

FCC Test Report

APPLICANT : Sony Mobile Communications AB
EQUIPMENT : Smart phone
BRAND NAME : Sony
MODEL NAME : PM-0251-BV
MARKETING NAME : C1605
FCC ID : PY7PM-0251
STANDARD : FCC 47 CFR Part 15:2012 Subpart B
CLASSIFICATION : FCC CLASS B PERSONAL COMPUTERS
AND PERIPHERALS

The product was received on Sep. 04, 2012 and completely tested on Oct. 02, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards. The test results also comply with Industrial Canada Interference-Causing Equipment Standard ICES-003 with no deviation from the standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result (PASS/FAIL)	Remark
3.1	15.107	7.2.4	AC Conducted Emission	< 15.107 limits < RSS-Gen table 2 limits	PASS	Under limit 14.30 dB at 0.198 MHz
3.2	15.109	7.2.3.2	Radiated Emission	< 15.109 limits or < RSS-Gen table 1 limits (Section 6)	PASS	Under limit 8.16 dB at 38.640 MHz



1. General Description

1.1. Applicant

Sony Mobile Communications AB
Nya Vattentorget, 22188 Lund, Sweden

1.2. Manufacturer

Arima Communications Corp.
6F, No. 866, Jhongjheng Rd., Jhonghe City, Taipei County 23586, Taiwan

1.3. Feature of Equipment Under Test

The Equipment Under Test (hereafter called: EUT) is mobile phone supporting, GSM / WCDMA / Wi-Fi 2.4GHz 802.11b/g/n, Bluetooth with FM Receiver, and GPS features, and below is details of information.

General Information of Equipment Under Test	
Equipment	Smart phone
Brand Name	Sony
Model Name	PM-0251-BV
Marketing Name	C1605
FCC ID	PY7PM-0251
GSM Operating Band(s)	GSM 850/900/1800/1900MHz
WCDMA Operating Band(s)	FDD Band I / VIII
WCDMA Rel. Version	Rel. 6
GPRS / EGPRS Multi Slot Class	GPRS Class 12 , EGPRS Class 12
Wi-Fi Specification	802.11b/g/n (HT20)
Bluetooth Version	V2.1 + EDR / V3.0
Power Supply	Battery / AC Adapter /Car Charger

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4. Details of Tested Sample (EUT) Information

Below EUT sample and accessory are used to test.

EUT Serial Number	IMEI : 00440214-622774-3 S/N : WUJ012D9KD
H/W :	SP
S/W :	11.1.A.0.21
EUT Stage	Production Unit

Accessory List	
AC Adapter	Model No. : EP800
	Type No. : CAA-00002016-BV B
Battery	Model No. : BA700
	Type No. : CBA-0002025
Earphone	Model No. : MH410c
	Type No. : AG-1100
USB Cable	Model No. : EC450
	Part No. : 1242-6715.2

Note:

1. Above EUT list used are electrically identical per declared by manufacturer
2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report.
3. No modifications are made to the EUT during all test items.
4. For other wireless features of this EUT, test report will be issued separately.

1.5. Testing Facility

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH06-HY	722060/4086B-1

1.6. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 47 CFR FCC Part 15 Subpart B
- ANSI C63.4-2003
- IC ICES-003 Issue 5

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. For FCC 15 Subpart B - Unintentional Radiators, device supporting USB interface or similar peripherals (defined as the Section 15.3 (r) Peripheral device) acting as a peripheral for personal computers shall be authorized as “The Class B personal computers and peripherals” per the Section 15.101 (a) Equipment authorization of unintentional radiators.
3. For other Unintentional Radiators features of this EUT, test reports are issued separately.

Per the Note of the Section 15.101, when device supports features (USB, FM Radio, digital devices...etc) more than one category of authorization, type of authorization shall be appropriately chosen for FCC 15B compliance rule, and the Section 15.101 (b), only those receivers that operate (tune) within the frequency range of 30-960 MHz, CB receivers and radar detectors are subject to the authorizations shown in paragraph (a) of the Section 15.101. However, receivers indicated as being subject to Declaration of Conformity that are contained within a transceiver, the transmitter portion of which is subject to certification, shall be authorized under the verification procedure.

2. Test Configuration of Equipment Under Test

2.1. Descriptions of Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction (150 KHz to 30 MHz), radiation (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The following tables are showing the test mode as the worst cases and recorded in this report.

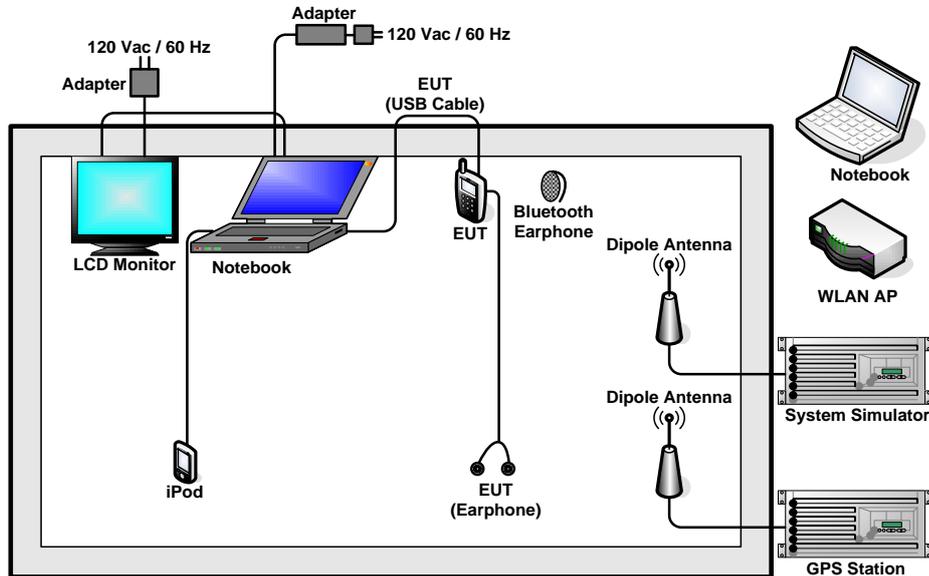
Item	EUT Configuration	Test Condition	
		EMI AC	EMI RE
1.	Data Link with Notebook	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The data application (each file size is greater than 30Mbytes) is continuously transferred between the EUT and Notebook connected via USB cable, while GSM, WLAN, and Bluetooth and GPS idle.

Abbreviations:

- EMI AC: AC conducted emissions
- EMI RE: EUT radiated emissions

2.2. Connection Diagram of EUT Test Configurations



2.3. Supported Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY70DA2029	N/A	N/A
5.	iPod	Apple	1285	FCC DoC	Unshielded, 1.0 m	N/A
6.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
7.	LCD Monitor	Dell	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m

2.4. Description of EUT Operation Test Setup

The data application (each file size is greater than 30Mbytes) is continuously transferred between the EUT and Notebook connected via USB cable, while GSM and Bluetooth, WLAN and GPS idle.

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1. Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

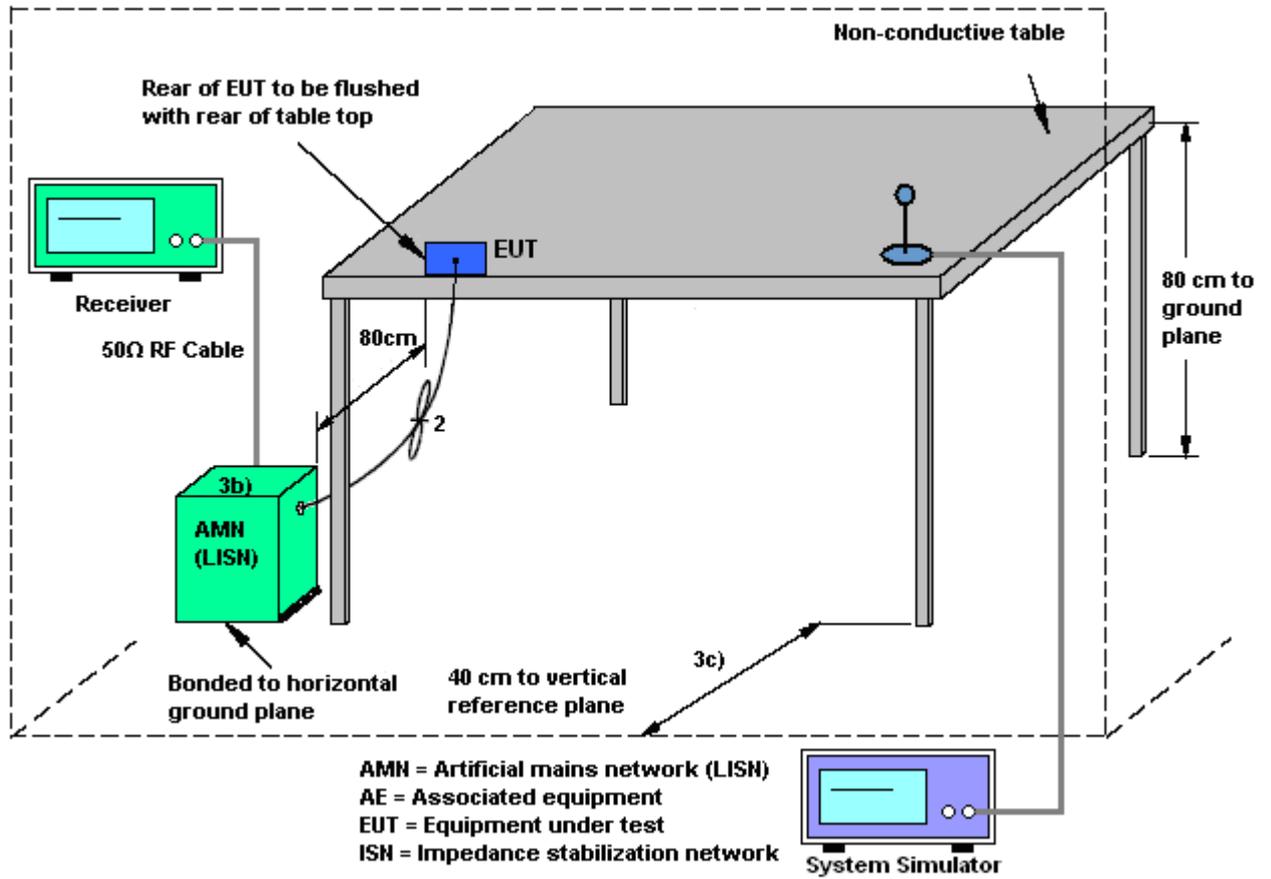
3.1.2. Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3. Test Procedure

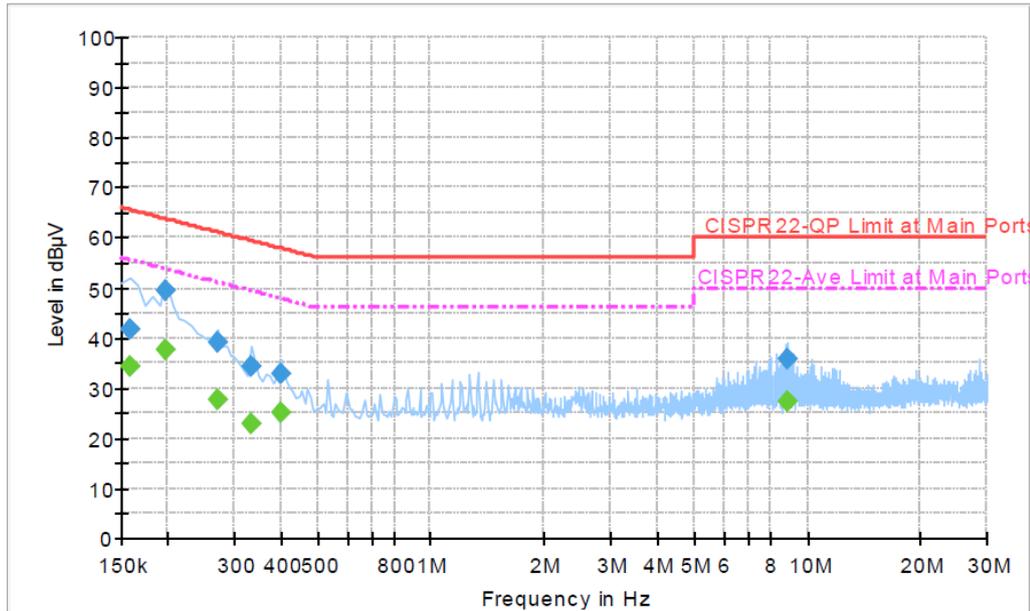
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 KHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.1.4. Test Setup



3.1.5. Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Slash Huang	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Data Link with Notebook		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : QuasiPeak

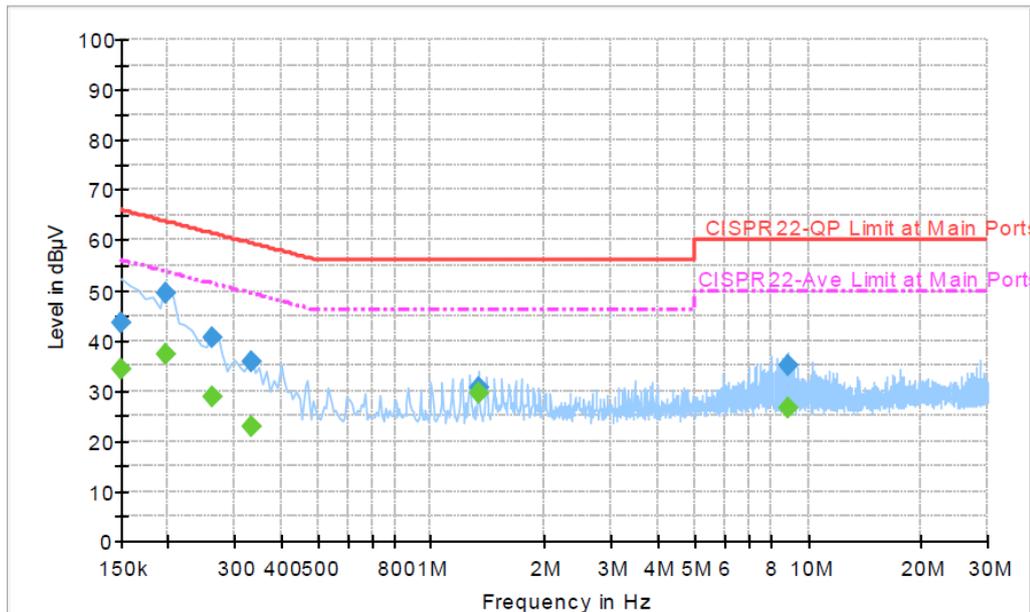
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	41.7	Off	L1	19.3	23.9	65.6
0.198000	49.4	Off	L1	19.3	14.3	63.7
0.270000	39.0	Off	L1	19.3	22.1	61.1
0.334000	34.2	Off	L1	19.4	25.2	59.4
0.398000	32.7	Off	L1	19.5	25.2	57.9
8.838000	35.7	Off	L1	19.8	24.3	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	34.3	Off	L1	19.3	21.3	55.6
0.198000	37.6	Off	L1	19.3	16.1	53.7
0.270000	27.7	Off	L1	19.3	23.4	51.1
0.334000	23.0	Off	L1	19.4	26.4	49.4
0.398000	25.1	Off	L1	19.5	22.8	47.9
8.838000	27.3	Off	L1	19.8	22.7	50.0



Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Slash Huang	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Data Link with Notebook		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	43.4	Off	N	19.4	22.6	66.0
0.198000	49.3	Off	N	19.3	14.4	63.7
0.262000	40.6	Off	N	19.4	20.8	61.4
0.334000	35.6	Off	N	19.4	23.8	59.4
1.334000	30.5	Off	N	19.5	25.5	56.0
8.838000	35.2	Off	N	19.8	24.8	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	34.3	Off	N	19.4	21.7	56.0
0.198000	37.3	Off	N	19.3	16.4	53.7
0.262000	28.9	Off	N	19.4	22.5	51.4
0.334000	23.0	Off	N	19.4	26.4	49.4
1.334000	29.5	Off	N	19.5	16.5	46.0
8.838000	26.7	Off	N	19.8	23.3	50.0



3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

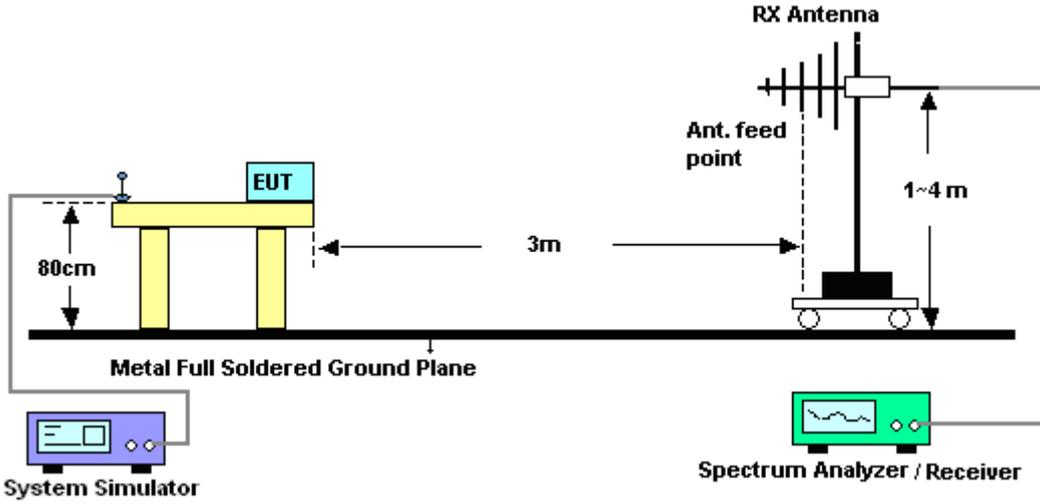
The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3. Test Procedures

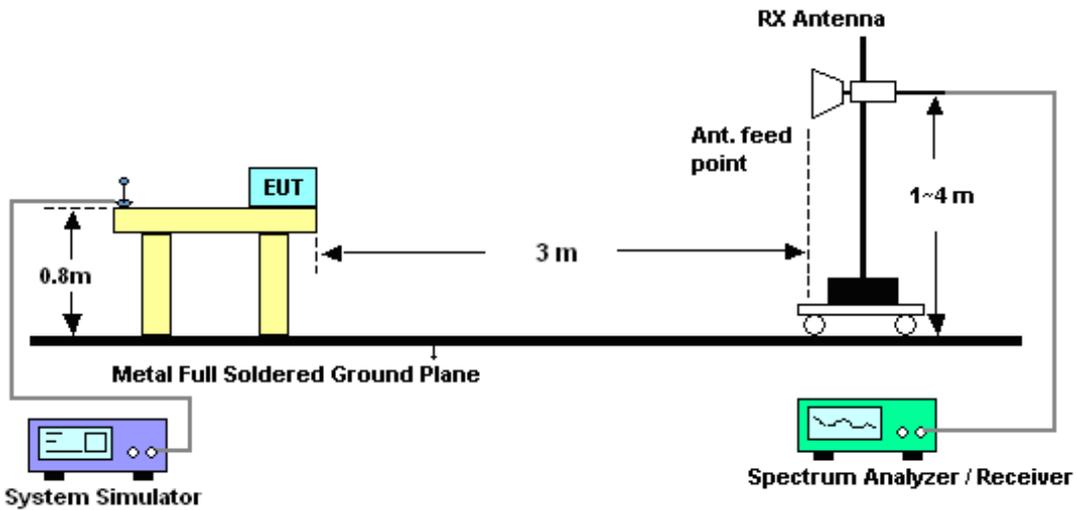
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported
8. Emission level (dBuV/m) = 20 log Emission level (uV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



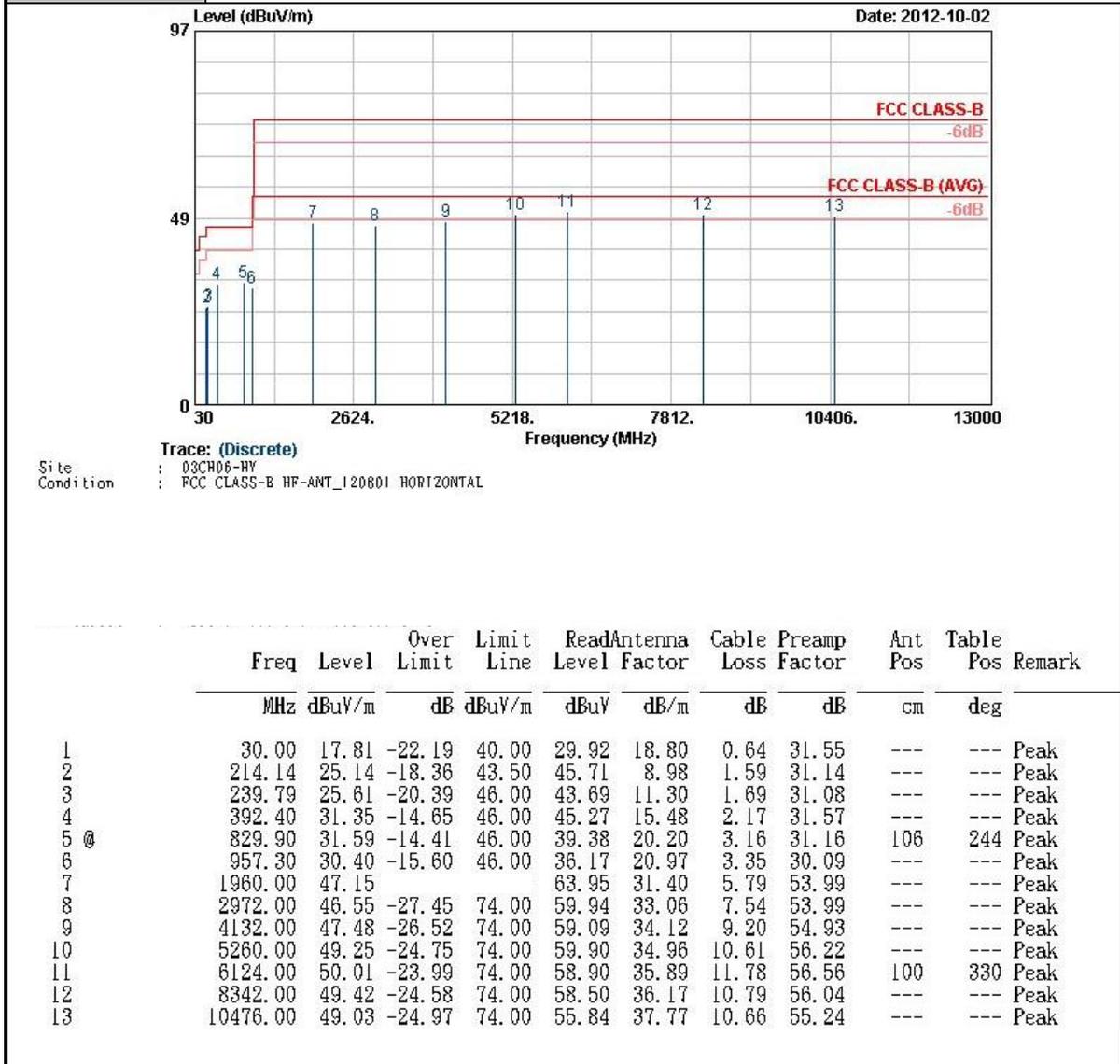
For radiated emissions above 1GHz





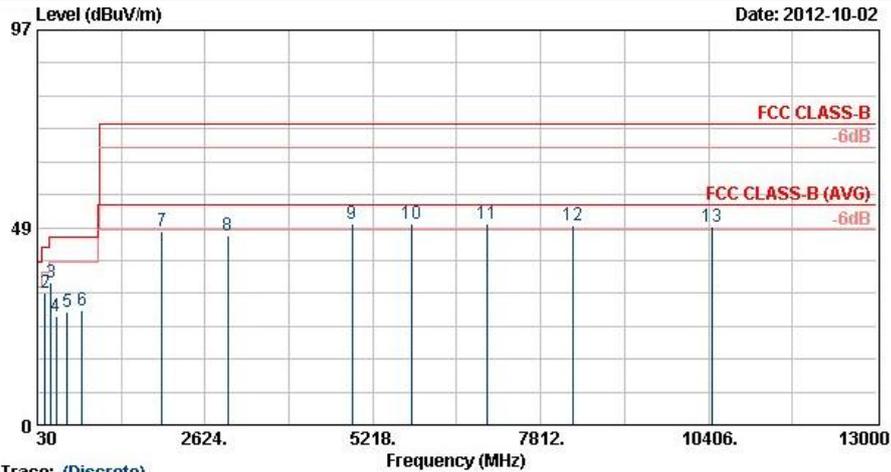
3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Kai Wang	Relative Humidity :	49~50%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	Data Link with Notebook		
Remark :	#7 is system simulator signal which can be ignored.		





Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Kai Wang	Relative Humidity :	49~50%
Test Distance :	3m	Polarization :	Vertical
Function Type :	Data Link with Notebook		
Remark :	#7 is system simulator signal which can be ignored.		



Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B HF-ANT_120801 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	38.64	31.84	-8.16	40.00	49.47	13.14	0.73	31.50	122	108	Peak
2 @	150.69	32.60	-10.90	43.50	52.41	10.10	1.34	31.25	---	---	Peak
3 @	239.79	35.09	-10.91	46.00	53.18	11.30	1.69	31.08	---	---	Peak
4	318.90	26.79	-19.21	46.00	42.24	13.59	1.96	31.00	---	---	Peak
5	497.40	27.81	-18.19	46.00	39.63	17.60	2.46	31.89	---	---	Peak
6	721.40	28.09	-17.91	46.00	37.27	19.35	2.96	31.50	---	---	Peak
7	1960.00	47.58			64.38	31.40	5.79	53.99	---	---	Peak
8	2980.00	46.44	-27.56	74.00	59.83	33.06	7.54	53.99	---	---	Peak
9	4892.00	49.24	-24.76	74.00	59.92	34.84	10.19	55.71	---	---	Peak
10	5812.00	49.52	-24.48	74.00	59.14	35.53	11.47	56.62	100	37	Peak
11	6980.00	49.34	-24.66	74.00	58.95	36.20	11.06	56.87	---	---	Peak
12	8318.00	49.14	-24.86	74.00	58.18	36.16	10.81	56.01	---	---	Peak
13	10454.00	48.67	-25.33	74.00	55.52	37.76	10.66	55.26	---	---	Peak



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receive	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Oct. 02, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Oct. 02, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Oct. 02, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Oct. 02, 2012	N/A	Conduction (CO05-HY)
Thermometer	Testo	608-H1	34913912	N/A	Dec. 13, 2011	Oct. 02, 2012	Dec. 12, 2012	Conduction (CO05-HY)
Test Software	N/A	EMC32	8.40.0	N/A	N/A	Oct. 02, 2012	N/A	Conduction (CO05-HY)
LF Cable	Shuner	RG-402	N/A	N/A	Oct. 07, 2012	Oct. 02, 2012	Nov. 06, 2012	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	Oct. 02, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Oct. 02, 2012	Jul. 27, 2013	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz ~ 26.5GHz	Nov. 23, 2011	Oct. 02, 2012	Nov. 22, 2012	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz-30GHz	Nov. 01, 2011	Oct. 02, 2012	Oct. 31, 2012	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz ~ 1000MHz	May 04, 2012	Oct. 02, 2012	May. 03, 2013	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 22, 2011	Oct. 02, 2012	Oct. 21, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Oct. 02, 2012	Jul. 31, 2013	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Oct. 02, 2012	Sep. 27, 2013	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 13, 2012	Oct. 02, 2012	Apr. 12, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz ~ 1GHz	Apr. 11, 2012	Oct. 02, 2012	Apr. 10, 2013	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 21, 2012	Oct. 02, 2012	Jul. 20, 2013	Radiation (03CH06-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Oct. 02, 2012	Feb. 26, 2013	Radiation (03CH06-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Filter	Microwave	H01G13G1	SN360979	1G HPF	Dec. 27, 2011	Oct. 02, 2012	Dec.26 , 2012	Radiation (03CH06-HY)
Thermometer	Wisewind	410	BU5004	N/A	Nov.22 , 2011	Oct. 02, 2012	Nov.21 , 2012	Radiation (03CH06-HY)
Test Software	Audix	E3	Version 6.2009-8-24	N/A	N/A	Oct. 02, 2012	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Oct. 02, 2012	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Oct. 02, 2012	N/A	Radiation (03CH06-HY)
RF Cable	Huber+Suhner	RG 142	NA	30M~1G	Dec.05 , 2011	Oct. 02, 2012	Dec.04 ,2012	Radiation (03CH06-HY)
RF Cable	Huber+Suhner	SF104	NA	1G~26.5G	Dec.05 , 2011	Oct. 02, 2012	Dec.04 ,2012	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Oct. 02, 2012	Jul. 27, 2013	Radiation (03CH06-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	Oct. 02, 2012	N/A	Radiation (03CH06-HY)

Note: Test equipment calibration is traceable to the procedure of ISO17025.



5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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