TEST REPORT

REPORT NUMBER: I22W00018-WCDMA RF-Rev2

ON

Type of Equipment:	4G Module
Type of Designation:	SIM7912A
Brand Name:	SIMCom
Manufacturer:	SIMCom Wireless Solutions Limited
FCC ID:	2AJYU-8XM0001

ACCORDING TO

FCC CFR Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS，e-CFR, 2019
PART 22, PUBLIC MOBILE SERVICES，e-CFR, 2019
PART 24, PERSONAL COMMUNICATIONS SERVICES，e-CFR, 2019
PART 27,MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES，e-CFR, 2019
ANSI C63.26-2015

Chongqing Academy of Information and Communications Technology

Month date, year
Jul, 15, 2022
Signature

Xiang Luoyong
Director

Note:
The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.

Revision Version

Report Number	Revision	Date	Memo
I22W00018-WCDMA RF	00	2022-05-18	Initial creation of test report
I22W00018-WCDMA RF-Rev1	01	2022-05-31	First change of test report
I22W00018-WCDMA RF-Rev2	02	2022-07-15	Second change of test report

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1. Test Laboratory

1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
FCC Registration Number:	CN1239
Address:	Building C, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	30-60%

1.3. Project data

Testing Start Date:	2022-03-12
Testing End Date:	2022-05-12

1.4. Signature

董俊鑫	2022-07-15
Dong Junxin (Prepared this test report)	**Date**
李旭	2022-07-15
Li Xu (Reviewed this test report)	**Date**
向罗勇	2022-07-15
Xiang Luoyong Director of the laboratory (Approved this test report)	**Date**

2. Client Information

2.1. Applicant Information

Company name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
City:	Shanghai
Country:	China
Telephone:	86-2131575100
Fax:	--
Email:	Yongsheng Li@simcom.com
Contact Person:	Yongsheng Li

2.2. Manufacturer Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
City:	Shanghai
Country:	China
Telephone:	86-2131575100
Fax:	--
Email:	Yongsheng Li@simcom.com
Contact Person:	Yongsheng Li

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	4G Module
Model name	SIM7912A
Brand name	SIMCom
LTE Frequency Band	2/4/5/7/12/13/14/17/25/26/41/42/66/71
LTE_CA Frequency Band	CA_7C/41C/42C
WCDMA Frequency Band	2/4/5
Type of modulation	QPSK/16QAM/64QAM
Extreme Temperature	-10/+55℃
Nominal Voltage	3.8
Extreme High Voltage	4.2
Extreme Low Voltage	3.4

Note: Photographs of EUT are shown in ANNEX A of this test report.
Note: High and low voltage values in extreme condition test are given by manufacturer.

3.2. Internal Identification of EUT used during the test

EUT ID	SN or IMEI	HW Version	SW Version	Date of receipt
S1	IMEI:864542050016092	V1.02	2110B01X12M42A-LGA	2022-03-02
S6	IMEI:864542050016100	V1.02	2110B01X12M42A-LGA	2022-03-02

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Outline of Equipment under Test

Technology	Band	UL Freq.(MHz)	DL Freq.(MHz)	Note
WCDMA	B2	1852.4-1907.6	1932.4-1987.6	--
	B4	1710.0-1755	2110.0-2155.0	--
	B5	826.4-846.6	871.4-891.6	--
LTE	B2	1850 – 1910	1930 – 1990	--
	B4	1710 – 1755	2110 – 2155	--
	B5	824 – 849	869 – 894	--
	B7	2500-2570	2620-2690	--
	B12	699-716	729-746	--
	B13	746-756	777-787	--
	B14	758-768	788-798	--
	B17	704-716	734-746	--
	B25	1850-1915	1930-1995	--
	B26	807-824	852-869	--
	B41	2496-2690	2496-2690	--
	B42	3400-3600	3400-3600	--
	B66	1710-1780	2110-2200	--
	B71	617-652	663-698	--
LTE_CA	B7	2500-2570	2620-2690	--
	B41	2496-2690	2496-2690	--
	B42	3400-3600	3400-3600	--

3.4. Internal Identification of AE used during the test

AE ID*	Description	dB*
AE1	--	≤1GHz：0.5 1GHz-2GHz：1.2 ≥1GHz：1.5

*AE ID: is used to identify the test sample in the lab internally.
dB*： is provided customer.

4. Reference Documents

4.1. Documents supplied by applicant

PICS/PIXIT, referring to Annex B for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS，e-CFR	2019
Part 22	PUBLIC MOBILE SERVICES	2019
Part 24	PERSONAL COMMUNICATIONS SERVICES，e-CFR	2019
PART 27	MISCELLANEOUS WIRELESS OMMUNICATIONS SERVICES，e-CFR	2019
ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015

5. Test Equipments Utilized

5.1. RF Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	spectrum analyzer	FSQ 26	201137/026	--	--	R&S	2022-06-11
2	DC Power Supply	N6705B	MY50000919	--	--	Agilent	2022-06-11
3	Universal Radio Communication Tester	CMW500	152395	--	--	R&S	2022-06-11

5.2. RSE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	Test Receiver	ESU26	100367	01	4.43 SP3	R&S	2022-06-11
2	Ultra-wideband Log Periodic Antenna	VULB 9163	01392	--	--	Schwarzbeck	2024-05-04
3	Double Ridged Guide Antenna	HF907	100357	--	--	R&S	2023-02-10

5.3. Climate Chamber

No.	Name	Type	SN	Manufacture	Cal.Due Date
1	Climate chamber	SH-241	92010759	ESPEC	2022-07-25
2	Fully-Anechoic Chamber	FACT3-2	--	ETS	2025-04-29

5.4. Vibration table

No.	Name	Type	SN	Manufacture	Cal.Due Date
--	--	--	--	--	--

Anechoic chamber

Fully anechoic chamber by ETS-LINDGREN.

5.5. Test software

No.	Name	version	SN	Manufacture
1	EMC32	V 8.51.00	--	R&S
2	T-RFS500	V2.0	--	Manufacturer:Beijing Zhiwang Xince Technology Co., Ltd.

6. Test Results

6.1. Summary of Test Results

A brief summary of the tests carried out is shown as following.

FCC Rules	Name of Test	Result
2.1046,22.913(a),24.232(c),27.50,	Conducted RF Power Output	Pass
2.1046,22.913(a),24.232 (c),27.50	ERP and EIRP	Pass
2.1049,22.917(b), 24.238(b)	Occupied Bandwidth	*Note 1
2.1051,24.238,2.1053,22.917, 27.53	Conducted spurious emissions	Pass
2.1051,24.238,2.1053,22.917, 27.53	Radiated Spurious Emission	Pass
2.1051,24.238, 2.1053, 22.917, 27.53	Band Edge	Pass
2.1055, 22.355, 24.235, 27.54	Frequency Stability	Pass
24.232, 27.50	Peak to Average Ratio	Pass

Note 1: No applicable performance criteria.

Note 2：Explanation of worst-case configuration The worst-case scenario for all measurements is based on the conducted output power. Output power was measured on QPSK,16QAM modulations. It was found that QPSK was the worst case. All testing was performed using QPSK modulations to represent the worst case unless otherwise stated. The test results shown in the following sections represent the worst case emission.

6.2. Conducted RF Power Output

Specifications:	FCC Part 2.1046, 22.913(a), 24.232(c), 27.50
DUT Serial Number:	864542050016100
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 22.913(a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to Part24.232(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.

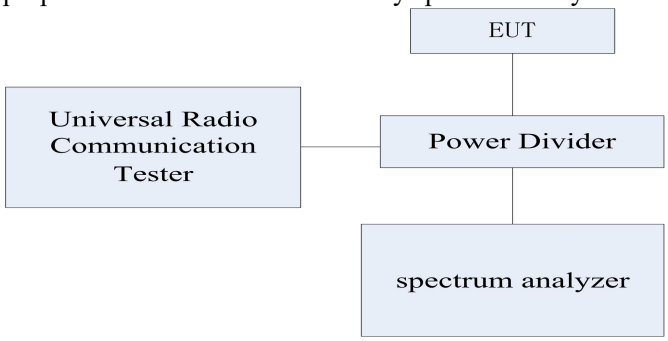
According to Part 27.50(d), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz Band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz Bands are limited to 1 watt EIRP.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.62 dB (k=2)

Test Setup:

During the test, the EUT was controlled via the Wireless Telecommunications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method:

1) The EUT was coupled to the spectrum analyzer and the Wireless Telecommunications Test Set through a power divider. The loss of the RF cables of the test system is calibrated to correct the readings.

2) For RMS power test, the spectrum analyzer was set to RMS Detector function and Maximum hold mode.

3) For Peak power test, the spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.

4) The resolution Bandwidth of the spectrum analyzer was comparable to the emission Bandwidth.

Note: --

6.2.1 Conducted RF Power Output Results

WCDMA Band 2

Mode	Subtest	Channel	Frequency (MHz)	Modulation	Average Power (dBm)	peak power (dBm)
RMC	-	9262	1852.4	QPSK	21.39	21.50
RMC	-	9400	1880	QPSK	21.82	21.88
RMC	-	9538	1907.6	QPSK	22.10	22.27
HSDPA	1	9262	1852.4	QPSK	20.12	20.19
HSDPA	2	9262	1852.4	QPSK	19.78	21.52
HSDPA	3	9262	1852.4	QPSK	18.52	21.12
HSDPA	4	9262	1852.4	QPSK	18.22	21.11
HSDPA	1	9400	1880	QPSK	21.01	21.06
HSDPA	2	9400	1880	QPSK	19.69	21.12
HSDPA	3	9400	1880	QPSK	18.52	20.64
HSDPA	4	9400	1880	QPSK	18.28	20.64
HSDPA	1	9538	1907.6	QPSK	19.50	19.56
HSDPA	2	9538	1907.6	QPSK	18.21	19.67
HSDPA	3	9538	1907.6	QPSK	17.04	19.19
HSDPA	4	9538	1907.6	QPSK	15.13	19.19
HSUPA	1	9262	1852.4	QPSK	17.46	17.70
HSUPA	1	9262	1852.4	Q16	18.47	18.75
HSUPA	2	9262	1852.4	QPSK	19.66	20.04
HSUPA	2	9262	1852.4	Q16	19.64	20.02
HSUPA	3	9262	1852.4	QPSK	16.66	16.70
HSUPA	3	9262	1852.4	Q16	16.66	16.71
HSUPA	4	9262	1852.4	QPSK	21.37	21.52
HSUPA	4	9262	1852.4	Q16	21.34	21.49
HSUPA	5	9262	1852.4	QPSK	15.30	15.51
HSUPA	5	9262	1852.4	Q16	15.31	15.52
HSUPA	1	9400	1880	QPSK	17.90	18.13
HSUPA	1	9400	1880	Q16	17.89	18.13
HSUPA	2	9400	1880	QPSK	19.19	19.59
HSUPA	2	9400	1880	Q16	19.19	19.59
HSUPA	3	9400	1880	QPSK	16.08	16.12
HSUPA	3	9400	1880	Q16	16.08	16.13
HSUPA	4	9400	1880	QPSK	20.82	20.95
HSUPA	4	9400	1880	Q16	20.81	20.94

HSUPA	5	9400	1880	QPSK	20.75	20.96
HSUPA	5	9400	1880	Q16	20.74	20.96
HSUPA	1	9538	1907.6	QPSK	16.45	16.68
HSUPA	1	9538	1907.6	Q16	16.45	16.68
HSUPA	2	9538	1907.6	QPSK	17.76	18.17
HSUPA	2	9538	1907.6	Q16	17.75	18.15
HSUPA	3	9538	1907.6	QPSK	14.63	14.69
HSUPA	3	9538	1907.6	Q16	14.63	14.70
HSUPA	4	9538	1907.6	QPSK	19.36	19.51
HSUPA	4	9538	1907.6	Q16	19.35	19.50
HSUPA	5	9538	1907.6	QPSK	13.34	13.55
HSUPA	5	9538	1907.6	Q16	13.37	13.58

WCDMA Band 4

Mode	Subtest	Channel	Frequency (MHz)	Modulation	Average Power power (dBm)	peak power (dBm)
RMC	-	1312	1712.4	QPSK	22.34	22.47
RMC	-	1412	1732.4	QPSK	22.08	22.20
RMC	-	1513	1752.6	QPSK	21.97	22.09
HSDPA	1	1312	1712.4	QPSK	21.79	21.85
HSDPA	2	1312	1712.4	QPSK	17.95	19.43
HSDPA	3	1312	1712.4	QPSK	16.86	19.06
HSDPA	4	1312	1712.4	QPSK	16.63	19.07
HSDPA	1	1412	1732.4	QPSK	20.66	20.72
HSDPA	2	1412	1732.4	QPSK	18.49	20.80
HSDPA	3	1412	1732.4	QPSK	17.82	20.41
HSDPA	4	1412	1732.4	QPSK	18.04	20.42
HSDPA	1	1513	1752.6	QPSK	20.37	20.43
HSDPA	2	1513	1752.6	QPSK	19.04	20.48
HSDPA	3	1513	1752.6	QPSK	17.90	20.02
HSDPA	4	1513	1752.6	QPSK	17.65	20.02
HSUPA	1	1312	1712.4	QPSK	18.54	18.76
HSUPA	1	1312	1712.4	Q16	16.27	16.48
HSUPA	2	1312	1712.4	QPSK	17.45	17.85
HSUPA	2	1312	1712.4	Q16	17.53	17.93
HSUPA	3	1312	1712.4	QPSK	14.40	14.52
HSUPA	3	1312	1712.4	Q16	14.36	14.49
HSUPA	4	1312	1712.4	QPSK	19.14	19.29

HSUPA	4	1312	1712.4	Q16	19.12	19.27
HSUPA	5	1312	1712.4	QPSK	13.05	13.33
HSUPA	5	1312	1712.4	Q16	13.06	13.33
HSUPA	1	1412	1732.4	QPSK	17.68	17.90
HSUPA	1	1412	1732.4	Q16	17.67	17.89
HSUPA	2	1412	1732.4	QPSK	18.86	19.25
HSUPA	2	1412	1732.4	Q16	18.84	19.24
HSUPA	3	1412	1732.4	QPSK	15.85	15.90
HSUPA	3	1412	1732.4	Q16	15.85	15.90
HSUPA	4	1412	1732.4	QPSK	20.49	20.64
HSUPA	4	1412	1732.4	Q16	20.47	20.61
HSUPA	5	1412	1732.4	QPSK	14.47	14.72
HSUPA	5	1412	1732.4	Q16	14.49	14.74
HSUPA	1	1513	1752.6	QPSK	17.28	17.51
HSUPA	1	1513	1752.6	Q16	17.27	17.50
HSUPA	2	1513	1752.6	QPSK	18.50	18.90
HSUPA	2	1513	1752.6	Q16	18.49	18.89
HSUPA	3	1513	1752.6	QPSK	15.45	15.51
HSUPA	3	1513	1752.6	Q16	15.45	15.51
HSUPA	4	1513	1752.6	QPSK	20.12	20.27
HSUPA	4	1513	1752.6	Q16	20.11	20.26
HSUPA	5	1513	1752.6	QPSK	14.23	14.47
HSUPA	5	1513	1752.6	Q16	14.14	14.40

WCDMA Band 5

Mode	Subtest	Channel	Frequency (MHz)	Modulation	Average Power (dBm)	peak power (dBm)
RMC	-	4132	826.4	QPSK	22.10	22.19
RMC	-	4183	836.6	QPSK	22.08	22.18
RMC	-	4233	846.6	QPSK	22.09	22.23
HSDPA	1	4132	826.4	QPSK	20.16	20.20
HSDPA	2	4132	826.4	QPSK	17.67	19.94
HSDPA	3	4132	826.4	QPSK	17.00	19.57
HSDPA	4	4132	826.4	QPSK	16.69	19.56
HSDPA	1	4183	836.6	QPSK	21.03	21.08
HSDPA	2	4183	836.6	QPSK	19.72	21.10
HSDPA	3	4183	836.6	QPSK	18.54	20.64
HSDPA	4	4183	836.6	QPSK	17.23	20.62

HSDPA	1	4233	846.6	QPSK	20.42	20.47
HSDPA	2	4233	846.6	QPSK	18.19	20.50
HSDPA	3	4233	846.6	QPSK	17.91	20.03
HSDPA	4	4233	846.6	QPSK	17.76	20.13
HSUPA	1	4132	826.4	QPSK	17.24	17.47
HSUPA	1	4132	826.4	Q16	16.92	17.15
HSUPA	2	4132	826.4	QPSK	18.10	18.44
HSUPA	2	4132	826.4	Q16	18.19	18.53
HSUPA	3	4132	826.4	QPSK	15.13	15.17
HSUPA	3	4132	826.4	Q16	15.12	15.16
HSUPA	4	4132	826.4	QPSK	19.78	19.92
HSUPA	4	4132	826.4	Q16	19.76	19.91
HSUPA	5	4132	826.4	QPSK	13.70	13.91
HSUPA	5	4132	826.4	Q16	13.71	13.92
HSUPA	1	4183	836.6	QPSK	18.10	18.32
HSUPA	1	4183	836.6	Q16	18.10	18.32
HSUPA	2	4183	836.6	QPSK	19.33	19.68
HSUPA	2	4183	836.6	Q16	19.32	19.67
HSUPA	3	4183	836.6	QPSK	16.24	16.26
HSUPA	3	4183	836.6	Q16	16.25	16.27
HSUPA	4	4183	836.6	QPSK	20.93	21.06
HSUPA	4	4183	836.6	Q16	20.91	21.05
HSUPA	5	4183	836.6	QPSK	14.86	15.07
HSUPA	5	4183	836.6	Q16	14.88	15.09
HSUPA	1	4233	846.6	QPSK	17.38	17.60
HSUPA	1	4233	846.6	Q16	17.38	17.60
HSUPA	2	4233	846.6	QPSK	18.70	19.07
HSUPA	2	4233	846.6	Q16	18.70	19.06
HSUPA	3	4233	846.6	QPSK	15.61	15.66
HSUPA	3	4233	846.6	Q16	15.62	15.66
HSUPA	4	4233	846.6	QPSK	20.34	20.52
HSUPA	4	4233	846.6	Q16	20.37	20.49
HSUPA	5	4233	846.6	QPSK	14.28	14.57
HSUPA	5	4233	846.6	Q16	14.32	14.58

6.3. ERP and EIRP

Limit Level Construction:

This is the test for the maximum radiated power from the EUT.

According to Part 24.232(c),"Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power"and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

According to 22.913(a), The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

According to Part 27.50(d), 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.

Conducted RF Power+Antenna Gain=ERIP

Conducted RF Power+Antenna Gain=ERP

6.3.1 WCDMA result

WCDMA Band 2
Limits 33dBm(2w)
Max EIRP:23.6dBm

Mode	Subtest	Channel	Frequency (MHz)	Modulation	Average Power (dBm)	Radiated Power(dBm) G_T= 1.5dBi
RMC	-	9262	1852.4	QPSK	21.39	22.89
RMC	-	9400	1880	QPSK	21.82	23.32
RMC	-	9538	1907.6	QPSK	22.10	**23.60**
HSDPA	1	9262	1852.4	QPSK	20.12	21.62
HSDPA	2	9262	1852.4	QPSK	19.78	21.28
HSDPA	3	9262	1852.4	QPSK	18.52	20.02
HSDPA	4	9262	1852.4	QPSK	18.22	19.72
HSDPA	1	9400	1880	QPSK	21.01	22.51
HSDPA	2	9400	1880	QPSK	19.69	21.19
HSDPA	3	9400	1880	QPSK	18.52	20.02
HSDPA	4	9400	1880	QPSK	18.28	19.78
HSDPA	1	9538	1907.6	QPSK	19.50	21.00
HSDPA	2	9538	1907.6	QPSK	18.21	19.71
HSDPA	3	9538	1907.6	QPSK	17.04	18.54
HSDPA	4	9538	1907.6	QPSK	15.13	16.63
HSUPA	1	9262	1852.4	QPSK	17.46	18.96
HSUPA	1	9262	1852.4	Q16	18.47	19.97
HSUPA	2	9262	1852.4	QPSK	19.66	21.16
HSUPA	2	9262	1852.4	Q16	19.64	21.14
HSUPA	3	9262	1852.4	QPSK	16.66	18.16
HSUPA	3	9262	1852.4	Q16	16.66	18.16
HSUPA	4	9262	1852.4	QPSK	21.37	22.87
HSUPA	4	9262	1852.4	Q16	21.34	22.84
HSUPA	5	9262	1852.4	QPSK	15.30	16.80
HSUPA	5	9262	1852.4	Q16	15.31	16.81
HSUPA	1	9400	1880	QPSK	17.90	19.40
HSUPA	1	9400	1880	Q16	17.89	19.39
HSUPA	2	9400	1880	QPSK	19.19	20.69
HSUPA	2	9400	1880	Q16	19.19	20.69

HSUPA	3	9400	1880	QPSK	16.08	17.58
HSUPA	3	9400	1880	Q16	16.08	17.58
HSUPA	4	9400	1880	QPSK	20.82	22.32
HSUPA	4	9400	1880	Q16	20.81	22.31
HSUPA	5	9400	1880	QPSK	20.75	22.25
HSUPA	5	9400	1880	Q16	20.74	22.24
HSUPA	1	9538	1907.6	QPSK	16.45	17.95
HSUPA	1	9538	1907.6	Q16	16.45	17.95
HSUPA	2	9538	1907.6	QPSK	17.76	19.26
HSUPA	2	9538	1907.6	Q16	17.75	19.25
HSUPA	3	9538	1907.6	QPSK	14.63	16.13
HSUPA	3	9538	1907.6	Q16	14.63	16.13
HSUPA	4	9538	1907.6	QPSK	19.36	20.86
HSUPA	4	9538	1907.6	Q16	19.35	20.85
HSUPA	5	9538	1907.6	QPSK	13.34	14.84
HSUPA	5	9538	1907.6	Q16	13.37	14.87

WCDMA Band 4

Limits 30dBm(1w)
Max EIRP:23.34dBm

Mode	Subtest	Channel	Frequency (MHz)	Modulation	Average Power (dBm)	Radiated Power(dBm) G_T= 1.0 dBi
RMC	-	1312	1712.4	QPSK	22.34	**23.34**
RMC	-	1412	1732.4	QPSK	22.08	23.08
RMC	-	1513	1752.6	QPSK	21.97	22.97
HSDPA	1	1312	1712.4	QPSK	21.79	22.79
HSDPA	2	1312	1712.4	QPSK	17.95	18.95
HSDPA	3	1312	1712.4	QPSK	16.86	17.86
HSDPA	4	1312	1712.4	QPSK	16.63	17.63
HSDPA	1	1412	1732.4	QPSK	20.66	21.66
HSDPA	2	1412	1732.4	QPSK	18.49	19.49
HSDPA	3	1412	1732.4	QPSK	17.82	18.82
HSDPA	4	1412	1732.4	QPSK	18.04	19.04
HSDPA	1	1513	1752.6	QPSK	20.37	21.37
HSDPA	2	1513	1752.6	QPSK	19.04	20.04
HSDPA	3	1513	1752.6	QPSK	17.90	18.90
HSDPA	4	1513	1752.6	QPSK	17.65	18.65
HSUPA	1	1312	1712.4	QPSK	18.54	19.54
HSUPA	1	1312	1712.4	Q16	16.27	17.27
HSUPA	2	1312	1712.4	QPSK	17.45	18.45
HSUPA	2	1312	1712.4	Q16	17.53	18.53
HSUPA	3	1312	1712.4	QPSK	14.40	15.40
HSUPA	3	1312	1712.4	Q16	14.36	15.36
HSUPA	4	1312	1712.4	QPSK	19.14	20.14
HSUPA	4	1312	1712.4	Q16	19.12	20.12
HSUPA	5	1312	1712.4	QPSK	13.05	14.05
HSUPA	5	1312	1712.4	Q16	13.06	14.06
HSUPA	1	1412	1732.4	QPSK	17.68	18.68
HSUPA	1	1412	1732.4	Q16	17.67	18.67
HSUPA	2	1412	1732.4	QPSK	18.86	19.86
HSUPA	2	1412	1732.4	Q16	18.84	19.84
HSUPA	3	1412	1732.4	QPSK	15.85	16.85

HSUPA	3	1412	1732.4	Q16	15.85	16.85
HSUPA	4	1412	1732.4	QPSK	20.49	21.49
HSUPA	4	1412	1732.4	Q16	20.47	21.47
HSUPA	5	1412	1732.4	QPSK	14.47	15.47
HSUPA	5	1412	1732.4	Q16	14.49	15.49
HSUPA	1	1513	1752.6	QPSK	17.28	18.28
HSUPA	1	1513	1752.6	Q16	17.27	18.27
HSUPA	2	1513	1752.6	QPSK	18.50	19.50
HSUPA	2	1513	1752.6	Q16	18.49	19.49
HSUPA	3	1513	1752.6	QPSK	15.45	16.45
HSUPA	3	1513	1752.6	Q16	15.45	16.45
HSUPA	4	1513	1752.6	QPSK	20.12	21.12
HSUPA	4	1513	1752.6	Q16	20.11	21.11
HSUPA	5	1513	1752.6	QPSK	14.23	15.23
HSUPA	5	1513	1752.6	Q16	14.14	15.14

WCDMA Band 5

Limits 38.5dBm(7w)
Max ERP:22.60dBm

Mode	Subtest	Channel	Frequency (MHz)	Modulation	Average Power (dBm)	Radiated Power(dBm) G_T= 0.5dBi
RMC	-	4132	826.4	QPSK	22.10	**22.60**
RMC	-	4183	836.6	QPSK	22.08	22.58
RMC	-	4233	846.6	QPSK	22.09	22.59
HSDPA	1	4132	826.4	QPSK	20.16	20.66
HSDPA	2	4132	826.4	QPSK	17.67	18.17
HSDPA	3	4132	826.4	QPSK	17.00	17.50
HSDPA	4	4132	826.4	QPSK	16.69	17.19
HSDPA	1	4183	836.6	QPSK	21.03	21.53
HSDPA	2	4183	836.6	QPSK	19.72	20.22
HSDPA	3	4183	836.6	QPSK	18.54	19.04
HSDPA	4	4183	836.6	QPSK	17.23	17.73
HSDPA	1	4233	846.6	QPSK	20.42	20.92
HSDPA	2	4233	846.6	QPSK	18.19	18.69
HSDPA	3	4233	846.6	QPSK	17.91	18.41
HSDPA	4	4233	846.6	QPSK	17.76	18.26
HSUPA	1	4132	826.4	QPSK	17.24	17.74
HSUPA	1	4132	826.4	Q16	16.92	17.42
HSUPA	2	4132	826.4	QPSK	18.10	18.60
HSUPA	2	4132	826.4	Q16	18.19	18.69
HSUPA	3	4132	826.4	QPSK	15.13	15.63
HSUPA	3	4132	826.4	Q16	15.12	15.62
HSUPA	4	4132	826.4	QPSK	19.78	20.28
HSUPA	4	4132	826.4	Q16	19.76	20.26
HSUPA	5	4132	826.4	QPSK	13.70	14.20
HSUPA	5	4132	826.4	Q16	13.71	14.21
HSUPA	1	4183	836.6	QPSK	18.10	18.60
HSUPA	1	4183	836.6	Q16	18.10	18.60
HSUPA	2	4183	836.6	QPSK	19.33	19.83
HSUPA	2	4183	836.6	Q16	19.32	19.82
HSUPA	3	4183	836.6	QPSK	16.24	16.74

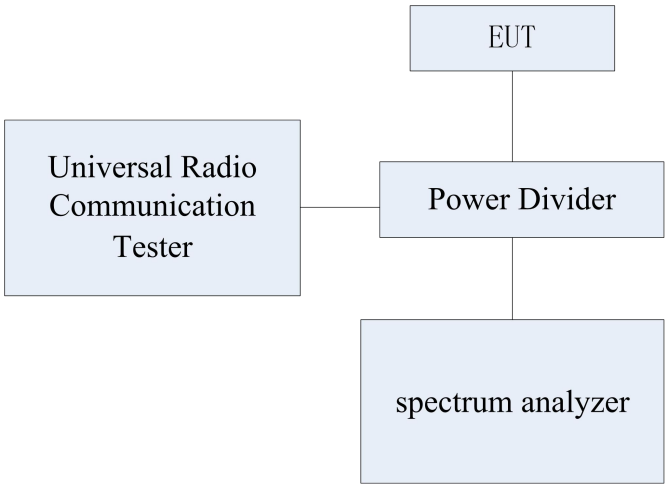
HSUPA	3	4183	836.6	Q16	16.25	16.75
HSUPA	4	4183	836.6	QPSK	20.93	21.43
HSUPA	4	4183	836.6	Q16	20.91	21.41
HSUPA	5	4183	836.6	QPSK	14.86	15.36
HSUPA	5	4183	836.6	Q16	14.88	15.38
HSUPA	1	4233	846.6	QPSK	17.38	17.88
HSUPA	1	4233	846.6	Q16	17.38	17.88
HSUPA	2	4233	846.6	QPSK	18.70	19.20
HSUPA	2	4233	846.6	Q16	18.70	19.20
HSUPA	3	4233	846.6	QPSK	15.61	16.11
HSUPA	3	4233	846.6	Q16	15.62	16.12
HSUPA	4	4233	846.6	QPSK	20.34	20.84
HSUPA	4	4233	846.6	Q16	20.37	20.87
HSUPA	5	4233	846.6	QPSK	14.28	14.78
HSUPA	5	4233	846.6	Q16	14.32	14.82

6.4. Occupied Bandwidth

Specifications:	FCC Part 2.1049, 22.917(b), 24.238(b)
DUT Serial Number:	864542050016100
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	500 kHz (k=2)

Test Method

The 99% occupied Bandwidth was calculated from the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power Band. The 26dB Bandwidth was also measured and recorded.

Note: --

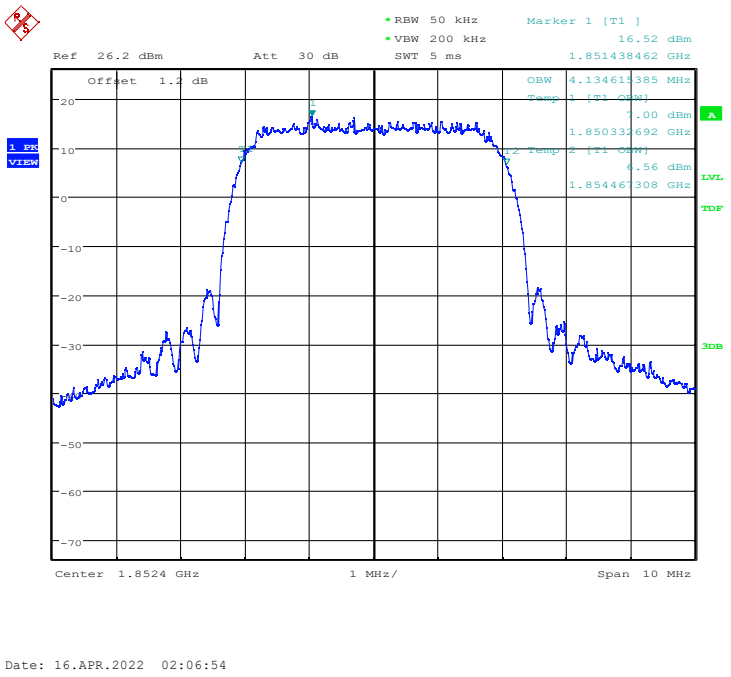
6.4.1 occupied bandwidth Results

WCDMA Band 2 (99%)-QPSK

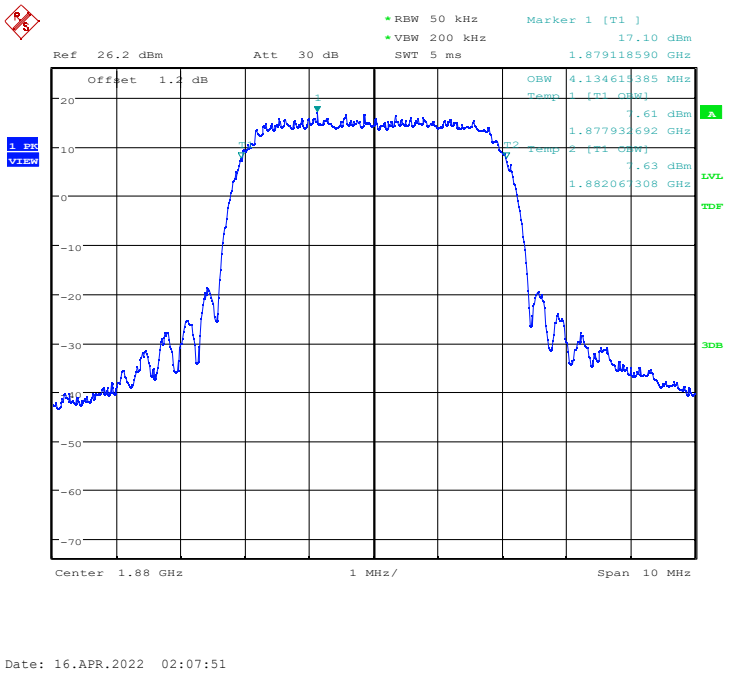
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
1852.4	4.135
1880	4.135
1907.6	4.135

WCDMA Band 2 (99%)

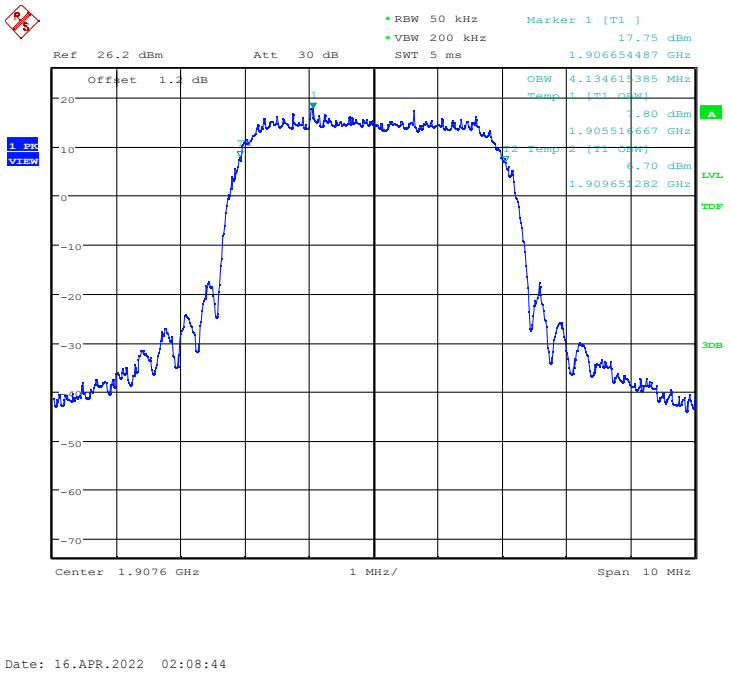
Channel 9262-Occupied Bandwidth (99% BW)



Channel 9400-Occupied Bandwidth (99% BW)



Channel 9538-Occupied Bandwidth (99% BW)

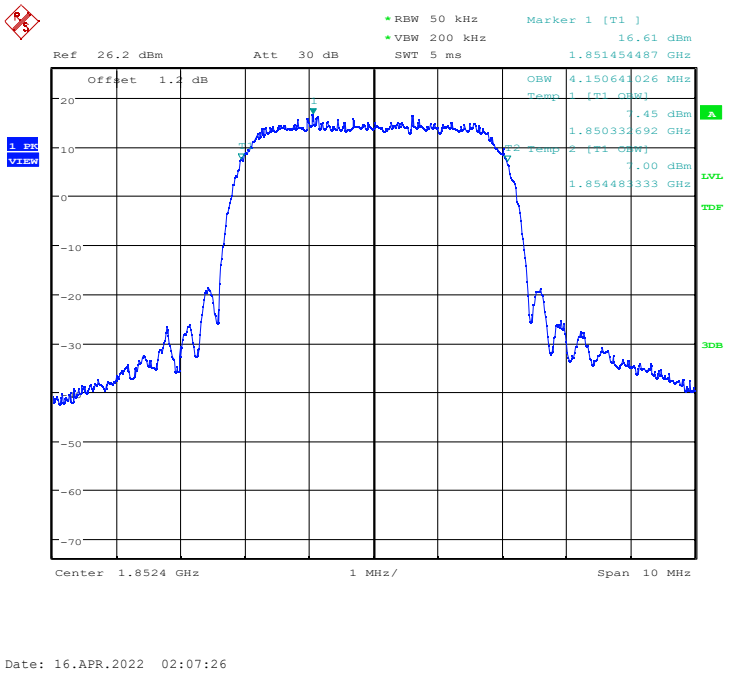


WCDMA Band 2 (99%)-16QAM

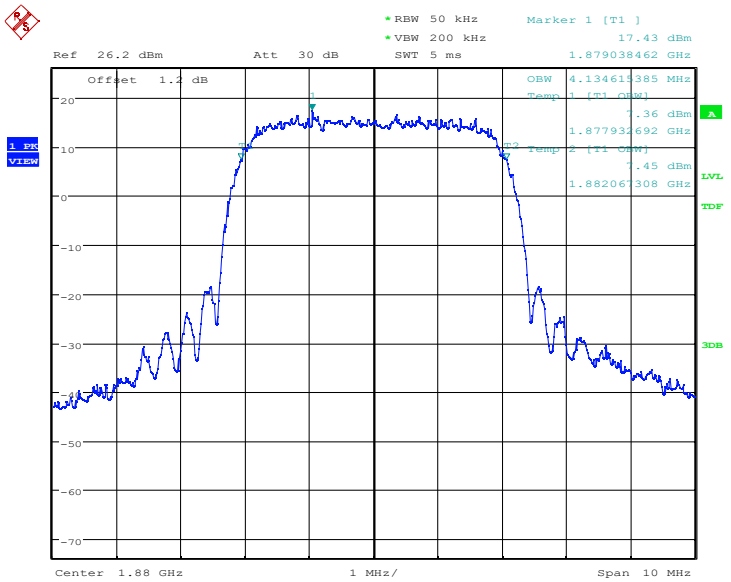
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
1852.4	4.151
1880	4.135
1907.6	4.135

WCDMA Band 2 (99%)

Channel 9262-Occupied Bandwidth (99% BW)

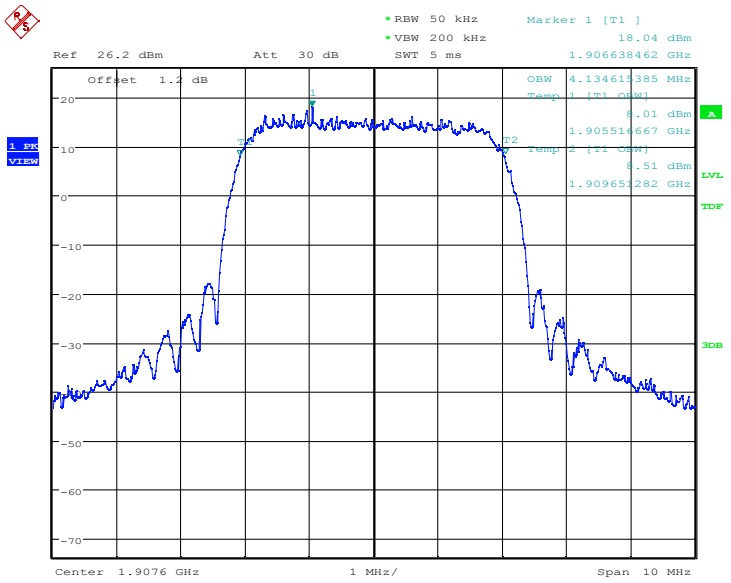


Channel 9400-Occupied Bandwidth (99% BW)



Date: 16.APR.2022 02:08:16

Channel 9538-Occupied Bandwidth (99% BW)



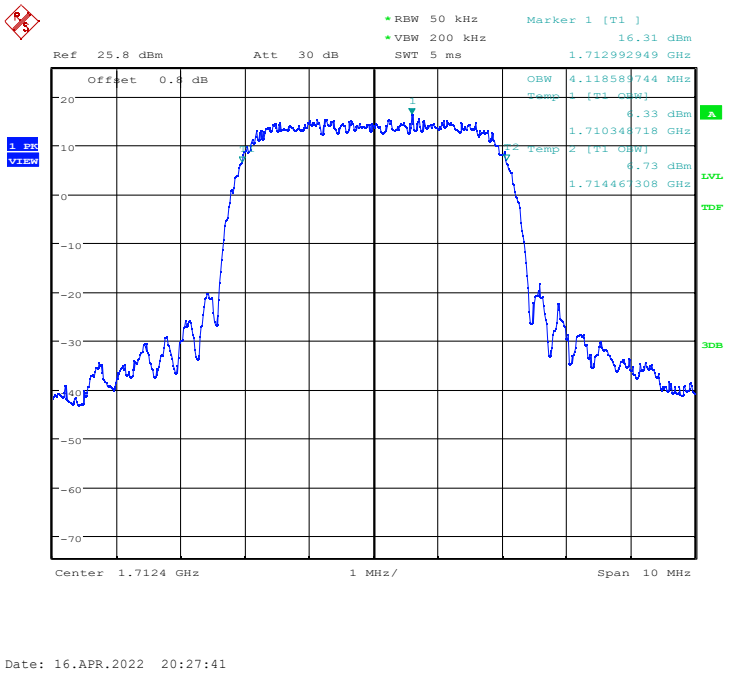
Date: 16.APR.2022 02:09:13

WCDMA Band 4 (99%)-QPSK

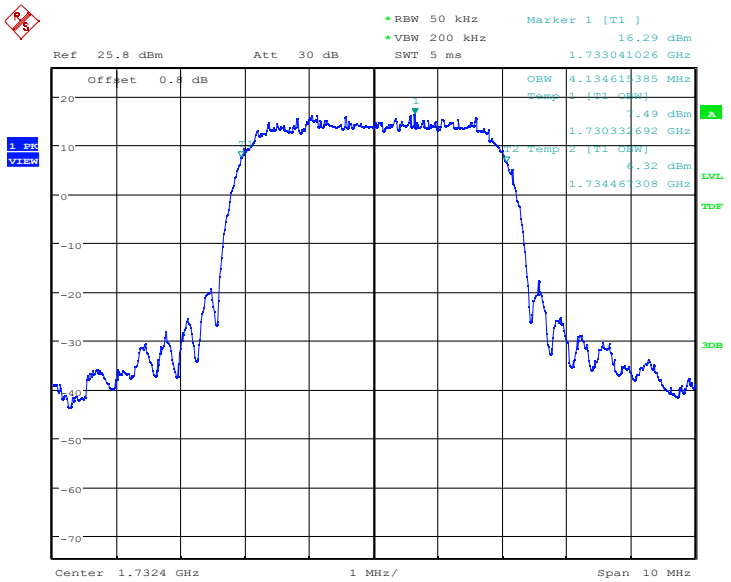
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
1712.4	4.119
1732.4	4.135
1752.6	4.151

WCDMA Band 4 (99%)

Channel 1312-Occupied Bandwidth (99% BW)

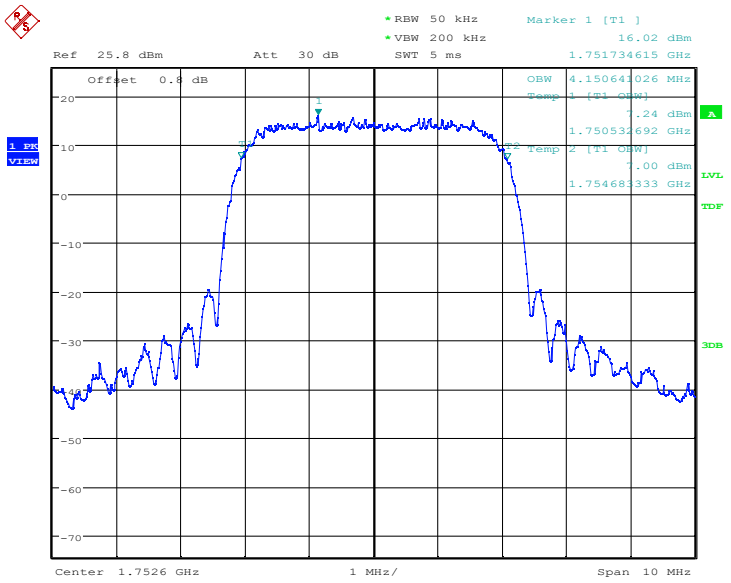


Channel 1412-Occupied Bandwidth (99% BW)



Date: 16.APR.2022 20:28:35

Channel 1513-Occupied Bandwidth (99% BW)



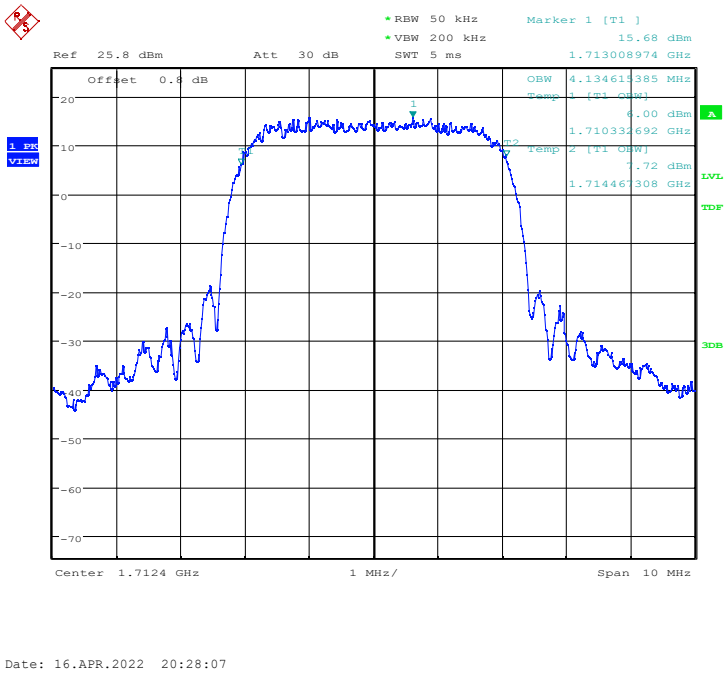
Date: 16.APR.2022 20:29:31

WCDMA Band 4 (99%)-16QAM

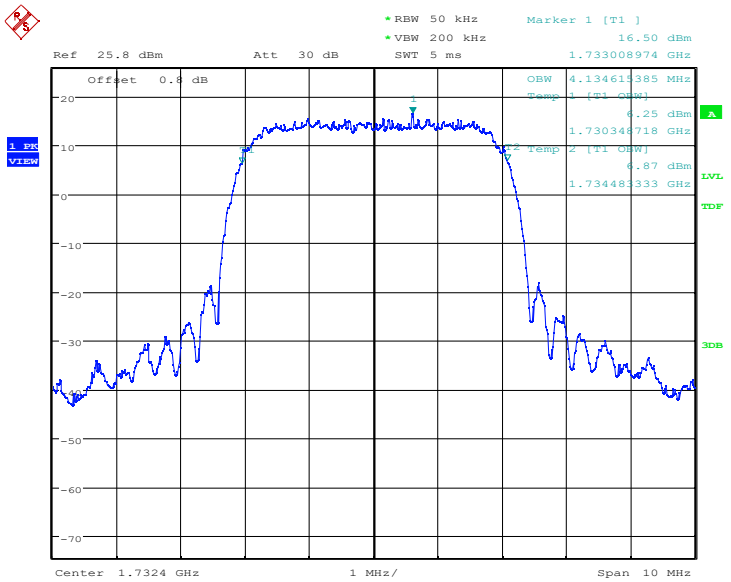
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
1712.4	4.135
1732.4	4.135
1752.6	4.135

WCDMA Band 4 (99%)

Channel 1312-Occupied Bandwidth (99% BW)



Channel 1412-Occupied Bandwidth (99% BW)



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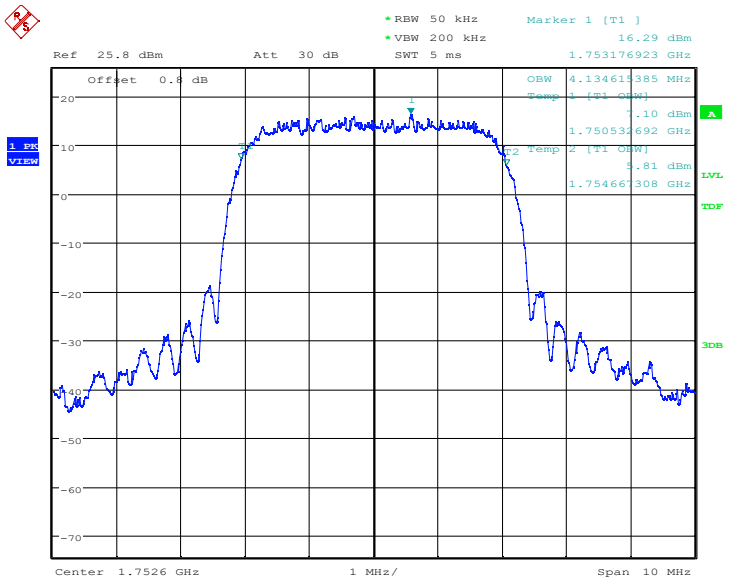
Channel 1513-Occupied Bandwidth (99% BW)



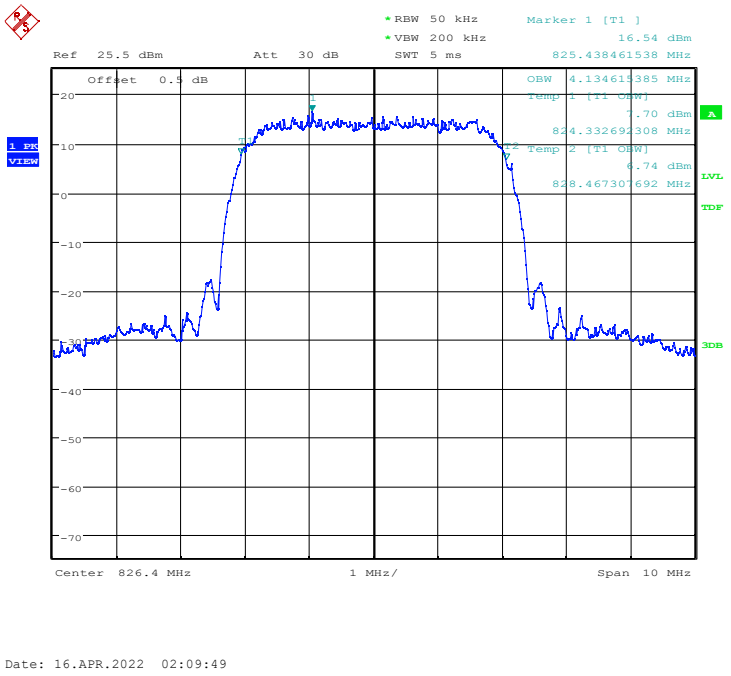
Date: 16.APR.2022 20:30:01

WCDMA Band 5 (99%)-QPSK

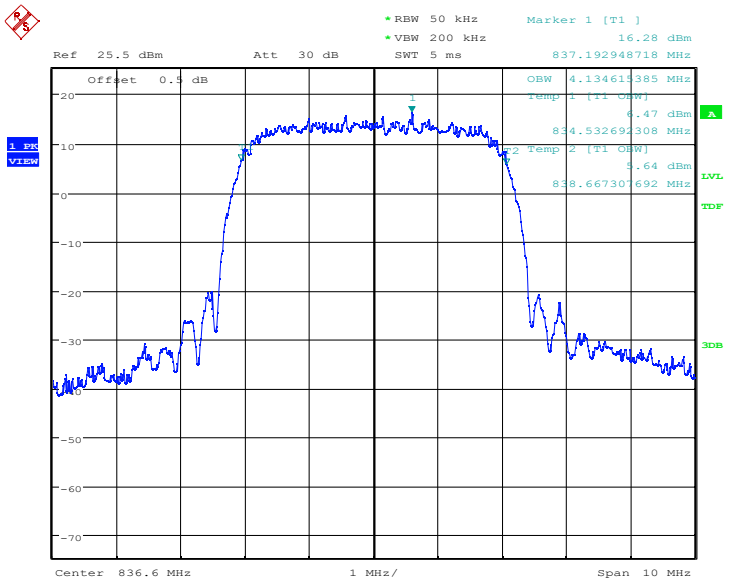
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
826.4	4.135
836.6	4.135
846.6	4.119

WCDMA Band 5 (99%)

Channel 4132-Occupied Bandwidth (99% BW)

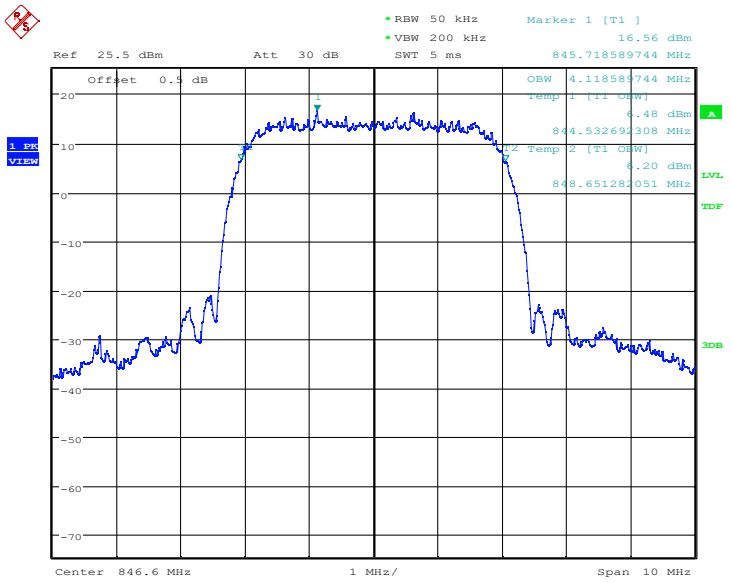


Channel 4183-Occupied Bandwidth (99% BW)



Date: 16.APR.2022 02:10:46

Channel 4233-Occupied Bandwidth (99% BW)



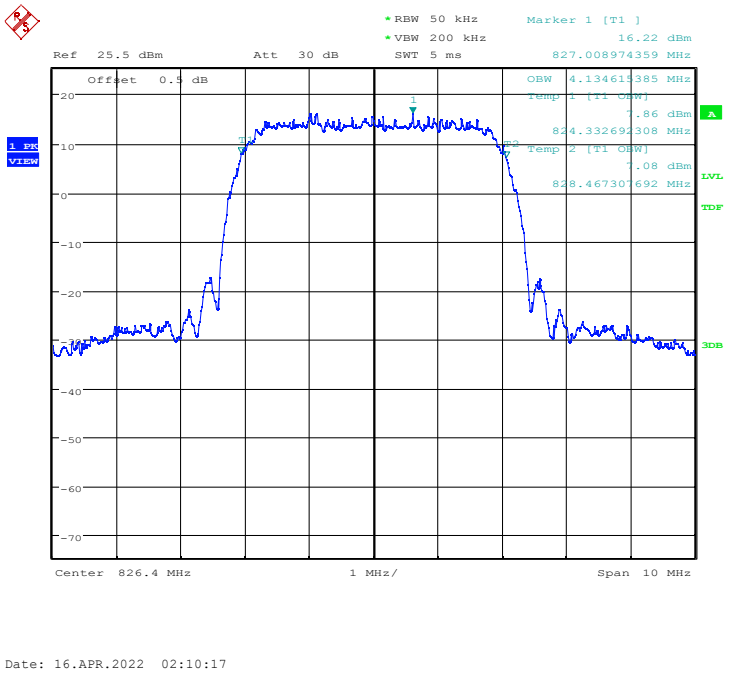
Date: 16.APR.2022 02:11:41

WCDMA Band 5 (99%)-16QAM

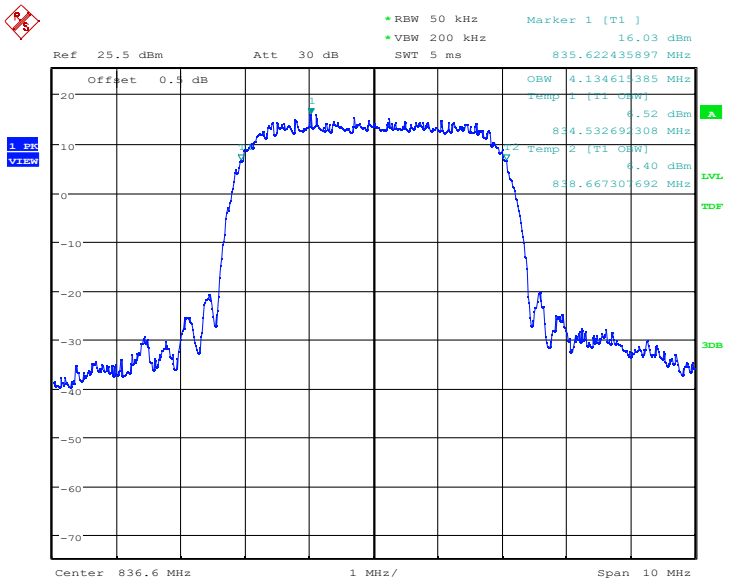
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
826.4	4.135
836.6	4.135
846.6	4.119

WCDMA Band 5 (99%)

Channel 4132-Occupied Bandwidth (99% BW)

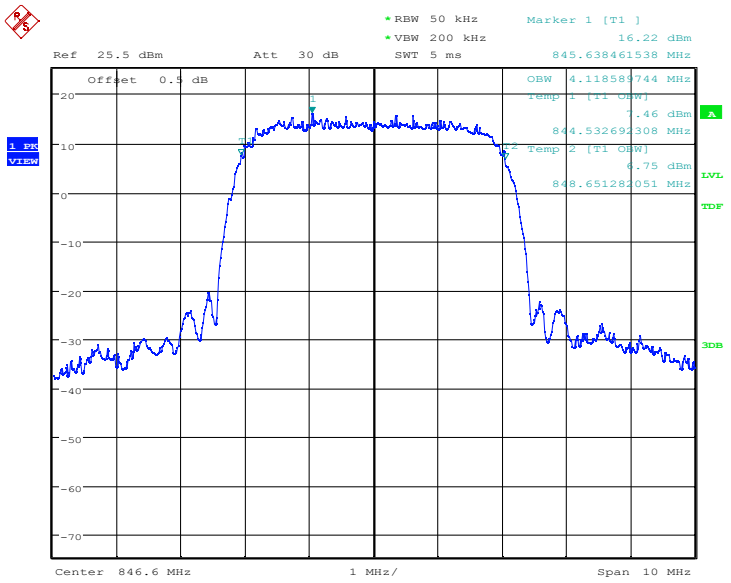


Channel 4183-Occupied Bandwidth (99% BW)



Date: 16.APR.2022 02:11:13

Channel 4233-Occupied Bandwidth (99% BW)



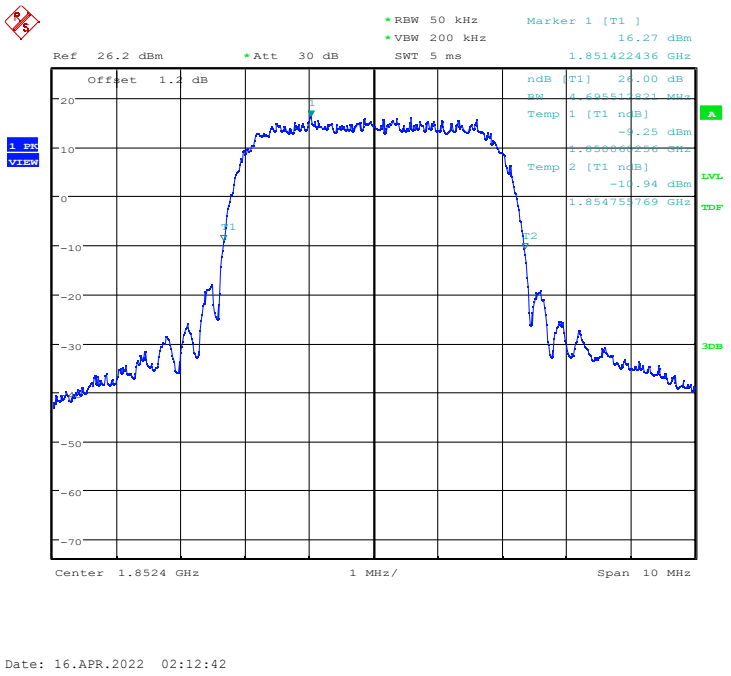
Date: 16.APR.2022 02:12:08

WCDMA Band 2 (-26dBc)-QPSK

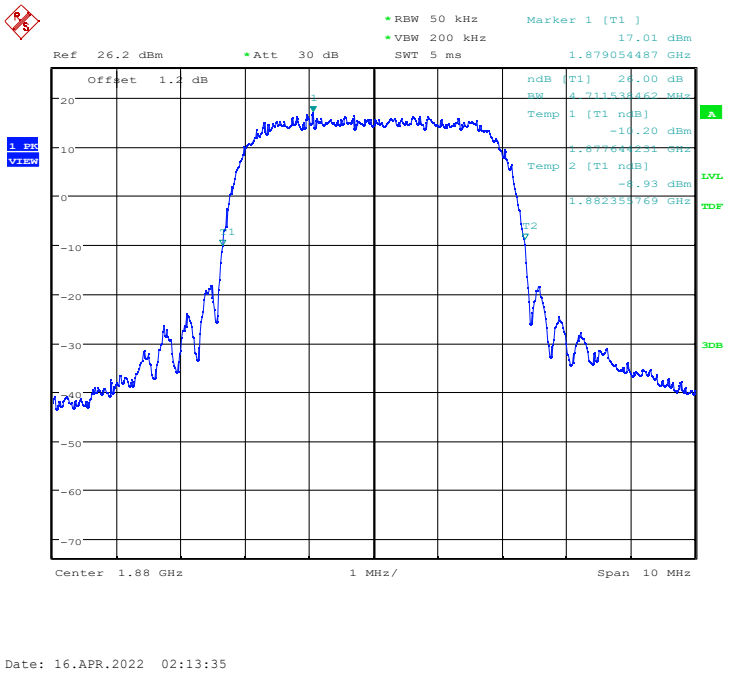
Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
1852.4	4.696
1880	4.712
1907.6	4.679

WCDMA Band 2 (-26dBc)

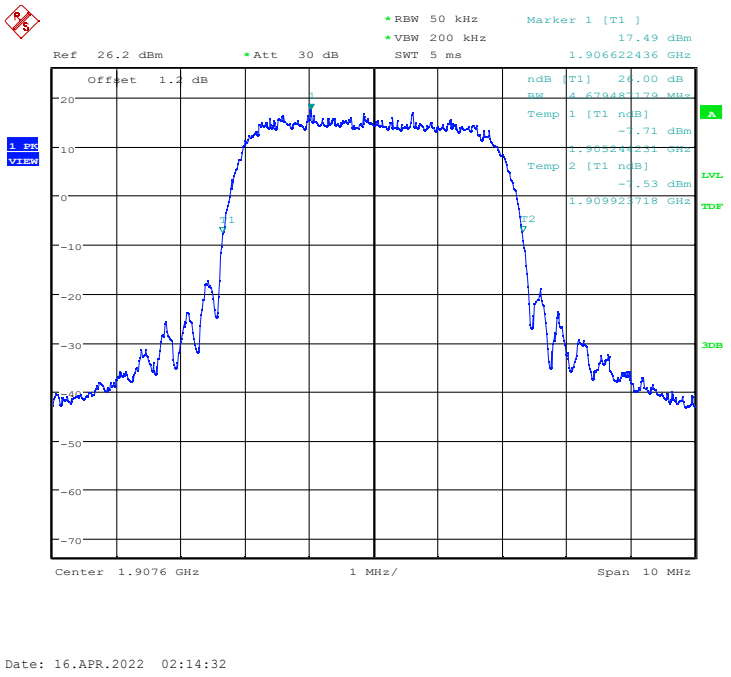
Channel 9262-Emission Bandwidth (-26dBc BW)



Channel 9400-Emission Bandwidth (-26dBc BW)



Channel 9538-Emission Bandwidth (-26dBc BW)

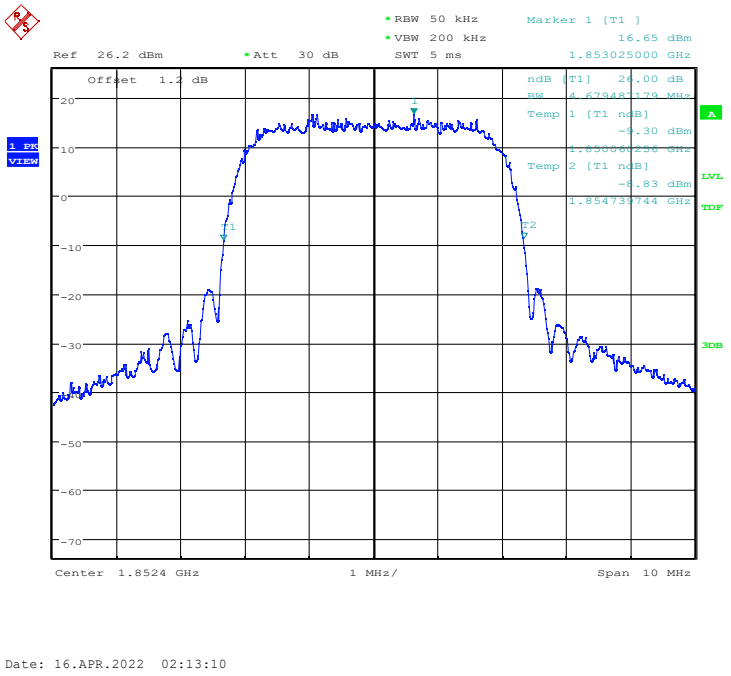


WCDMA Band 2 (-26dBc)-16QAM

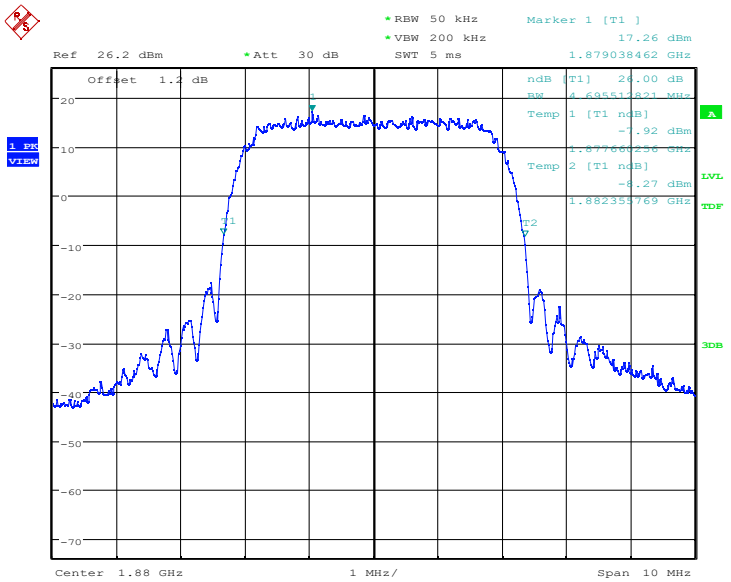
Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
1852.4	4.679
1880	4.696
1907.6	4.696

WCDMA Band 2 (-26dBc)

Channel 9262-Emission Bandwidth (-26dBc BW)

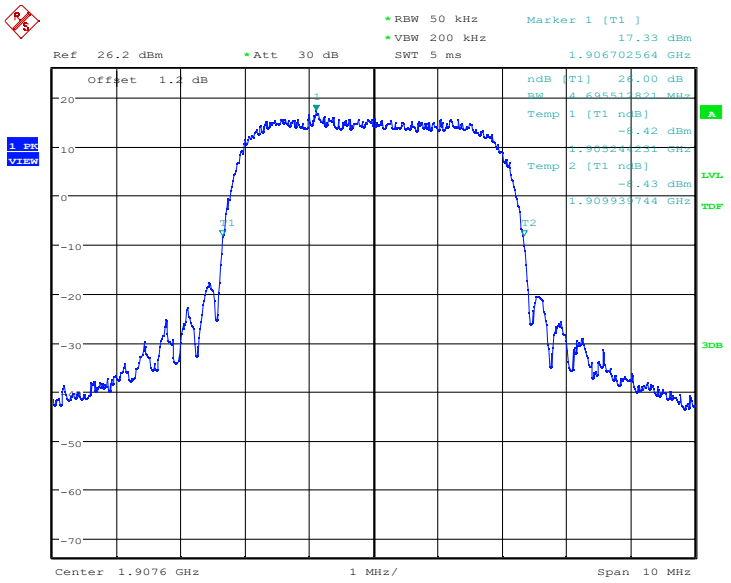


Channel 9400-Emission Bandwidth (-26dBc BW)



Date: 16.APR.2022 02:14:01

Channel 9538-Emission Bandwidth (-26dBc BW)



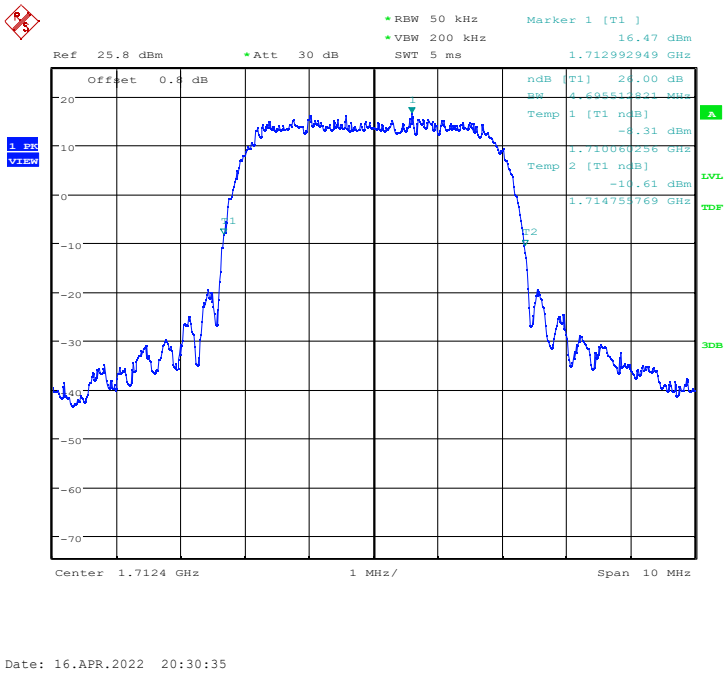
Date: 16.APR.2022 02:15:02

WCDMA Band 4 (-26dBc)-QPSK

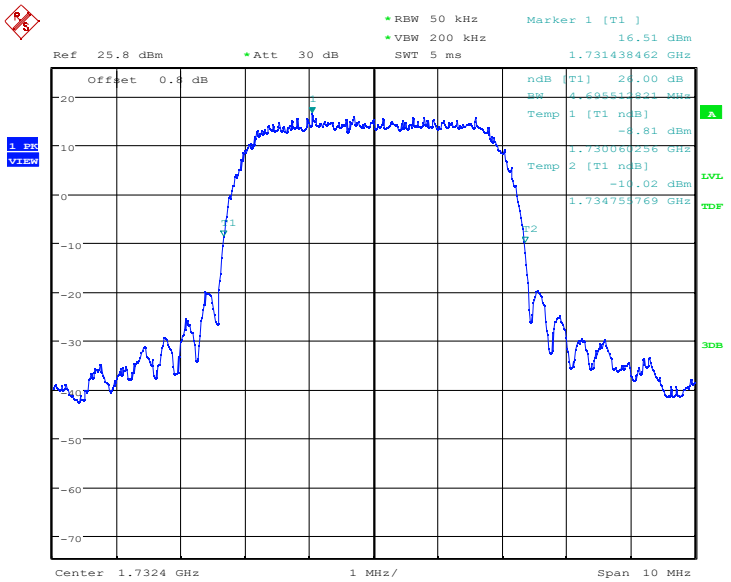
Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
1712.4	4.696
1732.4	4.696
1752.6	4.696

WCDMA Band 4 (-26dBc)

Channel 1312-Emission Bandwidth (-26dBc BW)

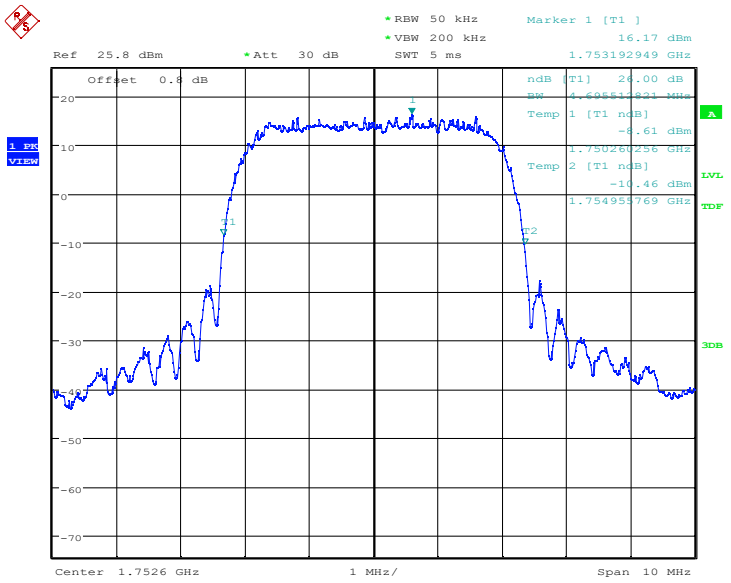


Channel 1412-Emission Bandwidth (-26dBc BW)



Date: 16.APR.2022 20:31:36

Channel 1513-Emission Bandwidth (-26dBc BW)



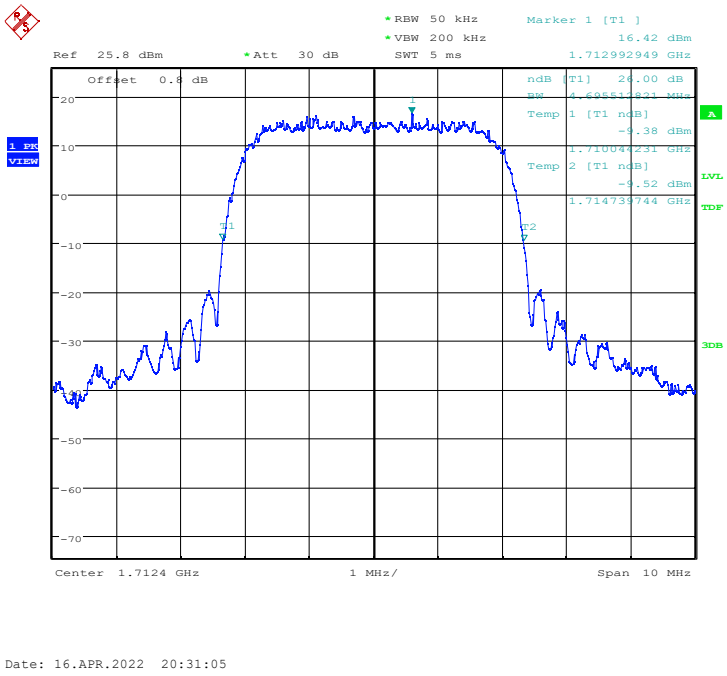
Date: 16.APR.2022 20:32:42

WCDMA Band 4 (-26dBc)-16QAM

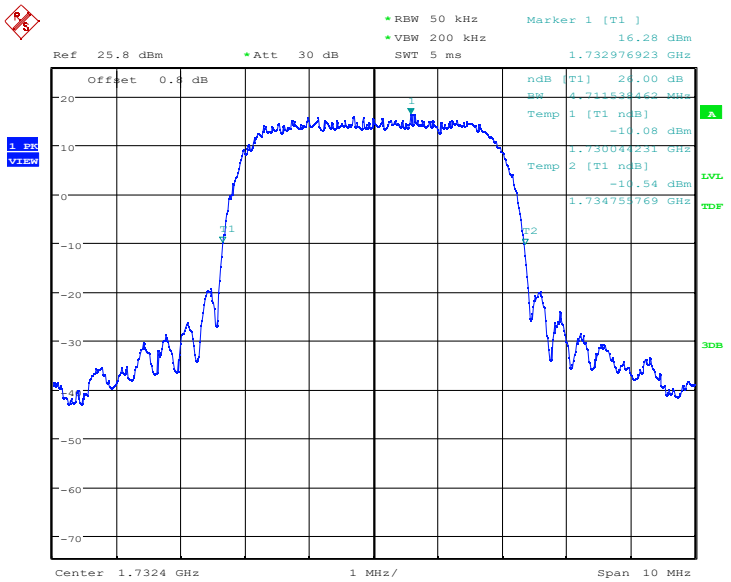
Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
1712.4	4.696
1732.4	4.712
1752.6	4.712

WCDMA Band 4 (-26dBc)

Channel 1312-Emission Bandwidth (-26dBc BW)

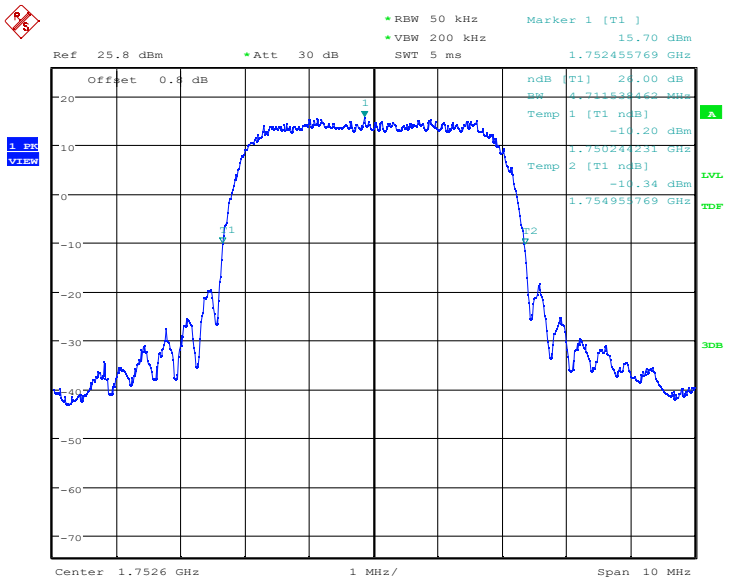


Channel 1412-Emission Bandwidth (-26dBc BW)



Date: 16.APR.2022 20:32:06

Channel 1513-Emission Bandwidth (-26dBc BW)



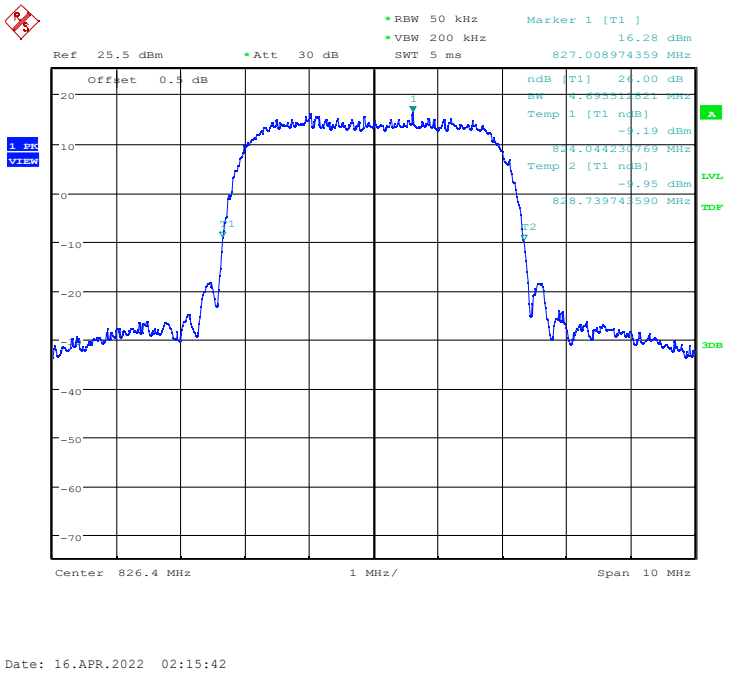
Date: 16.APR.2022 20:33:12

WCDMA Band 5 (-26dBc)-QPSK

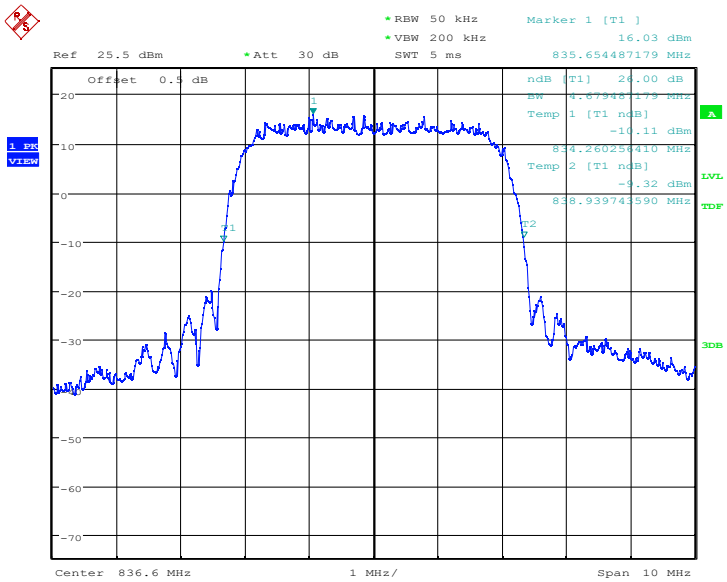
Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
826.4	4.696
836.6	4.679
846.6	4.712

WCDMA Band 5 (-26dBc)

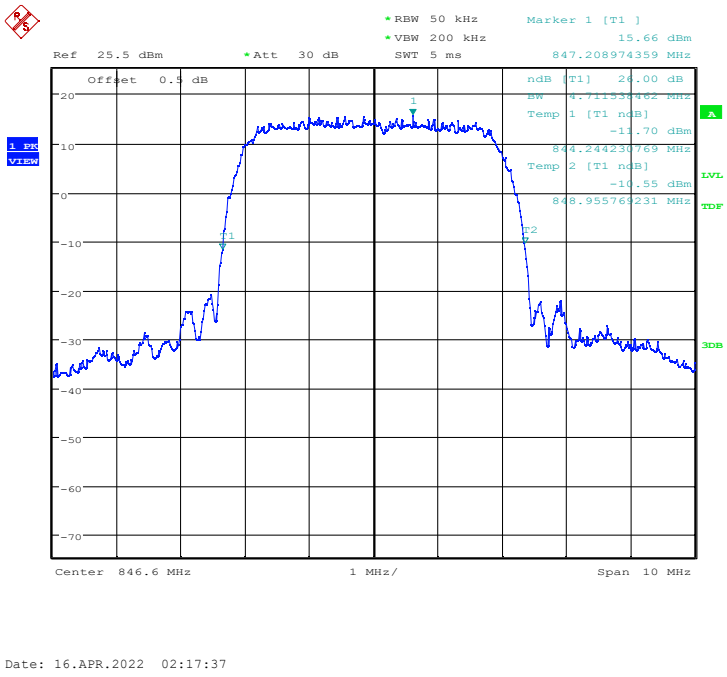
Channel 4132-Emission Bandwidth (-26dBc BW)



Channel 4183-Emission Bandwidth (-26dBc BW)



Channel 4233-Emission Bandwidth (-26dBc BW)

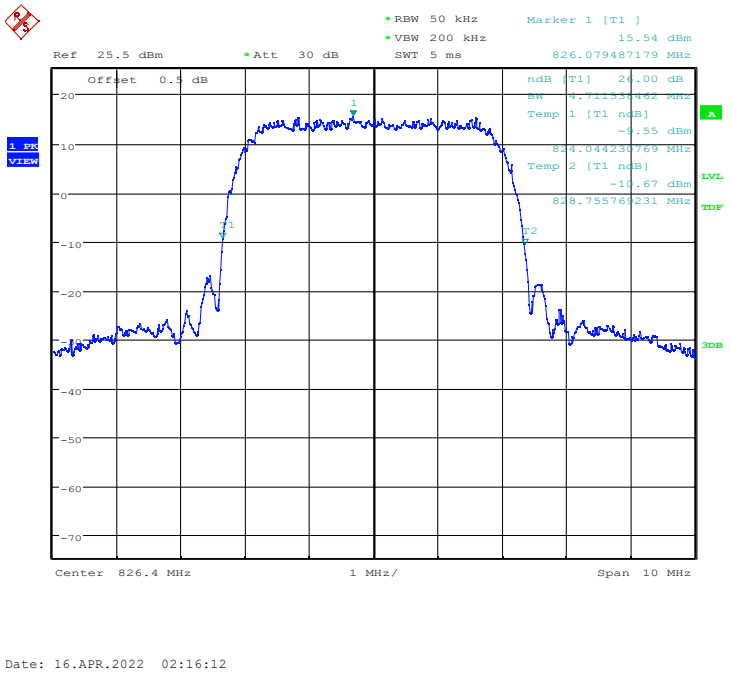


WCDMA Band 5 (-26dBc)-16QAM

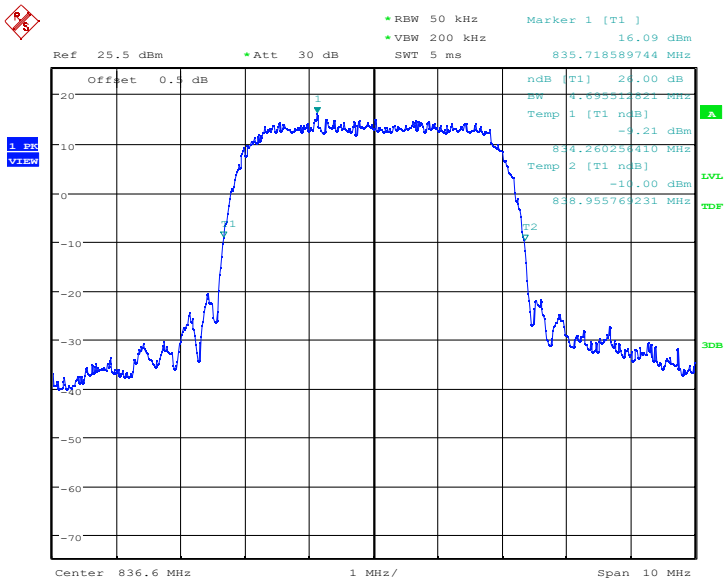
Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
826.4	4.712
836.6	4.696
846.6	4.712

WCDMA Band 5 (-26dBc)

Channel 4132-Emission Bandwidth (-26dBc BW)

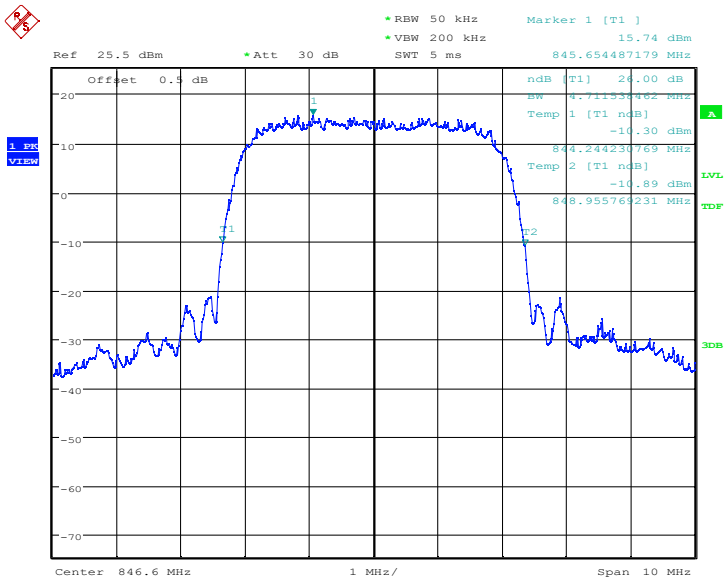


Channel 4183-Emission Bandwidth (-26dBc BW)



Date: 16.APR.2022 02:17:07

Channel 4233-Emission Bandwidth (-26dBc BW)



Date: 16.APR.2022 02:18:04

6.5. Conducted spurious emissions

Specifications:	FCC Part 2.1051, 24.238, 2.1053, 22.917, 27.53
DUT Serial Number:	864542050016100
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 22.917 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to Part 24.238 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is: P(dBm)– (43 + 10 log(P)) dB= -13dBm.

According to Part 27.53(h):

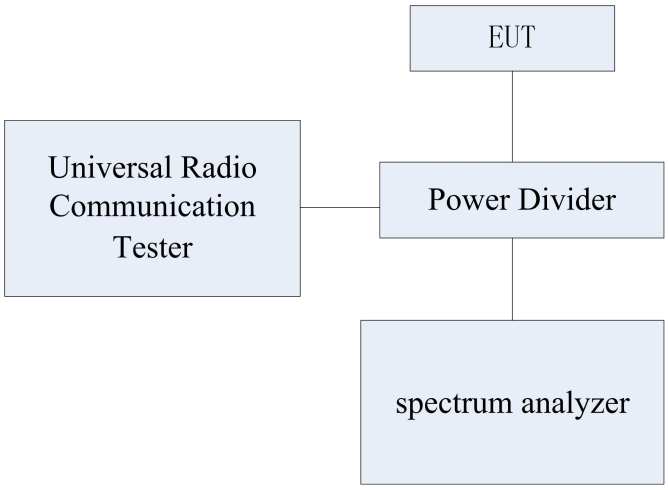
Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 Bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10(P) dB.

Measurement Uncertainty:

Item	Uncertainty	
Expanded Uncertainty	9kHz < f≤4GHz	0.71 dB (k=2)
	4GHz≤f < 12.75GHz	0.74 dB (k=2)
	12.75GHz≤f < 26GHz	2.70 dB (k=2)

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method:

The measurement was performed accordance with section 2.2.13 of ANSI/TIA-603-D: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

The measurement was performed accordance with section 2.2.13 of ANSI/TIA-603-D-2010: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-Band emissions, if any, up to 10th harmonic. The EUT was scanned for spurious emissions from 30MHz to 20GHz with sufficient Bandwidth and video resolution. The spectrum analyzer was set to Maximum hold mode to ensure that the worst-case emissions were captured.

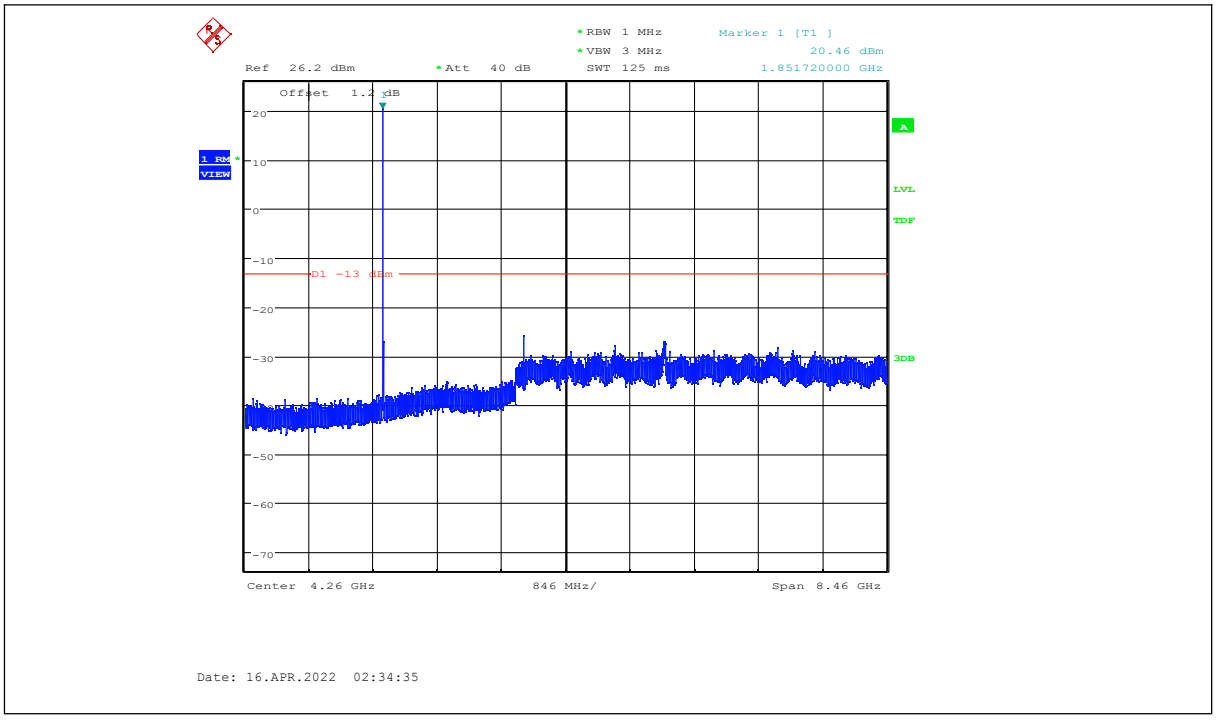
Note: --

6.5.1 Conducted Spurious Emission Results

WCDMA Band 2-QPSK

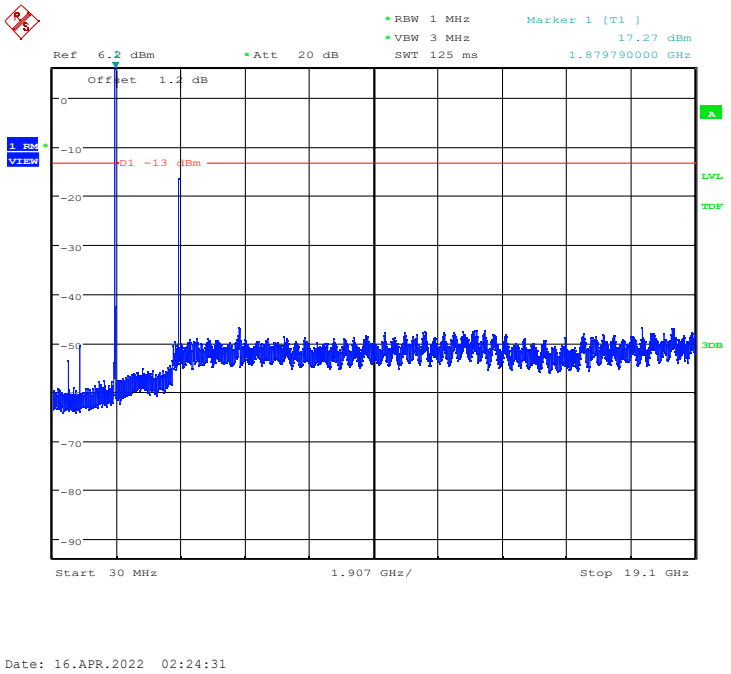
Channel 9262:30MHZ - 8490MHZ

NOTE: peak above the limit line is the carrier frequency.



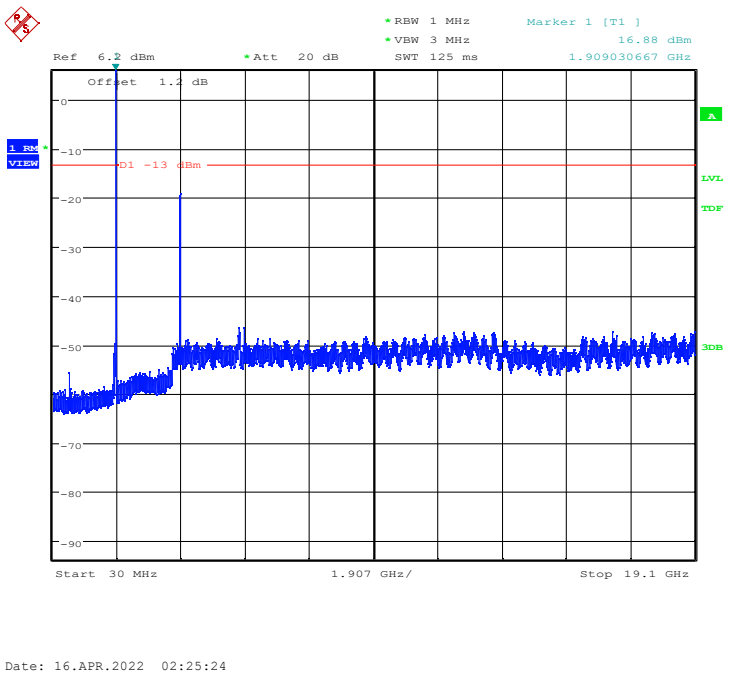
Channel 9400:30MHZ - 19100MHZ

NOTE: peak above the limit line is the carrier frequency.



Channel 9538:30MHZ - 19100MHZ

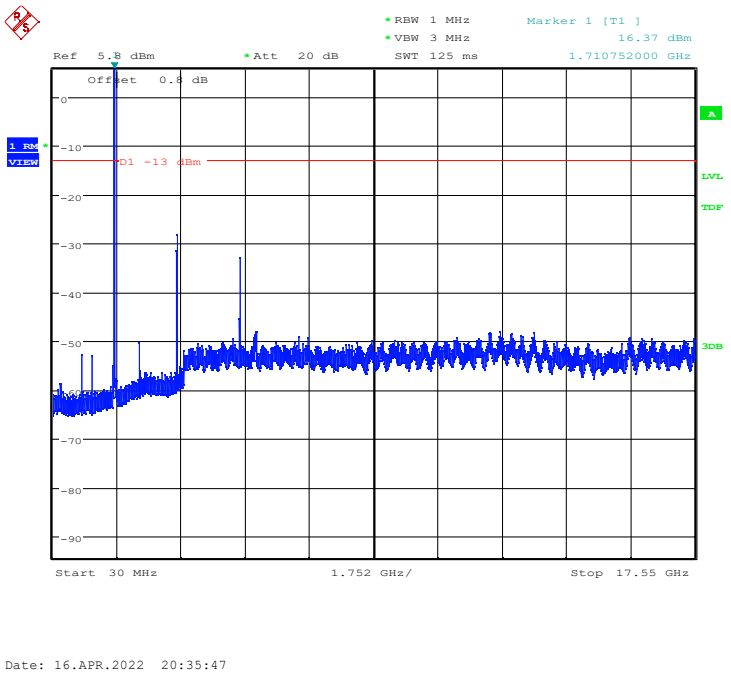
NOTE: peak above the limit line is the carrier frequency.



WCDMA Band 4-QPSK

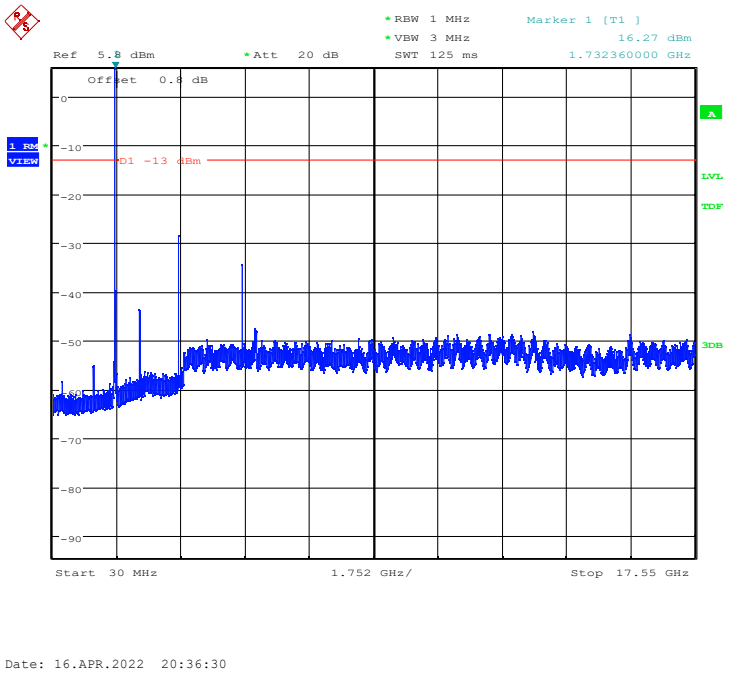
Channel 1312:30MHZ - 17550MHZ

NOTE: peak above the limit line is the carrier frequency.



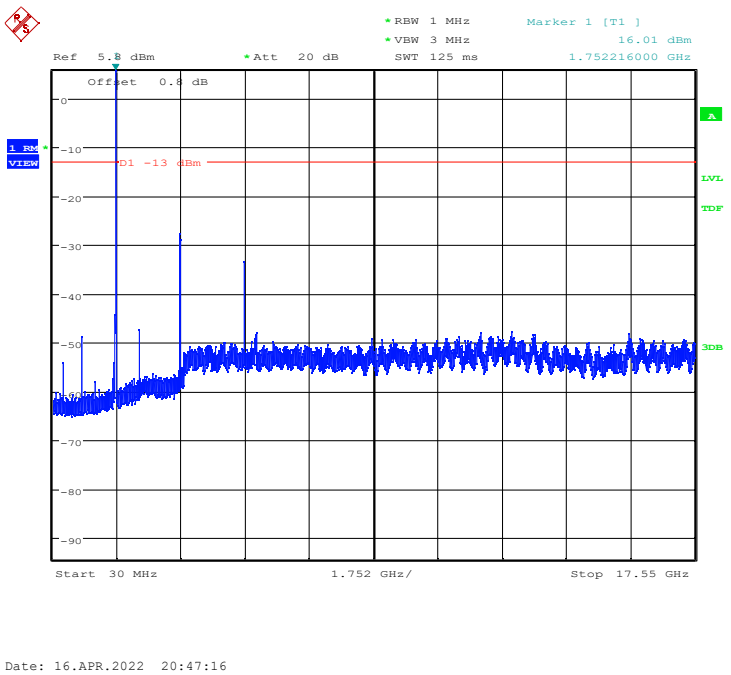
Channel 1412:30MHZ - 17550MHZ

NOTE: peak above the limit line is the carrier frequency.



Channel 1513:30MHZ - 17550MHZ

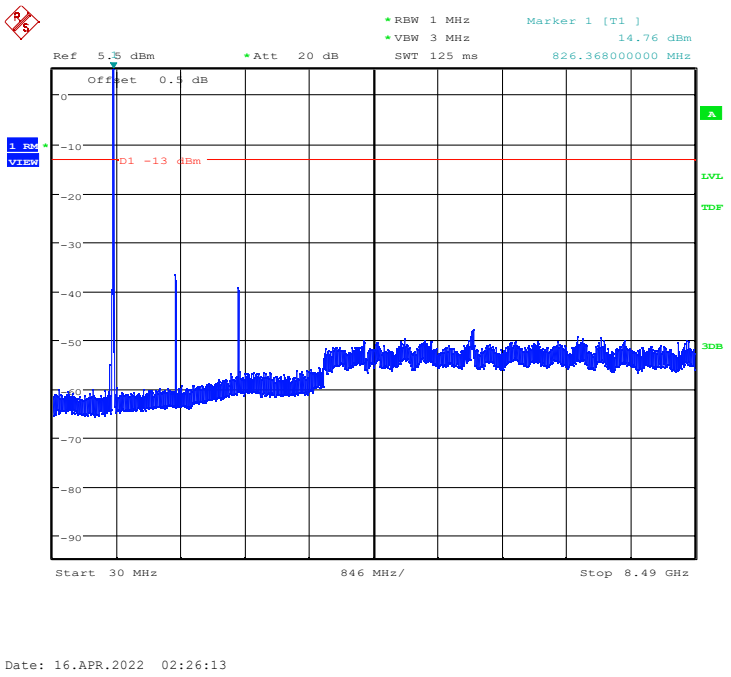
NOTE: peak above the limit line is the carrier frequency.



WCDMA Band 5-QPSK

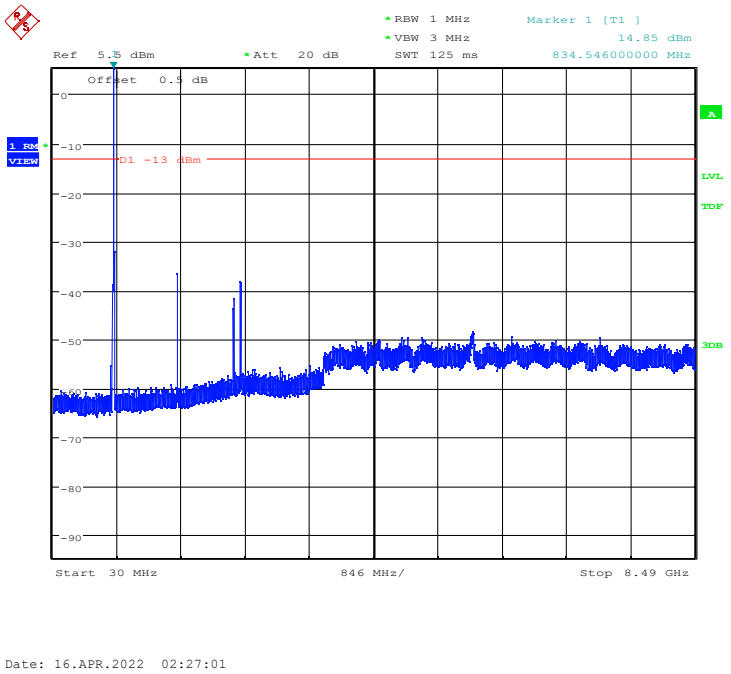
Channel 4132:30MHZ - 8490MHZ

NOTE: peak above the limit line is the carrier frequency.



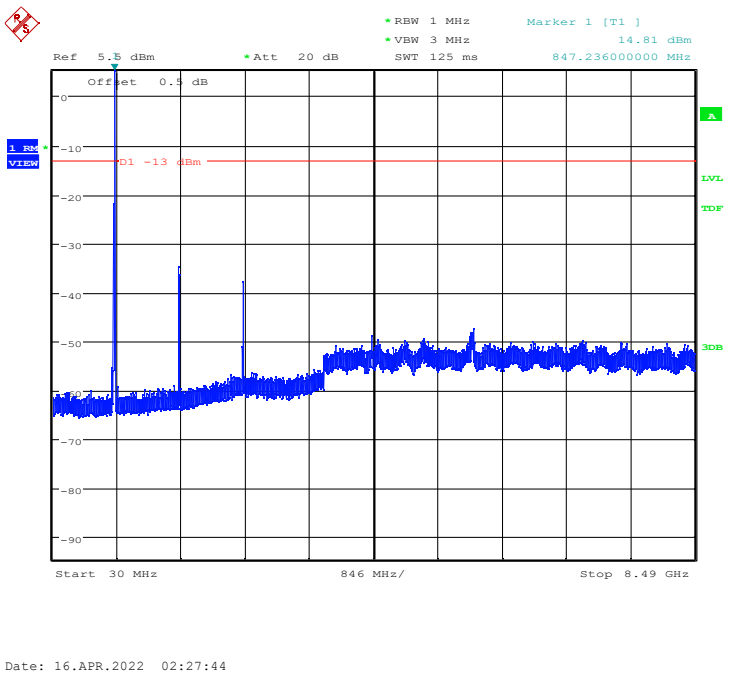
Channel 4183:30MHZ - 8490MHZ

NOTE: peak above the limit line is the carrier frequency.



Channel 4233:30MHZ - 8490MHZ

NOTE: peak above the limit line is the carrier frequency.



6.6. Radiated Spurious Emission

Specifications:	FCC Part 2.1051, 2.1053, 24.238, 22.917, 27.53
DUT Serial Number:	863427042009036
Test conditions:	Ambient Temperature:23.2℃-25.2℃ Relative Humidity:52.0%-53.0% Air pressure: 98.1kPa
Test Results:	Pass

Limit Level Construction:

According to Part 22.917 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to Part 24.238 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is: P(dBm)– (43 + 10 log(P)) dB= -13dBm.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty（30MHz-150MHz）	5.15 dB (k=2)
Expanded Uncertainty（150MHz-1GHz）	4.09dB (k=2)
Expanded Uncertainty（1GHz-3GHz）	2.92dB (k=2)
Expanded Uncertainty（3GHz-6GHz）	2.93dB (k=2)
Expanded Uncertainty（3GHz-12.75GHz）	2.69dB (k=2)

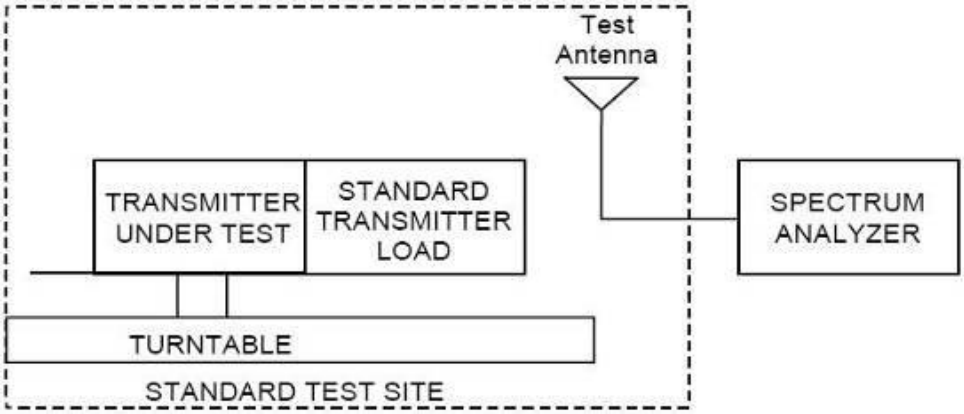
Test Setup:

The EUT was placed in an anechoic chamber. The Wireless Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

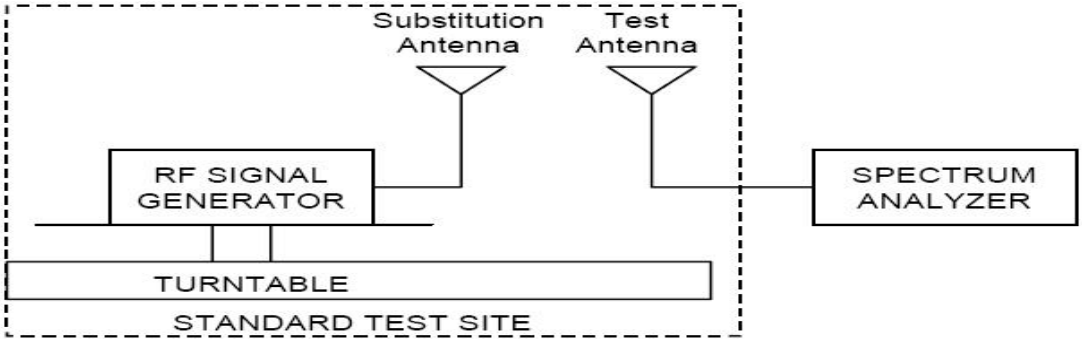
Test Method:

The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-E: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above. The distance from the device to the antenna is 3 m .



(b) Reconnect the equipment as illustrated.



(c) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter.

(d) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

(e) Repeat step d) with both antennas vertically polarized for each spurious frequency.

(f) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps d) and e) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

P_d(dBm) = P_g(dBm) – cable loss (dB) + antenna gain (dB)

where:

Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.

Note: The evaluation of radiated spurious emission under the simultaneous transmission of WWAN & WLAN.

6.6.1 WCDMA B2 Radiated Spurious Emission Results

Test Data （QPSK Mode channel 9262）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3704.8	-63.8	1.6	8.9	-56.5	V
5557.2	-62.5	2.2	10.5	-54.2	V
7409.6	-62.6	2.5	11.9	-53.2	V
9262.0	-57.1	3.1	11.5	-48.7	V
11114.4	-56.4	3.4	12.1	-47.7	V
12966.8	-54.8	3.7	12.4	-46.1	V

Test Data （QPSK Mode channel 9400）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3760.0	-65.1	1.6	8.9	-57.8	V
5640.0	-63.7	2.1	10.5	-55.3	V
7520.0	-63.2	2.5	11.9	-53.8	V
9400.0	-58.4	3.1	11.8	-49.7	V
11280.0	-56.4	3.4	12.1	-47.7	V
13160.0	-56.8	3.7	12.4	-48.1	V

Test Data （QPSK Mode channel 9538）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3815.2	-65.5	1.6	9.2	-57.9	V
5722.8	-63.5	2.2	10.5	-55.2	V
7630.4	-61.9	2.5	11.9	-52.5	V
9538.0	-58.8	3.1	11.8	-50.1	V
11445.6	-55.6	3.4	12.2	-46.8	V
13353.2	-56.1	3.5	12.4	-47.2	V

WCDMA B4 Radiated Spurious Emission Results

Test Data（QPSK Mode channel 1312）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3424.8	-63.9	1.5	8.9	-56.5	V
5137.2	-61.0	2.0	9.9	-53.1	V
6849.6	-62.5	2.5	11.9	-53.1	V
8562.0	-57.9	3.0	11.2	-49.7	V
10274.4	-57.8	3.5	12.2	-49.1	V
11986.8	-55.0	3.7	12.2	-46.5	V

Test Data（QPSK Mode channel 1412）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3464.8	-64.9	1.5	8.9	-57.5	V
5197.2	-61.5	2.0	9.9	-53.6	V
6929.6	-62.7	2.5	11.9	-53.3	V

8662.0	-57.7	3.0	11.2	-49.5	V
10394.4	-58.3	3.5	12.2	-49.6	V
12126.8	-54.7	3.7	12.2	-46.2	V

Test Data（QPSK Mode channel 1513）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3505.2	1.5	1.5	8.9	-57.1	V
5257.8	2.0	2.0	9.9	-52.6	V
7010.4	2.5	2.5	11.9	-52.0	V
8763.0	3.0	3.0	11.2	-49.3	V
10515.6	3.5	3.5	12.2	-48.7	V
12268.2	3.7	3.7	12.2	-46.9	V

WCDMA B5 Radiated Spurious Emission Results

Test Data （QPSK Mode channel 4132）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
1652.8	-62.6	1.1	7.3	-56.4	V
2479.2	-54.4	1.2	6.7	-48.9	H
3305.6	-63.7	1.5	8.9	-56.3	V
4132.0	-62.0	1.8	9.2	-54.6	V
4958.4	-61.3	2.0	9.9	-53.4	V
5784.8	-62.9	2.3	10.5	-54.7	V

Test Data （QPSK Mode channel 4182）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
1672.8	-63.7	1.1	7.3	-57.5	V
2509.2	-53.8	1.2	6.7	-48.3	V
3345.6	-62.5	1.5	8.9	-55.1	V
4182.0	-61.6	1.8	9.2	-54.2	V
5018.4	-60.8	2.0	9.9	-52.9	V
5854.8	-61.6	2.3	10.5	-53.4	V

Test Data （QPSK Mode channel 4233）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
1693.2	-63.8	1.1	8.0	-56.9	V
2539.8	-53.1	1.3	6.9	-47.5	V
3386.4	-61.9	1.5	8.9	-54.5	V
4233.0	-61.5	1.8	9.2	-54.1	V
5079.6	-61.0	2.1	9.9	-53.2	V
5926.2	-60.9	2.4	10.9	-52.4	V

6.7. Band Edge

Specifications:	FCC Part 2.1051, 24.238, 2.1053, 22.917, 27.53
DUT Serial Number:	864542050016100
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 22.917 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to Part 24.238 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is: P(dBm)– (43 + 10 log(P)) dB= -13dBm.

According to Part 27.53(h):

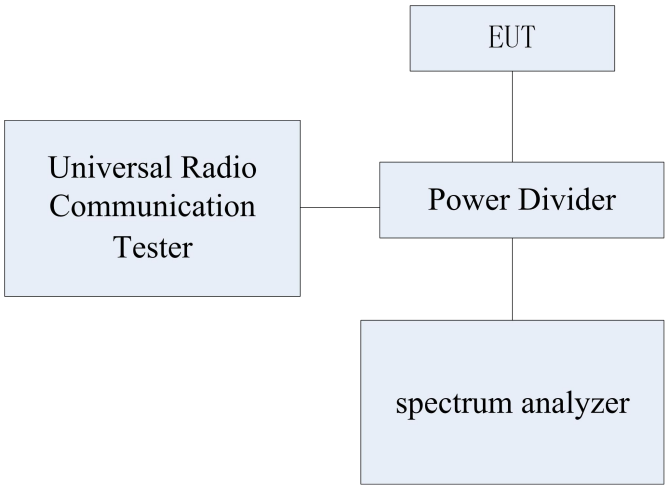
Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 Bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10(P) dB.

Measurement Uncertainty:

Item	Uncertainty	
Expanded Uncertainty	9kHz < f≤4GHz	0.71 dB (k=2)
	4GHz≤f < 12.75GHz	0.74 dB (k=2)
	12.75GHz≤f < 26GHz	2.70 dB (k=2)

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method:

1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The lost of the cables the test system is calibrated to correct the readings.

2) The spectrum analyzer was set to Average Detector function and Maximum hold mode.

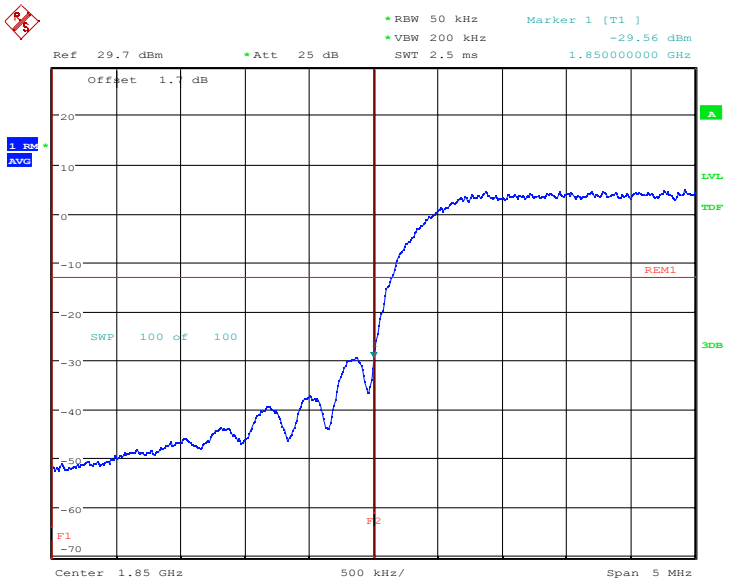
3) The resolution Bandwidth of the spectrum analyzer was a little greater than 1% of the 26dB emission Bandwidth.

Note: In the graphical result description (X, Y), X represents the number of RB, Y represents the RB offset.

6.7.1 Band Edge Results

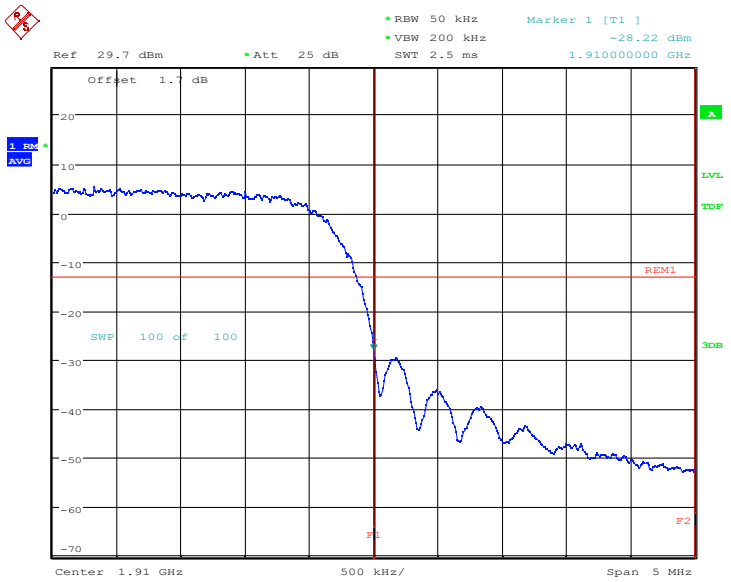
WCDMA Band 2-QPSK

Channel 9262



Date: 16.APR.2022 02:18:56

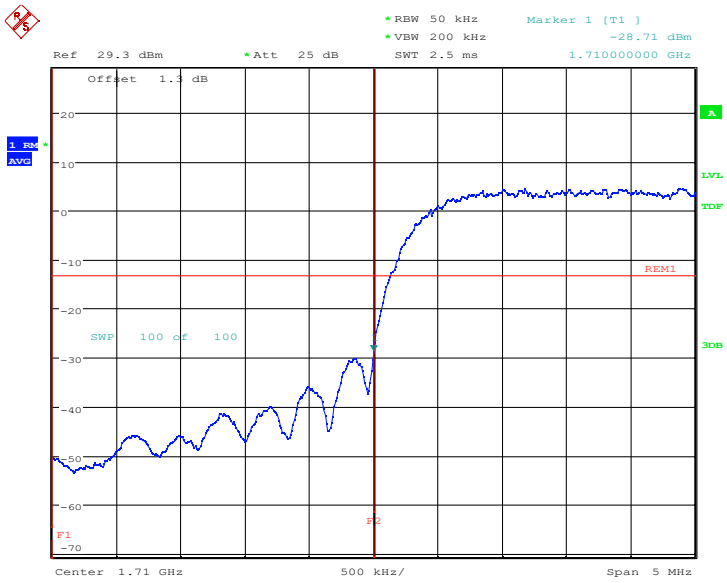
Channel 9538



Date: 16.APR.2022 02:19:47

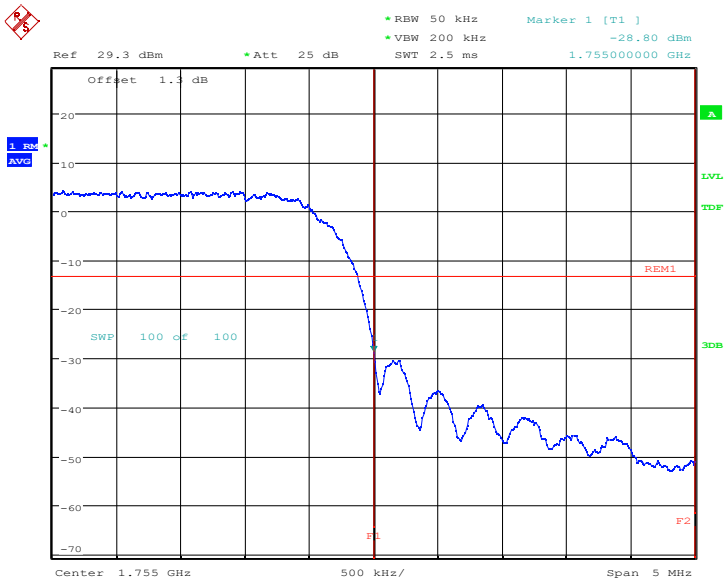
WCDMA Band 4-QPSK

Channel 1312



Date: 16.APR.2022 20:34:15

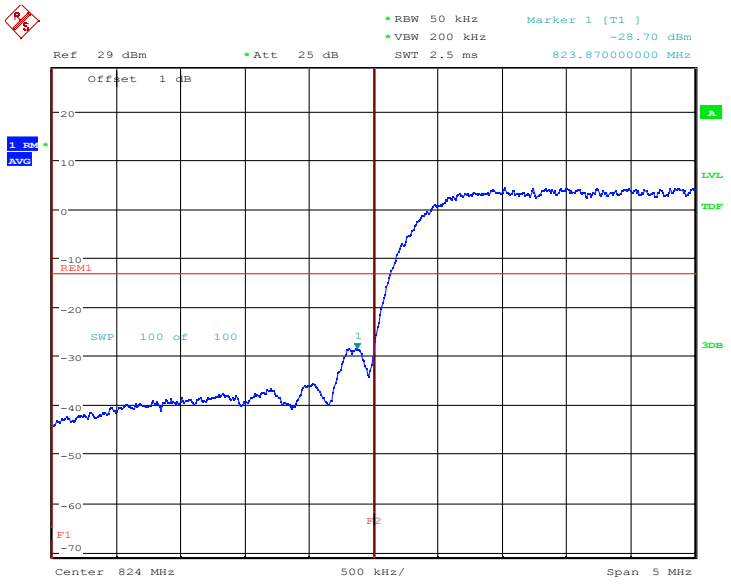
Channel 1513



Date: 16.APR.2022 20:35:05

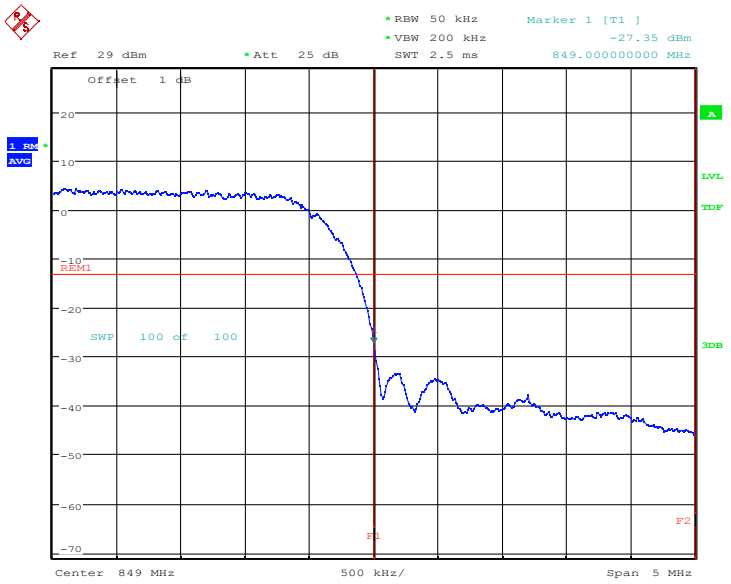
WCDMA Band 5-QPSK

Channel 4132



Date: 16.APR.2022 02:22:03

Channel 4233



Date: 16.APR.2022 02:22:55

6.8. Frequency Stability

Specifications:	FCC Part 2.1055, 22.355, 24.235, 27.54
DUT Serial Number:	864542050016100
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit	
Frequency deviation [ppm]	±2.5

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.54 Hz (k=2)

Test Method

Frequency stability is a measure of the frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at +20 °C and rated supply voltage. Two reference points are established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwanted emissions specification of the applicable regulatory standard. These reference points measured using the lowest and highest channel of operation shall be identified as FL and FH respectively.

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of CMW500.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500, and in a simulated call on middle channel for each LTE band, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.

6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the center channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 ℃increments from +50℃ to -30℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

6.8.1 Frequency Stability over Temperature Variation Results

WCDMA Band 2-QPSK

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1850.120	1909.890		
50				11.13	0.0118
40				11.32	0.0120
30				12.22	0.0130
10				11.80	0.0126
0				10.73	0.0114
-10				11.57	0.0123
-20				11.18	0.0119
-30				12.18	0.0130

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.4	20	1850.120	1909.890	10.86	0.0116
4.2				10.45	0.0111

WCDMA Band 4-QPSK

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1710.110	1754.890		
50				5.54	0.0064
40				5.50	0.0063
30				4.88	0.0056
10				5.31	0.0061
0				5.31	0.0061
-10				5.13	0.0059
-20				5.81	0.0067
-30				6.04	0.0070

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.4	20	1710.110	1754.890	5.54	0.0064
4.2				5.89	0.0068

WCDMA Band 5-QPSK

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	824.110	848.880		
50				-0.49	0.0012
40				-0.92	0.0022
30				-0.51	0.0012
10				-0.04	0.0001
0				-0.24	0.0006
-10				-0.57	0.0014
-20				-0.21	0.0005
-30				-0.24	0.0006

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.4	20	824.110	848.880	-0.24	0.0006
4.2				-0.69	0.0017

6.9. Peak to Average Ratio

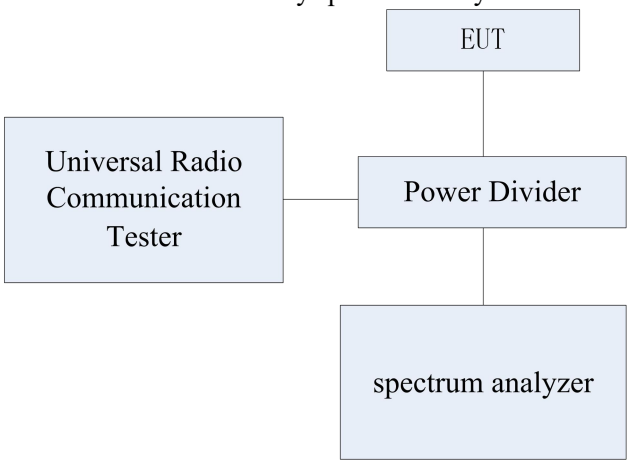
Specifications:	FCC Part 24.232, 27.50
DUT Serial Number:	864542050016100
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.62 dB (k=2)

Test Method

The transmitter output was connected to a CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each Band on the Spectrum Analyzer.

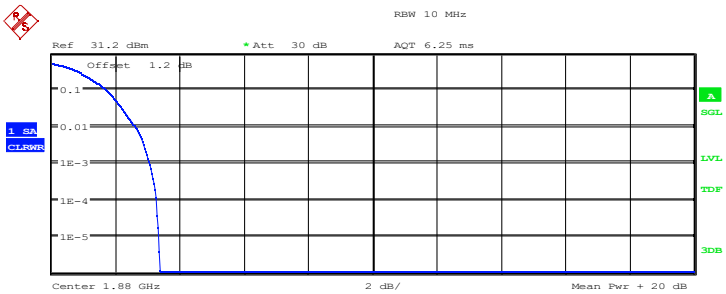
6.9.1 Peak to Average Ratio Results

WCDMA Band 2-QPSK

Measurement result

CH	Frequency (MHz)	PAPR (dB)
9400	1880	3.04

Channel 9400-1880MHz



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	24.03 dBm
Peak	27.40 dBm
Crest	3.37 dB
10 %	1.70 dB
1 %	2.60 dB
.1 %	3.04 dB
.01 %	3.27 dB

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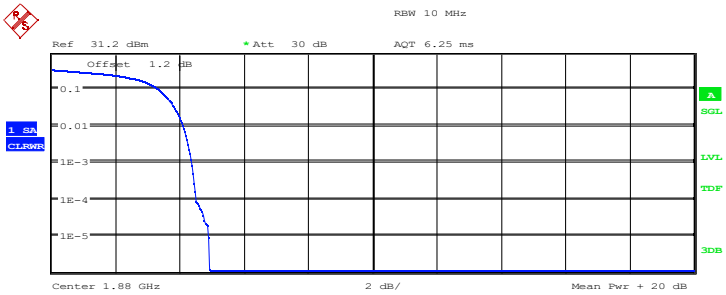
WCDMA Band 2-16QAM

Measurement result

CH	Frequency (MHz)	PAPR (dB)
9400	1880	4.36

Channel 9400-1880MHz



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	21.70 dBm
Peak	26.62 dBm
Crest	4.93 dB
10 %	3.33 dB
1 %	4.10 dB
.1 %	4.36 dB
.01 %	4.52 dB

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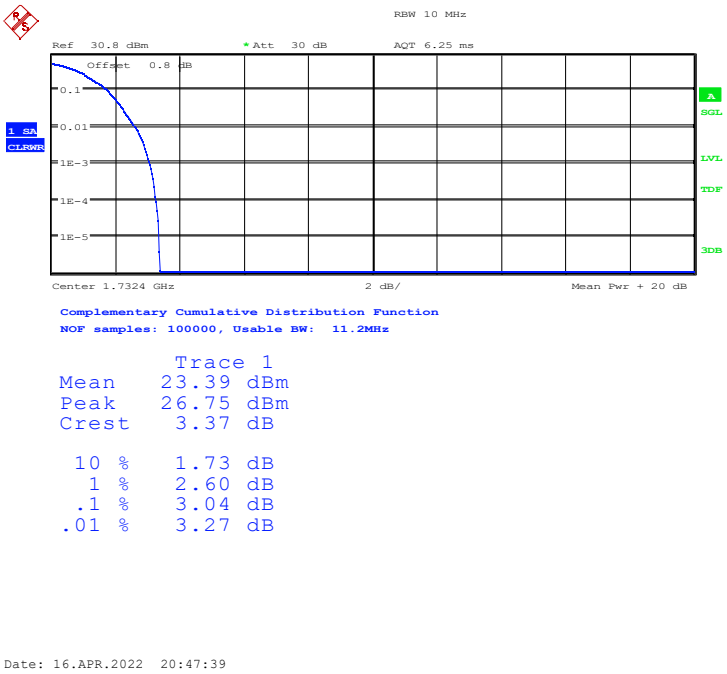
WCDMA Band 4-QPSK

Measurement result

CH	Frequency (MHz)	PAPR (dB)
1412	1732.4	3.04

Channel 1412-1732.4MHz

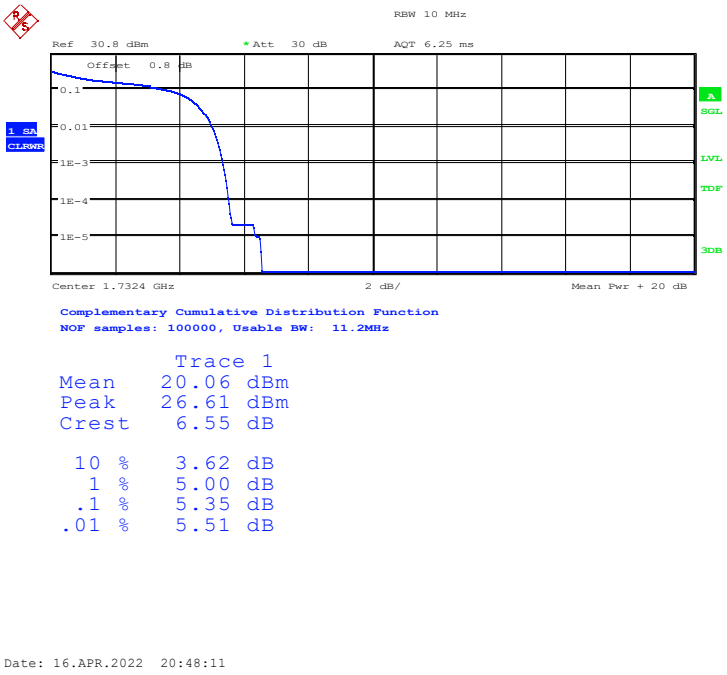


WCDMA Band 4-16QAM

Measurement result

CH	Frequency (MHz)	PAPR (dB)
1412	1732.4	5.35

Channel 1412-1732.4MHz

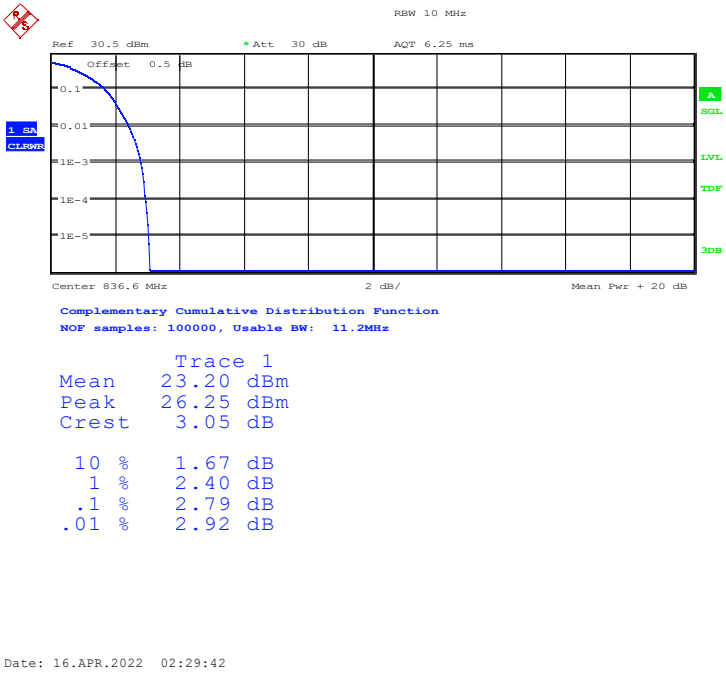


WCDMA Band 5-QPSK

Measurement result

CH	Frequency (MHz)	PAPR (dB)
4183	836.6	2.79

Channel 4183-836.6MHz

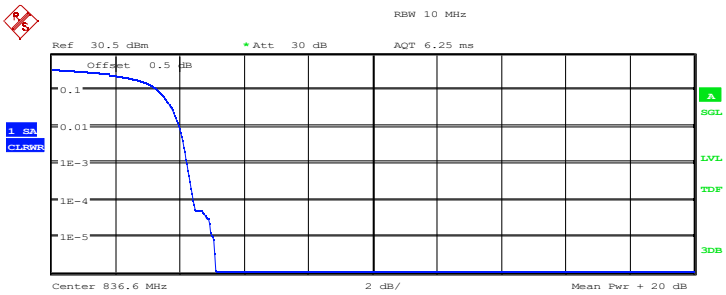


WCDMA Band 5-16QAM

Measurement result

CH	Frequency (MHz)	PAPR (dB)
4183	836.6	4.23

Channel 4183-836.6MHz



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	20.57 dBm
Peak	25.68 dBm
Crest	5.11 dB
10 %	3.30 dB
1 %	3.97 dB
.1 %	4.23 dB
.01 %	4.42 dB

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ANNEX A EUT Photos

See the document" I22W00018-External Photos".
See the document" I22W00018-Internal Photos ".

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

*****END OF REPORT*****