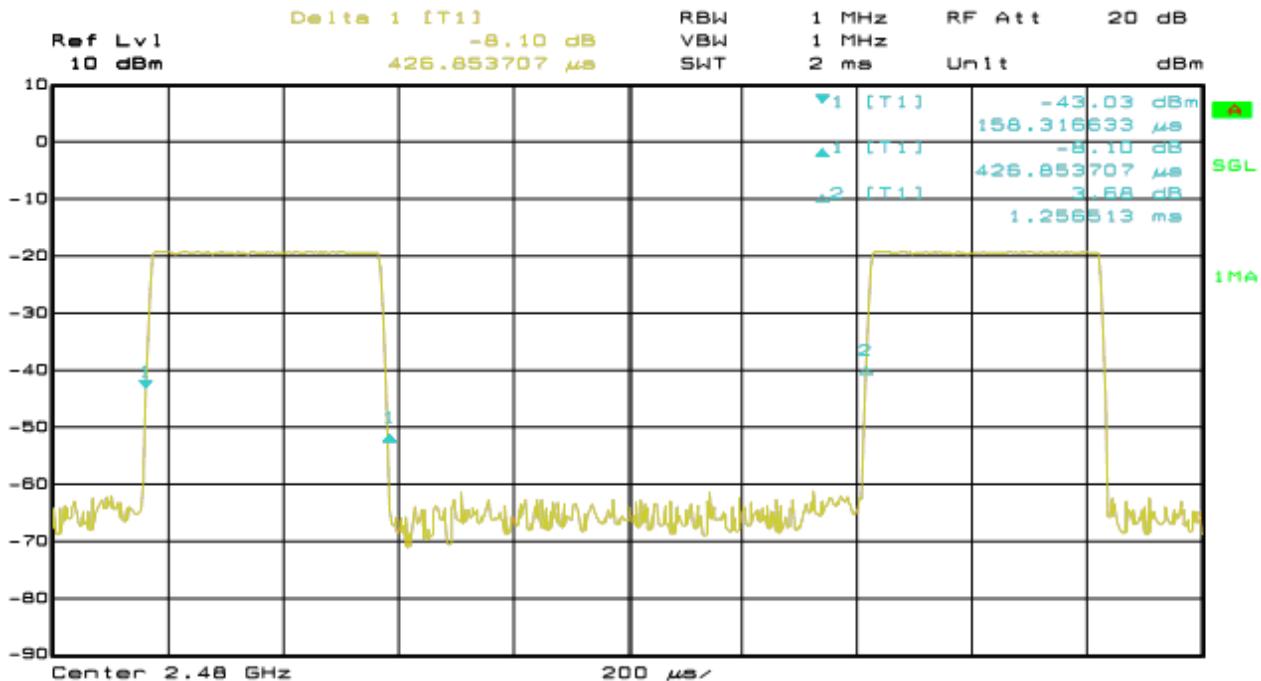
Low channel: DH1



Middle channel: DH1



High channel: DH1



11.0 Band age Measurement

11.1 Test Equipment

Please refer to the Section 2

11.2 Test specification:

Environmental conditions: Temperature 24° C Humidity: 52% Atmospheric pressure: 103kPa

11.3 Test Procedure

For bandage test, the spectrum set as follows: RBW=VBW=100 kHz. A conducted measure method is used

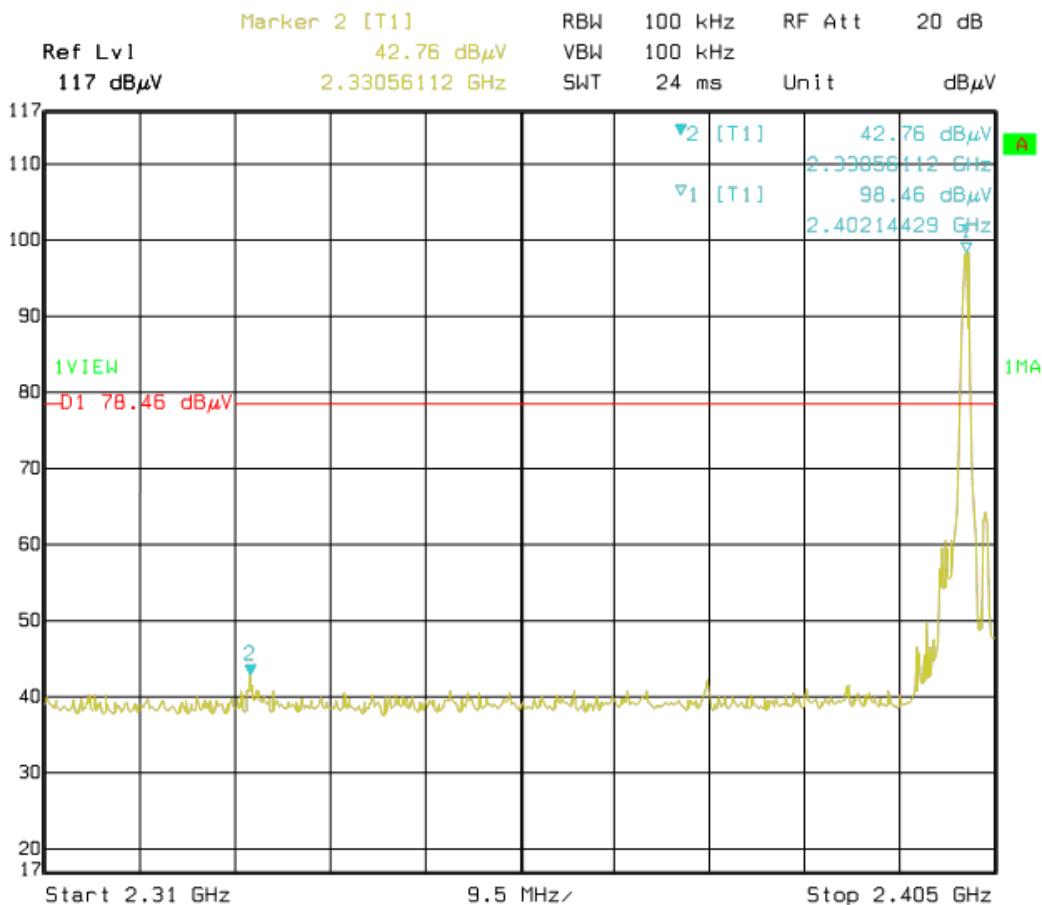
For signals allocated in the restricted bands above and below the 2.4-2.483GHz, a radiated measurement is made (Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector)

11.4 Limit

Below -20 dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

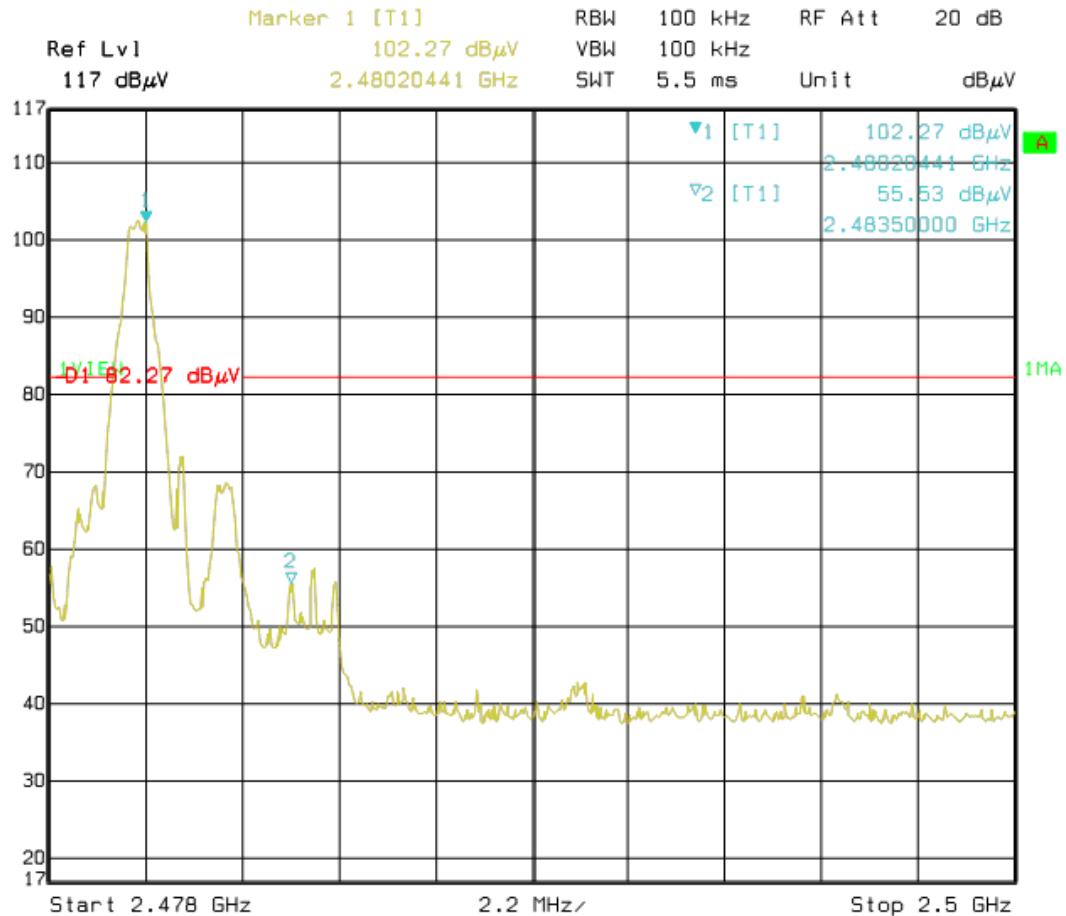
Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

EUT operation mode: Keep transmitting in low channel



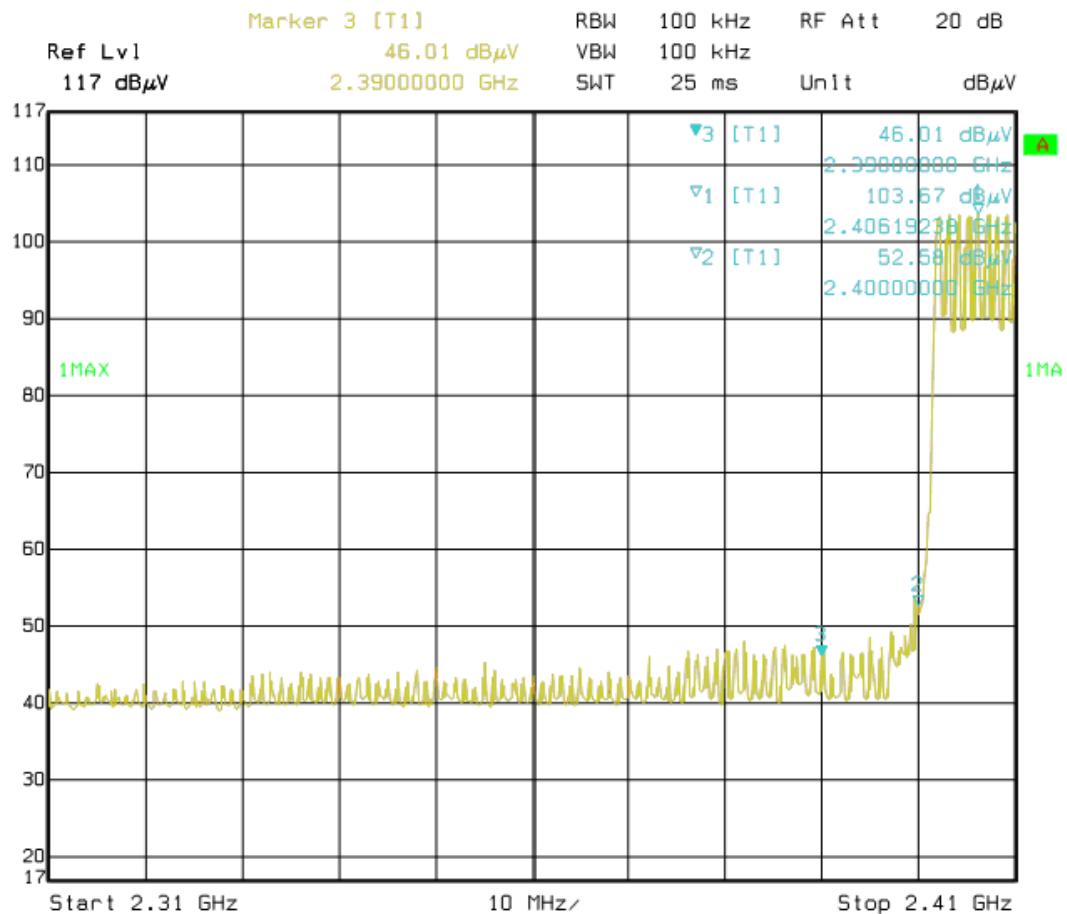
Remark: 1) The radiated measurement was made in horizontal and vertical polarity;
 2) The maximum emission was 44.65dB μ V at 2330.5 MHz, which is more than 10 dB below the limit.
 3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

EUT operation mode: Keep transmitting in high channel



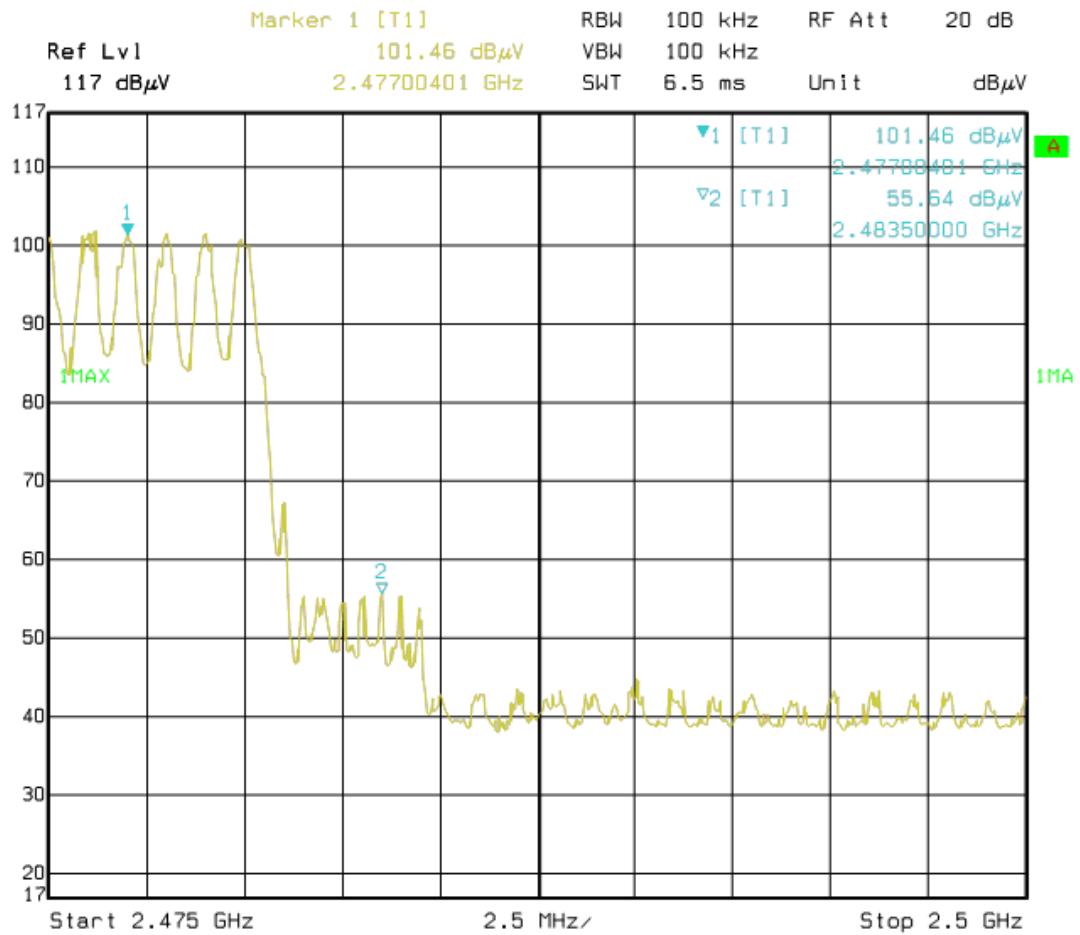
Remark: 1) The radiated measurement was made in horizontal and vertical polarity;
 2) The maximum emission was 58.52dB μ V at 2484.1 MHz, which is more than 10 dB below the limit;
 AV measurement is conducted, and the maximum emission is more than 10 dB below the limit.
 3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

EUT operation mode: Keep hopping



Remark: 1) The radiated measurement was made in horizontal and vertical polarity;
2) The maximum emission was 48.25dB μ V at 2390 MHz, which is more than 10 dB below the limit;
3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

EUT operation mode: Keep hopping



Remark: 1) The radiated measurement was made in horizontal and vertical polarity;
 2) The maximum emission was 48.53dB μ V at 2483.5 MHz, which is more than 10 dB below the limit;
 3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

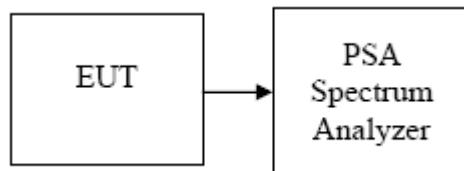
12.0 Spurious Emission Test

12.1 Conducted Measurement

12.1.1 Limit:

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)).

12.1.2 Test configuration



12.1.3 Test procedure

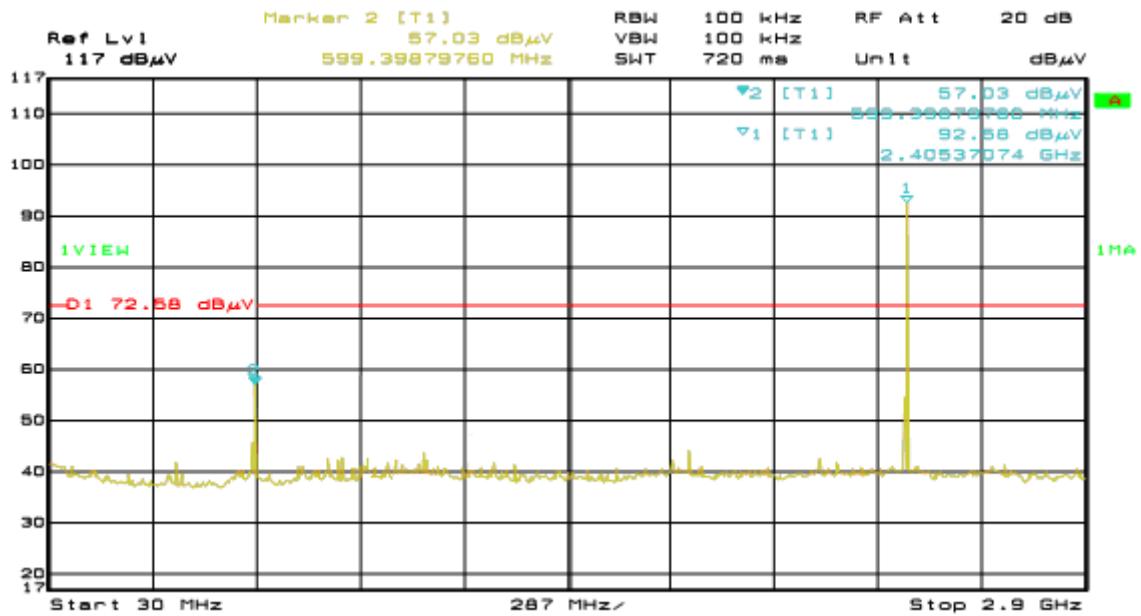
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 100 KHz.

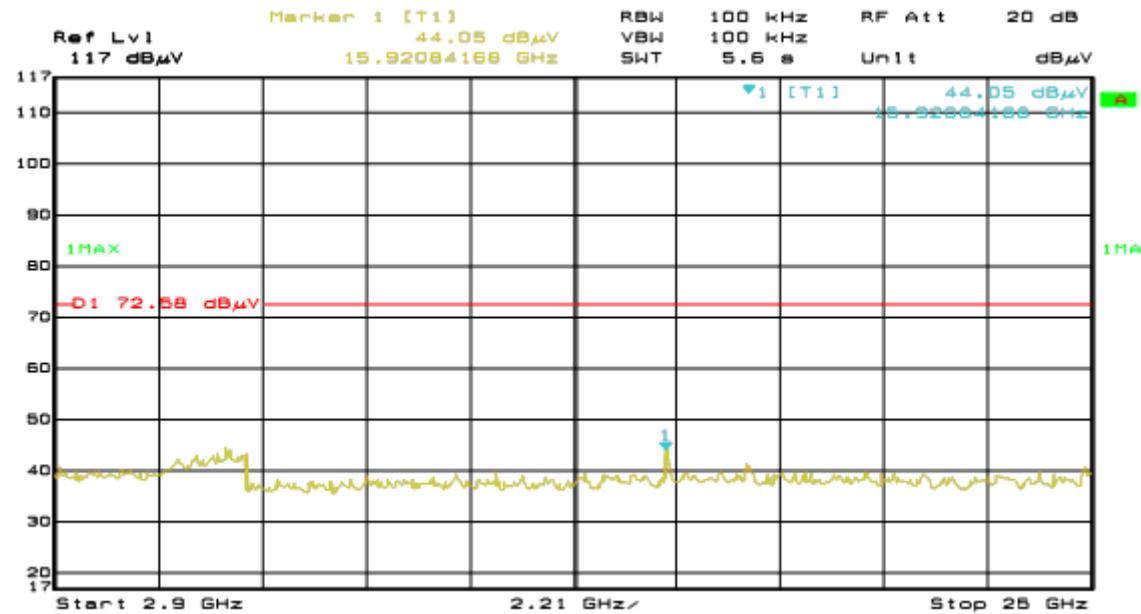
Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

12.1.4 Test Plots:

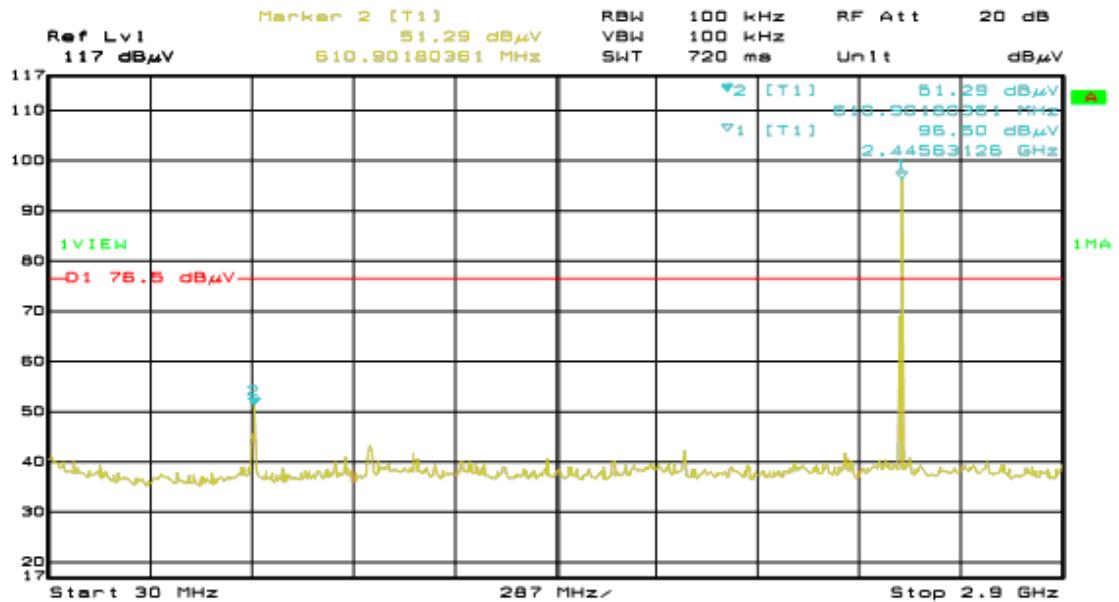
Low channel: 30MHz-2.9GHz



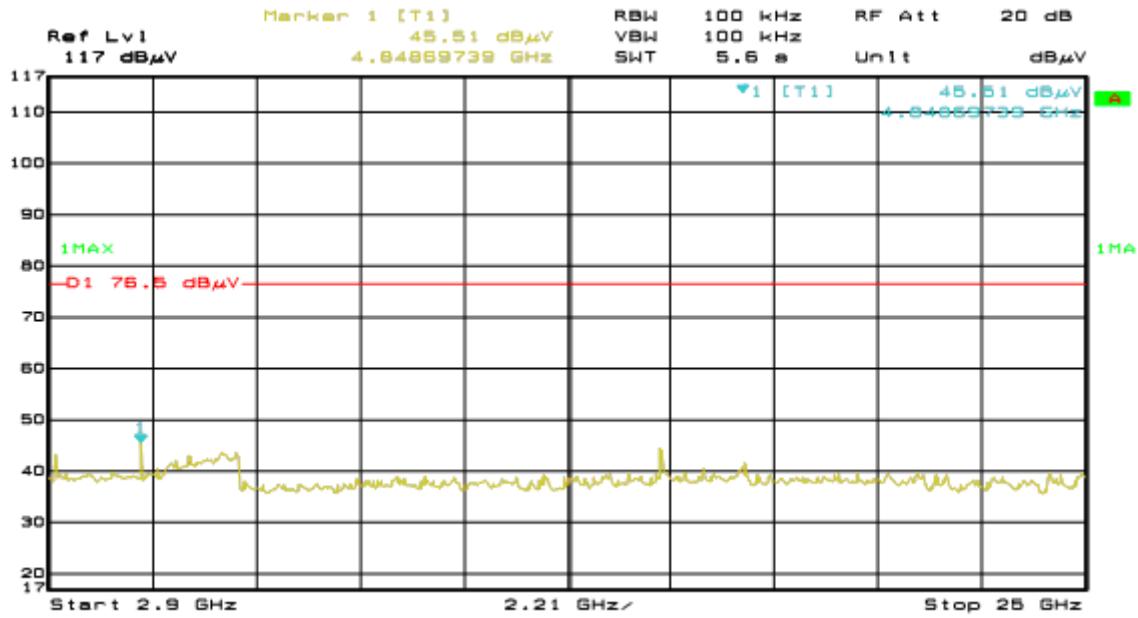
2.9GHz-25GHz



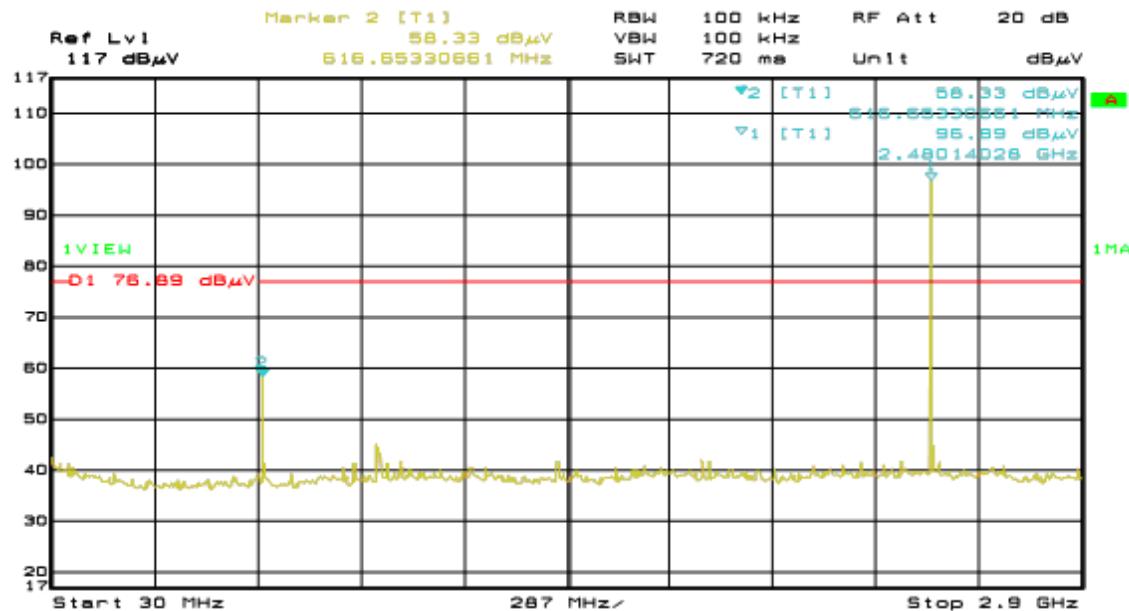
Middle channel: 30MHz-2.9GHz



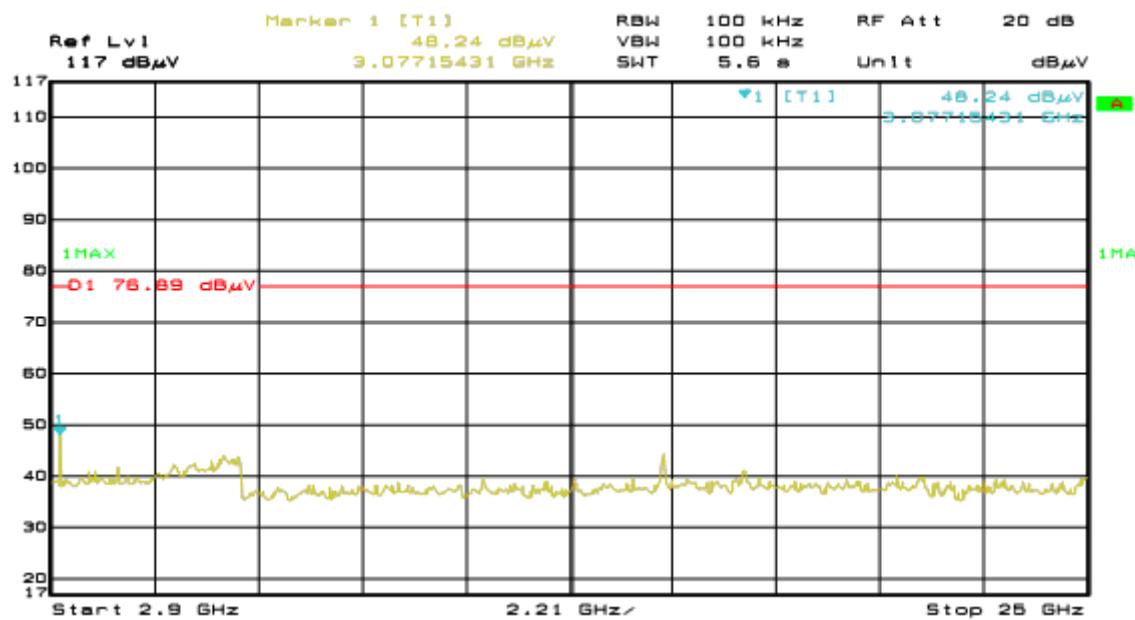
2.9GHz-25GHz



High channel: 30MHz-2.9GHz



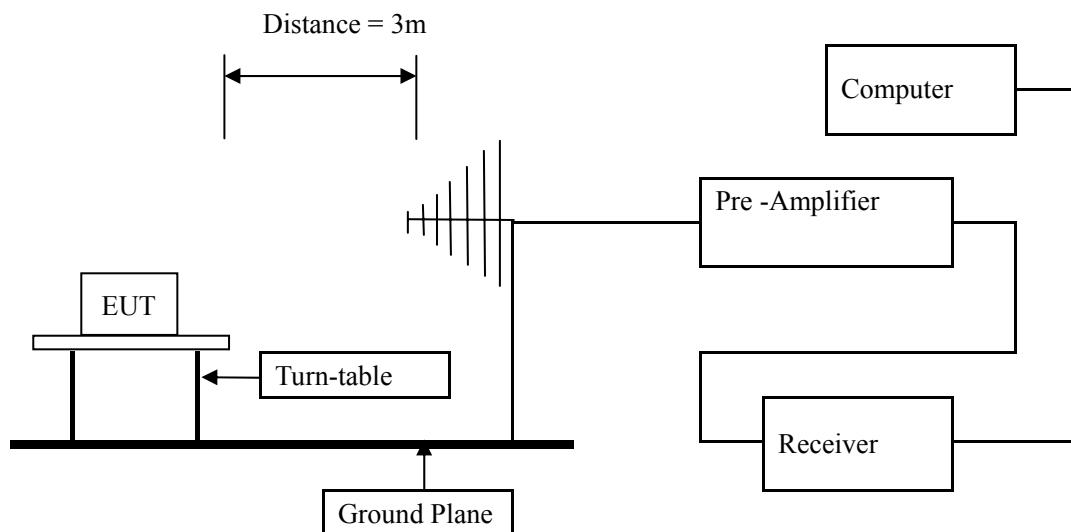
2.9GHz-25GHz



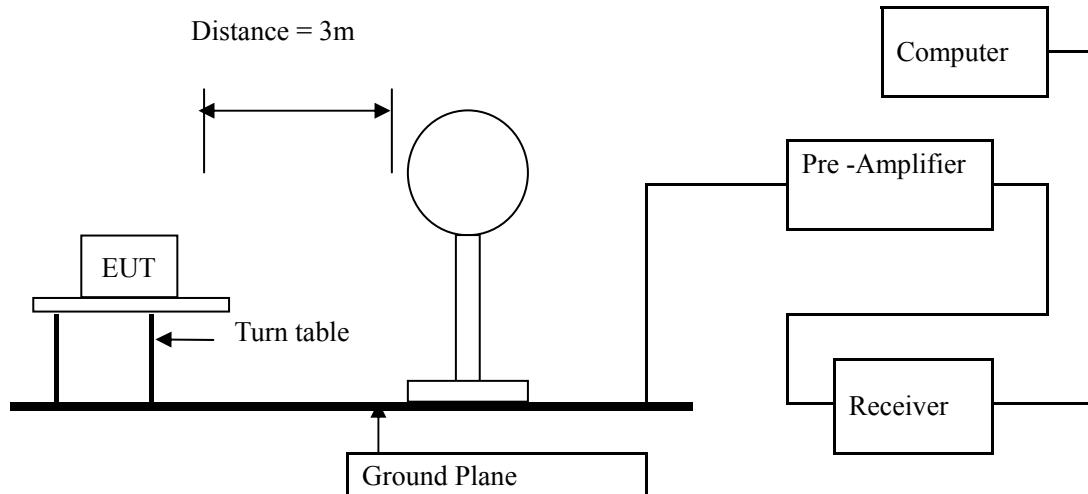
12.2 Radiated emissions

12.2.1 Test Method and test Procedure:

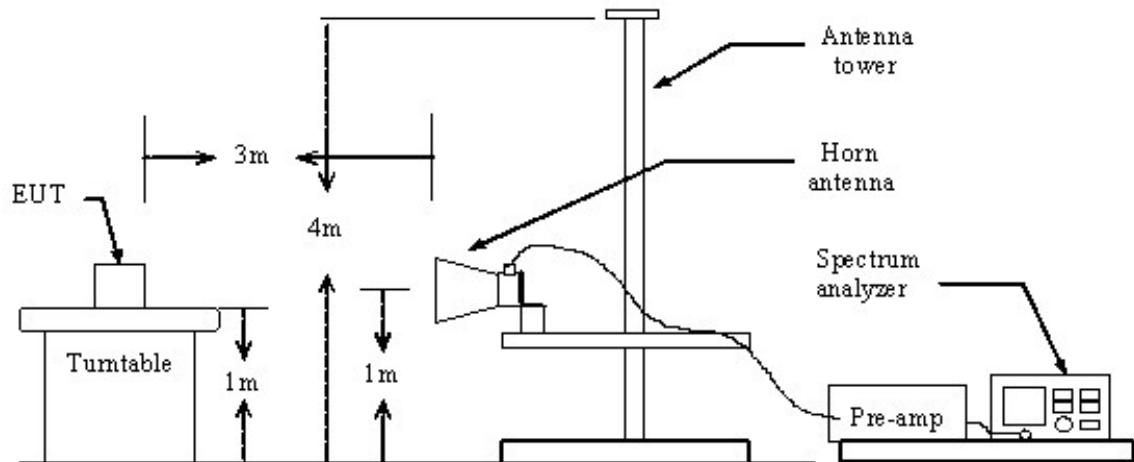
- (1) The EUT was tested according to ANSI C63.10 –2009. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2009.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

Block diagram of Test setup for frequency below 30MHz



Block diagram of Test setup for frequency above 1GHz



12.2.2 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009

12.2.3 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
0.009-0.490	3	$20\log 2400/F$ (kHz) + 80
0.490-1.705	3	$20\log 24000/F$ (kHz) + 40
1.705-30	3	$20\log 30 + 40$
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = $20 \log$ RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
4. This is a handheld device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
5. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz. As to 1G-25G, the final emission level got using PK and AV detector.
6. If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula $Ld1 = Ld2 * (d2/d1)$

12.2.4 Photo documentation of the test set-up

Please refer to the Section 16

12.2.5 Test Equipment:

Please refer to the Section 2

12.2.6 Test specification:

Environmental conditions: Temperature 24° C Humidity: 49% Atmospheric pressure: 103kPa

12.2.7 Test result

A Radiated Emission (9 kHz----30 MHz)

Note: 1) Emission Level=Reading+ Cable loss+ Antenna factor-Amp factor
2) The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

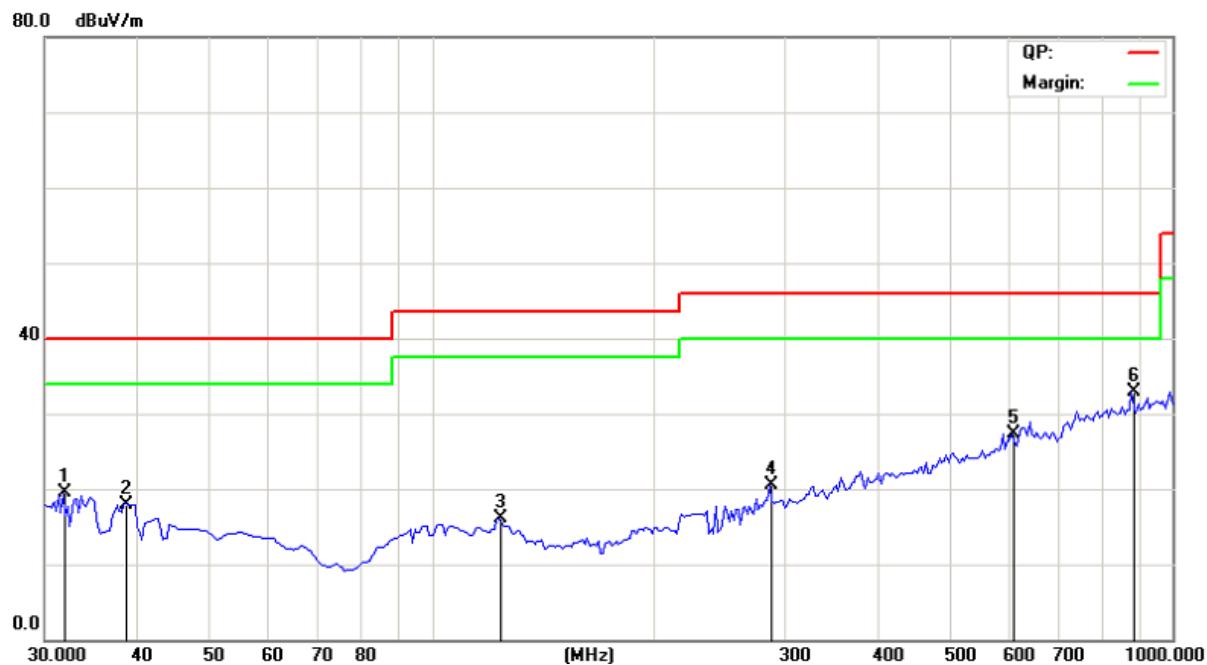
Result: Pass

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
--	--	V	--
--	--	H	--
--	--	V	--
--	--	H	--

B. General Radiated Emissions Data**Radiated Emission In Horizontal (30MHz----1000MHz)**

Please refer to following diagram for individual

High channel: 2480 MHz

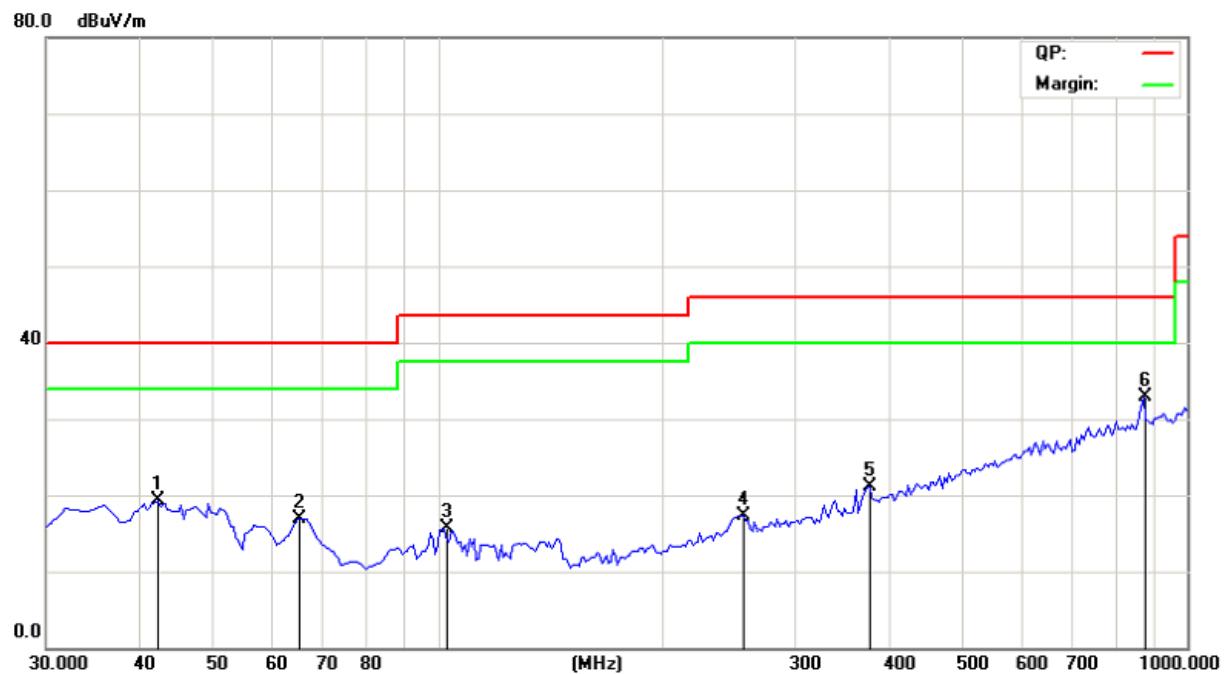


Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
31.943	19.59	H	40.00
38.635	18.00	H	40.00
123.306	16.11	H	43.50
286.593	20.45	H	46.00
609.278	27.35	H	46.00
883.366	32.91	H	46.00

Radiated Emission In Vertical (30MHz----1000MHz)

Please refer to following diagram for individual

High channel: 2480 MHz



Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
42.331	19.24	V	40.00
64.990	16.98	V	40.00
101.923	15.65	V	43.50
255.491	17.40	V	46.00
376.012	21.20	V	46.00
879.479	32.83	V	46.00

Note: Measurements were conducted in all three channels (high, middle, low), and the worst case (high channel) was submitted only.

C Fundamental & Harmonics Radiated Emission Data (1000MHz-25000MHz)

Low channel: 2402 MHz									
Freq. (MHz)	Ant. Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor (dB)	Emission Level		Peak limit (dBuV/m)	AV limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
1299.80	H	49.73	---	-4.20	45.53	---	74.00	54.00	-8.47
4804.00	H	50.36	---	-3.94	46.42	---	74.00	54.00	-7.58
5600.00	H	49.72	---	-2.83	46.89	---	74.00	54.00	-7.11
7206.00	H	46.59	---	0.52	47.11	---	74.00	54.00	-6.89
16814.00	H	40.90	---	6.73	47.63	---	74.00	54.00	-6.37
24020.00	H	39.94	---	8.11	48.05	---	74.00	54.00	-5.95
<hr/>									
1310.00	V	49.23	---	-4.25	44.98	---	74.00	54.00	-9.02
4804.00	V	49.25	---	-3.94	45.31	---	74.00	54.00	-8.69
5624.60	V	49.60	---	-2.87	46.73	---	74.00	54.00	-7.27
7206.00	V	45.70	---	0.52	46.22	---	74.00	54.00	-7.78
16814.00	V	39.55	---	6.73	46.28	---	74.00	54.00	-7.72
24020.00	V	40.71	---	8.11	48.82	---	74.00	54.00	-5.18

Notes:

1. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequencies above 1GHz were made with peak detector and Average (AV) detector.
3. Average test would be performed if the peak readings were greater than the average limit.
4. Data of measurement shown “---” in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
5. Emission Level=Peak (AV) Reading + Correction Factor;
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
6. Margin (dB) = Emission Level (Peak) (dBuV/m)-Average limit (dBuV/m)

Middle channel: 2441 MHz									
Freq. (MHz)	Ant. Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor (dB)	Emission Level		Peak limit (dBuV/m)	AV limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
1299.80	H	49.78	---	-4.20	45.58	---	74.00	54.00	-8.42
4882.00	H	49.69	---	-3.98	45.71	---	74.00	54.00	-8.29
5600.00	H	50.26	---	-2.83	47.43	---	74.00	54.00	-6.57
7323.00	H	47.06	---	0.57	47.63	---	74.00	54.00	-6.37
17087.00	H	41.49	---	6.79	48.28	---	74.00	54.00	-5.72
24410.00	H	40.99	---	8.16	49.15	---	74.00	54.00	-4.85
<hr/>									
1310.00	V	49.56	---	-4.25	45.31	---	74.00	54.00	-8.69
4804.00	V	49.67	---	-3.98	45.69	---	74.00	54.00	-8.31
5624.60	V	50.28	---	-2.87	47.41	---	74.00	54.00	-6.59
7206.00	V	47.18	---	0.57	47.75	---	74.00	54.00	-6.25
17087.00	V	40.09	---	6.79	46.88	---	74.00	54.00	-7.12
24410.00	V	39.44	---	8.16	47.60	---	74.00	54.00	-6.40

Notes:

1. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequencies above 1GHz were made with peak detector and Average (AV) detector.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement shown “---” in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
5. Emission Level=Peak (AV) Reading + Correction Factor;
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
6. Margin (dB) = Emission Level (Peak) (dBuV/m)-Average limit (dBuV/m)

High channel: 2480 MHz									
Freq. (MHz)	Ant. Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor (dB)	Emission Level		Peak limit (dBuV/m)	AV limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
1299.80	H	49.78	---	-4.20	45.58	---	74.00	54.00	-8.42
4960.00	H	49.69	---	-3.98	45.71	---	74.00	54.00	-8.29
5600.00	H	50.26	---	-2.83	47.43	---	74.00	54.00	-6.57
7440.00	H	47.06	---	0.57	47.63	---	74.00	54.00	-6.37
17360.00	H	41.49	---	6.79	48.28	---	74.00	54.00	-5.72
24800.00	H	40.99	---	8.16	49.15	---	74.00	54.00	-4.85
<hr/>									
1310.00	V	49.56	---	-4.25	45.31	---	74.00	54.00	-8.69
4804.00	V	49.67	---	-3.98	45.69	---	74.00	54.00	-8.31
5624.60	V	50.28	---	-2.87	47.41	---	74.00	54.00	-6.59
7440.00	V	47.18	---	0.57	47.75	---	74.00	54.00	-6.25
17360.00	V	40.09	---	6.79	46.88	---	74.00	54.00	-7.12
24800.00	V	39.44	---	8.16	47.60	---	74.00	54.00	-6.40

Notes: 1. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequencies above 1GHz were made with peak detector and Average (AV) detector.

3. Average test would be performed if the peak result were greater than the average limit.

4. Data of measurement shown “---” in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

5. Emission Level=Peak (AV) Reading + Correction Factor;
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

6. Margin (dB) = Emission Level (Peak) (dBuV/m)-Average limit (dBuV/m)

13.0 Antenna Requirement

13.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

13.2 Antenna Specification

According to the manufacturer declared, the EUT has a PCB printed antenna; the directional gain of antenna is 2.0 dBi, and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

14.0 Maximum Permissible Exposure

Applicable Standard

According to §1.1307(b)(5), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline. This is a Portable device.

Remark: 1. The maximum output power is -2.49 dBm (0.564mW) at 2480MHz,(with 1.58 numeric antenna gain.)
2. DXX device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20cm, even if the calculation indicate that the MPE distance would be lesser.

Calculation

$$\text{Given } E = \sqrt{\frac{30 \times P \times G}{d}} \quad \& \quad S = \frac{E^2}{3770}$$

Where E = Field Strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts / square centimeter

Maximum Permissible Exposure

EUT output power=0.564mW

Numeric Antenna gain=1.58

Substituting the MPE safe distance using $d=20\text{cm}$ into above equation.

Yields:

$$S=0.000199*P*G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW/cm^2

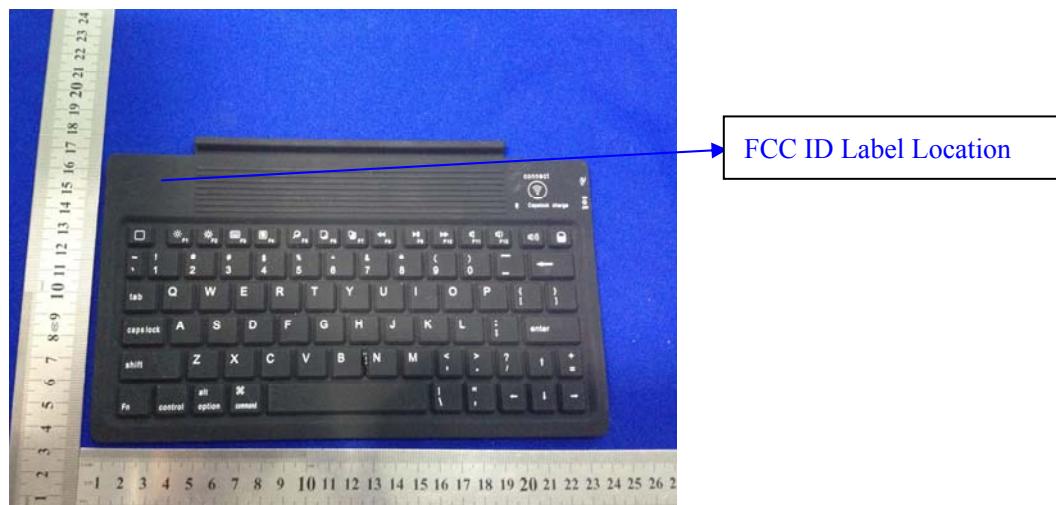
$$\rightarrow \text{Power density}=0.000177\text{mW}/\text{cm}^2$$

(For mobile or fixed location transmitters, the maximum power density is $1.0 \text{ mW}/\text{cm}^2$ even if the calculation indicates that the power density would be larger.)

15.0 FCC ID Label**FCC ID: PI6LY08**

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:

16.0 Photos of testing

16.1 Conducted test View--



16.2 Radiated emission test view



17.0 Photos for the EUT

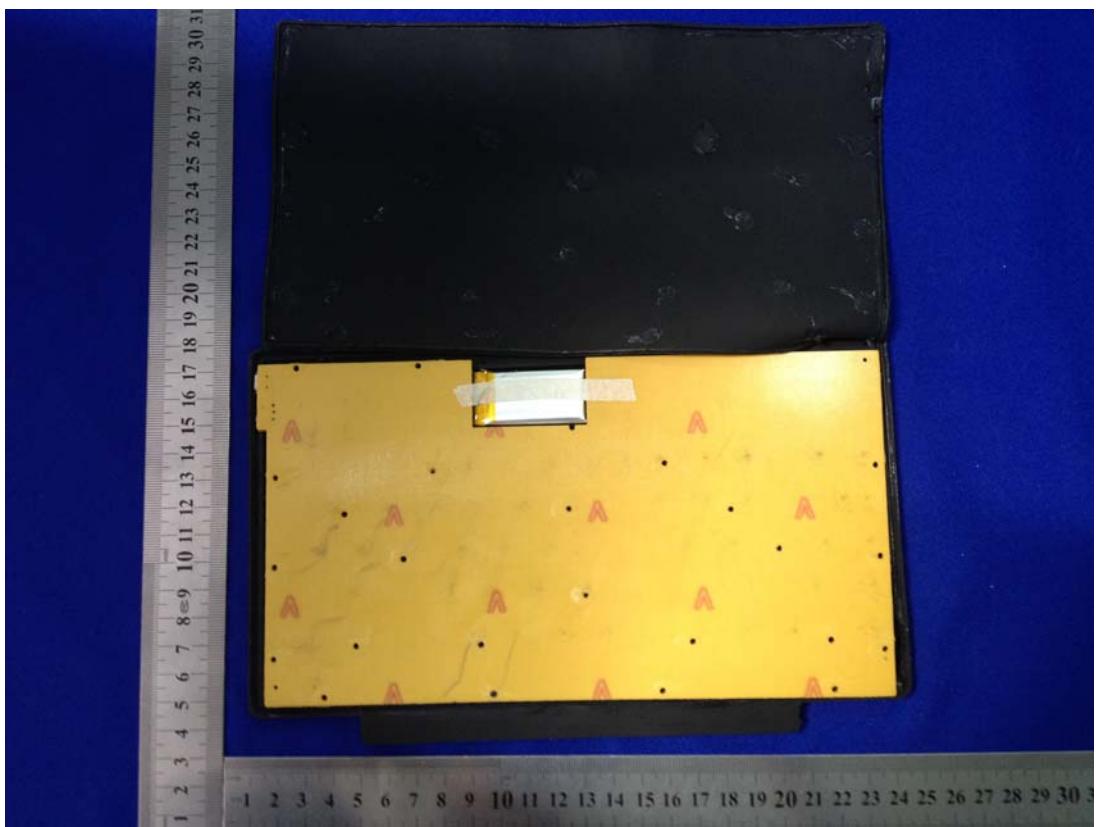
Outside View of the EUT



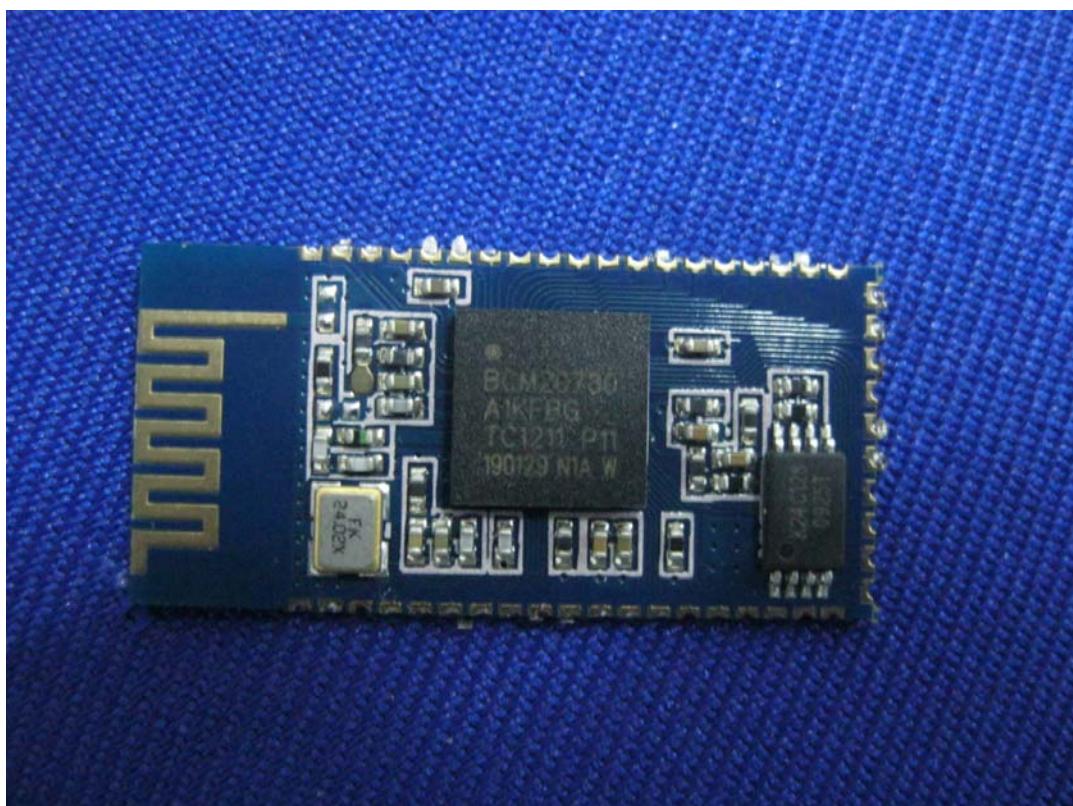
Outside View of the EUT



Inside View of the EUT



Inside View of the EUT



--End of the report--