

TEST REPORT FOR WCDMA TESTING

Report No.: SRTC2020-9004(F)-20050604(B)

Product Name: tracker

Product Model: CP314AT

Applicant: Yulong Computer Telecommunication Scientific
(Shenzhen) Co., Ltd

Manufacturer: Yulong Computer Telecommunication Scientific
(Shenzhen) Co., Ltd

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

FCC ID: R38YLC314AT

The State Radio_monitoring_center Testing Center (SRTC)
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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
Tel:	+86 10 57996183
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1.3 Applicant's details

Company:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
City:	Shenzhen
Country or Region:	China
Contacted person:	Emily
Tel:	15089742056
Fax:	---
Email:	zhangxuzhu@yulong.com

1.4 Manufacturer's details

Company:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
City:	Shenzhen
Country or Region:	China
Contacted person:	Emily
Tel:	15089742056
Fax:	---
Email:	zhangxuzhu@yulong.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2020-05-06
Testing Start Date:	2020-05-06
Testing End Date:	2020-10-21

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

Normal Supply Voltage (V d.c.):	3.85
Maximum Extreme Supply Voltage (V d.c.):	4.30
Minimum Extreme Supply Voltage (V d.c.):	3.60

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: -1.61dBi/W4: -1.10dBi/W5: -6.20dBi
Power Supply	Battery/Charger
Hardware Version	P1
Software Version	3.18.505.P0.200514.cp314AT
IMEI	864156050000038

2.2 Support Equipment

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

Equipment	Battery
Manufacturer	Lishen
Model Number	CPLD-432
Serial Number	---

Equipment	Charger
Manufacturer	Shenzhen RUIDE
Model Number	RD0501000-USBA-18MG
Serial Number	---

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	22.86	0.193	0.042	4M14F9W
22H	826.4-846.6	17.34	0.054	0.033	4M19F9W
27	1712.4-1752.6	23.10	0.204	-0.038	4M15F9W

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

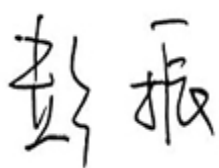
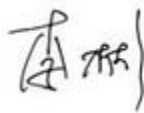
4 KEY TO NOTES AND RESULT CODES

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: Mr. Tong Daocheng 	Issued date: 20201022

6 TEST RESULT

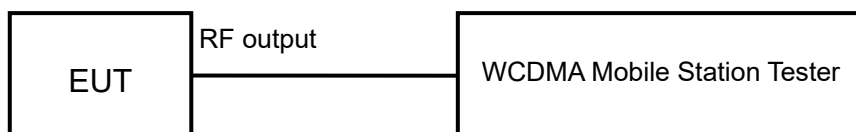
6.1 RF Power Output

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

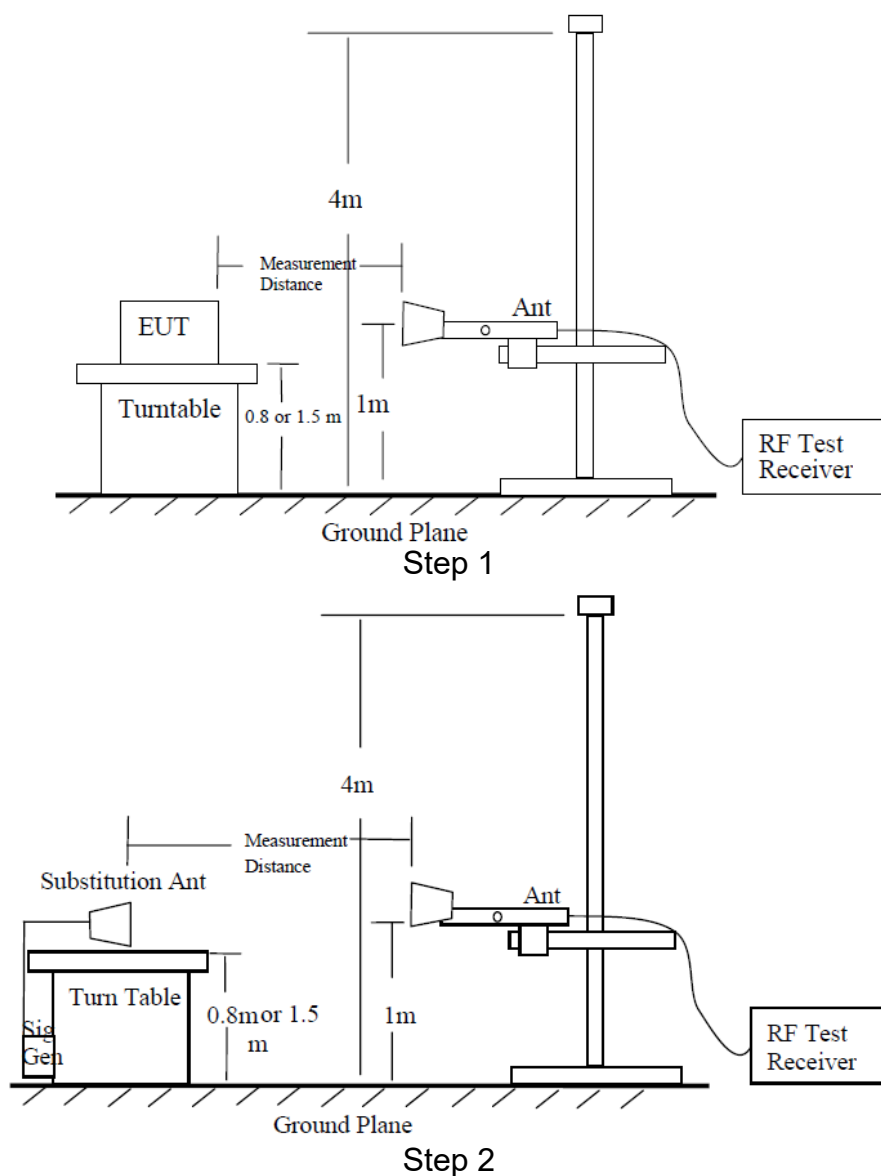
Rule Part(s):

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 the 99% power bandwidth of the fundamental signal. 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.

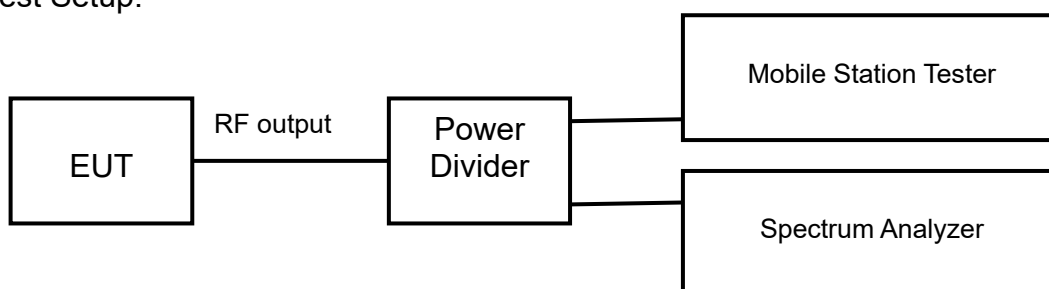
6.3 Occupied Bandwidth

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

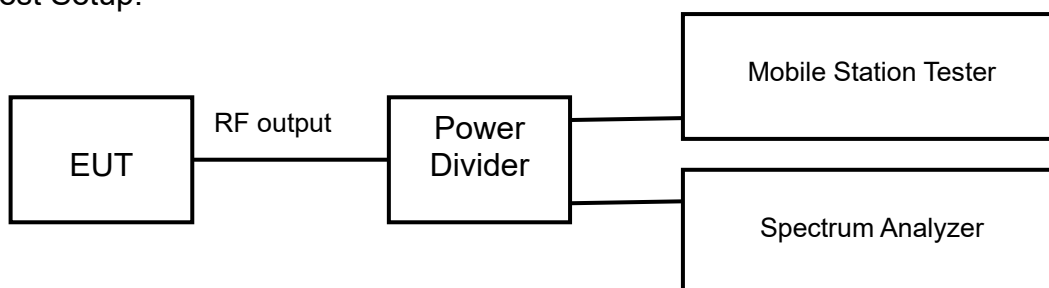
Rule Part(s):

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

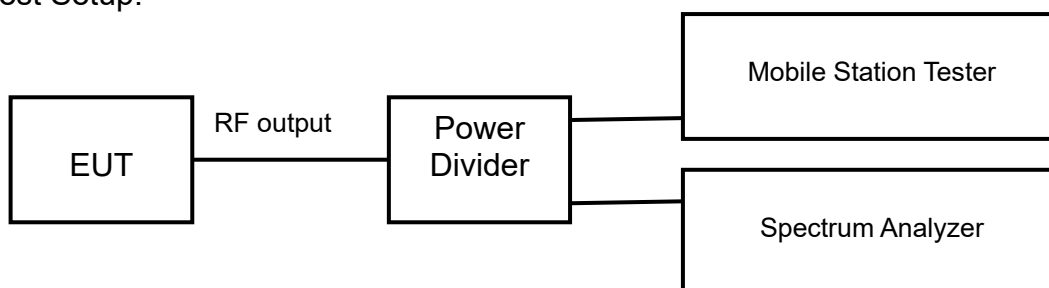
Rule Part(s):

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

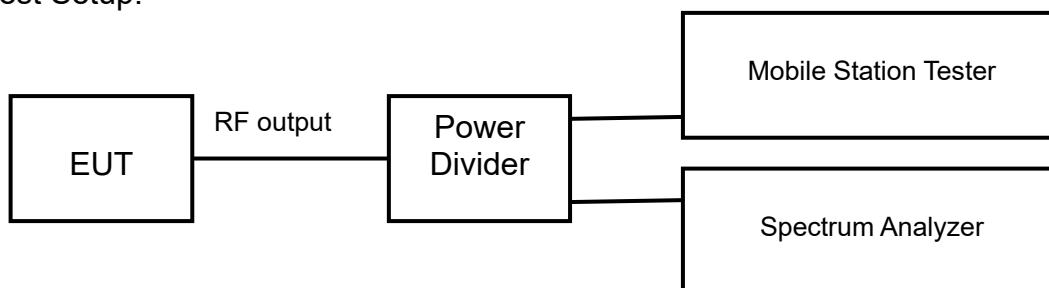
Rule Part(s)

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 $43 + \log_{10}(P_{\text{[Watts]}})$, where P is the transmitter power in Watts.

Test result:

The test results are shown in Appendix A.

6.7 Frequency Stability

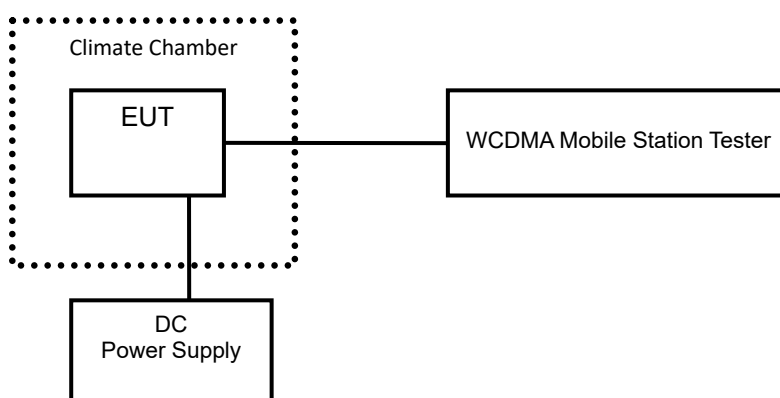
Rule Part(s)

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

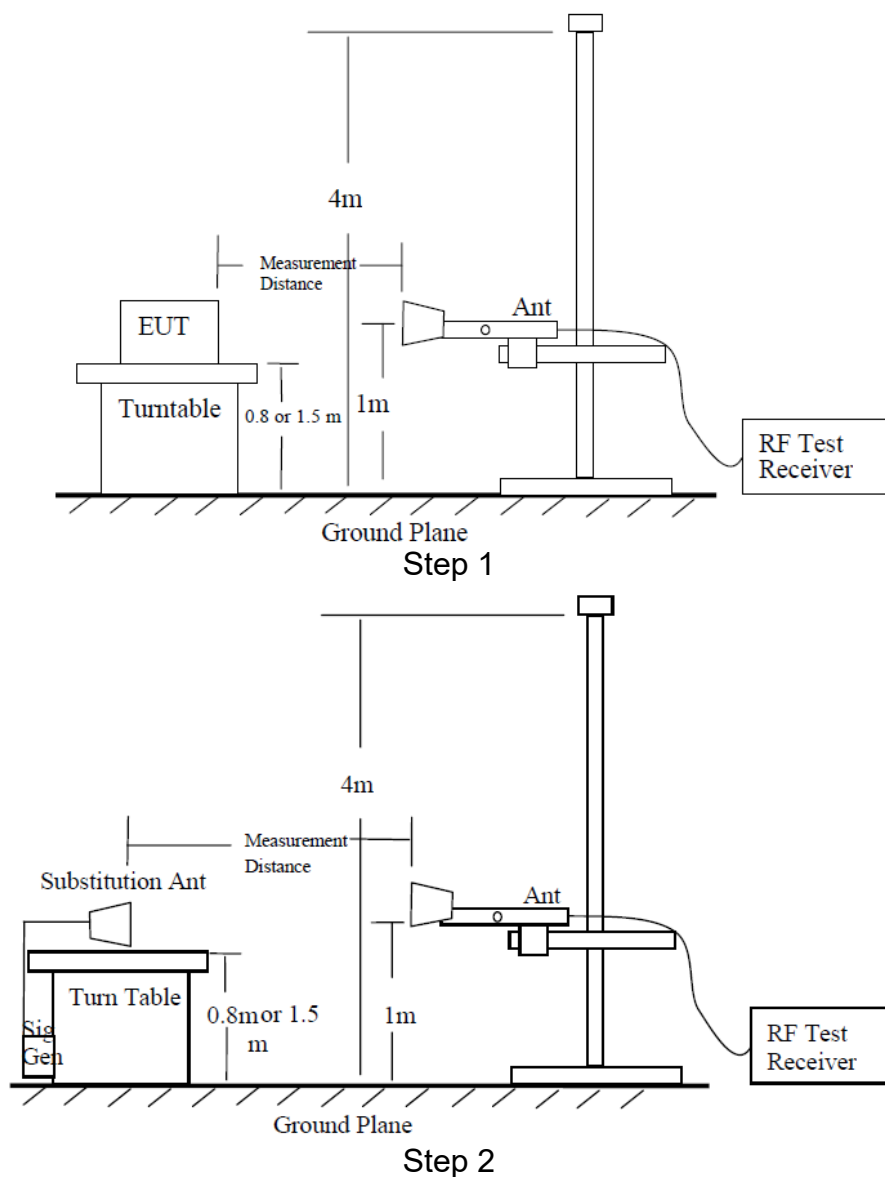
Rule Part(s)

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:

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

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.

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

Test result:

The test results are shown in Appendix B.

6.9 Peak-Average Ratio

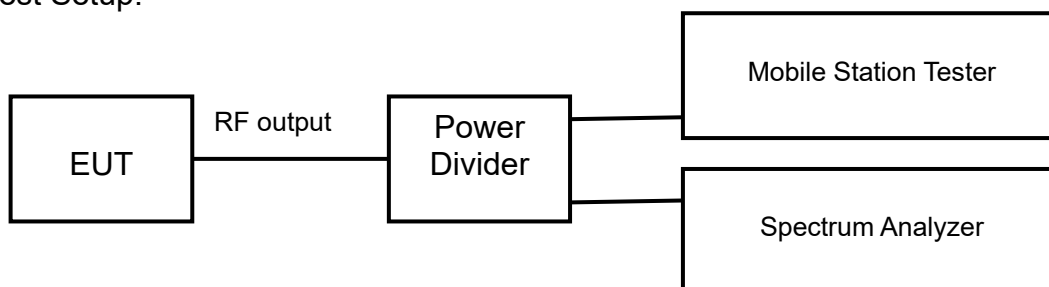
Rule Part(s)

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	21.86
		1880.0	9400	21.88
		1907.6	9538	21.75
HSDPA	Subtest 1	1852.4	9262	21.00
		1880.0	9400	21.04
		1907.6	9538	20.97
	Subtest 2	1852.4	9262	20.93
		1880.0	9400	20.96
		1907.6	9538	20.93
	Subtest 3	1852.4	9262	20.89
		1880.0	9400	20.91
		1907.6	9538	20.87
	Subtest 4	1852.4	9262	20.83
		1880.0	9400	20.85
		1907.6	9538	20.79
HSUPA	Subtest 1	1852.4	9262	21.05
		1880.0	9400	21.06
		1907.6	9538	21.01
	Subtest 2	1852.4	9262	21.08
		1880.0	9400	21.11
		1907.6	9538	21.04
	Subtest 3	1852.4	9262	21.03
		1880.0	9400	21.01
		1907.6	9538	20.99
	Subtest 4	1852.4	9262	21.07
		1880.0	9400	21.11
		1907.6	9538	21.03
	Subtest 5	1852.4	9262	20.99
		1880.0	9400	21.01
		1907.6	9538	20.96

HSPA+	QPSK	1852.4	9262	21.11
		1880.0	9400	21.14
		1907.6	9538	21.09
	16QAM	1852.4	9262	20.78
		1880.0	9400	20.81
		1907.6	9538	20.75
DC-HSDPA	Subtest 1	1852.4	9262	20.91
		1880.0	9400	20.94
		1907.6	9538	20.88
	Subtest 2	1852.4	9262	20.86
		1880.0	9400	20.87
		1907.6	9538	20.85
	Subtest 3	1852.4	9262	20.79
		1880.0	9400	20.83
		1907.6	9538	20.78
	Subtest 4	1852.4	9262	20.76
		1880.0	9400	20.77
		1907.6	9538	20.72

WCDMA band V

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	826.4	4132	22.57
		836.6	4183	22.58
		846.6	4233	22.68
HSDPA	Subtest 1	826.4	4132	21.82
		836.6	4183	21.85
		846.6	4233	21.89
	Subtest 2	826.4	4132	21.79
		836.6	4183	21.80
		846.6	4233	21.86
	Subtest 3	826.4	4132	21.73
		836.6	4183	21.77
		846.6	4233	21.82
	Subtest 4	826.4	4132	21.70
		836.6	4183	21.73
		846.6	4233	21.78
HSUPA	Subtest 1	826.4	4132	21.86
		836.6	4183	21.89
		846.6	4233	21.94
	Subtest 2	826.4	4132	21.80
		836.6	4183	21.84
		846.6	4233	21.88
	Subtest 3	826.4	4132	21.77
		836.6	4183	21.82
		846.6	4233	21.85
	Subtest 4	826.4	4132	21.78
		836.6	4183	21.80
		846.6	4233	21.87
	Subtest 5	826.4	4132	21.76
		836.6	4183	21.79
		846.6	4233	21.84
HSPA+	QPSK	826.4	4132	21.75

		836.6	4183	21.77
		846.6	4233	21.81
	16QAM	826.4	4132	21.68
		836.6	4183	21.71
		846.6	4233	21.75
DC-HSDPA	Subtest 1	826.4	4132	21.71
		836.6	4183	21.74
		846.6	4233	21.79
	Subtest 2	826.4	4132	21.71
		836.6	4183	21.73
		846.6	4233	21.75
	Subtest 3	826.4	4132	21.66
		836.6	4183	21.69
		846.6	4233	21.71
	Subtest 4	826.4	4132	21.63
		836.6	4183	21.66
		846.6	4233	21.69

WCDMA band IV

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	1712.4	1312	22.61
		1732.4	1412	22.64
		1752.6	1513	22.65
HSDPA	Subtest 1	1712.4	1312	21.97
		1732.4	1412	21.86
		1752.6	1513	21.90
	Subtest 2	1712.4	1312	21.79
		1732.4	1412	21.81
		1752.6	1513	21.82
	Subtest 3	1712.4	1312	21.75
		1732.4	1412	21.77
		1752.6	1513	21.81
	Subtest 4	1712.4	1312	21.71
		1732.4	1412	21.74
		1752.6	1513	21.78
HSUPA	Subtest 1	1712.4	1312	22.01
		1732.4	1412	22.03
		1752.6	1513	22.04
	Subtest 2	1712.4	1312	21.98
		1732.4	1412	21.98
		1752.6	1513	22.01
	Subtest 3	1712.4	1312	21.96
		1732.4	1412	21.99
		1752.6	1513	22.02
	Subtest 4	1712.4	1312	21.93
		1732.4	1412	21.95
		1752.6	1513	21.98
	Subtest 5	1712.4	1312	21.96
		1732.4	1412	21.97
		1752.6	1513	21.99
HSPA+	QPSK	1712.4	1312	21.85

		1732.4	1412	21.87
		1752.6	1513	21.84
	16QAM	1712.4	1312	21.73
		1732.4	1412	21.77
		1752.6	1513	21.72
DC-HSDPA	Subtest 1	1712.4	1312	21.89
		1732.4	1412	21.79
		1752.6	1513	21.80
	Subtest 2	1712.4	1312	21.70
		1732.4	1412	21.73
		1752.6	1513	21.73
	Subtest 3	1712.4	1312	21.64
		1732.4	1412	21.69
		1752.6	1513	21.72
	Subtest 4	1712.4	1312	21.60
		1732.4	1412	21.64
		1752.6	1513	21.69

Occupied Bandwidth

WCDMA band II

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1852.4	9262	4.1352
1880.0	9400	4.1333
1907.6	9538	4.1431

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1852.4	9262	4.1390
1880.0	9400	4.1165
1907.6	9538	4.1355

WCDMA band V

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
826.4	4132	4.1586
836.6	4183	4.1450
846.6	4233	4.1808

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
826.4	4132	4.1478
836.6	4183	4.1449
846.6	4233	4.1912

WCDMA band IV

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1712.4	1312	4.1531
1732.4	1412	4.1428
1752.6	1513	4.1353

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1712.4	1312	4.1214
1732.4	1412	4.1349
1752.6	1513	4.1244

Emission Bandwidth

WCDMA band II

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1852.4	9262	4.674
1880.0	9400	4.653
1907.6	9538	4.705

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1852.4	9262	4.711
1880.0	9400	4.651
1907.6	9538	4.674

WCDMA band V

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
826.4	4132	4.719
836.6	4183	4.735
846.6	4233	4.805

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
826.4	4132	4.720
836.6	4183	4.745
846.6	4233	4.797

WCDMA band IV

REL99 Mode:

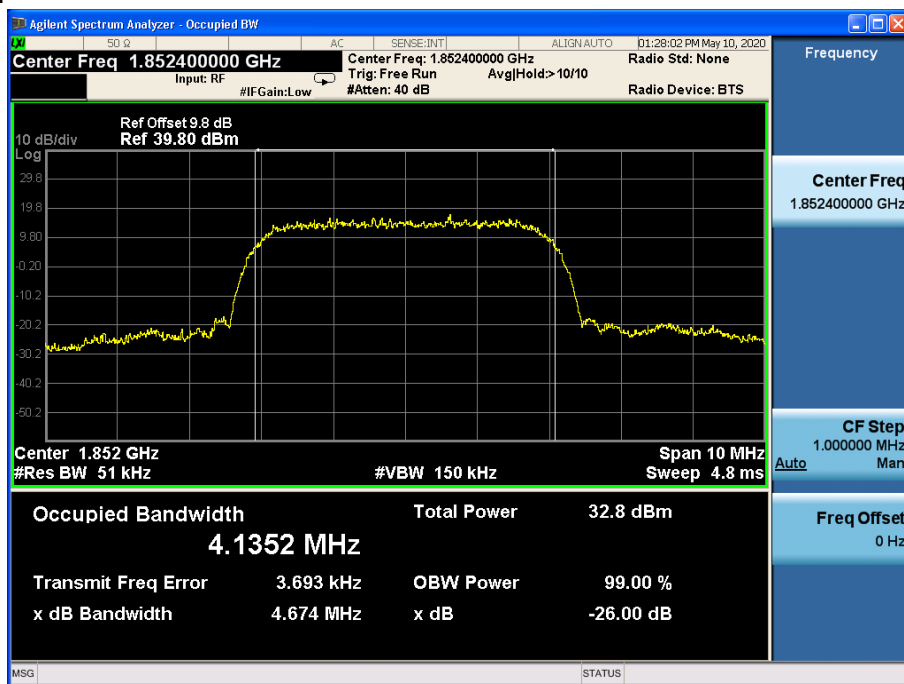
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1712.4	1312	4.694
1732.4	1412	4.696
1752.6	1513	4.669

HSUPA Mode:

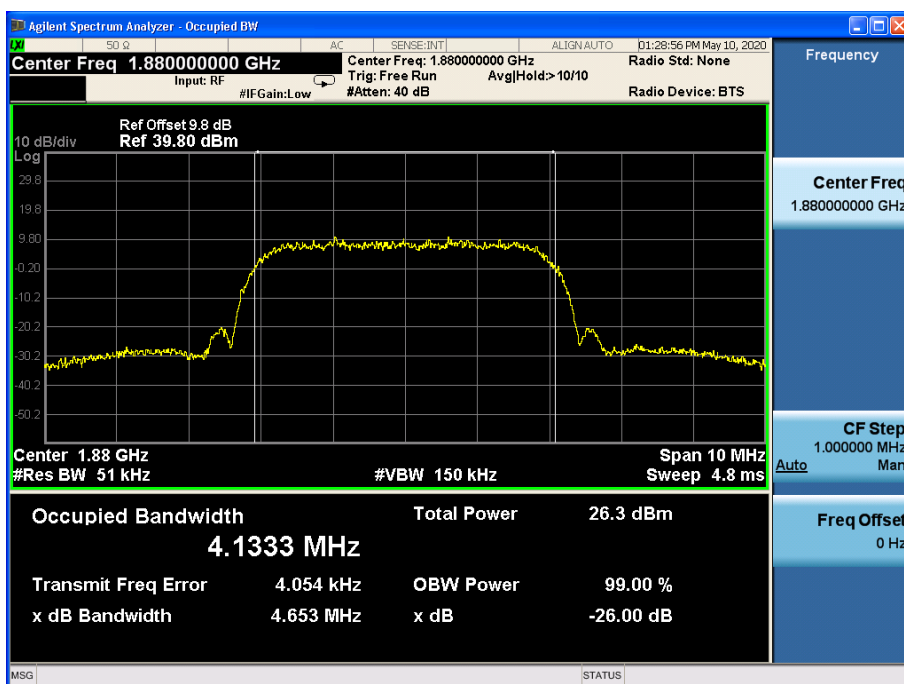
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1712.4	1312	4.662
1732.4	1412	4.723
1752.6	1513	4.678

WCDMA band II

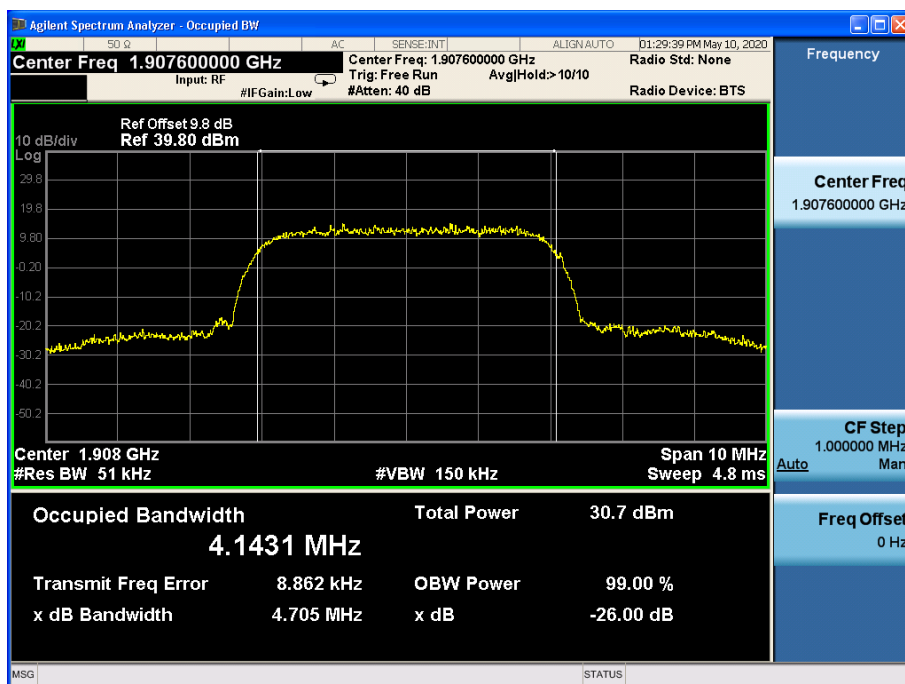
REL99 Mode:



Channel 9262

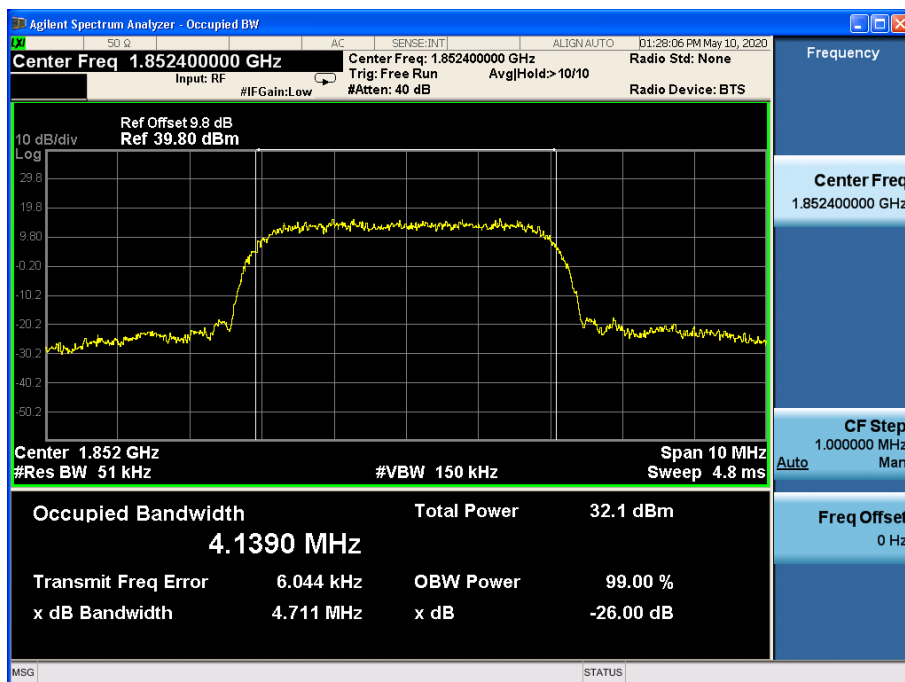


Channel 9400

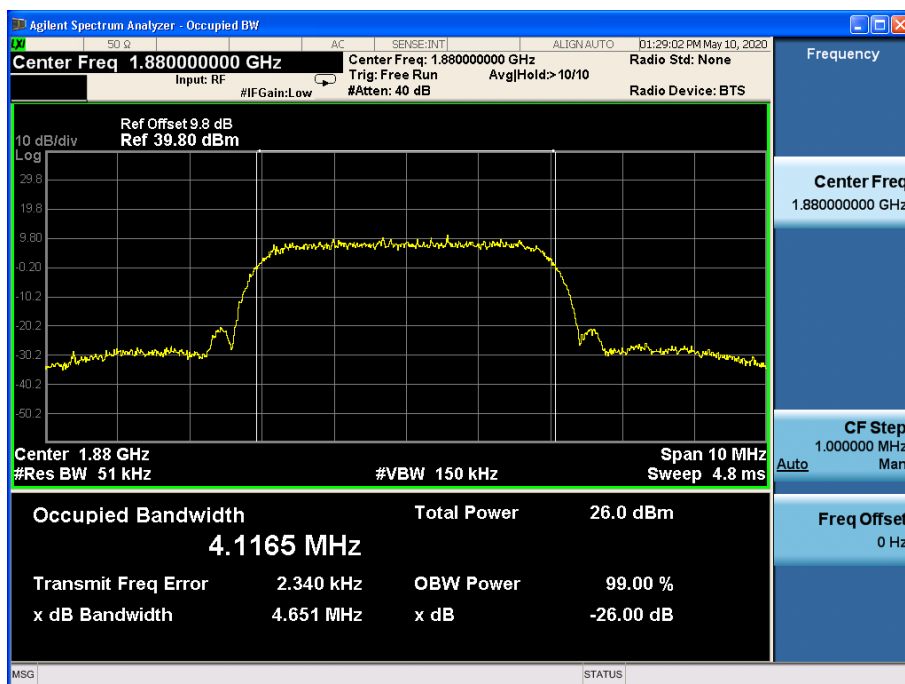


Channel 9538

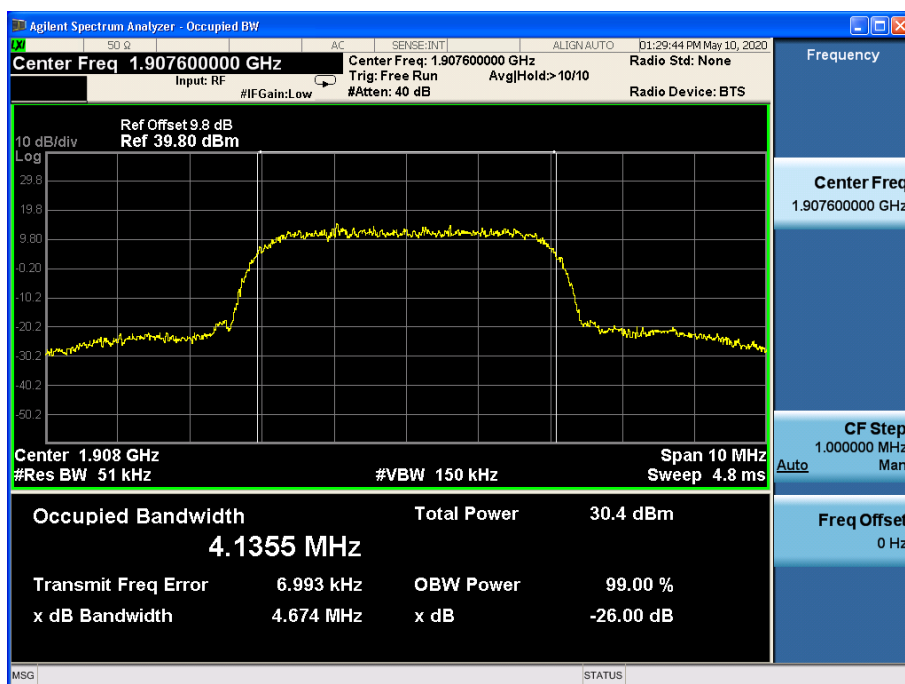
HSUPA Mode:



Channel 9262



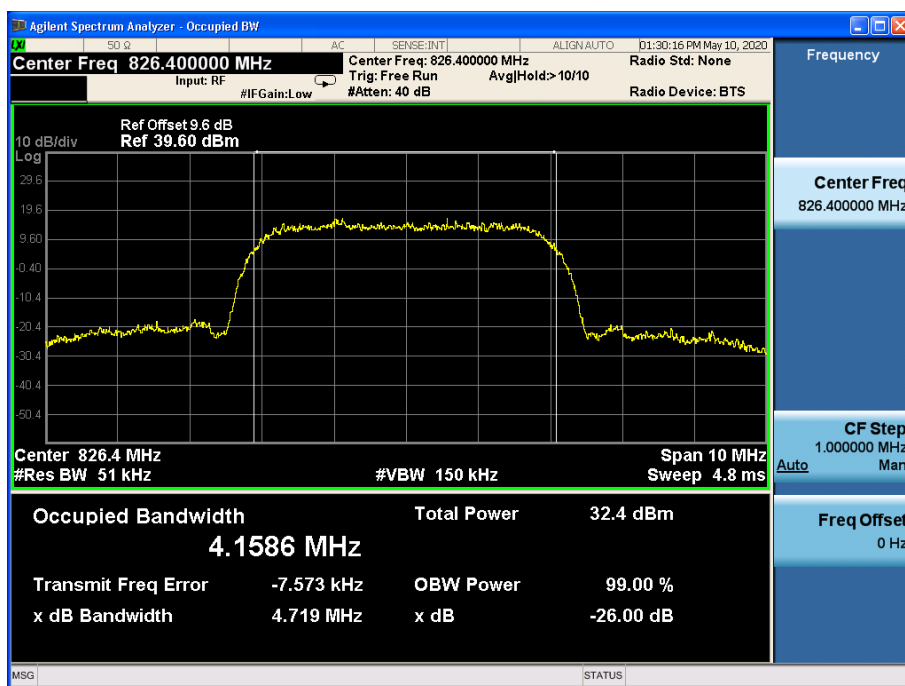
Channel 9400



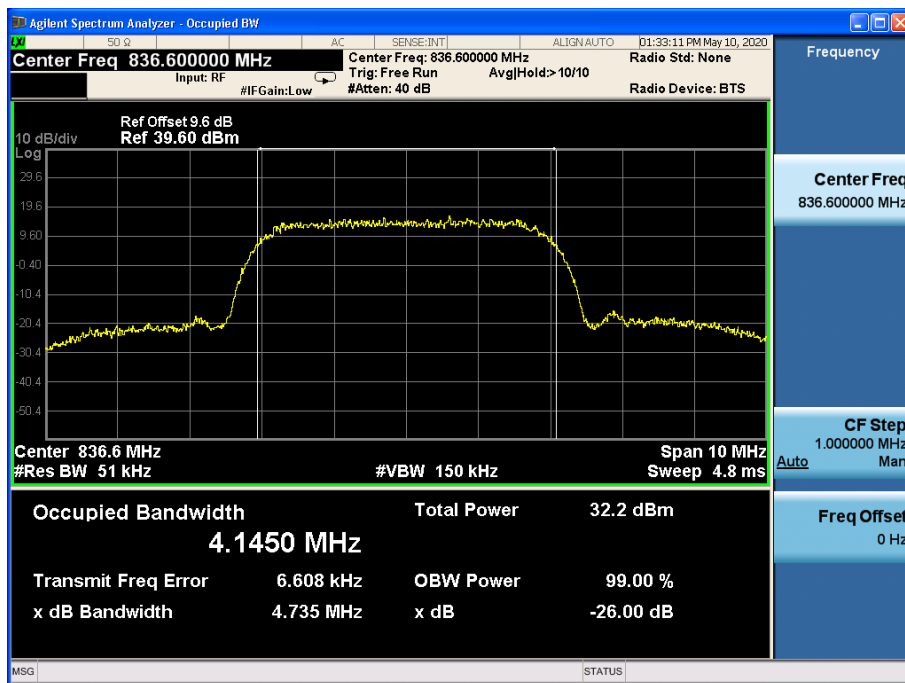
Channel 9538

WCDMA band V

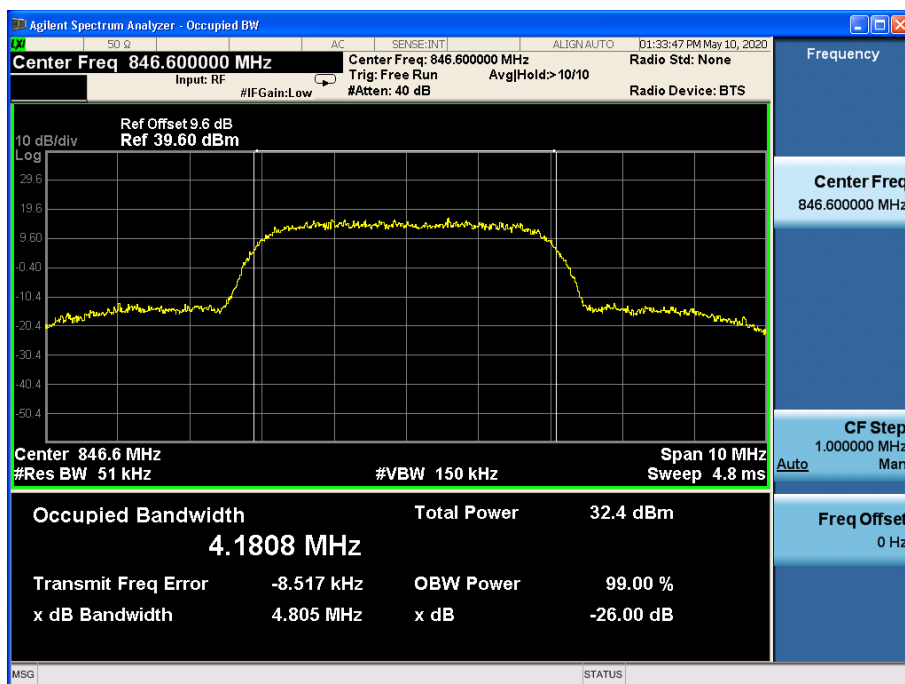
REL99 Mode:



Channel 4132

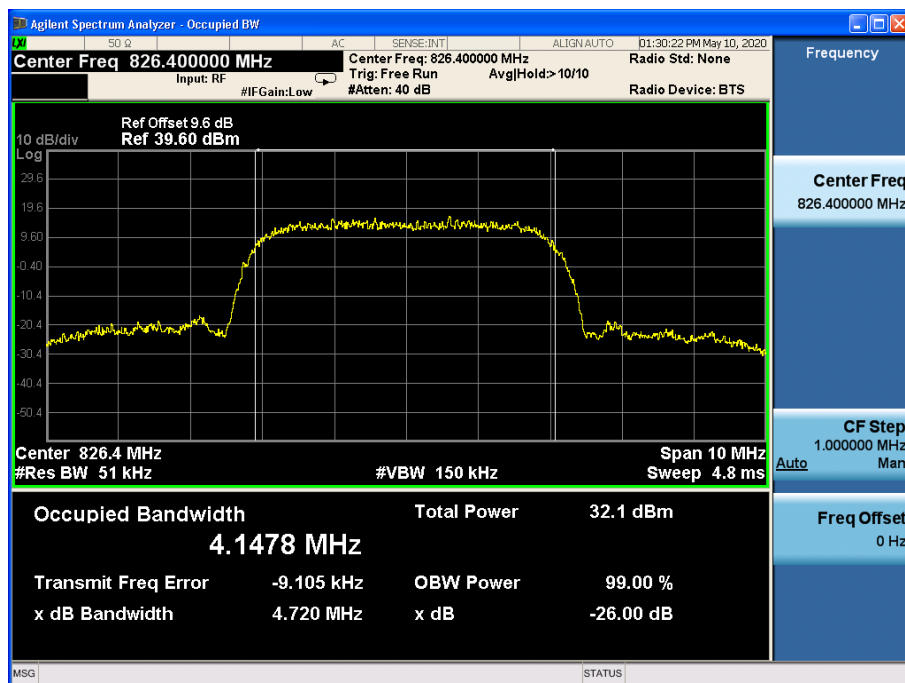


Channel 4183

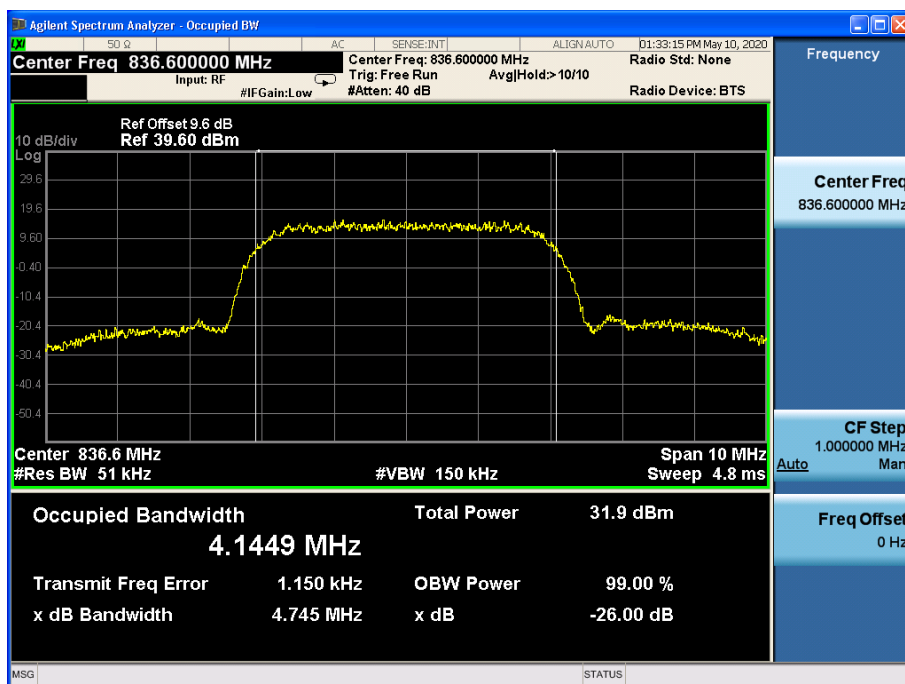


Channel 4233

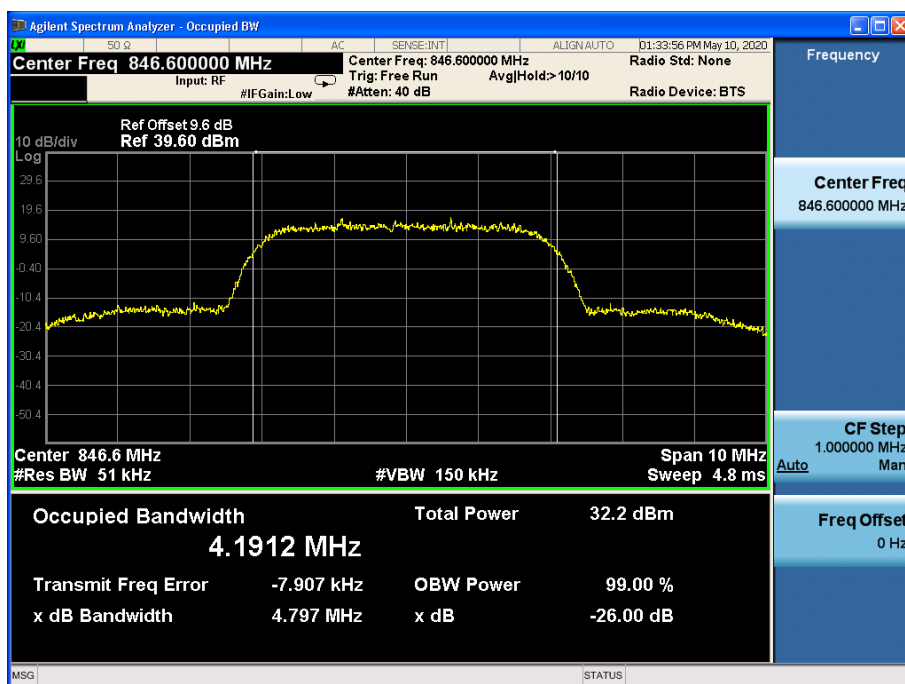
HSUPA Mode:



Channel 4132



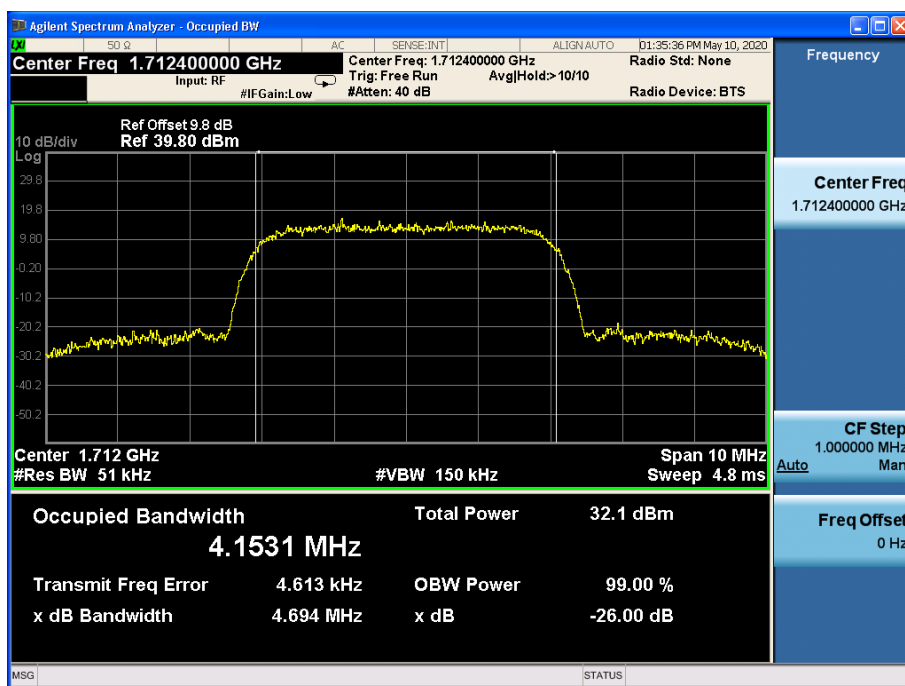
Channel 4183



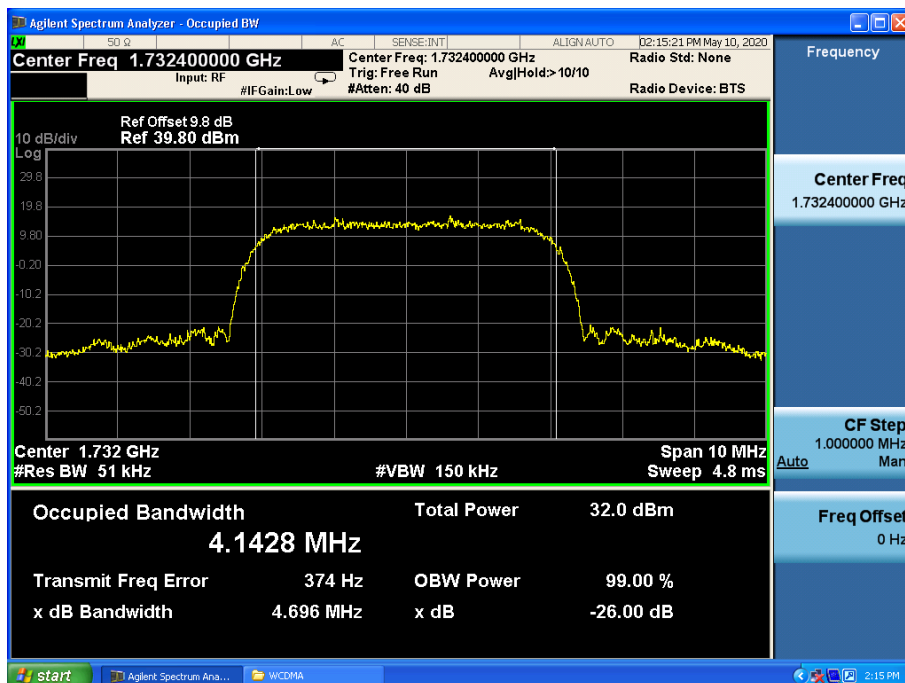
Channel 4233

WCDMA band IV

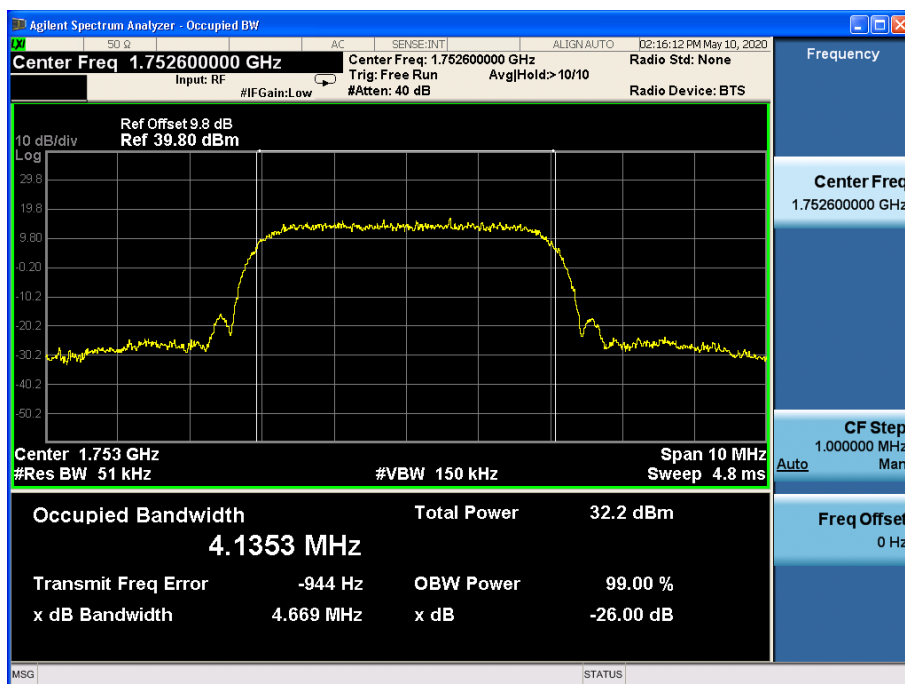
REL99 Mode:



Channel 1312

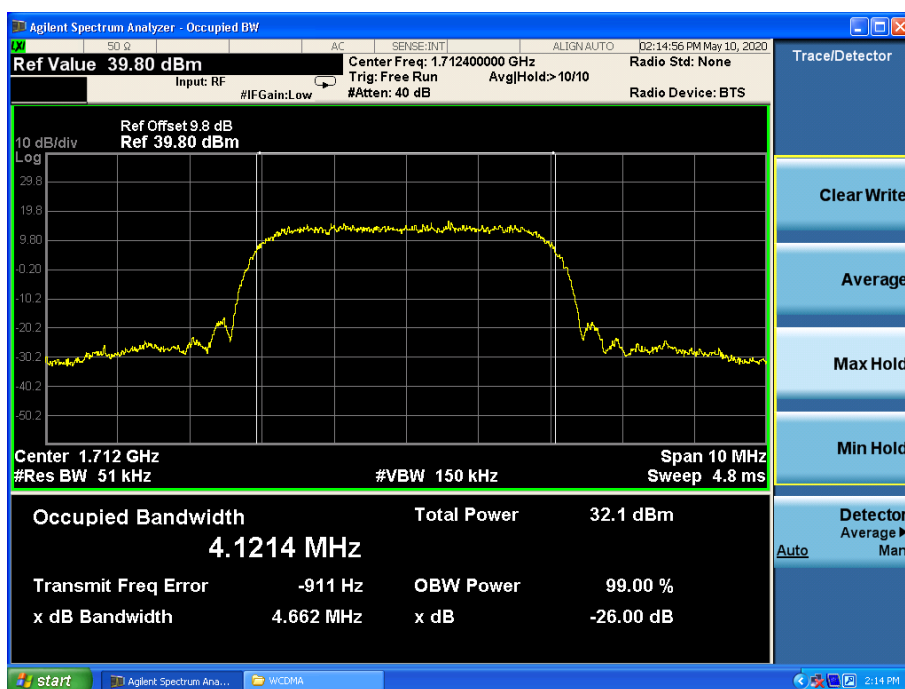


Channel 1412

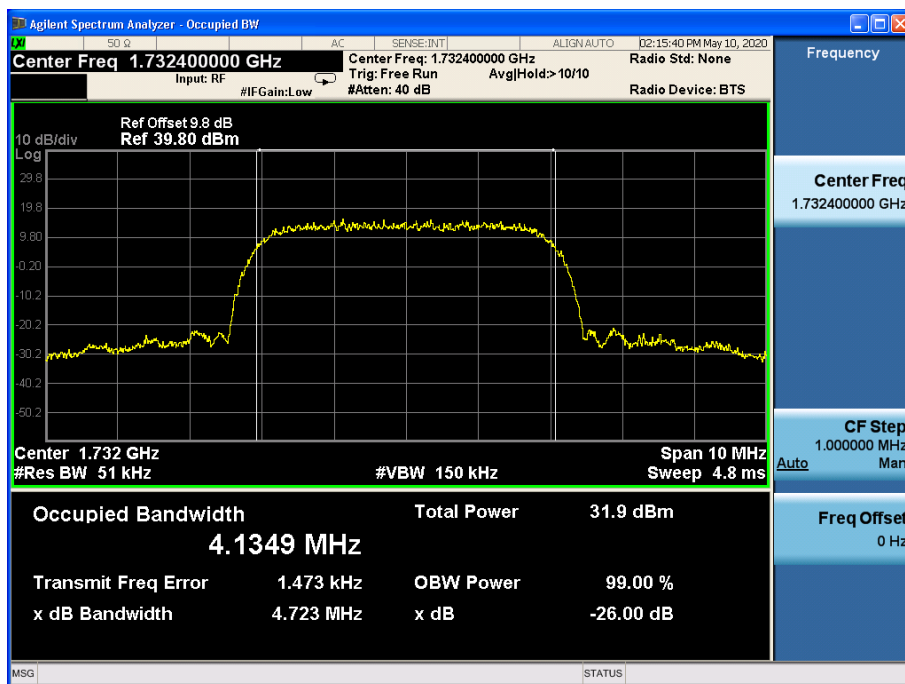


Channel 1513

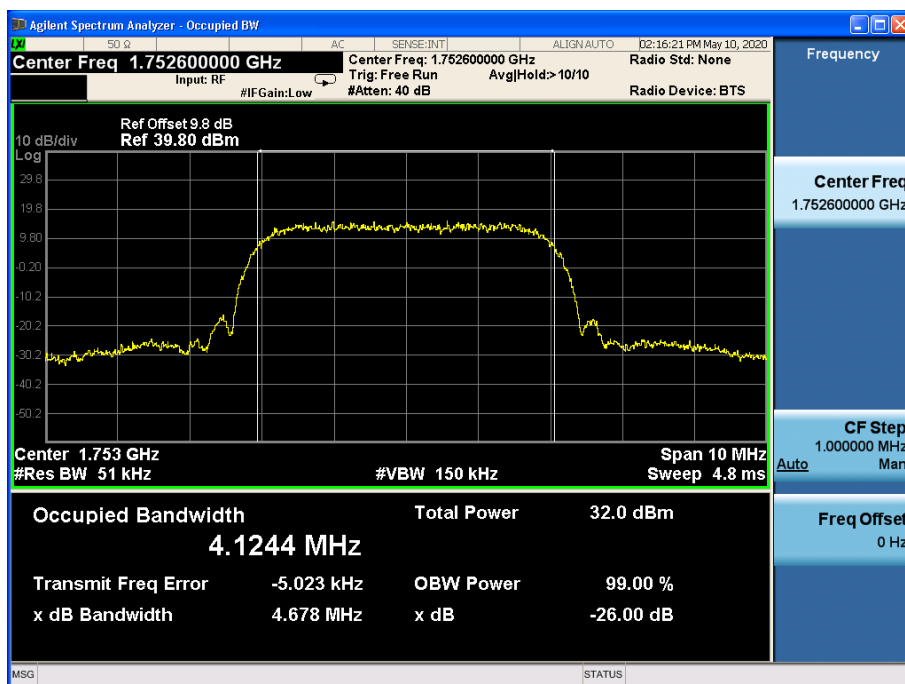
HSUPA Mode:



Ch7annel 1312



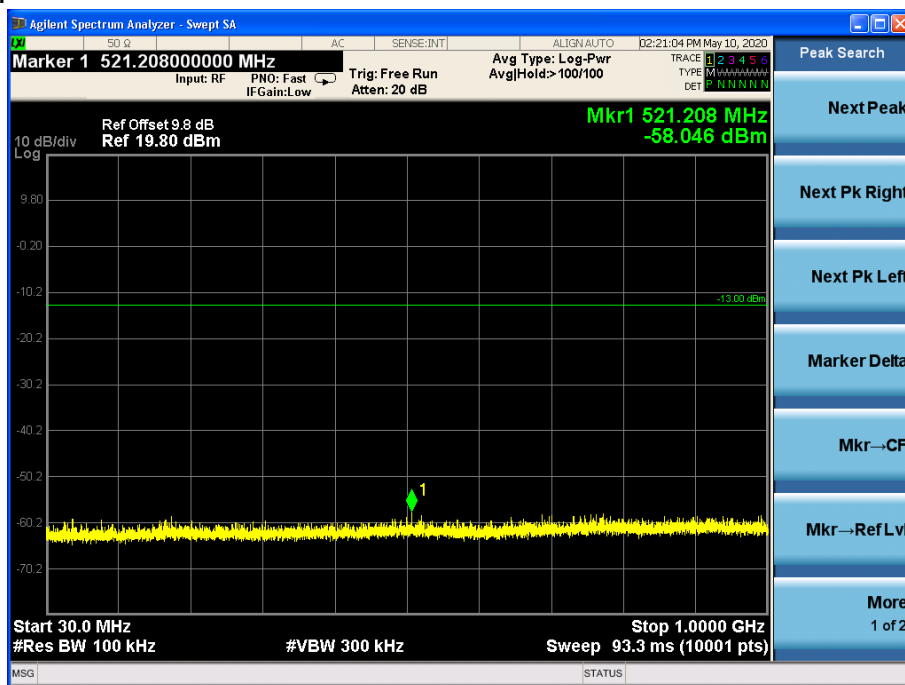
Channel 1412



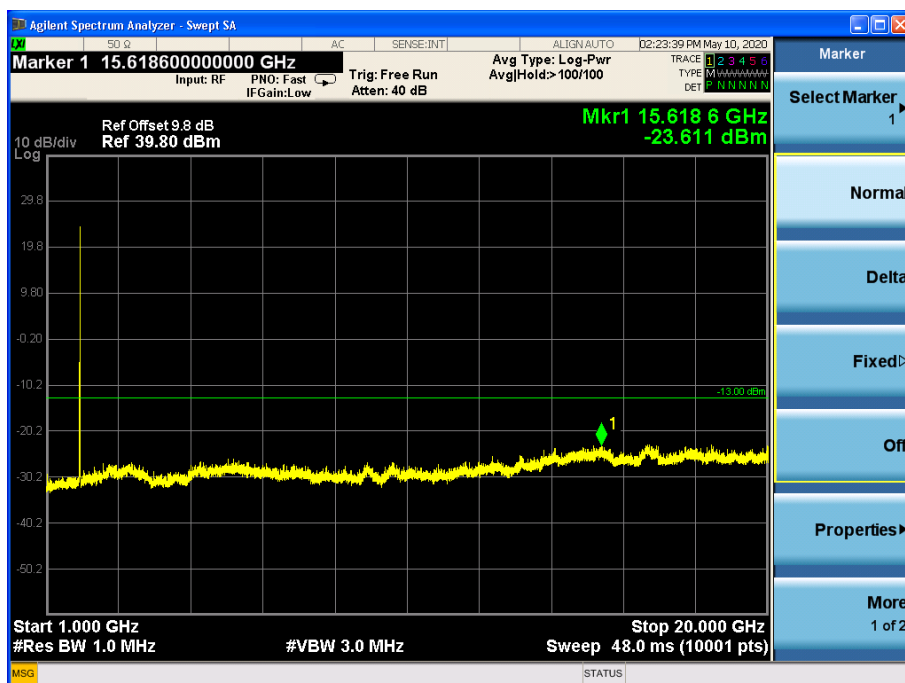
Channel 1513

Spurious Emissions at antenna terminal WCDMA band II

REL99 Mode:



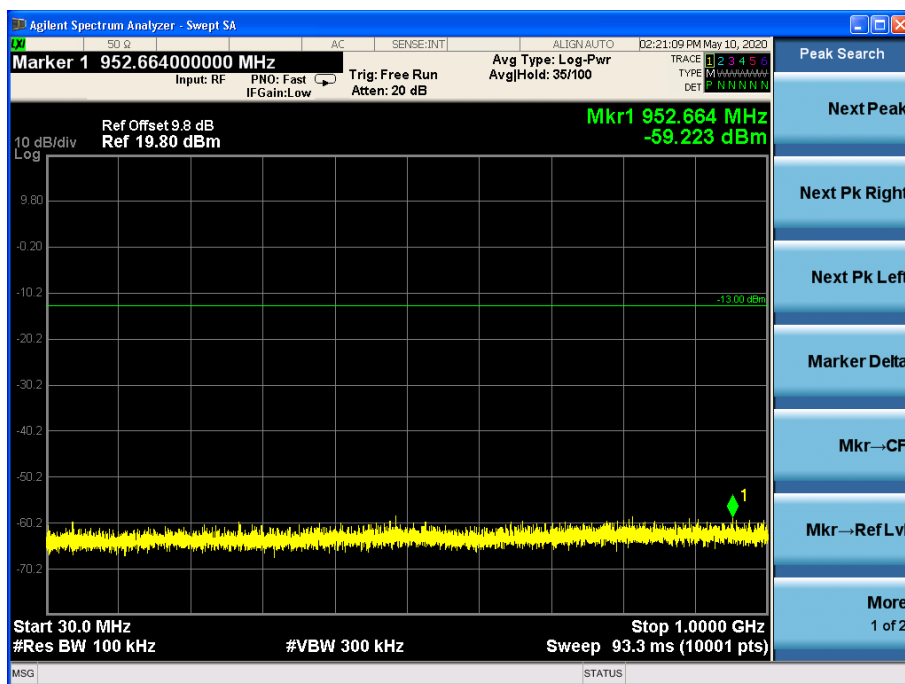
Channel 9400, 30MHz~1GHz



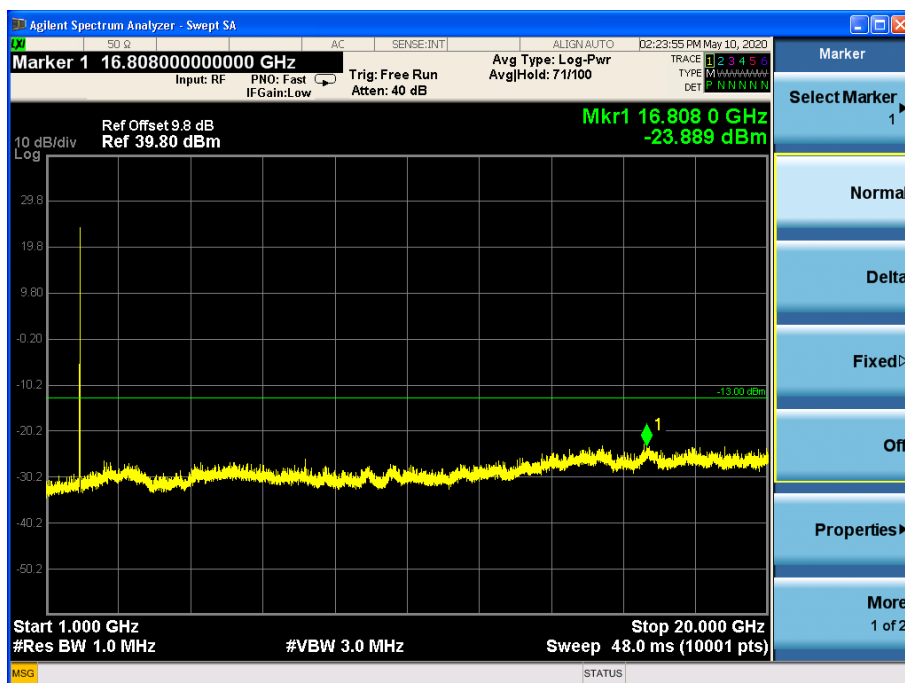
Channel 9400, 1GHz~20GHz

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

HSUPA Mode:



Channel 9400, 30MHz~1GHz

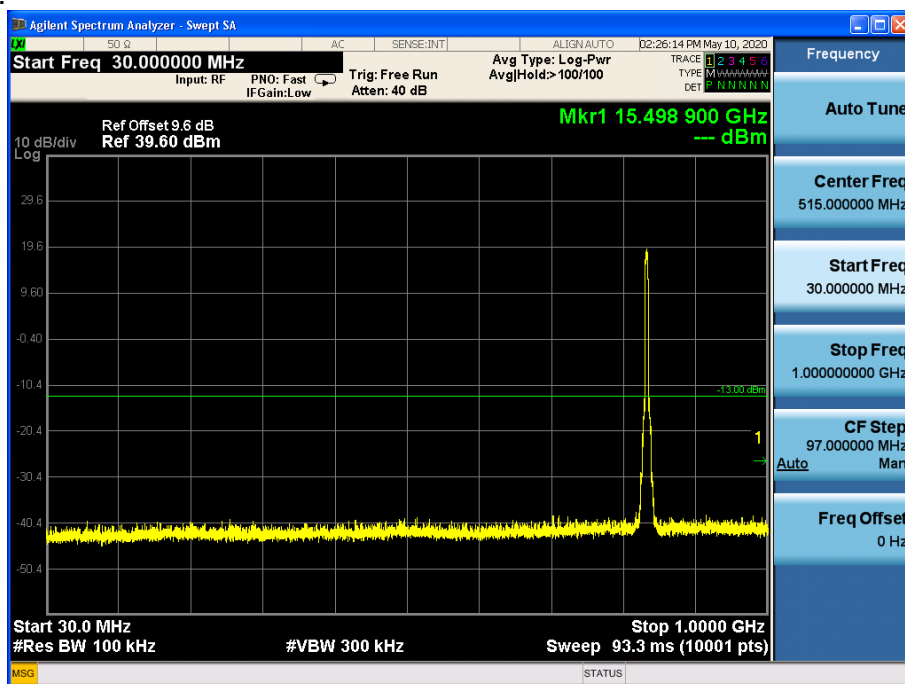


Channel 9400, 1GHz~20GHz

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

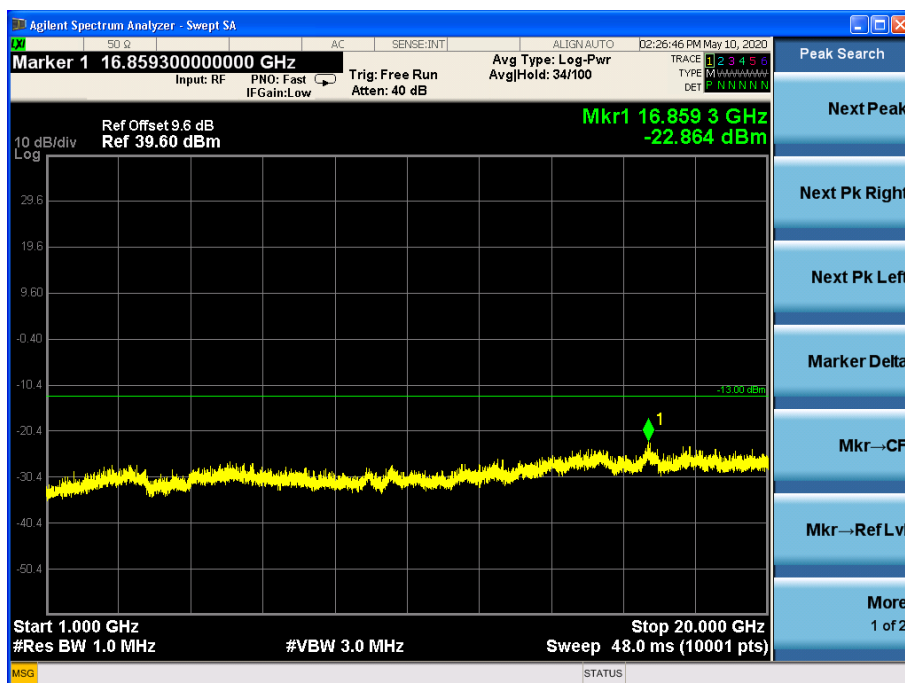
WCDMA band V

REL99 Mode:



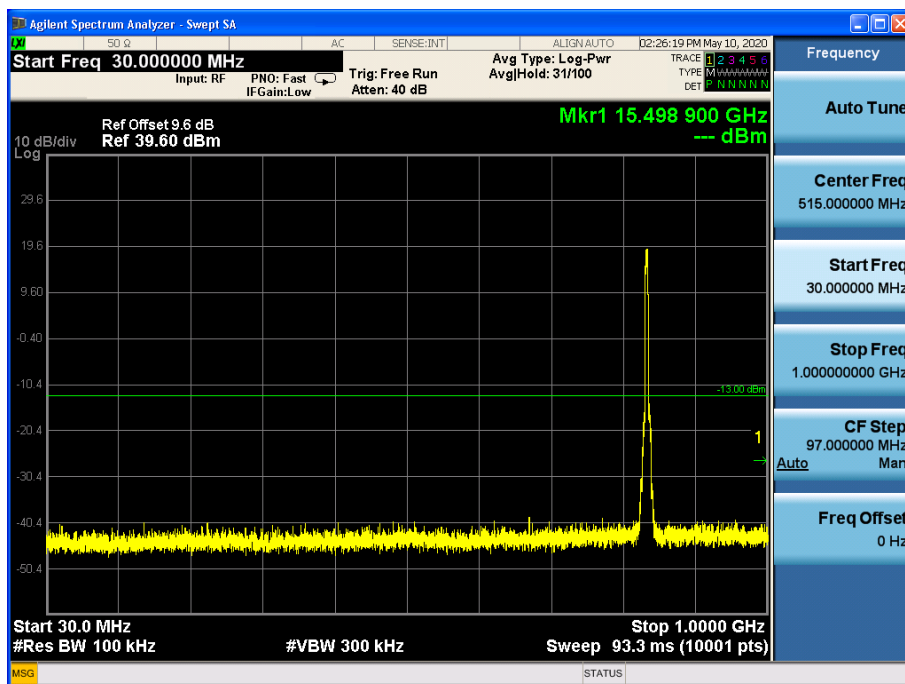
Channel 4183, 30MHz~1GHz

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



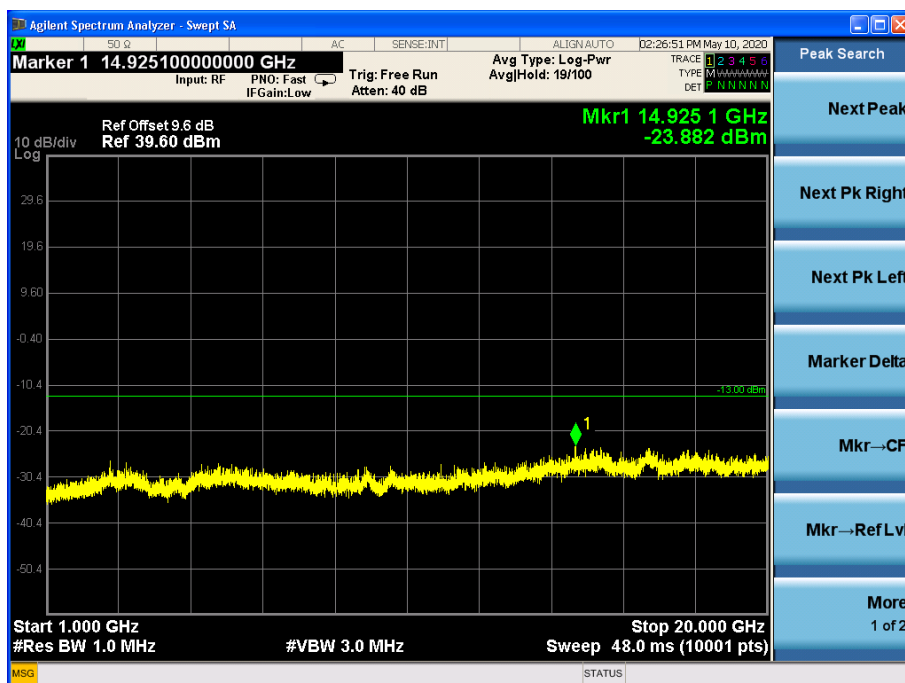
Channel 4183, 1GHz~10GHz

HSUPA Mode:



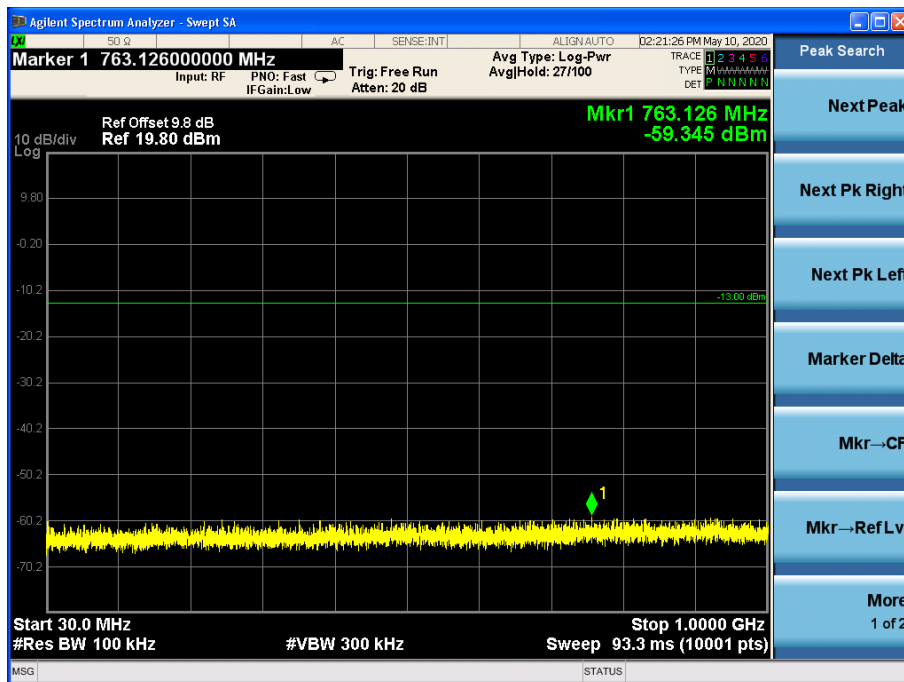
Channel 4183, 30MHz~1GHz

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

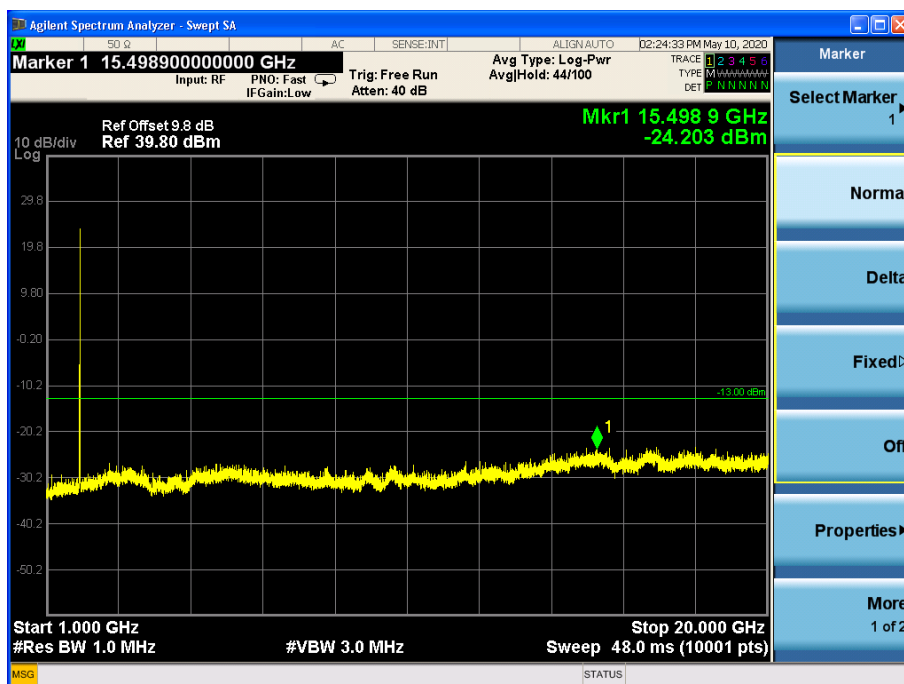


Channel 4183, 1GHz~10GHz

WCDMA band IV
REL99 Mode:



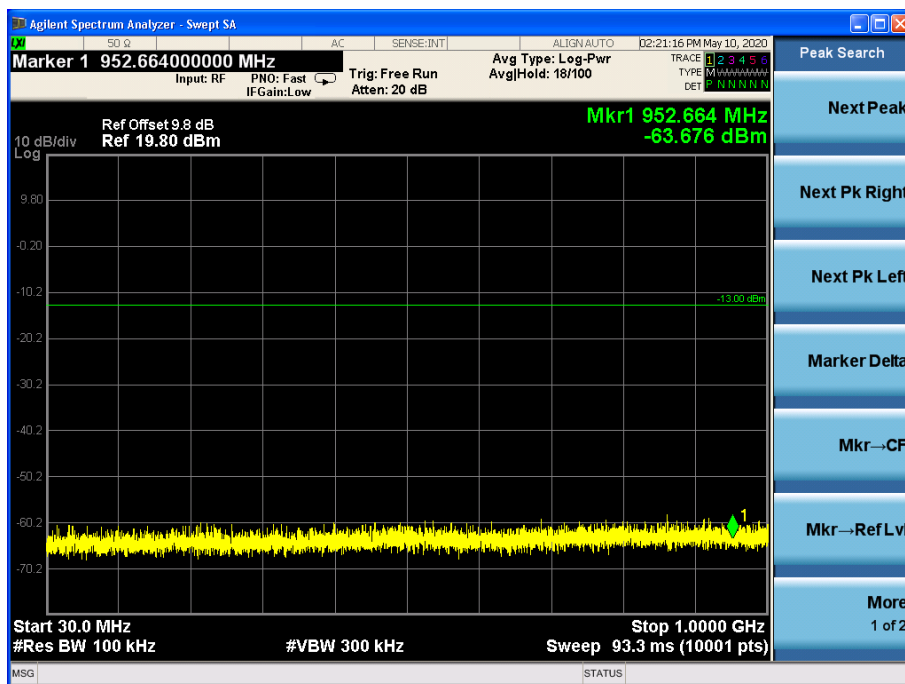
Channel 1412, 30MHz~1GHz



Channel 1412, 1GHz~20GHz

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

HSUPA Mode:



Channel 1412, 30MHz~1GHz



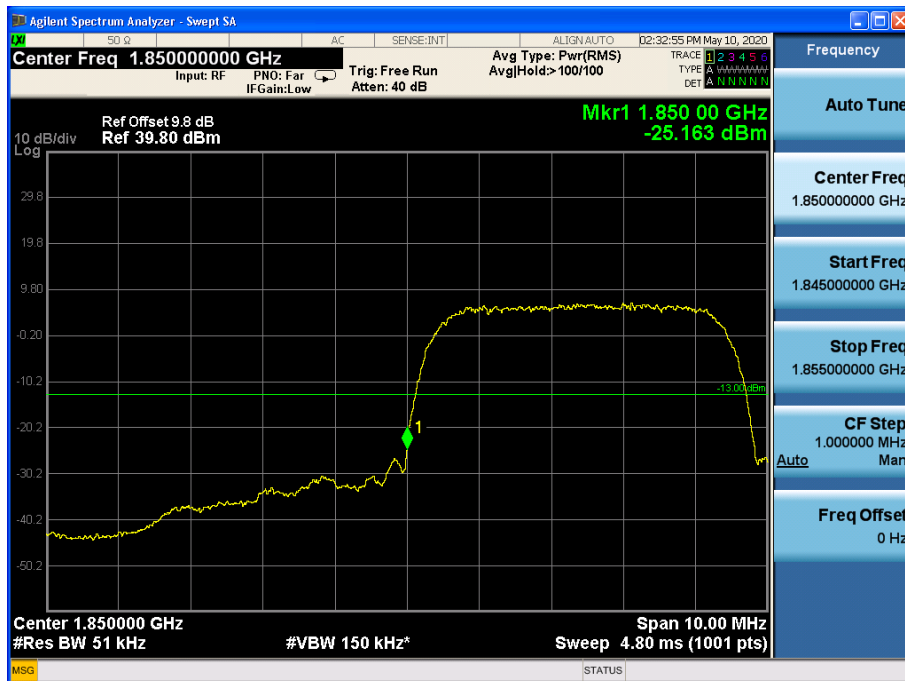
Channel 1412, 1GHz~20GHz

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

Band Edges Compliance

WCDMA band II

REL99 Mode:

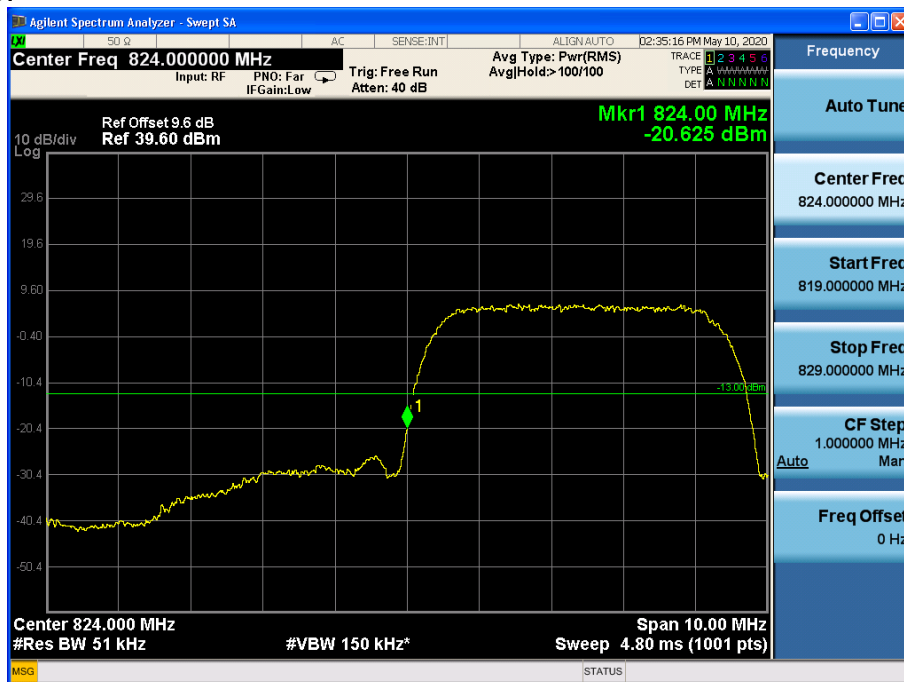


Channel 9262



Channel 9538

HSUPA Mode:



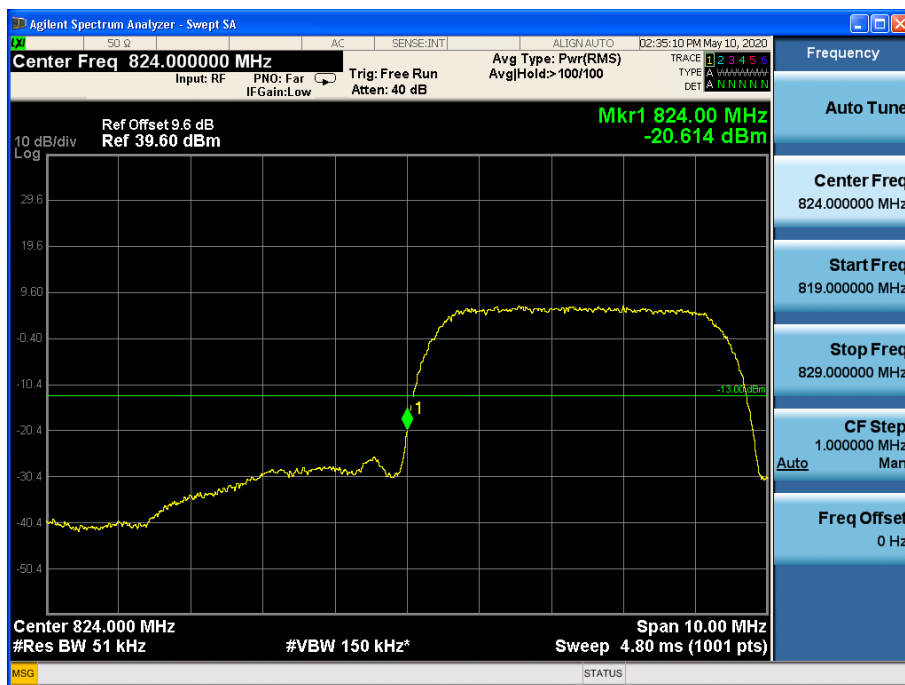
Channel 9262



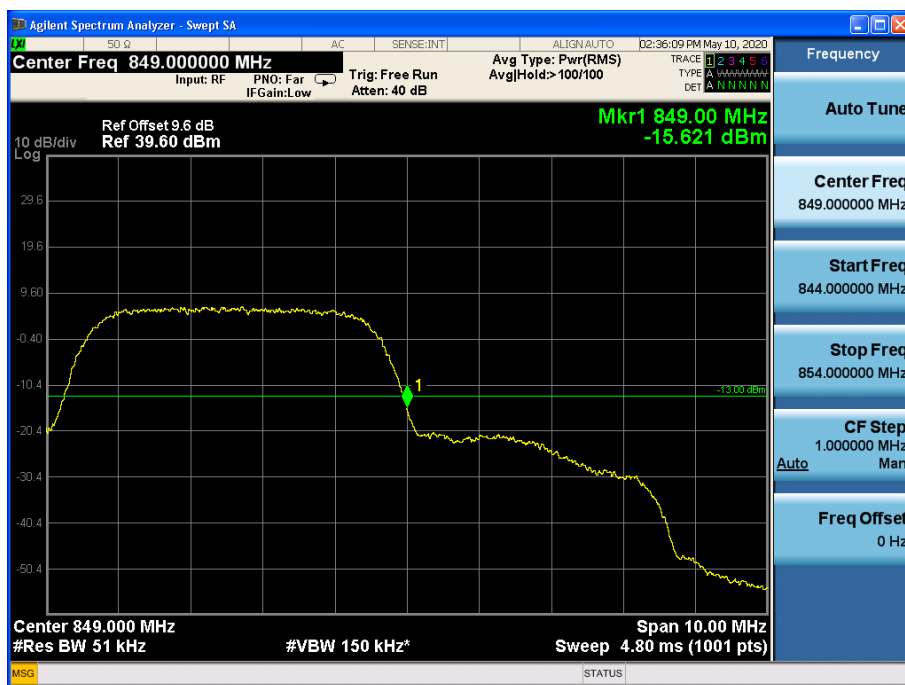
Channel 9538

WCDMA band V

REL99 Mode:

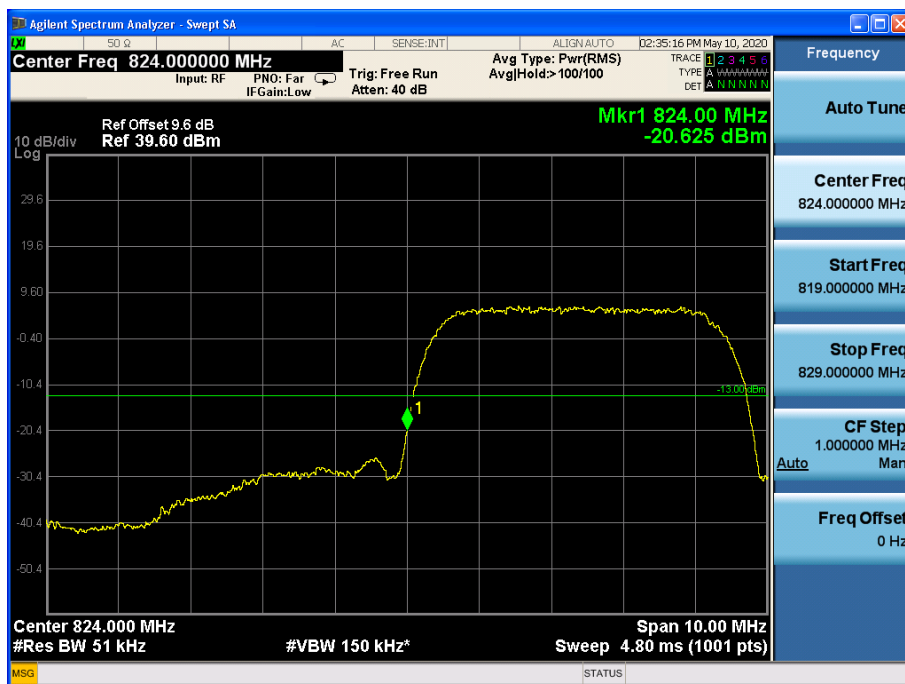


Channel 4132



Channel 4233

HSUPA Mode:



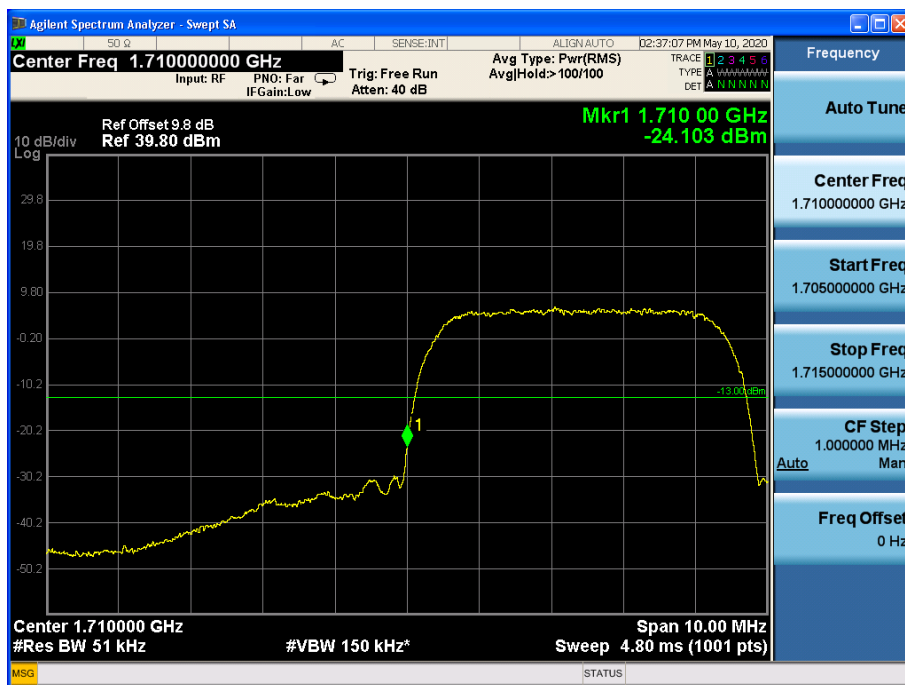
Channel 9262



Channel 9538

WCDMA band IV

REL99 Mode:

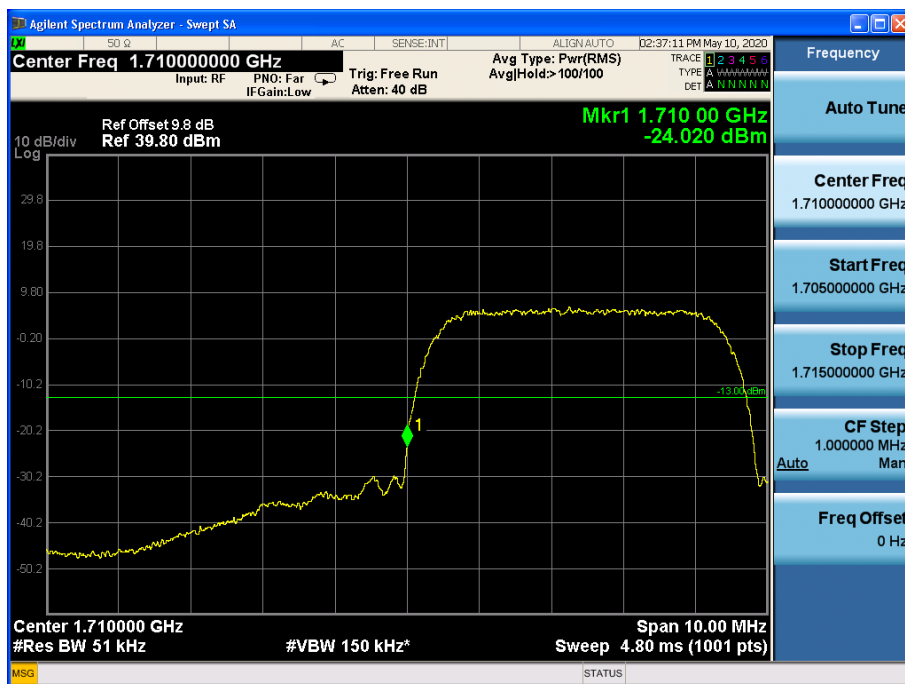


Channel 1312



Channel 1513

HSUPA Mode:



Channel 1312



Channel 1513

Frequency Stability

WCDMA band II

REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 9262	Channel 9400	Channel 9538
-20	0.031	0.025	0.018
-10	0.042	0.017	-0.030
0	0.013	-0.014	0.024
+10	0.001	0.031	-0.007
+20	0.000	0.000	0.000
+30	0.021	0.008	-0.014
+40	-0.001	0.009	-0.021
+50	0.016	-0.004	0.016
+55	-0.037	-0.006	-0.036
Voltage	Test Result (ppm)@NT		
	Channel 9262	Channel 9400	Channel 9538
LV	-0.018	0.023	0.020
HV	0.010	0.012	0.009

HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 9262	Channel 9400	Channel 9538
-20	0.024	0.011	-0.017
-10	-0.003	-0.016	-0.013
0	-0.041	0.015	0.024
+10	-0.020	0.028	0.001
+20	0.000	0.000	0.000
+30	0.006	-0.032	0.012
+40	0.023	0.029	0.015
+50	0.027	0.019	0.028
+55	-0.029	-0.021	0.015
Voltage	Test Result (ppm)NT		
	Channel 9262	Channel 9400	Channel 9538
LV	-0.011	0.014	-0.013
HV	0.024	-0.011	-0.022

WCDMA band V
REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 4132	Channel 4183	Channel 4233
-20	0.002	0.002	-0.015
-10	-0.026	-0.010	0.026
0	0.022	-0.011	-0.019
+10	0.010	0.033	0.022
+20	0.000	0.000	0.000
+30	0.026	0.017	0.006
+40	-0.027	-0.020	0.033
+50	0.012	0.024	-0.023
+55	-0.020	0.015	0.013
Voltage	Test Result (ppm)@NT		
	Channel 4132	Channel 4183	Channel 4233
LV	0.026	-0.022	-0.019
HV	-0.013	-0.031	-0.013

HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 4132	Channel 4183	Channel 4233
-20	0.025	0.011	0.000
-10	0.033	0.024	-0.022
0	0.013	0.023	0.018
+10	-0.026	0.029	0.026
+20	0.000	0.000	0.000
+30	-0.016	0.029	-0.023
+40	0.020	0.024	-0.007
+50	0.016	-0.029	0.017
+55	0.025	-0.005	0.023
Voltage	Test Result (ppm)@NT		
	Channel 4132	Channel 4183	Channel 4233
LV	-0.010	-0.021	-0.025
HV	0.027	0.016	0.017

WCDMA band IV
REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 1312	Channel 1412	Channel 1513
-10	0.004	-0.011	-0.021
0	0.003	0.017	0.019
+10	-0.028	0.022	-0.028
+20	0.000	0.000	0.000
+30	0.015	0.011	-0.024
+40	-0.014	0.035	-0.029
+50	0.014	-0.013	0.024
+55	-0.032	-0.031	-0.038
Voltage	Test Result (ppm)@NT		
	Channel 1312	Channel 1412	Channel 1513
LV	-0.004	0.014	0.005
HV	0.012	-0.019	0.027

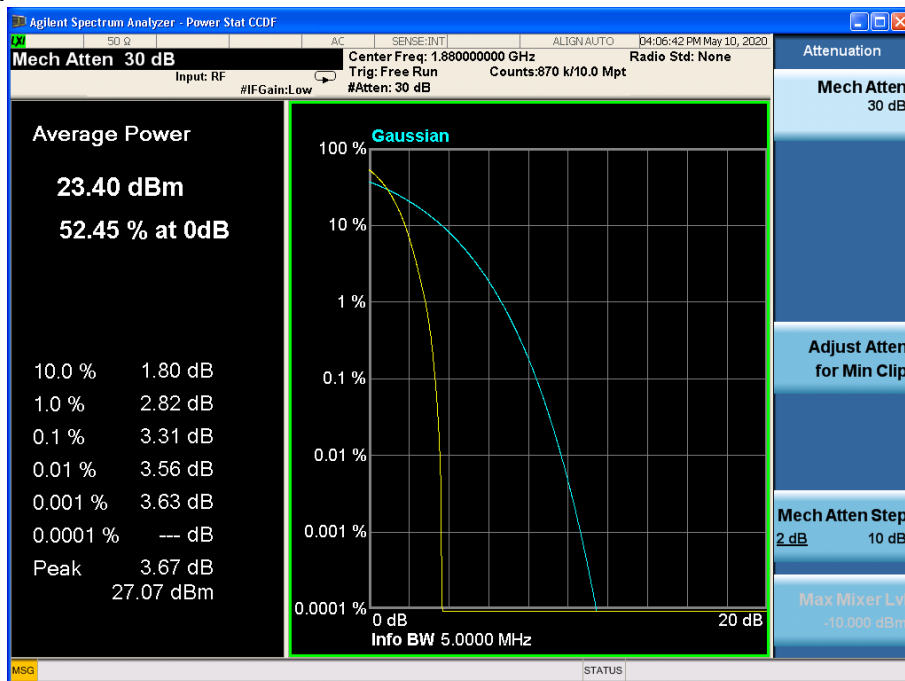
HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 1312	Channel 1412	Channel 1513
-10	-0.028	0.010	-0.022
0	0.018	0.026	0.010
+10	-0.008	0.023	-0.026
+20	0.000	0.000	0.000
+30	0.012	-0.010	0.013
+40	0.022	0.032	0.025
+50	-0.031	0.025	0.014
+55	0.027	-0.031	0.020
Voltage	Test Result (ppm)@NT		
	Channel 1312	Channel 1412	Channel 1513
LV	0.016	0.013	-0.012
HV	-0.028	0.017	0.017

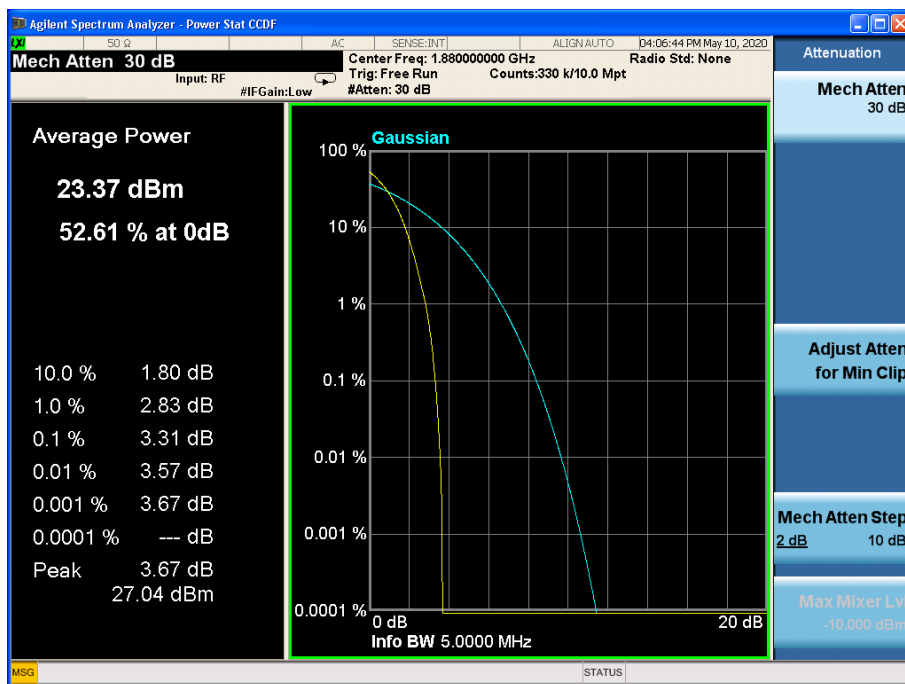
Peak-Average Ratio

WCDMA band II

REL99 Mode:

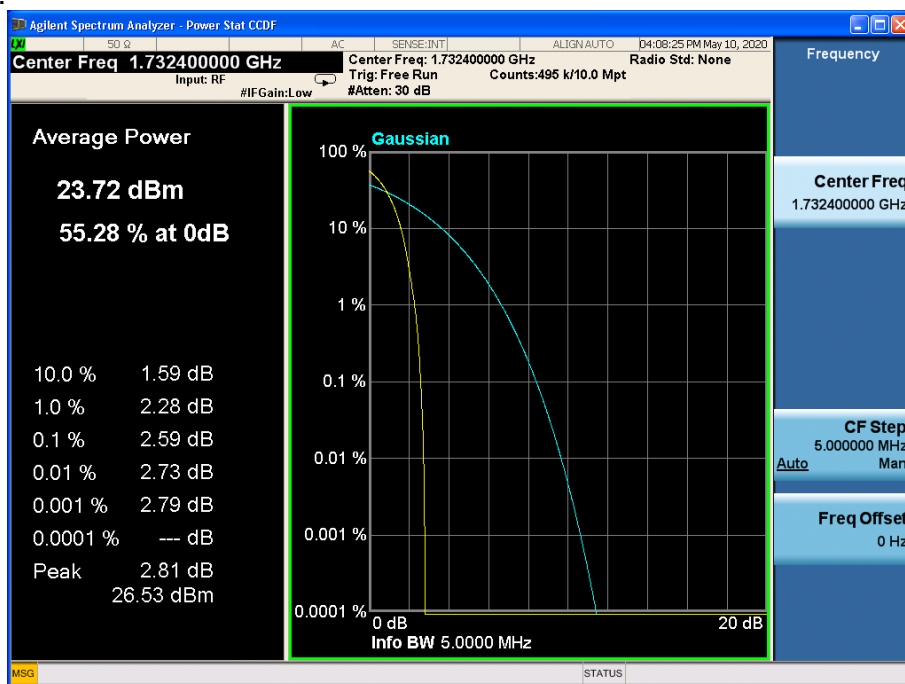


HSUPA Mode:

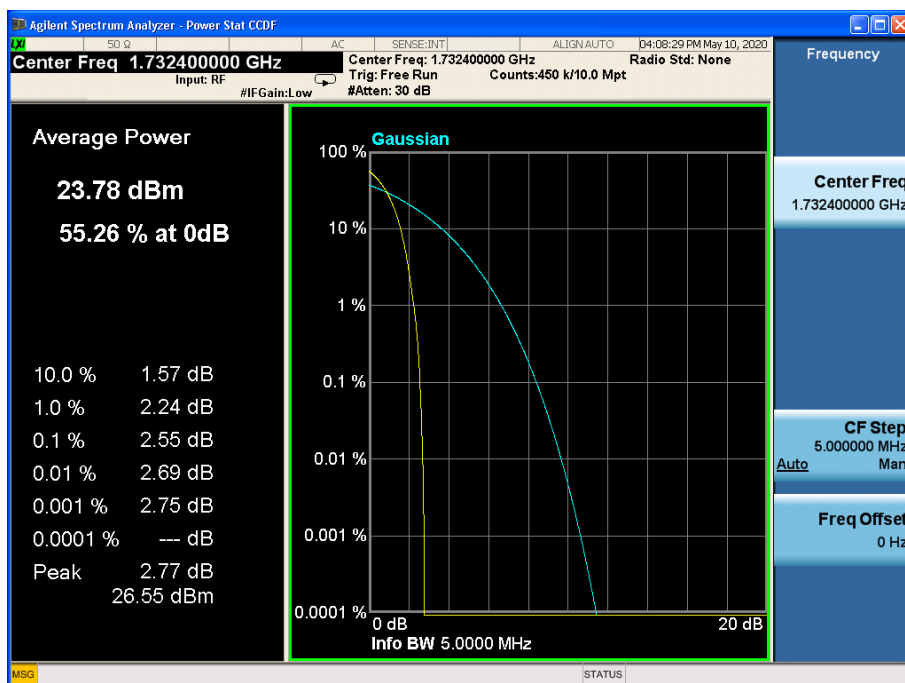


WCDMA band IV

REL99 Mode:

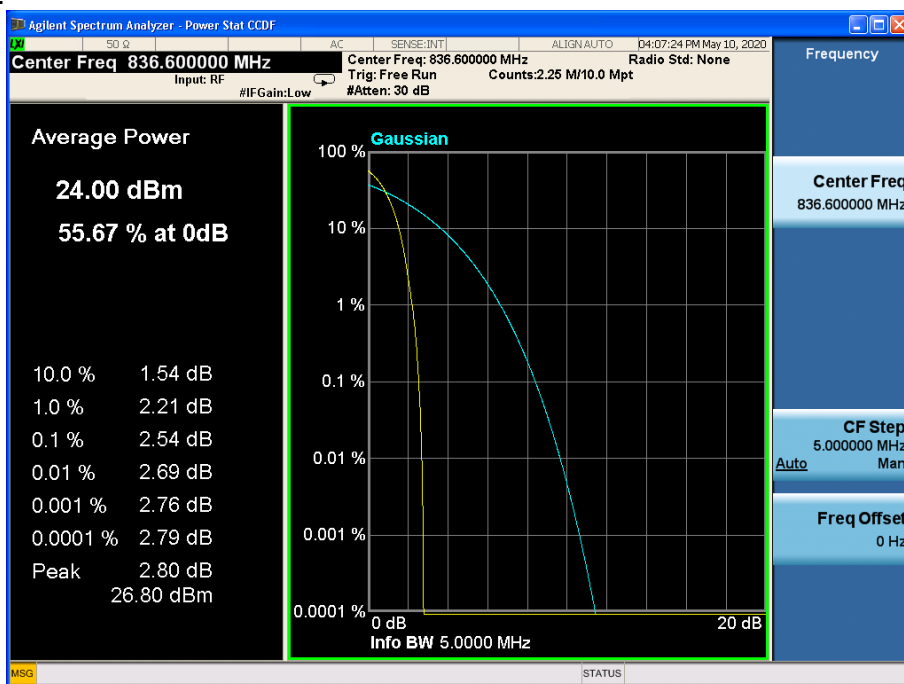


HSUPA Mode:

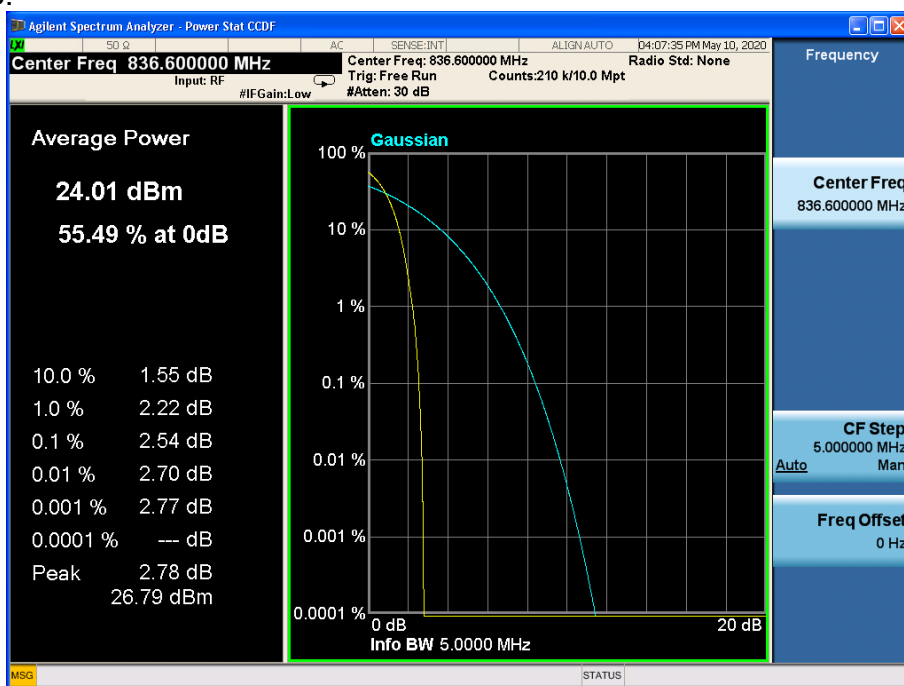


WCDMA band V

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: (24.48 dBm) = (19.68 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 (dBi)	P _{mea} (dBm)	Polarization
1852.4	24.48	-3.8	8.6	19.68	Vertical

WCDMA band II

Test result:

WCDMA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dBi)	P _{mea} (dBm)	Polarization
1852.4	22.37	-3.8	8.6	17.57	Vertical
1880.0	22.86	-3.8	8.6	18.06	Vertical
1907.6	22.36	-3.8	8.6	17.56	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dBi)	P _{mea} (dBm)	Polarization
1852.4	21.97	-3.8	8.6	17.17	Vertical
1880.0	22.23	-3.8	8.6	17.43	Vertical
1907.6	21.20	-3.8	8.6	16.40	Vertical

Test result:

WCDMA Mode:

Channel 9262

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2457.81	-49.40	-13	Vertical
2781.52	-47.13	-13	Vertical
3727.34	-40.54	-13	Vertical
6676.40	-39.43	-13	Vertical
9959.50	-36.88	-13	Vertical
17820.07	-33.67	-13	Vertical

Channel 9400

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2461.34	-49.09	-13	Vertical
2781.83	-47.53	-13	Vertical
3725.81	-41.32	-13	Vertical
6677.48	-39.47	-13	Vertical
9959.41	-37.36	-13	Vertical
17820.52	-33.57	-13	Vertical

Channel 9538

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.48	-49.10	-13	Vertical
2778.63	-47.66	-13	Vertical
3724.53	-41.23	-13	Vertical
6678.14	-40.02	-13	Vertical
9960.52	-37.71	-13	Vertical
17819.55	-33.50	-13	Vertical

HSDPA/HSUPA Mode:

Channel 9262

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.67	-48.98	-13	Vertical
2781.91	-47.33	-13	Vertical
3727.43	-40.41	-13	Vertical
6678.47	-39.87	-13	Vertical
9962.73	-37.18	-13	Vertical
17818.49	-33.83	-13	Vertical

Channel 9400

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.33	-49.10	-13	Vertical
2781.09	-47.59	-13	Vertical
3727.14	-40.75	-13	Vertical
6677.94	-39.70	-13	Vertical
9959.55	-37.68	-13	Vertical
17818.97	-34.33	-13	Vertical

Channel 9538

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.62	-48.62	-13	Vertical
2778.98	-47.20	-13	Vertical
3728.20	-40.51	-13	Vertical
6677.73	-39.37	-13	Vertical
9961.93	-36.83	-13	Vertical
17820.61	-33.90	-13	Vertical

WCDMA band IV

Test result:

WCDMA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dBi)	Pmea (dBm)	Polarization
1712.4	23.10	-3.8	8.6	18.30	Vertical
1732.4	23.00	-3.8	8.6	18.20	Vertical
1752.6	23.05	-3.8	8.6	18.25	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dBi)	Pmea (dBm)	Polarization
1712.4	21.99	-3.8	8.6	17.19	Vertical
1732.4	22.36	-3.8	8.6	17.56	Vertical
1752.6	21.53	-3.8	8.6	16.73	Vertical

Test result:

WCDMA Mode:

Channel 1312

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.11	-48.52	-13	Vertical
2781.56	-47.30	-13	Vertical
3726.23	-40.40	-13	Vertical
6675.95	-39.47	-13	Vertical
9962.06	-36.90	-13	Vertical
17821.17	-34.17	-13	Vertical

Channel 1412

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2458.15	-49.28	-13	Vertical
2781.41	-46.90	-13	Vertical
3724.68	-40.40	-13	Vertical
6676.36	-39.71	-13	Vertical
9959.56	-36.83	-13	Vertical
17822.00	-33.99	-13	Vertical

Channel 1513

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.32	-48.83	-13	Vertical
2781.13	-47.04	-13	Vertical
3727.25	-40.93	-13	Vertical
6678.76	-39.31	-13	Vertical
9962.13	-36.81	-13	Vertical
17818.65	-34.25	-13	Vertical

HSDPA/HSUPA Mode:

Channel 1312

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.44	-48.65	-13	Vertical
2781.29	-47.04	-13	Vertical
3726.72	-41.24	-13	Vertical
6678.57	-39.88	-13	Vertical
9961.83	-36.93	-13	Vertical
17821.55	-34.02	-13	Vertical

Channel 1412

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2461.14	-48.71	-13	Vertical
2779.31	-47.29	-13	Vertical
3728.18	-40.91	-13	Vertical
6676.15	-40.01	-13	Vertical
9962.34	-36.79	-13	Vertical
17821.90	-33.98	-13	Vertical

Channel 1513

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2457.79	-48.51	-13	Vertical
2782.02	-47.77	-13	Vertical
3728.23	-40.37	-13	Vertical
6675.90	-39.43	-13	Vertical
9960.69	-37.13	-13	Vertical
17818.91	-34.21	-13	Vertical

WCDMA band V

Test result:

WCDMA Mode:

Frequency (MHz)	Peak ERP (dBm)	Pca Cable loss(dB)	Ga Antenna Gain (dBi)	Correction (dB)	Pmea (dBm)	Polarization
826.4	17.34	-3.4	8.3	2.15	14.59	Vertical
836.6	16.97	-3.4	8.3	2.15	14.22	Vertical
846.6	16.54	-3.4	8.3	2.15	13.79	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak ERP (dBm)	Pca Cable loss(dB)	Ga Antenna Gain (dBi)	Correction (dB)	Pmea (dBm)	Polarization
826.4	16.39	-3.4	8.3	2.15	13.64	Vertical
836.6	16.33	-3.4	8.3	2.15	13.58	Vertical
846.6	16.28	-3.4	8.3	2.15	13.53	Vertical

Test result:
WCDMA Mode:
Channel 4132

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1649.63	-53.23	-13	Vertical
1668.72	-51.55	-13	Vertical
2533.13	-44.01	-13	Vertical
2575.62	-44.64	-13	Vertical
8963.61	-39.17	-13	Vertical
9972.91	-36.58	-13	Vertical

Channel 4183

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1647.28	-52.50	-13	Vertical
1664.91	-50.92	-13	Vertical
2535.44	-43.83	-13	Vertical
2575.65	-43.78	-13	Vertical
8963.56	-40.00	-13	Vertical
9971.59	-36.58	-13	Vertical

Channel 4233

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1650.49	-52.73	-13	Vertical
1666.13	-51.20	-13	Vertical
2533.06	-44.25	-13	Vertical
2576.41	-44.30	-13	Vertical
8962.63	-39.30	-13	Vertical
9969.83	-36.58	-13	Vertical

HSDPA/HSUPA Mode:
Channel 4132

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1647.34	-53.48	-13	Vertical
1668.54	-51.70	-13	Vertical
2532.67	-44.61	-13	Vertical
2579.11	-44.63	-13	Vertical
8961.53	-39.85	-13	Vertical
9970.02	-36.58	-13	Vertical

Channel 4183

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1646.51	-53.17	-13	Vertical
1665.75	-50.83	-13	Vertical
2532.59	-44.71	-13	Vertical
2577.96	-44.51	-13	Vertical
8962.19	-39.33	-13	Vertical
9971.49	-36.58	-13	Vertical

Channel 4233

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1648.94	-52.73	-13	Vertical
1664.89	-51.53	-13	Vertical
2534.27	-43.98	-13	Vertical
2578.38	-44.05	-13	Vertical
8964.32	-39.56	-13	Vertical
9970.74	-36.58	-13	Vertical

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