



FCC Test Report

APPLICANT : Sony Mobile Communications Inc.
EQUIPMENT : Smart phone
BRAND NAME : SONY
TYPE NAME : PM-0632-BV
FCC ID : PY7-PM0632
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : FCC CLASS B PERSONAL
COMPUTERS AND PERIPHERALS

The product was received on Oct. 21, 2014 and testing was completed on Nov. 03, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2009 and has been in compliance 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.

Reviewed by: Louis Wu / Manager

Approved 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	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 6.80 dB at 0.182 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 10.79 dB at 166.350 MHz



1. General Description

1.1. Applicant

Sony Mobile Communications Inc.
Nya Vattentorget, 22188 Lund, Sweden

1.2. Manufacturer

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

1.3. Feature of Equipment Under Test

The Equipment Under Test (hereafter called: EUT) is smart 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.

Product Feature	
Equipment	Smart phone
Brand Name	SONY
Type Name	PM-0632-BV
FCC ID	PY7-PM0632
GSM Operating Band(s)	GSM 850/900/1800/1900MHz
GPRS / EGPRS Multi Slot Class	GPRS Class 12, EGPRS Class 12
WCDMA Operating Band(s)	FDD Band I / II / V
WCDMA Rel. Version	Rel. 7
Wi-Fi Specification	802.11b/g/n (HT20/HT40)
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 Information List				
IMEI	HW Version	SW Version	S/N	Performed Test Item
IMEI : 004402147847713	A	24.0.B.0.22	FS4A10D09750	Conducted Emission Radiated Spurious Emission

Accessory List	
Battery	Model No. : Charles
Earphone	Model No. : MH410c
	Type No. : AG-1103
	S/N : 1411204B00BC72C
USB Cable 1	Model No. : EC450
	Type No. : AI-0700
	S/N : 1412D01471694
USB Cable 2	Model No. : EC300
	Type No. : AI-1000
	S/N : 14280D76058321C

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.
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 Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

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.	
	CO05-HY	03CH06-HY

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

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.

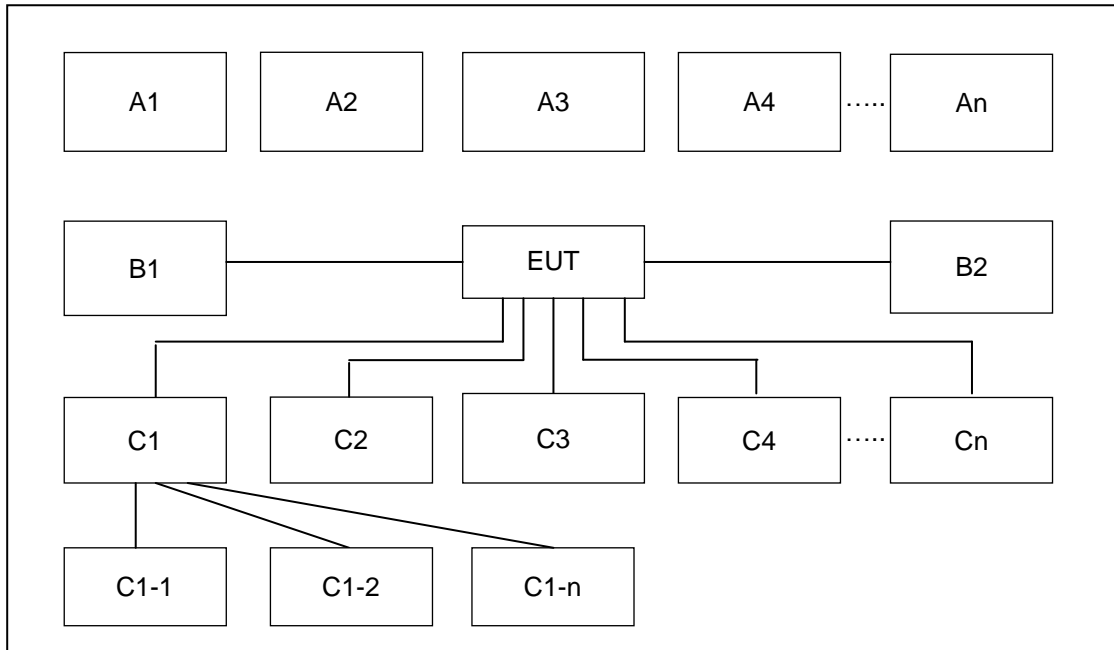
Item	EUT Configuration	Test Condition	
		EMI AC	EMI RE
1.	Data Link with Notebook	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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 Test System



Radiation and Conduction Test Setup									
No.	Wireless Station	Connection Type	Test Mode						
			1	-	-	-	-	-	-
A1	BT Earphone	Bluetooth	X						
A2	System Simulator	GSM	X						
A3	GPS Station	GPS	X						
A4	AP router	WiFi	X						
No.	Power Source	Connection Type	1	-	-	-	-	-	-
B1	Notebook	USB port	X						
No.	Setup Peripherals	Connection Type	1	-	-	-	-	-	-
C1	Notebook	USB cable	X						
C1-1	iPod	USB Cable to C1	X						
C1-2	AP router	RJ-45 Cable to C1	X						
C2	Earphone	Earphone jack	X						
C3	SD card	SD I/O interface without cable	X						



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.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	WLAN AP	D-Link	DIR-865L	KA2IR865LA1	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	Unshielded, 0.75m	N/A
6.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
7.	iPod	Apple	A1199	FCC DoC	Shielded, 1.0 m	N/A
8.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
9.	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.

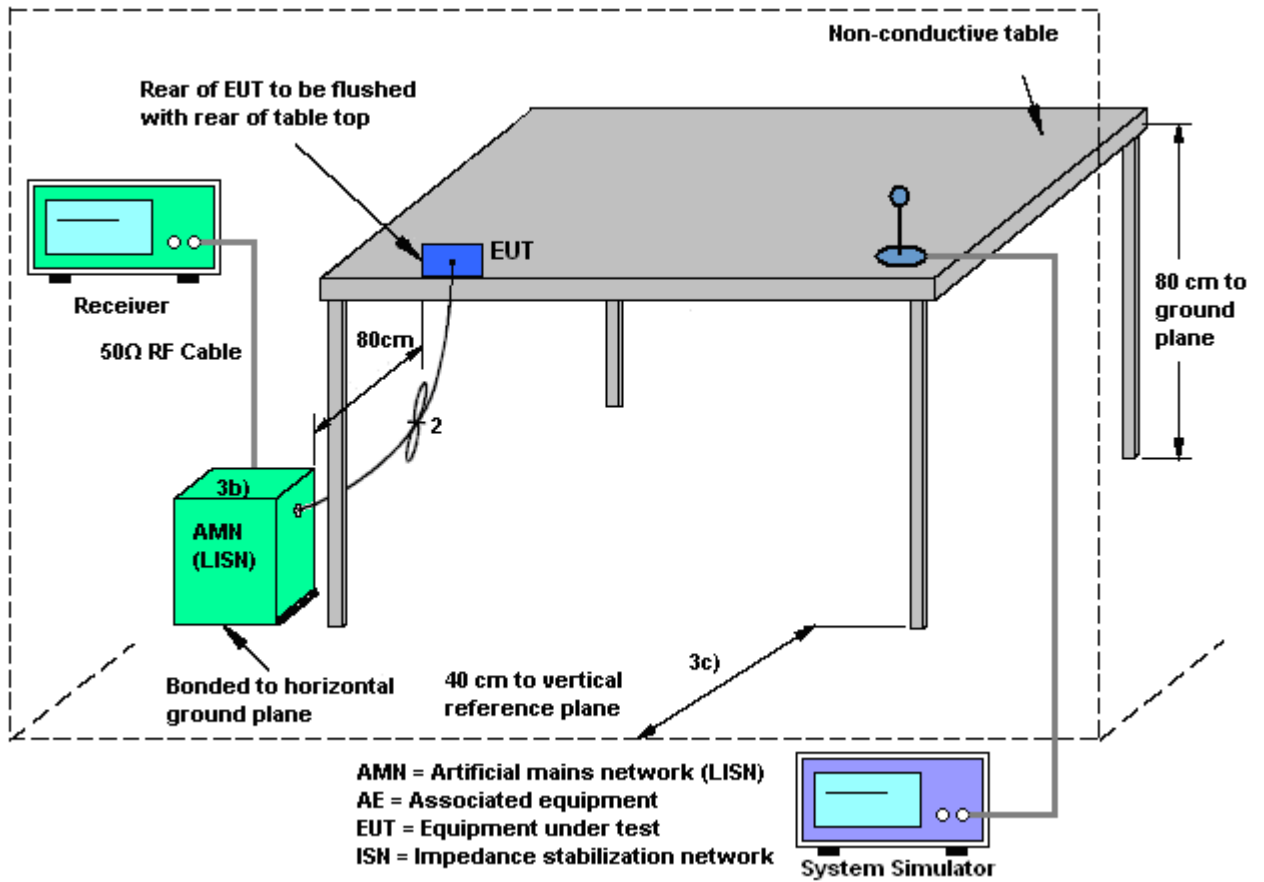
3.1.2 Measuring Instruments

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.

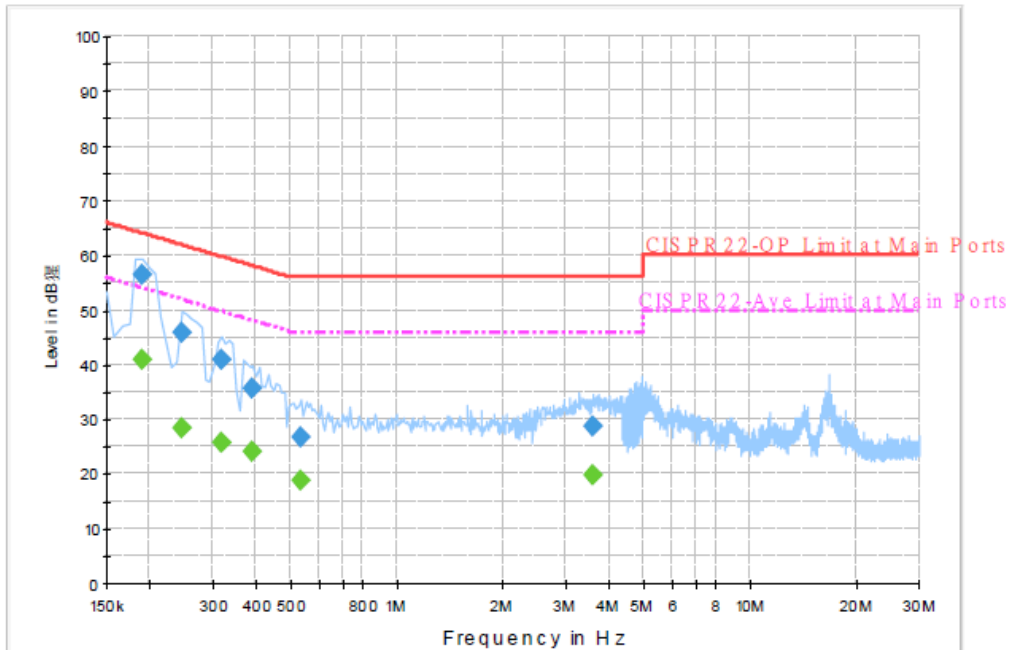
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Data Link with Notebook (with USB cable 1)		



Final Result : Quasi-Peak

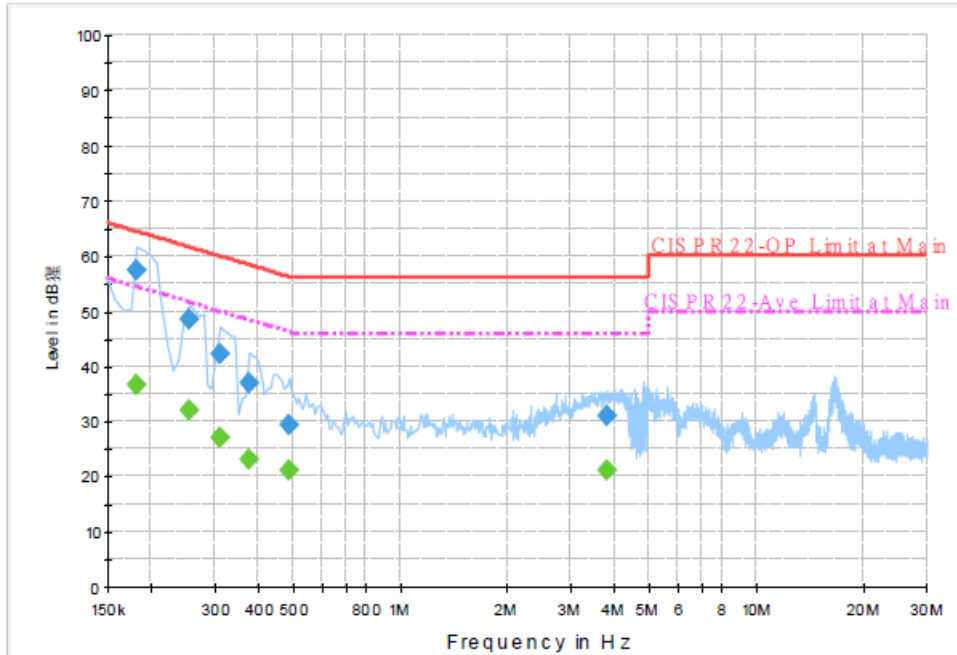
Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	56.3	Off	L1	19.5	7.7	64.0
0.246000	45.8	Off	L1	19.5	16.1	61.9
0.318000	41.0	Off	L1	19.5	18.8	59.8
0.390000	35.5	Off	L1	19.5	22.6	58.1
0.534000	26.6	Off	L1	19.5	29.4	56.0
3.582000	28.5	Off	L1	19.6	27.5	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	40.9	Off	L1	19.5	13.1	54.0
0.246000	28.4	Off	L1	19.5	23.5	51.9
0.318000	25.9	Off	L1	19.5	23.9	49.8
0.390000	23.9	Off	L1	19.5	24.2	48.1
0.534000	19.0	Off	L1	19.5	27.0	46.0
3.582000	19.7	Off	L1	19.6	26.3	46.0



Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Data Link with Notebook (with USB cable 1)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	57.6	Off	N	19.5	6.8	64.4
0.254000	48.5	Off	N	19.5	13.1	61.6
0.310000	42.2	Off	N	19.5	17.8	60.0
0.374000	36.9	Off	N	19.5	21.5	58.4
0.486000	29.5	Off	N	19.5	26.7	56.2
3.774000	31.1	Off	N	19.6	24.9	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	36.7	Off	N	19.5	17.7	54.4
0.254000	32.0	Off	N	19.5	19.6	51.6
0.310000	27.1	Off	N	19.5	22.9	50.0
0.374000	23.2	Off	N	19.5	25.2	48.4
0.486000	21.0	Off	N	19.5	25.2	46.2
3.774000	21.1	Off	N	19.6	24.9	46.0



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

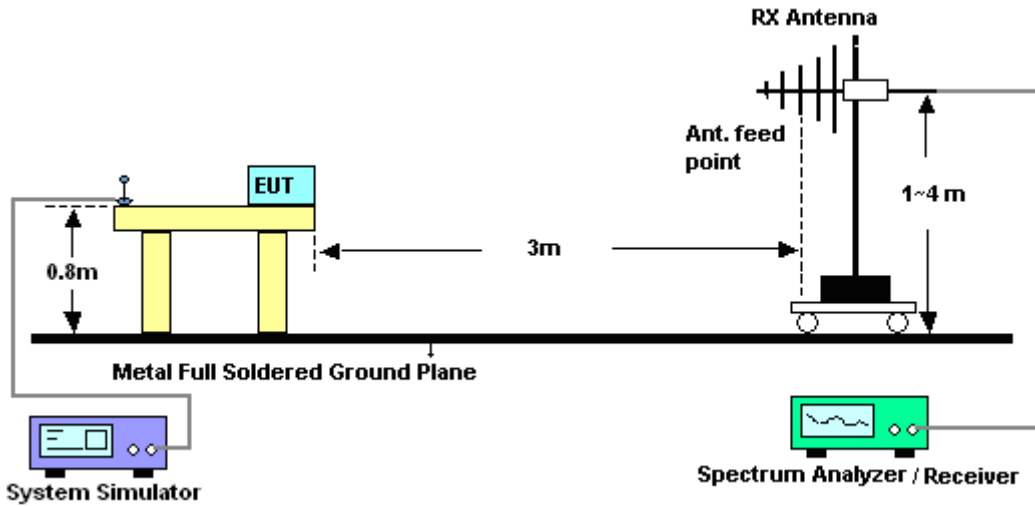
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

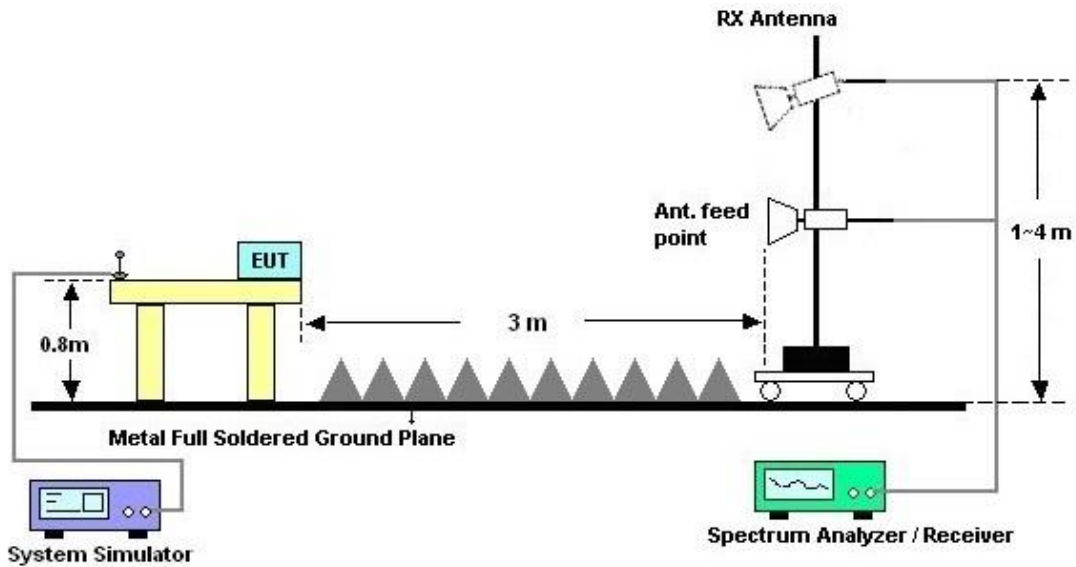
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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



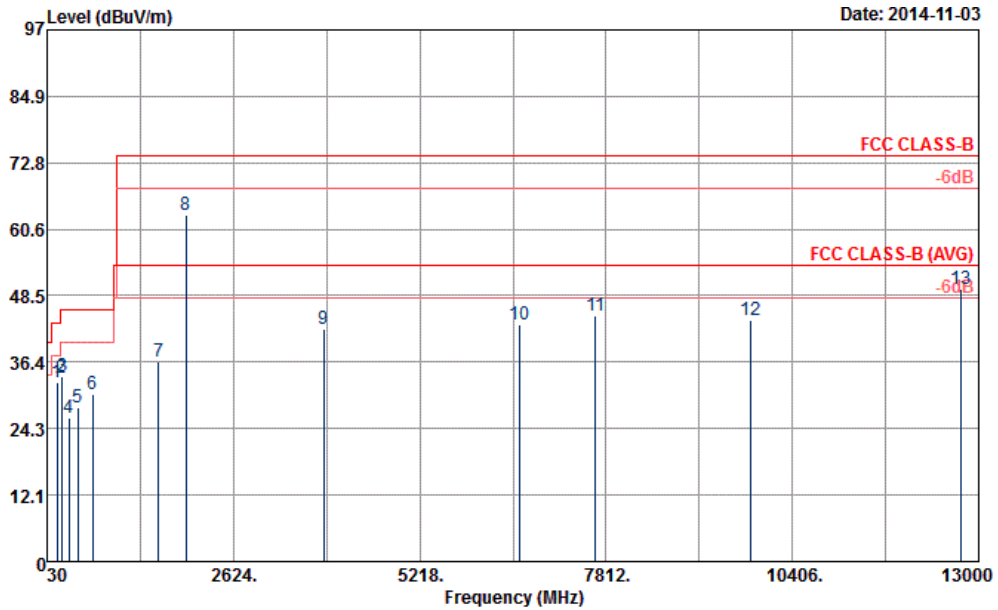
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 1	Temperature :	20~23°C
Test Engineer :	Daniel Lee	Relative Humidity :	50~53%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	Data Link with Notebook (with USB cable 2)		
Remark :	#8 is system simulator signal which can be ignored.		

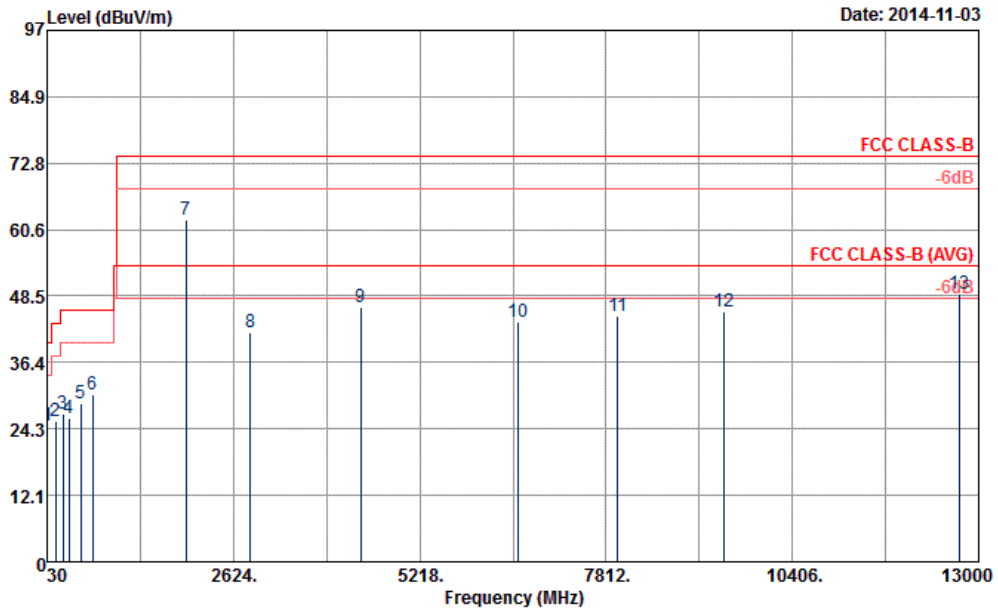


Site : 03CH06-HY
 Condition : FCC CLASS-B 3m HF-ANT_583_140731 HORIZONTAL
 Project : 402137
 Power : From System
 Mode : Mode 1

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	166.35	32.71	-10.79	43.50	53.02	9.86	1.58	31.75	100	163	Peak
2	231.15	33.62	-12.38	46.00	53.39	10.32	1.65	31.74	---	---	Peak
3	246.00	33.88	-12.12	46.00	51.86	12.04	1.72	31.74	---	---	Peak
4	335.00	26.29	-19.71	46.00	42.20	13.84	2.00	31.75	---	---	Peak
5	462.40	28.17	-17.83	46.00	40.48	17.25	2.33	31.89	---	---	Peak
6	667.50	30.45	-15.55	46.00	40.18	19.47	2.83	32.03	---	---	Peak
7	1584.00	36.35	-37.65	74.00	63.33	28.62	4.82	60.42	---	---	Peak
8	1960.00	63.18			86.94	31.33	5.40	60.49	---	---	Peak
9	3882.00	42.45	-31.55	74.00	63.33	33.23	7.53	61.64	---	---	Peak
10	6606.00	43.23	-30.77	74.00	58.09	35.80	9.82	60.48	---	---	Peak
11	7660.00	44.73	-29.27	74.00	57.21	35.73	12.09	60.30	---	---	Peak
12	9832.00	44.12	-29.88	74.00	55.41	36.84	13.04	61.17	---	---	Peak
13	12750.00	49.61	-24.39	74.00	54.40	39.40	15.81	60.00	100	245	Peak



Test Mode :	Mode 1	Temperature :	20~23°C
Test Engineer :	Daniel Lee	Relative Humidity :	50~53%
Test Distance :	3m	Polarization :	Vertical
Function Type :	Data Link with Notebook (with USB cable 2)		
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH06-HY
 Condition : FCC CLASS-B 3m HF-ANT_583_140731 VERTICAL
 Project : 402137
 Power : From System
 Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	32.70	24.76	-15.24	40.00	39.18	16.70	0.67	31.79	100	148	Peak
2	144.75	25.59	-17.91	43.50	45.34	10.68	1.32	31.75	---	---	Peak
3	246.54	26.95	-19.05	46.00	44.93	12.04	1.72	31.74	---	---	Peak
4	338.50	26.19	-19.81	46.00	41.99	13.95	2.01	31.76	---	---	Peak
5	499.50	28.95	-17.05	46.00	40.61	17.79	2.48	31.93	---	---	Peak
6	665.40	30.65	-15.35	46.00	40.40	19.45	2.83	32.03	---	---	Peak
7	1960.00	62.52			86.28	31.33	5.40	60.49	---	---	Peak
8	2864.00	41.80	-32.20	74.00	63.44	32.59	6.64	60.87	---	---	Peak
9	4396.00	46.35	-27.65	74.00	65.99	33.96	8.02	61.62	---	---	Peak
10	6596.00	43.65	-30.35	74.00	58.52	35.80	9.81	60.48	---	---	Peak
11	7978.00	44.72	-29.28	74.00	56.68	35.79	12.01	59.76	---	---	Peak
12	9456.00	45.56	-28.44	74.00	56.68	36.45	13.46	61.03	---	---	Peak
13	12734.00	48.80	-25.20	74.00	53.61	39.39	15.79	59.99	100	258	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. 02, 2014	Nov. 14, 2014	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Nov. 02, 2014	Dec. 11, 2014	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Nov. 02, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Nov. 02, 2014	N/A	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Apr. 23, 2014	Nov. 02, 2014	Apr. 22, 2015	Conduction (CO05-HY)
Test Software	N/A	EMC32	8.40.0	N/A	N/A	Nov. 02, 2014	N/A	Conduction (CO05-HY)
LF Cable	Shuner	RG-402	N/A	N/A	Oct. 07, 2014	Nov. 02, 2014	Oct. 06, 2015	Conduction (CO05-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2014	Nov. 03, 2014	May 05, 2015	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211028	9kHz ~ 26.5GHz	Aug. 23, 2014	Nov. 03, 2014	Aug. 22, 2015	Radiation (03CH06-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Jan. 15, 2014	Nov. 03, 2014	Jan. 14, 2015	Radiation (03CH06-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz -2GHz	Sep. 27, 2014	Nov. 03, 2014	Sep. 26, 2015	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Jul. 24, 2014	Nov. 03, 2014	Jul. 23, 2015	Radiation (03CH06-HY)
Amplifier	SONOMA	310N	186713	9kHz ~ 1GHz	Apr. 16, 2014	Nov. 03, 2014	Apr. 15, 2015	Radiation (03CH06-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1850117	1GHz ~ 18GHz	Apr. 11, 2014	Nov. 03, 2014	Apr. 10, 2015	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Nov. 03, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Nov. 03, 2014	N/A	Radiation (03CH06-HY)
Hygrometer	WISEWIND	0410	BU5004	N/A	May 06, 2014	Nov. 03, 2014	May 05, 2015	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	RG 142	N/A	30MHz ~1GHz	Nov. 28, 2013	Nov. 03, 2014	Nov. 27, 2014	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	286027/4	1GHz ~26.5GHz	Nov. 28, 2013	Nov. 03, 2014	Nov. 27, 2014	Radiation (03CH06-HY)
Test Software	Audix	E3	Version 6.2009-8-24	N/A	N/A	Nov. 03, 2014	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
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

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