FCC/IC Test Report

APPLICANT	:	Sony Mobile Communications AB
EQUIPMENT	:	Smart phone
BRAND NAME	:	SONY
MODEL NAME	:	D2004
TYPE NAME	:	PM-0672-BV
FCC ID	:	PY7PM-0672
IC		4170B-PM0672
STANDARD	:	FCC 47 CFR FCC Part 15 Subpart B ICES-003 ISSUE 5
CLASSIFICATION	:	FCC CLASS B PERSONAL COMPUTERS AND PERIPHERALS

The product was received on Oct. 31, 2013 and testing was completed on Nov. 23, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2009 and shown to be compliant with the applicable technical 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.

Louis Wu

Reviewed by: Louis Wu / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FD3O3110	Rev. 01	Initial issue of report	Dec. 18, 2013
FD3O3110	Rev. 02	Revising description of HW version in section 1.4 Details of Tested Sample (EUT) Information.	Dec. 30, 2013
FD3O3110	Rev. 03	Revising description of GPRS/EGPRS multi slot class 12 to 33.	Jan. 08, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.107	ICES003 Section 6.1	AC Conducted Emission	< 15.107 limits < ICES003 6.1 limits	PASS	Under limit 8.60 dB at 0.182 MHz
3.2	15.109	ICES003 Section 6.2	Radiated Emission	< 15.109 limits < ICES003 6.2 limits	PASS	Under limit 4.70 dB at 951.000 MHz

1. General Description

1.1. Applicant

Sony Mobile Communications AB
Nya Vattentornet, 22188 Lund, Sweden

1.2. Manufacturer

Arima Communication Corp.
6F., No. 866, Jhongjheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

1.3. Feature of Equipment Under Test

Product Feature	
Equipment	Smart phone
Brand Name	SONY
Model Name	D2004
Type Name	PM-0672-BV
FCC ID	PY7PM-0672
IC	4170B-PM0672
GSM Operating Band(s)	GSM 850/900/1800/1900MHz
WCDMA Operating Band(s)	FDD Band I / II / V
WCDMA Rel. Version	Rel. 7
GPRS / EGPRS Multi Slot Class	GPRS Class 33, EGPRS Class 33
Wi-Fi Specification	802.11b/g/n (HT20)
Bluetooth Version	v3.0 +EDR / v4.0-LE
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 : 004402147024768 S/N : WUJ016R6J4
HW Version	A
SW Version	20.0.A.0.26
EUT Stage	Production Unit

Accessory List	
Battery	Model No. : BA900
	Type No. : AB-0500
Earphone	Model No. : MH410c
	Type No. : AG-1100
USB Cable	Model No. : EC450
	Part No. : 1242-6715.3 12W46 / 1242-6715.3 12W24

Note:

1. Above EUT list and accessory 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. For other wireless features of this EUT, test report will be issued separately.

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st 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	TW1022/4086B-1

1.7. 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 C63.4-2009
- 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 be 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. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2009 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 modes as the worst cases and recorded in this report.

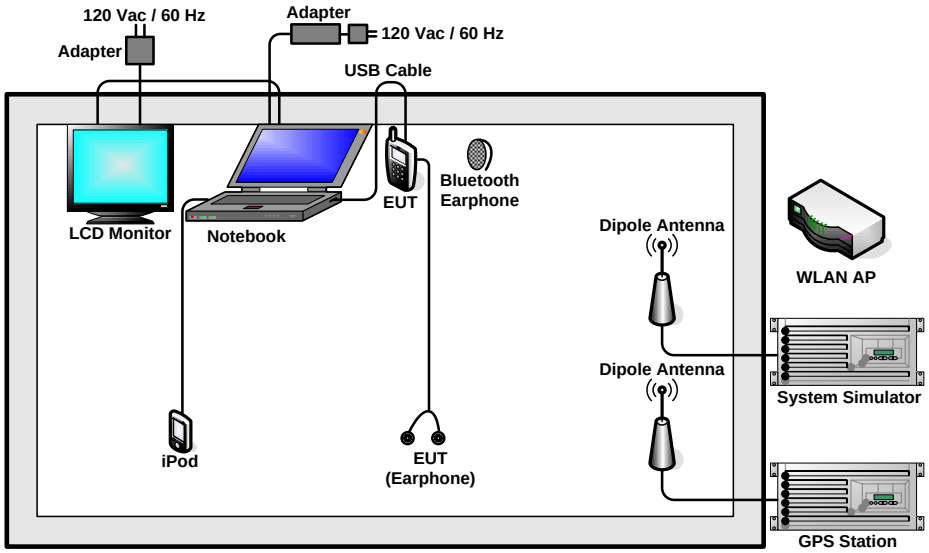
Item	EUT Configuration	Test Condition	
		EMI AC	EMI RE
1.	Data Link with Notebook	☒	☒

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 Test System



2.3. Support 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	Pendulum	GSG -54	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
5.	iPod	Apple	A1285	FCC DoC	Shielded, 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
8.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.4. 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.

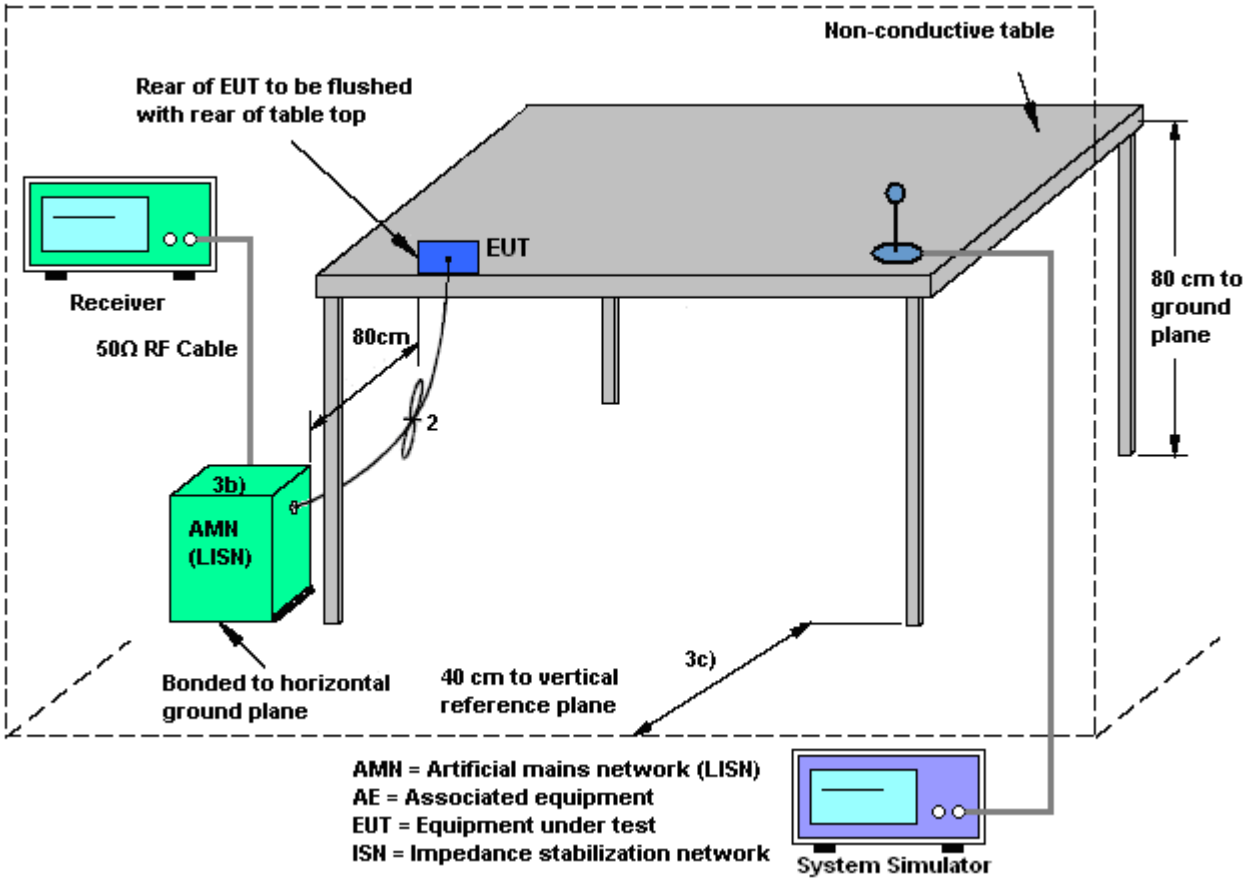
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

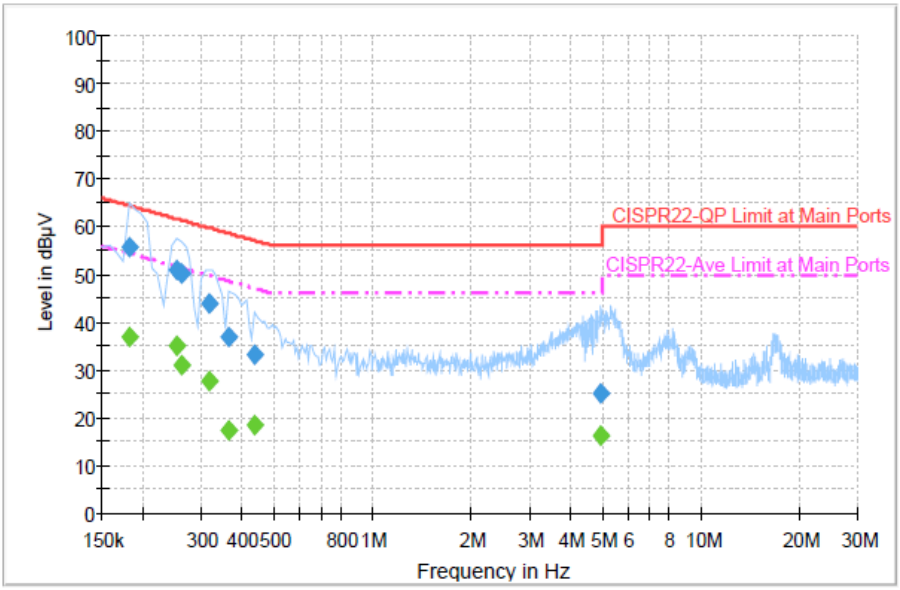
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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 :	20~22℃
Test Engineer :	Cosmo Xu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Data Link with Notebook		



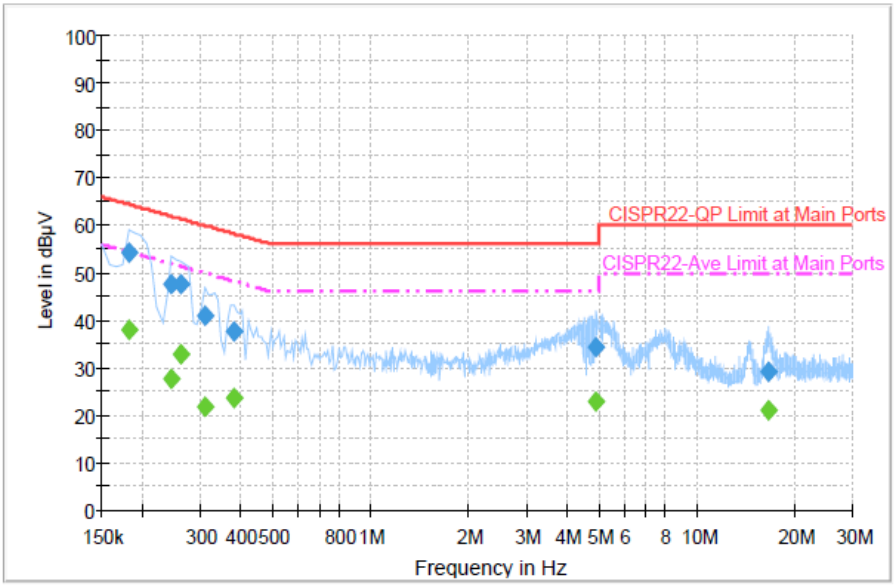
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	55.8	Off	L1	19.4	8.6	64.4
0.254000	50.9	Off	L1	19.5	10.7	61.6
0.262000	50.1	Off	L1	19.4	11.3	61.4
0.318000	43.9	Off	L1	19.4	15.9	59.8
0.366000	37.0	Off	L1	19.4	21.6	58.6
0.438000	33.2	Off	L1	19.4	23.9	57.1
4.958000	25.1	Off	L1	19.7	30.9	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	37.0	Off	L1	19.4	17.4	54.4
0.254000	35.0	Off	L1	19.5	16.6	51.6
0.262000	31.2	Off	L1	19.4	20.2	51.4
0.318000	27.7	Off	L1	19.4	22.1	49.8
0.366000	17.5	Off	L1	19.4	31.1	48.6
0.438000	18.3	Off	L1	19.4	28.8	47.1
4.958000	16.1	Off	L1	19.7	29.9	46.0

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Cosmo Xu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Data Link with Notebook		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	54.3	Off	N	19.4	10.1	64.4
0.246000	47.4	Off	N	19.4	14.5	61.9
0.262000	47.7	Off	N	19.4	13.7	61.4
0.310000	41.0	Off	N	19.4	19.0	60.0
0.382000	37.6	Off	N	19.4	20.6	58.2
4.926000	34.3	Off	N	19.7	21.7	56.0
16.630000	29.2	Off	N	19.9	30.8	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	37.9	Off	N	19.4	16.5	54.4
0.246000	27.8	Off	N	19.4	24.1	51.9
0.262000	32.8	Off	N	19.4	18.6	51.4
0.310000	21.9	Off	N	19.4	28.1	50.0
0.382000	23.5	Off	N	19.4	24.7	48.2
4.926000	23.0	Off	N	19.7	23.0	46.0
16.630000	21.2	Off	N	19.9	28.8	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

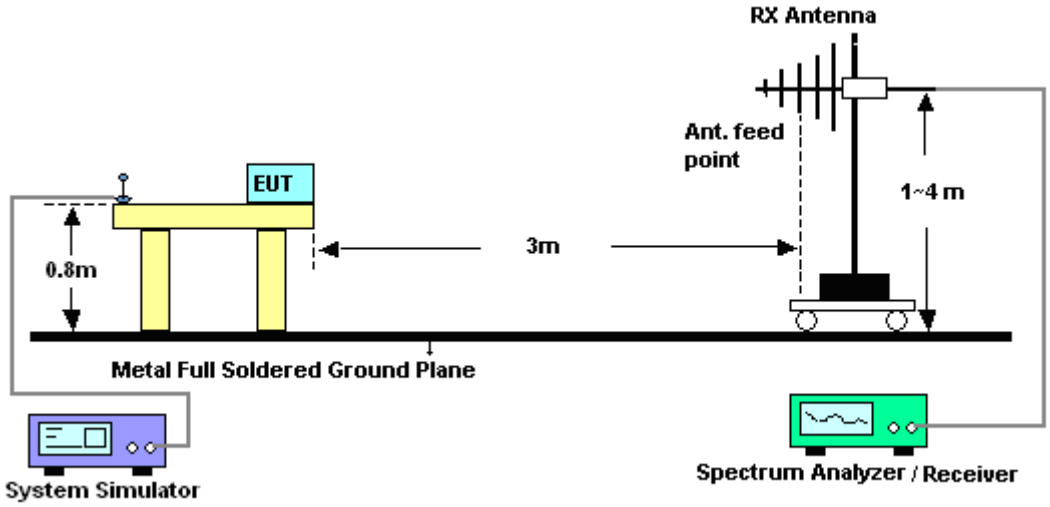
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

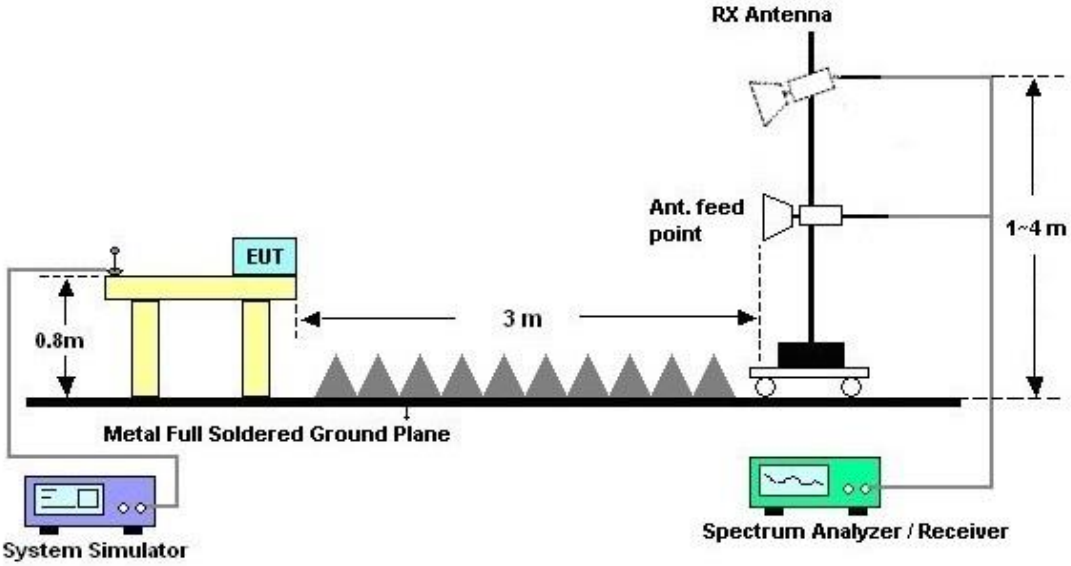
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to 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, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/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

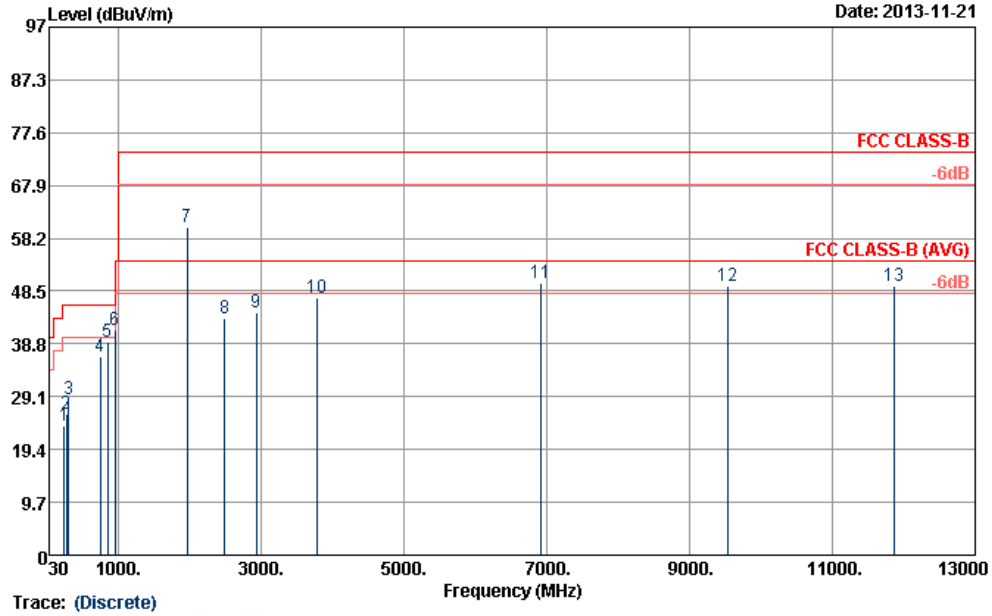


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 1	**Temperature :**	22~24°C
Test Engineer :	Slash Huang	**Relative Humidity :**	46~48%
Test Distance :	3m	**Polarization :**	Horizontal
Function Type :	Data Link with Notebook		
Remark :	#7 is system simulator signal which can be ignored.		

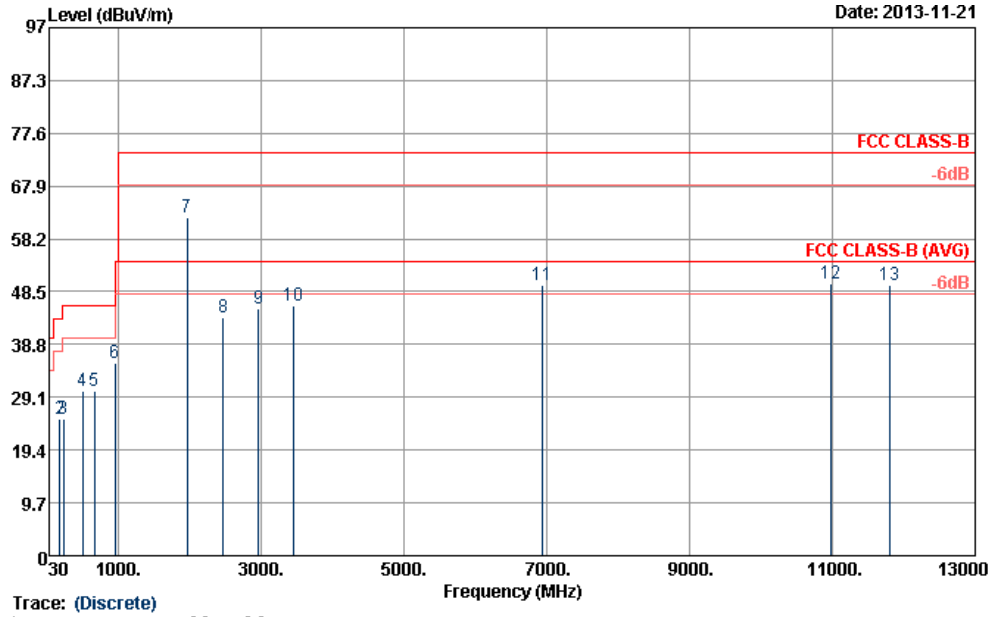


Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT_583_130802 HORIZONTAL
Project : 3O3110
Power : From System
Mode : Mode 1

		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1		240.60	23.82	-22.18	46.00	42.38	11.49	1.69	31.74	---	---	Peak
2		268.14	25.87	-20.13	46.00	42.70	13.09	1.81	31.73	---	---	Peak
3		300.00	28.55	-17.45	46.00	45.16	13.20	1.91	31.72	---	---	Peak
4		749.40	36.45	-9.55	46.00	45.19	20.20	3.05	31.99	---	---	Peak
5		849.50	39.29	-6.71	46.00	47.00	20.80	3.23	31.74	---	---	Peak
6	!	951.00	41.30	-4.70	46.00	47.70	21.31	3.35	31.06	100	142	Peak
7		1960.00	60.36			77.34	31.22	5.79	53.99	---	---	Peak
8		2494.00	43.54	-30.46	74.00	58.85	32.00	6.59	53.90	---	---	Peak
9		2928.00	44.46	-29.54	74.00	58.41	32.58	7.45	53.98	---	---	Peak
10		3790.00	47.26	-26.74	74.00	60.14	33.15	8.54	54.57	---	---	Peak
11		6918.00	49.85	-24.15	74.00	59.70	35.78	11.13	56.76	100	0	Peak
12		9544.00	49.48	-24.52	74.00	58.73	36.26	10.56	56.07	---	---	Peak
13		11868.00	49.32	-24.68	74.00	53.18	38.45	11.27	53.58	---	---	Peak

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Slash Huang	Relative Humidity :	46~48%
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 3m HF-ANT_583_130802 VERTICAL
Project : 3O3110
Power : From System
Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	23.73	-16.27	40.00	36.39	18.50	0.64	31.80	---	---	Peak
2	175.80	25.10	-18.40	43.50	45.77	9.55	1.53	31.75	---	---	Peak
3	232.50	25.20	-20.80	46.00	44.72	10.56	1.66	31.74	---	---	Peak
4	499.50	30.25	-15.75	46.00	41.91	17.79	2.48	31.93	---	---	Peak
5	664.00	30.25	-15.75	46.00	40.00	19.45	2.83	32.03	---	---	Peak
6	951.00	35.27	-10.73	46.00	41.67	21.31	3.35	31.06	100	57	Peak
7	1960.00	62.05			79.03	31.22	5.79	53.99	---	---	Peak
8	2464.00	43.70	-30.30	74.00	59.08	31.97	6.56	53.91	---	---	Peak
9	2966.00	45.38	-28.62	74.00	59.18	32.65	7.54	53.99	---	---	Peak
10	3448.00	45.81	-28.19	74.00	59.12	32.79	7.99	54.09	---	---	Peak
11	6932.00	49.67	-24.33	74.00	59.54	35.79	11.13	56.79	---	---	Peak
12	10970.00	49.92	-24.08	74.00	56.23	37.58	10.75	54.64	100	0	Peak
13	11814.00	49.68	-24.32	74.00	53.69	38.36	11.24	53.61	---	---	Peak

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Nov. 23, 2013	Nov. 14, 2014	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Nov. 23, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Nov. 23, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Nov.23, 2013	N/A	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Apr. 25, 2013,	Nov. 23, 2013	Apr. 24, 2014	Conduction (CO05-HY)
Test Software	N/A	EMC32	8.40.0	N/A	N/A	Nov. 23, 2013	N/A	Conduction (CO05-HY)
LF Cable	Shuner	RG-402	N/A	N/A	Oct. 17, 2013	Nov. 23, 2013	Oct. 16, 2014	Conduction (CO05-HY)
Spectrum Analyzer	Rohde & Schwarz	ESU26	100390	20Hz ~ 26.5GHz	Doc. 14, 2012	Nov. 21, 2013	Dec. 13, 2013	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211028	9kHz ~ 26.5GHz	Aug. 29, 2013	Nov. 21, 2013	Aug. 28, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Nov. 21, 2013	May 05, 2014	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz -2GHz	Oct. 10, 2013	Nov. 21, 2013	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Nov. 21, 2013	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Nov. 21, 2013	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Nov. 21, 2013	Jul. 17, 2014	Radiation (03CH06-HY)
RF Cable	warison	WCBA-WC04 NM.NM2	N/A	30MHz ~1GHz	Dec. 04, 2012	Nov. 21, 2013	Dec. 03, 2013	Radiation (03CH06-HY)
RF Cable	Huber + Suhner	sucoflex 104	286027/4	1GHz ~26.5GHz	Dec. 04, 2012	Nov. 21, 2013	Dec. 03, 2013	Radiation (03CH06-HY)
Hygrometer	WISEWIND	0410	BU5004	N/A	May. 07, 2013	Nov. 21, 2013	May. 06, 2014	Radiation (03CH06-HY)
Test Software	Audix	E3	Version 6.2009-8-24	N/A	N/A	Nov. 21, 2013	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Nov. 21, 2013	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Nov. 21, 2013	N/A	Radiation (03CH06-HY)

Note: The test equipment calibration is traceable to the 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**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.50**