



# FCC RF Test Report

APPLICANT : ZTE CORPORATION  
EQUIPMENT : CDMA/LTE Multi-Mode Digital Mobile Phone  
BRAND NAME : ZTE  
MODEL NAME : ZTE N9810  
FCC ID : Q78-ZTEN9810  
STANDARD : FCC 47 CFR Part 2, and 90(S)  
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Dec. 18, 2012 and completely tested on Jan. 31, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown 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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## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	N/A , Reporting only	PASS	-
3.2	§90.635(b)	Effective Radiated Power	< 100 Watts (50dBm)	PASS	-
3.3	§2.1049 §90.209	Bandwidth limitations	N/A, Reporting only (*)	PASS	-
3.4	§2.1051 §90.691	Emission masks – In-band emissions	< 50+10log <sub>10</sub> (P[Watts])	PASS	-
3.5	§2.1051 §90.691	Emission masks – Out of band emissions	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.6	§2.1053 §90.691	Field Strength of Spurious Radiation	< 43+10log <sub>10</sub> (P[Watts])	PASS	Under limit 22.64 dB at 1639.000 MHz
3.7	§2.1055 §90.213	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

Note: (\*) The test case of bandwidth limitations is waiver, and please refer to the appendix A.



# 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	
Equipment	CDMA/LTE Multi-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	ZTE N9810
FCC ID	Q78-ZTEN9810
EUT supports Radios application	CDMA/EV-DO/LTE/WLAN 11abgn/Bluetooth EDR/Bluetooth 4.0 - LE/ NFC
HW Version	c9zB
SW Version	N9810V1.0.0B01
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.

Product Specification subjective to this standard	
Tx Frequency	CDMA2000 BC10 : 817.9 MHz ~ 823.1 MHz
Rx Frequency	CDMA2000 BC10 : 903.8 MHz ~ 914.2 MHz
Maximum Output Power to Antenna	CDMA2000 BC10 : 23.91 dBm
Antenna Type	PIFA Antenna
Type of Modulation	CDMA2000 : QPSK CDMA2000 1xEV-DO : 8PSK

## 1.4 Maximum ERP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (% , Hz, ppm)	Emission Designator
Part 90S	CDMA2000 BC10 1xRTT	QPSK/8PSK	0.1778	0.05 ppm	1M28F9W

## 1.5 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> 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		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	TH02-HY	03CH05-HY	722060/4086B-1

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.		
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	TH01-KS		149928/4086E-1



## 1.6 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- FCC 47 CFR Part 2, 90
- ANSI / TIA / EIA-603-C-2004
- FCC Document is used to wavier Part 90.209 bandwidth limitations, please refer to Appendix A.

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 1.7 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is 30 MHz to 9000 MHz for CDMA2000 BC10.

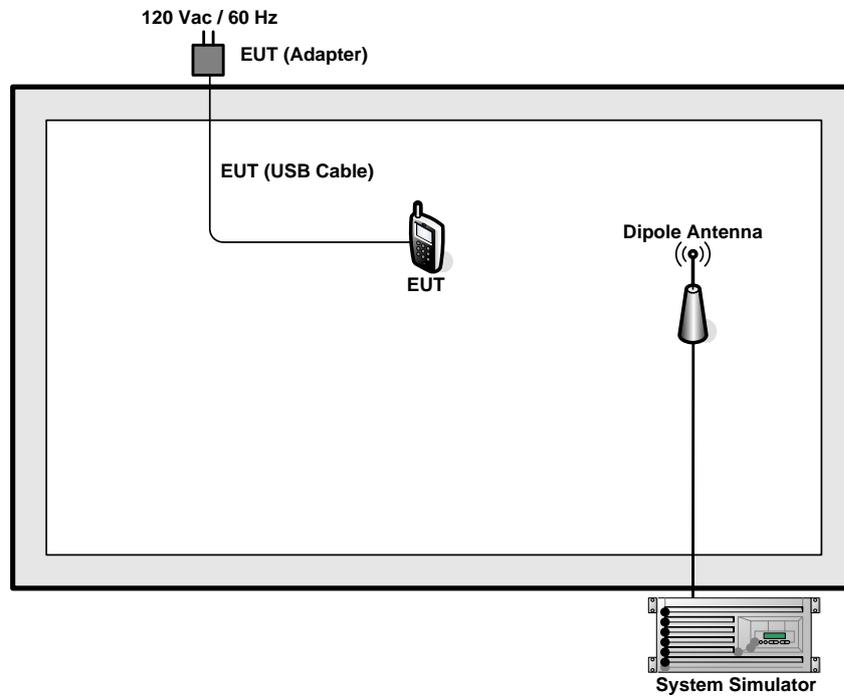
Test Modes		
Band	Radiated TCs	Conducted TCs
CDMA2000 BC10	■ 1xRTT Link	■ 1xRTT Link

**Note:** The maximum RF output power levels are 1xRTT RC3+SO32 mode for CDMA2000 BC10 on QPSK Link; only these modes were used for all tests.

The conducted power table is as follows:

Conducted Power (*Unit: dBm)			
Band	CDMA2000 BC10		
Channel	476	580	684
Frequency	817.90	820.50	823.10
1xRTT RC1 SO55	23.86	23.78	23.89
1xRTT RC3 SO55	23.81	23.82	23.87
1xRTT RC3 SO32(+ F-SCH)	23.88	23.84	23.91
1xRTT RC3 SO32(+SCH)	23.78	23.80	23.88
1xEVDO RTAP 153.6K	23.79	23.83	23.89
1xEVDO RETAP 4096K	23.71	23.76	23.86

## 2.2 Connection Diagram of Test System



### 3 Test Result

#### 3.1 Conducted Output Power Measurement

##### 3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

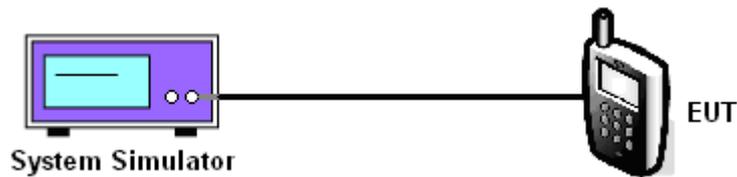
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

##### 3.1.4 Test Setup



##### 3.1.5 Test Result of Conducted Output Power

CDMA2000 BC10			
Test Mode	CDMA 2000 1xRTT		
Test Status	RC3+SO32		
Channel	476 (Low)	580 (Mid)	684 (High)
Frequency (MHz)	817.90	820.50	823.10
Conducted Power (dBm)	23.88	23.84	23.91
Conducted Power (Watts)	0.24	0.24	0.25

**Note:** maximum average power for CDMA2000.



## **3.2 Effective Radiated Power Measurement**

### **3.2.1 Description of the ERP Measurement**

The ERP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 100 Watts according to FCC Part 90.635.

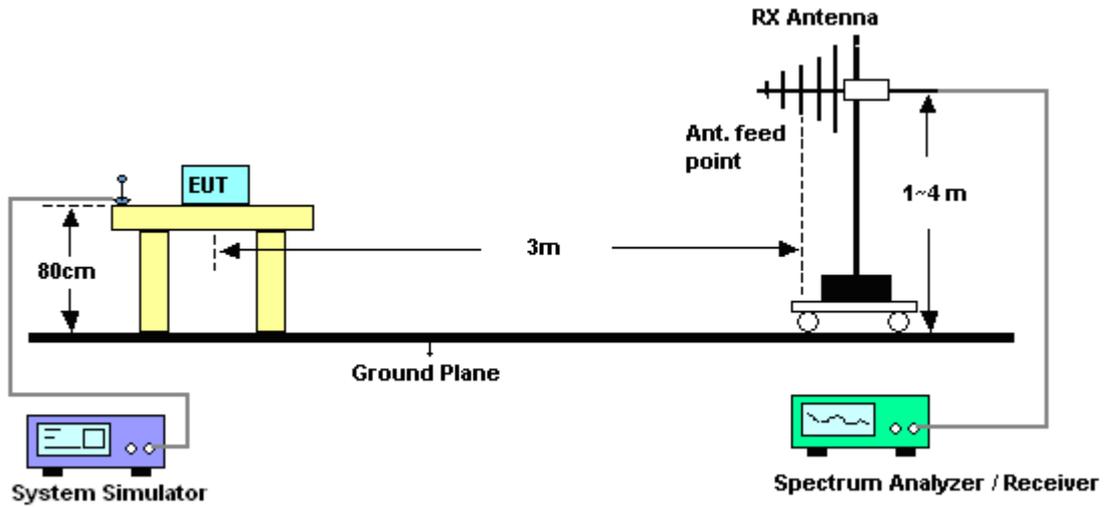
### **3.2.2 Measuring Instruments**

See list of measuring instruments of this test report.

### **3.2.3 Test Procedures**

1. The EUT was placed on a non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 30kHz, VBW= 100kHz, and RMS detector settings per section 4.0 of KDB 971168 D01.
  1. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
  2. Effective Isotropic Radiated Power(EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and  $ERP = EIRP - 2.15$ .

### 3.2.4 Test Setup



### 3.2.5 Test Result of ERP

CDMA2000 BC10 1xRTT_RC3+SO32 Radiated Power ERP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
817.90	-4.64	28.65	21.86	0.1535
820.50	-4.06	28.65	22.44	0.1754
823.10	-4.00	28.65	22.50	0.1778
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
817.90	-14.59	32.64	15.90	0.0389
820.50	-14.33	32.76	16.28	0.0425
823.10	-14.20	32.89	16.54	0.0451

\* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

### 3.3 Occupied Bandwidth and 26dB Bandwidth Measurement

#### 3.3.1 Description of Occupied Bandwidth and 26dB Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. This bandwidth measurement is reporting only according to FCC waiver document as shown as annex A.

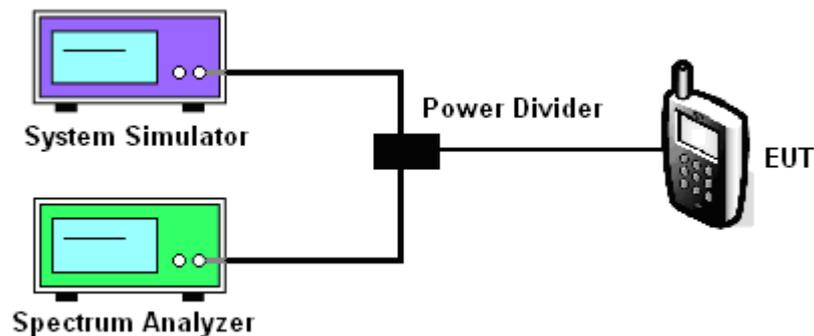
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

#### 3.3.4 Test Setup





3.3.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

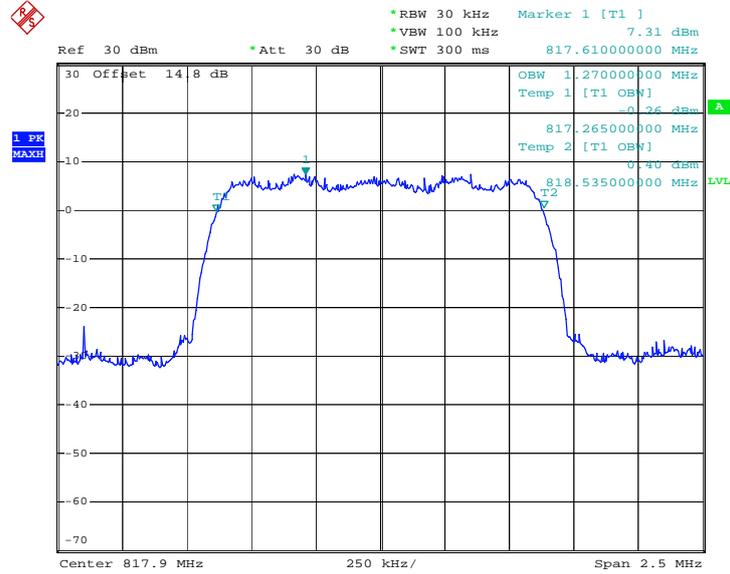
CDMA2000 BC10			
Test Mode	CDMA 2000 1xRTT		
Test Status	RC3+SO32		
Channel	476 (Low)	580 (Mid)	684 (High)
Frequency (MHz)	817.90	820.50	823.10
99% OBW (MHz)	1.270	1.275	1.270
26dB BW (MHz)	1.435	1.430	1.425



3.3.6 Test Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

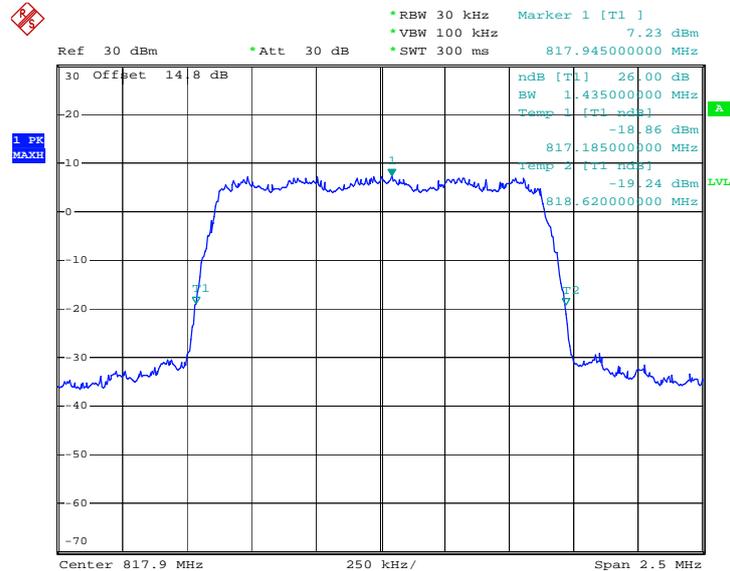
Band :	CDMA2000 BC 10	Test Mode :	1xRTT_RC3+SO32
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99% Occupied Bandwidth Plot on Channel 476 (817.90MHz)



Date: 31.JAN.2013 01:21:58

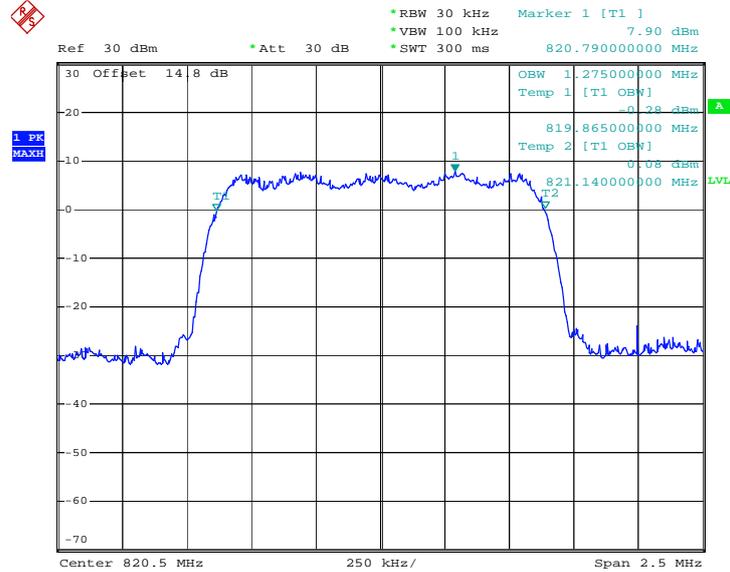
26dB Bandwidth Plot on Channel 476 (817.90MHz)



Date: 31.JAN.2013 00:44:02

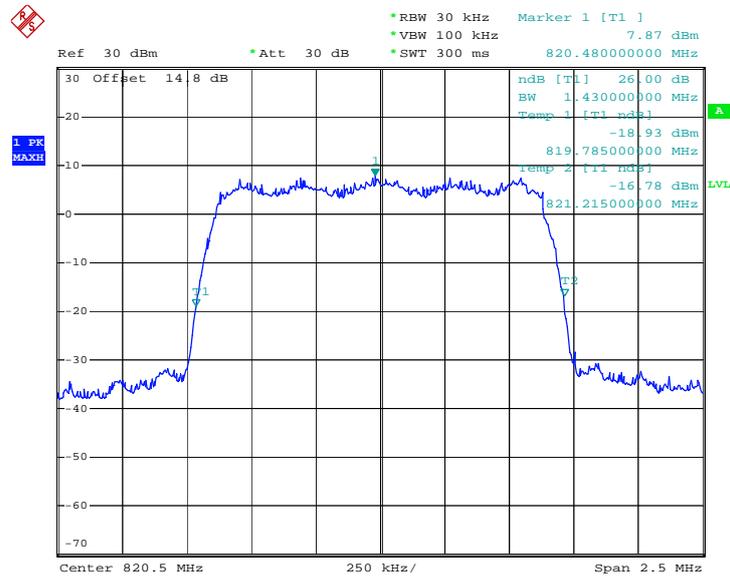


99% Occupied Bandwidth Plot on Channel 580 (820.50MHz)



Date: 31.JAN.2013 01:22:37

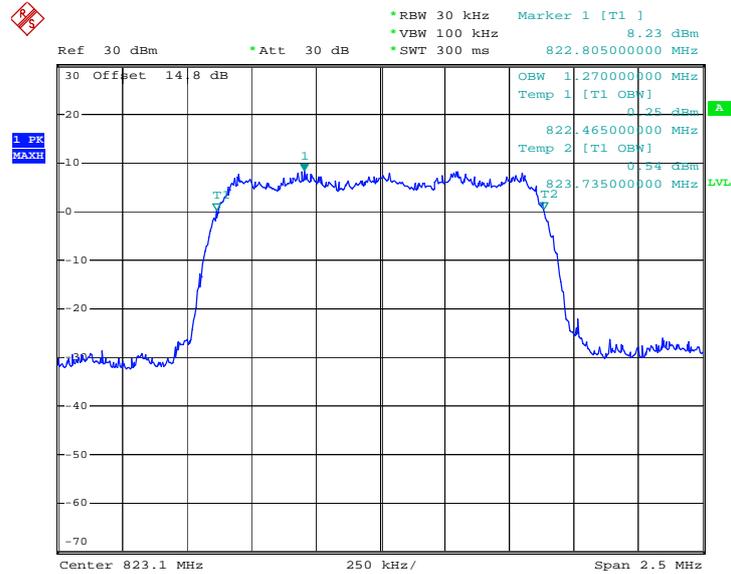
26dB Bandwidth Plot on Channel 580 (820.50MHz)



Date: 31.JAN.2013 00:45:29

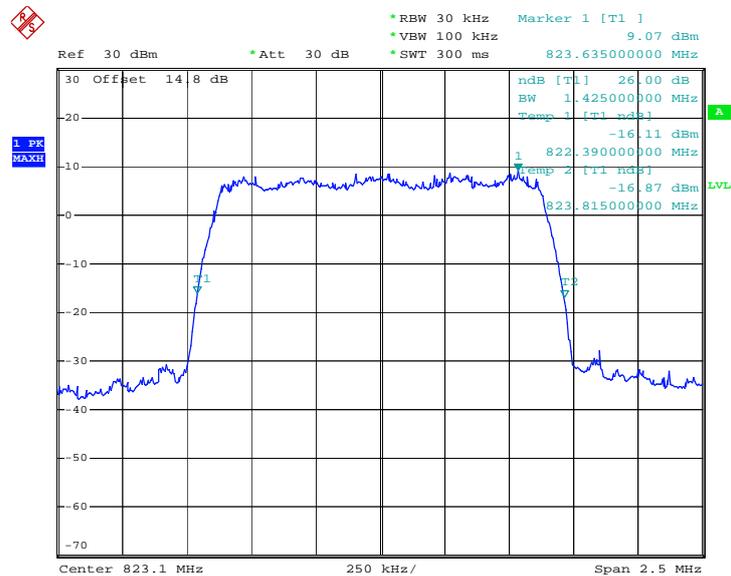


99% Occupied Bandwidth Plot on Channel 684 (823.10MHz)



Date: 31.JAN.2013 01:23:03

26dB Bandwidth Plot on Channel 684 (823.10MHz)



Date: 31.JAN.2013 00:46:43

## 3.4 Emissions Mask Measurement

### 3.4.1 Description of Emissions Mask Measurement

Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of FCC Part 90.691.(a)(1)

- (a). Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
- (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \text{ Log}_{10}(f/6.1)$  decibels or  $50 + 10 \text{ Log}_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

### 3.4.2 Measuring Instruments

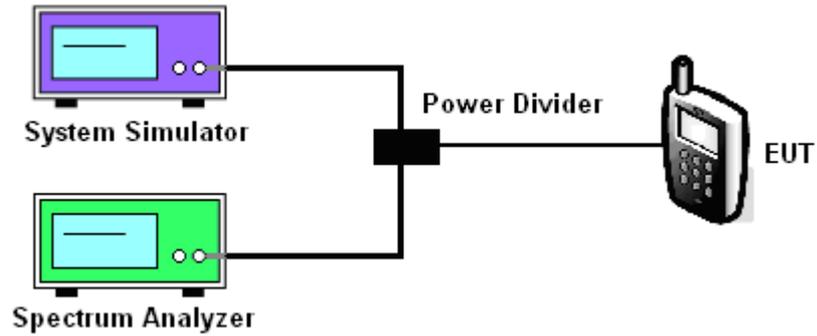
See list of measuring instruments of this test report.

### 3.4.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The emissions mask of low and high channels for the highest RF powers were measured.
3. The RBW was set 30 kHz, higher than 1% of bandwidth 1.27MHz, and VBW was set 3 times of RBW.
4. The final test results were shown below plots with a correction offset factor including cable loss, insertion loss of power divider.
5. The 1% of bandwidth 1.27MHz approximately was 13kHz. The test results need to follow below equation.

$$\text{Test Result(dBm)} = \text{PwrAbs(dBm)} + 10 \cdot \text{LOG}(13\text{kHz}/30\text{KHz})(\text{dB}) (\sim -3.63\text{dB})$$

### 3.4.4 Test Setup

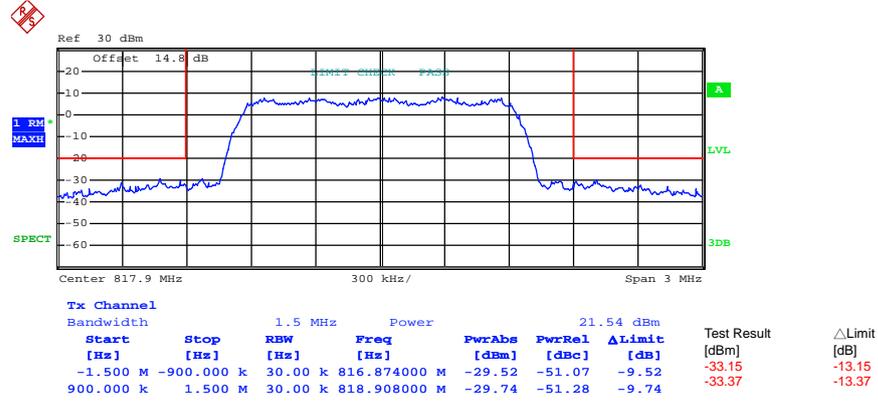




### 3.4.5 Test Result (Plots) of Conducted Emissions Mask

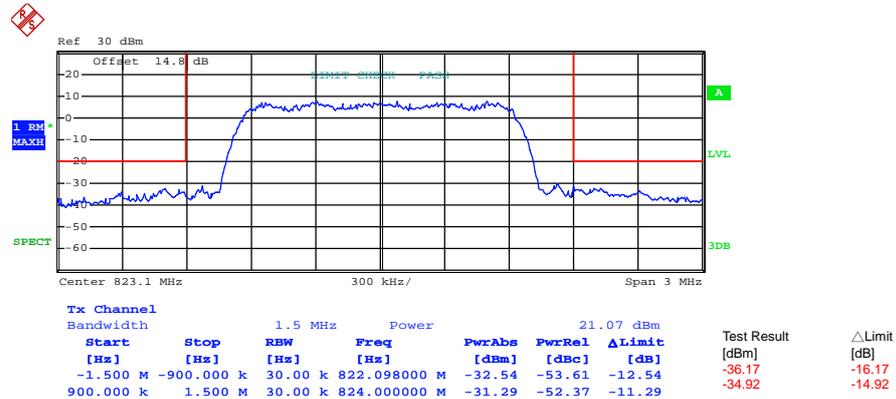
Band :	CDMA2000 BC10	Test Mode :	1xRTT_RC3+SO32
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#### Lower Band Edge Plot on Channel 476 (817.90MHz)



Date: 14.JAN.2013 09:37:05

#### Higher Band Edge Plot on Channel 684 (823.10MHz)



Date: 14.JAN.2013 09:38:21

### 3.5 Emissions Mask – Out Of Band Emissions Measurement

#### 3.5.1 Description of Conducted Emissions Out of band emissions measurement

The power of any emission FCC Part 90.691 (a)(2) on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least  $43 + 10 \log (P)$  dB. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10<sup>th</sup> harmonic.

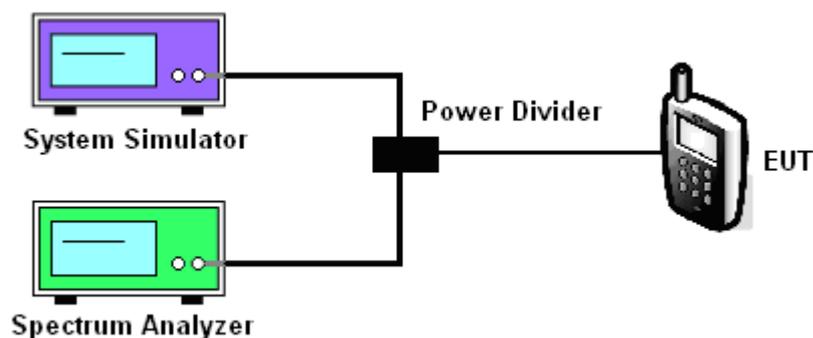
#### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.5.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.
4. The final test results were shown below plots with a correction offset factor including cable loss, insertion loss of power divider.

#### 3.5.4 Test Setup

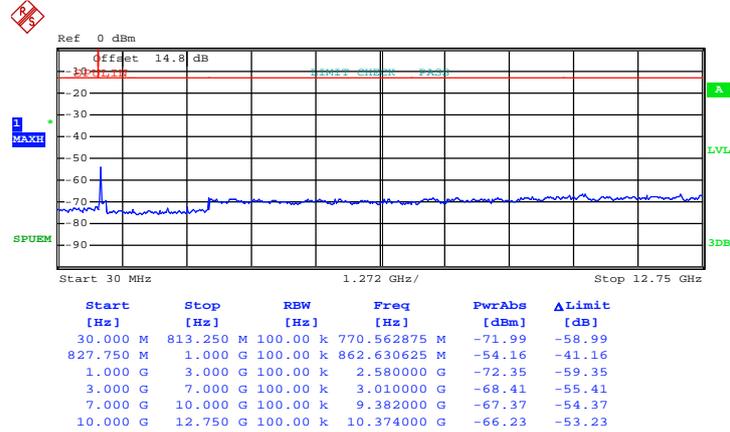




3.5.5 Test Result (Plots) of Conducted Emission

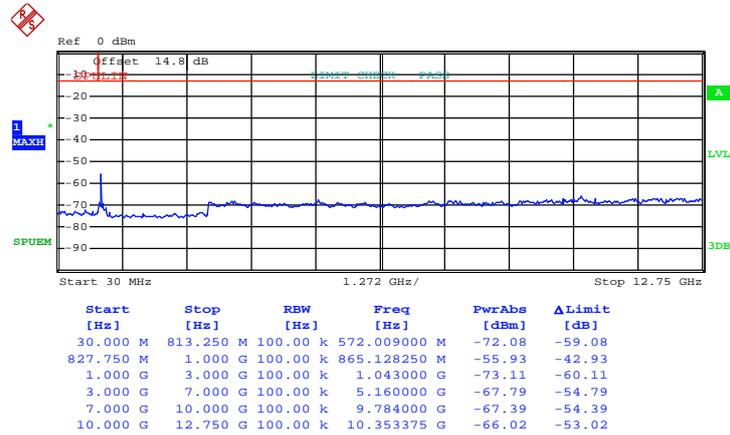
Band :	CDMA2000 BC10	Test Mode :	1xRTT_RC3+SO32
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Conducted Emission Plot between on Channel 476 (817.90MHz)



Date: 14.JAN.2013 09:44:16

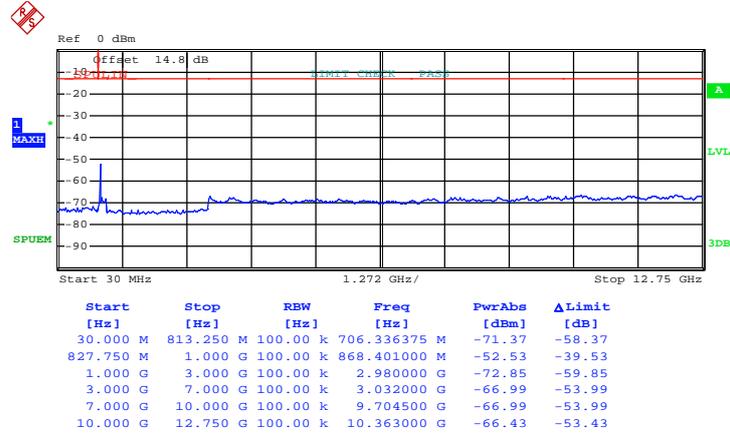
Conducted Emission Plot between on Channel 580 (820.50MHz)



Date: 14.JAN.2013 09:44:39



Conducted Emission Plot between on Channel 684 (823.10MHz)



Date: 14.JAN.2013 09:43:40

## 3.6 Field Strength of Spurious Radiation Measurement

### 3.6.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least  $43 + 10 \log (P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 3.6.2 Measuring Instruments

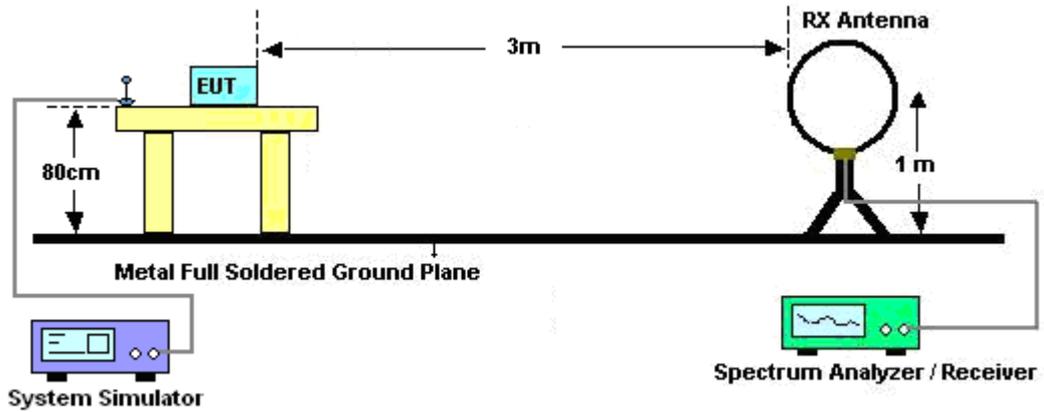
See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

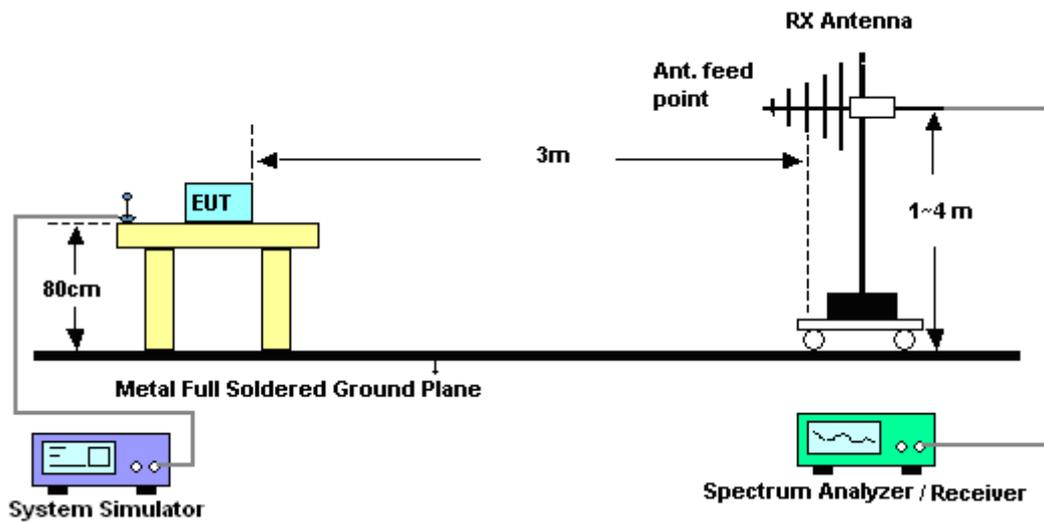
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10.  $EIRP (dBm) = S.G. Power - Tx Cable Loss + Tx Antenna Gain$
11.  $ERP (dBm) = EIRP - 2.15$

### 3.6.4 Test Setup

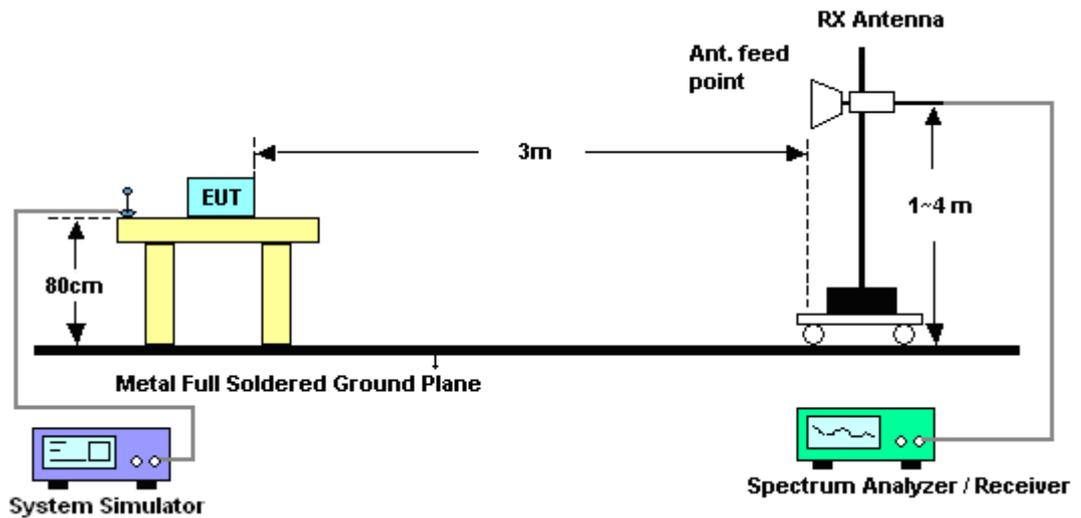
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



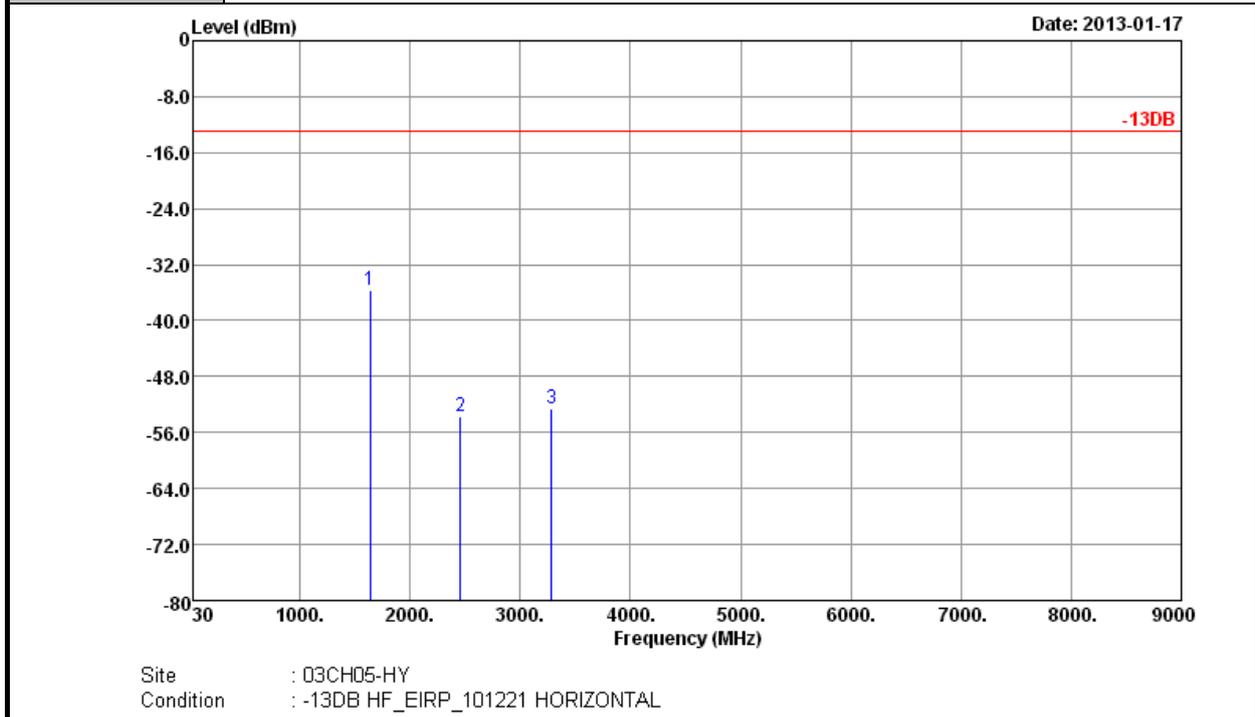
### 3.6.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



3.6.6 Test Result of Field Strength of Spurious Radiated

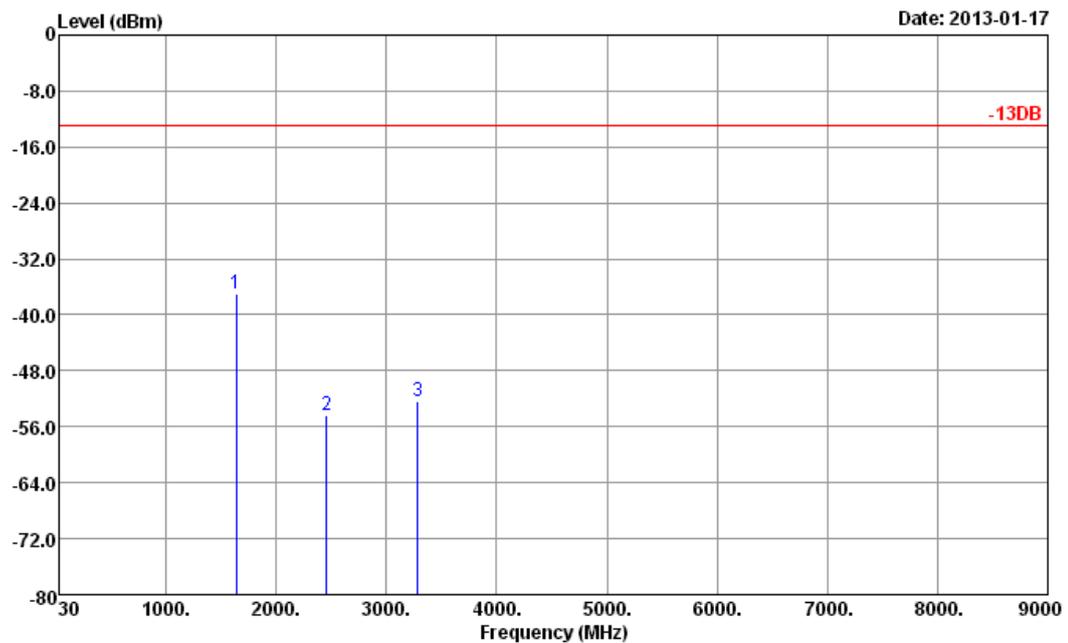
Band :	CDMA2000 BC10	Temperature :	20~22°C
Test Mode :	1xRTT_RC3+SO32	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1639	-35.64	-13	-22.64	-41.4	-37.4	1.35	5.25	H	Pass
2461	-53.72	-13	-40.72	-62.97	-56.1	1.58	6.12	H	Pass
3283	-52.65	-13	-39.65	-64.08	-56.5	1.94	7.94	H	Pass



<b>Band :</b>	CDMA2000 BC10	<b>Temperature :</b>	20~22°C
<b>Test Mode :</b>	1xRTT_RC3+SO32	<b>Relative Humidity :</b>	40~42%
<b>Test Engineer :</b>	David Ke	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY  
 Condition : -13DB HF\_EIRP\_101221 VERTICAL

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1639	-37.04	-13	-24.04	-42.88	-38.8	1.35	5.25	V	Pass
2461	-54.32	-13	-41.32	-63.48	-56.7	1.58	6.12	V	Pass
3283	-52.35	-13	-39.35	-63.73	-56.2	1.94	7.94	V	Pass

## 3.7 Frequency Stability Measurement

### 3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency according to FCC Part 90.213.

### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

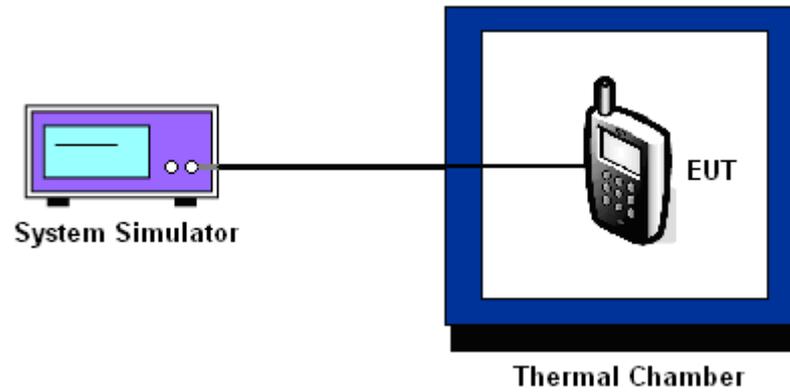
### 3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  step up to  $50^{\circ}\text{C}$ . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT cannot be turned on at  $-30^{\circ}\text{C}$ , the testing lowest temperature will be raised in  $10^{\circ}\text{C}$  step until the EUT can be turned on.

### 3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at  $25\pm 5^{\circ}\text{C}$  and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

### 3.7.5 Test Setup



### 3.7.6 Test Result of Temperature Variation

<b>Band :</b>	CDMA2000 BC10 1xRTT_RC3+SO32	<b>Channel :</b>	580
<b>Limit (ppm) :</b>	2.5	<b>Frequency :</b>	820.5 MHz

Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	-41	-0.05	PASS
-20	-37	-0.04	
-10	-31	-0.04	
0	-29	-0.03	
10	-27	-0.03	
20	-22	-0.03	
30	-23	-0.03	
40	-28	-0.03	
50	-33	-0.04	
55	-43	-0.05	

**Note:** The manufacturer declared that the EUT could work properly at temperature 55°C.

### 3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
CDMA2000 BC10 CH580	1xRTT RC3+SO32	3.8	-36	-0.04	2.5	PASS
		BEP	-32	-0.04		
		4.35	-25	-0.03		

**Note :**

1. Normal Voltage = 3.8V.
2. Battery End Point (BEP) = 3.6 V.



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 29, 2012	Jan. 31, 2013	Dec. 28, 2013	Conducted (TH01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 29, 2012	Jan. 31, 2013	Dec. 28, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Jan. 31, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Jan. 31, 2013	Dec. 28, 2013	Conducted (TH01-KS)
System Simulator	R&S	CMU200	117995	N/A	Jul. 30, 2012	Jan. 19, 2013	Jul. 29, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Jan. 19, 2013	Jun. 05, 2013	Conducted (TH02-HY)
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	Apr. 17, 2012	Jan. 19, 2013	Apr. 16, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Jan. 19, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Jan. 19, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Feb. 21, 2012	Jan. 19, 2013	Feb. 20, 2013	Conducted (TH02-HY)
Power	Agilent	E9327A	US40441548	300MHz~40GHz	Feb. 21, 2012	Jan. 19, 2013	Feb. 20, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Jan. 19, 2013	Jul. 22, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz~26.5GHz	Dec. 14, 2012	Jan. 17, 2013	Dec. 13, 2013	Radiation (03CH05-HY)
Bilog Antenna	Schaffner	CBL6111C	2725	30MHz~2GHz	Oct. 06, 2012	Jan. 17, 2013	Oct. 05, 2013	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Jan. 17, 2013	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Jan. 17, 2013	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Jan. 17, 2013	Aug. 09, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Aug. 28, 2012	Jan. 17, 2013	Aug. 27, 2013	Radiation (03CH05-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Jan. 17, 2013	Sep. 27, 2013	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103	161075	10-1000MHz.32 dB.GAIN	Feb. 27, 2012	Jan. 17, 2013	Feb. 26, 2013	Radiation (03CH05-HY)

## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.54
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.72
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## **Appendix A. FCC Document**

Please see the document as below.



Federal Communications Commission  
Washington, D.C. 20554

March 14, 2011

James B. Goldstein  
12502 Sunrise Valley Drive  
Reston, VA 20196

Re: Sprint Nextel's Request for Waiver of Section 90.209 of the Commission's Rules to Permit the Operation of Broadband CDMA Technology in the 817-824/862-869 MHz Band

Dear Mr. Goldstein:

This letter addresses Nextel License Holdings 1, Inc.'s ("Sprint Nextel") request for a waiver of Section 90.209 of the Commission's Rules.<sup>1</sup> As explained below, we grant the waiver request to the extent described below.

Sprint Nextel seeks to deploy a 1.27 MHz wide CDMA channel with respect to license WPLM661<sup>2</sup> in the Enhanced Specialized Mobile Radio Band portion of the 800 MHz band, which would exceed Section 90.209's 25 kHz bandwidth limitation.<sup>3</sup> Sprint argues the bandwidth limitation is a remnant of a past licensing paradigm and that the Commission did not intend to leave this restriction in place. In support of the waiver request, Sprint Nextel maintains that the Commission has indicated on several occasions that 800 MHz SMR licensees on contiguous channel blocks have the flexibility to deploy larger bandwidth technologies. First, Sprint Nextel argues that, in a 1988 amendment to Part 90 of the Commission's Rules, the Commission expressed that its rules provided sufficient flexibility for SMR licensees authorized on contiguous spectrum to use non-standard bandwidths.<sup>4</sup> Next, Sprint Nextel contends that in 1995, the Commission modified its rules to license 20, 60 and 120 contiguous channel 800 MHz SMR spectrum blocks on a wide-area basis to allow utilization of broadband technologies, including CDMA, unavailable on non-contiguous channels.<sup>5</sup> Finally, Sprint Nextel draws attention to how the Commission, in 2004, modified rule section 90.645 to continue allowing non-standard channel bandwidths for the non-cellular portion of the 800 MHz band, while, according to Sprint Nextel, inexplicably failing to also modify the rules for larger spectrum blocks above 816-824/861-869 MHz.<sup>6</sup>

<sup>1</sup> See ULS file number 0004643006.

<sup>2</sup> The WPLM661 license, issued to Nextel License Holdings 1, authorizes operation in Basic Economic Area (BEA) 040 (Atlanta, GA-AL-NC) on frequencies 818-824/863-869 MHz.

<sup>3</sup> 47 C.F.R. § 90.209.

<sup>4</sup> See Amendment of Part 90, Subparts M and S, of the Commission's Rules, *Report and Order*, PR Docket No. 86-404, 3 FCC Rcd 1838 at ¶ 89 (1988).

<sup>5</sup> See Implementation of Sections 3(n) and 332 of the Communications Act; Implementation of Section 309 (j) of the Communications Act – Competitive Bidding; *First Report and Order, Eighth Report, and Second Further Notice of Proposed Rule Making*, PR Docket No. 93-144, GN Docket No. 93-252, PP Docket No. 253, 11 FCC Rcd 1463 at ¶ 14, 37 (1995).

<sup>6</sup> See Improving Public Safety Communications in the 800 MHz Band, *Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order*, 19 FCC Rcd 14969 (2004); see also Section 90.645 revisions in Appendix C.

We also note that Sprint Nextel has undertaken to impose “extremely tight out-of-band emissions (OOBE) filtering requirements on [its] base station vendors for frequencies below 861 MHz and aggressive OOBE roll-off requirements between 861-862 MHz” and has acknowledged its strict responsibility for compliance with Section 90.673 of the Commission’s rules.<sup>7</sup>

A waiver may be granted, pursuant to section 1.925 of the Commission’s Rules, if the petitioner establishes that: 1) the underlying purpose of the rule would not be served or would be frustrated by application to the instant case, and that grant of the waiver would be in the public interest; or 2) where the petitioner establishes unique or unusual factual circumstances, that application of the rule would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.<sup>8</sup>

Based on the unusual factual circumstances described by Sprint Nextel, we find that a waiver is warranted in this case because application of the rule would prevent CDMA operation, limit consumer choice, and thus be contrary to the public interest. Therefore, we waive the bandwidth restriction of Section 90.209 to permit Sprint Nextel to use transmitters with an authorized bandwidth of 1.27 MHz or less with respect to license WPLM661. With this waiver, equipment manufacturers are permitted to manufacture transmitters for 1.27 MHz CDMA operation in the 800 MHz band. Equipment manufacturers should include a copy of this letter in any application for equipment authorization for 800 MHz CDMA equipment. Further, this waiver is specifically conditioned on the following:

- § Before activating 800 MHz CDMA sites pursuant to this waiver, Sprint Nextel shall provide 60-day advance notice to 800 MHz public safety licensees having base stations in the applicable NPSPAC Region – and to 800 MHz public safety licensees having base stations within 70 miles of the NPSPAC region border. The notice shall include the planned activation date of the 800 MHz CDMA network. A copy of the notice shall be provided to (a) the regional coordinator of the 800 MHz NPSPAC region in which CDMA operation is to be initiated; and (b) to the regional coordinators of adjoining 800 MHz NPSPAC regions.
- § The 800 MHz CDMA operations authorized by this waiver are subject to the interference protection and mitigation requirements established in the Commission’s 800 MHz rebanding proceeding (WT Docket 02-55). Accordingly, Sprint Nextel shall strictly observe the requirements of Sections 90.672 *et seq.* of the Commission’s rules prohibiting unacceptable interference to non-cellular 800 MHz licensees from 800 MHz cellular systems.

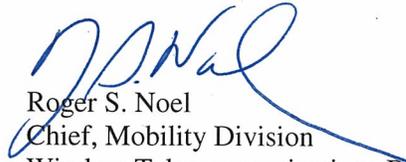
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<sup>7</sup> See 47 C.F.R. § 90.673.

<sup>8</sup> 47 C.F.R. § 1.925.

Accordingly, IT IS ORDERED that, pursuant to section 4(i) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), 303(r), and sections 0.331 and 1.925 of the Commission's rules, 47 C.F.R. §§ 0.331, 1.925, Sprint Nextel's waiver request IS GRANTED to the extent described above.<sup>9</sup>

Sincerely,



Roger S. Noel  
Chief, Mobility Division  
Wireless Telecommunications Bureau

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<sup>9</sup> 47 U.S.C. §§ 154(i); 303(r); 47 C.F.R. §§ 0.331, 1.925.



## **Appendix B. Photographs of EUT**

Please refer to Sporton report number EP2D1804 as below.