

TEST REPORT FOR WCDMA TESTING

Report No.: SRTC2019-9004(F)-19101501(B)

Product Name: Mobile Phone

Product Model: HLTE220E

Applicant: Hisense International Co., Ltd.

Manufacturer: Hisense Communications Co., Ltd.

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

FCC ID: 2ADOBHLTE220E

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

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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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Email:	liujiat@srtc.org.cn

1.3 Applicant's details

Company:	Hisense International Co., Ltd.
Address:	Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China
City:	Qingdao
Country or Region:	China
Contacted person:	Geng Ruifeng
Tel:	+86-532-80877742
Fax:	---
Email:	gengruifeng@hisense.com

1.4 Manufacturer's details

Company:	Hisense Communications Co., Ltd.
Address:	No.218 Qianwangang Road, Economic & Technological Development Zone, Qingdao, China
City:	Qingdao
Country or Region:	China
Contacted person:	Song Haibin
Tel:	+86-532-55753700
Fax:	---
Email:	songhaibin@hisense.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2019-10-15
Testing Start Date:	2019-10-15
Testing End Date:	2019-10-31

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	30
Maximum Extreme	50	---
Minimum Extreme	0	---

Normal Supply Voltage (V d.c.):	3.80
Maximum Extreme Supply Voltage (V d.c.):	4.35
Minimum Extreme Supply Voltage (V d.c.):	3.50

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/HSPA+
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: -2.1dBi/W4: -1.7dBi/W5: -1.2dBi
Power Supply	Battery/Charger
Hardware Version	YK680--MB-V0.1
Software Version	Hisense_HLTE220E_MX02_L201.01_20190926
IMEI	863501040485537

Note: The equipments have two supplies, is different on the supplier of CTP/Earphone/Camera/Data cable.

Main Supply

Part Name	Model	Supplier(Brand)	Description
Camera	ST-CFKS816-5MFF-V2.0/ ST-CFKS816-30WFF-V2.0/	Union Image	Front CAM
Camera	ST-CFKS816BF-V2.0	Union Image	Rear CAM
CTP	CCF11700-6.0	Jiangxi Holitech Technology Co.,Ltd	CTP
Data cable	KLKS816AUSB	Dongguan Keling Electronic Technology Co., Ltd.	
Earphone	KLKS816A	Shenzhen Jinchuangju Electronic Technology Co.,Ltd.	

Secondary Supply

Part Name	Model Name	supplier	Remark
Camera	HTP1157/HTV1155	JIXIHOLITECH TECHNOLOGY CO.LTD	Front CAM
Camera	HTV1156	JIXIHOLITECH TECHNOLOGY CO.LTD	Rear CAM
CTP	Y152073B2-D-X	Dongguan Yuye Communication Technology CO.,ted	CTP
Data cable	A106-0022-S	SHENZHEN KOAR ELECTIC CO.,LTD	
Earphone	W1G513A06S	Shenzhen Jinchuangju Electronic Technology Co.,Ltd.	

2.2 Support Equipment

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

Equipment	Battery
Manufacturer	Shenzhen Tianjin New Energy Technology Co.,Ltd;
Model Number	KS816
Serial Number	---

Equipment	Charger
Manufacturer	Shenzhen Tianyin Electronics Co., Ltd
Model Number	TPA-97050100VU
Serial Number	---

Equipment	USB Cable1
Manufacturer	SHENZHEN KOAR ELECTIC CO.,LTD
Model Number	A106-0022-S
Serial Number	---

Equipment	USB Cable2
Manufacturer	Dongguan Keling Electronic Technology Co., Ltd.
Model Number	KLKS816AUSB
Serial Number	---

2.3 Summary table.

FCC Rule Part	Frequency Range(MHz)	Modulation	ERP/ EIRP (dBm)	ERP/ EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
24E	1852.4-1907.6	QPSK	23.82	0.241	0.090	4M17F9W
22H	826.4-846.6	QPSK	22.04	0.160	-0.097	4M18F9W
27	1712.4-1752.6	QPSK	24.10	0.257	0.097	4M18F9W

3 REFERENCE SPECIFICATION

Specification	Version	Title
2.1046	2019	Measurements required: RF power output.
2.1049	2019	Measurements required: Occupied bandwidth.
2.1051	2019	Measurements required: Spurious emissions at antenna terminals.
2.1053	2019	Measurements required: Field strength of spurious radiation.
2.1055	2019	Measurements required: Frequency stability.
22.355	2019	Frequency tolerance.
22.913	2019	Effective radiated power limits.
22.917	2019	Emission limitations for cellular equipment.
24.232	2019	Power and antenna height limits.
24.235/27.54	2019	Frequency stability.
24.238	2019	Emission limitations for Broadband PCS equipment.
27.50	2019	Power limits and duty cycle.
27.53	2019	Emission limits.
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

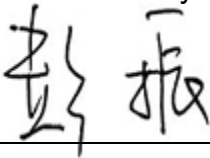
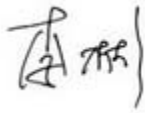
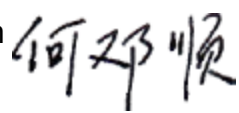
4 KEY TO NOTES AND RESULT CODES

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.
N/T	Test case is not tested.
NTC	Nominal voltage, Normal Temperature
HV	High voltage, Normal Temperature
LV	Low voltage, Normal Temperature
HTHV	high voltage, High Temperature
LTHV	High voltage, Low Temperature
HTLV	Low voltage, High Temperature
LTLV	Low voltage, Low Temperature

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. He Dengshun 	Issued date: 20191101

6 TEST RESULT

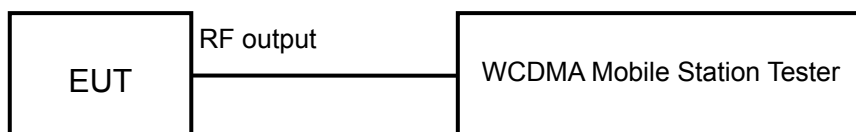
6.1 RF Power Output

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 of WCDMA).

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

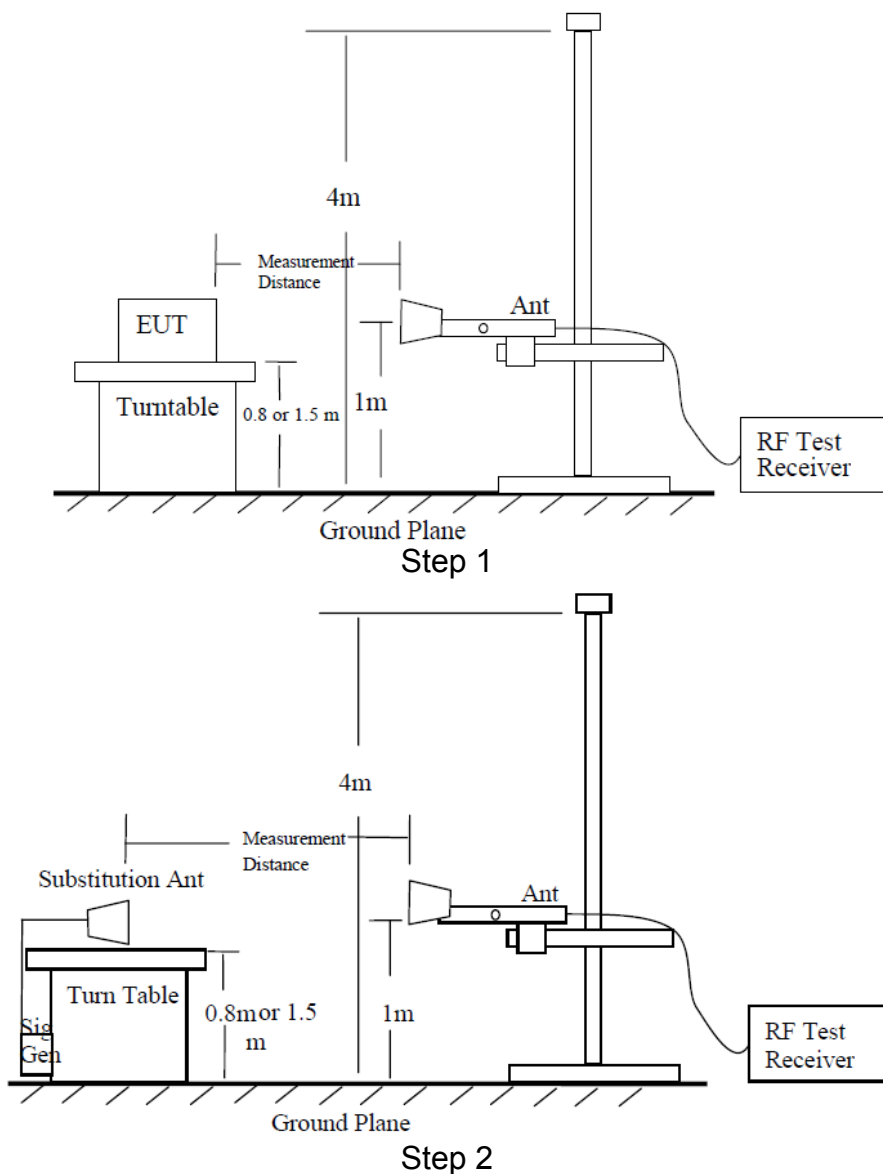
Rule Part(s):

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 fully anechoic chamber. EUT was placed on a 2.4 meters 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 is 2.4m 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 3MHz. Then the height of receive antenna shall be moved from 1 to 4 meters, and 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 and the reading of the spectrum analyzer or receiver.

A power (Pmea) 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 (Pmea) 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 (Pca) and the Substitution Antenna Gain (Ga).

The measurement results are obtained as described below:

Power (EIRP) = Pmea+ Pca+ Ga

The measurement will be done at three channels(Low, middle and High channels).

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 (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.

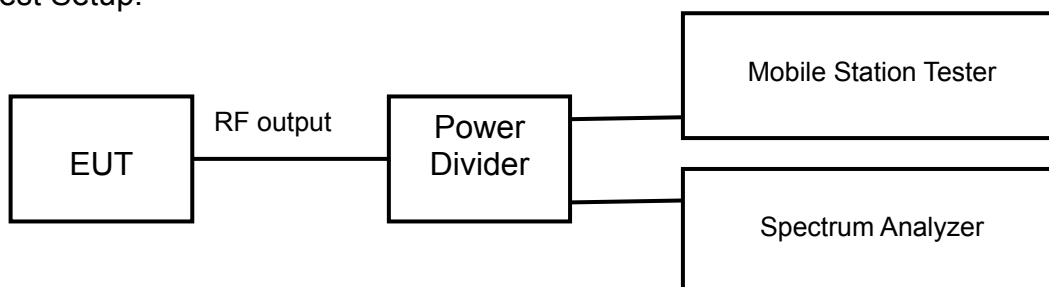
6.3 Occupied Bandwidth

Rule Part(s):
FCC: 2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied 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 x 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

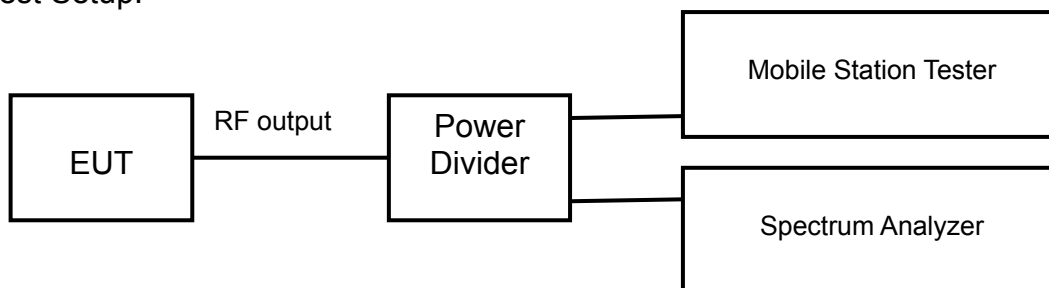
Rule Part(s):

FCC: 2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:

1. The signal analyzer's automatic bandwidth measurement capability was used to perform 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 ≥ 3 x 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 26dB bandwidth observed in Step 7

Limits: No specific emission bandwidth requirements in part 2.1049

Test result:

The test results are shown in Appendix A.

6.5 Spurious Emissions at antenna terminal

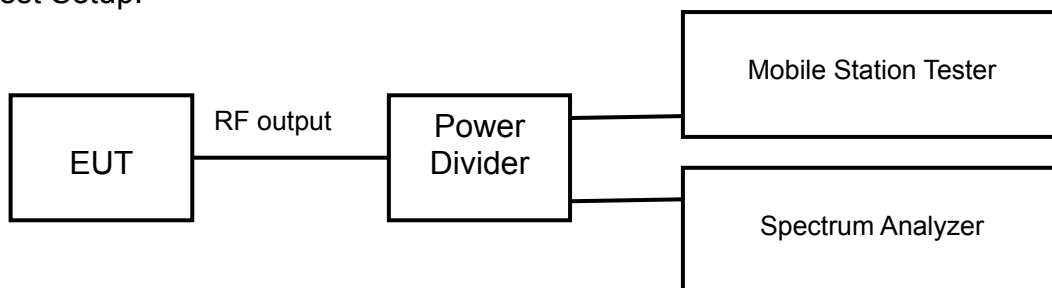
Rule Part(s):

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:

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz for Cell, 20GHz for AWS, 20 GHz for PCS (separated into at least two plots per channel)
2. RBW=1MHz
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 $43 + \log_{10}(P)$ [Watts], where P is the transmitter power in Watts.

Test result:

The test results are shown in Appendix A.

6.6 Band Edges Compliance

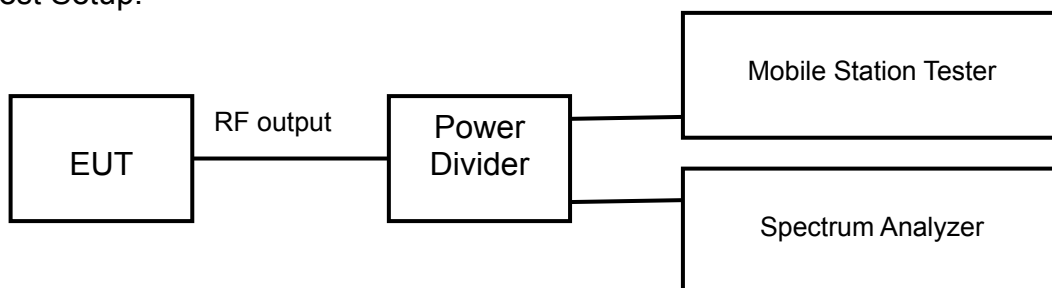
Rule Part(s)

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:

- Start and stop frequency were set such that the band edge would be placed in the center of the plot
- Span was set large enough so as to capture all out of band emissions near the band edge
- RBW > 1% of the emission bandwidth
- VBW > 3 x RBW
- Detector = RMS
- Number of sweep points $\geq 2 \times \text{Span}/\text{RBW}$
- Trace mode = trace average for continuous emissions, max hold for pulse emissions
- Sweep time = auto couple
- The trace was allowed to stabilize

Limits

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.

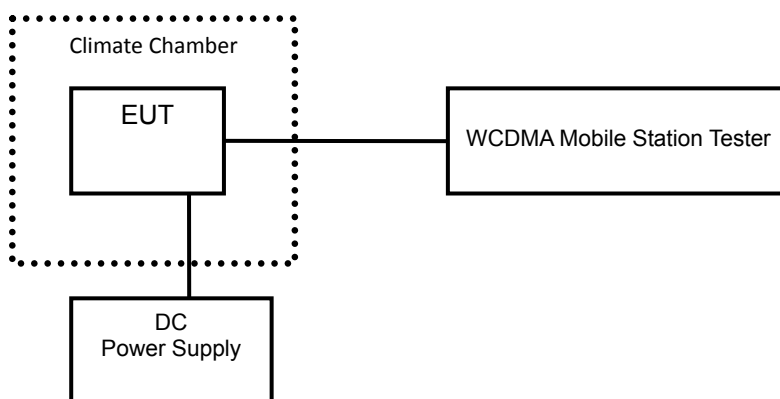
6.7 Frequency Stability

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:

A radio link shall be established between EUT and Tester. The tester will sample the transmitter RF output signal and measure its frequency. The temperature inside the climate chamber is varied from -30 to +50°C in 10°C step size, and also the DC power supply voltage to the EUT is varied from LV to HV. The measurement will be conducted at three channels (Low, middle and High channels).

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, Part 27, 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.

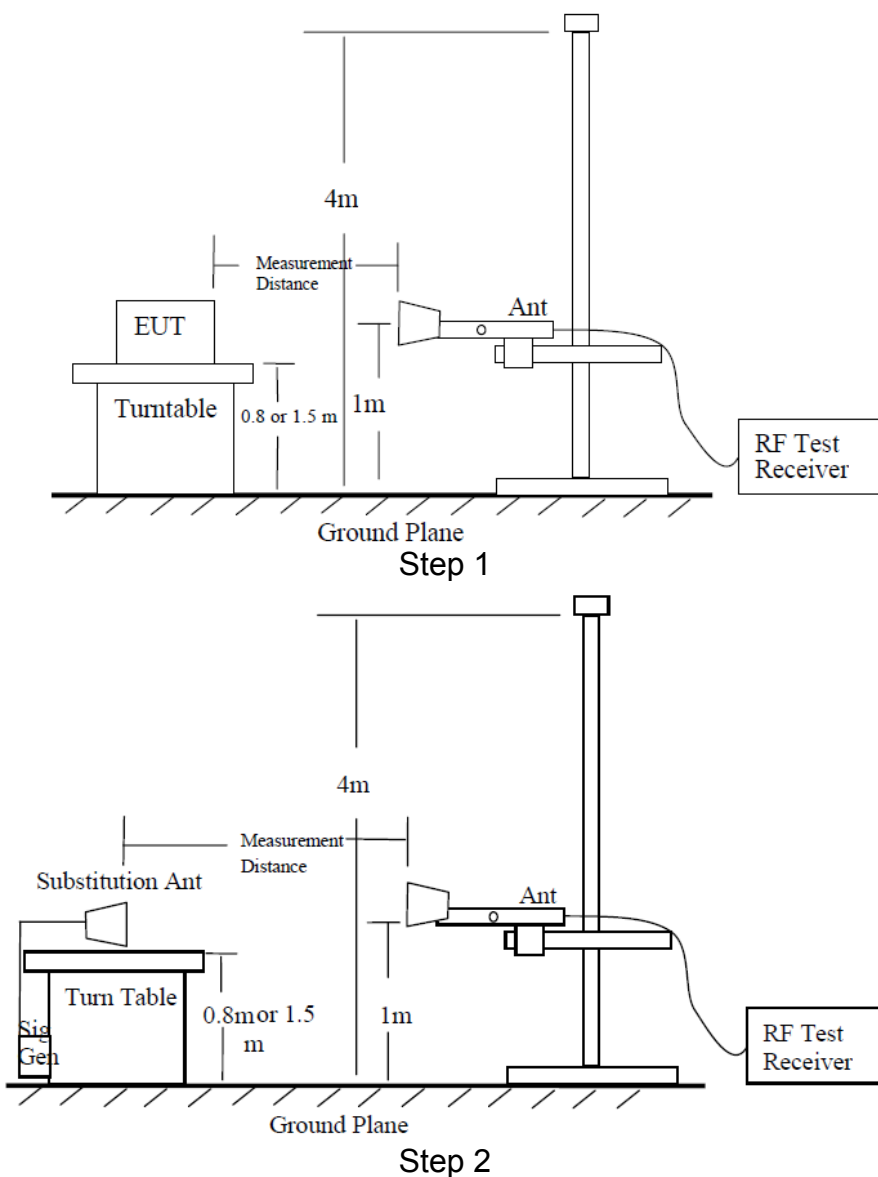
6.8 Radiated Spurious Emissions

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 fully anechoic chamber. EUT was placed on a 2.4 meter high non-conductive table at a 3 meter 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 is 2.4m 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. The measurement is carried out using a spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 20GHz (higher than the 10th harmonic of the carrier). The peak detector is used and RBW is set to 1MHz on spectrum analyzer. Then the antenna height and turn table rotation is adjusted till the maximum power value is founded on spectrum analyzer or receiver. 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, $ERP = EIRP - 2.15 \text{ (dB)}$.

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.

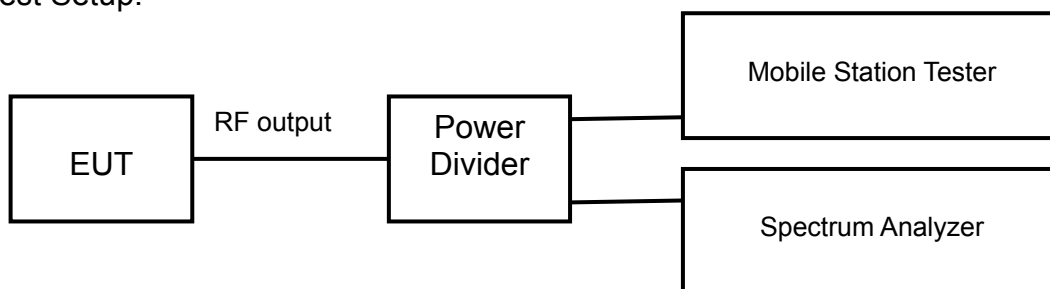
6.9 Peak-Average Ratio

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:

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:

In measuring transmissions in this band using an average power technique, 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	2019.08.20	2020.08.19
2	N9020A Spectrum Analyzer	Agilent	MY48010771	2019.08.20	2020.08.19
3	6007 Power Divider	Weinschel	6007-GJ-1	2019.08.20	2020.08.19
4	DC Power Supply E3645A	Agilent	MY40000741	2019.03.01	2020.02.29
5	Temperature chamber SH241	ESPEC	92013758	2019.08.20	2020.08.19
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	2019.08.20	2020.08.19
14	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100513	2019.08.20	2020.08.19
15	HL562 Ultra log antenna	R&S	100016	2019.08.20	2020.08.19
16	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2019.08.20	2020.08.19
17	ESI 40 EMI test receiver	R&S	100015	2019.08.20	2020.08.19
18	ESCS30 EMI test receiver	R&S	100029	2019.08.20	2020.08.19
19	HL562 Receive antenna	R&S	100167	2019.08.20	2020.08.19
20	ENV216 AMN	R&S	3560.6550.12	2019.08.20	2020.08.19

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	22.93
		1880.0	9400	23.04
		1907.6	9538	23.05
HSDPA	Subtest 1	1852.4	9262	22.18
		1880.0	9400	22.24
		1907.6	9538	22.14
	Subtest 2	1852.4	9262	22.14
		1880.0	9400	22.05
		1907.6	9538	22.25
	Subtest 3	1852.4	9262	22.18
		1880.0	9400	22.11
		1907.6	9538	22.10
	Subtest 4	1852.4	9262	22.26
		1880.0	9400	22.11
		1907.6	9538	22.27
HSUPA	Subtest 1	1852.4	9262	22.06
		1880.0	9400	22.21
		1907.6	9538	22.21
	Subtest 2	1852.4	9262	22.14
		1880.0	9400	22.21
		1907.6	9538	22.15
	Subtest 3	1852.4	9262	22.07
		1880.0	9400	22.13
		1907.6	9538	22.30
	Subtest 4	1852.4	9262	22.28
		1880.0	9400	22.08
		1907.6	9538	22.08
	Subtest 5	1852.4	9262	22.17
		1880.0	9400	22.00
		1907.6	9538	22.05

WCDMA band V

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC, 12.2kbps	826.4	4132	22.85
		836.6	4183	22.91
		846.6	4233	22.86
HSDPA	Subtest 1	826.4	4132	22.15
		836.6	4183	22.09
		846.6	4233	22.15
	Subtest 2	826.4	4132	22.04
		836.6	4183	22.13
		846.6	4233	22.14
	Subtest 3	826.4	4132	22.20
		836.6	4183	22.09
		846.6	4233	22.14
	Subtest 4	826.4	4132	22.06
		836.6	4183	22.20
		846.6	4233	22.13
HSUPA	Subtest 1	826.4	4132	22.16
		836.6	4183	22.14
		846.6	4233	22.21
	Subtest 2	826.4	4132	22.14
		836.6	4183	22.07
		846.6	4233	22.10
	Subtest 3	826.4	4132	22.13
		836.6	4183	22.06
		846.6	4233	22.09
	Subtest 4	826.4	4132	22.04
		836.6	4183	22.17
		846.6	4233	22.08
	Subtest 5	826.4	4132	22.11
		836.6	4183	22.10
		846.6	4233	22.08

WCDMA band IV

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC, 12.2kbps	1712.4	1312	22.56
		1732.4	1412	22.61
		1752.6	1513	22.55
HSDPA	Subtest 1	1712.4	1312	22.11
		1732.4	1412	22.04
		1752.6	1513	21.95
	Subtest 2	1712.4	1312	22.06
		1732.4	1412	21.98
		1752.6	1513	22.05
	Subtest 3	1712.4	1312	22.05
		1732.4	1412	22.00
		1752.6	1513	22.02
	Subtest 4	1712.4	1312	21.97
		1732.4	1412	22.07
		1752.6	1513	22.01
HSUPA	Subtest 1	1712.4	1312	22.10
		1732.4	1412	22.04
		1752.6	1513	22.00
	Subtest 2	1712.4	1312	22.06
		1732.4	1412	22.07
		1752.6	1513	22.03
	Subtest 3	1712.4	1312	21.96
		1732.4	1412	22.10
		1752.6	1513	22.01
	Subtest 4	1712.4	1312	21.95
		1732.4	1412	22.09
		1752.6	1513	22.05
	Subtest 5	1712.4	1312	22.01
		1732.4	1412	22.08
		1752.6	1513	22.05

Occupied Bandwidth

WCDMA band II

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1852.4	9262	4.1631
1880.0	9400	4.1730
1907.6	9538	4.1669

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1852.4	9262	4.1553
1880.0	9400	4.1699
1907.6	9538	4.1639

WCDMA band V

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
826.4	4132	4.1741
836.6	4183	4.1764
846.6	4233	4.1611

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
826.4	4132	4.1538
836.6	4183	4.1871
846.6	4233	4.1651

WCDMA band IV

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1712.4	1312	4.1672
1732.4	1412	4.1699
1752.6	1513	4.1651

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
1712.4	1312	4.1647
1732.4	1412	4.1804
1752.6	1513	4.1726

Emission Bandwidth

WCDMA band II

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1852.4	9262	4.665
1880.0	9400	4.662
1907.6	9538	4.705

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1852.4	9262	4.676
1880.0	9400	4.676
1907.6	9538	4.654

WCDMA band V

REL99 Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
826.4	4132	4.680
836.6	4183	4.665
846.6	4233	4.685

HSUPA Mode:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
826.4	4132	4.659
836.6	4183	4.684
846.6	4233	4.684

WCDMA band IV

REL99 Mode:

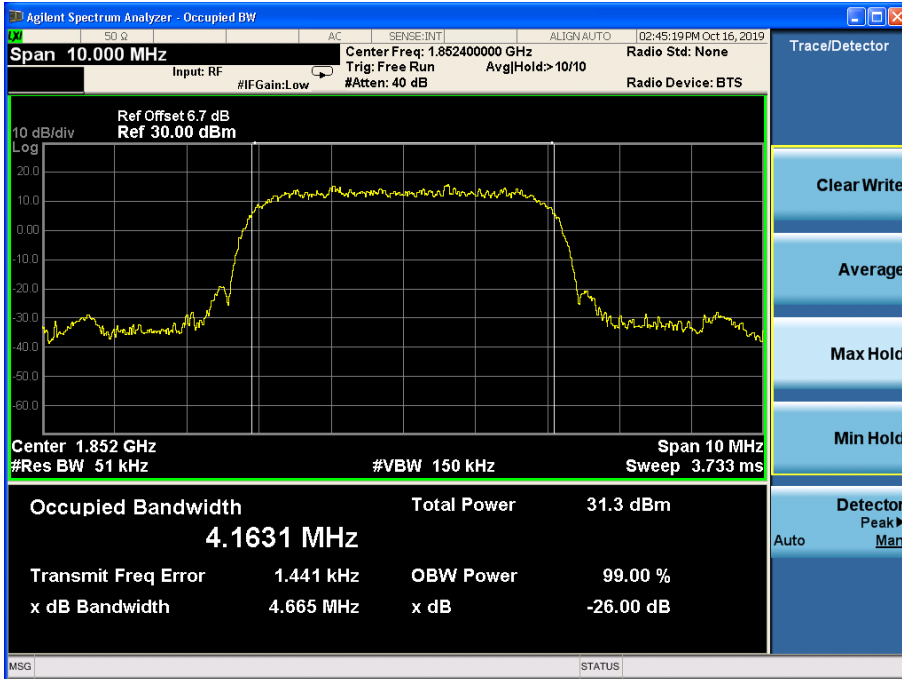
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1712.4	1312	4.669
1732.4	1412	4.657
1752.6	1513	4.683

HSUPA Mode:

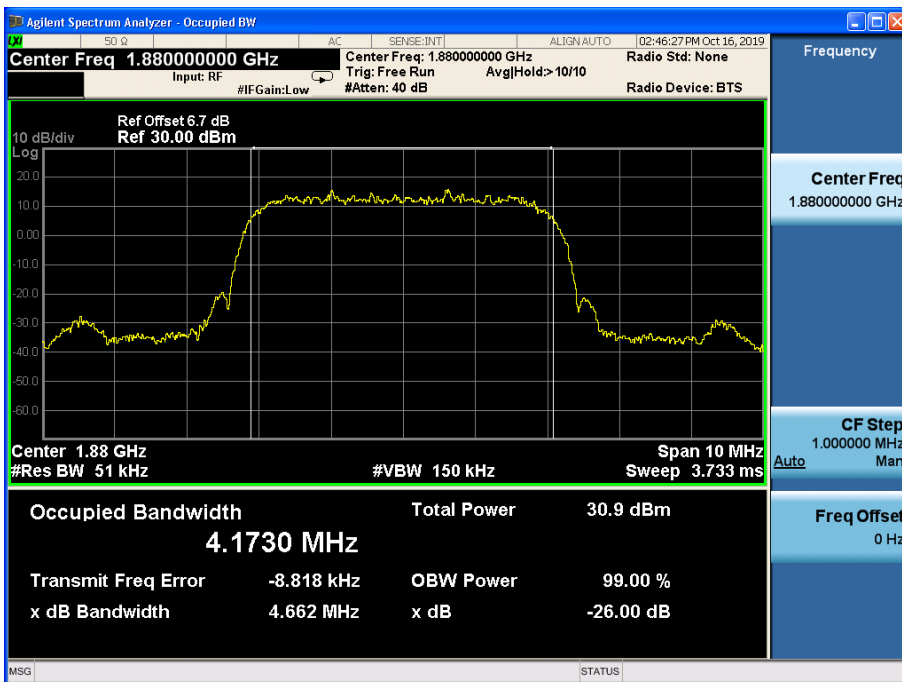
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
1712.4	1312	4.660
1732.4	1412	4.684
1752.6	1513	4.687

WCDMA band II

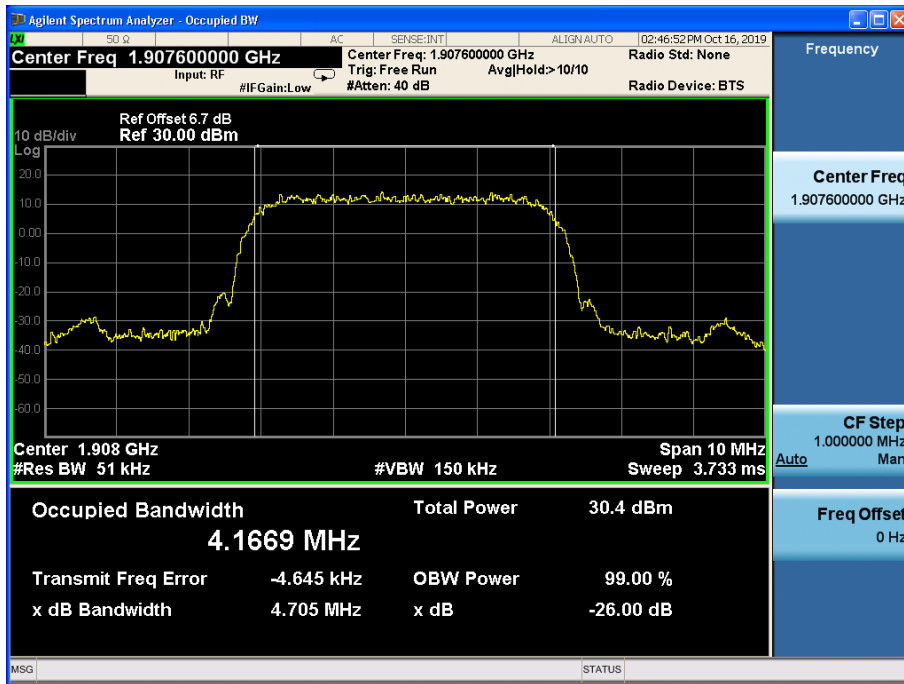
REL99 Mode:



Channel 9262

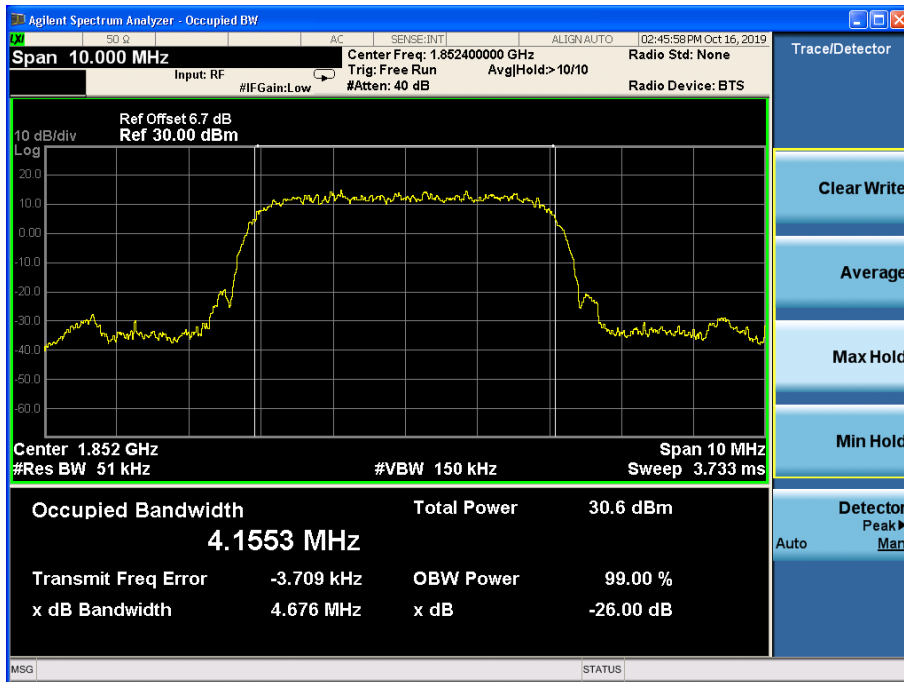


Channel 9400

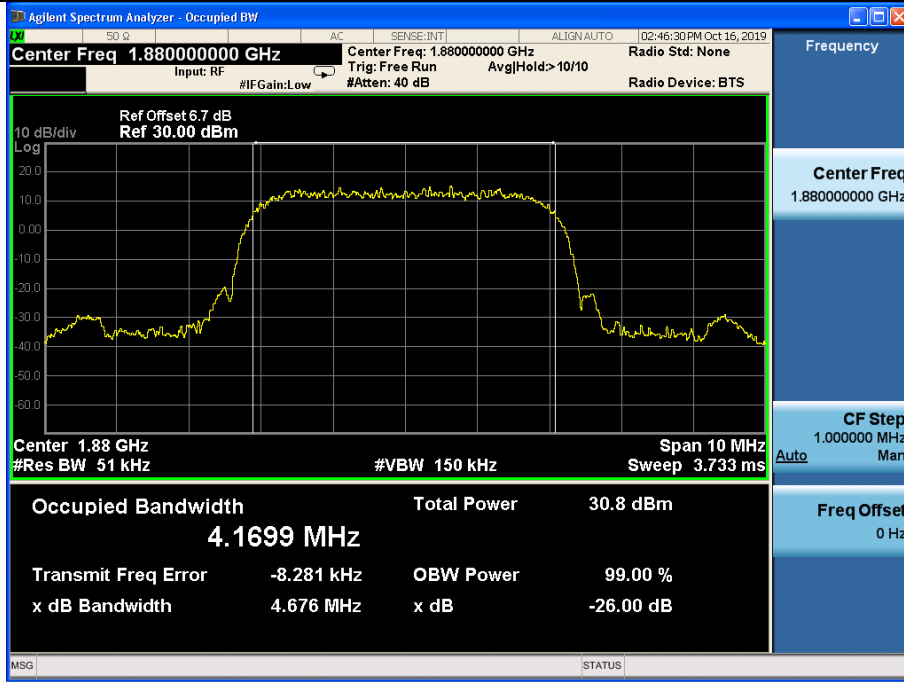


Channel 9538

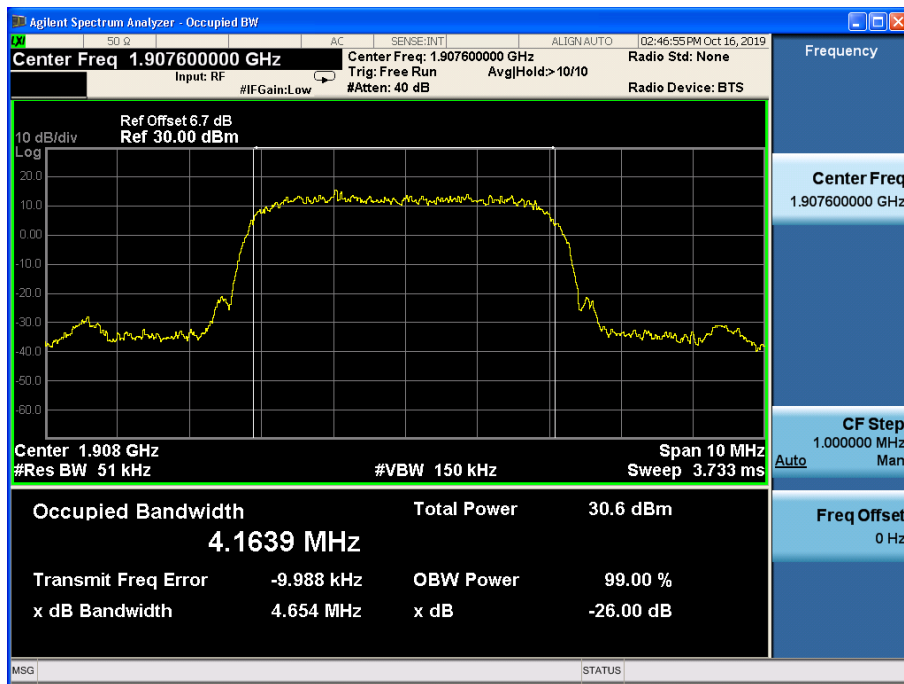
HSUPA Mode:



Channel 9262



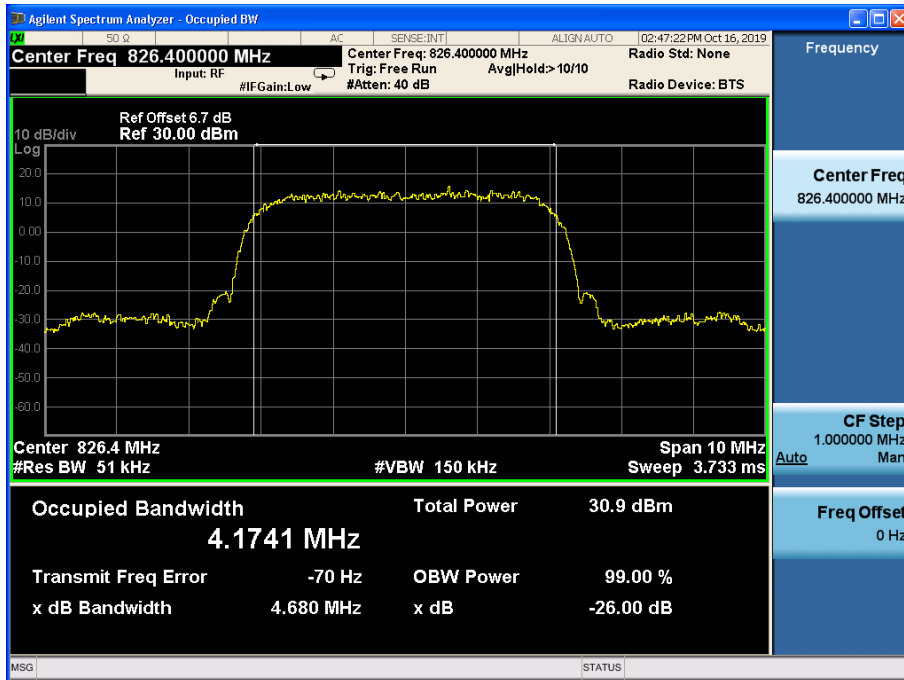
Channel 9400



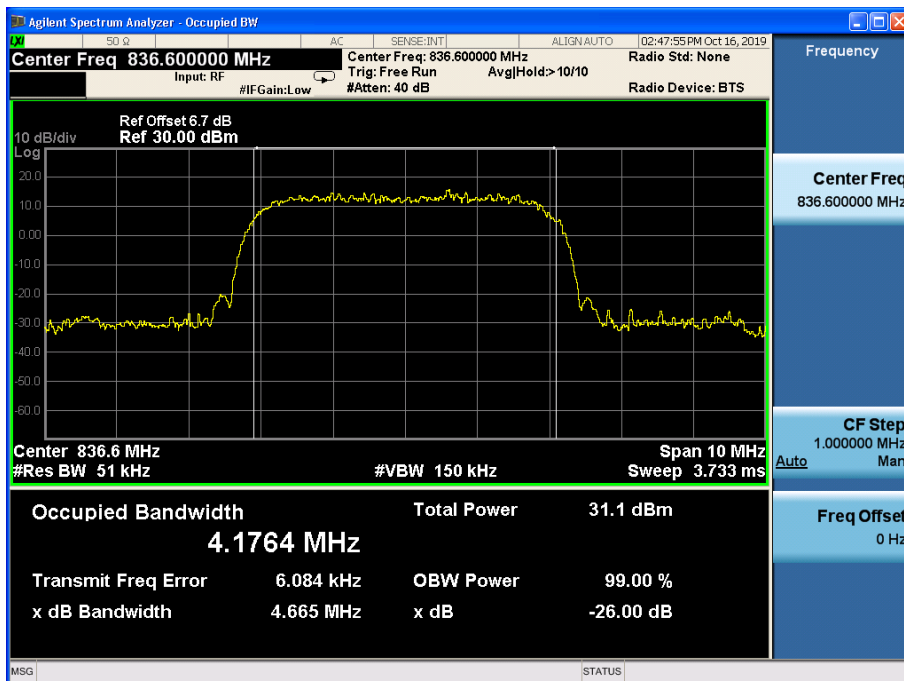
Channel 9538

WCDMA band V

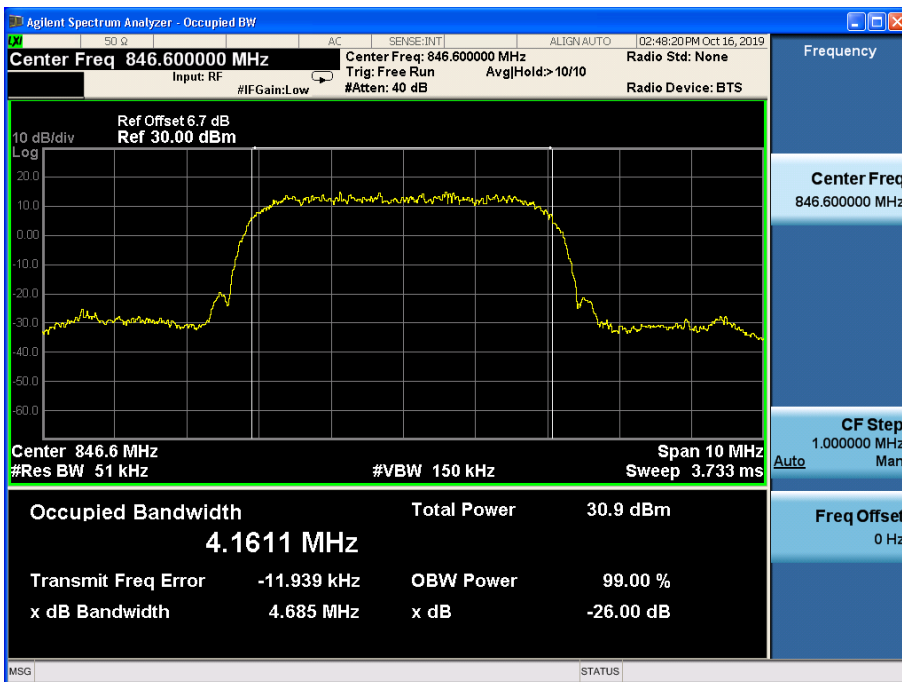
REL99 Mode:



Channel 4132

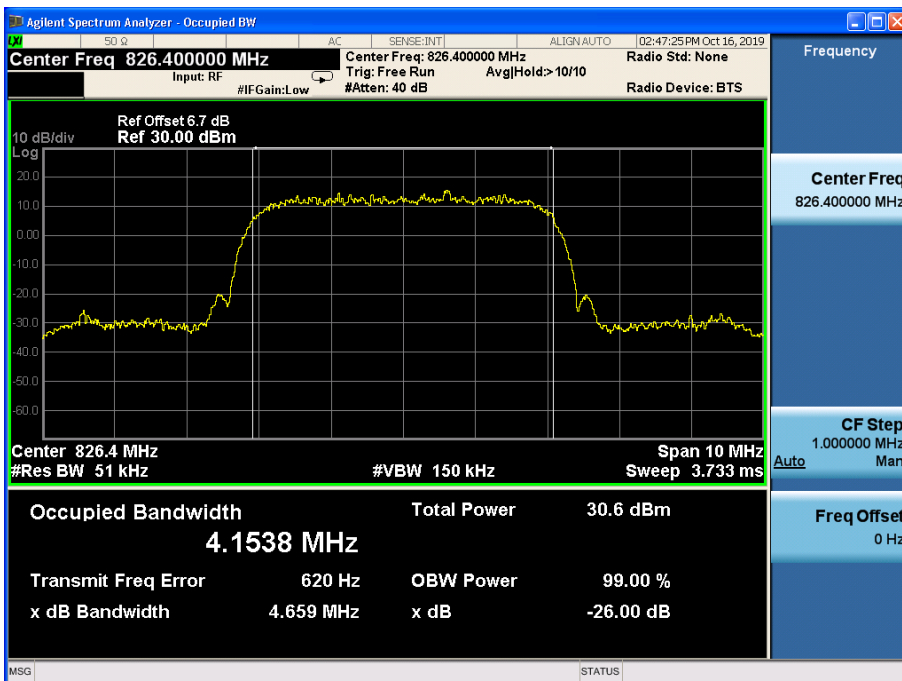


Channel 4183

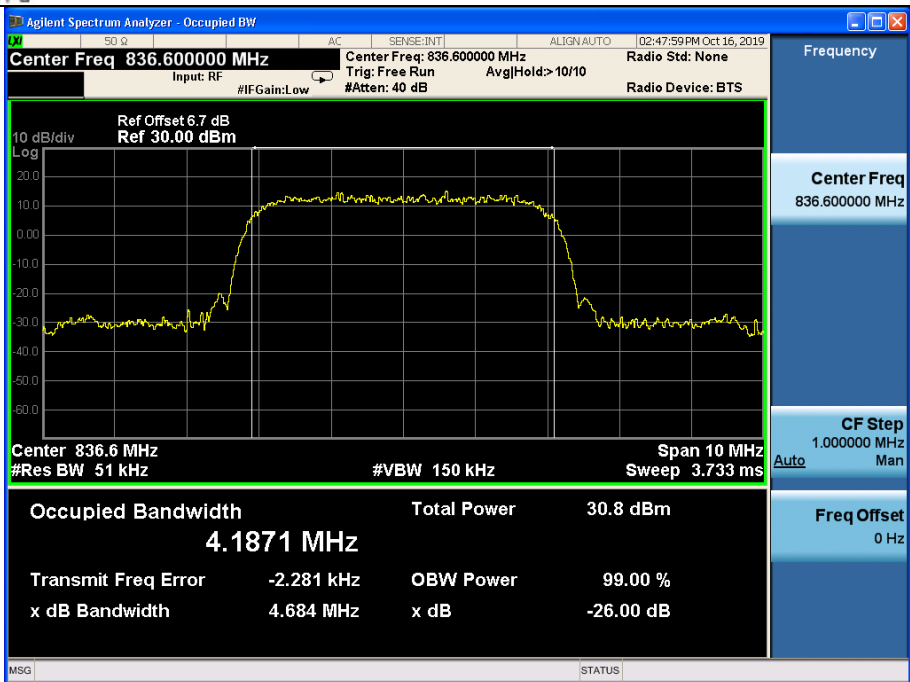


Channel 4233

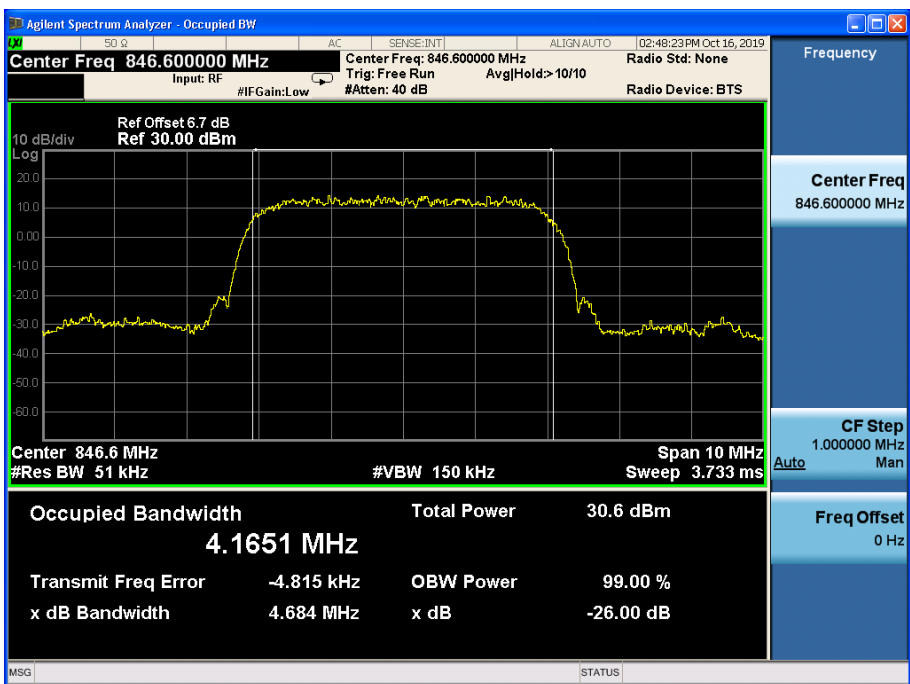
HSUPA Mode:



Channel 4132



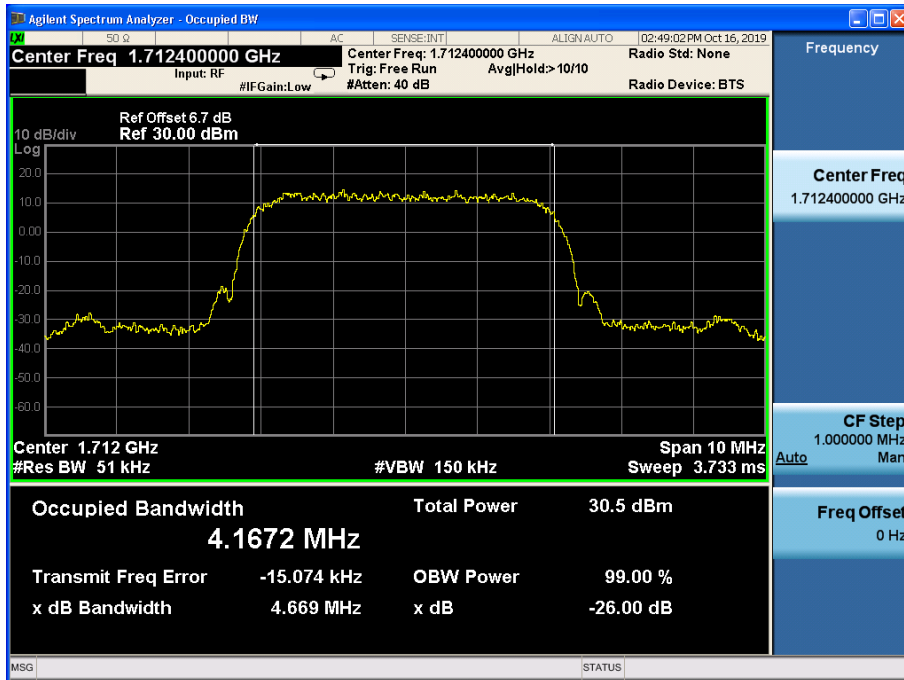
Channel 4183



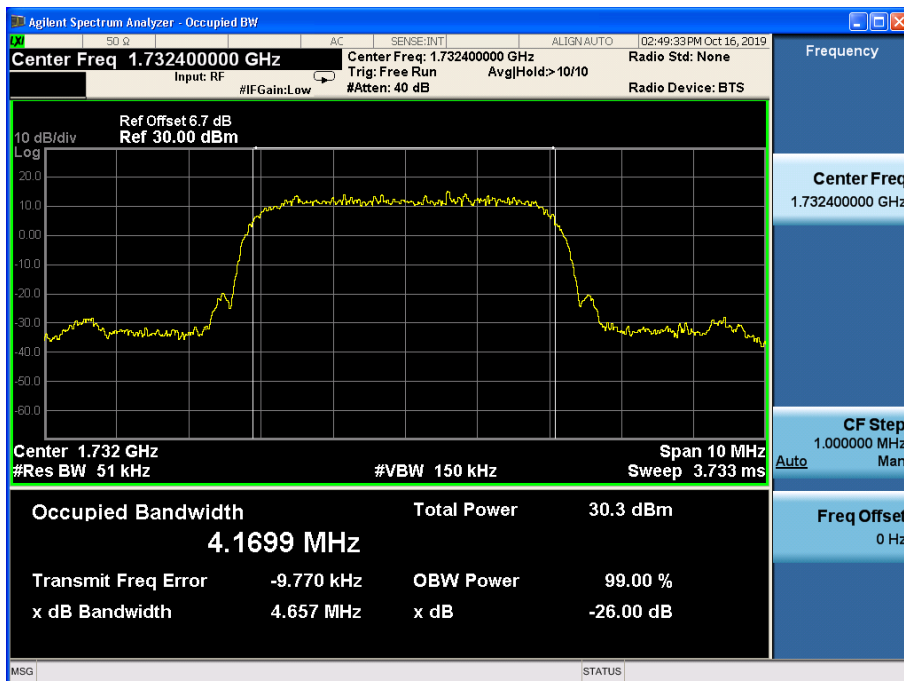
Channel 4233

WCDMA band IV

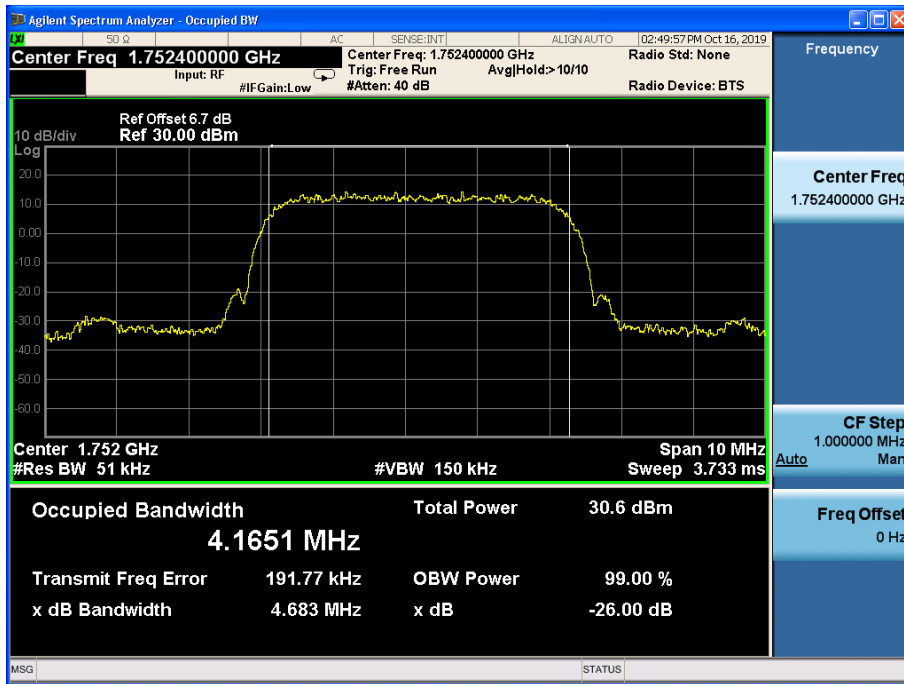
REL99 Mode:



Channel 1312

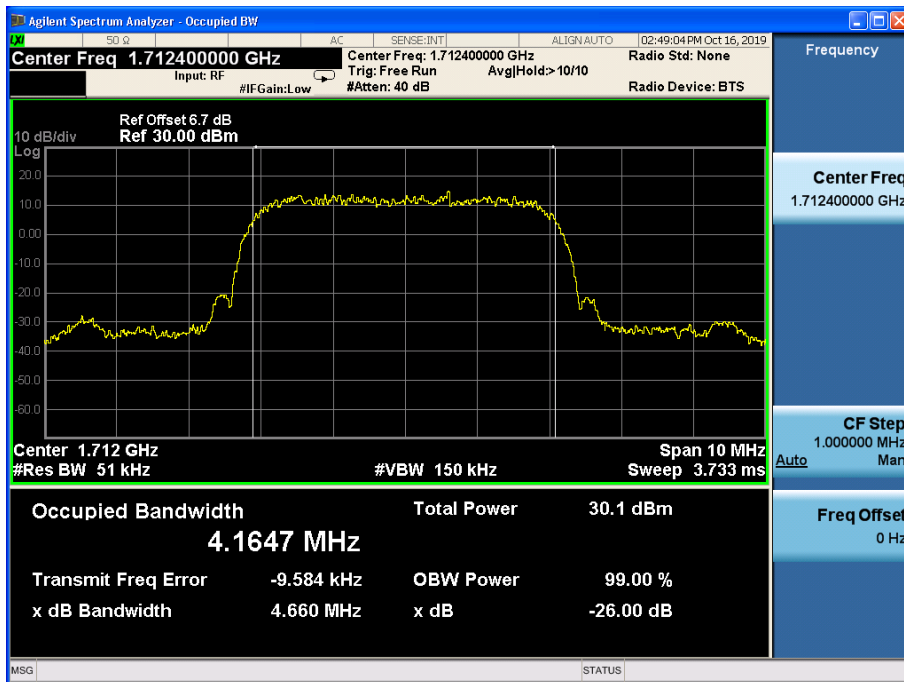


Channel 1412

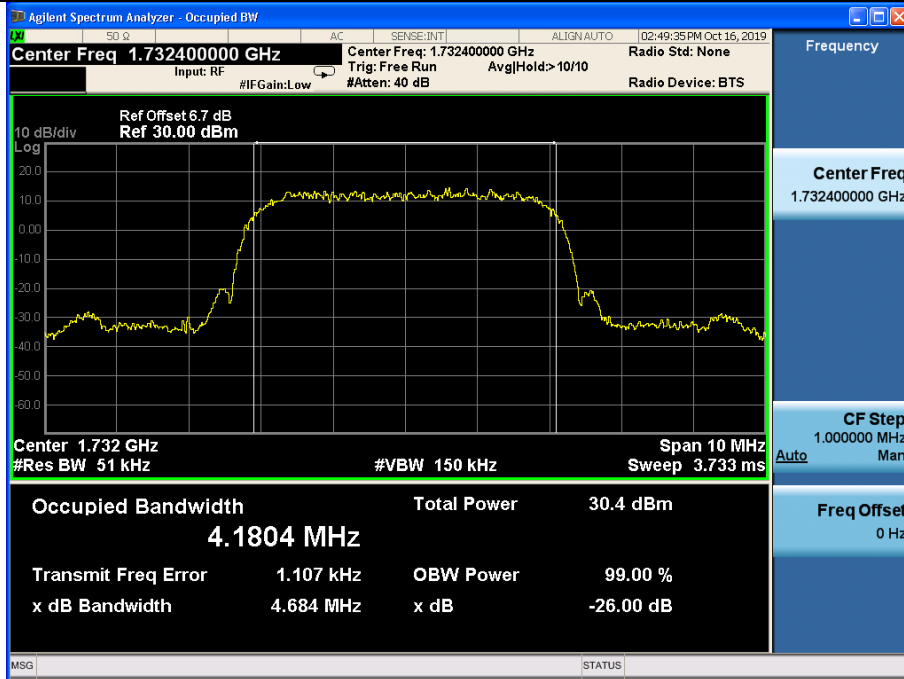


Channel 1513

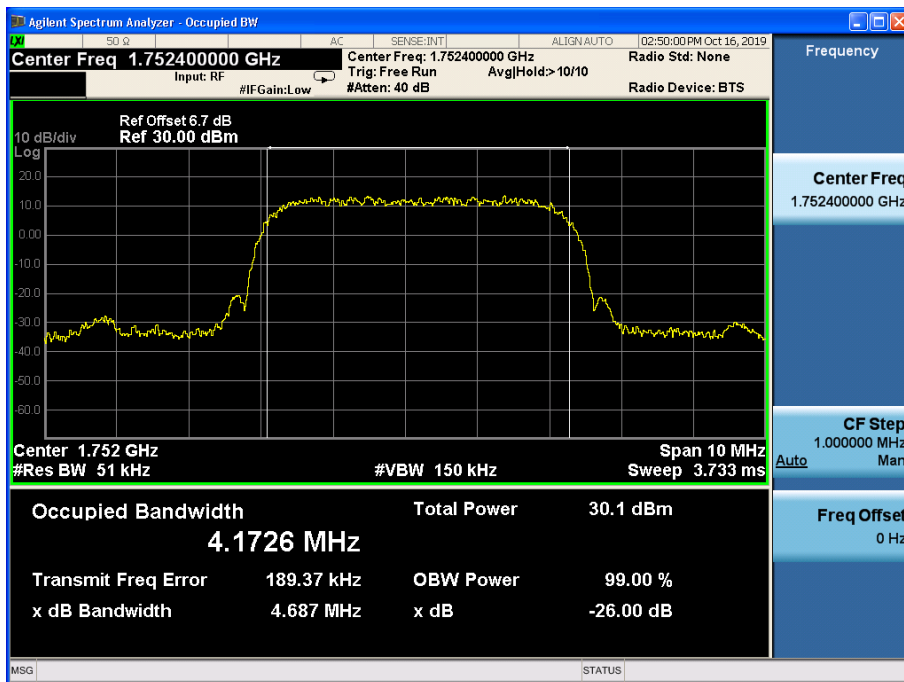
HSUPA Mode:



Ch7annel 1312



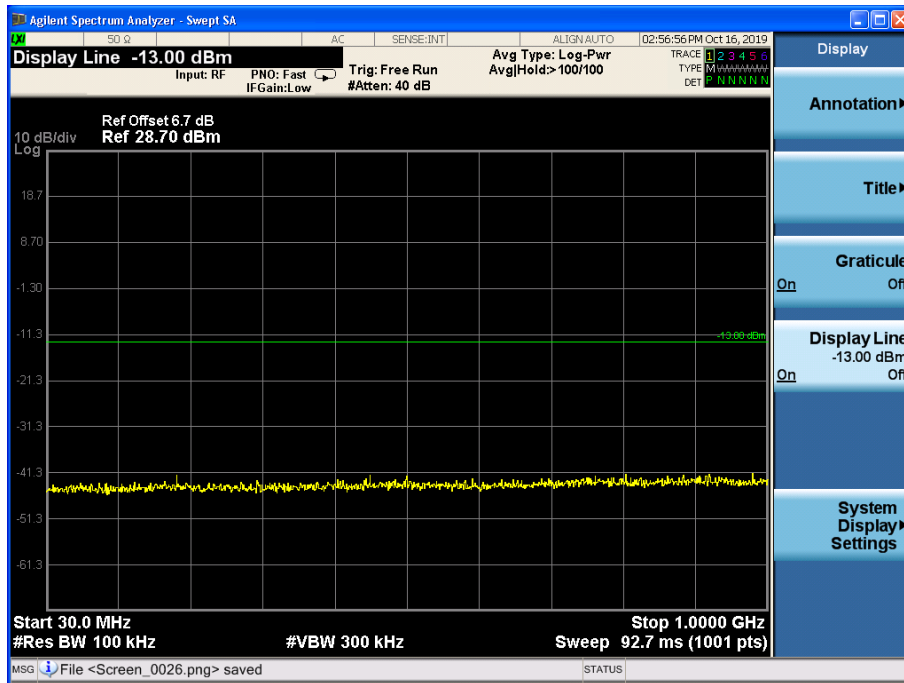
Channel 1412



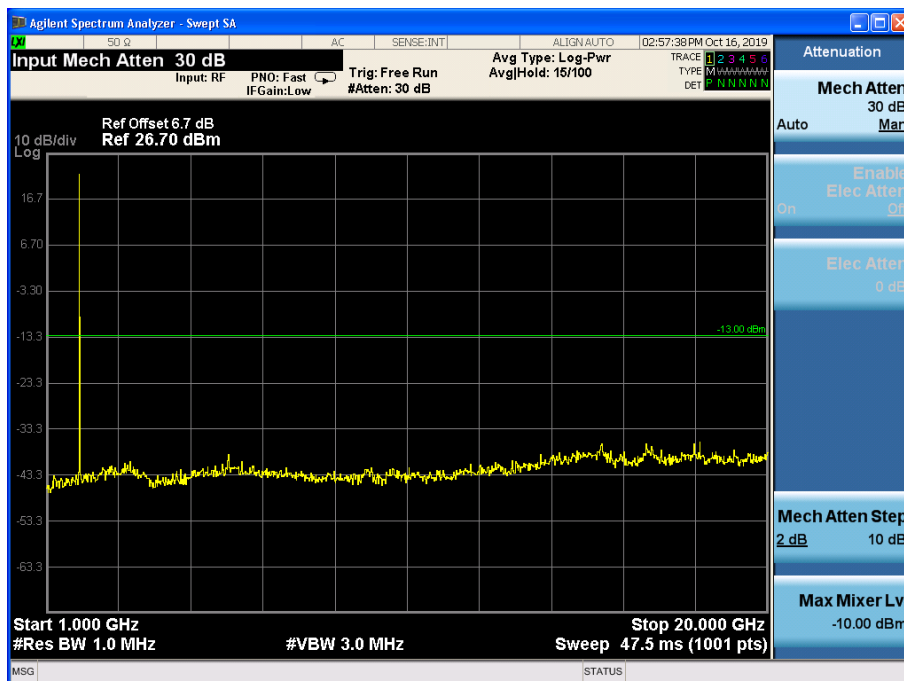
Channel 1513

Spurious Emissions at antenna terminal WCDMA band II

REL99 Mode:



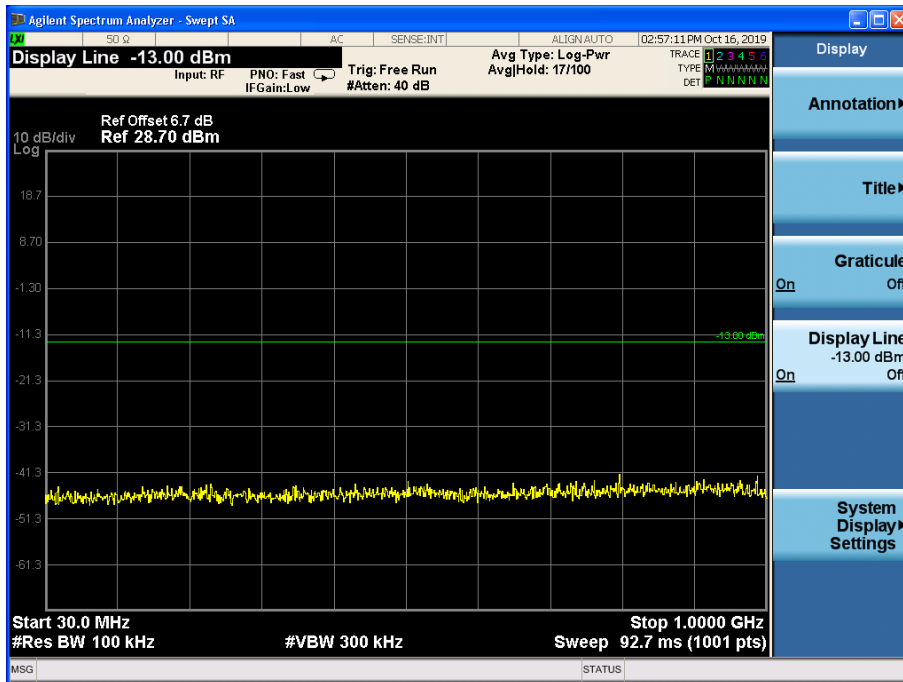
Channel 9400, 30MHz~1GHz



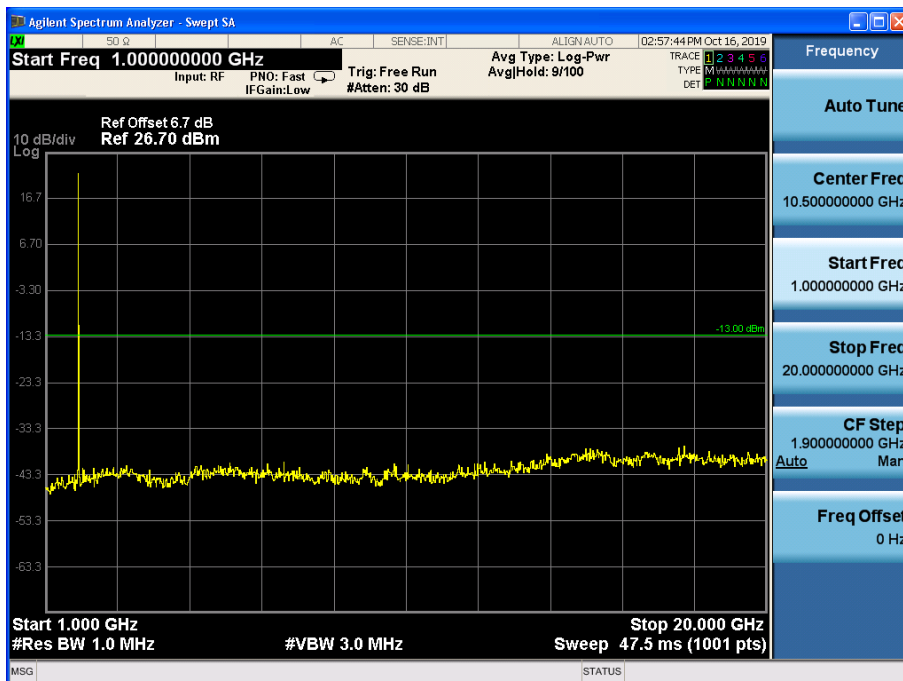
Channel 9400, 1GHz~20GHz

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

HSUPA Mode:



Channel 9400, 30MHz~1GHz

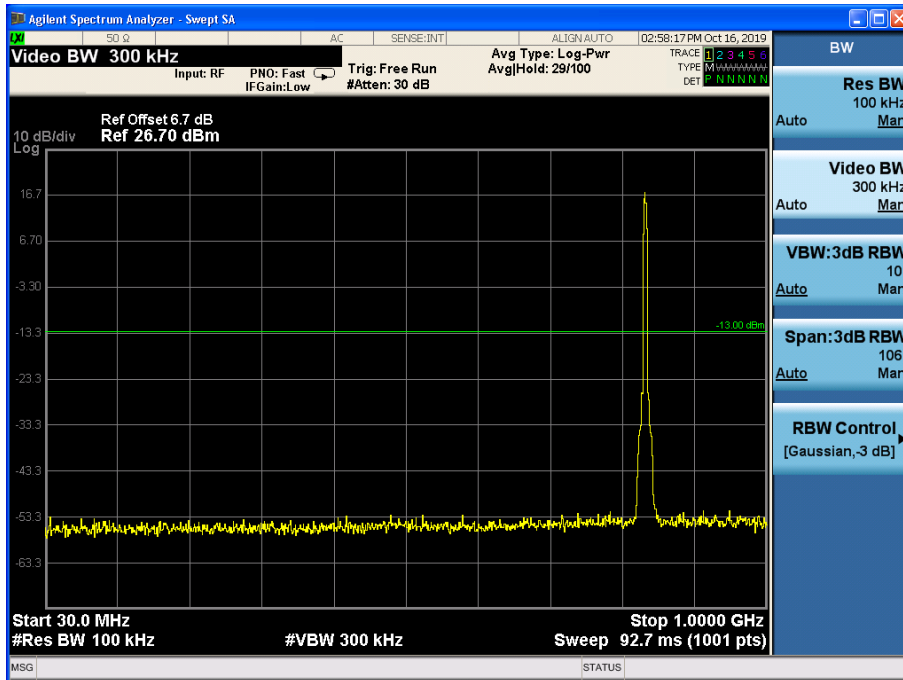


Channel 9400, 1GHz~20GHz

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

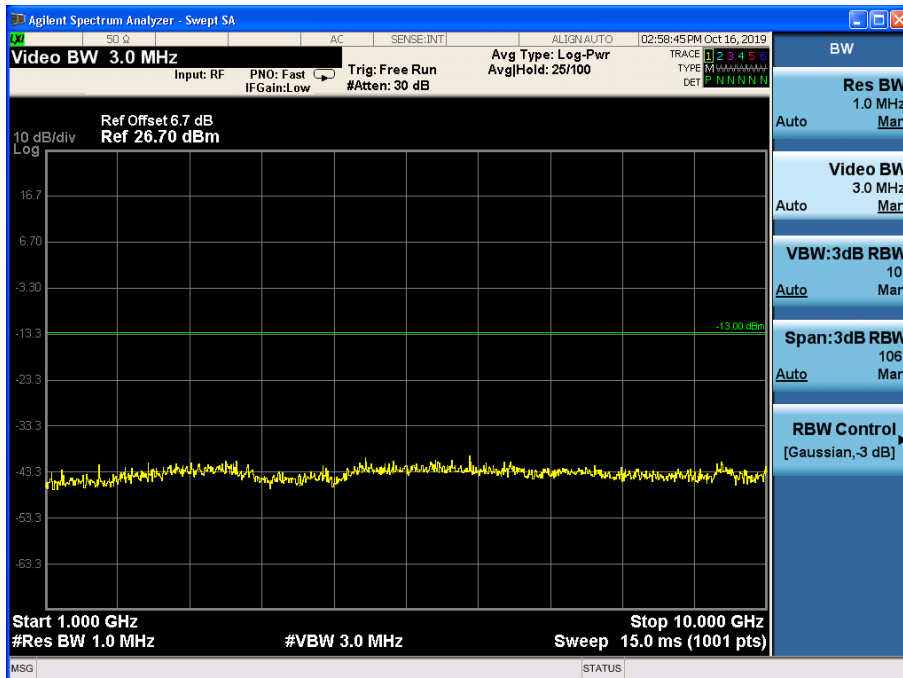
WCDMA band V

REL99 Mode:



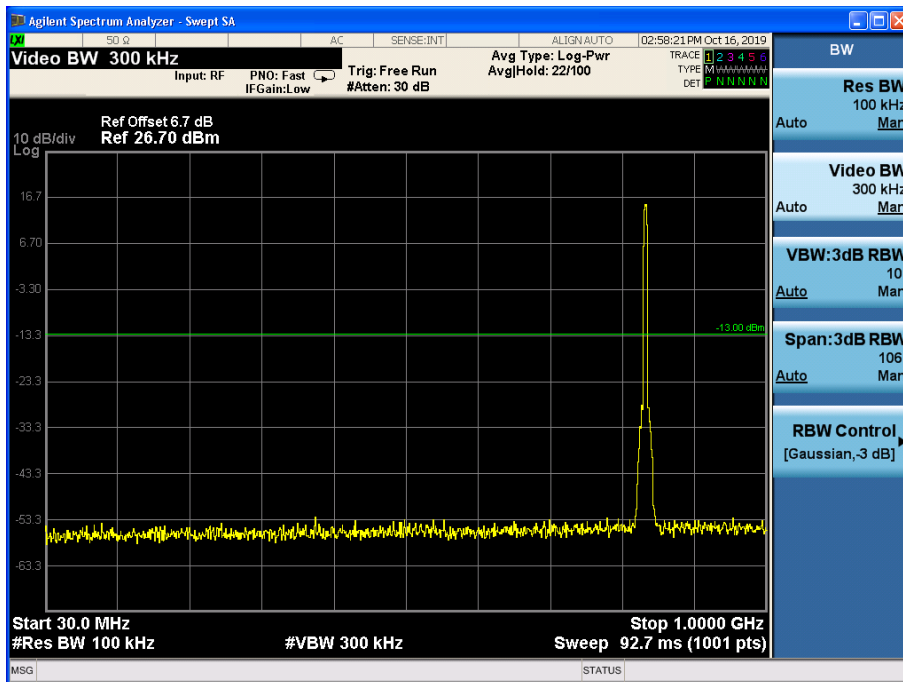
Channel 4183, 30MHz~1GHz

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



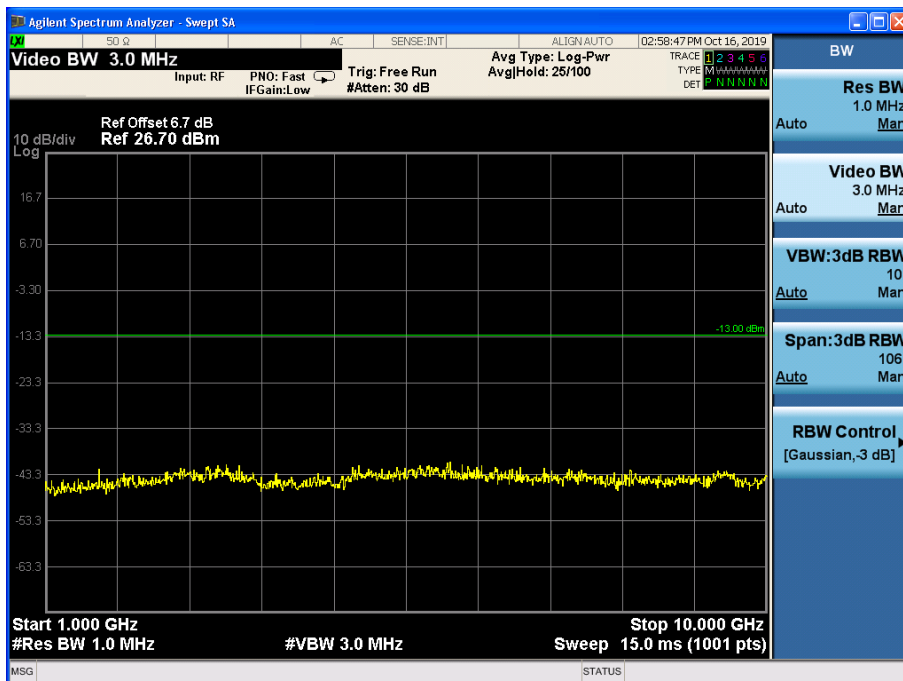
Channel 4183, 1GHz~10GHz

HSUPA Mode:



Channel 4183, 30MHz~1GHz

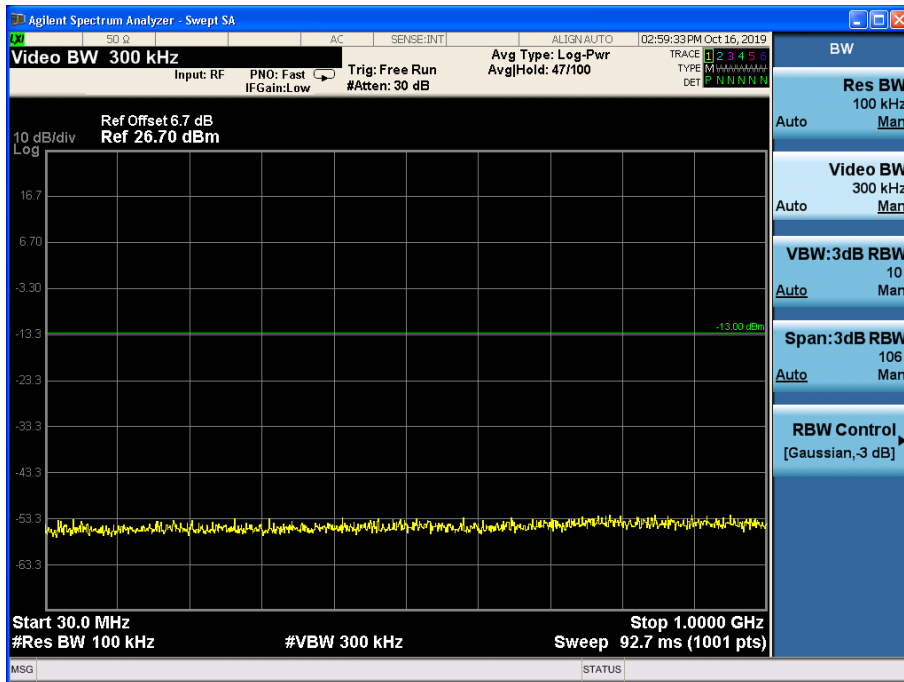
Note: The signal beyond the limit is the signal transmitted by EUT.



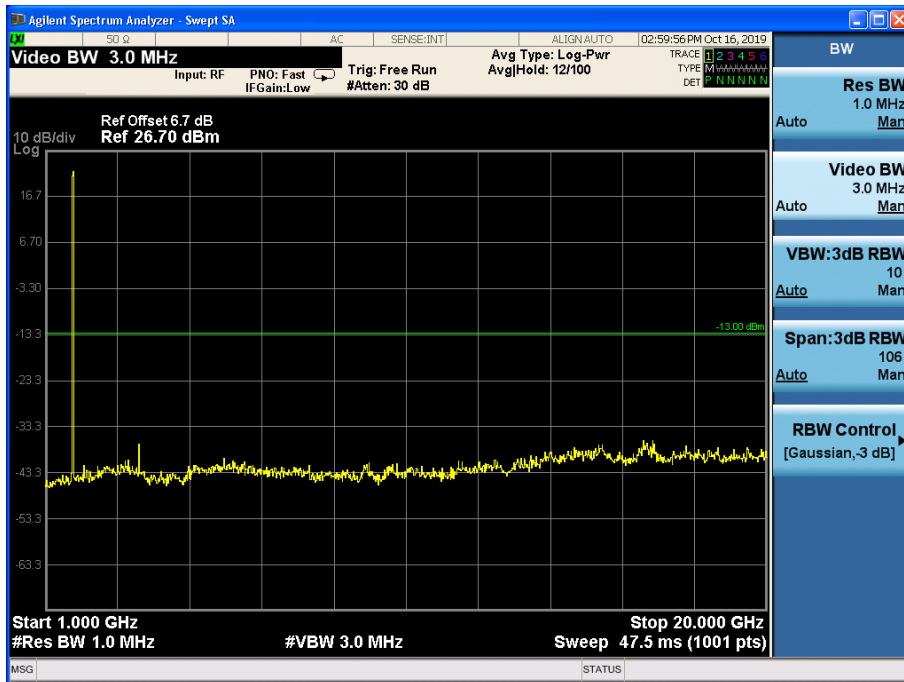
Channel 4183, 1GHz~10GHz

WCDMA band IV

REL99 Mode:



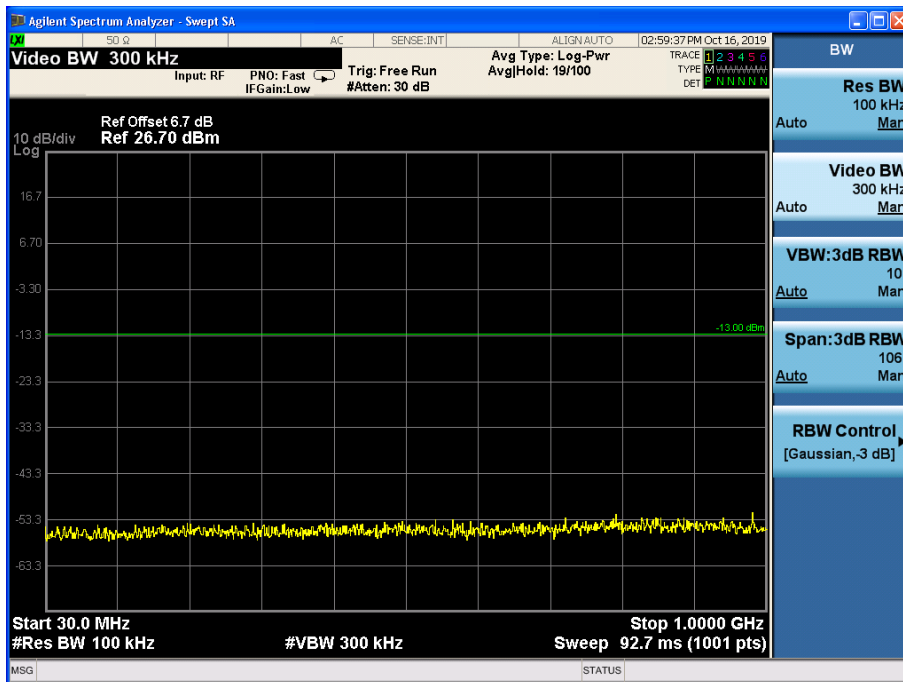
Channel 1412, 30MHz~1GHz



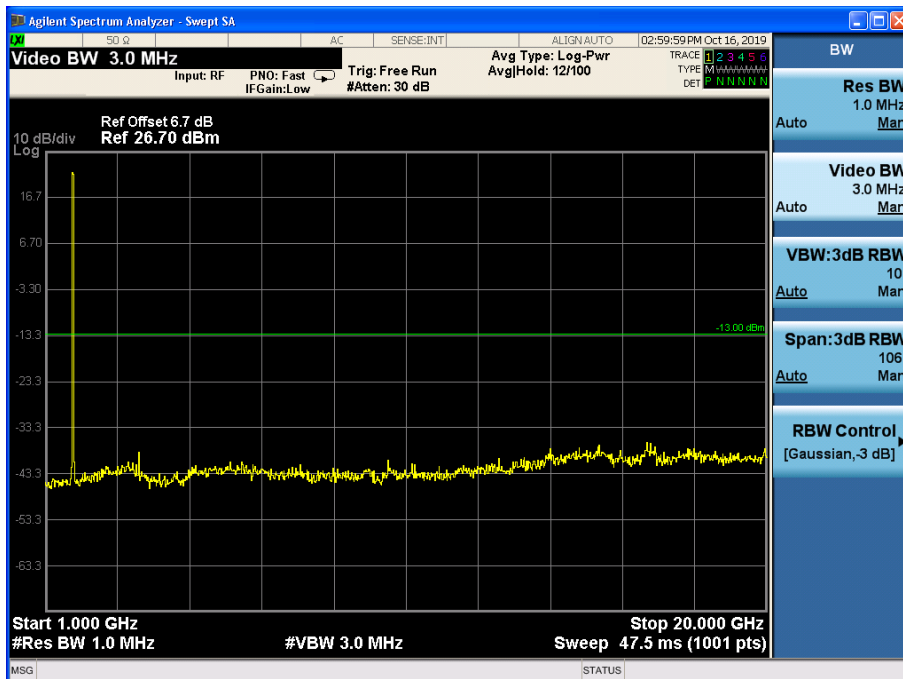
Channel 1412, 1GHz~20GHz

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

HSUPA Mode:



Channel 1412, 30MHz~1GHz



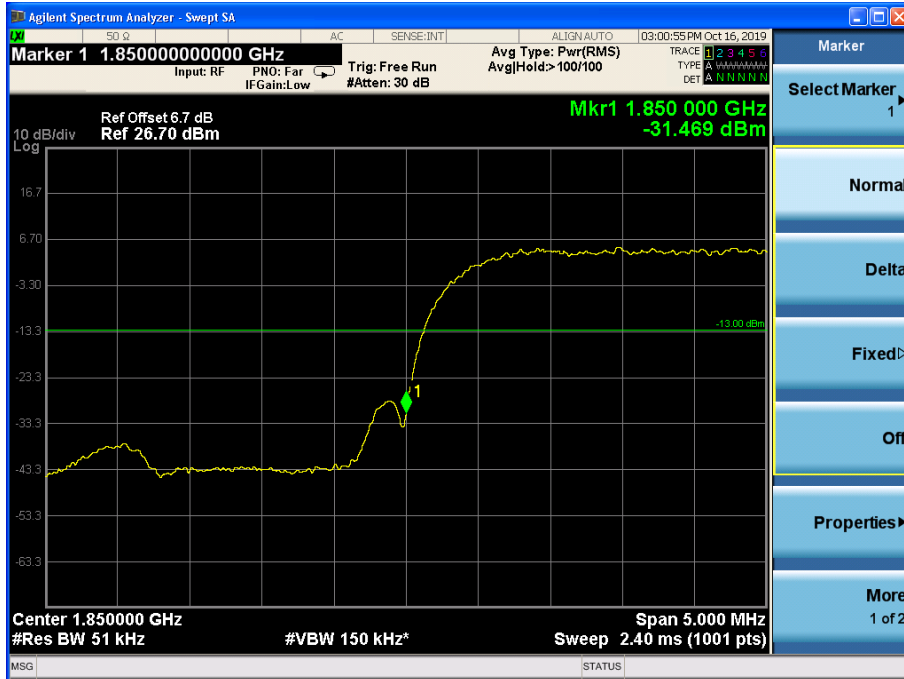
Channel 1412, 1GHz~20GHz

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

Band Edges Compliance

WCDMA band II

REL99 Mode:

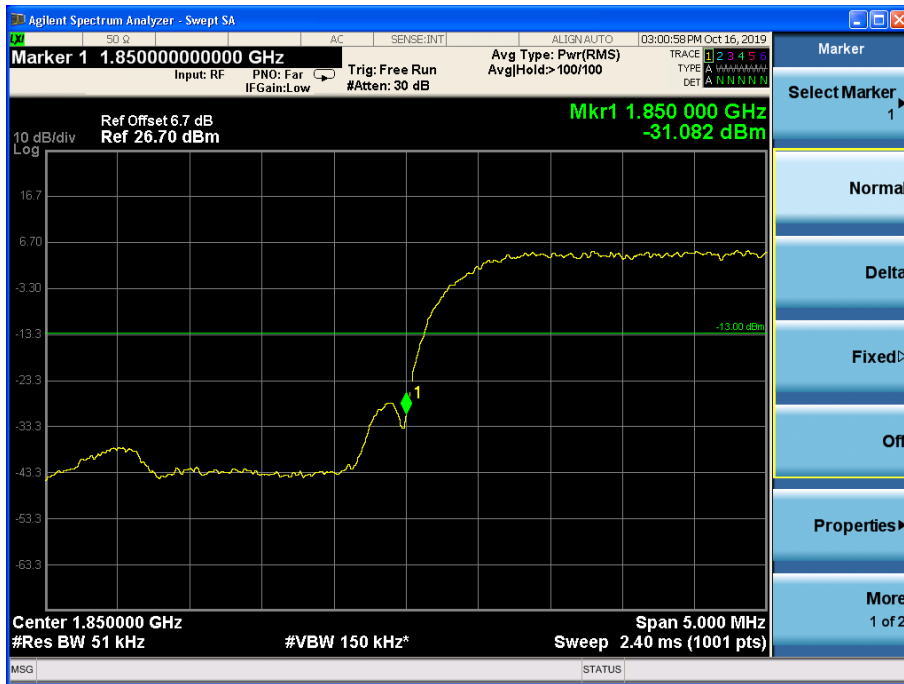


Channel 9262



Channel 9538

HSUPA Mode:



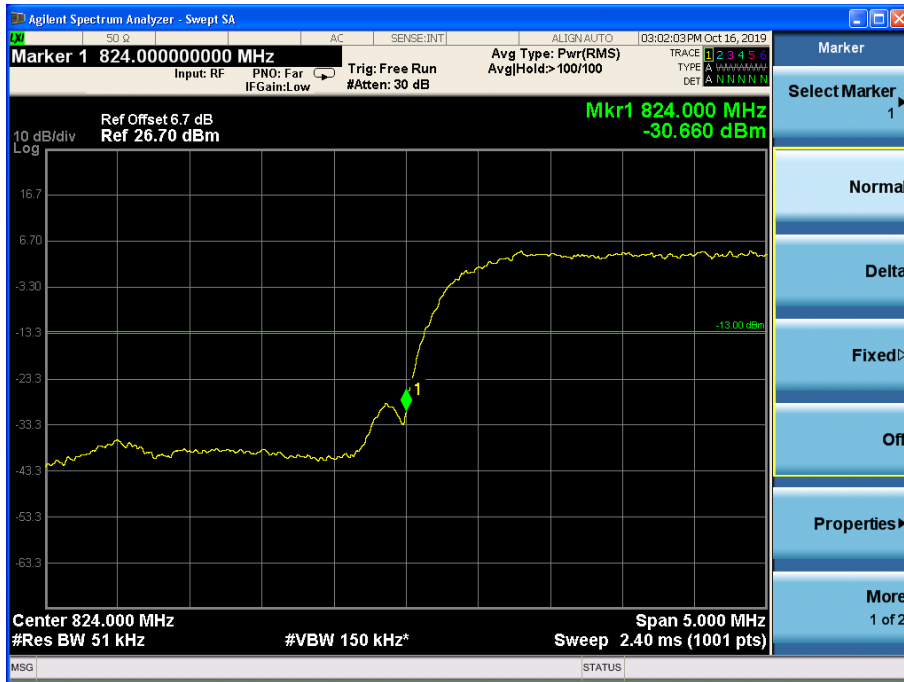
Channel 1412, 30MHz~1GHz



Channel 1412, 1GHz~20GHz

WCDMA band V

REL99 Mode:

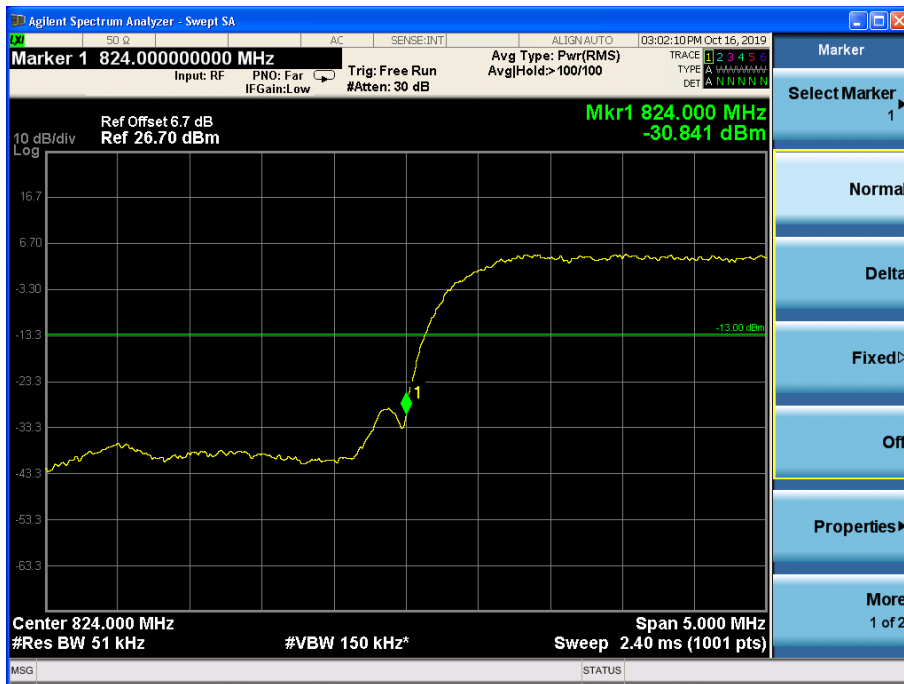


Channel 4132



Channel 4233

HSUPA Mode:



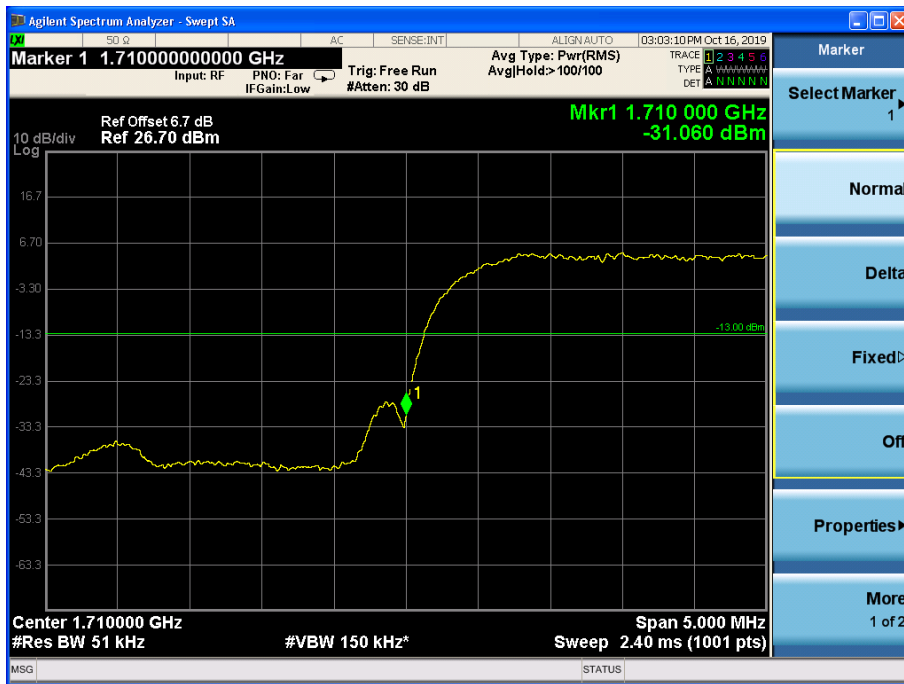
Channel 9262



Channel 9538

WCDMA band IV

REL99 Mode:

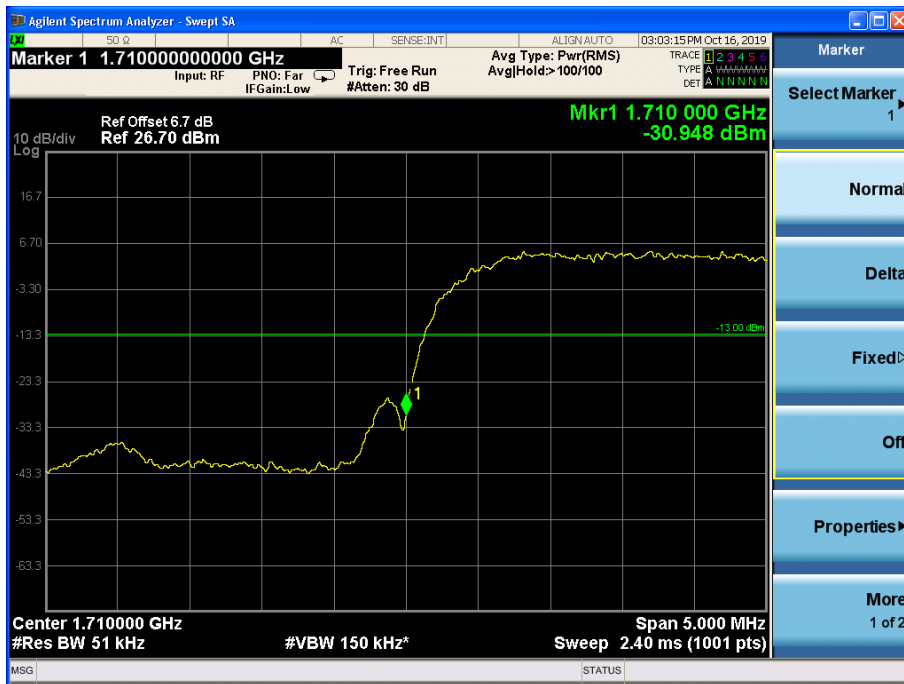


Channel 1312



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
0	0.083	-0.004	0.025
+10	-0.013	0.085	-0.025
+20	0.016	0.090	0.027
+30	-0.031	-0.071	-0.082
+40	0.081	-0.050	-0.022
+50	-0.009	0.016	0.053
Voltage	Test Result (ppm)@NT		
	Channel 9262	Channel 9400	Channel 9538
LV	-0.079	-0.051	-0.053
HV	0.097	0.014	-0.052

HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 9262	Channel 9400	Channel 9538
0	0.068	-0.047	-0.072
+10	0.011	-0.029	-0.052
+20	0.041	0.022	-0.063
+30	-0.074	-0.073	-0.037
+40	-0.028	0.035	-0.092
+50	-0.088	-0.078	0.061
Voltage	Test Result (ppm)NT		
	Channel 9262	Channel 9400	Channel 9538
LV	0.056	0.078	0.090
HV	-0.012	-0.039	0.086

WCDMA band V
REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 4132	Channel 4183	Channel 4233
0	0.095	-0.036	0.007
+10	0.002	-0.061	0.028
+20	-0.061	-0.016	0.042
+30	-0.043	0.064	-0.070
+40	0.067	-0.017	0.095
+50	0.018	-0.090	0.057
Voltage	Test Result (ppm)@NT		
	Channel 4132	Channel 4183	Channel 4233
LV	0.007	0.016	-0.063
HV	-0.023	0.059	-0.063

HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 4132	Channel 4183	Channel 4233
0	0.100	0.039	0.088
+10	-0.012	-0.038	-0.067
+20	0.061	-0.082	0.010
+30	-0.097	0.020	-0.086
+40	0.082	-0.046	-0.085
+50	0.000	0.024	-0.042
Voltage	Test Result (ppm)@NT		
	Channel 4132	Channel 4183	Channel 4233
LV	-0.007	-0.089	0.073
HV	0.092	-0.100	-0.062

WCDMA band IV
REL99 Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 1312	Channel 1412	Channel 1513
0	-0.013	-0.021	0.078
+10	-0.095	0.073	0.058
+20	-0.088	0.008	-0.046
+30	0.048	-0.069	-0.056
+40	0.063	-0.092	-0.043
+50	-0.071	0.039	0.018
Voltage	Test Result (ppm)@NT		
	Channel 1312	Channel 1412	Channel 1513
LV	-0.053	0.041	-0.083
HV	-0.002	0.062	-0.064

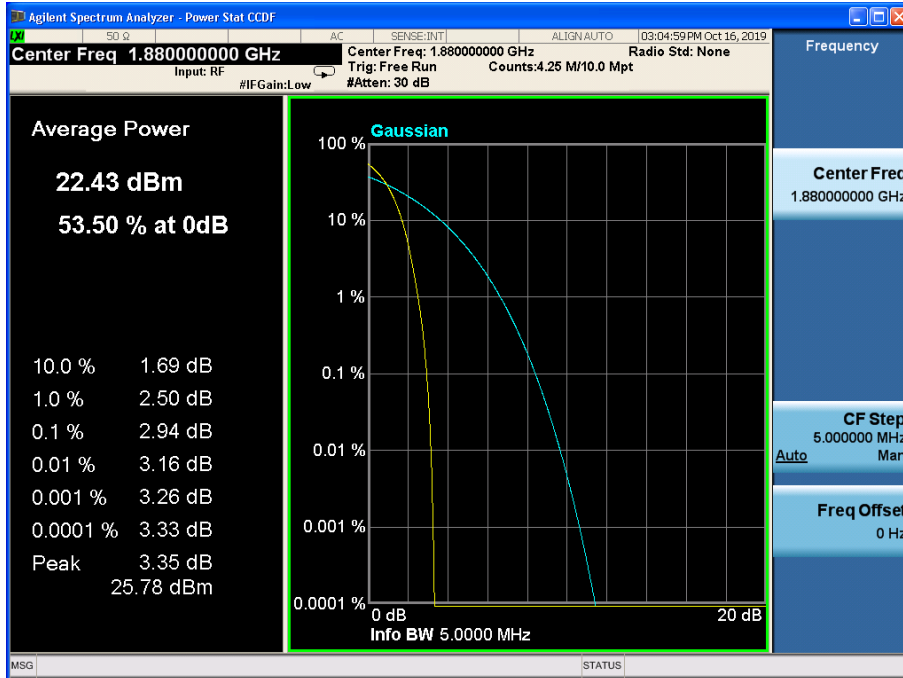
HSUPA Mode:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 1312	Channel 1412	Channel 1513
0	-0.097	0.075	0.021
+10	-0.061	-0.084	-0.022
+20	0.028	-0.025	-0.012
+30	0.084	-0.070	0.034
+40	-0.009	0.050	-0.083
+50	-0.034	0.073	0.097
Voltage	Test Result (ppm)@NT		
	Channel 1312	Channel 1412	Channel 1513
LV	-0.023	0.002	0.019
HV	-0.095	0.051	0.057

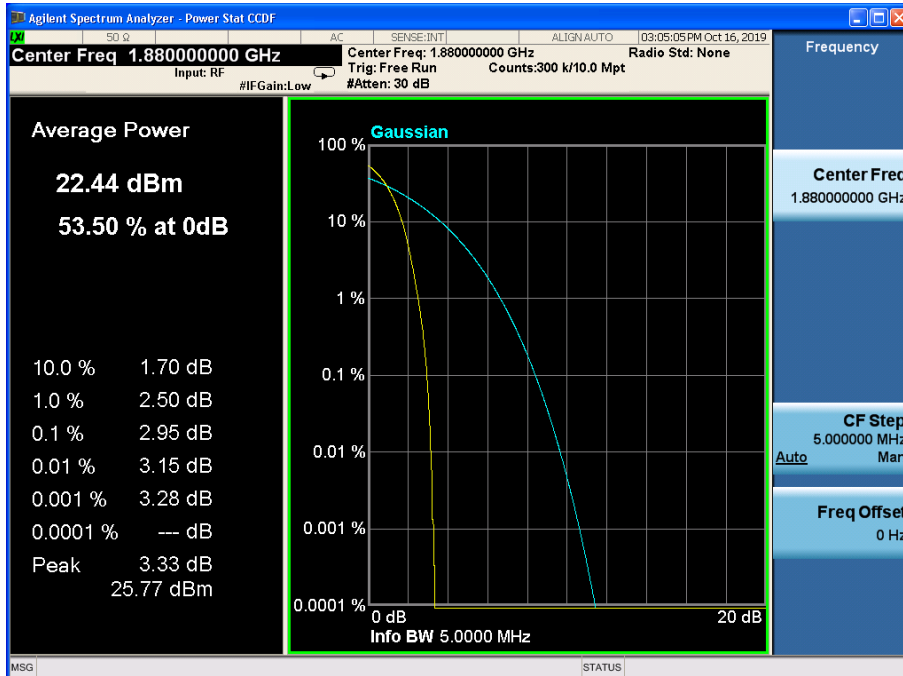
Peak-Average Ratio

WCDMA band II

REL99 Mode:

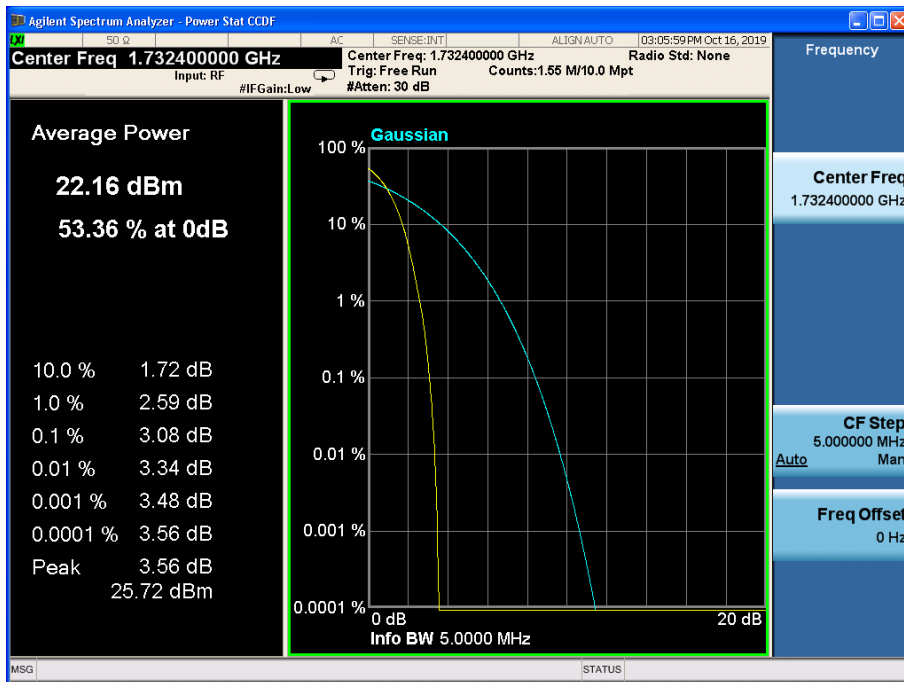


HSUPA Mode:

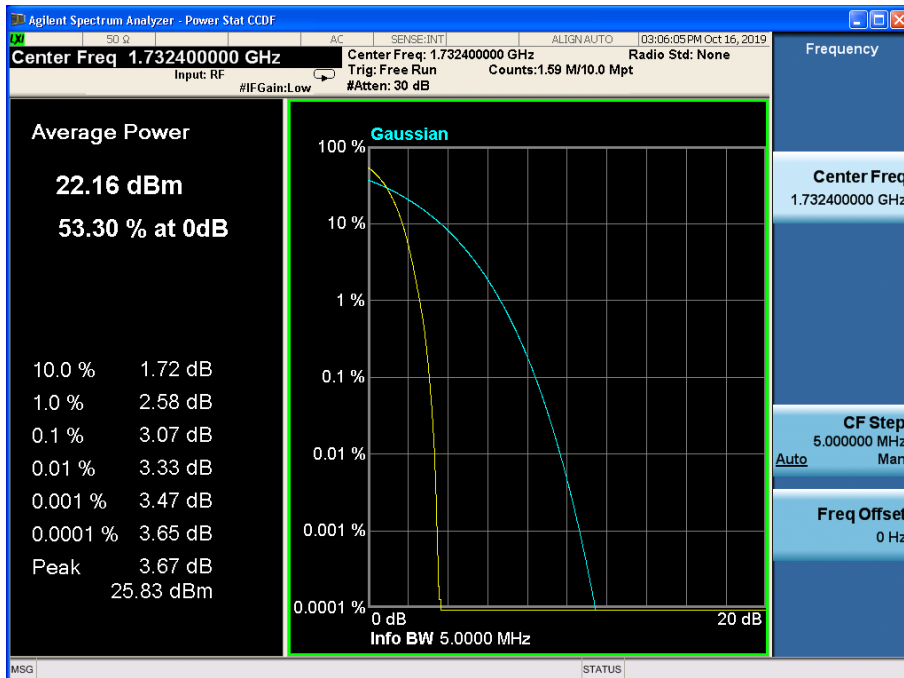


WCDMA band IV

REL99 Mode:

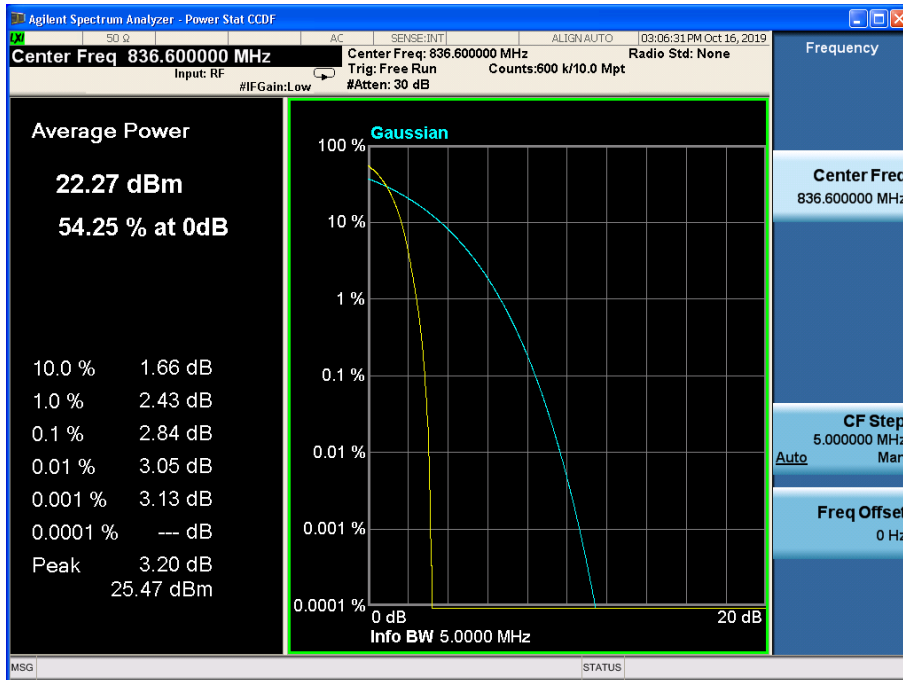


HSUPA Mode:

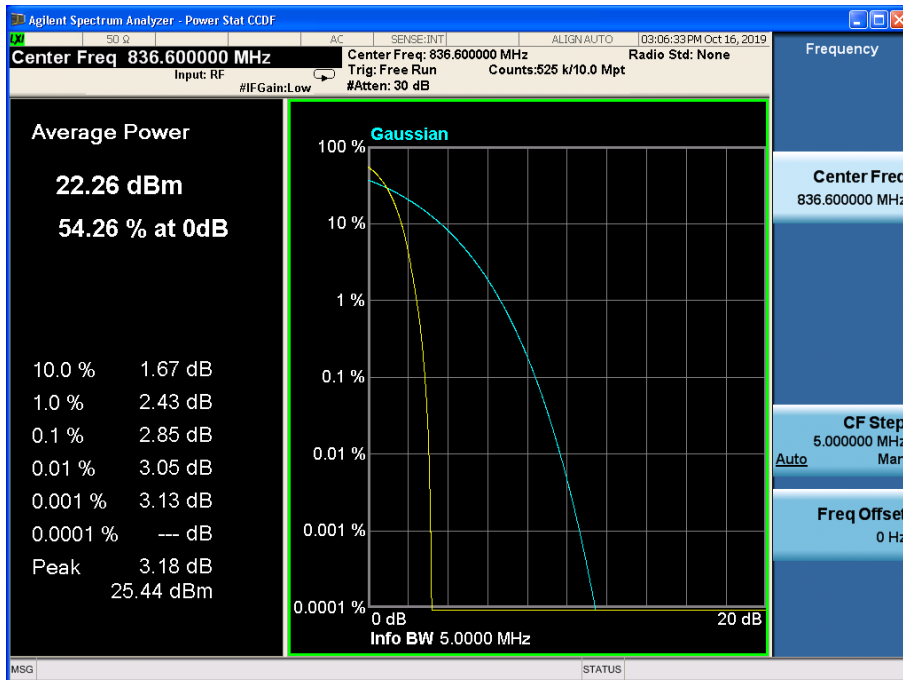


WCDMA band V

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: (23.82 dBm) = (19.02 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	23.82	-3.8	8.6	19.02	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	23.82	-3.8	8.6	19.02	Vertical
1880.0	23.72	-3.8	8.6	18.92	Vertical
1907.6	23.46	-3.8	8.6	18.66	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dB)	P _{mea} (dBm)	Polarization
1852.4	23.46	-3.8	8.6	18.66	Vertical
1880.0	22.67	-3.8	8.6	17.87	Vertical
1907.6	22.80	-3.8	8.6	18.00	Vertical

Test result:

WCDMA Mode:

Channel 9262

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.96	-48.54	-13	Vertical
2782.02	-47.84	-13	Vertical
3727.80	-40.78	-13	Vertical
6677.11	-39.94	-13	Vertical
9959.91	-37.40	-13	Vertical
17821.66	-33.84	-13	Vertical

Channel 9400

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.81	-48.90	-13	Vertical
2779.52	-47.65	-13	Vertical
3724.60	-41.31	-13	Vertical
6676.54	-39.93	-13	Vertical
9962.90	-36.99	-13	Vertical
17820.46	-33.65	-13	Vertical

Channel 9538

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2461.40	-49.01	-13	Vertical
2782.05	-47.22	-13	Vertical
3728.32	-40.72	-13	Vertical
6675.11	-40.07	-13	Vertical
9960.55	-36.94	-13	Vertical
17821.86	-33.57	-13	Vertical

HSDPA/HSUPA Mode:
Channel 9262

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.07	-49.31	-13	Vertical
2778.67	-47.31	-13	Vertical
3724.58	-40.96	-13	Vertical
6675.54	-39.24	-13	Vertical
9959.72	-37.53	-13	Vertical
17818.48	-34.29	-13	Vertical

Channel 9400

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2457.94	-49.29	-13	Vertical
2781.09	-47.53	-13	Vertical
3727.65	-40.38	-13	Vertical
6678.70	-40.04	-13	Vertical
9962.44	-37.38	-13	Vertical
17820.90	-33.53	-13	Vertical

Channel 9538

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2461.51	-48.65	-13	Vertical
2779.31	-47.39	-13	Vertical
3724.45	-40.39	-13	Vertical
6677.24	-39.80	-13	Vertical
9962.34	-37.52	-13	Vertical
17821.51	-33.68	-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	23.84	-3.8	8.6	19.04	Vertical
1732.4	23.54	-3.8	8.6	18.74	Vertical
1752.6	23.06	-3.8	8.6	18.26	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak EIRP(dBm)	Pca Cable loss	Ga Antenna Gain (dB)	Pmea (dBm)	Polarization
1712.4	22.69	-3.8	8.6	17.89	Vertical
1732.4	22.84	-3.8	8.6	18.04	Vertical
1752.6	22.61	-3.8	8.6	17.81	Vertical

Test result:

WCDMA Mode:

Channel 1312

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.22	-49.37	-13	Vertical
2780.42	-47.85	-13	Vertical
3727.59	-41.35	-13	Vertical
6675.35	-39.42	-13	Vertical
9959.60	-37.46	-13	Vertical
17821.68	-34.42	-13	Vertical

Channel 1412

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.27	-48.56	-13	Vertical
2779.36	-46.98	-13	Vertical
3727.05	-41.15	-13	Vertical
6675.53	-39.28	-13	Vertical
9962.52	-37.01	-13	Vertical
17821.79	-34.43	-13	Vertical

Channel 1513

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.39	-49.04	-13	Vertical
2781.31	-47.33	-13	Vertical
3727.11	-41.21	-13	Vertical
6677.65	-40.04	-13	Vertical
9961.81	-36.91	-13	Vertical
17818.95	-33.78	-13	Vertical

HSDPA/HSUPA Mode:

Channel 1312

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.42	-49.37	-13	Vertical
2778.38	-47.43	-13	Vertical
3724.90	-40.87	-13	Vertical
6676.56	-40.10	-13	Vertical
9962.03	-37.17	-13	Vertical
17821.78	-33.97	-13	Vertical

Channel 1412

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.01	-48.53	-13	Vertical
2779.08	-47.47	-13	Vertical
3726.96	-41.29	-13	Vertical
6677.71	-39.84	-13	Vertical
9960.16	-37.01	-13	Vertical
17822.31	-33.47	-13	Vertical

Channel 1513

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2458.94	-48.64	-13	Vertical
2781.34	-47.16	-13	Vertical
3726.60	-41.00	-13	Vertical
6677.32	-39.75	-13	Vertical
9959.67	-37.42	-13	Vertical
17820.35	-34.32	-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	23.98	-3.4	8.3	2.15	21.23	Vertical
836.6	23.54	-3.4	8.3	2.15	20.79	Vertical
846.6	24.10	-3.4	8.3	2.15	21.35	Vertical

HSDPA/HSUPA Mode:

Frequency (MHz)	Peak ERP (dBm)	Pca Cable loss(dB)	Ga Antenna Gain (dB)	Correction (dB)	Pmea (dBm)	Polarization
826.4	22.48	-3.4	8.3	2.15	19.73	Vertical
836.6	23.33	-3.4	8.3	2.15	20.58	Vertical
846.6	22.76	-3.4	8.3	2.15	20.01	Vertical

Test result:

WCDMA Mode:

Channel 4132

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1647.48	-52.99	-13	Vertical
1666.71	-51.05	-13	Vertical
2536.21	-44.17	-13	Vertical
2576.77	-43.71	-13	Vertical
8963.90	-39.03	-13	Vertical
9972.24	-36.00	-13	Vertical

Channel 4183

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1646.86	-52.90	-13	Vertical
1668.56	-51.57	-13	Vertical
2533.61	-44.32	-13	Vertical
2578.89	-44.31	-13	Vertical
8960.83	-39.14	-13	Vertical
9970.30	-36.51	-13	Vertical

Channel 4233

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1649.47	-53.47	-13	Vertical
1665.86	-51.33	-13	Vertical
2536.10	-44.66	-13	Vertical
2578.24	-44.62	-13	Vertical
8964.31	-39.02	-13	Vertical
9969.96	-36.38	-13	Vertical

HSDPA/HSUPA Mode:
Channel 4132

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1649.25	-52.81	-13	Vertical
1667.57	-51.06	-13	Vertical
2535.74	-44.59	-13	Vertical
2576.29	-44.19	-13	Vertical
8962.03	-39.83	-13	Vertical
9971.62	-36.73	-13	Vertical

Channel 4183

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1650.10	-52.59	-13	Vertical
1666.79	-51.53	-13	Vertical
2535.66	-43.85	-13	Vertical
2578.05	-44.16	-13	Vertical
8961.58	-39.11	-13	Vertical
9972.32	-36.31	-13	Vertical

Channel 4233

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1647.95	-52.82	-13	Vertical
1666.35	-50.83	-13	Vertical
2533.81	-43.93	-13	Vertical
2579.24	-44.31	-13	Vertical
8962.18	-39.09	-13	Vertical
9969.89	-36.83	-13	Vertical

Test with secondary supply:

WCDMA band II MODE Channel 9538 is selected as the worst point for RSE.

WCDMA band II MODE Channel 9538:

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1646.92	-53.48	-13	Vertical
1666.97	-50.81	-13	Vertical
2536.01	-44.60	-13	Vertical
2576.63	-43.79	-13	Vertical
8961.54	-39.81	-13	Vertical
9969.96	-36.30	-13	Vertical

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