

TEST REPORT FOR WCDMA TESTING

Report No.: SRTC2020-9004(F)-20090802(B)

Product Name: Mobile Broadband Internet Device

Product Model: K87CC

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: FCC Part 24E, Part 22H, Part 2, Part 27 (2019)

FCC ID: SRQ-K87CC

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District,

Beijing, P.R.China

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1. GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC). The test results relate only to individual items of the samples which have been tested. The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
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1.3 Applicant's details

Company:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
City:	Shenzhen
Country or Region:	P.R.China
Contacted person:	Zhao Yang
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Fax:	---
Email:	zhao.yangxa@zte.com.cn

1.4 Manufacturer's details

Company:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
City:	Shenzhen
Country or Region:	P.R.China
Contacted person:	Zhao Yang
Tel:	86-029-83637990
Fax:	---
Email:	zhao.yangxa@zte.com.cn

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2020-09-08
Testing Start Date:	2020-09-08
Testing End Date:	2020-09-30

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	30
Maximum Extreme	55	---
Minimum Extreme	-10	---

Normal Supply Voltage (V d.c.):	3.80
Maximum Extreme Supply Voltage (V d.c.):	3.60
Minimum Extreme Supply Voltage (V d.c.):	4.35

2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

Frequency Range	WCDMA Band II: Tx:1852.4~1907.6MHz Rx:1932.4~1987.6MHz WCDMA Band IV: Tx:1712.4~1752.6MHz Rx:2112.4~2152.6MHz WCDMA Band V: Tx:826.4~846.6MHz Rx:871.4~891.6MHz
Mode	HSDPA/HSUPA
Emission Designator	4M50F9W
Duplex Mode	FDD
Duplex Spacing	WCDMA Band II:80MHz WCDMA Band IV:400MHz WCDMA Band V:45MHz
Antenna Type	Fixed Internal Antenna
Antenna Gain	W2: 0.6dBi/W4: 0.8dBi/W5:-1.2dBi
Power Supply	Battery/Charger
Hardware Version	K87CCHW1.0
Software Version	K87CCV1.0.0B01
IMEI	863753050001643

2.2 Support Equipment

The following support equipment was used to exercise the DUT during testing:

Equipment	Battery
Manufacturer	ZHUHAI COSMX BATTERY CO., LTD.
Model Number	Li3945T44P8hA69203

Equipment	Charger 1
Manufacturer	PUAN
Model Number	STC-A51D-Z

Equipment	Charger 2
Manufacturer	AOHAI
Model Number	STC-A51D-Z

Equipment	Charger 3
Manufacturer	Ruijing
Model Number	STC-A51D-Z

Equipment	USB Cable 1
Manufacturer	Shen Zhen Shi Yi HUA XING Electron Co.,Ltd
Model Number	USB-MU5-W-100-M

Equipment	USB Cable 2
Manufacturer	Kingpower Co.,Ltd
Model Number	USB-MU5-W-100-M

2.3 Summary table.

FCC Rule Part	Frequency Range(MHz)	ERP/ EIRP (dBm)	ERP/ EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
24E	1852.4-1907.6	24.69	0.294	0.052	4M14F9W
22H	826.4-846.6	23.91	0.246	0.050	4M21F9W
27	1712.4-1752.6	24.05	0.254	0.052	4M16F9W

3 REFERENCE SPECIFICATION

Specification	Version	Title
FCC Part2	2019	Frequency allocations and radio treaty matters; general rules and regulations
FCC Part22	2019	Public mobile services
FCC Part24	2019	Personal communications services
FCC Part27	2019	Miscellaneous wireless communications services
ANSI C63.26	2015	American national standard for compliance testing of transmitters used in licensed radio services
KDB 971168 D01	April 9, 2018	Measurement guidance for certification of licensed digital transmitters
TIA-603-E-2016	March 2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

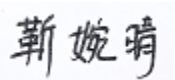
4 KEY TO NOTES AND RESULT CODES

The following are the definition of the test result.

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
NT	Normal Temperature
NV	Nominal voltage
HV	High voltage
LV	Low voltage

5 RESULT SUMMARY

No.	Test case	FCC reference	Verdict
1	RF Power Output	2.1046	Pass
2	Effective Radiated Power and Effective Isotropic Radiated Power	22.913(a),24.232(c),27.50(d)(4)	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Emission Bandwidth	2.1049	Pass
5	Spurious Emissions at antenna terminal	2.1051,22.917(a),24.238(a),27.53(h)	Pass
6	Band Edges Compliance	2.1051,22.917(a),24.238(b),27.53(h)	Pass
7	Frequency Stability	2.1055,22.355,24.235,27.54	Pass
8	Radiated Spurious Emissions	2.1053,22.917(a),24.238(a),27.53(h)	Pass
9	Peak-Average Ratio	24.232(d),27.50(d) (5)	Pass

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Li Bin 
Tested by: Miss. Jin Wanqing 	Issued date: 20200930

6 TEST RESULT

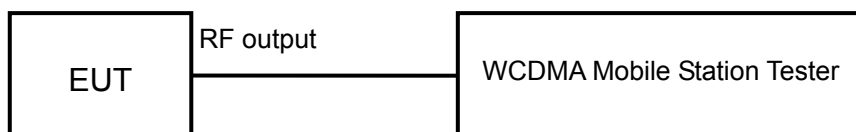
6.1 RF Power Output

Rule Part(s):
2.1046

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:

After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration. The measurement will be conducted at three channels (Low, middle and High channels).

Limits: Limits: No specific conduct power requirements in part 2.1046.

Test result:

The test results are shown in Appendix A.

6.2 Effective Radiated Power and Effective Isotropic Radiated Power

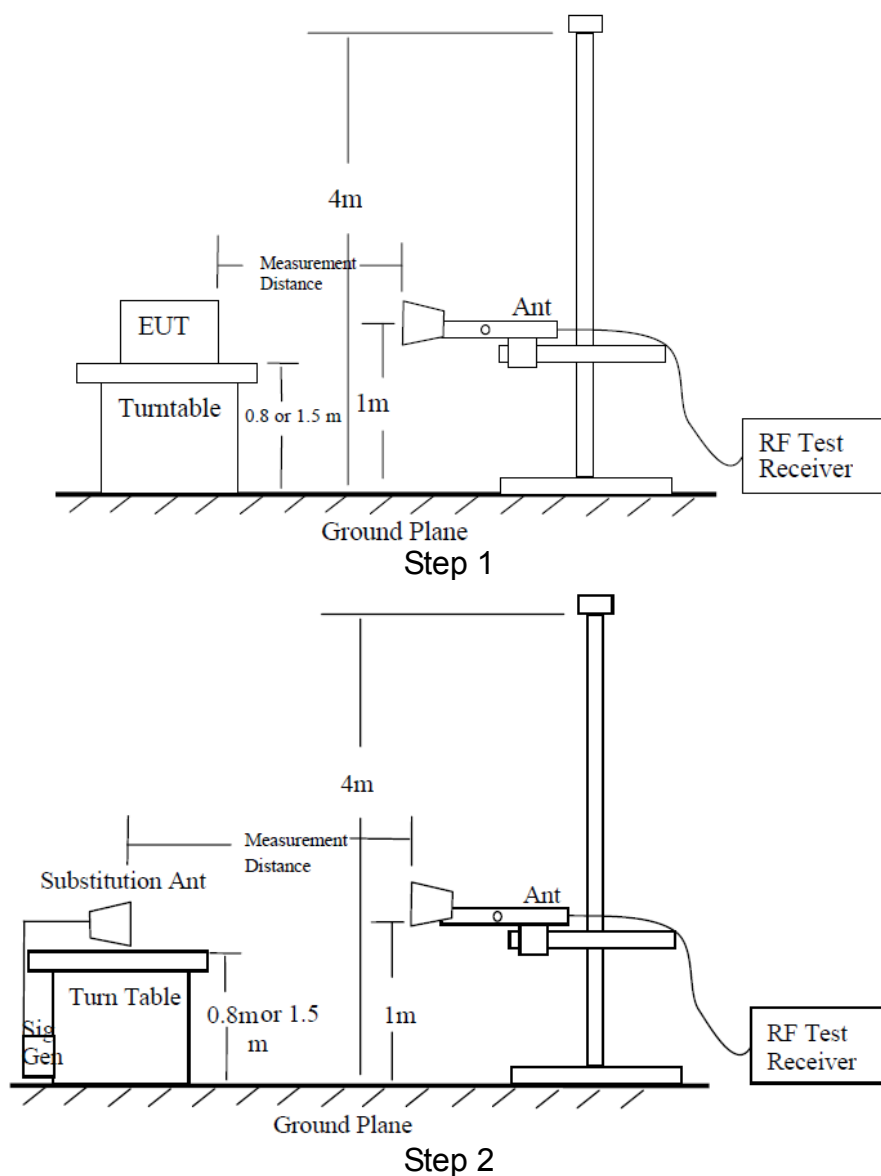
Rule Part(s):

FCC: 22.913(a) (5), 24.232(c), 27.50(d) (4)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test setup:



Test procedure:

The measurements procedures in TIA-603-E-2016 are used.

Step 1:

The measurement is carried out in the chamber. EUT was placed on a 0.8m ($f < 1\text{GHz}$)/1.5m ($f > 1\text{GHz}$) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100KHz($f < 1\text{GHz}$)/1MHz ($f > 1\text{GHz}$). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. And the maximum value of the receiver should be recorded as (Pr).

Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator. To repeat the same procedure as step1 and the level of signal generator will be adjusted till the same power value on the spectrum analyzer or receiver. The ERP/EIRP of the EUT can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna.

A power (P_{mea}) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (P_{mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

A "reference path loss" should be calculated after test. The attenuation of "reference path loss" is the cable loss between the Signal Source with the Substitution Antenna (P_{ca}) and the Substitution Antenna Gain (G_a).

The measurement results are obtained as described below:

Power (EIRP) = $P_{mea} + P_{ca} + G_a$

ERP/EIRP LIMIT

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15 \text{ (dB)}$.

22.913(a) (5)

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

24.232(c)

Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

27.50(d) (4)

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications

Test result:

The test results are shown in Appendix B.

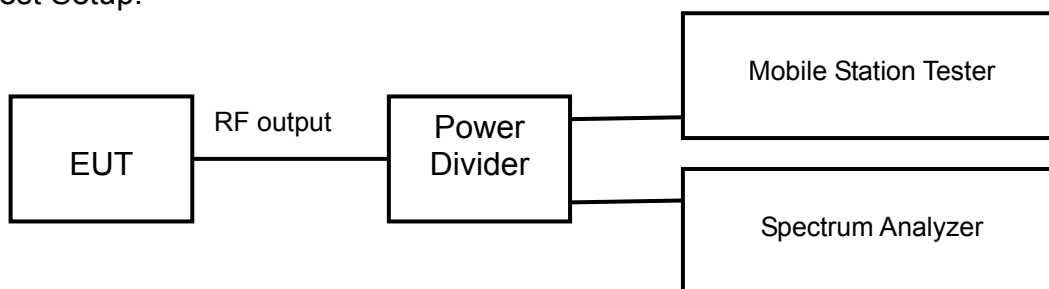
6.3 Occupied Bandwidth

Rule Part(s):
FCC: 2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 4.2

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:
The test results are shown in Appendix A.

6.4 Emission Bandwidth

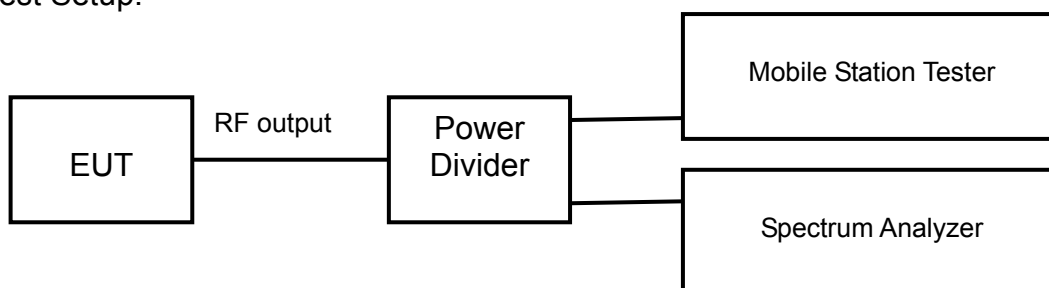
Rule Part(s):

FCC: 2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 26dB occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the emission bandwidth observed in Step 7

Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

The test results are shown in Appendix A.

6.5 Spurious Emissions at antenna terminal

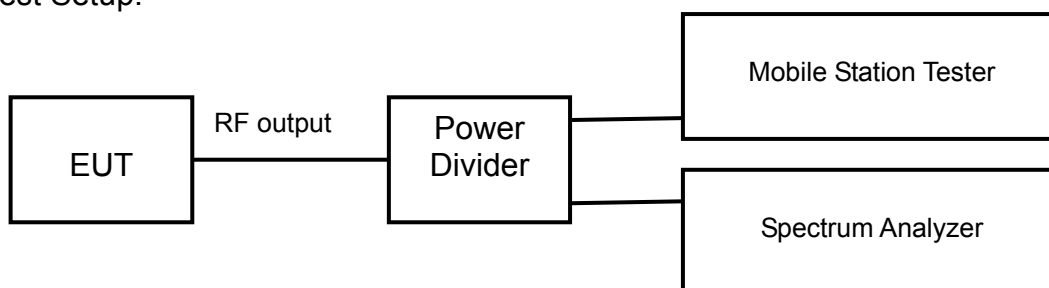
Rule Part(s):

FCC: 2.1051, 22.917(a), 24.238(a), 27.53(h)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz for Cell, 20GHz for PCS
2. RBW=100 kHz (For below 1GHz), 1MHz (For above 1GHz)
3. VBW $\geq 3 \times$ RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Limits:

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{\text{[Watts]}})$, where P is the transmitter power in Watts.

Test result:

The test results are shown in Appendix A.

6.6 Band Edges Compliance

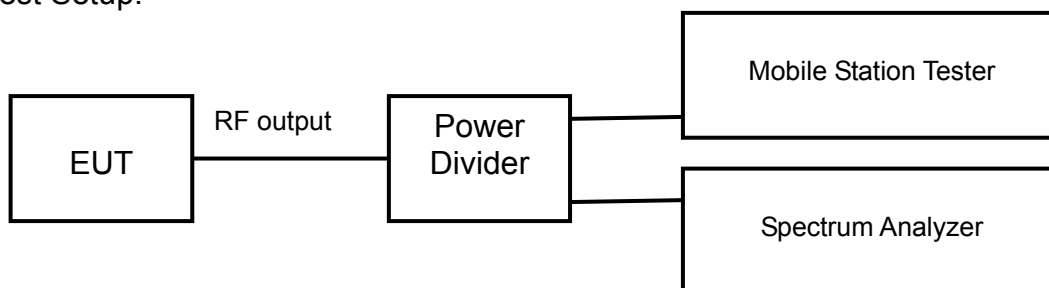
Rule Part(s)

FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span=2MHz
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limit: The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P)$ [Watts]), where P is the transmitter power in Watts.

Test result:

The test results are shown in Appendix A.

6.7 Frequency Stability

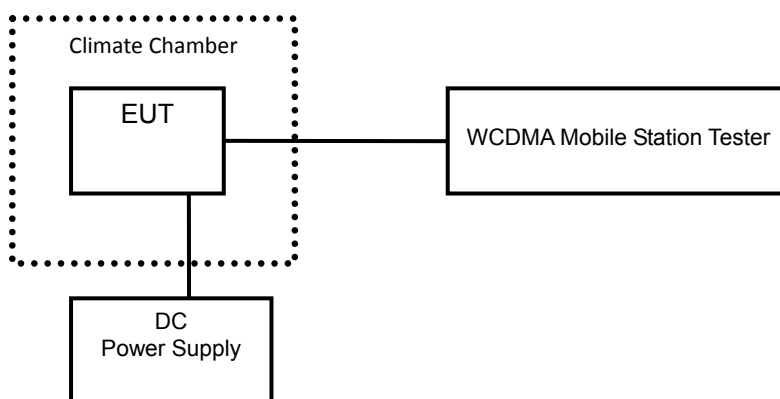
Rule Part(s)

FCC: 2.1055, 22.355, 24.235, 27.54

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test setup:



Test Procedure:

ANSI/TIA-603-E-2016

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C (The temperature range can be declared by the manufacturer). A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Limits: For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test result:

The test results are shown in Appendix A.

6.8 Radiated Spurious Emissions

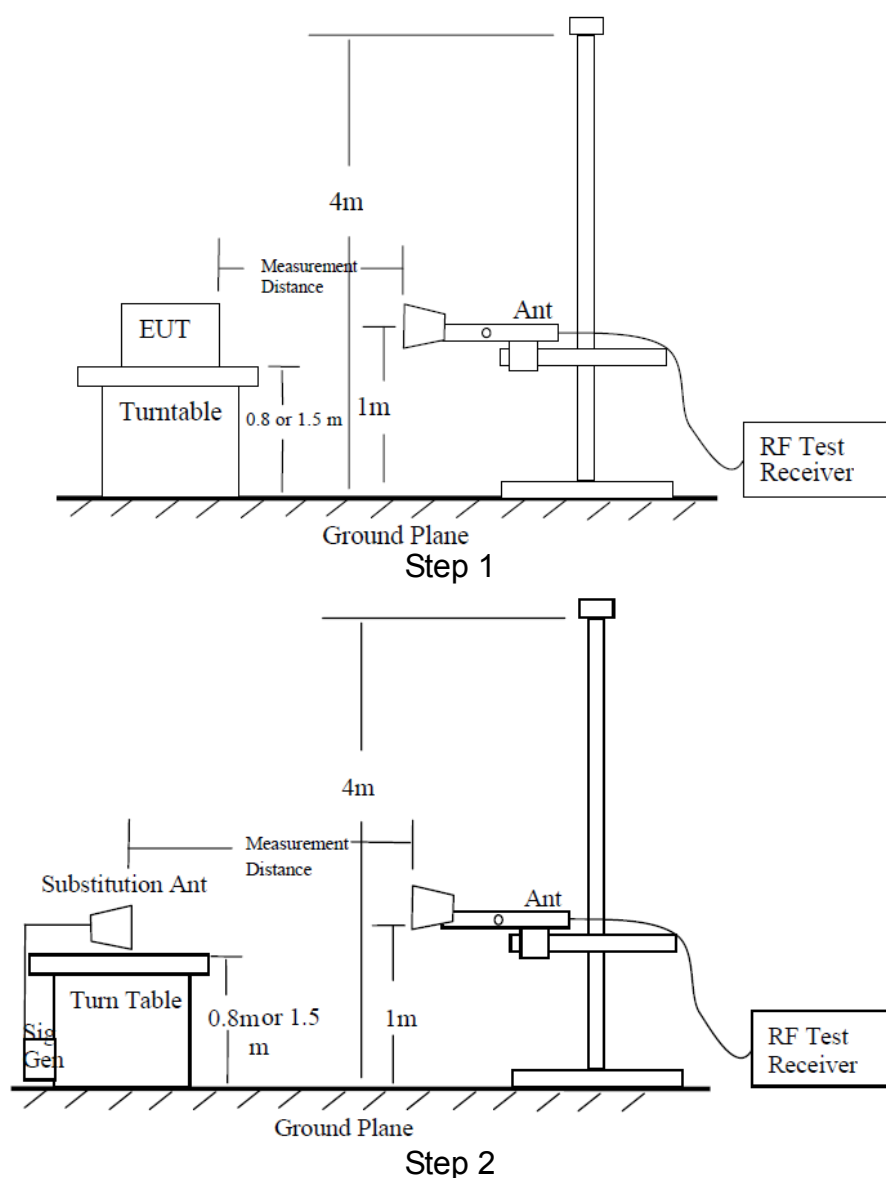
Rule Part(s)

FCC: 2.1053, 22.917(a), 24.238(a), 27.53(h)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:

The measurements procedures in TIA-603-E-2016 are used.

The spectrum was scanned from 30MHz to the 10th harmonic of the highest frequency generated within the equipment.

Step 1:

The measurement is carried out in the chamber. EUT was placed on a 0.8m ($f < 1\text{GHz}$)/1.5m ($f > 1\text{GHz}$) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100 kHz ($f < 1\text{GHz}$)/1MHz ($f > 1\text{GHz}$). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 10th harmonic of the carrier. A notch filter is necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

A power (P_{mea}) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

A "reference path loss" should be calculated after test. The attenuation of "reference path loss" is the cable loss between the Signal Source with the Substitution Antenna (P_{ca}) and the Substitution Antenna Gain (G_a).

Calculation procedure:

The data of cable loss and antenna gain has been calibrated in full testing frequency range before the testing.

The power of the Radiated Spurious Emissions is calculated by adding the cable loss and antenna gain. The basic equation with a sample calculation is as followed:

$$\text{Power (EIRP)} = P_{\text{mea}} + P_{\text{ca}} + G_a$$

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15 \text{ (dB)}$.

Assumed the power of signal source record is -20dBm. A cable loss of -30dB, and an antenna gain of 11dB are added.

$$P = P_{\text{mea}} + P_{\text{ca}} + G_a = (-20\text{dBm}) + (-30\text{dB}) + (11\text{dB}) = -39\text{dBm}$$

Test result:

The test results are shown in Appendix B.

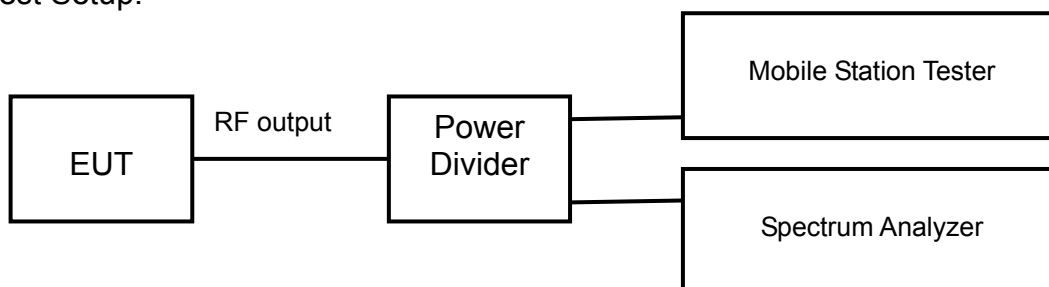
6.9 Peak-Average Ratio

Rule Part(s)
FCC: 24.232(d), 27.50(d) (5)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 5.7.1

Test settings:

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

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

Test result:

The test results are shown in Appendix A

7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
RF Power Output	U=0.6 dB	
Occupied Bandwidth	3kHz	
Spurious Emissions	9kHz~2GHz	U=1.2dB
	2G~3.6GHz	U=1.4dB
	3.6G~8GHz	U=2.2dB
	8G~12.75GHz	U=2.7dB
Band Edges Compliance	1.2dB	
Frequency Stability	U=48 Hz	

8 TEST EQUIPMENTS

No.	Name/Model	Manufacturer	S/N	Calibration Date	Calibration Due Date
1	E5515C(8960) Mobile Station Tester	Agilent	MY50266302	2020.08.20	2021.08.19
2	N9020A Spectrum Analyzer	Agilent	MY48010771	2020.08.20	2021.08.19
3	6007 Power Divider	Weinschel	6007-GJ-1	2020.08.20	2021.08.19
4	DC Power Supply E3645A	Agilent	MY40000741	2020.03.01	2021.02.28
5	Temperature chamber SH241	ESPEC	92013758	2020.08.20	2021.08.19
6	12.65m×8.03m×7.50m Fully-Anechoic Chamber	FRANKONIA	-----	-----	-----
7	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	---	-----	-----
8	Turn table Diameter:1m	FRANKONIA	-----	-----	-----
9	Turn table Diameter:5m	FRANKONIA	-----	-----	-----
10	Antenna master FAC(MA4.0)	MATURO	-----	-----	-----
11	Antenna master SAC(MA4.0)	MATURO	-----	-----	-----
12	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	-----	-----
13	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2020.08.20	2021.08.19
14	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100513	2020.08.20	2021.08.19
15	HL562 Ultra log antenna	R&S	100016	2020.08.20	2021.08.19
16	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2020.08.20	2021.08.19
17	ESI 40 EMI test receiver	R&S	100015	2020.08.20	2021.08.19
18	ESCS30 EMI test receiver	R&S	100029	2020.08.20	2021.08.19
19	HL562 Receive antenna	R&S	100167	2020.08.20	2021.08.19
20	ENV216 AMN	R&S	3560.6550.12	2020.08.20	2021.08.19

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

RF Power Output

WCDMA band II

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	1852.4	9262	23.66
		1880.0	9400	23.74
		1907.6	9538	23.83
HSDPA	Subtest 1	1852.4	9262	22.89
		1880.0	9400	22.91
		1907.6	9538	22.93
	Subtest 2	1852.4	9262	22.51
		1880.0	9400	22.49
		1907.6	9538	22.55
	Subtest 3	1852.4	9262	22.50
		1880.0	9400	22.45
		1907.6	9538	22.47
	Subtest 4	1852.4	9262	22.49
		1880.0	9400	22.42
		1907.6	9538	22.44
HSUPA	Subtest 1	1852.4	9262	22.97
		1880.0	9400	22.99
		1907.6	9538	22.90
	Subtest 2	1852.4	9262	22.40
		1880.0	9400	22.45
		1907.6	9538	22.50
	Subtest 3	1852.4	9262	23.00
		1880.0	9400	22.96
		1907.6	9538	22.97
	Subtest 4	1852.4	9262	22.33
		1880.0	9400	22.40
		1907.6	9538	22.43
	Subtest 5	1852.4	9262	22.94
		1880.0	9400	22.85
		1907.6	9538	22.94

WCDMA band V

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	826.4	4132	23.99
		836.6	4183	24.28
		846.6	4233	24.19
HSDPA	Subtest 1	826.4	4132	23.01
		836.6	4183	23.24
		846.6	4233	23.18
	Subtest 2	826.4	4132	22.85
		836.6	4183	23.27
		846.6	4233	23.07
	Subtest 3	826.4	4132	23.08
		836.6	4183	23.20
		846.6	4233	23.18
	Subtest 4	826.4	4132	23.03
		836.6	4183	23.21
		846.6	4233	23.32
HSUPA	Subtest 1	826.4	4132	22.92
		836.6	4183	23.14
		846.6	4233	23.21
	Subtest 2	826.4	4132	22.97
		836.6	4183	23.10
		846.6	4233	23.00
	Subtest 3	826.4	4132	22.80
		836.6	4183	23.18
		846.6	4233	23.27
	Subtest 4	826.4	4132	23.11
		836.6	4183	23.28
		846.6	4233	23.29
	Subtest 5	826.4	4132	22.81
		836.6	4183	23.22
		846.6	4233	23.14

WCDMA band IV

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	1712.4	1312	23.27
		1732.4	1412	23.31
		1752.6	1513	23.33
HSDPA	Subtest 1	1712.4	1312	22.48
		1732.4	1412	22.57
		1752.6	1513	22.66
	Subtest 2	1712.4	1312	22.55
		1732.4	1412	22.56
		1752.6	1513	22.60
	Subtest 3	1712.4	1312	22.00
		1732.4	1412	22.03
		1752.6	1513	22.07
	Subtest 4	1712.4	1312	22.01
		1732.4	1412	22.05
		1752.6	1513	22.13
HSUPA	Subtest 1	1712.4	1312	22.54
		1732.4	1412	22.57
		1752.6	1513	22.59
	Subtest 2	1712.4	1312	21.99
		1732.4	1412	21.96
		1752.6	1513	22.15
	Subtest 3	1712.4	1312	22.43
		1732.4	1412	22.52
		1752.6	1513	22.57
	Subtest 4	1712.4	1312	22.39
		1732.4	1412	22.46
		1752.6	1513	22.49
	Subtest 5	1712.4	1312	22.38
		1732.4	1412	22.44
		1752.6	1513	22.53

Occupied Bandwidth

WCDMA band II

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1852.4	9262	4.1165
1880.0	9400	4.1191
1907.6	9538	4.1301

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1852.4	9262	4.1281
1880.0	9400	4.1374
1907.6	9538	4.1179

WCDMA band V

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
826.4	4132	4.2094
836.6	4183	4.1320
846.6	4233	4.1666

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
826.4	4132	4.1867
836.6	4183	4.1318
846.6	4233	4.1368

WCDMA band IV

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1712.4	1312	4.1259
1732.4	1412	4.1224
1752.6	1513	4.1565

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1712.4	1312	4.1158
1732.4	1412	4.1255
1752.6	1513	4.1551

Emission Bandwidth

WCDMA band II

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1852.4	9262	4.683
1880.0	9400	4.687
1907.6	9538	4.683

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1852.4	9262	4.665
1880.0	9400	4.702
1907.6	9538	4.672

WCDMA band V

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
826.4	4132	4.835
836.6	4183	4.684
846.6	4233	4.721

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
826.4	4132	4.855
836.6	4183	4.685
846.6	4233	4.698

WCDMA band IV

REL99 Mode:

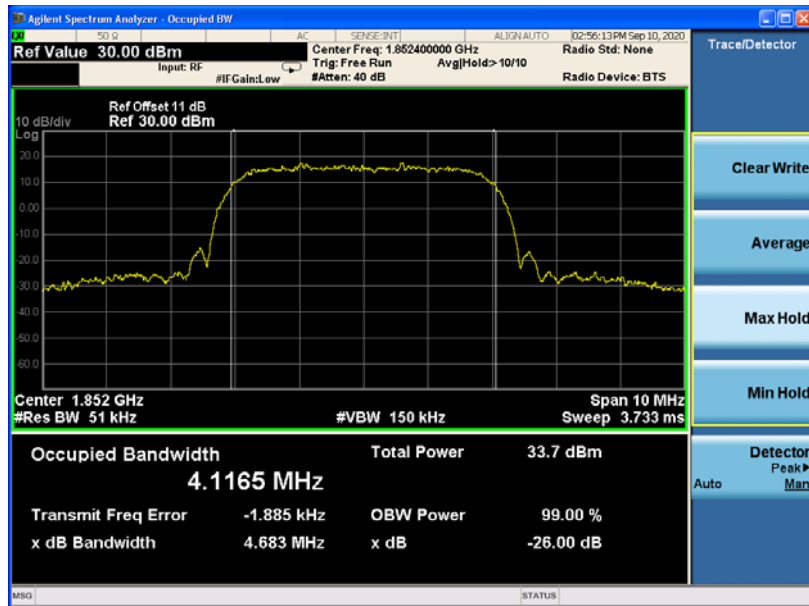
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1712.4	1312	4.659
1732.4	1412	4.685
1752.6	1513	4.768

HSUPA Mode:

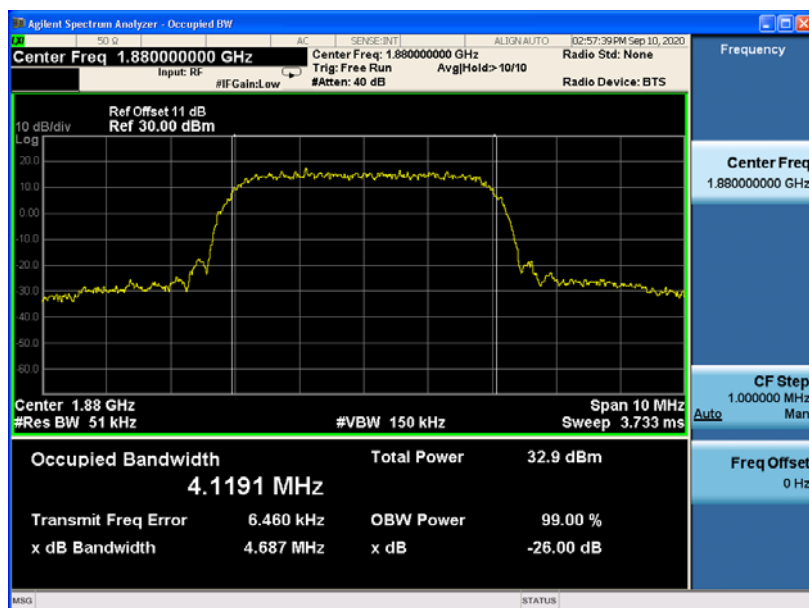
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1712.4	1312	4.662
1732.4	1412	4.695
1752.6	1513	4.751

WCDMA band II

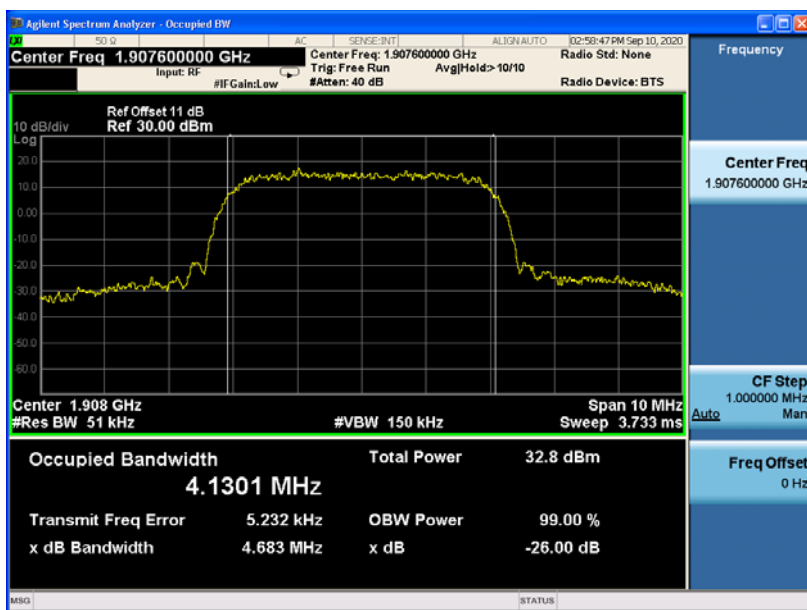
REL99 Mode:



Channel 9262

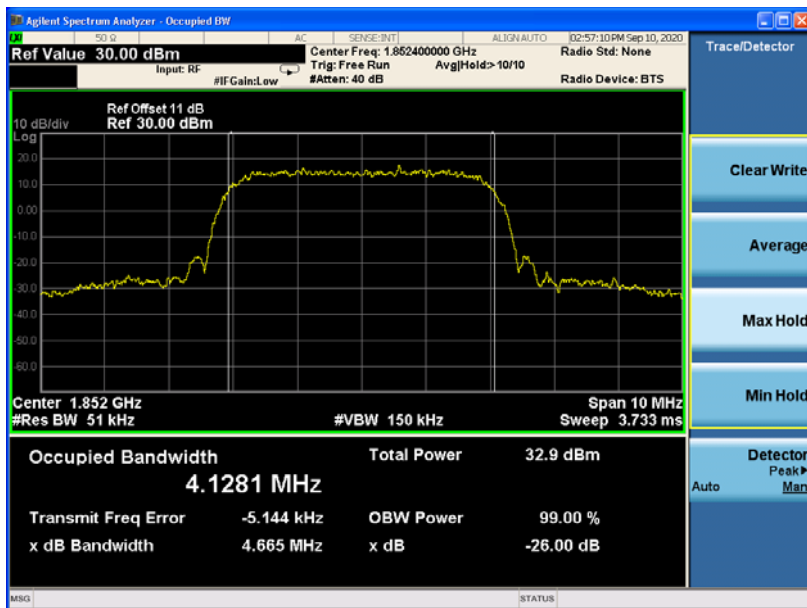


Channel 9400

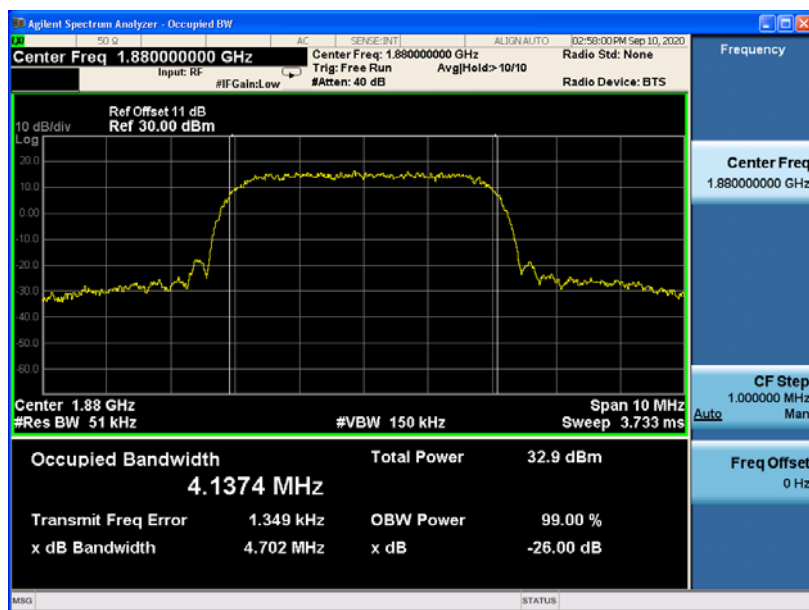


Channel 9538

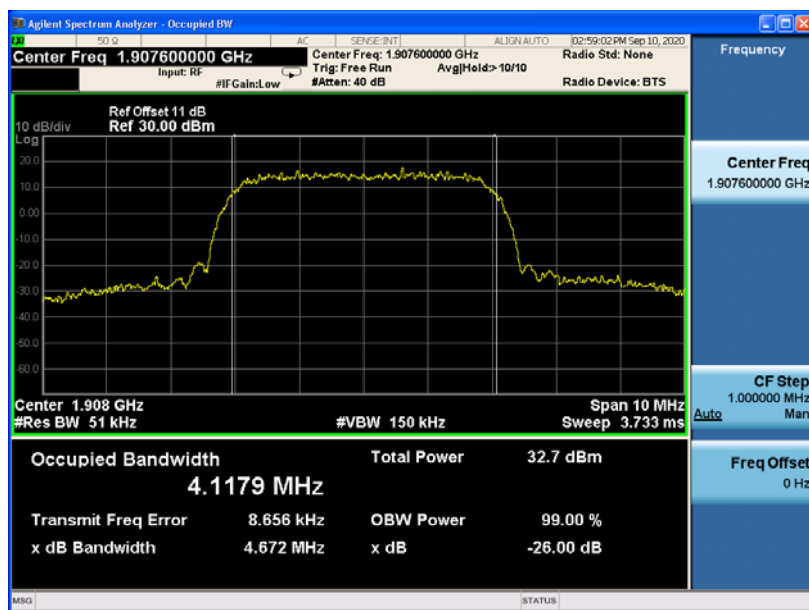
HSUPA Mode:



Channel 9262



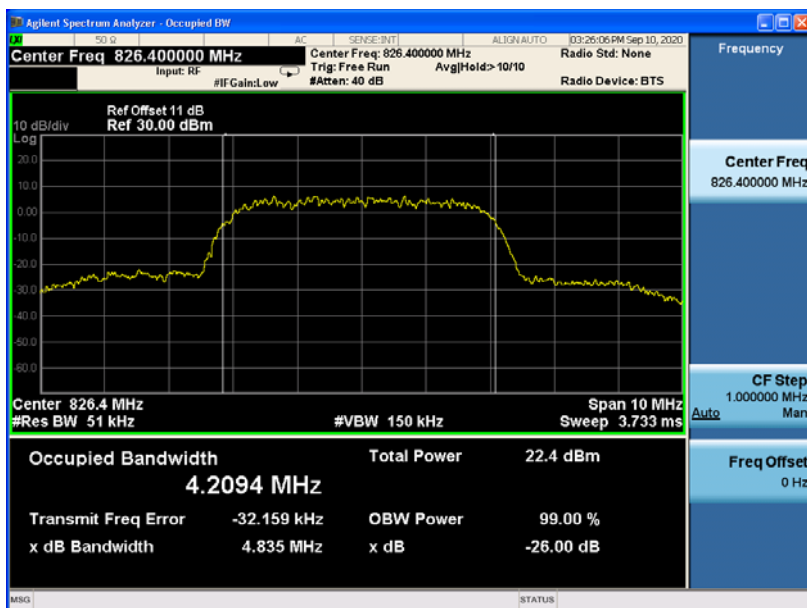
Channel 9400



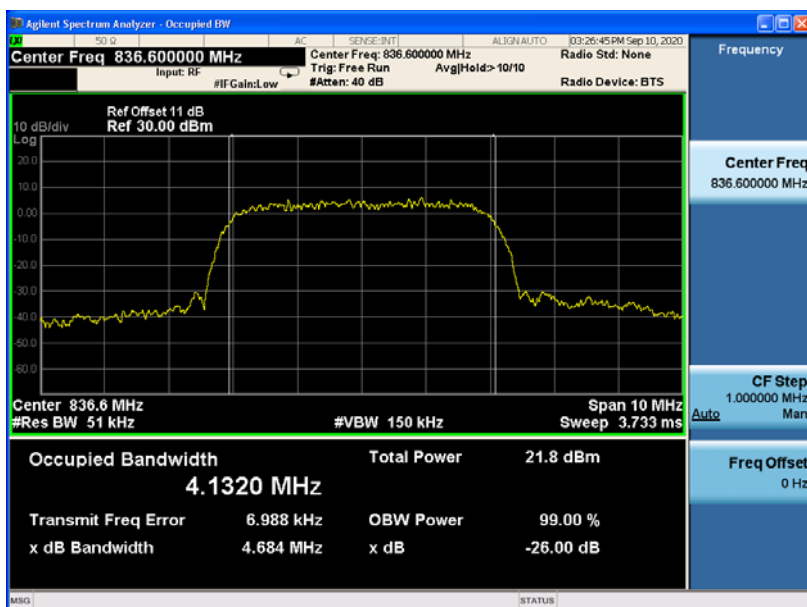
Channel 9538

WCDMA band V

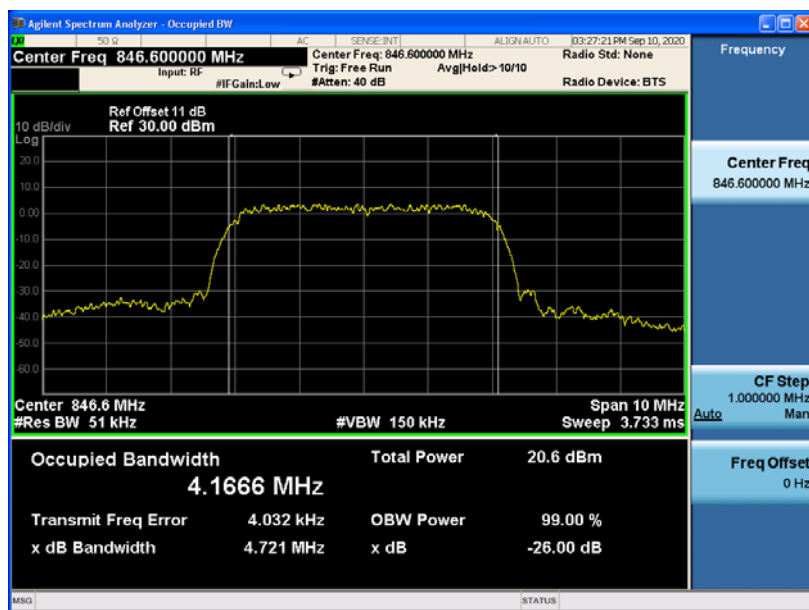
REL99 Mode:



Channel 4132

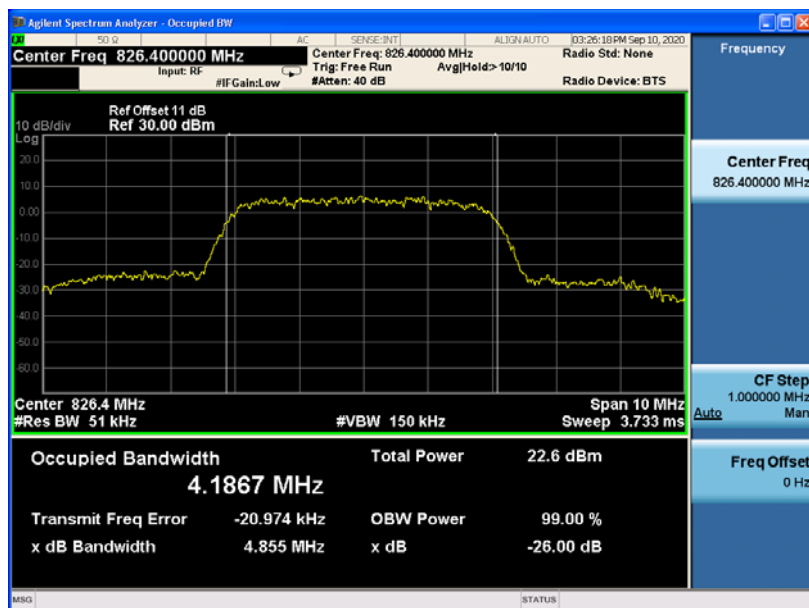


Channel 4183

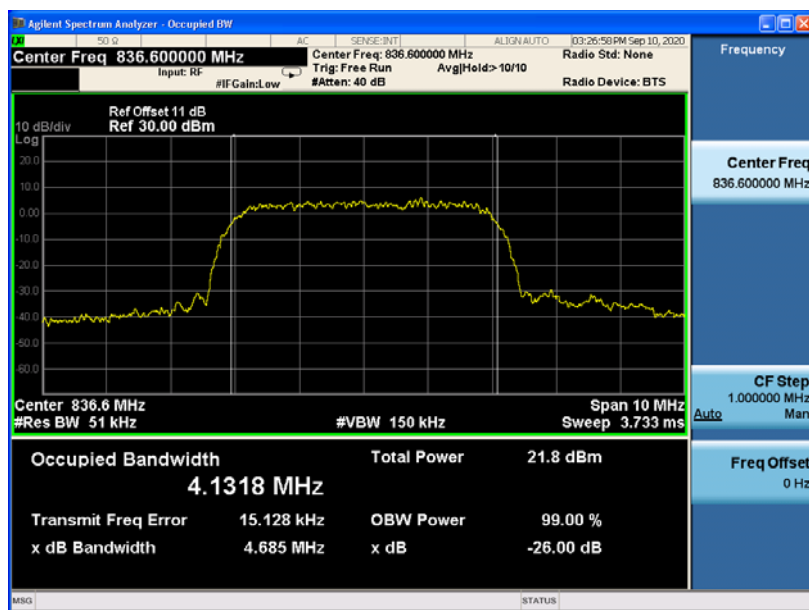


Channel 4233

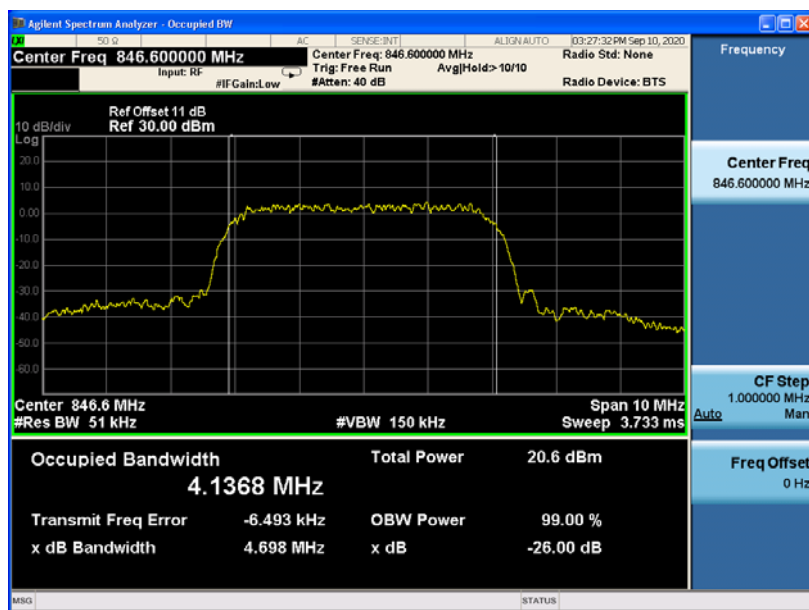
HSUPA Mode:



Channel 4132



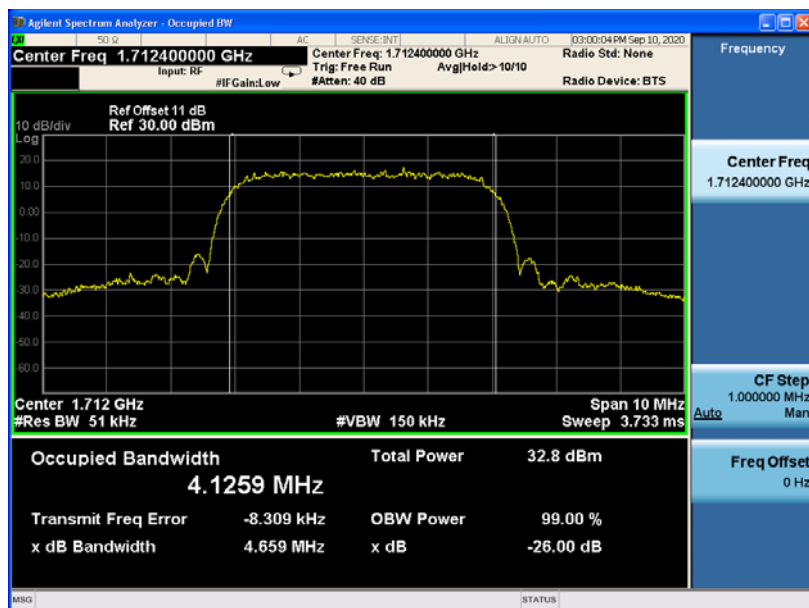
Channel 4183



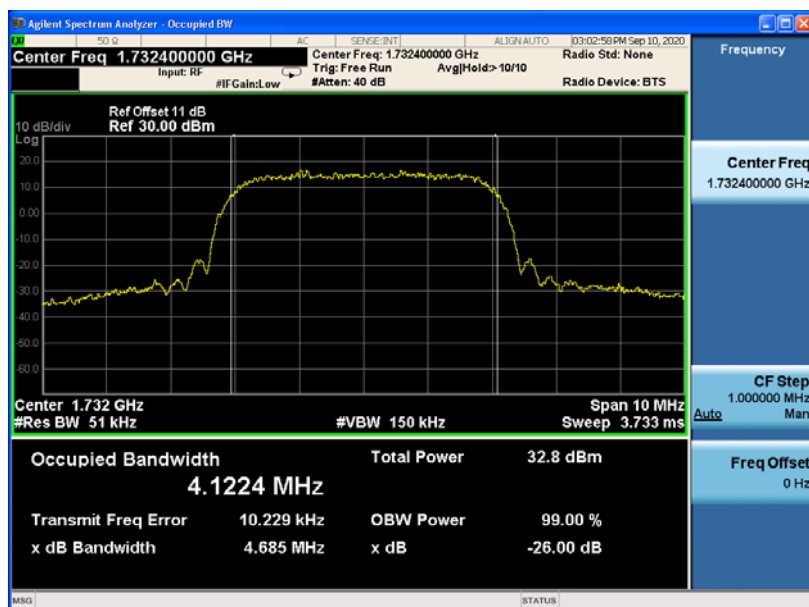
Channel 4233

WCDMA band IV

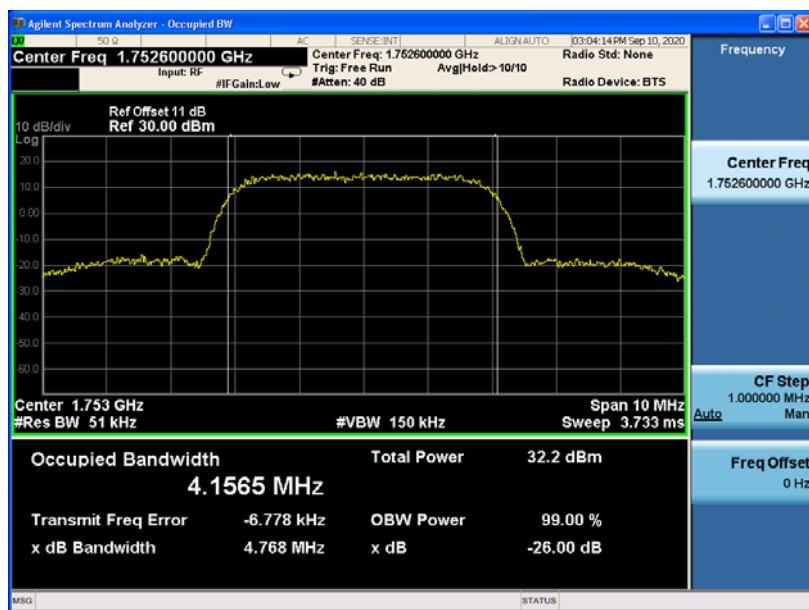
REL99 Mode:



Channel 1312

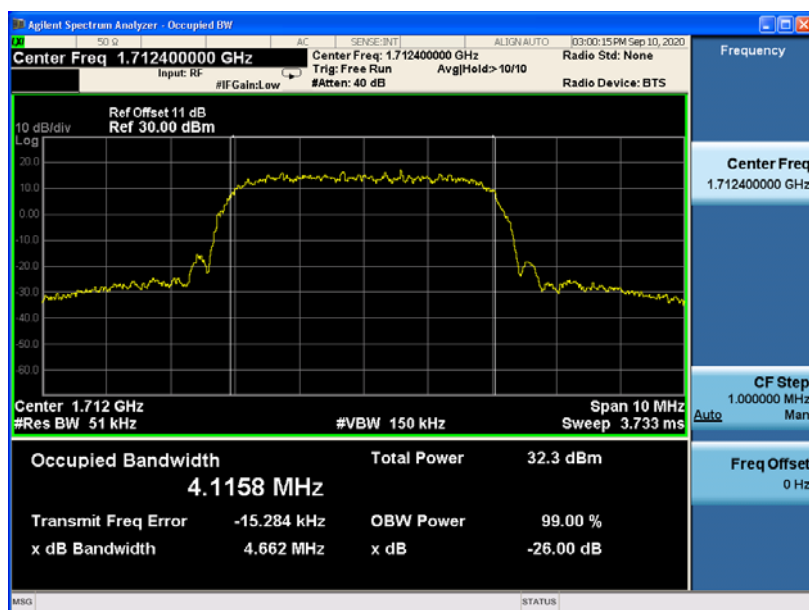


Channel 1412

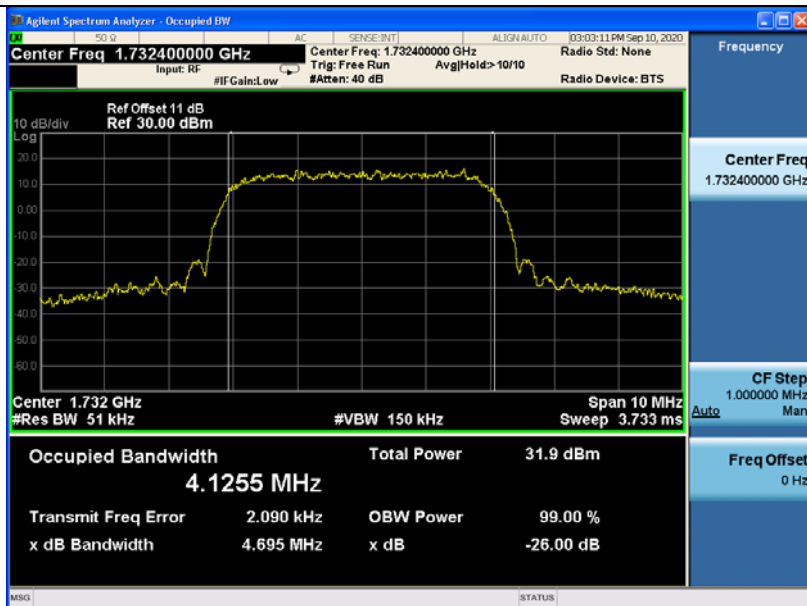


Channel 1513

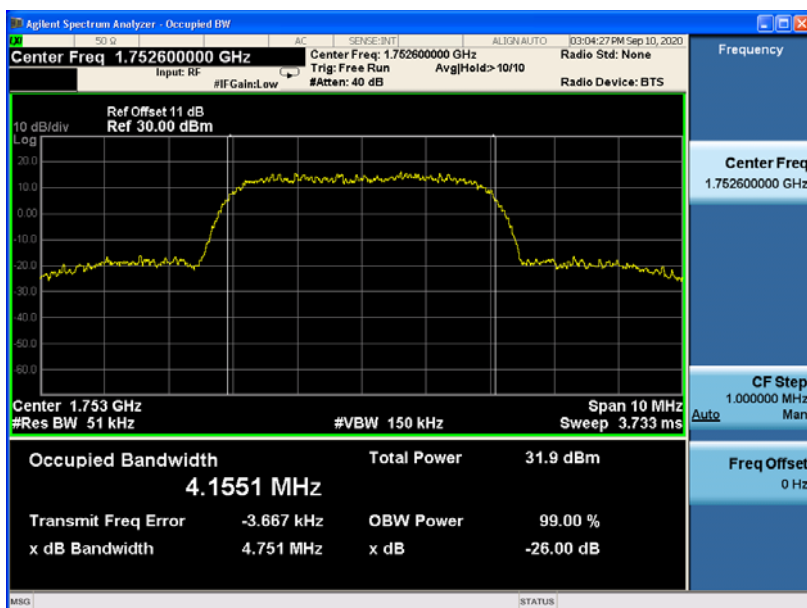
HSUPA Mode:



Channel 1312



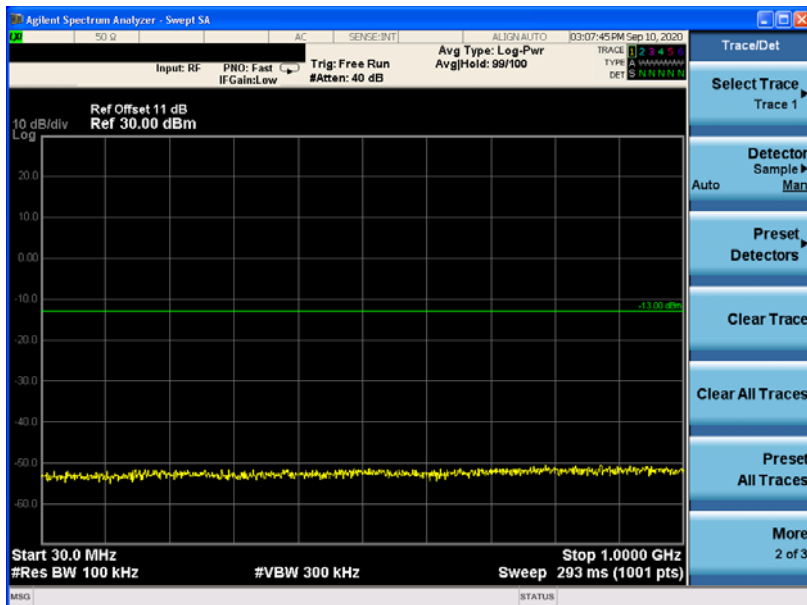
Channel 1412



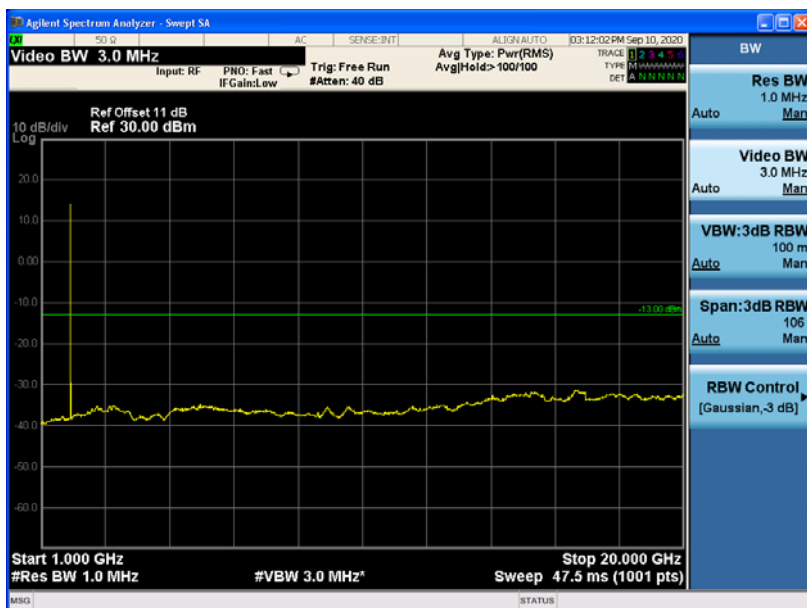
Channel 1513

Spurious Emissions at antenna terminal WCDMA band II

REL99 Mode:



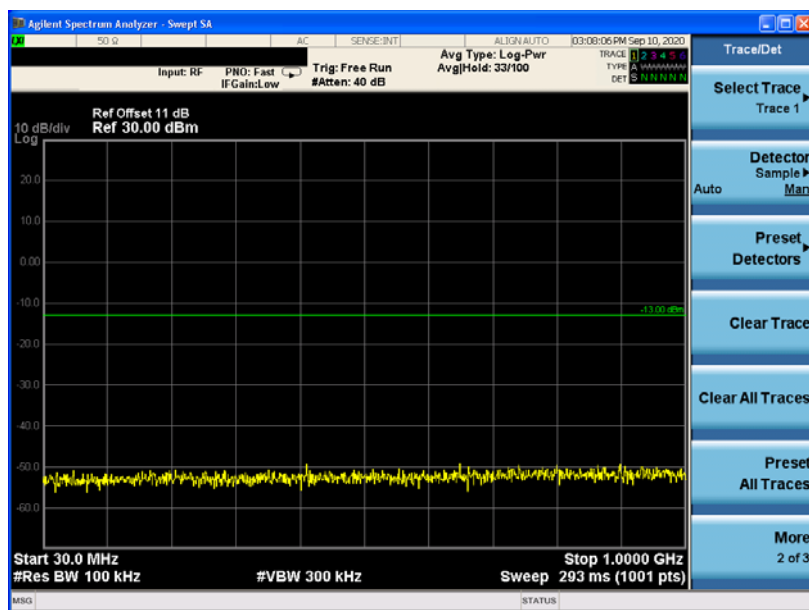
Channel 9400, 30MHz~1GHz



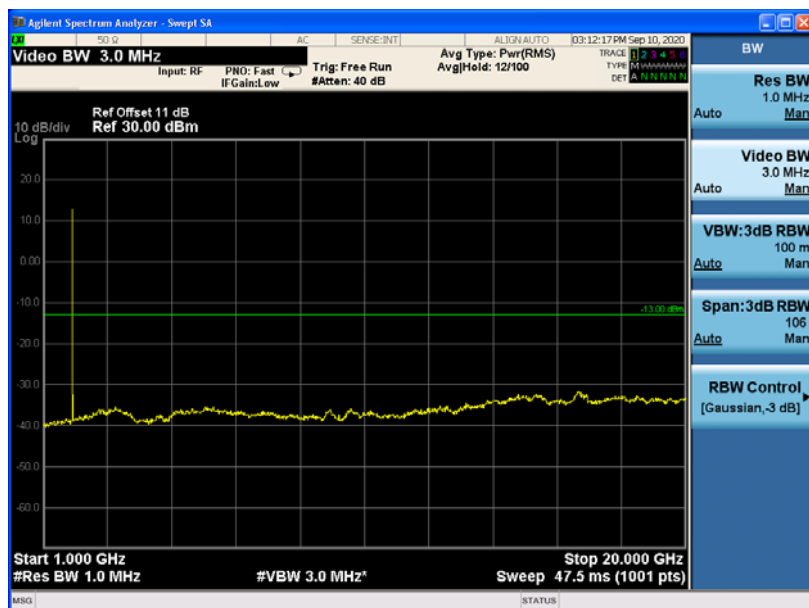
Channel 9400, 1GHz~20GHz

Note: The signal beyond the limit is the signal transmitted by EUT.

HSUPA Mode:



Channel 9400, 30MHz~1GHz

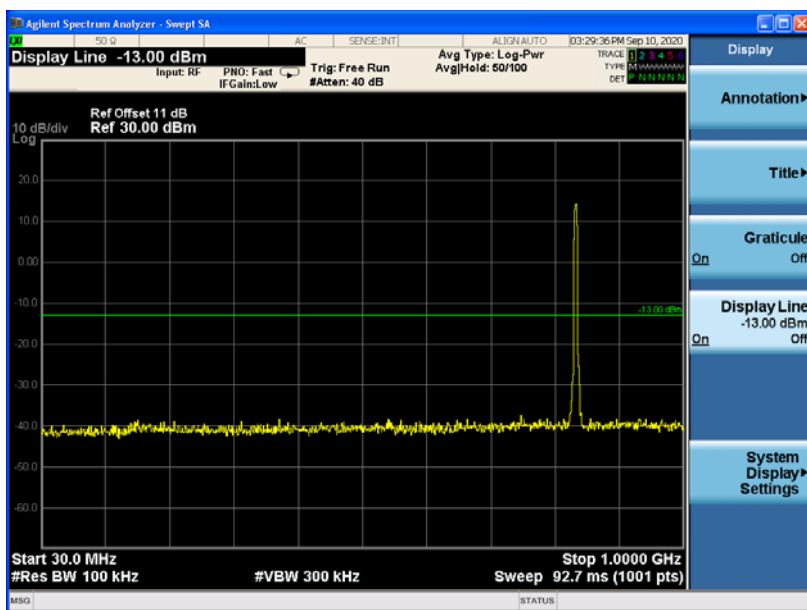


Channel 9400, 1GHz~20GHz

Note: The signal beyond the limit is the signal transmitted by EUT.

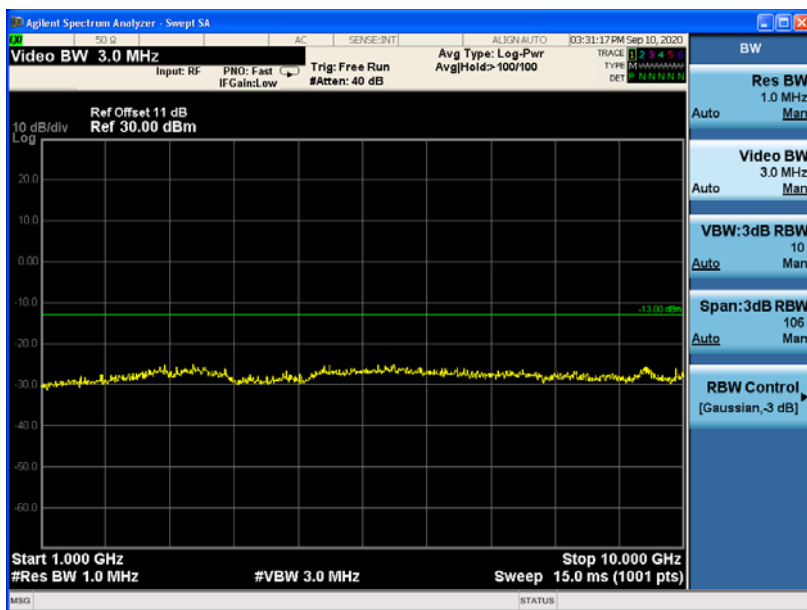
WCDMA band V

REL99 Mode:



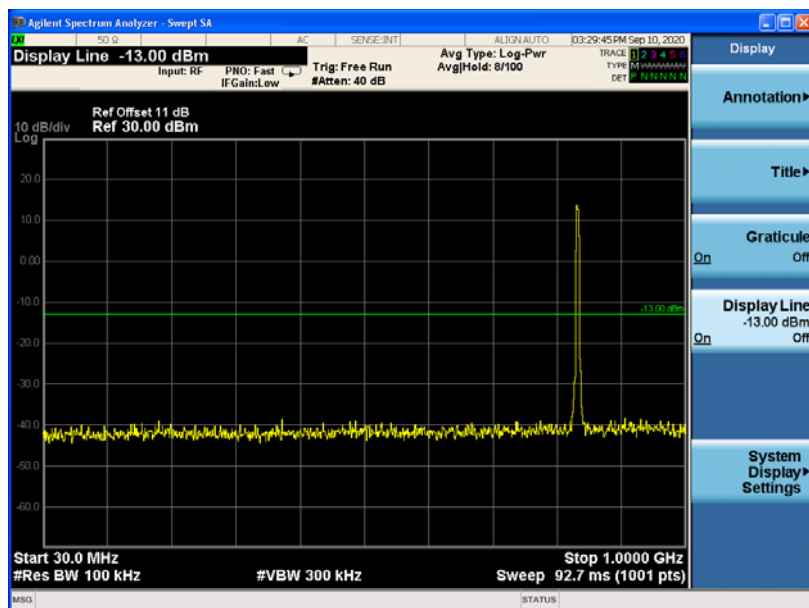
Channel 4183, 30MHz~1GHz

Note: The signal beyond the limit is the signal transmitted by EUT.



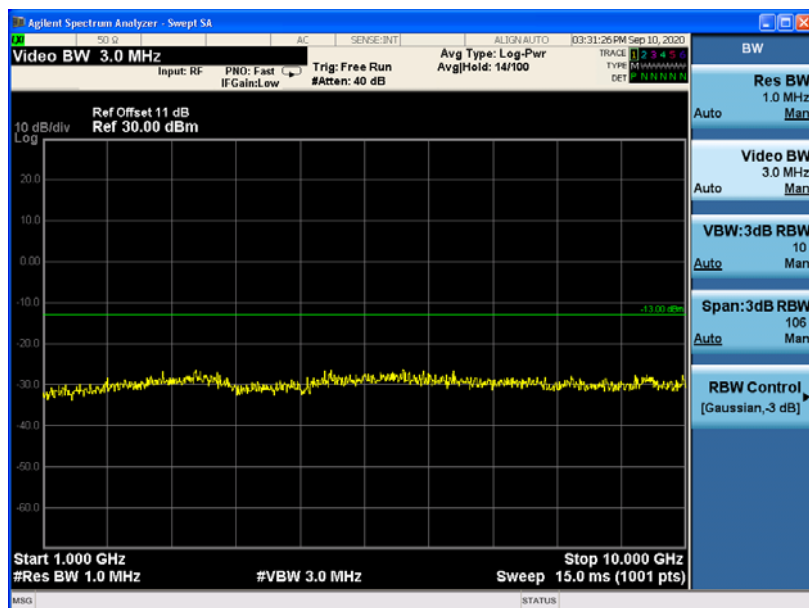
Channel 4183, 1GHz~10GHz

HSUPA Mode:



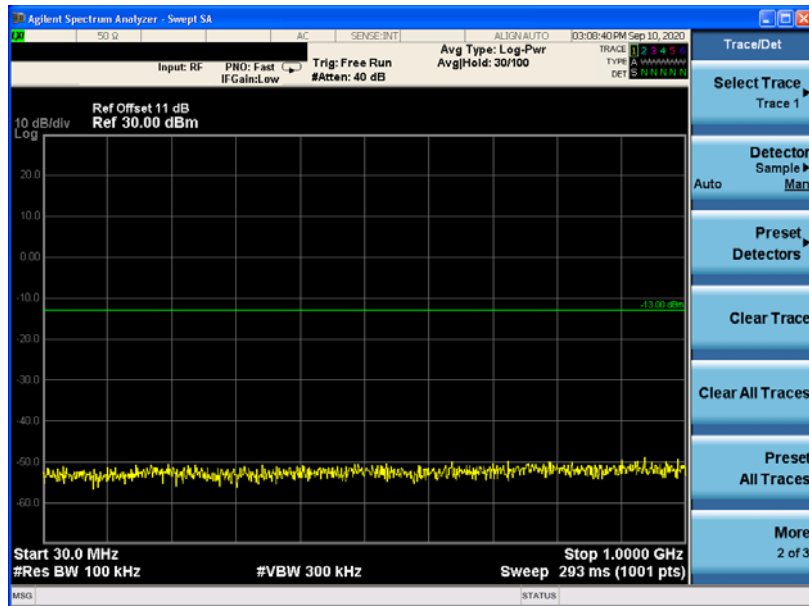
Channel 4183, 30MHz~1GHz

Note: The signal beyond the limit is the signal transmitted by EUT.

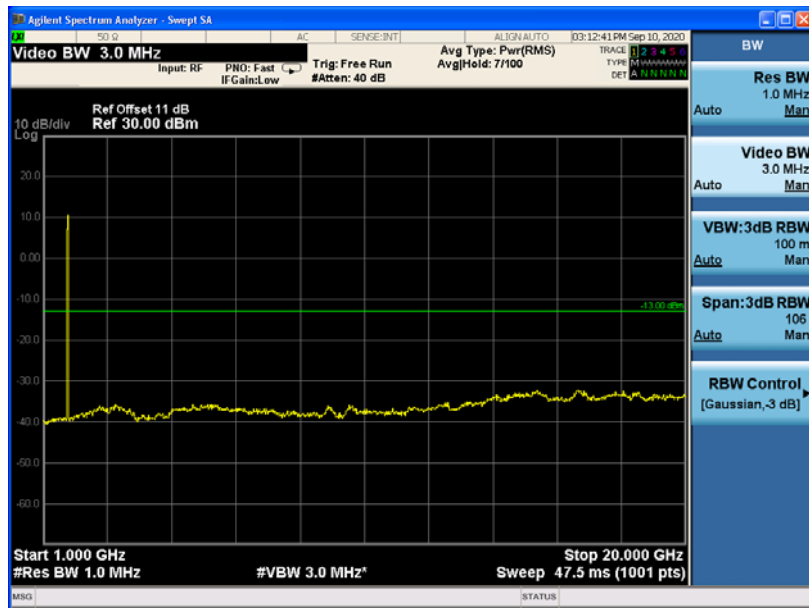


Channel 4183, 1GHz~10GHz

WCDMA band IV
REL99 Mode:



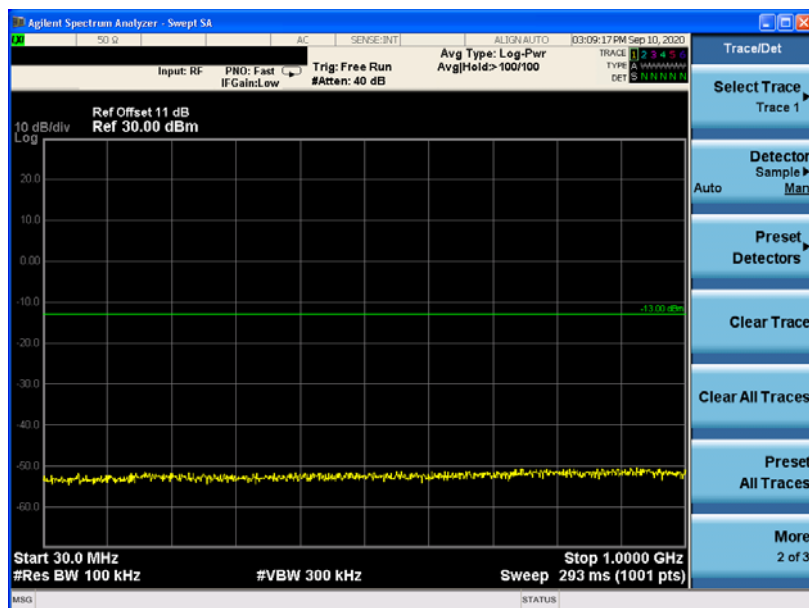
Channel 1412, 30MHz~1GHz



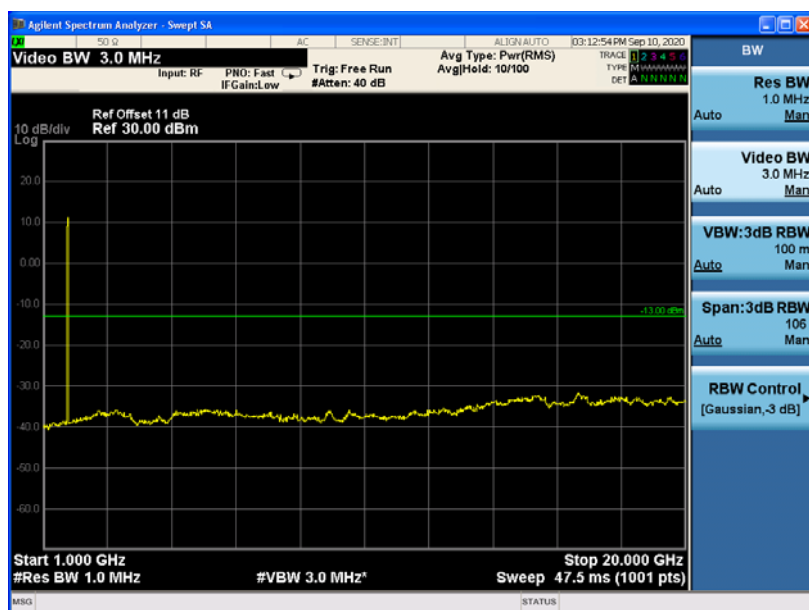
Channel 1412, 1GHz~20GHz

Note: The signal beyond the limit is the signal transmitted by EUT.

HSUPA Mode:



Channel 1412, 30MHz~1GHz



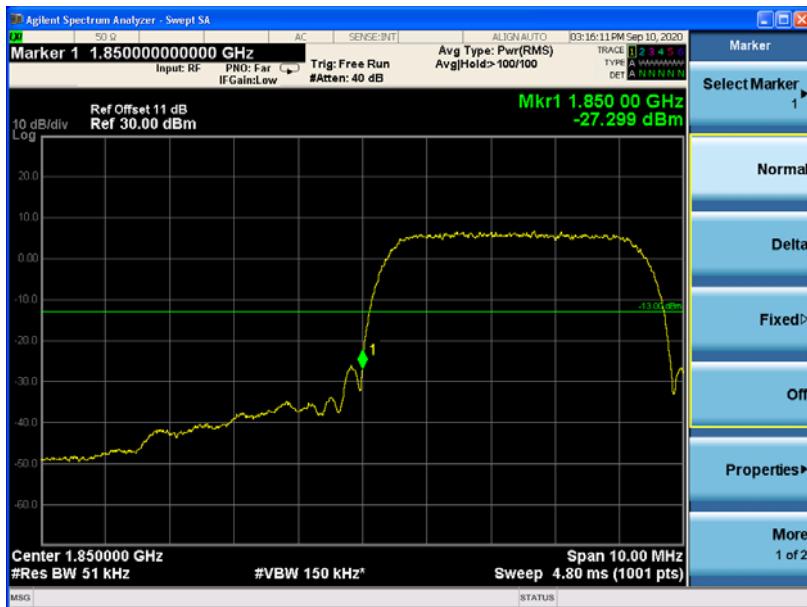
Channel 1412, 1GHz~20GHz

Note: The signal beyond the limit is the signal transmitted by EUT.

Band Edges Compliance

WCDMA band II

REL99 Mode:



HSUPA Mode:



Channel 9262



Channel 9538

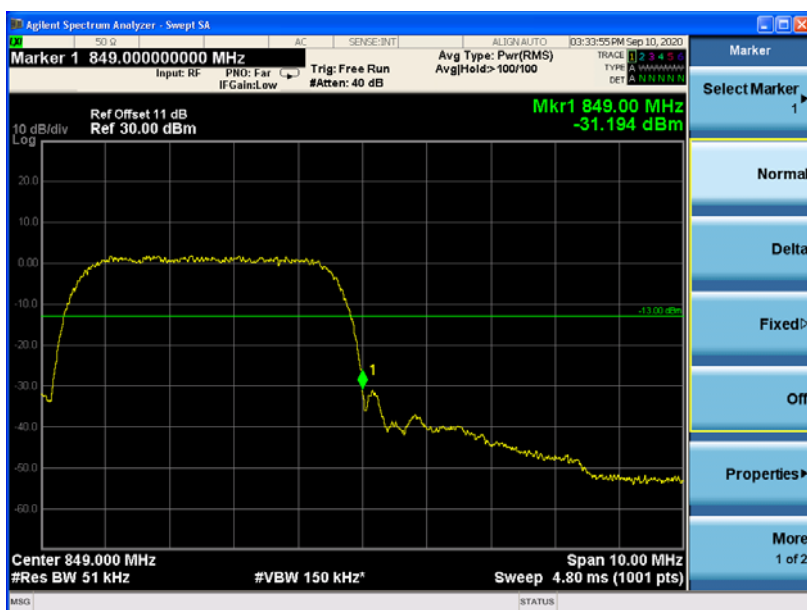
REL99 Mode:



HSUPA Mode:



Channel 9262



Channel 9538

REL99 Mode:



Agilent Spectrum Analyzer - Sweep 1 SA

Marker 1 1.710000000000 GHz

Input: RF PNO: Far Trig: Free Run Avg Type: Pwr(RMS) AvgHold: 90/100

IF Gain: Low #Atten: 40 dB

03:10:02 PM Sep 10, 2020

TRACE 1 2 3 4 5 6

TYPE: S Parameters

DET: A 1/N 1/N 1/N 1/N

Ref Offset 11 dB

Ref 30.00 dBm

Mkr1 1.710 00 GHz

-28.178 dBm

10 dB/div

Log

20.0

10.0

0.00

-10.0

-20.0

-30.0

-40.0

-50.0

-60.0

Center 1.710000 GHz

#Res BW 51 kHz

#VBW 150 KHz*

Span 10.00 MHz

Sweep 4.80 ms (1001 pts)

MSO STATUS

Agilent Spectrum Analyzer - Swept SA

Marker 1 1.755000000000 GHz

Input: RF PNO: Far IF Gain: Low

Trig: Free Run #Atten: 40 dB

Avg Type: Pwr(RMS) AvgHold: 91/100

ALIGN AUTO 03:19:06 PM Sep 10, 2020

TRACE 1 2 3 4 5 6

TYPE A W W W W W W W W

DET 6.1 1.0 1.0 1.0 1.0 1.0

Ref Offset 11 dB Ref 30.00 dBm

Mkr1 1.755 00 GHz -19.755 dBm

10 dB/div Log

Center 1.755000 GHz

Res BW 51 kHz

#VBW 150 kHz

Span 10.00 MHz

Sweep 4.80 ms (1001 pts)

13.00 dBm

Select Marker 1

Normal

Delta

Fixed

Properties

More

1 of 2

V3.0.0

Frequency Stability

WCDMA band II

REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 9262	Channel 9400	Channel 9538
-10	0.026	0.033	-0.015
0	-0.007	0.044	-0.037
+10	0.009	-0.012	0.021
+20	0.000	0.000	0.000
+30	-0.022	0.048	-0.036
+40	0.015	0.015	0.040
+50	-0.038	0.028	0.026
+55	-0.022	0.011	-0.022
Voltage	Test Result (ppm)@NT		
	Channel 9262	Channel 9400	Channel 9538
LV	0.038	0.001	0.002
HV	0.052	0.013	-0.001

HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 9262	Channel 9400	Channel 9538
-10	0.046	0.018	0.010
0	0.011	0.017	-0.025
+10	-0.026	0.050	-0.039
+20	0.000	0.000	0.000
+30	0.043	-0.002	-0.007
+40	-0.019	-0.037	-0.019
+50	0.042	0.051	0.046
+55	-0.002	0.010	-0.020
Voltage	Test Result (ppm)NT		
	Channel 9262	Channel 9400	Channel 9538
LV	-0.020	-0.032	-0.017
HV	0.028	-0.012	-0.023

WCDMA band V
REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 4132	Channel 4183	Channel 4233
-10	0.036	0.031	0.023
0	0.015	0.044	0.015
+10	0.004	-0.002	-0.021
+20	0.000	0.000	0.000
+30	-0.019	0.011	0.010
+40	-0.030	0.044	0.042
+50	0.014	0.000	0.025
+55	0.027	-0.013	-0.026
Voltage	Test Result (ppm)@NT		
	Channel 4132	Channel 4183	Channel 4233
LV	-0.010	-0.010	-0.012
HV	0.011	-0.042	0.011

HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 4132	Channel 4183	Channel 4233
-10	0.000	-0.017	0.010
0	-0.013	-0.014	-0.038
+10	-0.014	0.038	-0.037
+20	0.000	0.000	0.000
+30	-0.011	0.039	0.014
+40	0.031	-0.032	0.041
+50	0.004	0.050	-0.012
+55	-0.007	-0.042	-0.035
Voltage	Test Result (ppm)@NT		
	Channel 4132	Channel 4183	Channel 4233
LV	-0.004	0.016	-0.027
HV	0.008	0.049	-0.010

WCDMA band IV

REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 1312	Channel 1412	Channel 1513
-10	0.045	0.032	0.050
0	0.052	-0.037	-0.035
+10	0.001	0.003	0.044
+20	0.000	0.000	0.000
+30	0.008	-0.034	0.005
+40	-0.034	0.036	0.006
+50	-0.038	0.000	0.046
+55	0.044	-0.019	0.034
Voltage	Test Result (ppm)@NT		
	Channel 1312	Channel 1412	Channel 1513
LV	-0.005	0.044	0.018
HV	0.010	0.051	0.021

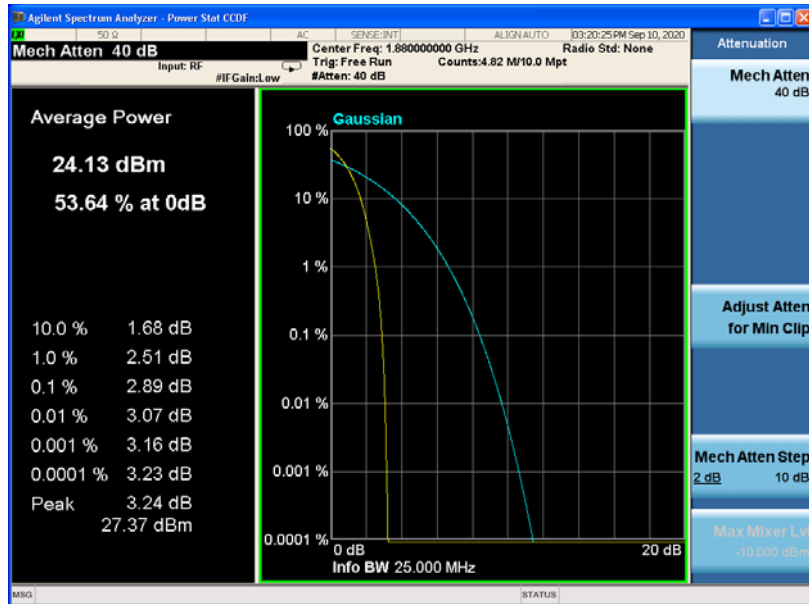
HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 1312	Channel 1412	Channel 1513
-10	-0.038	-0.031	-0.040
0	0.030	0.019	-0.027
+10	-0.015	0.045	-0.009
+20	0.000	0.000	0.000
+30	0.000	-0.002	0.039
+40	0.023	-0.029	0.048
+50	-0.009	0.033	-0.015
+55	0.044	0.033	-0.028
Voltage	Test Result (ppm)@NT		
	Channel 1312	Channel 1412	Channel 1513
LV	-0.003	-0.027	0.030
HV	0.032	-0.025	0.012

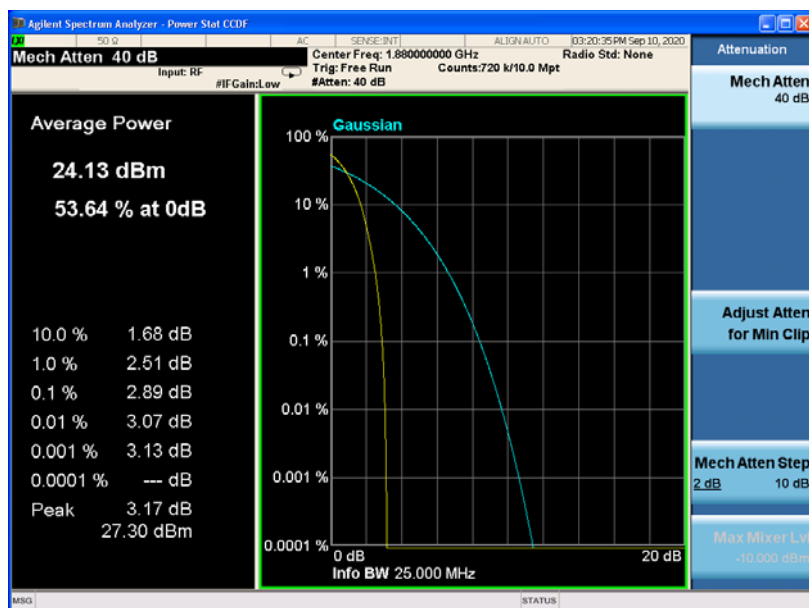
Peak-Average Ratio

WCDMA band II

REL99 Mode:

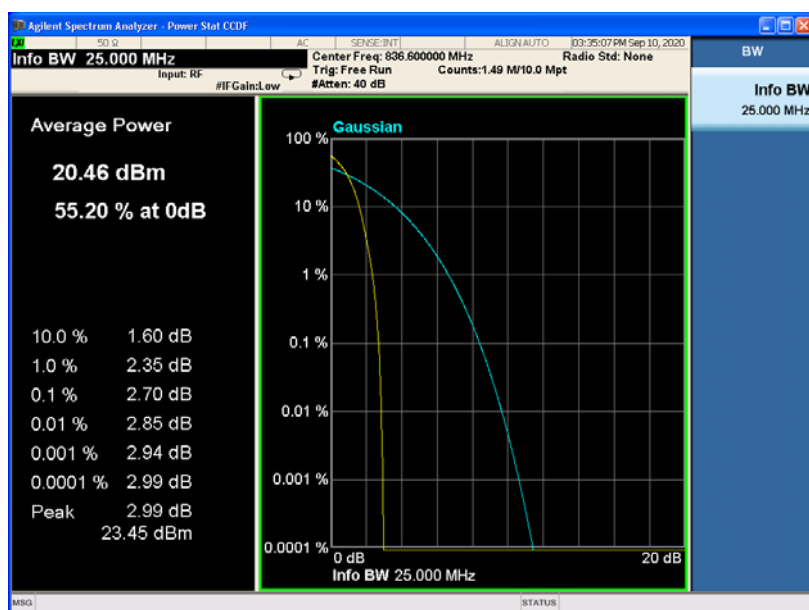


HSUPA Mode:

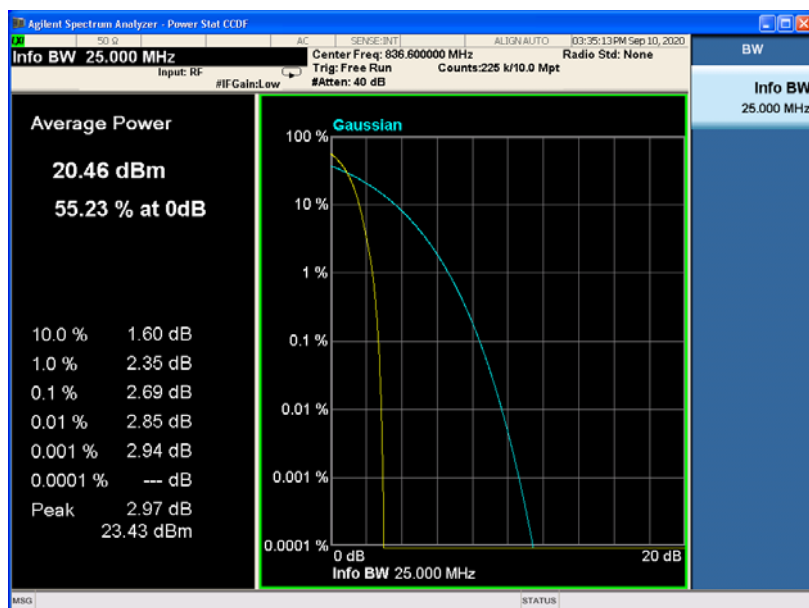


WCDMA band V

REL99 Mode:

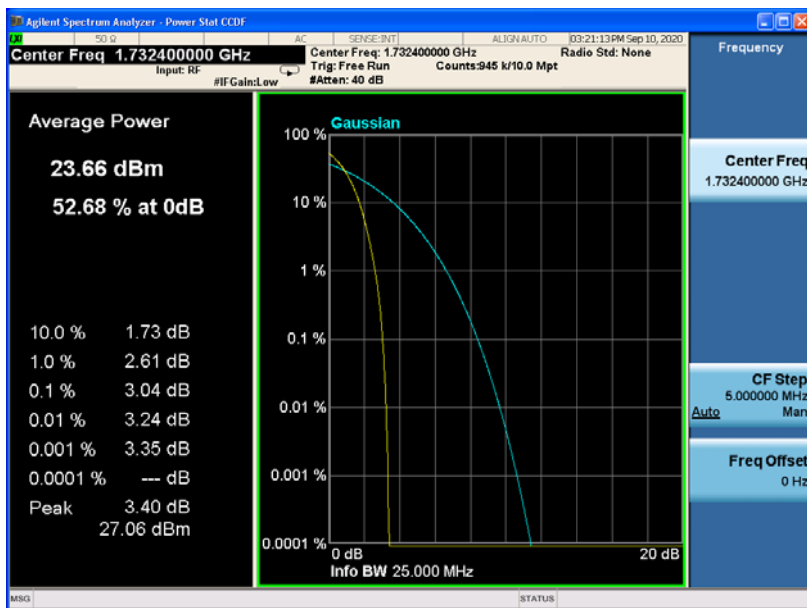


HSUPA Mode:

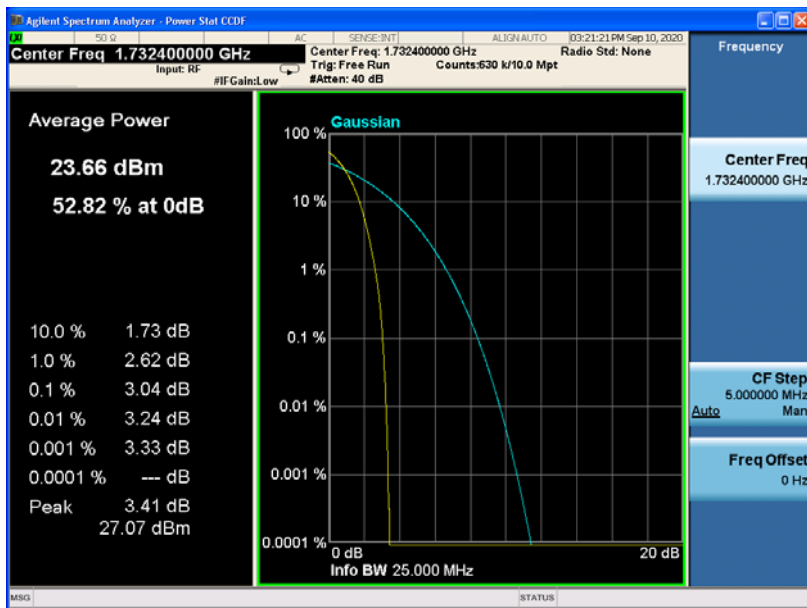


WCDMA band IV

REL99 Mode:



HSUPA Mode:



APPENDIX B – TEST DATA OF RADIATED EMISSION

The measurement results are obtained as described below:

Peak EIRP = P_{mea} + P_{ca} Cable loss+ G_a Antenna Gain

Sample calculation: (24.41 dBm) = (19.61 dBm) + (-3.8 dB) + (8.6 dB), the corresponding frequency is 1852.4MHz.

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss(dB)	Ga Antenna Gain (dB)	P _{mea} (dBm)	Polarization
1852.4	24.41	-3.8	8.6	19.61	Vertical

WCDMA band II

Test result:

WCDMA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dB)	P _{mea} (dBm)	Polarization
1852.4	24.41	-3.8	8.6	19.61	Vertical
1880.0	24.69	-3.8	8.6	19.89	Vertical
1907.6	24.65	-3.8	8.6	19.85	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dB)	P _{mea} (dBm)	Polarization
1852.4	23.51	-3.8	8.6	18.71	Vertical
1880.0	23.90	-3.8	8.6	19.10	Vertical
1907.6	22.73	-3.8	8.6	17.93	Vertical

Test result:

WCDMA Mode:

Channel 9262

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2455.63	-49.46	-13	Vertical
2781.29	-47.97	-13	Vertical
3729.09	-39.61	-13	Vertical
6679.32	-40.09	-13	Vertical
9959.78	-37.38	-13	Vertical
17821.94	-33.70	-13	Vertical

Channel 9400

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2458.48	-49.02	-13	Vertical
2781.87	-47.26	-13	Vertical
3726.82	-41.23	-13	Vertical
6674.51	-40.40	-13	Vertical
9961.86	-36.52	-13	Vertical
17818.96	-33.97	-13	Vertical

Channel 9538

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2462.54	-48.62	-13	Vertical
2781.74	-47.14	-13	Vertical
3728.07	-40.53	-13	Vertical
6678.07	-39.81	-13	Vertical
9961.18	-37.69	-13	Vertical
17822.94	-34.54	-13	Vertical

HSDPA/HSUPA Mode:

Channel 9262

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2461.28	-49.42	-13	Vertical
2779.96	-46.82	-13	Vertical
3725.04	-41.50	-13	Vertical
6674.56	-39.58	-13	Vertical
9957.76	-37.08	-13	Vertical
17821.92	-34.38	-13	Vertical

Channel 9400

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.24	-49.60	-13	Vertical
2782.02	-47.55	-13	Vertical
3727.79	-41.29	-13	Vertical
6677.75	-39.90	-13	Vertical
9961.70	-37.06	-13	Vertical
17821.24	-33.70	-13	Vertical

Channel 9538

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.79	-49.41	-13	Vertical
2781.57	-47.07	-13	Vertical
3726.39	-40.94	-13	Vertical
6676.37	-39.55	-13	Vertical
9962.45	-37.32	-13	Vertical
17818.19	-33.61	-13	Vertical

WCDMA band IV

Test result:

WCDMA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dB)	Pmea (dBm)	Polarization
1712.4	24.05	-3.8	8.6	19.25	Vertical
1732.4	23.28	-3.8	8.6	18.48	Vertical
1752.6	24.00	-3.8	8.6	19.20	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dB)	Pmea (dBm)	Polarization
1712.4	23.15	-3.8	8.6	18.35	Vertical
1732.4	23.65	-3.8	8.6	18.85	Vertical
1752.6	22.81	-3.8	8.6	18.01	Vertical

Test result:

WCDMA Mode:

Channel 1312

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.81	-48.74	-13	Vertical
2779.37	-47.16	-13	Vertical
3729.05	-40.62	-13	Vertical
6677.32	-39.60	-13	Vertical
9963.54	-36.78	-13	Vertical
17819.80	-34.00	-13	Vertical

Channel 1412

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.59	-48.90	-13	Vertical
2782.78	-47.15	-13	Vertical
3727.25	-40.93	-13	Vertical
6678.59	-39.79	-13	Vertical
9961.38	-37.17	-13	Vertical
17820.46	-33.27	-13	Vertical

Channel 1513

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2461.87	-49.06	-13	Vertical
2780.18	-46.76	-13	Vertical
3726.34	-41.23	-13	Vertical
6677.01	-40.17	-13	Vertical
9959.97	-36.76	-13	Vertical
17820.78	-34.06	-13	Vertical

HSDPA/HSUPA Mode:

Channel 1312

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.18	-48.43	-13	Vertical
2779.02	-47.22	-13	Vertical
3728.86	-40.40	-13	Vertical
6675.53	-39.84	-13	Vertical
9960.67	-36.82	-13	Vertical
17820.64	-34.44	-13	Vertical

Channel 1412

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.96	-49.06	-13	Vertical
2781.57	-47.03	-13	Vertical
3726.31	-41.00	-13	Vertical
6680.34	-39.37	-13	Vertical
9964.26	-36.75	-13	Vertical
17821.00	-33.85	-13	Vertical

Channel 1513

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2458.14	-48.41	-13	Vertical
2780.92	-47.75	-13	Vertical
3725.12	-39.98	-13	Vertical
6674.54	-39.57	-13	Vertical
9963.56	-36.94	-13	Vertical
17823.43	-33.59	-13	Vertical

WCDMA band V

Test result:

WCDMA Mode:

Frequency (MHz)	Peak ERP (dBm)	Pca Cable loss(dB)	Ga Antenna Gain (dB)	Correction (dB)	Pmea (dBm)	Polarization
826.4	23.38	-3.4	8.3	2.15	20.63	Vertical
836.6	23.49	-3.4	8.3	2.15	20.74	Vertical
846.6	23.91	-3.4	8.3	2.15	21.16	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak ERP (dBm)	Pca Cable loss(dB)	Ga Antenna Gain (dB)	Correction (dB)	Pmea (dBm)	Polarization
826.4	22.97	-3.4	8.3	2.15	20.22	Vertical
836.6	22.47	-3.4	8.3	2.15	19.72	Vertical
846.6	23.34	-3.4	8.3	2.15	20.59	Vertical

Test result:

WCDMA Mode:

Channel 4132

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1651.84	-53.41	-13	Vertical
1668.25	-50.74	-13	Vertical
2533.54	-43.83	-13	Vertical
2574.64	-44.56	-13	Vertical
8961.37	-40.20	-13	Vertical
9970.53	-36.19	-13	Vertical

Channel 4183

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1647.66	-53.15	-13	Vertical
1663.92	-51.03	-13	Vertical
2533.96	-44.25	-13	Vertical
2579.37	-43.62	-13	Vertical
8961.40	-40.05	-13	Vertical
9970.46	-37.00	-13	Vertical

Channel 4233

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1651.35	-52.53	-13	Vertical
1667.23	-51.91	-13	Vertical
2532.10	-44.38	-13	Vertical
2575.73	-43.55	-13	Vertical
8962.55	-39.41	-13	Vertical
9974.99	-36.12	-13	Vertical

HSDPA/HSUPA Mode:

Channel 4132

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1650.11	-52.03	-13	Vertical
1665.18	-50.61	-13	Vertical
2534.29	-43.62	-13	Vertical
2579.07	-44.20	-13	Vertical
8963.28	-39.34	-13	Vertical
9970.52	-36.96	-13	Vertical

Channel 4183

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1646.28	-52.59	-13	Vertical
1669.92	-51.31	-13	Vertical
2534.54	-44.13	-13	Vertical
2575.65	-44.55	-13	Vertical
8962.14	-39.86	-13	Vertical
9968.80	-35.65	-13	Vertical

Channel 4233

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1651.98	-52.36	-13	Vertical
1665.76	-50.46	-13	Vertical
2535.52	-44.48	-13	Vertical
2576.72	-44.21	-13	Vertical
8963.94	-39.21	-13	Vertical
9972.99	-35.85	-13	Vertical

---The end of the test report---