FCC RF Test Report

Equipment	: UMTS Femtocell Access Point
Brand Name	: Alcatel-Lucent, NOKIA
Model No.	: 9362 Enterprise Cell V2.2 WCDMA B2/B5 Int 9362 Enterprise Cell V2.2 WCDMA B2/B5 Ext
FCC ID	: ZMYV22DBWCDMA
Standard	: 47 CFR Part2, 22(H), 24(E)
Applicant	: MitraStar Technology Corporation No. 6, Innovation Rd II, Science-Based Industrial, Hsin-Chu, Taiwan
Manufacturer (1)	: MitraStar Technology Corporation No. 6, Innovation Rd II, Hsinchu Science Park, Hsinchu 30076, Taiwan
Manufacturer (2)	: WuXi MitraStar Technology Co. Ltd 60#-E, Minshan Road, Wuxi New district Jangsu, P.R.C.

The product sample received on Jan. 19, 2016 and completely tested on Mar. 30, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures give in ANSI/TIA-603-D (2010) and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Sam Chen
SPORTON INTERNATIONAL INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG612817	Rev. 01	Initial issue of report	Apr. 29, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1046	Conducted Output Power	N/A	PASS	-
	22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
	24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.2	24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	-
3.3	2.1049 22.917(b) 24.238(b)	Occupied Bandwidth	N/A	PASS	-
3.4	2.1051 22.917(a) 24.238(a)	Band Edge Measurement	$<43+10\log_{10}(P[Watts])$	PASS	-
3.5	2.1051 22.917(a) 24.238(a)	Conducted Emission	$<43+10\log_{10}(P[Watts])$	PASS	-
3.6	2.1053 22.917(a) 24.238(a)	Field Strength of Spurious Radiation	$<43+10\log_{10}(P[Watts])$	PASS	Under limit 18.76 dB at 3920.10 MHz
3.7	2.1055 22.355	Frequency Stability for Temperature & Voltage	<2.5ppm for Part 22 within authorized band	PASS	-
	2.1055 24.235				

1 General Description

1.1 Product Feature of Equipment Under Test

Items	Description
Power Type	From power adapter
EUT supports Radios application	WCDMA

1.2 Product Specification subjective to this standard

Items	Description
Base Station Classes	☐ Macro Cell ☐ Micro Cell ☒ Picocell ☒ Femtocell
TX Frequency	WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz
RX Frequency	WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
Maximum Output Power to Antenna	For Picocell WCDMA Band V: 23.89 dBm WCDMA Band II: 24.18 dBm For Femtocell WCDMA Band V: 20.09 dBm WCDMA Band II: 20.11 dBm
99% Occupied Bandwidth	WCDMA Band V: 4.18 MHz WCDMA Band II: 4.177 MHz
Type of Modulation	WCDMA: QPSK,16-QAM,64-QAM

1.3 Antenna Information

Ant.	Brand	Part Number	Ant. Type	Connector	Gain (dBi)		Remark
					WCDMA Band V	WCDMA Band II	
1	Hong Lin	290-10379	PIFA	I-PEX	2.81	2.41	Internal Ant.
2	ARISTOTLE	RFA-09-C55-B93-427M	Dipole	SMA	1	4	External Ant.

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

For EUT 1 (Internal Ant.)

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (dBm)	Frequency Tolerance (ppm)	Emission Designator
Part 22	WCDMA Band V	QPSK	22.16	0.09982984	4M18F9W
		16QAM	21.83		4M15F9W
		64QAM	21.62		4M17F9W
Part 24	WCDMA Band II	QPSK	21.36	0.06427041	4M16F9W
		16QAM	23.17		4M18F9W
		64QAM	23.15		4M17F9W

For EUT 2 (External Ant.)

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (dBm)	Frequency Tolerance (ppm)	Emission Designator
Part 22	WCDMA Band V	QPSK	18.71	0.09982984	4M18F9W
		16QAM	18.89		4M15F9W
		64QAM	19.16		4M17F9W
Part 24	WCDMA Band II	QPSK	26.61	0.06427041	4M16F9W
		16QAM	26.91		4M18F9W
		64QAM	26.34		4M17F9W

1.5 Table for Multiple Listing

The EUT has two brand and model names which are identical to each other in all aspects except for the following table:

Brand Name	EUT	Model Name	Description
Alcatel-Lucent, NOKIA	EUT 1	9362 Enterprise Cell V2.2 WCDMA B2/B5 Int	Internal Antenna
	EUT 2	9362 Enterprise Cell V2.2 WCDMA B2/B5 Ext	External Antenna

Note: The difference brand name served as marketing strategy.

1.6 Accessories

Accessories				
No.	**Equipment Name**	**Brand Name**	**Model Name**	**Rating**
1	AC Power Adapter	LEADER	MU24-Y120200-A1	Input: 100-240 Vac, 0.7 A, Output: 12 Vdc, 2 A
Others				
LAN Cable*1: 2.0 meter, non-shielded, w/o ferrite core Wall-mounted rack*1				

1.7 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC

1.8 Applicable Standards

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

- 47 CFR Part2, 22(H), 24(E)
- ANSI/TIA-603-D (2010)
- FCC KDB 971168 D01 v02r02
- FCC KDB 412172 D01 v01r01

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

1.9 Testing Location

Testing Location					
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973			
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085			
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
RF Conducted		TH01-CB	Nick Peng	23°C / 67%	29-Jan-16 ~ 03-Mar-16
Radiated Emission		03CH01-CB	Nick Peng	23°C / 67%	29-Jan-16 ~ 30-Mar-16

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Test Item	Bandwidth (MHz)	Tested Frequency (MHz)	Mode
Conducted Output Power	5	B,M,T	QPSK,16-QAM,64-QAM
Peak-to-Average Ratio	5	B,M,T	QPSK,16-QAM,64-QAM
ERP and EIRP	5	B,M,T	QPSK,16-QAM,64-QAM
99% OBW and 26dB Bandwidth	5	B,M,T	QPSK,16-QAM,64-QAM
Band Edge	5	B,T	QPSK,16-QAM,64-QAM
Conducted Spurious Emission	5	B,M,T	QPSK,16-QAM,64-QAM
Field Strength of Spurious Radiation	5	B,M,T	QPSK
Frequency Stability	5	M	-

Note 1:

B: Bottom

M: Middle

T: Top

Note 2:

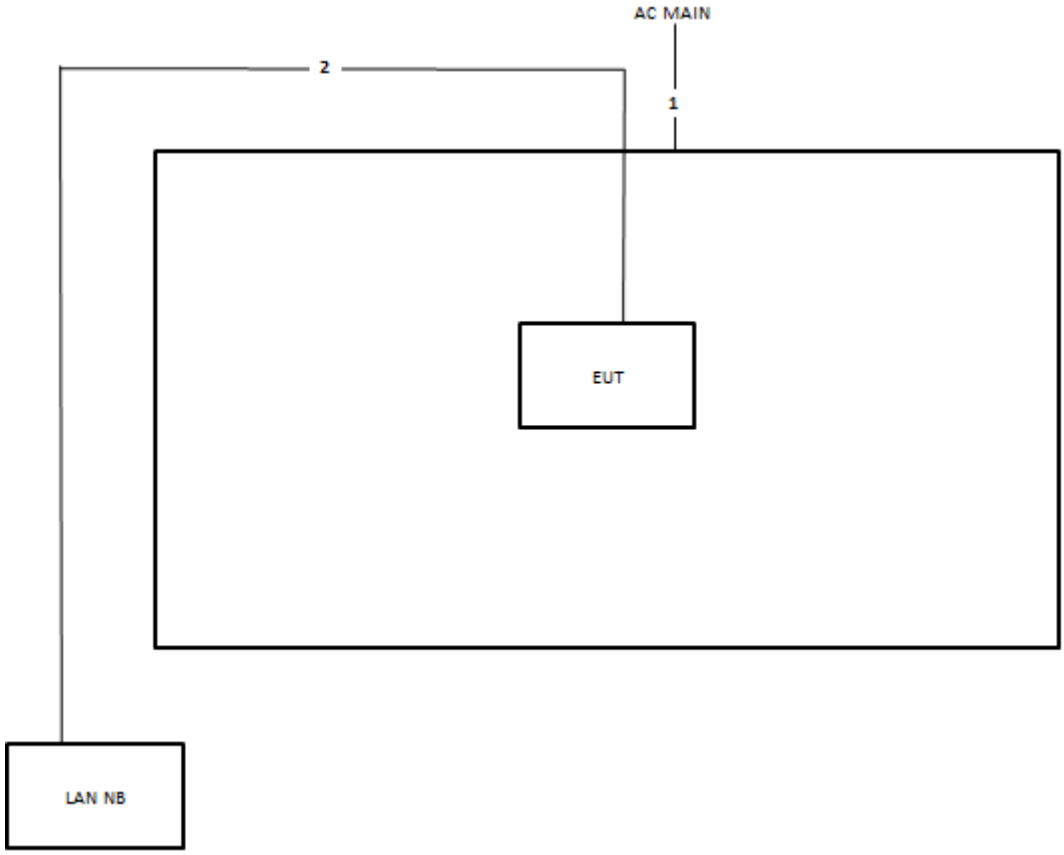
For ERP and EIRP, Field Strength of Spurious Radiation test:

The EUT was performed at Y axis and Z axis position, and the worst case was found at Z axis for EUT 1, Y axis for EUT 2. So the measurement will follow this same test configuration.

Mode 1: EUT 1 (Internal Ant.) - Z axis

Mode 2: EUT 2 (External Ant.) - Y axis

2.2 Test Setup Diagram



Item	Connection	Shielded	Length
1	Power cable	No	2m
2	RJ-45 cable	No	10m

2.3 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 1 dB and a 20dB attenuator.

Example:

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

= 1 + 20 = 21 (dB)

3 Test Result

3.1 Conducted Output Power and ERP/EIRP Measurement

3.1.1 Description of the Conducted Output Power and ERP/EIRP 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.

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). According to FCC KDB 412172 D01 v01r01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.1.2 Measuring Instruments

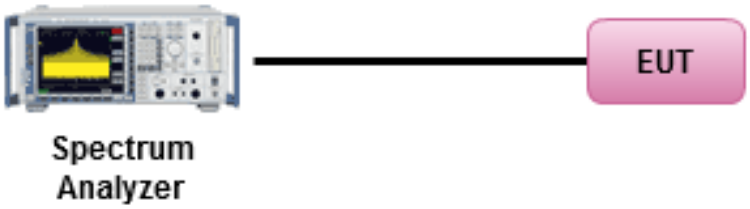
The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

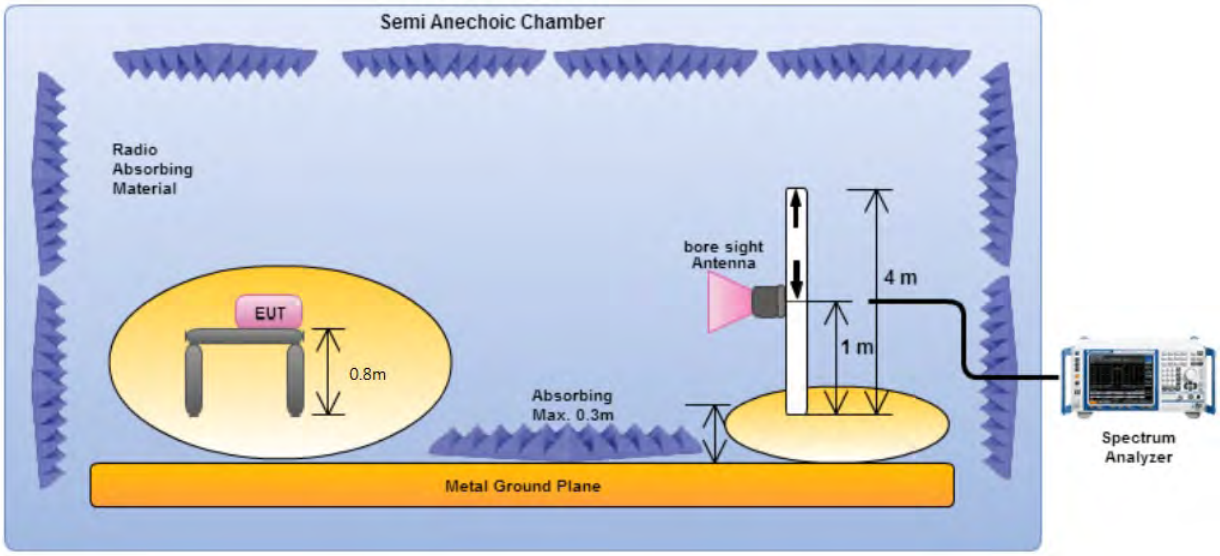
1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power for WCDMA and maximum average power for other modulation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

3.1.4 Test Setup

Test Setup of Conducted Output Power



Test Setup of ERP/EIRP



3.1.5 Test Result of Conducted Output Power

Base Station Classes: Picocell

Item		Conducted Output Power (dBm)		
Band		WCDMA Band V		
Channel		4357 (B)	4407 (M)	4458 (T)
Frequency (MHz)		871.4	881.5	891.6
Modulation	QPSK	23.79	23.7	23.89
	16QAM	23.79	23.72	23.85
	64QAM	23.85	23.79	23.83

Item		Conducted Output Power (dBm)		
Band		WCDMA Band II		
Channel		9662 (B)	9800 (M)	9938 (T)
Frequency (MHz)		1932.4	1960	1987.6
Modulation	QPSK	24.15	23.6	23.94
	16QAM	24.13	23.56	23.81
	64QAM	24.18	23.62	23.96

Base Station Classes: Femtocell

Item		Conducted Output Power (dBm)		
Band		WCDMA Band V		
Channel		4357 (B)	4407 (M)	4458 (T)
Frequency (MHz)		871.4	881.5	891.6
Modulation	QPSK	20.09	19.94	19.68
	16QAM	20.03	19.87	19.62
	64QAM	20.03	19.9	19.63

Item		Conducted Output Power (dBm)		
Band		WCDMA Band II		
Channel		9662 (B)	9800 (M)	9938 (T)
Frequency (MHz)		1932.4	1960	1987.6
Modulation	QPSK	19.9	19.81	20.11
	16QAM	19.99	19.86	20.05
	64QAM	19.96	19.86	20.09

3.1.6 Test Result of ERP/EIRP

For EUT 1 (Internal Ant.)

Item	Effective Radiated Power				
Band	WCDMA Band V				
Modulation	QPSK				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-11.89	34.91	20.87	38.45	Complied
881.5	-12.79	37.1	22.16	38.45	Complied
891.6	-14.54	36.94	20.25	38.45	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-21.48	35.93	12.3	38.45	Complied
881.5	-23.92	38.32	12.25	38.45	Complied
891.6	-25.25	38.37	10.97	38.45	Complied

Item	Effective Radiated Power				
Band	WCDMA Band V				
Modulation	16QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-12.62	34.91	20.14	38.45	Complied
881.5	-13.12	37.1	21.83	38.45	Complied
891.6	-14.69	36.94	20.1	38.45	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-23.27	35.93	10.51	38.45	Complied
881.5	-24.16	38.32	12.01	38.45	Complied
891.6	-25.86	38.37	10.36	38.45	Complied

Item	Effective Radiated Power				
Band	WCDMA Band V				
Modulation	64QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-12.79	34.91	19.97	38.45	Complied
881.5	-13.33	37.1	21.62	38.45	Complied
891.6	-14.64	36.94	20.15	38.45	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-22.81	35.93	10.97	38.45	Complied
881.5	-24.52	38.32	11.65	38.45	Complied
891.6	-25.72	38.37	10.5	38.45	Complied

Item	Effective Isotropic Radiated Power				
Band	WCDMA Band II				
Modulation	QPSK				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-24.15	45.51	21.36	33	Complied
1960	-24.77	45.77	21	33	Complied
1987.6	-25.13	45.99	20.86	33	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-27.61	44.51	16.9	33	Complied
1960	-29.71	44.71	15	33	Complied
1987.6	-29.48	44.88	15.4	33	Complied

Item	Effective Isotropic Radiated Power				
Band	WCDMA Band II				
Modulation	16QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-22.34	45.51	23.17	33	Complied
1960	-24.73	45.77	21.04	33	Complied
1987.6	-26.39	45.99	19.6	33	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-25.29	44.51	19.22	33	Complied
1960	-28.47	44.71	16.24	33	Complied
1987.6	-29.32	44.88	15.56	33	Complied

Item	Effective Isotropic Radiated Power				
Band	WCDMA Band II				
Modulation	64QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-22.36	45.51	23.15	33	Complied
1960	-24.48	45.77	21.29	33	Complied
1987.6	-26.51	45.99	19.48	33	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-27.15	44.51	17.36	33	Complied
1960	-28.79	44.71	15.92	33	Complied
1987.6	-29.39	44.88	15.49	33	Complied

For EUT 2 (External Ant.)

Item	Effective Radiated Power				
Band	WCDMA Band V				
Modulation	QPSK				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-22.03	34.91	10.73	38.45	Complied
881.5	-22.43	37.1	12.52	38.45	Complied
891.6	-22.34	36.94	12.45	38.45	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-15.88	35.93	17.9	38.45	Complied
881.5	-17.46	38.32	18.71	38.45	Complied
891.6	-17.97	38.37	18.25	38.45	Complied

Item	Effective Radiated Power				
Band	WCDMA Band V				
Modulation	16QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-22.21	34.91	10.55	38.45	Complied
881.5	-22.3	37.1	12.65	38.45	Complied
891.6	-21.77	36.94	13.02	38.45	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-15.54	35.93	18.24	38.45	Complied
881.5	-17.28	38.32	18.89	38.45	Complied
891.6	-17.68	38.37	18.54	38.45	Complied

Item	Effective Radiated Power				
Band	WCDMA Band V				
Modulation	64QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-20.44	34.91	12.32	38.45	Complied
881.5	-22.29	37.1	12.66	38.45	Complied
891.6	-21.6	36.94	13.19	38.45	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Result
871.4	-17.08	35.93	16.7	38.45	Complied
881.5	-17.01	38.32	19.16	38.45	Complied
891.6	-17.49	38.37	18.73	38.45	Complied

Item	Effective Isotropic Radiated Power				
Band	WCDMA Band II				
Modulation	QPSK				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-26.51	45.51	19	33	Complied
1960	-26.39	45.77	19.38	33	Complied
1987.6	-27.5	45.99	18.49	33	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-17.9	44.51	26.61	33	Complied
1960	-18.56	44.71	26.15	33	Complied
1987.6	-18.73	44.88	26.15	33	Complied

Item	Effective Isotropic Radiated Power				
Band	WCDMA Band II				
Modulation	16QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-26.3	45.51	19.21	33	Complied
1960	-26.38	45.77	19.39	33	Complied
1987.6	-27.8	45.99	18.19	33	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-17.6	44.51	26.91	33	Complied
1960	-18.9	44.71	25.81	33	Complied
1987.6	-18.88	44.88	26	33	Complied

Item	Effective Isotropic Radiated Power				
Band	WCDMA Band II				
Modulation	64QAM				
Polarization	Horizontal				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-26.33	45.51	19.18	33	Complied
1960	-26.77	45.77	19	33	Complied
1987.6	-28.19	45.99	17.8	33	Complied
Polarization	Vertical				
Frequency (MHz)	LVL	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Result
1932.4	-18.17	44.51	26.34	33	Complied
1960	-18.79	44.71	25.92	33	Complied
1987.6	-18.73	44.88	26.15	33	Complied

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.

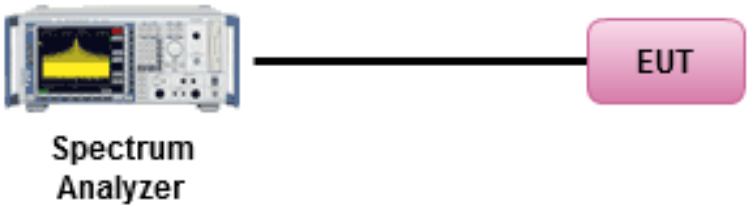
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.

3.2.4 Test Setup



3.2.5 Test Result of Peak-to-Average Ratio

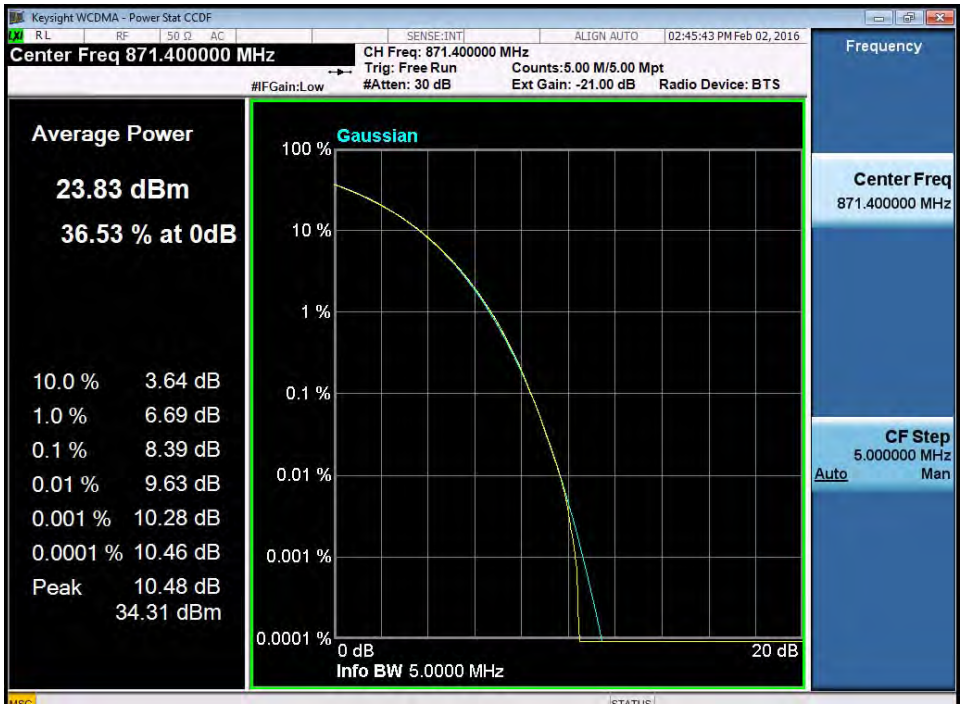
Item		Peak-to-Average Ratio				
Band		WCDMA Band V				
Channel		4357 (B)	4407 (M)	4458 (T)	Limit (dB)	Result
Frequency (MHz)		871.4	881.5	891.6		
Modulation	QPSK	8.39	8.22	8.41	13	Complied
	16QAM	8.75	8.58	8.77	13	Complied
	64QAM	8.2	8.02	8.19	13	Complied

Item		Peak-to-Average Ratio				
Band		WCDMA Band II				
Channel		9662 (B)	9800 (M)	9938 (T)	Limit (dB)	Result
Frequency (MHz)		1932.4	1960	1987.6		
Modulation	QPSK	8.34	8.35	8.35	13	Complied
	16QAM	8.67	8.71	8.77	13	Complied
	64QAM	8.14	8.17	8.18	13	Complied

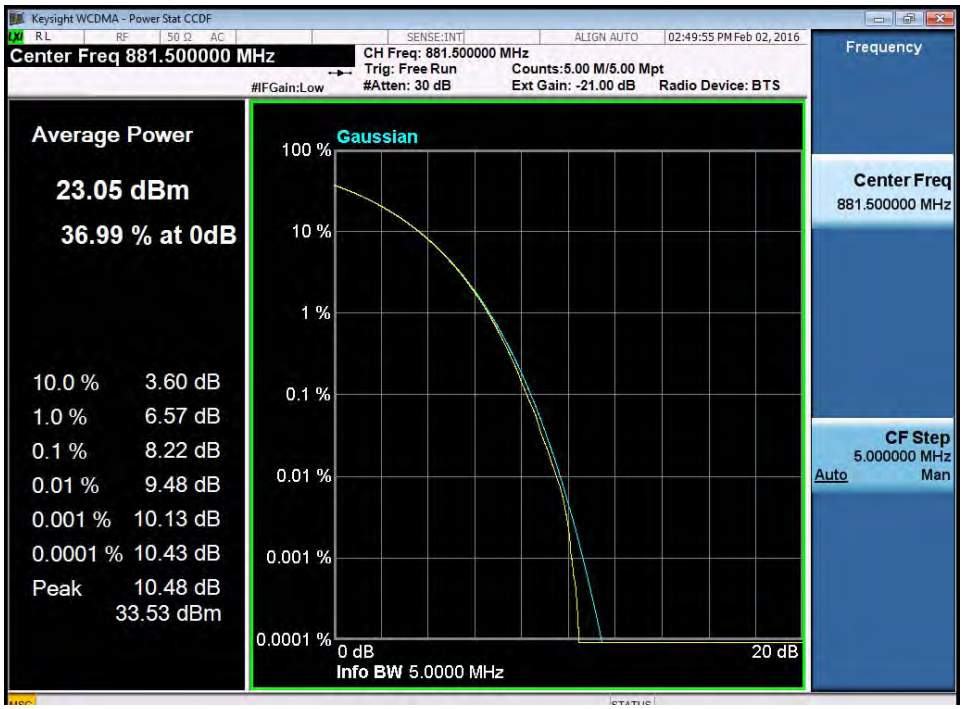
3.2.6 Test Result (Plots) of Peak-to-Average Ratio

Band	Test Mode
WCDMA Band V	QPSK

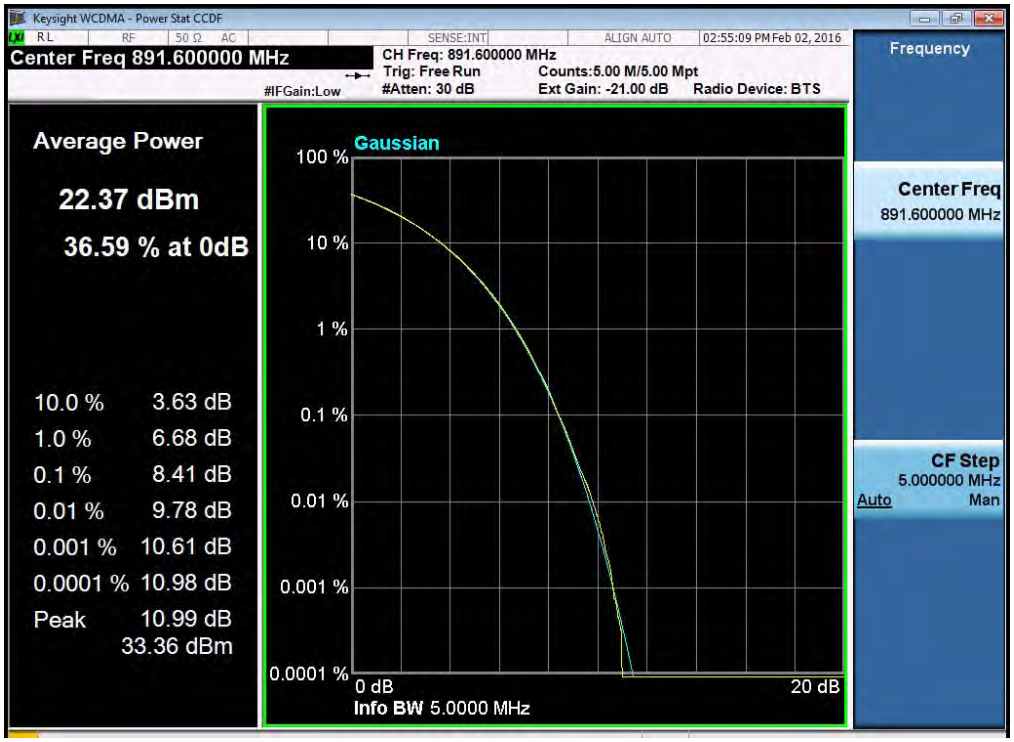
Peak-to-Average Ratio on Channel 4357 (871.4 MHz)



Peak-to-Average Ratio on Channel 4407 (881.5 MHz)

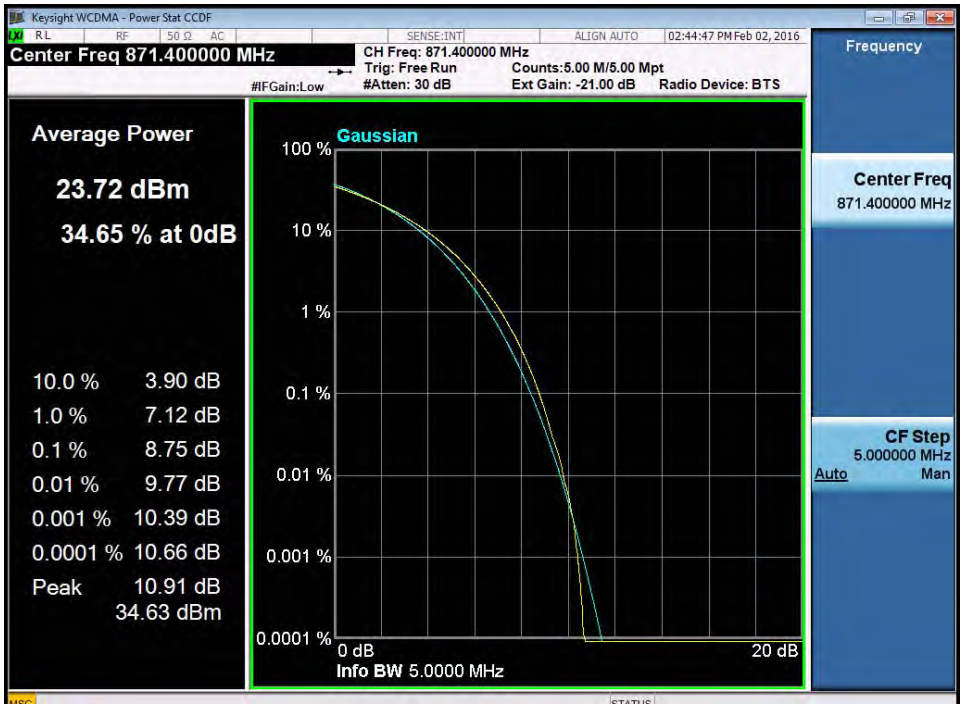


Peak-to-Average Ratio on Channel 4458 (891.6 MHz)

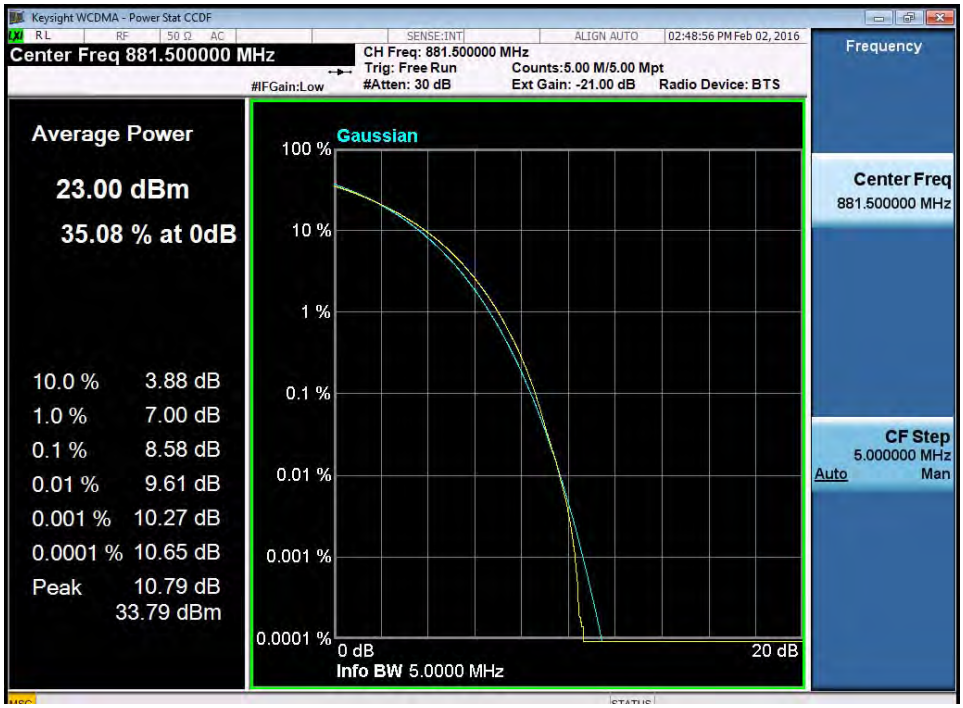


Band	Test Mode
WCDMA Band V	16QAM

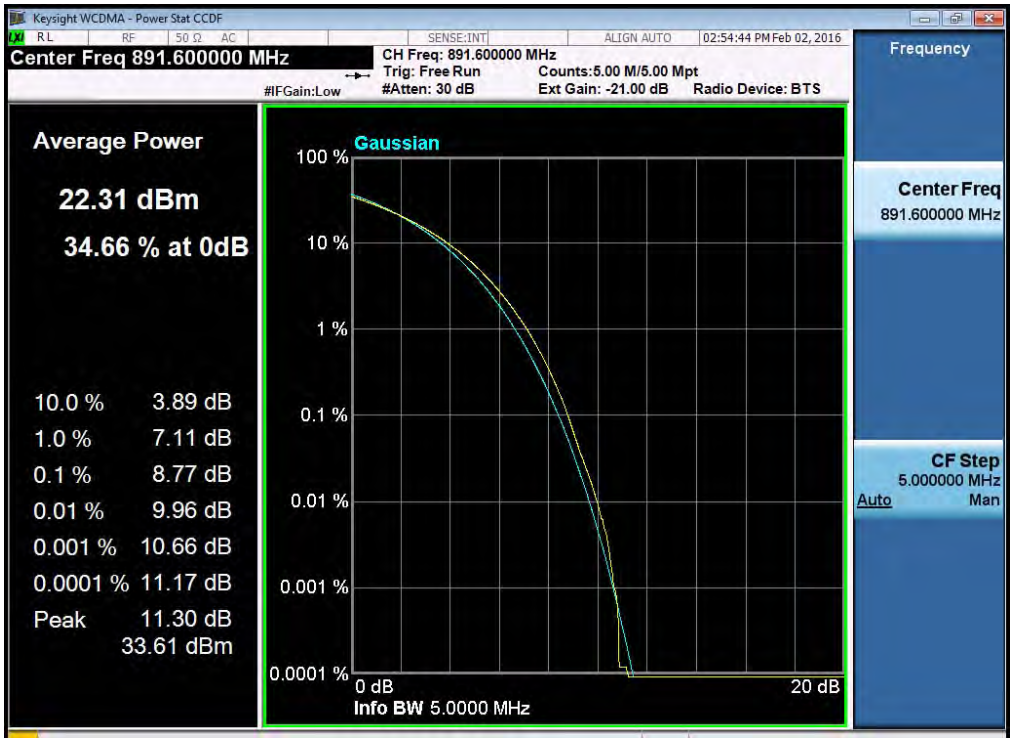
Peak-to-Average Ratio on Channel 4357 (871.4 MHz)



Peak-to-Average Ratio on Channel 4407 (881.5 MHz)

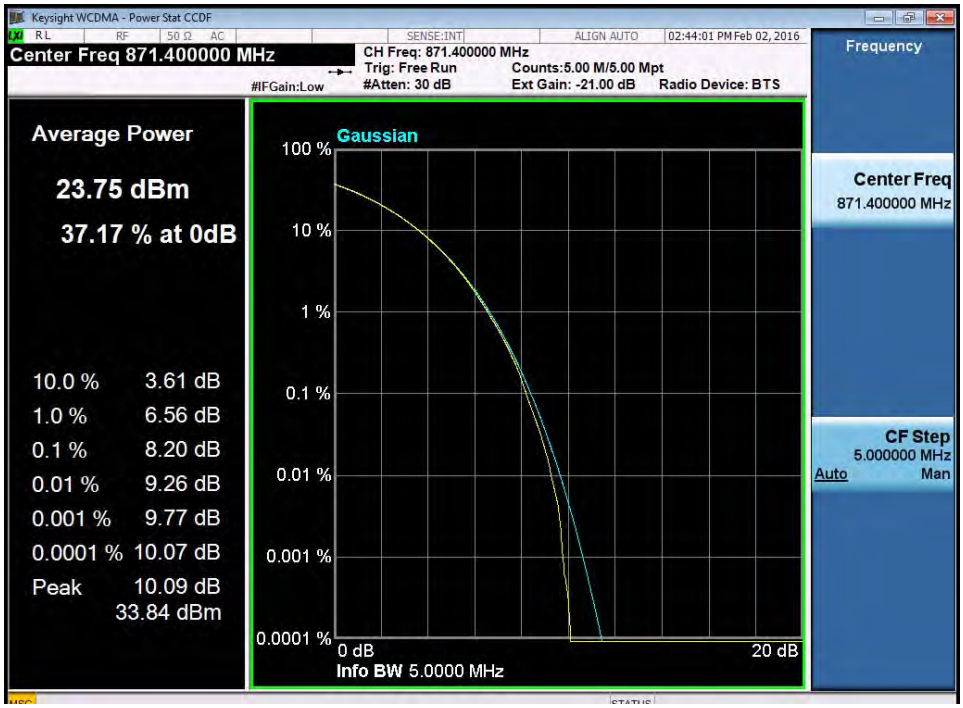


Peak-to-Average Ratio on Channel 4458 (891.6 MHz)

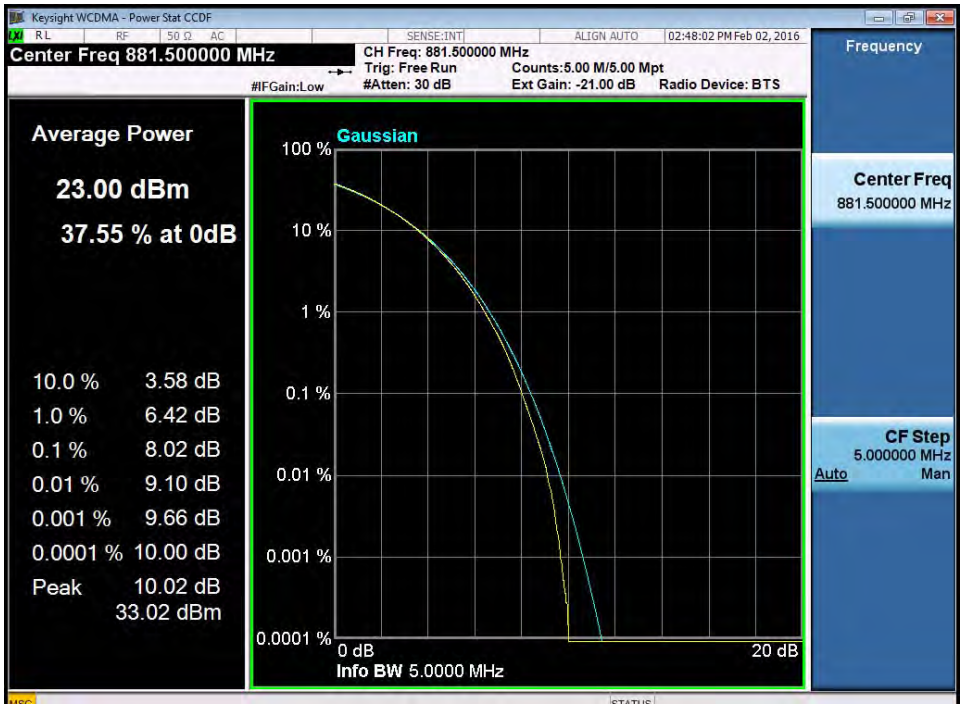


Band	Test Mode
WCDMA Band V	64QAM

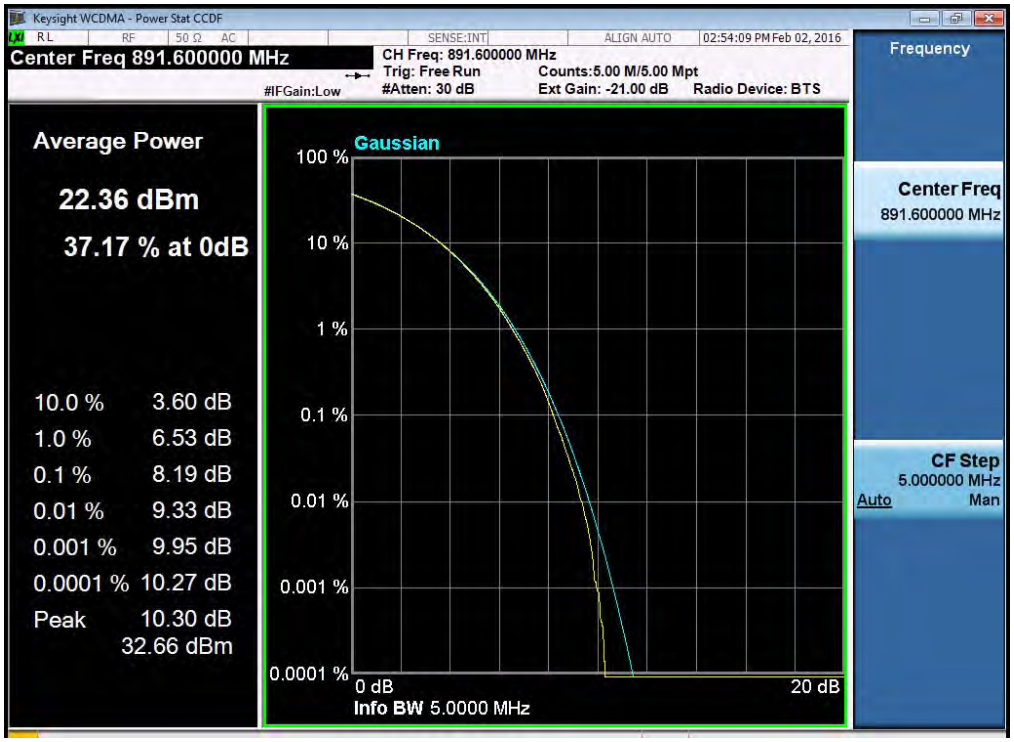
Peak-to-Average Ratio on Channel 4357 (871.4 MHz)



Peak-to-Average Ratio on Channel 4407 (881.5 MHz)

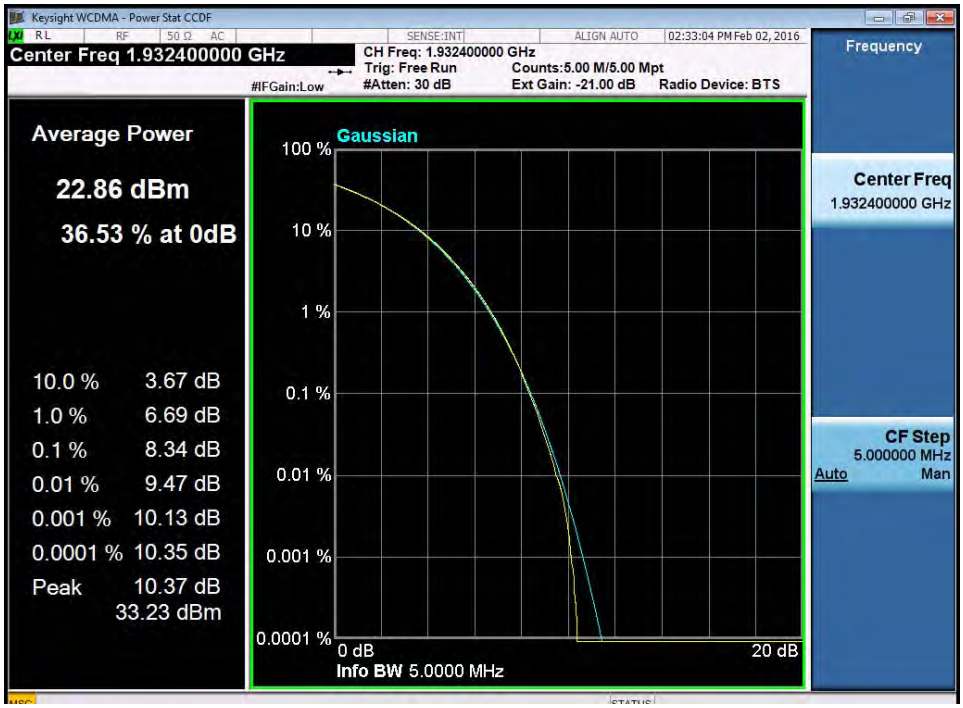


Peak-to-Average Ratio on Channel 4458 (891.6 MHz)

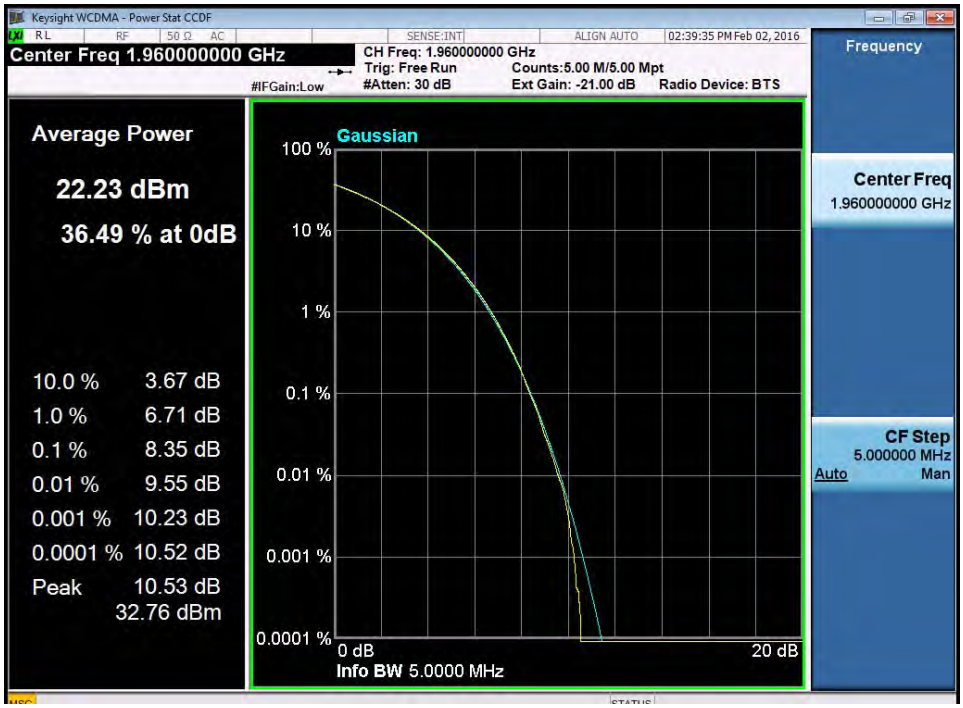


Band	Test Mode
WCDMA Band II	QPSK

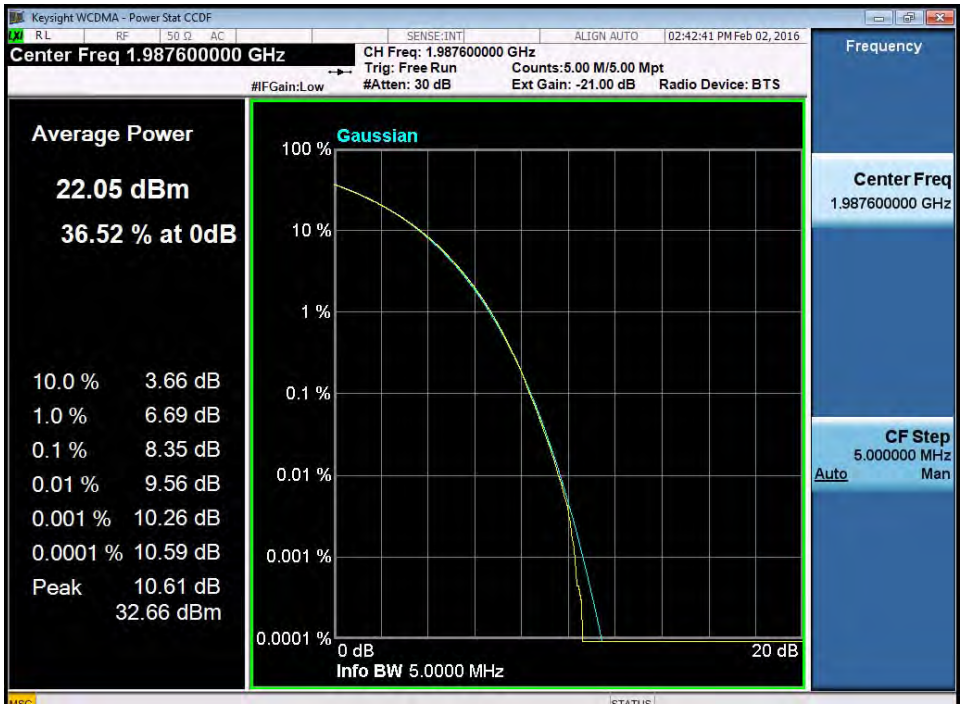
Peak-to-Average Ratio on Channel 9662 (1932.4 MHz)



Peak-to-Average Ratio on Channel 9800 (1960 MHz)

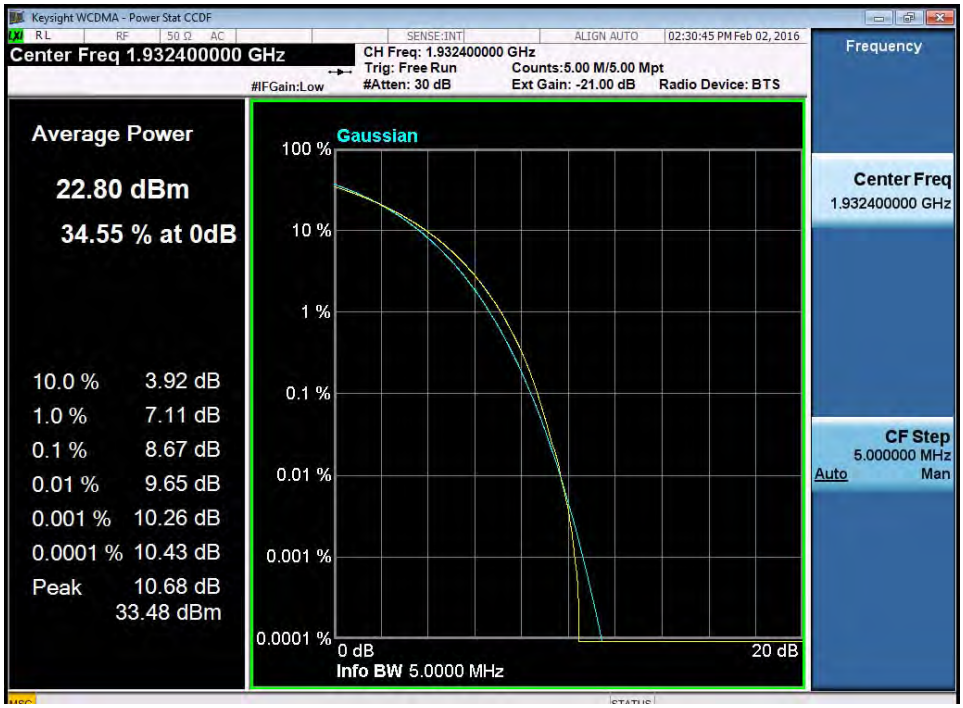


Peak-to-Average Ratio on Channel 9938 (1987.6 MHz)

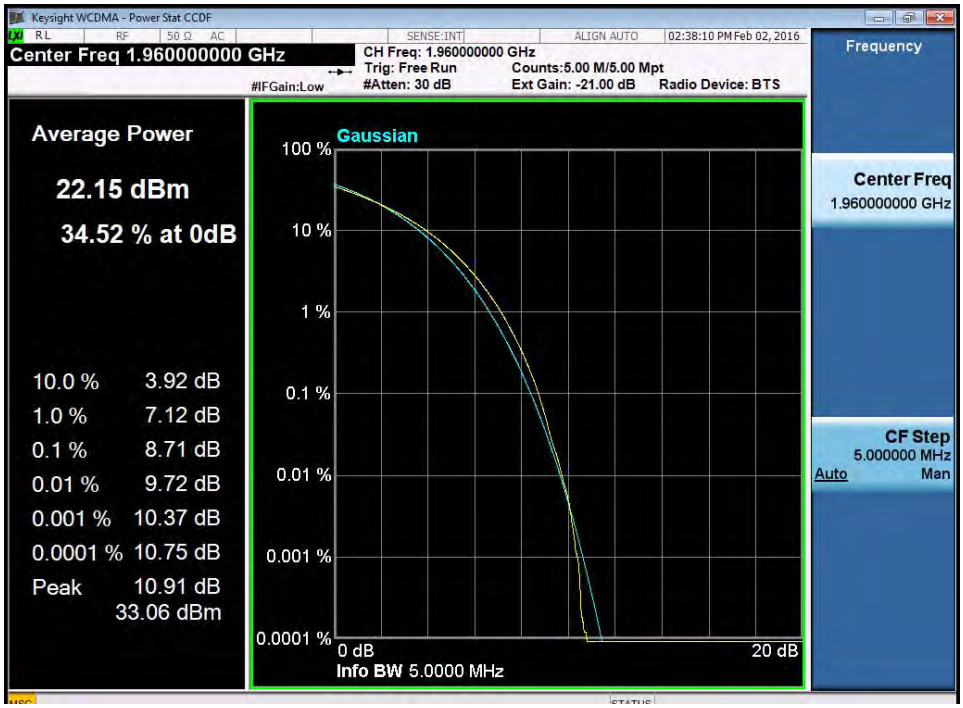


Band	Test Mode
WCDMA Band II	16QAM

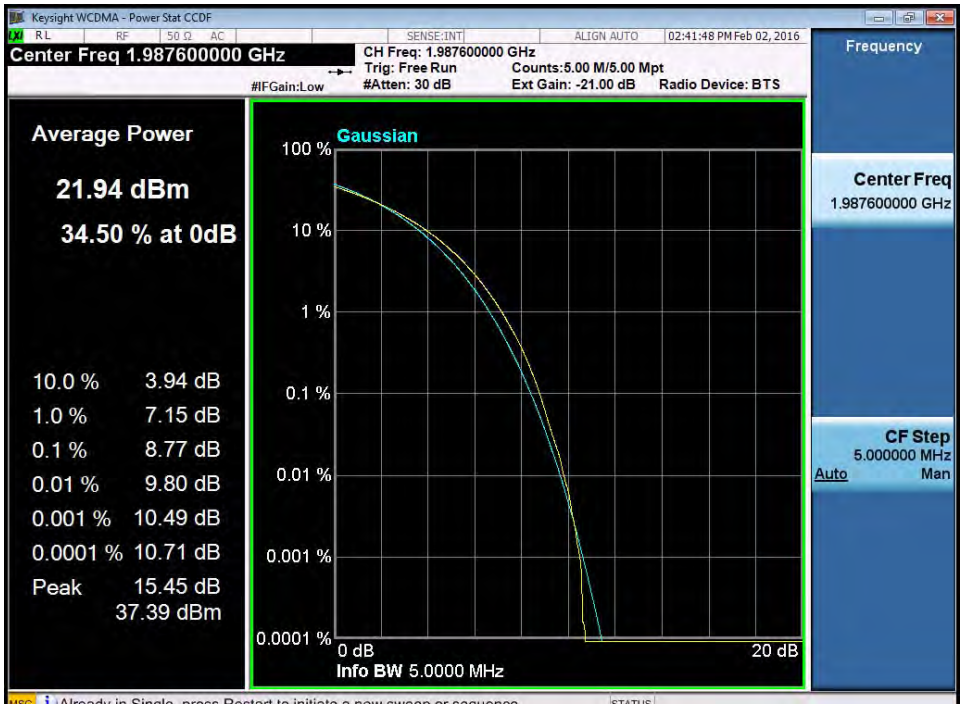
Peak-to-Average Ratio on Channel 9662 (1932.4 MHz)



Peak-to-Average Ratio on Channel 9800 (1960 MHz)

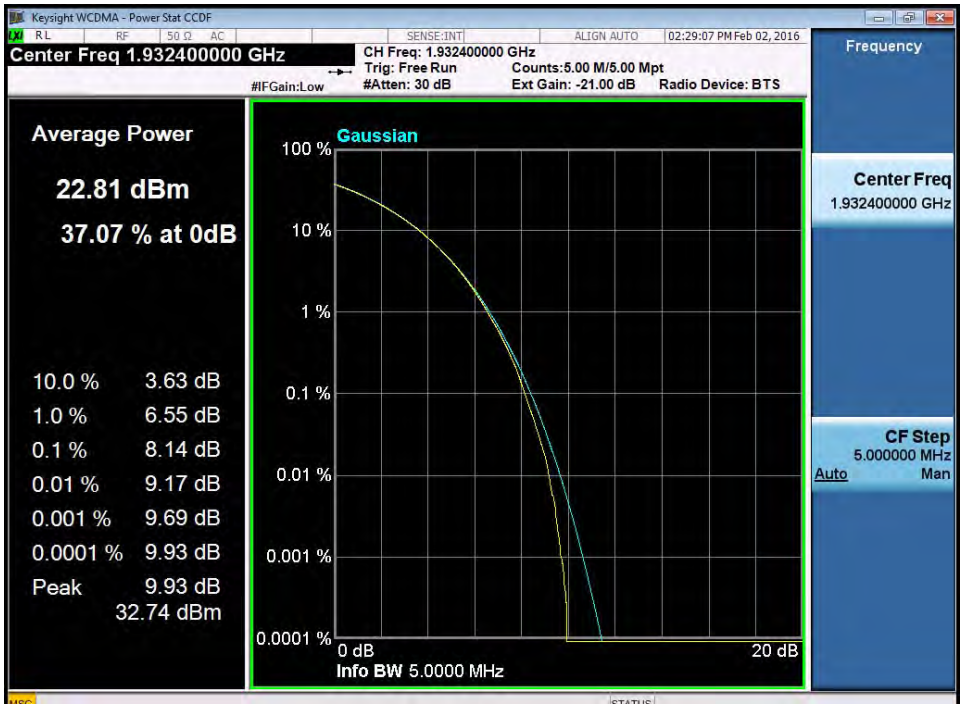


Peak-to-Average Ratio on Channel 9938 (1987.6 MHz)

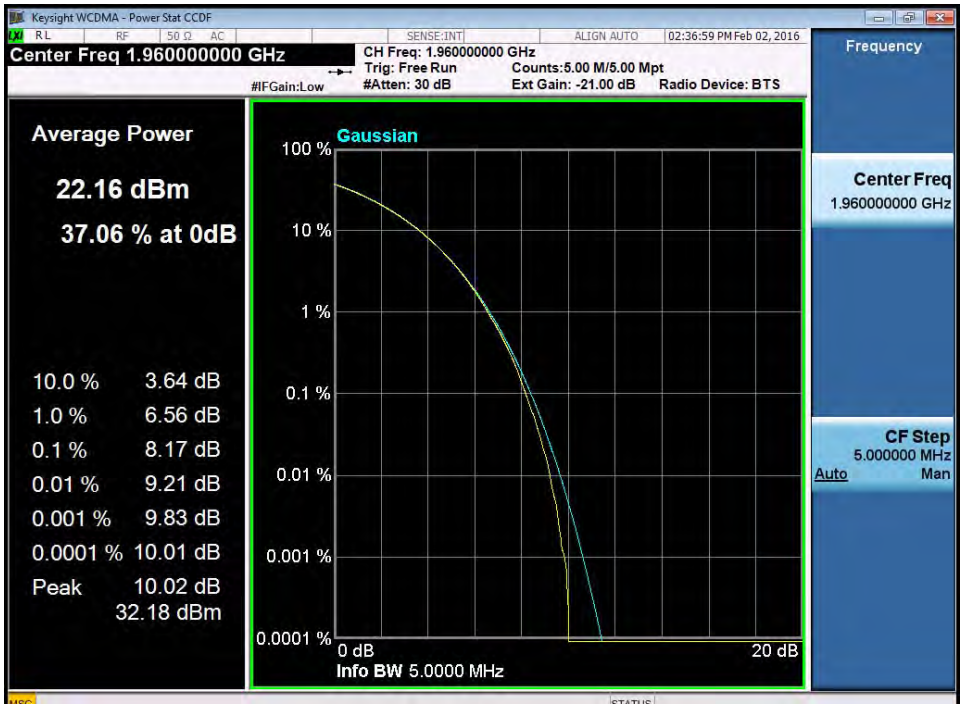


Band	Test Mode
WCDMA Band II	64QAM

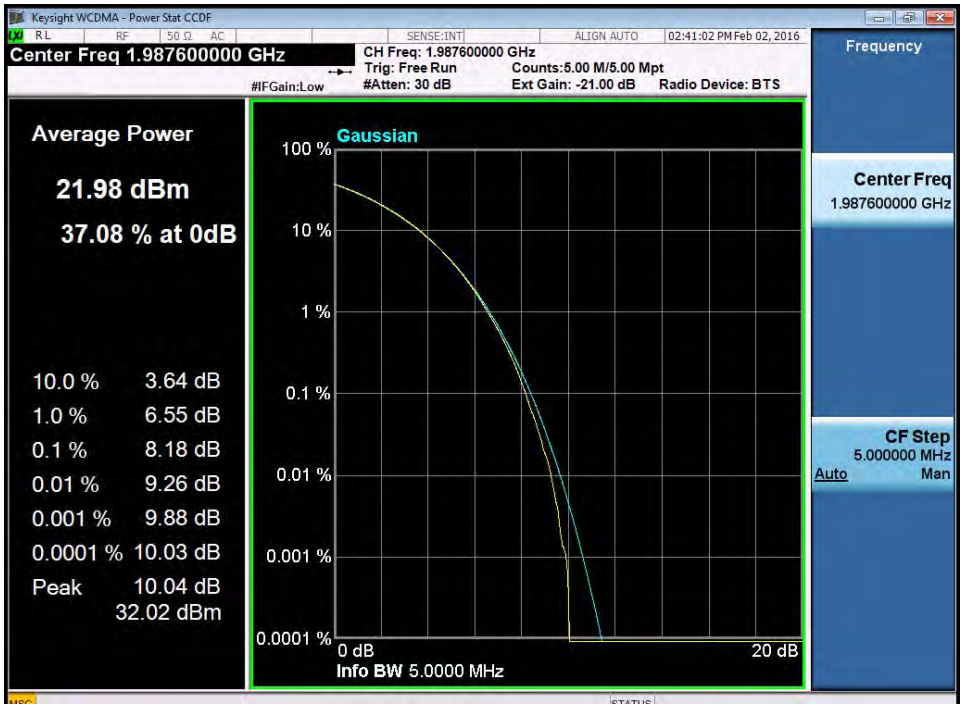
Peak-to-Average Ratio on Channel 9662 (1932.4 MHz)



Peak-to-Average Ratio on Channel 9800 (1960 MHz)



Peak-to-Average Ratio on Channel 9938 (1987.6 MHz)



3.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.3.1 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.

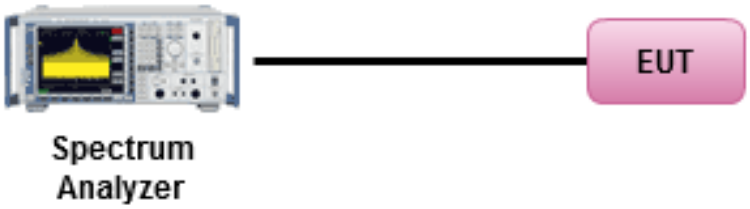
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 4.2.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. 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.
4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

3.3.4 Test Setup



3.3.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

Item		99% Occupied Bandwidth and 26dB Bandwidth					
Band		WCDMA Band V					
Channel		4357 (B)		4407 (M)		4458 (T)	
Frequency (MHz)		871.4		881.5		891.6	
Test Item		99% OBW	26dB BW	99% OBW	26dB BW	99% OBW	26dB BW
Modulation	QPSK	4.146	4.639	4.18	4.66	4.137	4.631
	16QAM	4.114	4.621	4.145	4.627	4.128	4.621
	64QAM	4.148	4.62	4.17	4.618	4.143	4.61

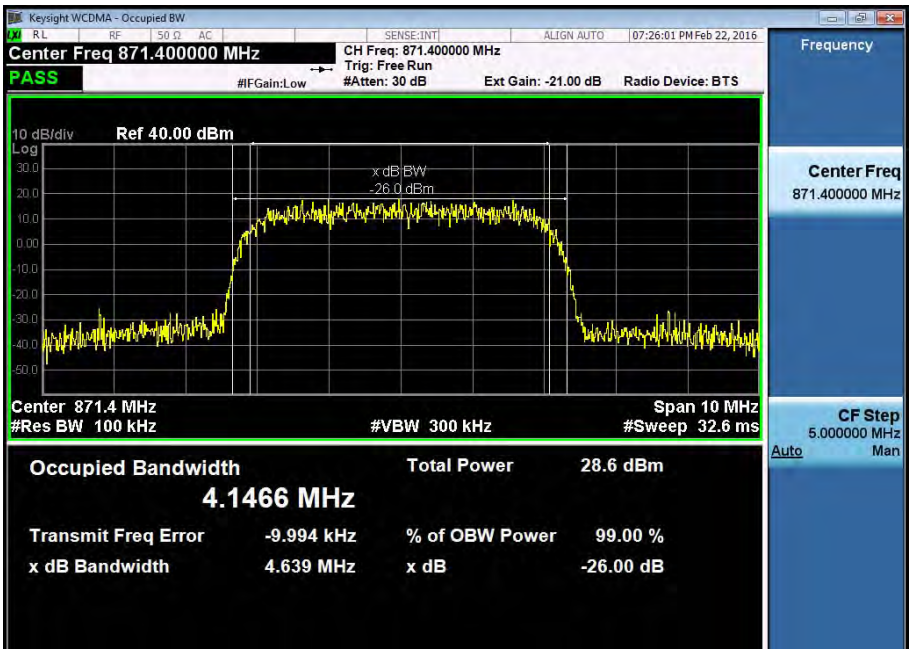
Item		99% Occupied Bandwidth and 26dB Bandwidth					
Band		WCDMA Band II					
Channel		9662 (B)		9800 (M)		9938 (T)	
Frequency (MHz)		1932.4		1960		1987.6	
Test Item		99% OBW	26dB BW	99% OBW	26dB BW	99% OBW	26dB BW
Modulation	QPSK	4.147	4.623	4.157	4.654	4.161	4.594
	16QAM	4.177	4.632	4.17	4.635	4.159	4.631
	64QAM	4.165	4.609	4.17	4.617	4.156	4.622

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

Band	Test Mode
WCDMA Band V	QPSK

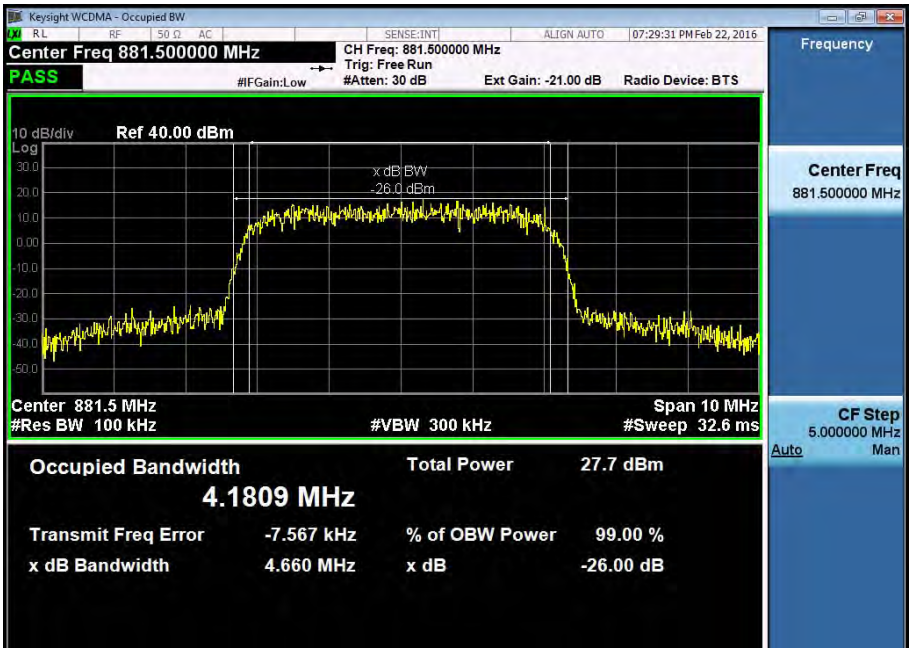
Channel 4357 (871.4 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



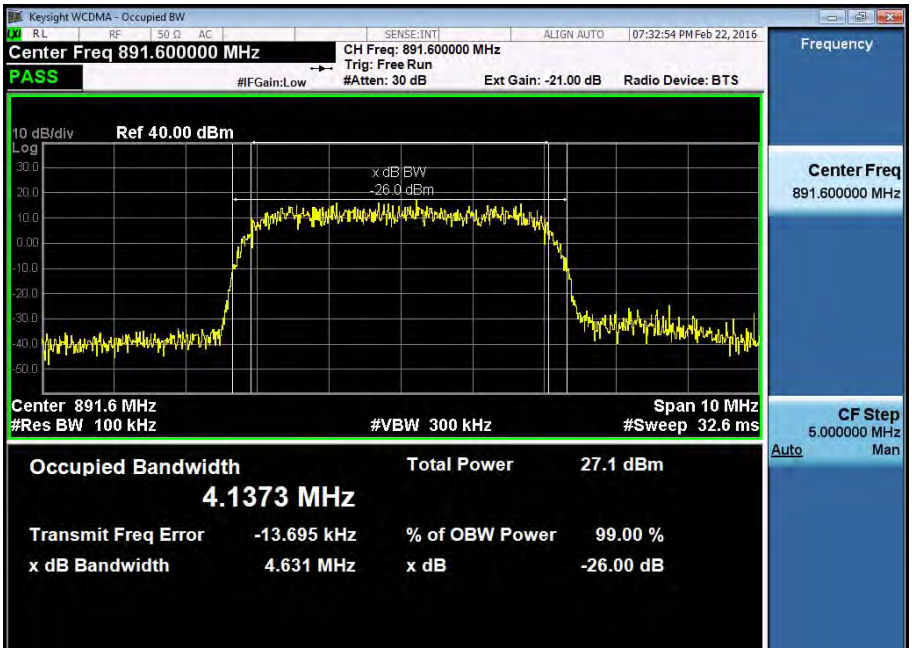
Channel 4407 (881.5 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



Channel 4458 (891.6 MHz)

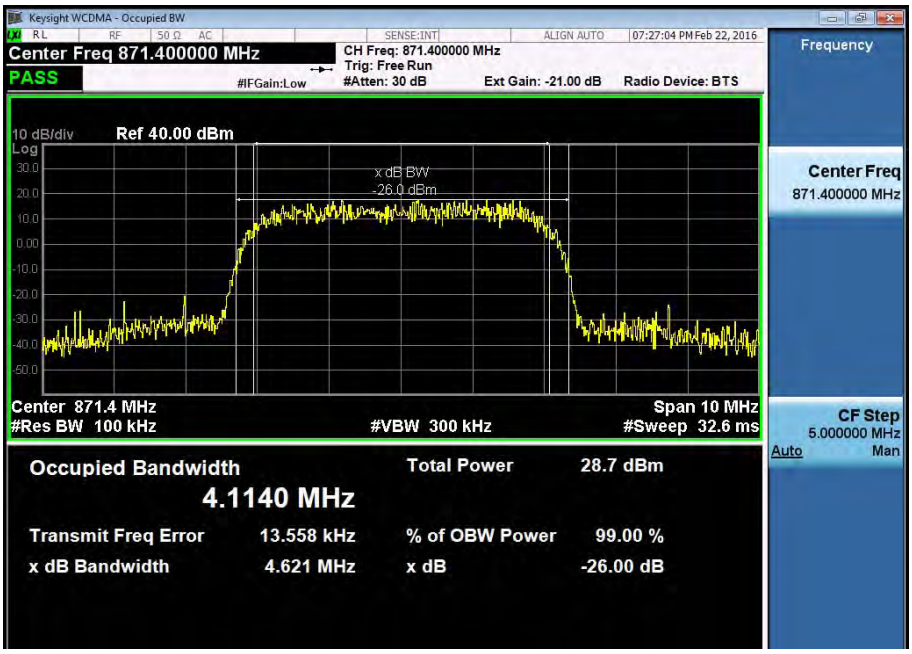
Occupied Bandwidth and 26dB Bandwidth Plot



Band	Test Mode
WCDMA Band V	16QAM

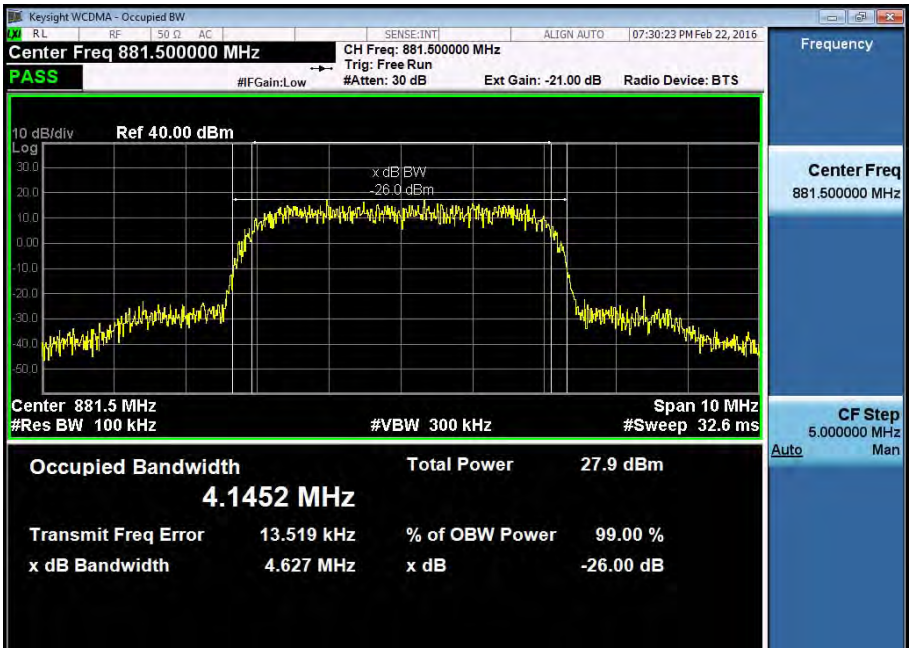
Channel 4357 (871.4 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



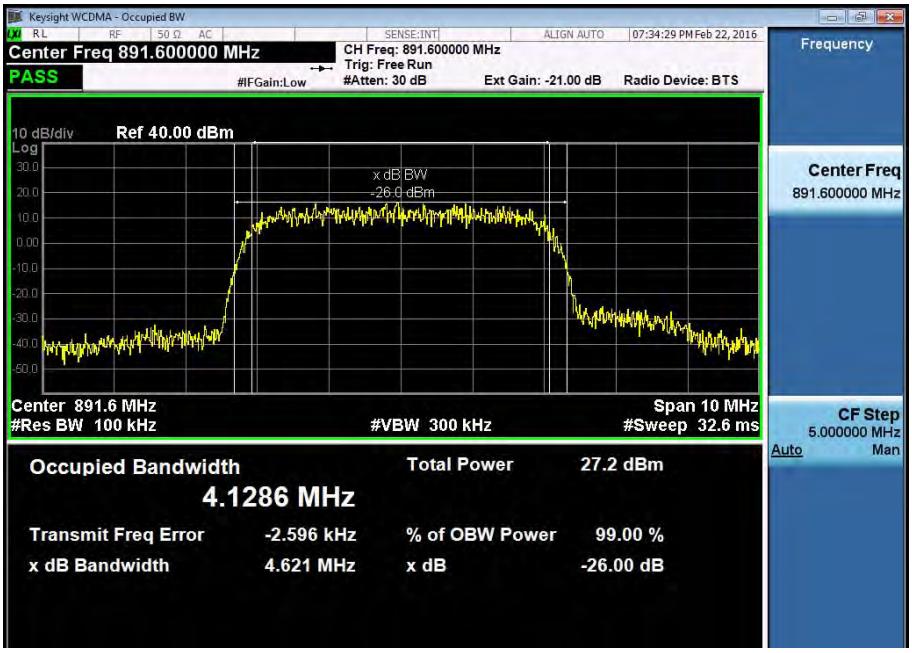
Channel 4407 (881.5 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



Channel 4458 (891.6 MHz)

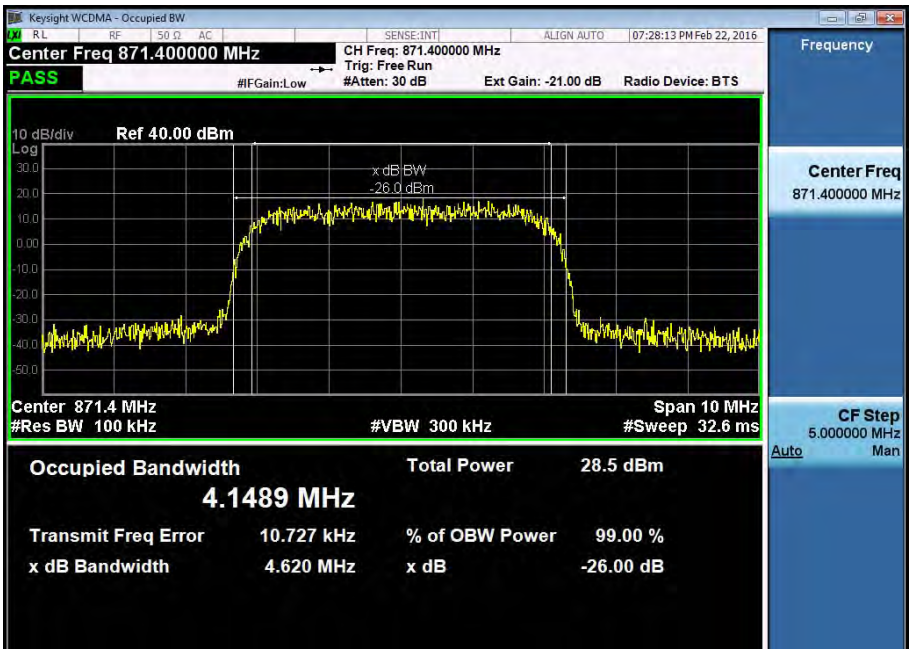
Occupied Bandwidth and 26dB Bandwidth Plot



Band	Test Mode
WCDMA Band V	64QAM

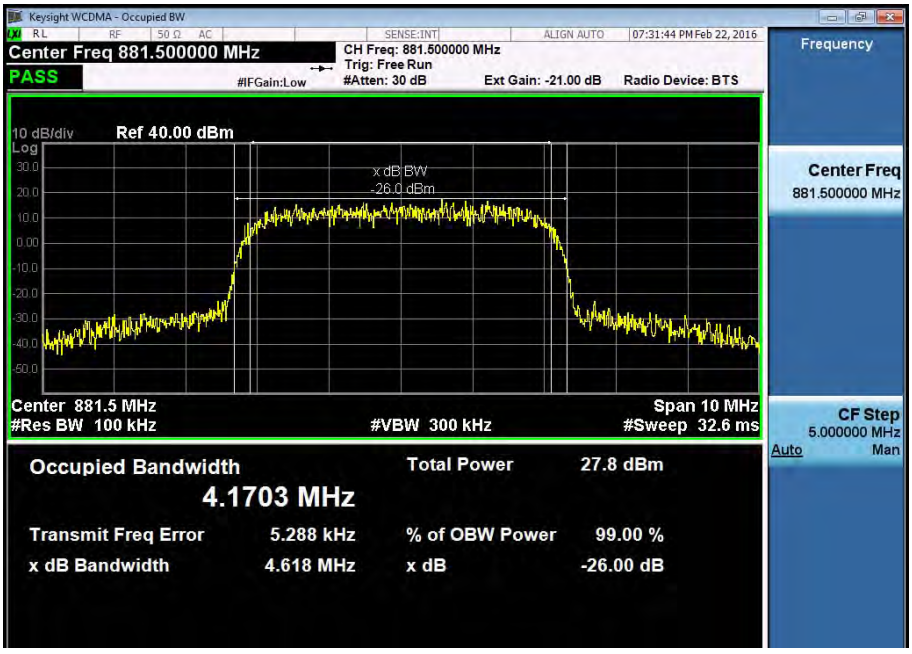
Channel 4357 (871.4 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



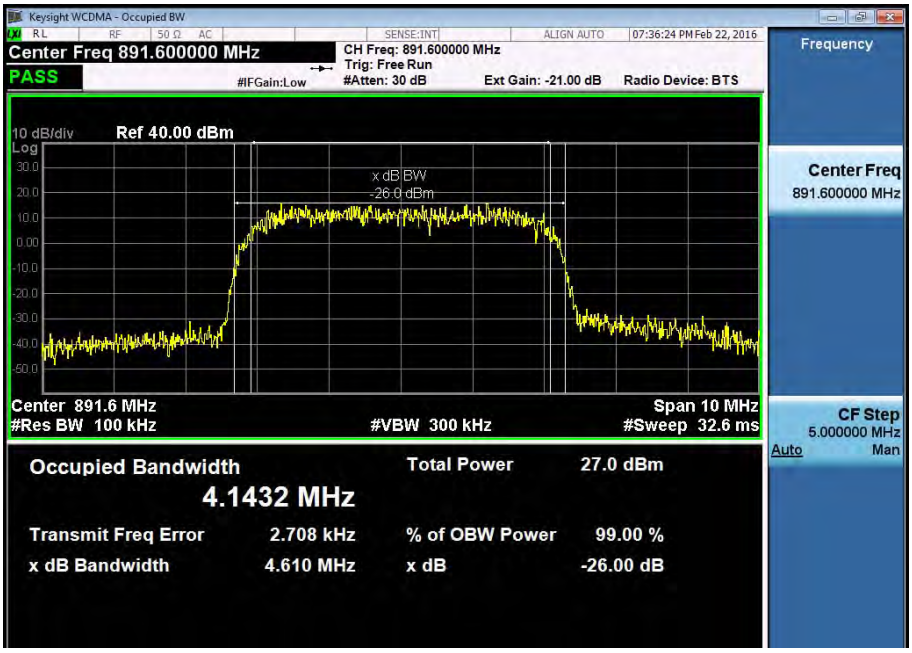
Channel 4407 (881.5 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



Channel 4458 (891.6 MHz)

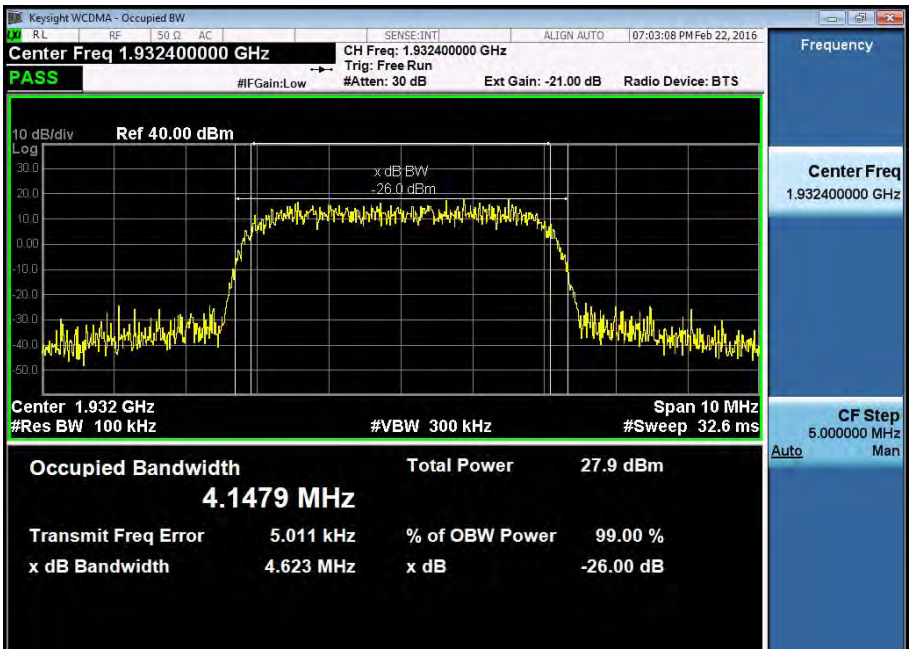
Occupied Bandwidth and 26dB Bandwidth Plot



Band	Test Mode
WCDMA Band II	QPSK

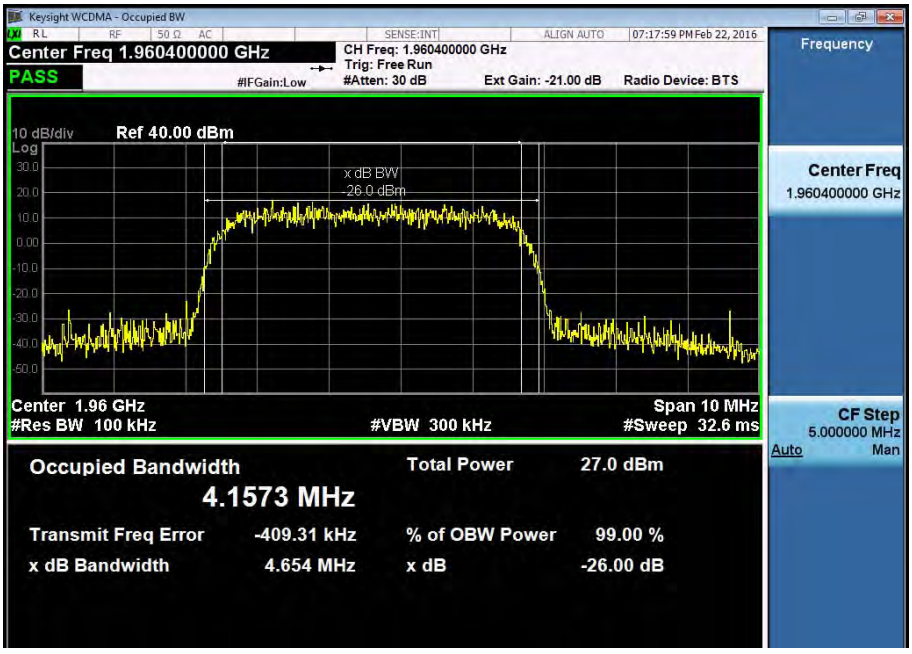
Channel 9662 (1932.4 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



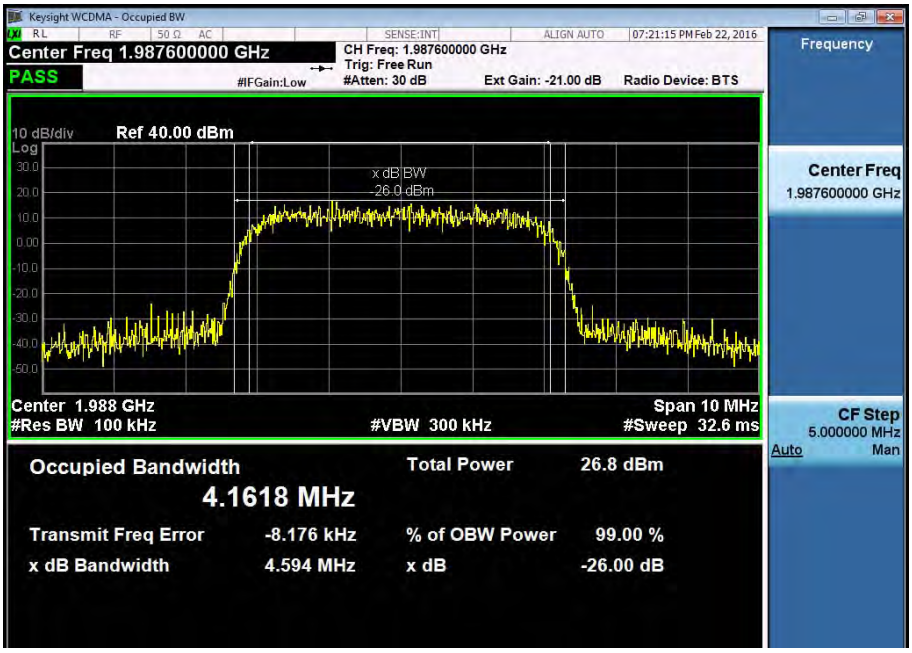
Channel 9800 (1960 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



Channel 9938 (1987.6 MHz)

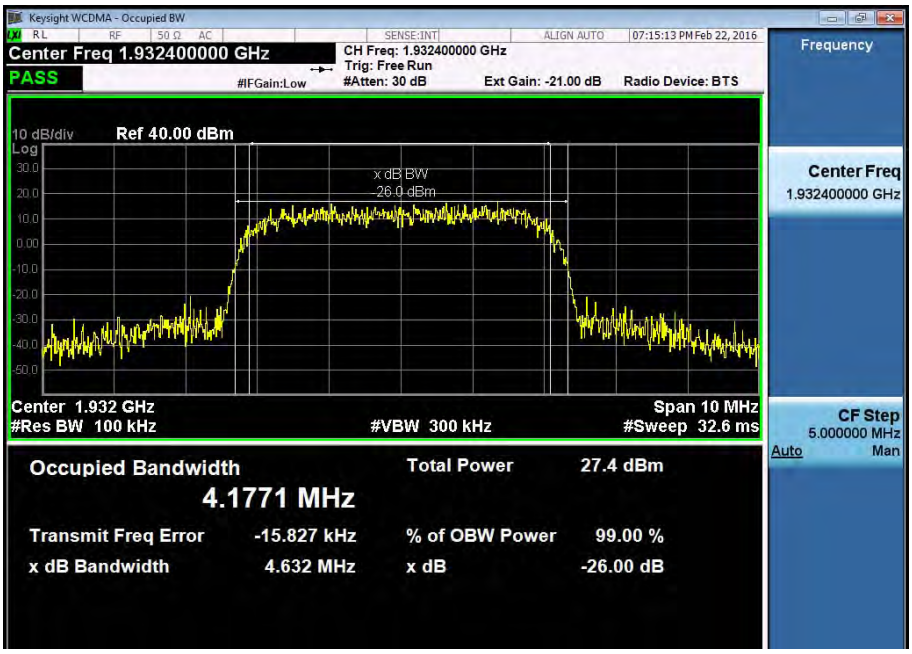
Occupied Bandwidth and 26dB Bandwidth Plot



Band	Test Mode
WCDMA Band II	16QAM

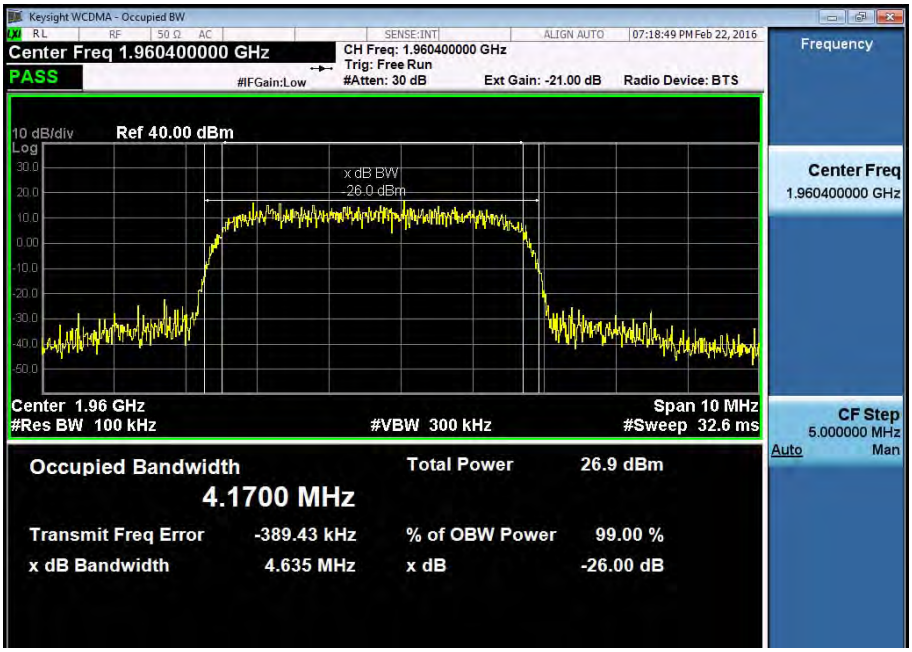
Channel 9662 (1932.4 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



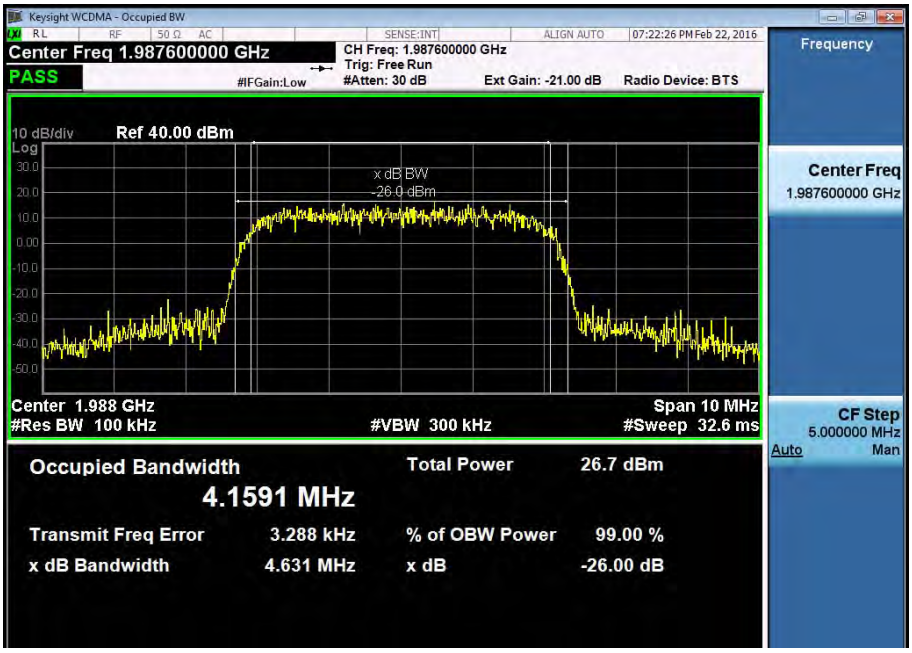
Channel 9800 (1960 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



Channel 9938 (1987.6 MHz)

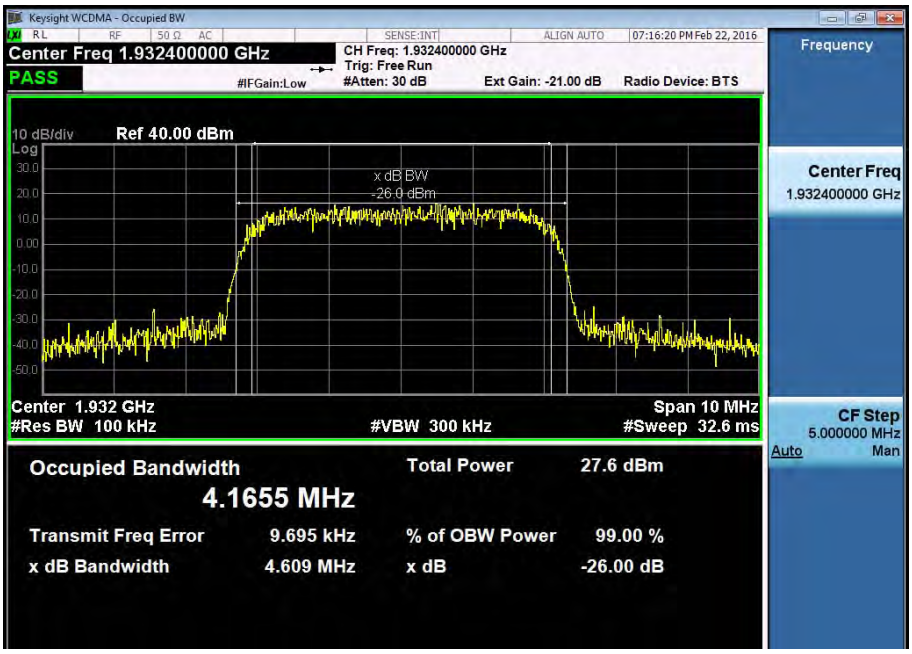
Occupied Bandwidth and 26dB Bandwidth Plot



Band	Test Mode
WCDMA Band II	64QAM

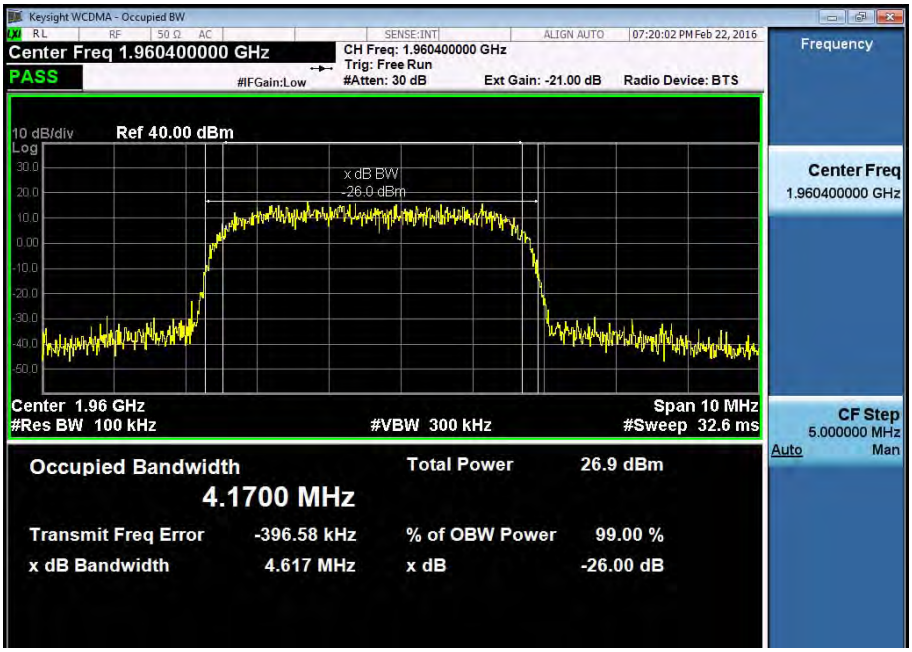
Channel 9662 (1932.4 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



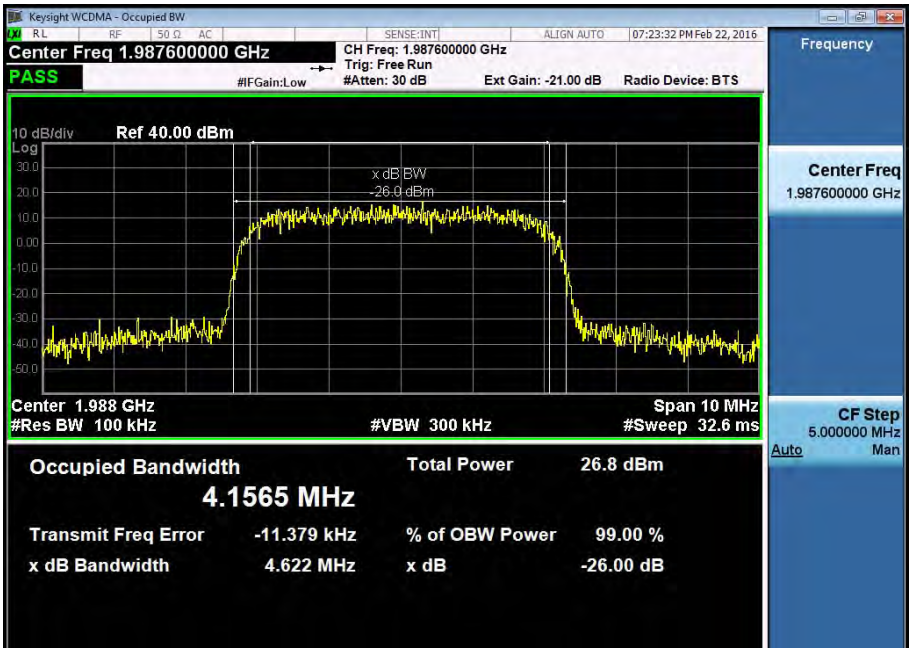
Channel 9800 (1960 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



Channel 9938 (1987.6 MHz)

Occupied Bandwidth and 26dB Bandwidth Plot



3.4 Band Edge Measurement

3.4.1 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.

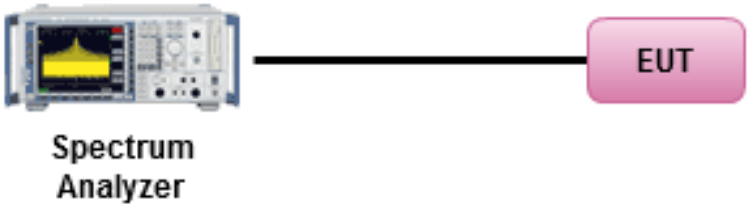
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. 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.
4. The band edges of low and high channels for the highest RF powers were measured.
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.

3.4.4 Test Setup



3.4.5 Test Result (Plots) of Conducted Band Edge

Band	Test Mode
WCDMA Band V	QPSK

Lower Band Edge Plot on Channel 4357 (871.4 MHz)

Higher Band Edge Plot on Channel 4458 (891.6 MHz)

Band	Test Mode
WCDMA Band V	16QAM

Lower Band Edge Plot on Channel 4357 (871.4 MHz)

Higher Band Edge Plot on Channel 4458 (891.6 MHz)

Band	Test Mode
WCDMA Band V	64QAM

Lower Band Edge Plot on Channel 4357 (871.4 MHz)

Higher Band Edge Plot on Channel 4458 (891.6 MHz)

Band	Test Mode
WCDMA Band II	QPSK

Lower Band Edge Plot on Channel 9662 (1932.4 MHz)

Higher Band Edge Plot on Channel 9938 (1987.6 MHz)

Band	Test Mode
WCDMA Band II	16QAM

Lower Band Edge Plot on Channel 9662 (1932.4 MHz)

Higher Band Edge Plot on Channel 9938 (1987.6 MHz)

Band	Test Mode
WCDMA Band II	64QAM

Lower Band Edge Plot on Channel 9662 (1932.4 MHz)

Higher Band Edge Plot on Channel 9938 (1987.6 MHz)

3.5 Conducted Spurious Emission Measurement

3.5.1 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^{th} harmonic.

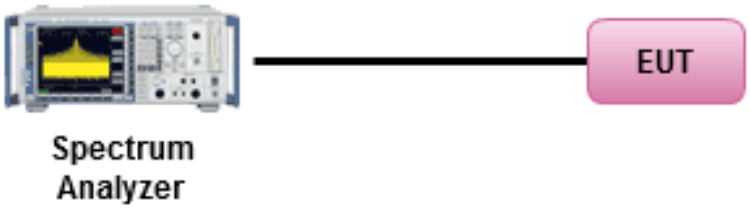
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. 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.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. 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 Spurious Emission

Band	Test Mode
WCDMA Band V	QPSK

Channel 4357 (871.4 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Channel 4407 (881.5 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Channel 4458 (891.6 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Band	Test Mode
WCDMA Band V	16QAM

Channel 4357 (871.4 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Channel 4407 (881.5 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Channel 4458 (891.6 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Band	Test Mode
WCDMA Band V	64QAM

Channel 4357 (871.4 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Channel 4407 (881.5 MHz)

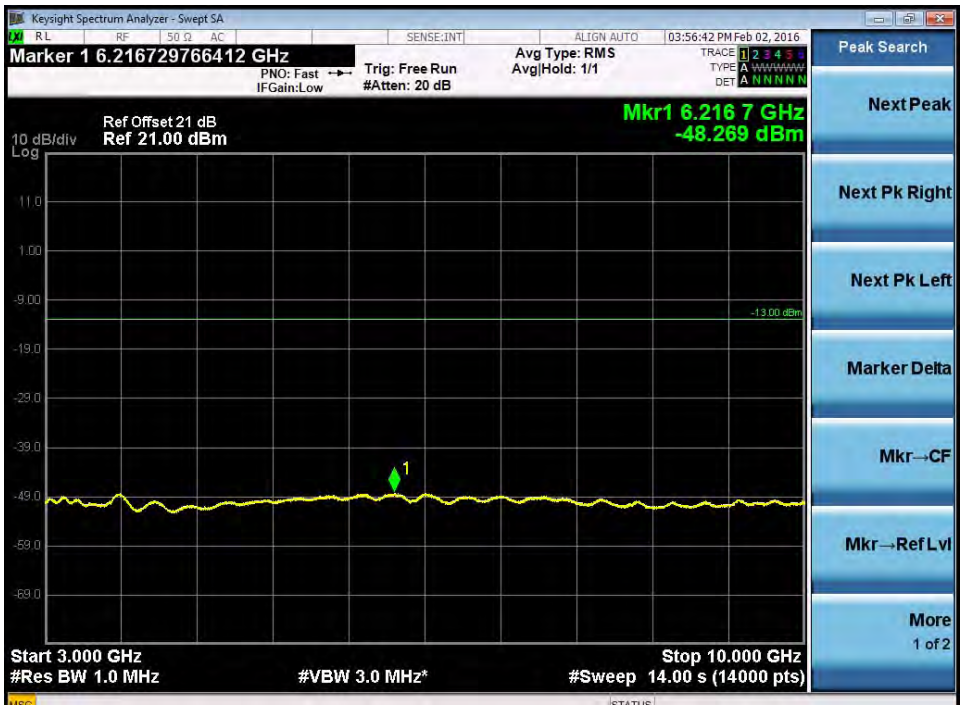
Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Channel 4458 (891.6 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz



Band	Test Mode
WCDMA Band II	QPSK

Channel 9662 (1932.4 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Channel 9800 (1960 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Channel 9938 (1987.6 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Band	Test Mode
WCDMA Band II	16QAM

Channel 9662 (1932.4 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Channel 9800 (1960 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Channel 9938 (1987.6 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Band	Test Mode
WCDMA Band II	64QAM

Channel 9662 (1932.4 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Channel 9800 (1960 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

Channel 9938 (1987.6 MHz)

Conducted Spurious Emission Plot between 9kHz ~ 3GHz

Conducted Spurious Emission Plot between 3GHz ~ 10GHz

Conducted Spurious Emission Plot between 10GHz ~ 22GHz

3.6 Field Strength of Spurious Radiation Measurement

3.6.1 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.

3.6.2 Measuring Instruments

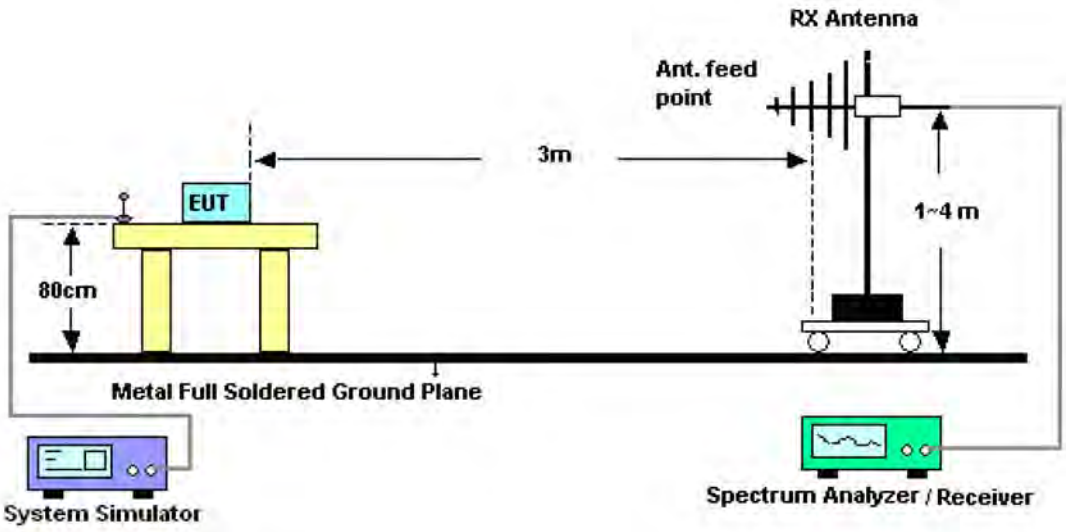
The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

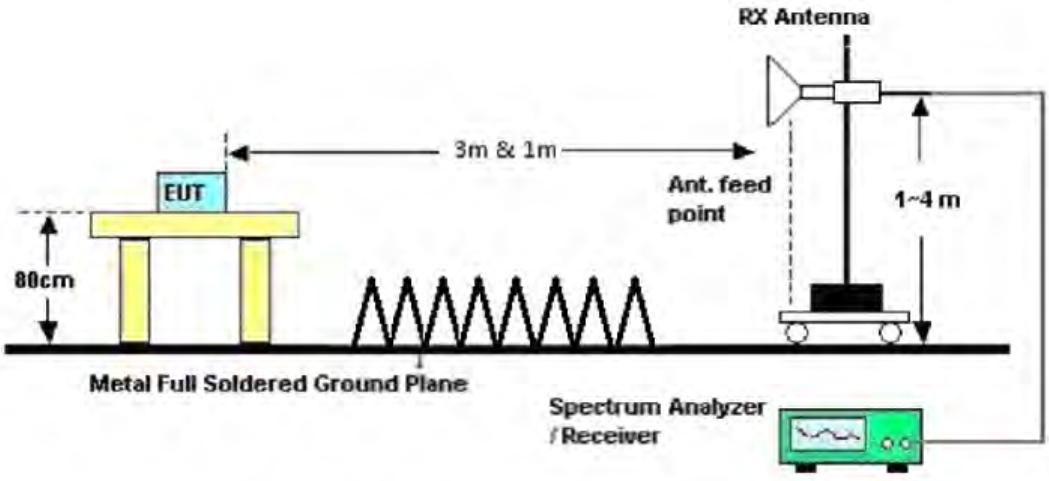
1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.8 and ANSI/TIA-603-D (2010) Section 2.2.12.
2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. 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.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. 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

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.6.5 Test Result of Field Strength of Spurious Radiated

For EUT 1 (Internal Ant.)

Band	WCDMA Band V	**Test Mode**	QPSK
Test Channel	4357 (871.4 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1742.49	-48.63	-35.63	-13.00	-56.17	7.54	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1742.73	-39.62	-26.62	-13.00	-46.72	7.10	VERTICAL

Band	WCDMA Band V	Test Mode	QPSK
Test Channel	4407 (881.5 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1765.36	-51.32	-38.32	-13.00	-59.13	7.81	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1763.03	-42.62	-29.62	-13.00	-49.87	7.25	VERTICAL

Band	WCDMA Band V	Test Mode	QPSK
Test Channel	4458 (891.6 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1782.63	-52.64	-39.64	-13.00	-60.61	7.97	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1782.63	-48.72	-35.72	-13.00	-56.13	7.41	VERTICAL

Band	WCDMA Band II	Test Mode	QPSK
Test Channel	9662 (1932.4 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3865.00	-32.63	-19.63	-13.00	-46.69	14.06	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3864.96	-32.36	-19.36	-13.00	-44.88	12.52	VERTICAL

Band	WCDMA Band II	Test Mode	QPSK
Test Channel	9800 (1960 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3920.10	-31.76	-18.76	-13.00	-45.98	14.22	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3920.32	-33.07	-20.07	-13.00	-45.53	12.46	VERTICAL

Band	WCDMA Band II	Test Mode	QPSK
Test Channel	9938 (1987.6 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3977.32	-40.52	-27.52	-13.00	-54.91	14.39	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3977.24	-42.73	-29.73	-13.00	-55.13	12.40	VERTICAL

For EUT 2 (External Ant.)

Band	WCDMA Band V	**Test Mode**	QPSK
Test Channel	4357 (871.4 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1744.67	-52.04	-39.04	-13.00	-59.63	7.59	HORIZONTAL
2	2617.28	-53.53	-40.53	-13.00	-63.22	9.69	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1745.37	-47.46	-34.46	-13.00	-54.59	7.13	VERTICAL
2	2617.29	-41.75	-28.75	-13.00	-50.71	8.96	VERTICAL

Band	WCDMA Band V	Test Mode	QPSK
Test Channel	4407 (881.5 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1721.02	-53.53	-40.53	-13.00	-60.85	7.32	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1764.40	-50.41	-37.41	-13.00	-57.66	7.25	VERTICAL

Band	WCDMA Band V	Test Mode	QPSK
Test Channel	4458 (891.6 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1784.03	-48.56	-35.56	-13.00	-56.53	7.97	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1781.93	-46.58	-33.58	-13.00	-53.99	7.41	VERTICAL

Band	WCDMA Band II	Test Mode	QPSK
Test Channel	9662 (1932.4 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3864.62	-48.50	-35.50	-13.00	-62.56	14.06	HORIZONTAL
2	5792.84	-50.39	-37.39	-13.00	-68.68	18.29	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3864.82	-51.13	-38.13	-13.00	-63.65	12.52	VERTICAL
2	5795.64	-54.33	-41.33	-13.00	-73.55	19.22	VERTICAL

Band	WCDMA Band II	Test Mode	QPSK
Test Channel	9800 (1960 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3920.52	-52.79	-39.79	-13.00	-67.01	14.22	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3917.88	-49.38	-36.38	-13.00	-61.85	12.47	VERTICAL

Band	WCDMA Band II	Test Mode	QPSK
Test Channel	9938 (1987.6 MHz)		

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3975.04	-51.51	-38.51	-13.00	-65.87	14.36	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	3974.48	-49.62	-36.62	-13.00	-62.03	12.41	VERTICAL

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.7.2 Measuring Instruments

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

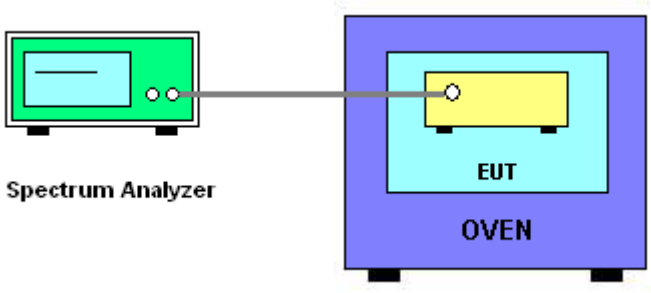
3.7.3 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. 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.
4. With power OFF, the temperature was raised in -30°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.

3.7.4 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

3.7.5 Test Setup



3.7.6 Test Result of Temperature and Voltage Variation

Band	WCDMA Band V	Channel	4407 (881.5 MHz)
Limit (ppm)	2.5		

Item	Frequency Stability		
Band	WCDMA Band V		
Frequency (MHz)	881.5		
Temperature (°C)	Deviation (ppm)	Limit	Result
-30	0.099829836	2.5	Complied
-20	-0.007305729	2.5	Complied
-10	-0.027634714	2.5	Complied
0	-0.031003971	2.5	Complied
10	-0.035439592	2.5	Complied
20 (Ref.)	-0.046738514	2.5	Complied
30	-0.045581395	2.5	Complied
40	-0.065467952	2.5	Complied
50	-0.078309699	2.5	Complied

Item	Frequency Stability		
Band	WCDMA Band V		
Frequency (MHz)	881.5		
Voltage (Volt)	Deviation (ppm)	Limit	Result
126.5	-0.043539421	2.5	Complied
110	-0.046738514	3.5	Complied
93.5	-0.046659104	4.5	Complied

Band	WCDMA Band II	Channel	9800 (1960 MHz)
Limit (ppm)	2.5		

Item	Frequency Stability		
Band	WCDMA Band II		
Frequency (MHz)	1960		
Temperature (°C)	Deviation (ppm)	Limit	Result
-30	0.064270408	2.5	Complied
-20	-0.010795918	2.5	Complied
-10	-0.037030612	2.5	Complied
0	-0.037520408	2.5	Complied
10	-0.04447449	2.5	Complied
20 (Ref.)	-0.052040816	2.5	Complied
30	-0.053556122	2.5	Complied
40	-0.070979592	2.5	Complied
50	-0.092581633	2.5	Complied

Item	Frequency Stability		
Band	WCDMA Band II		
Frequency (MHz)	1960		
Voltage (Volt)	Deviation (ppm)	Limit	Result
126.5	-0.051979592	2.5	Complied
110	-0.052040816	3.5	Complied
93.5	-0.052642857	4.5	Complied

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Sonoma	310N	187291	0.1MHz ~ 1GHz	Apr. 07, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	Keysight	N9020A	MY55400138	10 Hz up to 26.5 GHz	Jan. 14,2016	Conducted (TH01-CB
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

5 Measurement Uncertainty

Test Items	Uncertainty	Remark
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%