

Variant FCC Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : WiMAX EVDO Dual Mode USB Modem
BRAND NAME : ZTE
MODEL NAME : U226
FCC ID : Q78-ZTEAD226
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : Certification

This is a variant report which is only valid combined with the original test report. The product was received on Mar. 18, 2010 and completely tested on Mar. 22, 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



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	IC Rule	Description	Limit	Result	Remark
3.1	15.109	7.2.3.2	Radiated Emission	< 15.109 limits or < RSS-Gen table 1 limits (Section 6)	PASS	Under limit 10.80 dB at 140.97 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	WiMAX EVDO Dual Mode USB Modem
Brand Name	ZTE
Model Name	U226
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
Antenna Connector Type	CDMA2000 : QPSK 802.16e (Uplink) : OFDMA (QPSK / 16QAM) GPS : BPSK

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 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.
	03CH07-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.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	Notebook	Acer	MS2229	QDS-BRCM1028	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
5.	iPod	Apple	A1285	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: 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.

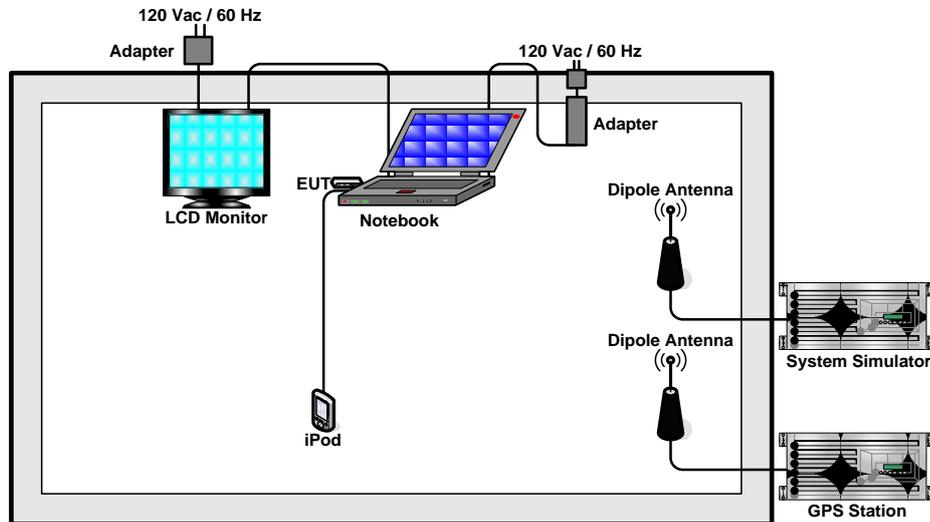
Item	EUT Configuration	Test Condition
		EMI RE
1.	Operating Mode (EUT link with notebook)	<input checked="" type="checkbox"/>

Abbreviations:

- EMI RE: EUT radiated emissions

Test Items	EUT Configure Mode	Function Type
Radiated Emissions	1	Mode 1 : CDMA2000 BC0 Idle + GPS Rx
Remark: The test matrix was based on the worst case in Sporton Report Number FD9N2716 shown in Appendix D.		

2.2. Connection Diagram of Test System



2.3. Test Software

The EUT was plugged into the notebook directly, and was in CDMA2000 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 Radiated Emission Measurement

3.1.1. 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

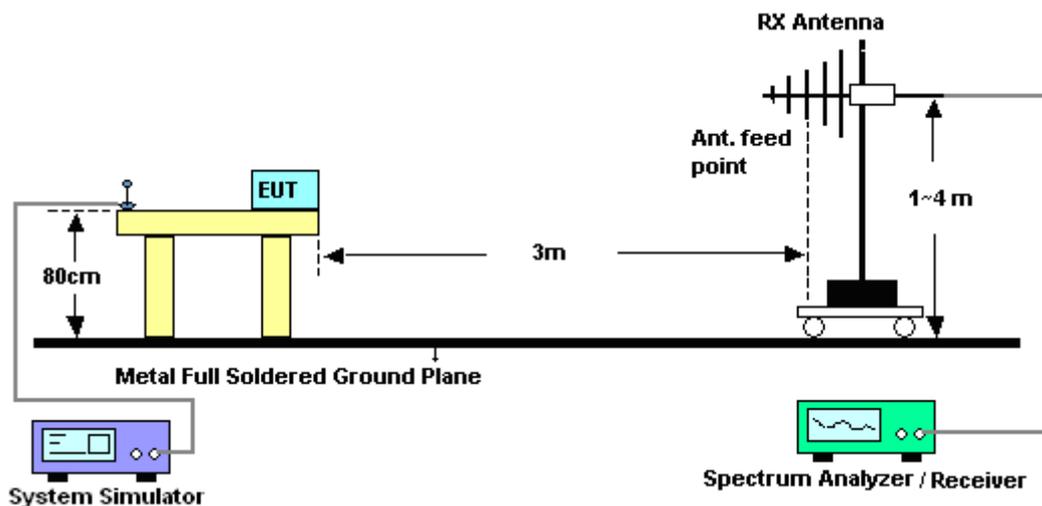
3.1.2. Measuring Instruments

See list of measuring instruments of this test report.

3.1.3. 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

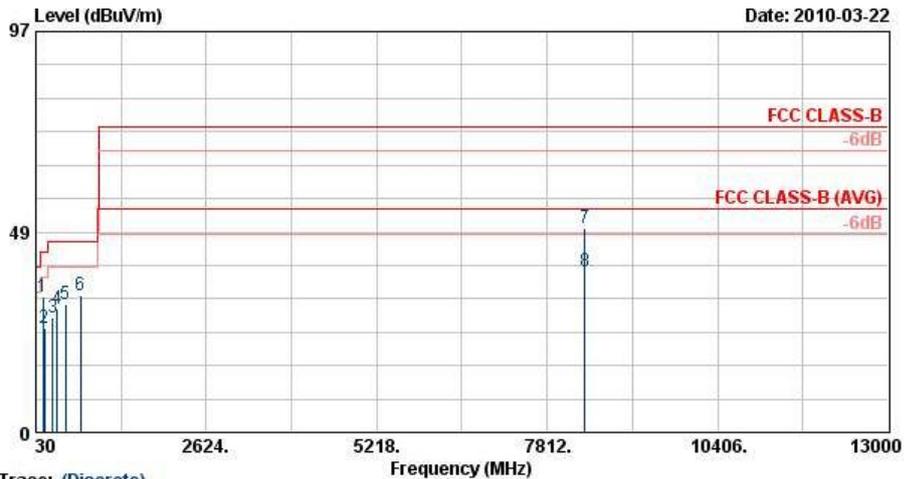
3.1.4. Test Setup of Radiated Emission





3.1.5. Test Result of Radiated Emission

Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Ivan Jiang	Relative Humidity :	47~48%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	CDMA2000 BC0 Idle + GPS Rx		

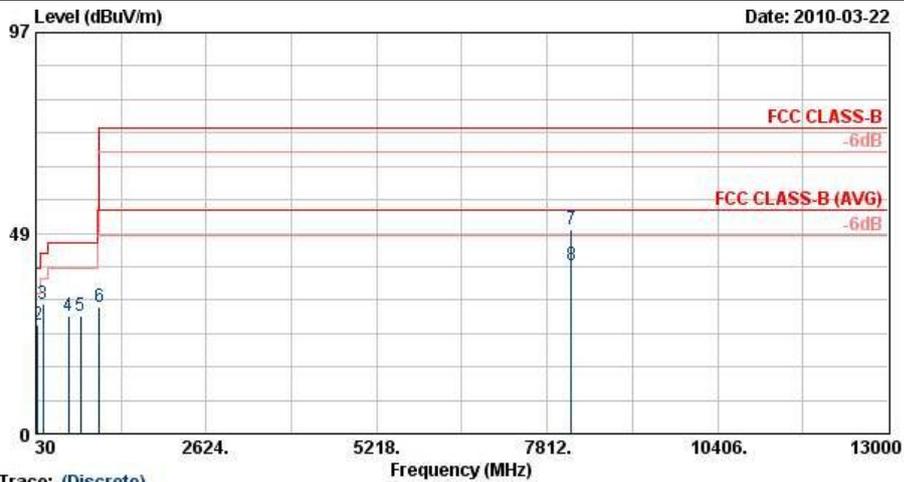


Trace: (Discrete)
 Site : 03CH07-HY
 Condition : FCC CLASS-B HF-ANT(6-18)-060918 HORIZONTAL
 Project : FD 9N2716-01
 Power : From System
 Mode : Model

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	140.97	32.70	-10.80	43.50	51.30	11.65	1.41	31.66	140	122	Peak
2	165.81	25.12	-18.38	43.50	45.26	9.96	1.53	31.63	---	---	Peak
3	283.26	27.92	-18.08	46.00	44.09	13.23	2.04	31.43	---	---	Peak
4	352.50	30.03	-15.97	46.00	44.13	14.85	2.35	31.30	---	---	Peak
5	478.50	31.11	-14.89	46.00	41.64	17.72	2.86	31.12	---	---	Peak
6	705.30	33.05	-12.95	46.00	39.47	20.91	3.56	30.89	---	---	Peak
7	8382.00	49.43	-24.57	74.00	38.43	36.00	10.10	35.10	100	133	Peak
8	8382.00	39.11	-14.89	54.00	28.11	36.00	10.10	35.10	100	133	Average



Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Ivan Jiang	Relative Humidity :	47~48%
Test Distance :	3m	Polarization :	Vertical
Function Type :	CDMA2000 BC0 Idle + GPS Rx		



Trace: (Discrete)
 Site : 03CH07-HY
 Condition : FCC CLASS-B HF-ANT(8-18)-060918 VERTICAL
 Project : FD 9N2716-01
 Power : From System
 Mode : Model

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	35.94	26.54	-13.46	40.00	41.35	16.20	0.69	31.70	---	Peak
2	54.57	26.40	-13.60	40.00	50.09	7.16	0.86	31.70	---	Peak
3 @	140.97	31.25	-12.25	43.50	49.85	11.65	1.41	31.66	162	Peak
4	528.20	28.65	-17.35	46.00	37.99	18.71	3.03	31.07	---	Peak
5	708.10	28.55	-17.45	46.00	34.91	20.95	3.57	30.88	---	Peak
6	998.60	30.50	-23.50	54.00	32.05	24.68	4.38	30.60	---	Peak
7	8174.00	49.53	-24.47	74.00	38.67	36.00	9.96	35.10	148	Peak
8	8174.00	40.64	-13.36	54.00	29.78	36.00	9.96	35.10	148	Average



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
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	-
System Simulator	R&S	CMU200	117997	N/A	May 14, 2009	May 13, 2011	-

5. Uncertainty of Evaluation

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 $\Gamma_1 = 0.197$ 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				

1. Certification of TAF Accreditation



Certificate No. : L1190-100316

財團法人全國認證基金會
Taiwan Accreditation Foundation

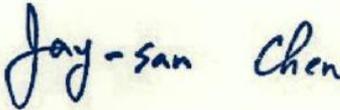
Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2010 to January 09, 2013
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities


Jay-San Chen
President, Taiwan Accreditation Foundation
Date : March 16, 2010

P1, total 21 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix



Appendix A. Photographs of EUT

Please refer to Sporton report number EP9N2716-01 as below.

Appendix C. Product Equality Declaration

ZTE中兴

Product Change Description

As the applicant of below model, [ZTE Corporation] declares that the product,

[U226 EVDO sub-board xf9C]
[ZTE Corporation]

is the variant of the initial certified product of,

[AD226 EVDO sub-board xf9B]
[ZTE Corporation]

The changes of the variant model are as following:

- 1、 On the EVDO sub-board, we added two 5pF capacitances on the USB HUB (uplink) data cable.
 - 2、 On the EVDO sub-board ,We added one NTC , two resistors and one capacitance to fast stabilize the control of TCXO and reduce the time of searching and entering the network.
 - 3、 On the EVDO sub-board, we added a series inductor to achieve better performance.
 - 4、 On the EVDO sub-board, we delete the resistors and capacitances connected the shield of USB connector to GND for ESD.
 - 5、 In the temperature test, We added a heat insulation material to decrease the temperature of shell.
- Except those changes above, the others are remained as previous model.
- 6、 The pattern of main antenna has been changed a little, but the form of main antenna is still monopole.

Signature:



Date:2010-03-24

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Appendix D. Original Report

Please refer to Sporton Report Number FD9N2716 as below.