

# FCC Radio Test Report

## FCC ID: KA2WR920VA1

This report concerns (check one):  Original Grant  Class I Change  Class II Change

**Project No.** : 1901H008B  
**Equipment** : U.S. Cellular Home Phone  
**Model Name** : DWR-920V  
**Series Model** : N/A  
**Applicant** : D-Link Corporation  
**Address** : No.289, Xinhua 3rd Rd., Neihu District, Taipei 11494, Taiwan

**Date of Receipt** : Jan. 22, 2019  
 Mar. 20, 2019  
**Date of Test** : Jan. 22, 2019~ Jan. 28, 2019  
 Mar. 25, 2019~ Mar. 26, 2019  
**Issued Date** : May. 13, 2019  
**Tested by** : BTL Inc.

**Technical Manager** : David Mao  
 (David Mao)

**Authorized Signatory** : Steven Lu  
 (Steven Lu)

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Certificate #5123.02

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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.

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### REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue. This is a supplementary report to the original test report (BTL-FCCP-1-1901H008). In this report only records the test results of AC/DC ADAPTER: AD120A120100UV.	Apr. 03, 2019
R01	Revised report to address TCB's comments as below: This is a supplementary report to the original test report of BTL-FCCP-1-1901H008, but it does not issue. In this report, records all the test results.	May. 13, 2019

## 1. GENERAL SUMMARY

Equipment : U.S. Cellular Home Phone  
Brand Name : N/A  
Model Name : DWR-920V  
Series Model : N/A  
Applicant : D-Link Corporation  
Manufacturer : D-Link Corporation  
Address : No.289, Xinhu 3rd Rd., Neihu District, Taipei 11494, Taiwan  
Date of Test : Jan. 22, 2019~ Jan. 28, 2019  
Mar. 25, 2019~ Mar. 26, 2019  
Test Sample : Engineering Sample No.: B190100025  
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-1-1901H008B) 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 is only for the 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	Judgment	Tested By
2.1046 & 24.232(c)	Radiated power	PASS	Paul Li
2.1046 & 24.232(c)	Maximum Output Power	PASS	Paul Li
2.1049 & 24.238(a)	Occupied Bandwidth	PASS	Paul Li
2.1051 & 24.238(a)	Conducted Spurious Emissions	PASS	Paul Li
2.1053 & 24.238(a)	Radiated Spurious Emissions	PASS	Paul Li
24.238(a)	Band Edge Measurements	PASS	Paul Li
24.232(d)	Peak To Average Ratio	PASS	Paul Li
2.1055 & 24.235	Frequency Stability	PASS	Paul Li

NOTE:

(1) "N/A" denotes test is not applicable to this device.

## 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

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

The BTL measurement uncertainty as below table:

### A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03	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

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03	CISPR	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	U.S. Cellular Home Phone			
Brand Name	N/A			
Model Name	DWR-920V			
Series Model	N/A			
Model Difference(s)	N/A			
Hardware Version	A1			
Software Version	01.01			
Antenna Type	External Antenna			
Antenna Gain	4.10035 dBi (LTE Band 2)			
IMEI No.	357471055275665			
Modulation Type	LTE	UL: QPSK,16QAM DL: QPSK,16QAM		
Operation Frequency	LTE 2 (Channel Bandwidth: 1.4MHz)	1850.7 ~ 1909.3 MHz		
	LTE 2 (Channel Bandwidth: 3MHz)	1851.5 ~ 1908.5 MHz		
	LTE 2 (Channel Bandwidth: 5MHz)	1852.5 ~ 1907.5 MHz		
	LTE 2 (Channel Bandwidth: 10MHz)	1855.0 ~ 1905.0 MHz		
	LTE 2 (Channel Bandwidth: 15MHz)	1857.5 ~ 1902.5 MHz		
	LTE 2 (Channel Bandwidth: 20MHz)	1860.0 ~ 1900.0 MHz		
Max. EIRP Power	LTE 2 (Channel Bandwidth: 1.4MHz)	QPSK	26.12	dBm
		16QAM	25.53	dBm
	LTE 2 (Channel Bandwidth: 3MHz)	QPSK	26.28	dBm
		16QAM	25.25	dBm
	LTE 2 (Channel Bandwidth: 5MHz)	QPSK	26.22	dBm
		16QAM	25.13	dBm
	LTE 2 (Channel Bandwidth: 10MHz)	QPSK	26.64	dBm
		16QAM	25.57	dBm
	LTE 2 (Channel Bandwidth: 15MHz)	QPSK	26.53	dBm
		16QAM	25.60	dBm
	LTE 2 (Channel Bandwidth: 20MHz)	QPSK	26.11	dBm
		16QAM	25.35	dBm
	Power Source	DC voltage supplied from AC/DC adapter. Model: 1#: AMS135-1201000FU 2#: AD120A120100UV		
	Power Rating	I/P: 1#:100-240V~,50/60Hz,0.5A      O/P:12V $\overline{\text{---}}$ 1.0A 2#:100-240V~,50-60Hz,0.4A MAX    O/P:12V $\overline{\text{---}}$ 1.0A		

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:

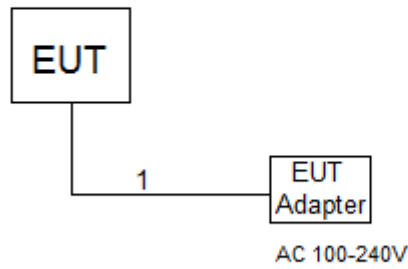
LTE BAND 2 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	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		
	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	22°C, 45%RH	DC 12V
Maximum Output Power	22°C, 45%RH	DC 12V
Occupied Bandwidth	22°C, 45%RH	DC 12V
Conducted Emission	22°C, 45%RH	DC 12V
Radiated Emission	22°C, 45%RH	AC 120V/60Hz
Band Edge	22°C, 45%RH	DC 12V
Peak to Average Ratio	22°C, 45%RH	DC 12V
Frequency Stability	Normal and Extreme	Normal and Extreme

### 3.3 BLOCKDIGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED FOR RADIATED



### 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	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2m	DC Cable

## 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/ERP:

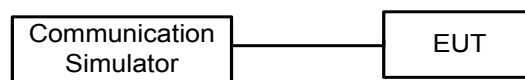
$EIRP = \text{Output Power} + \text{Antenan gain}$

##### Maximum Output Power:

The EUT was set up for the maximum power with 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 TESTSETUP LAYOUT

Output Power Measurement



#### 4.1.4 TEST DEVIATION

No deviation

#### 4.1.5 TEST RESULTS

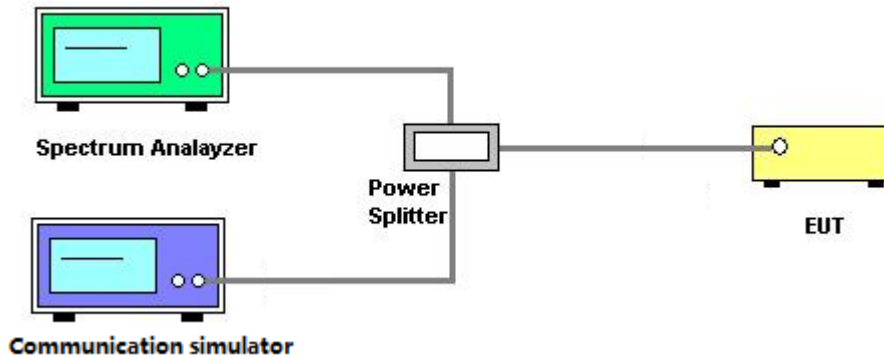
Please refer to the Appendix A.

## 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

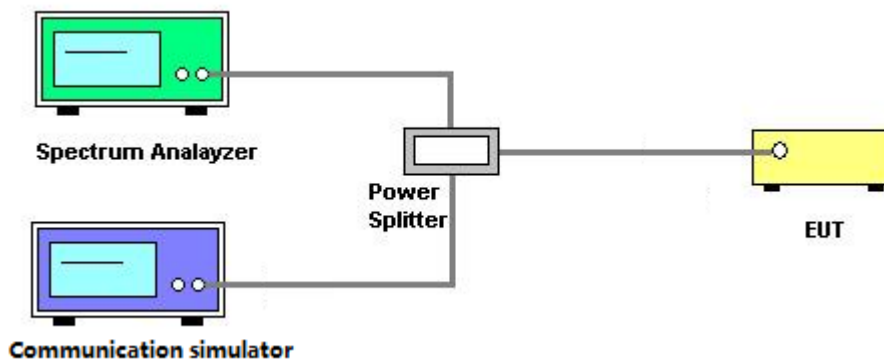
#### 4.3.1 LIMIT

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.
6. The limit line is derived from  $43+10\log(P)\text{dB}$  below the transmitter power P(Watts)  
 $=P(W)-[43+10\log(P)](\text{dB})$   
 $=[30+10\log(P)](\text{dBm})-[43+10\log(P)](\text{dB})$   
 $=-13\text{dBm}$

#### 4.3.3 TESTSETUP LAYOUT



#### 4.3.4 TESTDEVIATION

No deviation

#### 4.3.5 TEST RESULTS

Please refer to the Appendix C.



## 4.4 RADIATED EMISSIONS MEASUREMENT

### 4.4.1 LIMIT

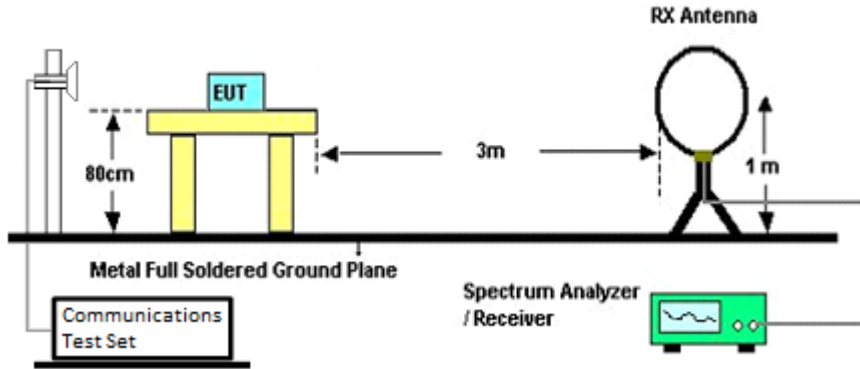
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13dBm.

### 4.4.2 TEST PROCEDURES

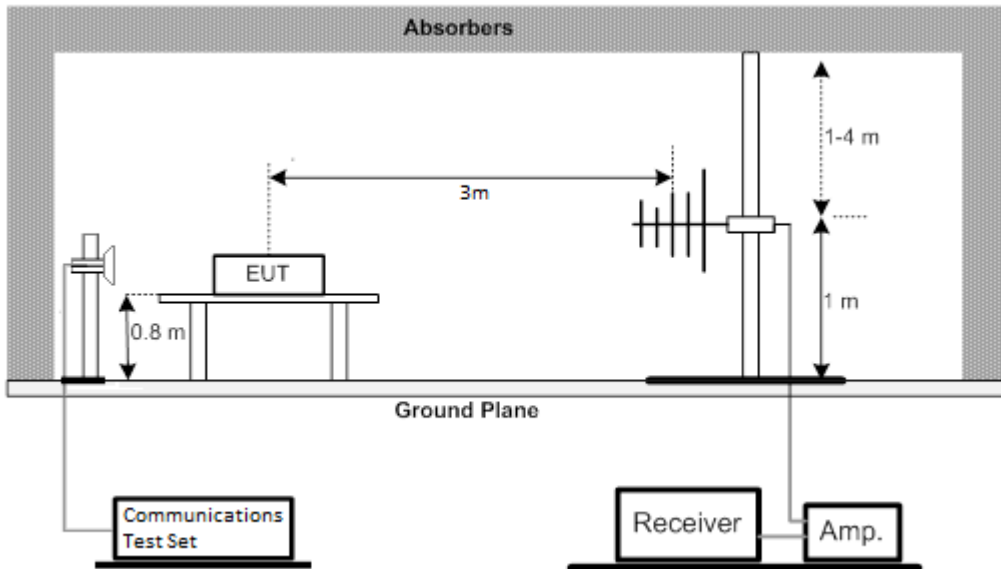
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. 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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi.}$
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.4.3 TESTSETUP LAYOUT

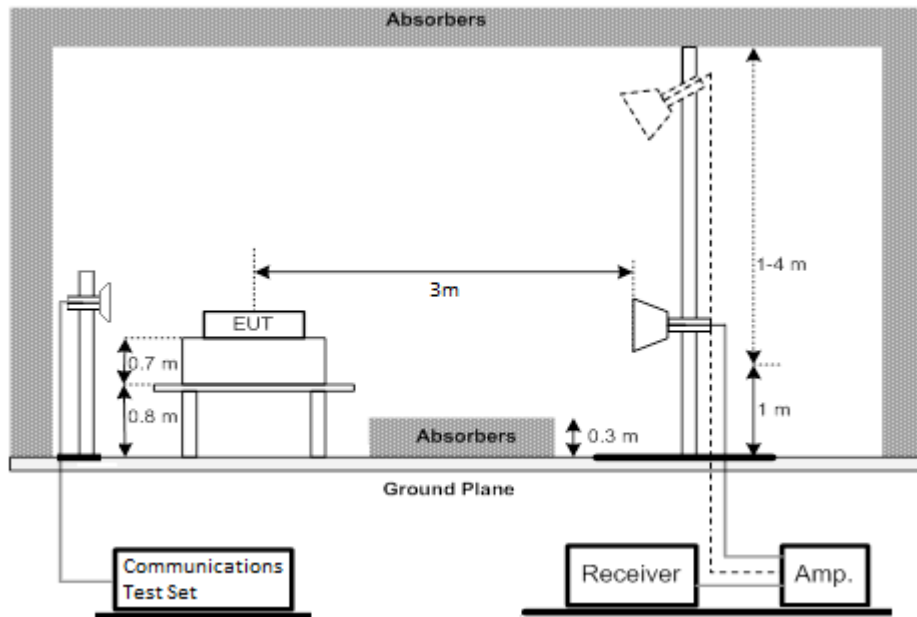
#### Below 30MHz



#### Below 1GHz



### Above 1GHz



#### 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

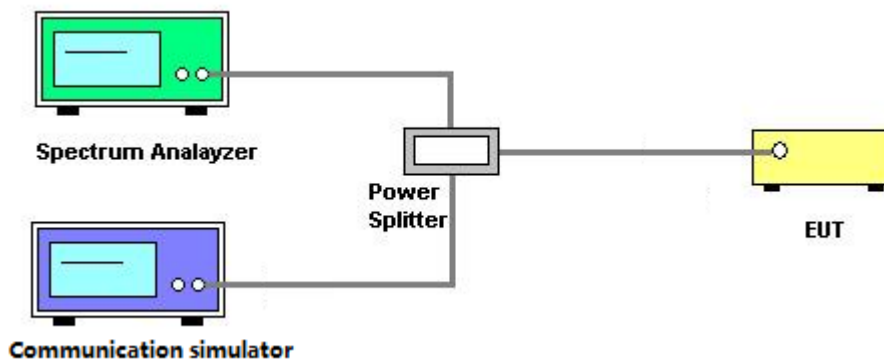
### 4.5.1 LIMIT

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 2MHz. RB of the spectrum is 15kHz and VB of the spectrum is 43kHz (LTE Bandwidth 1.4MHz).
3. 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).
4. 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).
5. 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).
6. 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).
7. 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).
8. Record the max trace plot into the test report.

### 4.5.3 TESTSETUP LAYOUT



### 4.5.4 TESTDEVIATION

No deviation

### 4.5.5 TEST RESULTS

Please refer to the Appendix G.

## 4.6 PEAK TO AVERAGE RATIO MEASUREMENT

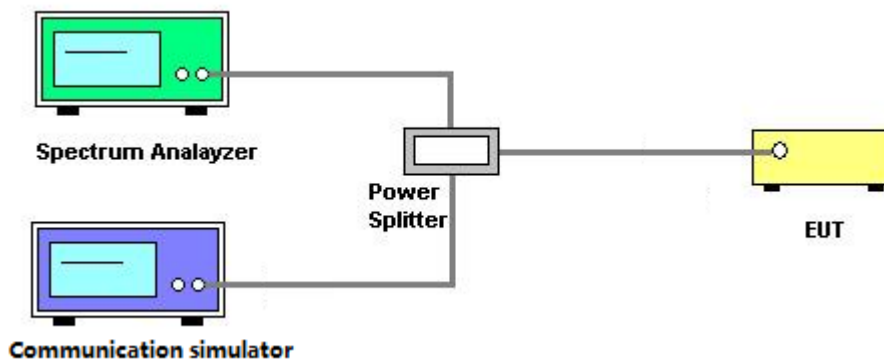
### 4.6.1 LIMIT

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 TESTSETUP LAYOUT



### 4.6.4 TESTDEVIATION

No deviation

### 4.6.5 TEST RESULTS

Please refer to the Appendix H.

## 4.7 FREQUENCY STABILITY MEASUREMENT

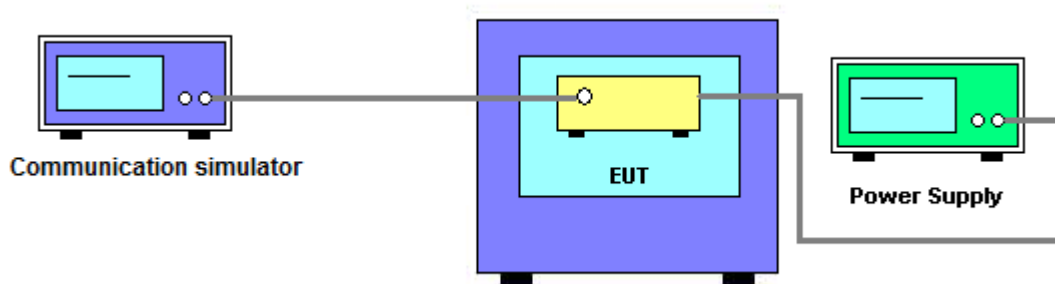
### 4.7.1 LIMIT

1.5 ppm is for base and fixed station. 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 TESTSETUP LAYOUT



### 4.7.4 TESTDEVIATION

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	Schwarbeck	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	Cable	emci	LMR-400(30MHz-1G Hz)(8m+5m)	N/A	May 25, 2019
15	Cable	mitron	B10-01-01-12M	18072744	Jul. 30, 2019
16	Controller	ETS-Lindgren	2090	N/A	N/A
17	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
18	Loop Antenna	EM	EM-6876-1	230	Jan. 15, 2020
19	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 09, 2020
20	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2019

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

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

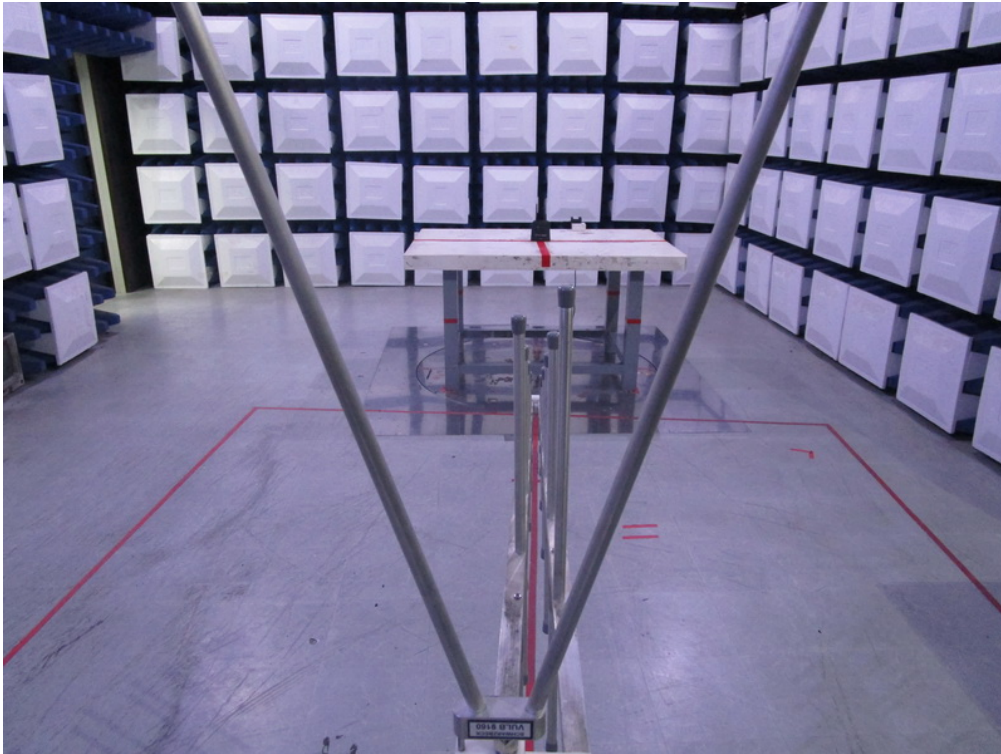
All calibration period of equipment list is one year.

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



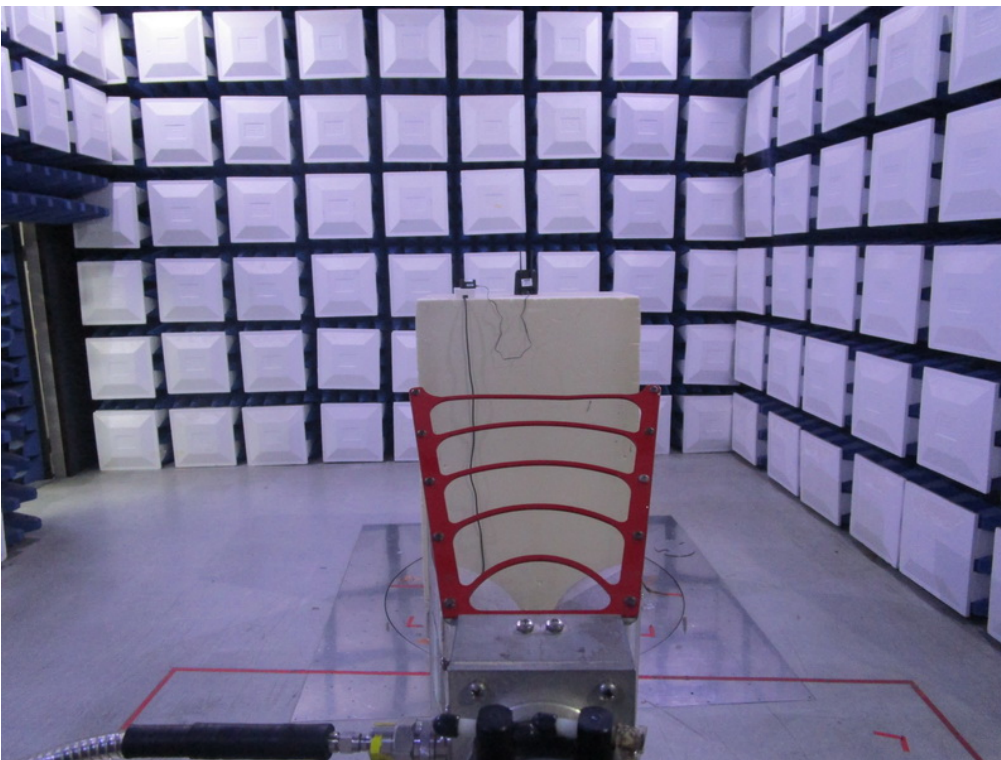
**6. EUT TEST PHOTO****9 kHz to 30 MHz**

**30 MHz to 1 GHz**





**Above 1 GHz**



## APPENDIX A – MAXIMUM OUTPUT POWER

**Maximum Output Power (dBm):**

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	21.79	21.72	21.80
		1	2	21.98	21.67	21.61
		1	5	21.86	21.68	21.80
		3	0	21.82	21.86	21.58
		3	1	21.94	22.00	21.62
		3	2	21.95	22.02	21.71
	16QAM	6	0	20.85	20.80	20.66
		1	0	20.92	21.11	20.79
		1	2	21.02	21.03	20.77
		1	5	20.94	21.01	20.74
		3	0	21.26	20.84	21.06
		3	1	21.43	20.90	20.92
		3	2	21.23	20.93	20.91
		6	0	20.27	19.74	19.88

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	22.05	21.96	21.55
		1	7	22.18	21.96	21.66
		1	14	22.18	21.84	21.54
		8	0	21.05	20.95	20.74
		8	4	21.06	20.97	20.73
		8	7	21.05	20.92	20.69
		15	0	21.00	20.92	20.73
	16QAM	1	0	21.09	20.92	20.83
		1	7	20.98	21.15	20.80
		1	14	20.95	20.79	20.70
		8	0	20.05	20.00	20.06
		8	4	20.24	20.01	19.60
		8	7	20.23	19.96	19.54
		15	0	20.12	20.04	19.82

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	22.10	21.68	21.89
		1	13	22.11	21.83	21.82
		1	24	22.12	21.64	21.59
		12	0	21.03	20.92	20.79
		12	6	21.03	21.03	20.69
		12	11	21.02	21.03	20.69
		25	0	20.98	21.01	20.72
	16QAM	1	0	20.66	20.89	20.57
		1	13	20.48	21.03	20.23
		1	24	20.55	20.83	20.17
		12	0	19.98	20.00	19.93
		12	6	20.02	20.05	19.77
		12	11	19.96	20.07	19.64
		25	0	20.30	20.09	19.74

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	22.29	21.85	21.81
		1	25	22.54	22.17	22.05
		1	49	21.99	21.99	21.96
		25	0	21.16	21.01	20.81
		25	13	21.14	21.07	20.80
		25	25	21.02	20.93	20.75
		50	0	21.14	20.99	20.76
	16QAM	1	0	21.07	20.67	20.71
		1	25	21.47	21.01	20.79
		1	49	20.80	20.74	20.84
		25	0	20.04	20.17	20.06
		25	13	20.18	20.02	20.17
		25	25	20.01	20.11	19.91
		50	0	20.02	20.04	19.88

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	22.06	21.88	21.75
		1	38	22.43	22.12	22.00
		1	74	21.94	21.87	21.77
		36	0	21.25	21.87	20.91
		36	18	21.13	21.08	20.85
		36	39	21.08	21.03	20.84
		75	0	21.07	20.96	20.74
	16QAM	1	0	21.05	20.74	21.50
		1	38	21.16	20.96	21.47
		1	74	21.03	20.26	21.39
		36	0	20.31	20.26	20.03
		36	18	20.11	20.25	19.90
		36	39	20.06	20.07	19.76
		75	0	20.16	20.01	19.91

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	21.74	22.01	21.53
		1	50	21.97	21.06	21.98
		1	99	21.52	21.91	21.59
		50	0	21.13	21.07	20.97
		50	25	21.09	21.15	20.96
		50	50	21.06	21.00	20.80
		100	0	21.09	21.02	20.85
	16QAM	1	0	20.85	20.22	20.38
		1	50	21.25	20.06	20.69
		1	99	20.48	20.26	20.34
		50	0	20.01	19.83	19.86
		50	25	20.28	19.92	19.93
		50	50	20.06	19.78	19.84
		100	0	20.09	19.98	19.86

**EIRP Power (dBm):**

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	25.89	25.82	25.90
		1	2	26.08	25.77	25.71
		1	5	25.97	25.78	25.90
		3	0	25.92	25.96	25.68
		3	1	26.04	26.10	25.72
		3	2	26.05	26.12	25.81
	16QAM	6	0	24.95	24.90	24.76
		1	0	25.02	25.21	24.89
		1	2	25.12	25.13	24.87
		1	5	25.04	25.11	24.84
		3	0	25.36	24.94	25.16
		3	1	25.53	25.00	25.02
		3	2	25.33	25.03	25.01
		6	0	24.37	23.84	23.98

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	26.15	26.06	25.65
		1	7	26.28	26.06	25.76
		1	14	26.28	25.94	25.64
		8	0	25.15	25.05	24.84
		8	4	25.16	25.07	24.83
		8	7	25.15	25.02	24.79
		15	0	25.10	25.02	24.83
	16QAM	1	0	25.19	25.02	24.93
		1	7	25.08	25.25	24.90
		1	14	25.05	24.89	24.80
		8	0	24.15	24.10	24.16
		8	4	24.34	24.11	23.70
		8	7	24.33	24.06	23.64
		15	0	24.22	24.14	23.93



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	26.20	25.78	25.99
		1	13	26.21	25.93	25.92
		1	24	26.22	25.74	25.69
		12	0	25.13	25.02	24.89
		12	6	25.13	25.13	24.79
		12	11	25.12	25.13	24.79
	16QAM	25	0	25.08	25.11	24.82
		1	0	24.76	24.99	24.67
		1	13	24.58	25.13	24.33
		1	24	24.65	24.93	24.27
		12	0	24.08	24.10	24.03
		12	6	24.12	24.15	23.87
		12	11	24.06	24.17	23.74
		25	0	24.40	24.19	23.84

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	26.39	25.95	25.91
		1	25	26.64	26.27	26.15
		1	49	26.09	26.09	26.07
		25	0	25.26	25.11	24.91
		25	13	25.24	25.17	24.90
		25	25	25.12	25.04	24.85
		50	0	25.24	25.09	24.86
	16QAM	1	0	25.17	24.77	24.81
		1	25	25.57	25.11	24.89
		1	49	24.90	24.84	24.94
		25	0	24.14	24.27	24.16
		25	13	24.28	24.12	24.27
		25	25	24.11	24.21	24.01
		50	0	24.12	24.14	23.99

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	26.16	25.98	25.85
		1	38	26.53	26.22	26.10
		1	74	26.04	25.97	25.87
		36	0	25.35	25.97	25.01
		36	18	25.23	25.18	24.95
		36	39	25.18	25.13	24.95
		75	0	25.17	25.06	24.84
	16QAM	1	0	25.15	24.84	25.60
		1	38	25.26	25.06	25.57
		1	74	25.13	24.36	25.49
		36	0	24.41	24.36	24.13
		36	18	24.21	24.35	24.00
		36	39	24.17	24.17	23.86
		75	0	24.26	24.11	24.01

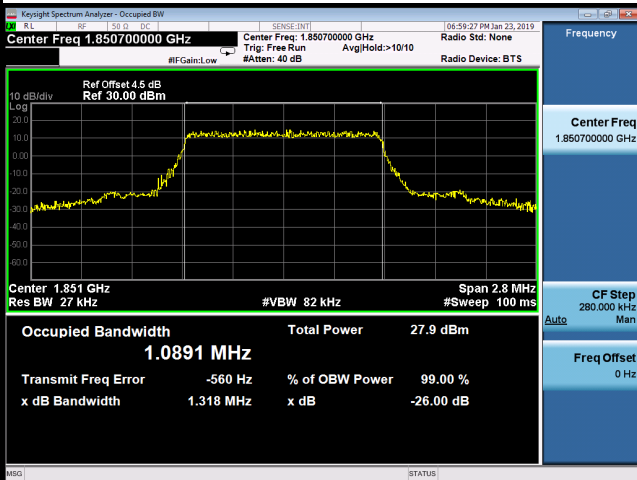
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18700CH	18900CH	19100CH
				1860MHz	1880MHz	1900MHz
2 / 20M	QPSK	1	0	25.84	26.11	25.63
		1	50	26.07	25.16	26.08
		1	99	25.62	26.01	25.69
		50	0	25.23	25.17	25.07
		50	25	25.19	25.25	25.06
		50	50	25.16	25.10	24.90
		100	0	25.19	25.12	24.95
	16QAM	1	0	24.95	24.32	24.48
		1	50	25.35	24.16	24.79
		1	99	24.58	24.36	24.44
		50	0	24.11	23.93	23.96
		50	25	24.38	24.02	24.03
		50	50	24.16	23.88	23.94
		100	0	24.19	24.08	23.96

## APPENDIX B - OCCUPIED BANDWIDTH

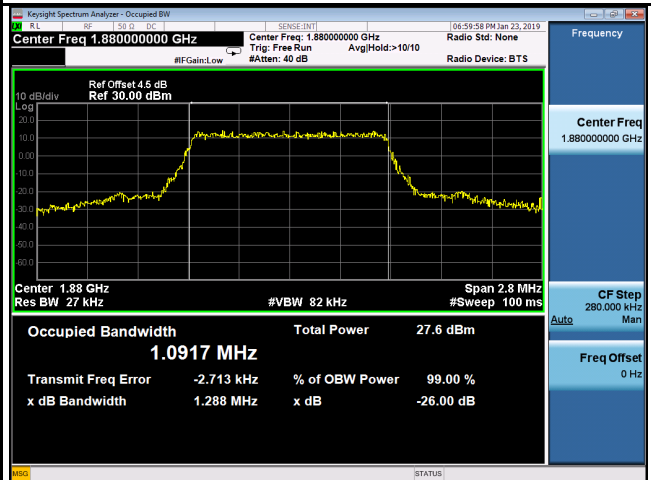
LTE Band 2_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18607	1850.7	1.089	18607	1850.7	1.096
18900	1880	1.091	18900	1880	1.089
19193	1909.3	1.084	19193	1909.3	1.093
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.318	18607	1850.7	1.290
18900	1880	1.288	18900	1880	1.291
19193	1909.3	1.267	19193	1909.3	1.267

### Spectrum Plot

#### QPSK-18607



#### QPSK-18900



#### QPSK-19193



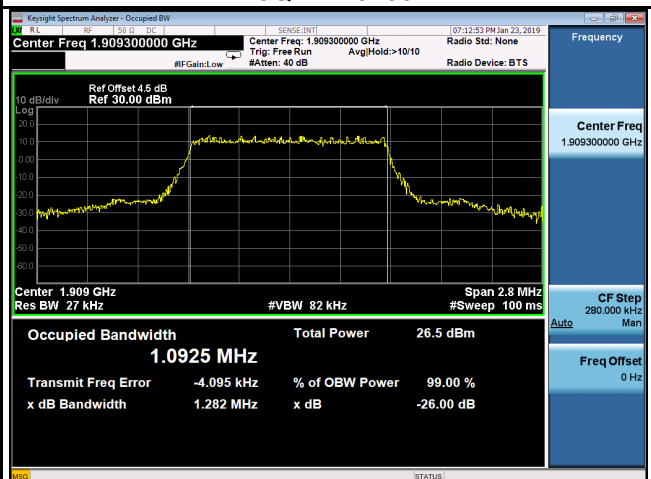
#### 16QAM-18607



#### 16QAM-18900

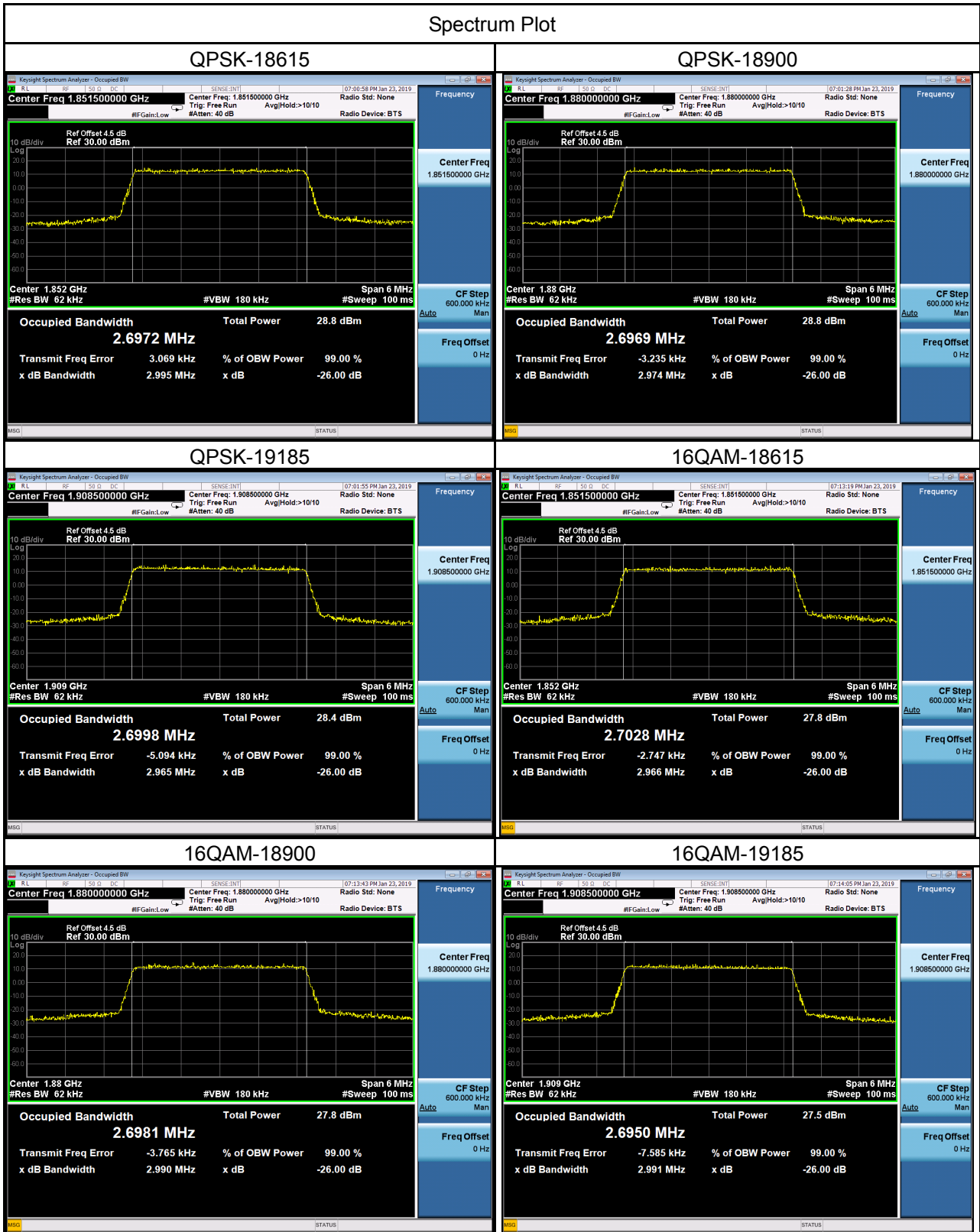


#### 16QAM-19193



LTE Band 2_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18615	1851.5	2.697	18615	1851.5	2.703
18900	1880	2.697	18900	1880	2.698
19185	1908.5	2.700	19185	1908.5	2.695
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.995	18615	1851.5	2.966
18900	1880	2.974	18900	1880	2.990
19185	1908.5	2.965	19185	1908.5	2.991

### Spectrum Plot

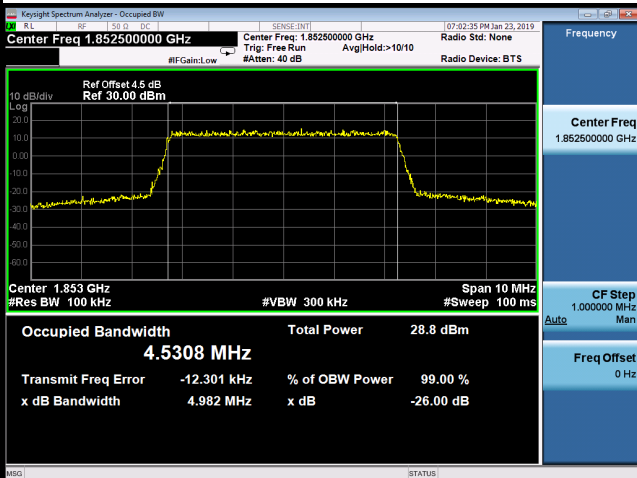


LTE Band 2_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18625	1852.5	4.531	18625	1852.5	4.508
18900	1880	4.512	18900	1880	4.502
19175	1907.5	4.506	19175	1907.5	4.496
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.982	18625	1852.5	4.984
18900	1880	4.971	18900	1880	4.993
19175	1907.5	4.982	19175	1907.5	4.924

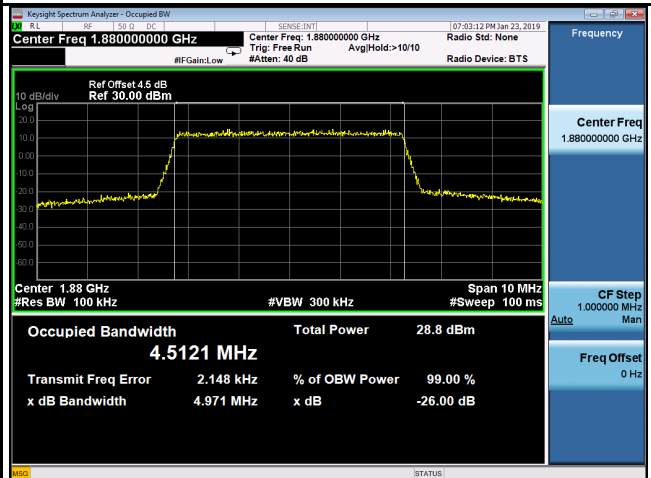


### Spectrum Plot

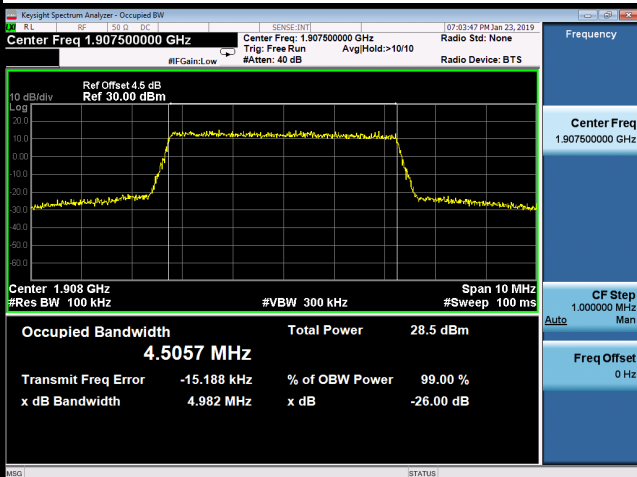
#### QPSK-18625



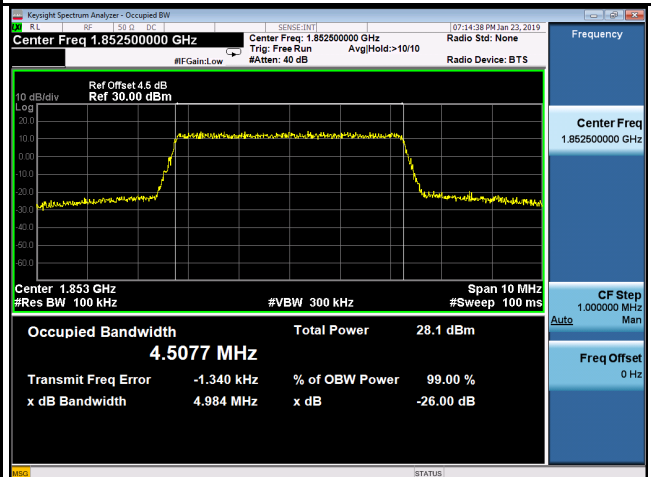
#### QPSK-18900



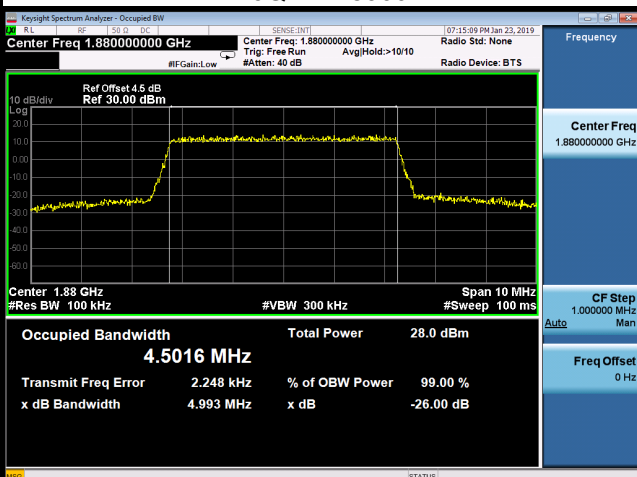
#### QPSK-19175



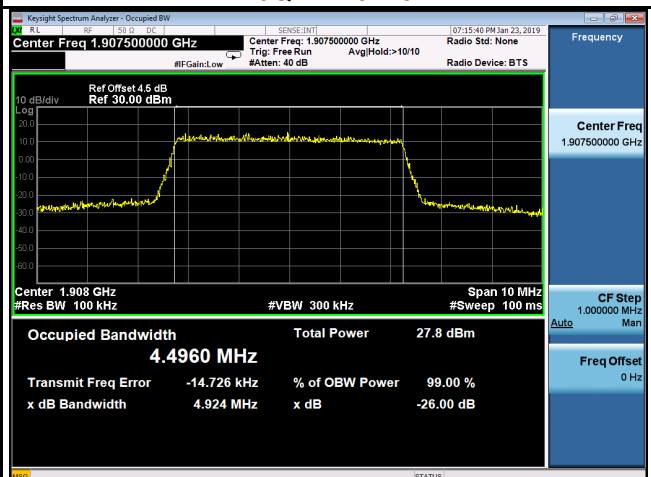
#### 16QAM-18625



#### 16QAM-18900



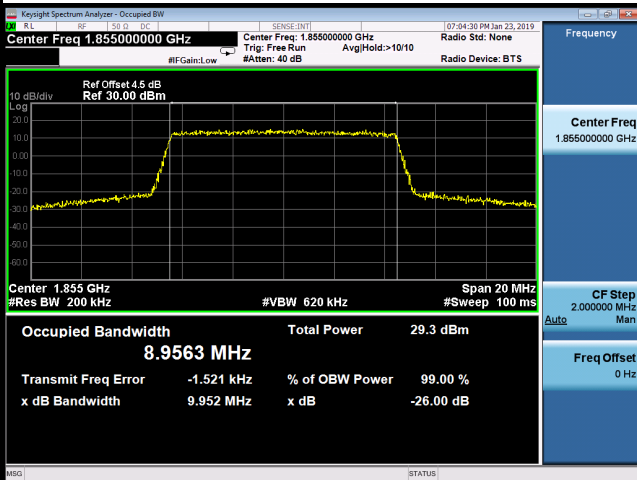
#### 16QAM-19175



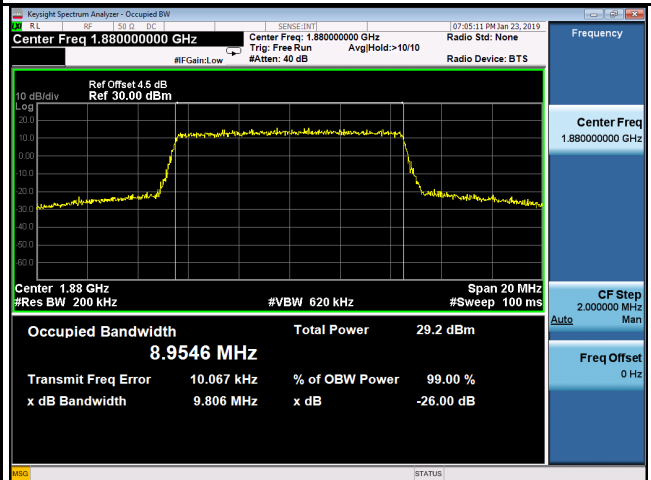
LTE Band 2_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18650	1855	8.956	18650	1855	8.946
18900	1880	8.955	18900	1880	8.948
19150	1905	8.946	19150	1905	8.935
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	9.952	18650	1855	9.840
18900	1880	9.806	18900	1880	9.836
19150	1905	9.810	19150	1905	9.769

### Spectrum Plot

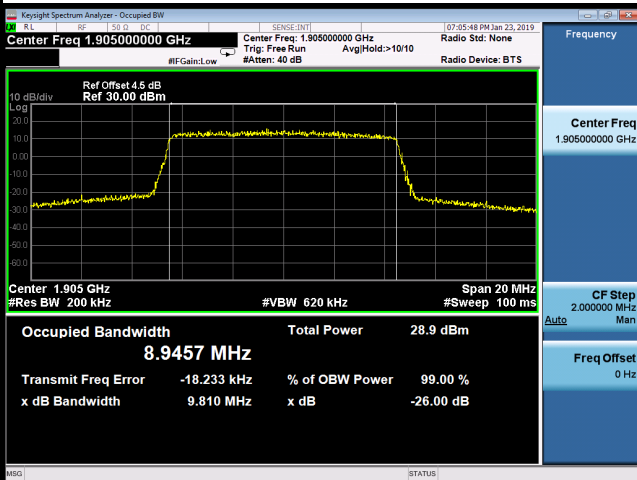
#### QPSK-18650



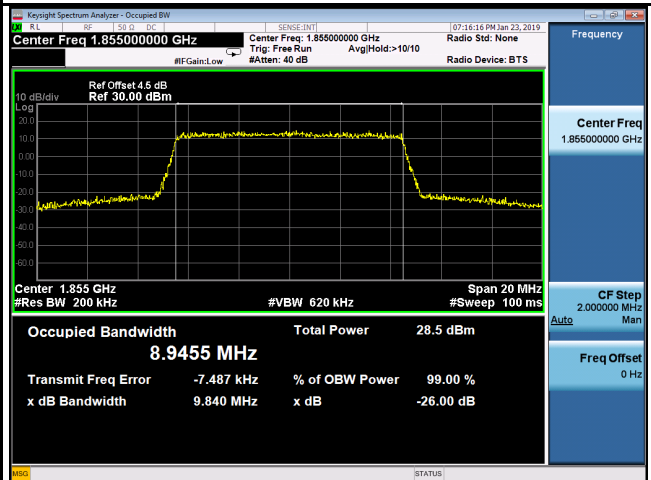
#### QPSK-18900



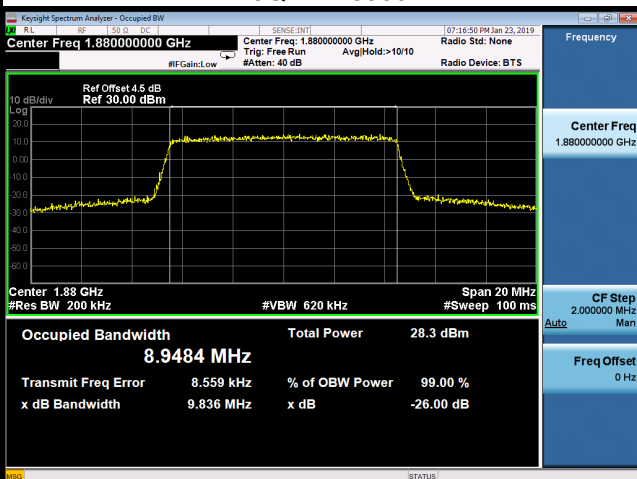
#### QPSK-19150



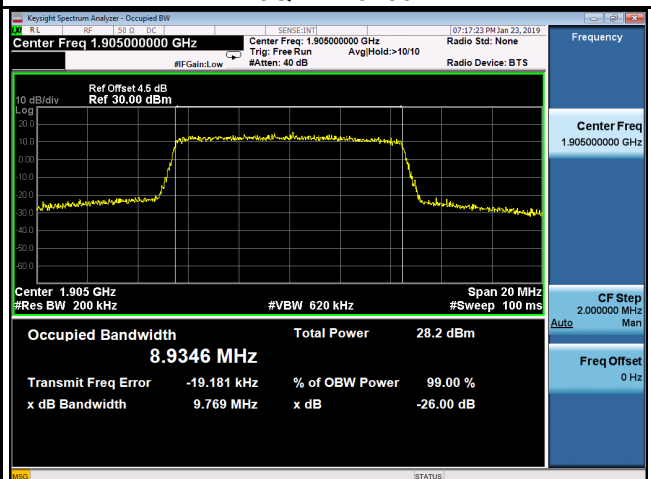
#### 16QAM-18650



#### 16QAM-18900



#### 16QAM-19150



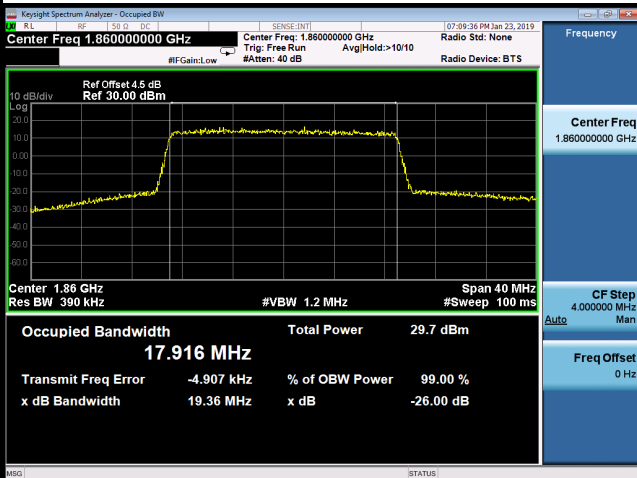
LTE Band 2_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18675	1857.5	13.415	18675	1857.5	13.421
18900	1880	13.392	18900	1880	13.420
19125	1902.5	13.361	19125	1902.5	13.359
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	14.550	18675	1857.5	14.580
18900	1880	14.580	18900	1880	14.630
19125	1902.5	14.600	19125	1902.5	14.530



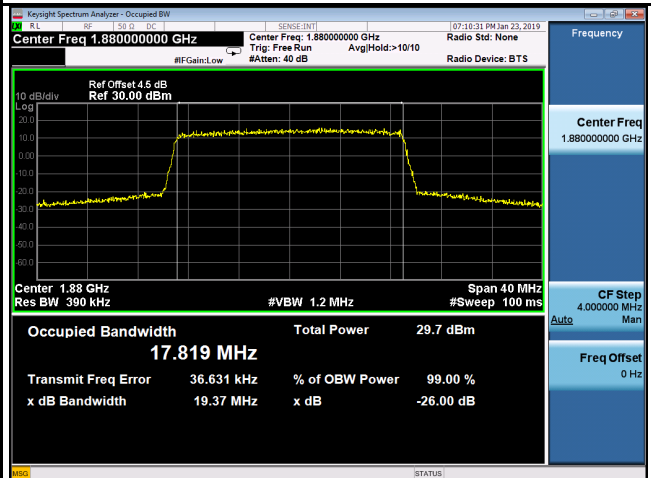
LTE Band 2_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
18700	1860	17.916	18700	1860	17.871
18900	1880	17.819	18900	1880	17.856
19100	1900	17.815	19100	1900	17.859
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	19.360	18700	1860	19.360
18900	1880	19.370	18900	1880	19.330
19100	1900	19.410	19100	1900	19.390

### Spectrum Plot

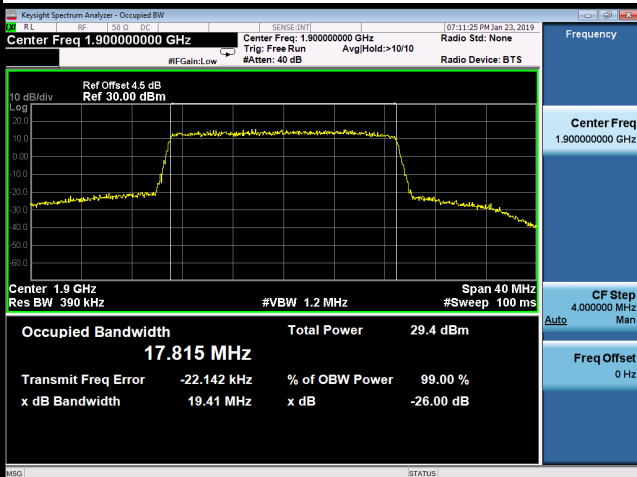
#### QPSK-18700



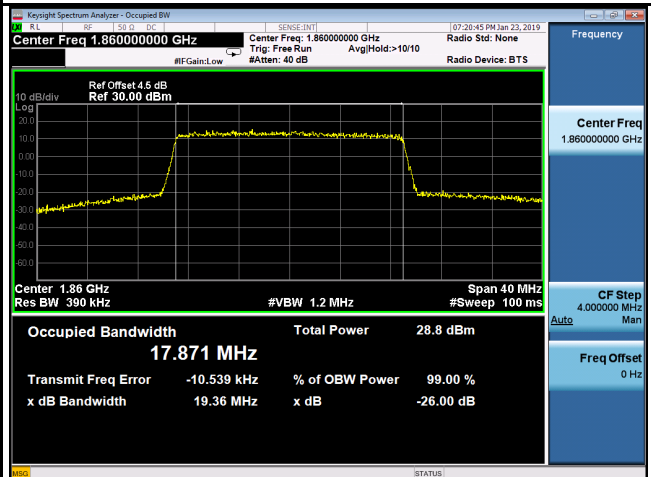
#### QPSK-18900



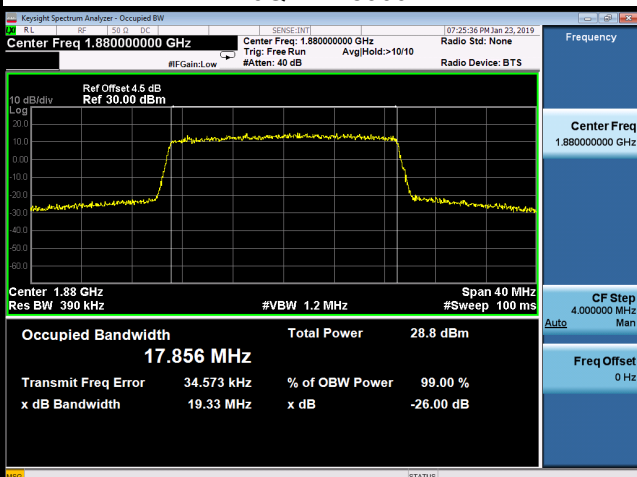
#### QPSK-19100



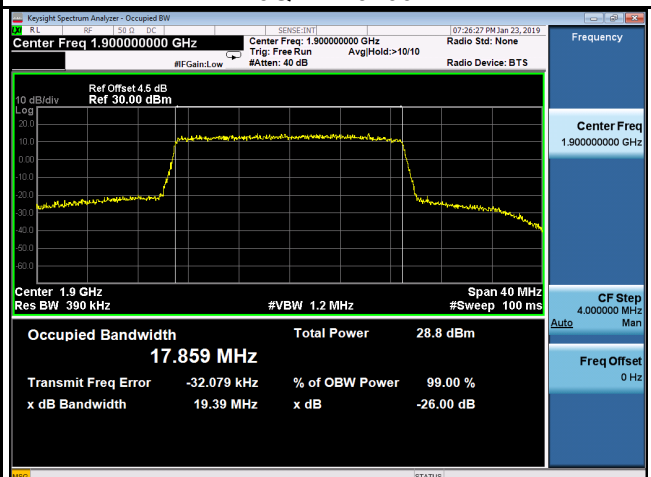
#### 16QAM-18700



#### 16QAM-18900



#### 16QAM-19100



## APPENDIX C - CONDUCTED EMISSIONS



LTE Band 2\_1.4M

Channel	Frequency(MHz)	Channel	Frequency(MHz)
18900	1880	18900	1880
<p>Date: 24.JAN.2019 13:22:28</p>		<p>Date: 24.JAN.2019 12:57:36</p>	
Channel	Frequency(MHz)	-	-
18900	1880	-	-
<p>Date: 27.JAN.2019 13:28:22</p>		-	

LTE Band 2\_5M

Channel	Frequency(MHz)	Channel	Frequency(MHz)
18900	1880	18900	1880
Date: 24.JAN.2019 13:23:36		Date: 24.JAN.2019 12:55:39	
Channel	Frequency(MHz)	-	-
18900	1880	-	-
Date: 27.JAN.2019 13:29:52			

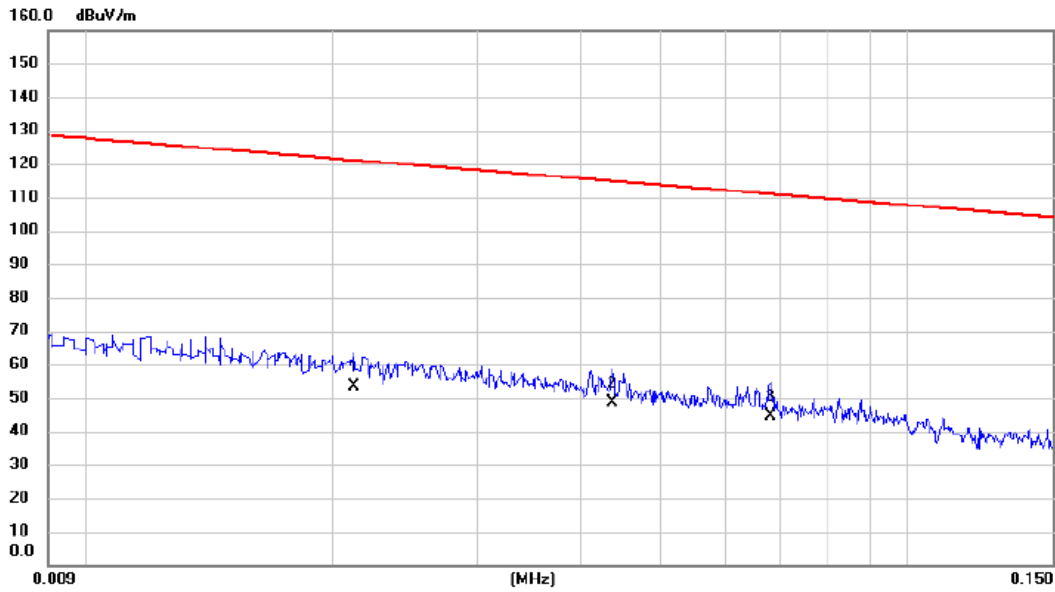
LTE Band 2\_20M

Channel	Frequency(MHz)	Channel	Frequency(MHz)
18900	1880	18900	1880
Date: 24.JAN.2019 13:29:27		Date: 24.JAN.2019 12:52:14	
Channel	Frequency(MHz)	-	-
18900	1880	-	-
		-	
Date: 27.JAN.2019 13:33:55			

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

Test Mode: TX Mode\_Adapter AMS135-1201000FU

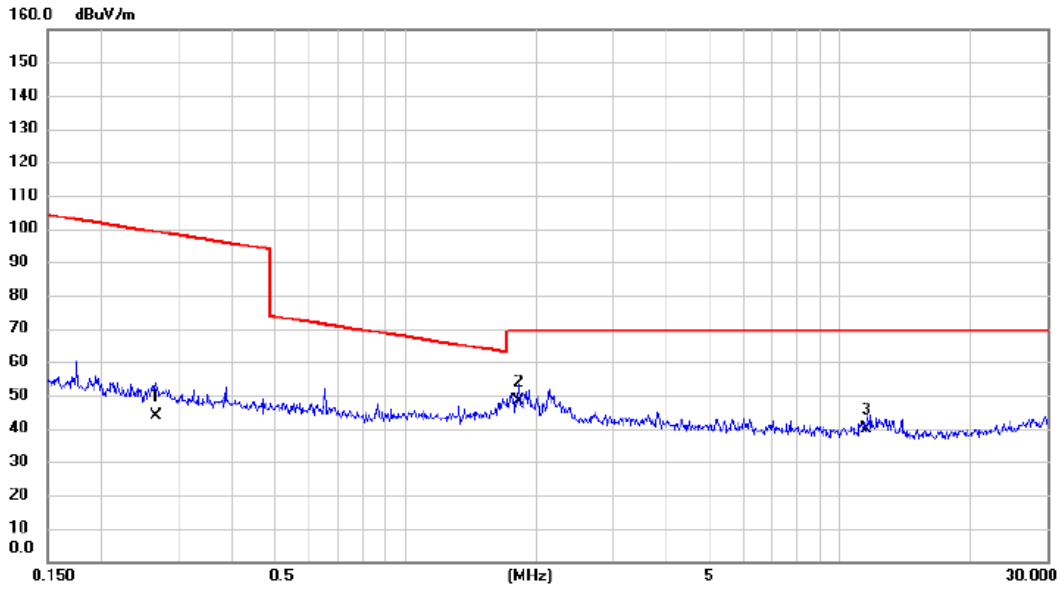
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.0212	33.50	20.00	53.50	121.08	-67.58	AVG	
2	*	0.0437	29.10	19.64	48.74	114.80	-66.06	AVG	
3		0.0680	25.40	19.17	44.57	110.95	-66.38	AVG	

Test Mode: TX Mode\_Adapter AMS135-1201000FU

Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.2672	26.80	17.05	43.85	99.07	-55.22	AVG	
2	*	1.8288	31.30	17.02	48.32	69.54	-21.22	QP	
3		11.5594	25.40	14.46	39.86	69.54	-29.68	QP	