FCC Radio Test Report

FCC ID: QISB315S-22

This report concerns (check one): ☒**Original Grant** ☐**Class II Change**

Project No.	: 1602C003
Equipment	: LTE CPE
Model Name	: B315s-22
Applicant	: Huawei Technologies Co.,Ltd.
Address	: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen, 518129, P.R.C

Date of Receipt	: Feb. 02, 2016
Date of Test	: Feb. 02, 2016 ~ Feb. 25, 2016
Issued Date	: Feb. 26, 2016
Tested by	: BTL Inc.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-4-1602C003	Original Issue.	Feb. 26, 2016

1. CERTIFICATION

Equipment	:	LTE CPE
Brand Name	:	HUAWEI
Model Name	:	B315s-22
Applicant	:	Huawei Technologies Co.,Ltd.
Manufacturer	:	Huawei Technologies Co.,Ltd.
Address	:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen, 518129, P.R.C
Factory	:	Huawei Technologies Co.,Ltd.
Address	:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen, 518129, P.R.C
Date of Test	:	Feb. 02, 2016 ~ Feb. 25, 2016
Test Sample	:	Engineering Sample
Standard(s)	:	47 CFR FCC Part 27 47 CFR FCC Part 2 & ANSI/TIA-603-D-2010

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-4-1602C003) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

Test result included in this report is only for the LTE Band VII and Band XXXVIII approval part of the product.

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 27 & Part 2			
Standard(s) Section	Test Item	Judgment	Tested By
2.1047(d)	Modulation Characteristics	PASS	Robort Luo
2.1046(a) 27.50(d)(4)	Radiated RF Output	PASS	Allen Li
2.1049(h) 27.53(h)	99% Occupied Bandwidth	PASS	Allen Li
2.1051 27.53(h)	Spurious Emissions at Antenna Terminal	PASS	Allen Li
2.1053 27.53(h)	Spurious Radiated Emissions	PASS	Robort Luo
27.53(h)	Band Edge Emissions	PASS	Allen Li
2.1055 27.54	Frequency Stability	PASS	Allen Li
2.1046(d) 27.50(d)(5)	Peak to Average Ratio	PASS	Allen Li

NOTE:

(1)" N/A" denotes test is not applicable in this test report

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's test firm number for FCC: 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimatedfor tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

The reported uncertainty of measurement **y ±U**, where expanded uncertainty **U** is based on astandard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95**% ◦

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB	Note
DG-CB03 (3m)	CISPR	9KHz~30MHz	V	3.79	
		9KHz~30MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.78	
		200MHz ~ 1,000MHz	V	4.10	
		200MHz ~ 1,000MHz	H	4.06	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE CPE	
Brand Name	HUAWEI	
Model Name	B315s-22	
Model Difference	N/A	
Product Description	Operation Frequency	**LTE Band VII:** TX:2502.5MHz~2567.5MHz RX:2622.5MHz~2687.5MHz **LTE Band XXXVIII:** TX: 2570 MHz~2620 MHz RX: 2570 MHz~2620 MHz
	Modulation Type	QPSK;16QAM
	Bandwidth	5M/10M/15M/20M
	EIRP Output Power LTE Band VII	24.29 dBm
	EIRP Output Power LTE Band XXXVIII	21.65 dBm
Hardware Version	WL1B310I	
Softwarre Version	V100R001	
IMEI No.	86616902	
Power Source	DC voltage supplied from AC Adapter. Brand / Model: HUAWEI / HW-120100U6W	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

3.2 DESCRIPTION OF TEST MODES

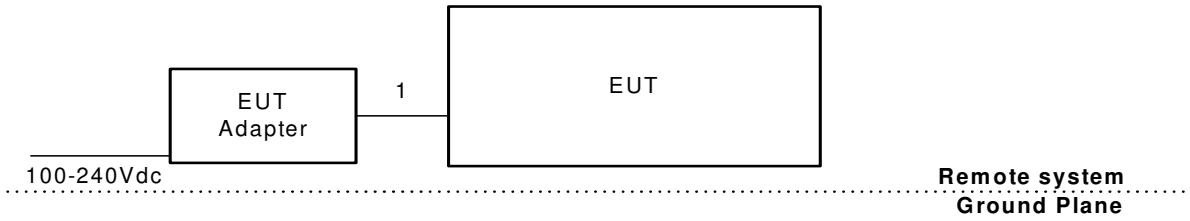
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Items	Worst TX Mode	Channel
Radiated RF Output	QPSK/16QAM	Lowest/Middle/Highest
Spurious Radiated Emissions	QPSK	Middle
Band Edge Emissions	QPSK/16QAM	Lowest/Highest
Frequency Stability	QPSK	Middle
99% Occupied Bandwidth	QPSK/16QAM	Lowest/Middle/Highest
Spurious Emissions at Antenna Terminal	QPSK	Lowest/Middle/Highest
Peak to Average Ratio	QPSK/16QAM	Middle

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
-	-	-	-	-	-	

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2m	Power Cable

4. TEST RESULT

4.1 RADIATEDRF OUTPUT POWER MEASUREMENT

4.1.1 LIMIT

The Radiated Peak Output Power shall be according to the specific rule Part 27.50(c)(9)& 27.50(d)(4)&27.50(h)(2) that “Mobile/Portable station are limited to 1 watts e.i.r.p.” and 27.50(c)(9)&27.50(d)(4)&27.50(h)(2) specifed that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.

4.1.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of the Spectrum Analyzer.

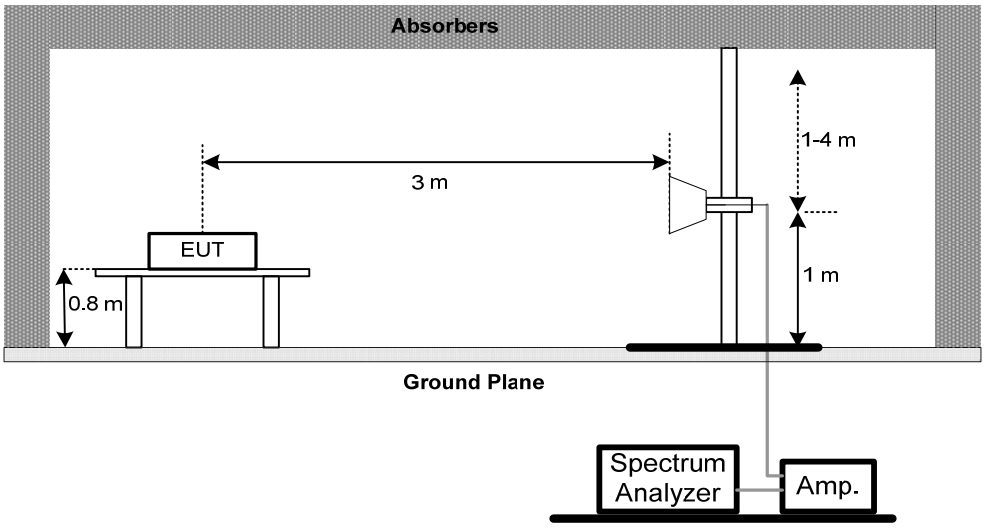
Spectrum Parameters	Setting
Attenuation	Auto
Center Frequency	Low / middle / high channels
Span Frequency	10MHz
RB / VB	3MHz / 3MHz for Peak

4.1.3 TEST PROCEDURE

EIRP/ERP:

1. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, GPRS & EDGE, 5MHz for WCDMA & CDMA, and 10MHz for LTE mode.
2. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
3. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of Integral, E.R.P power=E.I.P.R power-2.15dBi.

4.1.4 TESTSETUP LAYOUT
EIRP Power Measurement



4.1.5 TESTDEVIATION

There is no deviation with the original standard.

4.1.6 EUT OPERATIONDURING TEST

The BS simulator was used to set the TX channel and power level and modulate the TX signal.

4.1.7 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage:AC 120V/60Hz

4.1.8 TEST RESULTS

Please refer to the Attachment A.

4.2 99% OCCUPIED BANDWIDTH MEASUREMENT

4.2.1 LIMIT

According to FCC 27.53(h) specified that emission bandwidth is defined as thewidth of the signal between two points,one below the carrier center frequencyand one above the carrier center frequency,outside of which all emissionsare attenuated at least 26 dB below thetransmitter power.

4.2.2 MEASURING INSTRUMENTS AND SETTING

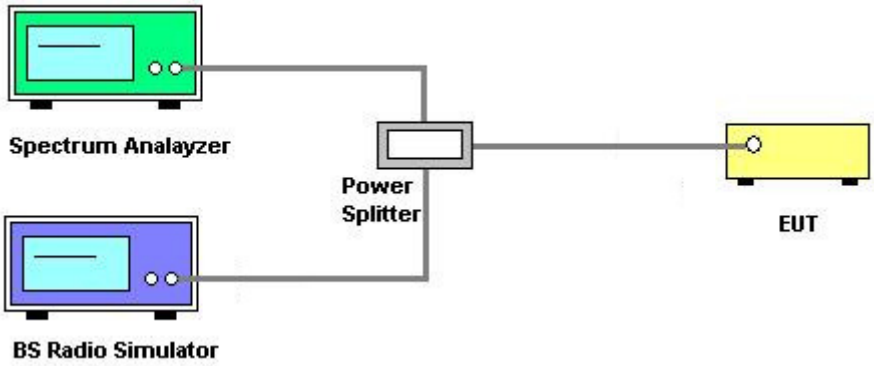
Please refer to section 5 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) ofthe signal
RB	30 kHz
VB	100 kHz
Trace	Max Hold

4.2.3 TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Used measurement function of spectrum to measure the 99% occupied bandwidth..

4.2.4 TESTSETUP LAYOUT



4.2.5 TESTDEVIATION

There is no deviation with the original standard.

4.2.6 EUT OPERATIONDURING TEST

The BS simulator was used to set the TX channel and power level and modulate the TX signal.

4.2.7 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: AC 120V/60Hz

4.2.8 TEST RESULTS

Please refer to the Attachment B.

4.3 SPURIOUS EMISSIONS AT ANTENNA TERMINALS MEASUREMENT

4.3.1 LIMIT

In the FCC 27.53(h)& RSS-199 section 4.6, on any frequency outside a licensee's frequency block within GSM spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. The limit translates in the relevant power range (1 to 0.001W). At 1W(Power Control Level 0) the specified minimum attenuation becomes 43dB and the limit of emission equal to –13dBm.

4.3.2 MEASURING INSTRUMENTS AND SETTING

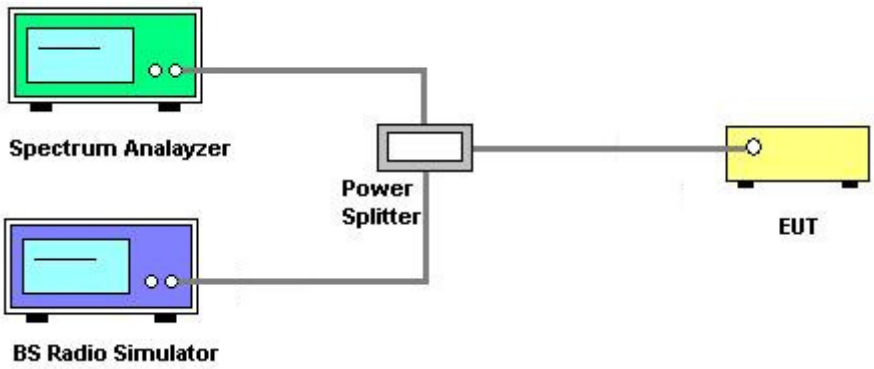
Please refer to section 5 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Start Frequency	30MHz
Stop Frequency	10th carrier harmonic
RB / VB	1 MHz / 1MHz for Peak

4.3.3 TEST PROCEDURES

1. The EUT was set up for the maximum peak power with QPSK link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, Lowest,Middle,Highest(low, middle and high operational frequency range.)
2. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 4.5dB in the transmitted path track.
3. When the spectrum scanned from 9kHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB/VB 1MHz.
4. When the spectrum scanned from 2.5GHz to 10th carrier harmonic, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB/VB 1MHz.

4.3.4TESTSETUP LAYOUT



4.3.5 TESTDEVIATION

There is no deviation with the original standard.

4.3.6 EUT OPERATIONDURING TEST

The BS simulator was used to set the TX channel and power level and modulate the TX signal.

4.3.7 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage:AC 120V/60Hz

4.3.8 TEST RESULTS

Please refer to the Attachment C.

4.4 SPURIOUS RADIATED EMISSIONS MEASUREMENT

4.4.1 LIMIT

In the FCC 27.53(h), On any frequency outside a licensee's frequency block within GSM spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. The limit translates in the relevant power range (1 to 0.001W). At 1W(Power Control Level 0) the specified minimum attenuation becomes 43dB and the limit of emission equal to –13dBm.At 0.001W(Power Control Level 15) the specified minimum attenuation becomes 13dB and the emission of limit equal to –13dBm.So the limit of emission is the same absolute specified line.

4.4.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Start Frequency	30 MHz
Stop Frequency	10th carrier harmonic
Detector	Positive Peak
Span	100 MHz
Sweep Time	1s
RB / VB	1 MHz / 1MHz
Attenuation	Positive Peak

4.4.3 TEST PROCEDURES

1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
3. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.4.4 TESTSETUP LAYOUT

This test setup layout is the same as that shown in **section 4.1.3.**

4.4.5 TESTDEVIATION

There is no deviation with the original standard.

4.4.6 EUT OPERATIONDURING TEST

The BS simulator was used to set the TX channel and power level and modulate the TX signal.

4.4.7 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: AC 120V/60Hz

4.4.8 TEST RESULTS

Please refer to the Attachment D.

4.5 BAND EDGE MEASUREMENT

4.5.1 LIMIT

According to FCC 27.53(h) specified that power of any emission outside of the authorized operating frequency rangesmust be attenuated below the transmitting power (P) by a factor of at least 43 +10 log(P) dB . In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. Then we measure that the bandwidth is about 300kHz and the resolution bandwidth is 3kHz.

4.5.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	5 MHz
RB / VB	10 kHz /30 kHz
Trace	Sample
Sweep Time	Auto

4.5.3 TEST PROCEDURES

1. The EUT was set up for the maximum peak power with QPSK link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels, Lowest and Highest(low and high operational frequency range.)
2. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. The splitter loss and cable loss are the worst loss 4dB in the transmitted path track.
3. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 10kHz and VB of the spectrum is 30KHz.
4. Record the Sample trace plot into the test report.

4.5.4 TESTSETUP LAYOUT

This test setup layout is the same as that shown in section 4.2.4.

4.5.5 TESTDEVIATION

There is no deviation with the original standard.

4.5.6 EUT OPERATIONDURING TEST

The BS simulator was used to set the TX channel and power level and modulate the TX signal.

4.5.7 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: AC 120V/60Hz

4.5.8 TEST RESULTS

Please refer to the Attachment E.

4.6 FREQUENCY STABILITY MEASUREMENT

4.6.1 LIMIT

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The frequency error rate is according to the JTC standard that the frequency error rate shall be accurate to within 0.1 ppm of the received frequency from the base station. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 2.1055(a)(1) –30℃~50℃.

4.6.2 MEASURING INSTRUMENTS AND SETTING

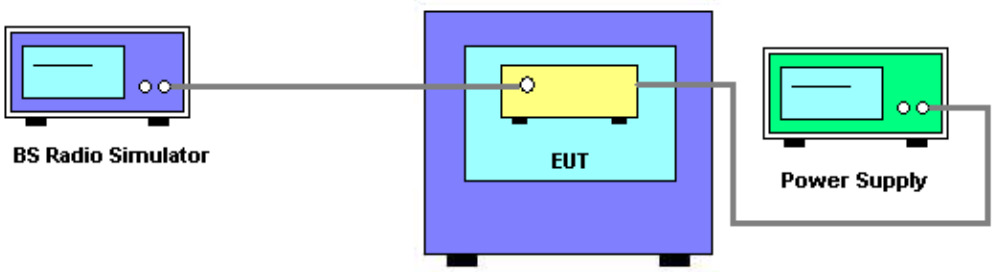
Please refer to section 5 in this report. The following table is the setting of the BS Simulator.

Spectrum Parameters	Setting
Frequency Error	The maximum of transmit frequency error

4.6.3 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the BS Simulator.
2. The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.
3. BS simulator used the frequency error function and measured the peak frequency error. Power must be removed when changingfrom one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
   The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. EUT is connected the external power supply to control the DC input power. The various Volts from the minimum 3.1 Volts to 4.3 Volts. Each step shall be record the frequency error rate.
5. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
6. Reduced operating temperature range of -10° ~ +45° C as defined in Operational description and declared in User Manual.

4.6.4 TESTSETUP LAYOUT



4.6.5 TESTDEVIATION

There is no deviation with the original standard.

4.6.6 EUT OPERATIONDURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

4.6.7 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: AC 120V/60Hz

4.6.8 TEST RESULTS

Please refer to the Attachment F.

4.7 PEAK TO AVERAGE RATIO

4.7.1 LIMIT

In the FCC 27.50) Peak transmit power shall be measured over any interval of continuous transmission using instrumen-tation calibrated in terms of rms-equivalent voltage.
The measurement results shall be properly adjusted for any instrument limitations, such as detector re-sponse times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.
To measure transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission shall not exceed 13 dB.

4.7.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth ⩾ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;

4.7.3 TESTSETUP LAYOUT

Please refer to section 3.4 in this report.

4.7.4 TESTDEVIATION

There is no deviation with the original standard.

4.7.5EUT OPERATIONDURING TEST

The BS simulator was used to set the TX channel and power level and modulate the TX signal.

4.7.6 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage:AC 120V/60Hz

4.7.7 TEST RESULTS

Please refer to the Attachment G.

5. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emission & ERP or EIRP Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 09, 2016
3	Receiver	AGILENT	N9038A	MY52130039	Oct. 11, 2016
4	Test Cable	emci	LMR-400(30MHz-1GHz)	C-01	Jun. 28, 2016
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	75789	Mar. 28, 2016
7	Test Cable	emci	EMC104-SM-SM-10000(1GHz－26.5GHz)	C-68	Jun. 28, 2016
8	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016
9	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016
10	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
11	wideband radio communication tester	R&S	CMW500	152372	Mar.30, 2016
12	HighPass Filter	Wairrwright Instruments Gmbh Gmbh	WHK 1.5/15G-10ST	11	Jul. 06, 2016
13	HighPass Filter	Wairrwright Instruments Gmbh	WHK 3.1/18G-10SS	24	Mar. 04, 2016
14	HighPass Filter	ZHPF-M1000-4000-1	WHK 1000-4000MHz	B2015073762	Aug. 05, 2016
15	HighPass Filter	ZHPF-M3-12.75G-3869	WHK 3000-12750MHz	B2015073763	Aug. 05, 2016
16	HighPass Filter	ZHPF-M6-18G-1727	WHK 6000-18000MHz	B2015073764	Aug. 05, 2016

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA SpectrumAnalyzer	Agilent	N9010A	MY50520044	Mar. 28, 2016
2	Wireless Communication Test Set	(8960 Series)Agilent	E5515C	MY48364183	Mar. 28, 2016
3	wideband radio communication tester	R&S	CMW500	152372	Mar.30, 2016
4	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Feb. 26, 2017
5	Test Cable	N/A	RG316	Cable4-001	Jul. 15, 2016
6	Test Cable	N/A	RG316	Cable4-002	Jul. 15, 2016

Band Edge Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA SpectrumAnalyzer	Agilent	N9010A	MY50520044	Mar. 28, 2016
2	Wireless Communication Test Set	(8960 Series)Agilent	E5515C	MY48364183	Mar. 28, 2016
3	wideband radio communication tester	R&S	CMW500	152372	Mar.30, 2016
4	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Feb. 26, 2017
5	Test Cable	N/A	RG316	Cable4-001	Jul. 15, 2016
6	Test Cable	N/A	RG316	Cable4-002	Jul. 15, 2016

99% Occupied Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA SpectrumAnalyzer	Agilent	N9010A	MY50520044	Mar. 28, 2016
2	Wireless Communication Test Set	(8960 Series)Agilent	E5515C	MY48364183	Mar. 28, 2016
3	wideband radio communication tester	R&S	CMW500	152372	Mar.30, 2016
4	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Feb. 26, 2017
5	Test Cable	N/A	RG316	Cable4-001	Jul. 15, 2016
6	Test Cable	N/A	RG316	Cable4-002	Jul. 15, 2016

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	wideband radio communication tester	R&S	CMW500	152372	Mar. 30, 2016
2	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Feb. 26, 2017
3	Test Cable	N/A	RG316	Cable4-001	Jul. 15, 2016
4	Const Temp. & Humidity Chamber	GIANT FORCE	ITH-225-20-S	IAB0309-001	Dec.04, 2016
5	DC power supply	GW Instek	GPC-3030DN	EK880675	Oct. 13, 2016

Peak to Average Ratio					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA SpectrumAnalyzer	Agilent	N9010A	MY50520044	Mar. 28, 2016
2	Wireless Communication Test Set	(8960 Series)Agilent	E5515C	MY48364183	Mar. 28, 2016
3	wideband radio communication tester	R&S	CMW500	152372	Mar.30, 2016
4	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Feb. 26, 2017
5	Test Cable	N/A	RG316	Cable4-001	Jul. 15, 2016
6	Test Cable	N/A	RG316	Cable4-002	Jul. 15, 2016

Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

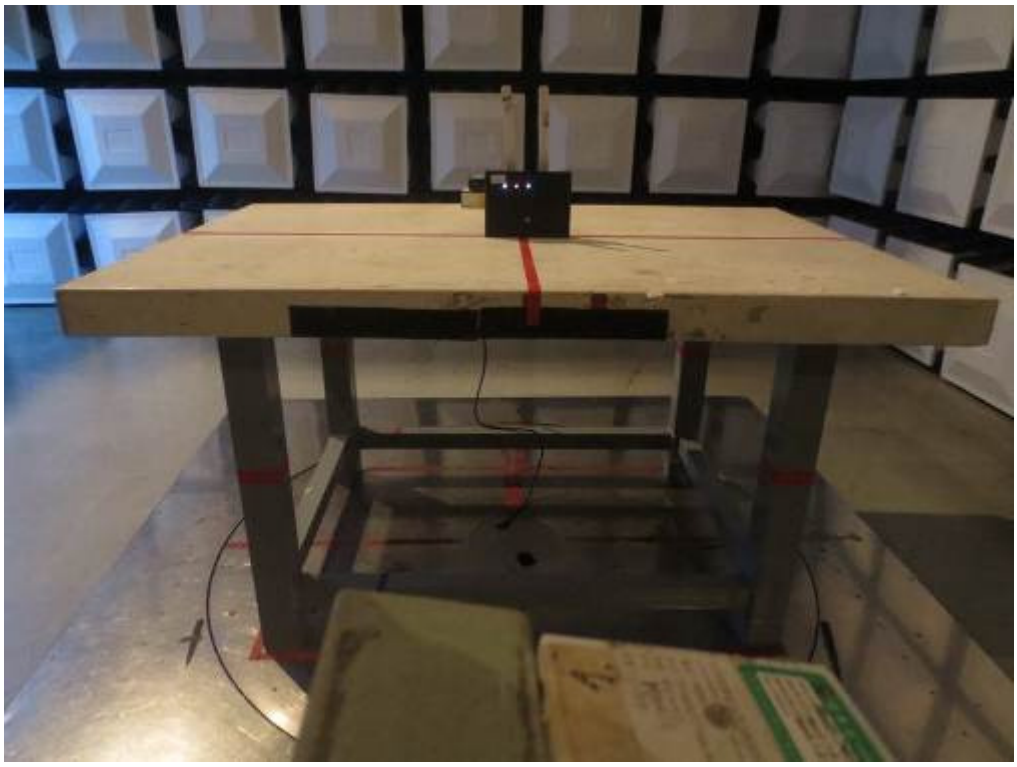
6. EUT TEST PHOTO

Radiated Measurement Photos
9KHz to 30MHz

Radiated Measurement Photos
30 MHz to 1000MHz

Radiated Measurement Photos
1GHz to 18GHz

Radiated Measurement Photos
18GHz to 26.5GHz



ATTACHMENTA -RADIATED RF OUTPUT POWER

Test Mode:	TX Mode

LTE Band VII				Radiated Power (dBm)			Max. Limit (dBm)	Result
BW	Modulation	RB Size	V/H	Lowest	Middle	Highest		
5M	QPSK	1RB	V	9.75	14.77	8.55	33	Complies
5M			H	3.81	7.09	4.80	33	Complies
20M			V	23.28	20.35	21.88	33	Complies
20M			H	18.20	18.44	18.94	33	Complies
5M	16-QAM	1RB	H	9.54	14.12	13.54	33	Complies
10M			H	12.52	11.85	11.83	33	Complies
15M			H	24.29	21.02	21.89	33	Complies
20M			H	18.54	19.06	18.80	33	Complies

LTE Band XXXVIII				Radiated Power (dBm)			Max. Limit (dBm)	Result
BW	Modulation	RB Size	V/H	Lowest	Middle	Highest		
5M	QPSK	1RB	V	17.02	16.27	18.00	33	Complies
5M			H	14.88	14.57	14.63	33	Complies
20M			V	19.92	19.02	20.28	33	Complies
20M			H	18.06	17.58	18.43	33	Complies
5M	16-QAM	1RB	H	20.44	20.41	21.65	33	Complies
10M			H	18.29	18.13	19.62	33	Complies
15M			H	18.18	16.76	18.38	33	Complies
20M			H	15.46	15.20	15.25	33	Complies

Test Mode:	TX Mode LTE Band VII

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
5MHz	QPSK	1	21.06	21.73	21.10
		1	21.94	22.50	21.61
		1	21.47	21.81	21.01
		12	20.99	21.62	20.89
		12	21.34	21.85	21.07
		12	21.26	21.86	20.99
		25	21.13	21.72	20.96
	16-QAM	1	20.68	21.28	20.95
		1	21.64	22.01	21.43
		1	21.21	21.34	20.83
		12	20.14	20.52	20.06
		12	20.60	20.74	20.27
		12	20.53	20.76	20.21
		25	20.38	20.84	20.18

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
10MHz	QPSK	1	21.28	22.02	21.45
		1	22.50	22.76	21.91
		1	21.55	21.67	20.72
		25	21.31	21.70	21.06
		25	21.80	21.97	21.16
		25	21.63	21.78	21.03
		50	21.69	21.78	21.26
	16-QAM	1	21.04	21.81	21.10
		1	22.20	22.53	21.58
		1	21.05	21.33	20.28
		25	20.35	20.76	20.17
		25	20.83	21.04	20.30
		25	20.60	20.83	20.18
		50	20.72	20.83	20.37

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
15MHz	QPSK	1	21.58	22.15	22.12
		1	22.40	22.64	21.91
		1	21.70	22.10	21.07
		36	21.43	21.78	21.32
		36	21.56	21.88	21.36
		36	21.58	21.90	21.15
		75	21.70	21.83	21.54
	16-QAM	1	21.35	21.95	21.72
		1	22.11	22.21	21.55
		1	21.41	21.66	20.74
		36	20.49	20.69	20.23
		36	20.56	20.79	20.28
		36	20.57	20.78	20.12
		75	20.70	20.70	20.49

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
20MHz	QPSK	1	21.54	22.09	22.25
		1	22.22	22.24	21.65
		1	21.67	21.84	21.00
		50	21.36	21.68	21.29
		50	21.51	21.62	21.19
		50	21.65	21.74	20.99
		100	21.68	21.61	21.38
	16-QAM	1	21.34	21.77	22.03
		1	21.87	22.12	21.49
		1	21.43	21.65	20.72
		50	20.16	20.77	20.47
		50	20.32	20.73	20.38
		50	20.51	20.86	20.21
		100	20.47	20.79	20.56

Test Mode:	TX Mode LTE Band XXXVIII

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
5MHz	QPSK	1	21.70	22.38	22.06
		1	22.51	23.17	22.56
		1	22.01	22.50	21.82
		12	21.72	22.20	21.92
		12	22.04	22.54	22.35
		12	21.96	22.18	22.29
		25	21.82	22.30	22.14
	16-QAM	1	21.47	22.39	21.84
		1	22.25	23.41	22.63
		1	21.64	22.78	21.89
		12	20.66	21.80	21.26
		12	20.97	21.83	21.39
		12	20.97	21.71	21.33
		25	20.76	21.51	21.12

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
10MHz	QPSK	1	21.82	22.28	22.25
		1	22.66	23.24	22.78
		1	21.63	22.03	21.64
		25	21.63	22.02	21.82
		25	21.86	22.29	22.00
		25	21.87	22.13	21.73
		50	21.86	21.92	21.78
	16-QAM	1	21.42	22.07	22.19
		1	22.39	22.99	22.69
		1	21.35	21.82	21.48
		25	20.44	21.34	21.14
		25	20.77	21.61	21.30
		25	20.78	21.43	21.03
		50	20.79	21.26	21.10

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
15MHz	QPSK	1	22.20	23.01	23.34
		1	22.66	23.38	23.16
		1	22.08	22.91	22.25
		36	21.91	22.56	22.31
		36	22.16	22.67	22.48
		36	22.25	22.59	22.10
		75	22.26	22.56	22.38
	16-QAM	1	22.13	22.60	22.84
		1	22.51	22.99	22.62
		1	22.26	22.53	22.03
		36	21.01	21.64	21.49
		36	21.26	21.74	21.55
		36	21.11	21.65	21.17
		75	21.16	21.57	21.42

Bandwidth	Modulation	RB size	Conducted Power		
			Lowest	Middle	Highest
20MHz	QPSK	1	22.62	23.19	23.64
		1	22.68	23.42	23.21
		1	22.94	23.25	22.71
		50	22.43	22.60	22.63
		50	22.30	22.49	22.51
		50	22.42	22.68	22.38
		100	22.52	22.63	22.63
	16-QAM	1	22.49	22.87	23.29
		1	22.63	23.14	22.80
		1	22.78	23.01	22.60
		50	21.57	21.90	21.85
		50	21.45	21.80	21.74
		50	21.77	21.68	21.60
		100	21.57	21.93	21.92

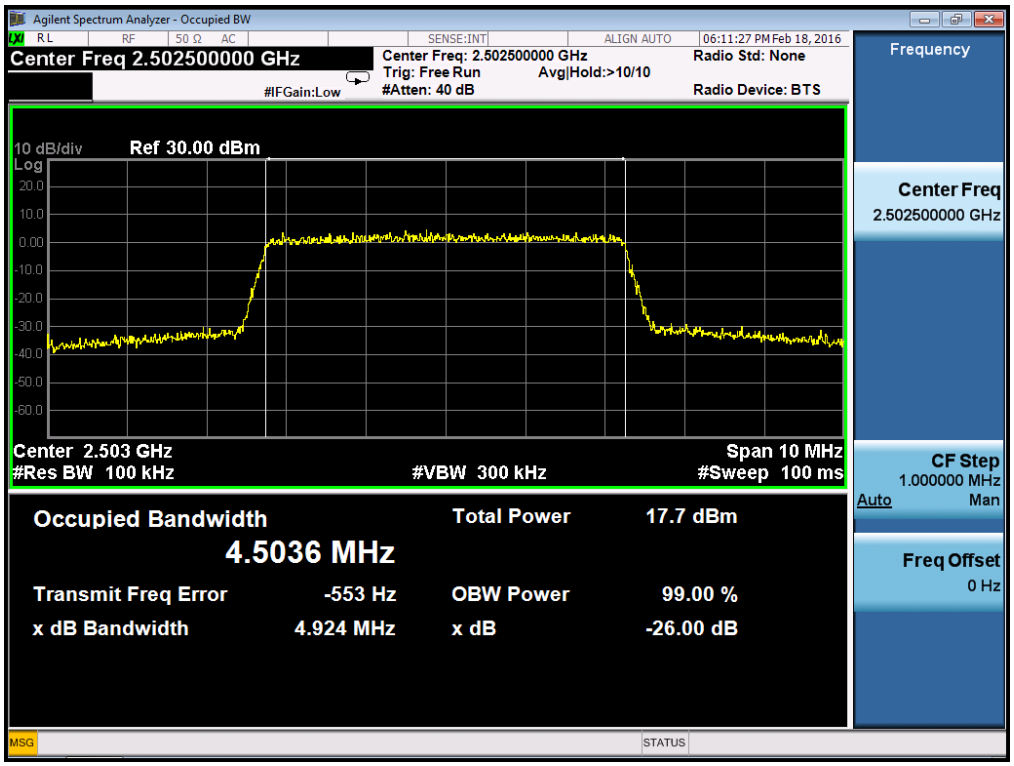
REMARKS:

1. Radiated Output Power(dBm)=Raw Value(dBm) + Correction Factor(dB) +Ant Gain(dBi)
2. Correction Factor(dB) = Power SplitterLoss(dB) + Cable Loss(dB)
3. The antenna gain is 4 dBi
4. Tests have been conducted for both vertical and horizontal plane and the worst case was found in horizontal plane and the results were selected and recorded in the report

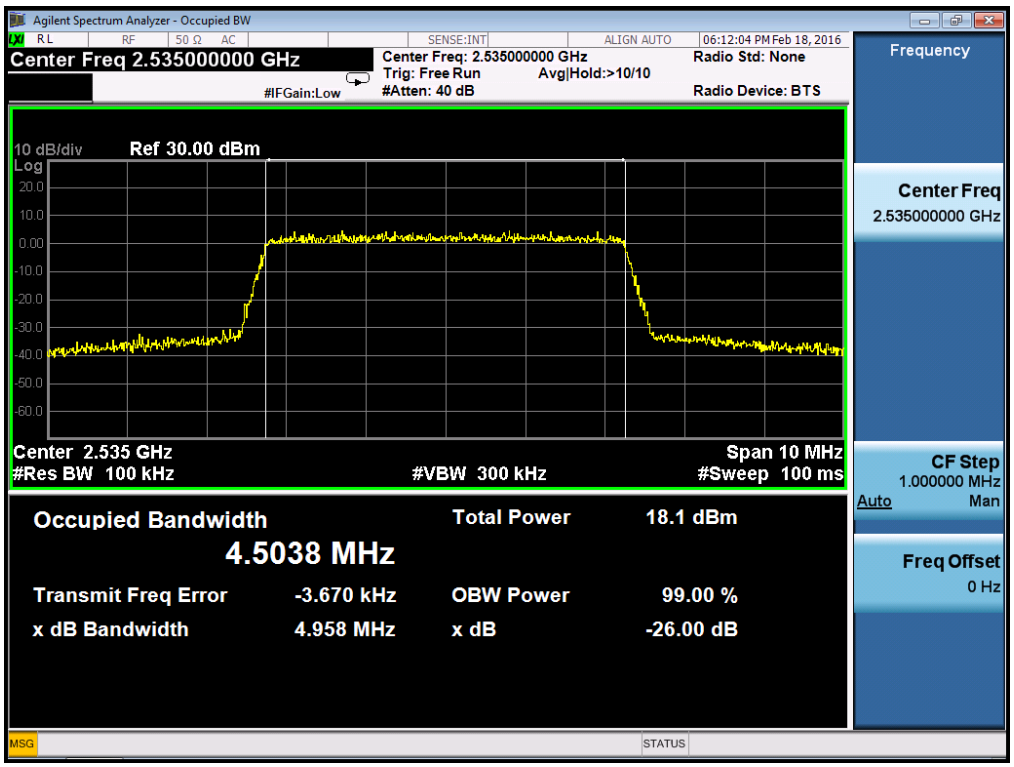
ATTACHMENT B - 99% OCCUPIED BANDWIDTH

Test Mode : LTE Band VII TX Mode ConfigurationQPSK-5M/25RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	4.504	4.924	**Complies**
Middle	4.504	4.958	**Complies**
Highest	4.497	4.934	**Complies**

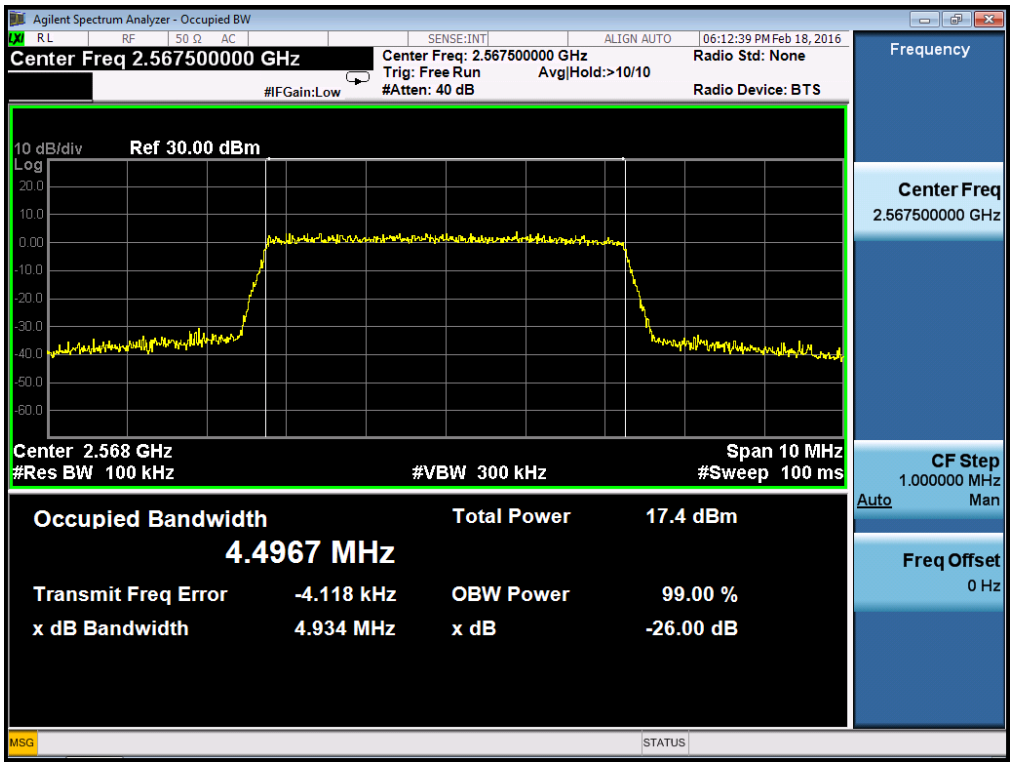
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

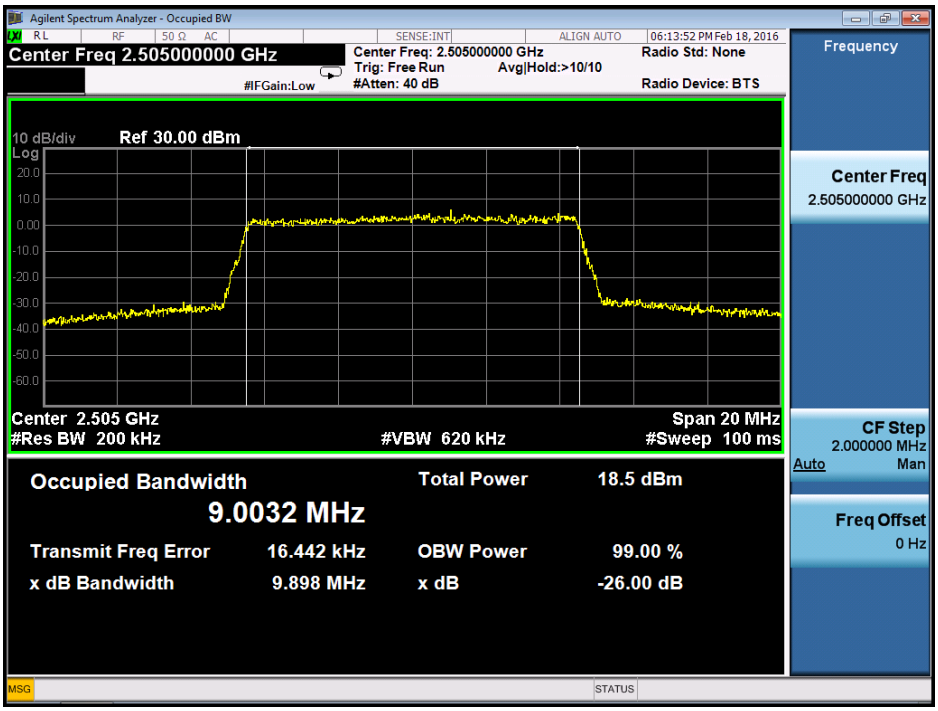


99% Occupied Bandwidth channel Highest



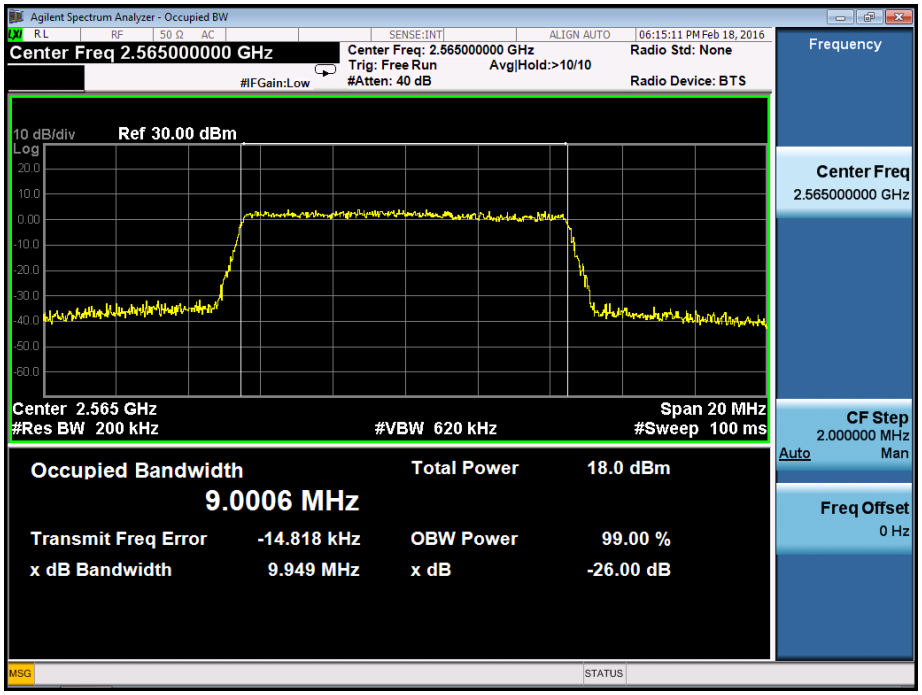
Test Mode : LTE Band VII TX Mode ConfigurationQPSK-10M/50RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	9.003	9.888	**Complies**
Middle	9.000	9.935	**Complies**
Highest	9.000	9.949	**Complies**

99% Occupied Bandwidth channel Lowest



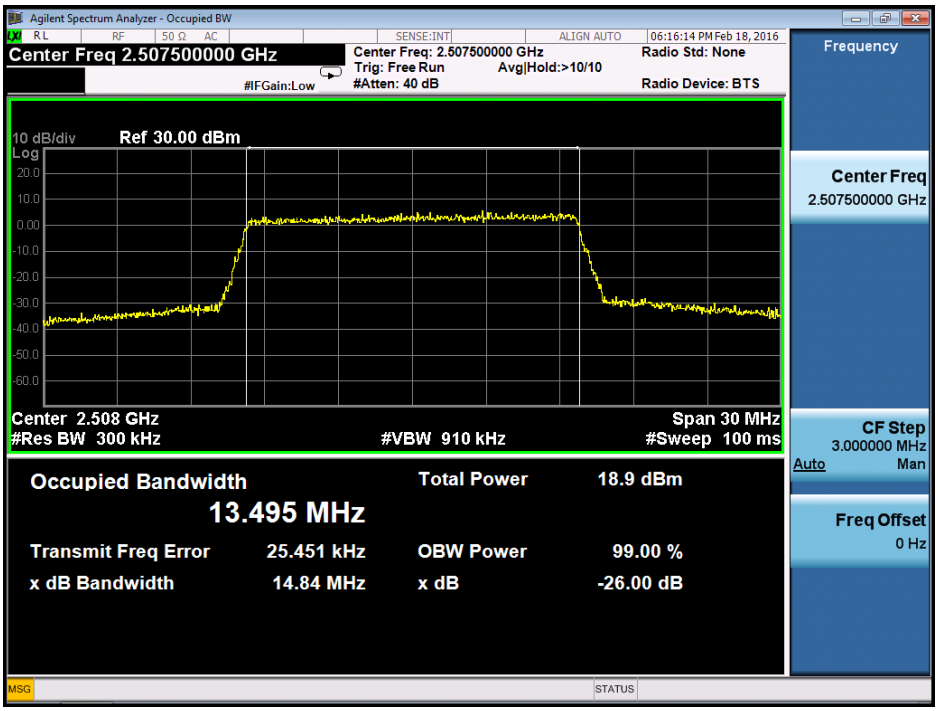
99% Occupied Bandwidth channel Middle

99% Occupied Bandwidth channel Highest

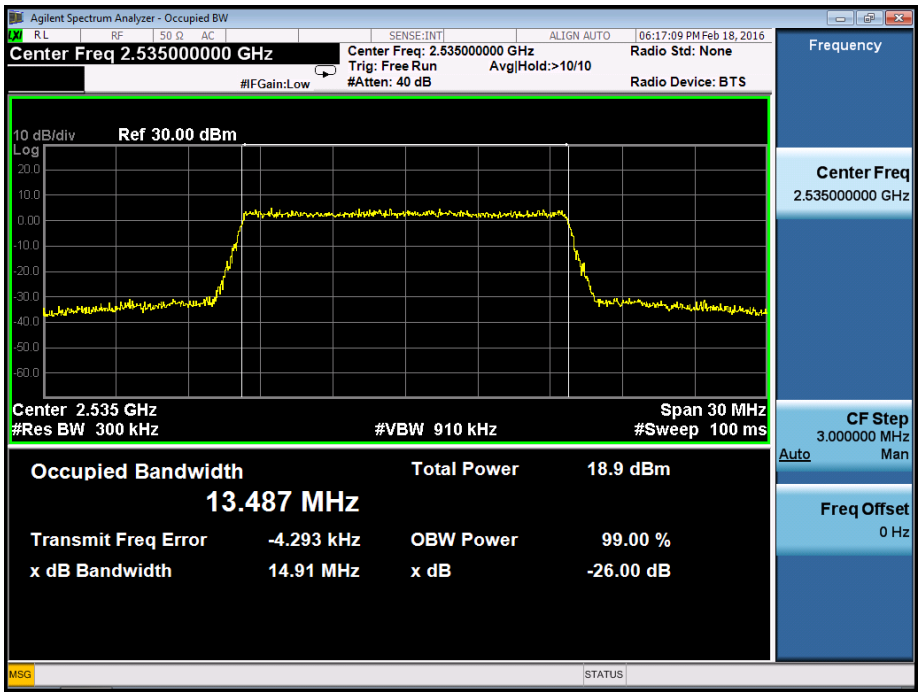


Test Mode : LTE Band VII TX Mode ConfigurationQPSK-15M/75RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	13.495	14.840	**Complies**
Middle	13.487	14.910	**Complies**
Highest	13.476	14.890	**Complies**

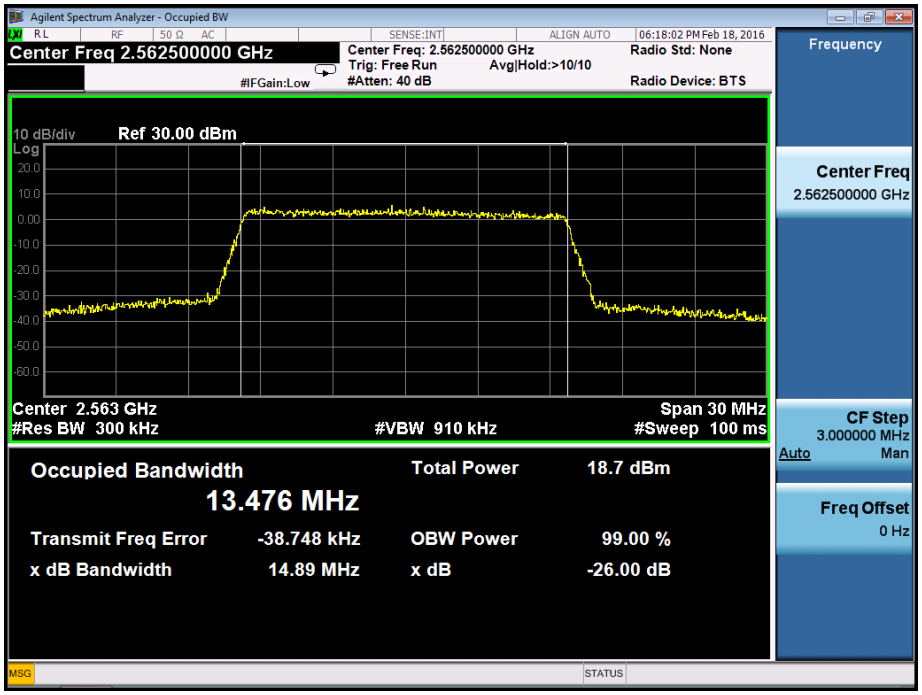
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

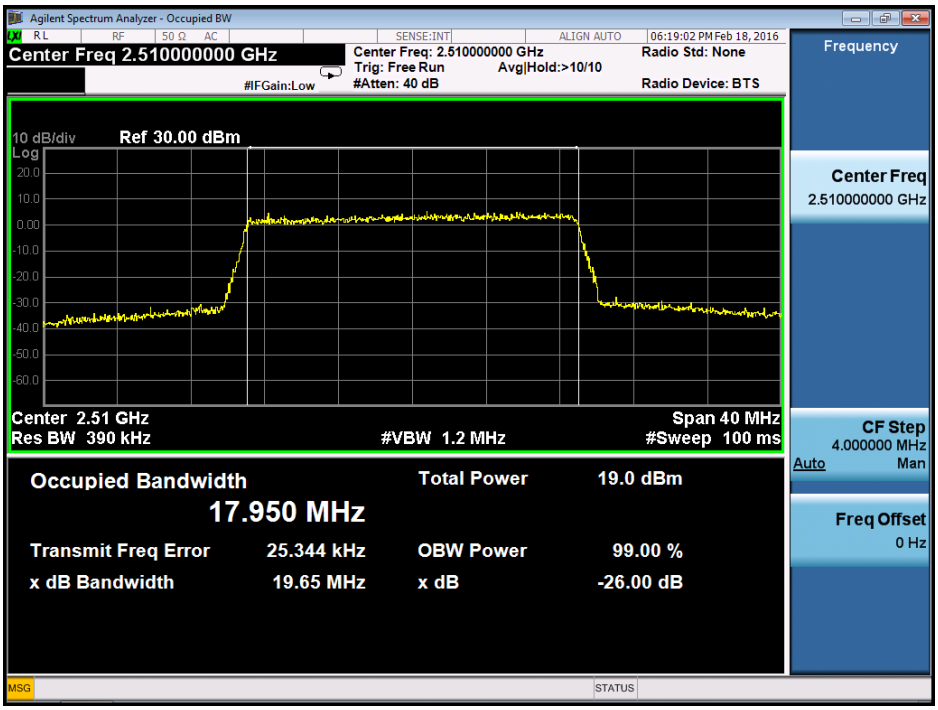


99% Occupied Bandwidth channel Highest

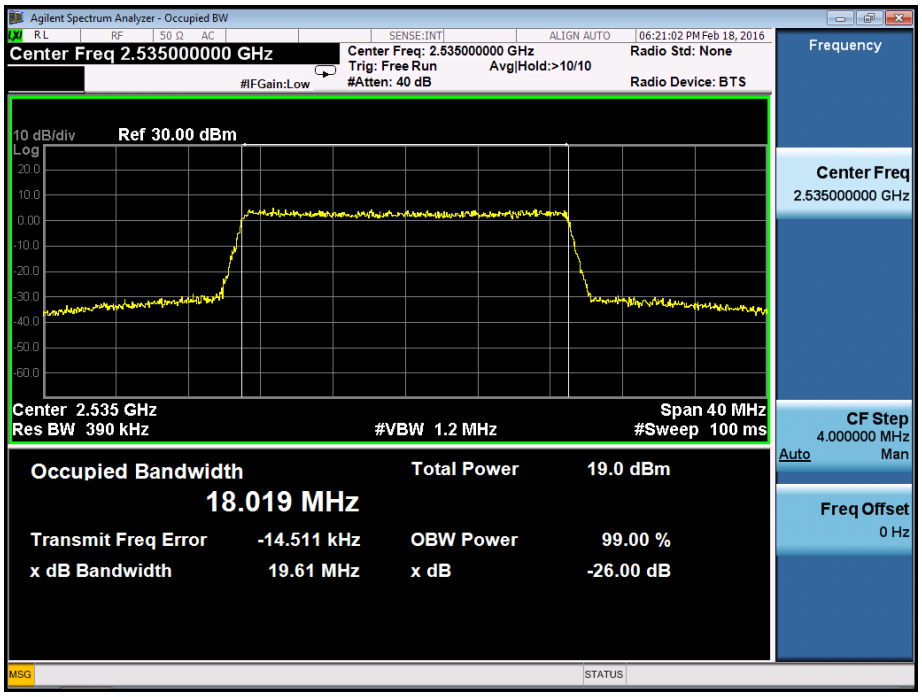


Test Mode : LTE Band VII TX Mode ConfigurationQPSK-20M/100RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	17.950	19.650	**Complies**
Middle	18.019	19.610	**Complies**
Highest	17.928	19.720	**Complies**

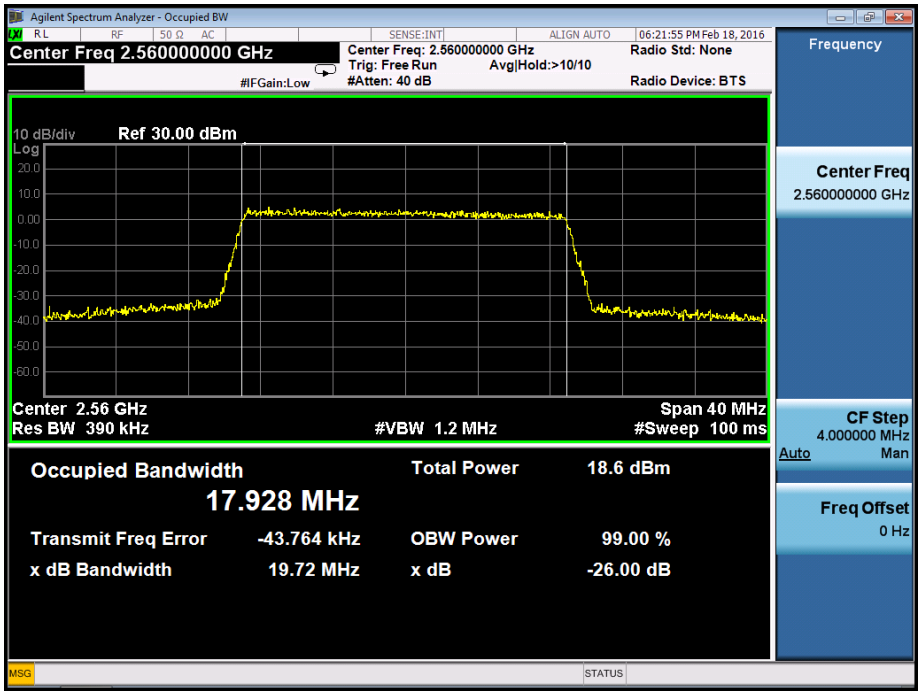
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

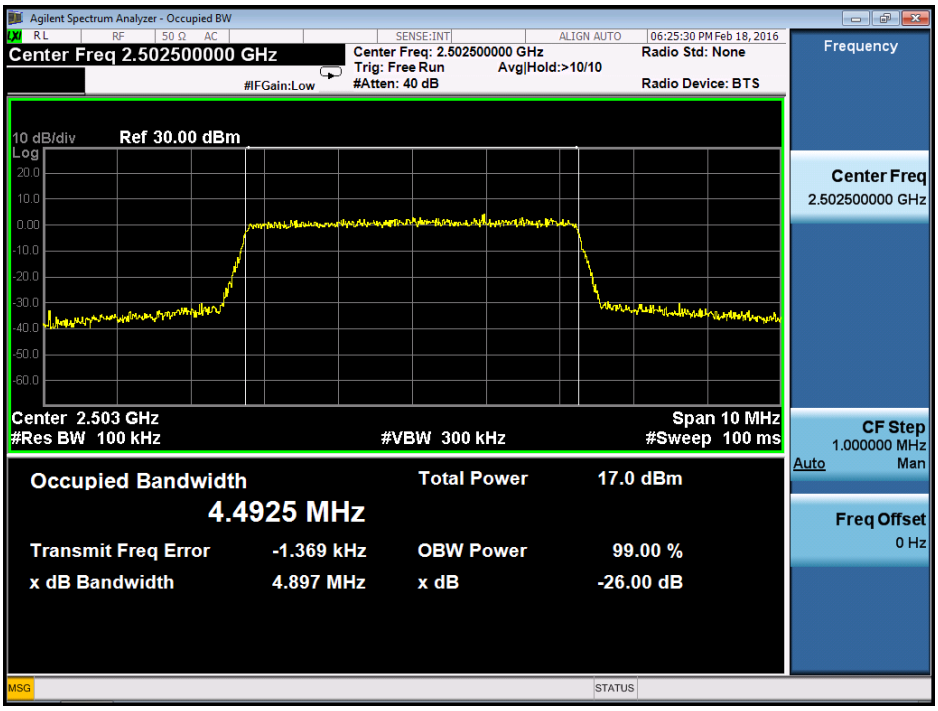


99% Occupied Bandwidth channel Highest

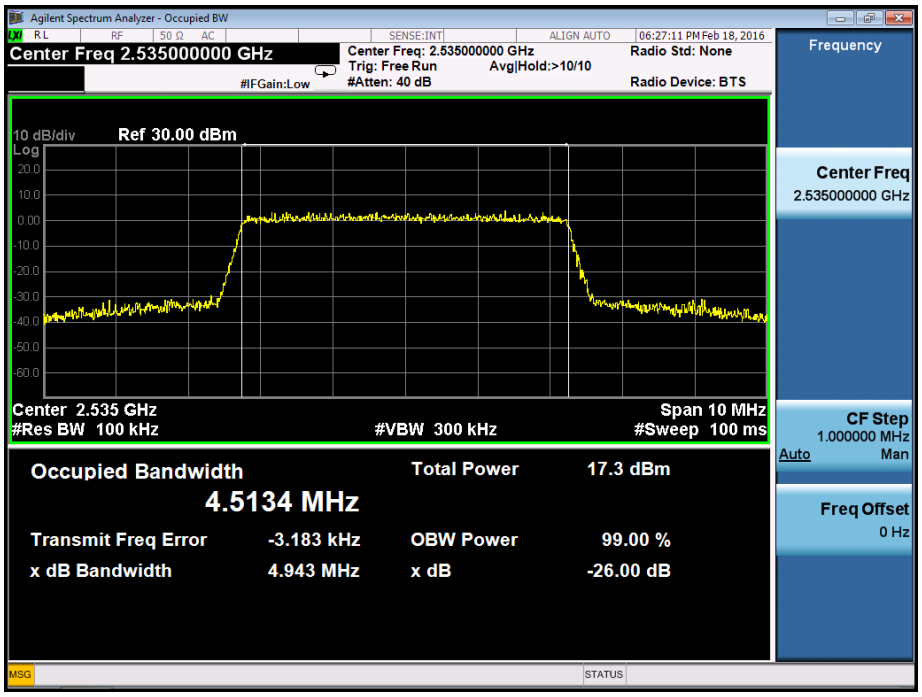


Test Mode : LTE Band VII TX Mode Configuration16-QAM-5M//25RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	4.493	4.897	**Complies**
Middle	4.513	4.943	**Complies**
Highest	4.490	4.932	**Complies**

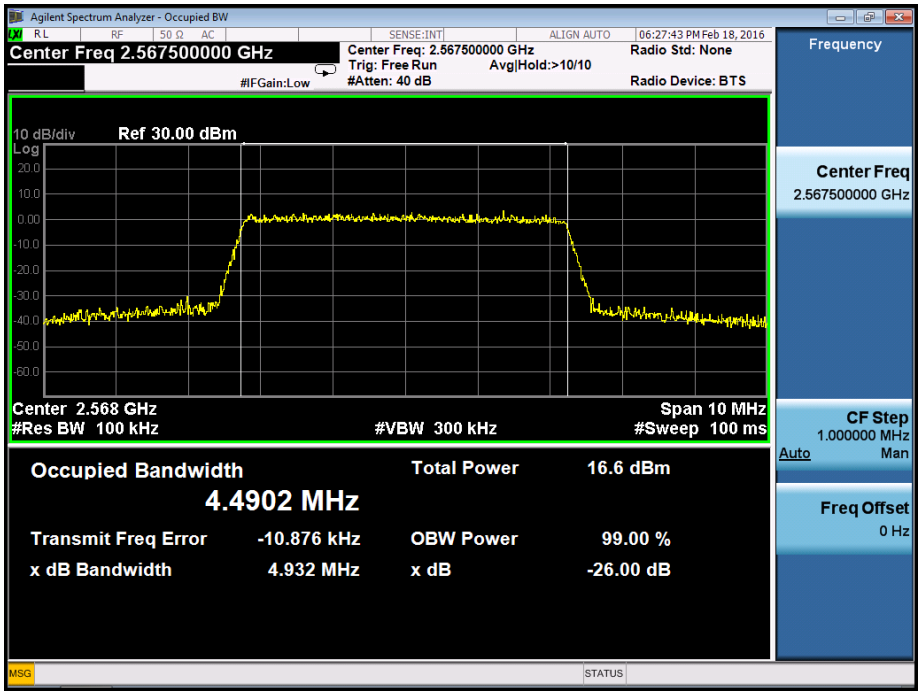
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

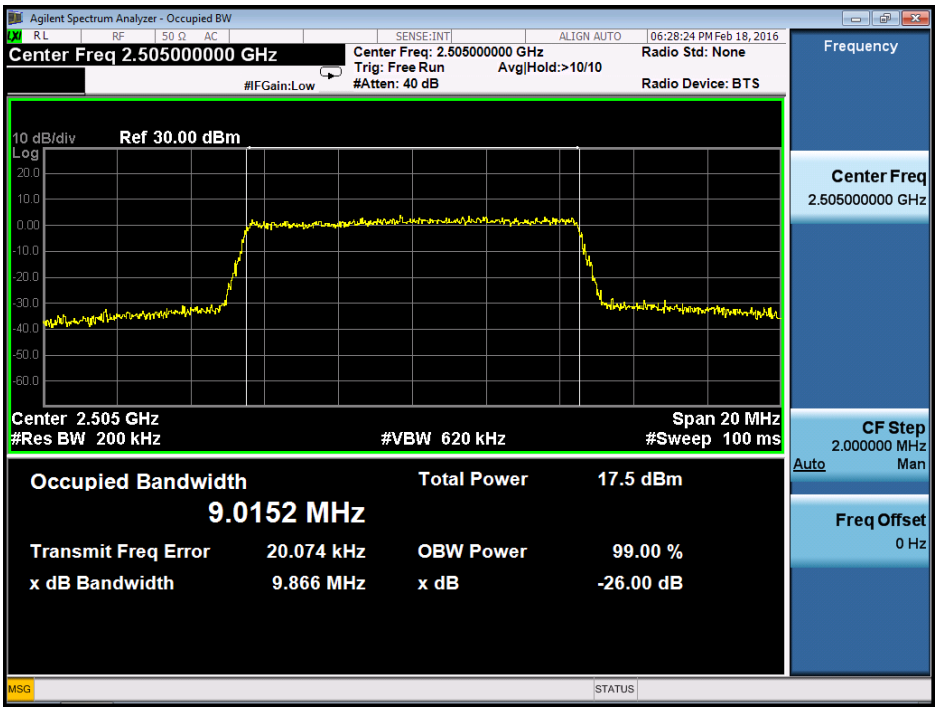


99% Occupied Bandwidth channel Highest



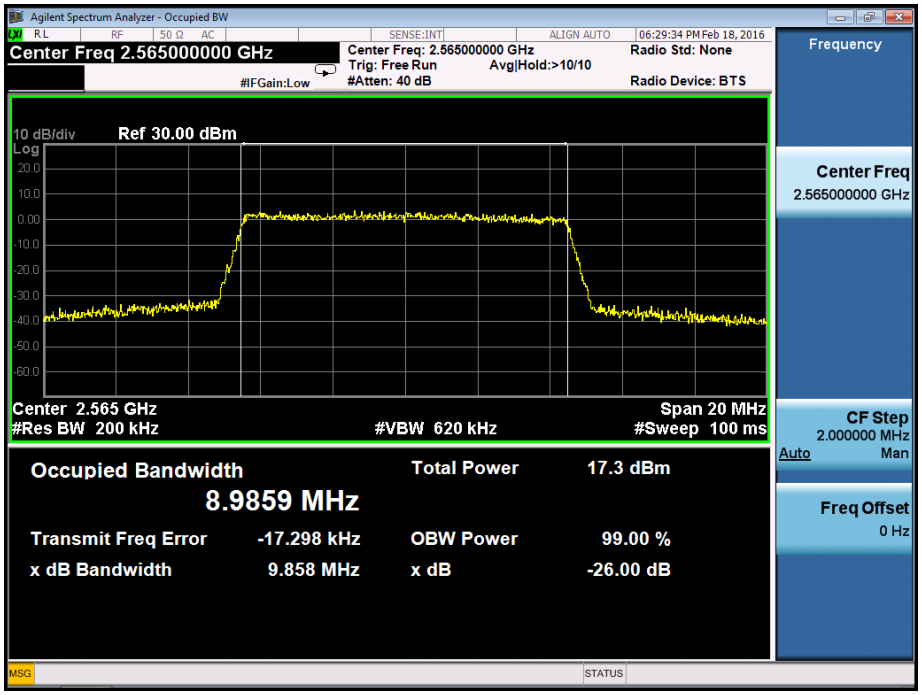
Test Mode : LTE Band VII TX Mode Configuration16-QAM-10M/50RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	9.015	9.866	**Complies**
Middle	9.009	9.931	**Complies**
Highest	9.986	9.858	**Complies**

99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

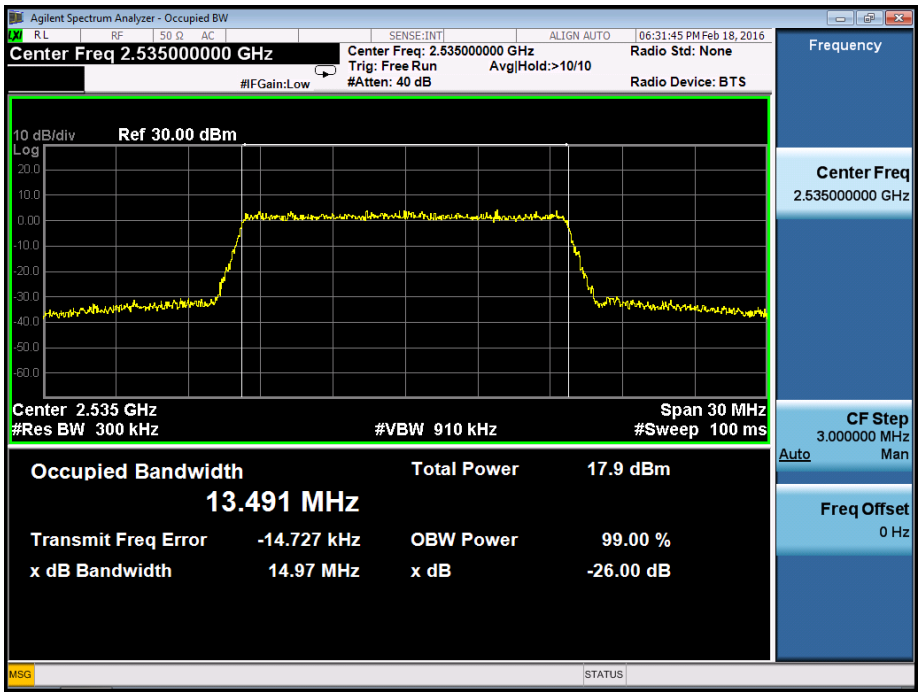
99% Occupied Bandwidth channel Highest



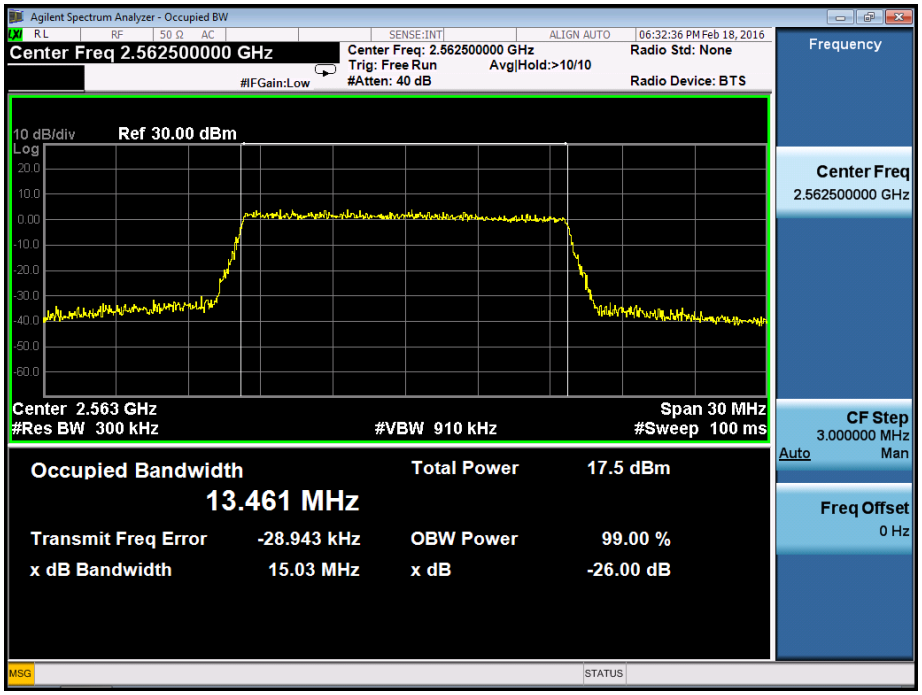
Test Mode : LTE Band VII TX Mode Configuration16-QAM-15M/75RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	13.489	14.910	**Complies**
Middle	13.491	14.970	**Complies**
Highest	13.461	15.030	**Complies**

99% Occupied Bandwidth channel Lowest

99% Occupied Bandwidth channel Middle

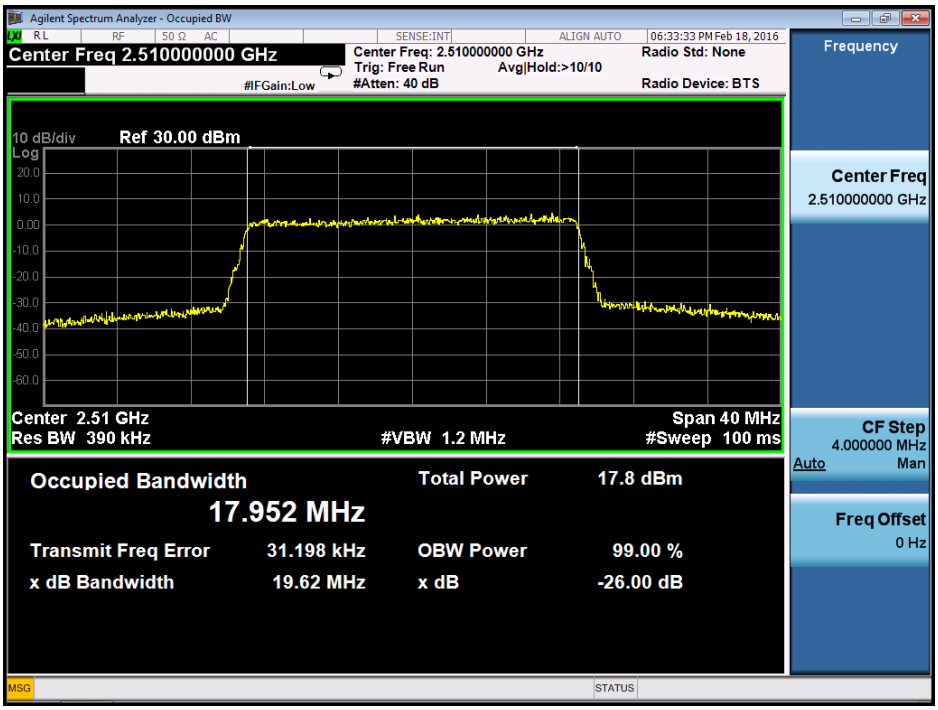


99% Occupied Bandwidth channel Highest

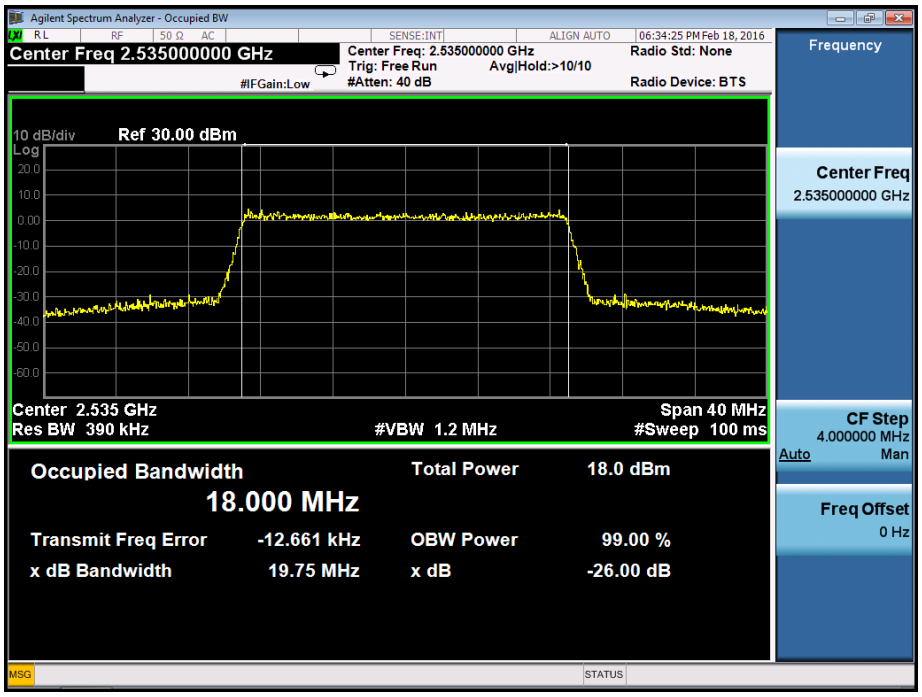


Test Mode : LTE Band VII TX Mode Configuration16-QAM-20M/100RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	17.952	19.620	**Complies**
Middle	18.000	19.750	**Complies**
Highest	17.921	19.600	**Complies**

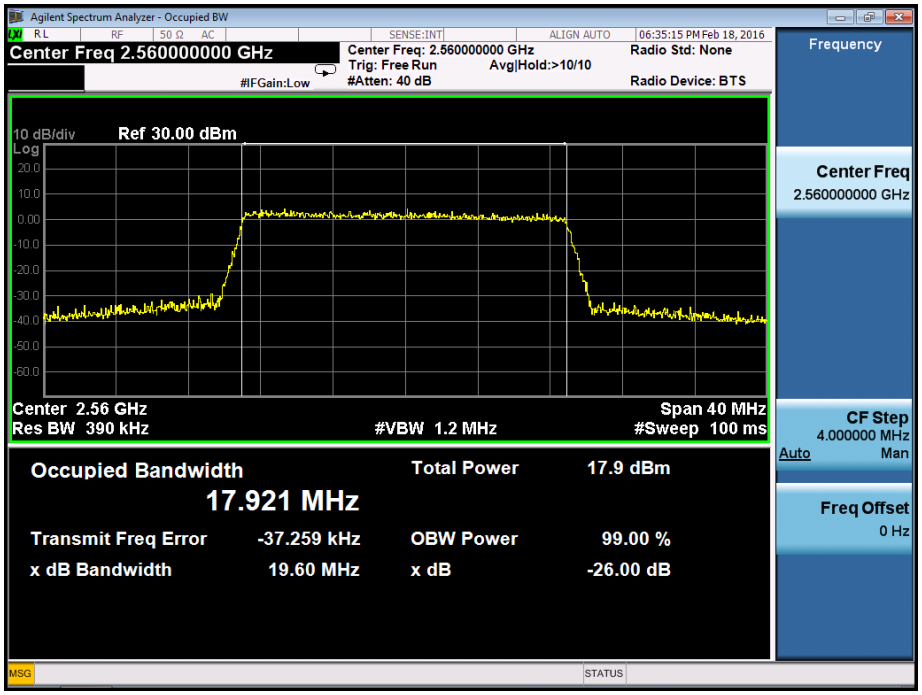
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

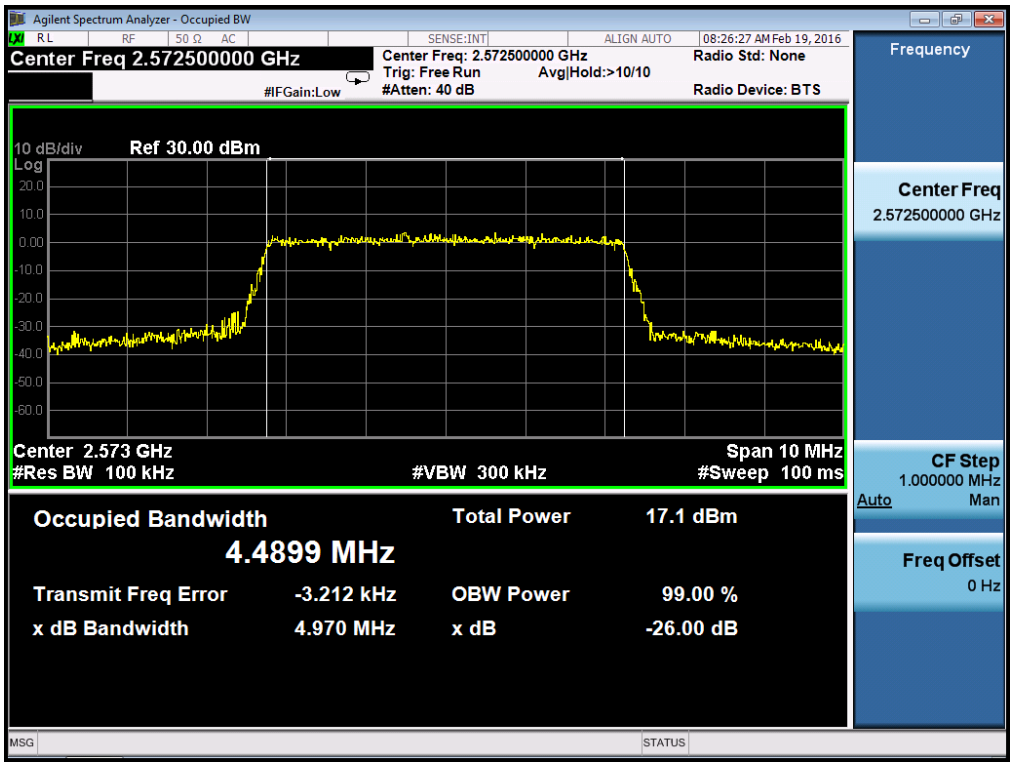


99% Occupied Bandwidth channel Highest

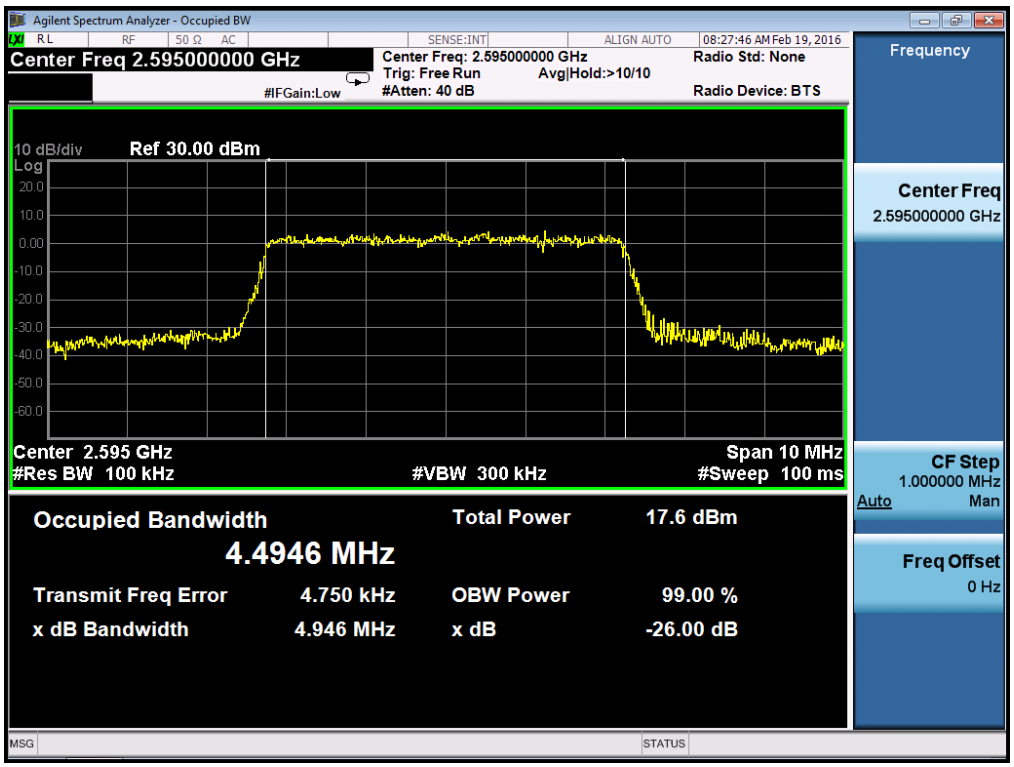


Test Mode : LTE Band XXXVIII TX Mode ConfigurationQPSK-5M/25RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	4.490	4.970	**Complies**
Middle	4.495	4.946	**Complies**
Highest	4.502	5.136	**Complies**

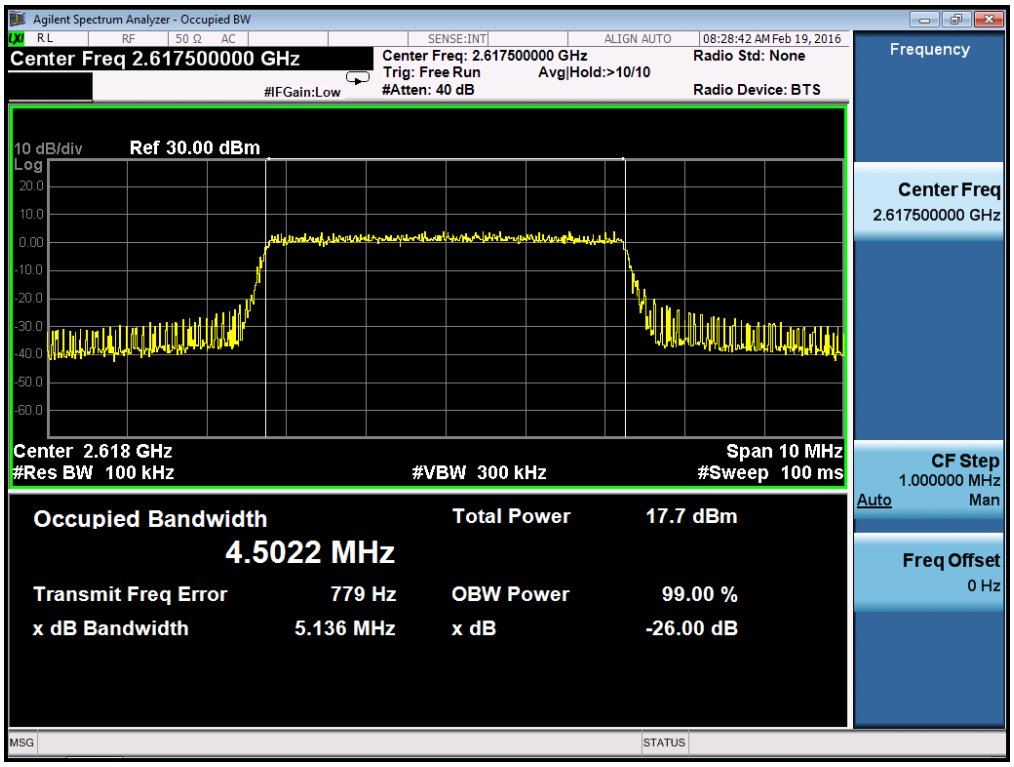
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

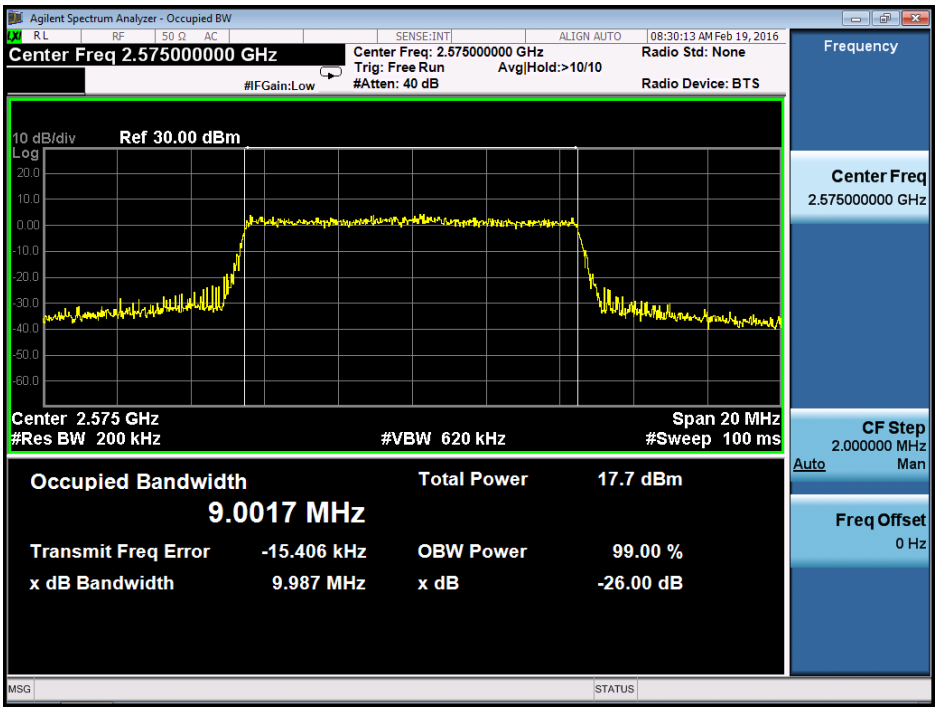


99% Occupied Bandwidth channel Highest

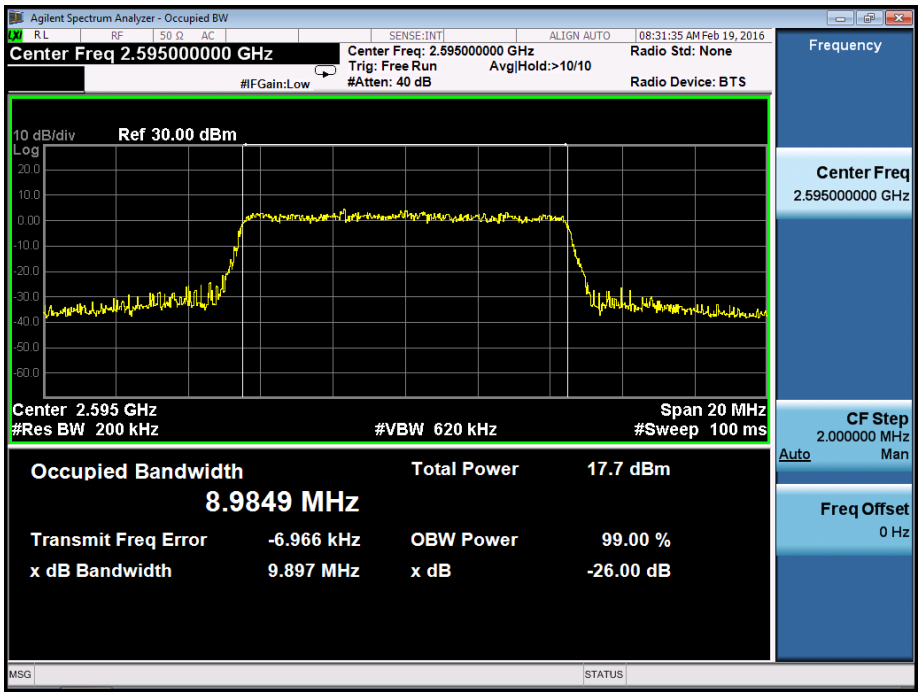


Test Mode : LTE Band XXXVIII TX Mode ConfigurationQPSK-10M/50RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	9.003	9.888	**Complies**
Middle	9.000	9.935	**Complies**
Highest	9.000	9.949	**Complies**

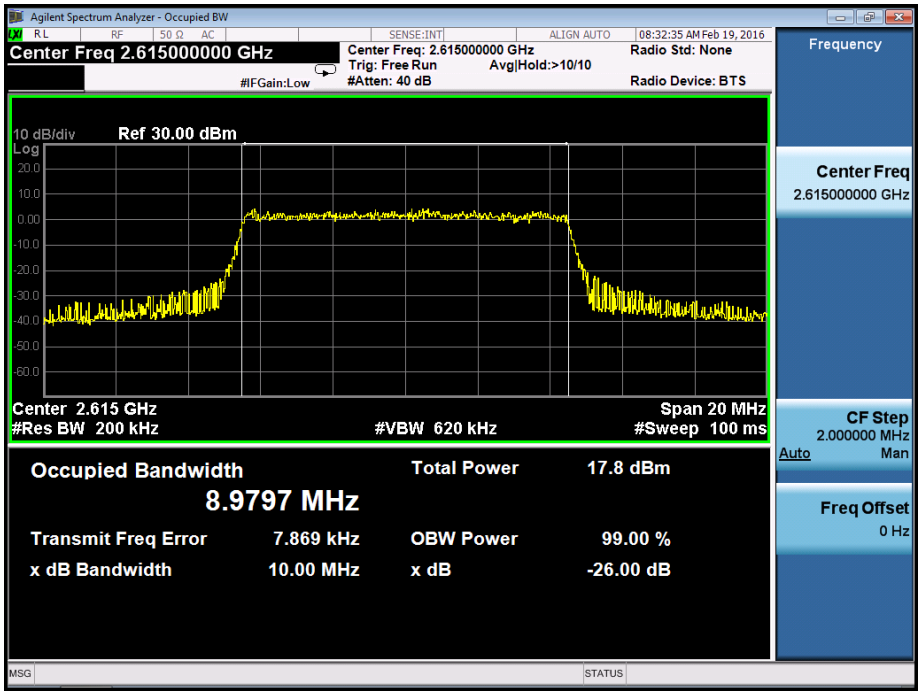
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

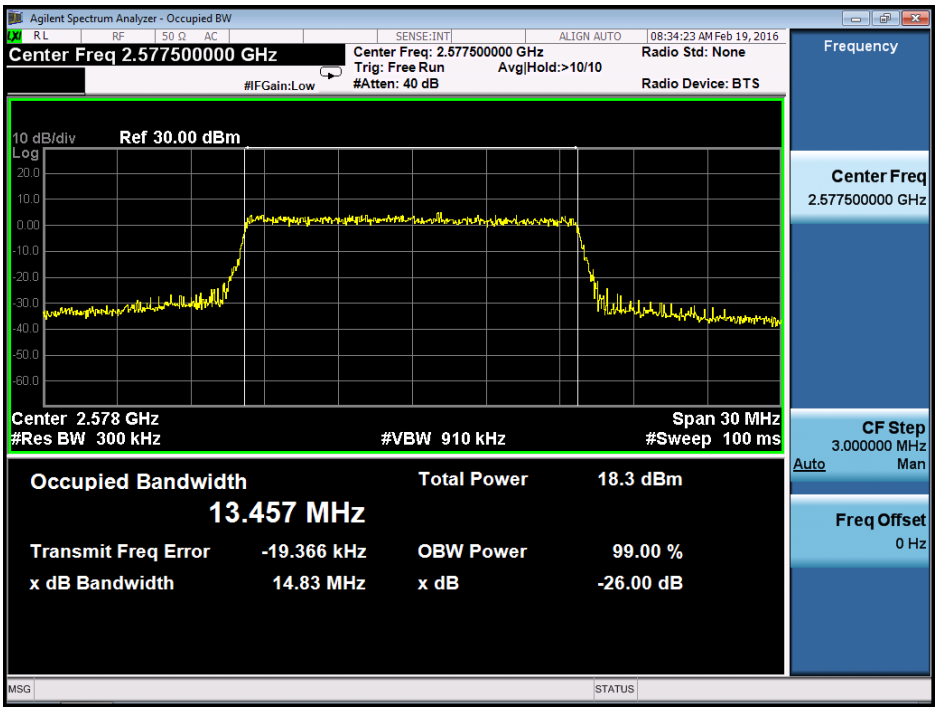


99% Occupied Bandwidth channel Highest

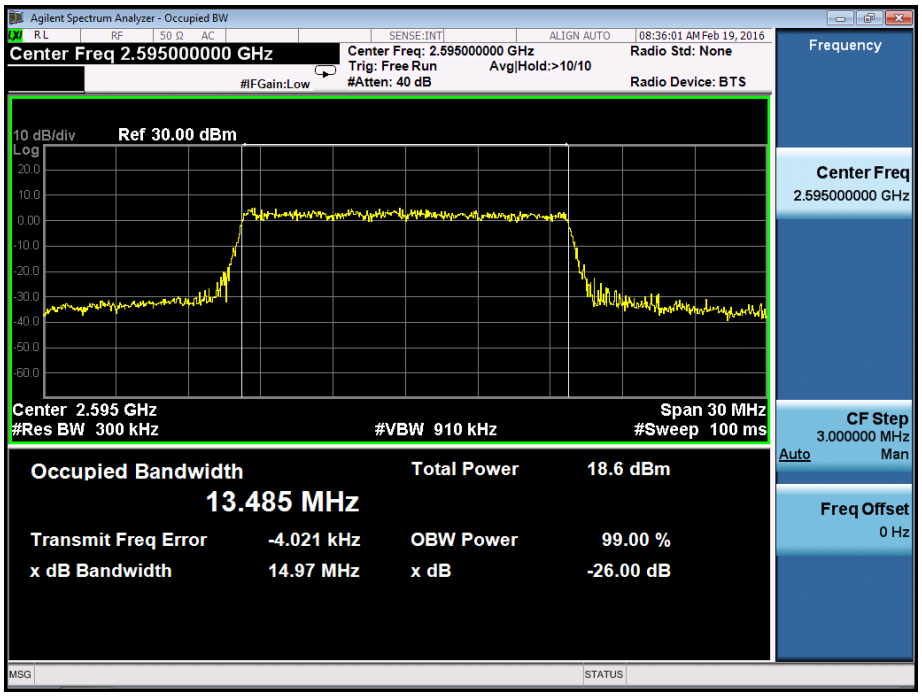


Test Mode : LTE Band XXXVIII TX Mode ConfigurationQPSK-15M/75RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	13.457	14.830	**Complies**
Middle	13.485	14.970	**Complies**
Highest	13.489	15.220	**Complies**

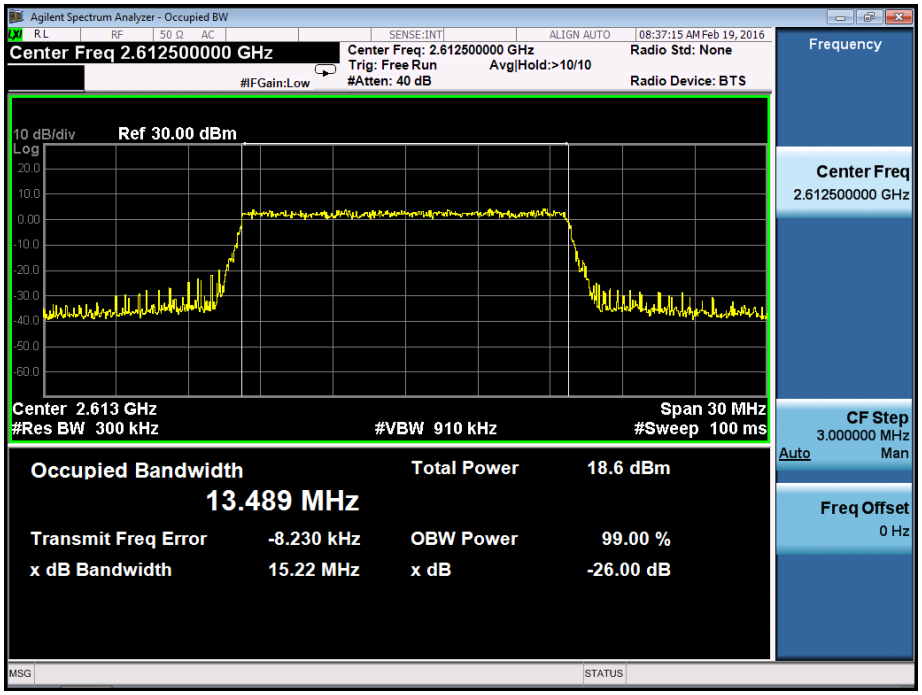
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

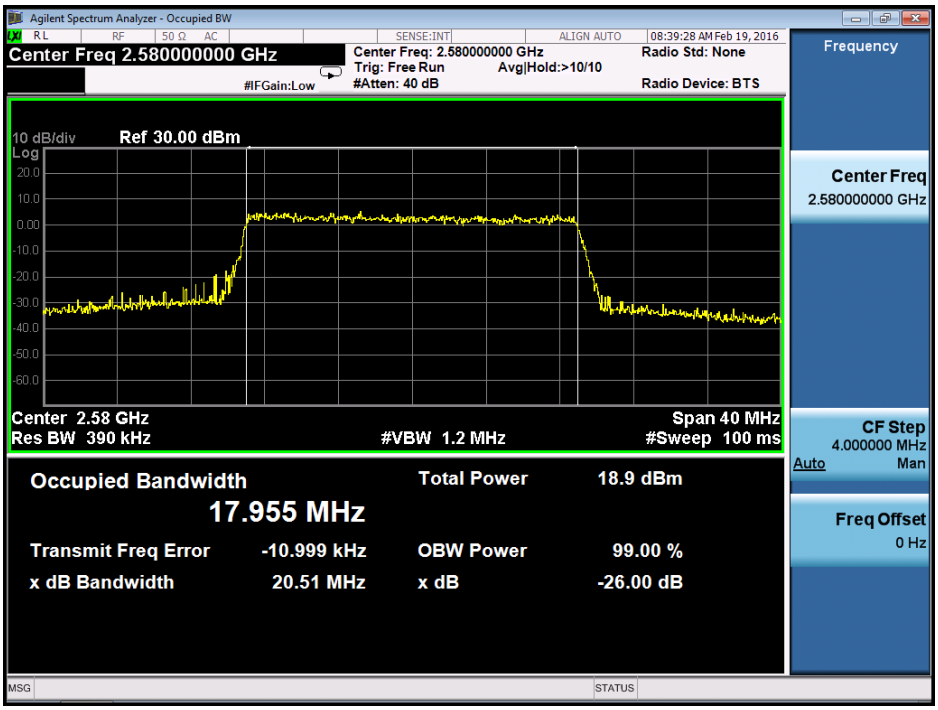


99% Occupied Bandwidth channel Highest

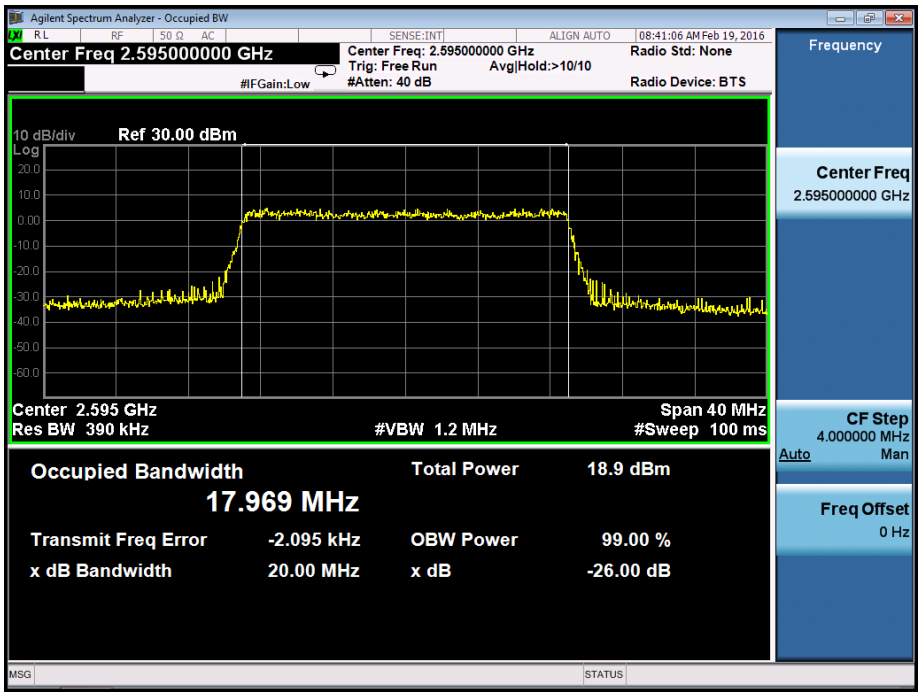


Test Mode : LTE Band XXXVIII TX Mode ConfigurationQPSK-20M/100RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	17.955	20.510	**Complies**
Middle	17.969	20.000	**Complies**
Highest	17.937	19.700	**Complies**

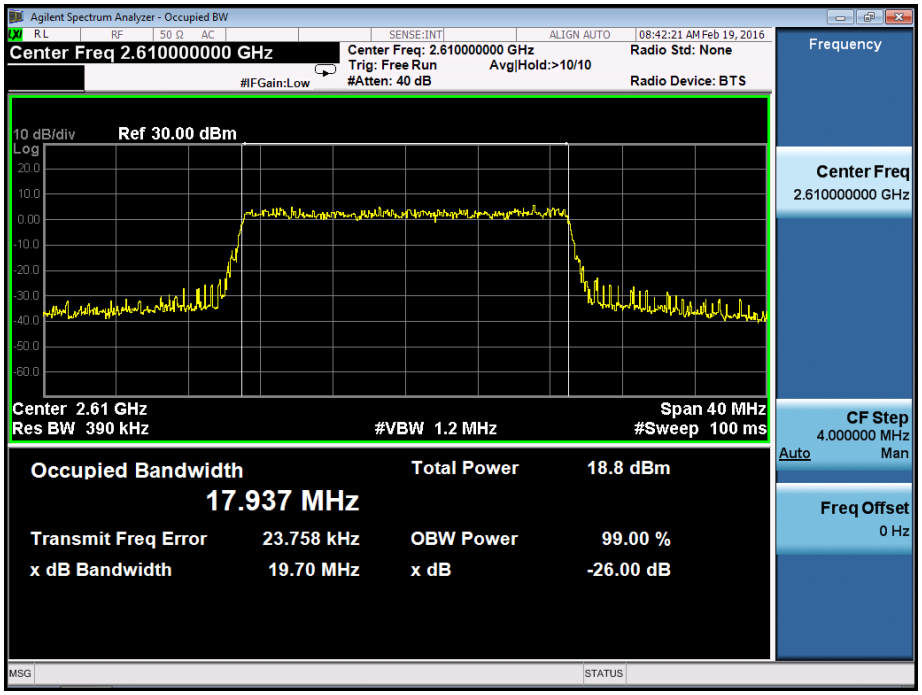
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

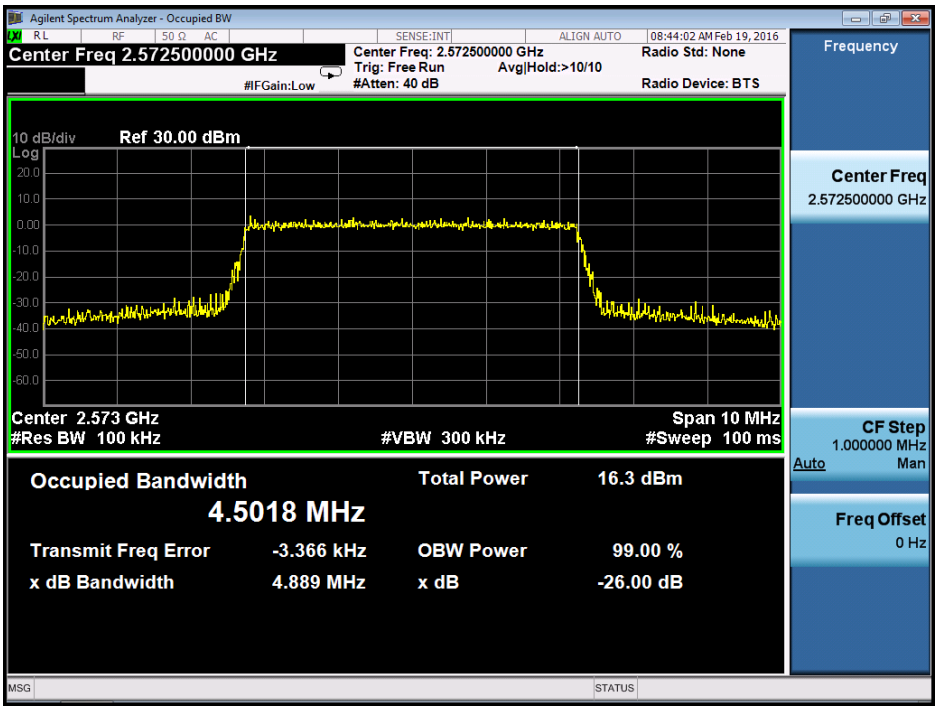


99% Occupied Bandwidth channel Highest

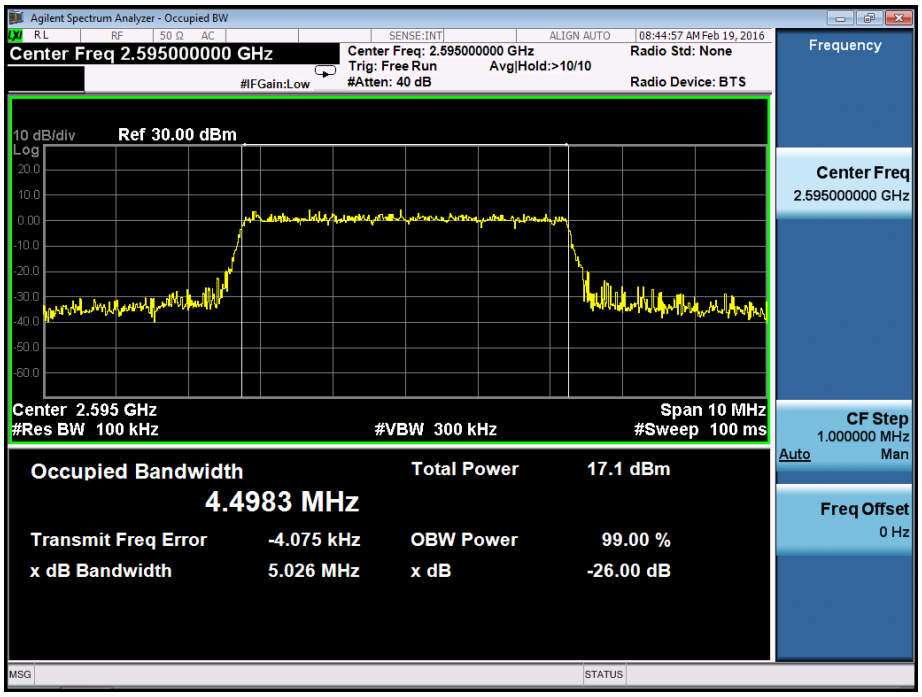


Test Mode : LTE Band XXXVIII TX Mode Configuration16-QAM-5M//25RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	4.502	4.889	**Complies**
Middle	4.498	5.026	**Complies**
Highest	4.498	4.985	**Complies**

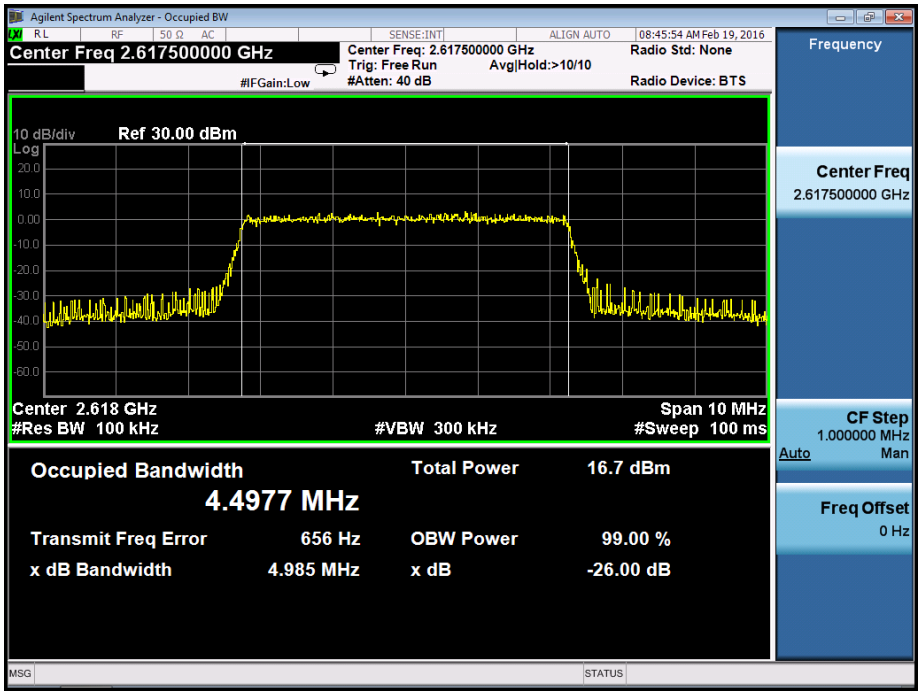
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

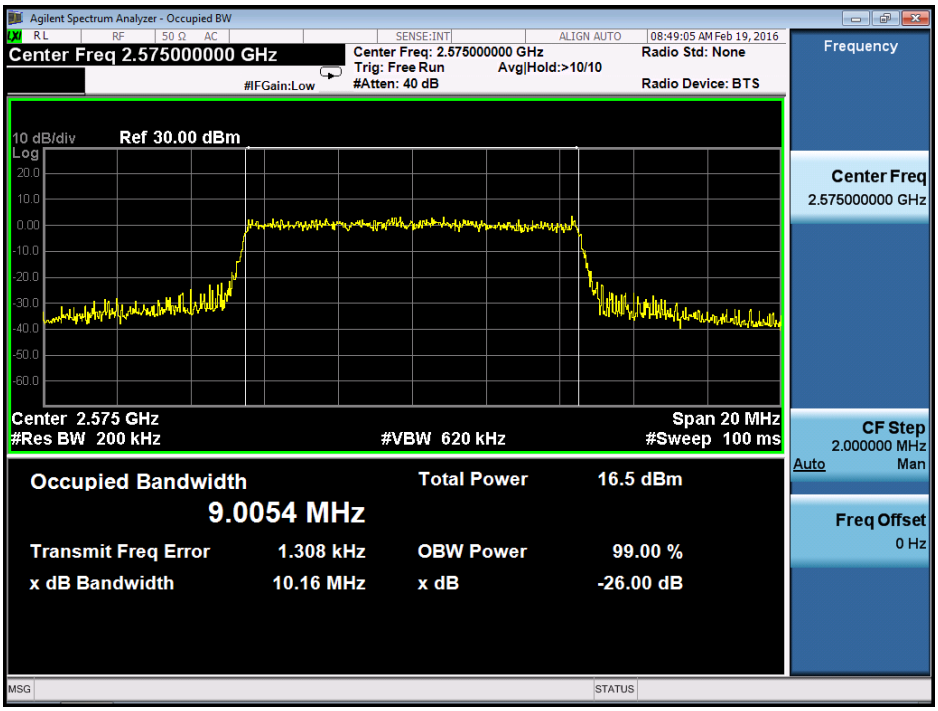


99% Occupied Bandwidth channel Highest

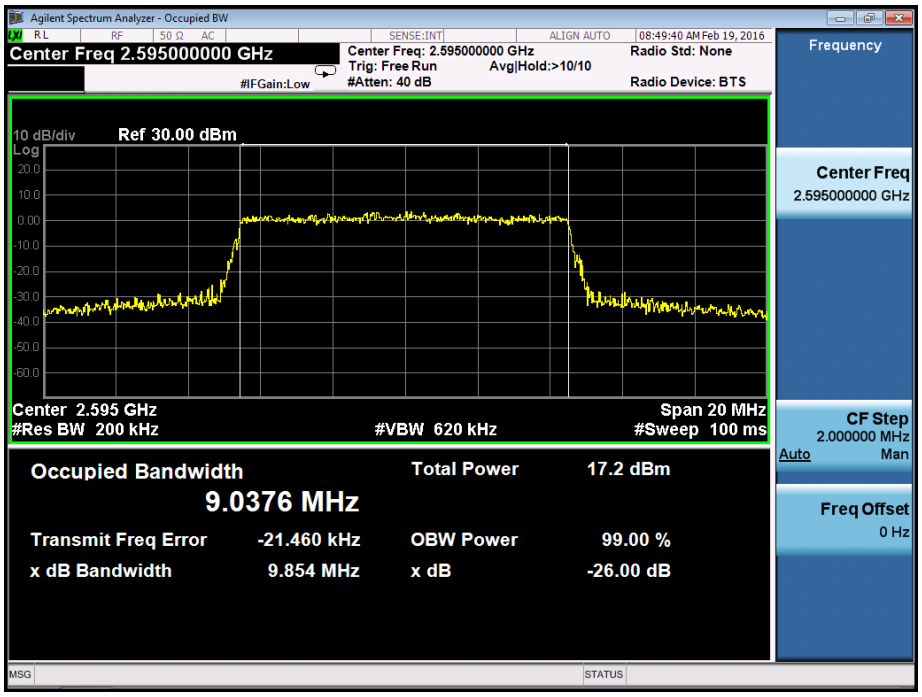


Test Mode : LTE Band XXXVIII TX Mode Configuration16-QAM-10M/50RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	9.005	10.160	**Complies**
Middle	9.038	9.854	**Complies**
Highest	9.016	10.010	**Complies**

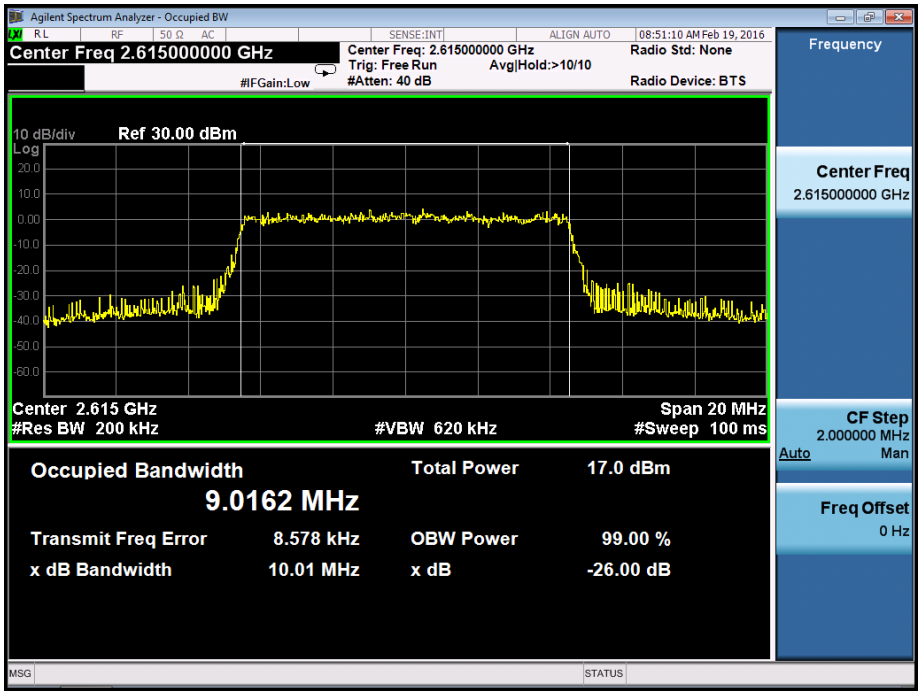
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

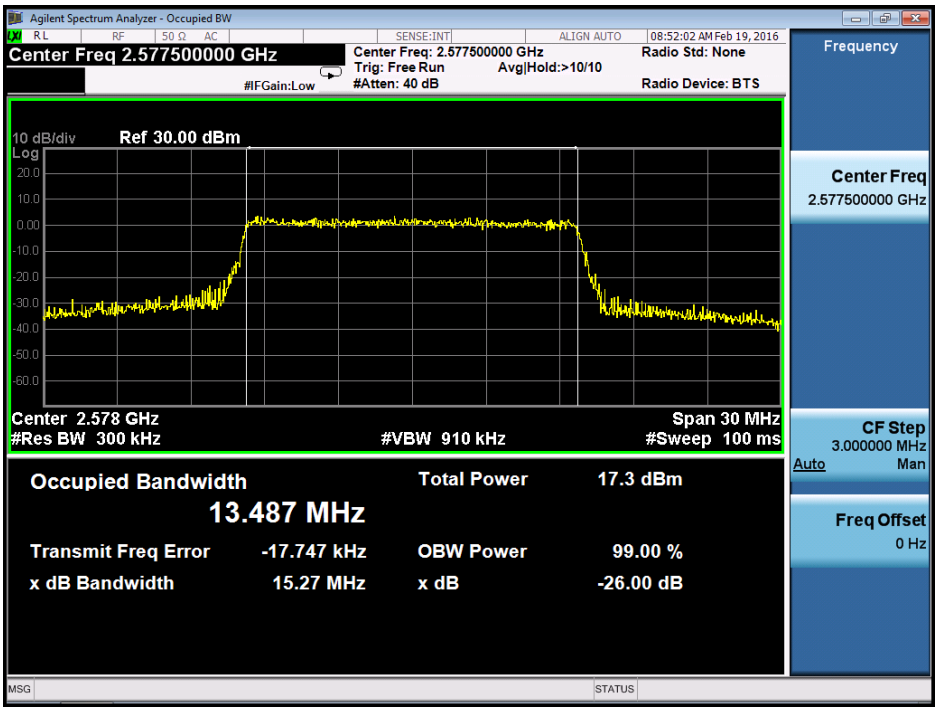


99% Occupied Bandwidth channel Highest

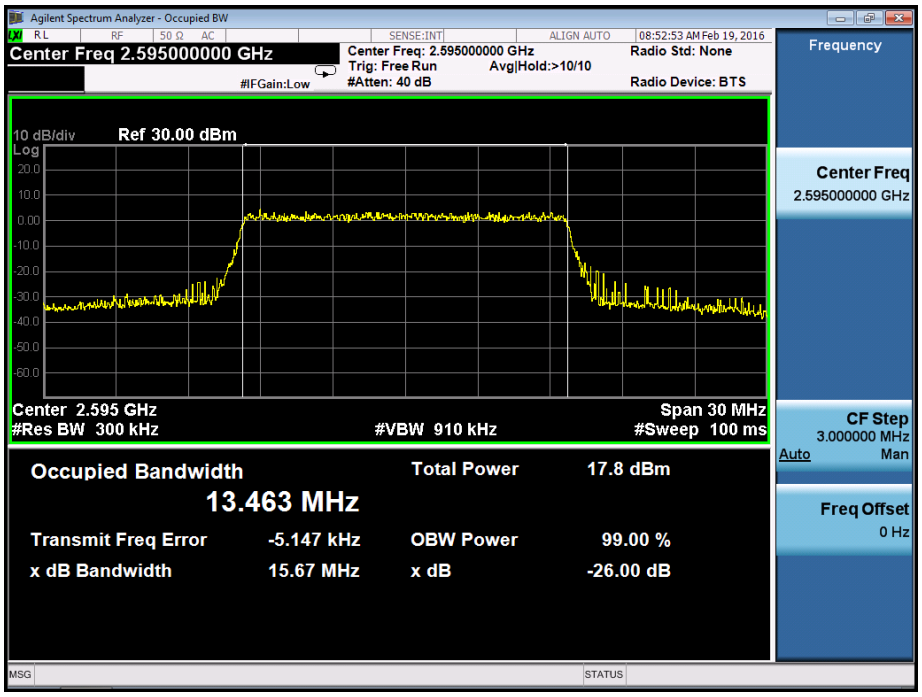


Test Mode : LTE Band XXXVIII TX Mode Configuration16-QAM-15M/75RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	13.487	15.270	**Complies**
Middle	13.463	15.670	**Complies**
Highest	13.484	15.370	**Complies**

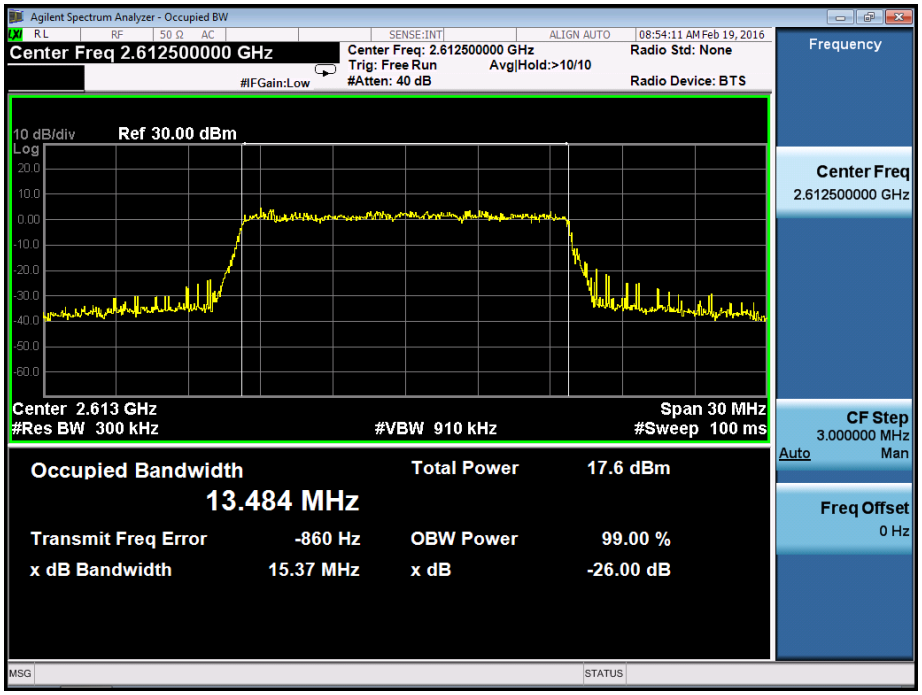
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle

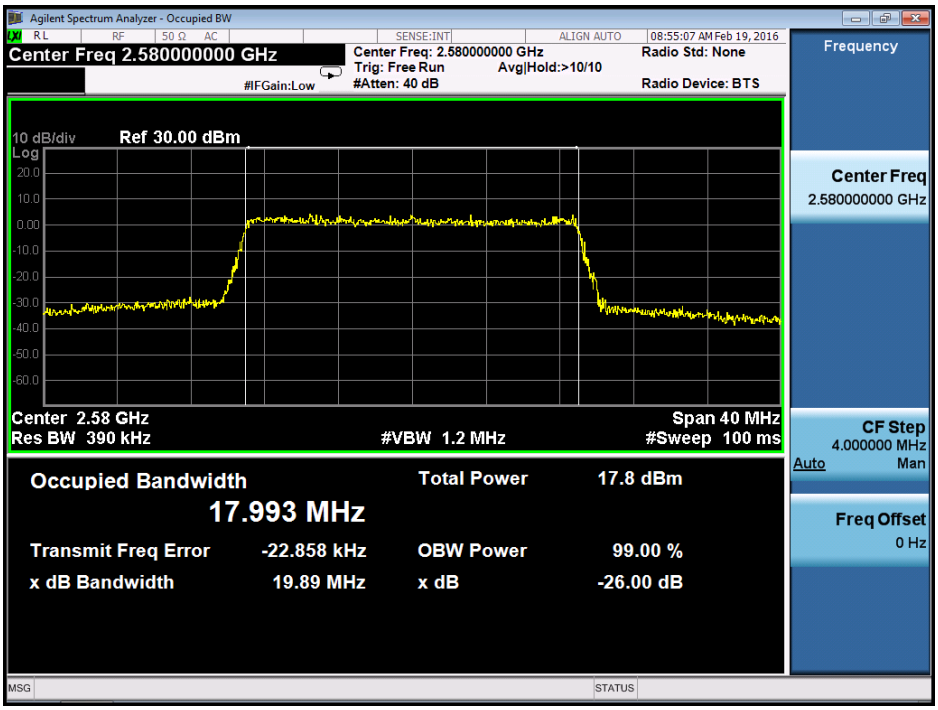


99% Occupied Bandwidth channel Highest

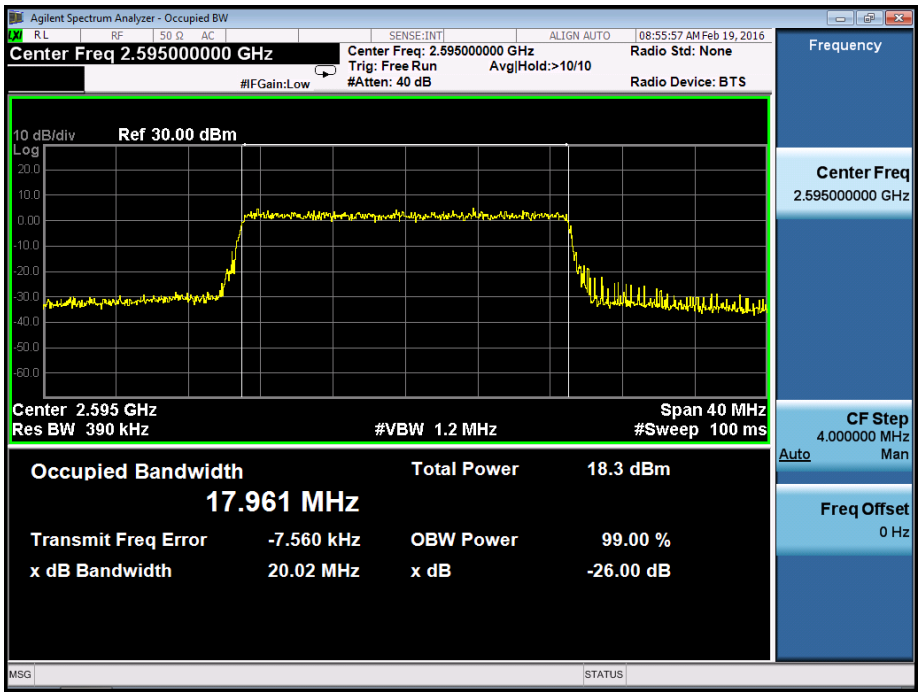


Test Mode : LTE Band XXXVIII TX Mode Configuration16-QAM-20M/100RB			
Channel	**99% OBW (MHz)**	**-26dBc Bandwidth**	**Result**
Lowest	17.993	19.890	**Complies**
Middle	17.961	20.020	**Complies**
Highest	17.969	19.730	**Complies**

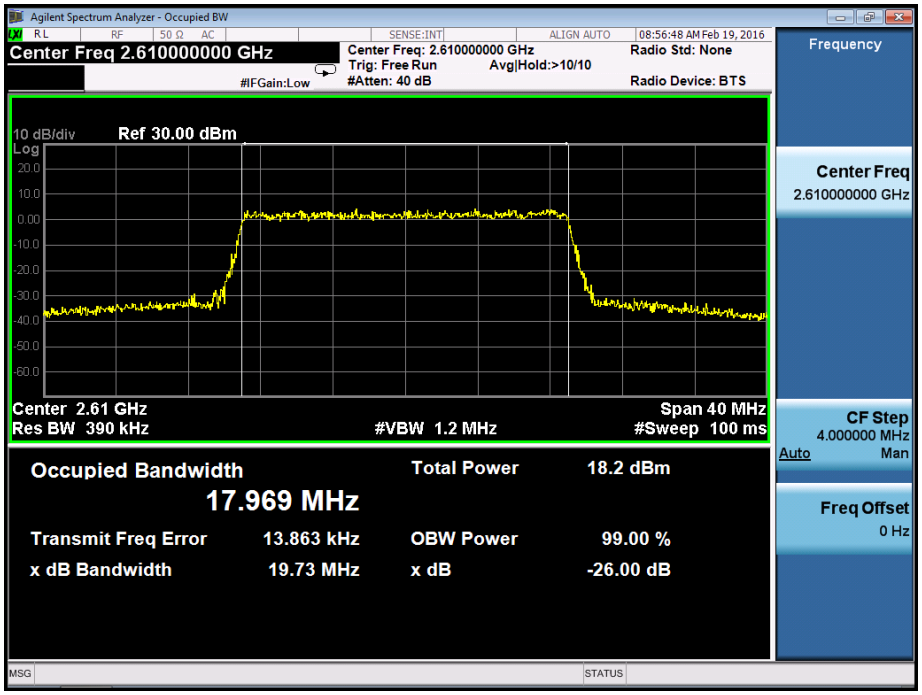
99% Occupied Bandwidth channel Lowest



99% Occupied Bandwidth channel Middle



99% Occupied Bandwidth channel Highest



ATTACHMENT C - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Conducted Spurious of Configuration-LTE Band VII QPSK-5M/1RB

Conducted Spurious of Configuration-LTE Band VII QPSK-10M/1RB

Conducted Spurious of Configuration- LTE Band VII QPSK-15M/1RB

Conducted Spurious of Configuration- LTE Band VII QPSK-20M/1RB

Conducted Spurious of Configuration- LTE Band XXXVIII QPSK-5M/1RB

Conducted Spurious of Configuration- LTE Band XXXVIII QPSK-10M/1RB

Conducted Spurious of Configuration- LTE Band XXXVIII

QPSK-15M/1RB

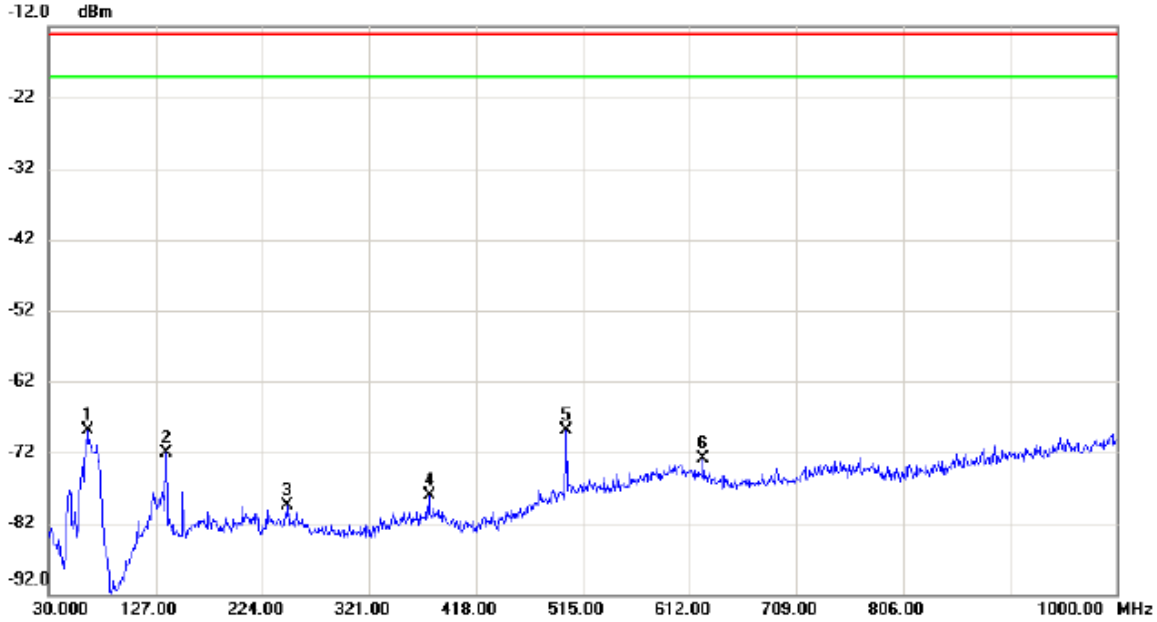
Conducted Spurious of Configuration- LTE Band XXXVIII

QPSK-20M/1RB

ATTACHMENTD - SPURIOUS RADIATED EMISSION

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

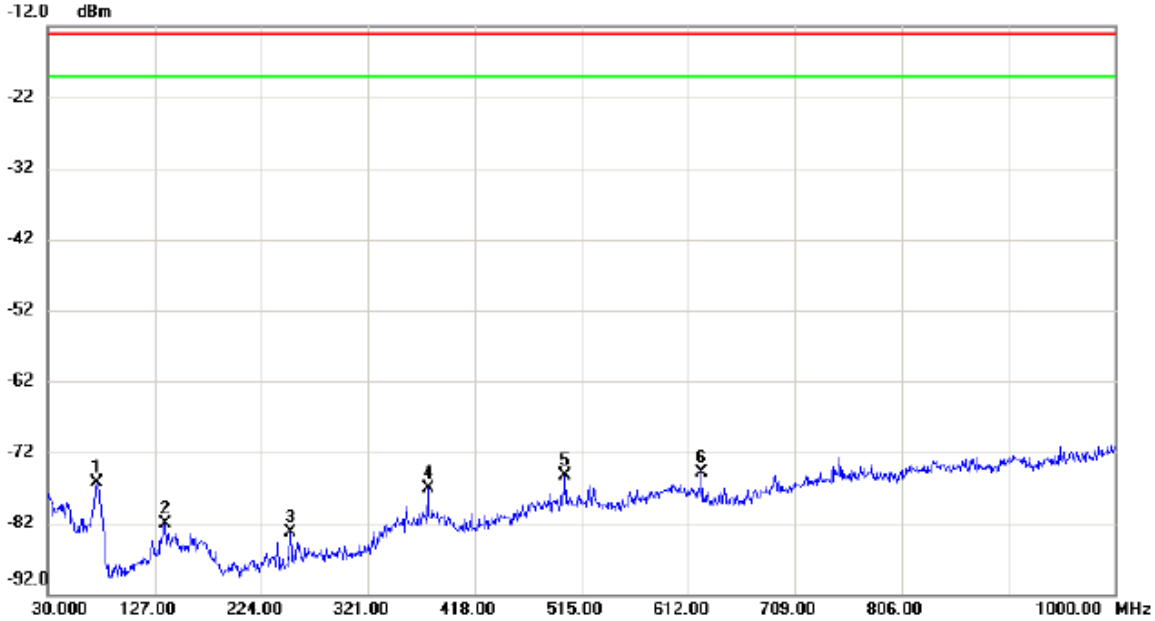
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	64.9200	-66.11	-2.81	-68.92	-13.00	-55.92	peak	
2		136.7000	-69.39	-2.70	-72.09	-13.00	-59.09	peak	
3		246.3100	-79.00	-0.46	-79.46	-13.00	-66.46	peak	
4		375.3200	-78.00	-0.09	-78.09	-13.00	-65.09	peak	
5		500.4500	-71.53	2.59	-68.94	-13.00	-55.94	peak	
6		624.6100	-77.37	4.42	-72.95	-13.00	-59.95	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

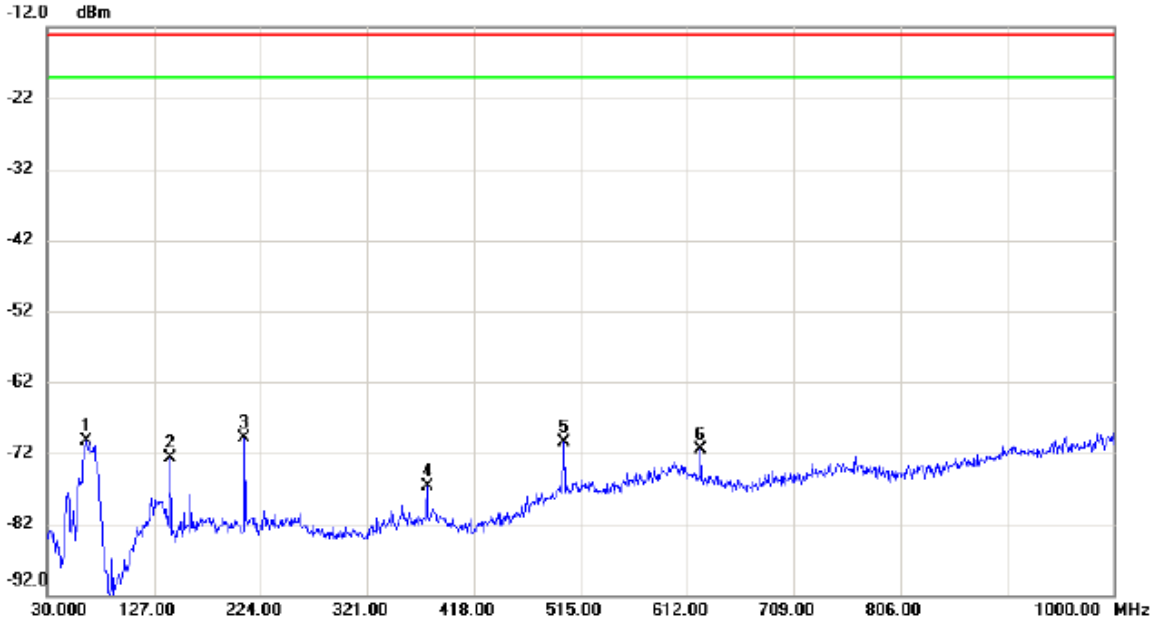
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		74.6200	-70.29	-6.03	-76.32	-13.00	-63.32	peak	
2		136.7000	-76.76	-5.30	-82.06	-13.00	-69.06	peak	
3		250.1900	-77.00	-6.20	-83.20	-13.00	-70.20	peak	
4		375.3200	-76.49	-0.59	-77.08	-13.00	-64.08	peak	
5		500.4500	-76.21	0.95	-75.26	-13.00	-62.26	peak	
6	*	624.6100	-76.47	1.57	-74.90	-13.00	-61.90	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

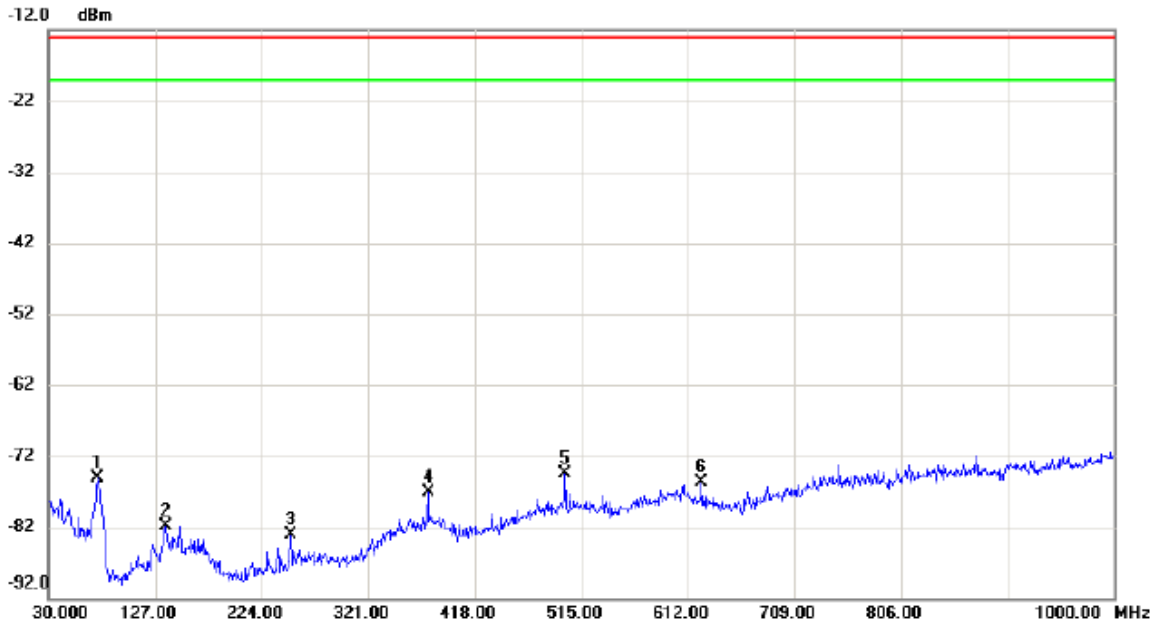
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		65.8900	-67.14	-3.14	-70.28	-13.00	-57.28	peak	
2		141.5500	-69.86	-2.88	-72.74	-13.00	-59.74	peak	
3	*	209.4500	-66.17	-3.71	-69.88	-13.00	-56.88	peak	
4		375.3200	-76.63	-0.09	-76.72	-13.00	-63.72	peak	
5		500.4500	-73.04	2.59	-70.45	-13.00	-57.45	peak	
6		624.6100	-75.88	4.42	-71.46	-13.00	-58.46	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

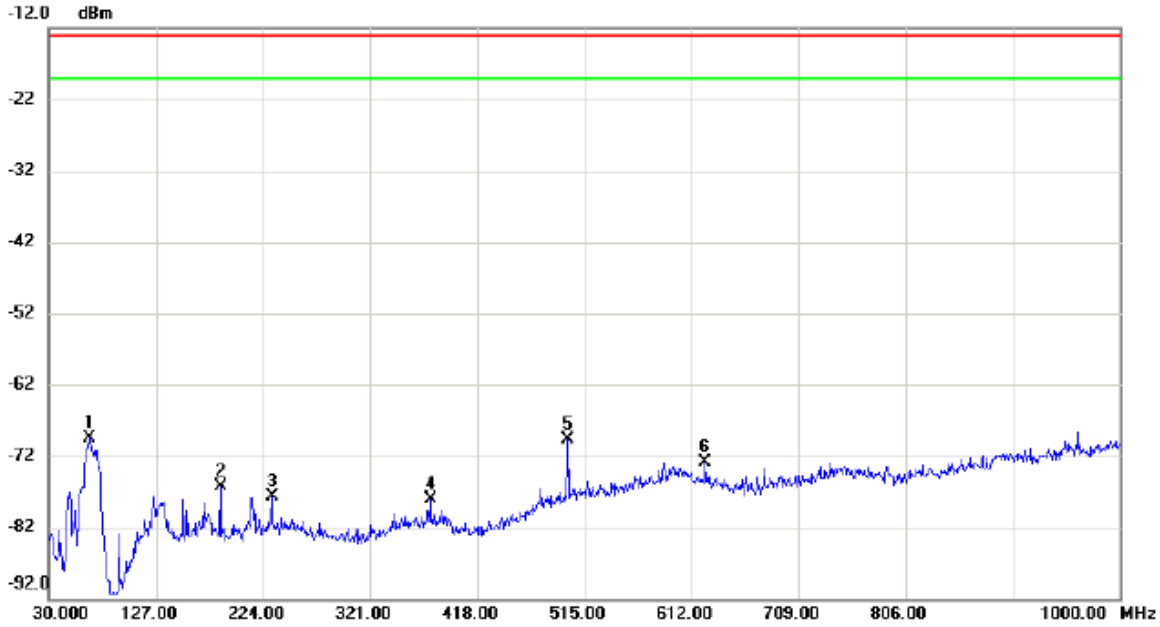
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		74.6200	-69.08	-6.03	-75.11	-13.00	-62.11	peak	
2		136.7000	-76.58	-5.30	-81.88	-13.00	-68.88	peak	
3		250.1900	-76.98	-6.20	-83.18	-13.00	-70.18	peak	
4		375.3200	-76.51	-0.59	-77.10	-13.00	-64.10	peak	
5	*	500.4500	-75.45	0.95	-74.50	-13.00	-61.50	peak	
6		624.6100	-77.19	1.57	-75.62	-13.00	-62.62	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

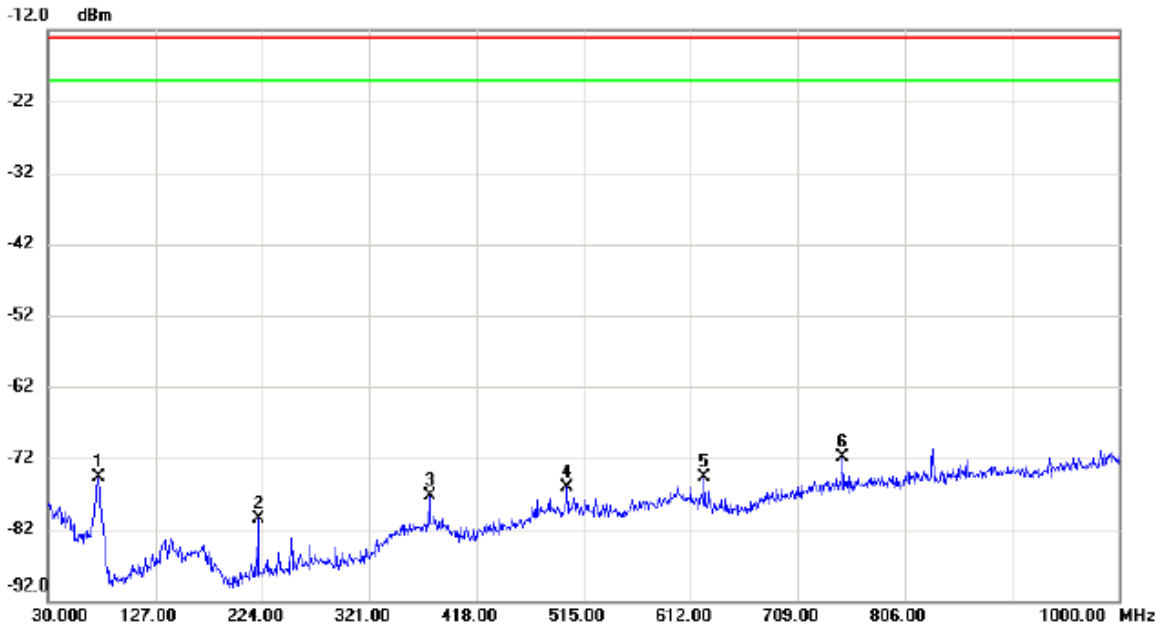
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	66.8600	-66.04	-3.53	-69.57	-13.00	-56.57	peak	
2		185.2000	-72.43	-3.92	-76.35	-13.00	-63.35	peak	
3		231.7600	-76.99	-0.64	-77.63	-13.00	-64.63	peak	
4		375.3200	-78.03	-0.09	-78.12	-13.00	-65.12	peak	
5		500.4500	-72.38	2.59	-69.79	-13.00	-56.79	peak	
6		624.6100	-77.33	4.42	-72.91	-13.00	-59.91	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

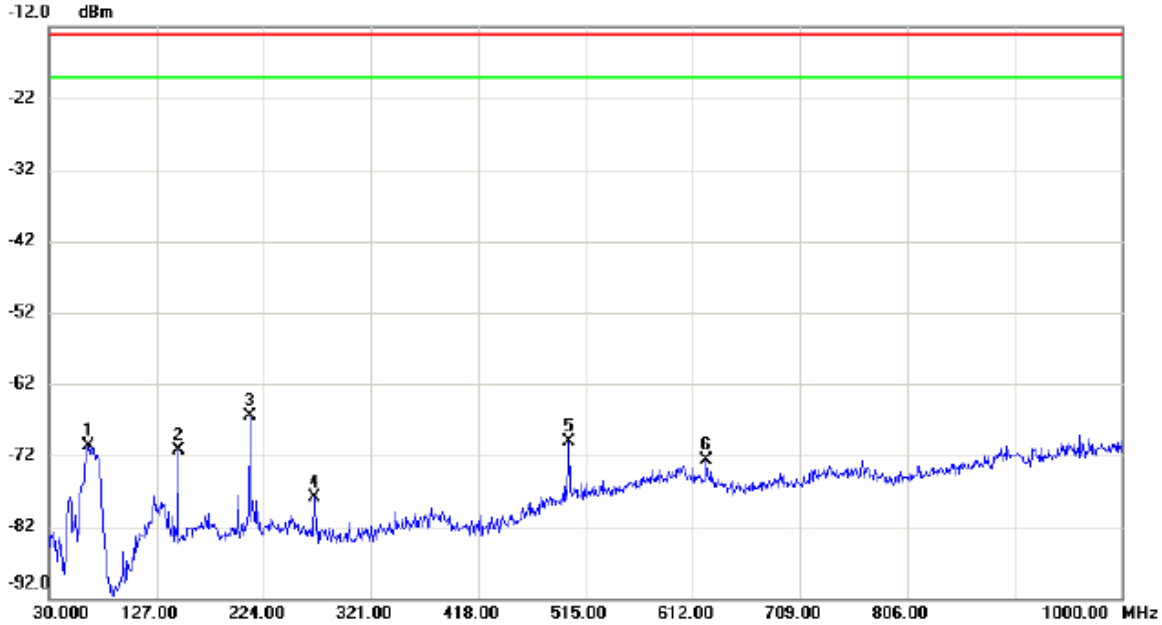
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		75.5900	-68.48	-6.23	-74.71	-13.00	-61.71	peak	
2		220.1200	-73.00	-7.44	-80.44	-13.00	-67.44	peak	
3		375.3200	-76.63	-0.59	-77.22	-13.00	-64.22	peak	
4		500.4500	-77.03	0.95	-76.08	-13.00	-63.08	peak	
5		624.6100	-76.34	1.57	-74.77	-13.00	-61.77	peak	
6	*	749.7400	-76.36	4.41	-71.95	-13.00	-58.95	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

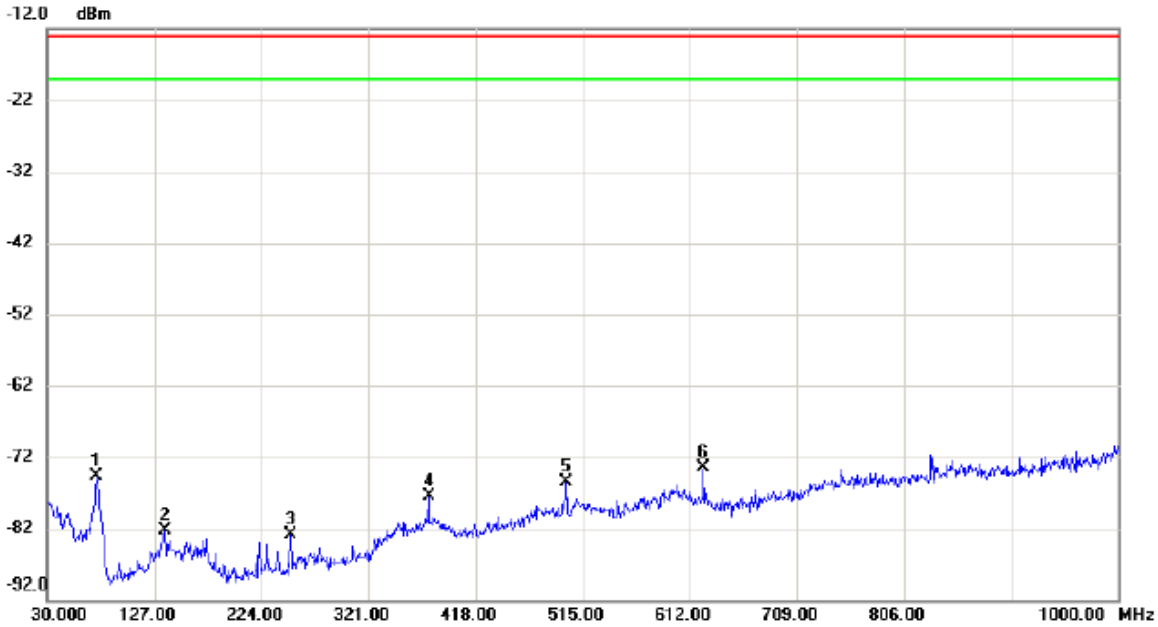
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		64.9200	-67.96	-2.81	-70.77	-13.00	-57.77	peak	
2		146.4000	-68.44	-2.83	-71.27	-13.00	-58.27	peak	
3	*	211.3900	-62.94	-3.55	-66.49	-13.00	-53.49	peak	
4		269.5900	-76.21	-1.63	-77.84	-13.00	-64.84	peak	
5		500.4500	-72.72	2.59	-70.13	-13.00	-57.13	peak	
6		624.6100	-77.05	4.42	-72.63	-13.00	-59.63	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

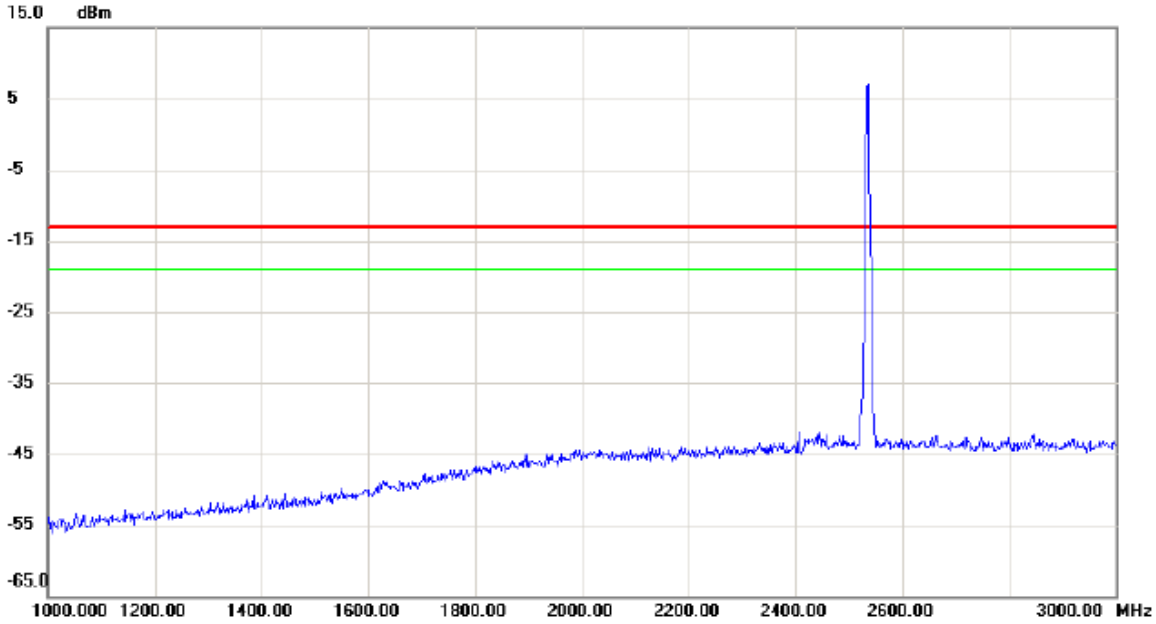
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		74.6200	-68.61	-6.03	-74.64	-13.00	-61.64	peak	
2		136.7000	-76.93	-5.30	-82.23	-13.00	-69.23	peak	
3		250.1900	-76.66	-6.20	-82.86	-13.00	-69.86	peak	
4		375.3200	-76.83	-0.59	-77.42	-13.00	-64.42	peak	
5		500.4500	-76.43	0.95	-75.48	-13.00	-62.48	peak	
6	*	624.6100	-75.17	1.57	-73.60	-13.00	-60.60	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

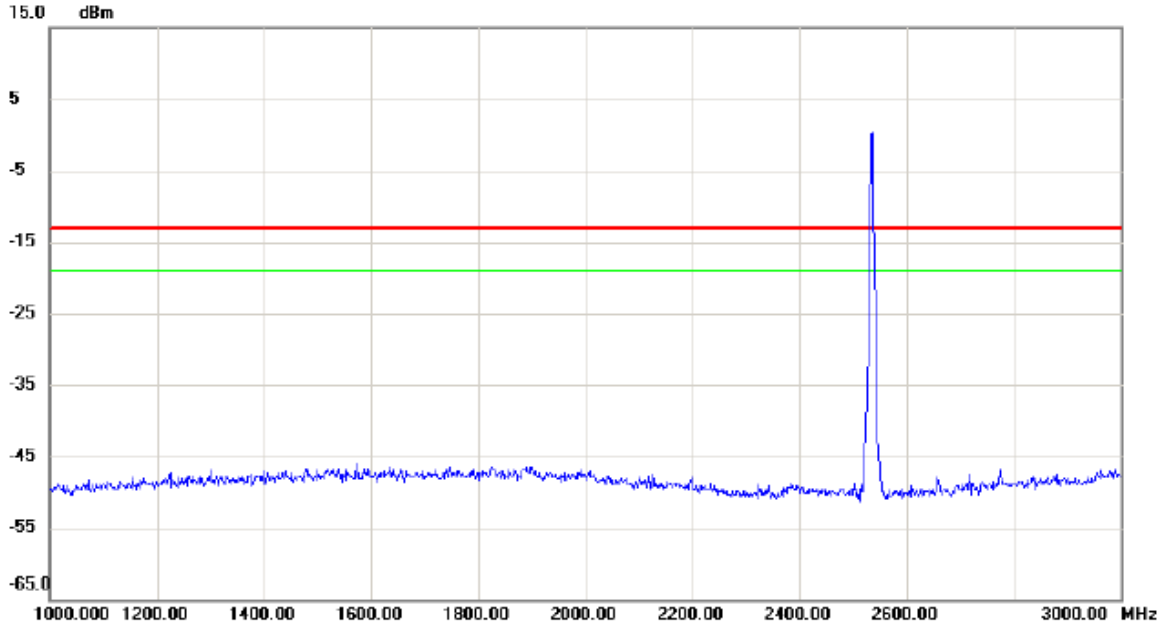
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

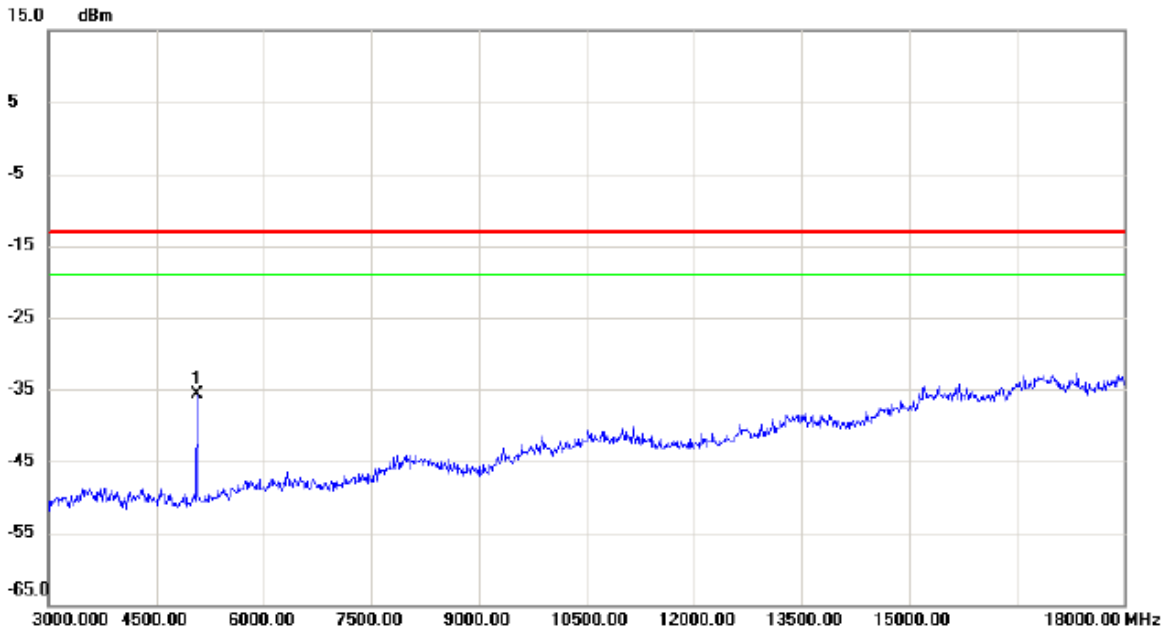
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

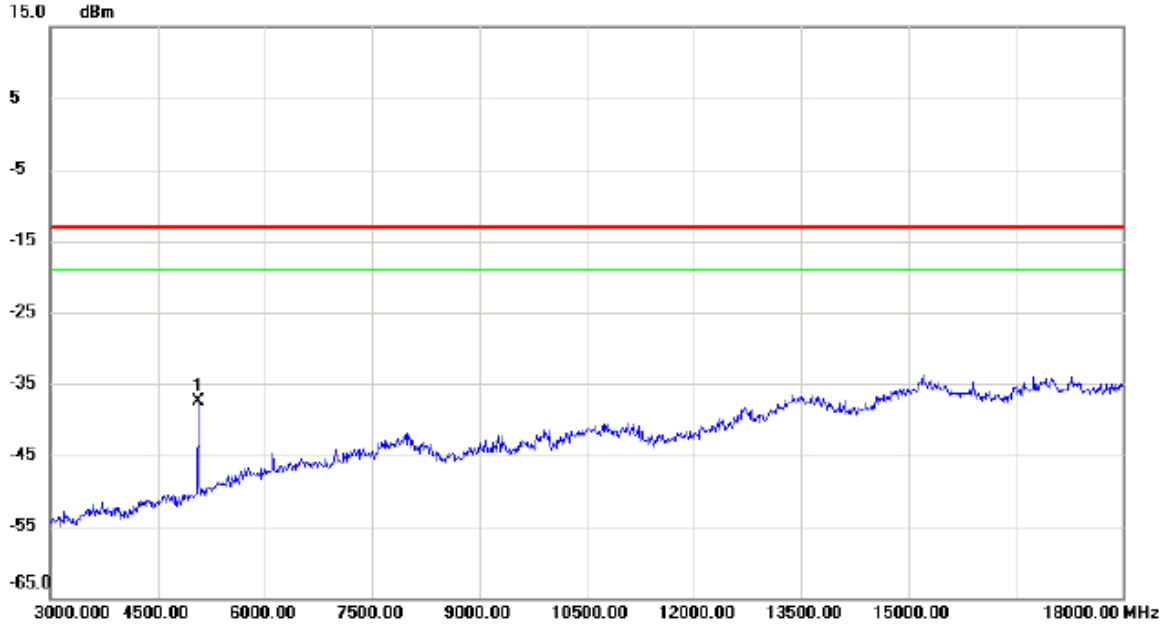
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5070.000	-50.41	14.79	-35.62	-13.00	-22.62	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

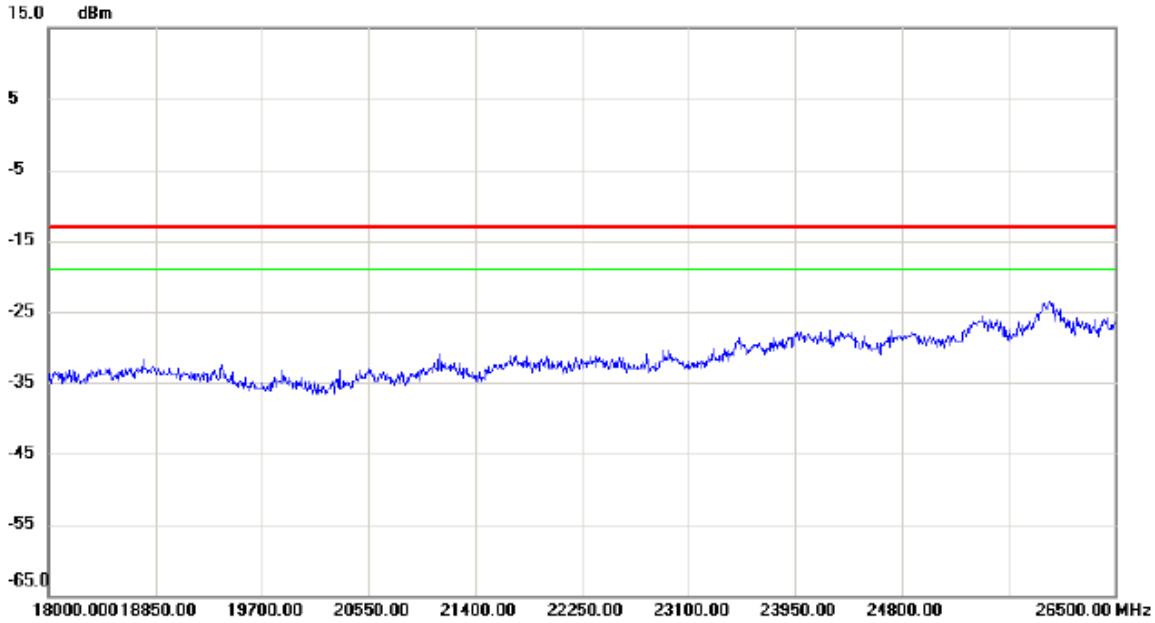
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5070.000	-52.35	14.93	-37.42	-13.00	-24.42	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

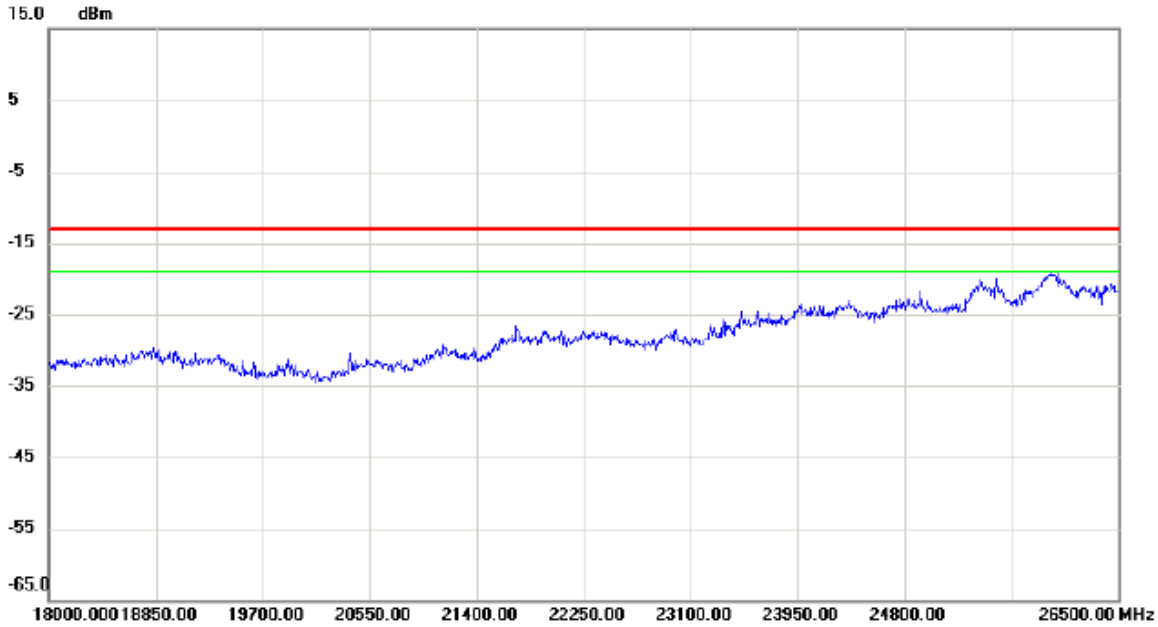
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band VII TX Channel Middle-QPSK 5M/1RB

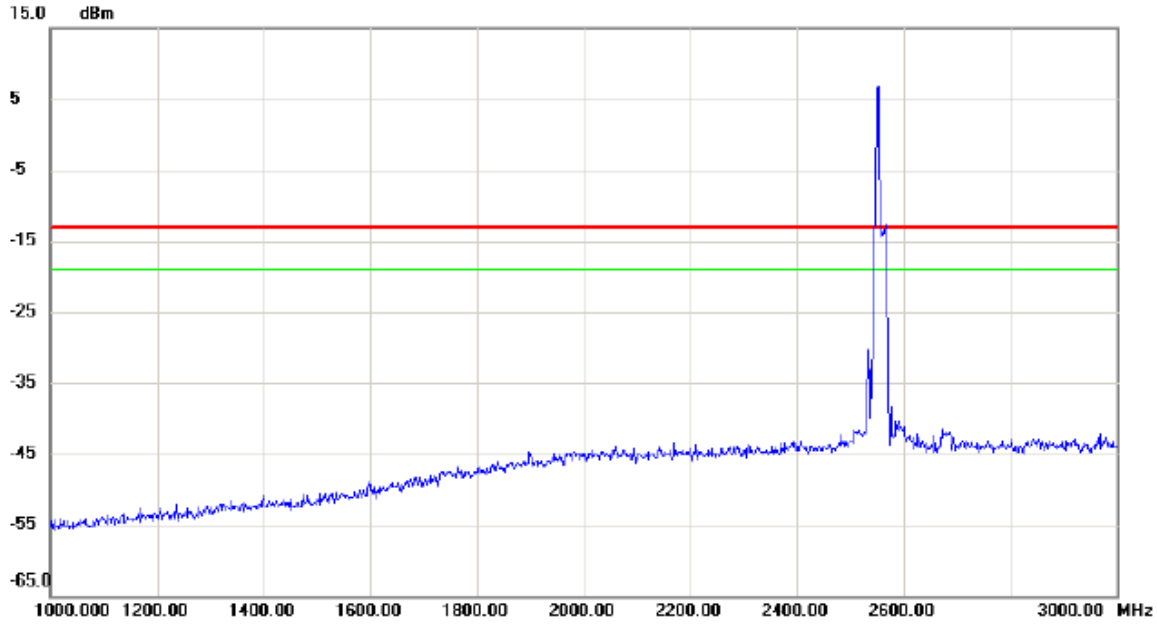
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

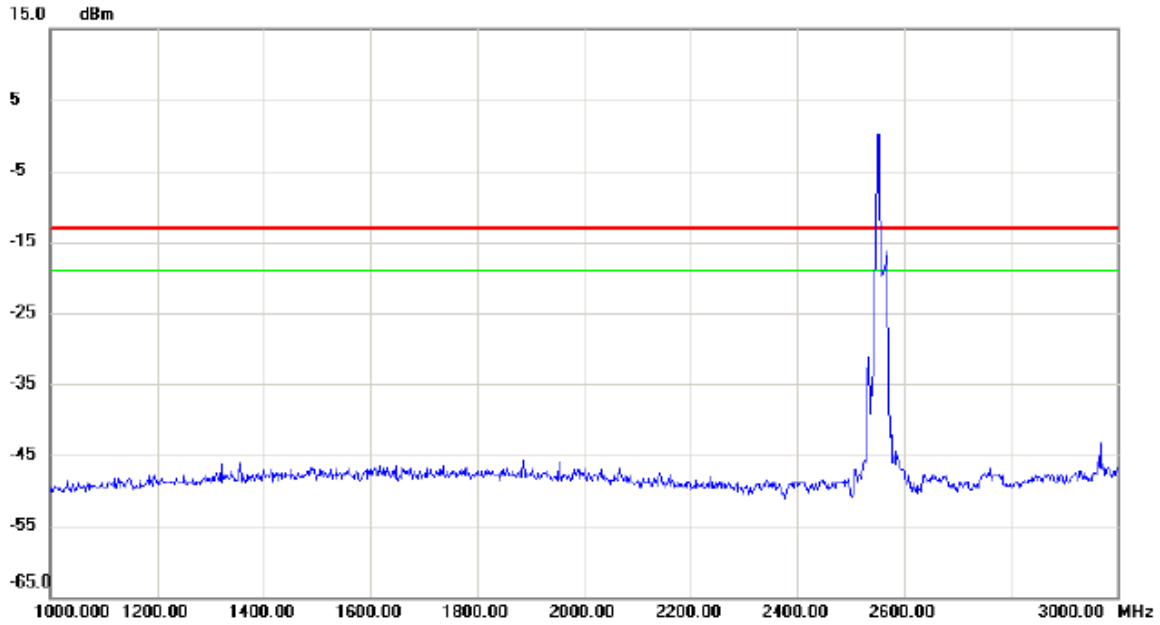
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

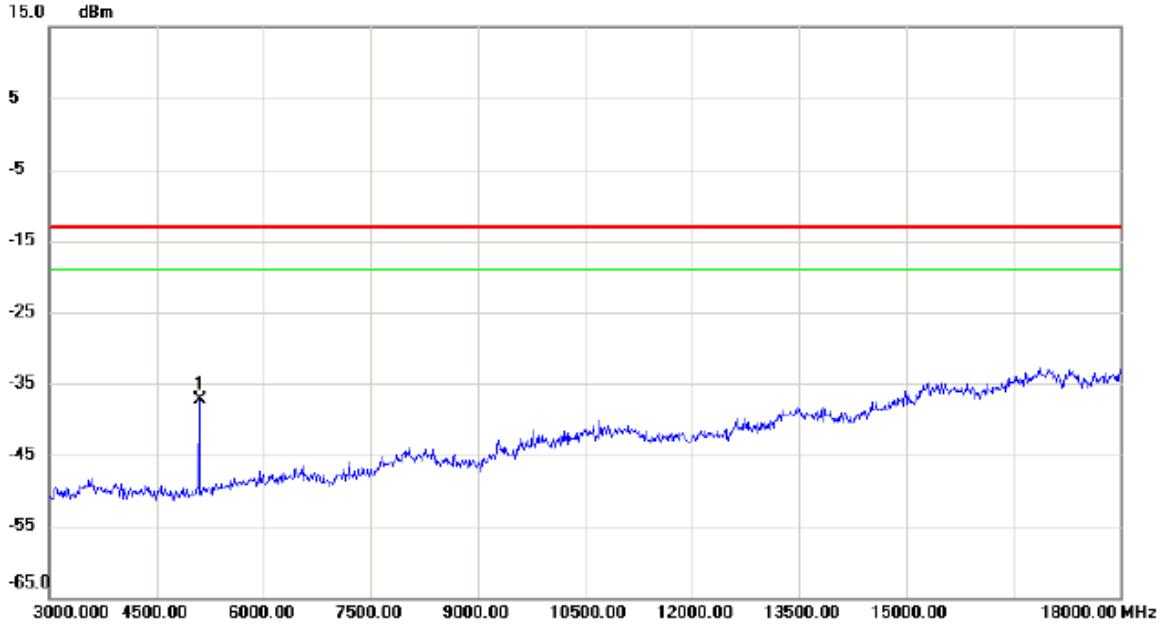
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

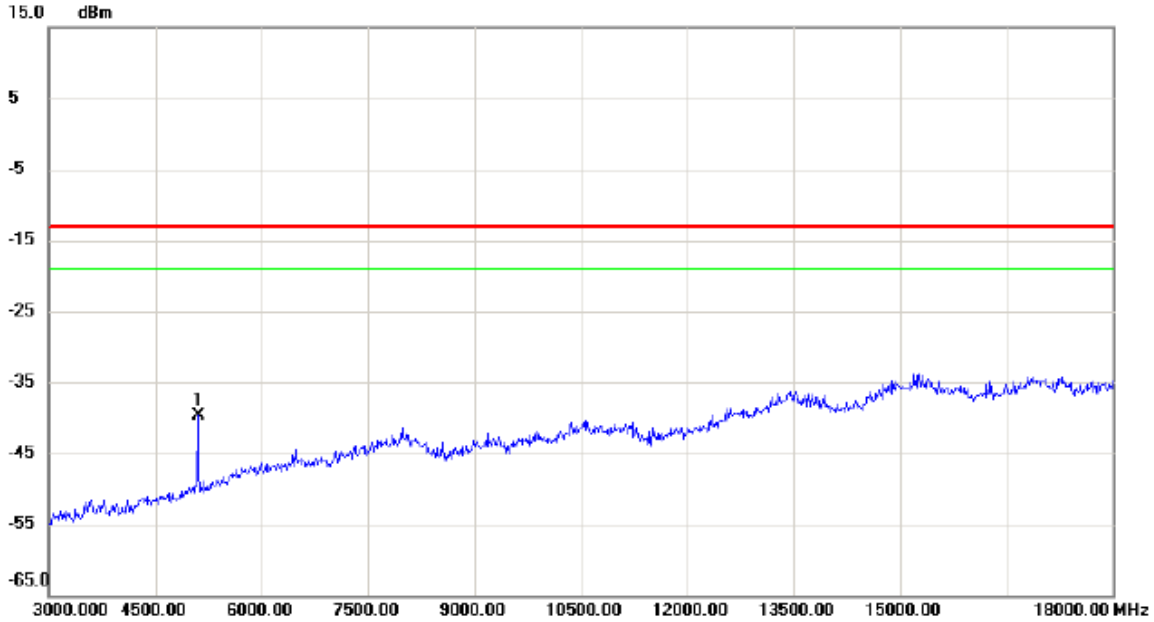
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5100.000	-52.27	14.88	-37.39	-13.00	-24.39	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

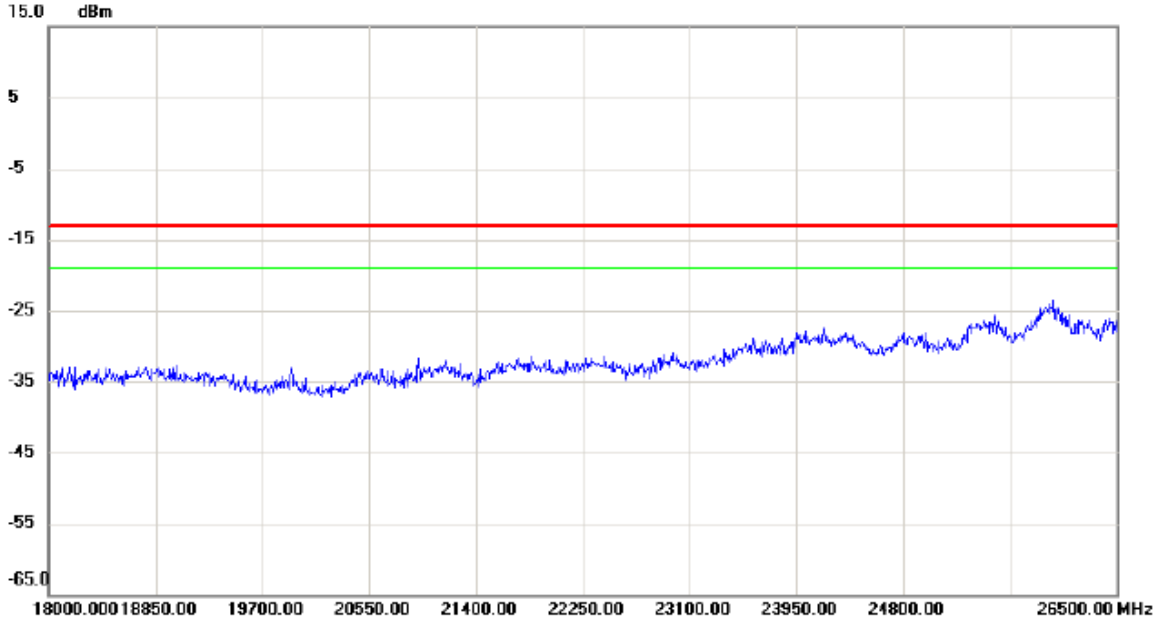
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5100.000	-54.83	15.05	-39.78	-13.00	-26.78	peak	

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

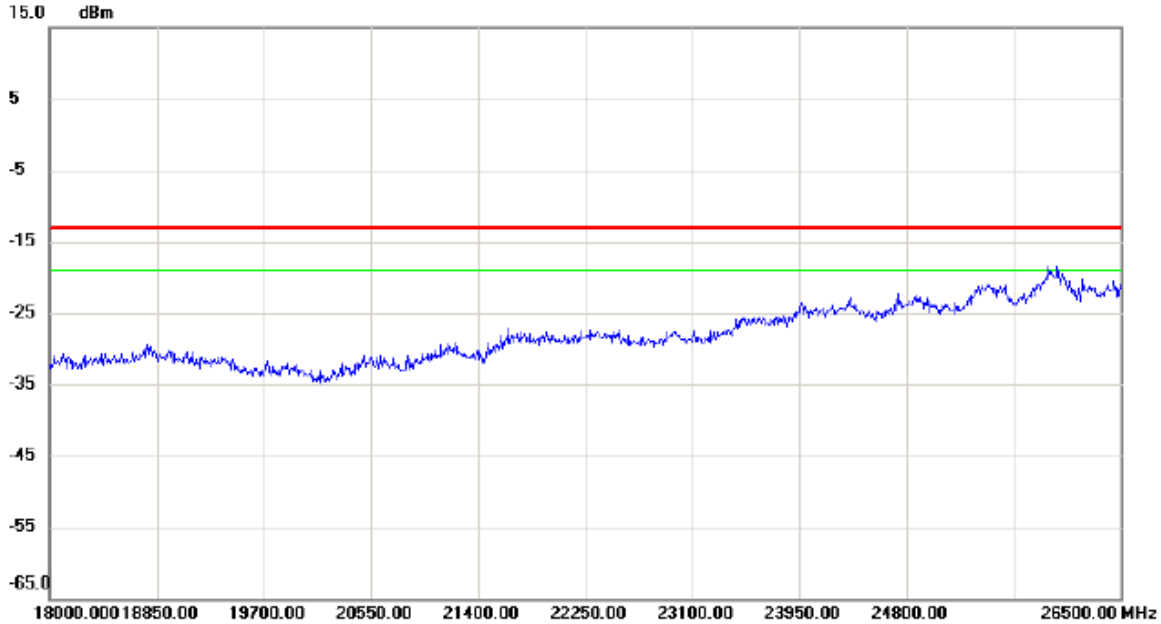
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band VII TX Channel Middle-QPSK 20M/1RB

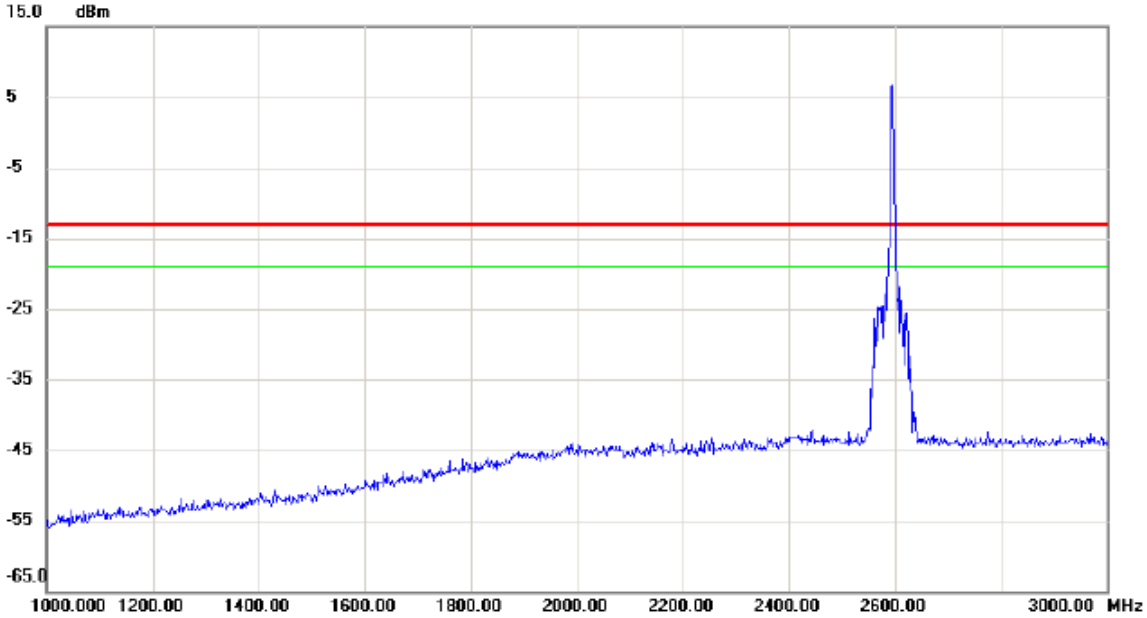
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

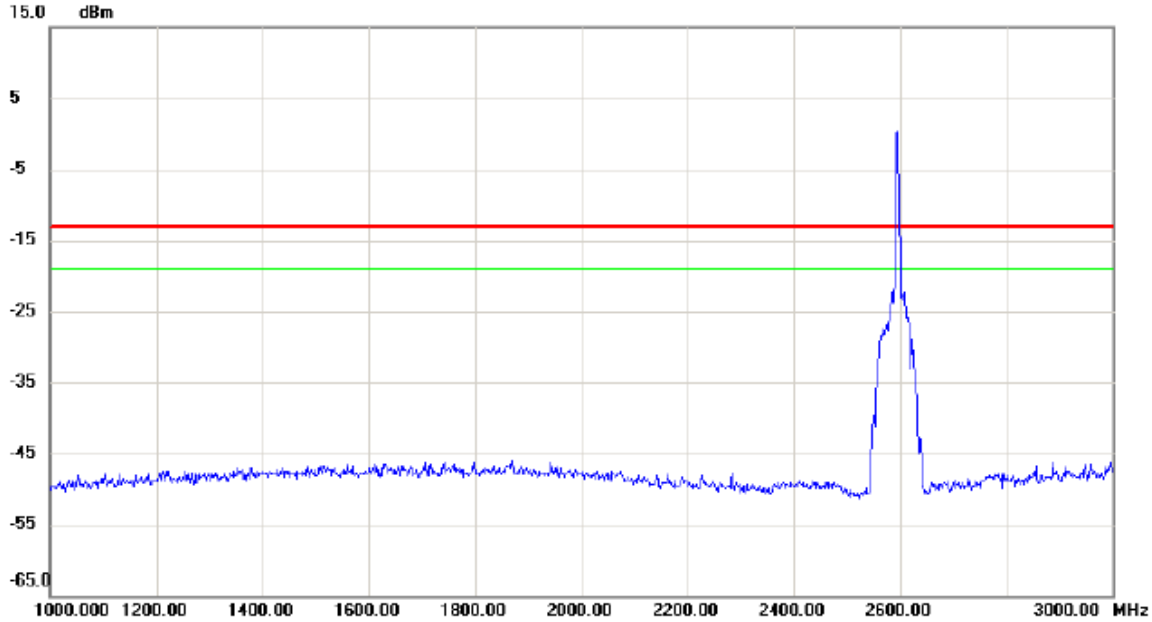
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

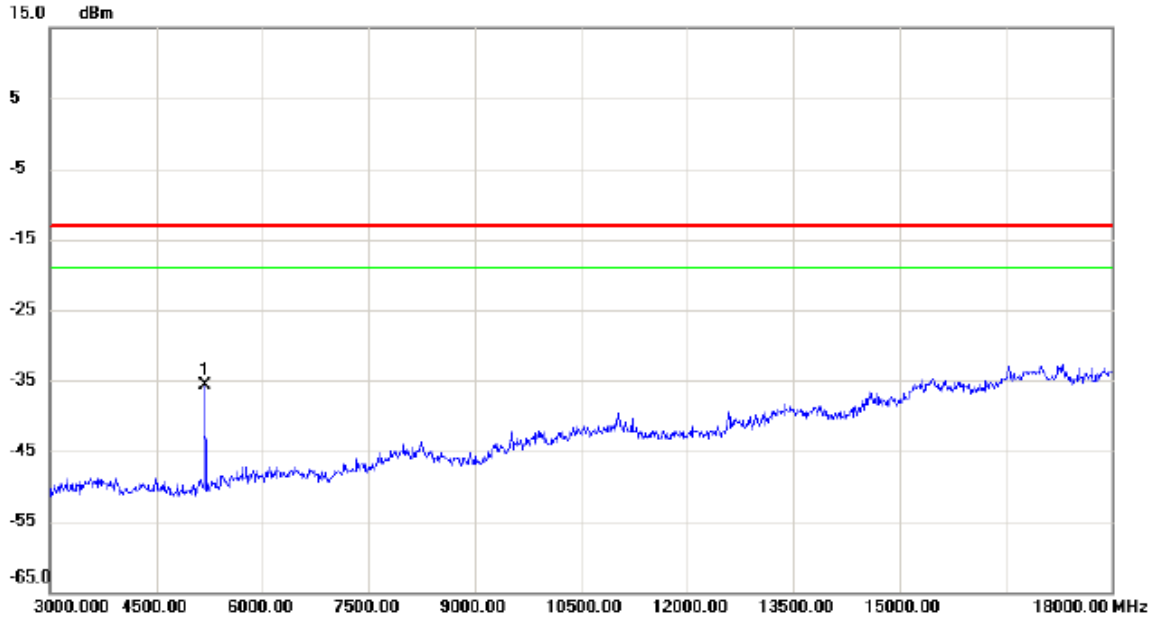
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

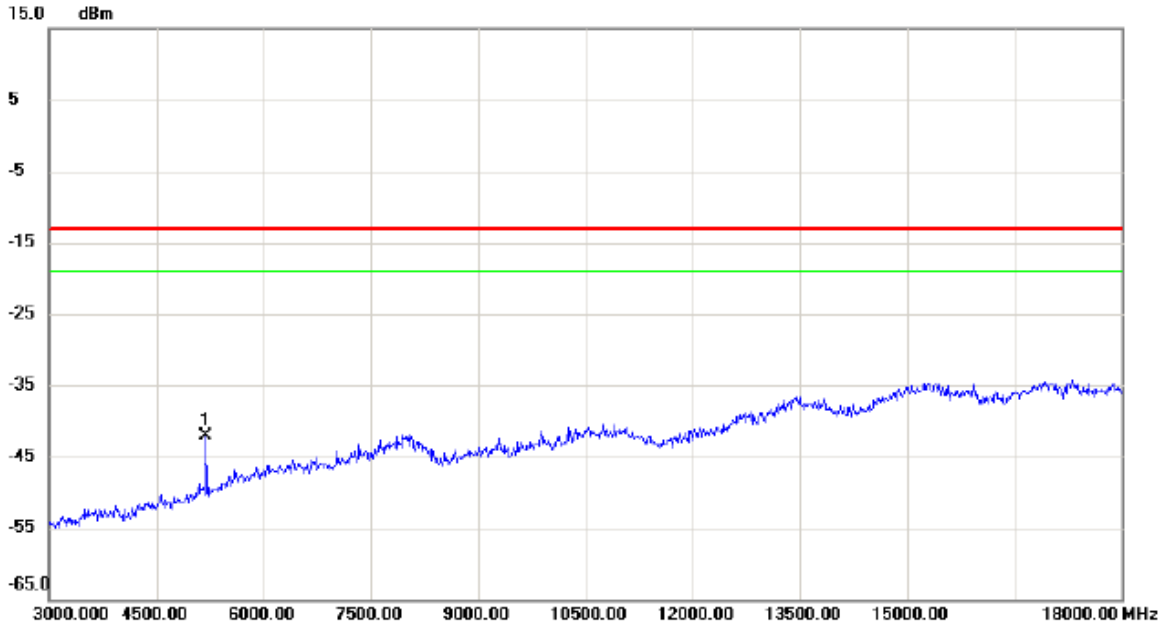
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5190.000	-50.79	15.15	-35.64	-13.00	-22.64	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

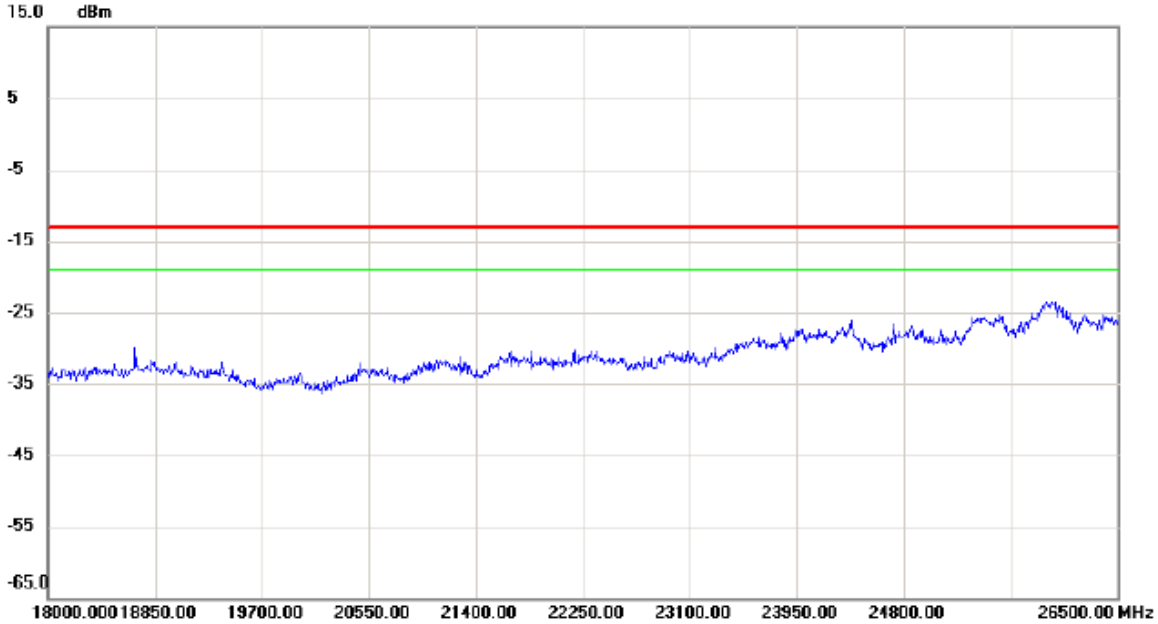
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5190.000	-57.47	15.39	-42.08	-13.00	-29.08	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

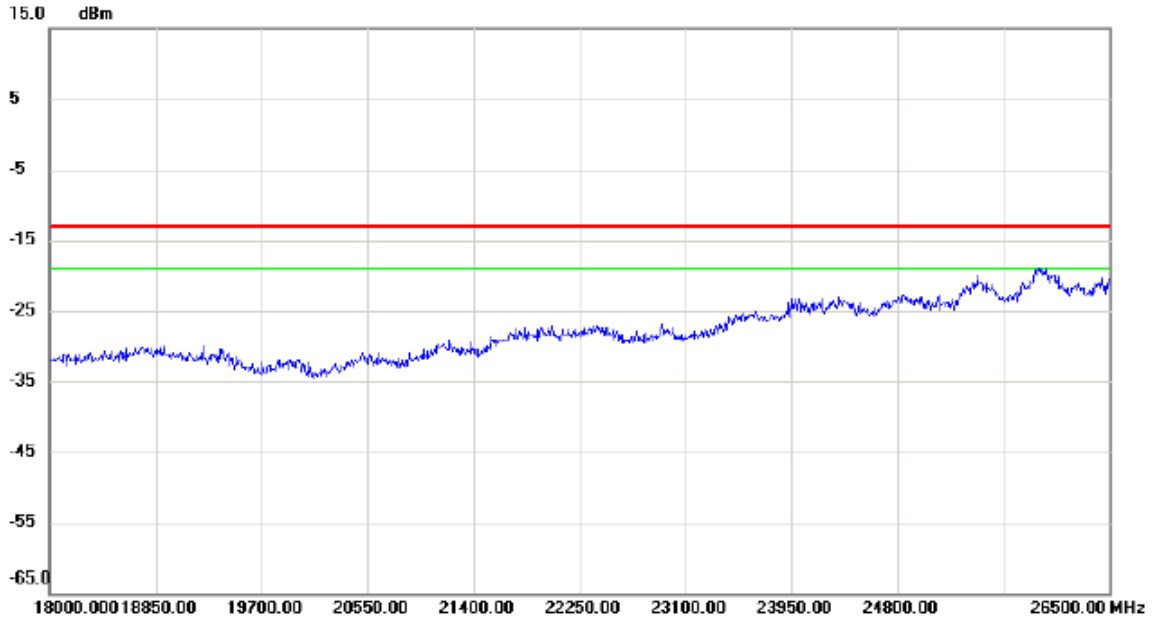
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-16QAM 5M/1RB

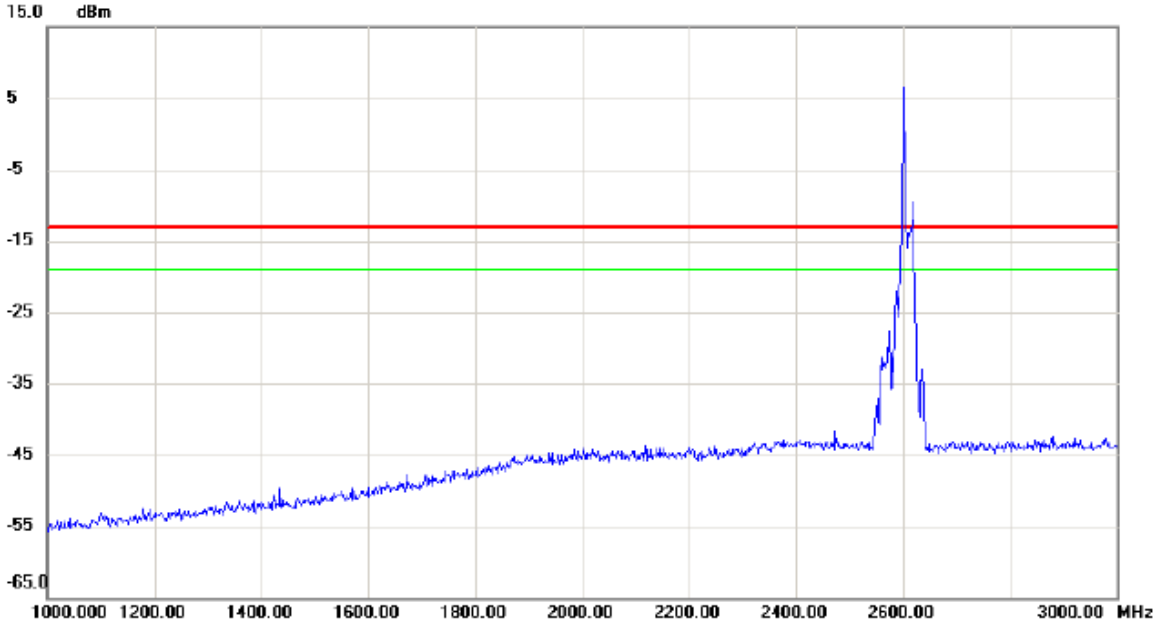
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

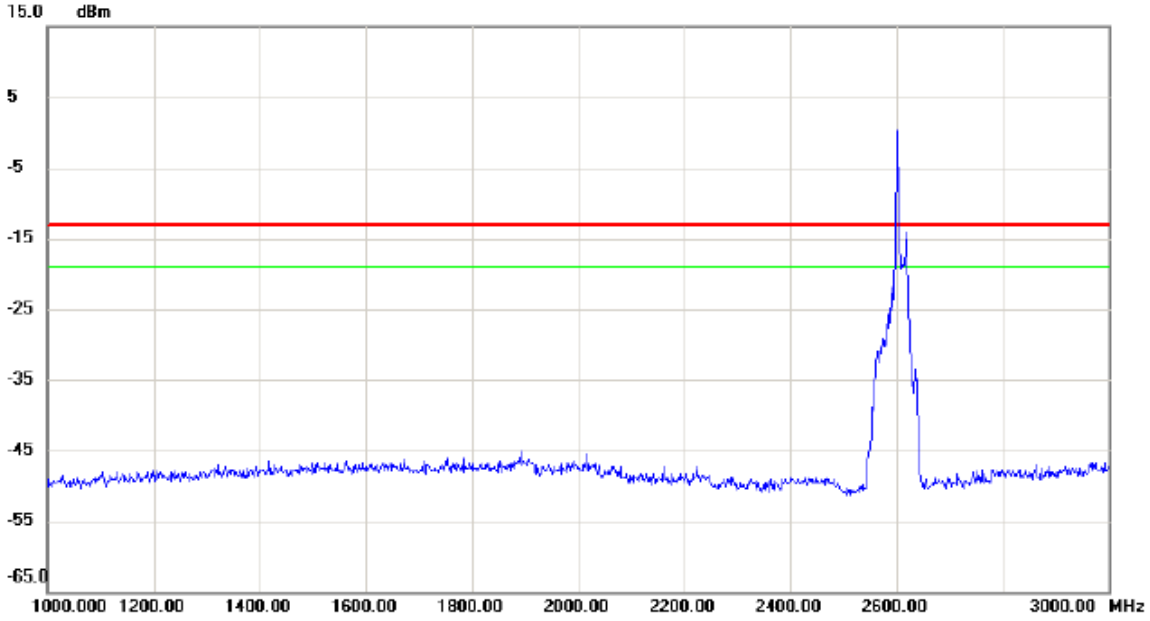
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

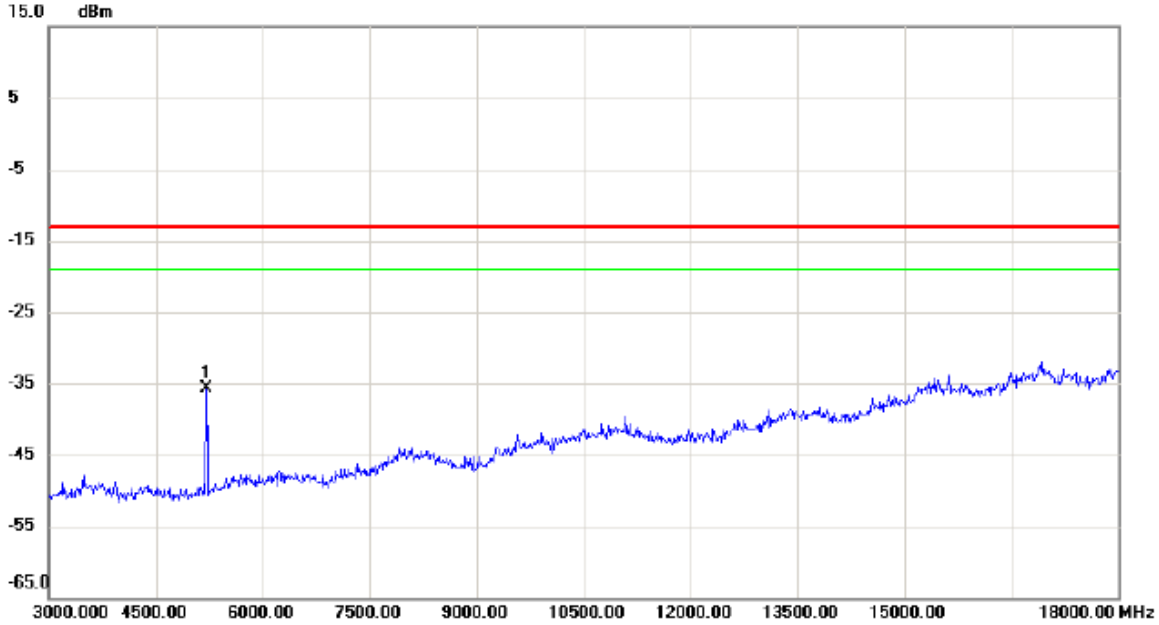
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

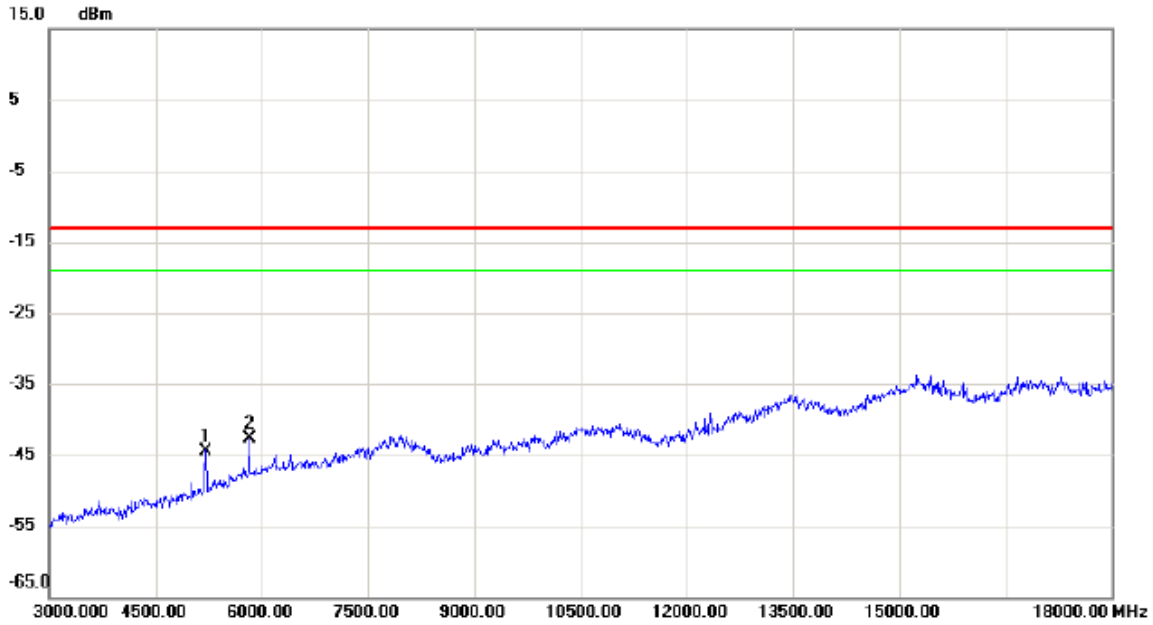
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5205.000	-50.89	15.19	-35.70	-13.00	-22.70	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

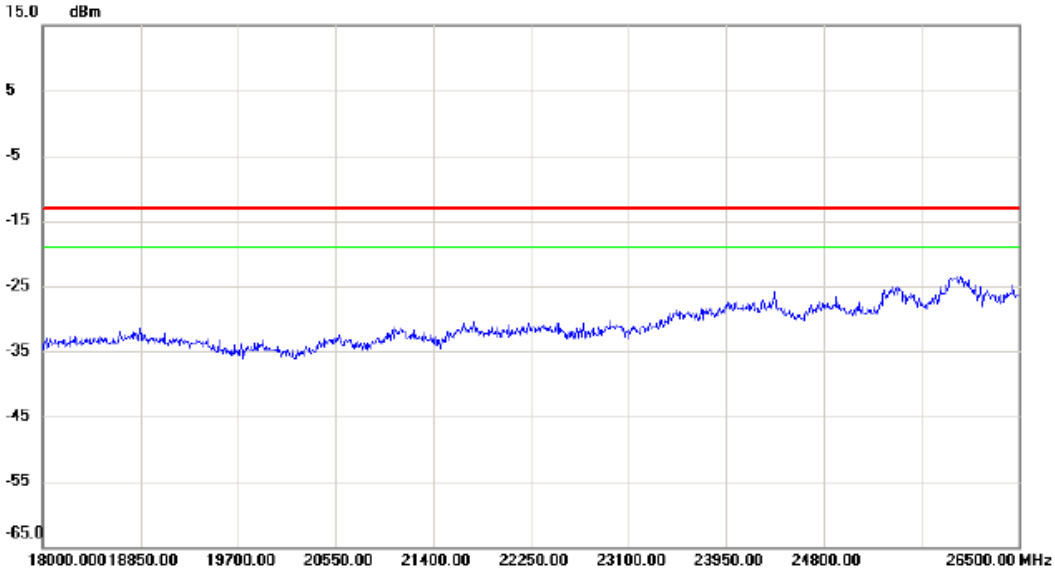
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		5205.000	-59.85	15.45	-44.40	-13.00	-31.40	peak	
2	*	5820.000	-60.24	17.62	-42.62	-13.00	-29.62	peak	

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

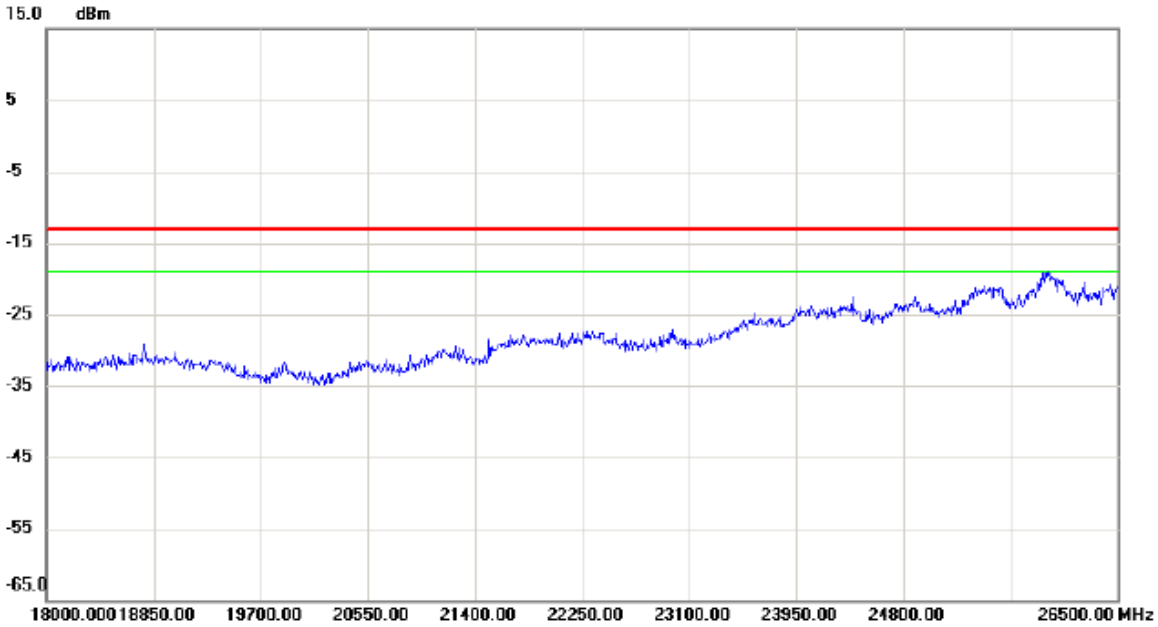
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Test Mode:	LTE Band XXXVIII TX Channel Middle-QPSK 20M/1RB

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment