



RF TEST REPORT

Applicant Xiaomi Communications Co., Ltd.

FCC ID 2AFZZ119UY

Product Mobile Phone

Brand Redmi

Model 22011119UY

Report No. R2110A0907-R2

Issue Date November 24, 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.

Prepared by: Peng Tao

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000

TABLE OF CONTENT

1. Test Laboratory	4
1.1. Notes of the test report	4
1.2. Test facility	4
1.3. Testing Location	4
2. General Description of Equipment under Test	5
2.1. Applicant and Manufacturer Information	5
2.2. General information	5
3. Applied Standards	7
4. Test Configuration	8
5. Test Case Results	10
5.1. RF Power Output and Effective Isotropic Radiated Power	10
5.2. Occupied Bandwidth	16
5.3. Band Edge Compliance	30
5.4. Peak-to-Average Power Ratio (PAPR)	45
5.5. Frequency Stability	49
5.6. Spurious Emissions at Antenna Terminals	55
5.7. Radiates Spurious Emission	61
6. Main Test Instruments	70
ANNEX A: The EUT Appearance	71
ANNEX B: Test Setup Photos	72

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: October 26, 2021~ November 22, 2021			
Date of Sample Received: October 26, 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.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

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	22011119UY		
IMEI	IMEI 1:865366050037984 IMEI 2:865366050037992		
Hardware Version	P2		
Software Version	MIUI12.5		
Antenna Type	Internal Antenna		
Antenna Gain	Band	Low Antenna	Upper Antenna
	GSM1900	0dBi	-0.4dBi
	WCDMA Band II	0dBi	-0.4dBi
	LTE Band 2	0dBi	-0.4dBi
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	12		
EGPRS Multislot Class	12		
HSDPA UE Category	24		
HSUPA UE Category	7		
LTE Category	7		
Memory	4G+64G, 4G+128G		
Maximum E.I.R.P	GSM 1900	29.93dBm	
	WCDMA Band II	24.21dBm	
	LTE Band 2	24.32dBm	
Rated Power Supply Voltage	3.87V		
Operating Voltage	Minimum: 3.6V	Maximum: 4.45V	
Operating Temperature	Lowest: -10°C	Highest: +60°C	
Testing 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
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 (2020)

FCC CFR47 Part 2 (2020)

Reference standard:

ANSI C63.26 (2015)

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 (Z 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
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.

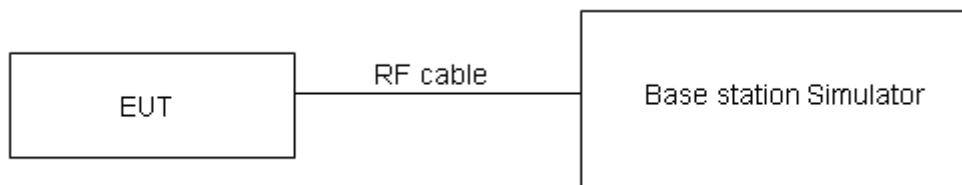
ERP can then be calculated as follows:

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

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)
-------	-----------------------------

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)			Low Antenna EIRP (dBm)			Upper Antenna EIRP (dBm)		
		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	29.82	29.93	29.85	29.82	29.93	29.85	29.42	29.53	29.45
GPRS (GMSK)	1TXslot	29.70	29.81	29.71	29.70	29.81	29.71	29.30	29.41	29.31
	2TXslots	29.07	29.20	29.11	29.07	29.20	29.11	28.67	28.80	28.71
	3TXslots	27.44	27.42	27.39	27.44	27.42	27.39	27.04	27.02	26.99
	4TXslots	26.35	26.47	26.33	26.35	26.47	26.33	25.95	26.07	25.93
EGPRS (8PSK)	1TXslot	25.68	25.46	25.70	25.68	25.46	25.70	25.28	25.06	25.30
	2TXslots	23.39	23.68	23.46	23.39	23.68	23.46	22.99	23.28	23.06
	3TXslots	21.42	21.62	21.39	21.42	21.62	21.39	21.02	21.22	20.99
	4TXslots	20.41	20.62	20.44	20.41	20.62	20.44	20.01	20.22	20.04

WCDMA Band II		Maximum Output Power (dBm)			Low Antenna EIRP (dBm)			Upper Antenna EIRP (dBm)		
		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)
RMC		23.94	24.01	24.05	23.94	24.01	24.05	23.54	23.61	23.65
HSDPA	Sub - Test 1	22.80	23.03	22.93	22.80	23.03	22.93	22.40	22.63	22.53
	Sub - Test 2	22.86	23.09	23.01	22.86	23.09	23.01	22.46	22.69	22.61
	Sub - Test 3	22.50	22.65	22.61	22.50	22.65	22.61	22.10	22.25	22.21
	Sub - Test 4	22.42	22.67	22.55	22.42	22.67	22.55	22.02	22.27	22.15
HSUPA	Sub - Test 1	22.08	22.05	21.93	22.08	22.05	21.93	21.68	21.65	21.53
	Sub - Test 2	20.92	21.09	21.01	20.92	21.09	21.01	20.52	20.69	20.61
	Sub - Test 3	21.84	22.13	21.95	21.84	22.13	21.95	21.44	21.73	21.55
	Sub - Test 4	20.86	20.97	20.99	20.86	20.97	20.99	20.46	20.57	20.59
	Sub - Test 5	22.92	23.01	22.93	22.92	23.01	22.93	22.52	22.61	22.53
DC-HSDPA	Sub - Test 1	22.84	23.03	23.17	22.84	23.03	23.17	22.44	22.63	22.77
	Sub - Test 2	23.04	23.17	22.93	23.04	23.17	22.93	22.64	22.77	22.53
	Sub - Test 3	22.30	22.59	22.59	22.30	22.59	22.59	21.90	22.19	22.19
	Sub - Test 4	22.58	22.61	22.71	22.58	22.61	22.71	22.18	22.21	22.31



LTE Band 2				Maximum Output Power(dBm)			Low Antenna EIRP (dBm)			Upper Antenna 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	24.05	24.06	24.04	24.05	24.06	24.04	23.65	23.66	23.64
		1	2	24.27	24.27	24.27	24.27	24.27	24.27	23.87	23.87	23.87
		1	5	24.03	23.99	24.04	24.03	23.99	24.04	23.63	23.59	23.64
		3	0	24.05	24.21	24.32	24.05	24.21	24.32	23.65	23.81	23.92
		3	2	24.18	24.19	24.27	24.18	24.19	24.27	23.78	23.79	23.87
		3	3	24.14	24.16	24.20	24.14	24.16	24.20	23.74	23.76	23.80
		6	0	23.08	23.23	23.33	23.08	23.23	23.33	22.68	22.83	22.93
	16QAM	1	0	23.51	23.40	23.18	23.51	23.40	23.18	23.11	23.00	22.78
		1	2	23.49	23.50	23.39	23.49	23.50	23.39	23.09	23.10	22.99
		1	5	23.31	23.23	23.20	23.31	23.23	23.20	22.91	22.83	22.80
		3	0	23.05	23.17	23.27	23.05	23.17	23.27	22.65	22.77	22.87
		3	2	23.17	23.21	23.25	23.17	23.21	23.25	22.77	22.81	22.85
		3	3	23.13	23.16	23.15	23.13	23.16	23.15	22.73	22.76	22.75
		6	0	22.09	22.27	22.28	22.09	22.27	22.28	21.69	21.87	21.88
	64QAM	1	0	22.23	22.36	22.34	22.23	22.36	22.34	21.83	21.96	21.94
		1	2	22.43	22.44	22.62	22.43	22.44	22.62	22.03	22.04	22.22
		1	5	22.17	22.25	22.34	22.17	22.25	22.34	21.77	21.85	21.94
		3	0	22.04	22.17	22.22	22.04	22.17	22.22	21.64	21.77	21.82
		3	2	22.13	22.17	22.22	22.13	22.17	22.22	21.73	21.77	21.82
		3	3	22.05	22.14	22.11	22.05	22.14	22.11	21.65	21.74	21.71
		6	0	21.07	21.19	21.28	21.07	21.19	21.28	20.67	20.79	20.88
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	18615/1851.5	18900/1880	19185/1908.5
3MHz	QPSK	1	0	24.07	24.10	24.07	24.07	24.10	24.07	23.67	23.70	23.67
		1	7	24.25	24.30	24.31	24.25	24.30	24.31	23.85	23.90	23.91
		1	14	24.06	24.04	24.08	24.06	24.04	24.08	23.66	23.64	23.68
		8	0	23.15	23.33	23.45	23.15	23.33	23.45	22.75	22.93	23.05
		8	4	23.30	23.29	23.39	23.30	23.29	23.39	22.90	22.89	22.99
		8	7	23.24	23.27	23.30	23.24	23.27	23.30	22.84	22.87	22.90
		15	0	23.08	23.27	23.36	23.08	23.27	23.36	22.68	22.87	22.96
	16QAM	1	0	23.54	23.42	23.21	23.54	23.42	23.21	23.14	23.02	22.81



		1	7	23.52	23.50	23.43	23.52	23.50	23.43	23.12	23.10	23.03
		1	14	23.33	23.27	23.23	23.33	23.27	23.23	22.93	22.87	22.83
		8	0	22.16	22.30	22.39	22.16	22.30	22.39	21.76	21.90	21.99
		8	4	22.28	22.34	22.37	22.28	22.34	22.37	21.88	21.94	21.97
		8	7	22.23	22.28	22.28	22.23	22.28	22.28	21.83	21.88	21.88
		15	0	22.12	22.31	22.31	22.12	22.31	22.31	21.72	21.91	21.91
	64QAM	1	0	22.26	22.38	22.37	22.26	22.38	22.37	21.86	21.98	21.97
		1	7	22.46	22.44	22.64	22.46	22.44	22.64	22.06	22.04	22.24
		1	14	22.19	22.24	22.37	22.19	22.24	22.37	21.79	21.84	21.97
		8	0	21.15	21.30	21.34	21.15	21.30	21.34	20.75	20.90	20.94
		8	4	21.24	21.30	21.34	21.24	21.30	21.34	20.84	20.90	20.94
		8	7	21.15	21.26	21.24	21.15	21.26	21.24	20.75	20.86	20.84
		15	0	21.10	21.23	21.31	21.10	21.23	21.31	20.70	20.83	20.91
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	24.04	24.08	24.03	24.04	24.08	24.03	23.64	23.68	23.63
		1	13	24.23	24.26	24.28	24.23	24.26	24.28	23.83	23.86	23.88
		1	24	24.03	23.99	24.04	24.03	23.99	24.04	23.63	23.59	23.64
		12	0	23.12	23.28	23.41	23.12	23.28	23.41	22.72	22.88	23.01
		12	6	23.28	23.25	23.34	23.28	23.25	23.34	22.88	22.85	22.94
		12	13	23.22	23.25	23.26	23.22	23.25	23.26	22.82	22.85	22.86
		25	0	23.08	23.26	23.34	23.08	23.26	23.34	22.68	22.86	22.94
	16QAM	1	0	23.51	23.38	23.18	23.51	23.38	23.18	23.11	22.98	22.78
		1	13	23.49	23.48	23.40	23.49	23.48	23.40	23.09	23.08	23.00
		1	24	23.30	23.25	23.19	23.30	23.25	23.19	22.90	22.85	22.79
		12	0	22.14	22.26	22.36	22.14	22.26	22.36	21.74	21.86	21.96
		12	6	22.25	22.29	22.33	22.25	22.29	22.33	21.85	21.89	21.93
		12	13	22.20	22.23	22.24	22.20	22.23	22.24	21.80	21.83	21.84
		25	0	22.10	22.27	22.26	22.10	22.27	22.26	21.70	21.87	21.86
	64QAM	1	0	22.23	22.38	22.34	22.23	22.38	22.34	21.83	21.98	21.94
		1	13	22.43	22.46	22.61	22.43	22.46	22.61	22.03	22.06	22.21
		1	24	22.20	22.22	22.33	22.20	22.22	22.33	21.80	21.82	21.93
		12	0	21.13	21.26	21.35	21.13	21.26	21.35	20.73	20.86	20.95
		12	6	21.21	21.25	21.30	21.21	21.25	21.30	20.81	20.85	20.90
		12	13	21.12	21.21	21.20	21.12	21.21	21.20	20.72	20.81	20.80
		25	0	21.08	21.19	21.26	21.08	21.19	21.26	20.68	20.79	20.86



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	24.06	24.09	24.06	24.06	24.09	24.06	23.66	23.69	23.66
		1	25	24.26	24.31	24.32	24.26	24.31	24.32	23.86	23.91	23.92
		1	49	24.05	24.03	24.07	24.05	24.03	24.07	23.65	23.63	23.67
		25	0	23.15	23.33	23.45	23.15	23.33	23.45	22.75	22.93	23.05
		25	13	23.31	23.30	23.38	23.31	23.30	23.38	22.91	22.90	22.98
		25	25	23.24	23.29	23.31	23.24	23.29	23.31	22.84	22.89	22.91
		50	0	23.12	23.28	23.38	23.12	23.28	23.38	22.72	22.88	22.98
	16QAM	1	0	23.53	23.41	23.20	23.53	23.41	23.20	23.13	23.01	22.80
		1	25	23.52	23.52	23.43	23.52	23.52	23.43	23.12	23.12	23.03
		1	49	23.33	23.27	23.22	23.33	23.27	23.22	22.93	22.87	22.82
		25	0	22.17	22.31	22.40	22.17	22.31	22.40	21.77	21.91	22.00
		25	13	22.27	22.33	22.36	22.27	22.33	22.36	21.87	21.93	21.96
		25	25	22.23	22.28	22.28	22.23	22.28	22.28	21.83	21.88	21.88
		50	0	22.13	22.32	22.30	22.13	22.32	22.30	21.73	21.92	21.90
	64QAM	1	0	22.25	22.37	22.36	22.25	22.37	22.36	21.85	21.97	21.96
		1	25	22.46	22.46	22.64	22.46	22.46	22.64	22.06	22.06	22.24
		1	49	22.19	22.24	22.36	22.19	22.24	22.36	21.79	21.84	21.96
		25	0	21.16	21.31	21.35	21.16	21.31	21.35	20.76	20.91	20.95
		25	13	21.23	21.29	21.33	21.23	21.29	21.33	20.83	20.89	20.93
		25	25	21.15	21.26	21.24	21.15	21.26	21.24	20.75	20.86	20.84
		50	0	21.11	21.24	21.30	21.11	21.24	21.30	20.71	20.84	20.90
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	24.05	24.05	24.04	24.05	24.05	24.04	23.65	23.65	23.64
		1	38	24.24	24.30	24.29	24.24	24.30	24.29	23.84	23.90	23.89
		1	74	24.02	23.98	24.03	24.02	23.98	24.03	23.62	23.58	23.63
		36	0	23.13	23.29	23.42	23.13	23.29	23.42	22.73	22.89	23.02
		36	18	23.28	23.25	23.34	23.28	23.25	23.34	22.88	22.85	22.94
		36	39	23.21	23.26	23.27	23.21	23.26	23.27	22.81	22.86	22.87
		75	0	23.10	23.24	23.33	23.10	23.24	23.33	22.70	22.84	22.93
	16QAM	1	0	23.48	23.39	23.18	23.48	23.39	23.18	23.08	22.99	22.78
		1	38	23.50	23.49	23.41	23.50	23.49	23.41	23.10	23.09	23.01
		1	74	23.30	23.23	23.19	23.30	23.23	23.19	22.90	22.83	22.79



		36	0	22.14	22.29	22.37	22.14	22.29	22.37	21.74	21.89	21.97
		36	18	22.24	22.28	22.32	22.24	22.28	22.32	21.84	21.88	21.92
		36	39	22.21	22.24	22.25	22.21	22.24	22.25	21.81	21.84	21.85
		75	0	22.10	22.27	22.26	22.10	22.27	22.26	21.70	21.87	21.86
	64QAM	1	0	22.20	22.35	22.34	22.20	22.35	22.34	21.80	21.95	21.94
		1	38	22.44	22.43	22.62	22.44	22.43	22.62	22.04	22.03	22.22
		1	74	22.20	22.23	22.37	22.20	22.23	22.37	21.80	21.83	21.97
		36	0	21.15	21.33	21.36	21.15	21.33	21.36	20.75	20.93	20.96
		36	18	21.21	21.26	21.32	21.21	21.26	21.32	20.81	20.86	20.92
		36	39	21.13	21.22	21.21	21.13	21.22	21.21	20.73	20.82	20.81
		75	0	21.08	21.19	21.26	21.08	21.19	21.26	20.68	20.79	20.86
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	24.02	24.01	24.01	24.02	24.01	24.01	23.62	23.61	23.61
		1	50	24.23	24.26	24.27	24.23	24.26	24.27	23.83	23.86	23.87
		1	99	24.00	23.97	24.00	24.00	23.97	24.00	23.60	23.57	23.60
		50	0	23.10	23.24	23.38	23.10	23.24	23.38	22.70	22.84	22.98
		50	25	23.26	23.21	23.31	23.26	23.21	23.31	22.86	22.81	22.91
		50	50	23.18	23.21	23.23	23.18	23.21	23.23	22.78	22.81	22.83
		100	0	23.07	23.19	23.29	23.07	23.19	23.29	22.67	22.79	22.89
	16QAM	1	0	23.21	23.35	23.13	23.21	23.35	23.13	22.81	22.95	22.73
		1	50	23.46	23.47	23.37	23.46	23.47	23.37	23.06	23.07	22.97
		1	99	23.28	23.20	23.17	23.28	23.20	23.17	22.88	22.80	22.77
		50	0	22.11	22.25	22.34	22.11	22.25	22.34	21.71	21.85	21.94
		50	25	22.21	22.26	22.29	22.21	22.26	22.29	21.81	21.86	21.89
		50	50	22.18	22.19	22.21	22.18	22.19	22.21	21.78	21.79	21.81
		100	0	22.08	22.23	22.23	22.08	22.23	22.23	21.68	21.83	21.83
	64QAM	1	0	22.18	22.31	22.29	22.18	22.31	22.29	21.78	21.91	21.89
		1	50	22.40	22.41	22.58	22.40	22.41	22.58	22.00	22.01	22.18
		1	99	22.14	22.17	22.31	22.14	22.17	22.31	21.74	21.77	21.91
		50	0	21.10	21.25	21.29	21.10	21.25	21.29	20.70	20.85	20.89
		50	25	21.17	21.22	21.26	21.17	21.22	21.26	20.77	20.82	20.86
		50	50	21.10	21.17	21.17	21.10	21.17	21.17	20.70	20.77	20.77
		100	0	21.06	21.15	21.23	21.06	21.15	21.23	20.66	20.75	20.83

5.2.Occupied Bandwidth

Ambient condition

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

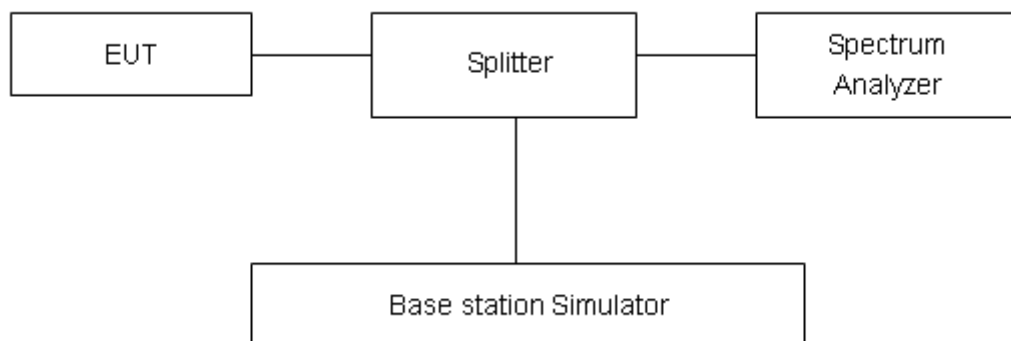
Method of Measurement

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	1850.2	0.2463	0.3127
	661	1880.0	0.2428	0.3128
	810	1909.8	0.2419	0.3115
GPRS 1900 (GMSK)	512	1850.2	0.2447	0.3105
	661	1880.0	0.2427	0.3109
	810	1909.8	0.246	0.3114
EGPRS 1900 (8PSK)	512	1850.2	0.2545	0.3081
	661	1880.0	0.2459	0.3166
	810	1909.8	0.2485	0.3036
WCDMA Band II (RMC)	9262	1852.4	4.1665	4.715
	9400	1880	4.1606	4.691
	9538	1907.6	4.1599	4.697

LTE Band 2						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	18607	1850.7	1.089	1.284
			18900	1880.0	1.095	1.281
			19193	1909.3	1.093	1.295
		3	18615	1851.5	2.699	2.930
			18900	1880	2.691	2.910
			19185	1908.5	2.687	2.901
		5	18625	1852.5	4.513	4.883
			18900	1880	4.508	4.895
			19175	1907.5	4.517	4.850
		10	18650	1855	8.979	9.751
			18900	1880	9.003	9.734
			19150	1905	8.980	9.690
		15	18675	1857.5	13.427	14.590
			18900	1880	13.457	14.514
			19125	1902.5	13.447	14.641
		20	18700	1860	17.925	19.392
			18900	1880	17.954	19.213



	16QAM		19100	1900	17.988	19.353
		1.4	18607	1850.7	1.095	1.273
			18900	1880.0	1.096	1.301
			19193	1909.3	1.097	1.260
			19193	1909.3	1.097	1.260
		3	18615	1851.5	2.686	2.930
			18900	1880	2.685	2.900
			19185	1908.5	2.695	2.916
		5	18625	1852.5	4.510	4.875
			18900	1880	4.502	4.920
			19175	1907.5	4.503	4.945
		10	18650	1855	8.975	9.646
			18900	1880	9.008	9.751
			19150	1905	9.006	9.684
		15	18675	1857.5	13.473	14.547
			18900	1880	13.468	14.592
			19125	1902.5	13.517	14.432
		20	18700	1860	18.000	19.473
			18900	1880	17.995	19.296
			19100	1900	17.985	19.517
	64QAM	1.4	18607	1850.7	1.091	1.264
			18900	1880.0	1.098	1.299
			19193	1909.3	1.088	1.275
		3	18615	1851.5	2.683	2.947
			18900	1880	2.683	2.922
			19185	1908.5	2.696	2.936
		5	18625	1852.5	4.507	4.907
			18900	1880	4.508	4.938
			19175	1907.5	4.522	4.904
		10	18650	1855	9.003	9.653
			18900	1880	8.980	9.680
			19150	1905	8.993	9.685
		15	18675	1857.5	13.456	17.866
			18900	1880	13.464	14.498
			19125	1902.5	13.471	14.549
		20	18700	1860	17.931	19.291
			18900	1880	17.963	19.251
			19100	1900	17.970	19.243

GSM1900 GSM CH-Low



GSM1900 GPRS CH-Low



GSM 1900 GSM CH-Middle



GSM 1900 GPRS CH-Middle



GSM 1900 GSM CH-High



GSM 1900 GPRS CH-High



GSM1900 EGPRS CH-Low



WCDMA Band II RMC CH-LOW



GSM 1900 EGPRS CH-Middle



WCDMA Band II RMC CH-Middle



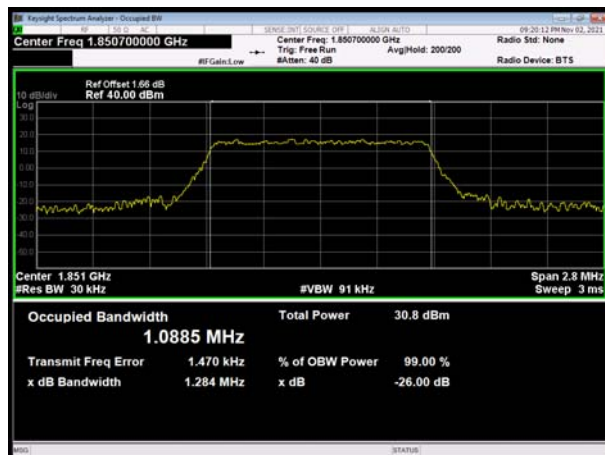
GSM 1900 EGPRS CH-High



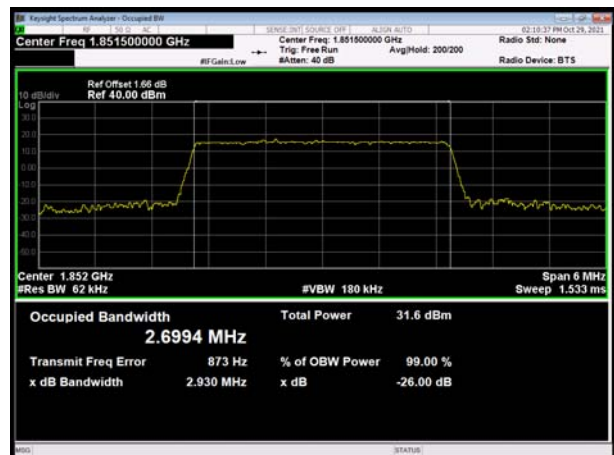
WCDMA Band II RMC CH-High



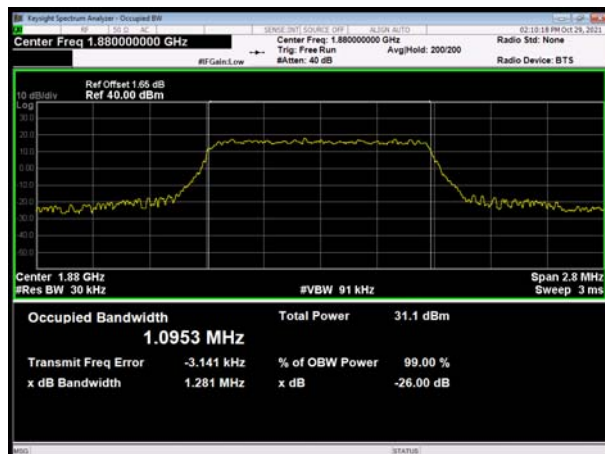
LTE Band 2 1.4MHz QPSK CH-Low



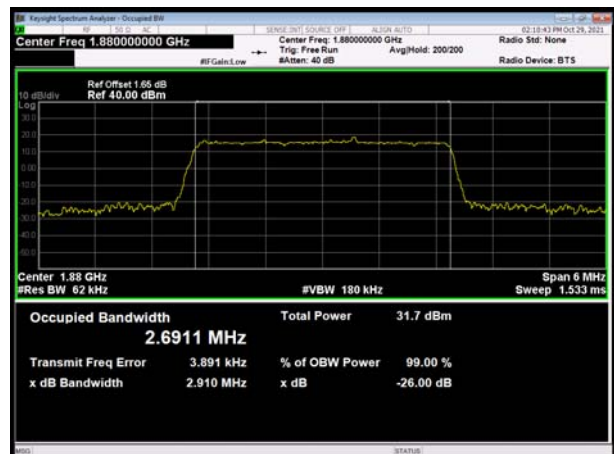
LTE Band 2 3MHz QPSK CH-Low



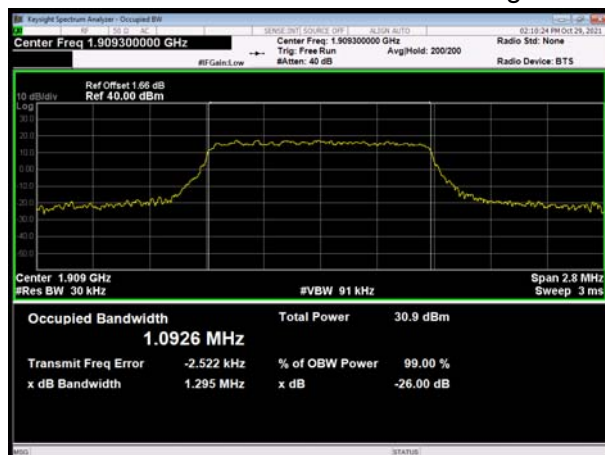
LTE Band 2 1.4MHz QPSK CH-Middle



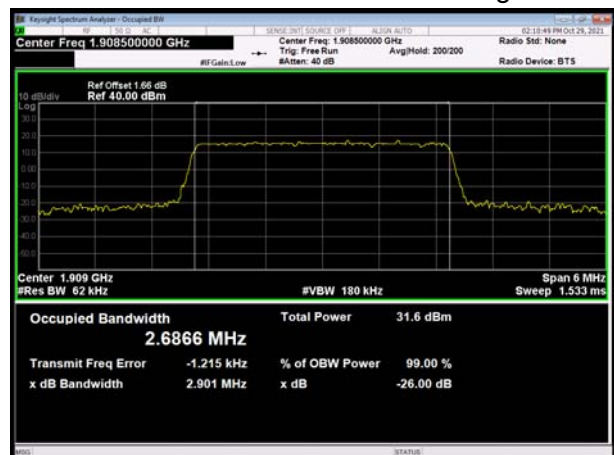
LTE Band 2 3MHz QPSK CH-Middle



LTE Band 2 1.4MHz QPSK CH-High

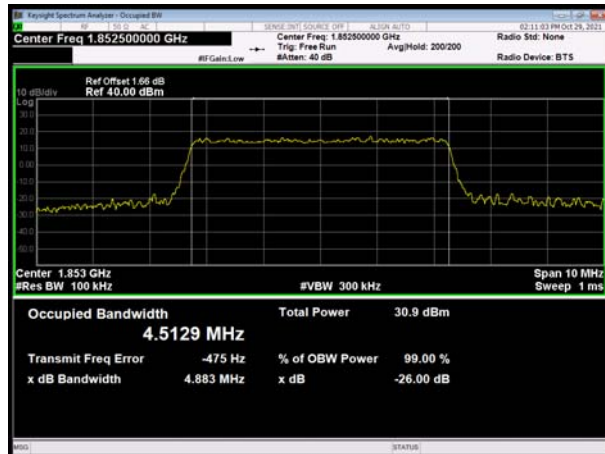


LTE Band 2 3MHz QPSK CH-High

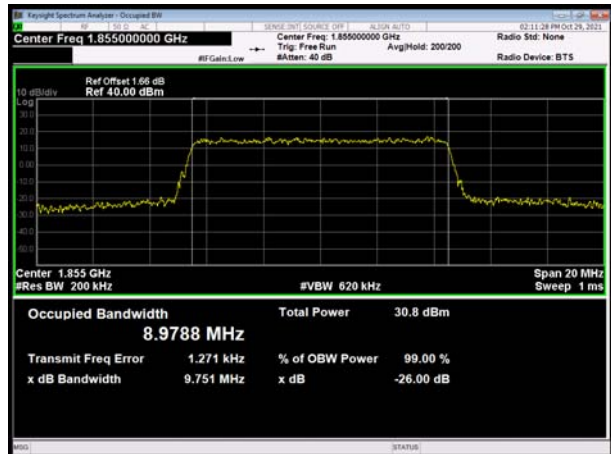




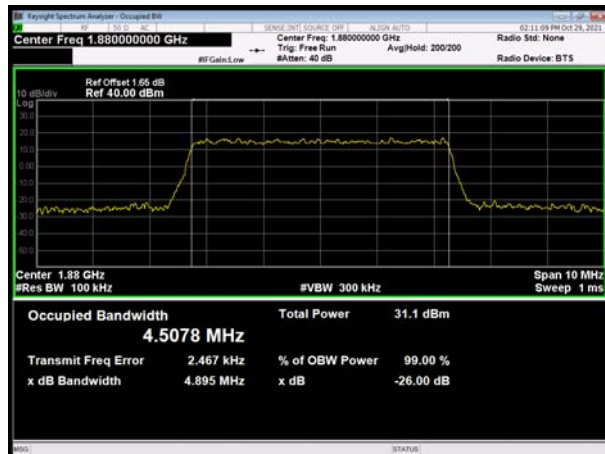
LTE Band 2 5MHz QPSK CH-Low



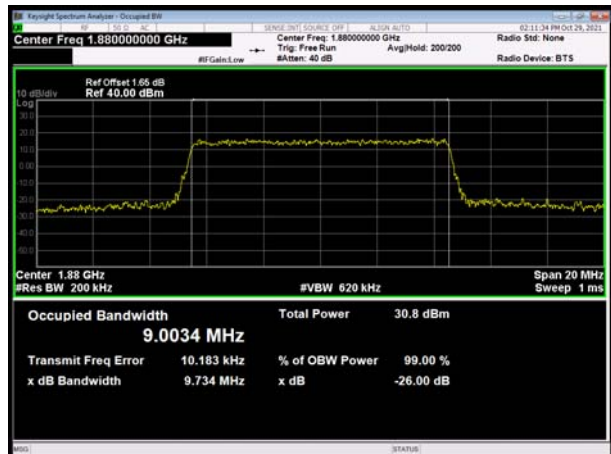
LTE Band 2 10MHz QPSK CH-Low



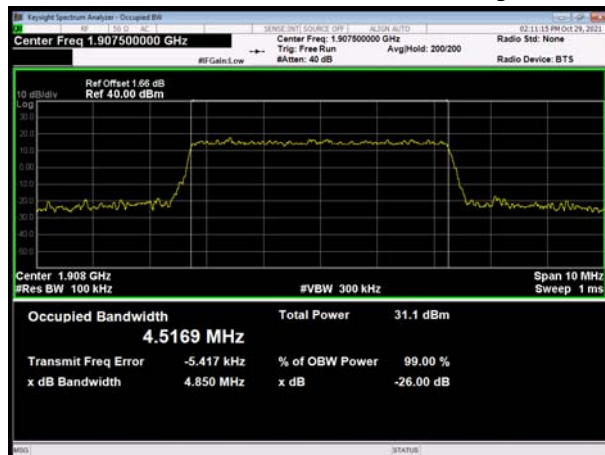
LTE Band 2 5MHz QPSK CH-Middle



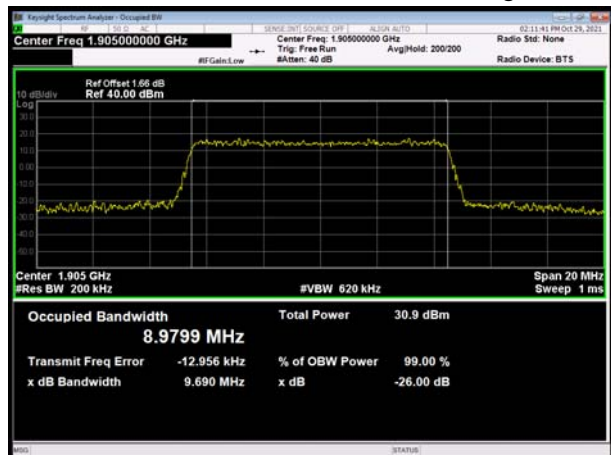
LTE Band 2 10MHz QPSK CH-Middle



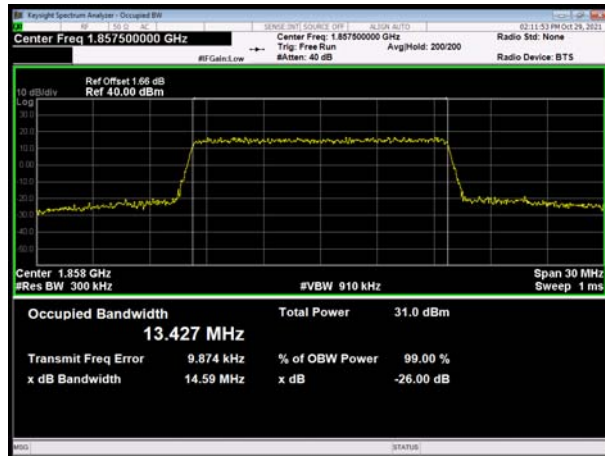
LTE Band 2 5MHz QPSK CH-High



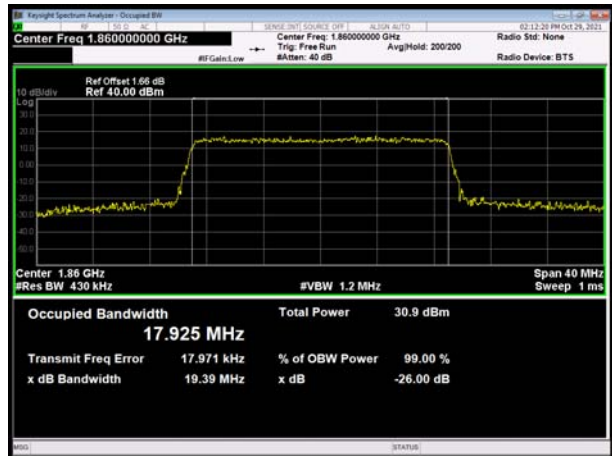
LTE Band 2 10MHz QPSK CH-High



LTE Band 2 15MHz QPSK CH-Low



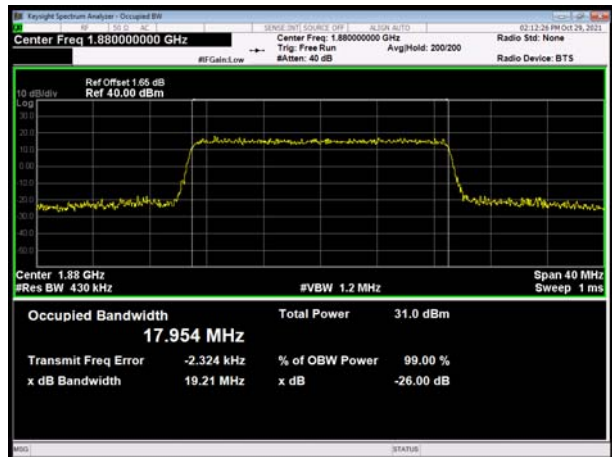
LTE Band 2 20MHz QPSK CH-Low



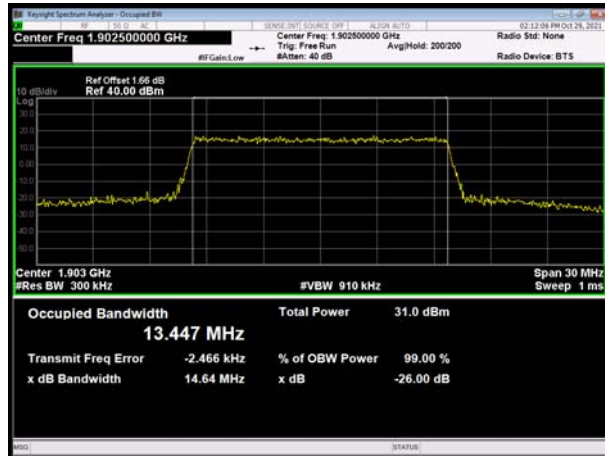
LTE Band 2 15MHz QPSK CH-Middle



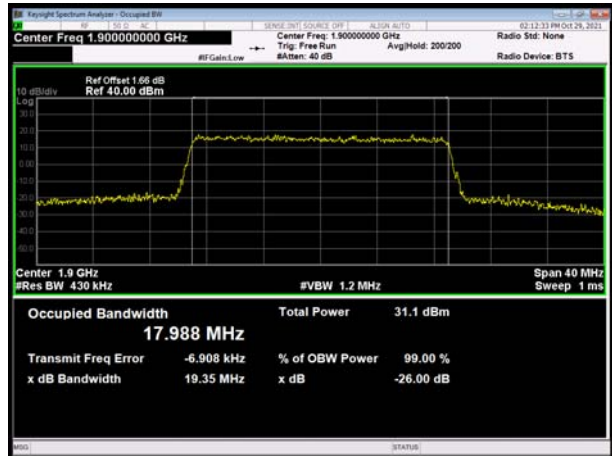
LTE Band 2 20MHz QPSK CH-Middle



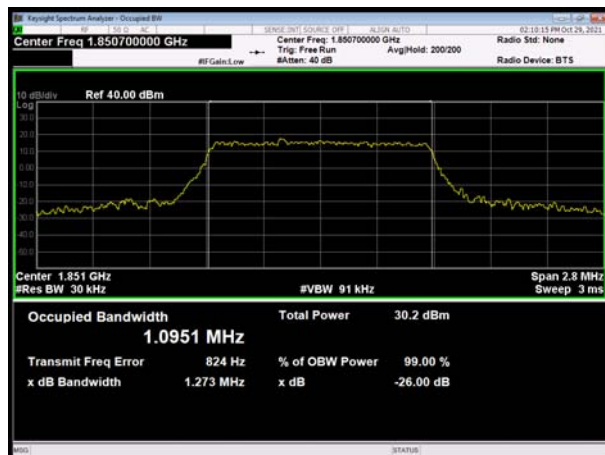
LTE Band 2 15MHz QPSK CH-High



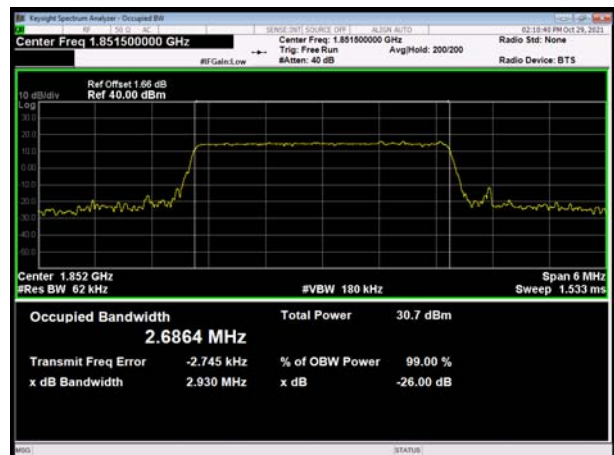
LTE Band 2 20MHz QPSK CH-High



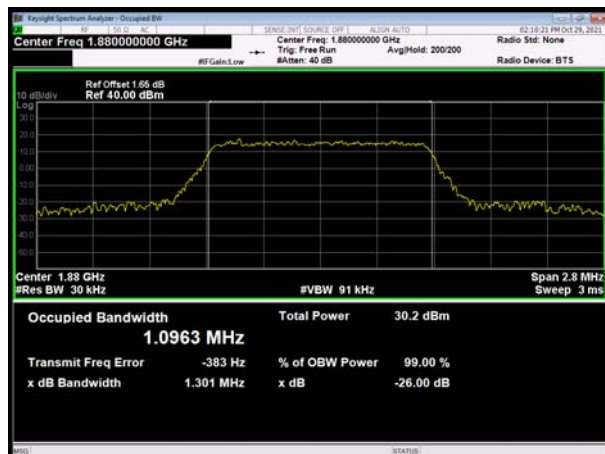
LTE Band 2 1.4MHz 16QAM CH-Low



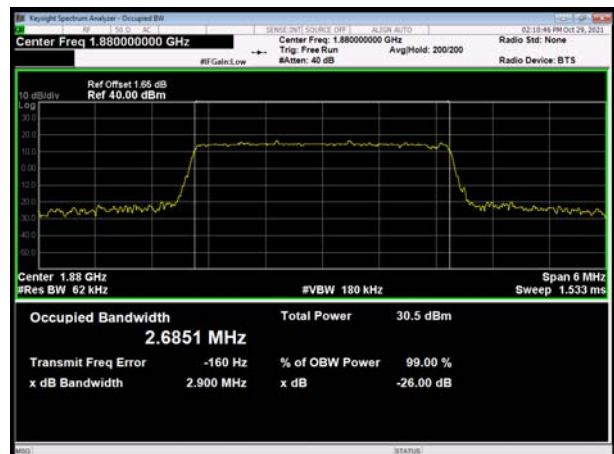
LTE Band 2 3MHz 16QAM CH-Low



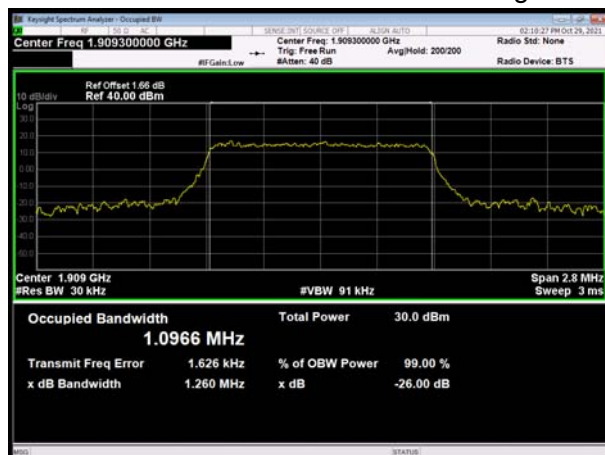
LTE Band 2 1.4MHz 16QAM CH-Middle



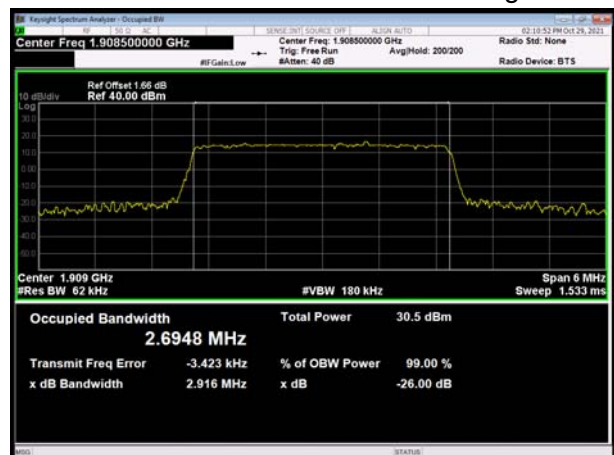
LTE Band 2 3MHz 16QAM CH-Middle



LTE Band 2 1.4MHz 16QAM CH-High

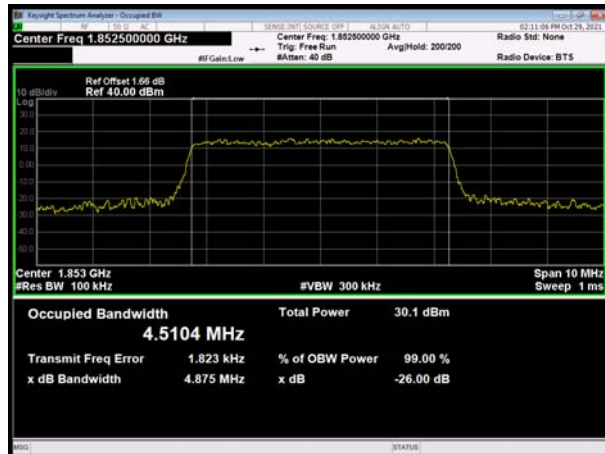


LTE Band 2 3MHz 16QAM CH-High

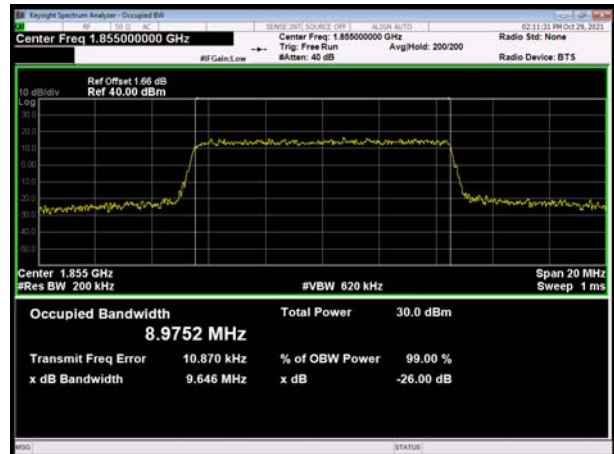




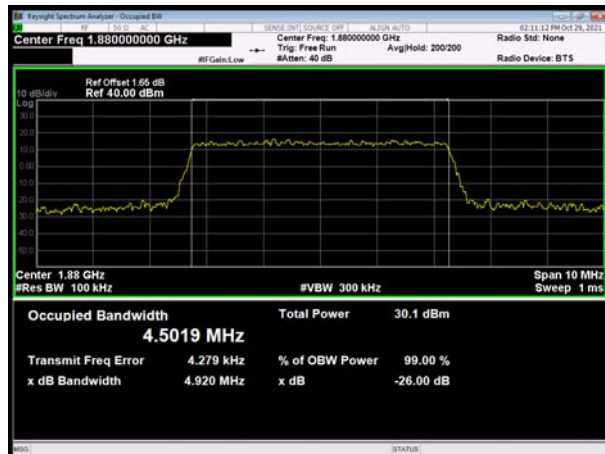
LTE Band 2 5MHz 16QAM CH-Low



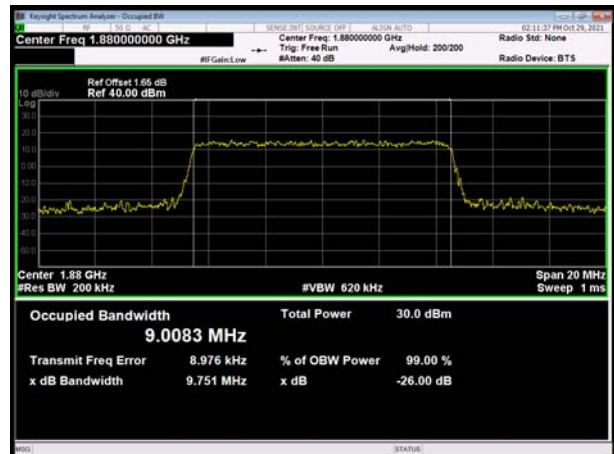
LTE Band 2 10MHz 16QAM CH-Low



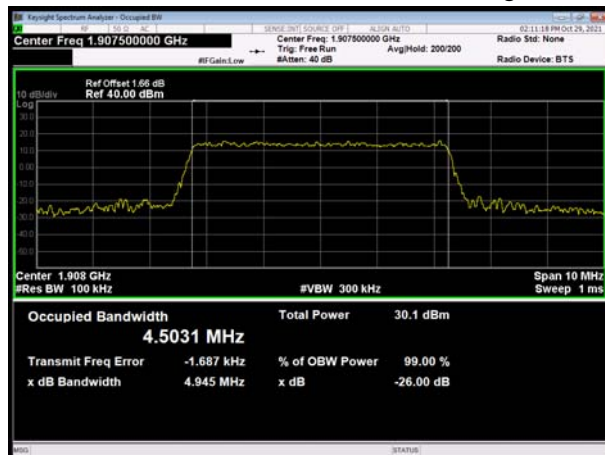
LTE Band 2 5MHz 16QAM CH-Middle



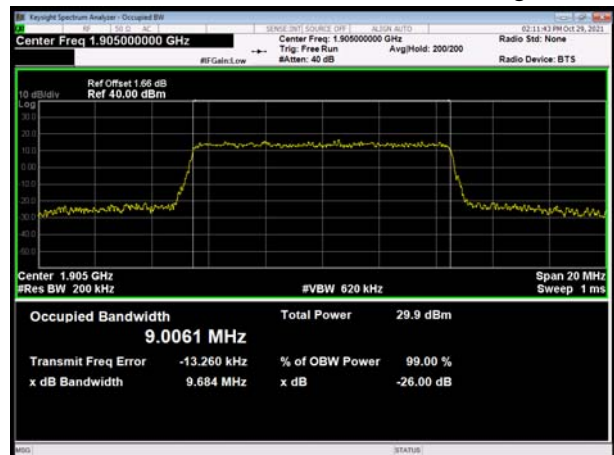
LTE Band 2 10MHz 16QAM CH-Middle



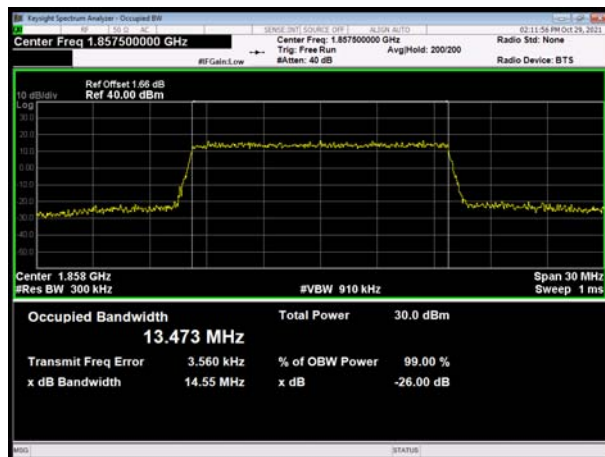
LTE Band 2 5MHz 16QAM CH-High



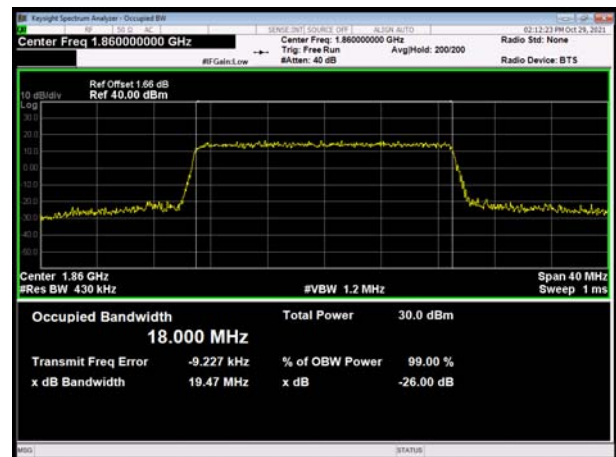
LTE Band 2 10MHz 16QAM CH-High



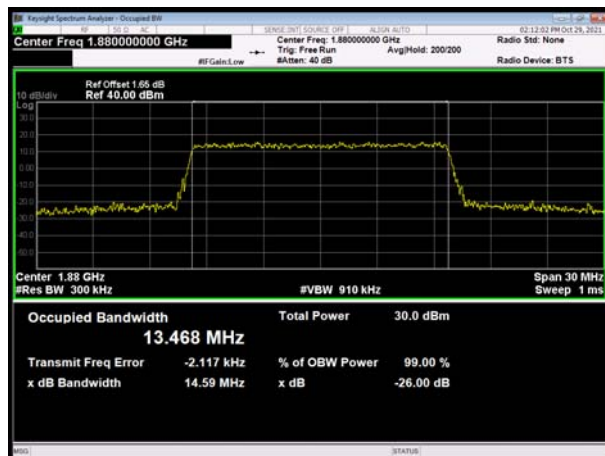
LTE Band 2 15MHz 16QAM CH-Low



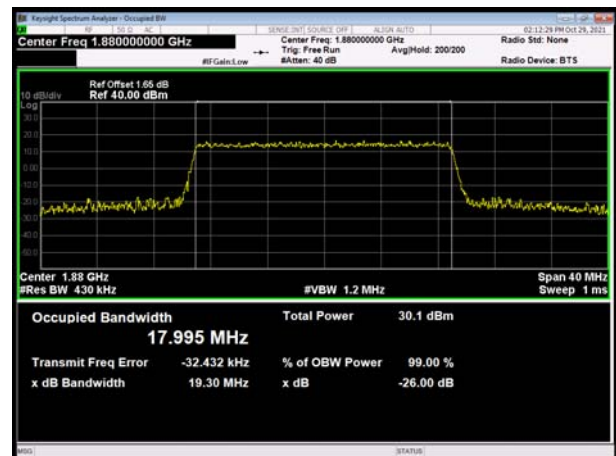
LTE Band 2 20MHz 16QAM CH-Low



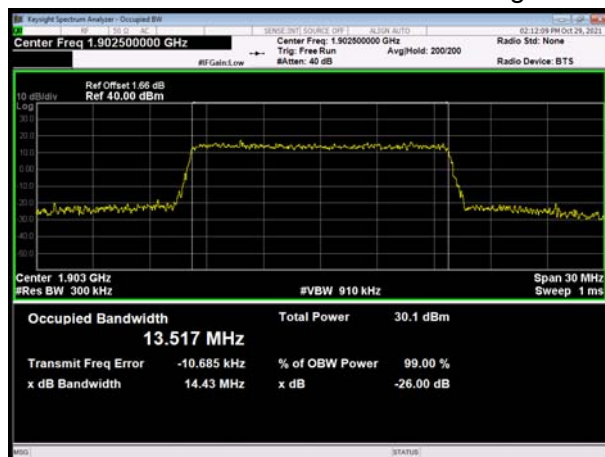
LTE Band 2 15MHz 16QAM CH-Middle



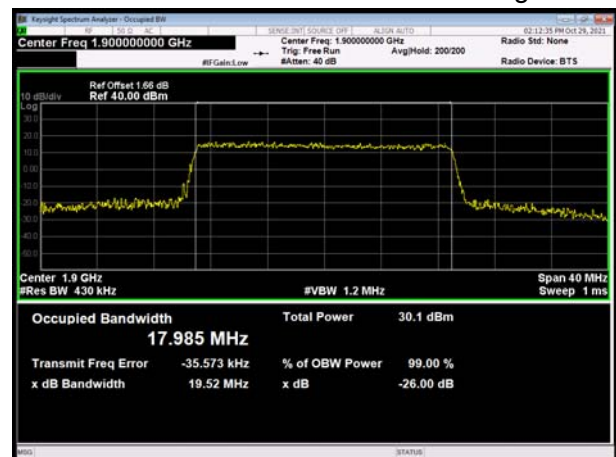
LTE Band 2 20MHz 16QAM CH-Middle



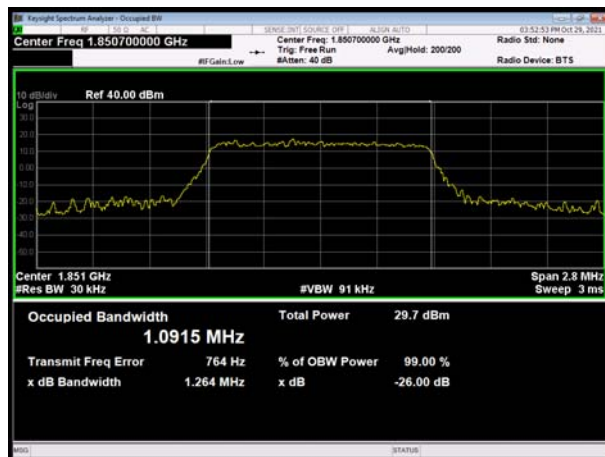
LTE Band 2 15MHz 16QAM CH-High



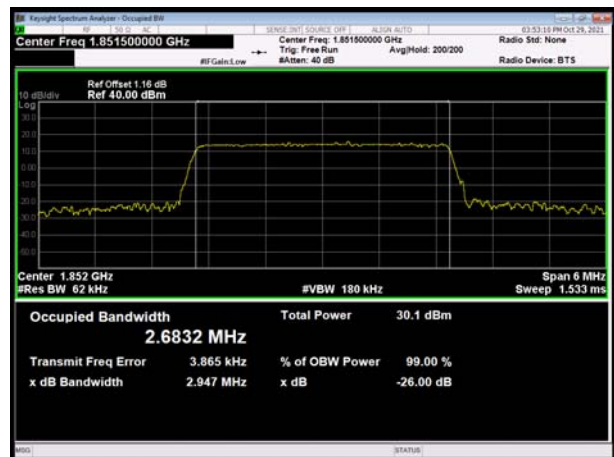
LTE Band 2 20MHz 16QAM CH-High



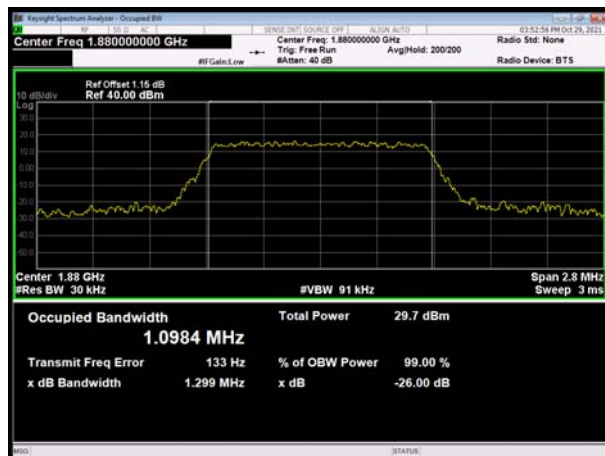
LTE Band 2 1.4MHz 64QAM CH-Low



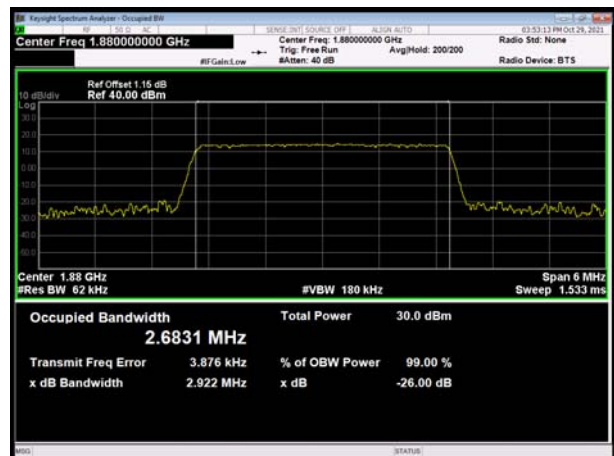
LTE Band 2 3MHz 64QAM CH-Low



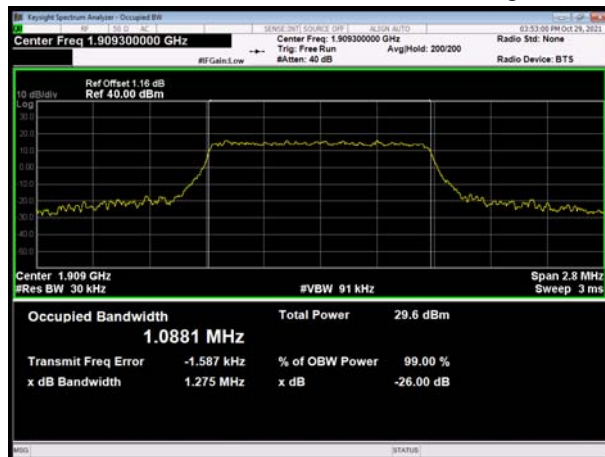
LTE Band 2 1.4MHz 64QAM CH-Middle



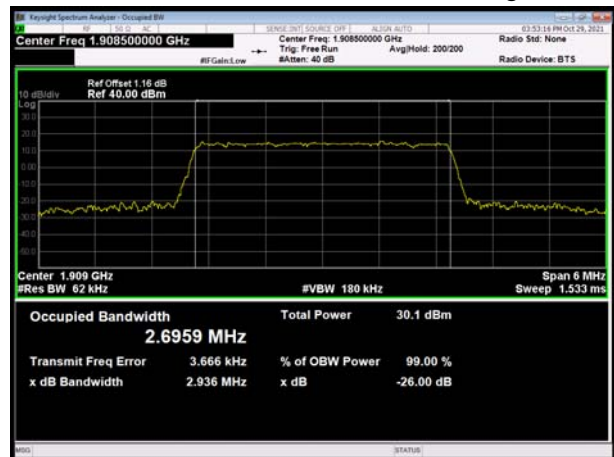
LTE Band 2 3MHz 64QAM CH-Middle



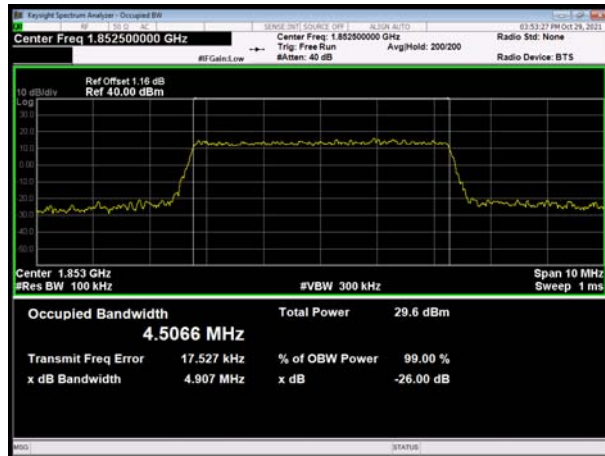
LTE Band 2 1.4MHz 64QAM CH-High



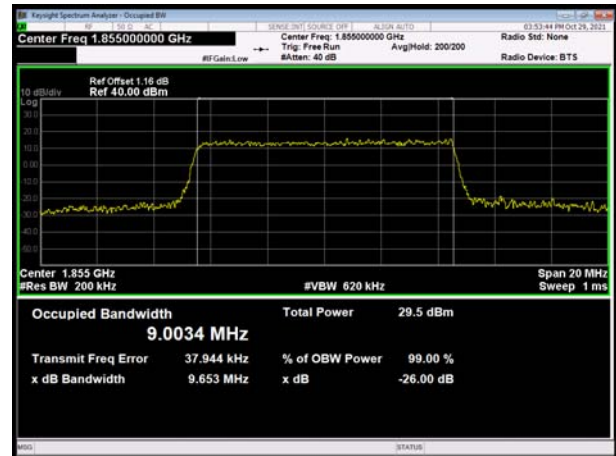
LTE Band 2 3MHz 64QAM CH-High



LTE Band 2 5MHz 64QAM CH-Low



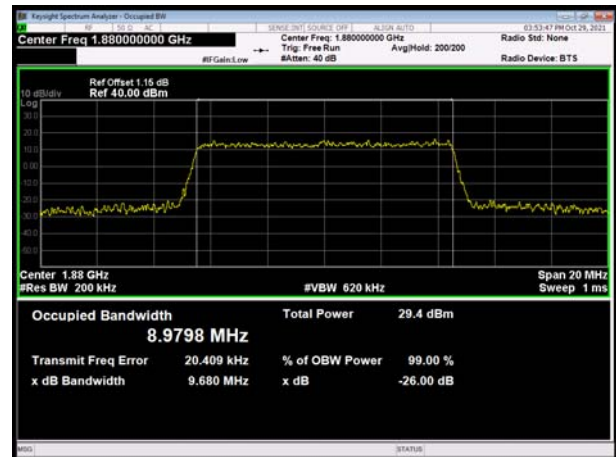
LTE Band 2 10MHz 64QAM CH-Low



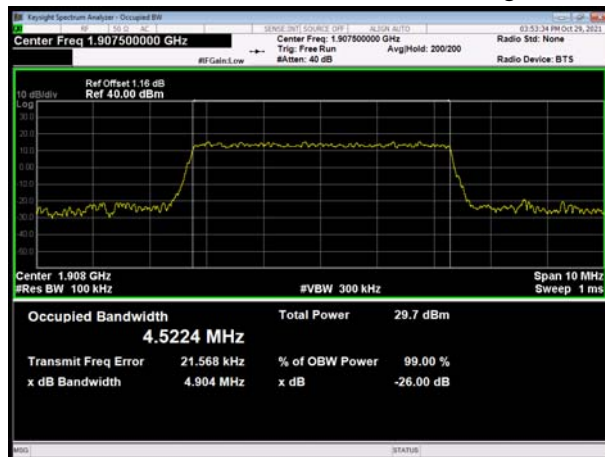
LTE Band 2 5MHz 64QAM CH-Middle



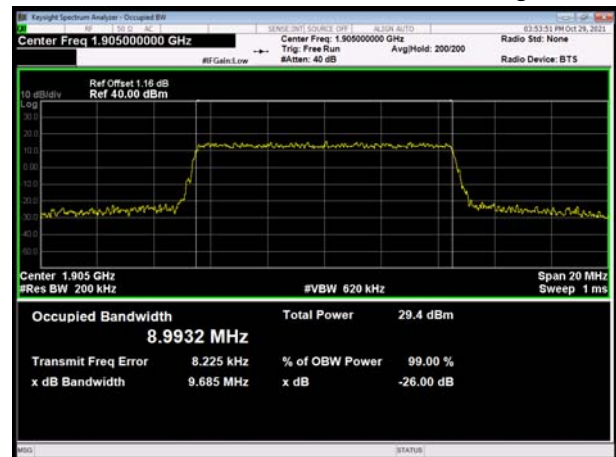
LTE Band 2 10MHz 64QAM CH-Middle



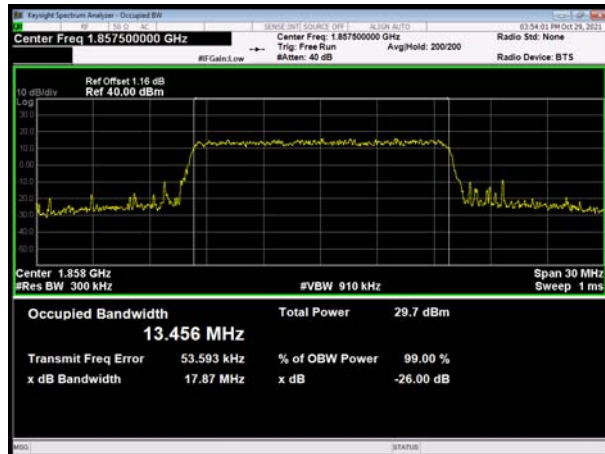
LTE Band 2 5MHz 64QAM CH-High



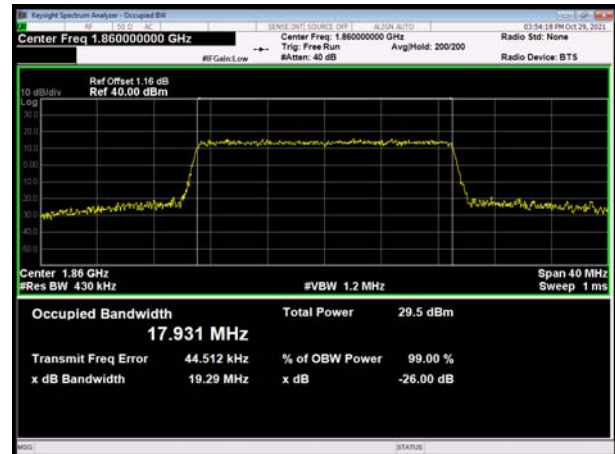
LTE Band 2 10MHz 64QAM CH-High



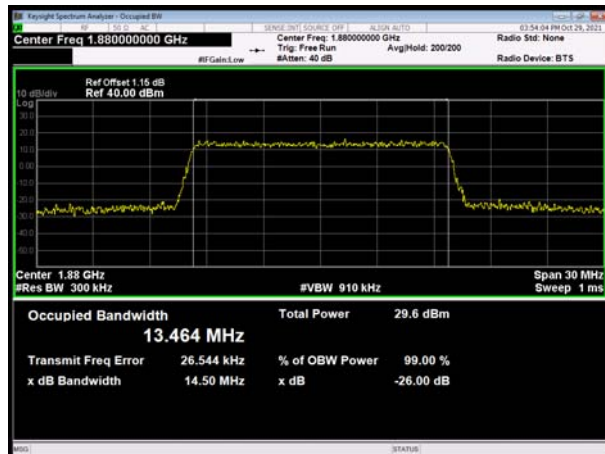
LTE Band 2 15MHz 64QAM CH-Low



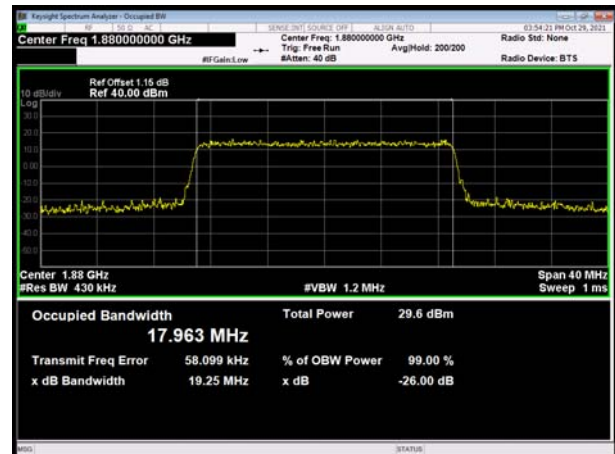
LTE Band 2 20MHz 64QAM CH-Low



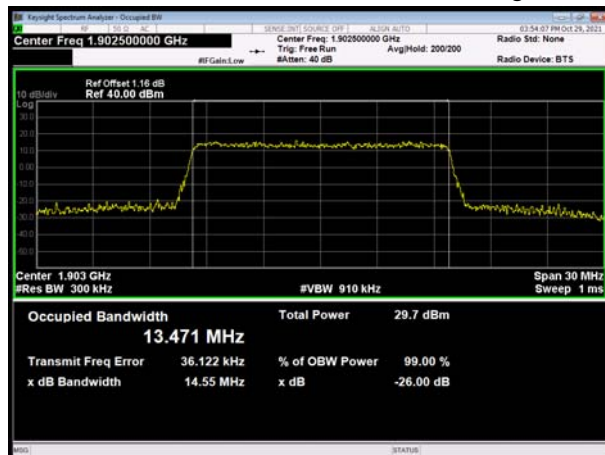
LTE Band 2 15MHz 64QAM CH-Middle



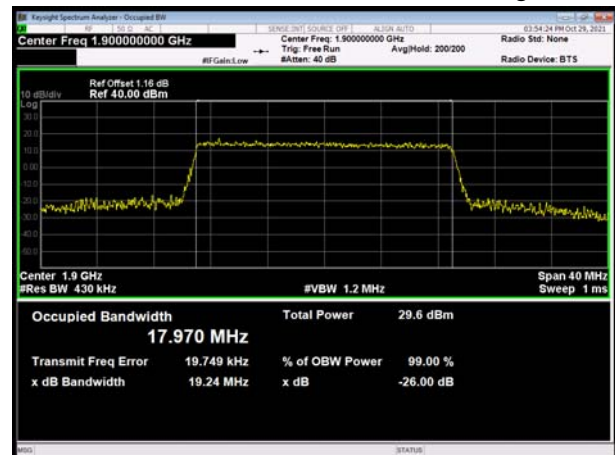
LTE Band 2 20MHz 64QAM CH-Middle



LTE Band 2 15MHz 64QAM CH-High



LTE Band 2 20MHz 64QAM CH-High



5.3. Band Edge Compliance

Ambient condition

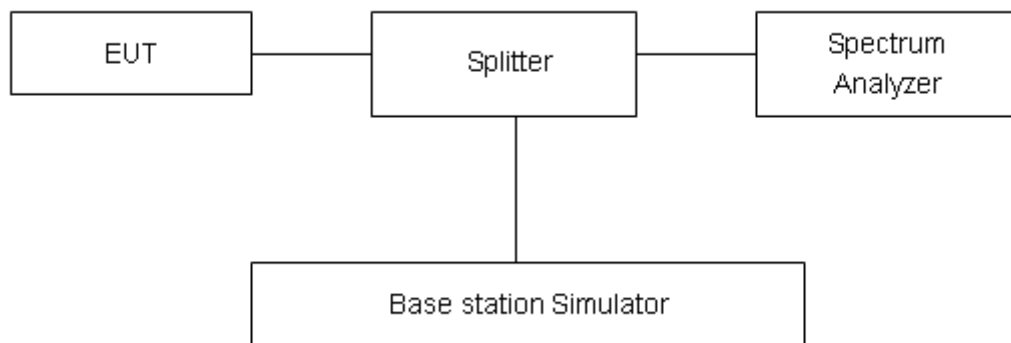
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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
-------	---------

Measurement Uncertainty

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



Test Result:

GSM1900 GSM CH-Low



GSM 1900 GSM CH-High



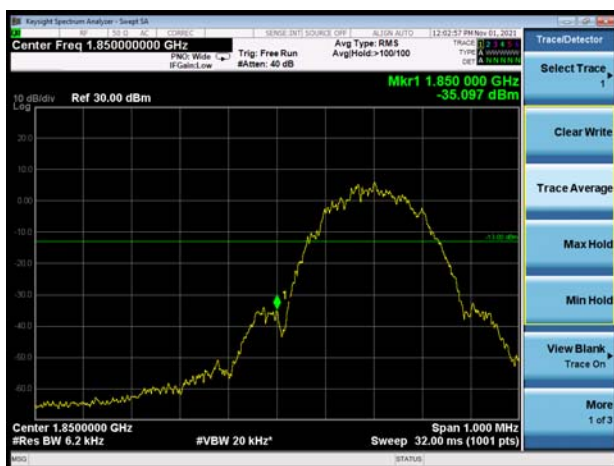
GSM1900 GPRS CH-Low



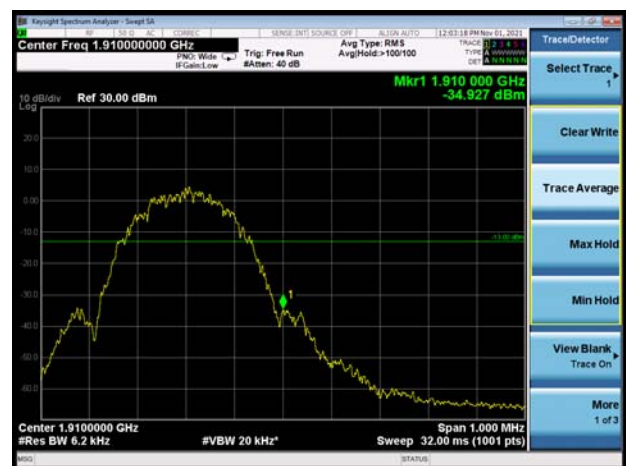
GSM 1900 GPRS CH-High



GSM1900 EGPRS CH-Low



GSM 1900 EGPRS CH-High





WCDMA Band II RMC CH-Low

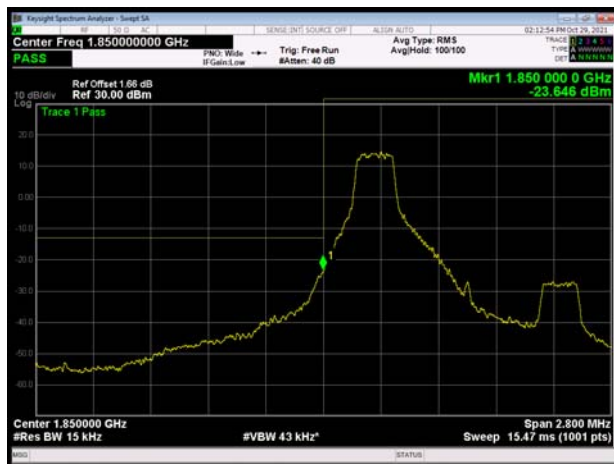


WCDMA Band II RMC CH-High





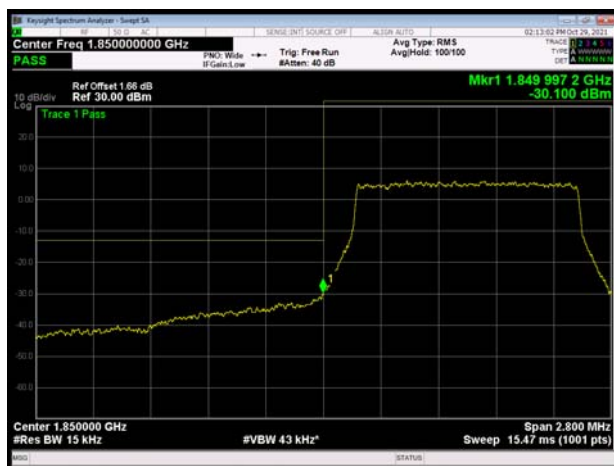
LTE Band 2 1.4MHz QPSK 1RB CH-Low



LTE Band 2 1.4MHz QPSK 1RB CH-High



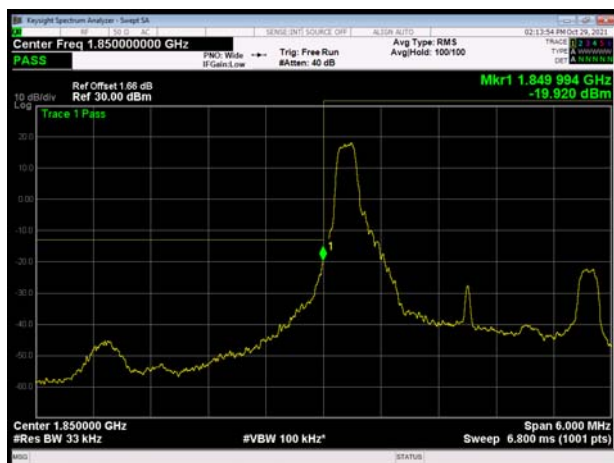
LTE Band 2 1.4MHz QPSK 100%RB CH-Low



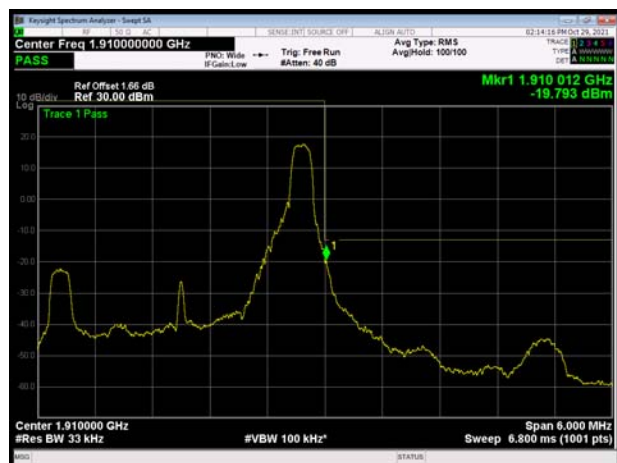
LTE Band 2 1.4MHz QPSK 100%RB CH-High



LTE Band 2 3MHz QPSK 1RB CH-Low

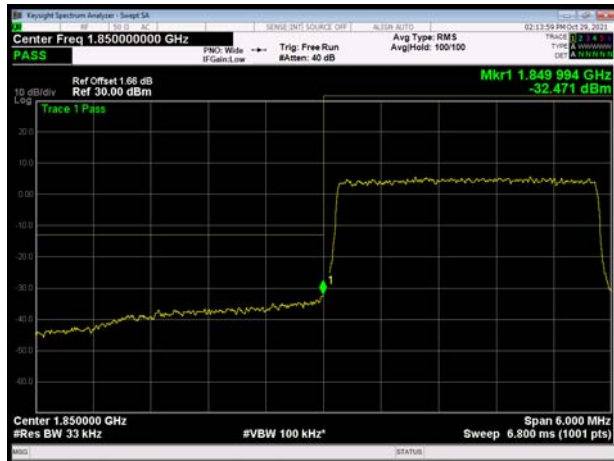


LTE Band 2 3MHz QPSK 1RB CH-High





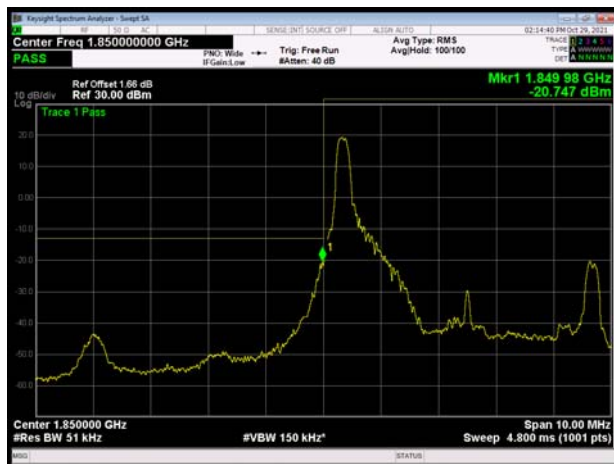
LTE Band 2 3MHz QPSK 100%RB CH-Low



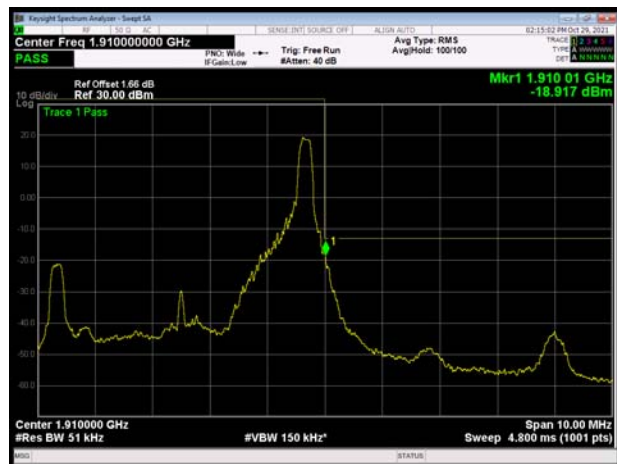
LTE Band 2 3MHz QPSK 100%RB CH-High



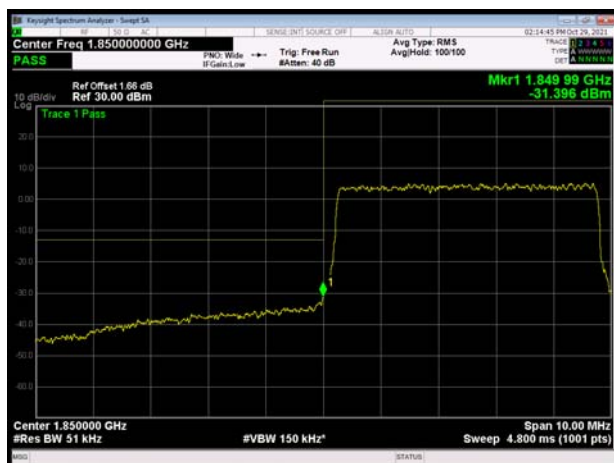
LTE Band 2 5MHz QPSK 1RB CH-Low



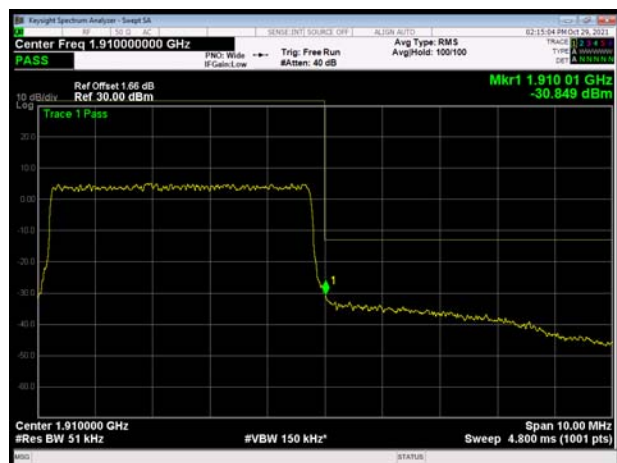
LTE Band 2 5MHz QPSK 1RB CH-High



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

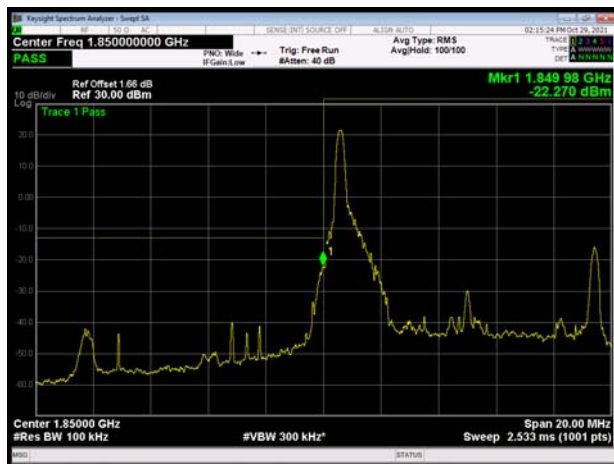


LTE Band 2 5MHz QPSK 100%RB CH-High

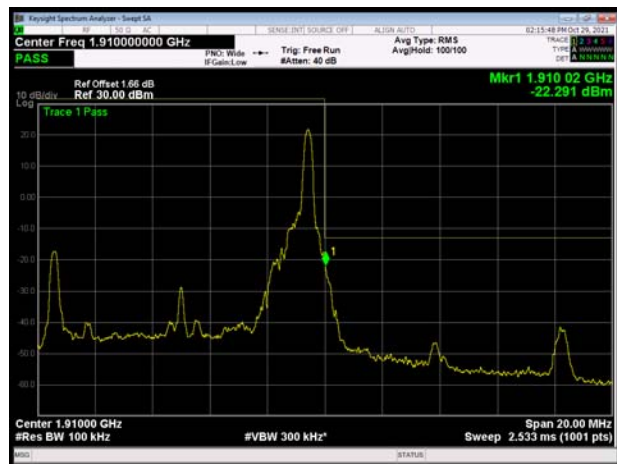




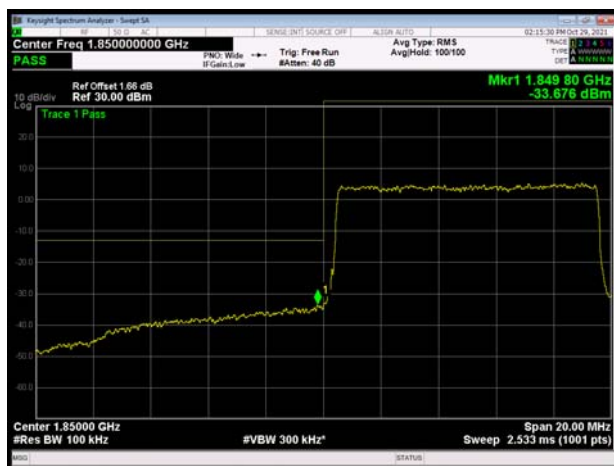
LTE Band 2 10MHz QPSK 1RB CH-Low



LTE Band 2 10MHz QPSK 1RB CH-High



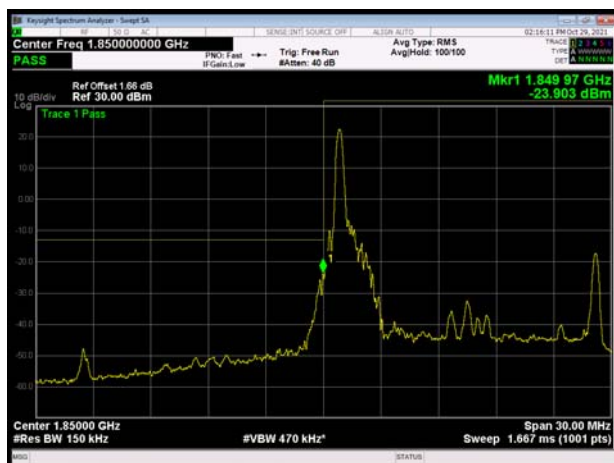
LTE Band 2 10MHz QPSK 100%RB CH-Low



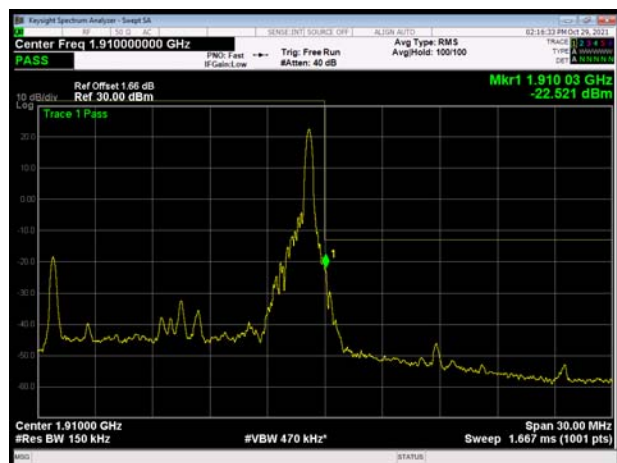
LTE Band 2 10MHz QPSK 100%RB CH-High



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



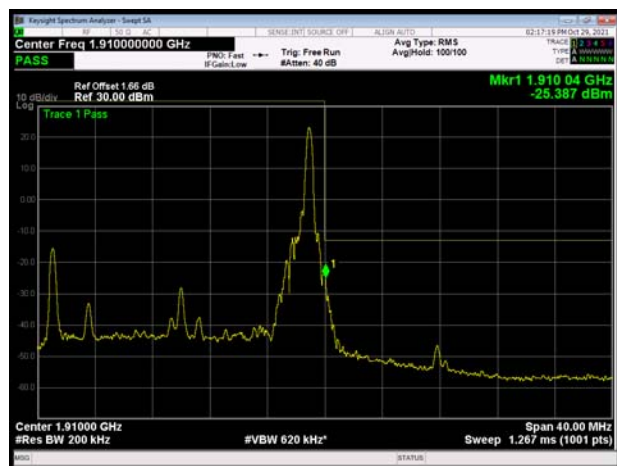
LTE Band 2 15MHz QPSK 100%RB CH-High



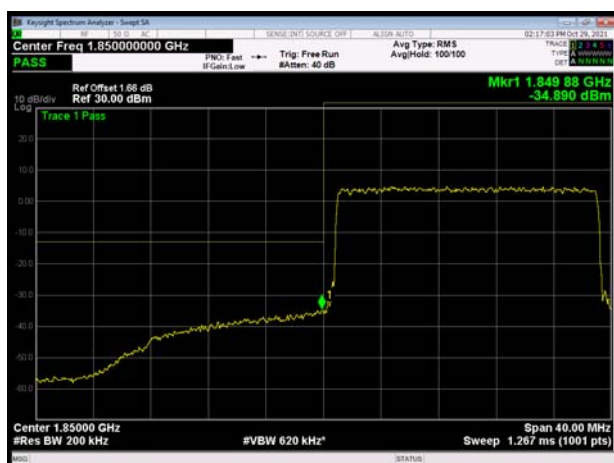
LTE Band 2 20MHz QPSK 1RB CH-Low



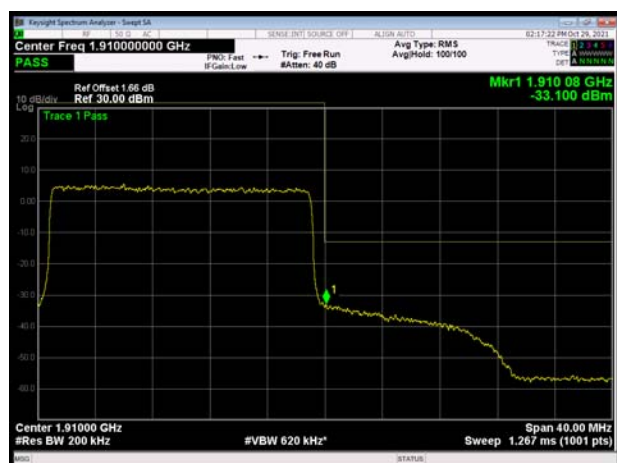
LTE Band 2 20MHz QPSK 1RB CH-High



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

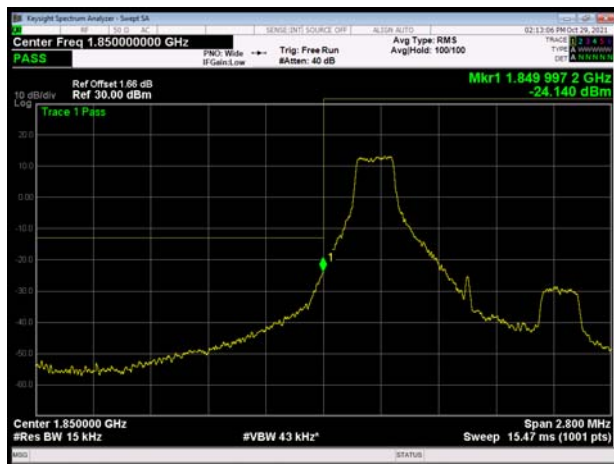


LTE Band 2 20MHz QPSK 100%RB CH-High

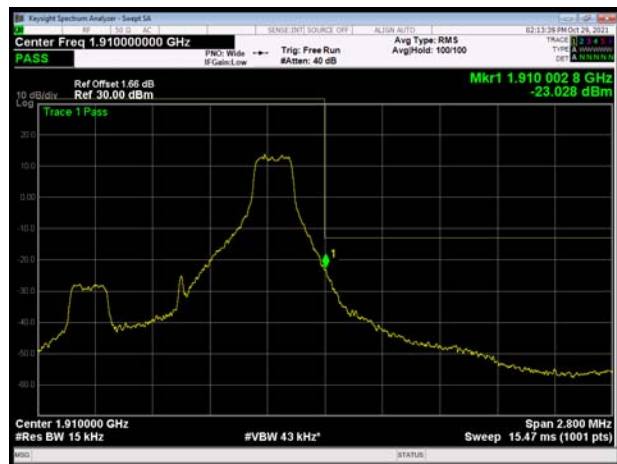




LTE Band 2 1.4MHz 16QAM 1RB CH-Low



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



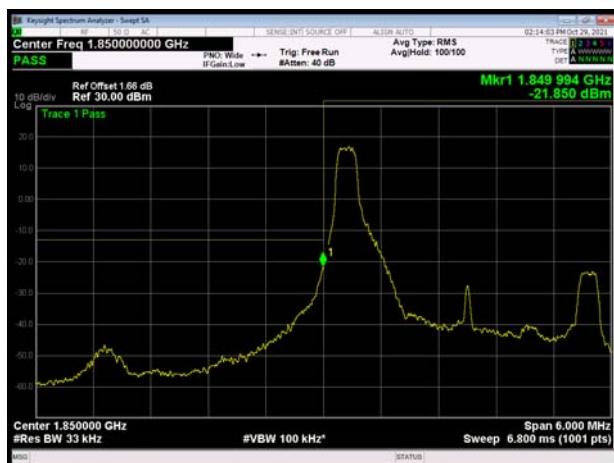
LTE Band 2 1.4MHz 16QAM 100%RB CH-Low



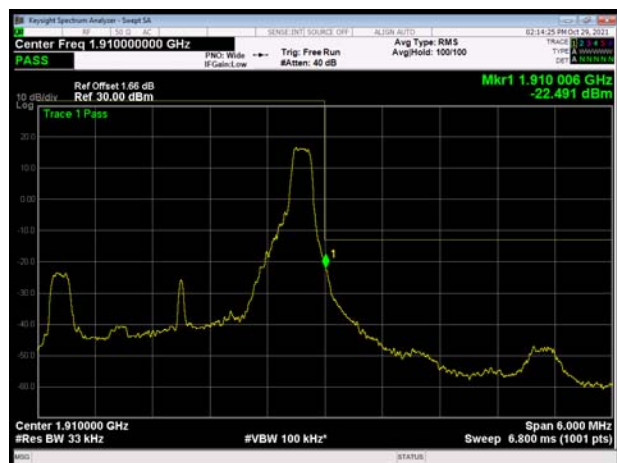
LTE Band 2 1.4MHz 16QAM 100%RB CH-High



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

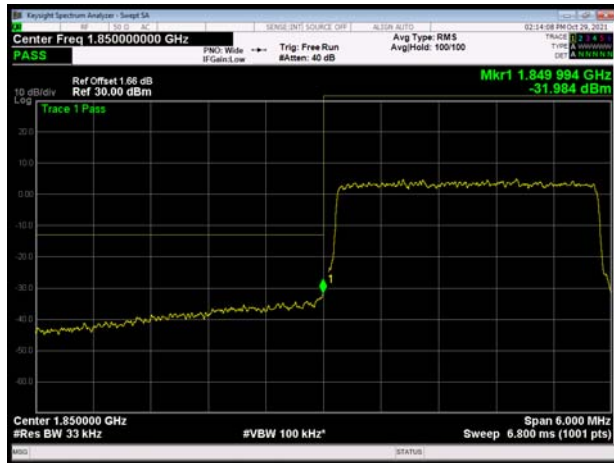


LTE Band 2 3MHz 16QAM 1RB CH-High





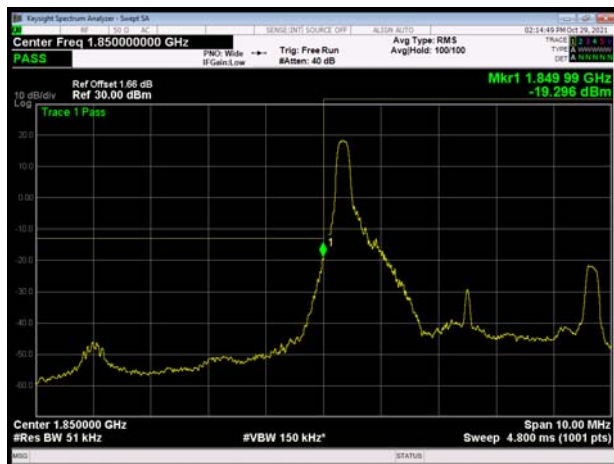
LTE Band 2 3MHz 16QAM 100%RB CH-Low



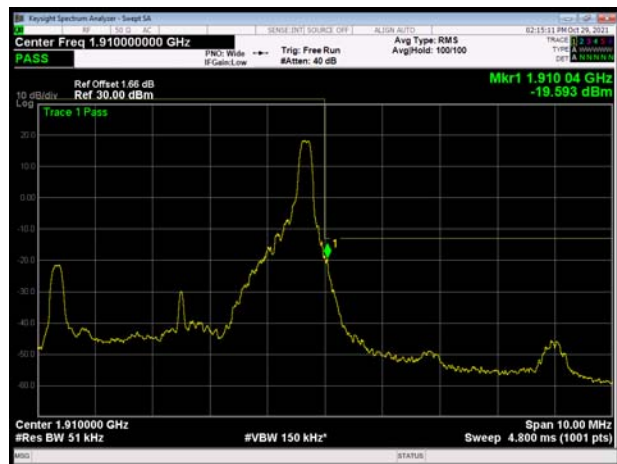
LTE Band 2 3MHz 16QAM 100%RB CH-High



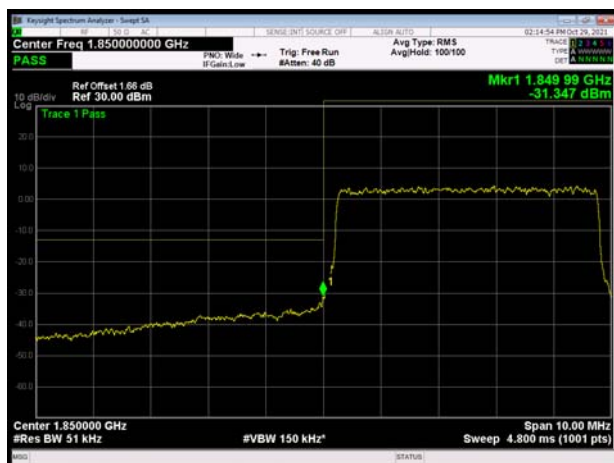
LTE Band 2 5MHz 16QAM 1RB CH-Low



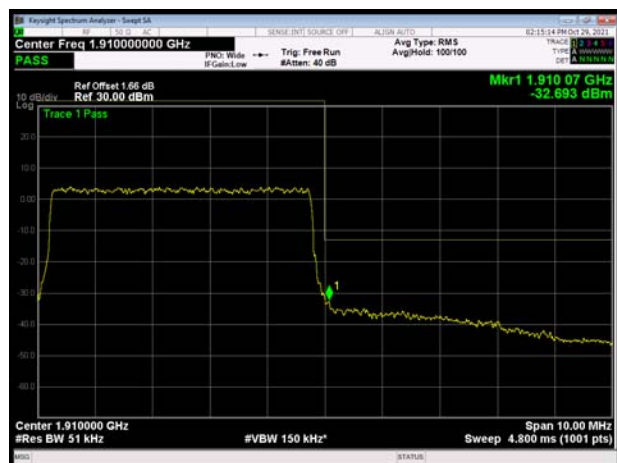
LTE Band 2 5MHz 16QAM 1RB CH-High



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



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

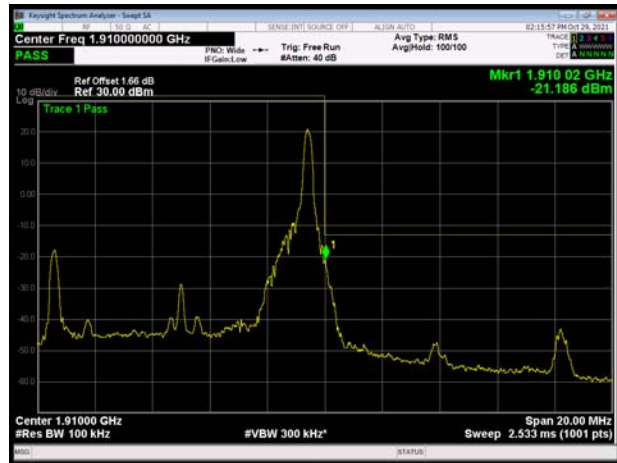




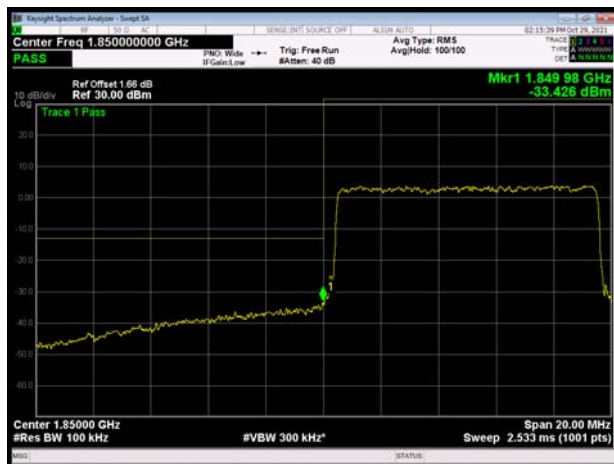
LTE Band 2 10MHz 16QAM 1RB CH-Low



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



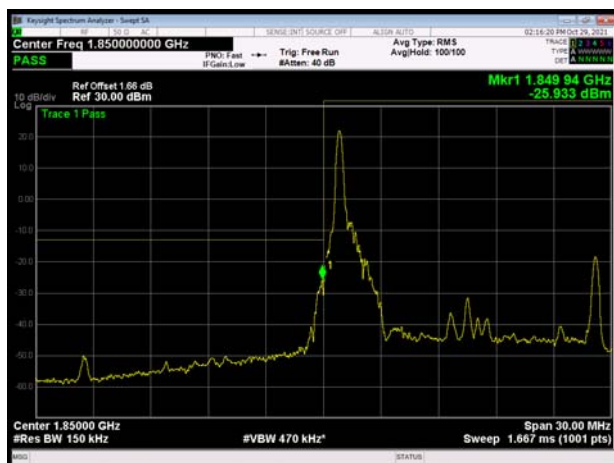
LTE Band 2 10MHz 16QAM 100%RB CH-Low



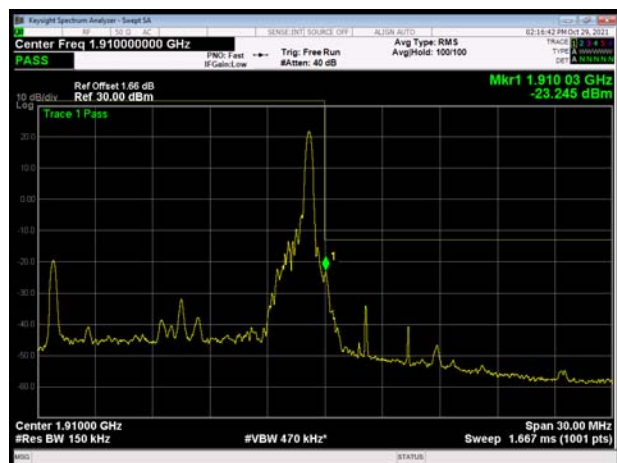
LTE Band 2 10MHz 16QAM 100%RB CH-High



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



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





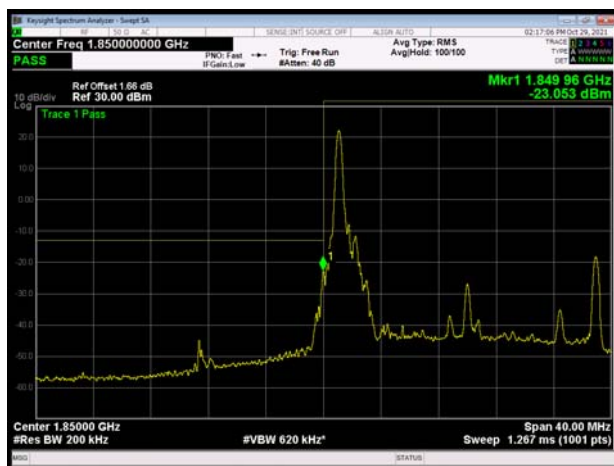
LTE Band 2 15MHz 16QAM 100%RB CH-Low



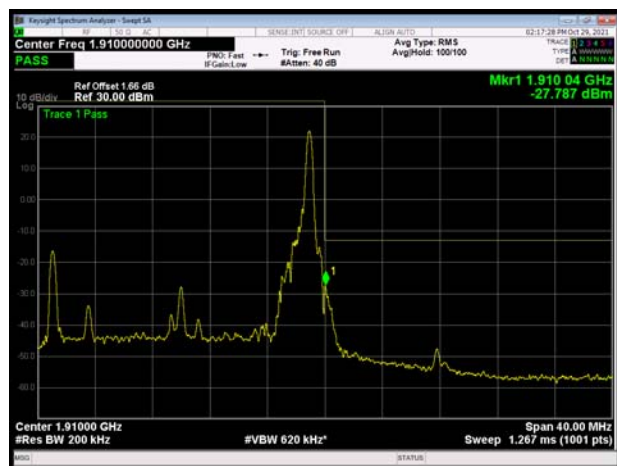
LTE Band 2 15MHz 16QAM 100%RB CH-High



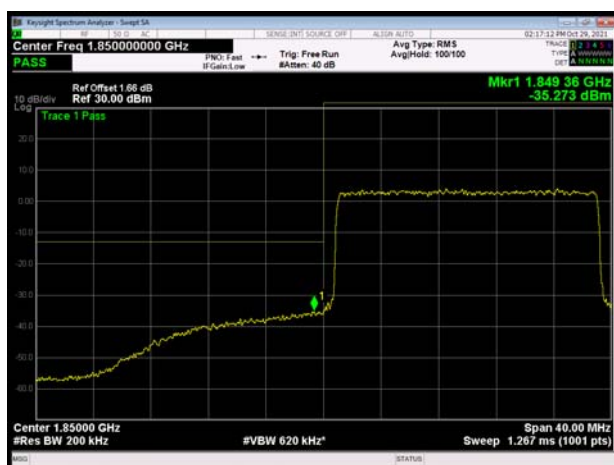
LTE Band 2 20MHz 16QAM 1RB CH-Low



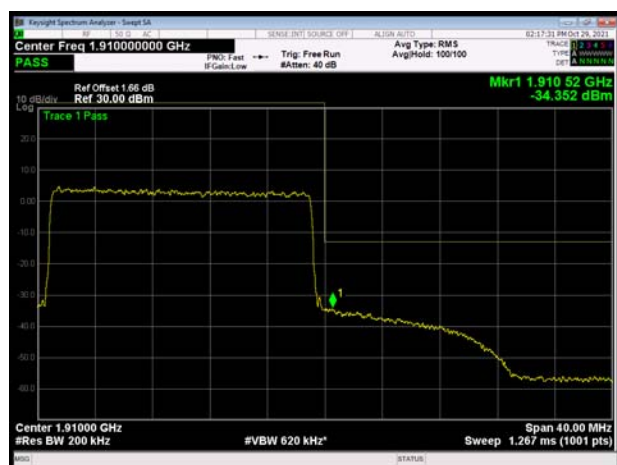
LTE Band 2 20MHz 16QAM 1RB CH-High



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

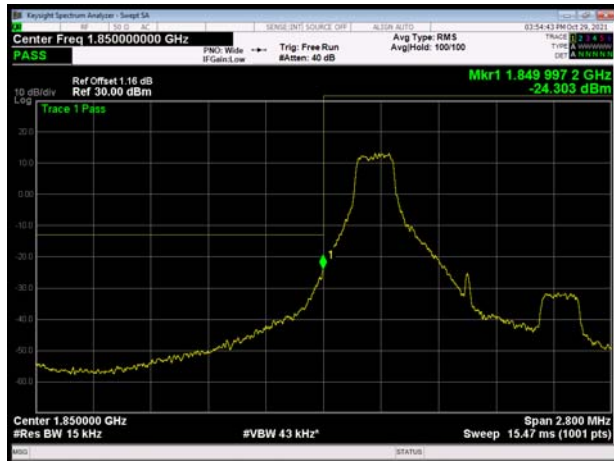


LTE Band 2 20MHz 16QAM 100%RB CH-High





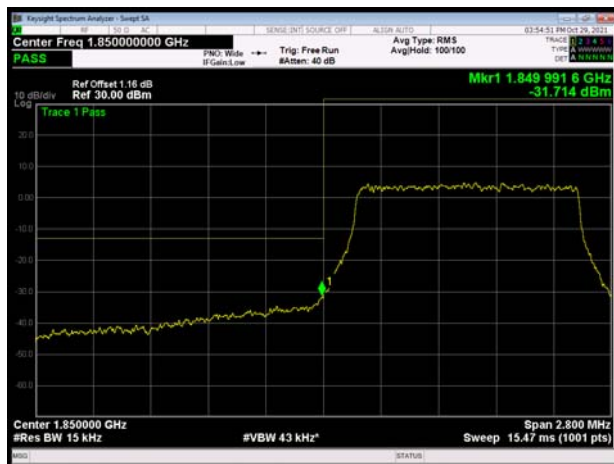
LTE Band 2 1.4MHz 64QAM 1RB CH-Low



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



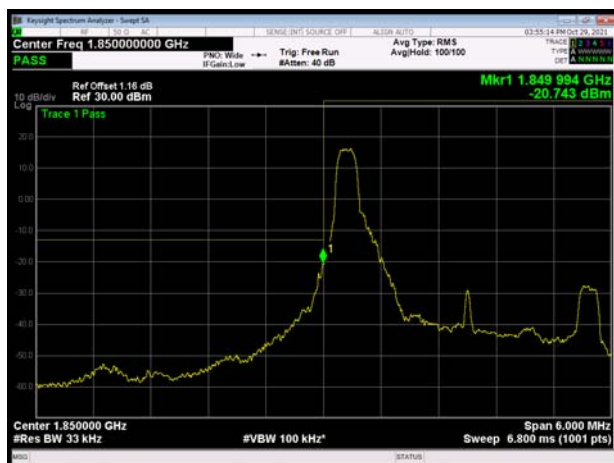
LTE Band 2 1.4MHz 64QAM 100%RB CH-Low



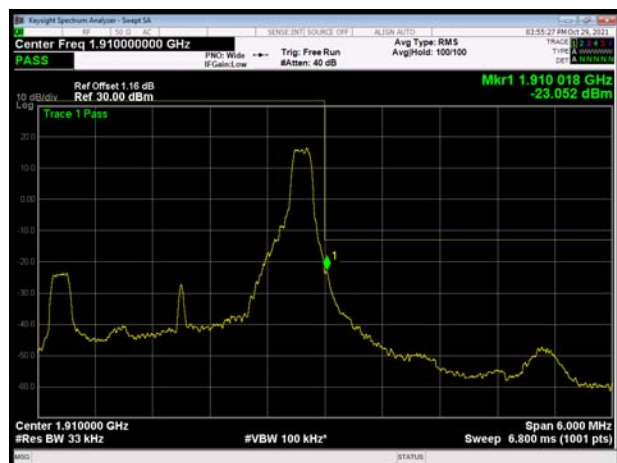
LTE Band 2 1.4MHz 64QAM 100%RB CH-High



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



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





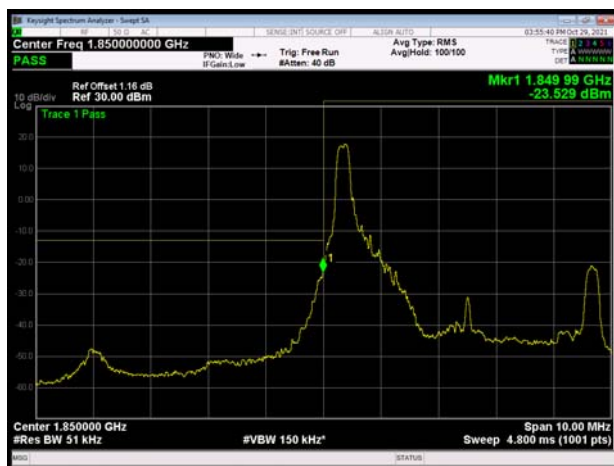
LTE Band 2 3MHz 64QAM 100%RB CH-Low



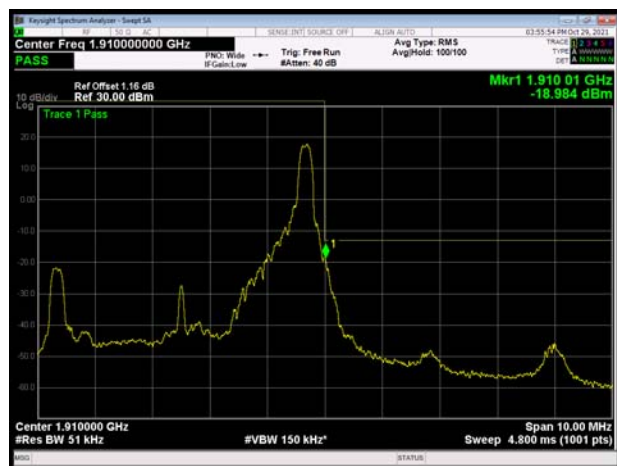
LTE Band 2 3MHz 64QAM 100%RB CH-High



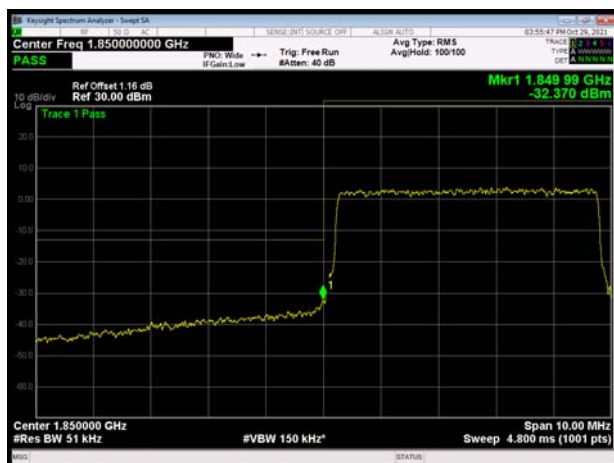
LTE Band 2 5MHz 64QAM 1RB CH-Low



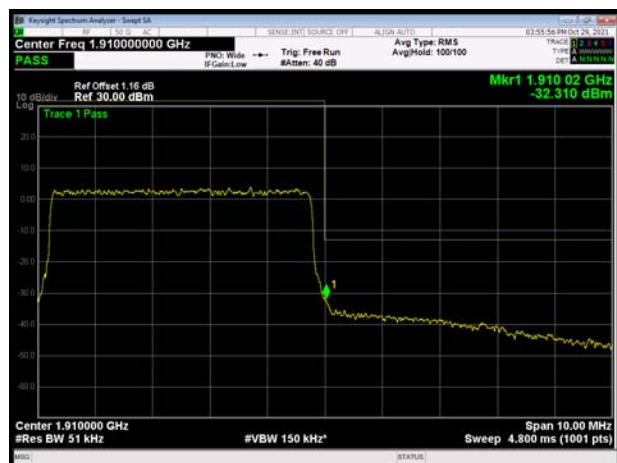
LTE Band 2 5MHz 64QAM 1RB CH-High



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



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

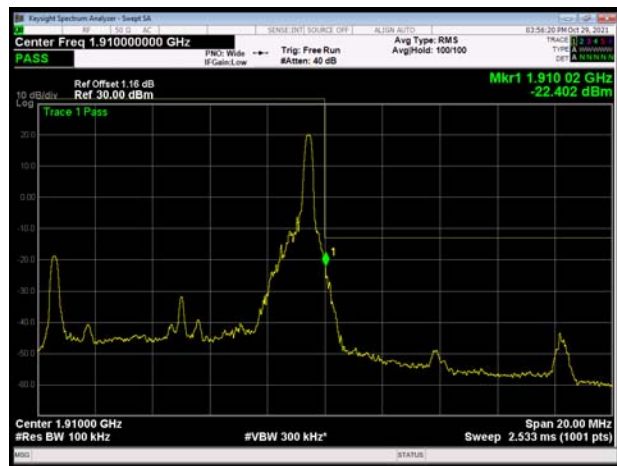




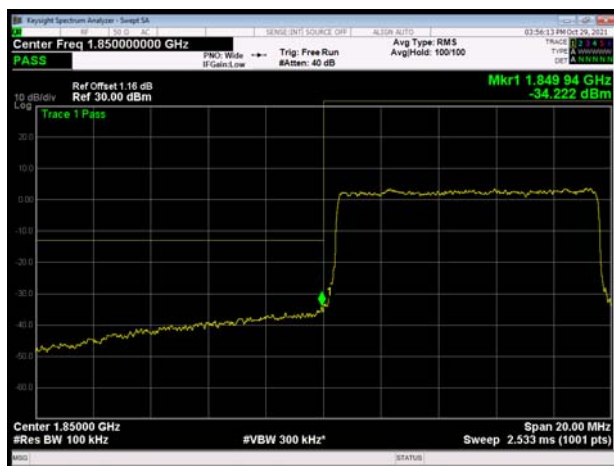
LTE Band 2 10MHz 64QAM 1RB CH-Low



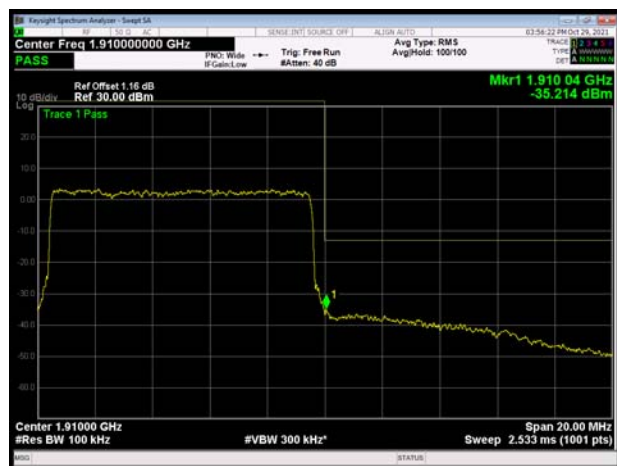
LTE Band 2 10MHz 64QAM 1RB CH-High



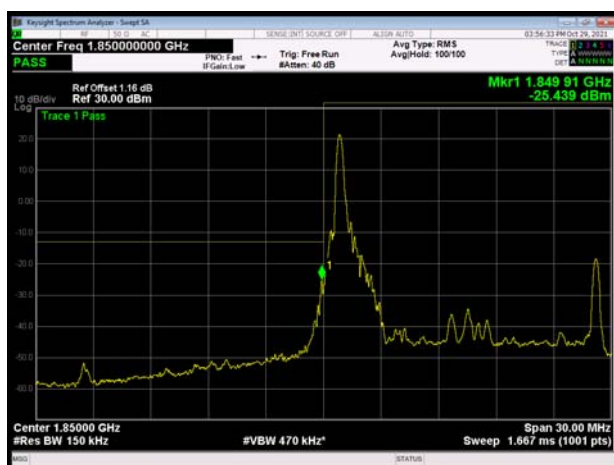
LTE Band 2 10MHz 64QAM 100%RB CH-Low



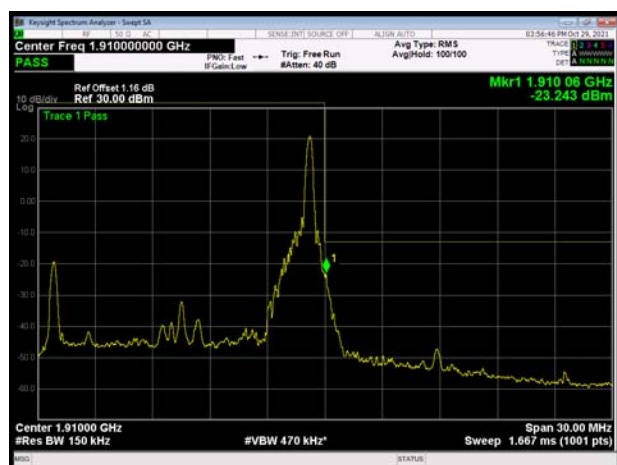
LTE Band 2 10MHz 64QAM 100%RB CH-High



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



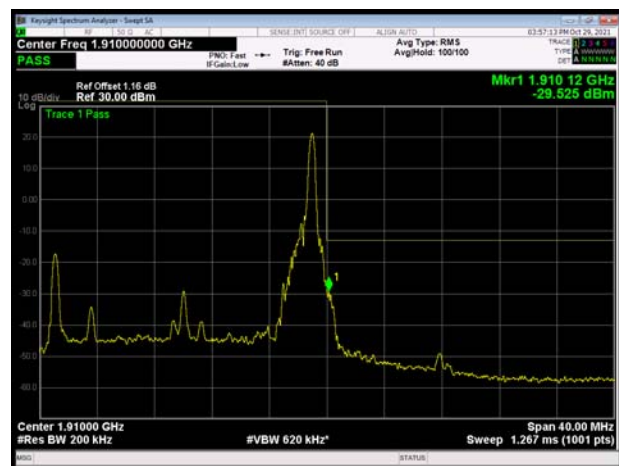
LTE Band 2 15MHz 64QAM 100%RB CH-High



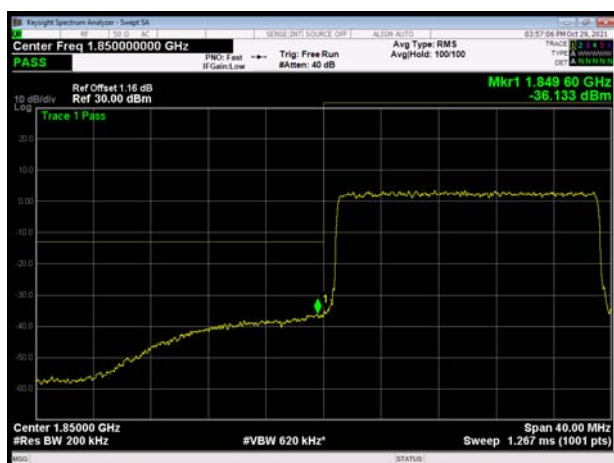
LTE Band 2 20MHz 64QAM 1RB CH-Low



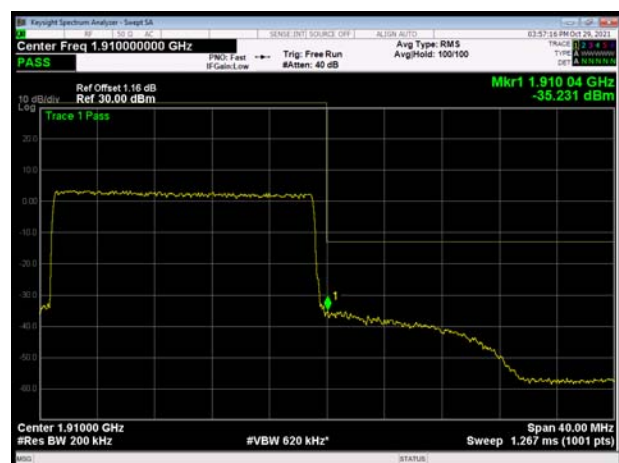
LTE Band 2 20MHz 64QAM 1RB CH-High



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

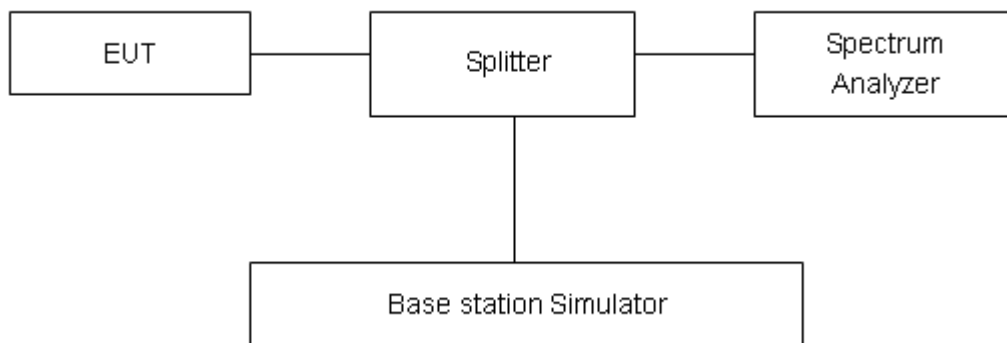
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

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	29.81	27.20	2.61	≤13	PASS
	661	1880	28.91	26.30	2.61	≤13	PASS
	810	1909.8	28.59	25.98	2.61	≤13	PASS
GPRS 1900 (GMSK)	512	1850.2	29.83	27.22	2.61	≤13	PASS
	661	1880	28.92	26.31	2.61	≤13	PASS
	810	1909.8	28.59	25.98	2.61	≤13	PASS
EGPRS 1900 (8PSK)	512	1850.2	29.26	23.52	5.74	≤13	PASS
	661	1880	28.47	22.84	5.63	≤13	PASS
	810	1909.8	28.22	22.54	5.68	≤13	PASS
WCDMA Band II (RMC)	9262	1852.4	26.41	23.60	2.81	≤13	PASS
	9400	1880	26.26	23.40	2.86	≤13	PASS
	9538	1907.6	26.18	23.39	2.79	≤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	27.58	22.83	4.75	≤13	PASS
		18900	1880.0	27.66	22.75	4.91	≤13	PASS
		19193	1909.3	27.34	22.78	4.56	≤13	PASS
	3	18615	1851.5	27.63	22.77	4.86	≤13	PASS
		18900	1880	27.73	22.67	5.06	≤13	PASS
		19185	1908.5	27.47	22.73	4.74	≤13	PASS
	5	18625	1852.5	27.69	22.78	4.91	≤13	PASS
		18900	1880	27.72	22.67	5.05	≤13	PASS
		19175	1907.5	27.63	22.71	4.92	≤13	PASS
	10	18650	1855	27.76	22.79	4.97	≤13	PASS
		18900	1880	27.83	22.79	5.04	≤13	PASS
		19150	1905	27.84	22.80	5.04	≤13	PASS
	15	18675	1857.5	28.23	22.84	5.39	≤13	PASS
		18900	1880	28.20	22.83	5.37	≤13	PASS
		19125	1902.5	28.21	22.86	5.35	≤13	PASS
	20	18700	1860	28.06	22.74	5.32	≤13	PASS
		18900	1880	28.08	22.76	5.32	≤13	PASS
		19100	1900	28.01	22.80	5.21	≤13	PASS
16QAM	1.4	18607	1850.7	27.39	21.81	5.58	≤13	PASS
		18900	1880.0	27.54	21.78	5.76	≤13	PASS
		19193	1909.3	27.20	21.76	5.44	≤13	PASS
	3	18615	1851.5	27.51	21.79	5.72	≤13	PASS
		18900	1880	27.58	21.69	5.89	≤13	PASS
		19185	1908.5	27.36	21.71	5.65	≤13	PASS
	5	18625	1852.5	27.50	21.79	5.71	≤13	PASS
		18900	1880	27.58	21.73	5.85	≤13	PASS
		19175	1907.5	27.44	21.72	5.72	≤13	PASS
	10	18650	1855	27.58	21.79	5.79	≤13	PASS
		18900	1880	27.66	21.79	5.87	≤13	PASS
		19150	1905	27.66	21.81	5.85	≤13	PASS
	15	18675	1857.5	27.79	21.82	5.97	≤13	PASS
		18900	1880	27.82	21.79	6.03	≤13	PASS
		19125	1902.5	27.81	21.82	5.99	≤13	PASS
	20	18700	1860	27.77	21.73	6.04	≤13	PASS
		18900	1880	27.80	21.78	6.02	≤13	PASS
		19100	1900	27.83	21.84	5.99	≤13	PASS
64QAM	1.4	18607	1850.7	27.25	21.64	5.61	≤13	PASS
		18900	1880.0	27.43	21.62	5.81	≤13	PASS
		19193	1909.3	27.05	21.59	5.46	≤13	PASS



	3	18615	1851.5	27.35	21.61	5.74	≤13	PASS
		18900	1880	27.45	21.52	5.93	≤13	PASS
		19185	1908.5	27.26	21.56	5.70	≤13	PASS
	5	18625	1852.5	27.34	21.59	5.75	≤13	PASS
		18900	1880	27.45	21.54	5.91	≤13	PASS
		19175	1907.5	27.36	21.58	5.78	≤13	PASS
	10	18650	1855	27.42	21.62	5.80	≤13	PASS
		18900	1880	27.55	21.62	5.93	≤13	PASS
		19150	1905	27.54	21.61	5.93	≤13	PASS
	15	18675	1857.5	27.62	21.62	6.00	≤13	PASS
		18900	1880	27.67	21.59	6.08	≤13	PASS
		19125	1902.5	27.70	21.64	6.06	≤13	PASS
	20	18700	1860	27.65	21.58	6.07	≤13	PASS
		18900	1880	27.69	21.60	6.09	≤13	PASS
		19100	1900	27.69	21.66	6.03	≤13	PASS

5.5. Frequency Stability

Ambient condition

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

Method of Measurement

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.

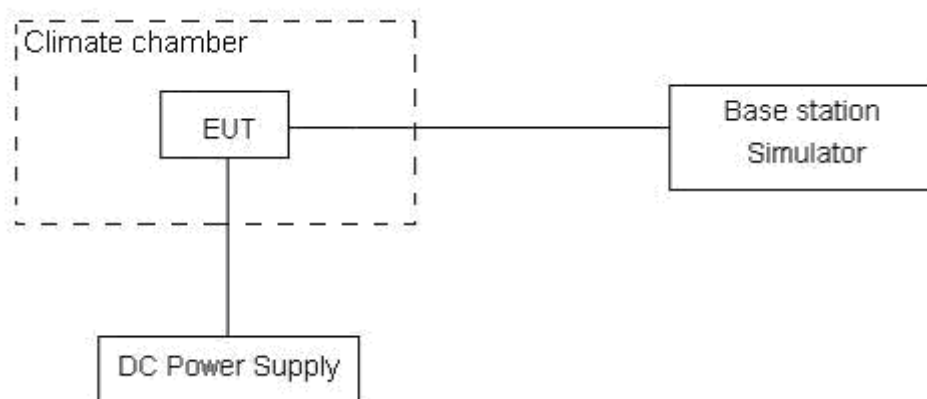
(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements. Frequency Stability (Voltage Variation)

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 3.6 V and 4.45 V, 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

GSM1900						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	GMSK	8PSK	GMSK	8PSK	
Normal (25℃)	Normal	8.75	2.14	0.00465	0.00114	PASS
Extreme (50℃)		11.67	5.53	0.00621	0.00294	PASS
Extreme (40℃)		4.36	10.66	0.00232	0.00567	PASS
Extreme (30℃)		9.19	7.80	0.00489	0.00415	PASS
Extreme (20℃)		15.04	2.68	0.00800	0.00142	PASS
Extreme (10℃)		14.45	9.97	0.00769	0.00530	PASS
Extreme (0℃)		4.68	6.55	0.00249	0.00348	PASS
Extreme (-10℃)		3.06	5.53	0.00163	0.00294	PASS
Extreme (-20℃)		11.51	13.91	0.00612	0.00740	PASS
Extreme (-30℃)		4.49	4.44	0.00239	0.00236	PASS
25℃	LV	17.31	9.58	0.00921	0.00510	PASS
	HV	5.56	12.58	0.00296	0.00669	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℃)	Normal	3.30	15.64	0.00176	0.00832	PASS
Extreme (50℃)		2.85	11.72	0.00152	0.00623	PASS
Extreme (40℃)		9.19	2.42	0.00489	0.00129	PASS
Extreme (30℃)		13.68	17.18	0.00728	0.00914	PASS
Extreme (20℃)		10.79	15.11	0.00574	0.00804	PASS
Extreme (10℃)		1.78	12.04	0.00094	0.00640	PASS
Extreme (0℃)		10.22	12.77	0.00544	0.00679	PASS
Extreme (-10℃)		6.56	11.59	0.00349	0.00616	PASS
Extreme (-20℃)		7.55	6.95	0.00402	0.00370	PASS
Extreme (-30℃)		5.15	3.27	0.00274	0.00174	PASS
25℃	LV	13.99	1.57	0.00744	0.00083	PASS
	HV	6.23	7.78	0.00332	0.00414	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	PASS
Normal (25℃)	Normal	10.69	3.71	6.91	0.00569	0.00197	0.00367	
Extreme (50℃)		17.98	4.79	11.51	0.00956	0.00255	0.00612	
Extreme (40℃)		9.03	14.26	6.71	0.00480	0.00758	0.00357	
Extreme (30℃)		3.45	16.50	17.58	0.00183	0.00878	0.00935	
Extreme (20℃)		2.66	15.26	11.21	0.00141	0.00812	0.00596	
Extreme (10℃)		9.11	2.81	11.23	0.00485	0.00150	0.00598	
Extreme (0℃)		10.49	7.73	7.38	0.00558	0.00411	0.00393	
Extreme (-10℃)		7.07	7.00	14.56	0.00376	0.00372	0.00775	
Extreme (-20℃)		10.09	1.63	12.56	0.00537	0.00087	0.00668	
Extreme (-30℃)		6.35	9.48	8.96	0.00338	0.00505	0.00477	
25℃	LV	1.80	15.06	15.06	0.00096	0.00801	0.00801	PASS
	HV	6.62	13.26	17.35	0.00352	0.00705	0.00923	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	PASS
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	6.42	9.99	5.26	0.00342	0.00531	0.00280	
Extreme (50℃)		17.07	3.88	5.99	0.00908	0.00206	0.00318	
Extreme (40℃)		3.79	9.83	14.68	0.00202	0.00523	0.00781	
Extreme (30℃)		2.00	16.43	16.70	0.00106	0.00874	0.00888	
Extreme (20℃)		16.59	3.52	2.80	0.00883	0.00187	0.00149	
Extreme (10℃)		6.94	11.65	10.31	0.00369	0.00620	0.00548	
Extreme (0℃)		6.46	15.95	15.75	0.00344	0.00849	0.00838	
Extreme (-10℃)		3.99	2.88	11.22	0.00212	0.00153	0.00597	
Extreme (-20℃)		13.71	13.33	2.02	0.00729	0.00709	0.00107	
Extreme (-30℃)		17.25	3.48	9.13	0.00918	0.00185	0.00486	
25℃	LV	7.52	6.63	13.63	0.00400	0.00353	0.00725	PASS
	HV	10.18	8.67	12.88	0.00542	0.00461	0.00685	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℃)	Normal	11.43	11.12	14.77	0.00608	0.00591	0.00785	PASS
Extreme (50℃)		13.33	7.33	3.65	0.00709	0.00390	0.00194	PASS



Extreme (40℃)		2.99	12.65	17.07	0.00159	0.00673	0.00908	PASS
Extreme (30℃)		10.06	8.48	13.08	0.00535	0.00451	0.00696	PASS
Extreme (20℃)		4.81	17.52	7.79	0.00256	0.00932	0.00414	PASS
Extreme (10℃)		2.39	5.05	13.74	0.00127	0.00268	0.00731	PASS
Extreme (0℃)		3.68	8.60	10.01	0.00196	0.00457	0.00533	PASS
Extreme (-10℃)		4.93	7.37	7.59	0.00262	0.00392	0.00404	PASS
Extreme (-20℃)		7.24	2.92	5.99	0.00385	0.00155	0.00319	PASS
Extreme (-30℃)		8.63	15.00	3.78	0.00459	0.00798	0.00201	PASS
25℃	LV	5.56	1.24	7.66	0.00296	0.00066	0.00407	PASS
	HV	5.91	14.48	11.78	0.00315	0.00770	0.00627	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℃)	Normal	3.02	16.47	9.35	0.00160	0.00876	0.00497	PASS
Extreme (50℃)		6.53	13.93	16.43	0.00347	0.00741	0.00874	PASS
Extreme (40℃)		13.77	8.05	14.39	0.00732	0.00428	0.00766	PASS
Extreme (30℃)		7.74	4.34	10.85	0.00412	0.00231	0.00577	PASS
Extreme (20℃)		16.72	1.84	12.09	0.00889	0.00098	0.00643	PASS
Extreme (10℃)		13.67	4.91	4.96	0.00727	0.00261	0.00264	PASS
Extreme (0℃)		11.38	7.96	17.08	0.00606	0.00424	0.00909	PASS
Extreme (-10℃)		15.91	11.90	12.32	0.00846	0.00633	0.00656	PASS
Extreme (-20℃)		17.18	1.32	2.82	0.00914	0.00070	0.00150	PASS
Extreme (-30℃)		17.95	8.18	1.63	0.00955	0.00435	0.00086	PASS
25℃	LV	7.36	7.65	9.58	0.00392	0.00407	0.00509	PASS
	HV	4.32	12.05	1.51	0.00230	0.00641	0.00080	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℃)	Normal	5.20	5.32	1.25	0.00276	0.00283	0.00066	PASS
Extreme (50℃)		8.77	1.73	17.33	0.00467	0.00092	0.00922	PASS
Extreme (40℃)		14.22	1.19	4.18	0.00756	0.00063	0.00222	PASS
Extreme (30℃)		15.37	9.20	11.72	0.00818	0.00489	0.00624	PASS
Extreme (20℃)		17.86	1.85	2.94	0.00950	0.00098	0.00156	PASS
Extreme (10℃)		7.31	7.11	1.95	0.00389	0.00378	0.00104	PASS
Extreme (0℃)		17.54	10.34	6.87	0.00933	0.00550	0.00365	PASS
Extreme (-10℃)		6.48	7.47	12.08	0.00345	0.00397	0.00643	PASS
Extreme (-20℃)		2.20	11.30	4.42	0.00117	0.00601	0.00235	PASS
Extreme (-30℃)		10.89	4.15	2.95	0.00579	0.00221	0.00157	PASS
25℃	LV	1.28	12.37	2.23	0.00068	0.00658	0.00119	PASS



	HV	11.17	7.72	8.93	0.00594	0.00411	0.00475	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℃)	Normal	5.50	15.72	17.40	0.00293	0.00836	0.00925	PASS
Extreme (50℃)		1.09	5.57	8.86	0.00058	0.00296	0.00471	PASS
Extreme (40℃)		17.70	9.09	14.89	0.00942	0.00484	0.00792	PASS
Extreme (30℃)		10.97	10.33	4.94	0.00584	0.00550	0.00263	PASS
Extreme (20℃)		13.15	1.76	10.83	0.00699	0.00093	0.00576	PASS
Extreme (10℃)		13.25	4.78	10.66	0.00705	0.00254	0.00567	PASS
Extreme (0℃)		10.30	3.24	15.04	0.00548	0.00172	0.00800	PASS
Extreme (-10℃)		6.28	8.49	6.45	0.00334	0.00452	0.00343	PASS
Extreme (-20℃)		7.26	3.28	4.48	0.00386	0.00174	0.00239	PASS
Extreme (-30℃)		4.16	11.90	8.32	0.00221	0.00633	0.00443	PASS
25℃	LV	15.45	9.69	12.23	0.00822	0.00515	0.00651	PASS
	HV	9.95	11.15	2.00	0.00529	0.00593	0.00106	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),

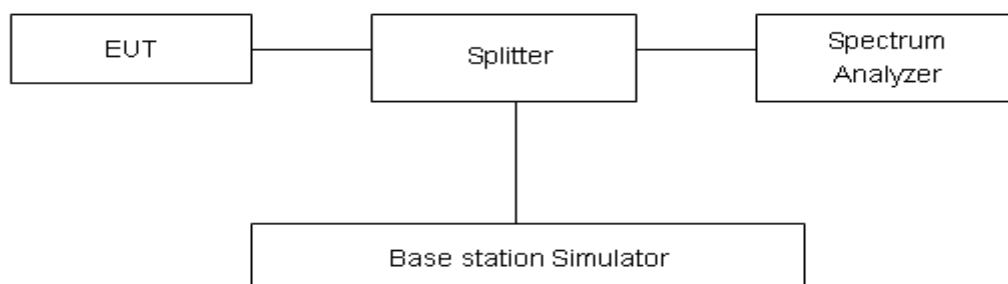
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

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 $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
-------	---------

Measurement Uncertainty

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

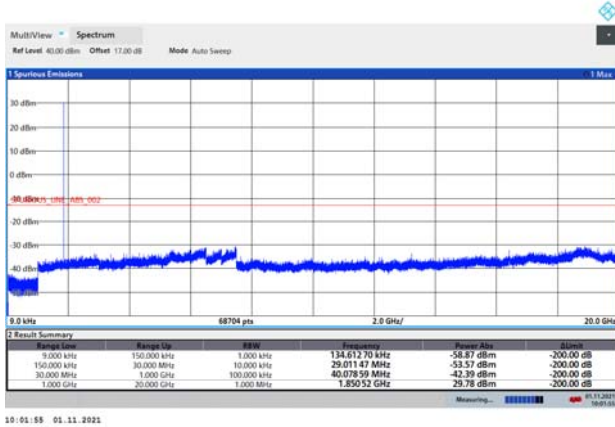
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

Test Result

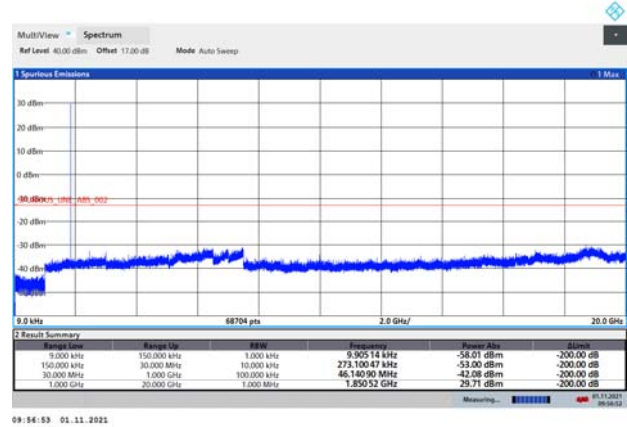
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

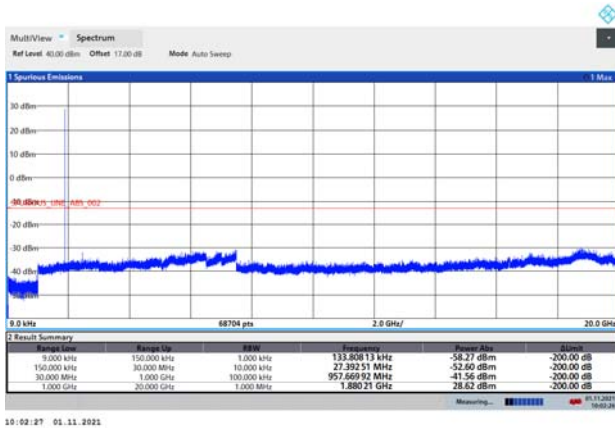
GSM 1900 CH-Low 9kHz ~ 20GHz



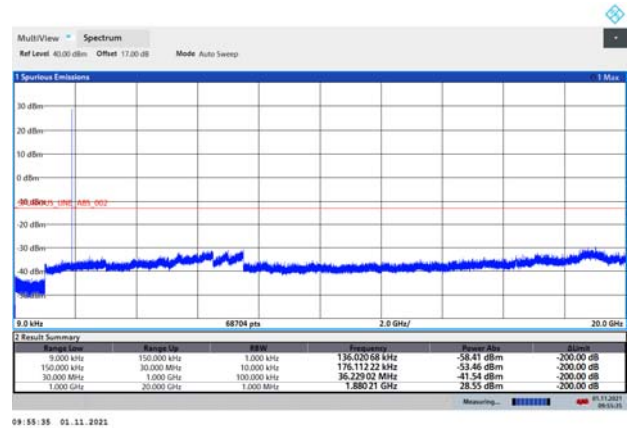
GPRS 1900 CH-Low 9kHz ~ 20GHz



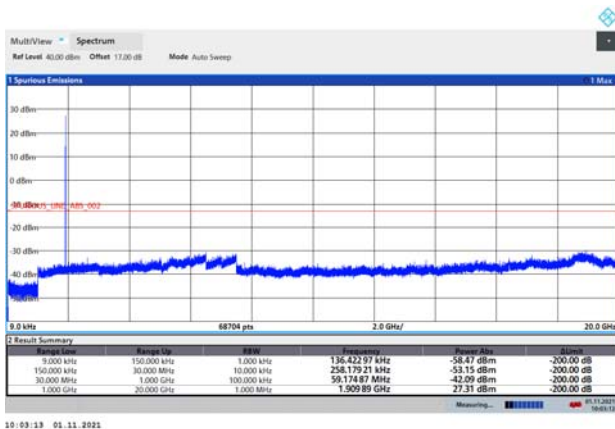
GSM 1900 CH- Middle 9kHz ~ 20GHz



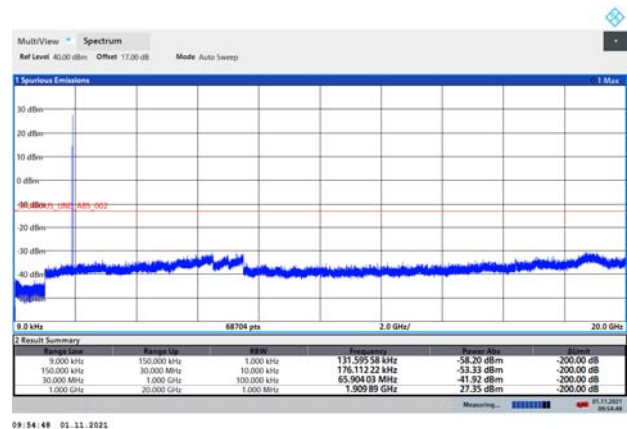
GPRS 1900 CH- Middle 9kHz ~ 20GHz



GSM 1900 CH-High 9kHz ~ 20GHz

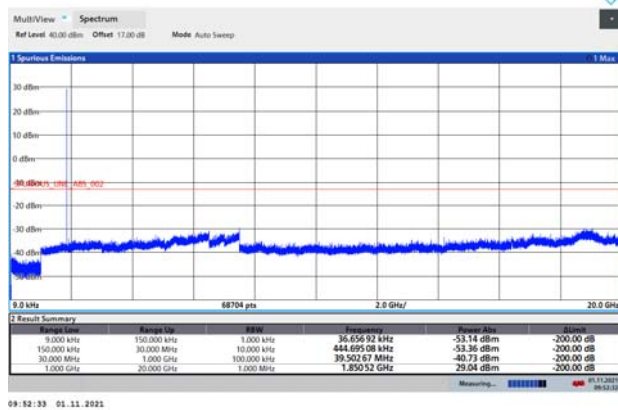


GPRS 1900 CH-High 9kHz ~ 20GHz



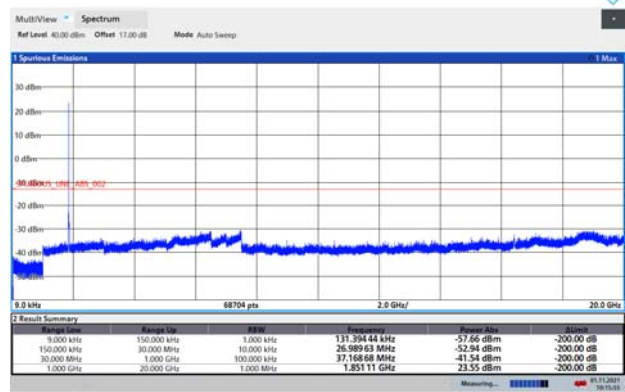


EGPRS 1900 CH-Low 9kHz ~ 20GHz



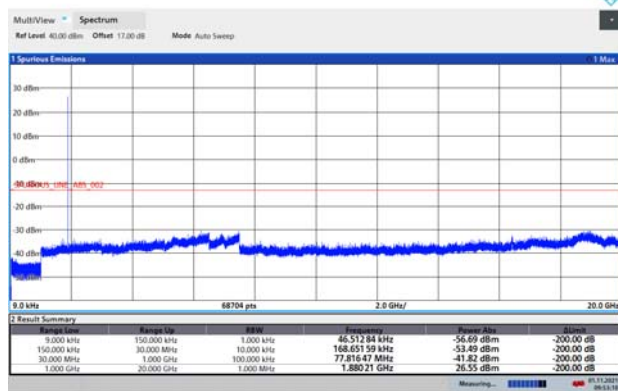
09:52:39 01.11.2021

WCDMA BAND II CH-Low 9kHz ~ 20GHz



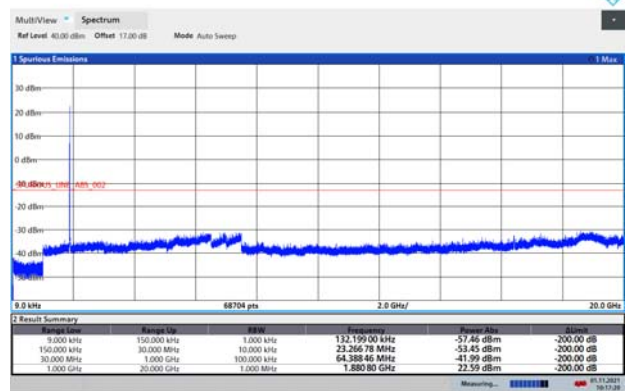
10:15:55 01.11.2021

EGPRS 1900 CH- Middle 9kHz ~ 20GHz



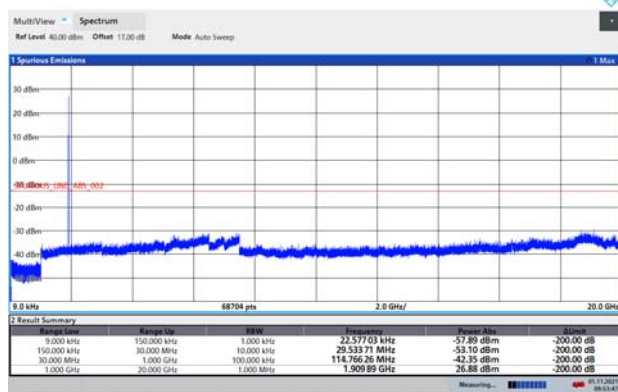
09:53:15 01.11.2021

WCDMA BAND II CH- Middle 9kHz ~ 20GHz



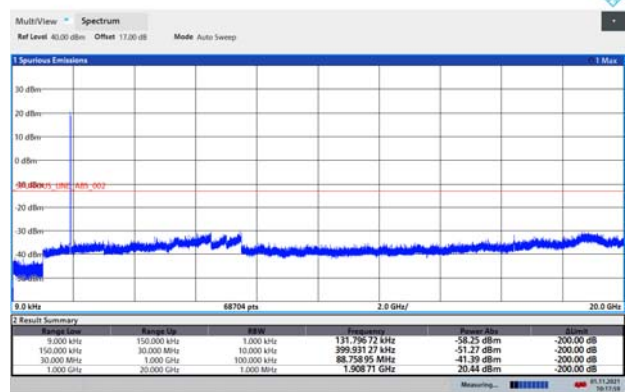
10:17:21 01.11.2021

EGPRS 1900 CH-High 9kHz ~ 20GHz



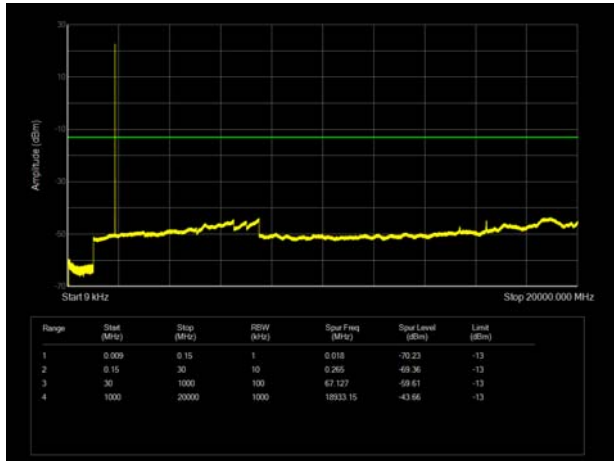
09:53:48 01.11.2021

WCDMA BAND II CH-High 9kHz ~ 20GHz

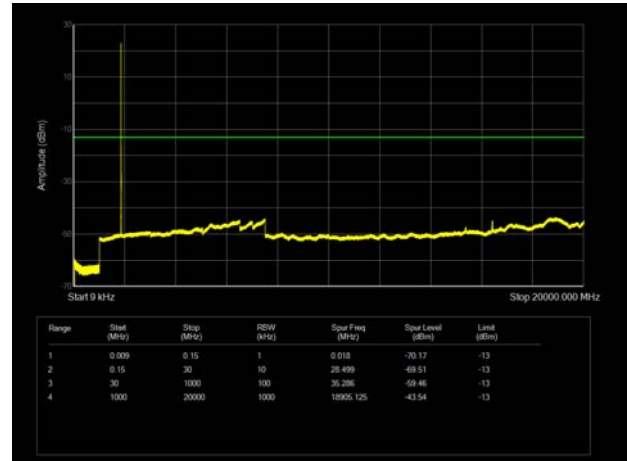


10:17:59 01.11.2021

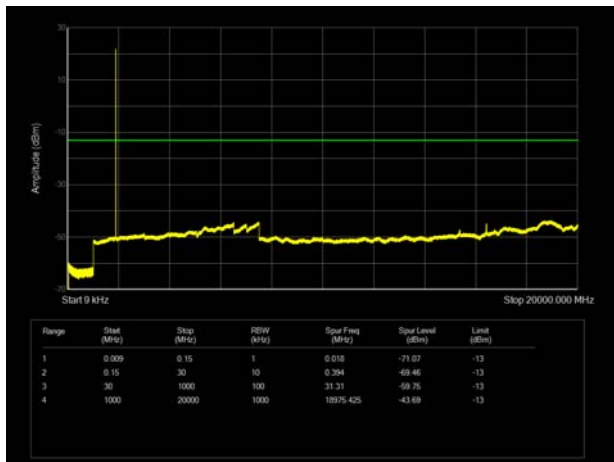
LTE Band 2 1.4MHz CH-Low 9kHz~20GHz



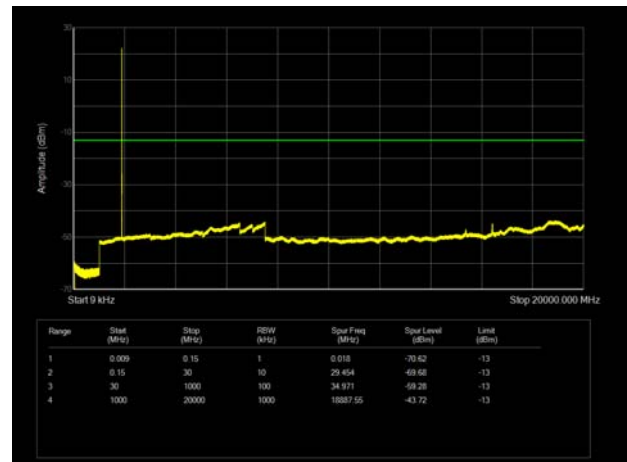
LTE Band 2 3MHz CH-Low 9kHz~20GHz



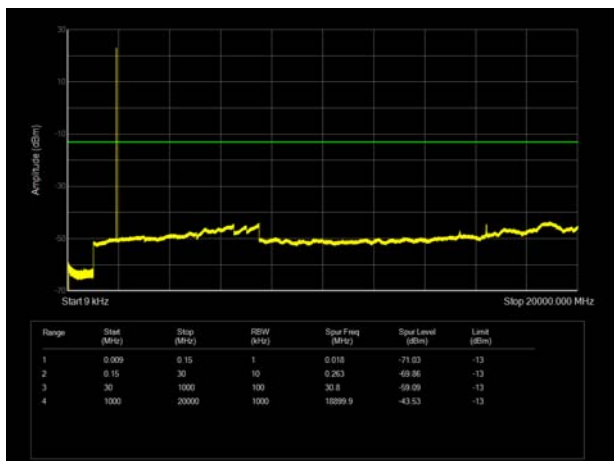
LTE Band 2 1.4MHz CH-Middle 9kHz~20GHz



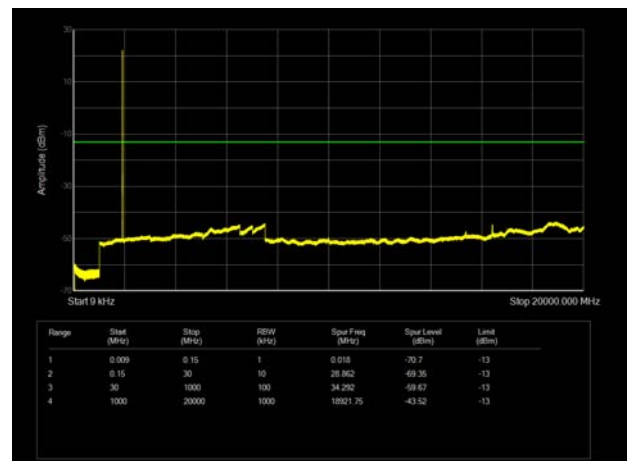
LTE Band 2 3MHz CH-Middle 9kHz~20GHz



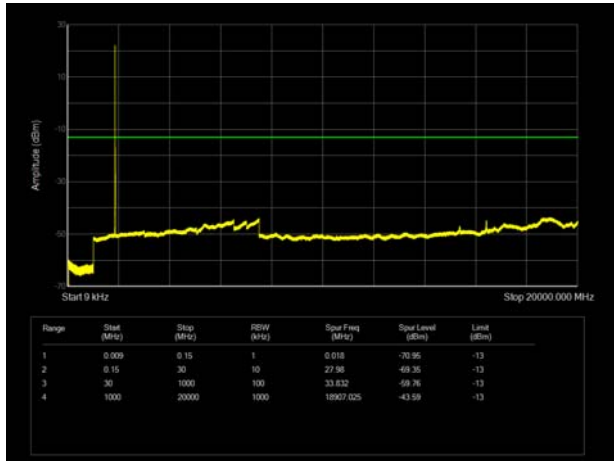
LTE Band 2 1.4MHz CH-High 9kHz~20GHz



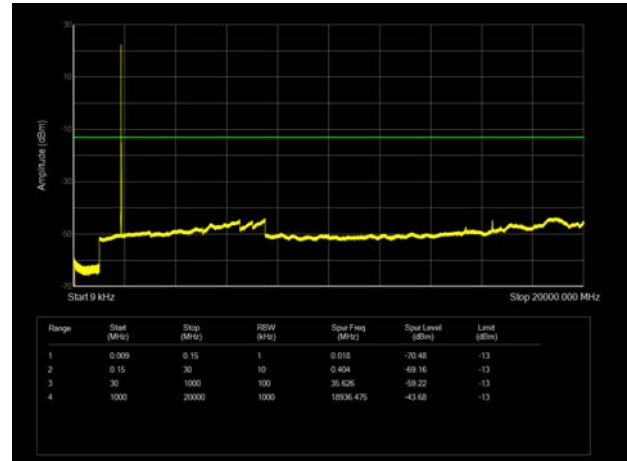
LTE Band 2 3MHz CH-High 9kHz~20GHz



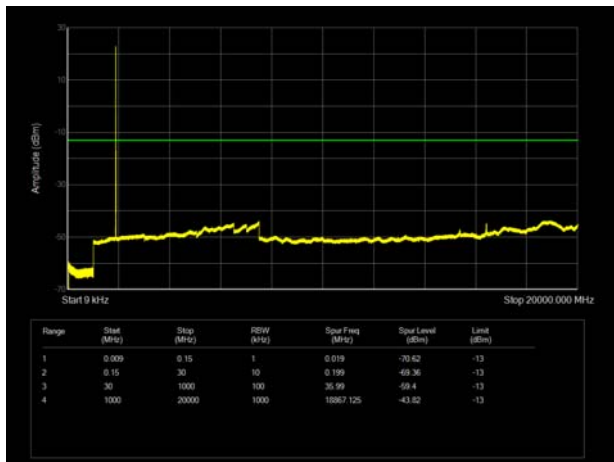
LTE Band 2 5MHz CH-Low 9kHz~20GHz



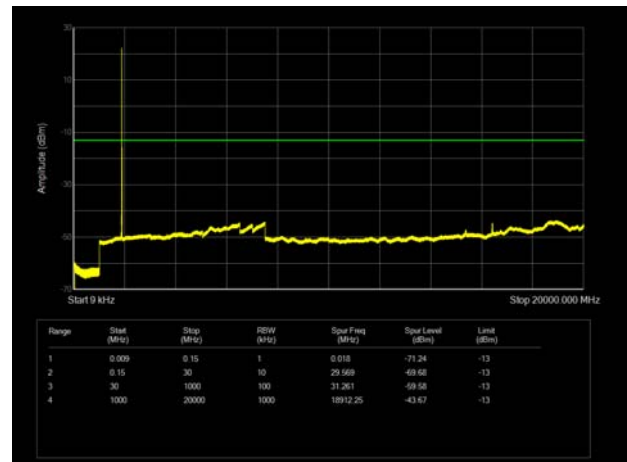
LTE Band 2 10MHz CH-Low 9kHz~20GHz



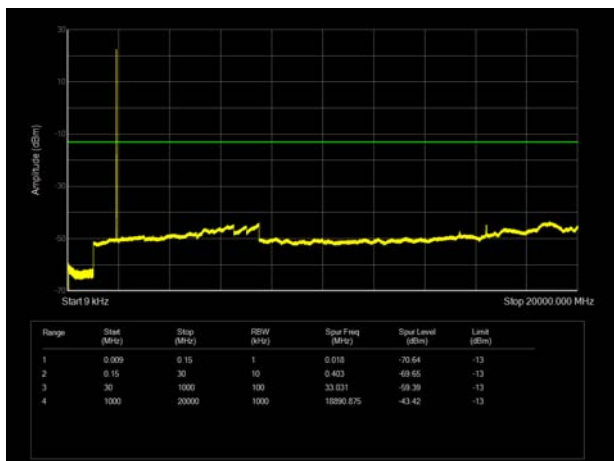
LTE Band 2 5MHz CH-Middle 9kHz~20GHz



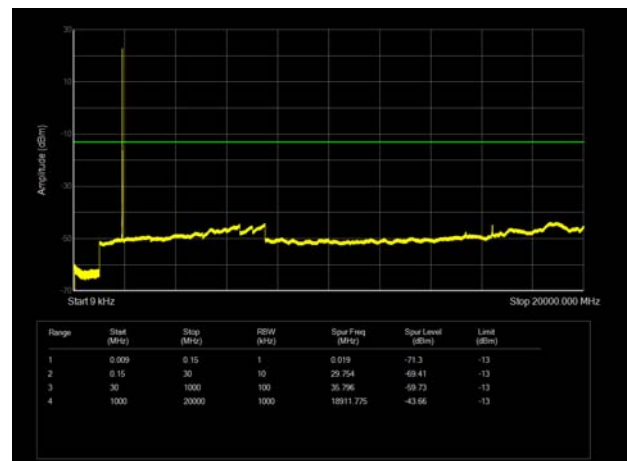
LTE Band 2 10MHz CH-Middle 9kHz~20GHz



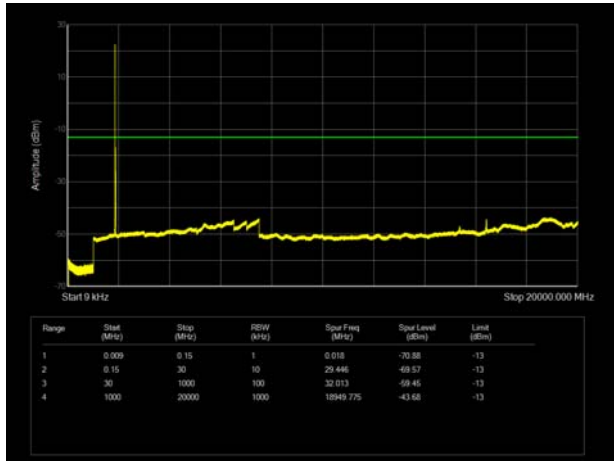
LTE Band 2 5MHz CH-High 9kHz~20GHz



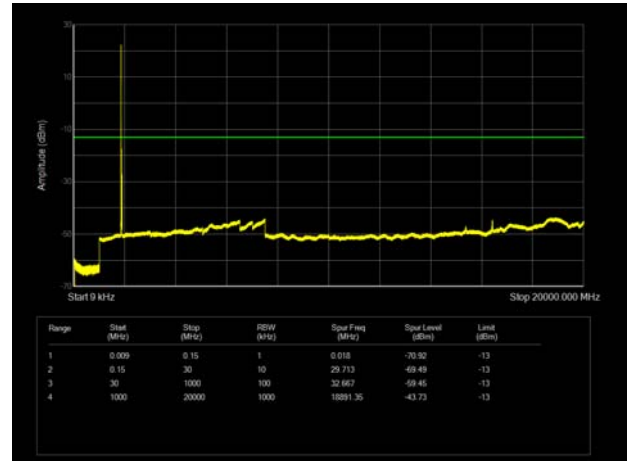
LTE Band 2 10MHz CH-High 9kHz~20GHz



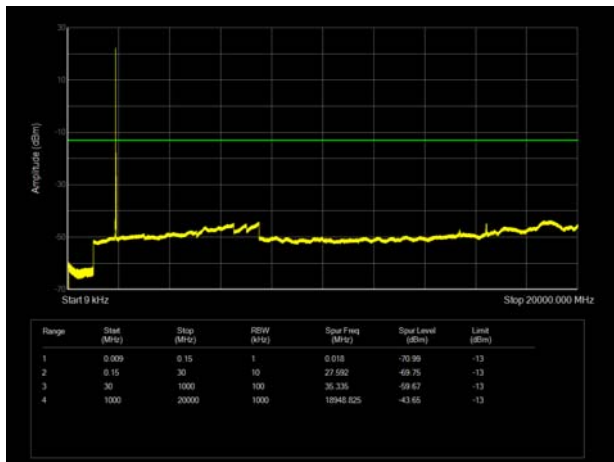
LTE Band 2 15MHz CH-Low 9kHz~20GHz



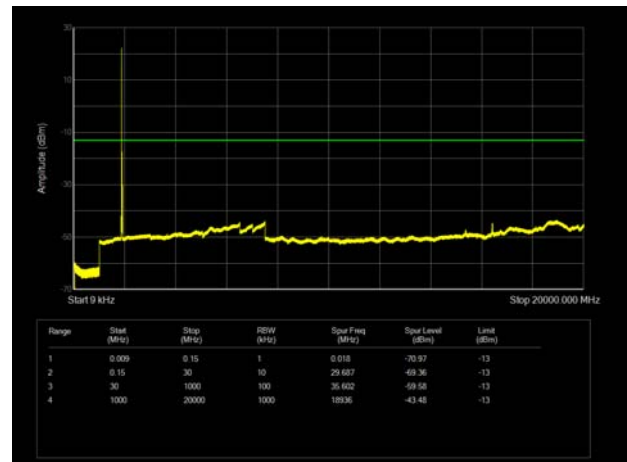
LTE Band 2 20MHz CH-Low 9kHz~20GHz



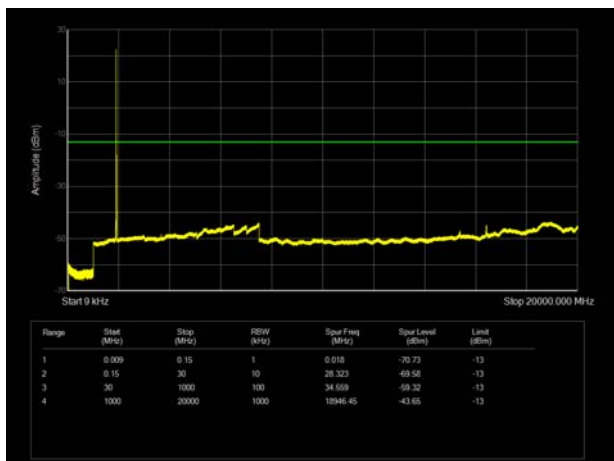
LTE Band 2 15MHz CH-Middle 9kHz~20GHz



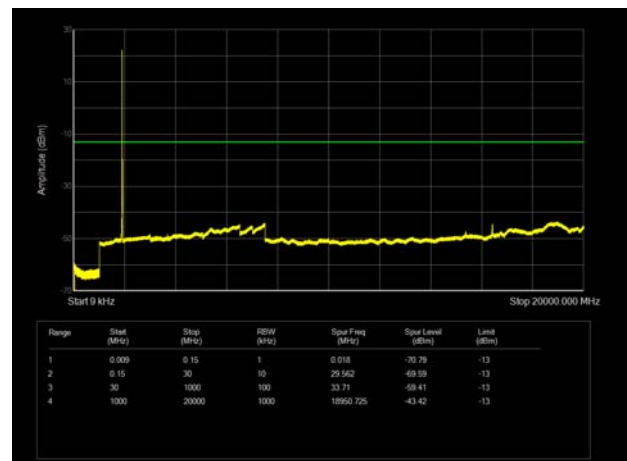
LTE Band 2 20MHz CH-Middle 9kHz~20GHz



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:

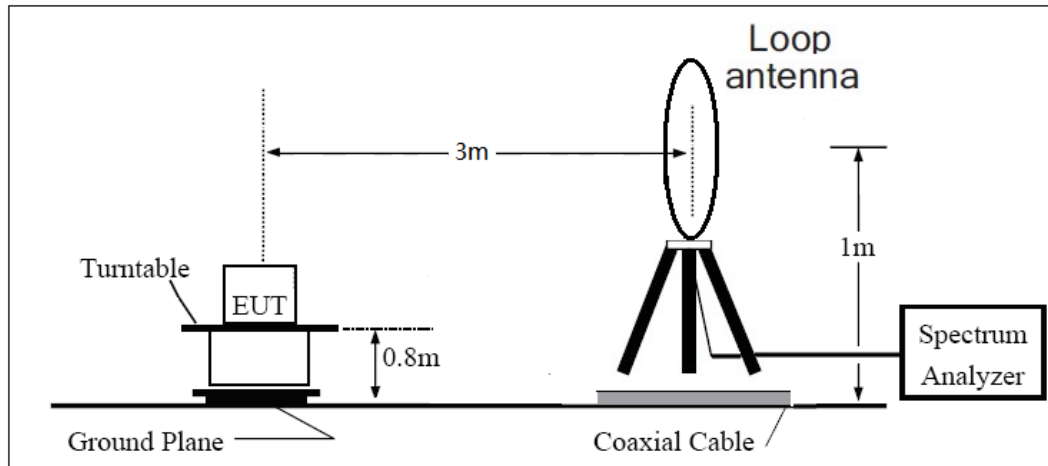
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

= EIRP-2.15dB.

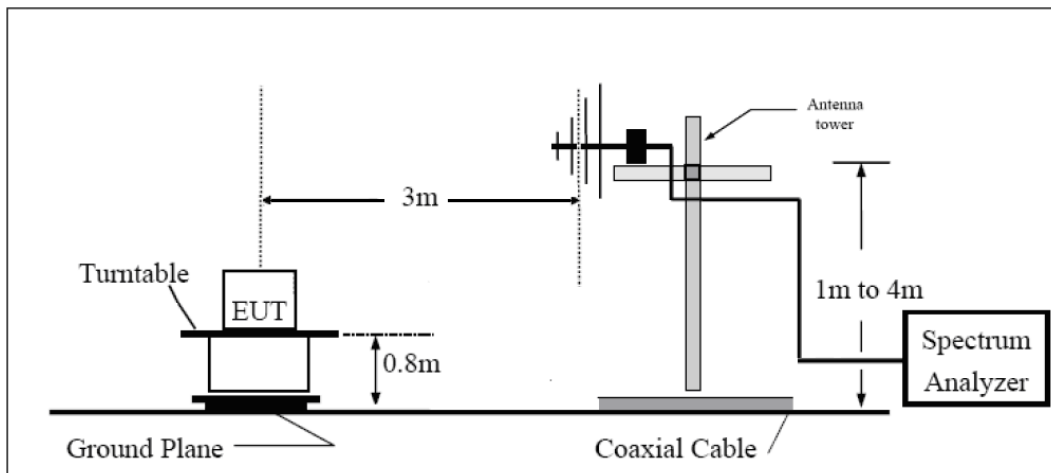
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

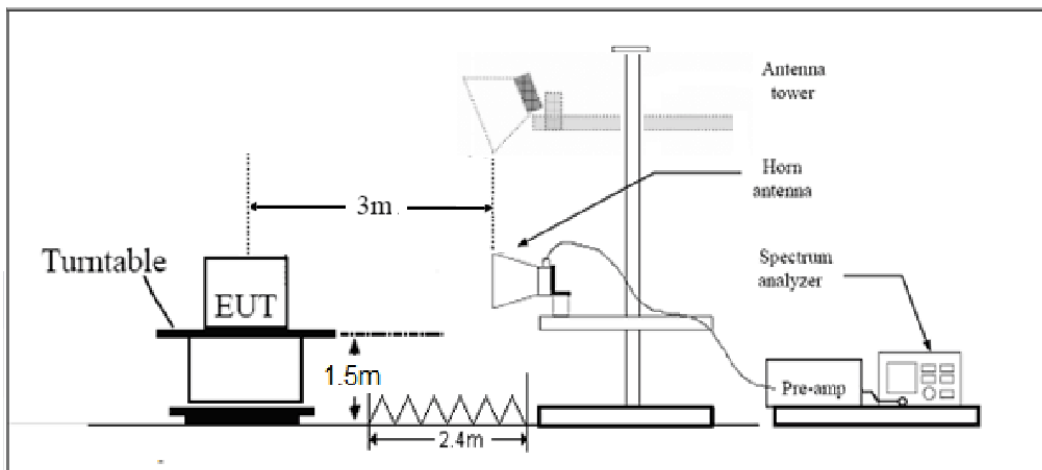
9KHz ~ 30MHz



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
-------	---------

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.

Low Antenna

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	-57.51	2.60	12.50	Horizontal	-47.61	-13.00	34.61	45
3	5640.00	-59.18	3.30	12.50	Horizontal	-49.98	-13.00	36.98	90
4	7520.00	-57.21	4.20	12.20	Horizontal	-49.21	-13.00	36.21	0
5	9400.00	-53.67	4.30	11.10	Horizontal	-46.87	-13.00	33.87	45
6	11280.00	-51.18	5.90	11.90	Horizontal	-45.18	-13.00	32.18	270
7	13160.00	-54.91	5.70	14.00	Horizontal	-46.61	-13.00	33.61	45
8	15040.00	-51.36	5.80	13.10	Horizontal	-44.06	-13.00	31.06	135
9	16920.00	-50.86	6.10	14.60	Horizontal	-42.36	-13.00	29.36	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.

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	-65.12	2.60	12.50	Horizontal	-55.22	-13.00	42.22	45
3	5640.00	-67.57	3.30	12.50	Horizontal	-58.37	-13.00	45.37	135
4	7520.00	-57.80	4.20	12.20	Horizontal	-49.80	-13.00	36.80	45
5	9400.00	-55.26	4.30	11.10	Horizontal	-48.46	-13.00	35.46	270
6	11280.00	-51.84	5.90	11.90	Horizontal	-45.84	-13.00	32.84	90
7	13160.00	-53.45	5.70	14.00	Horizontal	-45.15	-13.00	32.15	45
8	15040.00	-52.68	5.80	13.10	Horizontal	-45.38	-13.00	32.38	135
9	16920.00	-49.93	6.10	14.60	Horizontal	-41.43	-13.00	28.43	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 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	-59.39	2.60	12.50	Horizontal	-49.49	-13.00	36.49	90
3	5638.88	-64.11	3.30	12.50	Horizontal	-54.91	-13.00	41.91	315
4	7520.00	-58.46	4.20	12.20	Horizontal	-50.46	-13.00	37.46	45
5	9400.00	-50.73	4.30	11.10	Horizontal	-43.93	-13.00	30.93	90
6	11280.00	-51.08	5.90	11.90	Horizontal	-45.08	-13.00	32.08	315
7	13160.00	-53.42	5.70	14.00	Horizontal	-45.12	-13.00	32.12	45
8	15040.00	-54.17	5.80	13.10	Horizontal	-46.87	-13.00	33.87	0
9	16920.00	-50.68	6.10	14.60	Horizontal	-42.18	-13.00	29.18	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.

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	-63.06	2.60	12.50	Horizontal	-53.16	-13.00	40.16	315
3	5632.50	-62.58	3.30	12.50	Horizontal	-53.38	-13.00	40.38	0
4	7510.00	-58.60	4.20	12.20	Horizontal	-50.60	-13.00	37.60	0
5	9387.50	-51.41	4.30	11.10	Horizontal	-44.61	-13.00	31.61	45
6	11265.00	-51.64	5.90	11.90	Horizontal	-45.64	-13.00	32.64	270
7	13142.50	-53.43	5.70	14.00	Horizontal	-45.13	-13.00	32.13	90
8	15020.00	-52.97	5.80	13.10	Horizontal	-45.67	-13.00	32.67	45
9	16897.50	-49.72	6.10	14.60	Horizontal	-41.22	-13.00	28.22	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 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	3740.00	-61.55	2.60	12.50	Horizontal	-51.65	-13.00	38.65	135
3	5610.00	-64.15	3.30	12.50	Horizontal	-54.95	-13.00	41.95	180
4	7480.00	-58.40	4.20	12.20	Horizontal	-50.40	-13.00	37.40	45
5	9350.00	-51.55	4.30	11.10	Horizontal	-44.75	-13.00	31.75	0
6	11220.00	-53.24	5.90	11.90	Horizontal	-47.24	-13.00	34.24	90
7	13090.00	-51.31	5.70	14.00	Horizontal	-43.01	-13.00	30.01	45
8	14960.00	-52.05	5.80	13.10	Horizontal	-44.75	-13.00	31.75	135
9	16830.00	-50.37	6.10	14.60	Horizontal	-41.87	-13.00	28.87	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.

**Upper Antenna**

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	-58.32	2.60	12.50	Horizontal	-48.42	-13.00	35.42	0
3	5640.00	-60.60	3.30	12.50	Horizontal	-51.40	-13.00	38.40	135
4	7520.00	-58.65	4.20	12.20	Horizontal	-50.65	-13.00	37.65	225
5	9400.00	-54.65	4.30	11.10	Horizontal	-47.85	-13.00	34.85	45
6	11280.00	-51.32	5.90	11.90	Horizontal	-45.32	-13.00	32.32	180
7	13160.00	-53.61	5.70	14.00	Horizontal	-45.31	-13.00	32.31	0
8	15040.00	-54.79	5.80	13.10	Horizontal	-47.49	-13.00	34.49	315
9	16920.00	-52.57	6.10	14.60	Horizontal	-44.07	-13.00	31.07	45
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	-64.50	2.60	12.50	Horizontal	-54.60	-13.00	41.60	90
3	5640.00	-64.32	3.30	12.50	Horizontal	-55.12	-13.00	42.12	225
4	7520.00	-59.44	4.20	12.20	Horizontal	-51.44	-13.00	38.44	180
5	9400.00	-55.06	4.30	11.10	Horizontal	-48.26	-13.00	35.26	45
6	11280.00	-51.76	5.90	11.90	Horizontal	-45.76	-13.00	32.76	315
7	13160.00	-54.32	5.70	14.00	Horizontal	-46.02	-13.00	33.02	0
8	15040.00	-53.91	5.80	13.10	Horizontal	-46.61	-13.00	33.61	270
9	16920.00	-54.22	6.10	14.60	Horizontal	-45.72	-13.00	32.72	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	-61.36	2.60	12.50	Horizontal	-51.46	-13.00	38.46	90
3	5638.88	-63.17	3.30	12.50	Horizontal	-53.97	-13.00	40.97	135
4	7520.00	-57.58	4.20	12.20	Horizontal	-49.58	-13.00	36.58	270
5	9400.00	-54.39	4.30	11.10	Horizontal	-47.59	-13.00	34.59	45
6	11280.00	-52.17	5.90	11.90	Horizontal	-46.17	-13.00	33.17	315
7	13160.00	-53.48	5.70	14.00	Horizontal	-45.18	-13.00	32.18	90
8	15040.00	-51.96	5.80	13.10	Horizontal	-44.66	-13.00	31.66	45
9	16920.00	-51.67	6.10	14.60	Horizontal	-43.17	-13.00	30.17	225
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	-60.10	2.60	12.50	Horizontal	-50.20	-13.00	37.20	315
3	5632.50	-64.39	3.30	12.50	Horizontal	-55.19	-13.00	42.19	90
4	7510.00	-58.26	4.20	12.20	Horizontal	-50.26	-13.00	37.26	0
5	9387.50	-53.13	4.30	11.10	Horizontal	-46.33	-13.00	33.33	45
6	11265.00	-50.82	5.90	11.90	Horizontal	-44.82	-13.00	31.82	270
7	13142.50	-52.32	5.70	14.00	Horizontal	-44.02	-13.00	31.02	90
8	15020.00	-52.57	5.80	13.10	Horizontal	-45.27	-13.00	32.27	45
9	16897.50	-50.50	6.10	14.60	Horizontal	-42.00	-13.00	29.00	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 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	3740.00	-60.85	2.60	12.50	Horizontal	-50.95	-13.00	37.95	225
3	5610.00	-63.58	3.30	12.50	Horizontal	-54.38	-13.00	41.38	270
4	7480.00	-57.52	4.20	12.20	Horizontal	-49.52	-13.00	36.52	180
5	9350.00	-55.08	4.30	11.10	Horizontal	-48.28	-13.00	35.28	45
6	11220.00	-51.47	5.90	11.90	Horizontal	-45.47	-13.00	32.47	315
7	13090.00	-52.92	5.70	14.00	Horizontal	-44.62	-13.00	31.62	45
8	14960.00	-52.22	5.80	13.10	Horizontal	-44.92	-13.00	31.92	0
9	16830.00	-50.75	6.10	14.60	Horizontal	-42.25	-13.00	29.25	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.

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Climate Chamber	WEISS	VT 4002	582261194500 10	2021-05-15	2022-05-14
Wireless Communication Tester	R&S	CMW500	150415	2021-05-15	2022-05-14
Spectrum Analyzer	Keysight	N9020A	MY52330084	2021-05-15	2022-05-14
Universal Radio Communication Tester	Agilent	E5515C	GB44400275	2021-05-15	2022-05-14
Spectrum Analyzer	R&S	FSV3030	101411	2020-12-13	2021-12-12
Spectrum Analyzer	R&S	FSV30	100815	2020-12-17	2021-12-16
Horn Antenna	Schwarzbeck	BBHA 9120D	01799	2019-09-21	2022-09-20
Horn Antenna	Schwarzbeck	VULB 9163	01439	2021-06-30	2024-06-29
Software	R&S	EMC32	10.35.10	/	/

*****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.