

TEST REPORT

REPORT NUMBER: I22W00023-WCDMA-WWAN_Rev1

ON

Type of Equipment: LTE Module
Type of Designation: L508
Brand Name: LYNQ
Manufacturer: Shanghai MobileTek Communication Ltd.
FCC ID: 2AK9DL508

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
ANSI C63.26-2015**

Chongqing Academy of Information and Communications Technology

Month date, year

Mar, 25, 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.: I22W00023-WCDMA-WWAN_Rev1

Revision Version

Report Number	Revision	Date	Memo
I22W00023-WCDMA-WWAN	00	2022-03-20	Initial creation of test report
I22W00023-WCDMA-WWAN_Rev1	01	2022-03-25	Second creation of test report

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1. Test Laboratory

1.1. Testing Location

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

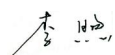
1.2. Testing Environment

Normal Temperature:	15-35°C
Relative Humidity:	30-60%

1.3. Project data

Testing Start Date:	2022-03-18
Testing End Date:	2022-03-20

1.4. Signature



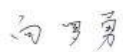
2022-03-25

LiXu
(Prepared this test report)

Date

2022-03-25

ChenWen
(Reviewed this test report)

Date

2022-03-25

XiangLuoYong
Director of the laboratory
(Approved this test report)

Date

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2. Client Information

2.1. Applicant Information

Company name:	Shanghai MobileTek Communication Ltd.
Address /Post:	Free Trade Zone No. 33, No. 17 building 6H3 Xiya Road China (Shanghai)
City:	Shanghai
Country:	China
Telephone:	15821966417
Fax:	--
Email:	qh.zhang@mobiletek.cn
Contact Person:	Qinghua Zhang

2.2. Manufacturer Information

Company Name:	--
Address /Post:	--
City:	--
Country:	--
Telephone:	--
Fax:	--
Email:	--
Contact Person:	--

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

3.1. About EUT

EUT Description	LTE Module
Model name	L508
Brand name	LYNQ
LTE Frequency Band	B4
WCDMA Frequency Band	B5
Type of modulation	QPSK/16QAM
Extreme Temperature	-40/+85°C
Nominal Voltage	3.8
Extreme High Voltage	4.2
Extreme Low Voltage	3.4

Note: Photographs of EUT are shown in ANNEX A of this test report.

Note: High and low voltage values in extreme condition test are given by manufacturer.

3.2. Internal Identification of EUT used during the test

EUT ID	SN or IMEI	HW Version	SW Version	Date of receipt
S1	864788050018436	V2	--	2022-03-18
S2	864788050018584	V2	--	2022-03-18

*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	B5	826.4-846.6	871.4-891.6	--
LTE	B4	1710 – 1755	2110 – 2155	--

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
PART 22	PUBLIC MOBILE SERVICES	2019
ANSI C63.26-2015	--	2015

5. Test Equipments Utilized

5.1. RF Test System

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

5.2. RSE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	Test Receiver	ESU26	100367	--	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

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

5.4. Vibration table

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

Anechoic chamber

Fully anechoic chamber by ETS-LINDGREN.

5.5. Test software

No.	Name	version	SN	Manufacture
1	EMC32	V 8.51.00	--	R&S

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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)	Conducted RF Power Output	Pass
2.1046,22.913(a)	ERP and EIRP	Pass
2.1049,22.917(b)	Occupied Bandwidth	*Note 1
2.1051,2.1053,22.917	Conducted spurious emissions	Pass
2.1051,2.1053,22.917	Radiated Spurious Emission	Pass
2.1051,2.1053, 22.917	Band Edge	Pass
2.1055, 22.355	Frequency Stability over Temperature Variation	Pass
2.1055, 22.355	Frequency Stability over Voltage Variation	Pass
ANSI C63.26-2015	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)
DUT Serial Number:	864788050018436
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

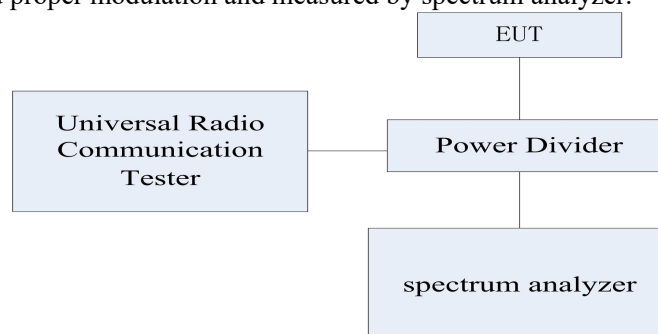
According to Part 22.913(a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.62 dB (k=2)

Test Setup:

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



Test Method:

- 1) The EUT was coupled to the spectrum analyzer and the Wireless Telecommunications Test Set through a power divider. The loss of the RF cables of the test system is calibrated to correct the readings.
- 2) For RMS power test, the spectrum analyzer was set to RMS Detector function and Maximum hold mode.
- 3) For Peak power test, the spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.
- 4) The resolution Bandwidth of the spectrum analyzer was comparable to the emission Bandwidth.

Note: --

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6.2.1 Conducted RF Power Output Results

WCDMA Band 5

Mode	Subtest	Channel	Frequency (MHz)	Modulation	output power (dBm)	peak power (dBm)
RMC	-	4132	826.4	QPSK	25.19	25.19
RMC	-	4183	836.6	QPSK	25.09	25.10
RMC	-	4233	846.6	QPSK	25.28	25.29
HSDPA	1	4132	826.4	QPSK	24.94	25.03
HSDPA	2	4132	826.4	QPSK	22.87	24.60
HSDPA	3	4132	826.4	QPSK	21.67	24.06
HSDPA	4	4132	826.4	QPSK	21.34	24.03
HSDPA	1	4183	836.6	QPSK	24.73	24.86
HSDPA	2	4183	836.6	QPSK	22.44	24.30
HSDPA	3	4183	836.6	QPSK	21.00	23.77
HSDPA	4	4183	836.6	QPSK	21.15	23.73
HSDPA	1	4233	846.6	QPSK	24.88	24.96
HSDPA	2	4233	846.6	QPSK	22.99	24.38
HSDPA	3	4233	846.6	QPSK	21.56	23.86
HSDPA	4	4233	846.6	QPSK	21.28	23.85
HSUPA	1	4132	826.4	QPSK	21.92	22.17
HSUPA	1	4132	826.4	16QAM	21.71	22.15
HSUPA	2	4132	826.4	QPSK	23.44	23.73
HSUPA	2	4132	826.4	16QAM	23.44	23.71
HSUPA	3	4132	826.4	QPSK	19.32	19.55
HSUPA	3	4132	826.4	16QAM	19.30	19.54
HSUPA	4	4132	826.4	QPSK	24.74	24.85
HSUPA	4	4132	826.4	16QAM	24.73	24.83
HSUPA	5	4132	826.4	QPSK	22.05	24.32
HSUPA	5	4132	826.4	16QAM	22.47	24.18
HSUPA	1	4183	836.6	QPSK	23.00	25.02
HSUPA	1	4183	836.6	16QAM	22.99	24.98
HSUPA	2	4183	836.6	QPSK	23.80	24.78
HSUPA	2	4183	836.6	16QAM	23.76	24.75
HSUPA	3	4183	836.6	QPSK	21.10	24.34
HSUPA	3	4183	836.6	16QAM	20.63	24.34
HSUPA	4	4183	836.6	QPSK	24.68	24.82
HSUPA	4	4183	836.6	16QAM	24.66	24.79

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HSUPA	5	4183	836.6	QPSK	21.45	24.47
HSUPA	5	4183	836.6	16QAM	22.17	24.36
HSUPA	1	4233	846.6	QPSK	23.54	25.17
HSUPA	1	4233	846.6	16QAM	23.47	25.10
HSUPA	2	4233	846.6	QPSK	23.94	24.90
HSUPA	2	4233	846.6	16QAM	23.93	24.87
HSUPA	3	4233	846.6	QPSK	22.22	24.47
HSUPA	3	4233	846.6	16QAM	21.59	24.47
HSUPA	4	4233	846.6	QPSK	24.89	24.99
HSUPA	4	4233	846.6	16QAM	24.83	24.96
HSUPA	5	4233	846.6	QPSK	21.35	24.42
HSUPA	5	4233	846.6	16QAM	22.14	24.05

6.3. ERP and EIRP

6.3.1 Measurement result

Conducted RF Power+Antenna Gain=ERP

Limits 38.5dBm(7w)

Max ERP:≤29.03dBm

WCDMA Band 5

Mode	Subtest	Channel	Frequency (MHz)	Modulation	output power (dBm)	Radiated Power(dBm) G _T = 3.75. dBd
RMC	-	4132	826.4	QPSK	25.19	28.94
RMC	-	4183	836.6	QPSK	25.09	28.84
RMC	-	4233	846.6	QPSK	25.28	29.03
HSDPA	1	4132	826.4	QPSK	24.94	28.69
HSDPA	2	4132	826.4	QPSK	22.87	26.62
HSDPA	3	4132	826.4	QPSK	21.67	25.42
HSDPA	4	4132	826.4	QPSK	21.34	25.09
HSDPA	1	4183	836.6	QPSK	24.73	28.48
HSDPA	2	4183	836.6	QPSK	22.44	26.19
HSDPA	3	4183	836.6	QPSK	21.00	24.75
HSDPA	4	4183	836.6	QPSK	21.15	24.90
HSDPA	1	4233	846.6	QPSK	24.88	28.63
HSDPA	2	4233	846.6	QPSK	22.99	26.74
HSDPA	3	4233	846.6	QPSK	21.56	25.31
HSDPA	4	4233	846.6	QPSK	21.28	25.03
HSUPA	1	4132	826.4	QPSK	21.92	25.67
HSUPA	1	4132	826.4	16QAM	21.71	25.46
HSUPA	2	4132	826.4	QPSK	23.44	27.19
HSUPA	2	4132	826.4	16QAM	23.44	27.19
HSUPA	3	4132	826.4	QPSK	19.32	23.07
HSUPA	3	4132	826.4	16QAM	19.30	23.05
HSUPA	4	4132	826.4	QPSK	24.74	28.49
HSUPA	4	4132	826.4	16QAM	24.73	28.48
HSUPA	5	4132	826.4	QPSK	22.05	25.80
HSUPA	5	4132	826.4	16QAM	22.47	26.22
HSUPA	1	4183	836.6	QPSK	23.00	26.75

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HSUPA	1	4183	836.6	16QAM	22.99	26.74
HSUPA	2	4183	836.6	QPSK	23.80	27.55
HSUPA	2	4183	836.6	16QAM	23.76	27.51
HSUPA	3	4183	836.6	QPSK	21.10	24.85
HSUPA	3	4183	836.6	16QAM	20.63	24.38
HSUPA	4	4183	836.6	QPSK	24.68	28.43
HSUPA	4	4183	836.6	16QAM	24.66	28.41
HSUPA	5	4183	836.6	QPSK	21.45	25.20
HSUPA	5	4183	836.6	16QAM	22.17	25.92
HSUPA	1	4233	846.6	QPSK	23.54	27.29
HSUPA	1	4233	846.6	16QAM	23.47	27.22
HSUPA	2	4233	846.6	QPSK	23.94	27.69
HSUPA	2	4233	846.6	16QAM	23.93	27.68
HSUPA	3	4233	846.6	QPSK	22.22	25.97
HSUPA	3	4233	846.6	16QAM	21.59	25.34
HSUPA	4	4233	846.6	QPSK	24.89	28.64
HSUPA	4	4233	846.6	16QAM	24.83	28.58
HSUPA	5	4233	846.6	QPSK	21.35	25.10
HSUPA	5	4233	846.6	16QAM	22.14	25.89

Antenna Gain

Technology/Band	Max Gain
FDD-LTE Band4	6dBi
WCDMA B5	6dBi/3.75dBd

Note :Antenna gain is provided by the customer and the laboratory is not responsible for its authenticity.

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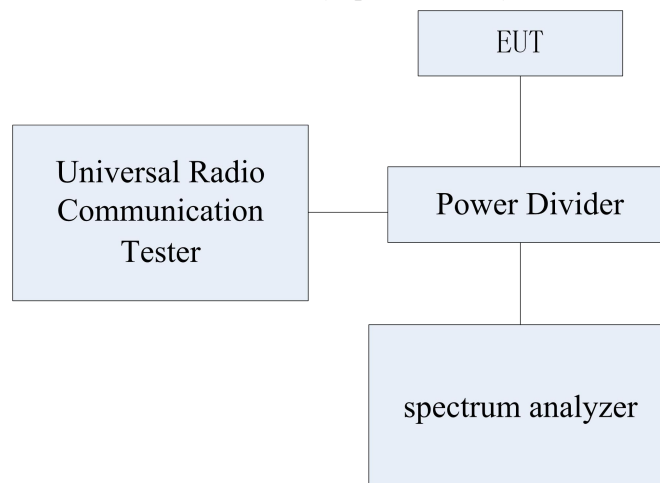
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6.4. Occupied Bandwidth

Specifications:	FCC Part 2.1049, 22.917(b)
DUT Serial Number:	864788050018436
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: --

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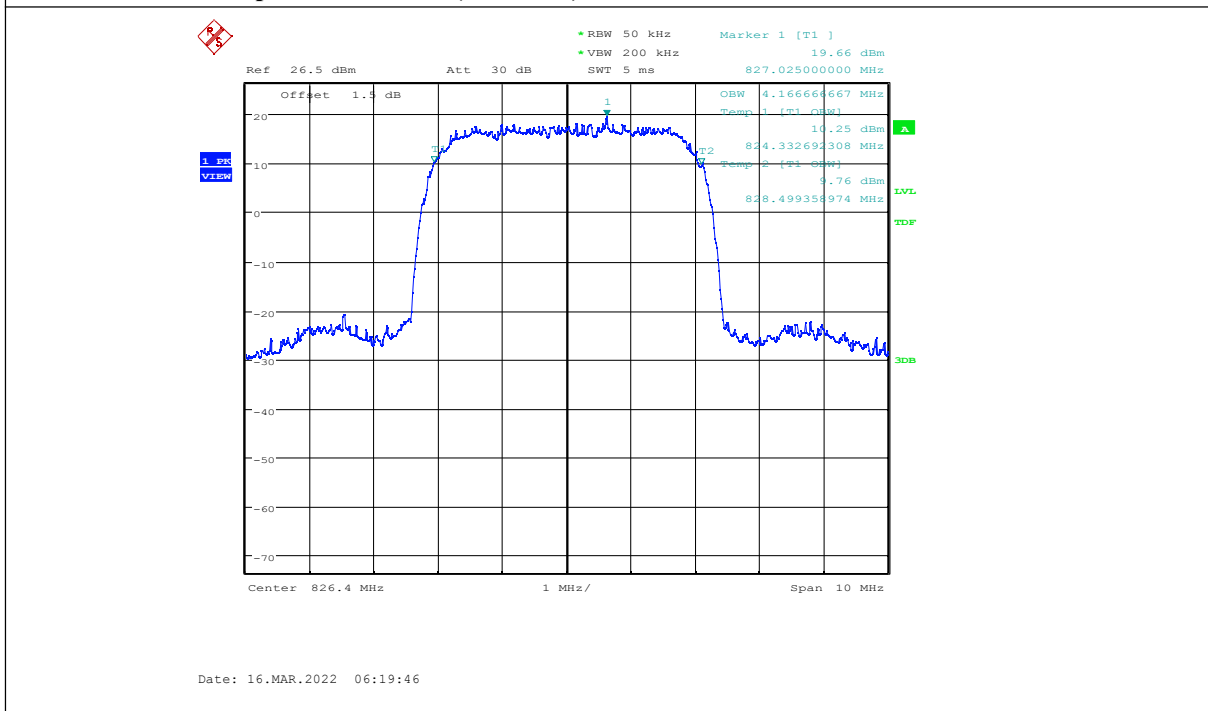
6.4.1 occupied bandwidth Results

WCDMA Band 5 (99%)-QPSK

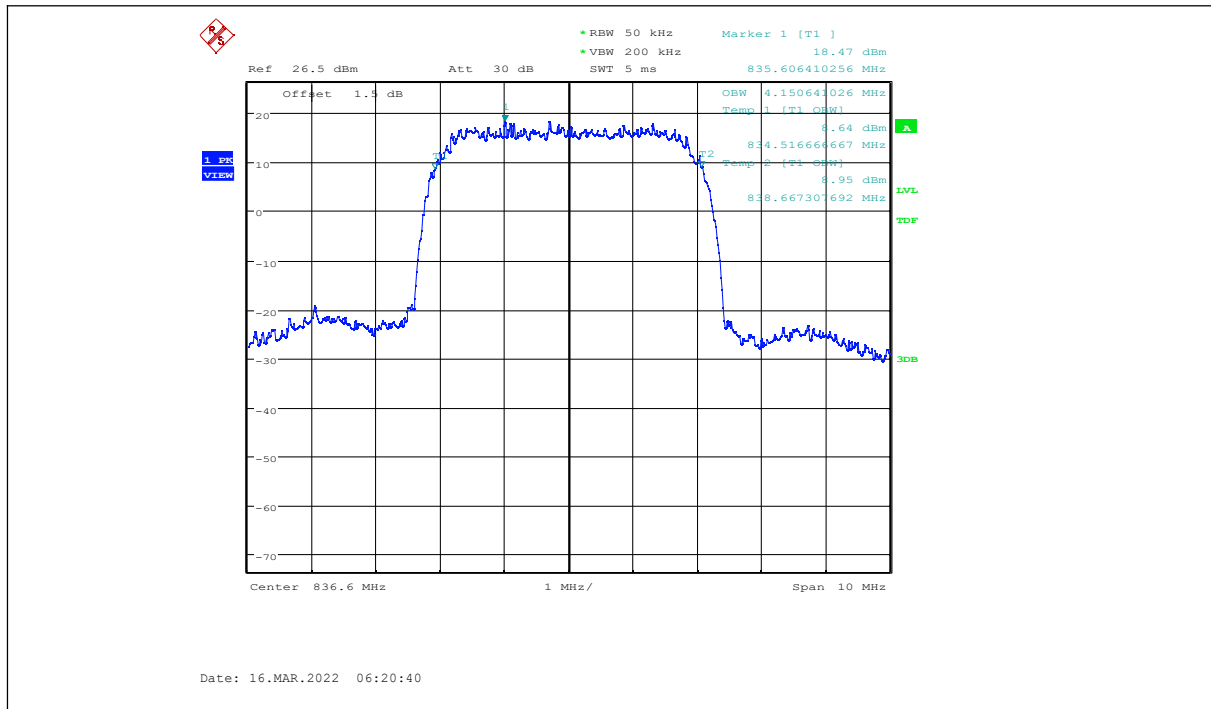
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
826.4	4.167
836.6	4.151
846.6	4.151

WCDMA Band 5 (99%)

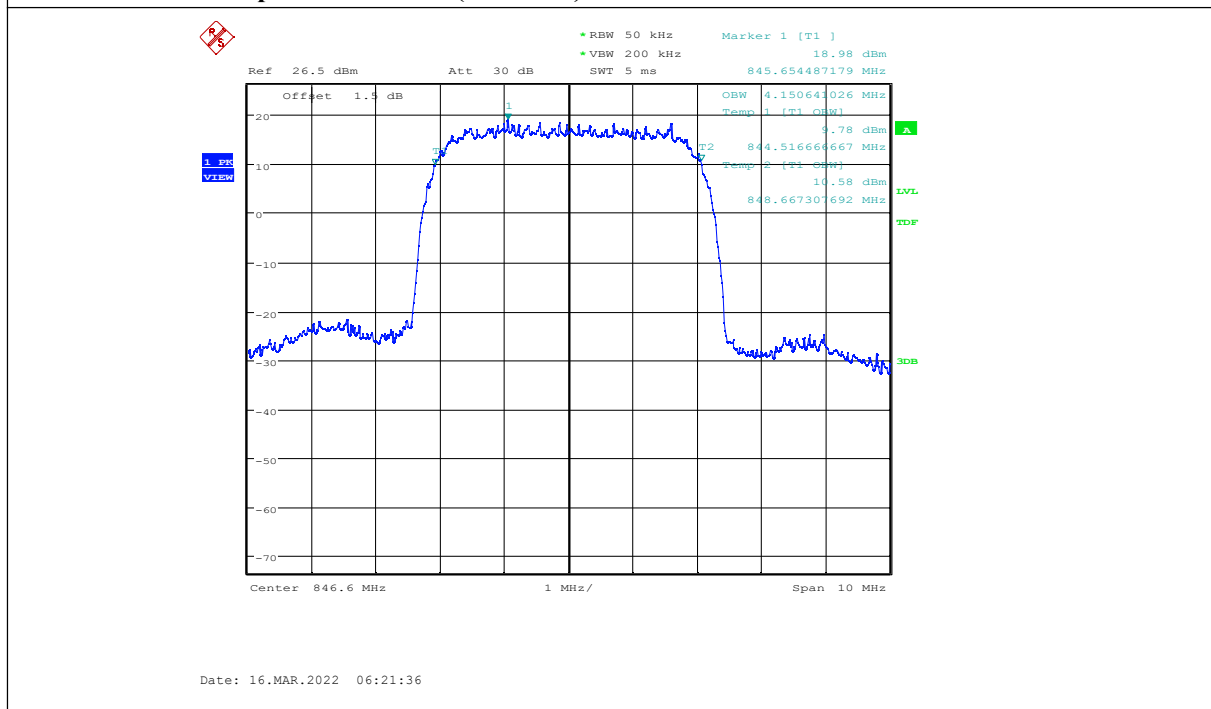
Channel 4132-Occupied Bandwidth (99% BW)



Channel 4183-Occupied Bandwidth (99% BW)



Channel 4233-Occupied Bandwidth (99% BW)



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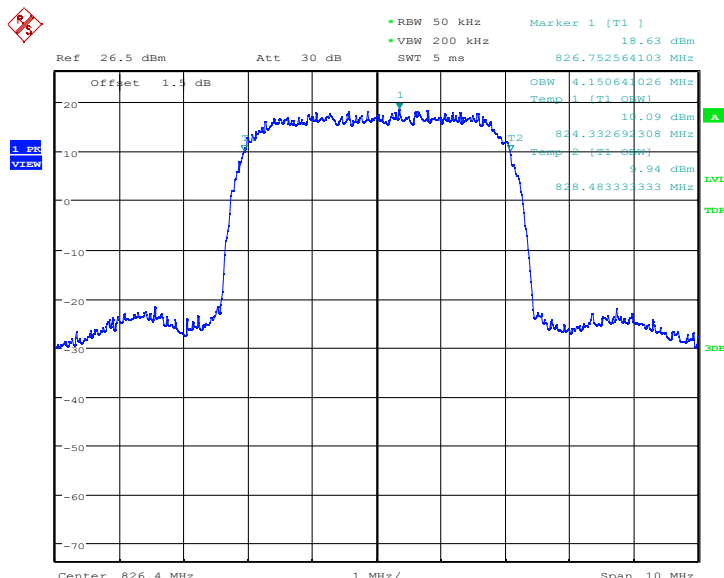
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WCDMA Band 5 (99%)-16QAM

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
826.4	4.151
836.6	4.167
846.6	4.151

WCDMA Band 5 (99%)

Channel 4132-Occupied Bandwidth (99% BW)

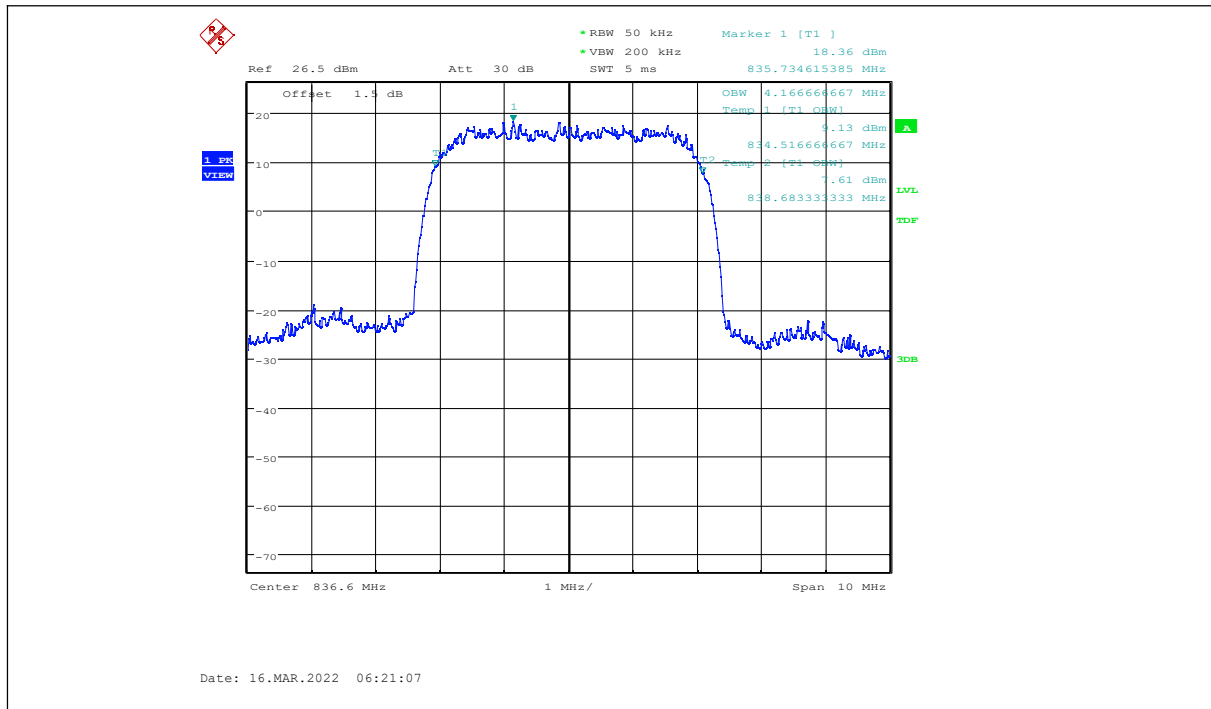


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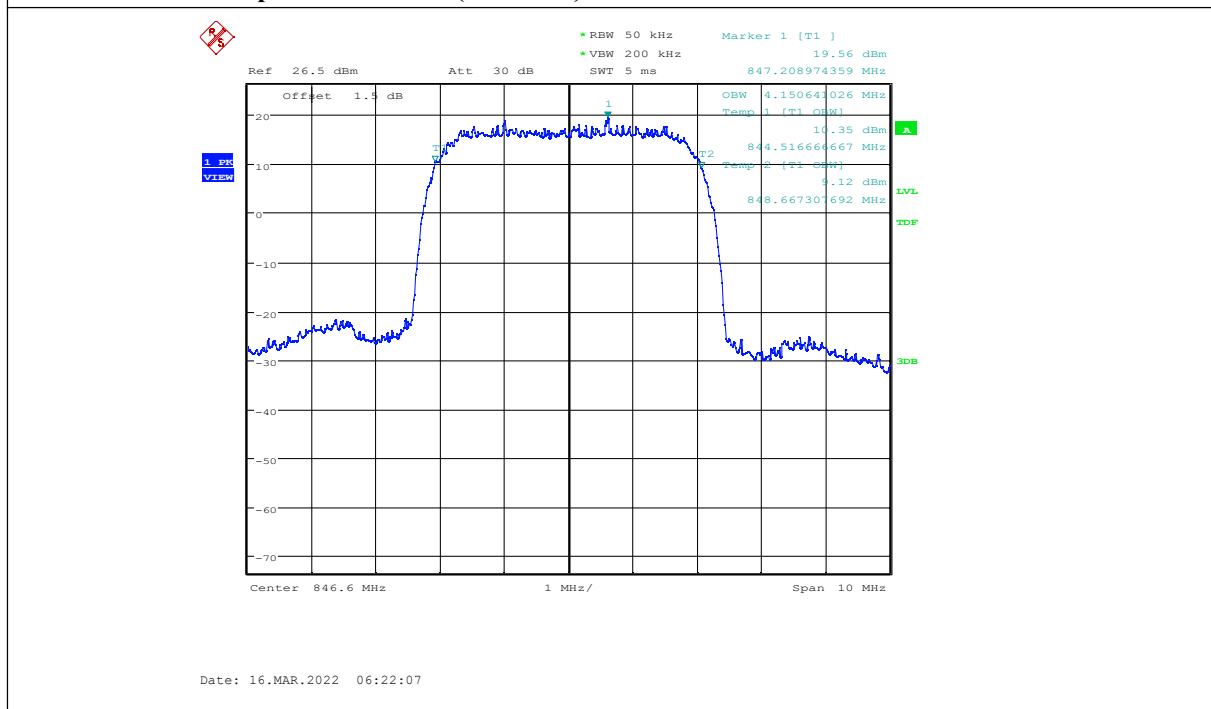
Channel 4183-Occupied Bandwidth (99% BW)

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Channel 4233-Occupied Bandwidth (99% BW)



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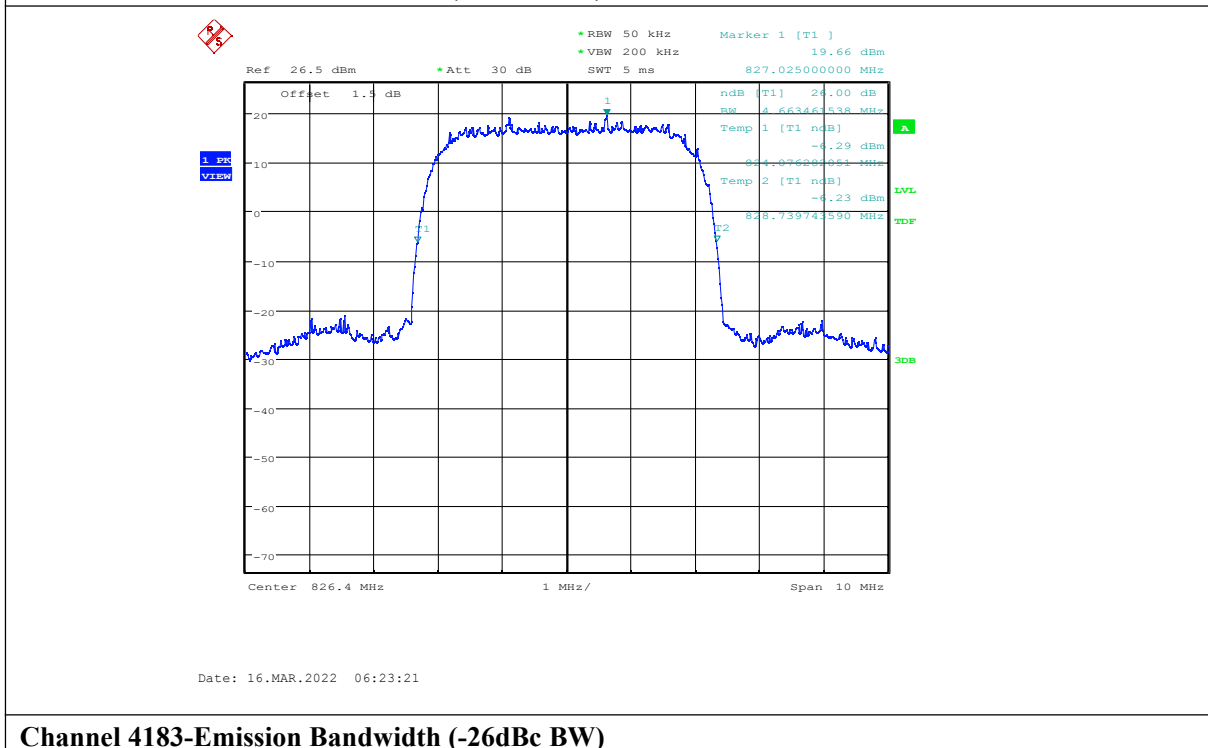
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WCDMA Band 5 (-26dBc)-QPSK

Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
826.4	4.663
836.6	4.679
846.6	4.679

WCDMA Band 5 (-26dBc)

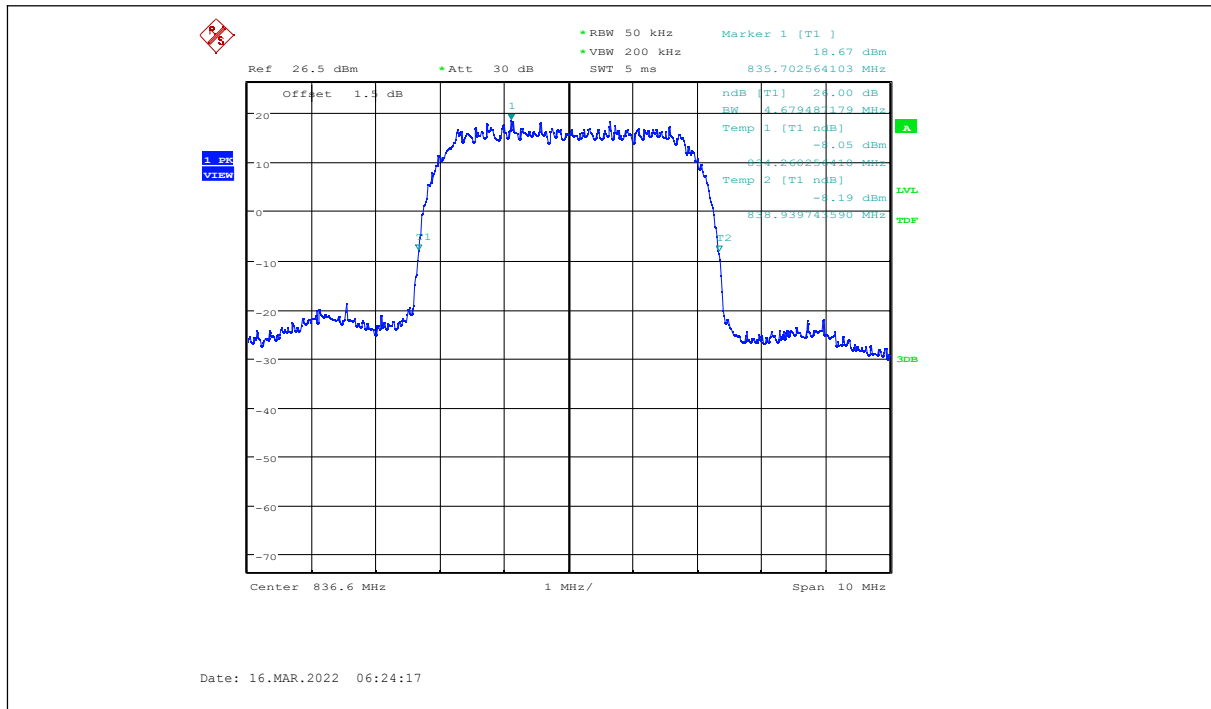
Channel 4132-Emission Bandwidth (-26dBc BW)



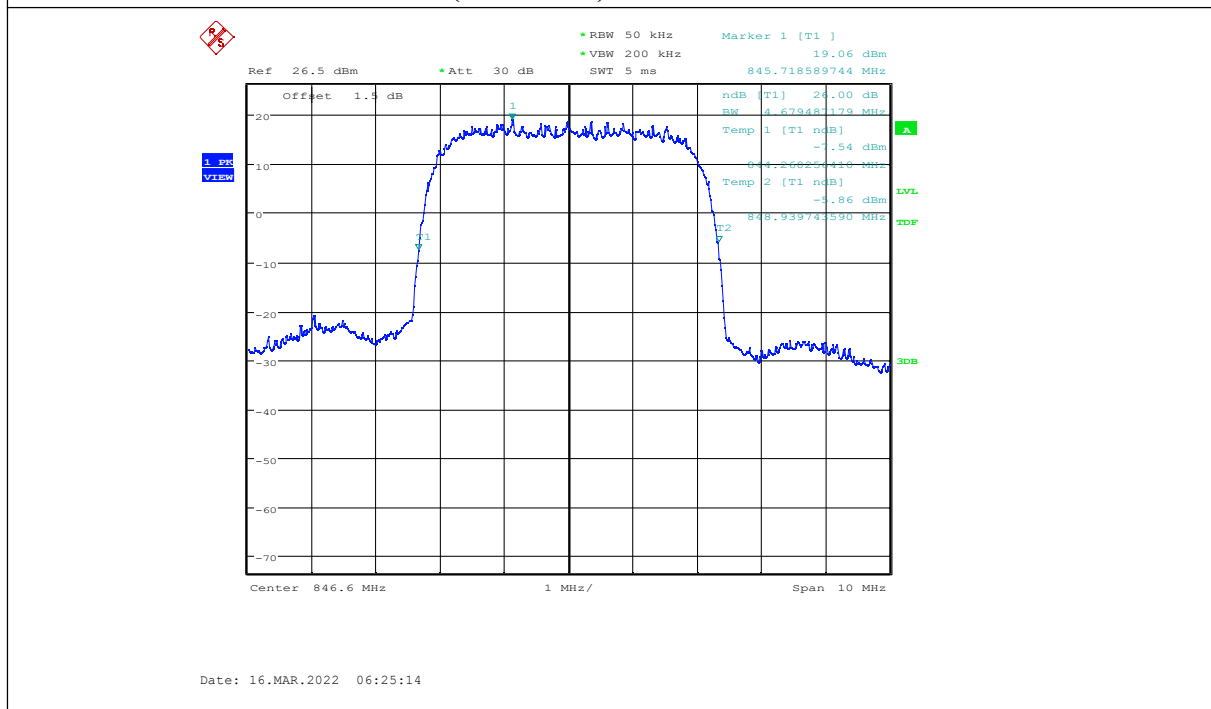
Channel 4183-Emission Bandwidth (-26dBc BW)

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Channel 4233-Emission Bandwidth (-26dBc BW)



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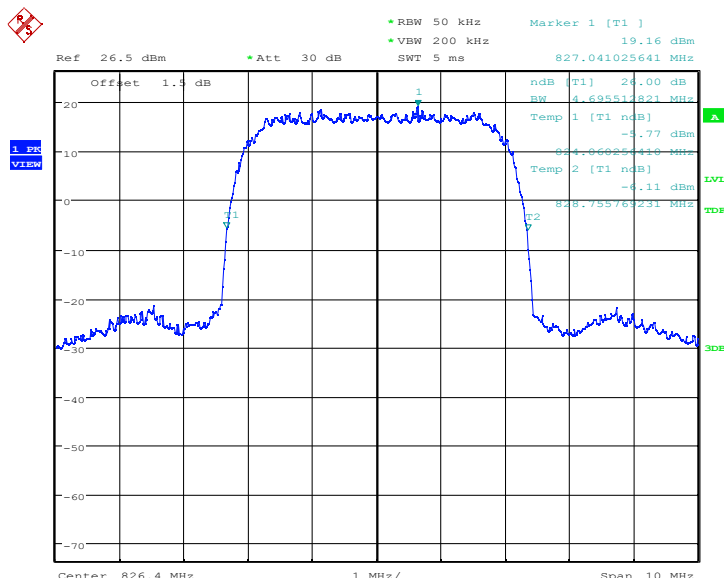
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WCDMA Band 5 (-26dBc)-16QAM

Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
826.4	4.696
836.6	4.663
846.6	4.679

WCDMA Band 5 (-26dBc)

Channel 4132-Emission Bandwidth (-26dBc BW)

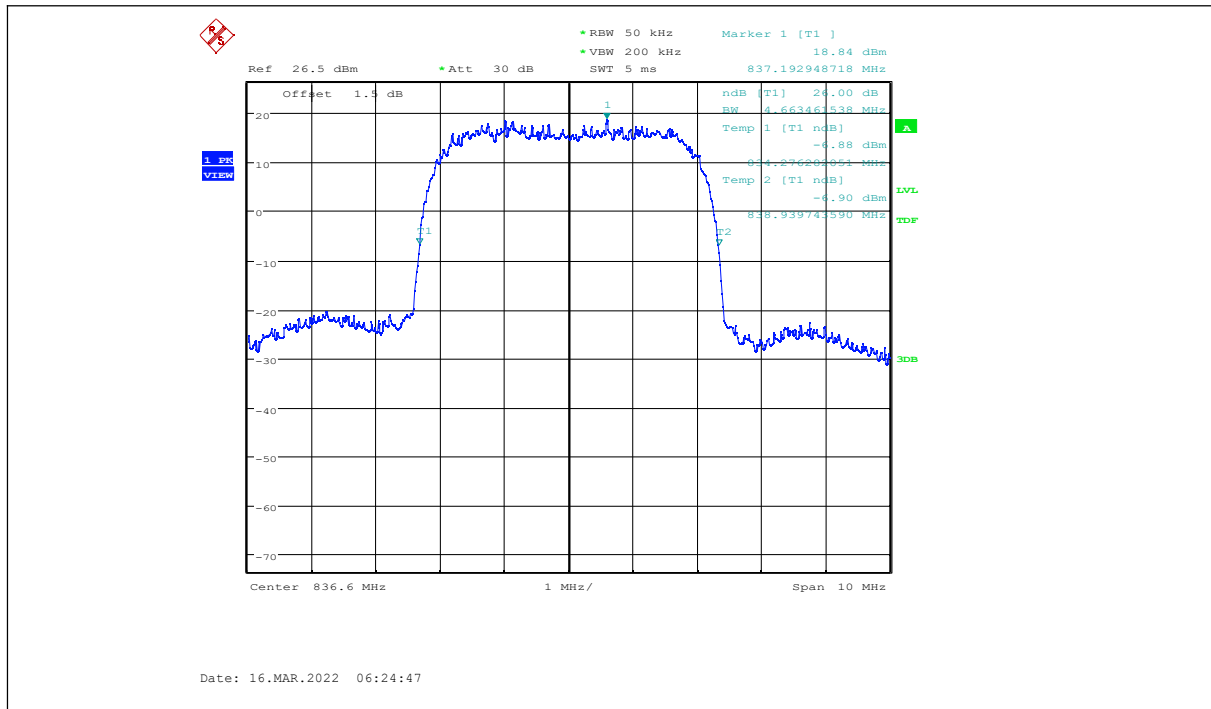


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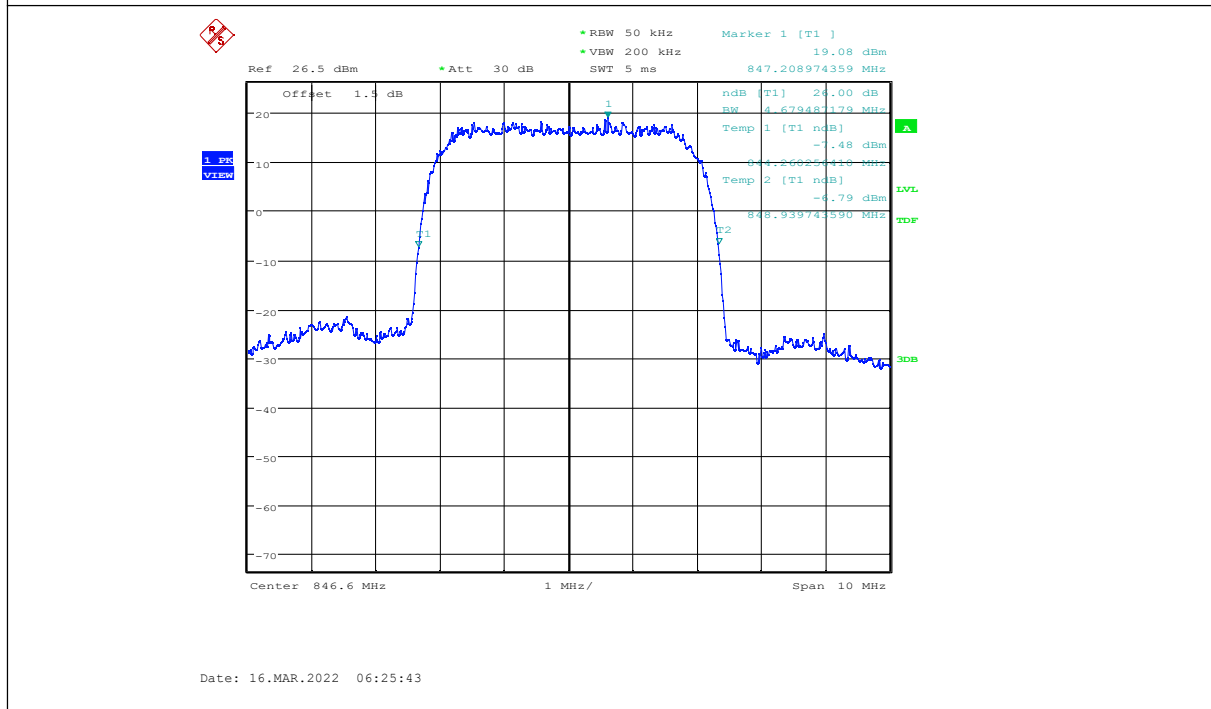
Channel 4183-Emission Bandwidth (-26dBc BW)

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Channel 4233-Emission Bandwidth (-26dBc BW)



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6.5. Conducted spurious emissions

Specifications:	FCC Part 2.1051, 2.1053, 22.917
DUT Serial Number:	864788050018436
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

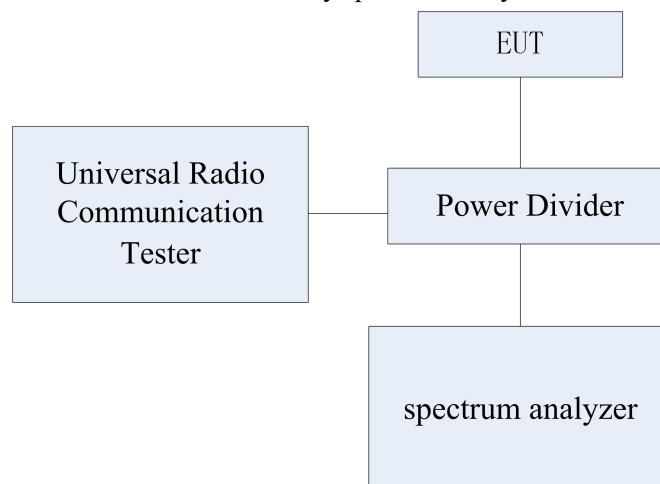
According to Part 22.917 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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 measurement was performed accordance with section 2.2.13 of ANSI/TIA-603-D: Land Mobile FM or

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PM Communications Equipment Measurement and Performance Standards.

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

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

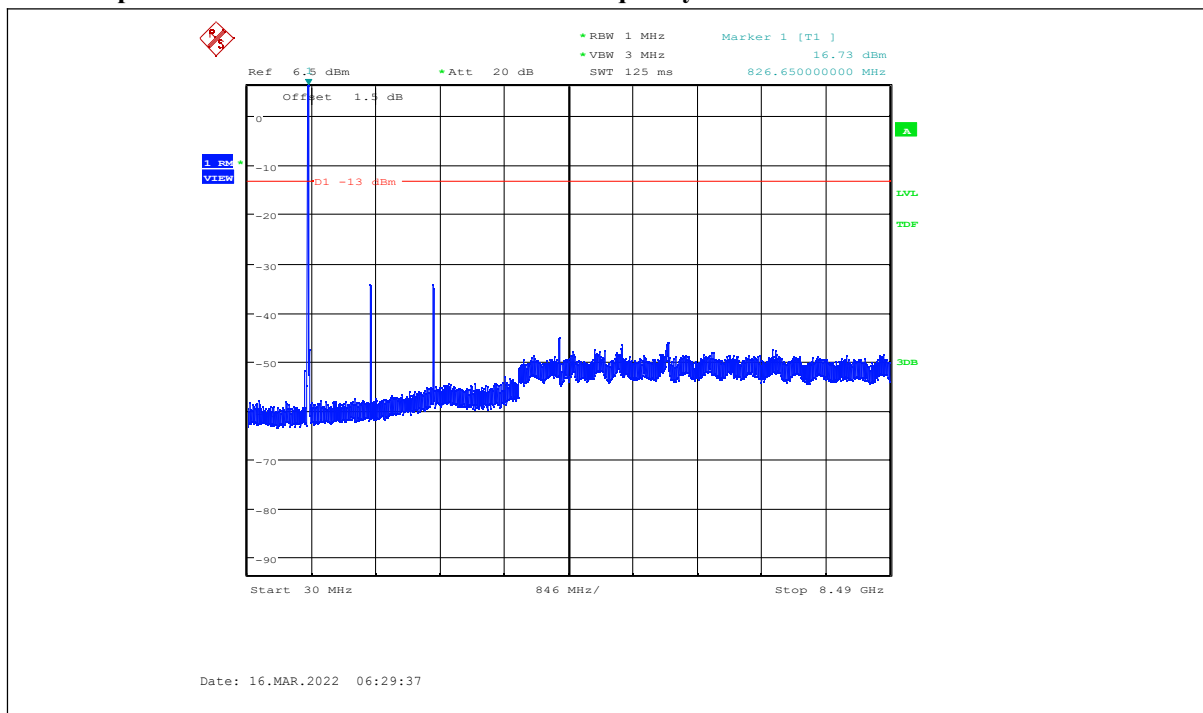
Note: --

6.5.1 Conducted Spurious Emission Results

WCDMA Band 5-QPSK

Channel 4132:30MHZ - 8490MHZ

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

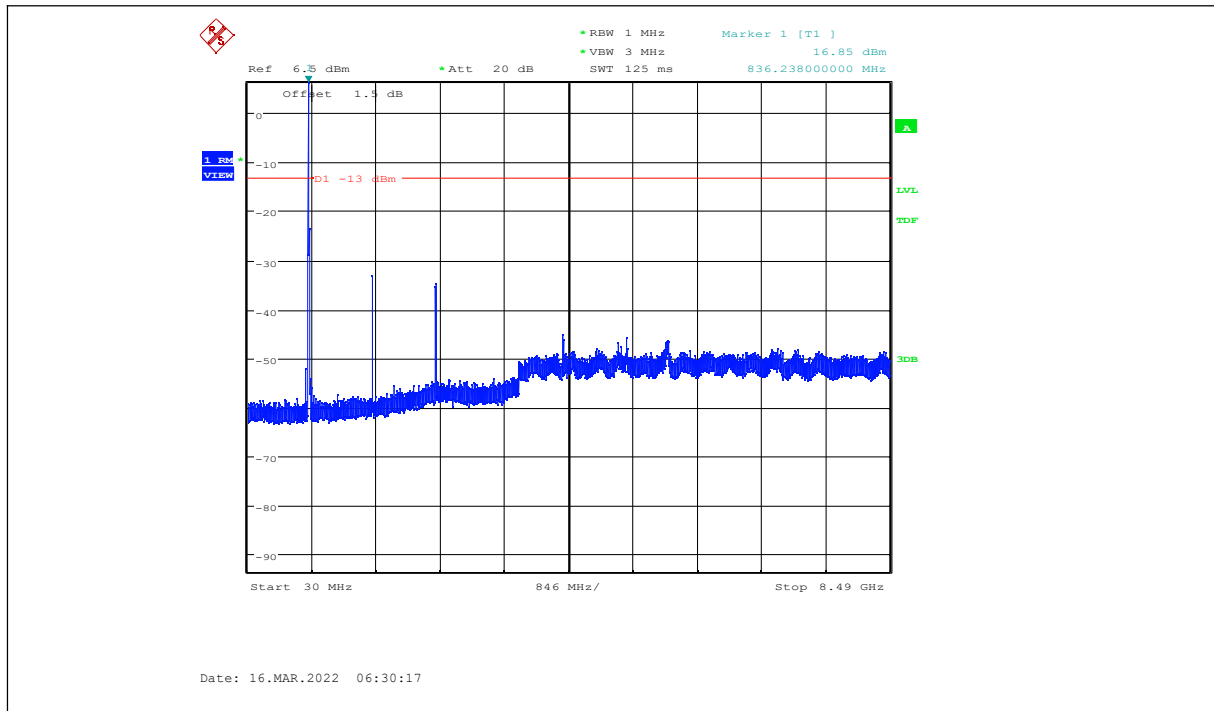


Channel 4183:30MHZ - 8490MHZ

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

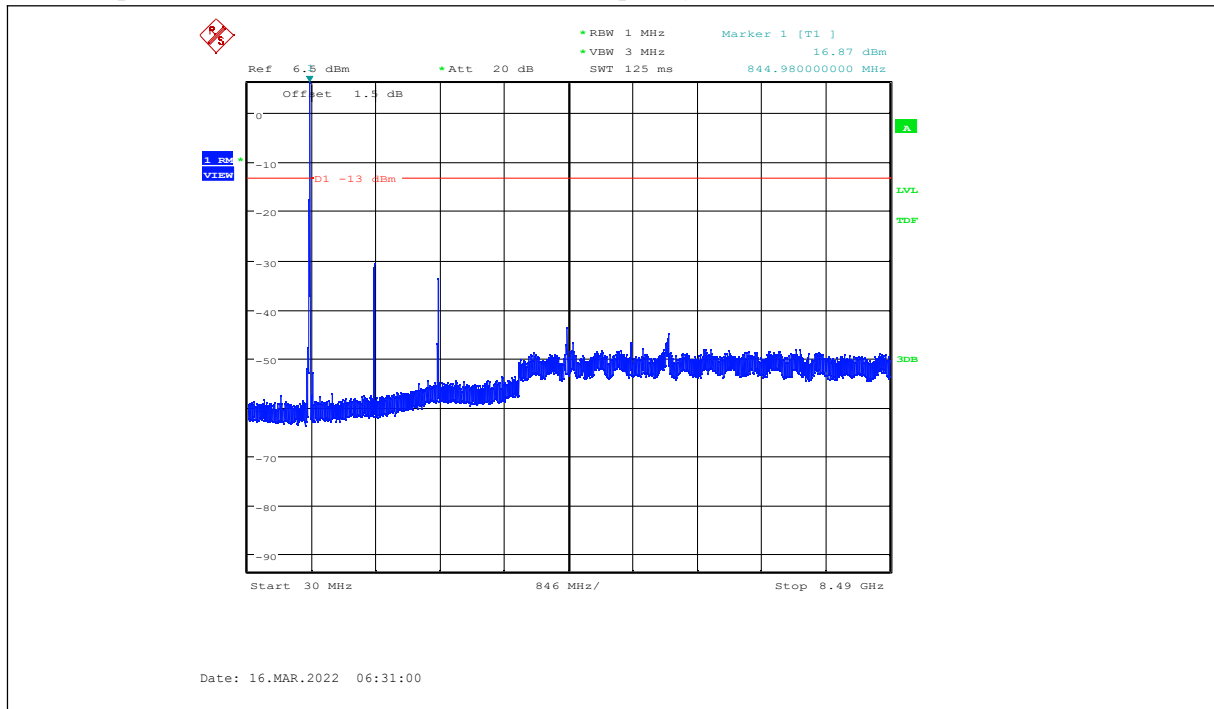
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Channel 4233:30MHZ - 8490MHZ

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



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6.6. Radiated Spurious Emission

Specifications:	FCC Part 2.1051, 2.1053, 22.917
DUT Serial Number:	864788050018584
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.

Limits for Radiated spurious emissions(UE)	
Frequency range	Limit Level /Resolution Bandwidth
30 MHz to 20000 MHz	-13dBm/1MHz

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:

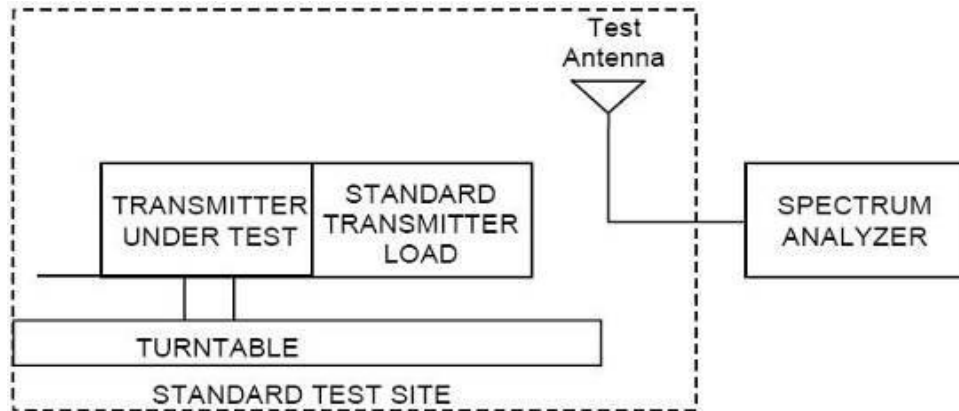
The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-E: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above. The

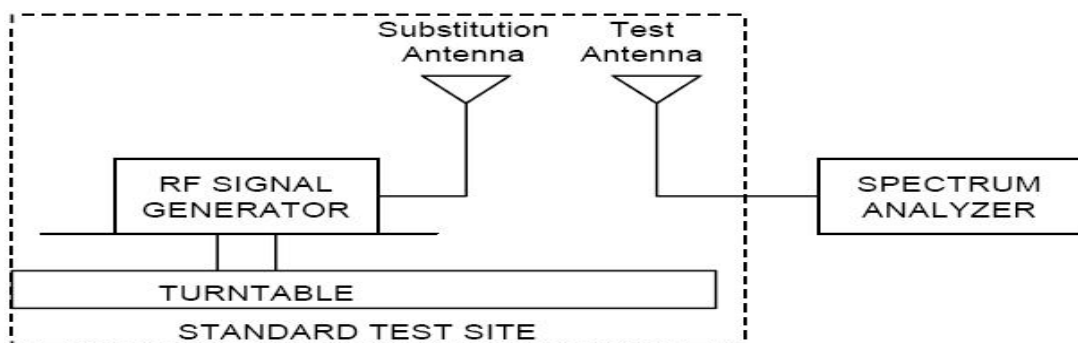
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distance from the device to the antenna is 3 m .



(b) Reconnect the equipment as illustrated.



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

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

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

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

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

where:

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

Note: --

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6.6.1 WCDMA B5 Radiated Spurious Emission Results

Test Data (RMC 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	-57.3	6.9	8.9	-55.3	H
2479.2	-54.8	6.3	9.9	-51.2	H
3305.6	-67.2	0.8	11.9	-56.1	V
4132.0	-66.6	0.9	11.2	-56.3	V
4958.4	-64.8	0.5	12.0	-53.3	V
5784.8	-65.0	0.4	12.2	-53.2	V

Test Data (RMC 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	-58.0	6.9	8.9	-56.0	H
2509.8	-54.6	6.3	9.9	-51.0	H
3346.4	-66.2	0.8	11.9	-55.1	V
4183.0	-65.9	0.9	11.2	-55.6	V
5019.6	-65.9	0.5	12.0	-54.4	V
5856.2	-64.7	0.4	12.2	-52.9	V

Test Data (RMC 4233 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	-57.2	6.9	8.9	-55.2	H
2539.8	-56.6	6.3	9.9	-53.0	H
3386.4	-67.6	0.8	11.9	-56.5	V

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4233.0	-65.9	0.9	11.2	-55.6	V
5079.6	-65.8	0.5	12.0	-54.3	V
5926.2	-65.1	0.4	12.2	-53.3	V

6.7. Band Edge

Specifications:	FCC Part 2.1051,2.1053, 22.917
DUT Serial Number:	864788050018436
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

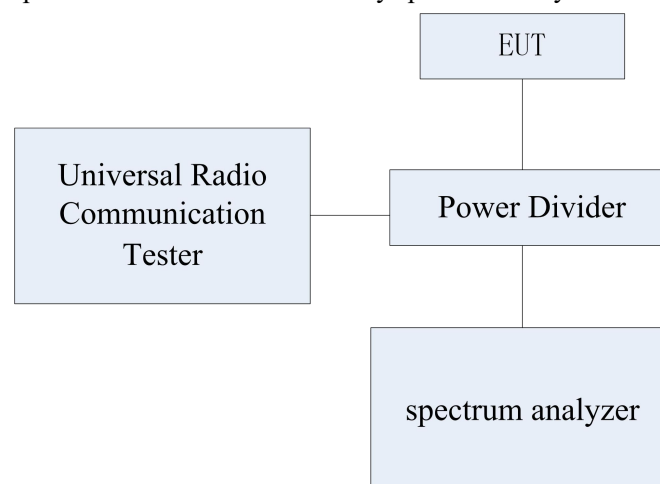
According to Part 22.917 (a), i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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.



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Test Method:

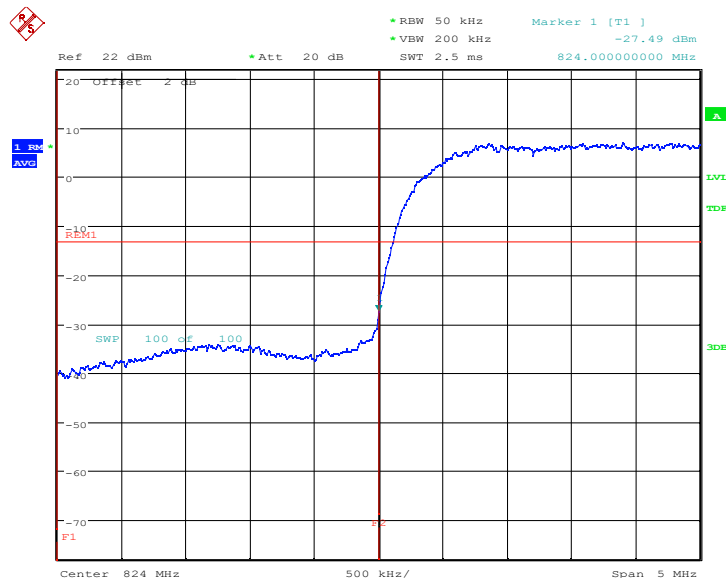
- 1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The loss of the cables the test system is calibrated to correct the readings.
- 2) The spectrum analyzer was set to Average Detector function and Maximum hold mode.
- 3) The resolution 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 5-QPSK

Channel 4132

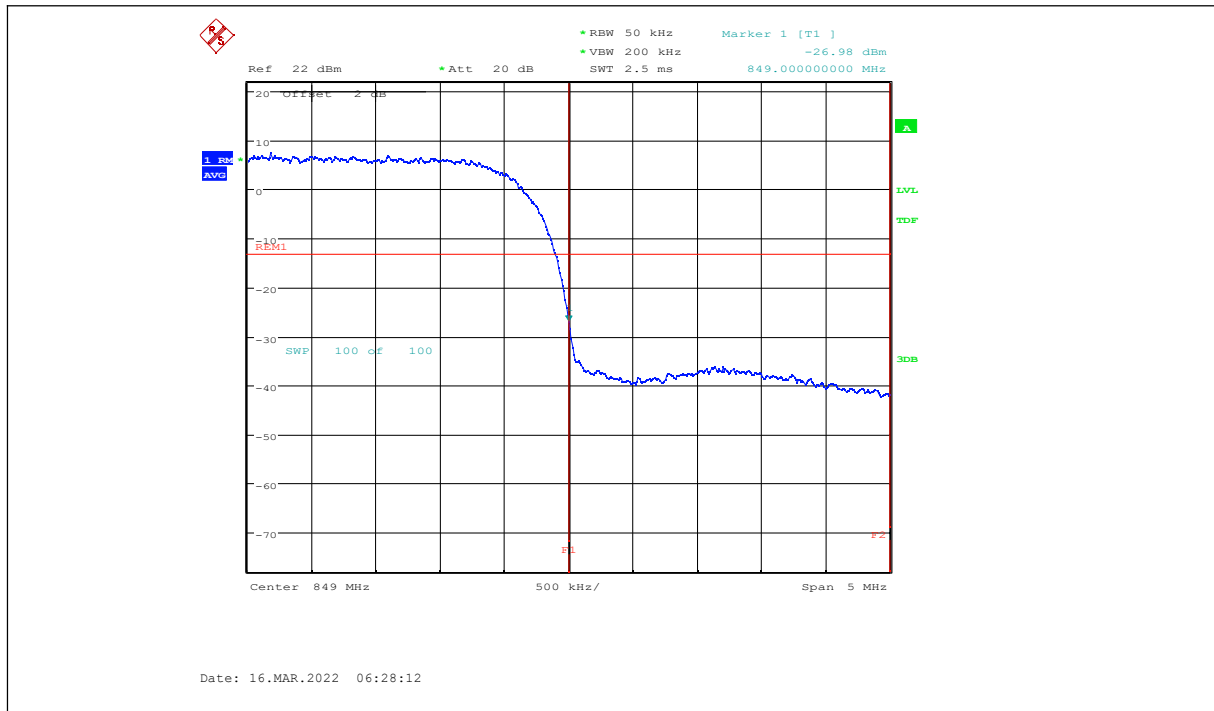


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Channel 4233

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6.8. Frequency Stability

Specifications:	FCC Part 2.1055, 22.355
DUT Serial Number:	864788050018436
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.

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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 5-QPSK(worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	824.100	848.910		
50				-6.80	0.0163
40				-5.09	0.0122
30				-10.34	0.0247
10				-5.88	0.0141
0				-0.93	0.0022
-10				-4.09	0.0098
-20				-8.63	0.0206
-30				-5.11	0.0122

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.4	20	824.100	848.910	-7.02	0.0168
4.2				1.25	0.0030

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6.9. Peak to Average Ratio

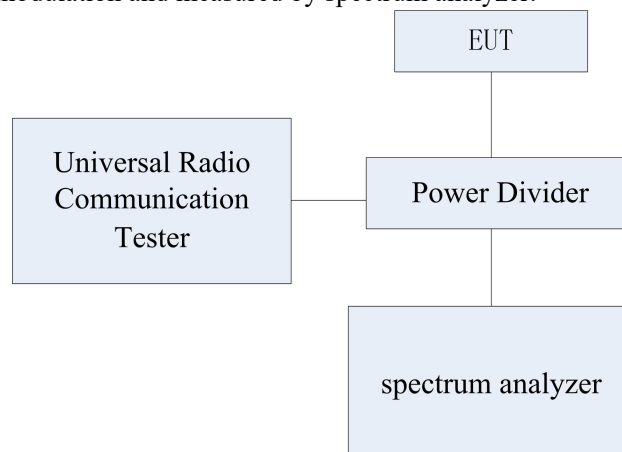
Specifications:	ANSI C63.26-2015
DUT Serial Number:	864788050018436
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

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.

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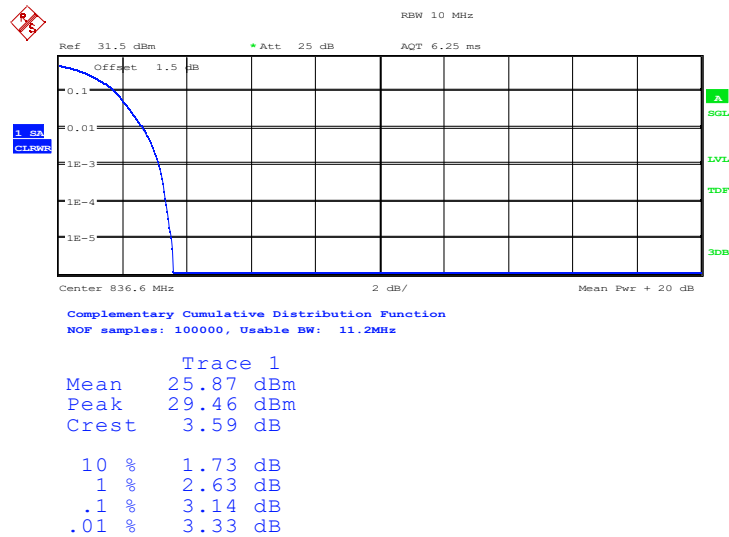
6.9.1 Peak to Average Ratio Results

WCDMA Band 5-QPSK

Measurement result

CH	Frequency (MHz)	PAPR (dB)
4183	836.6	3.14

Channel 4183-836.6MHz



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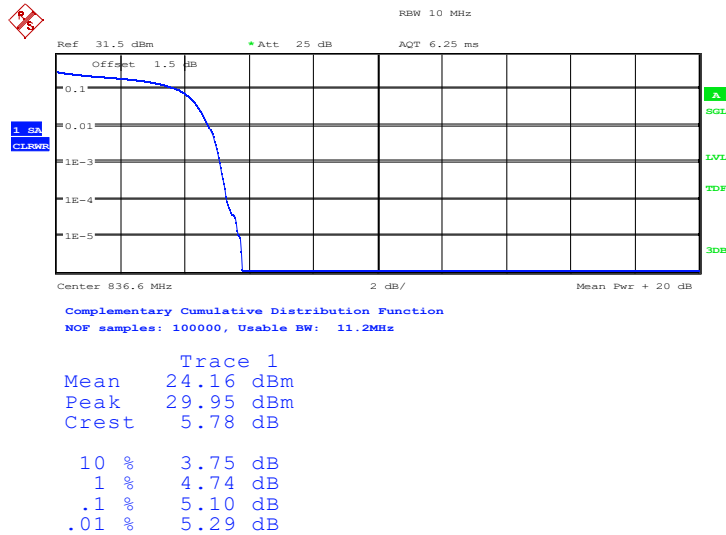
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WCDMA Band 5-16QAM

Measurement result

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

Channel 4183-836.6MHz



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Annex A EUT Photos

See the document "I22W00023-External Photos".

See the document "I22W00023-Internal Photos".

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ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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

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