



FCC Test Report

APPLICANT : Sony Mobile Communications AB
EQUIPMENT : Smart phone
BRAND NAME : SONY
MODEL NAME : D2303
TYPE NAME : PM-0722-BV
FCC ID : PY7PM-0722
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : FCC CLASS B PERSONAL
COMPUTERS AND PERIPHERALS

The product was received on Nov. 15, 2013 and testing was completed on Dec. 04, 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.

Reviewed by: Louis Wu / Manager

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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FCC ID : PY7PM-0722

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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 7.90 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 9.98 dB at 898.500 MHz



1. General Description

1.1. Applicant

Sony Mobile Communications AB
Nya Vattentorget, 22188 Lund, Sweden

1.2. Manufacturer

Compal Communications, INC.
No. 385, Yangguang Street, Neihu, Taipei 11491, Taiwan

1.3. Feature of Equipment Under Test

The Equipment Under Test (hereafter called: EUT) is smart phone supporting, GSM / WCDMA / LTE, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n, Bluetooth with FM Receiver, GPS, and NFC features, and below is details of information.

Product Feature	
Equipment	Smart phone
Brand Name	SONY
Model Name	D2303
Type Name	PM-0722-BV
FCC ID	PY7PM-0722
GSM Operating Band(s)	GSM 850/900/1800/1900MHz
GPRS / EGPRS Multi Slot Class	GPRS Class 33, EGPRS Class 33
WCDMA Operating Band(s)	FDD Band I / V / VIII
WCDMA Rel. Version	Rel. 8
LTE Operating Band(s)	FDD Band I / III / V / VII / VIII / XX
Wi-Fi Specification	802.11b/g/n (HT20), 802.11a/n (HT20/HT40)
Bluetooth Version	v3.0 + EDR / v4.0-LE
NFC Specification	ISO14443A / ISO14443B / Felica
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 1: 004402451655892 S/N : ZH8001PF31
HW Version	A
SW Version	18.0.C.0.30
EUT Stage	Production Unit

Accessory List	
Battery	Model No. : LIS1502ERPC
	Type No. : LIS1502ERPC
Earphone	Model No. : MH410c
	Type No. : AG-1100
USB Cable	Model No. : AHAB EC450
	Part No. : 1242-6715.4

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 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	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

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. Descriptions of 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.

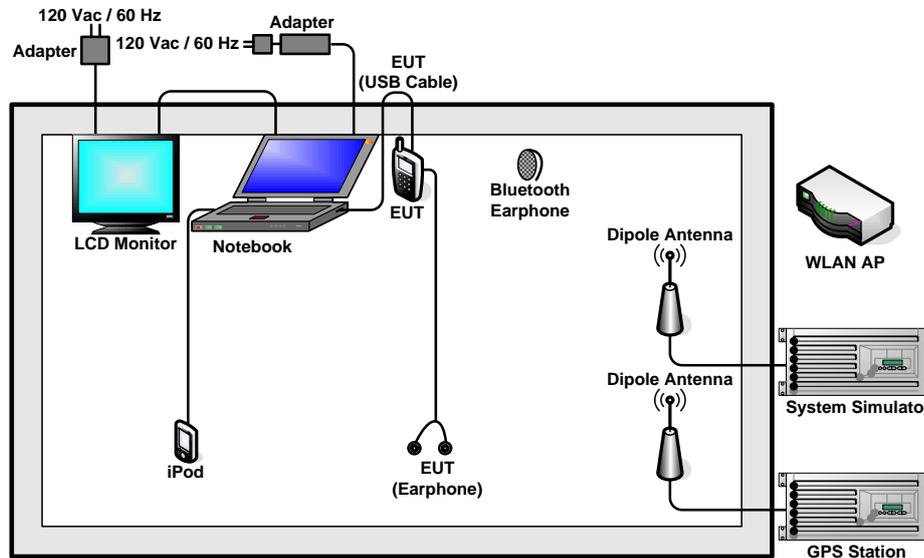
Item	EUT Configuration	Test Condition	
		EMI AC	EMI RE
1.	Data Link with Notebook	☒	☒

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.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Bluetooth Earphone	Sony Ericsson	MH755	FCC Doc	N/A	N/A
5.	Bluetooth Body	Sony Ericsson	SBH20	PY7-RD0010	N/A	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.	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.

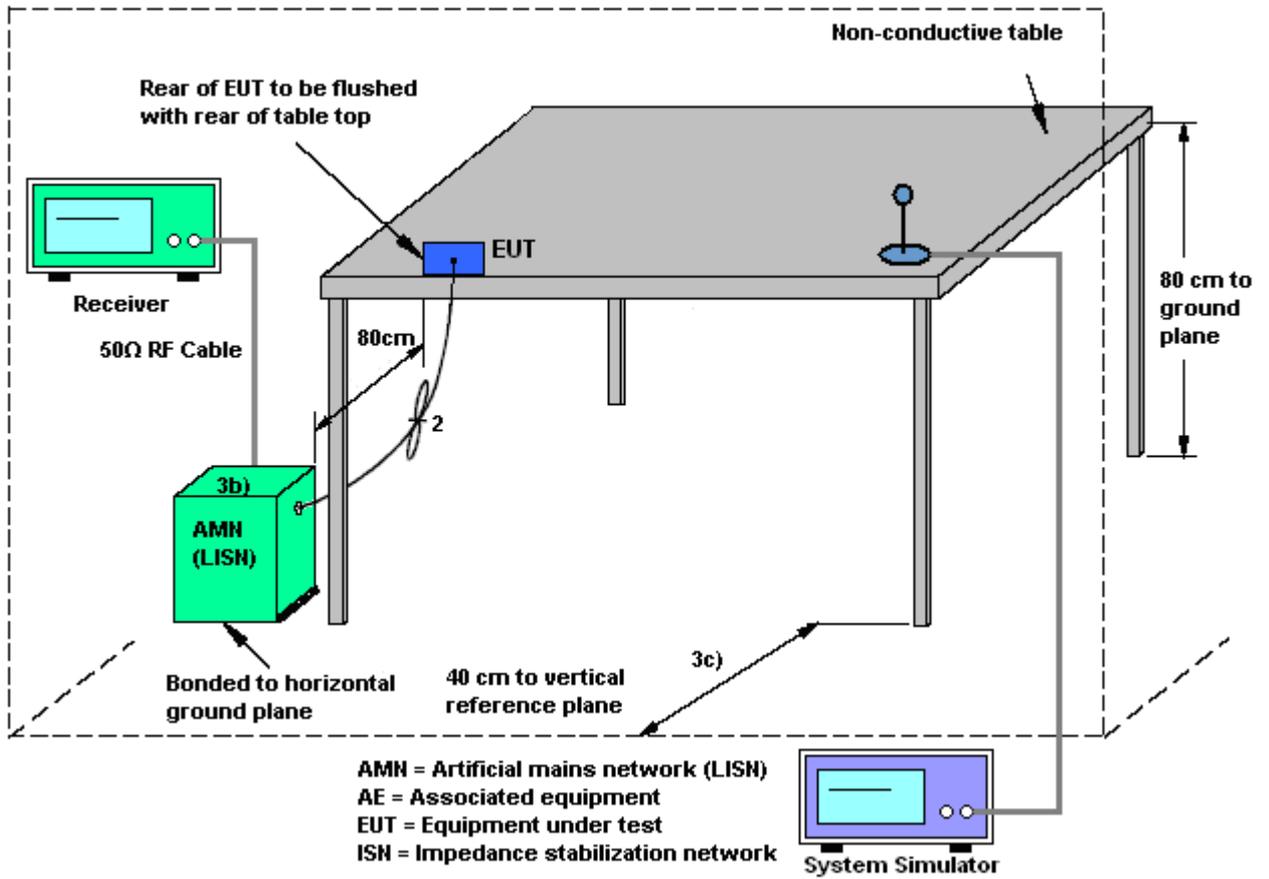
3.1.2 Measuring Instruments

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

3.1.3 Test Procedure

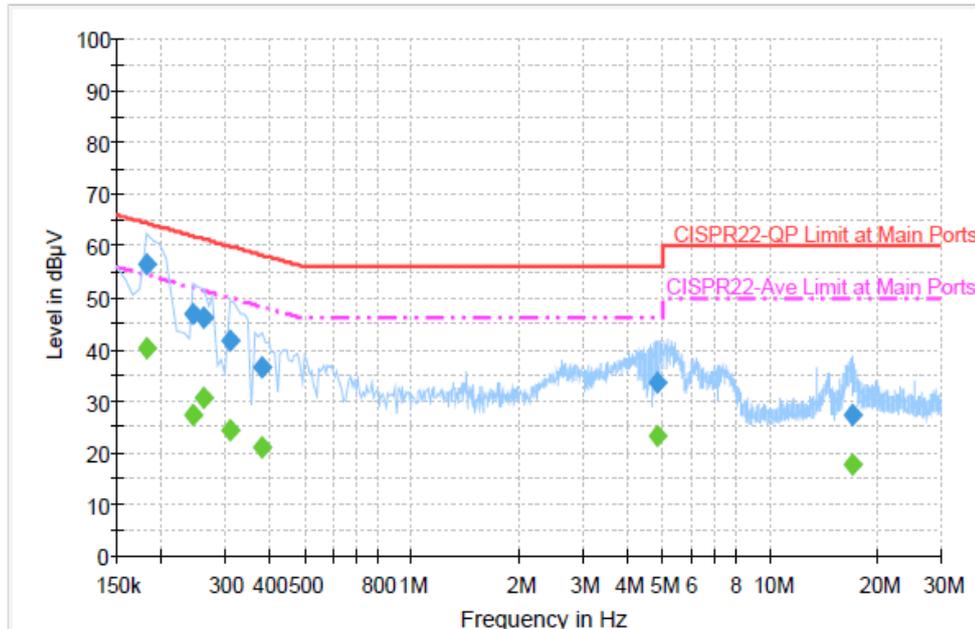
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.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



Final Result : Quasi-Peak

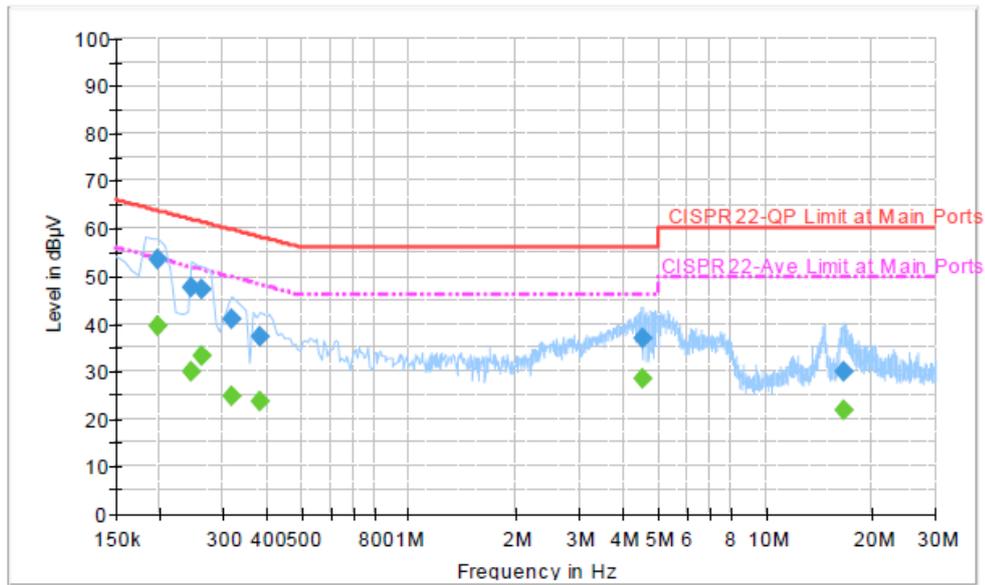
Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	56.5	Off	L1	19.4	7.9	64.4
0.246000	46.8	Off	L1	19.4	15.1	61.9
0.262000	46.3	Off	L1	19.4	15.1	61.4
0.310000	41.8	Off	L1	19.4	18.2	60.0
0.382000	36.6	Off	L1	19.4	21.6	58.2
4.854000	33.5	Off	L1	19.6	22.5	56.0
16.966000	27.3	Off	L1	19.8	32.7	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	40.4	Off	L1	19.4	14.0	54.4
0.246000	27.4	Off	L1	19.4	24.5	51.9
0.262000	30.7	Off	L1	19.4	20.7	51.4
0.310000	24.3	Off	L1	19.4	25.7	50.0
0.382000	21.0	Off	L1	19.4	27.2	48.2
4.854000	23.3	Off	L1	19.6	22.7	46.0
16.966000	17.7	Off	L1	19.8	32.3	50.0



Test Mode :	Mode 1	Temperature :	20~22°C
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)
0.198000	53.5	Off	N	19.3	10.2	63.7
0.246000	47.6	Off	N	19.4	14.3	61.9
0.262000	47.1	Off	N	19.4	14.3	61.4
0.318000	41.1	Off	N	19.4	18.7	59.8
0.382000	37.3	Off	N	19.4	20.9	58.2
4.542000	37.1	Off	N	19.6	18.9	56.0
16.606000	29.9	Off	N	19.9	30.1	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	39.4	Off	N	19.3	14.3	53.7
0.246000	30.0	Off	N	19.4	21.9	51.9
0.262000	33.2	Off	N	19.4	18.2	51.4
0.318000	24.6	Off	N	19.4	25.2	49.8
0.382000	23.7	Off	N	19.4	24.5	48.2
4.542000	28.3	Off	N	19.6	17.7	46.0
16.606000	21.8	Off	N	19.9	28.2	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

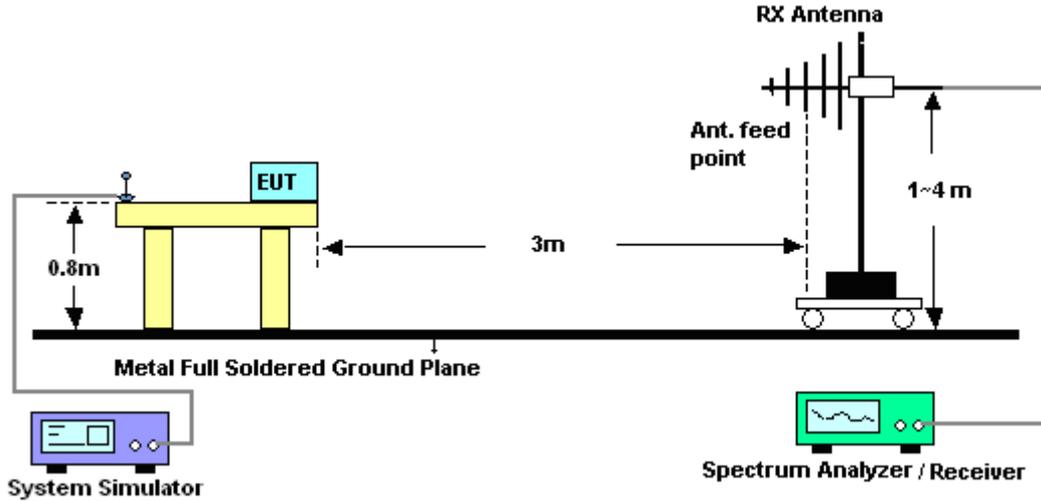
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

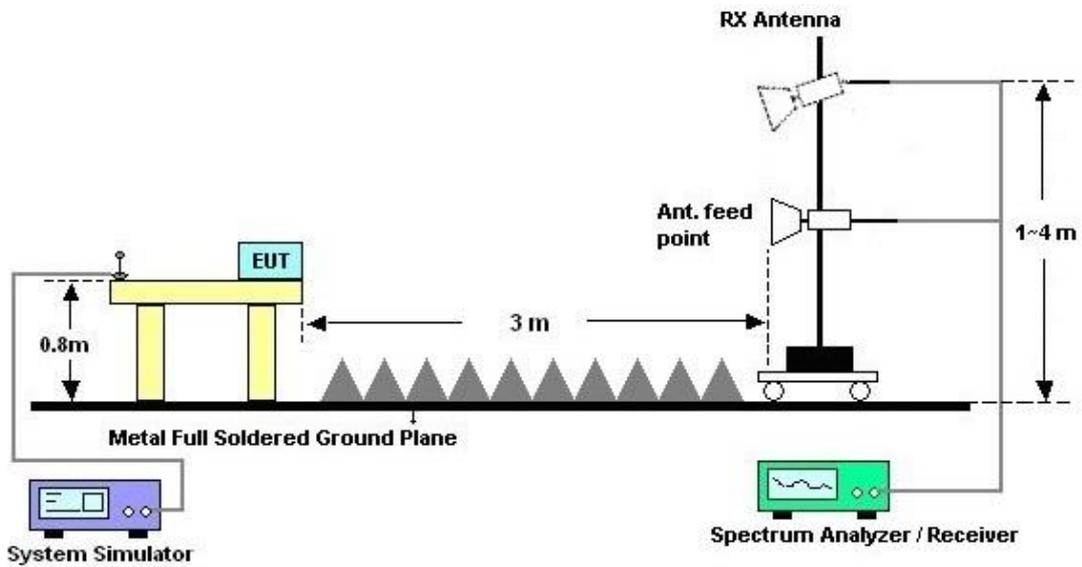
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna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



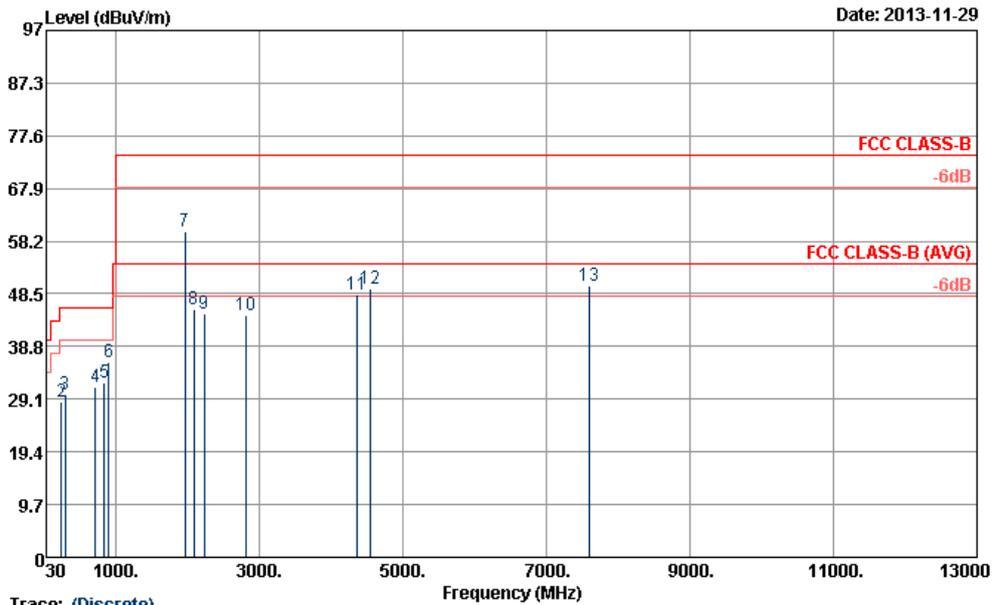
For radiated emissions above 1GHz





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.		



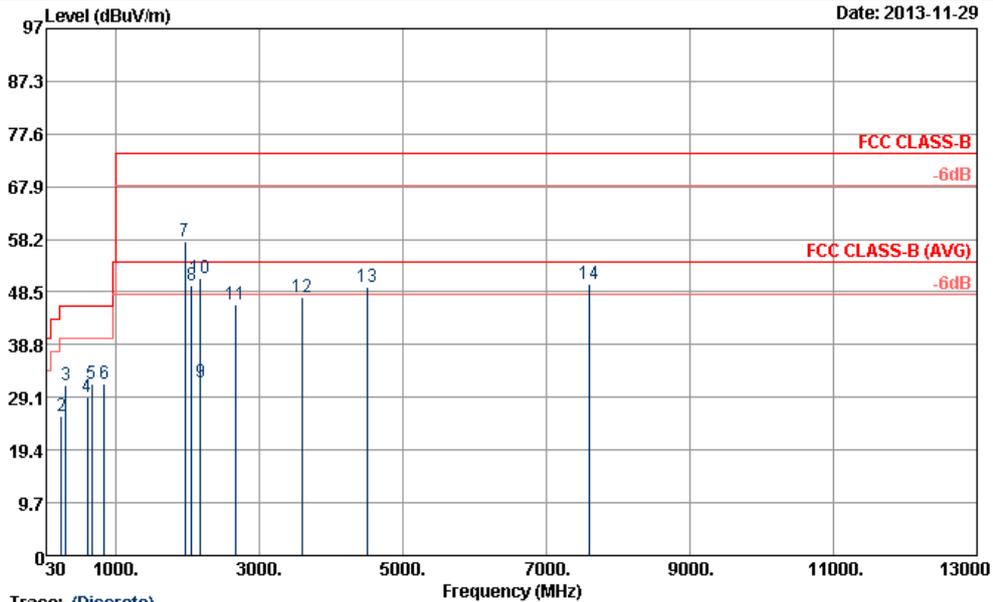
Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m HF-ANT_583_130802 HORIZONTAL
 Project : 3N1532
 Power : From System
 Mode : Mode 1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	32.16	19.98	-20.02	40.00	33.81	17.30	0.66	31.79	---	---	Peak
2	240.06	28.60	-17.40	46.00	47.16	11.49	1.69	31.74	---	---	Peak
3	297.84	30.13	-15.87	46.00	46.79	13.16	1.90	31.72	---	---	Peak
4	720.00	31.41	-14.59	46.00	40.67	19.80	2.95	32.01	---	---	Peak
5	837.60	32.25	-13.75	46.00	40.17	20.68	3.19	31.79	---	---	Peak
6	898.50	36.02	-9.98	46.00	43.14	21.06	3.36	31.54	100	121	Peak
7	1960.00	59.94			76.92	31.22	5.79	53.99	---	---	Peak
8	2082.00	45.77	-28.23	74.00	62.08	31.67	6.00	53.98	---	---	Peak
9	2232.00	44.92	-29.08	74.00	60.89	31.78	6.21	53.96	---	---	Peak
10	2810.00	44.55	-29.45	74.00	58.88	32.42	7.21	53.96	---	---	Peak
11	4352.00	48.27	-25.73	74.00	59.26	34.24	9.74	54.97	---	---	Peak
12	4542.00	49.39	-24.61	74.00	59.79	34.58	10.08	55.06	---	---	Peak
13	7598.00	50.10	-23.90	74.00	59.54	35.52	10.90	55.86	100	86	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 : 3N1532
 Power : From System
 Mode : Mode 1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.27	23.47	-16.53	40.00	36.13	18.50	0.64	31.80	---	---	Peak
2	240.06	25.78	-20.22	46.00	44.34	11.49	1.69	31.74	---	---	Peak
3	300.00	31.28	-14.72	46.00	47.89	13.20	1.91	31.72	---	---	Peak
4	601.00	29.24	-16.76	46.00	39.12	19.41	2.77	32.06	---	---	Peak
5	664.00	31.50	-14.50	46.00	41.25	19.45	2.83	32.03	---	---	Peak
6	837.60	31.67	-14.33	46.00	39.59	20.68	3.19	31.79	100	89	Peak
7	1960.00	57.87			74.85	31.22	5.79	53.99	---	---	Peak
8	2060.00	49.66	-24.34	74.00	66.04	31.64	5.97	53.99	---	---	Peak
9	2180.00	32.01	-21.99	54.00	48.10	31.74	6.14	53.97	100	35	Average
10	2180.00	51.10	-22.90	74.00	67.19	31.74	6.14	53.97	100	35	Peak
11	2668.00	46.18	-27.82	74.00	60.91	32.23	6.97	53.93	---	---	Peak
12	3604.00	47.67	-26.33	74.00	60.82	32.92	8.20	54.27	---	---	Peak
13	4504.00	49.40	-24.60	74.00	59.74	34.60	10.06	55.00	---	---	Peak
14	7590.00	50.09	-23.91	74.00	59.53	35.52	10.90	55.86	---	---	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	Dec. 04, 2013	Nov. 14, 2014	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Dec. 04, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Dec. 04, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Dec. 04, 2013	N/A	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Apr. 25, 2013	Dec. 04, 2013	Apr. 24, 2014	Conduction (CO05-HY)
Test Software	N/A	EMC32	8.40.0	N/A	N/A	Dec. 04, 2013	N/A	Conduction (CO05-HY)
LF Cable	Shuner	RG-402	N/A	N/A	Oct. 17, 2013	Dec. 04, 2013	Oct. 16, 2014	Conduction (CO05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Nov. 29, 2013	Nov. 19, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211028	9kHz ~ 26.5GHz	Aug. 29, 2013	Nov. 29, 2013	Aug. 28, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Nov. 29, 2013	May 05, 2014	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz -2GHz	Oct. 10, 2013	Nov. 29, 2013	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Nov. 29, 2013	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Nov. 29, 2013	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Nov. 29, 2013	Jul. 17, 2014	Radiation (03CH06-HY)
Filter	Microwave Circuits	H1G013G1	SN477217	1GHz HPF	Nov. 28, 2013	Nov. 29, 2013	Nov. 27, 2014	Radiation (03CH06-HY)
RF Cable	warison	WCBA-WC04 NM.NM2	N/A	30MHz ~1GHz	Nov. 28, 2013	Nov. 29, 2013	Nov. 27, 2014	Radiation (03CH06-HY)
RF Cable	Huber + Suhner	sucoflex 104	286027/4	1GHz ~26.5GHz	Nov. 28, 2013	Nov. 29, 2013	Nov. 27, 2014	Radiation (03CH06-HY)
Hygrometer	WISEWIND	0410	BU5004	N/A	May 07, 2013	Nov. 29, 2013	May 06, 2014	Radiation (03CH06-HY)
Test Software	Audix	E3	Version 6.2009-8-24	N/A	N/A	Nov. 29, 2013	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Nov. 29, 2013	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Nov. 29, 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
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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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