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

Test Report No.	**: E079R-004**
AGR No.	**: A076A-123R**
Applicant	**: Be Interactive Co., Ltd.**
Address	**: #1007 Byucksan DigitalValley 5th, 60-73 Gasan-Dong, Geumchun-Gu, Seoul, 153-807, Korea**
Manufacturer	**: Be Interactive Co., Ltd.**
Address	**: #1007 Byucksan DigitalValley 5th, 60-73 Gasan-Dong, Geumchun-Gu, Seoul, 153-807, Korea**
Type of Equipment	**: Industrial Mobile Computer with WLAN 802.11b, 802.11g**
FCC ID.	**: PNGUD720**
Model Name	**: UD720**
Multiple Model Name	**: UD720W, UD720B, UD720WB, UD721, UD721W, UD721B, UD721WB**
Serial number	**: N/A**
Total page of Report	**: 72 pages (including this page)**
Date of Incoming	**: July 30, 2007**
Date of issue	**: September 04, 2007**

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: Young-Min, Choi / Senior Engineer
EMC Div.
ONETECH Corp.

Reviewed by: Y. K. Kwon / Director
EMC Div.
ONETECH Corp.

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EMC Testing Dept : 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

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1. VERIFICATION OF COMPLIANCE

APPLICANT	: Be Interactive Co., Ltd.
ADDRESS	: #1007 Byucksan DigitalValley 5th, 60-73 Gasan-Dong, Geumchun-Gu, Seoul, 153-807, Korea
CONTACT PERSON	: Mr. Ho-Il, Kim / Lead Engineer
TELEPHONE NO	: +82-2-3281-6716
FCC ID	: PNGUD720
MODEL NAME	: UD720
SERIAL NUMBER	: N/A
DATE	: September 04, 2007

EQUIPMENT CLASS	***DTS – DIGITAL TRNSMISSION SYSTEM***
KIND OF EQUIPMENT	Industrial Mobile Computer with WLAN 802.11b, 802.11g
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2003
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	Yes
FINAL TEST WAS CONDUCTED ON	3 METER(S) 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) (2)	Minimum 6dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (b) (5)	Radio Frequency Exposure Level	Met the Limit / PASS
15.247 (c)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (c)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (d)	Peak Power Spectral Density	Met the Limit / PASS
15.209 and 15.109	Radiated Emission Limits	Met the Limit / PASS
15.207 and 15.107	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

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

Radiated testing was performed according to the procedures in ANSI C63.4: 2003 at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The Electromagnetic compatibility measurement facilities are located on at 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-080, Korea. Description details of test facilities were submitted to the Federal Communications Commission on August 31, 2005 (Registration Number: 92819 and 340658), accredited by KOLAS (Korea Laboratory Accreditation Scheme, No: 85) and approved by TUV, DNV and MIC (Ministry of Information and Communications in Korea) according to the requirement of ISO17025.

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3. GENERAL INFORMATION

3.1 Product Description

The Be Interactive Co., Ltd., Model UD720 (referred to as the EUT in this report) is a Industrial Mobile Computer which has a function of data uploading/downloading, Bluetooth and WLAN modes. This report is for WLAN function. And the report for the Bluetoorh and Peripheral Device for Class B Computing Device will be issued by other report. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Industrial Mobile Computer with WLAN 802.11b/g
OPERATING FREQUENCY	2412-2462 MHz
TEMPERATURE RANGE	Operating: -20 ~ 50℃, Storage: -40 ~ 70℃
RF OUTPUT POWER	18.6 dBm(802.11b), 16.9 dBm(802.11g)
NUMBER OF CHANNEL	11 Channels
MAX. DATA TRANSFER RATE	11 Mbps (802.11b), 54Mbps (802.11g)
MODULATION TYPE	DSSS/CCK(802.11b), CCK/OFDM(802.11g)
ANTENNA	MFR.: PARTRON, Model No.: ACS2450KC
ANTENNA CONNECTOR TYPE	SMT pads (Pin No. 51)
ANTENNA GAIN	1.0dBi
USED WLAN MODULE	MFR: Samsung Electro-Mechanics Co., Ltd.
	Model No: SWL-2460
LIST OF EACH OSC. OR CRYSTAL. FREQ.(FREQ.>=1MHz)	13 MHz, 3.6864 MHz, 2405760 MHz, 14.7456 MHz and 1.8432 MHz
NUMBER OF LAYER	8 Layers
POWER REQUIREMENT	DC 5V, 3A from an AC/DC Adaptor, Model Name: HAPU05B5, MFR: HJC Rechargeable Lithium-ion Battery, Standard Type: 3.7V, 20000mAh

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

-. The following lists consist of the added model and their differences.

	Model Name	Model Differences
Basic Model	UD720	Only PDA function
Multiple Models	UD720W	PDA + Wireless LAN functions
	UD720B	PDA + Bluetooth functions
	UD720WB	PDA + Wireless LAN + Bluetooth functions
	UD721	PDA + Barcode Scanner functions
	UD721W	PDA + Barcode Scanner + Wireless LAN functions
	UD721B	PDA + Barcode Scanner + Bluetooth functions
	UD721WB	PDA + Barcode Scanner + Wireless LAN + Bluetooth functions

Remark: All tests were performed by full function model, UD721WB.

4. EUT MODIFICATIONS

To active compliance to FCC part 15, the following changes were made by an applicant during compliance testing.

- ESD Test
- Two 68uF capacitors connected from LCD supply voltage(CN1.37, CN1.38) to DGND.
- Four ESD diodes(RSB6.8S-TE61) connected from LCD touch panel(CN1.47, CN1.48, CN1.49, CN1.50) to DGND.

- EMC Test
- C334 and C335 exchanged 100pF capacitors for 120pF capacitors
- Two ferrite cores are attached to the USB cable.
- A radio wave absorbent unit attached to the PXA270 area of PCB.

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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	Beinteractive	NIRVANA V1.2	N/A
Function Key Board	Beinteractive	KEYPAD V1.2	N/A
Bluetooth Board	N/A	N/A	N/A
LCD	N/A	N/A	N/A
Barcode Scanner Board	N/A	N/A	N/A
Cradle Main Board	Beinteractive	CRADLE-MAIN V1.2	N/A
Cradle Connector Board	Beinteractive	CRADLE-PIN V1.2	N/A
WLAN Module	Samsung	SWL-2460	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
UD720	Be Interactive Co., Ltd.	PNGUD720	Industrial Mobile Computer (EUT)	PC
HAPU05B5	HJC	N/A	AC/DC Adapter	EUT
PP10L	Dell Computer	DoC	PC	-
MO56UOA	Dell Computer	N/A	Mouse	PC

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, WLAN was set at Low Channel (2412MHz), Middle Channel (2437MHz), and High Channel (2462MHz) with 11Mbps(802.11b) and Low Channel (2412MHz), Middle Channel (2437MHz), and High Channel (2462MHz) with 54Mbps(802.11g) data rate. To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

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5.4 Configuration of Test System

Line Conducted Test: The EUT was connected to adaptor and the power line of adaptor was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power lines Conducted Emission tests were performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter 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)
TX mode	X

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)
TX mode	X

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7. TEST DATA FOR 802.11b WLAN MODE

7.1 MIMIMUM 6dB BANDWIDTH

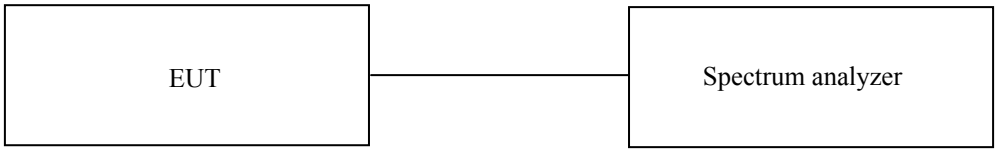
7.1.1 Operating environment

Temperature : 24.5 °C

Relative humidity : 40.1 %

7.1.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



7.1.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 19, 2007

All test equipment used is calibrated on a regular basis.

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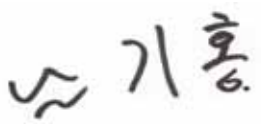
7.1.4 Test data

-. Test Date : August 20, 2007

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2412	10130	500	-9630
Middle	2437	10100	500	-9600
High	2462	10170	500	-9670

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



Tested by: Ki-Hong, Nam / Test Engineer

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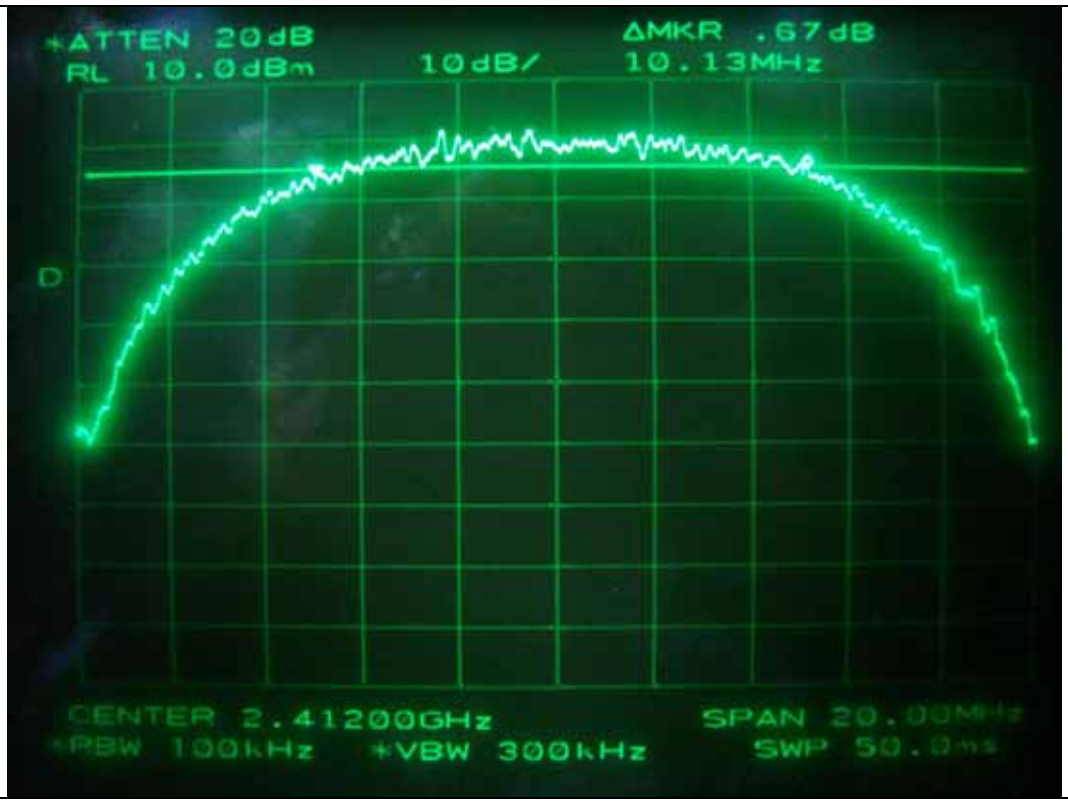
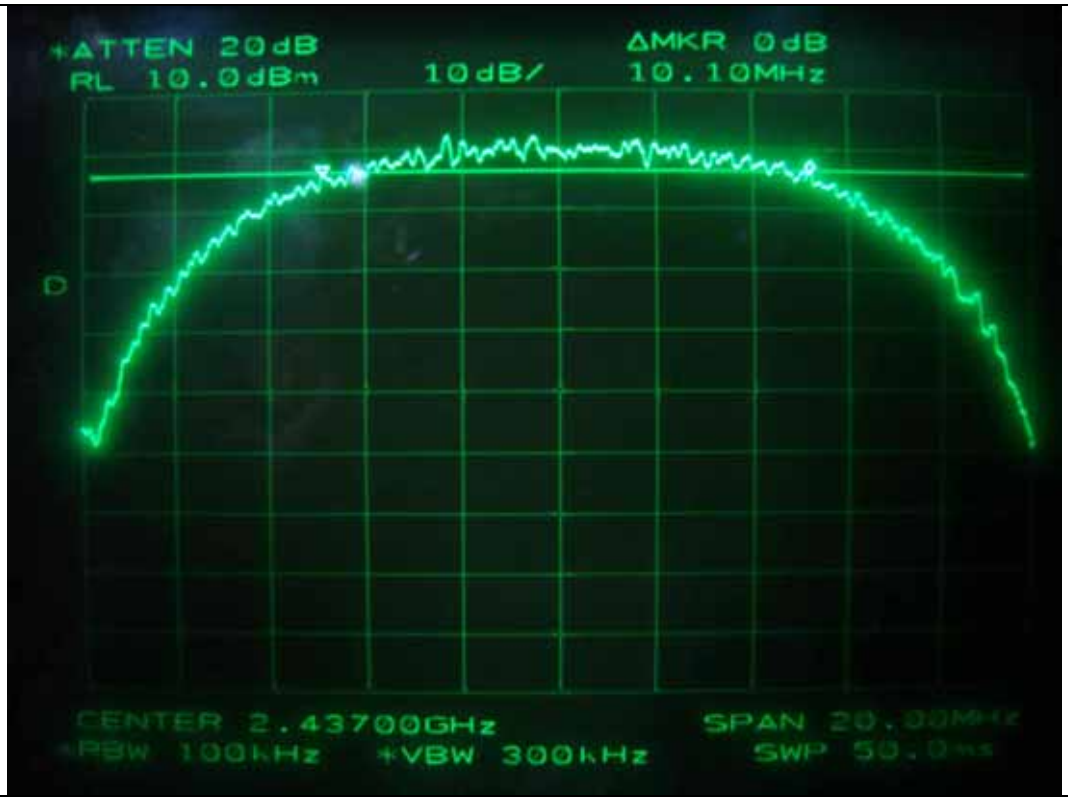


Low Channel



Middle Channel

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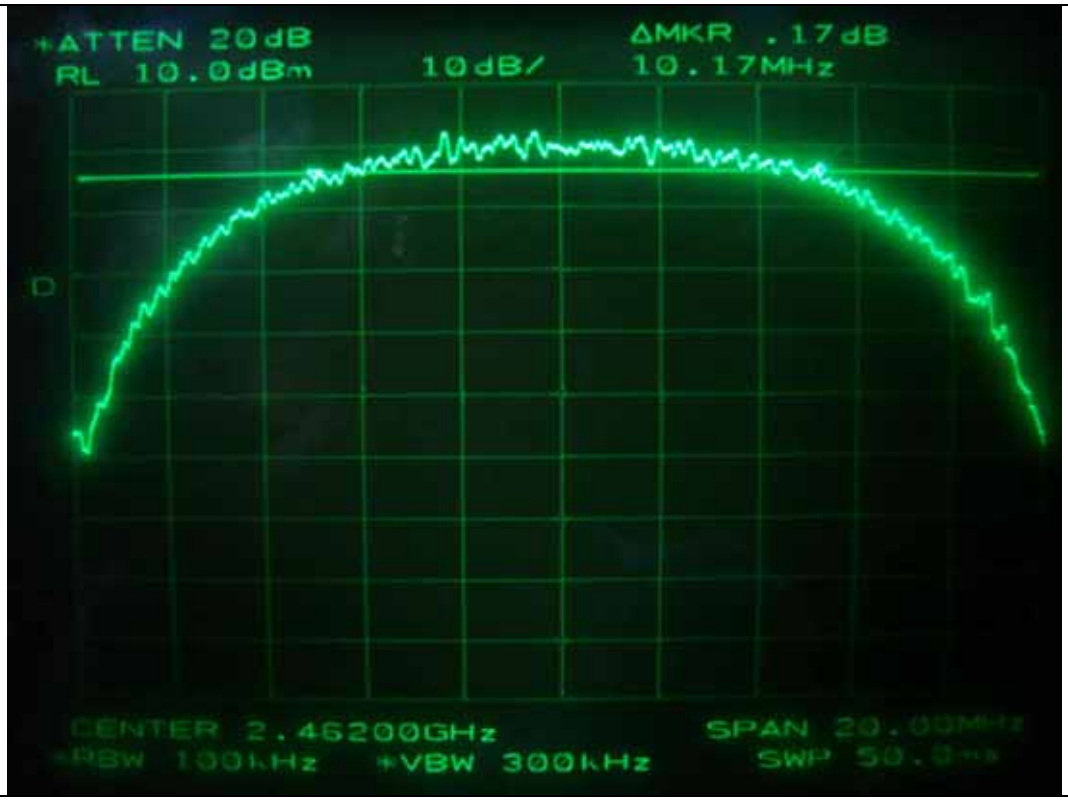

High Channel

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7.2. MAXIMUM PEAK OUTPUT POWER

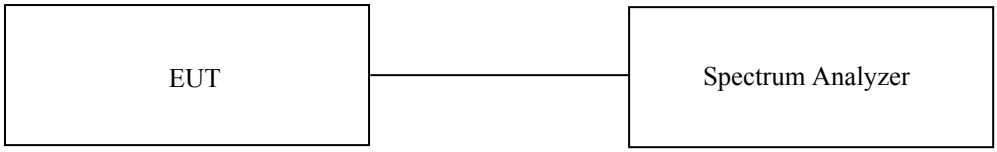
7.2.1 Operating environment

Temperature : 24.5 °C

Relative humidity : 40.1 %

7.2.2 Test set-up

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.



7.2.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 19, 2007

All test equipment used is calibrated on a regular basis.

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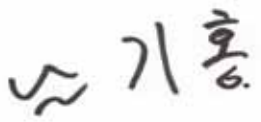
7.2.4 Test data

-. Test Date : August 20, 2007

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	99% Occupied Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2412	13.87	17.60	30.0	-12.40
Middle	2437	13.87	18.60	30.0	-11.40
High	2462	13.93	18.50	30.0	-11.50

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



Tested by: Ki-Hong, Nam / Test Engineer

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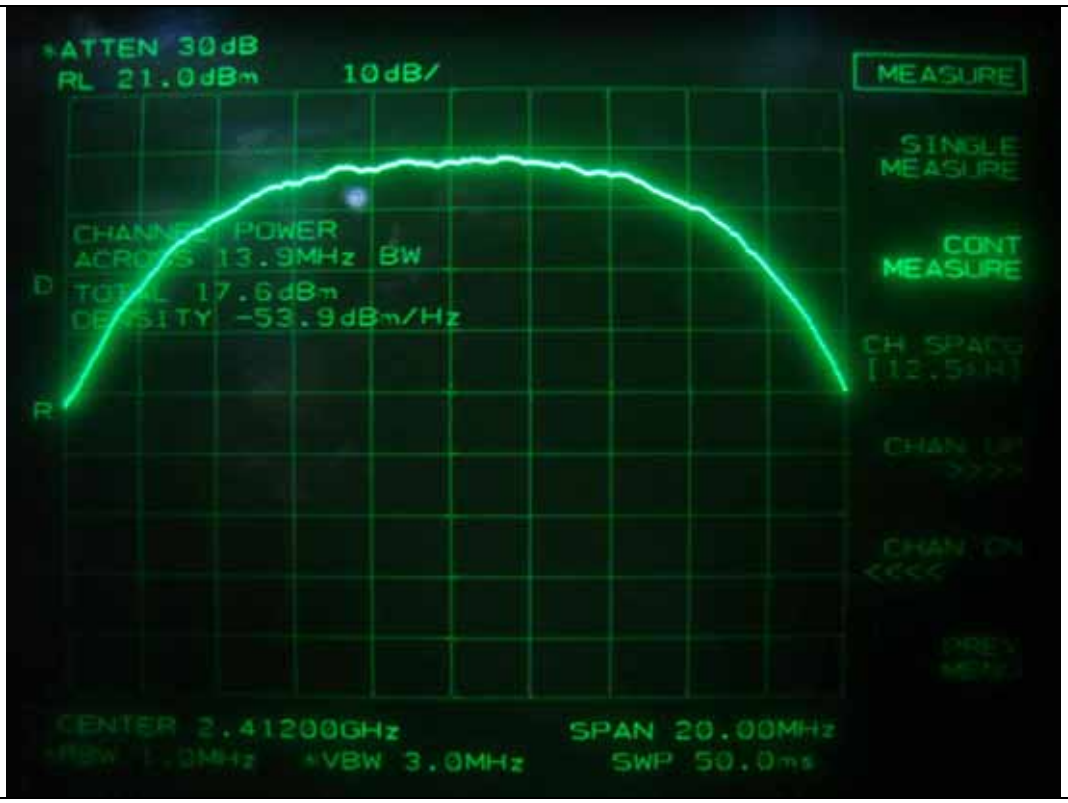
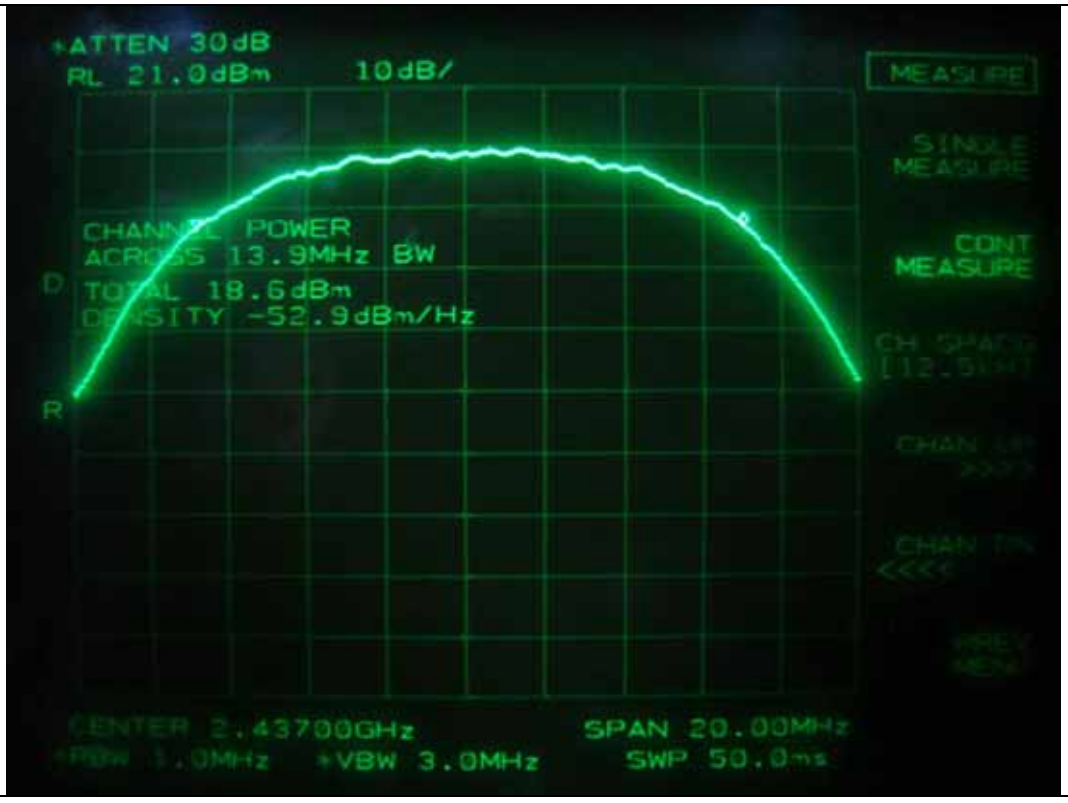


Low Channel



Middle Channel

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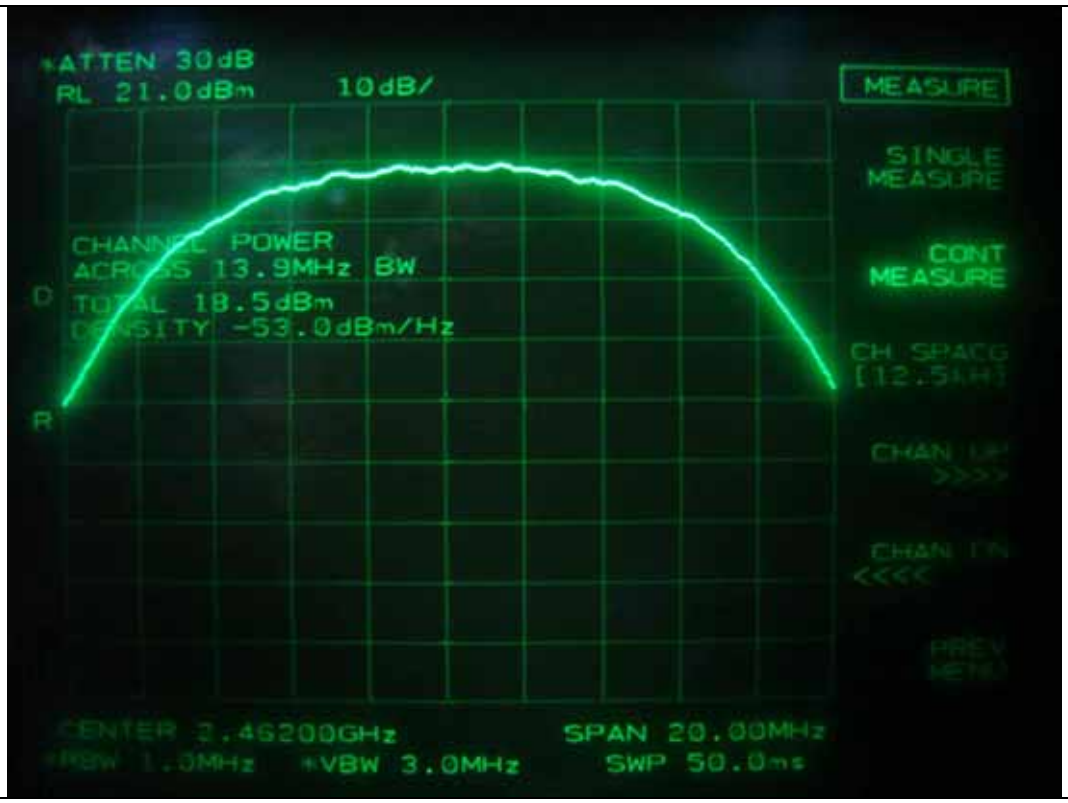

High Channel

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7.3 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

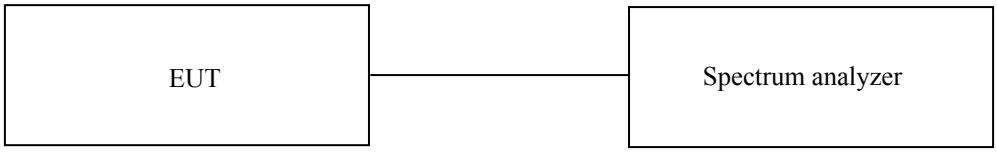
7.3.1 Operating environment

Temperature : 24.5 °C

Relative humidity : 40.1 %

7.3.2 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.



7.3.3 Test set-up for radiated measurement

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

The frequency spectrum from 30MHz to 25GHz 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 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

7.3.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	Hewlett-Packard	Spectrum Analyzer	3650A00756	June 19, 2007
■ -	8447D	Hewlett-Packard	Amplifier	2727A04987	June 19, 2007
□ -	83051A	Agilent	Preamplifier	3950M00201	June 20, 2007
■ -	F-40-5000-RF	RLC Electronics	Highpass Filter	0425	July 15, 2007
■ -	MA220	HD	Turn Table	N/A	N/A
■ -	HD240	HD	Antenna Mast	N/A	N/A
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D294	July 03, 2006(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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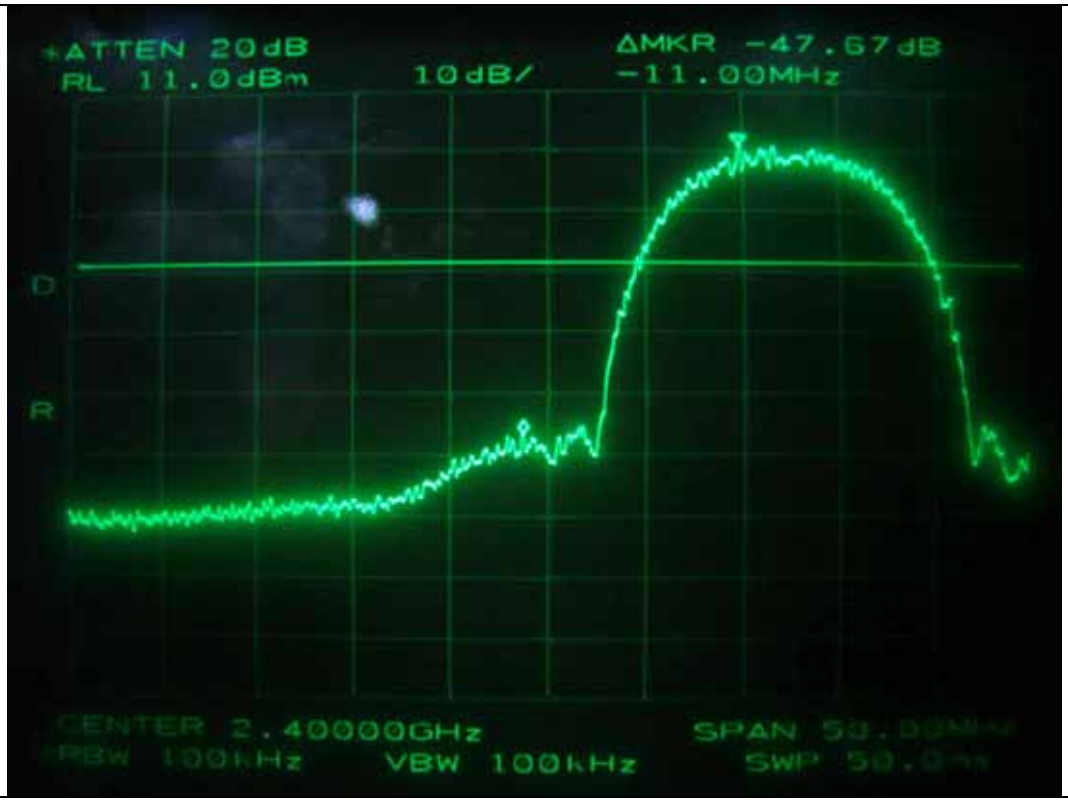
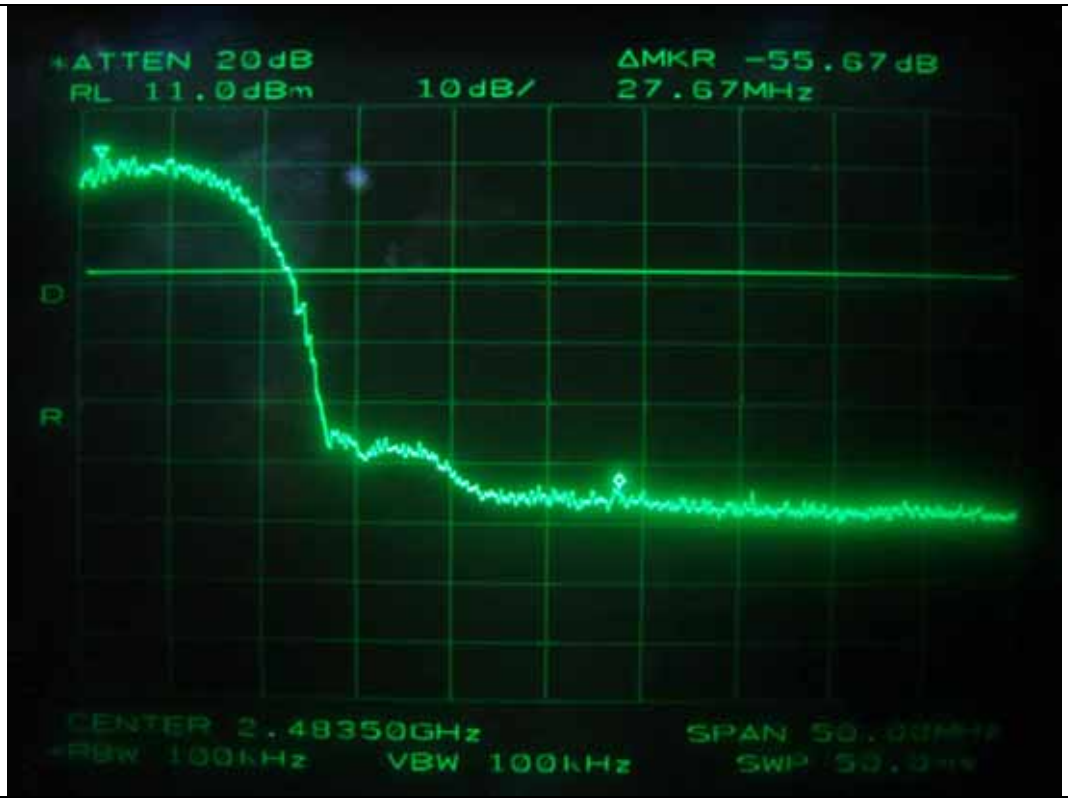
7.3.5. Test data for conducted emission



Low Channel



High Channel

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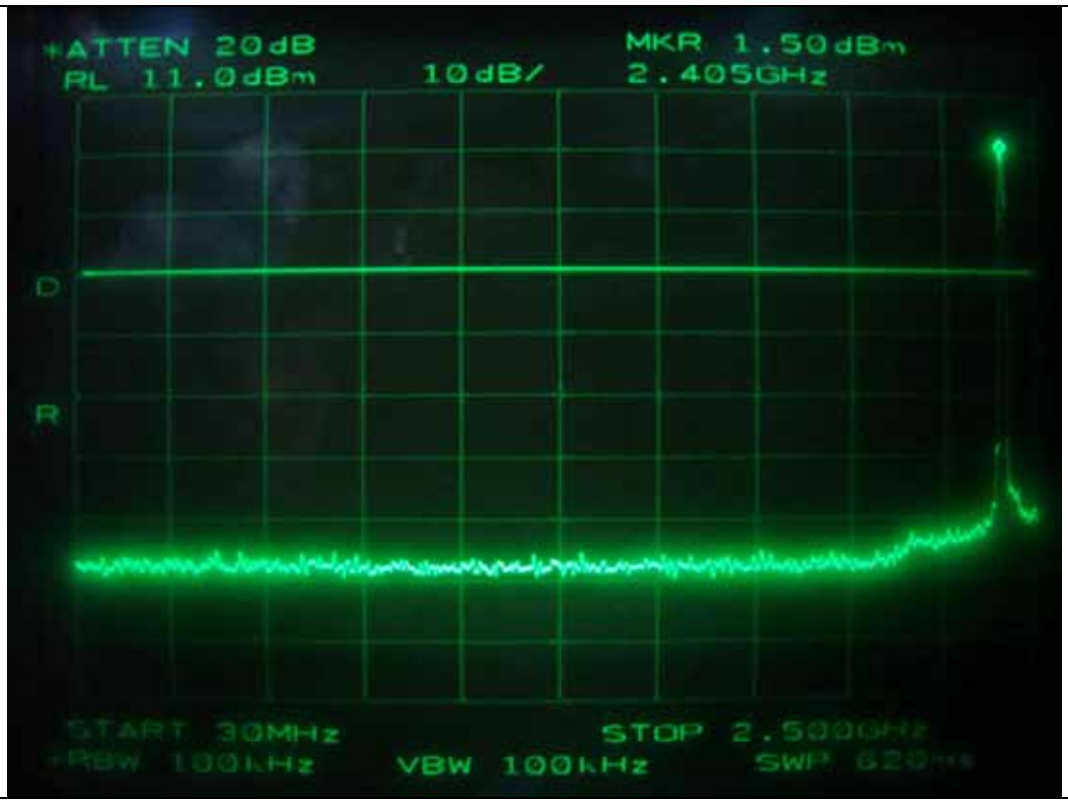
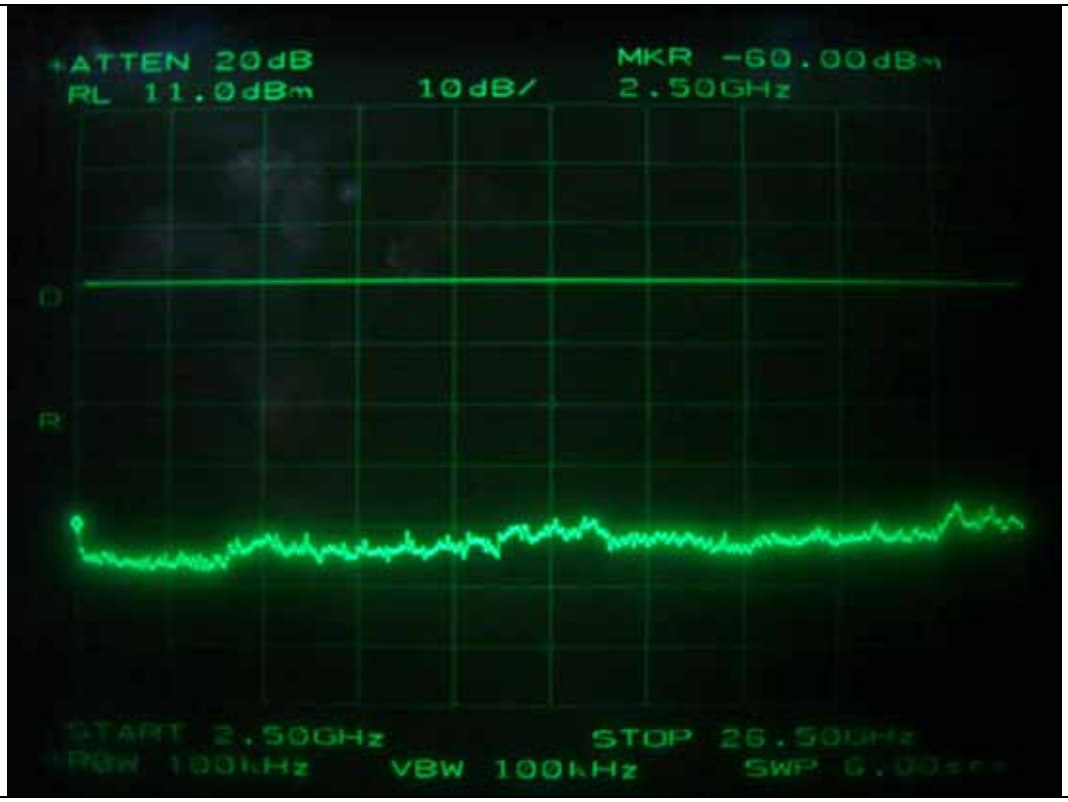


Low Channel



Low Channel

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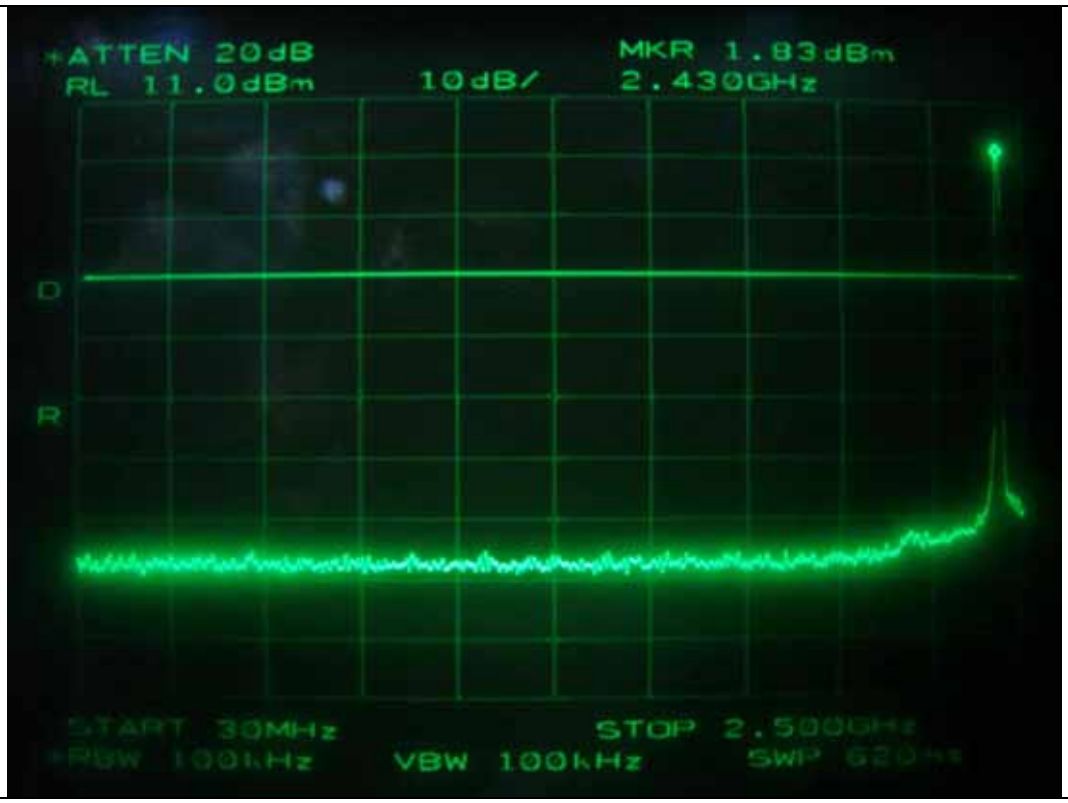
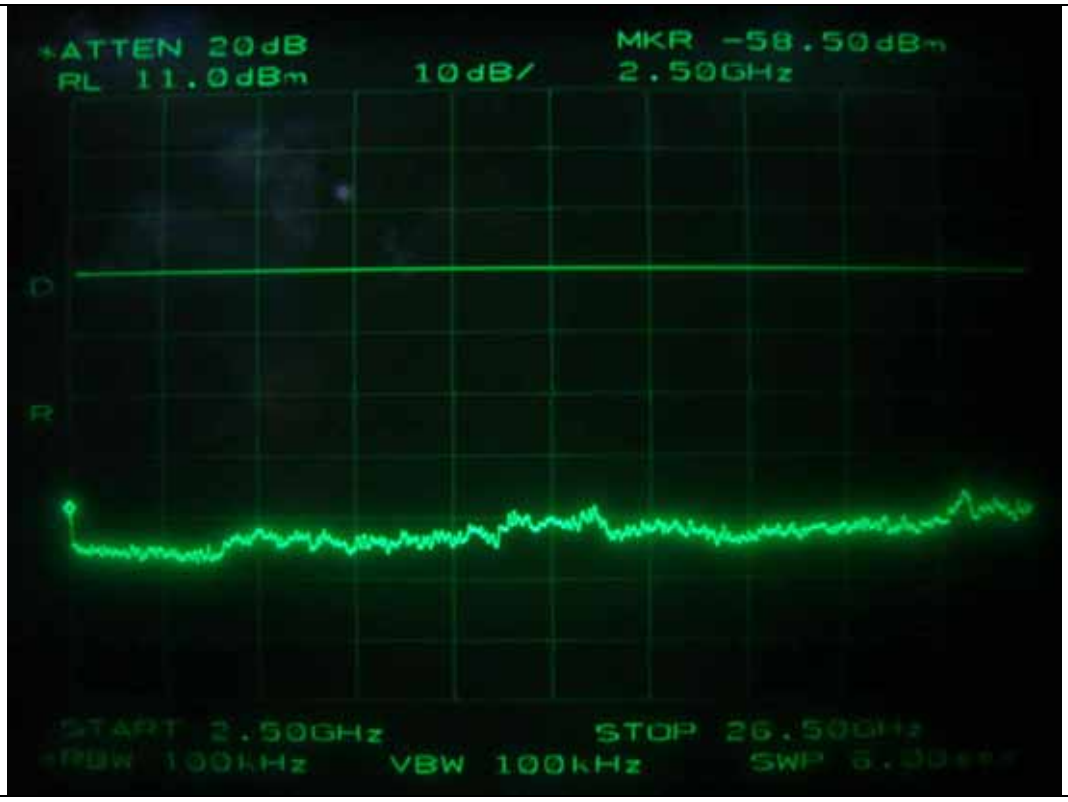


Middle Channel



Middle Channel

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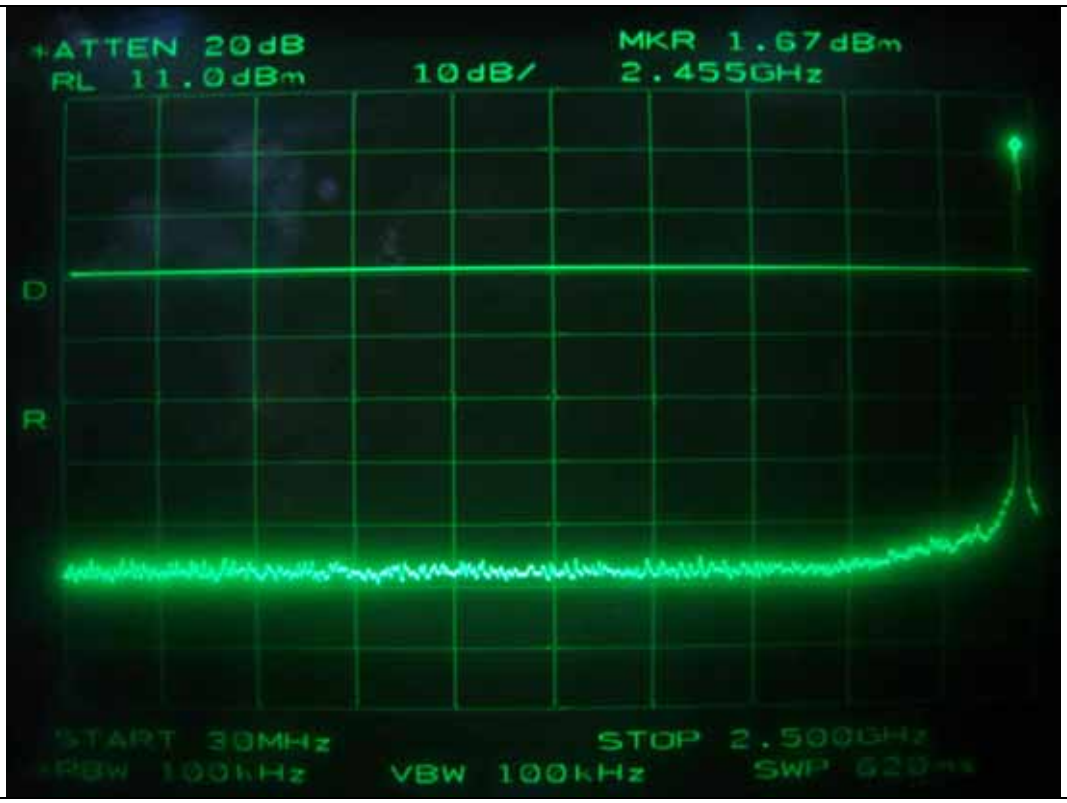
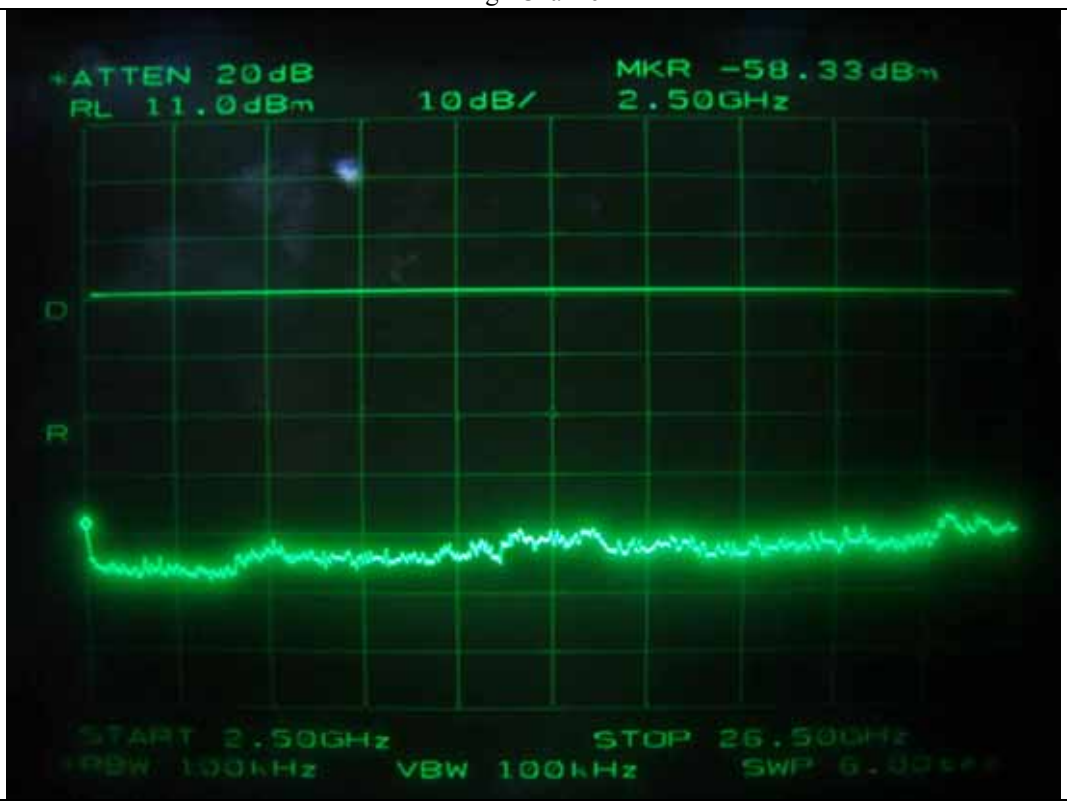


High Channel



High Channel

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7.3.6. Test data for radiated emission

7.3.6.1 Radiated Emission which fall in the Restricted Band

-. Test Date : August 30, 2007

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

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

-. Frequency range : 1 GHz ~ 25GHz

-. Measurement distance : 3m

-. Operating Condition : Low / High Channel

-. Result : PASSED BY –23.18 dB at Low Channel(11 Mbps)

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Low Channel (1 Mbps)										
2390.00	37.33	Peak	H	27.26	3.83	26.10		42.32	74.00	-31.68
	25.50	Average	H					30.49	54.00	-23.51
	37.50	Peak	V					42.49	74.00	-31.51
	25.67	Average	V					30.66	54.00	-23.34
Test Data for Low Channel (2 Mbps)										
2390.00	37.50	Peak	H	27.26	3.83	26.10		42.49	74.00	-31.51
	25.67	Average	H					30.66	54.00	-23.34
	37.33	Peak	V					42.32	74.00	-31.68
	25.50	Average	V					30.49	54.00	-23.51
Test Data for Low Channel (5.5 Mbps)										
2390.00	37.17	Peak	H	27.26	3.83	26.10		42.16	74.00	-31.84
	25.33	Average	H					30.32	54.00	-23.68
	37.50	Peak	V					42.49	74.00	-31.51
	25.50	Average	V					30.49	54.00	-23.51
Test Data for Low Channel (11 Mbps)										
2390.00	37.33	Peak	H	27.26	3.83	26.10		42.32	74.00	-31.68
	25.33	Average	H					30.32	54.00	-23.68
	37.67	Peak	V					42.66	74.00	-31.34
	25.83	Average	V					30.82	54.00	-23.18

Tabulated test data for Restricted Band

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

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-Continued

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for High Channel (1 Mbps)										
2483.50	37.83	Peak	H	27.55	3.83	26.10		43.11	74.00	-30.90
	25.33	Average	H					30.61	54.00	-23.40
	37.67	Peak	V					42.95	74.00	-31.06
	25.17	Average	V					30.45	54.00	-23.56
Test Data for High Channel (2 Mbps)										
2483.50	37.67	Peak	H	27.55	3.83	26.10		42.95	74.00	-31.06
	25.17	Average	H					30.45	54.00	-23.56
	37.50	Peak	V					42.78	74.00	-31.23
	25.33	Average	V					30.61	54.00	-23.40
Test Data for High Channel (5.5 Mbps)										
2483.50	37.50	Peak	H	27.55	3.83	26.10		42.78	74.00	-31.23
	25.33	Average	H					30.61	54.00	-23.40
	37.83	Peak	V					43.11	74.00	-30.90
	25.50	Average	V					30.78	54.00	-23.23
Test Data for High Channel (11 Mbps)										
2483.50	37.67	Peak	H	27.55	3.83	26.10		42.95	74.00	-31.06
	25.50	Average	H					30.78	54.00	-23.23
	37.50	Peak	V					42.78	74.00	-31.23
	25.00	Average	V					30.28	54.00	-23.73

Tested by: Ki-Hong, Nam / Test Engineer

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7.3.6.2 Spurious & Harmonic Radiated Emission

-. Test Date : August 30, 2007

-. 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, 10Hz for Average Mode

-. Frequency range : 1 GHz ~ 25 GHz

-. Measurement distance : 3m

-. Result : PASSED BY –15.79 dB at Middle Channel(2Mbps)

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Low Channel (1 Mbps)										
2412.00	60.10	Peak	H	27.33	3.83			91.26	-	
	59.17	Peak	V					90.33	-	
4824.00	38.17	Peak	H	31.63	6.55	26.10		50.26	74.00	-23.74
	25.83	Average	H					37.92	54.00	-16.08
	38.00	Peak	V					50.09	74.00	-23.91
	25.50	Average	V					37.59	54.00	-16.41
Test Data for Low Channel (2 Mbps)										
2412.00	60.33	Peak	H	27.33	3.83			91.49	-	
	59.33	Peak	V					90.49	-	
4824.00	38.33	Peak	H	31.63	6.55	26.10		50.42	74.00	-23.58
	25.83	Average	H					37.92	54.00	-16.08
	38.17	Peak	V					50.26	74.00	-23.74
	25.67	Average	V					37.76	54.00	-16.24
Test Data for Low Channel (5.5 Mbps)										
2412.00	60.50	Peak	H	27.33	3.83			91.66	-	
	59.33	Peak	V					90.49	-	
4824.00	38.33	Peak	H	31.63	6.55	26.10		50.42	74.00	-23.58
	25.67	Average	H					37.76	54.00	-16.24
	38.50	Peak	V					50.59	74.00	-23.41
	25.83	Average	V					37.92	54.00	-16.08

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Test Data for Low Channel (11 Mbps)										
2412.00	60.67	Peak	H	27.33	3.83			91.83	-	
	59.50	Peak	V					90.66	-	
4824.00	38.50	Peak	H	31.63	6.55	26.10		50.59	74.00	-23.41
	25.83	Average	H					37.92	54.00	-16.08
	38.33	Peak	V					50.42	74.00	-23.58
	25.67	Average	V					37.76	54.00	-16.24

Tabulated test data for Restricted Band

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Middle Channel (1 Mbps)										
2437.00	62.00	Peak	H	27.40	3.83			93.23	-	
	60.33	Peak	V					91.56	-	
4874.00	38.67	Peak	H	31.72	6.59	26.10		50.88	74.00	-23.12
	25.83	Average	H					38.04	54.00	-15.96
	38.50	Peak	V					50.71	74.00	-23.29
	25.67	Average	V					37.88	54.00	-16.12
Test Data for Middle Channel (2 Mbps)										
2437.00	62.17	Peak	H	27.40	3.83			93.40	-	
	60.50	Peak	V					91.73	-	
4874.00	38.83	Peak	H	31.72	6.59	26.10		51.04	74.00	-22.96
	26.00	Average	H					38.21	54.00	-15.79
	38.33	Peak	V					50.54	74.00	-23.46
	25.50	Average	V					37.71	54.00	-16.29
Test Data for Middle Channel (5.5 Mbps)										
2437.00	62.33	Peak	H	27.40	3.83			93.56	-	
	60.67	Peak	V					91.90	-	
4874.00	38.67	Peak	H	31.72	6.59	26.10		50.88	74.00	-23.12
	25.67	Average	H					37.88	54.00	-16.12
	38.50	Peak	V					50.71	74.00	-23.29
	25.33	Average	V					37.54	54.00	-16.46

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Test Data for Middle Channel (11 Mbps)										
2437.00	62.50	Peak	H	27.40	3.83			93.73	-	
	60.83	Peak	V					92.06	-	
4874.00	38.83	Peak	H	31.72	6.59	26.10		51.04	74.00	-22.96
	25.50	Average	H					37.71	54.00	-16.29
	38.67	Peak	V					50.88	74.00	-23.12
	25.67	Average	V					37.88	54.00	-16.12

Tabulated test data for Restricted Band

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for High Channel (1 Mbps)										
2462.00	63.00	Peak	H	27.48	3.83			94.31	-	
	61.17	Peak	V					92.48	-	
4924.00	38.33	Peak	H	31.81	6.62	26.10		50.66	74.00	-23.34
	25.50	Average	H					37.83	54.00	-16.17
	38.17	Peak	V					50.50	74.00	-23.50
	25.33	Average	V					37.66	54.00	-16.34
Test Data for High Channel (2 Mbps)										
2462.00	63.33	Peak	H	27.48	3.83			94.64	-	
	61.33	Peak	V					92.64	-	
4924.00	38.50	Peak	H	31.81	6.62	26.10		50.83	74.00	-23.17
	25.67	Average	H					38.00	54.00	-16.00
	38.33	Peak	V					50.66	74.00	-23.34
	25.67	Average	V					38.00	54.00	-16.00
Test Data for High Channel (5.5 Mbps)										
2462.00	63.50	Peak	H	27.48	3.83			94.81	-	
	61.33	Peak	V					92.64	-	
4924.00	38.67	Peak	H	31.81	6.62	26.10		51.00	74.00	-23.00
	25.83	Average	H					38.16	54.00	-15.84
	38.50	Peak	V					50.83	74.00	-23.17
	25.50	Average	V					37.83	54.00	-16.17

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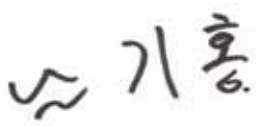
Test Data for High Channel (11 Mbps)										
2462.00	63.67	Peak	H	27.48	3.83			94.98	-	
	61.55	Peak	V					92.86	-	
4924.00	38.33	Peak	H	31.81	6.62	26.10		50.66	74.00	-23.34
	25.67	Average	H					38.00	54.00	-16.00
	38.67	Peak	V					51.00	74.00	-23.00
	25.33	Average	V					37.66	54.00	-16.34

Tabulated test data for Restricted Band

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



Tested by: Ki-Hong, Nam / Test Engineer

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7.4 PEAK POWER SPECTRUL DENSITY

7.4.1 Operating environment

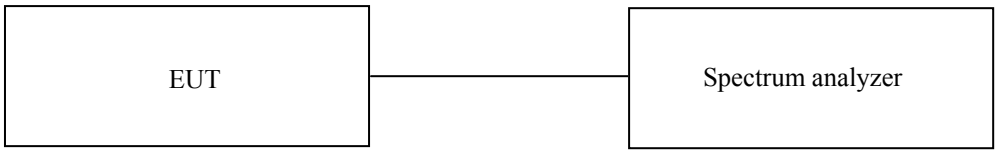
Temperature : 24.5 °C

Relative humidity : 40.1 %

7.4.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 3 kHz, the video bandwidth is set to 3 times the resolution bandwidth, and sweep time was set to span / 3 kHz. The sweep time was allowed to be longer than span / 3 kHz for a full response of the mixer in the spectrum analyzer.

The maximum level from the EUT in a 3 kHz bandwidth was measured with above condition.



7.4.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 19, 2007

All test equipment used is calibrated on a regular basis.

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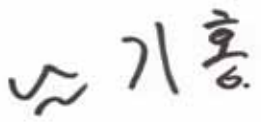
7.4.4 Test data

-. Test Date : August 20, 2007

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2412	-14.00	8.00	-22.00
Middle	2437	-13.00	8.00	-21.00
High	2462	-12.83	8.00	-20.83

Remark: See next page for measurement data.



Tested by: Ki-Hong, Nam / Test Engineer

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Low Channel

Middle Channel

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High Channel

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7.5 RADIATED EMISSION TEST FOR DIGITAL DEVICE PART

7.5.1 Operating environment

Temperature : 29 °C

Relative humidity : 37 %

7.5.2 Test set-up

The radiated emissions measurements were on the 3 meters, 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 30MHz to 1000MHz 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 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

7.5.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	ESVS10	Rohde & Schwarz	EMI Test Receiver	827864/005	Dec. 21, 2006
■ -	8566B	HP	Spectrum Analyzer	3407A08547	June 20, 2007
■ -	8447D	Hewlett Packard	Amplifier	2727A04987	June 19, 2007
■ -	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
■ -	VHA9103	Schwarzbeck	Biconical Antenna	91031852	Feb. 08, 2007
■ -	9108-A(494)	Schwarzbeck	Log Periodic Antenna	62281001	Feb. 08, 2007

All test equipment used is calibrated on a regular basis.

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EMC Testing Dept : 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

7.5.4 Test data

-. Test Date : August 30, 2007

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30MHz ~ 1000MHz

-. Measurement distance : 3m

-. Test result : Passed by -7.33 dB at 621.11 MHz(Low Channel)

Frequency (MHz)	Reading (dBuV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBuV/m)	Limits (dBuV/m)	Margin (dB)
Low Channel							
33.88	10.50	V	17.19	1.46	29.15	40.00	-10.85
50.35	15.83	V	11.05	1.60	28.48	40.00	-11.52
118.18	18.72	V	12.74	2.66	34.12	43.52	-9.40
198.61	14.83	H	16.37	3.33	34.53	43.52	-8.99
621.11	12.50	H	20.26	5.93	38.69	46.02	-7.33
648.24	10.33	H	21.11	6.09	37.53	46.02	-8.49
Middle Channel							
33.88	10.33	V	17.19	1.46	28.98	40.00	-11.02
50.35	15.50	V	11.05	1.60	28.15	40.00	-11.85
118.18	19.00	V	12.74	2.66	34.40	43.52	-9.12
198.61	15.00	H	16.37	3.33	34.70	43.52	-8.82
621.11	12.33	H	20.26	5.93	38.52	46.02	-7.50
648.24	10.00	H	21.11	6.09	37.20	46.02	-8.82
Low Channel							
33.88	10.17	V	17.19	1.46	28.82	40.00	-11.18
50.35	16.00	V	11.05	1.60	28.65	40.00	-11.35
118.18	18.50	V	12.74	2.66	33.90	43.52	-9.62
198.61	15.00	H	16.37	3.33	34.70	43.52	-8.82
621.11	12.00	H	20.26	5.93	38.19	46.02	-7.83
648.24	10.17	H	21.11	6.09	37.37	46.02	-8.65

Tabulated test data for Radiated Electromagnetic Field

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

Tested by: Ki-Hong, Nam / Test Engineer

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7.6 CONDUCTED EMISSION TEST

7.6.1 Operating environment

Temperature : 25 °C

Relative humidity : 48 %

7.6.2 Test set-up

The EUT was placed on a wooden table, 0.8 meters height above the floor. The power of the EUT was connected through a 50 ohm/ 50 uH + 5ohm Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

7.6.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	May 11, 2007
■ -	NSLK 8128	Schwarzbeck	AMN	8128-216	July 04, 2007
■ -	3825/2	EMCO	AMN	9109-1867	June 21, 2007

All test equipment used is calibrated on a regular basis.

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7.6.4 Test data

-. Test Date : August 31, 2007

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15MHz ~ 30MHz

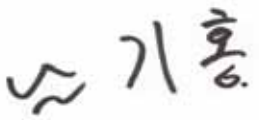
-. Test Result : PASSED BY –10.35dB at 0.17 MHz under peak mode

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Limits		Emission level	Limits	
0.16	N	52.77	65.46	-12.69	21.71	55.46	-33.75
0.17	H	54.61	64.96	-10.35	43.95	54.96	-11.01
0.34	N	43.79	59.08	-15.29	36.67	49.08	-12.41
1.35	H	40.83	56.00	-15.17	26.65	46.00	-19.35
2.53	H	43.48	56.00	-12.52	26.75	46.00	-19.25
2.58	N	43.98	56.00	-12.02	28.96	46.00	-17.04

Line Conducted Emissions Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

See next page for an overview sweep performed with peak and average detector modes.



Tested by: Ki-Hong, Nam / Test Engineer

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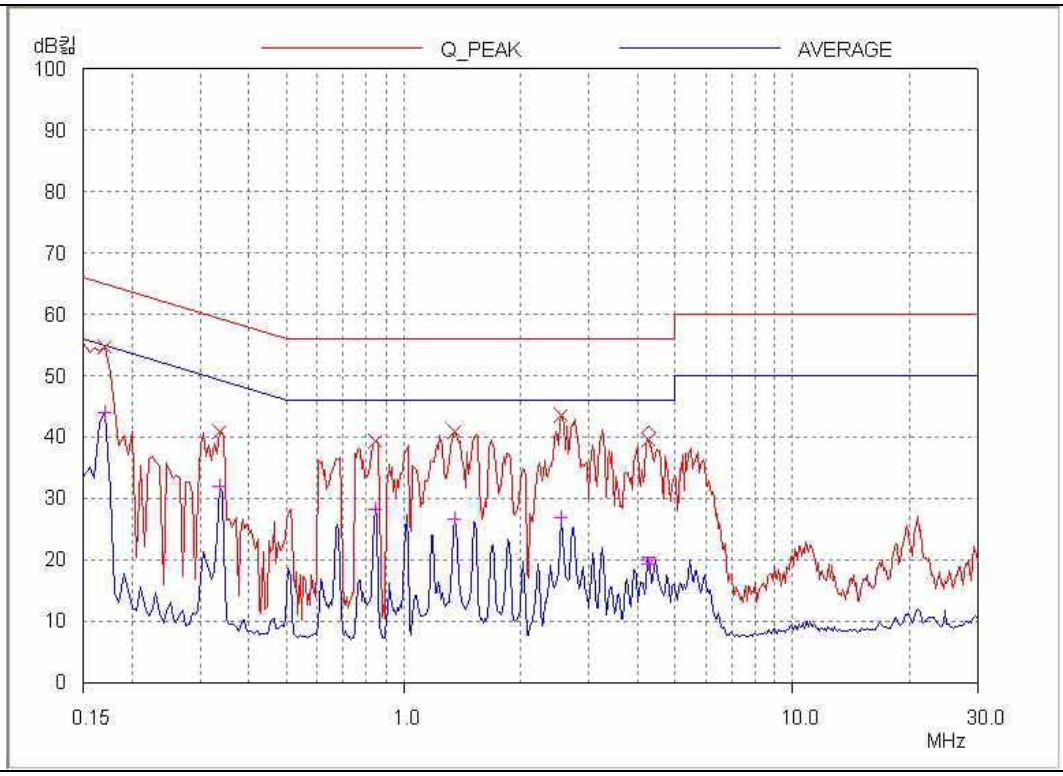
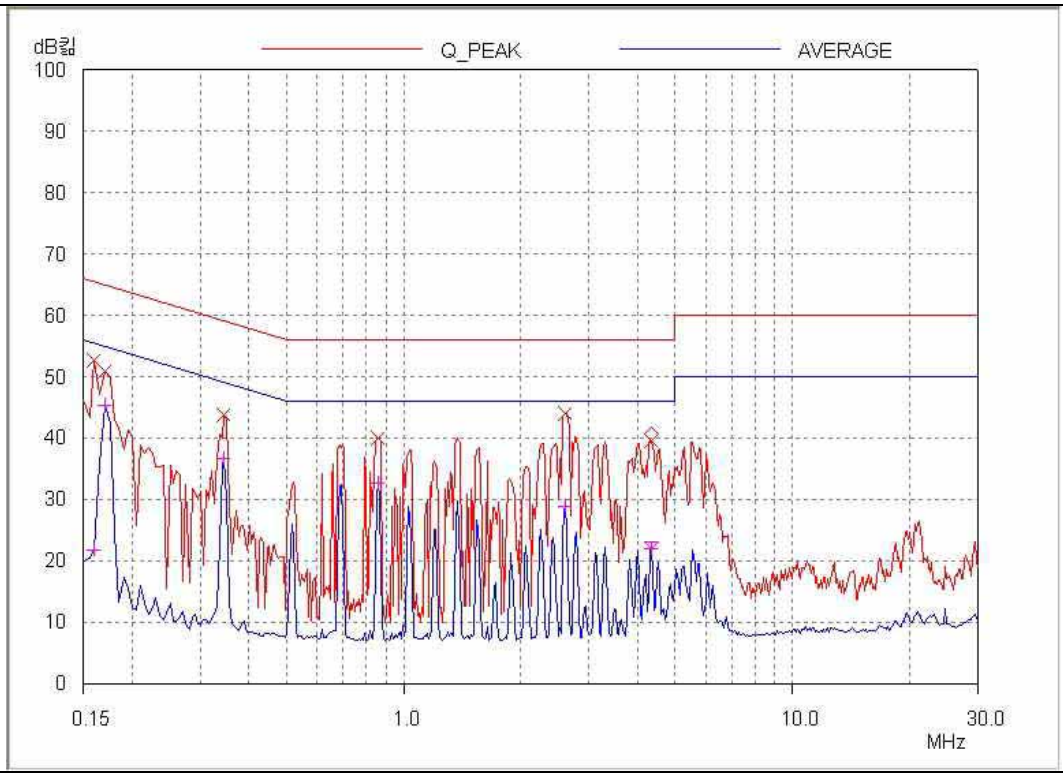


HOT LINE



NEUTRAL LINE

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8. TEST DATA FOR 802.11g WLAN MODE

8.1 MIMIMUM 6dB BANDWIDTH

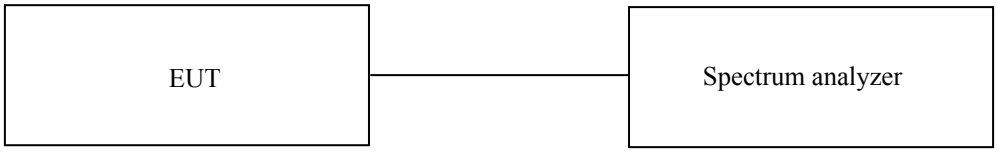
8.1.1 Operating environment

Temperature : 24.5 °C

Relative humidity : 40.1 %

8.1.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



8.1.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 19, 2007

All test equipment used is calibrated on a regular basis.

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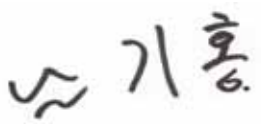
8.1.4 Test data

-. Test Date : August 20, 2007

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2412	16570	500	-16070
Middle	2437	16600	500	-16100
High	2462	16600	500	-16100

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



Tested by: Ki-Hong, Nam / Test Engineer

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Low Channel

Middle Channel

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High Channel

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8.2. MAXIMUM PEAK OUTPUT POWER

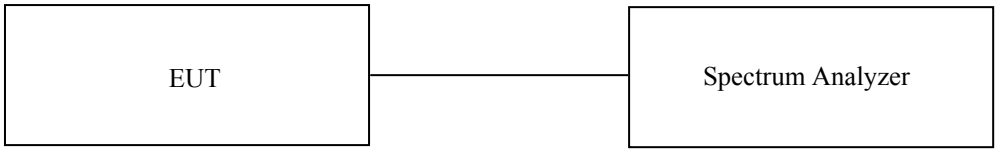
8.2.1 Operating environment

Temperature : 24.5 °C

Relative humidity : 40.1 %

8.2.2 Test set-up

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.



8.2.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 19, 2007

All test equipment used is calibrated on a regular basis.

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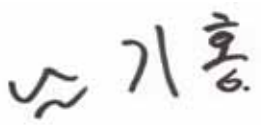
8.2.4 Test data

-. Test Date : August 20, 2007

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	99% Occupied Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2412	18.11	16.30	30.00	-13.70
Middle	2437	17.89	16.90	30.00	-13.10
High	2462	18.11	16.90	30.00	-13.10

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



Tested by: Ki-Hong, Nam / Test Engineer

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 dong, Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-705, Korea (TEL: +82-31-746-8500, FAX: +82-31-746-8700)

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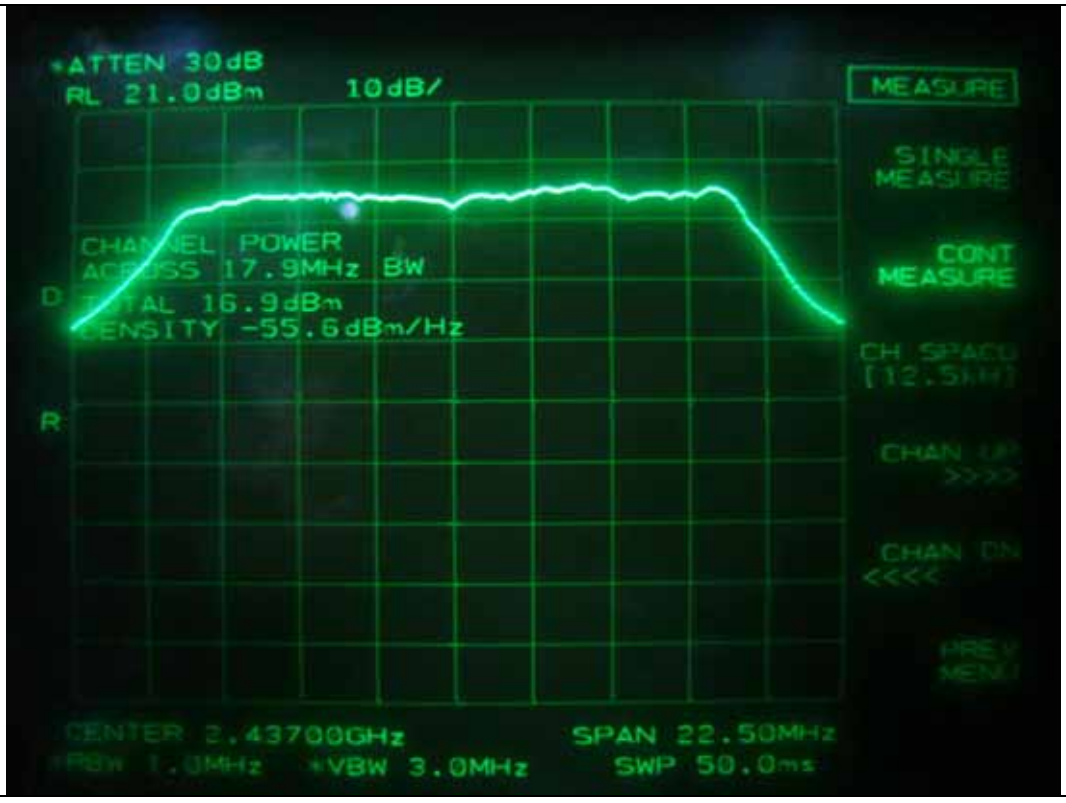
Low Channel



Middle Channel

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High Channel

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8.3 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

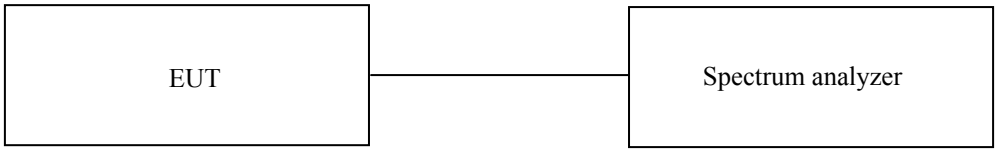
8.3.1 Operating environment

Temperature : 24.5 °C

Relative humidity : 40.1 %

8.3.2 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.



8.3.3 Test set-up for radiated measurement

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

The frequency spectrum from 30MHz to 25GHz 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 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

8.3.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	Hewlett-Packard	Spectrum Analyzer	3650A00756	June 19, 2007
■ -	8447D	Hewlett-Packard	Amplifier	2727A04987	June 19, 2007
□ -	83051A	Agilent	Preamplifier	3950M00201	June 20, 2007
■ -	F-40-5000-RF	RLC Electronics	Highpass Filter	0425	July 15, 2007
■ -	MA220	HD	Turn Table	N/A	N/A
■ -	HD240	HD	Antenna Mast	N/A	N/A
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D294	July 03, 2006(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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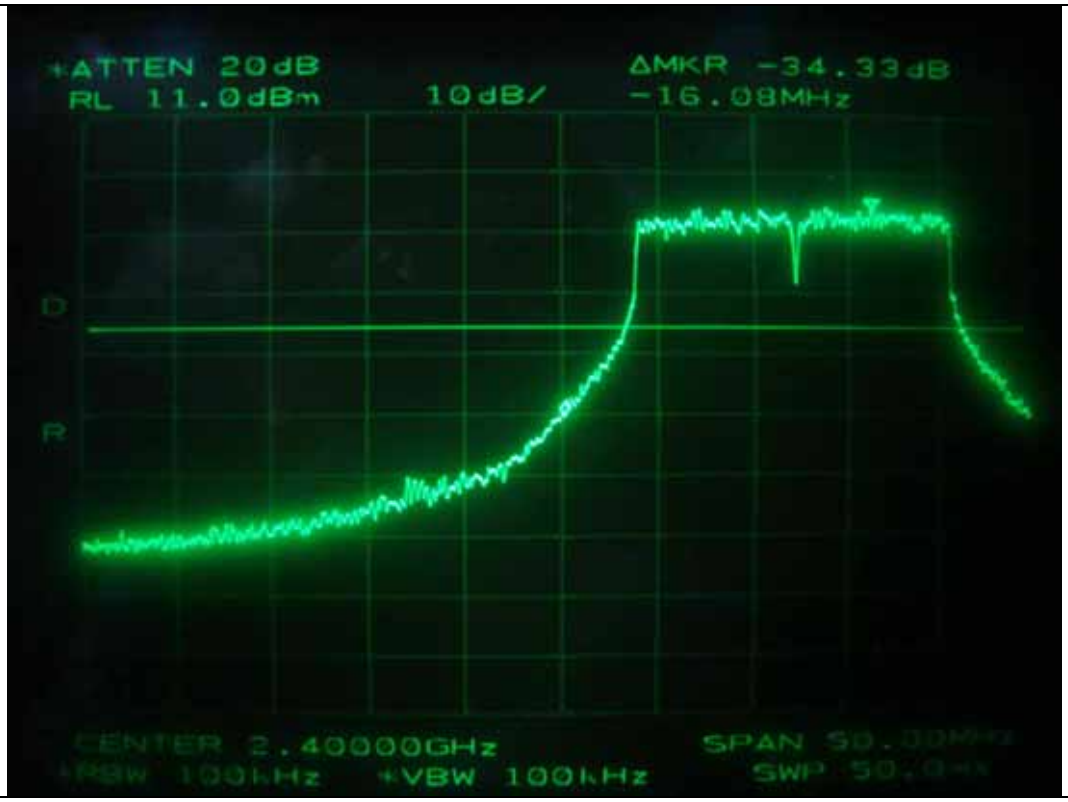
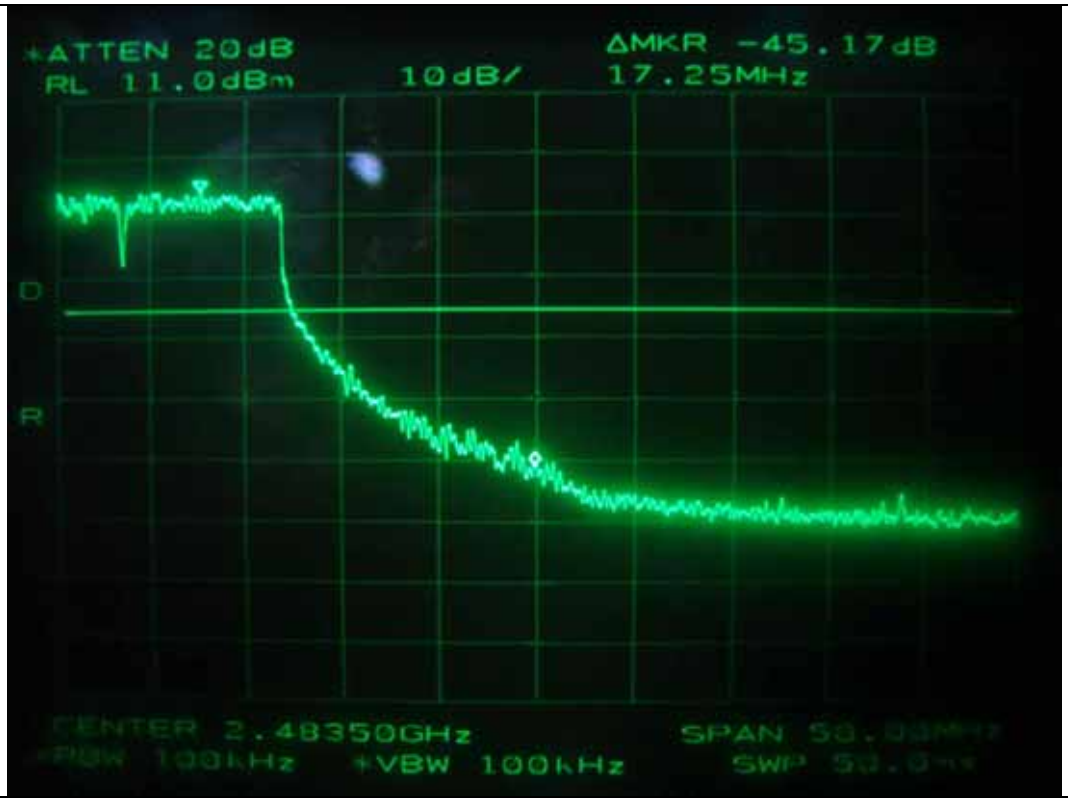
8.3.5. Test data for conducted emission



Low Channel



High Channel

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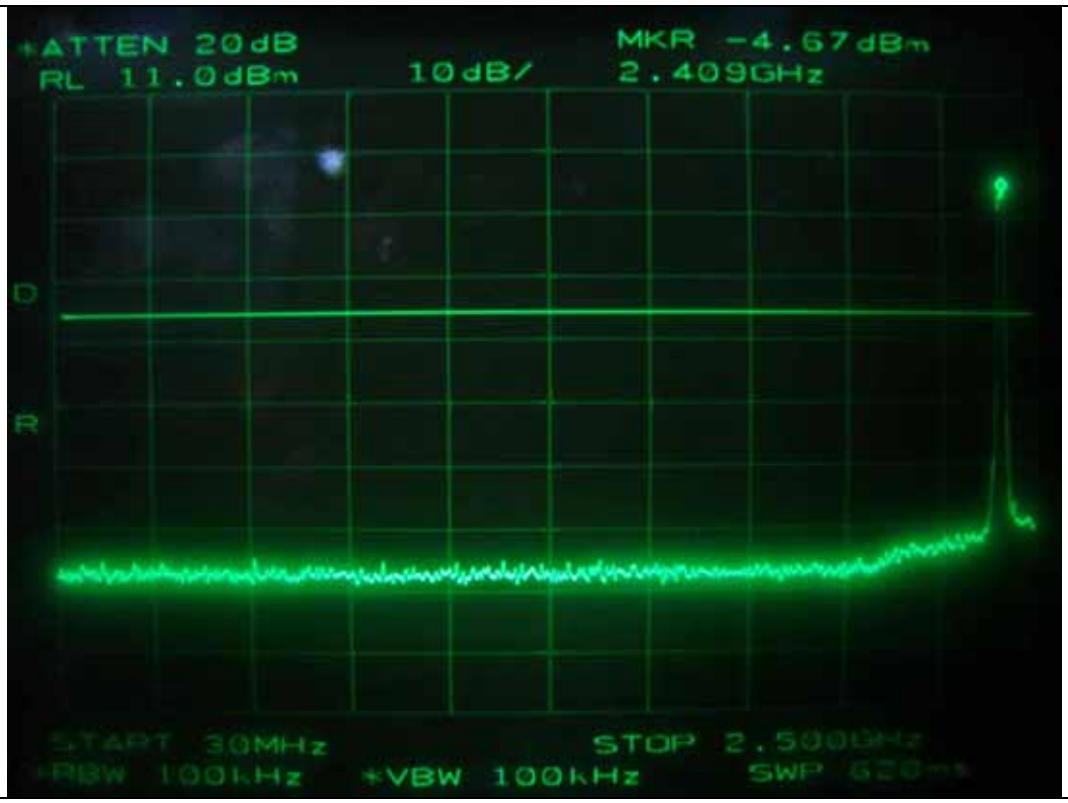
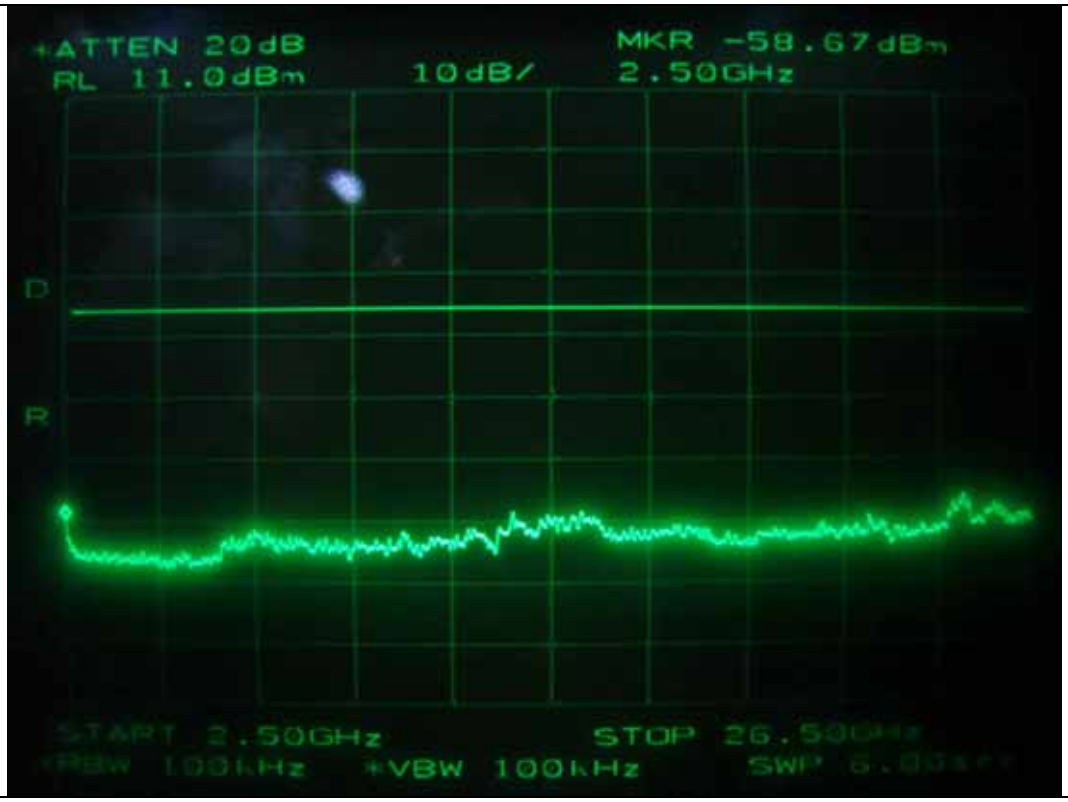


Low Channel



Low Channel

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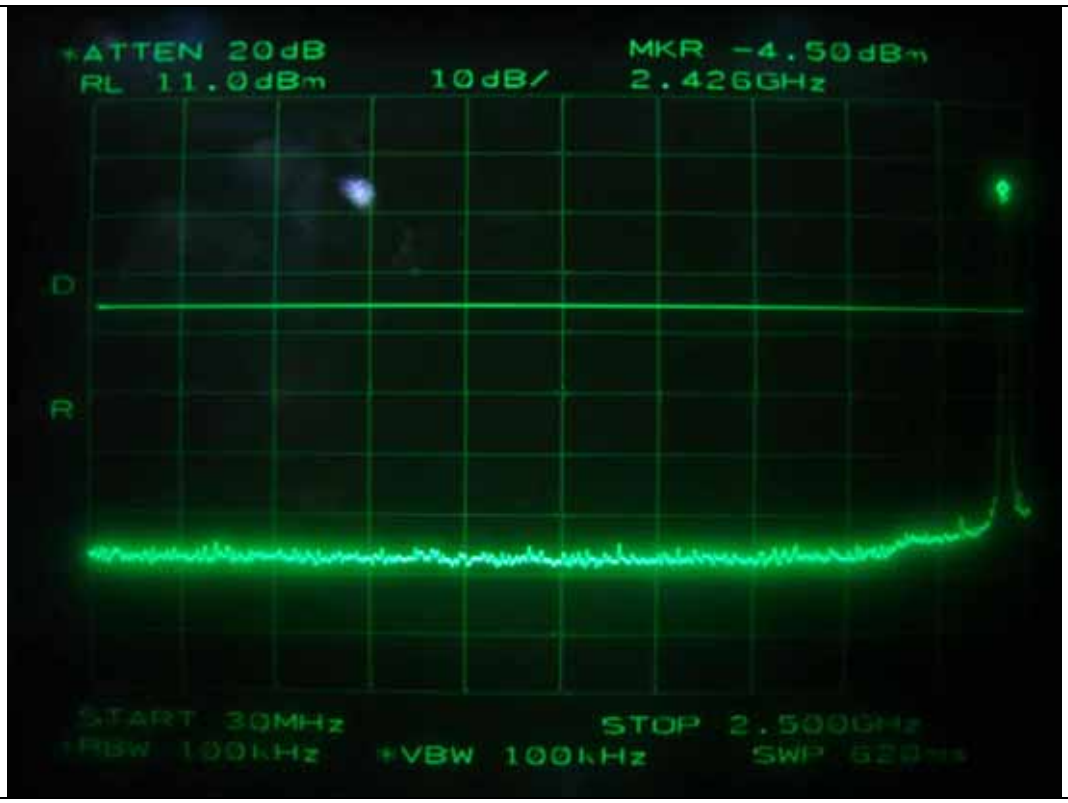
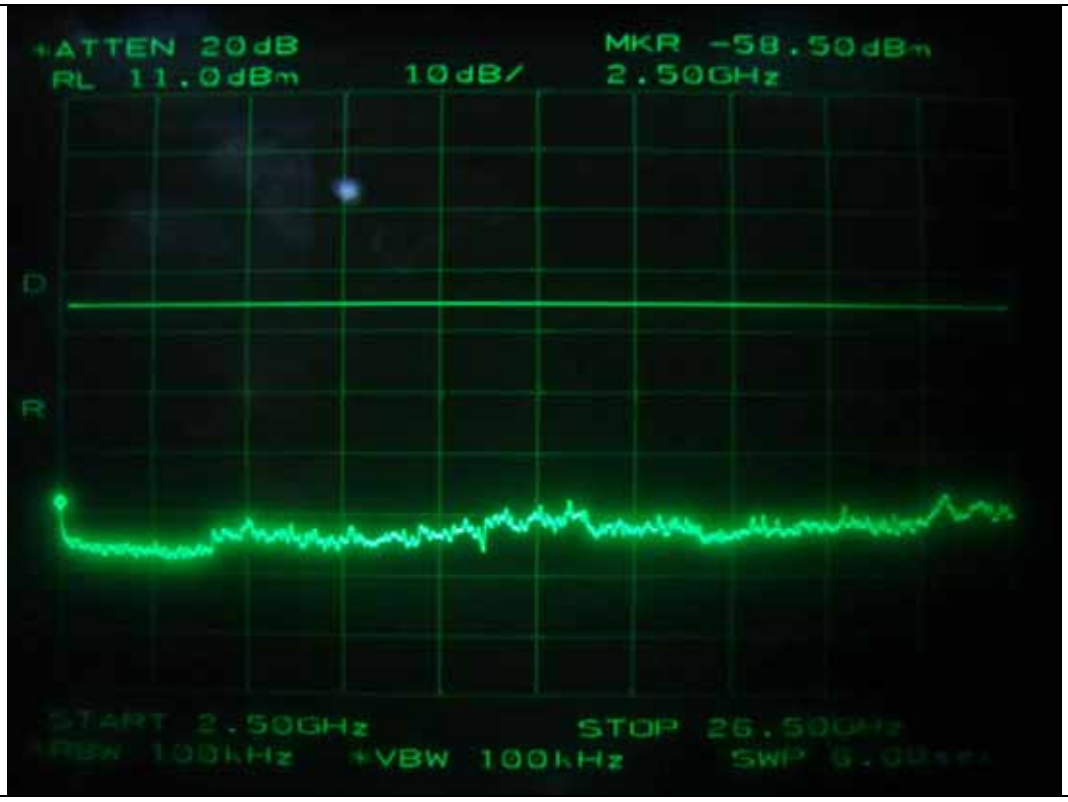


Middle Channel



Middle Channel

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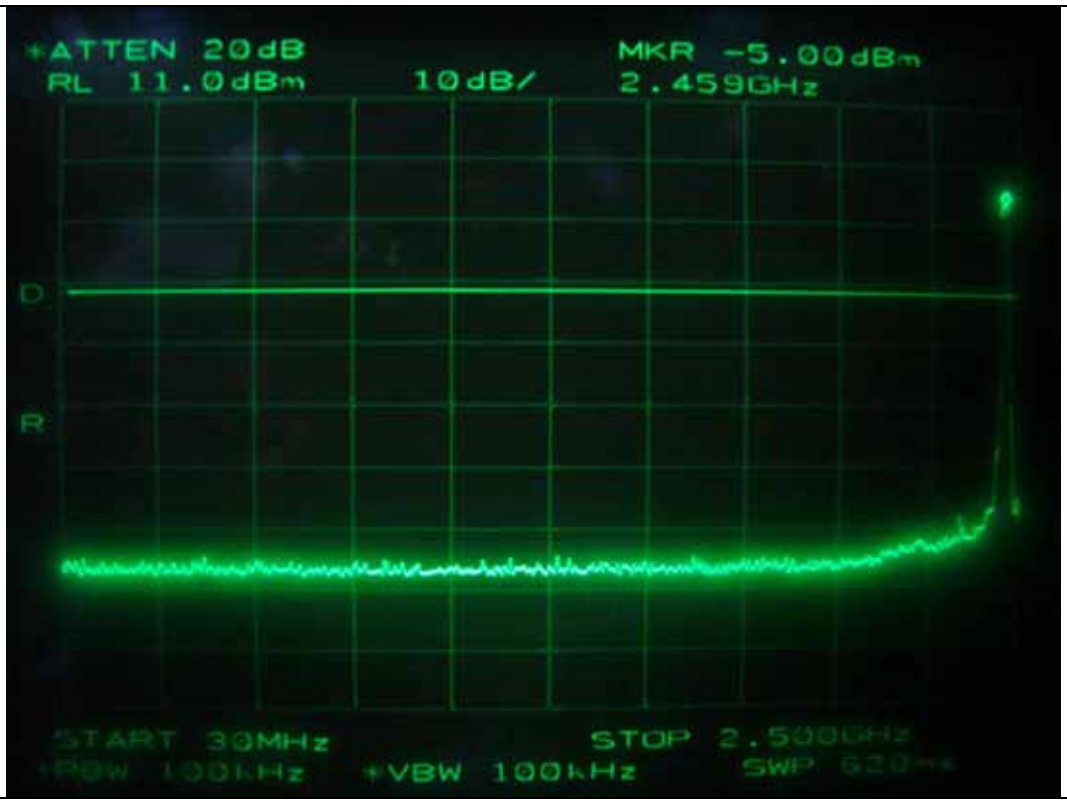
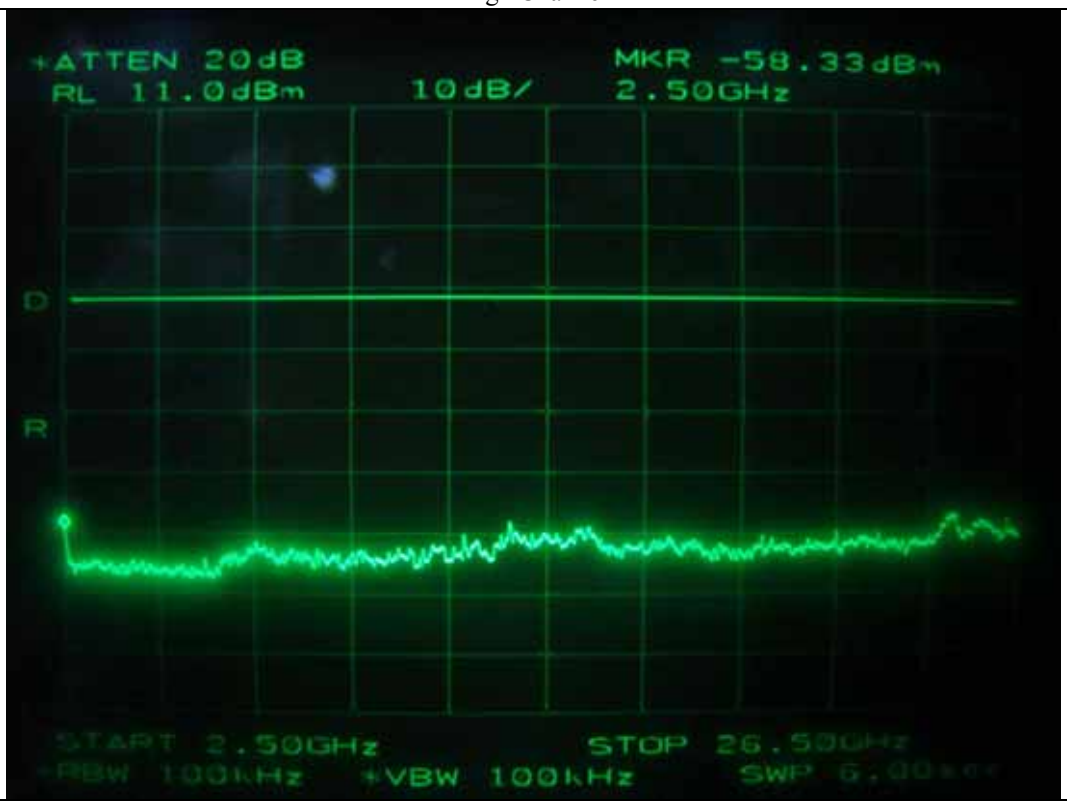


High Channel



High Channel

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8.3.6. Test data for radiated emission

8.3.6.1 Radiated Emission which fall in the Restricted Band

-. Test Date : August 30, 2007

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

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

-. Frequency range : 1 GHz ~ 25GHz

-. Measurement distance : 3m

-. Operating Condition : Low / High Channel

-. Result : PASSED BY –23.23 dB at High Channel (9, 18, 24 and 28 Mbps)

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Low Channel (6 Mbps)										
2390.00	37.50	Peak	H	27.26	3.83	26.10		42.49	74.00	-31.51
	25.50	Average	H					30.49	54.00	-23.51
	37.67	Peak	V					42.66	74.00	-31.34
	25.67	Average	V					30.66	54.00	-23.34
Test Data for Low Channel (9 Mbps)										
2390.00	37.33	Peak	H	27.26	3.83	26.10		42.32	74.00	-31.68
	25.67	Average	H					30.66	54.00	-23.34
	37.50	Peak	V					42.49	74.00	-31.51
	25.33	Average	V					30.32	54.00	-23.68
Test Data for Low Channel (12 Mbps)										
2390.00	37.67	Peak	H	27.26	3.83	26.10		42.66	74.00	-31.34
	25.50	Average	H					30.49	54.00	-23.51
	37.33	Peak	V					42.32	74.00	-31.68
	25.50	Average	V					30.49	54.00	-23.51
Test Data for Low Channel (18 Mbps)										
2390.00	37.83	Peak	H	27.26	3.83	26.10		42.82	74.00	-31.18
	25.67	Average	H					30.66	54.00	-23.34
	37.50	Peak	V					42.49	74.00	-31.51
	25.33	Average	V					30.32	54.00	-23.68

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Test Data for Low Channel (24 Mbps)										
2390.00	37.67	Peak	H	27.26	3.83	26.10		42.66	74.00	-31.34
	25.67	Average	H					30.66	54.00	-23.34
	37.33	Peak	V					42.32	74.00	-31.68
	25.17	Average	V					30.16	54.00	-23.84
Test Data for Low Channel (36 Mbps)										
2390.00	37.33	Peak	H	27.26	3.83	26.10		42.32	74.00	-31.68
	25.50	Average	H					30.49	54.00	-23.51
	37.50	Peak	V					42.49	74.00	-31.51
	25.33	Average	V					30.32	54.00	-23.68
Test Data for Low Channel (48 Mbps)										
2390.00	37.67	Peak	H	27.26	3.83	26.10		42.66	74.00	-31.34
	25.33	Average	H					30.32	54.00	-23.68
	37.83	Peak	V					42.82	74.00	-31.18
	25.67	Average	V					30.66	54.00	-23.34
Test Data for Low Channel (54 Mbps)										
2390.00	37.83	Peak	H	27.26	3.83	26.10		42.82	74.00	-31.18
	25.50	Average	H					30.49	54.00	-23.51
	37.33	Peak	V					42.32	74.00	-31.68
	25.33	Average	V					30.32	54.00	-23.68

Tabulated test data for Restricted Band

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

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-Continued

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for High Channel (6 Mbps)										
2483.50	37.67	Peak	H	27.55	3.83	26.10		42.95	74.00	-31.06
	25.33	Average	H					30.61	54.00	-23.40
	37.50	Peak	V					42.78	74.00	-31.23
	25.00	Average	V					30.28	54.00	-23.73
Test Data for High Channel (9 Mbps)										
2483.50	37.83	Peak	H	27.55	3.83	26.10		43.11	74.00	-30.90
	25.50	Average	H					30.78	54.00	-23.23
	37.33	Peak	V					42.61	74.00	-31.40
	25.17	Average	V					30.45	54.00	-23.56
Test Data for High Channel (12 Mbps)										
2483.50	37.67	Peak	H	27.55	3.83	26.10		42.95	74.00	-31.06
	25.33	Average	H					30.61	54.00	-23.40
	37.67	Peak	V					42.95	74.00	-31.06
	25.33	Average	V					30.61	54.00	-23.40
Test Data for High Channel (18 Mbps)										
2483.50	37.83	Peak	H	27.55	3.83	26.10		43.11	74.00	-30.90
	25.50	Average	H					30.78	54.00	-23.23
	37.50	Peak	V					42.78	74.00	-31.23
	25.17	Average	V					30.45	54.00	-23.56
Test Data for High Channel (24 Mbps)										
2483.50	37.67	Peak	H	27.55	3.83	26.10		42.95	74.00	-31.06
	25.50	Average	H					30.78	54.00	-23.23
	37.33	Peak	V					42.61	74.00	-31.40
	25.33	Average	V					30.61	54.00	-23.40

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Test Data for High Channel (36 Mbps)										
2483.50	37.33	Peak	H	27.55	3.83	26.10		42.61	74.00	-31.40
	25.17	Average	H					30.45	54.00	-23.56
	37.50	Peak	V					42.78	74.00	-31.23
	25.33	Average	V					30.61	54.00	-23.40
Test Data for High Channel (48 Mbps)										
2483.50	37.67	Peak	H	27.55	3.83	26.10		42.95	74.00	-31.06
	25.50	Average	H					30.78	54.00	-23.23
	37.33	Peak	V					42.61	74.00	-31.40
	25.10	Average	V					30.38	54.00	-23.63
Test Data for High Channel (54 Mbps)										
2483.50	37.83	Peak	H	27.55	3.83	26.10		43.11	74.00	-30.90
	25.33	Average	H					30.61	54.00	-23.40
	37.17	Peak	V					42.45	74.00	-31.56
	25.00	Average	V					30.28	54.00	-23.73

Tabulated test data for Restricted Band

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

Tested by: Ki-Hong, Nam / Test Engineer

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8.3.6.2 Spurious & Harmonic Radiated Emission

-. Test Date : August 30, 2007

-. 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, 10Hz for Average Mode

-. Frequency range : 1 GHz ~ 25 GHz

-. Measurement distance : 3m

-. Result : PASSED BY –16.00 dB at High Channel (6, 9, 18 and 24 Mbps)

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Low Channel (6 Mbps)										
2412.00	59.83	Peak	H	27.33	3.83			90.99	-	
	58.33	Peak	V					89.49	-	
4824.00*	38.33	Peak	H	31.63	6.55	26.10		50.42	74.00	-23.58
	25.83	Average	H					37.92	54.00	-16.08
	38.17	Peak	V					50.26	74.00	-23.74
	25.33	Average	V					37.42	54.00	-16.58
Test Data for Low Channel (9 Mbps)										
2412.00	59.83	Peak	H	27.33	3.83			90.99	-	
	58.50	Peak	V					89.66	-	
4824.00*	38.17	Peak	H	31.63	6.55	26.10		50.26	74.00	-23.74
	25.50	Average	H					37.59	54.00	-16.41
	38.33	Peak	V					50.42	74.00	-23.58
	25.50	Average	V					37.59	54.00	-16.41
Test Data for Low Channel (12 Mbps)										
2412.00	60.00	Peak	H	27.33	3.83			91.16	-	
	58.67	Peak	V					89.83	-	
4824.00*	38.67	Peak	H	31.63	6.55	26.10		50.76	74.00	-23.24
	25.67	Average	H					37.76	54.00	-16.24
	38.50	Peak	V					50.59	74.00	-23.41
	25.67	Average	V					37.76	54.00	-16.24

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Test Data for Low Channel (18 Mbps)										
2412.00	60.17	Peak	H	27.33	3.83			91.33	-	
	58.83	Peak	V					89.99	-	
4824.00*	38.83	Peak	H	31.63	6.55	26.10		50.92	74.00	-23.08
	25.33	Average	H					37.42	54.00	-16.58
	38.33	Peak	V					50.42	74.00	-23.58
	25.83	Average	V					37.92	54.00	-16.08
Test Data for Low Channel (24 Mbps)										
2412.00	60.17	Peak	H	27.33	3.83			91.33	-	
	59.00	Peak	V					90.16	-	
4824.00*	38.67	Peak	H	31.63	6.55	26.10		50.76	74.00	-23.24
	25.50	Average	H					37.59	54.00	-16.41
	38.17	Peak	V					50.26	74.00	-23.74
	25.50	Average	V					37.59	54.00	-16.41
Test Data for Low Channel (36 Mbps)										
2412.00	60.33	Peak	H	27.33	3.83			91.49	-	
	59.10	Peak	V					90.26	-	
4824.00*	38.83	Peak	H	31.63	6.55	26.10		50.92	74.00	-23.08
	25.67	Average	H					37.76	54.00	-16.24
	38.33	Peak	V					50.42	74.00	-23.58
	25.50	Average	V					37.59	54.00	-16.41
Test Data for Low Channel (48 Mbps)										
2412.00	60.40	Peak	H	27.33	3.83			91.56	-	
	59.33	Peak	V					90.49	-	
4824.00*	38.67	Peak	H	31.63	6.55	26.10		50.76	74.00	-23.24
	25.50	Average	H					37.59	54.00	-16.41
	38.17	Peak	V					50.26	74.00	-23.74
	25.33	Average	V					37.42	54.00	-16.58

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Test Data for Low Channel (54 Mbps)										
2412.00	60.50	Peak	H	27.33	3.83			91.66	-	
	59.50	Peak	V					90.66	-	
4824.00*	38.83	Peak	H	31.63	6.55	26.10		50.92	74.00	-23.08
	25.67	Average	H					37.76	54.00	-16.24
	38.33	Peak	V					50.42	74.00	-23.58
	25.17	Average	V					37.26	54.00	-16.74

Tabulated test data for Restricted Band

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

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Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Middle Channel (6 Mbps)										
2437.00	60.83	Peak	H	27.40	3.83			92.06	-	
	59.10	Peak	V					90.33	-	
4874.00*	38.50	Peak	H	31.72	6.59	26.10		50.71	74.00	-23.29
	25.50	Average	H					37.71	54.00	-16.29
	38.33	Peak	V					50.54	74.00	-23.46
	25.17	Average	V					37.38	54.00	-16.62
Test Data for Middle Channel (9 Mbps)										
2437.00	61.00	Peak	H	27.40	3.83			92.23	-	
	59.17	Peak	V					90.40	-	
4874.00*	38.67	Peak	H	31.72	6.59	26.10		50.88	74.00	-23.12
	25.33	Average	H					37.54	54.00	-16.46
	38.50	Peak	V					50.71	74.00	-23.29
	25.33	Average	V					37.54	54.00	-16.46
Test Data for Middle Channel (12 Mbps)										
2437.00	61.00	Peak	H	27.40	3.83			92.23	-	
	59.33	Peak	V					90.56	-	
4874.00*	38.33	Peak	H	31.72	6.59	26.10		50.54	74.00	-23.46
	25.17	Average	H					37.38	54.00	-16.62
	38.50	Peak	V					50.71	74.00	-23.29
	25.33	Average	V					37.54	54.00	-16.46
Test Data for Middle Channel (18 Mbps)										
2437.00	61.33	Peak	H	27.40	3.83			92.56	-	
	59.40	Peak	V					90.63	-	
4874.00*	38.83	Peak	H	31.72	6.59	26.10		51.04	74.00	-22.96
	25.50	Average	H					37.71	54.00	-16.29
	38.67	Peak	V					50.88	74.00	-23.12
	25.67	Average	V					37.88	54.00	-16.12

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Test Data for Middle Channel (24 Mbps)										
2437.00	61.50	Peak	H	27.40	3.83			92.73	-	
	59.50	Peak	V					90.73	-	
4874.00*	38.67	Peak	H	31.72	6.59	26.10		50.88	74.00	-23.12
	25.33	Average	H					37.54	54.00	-16.46
	38.83	Peak	V					51.04	74.00	-22.96
	25.50	Average	V					37.71	54.00	-16.29
Test Data for Middle Channel (36 Mbps)										
2437.00	61.67	Peak	H	27.40	3.83			92.90	-	
	59.67	Peak	V					90.90	-	
4874.00*	38.33	Peak	H	31.72	6.59	26.10		50.54	74.00	-23.46
	25.17	Average	H					37.38	54.00	-16.62
	38.67	Peak	V					50.88	74.00	-23.12
	25.33	Average	V					37.54	54.00	-16.46
Test Data for Middle Channel (48 Mbps)										
2437.00	61.67	Peak	H	27.40	3.83			92.90	-	
	59.83	Peak	V					91.06	-	
4874.00*	38.83	Peak	H	31.72	6.59	26.10		51.04	74.00	-22.96
	25.67	Average	H					37.88	54.00	-16.12
	38.72	Peak	V					50.93	74.00	-23.07
	25.60	Average	V					37.81	54.00	-16.19
Test Data for Middle Channel (54 Mbps)										
2437.00	61.92	Peak	H	27.40	3.83			93.15	-	
	60.00	Peak	V					91.23	-	
4874.00*	38.67	Peak	H	31.72	6.59	26.10		50.88	74.00	-23.12
	25.50	Average	H					37.71	54.00	-16.29
	38.33	Peak	V					50.54	74.00	-23.46
	25.38	Average	V					37.59	54.00	-16.41

Tabulated test data for Restricted Band

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

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Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for High Channel (6 Mbps)										
2462.00	60.00	Peak	H	27.48	3.83			91.31	-	
	58.83	Peak	V					90.14	-	
4924.00*	38.67	Peak	H	31.81	6.62	26.10		51.00	74.00	-23.00
	25.67	Average	H					38.00	54.00	-16.00
	38.50	Peak	V					50.83	74.00	-23.17
	25.50	Average	V					37.83	54.00	-16.17
Test Data for High Channel (9 Mbps)										
2462.00	60.33	Peak	H	27.48	3.83			91.64	-	
	59.00	Peak	V					90.31	-	
4924.00*	38.83	Peak	H	31.81	6.62	26.10		51.16	74.00	-22.84
	25.67	Average	H					38.00	54.00	-16.00
	38.33	Peak	V					50.66	74.00	-23.34
	25.33	Average	V					37.66	54.00	-16.34
Test Data for High Channel (12 Mbps)										
2462.00	60.40	Peak	H	27.48	3.83			91.71	-	
	59.10	Peak	V					90.41	-	
4924.00*	38.92	Peak	H	31.81	6.62	26.10		51.25	74.00	-22.75
	25.17	Average	H					37.50	54.00	-16.50
	38.67	Peak	V					51.00	74.00	-23.00
	25.33	Average	V					37.66	54.00	-16.34
Test Data for High Channel (18 Mbps)										
2462.00	60.67	Peak	H	27.48	3.83			91.98	-	
	59.33	Peak	V					90.64	-	
4924.00*	38.83	Peak	H	31.81	6.62	26.10		51.16	74.00	-22.84
	25.67	Average	H					38.00	54.00	-16.00
	38.50	Peak	V					50.83	74.00	-23.17
	25.67	Average	V					38.00	54.00	-16.00

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Test Data for High Channel (24 Mbps)										
2462.00	60.67	Peak	H	27.48	3.83			91.98	-	
	59.50	Peak	V					90.81	-	
4924.00*	38.17	Peak	H	31.81	6.62	26.10		50.50	74.00	-23.50
	25.33	Average	H					37.66	54.00	-16.34
	38.50	Peak	V					50.83	74.00	-23.17
	25.67	Average	V					38.00	54.00	-16.00
Test Data for High Channel (36 Mbps)										
2462.00	60.83	Peak	H	27.48	3.83			92.14	-	
	59.72	Peak	V					91.03	-	
4924.00*	38.72	Peak	H	31.81	6.62	26.10		51.05	74.00	-22.95
	25.17	Average	H					37.50	54.00	-16.50
	38.50	Peak	V					50.83	74.00	-23.17
	25.33	Average	V					37.66	54.00	-16.34
Test Data for High Channel (48 Mbps)										
2462.00	61.00	Peak	H	27.48	3.83			92.31	-	
	59.83	Peak	V					91.14	-	
4924.00*	38.83	Peak	H	31.81	6.62	26.10		51.16	74.00	-22.84
	25.17	Average	H					37.50	54.00	-16.50
	38.67	Peak	V					51.00	74.00	-23.00
	25.48	Average	V					37.81	54.00	-16.19
Test Data for High Channel (54 Mbps)										
2462.00	61.10	Peak	H	27.48	3.83			92.41	-	
	60.10	Peak	V					91.41	-	
4924.00*	38.67	Peak	H	31.81	6.62	26.10		51.00	74.00	-23.00
	25.33	Average	H					37.66	54.00	-16.34
	38.72	Peak	V					51.05	74.00	-22.95
	25.50	Average	V					37.83	54.00	-16.17

Tabulated test data for Restricted Band

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

Tested by: Ki-Hong, Nam / Test Engineer

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8.4 PEAK POWER SPECTRUL DENSITY

8.4.1 Operating environment

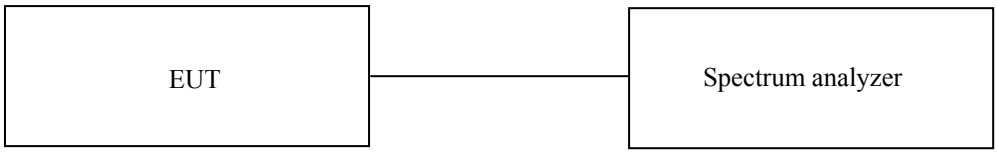
Temperature : 24.5 °C

Relative humidity : 40.1 %

8.4.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 3 kHz, the video bandwidth is set to 3 times the resolution bandwidth, and sweep time was set to span / 3 kHz. The sweep time was allowed to be longer than span / 3 kHz for a full response of the mixer in the spectrum analyzer.

The maximum level from the EUT in a 3 kHz bandwidth was measured with above condition.



8.4.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 19, 2007

All test equipment used is calibrated on a regular basis.

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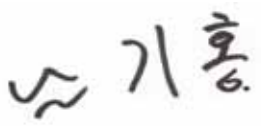
8.4.4 Test data

-. Test Date : August 20, 2007

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2412	-27.17	8.00	-35.17
Middle	2437	-26.83	8.00	-34.83
High	2462	-26.00	8.00	-34.00

Remark: See next page for measurement data.



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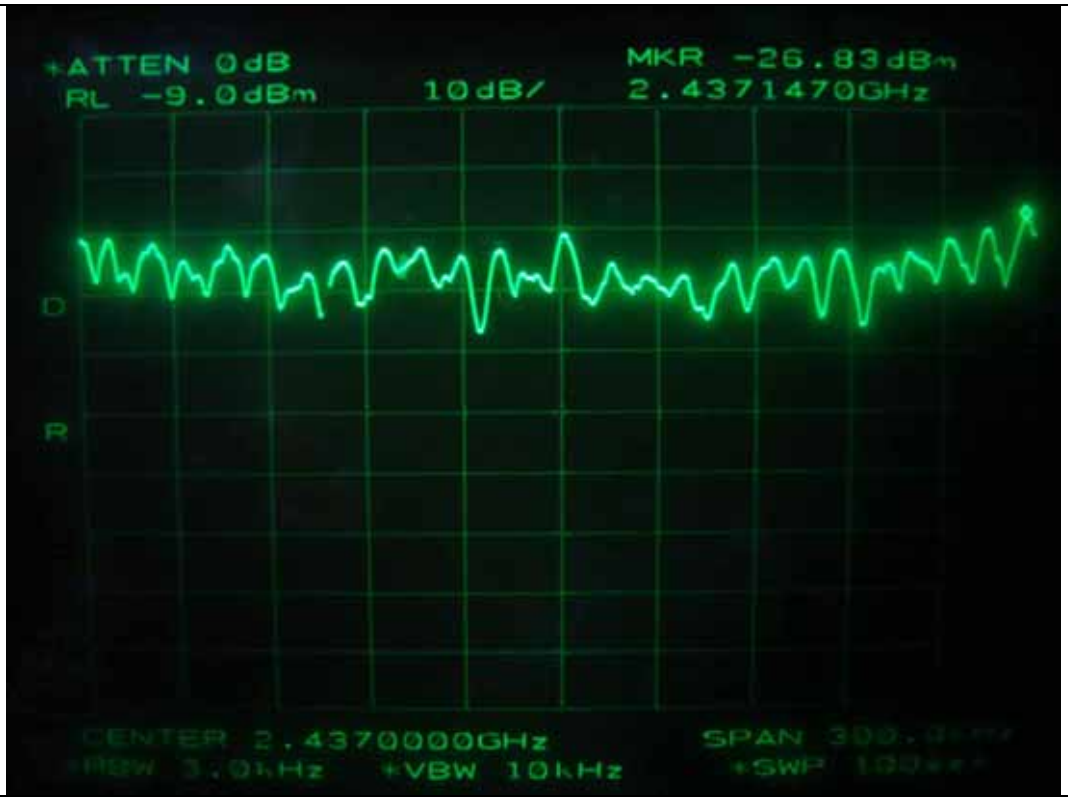
Low Channel



Middle Channel

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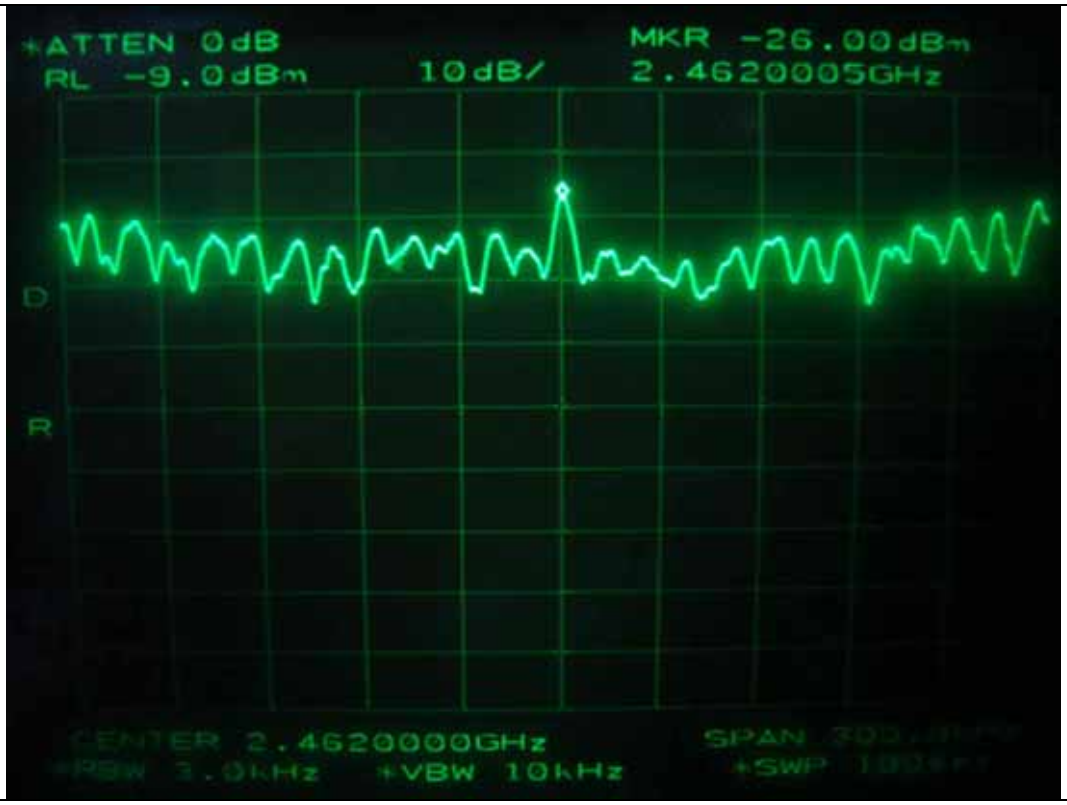

High Channel

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8.5 RADIATED EMISSION TEST FOR DIGITAL DEVICE PART

8.5.1 Operating environment

Temperature : 29 °C

Relative humidity : 37 %

8.5.2 Test set-up

The radiated emissions measurements were on the 3 meters, 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 30MHz to 1000MHz 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 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

8.5.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	ESVS10	Rohde & Schwarz	EMI Test Receiver	827864/005	Dec. 21, 2006
■ -	8566B	HP	Spectrum Analyzer	3407A08547	June 20, 2007
■ -	8447D	Hewlett Packard	Amplifier	2727A04987	June 19, 2007
■ -	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
■ -	VHA9103	Schwarzbeck	Biconical Antenna	91031852	Feb. 08, 2007
■ -	9108-A(494)	Schwarzbeck	Log Periodic Antenna	62281001	Feb. 08, 2007

All test equipment used is calibrated on a regular basis.

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8.5.4 Test data

-. Test Date : August 30, 2007

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30MHz ~ 1000MHz

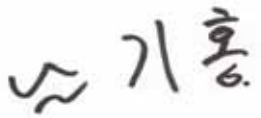
-. Measurement distance : 3m

-. Test result : Passed by -7.33 dB at 621.11 MHz(Low Channel)

Frequency (MHz)	Reading (dBuV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBuV/m)	Limits (dBuV/m)	Margin (dB)
Low Channel							
33.88	10.67	V	17.19	1.46	29.32	40.00	-10.68
50.35	16.00	V	11.05	1.60	28.65	40.00	-11.35
118.18	19.17	V	12.74	2.66	34.57	43.52	-8.95
198.61	15.00	H	16.37	3.33	34.70	43.52	-8.82
621.11	12.33	H	20.26	5.93	38.52	46.02	-7.50
648.24	10.50	H	21.11	6.09	37.70	46.02	-8.32
Middle Channel							
33.88	10.83	V	17.19	1.46	29.48	40.00	-10.52
50.35	15.92	V	11.05	1.60	28.57	40.00	-11.43
118.18	19.00	V	12.74	2.66	34.40	43.52	-9.12
198.61	15.17	H	16.37	3.33	34.87	43.52	-8.65
621.11	12.50	H	20.26	5.93	38.69	46.02	-7.33
648.24	10.33	H	21.11	6.09	37.53	46.02	-8.49
Low Channel							
33.88	10.67	V	17.19	1.46	29.32	40.00	-10.68
50.35	15.83	V	11.05	1.60	28.48	40.00	-11.52
118.18	19.33	V	12.74	2.66	34.73	43.52	-8.79
198.61	15.50	H	16.37	3.33	35.20	43.52	-8.32
621.11	12.17	H	20.26	5.93	38.36	46.02	-7.66
648.24	10.50	H	21.11	6.09	37.70	46.02	-8.32

Tabulated test data for Radiated Electromagnetic Field

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



Tested by: Ki-Hong, Nam / Test Engineer

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8.6 CONDUCTED EMISSION TEST

8.6.1 Operating environment

Temperature : 25 °C

Relative humidity : 48 %

8.6.2 Test set-up

The EUT was placed on a wooden table, 0.8 meters height above the floor. The power of the EUT was connected through a 50 ohm/ 50 uH + 5ohm Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

8.6.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	May 11, 2007
■ -	NSLK 8128	Schwarzbeck	AMN	8128-216	July 04, 2007
■ -	3825/2	EMCO	AMN	9109-1867	June 21, 2007

All test equipment used is calibrated on a regular basis.

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8.6.4 Test data

-. Test Date : August 31, 2007

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15MHz ~ 30MHz

-. Test Result : PASSED BY –9.90dB at 0.15 MHz under average mode

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Limits		Emission level	Limits	
0.15	H	55.23	65.73	-10.50	45.83	55.73	-9.90
0.30	N	43.69	60.24	-16.55	35.70	50.24	-14.54
1.43	H	40.40	56.00	-15.60	26.74	46.00	-19.26
2.55	H	42.32	56.00	-13.68	26.10	46.00	-19.90
2.73	N	43.83	56.00	-12.17	27.61	46.00	-18.39
4.27	N	39.70	56.00	-16.30	20.97	46.00	-25.03

Line Conducted Emissions Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

See next page for an overview sweep performed with peak and average detector modes.

Tested by: Ki-Hong, Nam / Test Engineer

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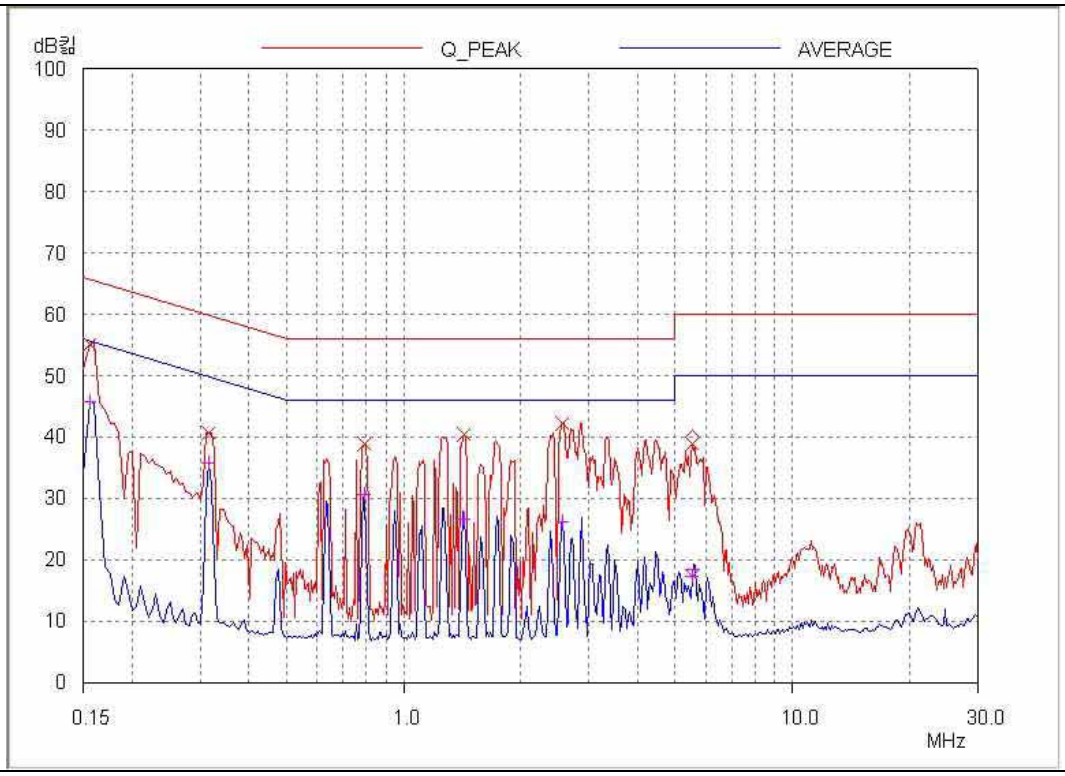
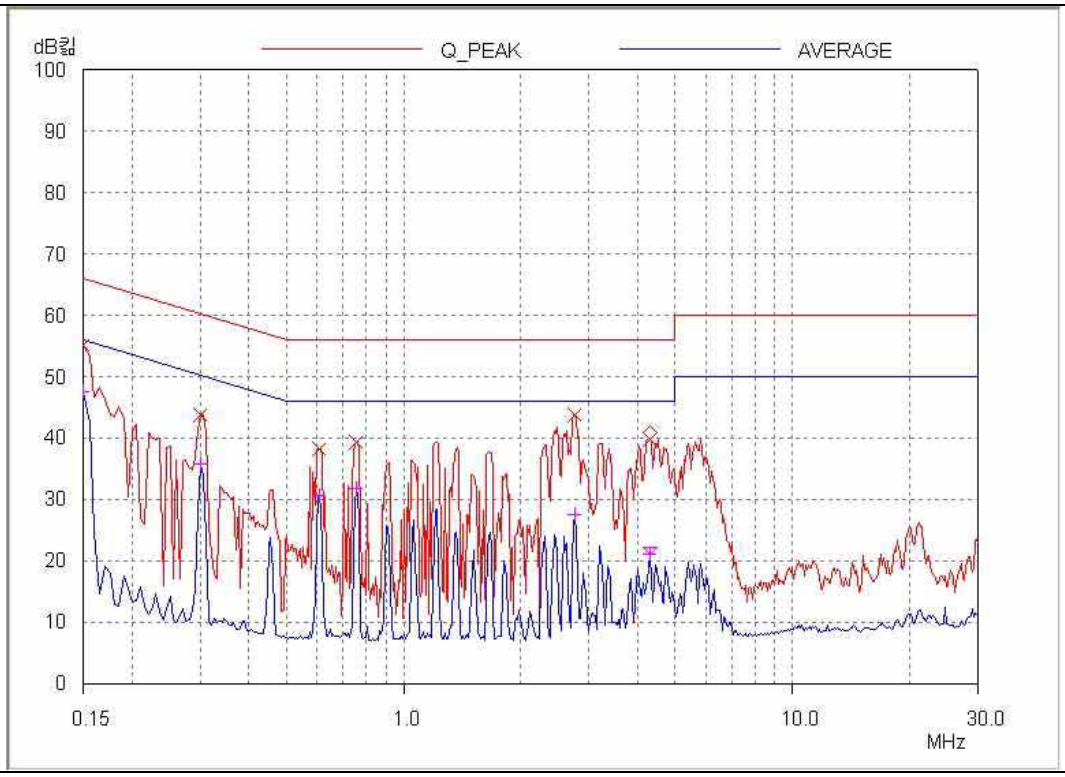


HOT LINE



NEUTRAL LINE

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9. RADIO FREQUENCY EXPOSURE

9.1 RF Exposure Limit

According to the FCC rule §1.1310, the limit for General Population/Uncontrolled exposure is 1mW/cm² for the device operating 1,500~100,000 MHz.

9.2 EUT Description

Kind of EUT	Industrial Mobile Computer with Bluetooth and WLAN 802.11b, 802.11g
Operating Frequency Band	■ WLAN: 2400 ~ 2483.5 MHz ☐ WLAN: 5180 ~ 5320 MHz / 5500 ~ 5700 MHz ☐ WLAN: 5745 ~ 5825 MHz ☐ Bluetooth: 2400 ~ 2483.5 MHz
Device Category	■ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☐ Others
Max. Output Power	18.60 dBm(72.444mW) at 2437MHz (802.11b), 16.90 dBm(48.978mW) at 2437MHz & 2462MHz (802.11g)
Used Antenna	MFR.: PARTRON, Model No.: ACS2450KC
Used Antenna Gain	1.0dBi
Exposure Evaluation Applied	☐ MPE ☐ SAR ■ N/A

9.3 Test Result

According to the rule, §1.1307(b) (1) and §2.1093, PORTABLE devices using WLAN technology according to §15.247 are exempt from the regulation.

So, the device meets the RF exposure requirement.

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