Certificate #5505.02

TEST REPORT FOR WCDMA TESTING

Report No.: SRTC2022-9004(F)-22070502(B)

Product Name: Smart Phone

Applicant: Sharp Corporation

Manufacturer: Sharp Corporation

Specification: FCC Part 24E, Part 22H, Part 27,Part 2 (2021)

FCC ID: APYHRO00318

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)
Test Site 1:	15th Building, No.30 Shixing Street, Shijingshan District
Test Site 2:	No.80, Zhaojiachang, Beizang, Daxing District
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
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Fax:	+86 10 57996388
Email:	liujiaf@srtc.org.cn
Designation Number:	CN1267
Registration number:	239125

1.3 Applicant’s details

Company:	Sharp Corporation
Address:	1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

1.4 Manufacturer’s details

Company:	Sharp Corporation
Address:	1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2022-02-08
Testing Start Date:	2022-02-10
Testing End Date:	2022-07-18

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40
Maximum Extreme	55	---
Minimum Extreme	-10	---

Normal Supply Voltage (V d.c.):	4.0
Maximum Extreme Supply Voltage (V d.c.):	4.0
Minimum Extreme Supply Voltage (V d.c.):	3.7

2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1Final Equipment Build Status

Frequency Range:	WCDMA Band II: Tx:1852.4~1907.6MHz Rx:1932.4~1987.6MHz 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 V:45MHz
Antenna Type:	Inverted-F Antenna
Antenna Gain:	WCDMA Band II: -4.8dBi WCDMA Band V: -4.5dBi ERP = EIRP(Power +Gain) – 2.15 (dB)
Power Supply:	Battery / Charger
Software Revision:	A6220
Hardware Revision:	DVT(Remodeled to the equivalent of MP products)
IMEI:	004401230696045 004401231311206

2.2 Support Equipment

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

3 REFERENCE SPECIFICATION

Specification	Version	Title
FCC Part2	2021	Frequency allocations and radio treaty matters; general rules and regulations
FCC Part22	2021	Public mobile services
FCC Part24	2021	Personal communications services
FCC Part27	2021	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	Peak-Average Ratio	24.232(d),27.50(d)(5)	Pass

Test Site 1: 15th Building, No.30 Shixing Street, Shijingshan District

This Test Report Is Approved by: Mr. Peng Zhen	Review by: Mr. Li Bin
Tested and Issued by: Mr. Liu Ce	Approved date: 20220727

No.	Test case	FCC reference	Verdict
9	Radiated Spurious Emissions	2.1053,22.917(a),24.238(a),27.53(h)	Pass

Test Site 2: No.80, Zhaojiachang, Beizang, Daxing District

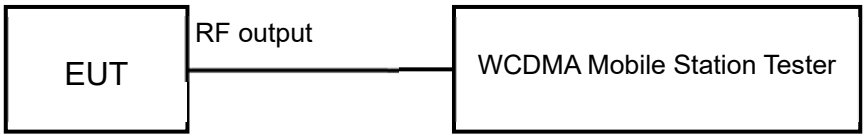
This Test Report Is Approved by: Mr. Liu Wei	Review by: Mr. Guo Yu
Tested and Issued by: Mr. Dong Qifeng	Approved date: 20220727

6 TEST RESULT

6.1 RF Power Output

Rule Part(s):
2.1046

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).

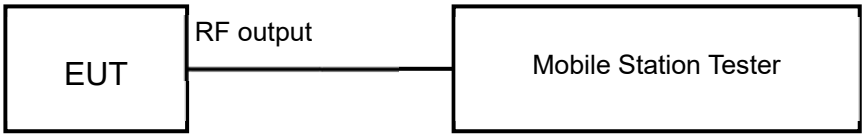
Limits: Limits: No specific conduct power requirements in part 2.1046.

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)

Test setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 5.6
Test Settings
Subclause 5.2.5.5 of ANSI C63.26-2015 is applicable, along with the following provisions. For personal/portable radios utilizing an integral antenna, the factor LC is typically negligible. However, in a fixed station transmit system that utilizes a long cable run between the transmitter and the transmitting antenna, this factor can be significant. The minimum cable loss should be used in this equation.
The relevant equation for determining the ERP or EIRP from the conducted RF output power measured is:
ERP/EIRP = PMeas – LC + GT
Where:
ERP/EIRP = effective or equivalen radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm)
PMeas = measured transmitter output power or PSD, in dBW or dBm
LC = signal attenuation in the connecting cable between the transmitter and antenna in dB
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

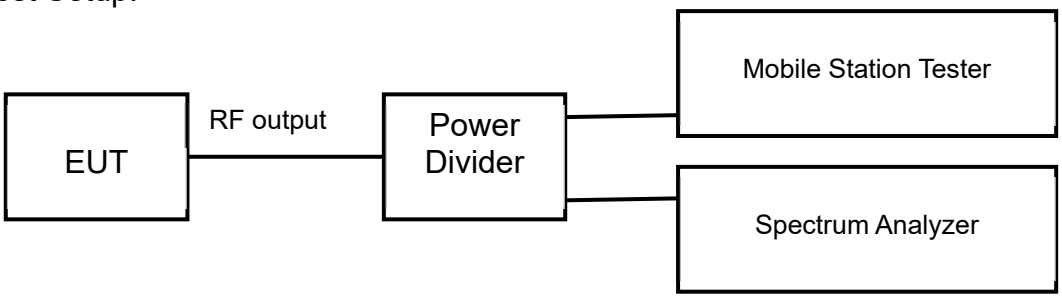
ERP/EIRP LIMIT

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 A.

6.3 Occupied Bandwidth

Rule Part(s):
FCC: 2.1049

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 ≥ 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

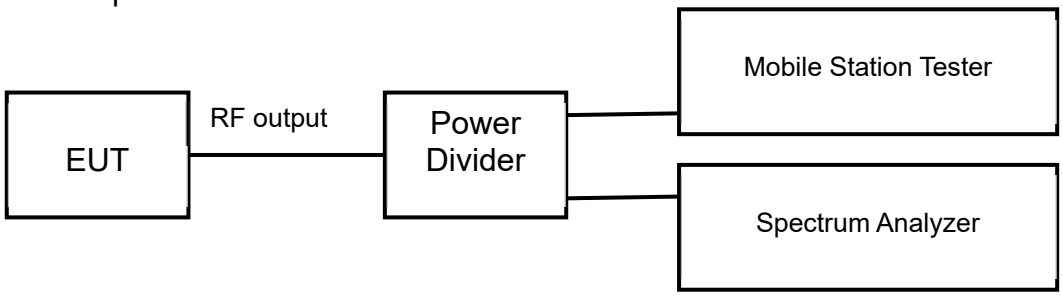
Limits: No specific occupied bandwidth requirements in part 2.1049

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

6.4 Emission Bandwidth

Rule Part(s):
FCC: 2.1049

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 ≥ 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 emission bandwidth observed in Step 7

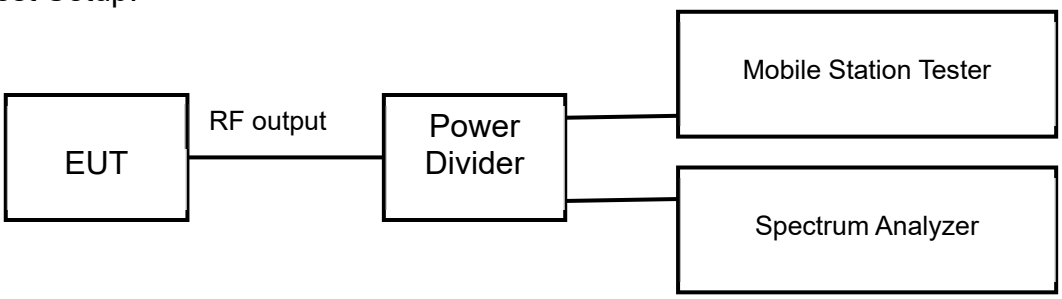
Limits: No specific occupied bandwidth requirements in part 2.1049

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)

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 ≥ 3 x 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

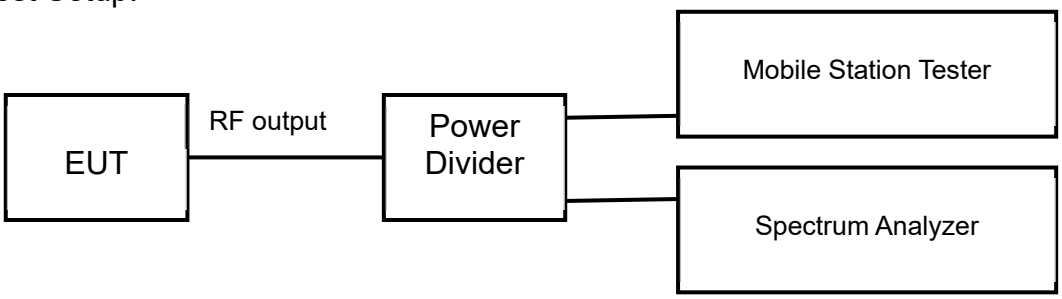
Limits:
The minimum permissible attenuation level of any spurious emission is $43+\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

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)

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 ≥ 2 x Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

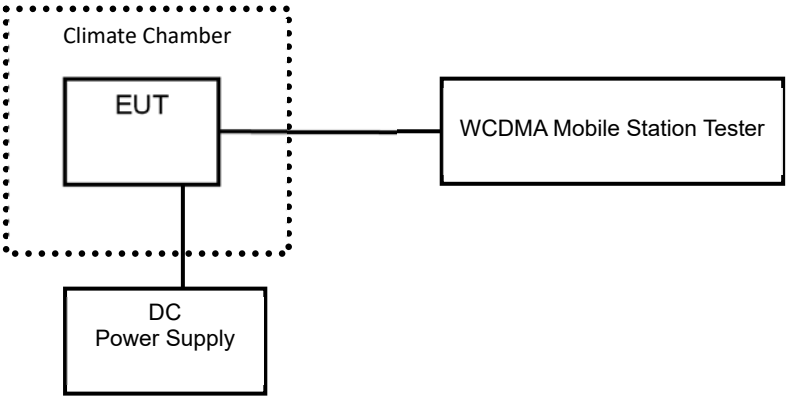
Limit: The minimum permissible attenuation level of any spurious emission is $43+\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

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

6.7 Frequency Stability

Rule Part(s)
FCC: 2.1055, 22.355, 24.235, 27.54

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.

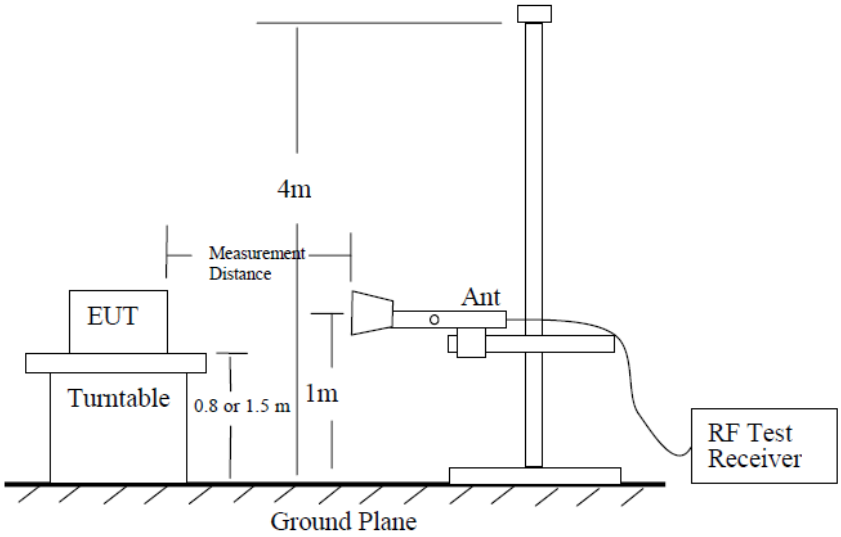
Limits: For Part 22, the frequency stability of the transmitter shall be maintained within±0.00025% (±2.5 ppm) of the center frequency. For Part 24, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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

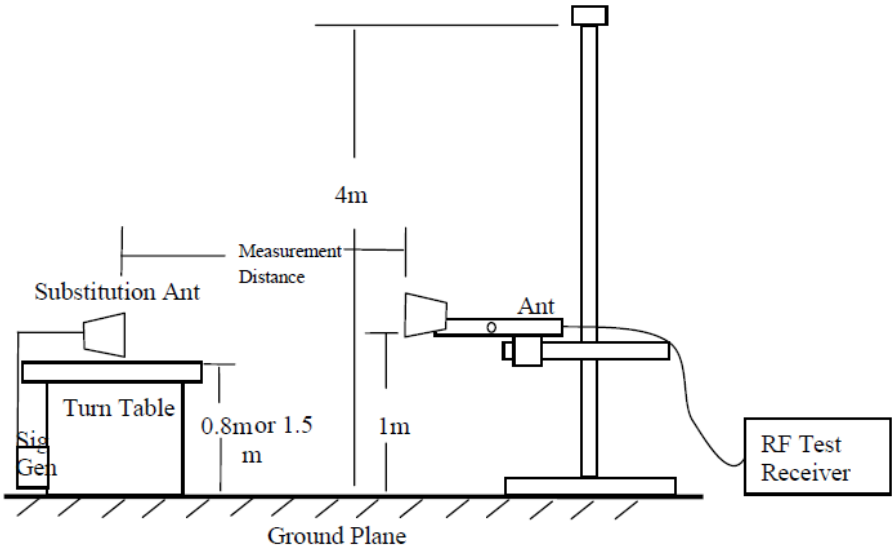
6.8 Radiated Spurious Emissions

Rule Part(s)
FCC: 2.1053, 22.917(a), 24.238(a), 27.53(h)

Test Setup:



Step 1



Step 2

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<1GHz)/ 1.5m (f>1GHz) 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<1GHz)/1MHz (f>1GHz). 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 (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).

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:

Power (EIRP) = Pmea+ Pca + Ga

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).

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

P=Pmea+Pca+Ga=(-20dBm)+(-30dB)+(11dB)= -39dBm

Note: We tested both horizontal and vertical polarization, but only the largest numerical polarity of the two polarities was recorded in the final report.

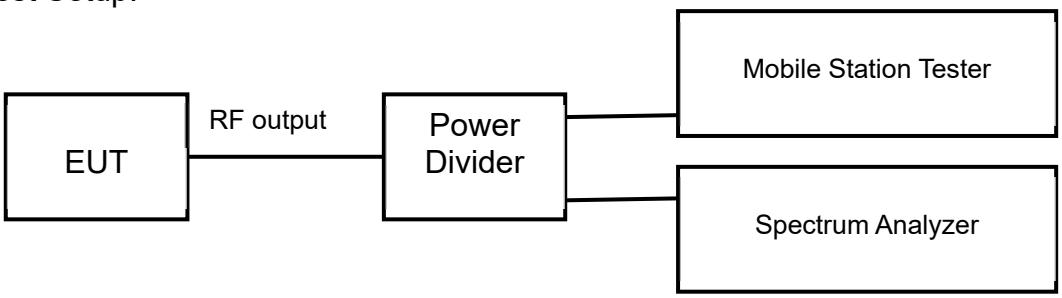
Test result:

The test results are shown in Appendix B.

6.9 Peak-Average Ratio

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

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	0.6 dB	
Effective Radiated Power and Effective Isotropic Radiated Power	0.6 dB	
Occupied Bandwidth	3kHz	
Emission Bandwidth	3kHz	
Peak-Average Ratio	0.8dB	
Frequency Stability	48Hz	
Band Edges Compliance	1.2dB	
Spurious Emissions at antenna terminal	9kHz~2GHz	1.2dB
	2G~3.6GHz	1.4dB
	3.6G~8GHz	2.2dB
	8G~12.75GHz	2.7dB
Radiated Emission Measurement	30MHz～200MHz	4.88dB
	200MHz～1GHz	4.87dB
	1GHz～18GHz	4.58dB
	18GHz~40GHz	4.35dB

8 TEST EQUIPMENTS

No.	Name/Model	Manufacturer	S/N	Calibration Date	Calibration Due Date
1	Mobile Station Tester / MT8820C	Anritsu	6201300660	2022.06.21	2023.06.20
2	Radio Communication Station / CMW500	R&S	161702	2022.06.21	2023.06.20
3	Spectrum Analyzer / FSV40	R&S	101065	2022.06.21	2023.06.20
4	Spectrum Analyzer / N9020A	Agilent	MY48010771	2022.05.18	2023.05.17
5	Power Divider / 11667A	HP	19632	2022.06.21	2023.06.20
6	DC Power Supply / E3645A	Agilent	MY40000741	2022.04.22	2023.04.21
7	Temperature chamber / SH241	ESPEC	92013758	2022.06.21	2023.06.20
8	Fully-Anechoic Chamber / 12.65m×8.03m×7.50m	FRANKONIA	-----	-----	-----
9	Semi-Anechoic/Chamber / 23.18m×16.88m×9.60m	FRANKONIA	---	-----	-----
10	Turn table Diameter:1m	FRANKONIA	-----	-----	-----
11	Turn table Diameter:5m	FRANKONIA	-----	-----	-----
12	Antenna master FAC(MA4.0)	MATURO	-----	-----	-----
13	Antenna master SAC(MA4.0)	MATURO	-----	-----	-----
14	Shielding room / 9.080m×5.255m×3.525m	FRANKONIA	-----	-----	-----
15	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100512	2022.06.21	2023.06.20
16	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100513	2022.06.21	2023.06.20
17	Ultra log antenna / HL562	R&S	100016	2022.06.21	2023.06.20
18	Receive antenna /3160-09	SCHWARZ-BECK	002058-002	2022.06.21	2023.06.20
19	EMI test receiver / ESI 40	R&S	100015	2022.06.21	2023.06.20
20	EMI test receiver / ESCS30	R&S	100029	2022.06.21	2023.06.20
21	Receive antenna / HL562	R&S	100167	2022.06.21	2023.06.20
22	AMN / ENV216	R&S	3560.6550.12	2022.06.21	2023.06.20
23	FCC auto test system / RT9100L-2	Radiosky	V1.05	/	/
24	EMI test software / EMC32	R&S	V10.20.01	/	/

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

1. RF Power Output

WCDMA band II

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	1852.4	9262	22.68
Release 99	RMC,12.2kbps	1880	9400	22.61
Release 99	RMC,12.2kbps	1907.6	9538	22.74

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSDPA	Subtest1	1852.4	9262	21.7
HSDPA	Subtest1	1880	9400	21.59
HSDPA	Subtest1	1907.6	9538	21.75
HSDPA	Subtest2	1852.4	9262	21.67
HSDPA	Subtest2	1880	9400	21.6
HSDPA	Subtest2	1907.6	9538	21.74
HSDPA	Subtest3	1852.4	9262	21.2
HSDPA	Subtest3	1880	9400	21.11
HSDPA	Subtest3	1907.6	9538	21.26
HSDPA	Subtest4	1852.4	9262	21.15
HSDPA	Subtest4	1880	9400	21.12
HSDPA	Subtest4	1907.6	9538	21.28

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSUPA	Subtest1	1852.4	9262	21.67
HSUPA	Subtest1	1880	9400	21.45
HSUPA	Subtest1	1907.6	9538	21.83
HSUPA	Subtest2	1852.4	9262	19.62
HSUPA	Subtest2	1880	9400	19.53
HSUPA	Subtest2	1907.6	9538	19.61
HSUPA	Subtest3	1852.4	9262	20.67
HSUPA	Subtest3	1880	9400	20.44
HSUPA	Subtest3	1907.6	9538	20.73
HSUPA	Subtest4	1852.4	9262	19.52
HSUPA	Subtest4	1880	9400	19.67
HSUPA	Subtest4	1907.6	9538	19.84
HSUPA	Subtest5	1852.4	9262	21.53
HSUPA	Subtest5	1880	9400	21.78
HSUPA	Subtest5	1907.6	9538	21.88

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSPA+	QPSK	1852.4	9262	21.2
HSPA+	QPSK	1880	9400	21.07
HSPA+	QPSK	1907.6	9538	21.26
HSPA+	16QAM	1852.4	9262	21.2
HSPA+	16QAM	1880	9400	21.09
HSPA+	16QAM	1907.6	9538	21.25

2. Occupied Bandwidth

WCDMA band II

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
Release 99	1852.4	9262	4.2
Release 99	1880	9400	4.15
Release 99	1907.6	9538	4.17

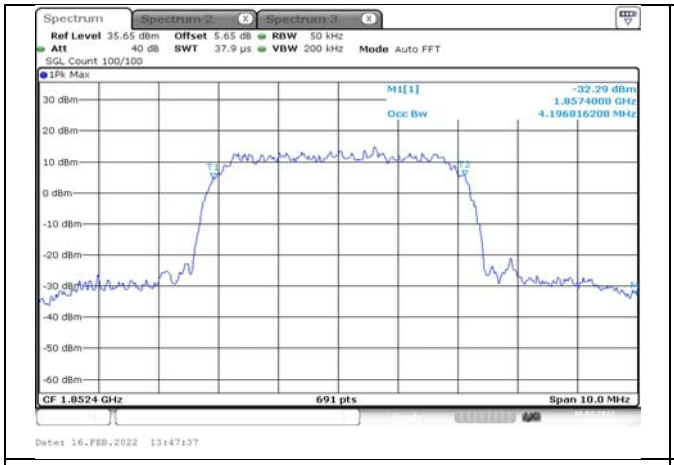
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
HSDPA	1852.4	9262	4.14
HSDPA	1880	9400	4.15
HSDPA	1907.6	9538	4.15

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
HSUPA	1852.4	9262	4.14
HSUPA	1880	9400	4.17
HSUPA	1907.6	9538	4.17

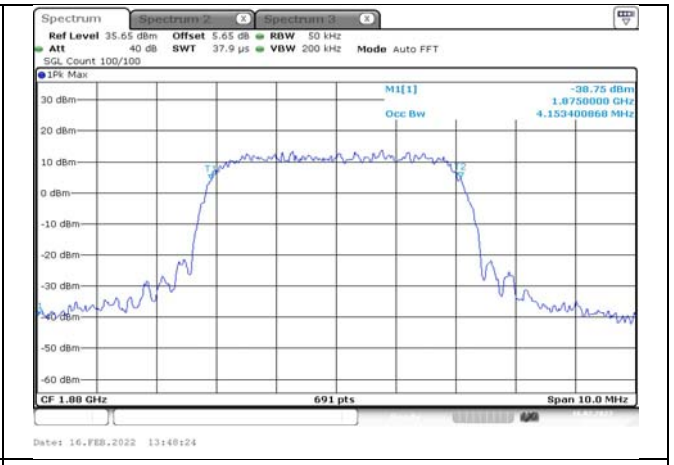
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
HSPA+	1852.4	9262	4.15
HSPA+	1880	9400	4.14
HSPA+	1907.6	9538	4.15

WCDMA band II

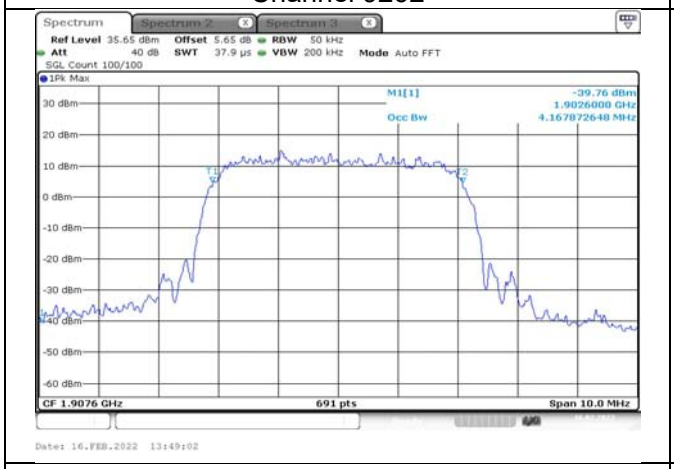
Test Mode: Release 99



Channel 9262

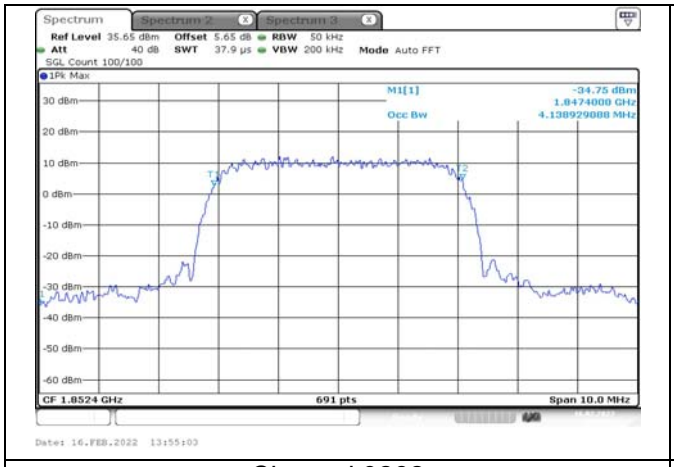


Channel 9400

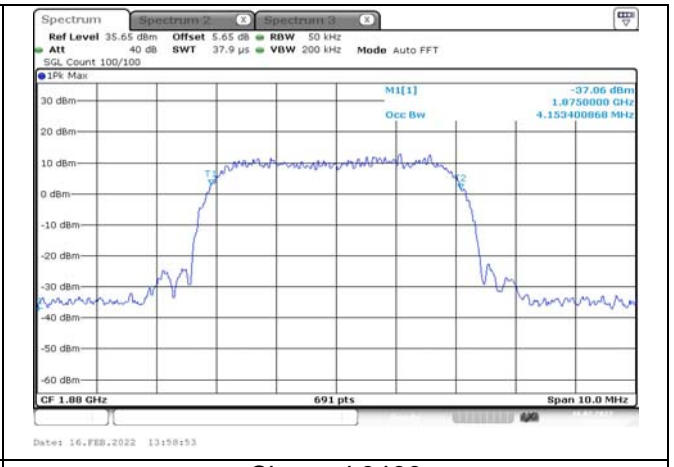


Channel 9538

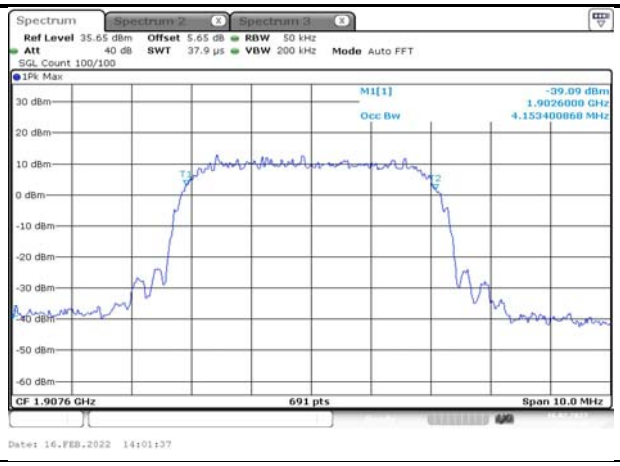
Test Mode: HSDPA



Channel 9262

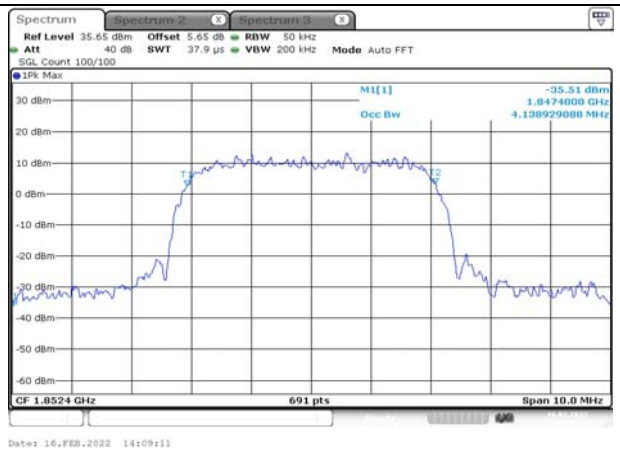


Channel 9400

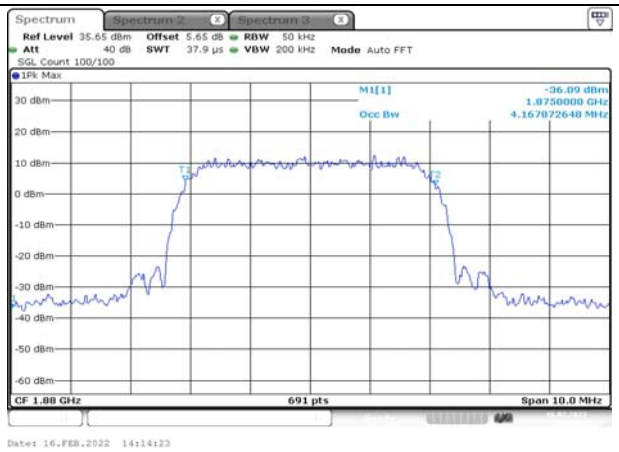


Channel 9538

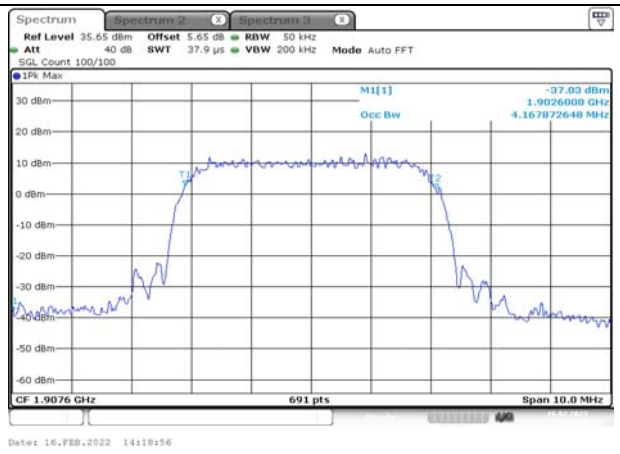
Test Mode: HSUPA



Channel 9262



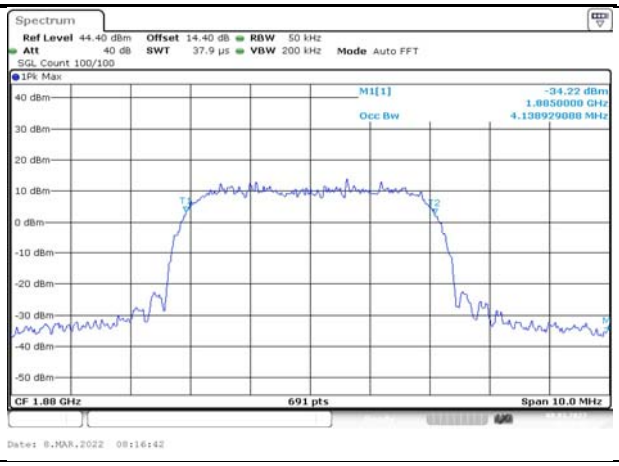
Channel 9400



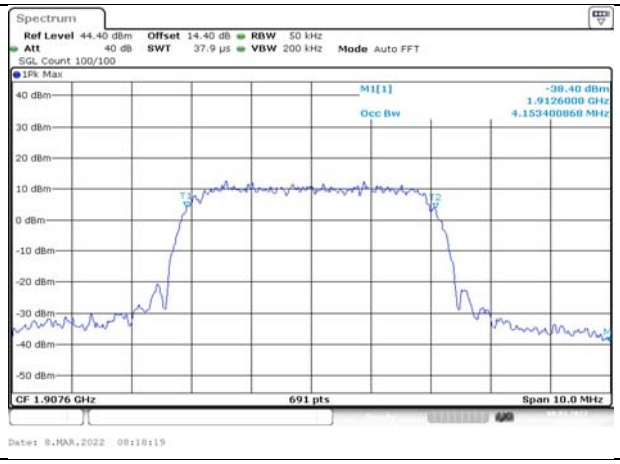
Channel 9538

Test Mode: HSPA+

Channel 9262



Channel 9400



Channel 9538

3. Emission Bandwidth

WCDMA band II

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
Release 99	1852.4	9262	4.70
Release 99	1880	9400	4.69
Release 99	1907.6	9538	4.72

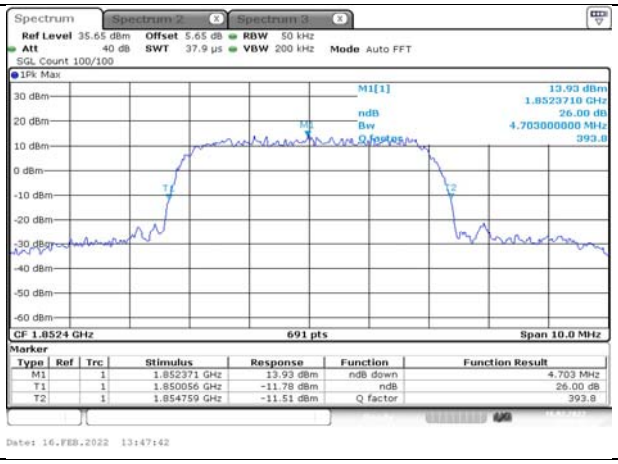
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
HSDPA	1852.4	9262	4.69
HSDPA	1880	9400	4.72
HSDPA	1907.6	9538	4.69

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
HSUPA	1852.4	9262	4.70
HSUPA	1880	9400	4.72
HSUPA	1907.6	9538	4.72

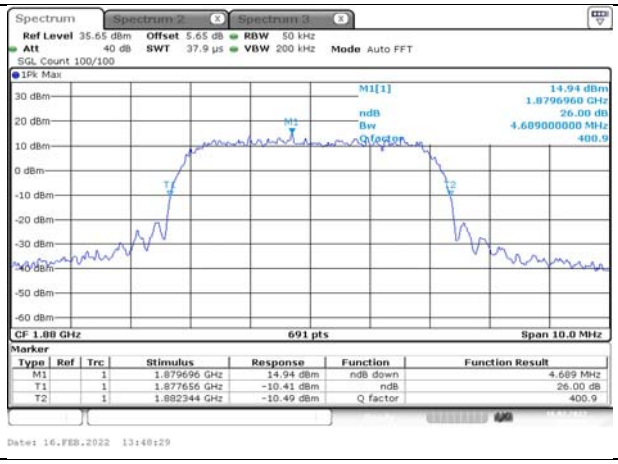
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
HSPA+	1852.4	9262	4.67
HSPA+	1880	9400	4.70
HSPA+	1907.6	9538	4.72

WCDMA band II

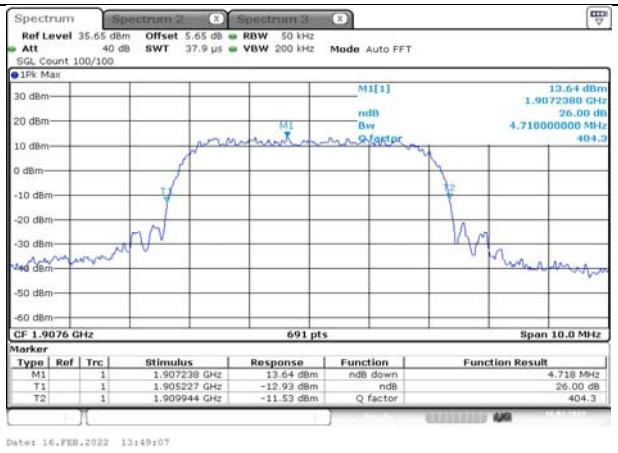
Test Mode: Release 99



Channel 9262

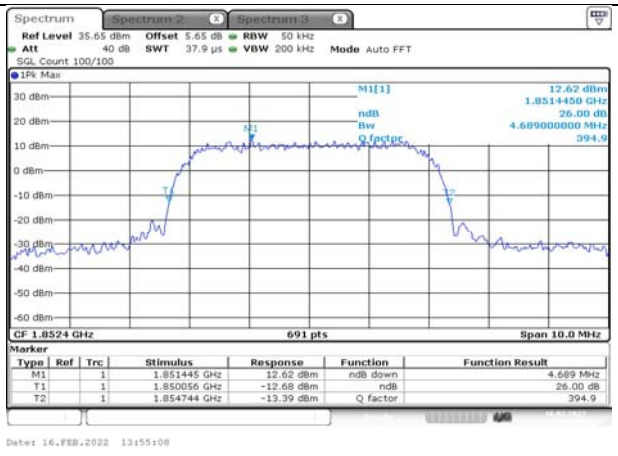


Channel 9400

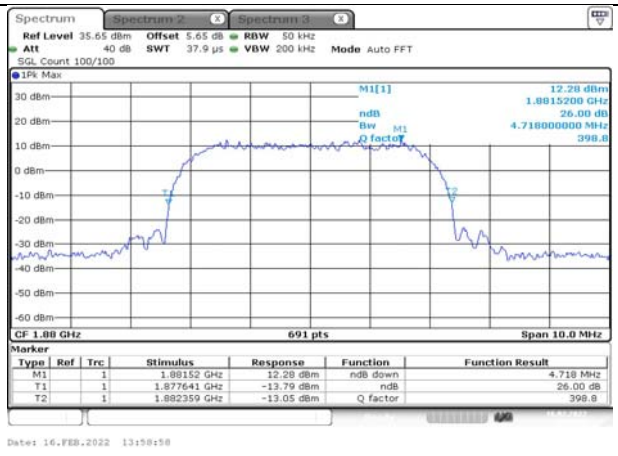


Channel 9538

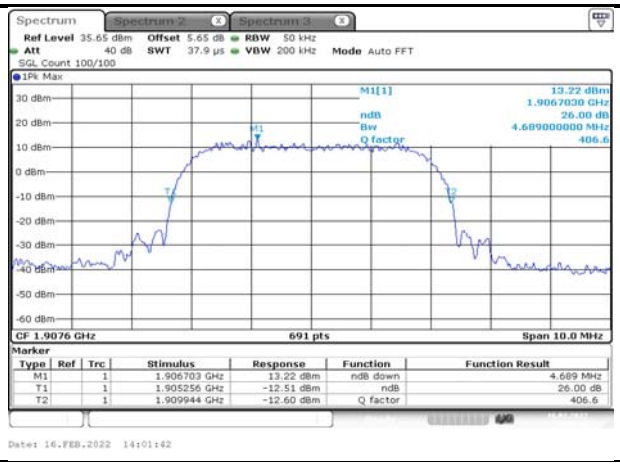
Test Mode: HSDPA



Channel 9262

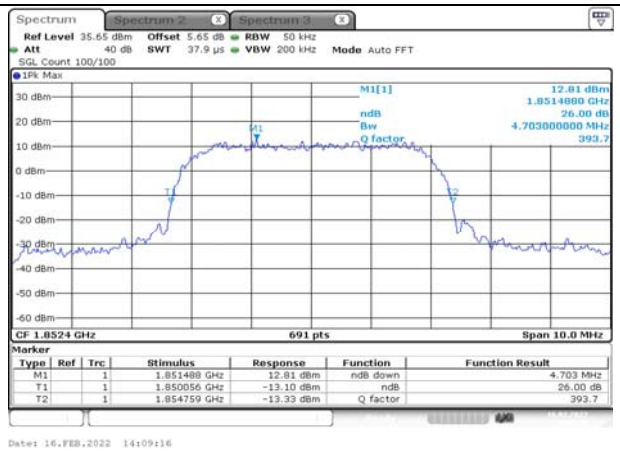


Channel 9400

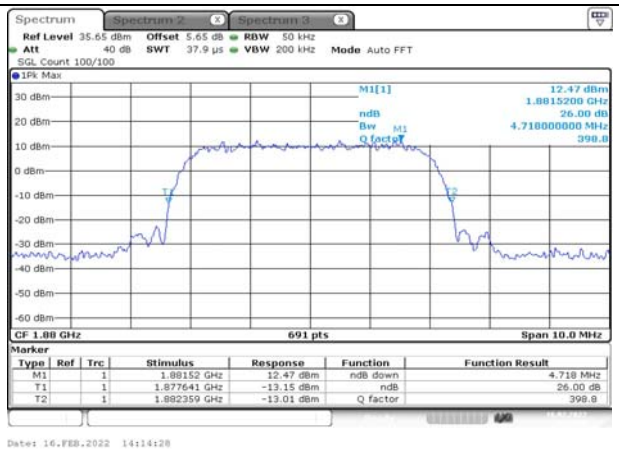


Channel 9538

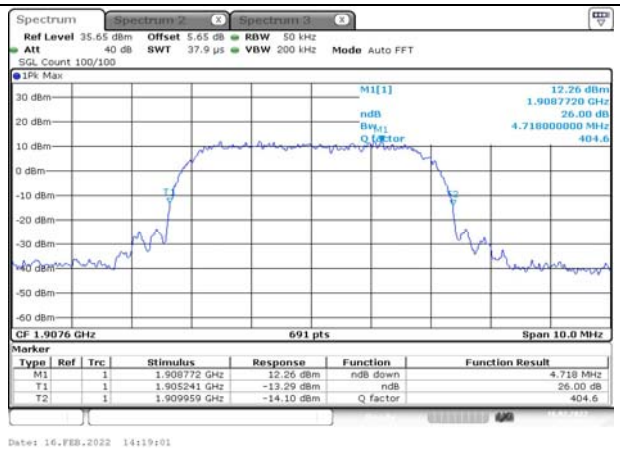
Test Mode: HSUPA



Channel 9262

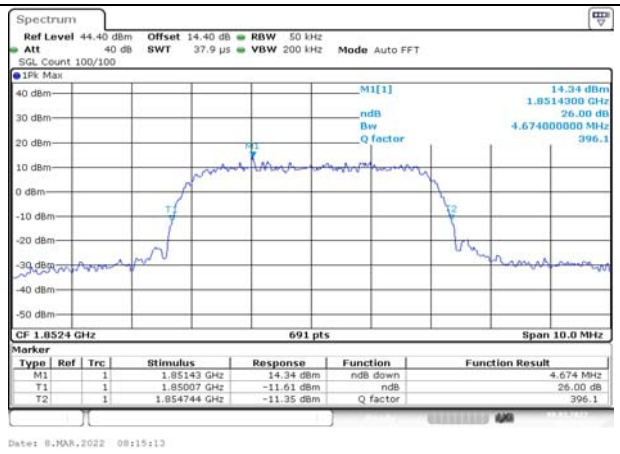


Channel 9400

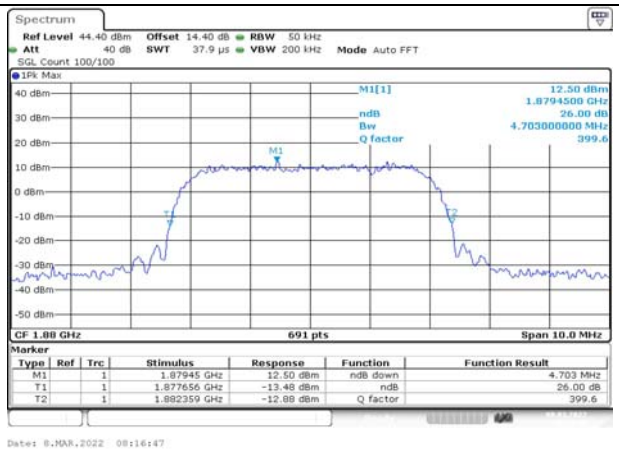


Channel 9538

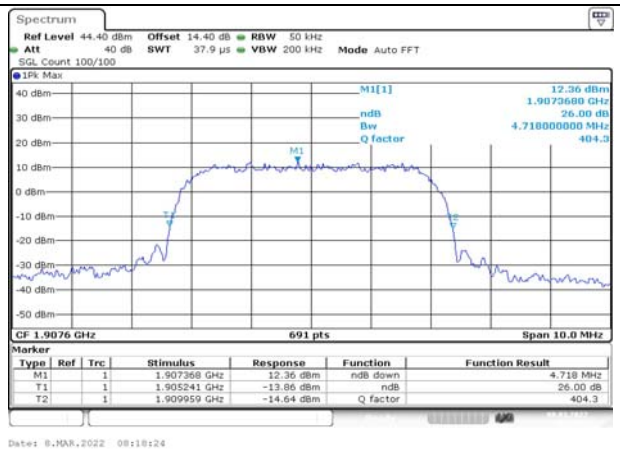
Test Mode: HSPA+



Channel 9262



Channel 9400

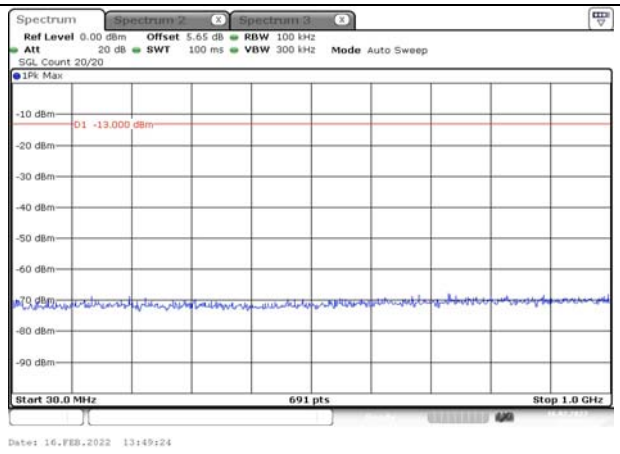


Channel 9538

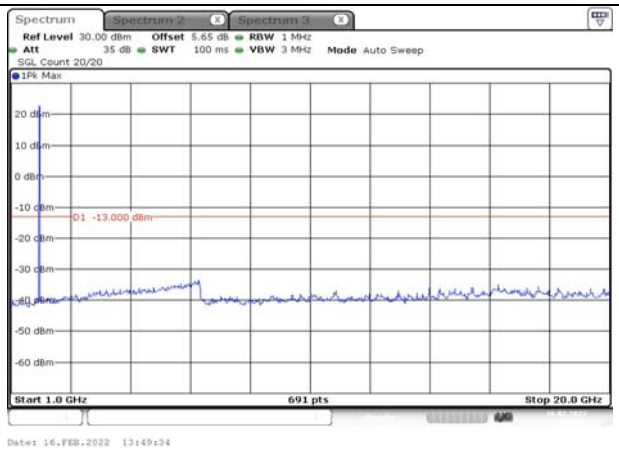
4. Spurious Emissions at antenna terminal

WCDMA band II

Test Mode: Release 99



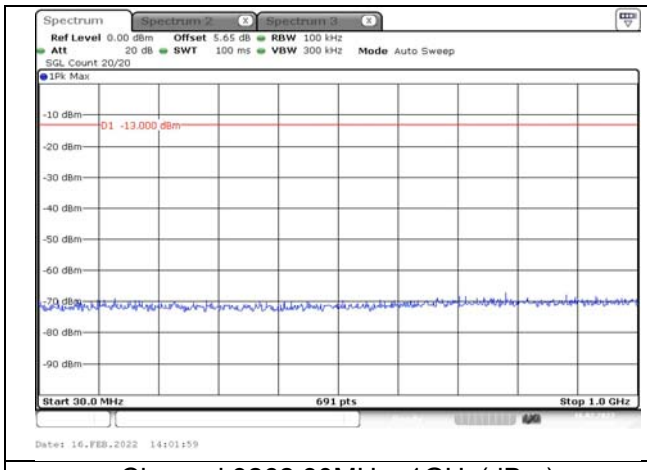
Channel 9262 30MHz~1GHz(dBm)



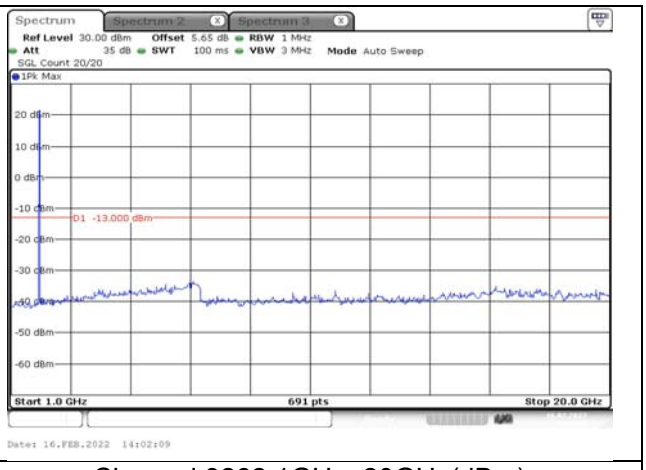
Channel 9262 1GHz~20GHz(dBm)

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

Test Mode: HSDPA



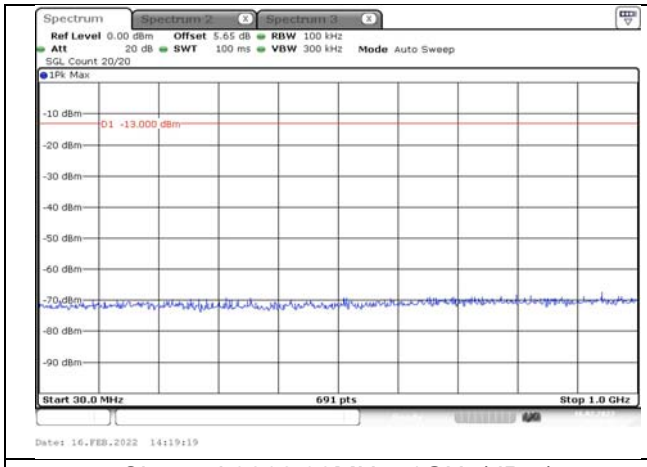
Channel 9262 30MHz~1GHz(dBm)



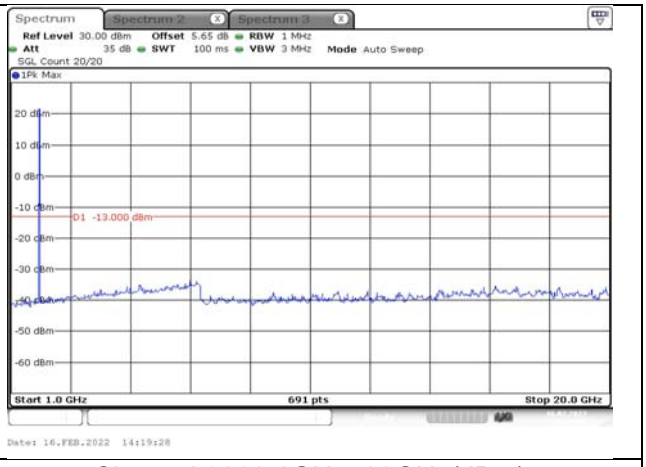
Channel 9262 1GHz~20GHz(dBm)

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

Test Mode: HSUPA



Channel 9262 30MHz~1GHz(dBm)



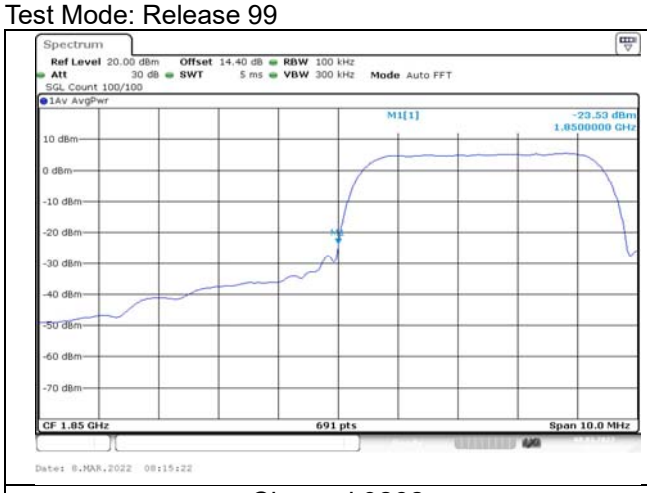
Channel 9262 1GHz~20GHz(dBm)

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

5. Band Edges Compliance

WCDMA band II

Test Mode: Release 99



Channel 9262

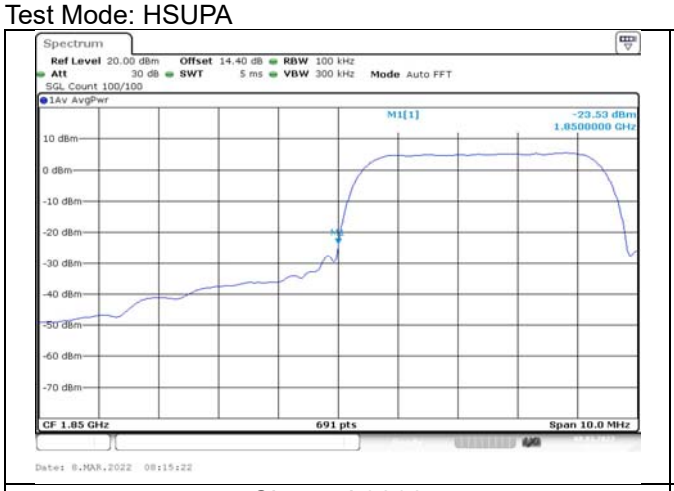
Channel 9538

Test Mode: HSDPA

Channel 9262

Channel 9538

Test Mode: HSUPA

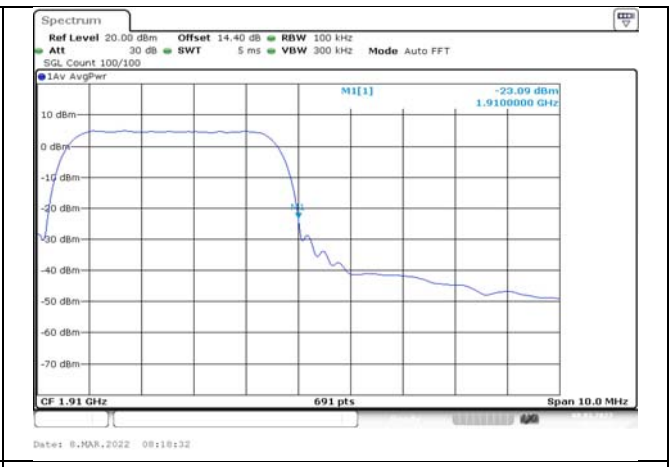


Channel 9262

Channel 9538

Test Mode: HSPA+

Channel 9262



Channel 9538

6. Frequency Stability

WCDMA band II

Mode	Temperature(°C)	Test Result (ppm)@NV		
		Channel 9262	Channel 9400	Channel 9538
Release 99	-10	-0.030	0.090	-0.060
Release 99	-0	0.040	0.020	-0.040
Release 99	+10	0.060	0.070	-0.080
Release 99	+30	0.090	0.050	-0.070
Release 99	+40	0.080	-0.060	-0.090
Release 99	+55	-0.020	-0.040	-0.070
Name	Voltage	Test Result (ppm)@NT		
		Channel 9262	Channel 9400	Channel 9538
Release 99	LV	0.030	0.050	0.030
Release 99	HV	0.060	0.040	0.030

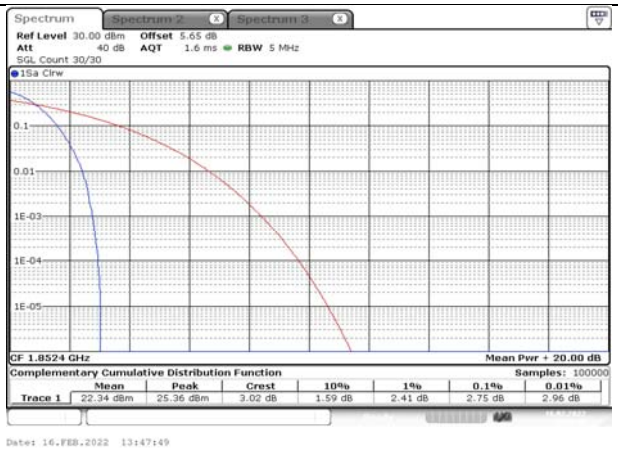
Mode	Temperature(°C)	Test Result (ppm)@NV		
		Channel 9262	Channel 9400	Channel 9538
HSDPA	-10	0.070	0.050	0.080
HSDPA	-0	0.060	0.050	0.010
HSDPA	+10	-0.020	-0.010	-0.070
HSDPA	+30	0.040	0.080	-0.020
HSDPA	+40	0.060	-0.050	-0.010
HSDPA	+55	-0.030	-0.060	-0.020
Name	Voltage	Test Result (ppm)@NT		
		Channel 9262	Channel 9400	Channel 9538
HSDPA	LV	0.010	-0.060	0.030
HSDPA	HV	0.090	-0.010	0.040

Mode	Temperature(°C)	Test Result (ppm)@NV		
		Channel 9262	Channel 9400	Channel 9538
HSUPA	-10	-0.090	0.010	0.090
HSUPA	-0	-0.050	0.030	0.050
HSUPA	+10	-0.008	0.030	-0.030
HSUPA	+30	-0.000	-0.020	-0.040
HSUPA	+40	-0.080	-0.070	-0.020
HSUPA	+55	-0.040	-0.030	-0.010
Mode	Voltage	Test Result (ppm)@NT		
		Channel 9262	Channel 9400	Channel 9538
HSUPA	LV	-0.090	0.080	-0.010
HSUPA	HV	-0.040	0.040	0.020

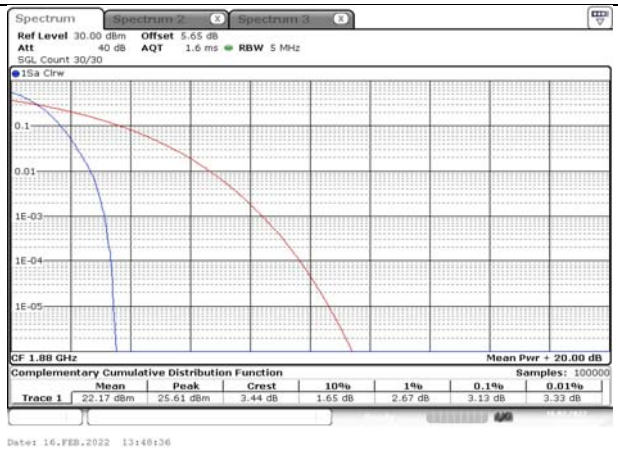
7. Peak-Average Ratio

WCDMA band II

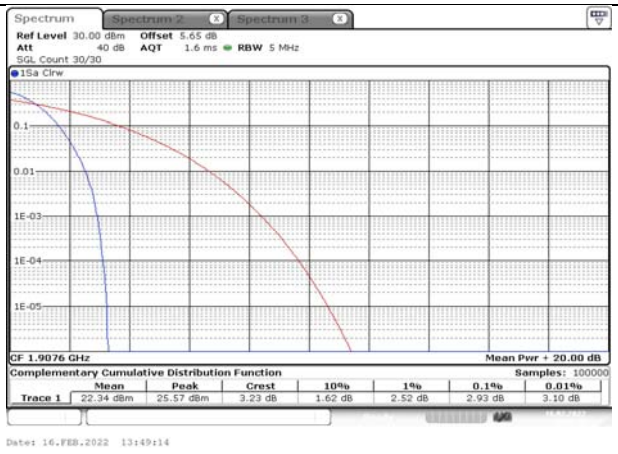
Test Mode: Release 99



Channel 9262

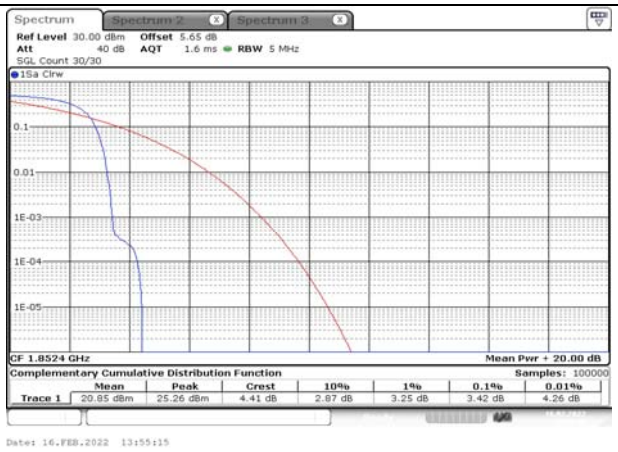


Channel 9400

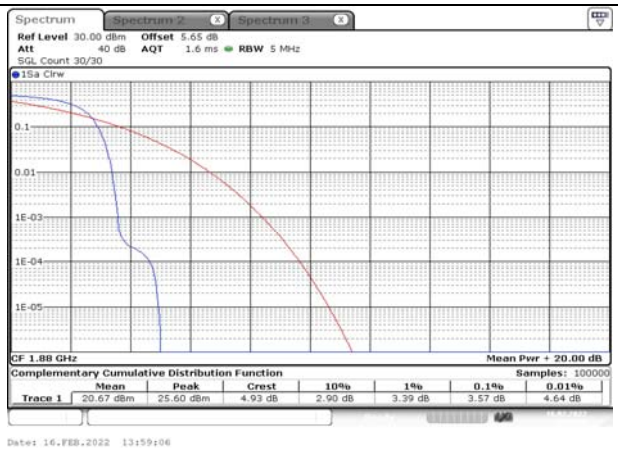


Channel 9538

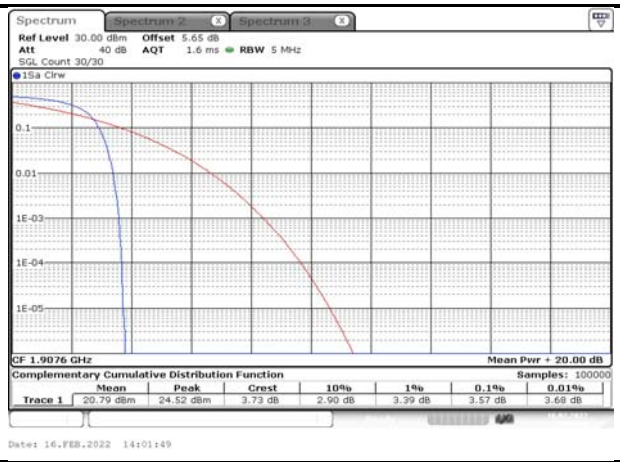
Test Mode: HSDPA



Channel 9262

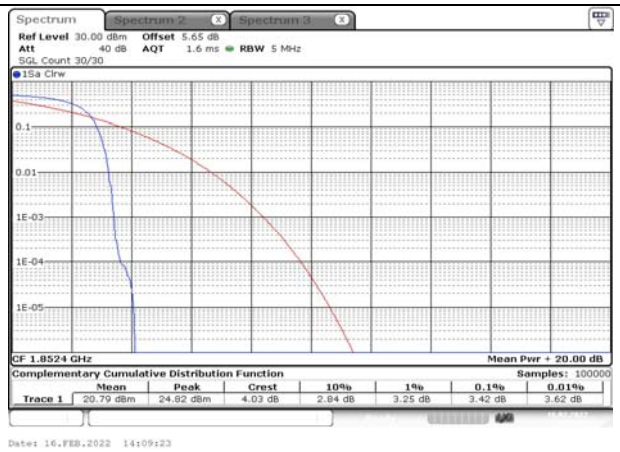


Channel 9400

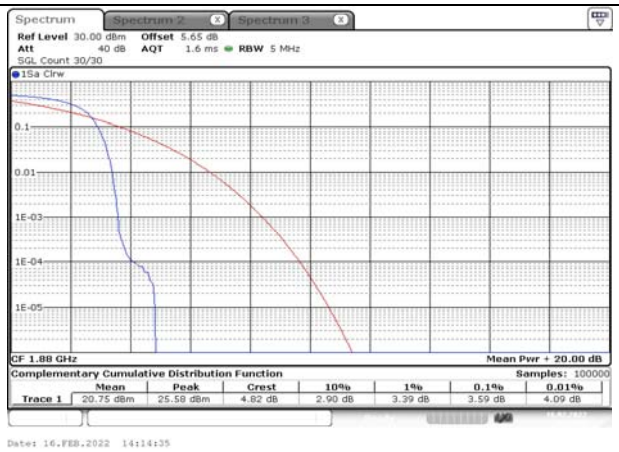


Channel 9538

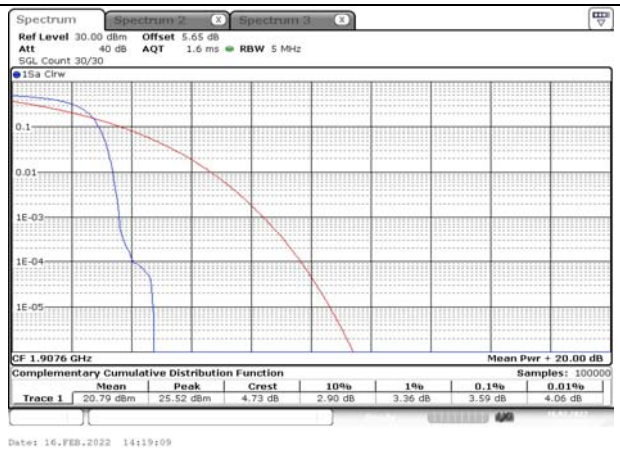
Test Mode: HSUPA



Channel 9262



Channel 9400



Channel 9538

8. Effective Radiated Power and Effective Isotropic Radiated Power

WCDMA band II

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
Release 99	RMC,12.2kbps	1852.4	9262	22.68	17.88	0.061
Release 99	RMC,12.2kbps	1880	9400	22.61	17.81	0.060
Release 99	RMC,12.2kbps	1907.6	9538	22.74	17.94	0.062

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
HSDPA	Subtest1	1852.4	9262	21.7	16.90	0.049
HSDPA	Subtest1	1880	9400	21.59	16.79	0.048
HSDPA	Subtest1	1907.6	9538	21.75	16.95	0.050
HSDPA	Subtest2	1852.4	9262	21.67	16.87	0.049
HSDPA	Subtest2	1880	9400	21.6	16.80	0.048
HSDPA	Subtest2	1907.6	9538	21.74	16.94	0.049
HSDPA	Subtest3	1852.4	9262	21.2	16.40	0.044
HSDPA	Subtest3	1880	9400	21.11	16.31	0.043
HSDPA	Subtest3	1907.6	9538	21.26	16.46	0.044
HSDPA	Subtest4	1852.4	9262	21.15	16.35	0.043
HSDPA	Subtest4	1880	9400	21.12	16.32	0.043
HSDPA	Subtest4	1907.6	9538	21.28	16.48	0.044

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
HSUPA	Subtest1	1852.4	9262	21.67	16.87	0.049
HSUPA	Subtest1	1880	9400	21.45	16.65	0.046
HSUPA	Subtest1	1907.6	9538	21.83	17.03	0.050
HSUPA	Subtest2	1852.4	9262	19.62	14.82	0.030
HSUPA	Subtest2	1880	9400	19.53	14.73	0.030
HSUPA	Subtest2	1907.6	9538	19.61	14.81	0.030
HSUPA	Subtest3	1852.4	9262	20.67	15.87	0.039
HSUPA	Subtest3	1880	9400	20.44	15.64	0.037
HSUPA	Subtest3	1907.6	9538	20.73	15.93	0.039
HSUPA	Subtest4	1852.4	9262	19.52	14.72	0.030
HSUPA	Subtest4	1880	9400	19.67	14.87	0.031
HSUPA	Subtest4	1907.6	9538	19.84	15.04	0.032
HSUPA	Subtest5	1852.4	9262	21.53	16.73	0.047
HSUPA	Subtest5	1880	9400	21.78	16.98	0.050
HSUPA	Subtest5	1907.6	9538	21.88	17.08	0.051

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
HSPA+	QPSK	1852.4	9262	21.2	16.40	0.044
HSPA+	QPSK	1880	9400	21.07	16.27	0.042
HSPA+	QPSK	1907.6	9538	21.26	16.46	0.044
HSPA+	16QAM	1852.4	9262	21.2	16.40	0.044
HSPA+	16QAM	1880	9400	21.09	16.29	0.043
HSPA+	16QAM	1907.6	9538	21.25	16.45	0.044

WCDMA band V

1. RF Power Output

WCDMA band V

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	826.4	4132	23.28
Release 99	RMC,12.2kbps	836.6	4183	23.45
Release 99	RMC,12.2kbps	846.6	4233	23.59

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSDPA	Subtest1	826.4	4132	22.29
HSDPA	Subtest1	836.6	4183	22.46
HSDPA	Subtest1	846.6	4233	22.61
HSDPA	Subtest2	826.4	4132	22.32
HSDPA	Subtest2	836.6	4183	22.47
HSDPA	Subtest2	846.6	4233	22.6
HSDPA	Subtest3	826.4	4132	21.79
HSDPA	Subtest3	836.6	4183	21.98
HSDPA	Subtest3	846.6	4233	22.08
HSDPA	Subtest4	826.4	4132	21.8
HSDPA	Subtest4	836.6	4183	21.94
HSDPA	Subtest4	846.6	4233	22.09

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSUPA	Subtest1	826.4	4132	22.20
HSUPA	Subtest1	836.6	4183	22.19
HSUPA	Subtest1	846.6	4233	22.20
HSUPA	Subtest2	826.4	4132	20.24
HSUPA	Subtest2	836.6	4183	20.20
HSUPA	Subtest2	846.6	4233	20.49
HSUPA	Subtest3	826.4	4132	21.03
HSUPA	Subtest3	836.6	4183	21.14
HSUPA	Subtest3	846.6	4233	21.36
HSUPA	Subtest4	826.4	4132	20.00
HSUPA	Subtest4	836.6	4183	20.47
HSUPA	Subtest4	846.6	4233	20.57
HSUPA	Subtest5	826.4	4132	22.13
HSUPA	Subtest5	836.6	4183	22.22
HSUPA	Subtest5	846.6	4233	22.31

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSPA+	QPSK	826.4	4132	22.83
HSPA+	QPSK	836.6	4183	22.84
HSPA+	QPSK	846.6	4233	22.74
HSPA+	16QAM	826.4	4132	22.84
HSPA+	16QAM	836.6	4183	22.84
HSPA+	16QAM	846.6	4233	22.74

2. Occupied Bandwidth

WCDMA band V

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
Release 99	826.4	4132	4.15
Release 99	836.6	4183	4.12
Release 99	846.6	4233	4.11

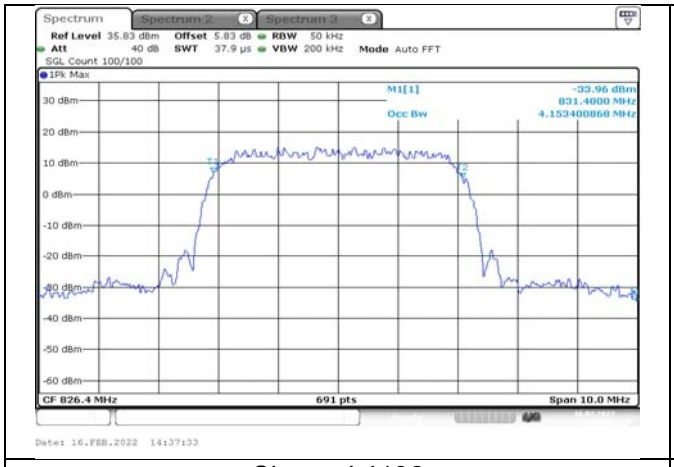
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
HSDPA	826.4	4132	4.15
HSDPA	836.6	4183	4.14
HSDPA	846.6	4233	4.11

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
HSUPA	826.4	4132	4.12
HSUPA	836.6	4183	4.14
HSUPA	846.6	4233	4.11

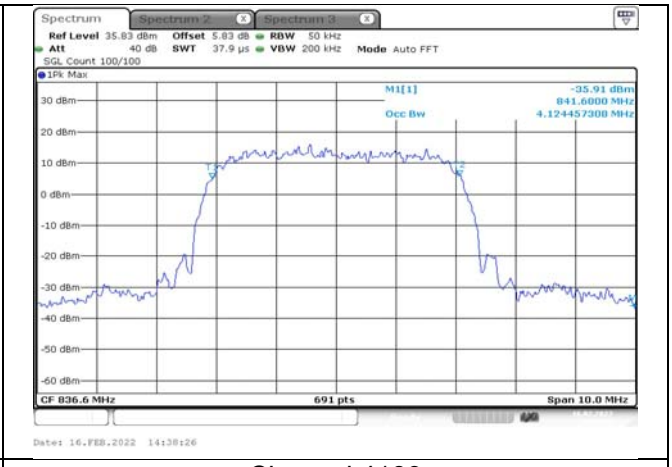
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
HSPA+	826.4	4132	4.17
HSPA+	836.6	4183	4.12
HSPA+	846.6	4233	4.14

WCDMA band V

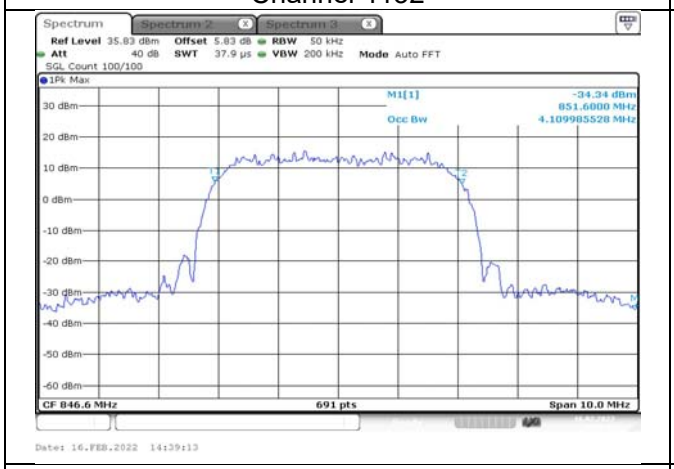
Test Mode: Release 99



Channel 4132

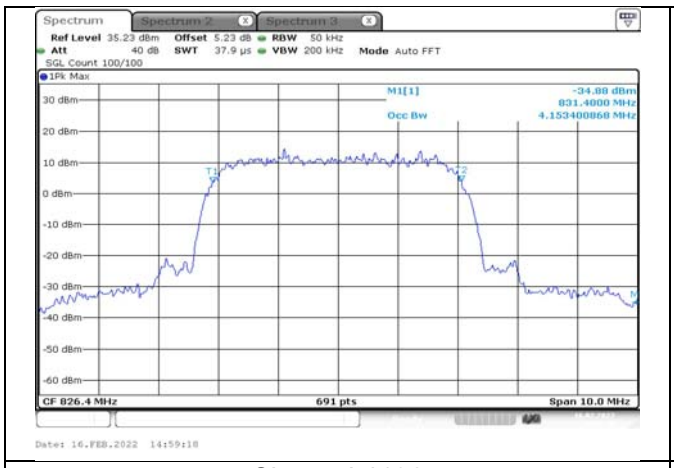


Channel 4183

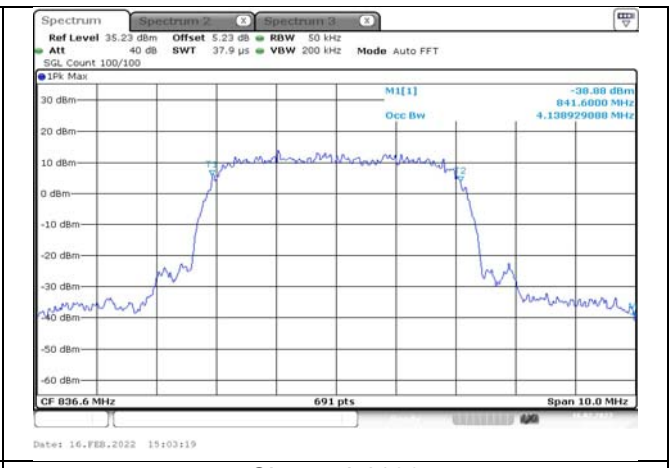


Channel 4233

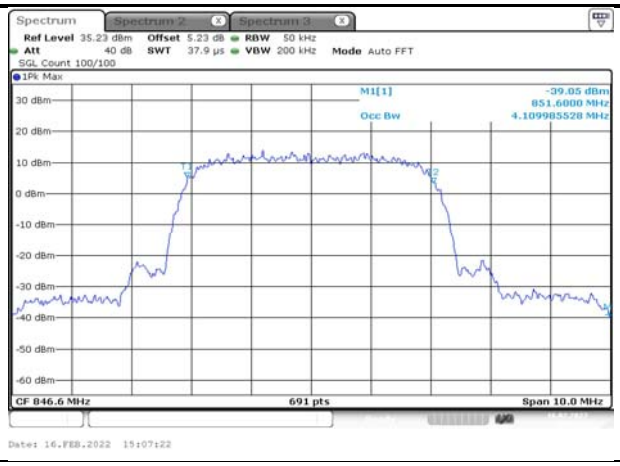
Test Mode: HSDPA



Channel 4132

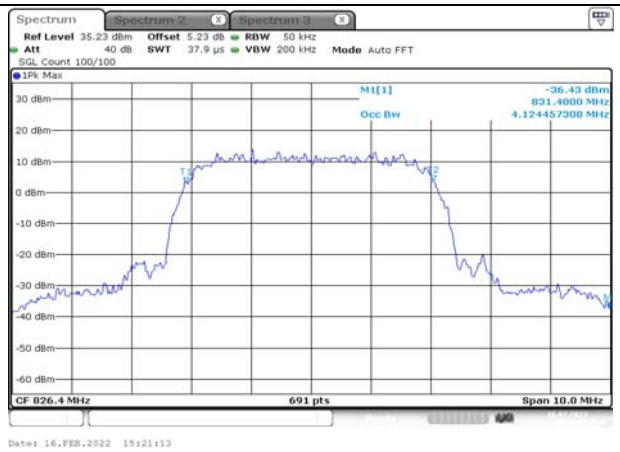


Channel 4183

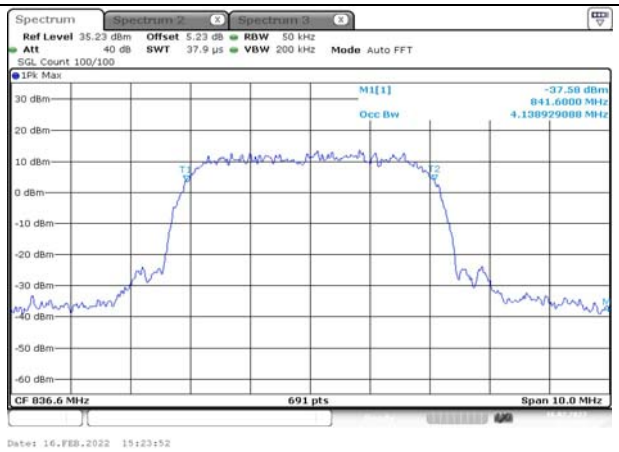


Channel 4233

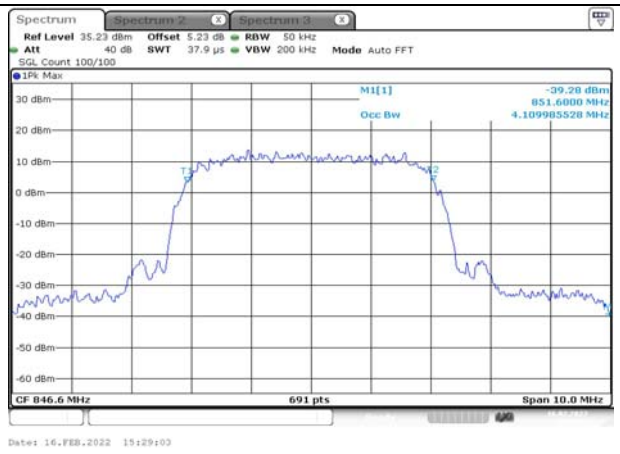
Test Mode: HSUPA



Channel 4132

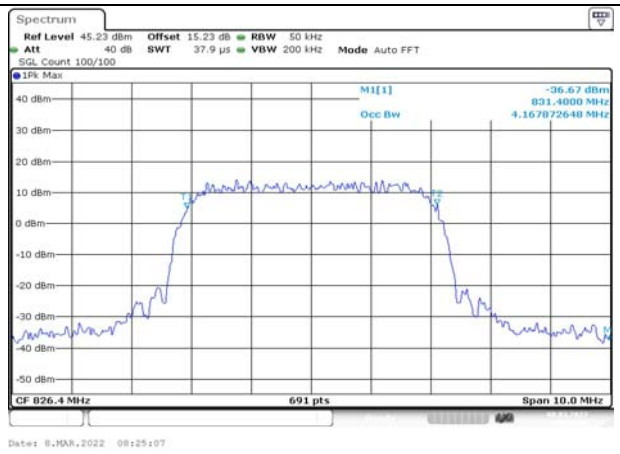


Channel 4183

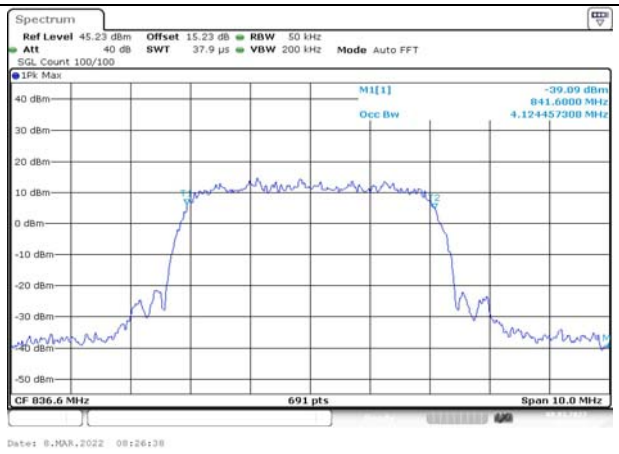


Channel 4233

Test Mode: HSPA+



Channel 4132



Channel 4183

Channel 4233

3. Emission Bandwidth

WCDMA band V

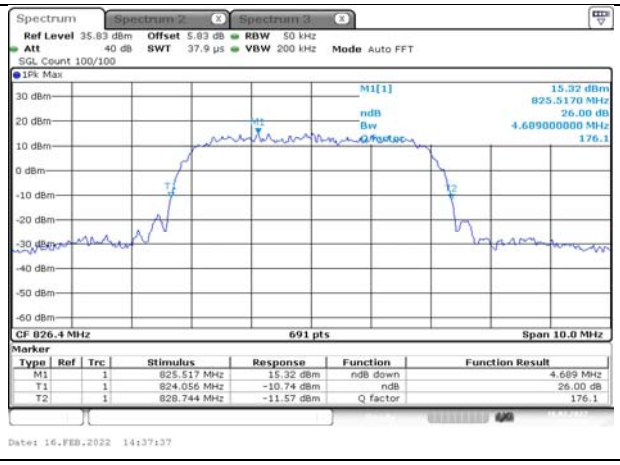
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
Release 99	826.4	4132	4.69
Release 99	836.6	4183	4.70
Release 99	846.6	4233	4.66

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
HSDPA	826.4	4132	4.72
HSDPA	836.6	4183	4.69
HSDPA	846.6	4233	4.69

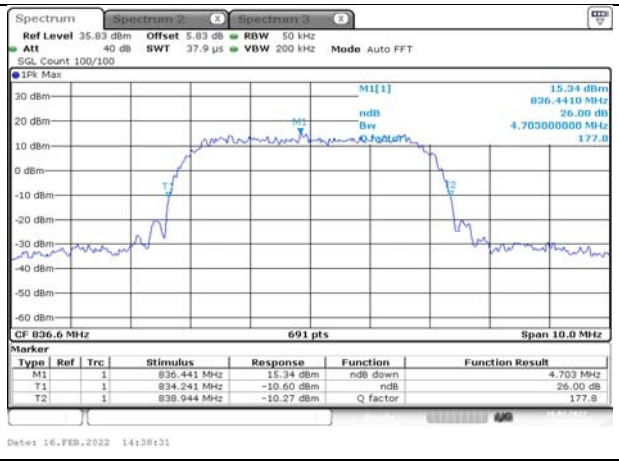
Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
HSUPA	826.4	4132	4.69
HSUPA	836.6	4183	4.67
HSUPA	846.6	4233	4.67

Mode	Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
HSPA+	826.4	4132	4.72
HSPA+	836.6	4183	4.69
HSPA+	846.6	4233	4.72

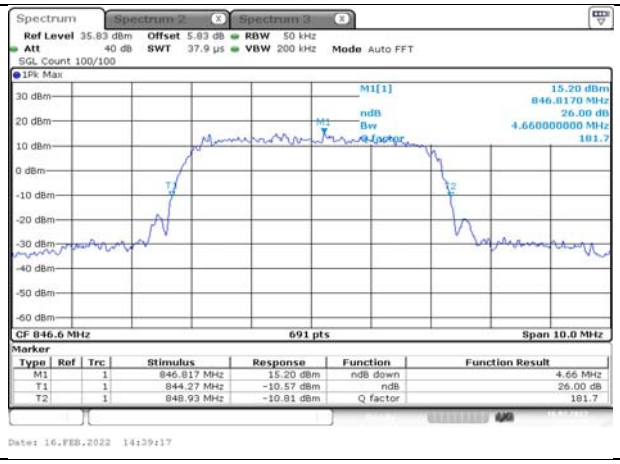
WCDMA band V
Test Mode: Release 99



Channel 4132

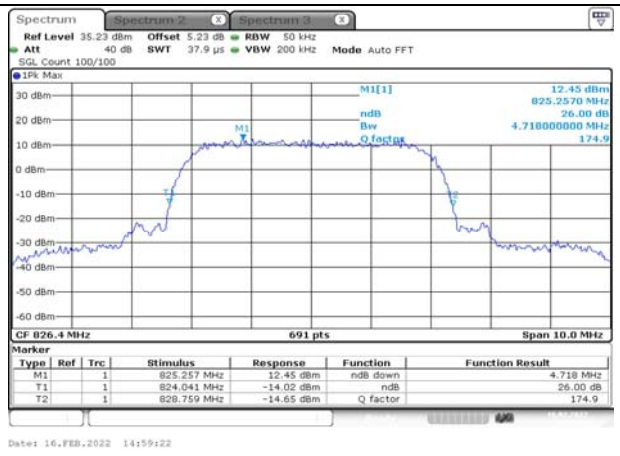


Channel 4183

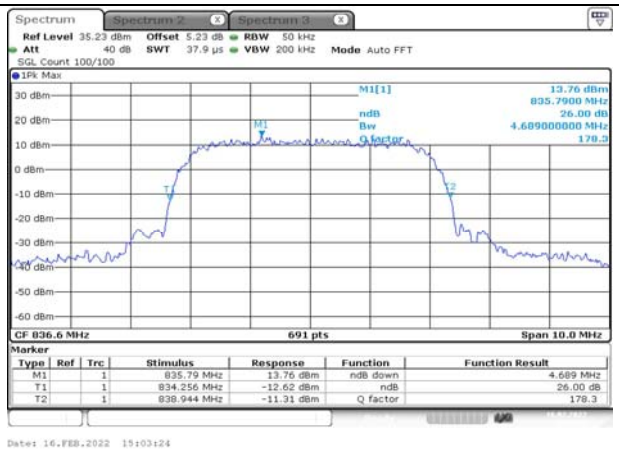


Channel 4233

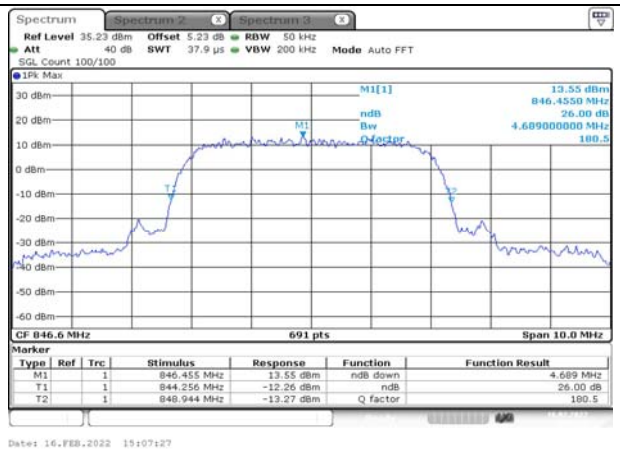
Test Mode: HSDPA



Channel 4132

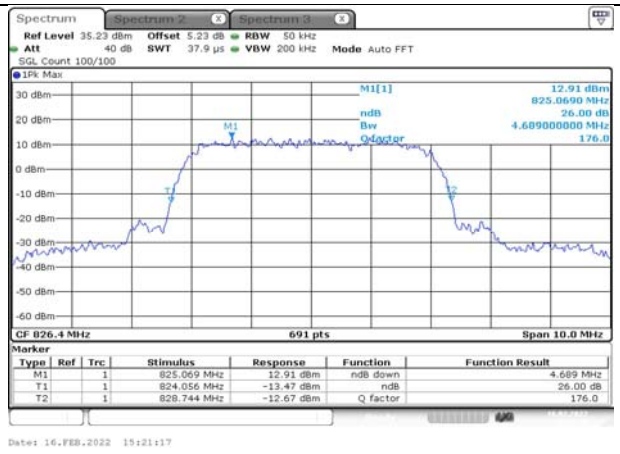


Channel 4183



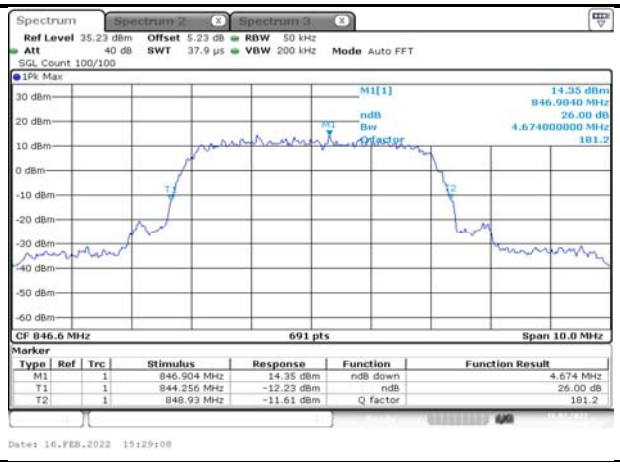
Channel 4233

Test Mode: HSUPA



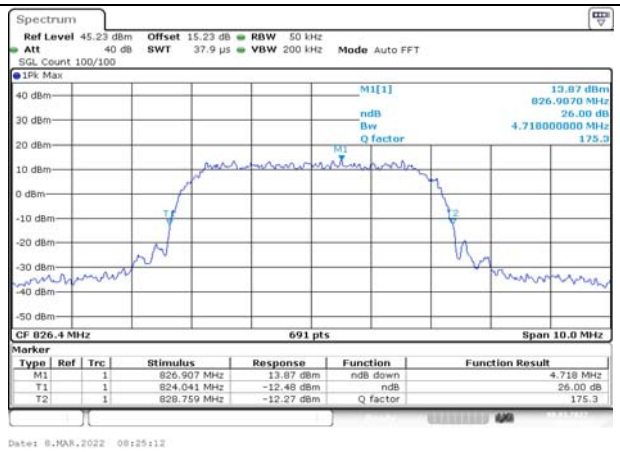
Channel 4132

Channel 4183



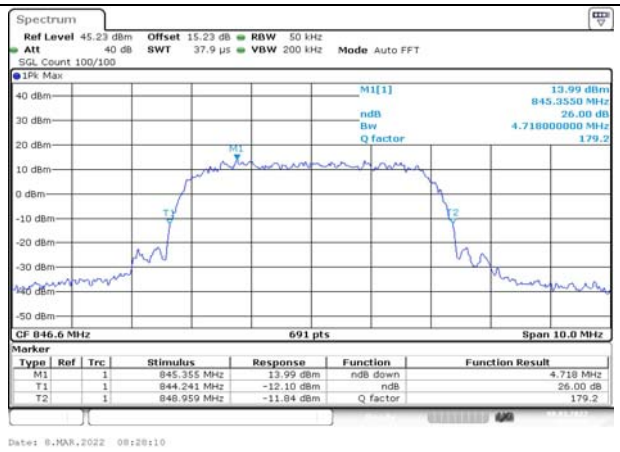
Channel 4233

Test Mode: HSPA+



Channel 4132

Channel 4183

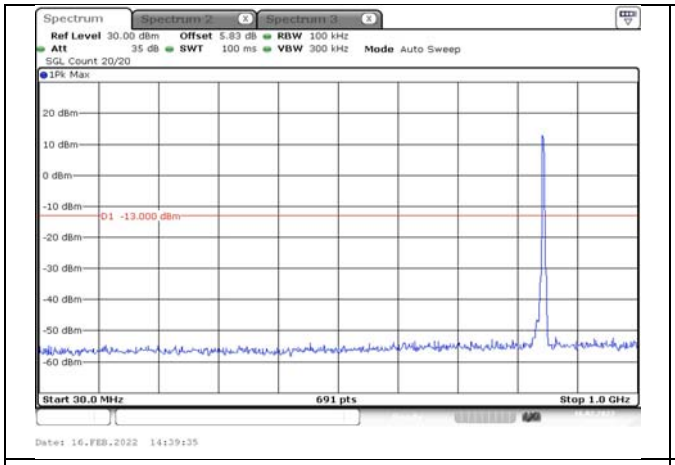


Channel 4233

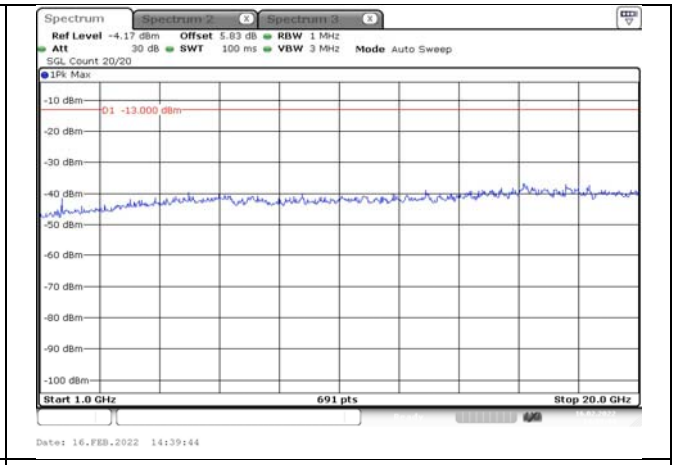
4. Spurious Emissions at antenna terminal

WCDMA band V

Test Mode: Release 99



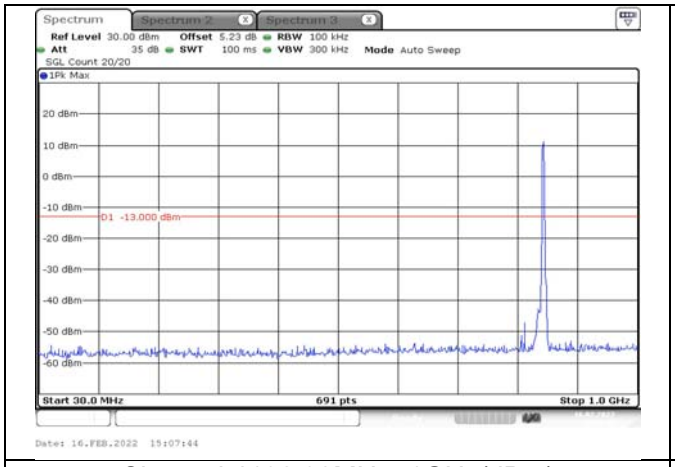
Channel 4132 30MHz~1GHz(dBm)



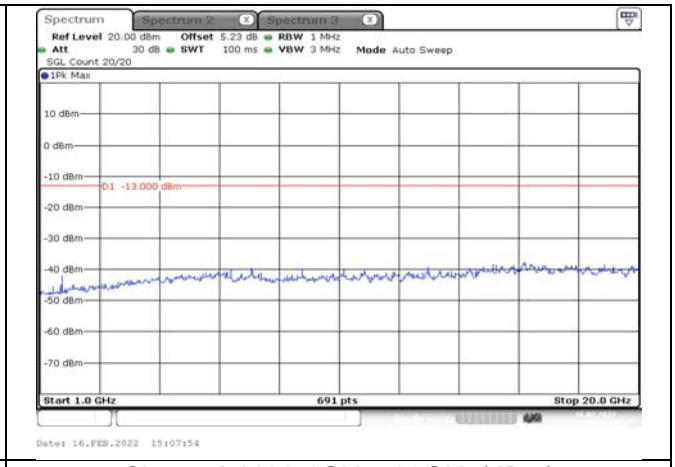
Channel 4132 1GHz~20GHz(dBm)

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

Test Mode: HSDPA



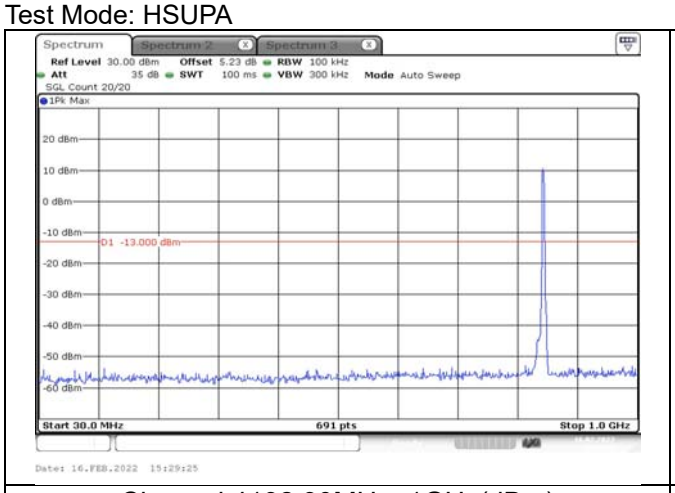
Channel 4132 30MHz~1GHz(dBm)



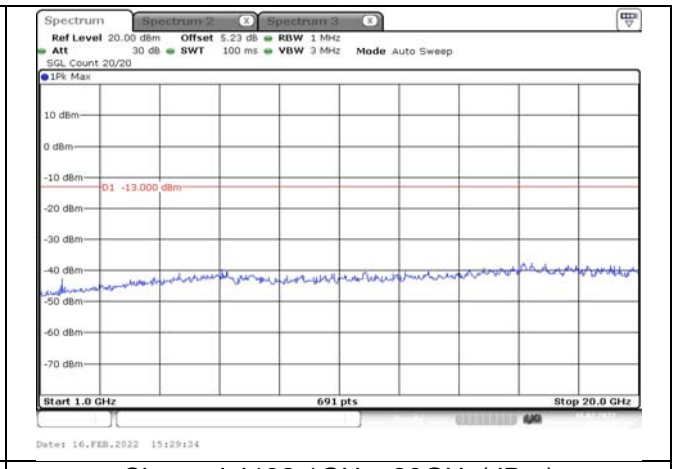
Channel 4132 1GHz~20GHz(dBm)

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

Test Mode: HSUPA



Channel 4132 30MHz~1GHz(dBm)



Channel 4132 1GHz~20GHz(dBm)

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

5. Band Edges Compliance

WCDMA band V

Test Mode: Release 99

Channel 4132

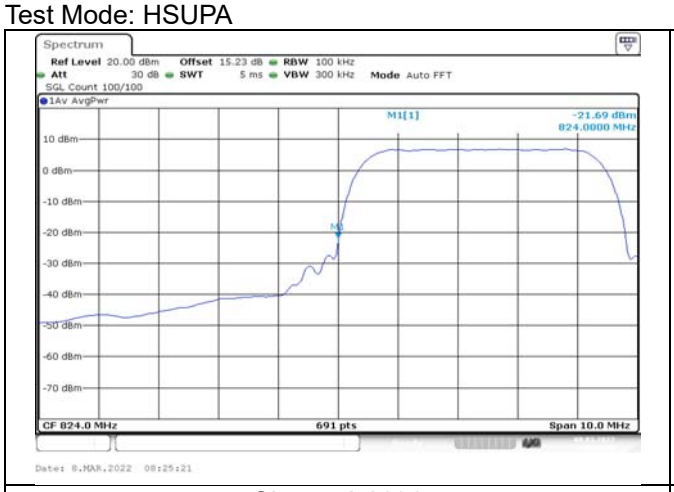
Channel 4233

Test Mode: HSDPA

Channel 4132

Channel 4233

Test Mode: HSUPA



Channel 4132

Channel 4233

Test Mode: HSPA+

Channel 4132

Channel 4233

6. Frequency Stability

WCDMA band V

Mode	Temperature(°C)	Test Result (ppm)@NV		
		Channel 9262	Channel 9400	Channel 9538
Release 99	-10	0.000	-0.060	0.090
Release 99	-0	0.060	0.020	0.050
Release 99	+10	0.030	-0.070	-0.030
Release 99	+30	0.060	-0.010	-0.020
Release 99	+40	-0.030	-0.010	-0.080
Release 99	+55	-0.070	0.020	-0.000
Mode	Voltage	Test Result (ppm)@NT		
		Channel 9262	Channel 9400	Channel 9538
Release 99	LV	0.090	0.050	0.010
Release 99	HV	0.020	0.070	-0.070

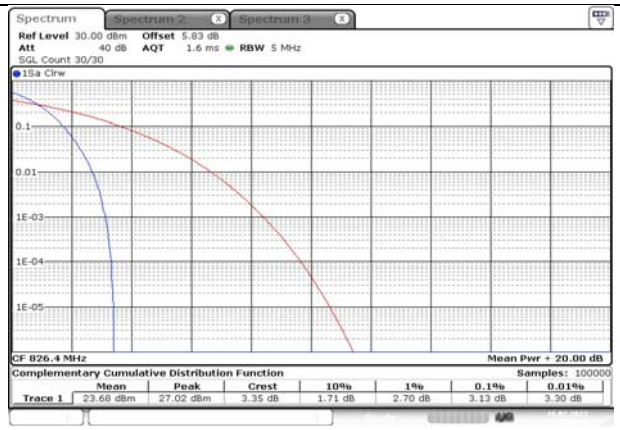
Mode	Temperature(°C)	Test Result (ppm)@NV		
		Channel 9262	Channel 9400	Channel 9538
HSDPA	-10	0.020	0.060	-0.020
HSDPA	-0	-0.010	0.030	0.000
HSDPA	+10	-0.040	0.030	-0.000
HSDPA	+30	-0.070	-0.060	-0.070
HSDPA	+40	-0.040	0.000	0.080
HSDPA	+55	-0.060	-0.050	-0.050
Mode	Voltage	Test Result (ppm)@NT		
		Channel 9262	Channel 9400	Channel 9538
HSDPA	LV	0.000	0.000	0.060
HSDPA	HV	-0.060	-0.040	0.000

Mode	Temperature(°C)	Test Result (ppm)@NV		
		Channel 9262	Channel 9400	Channel 9538
HSUPA	-10	0.070	0.050	-0.010
HSUPA	-0	-0.060	0.020	0.010
HSUPA	+10	-0.090	-0.050	-0.010
HSUPA	+30	-0.008	-0.070	-0.080
HSUPA	+40	-0.010	-0.040	-0.040
HSUPA	+55	-0.070	0.010	-0.060
Mode	Voltage	Test Result (ppm)@NT		
		Channel 9262	Channel 9400	Channel 9538
HSUPA	LV	0.010	0.020	0.050
HSUPA	HV	0.080	0.090	0.030

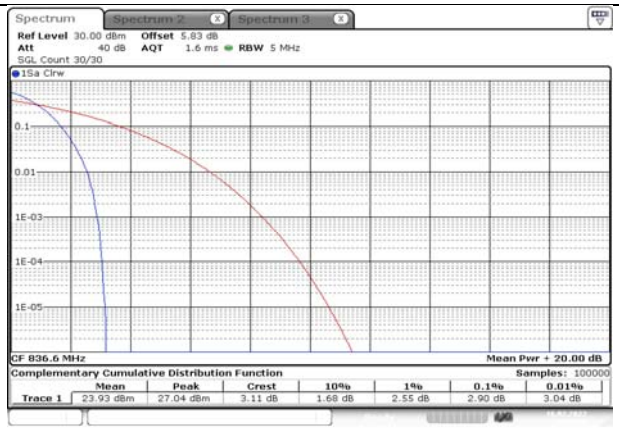
7. Peak-Average Ratio

WCDMA band V

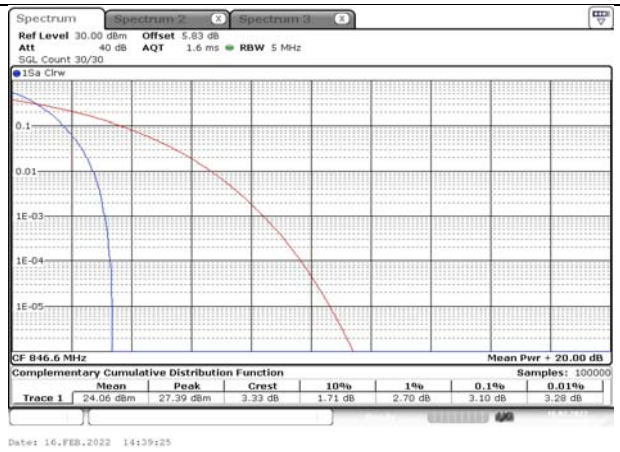
Test Mode: Release 99



Channel 4132

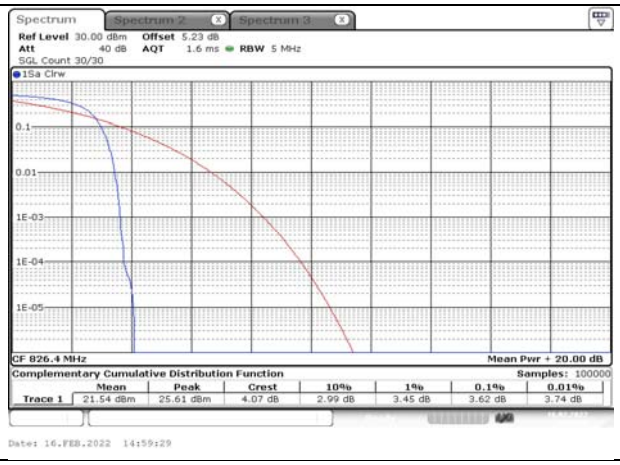


Channel 4183

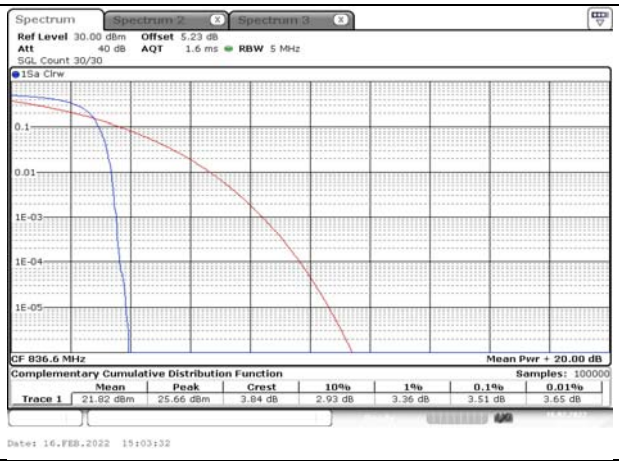


Channel 4233

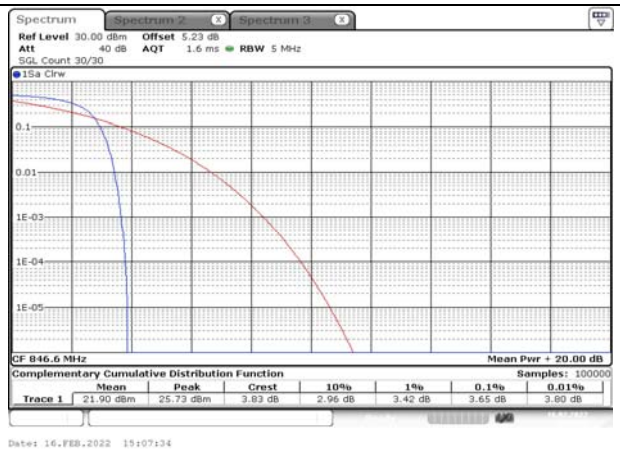
Test Mode: HSDPA



Channel 4132

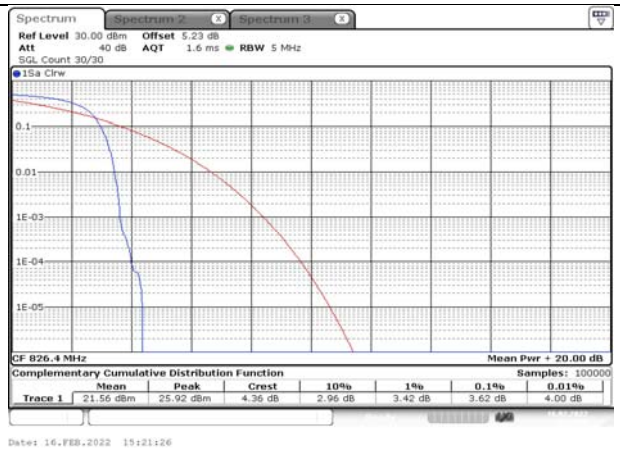


Channel 4183

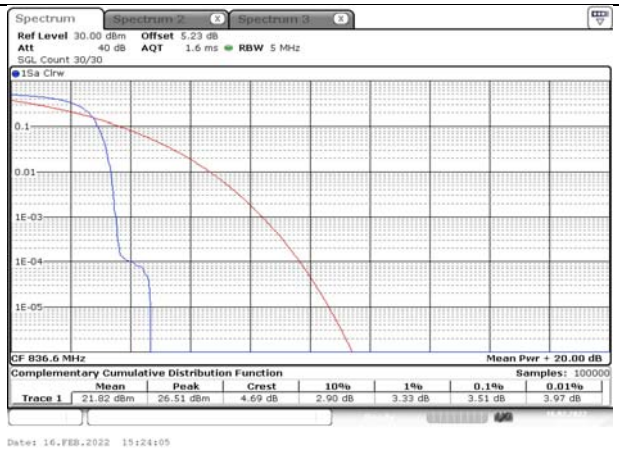


Channel 4233

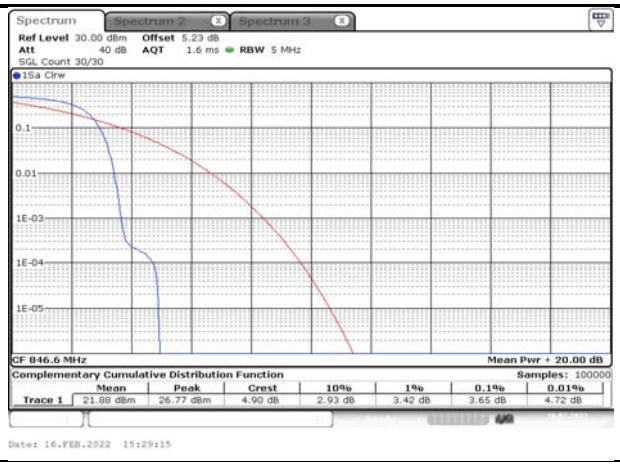
Test Mode: HSUPA



Channel 4132



Channel 4183



Channel 4233

8. Effective Radiated Power and Effective Isotropic Radiated Power

WCDMA band V

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
Release 99	RMC,12.2kbps	826.4	4132	23.28	16.63	0.046
Release 99	RMC,12.2kbps	836.6	4183	23.45	16.80	0.048
Release 99	RMC,12.2kbps	846.6	4233	23.59	16.94	0.049

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
HSDPA	Subtest1	826.4	4132	22.29	15.64	0.037
HSDPA	Subtest1	836.6	4183	22.46	15.81	0.038
HSDPA	Subtest1	846.6	4233	22.61	15.96	0.039
HSDPA	Subtest2	826.4	4132	22.32	15.67	0.037
HSDPA	Subtest2	836.6	4183	22.47	15.82	0.038
HSDPA	Subtest2	846.6	4233	22.6	15.95	0.039
HSDPA	Subtest3	826.4	4132	21.79	15.14	0.033
HSDPA	Subtest3	836.6	4183	21.98	15.33	0.034
HSDPA	Subtest3	846.6	4233	22.08	15.43	0.035
HSDPA	Subtest4	826.4	4132	21.8	15.15	0.033
HSDPA	Subtest4	836.6	4183	21.94	15.29	0.034
HSDPA	Subtest4	846.6	4233	22.09	15.44	0.035

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
HSUPA	Subtest1	826.4	4132	22.2	15.55	0.036
HSUPA	Subtest1	836.6	4183	22.19	15.54	0.036
HSUPA	Subtest1	846.6	4233	22.2	15.55	0.036
HSUPA	Subtest2	826.4	4132	20.24	13.59	0.023
HSUPA	Subtest2	836.6	4183	20.2	13.55	0.023
HSUPA	Subtest2	846.6	4233	20.49	13.84	0.024
HSUPA	Subtest3	826.4	4132	21.03	14.38	0.027
HSUPA	Subtest3	836.6	4183	21.14	14.49	0.028
HSUPA	Subtest3	846.6	4233	21.36	14.71	0.030
HSUPA	Subtest4	826.4	4132	20	13.35	0.022
HSUPA	Subtest4	836.6	4183	20.47	13.82	0.024
HSUPA	Subtest4	846.6	4233	20.57	13.92	0.025
HSUPA	Subtest5	826.4	4132	22.13	15.48	0.035
HSUPA	Subtest5	836.6	4183	22.22	15.57	0.036
HSUPA	Subtest5	846.6	4233	22.31	15.66	0.037

Mode		Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
HSPA+	QPSK	826.4	4132	22.83	16.18	0.041
HSPA+	QPSK	836.6	4183	22.84	16.19	0.042
HSPA+	QPSK	846.6	4233	22.74	16.09	0.041
HSPA+	16QAM	826.4	4132	22.84	16.19	0.042
HSPA+	16QAM	836.6	4183	22.84	16.19	0.042
HSPA+	16QAM	846.6	4233	22.74	16.09	0.041

APPENDIX B – TEST DATA OF RADIATED EMISSION

Radiated Spurious Emissions

Note：The worst channel results are reflected in the report.

Note: The scanned graph represents the maximum of both horizontal and vertical polarizations and is not a single horizontal or vertical polarization scan.

WCDMA band II
Test result：
WCDMA Mode：
Channel 9400

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
11564.062500	-55.43	-13	Vertical
14564.062500	-50.38	-13	Vertical
16770.000000	-44.84	-13	Vertical
8981.250000	-55.56	-13	Vertical
7265.625000	-57.29	-13	Vertical
8622.656250	-55.84	-13	Vertical

WCDMA band V
Test result：
WCDMA Mode：
Channel 4183

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1671.812500	-61.17	-13	Vertical
1674.500000	-59.41	-13	Vertical
2508.375000	-67.06	-13	Vertical
2928.062500	-66.14	-13	Vertical
1400.000000	-62.19	-13	Vertical
2065.437500	-68.08	-13	Vertical

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