

FCC Test Report

APPLICANT : Huawei Technologies Co., Ltd.
EQUIPMENT : CDMA 1X Mobile Phone
BRAND NAME : HUAWEI
MODEL NAME : HUAWEI C2839M
FCC ID : QISC2839M
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Jan. 11, 2012 and completely tested on Feb. 08, 2012. We, SPORTON INTERNATIONAL (KUNSAHN) 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 in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FD211103	Rev. 01	Initial issue of report	Feb. 21, 2012



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 10.19 dB at 0.15 MHz
3.2	15.109	Radiated Emission	< 15.109 limits>	PASS	Under limit 1.49 dB at 35.94 MHz

1. General Description

1.1. Applicant

Huawei Technologies Co., Ltd.

Bantian, Longgang District, Shenzhen, 518129 Guangdong, P. R. China

1.2. Manufacturer

Huawei Technologies Co., Ltd.

Bantian, Longgang District, Shenzhen, 518129 Guangdong, P. R. China

1.3. Feature of Equipment Under Test

Product Feature & Specification	
Equipment	CDMA 1X Mobile Phone
Brand Name	HUAWEI
Model Name	HUAWEI C2839M
FCC ID	QISC2839M
Tx Frequency Range	824 MHz ~ 849 MHz
Rx Frequency Range	869 MHz ~ 894 MHz
Antenna Type	Fixed Internal Antenna
HW Version	Ver.C
SW Version	C2839MMT01
Type of Modulation	QPSK
EUT Stage	Identical Prototype

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. Test Site

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.
Test Site Location	No. 101, Complex Building C, Guanglong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755-8637-9589 FAX: +86-755-8637-9595
Test Site No.	Sporton Site No. : CO01-SZ

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958
Test Site No.	Sporton Site No. 03CH01-KS

1.5. 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

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This report is intention of applying for FCC 15B certification only.

**1.6. Ancillary Equipment List**

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.	System Simulator	Agilent	8960	N/A	N/A	Unshielded, 1.8 m
3.	PC	DELL	MT380	FCC DoC	N/A	Unshielded, 1.8 m
4.	Notebook	IBM	1706	FCC DoC	N/A	Unshielded, 1.8 m
5.	Monitor	DELL	E1910Hc	FCC DoC	Shielded, 1.2 m	Unshielded, 1.8 m
6.	Monitor	DELL	1707FPt	FCC DoC	Shielded, 1.2 m	Unshielded, 1.8 m
7.	(USB) Keyboard	DELL	L100	FCC DoC	Shielded, 1.8 m With Core	N/A
8.	(USB) Mouse	DELL	MO56UC	FCC DoC	Shielded, 1.8 m	N/A
9.	iPod	Apple	A1199	FCC DoC	Shielded, 1.0 m	N/A
10.	iPod	Apple	MC525 ZP/A	FCC DoC	Shielded, 1.0 m	N/A
11.	Printer	HP	Laser Jet1018	FCC DoC	Shielded, 1.8 m	Unshielded, 1.8 m
12.	Mini Card	Kingston	N0214-001.AOOLF	N/A	N/A	N/A
13.	Earphone	Eimuse	E-500MV	FCC DoC	Shielded, 2.2 m	N/A

2. Test Configuration of Equipment Under Test

2.1. 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 modes as the worst cases and recorded in this report.

Item	EUT Configuration	Test Condition		
		EMI AC	EMI RE<1G	EMI RE≥1G
1.	Data application transferred Mode (EUT with PC)	☒	☒	☒

Abbreviations:

- I EMI AC: AC conducted emissions
- I EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz
- I EMI RE < 1G: EUT radiated emissions < 1GHz

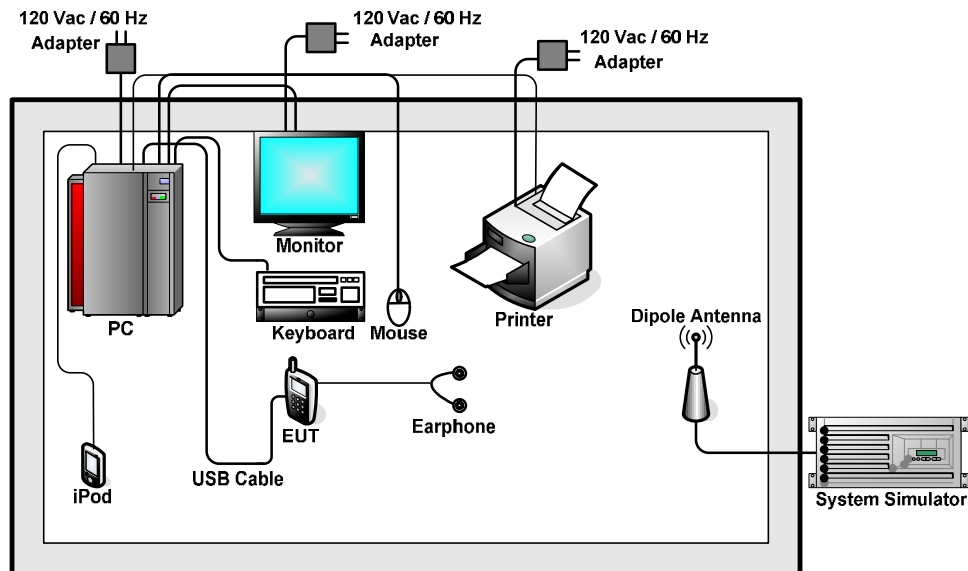
Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1	Mode 1::CDMA850 Idle + USB Cable (Data Link with PC) + Earphone + Battery 2
Radiated Emissions < 1GHz	1	Mode 1: CDMA850 Idle + USB Cable (Data Link with PC) + Earphone + Battery 2
Radiated Emissions ≥ 1GHz	1	Mode 1: CDMA850 Idle + USB Cable (Data Link with PC) + Earphone + Battery 2

Remark:

1. After pre-scan all configures of different accessory, we only choose the worst configures to report.
- 2.Link with PC means data application transferred mode between DUT and PC.

2.2. Connection Diagram of Test System

<EUT with USB Cable (Link with PC) Mode>





2.3. Test Software

The EUT was in CDMA2000 idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the following programs installed in the EUT were programmed during the test.

1. Execute the program, "Winthrax", installed in PC for active sync files transfer with EUT via USB cable / iPod.
2. To keep EUT receiving signals continuously from base station.

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.

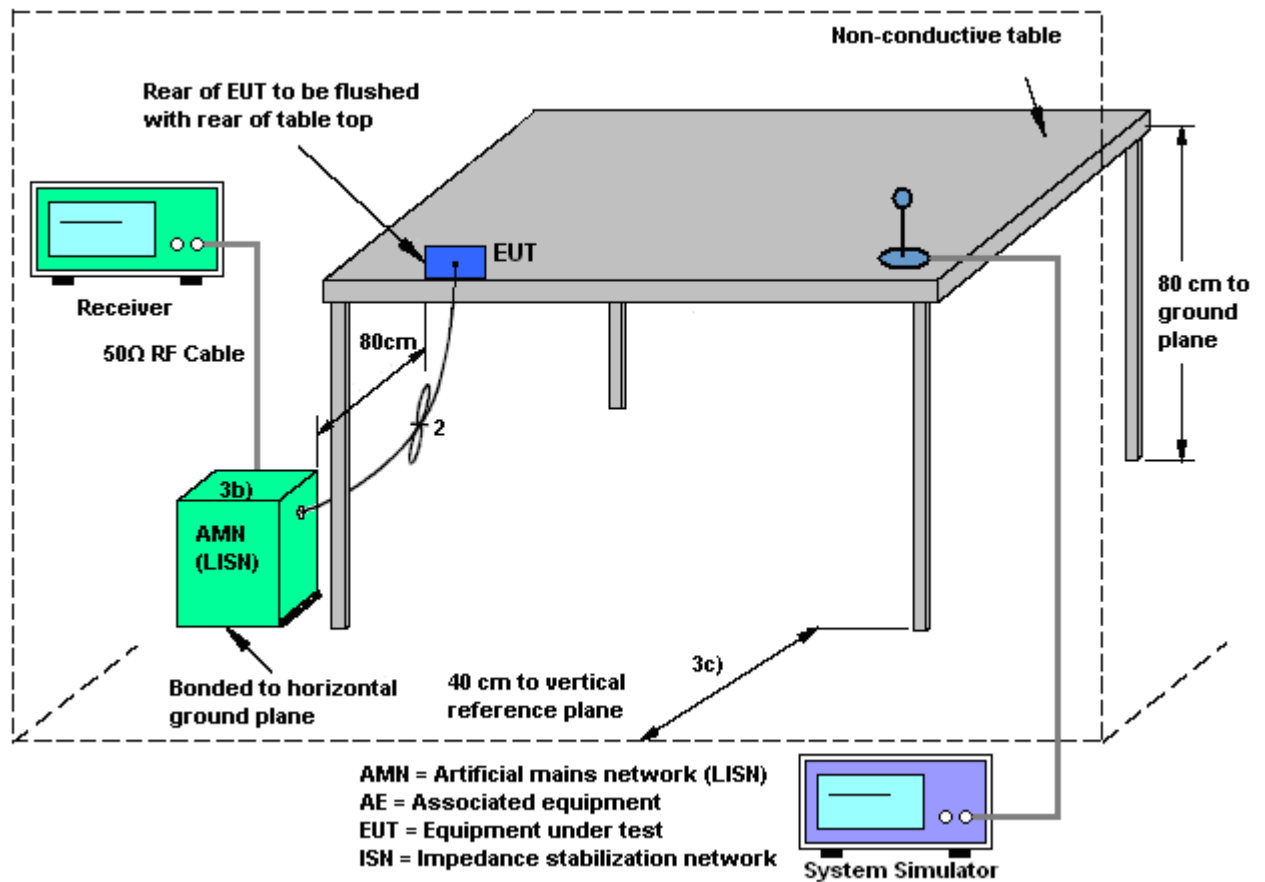
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

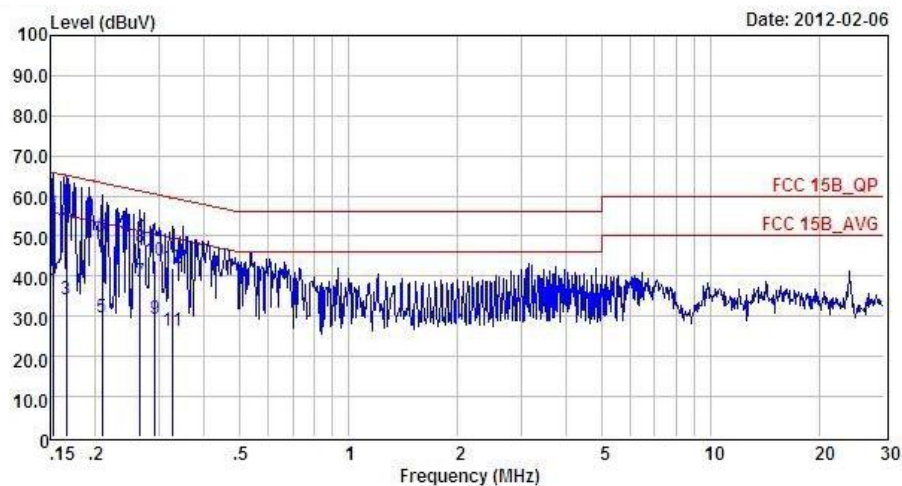
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. The EUT link with PC, connect PC to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting 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 :	22~23°C
Test Engineer :	King Liu	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	CDMA850 Idle + USB Cable (Data Link with PC) + Earphone + Battery 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15B_QP LISN_L_2000601 LINE
Project : (FD)211103

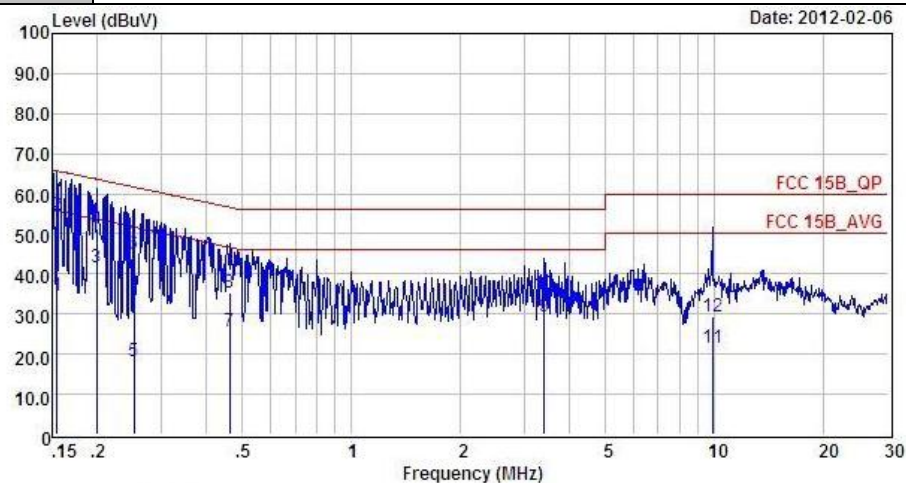
	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
		dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	36.48	-19.39	55.87	26.40	0.03	10.05	Average
2	0.15	55.68	-10.19	65.87	45.60	0.03	10.05	QP
3	0.17	34.28	-20.88	55.16	24.20	0.03	10.05	Average
4	0.17	53.68	-11.48	65.16	43.60	0.03	10.05	QP
5	0.21	29.68	-23.59	53.27	19.60	0.02	10.06	Average
6	0.21	49.88	-13.39	63.27	39.80	0.02	10.06	QP
7	0.27	38.48	-12.77	51.25	28.40	0.02	10.06	Average
8	0.27	47.18	-14.07	61.25	37.10	0.02	10.06	QP
9	0.29	29.19	-21.27	50.46	19.11	0.02	10.06	Average
10	0.29	43.89	-16.57	60.46	33.81	0.02	10.06	QP
11	0.33	26.29	-23.24	49.53	16.20	0.02	10.07	Average
12	0.33	42.09	-17.44	59.53	32.00	0.02	10.07	QP



FCC Test Report

Report No. : FD211103

Test Mode :	Mode 1	Temperature :	22~23°C
Test Engineer :	King Liu	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	CDMA850 Idle + USB Cable (Data Link with PC) + Earphone + Battery 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15B_QP LISN_N_2000601 NEUTRAL
Project : (FD)211103

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
		dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	34.47	-21.27	55.74	24.40	0.02	10.05	Average
2	0.15	54.57	-11.17	65.74	44.50	0.02	10.05	QP
3	0.20	41.77	-11.90	53.67	31.69	0.02	10.06	Average
4	0.20	51.47	-12.20	63.67	41.39	0.02	10.06	QP
5	0.25	18.08	-33.61	51.69	8.00	0.02	10.06	Average
6	0.25	44.98	-16.71	61.69	34.90	0.02	10.06	QP
7	0.46	25.70	-20.97	46.67	15.60	0.02	10.08	Average
8	0.46	35.20	-21.47	56.67	25.10	0.02	10.08	QP
9	3.40	29.24	-16.76	46.00	19.00	0.05	10.19	Average
10	3.40	34.94	-21.06	56.00	24.70	0.05	10.19	QP
11	9.86	21.67	-28.33	50.00	11.11	0.28	10.28	Average
12	9.86	29.47	-30.53	60.00	18.91	0.28	10.28	QP

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

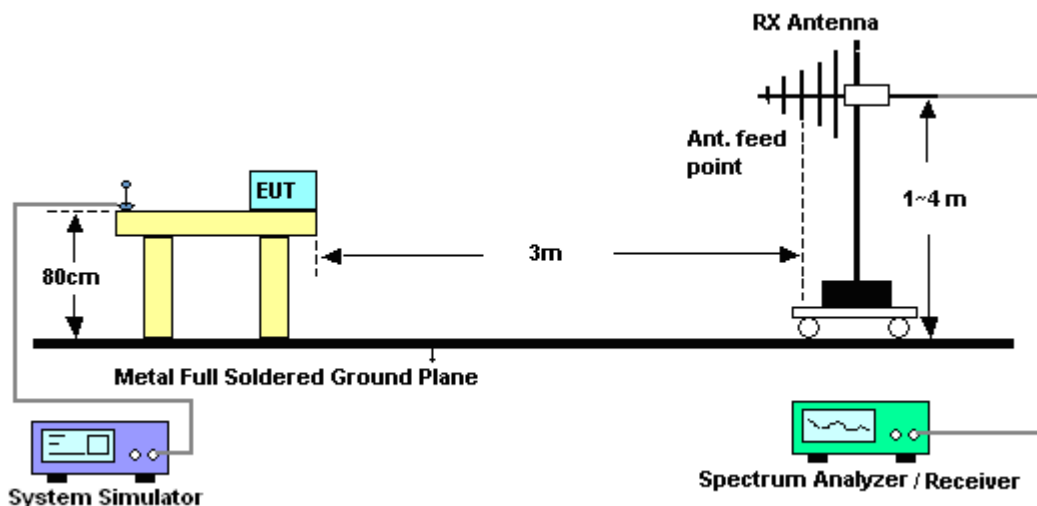
3.2.2. Measuring Instruments

See list of measuring instruments of this test report.

3.2.3. Test Procedures

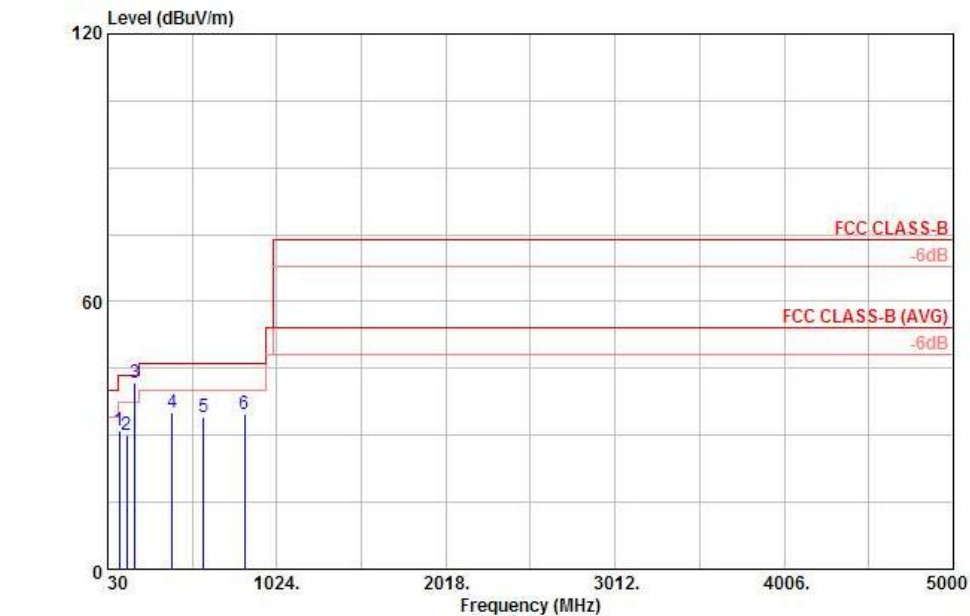
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna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



**3.2.5. Test Result of Radiated Emission**

Test Mode :	Mode 1	Temperature :	20~21°C
Test Engineer :	Jack Li	Relative Humidity :	40~41%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	CDMA850 Idle + USB Cable (Data Link with PC) + Earphone + Battery 2		



Site : 03CH01-KS
Condition: FCC CLASS-B 3m LF_ANT_100803 HORIZONTAL
Project : (FD) 211103

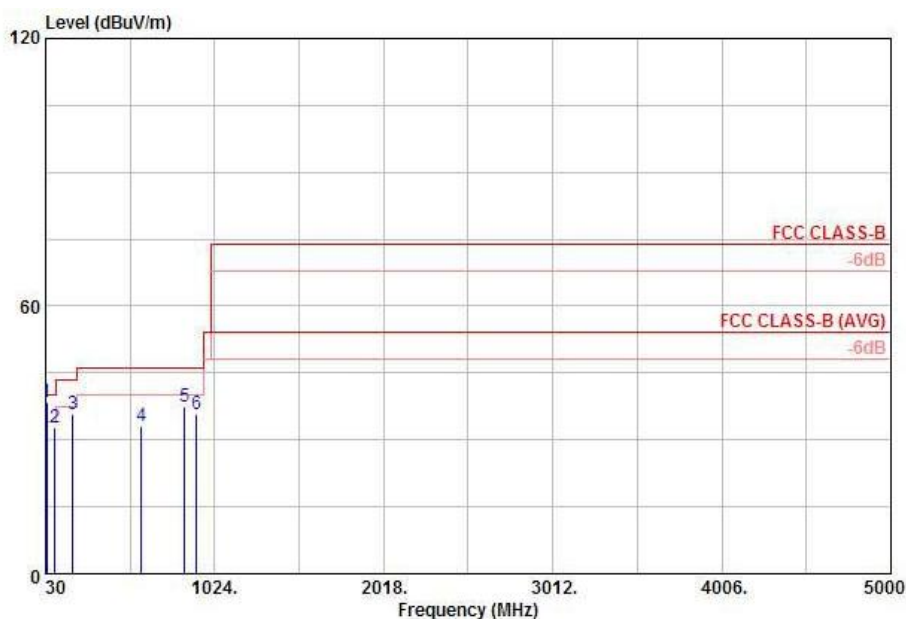
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	95.88	30.97	-12.53	43.50	50.63	9.91	0.40	29.97	---	Peak
2	143.94	30.18	-13.32	43.50	49.12	10.55	0.50	29.99	---	Peak
3	192.00	41.81	-1.69	43.50	62.60	8.59	0.58	29.96	100	333 QP
4	407.10	35.05	-10.95	46.00	48.00	16.03	0.85	29.83	---	Peak
5	594.00	34.03	-11.97	46.00	44.01	18.59	1.06	29.63	---	Peak
6	836.20	34.91	-11.09	46.00	42.92	20.36	1.27	29.64	---	Peak



FCC Test Report

Report No. : FD211103

Test Mode :	Mode 1	Temperature :	20~21°C
Test Engineer :	Jack Li	Relative Humidity :	40~41%
Test Distance :	3m	Polarization :	Vertical
Function Type :	CDMA850 Idle + USB Cable (Data Link with PC) + Earphone + Battery 2		



Site : 03CH01-KS
Condition: FCC CLASS-B 3m LF_ANT_100803 VERTICAL
Project : (FD) 211103

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB	dB	cm	deg	
1	35.94	38.51	-1.49	40.00	53.71	14.65	0.23	30.08	100	QP
2	84.00	32.81	-7.19	40.00	54.93	7.53	0.37	30.02	---	Peak
3	192.00	35.86	-7.64	43.50	56.65	8.59	0.58	29.96	---	Peak
4	594.00	33.26	-12.74	46.00	43.24	18.59	1.06	29.63	---	Peak
5	845.30	37.46	-8.54	46.00	45.37	20.47	1.28	29.66	---	Peak
6	919.50	35.61	-10.39	46.00	43.25	20.55	1.31	29.50	---	Peak



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Receiver	R&S	1142.8007.03	100724	9K-3GHz	Mar. 08, 2011	Feb. 06, 2012	Mar. 07, 2012	Conduction (CO01-SZ)
AC LISN	ETS-LINDGR EN	3816/2SH	00103912	0.1MHz~108M Hz	Feb. 28, 2011	Feb. 06, 2012	Feb. 27, 2012	Conduction (CO01-SZ)
AC LISN	ETS-LINDGR EN	3816/2SH	00103892	0.1MHz~108M Hz	Feb. 28, 2011	Feb. 06, 2012	Feb. 27, 2012	Conduction (CO01-SZ)
AVR	Throma	61602	6160200008 91N/A	N/A	Oct. 12, 2011	Feb. 06, 2012	Oct. 11, 2012	Conduction (CO01-SZ)
AC Filter	ETS-LINDGR EN	LRE-2030/PE N 256260	00093783	N/A	Dec. 30, 2011	Feb. 06, 2012	Dec. 29, 2012	Conduction (CO01-SZ)
AC Filter	ETS-LINDGR EN	LRE-2030/PE N 256260	00097973	N/A	N/A	Feb. 06, 2012	N/A	Conduction (CO01-SZ)
System Simulator	Agilent	8960	MY5026416 8	GSM/WCDMA /CDMA2000	Mar. 14, 2011	Feb. 08, 2012	Mar. 13, 2012	Conduction (CO01-SZ)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Feb. 08, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Feb. 08, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Feb. 08, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/00	9 kHz~30 MHz	Jul. 28, 2011	Feb. 08, 2012	Jul. 27, 2012	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Feb. 08, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060007	30MHz~2GHz	Dec. 30, 2011	Feb. 08, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Feb. 08, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Feb. 08, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHE-EHF Horn	Schwarzbeck	BBHA9170	BBHA17024 9	15GHz~40GHz	Oct. 11, 2011	Feb. 08, 2012	Oct. 10, 2012	Radiation (03CH01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	Feb. 08, 2012	Dec. 29, 2012	Radiation (03CH01-KS)

5. Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $Uc(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP211103 as below.