

# FCC Radio Test Report

## FCC ID: QISME919BS-567AB

This report concerns: Original Grant


**Project No.** : 1907C127  
**Equipment** : LTE Module  
**Test Model** : ME919Bs-567ab  
**Series Model** : N/A  
**Applicant** : Huawei Technologies Co., Ltd.  
**Address** : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, China

**Date of Receipt** : Jul. 16, 2019  
**Date of Test** : Jul. 17, 2019 ~ Aug. 01, 2019  
**Issued Date** : Aug. 06, 2019  
**Tested by** : BTL Inc.

**Technical Manager** :

  
\_\_\_\_\_  
(Ethan Ma)

**Authorized Signatory** :

  
\_\_\_\_\_  
(Steven Lu)

# **B T L I N C .**

No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

TEL: +86-769-8318-3000 FAX: +86-769-8319-6000



Certificate #5123.02

## Declaration

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL's** reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL's** laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and is not use in determining the Pass/Fail results.

<b>Table of Contents</b>	<b>Page</b>
<b>REPORT ISSUED HISTORY</b>	<b>5</b>
<b>1 . GENERAL SUMMARY</b>	<b>6</b>
<b>2 . SUMMARY OF TEST RESULTS</b>	<b>7</b>
2.1 TEST FACILITY	8
2.2 MEASUREMENT UNCERTAINTY	8
<b>3 . GENERAL INFORMATION</b>	<b>9</b>
3.1 GENERAL DESCRIPTION OF EUT	9
3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION	11
3.3 BLOCKDIGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED	14
3.4 DESCRIPTION OF SUPPORT UNITS	14
<b>4 . TEST RESULT</b>	<b>15</b>
4.1 OUTPUT POWER MEASUREMENT	15
4.1.1 LIMIT	15
4.1.2 TEST PROCEDURE	15
4.1.3 TEST SETUP LAYOUT	15
4.1.4 TEST DEVIATION	15
4.1.5 TEST RESULTS	15
4.2 OCCUPIED BANDWIDTH MEASUREMENT	16
4.2.1 TEST PROCEDURE	16
4.2.2 TEST SETUP LAYOUT	16
4.2.3 TEST DEVIATION	16
4.2.4 TEST RESULTS	16
4.3 CONDUCTED EMISSIONS MEASUREMENT	17
4.3.1 LIMIT	17
4.3.2 TEST PROCEDURES	17
4.3.3 TEST SETUP LAYOUT	17
4.3.4 TEST DEVIATION	17
4.3.5 TEST RESULTS	17
4.4 RADIATED EMISSIONS MEASUREMENT	18
4.4.1 LIMIT	18
4.4.2 TEST PROCEDURES	18
4.4.3 TEST SETUP LAYOUT	19
4.4.4 TEST DEVIATION	21
4.4.5 TEST RESULTS (9KHZ TO 30MHZ)	21
4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)	21
4.4.7 TEST RESULTS (ABOVE 1000MHZ)	21
4.5 BAND EDGE MEASUREMENT	22
4.5.1 LIMIT	22

<b>Table of Contents</b>	<b>Page</b>
4.5.2 TEST PROCEDURES	22
4.5.3 TEST SETUP LAYOUT	22
4.5.4 TEST DEVIATION	22
4.5.5 TEST RESULTS	22
4.6 PEAK TO AVERAGE RATIO MEASUREMENT	23
4.6.1 LIMIT	23
4.6.2 TEST PROCEDURES	23
4.6.3 TEST SETUP LAYOUT	23
4.6.4 TEST DEVIATION	23
4.6.5 TEST RESULTS	23
4.7 FREQUENCY STABILITY MEASUREMENT	24
4.7.1 LIMIT	24
4.7.2 TEST PROCEDURES	24
4.7.3 TEST SETUP LAYOUT	24
4.7.4 TEST DEVIATION	24
4.7.5 TEST RESULTS	24
5. LIST OF MEASUREMENT EQUIPMENTS	25
APPENDIX A - OUTPUT POWER	27
APPENDIX B - OCCUPIED BANDWIDTH	36
APPENDIX C - CONDUCTED EMISSIONS	54
APPENDIX D - RADIATED EMISSION (9KHZ TO 30MHZ)	60
APPENDIX E - RADIATED EMISSION (30MHZ TO 1GHZ)	65
APPENDIX F - RADIATED EMISSION (ABOVE 1GHZ)	78
APPENDIX G - BAND EDGE	115
APPENDIX H - PEAK TO AVERAGE RATIO	125
APPENDIX I - FREQUENCY STABILITY	136

### REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Aug. 06, 2019

## 1. GENERAL SUMMARY

Equipment : LTE Module  
Brand Name : HUAWEI  
Test Model : ME919Bs-567ab  
Series Model : N/A  
Applicant : Huawei Technologies Co., Ltd.  
Manufacturer : Huawei Technologies Co., Ltd.  
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, China  
Factory : Huawei Technologies Co., Ltd.  
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, China  
Date of Test : Jul. 17, 2019 ~ Aug. 01, 2019  
Test Sample : Engineering Sample No.: DG19071638 for conducted, DG19071639 for  
radiated.  
Standard(s) : 47 CFR FCC Part 24 Subpart E  
47 CFR FCC Part 2  
ANSI/TIA/EIA-603-E-2016  
KDB 971168 D01 Power Meas License Digital Systems v03r01

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-2-1907C127) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

**Test results included in this report are only for the PCS1900, WCDMA Band II and LTE Band 2 part.**

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 24 Subpart E& Part 2			
Standard(s) Section	Test Item	Verdict	Tested By
2.1046 & 24.232(c)	Equivalent Isotropic Radiated Power	PASS	Treyy Chen
2.1049	Occupied Bandwidth	PASS	Treyy Chen
2.1051 & 24.238(a)	Conducted Spurious Emissions	PASS	Treyy Chen
2.1053 & 24.238(a)	Radiated Spurious Emissions	PASS	Treyy Chen
24.238(a)	Band Edge Measurements	PASS	Treyy Chen
24.232(d)	Peak To Average Ratio	PASS	Treyy Chen
2.1055 & 24.235	Frequency Stability	PASS	Treyy Chen

## 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 Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

## 2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor)  $k=1.96$  or  $k=2$ (which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Measurement Uncertainty for a Level of Confidence of 95 %,  $U=2xUc(y)$ .

The BTL measurement uncertainty as below table:

### A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.88
		30MHz ~ 200MHz	H	4.14
		200MHz ~ 1,000MHz	V	4.62
		200MHz ~ 1,000MHz	H	4.80

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (3m)	CISPR	1GHz ~ 6GHz	4.58
		6GHz ~ 18GHz	5.18

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (1m)	CISPR	18 ~ 26.5 GHz	3.80
		26.5 ~ 40 GHz	4.30

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 Module	
Brand Name	HUAWEI	
Test Model	ME919Bs-567ab	
Series Model	N/A	
Model Difference(s)	N/A	
Hardware Version	RM3ME919BSM31	
Software Version	11.790.01.05.1419	
Antenna Type	Internal Antenna	
Antenna Gain	PCS1900	2.5 dBi
	WCDMA II	
	LTE Band 2	
Modulation Type	GSM/GPRS	GMSK
	EDGE	GMSK, 8PSK
	WCDMA	UL: QPSK DL: QPSK, 16QAM
	WCDMA(HSDPA/HSUPA)	16QAM
	LTE	UL: QPSK, 16QAM DL: QPSK, 16QAM, 64QAM
Operation Frequency	GSM /EDGE/GPRS	1850.2MHz ~ 1909.8MHz
	WCDMA Band II	1852.4MHz ~ 1907.6MHz
	LTE Band 2 (Channel Bandwidth: 1.4MHz)	1850.7MHz ~ 1909.3MHz
	LTE Band 2 (Channel Bandwidth: 3MHz)	1851.5MHz ~ 1908.5MHz
	LTE Band 2 (Channel Bandwidth: 5MHz)	1852.5MHz ~ 1907.5MHz
	LTE Band 2 (Channel Bandwidth: 10MHz)	1855.0MHz ~ 1905.0MHz
	LTE Band 2 (Channel Bandwidth: 15MHz)	1857.5MHz ~ 1902.5MHz
	LTE Band 2 (Channel Bandwidth: 20MHz)	1860.0MHz ~ 1900.0MHz

Max. EIRP Power	GSM/GPRS	GMSK	31.91	dBm
	EDGE	8PSK	28.40	dBm
	WCDMA	QPSK	25.23	dBm
	WCDMA_HSDPA	16QAM	25.31	dBm
	WCDMA_HSUPA	16QAM	25.35	dBm
	LTE Band 2 (Channel Bandwidth: 1.4MHz)	QPSK	25.40	dBm
		16QAM	24.55	dBm
	LTE Band 2 (Channel Bandwidth: 3MHz)	QPSK	25.43	dBm
		16QAM	24.61	dBm
	LTE Band 2 (Channel Bandwidth: 5MHz)	QPSK	25.44	dBm
		16QAM	24.51	dBm
	LTE Band 2 (Channel Bandwidth: 10MHz)	QPSK	25.47	dBm
		16QAM	24.54	dBm
	LTE Band 2 (Channel Bandwidth: 15MHz)	QPSK	25.44	dBm
16QAM		24.44	dBm	
LTE Band 2 (Channel Bandwidth: 20MHz)	QPSK	25.45	dBm	
	16QAM	24.42	dBm	
Power Source	DC Voltage supplied from AC/DC adapter (support unit).			
Power Rating	I/P: 100-240V ~50/60Hz    O/P: 12V <b>===</b> 2A EUT: 4V <b>===</b>			

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 AND TEST CONDITION

Following channel(s) was (were) selected for the final test as listed below:

GSM MODE			
Test Item	Available Channel	Tested Channel	Mode
EIRP	512 to 810	512, 661, 810	GSM, GPRS, EDGE
Output Power	512 to 810	512, 661, 810	GSM, GPRS, EDGE
Occupied Bandwidth	512 to 810	512, 661, 810	GSM, EDGE
Condcudeted Emission	512 to 810	661	GSM, EDGE
Radiated Emission	512 to 810	661	GSM, EDGE
Band Edge	512 to 810	512, 810	GSM, EDGE
Peak to Average Ratio	512 to 810	512, 661, 810	GSM, EDGE
Frequency Stability	512 to 810	661	GSM

WCDMA MODE			
Test Item	Available Channel	Tested Channel	Mode
EIRP	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
Output Power	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
Conducted Emission	9262 to 9538	9400	WCDMA
Radiated Emission	9262 to 9538	9400	WCDMA
Band Edge	9262 to 9538	9262, 9538	WCDMA, HSDPA, HSUPA
Peak to Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
Frequency Stability	9262 to 9538	9400	WCDMA

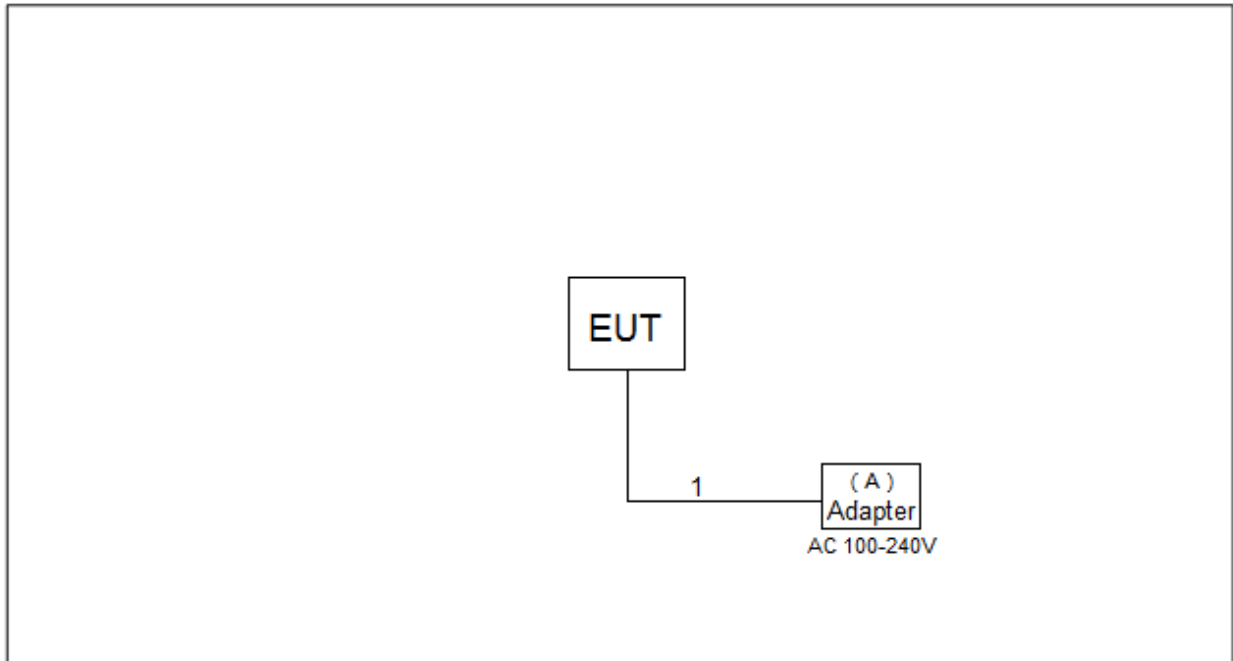
LTE BAND 2 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	6RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	15RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	25RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	50RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	75 RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	100RB
Conducted Emission	18607 to 19193	18900	1.4 MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB
Radiated Emission	18607 to 19193	18900	1.4 MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB
Band Edge	18607 to 19193	18607	1.4MHz	QPSK	1RB/6RB
		19193	1.4MHz	QPSK	
	18615 to 19185	18615	3MHz	QPSK	1RB/15RB
		19185	3MHz	QPSK	
	18625 to 19175	18625	5MHz	QPSK	1RB/25RB
		19175	5MHz	QPSK	
	18650 to 19150	18650	10MHz	QPSK	1RB/50RB
		19150	10MHz	QPSK	
	18675 to 19125	18675	15MHz	QPSK	1RB/75RB
		19125	15MHz	QPSK	
	18700 to 19100	18700	20MHz	QPSK	1RB/100RB
		19100	20MHz	QPSK	

LTE BAND 2 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Peak To Average Ratio	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	1RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1RB
Frequency Stability	18607 to 19193	18900	1.4MHz	QPSK	1RB
	18615 to 19185	18900	3MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18650 to 19150	18900	10MHz	QPSK	1RB
	18675 to 19125	18900	15MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB

**EUT TEST CONDITIONS:**

Test Item	Environmental Conditions	Test Voltage
EIRP	24.5°C, 53%RH	DC 4.0V
Output Power	24.5°C, 53%RH	DC 4.0V
Occupied Bandwidth	24.5°C, 53%RH	DC 4.0V
Conducted Emission	24.5°C, 53%RH	DC 4.0V
Radiated Emission	24°C, 68%RH	AC 120V/60Hz
Band Edge	24.5°C, 53%RH	DC 4.0V
Peak to Average Ratio	24.5°C, 53%RH	DC 4.0V
Frequency Stability	Normal and Extreme	Normal and Extreme

### 3.3 BLOCK DIAGRAM 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.	Series No.
-	-	-	-	-

Item	Cable Type	Shielded Type	Ferrite Core	Length
A	DC Cable	NO	NO	1.5m

## 4. TEST RESULT

### 4.1 OUTPUT POWER MEASUREMENT

#### 4.1.1 LIMIT

Mobile / Portable station are limited to 2 watts e.i.r.p.

#### 4.1.2 TEST PROCEDURE

##### EIRP:

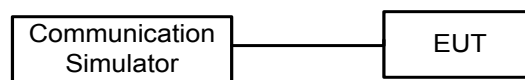
$EIRP = \text{Output Power} + \text{Antenan gain}$

##### Output Power:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

#### 4.1.3 TEST SETUP LAYOUT

Output Power Measurement



#### 4.1.4 TEST DEVIATION

No deviation

#### 4.1.5 TEST RESULTS

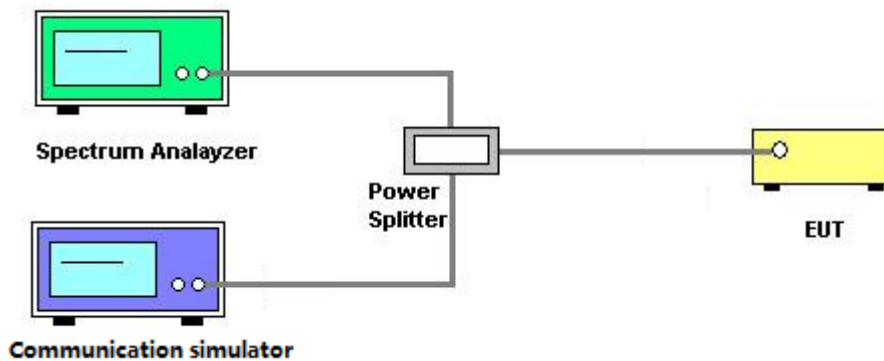
Please refer to the Appendix A.

## 4.2 OCCUPIED BANDWIDTH MEASUREMENT

### 4.2.1 TEST PROCEDURE

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26dB bandwidth.

### 4.2.2 TEST SETUP LAYOUT



### 4.2.3 TEST DEVIATION

No deviation

### 4.2.4 TEST RESULTS

Please refer to the Appendix B.



### 4.3 CONDUCTED EMISSIONS MEASUREMENT

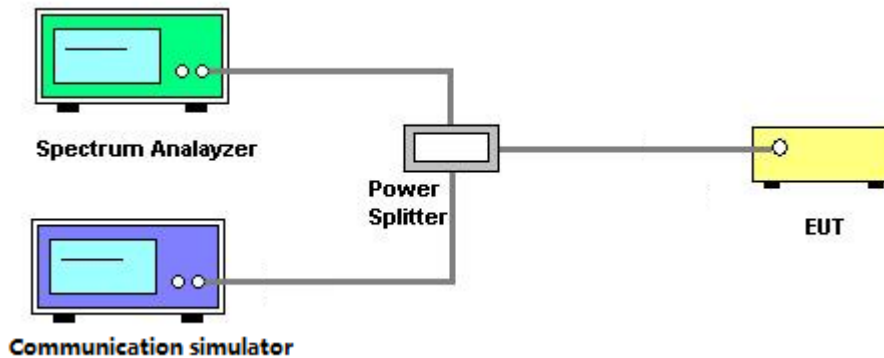
#### 4.3.1 LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

#### 4.3.2 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set  $\text{RBW} \geq 1\%$  EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

#### 4.3.3 TEST SETUP LAYOUT



#### 4.3.4 TEST DEVIATION

No deviation

#### 4.3.5 TEST RESULTS

Please refer to the Appendix C.

## 4.4 RADIATED EMISSIONS MEASUREMENT

### 4.4.1 LIMIT

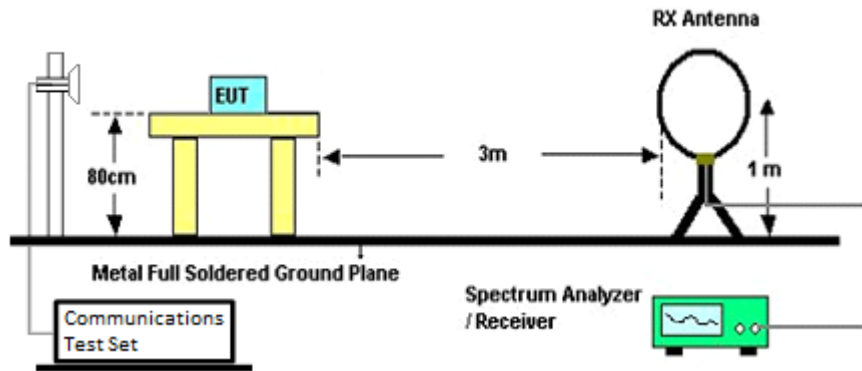
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13dBm.

### 4.4.2 TEST PROCEDURES

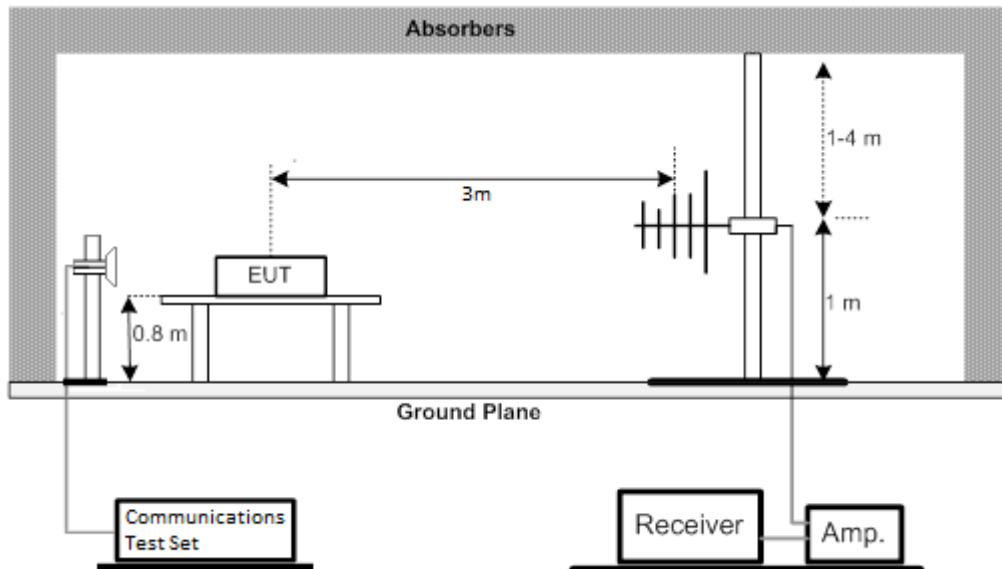
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. 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.

**4.4.3 TEST SETUP LAYOUT**

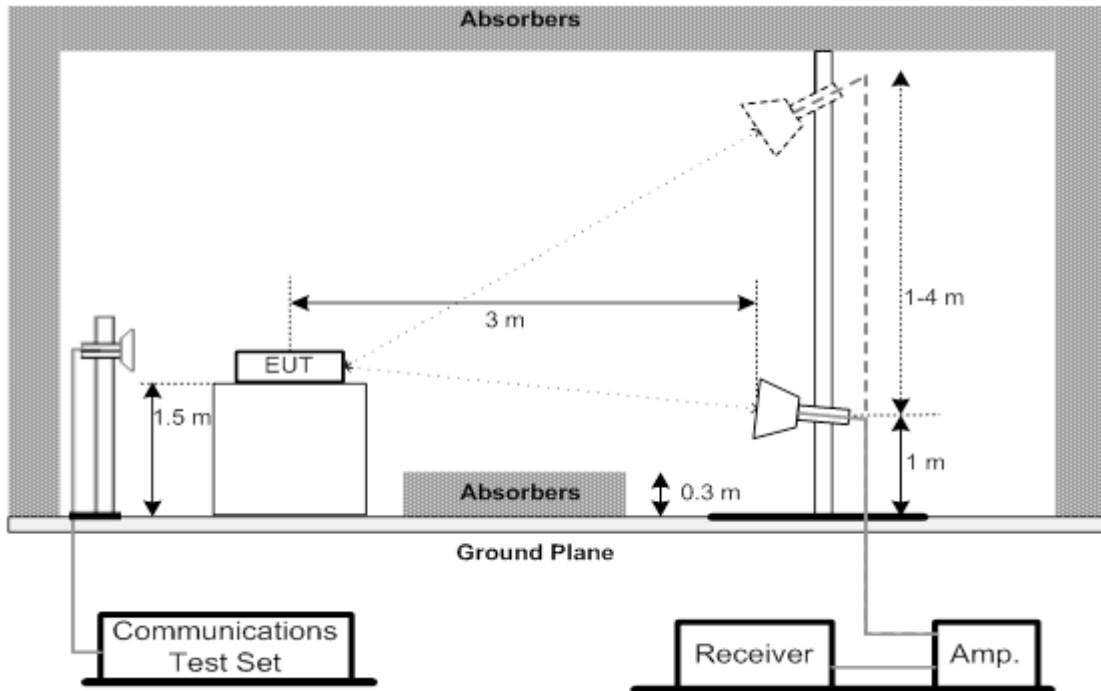
**Below 30MHz**



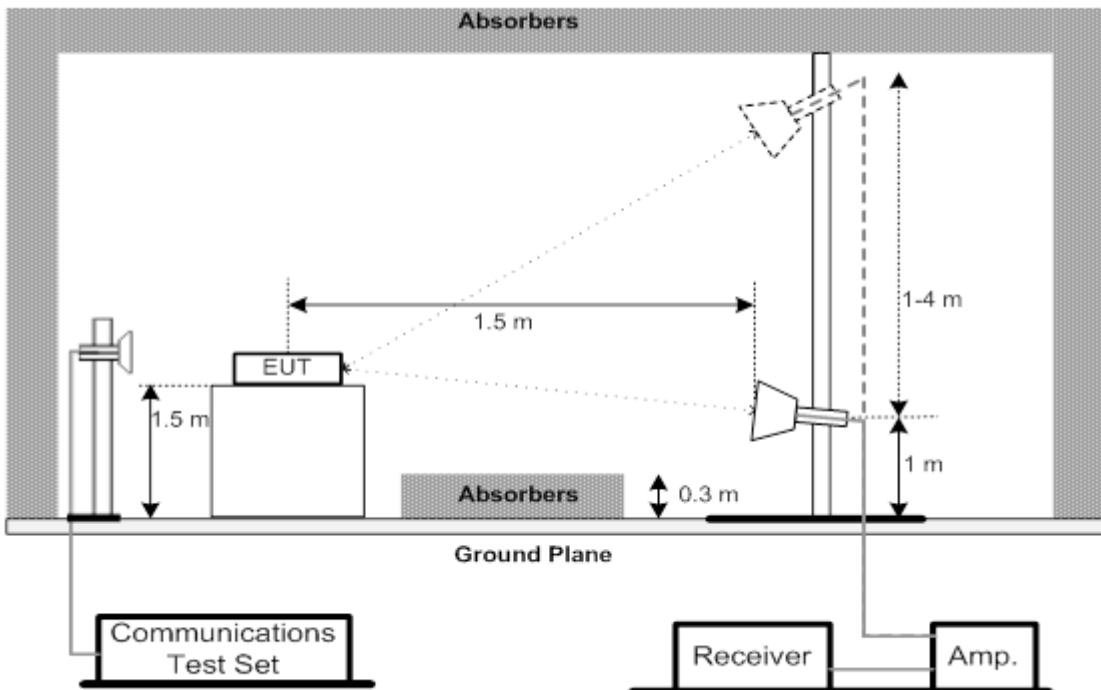
**30MHz to 1GHz**



### 1GHz to 18GHz



### Above 18GHz



#### **4.4.4 TEST DEVIATION**

No deviation

#### **4.4.5 TEST RESULTS (9KHZ TO 30MHZ)**

Please refer to the Appendix D.

#### **4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)**

Please refer to the Appendix E.

#### **4.4.7 TEST RESULTS (ABOVE 1000MHZ)**

Please refer to the Appendix F.

## 4.5 BAND EDGE MEASUREMENT

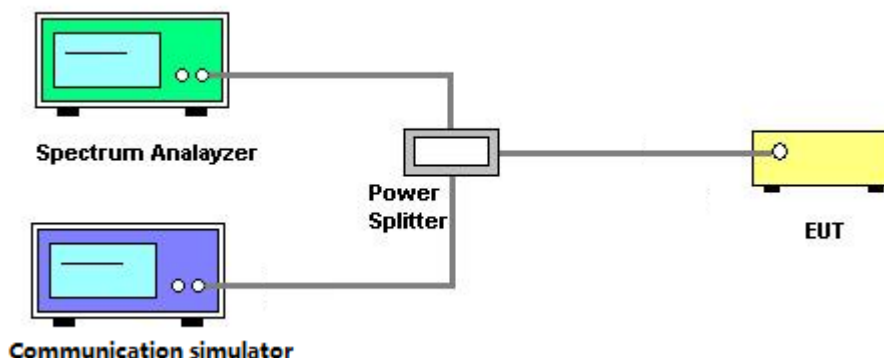
### 4.5.1 LIMIT

A Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. 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.

### 4.5.2 TEST PROCEDURES

1. All measurements were done at low and high operational frequency range.
2. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/GPRS/EDGE).
3. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).
4. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 15kHz and VB of the spectrum is 43kHz (LTE Bandwidth 1.4MHz).
5. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 30kHz and VB of the spectrum is 91kHz (LTE Bandwidth 3MHz).
6. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (LTE Bandwidth 5MHz).
7. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 10MHz).
8. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Bandwidth 15MHz).
9. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (LTE Bandwidth 20MHz).
10. Record the max trace plot into the test report.

### 4.5.3 TEST SETUP LAYOUT



### 4.5.4 TEST DEVIATION

No deviation

### 4.5.5 TEST RESULTS

Please refer to the Appendix G.

## 4.6 PEAK TO AVERAGE RATIO MEASUREMENT

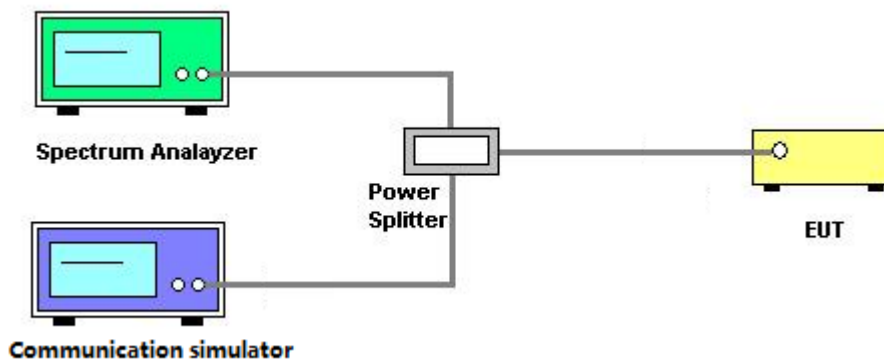
### 4.6.1 LIMIT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 4.6.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

### 4.6.3 TEST SETUP LAYOUT



### 4.6.4 TEST DEVIATION

No deviation

### 4.6.5 TEST RESULTS

Please refer to the Appendix H.

## 4.7 FREQUENCY STABILITY MEASUREMENT

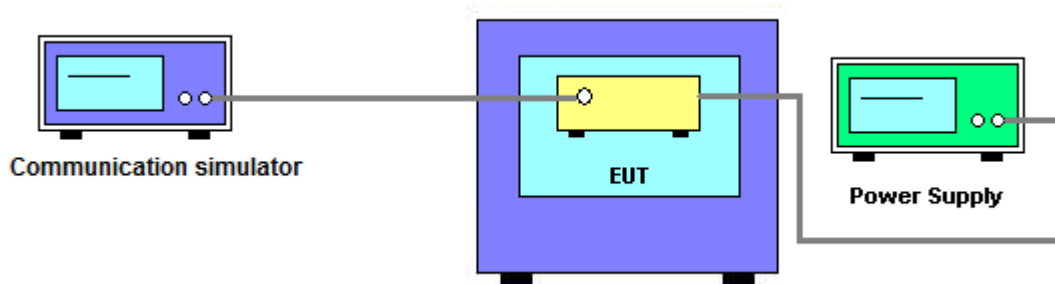
### 4.7.1 LIMIT

$\pm 1.5$  ppm is for base and fixed station.  $\pm 2.5$  ppm is for mobile station.

### 4.7.2 TEST PROCEDURES

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^\circ\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

### 4.7.3 TEST SETUP LAYOUT



### 4.7.4 TEST DEVIATION

No deviation

### 4.7.5 TEST RESULTS

Please refer to the Appendix I.



## 5. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 09, 2020
2	Amplifier	Agilent	8449B	3008A02274	Mar. 10, 2020
3	Amplifier	HP	8447D	2944A09673	Aug. 11, 2019
4	HighPass Filter	Wairwright Instruments Gmbh	WHK 1.5/15G-10ST	11	Mar. 10, 2020
5	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1710/1785-1690/180 5-60/12SS	38	Mar. 10, 2020
6	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 824/849-810/863-60/ 9SS	7	Mar. 10, 2020
7	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 880/915-860/935-60/ 9SS	14	Mar. 10, 2020
8	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1850/1910-1830/193 0-60/10SS	17	Mar. 10, 2020
9	HighPass Filter	Wairwright Instruments Gmbh	WHK3.1/18G-10SS	24	Mar. 10, 2020
10	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 10, 2020
12	Receiver	Agilent	N9038A	MY52130039	Aug. 11, 2019
13	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
14	High pass filter	KANGMAIWEI	ZHPF-M3-12.75G-38 69	B2015073763	Feb. 12, 2020
15	High pass filter	KANGMAIWEI	ZHPF-M1000-4000-1	B2015073762	Feb. 12, 2020
16	High pass filter	KANGMAIWEI	ZHPF-M6-186-1727	B2015073764	Feb. 12, 2020
17	Cable	emci	LMR-400(30MHz-1G Hz)(8m+5m)	N/A	May 24, 2020
18	Cable	mitron	B10-01-01-12M	18072744	Jun. 29, 2020
19	Controller	ETS-Lindgren	2090	N/A	N/A
20	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
21	Loop Antenna	EM	EM-6876-1	230	Jan. 15, 2020
22	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 09, 2020
23	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 23, 2020

**Conducted Emission & Band Edge & Occupied Bandwidth Measurement**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Mar. 10, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
5	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019

**Frequency Stability Measurement**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2*	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Sep. 26, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
5	Const Temp, & Humidity Chamber	Bell	BTH-50C	20170306001	Mar. 10, 2020

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

\* All calibration period of equipment list is three year.

## APPENDIX A - OUTPUT POWER

**Output Power (dBm):**

PCS1900		Burst Output Power		
		512CH	661CH	810CH
		1850.2MHz	1880MHz	1909.8MHz
GSM (CS)		29.41	29.09	29.07
GPRS/EDGE (GMSK)	1 Tx Slot	29.39	29.12	29.10
	2 Tx Slot	26.93	26.65	26.60
	3 Tx Slot	25.76	25.62	25.59
	4 Tx Slot	23.7	23.32	23.41
EDGE (8PSK)	1 Tx Slot	25.78	25.82	25.90
	2 Tx Slot	23.58	23.43	23.72
	3 Tx Slot	22.27	22.37	22.49
	4 Tx Slot	19.84	20.22	20.45

Modulation	Band	WCDMA Band II		
	Tx Channel	9262CH	9400CH	9538CH
	Frequency	1852.4MHz	1880MHz	1907.6MHz
QPSK	RMC 12.2K	22.58	22.63	22.6
	RMC 64K	22.61	22.64	22.72
	RMC 144K	22.64	22.65	22.73
	RMC 384K	22.54	22.64	22.71
16QAM	HSDPA Subtest-1	22.51	22.61	22.65
	HSDPA Subtest-2	22.55	22.77	22.81
	HSDPA Subtest-3	22.21	22.27	22.39
	HSDPA Subtest-4	22.21	22.26	22.36
	HSUPA Subtest-1	21.36	21.18	21.47
	HSUPA Subtest-2	19.75	19.77	19.76
	HSUPA Subtest-3	20.51	20.38	20.92
	HSUPA Subtest-4	20.41	19.72	19.84
	HSUPA Subtest-5	22.81	22.85	22.82

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18607CH	18900CH	19193CH
				1850.7MHz	1880MHz	1909.3MHz
2 / 1.4M	QPSK	1	0	22.36	22.69	22.10
		1	2	22.55	22.81	22.08
		1	5	22.46	22.87	21.70
		3	0	22.49	22.81	22.05
		3	1	22.53	22.82	22.05
		3	2	22.53	22.90	21.92
		6	0	21.36	21.72	20.99
	16QAM	1	0	21.24	21.92	21.17
		1	2	21.40	22.05	21.16
		1	5	21.30	22.05	21.16
		3	0	21.38	21.69	21.22
		3	1	21.43	21.70	21.20
		3	2	21.45	21.76	21.10
		6	0	21.35	21.69	21.03

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18615CH	18900CH	19185CH
				1851.5MHz	1880MHz	1908.5MHz
2 / 3M	QPSK	1	0	22.17	22.51	22.23
		1	7	22.62	22.93	22.37
		1	14	22.26	22.68	21.53
		8	0	21.31	21.57	21.32
		8	4	21.41	21.73	21.24
		8	7	21.34	21.68	21.01
		15	0	21.34	21.65	21.21
	16QAM	1	0	21.33	21.67	21.33
		1	7	21.76	22.11	21.42
		1	14	21.41	21.89	20.58
		8	0	21.23	21.53	21.29
		8	4	21.31	21.69	21.19
		8	7	21.25	21.64	20.94
		15	0	21.28	21.62	21.10

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18625CH	18900CH	19175CH
				1852.5MHz	1880MHz	1907.5MHz
2 / 5M	QPSK	1	0	22.18	22.33	22.24
		1	13	22.59	22.94	22.42
		1	24	22.23	22.78	21.61
		12	0	21.32	21.58	21.49
		12	6	21.42	21.68	21.50
		12	11	21.29	21.72	21.28
	16QAM	25	0	21.24	21.63	21.29
		1	0	21.14	21.39	21.54
		1	13	21.55	22.01	21.76
		1	24	21.21	21.85	20.90
		12	0	21.30	21.56	21.43
		12	6	21.37	21.66	21.37
		12	11	21.26	21.70	21.16
		25	0	21.14	21.55	21.14

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18650CH	18900CH	19150CH
				1855MHz	1880MHz	1905MHz
2 / 10M	QPSK	1	0	22.05	21.96	21.94
		1	25	22.54	22.97	22.57
		1	49	22.21	22.72	21.75
		25	0	21.24	21.44	21.36
		25	13	21.16	21.72	21.39
		25	25	21.11	21.61	21.25
		50	0	21.21	21.53	21.18
	16QAM	1	0	20.97	21.13	20.85
		1	25	21.48	22.04	21.58
		1	49	21.23	21.78	20.81
		25	0	21.25	21.37	21.30
		25	13	21.11	21.64	21.36
		25	25	21.10	21.54	21.12
		50	0	21.14	21.44	21.10

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18675CH	18900CH	19125CH
				1857.5MHz	1880MHz	1902.5MHz
2 / 15M	QPSK	1	0	21.86	21.89	21.66
		1	38	22.49	22.94	22.52
		1	74	21.78	22.27	21.63
		36	0	21.15	21.25	21.20
		36	18	21.21	21.63	21.36
		36	39	20.96	21.43	21.17
		75	0	21.17	21.47	21.07
	16QAM	1	0	20.85	20.92	20.81
		1	38	21.47	21.94	21.65
		1	74	20.81	21.27	20.81
		36	0	21.11	21.21	21.10
		36	18	21.23	21.57	21.28
		36	39	20.88	21.33	21.06
		75	0	21.09	21.35	21.04

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18700CH	18900CH	19100CH
				1860MHz	1880MHz	1900MHz
2 / 20M	QPSK	1	0	21.89	21.73	21.82
		1	50	22.43	22.95	22.40
		1	99	21.71	21.90	21.51
		50	0	21.17	21.27	21.00
		50	25	21.23	21.53	21.26
		50	50	20.90	21.29	20.92
		100	0	21.06	21.39	21.01
	16QAM	1	0	20.97	20.84	21.06
		1	50	21.53	21.92	21.59
		1	99	20.83	20.87	20.79
		50	0	21.08	21.18	20.95
		50	25	21.15	21.42	21.17
		50	50	20.82	21.20	20.84
		100	0	20.96	21.30	20.94

**EIRP Power (dBm):**

PCS1900		EIRP Power		
		512CH	661CH	810CH
		1850.2MHz	1880MHz	1909.8MHz
GSM (CS)		31.91	31.59	31.57
GPRS/EDGE (GMSK)	1 Tx Slot	31.89	31.62	31.60
	2 Tx Slot	29.43	29.15	29.10
	3 Tx Slot	28.26	28.12	28.09
	4 Tx Slot	26.20	25.82	25.91
EDGE (8PSK)	1 Tx Slot	28.28	28.32	28.40
	2 Tx Slot	26.08	25.93	26.22
	3 Tx Slot	24.77	24.87	24.99
	4 Tx Slot	22.34	22.72	22.95

Modulation	Band	WCDMA Band II		
	Tx Channel	9262CH	9400CH	9538CH
	Frequency	1852.4MHz	1880MHz	1907.6MHz
QPSK	RMC 12.2K	25.08	25.13	25.10
	RMC 64K	25.11	25.14	25.22
	RMC 144K	25.14	25.15	25.23
	RMC 384K	25.04	25.14	25.21
16QAM	HSDPA Subtest-1	25.01	25.11	25.15
	HSDPA Subtest-2	25.05	25.27	25.31
	HSDPA Subtest-3	24.71	24.77	24.89
	HSDPA Subtest-4	24.71	24.76	24.86
	HSUPA Subtest-1	23.86	23.68	23.97
	HSUPA Subtest-2	22.25	22.27	22.26
	HSUPA Subtest-3	23.01	22.88	23.42
	HSUPA Subtest-4	22.91	22.22	22.34
	HSUPA Subtest-5	25.31	25.35	25.32



LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18607CH	18900CH	19193CH
				1850.7MHz	1880MHz	1909.3MHz
2 / 1.4M	QPSK	1	0	24.86	25.19	24.60
		1	2	25.05	25.31	24.58
		1	5	24.96	25.37	24.20
		3	0	24.99	25.31	24.55
		3	1	25.03	25.32	24.55
		3	2	25.03	25.40	24.42
	16QAM	6	0	23.86	24.22	23.49
		1	0	23.74	24.42	23.67
		1	2	23.90	24.55	23.66
		1	5	23.80	24.55	23.66
		3	0	23.88	24.19	23.72
		3	1	23.93	24.20	23.70
		3	2	23.95	24.26	23.60
		6	0	23.85	24.19	23.53

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18615CH	18900CH	19185CH
				1851.5MHz	1880MHz	1908.5MHz
2 / 3M	QPSK	1	0	24.67	25.01	24.73
		1	7	25.12	25.43	24.87
		1	14	24.76	25.18	24.03
		8	0	23.81	24.07	23.82
		8	4	23.91	24.23	23.74
		8	7	23.84	24.18	23.51
		15	0	23.84	24.15	23.71
	16QAM	1	0	23.83	24.17	23.83
		1	7	24.26	24.61	23.92
		1	14	23.91	24.39	23.08
		8	0	23.73	24.03	23.79
		8	4	23.81	24.19	23.69
		8	7	23.75	24.14	23.44
		15	0	23.78	24.12	23.60

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18625CH	18900CH	19175CH
				1852.5MHz	1880MHz	1907.5MHz
2 / 5M	QPSK	1	0	24.68	24.83	24.74
		1	13	25.09	25.44	24.92
		1	24	24.73	25.28	24.11
		12	0	23.82	24.08	23.99
		12	6	23.92	24.18	24.00
		12	11	23.79	24.22	23.78
	16QAM	25	0	23.74	24.13	23.79
		1	0	23.64	23.89	24.04
		1	13	24.05	24.51	24.26
		1	24	23.71	24.35	23.40
		12	0	23.80	24.06	23.93
		12	6	23.87	24.16	23.87
		12	11	23.76	24.20	23.66
		25	0	23.64	24.05	23.64

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18650CH	18900CH	19150CH
				1855MHz	1880MHz	1905MHz
2 / 10M	QPSK	1	0	24.55	24.46	24.44
		1	25	25.04	25.47	25.07
		1	49	24.71	25.22	24.25
		25	0	23.74	23.94	23.86
		25	13	23.66	24.22	23.89
		25	25	23.61	24.11	23.75
		50	0	23.71	24.03	23.68
	16QAM	1	0	23.47	23.63	23.35
		1	25	23.98	24.54	24.08
		1	49	23.73	24.28	23.31
		25	0	23.75	23.87	23.80
		25	13	23.61	24.14	23.86
		25	25	23.60	24.04	23.62
		50	0	23.64	23.94	23.60

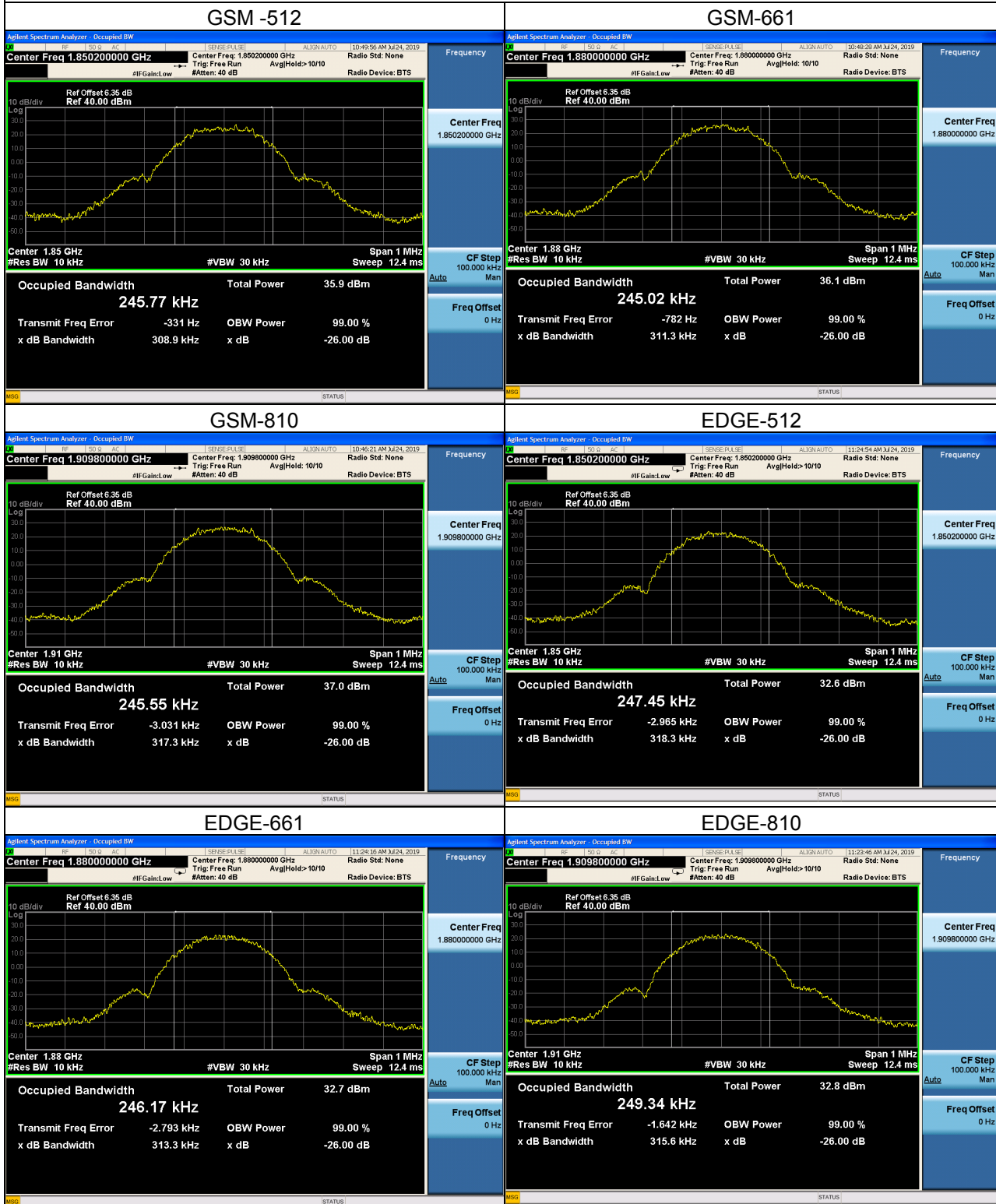
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18675CH	18900CH	19125CH
				1857.5MHz	1880MHz	1902.5MHz
2 / 15M	QPSK	1	0	24.36	24.39	24.16
		1	38	24.99	25.44	25.02
		1	74	24.28	24.77	24.13
		36	0	23.65	23.75	23.70
		36	18	23.71	24.13	23.86
		36	39	23.46	23.93	23.67
		75	0	23.67	23.97	23.57
	16QAM	1	0	23.35	23.42	23.31
		1	38	23.97	24.44	24.15
		1	74	23.31	23.77	23.31
		36	0	23.61	23.71	23.60
		36	18	23.73	24.07	23.78
		36	39	23.38	23.83	23.56
		75	0	23.59	23.85	23.54

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18700CH	18900CH	19100CH
				1860MHz	1880MHz	1900MHz
2 / 20M	QPSK	1	0	24.39	24.23	24.32
		1	50	24.93	25.45	24.90
		1	99	24.21	24.40	24.01
		50	0	23.67	23.77	23.50
		50	25	23.73	24.03	23.76
		50	50	23.40	23.79	23.42
		100	0	23.56	23.89	23.51
	16QAM	1	0	23.47	23.34	23.56
		1	50	24.03	24.42	24.09
		1	99	23.33	23.37	23.29
		50	0	23.58	23.68	23.45
		50	25	23.65	23.92	23.67
		50	50	23.32	23.70	23.34
		100	0	23.46	23.80	23.44

## APPENDIX B - OCCUPIED BANDWIDTH

PCS1900					
GSM			EDGE		
CS			8PSK		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
512	1850.2	0.2458	512	1850.2	0.2474
661	1880	0.2450	661	1880	0.2462
810	1909.8	0.2456	810	1909.8	0.2493
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
512	1850.2	0.3089	512	1850.2	0.3183
661	1880	0.3113	661	1880	0.3133
810	1909.8	0.3173	810	1909.8	0.3156

### Spectrum Plot



WCDMA Band II					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.1318	9262	1852.4	4.7000
9400	1880	4.1491	9400	1880	4.6910
9538	1907.6	4.1298	9538	1907.6	4.7080



WCDMA_HSDPA Band II					
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.1325	9262	1852.4	4.6840
9400	1880	4.1331	9400	1880	4.7090
9538	1907.6	4.1346	9538	1907.6	4.7020





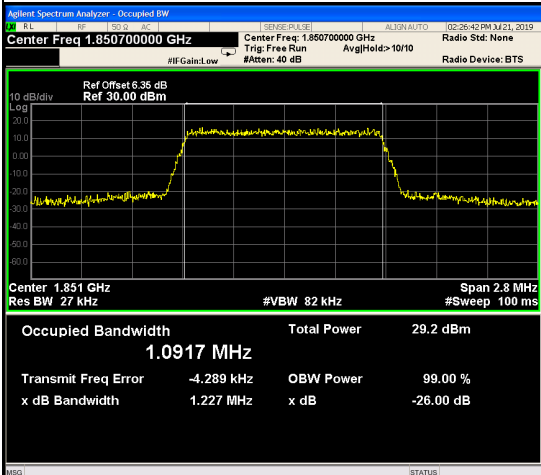
WCDMA_HSUPA Band II					
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.1338	9262	1852.4	4.6870
9400	1880	4.1658	9400	1880	4.7230
9538	1907.6	4.1795	9538	1907.6	4.7360



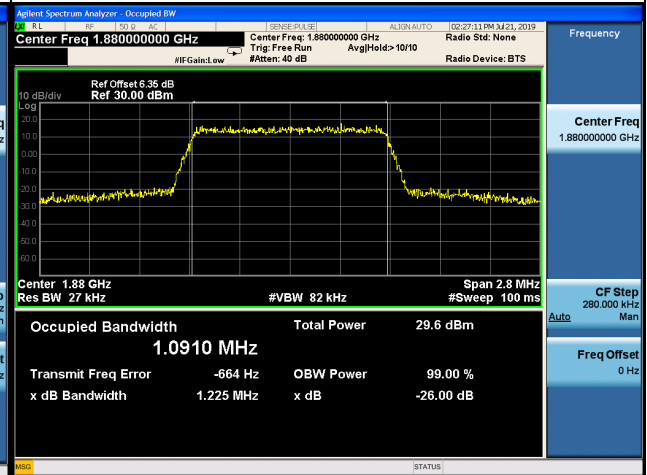
LTE Band 2_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18607	1850.7	1.0917	18607	1850.7	1.0870
18900	1880	1.0910	18900	1880	1.0922
19193	1909.3	1.0908	19193	1909.3	1.0930
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.2270	18607	1850.7	1.2330
18900	1880	1.2250	18900	1880	1.2250
19193	1909.3	1.2260	19193	1909.3	1.2270

### Spectrum Plot

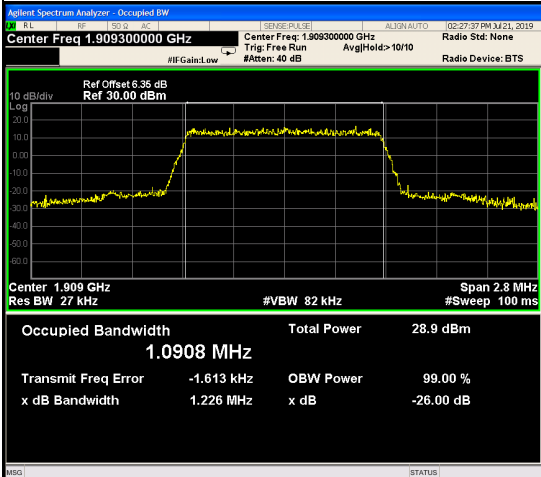
#### QPSK-18607



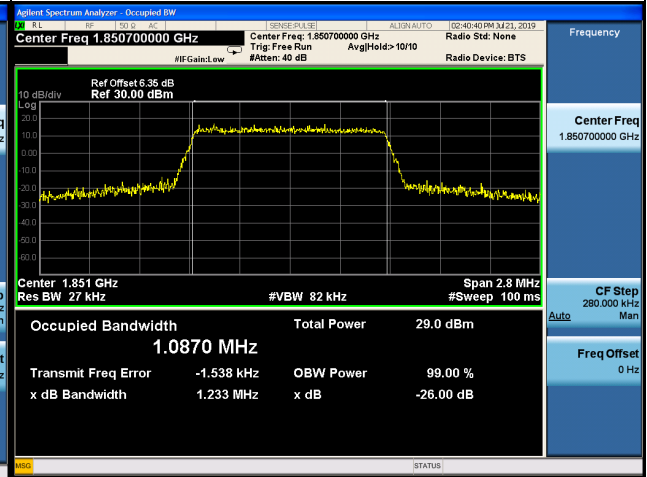
#### QPSK-18900



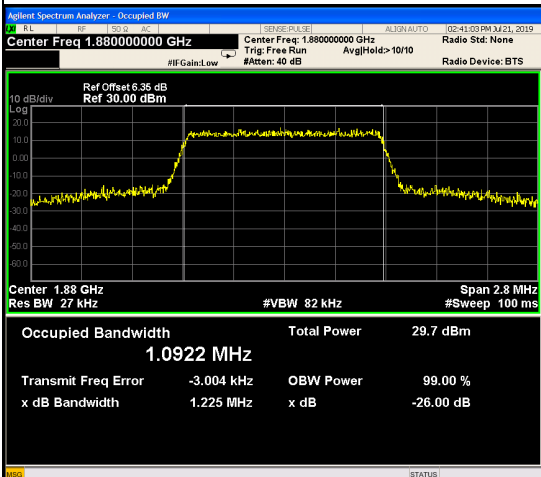
#### QPSK-19193



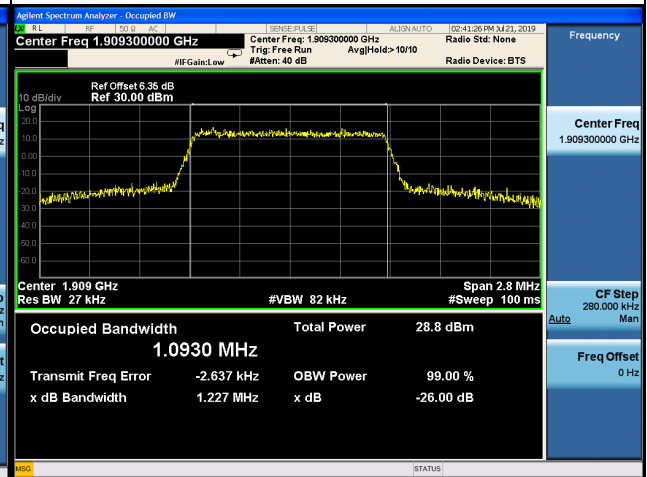
#### 16QAM-18607



#### 16QAM-18900



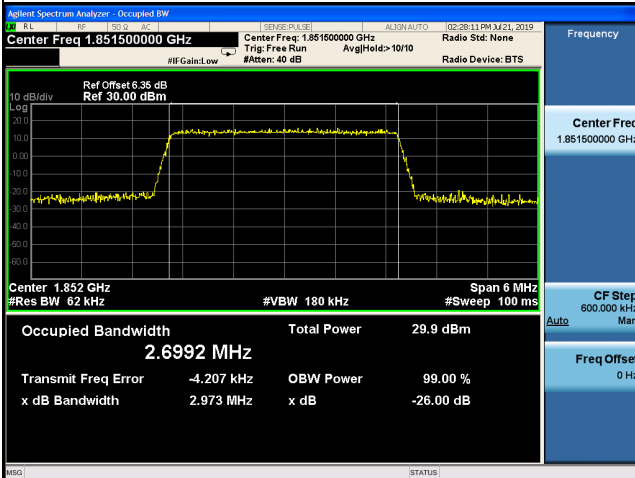
#### 16QAM-19193



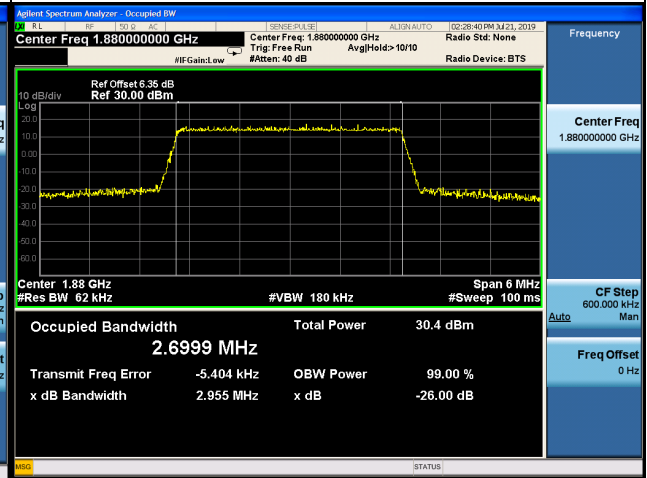
LTE Band 2_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18615	1851.5	2.6992	18615	1851.5	2.6985
18900	1880	2.6999	18900	1880	2.7018
19185	1908.5	2.6967	19185	1908.5	2.6902
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.9730	18615	1851.5	2.9420
18900	1880	2.9550	18900	1880	2.9750
19185	1908.5	2.9790	19185	1908.5	2.9840

### Spectrum Plot

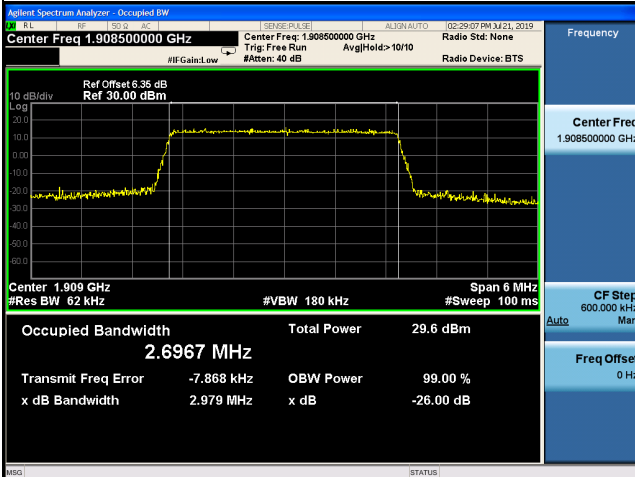
#### QPSK-18615



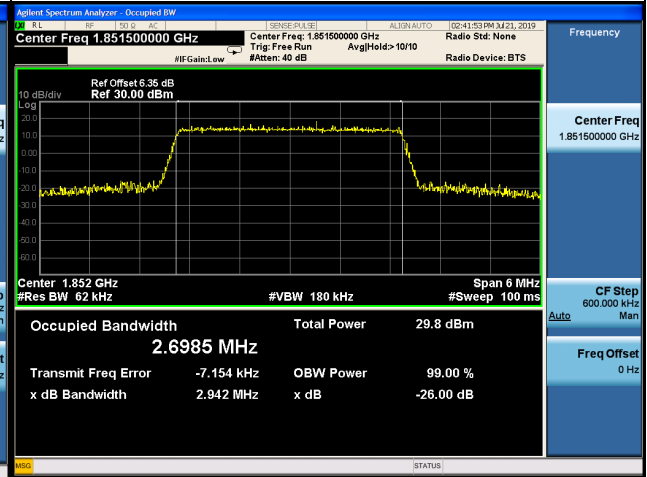
#### QPSK-18900



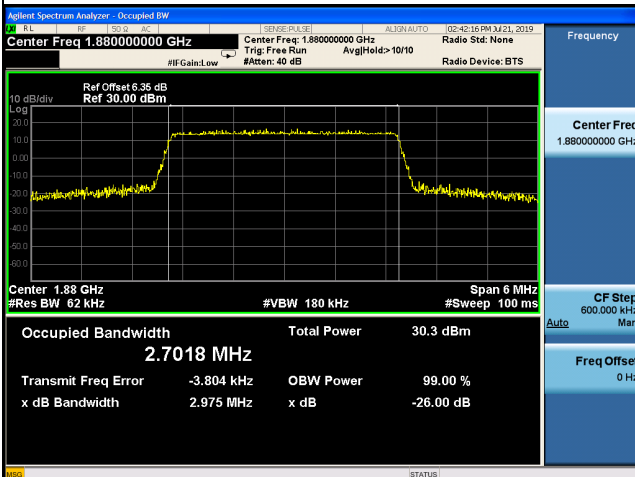
#### QPSK-19185



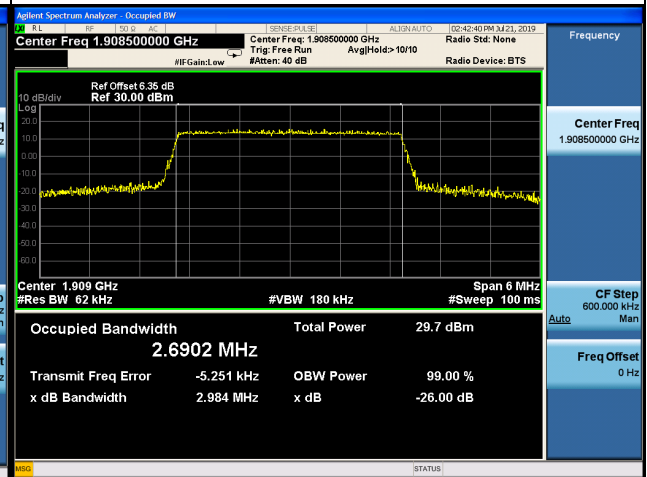
#### 16QAM-18615



#### 16QAM-18900



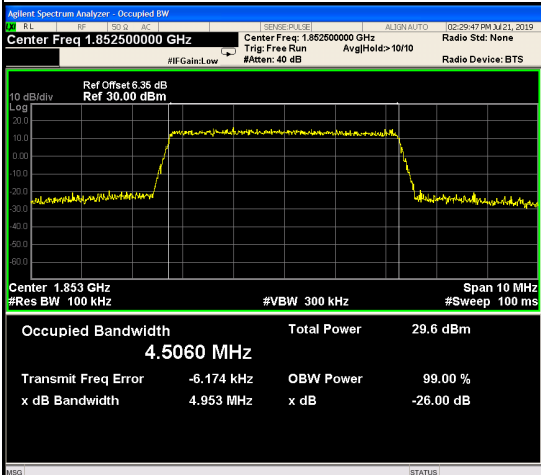
#### 16QAM-19185



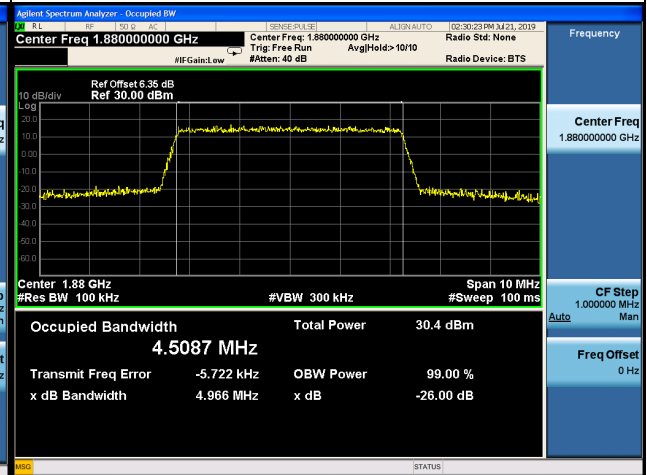
LTE Band 2_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18625	1852.5	4.5060	18625	1852.5	4.5008
18900	1880	4.5087	18900	1880	4.5144
19175	1907.5	4.5027	19175	1907.5	4.5146
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.9530	18625	1852.5	4.9280
18900	1880	4.9660	18900	1880	4.9350
19175	1907.5	4.9290	19175	1907.5	4.9570

### Spectrum Plot

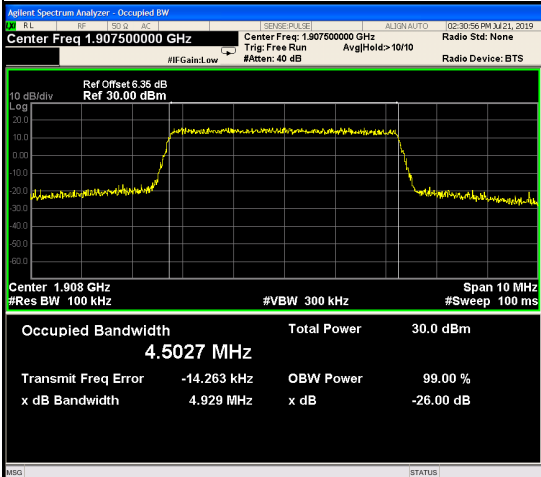
#### QPSK-18625



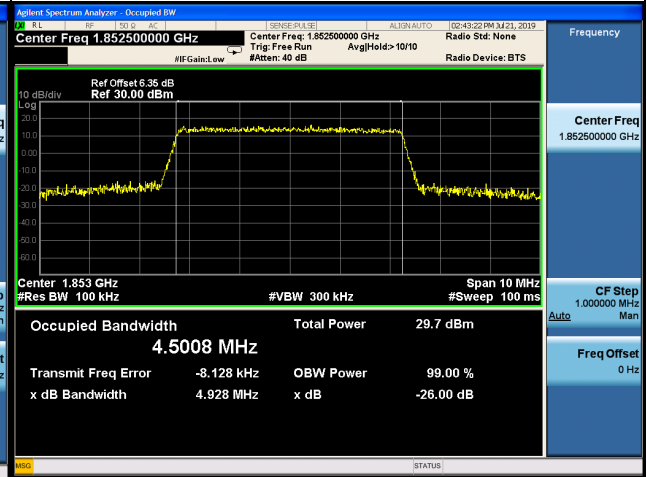
#### QPSK-18900



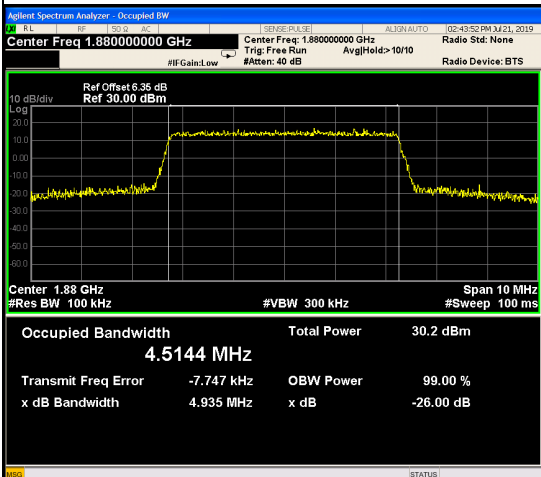
#### QPSK-19175



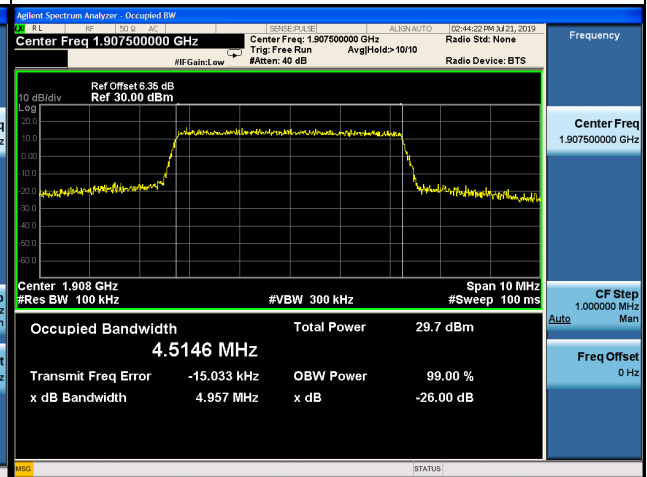
#### 16QAM-18625



#### 16QAM-18900



#### 16QAM-19175

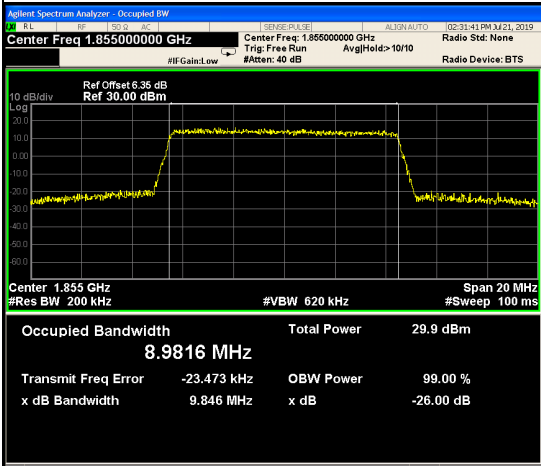


LTE Band 2_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18650	1855	8.9816	18650	1855	8.9816
18900	1880	8.9851	18900	1880	8.9943
19150	1905	8.9746	19150	1905	8.9795
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	9.8460	18650	1855	9.8210
18900	1880	9.8540	18900	1880	9.8680
19150	1905	9.8960	19150	1905	9.8690

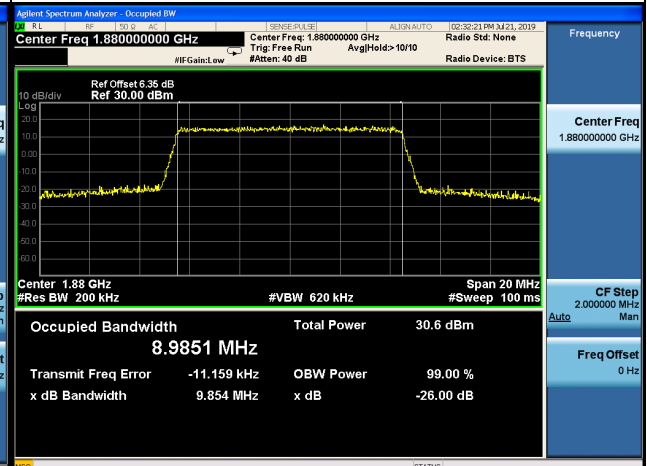


### Spectrum Plot

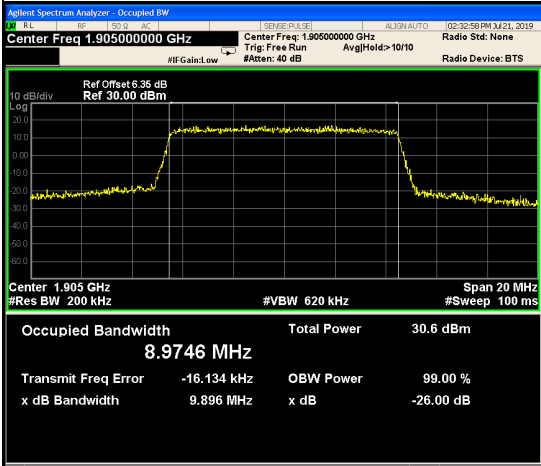
#### QPSK-18650



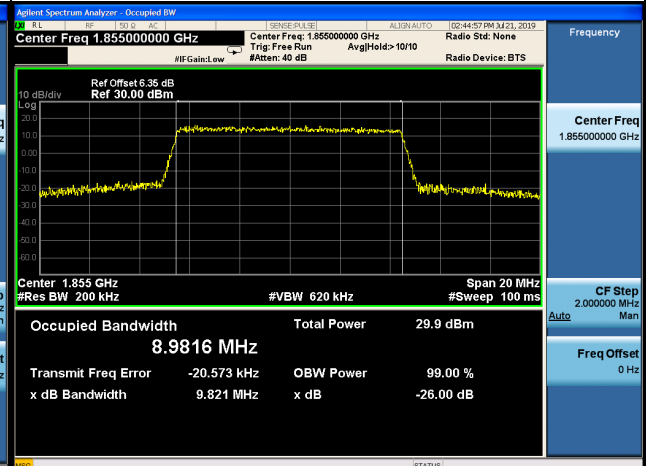
#### QPSK-18900



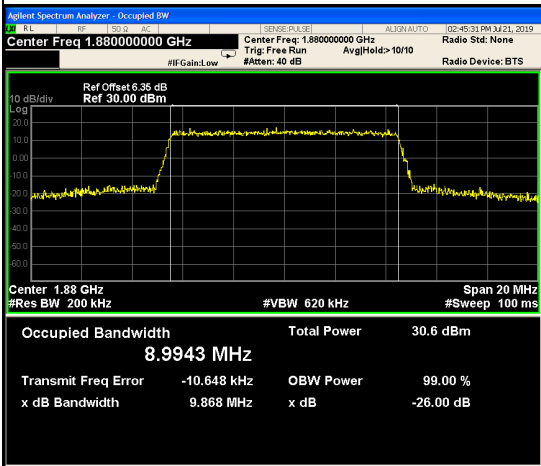
#### QPSK-19150



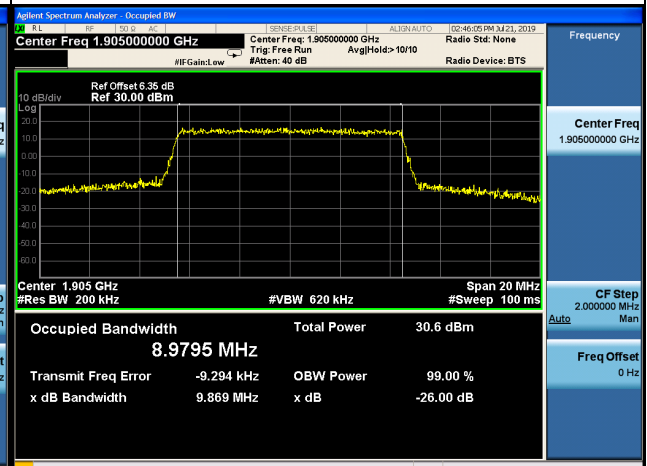
#### 16QAM-18650



#### 16QAM-18900



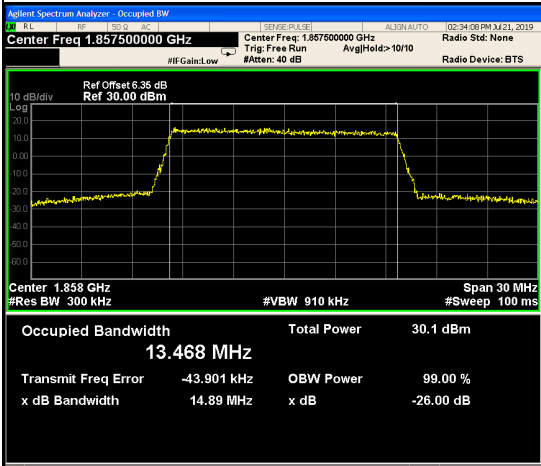
#### 16QAM-19150



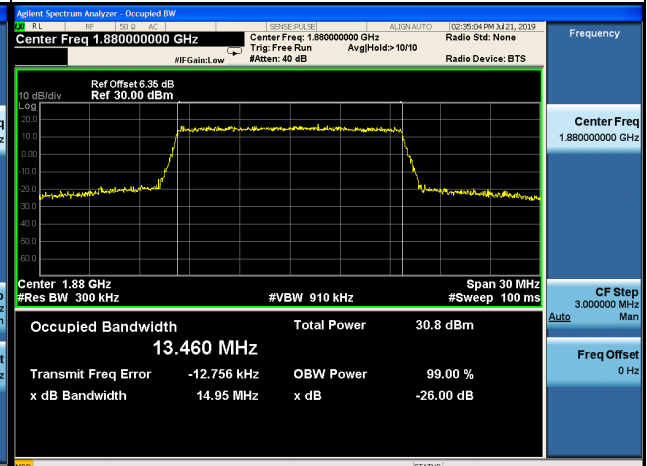
LTE Band 2_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18675	1857.5	13.4680	18675	1857.5	13.4650
18900	1880	13.4600	18900	1880	13.4650
19125	1902.5	13.4470	19125	1902.5	13.4540
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	14.8900	18675	1857.5	14.9500
18900	1880	14.9500	18900	1880	15.0800
19125	1902.5	14.8900	19125	1902.5	14.9800

### Spectrum Plot

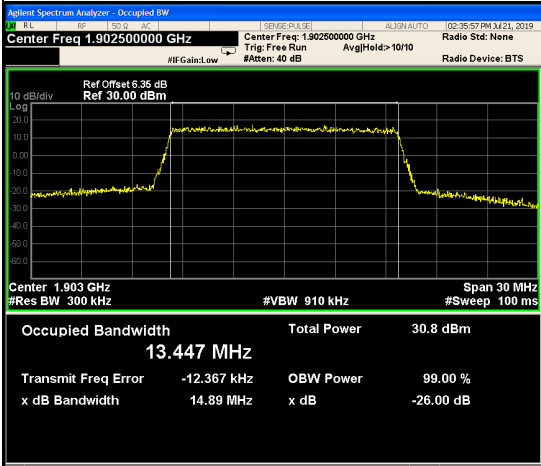
#### QPSK-18675



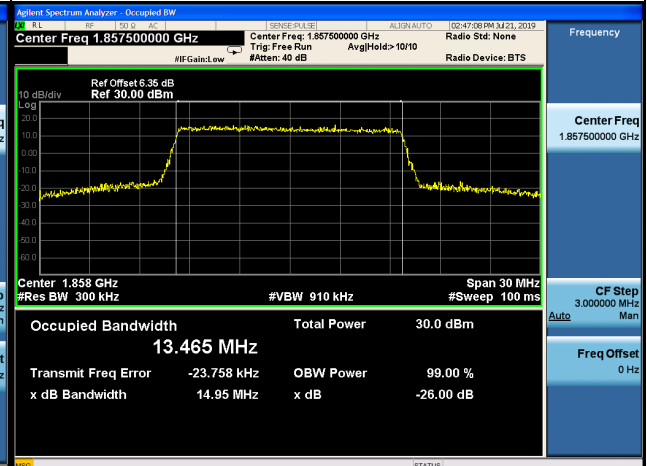
#### QPSK-18900



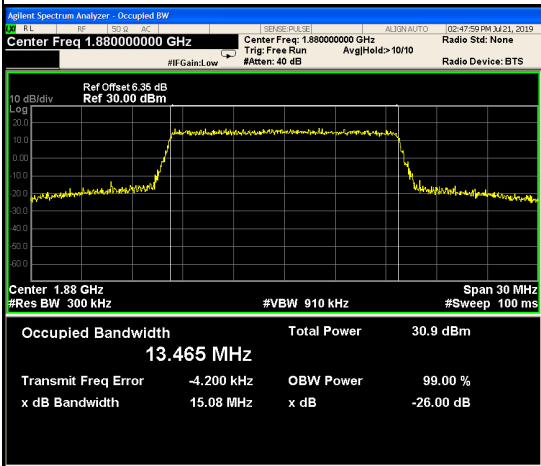
#### QPSK-19125



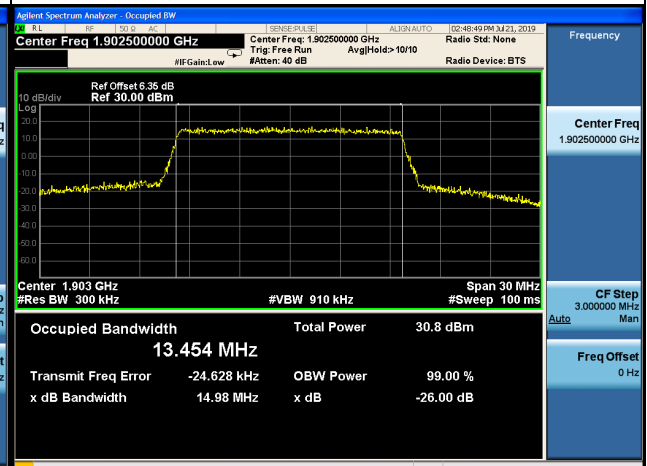
#### 16QAM-18675



#### 16QAM-18900



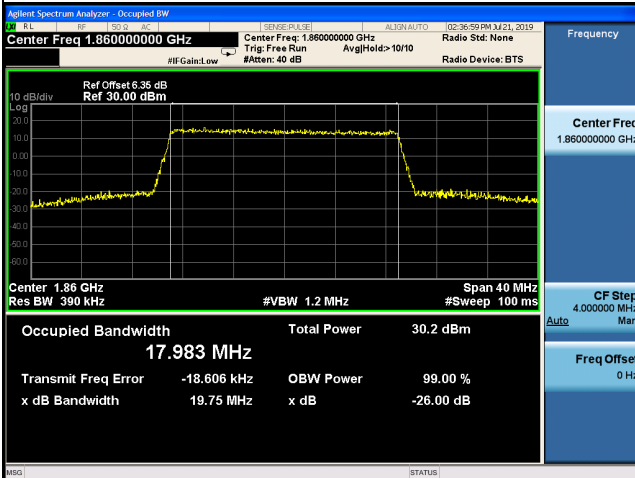
#### 16QAM-19125



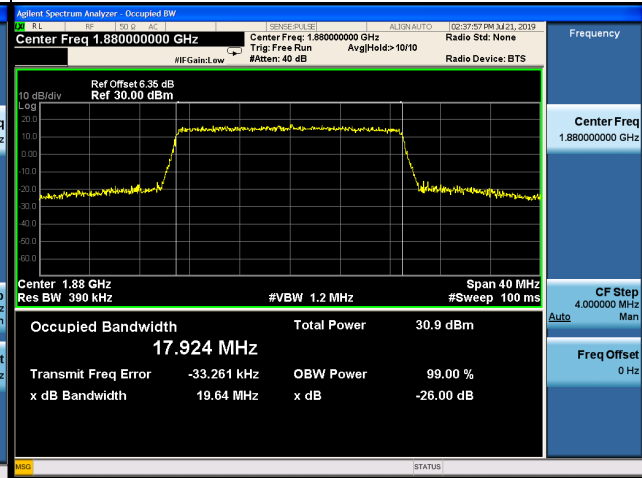
LTE Band 2_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18700	1860	17.9830	18700	1860	17.9930
18900	1880	17.9240	18900	1880	17.8630
19100	1900	17.9420	19100	1900	17.9600
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	19.7500	18700	1860	19.7200
18900	1880	19.6400	18900	1880	19.7800
19100	1900	19.7900	19100	1900	19.6000

### Spectrum Plot

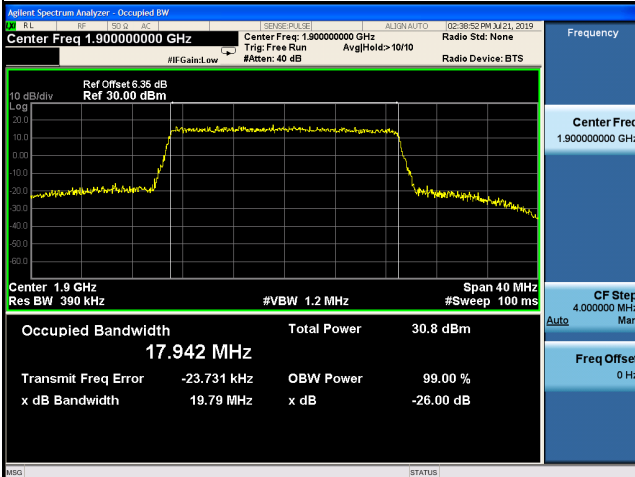
#### QPSK-18700



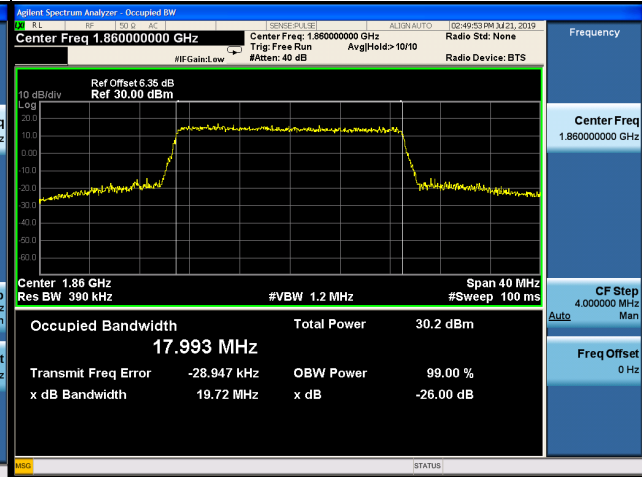
#### QPSK-18900



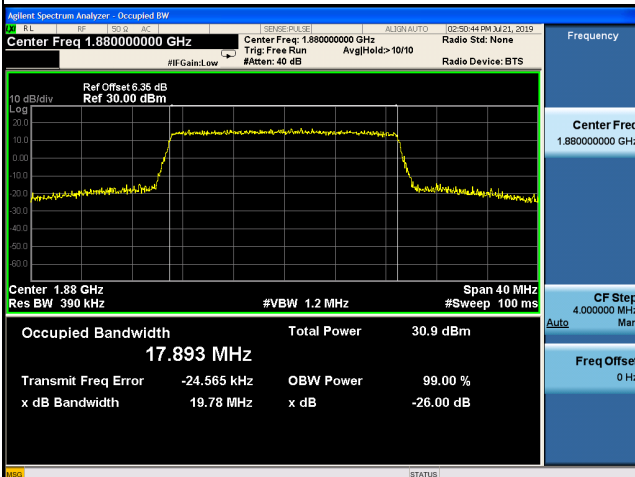
#### QPSK-19100



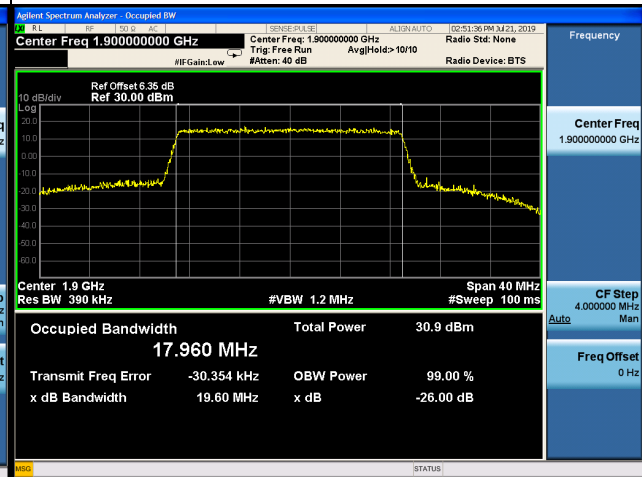
#### 16QAM-18700



#### 16QAM-18900



#### 16QAM-19100



## APPENDIX C - CONDUCTED EMISSIONS

PCS1900			
GSM		GSM	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
661	1880	661	1880
Date: 27.JUL.2019 15:01:53		Date: 27.JUL.2019 15:03:56	
GSM		EDGE	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
661	1880	661	1880
Date: 27.JUL.2019 15:11:04		Date: 27.JUL.2019 15:14:12	
EDGE		EDGE	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
661	1880	661	1880
Date: 27.JUL.2019 15:15:53		Date: 27.JUL.2019 15:12:43	

### WCDMA Band II

Channel	Frequency(MHz)	Channel	Frequency(MHz)
9400	1880	9400	1880
Date: 27.JUL.2019 15:25:09		Date: 27.JUL.2019 15:26:30	
Channel	Frequency(MHz)	-	-
9400	1880	-	-
		-	
Date: 27.JUL.2019 15:27:49			



LTE Band 2\_1.4M

Channel	Frequency(MHz)	Channel	Frequency(MHz)
18900	1880	18900	1880
Date: 29.JUL.2019 19:55:55		Date: 27.JUL.2019 16:01:00	
Channel	Frequency(MHz)	-	-
18900	1880	-	-
		-	
Date: 29.JUL.2019 17:39:59			

LTE Band 2\_5M

Channel	Frequency(MHz)	Channel	Frequency(MHz)
18900	1880	18900	1880
Date: 29.JUL.2019 19:58:13		Date: 27.JUL.2019 16:07:14	
Channel	Frequency(MHz)	-	-
18900	1880	-	-
		-	
Date: 29.JUL.2019 17:37:28			

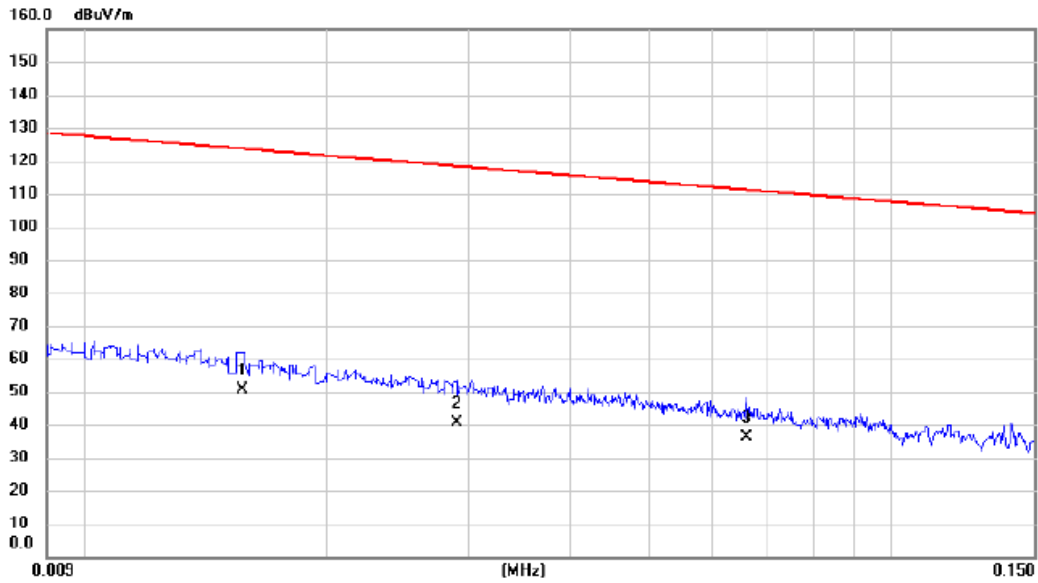
LTE Band 2\_20M

Channel	Frequency(MHz)	Channel	Frequency(MHz)
18900	1880	18900	1880
<p>Date: 27.JUL.2019 16:14:38</p>		<p>Date: 27.JUL.2019 16:15:51</p>	
Channel	Frequency(MHz)	-	-
18900	1880	-	-
<p>Date: 29.JUL.2019 17:49:07</p>			

## APPENDIX D - RADIATED EMISSION (9KHZ TO 30MHZ)

Test Mode: TX Mode

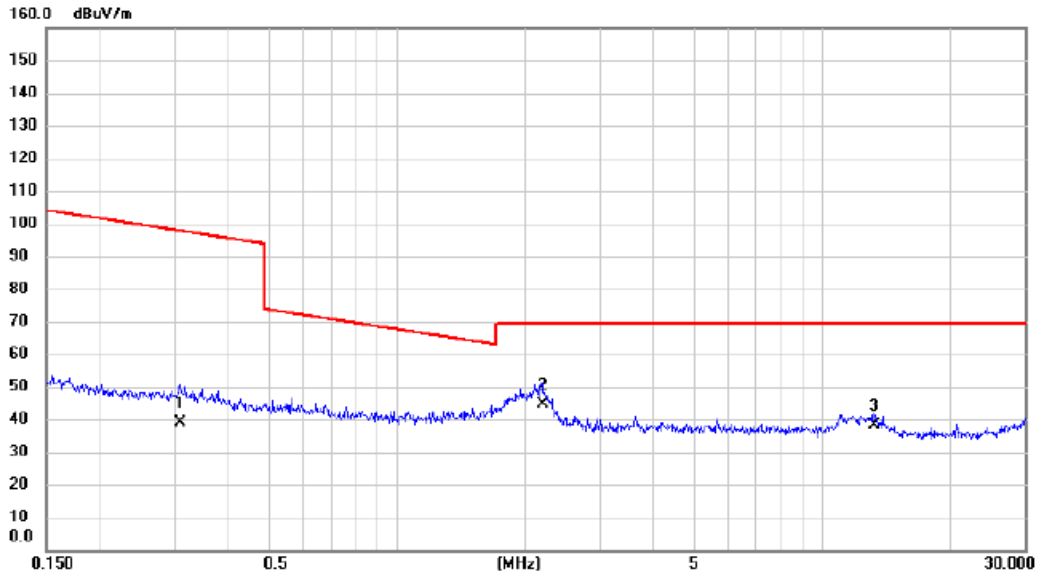
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0157	35.30	15.11	50.41	123.69	-73.28	AVG	
2		0.0290	26.80	13.85	40.65	118.36	-77.71	AVG	
3		0.0660	22.60	13.67	36.27	111.21	-74.94	AVG	

Test Mode: TX Mode

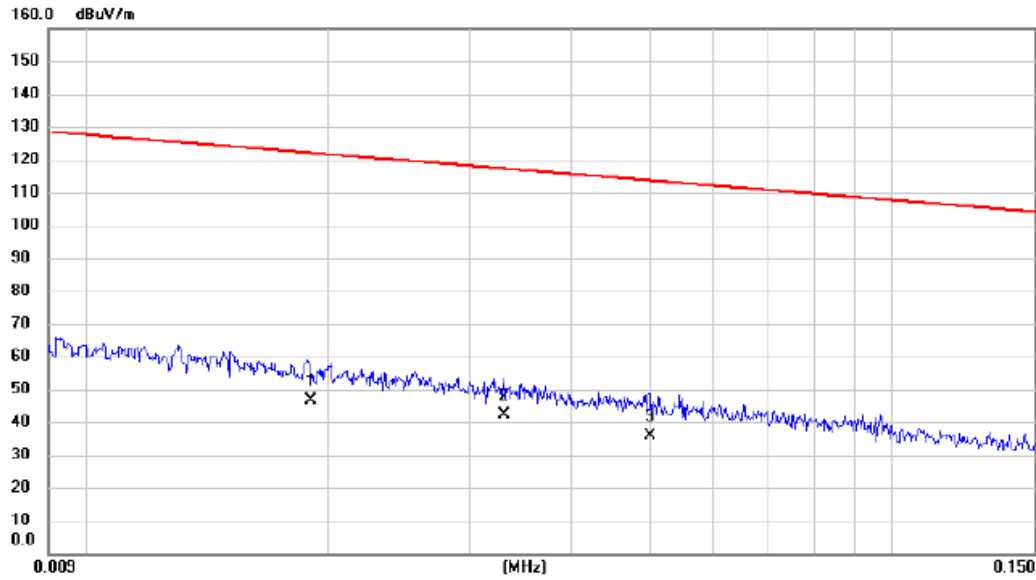
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.3100	25.30	13.52	38.82	97.78	-58.96	AVG	
2	*	2.2015	32.80	11.70	44.50	69.54	-25.04	QP	
3		13.2667	26.70	11.59	38.29	69.54	-31.25	QP	

Test Mode: TX Mode

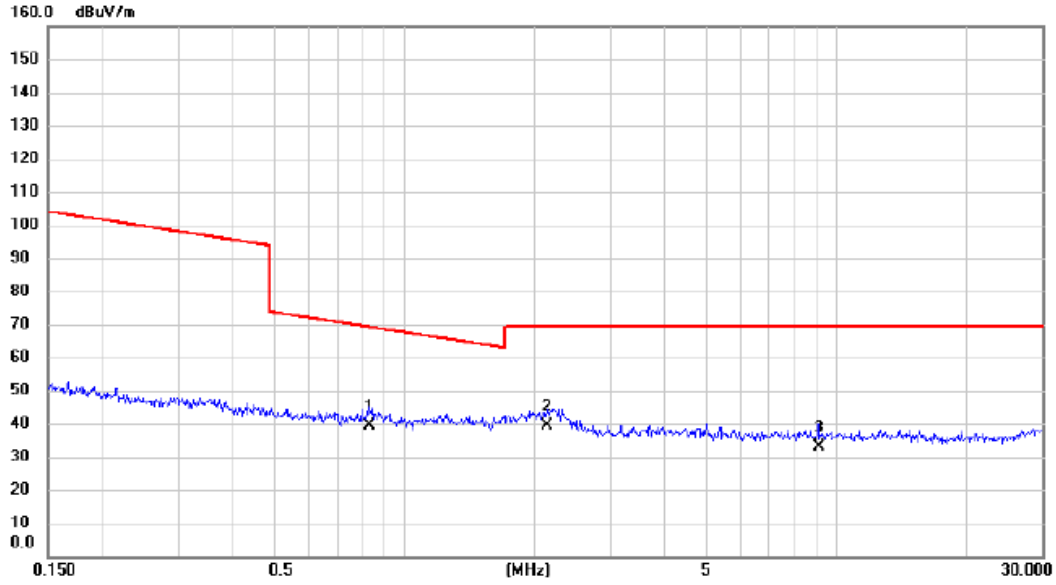
Ant 90°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.0190	32.53	14.12	46.65	122.03	-75.38	AVG	
2	*	0.0330	28.40	13.87	42.27	117.23	-74.96	AVG	
3		0.0500	21.90	13.93	35.83	113.63	-77.80	AVG	

Test Mode: TX Mode

Ant 90°



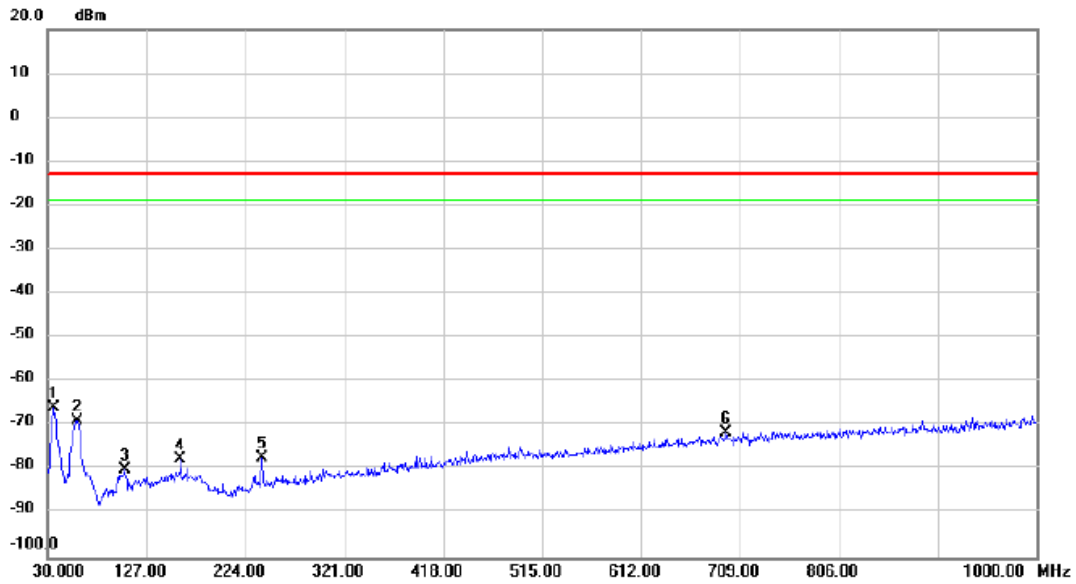
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	0.8305	26.80	12.56	39.36	69.22	-29.86	QP	
2		2.1440	27.50	11.73	39.23	69.54	-30.31	QP	
3		9.1073	21.60	11.50	33.10	69.54	-36.44	QP	



## APPENDIX E - RADIATED EMISSION (30MHZ TO 1GHZ)

Test Mode: PCS1900\_TX CH661\_GSM

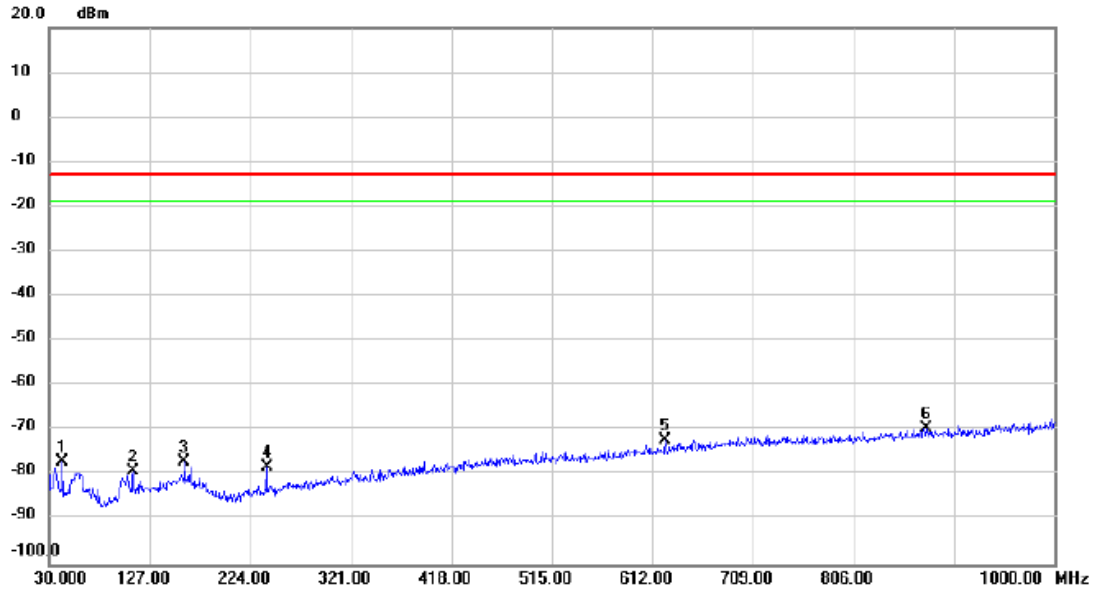
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.8200	-60.87	-5.08	-65.95	-13.00	-52.95	peak	
2		58.6150	-63.74	-5.12	-68.86	-13.00	-55.86	peak	
3		105.1750	-74.70	-5.27	-79.97	-13.00	-66.97	peak	
4		159.9800	-76.11	-1.41	-77.52	-13.00	-64.52	peak	
5		240.0050	-72.96	-4.41	-77.37	-13.00	-64.37	peak	
6		695.4200	-77.30	5.51	-71.79	-13.00	-58.79	peak	

Test Mode: PCS1900\_TX CH661\_GSM

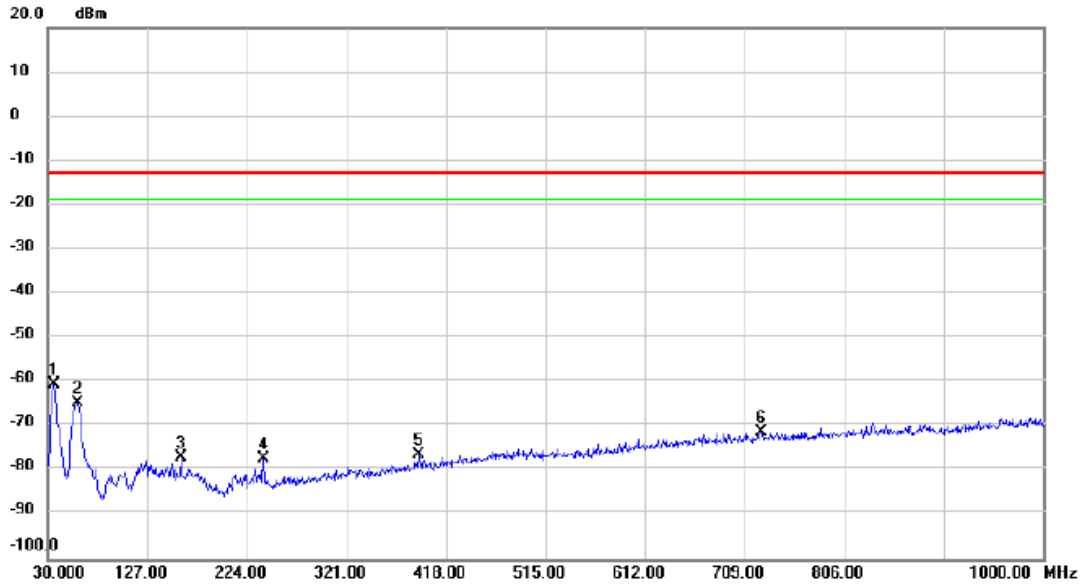
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.6100	-72.26	-4.90	-77.16	-13.00	-64.16	peak	
2		110.5100	-74.35	-4.86	-79.21	-13.00	-66.21	peak	
3		159.9800	-75.54	-1.41	-76.95	-13.00	-63.95	peak	
4		240.0050	-73.70	-4.41	-78.11	-13.00	-65.11	peak	
5		623.6400	-76.56	4.36	-72.20	-13.00	-59.20	peak	
6	*	876.3250	-76.92	7.46	-69.46	-13.00	-56.46	peak	

Test Mode: PCS1900\_TX CH661\_EDGE

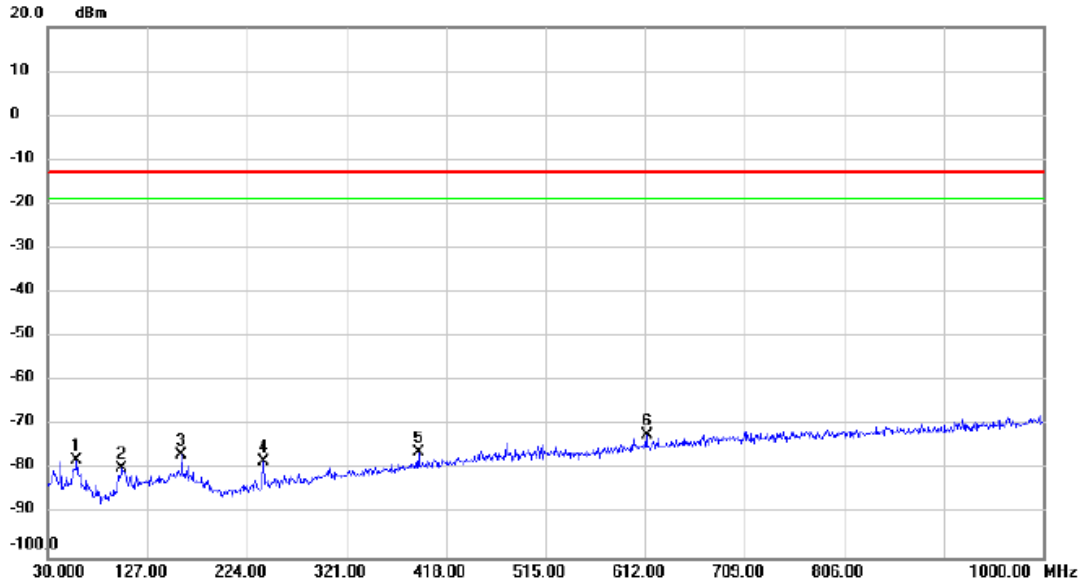
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.8200	-55.53	-5.08	-60.61	-13.00	-47.61	peak	
2		58.6150	-59.53	-5.12	-64.65	-13.00	-51.65	peak	
3		159.9800	-75.65	-1.41	-77.06	-13.00	-64.06	peak	
4		240.0050	-72.90	-4.41	-77.31	-13.00	-64.31	peak	
5		390.8400	-76.49	-0.09	-76.58	-13.00	-63.58	peak	
6		724.5200	-77.10	5.76	-71.34	-13.00	-58.34	peak	

Test Mode: PCS1900\_TX CH661\_EDGE

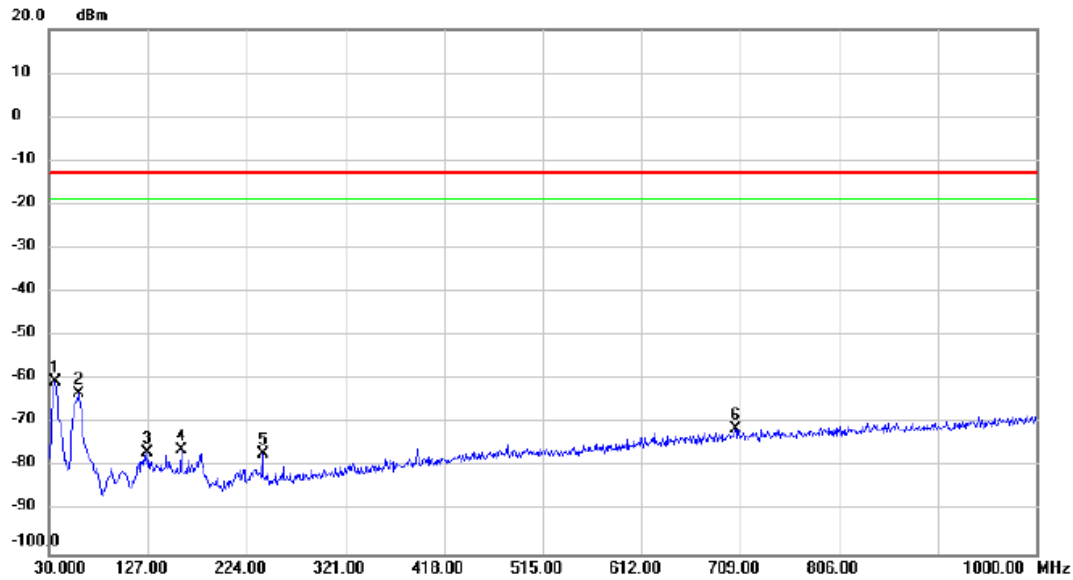
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		58.1300	-72.88	-5.07	-77.95	-13.00	-64.95	peak	
2		101.7800	-74.30	-5.51	-79.81	-13.00	-66.81	peak	
3		159.9800	-75.41	-1.41	-76.82	-13.00	-63.82	peak	
4		240.0050	-73.75	-4.41	-78.16	-13.00	-65.16	peak	
5		390.8400	-76.11	-0.09	-76.20	-13.00	-63.20	peak	
6	*	613.4550	-76.36	4.13	-72.23	-13.00	-59.23	peak	

Test Mode: WCDMA Band II\_TX CH9400

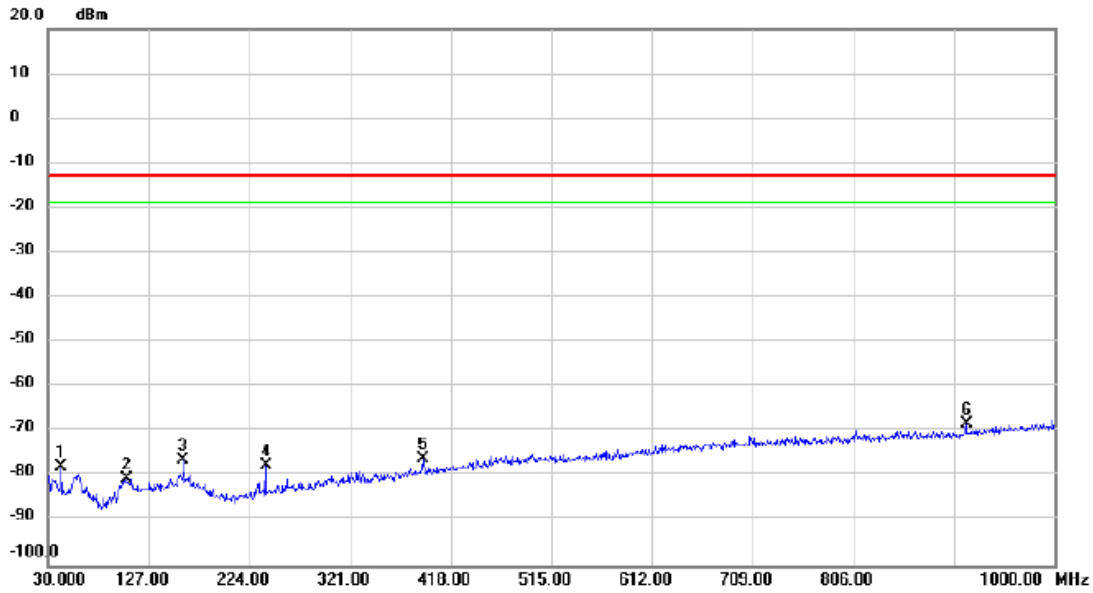
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.8200	-55.37	-5.08	-60.45	-13.00	-47.45	peak	
2		58.6150	-58.24	-5.12	-63.36	-13.00	-50.36	peak	
3		126.0300	-73.34	-3.45	-76.79	-13.00	-63.79	peak	
4		159.9800	-74.69	-1.41	-76.10	-13.00	-63.10	peak	
5		240.0050	-72.76	-4.41	-77.17	-13.00	-64.17	peak	
6		704.1500	-76.96	5.61	-71.35	-13.00	-58.35	peak	

Test Mode: WCDMA Band II\_TX CH9400

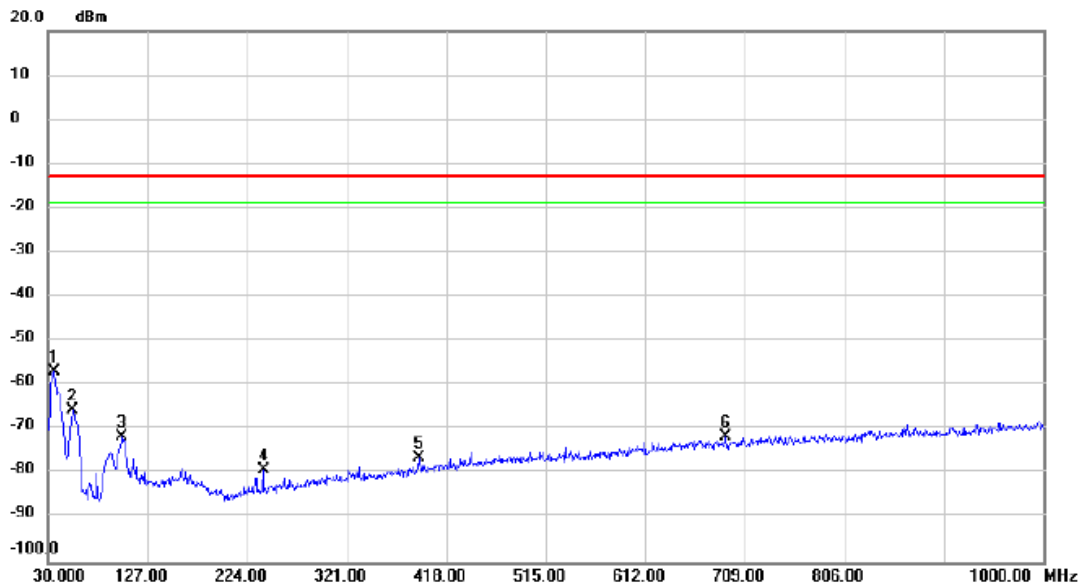
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.6100	-72.97	-4.90	-77.87	-13.00	-64.87	peak	
2		105.6600	-75.27	-5.23	-80.50	-13.00	-67.50	peak	
3		159.9800	-75.01	-1.41	-76.42	-13.00	-63.42	peak	
4		240.0050	-73.13	-4.41	-77.54	-13.00	-64.54	peak	
5		390.8400	-76.20	-0.09	-76.29	-13.00	-63.29	peak	
6	*	914.6400	-76.45	8.00	-68.45	-13.00	-55.45	peak	

Test Mode: LTE Band 2\_TX CH18900\_1.4M

Vertical

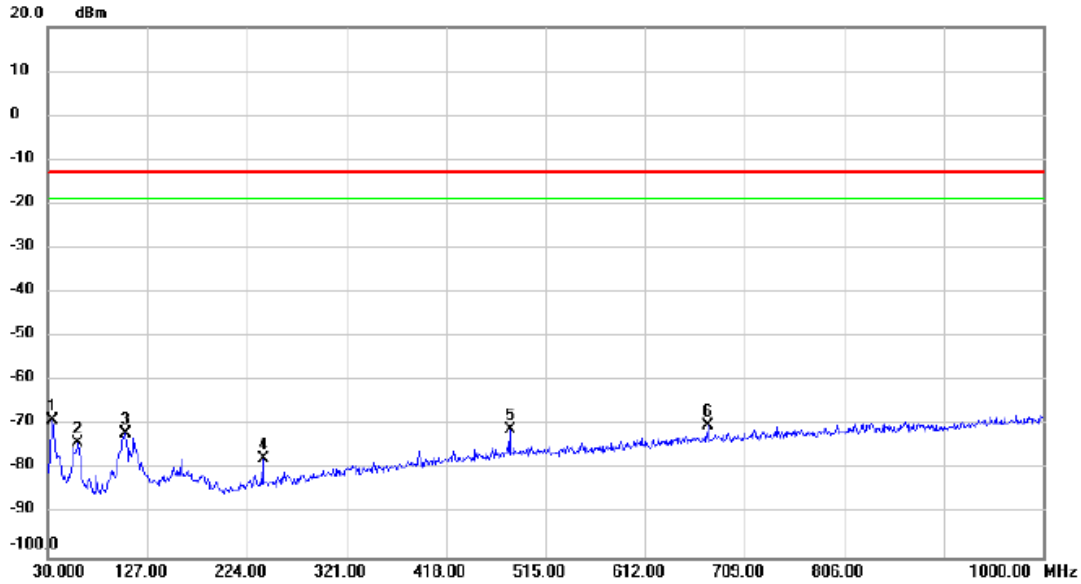


No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.8200	-51.91	-5.08	-56.99	-13.00	-43.99	peak	
2		54.2500	-61.26	-4.33	-65.59	-13.00	-52.59	peak	
3		101.7800	-66.09	-5.51	-71.60	-13.00	-58.60	peak	
4		240.0050	-74.63	-4.41	-79.04	-13.00	-66.04	peak	
5		390.8400	-76.30	-0.09	-76.39	-13.00	-63.39	peak	
6		690.0850	-77.05	5.44	-71.61	-13.00	-58.61	peak	



Test Mode: LTE Band 2\_TX CH18900\_1.4M

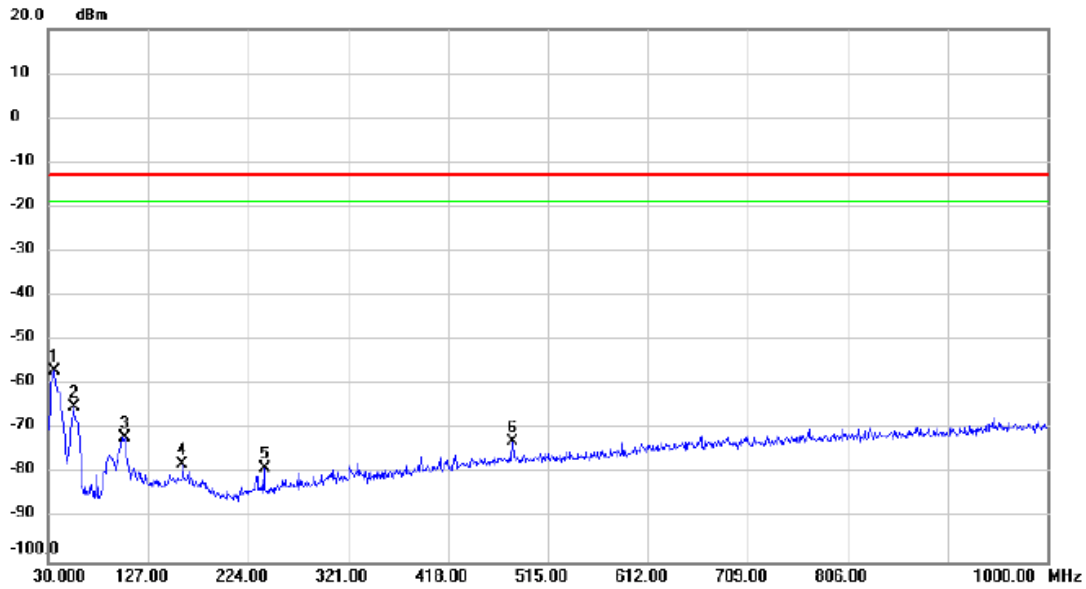
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	34.8500	-63.49	-5.33	-68.82	-13.00	-55.82	peak	
2		59.1000	-68.83	-5.17	-74.00	-13.00	-61.00	peak	
3		105.1750	-66.63	-5.27	-71.90	-13.00	-58.90	peak	
4		240.0050	-73.23	-4.41	-77.64	-13.00	-64.64	peak	
5		480.0800	-72.78	1.75	-71.03	-13.00	-58.03	peak	
6		673.5950	-75.37	5.23	-70.14	-13.00	-57.14	peak	

Test Mode: LTE Band 2\_TX CH18900\_5M

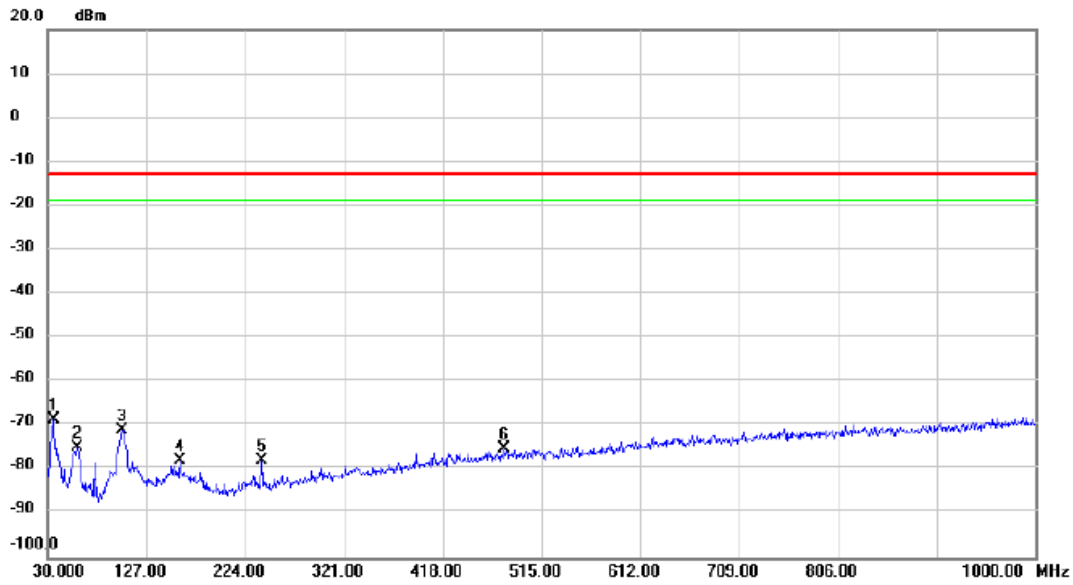
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.3350	-51.87	-5.21	-57.08	-13.00	-44.08	peak	
2		54.7350	-60.75	-4.36	-65.11	-13.00	-52.11	peak	
3		103.7200	-66.55	-5.37	-71.92	-13.00	-58.92	peak	
4		159.9800	-76.67	-1.41	-78.08	-13.00	-65.08	peak	
5		240.0050	-74.31	-4.41	-78.72	-13.00	-65.72	peak	
6		480.0800	-74.47	1.75	-72.72	-13.00	-59.72	peak	

Test Mode: LTE Band 2\_TX CH18900\_5M

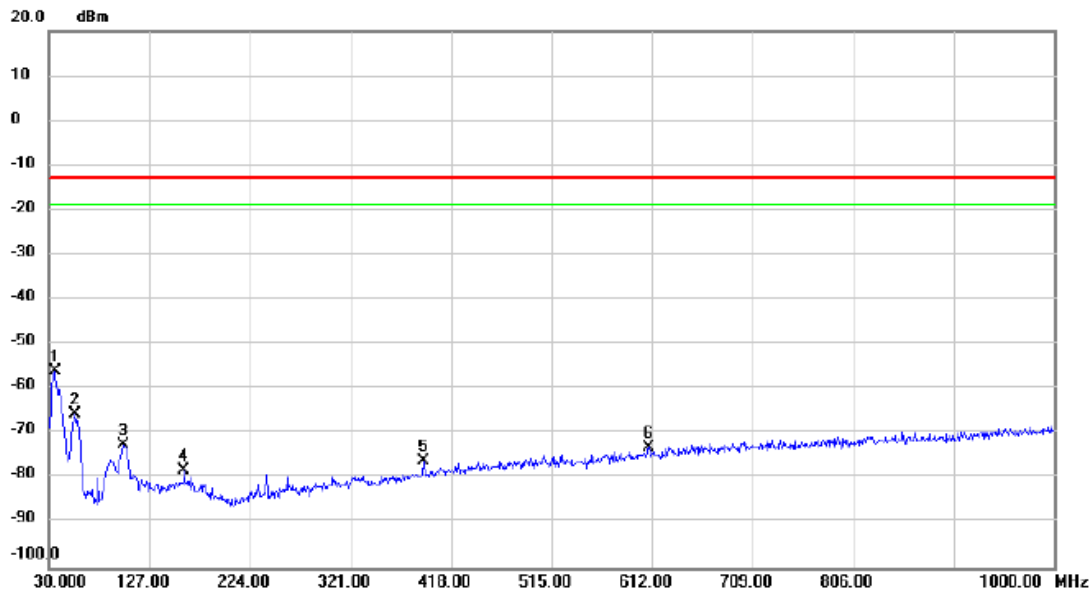
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.3350	-63.53	-5.21	-68.74	-13.00	-55.74	peak	
2		58.6150	-69.76	-5.12	-74.88	-13.00	-61.88	peak	
3		102.7500	-65.59	-5.45	-71.04	-13.00	-58.04	peak	
4		159.9800	-76.45	-1.41	-77.86	-13.00	-64.86	peak	
5		240.0050	-73.50	-4.41	-77.91	-13.00	-64.91	peak	
6		478.6250	-76.96	1.74	-75.22	-13.00	-62.22	peak	

Test Mode: LTE Band 2\_TX CH18900\_20M

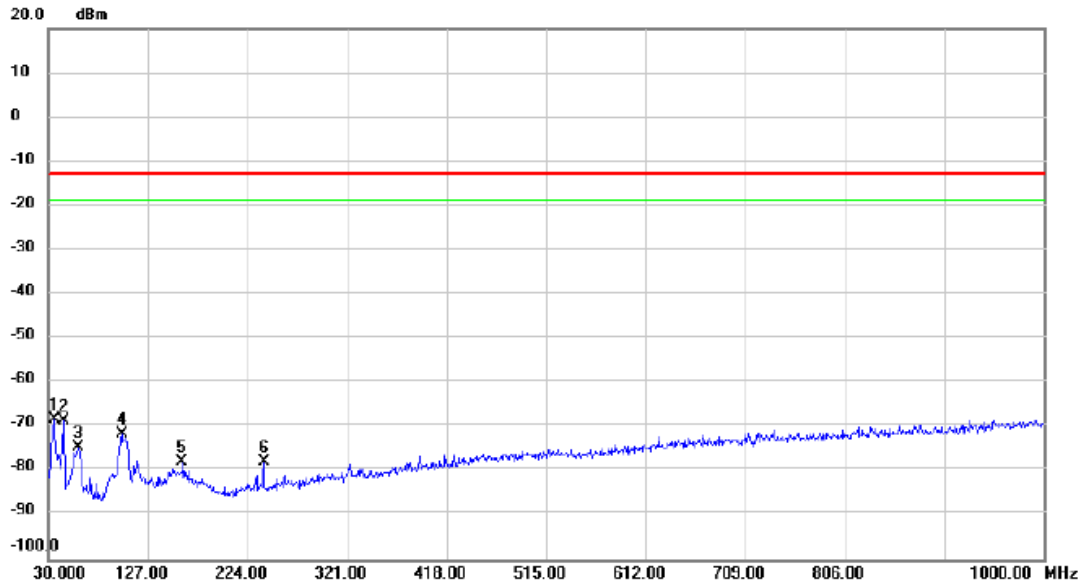
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.3350	-50.94	-5.21	-56.15	-13.00	-43.15	peak	
2		54.7350	-61.27	-4.36	-65.63	-13.00	-52.63	peak	
3		101.7800	-67.13	-5.51	-72.64	-13.00	-59.64	peak	
4		159.9800	-76.87	-1.41	-78.28	-13.00	-65.28	peak	
5		390.8400	-76.16	-0.09	-76.25	-13.00	-63.25	peak	
6		608.6050	-77.03	4.03	-73.00	-13.00	-60.00	peak	

Test Mode: LTE Band 2\_TX CH18900\_20M

### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	35.3350	-63.25	-5.21	-68.46	-13.00	-55.46	peak	
2		44.5500	-63.66	-4.94	-68.60	-13.00	-55.60	peak	
3		58.6150	-69.54	-5.12	-74.66	-13.00	-61.66	peak	
4		101.2950	-65.97	-5.54	-71.51	-13.00	-58.51	peak	
5		159.9800	-76.58	-1.41	-77.99	-13.00	-64.99	peak	
6		240.0050	-73.69	-4.41	-78.10	-13.00	-65.10	peak	