RF TEST REPORT

Applicant	Honor Device Co., Ltd.
FCC ID	2AYGCTFY-LX3
Product	Smart Phone
Model	TFY-LX3
Report No.	R2201A0036-R2V1
Issue Date	February 9, 2022

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

Version	Revision description	Issue Date
Rev.0	Initial issue of report.	January 29, 2022
Rev.1	Update information in Page 6 and Page 7.	February 9, 2022
Note: This revised report (Report No. R2201A0036-R2V1) supersedes and replaces the previously issued report (Report No. R2201A0036-R2). Please discard or destroy the previously issued report and dispose of it accordingly.		

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: January 13, 2022 ~ January 27, 2022 Date of Sample Received: January 10, 2022			
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	Honor Device Co., Ltd.
Applicant address	Shum Yip Sky Park, No. 8089, Hongli West Road, Shenzhen, China
Manufacturer	Honor Device Co., Ltd.
Manufacturer address	Shum Yip Sky Park, No. 8089, Hongli West Road, Shenzhen, China

2.2. General information

EUT Description			
Model	TFY-LX3		
SN	A7NX011C22000163		
Hardware Version	HL6TFYM		
Software Version	4.2.0.35(C900E14R1P1)		
Power Supply	Battery / AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	Band	Main Atenna	Sencond Atenna
	GSM1900	-1.60 dBi	0.11 dBi
	WCDMA Band II	-1.60 dBi	0.11 dBi
	LTE Band 2	-1.60 dBi	0.11 dBi
Test Mode(s)	GSM1900; WCDMA Band II; LTE Band 2;		
Test Modulation	(GSM/GPRS)GMSK, (EGPRS) GMSK/ 8PSK; (WCDMA) BPSK, QPSK; (LTE)QPSK,16QAM;		
GPRS Multislot Class	12		
EGPRS Multislot Class	12		
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
LTE Category	4		
Maximum E.I.R.P	GSM 1900:	30.02 dBm	
	WCDMA Band II:	23.44 dBm	
	LTE Band 2:	23.87 dBm	
Rated Power Supply Voltage	3.87V		
Operating Voltage	Minimum: 3.60V Maximum: 4.45V		
Operating Temperature	Lowest: 0°C Highest: 35°C		
Testing Temperature	Lowest: 0°C Highest: 35°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

EUT Accessory

Accessory	Model	Manufacture	No.
Adapter	HW-100225E00	Honor Device Co., Ltd. (Manufacturer:Huntkey)	1
	HW-100225U00	Honor Device Co., Ltd. (Manufacturer:Huntkey)	2
	HW-100225B00	Honor Device Co., Ltd. (Manufacturer:Huntkey)	3
	HN-100225E00	Honor Device Co., Ltd. (Manufacturer: Salcomp)	4
	HN-100225U00	Honor Device Co., Ltd. (Manufacturer: Salcomp)	5
Battery	HB416492EFW	Honor Device Co., Ltd. (Manufacturer: Sunwoda Electronic Co.,LTD)	1
	HB416492EFW	Honor Device Co., Ltd. (Manufacturer:NVT)	2
Earphone	MEND1532B528A11	Jiangxi Lianchuang Hongsheng Electronic Co., LTD.	1
	1293-3283-3.5mm-339	BOLUO COUNTY QUANCHENG ELECTRONIC CO.,LTD.	2
	EPAB542-2WH05-DH	FOXCONN INTERCONNECT TECHNOLOGY LIMITED	3
USB Cable	RY0002	NingBo Broad Telecommunication Co., Ltd.	1
	AU2-CRO013HF	Freeport Resources Enterprises Corp.	2
	2120-00001-0	MING JI ELECTRONICS CO., LTD.	3
	L125UC007-CS-H	LUXSHARE PRECISION INDUSTRY CO., LTD.	4
	CUDU01B-HC451-EH	FOXCONN INTERCONNECT TECHNOLOGY LIMITED	5

Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.

2. There are more than one Adapter, Battery, Earphone and USB Cable, each one should be applied throughout the compliance test respectively, however, only the worst case (Adapter 1, Battery 2, Earphone 1 and USB Cable 3) will be recorded in this report.

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 (X axis, horizontal polarization for GSM/WCDMA Band (Main Antenna); Z axis, horizontal polarization for LTE Band (Main Antenna); Z axis, horizontal polarization for GSM/WCDMA Band (Second Antenna); Z axis, verticalpolarization for LTE Band (Second Antenna)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
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	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

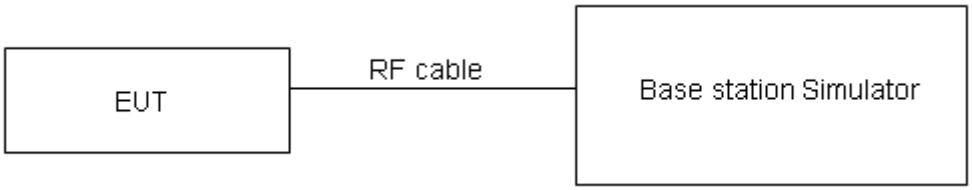
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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:
EIRP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBi)
where:dBd refers to gain relative to an ideal dipole.
EIRP (dBm) = ERP (dBm) + 2.15 (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	≤ 2 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 dB for RF power output, k = 2, U= 1.19 dB for EIRP.

Test Results

GSM 1900		Maximum Output Power (dBm)			Main Antenna EIRP (dBm)			Second 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	29.65	29.91	29.84	28.05	28.31	28.24	29.76	30.02	29.95
GPRS/EGPRS (GMSK)	1TXslot	29.34	29.87	29.58	27.74	28.27	27.98	29.45	29.98	29.69
	2TXslots	26.21	26.53	26.30	24.61	24.93	24.70	26.32	26.64	26.41
	3TXslots	23.87	24.17	23.94	22.27	22.57	22.34	23.98	24.28	24.05
	4TXslots	22.51	22.54	22.33	20.91	20.94	20.73	22.62	22.65	22.44
EGPRS	1TXslot	24.72	24.92	24.72	23.12	23.32	23.12	24.83	25.03	24.83
	2TXslots	22.76	22.74	22.15	21.16	21.14	20.55	22.87	22.85	22.26
	3TXslots	20.01	20.15	19.95	18.41	18.55	18.35	20.12	20.26	20.06
	4TXslots	19.02	18.94	18.74	17.42	17.34	17.14	19.13	19.05	18.85

WCDMA Band II		Maximum Output Power (dBm)			Main Antenna EIRP (dBm)			Second 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		23.04	23.33	23.25	21.44	21.73	21.65	23.15	23.44	23.36
AMR		23.18	23.23	23.31	21.58	21.63	21.71	23.29	23.34	23.42
HSDPA	Sub - Test 1	21.80	22.19	22.27	20.20	20.59	20.67	21.91	22.30	22.38
	Sub - Test 2	22.06	22.11	22.31	20.46	20.51	20.71	22.17	22.22	22.42
	Sub - Test 3	21.28	21.77	21.63	19.68	20.17	20.03	21.39	21.88	21.74
	Sub - Test 4	21.54	21.73	21.65	19.94	20.13	20.05	21.65	21.84	21.76
HSUPA	Sub - Test 1	22.08	22.21	22.23	20.48	20.61	20.63	22.19	22.32	22.34
	Sub - Test 2	20.08	20.39	20.05	18.48	18.79	18.45	20.19	20.50	20.16
	Sub - Test 3	20.80	21.07	21.11	19.20	19.47	19.51	20.91	21.18	21.22
	Sub - Test 4	20.10	20.33	20.13	18.50	18.73	18.53	20.21	20.44	20.24
	Sub - Test 5	22.04	22.23	22.07	20.44	20.63	20.47	22.15	22.34	22.18
DC-HSDPA	Sub - Test 1	21.80	22.27	22.17	20.20	20.67	20.57	21.91	22.38	22.28
	Sub - Test 2	22.06	22.21	22.03	20.46	20.61	20.43	22.17	22.32	22.14
	Sub - Test 3	21.60	21.81	21.63	20.00	20.21	20.03	21.71	21.92	21.74
	Sub - Test 4	21.30	21.59	21.61	19.70	19.99	20.01	21.41	21.70	21.72

LTE Band 2				Maximum Output Power(dBm)			Main Antenna EIRP (dBm)			Second 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	23.31	23.72	23.34	21.71	22.12	21.74	23.42	23.83	23.45
		1	2	23.31	23.10	23.25	21.71	21.50	21.65	23.42	23.21	23.36
		1	5	23.18	23.07	22.96	21.58	21.47	21.36	23.29	23.18	23.07
		3	0	23.32	23.51	23.35	21.72	21.91	21.75	23.43	23.62	23.46
		3	2	23.21	23.45	23.38	21.61	21.85	21.78	23.32	23.56	23.49
		3	3	23.31	23.39	23.32	21.71	21.79	21.72	23.42	23.50	23.43
		6	0	22.42	22.58	22.46	20.82	20.98	20.86	22.53	22.69	22.57
	16QAM	1	0	22.55	22.95	22.74	20.95	21.35	21.14	22.66	23.06	22.85
		1	2	22.53	22.34	22.47	20.93	20.74	20.87	22.64	22.45	22.58
		1	5	22.31	22.40	21.98	20.71	20.80	20.38	22.42	22.51	22.09
		3	0	22.55	22.45	22.32	20.95	20.85	20.72	22.66	22.56	22.43
		3	2	22.24	22.31	22.28	20.64	20.71	20.68	22.35	22.42	22.39
		3	3	22.29	22.40	22.03	20.69	20.80	20.43	22.40	22.51	22.14
		6	0	21.40	21.55	21.44	19.80	19.95	19.84	21.51	21.66	21.55
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	23.33	23.76	23.37	21.73	22.16	21.77	23.44	23.87	23.48
		1	7	23.29	23.13	23.29	21.69	21.53	21.69	23.40	23.24	23.40
		1	14	23.21	23.12	23.00	21.61	21.52	21.40	23.32	23.23	23.11
		8	0	22.42	22.63	22.48	20.82	21.03	20.88	22.53	22.74	22.59
		8	4	22.33	22.55	22.50	20.73	20.95	20.90	22.44	22.66	22.61
		8	7	22.41	22.50	22.42	20.81	20.90	20.82	22.52	22.61	22.53
		15	0	22.42	22.62	22.49	20.82	21.02	20.89	22.53	22.73	22.60
	16QAM	1	0	22.58	22.97	22.77	20.98	21.37	21.17	22.69	23.08	22.88
		1	7	22.56	22.34	22.51	20.96	20.74	20.91	22.67	22.45	22.62
		1	14	22.33	22.44	22.01	20.73	20.84	20.41	22.44	22.55	22.12
		8	0	21.66	21.58	21.44	20.06	19.98	19.84	21.77	21.69	21.55
		8	4	21.35	21.44	21.40	19.75	19.84	19.80	21.46	21.55	21.51
		8	7	21.39	21.52	21.16	19.79	19.92	19.56	21.50	21.63	21.27
		15	0	21.43	21.59	21.47	19.83	19.99	19.87	21.54	21.70	21.58
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	23.30	23.74	23.33	21.70	22.14	21.73	23.41	23.85	23.44

		1	13	23.27	23.09	23.26	21.67	21.49	21.66	23.38	23.20	23.37
		1	24	23.18	23.07	22.96	21.58	21.47	21.36	23.29	23.18	23.07
		12	0	22.39	22.58	22.44	20.79	20.98	20.84	22.50	22.69	22.55
		12	6	22.31	22.51	22.45	20.71	20.91	20.85	22.42	22.62	22.56
		12	13	22.39	22.48	22.38	20.79	20.88	20.78	22.50	22.59	22.49
		25	0	22.42	22.61	22.47	20.82	21.01	20.87	22.53	22.72	22.58
	16QAM	1	0	22.55	22.93	22.74	20.95	21.33	21.14	22.66	23.04	22.85
		1	13	22.53	22.32	22.48	20.93	20.72	20.88	22.64	22.43	22.59
		1	24	22.30	22.42	21.97	20.70	20.82	20.37	22.41	22.53	22.08
		12	0	21.64	21.54	21.41	20.04	19.94	19.81	21.75	21.65	21.52
		12	6	21.32	21.39	21.36	19.72	19.79	19.76	21.43	21.50	21.47
		12	13	21.36	21.47	21.12	19.76	19.87	19.52	21.47	21.58	21.23
		25	0	21.41	21.55	21.42	19.81	19.95	19.82	21.52	21.66	21.53
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18650/ 1855	18900/ 1880	19150/ 1905	18650/ 1855	18900/ 1880	18650/ 1855	18650/ 1855	18900/ 1880	18650/ 1855
10MHz	QPSK	1	0	23.32	23.75	23.36	21.72	22.15	21.76	23.43	23.86	23.47
		1	25	23.30	23.14	23.30	21.70	21.54	21.70	23.41	23.25	23.41
		1	49	23.20	23.11	22.99	21.60	21.51	21.39	23.31	23.22	23.10
		25	0	22.42	22.63	22.48	20.82	21.03	20.88	22.53	22.74	22.59
		25	13	22.34	22.56	22.49	20.74	20.96	20.89	22.45	22.67	22.60
		25	25	22.41	22.52	22.43	20.81	20.92	20.83	22.52	22.63	22.54
		50	0	22.46	22.63	22.51	20.86	21.03	20.91	22.57	22.74	22.62
	16QAM	1	0	22.57	22.96	22.76	20.97	21.36	21.16	22.68	23.07	22.87
		1	25	22.56	22.36	22.51	20.96	20.76	20.91	22.67	22.47	22.62
		1	49	22.33	22.44	22.00	20.73	20.84	20.40	22.44	22.55	22.11
		25	0	21.67	21.59	21.45	20.07	19.99	19.85	21.78	21.70	21.56
		25	13	21.34	21.43	21.39	19.74	19.83	19.79	21.45	21.54	21.50
		25	25	21.39	21.52	21.16	19.79	19.92	19.56	21.50	21.63	21.27
		50	0	21.44	21.60	21.46	19.84	20.00	19.86	21.55	21.71	21.57
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	23.31	23.71	23.34	21.71	22.11	21.74	23.42	23.82	23.45
		1	38	23.28	23.13	23.27	21.68	21.53	21.67	23.39	23.24	23.38
		1	74	23.17	23.06	22.95	21.57	21.46	21.35	23.28	23.17	23.06
		36	0	22.40	22.59	22.45	20.80	20.99	20.85	22.51	22.70	22.56
		36	18	22.31	22.51	22.45	20.71	20.91	20.85	22.42	22.62	22.56
		36	39	22.38	22.49	22.39	20.78	20.89	20.79	22.49	22.60	22.50
		75	0	22.44	22.59	22.46	20.84	20.99	20.86	22.55	22.70	22.57

	16QAM	1	0	22.52	22.94	22.74	20.92	21.34	21.14	22.63	23.05	22.85
		1	38	22.54	22.33	22.49	20.94	20.73	20.89	22.65	22.44	22.60
		1	74	22.30	22.40	21.97	20.70	20.80	20.37	22.41	22.51	22.08
		36	0	21.64	21.57	21.42	20.04	19.97	19.82	21.75	21.68	21.53
		36	18	21.31	21.38	21.35	19.71	19.78	19.75	21.42	21.49	21.46
		36	39	21.37	21.48	21.13	19.77	19.88	19.53	21.48	21.59	21.24
		75	0	21.41	21.55	21.42	19.81	19.95	19.82	21.52	21.66	21.53
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	23.28	23.67	23.31	21.68	22.07	21.71	23.39	23.78	23.42
		1	50	23.27	23.09	23.25	21.67	21.49	21.65	23.38	23.20	23.36
		1	99	23.15	23.05	22.92	21.55	21.45	21.32	23.26	23.16	23.03
		50	0	22.37	22.54	22.41	20.77	20.94	20.81	22.48	22.65	22.52
		50	25	22.29	22.47	22.42	20.69	20.87	20.82	22.40	22.58	22.53
		50	50	22.35	22.44	22.35	20.75	20.84	20.75	22.46	22.55	22.46
		100	0	22.41	22.54	22.42	20.81	20.94	20.82	22.52	22.65	22.53
	16QAM	1	0	22.52	22.90	22.69	20.92	21.30	21.09	22.63	23.01	22.80
		1	50	22.50	22.31	22.45	20.90	20.71	20.85	22.61	22.42	22.56
		1	99	22.28	22.37	21.95	20.68	20.77	20.35	22.39	22.48	22.06
		50	0	21.61	21.53	21.39	20.01	19.93	19.79	21.72	21.64	21.50
		50	25	21.28	21.36	21.32	19.68	19.76	19.72	21.39	21.47	21.43
		50	50	21.34	21.43	21.09	19.74	19.83	19.49	21.45	21.54	21.20
		100	0	21.39	21.51	21.39	19.79	19.91	19.79	21.50	21.62	21.50

5.2. Occupied Bandwidth

Ambient condition

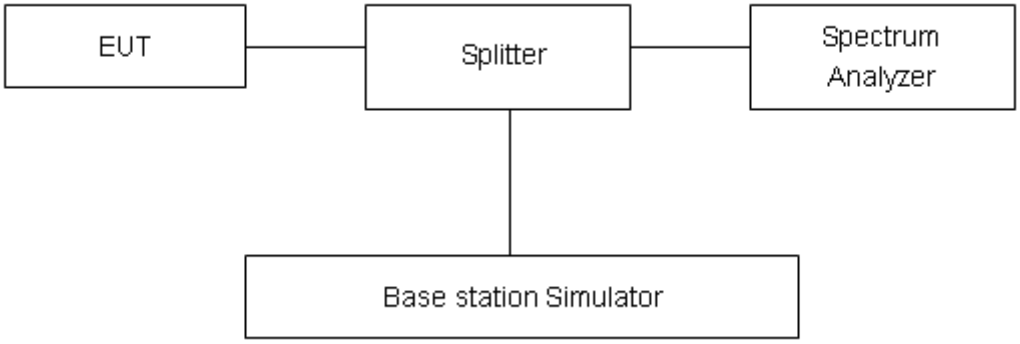
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 ≥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= 624Hz.

Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
GSM 1900 (GMSK)	512	1850.2	0.244	0.313
	661	1880	0.249	0.313
	810	1909.8	0.247	0.312
GPRS 1900 (GMSK)	512	1850.2	0.247	0.320
	661	1880	0.245	0.303
	810	1909.8	0.245	0.320
EGPRS 1900 (8PSK)	512	1850.2	0.244	0.310
	661	1880	0.239	0.307
	810	1909.8	0.245	0.309
WCDMA Band II (RMC)	9262	1852.4	4.139	4.680
	9400	1880	4.135	4.711
	9538	1907.6	4.142	4.700

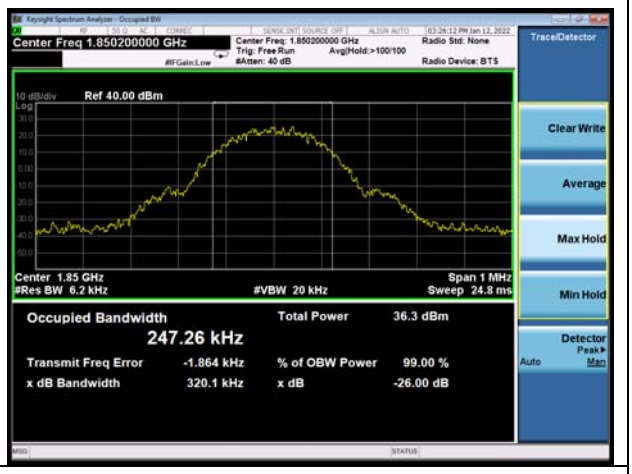
LTE Band 2						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
1	QPSK	1.4	18607	1850.7	0.260	0.400
			18900	1880.0	0.268	0.393
			19193	1909.3	0.269	0.397
		3	18615	1851.5	0.333	0.490
			18900	1880	0.337	0.469
			19185	1908.5	0.342	0.474
		5	18625	1852.5	0.462	0.652
			18900	1880	0.470	0.681
			19175	1907.5	0.498	0.705
		10	18650	1855	0.699	1.018
			18900	1880	0.695	0.965
			19150	1905	0.724	0.991
		15	18675	1857.5	1.078	1.534
			18900	1880	1.059	1.504
			19125	1902.5	1.084	1.486
		20	18700	1860	1.414	2.006
			18900	1880	1.354	1.960

			19100	1900	1.350	1.895
	16QAM	1.4	18607	1850.7	0.261	0.392
			18900	1880.0	0.273	0.395
			19193	1909.3	0.269	0.400
		3	18615	1851.5	0.325	0.443
			18900	1880	0.332	0.463
			19185	1908.5	0.320	0.445
		5	18625	1852.5	0.447	0.682
			18900	1880	0.471	0.671
			19175	1907.5	0.440	0.657
		10	18650	1855	0.656	0.989
			18900	1880	0.719	0.947
			19150	1905	0.713	1.004
		15	18675	1857.5	1.036	1.454
			18900	1880	1.008	1.429
			19125	1902.5	1.005	1.482
		20	18700	1860	1.404	1.936
			18900	1880	1.373	1.874
			19100	1900	1.326	1.911
100%	QPSK	1.4	18607	1850.7	1.103	1.272
			18900	1880.0	1.090	1.271
			19193	1909.3	1.101	1.295
		3	18615	1851.5	2.706	2.974
			18900	1880	2.698	2.978
			19185	1908.5	2.709	2.979
		5	18625	1852.5	4.525	4.916
			18900	1880	4.512	4.957
			19175	1907.5	4.516	4.930
		10	18650	1855	8.973	9.702
			18900	1880	8.965	9.708
			19150	1905	8.981	9.886
		15	18675	1857.5	13.464	14.625
			18900	1880	13.439	14.514
			19125	1902.5	13.453	14.415
		20	18700	1860	17.957	19.356
			18900	1880	17.963	19.496
			19100	1900	17.964	19.500
	16QAM	1.4	18607	1850.7	1.100	1.295
			18900	1880.0	1.101	1.303
			19193	1909.3	1.094	1.305

		3	18615	1851.5	2.701	2.972
			18900	1880	2.709	2.969
			19185	1908.5	2.701	2.989
		5	18625	1852.5	4.522	5.014
			18900	1880	4.505	5.001
			19175	1907.5	4.514	4.968
		10	18650	1855	8.986	9.777
			18900	1880	8.960	9.627
			19150	1905	9.003	9.822
		15	18675	1857.5	13.459	14.576
			18900	1880	13.436	14.477
			19125	1902.5	13.451	14.515
		20	18700	1860	17.914	19.368
			18900	1880	17.945	19.378
			19100	1900	17.951	19.357

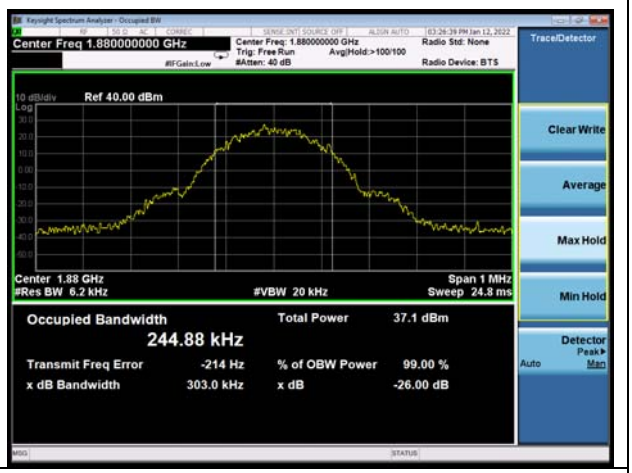
GSM1900 GSM CH-Low

GSM1900 GPRS CH-Low

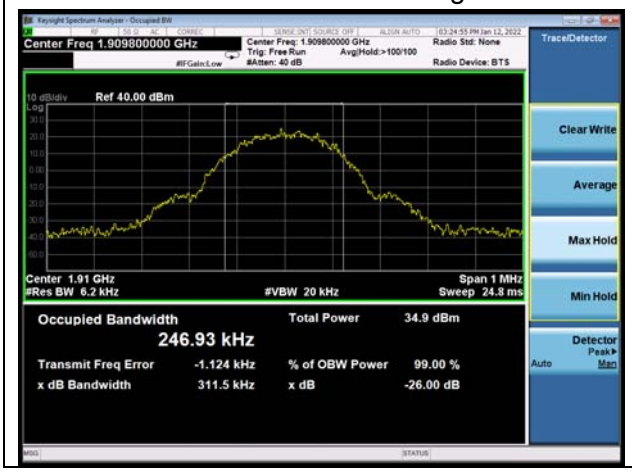


GSM 1900 GSM CH-Middle

GSM 1900 GPRS CH-Middle

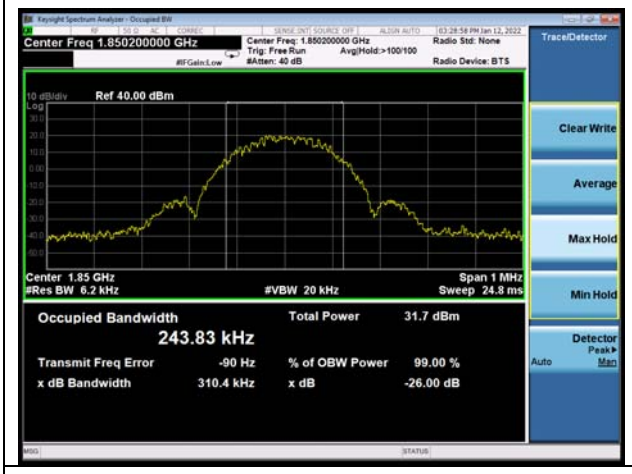


GSM 1900 GSM CH-High

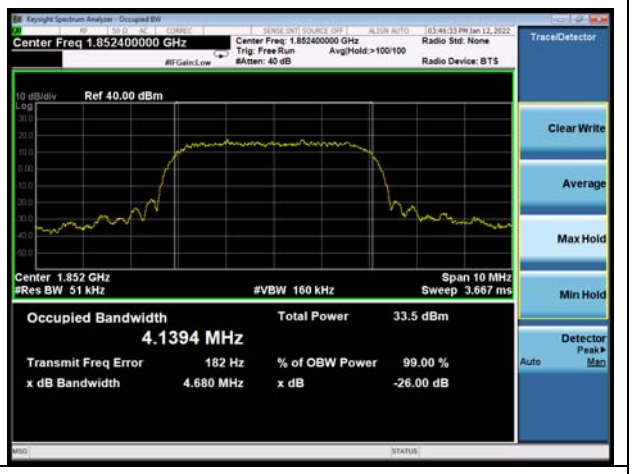


GSM 1900 GPRS CH-High

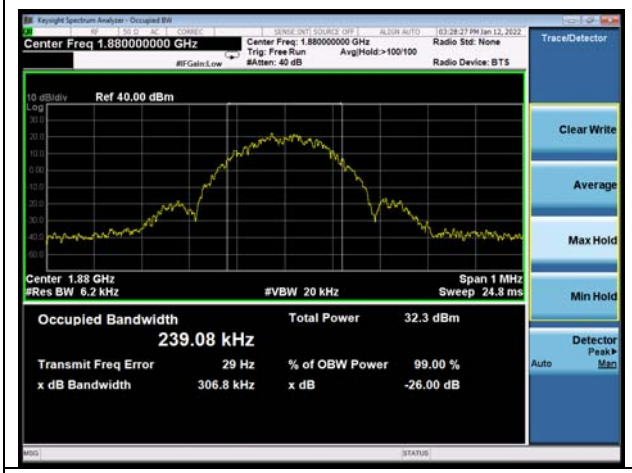
GSM1900 EGPRS CH-Low



WCDMA Band II RMC CH-LOW

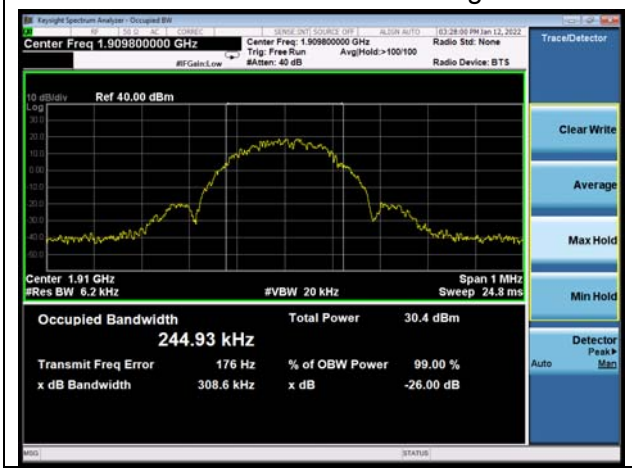


GSM 1900 EGPRS CH-Middle

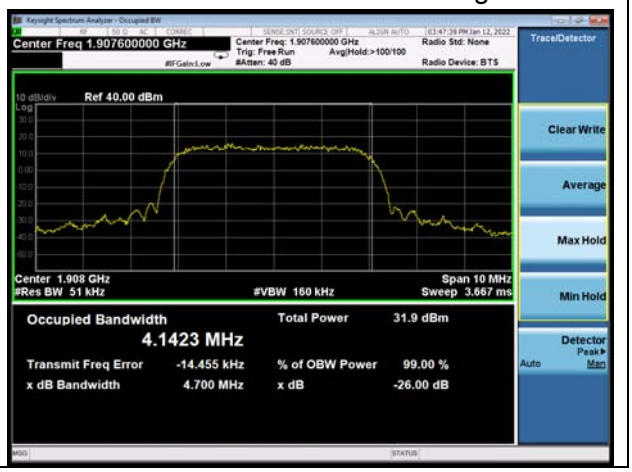


WCDMA Band II RMC CH-Middle

GSM 1900 EGPRS CH-High

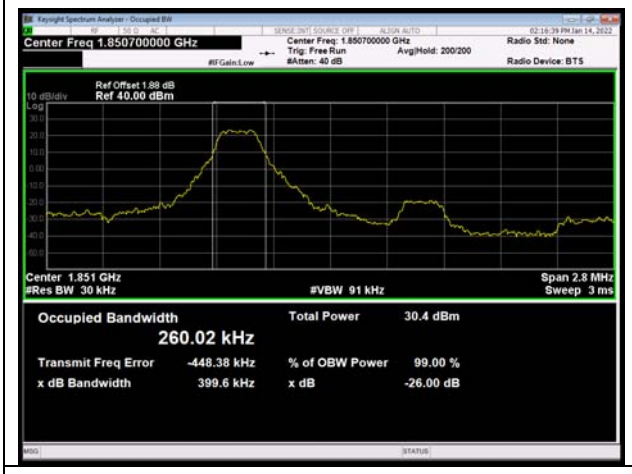


WCDMA Band II RMC CH-High

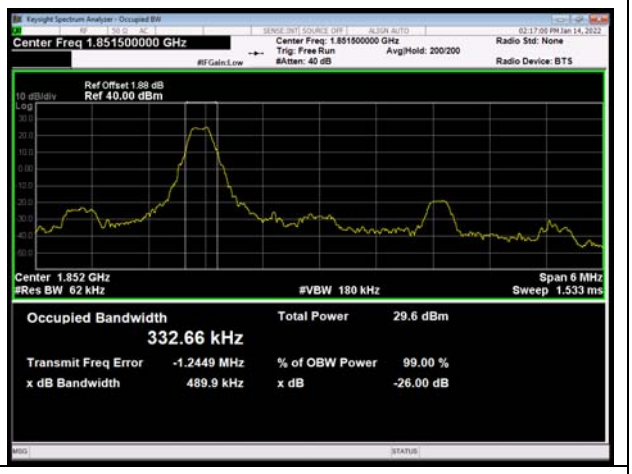


1RB

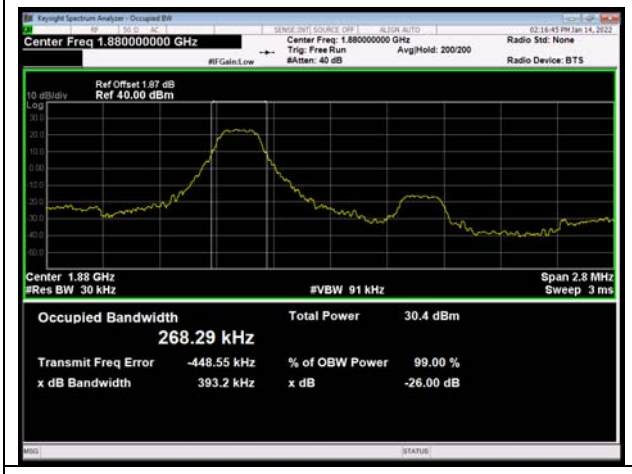
LTE Band 2 1.4MHz QPSK CH-Low



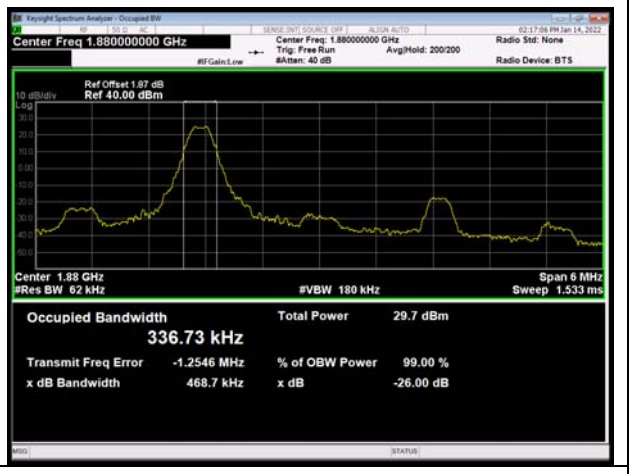
LTE Band 2 3MHz QPSK CH-Low



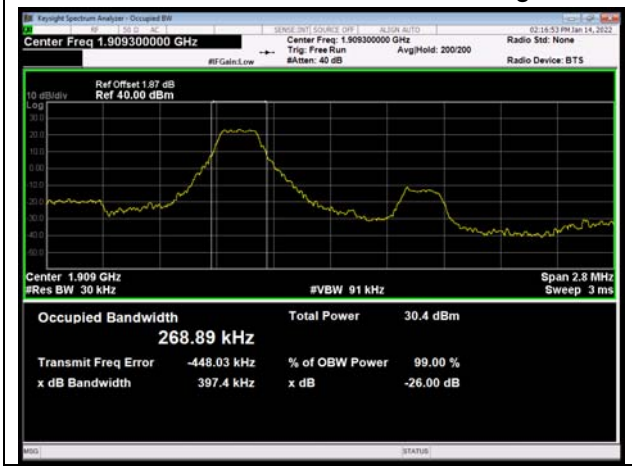
LTE Band 2 1.4MHz QPSK CH-Middle



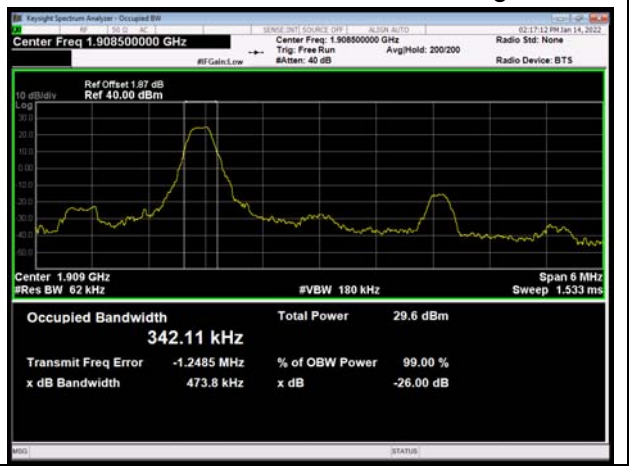
LTE Band 2 3MHz QPSK CH-Middle



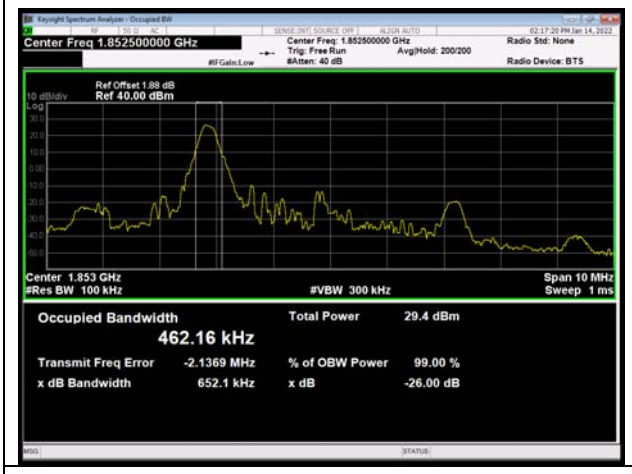
LTE Band 2 1.4MHz QPSK CH-High



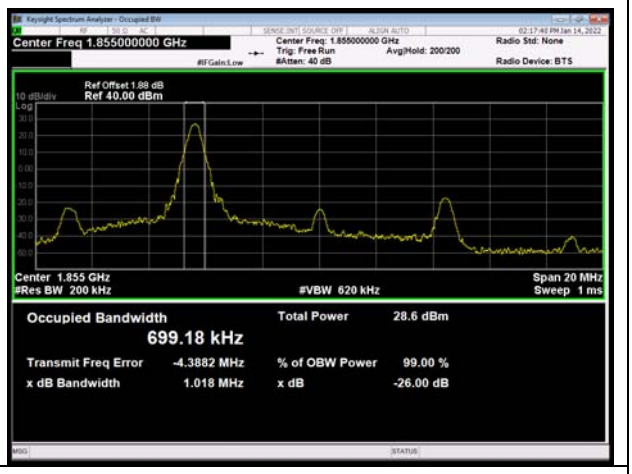
LTE Band 2 3MHz QPSK CH-High



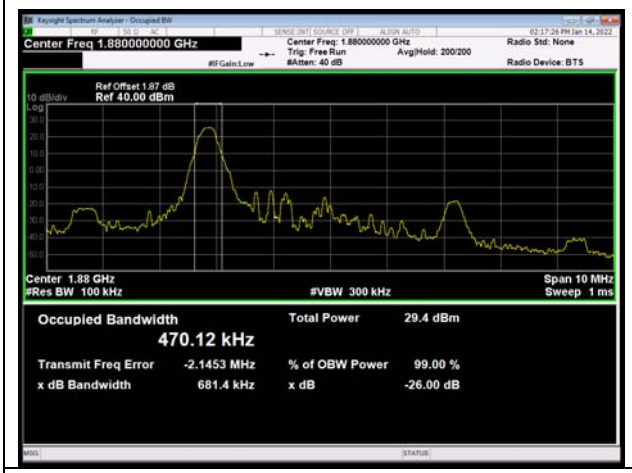
LTE Band 2 5MHz QPSK CH-Low



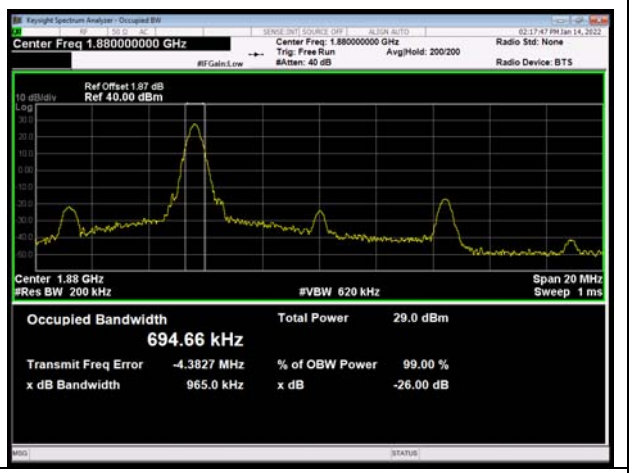
LTE Band 2 10MHz QPSK CH-Low



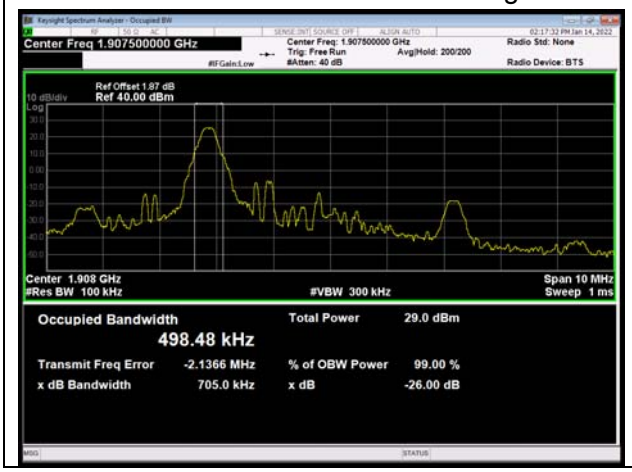
LTE Band 2 5MHz QPSK CH-Middle



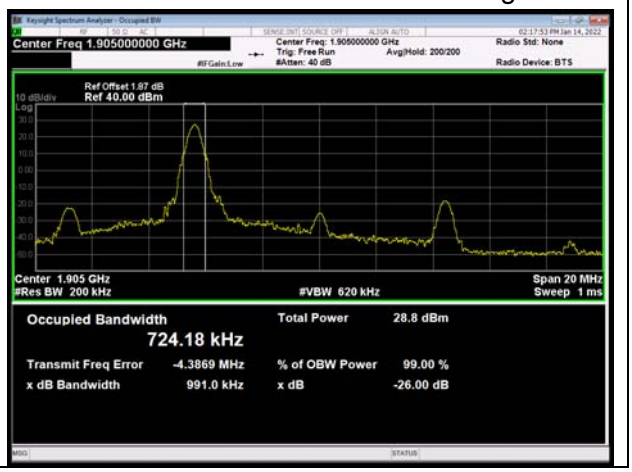
LTE Band 2 10MHz QPSK CH-Middle



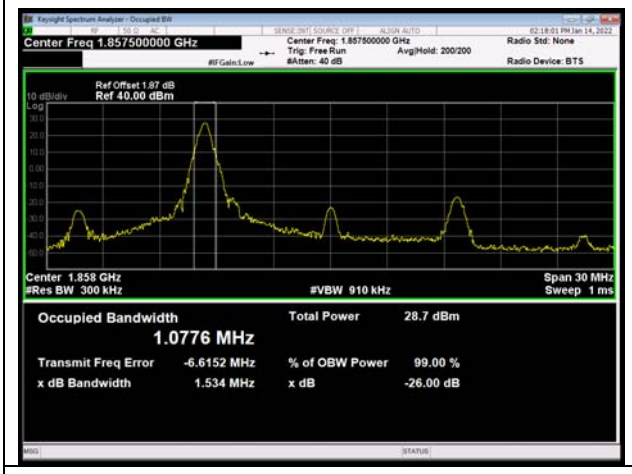
LTE Band 2 5MHz QPSK CH-High



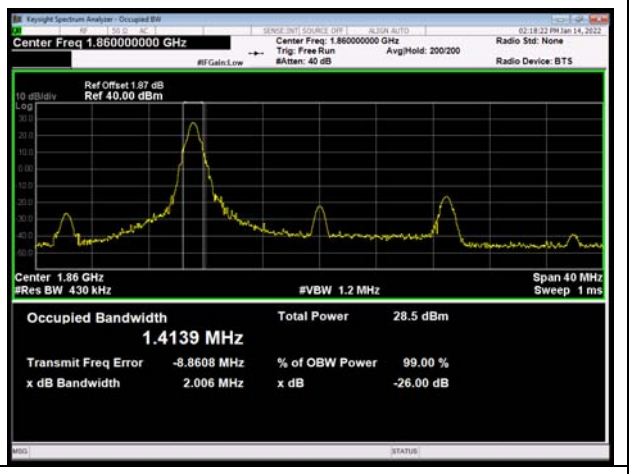
LTE Band 2 10MHz QPSK CH-High



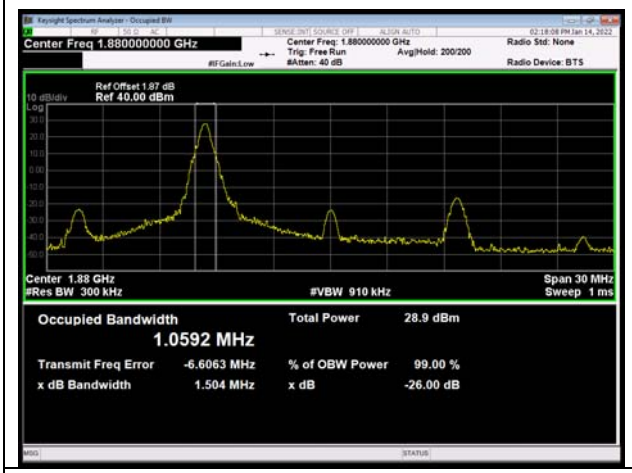
LTE Band 2 15MHz QPSK CH-Low



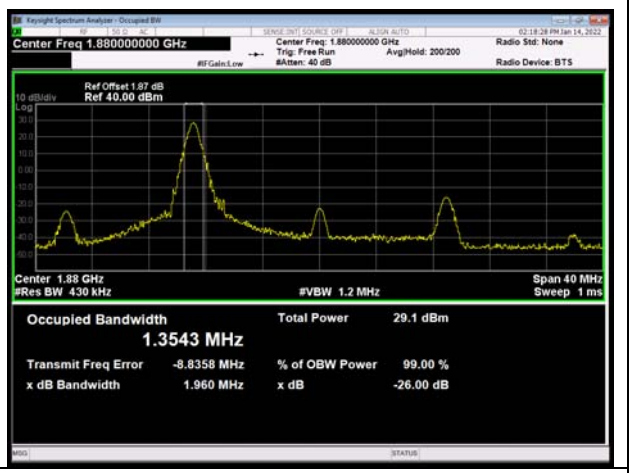
LTE Band 2 20MHz QPSK CH-Low



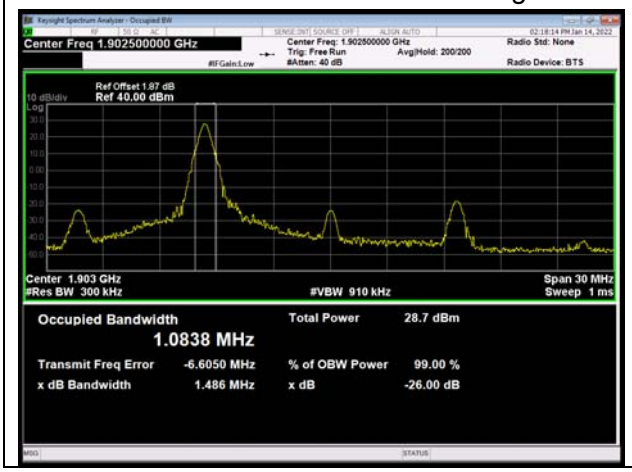
LTE Band 2 15MHz QPSK CH-Middle



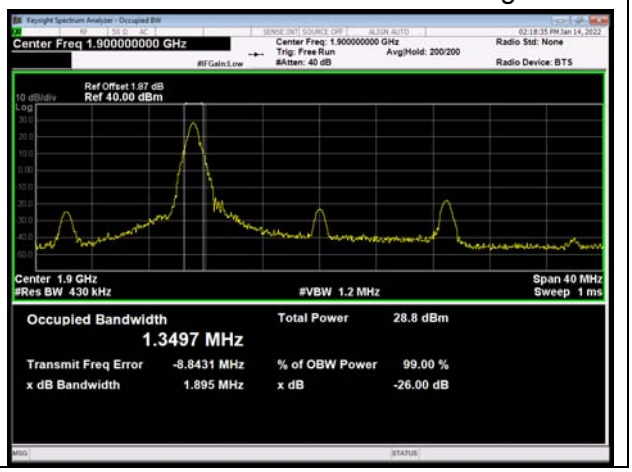
LTE Band 2 20MHz QPSK CH-Middle



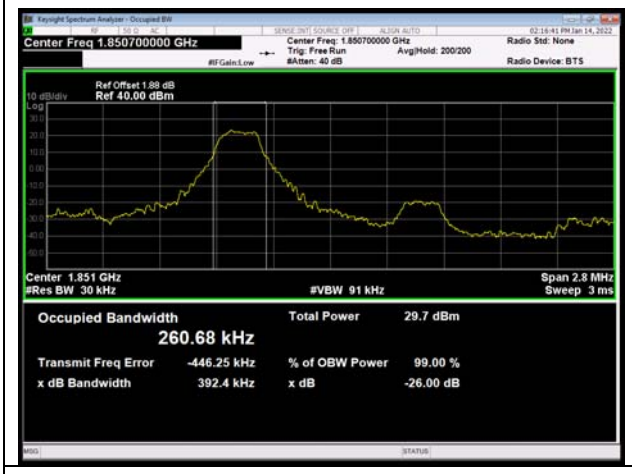
LTE Band 2 15MHz QPSK CH-High



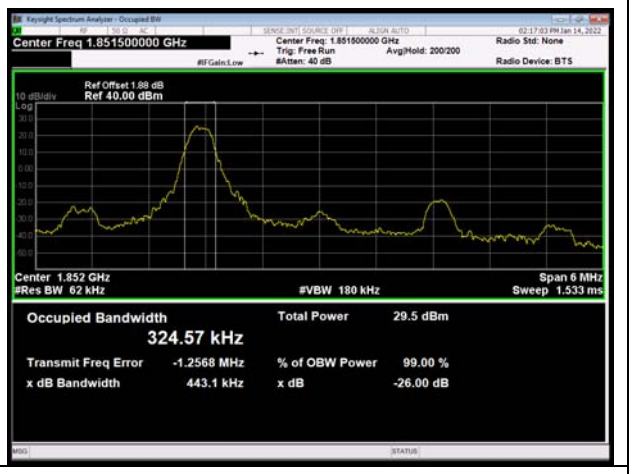
LTE Band 2 20MHz QPSK CH-High



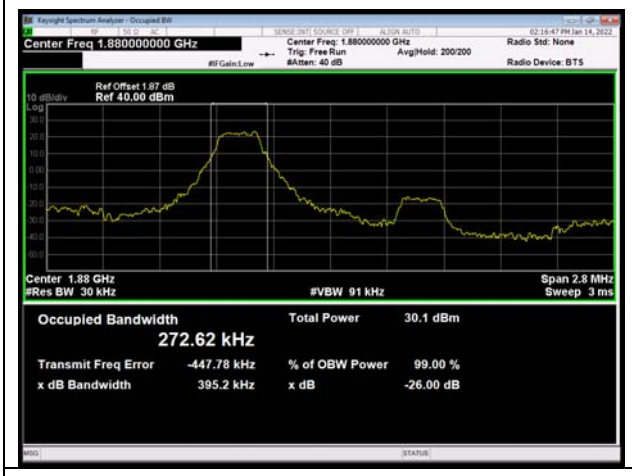
LTE Band 2 1.4MHz 16QAM CH-Low



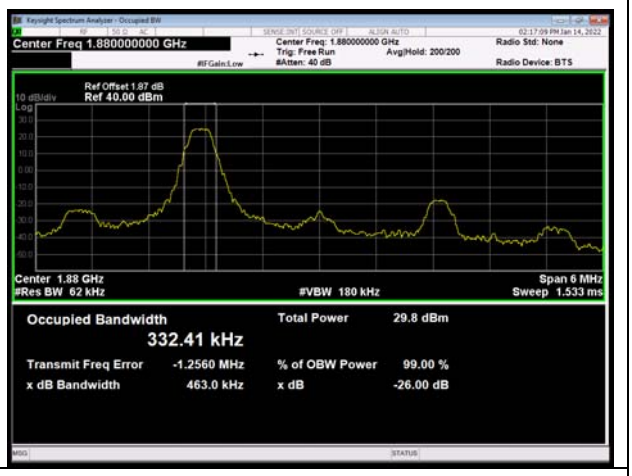
LTE Band 2 3MHz 16QAM CH-Low



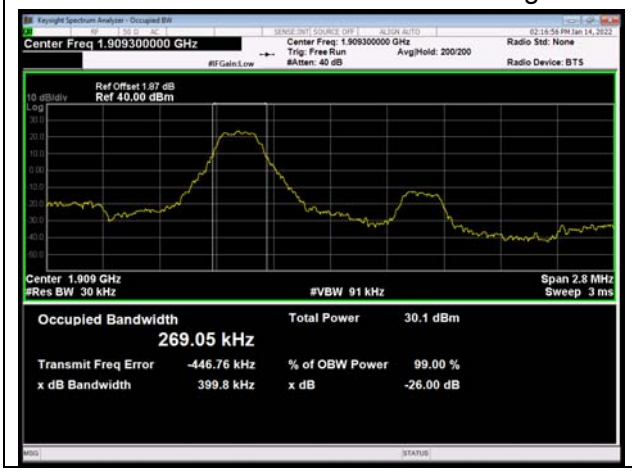
LTE Band 2 1.4MHz 16QAM CH-Middle



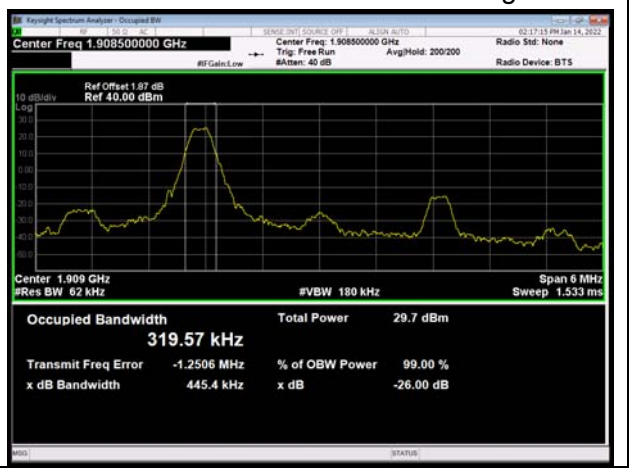
LTE Band 2 3MHz 16QAM CH-Middle



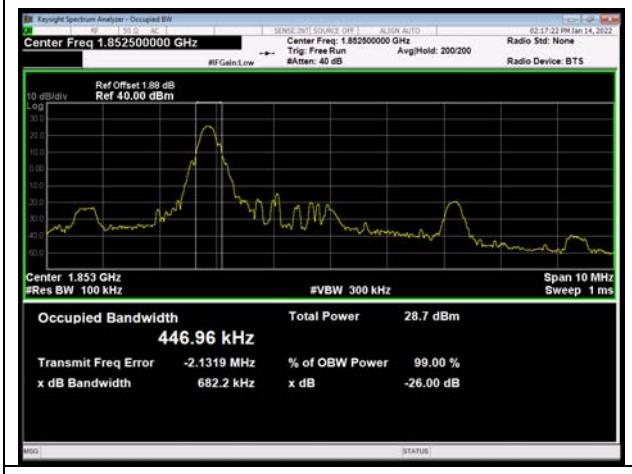
LTE Band 2 1.4MHz 16QAM CH-High



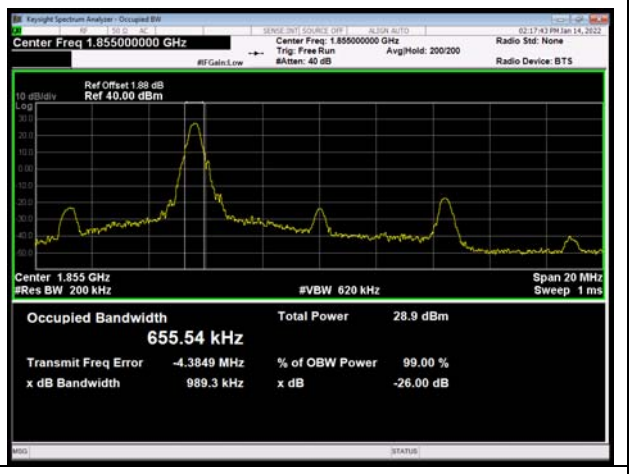
LTE Band 2 3MHz 16QAM CH-High



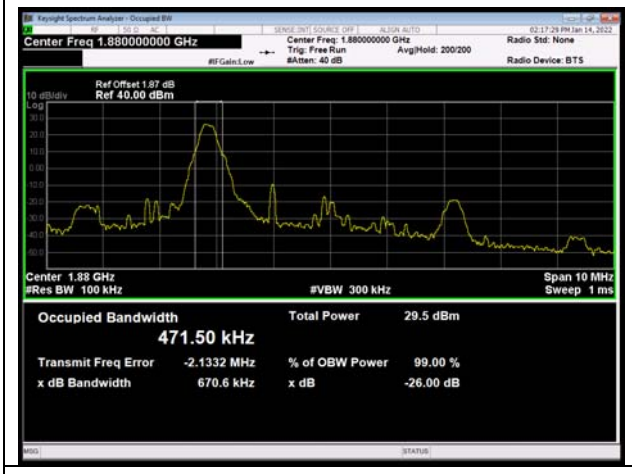
LTE Band 2 5MHz 16QAM CH-Low



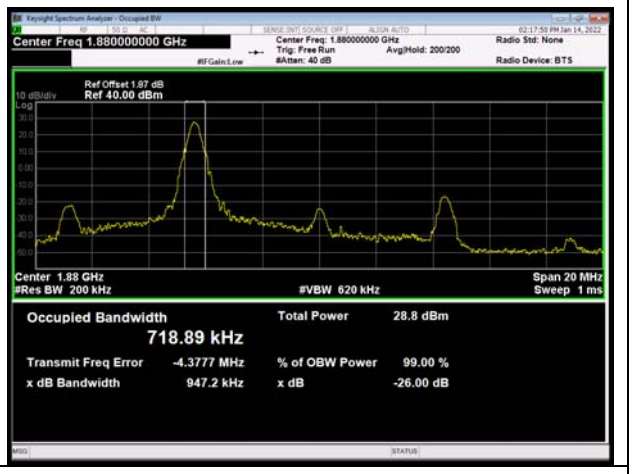
LTE Band 2 10MHz 16QAM CH-Low



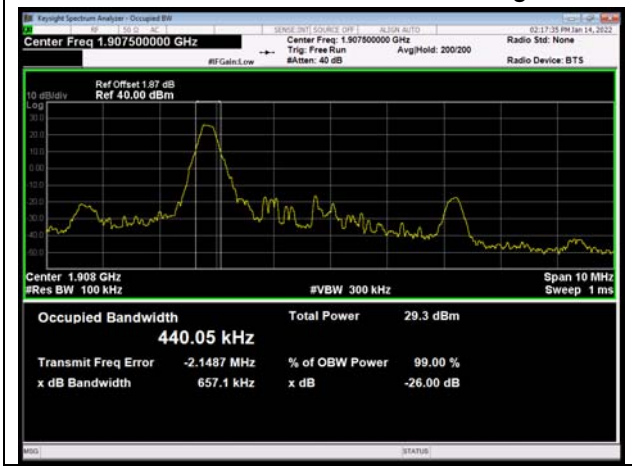
LTE Band 2 5MHz 16QAM CH-Middle



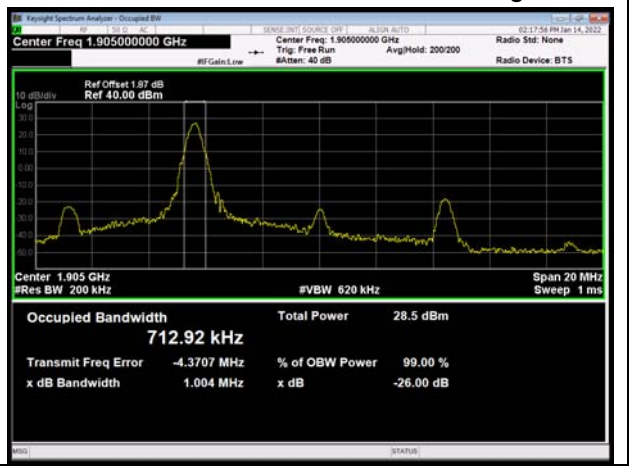
LTE Band 2 10MHz 16QAM CH-Middle



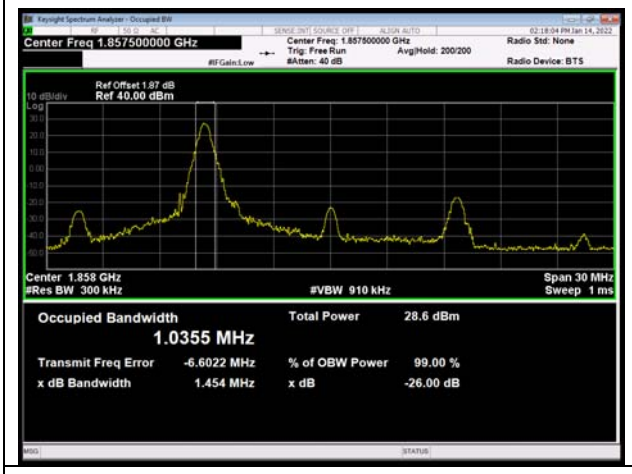
LTE Band 2 5MHz 16QAM CH-High



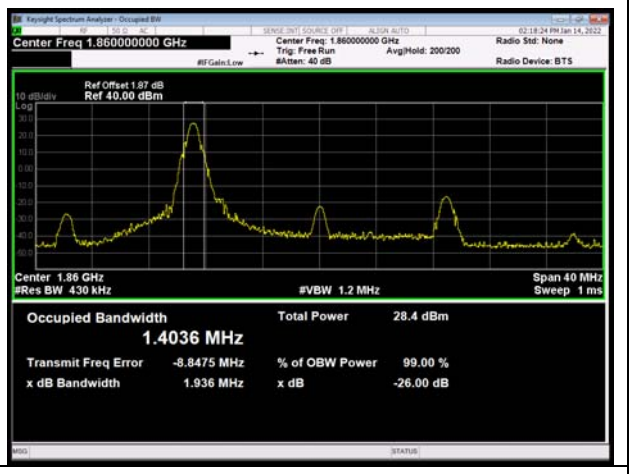
LTE Band 2 10MHz 16QAM CH-High



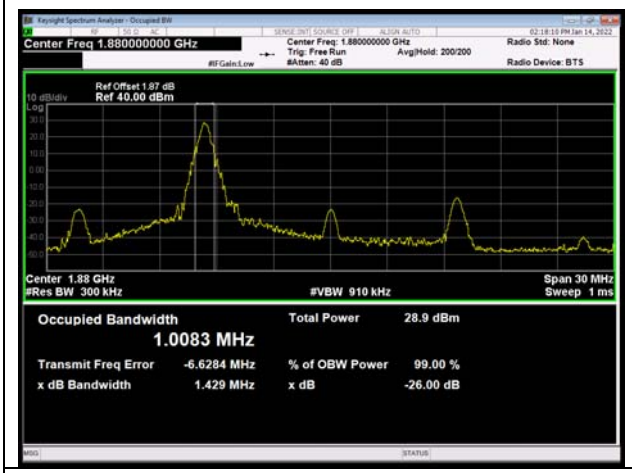
LTE Band 2 15MHz 16QAM CH-Low



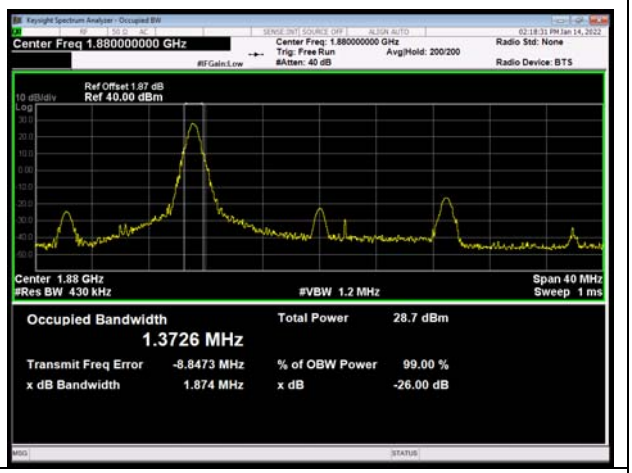
LTE Band 2 20MHz 16QAM CH-Low



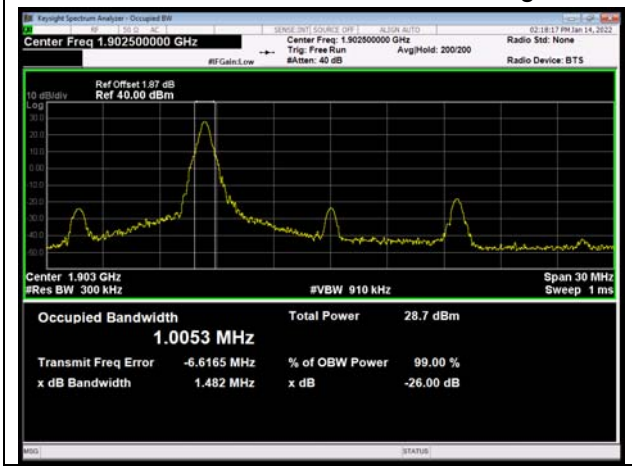
LTE Band 2 15MHz 16QAM CH-Middle



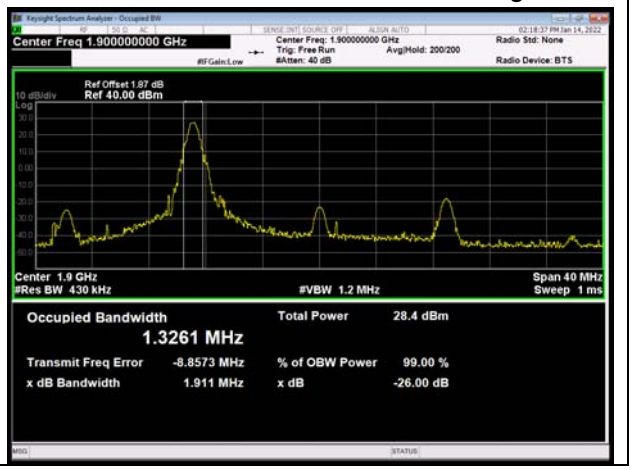
LTE Band 2 20MHz 16QAM CH-Middle



LTE Band 2 15MHz 16QAM CH-High

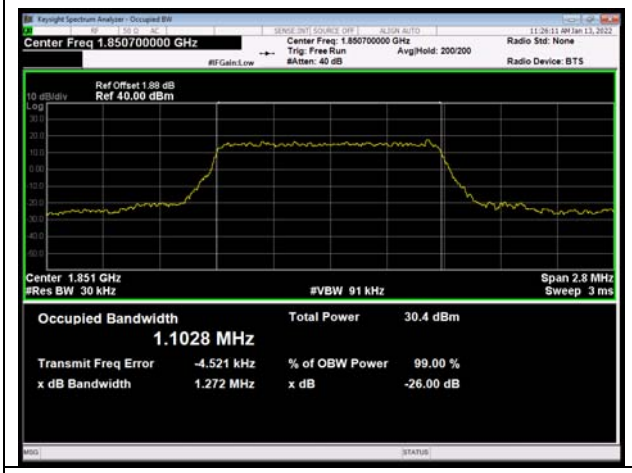


LTE Band 2 20MHz 16QAM CH-High

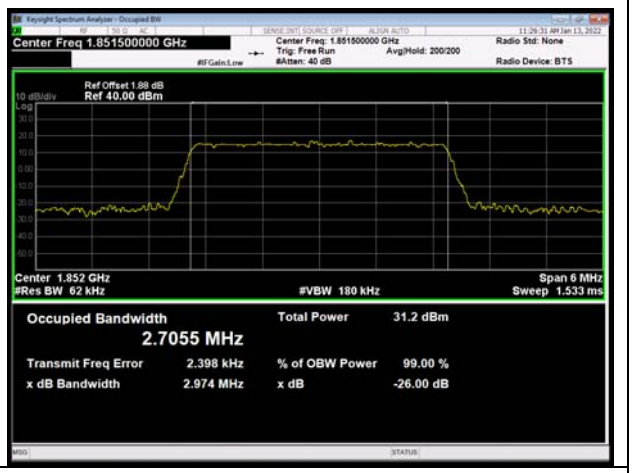


100 RB

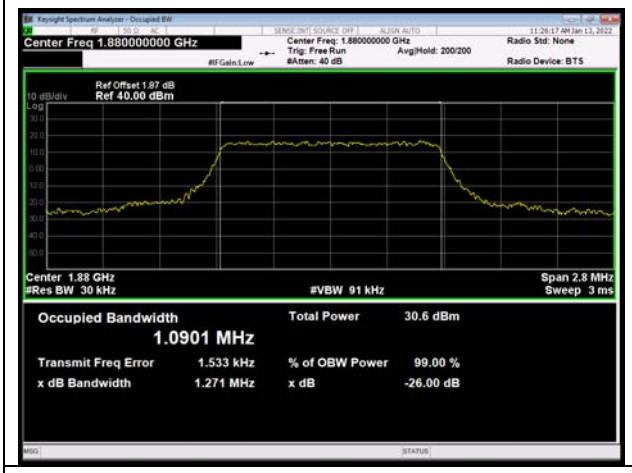
LTE Band 2 1.4MHz QPSK CH-Low



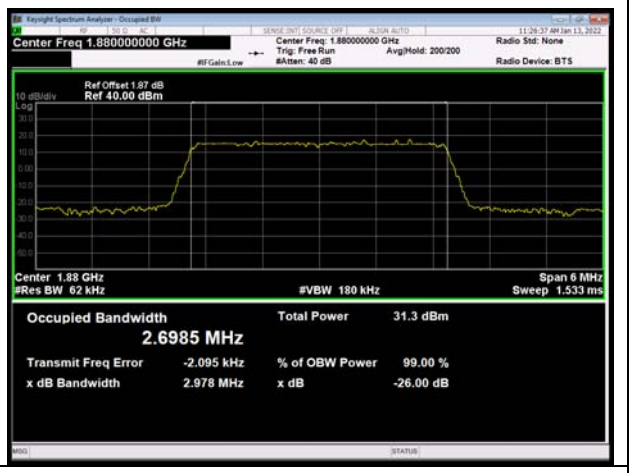
LTE Band 2 3MHz QPSK CH-Low



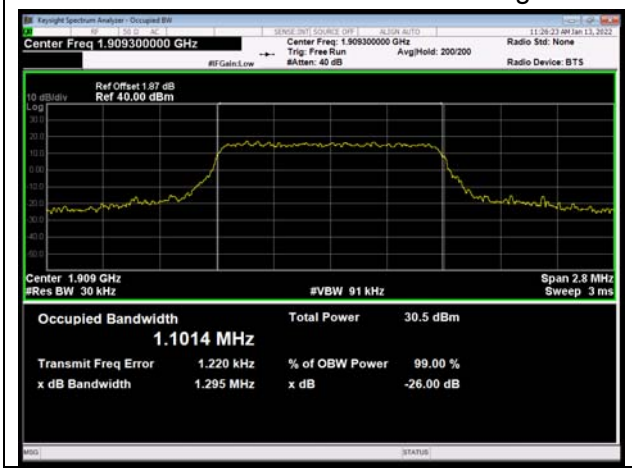
LTE Band 2 1.4MHz QPSK CH-Middle



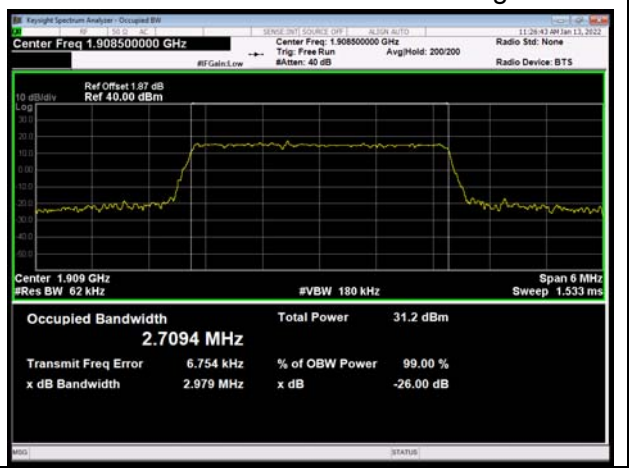
LTE Band 2 3MHz QPSK CH-Middle



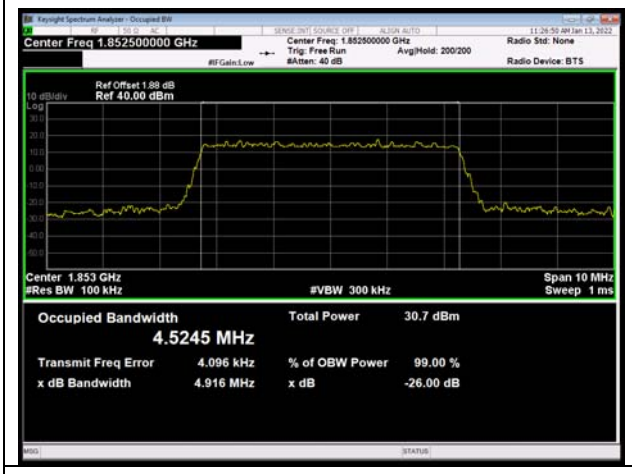
LTE Band 2 1.4MHz QPSK CH-High



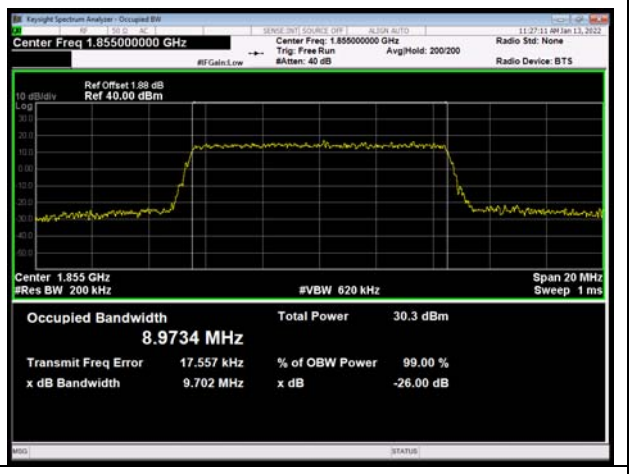
LTE Band 2 3MHz QPSK CH-High



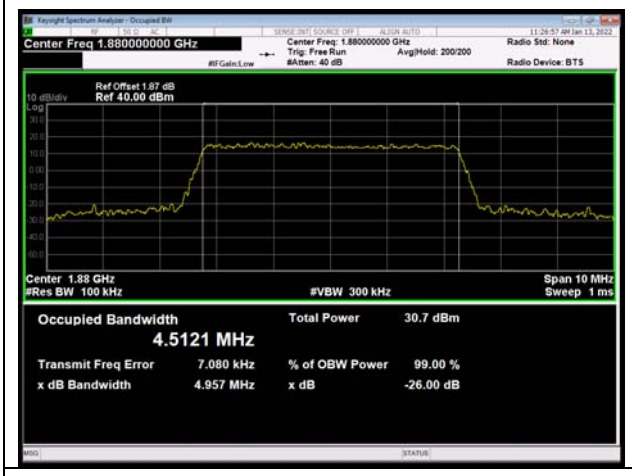
LTE Band 2 5MHz QPSK CH-Low



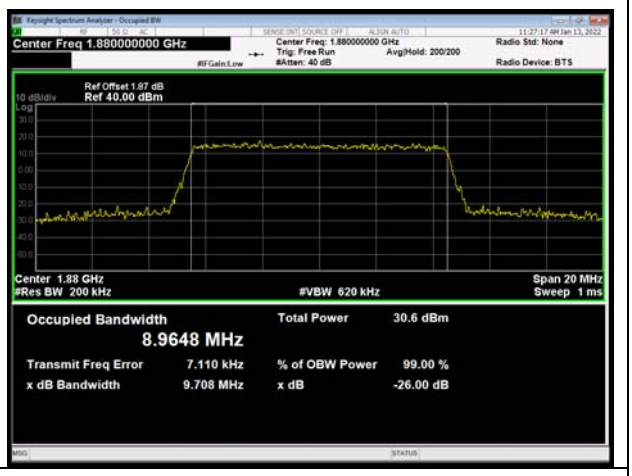
LTE Band 2 10MHz QPSK CH-Low



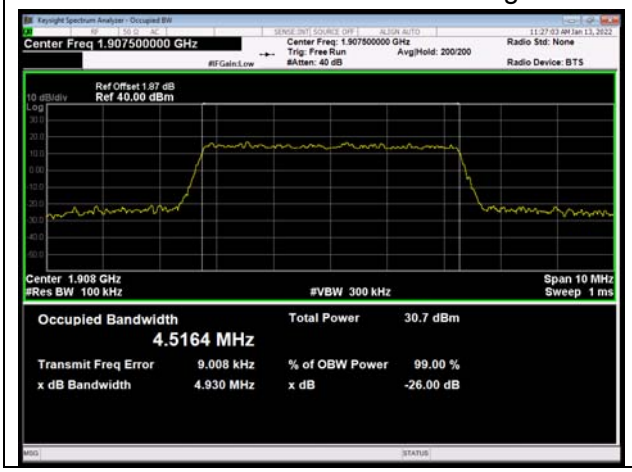
LTE Band 2 5MHz QPSK CH-Middle



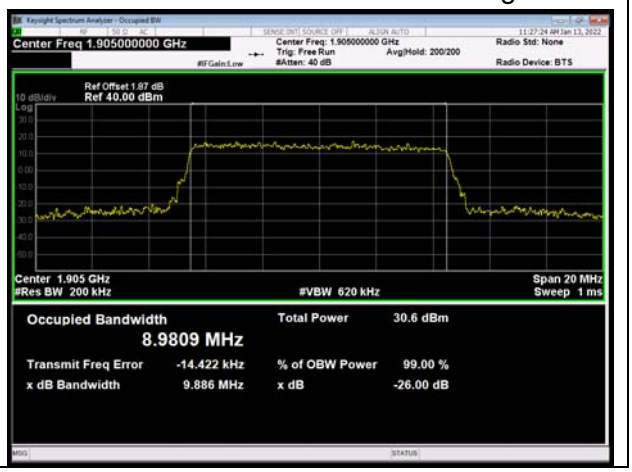
LTE Band 2 10MHz QPSK CH-Middle



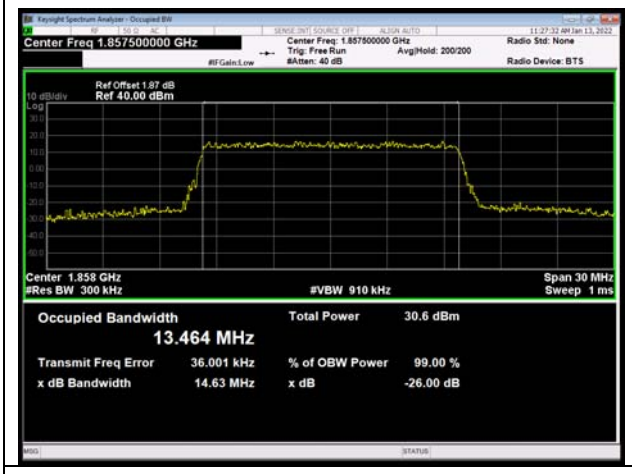
LTE Band 2 5MHz QPSK CH-High



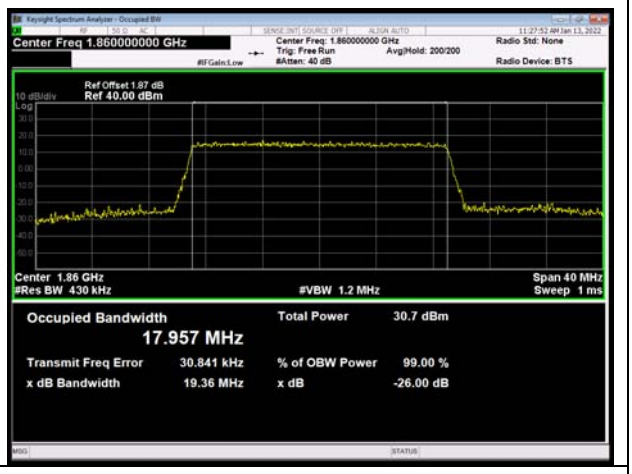
LTE Band 2 10MHz QPSK CH-High



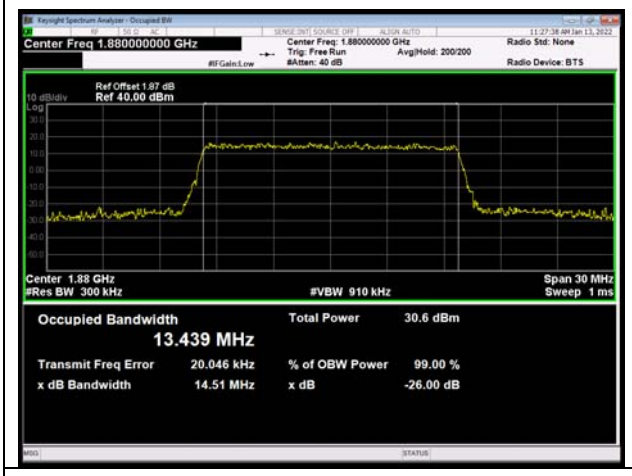
LTE Band 2 15MHz QPSK CH-Low



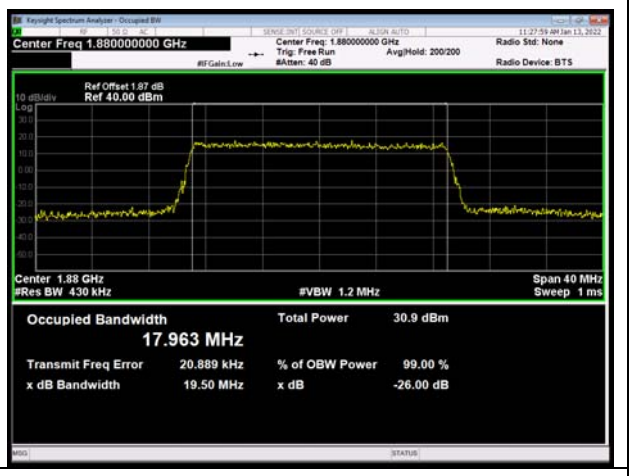
LTE Band 2 20MHz QPSK CH-Low



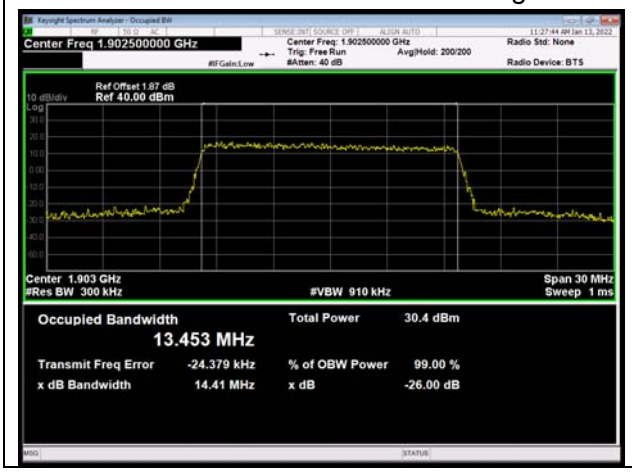
LTE Band 2 15MHz QPSK CH-Middle



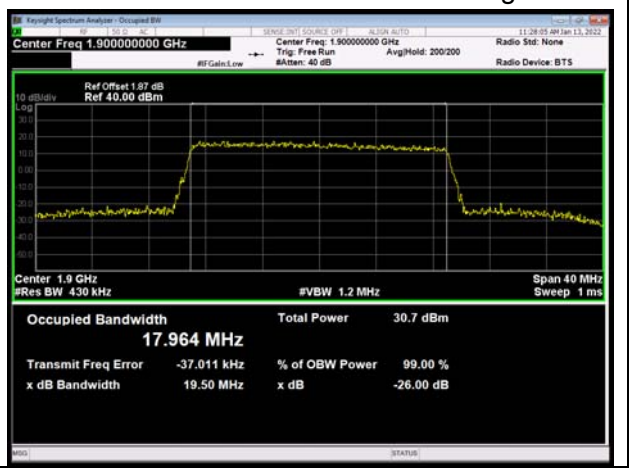
LTE Band 2 20MHz QPSK CH-Middle



LTE Band 2 15MHz QPSK CH-High



LTE Band 2 20MHz QPSK CH-High



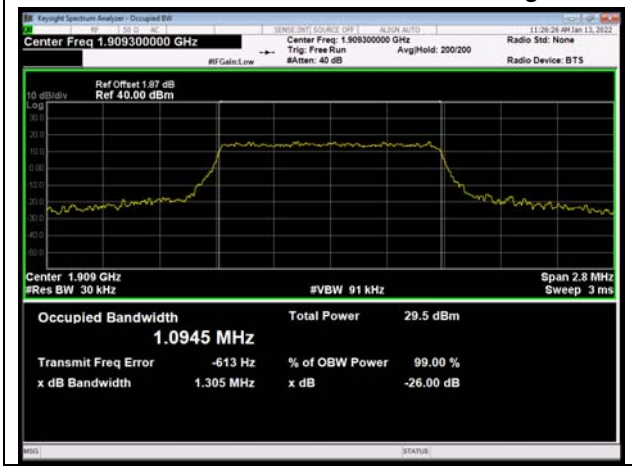
LTE Band 2 1.4MHz 16QAM CH-Low

LTE Band 2 3MHz 16QAM CH-Low

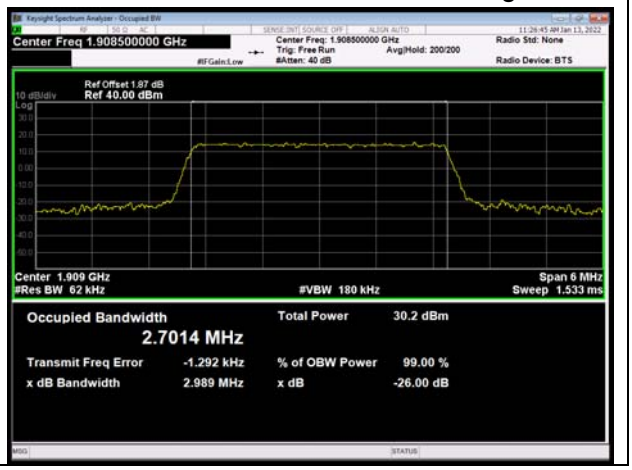
LTE Band 2 1.4MHz 16QAM CH-Middle

LTE Band 2 3MHz 16QAM CH-Middle

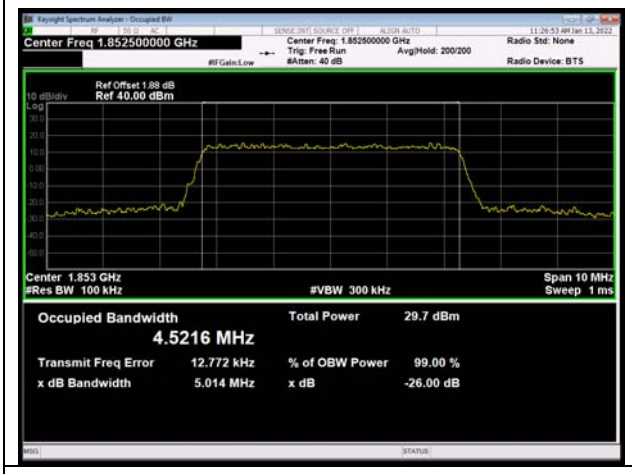
LTE Band 2 1.4MHz 16QAM CH-High



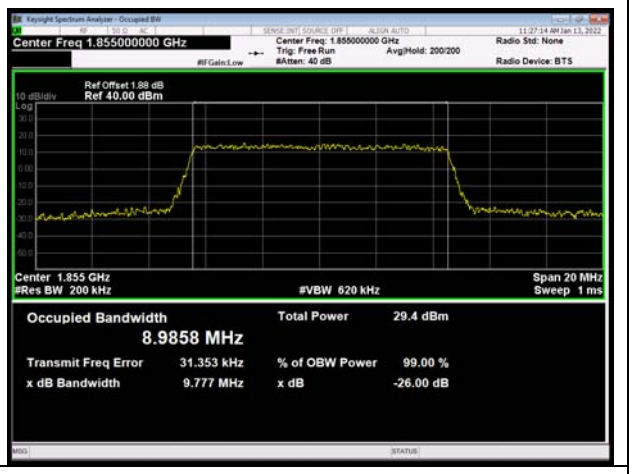
LTE Band 2 3MHz 16QAM CH-High



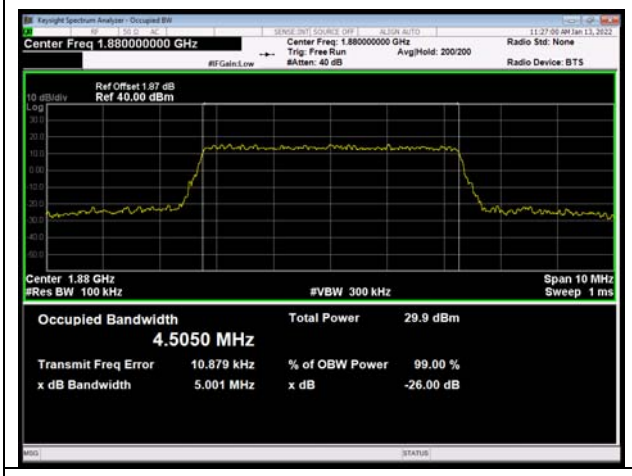
LTE Band 2 5MHz 16QAM CH-Low



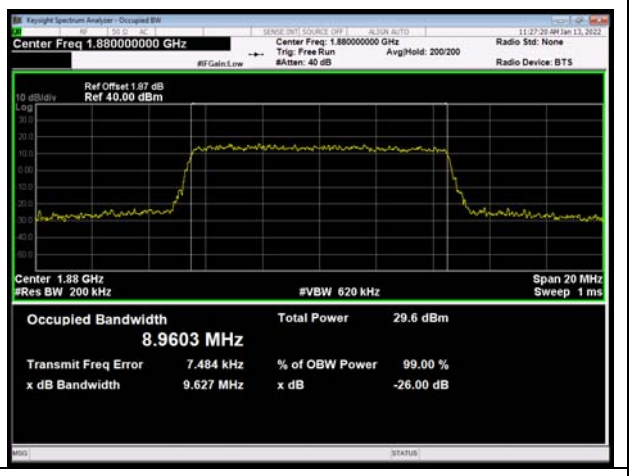
LTE Band 2 10MHz 16QAM CH-Low



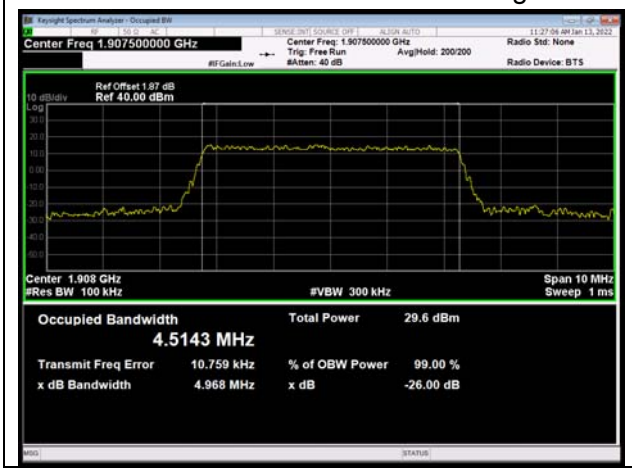
LTE Band 2 5MHz 16QAM CH-Middle



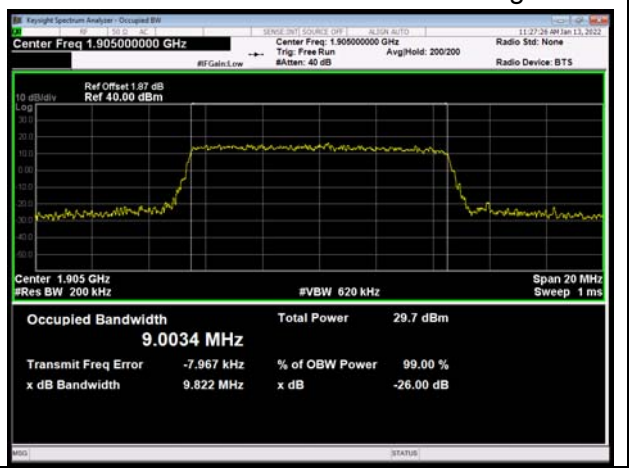
LTE Band 2 10MHz 16QAM CH-Middle



LTE Band 2 5MHz 16QAM CH-High

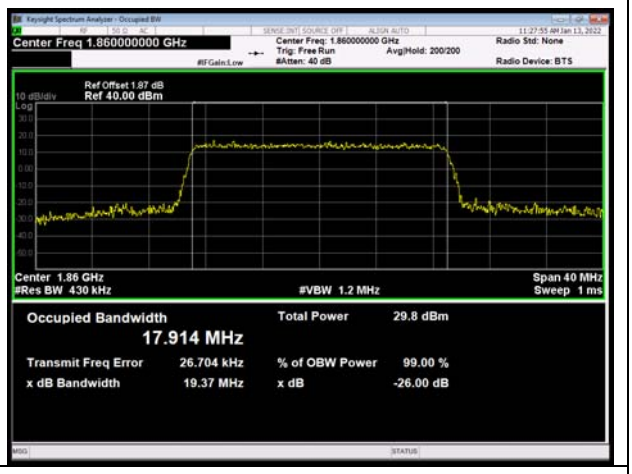


LTE Band 2 10MHz 16QAM CH-High

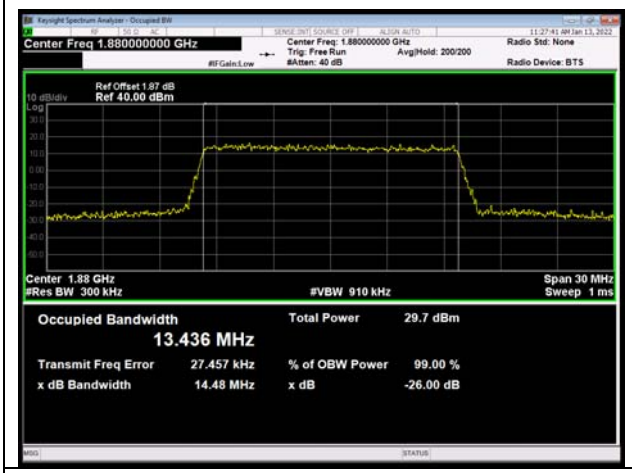


LTE Band 2 15MHz 16QAM CH-Low

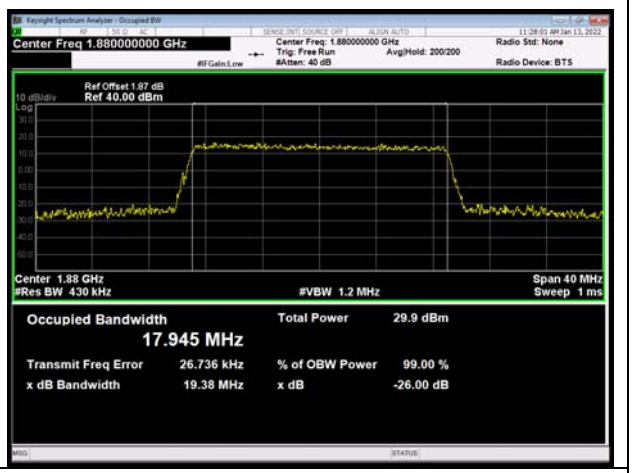
LTE Band 2 20MHz 16QAM CH-Low



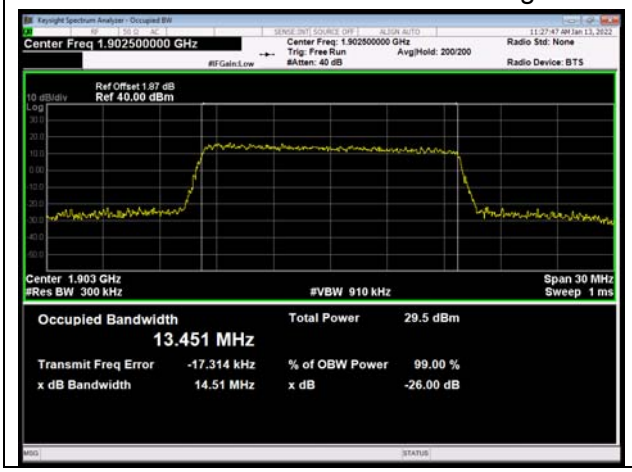
LTE Band 2 15MHz 16QAM CH-Middle



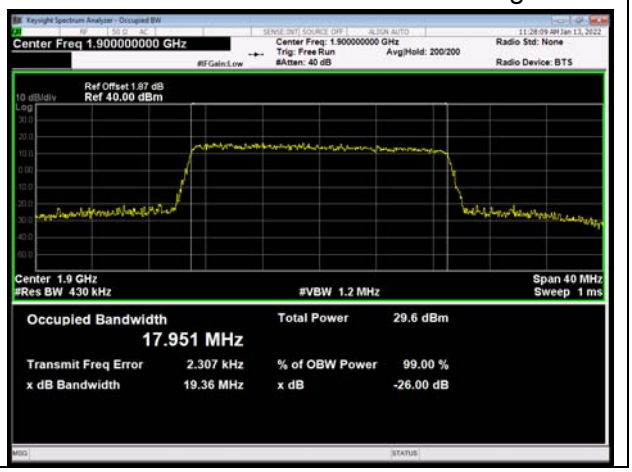
LTE Band 2 20MHz 16QAM CH-Middle



LTE Band 2 15MHz 16QAM CH-High



LTE Band 2 20MHz 16QAM CH-High



5.3. Band Edge Compliance

Ambient condition

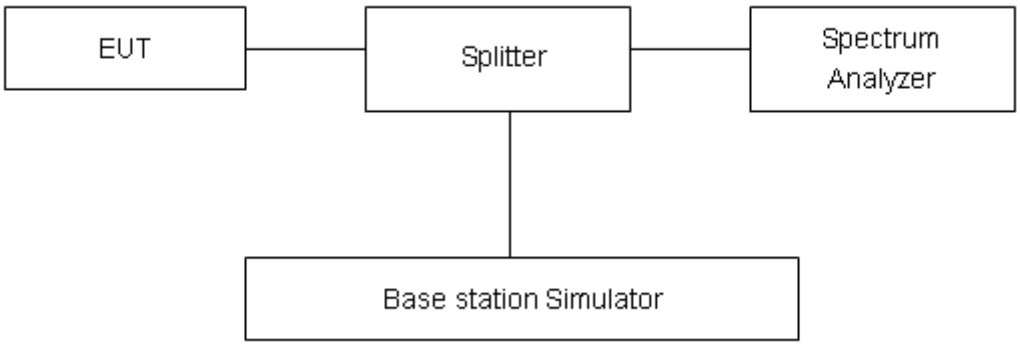
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 ≥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 log10 (P) dB.”

Limit	-13 dBm

Measurement Uncertainty

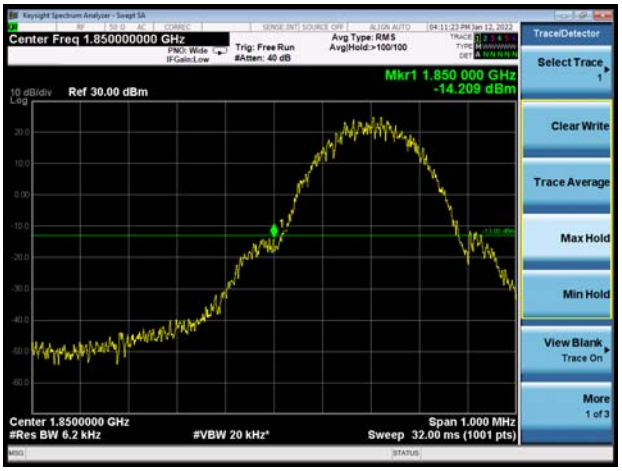
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U=0.684dB.

Test Result:

GSM1900 GSM CH-Low

GSM 1900 GSM CH-High

GSM1900 GPRS CH-Low



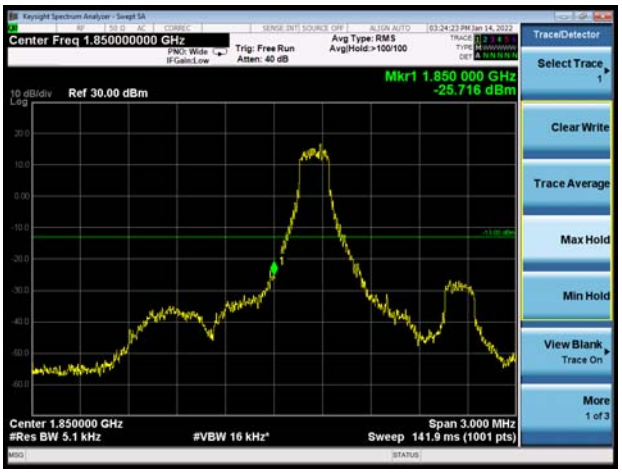
GSM 1900 GPRS CH-High

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



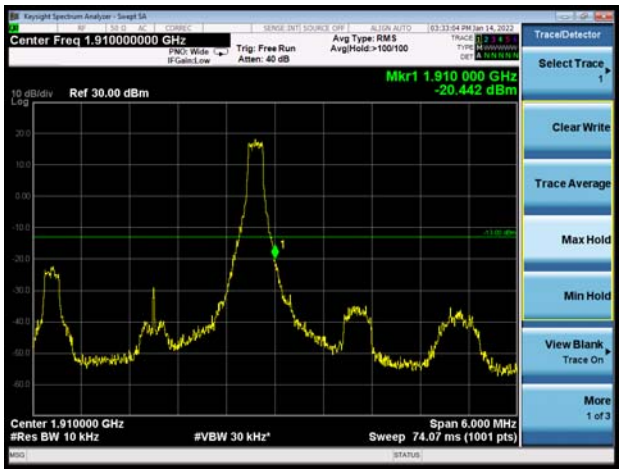
LTE Band 2 1.4MHz QPSK 1RB CH-High

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

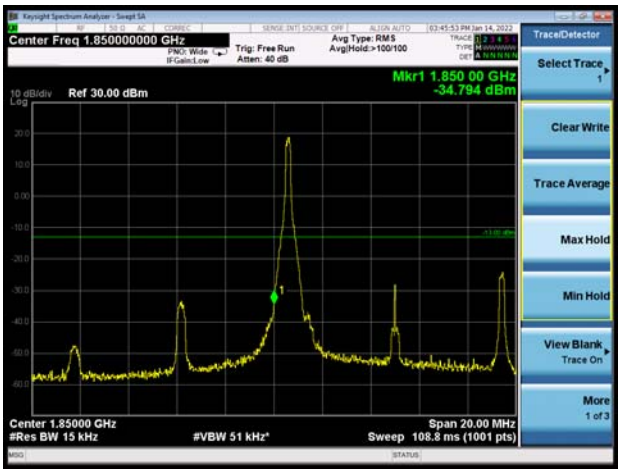
LTE Band 2 5MHz QPSK 1RB CH-Low

LTE Band 2 5MHz QPSK 1RB CH-High

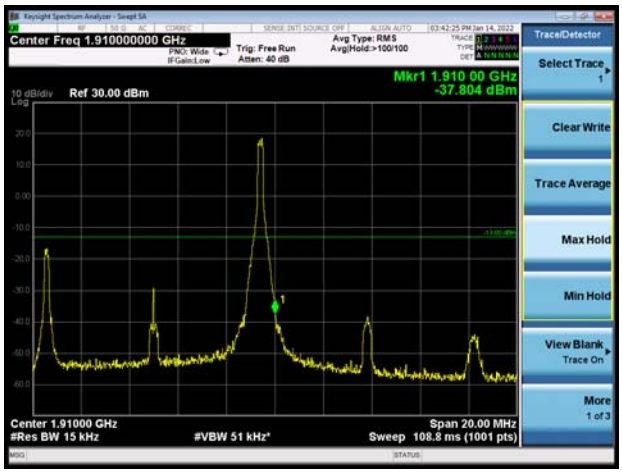
LTE Band 2 5MHz QPSK 100%RB CH-Low

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

LTE Band 2 10MHz QPSK 1RB CH-Low

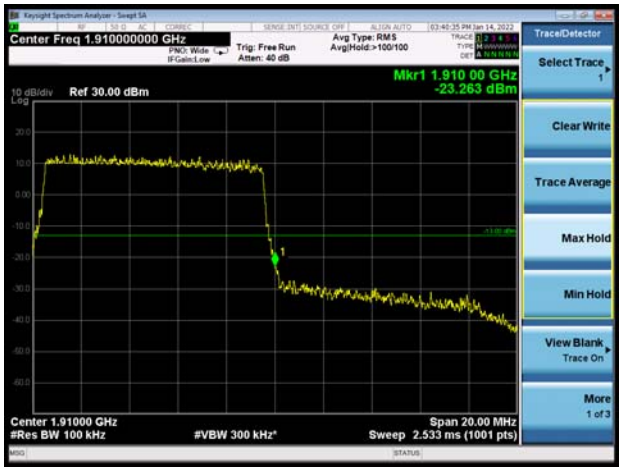


LTE Band 2 10MHz QPSK 1RB CH-High

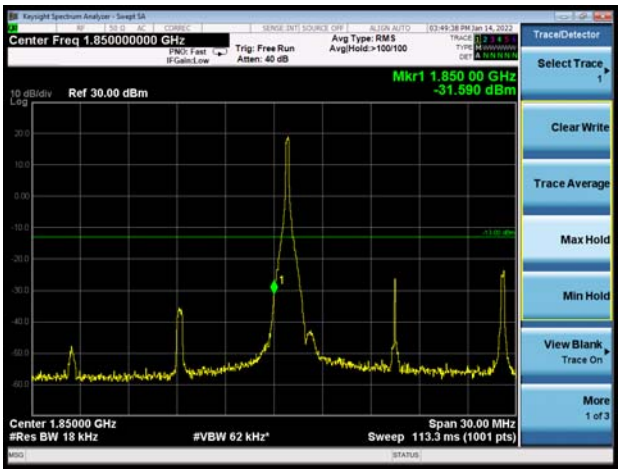


LTE Band 2 10MHz QPSK 100%RB CH-Low

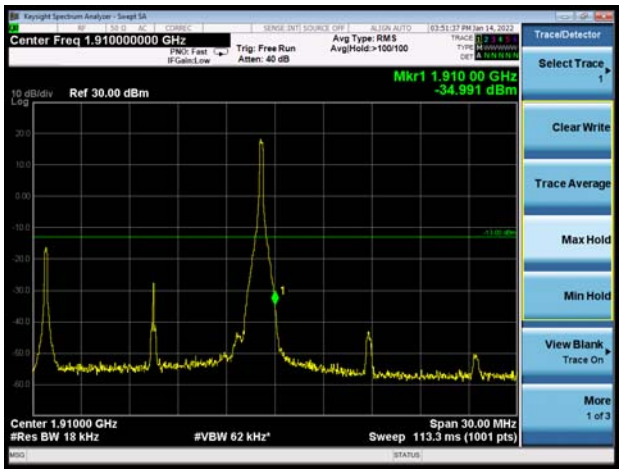
LTE Band 2 10MHz QPSK 100%RB CH-High



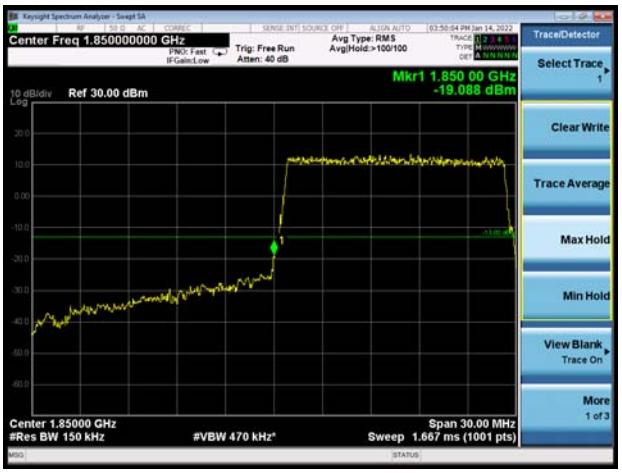
LTE Band 2 15MHz QPSK 1RB CH-Low



LTE Band 2 15MHz QPSK 1RB CH-High

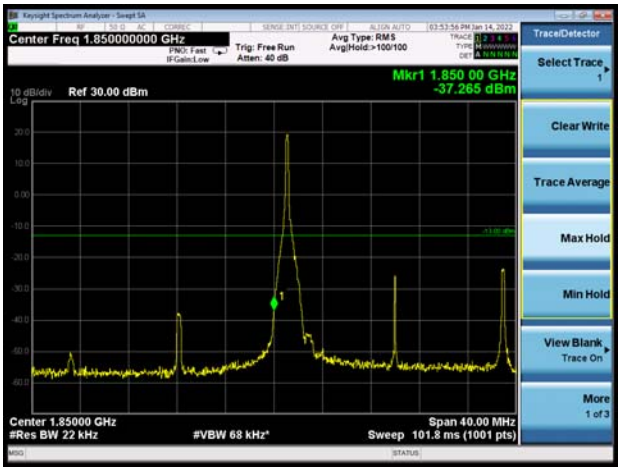


LTE Band 2 15MHz QPSK 100%RB CH-Low

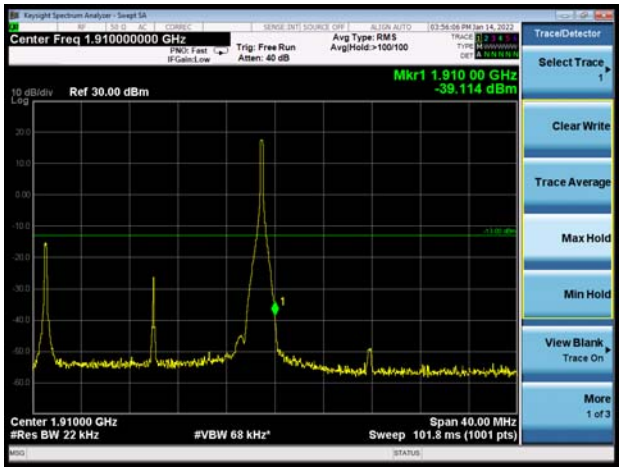


LTE Band 2 15MHz QPSK 100%RB CH-High

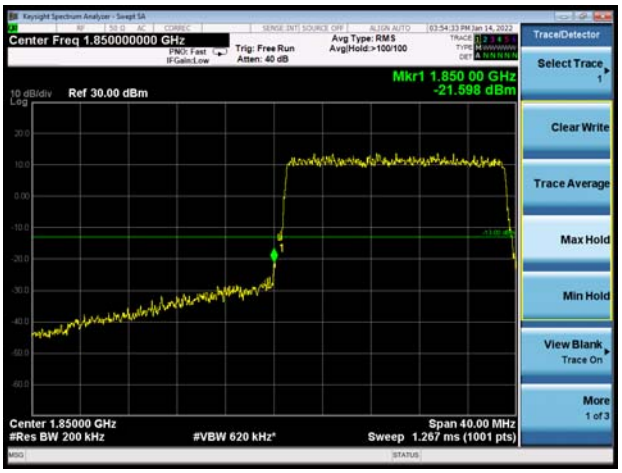
LTE Band 2 20MHz QPSK 1RB CH-Low



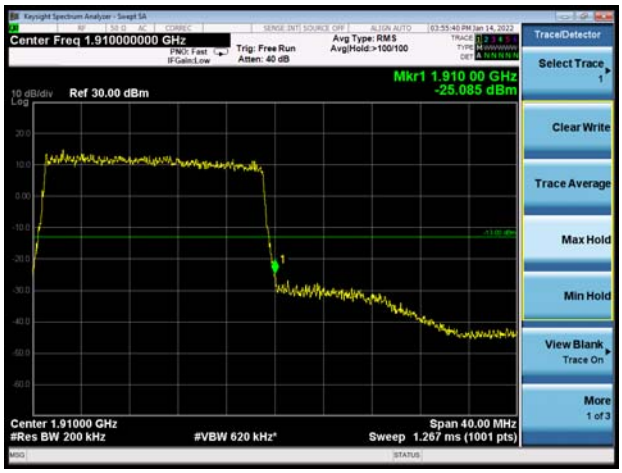
LTE Band 2 20MHz QPSK 1RB CH-High



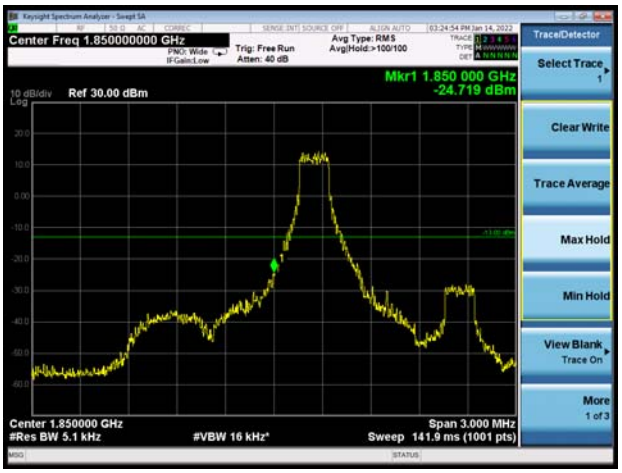
LTE Band 2 20MHz QPSK 100%RB CH-Low



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



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

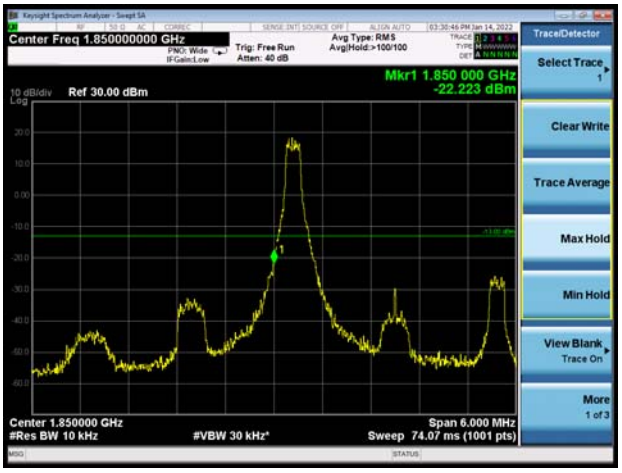


LTE Band 2 1.4MHz 16QAM 1RB CH-High

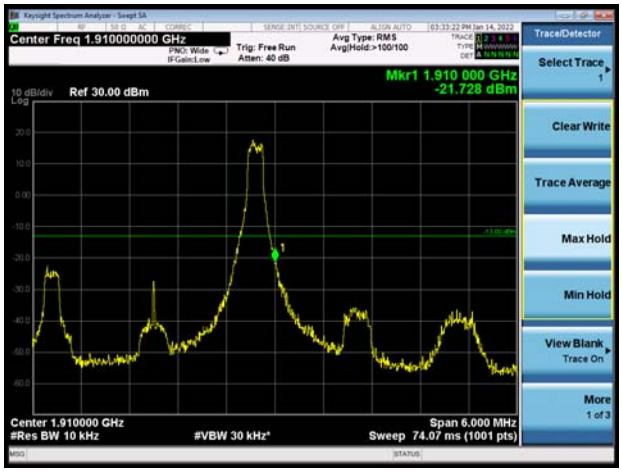
LTE Band 2 1.4MHz 16QAM 100%RB CH-Low

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

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

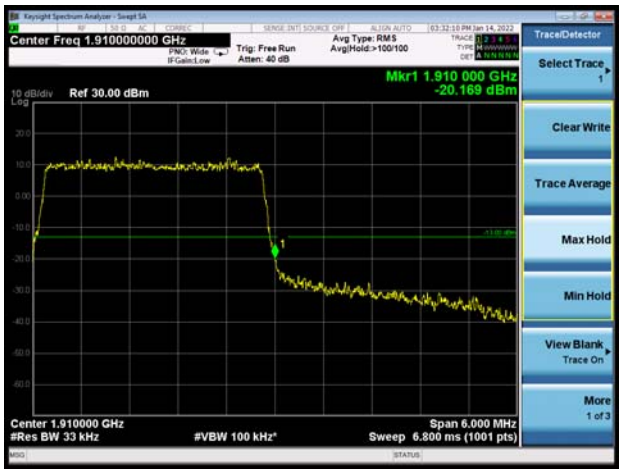


LTE Band 2 3MHz 16QAM 1RB CH-High



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

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

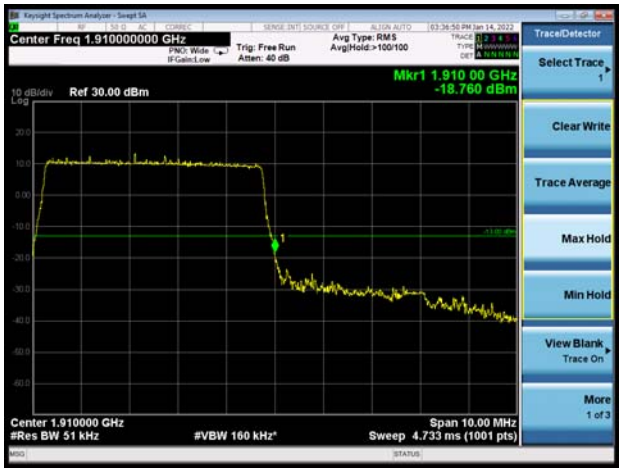


LTE Band 2 5MHz 16QAM 1RB CH-Low

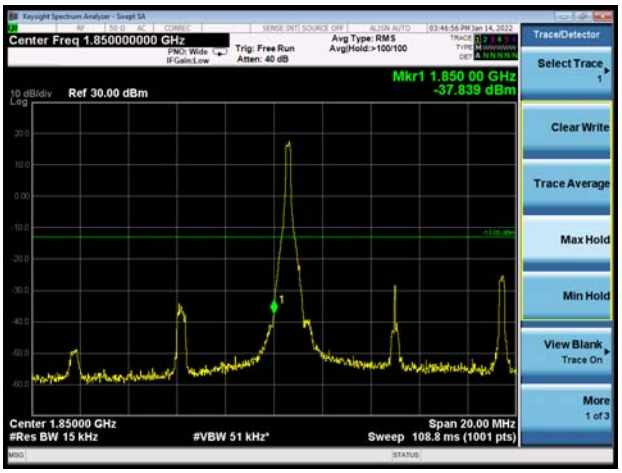
LTE Band 2 5MHz 16QAM 1RB CH-High

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

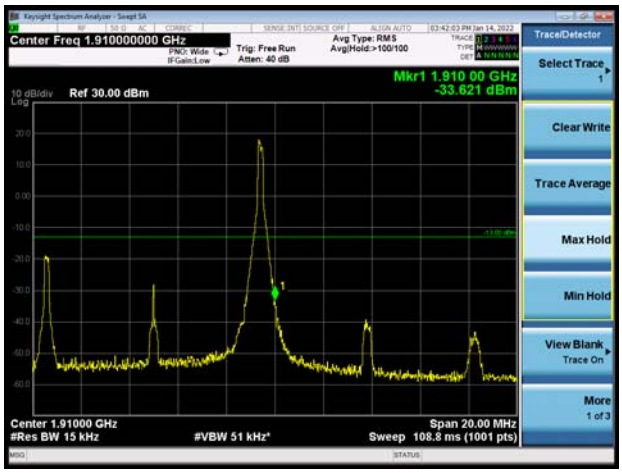
LTE Band 2 5MHz 16QAM 100%RB CH-High



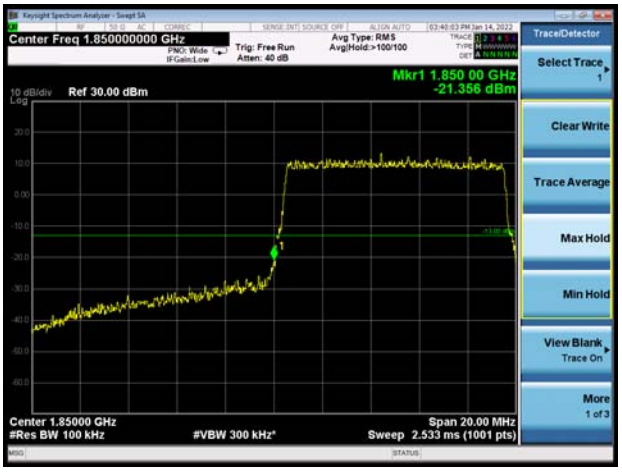
LTE Band 2 10MHz 16QAM 1RB CH-Low



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

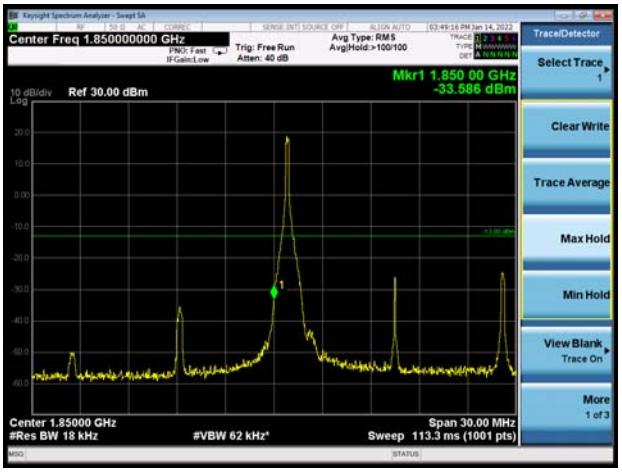


LTE Band 2 10MHz 16QAM 100%RB CH-Low

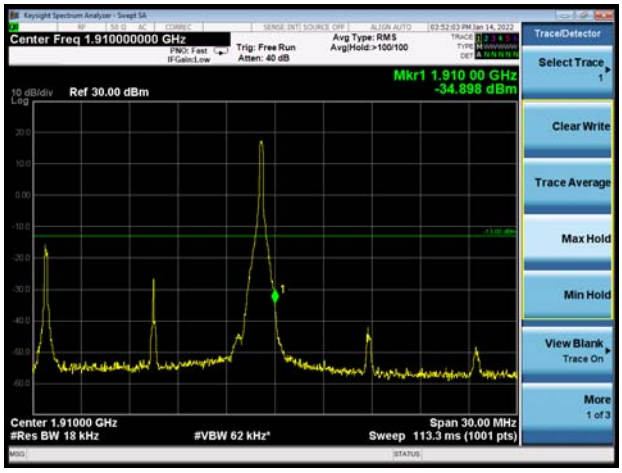


LTE Band 2 10MHz 16QAM 100%RB CH-High

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

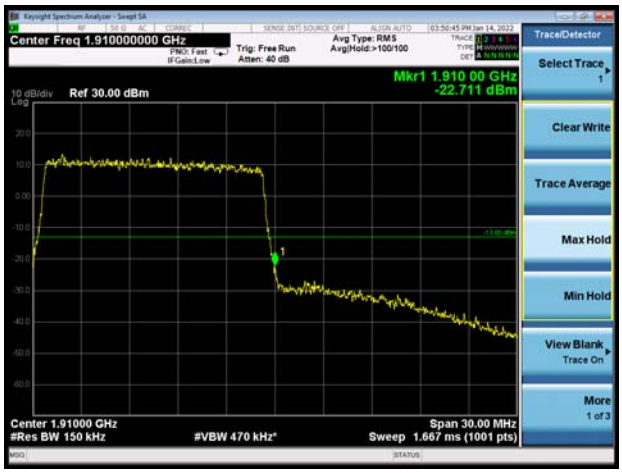


LTE Band 2 15MHz 16QAM 1RB CH-High

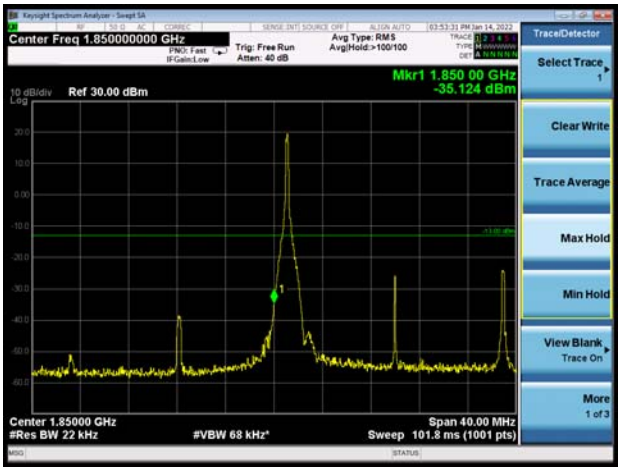


LTE Band 2 15MHz 16QAM 100%RB CH-Low

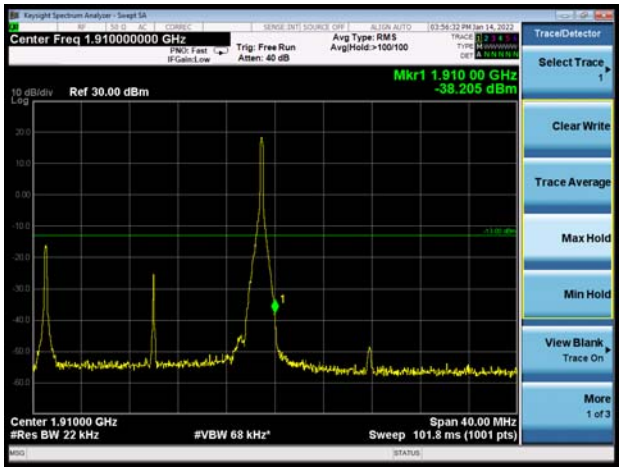
LTE Band 2 15MHz 16QAM 100%RB CH-High



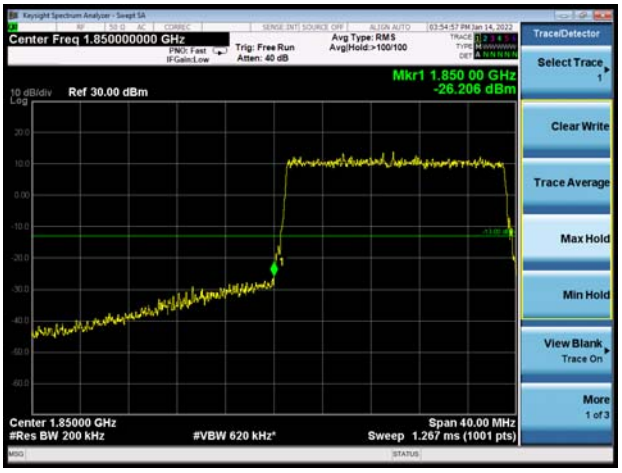
LTE Band 2 20MHz 16QAM 1RB CH-Low



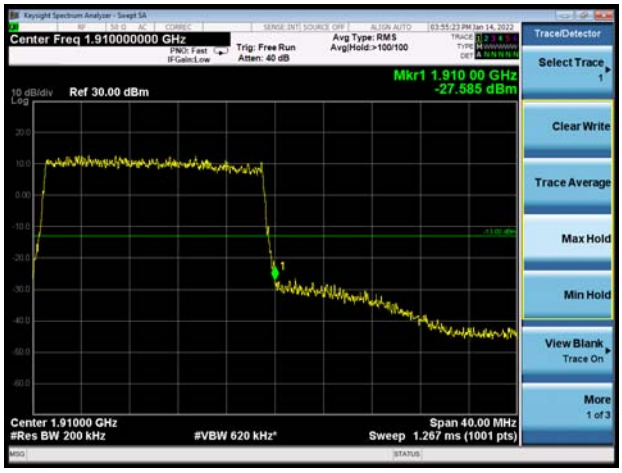
LTE Band 2 20MHz 16QAM 1RB CH-High



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



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



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

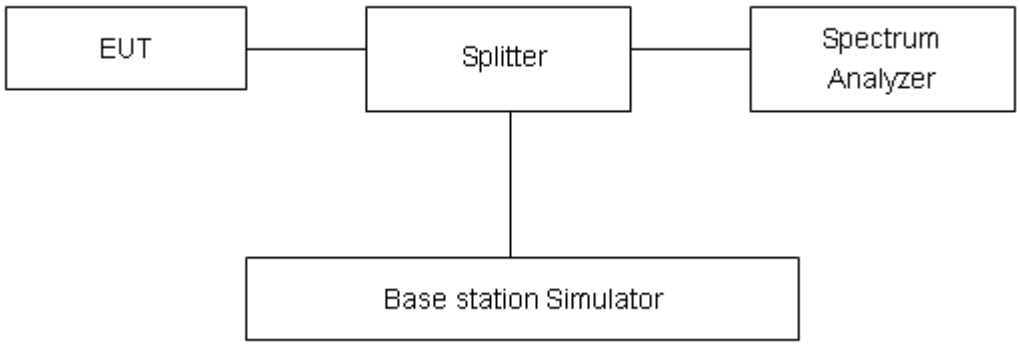
Ambient condition

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 peakto-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	30.85	28.02	2.83	≤13	PASS
	661	1880	31.39	28.60	2.79	≤13	PASS
	810	1909.8	29.58	26.59	2.99	≤13	PASS
GPRS 1900 (GMSK)	512	1850.2	30.84	28.04	2.80	≤13	PASS
	661	1880	31.41	28.62	2.79	≤13	PASS
	810	1909.8	29.61	26.58	3.03	≤13	PASS
EGPRS 1900 (8PSK)	512	1850.2	29.51	23.61	5.90	≤13	PASS
	661	1880	29.82	23.92	5.90	≤13	PASS
	810	1909.8	27.94	21.66	6.28	≤13	PASS
WCDMA Band II (RMC)	9262	1852.4	27.10	24.24	2.86	≤13	PASS
	9400	1880	27.51	24.60	2.91	≤13	PASS
	9538	1907.6	25.82	23.05	2.77	≤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	27.53	22.35	5.18	≤13	PASS
		18900	1880.0	27.87	22.56	5.31	≤13	PASS
		19193	1909.3	27.14	22.48	4.66	≤13	PASS
	3	18615	1851.5	27.58	22.46	5.12	≤13	PASS
		18900	1880	27.93	22.68	5.25	≤13	PASS
		19185	1908.5	27.44	22.60	4.84	≤13	PASS
	5	18625	1852.5	27.69	22.51	5.18	≤13	PASS
		18900	1880	28.04	22.74	5.30	≤13	PASS
		19175	1907.5	27.59	22.62	4.97	≤13	PASS
	10	18650	1855	27.80	22.59	5.21	≤13	PASS
		18900	1880	28.03	22.73	5.30	≤13	PASS
		19150	1905	27.74	22.64	5.10	≤13	PASS
	15	18675	1857.5	28.22	22.67	5.55	≤13	PASS
		18900	1880	28.30	22.66	5.64	≤13	PASS
		19125	1902.5	28.03	22.51	5.52	≤13	PASS
	20	18700	1860	28.18	22.85	5.33	≤13	PASS
		18900	1880	28.26	22.85	5.41	≤13	PASS
		19100	1900	27.98	22.67	5.31	≤13	PASS
16QAM	1.4	18607	1850.7	27.45	21.45	6.00	≤13	PASS
		18900	1880.0	27.86	21.70	6.16	≤13	PASS
		19193	1909.3	27.11	21.50	5.61	≤13	PASS
	3	18615	1851.5	27.52	21.48	6.04	≤13	PASS
		18900	1880	27.91	21.73	6.18	≤13	PASS
		19185	1908.5	27.35	21.59	5.76	≤13	PASS
	5	18625	1852.5	27.53	21.54	5.99	≤13	PASS
		18900	1880	27.86	21.74	6.12	≤13	PASS
		19175	1907.5	27.51	21.61	5.90	≤13	PASS
	10	18650	1855	27.60	21.56	6.04	≤13	PASS
		18900	1880	27.93	21.76	6.17	≤13	PASS
		19150	1905	27.62	21.65	5.97	≤13	PASS
	15	18675	1857.5	27.86	21.69	6.17	≤13	PASS
		18900	1880	27.95	21.69	6.26	≤13	PASS
		19125	1902.5	27.64	21.48	6.16	≤13	PASS
	20	18700	1860	27.99	21.86	6.13	≤13	PASS
		18900	1880	28.06	21.84	6.22	≤13	PASS
		19100	1900	27.83	21.70	6.13	≤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 0°C to +35°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 0°C to +35°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

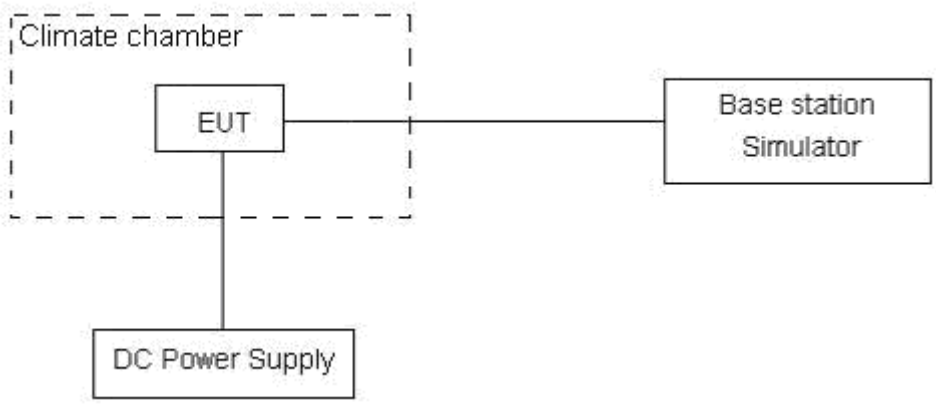
Frequency Stability (Voltage Variation)

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 3.60 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= 0.01ppm.

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	9.95	5.21	0.00529	0.00277	PASS
Extreme（35℃）		2.85	2.25	0.00152	0.00120	PASS
Extreme（30℃）		13.41	16.18	0.00713	0.00861	PASS
Extreme（20℃）		1.15	14.74	0.00061	0.00784	PASS
Extreme（10℃）		4.19	12.60	0.00223	0.00670	PASS
Extreme（0℃）		10.25	12.57	0.00545	0.00669	PASS
25℃	LV	5.30	6.54	0.00282	0.00348	PASS
	HV	15.19	14.54	0.00808	0.00774	PASS

WCDMA Band II						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability （ppm）	Frequency Stability （ppm）	Verdict
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal（25℃）	Normal	17.78	16.46	0.00946	0.00876	PASS
Extreme（35℃）		8.06	13.75	0.00429	0.00731	PASS
Extreme（30℃）		5.96	17.48	0.00317	0.00930	PASS
Extreme（20℃）		2.50	14.72	0.00133	0.00783	PASS
Extreme（10℃）		11.05	9.14	0.00588	0.00486	PASS
Extreme（0℃）		4.46	7.03	0.00237	0.00374	PASS
25℃	LV	15.60	12.92	0.00830	0.00687	PASS
	HV	6.35	4.71	0.00338	0.00251	PASS

LTE Band 2						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability （ppm）	Frequency Stability （ppm）	Verdict
BANDWIDTH	1.4MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal（25℃）	Normal	3.65	6.06	0.00194	0.00322	PASS
Extreme（35℃）		12.66	12.15	0.00673	0.00646	PASS
Extreme（30℃）		17.33	12.45	0.00922	0.00662	PASS
Extreme（20℃）		11.44	10.66	0.00609	0.00567	PASS
Extreme（10℃）		15.19	10.81	0.00808	0.00575	PASS
Extreme（0℃）		2.35	12.14	0.00125	0.00646	PASS

25℃	LV	12.64	9.21	0.00672	0.00490	PASS
	HV	15.35	17.11	0.00816	0.00910	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability （ppm）	Frequency Stability （ppm）	Verdict
BANDWIDTH	3MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal（25℃）	Normal	14.06	1.27	0.00748	0.00067	PASS
Extreme（35℃）		4.61	16.30	0.00245	0.00867	PASS
Extreme（30℃）		15.57	11.05	0.00828	0.00588	PASS
Extreme（20℃）		3.85	15.39	0.00205	0.00819	PASS
Extreme（10℃）		12.94	3.42	0.00689	0.00182	PASS
Extreme（0℃）		2.05	17.71	0.00109	0.00942	PASS
25℃	LV	4.64	12.28	0.00247	0.00653	PASS
	HV	5.17	15.91	0.00275	0.00847	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability （ppm）	Frequency Stability （ppm）	Verdict
BANDWIDTH	5MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal（25℃）	Normal	14.36	13.29	0.00764	0.00707	PASS
Extreme（35℃）		2.71	4.76	0.00144	0.00253	PASS
Extreme（30℃）		1.36	13.61	0.00072	0.00724	PASS
Extreme（20℃）		3.96	10.62	0.00210	0.00565	PASS
Extreme（10℃）		1.93	11.69	0.00103	0.00622	PASS
Extreme（0℃）		7.81	16.91	0.00416	0.00900	PASS
25℃	LV	6.05	15.49	0.00322	0.00824	PASS
	HV	17.59	13.73	0.00935	0.00730	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability （ppm）	Frequency Stability （ppm）	Verdict
BANDWIDTH	10MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal（25℃）	Normal	12.52	10.54	0.00666	0.00561	PASS
Extreme（35℃）		5.12	15.71	0.00272	0.00835	PASS
Extreme（30℃）		5.64	17.03	0.00300	0.00906	PASS
Extreme（20℃）		16.08	12.37	0.00856	0.00658	PASS
Extreme（10℃）		5.51	3.72	0.00293	0.00198	PASS
Extreme（0℃）		13.80	5.77	0.00734	0.00307	PASS
25℃	LV	17.97	16.63	0.00956	0.00884	PASS
	HV	4.01	8.53	0.00213	0.00454	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability （ppm）	Frequency Stability （ppm）	Verdict
BANDWIDTH	15MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal（25℃）	Normal	6.03	3.99	0.00321	0.00212	PASS

Extreme（35℃）		4.44	1.72	0.00236	0.00091	PASS
Extreme（30℃）		7.56	6.34	0.00402	0.00337	PASS
Extreme（20℃）		2.19	6.14	0.00117	0.00327	PASS
Extreme（10℃）		7.47	6.18	0.00397	0.00329	PASS
Extreme（0℃）		2.83	15.61	0.00150	0.00830	PASS
25℃	LV	17.37	17.98	0.00924	0.00957	PASS
	HV	6.78	5.15	0.00361	0.00274	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability （ppm）	Frequency Stability （ppm）	Verdict
BANDWIDTH	20MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal（25℃）	Normal	1.10	14.42	0.00058	0.00767	PASS
Extreme（35℃）		14.57	9.41	0.00775	0.00501	PASS
Extreme（30℃）		2.04	3.60	0.00109	0.00191	PASS
Extreme（20℃）		5.12	7.67	0.00272	0.00408	PASS
Extreme（10℃）		11.29	12.39	0.00601	0.00659	PASS
Extreme（0℃）		14.56	10.89	0.00774	0.00579	PASS
25℃	LV	14.49	15.11	0.00771	0.00804	PASS
	HV	10.52	13.80	0.00560	0.00734	PASS

5.6. Spurious Emissions at Antenna Terminals

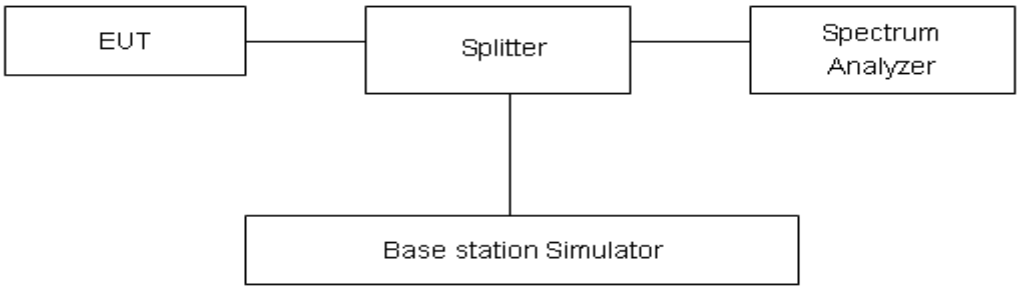
Ambient condition

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 log10 (P) dB.”

Limit	-13 dBm

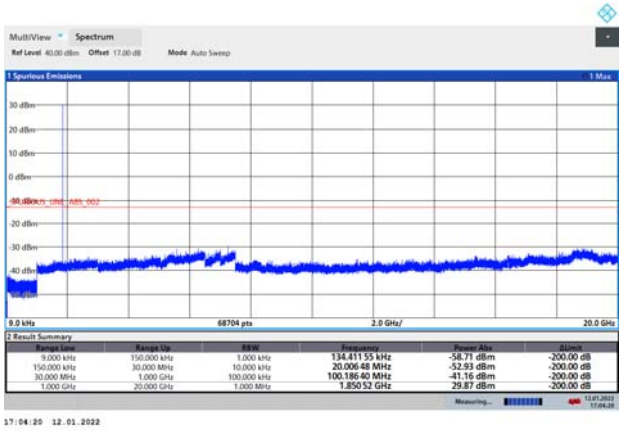
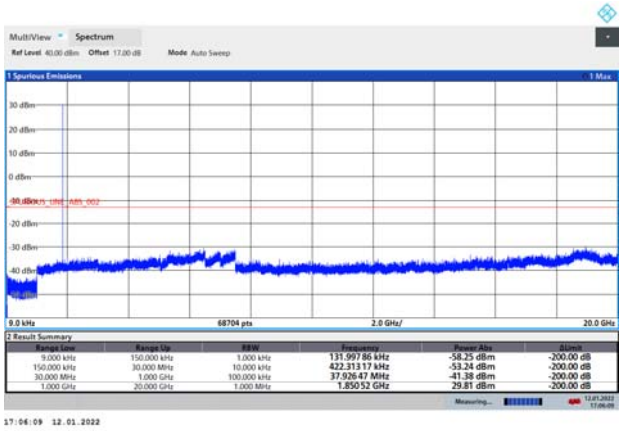
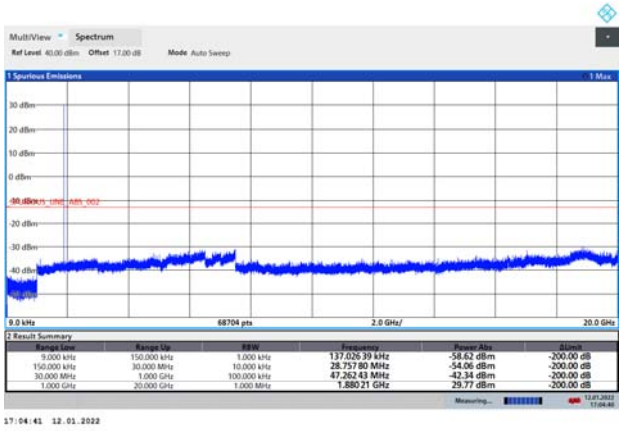
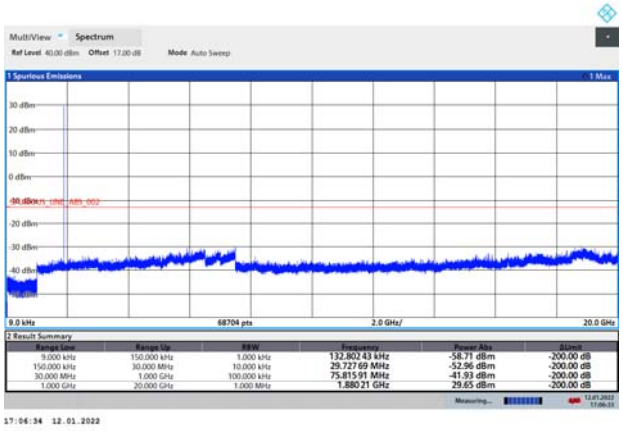
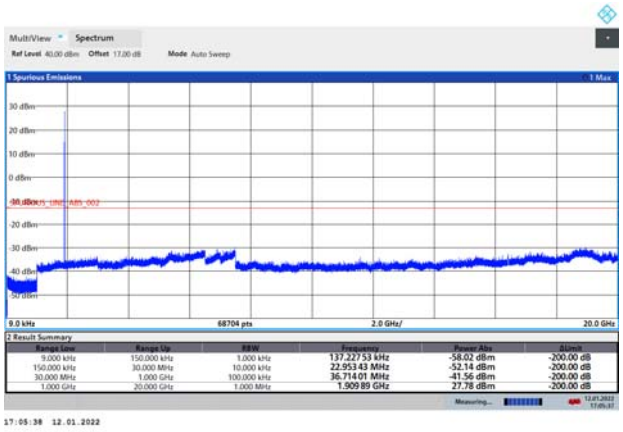
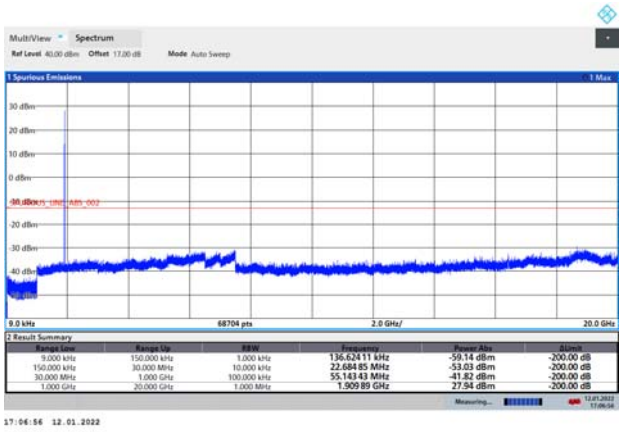
Measurement Uncertainty

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

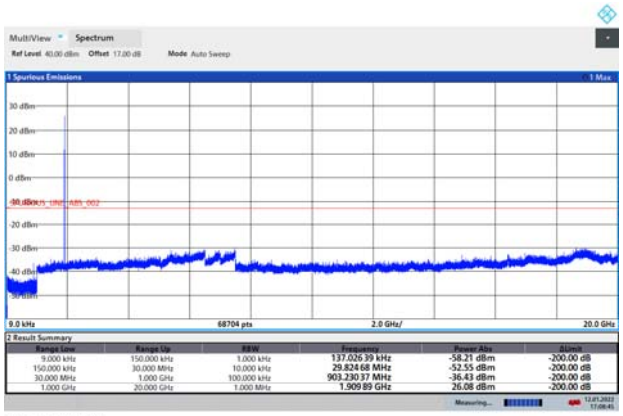
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

Test Result

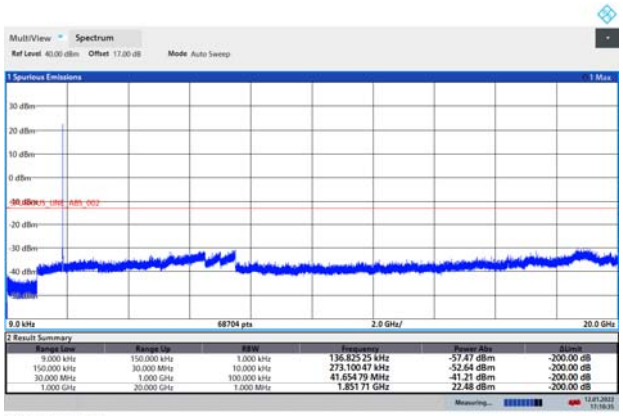
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.
The signal beyond the limit is carrier.

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
	

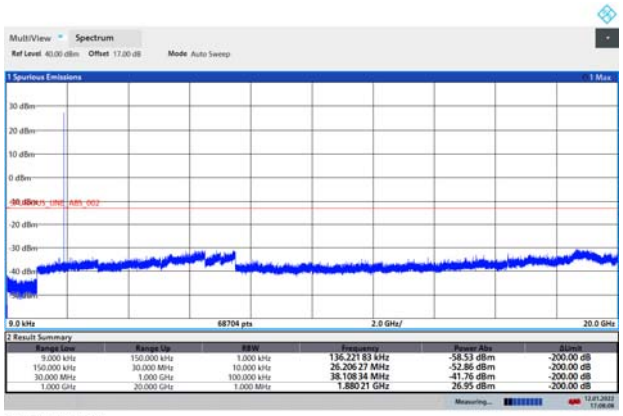
EGPRS 1900 CH-Low 9kHz ~ 20GHz



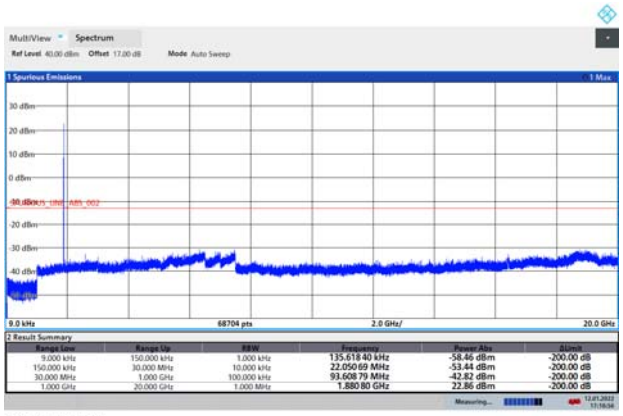
WCDMA BAND II CH-Low 9kHz ~ 20GHz



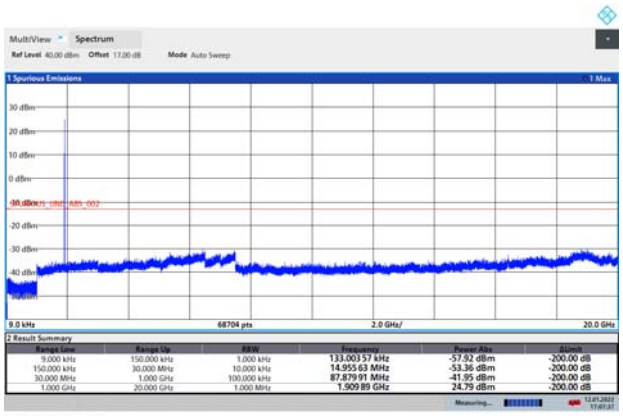
EGPRS 1900 CH- Middle 9kHz ~ 20GHz



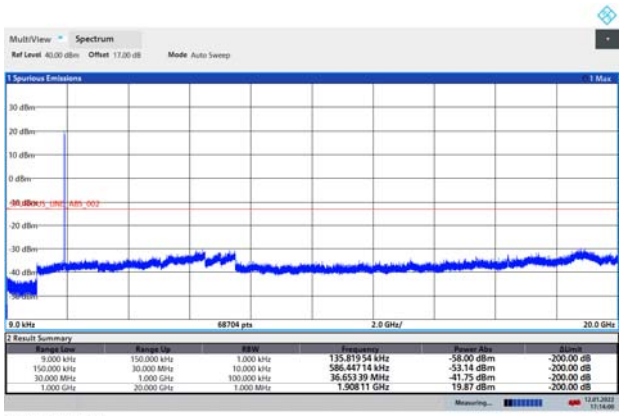
WCDMA BAND II CH- Middle 9kHz ~ 20GHz



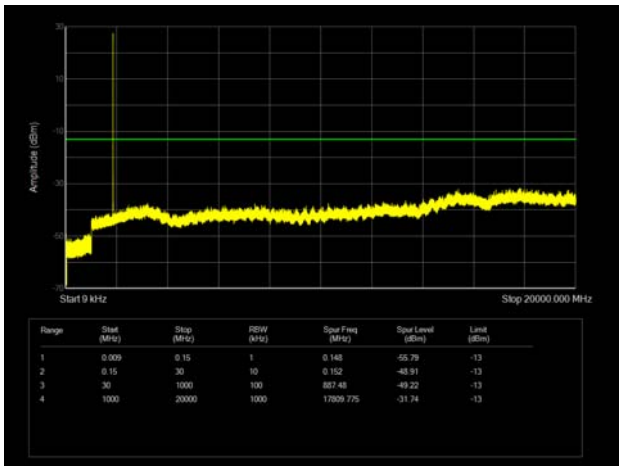
EGPRS 1900 CH-High 9kHz ~ 20GHz



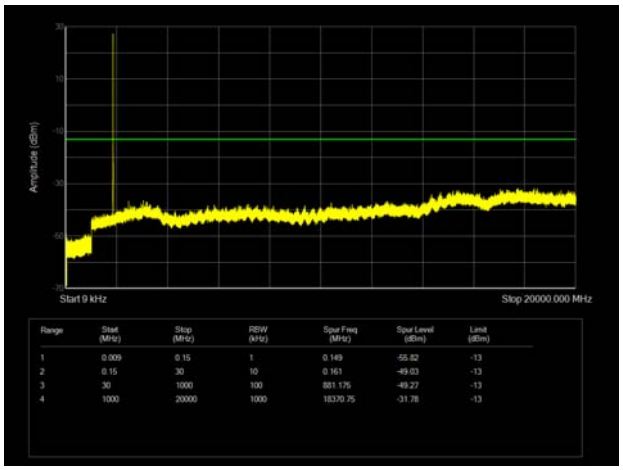
WCDMA BAND II CH-High 9kHz ~ 20GHz



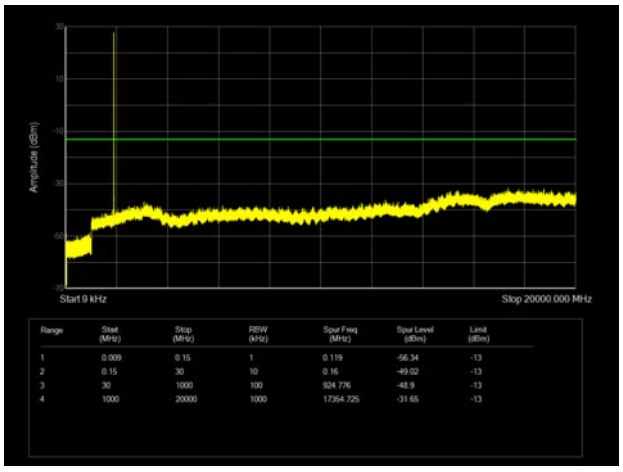
LTE Band 2 1.4MHz CH-Low 9kHz~20GHz



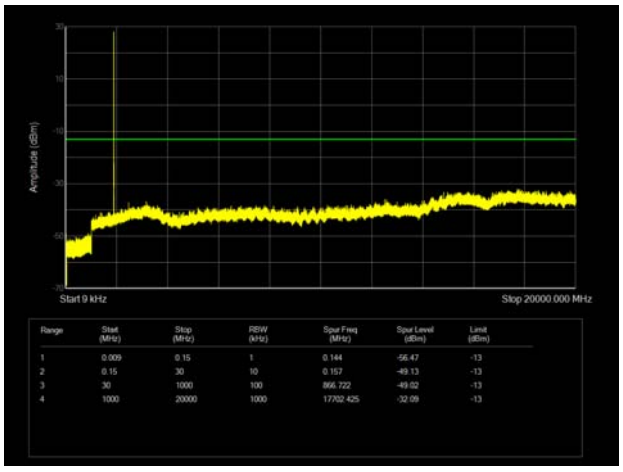
LTE Band 2 3MHz CH-Low 9kHz~20GHz



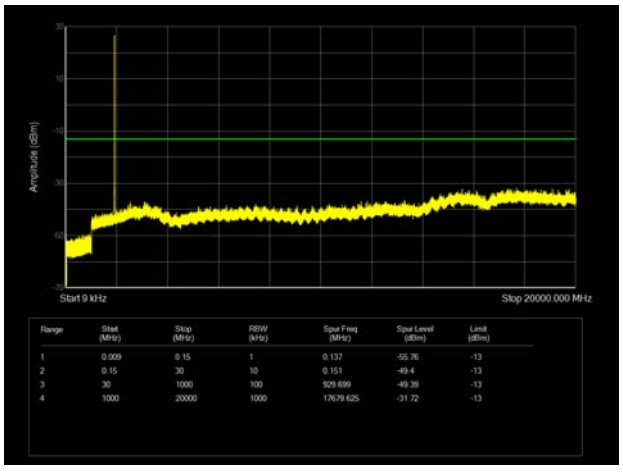
LTE Band 2 1.4MHz CH-Middle 9kHz~20GHz



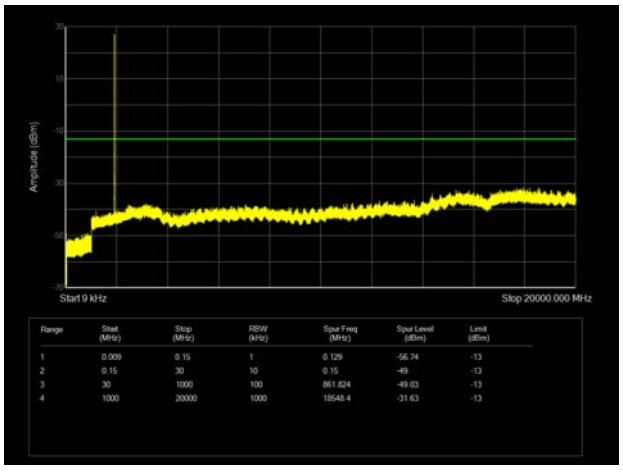
LTE Band 2 3MHz CH-Middle 9kHz~20GHz



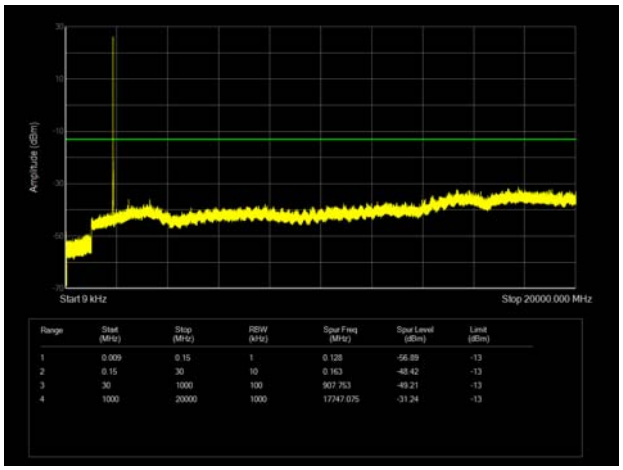
LTE Band 2 1.4MHz CH-High 9kHz~20GHz



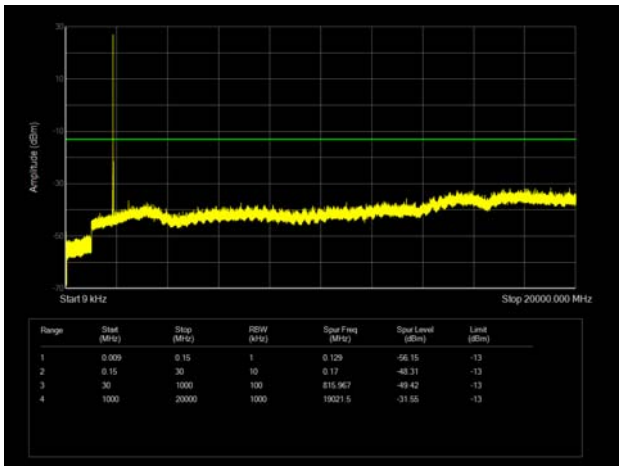
LTE Band 2 3MHz CH-High 9kHz~20GHz



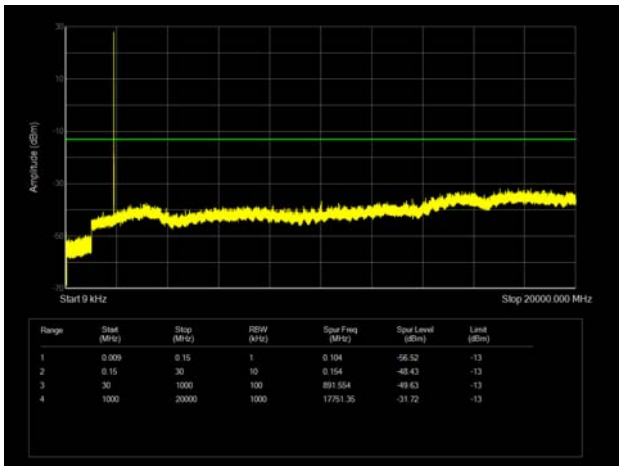
LTE Band 2 5MHz CH-Low 9kHz~20GHz



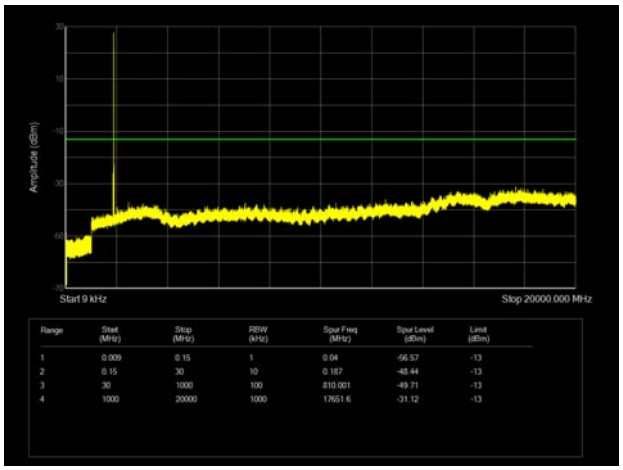
LTE Band 2 10MHz CH-Low 9kHz~20GHz



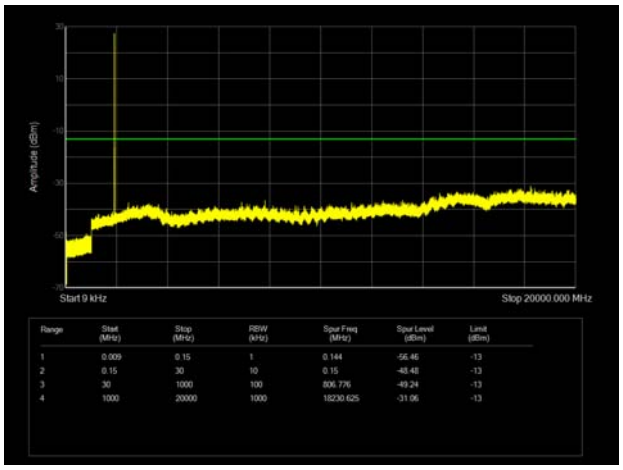
LTE Band 2 5MHz CH-Middle 9kHz~20GHz



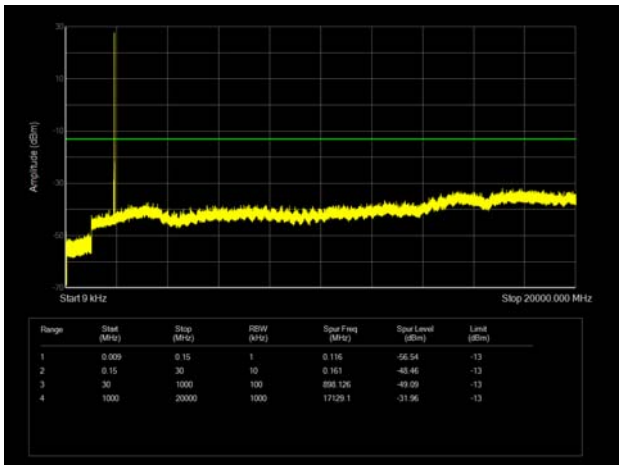
LTE Band 2 10MHz CH-Middle 9kHz~20GHz



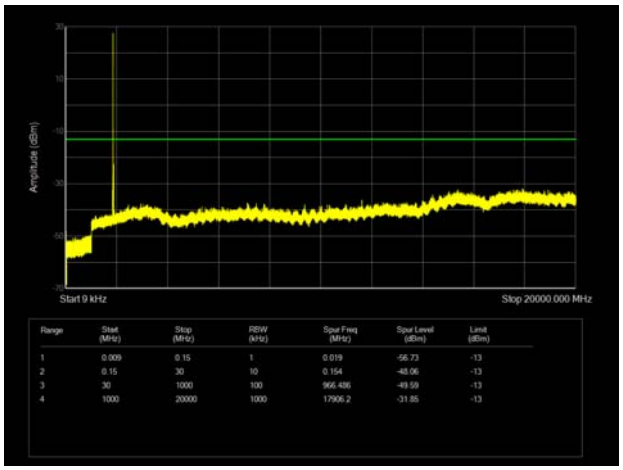
LTE Band 2 5MHz CH-High 9kHz~20GHz



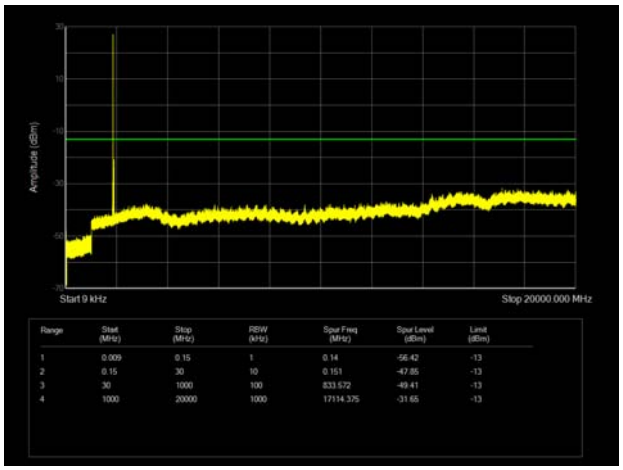
LTE Band 2 10MHz CH-High 9kHz~20GHz



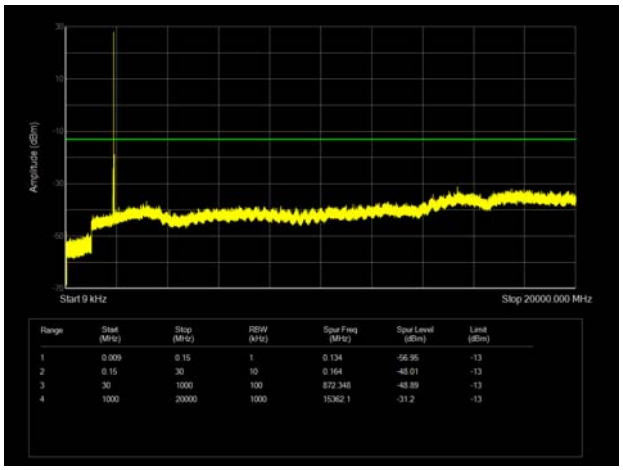
LTE Band 2 15MHz CH-Low 9kHz~20GHz



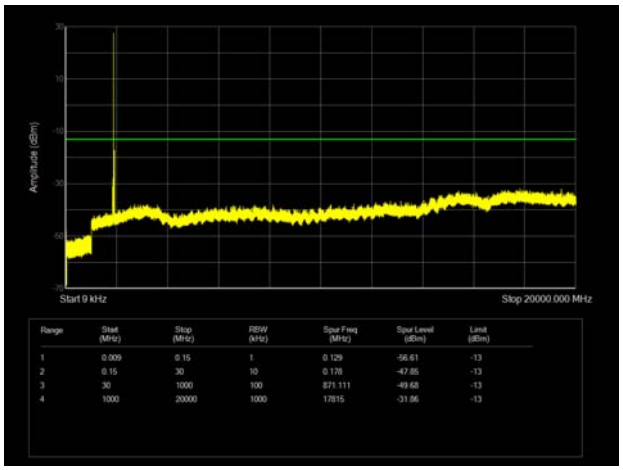
LTE Band 2 20MHz CH-Low 9kHz~20GHz



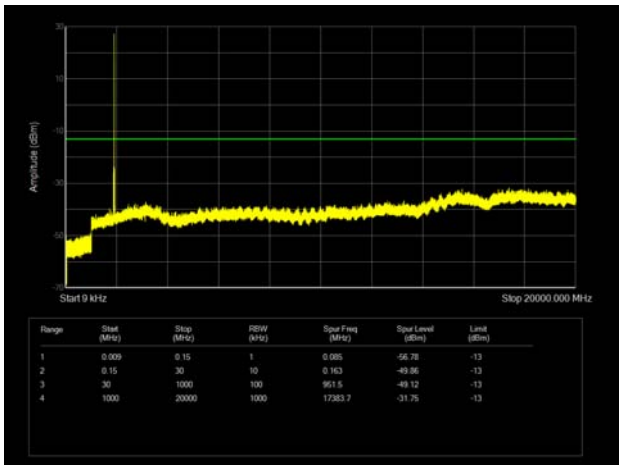
LTE Band 2 15MHz CH-Middle 9kHz~20GHz



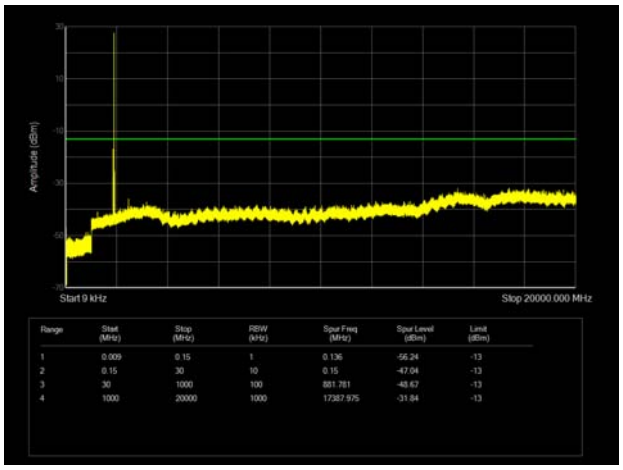
LTE Band 2 20MHz CH-Middle 9kHz~20GHz



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

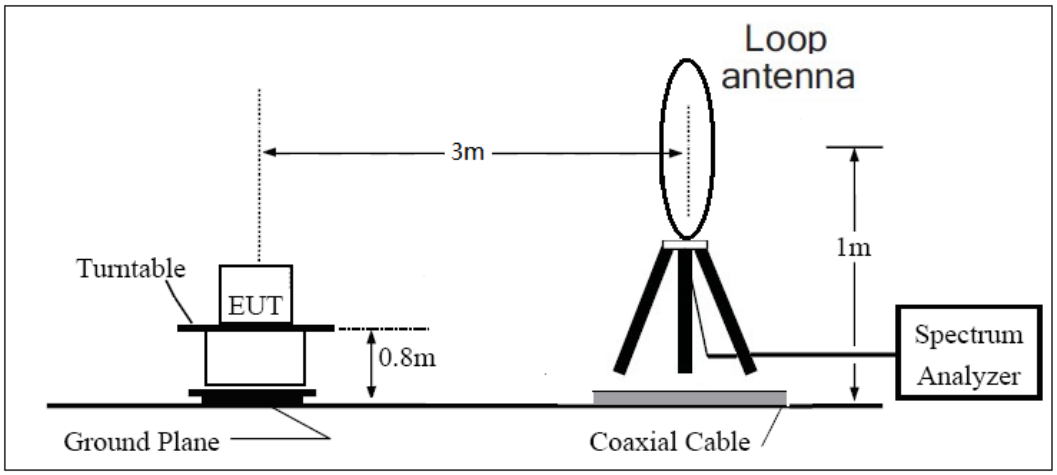
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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:
Power(EIRP)=PMea- PAg - Pcl + Ga
The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + 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.

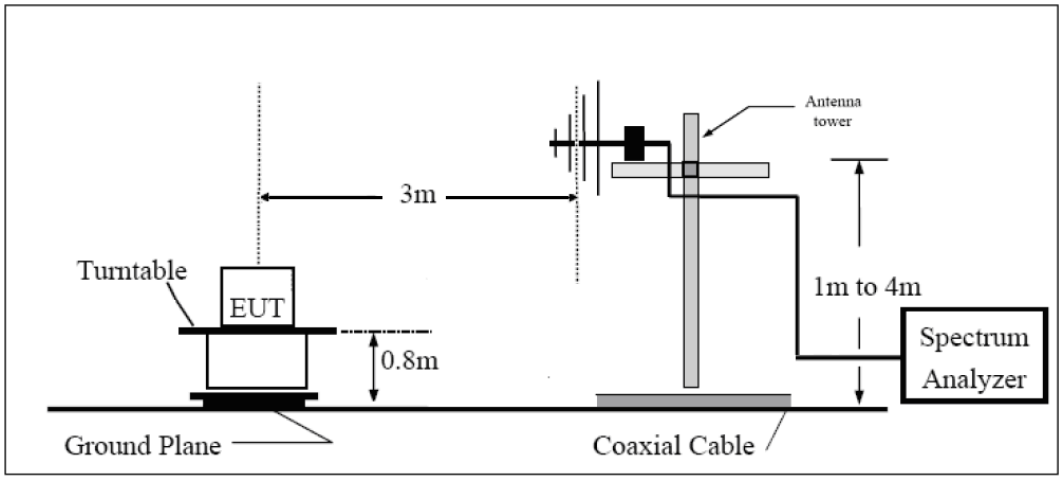
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

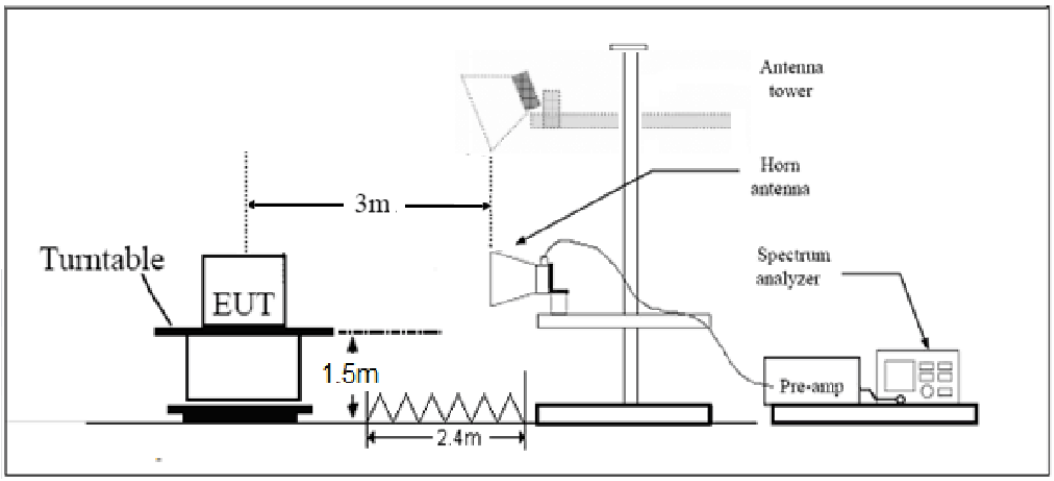
9KHz ~ 30MHz



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 log10 (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.

Main 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	-58.03	2.60	12.50	Horizontal	-48.13	-13.00	35.13	0
3	5640.00	-56.90	3.30	12.50	Horizontal	-47.70	-13.00	34.70	180
4	7520.00	-56.41	4.20	12.20	Horizontal	-48.41	-13.00	35.41	225
5	9400.00	-52.04	4.30	11.10	Horizontal	-45.24	-13.00	32.24	180
6	11280.00	-50.11	5.90	11.90	Horizontal	-44.11	-13.00	31.11	0
7	13160.00	-51.86	5.70	14.00	Horizontal	-43.56	-13.00	30.56	90
8	15040.00	-46.13	5.80	13.10	Horizontal	-38.83	-13.00	25.83	0
9	16920.00	-48.78	6.10	14.60	Horizontal	-40.28	-13.00	27.28	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	-65.17	2.60	12.50	Horizontal	-55.27	-13.00	42.27	135
3	5640.00	-62.41	3.30	12.50	Horizontal	-53.21	-13.00	40.21	0
4	7520.00	-55.48	4.20	12.20	Horizontal	-47.48	-13.00	34.48	225
5	9400.00	-53.02	4.30	11.10	Horizontal	-46.22	-13.00	33.22	180
6	11280.00	-50.09	5.90	11.90	Horizontal	-44.09	-13.00	31.09	135
7	13160.00	-51.98	5.70	14.00	Horizontal	-43.68	-13.00	30.68	180
8	15040.00	-46.69	5.80	13.10	Horizontal	-39.39	-13.00	26.39	315
9	16920.00	-48.59	6.10	14.60	Horizontal	-40.09	-13.00	27.09	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 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	-63.91	2.60	12.50	Horizontal	-54.01	-13.00	41.01	225
3	5638.88	-60.92	3.30	12.50	Horizontal	-51.72	-13.00	38.72	45
4	7520.00	-57.87	4.20	12.20	Horizontal	-49.87	-13.00	36.87	0
5	9400.00	-53.15	4.30	11.10	Horizontal	-46.35	-13.00	33.35	90
6	11280.00	-50.67	5.90	11.90	Horizontal	-44.67	-13.00	31.67	180
7	13160.00	-52.87	5.70	14.00	Horizontal	-44.57	-13.00	31.57	315
8	15040.00	-47.40	5.80	13.10	Horizontal	-40.10	-13.00	27.10	180
9	16920.00	-49.93	6.10	14.60	Horizontal	-41.43	-13.00	28.43	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 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	-62.63	2.60	12.50	Horizontal	-52.73	-13.00	39.73	135
3	5633.63	-59.98	3.30	12.50	Horizontal	-50.78	-13.00	37.78	90
4	7520.00	-57.58	4.20	12.20	Horizontal	-49.58	-13.00	36.58	270
5	9400.00	-53.99	4.30	11.10	Horizontal	-47.19	-13.00	34.19	0
6	11280.00	-50.04	5.90	11.90	Horizontal	-44.04	-13.00	31.04	225
7	13160.00	-50.69	5.70	14.00	Horizontal	-42.39	-13.00	29.39	180
8	15040.00	-46.98	5.80	13.10	Horizontal	-39.68	-13.00	26.68	135
9	16920.00	-50.16	6.10	14.60	Horizontal	-41.66	-13.00	28.66	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	3742.13	-62.88	2.60	12.50	Horizontal	-52.98	-13.00	39.98	225
3	5613.38	-60.64	3.30	12.50	Horizontal	-51.44	-13.00	38.44	315
4	7484.63	-57.69	4.20	12.20	Horizontal	-49.69	-13.00	36.69	135
5	9400.00	-54.36	4.30	11.10	Horizontal	-47.56	-13.00	34.56	0
6	11280.00	-50.08	5.90	11.90	Horizontal	-44.08	-13.00	31.08	225
7	13160.00	-52.36	5.70	14.00	Horizontal	-44.06	-13.00	31.06	270
8	15040.00	-46.48	5.80	13.10	Horizontal	-39.18	-13.00	26.18	180
9	16920.00	-49.71	6.10	14.60	Horizontal	-41.21	-13.00	28.21	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.									

Second 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	-54.83	2.60	12.50	Horizontal	-44.93	-13.00	31.93	45
3	5640.00	-58.74	3.30	12.50	Horizontal	-49.54	-13.00	36.54	315
4	7520.00	-57.64	4.20	12.20	Horizontal	-49.64	-13.00	36.64	225
5	9400.00	-54.81	4.30	11.10	Horizontal	-48.01	-13.00	35.01	270
6	11280.00	-51.83	5.90	11.90	Horizontal	-45.83	-13.00	32.83	180
7	13160.00	-52.52	5.70	14.00	Horizontal	-44.22	-13.00	31.22	225
8	15040.00	-47.43	5.80	13.10	Horizontal	-40.13	-13.00	27.13	0
9	16920.00	-50.11	6.10	14.60	Horizontal	-41.61	-13.00	28.61	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	-65.20	2.60	12.50	Horizontal	-55.30	-13.00	42.30	180
3	5640.00	-61.52	3.30	12.50	Horizontal	-52.32	-13.00	39.32	135
4	7520.00	-58.65	4.20	12.20	Horizontal	-50.65	-13.00	37.65	90
5	9400.00	-53.07	4.30	11.10	Horizontal	-46.27	-13.00	33.27	45
6	11280.00	-51.26	5.90	11.90	Horizontal	-45.26	-13.00	32.26	315
7	13160.00	-52.55	5.70	14.00	Horizontal	-44.25	-13.00	31.25	90
8	15040.00	-48.07	5.80	13.10	Horizontal	-40.77	-13.00	27.77	45
9	16920.00	-50.41	6.10	14.60	Horizontal	-41.91	-13.00	28.91	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	-66.04	2.60	12.50	Vertical	-56.14	-13.0	43.14	45
3	5638.88	-61.89	3.30	12.50	Vertical	-52.69	-13.0	39.69	135
4	7520.00	-58.13	4.20	12.20	Vertical	-50.13	-13.0	37.13	90
5	9400.00	-54.49	4.30	11.10	Vertical	-47.69	-13.0	34.69	180
6	11280.00	-48.35	5.90	11.90	Vertical	-42.35	-13.0	29.35	45
7	13160.00	-51.86	5.70	14.00	Vertical	-43.56	-13.0	30.56	180
8	15040.00	-50.55	5.80	13.10	Vertical	-43.25	-13.0	30.25	315
9	16920.00	-50.02	6.10	14.60	Vertical	-41.52	-13.0	28.52	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 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	3755.60	-66.04	2.60	12.50	Vertical	-56.14	-13.0	43.14	90
3	5633.60	-61.69	3.30	12.50	Vertical	-52.49	-13.0	39.49	135
4	7520.00	-58.13	4.20	12.20	Vertical	-50.13	-13.0	37.13	45
5	9400.00	-54.76	4.30	11.10	Vertical	-47.96	-13.0	34.96	315
6	11280.00	-50.38	5.90	11.90	Vertical	-44.38	-13.0	31.38	180
7	13160.00	-51.76	5.70	14.00	Vertical	-43.46	-13.0	30.46	135
8	15040.00	-50.78	5.80	13.10	Vertical	-43.48	-13.0	30.48	90
9	16920.00	-49.52	6.10	14.60	Vertical	-41.02	-13.0	28.02	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 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	46.43	2.60	12.50	Vertical	56.33	13.00	43.33	45.00
3	5613.38	43.12	3.30	12.50	Vertical	52.32	13.00	39.32	270.00
4	7484.63	42.33	4.20	12.20	Vertical	50.33	13.00	37.33	315.00
5	9400.00	41.16	4.30	11.10	Vertical	47.96	13.00	34.96	45.00
6	11280.00	38.38	5.90	11.90	Vertical	44.38	13.00	31.38	90.00
7	13160.00	35.16	5.70	14.00	Vertical	43.46	13.00	30.46	180.00
8	15040.00	35.95	5.80	13.10	Vertical	43.25	13.00	30.25	135.00
9	16920.00	32.86	6.10	14.60	Vertical	41.36	13.00	28.36	45.00
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	CMW500	113645	2021-05-15	2022-05-14
Climate Chamber	Weiss	VT4002	582261194500 10	2021-05-15	2022-05-14
Spectrum Analyzer	Keysight	N9020A	MY52330084	2021-05-15	2022-05-14
Universal Radio Communication Tester	Key sight	E5515C	GB44400275	2021-05-15	2022-05-14
Signal Analyzer	R&S	FSV3030	101411	2021-12-12	2022-12-12
Signal Analyzer	R&S	FSV30	100815	2021-12-12	2022-12-11
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	01439	2021-06-30	2024-06-29
Horn Antenna	Schwarzbeck	BBHA 9120D	01799	2019-09-21	2022-09-20
Horn Antenna	ETS-Lindgren	3160-09	00102643	2020-08-11	2023-08-10
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.