



# RF TEST REPORT

**Applicant**    Xiaomi Communications Co., Ltd.  
**FCC ID**        2AFZZJ20SG  
**Product**        Mobile Phone  
**Brand**          POCO  
**Model**          M2102J20SG  
**Report No.**    R2012A0844-R2  
**Issue Date**    January 19, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2019)/ FCC CFR 47 Part 24E (2019)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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### Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	2.1046 24.232(c)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	2.1051 /24.238(a)	PASS
4	Peak-to-Average Power Ratio	24.232/KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 24.235	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 24.238(a)	PASS
7	Radiates Spurious Emission	2.1053 / 24.238(a)	PASS
Date of Testing: December 19, 2020 ~January 12, 2021			
Date of Sample Received: December 14, 2020			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			



## 1. Test Laboratory

### 1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

### 1.2. Test facility

#### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

#### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong  
City: Shanghai  
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## 2. General Description of Equipment under Test

### 2.1. Applicant and Manufacturer Information

Applicant	Xiaomi Communications Co., Ltd.
Applicant address	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Manufacturer	Xiaomi Communications Co., Ltd.
Manufacturer address	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

### 2.2. General information

EUT Description			
Model	M2102J20SG		
IMEI	IMEI 1:864460050016600 IMEI 2:864460050016618		
Hardware Version	P1		
Software Version	MIUI12		
Power Supply	Battery / AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	Band	Main Antenna Gain(dBi)	Diversity Antenna Gain(dBi)
	GSM1900	-0.5	-3
	WCDMA Band II	-0.5	-3
	LTE Band 2	-0.5	-3
Test Mode(s)	GSM1900; WCDMA Band II; LTE Band 2;		
Test Modulation	(GSM/GPRS)GMSK, (EGPRS) GMSK/ 8PSK; (WCDMA) BPSK, QPSK,16QAM; (LTE)QPSK, 16QAM, 64QAM;		
GPRS Multislot Class	33		
EGPRS Multislot Class	33		
HSDPA UE Category	24		
HSUPA UE Category	6		
LTE Category	18		
Maximum E.I.R.P	GSM 1900:	29.76dBm	
	WCDMA Band II:	23.68dBm	
	LTE Band 2:	23.84dBm	
Rated Power Supply Voltage	3.87V		
Extreme Voltage	Minimum: 3.29V    Maximum: 4.45V		
Extreme Temperature	Lowest: -30°C    Highest: +50°C		
Operating Voltage	Minimum: 3.6V    Maximum: 4.4V		



Operating Temperature	Lowest: 0°C    Highest: +40°C		
Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM1900	1850 ~ 1910	1930 ~ 1990
	WCDMA Band II	1850 ~ 1910	1930 ~ 1990
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			

### 3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**Test standards:**

**FCC CFR 47 Part 24E (2019)**

**ANSI C63.26 (2015)**

**Reference standard:**

**FCC CFR47 Part 2 (2019)**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

## 4. Test Configuration

There is more than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated. Subsequently, only the worst case emissions are reported.

The following testing in GSM/WCDMA/LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below:

Test items	Modes/Modulation	
	GSM 1900	WCDMA Band II
RF Power Output and Effective Isotropic Radiated Power	GSM GPRS EGPRS	RMC HSDPA/HSUPA DC-HSDPA/HSPA+
Occupied Bandwidth	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Band Edge Compliance	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Peak-to-Average Power Ratio	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Frequency Stability	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Spurious Emissions at Antenna Terminals	GSM	RMC
Radiates Spurious Emission	GSM	RMC



Test modes are chosen to be reported as the worst case configuration below for LTE Band 2:

Test items	Bandwidth (MHz)						Modulation			RB			Test Channel		
	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	50%	100%	L	M	H
RF Power Output and Effective Isotropic Radiated Power	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	O	O	O	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Conducted Spurious Emissions	O	O	O	O	O	O	O	-	-	O	-	-	O	O	O
Radiates Spurious Emission	O	-	O	-	-	O	O	-	-	O	-	-	-	O	-
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.														

## 5. Test Case Results

### 5.1.RF Power Output and Effective Isotropic Radiated Power

#### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Methods of Measurement

During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

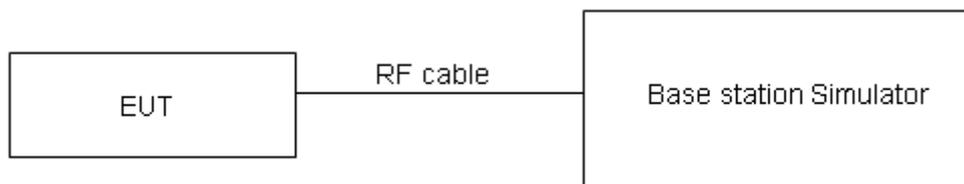
ERP can then be calculated as follows:

$$\text{EIRP (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$$

where:dBd refers to gain relative to an ideal dipole.

$$\text{EIRP (dBm)} = \text{ERP (dBm)} + 2.15 \text{ (dB.)}$$

#### Test Setup



#### Limits

No specific RF power output requirements in part 2.1046.

Rule Part 24.232(c) Mobile and portable stations are limited to 2 watts EIRP.

Rule Part 24.232(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Limit	$\leq 2 \text{ W}$ (33 dBm)
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#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4 \text{ dB}$  for RF power output,  $k = 2$ ,  $U = 1.19 \text{ dB}$  for EIRP.



**Test Results**

GSM 1900		Maximum Output Power (dBm)			EIRP (dBm)					
					Main Antenna			Diversity Antenna		
		Channel 512	Channel 661	Channel 810	Channel 512	Channel 661	Channel 810	Channel 512	Channel 661	Channel 810
		1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)	1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)	1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)
GSM(GMSK)	Results	30.23	30.18	30.25	29.73	29.68	29.75	27.23	27.18	27.25
GPRS/EGPRS (GMSK)	1TXslot	30.22	30.20	30.26	29.72	29.70	29.76	27.22	27.20	27.26
	2TXslots	26.96	27.19	27.30	26.46	26.69	26.80	23.96	24.19	24.30
	3TXslots	25.07	25.23	25.36	24.57	24.73	24.86	22.07	22.23	22.36
	4TXslots	24.00	23.91	24.10	23.50	23.41	23.60	21.00	20.91	21.10
EGPRS (8PSK)	1TXslot	25.93	26.09	26.23	25.43	25.59	25.73	22.93	23.09	23.23
	2TXslots	22.97	22.87	23.01	22.47	22.37	22.51	19.97	19.87	20.01
	3TXslots	21.26	21.38	21.54	20.76	20.88	21.04	18.26	18.38	18.54
	4TXslots	20.09	19.90	20.19	19.59	19.40	19.69	17.09	16.90	17.19

WCDMA Band II		Maximum Output Power (dBm)			EIRP (dBm)					
					Main Antenna			Diversity Antenna		
		Channel 9262	Channel 9400	Channel 9538	Channel 9262	Channel 9400	Channel 9538	Channel 9262	Channel 9400	Channel 9538
		1852.4 (MHz)	1880 (MHz)	1907.6 (MHz)	1852.4 (MHz)	1880 (MHz)	1907.6 (MHz)	1852.4 (MHz)	1880 (MHz)	1907.6 (MHz)
<b>RMC</b>		24.18	24.16	24.10	23.68	23.66	23.60	21.18	21.16	21.10
<b>HSDPA</b>	Sub - Test 1	23.30	23.30	23.19	22.80	22.80	22.69	20.30	20.30	20.19
	Sub - Test 2	23.31	23.26	23.14	22.81	22.76	22.64	20.31	20.26	20.14
	Sub - Test 3	22.81	22.76	22.61	22.31	22.26	22.11	19.81	19.76	19.61
	Sub - Test 4	22.76	22.74	22.61	22.26	22.24	22.11	19.76	19.74	19.61
<b>HSUPA</b>	Sub - Test 1	23.30	23.30	23.20	22.80	22.80	22.70	20.30	20.30	20.20
	Sub - Test 2	21.30	21.31	21.19	20.80	20.81	20.69	18.30	18.31	18.19
	Sub - Test 3	22.29	22.31	22.18	21.79	21.81	21.68	19.29	19.31	19.18
	Sub - Test 4	21.34	21.32	21.18	20.84	20.82	20.68	18.34	18.32	18.18
	Sub - Test 5	23.31	23.27	23.19	22.81	22.77	22.69	20.31	20.27	20.19
<b>DC-HSDPA</b>	Sub - Test 1	23.14	23.44	23.10	22.64	22.94	22.60	20.14	20.44	20.10
	Sub - Test 2	22.89	23.05	22.90	22.39	22.55	22.40	19.89	20.05	19.90
	Sub - Test 3	22.85	22.91	22.80	22.35	22.41	22.30	19.85	19.91	19.80
	Sub - Test 4	22.79	22.90	22.72	22.29	22.40	22.22	19.79	19.90	19.72
<b>HSPA+</b>	16QAM	21.87	21.90	22.01	21.37	21.40	21.51	18.87	18.90	19.01



LTE Band 2				Maximum Output Power (dBm)			EIRP (dBm)					
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18607/1850.7	18900/1880	19193/1909.3	18607/1850.7	18900/1880	19193/1909.3	18607/1850.7	18900/1880	19193/1909.3
1.4MHz	QPSK	1	0	24.09	24.05	24.13	23.59	23.55	23.63	21.09	21.05	21.13
		1	2	24.29	24.25	24.30	23.79	23.75	23.80	21.29	21.25	21.30
		1	5	24.20	24.19	24.25	23.70	23.69	23.75	21.20	21.19	21.25
		3	0	24.08	24.03	24.12	23.58	23.53	23.62	21.08	21.03	21.12
		3	2	24.18	24.14	24.23	23.68	23.64	23.73	21.18	21.14	21.23
		3	3	24.10	24.05	24.13	23.60	23.55	23.63	21.10	21.05	21.13
		6	0	23.25	23.20	23.29	22.75	22.70	22.79	20.25	20.20	20.29
	16QAM	1	0	23.38	23.34	23.40	22.88	22.84	22.90	20.38	20.34	20.40
		1	2	23.47	23.45	23.50	22.97	22.95	23.00	20.47	20.45	20.50
		1	5	23.34	23.31	23.38	22.84	22.81	22.88	20.34	20.31	20.38
		3	0	23.33	23.29	23.35	22.83	22.79	22.85	20.33	20.29	20.35
		3	2	23.37	23.35	23.42	22.87	22.85	22.92	20.37	20.35	20.42
		3	3	23.32	23.27	23.36	22.82	22.77	22.86	20.32	20.27	20.36
		6	0	22.40	22.36	22.45	21.90	21.86	21.95	19.40	19.36	19.45
	64QAM	1	0	23.41	23.37	23.43	22.91	22.87	22.93	20.41	20.37	20.43
		1	2	23.43	23.41	23.46	22.93	22.91	22.96	20.43	20.41	20.46
		1	5	23.43	23.37	23.44	22.93	22.87	22.94	20.43	20.37	20.44
		3	0	23.36	23.28	23.34	22.86	22.78	22.84	20.36	20.28	20.34
		3	2	23.45	23.41	23.48	22.95	22.91	22.98	20.45	20.41	20.48
		3	3	23.25	23.20	23.29	22.75	22.70	22.79	20.25	20.20	20.29
		6	0	22.27	22.23	22.32	21.77	21.73	21.82	19.27	19.23	19.32
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
3MHz	QPSK	1	0	18615/1851.5	18900/1880	19185/1908.5	18615/1851.5	18900/1880	19185/1908.5	18615/1851.5	18900/1880	19185/1908.5
		1	7	24.17	24.16	24.08	23.67	23.66	23.58	21.17	21.16	21.08
		1	14	24.23	24.34	23.84	23.73	23.84	23.34	21.23	21.34	20.84
		8	0	23.36	23.49	23.42	22.86	22.99	22.92	20.36	20.49	20.42
		8	4	23.38	23.55	23.45	22.88	23.05	22.95	20.38	20.55	20.45
		8	7	23.41	23.50	23.35	22.91	23.00	22.85	20.41	20.50	20.35
		15	0	23.34	23.54	23.43	22.84	23.04	22.93	20.34	20.54	20.43



	16QAM	1	0	23.62	23.56	23.62	23.12	23.06	23.12	20.62	20.56	20.62
		1	7	23.60	23.47	23.53	23.10	22.97	23.03	20.60	20.47	20.53
		1	14	23.63	23.57	23.58	23.13	23.07	23.08	20.63	20.57	20.58
		8	0	22.57	22.49	22.51	22.07	21.99	22.01	19.57	19.49	19.51
		8	4	22.66	22.56	22.60	22.16	22.06	22.10	19.66	19.56	19.60
		8	7	22.68	22.61	22.62	22.18	22.11	22.12	19.68	19.61	19.62
		15	0	22.54	22.47	22.50	22.04	21.97	22.00	19.54	19.47	19.50
	64QAM	1	0	23.57	23.43	23.49	23.07	22.93	22.99	20.57	20.43	20.49
		1	7	23.74	23.61	23.67	23.24	23.11	23.17	20.74	20.61	20.67
		1	14	23.48	23.38	23.39	22.98	22.88	22.89	20.48	20.38	20.39
		8	0	22.64	22.52	22.58	22.14	22.02	22.08	19.64	19.52	19.58
		8	4	22.73	22.60	22.64	22.23	22.10	22.14	19.73	19.60	19.64
		8	7	22.64	22.57	22.58	22.14	22.07	22.08	19.64	19.57	19.58
		15	0	22.71	22.64	22.67	22.21	22.14	22.17	19.71	19.64	19.67
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18625/ 1852.5	18900/ 1880	19175/ 1907.5	18625/ 1852.5	18900/ 1880	19175/ 1907.5	18625/ 1852.5	18900/ 1880	19175/ 1907.5
5MHz	QPSK	1	0	24.21	24.30	24.13	23.71	23.80	23.63	21.21	21.30	21.13
		1	13	24.15	24.12	24.05	23.65	23.62	23.55	21.15	21.12	21.05
		1	24	24.20	24.29	23.80	23.70	23.79	23.30	21.20	21.29	20.80
		12	0	23.33	23.44	23.38	22.83	22.94	22.88	20.33	20.44	20.38
		12	6	23.36	23.51	23.40	22.86	23.01	22.90	20.36	20.51	20.40
		12	13	23.39	23.48	23.31	22.89	22.98	22.81	20.39	20.48	20.31
		25	0	23.34	23.53	23.41	22.84	23.03	22.91	20.34	20.53	20.41
	16QAM	1	0	23.59	23.52	23.59	23.09	23.02	23.09	20.59	20.52	20.59
		1	13	23.57	23.45	23.50	23.07	22.95	23.00	20.57	20.45	20.50
		1	24	23.60	23.55	23.54	23.10	23.05	23.04	20.60	20.55	20.54
		12	0	22.55	22.45	22.48	22.05	21.95	21.98	19.55	19.45	19.48
		12	6	22.63	22.51	22.56	22.13	22.01	22.06	19.63	19.51	19.56
		12	13	22.65	22.56	22.58	22.15	22.06	22.08	19.65	19.56	19.58
		25	0	22.52	22.43	22.45	22.02	21.93	21.95	19.52	19.43	19.45
	64QAM	1	0	23.54	23.43	23.46	23.04	22.93	22.96	20.54	20.43	20.46
		1	13	23.71	23.63	23.64	23.21	23.13	23.14	20.71	20.63	20.64
		1	24	23.49	23.36	23.35	22.99	22.86	22.85	20.49	20.36	20.35
		12	0	22.62	22.48	22.59	22.12	21.98	22.09	19.62	19.48	19.59
		12	6	22.70	22.55	22.60	22.20	22.05	22.10	19.70	19.55	19.60
		12	13	22.61	22.52	22.54	22.11	22.02	22.04	19.61	19.52	19.54



		25	0	22.69	22.60	22.62	22.19	22.10	22.12	19.69	19.6	19.62
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18650/ 1855	18900/ 1880	19150/ 1905	18650/ 1855	18900/ 1880	19150/ 1905	18650/ 1855	18900/ 1880	19150/ 1905
10MHz	QPSK	1	0	24.23	24.31	24.16	23.73	23.81	23.66	21.23	21.31	21.16
		1	25	24.18	24.17	24.09	23.68	23.67	23.59	21.18	21.17	21.09
		1	49	24.22	24.33	23.83	23.72	23.83	23.33	21.22	21.33	20.83
		25	0	23.36	23.49	23.42	22.86	22.99	22.92	20.36	20.49	20.42
		25	13	23.39	23.56	23.44	22.89	23.06	22.94	20.39	20.56	20.44
		25	25	23.41	23.52	23.36	22.91	23.02	22.86	20.41	20.52	20.36
		50	0	23.38	23.55	23.45	22.88	23.05	22.95	20.38	20.55	20.45
	16QAM	1	0	23.61	23.55	23.61	23.11	23.05	23.11	20.61	20.55	20.61
		1	25	23.60	23.49	23.53	23.10	22.99	23.03	20.60	20.49	20.53
		1	49	23.63	23.57	23.57	23.13	23.07	23.07	20.63	20.57	20.57
		25	0	22.58	22.50	22.52	22.08	22.00	22.02	19.58	19.50	19.52
		25	13	22.65	22.55	22.59	22.15	22.05	22.09	19.65	19.55	19.59
		25	25	22.68	22.61	22.62	22.18	22.11	22.12	19.68	19.61	19.62
		50	0	22.55	22.48	22.49	22.05	21.98	21.99	19.55	19.48	19.49
	64QAM	1	0	23.56	23.42	23.48	23.06	22.92	22.98	20.56	20.42	20.48
		1	25	23.74	23.63	23.67	23.24	23.13	23.17	20.74	20.63	20.67
		1	49	23.48	23.38	23.38	22.98	22.88	22.88	20.48	20.38	20.38
		25	0	22.65	22.53	22.59	22.15	22.03	22.09	19.65	19.53	19.59
		25	13	22.72	22.59	22.63	22.22	22.09	22.13	19.72	19.59	19.63
		25	25	22.64	22.57	22.58	22.14	22.07	22.08	19.64	19.57	19.58
		50	0	22.72	22.65	22.66	22.22	22.15	22.16	19.72	19.65	19.66
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18675/ 1857.5	18900/ 1880	19125/ 1902.5	18675/ 1857.5	18900/ 1880	19125/ 1902.5	18675/ 1857.5	18900/ 1880	19125/ 1902.5
15MHz	QPSK	1	0	24.22	24.27	24.14	23.72	23.77	23.64	21.22	21.27	21.14
		1	38	24.16	24.16	24.06	23.66	23.66	23.56	21.16	21.16	21.06
		1	74	24.19	24.28	23.79	23.69	23.78	23.29	21.19	21.28	20.79
		36	0	23.34	23.45	23.39	22.84	22.95	22.89	20.34	20.45	20.39
		36	18	23.36	23.51	23.40	22.86	23.01	22.90	20.36	20.51	20.40
		36	39	23.38	23.49	23.32	22.88	22.99	22.82	20.38	20.49	20.32
		75	0	23.36	23.51	23.40	22.86	23.01	22.90	20.36	20.51	20.40
	16QAM	1	0	23.56	23.53	23.59	23.06	23.03	23.09	20.56	20.53	20.59
		1	38	23.58	23.46	23.51	23.08	22.96	23.01	20.58	20.46	20.51



		1	74	23.60	23.53	23.54	23.10	23.03	23.04	20.60	20.53	20.54	
		36	0	22.55	22.48	22.49	22.05	21.98	21.99	19.55	19.48	19.49	
		36	18	22.62	22.50	22.55	22.12	22.00	22.05	19.62	19.50	19.55	
		36	39	22.66	22.57	22.59	22.16	22.07	22.09	19.66	19.57	19.59	
		75	0	22.52	22.43	22.45	22.02	21.93	21.95	19.52	19.43	19.45	
	64QAM	1	0	23.51	23.40	23.46	23.01	22.90	22.96	20.51	20.40	20.46	
		1	38	23.72	23.60	23.65	23.22	23.10	23.15	20.72	20.60	20.65	
		1	74	23.49	23.37	23.39	22.99	22.87	22.89	20.49	20.37	20.39	
		36	0	22.64	22.55	22.60	22.14	22.05	22.10	19.64	19.55	19.60	
		36	18	22.70	22.56	22.62	22.20	22.06	22.12	19.70	19.56	19.62	
		36	39	22.62	22.53	22.55	22.12	22.03	22.05	19.62	19.53	19.55	
			75	0	22.69	22.60	22.62	22.19	22.10	22.12	19.69	19.60	19.62
	BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
18700/ 1860					18900/ 1880	19100/ 1900	18700/ 1860	18900/ 1880	19100/ 1900	18700/ 1860	18900/ 1880	19100/ 1900	
20MHz	QPSK	1	0	24.19	24.23	24.11	23.69	23.73	23.61	21.19	21.23	21.11	
		1	50	24.15	24.12	24.04	23.65	23.62	23.54	21.15	21.12	21.04	
		1	99	24.17	24.27	23.76	23.67	23.77	23.26	21.17	21.27	20.76	
		50	0	23.31	23.40	23.35	22.81	22.9	22.85	20.31	20.4	20.35	
		50	25	23.34	23.47	23.37	22.84	22.97	22.87	20.34	20.47	20.37	
		50	50	23.35	23.44	23.28	22.85	22.94	22.78	20.35	20.44	20.28	
		100	0	23.33	23.46	23.36	22.83	22.96	22.86	20.33	20.46	20.36	
	16QAM	1	0	23.62	23.49	23.54	23.12	22.99	23.04	20.62	20.49	20.54	
		1	50	23.54	23.44	23.47	23.04	22.94	22.97	20.54	20.44	20.47	
		1	99	23.58	23.50	23.52	23.08	23	23.02	20.58	20.5	20.52	
		50	0	22.52	22.44	22.46	22.02	21.94	21.96	19.52	19.44	19.46	
		50	25	22.59	22.48	22.52	22.09	21.98	22.02	19.59	19.48	19.52	
		50	50	22.63	22.52	22.55	22.13	22.02	22.05	19.63	19.52	19.55	
		100	0	22.50	22.39	22.42	22	21.89	21.92	19.5	19.39	19.42	
	64QAM	1	0	23.49	23.36	23.41	22.99	22.86	22.91	20.49	20.36	20.41	
		1	50	23.68	23.58	23.61	23.18	23.08	23.11	20.68	20.58	20.61	
		1	99	23.43	23.31	23.33	22.93	22.81	22.83	20.43	20.31	20.33	
		50	0	22.59	22.47	22.53	22.09	21.97	22.03	19.59	19.47	19.53	
		50	25	22.66	22.52	22.56	22.16	22.02	22.06	19.66	19.52	19.56	
		50	50	22.59	22.48	22.51	22.09	21.98	22.01	19.59	19.48	19.51	
		100	0	22.67	22.56	22.59	22.17	22.06	22.09	19.67	19.56	19.59	

## 5.2.Occupied Bandwidth

### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

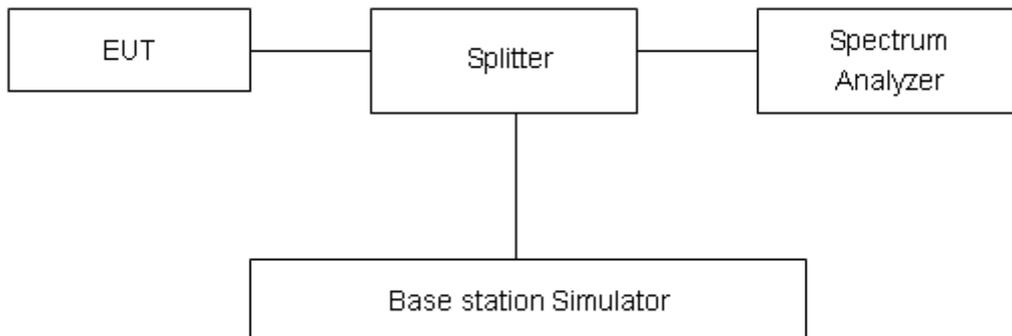
### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to 6.2kHz, VBW is set to 18kHz for GSM 1900,  
 RBW is set to 51 kHz, VBW is set to 160kHz for WCDMA Band II,  
 RBW is set to 30 kHz, VBW is set to 91kHz for LTE Band 2 (1.4MHz),  
 RBW is set to 62 kHz, VBW is set to 180 kHz for LTE Band 2 (3MHz),  
 RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 2 (5MHz),  
 RBW is set to 200 kHz, VBW is set to 620kHz for LTE Band 2 (10MHz),  
 RBW is set to 300kHz,VBW is set to 910kHz for LTE Band 2 (15MHz).  
 RBW is set to 430kHz,VBW is set to 1.2MHz for LTE Band 2 (20MHz).

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

### Test Setup



### Limits

No specific occupied bandwidth requirements in part 2.1049.

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 624\text{Hz}$ .



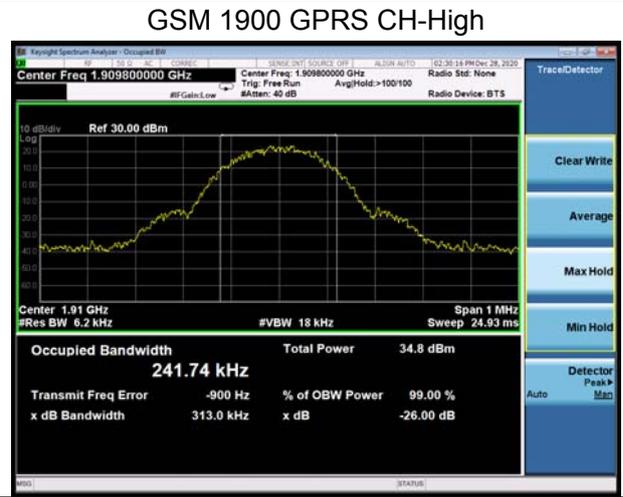
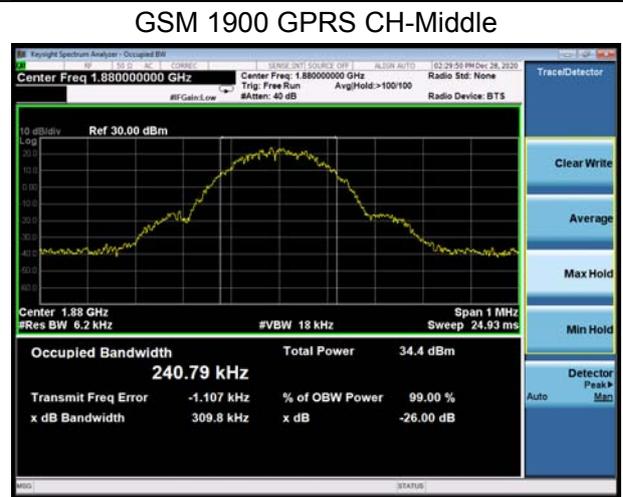
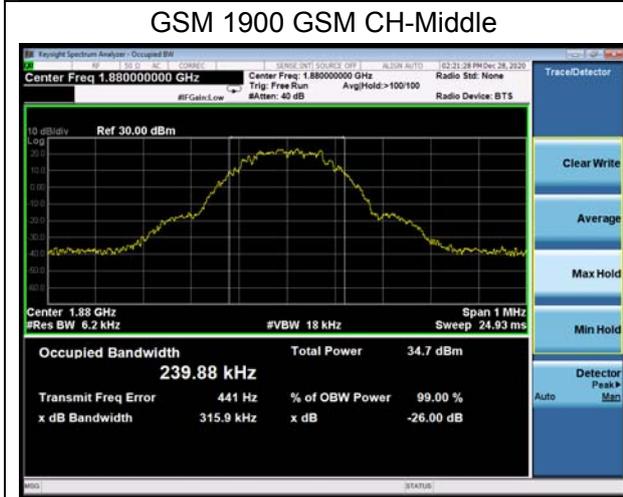
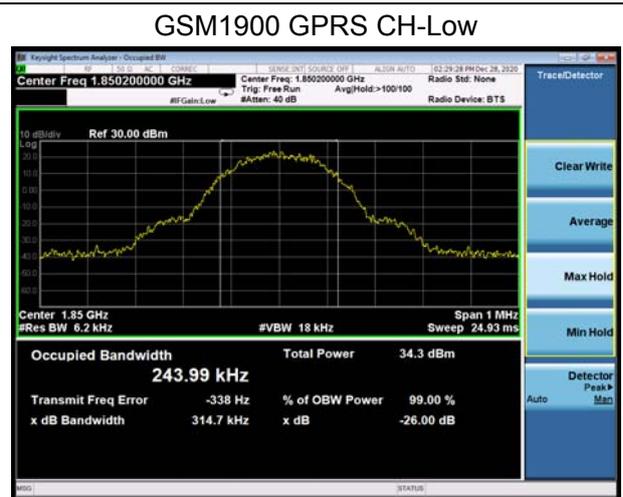
## Test Result

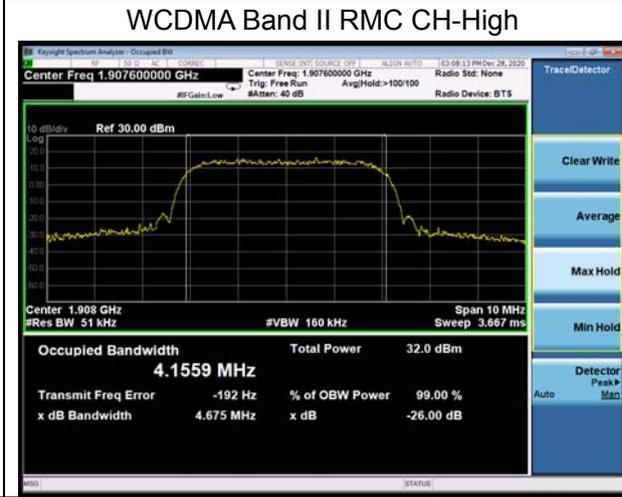
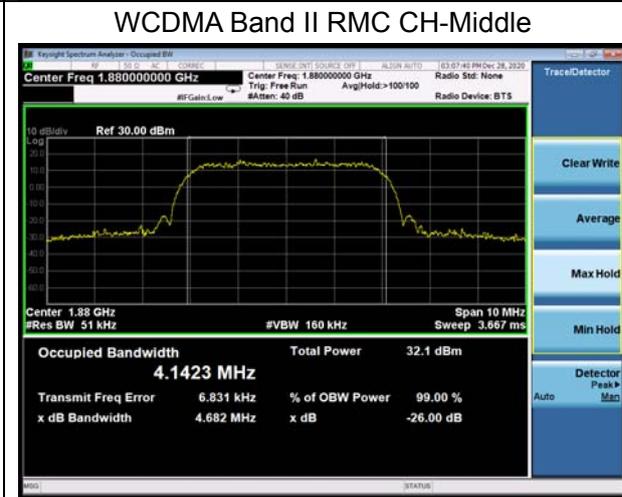
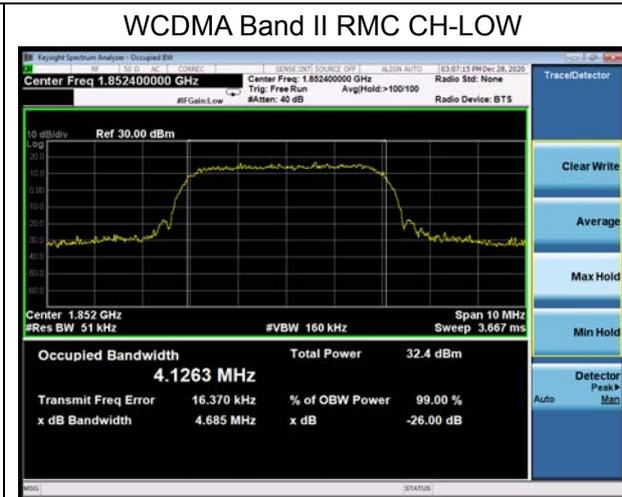
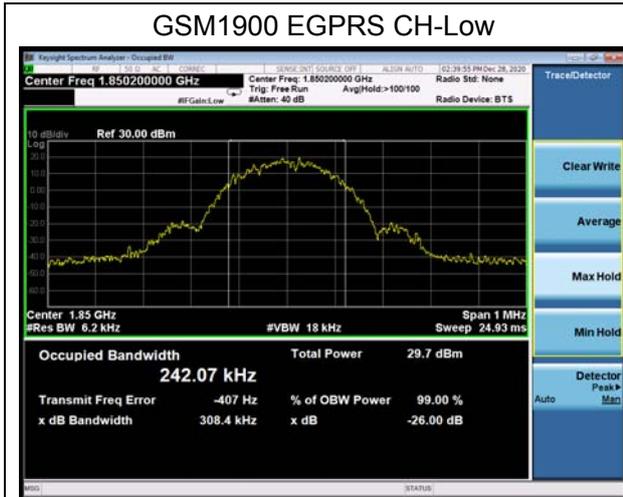
Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
GSM 1900 (GMSK)	512	1850.2	0.2450	0.315
	661	1880.0	0.2399	0.316
	810	1909.8	0.2435	0.314
GPRS 1900 (GMSK)	512	1850.2	0.2440	0.315
	661	1880.0	0.2408	0.310
	810	1909.8	0.2417	0.313
EGPRS 1900 (8PSK)	512	1850.2	0.2421	0.308
	661	1880.0	0.2457	0.315
	810	1909.8	0.2440	0.309
WCDMA Band II (RMC)	9262	1852.4	4.1263	4.685
	9400	1880	4.1423	4.682
	9538	1907.6	4.1559	4.675

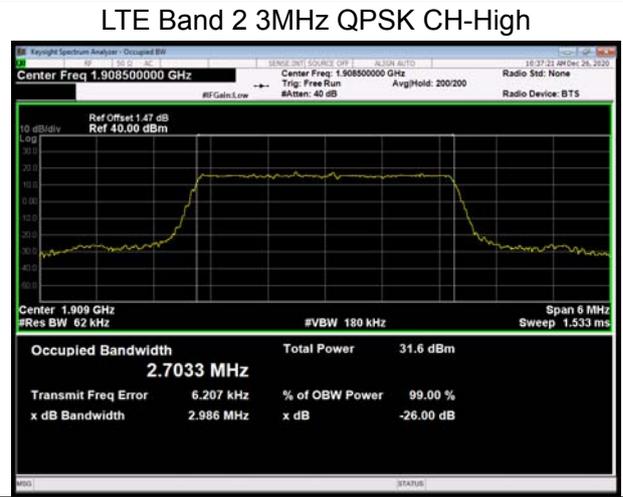
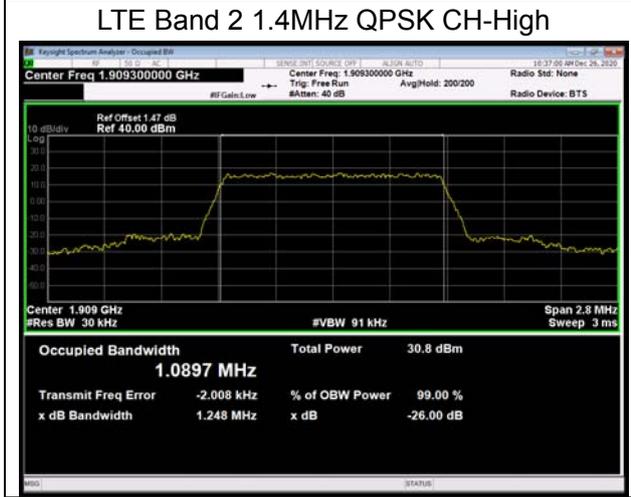
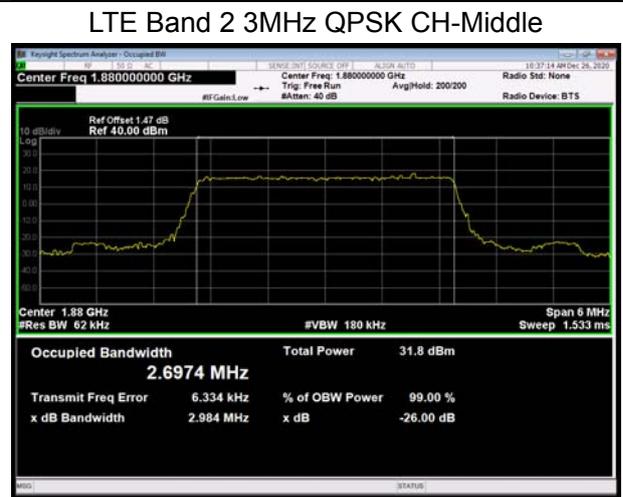
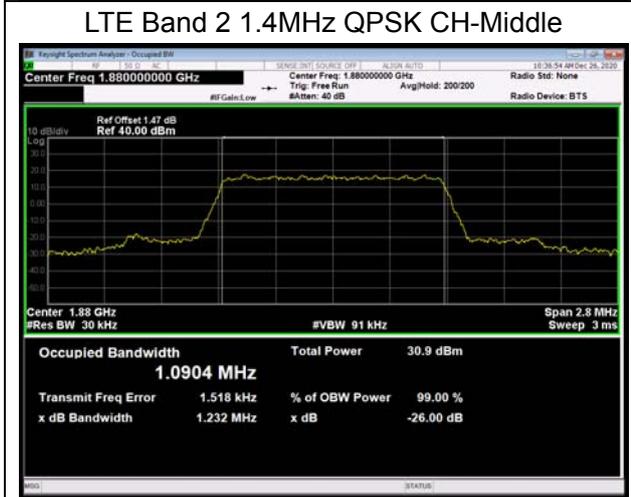
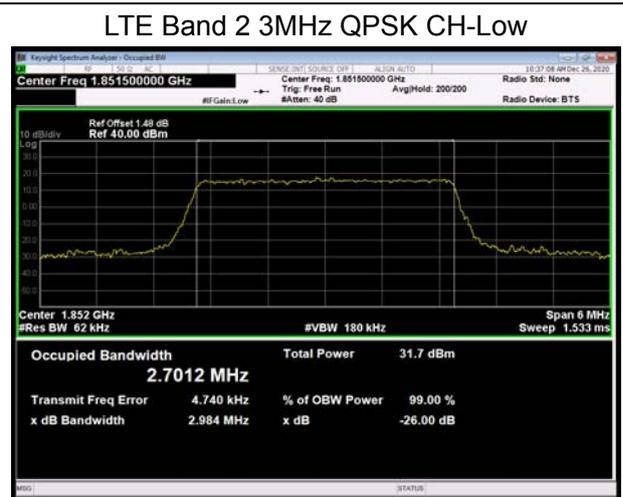
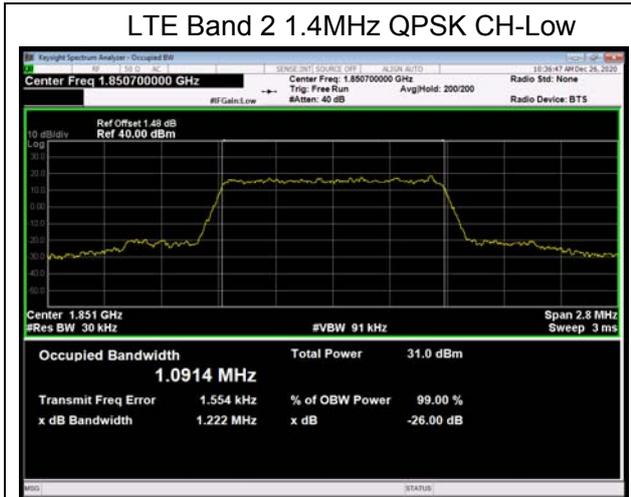
LTE Band 2					
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
QPSK	1.4	18607	1850.7	1.0914	1.222
		18900	1880.0	1.0904	1.232
		19193	1909.3	1.0897	1.248
	3	18615	1851.5	2.7012	2.984
		18900	1880	2.6974	2.984
		19185	1908.5	2.7033	2.986
	5	18625	1852.5	4.5232	4.945
		18900	1880	4.5146	4.962
		19175	1907.5	4.5145	4.919
	10	18650	1855	8.9668	9.695
		18900	1880	8.9593	9.729
		19150	1905	8.9605	9.741
	15	18675	1857.5	13.4560	14.460
		18900	1880	13.4610	14.640
		19125	1902.5	13.4610	14.550
20	18700	1860	17.9090	19.200	
	18900	1880	17.9690	19.340	
	19100	1900	17.9560	19.290	
16QAM	1.4	18607	1850.7	1.0906	1.242

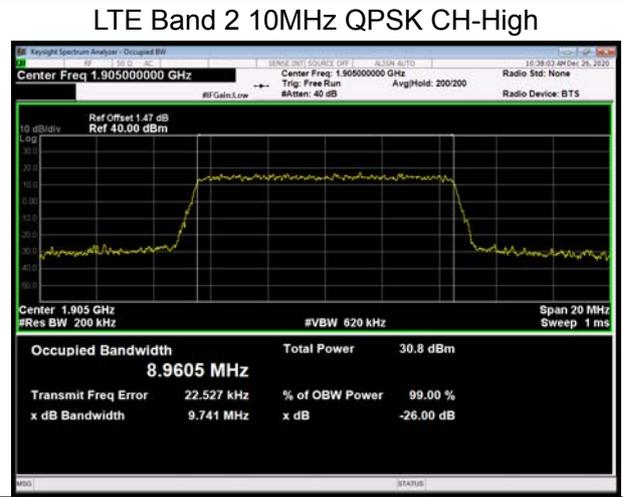
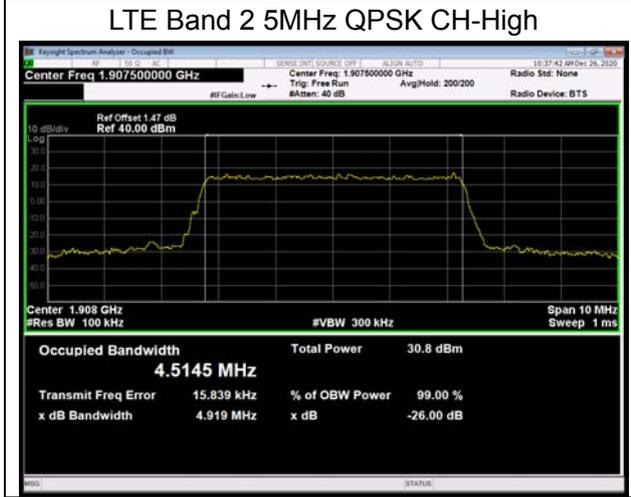
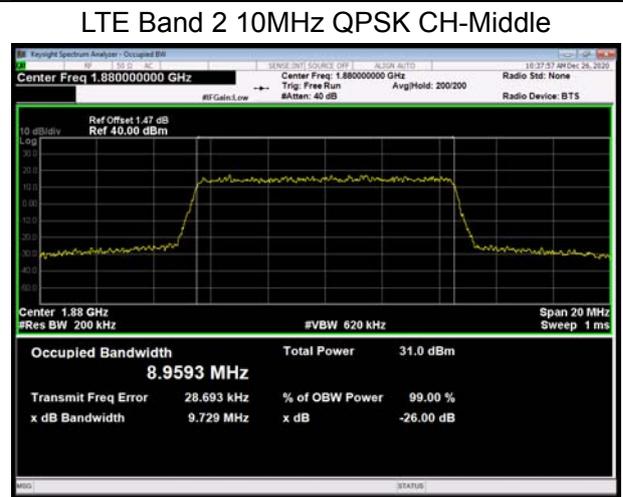
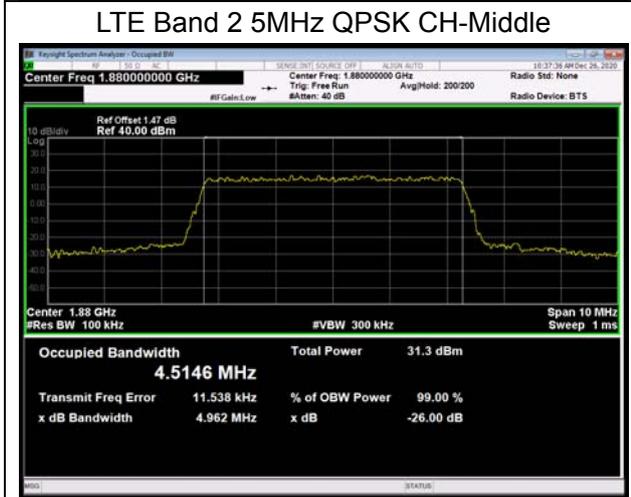
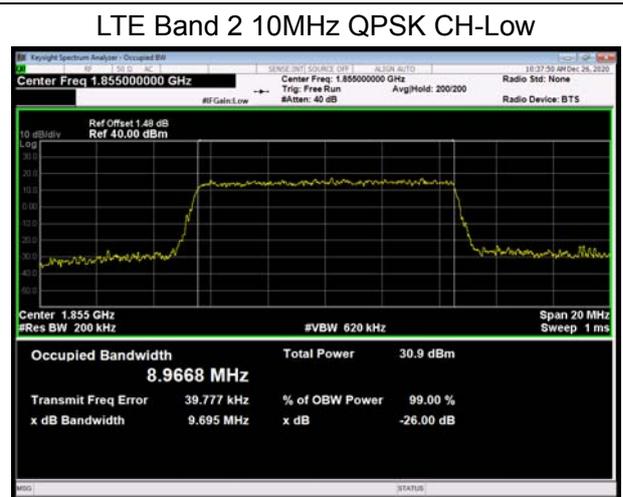
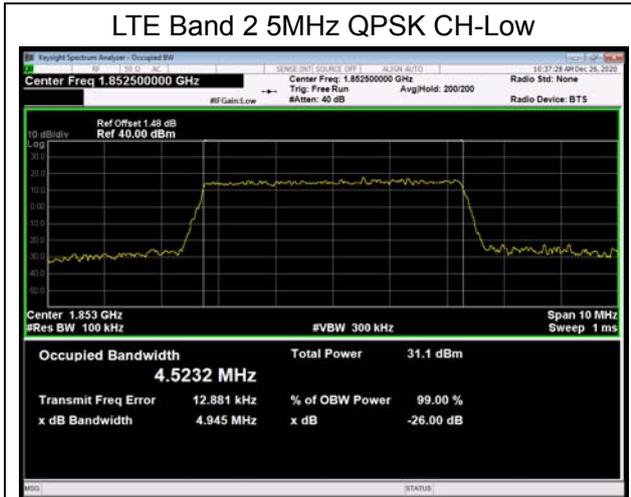


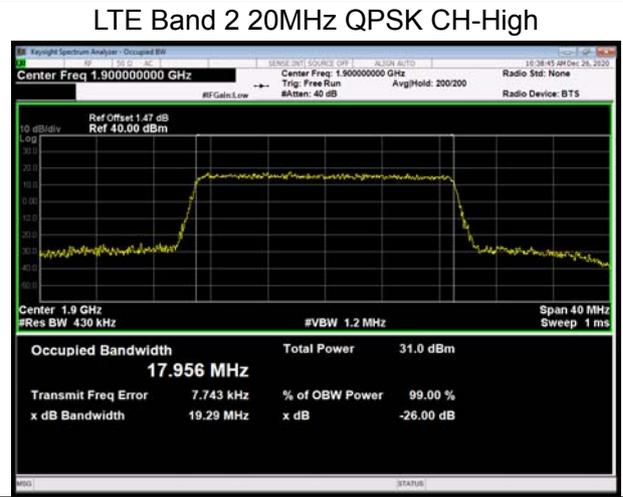
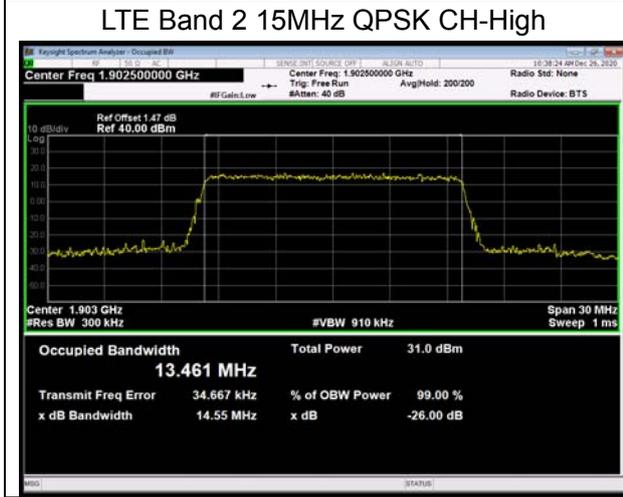
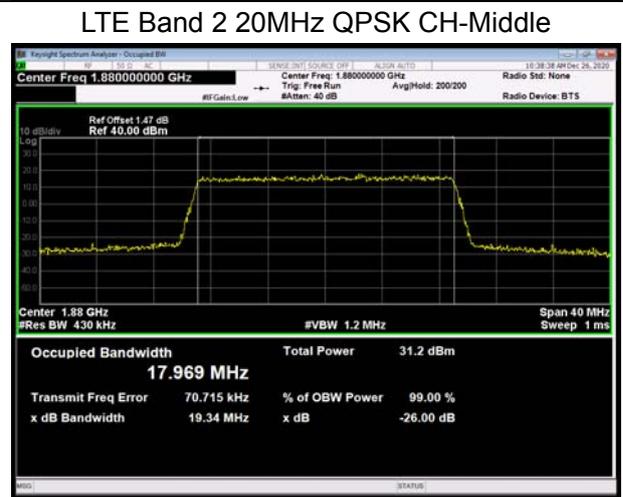
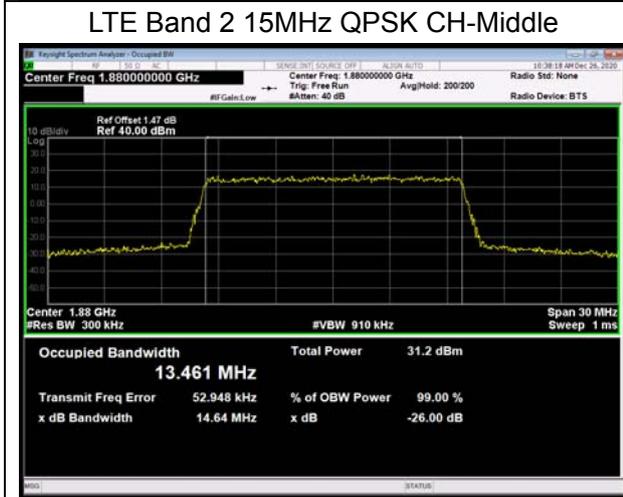
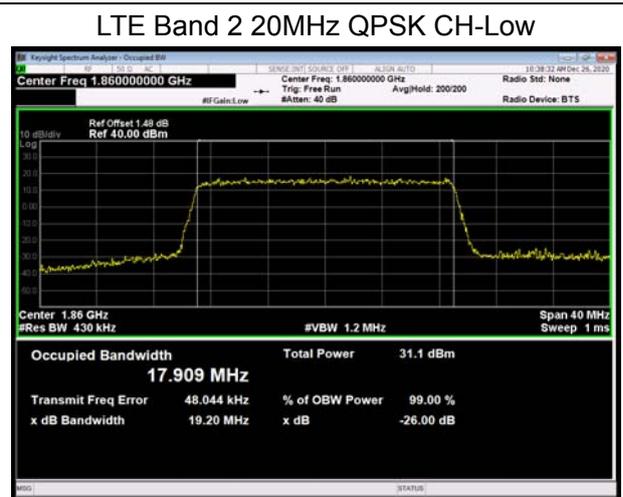
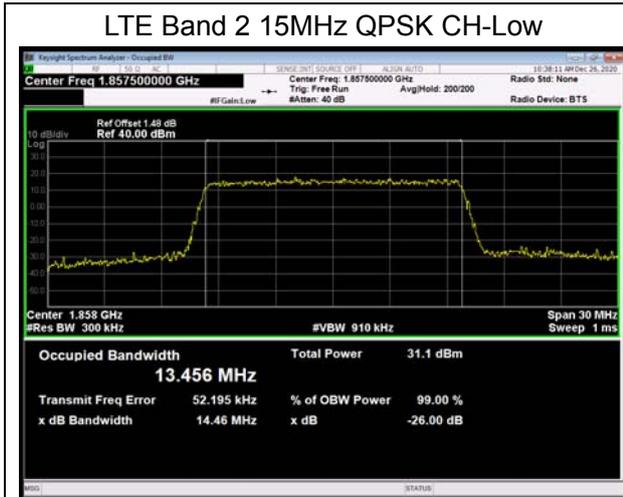
		18900	1880.0	1.0926	1.238
		19193	1909.3	1.0954	1.231
		18615	1851.5	2.7129	2.988
	3	18900	1880	2.7001	2.979
		19185	1908.5	2.7001	3.004
		18625	1852.5	4.4998	4.933
	5	18900	1880	4.5011	4.914
		19175	1907.5	4.5419	4.962
		18650	1855	8.9702	9.710
	10	18900	1880	8.9931	9.670
		19150	1905	8.9892	9.711
		18675	1857.5	13.4740	14.490
	15	18900	1880	13.4510	14.590
		19125	1902.5	13.4780	14.450
		18700	1860	17.9410	19.380
	20	18900	1880	17.9560	19.450
		19100	1900	17.9340	19.270
		18607	1850.7	1.0965	1.240
64QAM	1.4	18900	1880.0	1.0945	1.235
		19193	1909.3	1.0948	1.231
		18615	1851.5	2.7054	2.979
	3	18900	1880	2.7048	3.025
		19185	1908.5	2.7041	2.999
		18625	1852.5	4.5155	4.981
	5	18900	1880	4.5063	4.976
		19175	1907.5	4.5227	4.954
		18650	1855	8.9580	9.742
	10	18900	1880	8.9786	9.651
		19150	1905	8.9777	9.755
		18675	1857.5	13.4210	14.660
	15	18900	1880	13.4680	14.630
		19125	1902.5	13.4770	14.540
		18700	1860	17.8600	19.390
	20	18900	1880	17.9330	19.400
		19100	1900	17.9210	19.400





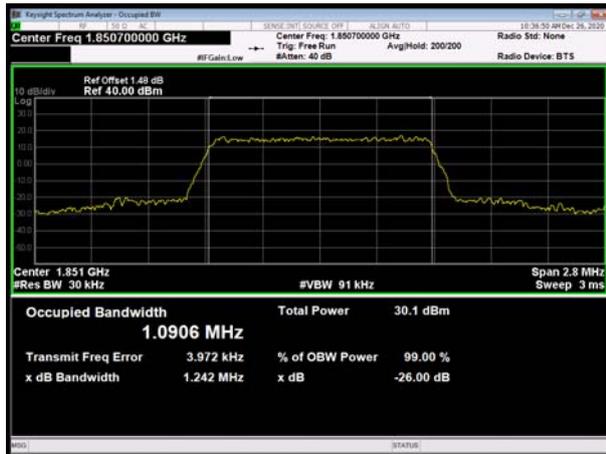




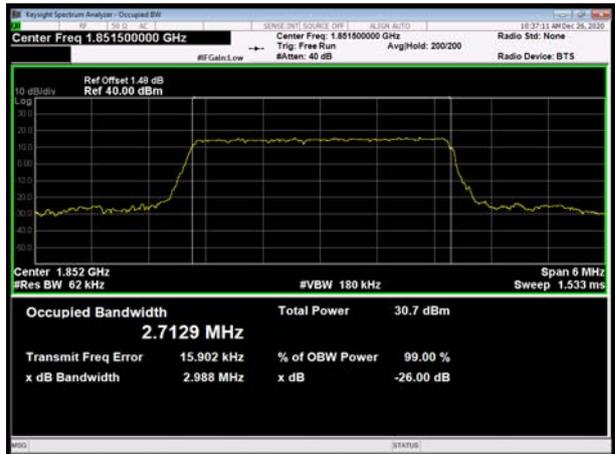




LTE Band 2 1.4MHz 16QAM CH-Low



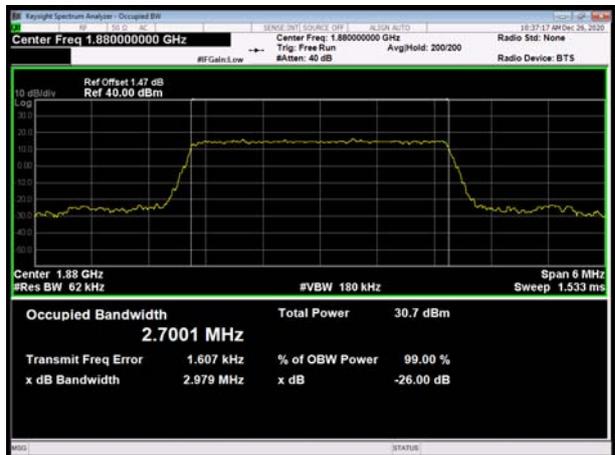
LTE Band 2 3MHz 16QAM CH-Low



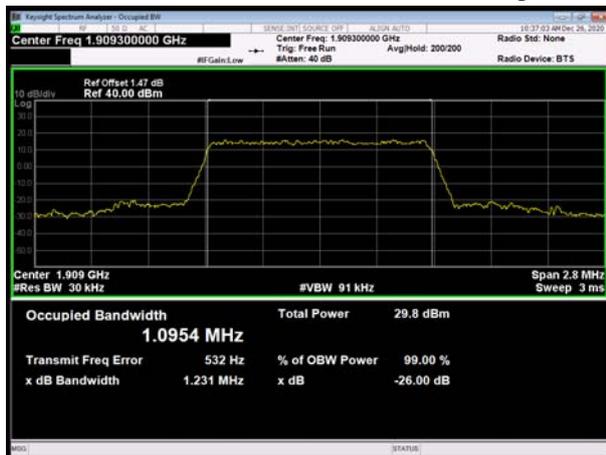
LTE Band 2 1.4MHz 16QAM CH-Middle



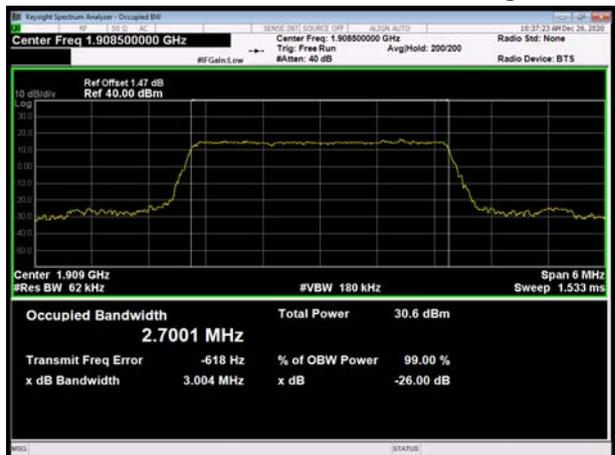
LTE Band 2 3MHz 16QAM CH-Middle

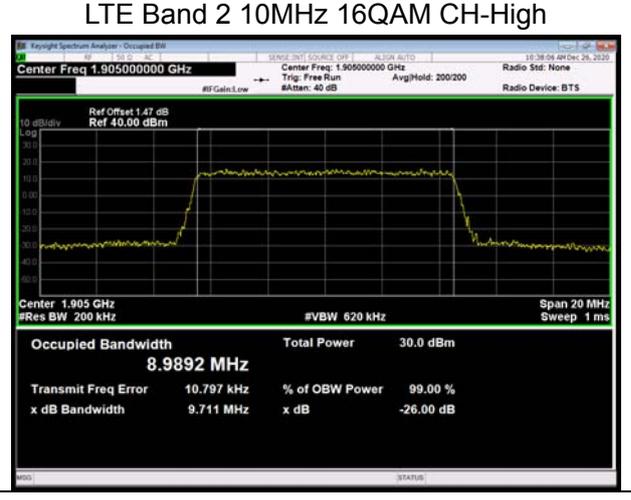
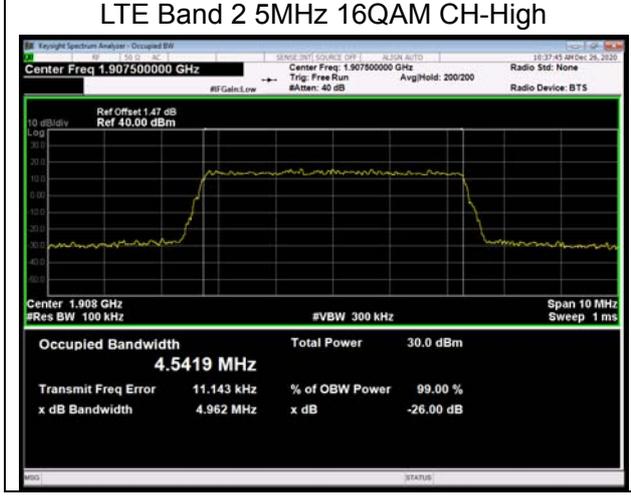
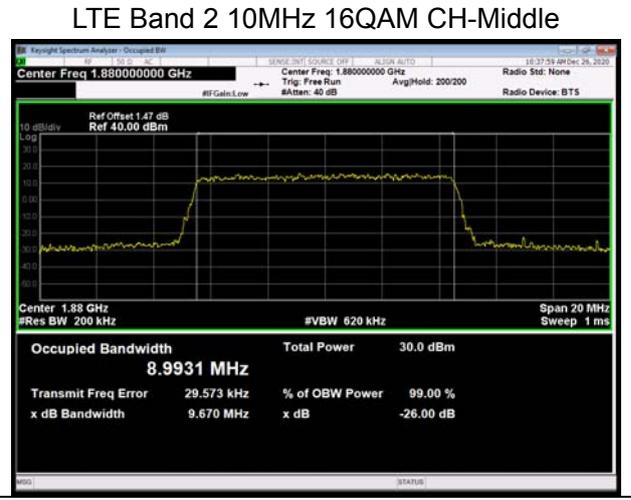
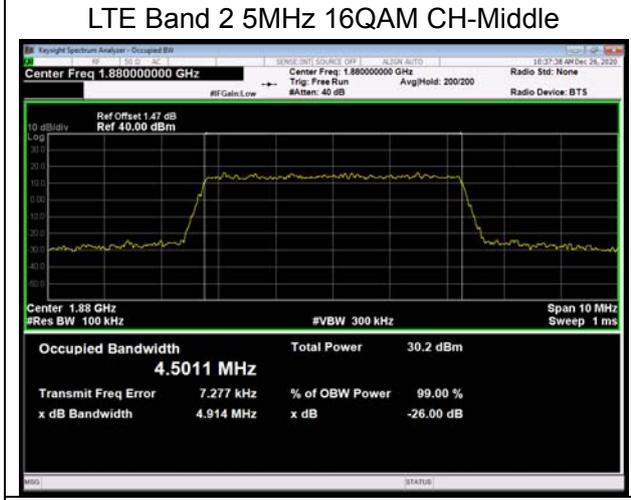
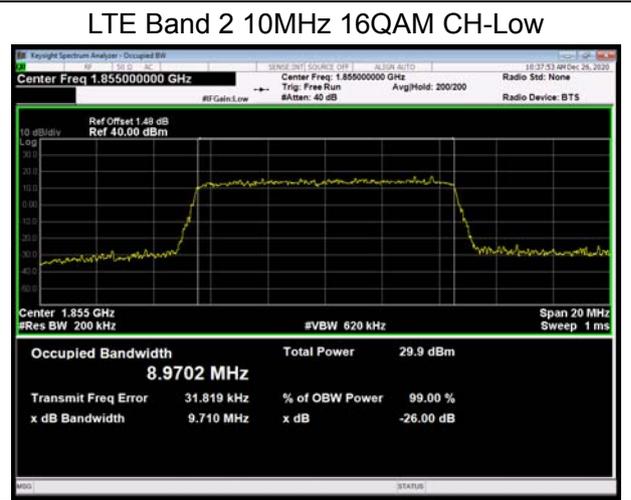
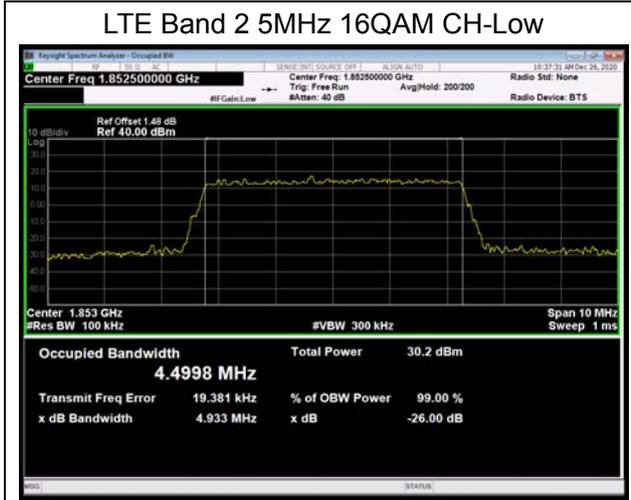


LTE Band 2 1.4MHz 16QAM CH-High



LTE Band 2 3MHz 16QAM CH-High

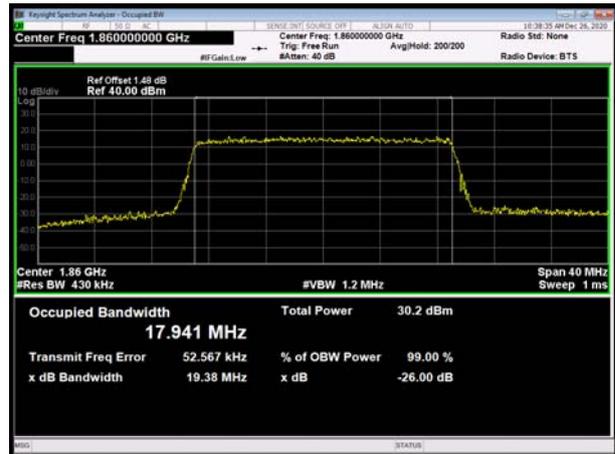




LTE Band 2 15MHz 16QAM CH-Low



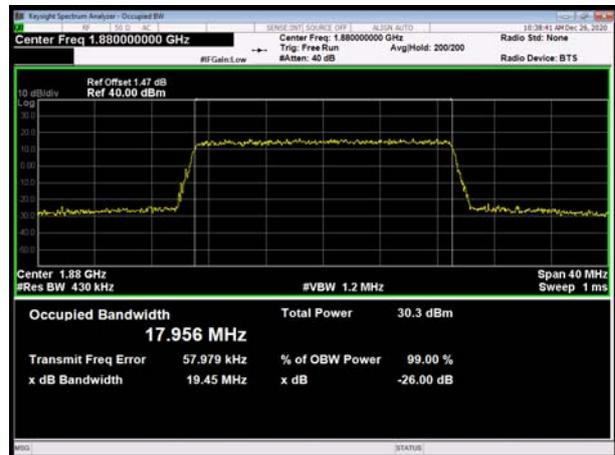
LTE Band 2 20MHz 16QAM CH-Low



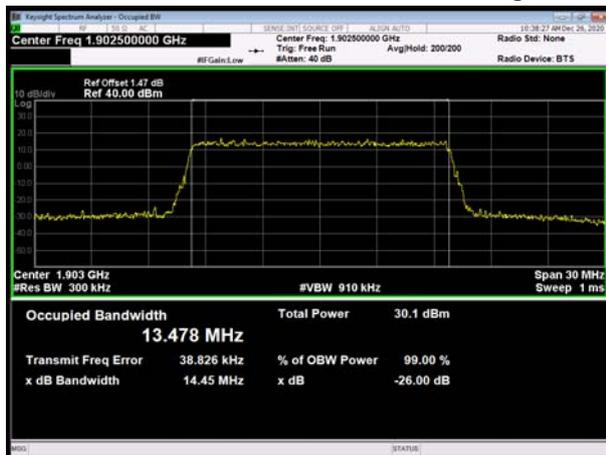
LTE Band 2 15MHz 16QAM CH-Middle



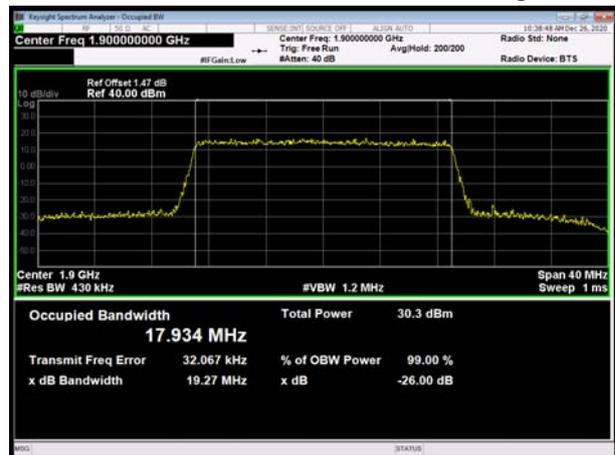
LTE Band 2 20MHz 16QAM CH-Middle



LTE Band 2 15MHz 16QAM CH-High



LTE Band 2 20MHz 16QAM CH-High

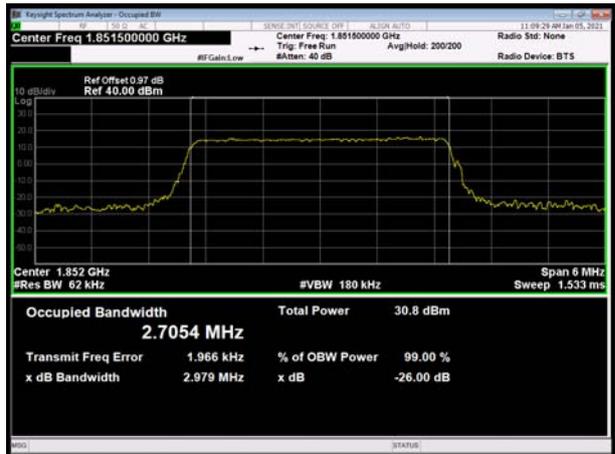




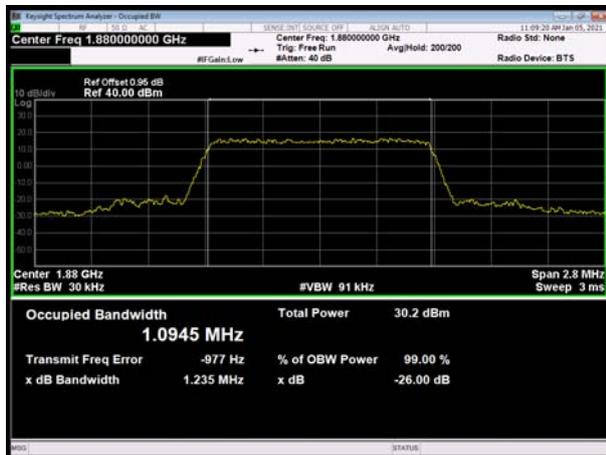
LTE Band 2 1.4MHz 64QAM CH-Low



LTE Band 2 3MHz 64QAM CH-Low



LTE Band 2 1.4MHz 64QAM CH-Middle



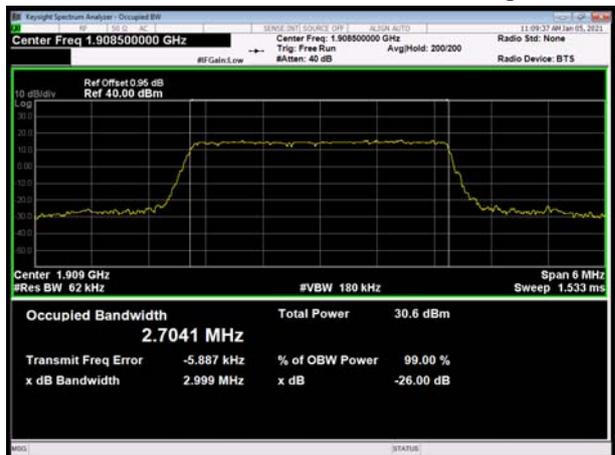
LTE Band 2 3MHz 64QAM CH-Middle

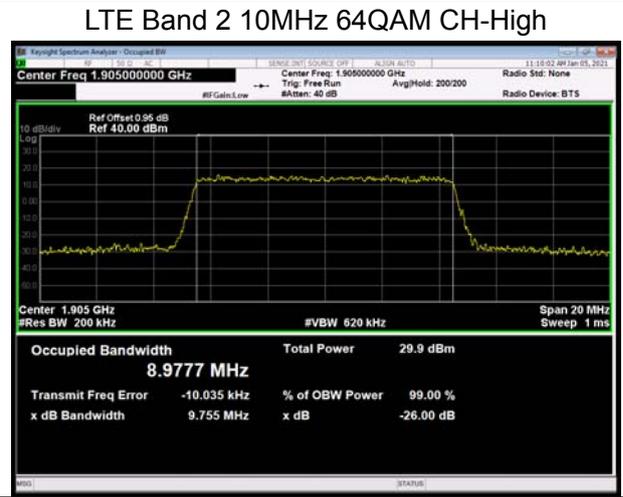
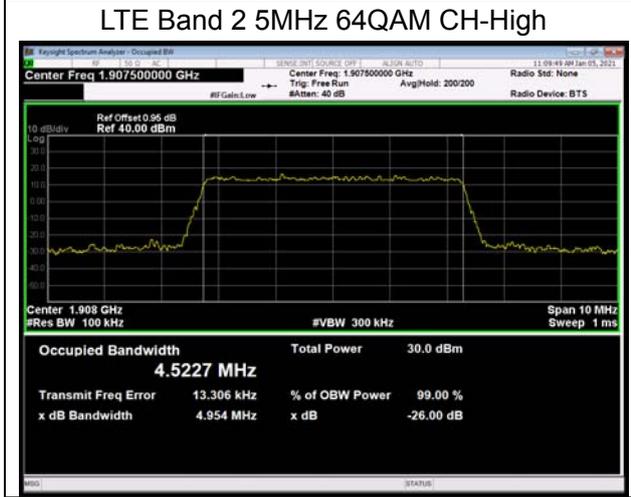
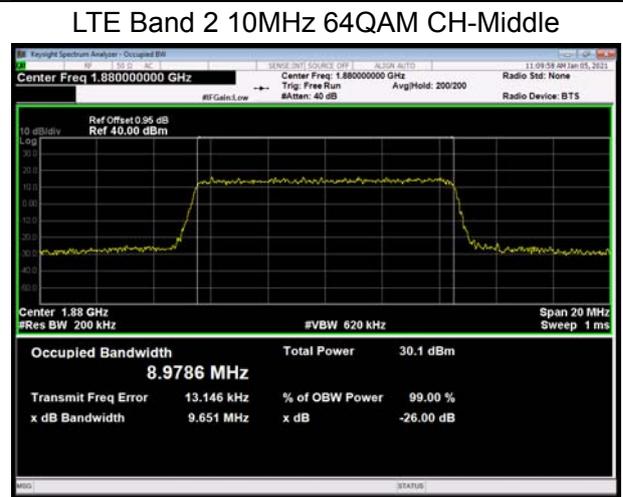
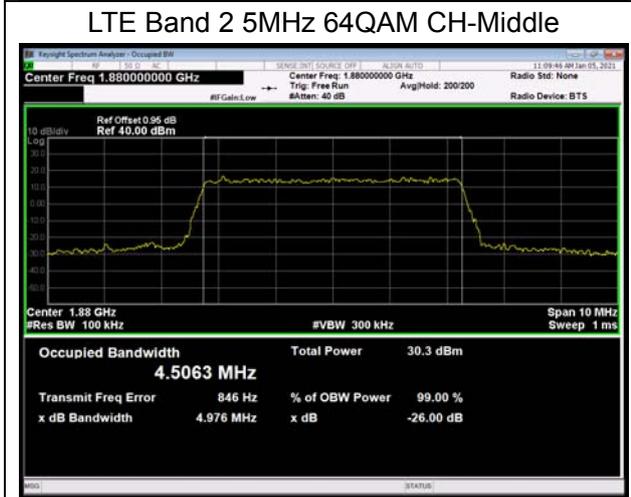
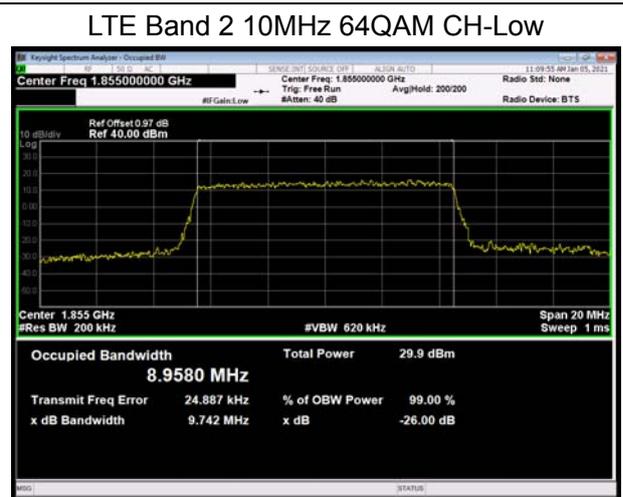
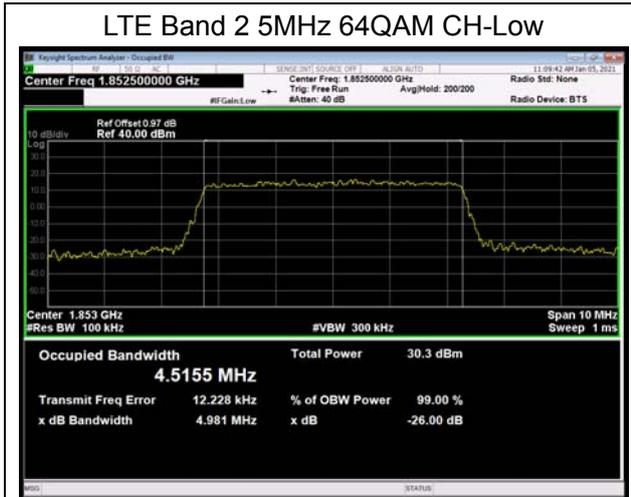


LTE Band 2 1.4MHz 64QAM CH-High



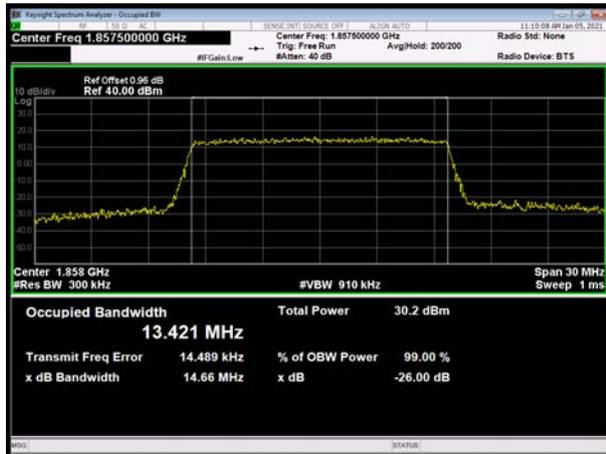
LTE Band 2 3MHz 64QAM CH-High



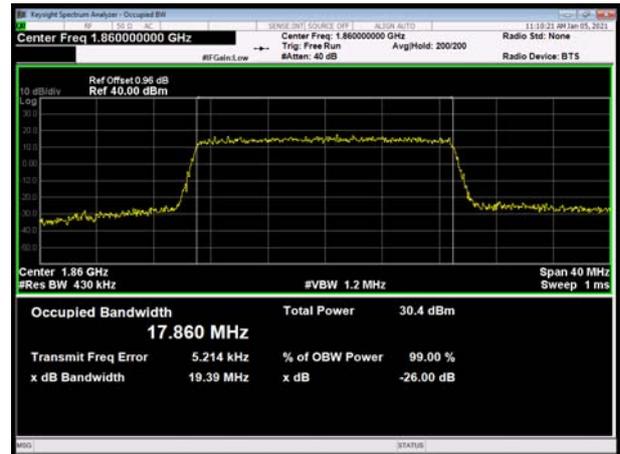




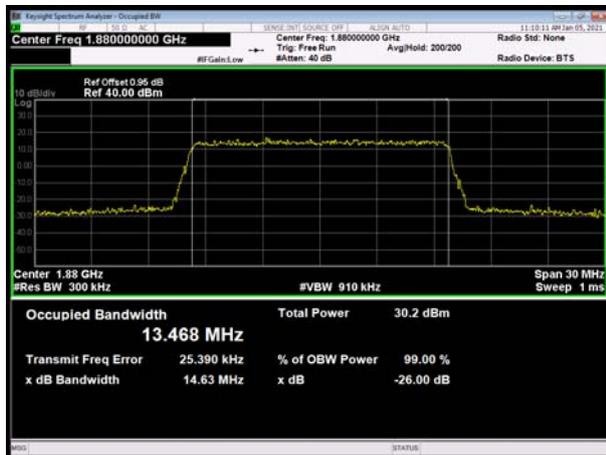
LTE Band 2 15MHz 64QAM CH-Low



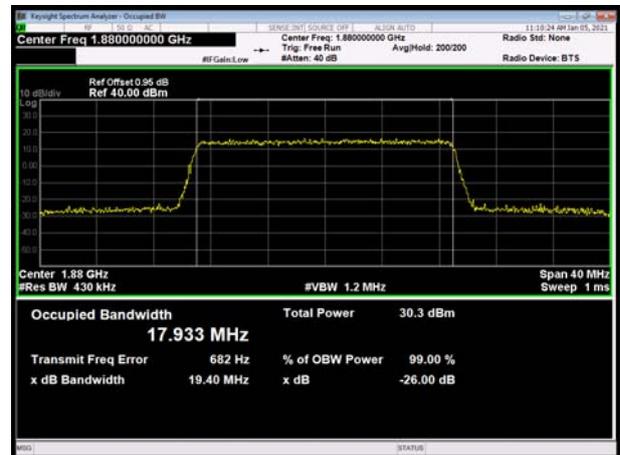
LTE Band 2 20MHz 64QAM CH-Low



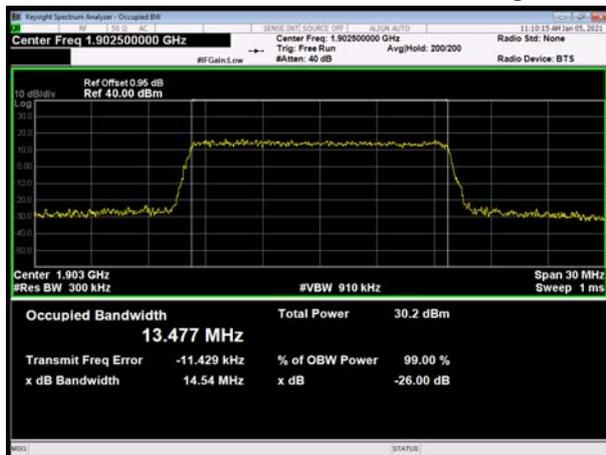
LTE Band 2 15MHz 64QAM CH-Middle



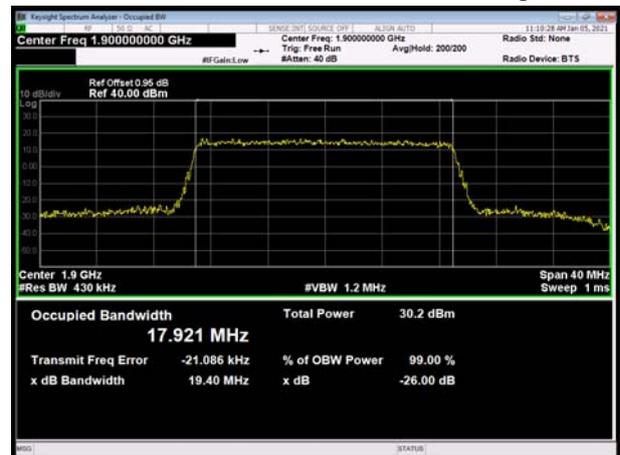
LTE Band 2 20MHz 64QAM CH-Middle



LTE Band 2 15MHz 64QAM CH-High



LTE Band 2 20MHz 64QAM CH-High



### 5.3. Band Edge Compliance

#### Ambient condition

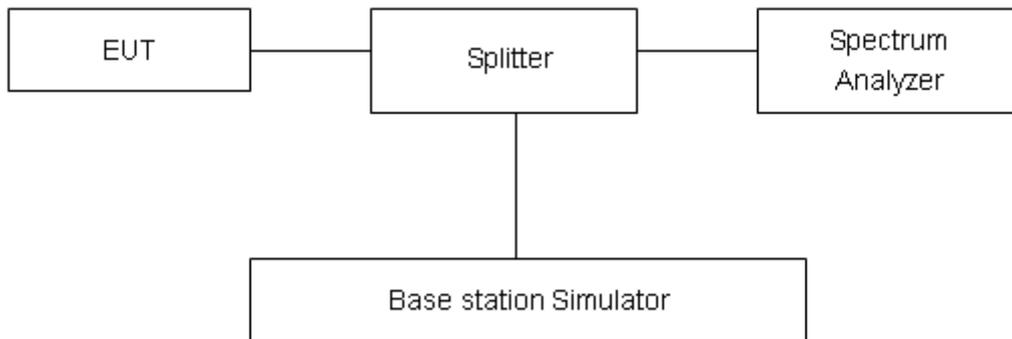
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The Average detector is used and RBW is set to 6.2kHz, VBW is set to 18kHz for GSM 1900, RBW is set to 51kHz, VBW is set to 160kHz for WCDMA Band II, RBW is set to 15kHz, VBW is set to 43kHz for LTE Band 2 (1.4MHz), RBW is set to 30kHz, VBW is set to 91kHz for LTE Band 2 (3MHz), RBW is set to 51kHz, VBW is set to 150kHz for LTE Band 2 (5MHz), RBW is set to 100kHz, VBW is set to 300kHz for LTE Band 2 (10MHz), RBW is set to 150kHz, VBW is set to 470kHz for LTE Band 2 (15MHz), RBW is set to 200kHz, VBW is set to 620kHz for LTE Band 2 (20MHz).

Spectrum analyzer plots are included on the following pages.

#### Test Setup



#### Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log<sub>10</sub> (P) dB.”

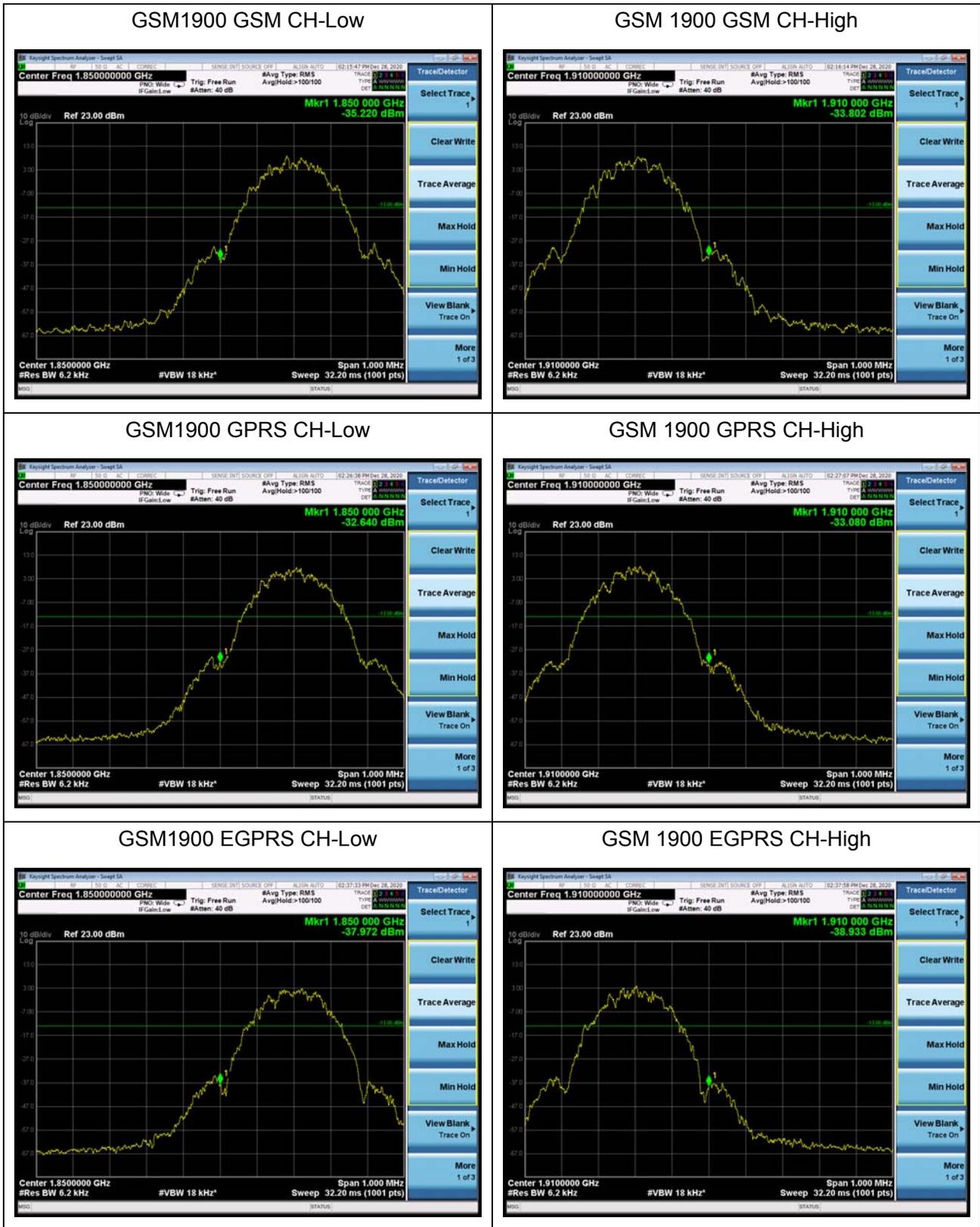
Limit	-13 dBm
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#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U=0.684$ dB.



Test Result:



WCDMA Band II RMC CH-Low



WCDMA Band II RMC CH-High



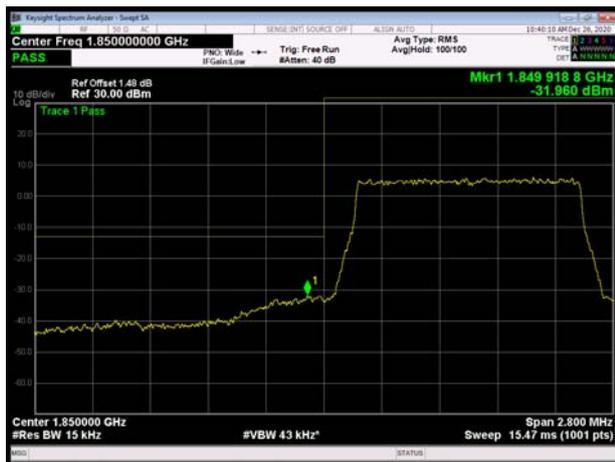
LTE Band 2 1.4MHz QPSK 1RB CH-Low



LTE Band 2 1.4MHz QPSK 1RB CH-High



LTE Band 2 1.4MHz QPSK 100%RB CH-Low

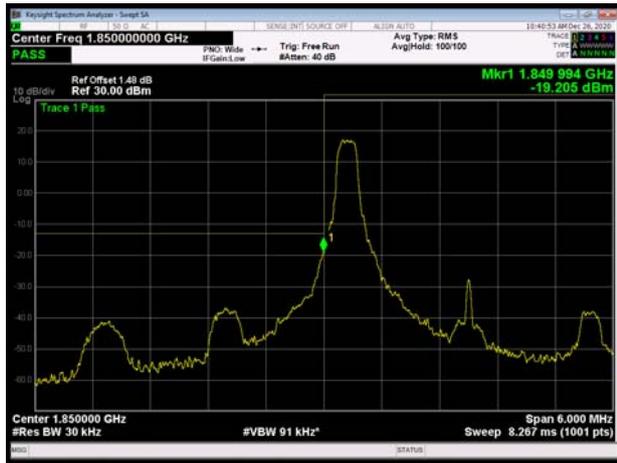


LTE Band 2 1.4MHz QPSK 100%RB CH-High

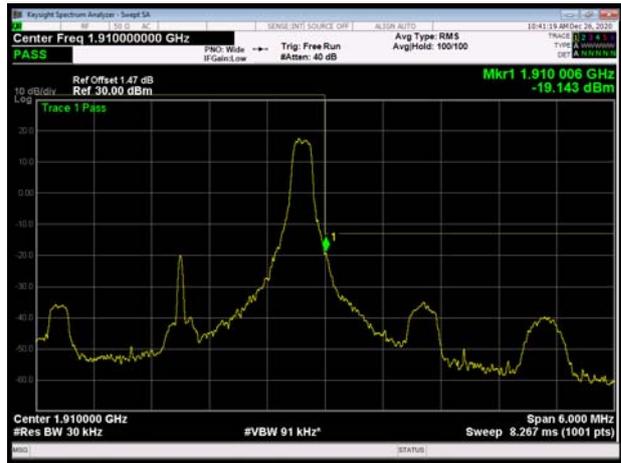




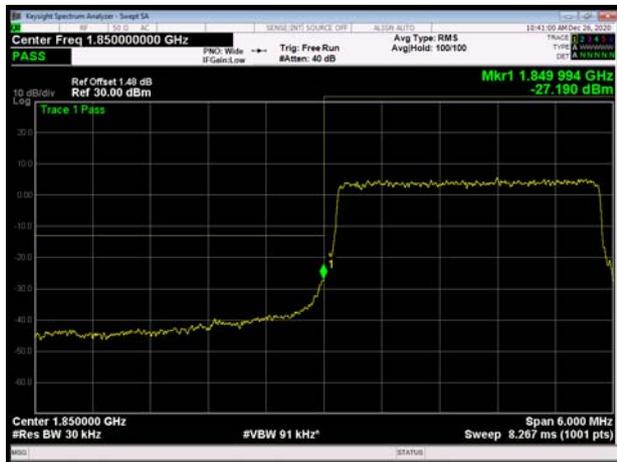
LTE Band 2 3MHz QPSK 1RB CH-Low



LTE Band 2 3MHz QPSK 1RB CH-High



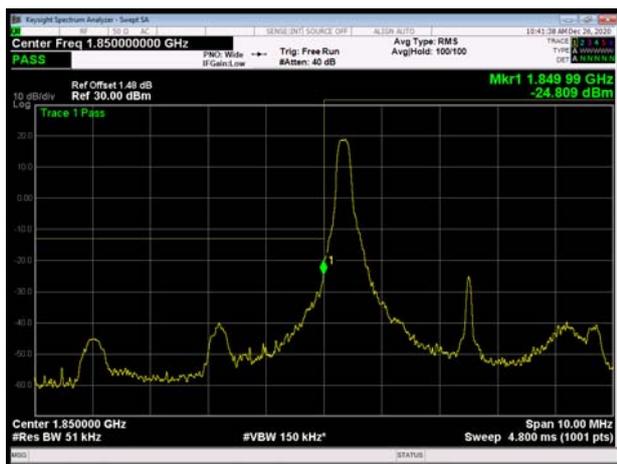
LTE Band 2 3MHz QPSK 100%RB CH-Low



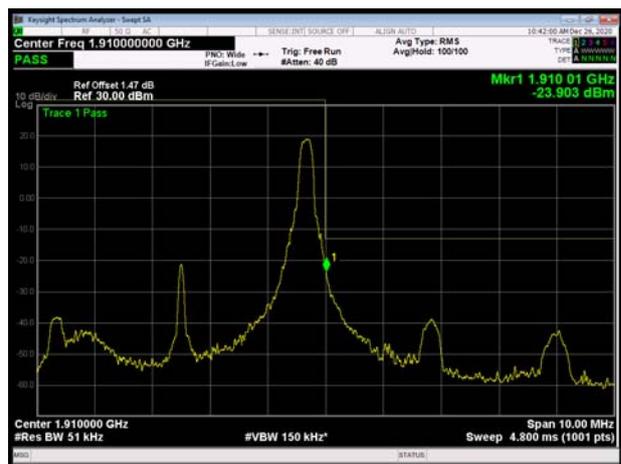
LTE Band 2 3MHz QPSK 100%RB CH-High



LTE Band 2 5MHz QPSK 1RB CH-Low



LTE Band 2 5MHz QPSK 1RB CH-High

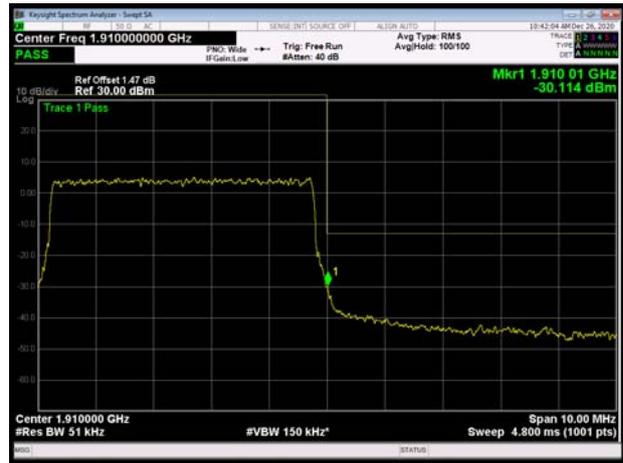




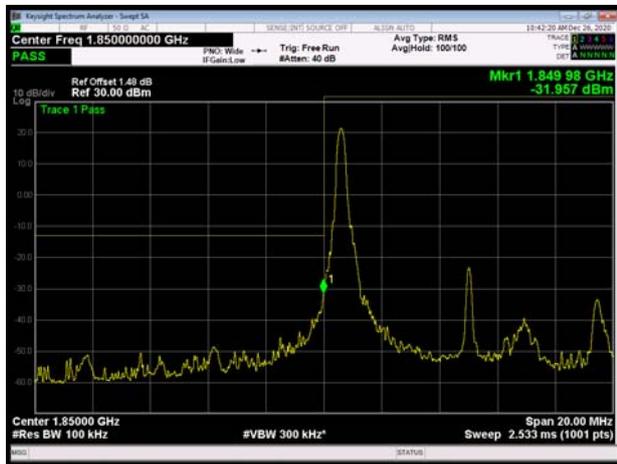
LTE Band 2 5MHz QPSK 100%RB CH-Low



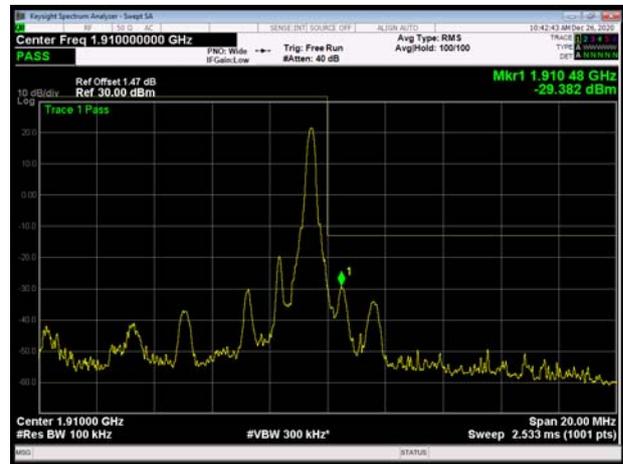
LTE Band 2 5MHz QPSK 100%RB CH-High



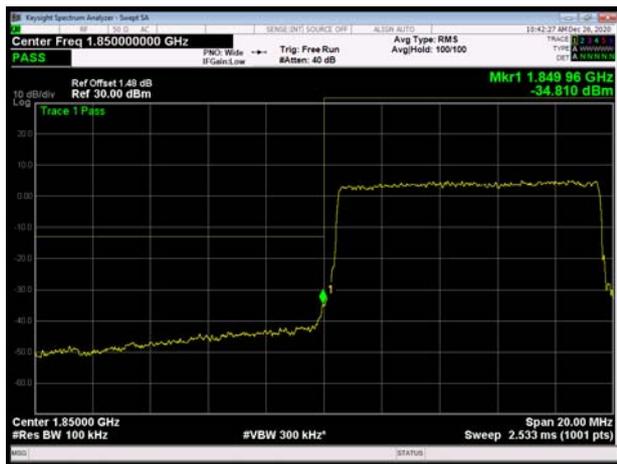
LTE Band 2 10MHz QPSK 1RB CH-Low



LTE Band 2 10MHz QPSK 1RB CH-High



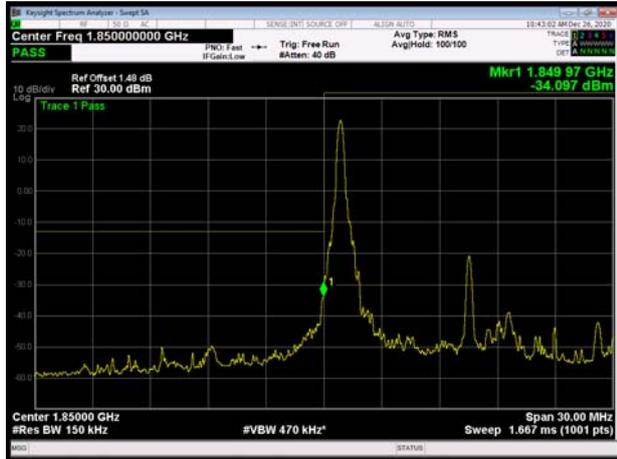
LTE Band 2 10MHz QPSK 100%RB CH-Low



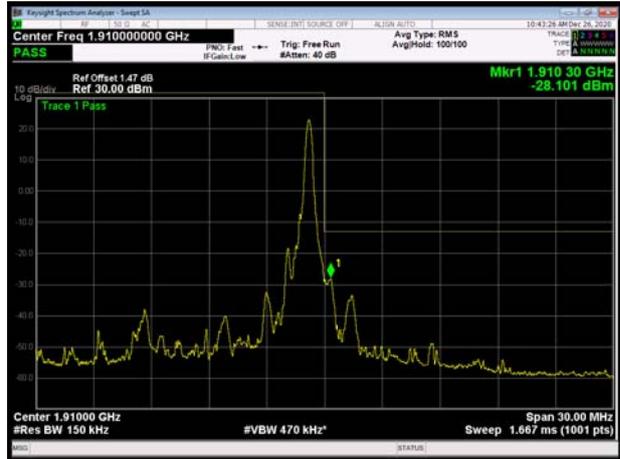
LTE Band 2 10MHz QPSK 100%RB CH-High



LTE Band 2 15MHz QPSK 1RB CH-Low



LTE Band 2 15MHz QPSK 1RB CH-High



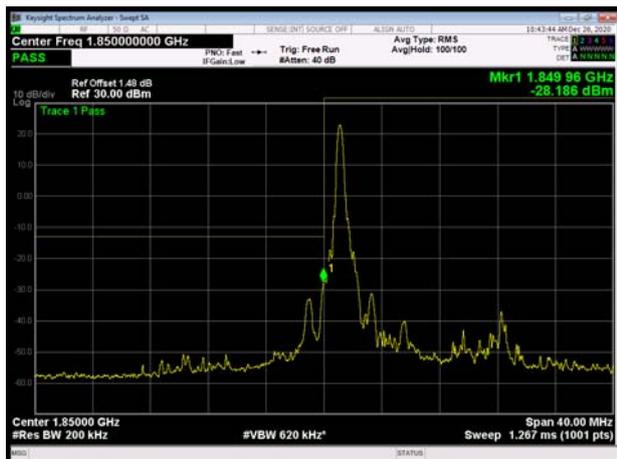
LTE Band 2 15MHz QPSK 100%RB CH-Low



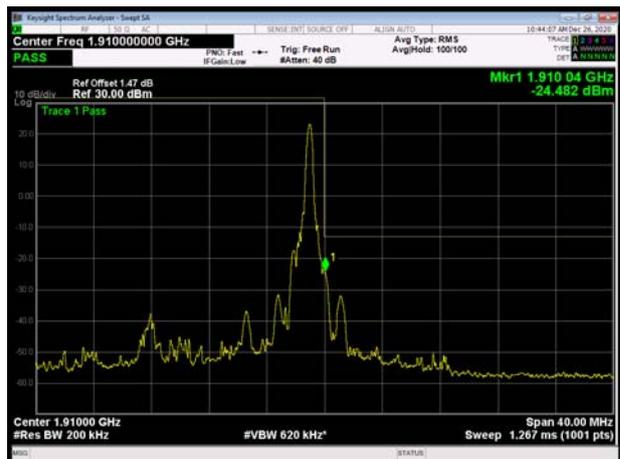
LTE Band 2 15MHz QPSK 100%RB CH-High



LTE Band 2 20MHz QPSK 1RB CH-Low

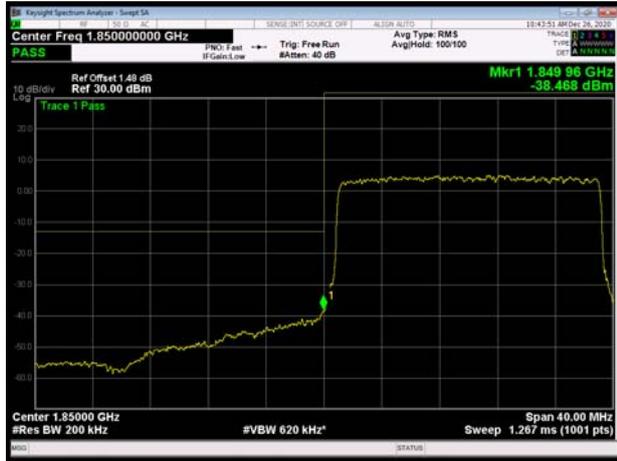


LTE Band 2 20MHz QPSK 1RB CH-High





LTE Band 2 20MHz QPSK 100%RB CH-Low



LTE Band 2 20MHz QPSK 100%RB CH-High



LTE Band 2 1.4MHz 16QAM 1RB CH-Low



LTE Band 2 1.4MHz 16QAM 1RB CH-High



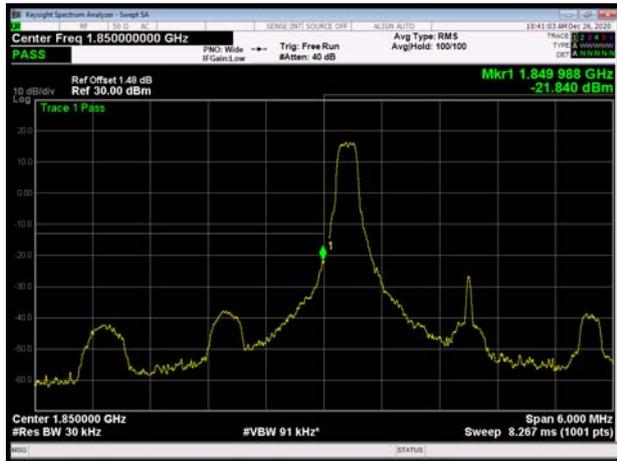
LTE Band 2 1.4MHz 16QAM 100%RB CH-Low



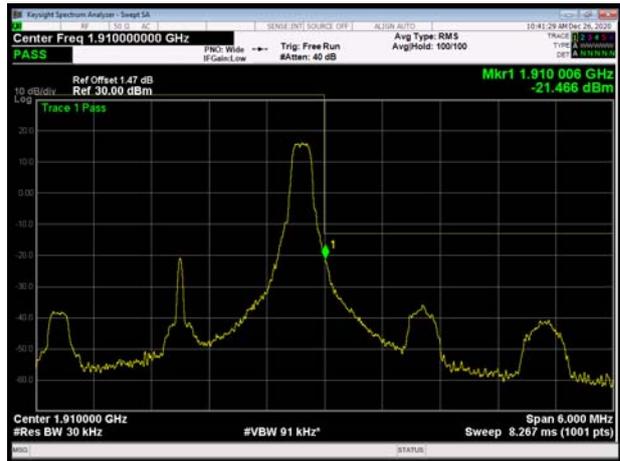
LTE Band 2 1.4MHz 16QAM 100%RB CH-High



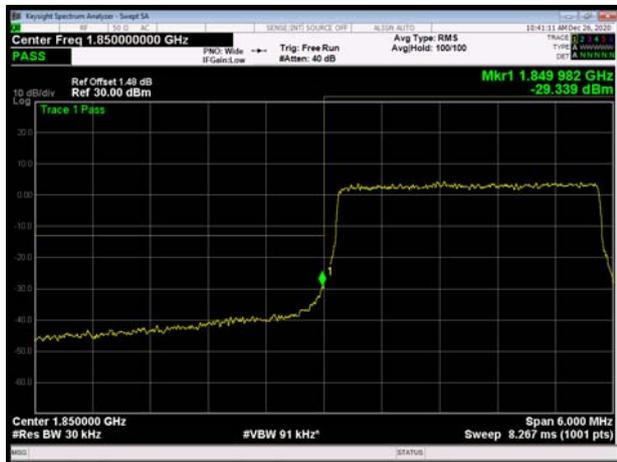
LTE Band 2 3MHz 16QAM 1RB CH-Low



LTE Band 2 3MHz 16QAM 1RB CH-High



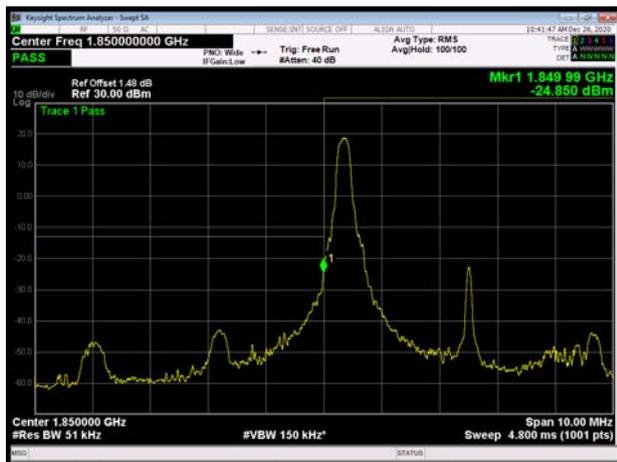
LTE Band 2 3MHz 16QAM 100%RB CH-Low



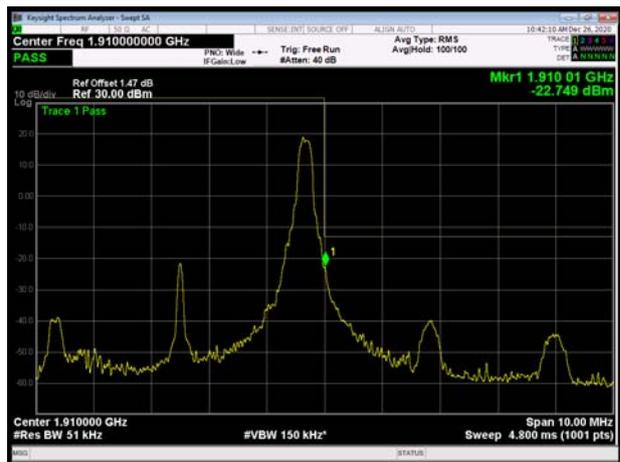
LTE Band 2 3MHz 16QAM 100%RB CH-High



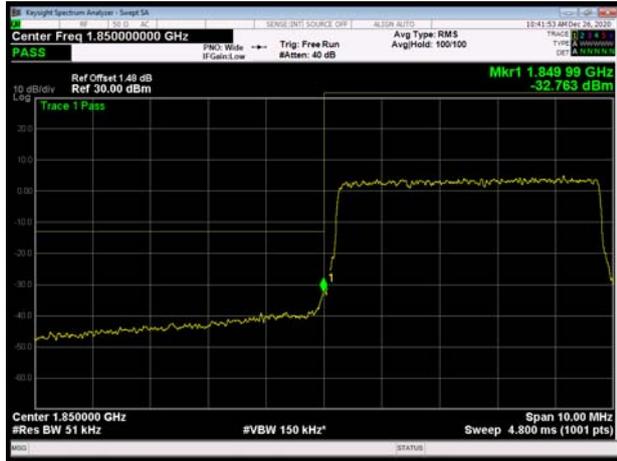
LTE Band 2 5MHz 16QAM 1RB CH-Low



LTE Band 2 5MHz 16QAM 1RB CH-High



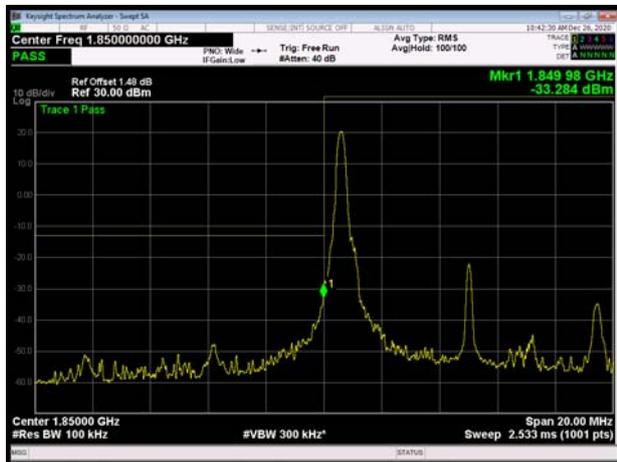
LTE Band 2 5MHz 16QAM 100%RB CH-Low



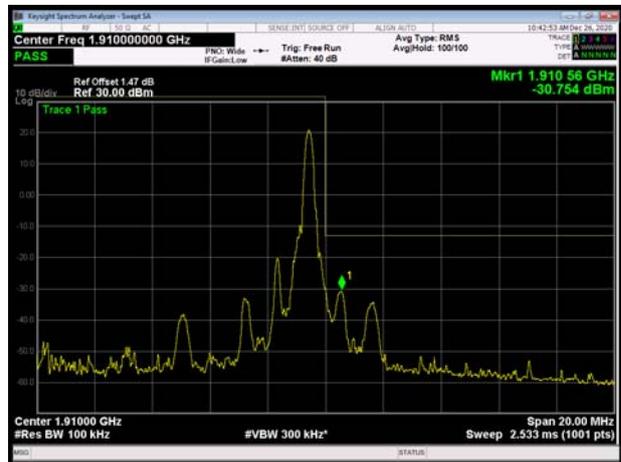
LTE Band 2 5MHz 16QAM 100%RB CH-High



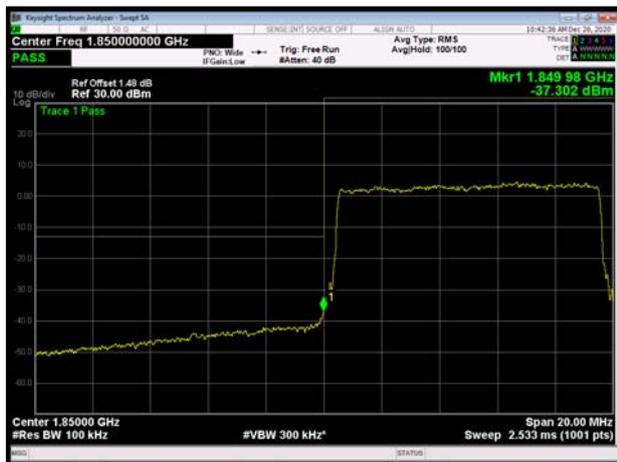
LTE Band 2 10MHz 16QAM 1RB CH-Low



LTE Band 2 10MHz 16QAM 1RB CH-High



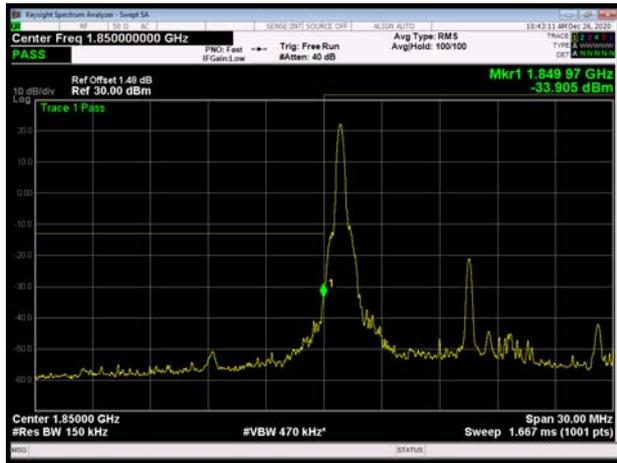
LTE Band 2 10MHz 16QAM 100%RB CH-Low



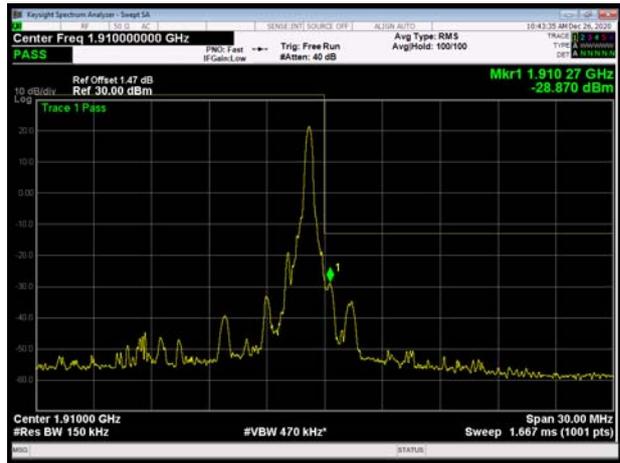
LTE Band 2 10MHz 16QAM 100%RB CH-High



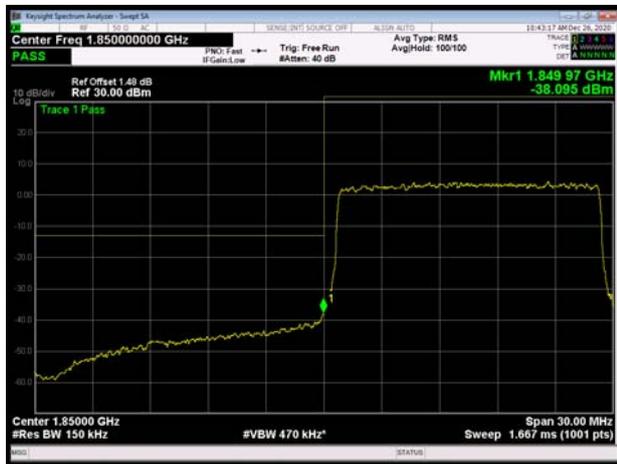
LTE Band 2 15MHz 16QAM 1RB CH-Low



LTE Band 2 15MHz 16QAM 1RB CH-High



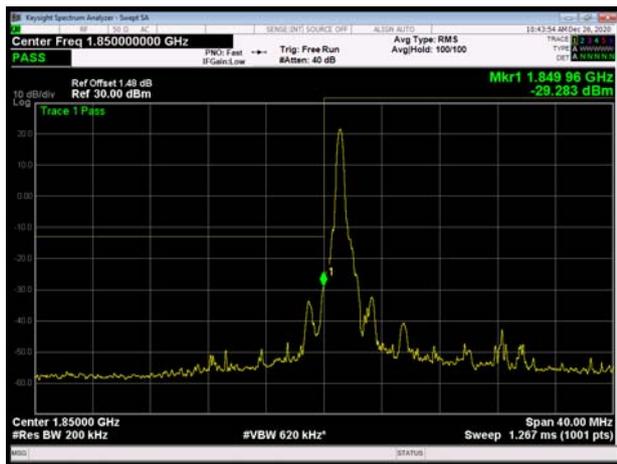
LTE Band 2 15MHz 16QAM 100%RB CH-Low



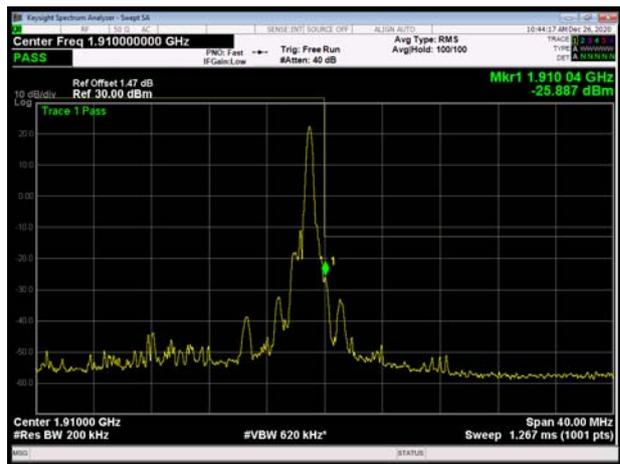
LTE Band 2 15MHz 16QAM 100%RB CH-High



LTE Band 2 20MHz 16QAM 1RB CH-Low

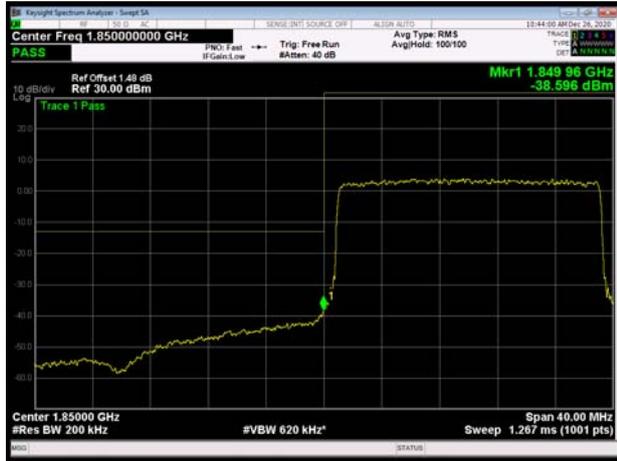


LTE Band 2 20MHz 16QAM 1RB CH-High





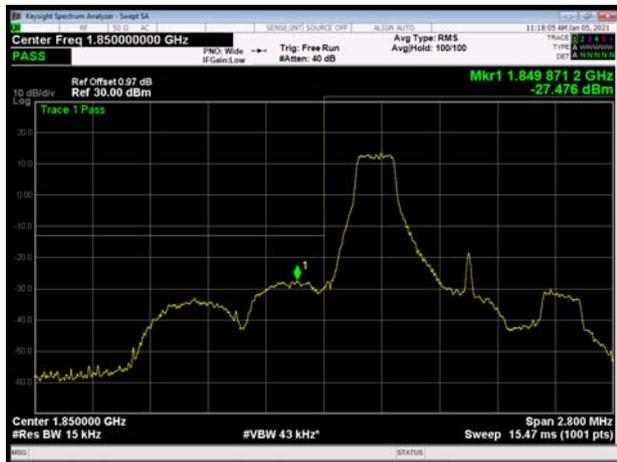
LTE Band 2 20MHz 16QAM 100%RB CH-Low



LTE Band 2 20MHz 16QAM 100%RB CH-High



LTE Band 2 1.4MHz 64QAM 1RB CH-Low



LTE Band 2 1.4MHz 64QAM 1RB CH-High



LTE Band 2 1.4MHz 64QAM 100%RB CH-Low

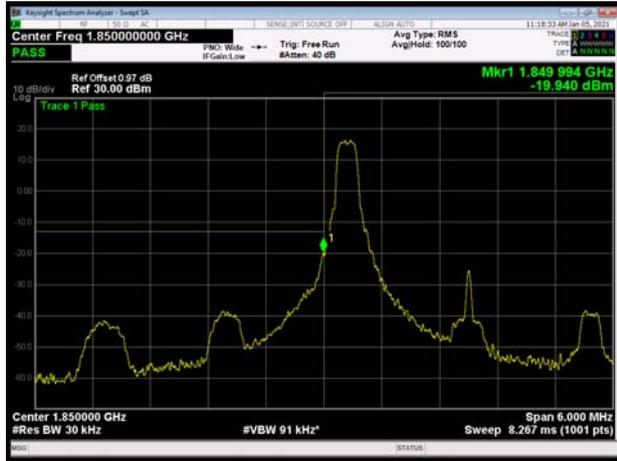


LTE Band 2 1.4MHz 64QAM 100%RB CH-High

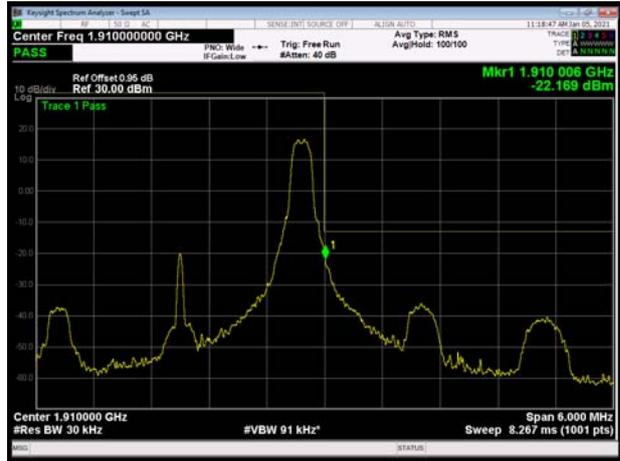




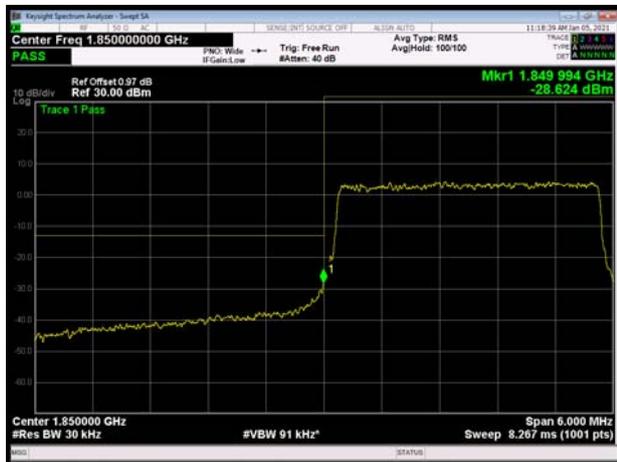
LTE Band 2 3MHz 64QAM 1RB CH-Low



LTE Band 2 3MHz 64QAM 1RB CH-High



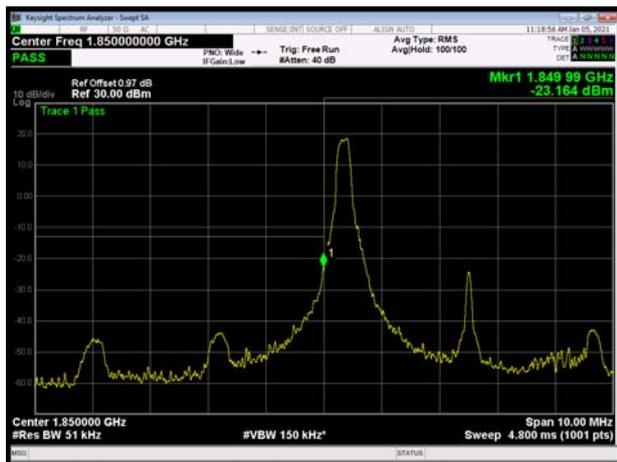
LTE Band 2 3MHz 16QAM 100%RB CH-Low



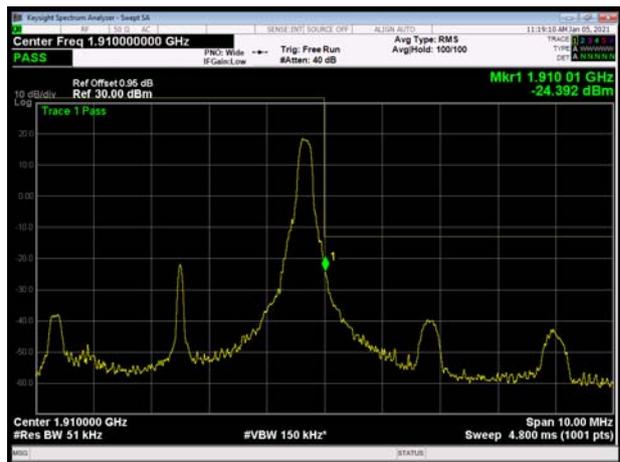
LTE Band 2 3MHz 64QAM 100%RB CH-High



LTE Band 2 5MHz 64QAM 1RB CH-Low

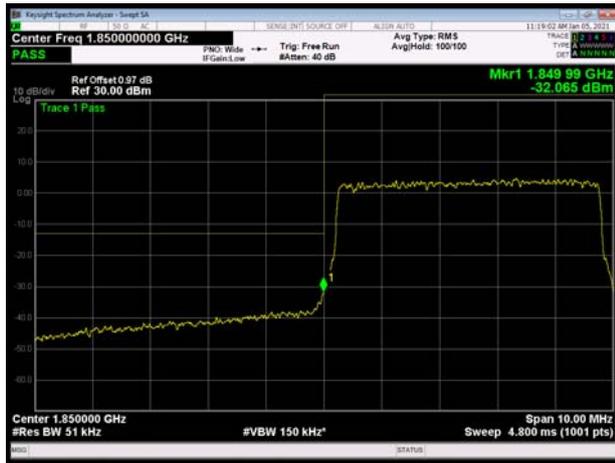


LTE Band 2 5MHz 64QAM 1RB CH-High





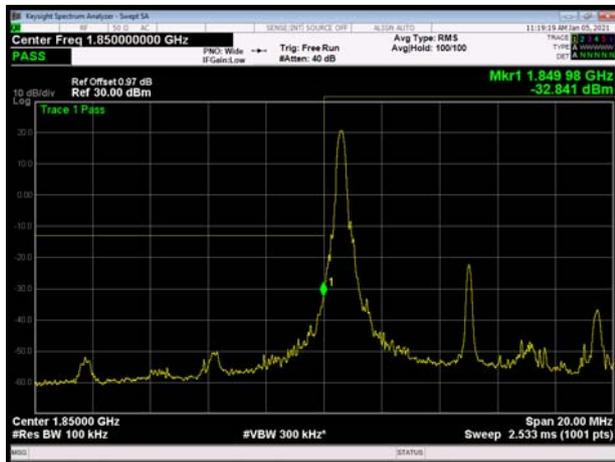
LTE Band 2 5MHz 64QAM 100%RB CH-Low



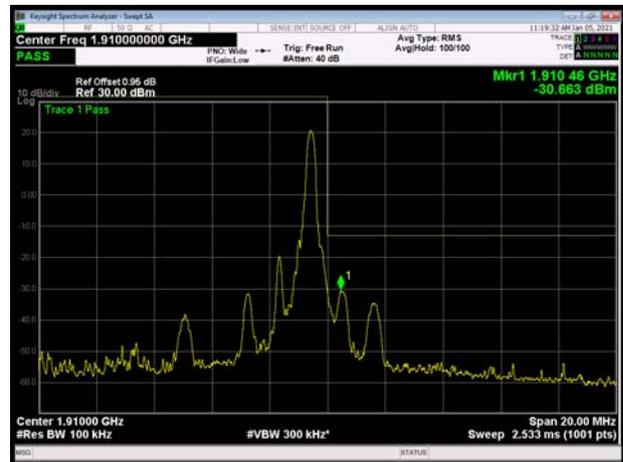
LTE Band 2 5MHz 64QAM 100%RB CH-High



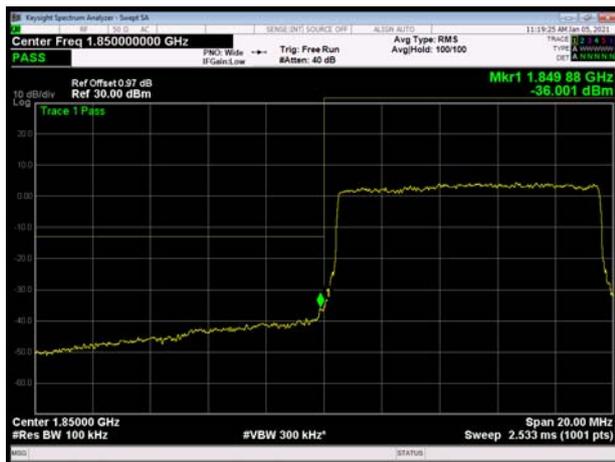
LTE Band 2 10MHz 64QAM 1RB CH-Low



LTE Band 2 10MHz 64QAM 1RB CH-High



LTE Band 2 10MHz 64QAM 100%RB CH-Low

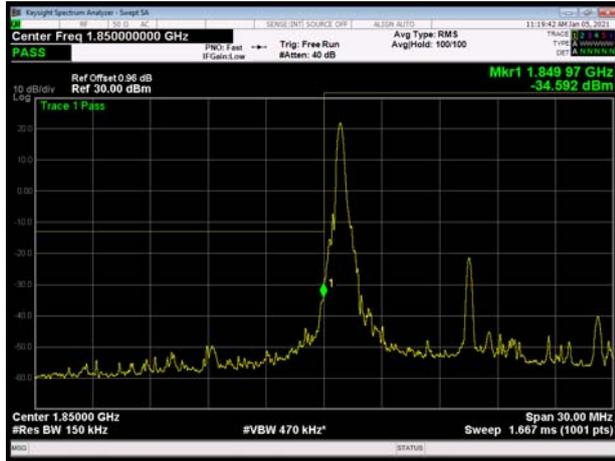


LTE Band 2 10MHz 64QAM 100%RB CH-High

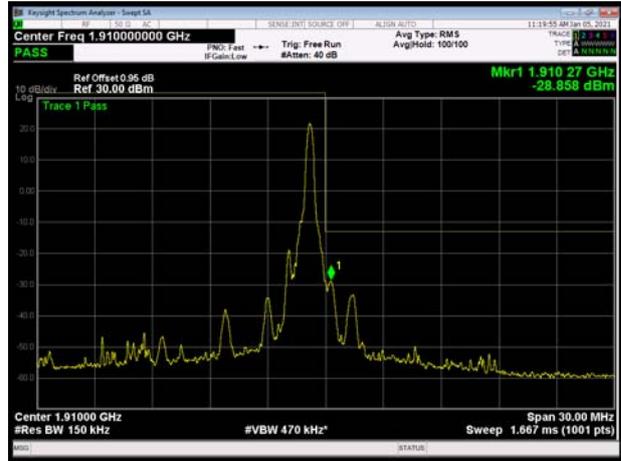




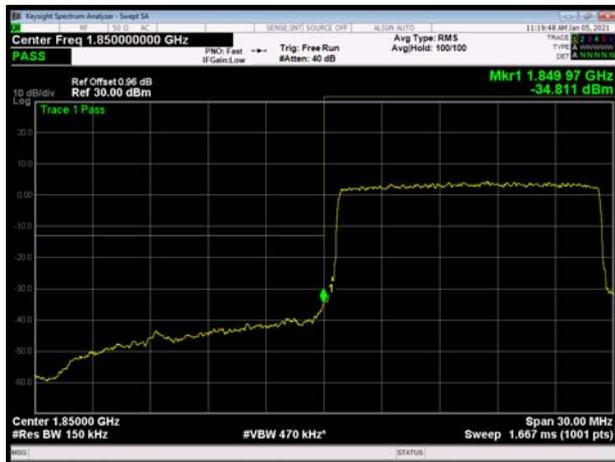
### LTE Band 2 15MHz 64QAM 1RB CH-Low



### LTE Band 2 15MHz 64QAM 1RB CH-High



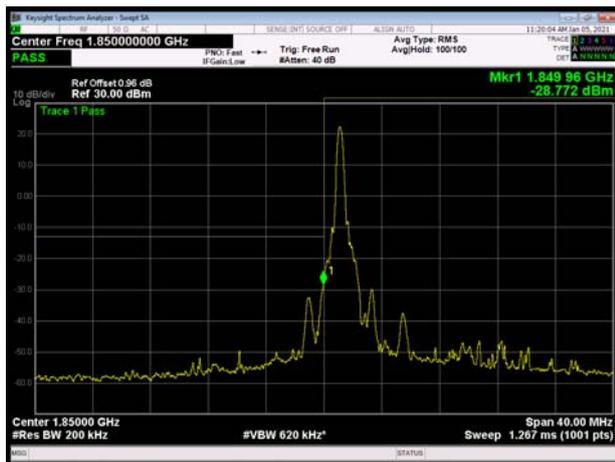
### LTE Band 2 15MHz 64QAM 100%RB CH-Low



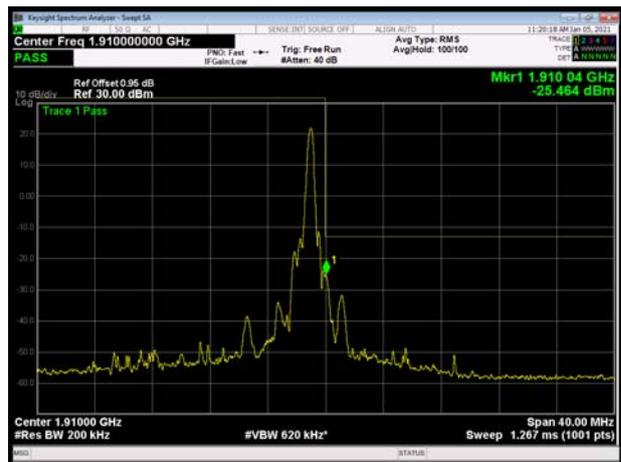
### LTE Band 2 15MHz 64QAM 100%RB CH-High



### LTE Band 2 20MHz 64QAM 1RB CH-Low

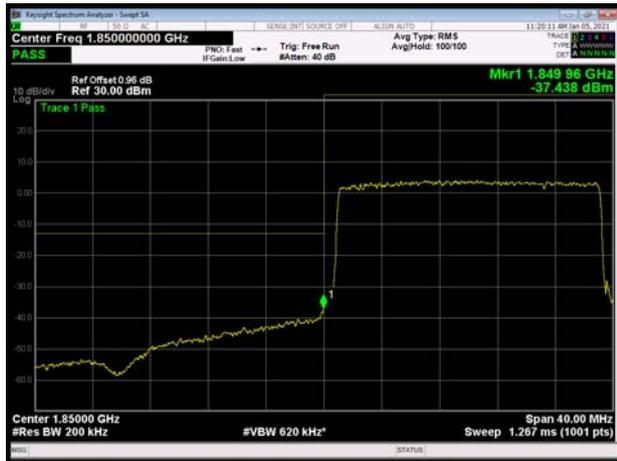


### LTE Band 2 20MHz 64QAM 1RB CH-High





LTE Band 2 20MHz 64QAM 100%RB CH-Low



LTE Band 2 20MHz 64QAM 100%RB CH-High



### 5.4. Peak-to-Average Power Ratio (PAPR)

**Ambient condition**

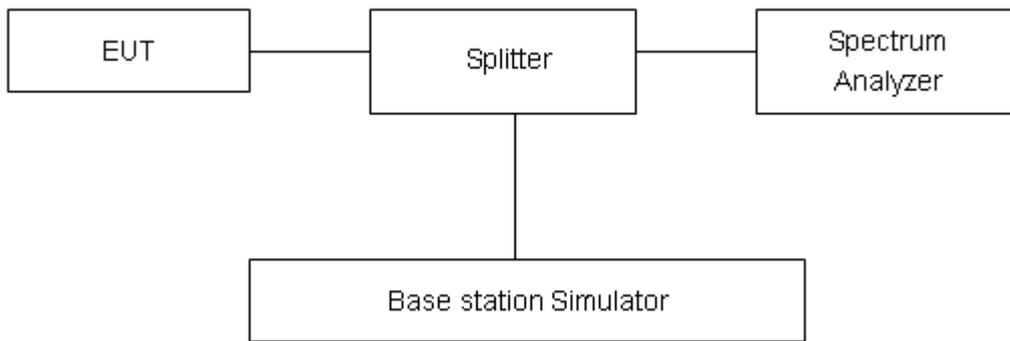
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

**Methods of Measurement**

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$PAPR (dB) = PPk (dBm) - PAvg (dBm).$$

**Test Setup**



**Limits**

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 in 24.232(d).

**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4$  dB.



## Test Results

Mode	Channel	Frequency (MHz)	Peak(dBm)	Avg(dBm)	PAPR(dB)	Limit(dB)	Conclusion
GSM 1900 (GMSK)	512	1850.2	32.09	30.23	1.86	≤13	PASS
	661	1880	32.02	30.18	1.84	≤13	PASS
	810	1909.8	31.98	30.25	1.73	≤13	PASS
GPRS 1900 (GMSK)	512	1850.2	32.13	30.22	1.91	≤13	PASS
	661	1880	32.02	30.20	1.82	≤13	PASS
	810	1909.8	32.11	30.26	1.85	≤13	PASS
EGPRS 1900 (8PSK)	512	1850.2	28.17	25.93	2.24	≤13	PASS
	661	1880	28.25	26.09	2.16	≤13	PASS
	810	1909.8	28.54	26.23	2.31	≤13	PASS
WCDMA Band II (RMC)	9262	1852.4	26.40	23.39	3.01	≤13	PASS
	9400	1880	26.39	23.15	3.24	≤13	PASS
	9538	1907.6	26.17	23.07	3.10	≤13	PASS

LTE Band 2								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	18607	1850.7	27.95	23.01	4.94	≤13	PASS
		18900	1880.0	28.34	22.99	5.35	≤13	PASS
		19193	1909.3	27.86	22.89	4.97	≤13	PASS
	3	18615	1851.5	27.93	23.12	4.81	≤13	PASS
		18900	1880	28.34	23.13	5.21	≤13	PASS
		19185	1908.5	27.93	23.01	4.92	≤13	PASS
	5	18625	1852.5	27.94	23.12	4.82	≤13	PASS
		18900	1880	28.40	23.13	5.27	≤13	PASS
		19175	1907.5	28.01	22.94	5.07	≤13	PASS
	10	18650	1855	27.91	23.06	4.85	≤13	PASS
		18900	1880	28.41	23.10	5.31	≤13	PASS
		19150	1905	28.04	22.94	5.10	≤13	PASS
	15	18675	1857.5	28.23	23.15	5.08	≤13	PASS
		18900	1880	28.66	23.21	5.45	≤13	PASS
		19125	1902.5	28.30	23.07	5.23	≤13	PASS
20	18700	1860	28.17	23.13	5.04	≤13	PASS	
	18900	1880	28.42	23.21	5.21	≤13	PASS	
	19100	1900	28.20	23.13	5.07	≤13	PASS	
16QAM	1.4	18607	1850.7	27.83	22.00	5.83	≤13	PASS
		18900	1880.0	28.19	22.05	6.14	≤13	PASS



	3	19193	1909.3	27.74	21.87	5.87	≤13	PASS	
		18615	1851.5	27.87	22.18	5.69	≤13	PASS	
		18900	1880	28.27	22.19	6.08	≤13	PASS	
		19185	1908.5	27.81	22.02	5.79	≤13	PASS	
	5	18625	1852.5	27.82	22.18	5.64	≤13	PASS	
		18900	1880	28.29	22.18	6.11	≤13	PASS	
		19175	1907.5	27.85	22.01	5.84	≤13	PASS	
	10	18650	1855	27.75	22.07	5.68	≤13	PASS	
		18900	1880	28.28	22.14	6.14	≤13	PASS	
		19150	1905	27.91	22.00	5.91	≤13	PASS	
	15	18675	1857.5	27.98	22.18	5.80	≤13	PASS	
		18900	1880	28.41	22.24	6.17	≤13	PASS	
		19125	1902.5	28.05	22.12	5.93	≤13	PASS	
	20	18700	1860	28.02	22.18	5.84	≤13	PASS	
		18900	1880	28.31	22.27	6.04	≤13	PASS	
		19100	1900	28.06	22.18	5.88	≤13	PASS	
	64QAM	1.4	18607	1850.7	27.71	22.14	5.57	≤13	PASS
			18900	1880.0	28.20	22.11	6.09	≤13	PASS
			19193	1909.3	27.59	22.00	5.59	≤13	PASS
		3	18615	1851.5	27.73	22.26	5.47	≤13	PASS
			18900	1880	28.21	22.27	5.94	≤13	PASS
19185			1908.5	27.72	22.16	5.56	≤13	PASS	
5		18625	1852.5	27.67	22.25	5.42	≤13	PASS	
		18900	1880	28.23	22.29	5.94	≤13	PASS	
		19175	1907.5	27.70	22.08	5.62	≤13	PASS	
10		18650	1855	27.60	22.19	5.41	≤13	PASS	
		18900	1880	28.23	22.25	5.98	≤13	PASS	
		19150	1905	27.78	22.07	5.71	≤13	PASS	
15		18675	1857.5	27.89	22.28	5.61	≤13	PASS	
		18900	1880	28.37	22.33	6.04	≤13	PASS	
		19125	1902.5	27.97	22.21	5.76	≤13	PASS	
20		18700	1860	27.95	22.27	5.68	≤13	PASS	
		18900	1880	28.28	22.32	5.96	≤13	PASS	
		19100	1900	28.00	22.24	5.76	≤13	PASS	

## 5.5. Frequency Stability

### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

### Method of Measurement

#### Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

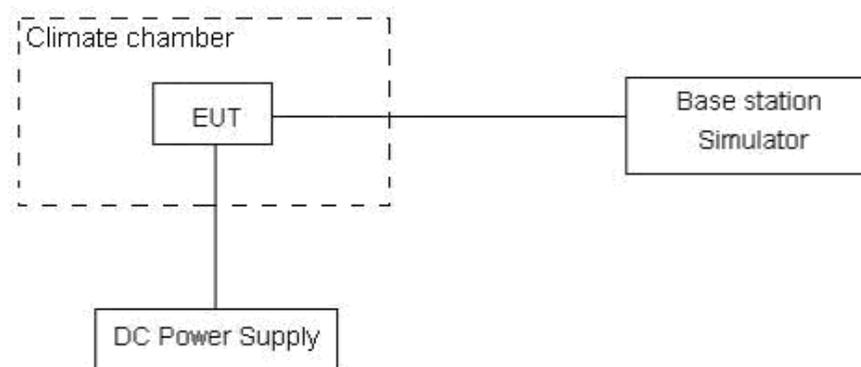
#### Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

**Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.29V and 4.45V, with a nominal voltage of 3.87V.

### Test setup



### Limits

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 3$ ,  $U = 0.01\text{ppm}$ .



## Test Result

GSM 1900						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	GMSK	8PSK	GMSK	8PSK	
Normal (25°C)	Normal	9.38	5.72	0.00499	0.00304	PASS
Extreme (50°C)		4.16	16.58	0.00221	0.00882	PASS
Extreme (40°C)		2.00	13.27	0.00106	0.00706	PASS
Extreme (30°C)		16.98	1.04	0.00903	0.00055	PASS
Extreme (20°C)		16.67	15.04	0.00887	0.00800	PASS
Extreme (10°C)		6.18	14.71	0.00328	0.00783	PASS
Extreme (0°C)		12.79	6.47	0.00680	0.00344	PASS
Extreme (-10°C)		2.69	14.90	0.00143	0.00792	PASS
Extreme (-20°C)		11.29	7.03	0.00600	0.00374	PASS
Extreme (-30°C)		12.00	15.78	0.00638	0.00840	PASS
25°C	LV	14.80	16.64	0.00787	0.00885	PASS
	HV	8.49	1.76	0.00452	0.00094	PASS

WCDMA Band II						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	QPSK	BPSK	QPSK	BPSK	
Normal (25°C)	Normal	2.99	12.04	0.00159	0.00640	PASS
Extreme (50°C)		1.77	3.97	0.00094	0.00211	PASS
Extreme (40°C)		10.07	16.40	0.00536	0.00872	PASS
Extreme (30°C)		14.96	14.80	0.00796	0.00787	PASS
Extreme (20°C)		13.32	7.82	0.00709	0.00416	PASS
Extreme (10°C)		3.71	17.67	0.00197	0.00940	PASS
Extreme (0°C)		9.03	5.49	0.00480	0.00292	PASS
Extreme (-10°C)		1.12	3.79	0.00059	0.00202	PASS
Extreme (-20°C)		17.88	6.20	0.00951	0.00330	PASS
Extreme (-30°C)		11.24	7.26	0.00598	0.00386	PASS
25°C	LV	7.58	3.10	0.00403	0.00165	PASS
	HV	3.57	3.37	0.00190	0.00179	PASS



LTE Band 2								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	1.42	15.95	10.78	0.00075	0.00848	0.00574	PASS
Extreme (50°C)		3.28	7.70	16.67	0.00174	0.00410	0.00887	PASS
Extreme (40°C)		16.69	5.66	9.20	0.00888	0.00301	0.00489	PASS
Extreme (30°C)		11.83	1.17	1.42	0.00629	0.00062	0.00075	PASS
Extreme (20°C)		4.39	10.38	7.00	0.00234	0.00552	0.00372	PASS
Extreme (10°C)		11.36	12.27	1.56	0.00604	0.00653	0.00083	PASS
Extreme (0°C)		1.24	8.74	11.21	0.00066	0.00465	0.00596	PASS
Extreme (-10°C)		12.18	10.46	5.14	0.00648	0.00556	0.00273	PASS
Extreme (-20°C)		11.93	14.36	1.66	0.00635	0.00764	0.00088	PASS
Extreme (-30°C)		9.29	2.45	13.82	0.00494	0.00130	0.00735	PASS
25°C	LV	2.89	17.61	13.12	0.00154	0.00937	0.00698	PASS
	HV	8.69	7.41	5.78	0.00462	0.00394	0.00308	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	14.12	12.40	14.96	0.00751	0.00659	0.00796	PASS
Extreme (50°C)		6.56	3.36	8.35	0.00349	0.00179	0.00444	PASS
Extreme (40°C)		13.92	10.30	8.15	0.00740	0.00548	0.00434	PASS
Extreme (30°C)		17.64	17.53	3.75	0.00938	0.00932	0.00200	PASS
Extreme (20°C)		3.49	5.56	14.99	0.00186	0.00296	0.00797	PASS
Extreme (10°C)		16.50	13.12	13.38	0.00878	0.00698	0.00712	PASS
Extreme (0°C)		8.95	15.56	7.39	0.00476	0.00828	0.00393	PASS
Extreme (-10°C)		1.77	9.22	13.58	0.00094	0.00491	0.00722	PASS
Extreme (-20°C)		1.21	11.74	6.29	0.00064	0.00624	0.00334	PASS
Extreme (-30°C)		12.81	7.77	12.22	0.00682	0.00413	0.00650	PASS
25°C	LV	10.73	6.64	17.95	0.00571	0.00353	0.00955	PASS
	HV	7.49	13.46	16.64	0.00398	0.00716	0.00885	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	9.26	6.09	10.07	0.00492	0.00324	0.00536	PASS
Extreme (50°C)		14.90	11.18	5.76	0.00793	0.00595	0.00306	PASS



Extreme (40°C)		1.08	14.82	9.81	0.00057	0.00788	0.00522	PASS
Extreme (30°C)		16.90	2.20	10.15	0.00899	0.00117	0.00540	PASS
Extreme (20°C)		13.64	15.09	3.07	0.00726	0.00803	0.00163	PASS
Extreme (10°C)		17.21	5.79	10.68	0.00915	0.00308	0.00568	PASS
Extreme (0°C)		16.38	1.60	6.33	0.00871	0.00085	0.00336	PASS
Extreme (-10°C)		1.81	15.17	16.06	0.00096	0.00807	0.00854	PASS
Extreme (-20°C)		10.02	9.13	5.18	0.00533	0.00486	0.00275	PASS
Extreme (-30°C)		5.42	9.89	14.07	0.00288	0.00526	0.00748	PASS
25°C	LV	3.70	1.56	8.67	0.00197	0.00083	0.00461	PASS
	HV	9.56	14.20	2.47	0.00508	0.00755	0.00131	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	14.52	3.50	12.51	0.00772	0.00186	0.00665	PASS
Extreme (50°C)		1.88	17.34	1.37	0.00100	0.00922	0.00073	PASS
Extreme (40°C)		10.73	9.68	4.06	0.00571	0.00515	0.00216	PASS
Extreme (30°C)		6.72	6.07	14.42	0.00358	0.00323	0.00767	PASS
Extreme (20°C)		14.24	3.03	14.77	0.00758	0.00161	0.00786	PASS
Extreme (10°C)		1.17	11.52	3.49	0.00062	0.00613	0.00186	PASS
Extreme (0°C)		2.00	14.26	17.98	0.00107	0.00758	0.00956	PASS
Extreme (-10°C)		4.98	3.26	4.79	0.00265	0.00173	0.00255	PASS
Extreme (-20°C)		14.58	7.68	10.54	0.00776	0.00409	0.00561	PASS
Extreme (-30°C)		12.06	13.54	16.12	0.00641	0.00720	0.00857	PASS
25°C	LV	9.56	5.96	10.96	0.00508	0.00317	0.00583	PASS
	HV	6.12	16.20	14.82	0.00325	0.00862	0.00788	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	4.86	6.09	1.80	0.00259	0.00324	0.00096	PASS
Extreme (50°C)		6.55	1.40	2.37	0.00348	0.00074	0.00126	PASS
Extreme (40°C)		14.35	5.44	1.74	0.00763	0.00289	0.00093	PASS
Extreme (30°C)		3.84	7.88	4.06	0.00204	0.00419	0.00216	PASS
Extreme (20°C)		6.51	6.76	4.11	0.00346	0.00360	0.00218	PASS
Extreme (10°C)		16.61	15.28	13.16	0.00884	0.00813	0.00700	PASS
Extreme (0°C)		4.39	6.57	9.52	0.00234	0.00349	0.00507	PASS
Extreme (-10°C)		9.60	5.26	4.44	0.00510	0.00280	0.00236	PASS
Extreme (-20°C)		3.66	10.25	16.02	0.00195	0.00545	0.00852	PASS
Extreme (-30°C)		5.34	15.12	4.65	0.00284	0.00804	0.00247	PASS
25°C	LV	10.96	8.38	3.35	0.00583	0.00446	0.00178	PASS



	HV	15.26	9.60	2.10	0.00812	0.00511	0.00112	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	4.49	17.99	13.71	0.00239	0.00957	0.00729	PASS
Extreme (50°C)		17.96	17.39	4.66	0.00955	0.00925	0.00248	PASS
Extreme (40°C)		10.88	15.04	7.73	0.00579	0.00800	0.00411	PASS
Extreme (30°C)		12.63	4.06	12.98	0.00672	0.00216	0.00690	PASS
Extreme (20°C)		11.34	8.29	9.78	0.00603	0.00441	0.00520	PASS
Extreme (10°C)		6.74	14.82	10.19	0.00359	0.00788	0.00542	PASS
Extreme (0°C)		3.97	12.80	11.09	0.00211	0.00681	0.00590	PASS
Extreme (-10°C)		6.09	13.21	17.55	0.00324	0.00703	0.00934	PASS
Extreme (-20°C)		10.88	14.37	11.01	0.00579	0.00764	0.00586	PASS
Extreme (-30°C)		11.35	10.88	10.31	0.00604	0.00578	0.00549	PASS
25°C	LV	2.63	10.16	13.53	0.00140	0.00540	0.00720	PASS
	HV	2.07	4.78	4.32	0.00110	0.00254	0.00230	PASS

### 5.6. Spurious Emissions at Antenna Terminals

#### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier. The peak detector is used.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

RBW is set to 10 kHz (0.15 MHz~ 30 MHz),

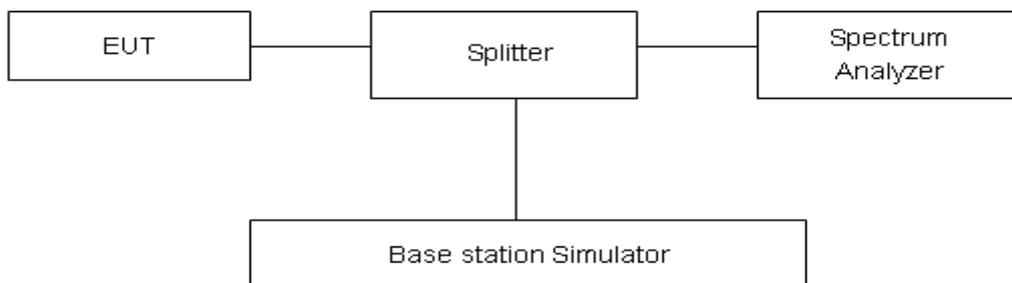
RBW is set to 100 kHz (30MHz~1000 MHz),

RBW is set to 1000 kHz (above 1000MHz),

Sweep is set to ATUO.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

#### Test setup



#### Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log<sub>10</sub> (P) dB.”

Limit	-13 dBm
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#### Measurement Uncertainty

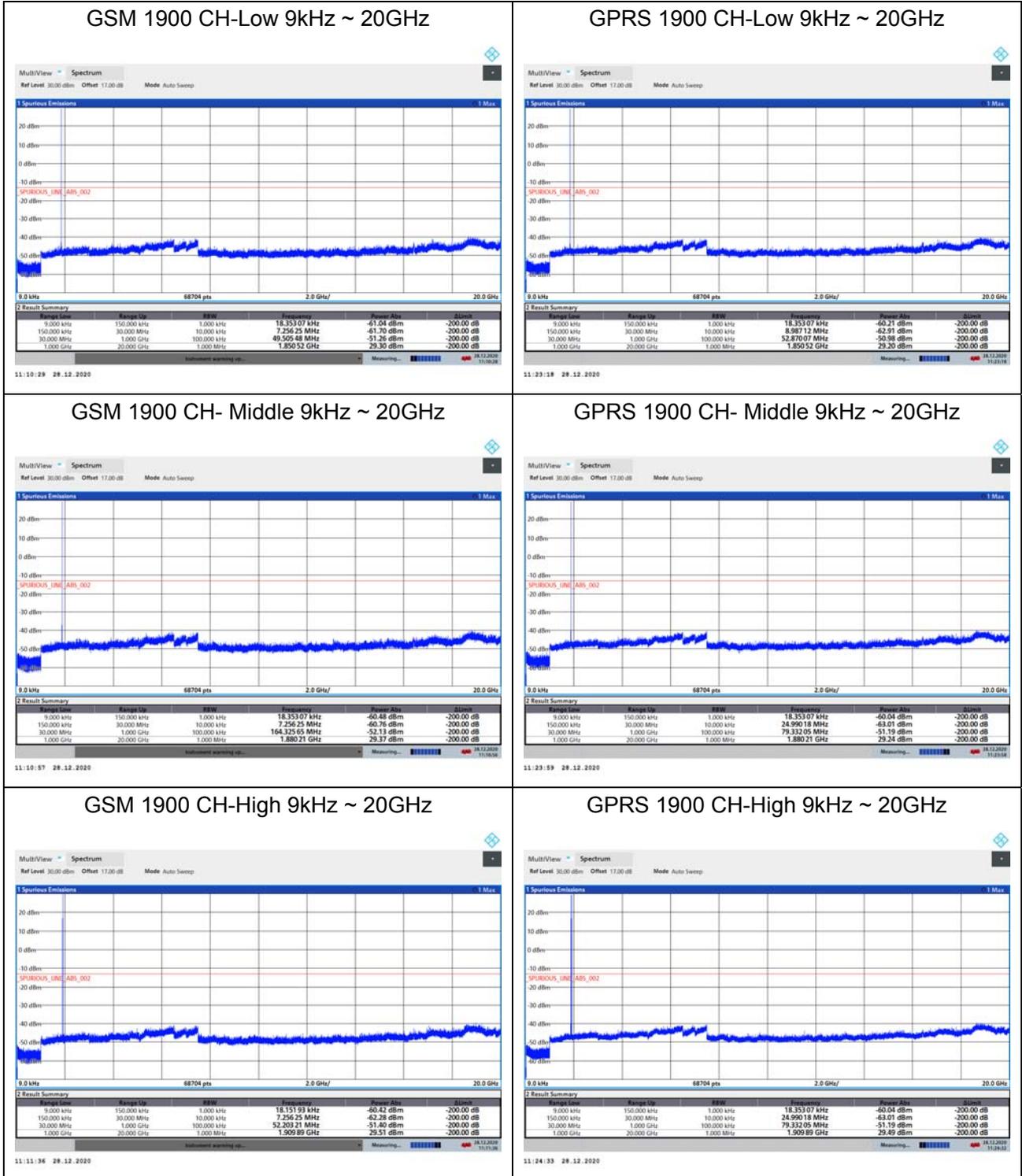
The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

**Test Result**

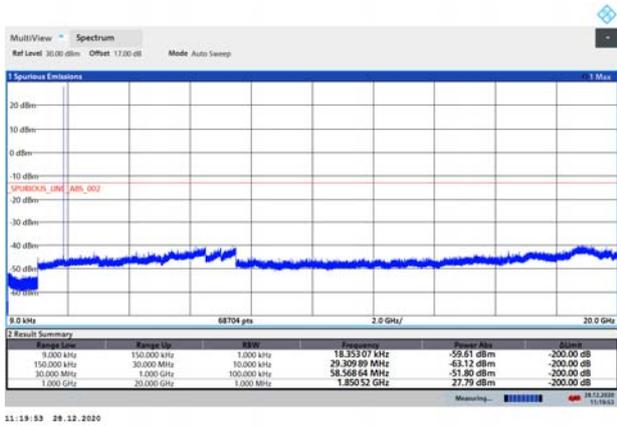
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

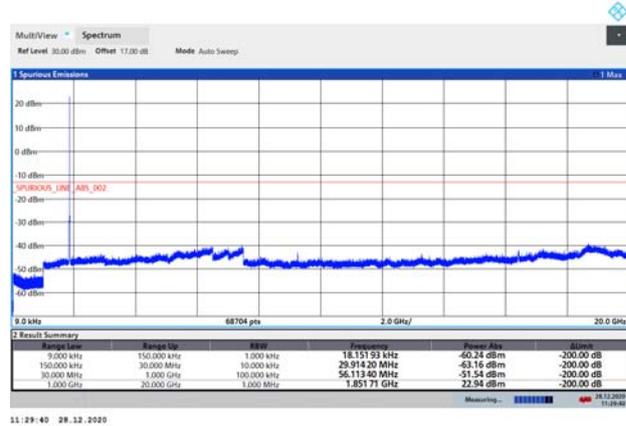




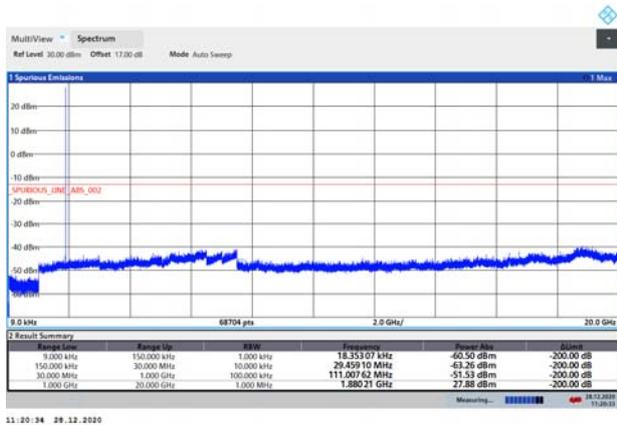
### EGPRS 1900 CH-Low 9kHz ~ 20GHz



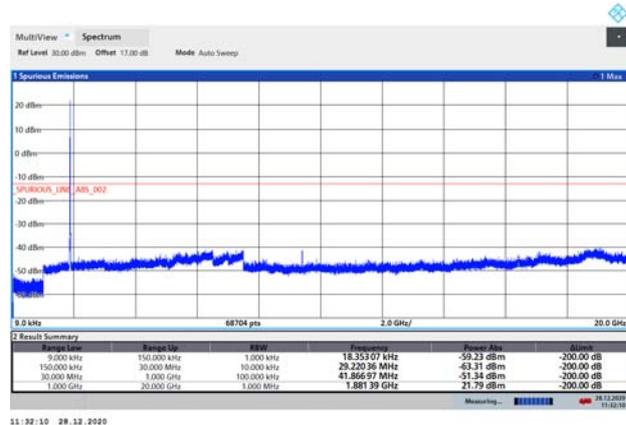
### WCDMA BAND II CH-Low 9kHz ~ 20GHz



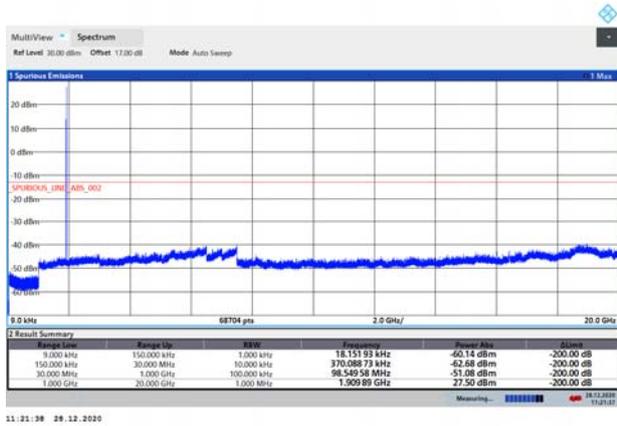
### EGPRS 1900 CH- Middle 9kHz ~ 20GHz



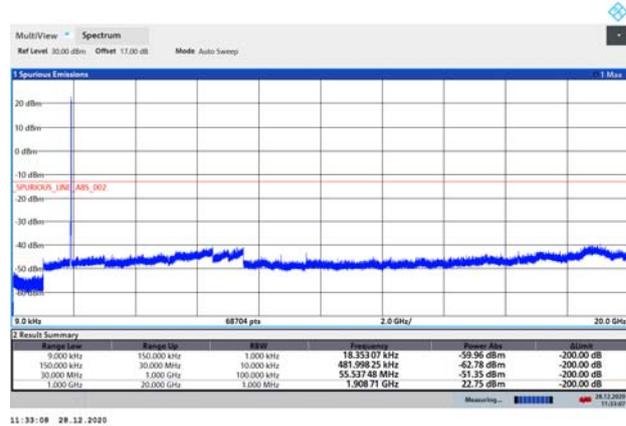
### WCDMA BAND II CH- Middle 9kHz ~ 20GHz



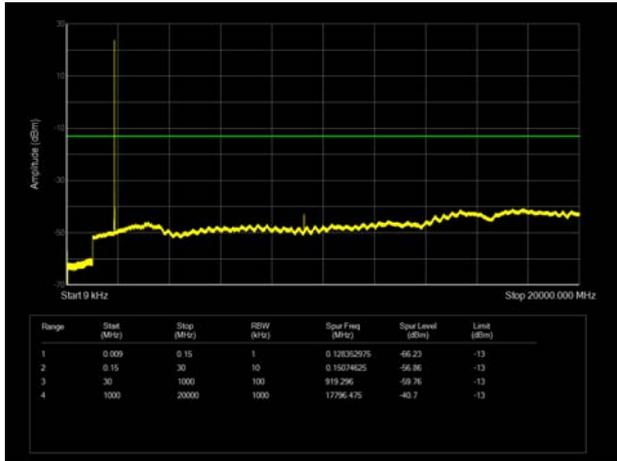
### EGPRS 1900 CH-High 9kHz ~ 20GHz



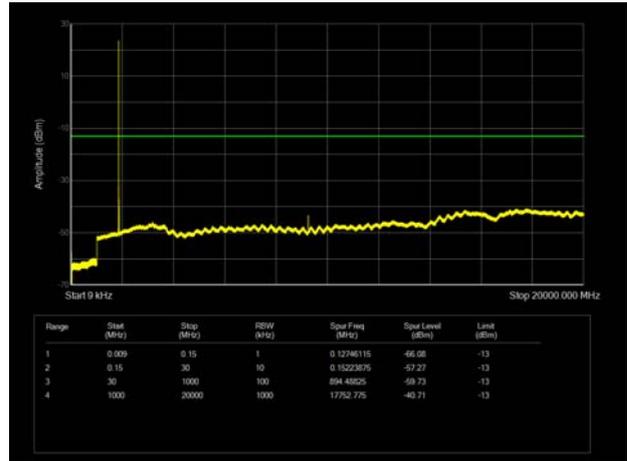
### WCDMA BAND II CH-High 9kHz ~ 20GHz



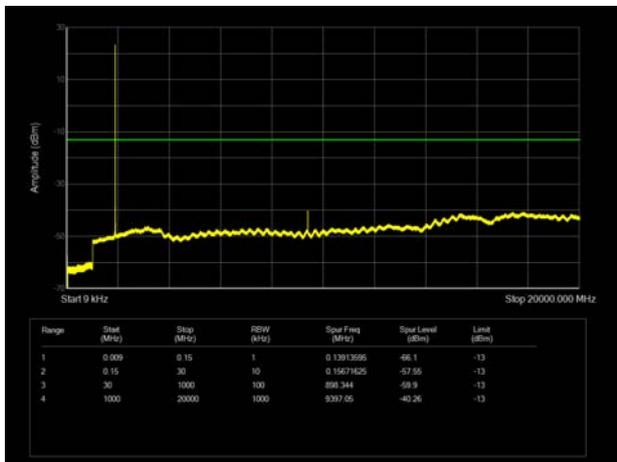
LTE Band 2 1.4MHz CH-Low 9kHz~20GHz



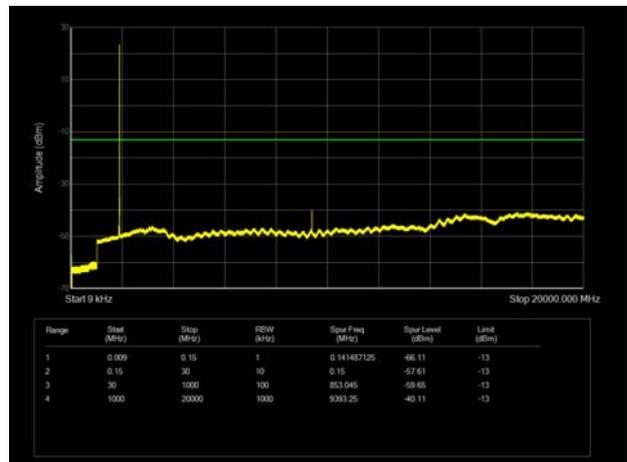
LTE Band 2 3MHz CH-Low 9kHz~20GHz



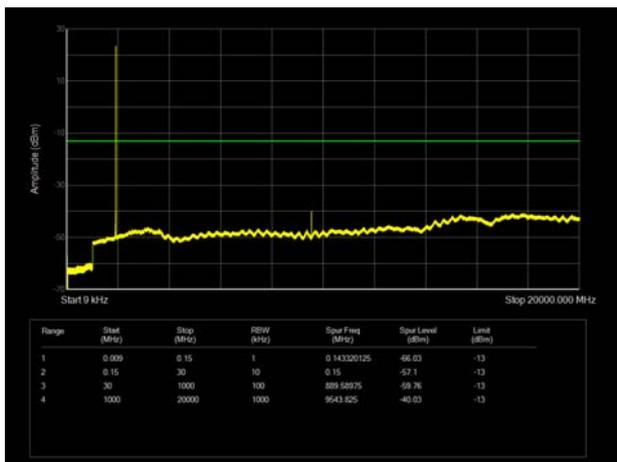
LTE Band 2 1.4MHz CH-Middle 9kHz~20GHz



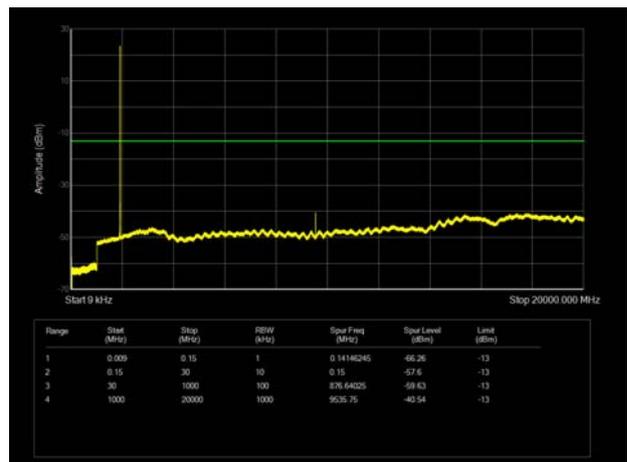
LTE Band 2 3MHz CH-Middle 9kHz~20GHz



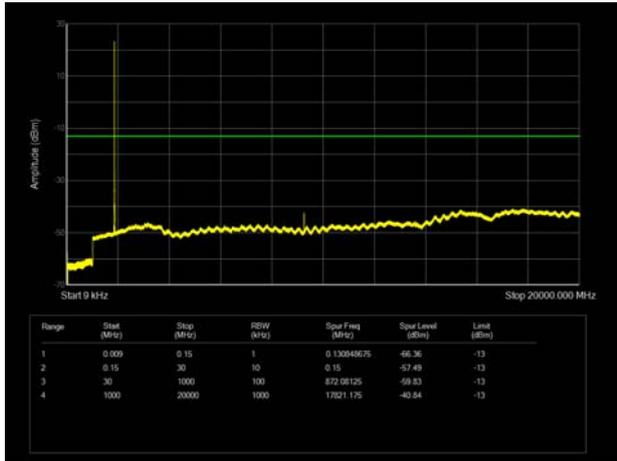
LTE Band 2 1.4MHz CH-High 9kHz~20GHz



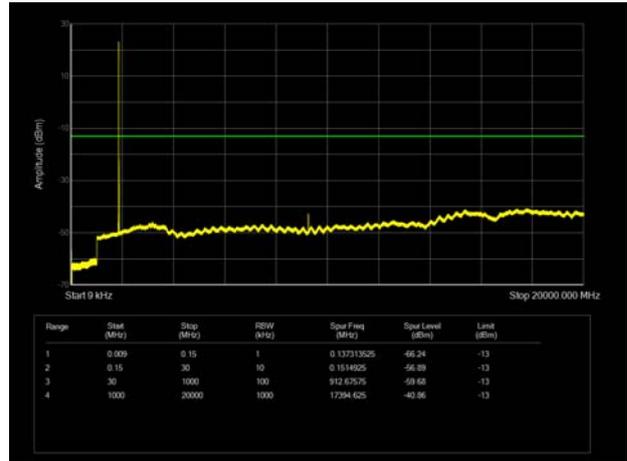
LTE Band 2 3MHz CH-High 9kHz~20GHz



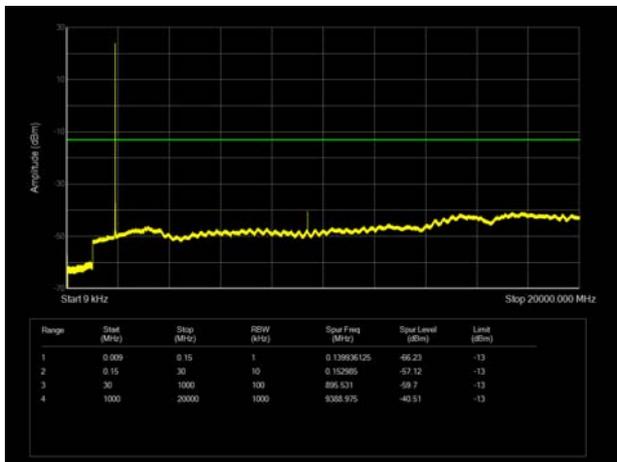
LTE Band 2 5MHz CH-Low 9kHz~20GHz



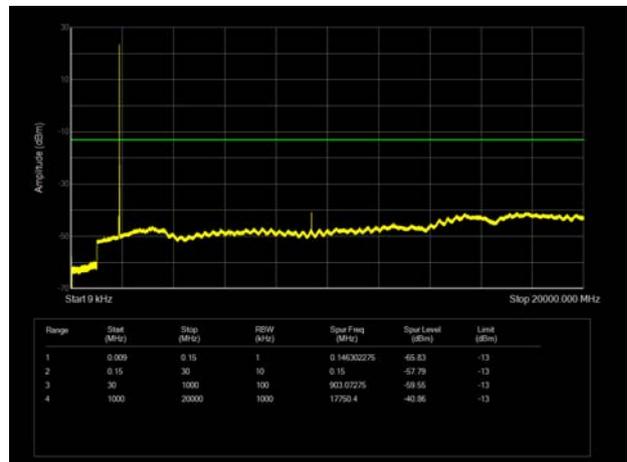
LTE Band 2 10MHz CH-Low 9kHz~20GHz



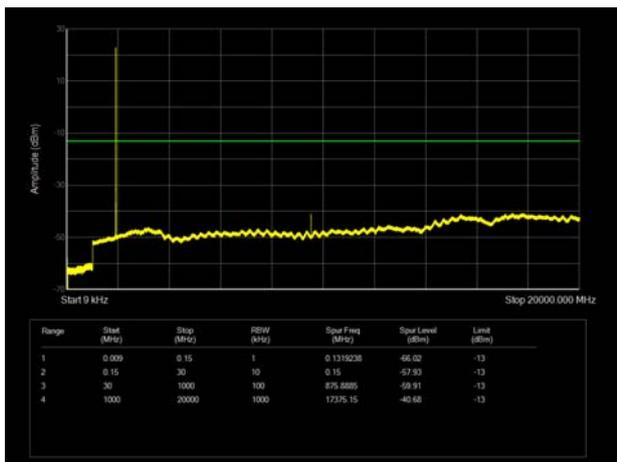
LTE Band 2 5MHz CH-Middle 9kHz~20GHz



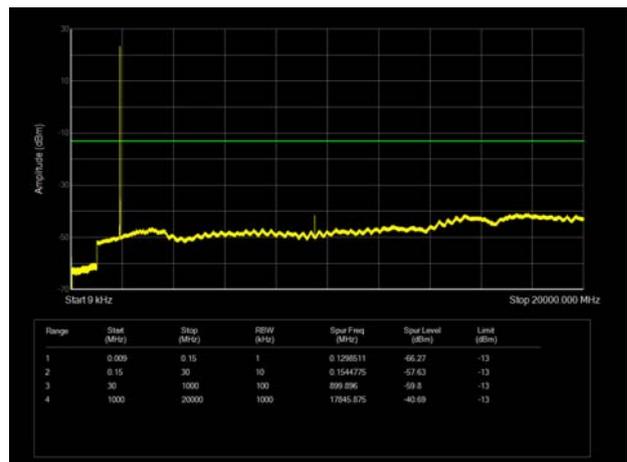
LTE Band 2 10MHz CH-Middle 9kHz~20GHz



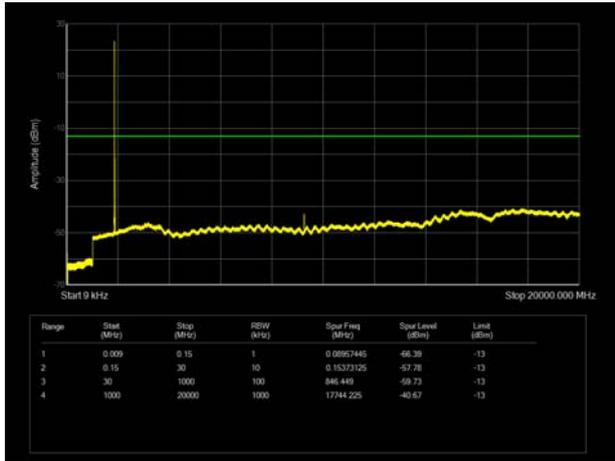
LTE Band 2 5MHz CH-High 9kHz~20GHz



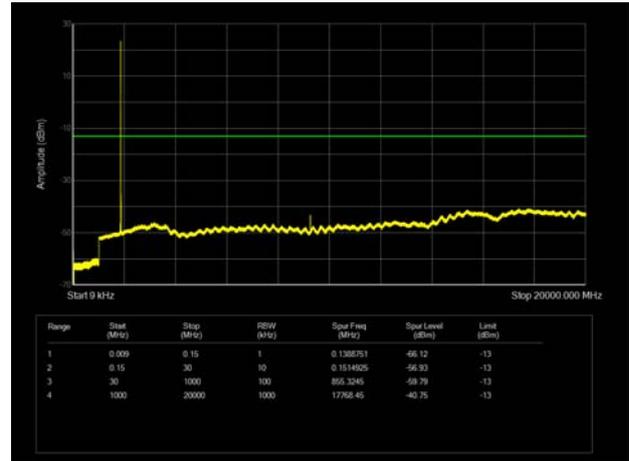
LTE Band 2 10MHz CH-High 9kHz~20GHz



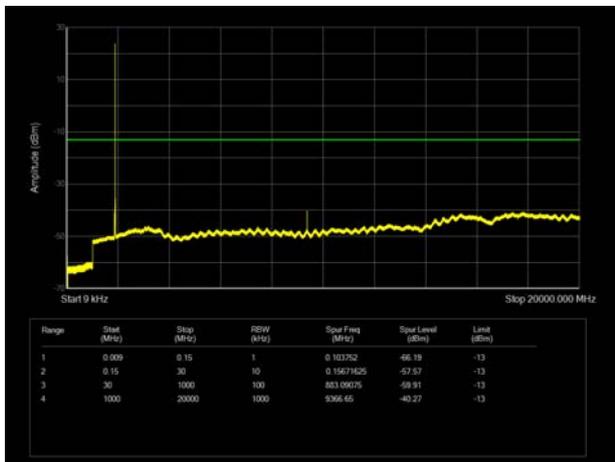
LTE Band 2 15MHz CH-Low 9kHz~20GHz



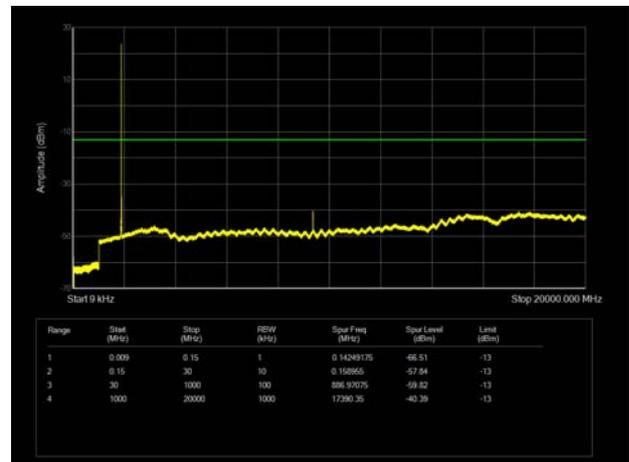
LTE Band 2 20MHz CH-Low 9kHz~20GHz



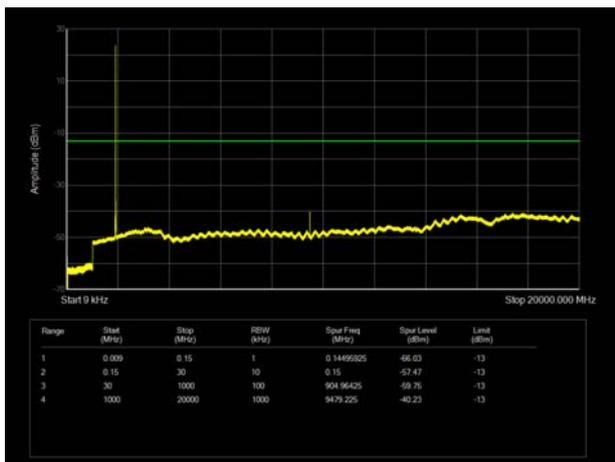
LTE Band 2 15MHz CH-Middle 9kHz~20GHz



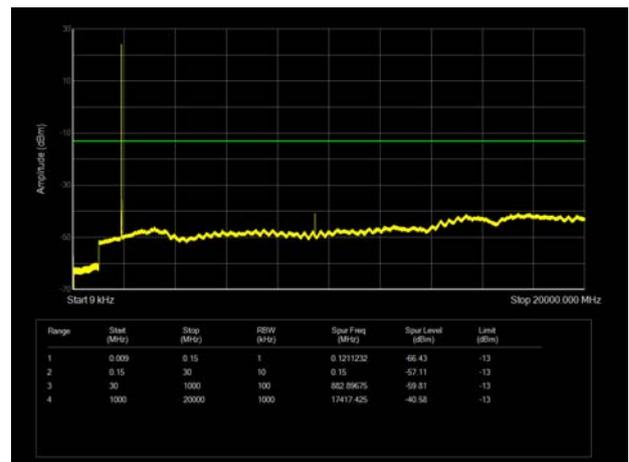
LTE Band 2 20MHz CH-Middle 9kHz~20GHz



LTE Band 2 15MHz CH-High 9kHz~20GHz



LTE Band 2 20MHz CH-High 9kHz~20GHz



## 5.7. Radiates Spurious Emission

### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

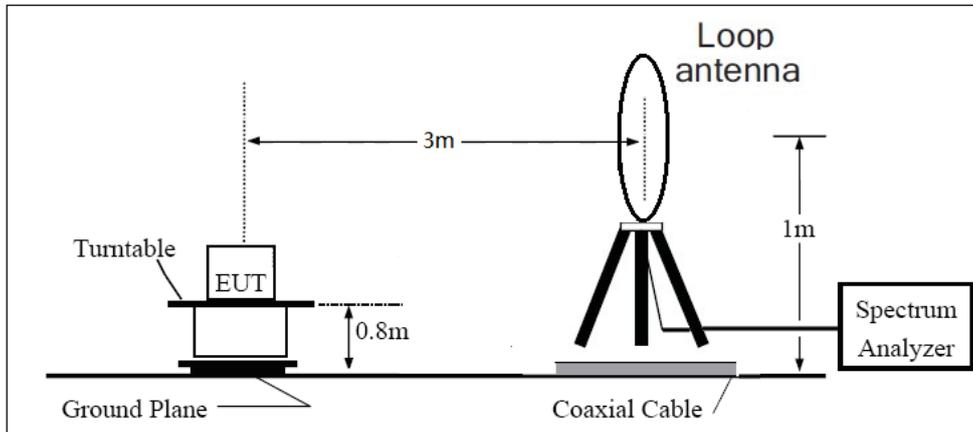
### Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz-150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:  
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
  
The measurement results are amend as described below:  
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .

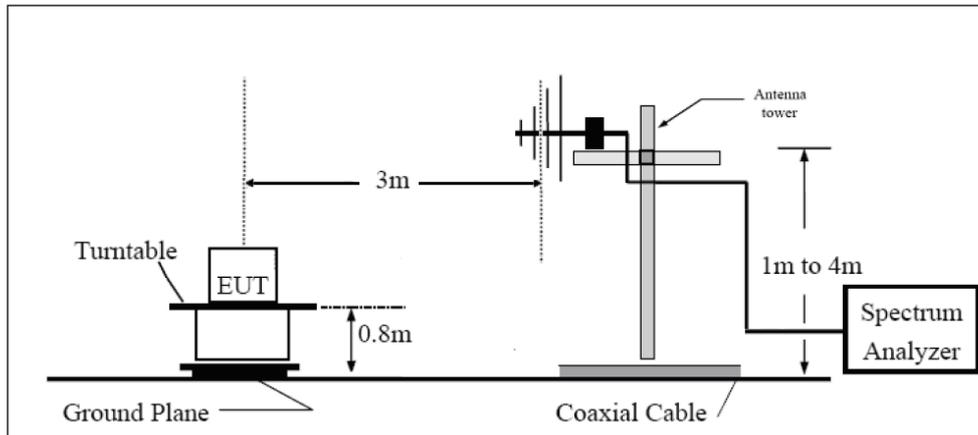
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

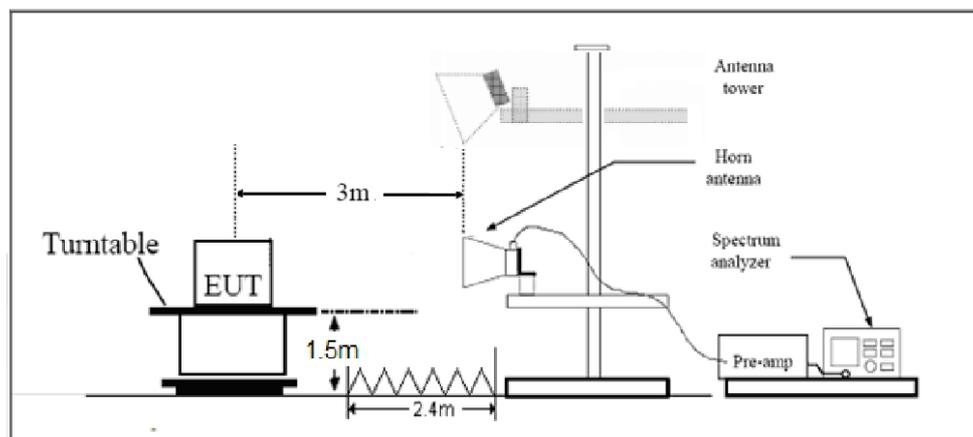
**9KHz ~ 30MHz**



**30MHz ~ 1GHz**



**Above 1GHz**



Note: Area side: 2.4mX3.6m

**Limits**

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.”

Limit	-13 dBm
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**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 3.55$  dB.

**Test Result**

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

After the pretest, main antenna was selected as the worst antenna. only the worst case will be recorded in this report.

GSM 1900 CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.00	-56.96	5.10	11.05	Horizontal	-51.01	-13.00	38.01	45
3	5640.00	-55.01	5.42	12.65	Horizontal	-47.78	-13.00	34.78	315
4	7520.00	-56.39	6.70	13.85	Horizontal	-49.24	-13.00	36.24	90
5	9400.00	-53.78	7.01	14.75	Horizontal	-46.04	-13.00	33.04	270
6	11280.00	-52.55	7.48	15.95	Horizontal	-44.08	-13.00	31.08	180
7	13160.00	-52.76	7.51	16.55	Horizontal	-43.72	-13.00	30.72	45
8	15040.00	-51.14	8.24	15.35	Horizontal	-44.03	-13.00	31.03	270
9	16920.00	-46.87	8.41	14.95	Horizontal	-40.33	-13.00	27.33	315
10	18800.00	-	-	-	-	-	-	-	-

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.  
 2. The worst emission was found in the antenna is Horizontal position.

WCDMA Band II CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.00	-62.25	5.10	11.05	Horizontal	-56.30	-13.00	43.30	315
3	5640.00	-59.68	5.42	12.65	Horizontal	-52.45	-13.00	39.45	45
4	7520.00	-57.64	6.70	13.85	Horizontal	-50.49	-13.00	37.49	315
5	9400.00	-53.29	7.01	14.75	Horizontal	-45.55	-13.00	32.55	90
6	11280.00	-54.10	7.48	15.95	Horizontal	-45.63	-13.00	32.63	135
7	13160.00	-53.18	7.51	16.55	Horizontal	-44.14	-13.00	31.14	45
8	15040.00	-54.00	8.24	15.35	Horizontal	-46.89	-13.00	33.89	315
9	16920.00	-47.46	8.41	14.95	Horizontal	-40.92	-13.00	27.92	135
10	18800.00	-	-	-	-	-	-	-	-

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.  
 2. The worst emission was found in the antenna is Horizontal position.

LTE Band 2 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3759.00	-61.76	5.10	11.05	Horizontal	-55.81	-13.00	42.81	0
3	5638.88	-60.26	5.42	12.65	Horizontal	-53.03	-13.00	40.03	315
4	7520.00	-58.44	6.70	13.85	Horizontal	-51.29	-13.00	38.29	90
5	9400.00	-48.43	7.01	14.75	Horizontal	-40.69	-13.00	27.69	45
6	11280.00	-53.43	7.48	15.95	Horizontal	-44.96	-13.00	31.96	270
7	13160.00	-53.05	7.51	16.55	Horizontal	-44.01	-13.00	31.01	180
8	15040.00	-50.56	8.24	15.35	Horizontal	-43.45	-13.00	30.45	45
9	16920.00	-45.82	8.41	14.95	Horizontal	-39.28	-13.00	26.28	315
10	18800.00	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.  
 2. The worst emission was found in the antenna is Horizontal position.

LTE Band 2 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3755.63	-60.34	5.10	11.05	Horizontal	-54.39	-13.00	41.39	45
3	5633.63	-60.49	5.42	12.65	Horizontal	-53.26	-13.00	40.26	270
4	7520.00	-55.97	6.70	13.85	Horizontal	-48.82	-13.00	35.82	135
5	9400.00	-46.59	7.01	14.75	Horizontal	-38.85	-13.00	25.85	270
6	11280.00	-52.70	7.48	15.95	Horizontal	-44.23	-13.00	31.23	135
7	13160.00	-53.92	7.51	16.55	Horizontal	-44.88	-13.00	31.88	0
8	15040.00	-51.48	8.24	15.35	Horizontal	-44.37	-13.00	31.37	315
9	16920.00	-44.42	8.41	14.95	Horizontal	-37.88	-13.00	24.88	90
10	18800.00	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.  
 2. The worst emission was found in the antenna is Horizontal position.



## LTE Band 2 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3742.13	-62.73	5.10	11.05	Horizontal	-56.78	-13.00	43.78	45
3	5613.38	-61.52	5.42	12.65	Horizontal	-54.29	-13.00	41.29	315
4	7484.63	-59.17	6.70	13.85	Horizontal	-52.02	-13.00	39.02	180
5	9400.00	-48.21	7.01	14.75	Horizontal	-40.47	-13.00	27.47	45
6	11280.00	-53.30	7.48	15.95	Horizontal	-44.83	-13.00	31.83	270
7	13160.00	-53.57	7.51	16.55	Horizontal	-44.53	-13.00	31.53	45
8	15040.00	-53.34	8.24	15.35	Horizontal	-46.23	-13.00	33.23	315
9	16920.00	-46.24	8.41	14.95	Horizontal	-39.70	-13.00	26.70	180
10	18800.00	-	-	-	-	-	-	-	-

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

## 6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMU200	118133	2020-05-17	2021-05-16
Base Station Simulator	R&S	CMW500	113824	2020-05-18	2021-05-17
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2020-05-18	2021-05-17
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2020-05-27	2021-05-26
Signal Analyzer	R&S	FSV30	100815	2020-12-13	2021-12-12
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2019-12-16	2021-12-15
Horn Antenna	R&S	HF907	102723	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2021-06-19
Signal generator	R&S	SMB 100A	102594	2020-05-18	2021-05-17
Climatic Chamber	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
Preamplifier	R&S	SCU18	102327	2020-05-18	2021-05-17
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2020-05-18	2021-05-17
RF Cable	Agilent	SMA 15cm	0001	2020-12-10	2021-06-09
Software	R&S	EMC32	9.26.0	/	/

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



## **ANNEX A: The EUT Appearance**

The EUT Appearance are submitted separately.



## **ANNEX B: Test Setup Photos**

**The Test Setup Photos are submitted separately.**