FCC Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	EVDO WiMAX Dual Mode USB Modem
BRAND NAME	:	ZTE
MODEL NAME	:	AD226
FCC ID	:	Q78-ZTEAD226
STANDARD	:	FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION	:	Certification

The product was received on Nov. 27, 2009 and completely tested on Jan. 26, 2010. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 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 INC., the test report shall not be reproduced except in full.

Reviewed by:

Roy Wu / 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
FD9N2716	Rev. 01	Initial issue of report	Jan. 26, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.107	7.2.2	AC Conducted Emission	< 15.107 limits < RSS-Gen table 2 limits	PASS	Under limit 16.9 dB at 25.982 MHz
3.2	15.109	7.2.3.2	Radiated Emission	< 15.109 limits or < RSS-Gen table 1 limits (Section 6)	PASS	Under limit 9.68 dB at 30.54 MHz

1. General Description

1.1. Applicant

ZTE CORPORATION
ZTE Plaza, Keji Road South, Hi-Tech Industrial Park,
Nanshan District,Shenzhen, Guangdong, 518057, P.R.China

1.2. Manufacturer

ZTE CORPORATION
ZTE Plaza, Keji Road South, Hi-Tech Industrial Park,
Nanshan District,Shenzhen, Guangdong, 518057, P.R.China

1.3. Feature of Equipment Under Test

Product Feature & Specification	
Equipment	EVDO WiMAX Dual Mode USB Modem
Brand Name	ZTE
Model Name	AD226
FCC ID	Q78-ZTEAD226
Tx Frequency Range	CDMA2000 BC0 : 824 MHz ~ 849 MHz CDMA2000 BC1 : 1850 MHz ~ 1910 MHz 802.16e : 2496 MHz ~ 2690 MHz
Rx Frequency Range	CDMA2000 BC0 : 869 ~ 894 MHz CDMA2000 BC1 : 1930 ~ 1990 MHz 802.16e : 2496 MHz ~ 2690 MHz GPS : 1.57542 GHz
Antenna Type	Fixed Internal Antenna
Type of Modulation	CDMA2000 : QPSK 802.16e (Uplink) : OFDMA (QPSK / 16QAM) GPS : BPSK
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 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.
	03CH06-HY, 03CH07-HY, CO05-HY	TW1022 / 4086B-1

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
- IC RSS-Gen Issue 2

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

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.	VSG (System Simulator)	Agilent	E4438C	N/A	N/A	Unshielded, 1.8 m
3.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
4.	Notebook	Acer	Z12	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Notebook	Acer	MS2229	QDS-BRCM1028	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
7.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
8.	iPod	Apple	A1199	FCC DoC	Shielded, 1.0 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).

Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

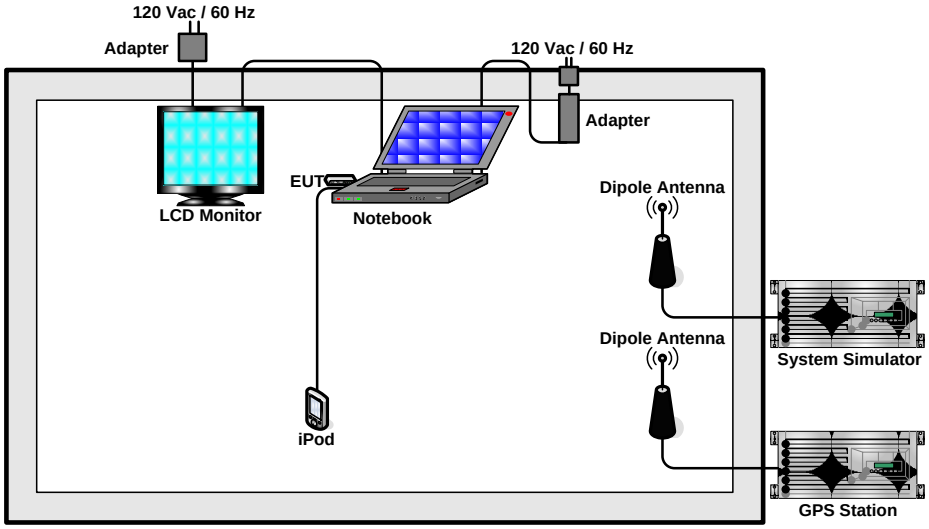
Item	EUT Configuration	Test Condition		
		EMI AC	EMI RE<1G	EMI RE≥1G
1.	Operating Mode (EUT link with notebook)	☒	☒	☒

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 : CDMA2000 BC0 Idle + GPS Rx Mode 2 : CDMA2000 BC1 Idle + GPS Rx Mode 3 : WiMAX Idle + GPS Rx
Radiated Emissions < 1GHz	1	Mode 1 : CDMA2000 BC0 Idle + GPS Rx Mode 2 : CDMA2000 BC1 Idle + GPS Rx Mode 3 : WiMAX Idle + GPS Rx
Radiated Emissions ≥ 1GHz	1	Mode 1 : CDMA2000 BC0 Idle + GPS Rx
Remark: **1.** The worst case of AC is mode 3; 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



2.3. Test Software

The EUT was plugged into the notebook directly, and was in CDMA2000 or WiMAX idle mode during testing. The EUT was synchronized to the system simulator, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, execute "QRCT.exe" to make the EUT receive signals from GPS station continuously.

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.

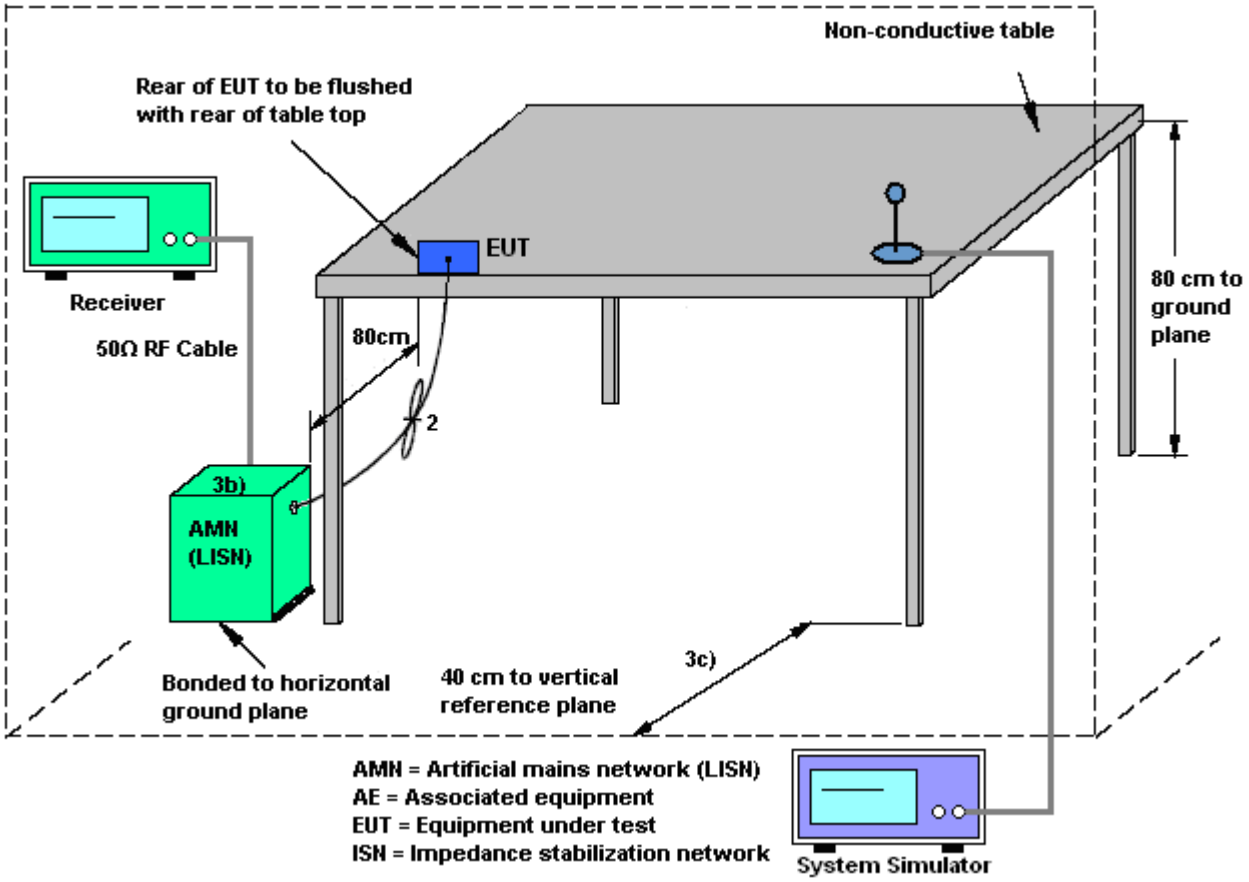
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

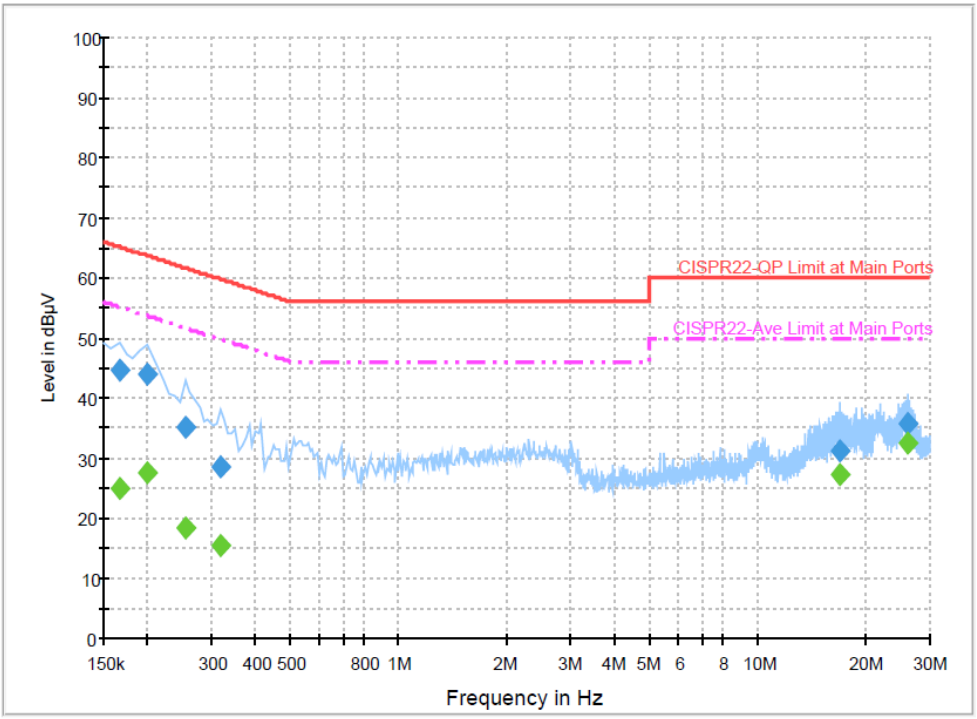
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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 3	**Temperature :**	20~22℃
Test Engineer :	Hayden Wu	**Relative Humidity :**	40~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WiMAX Idle + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



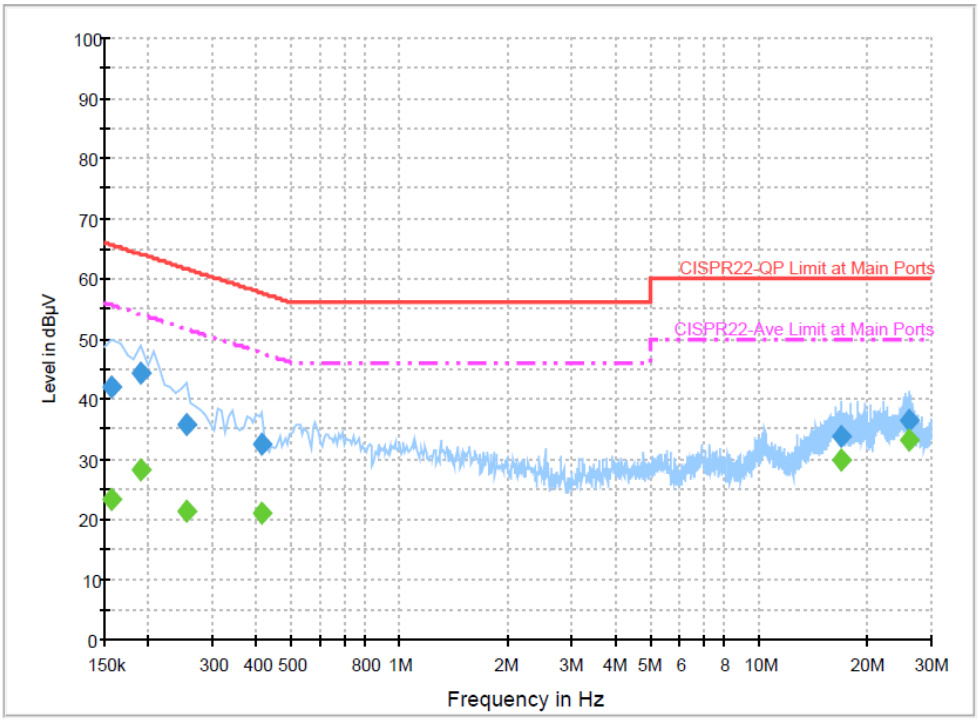
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	44.6	Off	L1	19.5	20.6	65.2
0.198000	43.8	Off	L1	19.6	19.9	63.7
0.254000	35.1	Off	L1	19.4	26.5	61.6
0.318000	28.6	Off	L1	19.5	31.2	59.8
16.862000	31.1	Off	L1	19.7	28.9	60.0
26.046000	35.9	Off	L1	19.7	24.1	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	25.0	Off	L1	19.5	30.2	55.2
0.198000	27.5	Off	L1	19.6	26.2	53.7
0.254000	18.2	Off	L1	19.4	33.4	51.6
0.318000	15.4	Off	L1	19.5	34.4	49.8
16.862000	27.2	Off	L1	19.7	22.8	50.0
26.046000	32.3	Off	L1	19.7	17.7	50.0

Test Mode :	Mode 3	**Temperature :**	20~22℃
Test Engineer :	Hayden Wu	**Relative Humidity :**	40~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WiMAX Idle + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	42.1	Off	N	19.5	23.5	65.6
0.190000	44.4	Off	N	19.5	19.6	64.0
0.254000	35.9	Off	N	19.4	25.7	61.6
0.414000	32.5	Off	N	19.4	25.2	57.6
16.926000	33.7	Off	N	19.7	26.3	60.0
25.982000	36.5	Off	N	19.9	23.5	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	23.4	Off	N	19.5	32.2	55.6
0.190000	28.1	Off	N	19.5	25.9	54.0
0.254000	21.3	Off	N	19.4	30.3	51.6
0.414000	21.0	Off	N	19.4	26.6	47.6
16.926000	29.7	Off	N	19.7	20.3	50.0
25.982000	33.1	Off	N	19.9	16.9	50.0

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

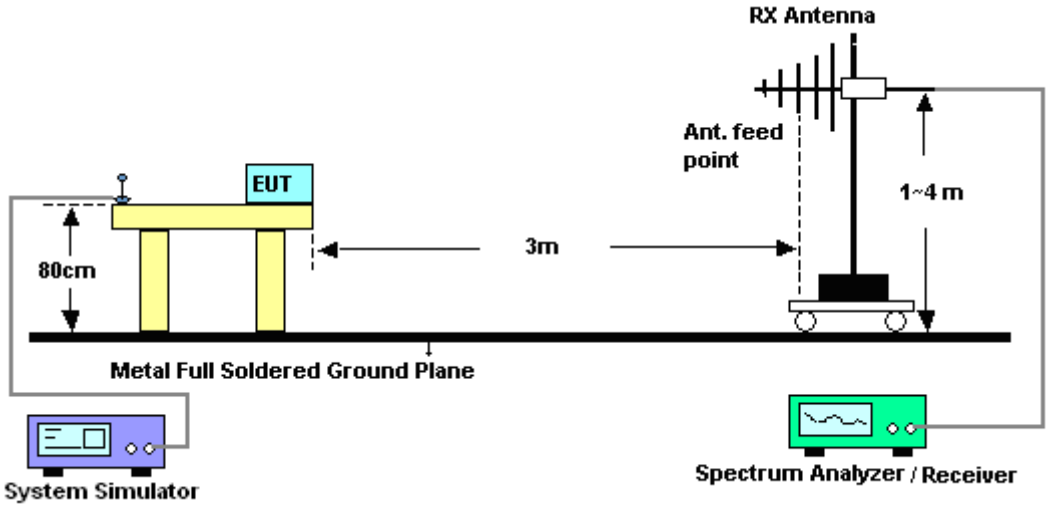
3.2.2. Measuring Instruments

See list of measuring instruments of this test report.

3.2.3. Test Procedures

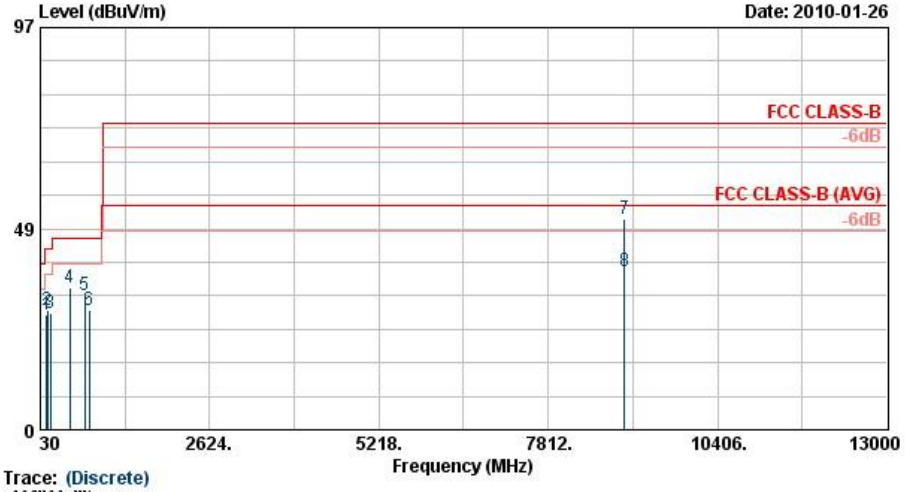
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna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

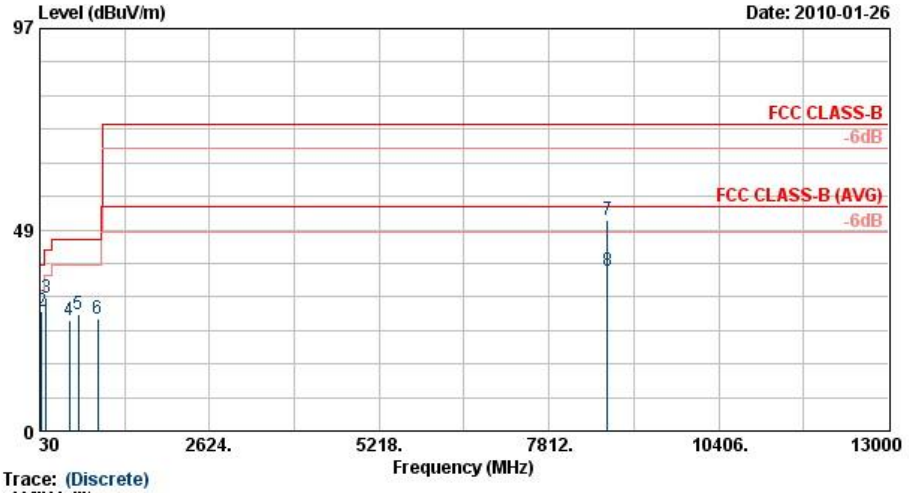
Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Kai Wang	Relative Humidity :	43~47%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	CDMA2000 BC0 Idle + GPS Rx		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT(8-18G)_091111 HORIZONTAL
Power : From System
Project : FD 9N2716
Memo : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	129.09	27.75	-15.75	43.50	45.93	11.69	1.82	31.69	---	---	Peak
2	141.24	28.90	-14.60	43.50	47.72	10.95	1.94	31.72	---	---	Peak
3	188.49	28.05	-15.45	43.50	48.97	8.79	2.32	32.03	---	---	Peak
4	479.90	34.40	-11.60	46.00	45.47	17.11	3.88	32.06	100	128	Peak
5	707.40	32.54	-13.46	46.00	40.94	19.30	4.72	32.42	---	---	Peak
6	775.30	28.97	-17.03	46.00	36.20	19.86	5.03	32.12	---	---	Peak
7	8984.00	50.78	-23.22	74.00	43.78	36.09	7.80	36.89	100	128	Peak
8	8984.00	38.28	-15.72	54.00	31.28	36.09	7.80	36.89	100	128	Average

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Kai Wang	Relative Humidity :	43~47%
Test Distance :	3m	Polarization :	Vertical
Function Type :	CDMA2000 BC0 Idle + GPS Rx		



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT(8-18G)_091111 VERTICAL
Power : From System
Project : FD 9N2716
Memo : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	30.54	30.32	-9.68	40.00	43.10	17.98	0.85	31.61	100	18	Peak
2	59.43	29.00	-11.00	40.00	52.88	6.91	1.24	32.02	---	---	Peak
3	129.09	31.96	-11.54	43.50	50.14	11.69	1.82	31.69	---	---	Peak
4	479.90	26.63	-19.37	46.00	37.70	17.11	3.88	32.06	---	---	Peak
5	623.40	28.19	-17.81	46.00	36.89	18.84	4.50	32.04	---	---	Peak
6	911.80	27.12	-18.88	46.00	32.47	20.78	5.48	31.61	---	---	Peak
7	8704.00	50.67	-23.33	74.00	44.14	35.86	7.45	36.78	100	183	Peak
8	8704.00	38.62	-15.38	54.00	32.09	35.86	7.45	36.78	100	183	Average

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 05, 2009	Aug. 04, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 30, 2009	Nov. 29, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 23, 2009	Nov. 22, 2010	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Oct. 23, 2009	Oct. 22, 2010	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 20, 2009	Oct. 19, 2010	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2009	Apr. 27, 2010	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Nov. 02, 2009	Nov. 01, 2010	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Nov. 11, 2009	Nov. 10, 2010	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 20, 2009	Apr. 19, 2010	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz~30MHz	May 22, 2008	May 21, 2010	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 04, 2009	Dec. 03, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec.09,2009	Dec. 08, 2010	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 27, 2009	Mar. 26, 2010	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 KHz~30 MHz	May 22, 2008	May 21, 2010	Radiation (03CH07-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	-
VSG (System Simulator)	Agilent	E4438C	MY49070423	N/A	Oct. 29, 2009	Oct. 28, 2011	-
System Simulator	R&S	CMU200	117997	N/A	May 14, 2009	May 13, 2011	-

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 Uc(y)	**1.13**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(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 Uc(y)	**1.27**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(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 Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+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 EP9N2716 as below.