

# FCC RF Test Report

APPLICANT : ZTE CORPORATION  
EQUIPMENT : LTE/WCDMA HOTSPOT  
BRAND NAME : ZTE  
MODEL NAME : Z289L  
FCC ID : SRQ-Z289L  
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)  
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Oct. 10, 2013 and testing was completed on Nov. 20, 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 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



**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	PASS	-
3.2	§24.232(d) §27.50(d)(5)	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	-
3.3	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.4	§2.1049 §22.917(a) §24.238(b) §27.53(g)	Occupied Bandwidth	N/A	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a) §27.53(g)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a) §27.53(g)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a) §27.53(g)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 31.79 dB at 6924.000 MHz
3.8	§2.1055 §22.355 §24.235 §27.54	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, 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	LTE/WCDMA HOTSPOT
Brand Name	ZTE
Model Name	Z289L
FCC ID	SRQ-Z289L
EUT supports Radios application	WCDMA/HSPA/HSPA+(Downlink Only)/LTE/WLAN 2.4GHz 802.11bgn HT20
HW Version	Z289LHWV1.0
SW Version	TF_US_Z289LV0.0.0B01
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 of Equipment Under Test

Product Specification subjective to this standard	
<b>Tx Frequency</b>	WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
<b>Rx Frequency</b>	WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz
<b>Maximum Output Power to Antenna</b>	WCDMA Band V : 22.84 dBm WCDMA Band IV : 22.71 dBm WCDMA Band II : 22.77 dBm
<b>Antenna Type</b>	LDS Antenna
<b>Type of Modulation</b>	WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) HSPA+: 16QAM (Downlink Only)

### 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	WCDMA Band V RMC 12.2Kbps	QPSK	0.0809	0.05 ppm	4M18F9W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.3113	0.02 ppm	4M18F9W
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	0.1839	0.03 ppm	4M18F9W

### 1.7 Testing Site

<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 Registration No.</b>	
	TH01-KS	03CH01-KS	OTA01-KS	149928	

### 1.8 Applied Standards

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

- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ 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

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 was rotated on three test planes to find out the worst emission (Y Plane for 22H and X Plane for 24E. 27L).

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for WCDMA Band II.

Test Modes		
Band	Radiated TCs	Conducted TCs
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

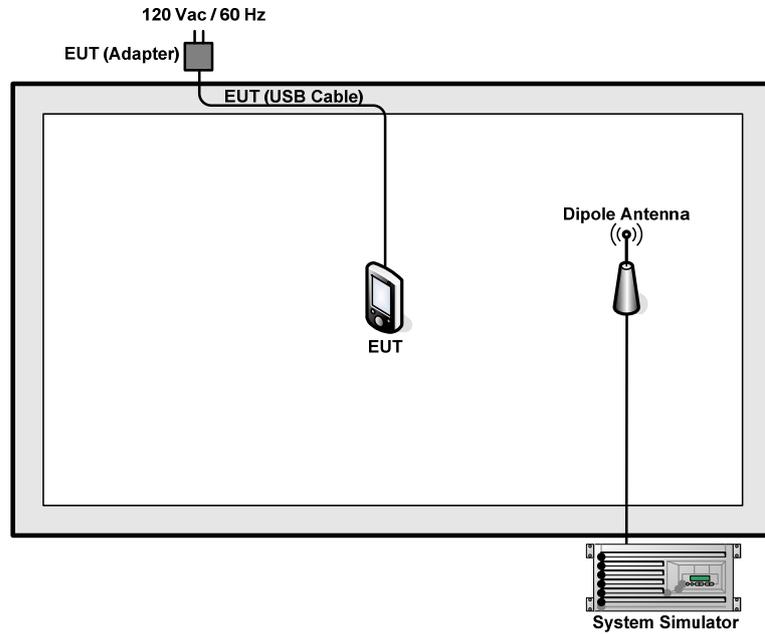
**Note:** The maximum power levels are RMC 12.2Kbps mode for WCDMA band V, RMC 12.2Kbps mode for WCDMA band IV, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.



The conducted power tables are as follows:

Conducted Power (*Unit: dBm)									
Band	WCDMA Band V			WCDMA Band II			WCDMA Band IV		
Channel	4132	4182	4233	9262	9400	9538	1312	1413	1513
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
RMC 12.2K	22.80	22.84	22.71	22.51	22.71	22.77	22.65	22.71	22.58
HSDPA Subtest-1	21.40	21.43	21.29	21.24	21.42	21.45	21.24	21.27	21.11
HSDPA Subtest-2	21.32	21.33	21.27	21.21	21.32	21.44	21.22	21.23	21.10
HSDPA Subtest-3	21.30	21.33	21.23	21.20	21.36	21.38	21.22	21.16	21.07
HSDPA Subtest-4	21.29	21.32	21.22	21.22	21.36	21.37	21.20	21.15	21.09
HSUPA Subtest-1	21.27	21.31	21.19	20.89	21.07	21.09	21.33	21.40	21.29
HSUPA Subtest-2	20.70	20.77	20.60	20.59	20.80	20.82	21.21	21.33	21.12
HSUPA Subtest-3	20.65	20.70	20.59	20.28	20.43	20.44	20.39	20.55	20.39
HSUPA Subtest-4	21.33	21.40	21.31	20.81	21.05	21.10	21.00	21.12	20.80
HSUPA Subtest-5	20.60	20.63	20.57	20.70	20.91	20.93	20.59	20.70	20.49

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

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



## **2.4 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 EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

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

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 4.8 dB and 10dB attenuator.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.8 + 10 = 14.8 \text{ (dB)} \end{aligned}$$

### 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.

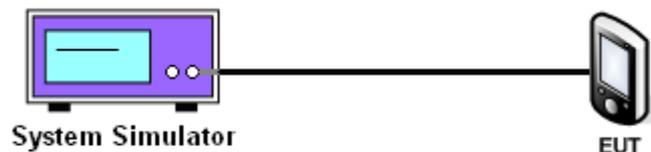
##### 3.1.2 Measuring Instruments

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.
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

Cellular Band			
Modes	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
Conducted Power (dBm)	22.80	22.84	22.71
Conducted Power (Watts)	0.19	0.19	0.19

PCS Band			
Modes	WCDMA Band II (RMC 12.2Kbps)		
Channel	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1852.4	1880	1907.6
Conducted Power (dBm)	22.51	22.71	22.77
Conducted Power (Watts)	0.18	0.19	0.19

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Conducted Power (dBm)	22.65	22.71	22.58
Conducted Power (Watts)	0.18	0.19	0.18

Note: Maximum average power for WCDMA.

## 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.

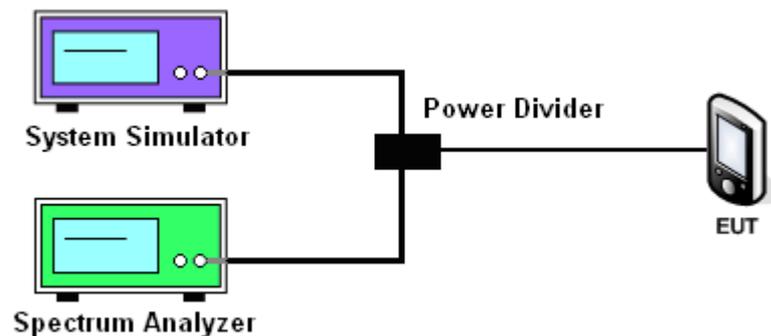
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. For UMTS operating modes:
  - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
  - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
3. Record the deviation as Peak to Average Ratio.

### 3.2.4 Test Setup





3.2.5 Test Result of Peak-to-Average Ratio

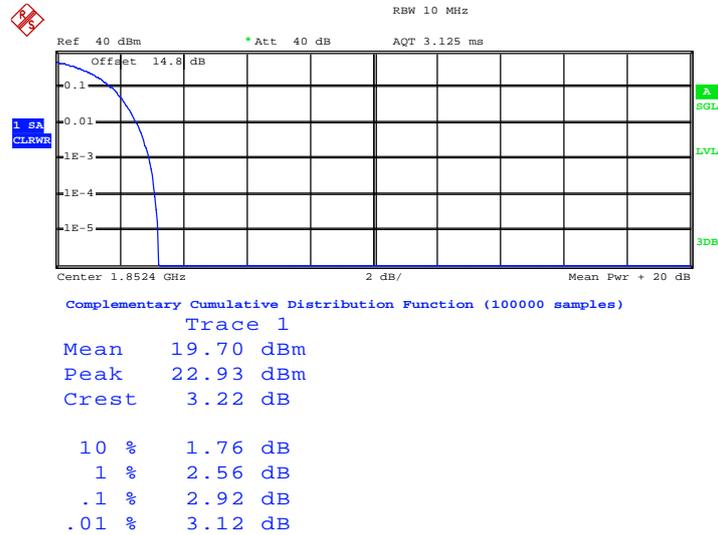
PCS Band			
Modes	WCDMA Band II (RMC 12.2Kbps)		
Channel	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1852.4	1880	1907.6
Peak-to-Average Ratio (dB)	2.92	3.08	3.12

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Peak-to-Average Ratio (dB)	3.16	3.20	3.24

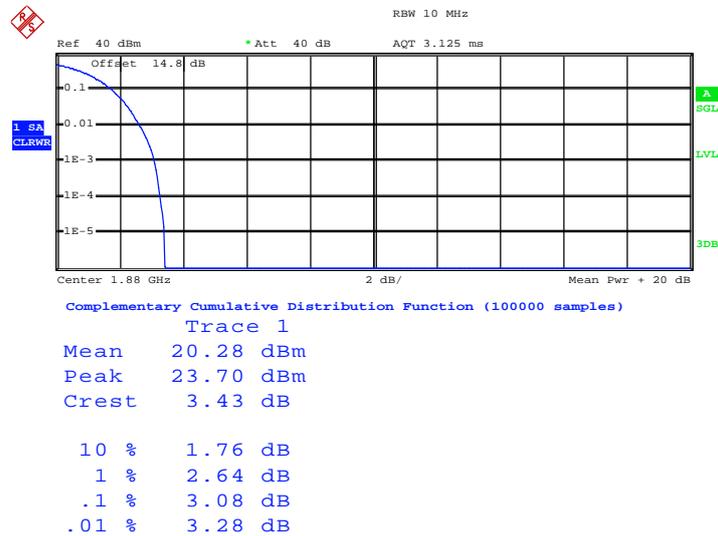
### 3.2.6 Test Result (Plots) of Peak-to-Average Ratio

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
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#### Peak-to-Average Ratio on Channel 9262 (1852.4 MHz)

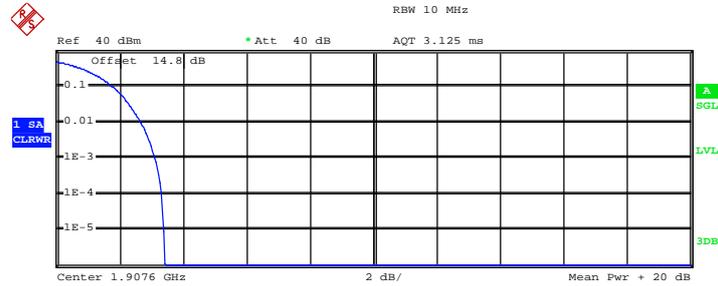


#### Peak-to-Average Ratio on Channel 9400 (1880.0 MHz)





Peak-to-Average Ratio on Channel 9538 (1907.6 MHz)



Complementary Cumulative Distribution Function (100000 samples)

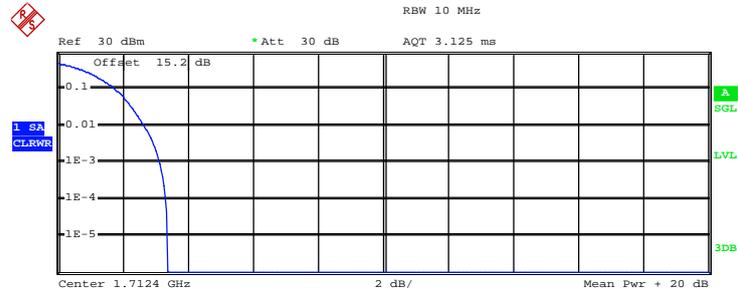
Trace 1

Mean	20.22 dBm
Peak	23.63 dBm
Crest	3.41 dB
10 %	1.80 dB
1 %	2.68 dB
.1 %	3.12 dB
.01 %	3.32 dB



<b>Band :</b>	WCDMA Band IV	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
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**Peak-to-Average Ratio on Channel 1312 (1712.4 MHz)**

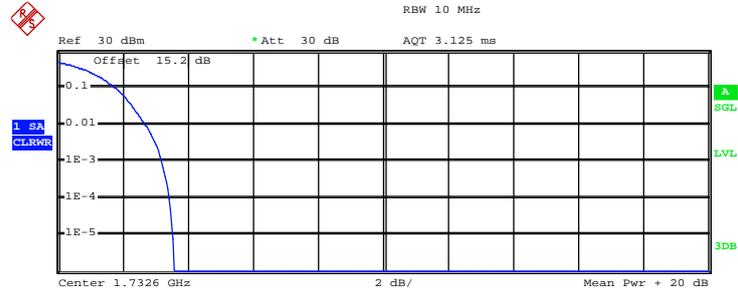


Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 18.71 dBm  
 Peak 22.10 dBm  
 Crest 3.39 dB

10 %	1.76 dB
1 %	2.68 dB
.1 %	3.16 dB
.01 %	3.32 dB

**Peak-to-Average Ratio on Channel 1413 (1732.6 MHz)**



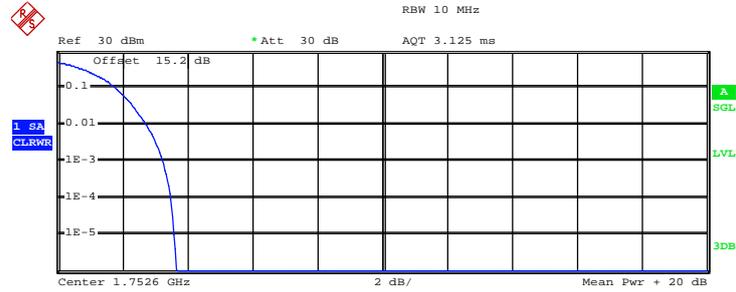
Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 18.31 dBm  
 Peak 21.89 dBm  
 Crest 3.58 dB

10 %	1.80 dB
1 %	2.72 dB
.1 %	3.20 dB
.01 %	3.44 dB



Peak-to-Average Ratio on Channel 1513 (1752.6 MHz)



Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 19.07 dBm  
 Peak 22.74 dBm  
 Crest 3.66 dB

10 % 1.80 dB  
 1 % 2.72 dB  
 .1 % 3.24 dB  
 .01 % 3.48 dB



### 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 (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band).

#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;  
UMTS operating modes: Set RBW= 100 kHz, VBW= 300 kHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of 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.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

$P_s$  (dBm) : Input power to substitution antenna.

$G_s$  (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

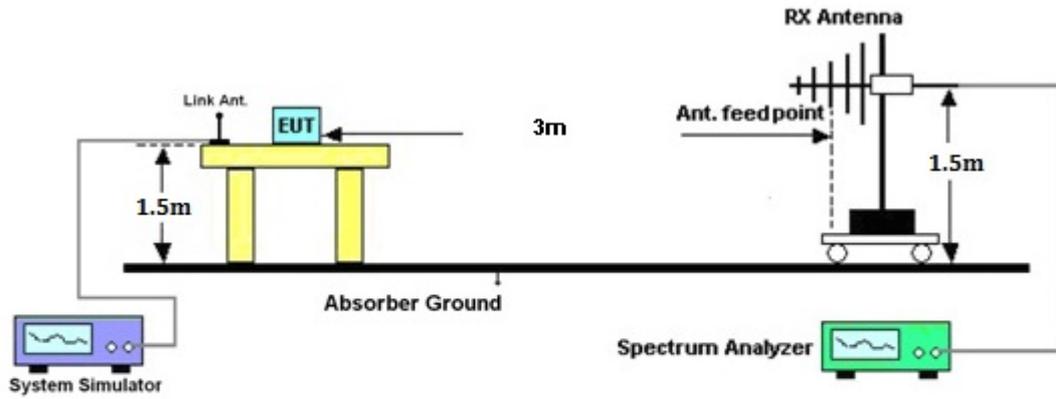
$E_s = R_s + AF$

$AF$  (dB/m) : Receive antenna factor

$R_t$  : The highest received signal in spectrum analyzer for EUT.

$R_s$  : The highest received signal in spectrum analyzer for substitution antenna.

### 3.3.4 Test Setup





3.3.5 Test Result of ERP

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-27.96	-48.12	0.00	-1.08	19.08	0.0809
836.40	-28.75	-48.28	0.00	-0.93	18.60	0.0724
846.60	-28.95	-48.35	0.00	-0.76	18.64	0.0732
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-42.85	-47.97	0.00	-1.08	4.04	0.0025
836.40	-43.87	-48.01	0.00	-0.93	3.21	0.0021
846.60	-43.88	-48.05	0.00	-0.76	3.41	0.0022



3.3.6 Test Result of EIRP

WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.40	-32.71	-51.88	0.00	1.96	21.13	0.1296
1732.60	-32.34	-52.99	0.00	2.00	22.65	0.1839
1752.60	-33.68	-54.28	0.00	1.98	22.58	0.1810
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.40	-32.85	-52.13	0.00	1.96	21.24	0.1330
1732.60	-32.89	-53.17	0.00	2.00	22.28	0.1690
1752.60	-33.86	-54.13	0.00	1.98	22.25	0.1677

WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-30.29	-51.88	0.00	1.96	23.55	0.2265
1880.00	-30.22	-52.99	0.00	2.00	24.77	0.3000
1907.60	-31.42	-54.28	0.00	1.98	24.84	0.3048
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-30.44	-52.13	0.00	1.96	23.65	0.2319
1880.00	-30.37	-53.17	0.00	2.00	24.80	0.3017
1907.60	-31.18	-54.13	0.00	1.98	24.93	0.3113

## 3.4 Occupied Bandwidth and 26dB Bandwidth Measurement

### 3.4.1 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.

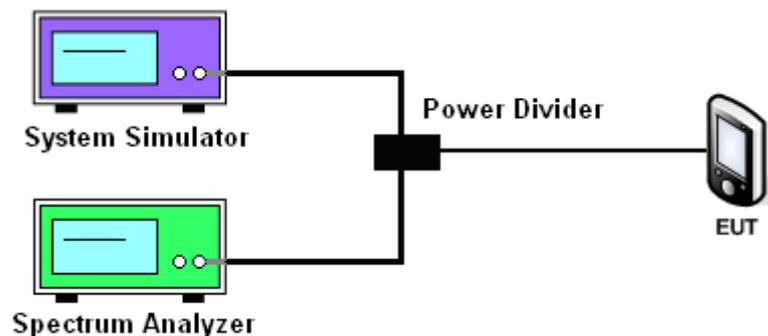
### 3.4.2 Measuring Instruments

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 RF output of 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

Cellular Band			
Modes	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
99% OBW (MHz)	4.180	4.160	4.140
26dB BW (MHz)	4.680	4.680	4.680

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
99% OBW (MHz)	4.160	4.160	4.180
26dB BW (MHz)	4.680	4.680	4.680

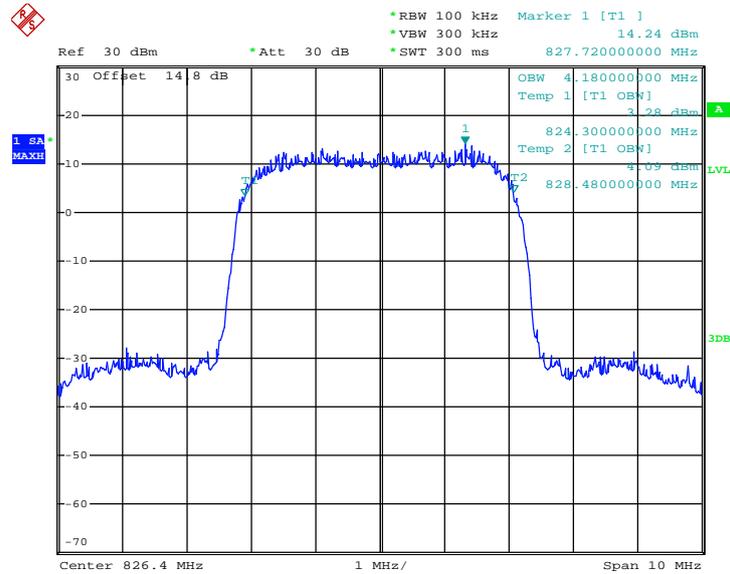
PCS Band			
Modes	WCDMA Band II (RMC 12.2Kbps)		
Channel	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1852.4	1880	1907.6
99% OBW (MHz)	4.180	4.180	4.180
26dB BW (MHz)	4.680	4.680	4.680



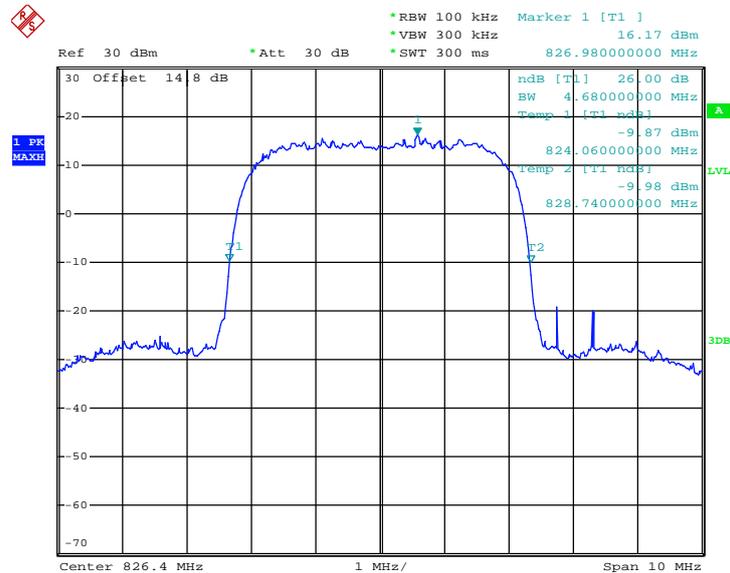
### 3.4.6 Test Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
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99% Occupied Bandwidth Plot on Channel 4132 (826.4 MHz)

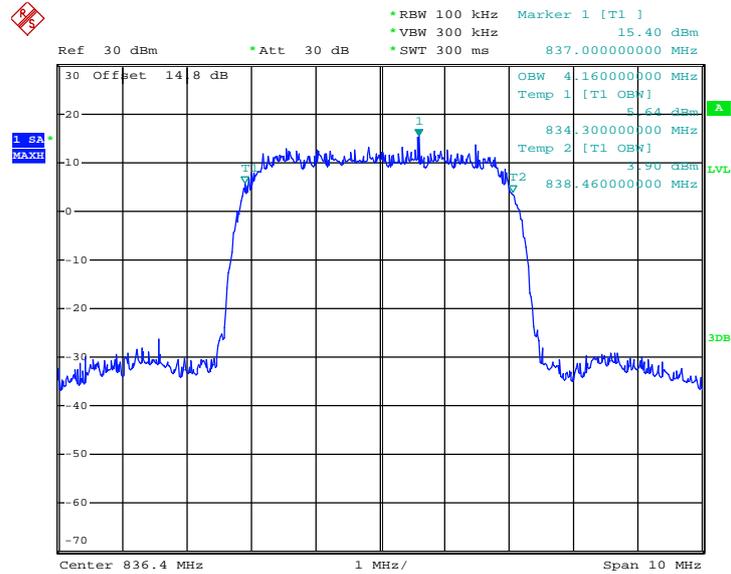


26dB Bandwidth Plot on Channel 4132 (826.4 MHz)

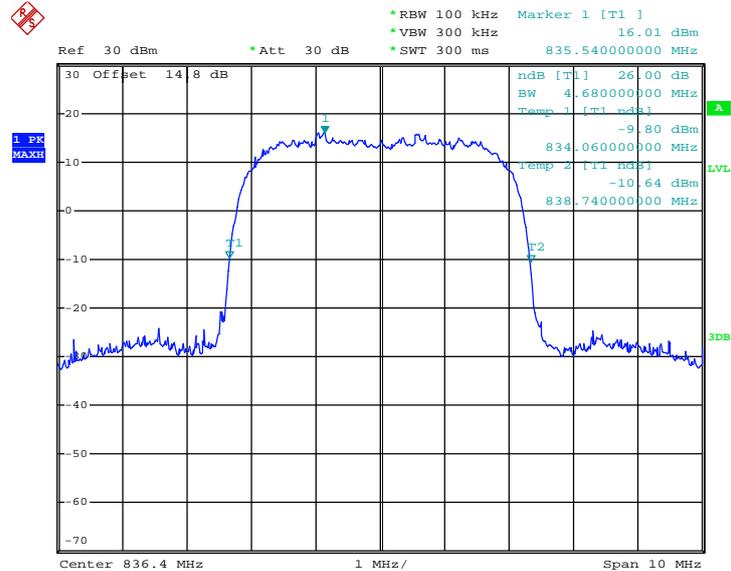




99% Occupied Bandwidth Plot on Channel 4182 (836.4 MHz)

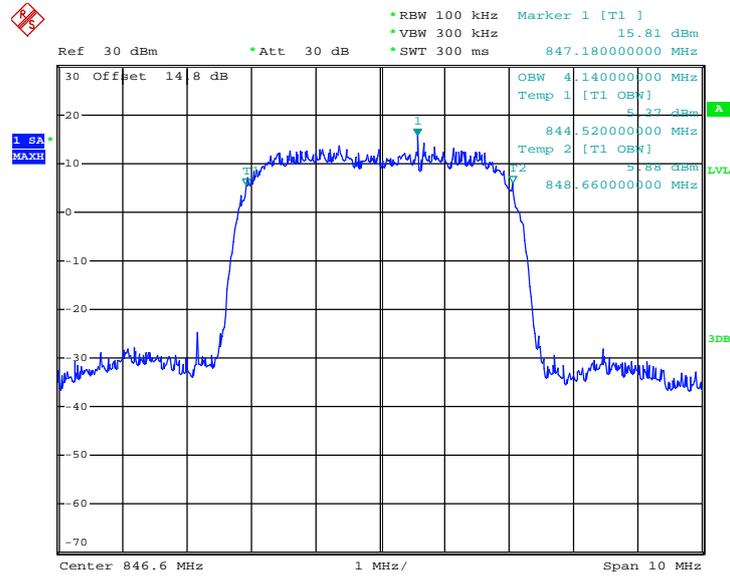


26dB Bandwidth Plot on Channel 4182 (836.4 MHz)

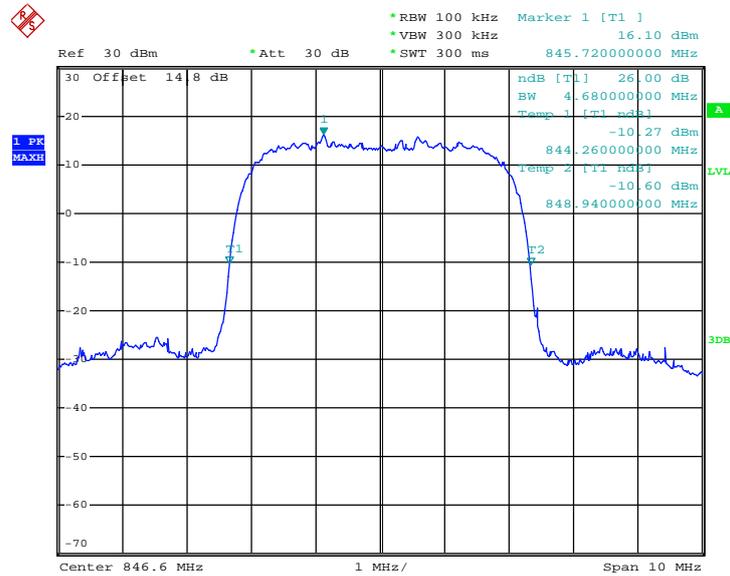




99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)



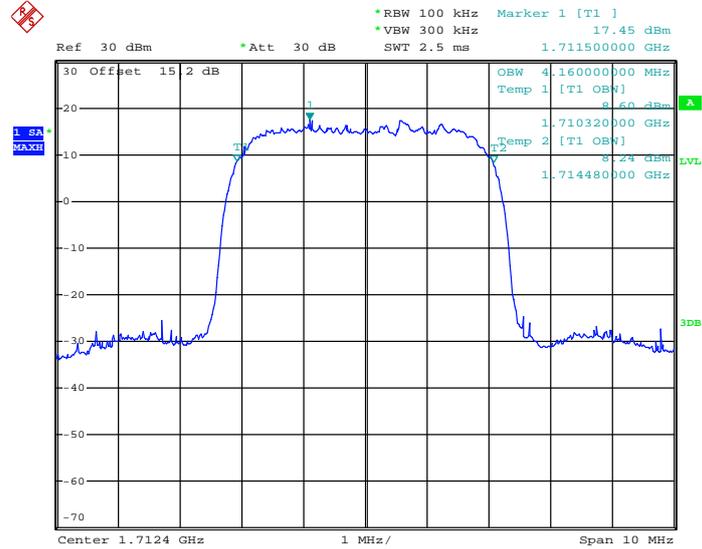
26dB Bandwidth Plot on Channel 4233 (846.6 MHz)



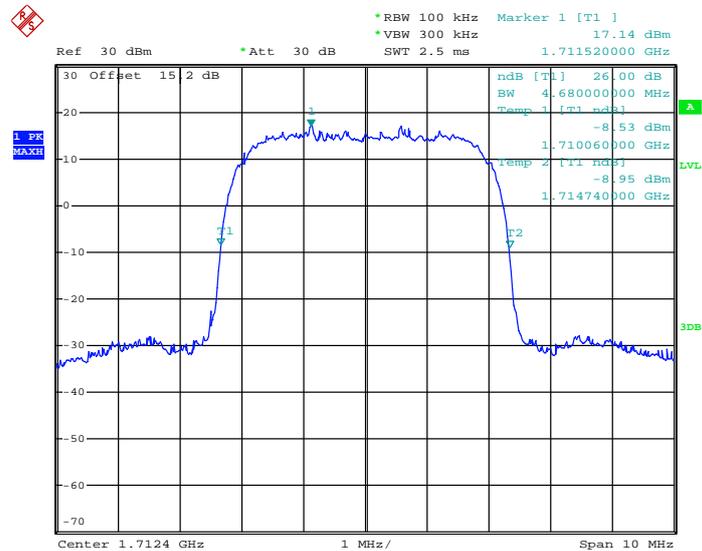


Band :	WCDMA Band IV	Test Mode :	RMC 12.2Kbps Link (QPSK)
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99% Occupied Bandwidth Plot on Channel 1312 (1712.4 MHz)

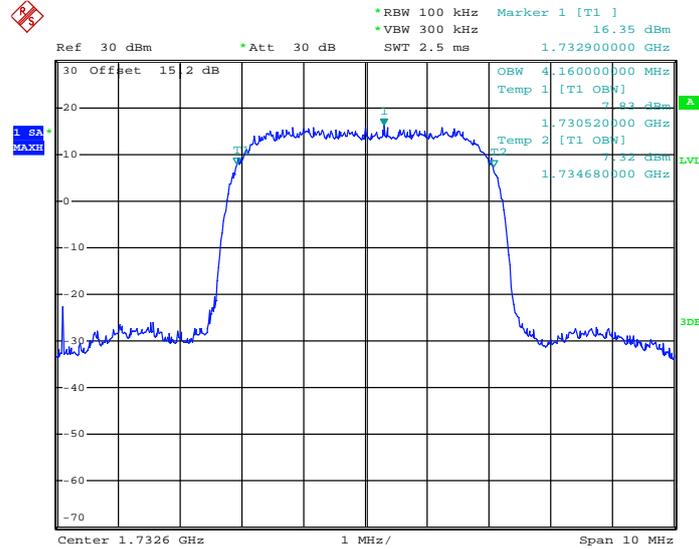


26dB Bandwidth Plot on Channel 1312 (1712.4 MHz)

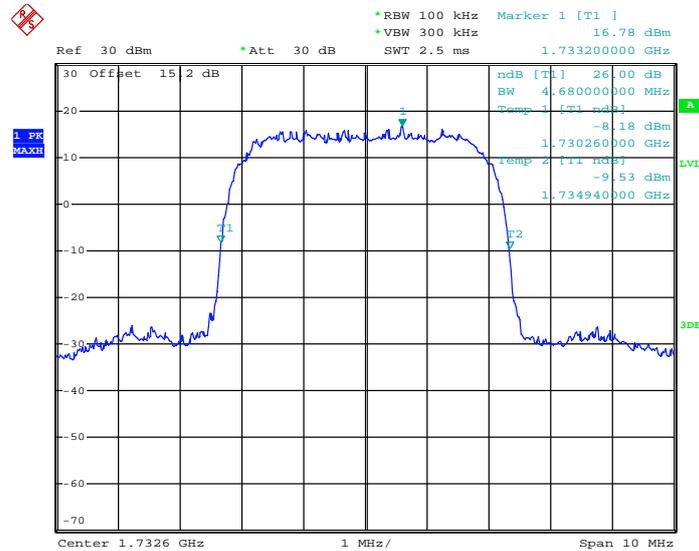




99% Occupied Bandwidth Plot on Channel 1413 (1732.6 MHz)

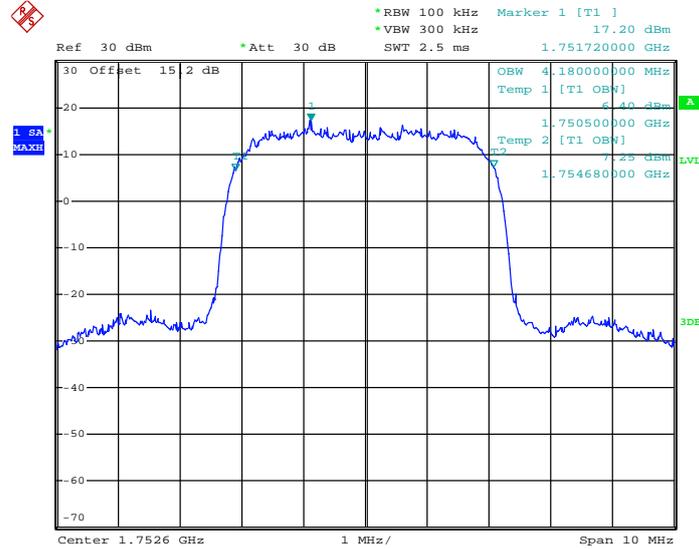


26dB Bandwidth Plot on Channel 1413 (1732.6 MHz)

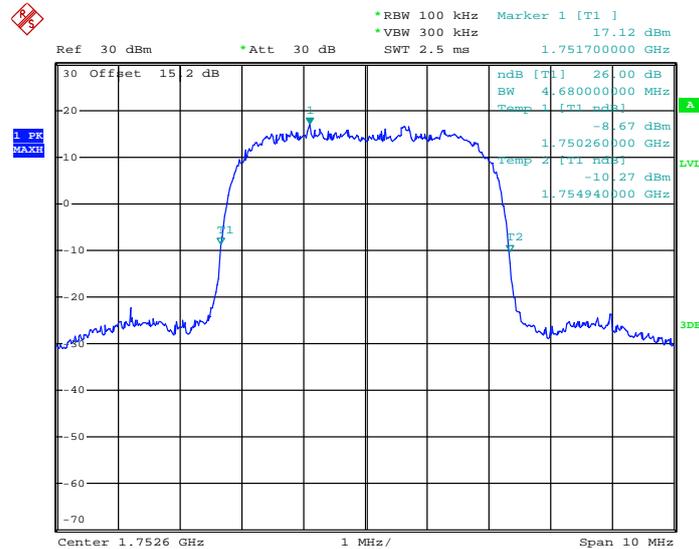




99% Occupied Bandwidth Plot on Channel 1513 (1752.6 MHz)



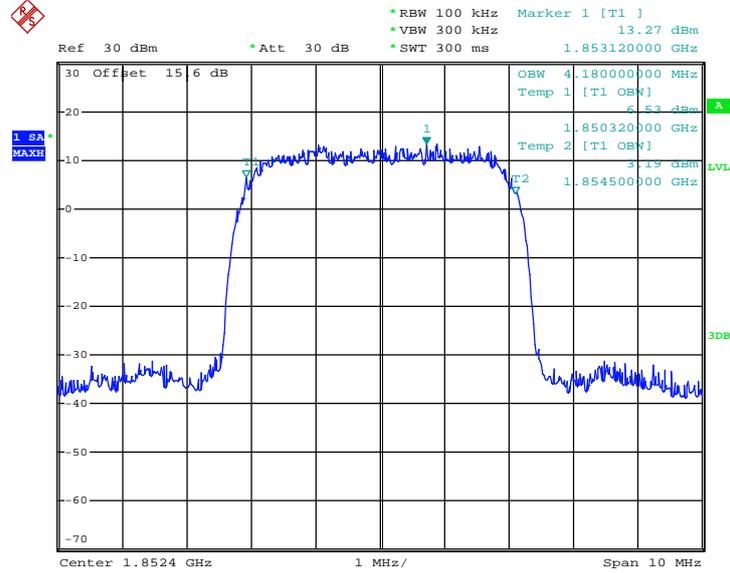
26dB Bandwidth Plot on Channel 1513 (1752.6 MHz)



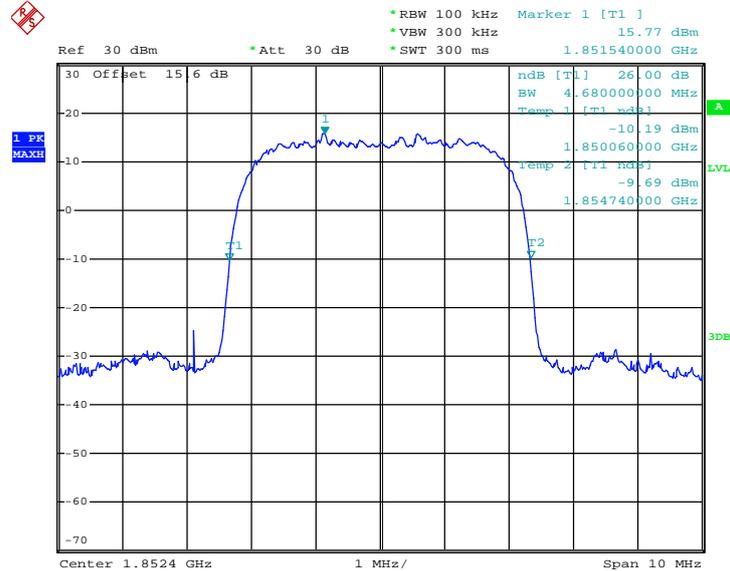


Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
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99% Occupied Bandwidth Plot on Channel 9262 (1852.4 MHz)

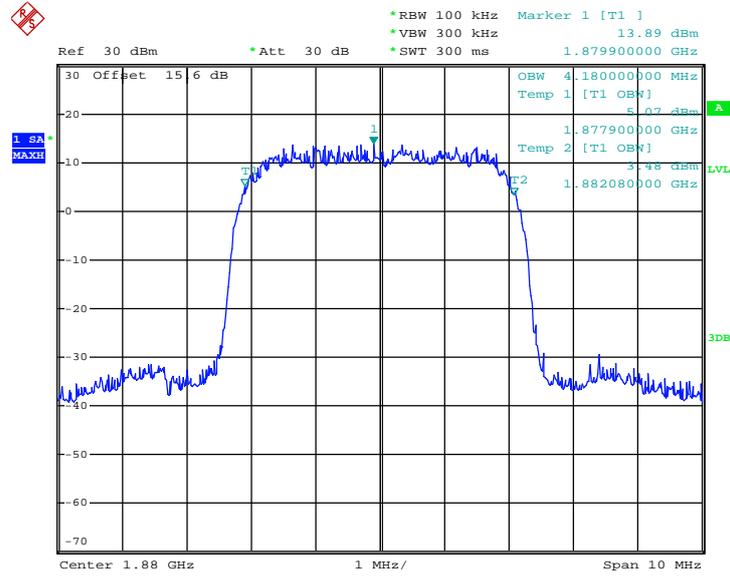


26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)

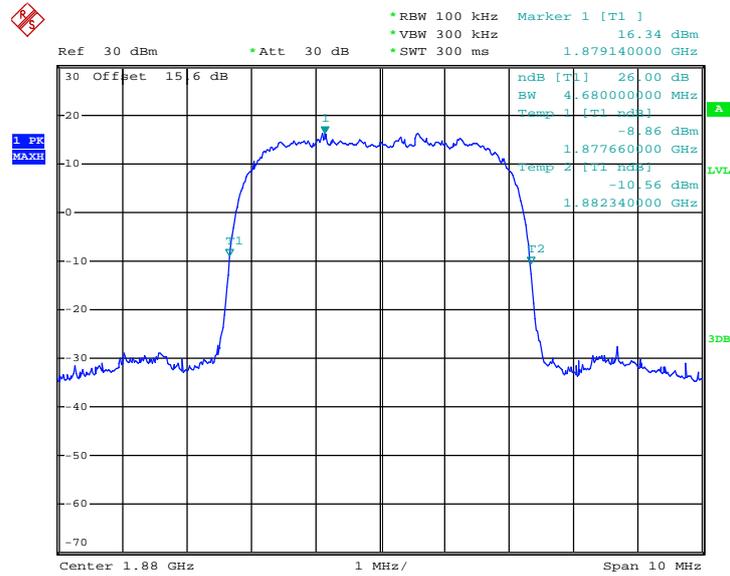




### 99% Occupied Bandwidth Plot on Channel 9400 (1880.0 MHz)

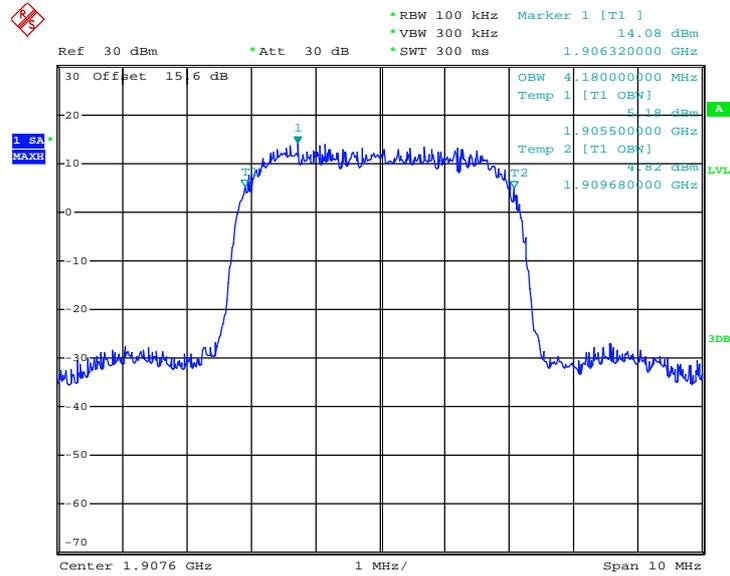


### 26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)

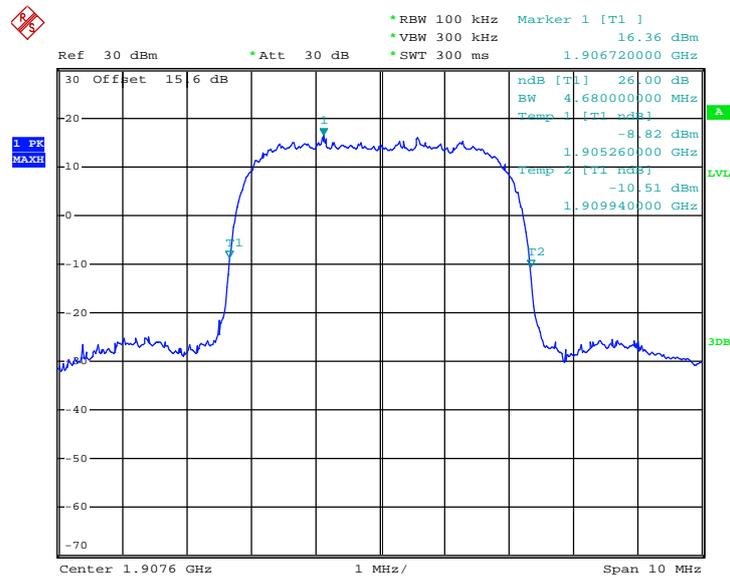




99% Occupied Bandwidth Plot on Channel 9538 (1907.6 MHz)



26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)



## 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.

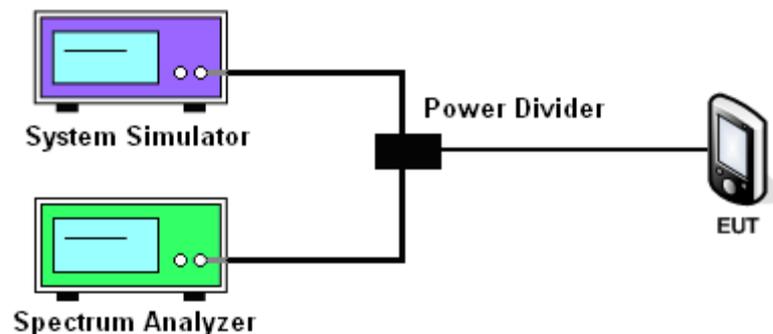
### 3.5.2 Measuring Instruments

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 RF output of 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 band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly  $BW/100$ .
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$   
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$   
 $= -13\text{dBm}.$

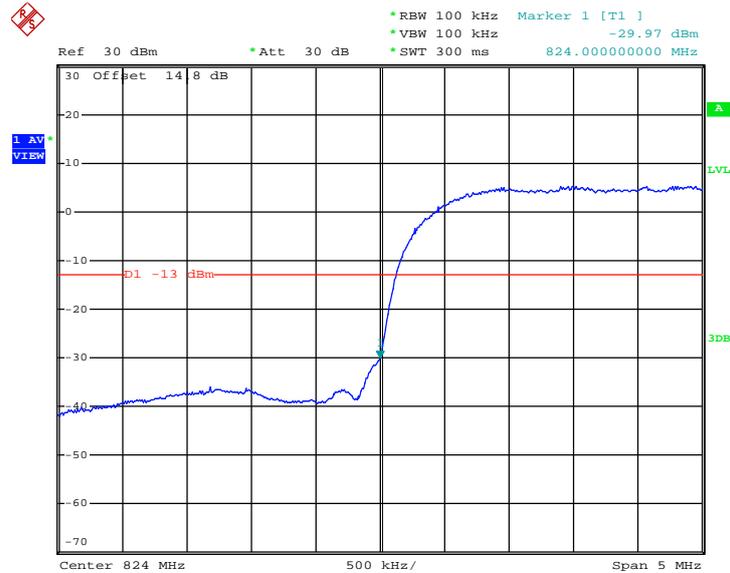
### 3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-33.27dBm	Measurement Value :	-29.97dBm

Lower Band Edge Plot on Channel 4132 (826.4 MHz)

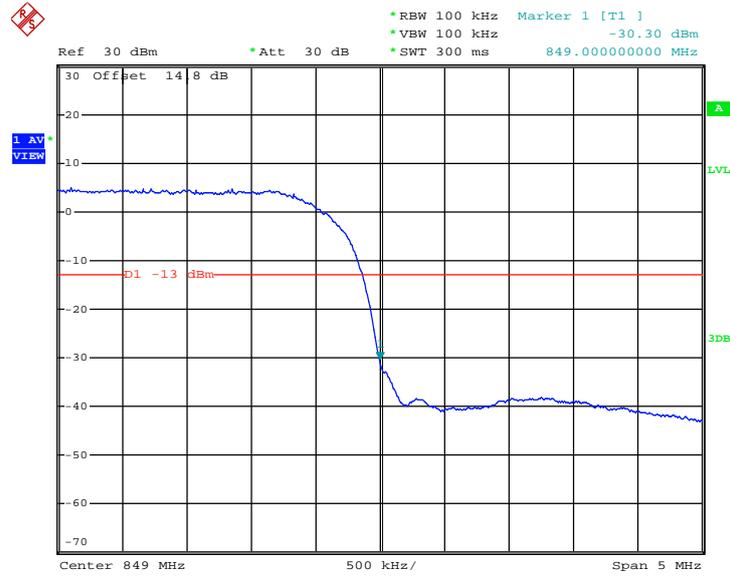


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)



Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-33.60dBm	Measurement Value :	-30.30dBm

Higher Band Edge Plot on Channel 4233 (846.6 MHz)

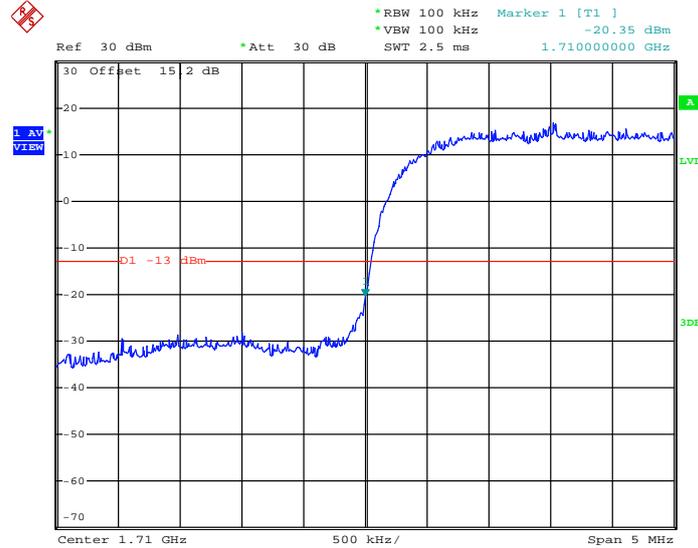


1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)



Band :	WCDMA Band IV	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-23.65dBm	Measurement Value :	-20.35dBm

Lower Band Edge Plot on Channel 1312 (1712.4 MHz)

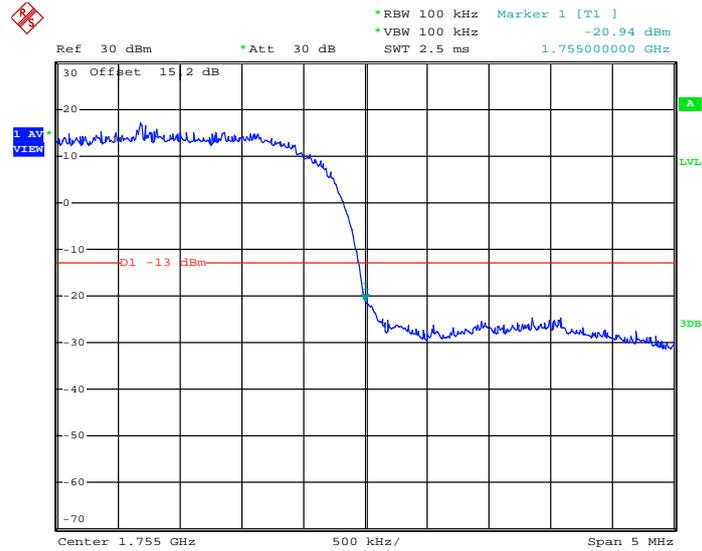


- 1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
- 2. Band Edge= Measurement Value + Correction Factor(dB)



<b>Band :</b>	WCDMA Band IV	<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)
<b>Correction Factor :</b>	-3.30dB	<b>Maximum 26dB Bandwidth :</b>	4.680MHz
<b>Band Edge :</b>	-24.24dBm	<b>Measurement Value :</b>	-20.94dBm

Higher Band Edge Plot on Channel 1513 (1752.6 MHz)

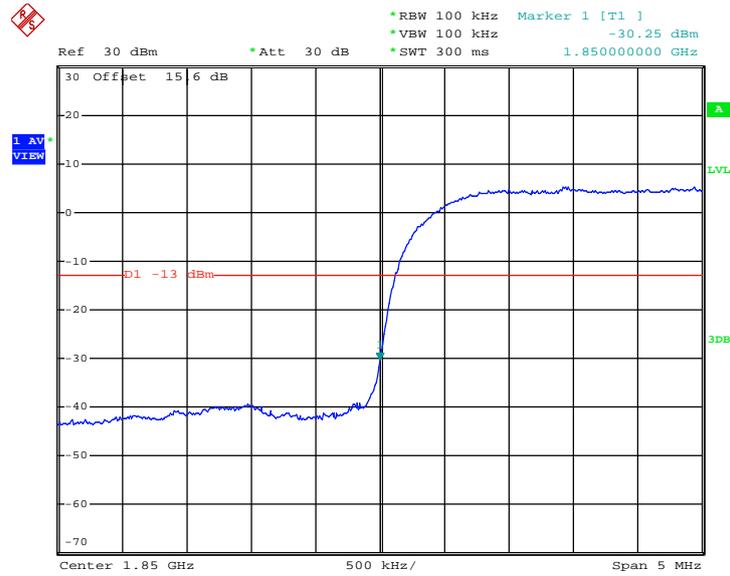


1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)



Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-33.55dBm	Measurement Value :	-30.25dBm

Lower Band Edge Plot on Channel 9262 (1852.4 MHz)

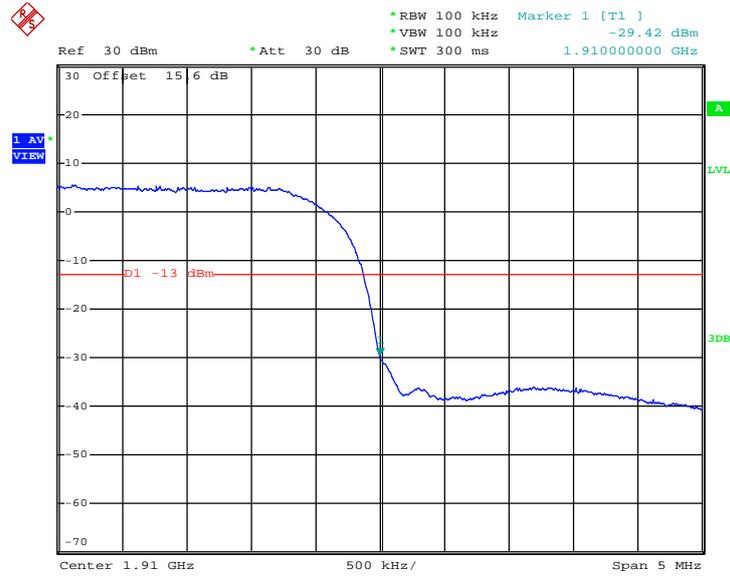


1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)



Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-32.72dBm	Measurement Value :	-29.42dBm

Higher Band Edge Plot on Channel 9538 (1907.6 MHz)



1. Correction Factor(dB)=  $10\log(1\% \text{ Emission BW}/\text{RBW})$
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 10<sup>th</sup> harmonic.

#### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

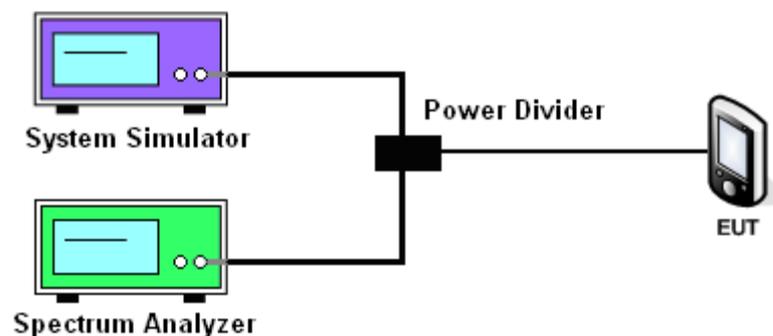
#### 3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of 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 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  $43 + 10\log(P)$  dB below the transmitter power P(Watts)
 
$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm}.$$

#### 3.6.4 Test Setup

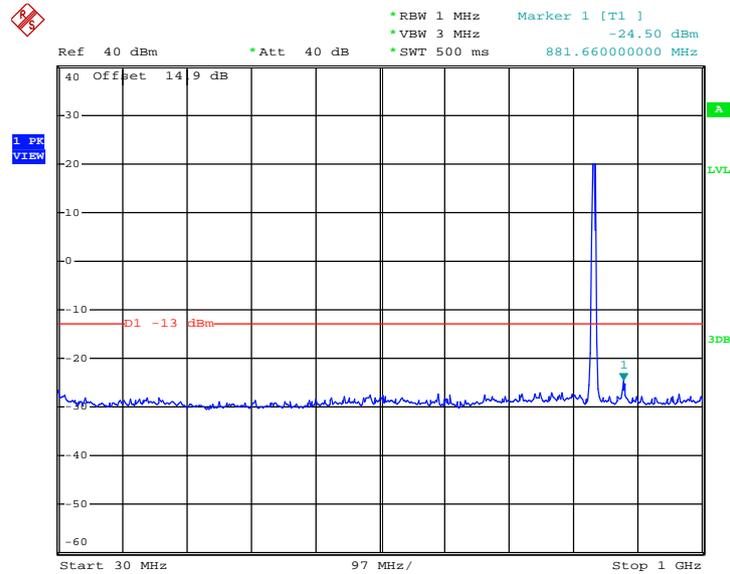




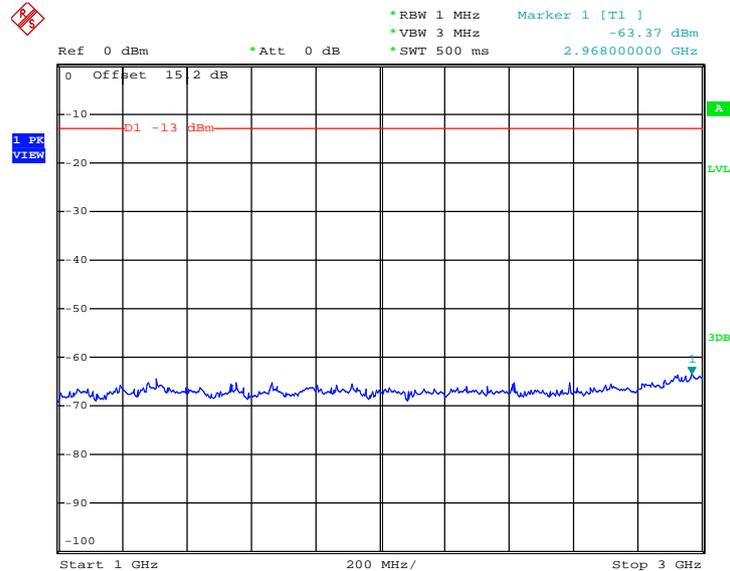
### 3.6.5 Test Result (Plots) of Conducted Emission

Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz

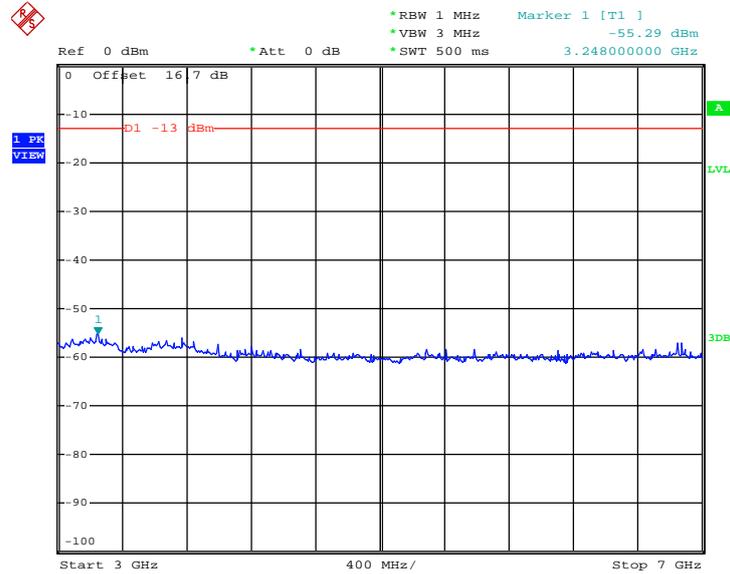


Conducted Spurious Emission Plot between 1GHz ~ 3GHz

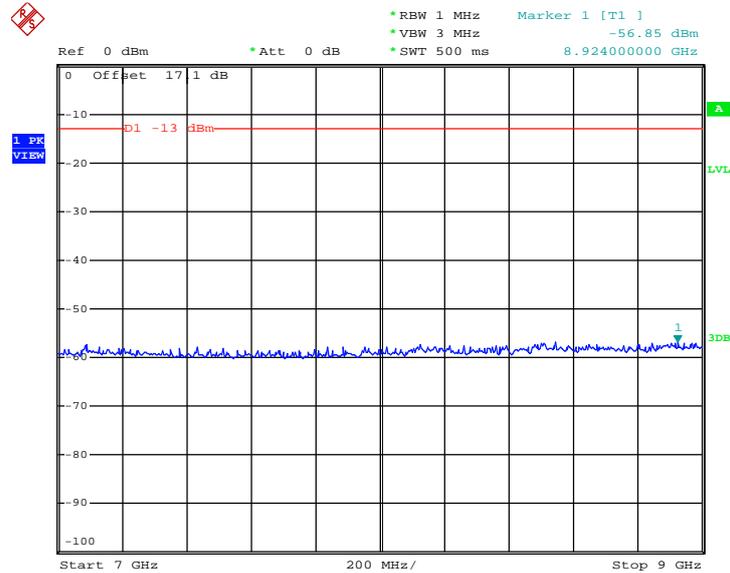




### Conducted Spurious Emission Plot between 3GHz ~ 7GHz



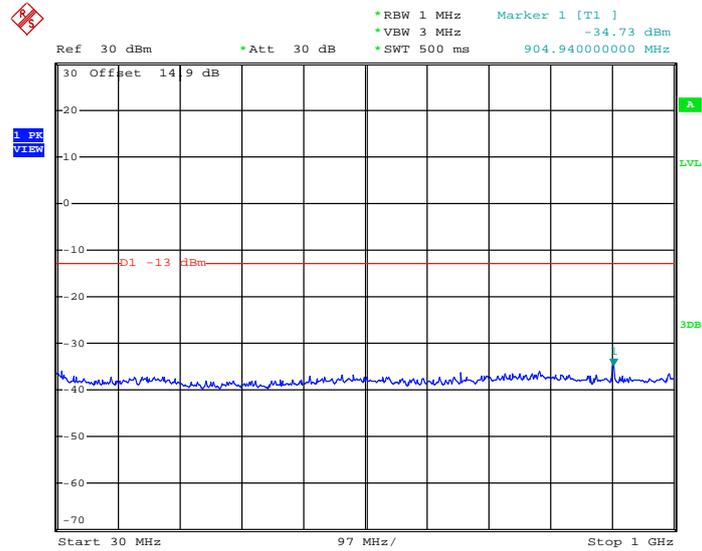
### Conducted Spurious Emission Plot between 7GHz ~ 9GHz



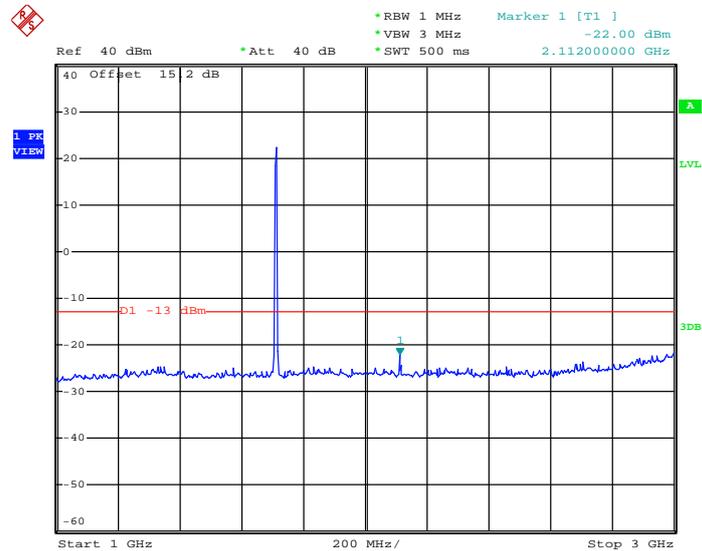


Band :	WCDMA Band IV	Channel :	CH1413
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	1732.6 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz

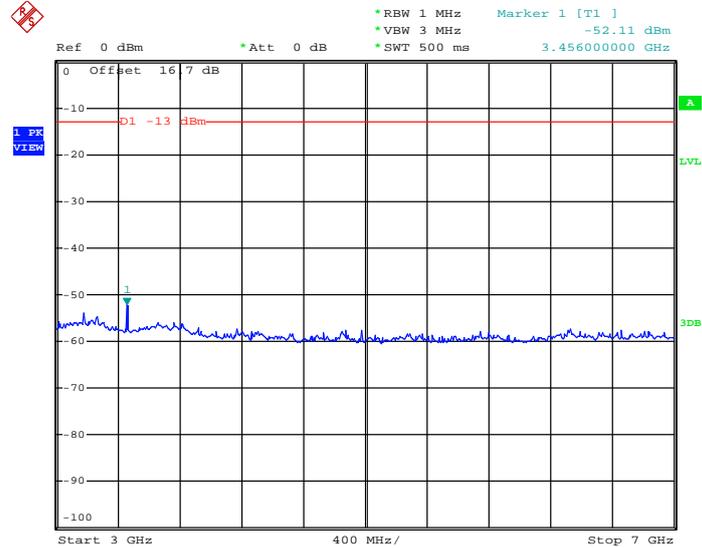


Conducted Spurious Emission Plot between 1GHz ~ 3GHz

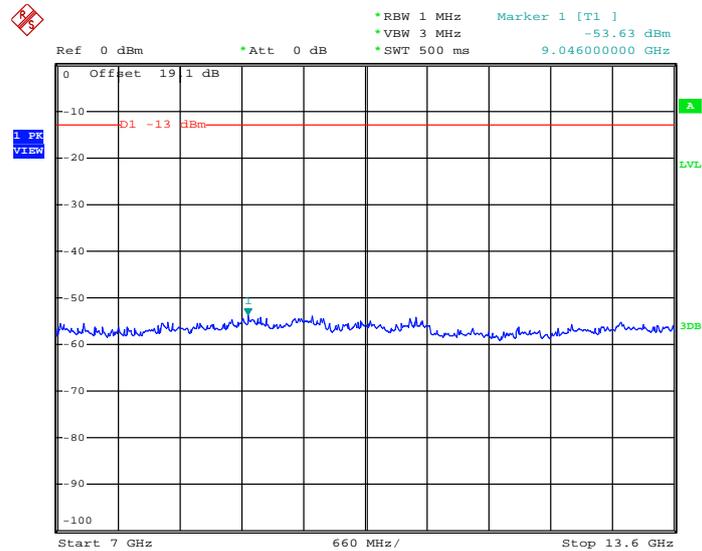




### Conducted Spurious Emission Plot between 3GHz ~ 7GHz

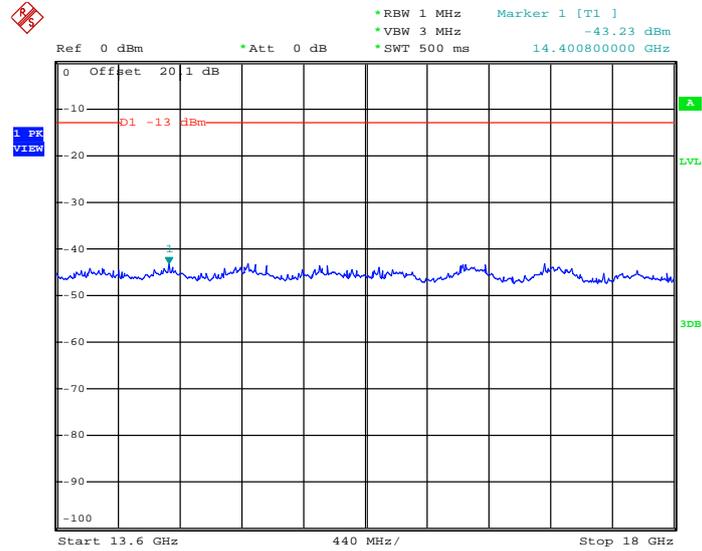


### Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz





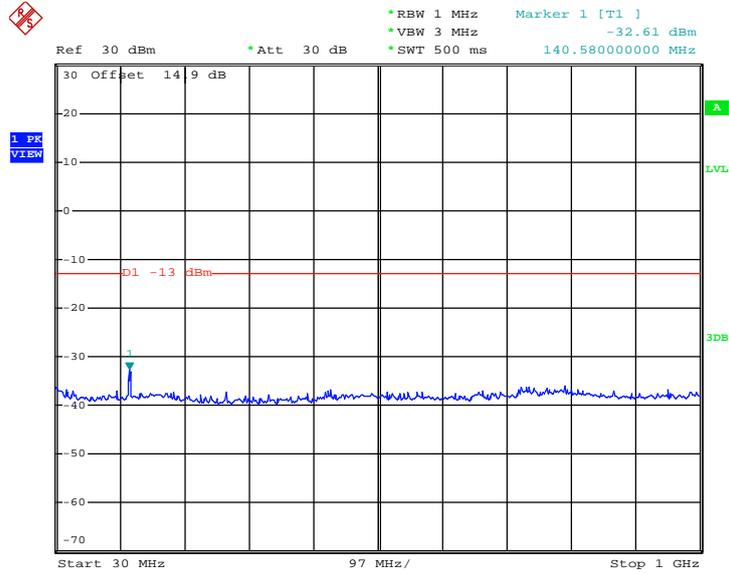
Conducted Spurious Emission Plot between 13.6GHz ~ 18GHz



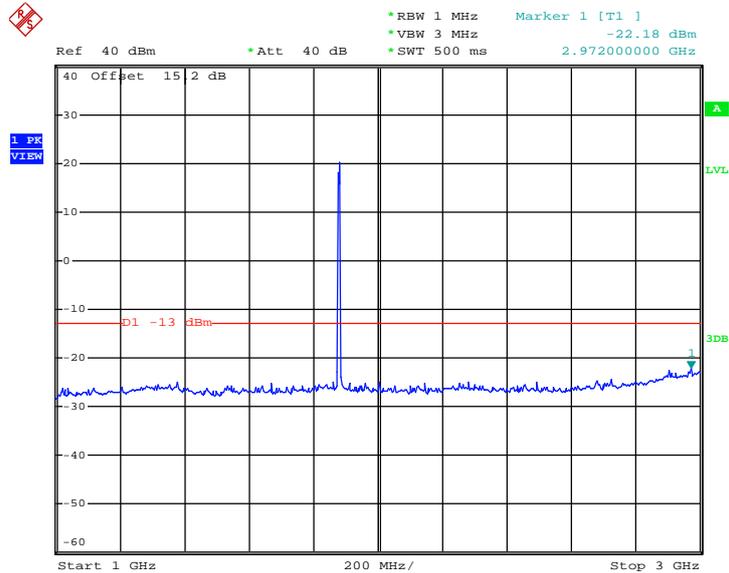


Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz

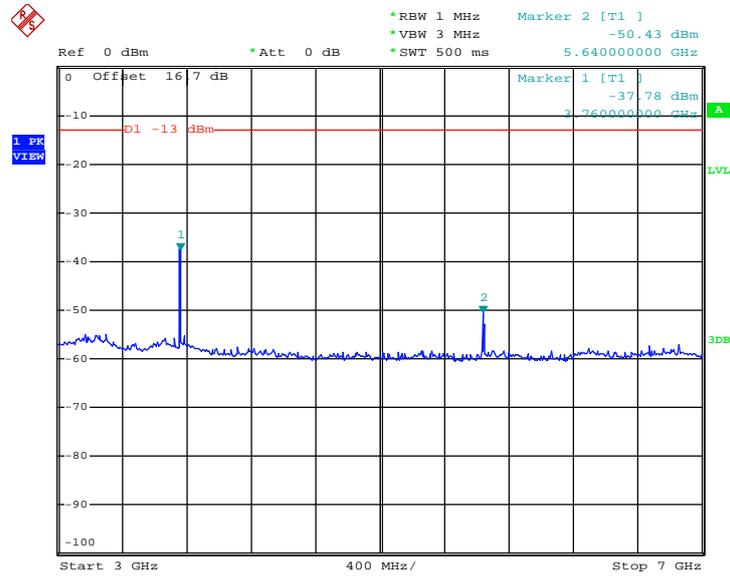


Conducted Spurious Emission Plot between 1GHz ~ 3GHz

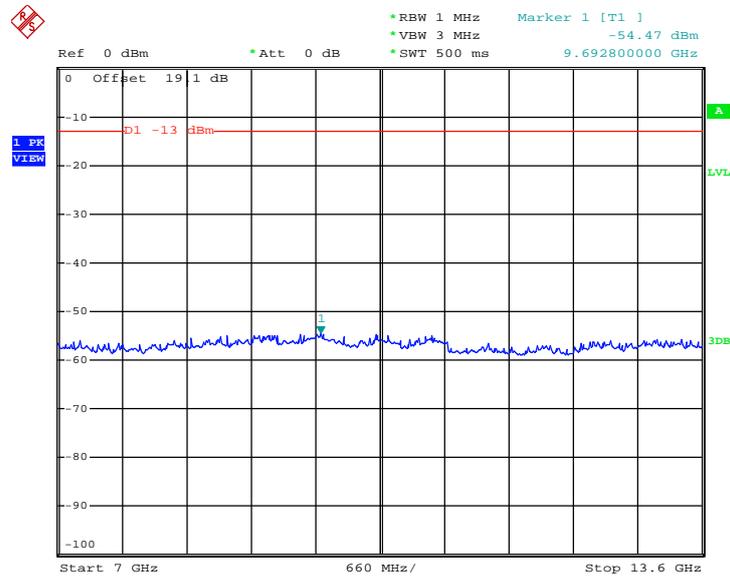




### Conducted Spurious Emission Plot between 3GHz ~ 7GHz

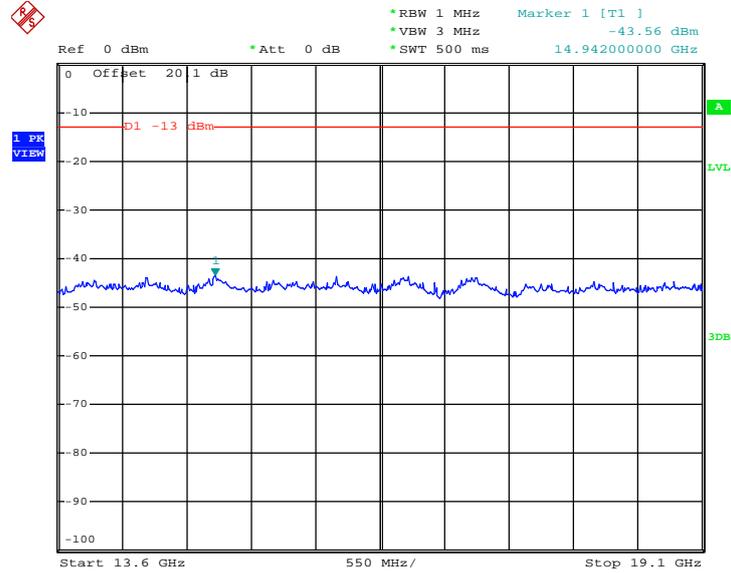


### Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz





Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz





### 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

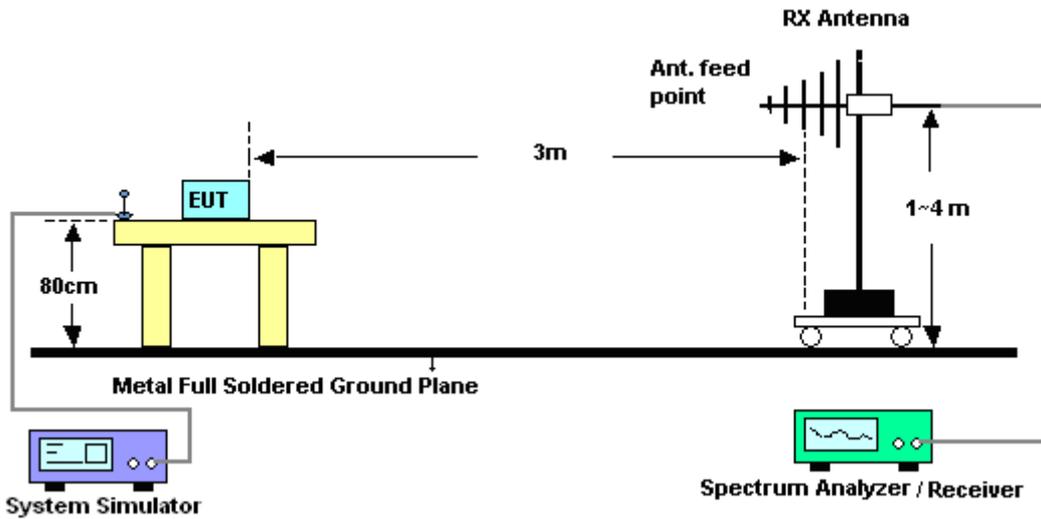
See list of measuring instruments of this test report.

#### 3.7.3 Test Procedures

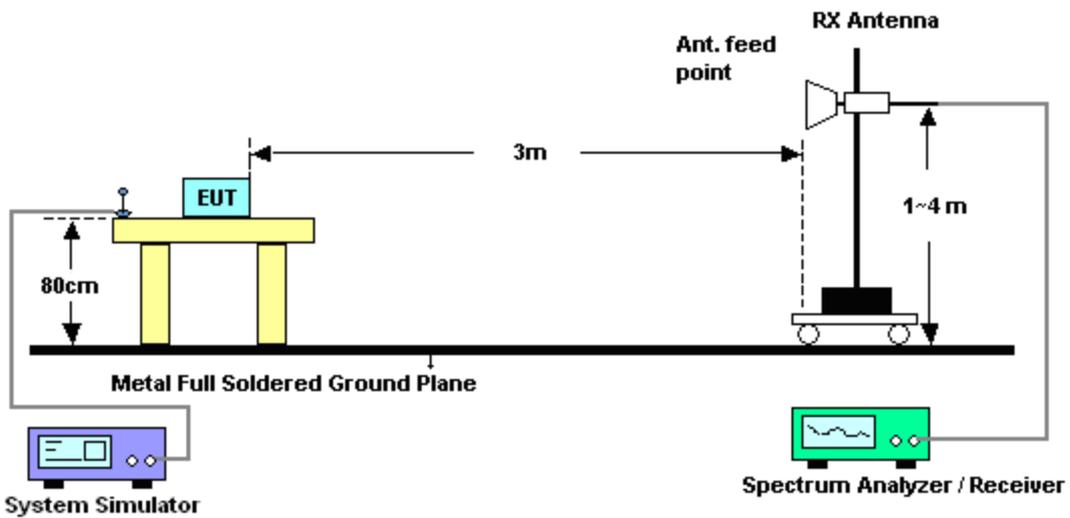
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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, 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.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11.  $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$   
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$   
 $= -13\text{dBm}.$

### 3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



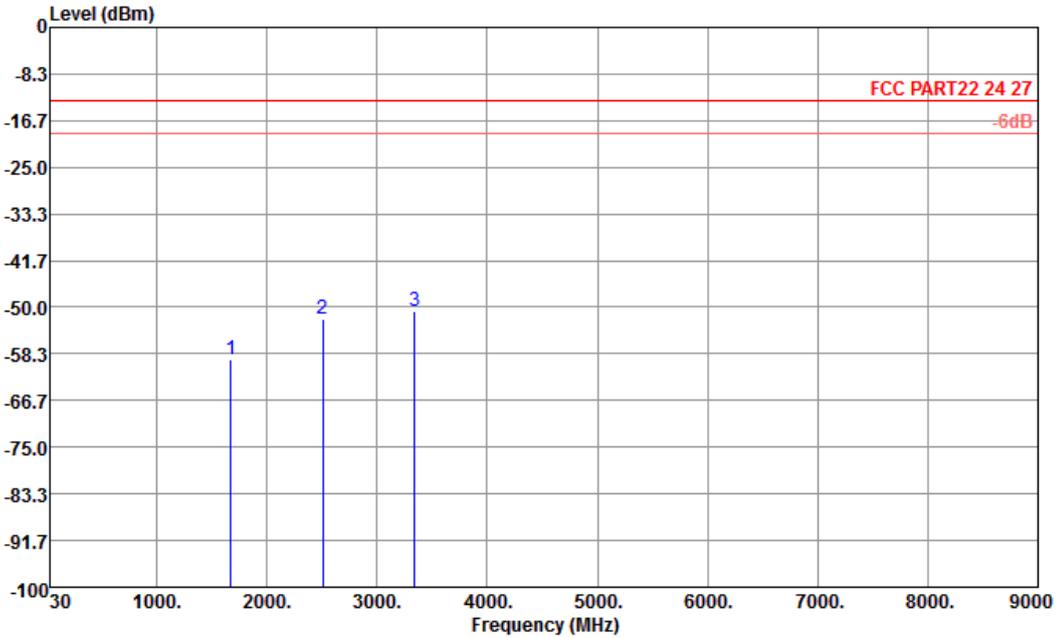
For radiated emissions above 1GHz





3.7.5 Test Result of Field Strength of Spurious Radiated

<b>Band :</b>	WCDMA Band V	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



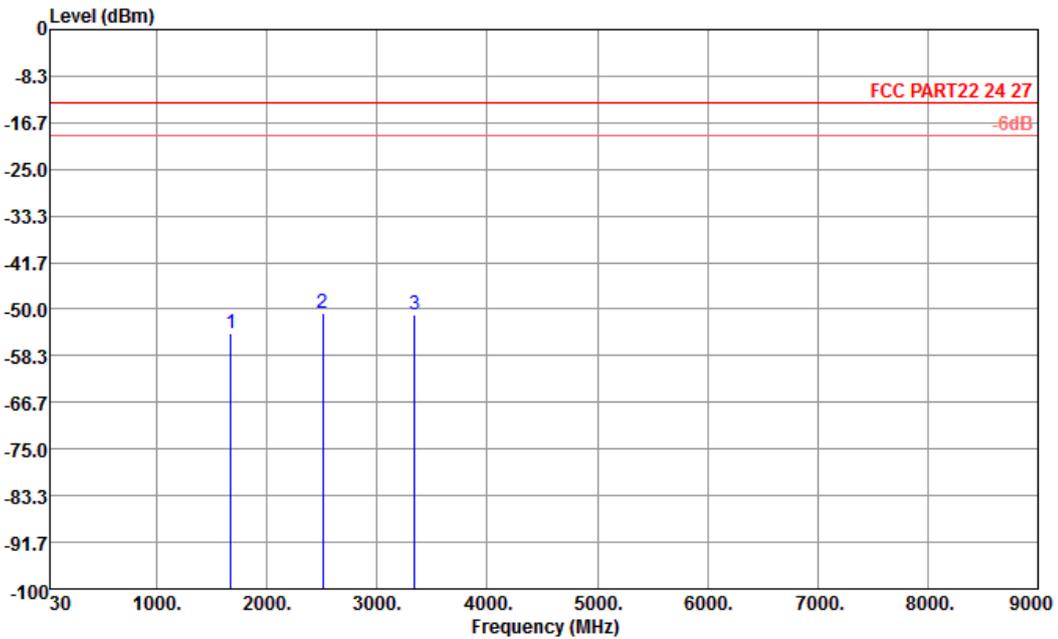
Site : 03CH01-KS  
 Condition : FCC PART22 24 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

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	-59.26	-13	-46.26	-62.40	-59.91	0.57	3.37	H	Pass
2509	-52.11	-13	-39.11	-63.13	-54.34	0.78	5.16	H	Pass
3344	-50.83	-13	-37.83	-63.72	-54.47	0.87	6.66	H	Pass



<b>Band :</b>	WCDMA Band V	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



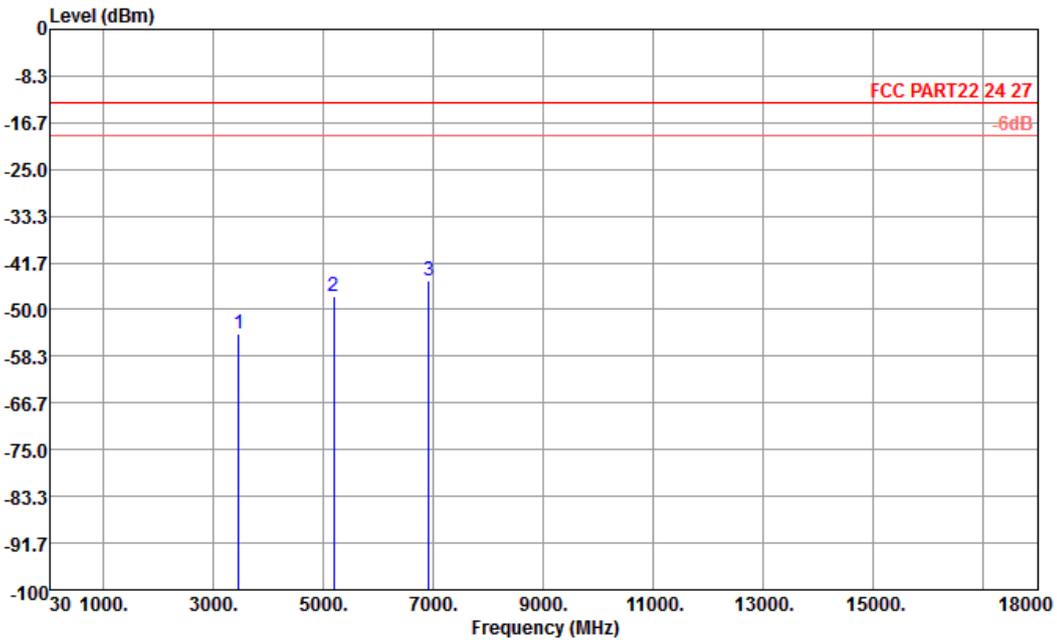
Site : 03CH01-KS  
 Condition : FCC PART22 24 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Y

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	-54.38	-13	-41.38	-60.29	-55.03	0.57	3.37	V	Pass
2508	-50.66	-13	-37.66	-63.16	-52.89	0.78	5.16	V	Pass
3344	-50.85	-13	-37.85	-65.09	-54.49	0.87	6.66	V	Pass



<b>Band :</b>	WCDMA Band IV	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



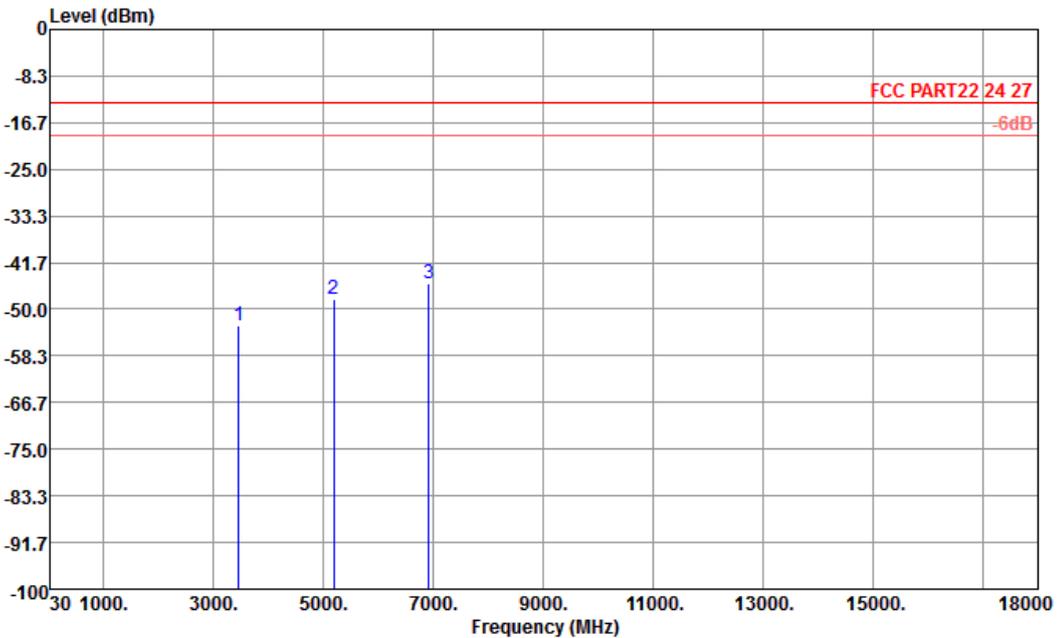
Site : 03CH01-KS  
 Condition : FCC PART22 24 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : X

Frequency ( MHz )	EIRP ( 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
3464	-54.37	-13	-41.37	-64.22	-59.77	2.2	7.60	H	Pass
5194	-47.70	-13	-34.70	-65.41	-54.48	3.12	9.90	H	Pass
6924	-44.79	-13	-31.79	-65.82	-52.68	2.98	10.87	H	Pass



<b>Band :</b>	WCDMA Band IV	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



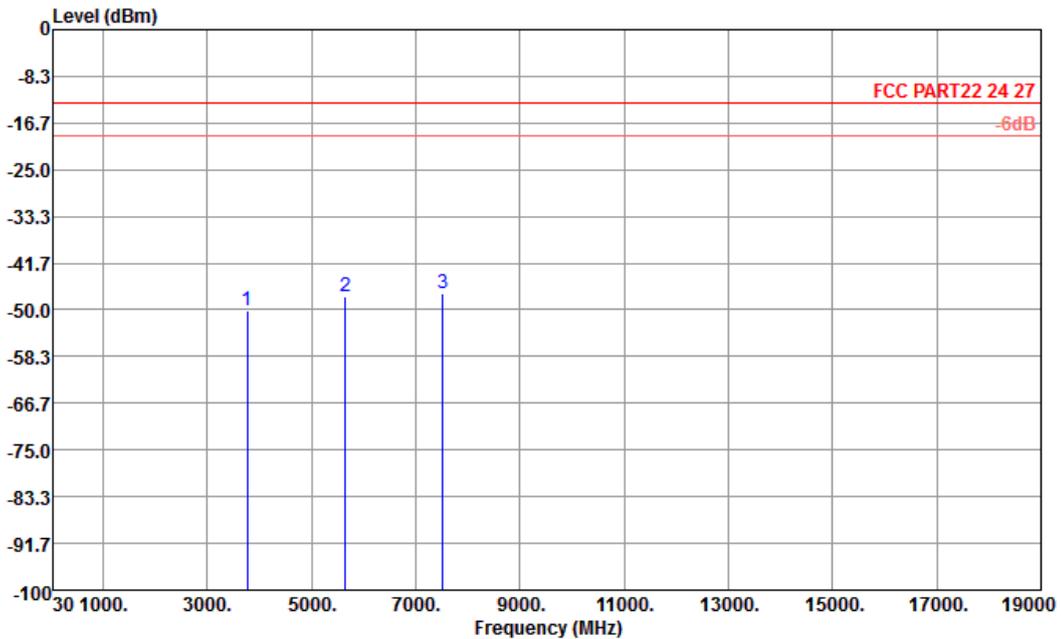
Site : 03CH01-KS  
 Condition : FCC PART22 24 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : X

Frequency ( MHz )	EIRP ( 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
3464	-52.81	-13	-39.81	-63.59	-58.21	2.2	7.6	V	Pass
5194	-48.31	-13	-35.31	-64.93	-55.09	3.12	9.9	V	Pass
6924	-45.54	-13	-32.54	-65.46	-53.43	2.98	10.87	V	Pass



<b>Band :</b>	WCDMA Band II	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



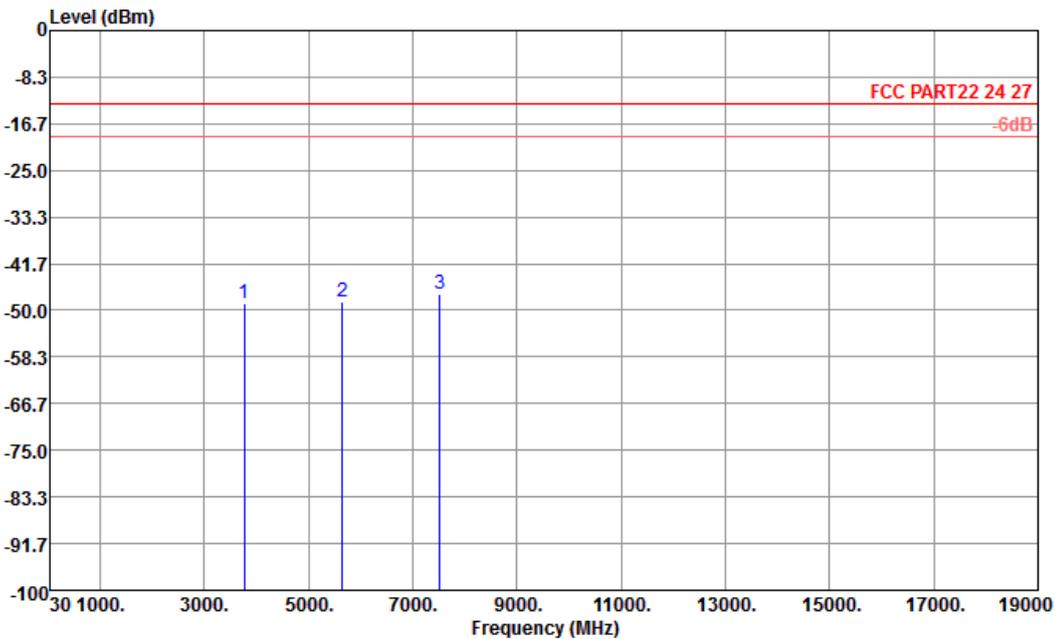
Site : 03CH01-KS  
 Condition : FCC PART22 24 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : X

Frequency ( MHz )	EIRP ( 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	-50.27	-13	-37.27	-65.26	-56.65	0.78	7.16	H	Pass
5640	-47.65	-13	-34.65	-65.94	-56.19	1.04	9.58	H	Pass
7520	-47.07	-13	-34.07	-65.46	-57.18	1.35	11.46	H	Pass



<b>Band :</b>	WCDMA Band II	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	RMC 12.2Kbps Link (QPSK)	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS  
 Condition : FCC PART22 24 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : X

Frequency ( MHz )	EIRP ( 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	-48.72	-13	-35.72	-64.23	-55.10	0.78	7.16	V	Pass
5640	-48.45	-13	-35.45	-65.8	-56.99	1.04	9.58	V	Pass
7520	-47.17	-13	-34.17	-64.63	-57.28	1.35	11.46	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  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

### 3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

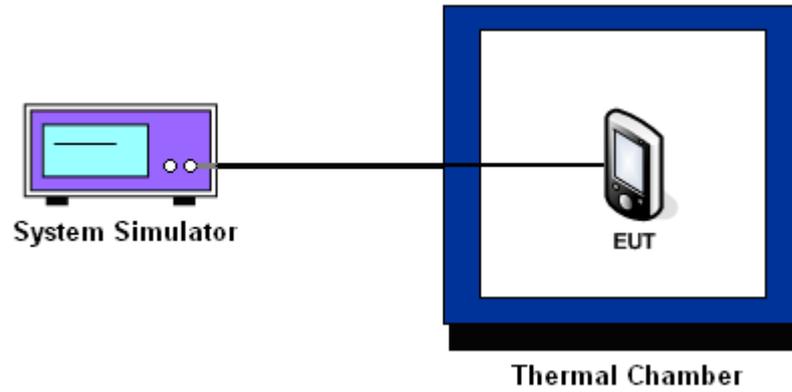
### 3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  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  $10^{\circ}\text{C}$  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.

### 3.8.4 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.

### 3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	WCDMA Band V	Channel :	4182
Limit (ppm) :	2.5	Frequency :	836.4 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-42	-0.05	PASS
-20	-31	-0.04	
-10	-16	-0.02	
0	-8	-0.01	
10	16	+0.02	
20	-11	-0.01	
30	-20	-0.02	
40	-29	-0.03	
50	-35	-0.04	

Band :	WCDMA Band IV	Channel :	1413
Limit (ppm) :	2.5	Frequency :	1732.6 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-49	-0.03	PASS
-20	-46	-0.03	
-10	-38	-0.02	
0	40	+0.02	
10	36	+0.02	
20	-32	-0.02	
30	-28	-0.02	
40	-33	-0.02	
50	38	+0.02	



Band :	WCDMA Band II	Channel :	9400
Limit (ppm) :	2.5	Frequency :	836.4 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-45	-0.02	PASS
-20	-34	-0.02	
-10	-21	-0.01	
0	-11	-0.01	
10	13	+0.01	
20	-15	-0.01	
30	-23	-0.01	
40	-34	-0.02	
50	-39	-0.02	

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
WCDMA Band V CH4182	RMC 12.2Kbps	3.7	-13	-0.02	2.5	Pass
		BEP	-8	-0.01		
		4.2	12	+0.01		
WCDMA Band IV CH1413	RMC 12.2Kbps	3.7	44	+0.03		
		BEP	46	+0.03		
		4.2	-30	-0.02		
WCDMA Band II CH9400	RMC 12.2Kbps	3.7	-12	-0.01		
		BEP	11	+0.01		
		4.2	-14	-0.01		

Note:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.5 V.



## 4 List of Measuring Equipments

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	Nov. 19, 2013~ Nov. 20, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	N/A	Feb. 28, 2013	Nov. 19, 2013~ Nov. 20, 2013	Feb. 27, 2014	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	N/A	Feb. 28, 2013	Nov. 19, 2013~ Nov. 20, 2013	Feb. 27, 2014	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Nov. 19, 2013~ Nov. 20, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 07, 2013	Nov. 20, 2013	Nov. 06, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 23, 2013	Nov. 20, 2013	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Nov. 20, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	75959	1GHz~18GHz	Dec. 07, 2012	Nov. 20, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	May 23, 2013	Nov. 20, 2013	May 22, 2014	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Nov. 20, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2013	Nov. 20, 2013	Nov. 06, 2014	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Nov. 23, 2012	Nov. 20, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0 ~ 360 degree	N/A	Nov. 20, 2013	N/A	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m - 4 m	N/A	Nov. 20, 2013	N/A	Radiation (03CH01-KS)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP 7	100819	9kHz~7GHz	May 23, 2013	Nov. 19, 2013~ Nov. 20, 2013	May 22, 2014	ERP/EIRP (OTA01-KS)
Switch Control Manframe	Agilent	3499A	MY420054 52	N/A	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Dual 1-to-6(4) MW MUX	Agilent	N2276A	MY420008 41	N/A	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY420025 73	N/A	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY420025 86	N/A	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Diagonal Dual Polarized Horn	ETS-Lindgren	3164-04	00066993	700MHz~6GHz	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00066604	N/A	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Conical Log Spiral (Small)	ETS-Lindgren	3102	00066951	1~10GHz	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Turn Table	ETS-Lindgren	2088	N/A	Resolution : 0.1degree	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Limiting Amplifier	ETS-lindgren	109643	920326	10M~2.5GHz	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
EMQuest	ETS-Lindgren	EMQ-100	1125	N/A	N/A	Nov. 19, 2013~ Nov. 20, 2013	N/A	ERP/EIRP (OTA01-KS)
Medium Duty Holder	ETS-Lindgren	2015	N/A	N/A	N/A	Nov. 19, 2013~ Nov. 20, 2013	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% ( $U = 2Uc(y)$ )	2.54
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