FCC RF Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	CDMA/LTE Multi-mode Digital Mobile Phone
BRAND NAME	:	ZTE
MODEL NAME	:	ZTE N9515
FCC ID	:	SRQ-ZTEN9515
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

The product was received on May 09, 2014 and testing was completed on Jul. 03, 2014. 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 to be compliant 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: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
2627

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
FG450908	Rev. 01	Initial issue of report	Jul. 08, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	N/A	PASS	-
3.2	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	-
3.3	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
3.3	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.4	§2.1049 §22.917(b) §24.238(b)	Occupied Bandwidth	N/A	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	Band Edge Measurement	< $43+10\log_{10}(P[Watts])$	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a)	Conducted Spurious Emission	< $43+10\log_{10}(P[Watts])$	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	< $43+10\log_{10}(P[Watts])$	PASS	Under limit 29.80 dB at 7520.000 MHz
3.8	§2.1055 §22.355 §24.235	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

ZTE CORPORATION

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

1.2 Manufacturer

ZTE CORPORATION

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

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	CDMA/LTE Multi-mode Digital Mobile Phone
Brand Name	ZTE
Model Name	ZTE N9515
FCC ID	SRQ-ZTEN9515
EUT supports Radios application	CDMA/EV-DO/LTE WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20 Bluetooth v3.0 + EDR/ Bluetooth v4.0 LE
HW Version	cwcA
SW Version	N9515V1.0.0B01
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.

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz
Rx Frequency	CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz
Maximum Output Power to Antenna	CDMA2000 BC0 : 24.19 dBm CDMA2000 BC1 : 24.23 dBm
Antenna Type	Dipole Antenna
Type of Modulation	CDMA2000 : QPSK CDMA2000 1xEV-DO : QPSK/8PSK

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	CDMA2000 BC0 1xRTT	QPSK	0.1208	0.04 ppm	1M28F9W
Part 24	CDMA2000 BC1 1xRTT	QPSK	0.2674	0.03 ppm	1M28F9W

1.7 Testing Location

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.**		**FCC Registration No.**
	TH01-KS	OTA01-KS	149928

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 Registration No.**
	03CH08-HY	TW1022

1.8 Applicable Standards

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

- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

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.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 with maximum output power.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for CDMA2000 BC0.
2. 30 MHz to 19000 MHz CDMA2000 BC1.

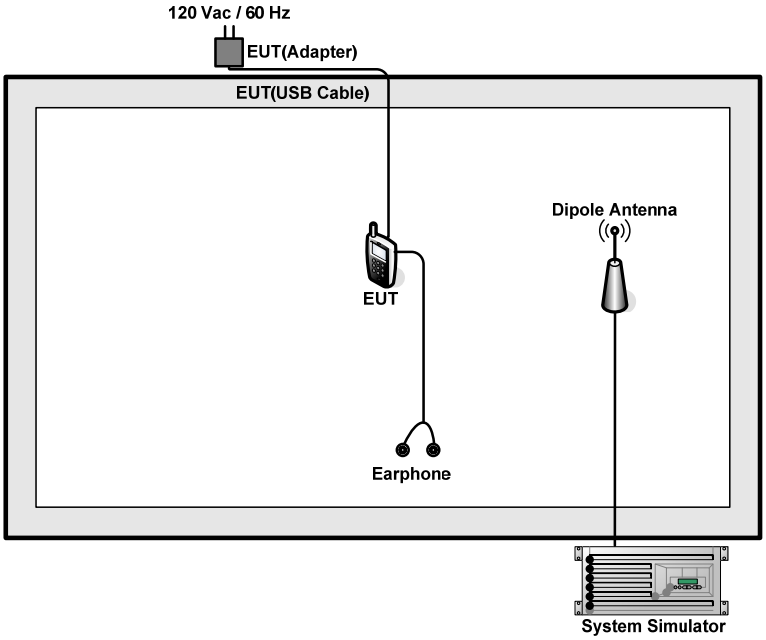
Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
CDMA2000 BC0	■ 1xRTT Link Mode	■ 1xRTT Link Mode
CDMA2000 BC1	■ 1xRTT Link Mode	■ 1xRTT Link Mode

Note: The maximum RF output power levels are 1xRTT RC1+SO55 mode for CDMA2000 BC0 and CDMA2000 BC1 on QPSK Link, only these modes were used for all tests.

Conducted Power Measurement Results:

Conducted Power (*Unit: dBm)						
Band	**CDMA2000 BC0**			**CDMA2000 BC1**		
Channel	**1013**	**384**	**777**	**25**	**600**	**1175**
Frequency	**824.7**	**836.52**	**848.31**	**1851.25**	**1880**	**1908.75**
1xRTT RC1 SO55	24.06	**24.19**	24.10	24.05	24.06	**24.23**
1xRTT RC3 SO55	23.99	24.15	24.06	23.99	23.94	24.19
1xRTT RC3 SO32(+ F-SCH)	23.98	24.12	24.04	23.97	23.93	24.18
1xRTT RC3 SO32(+SCH)	24.01	24.11	24.03	23.98	23.91	24.16
1xEV-DO RTAP 153.6kbps	24.00	24.14	24.06	23.99	23.95	24.21
1xEV-DO RETAP 4096Bits	24.07	24.18	24.11	24.03	24.03	24.20

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

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	TOPWORD	3303DR	N/A	N/A	Unshielded, 1.8 m
3.	Earphone	Apple	N/A	Fcc DoC	Shielded, 1.0 m	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 5.2 dB and a 10dB attenuator.

Example:

Offset (dB) = RF cable loss (dB) + attenuator factor (dB).

= 5.2 + 10 = 15.2 (dB)

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

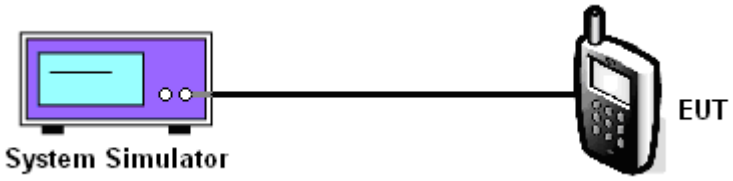
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

CDMA2000 BC0			
Test Mode	**CDMA 2000 1xRTT**		
Test Status	**RC1+SO55**		
Channel	**1013 (Low)**	**384 (Mid)**	**777 (High)**
Frequency (MHz)	**824.70**	**836.52**	**848.31**
Conducted Power (dBm)	24.06	24.19	24.10
Conducted Power (Watts)	0.25	0.26	0.26

CDMA2000 BC1			
Test Mode	**CDMA 2000 1xRTT**		
Test Status	**RC1+SO55**		
Channel	**25 (Low)**	**600 (Mid)**	**1175 (High)**
Frequency (MHz)	**1851.25**	**1880.00**	**1908.75**
Conducted Power (dBm)	24.05	24.06	24.23
Conducted Power (Watts)	0.25	0.25	0.26

Note: Maximum burst average power for CDMA2000.

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

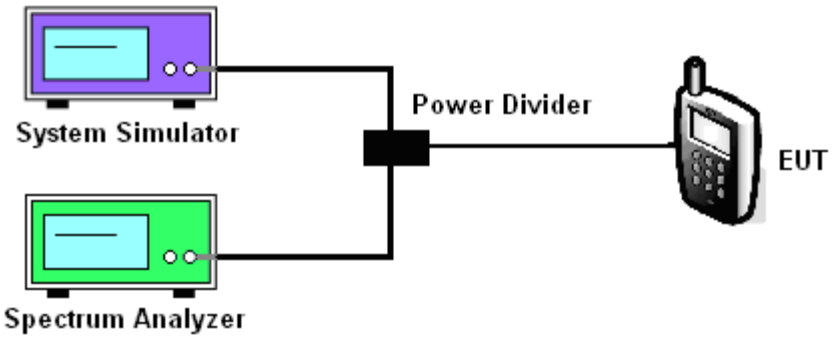
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option on the spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.2.4 Test Setup



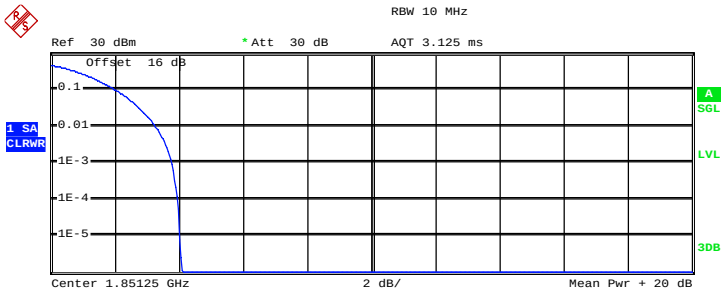
3.2.5 Test Result of Peak-to-Average Ratio

CDMA2000 BC1			
Modes	**CDMA 2000 1xRTT**		
Channel	**25 (Low)**	**600 (Mid)**	**1175 (High)**
Frequency (MHz)	**1851.25**	**1880**	**1908.75**
Peak-to-Average Ratio (dB)	3.80	3.80	4.04

3.2.6 Test Result (Plots) of Peak-to-Average Ratio

Band :	CDMA2000 BC1	Test Mode :	1xRTT Link (QPSK)

Peak-to-Average Ratio on Channel 25 (1851.25 MHz)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.43 dBm
Peak	28.52 dBm
Crest	4.09 dB
10 %	2.04 dB
1 %	3.28 dB
.1 %	3.80 dB
.01 %	3.96 dB

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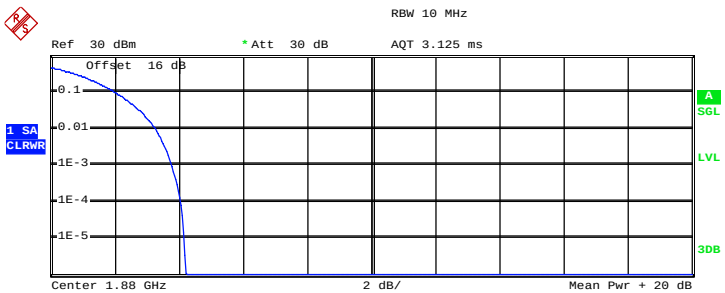
Peak-to-Average Ratio on Channel 600 (1880 MHz)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.25 dBm
Peak	28.45 dBm
Crest	4.20 dB
10 %	2.04 dB
1 %	3.28 dB
.1 %	3.80 dB
.01 %	4.08 dB

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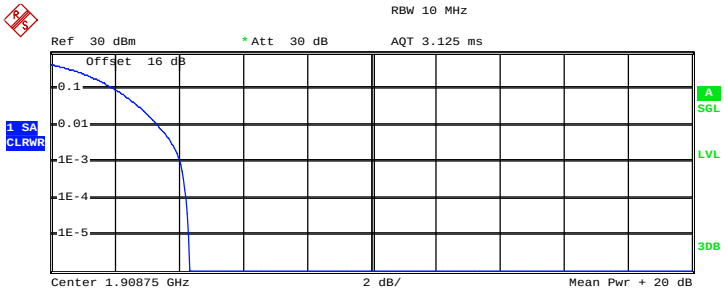
Peak-to-Average Ratio on Channel 1175 (1908.75 MHz)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.27 dBm
Peak	28.59 dBm
Crest	4.33 dB
10 %	2.04 dB
1 %	3.36 dB
.1 %	4.04 dB
.01 %	4.24 dB

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3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.3.1 Description of the ERP/EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

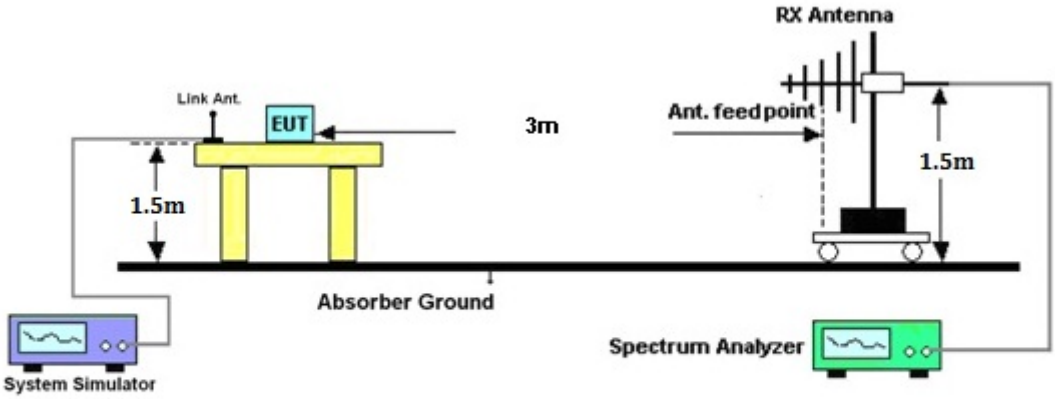
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The EUT was placed on a turntable 1.5 meters high in a fully anechoic chamber.
2. The EUT was placed 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. Set RBW= 100 kHz, VBW= 300 kHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
    Ps (dBm)：Input power to substitution antenna.
    Gs (dBi or dBd)：Substitution antenna Gain.
    Et = Rt + AF
    Es = Rs + AF
    AF (dB/m)：Receive antenna factor
    Rt：The highest received signal in spectrum analyzer for EUT.
    Rs：The highest received signal in spectrum analyzer for substitution antenna.

3.3.4 Test Setup



3.3.5 Test Result of ERP

CDMA2000 BC0 1xRTT_RC1+SO55 Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.70	-26.22	-48.12	0.00	-1.08	20.82	0.1208
836.52	-26.64	-48.28	0.00	-0.93	20.71	0.1178
848.31	-27.14	-48.35	0.00	-0.76	20.45	0.1109
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.70	-42.92	-47.97	0.00	-1.08	3.97	0.0025
836.52	-43.11	-48.01	0.00	-0.93	3.97	0.0025
848.31	-43.63	-48.05	0.00	-0.76	3.66	0.0023

3.3.6 Test Result of EIRP

CDMA2000 BC1 1xRTT_RC1+SO55 Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-30.52	-51.88	0.00	1.96	23.32	0.2146
1880.00	-31.40	-52.99	0.00	2.00	23.59	0.2288
1908.75	-32.74	-54.28	0.00	1.98	23.52	0.2248
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-30.45	-52.13	0.00	1.96	23.64	0.2313
1880.00	-31.29	-53.17	0.00	2.00	23.88	0.2442
1908.75	-31.84	-54.13	0.00	1.98	24.27	0.2674

3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The 99% 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.

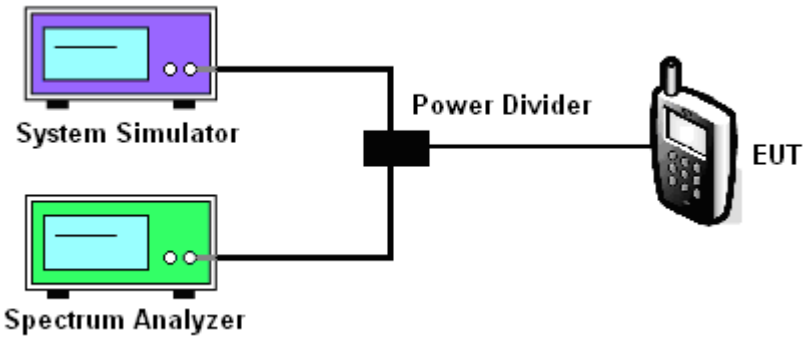
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
4. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

3.4.4 Test Setup



3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

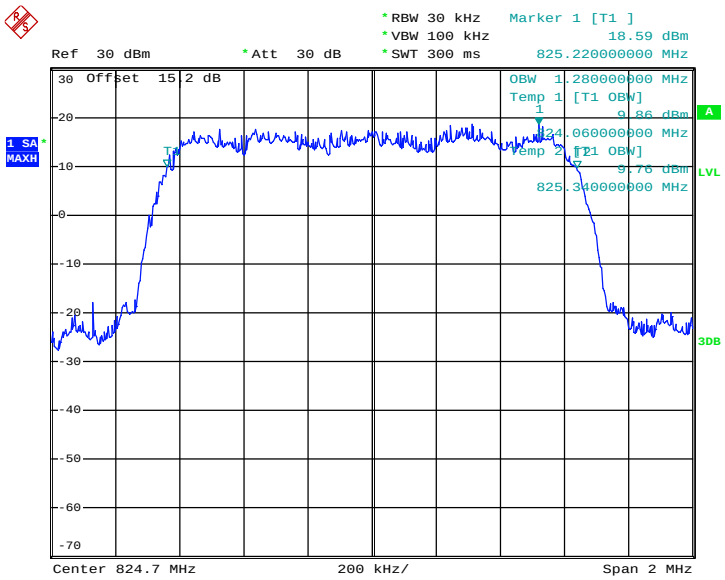
CDMA2000 BC0			
Test Mode	**CDMA 2000 1xRTT**		
Test Status	**RC1+SO55**		
Channel	**1013 (Low)**	**384 (Mid)**	**777 (High)**
Frequency (MHz)	**824.70**	**836.52**	**848.31**
99% OBW (MHz)	1.280	1.276	1.272
26dB BW (MHz)	1.424	1.424	1.424

CDMA2000 BC1			
Test Mode	**CDMA 2000 1xRTT**		
Test Status	**RC1+SO55**		
Channel	**25 (Low)**	**600 (Mid)**	**1175 (High)**
Frequency (MHz)	**1851.25**	**1880.00**	**1908.75**
99% OBW (MHz)	1.272	1.276	1.272
26dB BW (MHz)	1.420	1.424	1.424

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

Band :	CDMA2000 BC0	Test Mode :	1xRTT_RC1+SO55 (QPSK)

99% Occupied Bandwidth Plot on Channel 1013 (824.7 MHz)



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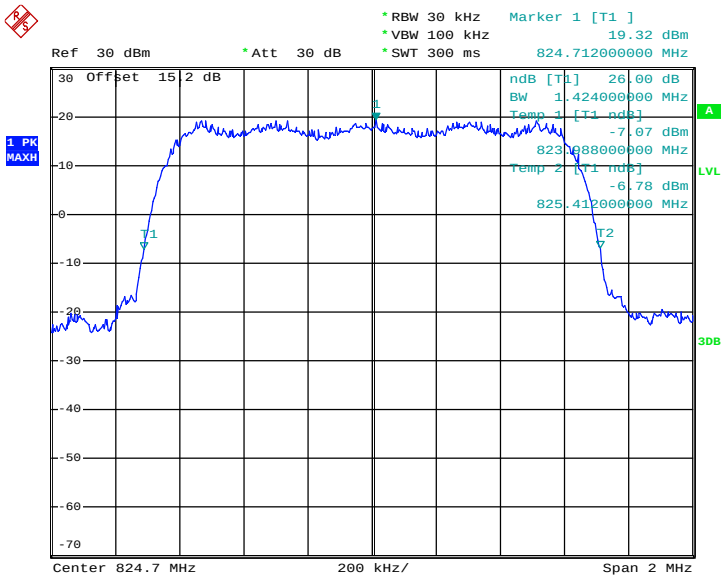
26dB Bandwidth Plot on Channel 1013 (824.7 MHz)



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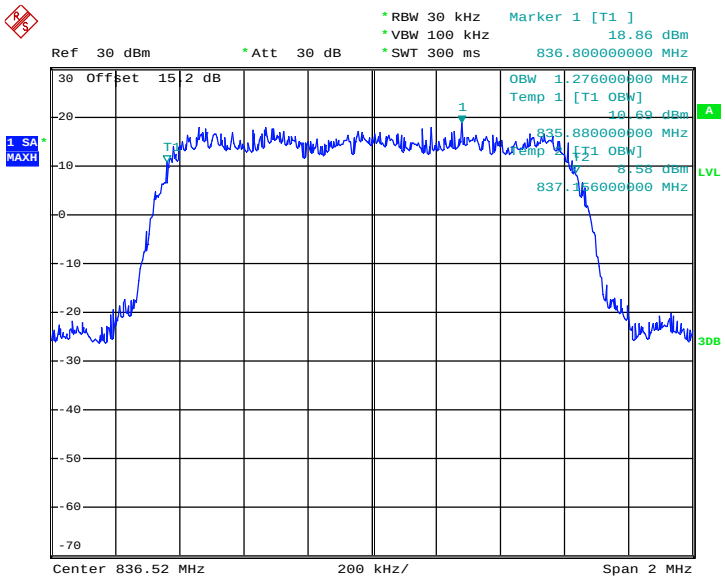
99% Occupied Bandwidth Plot on Channel 384 (836.52 MHz)



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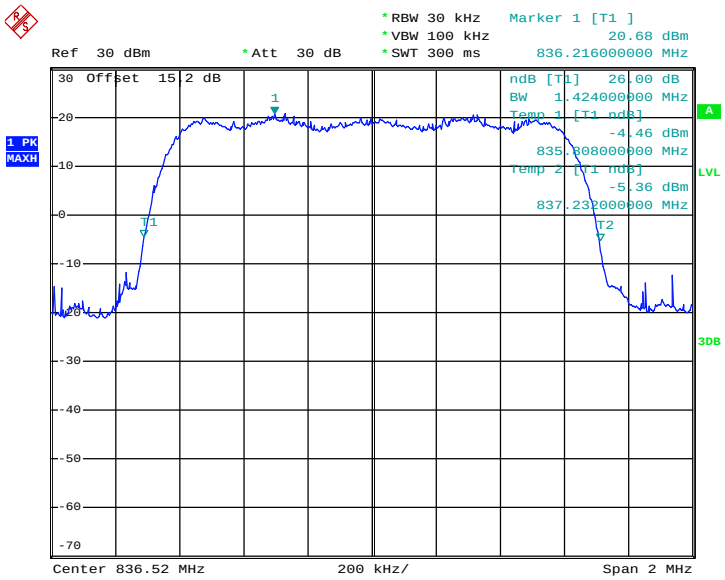
26dB Bandwidth Plot on Channel 384 (836.52 MHz)



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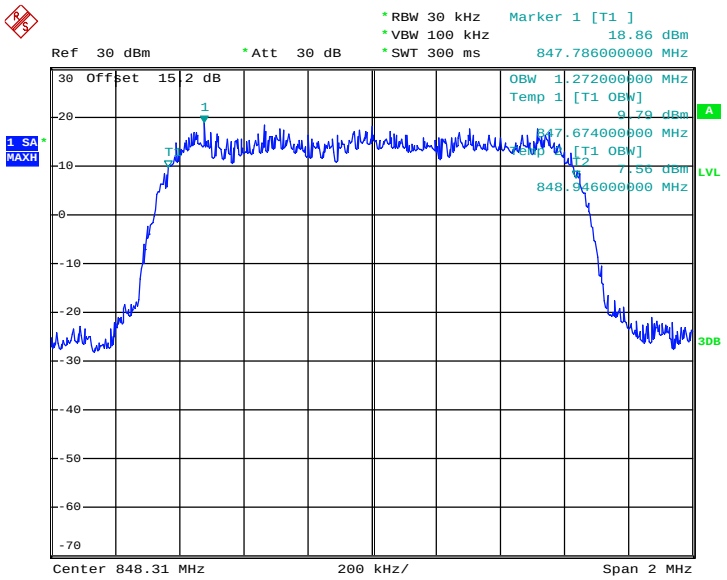
99% Occupied Bandwidth Plot on Channel 777 (848.31 MHz)



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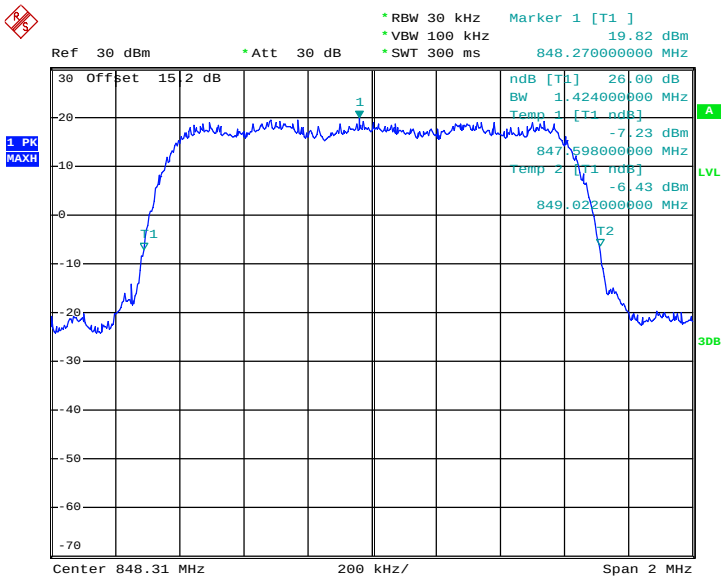
26dB Bandwidth Plot on Channel 777 (848.31 MHz)



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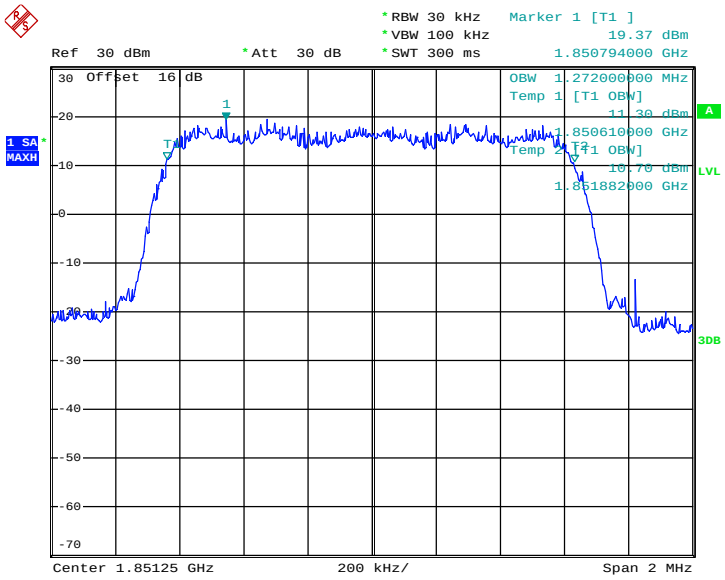
Band :	CDMA2000 BC1	Test Mode :	1xRTT_RC1+SO55 (QPSK)

99% Occupied Bandwidth Plot on Channel 25 (1851.24 MHz)



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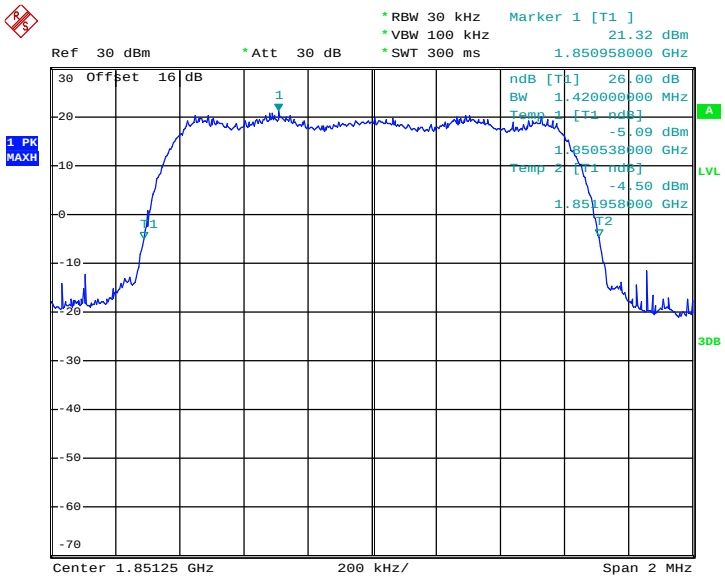
26dB Bandwidth Plot on Channel 25 (1851.24 MHz)



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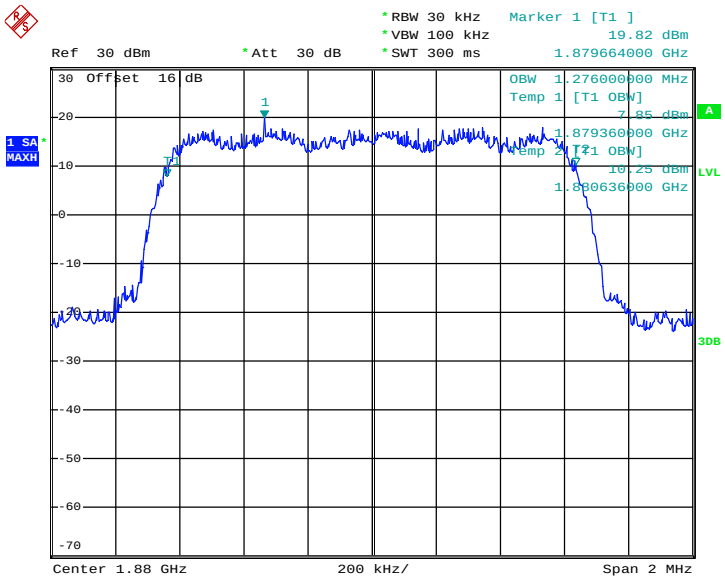
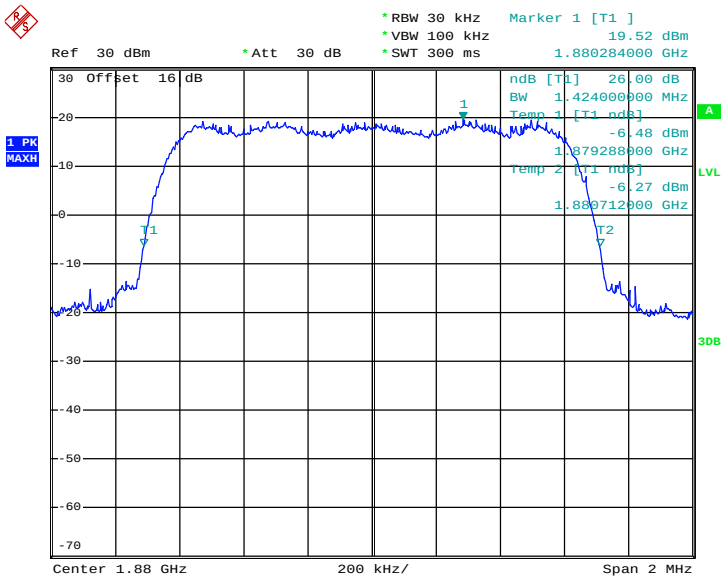
99% Occupied Bandwidth Plot on Channel 600 (1880.0 MHz)



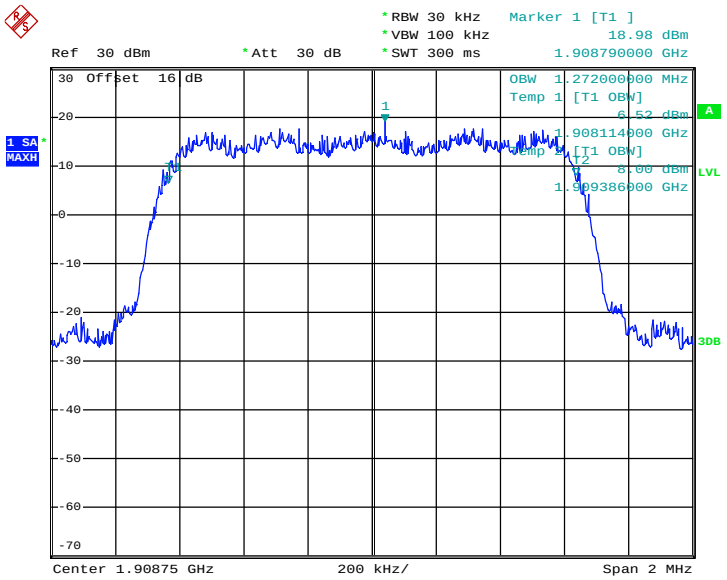
Date: 21.MAY.2014 22:19:51

26dB Bandwidth Plot on Channel 600 (1880.0 MHz)



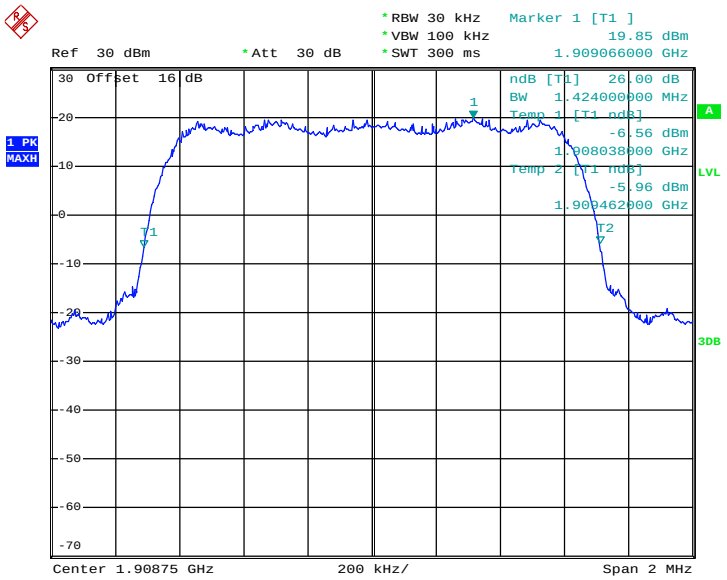
Date: 21.MAY.2014 22:04:03

99% Occupied Bandwidth Plot on Channel 1175 (1908.75 MHz)



Date: 21.MAY.2014 22:20:27

26dB Bandwidth Plot on Channel 1175 (1908.75 MHz)



Date: 21.MAY.2014 22:05:24

3.5 Band Edge Measurement

3.5.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

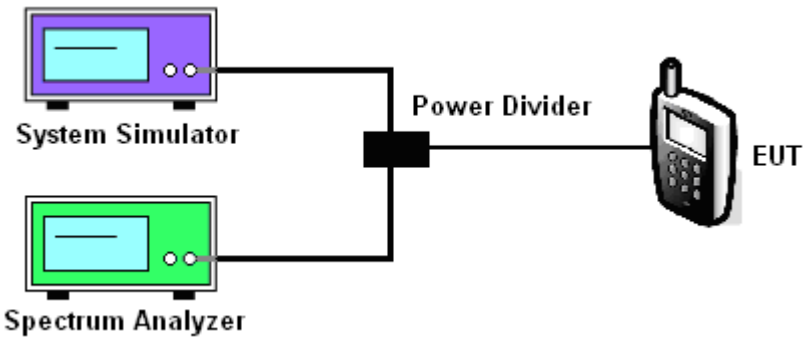
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured.
4. The RBW was replaced by 10 kHz, slightly smaller than the value in (2), due to the spectrum analyzer limitation to set the exact value. A worst case correction factor of 10*log (1% emission-BW/measurement RBW) was compensated.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

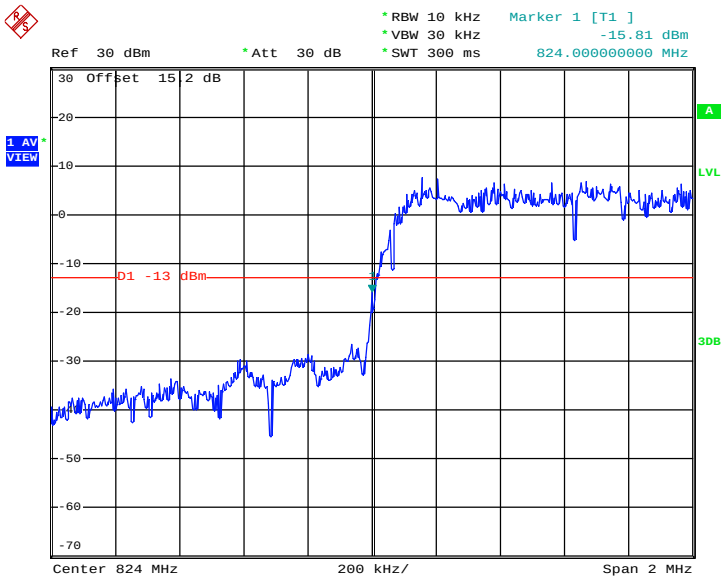
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	CDMA2000 BC0	Test Mode :	1xRTT_RC1+SO55 (QPSK)
Correction Factor :	1.54dB	Maximum 26dB Bandwidth :	1.424MHz
Band Edge :	-14.27dBm	Measurement Value :	-15.81dBm

Lower Band Edge Plot on Channel 1013 (824.7 MHz)

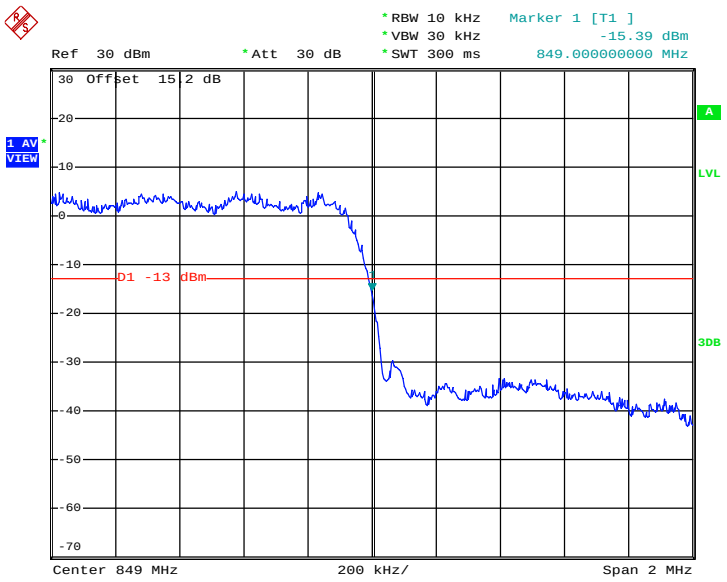


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	CDMA2000 BC0	Test Mode :	1xRTT_RC1+SO55 (QPSK)
Correction Factor :	1.54dB	Maximum 26dB Bandwidth :	1.424MHz
Band Edge :	-13.85dBm	Measurement Value :	-15.39dBm

Higher Band Edge Plot on Channel 777 (848.31 MHz)

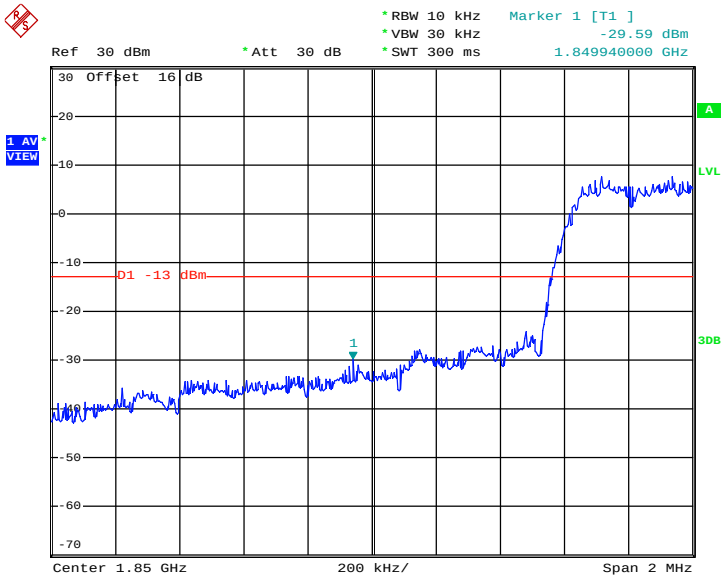


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	CDMA2000 BC1	Test Mode :	1xRTT_RC1+SO55 (QPSK)
Correction Factor :	1.54dB	Maximum 26dB Bandwidth :	1.424MHz
Band Edge :	-28.05dBm	Measurement Value :	-29.59dBm

Lower Band Edge Plot on Channel 25 (1851.25 MHz)



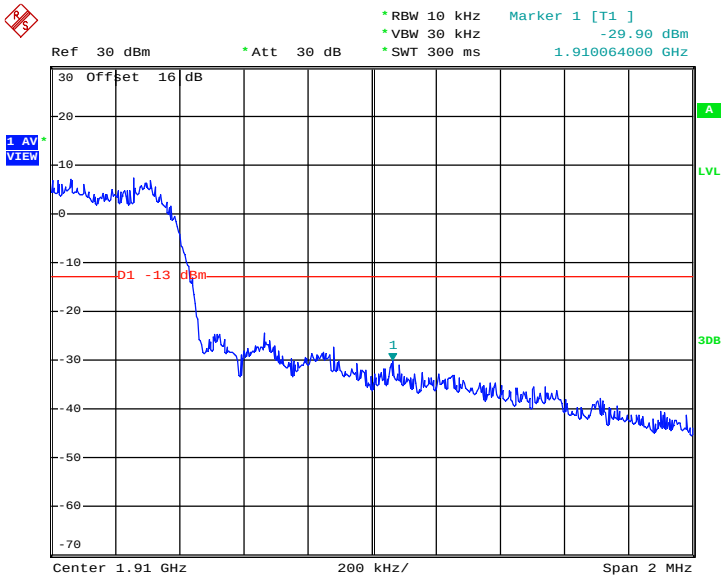
Date: 21.MAY.2014 22:38:39

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	CDMA2000 BC1	Test Mode :	1xRTT_RC1+SO55 (QPSK)
Correction Factor :	1.54dB	Maximum 26dB Bandwidth :	1.424MHz
Band Edge :	-28.36dBm	Measurement Value :	-29.90dBm

Higher Band Edge Plot on Channel 1175 (1908.75 MHz)



Date: 21.MAY.2014 22:39:38

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

3.6 Conducted Spurious Emission Measurement

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of 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 10th harmonic.

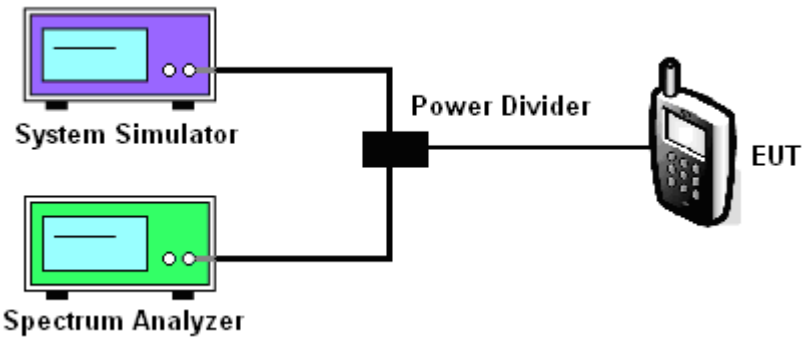
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

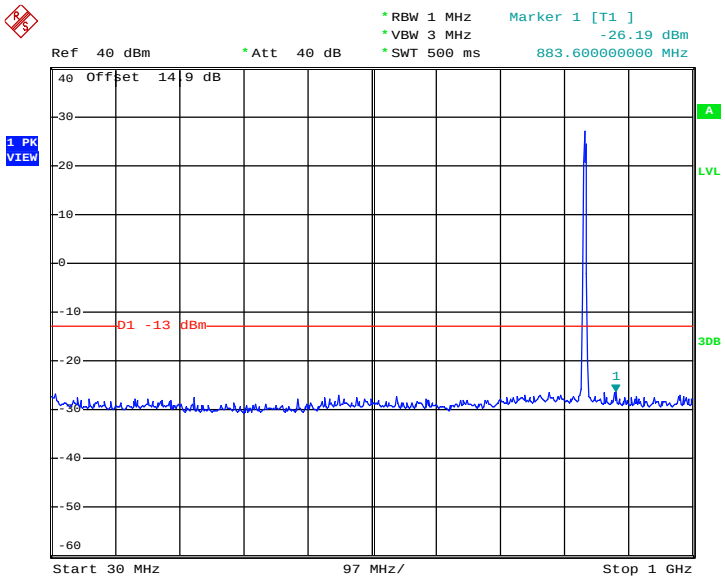
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Conducted Spurious Emission

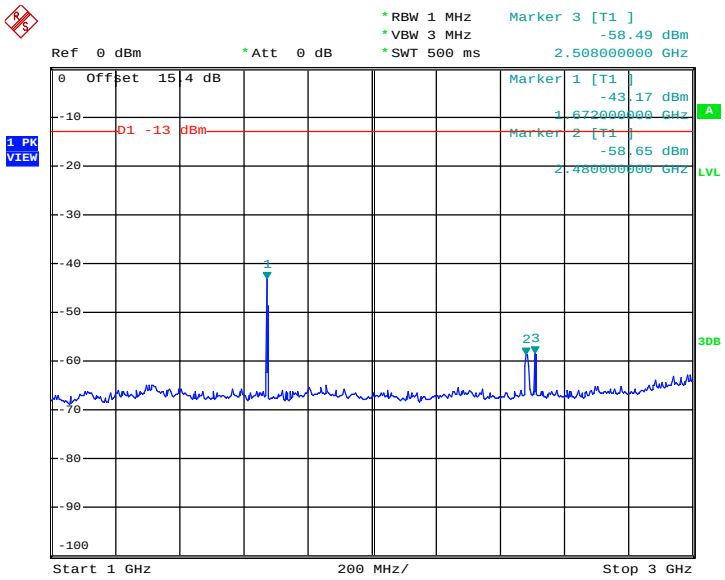
Band :	CDMA2000 BC0	Channel :	CH384
Test Mode :	1xRTT_RC1+SO55 (QPSK)	Frequency :	836.52 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



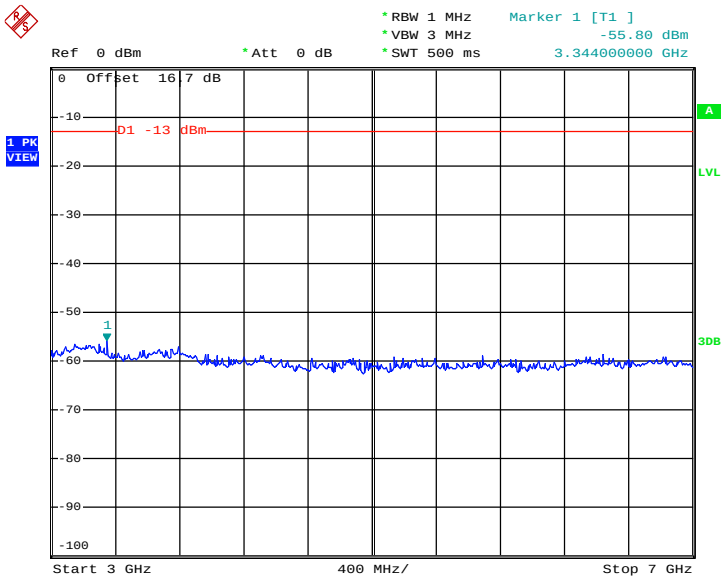
Date: 21.MAY.2014 21:50:24

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



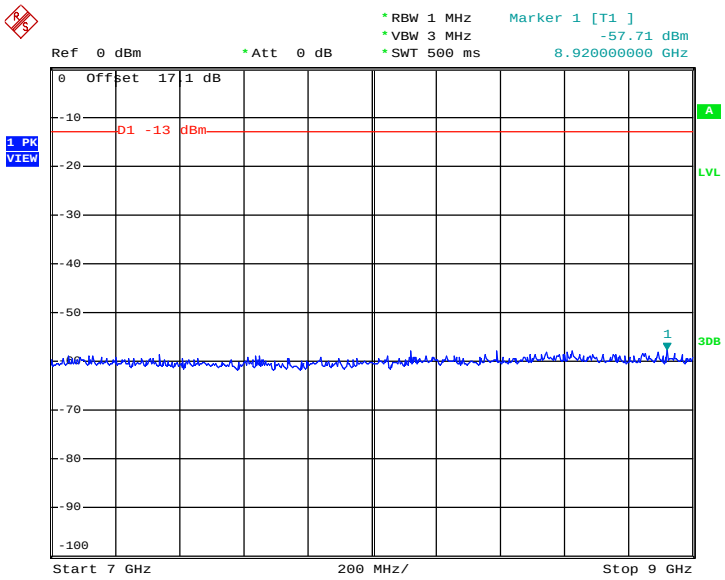
Date: 21.MAY.2014 21:52:22

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 21.MAY.2014 21:52:58

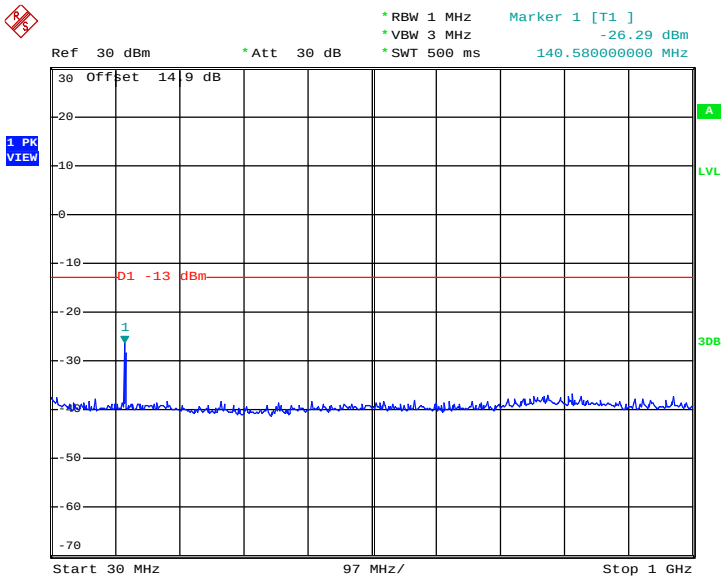
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 21.MAY.2014 21:53:28

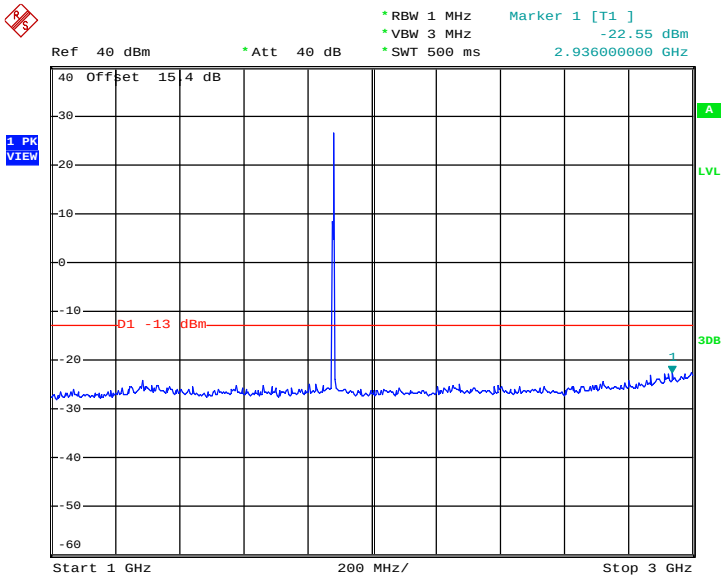
Band :	CDMA2000 BC1	Channel :	CH600
Test Mode :	1xRTT_RC1+SO55 (QPSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



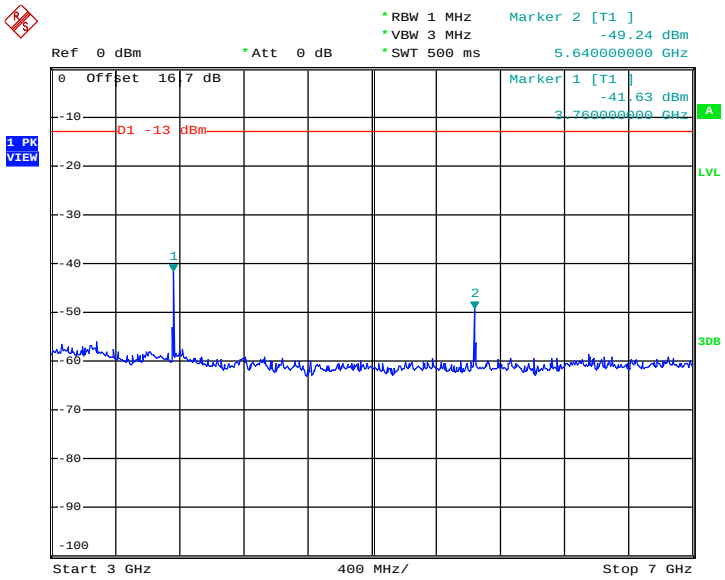
Date: 21.MAY.2014 22:30:25

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



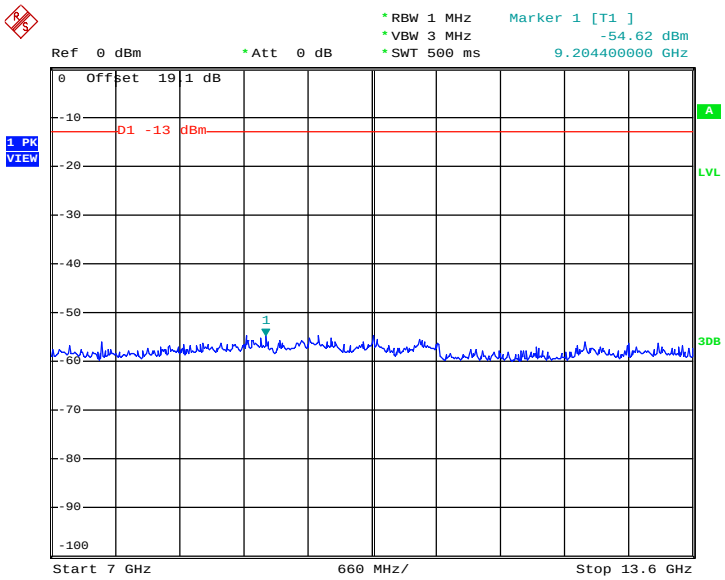
Date: 21.MAY.2014 22:31:23

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



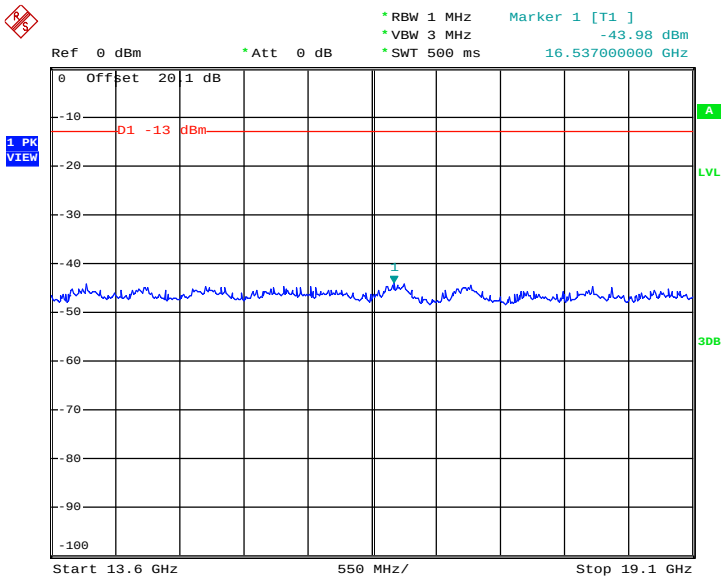
Date: 21.MAY.2014 22:32:43

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 21.MAY.2014 22:33:31

Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 21.MAY.2014 22:34:12

3.7 Field Strength of Spurious Radiation Measurement

3.7.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.7.2 Measuring Instruments

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

3.7.3 Test Procedures

1. The EUT was placed on a rotatable wooden table 0.8 meters above the 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 for the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking 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
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

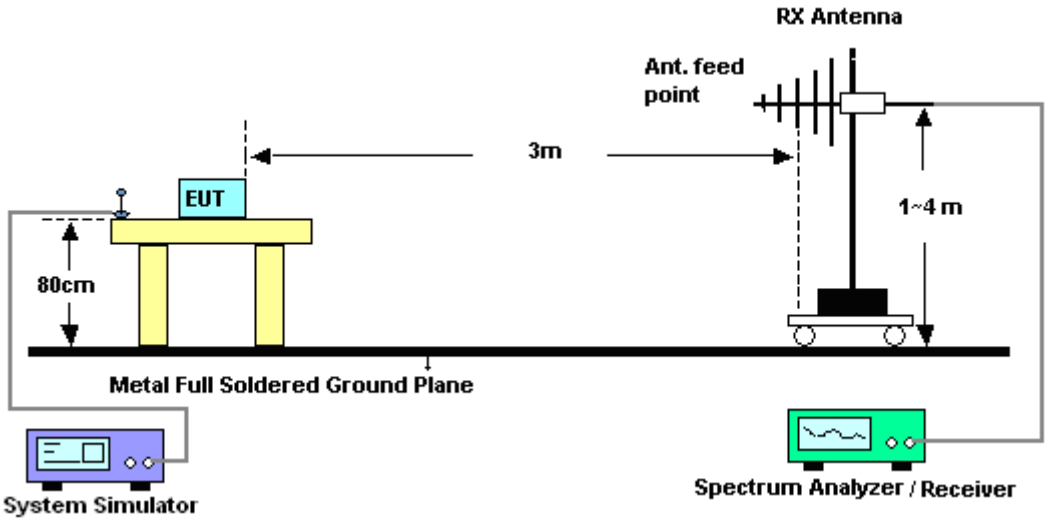
    = P(W) - [43 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

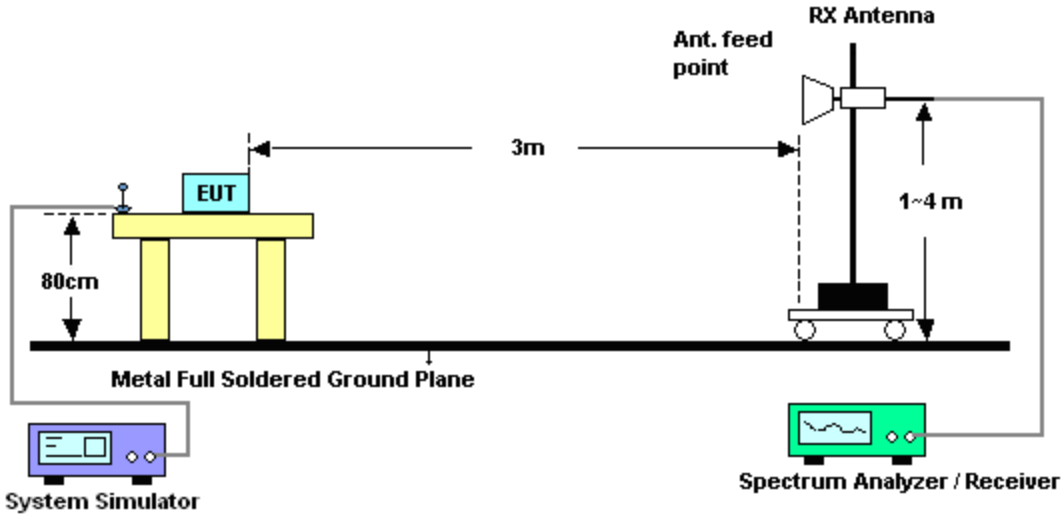
    = -13dBm.

3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	CDMA2000 BC0	Temperature :	23~25°C
Test Mode :	1xRTT_RC1+SO55 (QPSK)	Relative Humidity :	48~52%
Test Engineer :	Kyle Jhuang	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
1672	-45.53	-13	-32.53	-51.55	-49.4	1.62	5.49	H	Pass
2509	-50.79	-13	-37.79	-61.26	-54.91	2.1	6.22	H	Pass
3346	-52.96	-13	-39.96	-64.72	-58	3.03	8.07	H	Pass

Band :	CDMA2000 BC0	Temperature :	23~25°C
Test Mode :	1xRTT_RC1+SO55 (QPSK)	Relative Humidity :	48~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
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
1672	-46.66	-13	-33.66	-52.63	-50.53	1.62	5.49	V	Pass
2509	-52.76	-13	-39.76	-63.1	-56.88	2.1	6.22	V	Pass
3346	-52.77	-13	-39.77	-64.45	-57.81	3.03	8.07	V	Pass

Band :	CDMA2000 BC1	Temperature :	23~25°C
Test Mode :	1xRTT_RC1+SO55 (QPSK)	Relative Humidity :	48~52%
Test Engineer :	Kyle Jhuang	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
3760	-50.20	-13	-37.20	-64.03	-56.5	2.51	8.81	H	Pass
5636	-46.51	-13	-33.51	-64.28	-54.22	2.99	10.70	H	Pass
7520	-42.80	-13	-29.80	-66.69	-51.33	3.59	12.12	H	Pass

Band :	CDMA2000 BC1	Temperature :	23~25°C
Test Mode :	1xRTT_RC1+SO55 (QPSK)	Relative Humidity :	48~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
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
3760	-49.58	-13	-36.58	-63.26	-55.88	2.51	8.81	V	Pass
5643	-44.51	-13	-31.51	-62.41	-52.22	2.99	10.70	V	Pass
7520	-43.58	-13	-30.58	-67.2	-52.11	3.59	12.12	V	Pass

3.8 Frequency Stability Measurement

3.8.1 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 ±0.00025% (±2.5ppm) of the center frequency.

3.8.2 Measuring Instruments

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

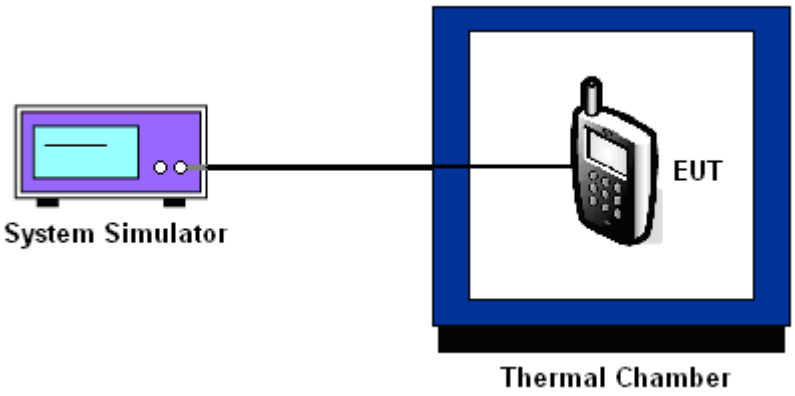
3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C steps up to 50°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.

3.8.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
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.

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	CDMA2000 BC0 1xRTT_RC1+SO55	Channel :	384
Limit (ppm) :	2.5	Frequency :	836.52 MHz

Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	26	+0.03	PASS
-20	-23	-0.03	
-10	18	+0.02	
0	-22	-0.03	
10	26	+0.03	
20(Ref.)	19	+0.02	
30	-30	-0.04	
40	32	+0.04	
50	31	+0.04	

Band :	CDMA2000 BC1 1xRTT_RC1+SO55	Channel :	600
Limit (ppm) :	2.5	Frequency :	1880.0 MHz

Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	44	+0.02	PASS
-20	-46	-0.02	
-10	41	+0.02	
0	48	+0.03	
10	-35	-0.02	
20(Ref.)	-32	-0.02	
30	26	+0.01	
40	31	+0.02	
50	40	+0.02	

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
CDMA2000 BC0 CH384	1xRTT RC1+SO55	3.80	15	+0.02	2.5	Pass
		BEP	13	+0.02		
		4.35	-12	-0.01		
CDMA2000 BC1 CH600	1xRTT RC1+SO55	3.80	33	+0.02		
		BEP	46	+0.02		
		4.35	29	+0.02		

Remark:

1. Normal Voltage = 3.80V.
2. Battery End Point (BEP) = 3.50 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. 28, 2013	May 21, 2014~ Jul. 03, 2014	Dec. 27, 2014	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Dec. 10, 2013	May 21, 2014~ Jul. 03, 2014	Dec. 09, 2014	Conducted (TH01-KS)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz – 26.5GHz	Jan. 15, 2014	Jun. 11, 2014	Jan. 14, 2015	Radiation (03CH08-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz~2GHz	Oct. 10, 2013	Jun. 11, 2014	Oct. 09, 2014	Radiation (03CH08-HY)
Horn Antenna	ESCO	3117	000143261	1GHz~18GHz	Jan. 16, 2014	Jun. 11, 2014	Jan. 15, 2015	Radiation (03CH08-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz~40GHz	Oct. 03, 2013	Jun. 11, 2014	Oct. 02, 2014	Radiation (03CH08-HY)
Amplifier	SONOMA	310N	187231	9kHz~1GHz	May 12, 2014	Jun. 11, 2014	May 11, 2015	Radiation (03CH08-HY)
Preamplifier	MITEQ	AMF-7D-00 101800-30-1	1590074	1GHz~18GHz	Jul. 09, 2013	Jun. 11, 2014	Jul. 08, 2014	Radiation (03CH08-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Sep. 04, 2013	Jun. 11, 2014	Sep. 03, 2014	Radiation (03CH08-HY)
Turn Table	Chaintek	Chaintek 3000	N/A	0~360 Degree	N/A	Jun. 11, 2014	N/A	Radiation (03CH08-HY)
Antenna Mast	MF	MFA520BS	N/A	1m~4m	N/A	Jun. 11, 2014	N/A	Radiation (03CH08-HY)

Spectrum Analyzer	R&S	FSP 7	100819	9kHz~7GHz	May 04, 2014	May 21, 2014~ Jul. 03, 2014	May 03, 2015	ERP/EIRP (OTA01-KS)
Switch Control Manframe	Agilent	3499A	MY42005452	N/A	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Dual 1-to-6(4) MW MUX	Agilent	N2276A	MY42000841	N/A	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002573	N/A	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002586	N/A	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Diagonal Dual Polarized Horn	ETS-Lindgren	3164-04	00066993	700MHz~6GHz	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00066604	N/A	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Conical Log Spiral (Small)	ETS-Lindgren	3102	00066951	1~10GHz	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Turn Table	ETS-Lindgren	2088	N/A	Resolution : 0.1degree	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Limiting Amplifier	ETS-lindgren	109643	920326	10MHz~2.5GHz	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
EMQuest	ETS-Lindgren	EMQ-100	1125	N/A	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)
Medium Duty Holder	ETS-Lindgren	2015	N/A	N/A	N/A	May 21, 2014~ Jul. 03, 2014	N/A	ERP/EIRP (OTA01-KS)

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))	**4.3**