



TEST REPORT

ETSI EN 301 908-1 V13.1.1(2019-11)
ETSI EN 301 908-13 V13.2.1(2022-02)
MEASUREMENT AND TEST REPORT
For

OpenVox Communication Co., Ltd.

Room 624, 6/F, Tsinghua Information Port, Qingqing Road, Longhua Street, Longhua District,
Shenzhen, Guangdong , China

Model: UC120P

2024-04-15

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: IP-PBX
Test Engineer: Blue Hu/ <i>Blue Hu</i>	
Report Number: TH2403326-C03-R02	
Test Date: 2024-03-29 to 2024-04-15	
Reviewed By: Neo Dong/ <i>Neo Dong</i>	
Approved By: Prince Huang/ <i>Prince Huang</i>	
Prepared By: Shenzhen Tian Hai Test Technology Co.,Ltd. 125-126, No.66, Zhangge Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, China Tel: +86-755-86615100 Fax: +86-755-86615105	

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Tian Hai Test Technology Co., Ltd.



TEST REPORT

ETSI EN 301 908-1 V13.1.1 (2019-11)
ETSI EN 301 908-13 V13.2.1(2022-02)

Report Reference No..... TH2403326-C03-R02

Tested by (signature)..... Blue Hu/



Reviewed by (signature)..... Neo Dong/

Approved by (signature)..... Prince Huang/

Date of issue..... 2024-04-15

Testing Laboratory Name..... Shenzhen Tian Hai Test Technology Co., Ltd.

Address..... 125-126, No.66, Zhangge Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, China

Testing location..... Same as above

Applicant's Name..... OpenVox Communication Co., Ltd.

Address..... Room 624, 6/F, Tsinghua Information Port, Qingqing Road, Longhua Street, Longhua District, Shenzhen, Guangdong, China

Manufacturer's Name..... OpenVox Communication Co., Ltd.

Address..... Room 201, Building I, Jinchangda, Building 00082, Shangwei Industrial Zone, Zhangkengjing Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China

Test specification

Standard..... ETSI EN 301 908-1 V13.1.1 (2019-11)
ETSI EN 301 908-13 V13.2.1(2022-02)

TRF Originator..... Shenzhen Tian Hai Test Technology Co., Ltd.

Master TRF..... Dated 2019-03

Shenzhen Tian Hai Test Technology Co., Ltd All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Tian Hai Test Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Tian Hai Test Technology Co., Ltd takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Test item description..... IP-PBX

Trade mark..... OpenVox

Model and/or type reference..... UC120P

Model Difference: N/A

Rating(s)..... DC12V,1A,12W

Note..... N/A



TABLE OF CONTENTS

1 TEST STANDARD 4

2 SUMMARY 5

2.1 PRODUCT DESCRIPTION 5

2.2 EQUIPMENT UNDER TEST 5

2.3 EUT OPERATION MODE 5

2.4 EUT CONFIGURATION 6

2.5 MODIFICATIONS 6

2.6 TEST CONDITIONS 6

3 TEST ENVIRONMENT 7

3.1 ENVIRONMENTAL CONDITIONS 7

3.2 TEST DESCRIPTION 7

3.3 STATEMENT OF THE MEASUREMENT UNCERTAINTY 8

3.4 EQUIPMENTS USED DURING THE TEST 9

4 TEST CONDITIONS AND RESULTS 10

4.1 REQUIREMENTS 10

4.1.1. RADIATED EMISSIONS (UE) 10

4.1.2. CONTROL AND MONITORING FUNCTIONS (UE) 13

4.1.3. TRANSMITTER MAXIMUM OUTPUT POWER 14

4.1.4. TRANSMITTER SPECTRUM EMISSION MASK 17

4.1.5. TRANSMITTER SPURIOUS EMISSIONS 45

4.1.6. TRANSMITTER MINIMUM OUTPUT POWER 50

4.1.7. RECEIVER ADJACENT CHANNEL SELECTIVITY (ACS) 52

4.1.8. RECEIVER BLOCKING CHARACTERISTICS 55

4.1.9. RECEIVER SPURIOUS RESPONSE 62

4.1.10. RECEIVER INTERMODULATION CHARACTERISTICS 64

4.1.11. RECEIVER SPURIOUS EMISSIONS 67

4.1.12. TRANSMITTER ADJACENT CHANNEL LEAKAGE POWER RATIO 71

4.1.13. RECEIVER REFERENCE SENSITIVITY LEVEL 81

5. PHOTOGRAPHS OF THE TEST CONFIGURATION 84

6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT 85



1 Test Standard

The tests were performed according to following standards:

ETSI EN 301 908-1 V13.1.1 (2019-11) – IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements

ETSI EN 301 908-13 V13.2.1(2022-02) – IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)





2 Summary

2.1 Product Description

The “EUT” as referred to in this report; more general information as follows, for more details, refer to the user’s manual of the EUT.

Name of EUT	IP-PBX
Model Number	UC120P
Operation Frequency	FDD LTE Band 1: 1920-1980 MHz FDD LTE Band 3: 1710-1785 MHz FDD LTE Band 5: 824-849 MHz FDD LTE Band 8: 880-915 MHz TDD LTE Band 34: 2010-2015 MHz TDD LTE Band 38: 2570-2620 MHz TDD LTE Band 39: 1880-1920 MHz TDD LTE Band 40: 2300-2400 MHz TDD LTE Band 41: 2496-2690 MHz (LTE only)
Modulation Type	QPSK, 16-QAM
Power Class	Power Class 3
Antenna Type	SMA Antenna
Antenna Gain	3dBi (Provided by customer)
Rating:	DC12V,1A,12W
Power Supply:	INPUT:100-240V~50/60Hz, 0.75A OUTPUT:12V= 2.0A 24W
Adapter:	Model:OLD120200AEU5D
Battery:	/
Sample No.	TH2403326-C03-R02#
Note	N/A

2.2 Equipment Under Test

For more details, refer to the user’s manual of the EUT.

2.3 EUT operation mode

The EUT and test equipment were configured for testing according to ETSI EN 301 908-1 V13.1.1 (2019-11) and ETSI EN 301 908-13 V13.2.1(2022-02).



2.4 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

2.5 Modifications

No modifications were implemented to meet testing criteria.

2.6 Test Conditions

	Normal Test Conditions	Extreme Test Conditions
Temperature	-40°C ~ 60°C	-40°C ~ 60°C Note: (1)
Relative Humidity	20% - 75%	N/A

Note:

- (1) Where tests at extreme temperatures are required, measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.
The HT 60°C and LT -40°C was declared by manufacturer, The EUT couldn't be operate normally with higher or lower temperature.



3 Test Environment

3.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature: 25 °C

High Temperature: 35 °C

Low Temperature: 0 °C

Normal Voltage: 3.7V

High Voltage: 4.2V

Low Voltage: 3.4V

Relative Humidity: 55 %

Air Pressure: 989 HPa

3.2 Test Description

SN	Rule and Clause	Description of Test	Test Result
1	EN 301 908-1 Clause 4.2.2	Radiated emissions (UE)	Pass
2	EN 301 908-1 Clause 4.2.3	Radiated emissions (BS and repeater)	Not applicable*
3	EN 301 908-1 Clause 4.2.4	Control and monitoring functions (UE)	Pass
4	EN 301 908-13 Clause 4.2.2	Transmitter maximum output power	Pass
5	EN 301 908-13 Clause 4.2.3	Transmitter spectrum emission mask	Pass
6	EN 301 908-13 Clause 4.2.4	Transmitter spurious emissions	Pass
7	EN 301 908-13 Clause 4.2.5	Transmitter minimum output power	Pass
8	EN 301 908-13 Clause 4.2.6	Receiver adjacent channel selectivity (ACS)	Pass
9	EN 301 908-13 Clause 4.2.7	Receiver blocking characteristics	Pass
10	EN 301 908-13 Clause 4.2.8	Receiver spurious response	Pass
11	EN 301 908-13 Clause 4.2.9	Receiver intermodulation characteristics	Pass
12	EN 301 908-13 Clause 4.2.10	Receiver spurious emissions	Pass
13	EN 301 908-13 Clause 4.2.11	Transmitter adjacent channel leakage power ratio	Pass
14	EN 301 908-13 Clause 4.2.12	Receiver reference sensitivity level	Pass

Remark: Not applicable*: This product does not belong to BS and repeater.



3.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01” Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1” and TR-100028-02 “Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 “ and is documented in the Bontek Compliance Testing Laboratory quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Test Items	Measurement Uncertainty	Notes
Frequency error	25 Hz	(1)
Frequency range	25 Hz	(1)
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Adjacent and alternate channel power Conducted	1.20 dB	(1)
Conducted spurious emission	1.60 dB	(1)
Radiated spurious emission	2.20 dB	(1)
Intermodulation attenuation	1.00 dB	(1)
Maximum useable receiver sensitivity	2.80 dB	(1)
Co-channel rejection	2.80 dB	(1)
Adjacent channel selectivity	2.80 dB	(1)
Spurious response rejection	2.80 dB	(1)
Intermodulation response rejection	2.80 dB	(1)
Blocking or desensitization	2.80 dB	(1)

- (1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.
- (2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.
- (3) The measurement uncertainty is not included in the test result.



3.4 Equipments Used during the Test

Radiated Emission (3m)				
Kind of Equipment	Manufacturer	Type	S/N	Calibrate until
EMI Test Receiver	R&S	ESR7	102333	2024-11-13
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2024-04-20
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2024-11-15
Pre-Amplifier	Schwarzbeck	BBV 9718 C	00109	2024-11-13
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2024-11-13
Pre-Amplifier	GUANGGU ELECTRONIC	GLNA18-40GK-5372	20210331001	2024-11-20
Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00148	2024-11-20
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2024-11-14
Broadband horn antenna	OCEAN MICROWAVE	0BH100400	26999002	2024-11-20
Test software	FALA	/	FA-03A2 RE	/
RF Test System				
Wideband radio communication tester	R&S	CMW500	131134	2024-04-15
EXA Signal Analyzer	Keysight	N9010A	MY54488841	2024-04-15
MXG Vector Signal Generator	Agilent	N5182B	MY59100603	2024-04-15
Signal Generator	R&S	SMB100A	113650	2024-04-15
RF control unit	Tonscend	JS0806-2	21C8060397	/
DC Power supply	Agilent	E3632A	MY50120052	/
RF test system	Tonscend	/	V2.6.88.0346	/
Software Version Information				
EMI Conduction Test	FALA	E-EMC	Ver. EMC-CON 3A1.1	N/A
EMI Radiation test	FALA	E-EMC	Ver. FA-03A2 RE+	N/A
RF test system	Tonscend	TS1120-3	Ver: 2.6.88.0346	N/A
RF Communication test system	R&S	CMW 500	Ver: V3.7.90	N/A



4 Test conditions and results

4.1 REQUIREMENTS

4.1.1. Radiated emissions (UE)

Limit

The frequency boundary and reference bandwidths for the detailed transitions of the limits between the requirements for out-of-band emissions and spurious emissions are based on Recommendations ITU-R SM.329-12 [1] and SM.1539-1 [i.6].

The requirements shown in table 4.2.2.2-1 are only applicable for frequencies in the spurious domain.

Table 4.2.2.2-1: Radiated spurious emissions requirements (UE)

Frequency	Minimum requirement (e.r.p.)/ reference bandwidth idle mode	Minimum requirement (e.r.p.)/ reference bandwidth traffic mode	Applicability
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-57 dBm/100 kHz	-36 dBm/100 kHz	All
$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$	-47 dBm/1 MHz	-30 dBm/1 MHz	All
$f_c - 2,5 \times 5 \text{ MHz} < f < f_c + 2,5 \times 5 \text{ MHz}$ (note 2)		Not defined	UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3
$f_c - 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz} < f < f_c + 2,5 \times \text{BW}_{\text{Channel}} \text{ MHz}$ (note 2)		Not defined	E-UTRA FDD, E-UTRA TDD, Mobile WiMAX™
$f_c - 2,5 \times 10 \text{ MHz} < f < f_c + 2,5 \times 10 \text{ MHz}$ (note 2)		Not defined	UTRA TDD, 7,68 Mcps option
$f_c - 4 \text{ MHz} < f < f_c + 4 \text{ MHz}$ (note 2)		Not defined	UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1

NOTE 1: f_c is the UE transmit centre frequency.
NOTE 2: This frequency range is not in the spurious domain, no requirement is then defined for this frequency range.

Test Procedure

According to ETSI EN 301 908-1 V13.1.1 (2019-11) clause 5.3.1

Test Results

Please refer to following:

Note: Pretest with low, middle, high channel, the worst case is middle channel.



Band 1 traffic mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1900.00	H	-51.65	-30.00	-21.65
2100.00	H	-41.34	-30.00	-11.34
56.00	H	-49.62	-36.00	-13.62
1954.00	V	-47.68	-30.00	-17.68
2176.00	V	-46.62	-30.00	-16.62
76.00	V	-48.34	-36.00	-12.34

Band 1 idle mode mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1954.00	H	-59.54	-47.00	-12.54
2106.00	H	-58.54	-47.00	-11.54
100.00	H	-43.89	-57.00	13.11
1934.00	V	-59.43	-47.00	-12.43
2143.00	V	-58.33	-47.00	-11.33
104.00	V	-43.54	-57.00	13.46

Band 3 traffic mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
2457.00	H	-51.11	-30.00	-21.11
3786.00	H	-41.43	-30.00	-11.43
108.00	H	-49.67	-36.00	-13.67
2356.00	V	-47.61	-30.00	-17.61
3778.00	V	-46.65	-30.00	-16.65
87.00	V	-48.87	-36.00	-12.87

Band 3 idle mode mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
2146.00	H	-59.43	-47.00	-12.43
4456.00	H	-58.51	-47.00	-11.51
112.00	H	-43.45	-57.00	13.55
2122.00	V	-59.47	-47.00	-12.47
3890.00	V	-58.32	-47.00	-11.32
129.00	V	-43.87	-57.00	13.13



Band 5 traffic mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
2456.00	H	-51.13	-30.00	-21.13
3766.00	H	-41.09	-30.00	-11.09
175.00	H	-49.15	-36.00	-13.15
2336.00	V	-47.43	-30.00	-17.43
3779.00	V	-46.35	-30.00	-16.35
96.00	V	-48.44	-36.00	-12.44

Band 5 idle mode mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3453.00	H	-59.55	-47.00	-12.55
4467.00	H	-58.53	-47.00	-11.53
115.00	H	-43.46	-57.00	13.54
2199.00	V	-59.43	-47.00	-12.43
3892.00	V	-58.35	-47.00	-11.35
123.00	V	-43.82	-57.00	13.18

Band 8 traffic mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
2467.00	H	-51.86	-30.00	-21.86
3733.00	H	-41.56	-30.00	-11.56
167.00	H	-49.45	-36.00	-13.45
2377.00	V	-47.65	-30.00	-17.65
3724.00	V	-46.33	-30.00	-16.33
76.00	V	-48.59	-36.00	-12.59

Band 8 idle mode mode middle channel

Spurious Emissions Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
3123.00	H	-59.49	-47.00	-12.49
6543.00	H	-58.26	-47.00	-11.26
165.00	H	-43.15	-57.00	13.85
2133.00	V	-59.22	-47.00	-12.22
3654.00	V	-58.17	-47.00	-11.17
76.00	V	-43.62	-57.00	13.38



4.1.2. Control and monitoring functions (UE)

Limit

The maximum measured power during the duration of the test shall not exceed -30dBm.

Test Procedure

According to ETSI EN 301 908-1 V13.1.1 (2019-11) clause 5.3.3

Test Results

Please refer to following:

Maximum power measured(dBm)			Limit(dBm)
First Switch on Observation Period	Switch off Observation Period (0.5 Minute)	Second Switch on Observation Period (1 Minute)	
-52.26	-55.32	-49.85	-30



4.1.3. Transmitter Maximum Output Power

Limit

The UE maximum output power shall be within the shown value in table 4.2.2.1.2-1.

Table 4.2.2.1.2-1: UE power classes

E-UTRA Band	Power Class 3 (dBm)	Tolerance (dB)
1	23	±2,7
3	23	±2,7 (see note)
7	23	±2,7 (see note)
8	23	±2,7 (see note)
20	23	±2,7 (see note)
22	23	+3,0/-4,5
28	23	+2,7/-3,2
31	23	±2,7
33	23	±2,7
34	23	±2,7
38	23	±2,7
40	23	±2,7
42	23	+3,0/-4,0
43	23	+3,0/-4,0
65	23	±2,7
68	23	±2,7

NOTE: For transmission bandwidths (ETSI TS 136 521-1 [1], clause 5) confined within F_{UL_low} and $F_{UL_low} + 4$ MHz or $F_{UL_high} - 4$ MHz and F_{UL_high} , the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1,5 dB (tolerance = +2,7/-4,2).

Note 1: These requirements do not take into account the maximum power reductions allowed to the UE subject to certain transmission conditions specified in ETSI TS 136 101 [3], clauses 6.2.3 and 6.2.4.

Note 2: The range of UE maximum output power for the various power classes are specified in ETSI TS 136 101 [3], clause 6.2.2. The values in table 4.2.2.1.2-1 correspond to the measurement limits.

Test Procedure

According to ETSI EN 301 908-13 V13.2.1(2022-02) clause 5.3.1

Test Results

Please refer to following:



Band 1 (Single carrier)

Bandwidth	Channel	RB	Result (dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
5 MHz	Low	RB1#0	22.4	22.3	22.1	22.5	22.4	23+2.7/-4.2
		RB8#0	22.4	22.7	22.1	22.8	22.3	
	Middle	RB1#0	22.5	22.7	22.9	22.5	22.9	23+2.7/-2.7
		RB8#0	22.1	22.3	22.1	22.9	22.5	
	High	RB1#24	22.1	22.6	22.4	22.6	22.9	23+2.7/-4.2
		RB8#17	22.1	22.6	22.1	22.8	22.5	
20 MHz	Low	RB1#0	22.2	22.5	22.3	22.6	22.4	23+2.7/-2.7
		RB18#0	22.6	22.9	22.5	22.3	22.1	
	Middle	RB1#0	22.5	22.4	22.2	22.1	23.1	23+2.7/-2.7
		RB18#0	22.2	21.4	21.5	22.5	22.5	
	High	RB1#99	22.3	22.3	23.0	21.8	23.0	23+2.7/-2.7
		RB18#82	22.1	22.4	22.2	22.3	22.8	

Band 3 (Single carrier)

Bandwidth	Channel	RB	Result (dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
1.4 MHz	Low	RB1#0	22.3	22.1	22.4	22.6	22.0	23+2.7/-4.2
		RB5#0	22.2	22.5	22.0	22.1	22.0	
	Middle	RB1#0	22.4	22.5	22.3	22.6	22.4	23+2.7/-2.7
		RB5#0	22.4	22.6	22.3	22.3	22.3	
	High	RB1#5	22.4	22.5	22.5	22.2	22.5	23+2.7/-4.2
		RB5#1	22.5	22.8	22.6	22.8	22.7	
5 MHz	Low	RB1#0	22.1	22.0	22.3	22.2	22.0	23+2.7/-4.2
		RB8#0	22.2	22.4	22.2	22.3	22.5	
	Middle	RB1#0	22.6	22.7	22.9	22.5	22.9	23+2.7/-2.7
		RB8#0	22.5	22.6	22.6	22.8	22.4	
	High	RB1#24	22.4	22.7	22.5	22.5	22.1	23+2.7/-4.2
		RB8#17	22.5	22.6	22.7	22.6	22.3	
20 MHz	Low	RB1#0	22.5	22.3	22.8	22.8	22.7	23+2.7/-2.7
		RB18#0	22.7	22.7	22.8	22.8	22.7	
	Middle	RB1#0	22.8	22.9	23.1	22.7	23.1	23+2.7/-2.7
		RB18#0	22.6	22.6	22.3	22.6	22.7	
	High	RB1#99	22.9	23.0	22.8	22.9	22.7	23+2.7/-2.7
		RB18#82	22.7	22.6	22.6	22.9	22.9	



Band 5 (Single carrier)

Bandwidth	Channel	RB	Result (dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
5 MHz	Low	RB1#0	22.3	22.2	22.5	22.1	22.6	23+2.7/-4.2
		RB8#0	22.7	22.2	22.1	22.4	22.3	
	Middle	RB1#0	22.2	22.6	22.2	22.4	22.3	23+2.7/-2.7
		RB8#0	22.7	22.2	22.6	22.2	22.7	
	High	RB1#24	22.1	22.3	22.0	22.9	22.2	23+2.7/-4.2
		RB8#17	22.3	22.5	22.2	22.6	22.8	
20 MHz	Low	RB1#0	22.2	22.3	22.4	22.8	22.5	23+2.7/-2.7
		RB18#0	22.1	22.2	22.8	22.1	22.3	
	Middle	RB1#0	22.2	22.3	23.6	22.1	23.2	23+2.7/-2.7
		RB18#0	22.2	22.3	22.2	22.4	22.5	
	High	RB1#99	22.5	23.1	22.4	22.3	22.8	23+2.7/-2.7
		RB18#82	22.3	22.1	22.0	22.6	22.3	

Band 8 (Single carrier)

Bandwidth	Channel	RB	Result (dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
5 MHz	Low	RB1#0	22.1	22.0	22.3	22.2	22.0	23+2.7/-4.2
		RB8#0	22.2	22.4	22.2	22.3	22.5	
	Middle	RB1#0	22.6	22.7	22.9	22.5	22.9	23+2.7/-2.7
		RB8#0	22.5	22.6	22.6	22.8	22.4	
	High	RB1#24	22.4	22.7	22.5	22.5	22.1	23+2.7/-4.2
		RB8#17	22.5	22.6	22.7	22.6	22.3	
20 MHz	Low	RB1#0	22.5	22.3	22.8	22.8	22.7	23+2.7/-2.7
		RB18#0	22.7	22.7	22.8	22.8	22.7	
	Middle	RB1#0	22.8	22.9	23.1	22.7	23.1	23+2.7/-2.7
		RB18#0	22.6	22.6	22.3	22.6	22.7	
	High	RB1#99	22.9	23.0	22.8	22.9	22.7	23+2.7/-2.7
		RB18#82	22.7	22.6	22.6	22.9	22.9	



4.1.4. Transmitter Spectrum Emission Mask

Limit

The power of any UE emission shall fulfil requirements in tables 4.2.3.1.2-1 to 4.2.3.1.2-3.

Table 4.2.3.1.2-1: General E-UTRA spectrum emission mask, E UTRA bands ≤ 3 GHz

Δf_{OOB} (MHz)	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Measurement bandwidth
0 to 1	-8,5	-11,5	-13,5	-16,5	-18,5	-19,5	30 kHz
1 to 2,5	-8,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz
2,5 to 2,8	-23,5	-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz
2,8 to 5		-8,5	-8,5	-8,5	-8,5	-8,5	1 MHz
5 to 6		-23,5	-11,5	-11,5	-11,5	-11,5	1 MHz
6 to 10			-23,5	-11,5	-11,5	-11,5	1 MHz
10 to 15				-23,5	-11,5	-11,5	1 MHz
15 to 20					-23,5	-11,5	1 MHz
20 to 25						-23,5	1 MHz

NOTE 1: The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0,015 MHz and 0,985 MHz.
 NOTE 2: The first and last measurement position with a 1 MHz filter for 1 MHz - 2,5 MHz offset range is at Δf_{OOB} equals to 1,5 MHz and 2,0 MHz. Similarly for other Δf_{OOB} ranges.
 NOTE 3: The measurements shall be performed above the upper edge of the channel and below the lower edge of the channel.
 NOTE 4: For the 2,5 MHz - 2,8 MHz offset range with 1,4 MHz channel bandwidth, the measurement position is at Δf_{OOB} equals to 3 MHz.

Table 4.2.3.1.2-2: General E-UTRA spectrum emission mask, 3 GHz < E-UTRA bands ≤ 4,2 GHz

Δf_{OOB} (MHz)	Spectrum emission limit (dBm)/Channel bandwidth						Measurement bandwidth
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
0 to 1	-8,2	-11,2	-13,2	-16,2	-18,2	-19,2	30 kHz
1 to 2,5	-8,2						1 MHz
2,5 to 2,8	-23,2	-8,2	-8,2	-8,2	-8,2	-8,2	1 MHz
2,8 to 5							1 MHz
5 to 6		-23,2	-11,2	-11,2	-11,2	-11,2	1 MHz
6 to 10			-23,2				1 MHz
10 to 15				-23,2			1 MHz
15 to 20					-23,2		1 MHz
20 to 25						-23,2	1 MHz

NOTE 1: The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0,015 MHz and 0,985 MHz.
 NOTE 2: At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0,5 MHz and -0,5 MHz, respectively.
 NOTE 3: The measurements shall be performed above the upper edge of the channel and below the lower edge of the channel.
 NOTE 4: For the 2,5-2,8 MHz offset range with 1,4 MHz channel bandwidth, the measurement position is at Δf_{OOB} equals to 3 MHz.

Table 4.2.3.1.2-3: Additional spectrum emission mask (network signalled value "NS_01")

E-UTRA band	Frequency range	Channel Bandwidth	Spectrum emission limit (dBm)	Measurement Bandwidth
20	863 MHz ≤ f ≤ 867 MHz	10 MHz (note 2)	-11,5	1 MHz
	867 MHz ≤ f ≤ 870 MHz	10 MHz (note 2)	-14,5	1 MHz

NOTE 1: At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0,5 MHz and -0,5 MHz, respectively.
 NOTE 2: The conformance shall be assessed at test frequency 857 MHz with 50 RB allocation.

Test Procedure

According to ETSI EN 301 908-13 V13.2.1(2022-02) clause 5.3.2

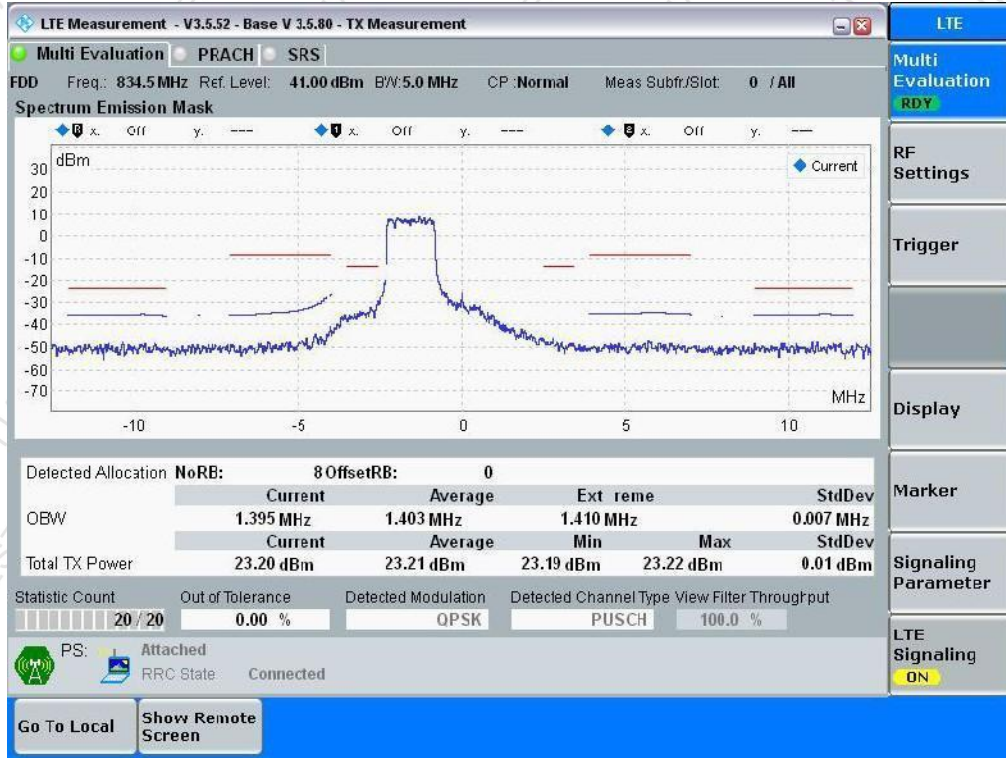


Test Results

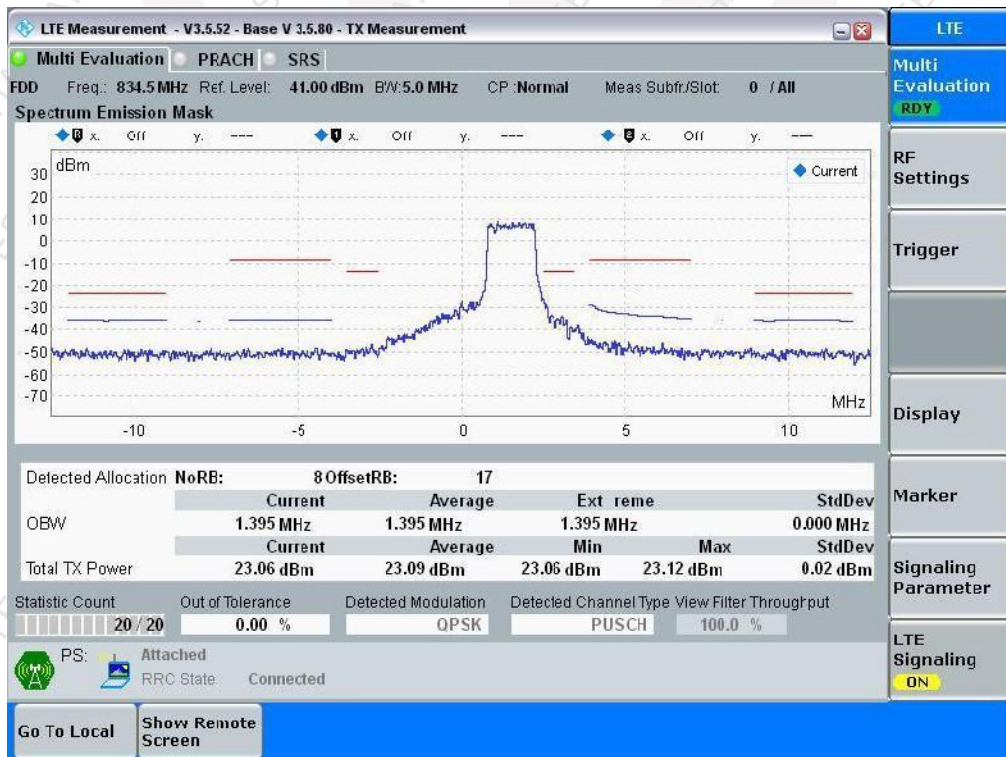
Please refer to following:

Note: Pretest all the bands and reported the worst-case band 20.

5 MHz_Low_QPSK_RB8#0

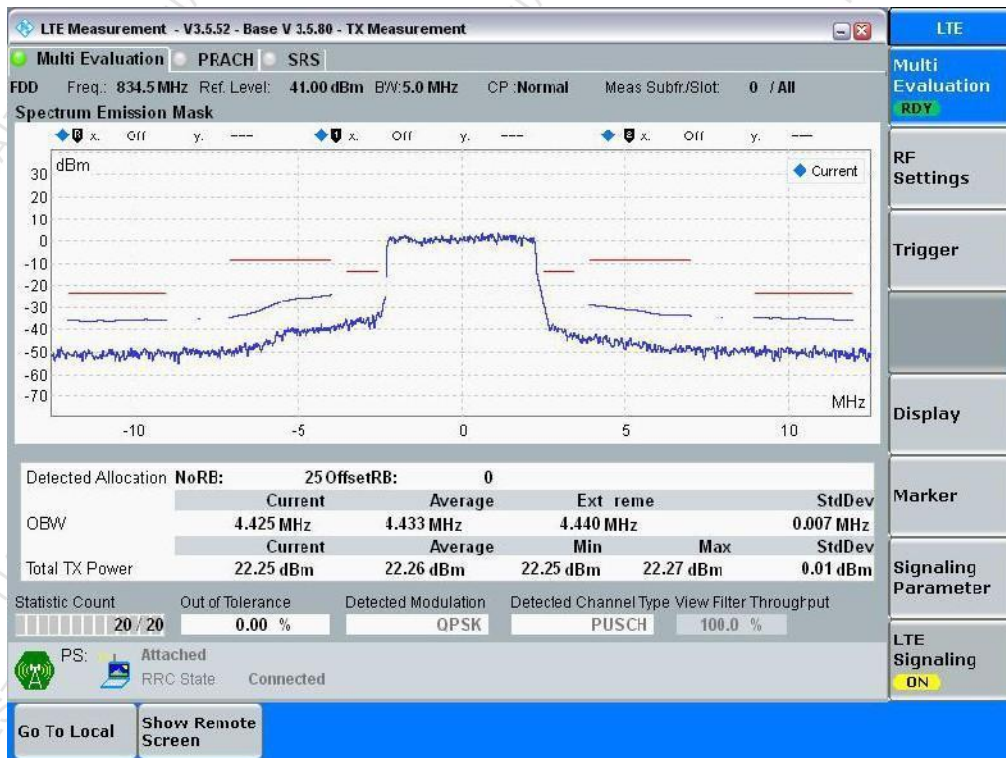


5 MHz_Low_QPSK_RB8#17

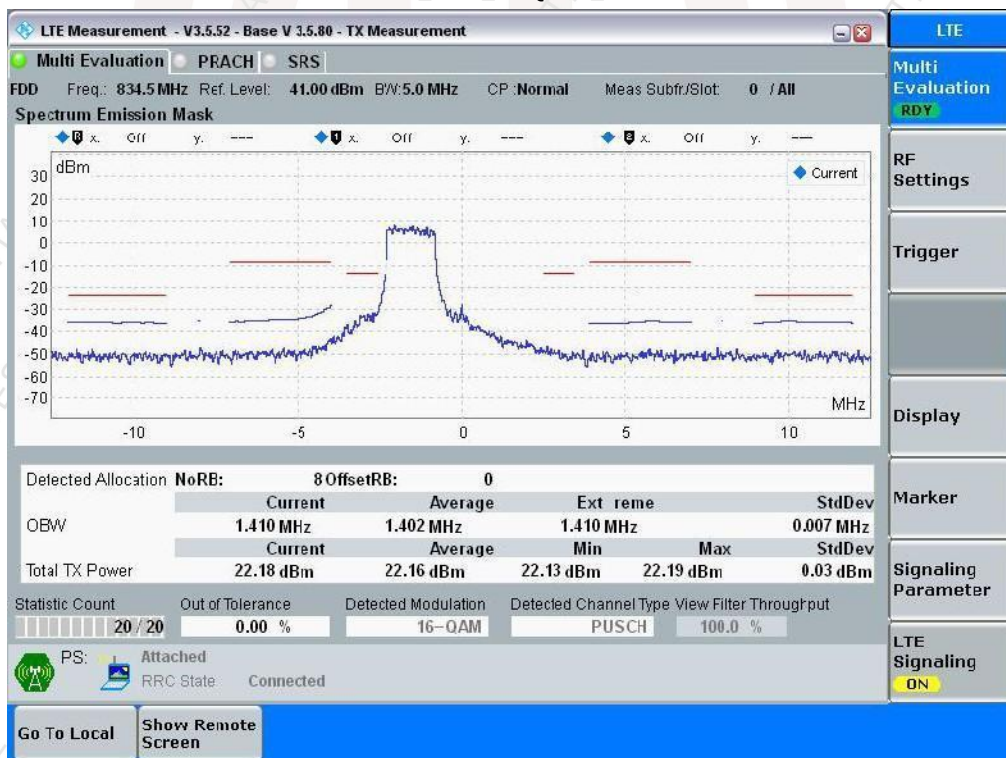




5 MHz_Low_QPSK_RB25#0

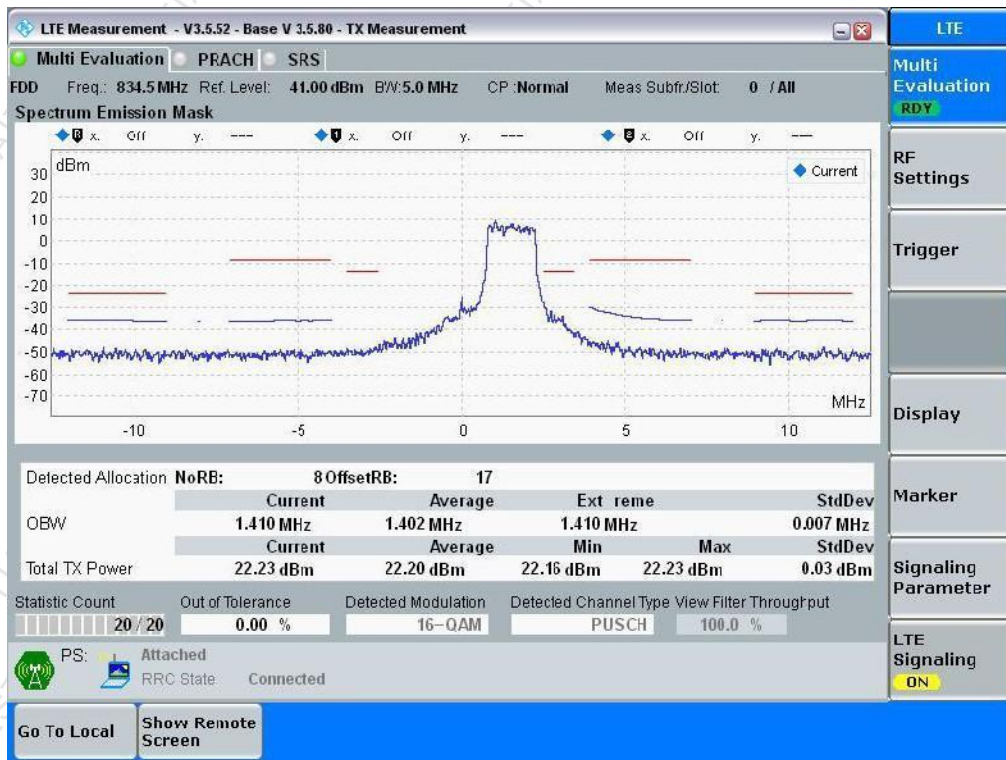


5 MHz_Low_16QAM_RB8#0

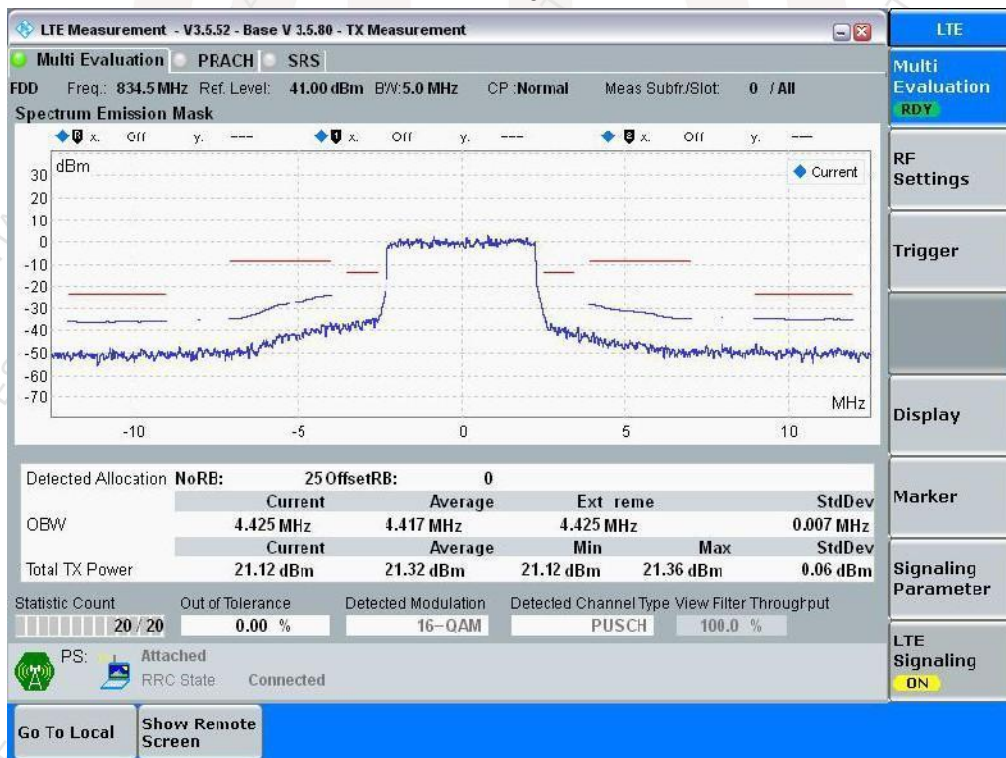




5 MHz_Low_16QAM_RB8#17

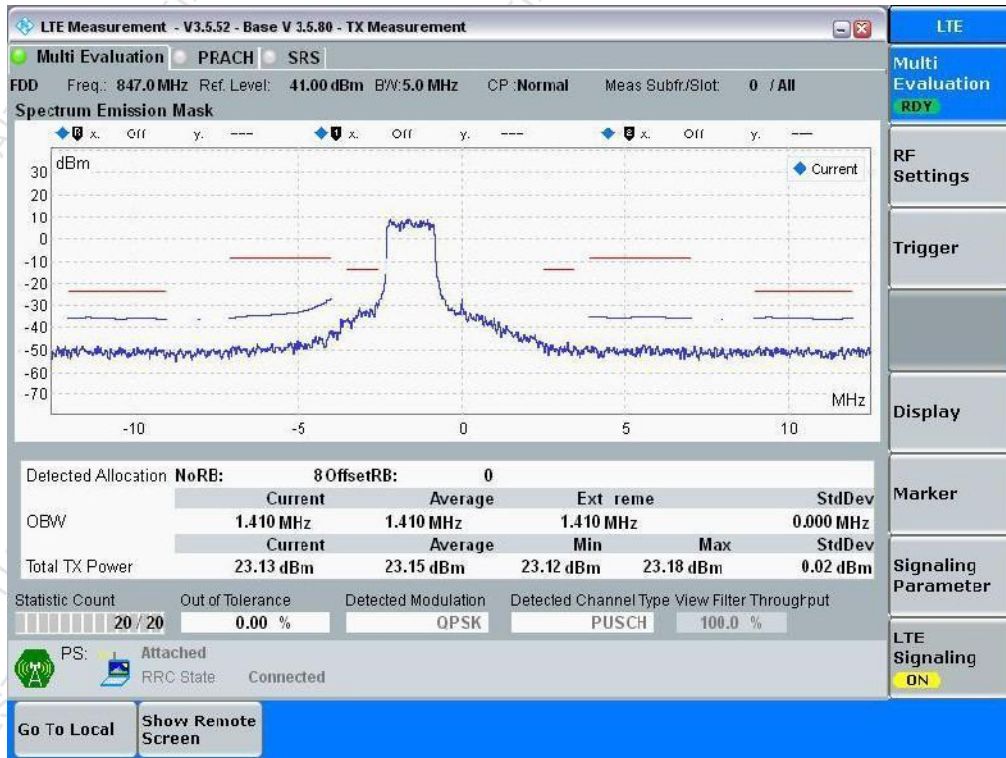


5 MHz_Low_16QAM_RB25#0

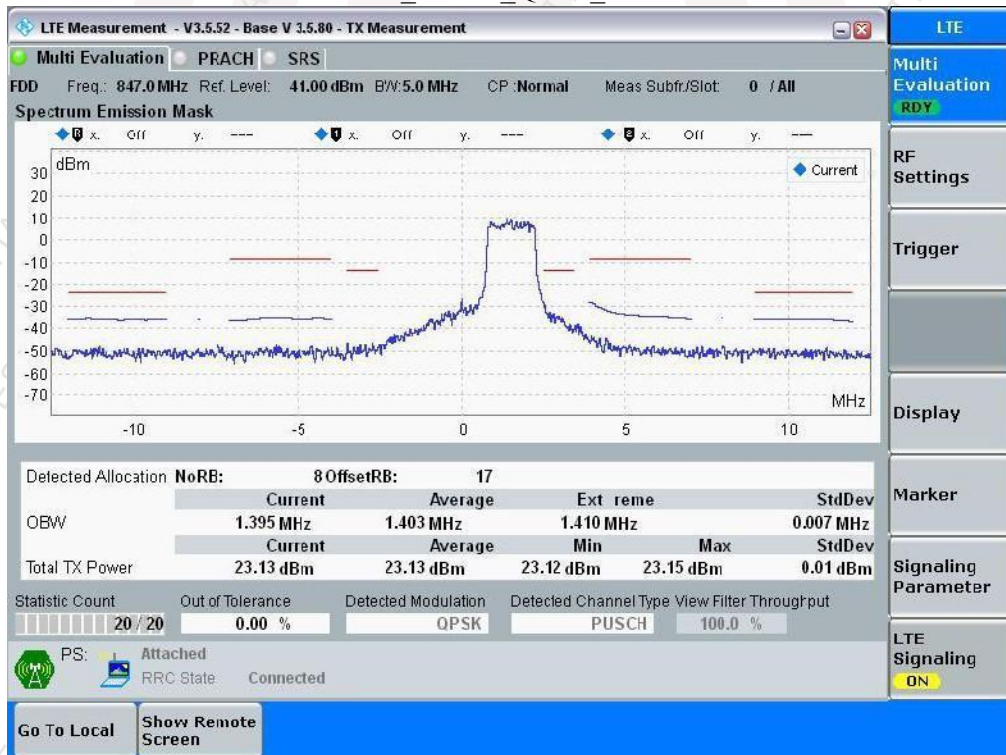




5 MHz_Middle_QPSK_RB8#0

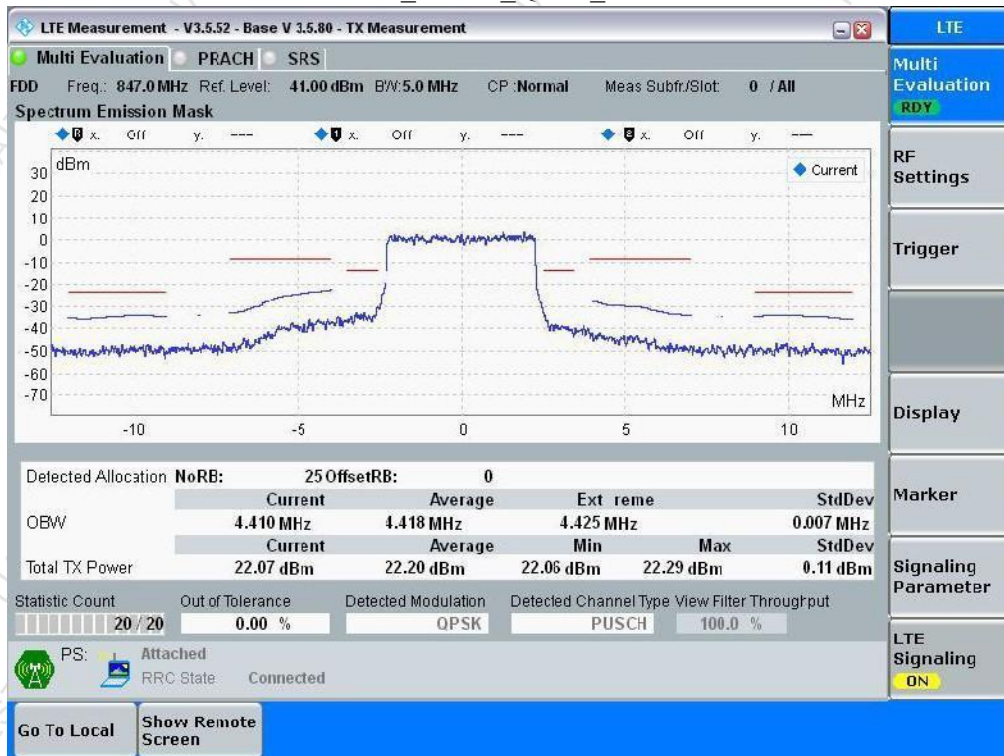


5 MHz_Middle_QPSK_RB8#17

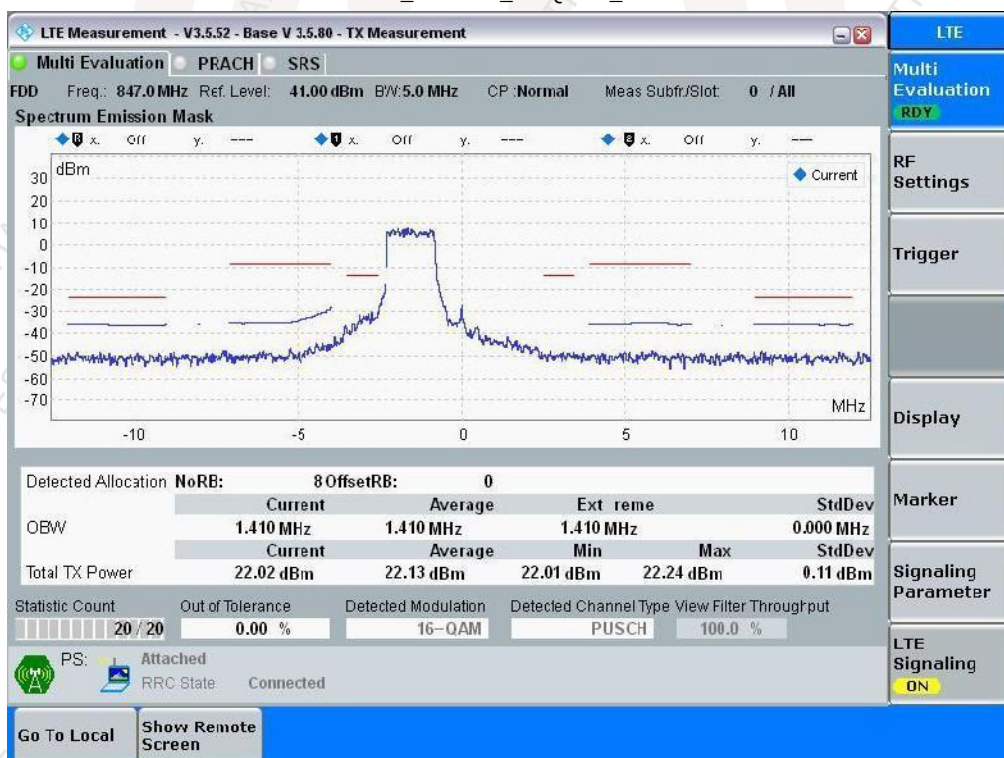




5 MHz_Middle_QPSK_RB25#0

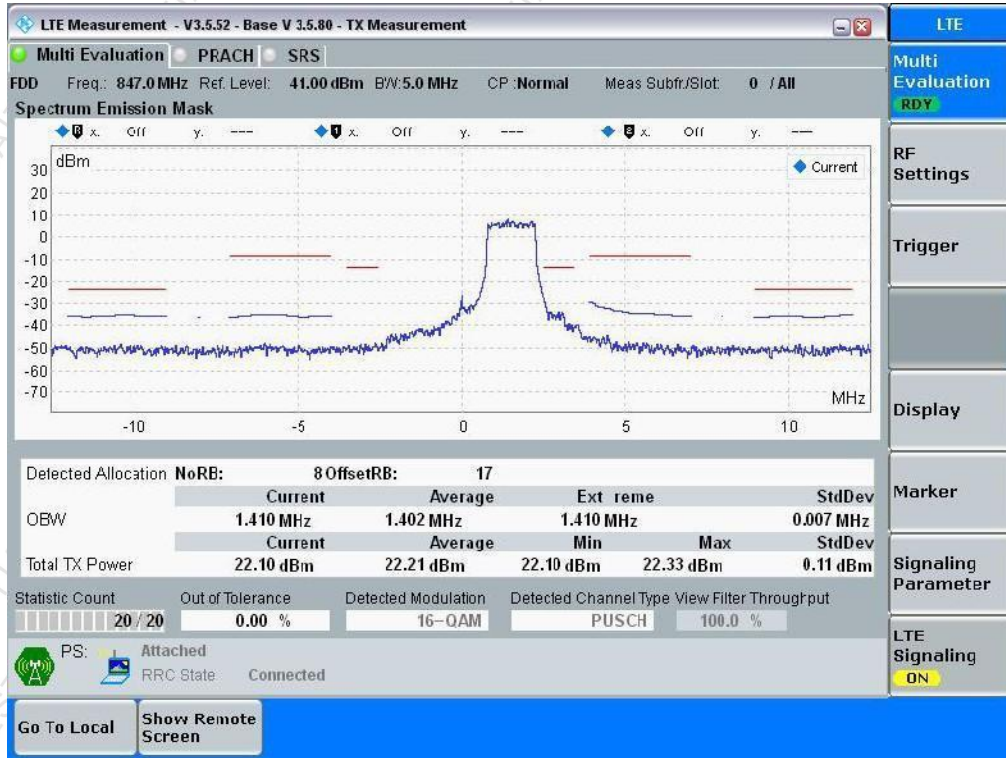


5 MHz_Middle_16QAM_RB8#0

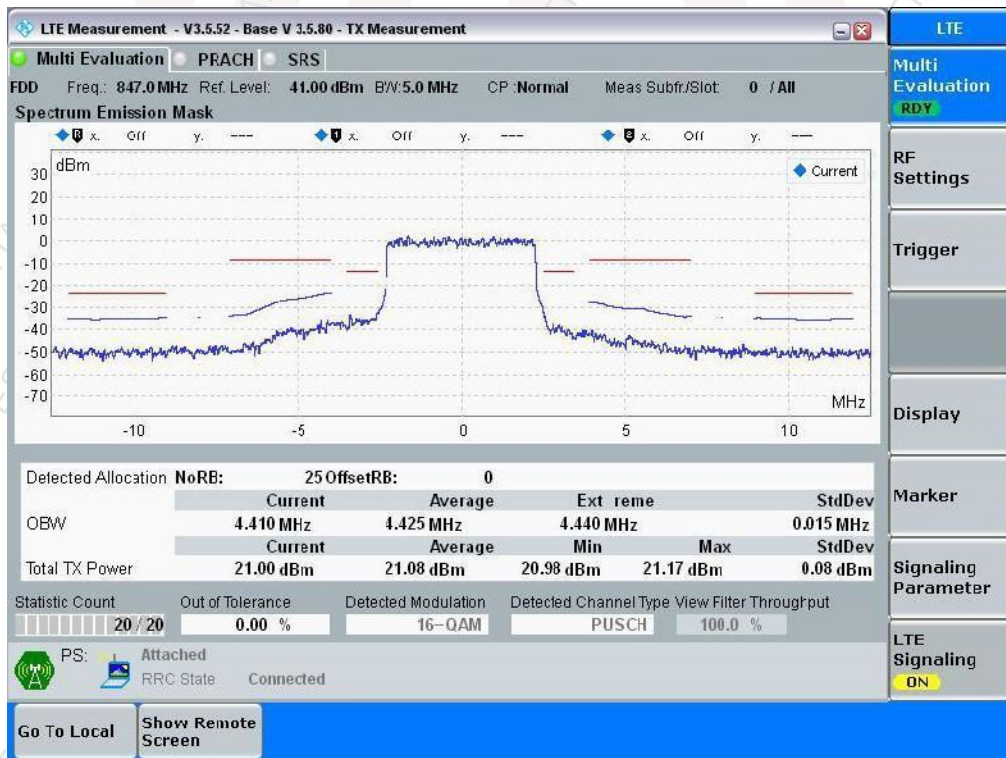




5 MHz_Middle_16QAM_RB8#17

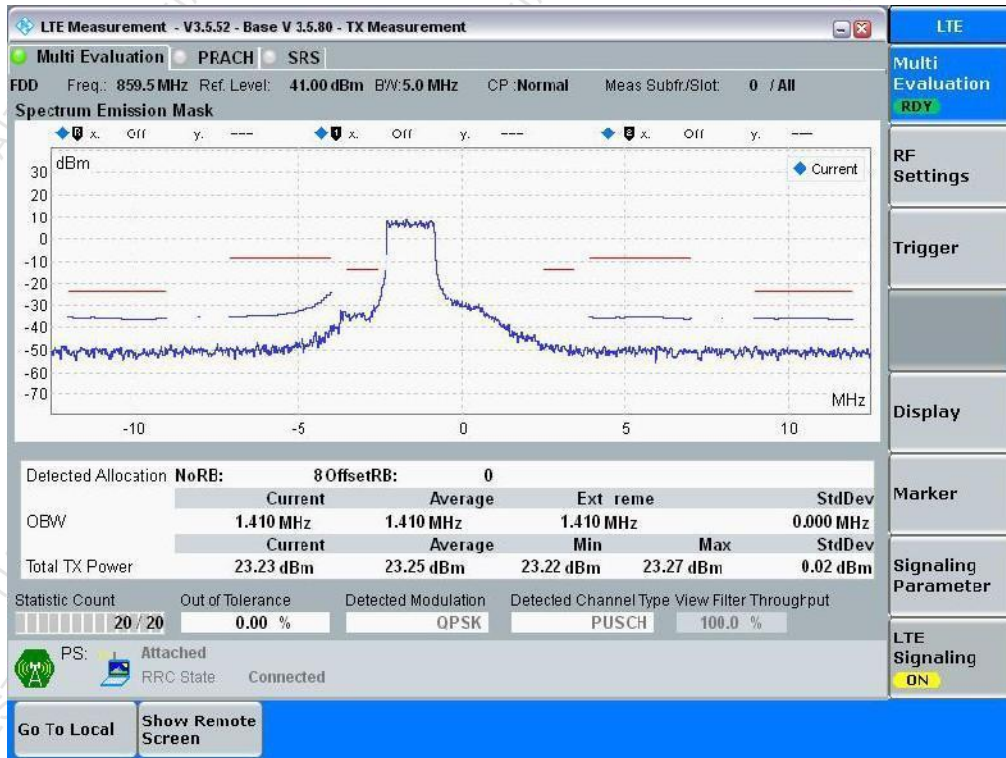


5 MHz_Middle_16QAM_RB25#0

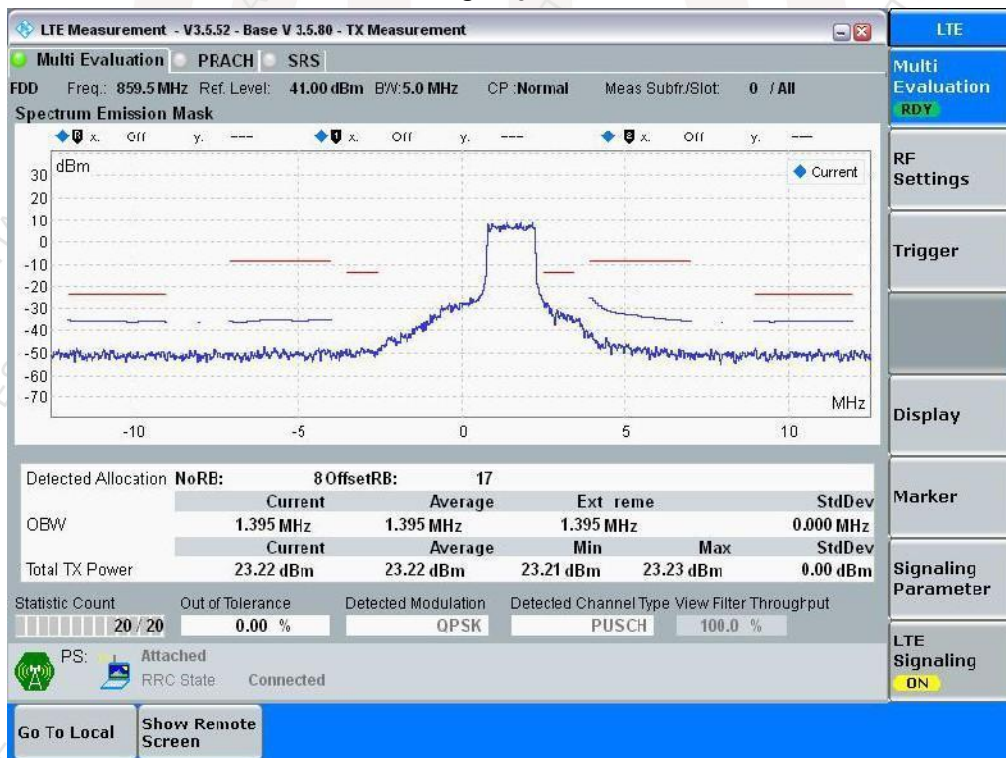




5 MHz_High_QPSK_RB8#0

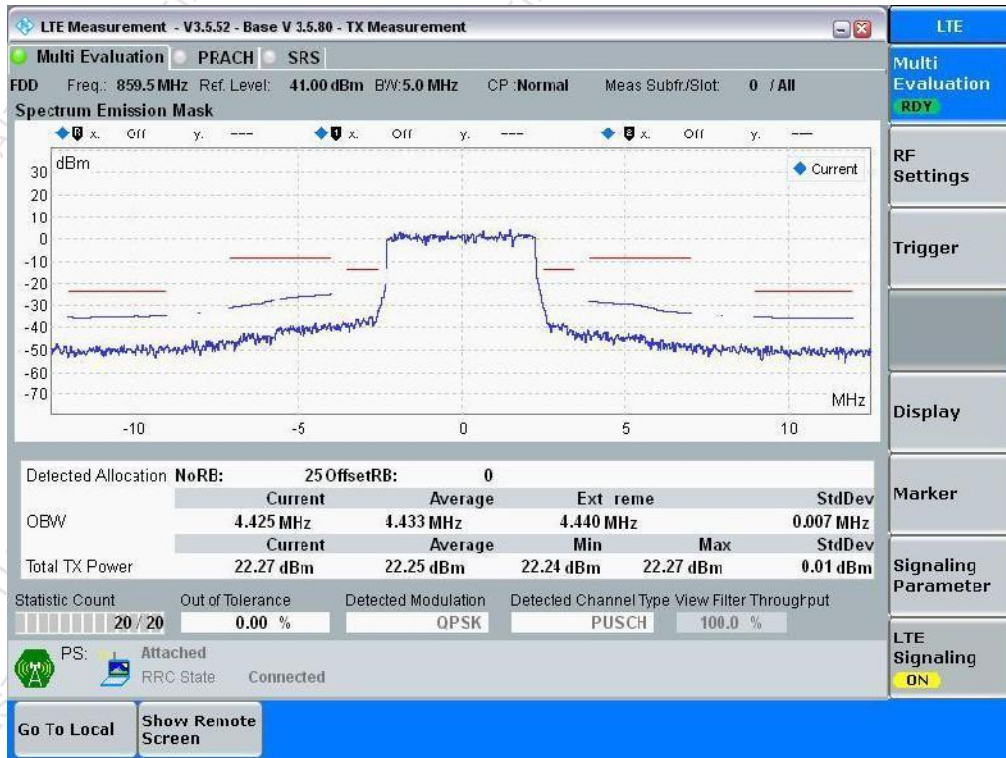


5 MHz_High_QPSK_RB8#17

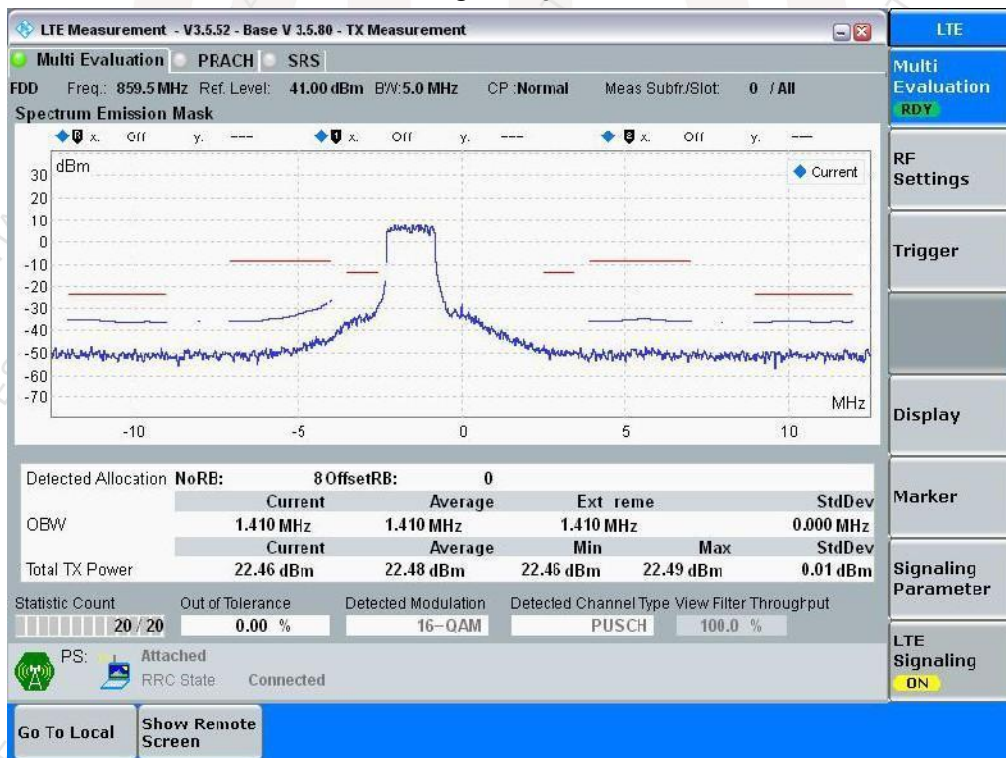




5 MHz_High_QPSK_RB25#0

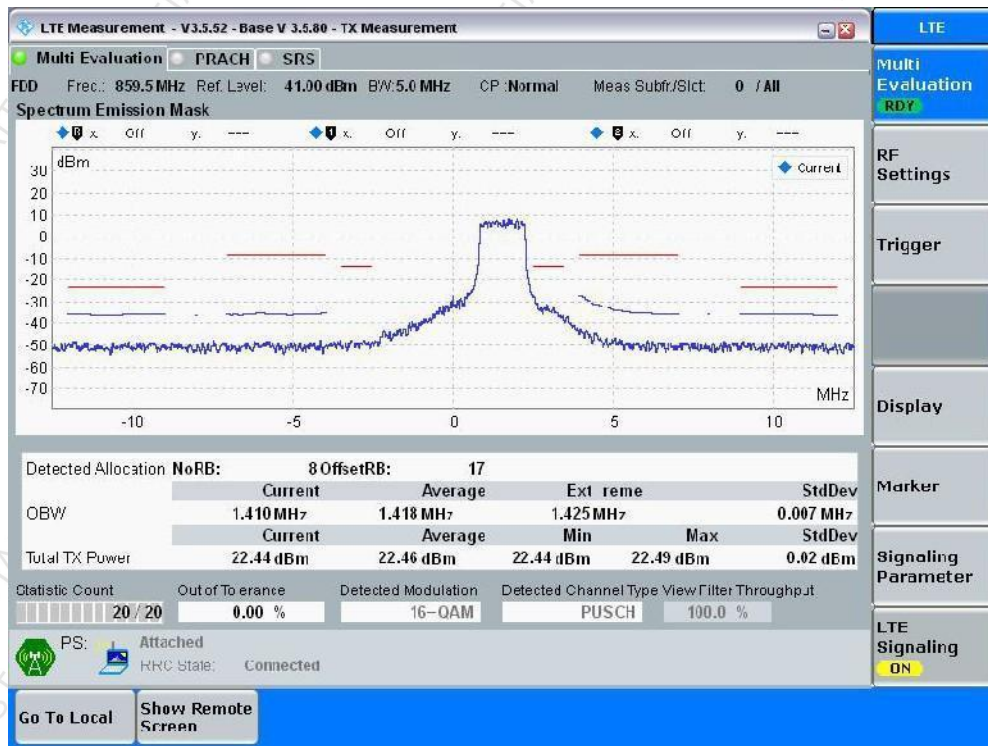


5 MHz_High_16QAM_RB8#0

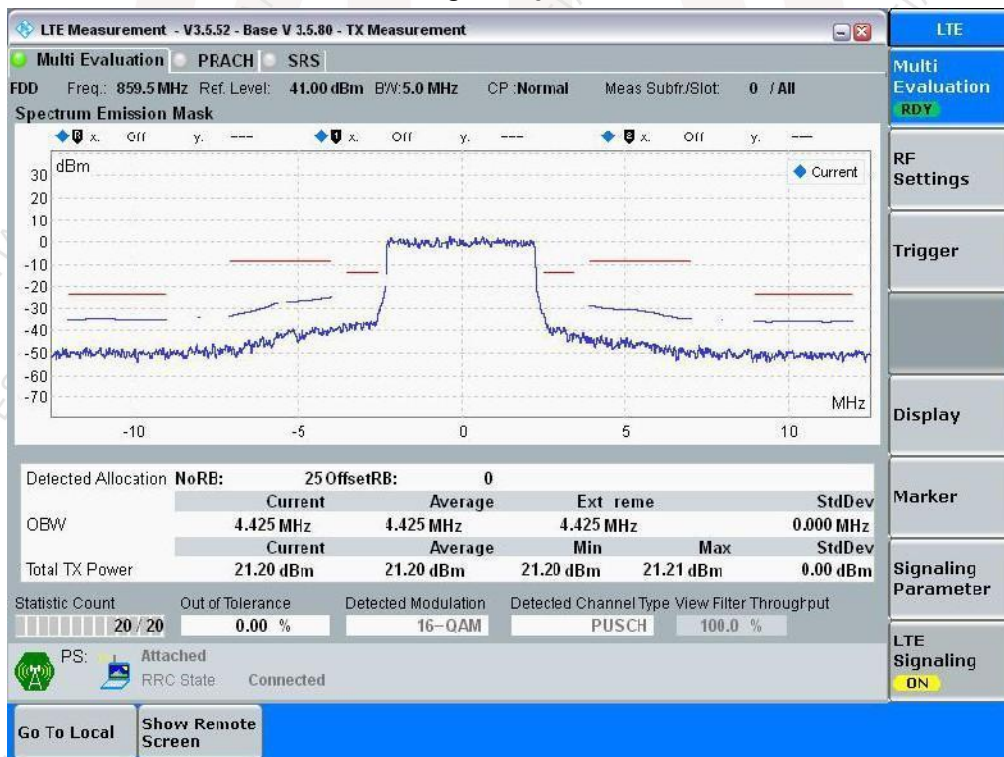




5 MHz_High_16QAM_RB8#17

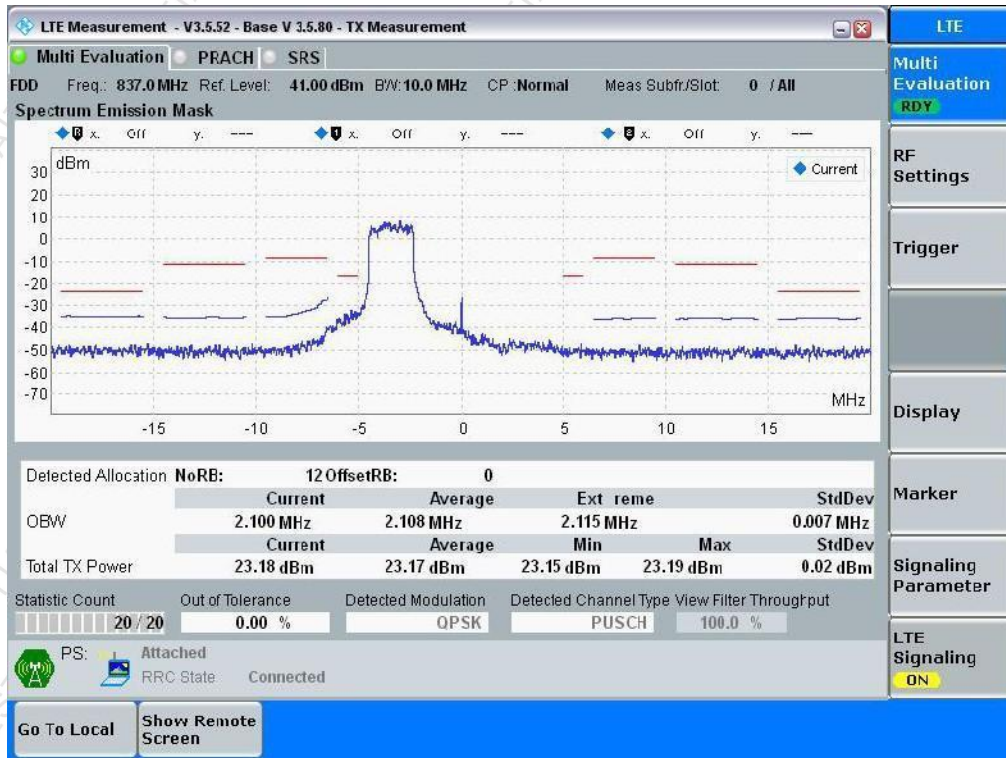


5 MHz_High_16QAM_RB25#0

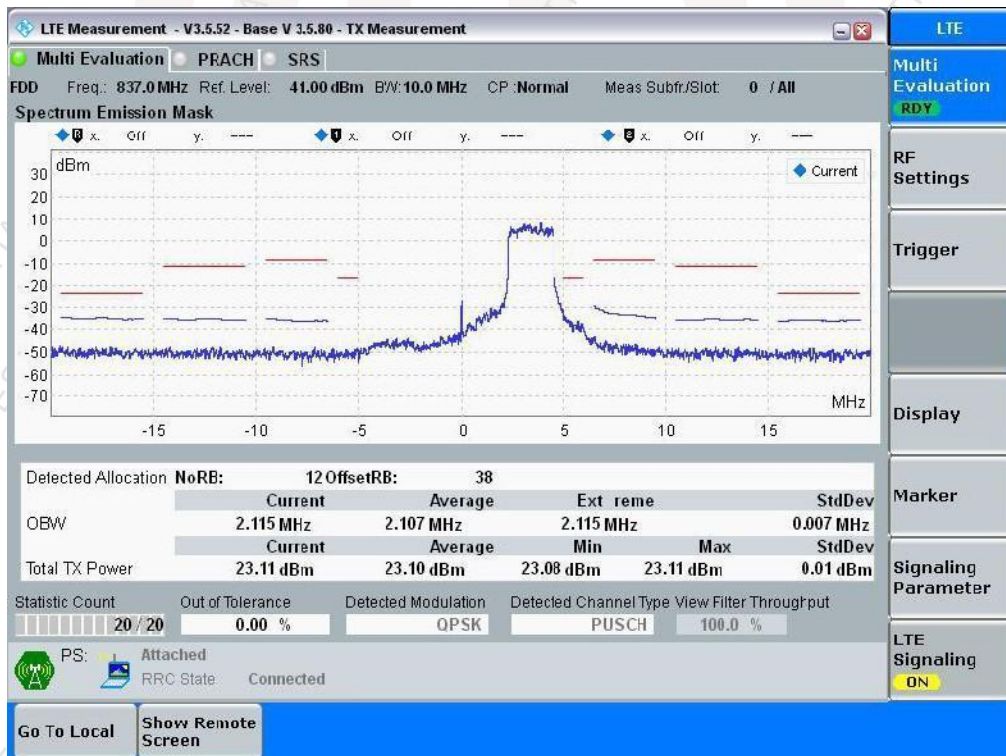




10 MHz_Low_QPSK_RB12#0

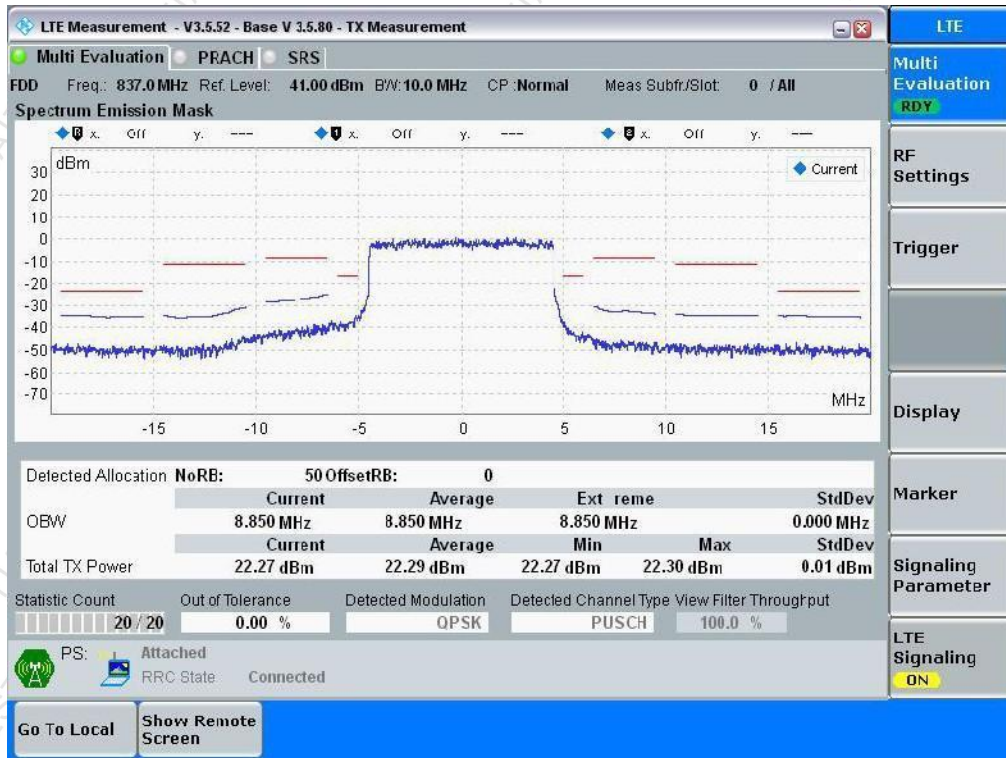


10 MHz_Low_QPSK_RB12#38

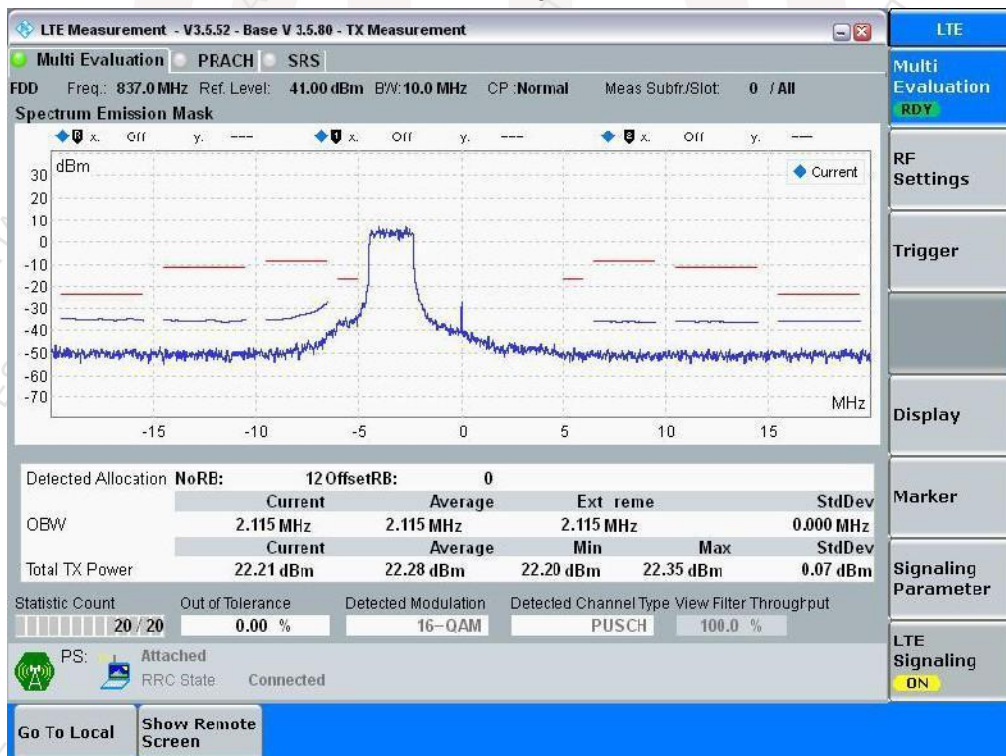




10 MHz_Low_QPSK_RB50#0

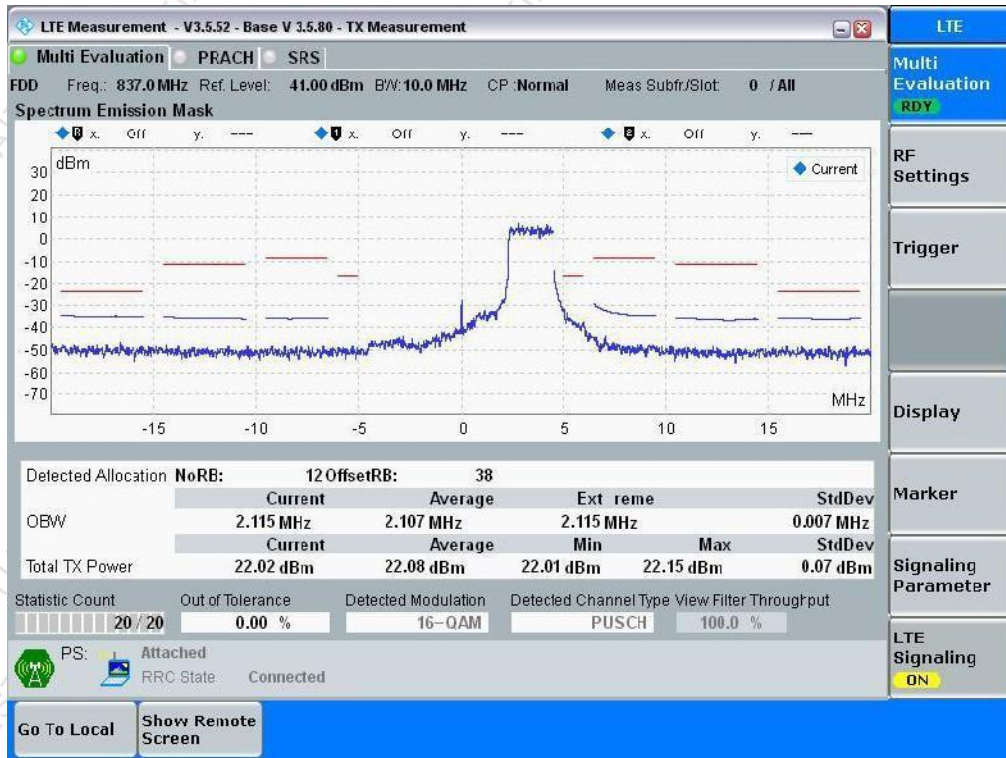


10 MHz_Low_16QAM_RB12#0

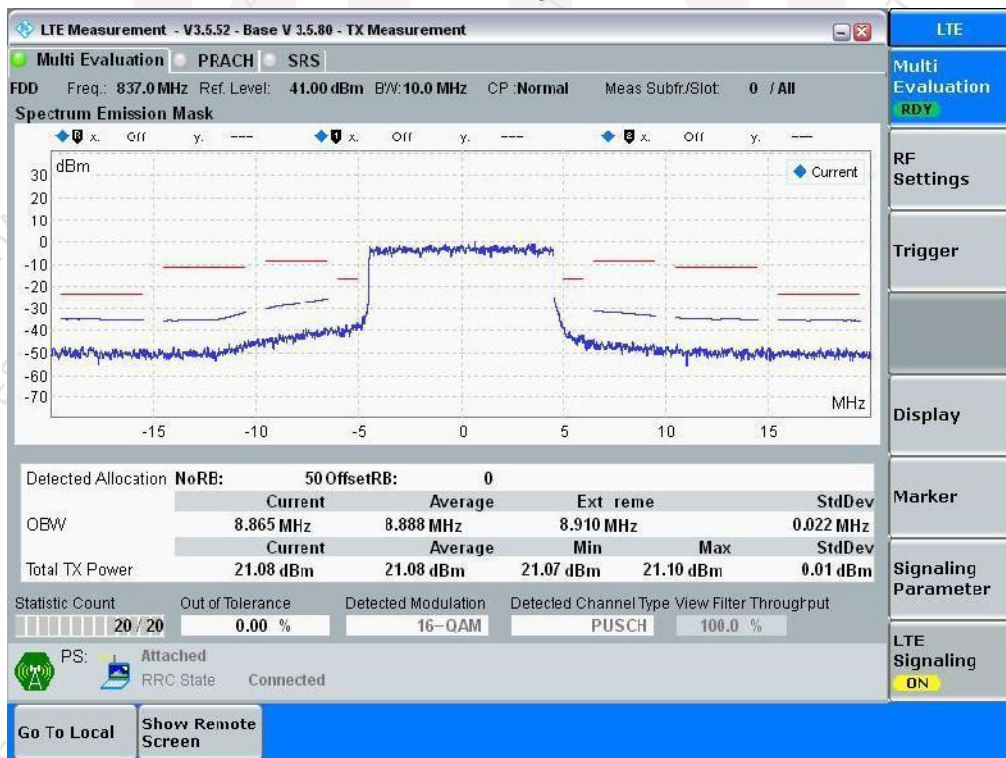




10 MHz_Low_16QAM_RB12#38

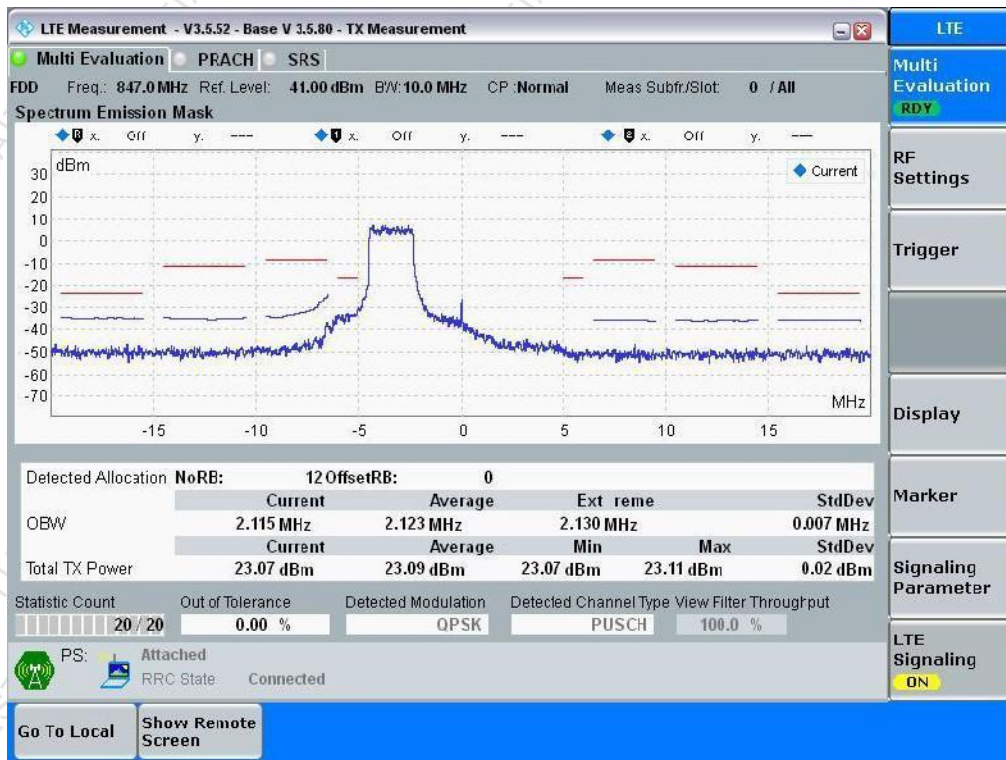


10 MHz_Low_16QAM_RB50#0

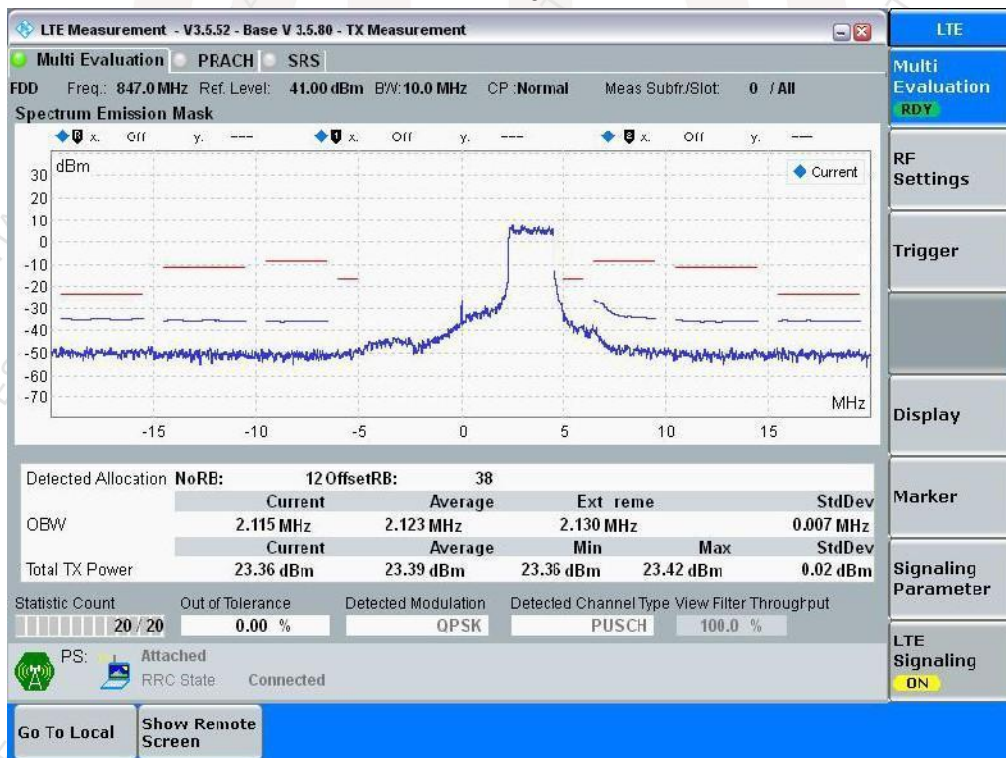




10 MHz_Middle_QPSK_RB12#0

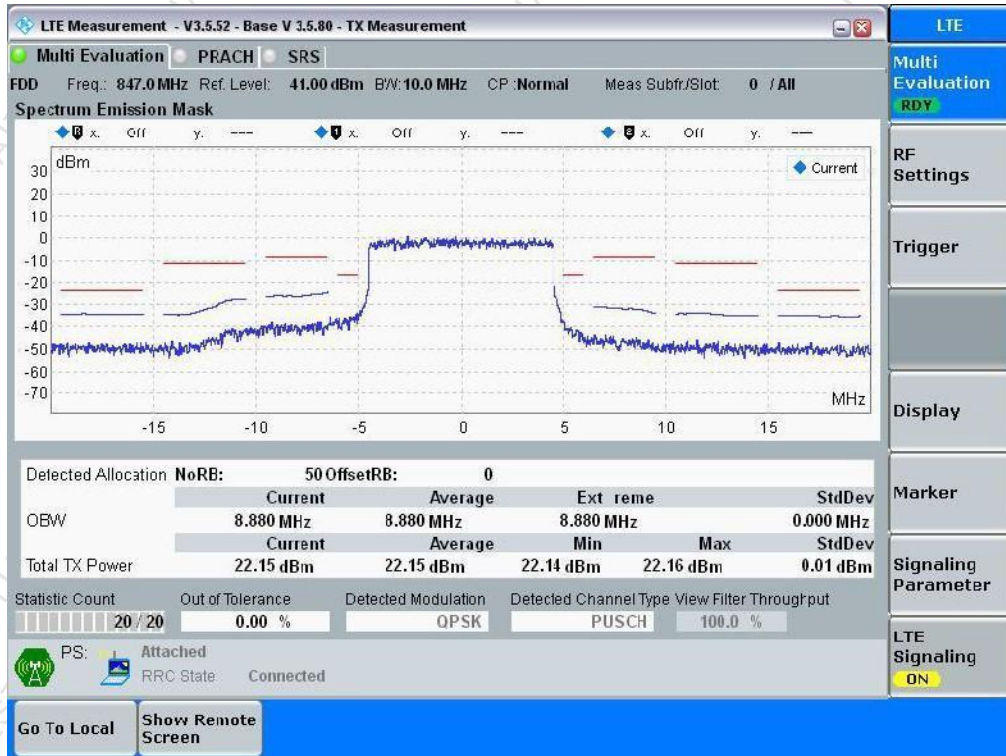


10 MHz_Middle_QPSK_RB12#38

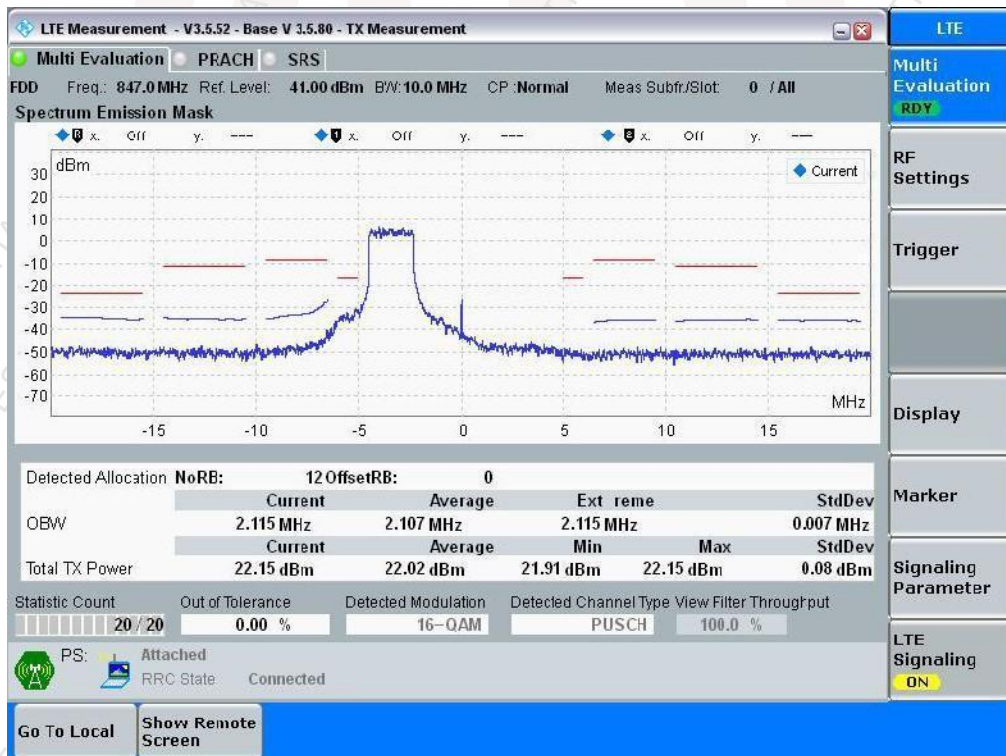




10 MHz_Middle_QPSK_RB50#0

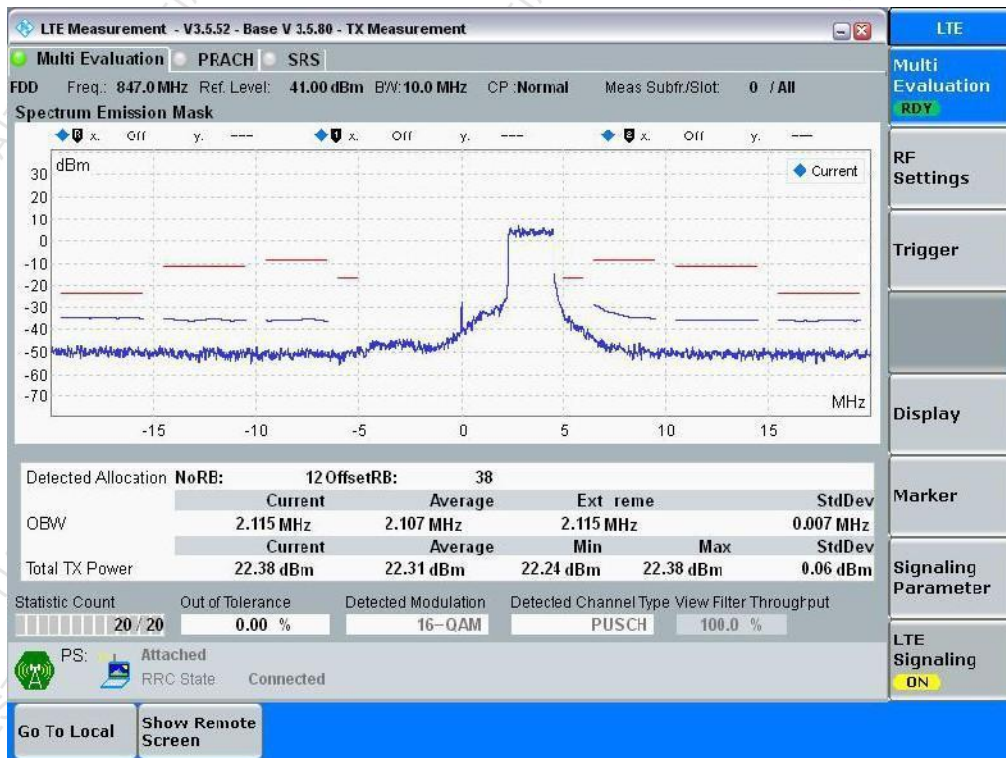


10 MHz_Middle_16QAM_RB12#0

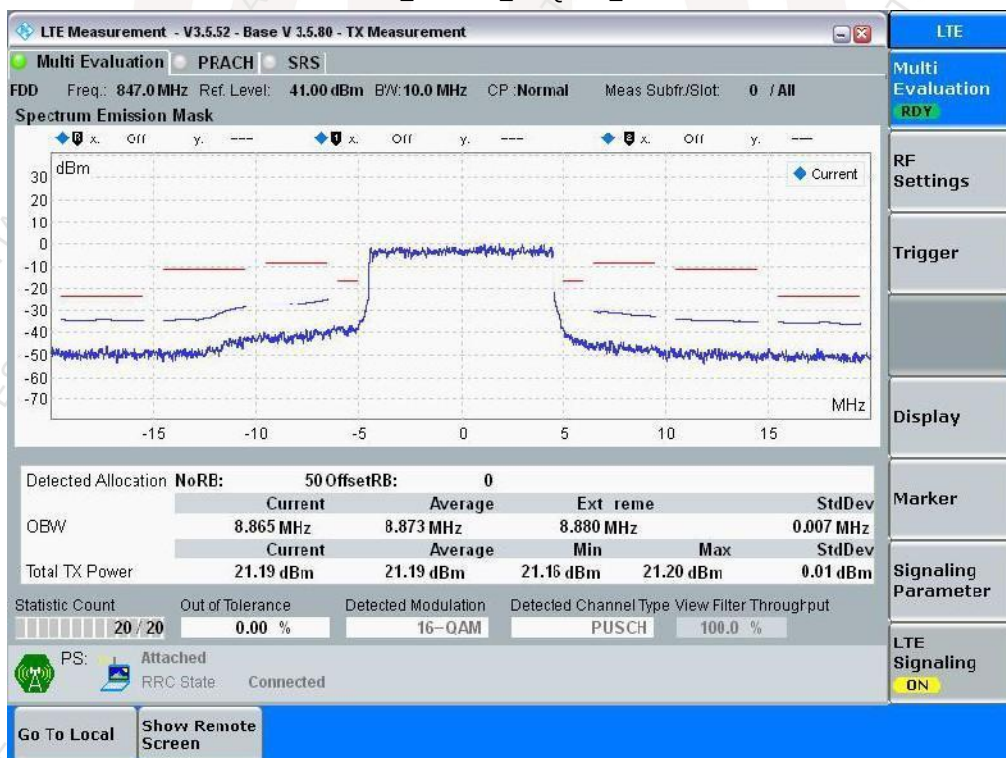




10 MHz_Middle_16QAM_RB12#38

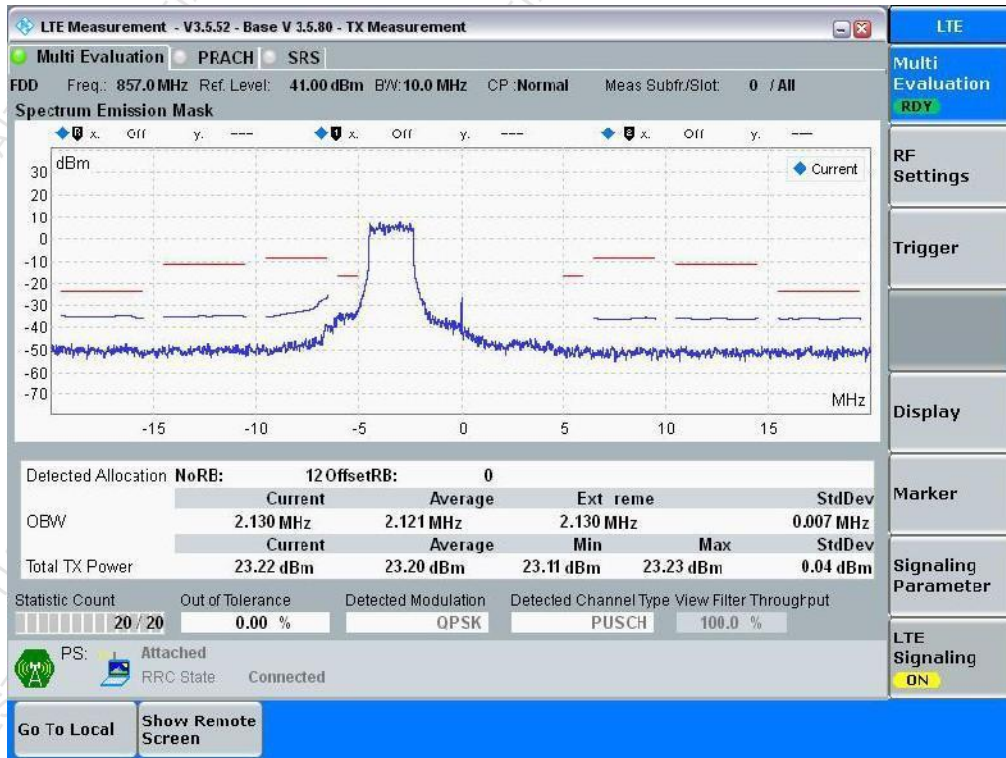


10 MHz_Middle_16QAM_RB50#0

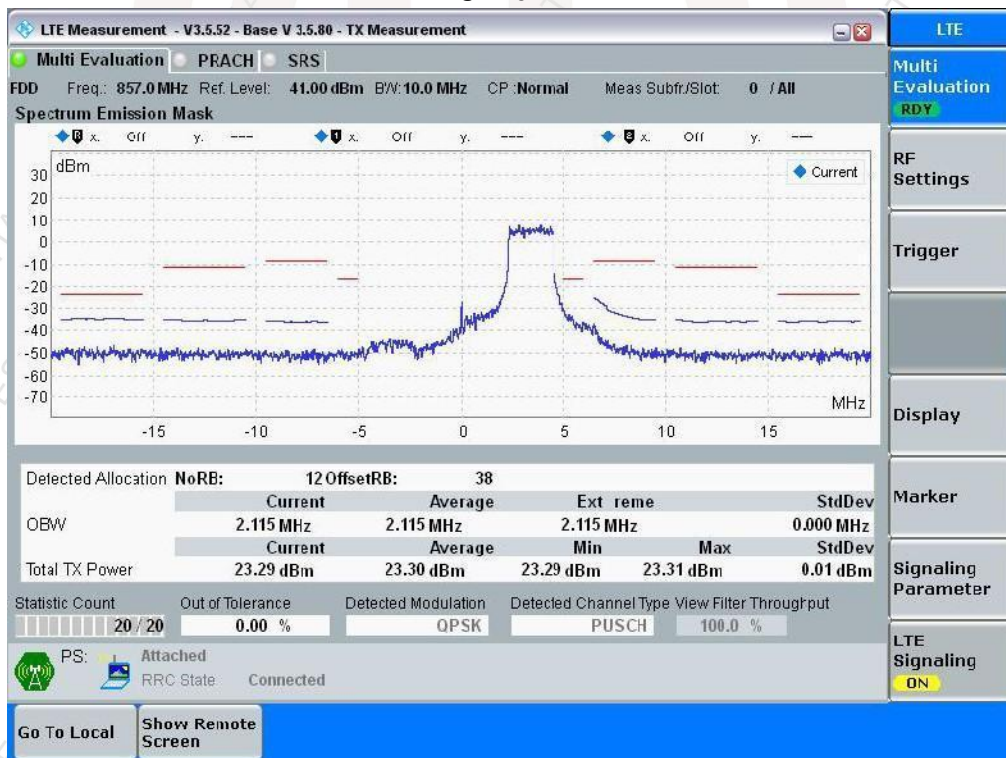




10 MHz_High_QPSK_RB12#0

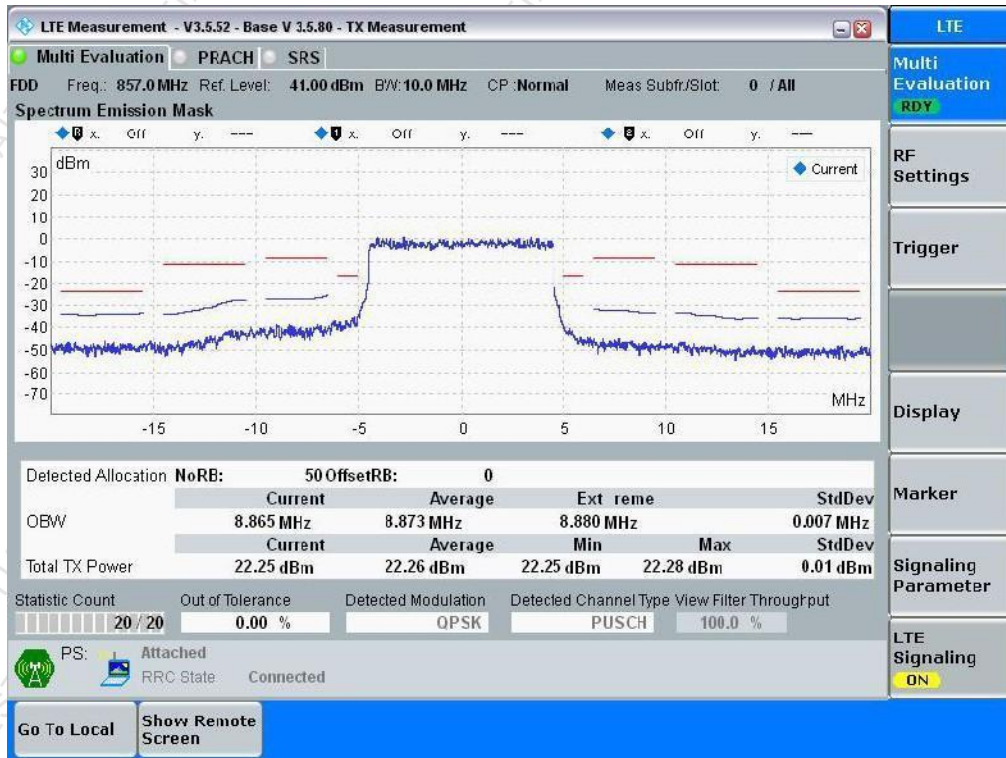


10 MHz_High_QPSK_RB12#38

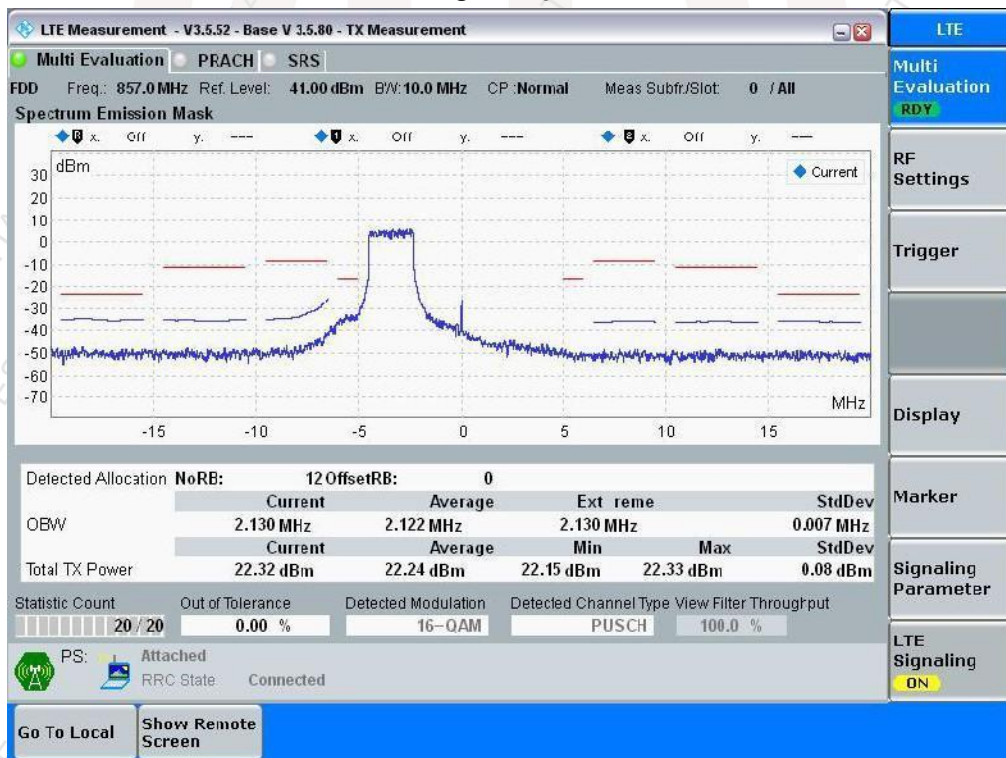




10 MHz_High_QPSK_RB50#0

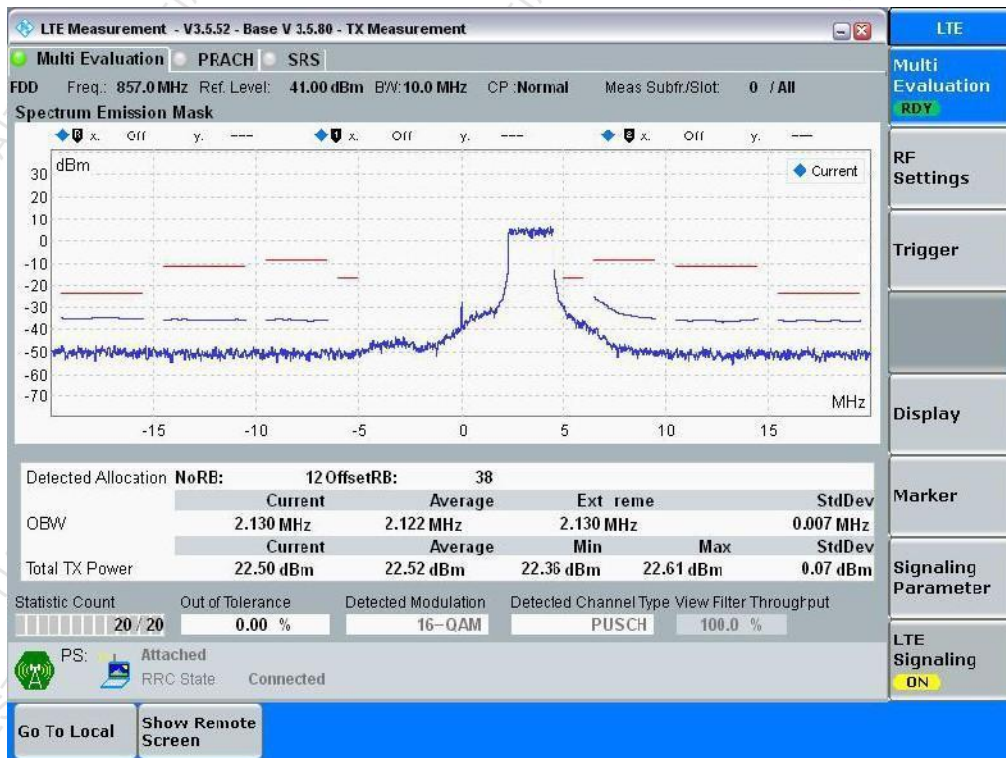


10 MHz_High_16QAM_RB12#0

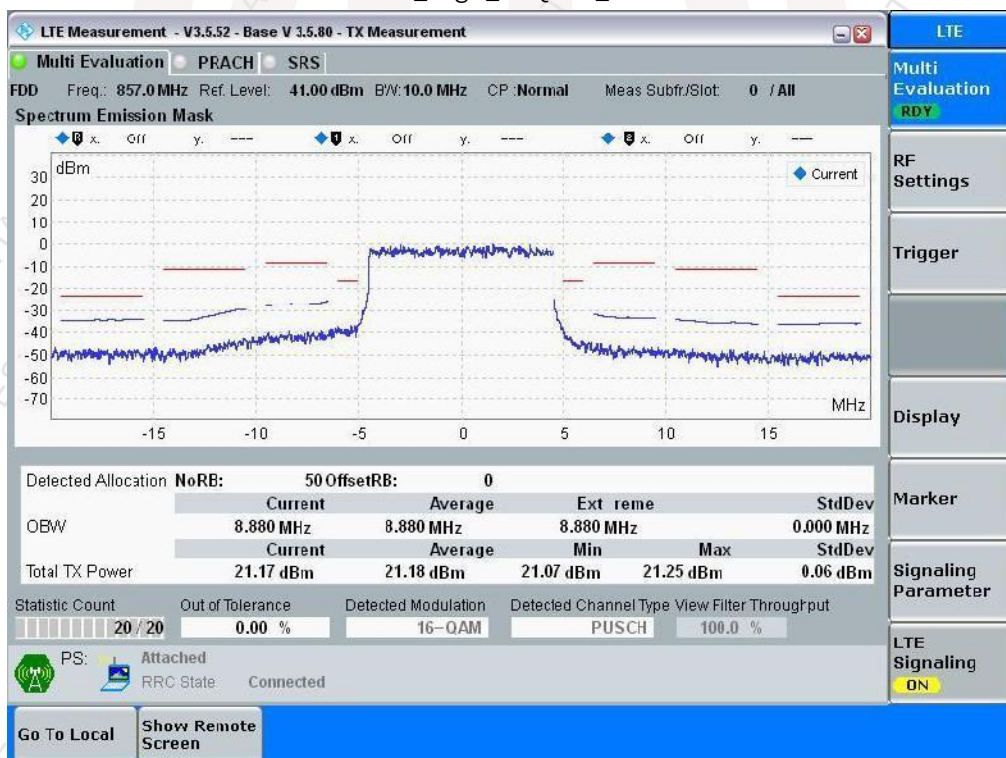




10 MHz_High_16QAM_RB12#38

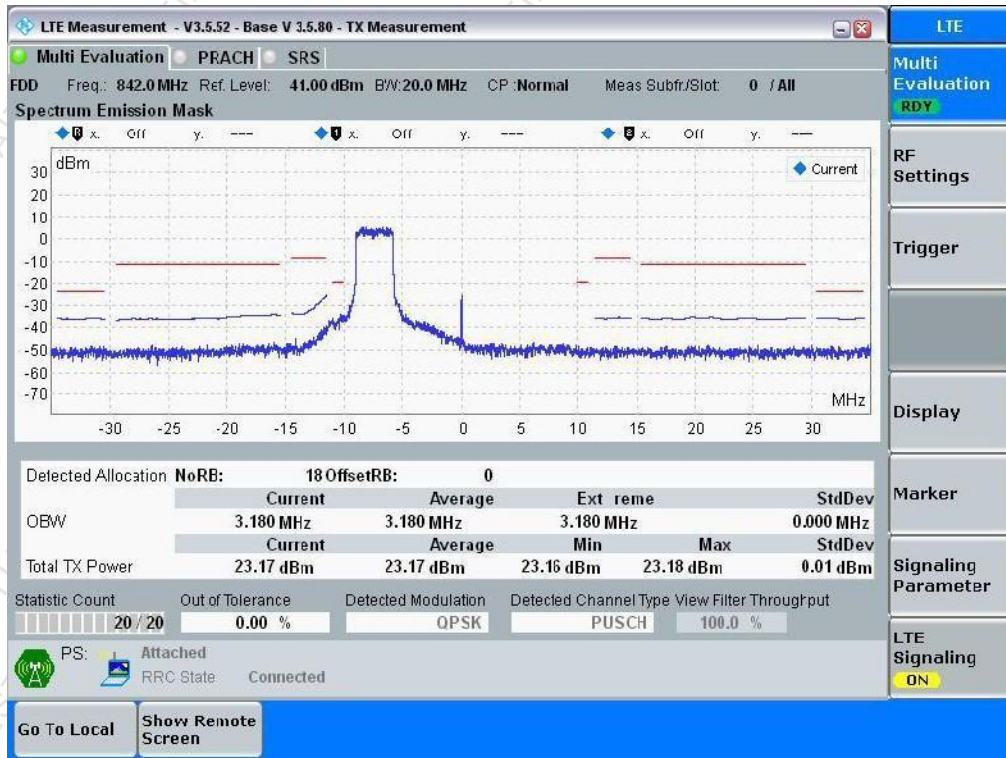


10 MHz_High_16QAM_RB50#0

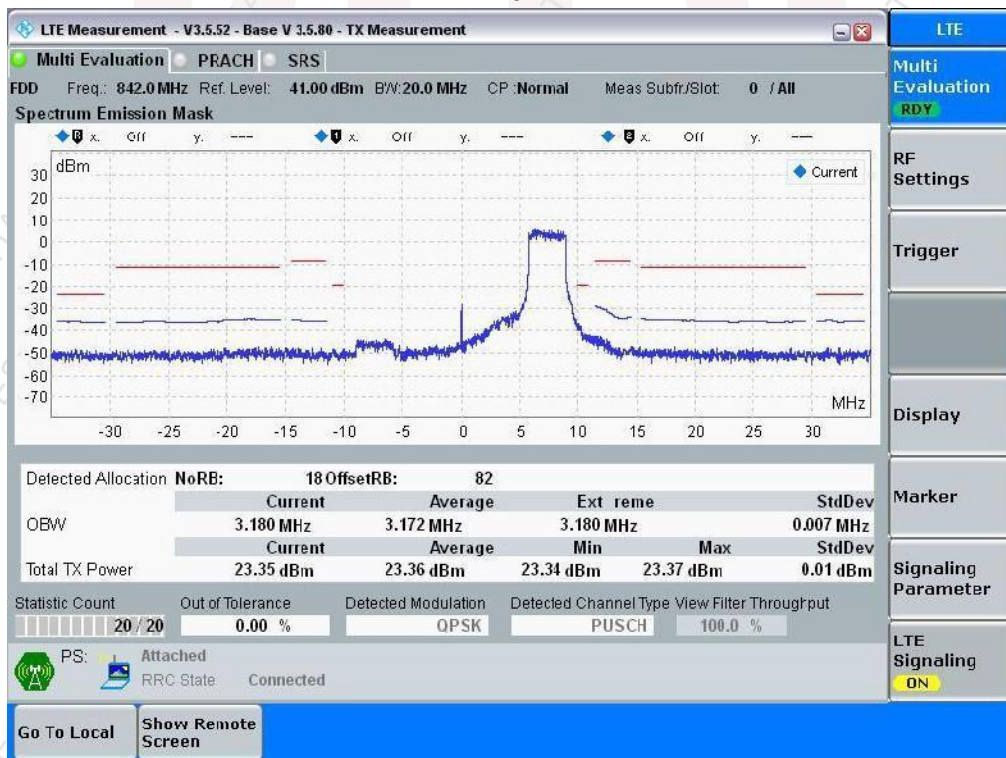




20 MHz_Low_QPSK_RB18#0

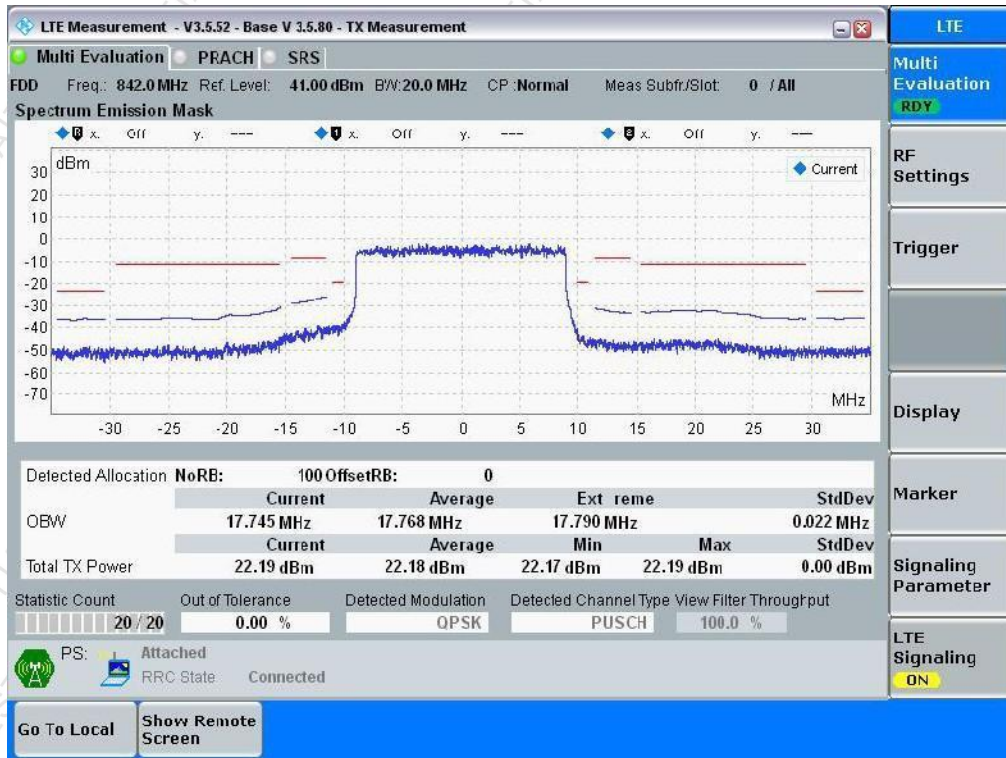


20 MHz_Low_QPSK_RB18#82

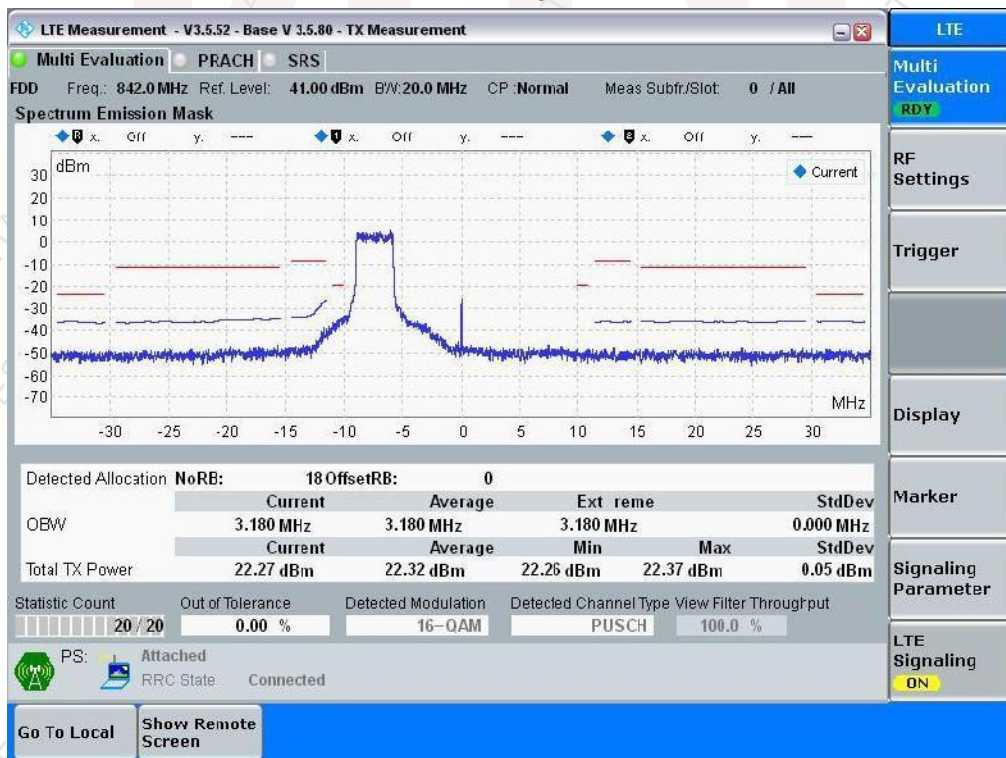




20 MHz_Low_QPSK_RB100#0

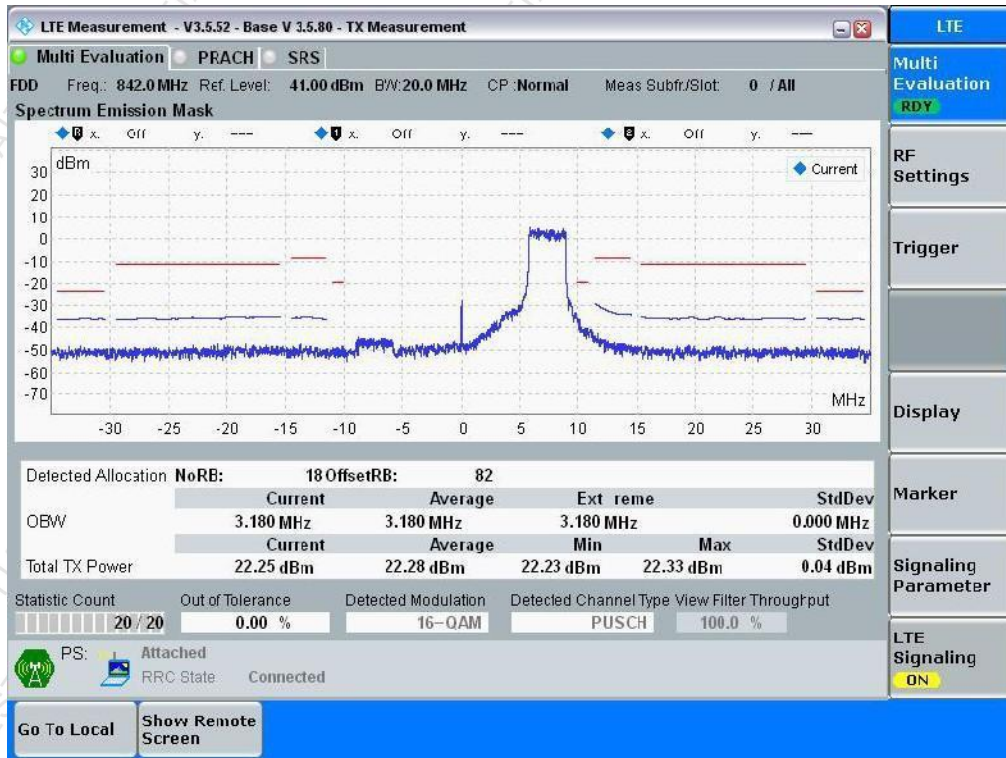


20 MHz_Low_16QAM_RB18#0





20 MHz_Low_16QAM_RB18#82

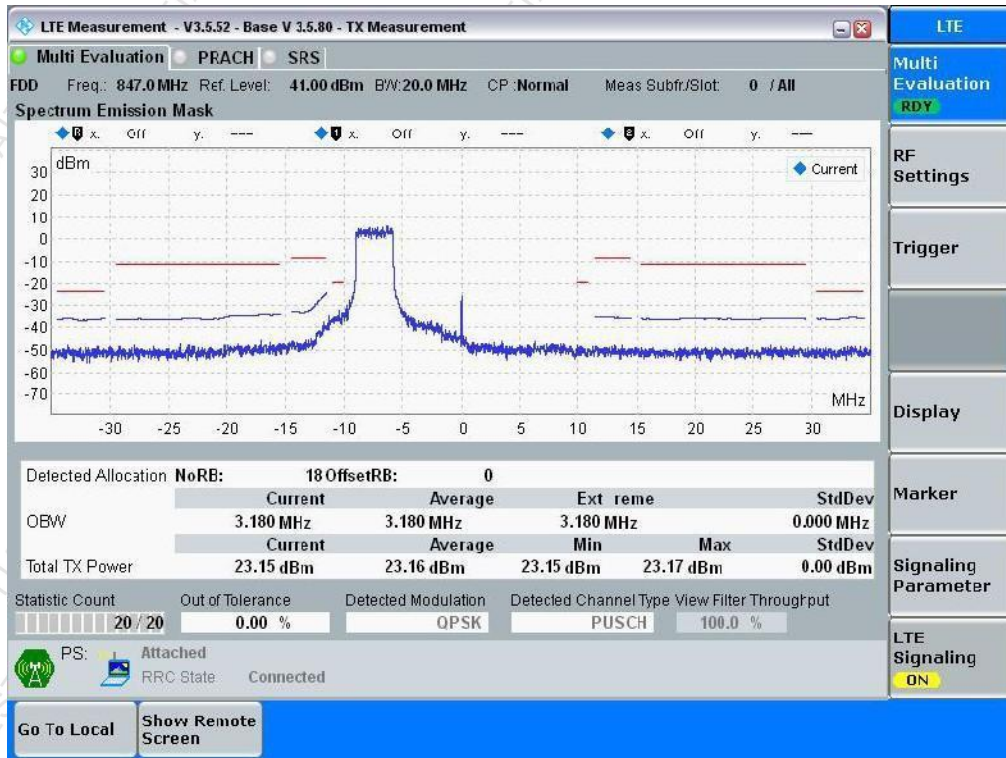


20 MHz_Low_16QAM_RB100#0

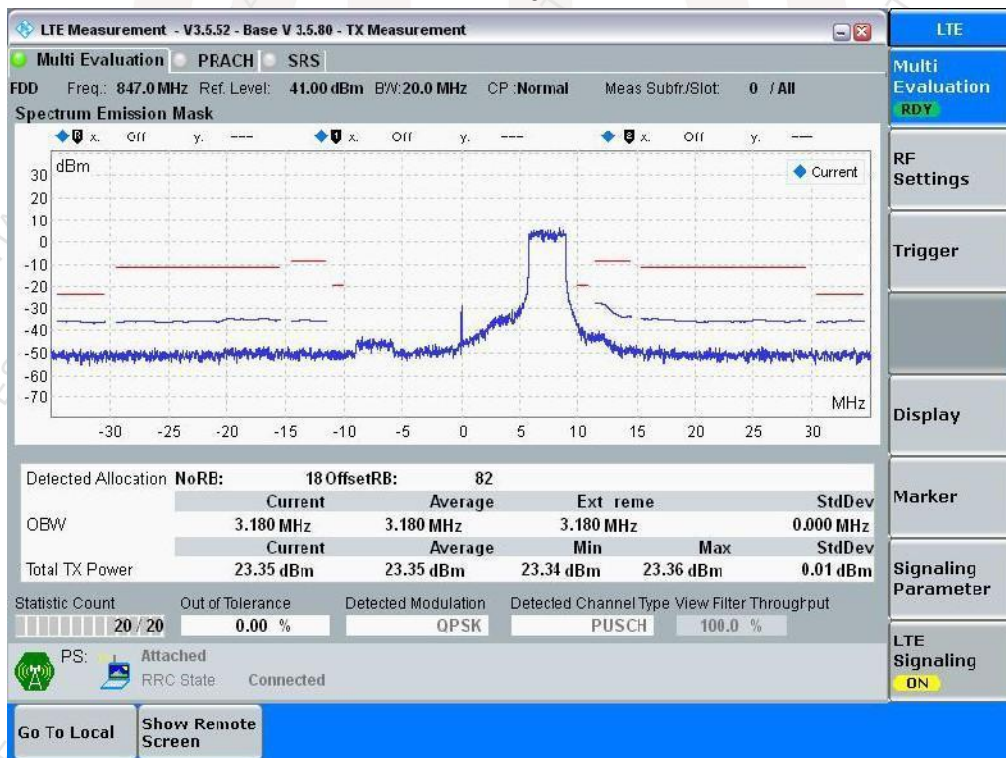




20 MHz_Middle_QPSK_RB18#0



20 MHz_Middle_QPSK_RB18#82

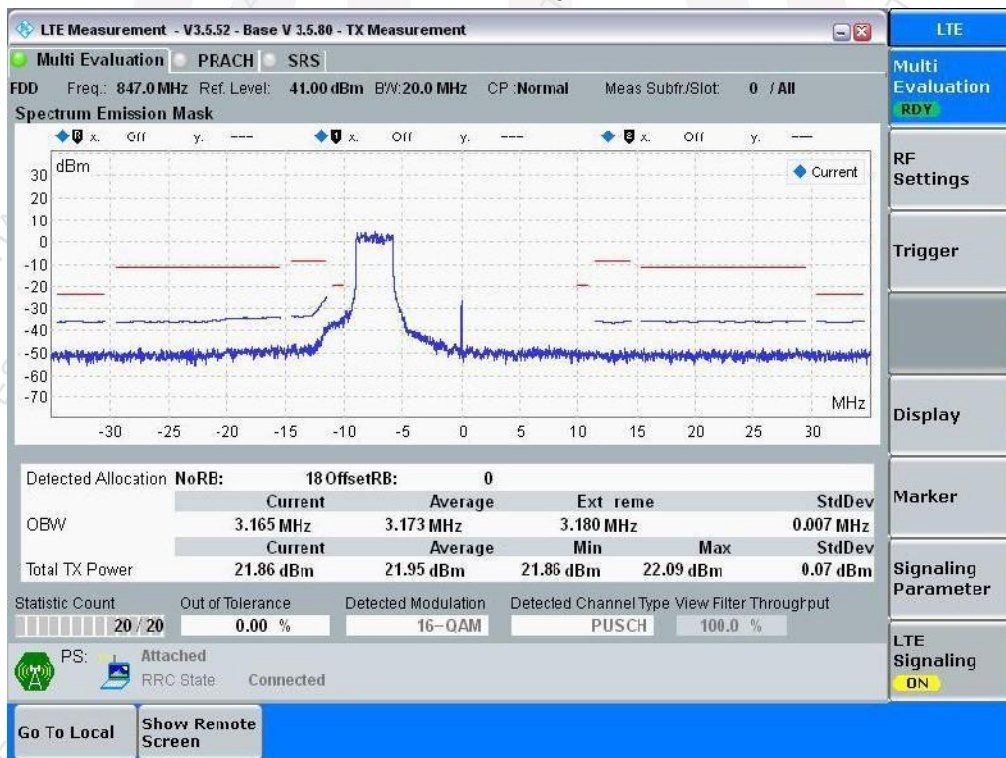




20 MHz_Middle_QPSK_RB100#0

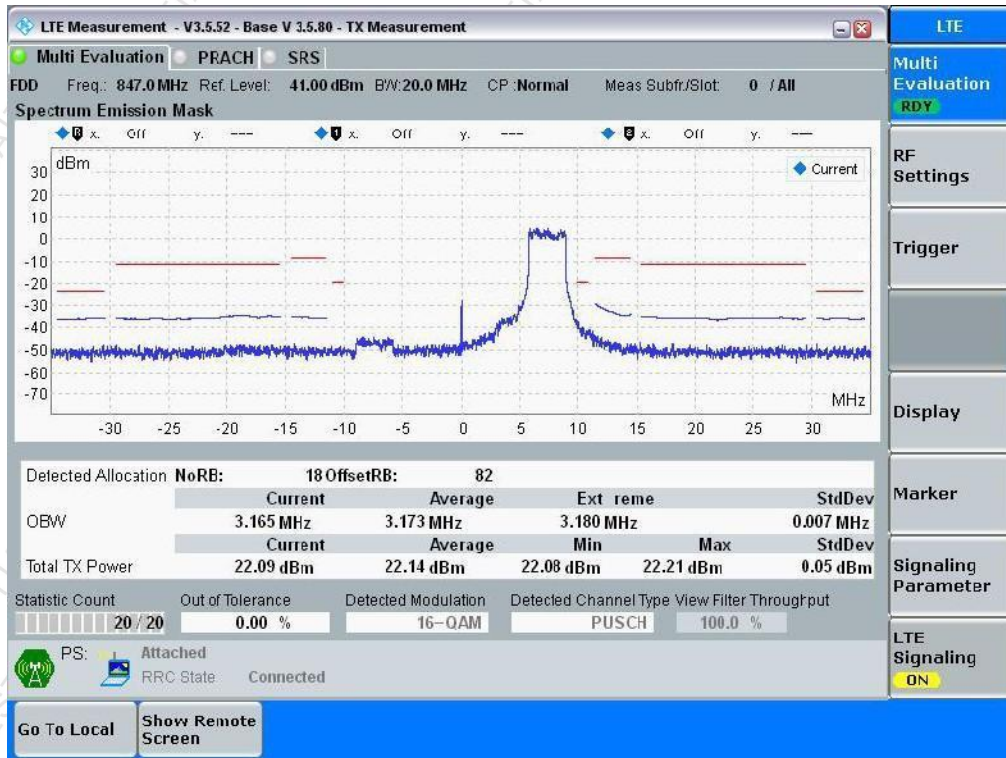


20 MHz_Middle_16QAM_RB18#0

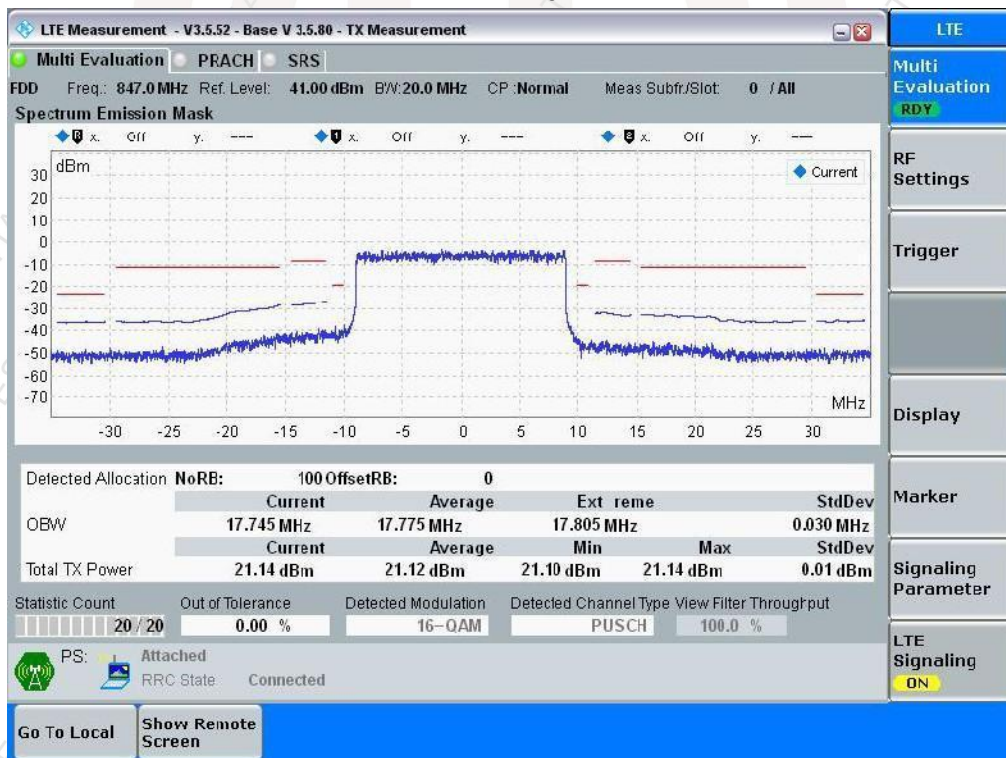




20 MHz_Middle_16QAM_RB18#82

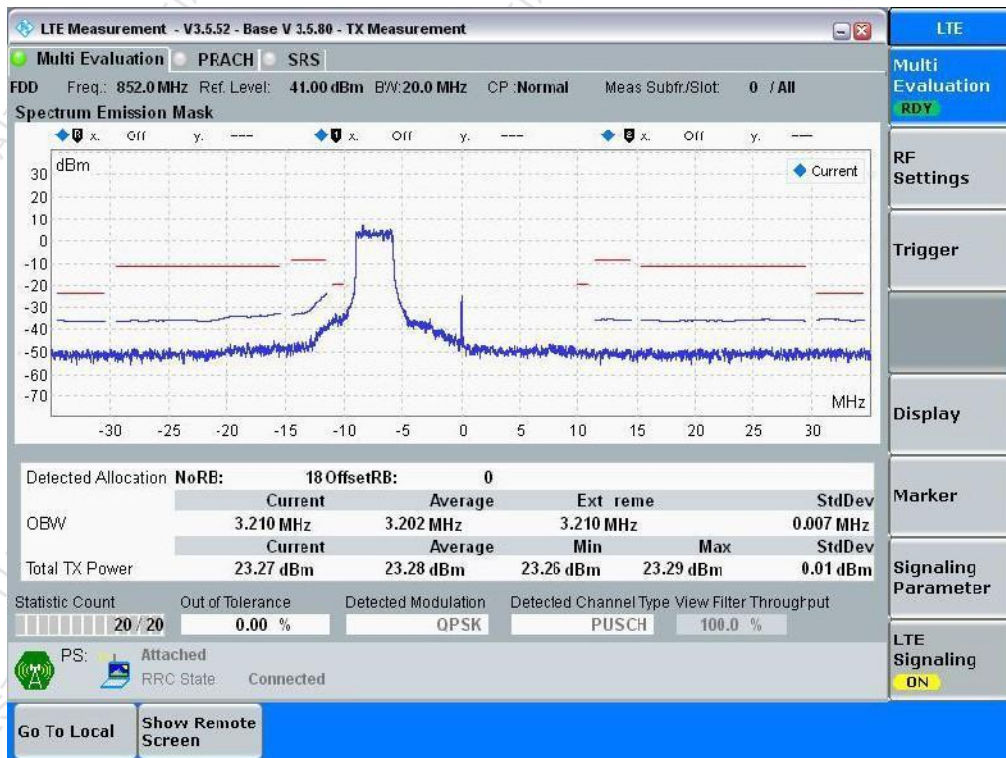


20 MHz_Middle_16QAM_RB100#0

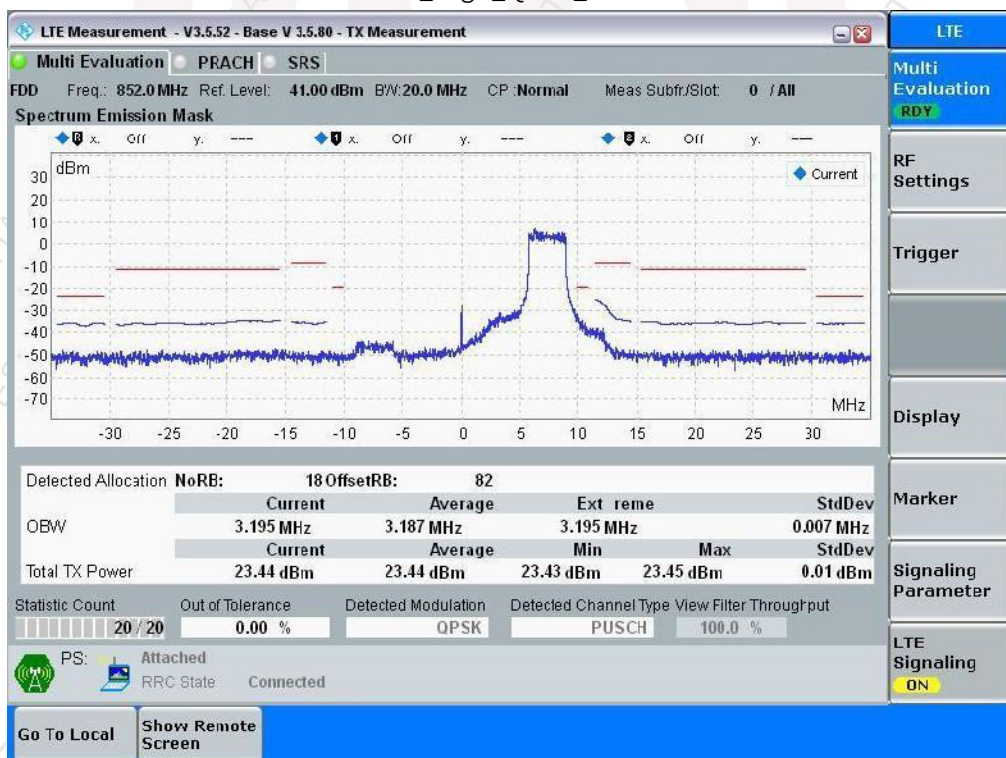




20 MHz_High_QPSK_RB18#0

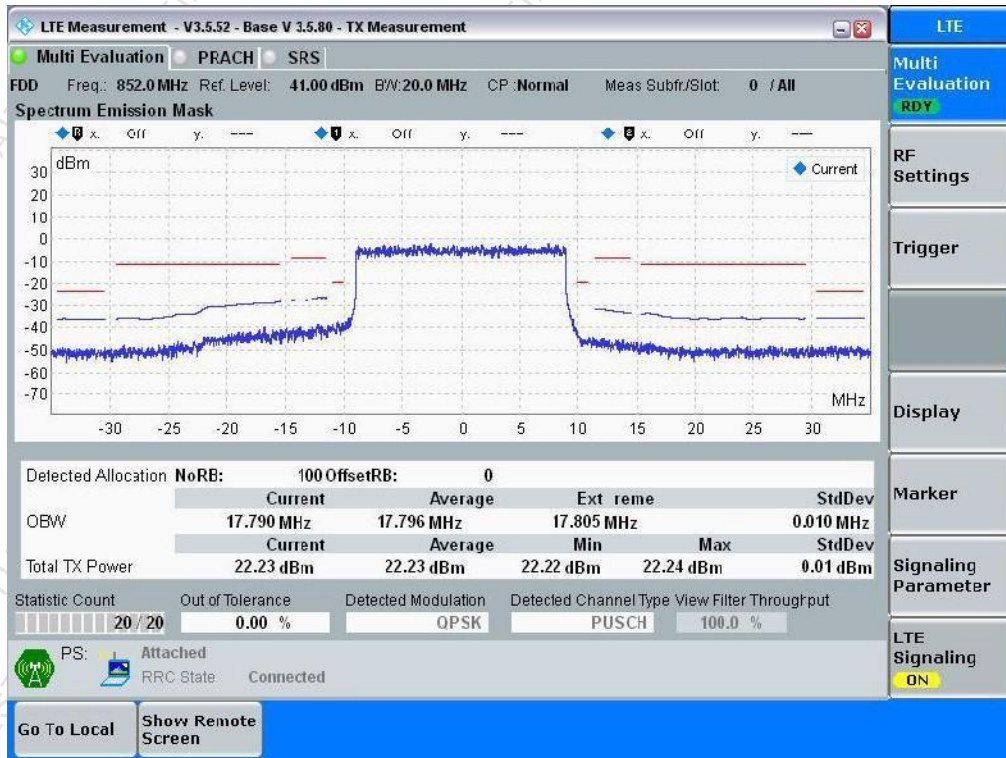


20 MHz_High_QPSK_RB18#82

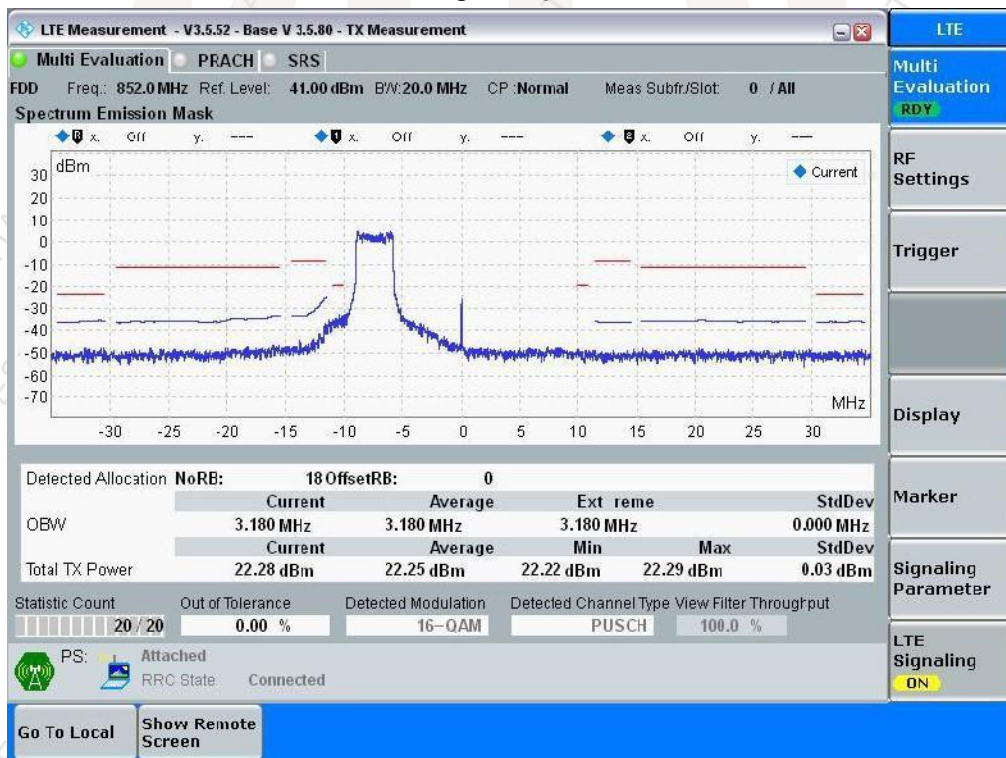




20 MHz_High_QPSK_RB100#0

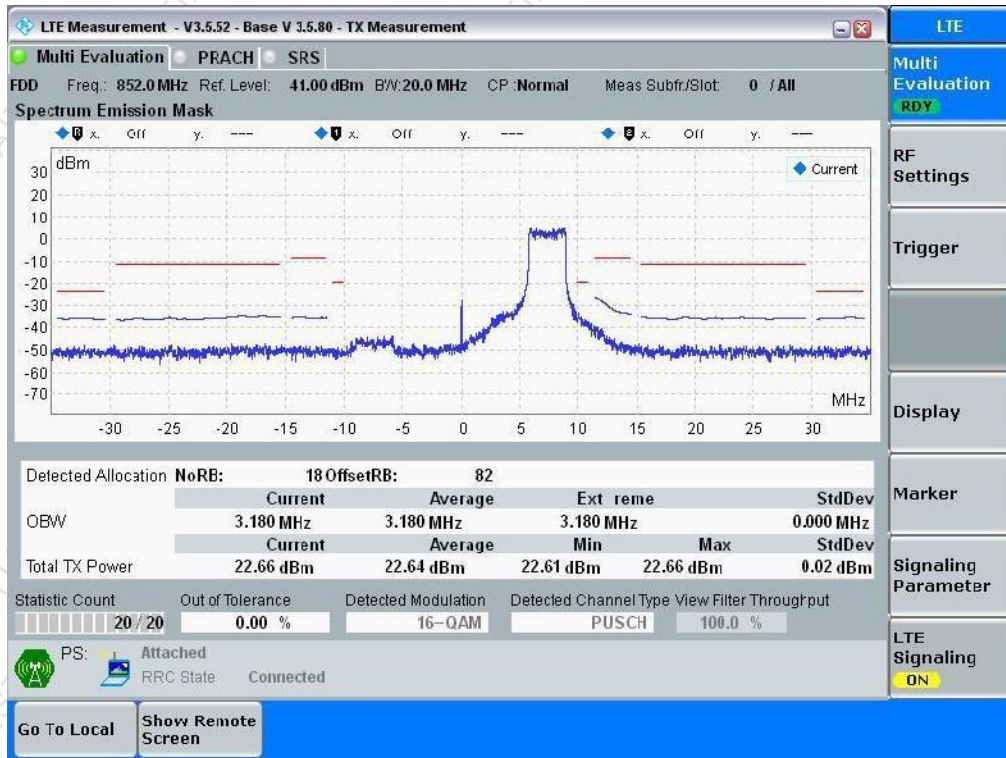


20 MHz_High_16QAM_RB18#0

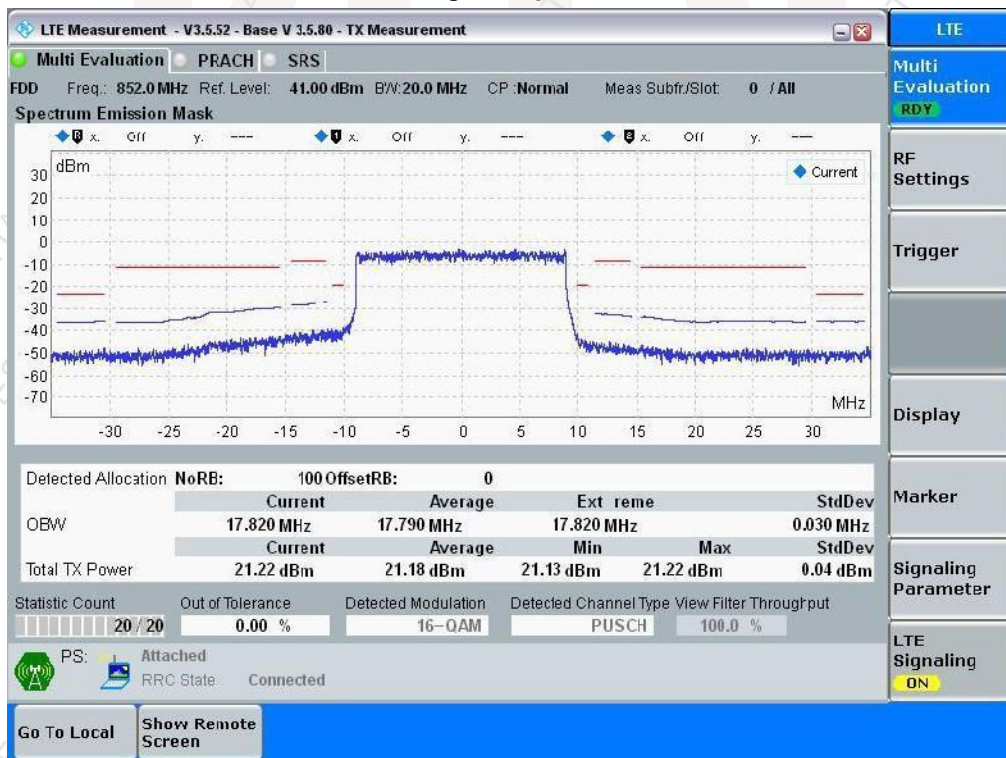




20 MHz_High_16QAM_RB18#82



20 MHz_High_16QAM_RB100#0





4.1.5. Transmitter Spurious Emissions

Limit

The spurious emission limits in table 4.2.4.1.2-2 apply for the frequency ranges that are more than Δf_{OOB} (MHz) from the edge of the channel bandwidth shown in table 4.2.4.1.2-1.

The measured average power of spurious emission for general requirements shall not exceed the described values in table 4.2.4.1.2-2.

The measured average power of spurious emission for E-UTRA operating band specific requirements to protected bands shall not exceed the described values in tables 4.2.4.1.2-3 and 4.2.4.1.2-6.

Table 4.2.4.1.2-1: Δf_{OOB} boundary between E-UTRA channel and spurious emission domain

Channel bandwidth	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Δf_{OOB} (MHz)	2,8	6	10	15	20	25

NOTE 1: For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth defined for the protected band.

Table 4.2.4.1.2-2: General spurious emissions limits

Frequency range	Maximum level	Measurement bandwidth	Comment
9 kHz ≤ f < 150 kHz	-36 dBm	1 kHz	
150 kHz ≤ f < 30 MHz	-36 dBm	10 kHz	
30 MHz ≤ f < 1 000 MHz	-36 dBm	100 kHz	
1 GHz ≤ f < 12,75 GHz	-30 dBm	1 MHz	
12,75 GHz ≤ f < 5 th harmonic of the upper frequency edge of the UL operating band in GHz	-30 dBm	1 MHz	See note
NOTE: Shall apply for Band 22, 42 and Band 43.			

The additional requirements in table 4.2.4.1.2-3 apply for the frequency ranges that are more and less than Δf_{OOB} (MHz) from the edge of the channel bandwidth shown in table 4.2.4.1.2-1.



E-UTRA Band	Spurious emission						
	Protected band	Frequency range (MHz)		Maximum Level (dBm)	MBW (MHz)	Comment	
1	E-UTRA Band 1, 7, 8, 20, 22, 28, 31, 32, 38, 40, 42, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 3, 34	F _{DL_low}	-	F _{DL_high}	-50	1	Note 3
	Frequency range	1 895	-	1 915	-15,5	5	Notes 3, 8
	Frequency range	1 915	-	1 920	+1,6	5	Notes 3, 8, 42
3	E-UTRA Band 1, 7, 8, 20, 28, 31, 32, 33, 34, 38, 40, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 3	F _{DL_low}	-	F _{DL_high}	-50	1	Note 3
	E-UTRA Band 22, 42	F _{DL_low}	-	F _{DL_high}	-50	1	Note 2
7	E-UTRA Band 1, 3, 7, 8, 20, 22, 28, 31, 32, 33, 34, 40, 42, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	Frequency range	2 570	-	2 575	+1,6	5	Notes 3, 4
	Frequency range	2 575	-	2 595	-15,5	5	Notes 3, 4
	Frequency range	2 595	-	2 620	-40	1	Notes 3, 4
8	E-UTRA Band 1, 20, 28, 31, 32, 33, 34, 38, 40, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 3	F _{DL_low}	-	F _{DL_high}	-50	1	Note 2
	E-UTRA Band 7	F _{DL_low}	-	F _{DL_high}	-50	1	Note 2
	E-UTRA Band 8	F _{DL_low}	-	F _{DL_high}	-50	1	Note 3
	E-UTRA Band 22, 42, 43	F _{DL_low}	-	F _{DL_high}	-50	1	Note 2
20	E-UTRA Band 1, 3, 7, 8, 22, 31, 32, 33, 34, 40, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 20	F _{DL_low}	-	F _{DL_high}	-50	1	Note 3
	E-UTRA Band 38, 42	F _{DL_low}	-	F _{DL_high}	-50	1	Note 2
	Frequency range	758	-	788	-50	1	
22	E-UTRA Band 1, 3, 7, 8, 20, 28, 31, 32, 33, 34, 38, 40, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	Frequency range	3 510	-	3 525	-40	1	Note 3
	Frequency range	3 525	-	3 590	-50	1	
28	E-UTRA Band 3, 7, 8, 20, 31, 34, 38	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 1, 22, 32, 42, 43, 65	F _{DL_low}	-	F _{DL_high}	-50	1	Note 2
	E-UTRA Band 1	F _{DL_low}	-	F _{DL_high}	-50	1	Note 6
	Frequency range	758	-	773	-32	1	Note 3
	Frequency range	773	-	803	-50	1	
	Frequency range	470	-	694	-42	8	Notes 3, 7
31	E-UTRA Band 1, 7, 8, 20, 22, 28, 31, 32, 33, 34, 38, 40, 42, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 3	F _{DL_low}	-	F _{DL_high}	-50	1	Note 2
33	E-UTRA Band 1, 7, 8, 20, 22, 28, 31, 32, 34, 38, 40, 42, 43, 65, 67	F _{DL_low}	-	F _{DL_high}	-50	1	Note 9
	E-UTRA Band 3	F _{DL_low}	-	F _{DL_high}	-50	1	Note 3



E-UTRA Band	Spurious emission						
	Protected band	Frequency range (MHz)		Maximum Level (dBm)	MBW (MHz)	Comment	
34	E-UTRA Band 1, 3, 7, 8, 20, 22, 28, 31, 32, 33, 38, 40, 42, 43, 65, 67	F _{DL_low}	-	F _{DL_high}	-50	1	Note 9
38	E-UTRA Band 1, 3, 8, 20, 22, 28, 31, 32, 33, 34, 40, 42, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	Frequency range	2 620	-	2 645	-15,5	5	Notes 3, 5
	Frequency range	2 645	-	2 690	-40	1	Notes 3, 5
40	E-UTRA Band 1, 3, 7, 8, 20, 22, 28, 31, 32, 33, 34, 38, 42, 43, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
42	E-UTRA Band 1, 3, 7, 8, 20, 28, 31, 32, 33, 34, 38, 40, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
43	E-UTRA Band 1, 3, 7, 8, 20, 28, 31, 32, 33, 34, 38, 40, 65, 67, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
65	E-UTRA Band 1, 7, 8, 20, 22, 28, 31, 32, 38, 40, 42, 43, 65, 68	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 3	F _{DL_low}	-	F _{DL_high}	-50	1	Note 3
	E-UTRA Band 5, 11, 18, 19, 21, 26, 27, 41	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 34	F _{DL_low}	-	F _{DL_high}	-50	1	Note 36
	Frequency range	1 884,5	-	1 915,7	-41	0,3	Note 37
	Frequency range	1 900	-	1 915	-15,5	5	Notes 3, 8
68	Frequency range	1 915	-	1 920	+1,6	5	Notes 3, 8
	E-UTRA Band 3, 7, 8, 20, 22, 28, 31, 38, 40, 42, 43, 65	F _{DL_low}	-	F _{DL_high}	-50	1	
	E-UTRA Band 1	F _{DL_low}	-	F _{DL_high}	50	1	Note 2

NOTE 1: F_{DL_low} and F_{DL_high} refer to each frequency range of the protected E-UTRA band.

NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in table 4.2.4.1.2.2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd, 3rd or 4th harmonic spurious emissions. Due to spreading of the harmonic emission the exception shall be allowed for the first 1 MHz frequency range immediately outside the harmonic emission on both sides of the harmonic emission. This results in an overall exception interval centred at the harmonic emission of (2 MHz + N x L_{CRB} x 180 kHz), where N is 2, 3, 4 for the 2nd, 3rd or 4th harmonic respectively. The exception is allowed if the measurement bandwidth (MBW) totally or partially overlaps the overall exception interval.

NOTE 3: These requirements shall also apply for the frequency ranges that are less than Δf_{DOB} (MHz) in table 4.2.4.1.2-1 from the edge of the channel bandwidth.



E-UTRA Band	Spurious emission			
	Protected band	Frequency range (MHz)	Maximum Level (dBm)	MBW (MHz)
<p>NOTE 4: This requirement shall be applicable for any channel bandwidths within the range 2 500 - 2 570 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 2 560,5 - 2 562,5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 2 552 - 2 560 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB.</p> <p>NOTE 5: This requirement shall be applicable for any channel bandwidths within the range 2 570 - 2 615 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 2 605,5 - 2 607,5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 2 597 - 2 605 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB. For carriers with channel bandwidth overlapping the frequency range 2 615 - 2 620 MHz the requirement shall apply with the maximum output power configured to +19 dBm.</p> <p>NOTE 6: As exceptions, measurements with a level up to the applicable requirement of -36 dBm/MHz is permitted for each assigned E-UTRA carrier used in the measurement due to 3rd harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see figure 5.4.2-1 in ETSI TS 136 521-1 [1]) for which the 3rd harmonic totally or partially overlaps the measurement bandwidth (MBW).</p> <p>NOTE 7: This requirement shall be applicable in the case of a 10 MHz E-UTRA carrier confined within 703 MHz and 733 MHz, otherwise the requirement of -25 dBm with a measurement bandwidth of 0 MHz applies.</p> <p>NOTE 8: This requirement shall be applicable for any channel bandwidths within the range 1 920 - 1 980 MHz with the following restriction: for carriers of 15 MHz bandwidth when carrier centre frequency is within the range 1 927,5 - 1 929,5 MHz and for carriers of 20 MHz bandwidth when carrier centre frequency is within the range 1 930 - 1 930 MHz the requirement is applicable only for an uplink transmission bandwidth less than or equal to 54 RB.</p> <p>NOTE 9: For non-synchronized TDD operation to meet these requirements some restriction will be needed for either the operating band or protected band.</p> <p>NOTE 10 to 35: N/A.</p> <p>NOTE 36: This requirement is applicable for E-UTRA channel bandwidth allocated within 1 920 - 1 980 MHz.</p> <p>NOTE 37: Applicable when the upper edge of the channel bandwidth frequency is greater than 1 980 MHz.</p> <p>NOTES 38 to 41: N/A.</p> <p>NOTE 42: For category NB1 and NB2 UE when carrier centre frequency is 1 920,1 MHz, in case of single-tone uplink transmission the requirement is applicable only for sub-carrier index > 2.</p>				

NOTE 2: For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth defined for the protected band.

Table 4.2.4.1.2-4: Additional spurious emissions limits (network signalled value "NS_01")

E-UTRA band	Protected Frequency range	Maximum Level (dBm)	MBW (MHz)
20	470 MHz ≤ f ≤ 790 MHz	-65	8 MHz
<p>NOTE: The conformance shall be assessed using the measurement position placed at the following centre frequencies: 474 MHz, 586 MHz, 690 MHz, 754 MHz, 770 MHz and 786 MHz.</p>			



Table 4.2.4.1.2-5: Additional spurious emissions limits (network signalled value "NS_22")

E-UTRA band	Protected Frequency range (MHz)	Channel bandwidth/ Maximum Level (dBm)	MBW (MHz)
		5, 10, 15, 20 MHz	
42, 43	3 400 Δ f Δ 3 800	-23 (note 1)	5 MHz
		-40 (note 2)	1 MHz

NOTE 1: This requirement shall apply within an offset between 5 MHz and 25 MHz from the lower and from the upper edge of the channel bandwidth.
 NOTE 2: This requirement shall apply from 3 400 MHz up to 25 MHz below the lower E-UTRA channel edge and from 25 MHz above the upper E-UTRA channel edge up to 3 800 MHz.

Table 4.2.4.1.2-6: Additional spurious emissions limits (network signalled value "NS_23")

E-UTRA band	Protected Frequency range (MHz)	Channel bandwidth/ Maximum Level (dBm)	MBW (MHz)
		5, 10, 15, 20 MHz	
42, 43	3 400 Δ f Δ 3 800	-23 (note 1)	5 MHz
		-40 (note 2)	1 MHz

NOTE 1: This requirement shall apply within an offset between 5 MHz and 25 MHz from the lower and from the upper edge of the channel bandwidth.
 NOTE 2: This requirement shall apply from 3 400 MHz up to 25 MHz below the lower E-UTRA channel edge and from 25 MHz above the upper E-UTRA channel edge up to 3 800 MHz.
 NOTE 3: F_{offset_NS_23} is:
 0 MHz for 5 MHz channel BW,
 5 MHz for 10 MHz channel BW,
 9 MHz for 15 MHz channel BW and
 12 MHz for 20 MHz channel BW.

Test Procedure

According to ETSI EN 301 908-13 V13.2.1(2022-02) clause 5.3.3

Test Results

Pass



4.1.6. Transmitter Minimum Output Power

Limit

The minimum output power measured shall not exceed the values specified in table 4.2.5.1.2-1.

Table 4.2.5.1.2-1: Minimum output power

	Channel bandwidth/minimum output power/measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Minimum output power	For carrier frequency $f \Delta 3,0$ GHz: $\Delta -39$ dBm For carrier frequency $3,0$ GHz $< f \Delta 4,2$ GHz: $\Delta -38,7$ dBm					
Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz

Test Procedure

According to ETSI EN 301 908-13 V13.2.1(2022-02) clause 5.3.4

Test Results

Please refer to following:

Band 1 (Single carrier)

Bandwidth	Channel	RB	Result(dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
5 MHz	Low	RB25#0	-43.2	-43.5	-43.3	-44.1	-43.2	≤ -39
	Middle	RB25#0	-44.3	-44.1	-44.2	-44.3	-44.3	
	High	RB25#0	-43.5	-43.6	-43.4	-44.2	-44.4	
20 MHz	Low	RB100#0	-43.1	-44.1	-44.0	-43.3	-43.3	
	Middle	RB100#0	-44.1	-44.2	-44.3	-44.5	-44.2	
	High	RB100#0	-44.1	-44.1	-43.2	-43.4	-44.7	

Band 3 (Single carrier)

Bandwidth	Channel	RB	Result(dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
1.4 MHz	Low	RB6#0	-44.3	-44.3	-44.1	-44.0	-44.1	≤ -39
	Middle	RB6#0	-44.2	-44.1	-44.3	-44.3	-44.1	
	High	RB6#0	-43.3	-43.9	-43.9	-43.6	-44.0	
5 MHz	Low	RB25#0	-43.4	-43.8	-43.9	-44.0	-43.8	
	Middle	RB25#0	-44.1	-44.1	-44.2	-44.0	-44.2	
	High	RB25#0	-43.4	-43.6	-43.6	-44.0	-44.0	
20 MHz	Low	RB100#0	-43.3	-44.4	-44.1	-43.6	-43.8	
	Middle	RB100#0	-44.3	-44.2	-44.2	-44.1	-44.0	
	High	RB100#0	-44.0	-44.2	-43.8	-43.9	-44.0	



Band 5 (Single carrier)

Bandwidth	Channel	RB	Result(dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
5 MHz	Low	RB25#0	-51.0	-50.8	-51.3	-51.1	-50.9	≤-39
	Middle	RB25#0	-50.4	-50.2	-50.2	-50.2	-50.3	
	High	RB25#0	-50.4	-50.3	-50.7	-50.6	-50.2	
20 MHz	Low	RB100#0	-51.5	-51.3	-51.8	-51.7	-51.7	
	Middle	RB100#0	-50.7	-50.7	-50.4	-50.6	-50.8	
	High	RB100#0	-50.9	-50.9	-51.0	-50.9	-50.6	

Band 8 (Single carrier)

Bandwidth	Channel	RB	Result(dBm)					Limit (dBm)
			Normal	LTLV	LTHV	HTLV	HTHV	
5 MHz	Low	RB25#0	-44.7	-44.6	-44.7	-44.7	-44.8	≤-39
	Middle	RB25#0	-44.7	-44.6	-44.5	-44.7	-44.9	
	High	RB25#0	-44.8	-44.8	-44.6	-44.9	-44.8	
20 MHz	Low	RB100#0	-45.1	-45.1	-45.3	-44.8	-45.0	
	Middle	RB100#0	-45.0	-45.3	-45.2	-44.8	-45.1	
	High	RB100#0	-45.0	-45.3	-45.3	-44.9	-44.9	



4.1.7. Receiver Adjacent Channel Selectivity (ACS)

Limit

The throughput R_{av} shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in TS 136 521-1 [1] under the conditions specified in table 4.2.6.1.2-2 and also under the conditions specified in table 4.2.6.1.2-3.

Table 4.2.6.1.2-1: Adjacent channel selectivity

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
ACS	dB	33,0	33,0	33,0	33,0	30	27

Table 4.2.6.1.2-2: Test parameters for Adjacent channel selectivity, Case 1

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + 14 dB					
$P_{Interferer}$	dBm	REFSENS +45,5 dB	REFSENS +45,5 dB	REFSENS +45,5 dB	REFSENS +45,5 dB	REFSENS +42,5 dB	REFSENS +39,5 dB
$BW_{Interferer}$	MHz	1,4	3	5	5	5	5
$F_{Interferer}$ (offset)	MHz	1,4025	3,0075	5,0025	7,5075	10,0125	12,5025
NOTE 1: The transmitter shall be set to 4 dB below P_{CMAX_L} or $P_{CMAX_L_CA}$ as defined in clause 6.2.5 in ETSI TS 136 101 [3].							
NOTE 2: The interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with set-up according to clause C.3.1 of ETSI TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in clause 7.3.3 in ETSI TS 136 521-1 [1].							
NOTE 4: For DL category M1 UE, the reference sensitivity for category M1 in ETSI TS 136 521-1 [1], table 7.3EA-1 and 7.3EA-2 should be used as REFSENS for the power in Transmission Bandwidth Configuration and $P_{Interferer}$.							
NOTE 5: For DL category M1 UE, the parameters for the applicable channel bandwidth apply.							

Table 4.2.6.1.2-3: Test parameters for Adjacent channel selectivity, Case 2

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	-56,5	-56,5	-56,5	-56,5	-53,5	-50,5
$P_{Interferer}$	dBm	-25					
$BW_{Interferer}$	MHz	1,4	3	5	5	5	5
$F_{Interferer}$ (offset)	MHz	1,4025	3,0075	5,0025	7,5075	10,0125	12,5025
NOTE 1: The transmitter shall be set to 24 dB below P_{CMAX_L} or $P_{CMAX_L_CA}$ as defined in clause 6.2.5 in ETSI TS 136 101 [3].							
NOTE 2: The interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with set-up according to clause C.3.1 of ETSI TS 136 521-1 [1].							



Test Procedure

According to ETSI EN 301 908-13 V13.2.1(2022-02) clause 5.3.5

Test Results

Please refer to following:

Band 1

Test Bandwidth	Test RB	Test Channel	Throughput (%)				Limits (%)
			Case 1		Case 2		
			F-Offset	F+FOffset	F-Offset	F+FOffset	
5M	15	Middle	97.49	97.53	97.47	97.39	≥95
	20		97.38	97.32	97.36	97.36	
	25		95.79	95.75	95.75	95.71	
20M	20		96.14	96.06	96.10	96.10	
	25		98.35	98.39	98.39	98.37	
	50		95.74	95.70	95.64	95.62	
	75		95.78	95.84	95.88	95.92	
	100		98.51	98.49	98.55	98.61	

Band 3

Test Bandwidth	Test RB	Test Channel	Throughput (%)				Limits (%)
			Case 1		Case 2		
			F-Offset	F+FOffset	F-Offset	F+FOffset	
1.4M	15	Middle	96.72	96.84	96.82	96.90	≥95
5M	15		97.34	97.34	97.43	97.12	
	20		97.43	97.17	97.34	97.32	
	25		95.75	95.73	95.72	95.78	
20M	20		96.15	96.04	96.11	96.14	
	25		98.33	98.35	98.32	98.31	
	50		95.71	95.72	95.63	95.65	
	75		95.71	95.81	95.82	95.93	
	100		98.53	98.43	98.54	98.62	



Band 5

Test Bandwidth	Test RB	Test Channel	Throughput (%)				Limits (%)
			Case 1		Case 2		
			F-Foffset	F+Foffset	F-Foffset	F+Foffset	
5M	15	Middle	97.12	97.43	97.37	97.29	≥95
	20		97.48	97.12	97.56	97.26	
	25		95.49	95.55	95.25	95.51	
20M	20		96.24	96.16	96.13	96.11	
	25		98.36	98.32	98.31	98.34	
	50		95.72	95.71	95.62	95.63	
	75		95.48	95.64	95.68	95.72	
	100		98.41	98.79	98.35	98.81	

Band 8

Test Bandwidth	Test RB	Test Channel	Throughput (%)				Limits (%)
			Case 1		Case 2		
			F-Foffset	F+Foffset	F-Foffset	F+Foffset	
5M	15	Middle	97.13	97.42	97.31	97.25	≥95
	20		97.42	97.15	97.52	97.23	
	25		95.45	95.52	95.23	95.53	
20M	20		96.24	96.18	96.12	96.17	
	25		98.32	98.34	98.32	98.30	
	50		95.73	95.75	95.62	95.67	
	75		95.43	95.61	95.62	95.71	
	100		98.40	98.72	98.31	98.11	



4.1.8. Receiver Blocking Characteristics

Limit

With parameters specified in tables 4.2.7.1.2-1 and 4.2.7.1.2-2, the throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in clauses A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in clauses A.5.1.1 and A.5.2.1) in ETSI TS 136 521-1 [1].

With parameters specified in tables 4.2.7.1.2-3 and 4.2.7.1.2-4, the throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in clauses A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in clauses A.5.1.1 and A.5.2.1) in ETSI TS 136 521-1 [1], except for the spurious response frequencies.

For table 4.2.7.1.2-4 in frequency range 1, 2 and 3, up to $\max(24, 6 \cdot [\text{NRB} / 6])$ exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size, where is the number of resource blocks in the downlink transmission bandwidth configuration. For these exceptions the requirements of clause 4.2.8.1 Spurious response are applicable.

With parameters specified in table 4.2.7.1.2-5, the throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in clauses A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in clauses A.5.1.1 and A.5.2.1) in ETSI TS 136 521-1 [1].

Table 4.2.7.1.2-1: In-band blocking parameters

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9
BW _{Interferer}	MHz	1,4	3	5	5	5	5
F _{offset, case 1}	MHz	2,1125	4,5075	7,5125	7,5025	7,5075	7,5125
F _{offset, case 2}	MHz	3,5075	7,5075	12,5075	12,5125	12,5025	12,5075
NOTE 1: The transmitter shall be set to 4 dB below P _{CMAX,L} at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with P _{CMAX,L} as defined in clause 6.2.5).							
NOTE 2: The interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with a set-up according to clause C.3.1 of ETSI TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in clause 7.3.3 in ETSI TS 136 521-1 [1].							
NOTE 4: For DL category M1 UE, the reference sensitivity for category M1 in ETSI TS 136 521-1 [1], tables 7.3EA-1 and 7.3EA-2 should be used as REFSENS for the power in Transmission Bandwidth Configuration.							
NOTE 5: For DL category M1 UE, the parameters for the applicable channel bandwidth apply.							



Table 4.2.7.1.2-2: In-band blocking

E-UTRA band	Parameter	Units	Case 1	Case 2
	$P_{\text{Interferer}}$		dBm	-56
	$F_{\text{Interferer}}$ (Offset)	MHz	= $-BW/2 - F_{\text{offset, case 1}}$ and = $+BW/2 + F_{\text{offset, case 1}}$	$\leq -BW/2 - F_{\text{offset, case 2}}$ and $\geq +BW/2 + F_{\text{offset, case 2}}$
1, 3, 7, 8, 20, 22, 28, 31, 33, 34, 38, 40, 42, 43, 65	$F_{\text{Interferer}}$	MHz	(note 2)	$F_{\text{DL_low}} - 15$ to $F_{\text{DL_high}} + 15$

NOTE 1: For certain bands, the unwanted modulated interfering signal may not fall inside the UE receive band, but within the first 15 MHz below or above the UE receive band.
 NOTE 2: For each carrier frequency the requirement is valid for two frequencies:
 a) the carrier frequency - $BW/2 - F_{\text{offset, case 1}}$; and
 b) the carrier frequency + $BW/2 + F_{\text{offset, case 1}}$.
 NOTE 3: $F_{\text{Interferer}}$ range values for unwanted modulated interfering signal are interferer centre frequencies.

Table 4.2.7.1.2-3: Out-of-band blocking parameters

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9

NOTE 1: The transmitter shall be set to 4 dB below $P_{\text{CMAX_L}}$ at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with $P_{\text{CMAX_L}}$ as defined in clause 6.2.5).
 NOTE 2: Reference measurement channel is clause A.3.2 of ETSI TS 136 521-1 [1].
 NOTE 3: REFSENS as defined in clause 7.3.3 in ETSI TS 136 521-1 [1].
 NOTE 4: For DL category M1 UE, the reference sensitivity for category M1 in ETSI TS 136 521-1 [1], tables 7.3EA-1 and 7.3EA-2 should be used as REFSENS for the power in Transmission Bandwidth Configuration.
 NOTE 5: For DL category M1 UE, the parameters for the applicable channel bandwidth apply.

Table 4.2.7.1.2-4: Out-of-band blocking

E-UTRA band	Parameter	Units	Frequency		
			Range 1	Range 2	Range 3
	$P_{\text{Interferer}}$	dBm	-44	-30	-15
1, 3, 7, 8, 20, 22, 28, 31, 33, 34, 38, 40, 42 (note 2), 43 (note 2), 65	$F_{\text{Interferer}}$ (CW)	MHz	$F_{\text{DL_low}} - 15$ to $F_{\text{DL_low}} - 60$	$F_{\text{DL_low}} - 60$ to $F_{\text{DL_low}} - 85$	$F_{\text{DL_low}} - 85$ to 1 MHz
			$F_{\text{DL_high}} + 15$ to $F_{\text{DL_high}} + 60$	$F_{\text{DL_high}} + 60$ to $F_{\text{DL_high}} + 85$	$F_{\text{DL_high}} + 85$ to +12 750 MHz

NOTE 1: Range 3 shall be tested only with the highest channel bandwidth.
 NOTE 2: The power level of the interferer ($P_{\text{Interferer}}$) for Range 3 shall be modified to -20 dBm for $F_{\text{Interferer}} > 2\ 800$ MHz and $F_{\text{Interferer}} < 4\ 400$ MHz.



Table 4.2.7.1.2-5: Narrow-band blocking

Parameter	Units	Channel Bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
P_w	dBm	$P_{REFSENS}$ + channel-bandwidth specific value below					
		22	18	16	13	14	16
P_{uw} (CW)	dBm	-55	-55	-55	-55	-55	-55
F_{uw} (offset for $\Delta f = 15$ kHz)	MHz	0,9075	1,7025	2,7075	5,2125	7,7025	10,2075
NOTE 1: The transmitter shall be set a 4 dB below $P_{CMAX,L}$ at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with $P_{CMAX,L}$ as defined in clause 6.2.5).							
NOTE 2: Reference measurement channel is in clause A.3.2 of ETSI TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in clause 7.3.3 in ETSI TS 136 521-1 [1].							
NOTE 4: For DL category M1 UE, the reference sensitivity for category M1 in ETSI TS 136 521-1 [1], tables 7.3EA-1 and 7.3EA-2 should be used as $P_{REFSENS}$ for P_w .							
NOTE 5: For DL category M1 UE, the parameters for the applicable channel bandwidth apply.							

Test Procedure

According to ETSI EN 301 908-13 V13.1.1 (2019-11) clause 5.3.6

Test Results

Please refer to following:



Band 1

Blocking Range	Test Bandwidth	Test RB	Throughput (%)			Limits (%)
			Case1	Case2	/	
In-band	5M	15	96.51	96.43	/	≥95
		20	95.99	95.91	/	
		25	95.77	95.85	/	
	20M	20	96.27	96.23	/	
		25	96.80	96.88	/	
		50	96.75	96.75	/	
		75	97.90	97.96	/	
		100	97.13	97.05	/	
Out-of-band	5M	15	97.02	96.98	/	
		20	98.14	98.20	/	
		25	97.83	97.87	/	
	20M	20	98.08	98.04	98.06	
		25	96.37	96.27	96.23	
		50	97.94	97.92	97.94	
		75	97.50	97.42	97.50	
		100	95.80	95.82	95.84	
Narrow-band	5M	15	96.10	/	/	
		20	97.69	/	/	
		25	96.62	/	/	
	20M	20	95.59	/	/	
		25	97.66	/	/	
		50	96.99	/	/	
		75	96.92	/	/	
		100	96.47	/	/	



Band 3

Blocking Range	Test Bandwidth	Test RB	Throughput (%)			Limits (%)
			Case1	Case2	/	
In-band	1.4M	6	95.81	95.85	/	≥95
		15	96.34	96.46	/	
	5M	20	95.91	95.93	/	
		25	95.22	95.85	/	
		20M	20	96.26	96.28	
	20M	25	96.82	96.81	/	
		50	96.77	96.73	/	
		75	97.91	97.96	/	
		100	97.17	97.01	/	
		Out-of-band	1.4M	6	97.02	
15	97.02			96.98	/	
5M	20		98.14	98.32	/	
	25		97.83	97.47	/	
	20M		20	98.08	98.34	
20M	25		96.37	96.21	96.26	
	50		97.97	97.98	97.92	
	75		97.50	97.45	97.52	
	100		95.80	95.86	95.83	
	Narrow-band		1.4M	6	95.78	/
15		96.12		/	/	
5M		20	97.69	/	/	
		25	96.66	/	/	
		20M	20	95.54	/	/
20M		25	97.62	/	/	
		50	96.92	/	/	
		75	96.98	/	/	
		100	96.43	/	/	



Band 5

Blocking Range	Test Bandwidth	Test RB	Throughput (%)			Limits (%)
			Case1	Case2	/	
In-band	5M	15	96.33	96.40	/	≥95
		20	95.34	95.56	/	
		25	95.72	95.18	/	
	20M	20	96.26	96.99	/	
		25	96.83	96.81	/	
		50	96.55	96.78	/	
		75	97.67	97.65	/	
		100	97.12	97.75	/	
Out-of-band	5M	15	97.15	96.92	/	
		20	98.10	98.22	/	
		25	97.82	97.85	/	
	20M	20	98.11	98.11	98.06	
		25	96.30	96.29	96.23	
		50	97.92	97.52	97.94	
		75	97.51	97.48	97.50	
		100	95.82	95.83	95.84	
Narrow-band	5M	15	96.14	/	/	
		20	97.62	/	/	
		25	96.92	/	/	
	20M	20	95.57	/	/	
		25	97.67	/	/	
		50	96.93	/	/	
		75	96.97	/	/	
		100	96.42	/	/	



Band 8

Blocking Range	Test Bandwidth	Test RB	Throughput (%)			Limits (%)
			Case1	Case2	/	
In-band	5M	15	96.36	96.43	/	≥95
		20	95.34	95.51	/	
		25	95.79	95.18	/	
	20M	20	96.23	96.92	/	
		25	96.82	96.66	/	
		50	96.57	96.75	/	
		75	97.62	97.68	/	
		100	97.14	97.72	/	
Out-of-band	5M	15	97.18	96.98	/	
		20	98.16	98.22	/	
		25	97.82	97.83	/	
	20M	20	98.16	98.17	98.11	
		25	96.31	96.23	96.47	
		50	97.98	97.59	97.45	
		75	97.55	97.42	97.18	
		100	95.81	95.89	95.44	
Narrow-band	5M	15	96.17	/	/	
		20	97.62	/	/	
		25	96.91	/	/	
	20M	20	95.53	/	/	
		25	97.68	/	/	
		50	96.92	/	/	
		75	96.97	/	/	
		100	96.40	/	/	



4.1.9. Receiver Spurious Response

Limit

The throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in clauses A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in clauses A.5.1.1 and A.5.2.1) in ETSI TS 136 521-1 [1] with parameters specified in tables 4.2.8.1.2-1 and 4.2.8.1.2-2.

Table 4.2.8.1.2-1: Spurious response parameters

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		6	6	6	6	7	9
NOTE 1: The transmitter shall be set to 4 dB below P_{CMAX_L} at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with P_{CMAX_L} as defined in clause 6.2.5).							
NOTE 2: Reference measurement channel is clause A.3.2 of ETSI TS 136 521-1 [1].							
NOTE 3: REFSENS as defined in clause 7.3.3 in ETSI TS 136 521-1 [1].							

Table 4.2.8.1.2-2: Spurious Response

Parameter	Units	Level
$P_{Interferer}$ (CW)	dBm	-44
$F_{Interferer}$	MHz	Spurious response frequencies

Test Procedure

According to ETSI EN 301 908-13 V13.1.1 (2019-11) clause 5.3.7

Test Results

Please refer to following:

Band 1

Test Bandwidth	Test RB	Test Channel	Throughput (%)	Limits (%)
5M	15	Middle	97.48	
	20		98.30	
	25		95.66	
20M	20		96.59	
	25		97.97	
	50		97.15	
	75		97.57	
	100	96.63		



Band 3

Test Bandwidth	Test RB	Test Channel	Throughput (%)	Limits (%)
1.4M	6	Middle	95.71	≥95
5M	15		97.62	
	20		98.32	
	25		95.61	
20M	20		96.52	
	25		97.95	
	50		97.10	
	75		97.52	
	100		96.68	

Band 5

Test Bandwidth	Test RB	Test Channel	Throughput (%)	Limits (%)
5M	15	Middle	97.18	≥95
	20		98.65	
	25		95.34	
20M	20		96.56	
	25		97.92	
	50		97.14	
	75		97.58	
	100		96.46	

Band 8

Test Bandwidth	Test RB	Test Channel	Throughput (%)	Limits (%)
5M	15	Middle	97.13	≥95
	20		98.33	
	25		95.37	
20M	20		96.52	
	25		97.67	
	50		97.33	
	75		97.55	
	100		96.48	



4.1.10. Receiver Intermodulation Characteristics

Limit

The throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in clauses A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in clauses A.5.1.1 and A.5.2.1) in ETSI TS 136 521-1 [1] with parameters specified in table 4.2.9.1.2-1 for the specified wanted signal mean power in the presence of two interfering signals.

Table 4.2.9.1.2-1: Test parameters for Wide band intermodulation

Rx Parameter	Units	Channel bandwidth					
		1,4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Power in Transmission Bandwidth Configuration	dBm	REFSENS + channel bandwidth specific value below					
		12	8	6	6	7	9
$P_{\text{Interferer 1}}$ (CW)	dBm	-46					
$P_{\text{Interferer 2}}$ (Modulated)	dBm	-46					
$BW_{\text{Interferer 2}}$		1,4	3	5			
$F_{\text{Interferer 1}}$ (Offset)	MHz	-BW/2 - 2,1 / +BW/2 + 2,1	-BW/2 - 4,5 / +BW/2 + 4,5	-BW/2 - 7,5 / +BW/2 + 7,5			
$F_{\text{Interferer 2}}$ (Offset)		MHz	$2 \times F_{\text{Interferer 1}}$				
NOTE 1: The transmitter shall be set to 4 dB below $P_{\text{CMAX_L}}$ at the minimum uplink configuration specified in ETSI TS 136 101 [3] (table 7.3.1-2 with $P_{\text{CMAX_L}}$ as defined in clause 6.2.5).							
NOTE 2: Reference measurement channel is clause A.3.2 of ETSI TS 136 521-1 [1].							
NOTE 3: The modulated interferer shall consist of the Reference measurement channel specified in clause A.3.2 of ETSI TS 136 521-1 [1] with set-up according to clause C.3.1 of ETSI TS 136 521-1 [1]. The interfering modulated signal is 5 MHz E-UTRA signal as described in annex C of ETSI TS 136 521-1 [1] for channel bandwidth ≥ 5 MHz.							
NOTE 4: REFSENS as defined in clause 7.3.3 in ETSI TS 136 521-1 [1].							
NOTE 5: For DL category M1 UE, the reference sensitivity for category M1 in ETSI TS 136 521-1 [1], tables 7.3EA-1 and 7.3EA-2 should be used as REFSENS for the power in Transmission Bandwidth Configuration.							
NOTE 6: For DL category M1 UE, the parameters for the applicable channel bandwidth apply, and BW refers to the corresponding channel bandwidth.							

Test Procedure

According to ETSI EN 301 908-13 V13.1.1 (2019-11) clause 5.3.8.5

Test Results

Please refer to following:



Band 1

Test Bandwidth	Test RB	Test Channel	Throughput (%)		Limits (%)
			Low Interferin	High Interferi	
5M	15	Middle	97.48	97.42	≥95
	20		96.98	97.00	
	25		97.10	97.20	
20M	20		98.25	98.19	
	25		95.91	95.87	
	50		98.22	98.14	
	75		95.96	96.06	
	100		95.81	95.85	

Band 3

Test Bandwidth	Test RB	Test Channel	Throughput (%)		Limits (%)
			Low Interferin	High Interferi	
1.4M	6	Middle	97.23	97.16	≥95
5M	15		97.46	97.41	
	20		96.92	97.04	
	25		97.14	97.27	
20M	20		98.27	98.17	
	25		95.92	95.83	
	50		98.27	98.16	
	75		95.92	96.01	
	100		95.87	95.82	

Band 5

Test Bandwidth	Test RB	Test Channel	Throughput (%)		Limits (%)
			Low Interferin	High Interferi	
5M	15	Middle	97.13	97.14	≥95
	20		96.33	97.54	
	25		97.14	97.56	
20M	20		98.45	98.18	
	25		95.45	95.82	
	50		98.42	98.16	
	75		95.54	96.11	
	100		95.83	95.90	



Band 8

Test Bandwidth	Test RB	Test Channel	Throughput (%)		Limits (%)
			Low Interferin	High Interferi	
5M	15	Middle	97.53	97.65	≥95
	20		96.37	97.87	
	25		97.12	97.52	
20M	20		98.41	98.17	
	25		95.47	95.81	
	50		98.14	98.13	
	75		95.54	96.10	
	100		95.81	95.92	



4.1.11. Receiver Spurious Emissions

Limit

The measured spurious emissions derived in clause 5.3.9 shall not exceed the maximum level specified in table 4.2.10.1.2-1.

Table 4.2.10.1.2-1: General receiver spurious emission requirements

Frequency Band	Measurement bandwidth	Maximum level	Note
$30 \text{ MHz} \leq f < 1 \text{ GHz}$	100 kHz	-57 dBm	
$1 \text{ GHz} \leq f \leq 12.75 \text{ GHz}$	1 MHz	-47 dBm	
$12.75 \text{ GHz} \leq f \leq 5^{\text{th}}$ harmonic of the upper frequency edge of the DL operating band in GHz	1 MHz	-47 dBm	Note 1

NOTE 1: Shall apply only for Band 22, 42 and Band 43.
 NOTE 2: Unused PDCCH resources are padded with resource element groups with power level given by PDCCH_RA/RB as defined in ETSI TS 136 101 [3], clause C.3.1.

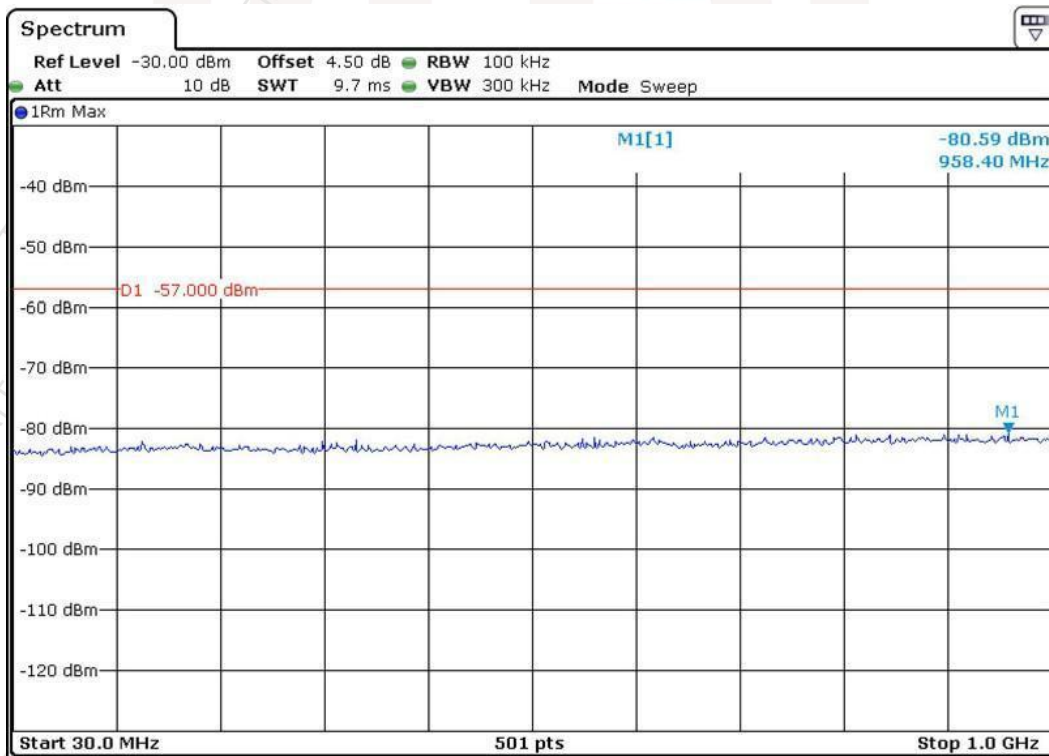
Test Procedure

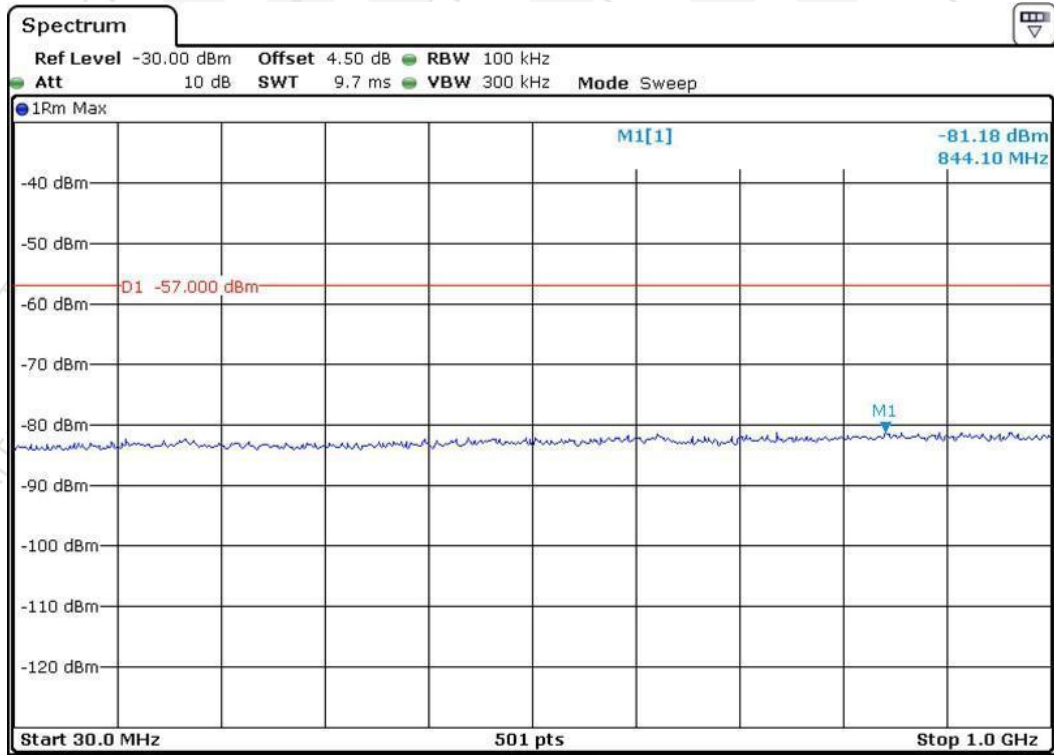
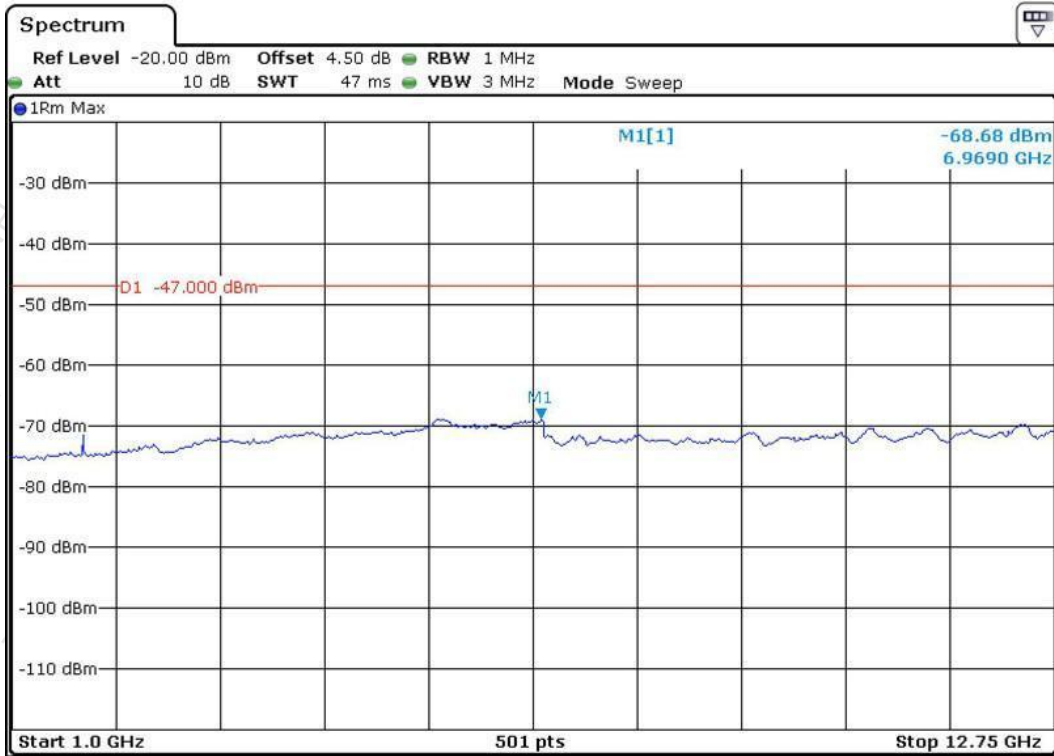
According to ETSI EN 301 908-13 V13.1.1 (2019-11) clause 5.3.9

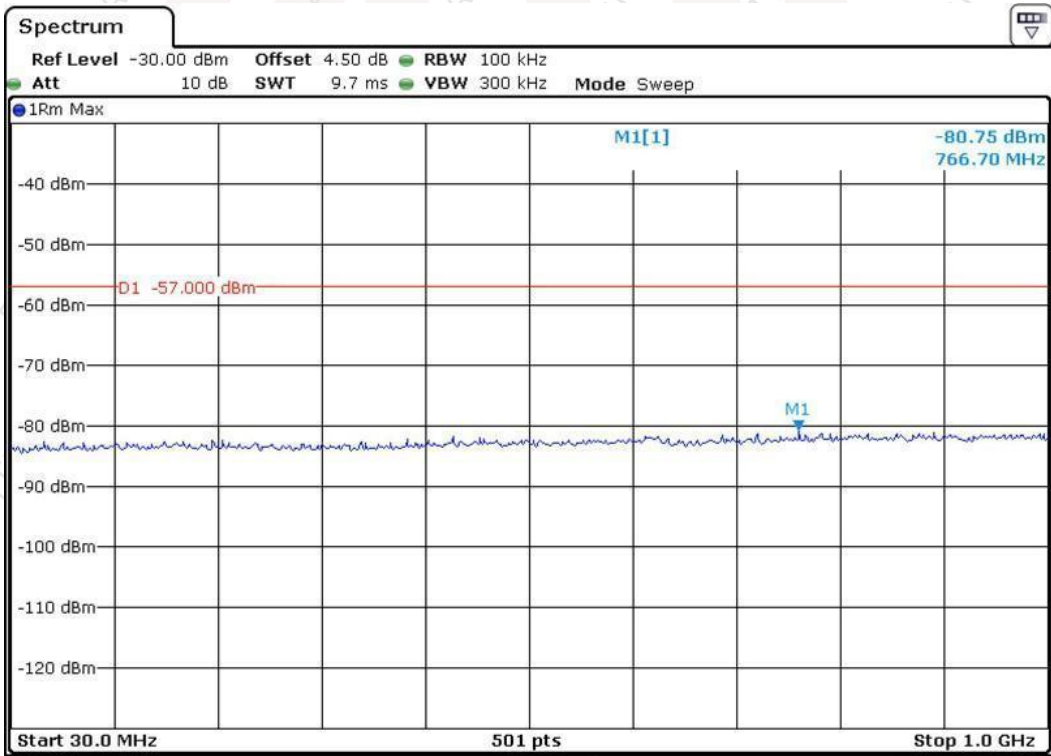
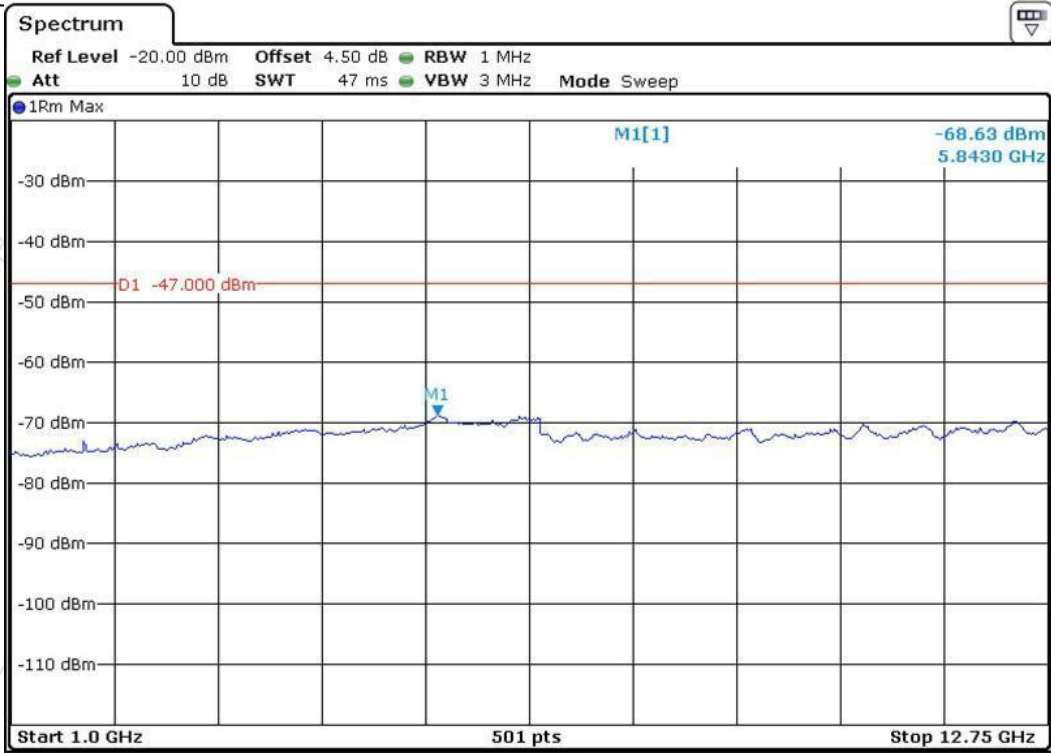
Test Results

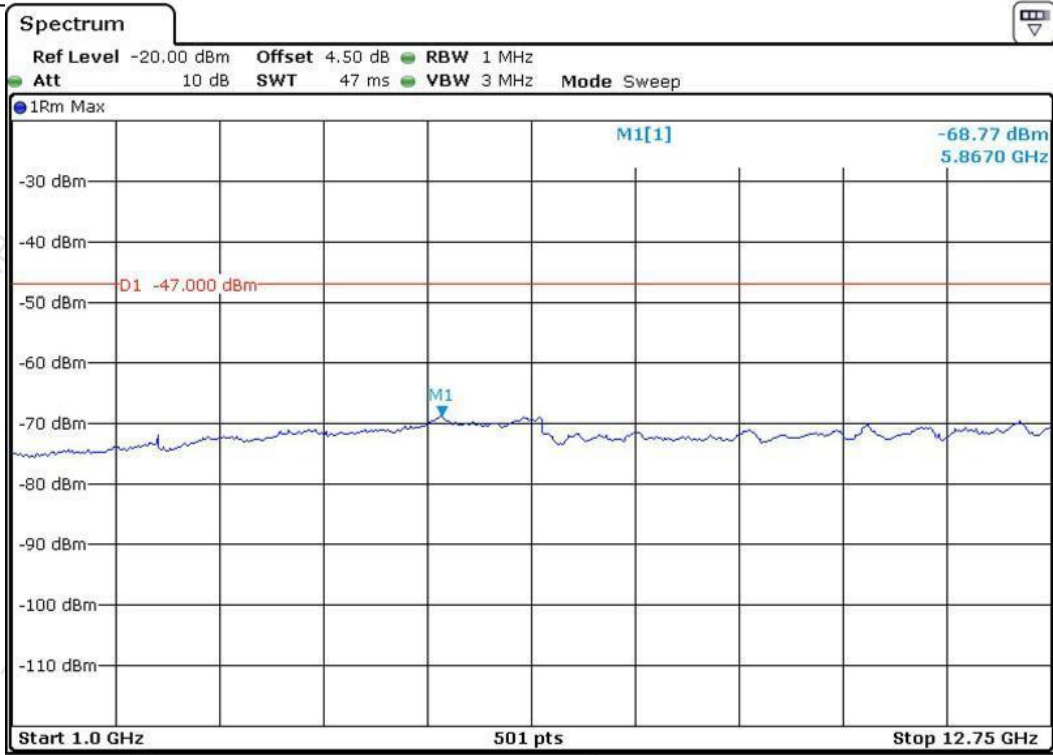
Please refer to following:

Note: Pretest all the bands and reported the worst-case band 3











4.1.12. Transmitter Adjacent Channel Leakage Power Ratio

Limit

If the measured adjacent channel power is greater than -50 dBm then the measured E-UTRA ACLR shall be higher than the limits in table 4.2.11.1.2-1.

Table 4.2.11.1.2-1: E-UTRA UE ACLR

	Channel bandwidth/E-UTRA _{ACLR1} /measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
E-UTRA _{ACLR1}	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB	29,2 dB
E-UTRA channel Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
UE channel	+1,4 MHz or -1,4 MHz	+3 MHz or -3 MHz	+5 MHz or -5 MHz	+10 MHz or -10 MHz	+15 MHz or -15 MHz	+20 MHz or -20 MHz

If the measured UTRA channel power is greater than -50 dBm then the measured UTRA ACLR1, UTRA ACLR2 shall be higher than the limits in table 4.2.11.1.2-2.

Table 4.2.11.1.2-2: UTRA UE ACLR

	Channel bandwidth/UTRA _{ACLR1/2} /measurement bandwidth					
	1,4 MHz	3,0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
UTRA _{ACLR1}	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB	32,2 dB
Adjacent channel centre frequency offset (in MHz)	0,7 + BW _{UTRA} /2 / -0,7 - BW _{UTRA} /2	1,5 + BW _{UTRA} /2 / -1,5 - BW _{UTRA} /2	2,5 + BW _{UTRA} /2 / -2,5 - BW _{UTRA} /2	5 + BW _{UTRA} /2 / -5 - BW _{UTRA} /2	7,5 + BW _{UTRA} /2 / -7,5 - BW _{UTRA} /2	10 + BW _{UTRA} /2 / -10 - BW _{UTRA} /2
UTRA _{ACLR2}	-	-	35,2 dB	35,2 dB	35,2 dB	35,2 dB
Adjacent channel centre frequency offset (in MHz)	-	-	2,5 + 3 × BW _{UTRA} /2 / -2,5 - 3 × BW _{UTRA} /2	5 + 3 × BW _{UTRA} /2 / -5 - 3 × BW _{UTRA} /2	7,5 + 3 × BW _{UTRA} /2 / -7,5 - 3 × BW _{UTRA} /2	10 + 3 × BW _{UTRA} /2 / -10 - 3 × BW _{UTRA} /2
E-UTRA channel Measurement bandwidth	1,08 MHz	2,7 MHz	4,5 MHz	9,0 MHz	13,5 MHz	18 MHz
UTRA 5 MHz channel Measurement bandwidth (see note 1)	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz	3,84 MHz
UTRA 1,6 MHz channel measurement bandwidth (see note 2)	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz	1,28 MHz

NOTE 1: Shall apply for E-UTRA FDD co-existence with UTRA FDD in paired spectrum.
 NOTE 2: Shall apply for E-UTRA TDD co-existence with UTRA TDD in unpaired spectrum.
 NOTE 3: BW_{UTRA} for UTRA FDD shall be 5 MHz and for UTRA TDD shall be 1,6 MHz.

Test Procedure

According to ETSI EN 301 908-13 V13.1.1 (2019-11) clause 5.3.10

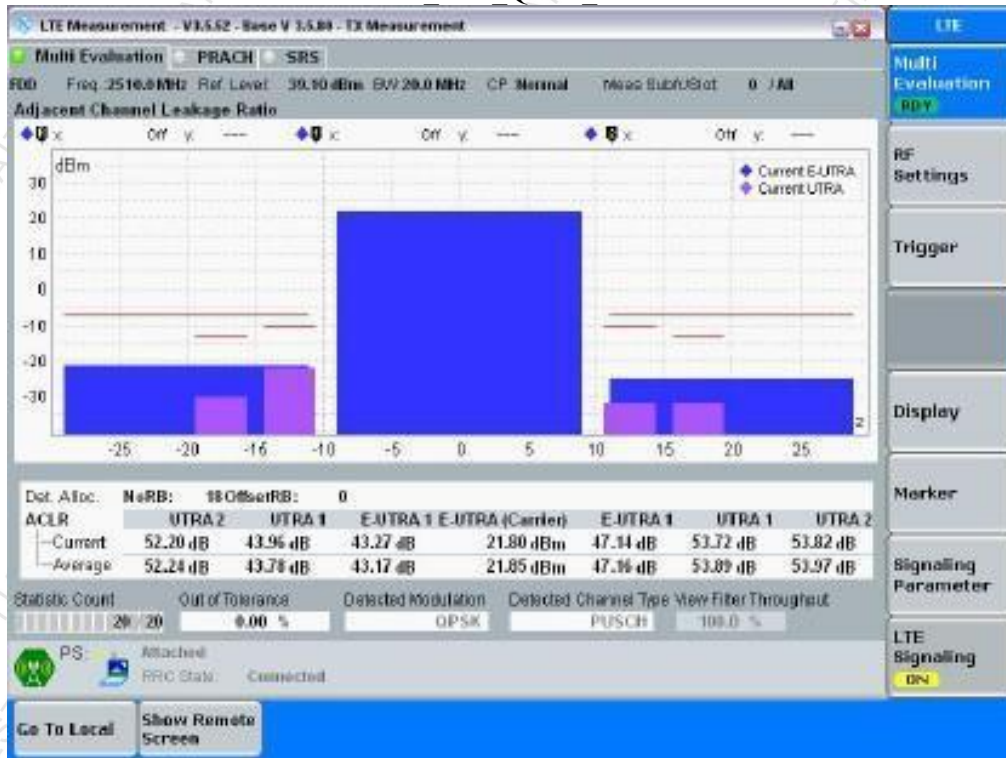
Test Results

Please refer to following:

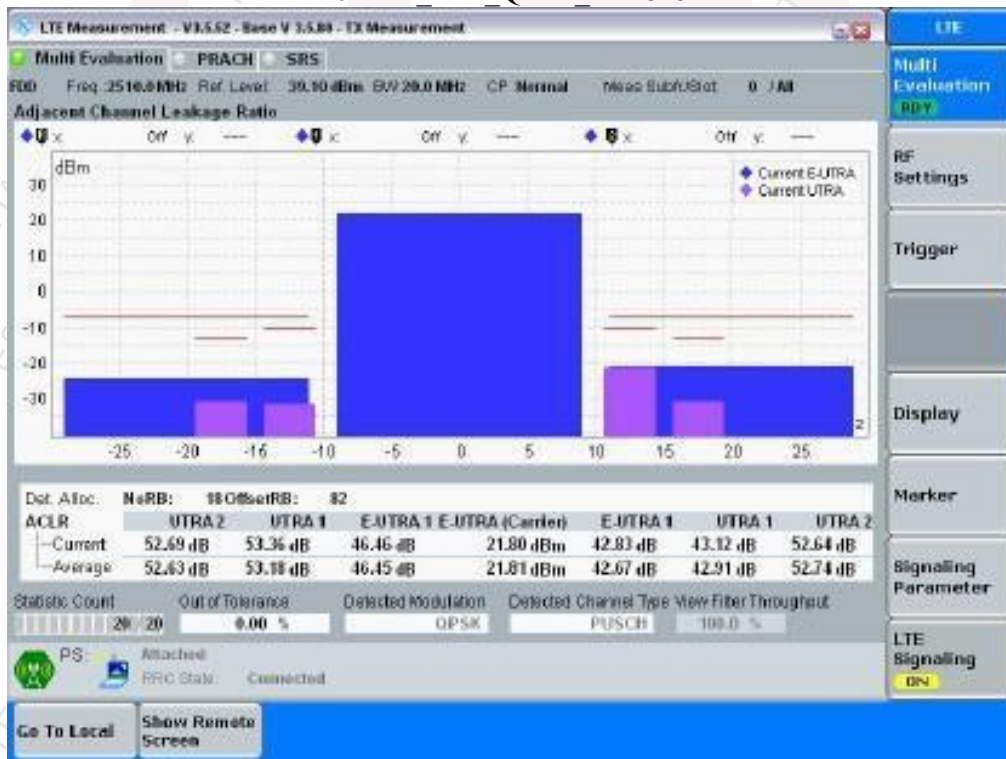
Note: Pretest all the bands and reported 20M bandwidth data in worst-case band 7



20 MHz Low QPSK RB18#0

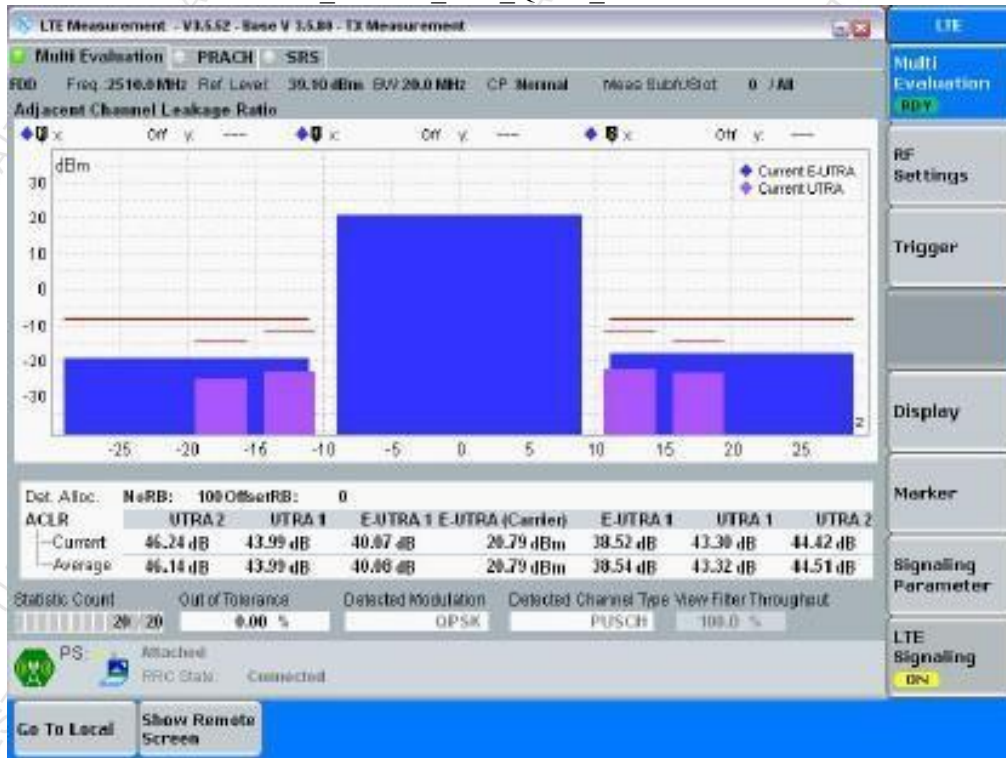


20 MHz Low QPSK RB18#82





7_20 MHz_Low_QPSK_RB100#0

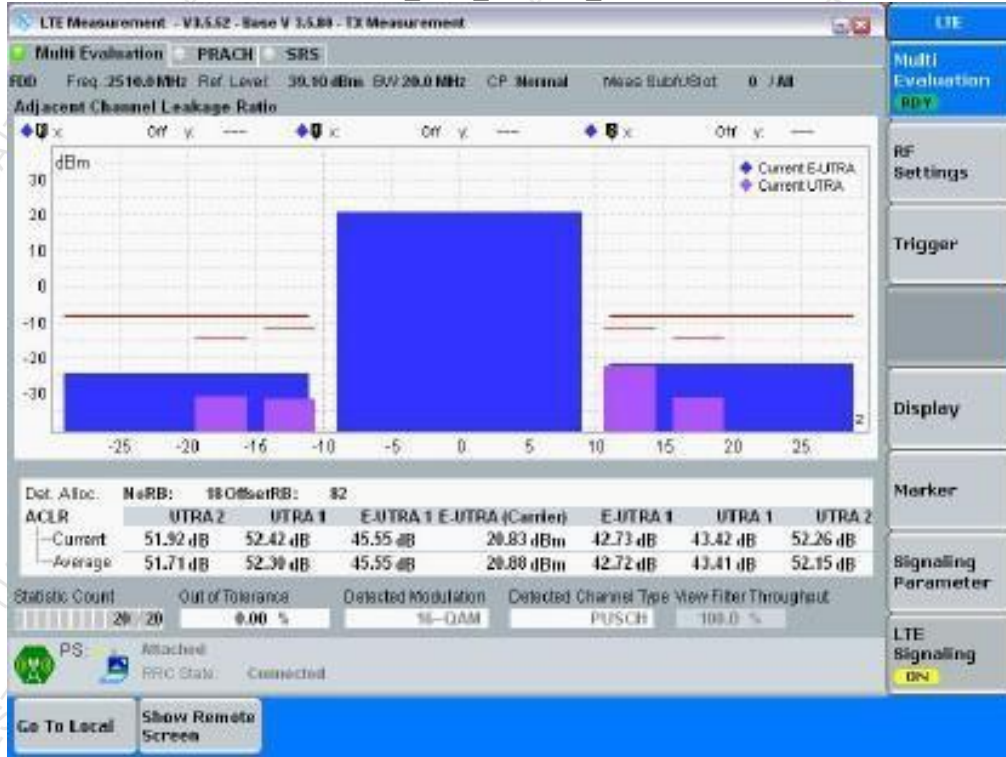


20 MHz_Low_16QAM_RB18#0

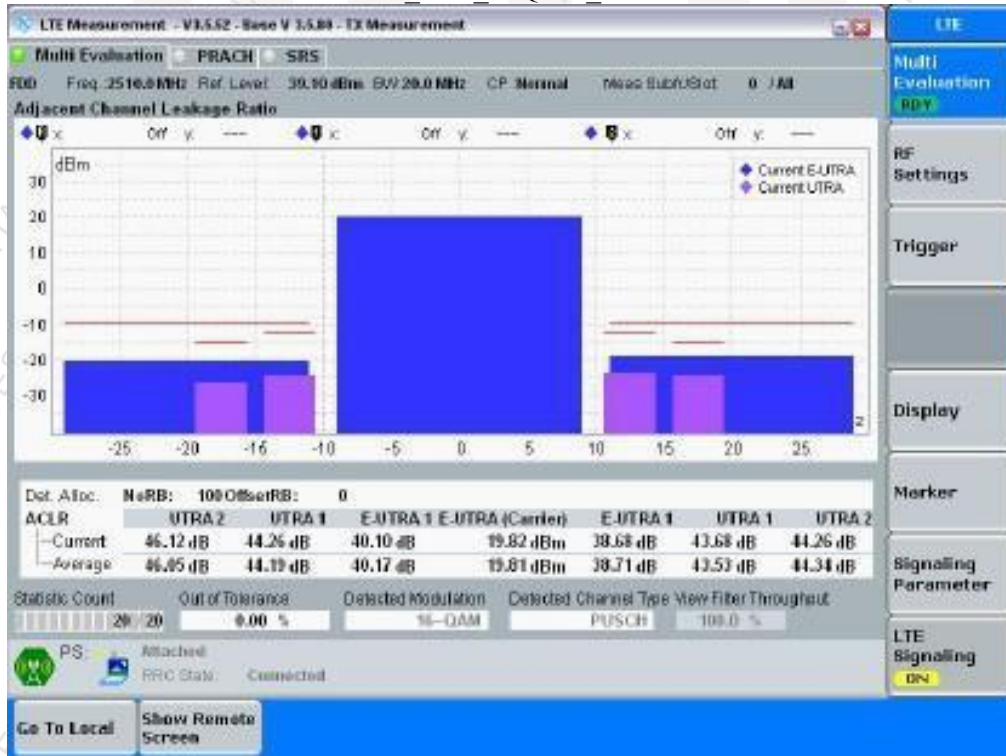




20 MHz Low 16QAM_RB18#82

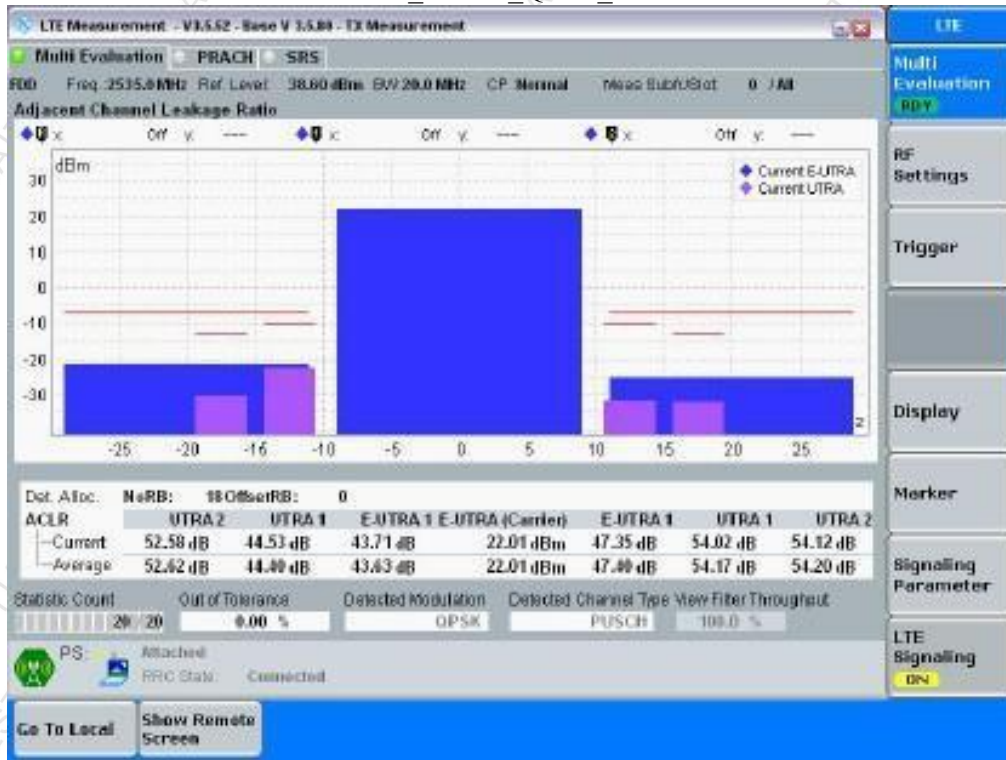


20 MHz Low 16QAM_RB100#0

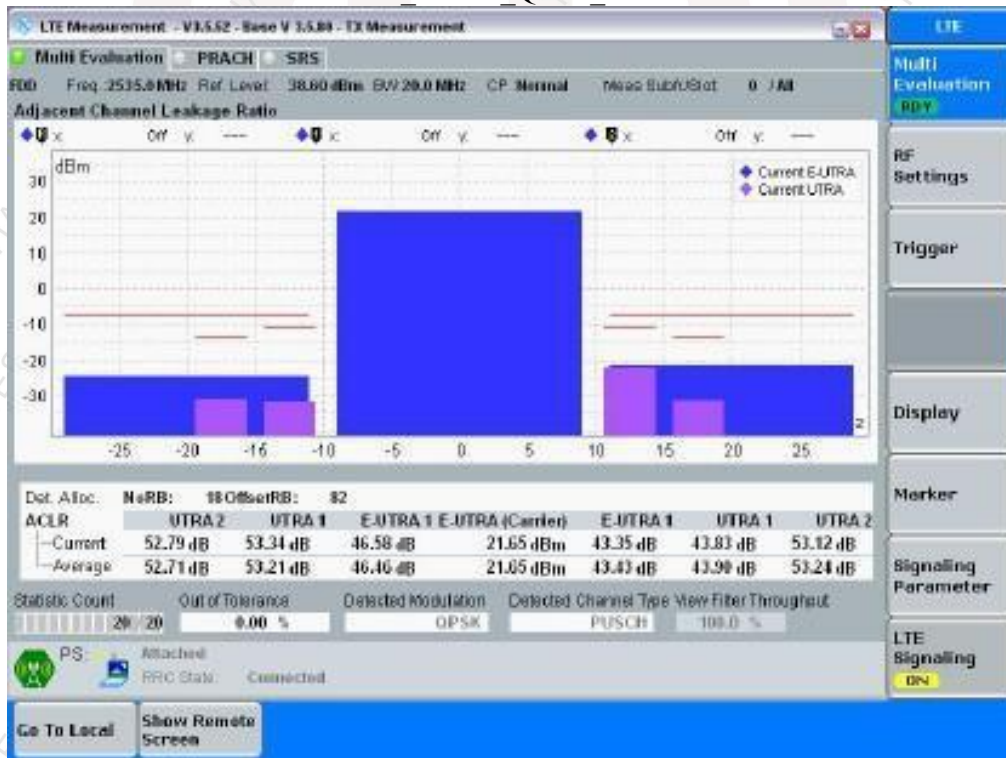




20 MHz Middle_QPSK_RB18#0



20 MHz Middle_QPSK_RB18#82

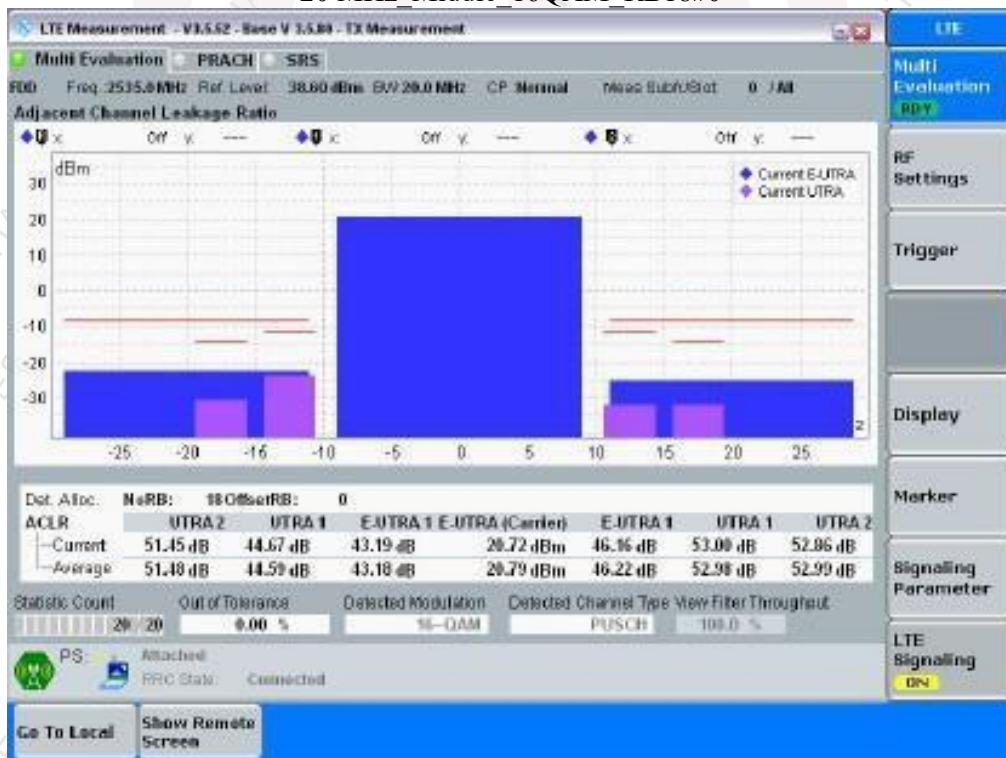




20 MHz_Middle_QPSK_RB100#0

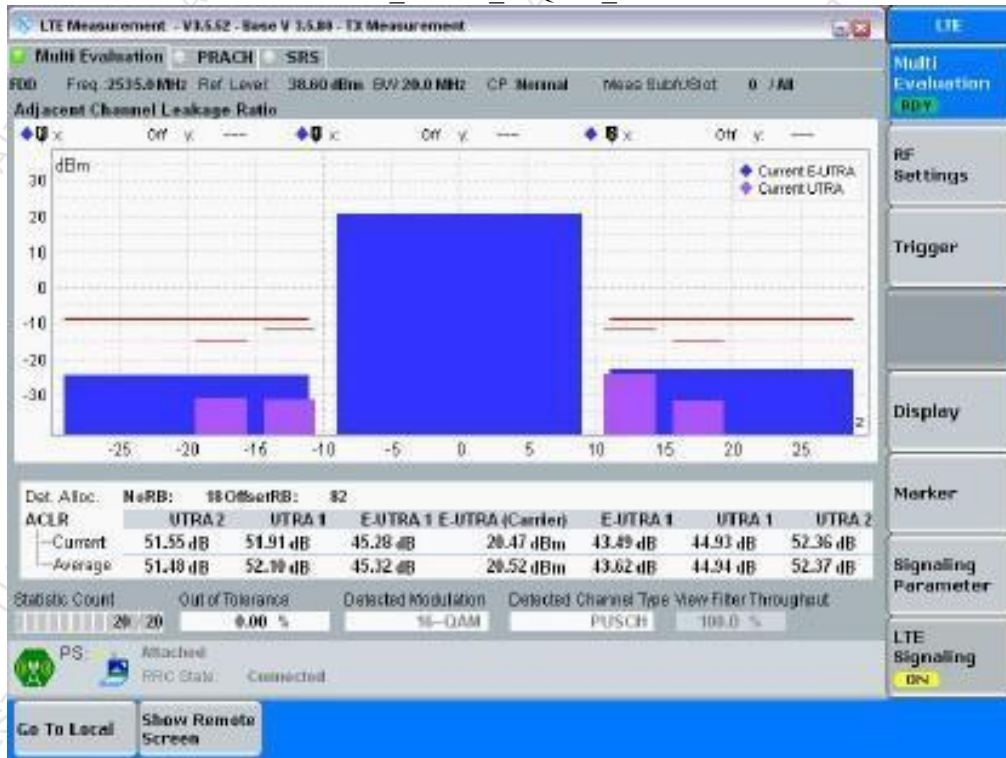


20 MHz_Middle_16QAM_RB18#0





20 MHz Middle 16QAM_RB18#82

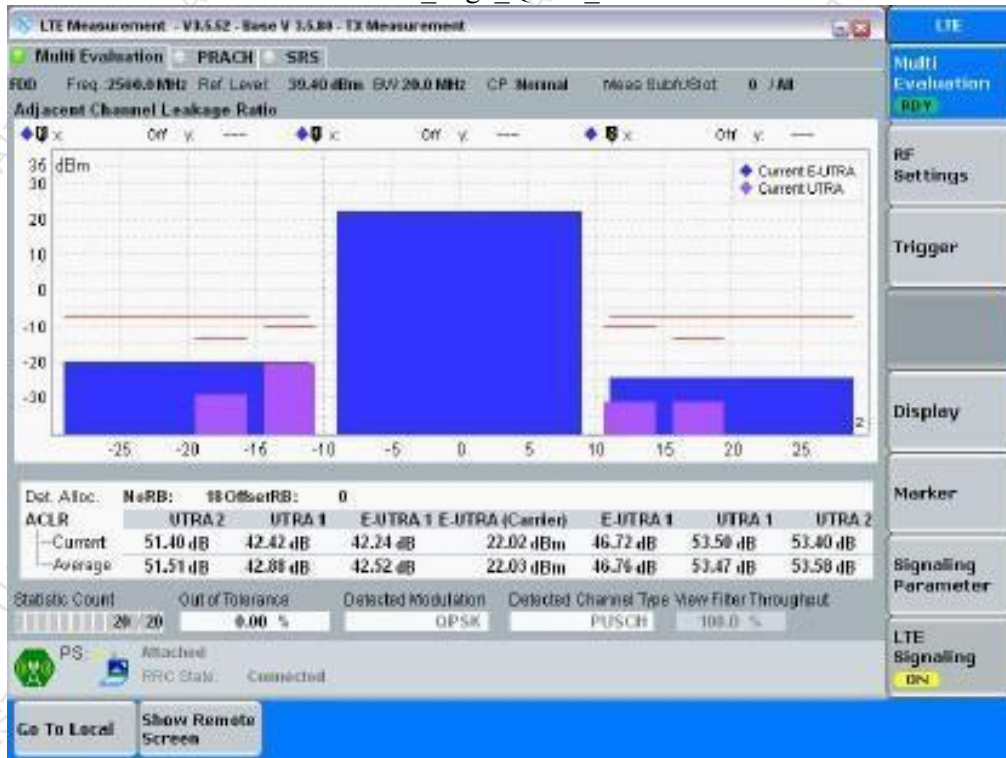


20 MHz Middle 16QAM_RB100#0

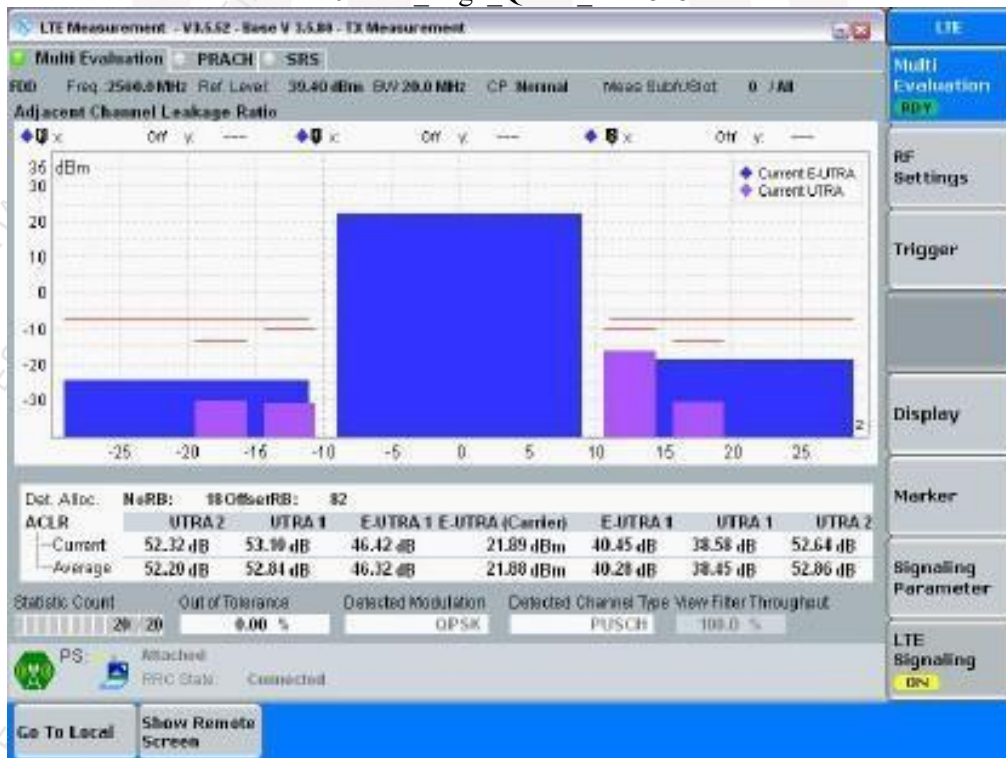




20 MHz_High_QPSK_RB18#0

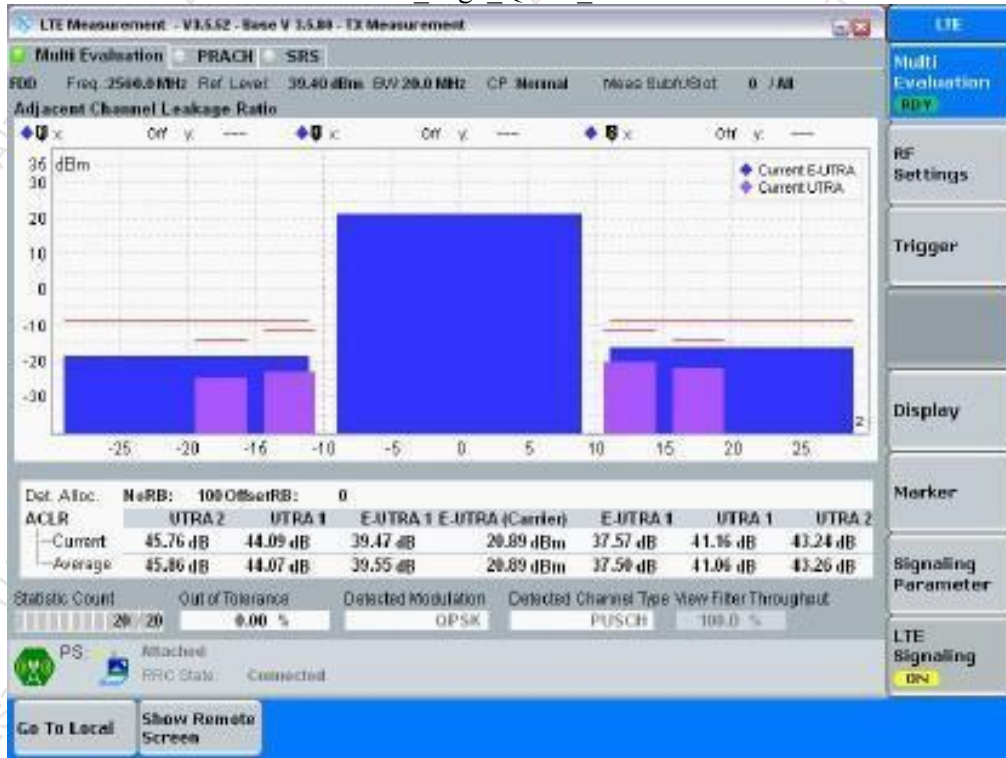


20 MHz_High_QPSK_RB18#82

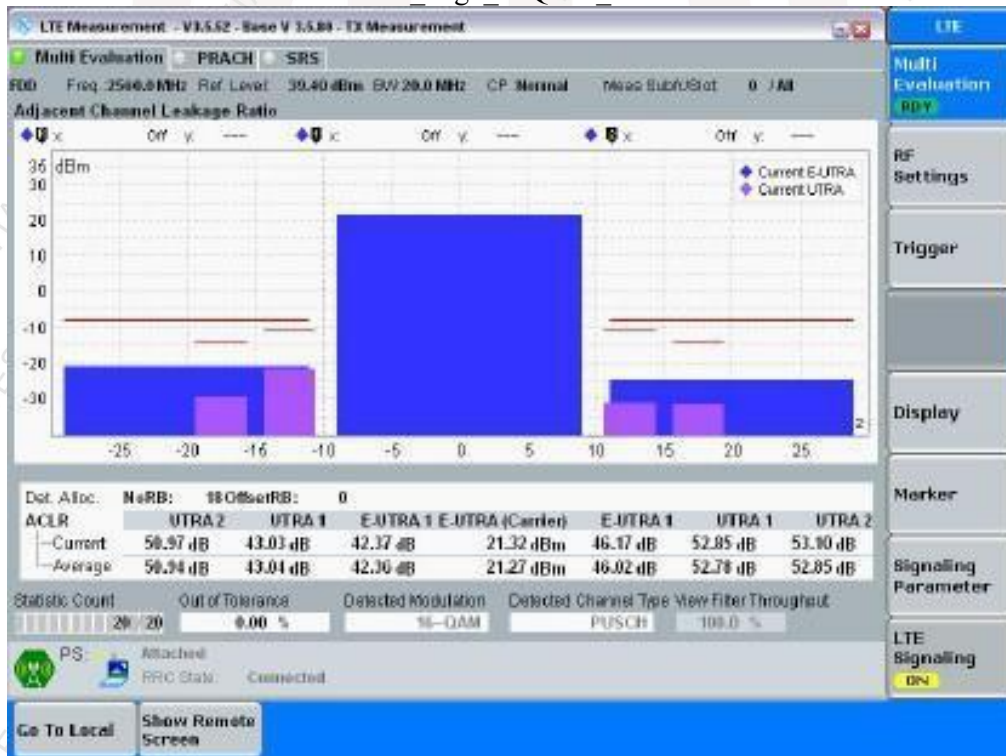




20 MHz_High_QPSK_RB100#0

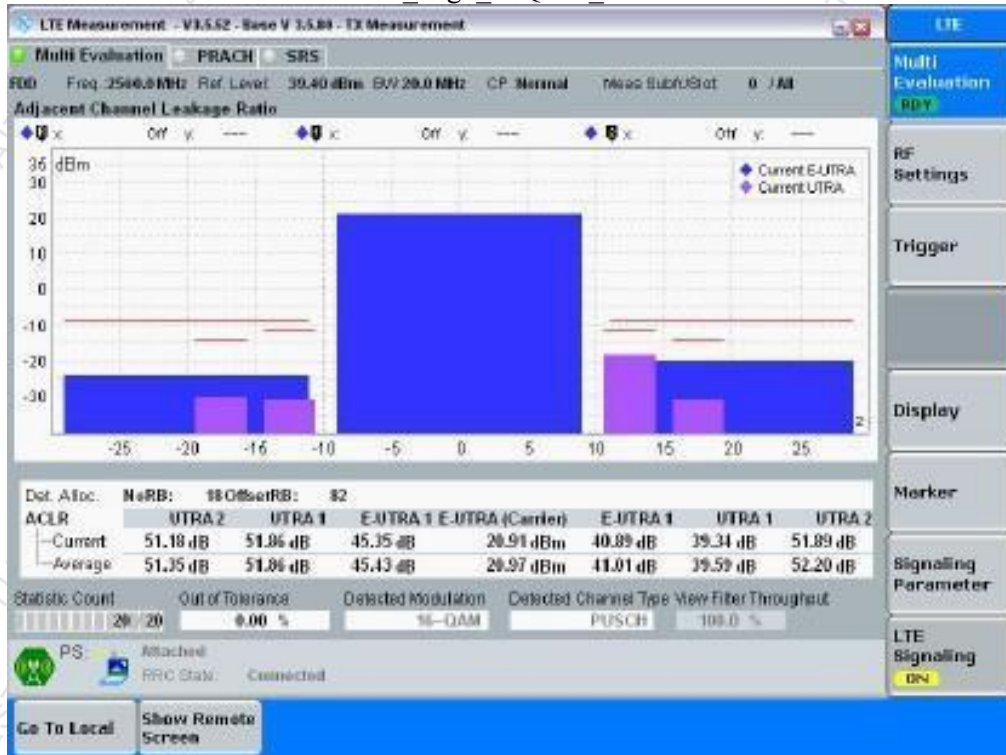


20 MHz_High_16QAM_RB18#0





20 MHz_High_16QAM_RB18#82



20 MHz_High_16QAM_RB100#0





4.1.13. Receiver Reference Sensitivity Level

Limit

The throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channels as specified in ETSI TS 136 521-1 [1], clauses A.2.2, A.2.3 and A.3.2 with parameters specified in table 4.2.12.5.2-1 and table 4.2.12.5.2-2.

Table 4.2.12.5.2-1: Reference sensitivity for FDD and TDD UE category M1 QPSK $P_{REFSENS}$

E-UTRA Band	REFSENS (dBm)	Duplex Mode
1	-101,5	FDD
3	-98,5	FDD
7	-95,5	FDD
8	-99,0	FDD
20	-99,0	FDD
28	-100,0	FDD
31	-95,8	FDD

NOTE 1: The transmitter shall be set to P_{UMAX} as defined in ETSI TS 136 521-1 [1], clause 6.2.5EA.
 NOTE 2: Reference measurement channel is specified in ETSI TS 136 521-1 [1], clause A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in ETSI TS 136 521-1 [1], clauses A.5.1.1 and A.5.2.1.
 NOTE 3: Void.
 NOTE 4: Void.
 NOTE 5: For cat M1 the same RF bandwidth applies for all applicable channel bandwidths as specified in ETSI TS 136 521-1 [1], table 5.4.2.1-1.
 NOTE 6: The reference receive sensitivity shall be met for an uplink transmission bandwidth less than or equal to 6 RB except for band 31. For band 31; in the case of 3 MHz channel bandwidth 5 RB applies and the UL resource blocks shall be located at $RB_{start} 9$. In case of 5 MHz channel bandwidth 5 RB applies and the UL resource blocks shall be located at $RB_{start} 10$.
 NOTE 7: The UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth.
 NOTE 8: These REFSENS levels are applicable only to 6 RB. OCNG shall be filled to entire channel bandwidth with the same PSD of REFSENS level in 6 RBs.

Table 4.2.12.5.2-2: Reference sensitivity for HD-FDD UE category M1 QPSK $P_{REFSENS}$

E-UTRA Band	REFSENS (dBm)	Duplex Mode
1	-102,3	HD-FDD
3	-99,3	HD-FDD
7	-100,3	HD-FDD
8	-99,8	HD-FDD
20	-99,8	HD-FDD
28	-100,8	HD-FDD
31	-96,6	HD-FDD

NOTE 1: The transmitter shall be set to P_{UMAX} as defined in ETSI TS 136 521-1 [1], clause 6.2.5EA.
 NOTE 2: Reference measurement channel is specified in ETSI TS 136 521-1 [1], clause A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in ETSI TS 136 521-1 [1], clauses A.5.1.1 and A.5.2.1.
 NOTE 3: Void.
 NOTE 4: Void.
 NOTE 5: For cat M1 the same RF bandwidth applies for all applicable channel bandwidths as specified in ETSI TS 136 521-1 [1], table 5.4.2-1.
 NOTE 6: These REFSENS levels are applicable only to 6 RB. OCNG shall be filled to entire channel bandwidth with the same PSD of REFSENS level in 6 RBs.

the reference receive sensitivity (REFSENS) requirement specified in table 4.2.12.5.2-1 and table 4.2.12.5.2-2 shall be met for an uplink transmission bandwidth less than or equal to that specified in ETSI TS 136 101 [3], table 7.3.1E-5.



Test Procedure

According to ETSI EN 301 908-13 V13.1.1 (2019-11) clause 5.3.11

Test Results

Please refer to following:

Band 1

Test Bandwidth	Test RB	Test Channel	Throughput (%)					Limits (%)
			Normal	TL/VL	TL/VH	TH/VL	TH/VH	
5M	15	Middle	95.45	95.32	95.44	95.42	95.27	≥95
	20		96.56	96.54	96.51	96.43	96.65	
	25		97.42	97.37	97.33	97.44	97.31	
20M	20		96.82	96.56	96.93	96.86	96.58	
	25		97.72	97.73	97.73	97.75	97.89	
	50		97.61	97.72	97.78	97.63	97.46	
	75		97.36	97.33	97.45	97.34	97.43	
	100		96.64	96.67	96.63	96.63	96.68	

Band 3

Test Bandwidth	Test RB	Test Channel	Throughput (%)					Limits (%)
			Normal	TL/VL	TL/VH	TH/VL	TH/VH	
1.4M	6	Middle	98.49	98.41	98.37	98.41	98.33	≥95
5M	15		95.61	95.51	95.57	95.47	95.67	
	20		96.59	96.61	96.57	96.49	96.55	
	25		97.48	97.36	97.36	97.46	97.36	
20M	20		96.88	96.86	96.90	96.88	96.98	
	25		97.76	97.70	97.76	97.74	97.84	
	50		97.68	97.78	97.74	97.68	97.76	
	75		97.33	97.33	97.41	97.31	97.41	
	100		96.62	96.66	96.60	96.60	96.66	



Band 5

Test Bandwidth	Test RB	Test Channel	Throughput (%)					Limits (%)
			Normal	TL/VL	TL/VH	TH/VL	TH/VH	
5M	15	Middle	95.12	95.87	95.25	95.22	95.15	≥95
	20		96.76	96.09	96.34	96.48	96.62	
	25		97.42	97.32	97.35	97.47	97.34	
20M	20		96.15	96.53	96.95	96.88	96.53	
	25		97.72	97.78	97.72	97.74	97.85	
	50		97.68	97.24	97.87	97.33	97.89	
	75		97.22	97.34	97.09	97.34	97.48	
	100		96.66	96.33	96.53	96.73	96.60	

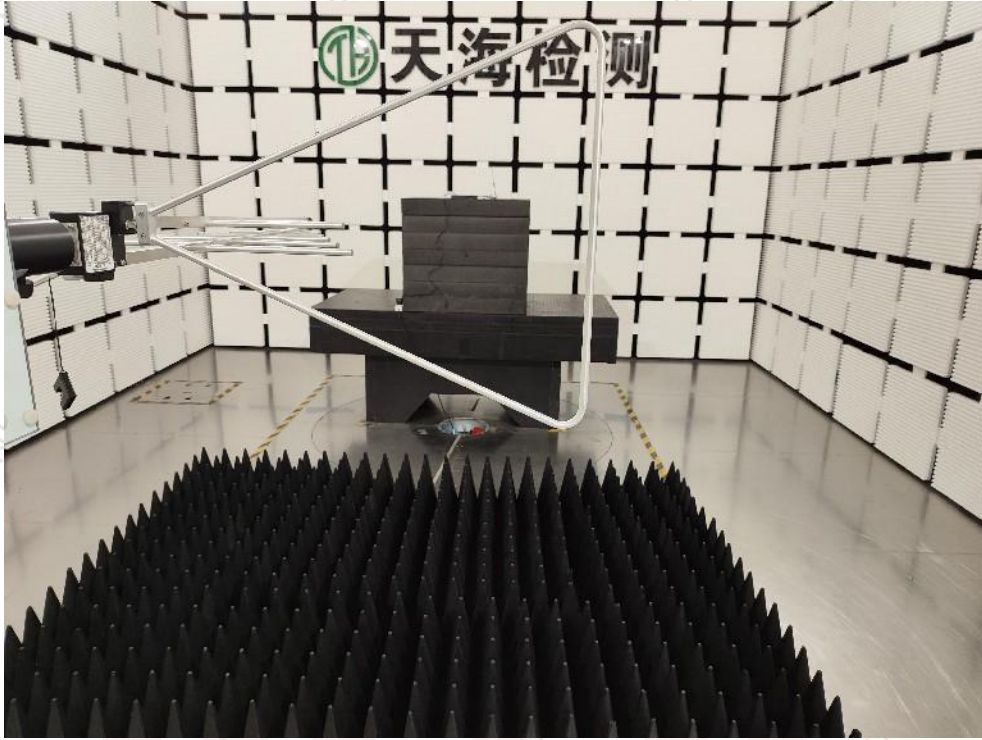
Band 8

Test Bandwidth	Test RB	Test Channel	Throughput (%)					Limits (%)
			Normal	TL/VL	TL/VH	TH/VL	TH/VH	
5M	15	Middle	95.13	95.82	95.26	95.29	95.12	≥95
	20		96.70	96.05	96.37	96.42	96.65	
	25		97.47	97.34	97.38	97.43	97.39	
20M	20		96.12	96.56	96.92	96.83	96.55	
	25		97.71	97.75	97.73	97.75	97.84	
	50		97.62	97.28	97.84	97.30	97.83	
	75		97.24	97.32	97.49	97.64	97.38	
	100		96.46	96.35	96.57	96.75	96.62	



5. Photographs of the test configuration

Emissions in the spurious (Below 1GHz)



Emissions in the spurious (Above 1GHz)





6. External and Internal Photos of the EUT

Reference to the test report No.: TH2403326-C05-R01.

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

