

TEST REPORT

REPORT NUMBER: I22W00025-WCDMA RF_Rev2

	ON
Type of Equipment:	LTE /HSPA/GSM/GNSS MODULE
Type of Designation:	SIM7600SA-H/SIM7600SA-H miniPCIE
Brand Name:	SIMCom
Manufacturer:	SIMCom Wireless Solutions Limited
FCC ID:	2AJYU-8PYA002

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
ANSI C63.26-2015

Chongqing Academy of Information and Communications Technology

Month date, year

May, 05, 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.



Report No.: I22W00025-WCDMA RF_Rev2

Revision Version

Report Number	Revision	Date	Memo
I22W00025-WCDMA RF	00	2022-03-30	Initial creation of test report
I22W00025-WCDMA RF_Rev1	01	2022-04-25	the second time creation of test report
I22W00025-WCDMA RF_Rev2	02	2022-05-05	the third time creation of test report

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

CONTENTS

1. Test Laboratory	5
1.1. Testing Location	5
1.2. Testing Environment	5
1.3. Project data	5
1.4. Signature	5
2. Client Information	6
2.1. Applicant Information	6
2.2. Manufacturer Information	6
3. Equipment under Test (EUT) and Ancillary Equipment (AE)	7
3.1. About EUT	7
3.2. Internal Identification of EUT used during the test	7
3.3. Outline of Equipment under Test	8
3.4. Internal Identification of AE used during the test	8
4. Reference Documents	9
4.1. Documents supplied by applicant	9
4.2. Reference Documents for testing	9
5. Test Equipments Utilized	10
5.1. RF Test System	10
5.2. RSE Test System	10
5.3. Climate Chamber	10
5.4. Vibration table	10
5.5. Test software	11
6. Test Results	12
6.1. Summary of Test Results	12
6.2. Conducted RF Power Output	13
6.3. ERP and EIRP	18

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Report No.: I22W00025-WCDMA RF_Rev2

6.4. Occupied Bandwidth	23
6.5. Conducted spurious emissions	40
6.6. Radiated Spurious Emission	46
6.7. Band Edge	50
6.8. Frequency Stability	54
6.9. Peak to Average Ratio	58
Annex A EUT Photos	63
ANNEX B Deviations from Prescribed Test Methods	64

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

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
	No.19 East Road, Xiantao Big-data Valley, Yubei 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°C
Relative Humidity:	30-60%

1.3. Project data

Testing Start Date:	2022-03-25
Testing End Date:	2022-03-30

1.4. Signature



2022-05-05

Dong Junxin
(Prepared this test report)

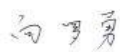
Date



2022-05-05

Li Xu
(Reviewed this test report)

Date



2022-05-05

Xiang Luoyong
Director of the laboratory
(Approved this test report)

Date

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

2. Client Information

2.1. Applicant Information

Company name:	SIMCom Wireless Solutions Limited
Address /Post:	Building 3, No. 289, Linhong Road, Changning District, Shanghai, P.R.China
City:	Shanghai
Country:	China
Telephone:	15902149520
Fax:	--
Email:	yue.hai@simcom.com
Contact Person:	Haiyue

2.2. Manufacturer Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	Building 3, No. 289, Linhong Road, Changning District, Shanghai, P.R.China
City:	Shanghai
Country:	China
Telephone:	15902149520
Fax:	--
Email:	yue.hai@simcom.com
Contact Person:	Haiyue

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

3.1. About EUT

EUT Description	LTE /HSPA/GSM/GNSS MODULE
Model name	SIM7600SA-H/SIM7600SA-H miniPCIE
Brand name	SIMCom
LTE Frequency Band	2/4/5/28/66
WCDMA Frequency Band	2/5
GSM Frequency Band	2/5
Type of modulation	GMSK/8PSK/QPSK/16QAM
Extreme Temperature	-10/+55°C
Nominal Voltage	3.8
Extreme High Voltage	4.2
Extreme Low Voltage	3.3

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	863427042013020	V1.01	SIM7600M11_A_V2.0.1	2022-03-25
S2	863427042010166	V1.01	SIM7600M11_A_V2.0.1	2022-03-25
S4	863427042009036	V1.01	SIM7600M11_A_V2.0.1	2022-03-25

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

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

3.3. Outline of Equipment under Test

Technology	Band	UL Freq.(MHz)	DL Freq.(MHz)	Note
GSM	B2	1850.2-1909.8	1930.2-1989.8	--
	B5	824.2-848.8	869.2-893.8	--
WCDMA	B2	1852.4-1907.6	1932.4-1987.6	--
	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	--
	B28	703-748	758-803	--
	B66	1710-1780	2110-2200	--

3.4. Internal Identification of AE used during the test

AE ID*	Description	dB*
AE1	--	--

*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
FCC CFR Part 22	PUBLIC MOBILE SERVICES	2019
FCC CFR Part 24	PERSONAL COMMUNICATIONS SERVICES, e-CFR	2019
ANSI C63.26-2015	--	2015
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016

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	--	5.1-24-3	R&S	2022-06-11
2	Ultra-wideband Log Periodic Antenna	VULB 9163	01392	--	--	Schwarzbeck	2023-03-04
3	Double Ridged Guide Antenna	HF907	100357	--	--	R&S	2023-02-10
4	Universal Radio Communication Tester	CMW500	152395	--	--	R&S	2021-05-12
5	Generator	SMU 200A	104517	--	--	R&S	2022-06-11
6	Ultra-wideband Log Periodic Antenna	VULB 9163	00995	--	--	R&S	2023-04-03
7	Double Ridged Guide Antenna	HF907	100356	--	--	R&S	2022-07-22

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	2023-06-25

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

5.4. Vibration table

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

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:	863427042010166
Test conditions:	Ambient Temperature:15°C-35°C 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.

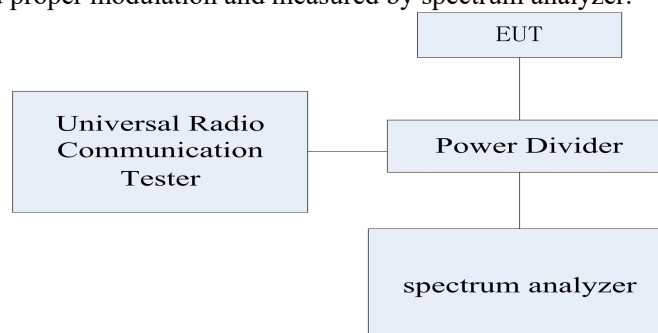
According to Part 24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

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.

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Report No.: I22W00025-WCDMA RF_Rev2

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

Note: --

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

6.2.1 Conducted RF Power Output Results

WCDMA Band 2

Mode	Subtest	Channel	Frequency (MHz)	Modulation	output power (dBm)	peak power (dBm)
RMC	-	9262	1852.4	QPSK	23.23	23.24
RMC	-	9400	1880	QPSK	23.36	23.37
RMC	-	9538	1907.6	QPSK	23.79	23.80
HSDPA	1	9262	1852.4	QPSK	22.34	22.41
HSDPA	2	9262	1852.4	QPSK	21.08	22.48
HSDPA	3	9262	1852.4	QPSK	19.36	22.02
HSDPA	4	9262	1852.4	QPSK	19.64	22.07
HSDPA	1	9400	1880	QPSK	22.58	22.62
HSDPA	2	9400	1880	QPSK	21.31	22.70
HSDPA	3	9400	1880	QPSK	19.12	22.28
HSDPA	4	9400	1880	QPSK	19.88	22.30
HSDPA	1	9538	1907.6	QPSK	22.82	22.94
HSDPA	2	9538	1907.6	QPSK	21.51	22.98
HSDPA	3	9538	1907.6	QPSK	20.30	22.59
HSDPA	4	9538	1907.6	QPSK	20.13	22.66
HSUPA	1	9262	1852.4	QPSK	19.43	19.67
HSUPA	1	9262	1852.4	Q16	19.44	19.69
HSUPA	2	9262	1852.4	QPSK	20.54	20.88
HSUPA	2	9262	1852.4	Q16	20.62	21.05
HSUPA	3	9262	1852.4	QPSK	17.48	17.52
HSUPA	3	9262	1852.4	Q16	17.47	17.51
HSUPA	4	9262	1852.4	QPSK	22.25	22.39
HSUPA	4	9262	1852.4	Q16	22.20	22.34
HSUPA	5	9262	1852.4	QPSK	16.10	16.34
HSUPA	5	9262	1852.4	Q16	16.12	16.36
HSUPA	1	9400	1880	QPSK	19.38	19.55
HSUPA	1	9400	1880	Q16	19.44	19.61
HSUPA	2	9400	1880	QPSK	20.71	21.11
HSUPA	2	9400	1880	Q16	20.68	21.08
HSUPA	3	9400	1880	QPSK	17.55	17.64
HSUPA	3	9400	1880	Q16	17.56	17.65
HSUPA	4	9400	1880	QPSK	22.40	22.71
HSUPA	4	9400	1880	Q16	22.42	22.65

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

HSUPA	5	9400	1880	QPSK	22.33	22.65
HSUPA	5	9400	1880	Q16	22.30	22.72
HSUPA	1	9538	1907.6	QPSK	19.44	19.69
HSUPA	1	9538	1907.6	Q16	19.43	19.69
HSUPA	2	9538	1907.6	QPSK	20.73	21.22
HSUPA	2	9538	1907.6	Q16	20.71	21.20
HSUPA	3	9538	1907.6	QPSK	17.66	17.76
HSUPA	3	9538	1907.6	Q16	17.58	17.77
HSUPA	4	9538	1907.6	QPSK	22.51	22.82
HSUPA	4	9538	1907.6	Q16	22.51	22.77
HSUPA	5	9538	1907.6	QPSK	16.34	16.72
HSUPA	5	9538	1907.6	Q16	16.26	16.57

WCDMA Band 5

Mode	Subtest	Channel	Frequency (MHz)	Modulation	output power (dBm)	peak power (dBm)
RMC	-	4132	826.4	QPSK	25.21	25.21
RMC	-	4183	836.6	QPSK	25.30	25.31
RMC	-	4233	846.6	QPSK	25.36	25.37
HSDPA	1	4132	826.4	QPSK	24.22	24.28
HSDPA	2	4132	826.4	QPSK	22.99	24.31
HSDPA	3	4132	826.4	QPSK	20.68	23.77
HSDPA	4	4132	826.4	QPSK	20.88	23.86
HSDPA	1	4183	836.6	QPSK	24.37	24.40
HSDPA	2	4183	836.6	QPSK	22.91	24.37
HSDPA	3	4183	836.6	QPSK	21.78	24.04
HSDPA	4	4183	836.6	QPSK	21.58	24.04
HSDPA	1	4233	846.6	QPSK	24.27	24.37
HSDPA	2	4233	846.6	QPSK	23.11	24.63
HSDPA	3	4233	846.6	QPSK	20.86	24.20
HSDPA	4	4233	846.6	QPSK	21.00	24.21
HSUPA	1	4132	826.4	QPSK	22.66	24.32
HSUPA	1	4132	826.4	Q16	22.45	24.28
HSUPA	2	4132	826.4	QPSK	22.89	23.73
HSUPA	2	4132	826.4	Q16	22.96	23.80
HSUPA	3	4132	826.4	QPSK	21.26	24.33

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

HSUPA	3	4132	826.4	Q16	21.23	24.32
HSUPA	4	4132	826.4	QPSK	24.24	24.33
HSUPA	4	4132	826.4	Q16	24.08	24.20
HSUPA	5	4132	826.4	QPSK	20.15	23.73
HSUPA	5	4132	826.4	Q16	20.73	23.75
HSUPA	1	4183	836.6	QPSK	23.03	24.37
HSUPA	1	4183	836.6	Q16	22.61	24.34
HSUPA	2	4183	836.6	QPSK	22.99	23.82
HSUPA	2	4183	836.6	Q16	22.95	23.80
HSUPA	3	4183	836.6	QPSK	21.35	24.52
HSUPA	3	4183	836.6	Q16	21.28	24.43
HSUPA	4	4183	836.6	QPSK	24.19	24.30
HSUPA	4	4183	836.6	Q16	24.21	24.29
HSUPA	5	4183	836.6	QPSK	20.86	23.95
HSUPA	5	4183	836.6	Q16	20.95	24.04
HSUPA	1	4233	846.6	QPSK	22.45	24.63
HSUPA	1	4233	846.6	Q16	22.50	24.63
HSUPA	2	4233	846.6	QPSK	23.22	24.13
HSUPA	2	4233	846.6	Q16	23.02	24.02
HSUPA	3	4233	846.6	QPSK	21.35	24.65
HSUPA	3	4233	846.6	Q16	21.35	24.65
HSUPA	4	4233	846.6	QPSK	24.33	24.45
HSUPA	4	4233	846.6	Q16	24.32	24.44
HSUPA	5	4233	846.6	QPSK	20.92	24.11
HSUPA	5	4233	846.6	Q16	20.45	24.23

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."

Conducted RF Power+Antenna Gain(dBi)=ERIP

Conducted RF Power+Antenna Gain (dBd) =ERP

Note: Antenna Gain is supplied by customer.

Frequency Band	AntennaGain (dBi)	AntennaGain (dBd)
GSM 850	0.91	-1.24
GSM 1900	1.87	--
GPRS 850 4TS	0.91	-1.24
GPRS 1900 4TS	1.87	--
WCDMA Band2	1.87	--
WCDMA Band5	--	-1.24
LTE Band2	1.87	--
LTE Band4	3.12	--
LTE Band5	0.91	-1.24
LTE Band28	0.95	-1.28
LTE Band66	3.12	--

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

6.3.1 WCDMA Band 2 result

WCDMA Band 2

Limits 32dBm(2w)

Max EIRP:25.66dBm

Mode	Subtest	Channel	Frequency (MHz)	Modulation	output power (dBm)	Radiated Power(dBm) G _T = 1.87dBi
RMC	-	9262	1852.4	QPSK	23.23	25.10
RMC	-	9400	1880	QPSK	23.36	25.23
RMC	-	9538	1907.6	QPSK	23.79	25.66
HSDPA	1	9262	1852.4	QPSK	22.34	24.21
HSDPA	2	9262	1852.4	QPSK	21.08	22.95
HSDPA	3	9262	1852.4	QPSK	19.36	21.23
HSDPA	4	9262	1852.4	QPSK	19.64	21.51
HSDPA	1	9400	1880	QPSK	22.58	24.45
HSDPA	2	9400	1880	QPSK	21.31	23.18
HSDPA	3	9400	1880	QPSK	19.12	20.99
HSDPA	4	9400	1880	QPSK	19.88	21.75
HSDPA	1	9538	1907.6	QPSK	22.82	24.69
HSDPA	2	9538	1907.6	QPSK	21.51	23.38
HSDPA	3	9538	1907.6	QPSK	20.30	22.17
HSDPA	4	9538	1907.6	QPSK	20.13	22.00
HSUPA	1	9262	1852.4	QPSK	19.43	21.30
HSUPA	1	9262	1852.4	Q16	19.44	21.31
HSUPA	2	9262	1852.4	QPSK	20.54	22.41
HSUPA	2	9262	1852.4	Q16	20.62	22.49
HSUPA	3	9262	1852.4	QPSK	17.48	19.35
HSUPA	3	9262	1852.4	Q16	17.47	19.34
HSUPA	4	9262	1852.4	QPSK	22.25	24.12
HSUPA	4	9262	1852.4	Q16	22.20	24.07
HSUPA	5	9262	1852.4	QPSK	16.10	17.97
HSUPA	5	9262	1852.4	Q16	16.12	17.99
HSUPA	1	9400	1880	QPSK	19.38	21.25
HSUPA	1	9400	1880	Q16	19.44	21.31
HSUPA	2	9400	1880	QPSK	20.71	22.58

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

HSUPA	2	9400	1880	Q16	20.68	22.55
HSUPA	3	9400	1880	QPSK	17.55	19.42
HSUPA	3	9400	1880	Q16	17.56	19.43
HSUPA	4	9400	1880	QPSK	22.40	24.27
HSUPA	4	9400	1880	Q16	22.42	24.29
HSUPA	5	9400	1880	QPSK	22.33	24.20
HSUPA	5	9400	1880	Q16	22.30	24.17
HSUPA	1	9538	1907.6	QPSK	19.44	21.31
HSUPA	1	9538	1907.6	Q16	19.43	21.30
HSUPA	2	9538	1907.6	QPSK	20.73	22.60
HSUPA	2	9538	1907.6	Q16	20.71	22.58
HSUPA	3	9538	1907.6	QPSK	17.66	19.53
HSUPA	3	9538	1907.6	Q16	17.58	19.45
HSUPA	4	9538	1907.6	QPSK	22.51	24.38
HSUPA	4	9538	1907.6	Q16	22.51	24.38
HSUPA	5	9538	1907.6	QPSK	16.34	18.21
HSUPA	5	9538	1907.6	Q16	16.26	18.13

6.3.2 WCDMA Band 5 result

WCDMA Band 5

Limits 38.5dBm(7w)

Max ERP:24.12dBm

Mode	Subtest	Channel	Frequency (MHz)	Modulation	output power (dBm)	Radiated Power(dBm) G _T = -1.24dBd
RMC	-	4132	826.4	QPSK	25.21	23.97
RMC	-	4183	836.6	QPSK	25.30	24.06
RMC	-	4233	846.6	QPSK	25.36	24.12
HSDPA	1	4132	826.4	QPSK	24.22	22.98
HSDPA	2	4132	826.4	QPSK	22.99	21.75
HSDPA	3	4132	826.4	QPSK	20.68	19.44
HSDPA	4	4132	826.4	QPSK	20.88	19.64
HSDPA	1	4183	836.6	QPSK	24.37	23.13
HSDPA	2	4183	836.6	QPSK	22.91	21.67
HSDPA	3	4183	836.6	QPSK	21.78	20.54
HSDPA	4	4183	836.6	QPSK	21.58	20.34
HSDPA	1	4233	846.6	QPSK	24.27	23.03
HSDPA	2	4233	846.6	QPSK	23.11	21.87
HSDPA	3	4233	846.6	QPSK	20.86	19.62
HSDPA	4	4233	846.6	QPSK	21.00	19.76
HSUPA	1	4132	826.4	QPSK	22.66	21.42
HSUPA	1	4132	826.4	Q16	22.45	21.21
HSUPA	2	4132	826.4	QPSK	22.89	21.65
HSUPA	2	4132	826.4	Q16	22.96	21.72
HSUPA	3	4132	826.4	QPSK	21.26	20.02
HSUPA	3	4132	826.4	Q16	21.23	19.99
HSUPA	4	4132	826.4	QPSK	24.24	23.00
HSUPA	4	4132	826.4	Q16	24.08	22.84
HSUPA	5	4132	826.4	QPSK	20.15	18.91
HSUPA	5	4132	826.4	Q16	20.73	19.49
HSUPA	1	4183	836.6	QPSK	23.03	21.79
HSUPA	1	4183	836.6	Q16	22.61	21.37
HSUPA	2	4183	836.6	QPSK	22.99	21.75
HSUPA	2	4183	836.6	Q16	22.95	21.71

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

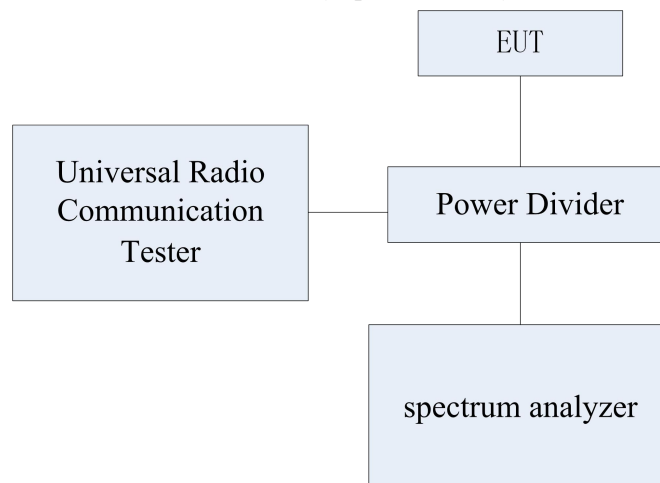
HSUPA	3	4183	836.6	QPSK	21.35	20.11
HSUPA	3	4183	836.6	Q16	21.28	20.04
HSUPA	4	4183	836.6	QPSK	24.19	22.95
HSUPA	4	4183	836.6	Q16	24.21	22.97
HSUPA	5	4183	836.6	QPSK	20.86	19.62
HSUPA	5	4183	836.6	Q16	20.95	19.71
HSUPA	1	4233	846.6	QPSK	22.45	21.21
HSUPA	1	4233	846.6	Q16	22.50	21.26
HSUPA	2	4233	846.6	QPSK	23.22	21.98
HSUPA	2	4233	846.6	Q16	23.02	21.78
HSUPA	3	4233	846.6	QPSK	21.35	20.11
HSUPA	3	4233	846.6	Q16	21.35	20.11
HSUPA	4	4233	846.6	QPSK	24.33	23.09
HSUPA	4	4233	846.6	Q16	24.32	23.08
HSUPA	5	4233	846.6	QPSK	20.92	19.68
HSUPA	5	4233	846.6	Q16	20.45	19.21

6.4. Occupied Bandwidth

Specifications:	FCC Part 2.1049, 22.917(b), 24.238(b)
DUT Serial Number:	863427042013020
Test conditions:	Ambient Temperature:15°C-35°C 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: --

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

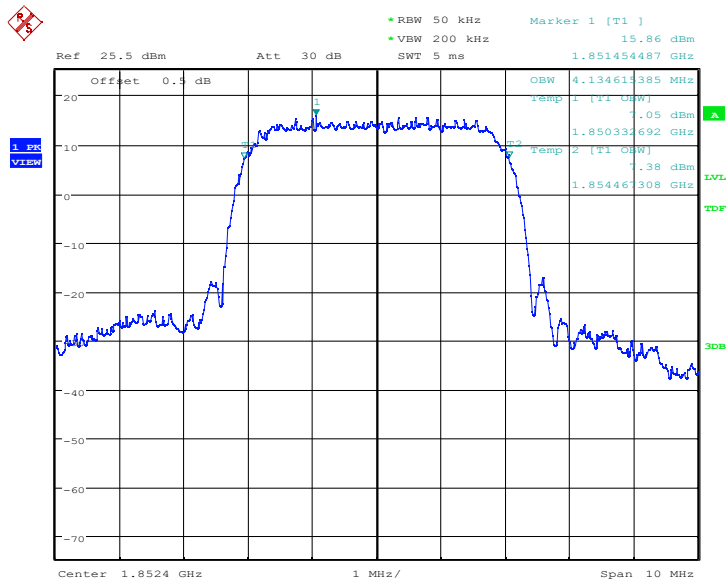
6.4.1 occupied bandwidth Results

WCDMA Band 2 (99%)-QPSK

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

WCDMA Band 2 (99%)

Channel 9262-Occupied Bandwidth (99% BW)

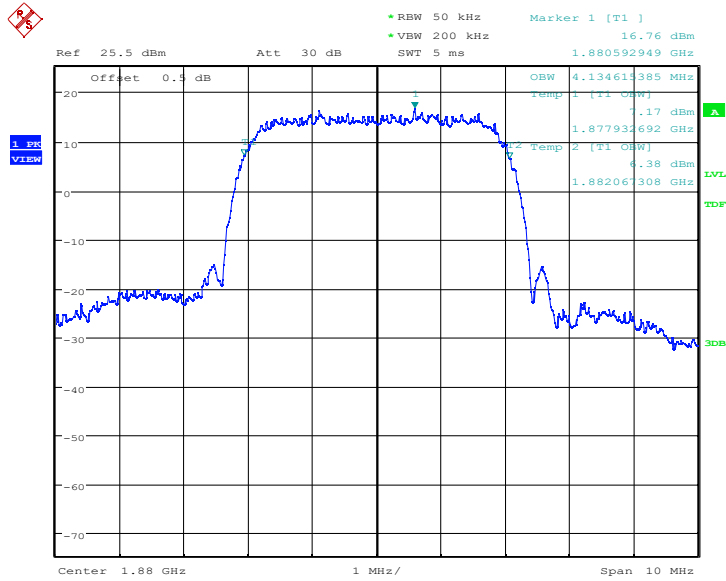


Date: 26.MAR.2022 21:16:30

Channel 9400-Occupied Bandwidth (99% BW)

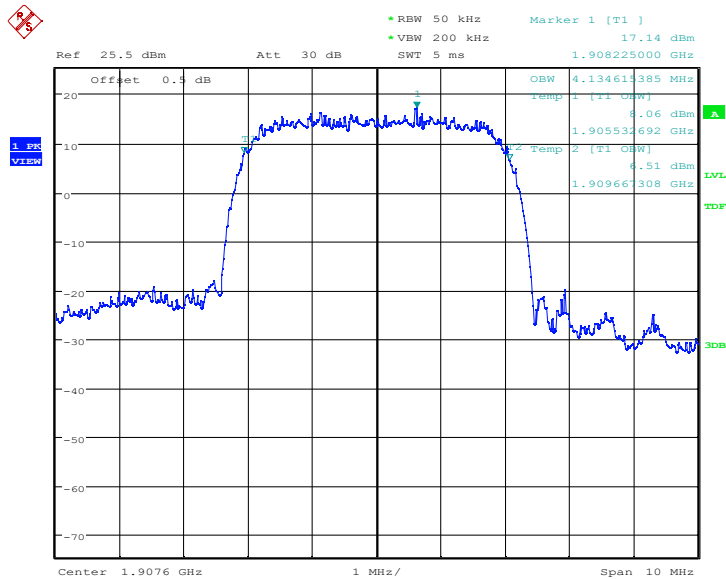
Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Date: 26.MAR.2022 21:17:23

Channel 9538-Occupied Bandwidth (99% BW)



Date: 26.MAR.2022 21:18:13

Chongqing Academy of Information and Communication Technology

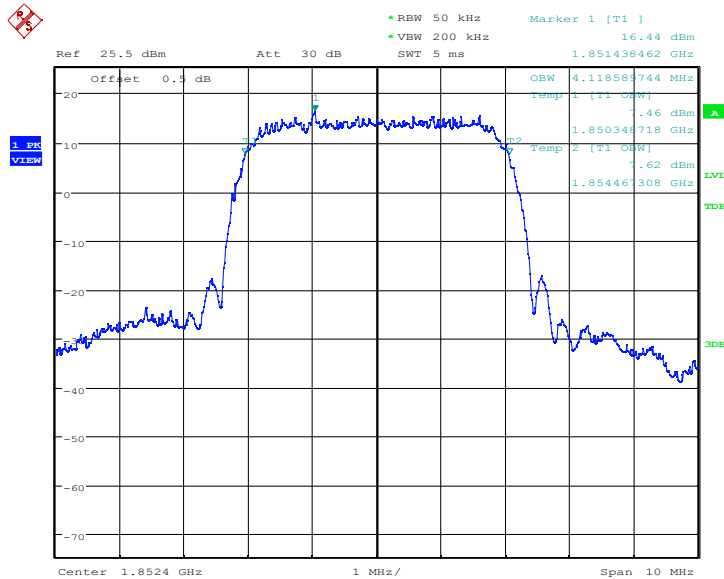
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 2 (99%)-16QAM

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
1852.4	4.119
1880	4.119
1907.6	4.135

WCDMA Band 2 (99%)

Channel 9262-Occupied Bandwidth (99% BW)

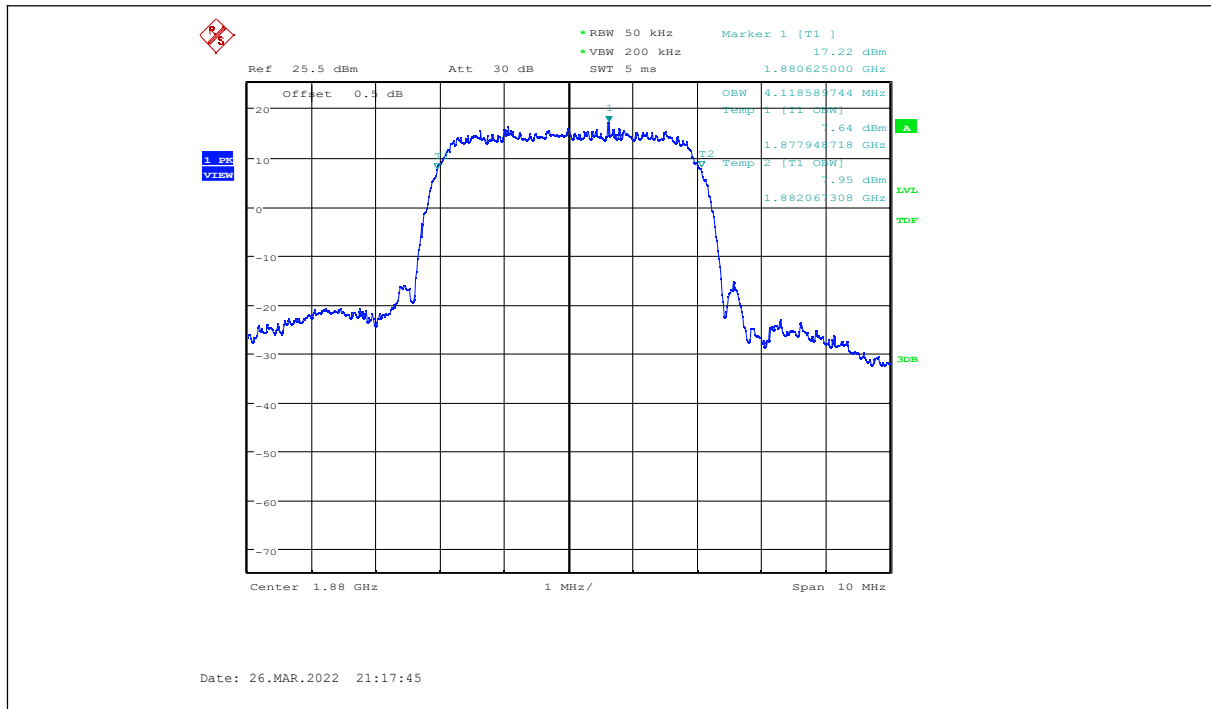


Date: 26.MAR.2022 21:16:57

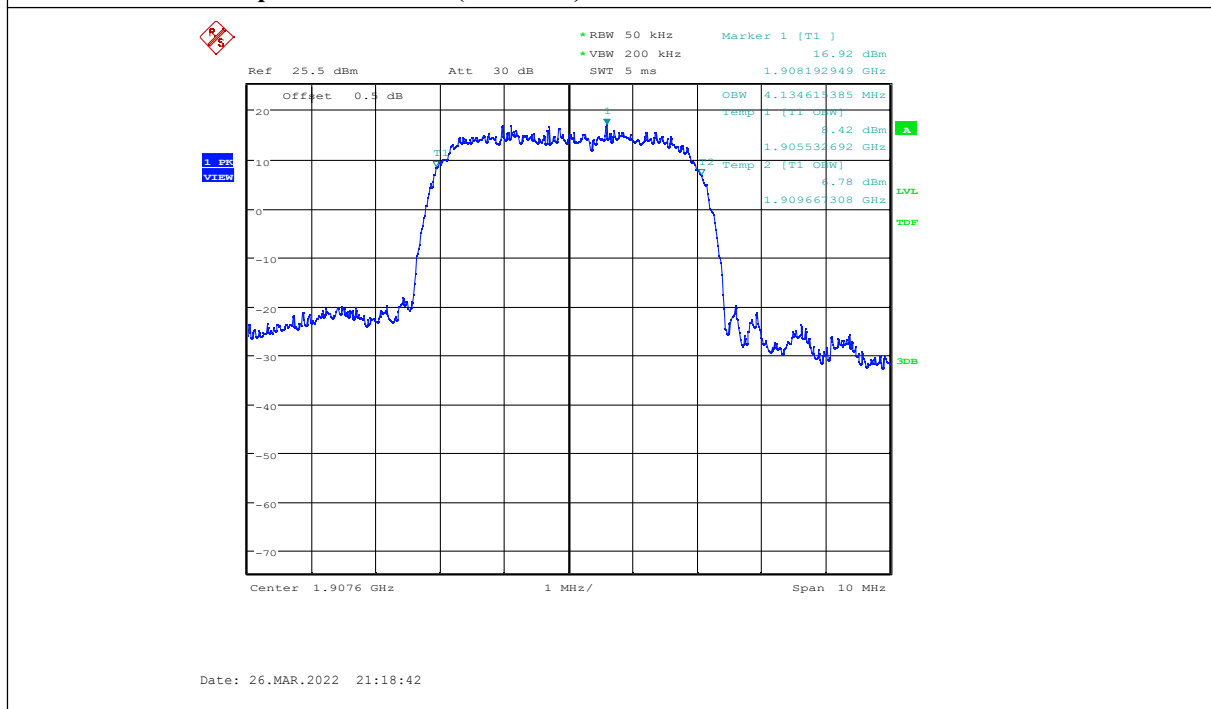
Channel 9400-Occupied Bandwidth (99% BW)

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Channel 9538-Occupied Bandwidth (99% BW)



Chongqing Academy of Information and Communication Technology

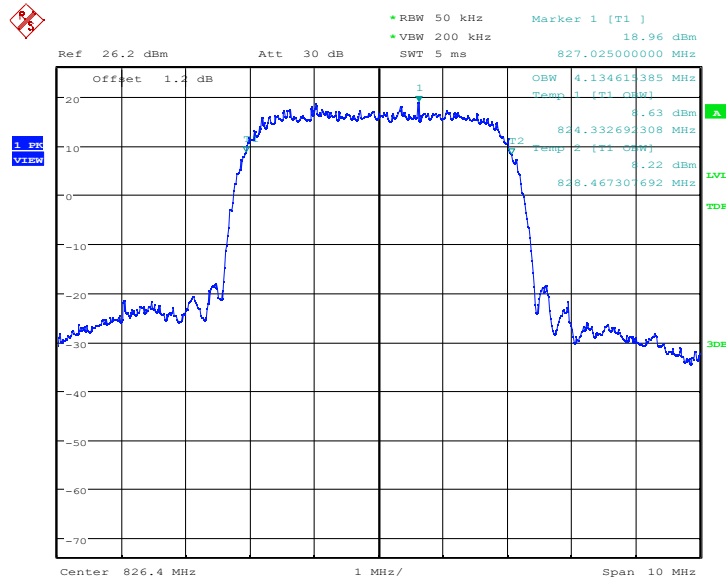
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 5 (99%)-QPSK

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
826.4	4.135
836.6	4.151
846.6	4.135

WCDMA Band 5 (99%)

Channel 4132-Occupied Bandwidth (99% BW)

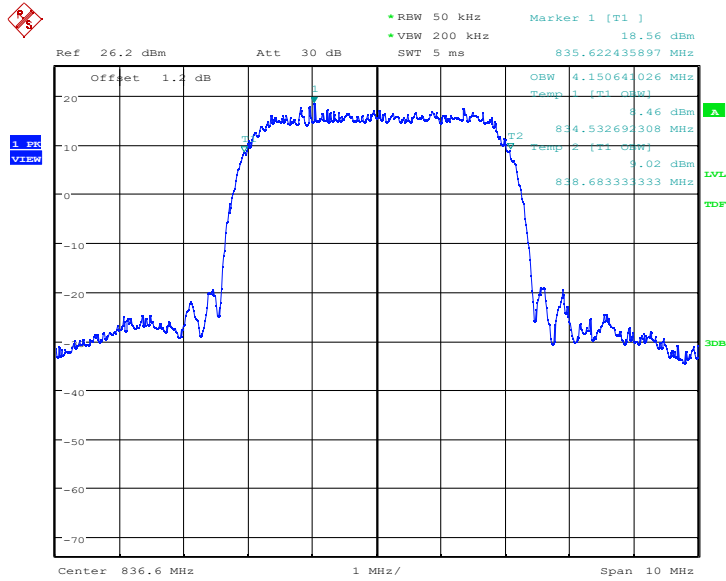


Date: 26.MAR.2022 21:19:17

Channel 4183-Occupied Bandwidth (99% BW)

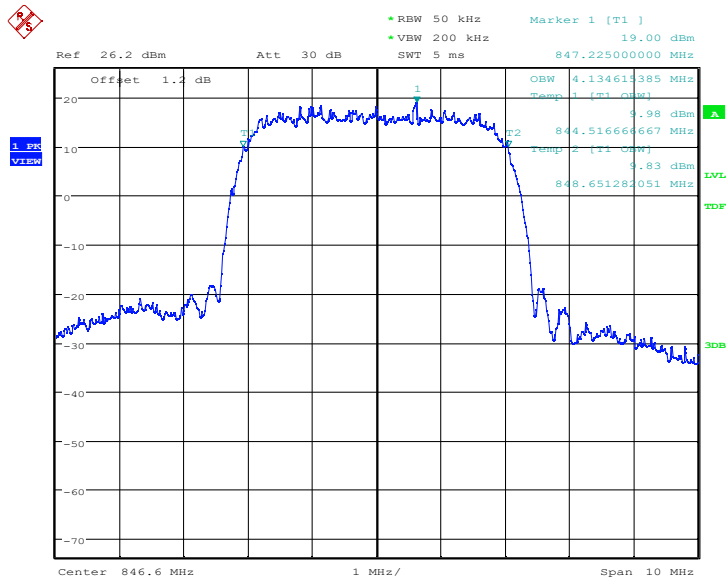
Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Date: 26.MAR.2022 21:20:14

Channel 4233-Occupied Bandwidth (99% BW)



Date: 26.MAR.2022 21:21:12

Chongqing Academy of Information and Communication Technology

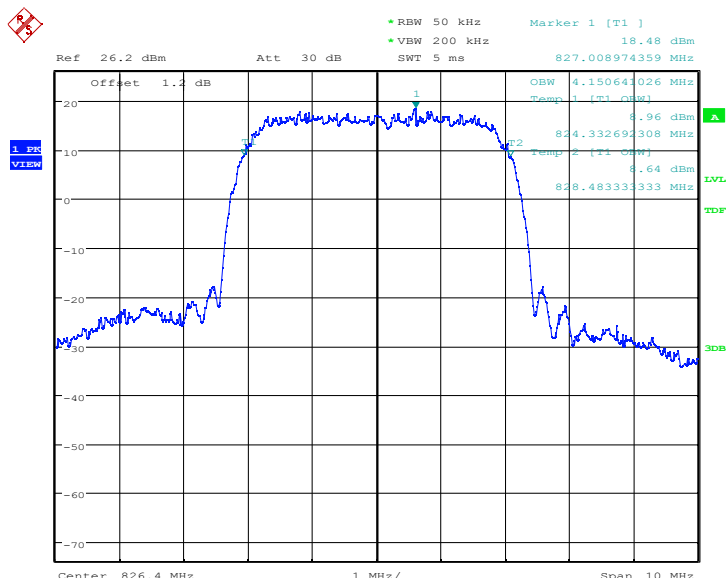
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 5 (99%)-16QAM

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
826.4	4.151
836.6	4.135
846.6	4.135

WCDMA Band 5 (99%)

Channel 4132-Occupied Bandwidth (99% BW)



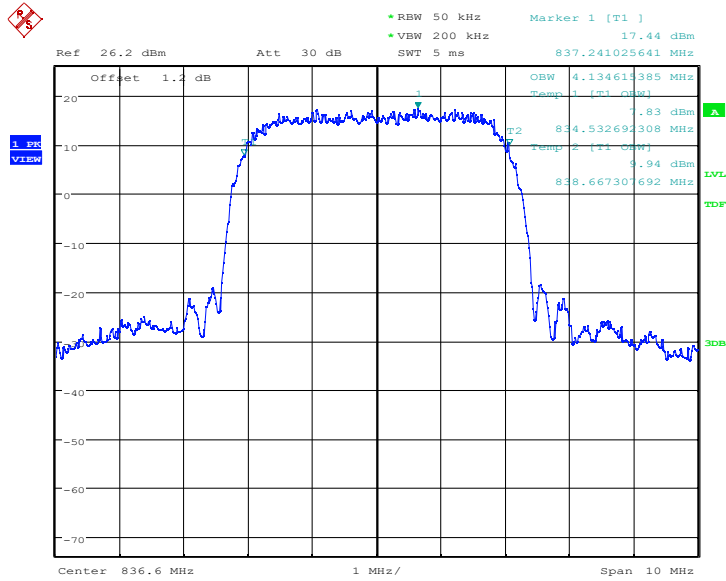
Date: 26.MAR.2022 21:19:44

Channel 4183-Occupied Bandwidth (99% BW)

Chongqing Academy of Information and Communication Technology

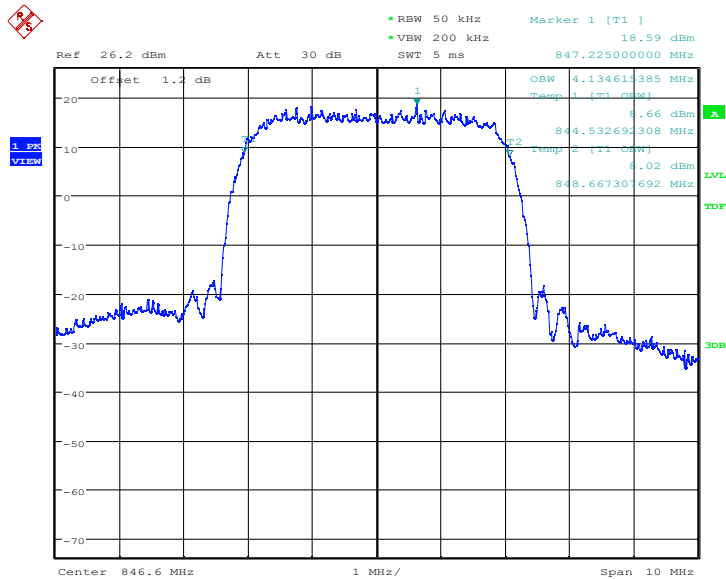
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Report No.: I22W00025-WCDMA RF_Rev2



Date: 26.MAR.2022 21:20:45

Channel 4233-Occupied Bandwidth (99% BW)



Date: 26.MAR.2022 21:21:43

Chongqing Academy of Information and Communication Technology

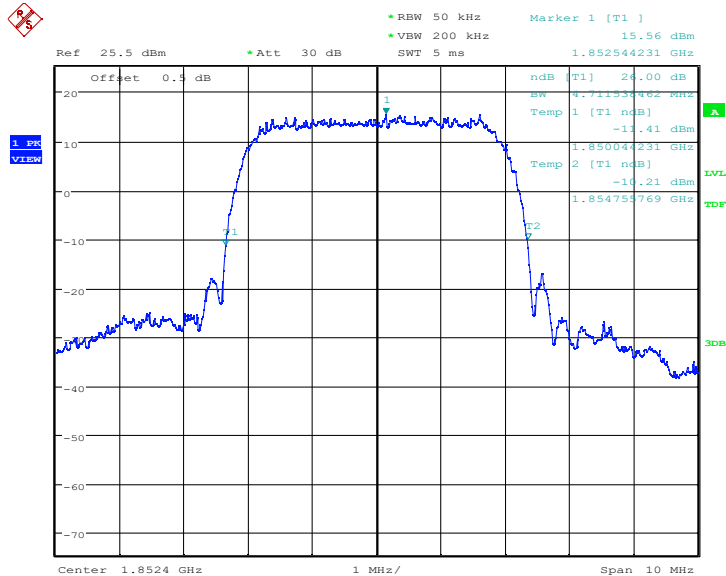
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777



WCDMA Band 2 (-26dBc)-QPSK

Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
1852.4	4.712
1880	4.679
1907.6	4.728

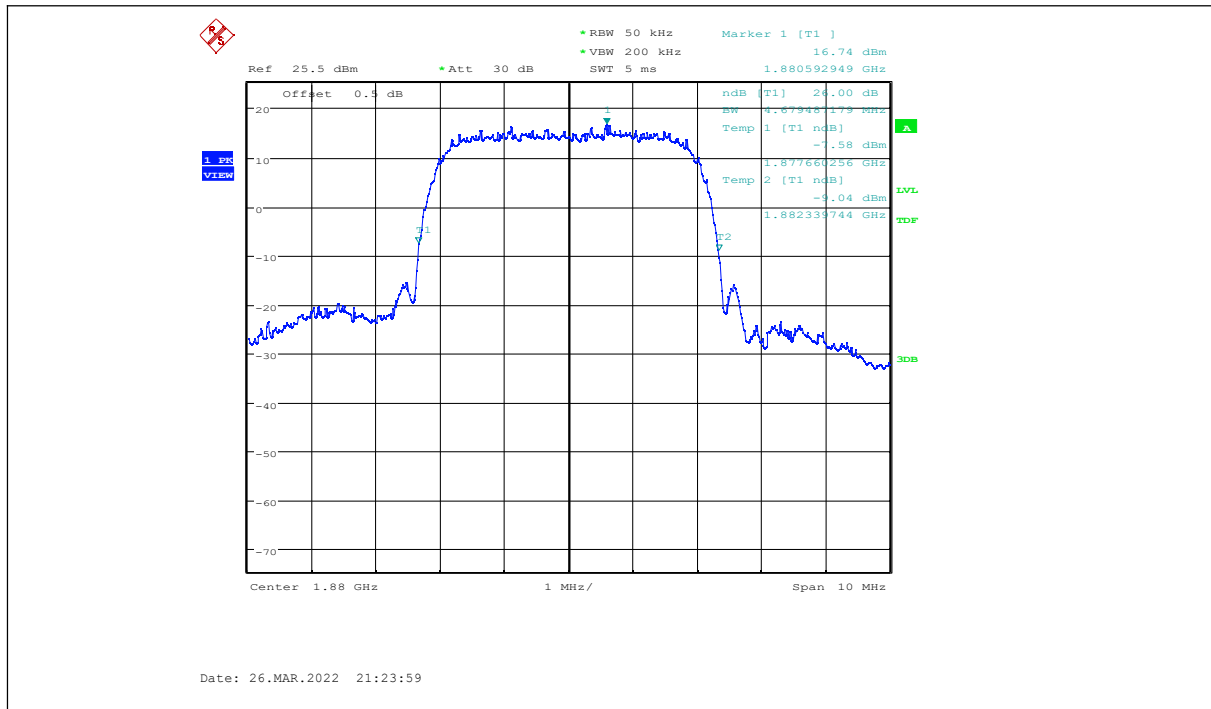
Channel 9262-Emission Bandwidth (-26dBc BW)



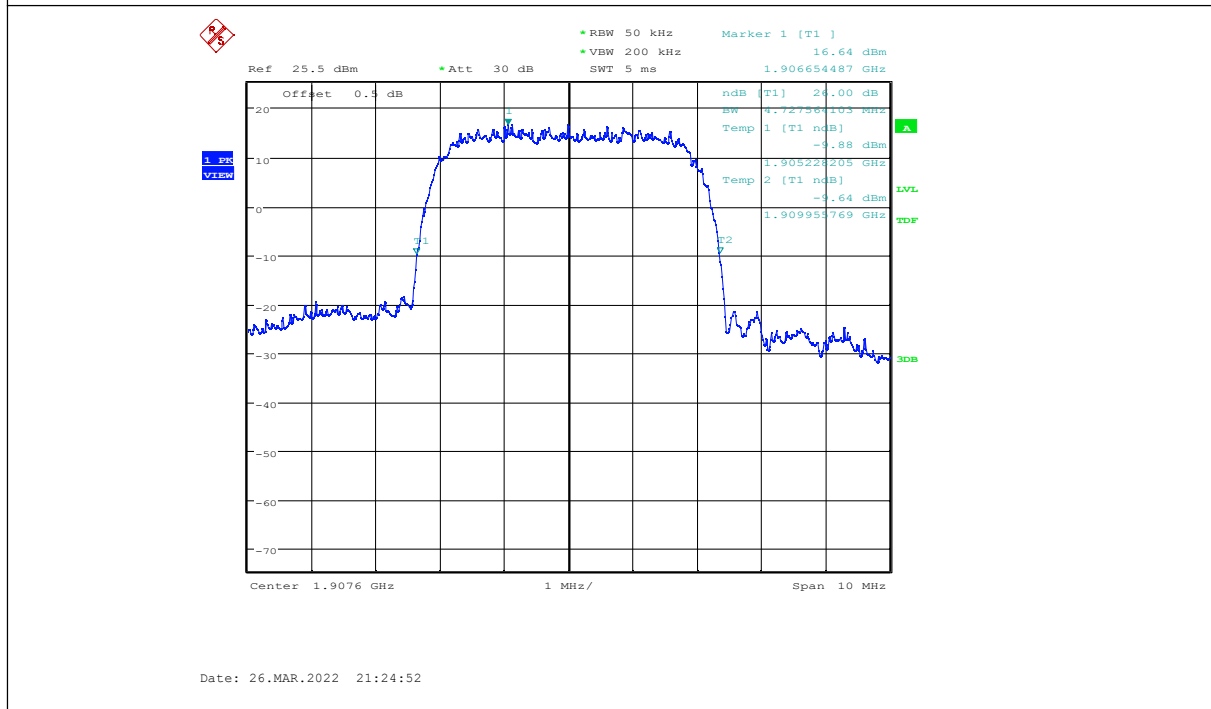
Date: 26.MAR.2022 21:22:56

Channel 9400-Emission Bandwidth (-26dBc BW)

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777



Channel 9538-Emission Bandwidth (-26dBc BW)



Chongqing Academy of Information and Communication Technology

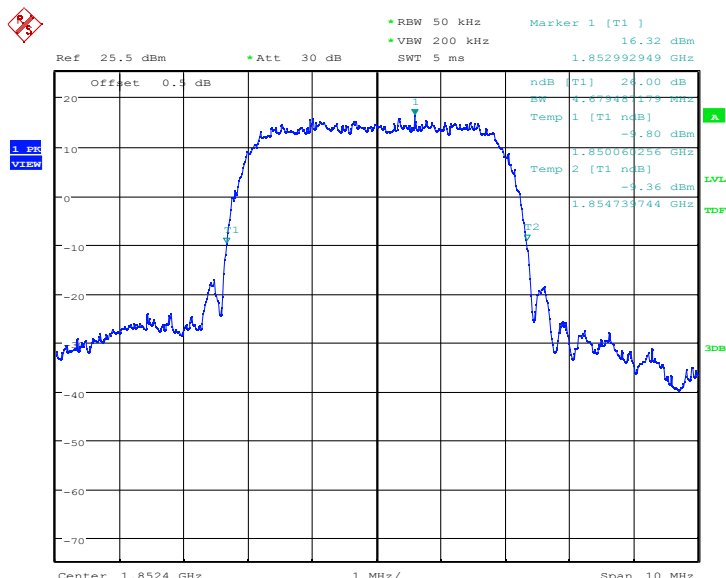
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 2 (-26dBc)-16QAM

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

WCDMA Band 2 (-26dBc)

Channel 9262-Emission Bandwidth (-26dBc BW)

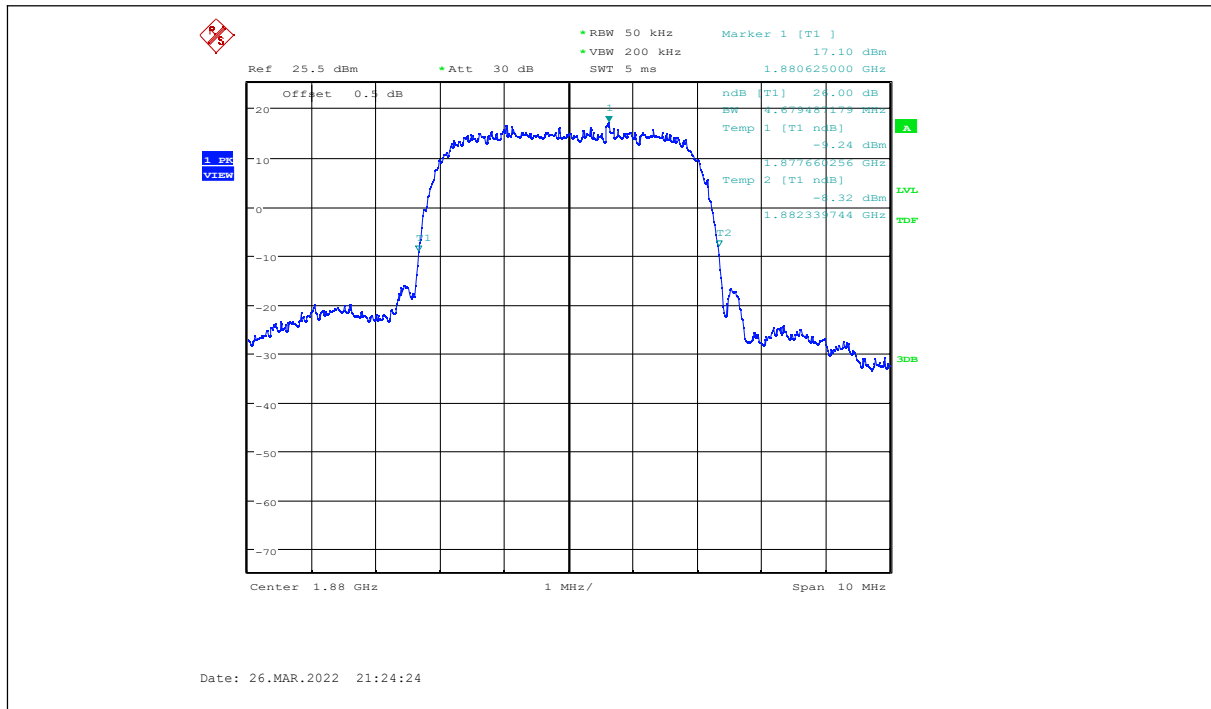


Date: 26.MAR.2022 21:23:34

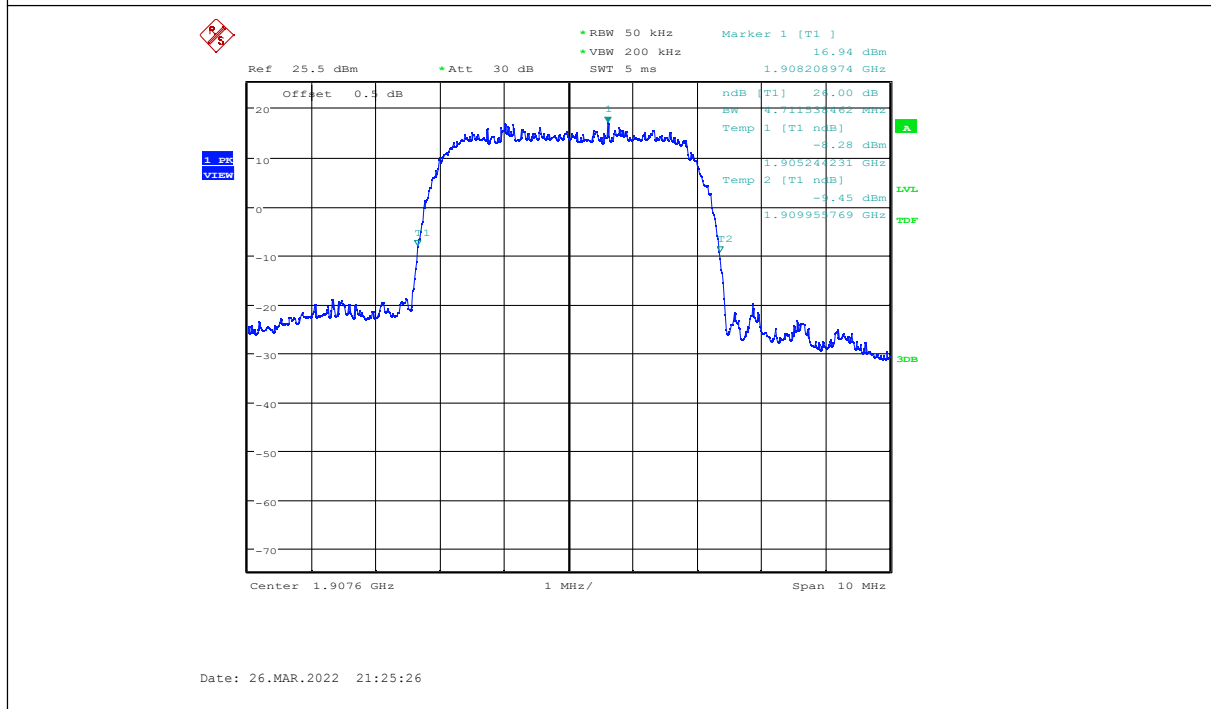
Channel 9400-Emission Bandwidth (-26dBc BW)

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Channel 9538-Emission Bandwidth (-26dBc BW)



Chongqing Academy of Information and Communication Technology

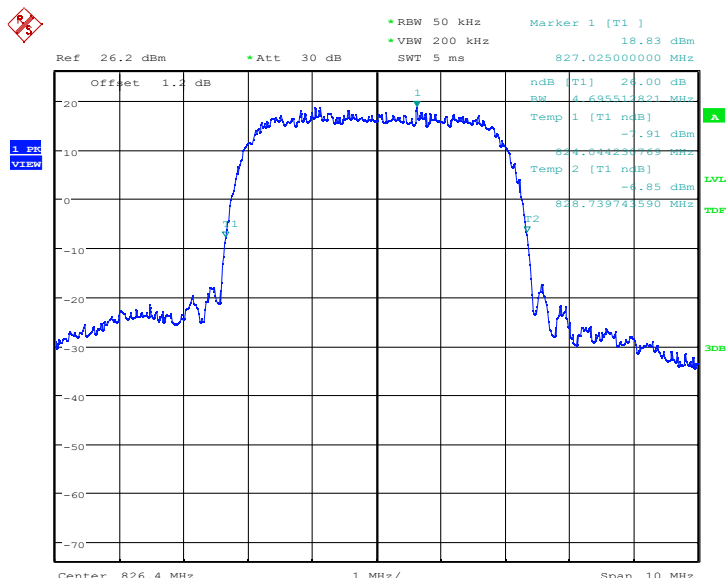
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 5 (-26dBc)-QPSK

Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
826.4	4.696
836.6	4.712
846.6	4.728

WCDMA Band 5 (-26dBc)

Channel 4132-Emission Bandwidth (-26dBc BW)



Date: 26.MAR.2022 21:25:56

Channel 4183-Emission Bandwidth (-26dBc BW)

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Ref 26.2 dBm • Att 30 dB SWT 5 ms 837.176923077 MHz

Marker 1 [T1] 18.70 dBm

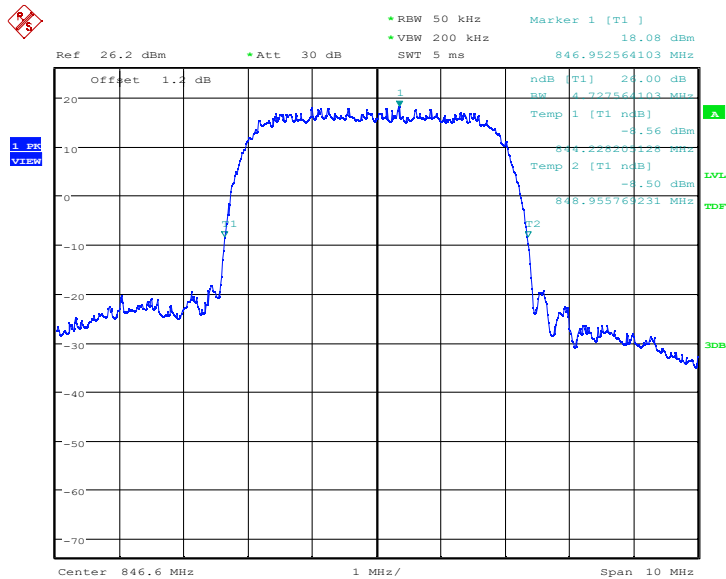
Offet 1.2 dB

1 dB VIEW

ndB [T1] 24.00 dB
BW 4.71153462 MHz
Temp 1 [T1 ndB] -4.97 dBm
834.24423769 MHz
Temp 2 [T1 ndB] -7.70 dBm
838.955769231 MHz

Center 836.6 MHz 1 MHz/ Span 10 MHz

Channel 4233-Emission Bandwidth (-26dBc BW)



Chongqing Academy of Information and Communication Technology

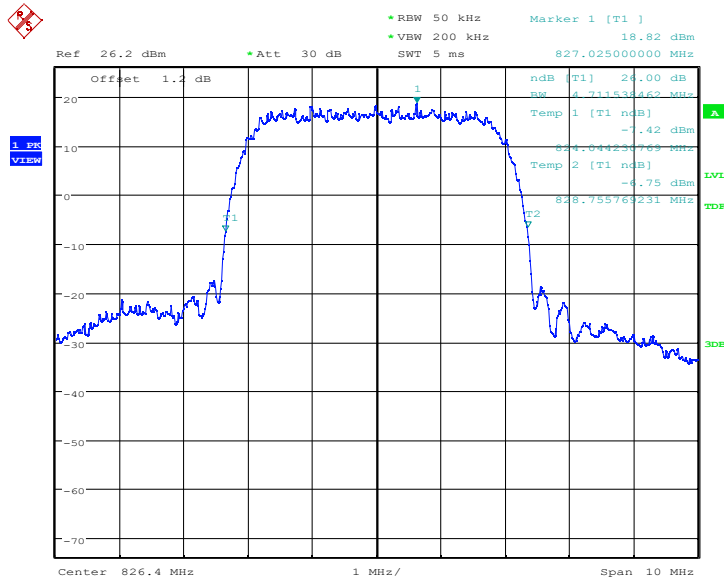
Page 37 of 64

WCDMA Band 5 (-26dBc)-16QAM

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

WCDMA Band 5 (-26dBc)

Channel 4132-Emission Bandwidth (-26dBc BW)

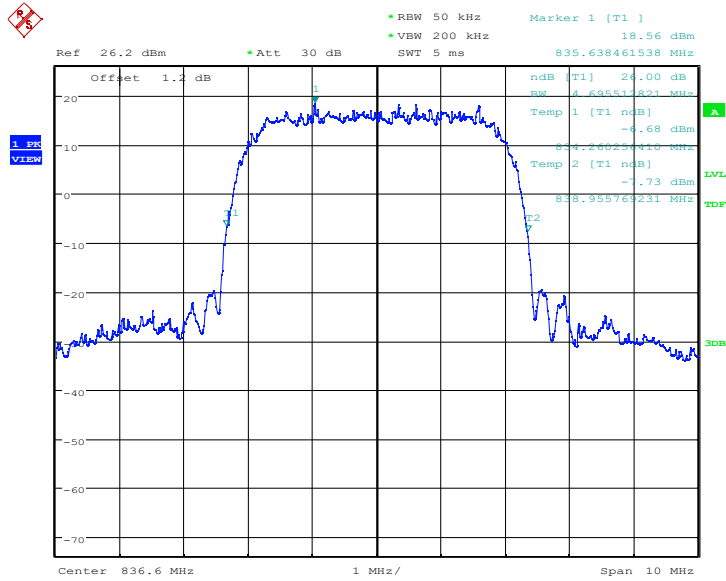


Date: 26.MAR.2022 21:26:34

Channel 4183-Emission Bandwidth (-26dBc BW)

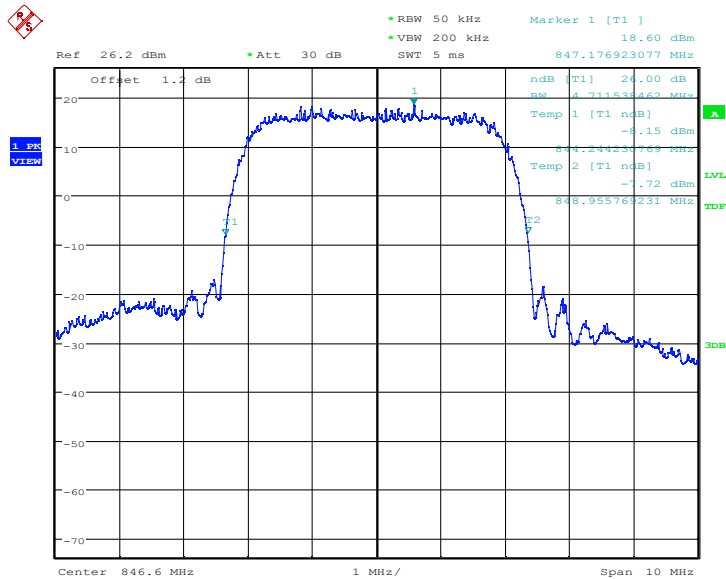
Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Date: 26.MAR.2022 21:27:43

Channel 4233-Emission Bandwidth (-26dBc BW)



Date: 26.MAR.2022 21:28:53

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

6.5. Conducted spurious emissions

Specifications:	FCC Part 2.1051, 24.238, 2.1053, 22.917, 27.53
DUT Serial Number:	863427042013020
Test conditions:	Ambient Temperature:15°C-35°C 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.

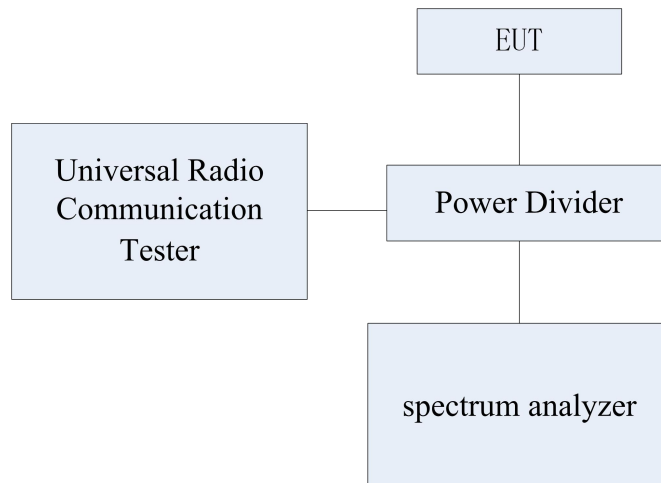
According to Part 24.238 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB, so the limit level is: $P(\text{dBm}) - (43 + 10 \log(P)) \text{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

Measurement Uncertainty:

Item	Uncertainty	
Expanded Uncertainty	$9\text{kHz} < f \leq 4\text{GHz}$	0.71 dB (k=2)
	$4\text{GHz} \leq f < 12.75\text{GHz}$	0.74 dB (k=2)
	$12.75\text{GHz} \leq f < 26\text{GHz}$	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 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.

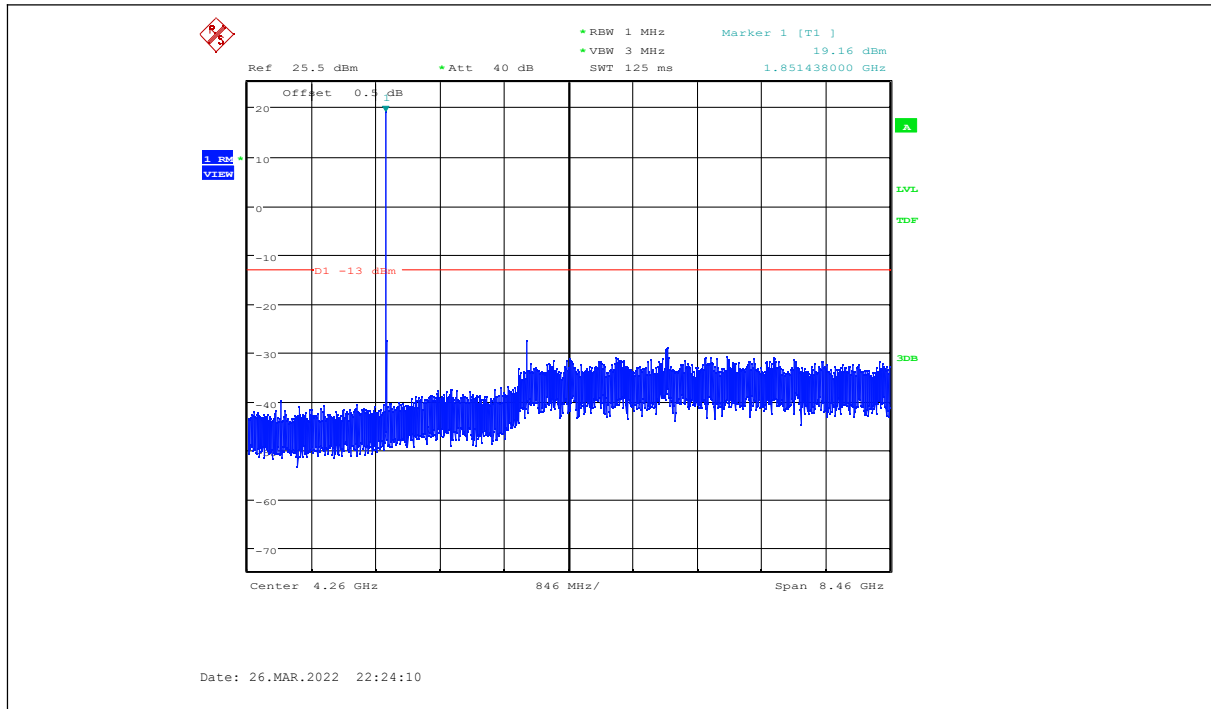
Note: --

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.

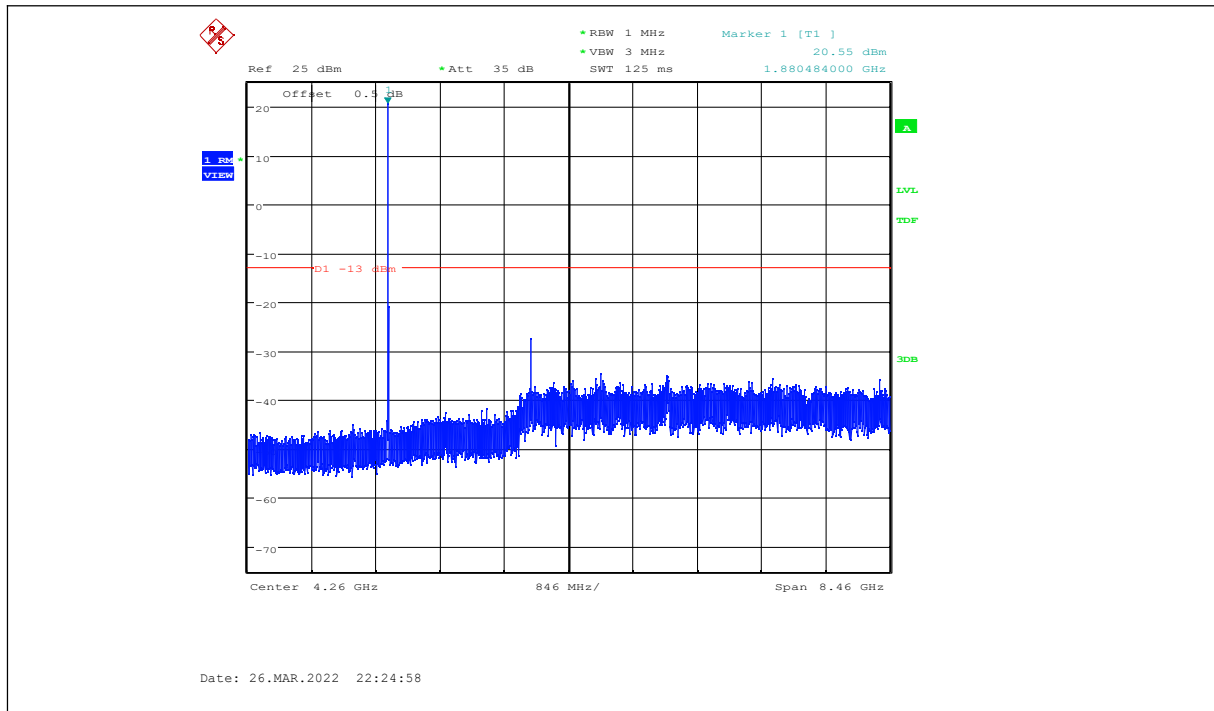


Channel 9400:30MHZ - 8490MHZ

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

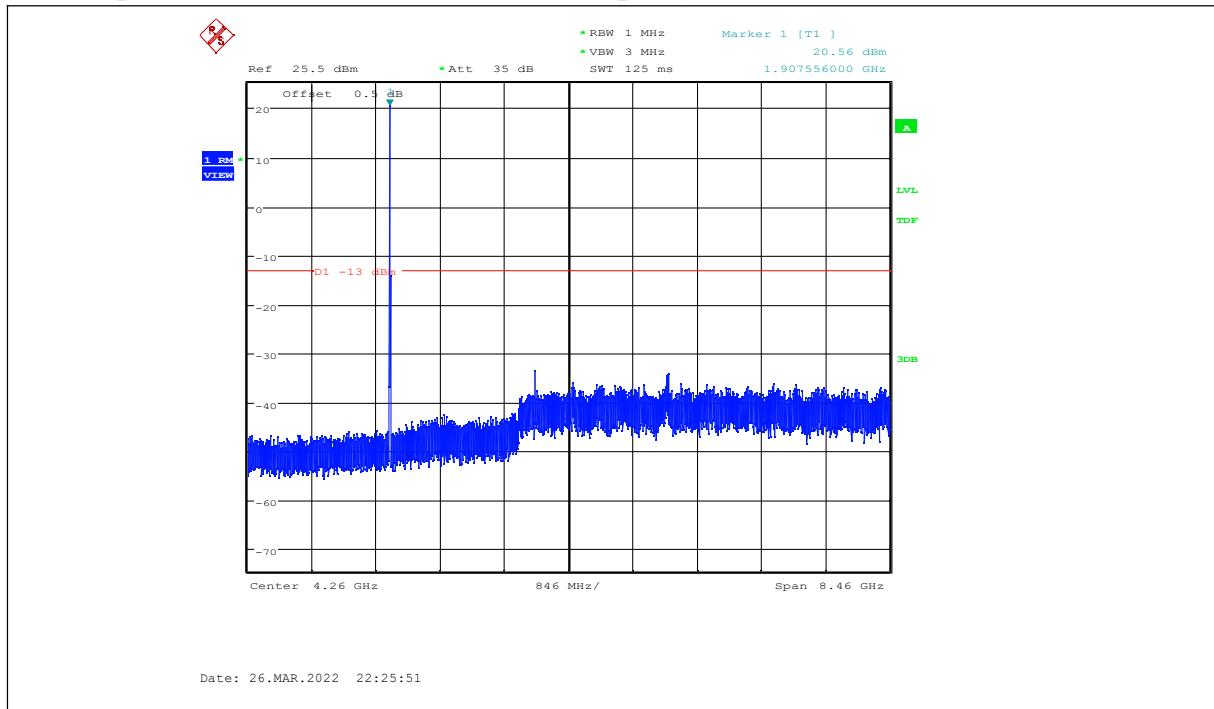
Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
 Tel: 0086-23-88069965 FAX:0086-23-88608777



Channel 9538:30MHZ - 8490MHZ

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



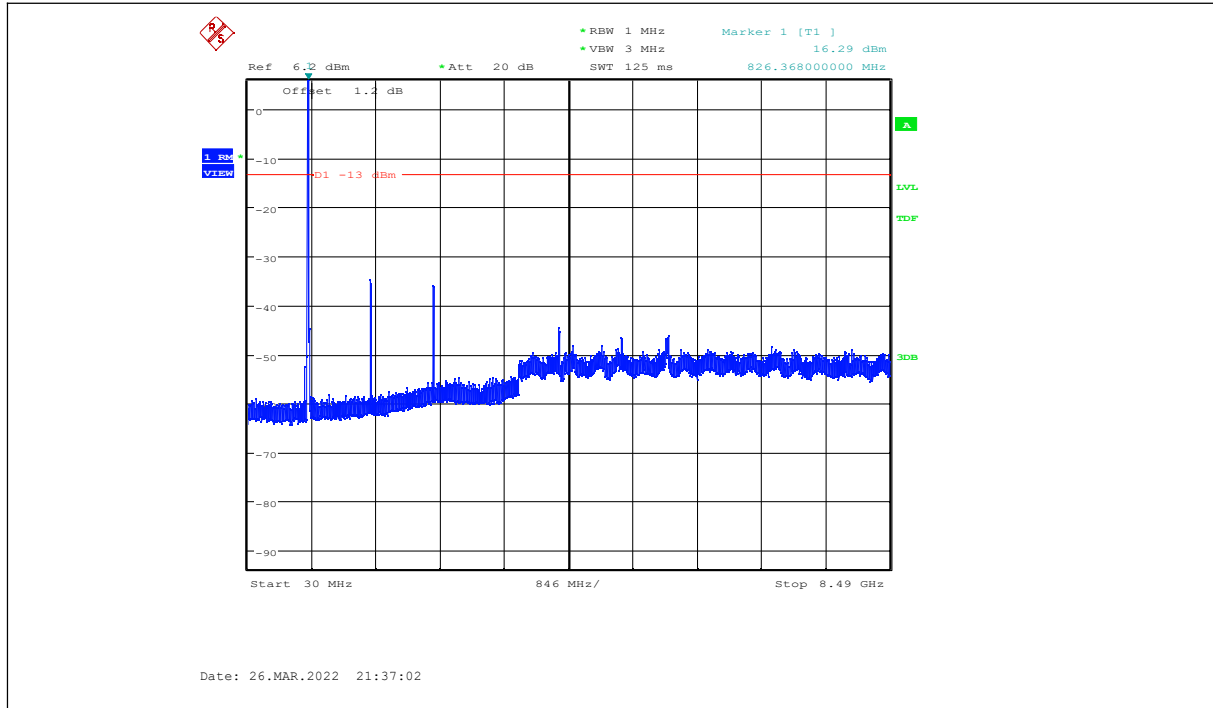
Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 5-QPSK

Channel 4132:30MHZ - 8490MHZ

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

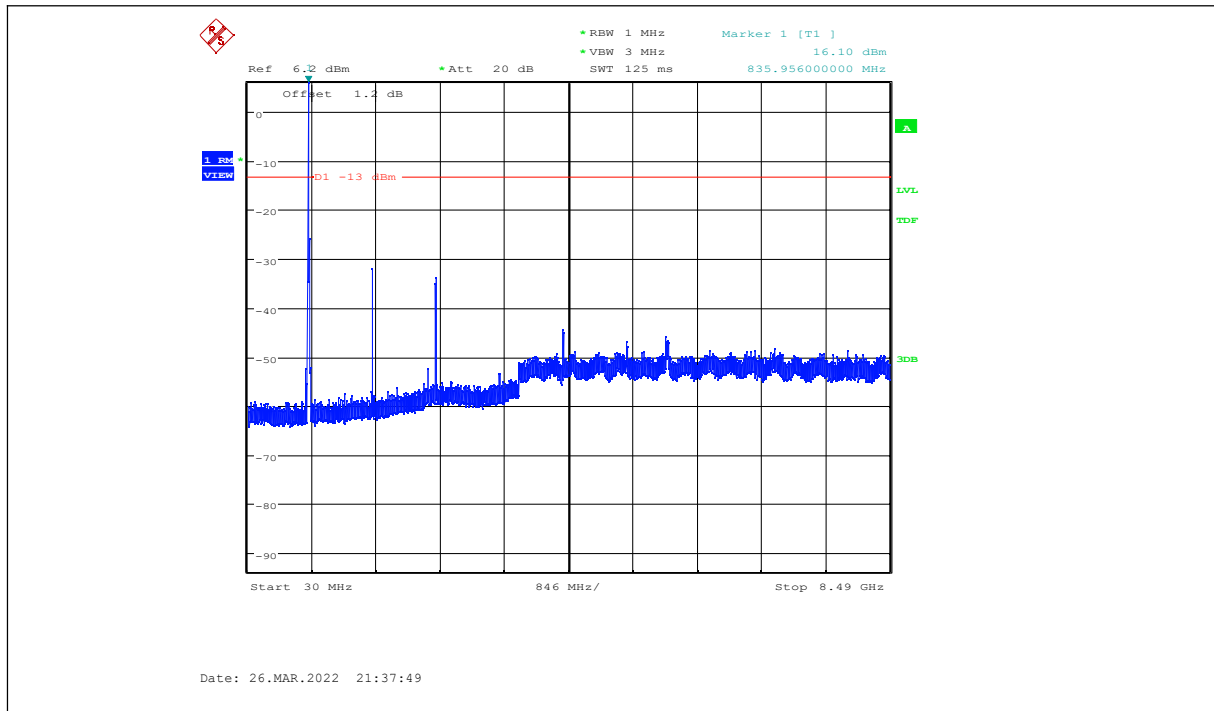


Channel 4183:30MHZ - 8490MHZ

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

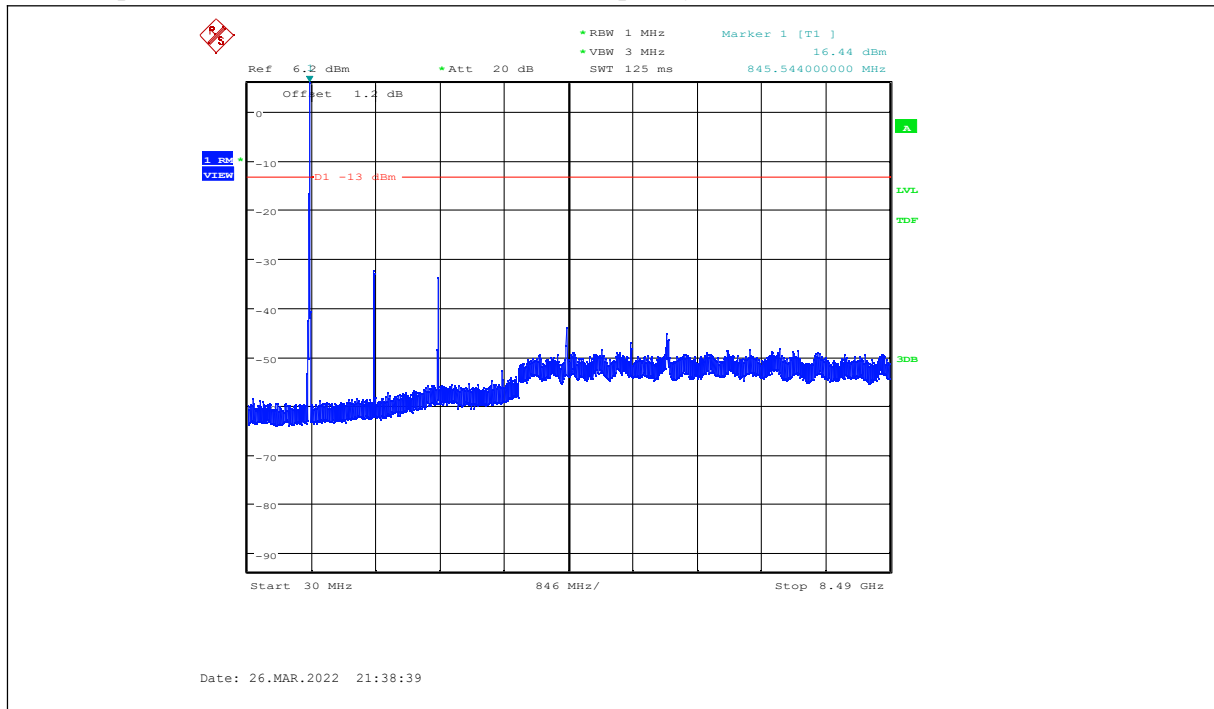
Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777



Channel 4233:30MHZ - 8490MHZ

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



Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

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:15°C-35°C 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: $P(\text{dBm}) - (43 + 10 \log(P)) \text{ dB} = -13\text{dBm}$.

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.

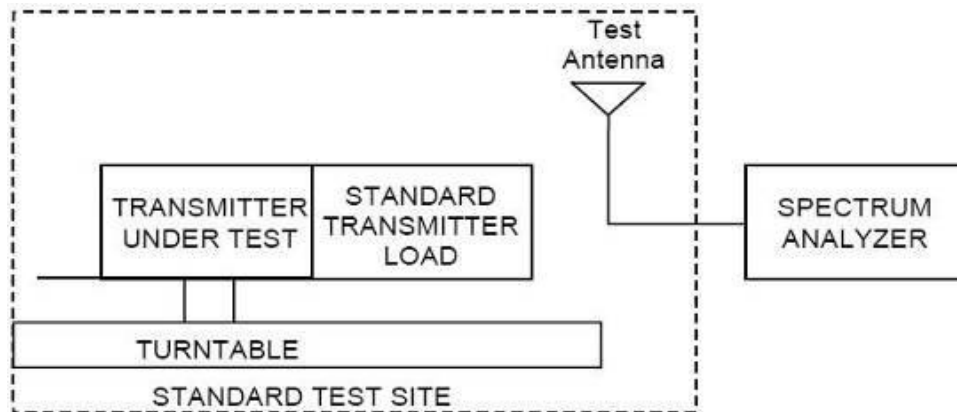
Test Method:

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.

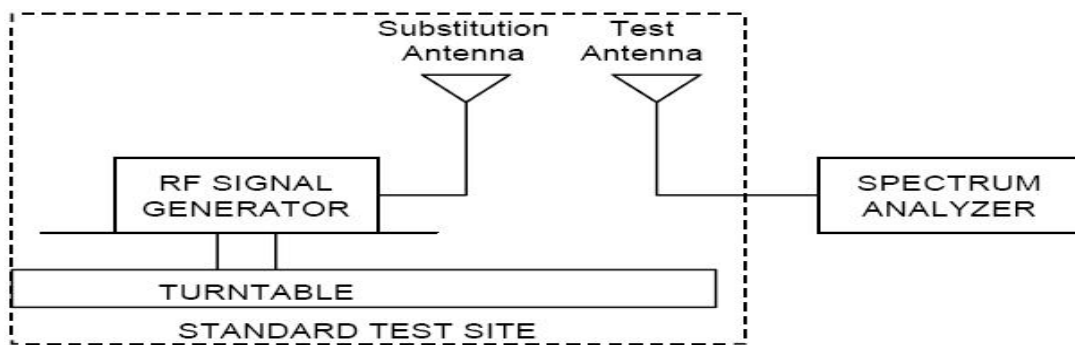
(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above. The distance from the device to the antenna is 3 m .

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



(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:

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

where:

P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

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

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

6.6.1 WCDMA B2 Radiated Spurious Emission Results

Test Data (RMC bandwidth 9262 QPSK Mode)

Frequency [MHz]	Generator output power(Pg)[dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd)[dBm]	Antenna Polarization [H/V]
3704.8	-66.0	7.2	8.9	-64.3	V
5557.2	-65.0	8.0	10.5	-62.5	V
7409.6	-64.9	7.9	11.9	-60.9	V
9262.0	-63.2	8.0	11.5	-59.7	V
11114.4	-62.3	8.4	12.1	-58.6	V
12966.8	-61.4	8.9	12.4	-57.9	V

Test Data (RMC bandwidth 9400 QPSK Mode)

Frequency [MHz]	Generator output power(Pg)[dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd)[dBm]	Antenna Polarization [H/V]
3760.0	-66.3	7.2	8.9	-64.6	V
5640.0	-65.0	8.2	10.5	-62.7	V
7520.0	-64.8	7.9	11.9	-60.8	V
9400.0	-63.2	8.0	11.5	-59.7	V
11280.0	-62.2	8.5	12.1	-58.6	V
13160.0	-61.1	9.1	12.4	-57.8	V

Test Data (RMC bandwidth 9538 QPSK Mode)

Frequency [MHz]	Generator output power(Pg)[dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd)[dBm]	Antenna Polarization [H/V]
3815.2	-66.5	7.2	8.9	-64.8	V
5722.8	-65.4	8.0	10.5	-62.9	V
7630.4	-64.8	8.3	11.9	-61.2	V
9538.0	-63.9	8.5	11.5	-60.9	V
11445.6	-63.1	8.4	12.1	-59.4	V
13353.2	-61.1	9.2	12.4	-57.9	V

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

6.6.2 WCDMA B5 Radiated Spurious Emission Results

Test Data (RMC bandwidth 4132 QPSK Mode)

Frequency [MHz]	Generator output power(Pg)[dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd)[dBm]	Antenna Polarization [H/V]
1652.8	-69.6	4.7	7.9	-66.4	V
2479.2	-58.8	5.9	6.9	-57.8	V
3305.6	-68.1	6.9	8.9	-66.1	V
4132.0	-65.1	7.8	9.2	-63.7	V
4958.4	-65.4	6.8	9.9	-62.3	V
5784.8	-71.8	1.4	10.9	-62.3	V

Test Data (RMC bandwidth 4183 QPSK Mode)

Frequency [MHz]	Generator output power(Pg)[dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd)[dBm]	Antenna Polarization [H/V]
1673.2	-69.9	4.8	7.9	-66.8	V
2509.8	-58.9	5.9	6.9	-57.9	V
3346.4	-68.2	7.0	8.9	-66.3	V
4183.0	-64.9	7.8	9.2	-63.5	V
5019.6	-65.6	6.8	9.9	-62.5	V
5856.2	-65.9	7.4	10.9	-62.4	V

Test Data (RMC bandwidth 9538 QPSK Mode)

Frequency [MHz]	Generator output power(Pg)[dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd)[dBm]	Antenna Polarization [H/V]
1693.2	-69.7	4.8	7.9	-66.6	V
2539.8	-58.7	5.9	6.9	-57.7	V
3386.4	-68.2	6.9	8.9	-66.2	V
4233.0	-65.2	7.9	9.2	-63.9	V
5079.6	-65.6	6.8	9.9	-62.5	V
5926.2	-65.6	7.5	10.9	-62.2	V

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

6.7. Band Edge

Specifications:	FCC Part 2.1051, 24.238, 2.1053, 22.917, 27.53
DUT Serial Number:	863427042013020
Test conditions:	Ambient Temperature:15°C-35°C 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.

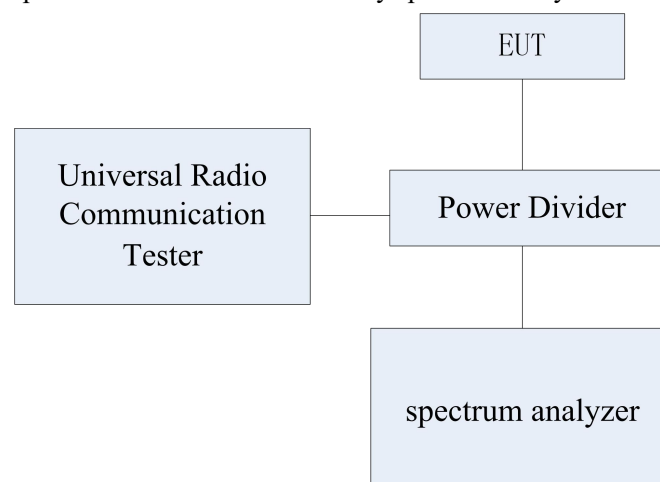
According to Part 24.238 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB, so the limit level is: $P(\text{dBm}) - (43 + 10 \log(P)) \text{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

Measurement Uncertainty:

Item	Uncertainty	
Expanded Uncertainty	$9\text{kHz} < f \leq 4\text{GHz}$	0.71 dB (k=2)
	$4\text{GHz} \leq f < 12.75\text{GHz}$	0.74 dB (k=2)
	$12.75\text{GHz} \leq f < 26\text{GHz}$	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.



Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Test Method:

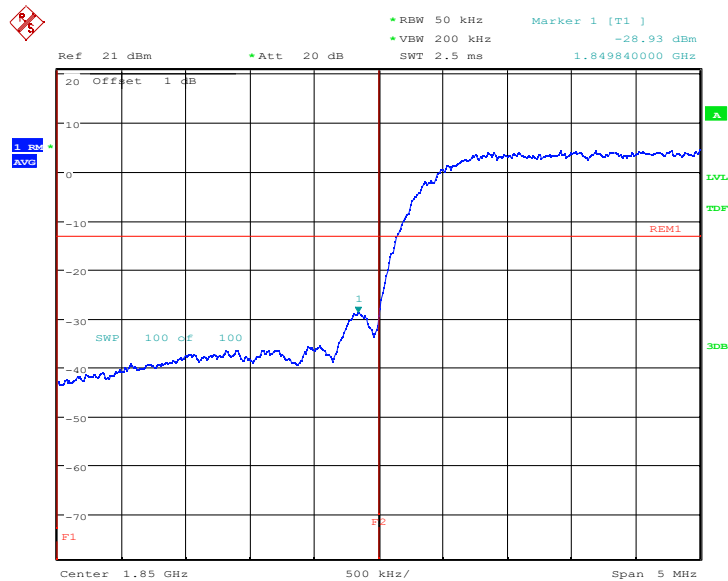
- 1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The loss of the cables the test system is calibrated to correct the readings.
- 2) The spectrum analyzer was set to Average Detector function and Maximum hold mode.
- 3) The resolution 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

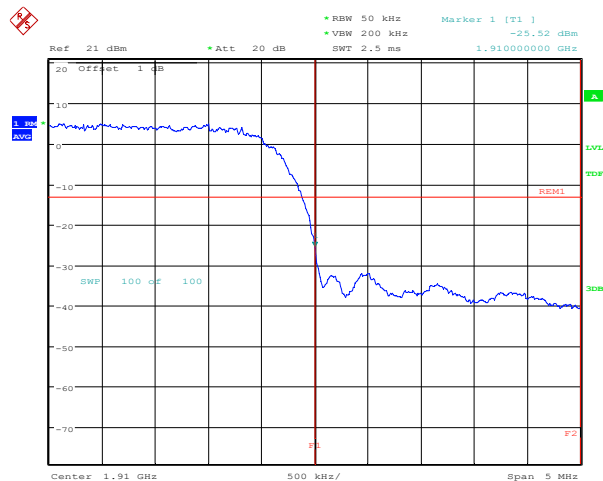
WCDMA Band 2-QPSK

Channel 9262



Date: 26.MAR.2022 21:30:28

Channel 9538



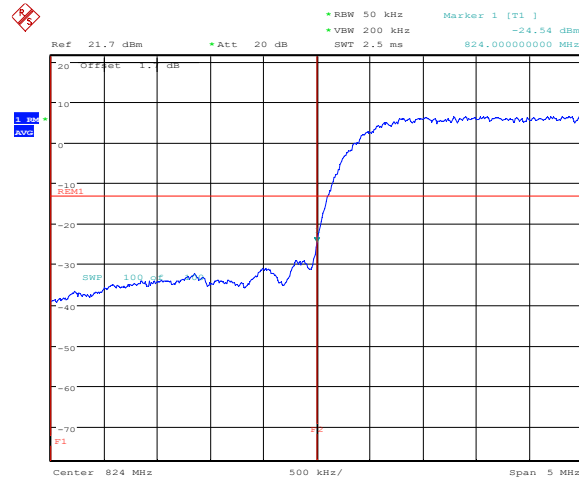
Date: 26.MAR.2022 21:31:20

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

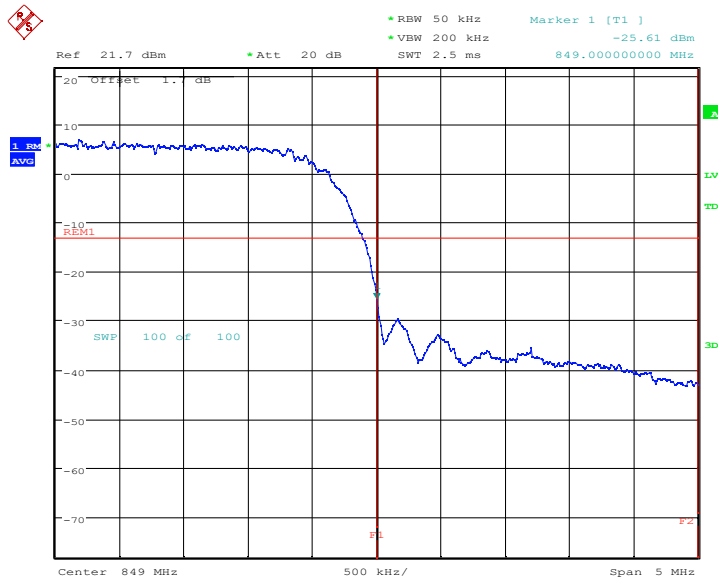
WCDMA Band 5-QPSK

Channel 4132



Date: 26.MAR.2022 21:32:11

Channel 4233



Date: 26.MAR.2022 21:33:07

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

6.8. Frequency Stability

Specifications:	FCC Part 2.1055, 22.355, 24.235, 27.54
DUT Serial Number:	863427042013020
Test conditions:	Ambient Temperature:15°C-35°C 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°C.
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°C increments from -30°C to +50°C. 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.

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

6. Subject the EUT to overnight soak at +50°C.
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 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

6.8.1 Frequency Stability over Temperature Variation Results

WCDMA Band 2-QPSK

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1850.130	1909.890		
50				10.60	0.0113
40				6.67	0.0071
30				5.48	0.0058
10				3.91	0.0042
0				2.96	0.0032
-10				2.55	0.0027
-20				2.29	0.0024
-30				1.67	0.0018

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1850.130	1909.890	1.12	0.0012
4.2				1.14	0.0012

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 5-QPSK
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	824.080	848.920		
50				-0.06	0.0001
40				0.43	0.0010
30				-0.29	0.0007
10				-0.37	0.0009
0				-0.56	0.0013
-10				-0.47	0.0011
-20				0.19	0.0005
-30				0.41	0.0010

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	824.080	848.920	0.19	0.0004
4.2				-0.49	0.0012

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

6.9. Peak to Average Ratio

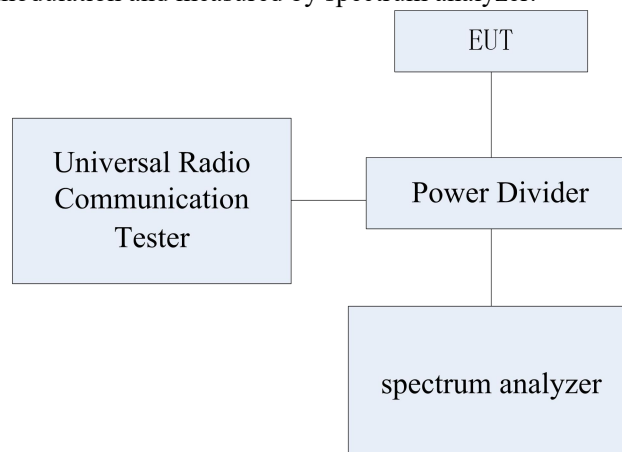
Specifications:	FCC Part 24.232, 27.50,
DUT Serial Number:	863427042013020
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

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.

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

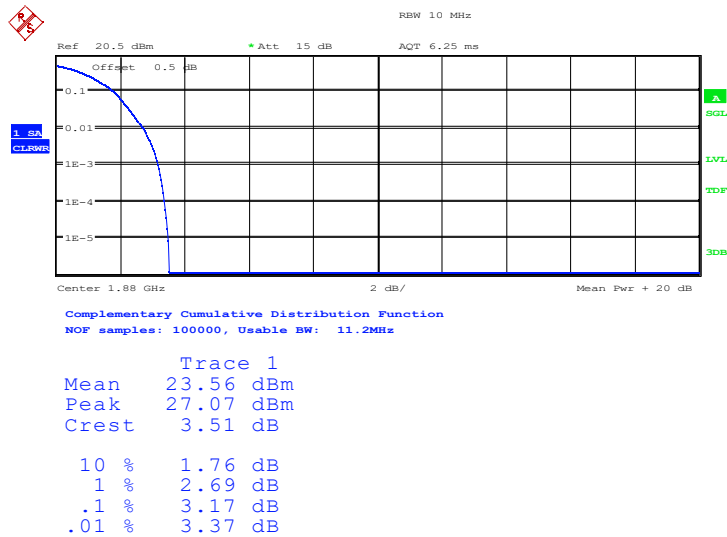
6.9.1 Peak to Average Ratio Results

WCDMA Band 2-QPSK

Measurement result

CH	Frequency (MHz)	PAPR (dB)
9400	1880	3.17

Channel 9400-1880MHz



Date: 25.MAR.2022 02:58:52

Chongqing Academy of Information and Communication Technology

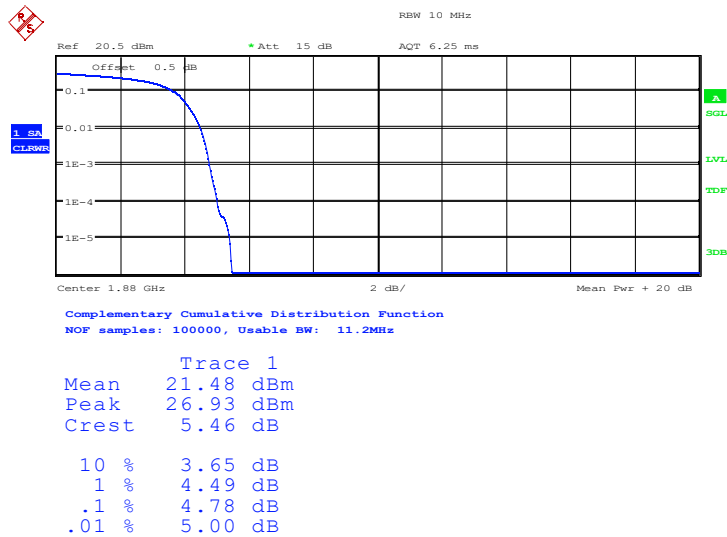
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 2-16QAM

Measurement result

CH	Frequency (MHz)	PAPR (dB)
9400	1880	4.78

Channel 9400-1880MHz



Date: 25.MAR.2022 02:59:48

Chongqing Academy of Information and Communication Technology

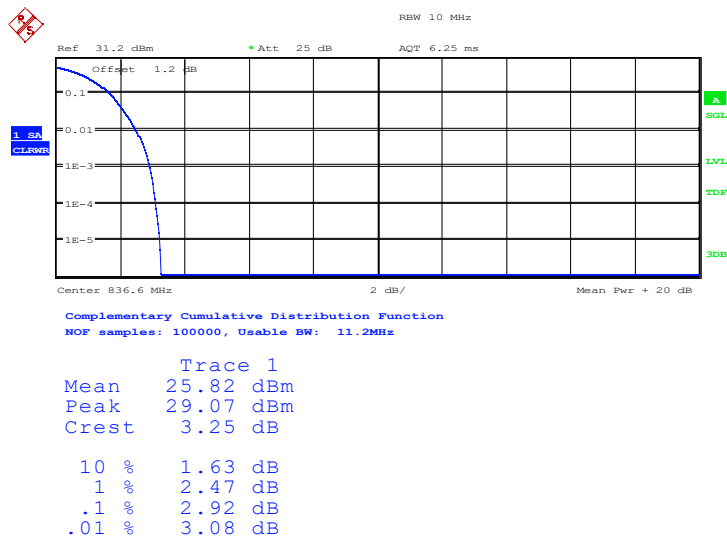
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 5-QPSK

Measurement result

CH	Frequency (MHz)	PAPR (dB)
4183	836.6	2.92

Channel 4183-836.6MHz



Date: 26.MAR.2022 21:39:44

Chongqing Academy of Information and Communication Technology

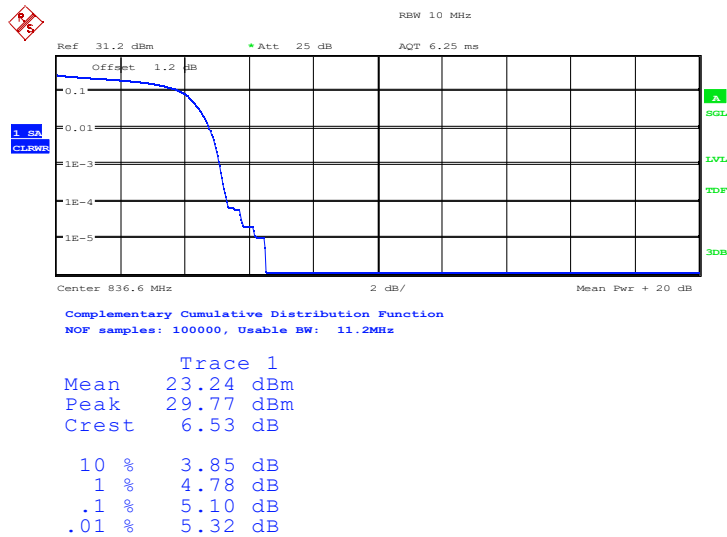
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

WCDMA Band 5-16QAM

Measurement result

CH	Frequency (MHz)	PAPR (dB)
4183	836.6	5.10

Channel 4183-836.6MHz



Date: 26.MAR.2022 21:40:42

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Report No.: I22W00025-WCDMA RF_Rev2

Annex A EUT Photos

See the document "I22W00025-External Photos".

See the document "I22W00025-Internal Photos".

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777



Report No.: I22W00025-WCDMA RF_Rev2

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777