



# RF TEST REPORT

**Applicant** ZTE Corporation  
**FCC ID** SRQ-Z6251  
**Product** LTE/WCDMA/GSM Multi-Mode  
Digital Mobile Phone  
**Model** Z6251  
**Report No.** R2108A0760-R2  
**Issue Date** October 22, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR 47 Part 24E (2020)**. 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: September 2, 2021 ~ October 22, 2021			
Date of Sample Received: August 27, 2021			
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.  
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City: Shanghai  
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## 2. General Description of Equipment under Test

### 2.1. Applicant and Manufacturer Information

Applicant	ZTE Corporation
Applicant address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Manufacturer	ZTE Corporation
Manufacturer address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

### 2.2. General information

EUT Description			
Model	Z6251		
SN	862947050003473		
Hardware Version	Z6251HW1.0		
Software Version	Z6251_CCv1.0.0B08		
Power Supply	Battery / AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	-0.95dBi		
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		
GPRS Multislot Class	12		
EGPRS Multislot Class	12		
HSDPA UE Category	14		
HSUPA UE Category	7		
HSPA+ UE Category	6		
LTE Category	5		
Maximum E.I.R.P	GSM 1900:	29.60dBm	
	WCDMA Band II:	23.18dBm	
	LTE Band 2:	22.49dBm	
Rated Power Supply Voltage	3.85V		
Operating Voltage	Minimum: 3.5V Maximum: 4.43V		
Operating Temperature	Lowest: -10°C Highest: +55°C		
Extreme Temperature	Lowest: -30°C Highest: +50°C		
Operating 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
<b>EUT Accessory</b>			
Adapter 1	Manufacturer: Jiangsu Chenyang Electron Co., Ltd. Model: STC-A520A-Z		
Adapter 2	Manufacturer: Shenzhen Ruijing Industrial Co Ltd Model: STC-A520A-Z		
Battery	Manufacturer: SCUD (Fujian) Electronics Co., LTD. Model: Li3839T44P8h866445		
USB Cable 1	Manufacturer: kingpower-tech Model: USB-TC20-W-100-M-L 100cm Cable, Shielded		
USB Cable 2	Manufacturer: Shenzhen Luxshare Precision Industry Co.,Ltd. Model: USB-TC20-W-100-M-L 100cm Cable, Shielded		
<p>Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.</p> <p>2. There are more than one Adapter and USB Cable, each one should be applied throughout the compliance test respectively, however, only the worst case (Adapter 2 and USB Cable 2) will be recorded in this report.</p>			



### 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 (2020)**

**FCC CFR47 Part 2 (2020)**

**Reference standard:**

**ANSI C63.26 (2015)**

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

## 4. Test Configuration

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 (Z axis, vertical polarization for GSM/WCDMA) and (Z axis, horizontal polarization for LTE) 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/AMR 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
Occupied Bandwidth	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
Peak-to-Average Power Ratio	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	O	O	-	-	-	O	-
Spurious Emissions at Antenna Terminals	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.

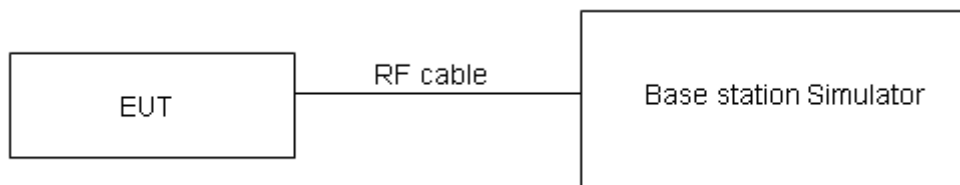
ERP can then be calculated as follows:

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

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**

<b>GSM 1900</b>		<b>Maximum Output Power (dBm)</b>			<b>EIRP (dBm)</b>		
		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)
GSM(GMSK)	Results	30.55	30.47	30.39	29.60	29.52	29.44
GPRS (GMSK)	1TXslot	30.55	30.48	30.38	29.60	29.53	29.43
	2TXslots	29.81	29.76	29.66	28.86	28.81	28.71
	3TXslots	28.06	27.98	27.88	27.11	27.03	26.93
	4TXslots	26.96	26.87	26.78	26.01	25.92	25.83
EGPRS (8PSK)	1TXslot	27.46	27.32	27.07	26.51	26.37	26.12
	2TXslots	26.51	26.37	26.06	25.56	25.42	25.11
	3TXslots	24.48	24.28	24.12	23.53	23.33	23.17
	4TXslots	23.37	23.29	23.08	22.42	22.34	22.13

<b>WCDMA Band II</b>		<b>Maximum Output Power (dBm)</b>			<b>EIRP (dBm)</b>		
		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)
<b>RMC</b>		24.03	23.93	23.91	23.08	22.98	22.96
<b>AMR</b>		24.13	23.85	23.81	23.18	22.90	22.86
<b>HSDPA</b>	Sub - Test 1	23.43	23.59	23.27	22.48	22.64	22.32
	Sub - Test 2	23.69	23.45	23.41	22.74	22.50	22.46
	Sub - Test 3	23.01	23.03	22.81	22.06	22.08	21.86
	Sub - Test 4	23.05	22.85	22.91	22.10	21.90	21.96
<b>HSUPA</b>	Sub - Test 1	22.63	22.51	22.29	21.68	21.56	21.34
	Sub - Test 2	21.93	21.97	21.91	20.98	21.02	20.96
	Sub - Test 3	22.51	22.53	22.35	21.56	21.58	21.40
	Sub - Test 4	21.55	21.37	21.53	20.60	20.42	20.58
	Sub - Test 5	22.99	23.07	23.03	22.04	22.12	22.08
<b>DC-HSDPA</b>	Sub - Test 1	23.63	23.29	23.33	22.68	22.34	22.38
	Sub - Test 2	23.51	23.53	23.53	22.56	22.58	22.58
	Sub - Test 3	23.05	22.89	22.75	22.10	21.94	21.80
	Sub - Test 4	22.89	22.99	22.79	21.94	22.04	21.84
<b>HSPA+</b>	16QAM	21.89	22.03	21.75	20.94	21.08	20.80



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
1.4MHz	QPSK	1	0	23.38	23.14	23.29	22.43	22.19	22.34
		1	2	23.44	23.37	23.37	22.49	22.42	22.42
		1	5	23.14	23.21	23.13	22.19	22.26	22.18
		3	0	23.37	23.31	23.40	22.42	22.36	22.45
		3	2	23.33	23.28	23.34	22.38	22.33	22.39
		3	3	23.26	23.38	23.14	22.31	22.43	22.19
		6	0	22.34	22.43	22.23	21.39	21.48	21.28
	16QAM	1	0	22.27	21.87	22.49	21.32	20.92	21.54
		1	2	22.25	22.21	22.74	21.30	21.26	21.79
		1	5	21.94	22.01	22.07	20.99	21.06	21.12
		3	0	22.29	22.22	22.66	21.34	21.27	21.71
		3	2	22.31	22.28	22.72	21.36	21.33	21.77
		3	3	22.20	22.50	22.05	21.25	21.55	21.10
		6	0	21.34	21.46	21.44	20.39	20.51	20.49
	64QAM	1	0	22.10	21.62	21.80	21.15	20.67	20.85
		1	2	22.18	22.06	22.01	21.23	21.11	21.06
		1	5	21.82	21.87	21.46	20.87	20.92	20.51
		3	0	21.80	21.96	22.36	20.85	21.01	21.41
		3	2	21.80	21.97	22.38	20.85	21.02	21.43
		3	3	21.97	22.31	21.86	21.02	21.36	20.91
		6	0	20.89	21.25	21.17	19.94	20.30	20.22
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)					
				18615/1851.5	18900/1880	19185/1908.5	18615/1851.5	18900/1880	19185/1908.5
3MHz	QPSK	1	0	23.40	23.18	23.32	22.45	22.23	22.37
		1	7	23.42	23.40	23.41	22.47	22.45	22.46
		1	14	23.17	23.26	23.17	22.22	22.31	22.22
		8	0	22.47	22.43	22.53	21.52	21.48	21.58
		8	4	22.45	22.38	22.46	21.50	21.43	21.51
		8	7	22.36	22.49	22.24	21.41	21.54	21.29
		15	0	22.34	22.47	22.26	21.39	21.52	21.31
	16QAM	1	0	22.30	21.89	22.52	21.35	20.94	21.57
		1	7	22.28	22.21	22.78	21.33	21.26	21.83
		1	14	21.96	22.05	22.10	21.01	21.10	21.15
		8	0	21.40	21.35	21.78	20.45	20.40	20.83
		8	4	21.42	21.41	21.84	20.47	20.46	20.89
		8	7	21.30	21.62	21.18	20.35	20.67	20.23



		15	0	21.37	21.50	21.47	20.42	20.55	20.52	
	64QAM	1	0	22.13	21.64	21.83	21.18	20.69	20.88	
		1	7	22.21	22.06	22.03	21.26	21.11	21.08	
		1	14	21.84	21.86	21.49	20.89	20.91	20.54	
		8	0	20.91	21.09	21.48	19.96	20.14	20.53	
		8	4	20.91	21.10	21.50	19.96	20.15	20.55	
		8	7	21.07	21.43	20.99	20.12	20.48	20.04	
		15	0	20.92	21.29	21.20	19.97	20.34	20.25	
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	
5MHz	QPSK	1	0	23.37	23.16	23.28	22.42	22.21	22.33	
		1	13	23.40	23.36	23.38	22.45	22.41	22.43	
		1	24	23.14	23.21	23.13	22.19	22.26	22.18	
		12	0	22.44	22.38	22.49	21.49	21.43	21.54	
		12	6	22.43	22.34	22.41	21.48	21.39	21.46	
		12	13	22.34	22.47	22.20	21.39	21.52	21.25	
		25	0	22.34	22.46	22.24	21.39	21.51	21.29	
	16QAM	1	0	22.27	21.85	22.49	21.32	20.90	21.54	
		1	13	22.25	22.19	22.75	21.30	21.24	21.80	
		1	24	21.93	22.03	22.06	20.98	21.08	21.11	
		12	0	21.38	21.31	21.75	20.43	20.36	20.80	
		12	6	21.39	21.36	21.80	20.44	20.41	20.85	
		12	13	21.27	21.57	21.14	20.32	20.62	20.19	
		25	0	21.35	21.46	21.42	20.40	20.51	20.47	
	64QAM	1	0	22.10	21.64	21.80	21.15	20.69	20.85	
		1	13	22.18	22.08	22.00	21.23	21.13	21.05	
		1	24	21.85	21.84	21.45	20.90	20.89	20.50	
		12	0	20.89	21.05	21.49	19.94	20.10	20.54	
		12	6	20.88	21.05	21.46	19.93	20.10	20.51	
		12	13	21.04	21.38	20.95	20.09	20.43	20.00	
		25	0	20.90	21.25	21.15	19.95	20.30	20.20	
	BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)					
					18650/ 1855	18900/ 1880	19150/ 1905	18650/ 1855	18900/ 1880	19150/ 1905
10MHz	QPSK	1	0	23.39	23.17	23.31	22.44	22.22	22.36	
		1	25	23.43	23.41	23.42	22.48	22.46	22.47	
		1	49	23.16	23.25	23.16	22.21	22.30	22.21	
		25	0	22.47	22.43	22.53	21.52	21.48	21.58	
		25	13	22.46	22.39	22.45	21.51	21.44	21.50	
		25	25	22.36	22.51	22.25	21.41	21.56	21.30	
		50	0	22.38	22.48	22.28	21.43	21.53	21.33	
	16QAM	1	0	22.29	21.88	22.51	21.34	20.93	21.56	



		1	25	22.28	22.23	22.78	21.33	21.28	21.83
		1	49	21.96	22.05	22.09	21.01	21.10	21.14
		25	0	21.41	21.36	21.79	20.46	20.41	20.84
		25	13	21.41	21.40	21.83	20.46	20.45	20.88
		25	25	21.30	21.62	21.18	20.35	20.67	20.23
		50	0	21.38	21.51	21.46	20.43	20.56	20.51
	64QAM	1	0	22.12	21.63	21.82	21.17	20.68	20.87
		1	25	22.21	22.08	22.03	21.26	21.13	21.08
		1	49	21.84	21.86	21.48	20.89	20.91	20.53
		25	0	20.92	21.10	21.49	19.97	20.15	20.54
		25	13	20.90	21.09	21.49	19.95	20.14	20.54
		25	25	21.07	21.43	20.99	20.12	20.48	20.04
		50	0	20.93	21.30	21.19	19.98	20.35	20.24
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
15MHz	QPSK	1	0	23.38	23.13	23.29	22.43	22.18	22.34
		1	38	23.41	23.40	23.39	22.46	22.45	22.44
		1	74	23.13	23.20	23.12	22.18	22.25	22.17
		36	0	22.45	22.39	22.50	21.50	21.44	21.55
		36	18	22.43	22.34	22.41	21.48	21.39	21.46
		36	39	22.33	22.48	22.21	21.38	21.53	21.26
		75	0	22.36	22.44	22.23	21.41	21.49	21.28
	16QAM	1	0	22.24	21.86	22.49	21.29	20.91	21.54
		1	38	22.26	22.20	22.76	21.31	21.25	21.81
		1	74	21.93	22.01	22.06	20.98	21.06	21.11
		36	0	21.38	21.34	21.76	20.43	20.39	20.81
		36	18	21.38	21.35	21.79	20.43	20.40	20.84
		36	39	21.28	21.58	21.15	20.33	20.63	20.20
		75	0	21.35	21.46	21.42	20.40	20.51	20.47
	64QAM	1	0	22.07	21.61	21.80	21.12	20.66	20.85
		1	38	22.19	22.05	22.01	21.24	21.10	21.06
		1	74	21.85	21.85	21.49	20.90	20.90	20.54
		36	0	20.91	21.12	21.50	19.96	20.17	20.55
		36	18	20.88	21.06	21.48	19.93	20.11	20.53
		36	39	21.05	21.39	20.96	20.10	20.44	20.01
		75	0	20.90	21.25	21.15	19.95	20.30	20.20
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)					
				18700/ 1860	18900/ 1880	19100/ 1900	18700/ 1860	18900/ 1880	19100/ 1900
20MHz	QPSK	1	0	23.35	23.09	23.26	22.40	22.14	22.31
		1	50	23.40	23.36	23.37	22.45	22.41	22.42
		1	99	23.11	23.19	23.09	22.16	22.24	22.14



		50	0	22.42	22.34	22.46	21.47	21.39	21.51
		50	25	22.41	22.30	22.38	21.46	21.35	21.43
		50	50	22.30	22.43	22.17	21.35	21.48	21.22
		100	0	22.33	22.39	22.19	21.38	21.44	21.24
	16QAM	1	0	22.20	21.82	22.44	21.25	20.87	21.49
		1	50	22.22	22.18	22.72	21.27	21.23	21.77
		1	99	21.91	21.98	22.04	20.96	21.03	21.09
		50	0	21.35	21.30	21.73	20.40	20.35	20.78
		50	25	21.35	21.33	21.76	20.40	20.38	20.81
		50	50	21.25	21.53	21.11	20.30	20.58	20.16
		100	0	21.33	21.42	21.39	20.38	20.47	20.44
	64QAM	1	0	22.05	21.57	21.75	21.10	20.62	20.80
		1	50	22.15	22.03	21.97	21.20	21.08	21.02
		1	99	21.79	21.79	21.43	20.84	20.84	20.48
		50	0	20.86	21.04	21.43	19.91	20.09	20.48
		50	25	20.84	21.02	21.42	19.89	20.07	20.47
		50	50	21.02	21.34	20.92	20.07	20.39	19.97
		100	0	20.88	21.21	21.12	19.93	20.26	20.17

## 5.2.Occupied Bandwidth

### Ambient condition

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

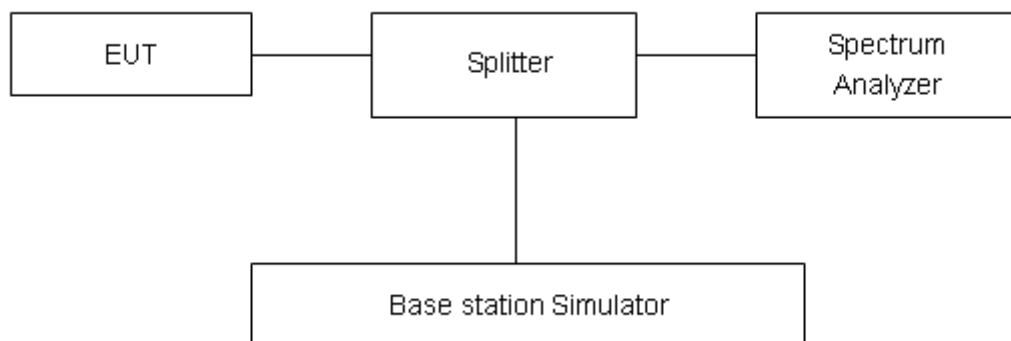
### Method of Measurement

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  $\geq 1\%EBW$ , VBW is set to 3x RBW.

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  $k = 2$ ,  $U = 624\text{Hz}$ .





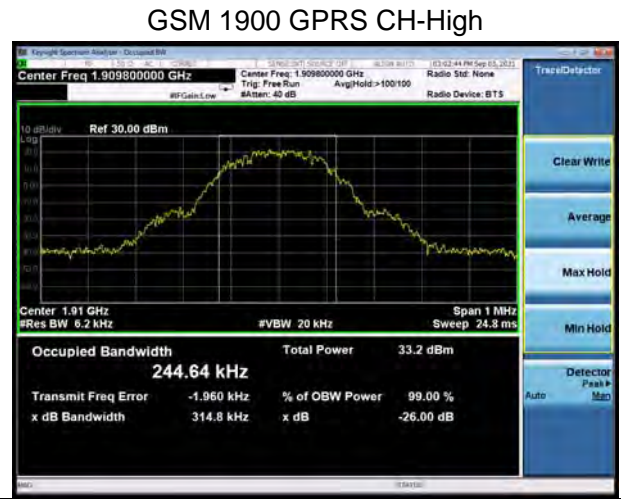
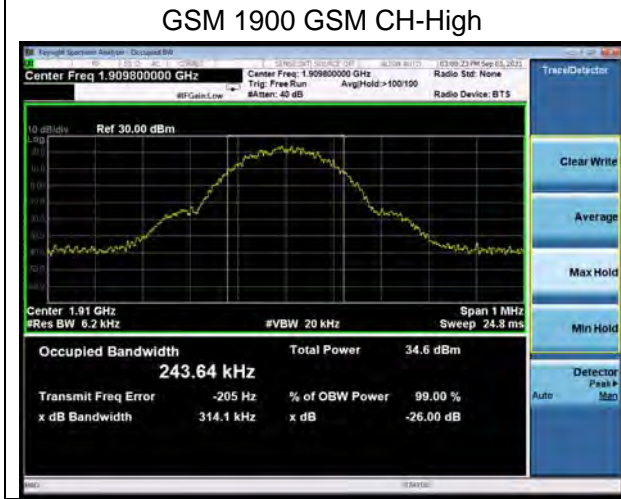
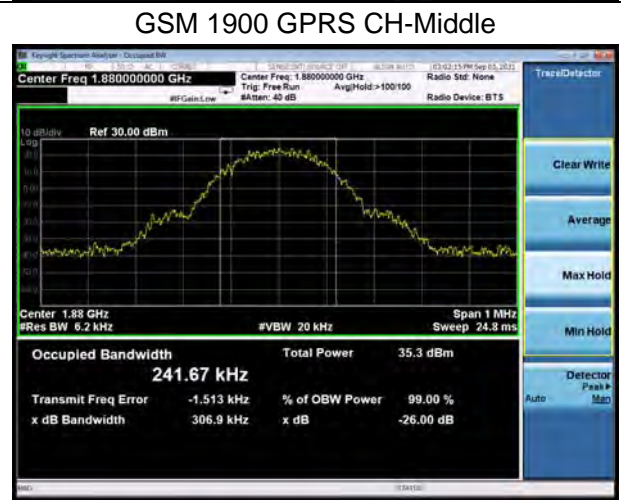
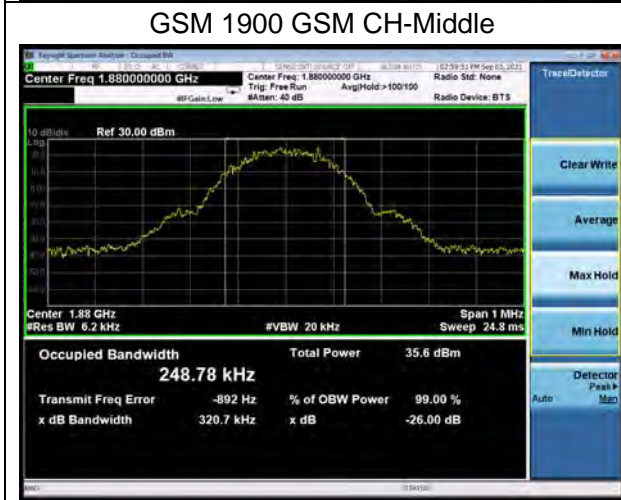
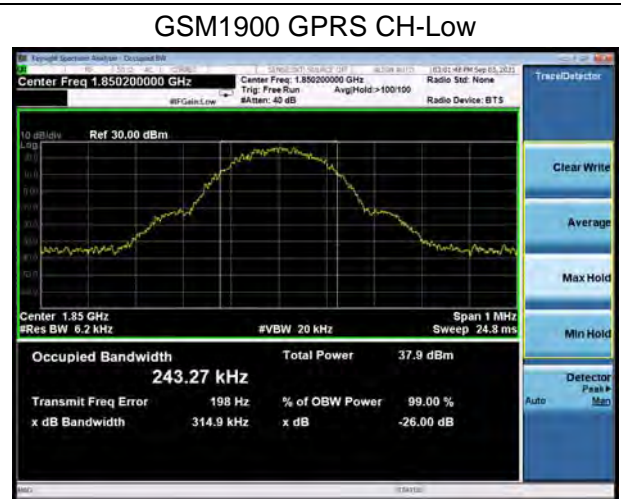
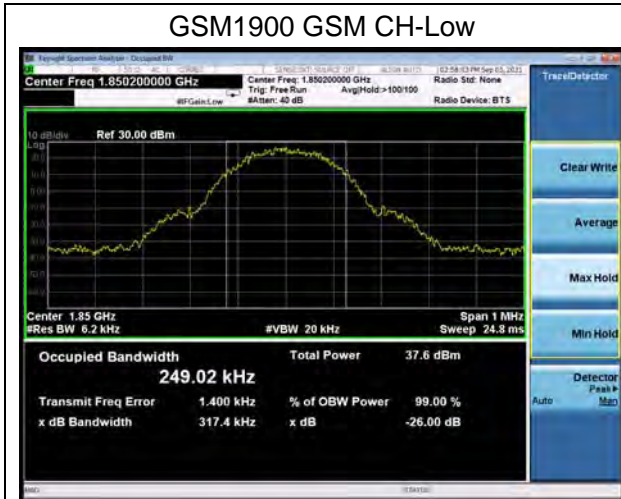
## Test Result

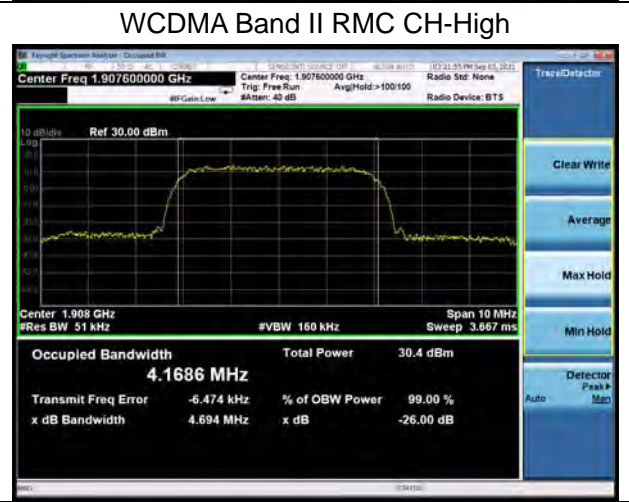
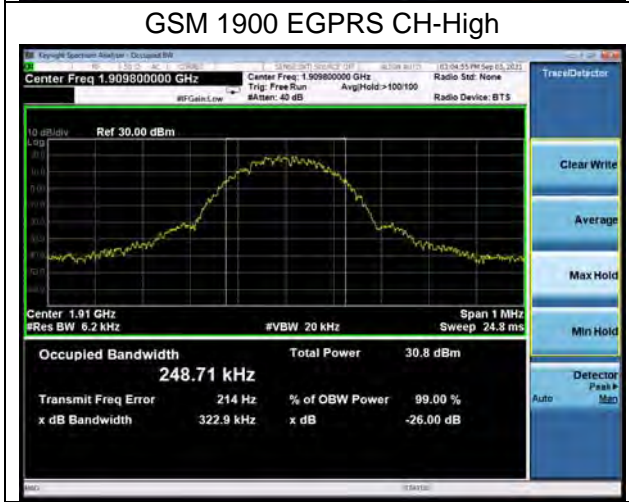
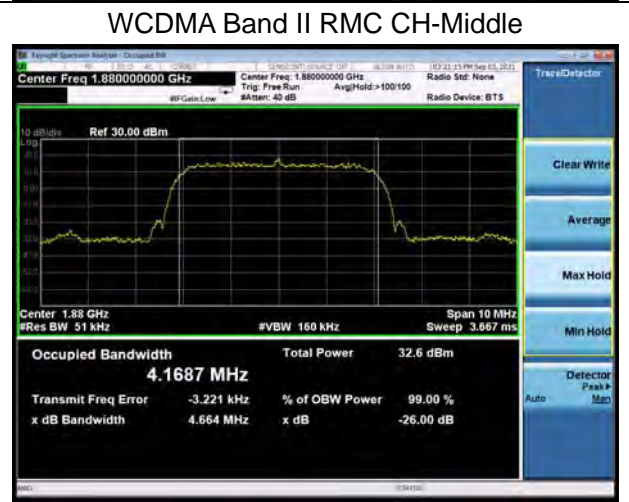
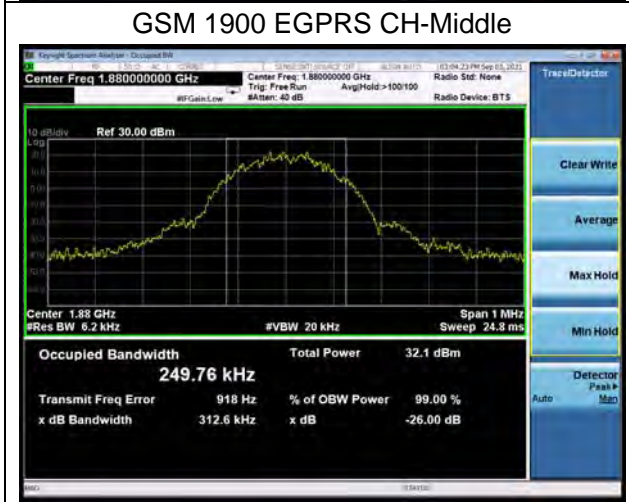
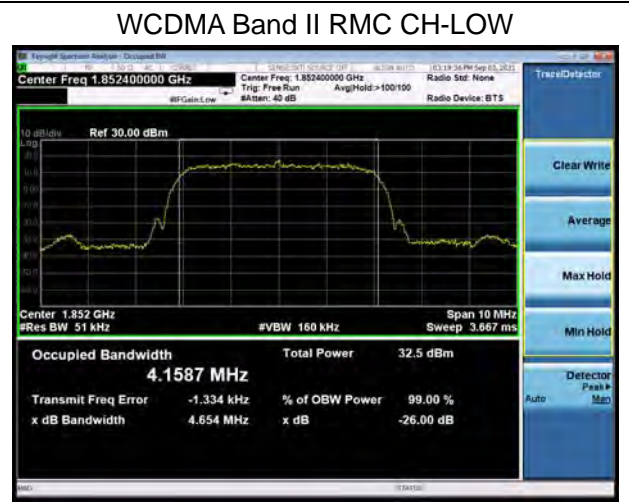
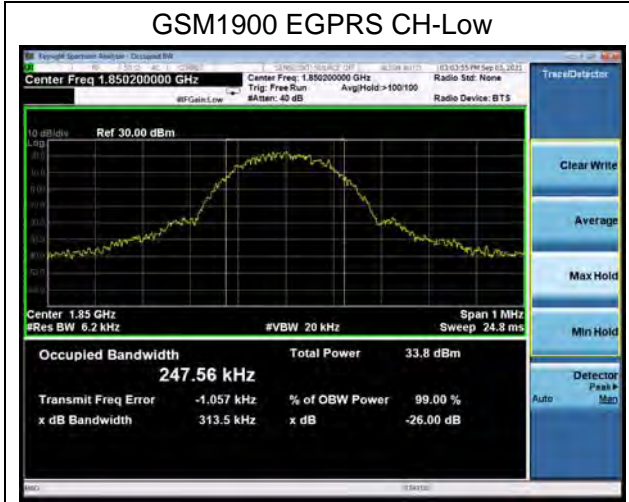
Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
GSM 1900 (GMSK)	512	1850.20	0.249	0.317
	661	1880.00	0.249	0.321
	810	1909.80	0.244	0.314
GPRS 1900 (GMSK)	512	1850.20	0.243	0.315
	661	1880.00	0.242	0.307
	810	1909.80	0.245	0.315
EGPRS 1900 (8PSK)	512	1850.20	0.248	0.314
	661	1880.00	0.250	0.313
	810	1909.80	0.249	0.323
WCDMA Band II (RMC)	9262	1852.40	4.1587	4.654
	9400	1880.00	4.1687	4.664
	9538	1907.60	4.1686	4.694

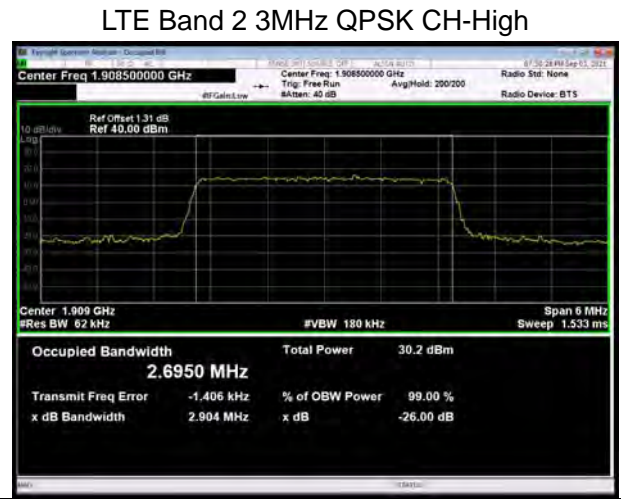
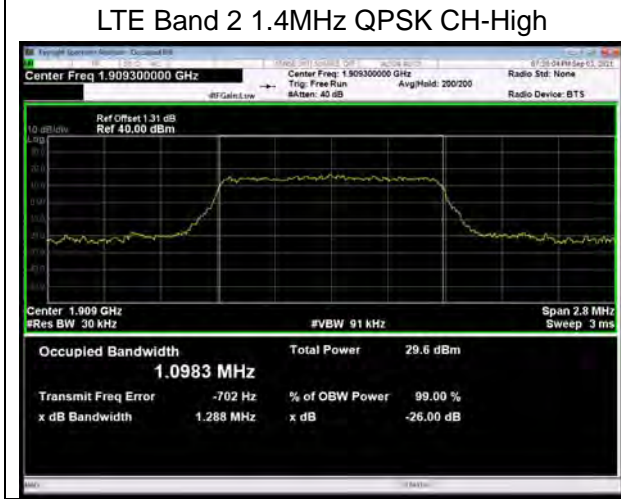
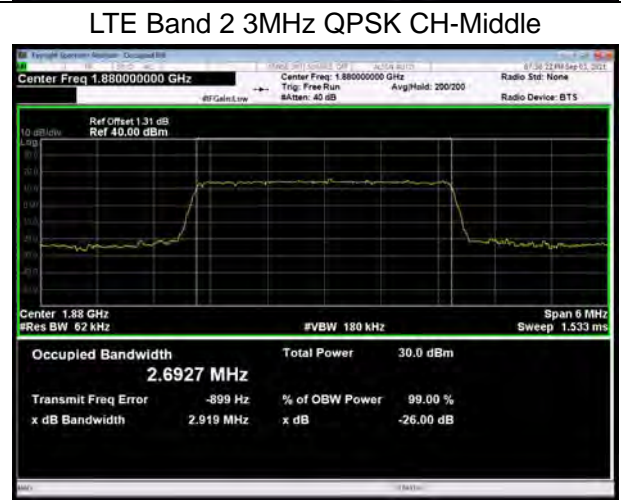
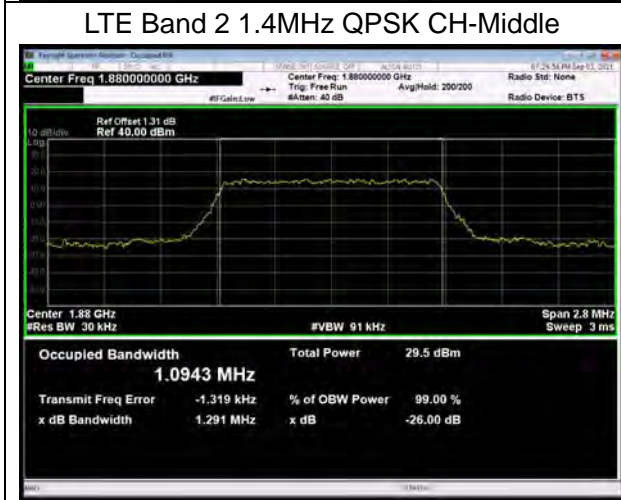
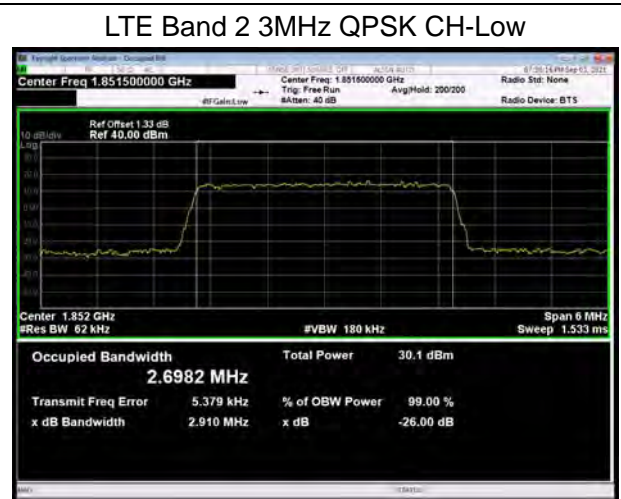
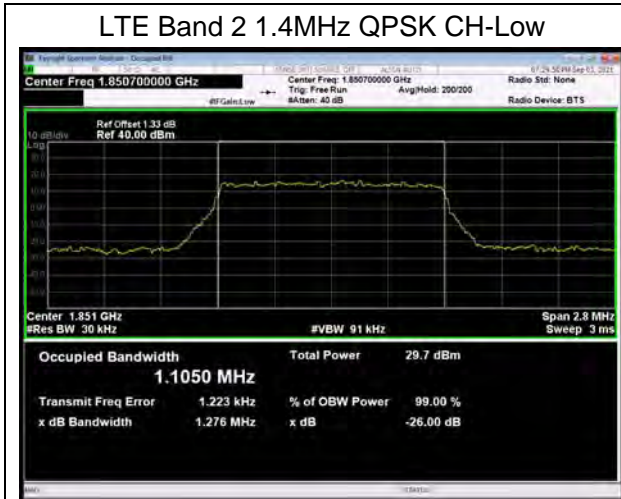
LTE Band 2						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	18607	1850.70	1.105	1.276
			18900	1880.00	1.094	1.291
			19193	1909.30	1.098	1.288
		3	18615	1851.50	2.698	2.910
			18900	1880.00	2.693	2.919
			19185	1908.50	2.695	2.904
		5	18625	1852.50	4.505	4.942
			18900	1880.00	4.514	4.868
			19175	1907.50	4.499	4.958
		10	18650	1855.00	8.988	9.642
			18900	1880.00	8.983	9.769
			19150	1905.00	8.961	9.606
		15	18675	1857.50	13.475	14.584
			18900	1880.00	13.465	14.551
			19125	1902.50	13.448	14.593
		20	18700	1860.00	18.030	19.490
			18900	1880.00	17.972	19.402



	16QAM	1.4	19100	1900.00	17.956	19.267
			18607	1850.70	1.097	1.287
			18900	1880.00	1.095	1.304
		19193	1909.30	1.094	1.265	
		3	18615	1851.50	2.697	2.895
			18900	1880.00	2.677	2.949
			19185	1908.50	2.686	2.905
		5	18625	1852.50	4.514	4.885
			18900	1880.00	4.504	4.918
			19175	1907.50	4.503	5.057
		10	18650	1855.00	8.990	9.687
			18900	1880.00	8.997	9.692
			19150	1905.00	8.993	9.708
		15	18675	1857.50	13.454	14.565
			18900	1880.00	13.446	14.376
	19125		1902.50	13.467	14.510	
	20	18700	1860.00	17.993	19.349	
		18900	1880.00	17.920	19.331	
		19100	1900.00	17.929	19.339	
	64QAM	1.4	18607	1850.70	1.098	1.278
			18900	1880.00	1.097	1.311
			19193	1909.30	1.094	1.283
		3	18615	1851.50	2.695	2.907
			18900	1880.00	2.686	2.916
			19185	1908.50	2.696	2.906
		5	18625	1852.50	4.501	4.894
			18900	1880.00	4.509	4.907
			19175	1907.50	4.506	4.911
		10	18650	1855.00	8.997	9.602
			18900	1880.00	9.000	9.716
19150			1905.00	8.971	9.726	
15		18675	1857.50	13.426	14.442	
		18900	1880.00	13.497	14.427	
		19125	1902.50	13.432	14.679	
20	18700	1860.00	17.972	19.297		
	18900	1880.00	17.959	19.191		
	19100	1900.00	17.972	19.176		

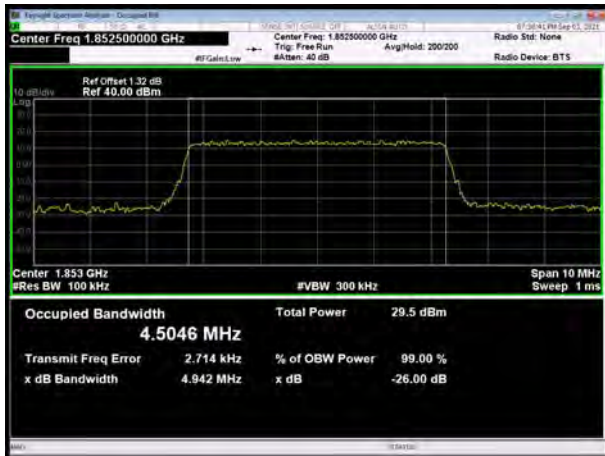




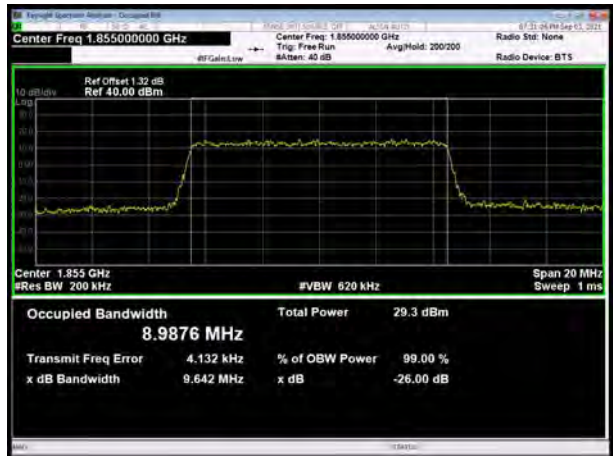




### LTE Band 2 5MHz QPSK CH-Low



### LTE Band 2 10MHz QPSK CH-Low



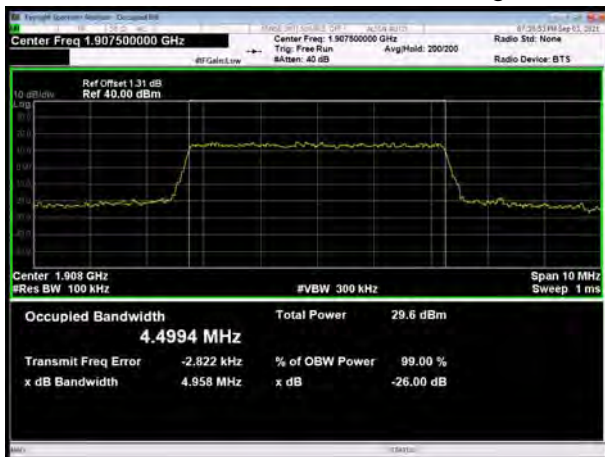
### LTE Band 2 5MHz QPSK CH-Middle



### LTE Band 2 10MHz QPSK CH-Middle

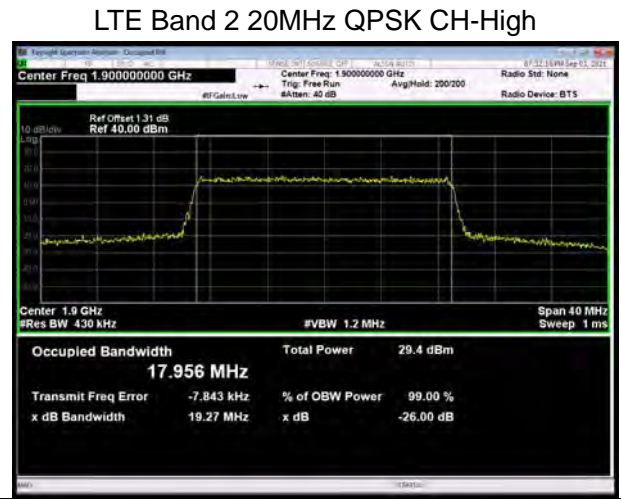
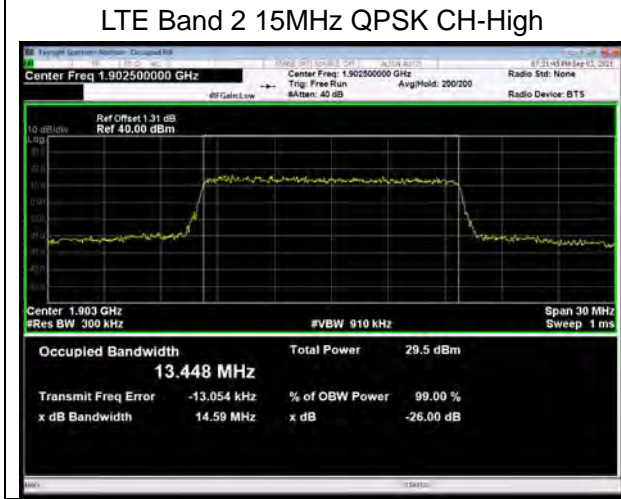
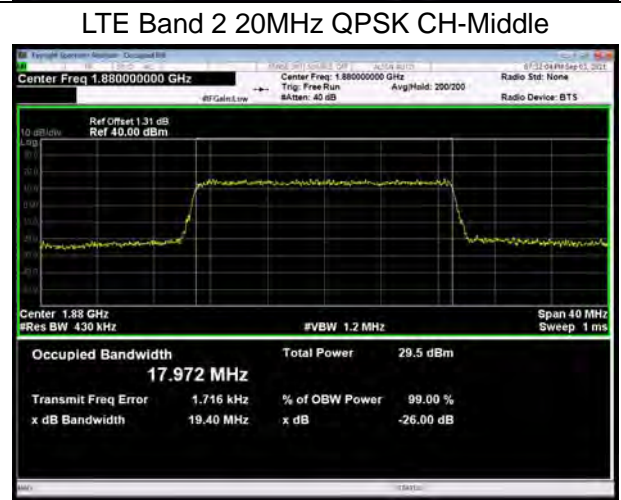
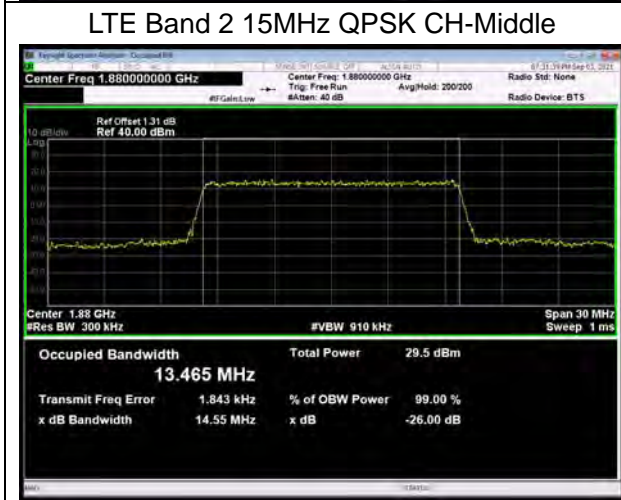
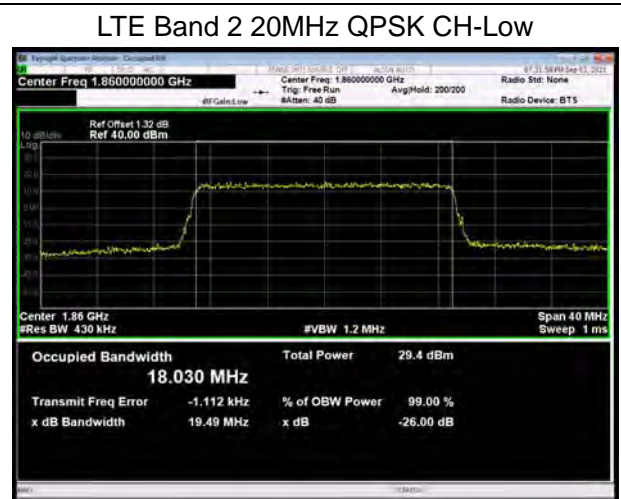
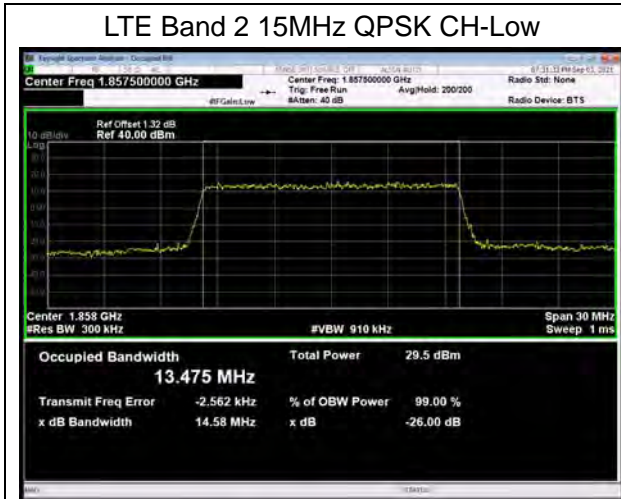


### LTE Band 2 5MHz QPSK CH-High



### LTE Band 2 10MHz QPSK CH-High



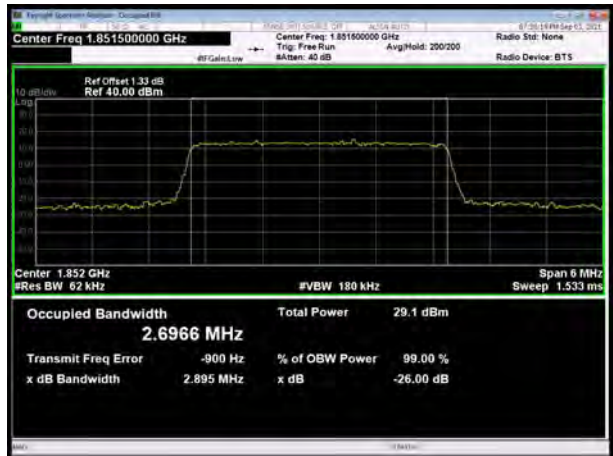




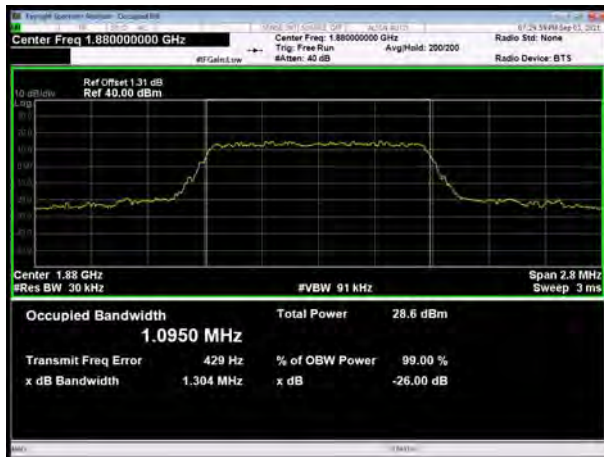
LTE Band 2 1.4MHz 16QAM CH-Low



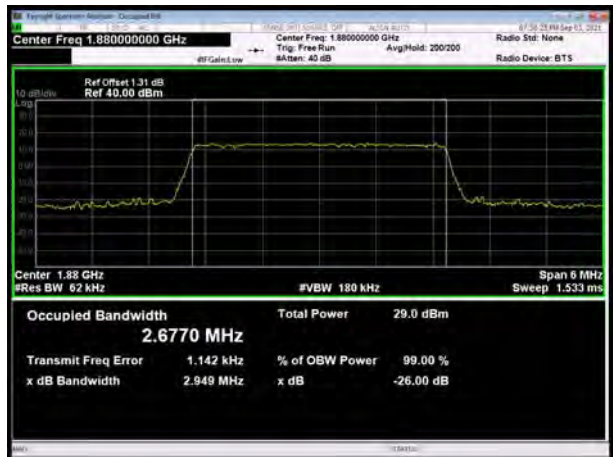
LTE Band 2 3MHz 16QAM CH-Low



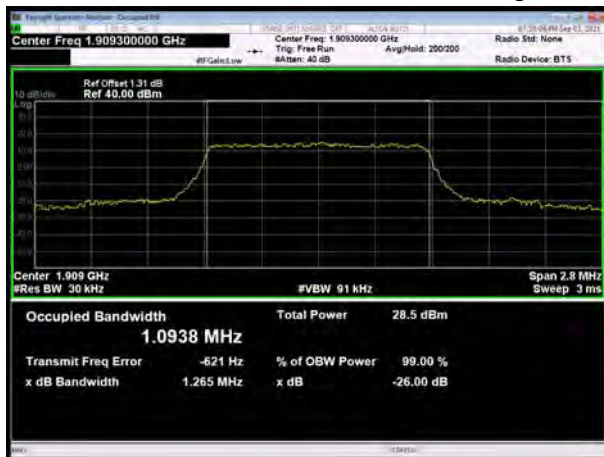
LTE Band 2 1.4MHz 16QAM CH-Middle



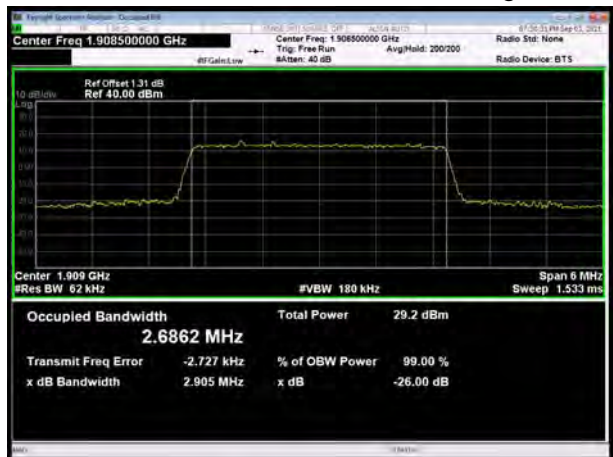
LTE Band 2 3MHz 16QAM CH-Middle



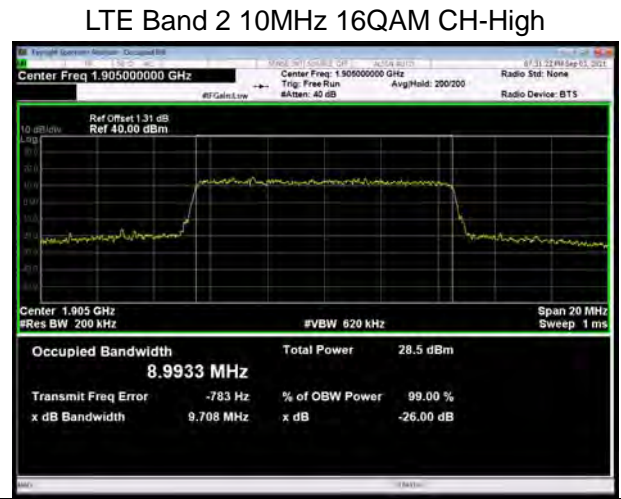
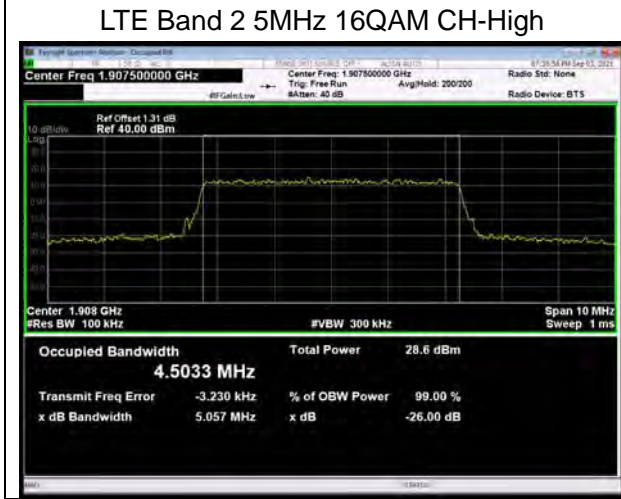
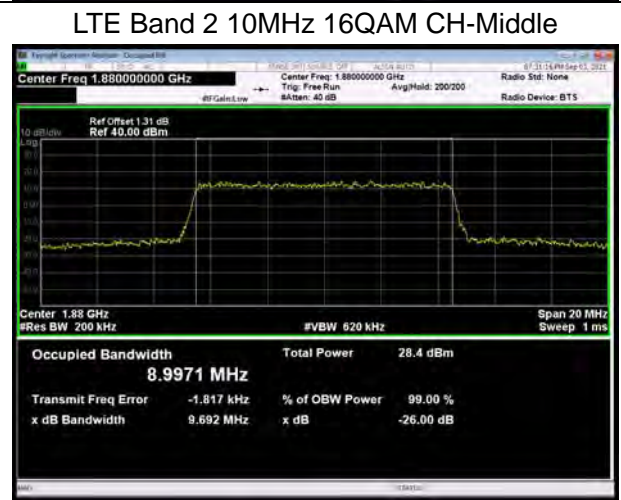
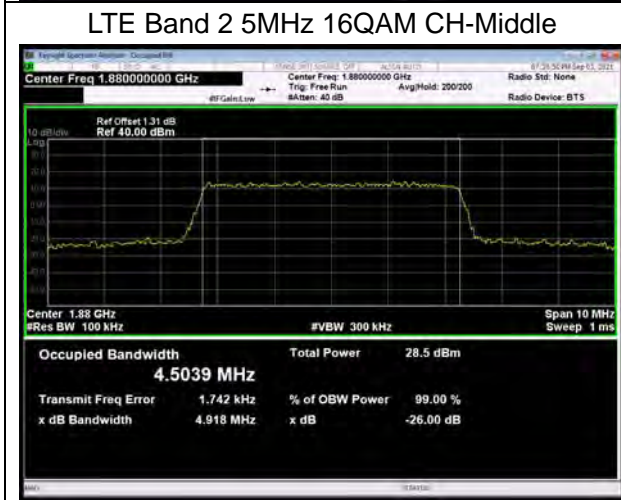
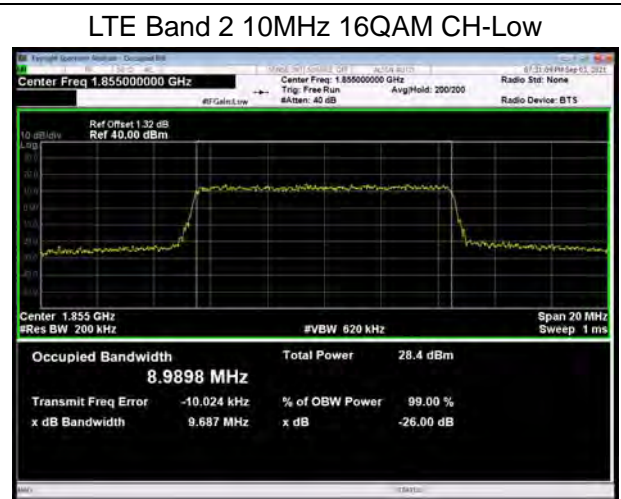
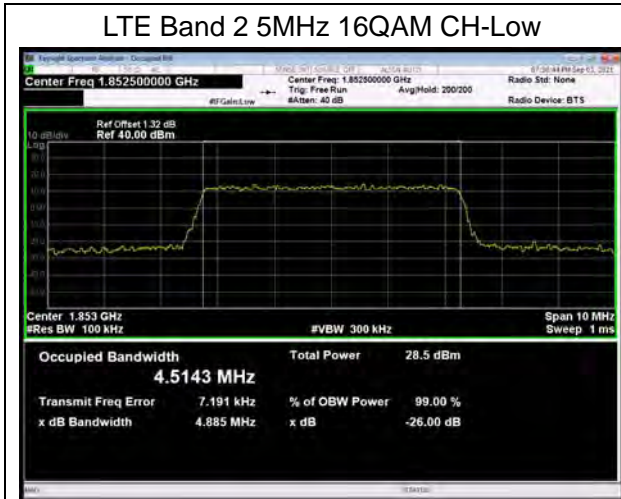
LTE Band 2 1.4MHz 16QAM CH-High



LTE Band 2 3MHz 16QAM CH-High

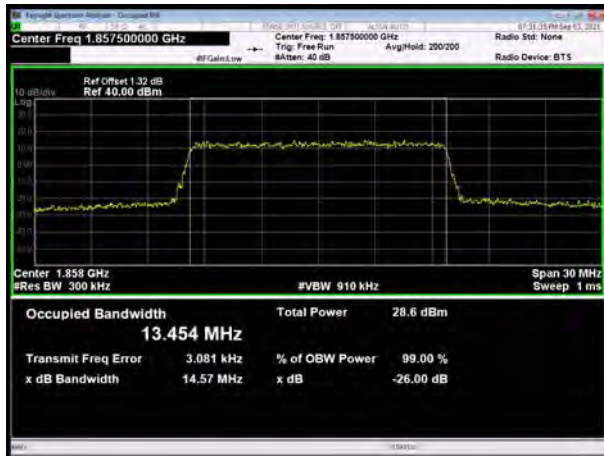




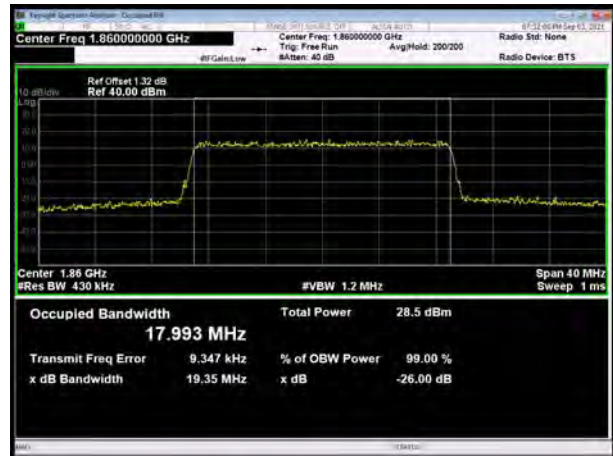




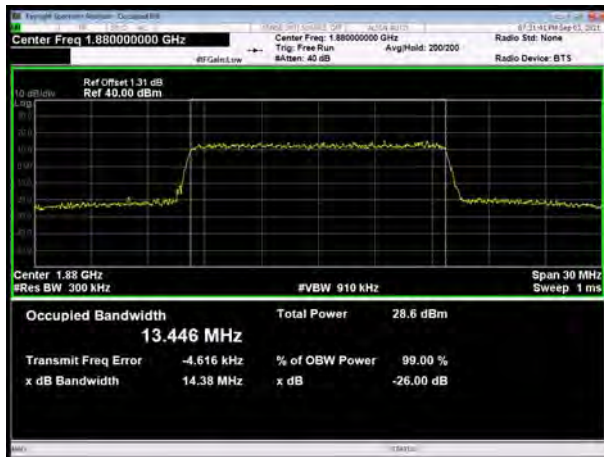
LTE Band 2 15MHz 16QAM CH-Low



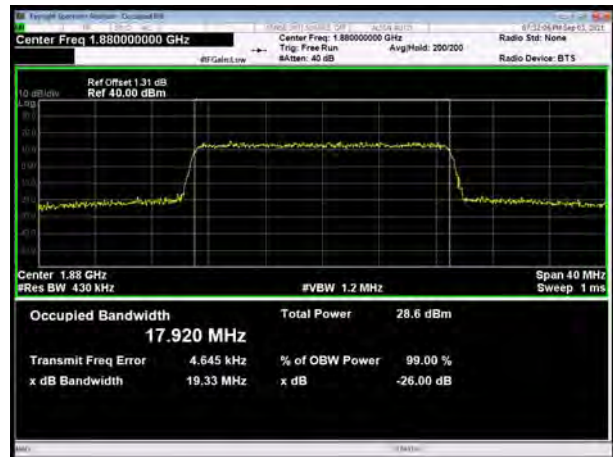
LTE Band 2 20MHz 16QAM CH-Low



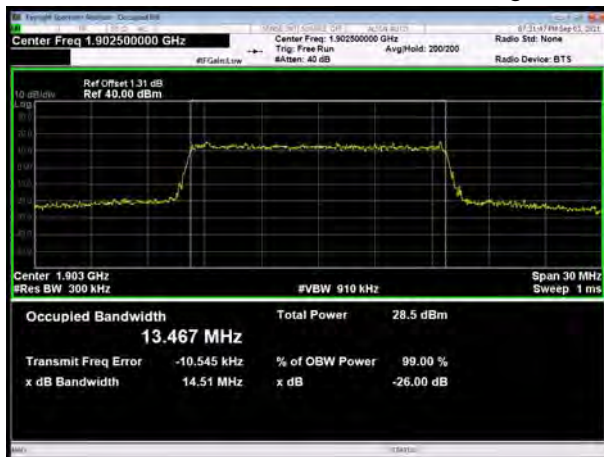
LTE Band 2 15MHz 16QAM CH-Middle



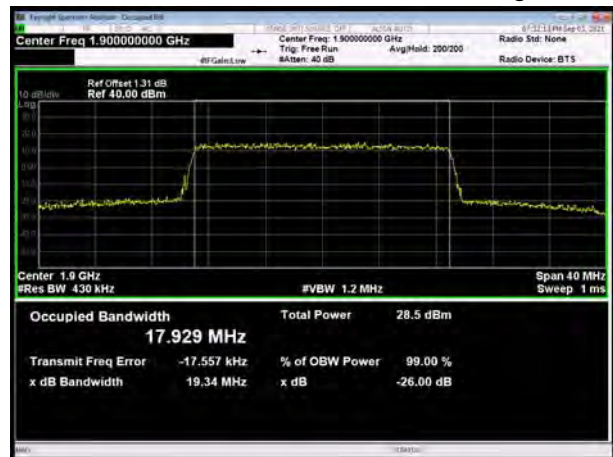
LTE Band 2 20MHz 16QAM CH-Middle



LTE Band 2 15MHz 16QAM CH-High

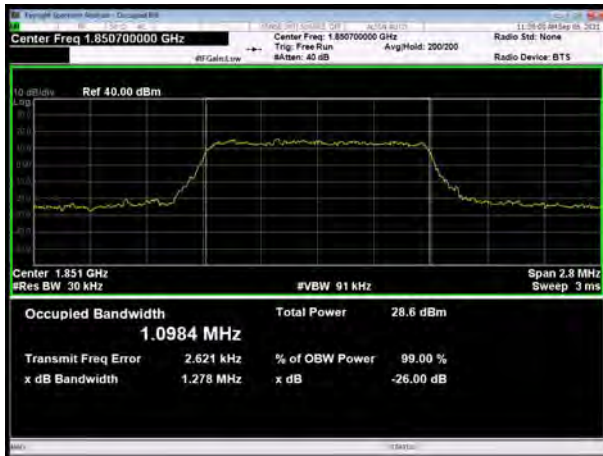


LTE Band 2 20MHz 16QAM CH-High





LTE Band 2 1.4MHz 64QAM CH-Low



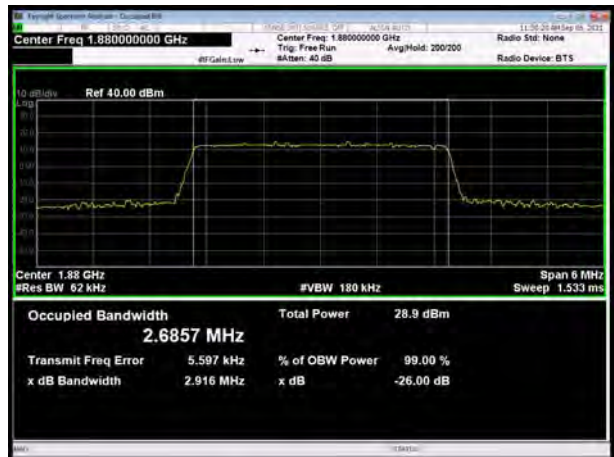
LTE Band 2 3MHz 64QAM CH-Low



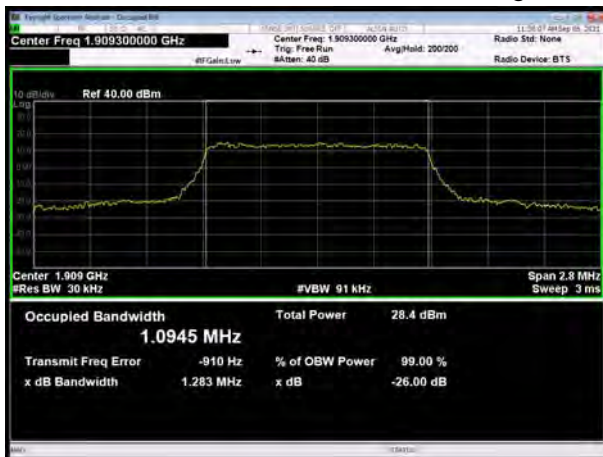
LTE Band 2 1.4MHz 64QAM CH-Middle



LTE Band 2 3MHz 64QAM CH-Middle

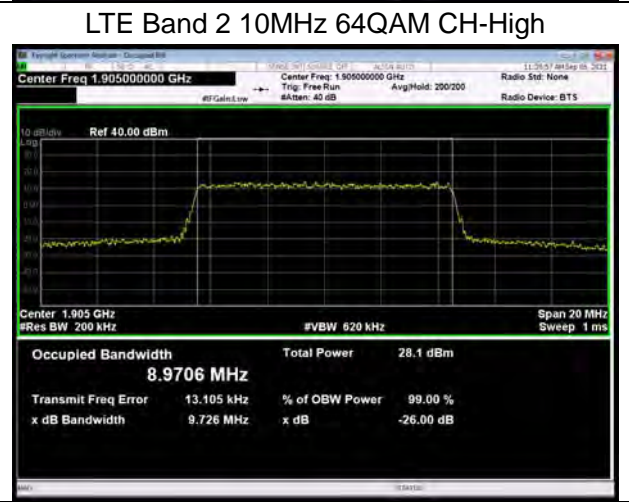
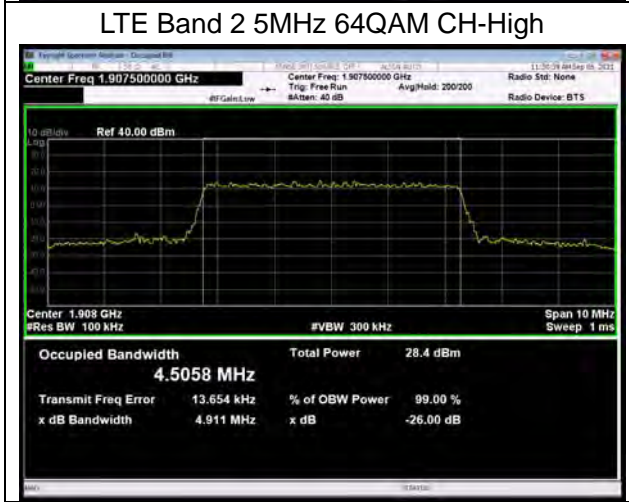
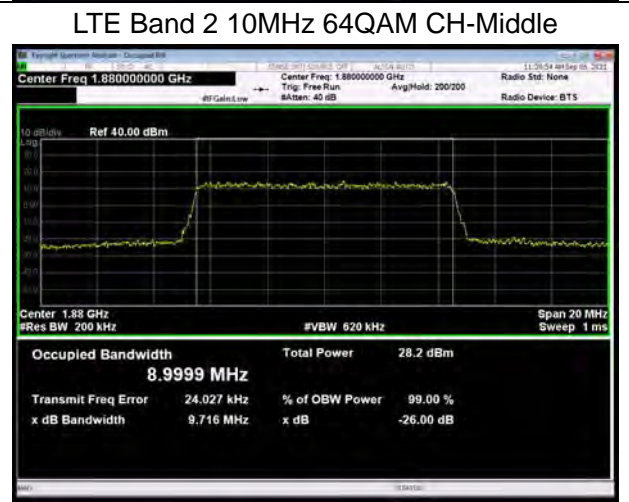
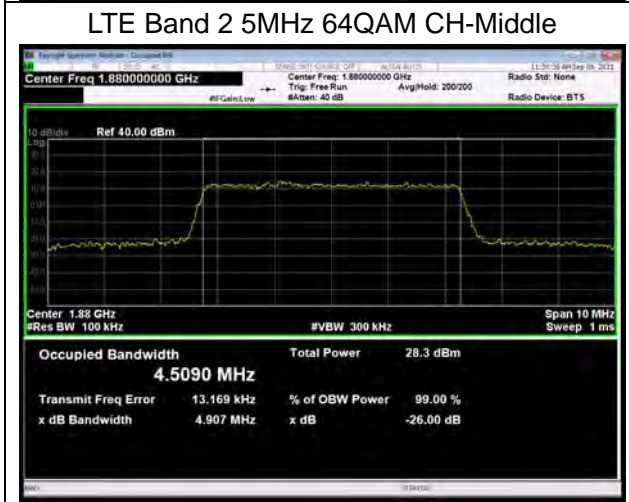
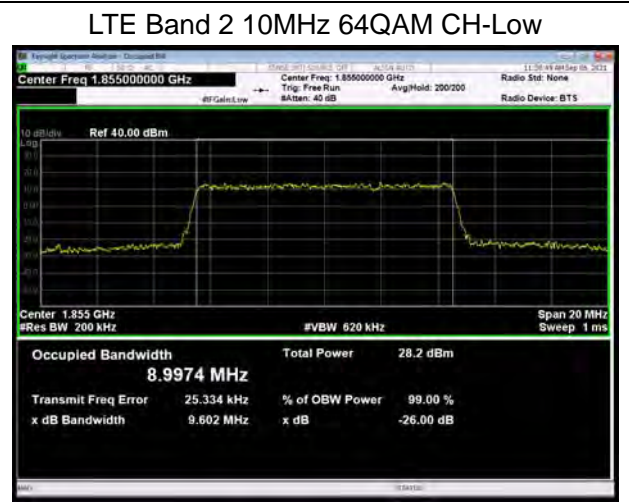
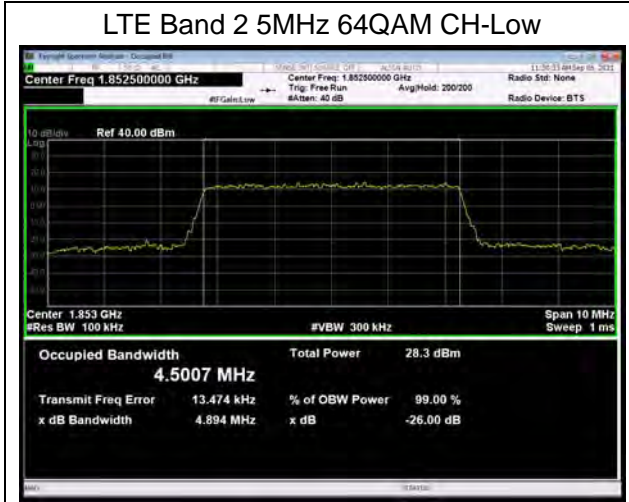


LTE Band 2 1.4MHz 64QAM CH-High



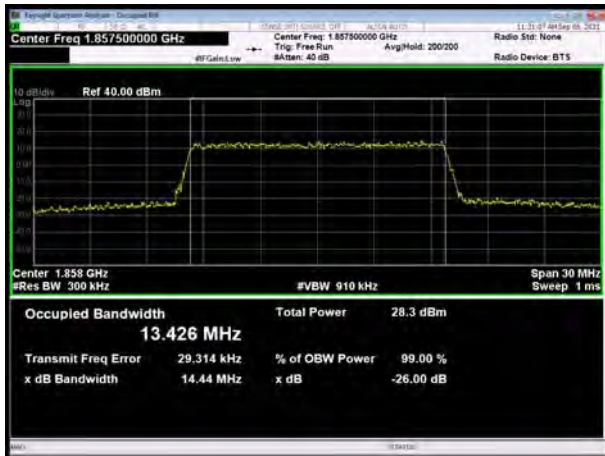
LTE Band 2 3MHz 64QAM CH-High



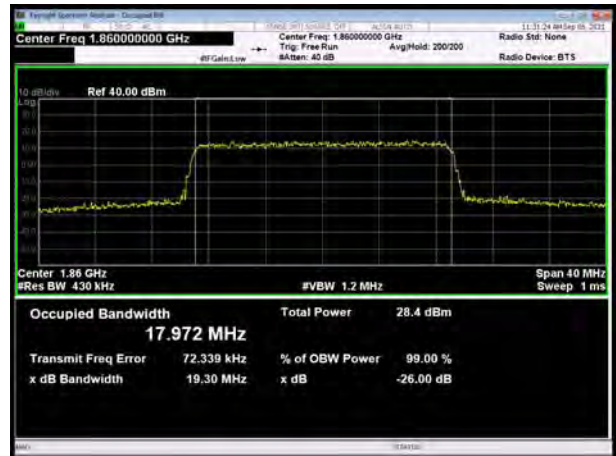




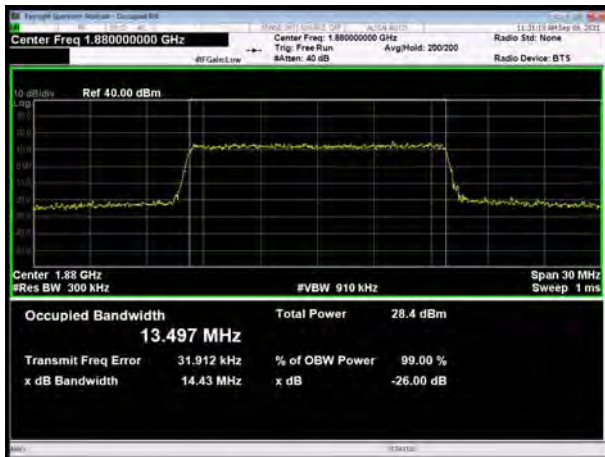
LTE Band 2 15MHz 64QAM CH-Low



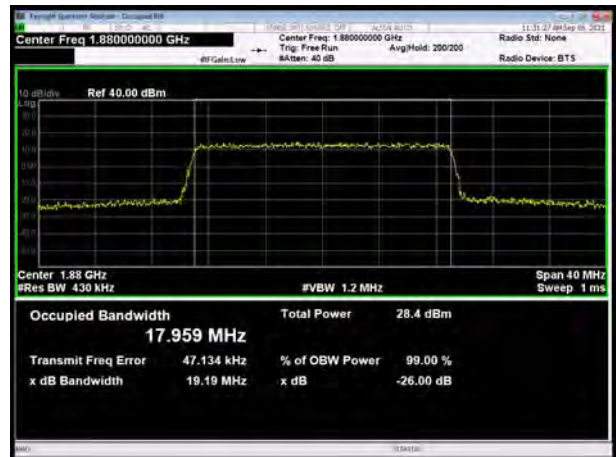
LTE Band 2 20MHz 64QAM CH-Low



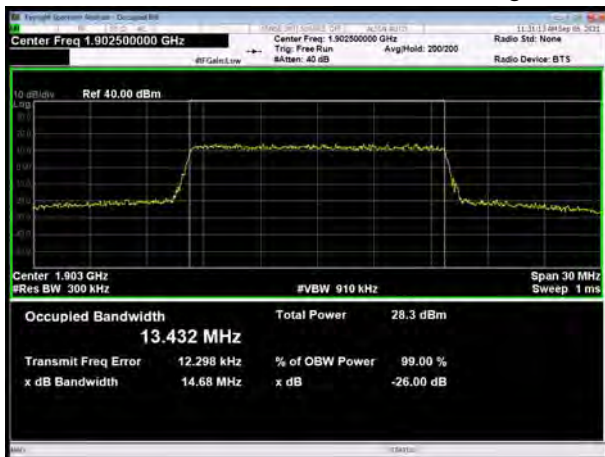
LTE Band 2 15MHz 64QAM CH-Middle



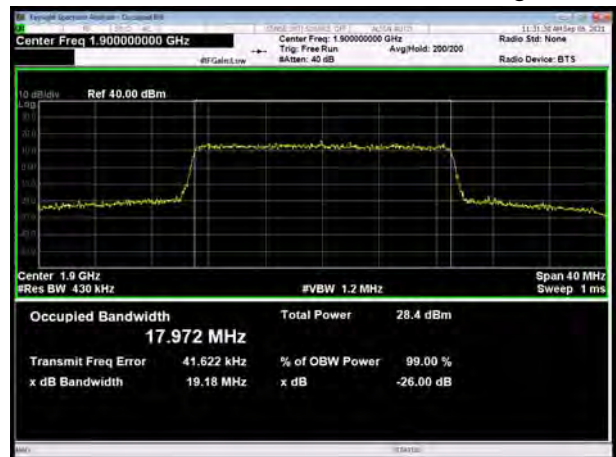
LTE Band 2 20MHz 64QAM CH-Middle



LTE Band 2 15MHz 64QAM CH-High



LTE Band 2 20MHz 64QAM CH-High



### 5.3. Band Edge Compliance

#### Ambient condition

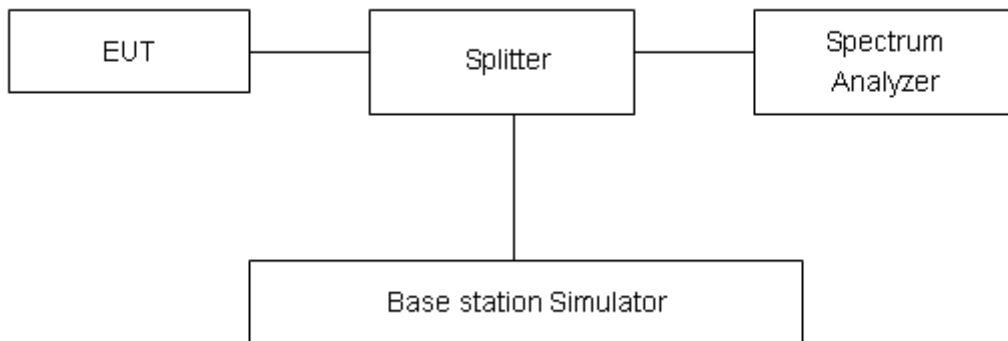
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### 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  $\geq 1\%EBW$ , VBW is set to 3x RBW.

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  $43 + 10 \log_{10} (P)$  dB.”

Limit	-13 dBm
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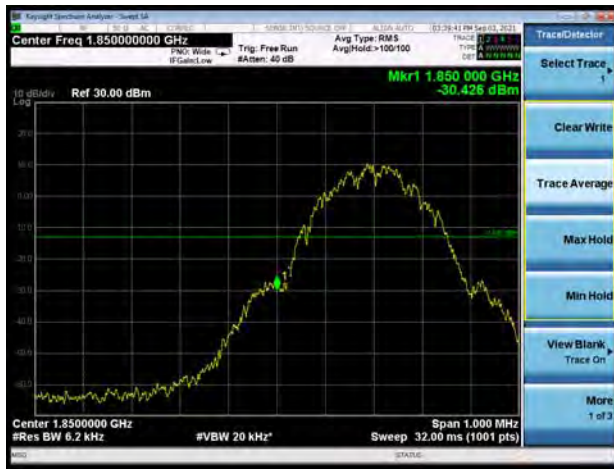
#### Measurement Uncertainty

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

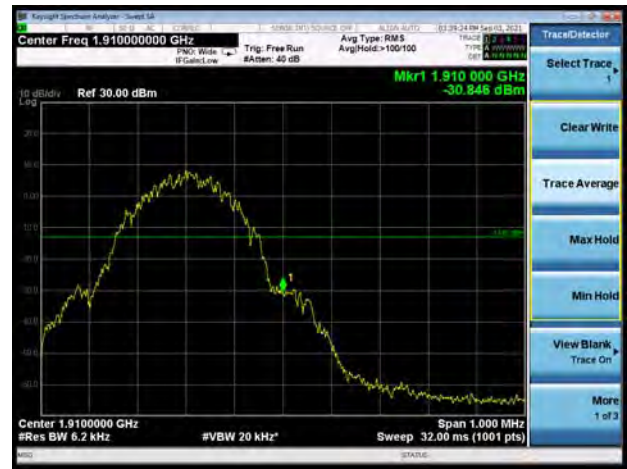


Test Result:

GSM1900 GSM CH-Low



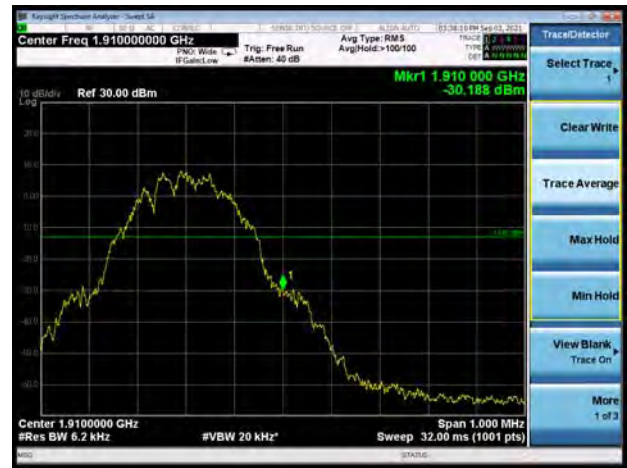
GSM 1900 GSM CH-High



GSM1900 GPRS CH-Low



GSM 1900 GPRS CH-High



GSM1900 EGPRS CH-Low



GSM 1900 EGPRS CH-High



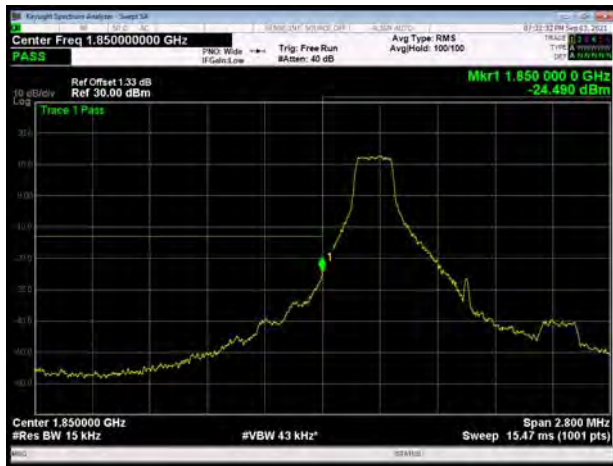
WCDMA Band II RMC CH-Low



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



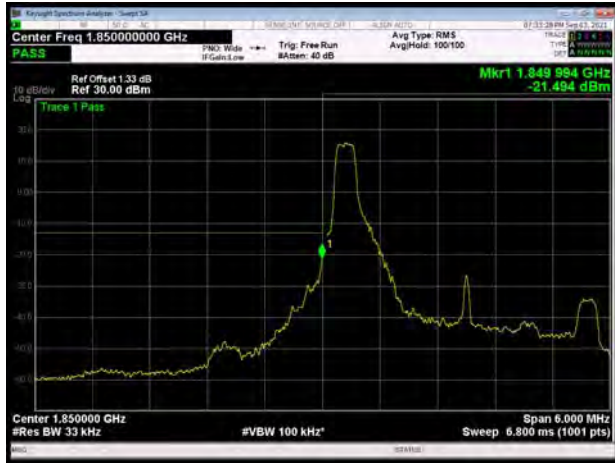
LTE Band 2 1.4MHz QPSK 100%RB CH-High







LTE Band 2 3MHz QPSK 1RB CH-Low



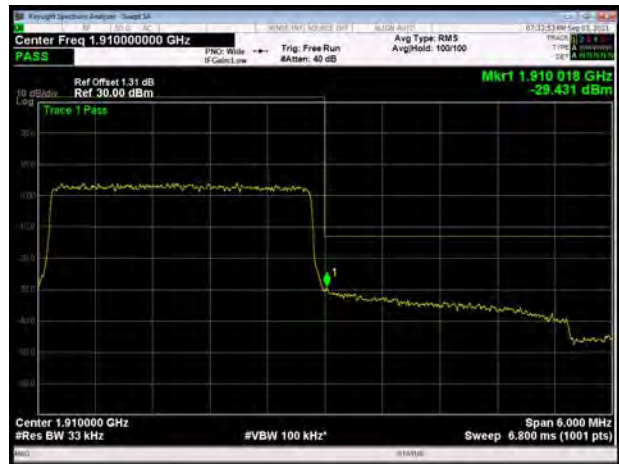
LTE Band 2 3MHz QPSK 1RB CH-High



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



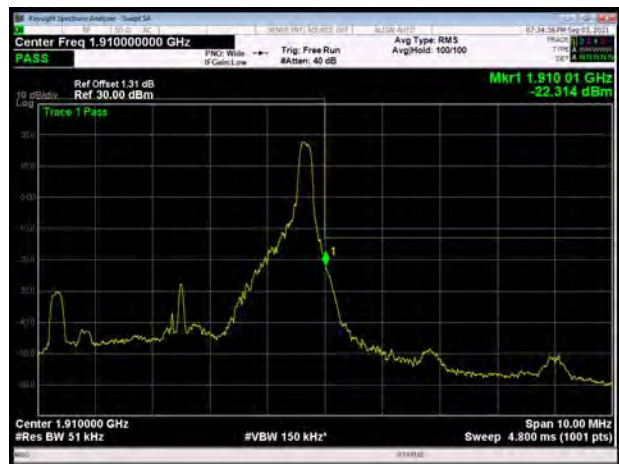
LTE Band 2 3MHz QPSK 100%RB CH-High



LTE Band 2 5MHz QPSK 1RB CH-Low



LTE Band 2 5MHz QPSK 1RB CH-High

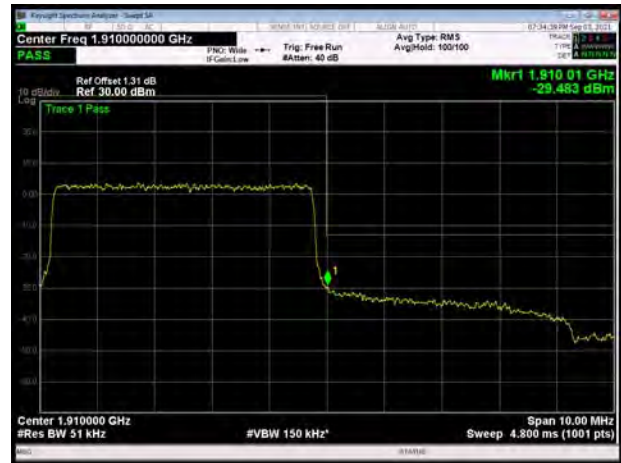




LTE Band 2 5MHz QPSK 100%RB CH-Low



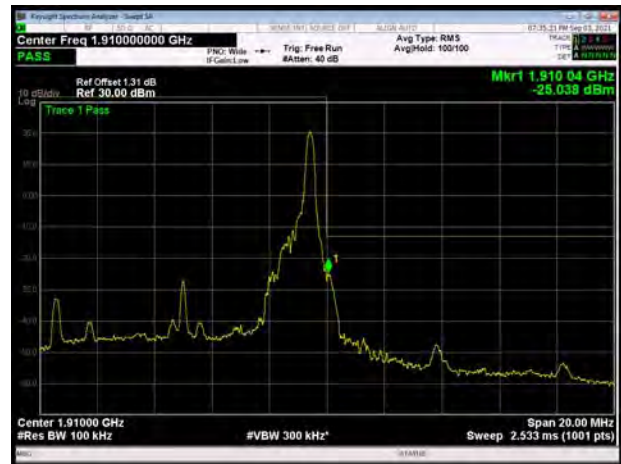
LTE Band 2 5MHz QPSK 100%RB CH-High



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

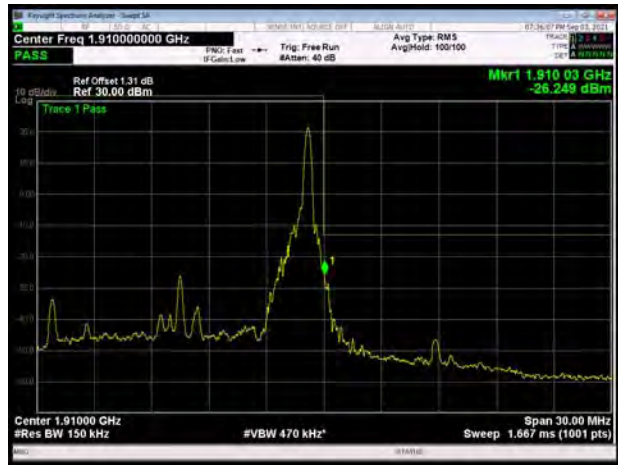




LTE Band 2 15MHz QPSK 1RB CH-Low



LTE Band 2 15MHz QPSK 1RB CH-High



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



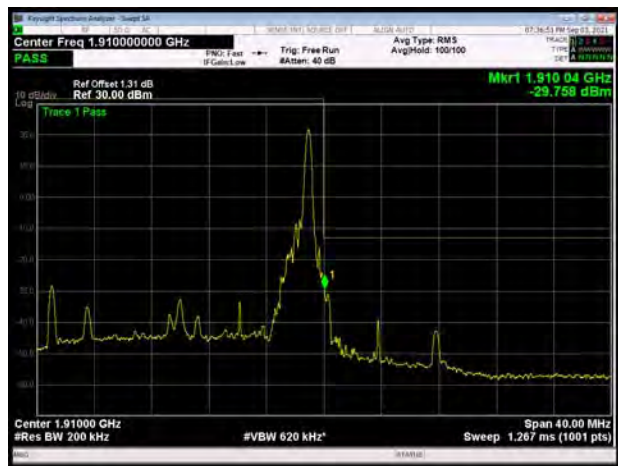
LTE Band 2 15MHz QPSK 100%RB CH-High



LTE Band 2 20MHz QPSK 1RB CH-Low



LTE Band 2 20MHz QPSK 1RB CH-High

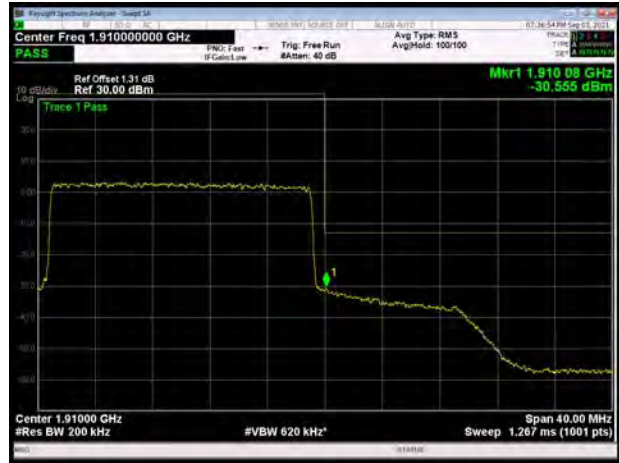




LTE Band 2 20MHz QPSK 100%RB CH-Low



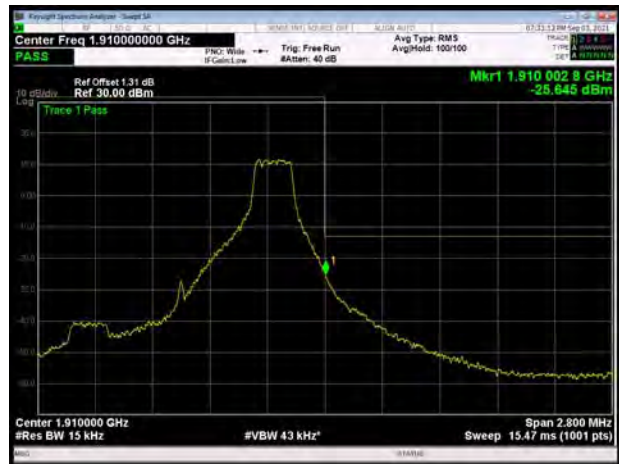
LTE Band 2 20MHz QPSK 100%RB CH-High



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

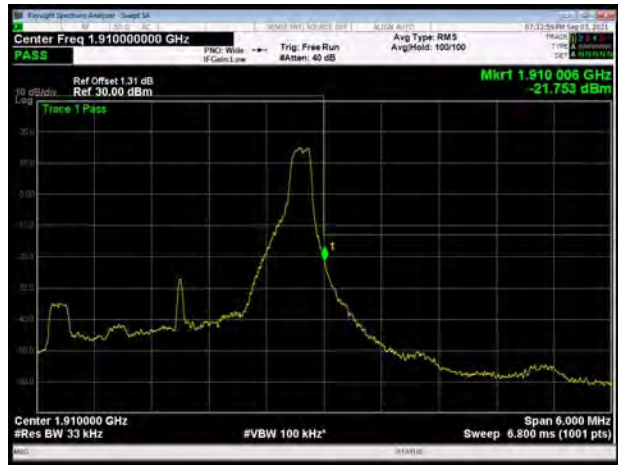




LTE Band 2 3MHz 16QAM 1RB CH-Low



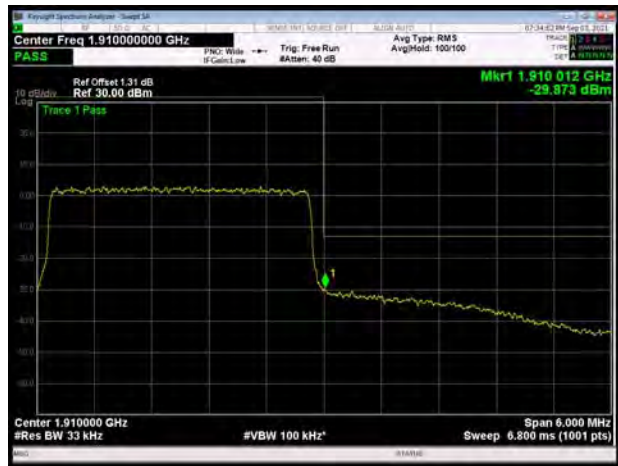
LTE Band 2 3MHz 16QAM 1RB CH-High



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



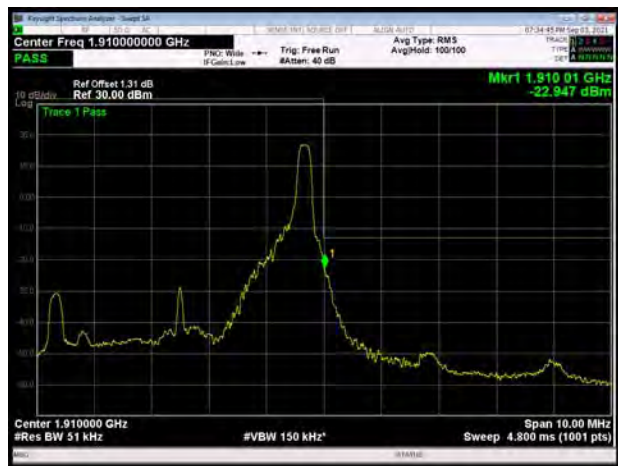
LTE Band 2 3MHz 16QAM 100%RB CH-High



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

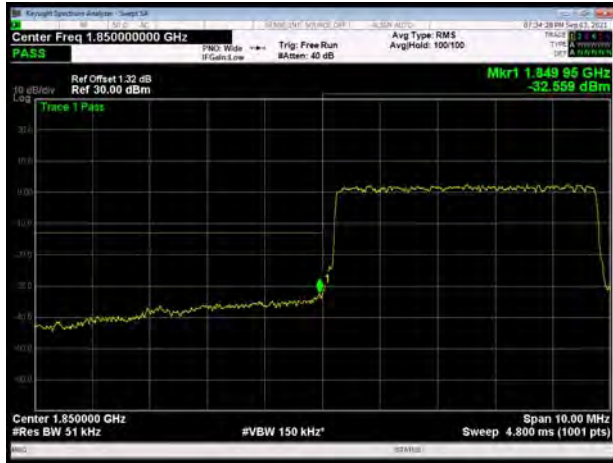


LTE Band 2 5MHz 16QAM 1RB CH-High





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



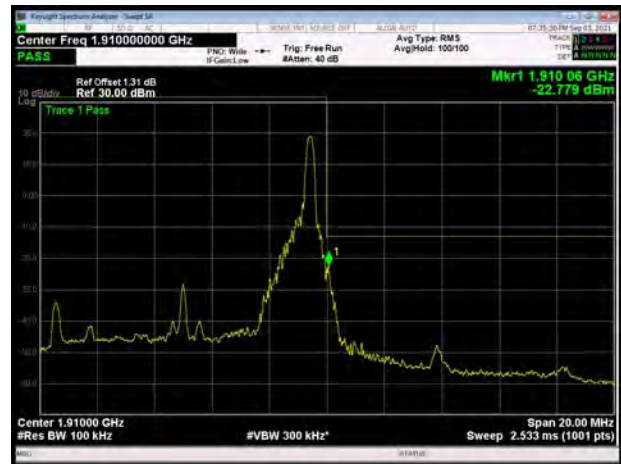
LTE Band 2 5MHz 16QAM 100%RB CH-High



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



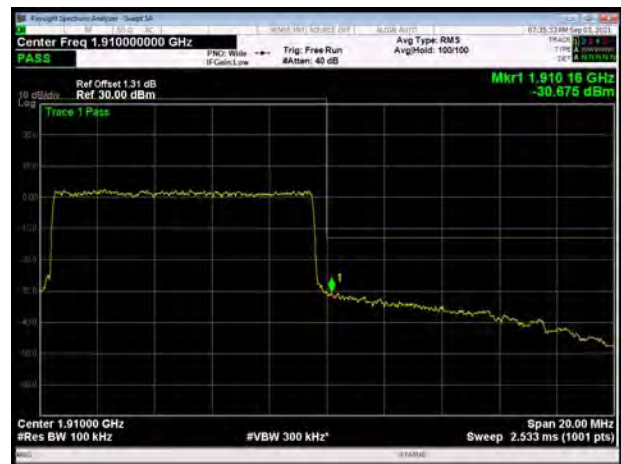
LTE Band 2 10MHz 16QAM 1RB CH-High



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



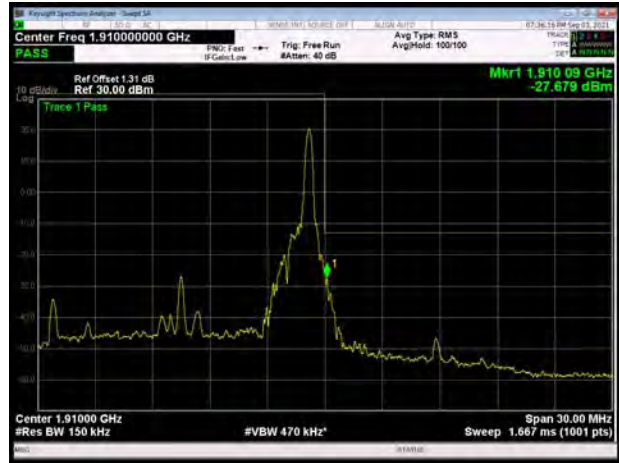
LTE Band 2 10MHz 16QAM 100%RB CH-High



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



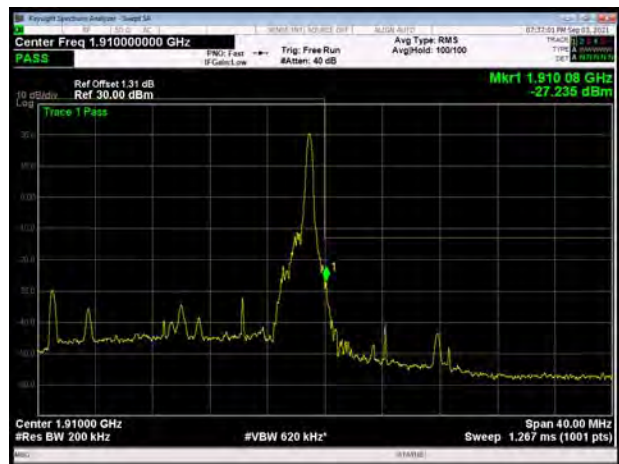
LTE Band 2 15MHz 16QAM 100%RB CH-High



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

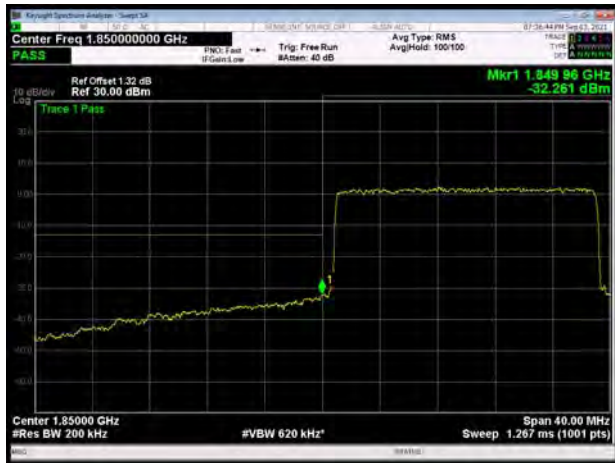


LTE Band 2 20MHz 16QAM 1RB CH-High

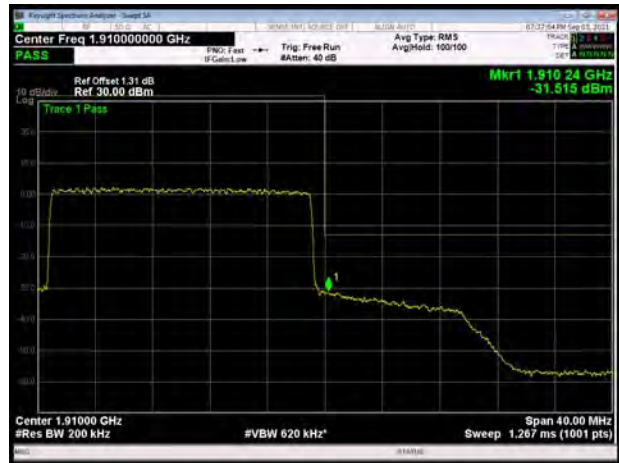




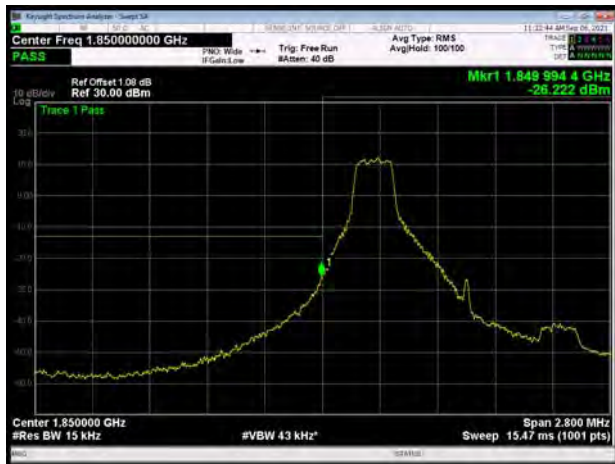
LTE Band 2 20MHz 16QAM 100%RB CH-Low



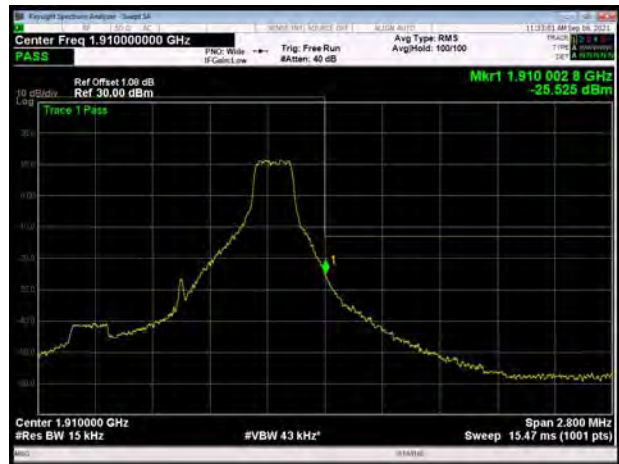
LTE Band 2 20MHz 16QAM 100%RB CH-High



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



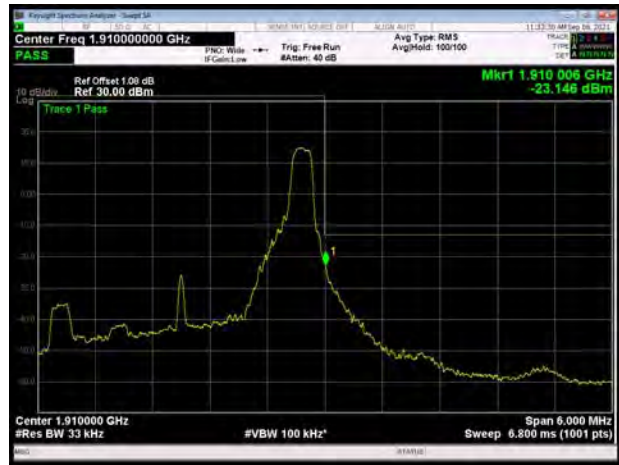




LTE Band 2 3MHz 64QAM 1RB CH-Low



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



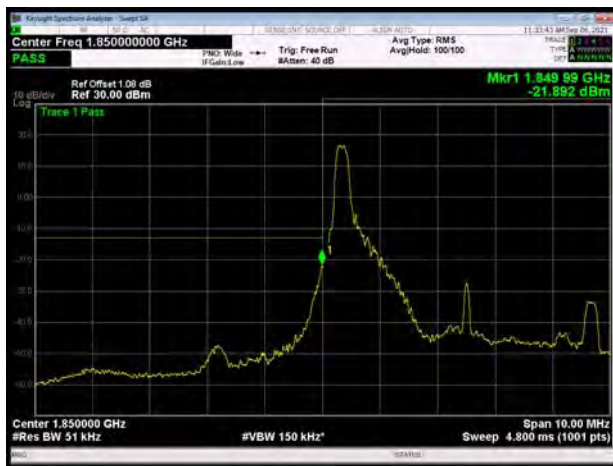
LTE Band 2 3MHz 64QAM 100%RB CH-Low



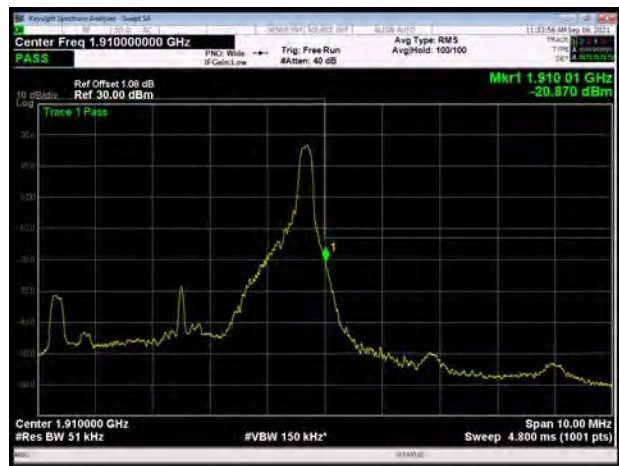
LTE Band 2 3MHz 64QAM 100%RB CH-High



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



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

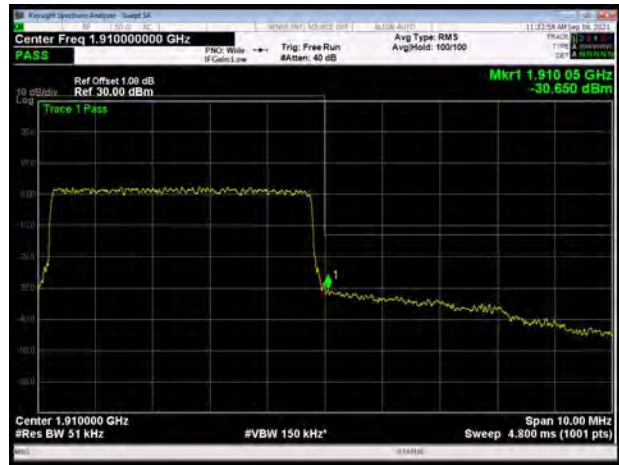




LTE Band 2 5MHz 64QAM 100%RB CH-Low



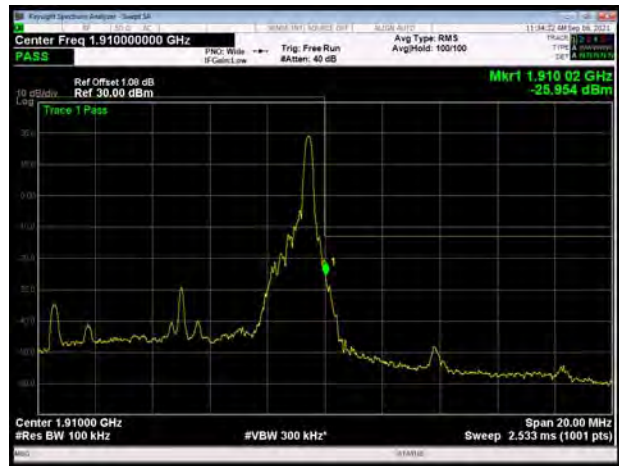
LTE Band 2 5MHz 64QAM 100%RB CH-High



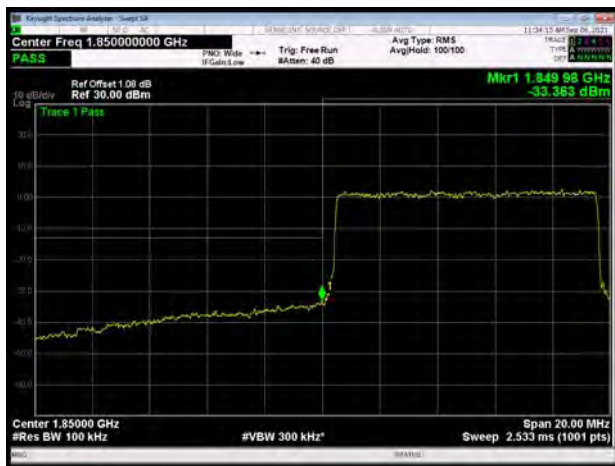
LTE Band 2 10MHz 64QAM 1RB CH-Low



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



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



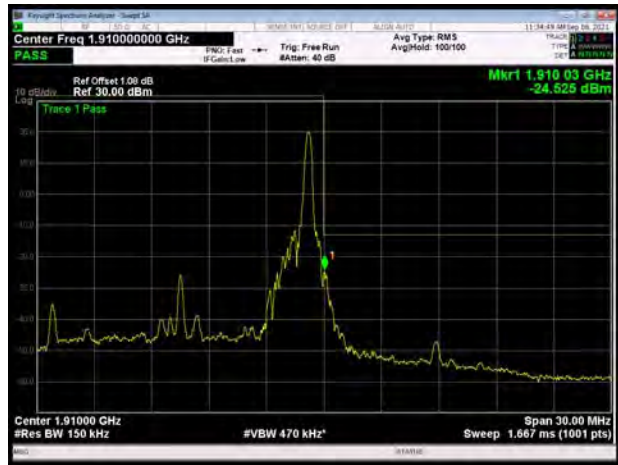
LTE Band 2 10MHz 64QAM 100%RB CH-High



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



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



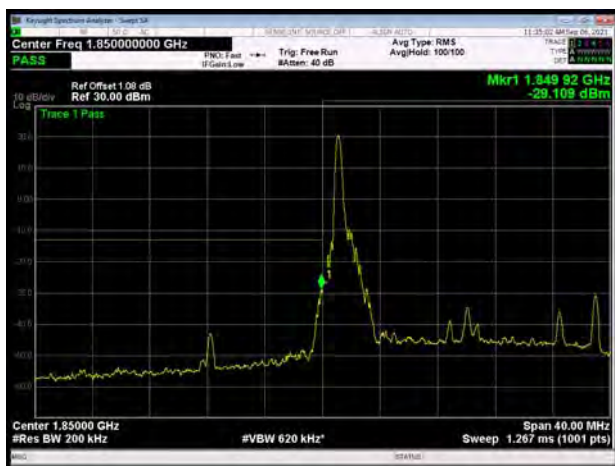
LTE Band 2 15MHz 64QAM 100%RB CH-Low



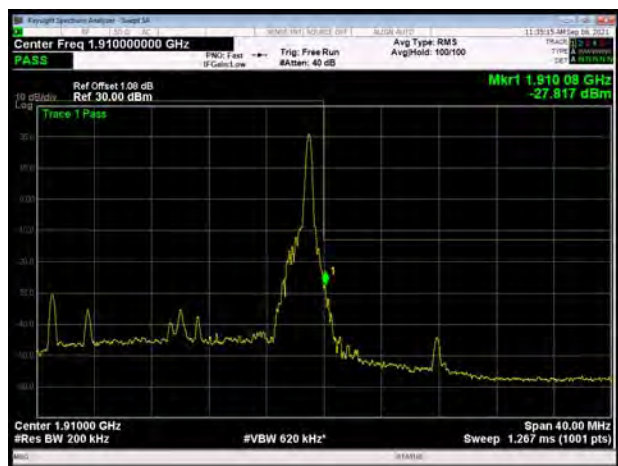
LTE Band 2 15MHz 64QAM 100%RB CH-High



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

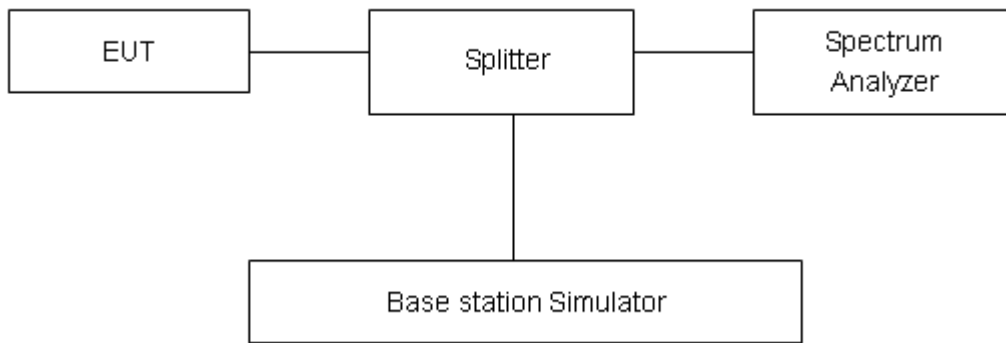
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### 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	30.97	28.36	2.61	≤13	PASS
	661	1880	29.74	27.12	2.62	≤13	PASS
	810	1909.8	28.10	25.49	2.61	≤13	PASS
GPRS 1900 (GMSK)	512	1850.2	30.99	28.38	2.61	≤13	PASS
	661	1880	29.75	27.13	2.62	≤13	PASS
	810	1909.8	28.09	25.47	2.62	≤13	PASS
EGPRS 1900 (8PSK)	512	1850.2	30.60	25.05	5.55	≤13	PASS
	661	1880	29.23	23.66	5.57	≤13	PASS
	810	1909.8	27.54	22.00	5.54	≤13	PASS
WCDMA Band II (RMC)	9262	1852.4	26.63	23.66	2.97	≤13	PASS
	9400	1880	26.59	23.67	2.92	≤13	PASS
	9538	1907.6	24.73	22.04	2.69	≤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	2.38	21.60	5.24	≤13	PASS
		18900	1880.0	2.39	21.56	5.02	≤13	PASS
		19193	1909.3	2.39	21.63	4.77	≤13	PASS
	3	18615	1851.5	5.61	21.51	5.32	≤13	PASS
		18900	1880	5.61	21.48	5.10	≤13	PASS
		19185	1908.5	5.60	21.54	4.90	≤13	PASS
	5	18625	1852.5	9.45	21.54	5.33	≤13	PASS
		18900	1880	9.38	21.52	5.20	≤13	PASS
		19175	1907.5	9.46	21.56	4.91	≤13	PASS
	10	18650	1855	18.63	21.57	5.32	≤13	PASS
		18900	1880	18.75	21.59	5.13	≤13	PASS
		19150	1905	18.57	21.59	4.93	≤13	PASS
	15	18675	1857.5	28.06	21.58	5.60	≤13	PASS
		18900	1880	28.02	21.61	5.50	≤13	PASS
		19125	1902.5	28.04	21.62	5.36	≤13	PASS
	20	18700	1860	37.52	21.52	5.37	≤13	PASS
		18900	1880	37.37	21.52	5.38	≤13	PASS
		19100	1900	37.22	21.50	5.20	≤13	PASS
16QAM	1.4	18607	1850.7	2.38	20.61	5.24	≤13	PASS
		18900	1880.0	2.40	20.59	5.02	≤13	PASS



	3	19193	1909.3	2.36	20.65	4.77	≤13	PASS
		18615	1851.5	5.59	20.50	5.32	≤13	PASS
		18900	1880	5.63	20.47	5.10	≤13	PASS
		19185	1908.5	5.59	20.59	4.90	≤13	PASS
	5	18625	1852.5	9.40	20.53	5.33	≤13	PASS
		18900	1880	9.42	20.52	5.20	≤13	PASS
		19175	1907.5	9.56	20.54	4.91	≤13	PASS
	10	18650	1855	18.68	20.55	5.32	≤13	PASS
		18900	1880	18.69	20.56	5.13	≤13	PASS
		19150	1905	18.70	20.55	4.93	≤13	PASS
	15	18675	1857.5	28.02	20.55	5.60	≤13	PASS
		18900	1880	27.82	20.54	5.50	≤13	PASS
		19125	1902.5	27.98	20.58	5.36	≤13	PASS
	20	18700	1860	37.34	20.51	5.37	≤13	PASS
		18900	1880	37.25	20.53	5.38	≤13	PASS
19100		1900	37.27	20.48	5.20	≤13	PASS	
64QAM	1.4	18607	1850.7	26.48	20.47	6.01	≤13	PASS
		18900	1880.0	26.21	20.39	5.82	≤13	PASS
		19193	1909.3	26.06	20.47	5.59	≤13	PASS
	3	18615	1851.5	26.43	20.33	6.10	≤13	PASS
		18900	1880	26.22	20.28	5.94	≤13	PASS
		19185	1908.5	26.12	20.43	5.69	≤13	PASS
	5	18625	1852.5	26.37	20.33	6.04	≤13	PASS
		18900	1880	26.30	20.33	5.97	≤13	PASS
		19175	1907.5	26.08	20.37	5.71	≤13	PASS
	10	18650	1855	26.46	20.36	6.10	≤13	PASS
		18900	1880	26.29	20.38	5.91	≤13	PASS
		19150	1905	26.13	20.37	5.76	≤13	PASS
	15	18675	1857.5	26.50	20.37	6.13	≤13	PASS
		18900	1880	26.45	20.39	6.06	≤13	PASS
		19125	1902.5	26.31	20.41	5.90	≤13	PASS
	20	18700	1860	26.42	20.34	6.08	≤13	PASS
		18900	1880	26.35	20.32	6.03	≤13	PASS
		19100	1900	26.26	20.31	5.95	≤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.

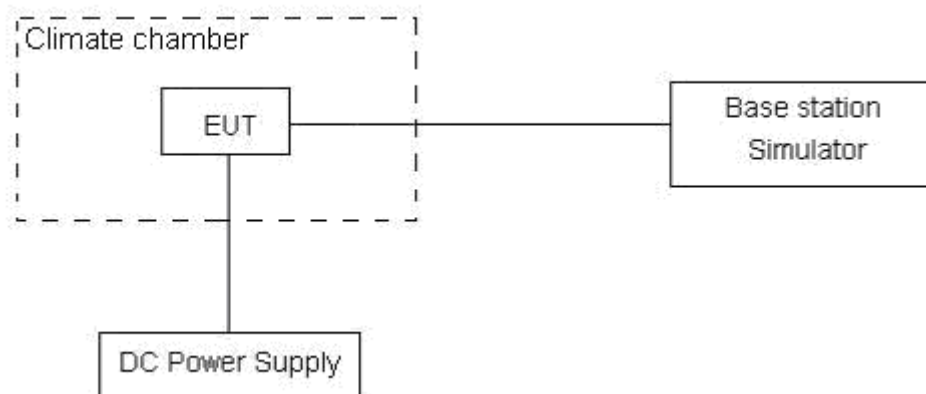
#### Frequency Stability (Voltage Variation)

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 3.5V and 4.43V, with a nominal voltage of 3.85V.

### 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**

GSM1900						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	GMSK	8PSK	GMSK	8PSK	
Normal (25°C)	Normal	10.63	5.64	0.00565	0.00300	PASS
Extreme (50°C)		4.72	8.57	0.00251	0.00456	PASS
Extreme (40°C)		14.24	6.00	0.00757	0.00319	PASS
Extreme (30°C)		15.47	5.66	0.00823	0.00301	PASS
Extreme (20°C)		2.07	15.85	0.00110	0.00843	PASS
Extreme (10°C)		15.55	1.90	0.00827	0.00101	PASS
Extreme (0°C)		8.99	3.47	0.00478	0.00184	PASS
Extreme (-10°C)		14.29	2.74	0.00760	0.00146	PASS
Extreme (-20°C)		12.97	9.29	0.00690	0.00494	PASS
Extreme (-30°C)		15.54	12.22	0.00826	0.00650	PASS
25°C	LV	3.38	2.94	0.00180	0.00156	PASS
	HV	16.94	2.69	0.00901	0.00143	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	9.76	3.77	0.00519	0.00201	PASS
Extreme (50°C)		2.42	8.21	0.00129	0.00437	PASS
Extreme (40°C)		16.15	7.20	0.00859	0.00383	PASS
Extreme (30°C)		5.41	1.67	0.00288	0.00089	PASS
Extreme (20°C)		7.69	12.17	0.00409	0.00647	PASS
Extreme (10°C)		2.66	16.55	0.00142	0.00880	PASS
Extreme (0°C)		5.46	16.92	0.00290	0.00900	PASS
Extreme (-10°C)		17.18	15.99	0.00914	0.00850	PASS
Extreme (-20°C)		13.84	3.95	0.00736	0.00210	PASS
Extreme (-30°C)		1.82	15.36	0.00097	0.00817	PASS
25°C	LV	12.54	5.90	0.00667	0.00314	PASS
	HV	12.32	1.74	0.00656	0.00092	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	4.29	16.25	2.98	0.00228	0.00864	0.00159	PASS
Extreme (50°C)		8.56	5.19	4.37	0.00455	0.00276	0.00232	PASS
Extreme (40°C)		15.65	17.90	16.03	0.00833	0.00952	0.00852	PASS
Extreme (30°C)		17.34	6.74	13.19	0.00922	0.00359	0.00702	PASS
Extreme (20°C)		6.44	16.67	13.02	0.00342	0.00887	0.00692	PASS
Extreme (10°C)		13.57	9.04	4.39	0.00722	0.00481	0.00233	PASS
Extreme (0°C)		5.66	3.06	2.11	0.00301	0.00163	0.00112	PASS
Extreme (-10°C)		17.51	7.51	9.04	0.00931	0.00399	0.00481	PASS
Extreme (-20°C)		16.79	3.88	16.79	0.00893	0.00206	0.00893	PASS
Extreme (-30°C)		12.03	15.67	9.38	0.00640	0.00833	0.00499	PASS
25°C	LV	12.79	13.78	4.88	0.00681	0.00733	0.00260	PASS
	HV	6.47	16.38	16.49	0.00344	0.00871	0.00877	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	15.32	4.52	2.95	0.00815	0.00241	0.00157	PASS
Extreme (50°C)		9.86	2.72	13.89	0.00524	0.00144	0.00739	PASS
Extreme (40°C)		4.86	2.44	13.43	0.00258	0.00130	0.00714	PASS
Extreme (30°C)		14.73	11.68	15.30	0.00783	0.00621	0.00814	PASS
Extreme (20°C)		12.08	4.79	5.29	0.00643	0.00255	0.00281	PASS
Extreme (10°C)		3.83	8.48	13.85	0.00204	0.00451	0.00737	PASS
Extreme (0°C)		7.39	11.67	15.69	0.00393	0.00621	0.00835	PASS
Extreme (-10°C)		5.71	17.34	11.75	0.00304	0.00922	0.00625	PASS
Extreme (-20°C)		1.85	1.24	14.98	0.00098	0.00066	0.00797	PASS
Extreme (-30°C)		15.47	13.11	5.58	0.00823	0.00698	0.00297	PASS
25°C	LV	17.06	2.74	1.19	0.00907	0.00146	0.00063	PASS
	HV	6.53	8.24	10.13	0.00347	0.00438	0.00539	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	3.38	15.22	2.61	0.00180	0.00810	0.00139	PASS
Extreme (50°C)		3.47	13.64	12.98	0.00185	0.00725	0.00690	PASS



Extreme (40°C)		13.98	10.60	11.47	0.00744	0.00564	0.00610	PASS
Extreme (30°C)		10.00	5.79	3.72	0.00532	0.00308	0.00198	PASS
Extreme (20°C)		8.49	6.52	3.66	0.00452	0.00347	0.00194	PASS
Extreme (10°C)		10.35	2.20	12.70	0.00551	0.00117	0.00676	PASS
Extreme (0°C)		5.98	15.88	5.73	0.00318	0.00845	0.00305	PASS
Extreme (-10°C)		4.84	12.46	12.39	0.00258	0.00663	0.00659	PASS
Extreme (-20°C)		7.97	3.69	6.10	0.00424	0.00196	0.00325	PASS
Extreme (-30°C)		11.37	6.59	9.72	0.00605	0.00351	0.00517	PASS
25°C	LV	16.69	1.48	9.94	0.00888	0.00079	0.00529	PASS
	HV	6.06	15.68	14.91	0.00322	0.00834	0.00793	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	6.38	8.63	14.83	0.00339	0.00459	0.00789	PASS
Extreme (50°C)		8.34	6.24	3.73	0.00444	0.00332	0.00198	PASS
Extreme (40°C)		6.65	15.47	15.97	0.00354	0.00823	0.00849	PASS
Extreme (30°C)		5.27	13.35	8.67	0.00281	0.00710	0.00461	PASS
Extreme (20°C)		12.34	3.84	13.52	0.00656	0.00204	0.00719	PASS
Extreme (10°C)		17.19	17.19	7.73	0.00915	0.00914	0.00411	PASS
Extreme (0°C)		8.83	5.89	13.24	0.00470	0.00313	0.00704	PASS
Extreme (-10°C)		10.12	3.82	2.32	0.00538	0.00203	0.00123	PASS
Extreme (-20°C)		5.51	16.03	6.91	0.00293	0.00853	0.00367	PASS
Extreme (-30°C)		6.51	11.16	11.45	0.00346	0.00594	0.00609	PASS
25°C	LV	6.92	9.80	7.00	0.00368	0.00521	0.00372	PASS
	HV	11.97	13.28	12.78	0.00637	0.00707	0.00680	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	6.45	3.08	3.17	0.00343	0.00164	0.00169	PASS
Extreme (50°C)		10.79	4.21	14.43	0.00574	0.00224	0.00768	PASS
Extreme (40°C)		9.06	2.94	9.29	0.00482	0.00156	0.00494	PASS
Extreme (30°C)		2.87	4.51	15.66	0.00153	0.00240	0.00833	PASS
Extreme (20°C)		16.85	15.02	8.18	0.00896	0.00799	0.00435	PASS
Extreme (10°C)		13.40	10.36	16.69	0.00713	0.00551	0.00888	PASS
Extreme (0°C)		14.92	17.70	16.74	0.00794	0.00941	0.00891	PASS
Extreme (-10°C)		6.61	3.03	5.97	0.00352	0.00161	0.00318	PASS
Extreme (-20°C)		11.76	12.38	7.26	0.00626	0.00659	0.00386	PASS
Extreme (-30°C)		8.30	4.68	5.30	0.00441	0.00249	0.00282	PASS
25°C	LV	2.68	4.24	1.62	0.00143	0.00225	0.00086	PASS



	HV	8.14	17.99	7.07	0.00433	0.00957	0.00376	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	14.60	16.62	1.44	0.00777	0.00884	0.00077	PASS
Extreme (50°C)		14.80	1.00	13.04	0.00787	0.00053	0.00693	PASS
Extreme (40°C)		16.94	15.67	11.96	0.00901	0.00834	0.00636	PASS
Extreme (30°C)		9.56	9.68	7.29	0.00509	0.00515	0.00388	PASS
Extreme (20°C)		3.70	1.33	7.29	0.00197	0.00071	0.00388	PASS
Extreme (10°C)		3.54	8.25	1.83	0.00188	0.00439	0.00097	PASS
Extreme (0°C)		16.09	14.09	13.08	0.00856	0.00749	0.00696	PASS
Extreme (-10°C)		9.65	6.70	12.00	0.00513	0.00357	0.00639	PASS
Extreme (-20°C)		13.97	6.57	2.52	0.00743	0.00349	0.00134	PASS
Extreme (-30°C)		1.98	12.56	1.46	0.00105	0.00668	0.00077	PASS
25°C	LV	6.49	3.79	9.61	0.00345	0.00202	0.00511	PASS
	HV	8.98	5.11	10.16	0.00477	0.00272	0.00540	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 100kHz, VBW is set to 300kHz for 30MHz~1GHz

RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.

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

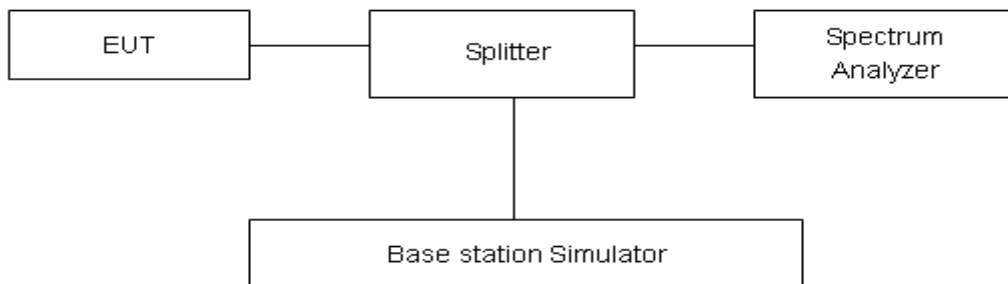
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

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

RBW is set to 1000 kHz (above 1000MHz)

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.

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



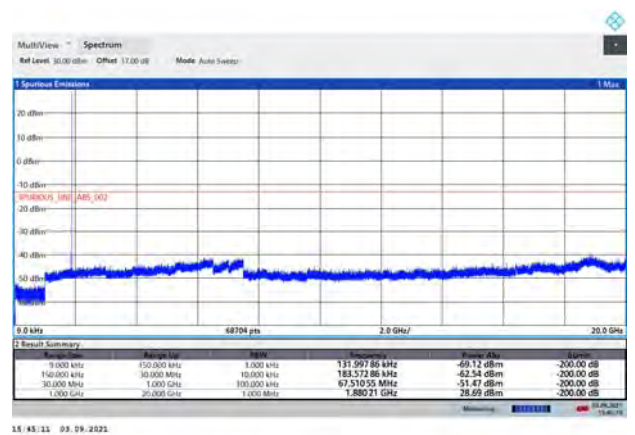
#### GPRS 1900 CH-Low 9kHz ~ 20GHz



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



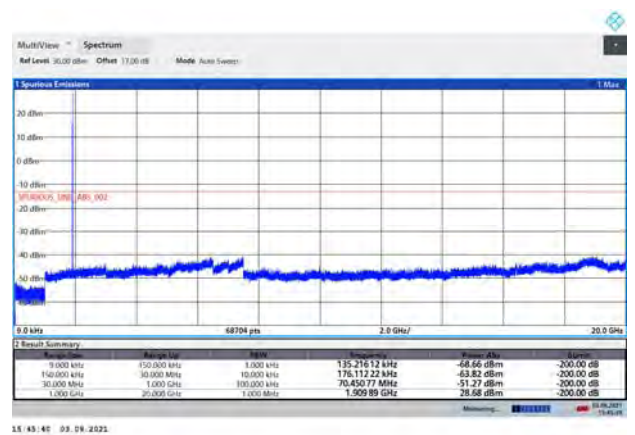
#### GPRS 1900 CH- Middle 9kHz ~ 20GHz



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

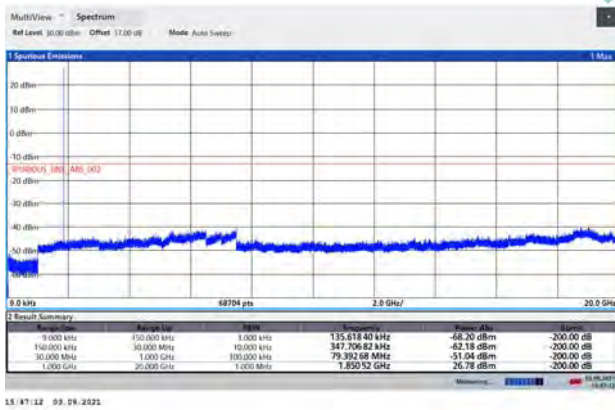


#### GPRS 1900 CH-High 9kHz ~ 20GHz

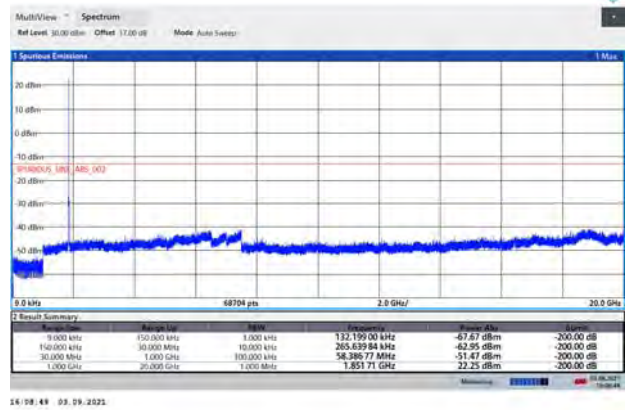




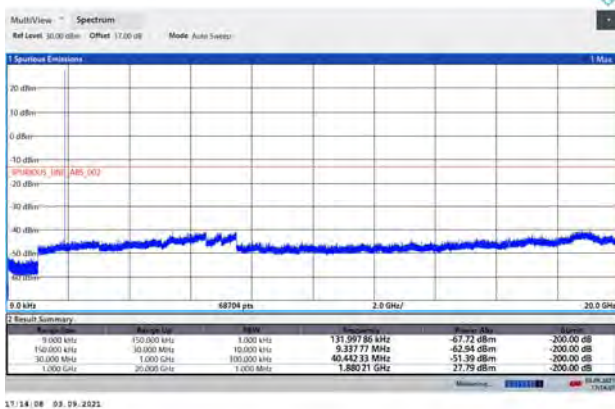
### EGPRS 1900 CH-Low 9kHz ~ 20GHz



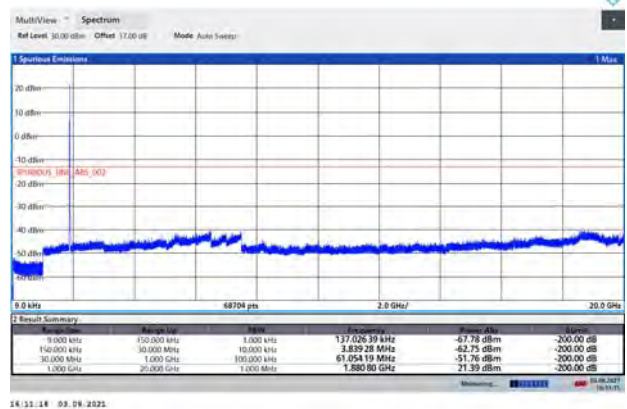
### WCDMA BAND II CH-Low 9kHz ~ 20GHz



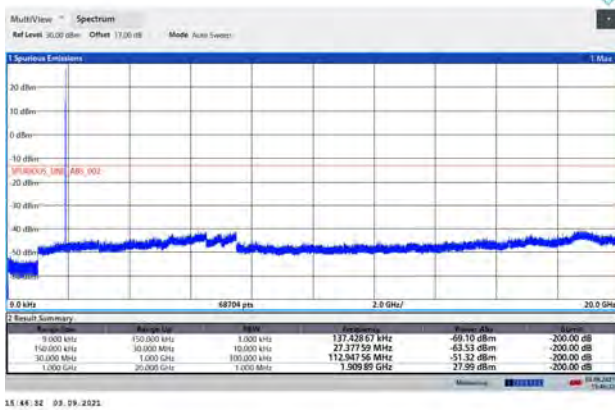
### EGPRS 1900 CH- Middle 9kHz ~ 20GHz



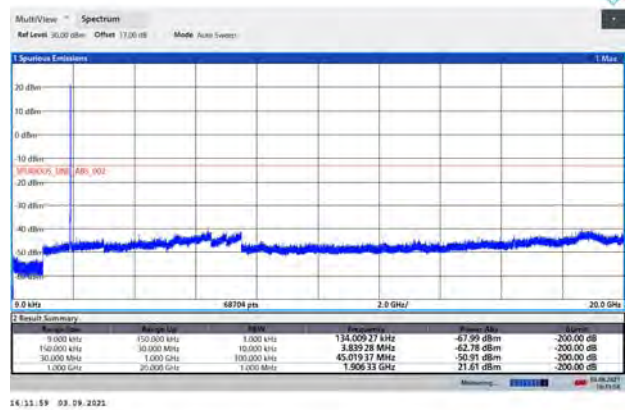
### WCDMA BAND II CH- Middle 9kHz ~ 20GHz



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

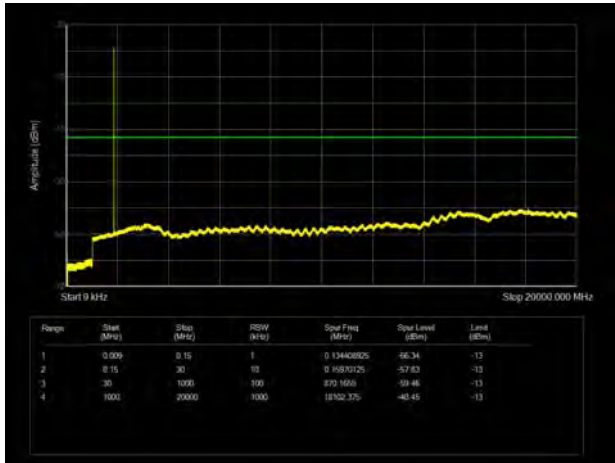


### WCDMA BAND II CH-High 9kHz ~ 20GHz

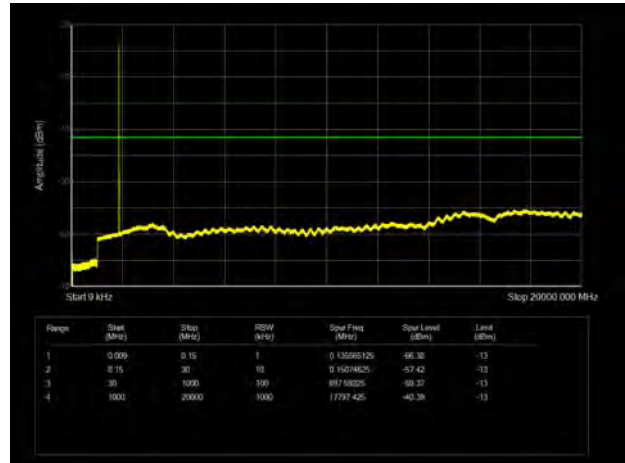




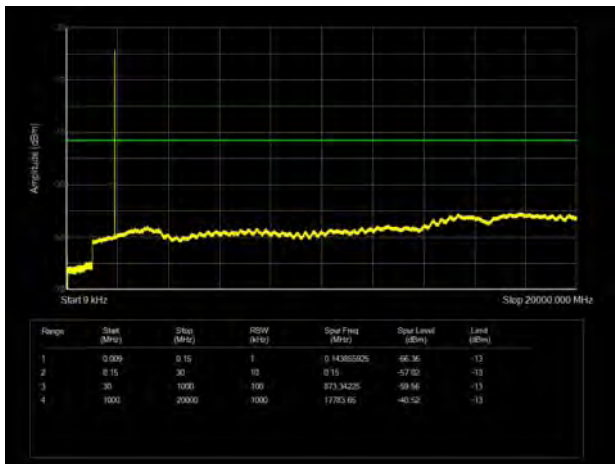
LTE Band 2 1.4MHz CH-Low 9kHz~20GHz



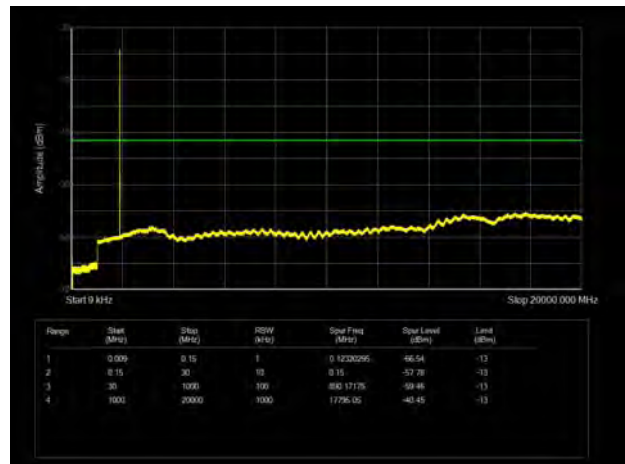
LTE Band 2 3MHz CH-Low 9kHz~20GHz



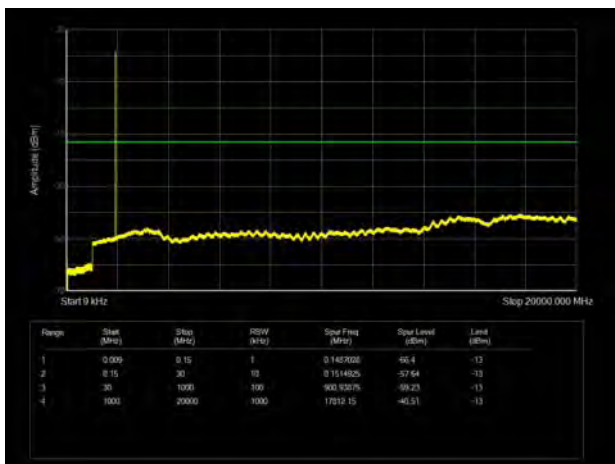
LTE Band 2 1.4MHz CH-Middle 9kHz~20GHz



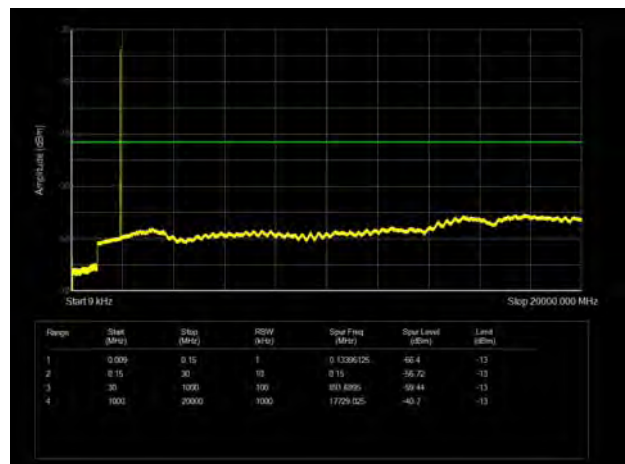
LTE Band 2 3MHz CH-Middle 9kHz~20GHz



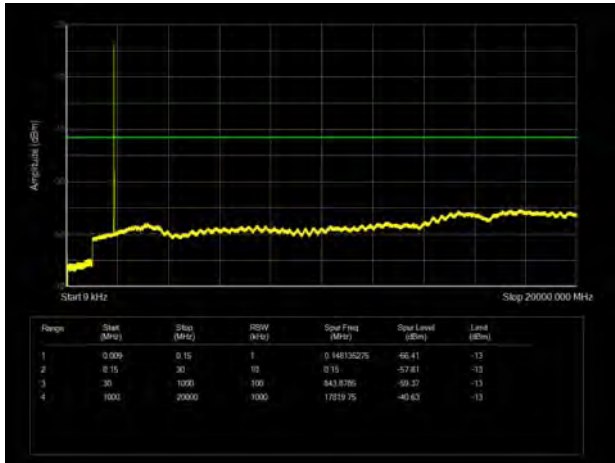
LTE Band 2 1.4MHz CH-High 9kHz~20GHz



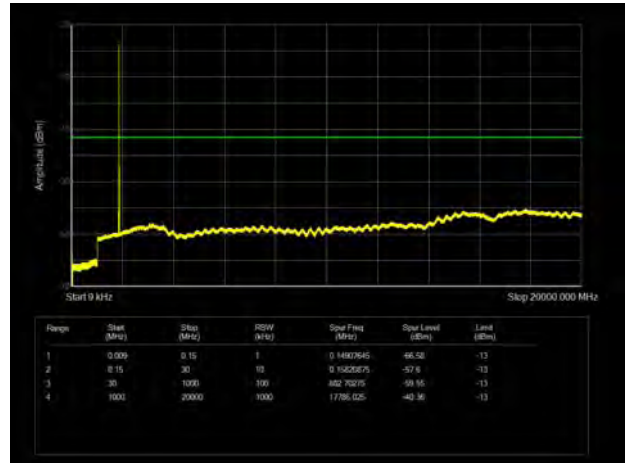
LTE Band 2 3MHz CH-High 9kHz~20GHz



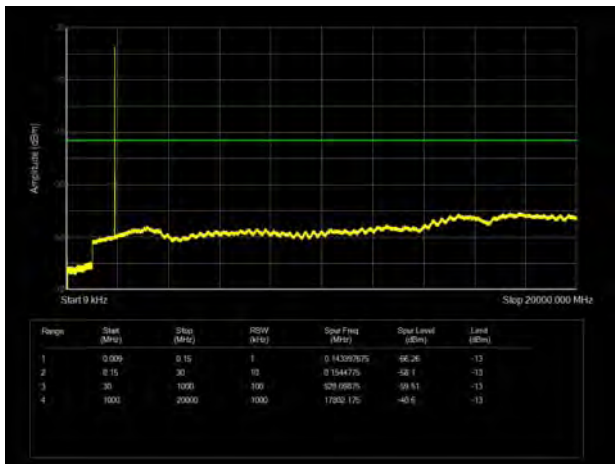
LTE Band 2 5MHz CH-Low 9kHz~20GHz



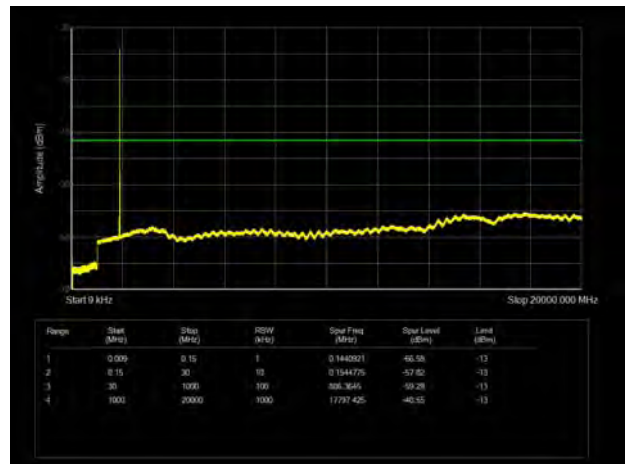
LTE Band 2 10MHz CH-Low 9kHz~20GHz



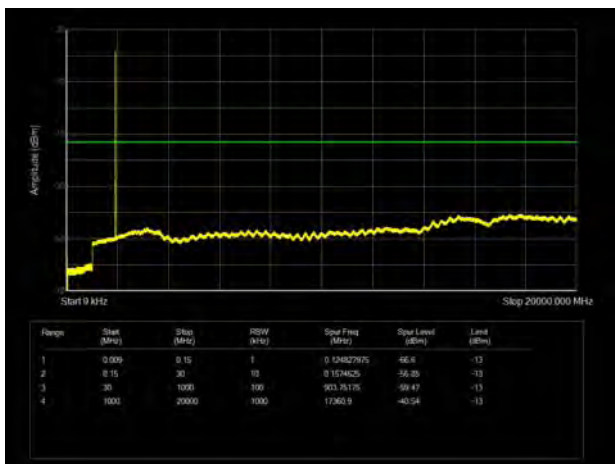
LTE Band 2 5MHz CH-Middle 9kHz~20GHz



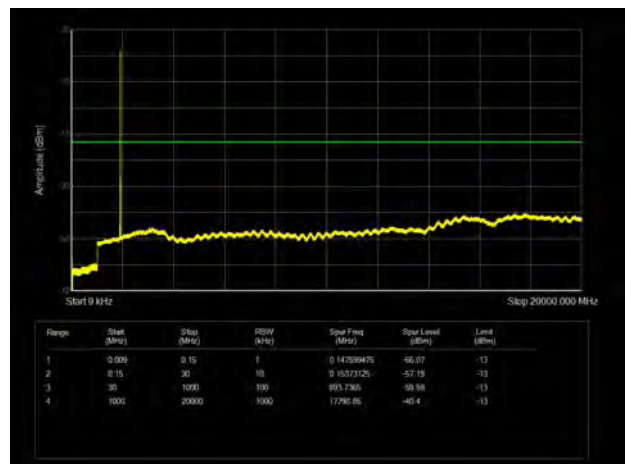
LTE Band 2 10MHz CH-Middle 9kHz~20GHz



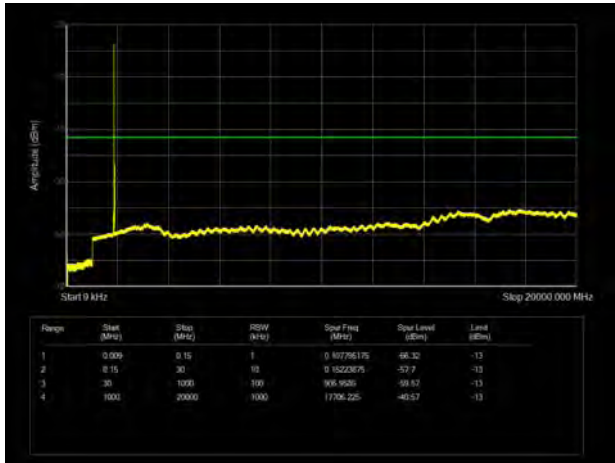
LTE Band 2 5MHz CH-High 9kHz~20GHz



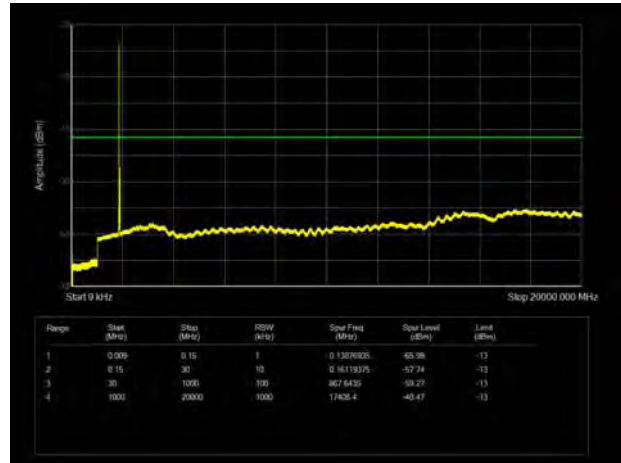
LTE Band 2 10MHz CH-High 9kHz~20GHz



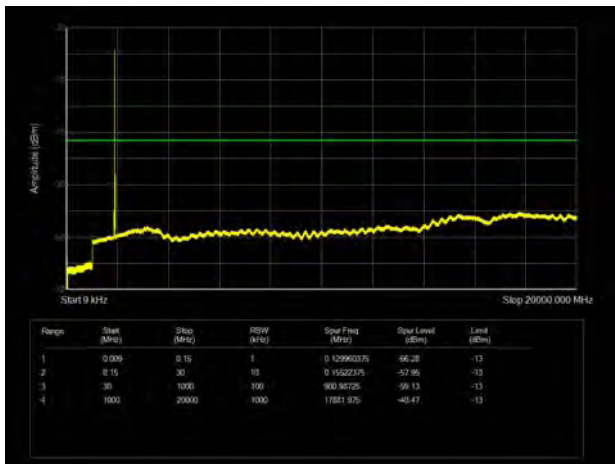
LTE Band 2 15MHz CH-Low 9kHz~20GHz



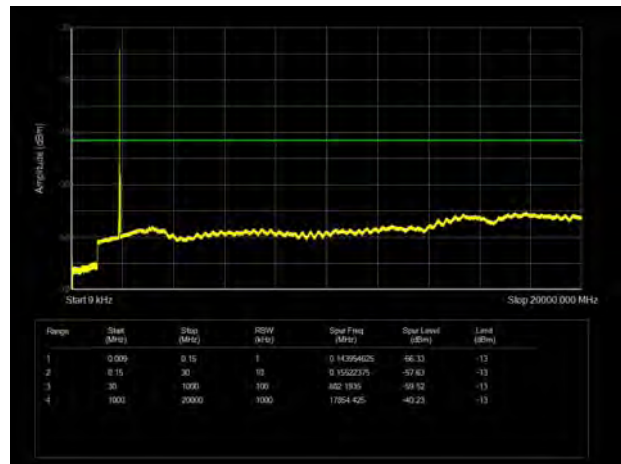
LTE Band 2 20MHz CH-Low 9kHz~20GHz



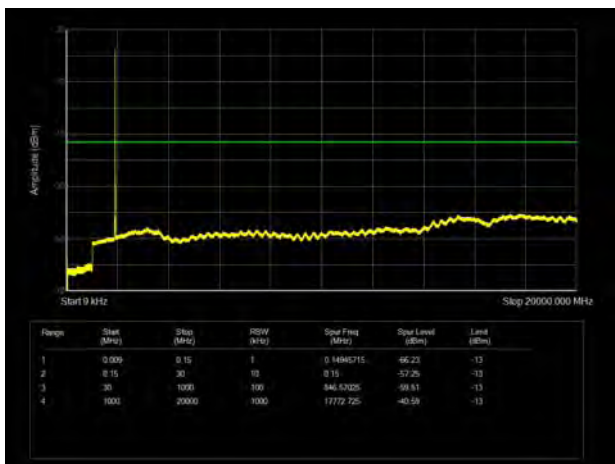
LTE Band 2 15MHz CH-Middle 9kHz~20GHz



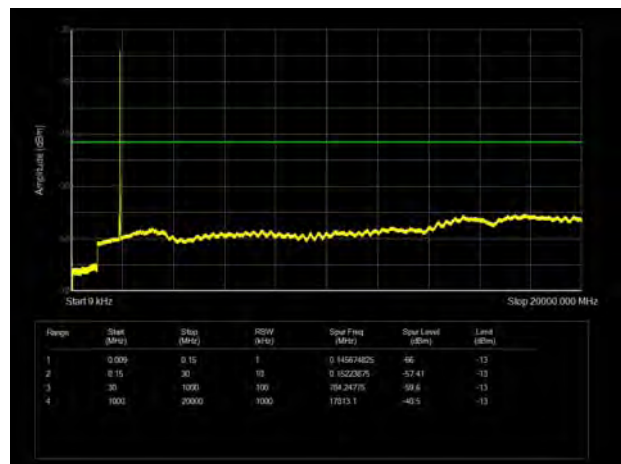
LTE Band 2 20MHz CH-Middle 9kHz~20GHz



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

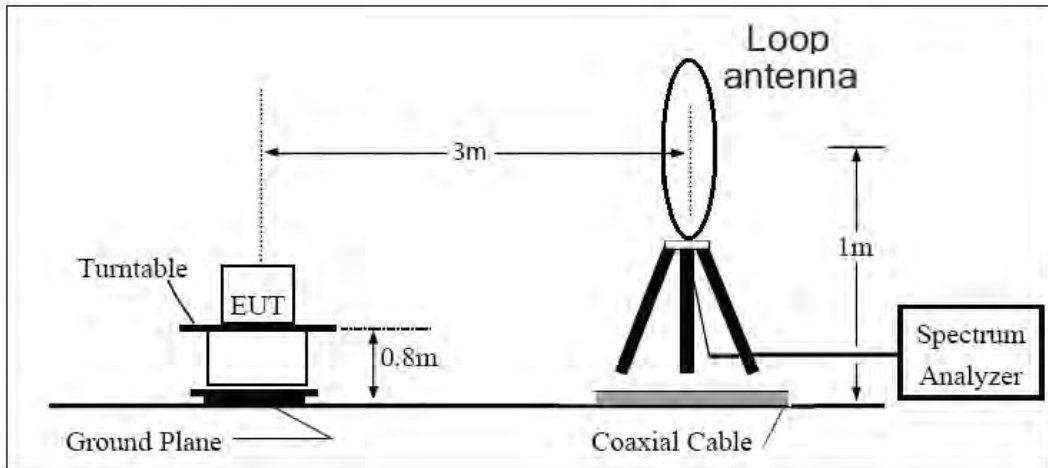
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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=1MHz, VBW=3MHz, 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 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

= EIRP-2.15dB.

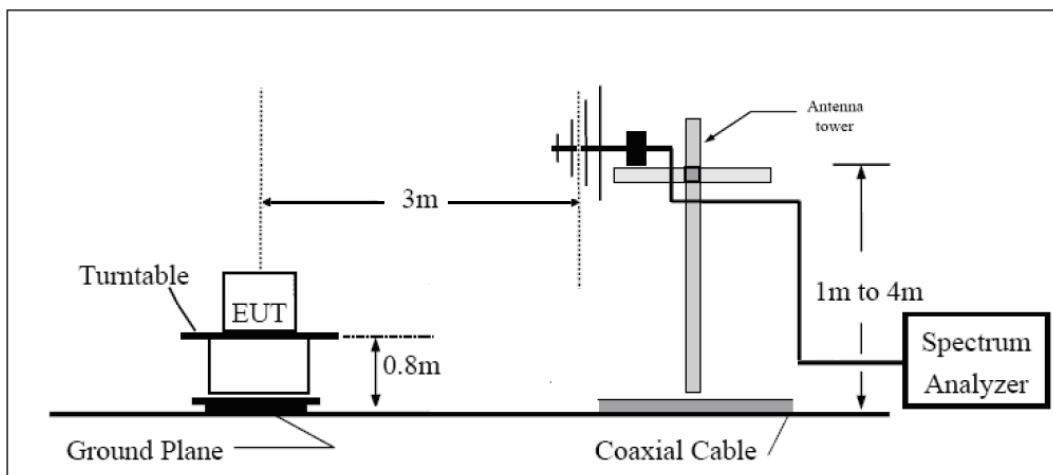
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

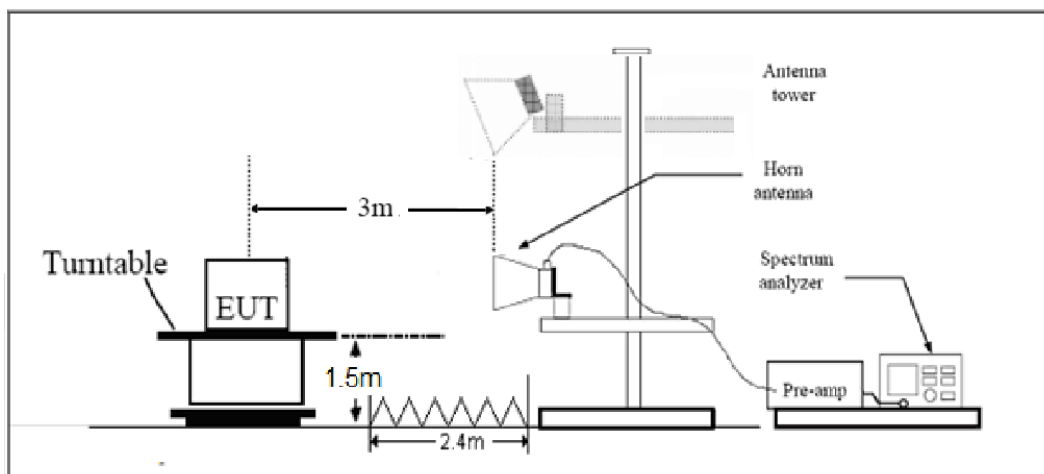
**9KHz ~ 30MHz**



**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.

**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	-65.13	2.60	12.50	Horizontal	-55.23	-13.00	42.23	45
3	5640.00	-60.50	3.30	12.50	Horizontal	-51.30	-13.00	38.30	0
4	7520.00	-57.25	4.20	12.20	Horizontal	-49.25	-13.00	36.25	225
5	9400.00	-54.15	4.30	11.10	Horizontal	-47.35	-13.00	34.35	135
6	11280.00	-48.42	5.90	11.90	Horizontal	-42.42	-13.00	29.42	135
7	13160.00	-51.23	5.70	14.00	Horizontal	-42.93	-13.00	29.93	45
8	15040.00	-52.56	5.80	13.10	Horizontal	-45.26	-13.00	32.26	0
9	16920.00	-51.63	6.10	14.60	Horizontal	-43.13	-13.00	30.13	0
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	-65.14	2.60	12.50	Horizontal	-55.24	-13.00	42.24	90
3	5640.00	-63.46	3.30	12.50	Horizontal	-54.26	-13.00	41.26	45
4	7520.00	-57.23	4.20	12.20	Horizontal	-49.23	-13.00	36.23	135
5	9400.00	-54.07	4.30	11.10	Horizontal	-47.27	-13.00	34.27	90
6	11280.00	-50.26	5.90	11.90	Horizontal	-44.26	-13.00	31.26	45
7	13160.00	-52.54	5.70	14.00	Horizontal	-44.24	-13.00	31.24	135
8	15040.00	-53.55	5.80	13.10	Horizontal	-46.25	-13.00	33.25	270
9	16920.00	-50.75	6.10	14.60	Horizontal	-42.25	-13.00	29.25	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.



## 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	-66.96	2.60	12.50	Vertical	-57.06	-13.00	44.06	180
3	5638.88	-63.80	3.30	12.50	Vertical	-54.60	-13.00	41.60	45
4	7520.00	-57.75	4.20	12.20	Vertical	-49.75	-13.00	36.75	90
5	9400.00	-54.65	4.30	11.10	Vertical	-47.85	-13.00	34.85	0
6	11280.00	-49.75	5.90	11.90	Vertical	-43.75	-13.00	30.75	135
7	13160.00	-52.63	5.70	14.00	Vertical	-44.33	-13.00	31.33	45
8	15040.00	-54.66	5.80	13.10	Vertical	-47.36	-13.00	34.36	225
9	16920.00	-53.48	6.10	14.60	Vertical	-44.98	-13.00	31.98	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 Vertical 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	-65.32	2.60	12.50	Vertical	-55.42	-13.00	42.42	45
3	5633.63	-63.61	3.30	12.50	Vertical	-54.41	-13.00	41.41	135
4	7520.00	-59.09	4.20	12.20	Vertical	-51.09	-13.00	38.09	270
5	9400.00	-54.86	4.30	11.10	Vertical	-48.06	-13.00	35.06	0
6	11280.00	-50.18	5.90	11.90	Vertical	-44.18	-13.00	31.18	90
7	13160.00	-51.94	5.70	14.00	Vertical	-43.64	-13.00	30.64	45
8	15040.00	-53.26	5.80	13.10	Vertical	-45.96	-13.00	32.96	225
9	16920.00	-54.04	6.10	14.60	Vertical	-45.54	-13.00	32.54	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 Vertical 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	-66.10	2.60	12.50	Vertical	-56.20	-13.00	43.20	225
3	5613.38	-64.57	3.30	12.50	Vertical	-55.37	-13.00	42.37	90
4	7484.63	-58.56	4.20	12.20	Vertical	-50.56	-13.00	37.56	0
5	9400.00	-55.07	4.30	11.10	Vertical	-48.27	-13.00	35.27	45
6	11280.00	-51.02	5.90	11.90	Vertical	-45.02	-13.00	32.02	315
7	13160.00	-53.60	5.70	14.00	Vertical	-45.30	-13.00	32.30	90
8	15040.00	-53.93	5.80	13.10	Vertical	-46.63	-13.00	33.63	45
9	16920.00	-53.69	6.10	14.60	Vertical	-45.19	-13.00	32.19	270
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 Vertical position.

## 6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMU200	118133	2021-05-15	2022-05-14
Climate Chamber	Weiss	VT4002	58226119450 010	2021-05-15	2022-05-14
Base Station Simulator	R&S	CMW500	113824	2021-05-15	2022-05-14
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2021-05-15	2022-05-14
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2021-05-15	2022-05-14
Signal Analyzer	R&S	FSV3030	101411	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	2022-12-15
Horn Antenna	R&S	HF907	102723	2020-08-11	2023-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2021-10-10	2024-10-09
Signal generator	R&S	SMB 100A	102594	2021-05-15	2022-05-14
Climatic Chamber	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2021-06-09	2021-12-08
RF Cable	Agilent	SMA 15cm	0001	2021-06-09	2021-12-08
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.**