



FCC Test Report

APPLICANT : Tecom Co., Ltd.
EQUIPMENT : 3G Femtocell Residential Access Point
BRAND NAME : CISCO
MODEL NAME : USC3330-BJ-K9
FCC ID : D6XUSC3330BJ
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Aug. 21, 2014 and testing was completed on Sep. 04, 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.

Louis Wu

Reviewed by: Louis Wu / Manager

Jones Tsai

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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC482160	Rev. 01	Initial issue of report	Sep. 26, 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 7.10 dB at 0.358 MHz
3.2	15.109	ICES003 Section 6.2	Radiated Emission	< 15.109 limits < ICES003 6.2 limits	PASS	Under limit 3.22 dB at 145.56 MHz For Quasi-Peak



1. General Description

1.1. Applicant

Tecom Co., Ltd.

23 R&D Road 2, Hsinchu Science-based Industrial Park, Hsin-Chu, Taiwan R.O.C.

1.2. Manufacturer

Global Brands Manufacture (DongGuan) Ltd.

Yue Yuan Industrial Estate, Huang Jiang Zhen, DongGuan City, Guangdong Province, China.

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	3G Femtocell Residential Access Point
Brand Name	CISCO
Model Name	USC3330-BJ-K9
FCC ID	D6XUSC3330BJ
EUT supports Radios application	WCDMA
EUT Stage	Beta Stage

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. Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	WCDMA Band V : 871.4 MHz ~ 891.6 MHz WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz
Rx Frequency	GSM850 : 869.2 MHz ~ 893.8 MHz GSM1900 : 1930.2 MHz ~ 1989.8 MHz WCDMA Band V : 826.4 MHz ~ 846.6 MHz WCDMA Band II : 1852.4 MHz ~ 1907.6 MHz GPS : 1.57542 GHz
Antenna Type	WWAN : Omni Antenna
Type of Modulation	GSM: GMSK WCDMA: 16QAM (Uplink) GPS : BPSK

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 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. Applicable 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: All test items were verified and recorded according to the standards and without any deviation during the test.



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<1G	EMI RE≥1G
1.	Charging Mode (EUT with adapter)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Abbreviations:

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

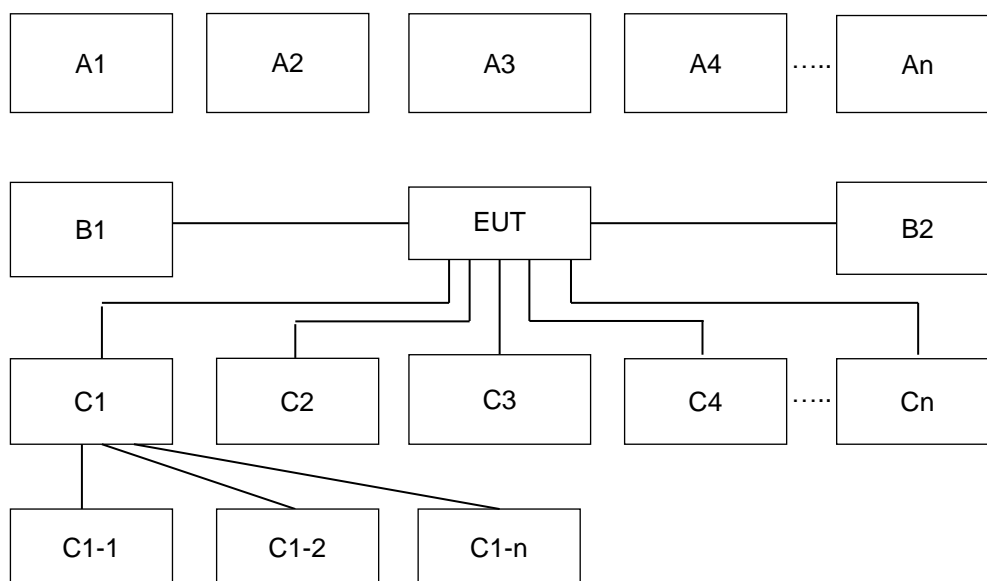
Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1	Mode 1 : WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 1 Mode 2 : WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 2
Radiated Emissions < 1GHz	1	Mode 1 : WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 1 Mode 2 : WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 2
Radiated Emissions ≥ 1GHz	1	Mode 1 : WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 1

Remark:

1. The worst case of AC is mode 2; only the test data of this mode was reported.
2. The worst case of RE < 1G is mode 1; only the test data of this mode was reported.



2.2. Connection Diagram of Test System



Conduction and Radiation Test Setup									
No.	Wireless Station	Connection Type	Test Mode						
			1	2	-	-	-	-	-
A1	GPS Station	GPS	X	X					
No.	Power Source	Connection Type	1	2	-	-	-	-	-
B1	AC : 120V/60Hz	AC Power Cable	X	X					
No.	Setup Peripherals	Connection Type	1	2	-	-	-	-	-
C1	Notebook	RJ-45 Cable	X	X					
C1-1	LCD Monitor	HDMI cable to C1	X	X					
C1-2	iPod	USB Cable to C1	X	X					
C2	GPS Antenna	GPS Cable	X	X					



2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
2.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
3.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	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

2.4. EUT Operation Test Setup

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

At the same time, the EUT was attached to the WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Execute "RPC Client" to make the EUT receive continuous signals from GPS station.
2. The EUT in notebook is connected with Laptop via RJ-45 cable and execute "PING IP" function under the "cmd" of Window system to transfer packet bi-directionally.

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.

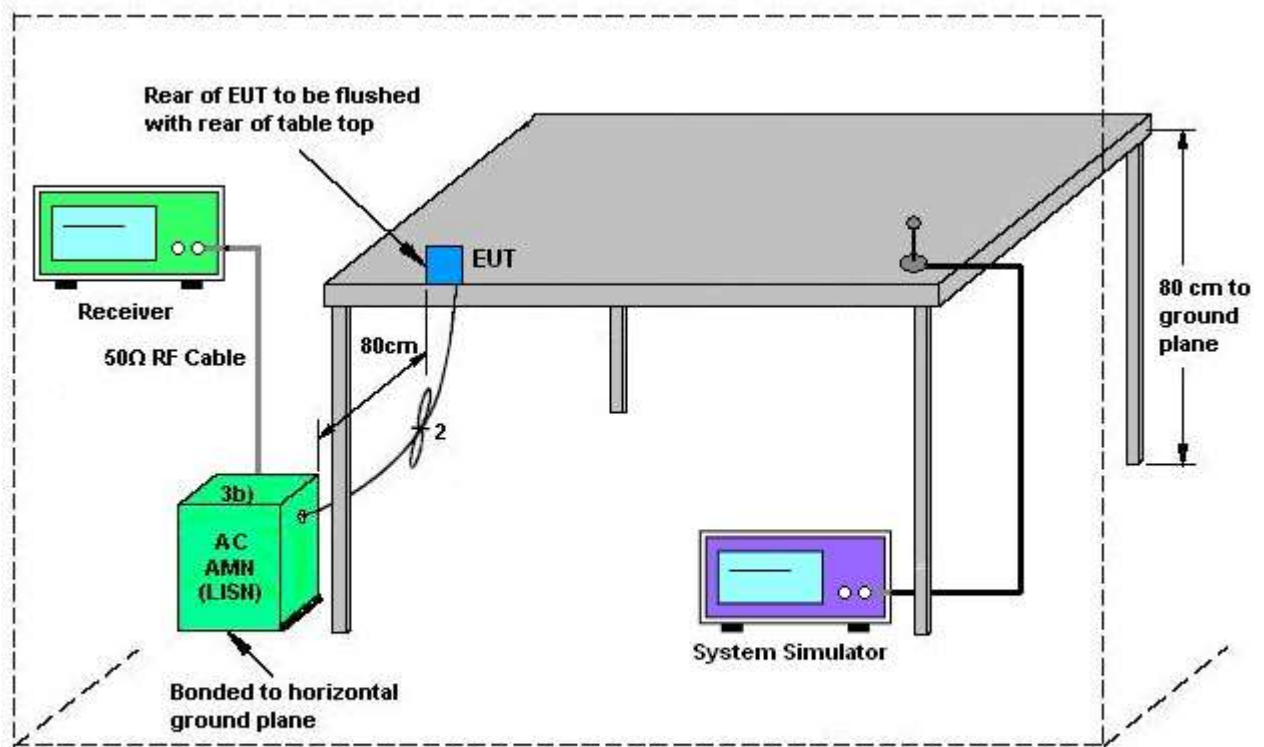
3.1.2 Measuring Instruments

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 (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test Setup

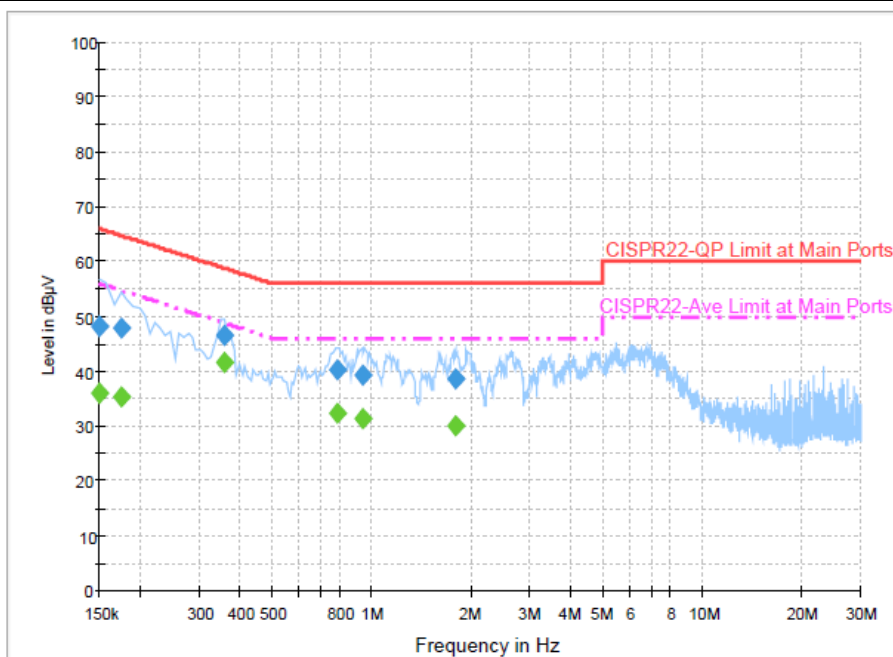


AMN = Artificial mains network (LISN)
 AE = Associated equipment
 EUT = Equipment under test
 ISN = Impedance stabilization network



3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Cosmo Xu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 2		



Final Result : Quasi-Peak

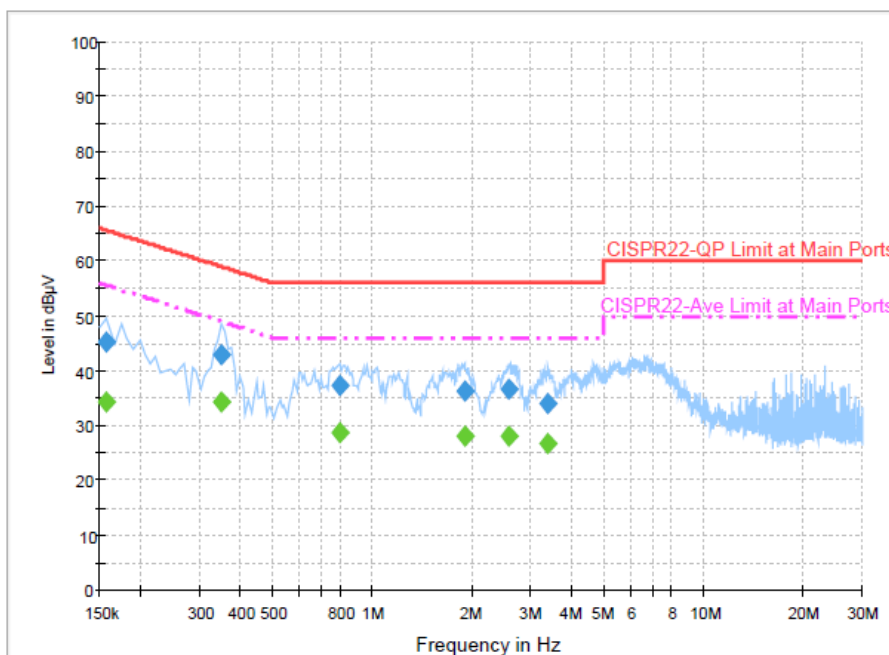
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	48.1	Off	L1	19.3	17.9	66.0
0.174000	47.8	Off	L1	19.3	17.0	64.8
0.358000	46.6	Off	L1	19.4	12.2	58.8
0.782000	40.3	Off	L1	19.5	15.7	56.0
0.934000	39.4	Off	L1	19.4	16.6	56.0
1.782000	38.6	Off	L1	19.5	17.4	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	35.9	Off	L1	19.3	20.1	56.0
0.174000	35.5	Off	L1	19.3	19.3	54.8
0.358000	41.7	Off	L1	19.4	7.1	48.8
0.782000	32.3	Off	L1	19.5	13.7	46.0
0.934000	31.4	Off	L1	19.4	14.6	46.0
1.782000	30.0	Off	L1	19.5	16.0	46.0



Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Cosmo Xu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 2		

**Final Result : Quasi-Peak**

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	45.1	Off	N	19.3	20.5	65.6
0.350000	42.8	Off	N	19.4	16.2	59.0
0.798000	37.3	Off	N	19.5	18.7	56.0
1.894000	36.3	Off	N	19.6	19.7	56.0
2.574000	36.5	Off	N	19.6	19.5	56.0
3.374000	34.1	Off	N	19.6	21.9	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	34.4	Off	N	19.3	21.2	55.6
0.350000	34.5	Off	N	19.4	14.5	49.0
0.798000	28.6	Off	N	19.5	17.4	46.0
1.894000	28.2	Off	N	19.6	17.8	46.0
2.574000	28.1	Off	N	19.6	17.9	46.0
3.374000	26.7	Off	N	19.6	19.3	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

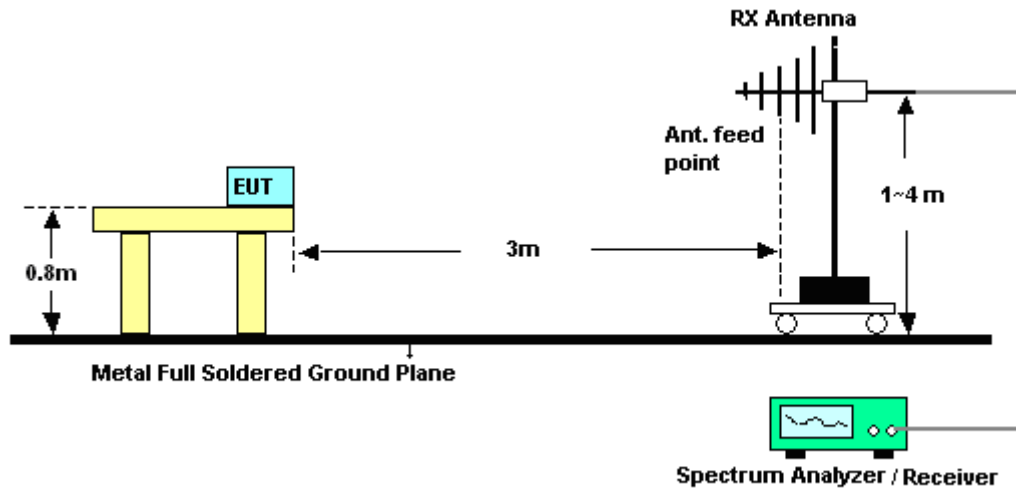
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

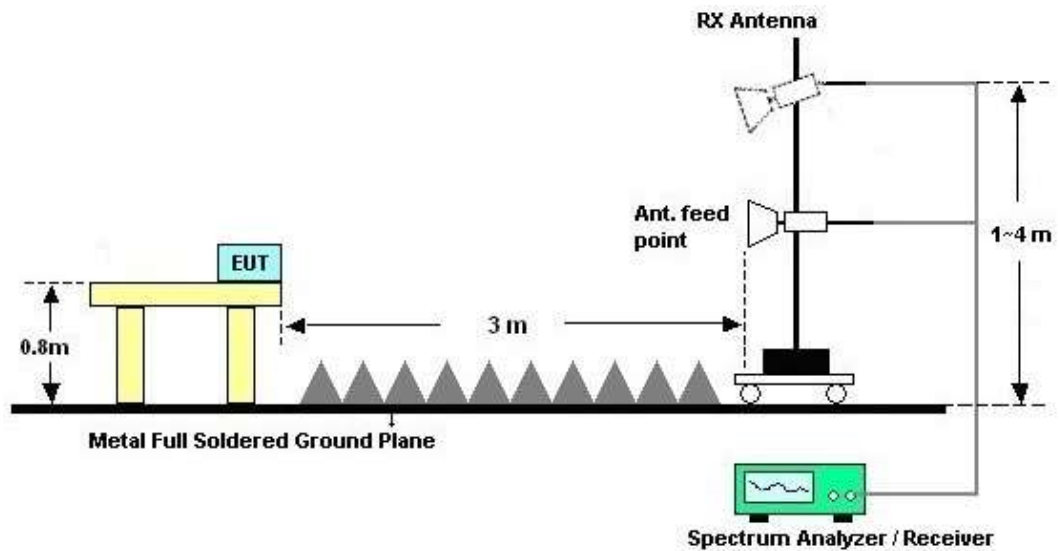
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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 (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
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 (dB μ V/m) = 20 log Emission level (μ V/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

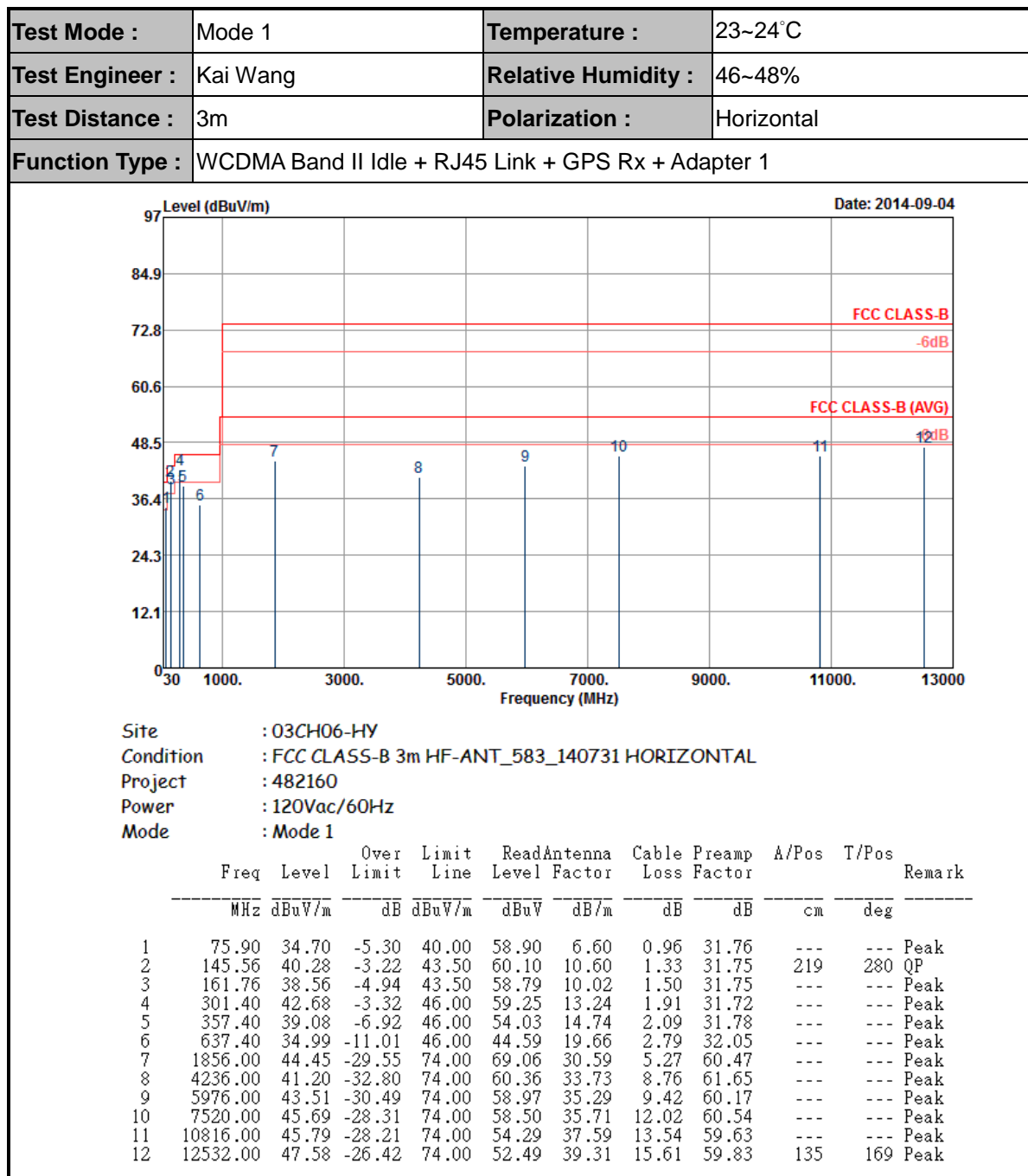


For radiated emissions above 1GHz



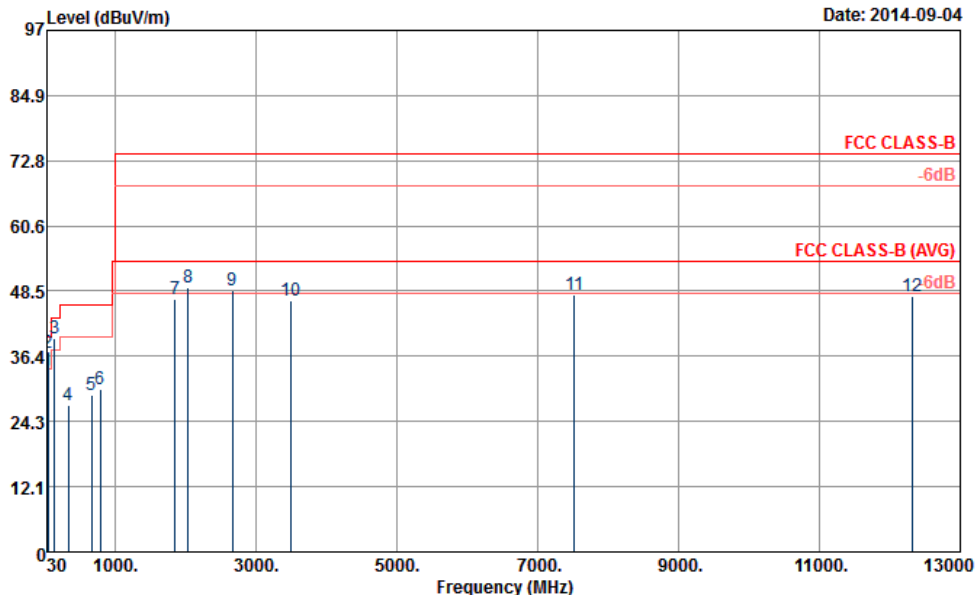


3.2.5. Test Result of Radiated Emission





Test Mode :	Mode 1	Temperature :	23~24°C
Test Engineer :	Kai Wang	Relative Humidity :	46~48%
Test Distance :	3m	Polarization :	Vertical
Function Type :	WCDMA Band II Idle + RJ45 Link + GPS Rx + Adapter 1		



Site : 03CH06-HY
 Condition : FCC CLASS-B 3m HF-ANT_583_140731 VERTICAL
 Project : 482160
 Power : 120Vac/60Hz
 Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	38.64	33.69	-6.31	40.00	51.33	13.42	0.73	31.79	---	---	Peak
2	47.55	36.97	-3.03	40.00	59.02	8.95	0.78	31.78	100	245	Peak
3	143.40	39.85	-3.65	43.50	59.51	10.77	1.32	31.75	---	---	Peak
4	338.50	27.27	-18.73	46.00	43.07	13.95	2.01	31.76	---	---	Peak
5	664.00	29.22	-16.78	46.00	38.97	19.45	2.83	32.03	---	---	Peak
6	791.40	30.38	-15.62	46.00	39.19	20.09	3.06	31.96	---	---	Peak
7	1848.00	47.05	-26.95	74.00	71.69	30.59	5.24	60.47	---	---	Peak
8	2036.00	49.24	-24.76	74.00	72.47	31.72	5.55	60.50	100	132	Peak
9	2666.00	48.52	-25.48	74.00	70.43	32.27	6.49	60.67	---	---	Peak
10	3494.00	46.87	-27.13	74.00	68.58	32.60	7.09	61.40	---	---	Peak
11	7520.00	47.76	-26.24	74.00	60.57	35.71	12.02	60.54	---	---	Peak
12	12328.00	47.66	-26.34	74.00	52.56	39.13	15.43	59.46	---	---	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	Aug. 28, 2014	Nov. 14, 2014	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Aug. 28, 2014	Dec. 11, 2014	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Aug. 28, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Aug. 28, 2014	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Sep. 04, 2014	Nov. 19, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9kHz ~ 26.5GHz	Dec. 02, 2013	Sep. 04, 2014	Dec. 01, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2014	Sep. 04, 2014	May 05, 2015	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz ~ 2GHz	Oct. 10, 2013	Sep. 04, 2014	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Jul. 24, 2014	Sep. 04, 2014	Jul. 23, 2015	Radiation (03CH06-HY)
Amplifier	SONOMA	310N	186713	9kHz ~ 1GHz	Apr. 16, 2014	Sep. 04, 2014	Apr. 15, 2015	Radiation (03CH06-HY)
Preamplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 17, 2014	Sep. 04, 2014	Jul. 16, 2015	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Sep. 04, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF78020821 2	1 m ~ 4 m	N/A	Sep. 04, 2014	N/A	Radiation (03CH06-HY)



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
-------------------------------------------------------------------------	------

