TEST REPORT

REPORT NUMBER:I23W00045-WCDMA RF

ON

Type of Equipment:	**4G Smart Phone**
Type of Designation:	**MobiWire H6322, Altice S35**
Brand Name:	**MobiWire, Altice**
Manufacturer:	**MobiWire SAS**
FCC ID:	**QPN-H6322**

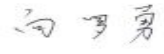
ACCORDING TO

FCC 47 CFR Part 22;FCC 47 CFR Part 2; FCC 47 CFR Part 24

Chongqing Academy of Information and Communications Technology

Month date, year
October 8, 2023

Signature



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
I23W00045-WCDMA RF	00	2023-09-18
I23W00045-WCDMA RF	01	2023-10-08

CONTENTS

1. Test Laboratory

1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
Identifier Number:	CN0044
Designation 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:	2023-08-16
Testing End Date:	2023-09-05

1.4. Signature

	2023-10-08
Junxin Dong **(Prepared this test report)**	**Date**
	2023-10-08
Lili Wang **(Reviewed this test report)**	**Date**
	2023-10-08
Luoyong Xiang **Director of the laboratory** **(Approved this test report)**	**Date**

2. Client Information

2.1. Applicant Information

Company Name:	MobiWire SAS
Address /Post:	107 Boulevard de la Mission Marchand 92400 Courbevoie,France
City:	Courbevoie
Country:	France
Telephone:	+33625028368
Fax:	N/A
Email:	olivier.tiennault@mobiwire.com
Contact Person:	Olivier Tiennault

2.2. Manufacturer Information

Company Name:	MobiWire SAS
Address /Post:	107 Boulevard de la Mission Marchand 92400 Courbevoie,France
City:	Courbevoie
Country:	France
Telephone:	+33625028368
Fax:	N/A
Email:	olivier.tiennault@mobiwire.com
Contact Person:	Olivier Tiennault

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

3.1. About EUT

EUT Description	4G Smart Phone
Model name	MobiWire H6322, Smart P24
Brand name	MobiWire
GSM Frequency Band	GSM:850/ 900/ 1800/1900
WCDMA Frequency Band	WCDMA:B1/B2/B5/B8
LTE Frequency Band	LTE:B1/2/3/4/5/7/8/20/28/38/41
BLUETOOTH Frequency Band	2402MHz-2480MHz
WLAN Frequency Band	Wi-Fi 2.4G:802.11b/g/n, Wi-Fi 5G U-NII-1/ U-NII-2a/U-NII-2c/U-NII-3:802.11a/n/ac
Type of WCDMA modulation	QPSK/16QAM
Power Class 2	N/A
Power Class 3	WCDMA:B1/B2/B5/B8
Extreme Temperature	-10/+55℃
Nominal Voltage	3.85V
Extreme High Voltage	4.4V
Extreme Low Voltage	3.6V

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	354365420300609 354365420300617	V01	Mobiwire_H6322_V01	2023-08-15
S2	354365420300385 354365420300393	V01	Mobiwire_H6322_V01	2023-08-15

S3	354365420300641 354365420300658	V01	Mobiwire_H6322_V01	2023-08-15

*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	II	1850-1910	1930-1990	--
WCDMA	V	824-849	869-894	--

3.4. Internal Identification of AE used during the test

AE ID*	Description	dB*
AE1	RF cable	0.5

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

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 47 CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	--
FCC 47 CFR Part 22	PUBLIC MOBILE SERVICES	--
FCC 47 CFR Part 24	PERSONAL COMMUNICATIONS SERVICES	--

5. Test Equipments Utilized

5.1. RF Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal. Interval	Cal.Due Date
1	Spectrum analyzer	FSQ 26	201137/026	--	--	R&S	1 Year	2023-06-29 2024-06-28
2	Spectrum analyzer	FSW26	104280	--	--	R&S	1 Year	2023-06-29 2024-06-28
3	DC Power Supply	3303D	801128	--	--	Topward	1 Year	2023-06-29 2024-06-28
4	Universal Radio Communication Tester	CMW500	152395	--	--	R&S	1 Year	2023-06-29 2024-06-28

5.2. RSE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal. Interval	Cal.Due Date
1	EMI Test Receiver	ESU40	100307	--	--	R&S	1 Year	2023-06-29 2024-06-28
2	TRILOG Broadband Antenna	VULB9163	9163-586	--	--	Schwarzbeck	1 Year	2022-10-20 2023-10-29
3	Horn antenna	9120D	1083	--	--	Schwarzbeck	2 Year	2022-10-25 2024-12-14
4	Horn antenna	DATE 1152	LM7127	--	--	ETS	2 Year	2022-09-07 2024-09-06
5	Horn antenna	DATE 1012	LM5945	--	--	ETS	2 Year	2022-09-07 2024-09-06

6	Amplifier1	SCU-08F1	8320027	--	--	R&S	1 Year	2023-06-29 2024-06-28
7	Amplifier2	SCU-18F	180093	--	--	R&S	1 Year	2023-06-29 2024-06-28

5.3. Climate Chamber

No.	Name	Type	SN	Manufacture	Cal. Interval	Cal.Due Date
1	Climate chamber	SH-241	92010759	--	1 Year	2023-06-29 2024-06-28

5.4. Anechoic chamber Vibration table

No.	Name	Type	SN	Manufacture	Cal. Interval	Cal.Due Date
1	Fully-Anechoic Chamber	FAC 5	--	TDK	3 Year	2021-09-23 2024-09-22
2	Anechoic Chamber	SAC 10	--	TDK	3 Year	2021-08-27 2024-08-26

5.5. Test software

No.	Name	version	SN	Manufacture
1	EMC32	V 10.20.01	--	R&S

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)	Output Power/EIPR	PASS
22.913(d)/ 24.232(d)	Peak-to-Average Ratio	PASS
2.1049(h)(i)/ 22.917(b)	99%Occupied Bandwidth	PASS
22.917(b)/ 24.238(b)	-26dB Emission Bandwidth	PASS
22.917(a) /24.238(a)	Band Edge at antenna terminals	PASS
22.235/2.1055//24.235	Frequency stability	PASS
2.1053/22.917(a) /24.238(a)	Conducted Spurious mission	PASS
2.1051/22.917/24.238/22.913/24.232	Emission Limit	PASS

Note:

The MobiWire H6322, Altice S35, manufactured by MobiWire SAS is a new product for testing.

This project has two configurations S1 (Mainly Supply) & S2 (Secondary Supply), the difference is memory, G-sensor and P/L sensor. We mainly test the S1 (Mainly Supply), and the S2 (Secondary Supply) tests the worst mode of the Radiated Emission of the S1 (Mainly Supply), and the test data of the worst mode will be reflected in the report.

The differences between S1 (Mainly Supply) & S2 (Secondary Supply) are shown in the table below:

Difference	Config 1: S1 (Mainly Supply)	Config 2: S2 (Secondary Supply)
CPU	MT8766V	MT6761V
Memory-ROM	HSEMSDS6S2B32G	KSI EMMC32G-PJ30
Memory-RAM	CXDB4ABAM-MK	micron FLXC2002G-N2
G-sensor	slan SC7A20ETR	sensortek STK8BA58
P-sensor	MN78912	Liteon LTR-569ALS-02

6.2. Output Power

Specifications:	FCC Part 2.1046/22.913(a) /24.232(c)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

During the process of testing, the EUT was controlled Rhode & Schwarz Digital Radio.
Communication tester to ensure max power transmission and proper modulation.
This result contains peak output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

6.2.1. Method of Measurements

Method of measurements please refer to KDB971168 D01 v03 clause 5.
The EUT was set up for the max output power with pseudo random data modulation.
The power was measured with Rhode & Schwarz Spectrum Analyzer FSQ(peak).
These measurements were done at 3 frequencies,826.4MHz, 836.6MHz and 846.6MHz for WCDMA Band V. (bottom, middle and top of operational frequency range).

6.2.2. Test procedures

The transmitter output port was connected to base station.
Set the EUT at maximum power through base station.
Select lowest, middle, and highest channels for each band and different modulation.
Measure maximum average power for other modulation signal.

6.2.3. Limit

22.913(a) Mobile stations are limited to 7 watts.
24.232(c) Mobile and portable stations are limited to 2 watts.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.62dB (k=2)

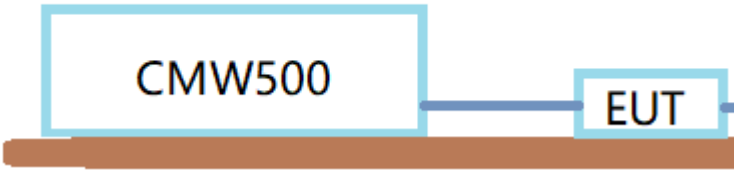
6.2.4. Test Proceduer

The transmitter output power was connected to calibrated attenuator, the other end of which was connected to signal analyzer. Transmitter output power was read off the power in dBm. The power outputs at the transmitter antenna port was determined by adding the value of attenuator to the signal analyzer reading.

6.2.5. Test Condition

RBW	VBW	Sweep time	Span
3MHz	10MHz	Auto	50MHz

6.2.6. Test Setup



6.2.7. Measurement results

WCDMA BAND II	
Channel	**Peak power (dBm)**
Low 9262/1852.4	23.70
Mid 9400 /1880	23.81
High 9538/1907.6	23.94

WCDMA BAND V	
Channel	**Peak power (dBm)**
Low 4132/826.4	22.80
Mid 4183/836.6	22.60
High 4233/846.4	22.58

6.3. EIRP

Specifications:	FCC Part 2.1046/22.913(a) /24.232(c)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

6.3.1. WCDMA EIRP

Description

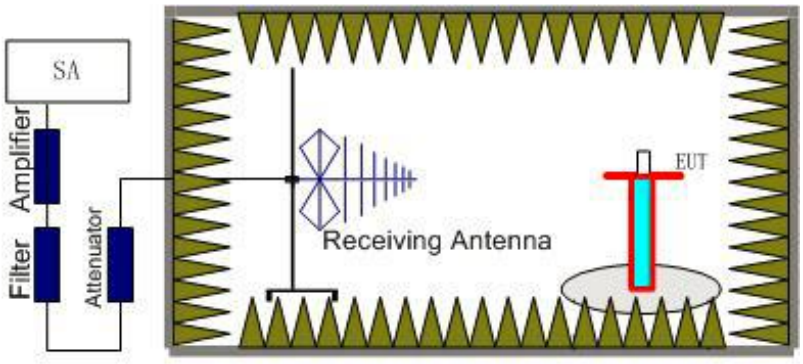
Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

"Rule Part 22.913(a) specifies ” The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

6.3.2. Method of Measurement

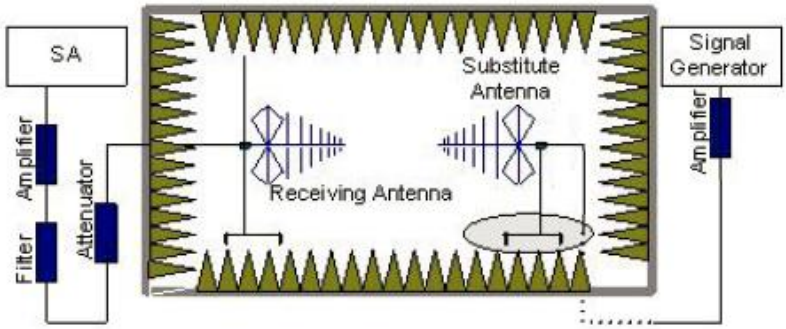
The measurements procedures in TIA-603E-2016 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).

3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna.

The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

The measurement results are obtained as described below:

Power (EIRP)=PMea+ PAg -Pcl+ Ga

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

6.3.3. Method of Measurement

CFR 22.917 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.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.62dB (k=2)

6.3.4. Measurement result

Maximum of Antenna Gain：

No.	Item(s)	Data
1	WCDMA II	0.12dBi
2	WCDMA V	0.2dBi
Note: The data of gain is provided by the customer may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.		

WCDMA Band II

Frequency (MHz)	Peak EIRP (dBm)	Polarization
1852.4	23.82	V
1880.0	23.93	H
1907.6	24.06	V

WCDMA Band V

Frequency(MHz)	Peak EIRP (dBm)	Peak ERP (dBm)	Polarization
826.4	23.00	20.85	H
836.6	22.80	20.65	H
846.6	22.78	20.63	H

6.4. Peak-to-Average Power Ratio

Specifications:	FCC Part 22.913(d)/ 24.232(d)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Method of test measurements please refer to KDB971168 D01 v03 clause 5.7.

6.4.1. PAPR Limit

The peak-to-average power ratio (PAPR) of the transmission may not exceed 13Db.

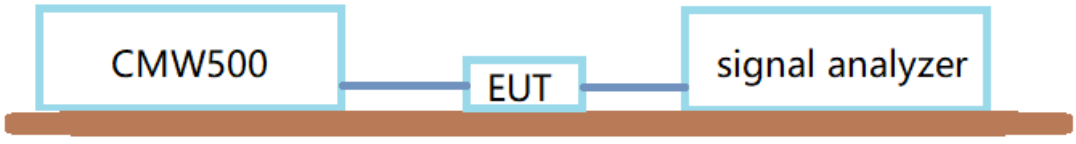
Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.62dB (k=2)

6.4.2. Test procedures

The EUT was connected to the spectrum analyzer and system simulator via a power divider.
Select the spectrum analyzer CCDF function.
Set RBW ≥ signal's occupied bandwidth.
Set the number of counts to a value that stabilizes the measured CCDF cure;
Sweep time ≥ 1s.
Record the maximum PAPR level associated with a probability of 0.1%.

6.4.3. Test Setup



6.4.4. Test result

Band	Channel/fc	PAPR	Limit
OB2	9263	3.04	13

Band	Channel/fc	PAPR	Limit
OB2	9400	3.01	13
OB2	9537	2.98	13

Band	Channel/fc	PAPR	Limit
OB5	4133	3.11	13
OB5	4175	3.11	13
OB5	4232	3.14	13

6.5. 99% Occupied Bandwidth

Specifications:	FCC Part 2.1049(h)(i)/ 22.917(b)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of WCDMA BAND II and WCDMA BAND V.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	500 kHz (k=2)

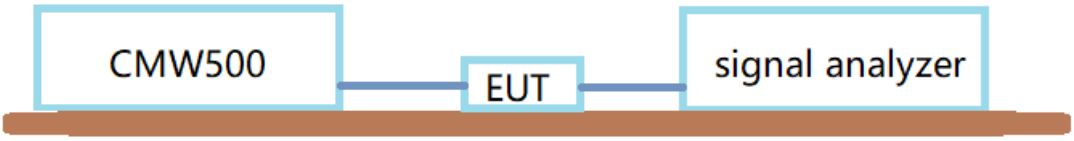
6.5.1. Test Procedure

The EUT output RF connector was connected with a short cable to the signal analyzer.

RBW was set to about 1% of emission BW, VBW >= 3 times RBW,.

99% bandwidth were measured, the occupied bandwidth is delta frequency between the two points where the display line intersects the signal trace.

6.5.2. Test Setup



6.5.3. Test result

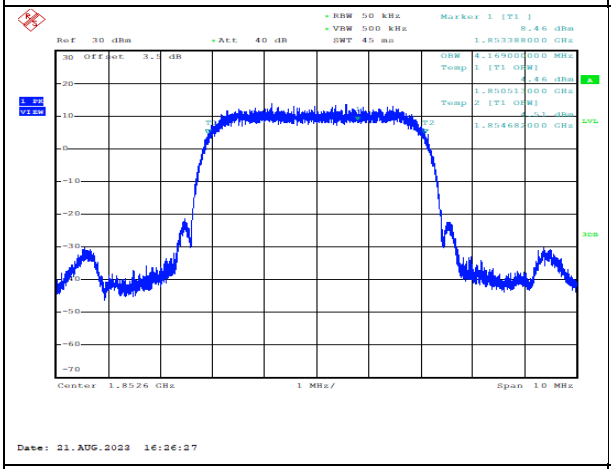
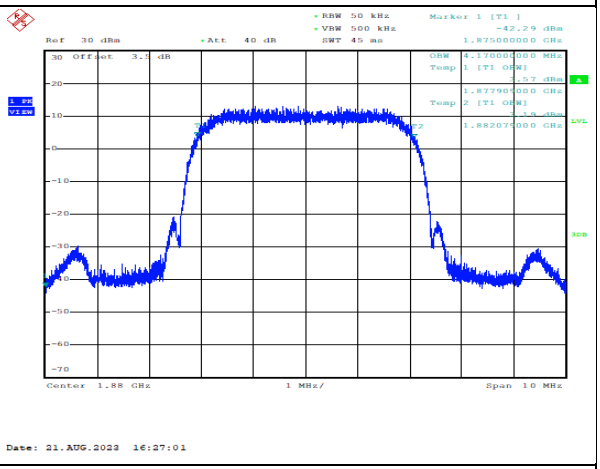
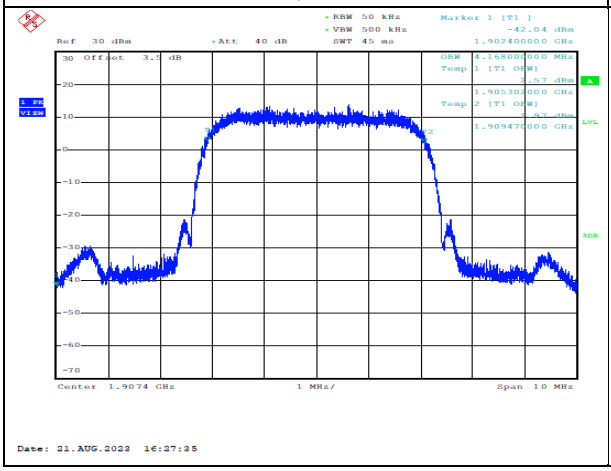
Band II

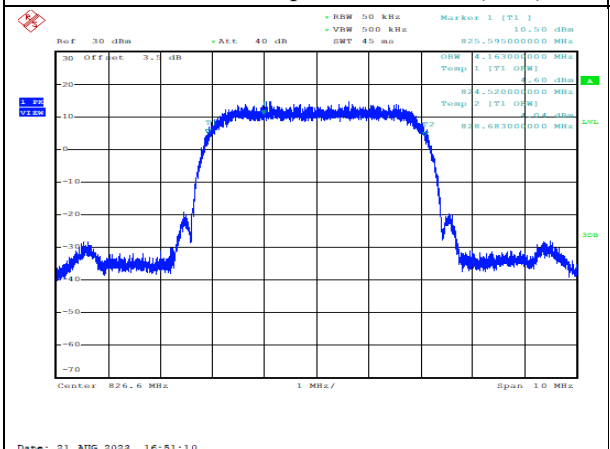
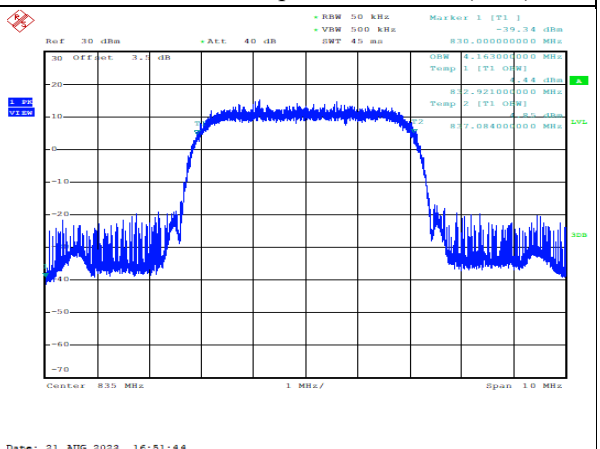
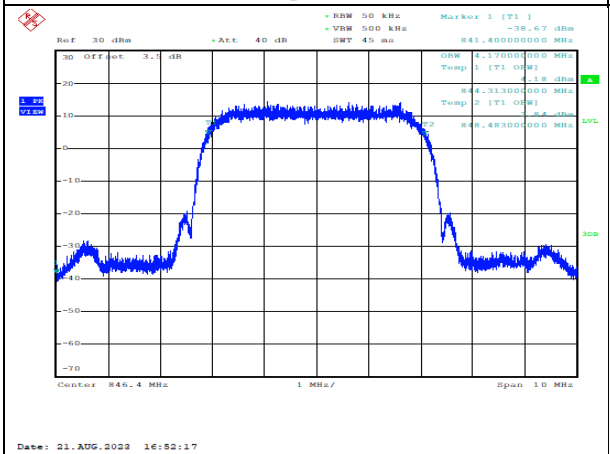
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
1852.4	4.169
1880	4.170
1907.6	4.168

Band V

Frequency (MHz)	Occupied Bandwidth (99%) (MHz)
826.4	4.163
836.6	4.163
846.6	4.170

Conclusion: PASS

WCDMA BAND II	
Channel 9262-Occupied Bandwidth (99%)	Channel 9400-Occupied Bandwidth (99%)
	
Channel 9538-Occupied Bandwidth (99%)	/
	/

WCDMA BAND V	
Channel 4132-Occupied Bandwidth (99%)	Channel 4175-Occupied Bandwidth (99%)
	
Channel 4233-Occupied Bandwidth (99%)	/
	/

6.6. -26dB Emission Bandwidth

Specifications:	FCC Part 22.917(b) /24.238(b)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Method of test please refer to KDB971168 D01 v03 clause 4.0.

Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of WCDMA BANDII,WCDMA BANDV.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	500 kHz (k=2)

6.6.1. Test Procedure

The EUT output RF connector related to a short cable to the signal analyzer.

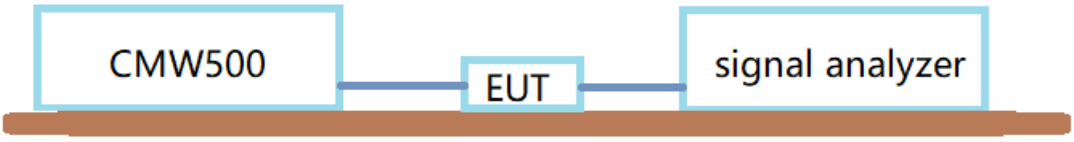
RBW was set to about 1% of emission BW, VBW >= 3 times RBW,.

26dB bandwidth were measured, the occupied bandwidth is delta frequency between the two points where the display line intersects the signal trace.

6.6.2. Measurement methods

For GSM: signal analyzer setting as: RBW= 3KHz; VBW=10KHz; Span=1MHz.

6.6.3. Test Setup



6.6.1 Test results

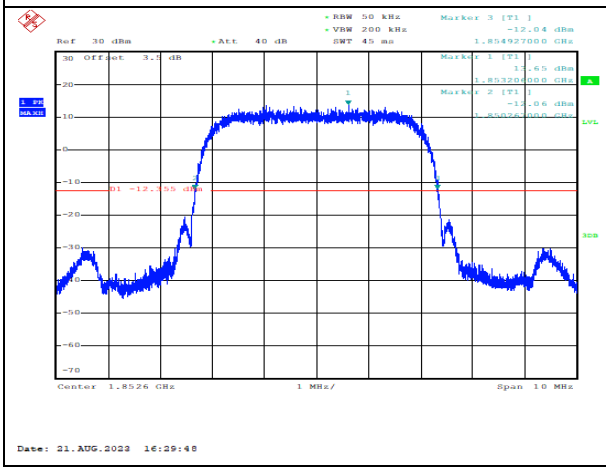
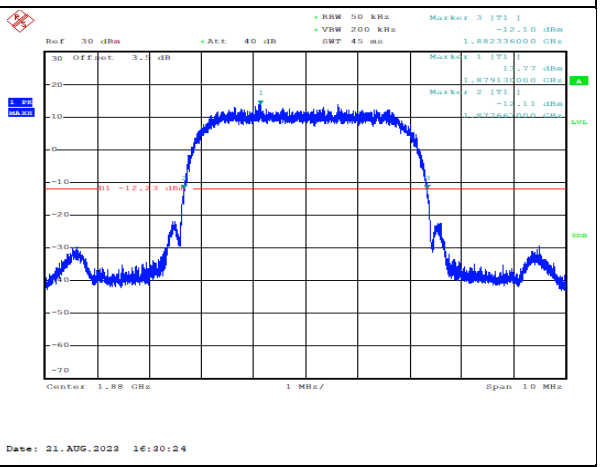
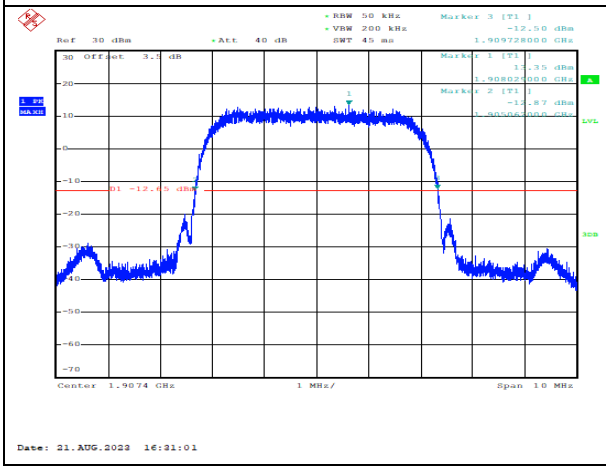
Band II

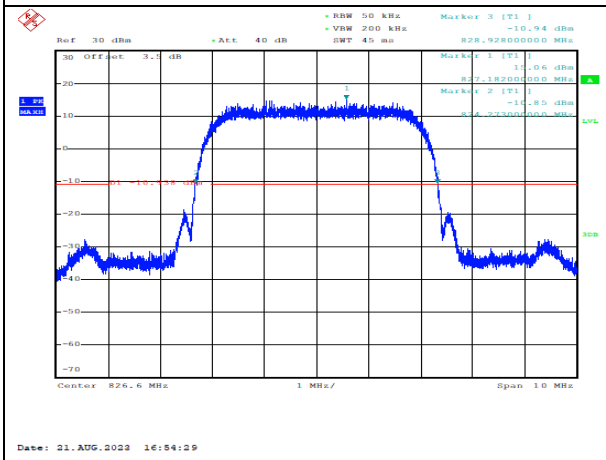
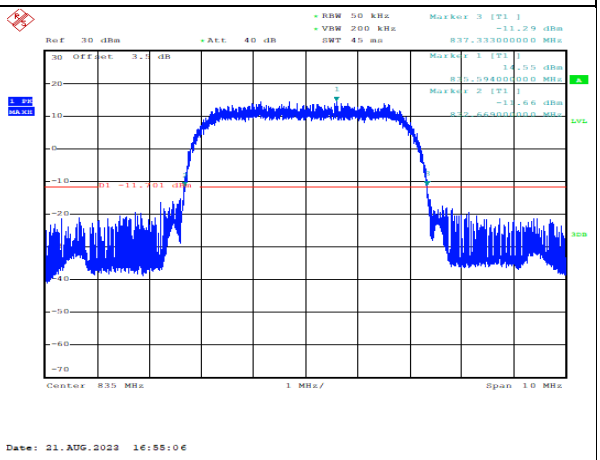
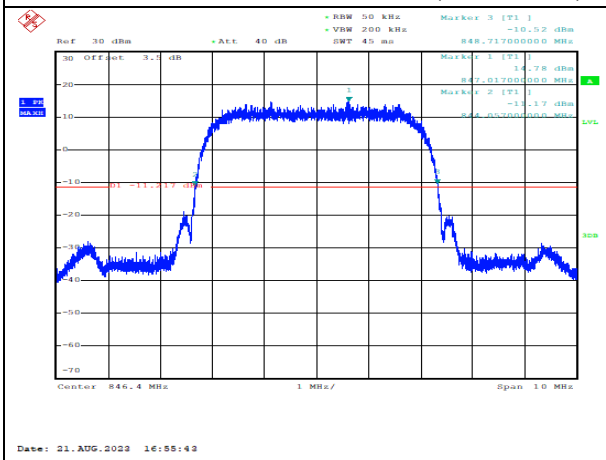
Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
1852.4	4.660
1880	4.669
1907.6	4.666

Band V

Frequency (MHz)	Emission Bandwidth (-26dBc)(MHz)
826.4	4.655
836.6	4.664
846.6	4.660

Conclusion: PASS

WCDMA BAND 2	
Channel 9262- Emission Bandwidth (-26dBc BW)	Channel 9400- Emission Bandwidth (-26dBc BW)
	
Channel 9537- Emission Bandwidth (-26dBc BW)	/
	/

WCDMA BAND V	
Channel 4132- Emission Bandwidth (-26dBc BW)	Channel 4175- Emission Bandwidth (-26dBc BW)
	
Channel 4233- Emission Bandwidth (-26dBc BW)	/
	/

6.7. Band Edge at antenna terminals

Specifications:	FCC Part 22.917(a)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Method of test measurements please refer to KDB971168 D01 v03 clause 6

6.7.1. Limit

Part 22.917(a) 24.238(a) state that 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.

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)

6.7.2. Test procedure

The RF output of the transceiver was connected to a signal analyzer through appropriate attenuation.

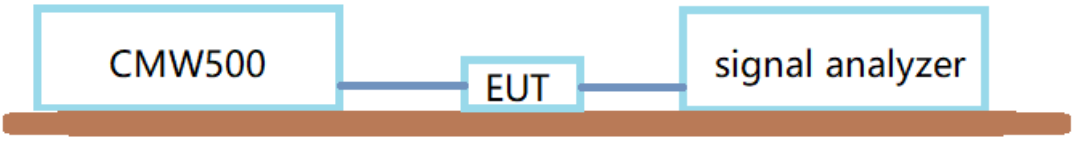
In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The RF fundamental frequency should be excluded against the limit line in the operating frequency band The limit line is derived from 43+10log(P) Db below the transmitter power P(Watts)

=P(W)-[43+10log(P)](Db)

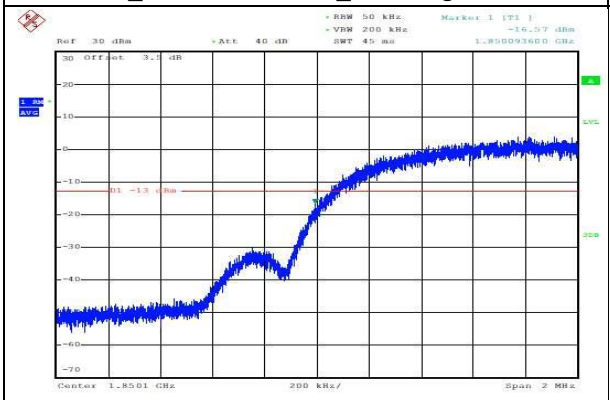
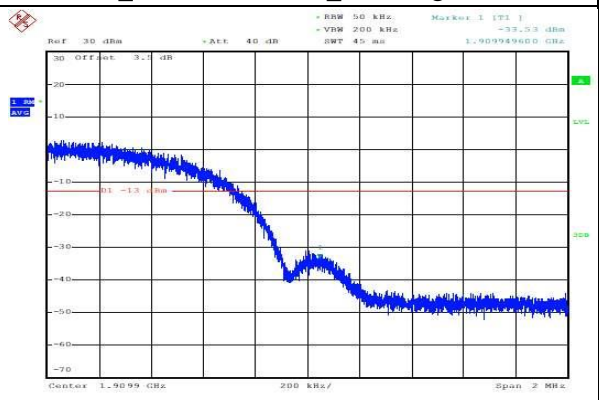
=[30+10log(P)](dBm)-[43+10log(P)](Db)

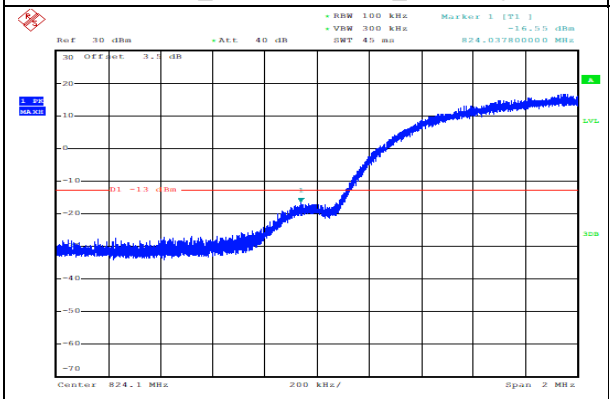
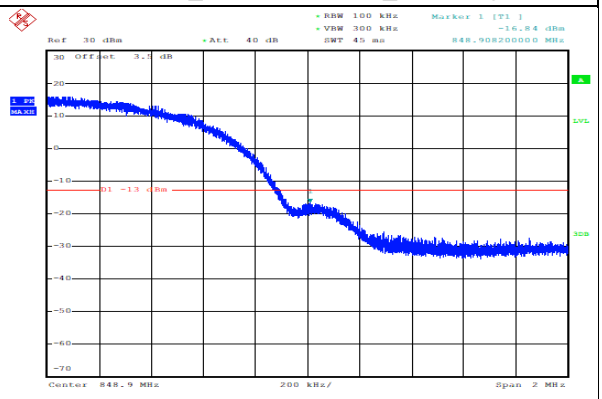
=-13dBm

6.7.3. Test Setup



6.7.4. Test Result

WCDMA BAND II	
WCDMA_OB2,1852.6MHz_BandEdge	WCDMA_OB2,1907.4MHz_BandEdge
	

WCDMA BAND V	
WCDMA_OB5,826.6MHz_BandEdge	WCDMA_OB5,846.4MHz_BandEdge
	

6.8. Frequency Stability

Specifications:	FCC Part 22.235,2.1055
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Method of test measurements please refer to KDB971168 D01 v03 clause 9

6.8.1. Method of Measurement and test procedures

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 R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -10℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on mid channel of GSM850, PCS1900, 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 -10℃ to +50℃. Allow at least 1 1/2 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 1/2 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 CMU200 and in a simulated call on the centre 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℃ to -10℃. 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.

6.8.2. Measurement Limit

For Hand carried battery powered equipment

According to the JTC standard the GSM frequency stability of the carrier shall be accurate to within 0.1ppm of the received frequency from the base station. And the WCDMA is 2.5ppm. This accuracy is sufficient to meet Sec.24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the

fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.6VDC and 4.4VDC, with a nominal voltage of 3.85VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages was varied from 85% to 115%.

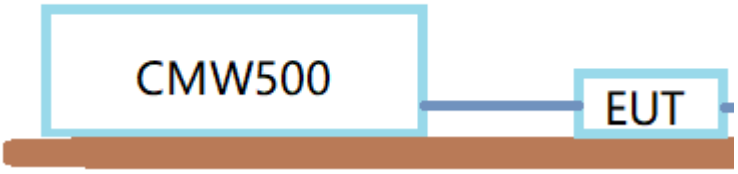
For equipment powered by primary supply voltage

According to the JTC standard the GSM frequency stability of the carrier shall be accurate to within 0.1ppm of the received frequency from the base station. And the WCDMA is 2.5ppm. This accuracy is sufficient to meet Sec.24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.54 Hz (k=2)

6.8.3. Test Setup



6.8.4. Test results

WCDMA BAND II

Band	Channel	Temperature	Voltage	Frequency Error(Hz)	Frequency Error(ppm)
OB2	9400	Normal	Low	-14.298	0.008
OB2	9400	Normal	Normal	-18.911	0.01
OB2	9400	Normal	High	-17.931	0.01

Band	Channel	Temperature	Voltage	Frequency Error(Hz)	Frequency Error(ppm)
OB2	9400	50	Normal	-13.89	0.007

Band	Channel	Temperature	Voltage	Frequency Error(Hz)	Frequency Error(ppm)
OB2	9400	40	Normal	-13.754	0.007
OB2	9400	30	Normal	-17.91	0.01
OB2	9400	20	Normal	-20.142	0.011
OB2	9400	10	Normal	-13.64	0.007
OB2	9400	0	Normal	-14.648	0.008
OB2	9400	-10	Normal	-14.927	0.008
OB2	9400	-20	Normal	-15.013	0.008
OB2	9400	-30	Normal	-10.536	0.006

WCDMA BAND V

Band	Channel	Temperature	Voltage	Frequency Error(Hz)	Frequency Error(ppm)
OB5	4175	Normal	Low	-8.397	0.01
OB5	4175	Normal	Normal	-6.688	0.008
OB5	4175	Normal	High	-10.25	0.012

Band	Channel	Temperature	Voltage	Frequency Error(Hz)	Frequency Error(ppm)
OB5	4175	50	Normal	-11.723	0.014
OB5	4175	40	Normal	-7.024	0.008
OB5	4175	30	Normal	-13.447	0.016
OB5	4175	20	Normal	-7.389	0.009
OB5	4175	10	Normal	-10.493	0.013
OB5	4175	0	Normal	-2.611	0.003
OB5	4175	-10	Normal	-7.324	0.009
OB5	4175	-20	Normal	-10.107	0.012
OB5	4175	-30	Normal	-8.669	0.01

Conclusion: PASS

6.9. Conducted Spurious Emission

Specifications:	FCC Part 2.1053/22.917(a)/ 24.238(a)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

6.9.1. Measurement Method and test procedures

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 10 GHz.

2. The sweep time is set automatically by instrument itself. That should be the optimal sweep time for the span and the RBW. If the sweep time is too short, that is sweep is too fast, the sweep result is not accurate; If the sweep time is too long, that is sweep is too low, some frequency components may be lost. The instrument will give a optimal sweep time according the selected span and RBW.

3. The procedure to get the conducted spurious emission is as follows:
The trace mode is set to MaxHold to get the highest signal at each frequency;
Wait 25 seconds; Get the result.

4. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

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)

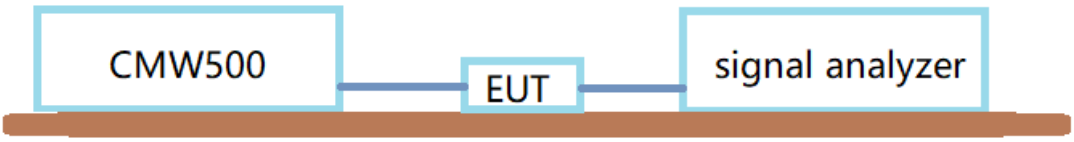
WCDMA Band II Transmitter

Channel	Frequency (MHz)
9263	1852.60
9400	1880.00
9537	1907.40

WCDMA Band V Transmitter

Channel	Frequency (MHz)
4132	826.60
4175	835.00
4233	846.40

6.9.2. Test Setup



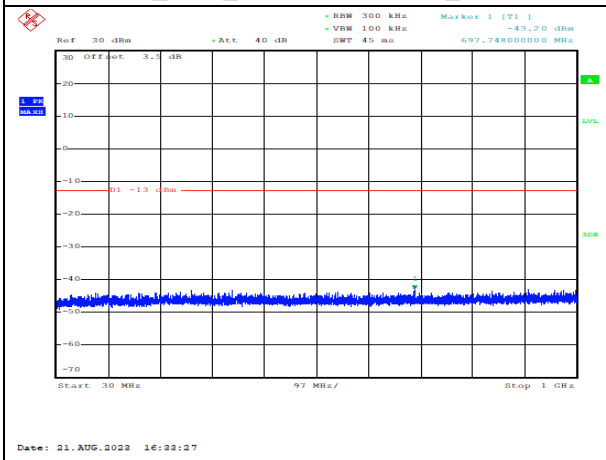
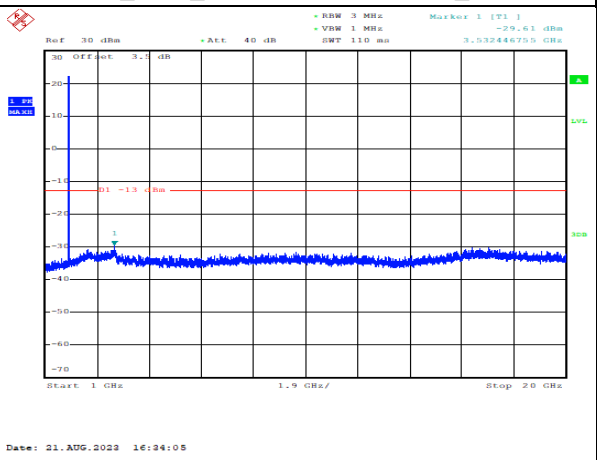
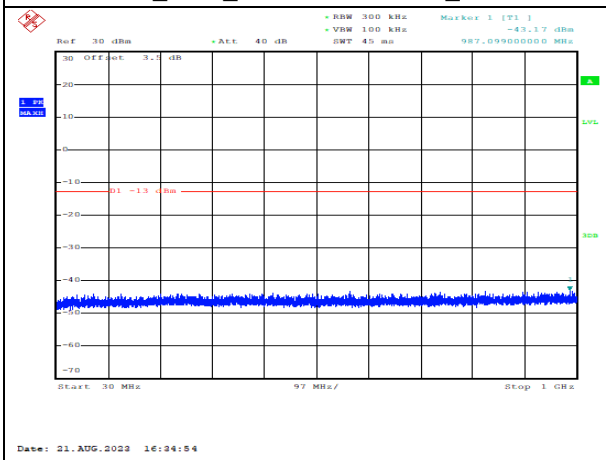
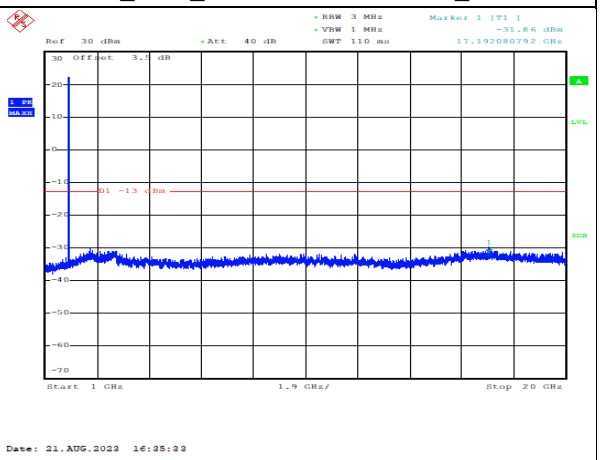
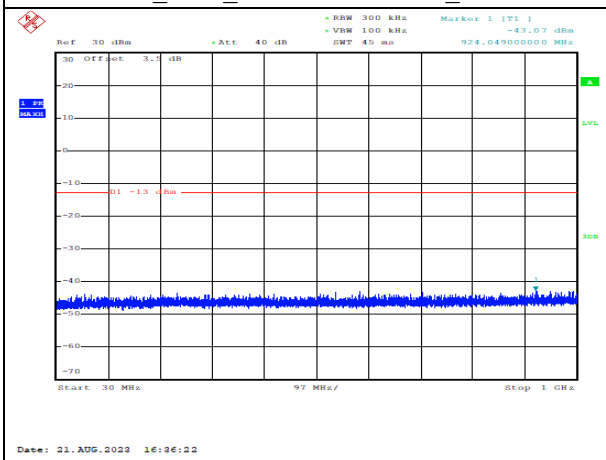
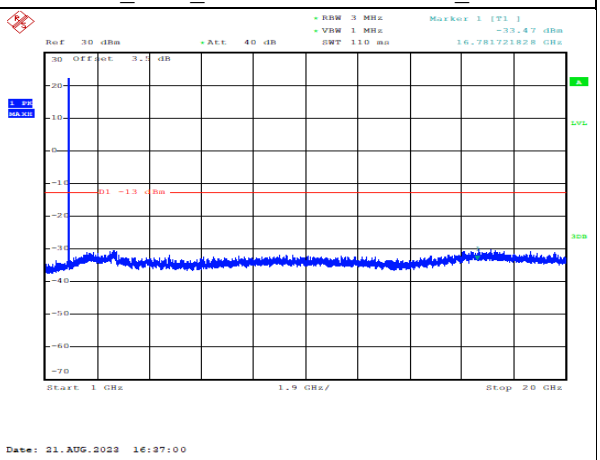
6.9.3. Measurement result

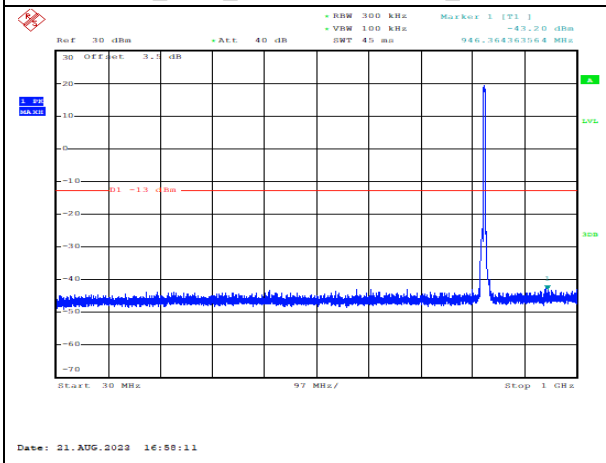
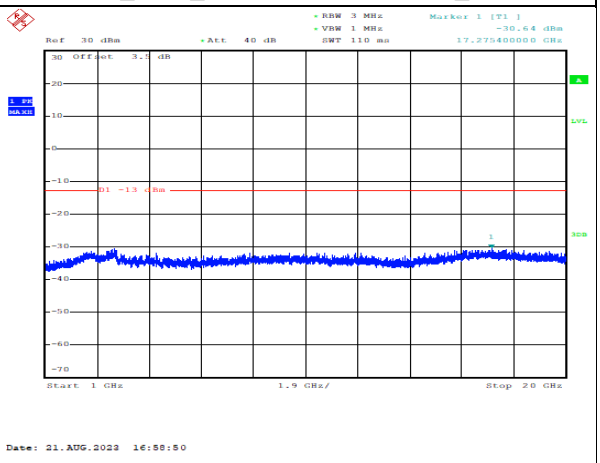
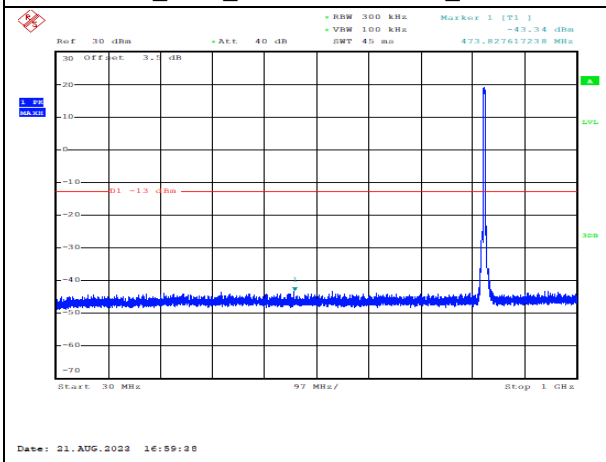
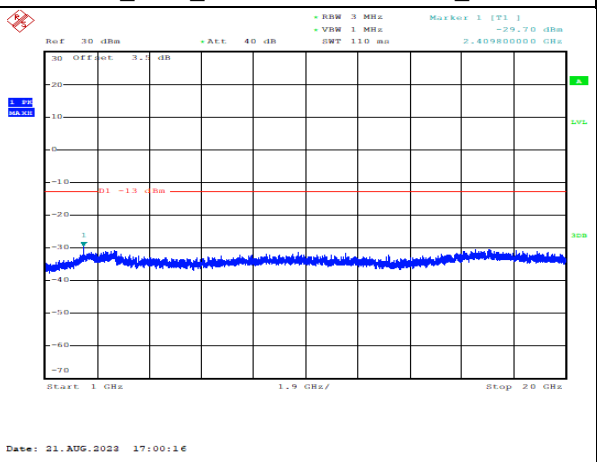
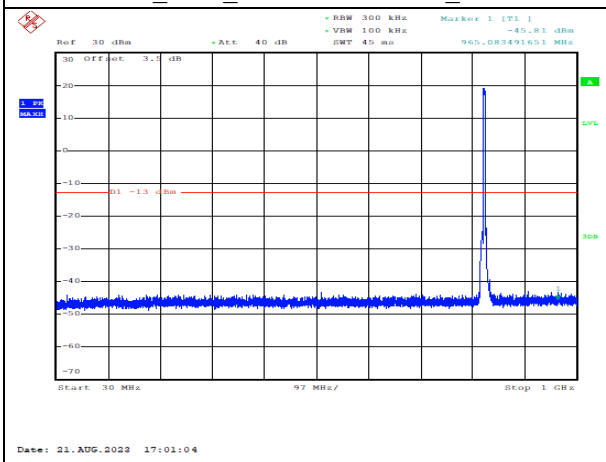
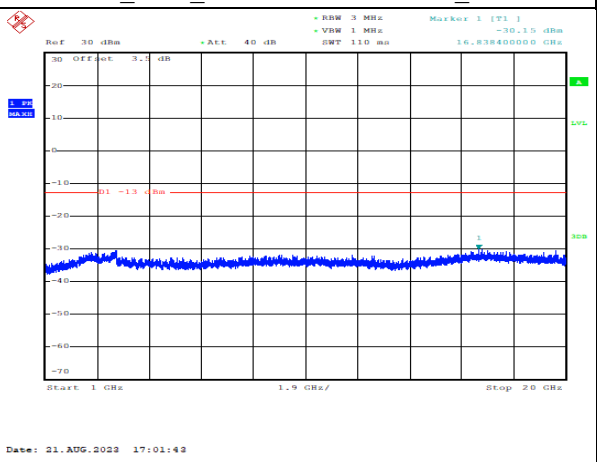
Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Spurious emission limit -13dBm.

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

WCDMA Band II	
OB2_9263_30MHz-1000MHz_CSE	OB2_9263_1000MHz-20000MHz_CSE
	
OB2_9400_30MHz-1000MHz_CSE	OB2_9400_1000MHz-20000MHz_CSE
	
OB2_9537_30MHz-1000MHz_CSE	OB2_9537_1000MHz-20000MHz_CSE
	

WCDMA Band V	
OB5_4133_30MHz-1000MHz_CSE	OB5_4133_1000MHz-20000MHz_CSE
	
OB5_4175_30MHz-1000MHz_CSE	OB5_4175_1000MHz-20000MHz_CSE
	
OB5_4232_30MHz-1000MHz_CSE	OB5_4232_1000MHz-20000MHz_CSE
	

6.10. EMISSION LIMIT

Specifications:	FCC Part 2.1051/22.917
DUT Serial Number:	S2 S3
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

6.10.1. Measurement Method

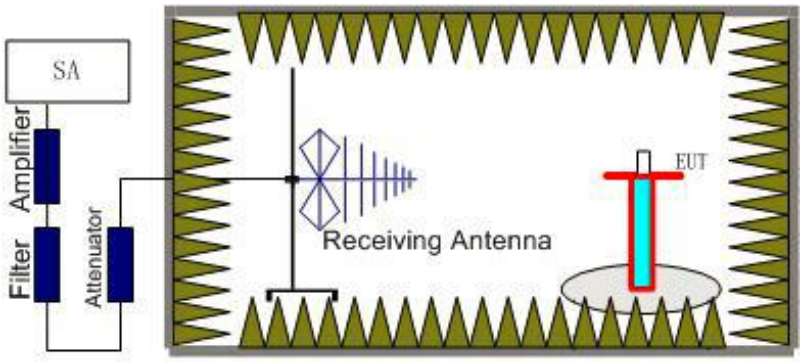
The measurements procedures in TIA-603E-2016 are used.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in CFR 22.917, 2.1051/24.232

The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of wcdma.

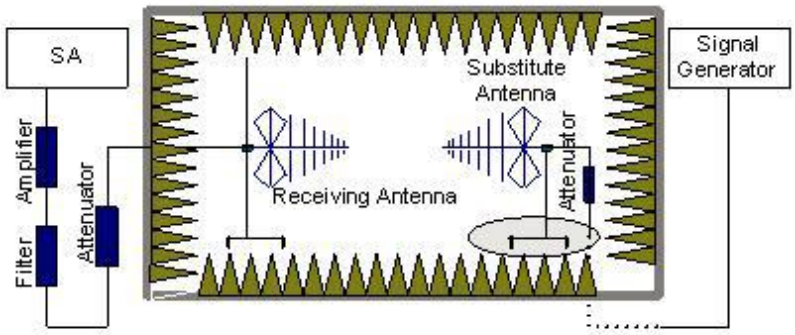
6.10.2. The procedure of radiated spurious emissions is as follows

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10thharmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).

3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (Ppl) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (Ga) should be recorded after test.

A amplifier should be connected in for the test.

The Path loss (Ppl) is the summation of the cable loss .

The measurement results are obtained as described below:

Power(EIRP)=PMea- Ppl+ Ga

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi

6.10.3. Measurement Limit

Part 24.238 and Part 22.917 specify that 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.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

According to KDB 971168 6, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often

implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	30MHz-150MHz 3.82 dB (k=2) 150MHz-1000MHz 3.97 dB (k=2) 1000MHz-3000MHz 3.09 dB (k=2) 3000MHz-6000MHz 3.29 dB (k=2) 6000MHz-18000MHz 3.91 dB (k=2) 18000MHz-26000MHz 4.60 dB (k=2) 26000MHz-40000MHz 4.77 dB (k=2)

6.10.4. WCDMA Measurement Results

Frequency	Channel	Frequency Range	Result
WCDMA Band II	Low	30MHz~20GHz	Pass
	Middle	30MHz~20GHz	Pass
	High	30MHz~20GHz	Pass
WCDMA Band V	Low	30MHz~20GHz	Pass
	Middle	30MHz~20GHz	Pass
	High	30MHz~20GHz	Pass

Mainly Supply

RSE-W2-H- S2

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit （dBm）	Polarization
3816.8	-53.57	6.7	7.9	-52.37	-13	H
5720.4	-50.92	8.5	10.2	-49.22	-13	V
7538.0	-60.25	9.7	11.6	-58.35	-13	V
9688.0	-57.91	10.9	12.7	-56.11	-13	V
12737.4	-55.04	12.7	12.3	-55.44	-13	H
16302.2	-48.85	14.7	12.3	-51.25	-13	V

RSE-W2-L- S2

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit （dBm）	Polarization
3704.0	-57.57	6.6	7.9	-56.27	-13	V
5554.4	-58.55	8.2	9.8	-56.95	-13	V
7427.2	-59.44	9.7	11.6	-57.54	-13	V
9003.2	-58.78	10.4	12.6	-56.58	-13	V
12241.8	-53.15	12.6	12.3	-53.45	-13	V
16314.8	-48.22	14.7	12.3	-50.62	-13	H

RSE-W2-M- S2

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit （dBm）	Polarization
3761.2	-56.92	6.6	7.9	-55.62	-13	H
5637.6	-55.94	8.3	10.2	-54.04	-13	H
7476.8	-60.16	9.7	11.6	-58.26	-13	H
9684.0	-58.18	10.9	12.7	-56.38	-13	V
11612.5	-53.36	12.2	12.3	-53.26	-13	V
16839.8	-47.94	15.8	12.3	-51.44	-13	H

RSE-W5-H- S2

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit （dBm）	Polarization
1691.1	-61.93	4.5	4.7	-61.73	-13	V
2533.8	-56.16	5.4	5.6	-55.96	-13	H
3388.8	-65.75	6.3	7.8	-64.25	-13	V
4218.8	-62.52	7.0	8.9	-60.62	-13	H
5050.8	-61.27	7.8	9.6	-59.47	-13	H
5933.6	-61.77	8.5	10.2	-60.07	-13	H

RSE-W5-L- S2

Frequency	PMea	Pcl (dBm)	Ga (dBd)	Peak ERP	Limit	Polarization

(MHz)	(dBm)			(dBm)	（dBm）	
1651.1	-61.96	4.5	4.7	-61.76	-13	H
2718.8	-54.6	5.6	6.1	-54.1	-13	H
3633.6	-60.72	6.6	7.9	-59.42	-13	V
4845.2	-59.92	7.6	9.0	-58.52	-13	H
6161.2	-60.99	8.7	10.3	-59.39	-13	H
7474.0	-60.25	9.7	11.6	-58.35	-13	V

RSE-W5-M- S2

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit （dBm）	Polarization
1674.3	-60.75	4.5	4.7	-60.55	-13	H
2506.2	-56.8	5.4	5.6	-56.6	-13	V
4190.8	-62.2	7.0	8.9	-60.3	-13	H
5139.6	-59.53	7.9	9.4	-58.03	-13	V
6522.8	-59.36	9.0	10.6	-57.76	-13	V
7592.8	-60.84	9.7	11.6	-58.94	-13	H

Secondary Supply

RSE-W2-H-S3

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit （dBm）	Polarization
3817.2	-51.93	6.7	7.9	-50.73	-13	H
5720.0	-52.87	8.5	10.2	-51.17	-13	H
8084.4	-60.23	9.9	12.2	-57.93	-13	H
11260.8	-54.65	12.1	12.3	-54.45	-13	H
13683.4	-53.77	13.9	12.3	-55.37	-13	H
15832.8	-49.49	14.9	12.3	-52.09	-13	H

RSE-W2-L-S3

Frequency	PMea	Pcl (dBm)	Ga (dBd)	Peak ERP	Limit	Polarization

(MHz)	(dBm)			(dBm)	（dBm）	
3702.4	-54.12	6.6	7.9	-52.82	-13	H
5560.0	-55.51	8.2	9.8	-53.91	-13	V
7191.2	-60.47	9.5	11.4	-58.57	-13	H
9276.4	-58.66	10.7	12.7	-56.66	-13	H
11602.4	-54.11	12.2	12.3	-54.01	-13	V
16158.3	-49.94	14.9	12.3	-52.54	-13	H

RSE-W2-M-S3

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit （dBm）	Polarization
3702.4	-54.71	6.6	7.9	-53.41	-13	H
5557.2	-56.38	8.2	9.8	-54.78	-13	H
7185.6	-59.24	9.5	11.4	-57.34	-13	H
8722.0	-59.76	10.4	12.7	-57.46	-13	H
12064.7	-54.08	12.6	12.3	-54.38	-13	H
16858.6	-47.58	16.3	12.3	-51.58	-13	H

Annex A EUT Photos

See the document"I23W00045-External Photos".
See the document"I23W00045-Internal Photos".

Annex B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

END OF REPORT