ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No.	**: E11NR-053**
AGR No.	**: A11OA-097**
Applicant	**: Gaon-Int Co., LTD.**
Address	**: Incheon IT Tower Suite 1501, 592-5, Dohwa1-dong, Nam-gu, Incheon, Korea**
Manufacturer	**: RUIHUA ELECTRONICS FACTORY**
Address	**: Xianxixin Industrial Zone, Shatou Village, Changan Town, Dongguan City, Guangdong Province, China**
Type of Equipment	**: FM Transmitter with Bluetooth module**
FCC ID.	**: UP4-GBT-T200**
Model Name	**: GBT-T200**
Serial number	**: N/A**
Total page of Report	**: 38 pages (including this page)**
Date of Incoming	**: November 14, 2011**
Date of issue	**: November 28, 2011**

SUMMARY

The equipment complies with the regulation; **FCC Part 15 Subpart C Section 15.247.**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by: Ki-Hong, Nam / Senior Engineer
EMC/RF Center
ONETECH Corp.

Approved by: Y. K. Kwon / Exe. Managing Director
EMC/RF Center
ONETECH Corp.

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EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-765-8289, FAX: 82-31-766-2904)

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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
E11NR-053	November 28, 2011	Initial Issue	All

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1. VERIFICATION OF COMPLIANCE

APPLICANT	: Gaon-Int Co., LTD.
ADDRESS	: Incheon IT Tower Suite 1501, 592-5, Dohwa1-dong, Nam-gu, Incheon, Korea
CONTACT PERSON	: Mr. D.S, Ha / General Manager
TELEPHONE NO	: +82-32-246-1800
FCC ID	: UP4-GBT-T200
MODEL NAME	: GBT-T200
BRAND NAME	: Sound-Fly VIEW
SERIAL NUMBER	: N/A
DATE	: November 28, 2011

EQUIPMENT CLASS	***DSS – PART 15 SPREAD SPECTRUM TRANSMITTER***
KIND OF EQUIPMENT	FM Transmitter with Bluetooth module
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.4: 2009
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None
FINAL TEST WAS CONDUCTED ON	3 m open area test site

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (1)	Carrier Frequency Separation	Met the Limit / PASS
15.247 (a) (1) (iii)	Minimum Number of Hopping Channels	Met the Limit / PASS
15.247 (a) (1) (iii)	Average Time of Occupancy	Met the Limit / PASS
15.247 (b) (1)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (b) (4)	Antenna Gain	Met requirement / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (i)	Radio Frequency Exposure Level	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	N/A (See Note)
15.203	Antenna Requirement	Met requirement / PASS

Note: This test is not performed because the power of the EUT supplies from a car battery.

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 2.1.

2.5 Test Methodology

The radiated testing was performed according to the procedures in ANSI C63.4: 2009 at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. Description details of test facilities were submitted to the Commission on August 21, 2008. (Registration Number: 340658)

3. GENERAL INFORMATION

3.1 Product Description

The Gaon-Int Co., LTD., Model GBT-T200 (referred to as the EUT in this report) is a FM Transmitter with Bluetooth module that has a function of FM transmitter and Bluetooth. This report is for Bluetooth function. And the report for the FM transmitter will be issued by another report. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	FM Transmitter with Bluetooth
TEMPERATURE RANGE	-20 °C ~ +50 °C
OPERATING FREQUENCY	2 402 MHz ~ 2 480 MHz
RF OUTPUT POWER	2.30 dBm
NUMBER OF CHANNEL	79 Channels
MODULATION TYPE	GFSK
ANTENNA	MFR.: F1media Corp., Model No.: F1M26
ANTENNA CONNECTOR TYPE	Internal PCB Antenna
ANTENNA GAIN	-4.44 dBi
LIST OF EACH OSC. OR CRYSTAL. FREQ.(FREQ.>=1 MHz)	8 MHz, 26 MHz and 16.934 4 MHz
NUMBER OF LAYER	2 Layers
EXRERNAL CONNECTOR	Audio In, Aux Out, USB Port(For charging only), SD card Slot

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

4. EUT MODIFICATIONS

-. None

5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	GBT-T200US Rev A	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
GBT-T200	Gaon-Int Co., LTD.	UP4-GBT-T200	FM Transmitter with Bluetooth module (EUT)	-
ORC-200	ORACOM	DoC	MP3 Player	EUT
LG P925	LG	N/A	Mobile phone(For charging)	EUT
N/A	SanDisk	N/A	SD Card	EUT
KY-1050	J.R. Electronics	N/A	Speaker	EUT
DC 12V	N/A	N/A	Battery	EUT

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting and receiving mode is programmed. For final testing, Bluetooth was set at Low Channel (2 402 MHz), Middle Channel (2 441 MHz), and High Channel (2 480 MHz). To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis.

The used Bluetooth module, F1M26, has an EDR function, but this model, GBT-T200, does not use the EDR function. So the test of this function was not performed.

5.4 Configuration of Test System

Line Conducted Test: This test is not performed because the power of the EUT supplies from a car battery.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2009 8.3.1.1 and 13.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 m open area test site.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

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

Antenna Construction:

The transmitter antenna of the EUT is installed inside of the EUT, so no consideration of replacement by the user.

6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
This test is not performed because the power of the EUT supplies from a car battery.	

6.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitter Mode	X

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7. CARRIER FREQUENCY SEPARATION

7.1 20 dB BANDWIDTH

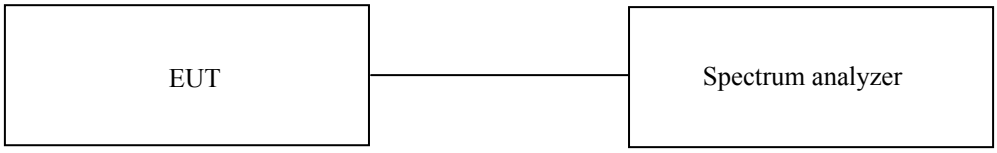
7.1.1 Operating environment

Temperature : 26 °C

Relative humidity : 46 % R.H.

7.1.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 10 kHz, and peak detection was used. The 20 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 20 dB.



7.1.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Aug. 29, 2011(1Y)

All test equipment used is calibrated on a regular basis.

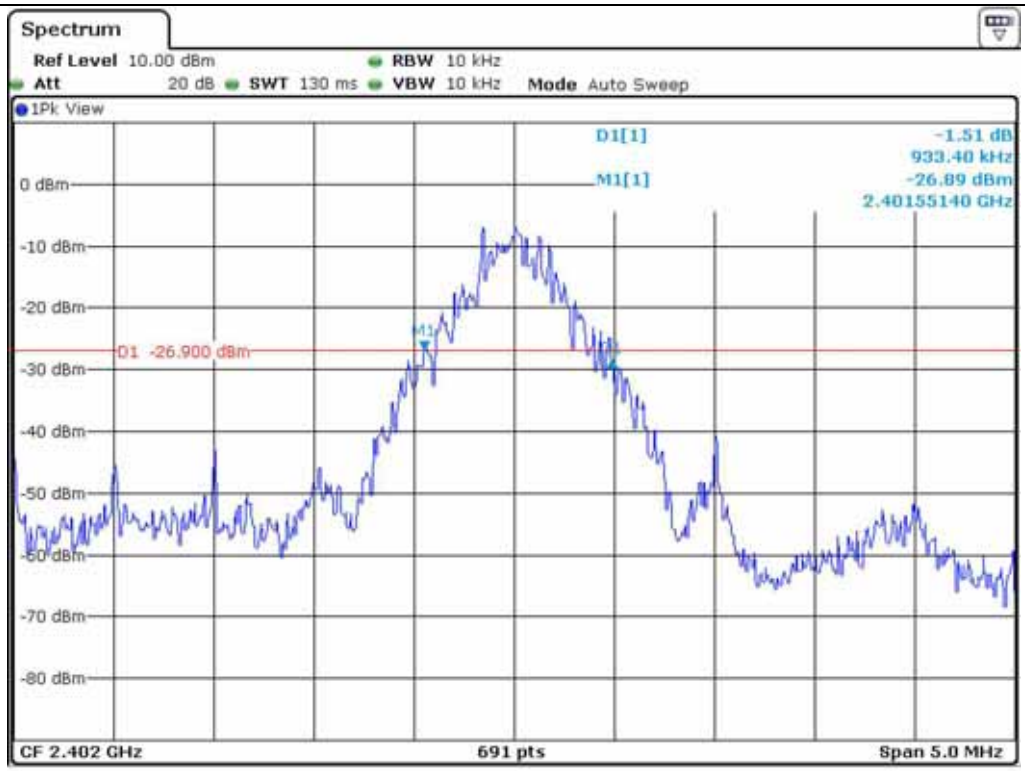
7.1.4 Test data

-. Test Date : November 22, 2011

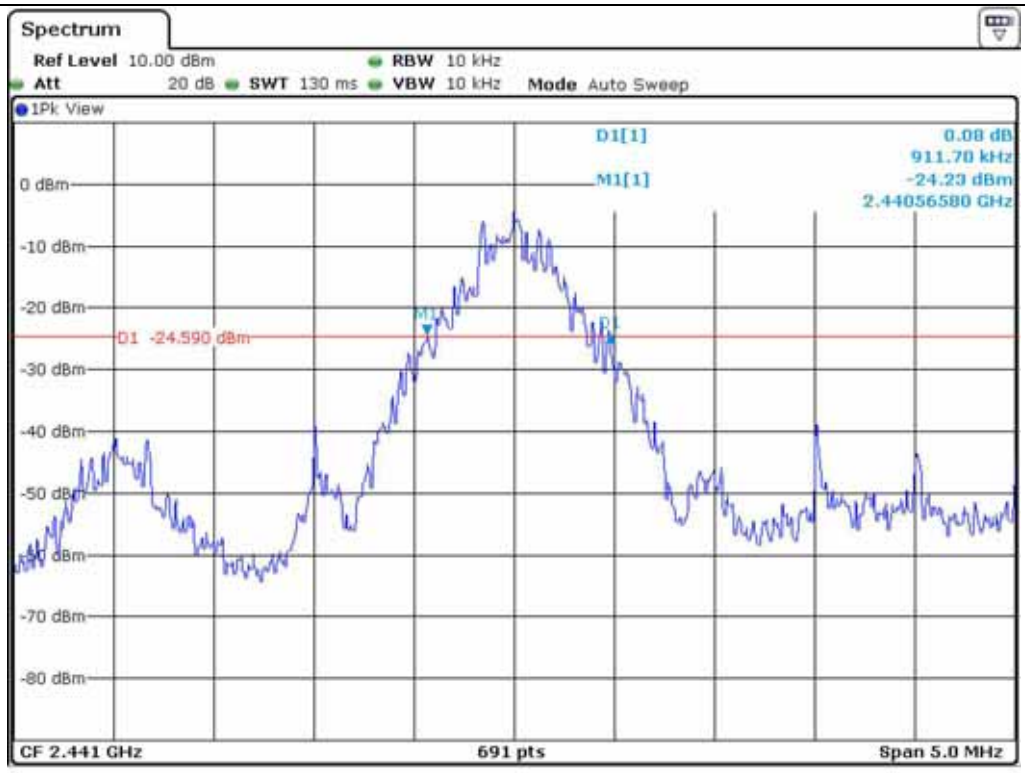
CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (kHz)
Low	2 402	933
Middle	2 441	911
High	2 480	911

Remark: See next page for an overview sweep performed with peak detector.

Tested by: Chang-Uk, Jun / Engineer



Low Channel



Middle Channel

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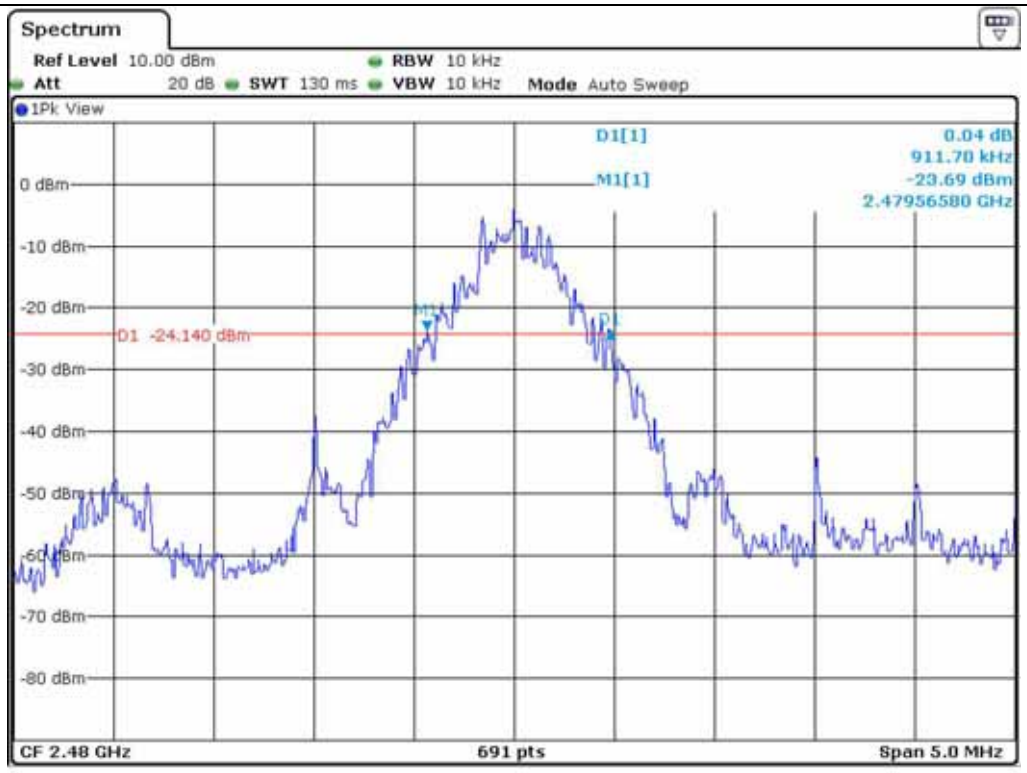

High Channel

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7.2 HOPPING FREQUENCY SEPARATION

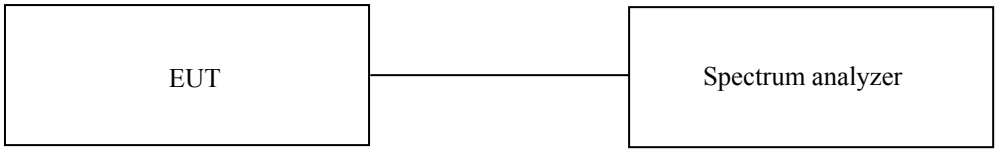
7.2.1 Operating environment

Temperature : 26 °C

Relative humidity : 46 % R.H.

7.2.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The frequency span is set to 10 MHz. The analyzer is set to peak hold then a pseudo-random hopping sequence of the transmitter is captured. The mark delta function was used to measure the frequency separation between two adjacent hopping channels.



7.2.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Aug. 29, 2011(1Y)

All test equipment used is calibrated on a regular basis.

7.2.4 Test data

-. Test Date : November 22, 2011

-. Test Result : Pass

MEASURED VLAUE (kHz)	LIMIT, 20 dB Bandwidth (kHz)	MARGIN (kHz)
999	911	-88

Remark: See next page for an overview sweep performed with peak detector.

Tested by: Chang-Uk, Jun / Engineer

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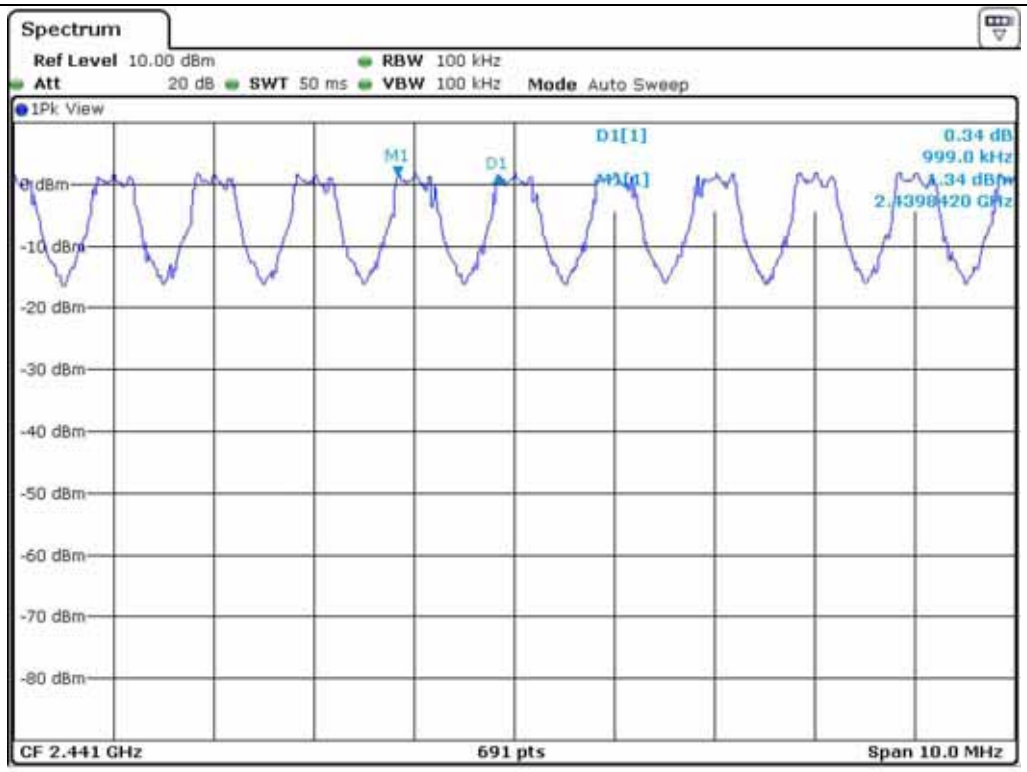

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7.3. NUMBER OF HOPPING CHANNELS

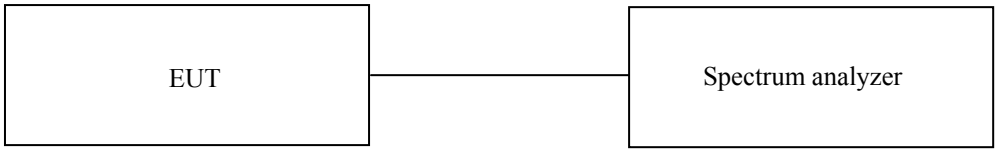
7.3.1 Operating environment

Temperature : 26 °C

Relative humidity : 46 % R.H.

7.3.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The frequency span is set to 100 MHz and the resolution bandwidth is set to 100 kHz. The analyzer is set to peak hold and then complete pseudo-random hopping sequence of the transmitter is captured.



7.3.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Aug. 29, 2011(1Y)

All test equipment used is calibrated on a regular basis.

7.3.4 Test data

-. Test Date : November 22, 2011

-. Test Result : Pass

MEASURED VLAUE (Number)	LIMIT (Number)	MARGIN (Number)
79	At least 15	64

Tested by: Chang-Uk, Jun / Engineer

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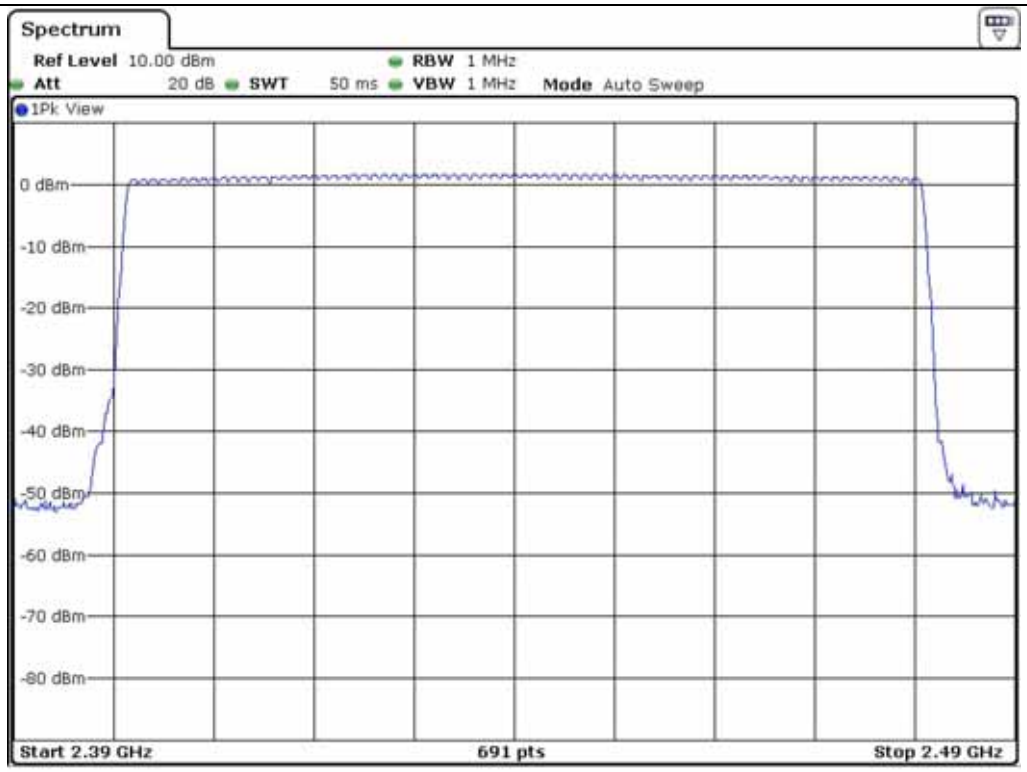

Total number of hopping channel: 28+30+21 = 79

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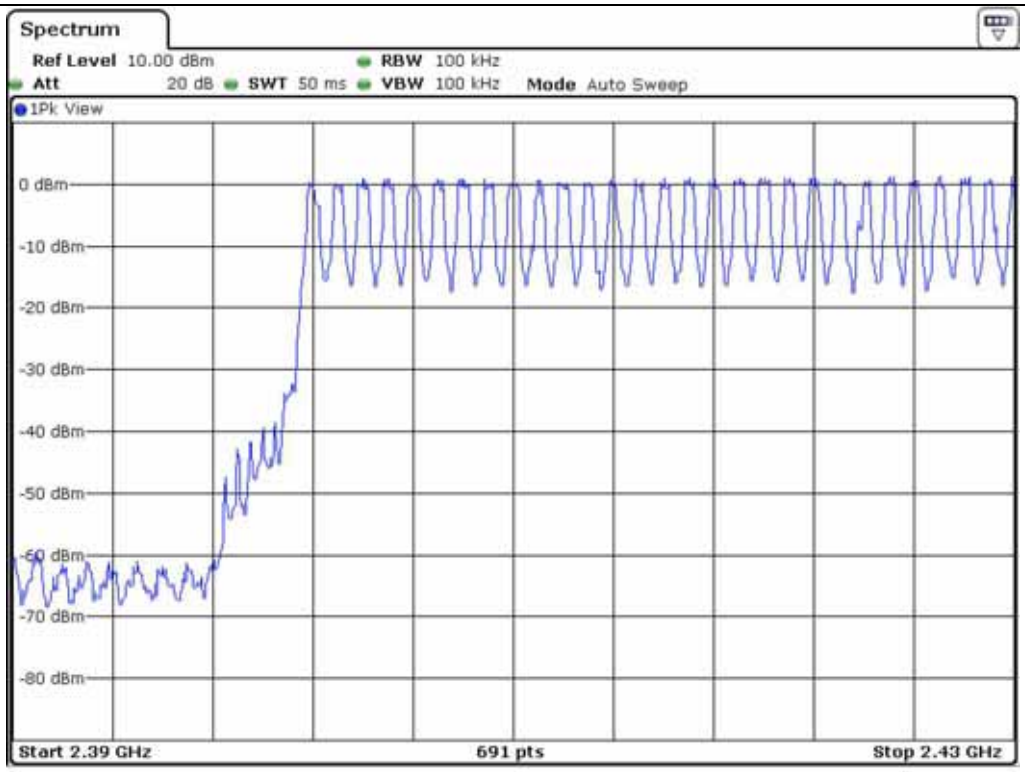
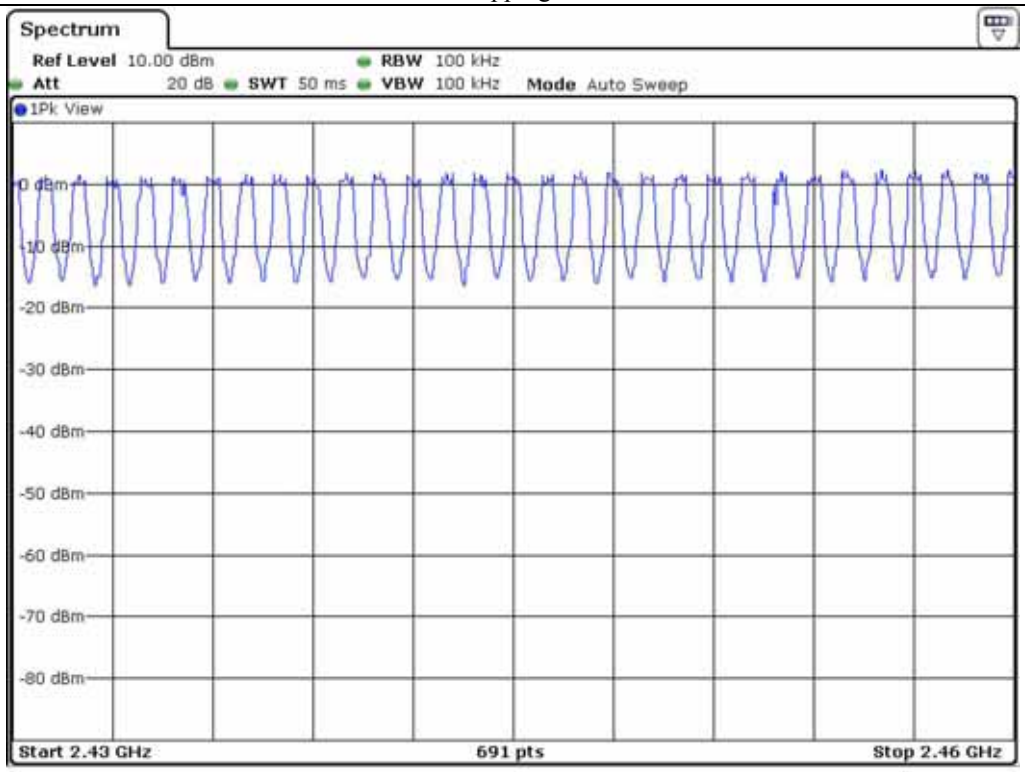


Number of hopping channel: 28



Number of hopping channel: 30

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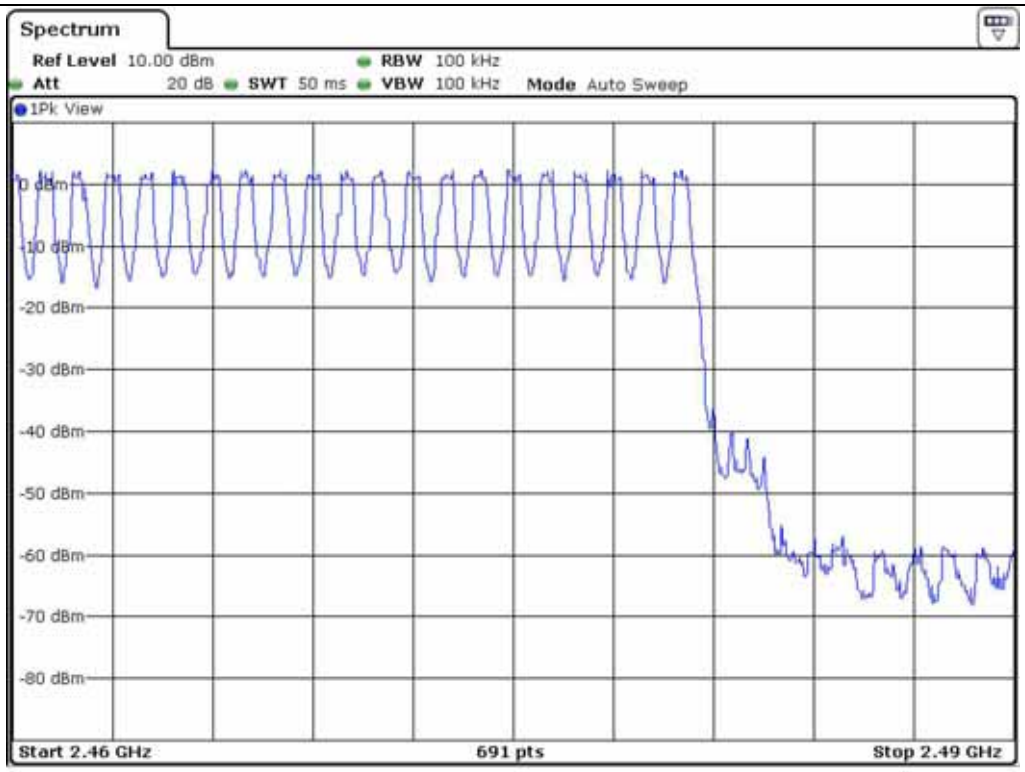


Number of hopping channel: 21

7.4 TIME OF OCCUPANCY

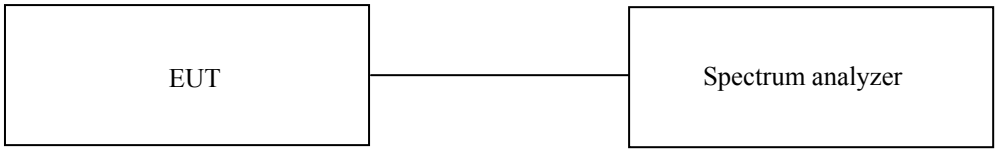
7.4.1 Operating environment

Temperature : 26 °C

Relative humidity : 46 % R.H.

7.4.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The transmitter is set to operate in its normal frequency hopping mode. The center frequency of the spectrum analyzer is set to one of hopping channels near the center of the operating band and span is set to zero Hz. The sweep time is set to display one complete pulse. The mark delta function is used to measure the duration of the pulses.



7.4.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Aug. 29, 2011(1Y)

All test equipment used is calibrated on a regular basis.

7.4.4 Test data

-. Test Date : November 22, 2011

The system makes worst case 1 600 hops per second or 1 time slot has a length of 625 μs with 79 channels.

For DH1 packet type, the EUT needs 1 time slot for transmitting and 1 time slot for receiving and for DH3 packet type, the EUT needs 3 times slots for transmitting and 1 time slot for receiving, and DH5 packet needs 5 times slots for transmitting and 1 time slot for receiving. So The EUT has each channel for 10.13 times per second (= 1 600/2/79) for DH1, and 5.06 times (= 1 600/4/79) for DH3, and 3.38 times (= 1 600/6/79) for DH5.

Packet Type	Pulse Time (ms)	Hops per second with channels	Period Time (ms)	Total Dwell Time (ms)	Limit (ms)	Test Result
DH1	0.391 3	10.13	31.6	125.26	400	PASS
DH3	1.608 7	5.06	31.6	257.22	400	PASS
DH5	2.898 6	3.38	31.6	309.59	400	PASS

Total dwell time is calculated as following.

Total Dwell Time = Pulse time * Hops per second with channels * period time

Tested by: Chang-Uk, Jun / Engineer

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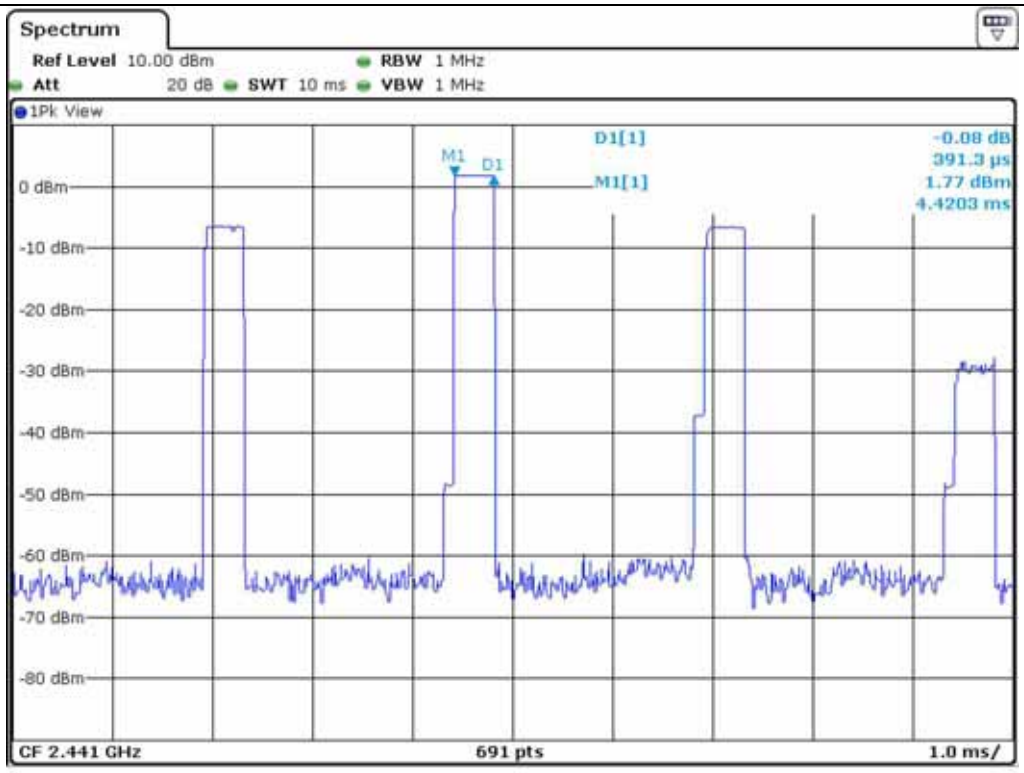
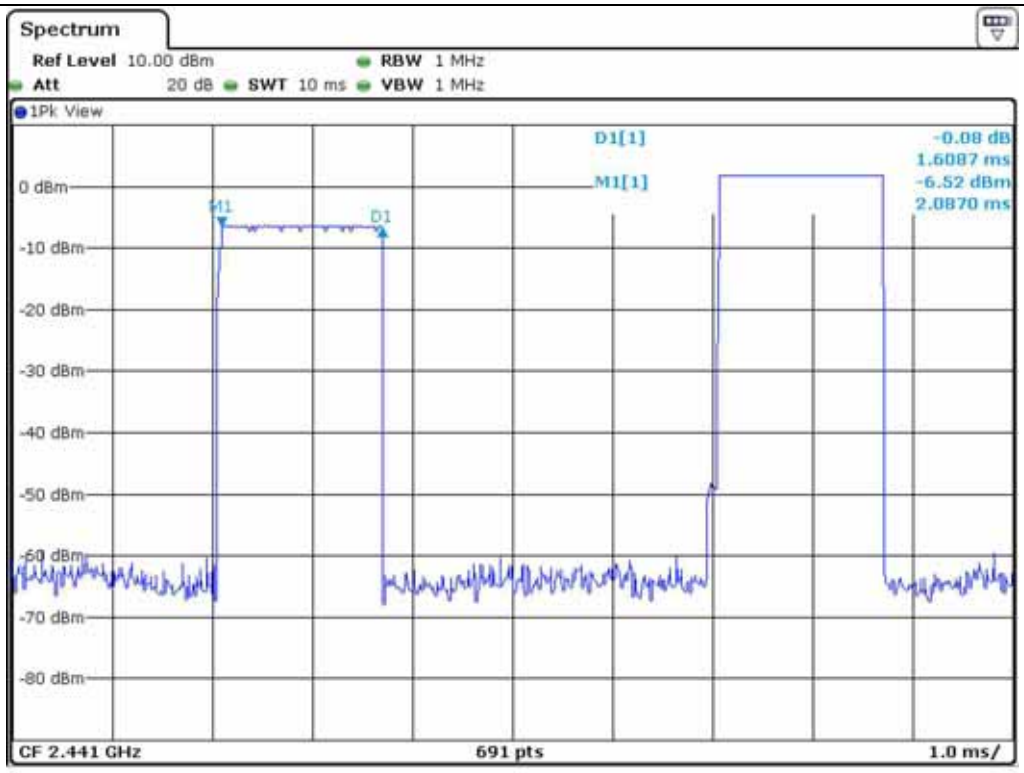


DH1



DH3

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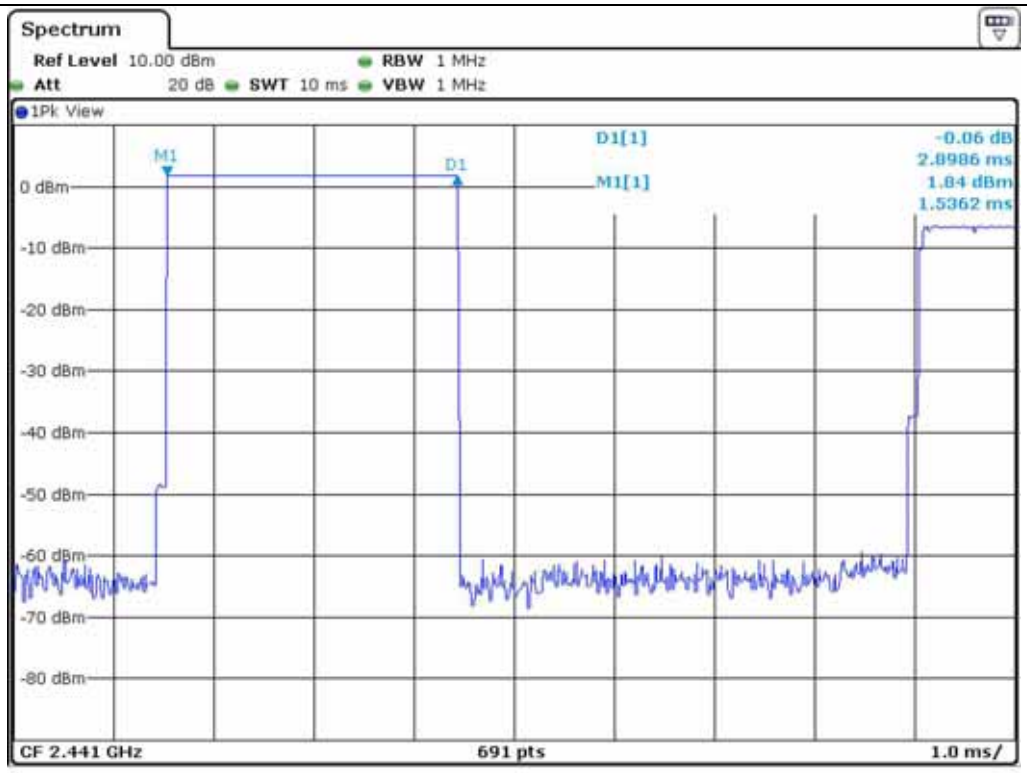

DH5

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7.5 MAXIMUM PEAK OUTPUT POWER

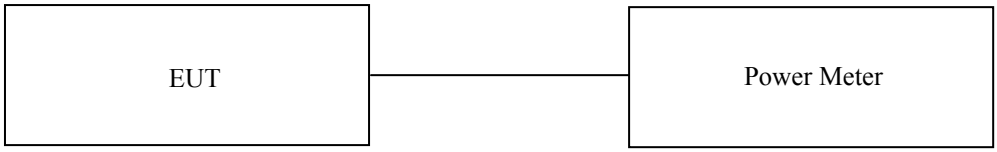
7.5.1 Operating environment

Temperature : 26 °C

Relative humidity : 46 % R.H.

7.5.2 Test set-up

The maximum peak output power was measured with the power meter connected to the antenna output of the EUT. The EUT was operating in transmit mode at the appropriate center frequency.



7.5.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Aug. 29, 2011(1Y)

All test equipment used is calibrated on a regular basis.

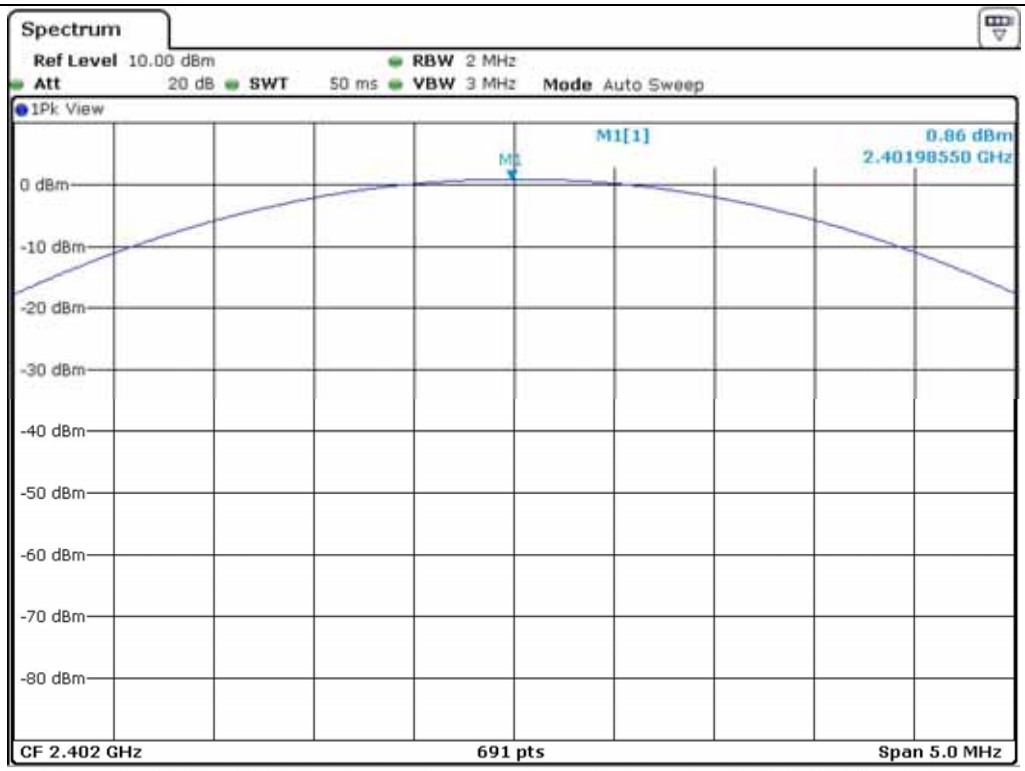
7.5.4 Test data

-. Test Date : November 22, 2011

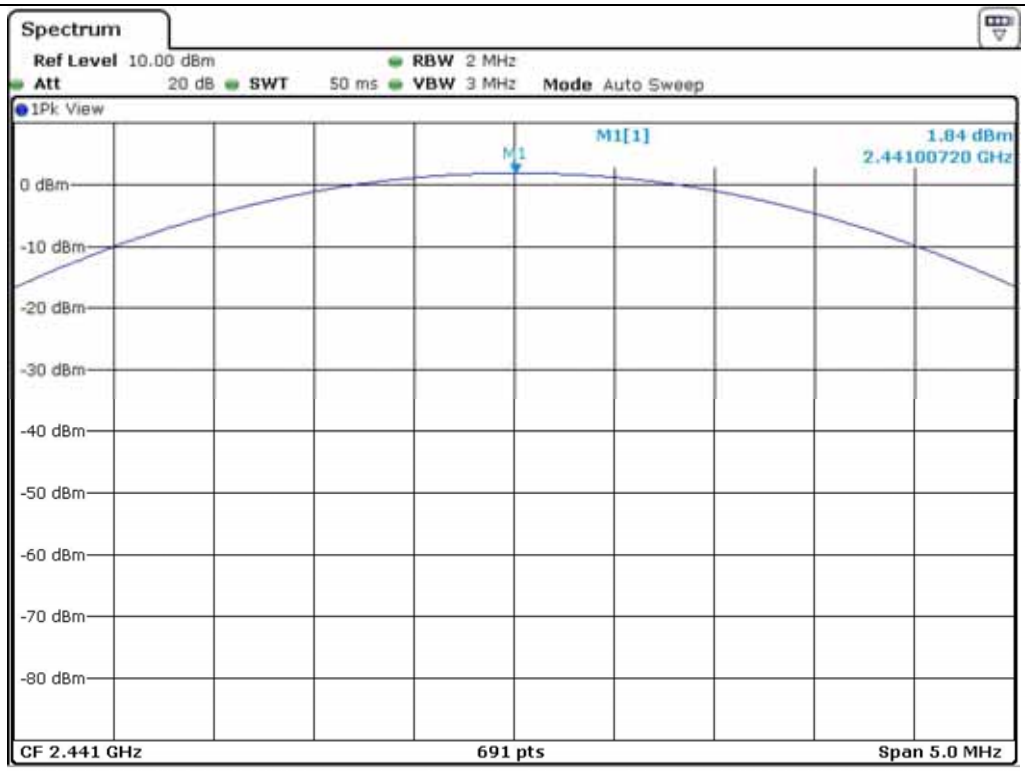
-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402	0.86	30.00	-29.14
Middle	2 441	1.84	30.00	-28.16
High	2 480	2.32	30.00	-27.68

Tested by: Chang-Uk, Jun / Engineer



Low Channel



Middle Channel

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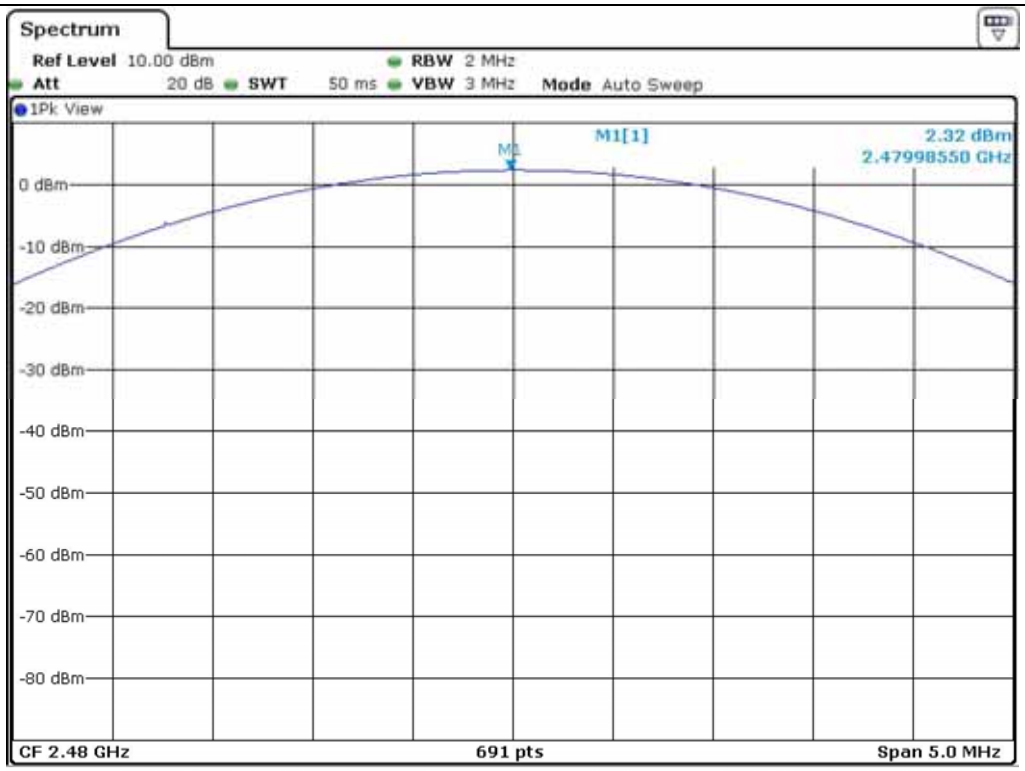

High Channel

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7.6 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

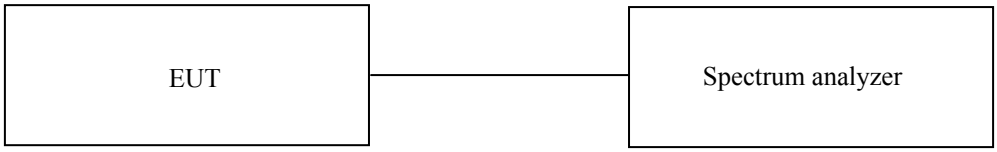
7.6.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 % R.H.

7.6.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.



7.6.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable approximately 0.8 m above the ground plane.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 ms in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

7.6.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Aug. 29, 2011(1Y)
■ -	8447D	Hewlett-Packard	Amplifier	2727A04987	Jun. 11, 2011(1Y)
■ -	83051A	Agilent	Preamplifier	3950M00201	Jun. 11, 2011(1Y)
■ -	F-40-5000-RF	RLC Electronics	Highpass Filter	0425	Jul. 09, 2011(1Y)
■ -	MA220	HD	Turn Table	N/A	N/A
■ -	HD240	HD	Antenna Mast	N/A	N/A
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D294	Jun. 17, 2011(2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jun. 17, 2011 (2Y)
■ -	YSE 500B	YoungShin Eng.	Frequency Converter	950413001	N/A
■ -	ETCR-10	DaeHa	Automatic Voltage Com.	N/A	N/A

All test equipment used is calibrated on a regular basis.

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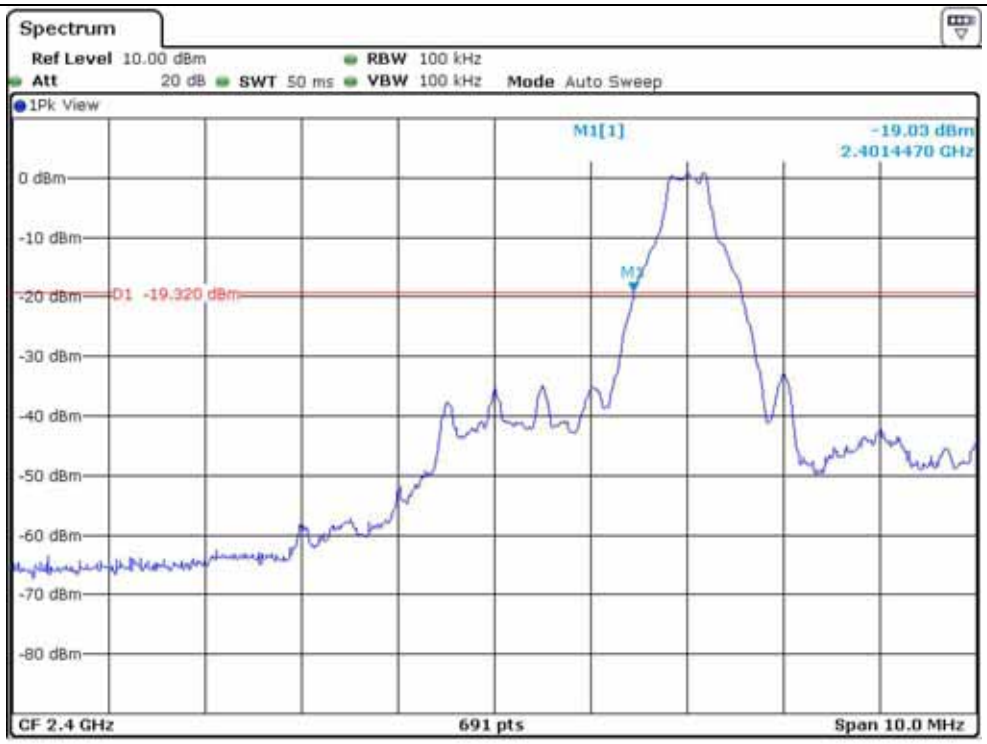
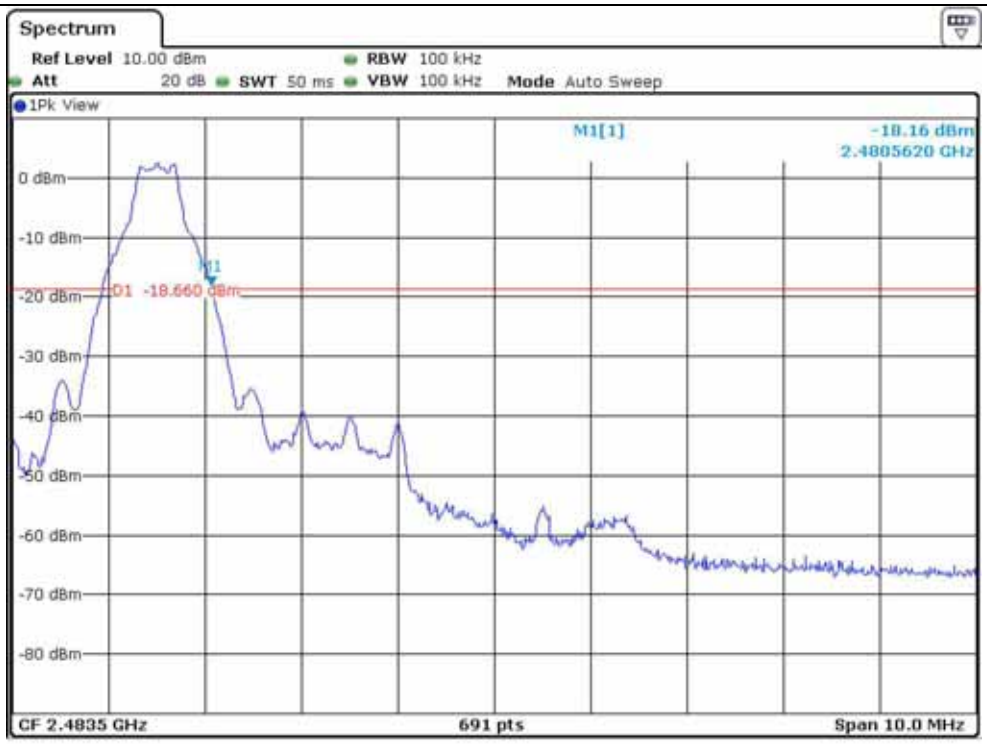
7.6.5. Test data

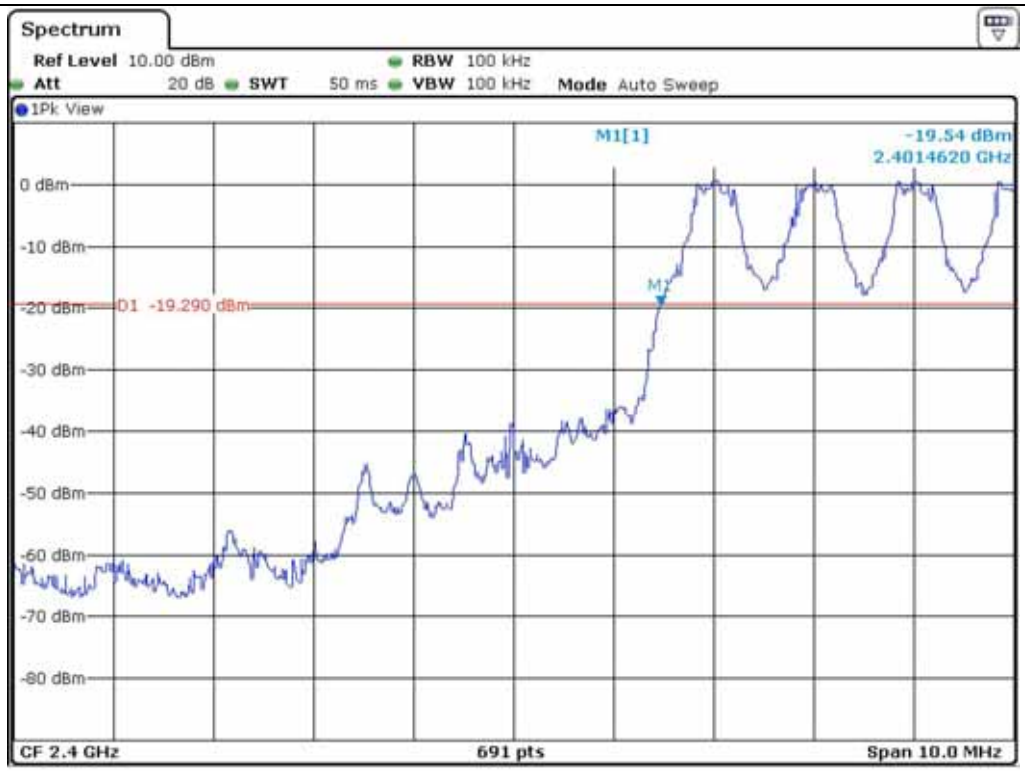
7.6.5.1. Test data for conducted emission



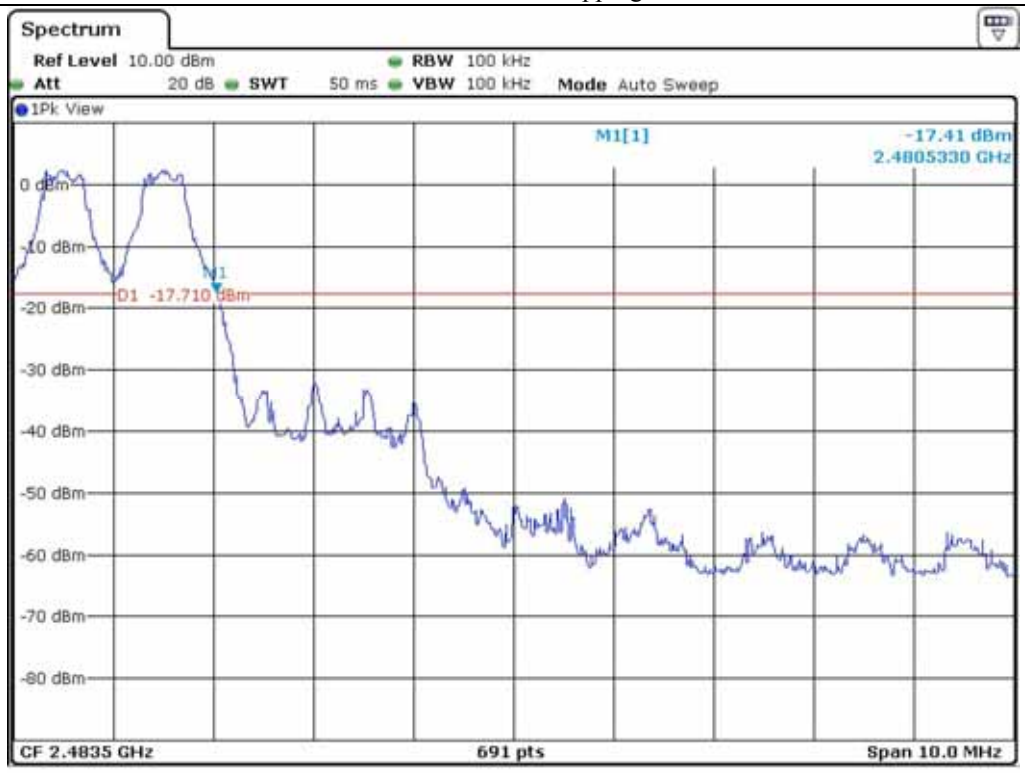
Low Channel



High Channel



Low Channel - Hopping



High Channel - Hopping

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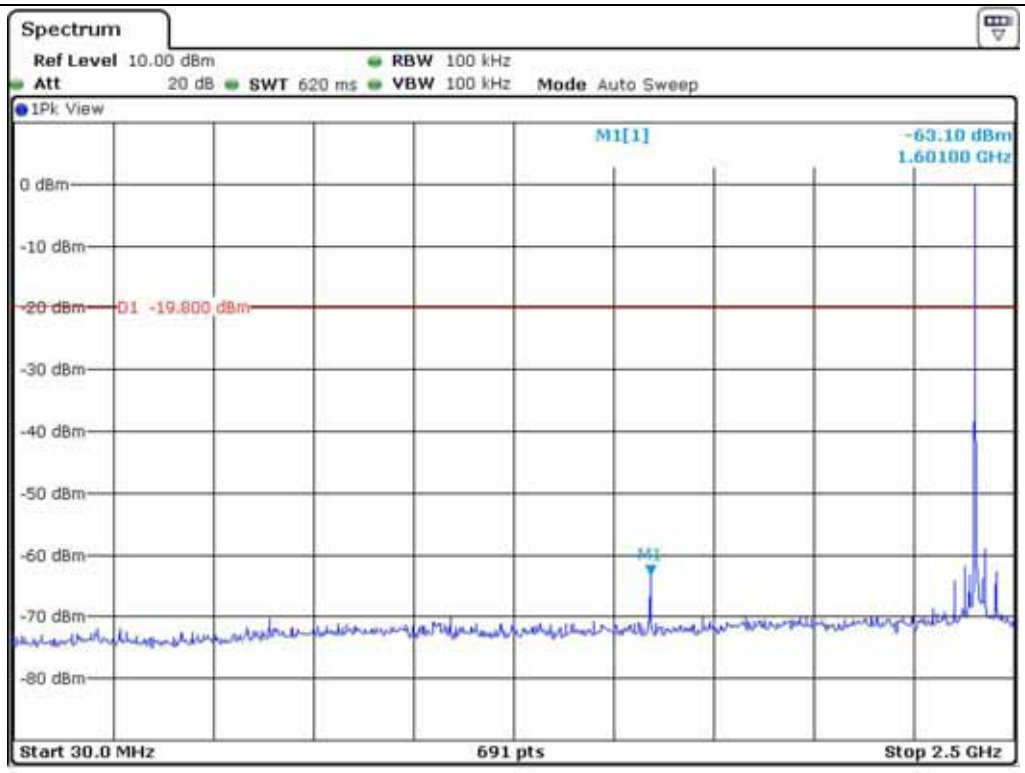
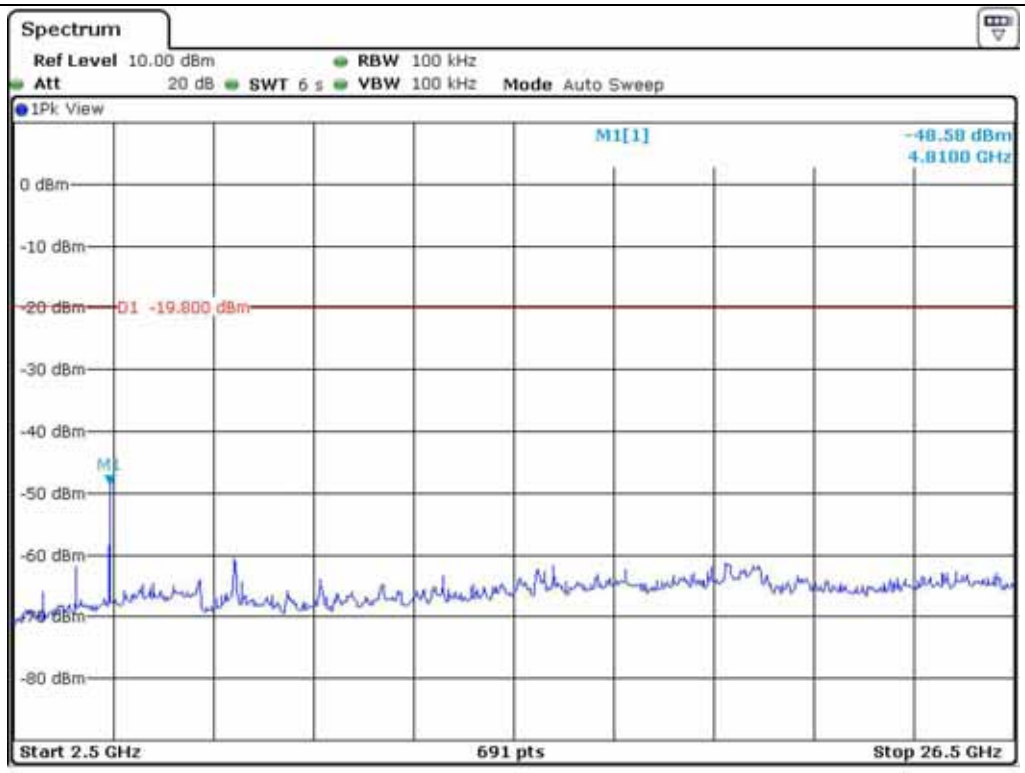


Low Channel



Low Channel

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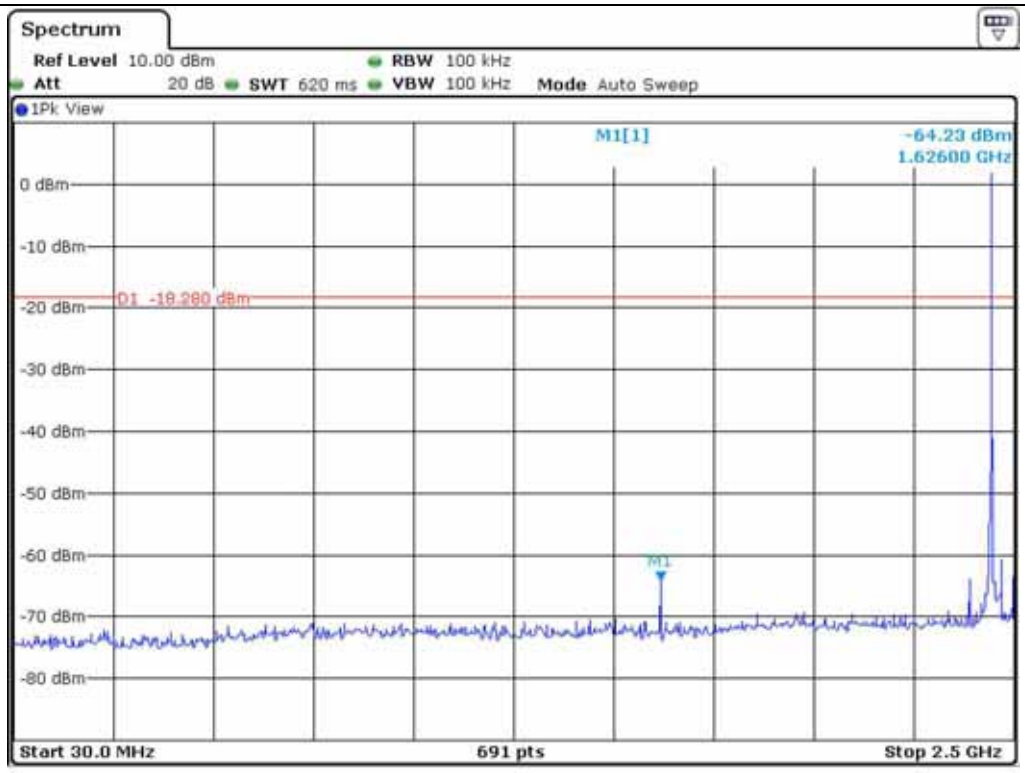
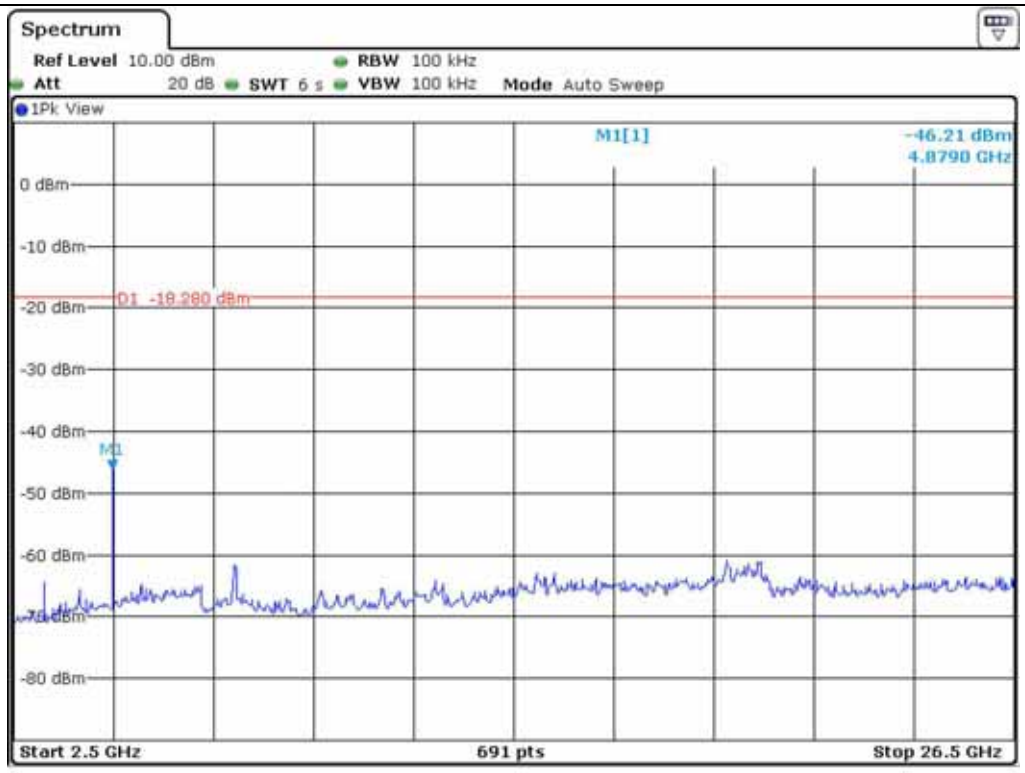


Middle Channel



Middle Channel

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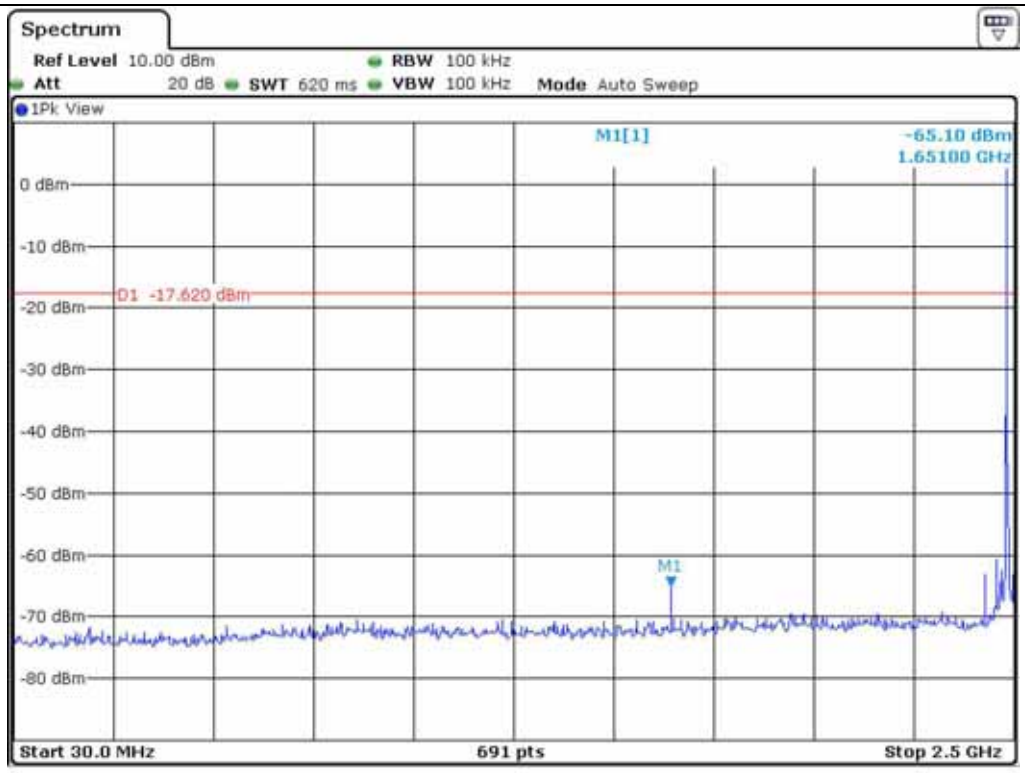
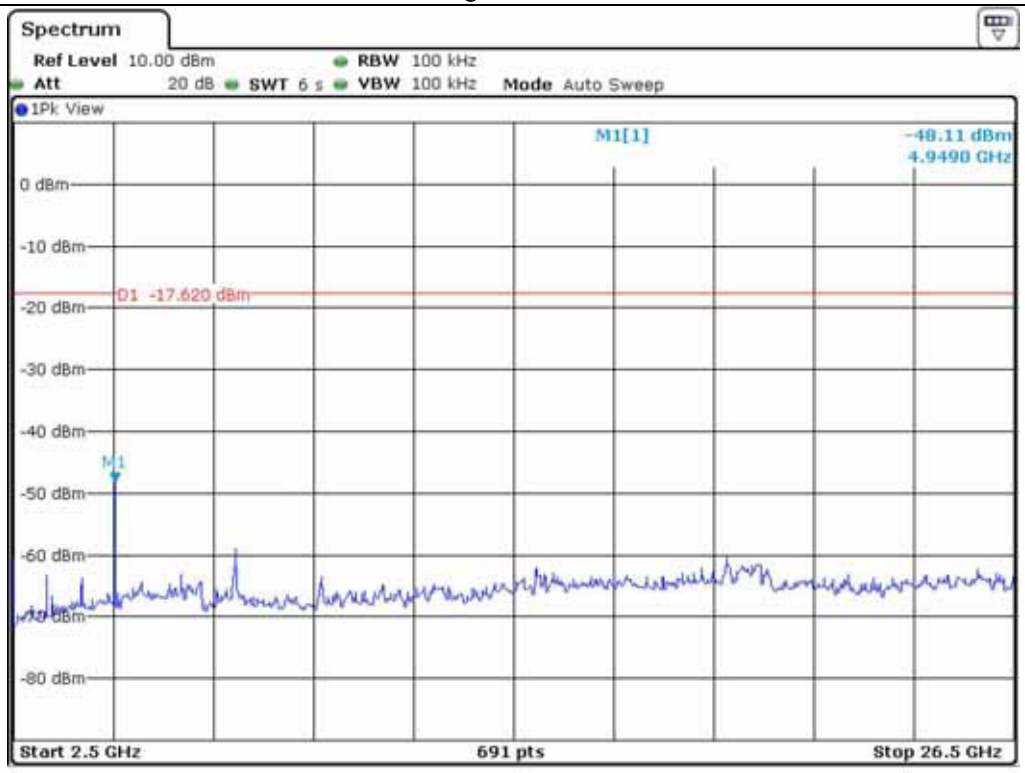


High Channel



High Channel

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7.6.5.2. Test data for radiated emission

7.6.5.2.1. Radiated Emission which fall in the Restricted Band

-. Test Date : November 23, 2011

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 25 GHz

-. Measurement distance : 1 m

-. Operating Condition : Low / High Channel

-. Result : PASSED

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Test Data for Low Channel									
2 389.73	37.33	Peak	H	27.05	3.13	28.98	38.53	74.00	-35.47
	26.83	Average	H				28.03	54.00	-25.97
	36.50	Peak	V				37.70	74.00	-36.30
	26.33	Average	V				27.53	54.00	-26.47
Test Data for High Channel									
2 483.53	36.67	Peak	H	27.31	3.17	28.82	38.33	74.00	-35.67
	26.33	Average	H				27.99	54.00	-26.01
	37.00	Peak	V				38.66	74.00	-35.34
	26.50	Average	V				28.16	54.00	-25.84

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

Tested by: Chang-Uk, Jun / Engineer

7.6.5.2.2. Spurious & Harmonic Radiated Emission

-. Test Date : November 23, 2011

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 25 GHz

-. Measurement distance : 1 m

-. Result : PASSED

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Test Data for Low Channel									
2 402.00	60.54	Peak	H	27.09	3.16	-	90.79	-	-
	54.75	Peak	V				85.00	-	-
4 804.00*	34.28	Peak	H	31.07	4.10	28.80	40.65	74.00	-33.35
	23.11	Average	H				29.48	54.00	-24.52
	36.15	Peak	V				42.52	74.00	-31.48
	24.51	Average	V				30.88	54.00	-23.12
Test Data for Middle Channel									
2 441.00	60.18	Peak	H	27.19	3.16	-	90.53	-	-
	53.88	Peak	V				84.23	-	-
4 882.00*	33.58	Peak	H	31.19	4.12	28.73	40.16	74.00	-33.84
	23.41	Average	H				29.99	54.00	-24.01
	34.67	Peak	V				41.25	74.00	-32.75
	23.81	Average	V				30.39	54.00	-23.61

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical, “*” Frequency fall in restricted band

-Continued

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for High Channel									
2 480.00	60.11	Peak	H	27.30	3.16	-	90.57	-	-
	52.74	Peak	V				83.20	-	-
4 960.00*	34.15	Peak	H	31.32	4.15	28.67	40.95	74.00	-33.05
	22.17	Average	H				28.97	54.00	-25.03
	35.64	Peak	V				42.44	74.00	-31.56
	23.74	Average	V				30.54	54.00	-23.46

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical, “*” Frequency fall in restricted band

Tested by: Chang-Uk, Jun / Engineer

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8. MAXIMUM PERMISSIBLE EXPOSURE

8.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment is 1 mW/cm²

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$E = \sqrt{(30 * P * G)} / d$, and $S = E^2 / Z = E^2 / 377$, because 1 mW/cm² = 10 W/m²

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric filed strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combing equations and rearranging the terms to express the distance as a function of the remaining variable

$d = \sqrt{(30 * P * G) / (377 * S)}$

Changing to units of mW and cm, using P (mW) = P (W) / 1 000, d (cm) = 100 * d (m)

$d = 0.282 * \sqrt{(P * G) / S}$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

8.2 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Peak Output Power		Antenna Gain		Safe Distance	Power Density (mW/cm²)	FCC Limit
(dBm)	(mW)	Log	Linear	(cm)	@ 20 cm Separation	(mW/cm²)
2.30	1.70	-4.44	0.36	0.22	0.000 12	1

According to above table, safe distance, $D = 0.282 * \sqrt{(1.70 * 0.36)} = 0.22$ cm.

For getting power density at 20 cm separation in above table, following formula was used.

$S = P * G / (4\pi * R^2) = 1.70 * 0.36 / (4 * 3.14 * 20^2) = 0.000\ 12$

Where:

S = Power Density,
P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),
G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna

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9. RADIATED EMISSION TEST

9.1 Operating environment

Temperature : 23 °C

Relative humidity : 43 % R.H.

9.2 Test set-up

The radiated emissions measurements were on the 3 m, open-field test site. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 1 000 MHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

9.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESVD	Rohde & Schwarz	Test Receiver	8384537018	Oct. 20, 2011 (1Y)
■ -	8566B	HP	Spectrum Analyzer	3407A08547	Jun. 11, 2011 (1Y)
■ -	8447D	Hewlett Packard	Amplifier	2727A04987	Jun. 11, 2011 (1Y)
■ -	MA240	HD GmbH	Antenna Master	N/A	N/A
■ -	HD100	HD GmbH	Position Controller	N/A	N/A
■ -	DS420S	HD GmbH	Turn Table	N/A	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	VULB9163-202	May 27, 2010(2Y)

All test equipment used is calibrated on a regular basis.

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9.4 Test data

-. Test Date : November 14, 2011

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30 MHz ~ 1 000 MHz

-. Measurement distance : 3 m

-. Channel : Low

Frequency (MHz)	Reading (dBµV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss(dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
71.50	25.40	H	2.30	270.00	8.35	2.03	35.78	40.00	-4.22
92.67	22.80	H	2.30	330.00	10.59	2.20	35.59	43.52	-7.93
161.84	15.50	V	2.20	90.00	8.25	2.96	26.71	43.52	-16.81
186.29	22.90	H	2.40	40.00	9.24	3.14	35.28	43.52	-8.24
322.68	15.80	V	2.30	110.00	13.89	3.55	33.24	46.02	-12.78
543.28	17.50	V	2.30	80.00	18.15	4.95	40.60	46.02	-5.42

Tabulated test data for Radiated Electromagnetic Field

-. Channel : Middle

Frequency (MHz)	Reading (dBµV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss(dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
72.84	25.50	H	2.30	260.00	8.11	2.06	35.67	40.00	-4.33
91.85	22.70	H	2.30	320.00	10.44	2.20	35.34	43.52	-8.18
161.24	15.30	V	2.20	85.00	8.23	2.98	26.51	43.52	-17.01
184.38	21.70	H	2.40	50.00	9.12	3.16	33.98	43.52	-9.54
322.74	16.40	V	2.30	110.00	13.90	3.55	33.85	46.02	-12.17
542.19	18.20	V	2.30	70.00	18.13	4.94	41.27	46.02	-4.75

Tabulated test data for Radiated Electromagnetic Field

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-. Channel : High

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss(dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)
72.38	25.10	H	2.30	270.00	8.20	2.05	35.35	40.00	-4.65
92.54	22.10	H	2.30	340.00	10.56	2.20	34.86	43.52	-8.66
162.22	15.80	V	2.20	95.00	8.26	2.96	27.02	43.52	-16.50
185.35	22.90	H	2.40	40.00	9.18	3.15	35.23	43.52	-8.29
322.68	15.50	V	2.30	120.00	13.89	3.55	32.94	46.02	-13.08
542.28	18.30	V	2.30	90.00	18.13	4.94	41.37	46.02	-4.65

Tabulated test data for Radiated Electromagnetic Field

Remark: “H”: Horizontal, “V”: Vertical

Tested by: Chang-Uk, Jun / Engineer

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