RF TEST REPORT

Applicant	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25T1711
Product	POS system
Brand	SUNMI
Model	T1711
Report No.	R1911A0661-R2V1
Issue Date	December 31, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2018)/ FCC CFR 47 Part 24E (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Peng Tao *Approved by: Kai Xu*

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Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF power output and Effective 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
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.			
Date of Testing: November 13, 2019~ December 2, 2019			

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 electromagnetic emissions measurements.

1.3. Testing Location

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

2.1. Applicant and Manufacturer Information

Applicant	Shanghai Sunmi Technology Co.,Ltd.
Applicant address	Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Manufacturer	Shanghai Sunmi Technology Co.,Ltd.
Manufacturer address	Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China

2.2. General information

EUT Description			
Model	T1711		
SN	DM03D9940005		
Hardware Version	D2MMB60C		
Software Version	V1.0.10		
Power Supply	AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	0.87dBi		
Test Mode(s)	GSM1900; WCDMA Band II; LTE Band 2;		
Test Modulation	(GSM)GMSK,8PSK; (WCDMA) BPSK, QPSK; (LTE)QPSK,16QAM		
GPRS Multislot Class	33		
EGPRS Multislot Class	33		
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
LTE Category	4		
Maximum E.I.R.P	GSM 1900:	28.88dBm	
	WCDMA Band II:	22.15dBm	
	LTE Band 2:	22.24dBm	
Rated Power Supply Voltage	24V		
Extreme Voltage	Minimum: 22.8V Maximum: 25.2V		
Extreme Temperature	Lowest: -20°C Highest: +60°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			

Adapter	Manufacturer: Jiangsu Chenyang Electron Co.,Ltd. Model: CYSE65-240250
Note: 1. The information of the EUT is declared by the manufacturer.	

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 (2018)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2018)

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, vertical 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	GPRS EGPRS	RMC HSDPA/HSUPA DC-HSDPA
Effective Isotropic Radiated power	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Occupied Bandwidth	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Band Edge Compliance	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Peak-to-Average Power Ratio	GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Frequency Stability	GPRS(1Tx slot)	RMC
Spurious Emissions at Antenna Terminals	GPRS(1Tx slot)	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	O	O	O	O	O	O	O	O	O	O	O	O	O	O
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	-
Conducted Spurious Emissions	O	O	O	O	O	O	O	-	O	-	-	O	O	O
Radiates Spurious Emission	O	-	O	-	-	O	O	-	O	-	-	-	O	-
Note	1. The mark “O” means that this configuration is chosen for testing. 2. The mark “-” means that this configuration is not testing.													

5. Test Case Results

5.1. RF Power Output and Effective Radiated Power

Ambient condition

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

Methods of Measurement

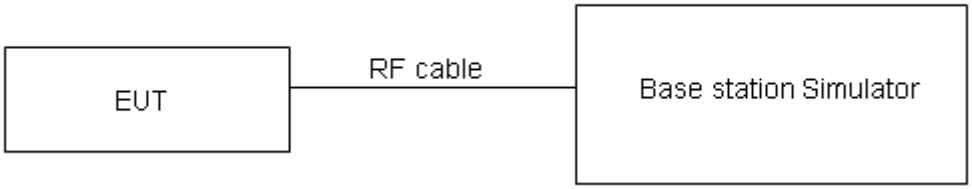
During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).

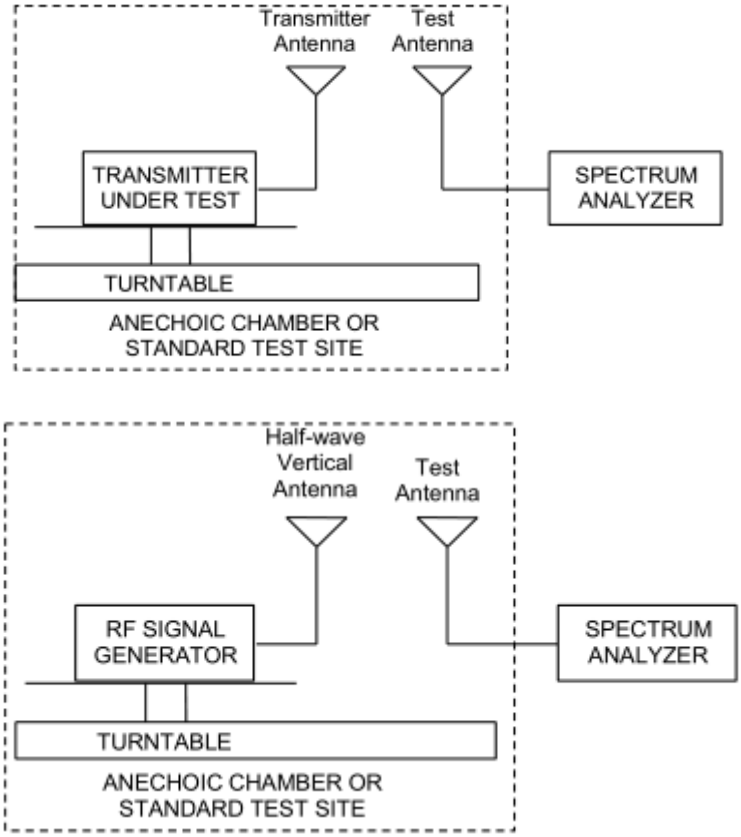
a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.LOSS = Generator Output Power (dBm) – Analyzer reading (dBm)
e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:ERP (dBm) = LVL (dBm) + LOSS (dB)
f) The maximum ERP is the maximum value determined in the preceding step.
g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. 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.)

The RB allocation refers to section 5.1, using the maximum output power configuration.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.



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		Conducted Power (dBm)			EIRP (dBm)		
		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)
GPRS/EGPRS (GMSK)	1TXslot	27.95	28.01	27.65	28.82	28.88	28.52
	2TXslots	27.88	27.95	27.61	28.75	28.82	28.48
	3TXslots	27.80	27.85	27.52	28.67	28.72	28.39
	4TXslots	27.66	27.74	27.36	28.53	28.61	28.23
EGPRS (8PSK)	1TXslot	25.34	25.56	25.03	26.21	26.43	25.90
	2TXslots	25.12	25.24	24.78	25.99	26.11	25.65
	3TXslots	25.04	25.01	24.71	25.91	25.88	25.58
	4TXslots	25.17	24.98	24.57	26.04	25.85	25.44

WCDMA Band II		Conducted Power (dBm)			EIRP (dBm)		
		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)
RMC		21.22	21.28	21.21	22.09	22.15	22.08
HSDPA	Sub - Test 1	20.68	20.70	20.65	21.55	21.57	21.52
	Sub - Test 2	20.67	20.72	20.62	21.54	21.59	21.49
	Sub - Test 3	20.14	20.22	20.14	21.01	21.09	21.01
	Sub - Test 4	20.15	20.23	20.12	21.02	21.10	20.99
HSUPA	Sub - Test 1	20.64	20.69	20.60	21.51	21.56	21.47
	Sub - Test 2	19.63	19.67	19.59	20.50	20.54	20.46
	Sub - Test 3	20.10	20.15	20.08	20.97	21.02	20.95
	Sub - Test 4	19.56	19.64	19.56	20.43	20.51	20.43
	Sub - Test 5	20.57	20.62	20.54	21.44	21.49	21.41
DC-HSDPA	Sub - Test 1	20.56	20.64	20.55	21.43	21.51	21.42
	Sub - Test 2	20.55	20.63	20.54	21.42	21.50	21.41
	Sub - Test 3	20.13	20.12	20.05	21.00	20.99	20.92
	Sub - Test 4	20.12	20.11	20.04	20.99	20.98	20.91

Band	Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Power (dBm)	EIRP
LTE Band2	1.4	18607	1	#0	QPSK	21.18	22.05
LTE Band2	1.4	18607	1	#Mid	QPSK	21.37	22.24
LTE Band2	1.4	18607	1	#Max	QPSK	21.24	22.11
LTE Band2	1.4	18607	3	#0	QPSK	21.08	21.95
LTE Band2	1.4	18607	3	#Mid	QPSK	20.89	21.76
LTE Band2	1.4	18607	3	#Max	QPSK	20.89	21.76
LTE Band2	1.4	18607	6	#0	QPSK	19.86	20.73
LTE Band2	1.4	18607	1	#0	QAM16	20.10	20.97
LTE Band2	1.4	18607	1	#Mid	QAM16	20.39	21.26
LTE Band2	1.4	18607	1	#Max	QAM16	20.16	21.03
LTE Band2	1.4	18607	3	#0	QAM16	20.08	20.95
LTE Band2	1.4	18607	3	#Mid	QAM16	20.07	20.94
LTE Band2	1.4	18607	3	#Max	QAM16	20.10	20.97
LTE Band2	1.4	18607	6	#0	QAM16	18.75	19.62
LTE Band2	1.4	18900	1	#0	QPSK	20.75	21.62
LTE Band2	1.4	18900	1	#Mid	QPSK	21.00	21.87
LTE Band2	1.4	18900	1	#Max	QPSK	20.82	21.69
LTE Band2	1.4	18900	3	#0	QPSK	20.94	21.81
LTE Band2	1.4	18900	3	#Mid	QPSK	20.93	21.80
LTE Band2	1.4	18900	3	#Max	QPSK	20.92	21.79
LTE Band2	1.4	18900	6	#0	QPSK	19.99	20.86
LTE Band2	1.4	18900	1	#0	QAM16	20.26	21.13
LTE Band2	1.4	18900	1	#Mid	QAM16	20.36	21.23
LTE Band2	1.4	18900	1	#Max	QAM16	20.15	21.02
LTE Band2	1.4	18900	3	#0	QAM16	19.92	20.79
LTE Band2	1.4	18900	3	#Mid	QAM16	19.92	20.79
LTE Band2	1.4	18900	3	#Max	QAM16	19.96	20.83
LTE Band2	1.4	18900	6	#0	QAM16	18.93	19.80
LTE Band2	1.4	19193	1	#0	QPSK	20.76	21.63
LTE Band2	1.4	19193	1	#Mid	QPSK	21.24	22.11
LTE Band2	1.4	19193	1	#Max	QPSK	20.88	21.75
LTE Band2	1.4	19193	3	#0	QPSK	20.90	21.77
LTE Band2	1.4	19193	3	#Mid	QPSK	20.88	21.75
LTE Band2	1.4	19193	3	#Max	QPSK	20.90	21.77
LTE Band2	1.4	19193	6	#0	QPSK	19.99	20.86
LTE Band2	1.4	19193	1	#0	QAM16	19.74	20.61
LTE Band2	1.4	19193	1	#Mid	QAM16	19.89	20.76
LTE Band2	1.4	19193	1	#Max	QAM16	19.78	20.65
LTE Band2	1.4	19193	3	#0	QAM16	19.74	20.61
LTE Band2	1.4	19193	3	#Mid	QAM16	19.73	20.60

LTE Band2	1.4	19193	3	#Max	QAM16	19.76	20.63
LTE Band2	1.4	19193	6	#0	QAM16	18.89	19.76
LTE Band2	3	18615	1	#0	QPSK	20.80	21.67
LTE Band2	3	18615	1	#Mid	QPSK	20.54	21.41
LTE Band2	3	18615	1	#Max	QPSK	20.64	21.51
LTE Band2	3	18615	8	#0	QPSK	19.69	20.56
LTE Band2	3	18615	8	#Mid	QPSK	19.74	20.61
LTE Band2	3	18615	8	#Max	QPSK	19.82	20.69
LTE Band2	3	18615	15	#0	QPSK	19.77	20.64
LTE Band2	3	18615	1	#0	QAM16	19.75	20.62
LTE Band2	3	18615	1	#Mid	QAM16	19.68	20.55
LTE Band2	3	18615	1	#Max	QAM16	19.67	20.54
LTE Band2	3	18615	8	#0	QAM16	18.54	19.41
LTE Band2	3	18615	8	#Mid	QAM16	18.68	19.55
LTE Band2	3	18615	8	#Max	QAM16	18.83	19.70
LTE Band2	3	18615	15	#0	QAM16	18.70	19.57
LTE Band2	3	18900	1	#0	QPSK	20.83	21.70
LTE Band2	3	18900	1	#Mid	QPSK	20.84	21.71
LTE Band2	3	18900	1	#Max	QPSK	20.76	21.63
LTE Band2	3	18900	8	#0	QPSK	19.71	20.58
LTE Band2	3	18900	8	#Mid	QPSK	19.71	20.58
LTE Band2	3	18900	8	#Max	QPSK	19.79	20.66
LTE Band2	3	18900	15	#0	QPSK	19.73	20.60
LTE Band2	3	18900	1	#0	QAM16	20.01	20.88
LTE Band2	3	18900	1	#Mid	QAM16	19.84	20.71
LTE Band2	3	18900	1	#Max	QAM16	20.17	21.04
LTE Band2	3	18900	8	#0	QAM16	18.99	19.86
LTE Band2	3	18900	8	#Mid	QAM16	19.00	19.87
LTE Band2	3	18900	8	#Max	QAM16	18.99	19.86
LTE Band2	3	18900	15	#0	QAM16	18.75	19.62
LTE Band2	3	19185	1	#0	QPSK	20.66	21.53
LTE Band2	3	19185	1	#Mid	QPSK	20.63	21.50
LTE Band2	3	19185	1	#Max	QPSK	21.06	21.93
LTE Band2	3	19185	8	#0	QPSK	19.65	20.52
LTE Band2	3	19185	8	#Mid	QPSK	19.65	20.52
LTE Band2	3	19185	8	#Max	QPSK	19.80	20.67
LTE Band2	3	19185	15	#0	QPSK	19.79	20.66
LTE Band2	3	19185	1	#0	QAM16	19.78	20.65
LTE Band2	3	19185	1	#Mid	QAM16	19.64	20.51
LTE Band2	3	19185	1	#Max	QAM16	19.67	20.54
LTE Band2	3	19185	8	#0	QAM16	18.45	19.32
LTE Band2	3	19185	8	#Mid	QAM16	18.64	19.51
LTE Band2	3	19185	8	#Max	QAM16	18.57	19.44

LTE Band2	3	19185	15	#0	QAM16	18.63	19.50
LTE Band2	5	18625	1	#0	QPSK	20.54	21.41
LTE Band2	5	18625	1	#Mid	QPSK	20.57	21.44
LTE Band2	5	18625	1	#Max	QPSK	20.53	21.40
LTE Band2	5	18625	12	#0	QPSK	19.61	20.48
LTE Band2	5	18625	12	#Mid	QPSK	19.61	20.48
LTE Band2	5	18625	12	#Max	QPSK	19.57	20.44
LTE Band2	5	18625	25	#0	QPSK	19.55	20.42
LTE Band2	5	18625	1	#0	QAM16	19.48	20.35
LTE Band2	5	18625	1	#Mid	QAM16	19.59	20.46
LTE Band2	5	18625	1	#Max	QAM16	19.40	20.27
LTE Band2	5	18625	12	#0	QAM16	18.49	19.36
LTE Band2	5	18625	12	#Mid	QAM16	18.49	19.36
LTE Band2	5	18625	12	#Max	QAM16	18.48	19.35
LTE Band2	5	18625	25	#0	QAM16	18.57	19.44
LTE Band2	5	18900	1	#0	QPSK	20.62	21.49
LTE Band2	5	18900	1	#Mid	QPSK	20.66	21.53
LTE Band2	5	18900	1	#Max	QPSK	20.59	21.46
LTE Band2	5	18900	12	#0	QPSK	19.63	20.50
LTE Band2	5	18900	12	#Mid	QPSK	19.62	20.49
LTE Band2	5	18900	12	#Max	QPSK	19.71	20.58
LTE Band2	5	18900	25	#0	QPSK	19.60	20.47
LTE Band2	5	18900	1	#0	QAM16	19.75	20.62
LTE Band2	5	18900	1	#Mid	QAM16	19.70	20.57
LTE Band2	5	18900	1	#Max	QAM16	19.90	20.77
LTE Band2	5	18900	12	#0	QAM16	18.38	19.25
LTE Band2	5	18900	12	#Mid	QAM16	18.39	19.26
LTE Band2	5	18900	12	#Max	QAM16	18.39	19.26
LTE Band2	5	18900	25	#0	QAM16	18.49	19.36
LTE Band2	5	19175	1	#0	QPSK	20.52	21.39
LTE Band2	5	19175	1	#Mid	QPSK	20.60	21.47
LTE Band2	5	19175	1	#Max	QPSK	20.69	21.56
LTE Band2	5	19175	12	#0	QPSK	19.68	20.55
LTE Band2	5	19175	12	#Mid	QPSK	19.70	20.57
LTE Band2	5	19175	12	#Max	QPSK	19.65	20.52
LTE Band2	5	19175	25	#0	QPSK	19.64	20.51
LTE Band2	5	19175	1	#0	QAM16	19.52	20.39
LTE Band2	5	19175	1	#Mid	QAM16	19.04	19.91
LTE Band2	5	19175	1	#Max	QAM16	19.44	20.31
LTE Band2	5	19175	12	#0	QAM16	18.46	19.33
LTE Band2	5	19175	12	#Mid	QAM16	18.39	19.26
LTE Band2	5	19175	12	#Max	QAM16	18.30	19.17
LTE Band2	5	19175	25	#0	QAM16	18.49	19.36

LTE Band2	10	18650	1	#0	QPSK	20.61	21.48
LTE Band2	10	18650	1	#Mid	QPSK	20.53	21.40
LTE Band2	10	18650	1	#Max	QPSK	20.50	21.37
LTE Band2	10	18650	25	#0	QPSK	19.66	20.53
LTE Band2	10	18650	25	#Mid	QPSK	19.63	20.50
LTE Band2	10	18650	25	#Max	QPSK	19.39	20.26
LTE Band2	10	18650	50	#0	QPSK	19.57	20.44
LTE Band2	10	18650	1	#0	QAM16	19.64	20.51
LTE Band2	10	18650	1	#Mid	QAM16	19.85	20.72
LTE Band2	10	18650	1	#Max	QAM16	19.47	20.34
LTE Band2	10	18650	25	#0	QAM16	18.77	19.64
LTE Band2	10	18650	25	#Mid	QAM16	18.78	19.65
LTE Band2	10	18650	25	#Max	QAM16	18.59	19.46
LTE Band2	10	18650	50	#0	QAM16	18.68	19.55
LTE Band2	10	18900	1	#0	QPSK	20.64	21.51
LTE Band2	10	18900	1	#Mid	QPSK	20.93	21.80
LTE Band2	10	18900	1	#Max	QPSK	20.79	21.66
LTE Band2	10	18900	25	#0	QPSK	19.63	20.50
LTE Band2	10	18900	25	#Mid	QPSK	19.62	20.49
LTE Band2	10	18900	25	#Max	QPSK	19.58	20.45
LTE Band2	10	18900	50	#0	QPSK	19.49	20.36
LTE Band2	10	18900	1	#0	QAM16	20.04	20.91
LTE Band2	10	18900	1	#Mid	QAM16	20.50	21.37
LTE Band2	10	18900	1	#Max	QAM16	20.16	21.03
LTE Band2	10	18900	25	#0	QAM16	18.38	19.25
LTE Band2	10	18900	25	#Mid	QAM16	18.39	19.26
LTE Band2	10	18900	25	#Max	QAM16	18.73	19.60
LTE Band2	10	18900	50	#0	QAM16	18.57	19.44
LTE Band2	10	19150	1	#0	QPSK	20.74	21.61
LTE Band2	10	19150	1	#Mid	QPSK	20.53	21.40
LTE Band2	10	19150	1	#Max	QPSK	20.53	21.40
LTE Band2	10	19150	25	#0	QPSK	19.71	20.58
LTE Band2	10	19150	25	#Mid	QPSK	19.69	20.56
LTE Band2	10	19150	25	#Max	QPSK	19.56	20.43
LTE Band2	10	19150	50	#0	QPSK	19.53	20.40
LTE Band2	10	19150	1	#0	QAM16	19.72	20.59
LTE Band2	10	19150	1	#Mid	QAM16	19.06	19.93
LTE Band2	10	19150	1	#Max	QAM16	18.98	19.85
LTE Band2	10	19150	25	#0	QAM16	18.87	19.74
LTE Band2	10	19150	25	#Mid	QAM16	18.89	19.76
LTE Band2	10	19150	25	#Max	QAM16	18.55	19.42
LTE Band2	10	19150	50	#0	QAM16	18.58	19.45
LTE Band2	15	18675	1	#0	QPSK	20.74	21.61

LTE Band2	15	18675	1	#Mid	QPSK	20.38	21.25
LTE Band2	15	18675	1	#Max	QPSK	20.30	21.17
LTE Band2	15	18675	36	#0	QPSK	19.50	20.37
LTE Band2	15	18675	36	#Mid	QPSK	19.44	20.31
LTE Band2	15	18675	36	#Max	QPSK	19.50	20.37
LTE Band2	15	18675	75	#0	QPSK	19.40	20.27
LTE Band2	15	18675	1	#0	QAM16	19.57	20.44
LTE Band2	15	18675	1	#Mid	QAM16	19.32	20.19
LTE Band2	15	18675	1	#Max	QAM16	19.27	20.14
LTE Band2	15	18675	36	#0	QAM16	18.52	19.39
LTE Band2	15	18675	36	#Mid	QAM16	18.46	19.33
LTE Band2	15	18675	36	#Max	QAM16	18.48	19.35
LTE Band2	15	18675	75	#0	QAM16	18.49	19.36
LTE Band2	15	18900	1	#0	QPSK	20.56	21.43
LTE Band2	15	18900	1	#Mid	QPSK	20.69	21.56
LTE Band2	15	18900	1	#Max	QPSK	20.62	21.49
LTE Band2	15	18900	36	#0	QPSK	19.39	20.26
LTE Band2	15	18900	36	#Mid	QPSK	19.37	20.24
LTE Band2	15	18900	36	#Max	QPSK	19.37	20.24
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LTE Band2	15	19125	1	#0	QPSK	20.47	21.34
LTE Band2	15	19125	1	#Mid	QPSK	20.35	21.22
LTE Band2	15	19125	1	#Max	QPSK	20.35	21.22
LTE Band2	15	19125	36	#0	QPSK	19.54	20.41
LTE Band2	15	19125	36	#Mid	QPSK	19.49	20.36
LTE Band2	15	19125	36	#Max	QPSK	19.48	20.35
LTE Band2	15	19125	75	#0	QPSK	19.57	20.44
LTE Band2	15	19125	1	#0	QAM16	19.22	20.09
LTE Band2	15	19125	1	#Mid	QAM16	18.10	18.97
LTE Band2	15	19125	1	#Max	QAM16	18.40	19.27
LTE Band2	15	19125	36	#0	QAM16	18.62	19.49
LTE Band2	15	19125	36	#Mid	QAM16	18.64	19.51
LTE Band2	15	19125	36	#Max	QAM16	18.33	19.20
LTE Band2	15	19125	75	#0	QAM16	18.64	19.51
LTE Band2	20	18700	1	#0	QPSK	20.60	21.47
LTE Band2	20	18700	1	#Mid	QPSK	20.20	21.07

LTE Band2	20	18700	1	#Max	QPSK	20.13	21.00
LTE Band2	20	18700	50	#0	QPSK	19.37	20.24
LTE Band2	20	18700	50	#Mid	QPSK	19.39	20.26
LTE Band2	20	18700	50	#Max	QPSK	19.30	20.17
LTE Band2	20	18700	100	#0	QPSK	19.51	20.38
LTE Band2	20	18700	1	#0	QAM16	19.57	20.44
LTE Band2	20	18700	1	#Mid	QAM16	19.87	20.74
LTE Band2	20	18700	1	#Max	QAM16	19.50	20.37
LTE Band2	20	18700	50	#0	QAM16	18.48	19.35
LTE Band2	20	18700	50	#Mid	QAM16	18.49	19.36
LTE Band2	20	18700	50	#Max	QAM16	18.46	19.33
LTE Band2	20	18700	100	#0	QAM16	18.53	19.40
LTE Band2	20	18900	1	#0	QPSK	20.37	21.24
LTE Band2	20	18900	1	#Mid	QPSK	20.69	21.56
LTE Band2	20	18900	1	#Max	QPSK	20.85	21.72
LTE Band2	20	18900	50	#0	QPSK	19.37	20.24
LTE Band2	20	18900	50	#Mid	QPSK	19.36	20.23
LTE Band2	20	18900	50	#Max	QPSK	19.35	20.22
LTE Band2	20	18900	100	#0	QPSK	19.35	20.22
LTE Band2	20	18900	1	#0	QAM16	18.92	19.79
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LTE Band2	20	18900	1	#Max	QAM16	18.99	19.86
LTE Band2	20	18900	50	#0	QAM16	18.23	19.10
LTE Band2	20	18900	50	#Mid	QAM16	18.21	19.08
LTE Band2	20	18900	50	#Max	QAM16	18.39	19.26
LTE Band2	20	18900	100	#0	QAM16	18.30	19.17
LTE Band2	20	19100	1	#0	QPSK	20.56	21.43
LTE Band2	20	19100	1	#Mid	QPSK	20.69	21.56
LTE Band2	20	19100	1	#Max	QPSK	20.20	21.07
LTE Band2	20	19100	50	#0	QPSK	19.51	20.38
LTE Band2	20	19100	50	#Mid	QPSK	19.44	20.31
LTE Band2	20	19100	50	#Max	QPSK	19.40	20.27
LTE Band2	20	19100	100	#0	QPSK	19.57	20.44
LTE Band2	20	19100	1	#0	QAM16	19.42	20.29
LTE Band2	20	19100	1	#Mid	QAM16	19.46	20.33
LTE Band2	20	19100	1	#Max	QAM16	19.17	20.04
LTE Band2	20	19100	50	#0	QAM16	18.55	19.42
LTE Band2	20	19100	50	#Mid	QAM16	18.58	19.45
LTE Band2	20	19100	50	#Max	QAM16	18.33	19.20
LTE Band2	20	19100	100	#0	QAM16	18.53	19.40

5.2. Occupied Bandwidth

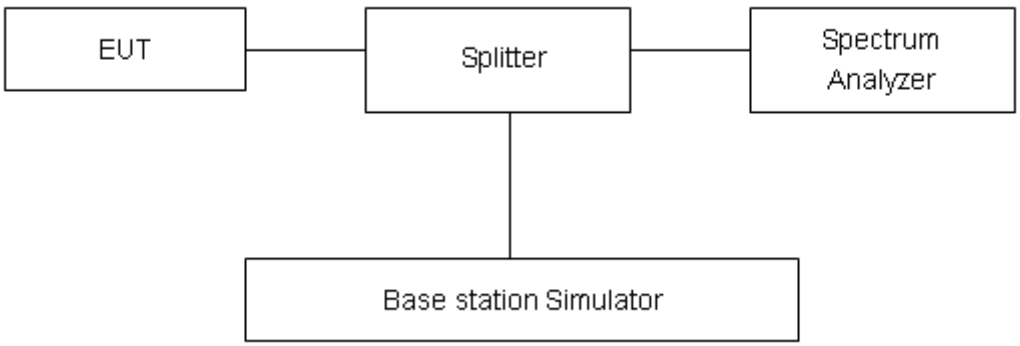
Ambient condition

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 3kHz, VBW is set to 10kHz for GSM 1900
RBW is set to 51kHz, VBW is set to 160kHz for WCDMA Band II,
RBW is set to 30 kHz, VBW is set to 91kHz for LTE Band 2 (1.4MHz),
RBW is set to 62 kHz, VBW is set to 180 kHz for LTE Band 2 (3MHz),
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 2(5MHz),
RBW is set to 200 kHz, VBW is set to 620kHz for LTE Band 2 (10MHz),
RBW is set to 300kHz,VBW is set to 910kHz for LTE Band 2 (15MHz).
RBW is set to 430kHz,VBW is set to 1.2MHz for LTE Band 2 (20MHz).
99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

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

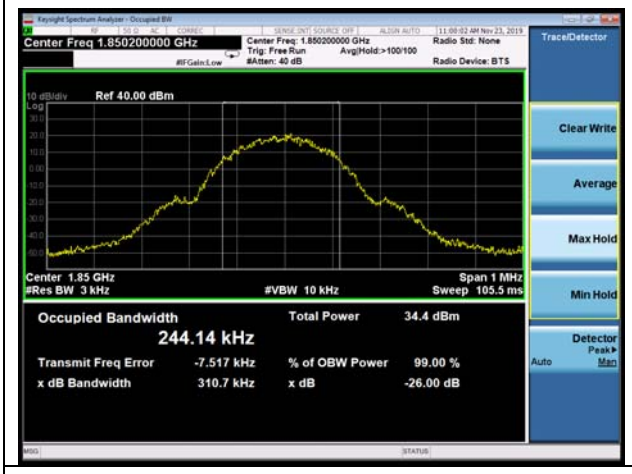
Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
GPRS 1900 (GMSK)	512	1850.2	0.24414	0.3107
	661	1880.0	0.24379	0.3161
	810	1909.8	0.24523	0.3157
EGPRS 1900 (8-PSK)	512	1850.2	0.24801	0.3193
	661	1880.0	0.25399	0.3143
	810	1909.8	0.24875	0.3176
WCDMA Band II (RMC)	9262	1852.4	4.1228	4.707
	9400	1880	4.1190	4.664
	9538	1907.6	4.1448	4.667

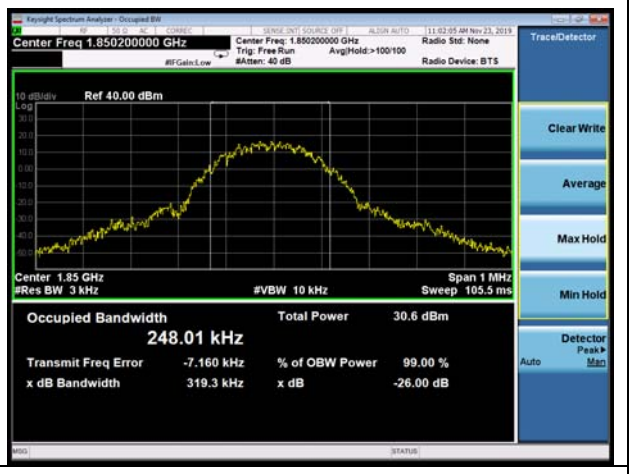
LTE Band 2					
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
QPSK	1.4	18607	1850.7	1.0918	1.290
		18900	1880.0	1.0973	1.299
		19193	1909.3	1.1051	1.270
	3	18615	1851.5	2.7097	3.000
		18900	1880	2.7063	2.974
		19185	1908.5	2.7163	2.985
	5	18625	1852.5	4.5078	5.001
		18900	1880	4.5082	4.910
		19175	1907.5	4.5165	4.948
	10	18650	1855	8.9416	9.665
		18900	1880	8.9719	9.773
		19150	1905	9.0189	9.876
	15	18675	1857.5	13.4020	14.530
		18900	1880	13.4510	14.570
		19125	1902.5	13.4680	14.650
	20	18700	1860	17.8620	19.350
		18900	1880	17.9840	19.350

		19100	1900	17.8240	19.280
16QAM	1.4	18607	1850.7	1.0978	1.310
		18900	1880.0	1.0955	1.268
		19193	1909.3	1.0934	1.298
	3	18615	1851.5	2.7254	2.978
		18900	1880	2.7096	2.995
		19185	1908.5	2.7014	2.995
	5	18625	1852.5	4.5085	4.912
		18900	1880	4.5239	5.027
		19175	1907.5	4.5304	5.019
	10	18650	1855	8.9665	9.823
		18900	1880	8.9707	9.735
		19150	1905	8.9922	9.739
	15	18675	1857.5	13.3990	14.600
		18900	1880	13.5080	14.570
		19125	1902.5	13.4490	14.470
	20	18700	1860	17.9270	19.250
		18900	1880	18.0100	19.600
		19100	1900	17.8570	19.360

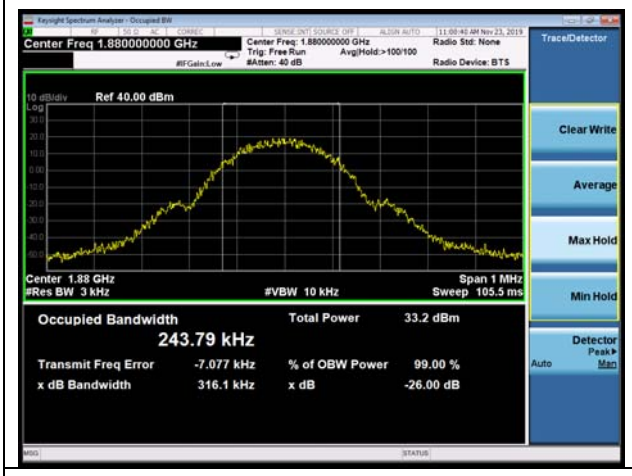
GSM1900 GPRS CH-Low



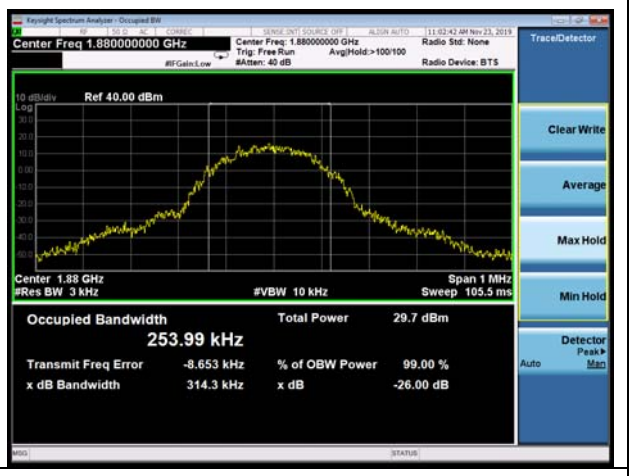
GSM1900 EGPRS CH-Low



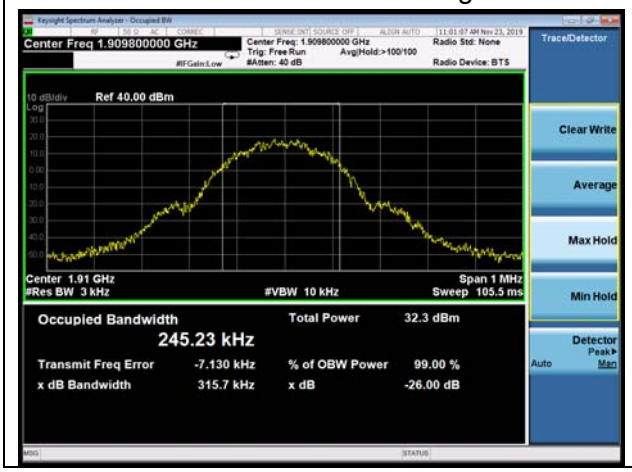
GSM 1900 GPRS CH-Middle



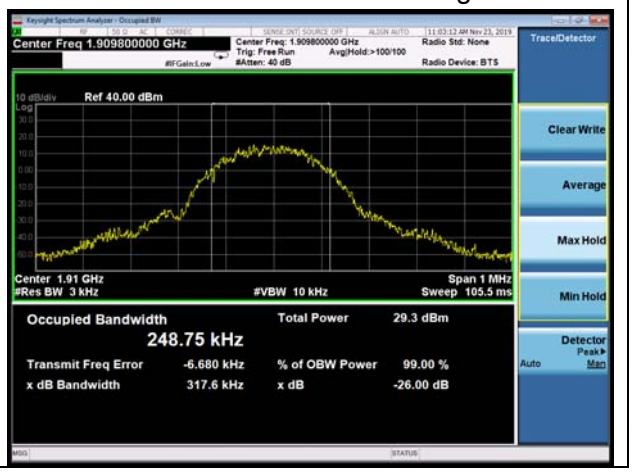
GSM 1900 EGPRS CH-Middle



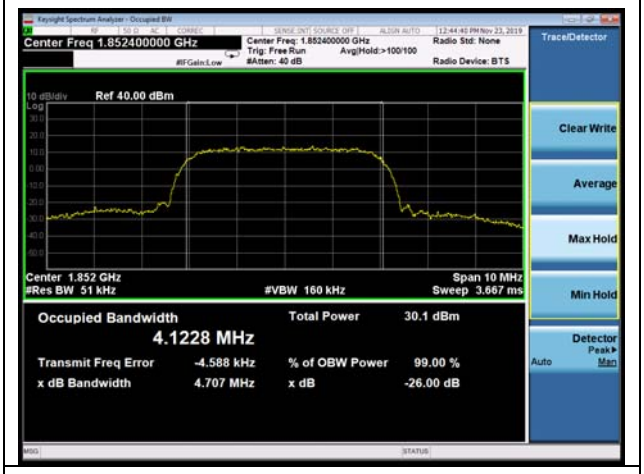
GSM 1900 GPRS CH-High



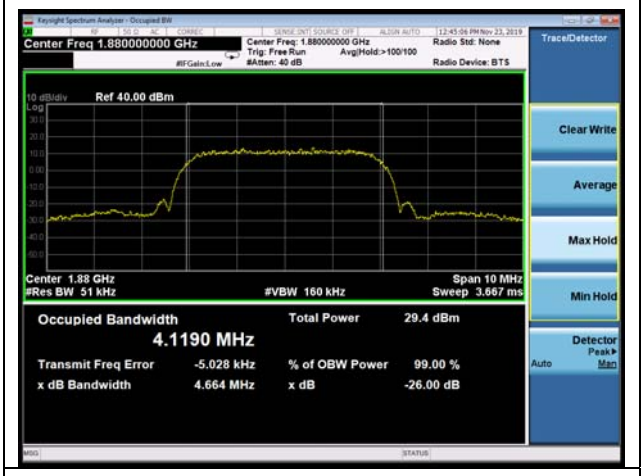
GSM 1900 EGPRS CH-High



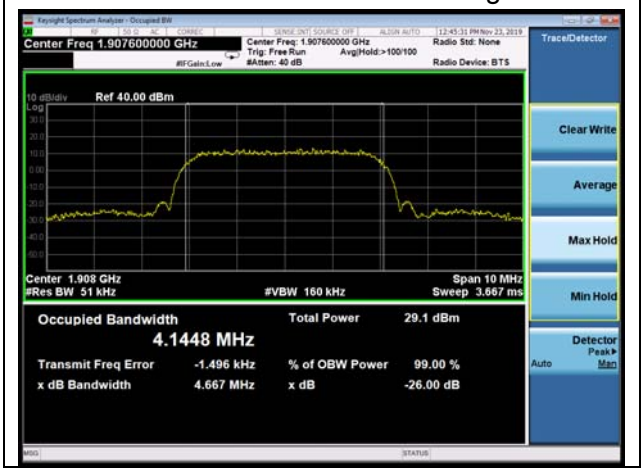
WCDMA Band II RMC CH-LOW



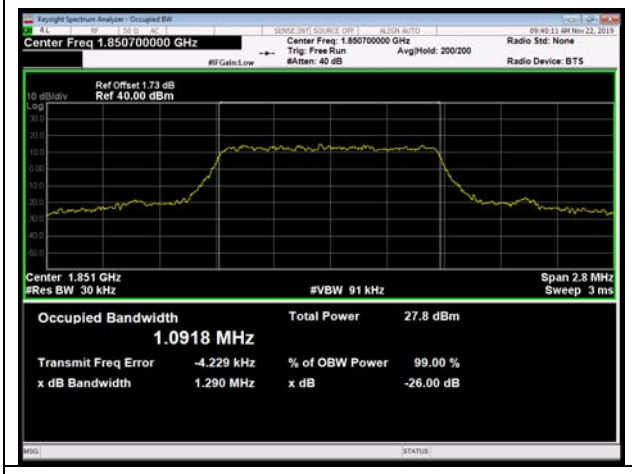
WCDMA Band II RMC CH-Middle



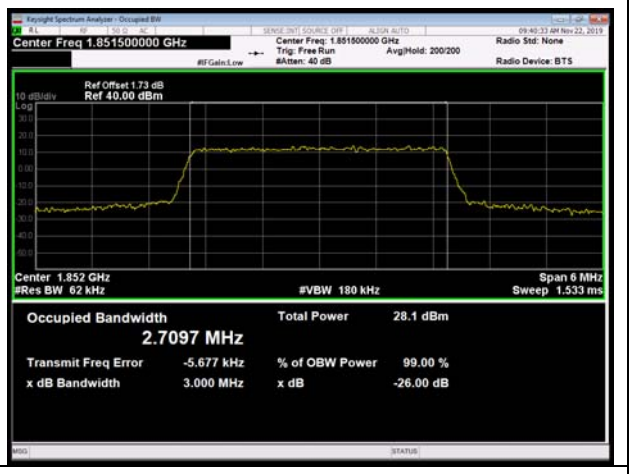
WCDMA Band II RMC CH-High



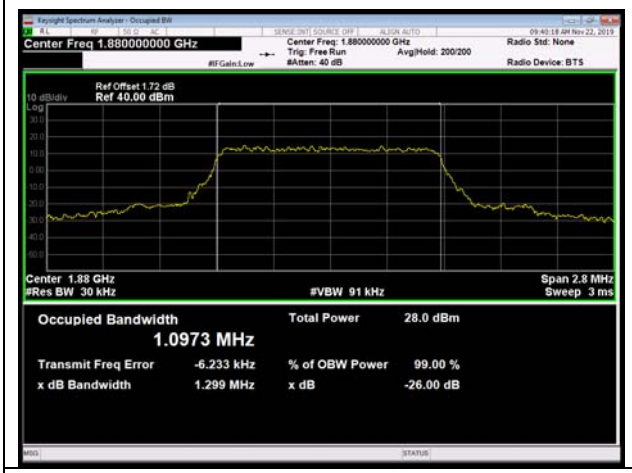
LTE Band 2 1.4MHz QPSK CH-Low



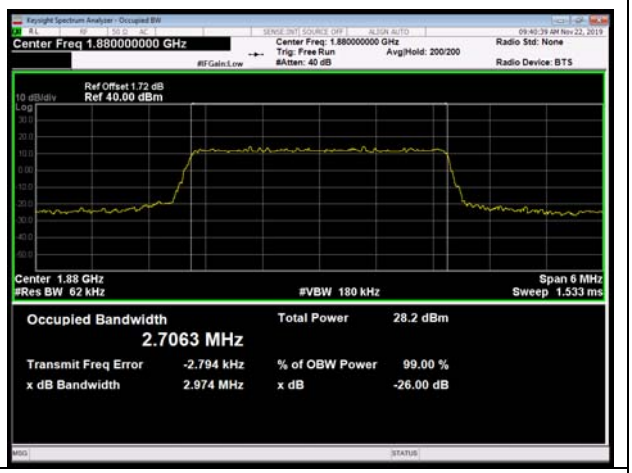
LTE Band 2 3MHz QPSK CH-Low



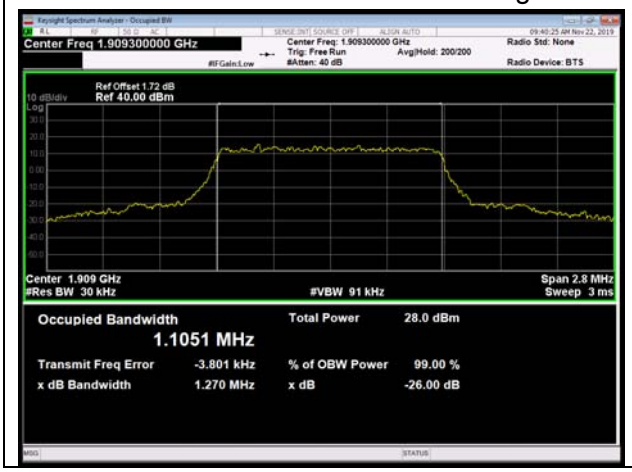
LTE Band 2 1.4MHz QPSK CH-Middle



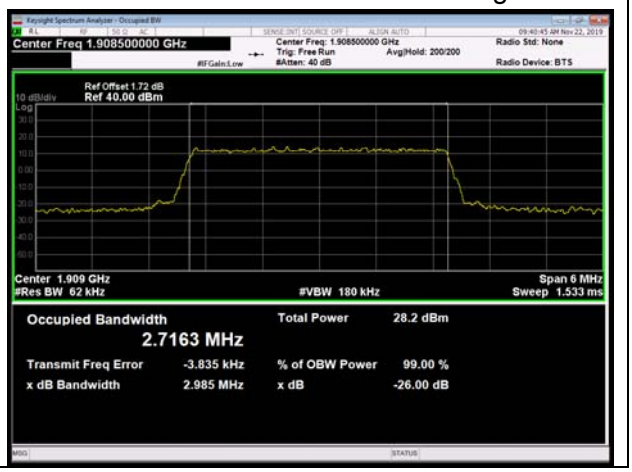
LTE Band 2 3MHz QPSK CH-Middle



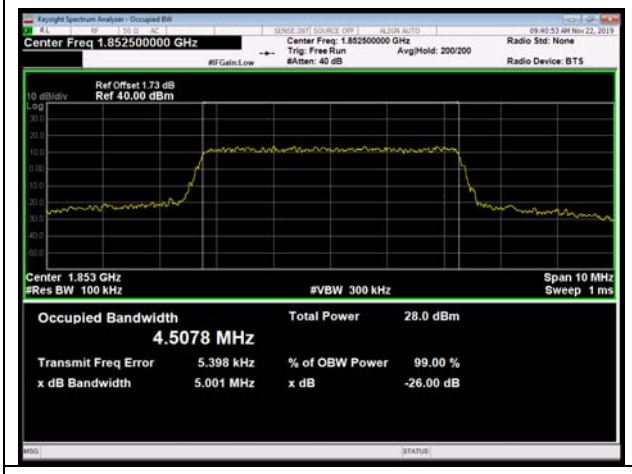
LTE Band 2 1.4MHz QPSK CH-High



LTE Band 2 3MHz QPSK CH-High

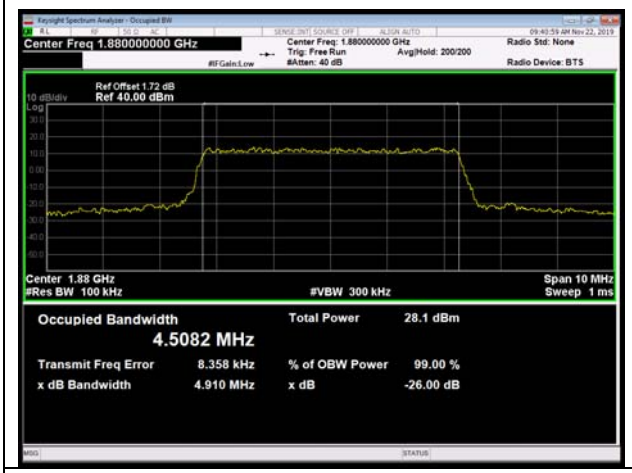


LTE Band 2 5MHz QPSK CH-Low

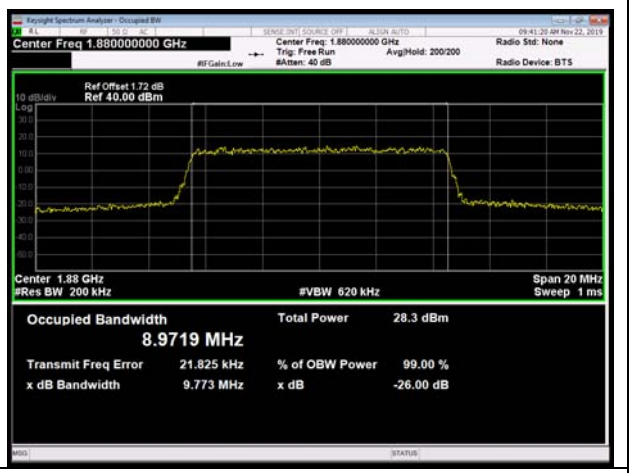


LTE Band 2 10MHz QPSK CH-Low

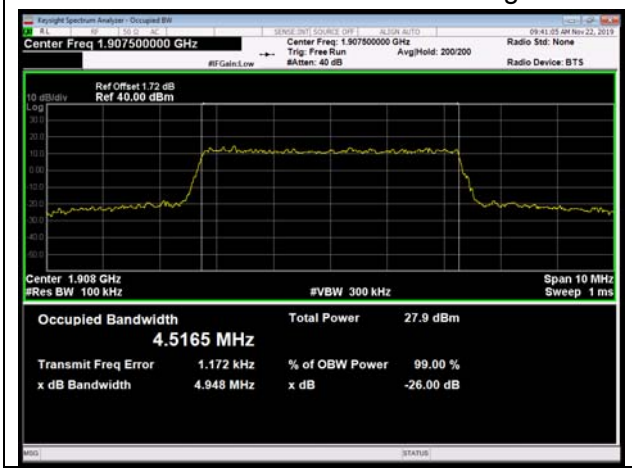
LTE Band 2 5MHz QPSK CH-Middle



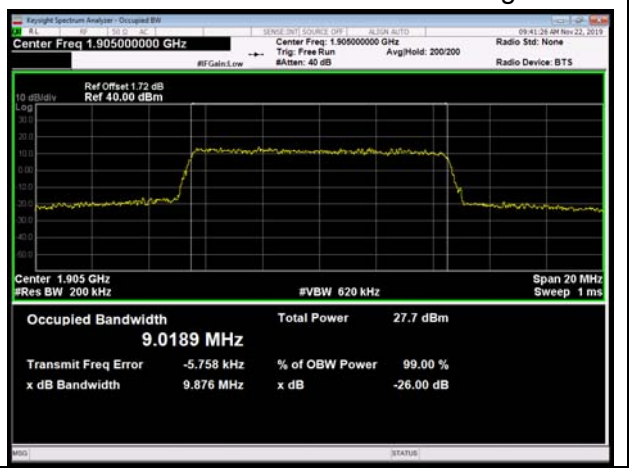
LTE Band 2 10MHz QPSK CH-Middle



LTE Band 2 5MHz QPSK CH-High

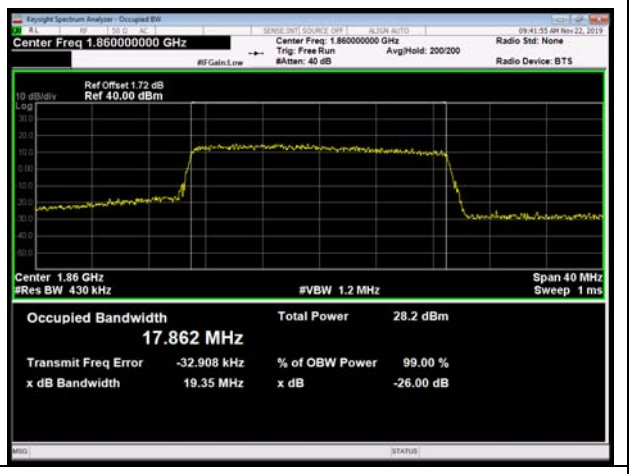


LTE Band 2 10MHz QPSK CH-High

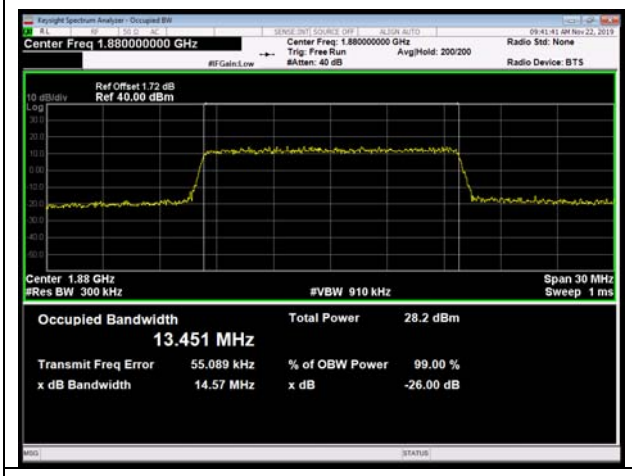


LTE Band 2 15MHz QPSK CH-Low

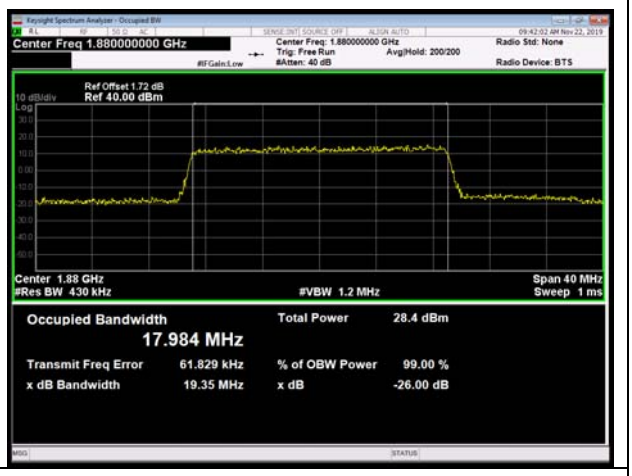
LTE Band 2 20MHz QPSK CH-Low



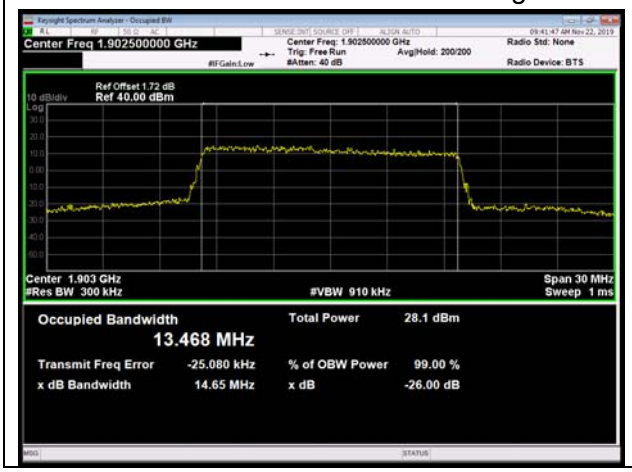
LTE Band 2 15MHz QPSK CH-Middle



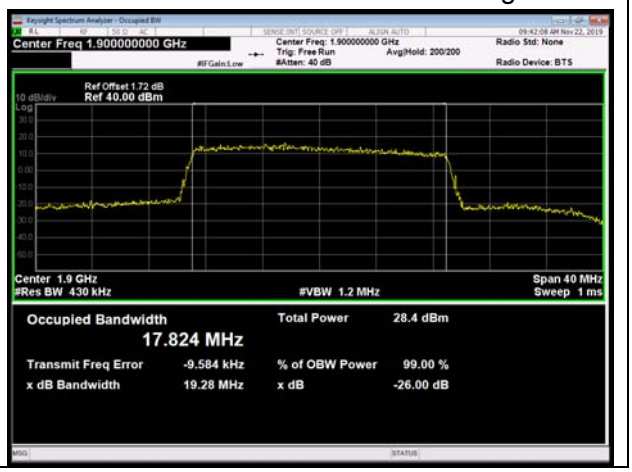
LTE Band 2 20MHz QPSK CH-Middle



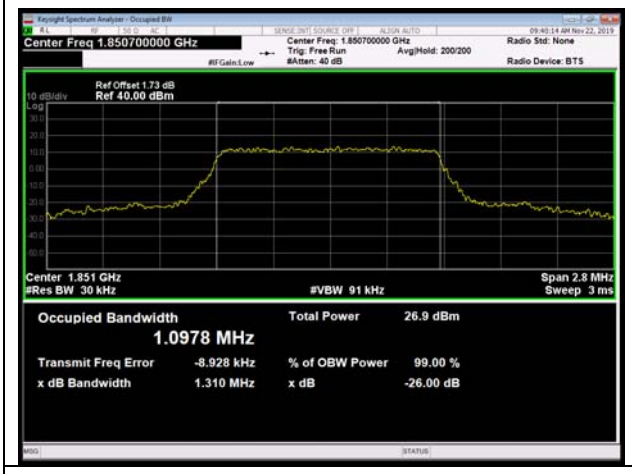
LTE Band 2 15MHz QPSK CH-High



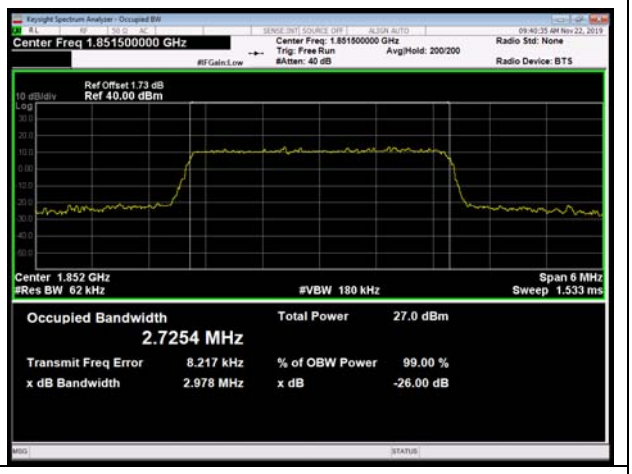
LTE Band 2 20MHz QPSK CH-High



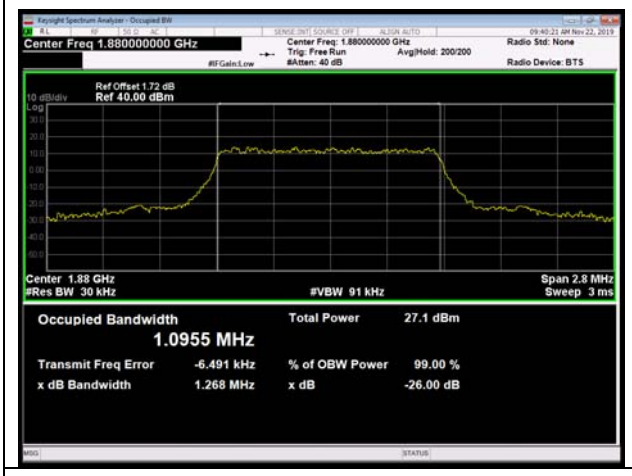
LTE Band 2 1.4MHz 16QAM CH-Low



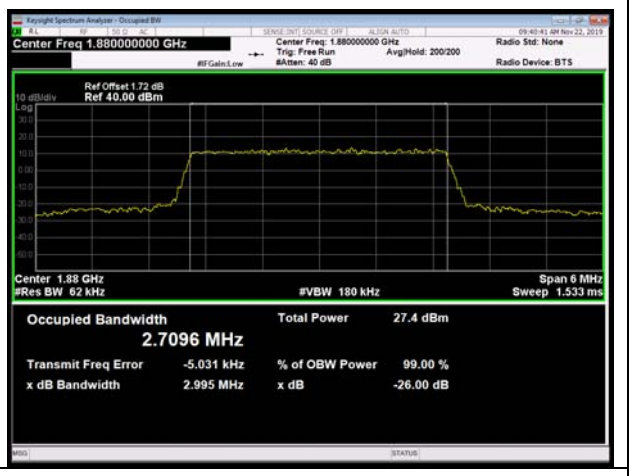
LTE Band 2 3MHz 16QAM CH-Low



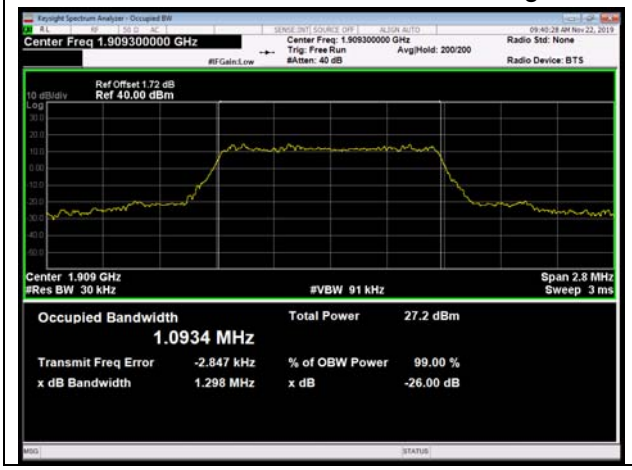
LTE Band 2 1.4MHz 16QAM CH-Middle



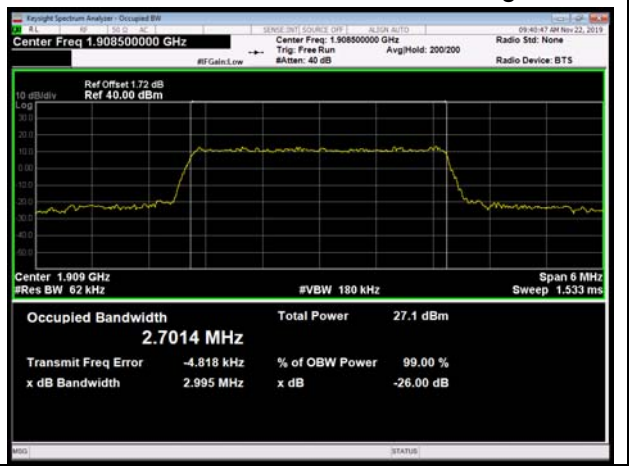
LTE Band 2 3MHz 16QAM CH-Middle



LTE Band 2 1.4MHz 16QAM CH-High



LTE Band 2 3MHz 16QAM CH-High

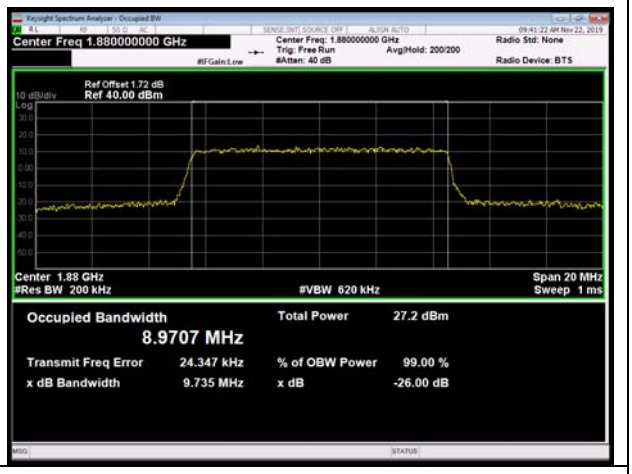


LTE Band 2 5MHz 16QAM CH-Low

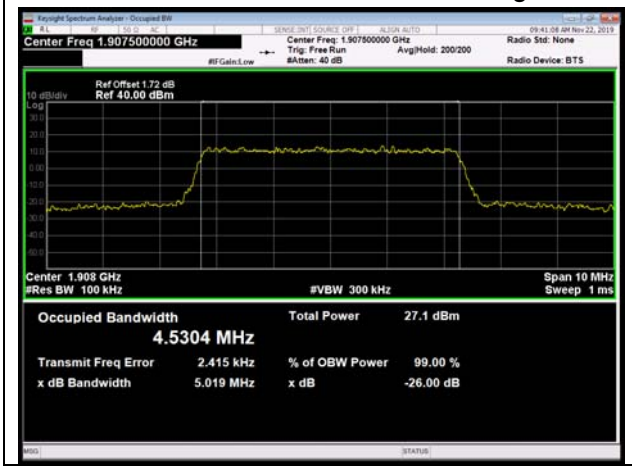
LTE Band 2 10MHz 16QAM CH-Low

LTE Band 2 5MHz 16QAM CH-Middle

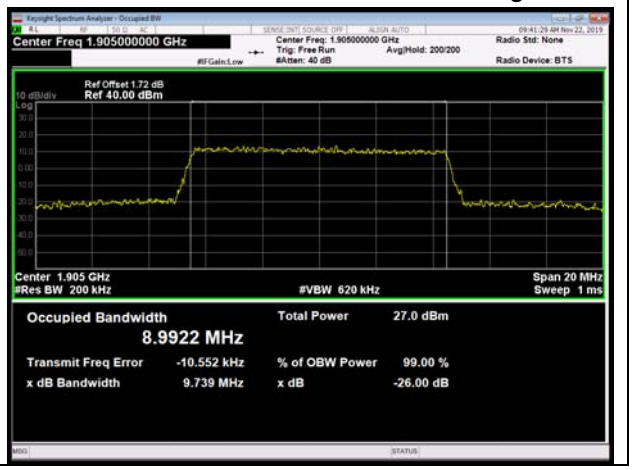
LTE Band 2 10MHz 16QAM CH-Middle



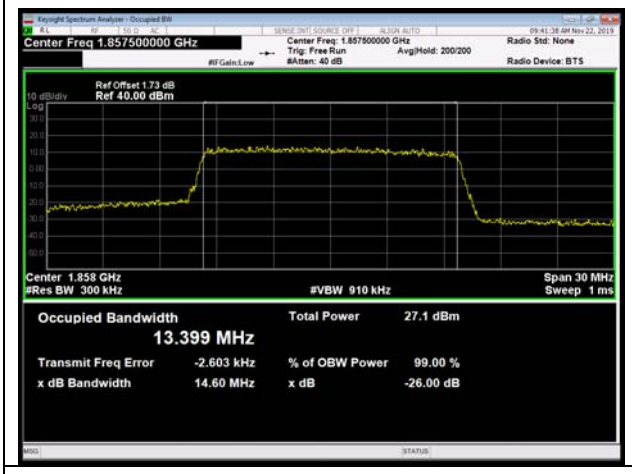
LTE Band 2 5MHz 16QAM CH-High



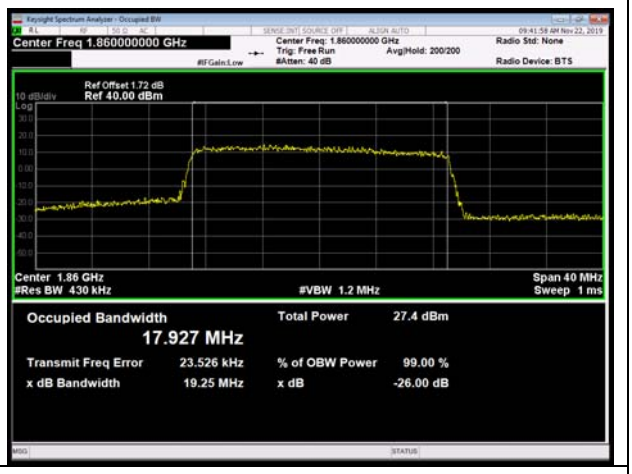
LTE Band 2 10MHz 16QAM CH-High



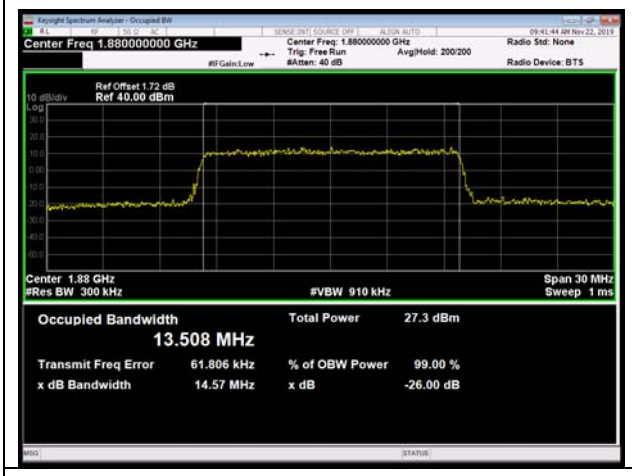
LTE Band 2 15MHz 16QAM CH-Low



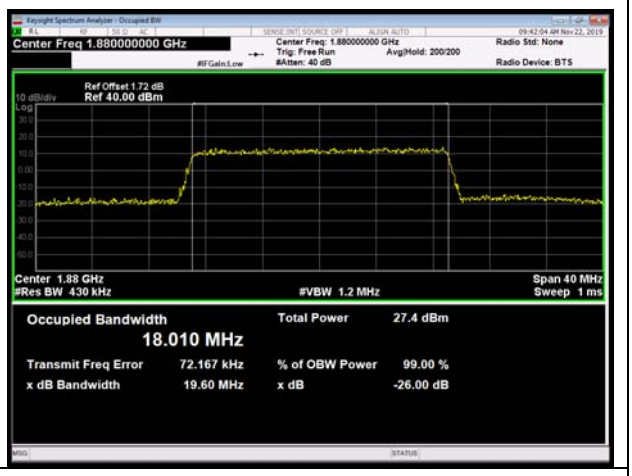
LTE Band 2 20MHz 16QAM CH-Low



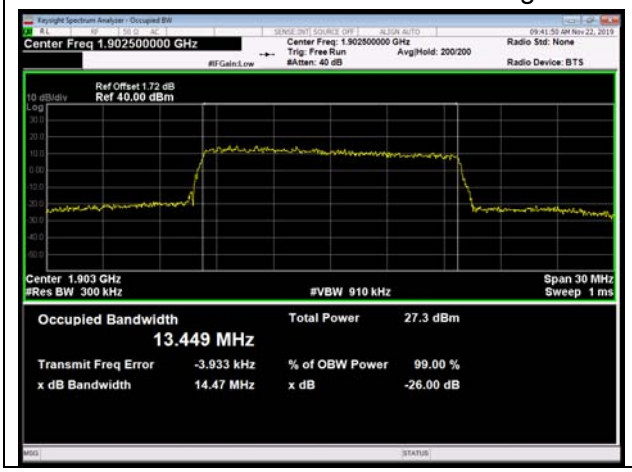
LTE Band 2 15MHz 16QAM CH-Middle



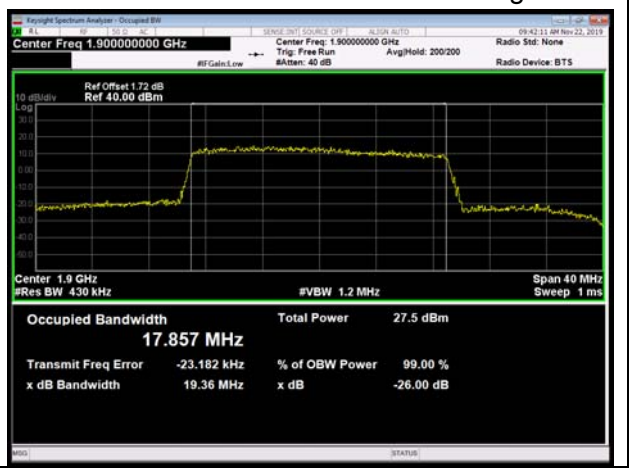
LTE Band 2 20MHz 16QAM CH-Middle



LTE Band 2 15MHz 16QAM CH-High



LTE Band 2 20MHz 16QAM CH-High



5.3. Band Edge Compliance

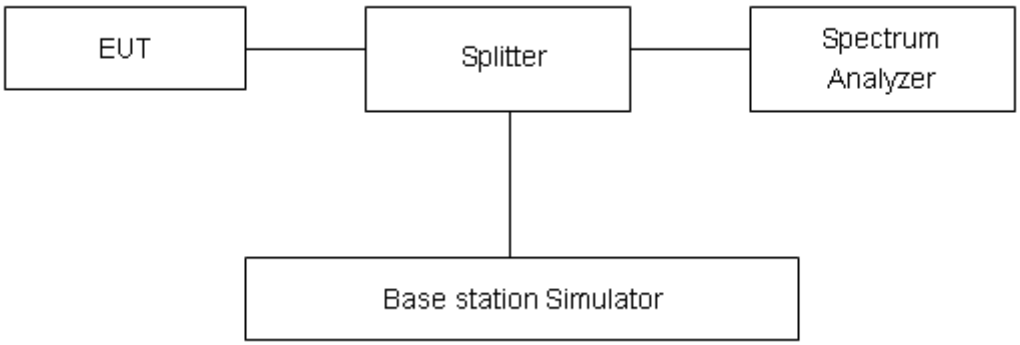
Ambient condition

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 3kHz, VBW is set to 10kHz for GSM 1900,
RBW is set to 51kHz, VBW is set to 160kHz for WCDMA Band II,
RBW is set to 15kHz, VBW is set to 43kHz for LTE Band 2 (1.4MHz),
RBW is set to 30kHz,VBW is set to 91kHz for LTE Band 2 (3MHz),
RBW is set to 51kHz,VBW is set to 150kHz for LTE Band 2 (5MHz),
RBW is set to 100kHz,VBW is set to 300kHz for LTE Band 2 (10MHz),
RBW is set to 150kHz,VBW is set to 470kHz for LTE Band 2 (15MHz),
RBW is set to 200kHz,VBW is set to 620kHz for LTE Band 2 (20MHz).
Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

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

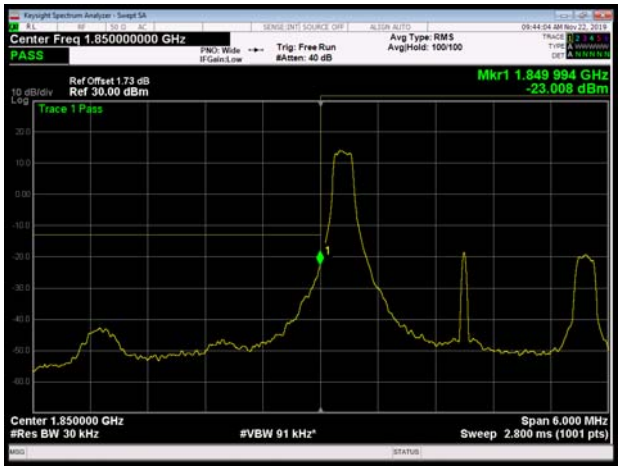
LTE Band 2 1.4MHz QPSK 1RB CH-Low

LTE Band 2 1.4MHz QPSK 1RB CH-High

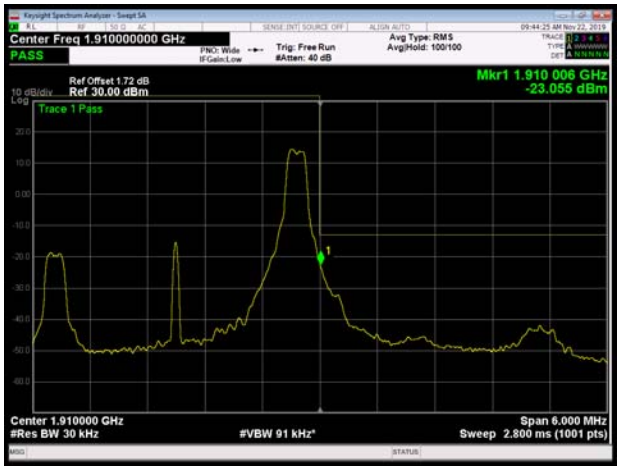
LTE Band 2 1.4MHz QPSK 100%RB CH-Low

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

LTE Band 2 3MHz QPSK 1RB CH-Low



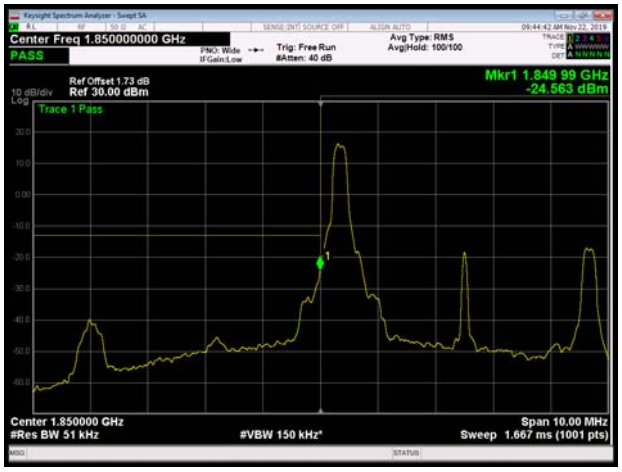
LTE Band 2 3MHz QPSK 1RB CH-High



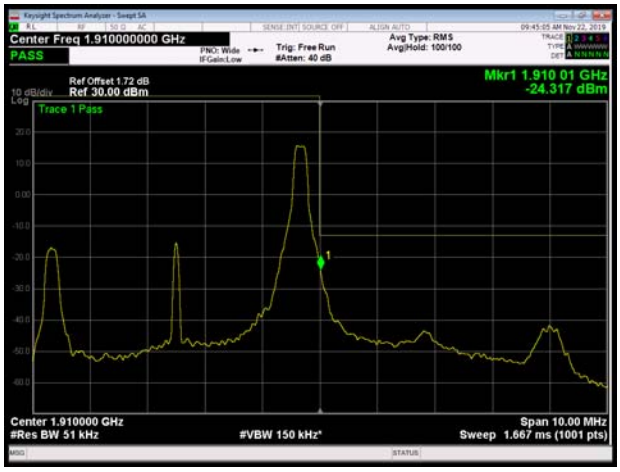
LTE Band 2 3MHz QPSK 100%RB CH-Low

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

LTE Band 2 5MHz QPSK 1RB CH-Low



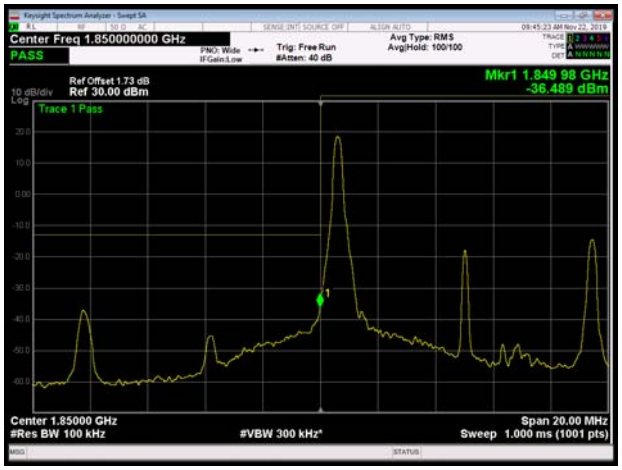
LTE Band 2 5MHz QPSK 1RB CH-High



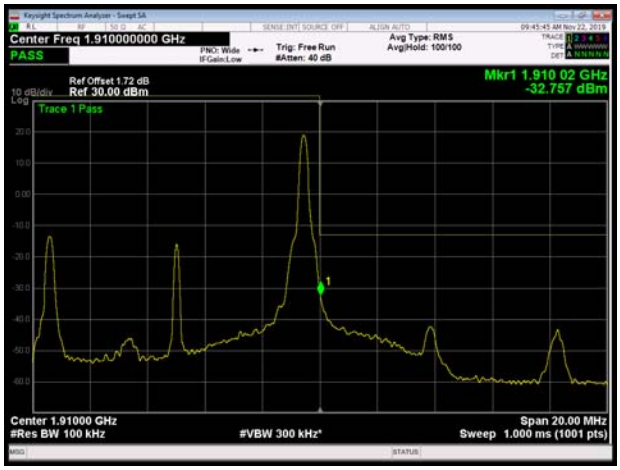
LTE Band 2 5MHz QPSK 100%RB CH-Low

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

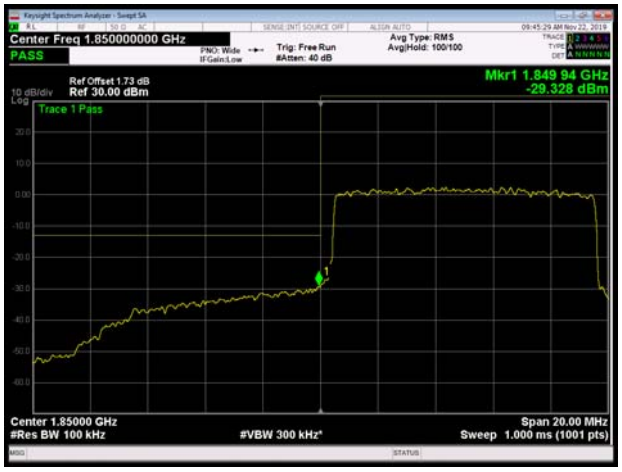
LTE Band 2 10MHz QPSK 1RB CH-Low



LTE Band 2 10MHz QPSK 1RB CH-High

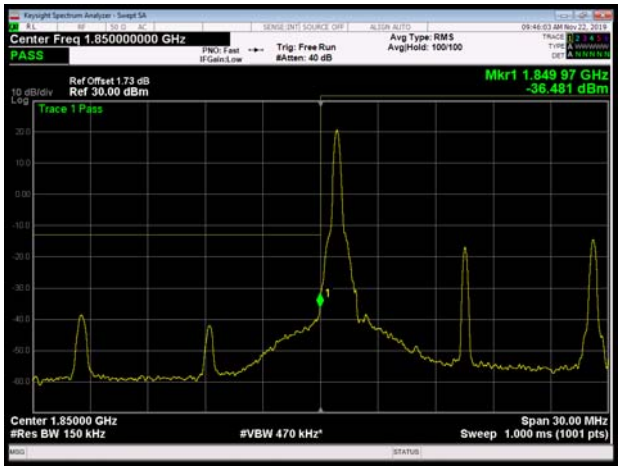


LTE Band 2 10MHz QPSK 100%RB CH-Low

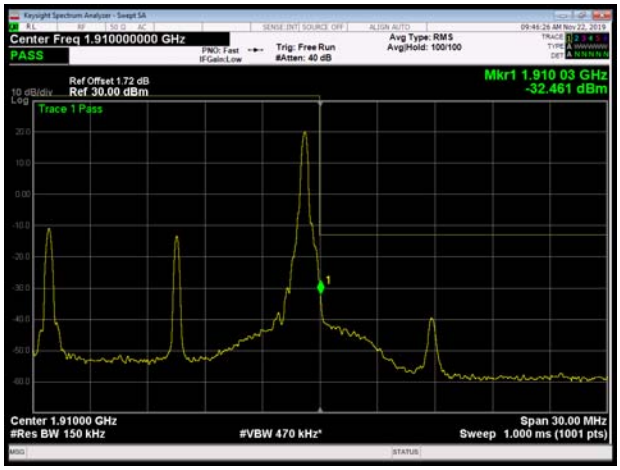


LTE Band 2 10MHz QPSK 100%RB CH-High

LTE Band 2 15MHz QPSK 1RB CH-Low



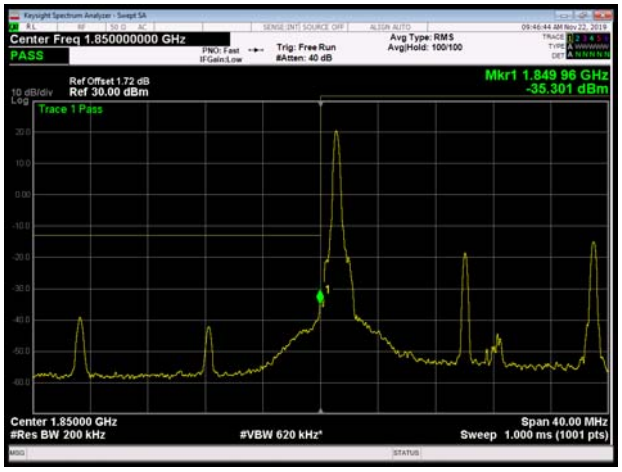
LTE Band 2 15MHz QPSK 1RB CH-High



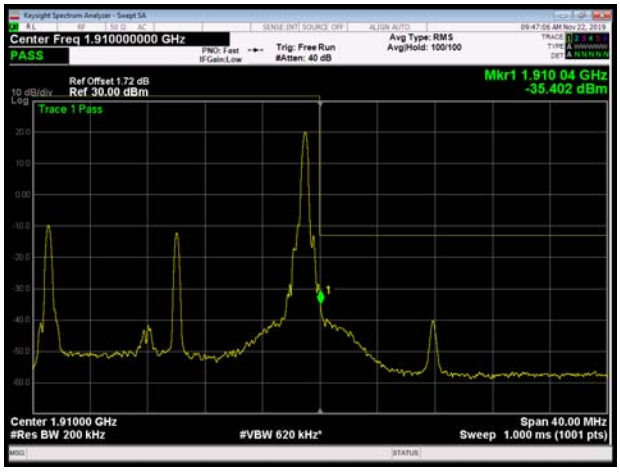
LTE Band 2 15MHz QPSK 100%RB CH-Low

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

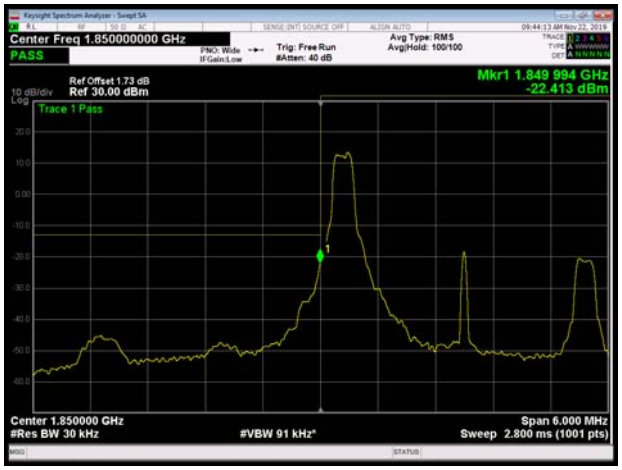
LTE Band 2 1.4MHz 16QAM 1RB CH-Low

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

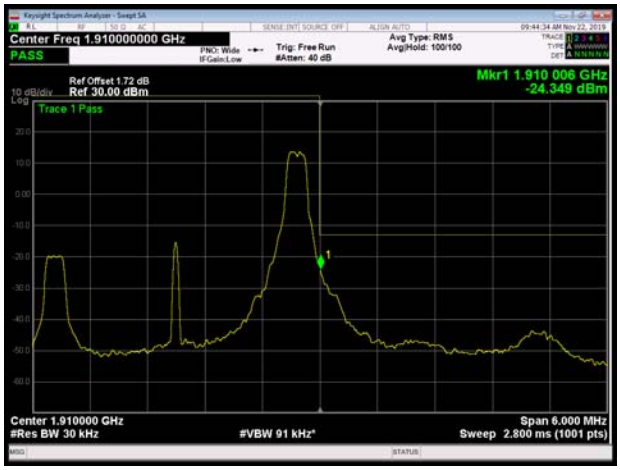
LTE Band 2 1.4MHz 16QAM 100%RB CH-Low

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

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



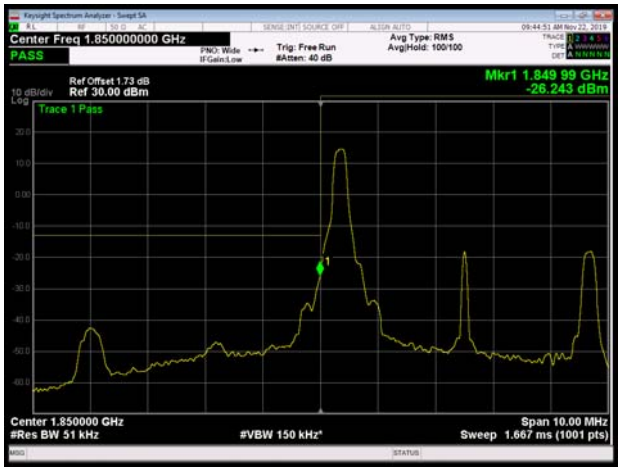
LTE Band 2 3MHz 16QAM 1RB CH-High



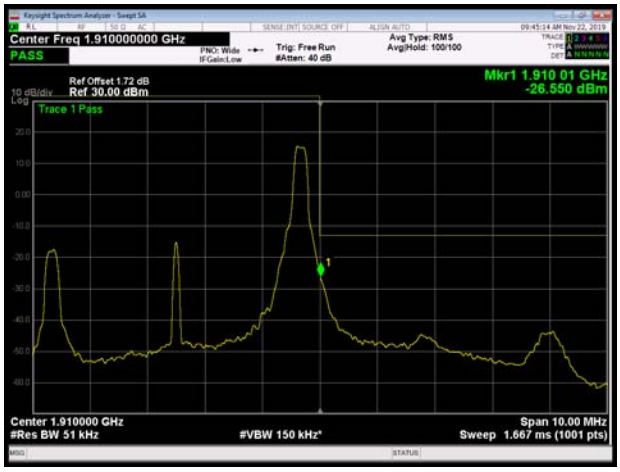
LTE Band 2 3MHz 16QAM 100%RB CH-Low

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

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



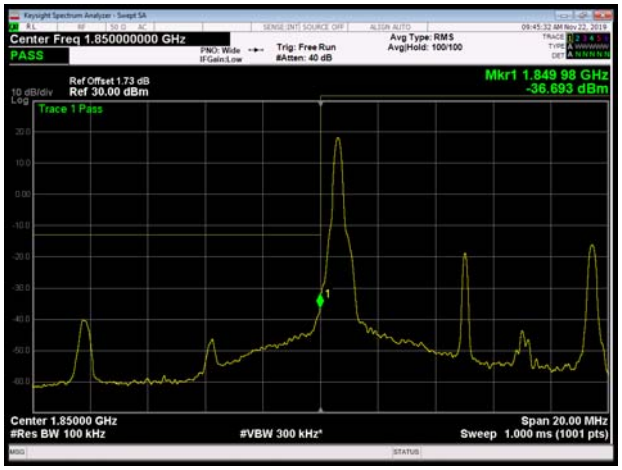
LTE Band 2 5MHz 16QAM 1RB CH-High



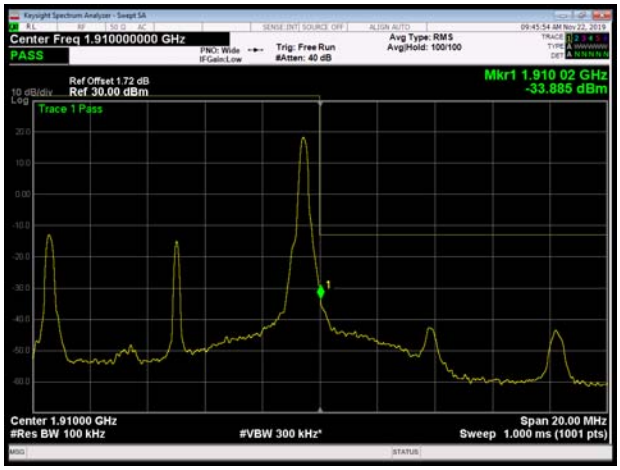
LTE Band 2 5MHz 16QAM 100%RB CH-Low

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

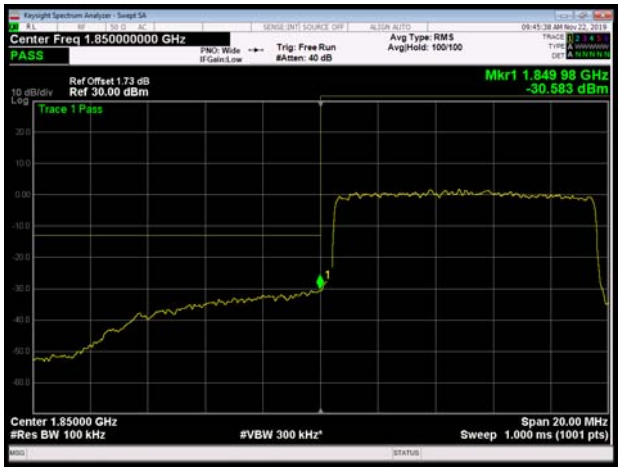
LTE Band 2 10MHz 16QAM 1RB CH-Low



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

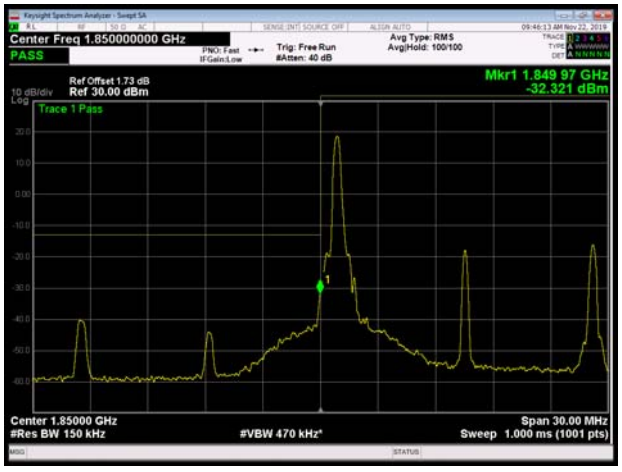


LTE Band 2 10MHz 16QAM 100%RB CH-Low

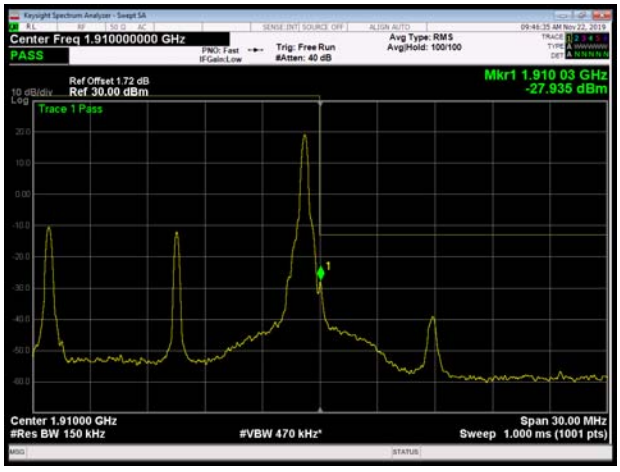


LTE Band 2 10MHz 16QAM 100%RB CH-High

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



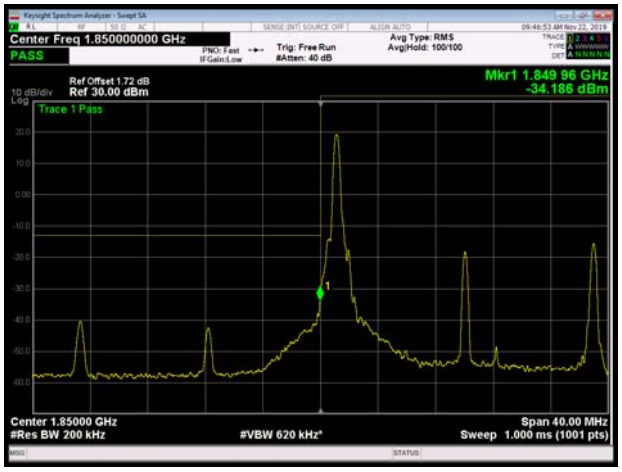
LTE Band 2 15MHz 16QAM 1RB CH-High



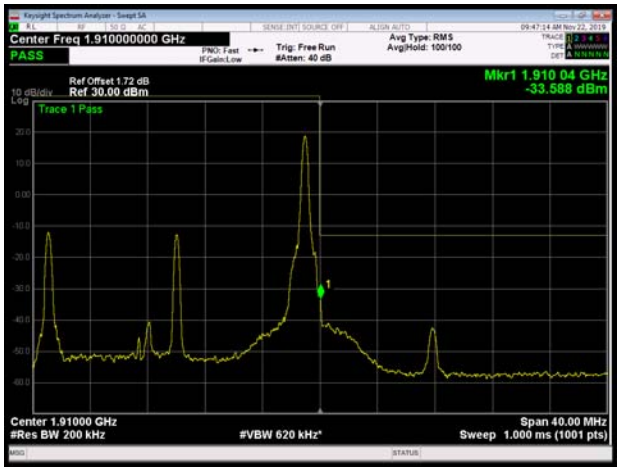
LTE Band 2 15MHz 16QAM 100%RB CH-Low

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)

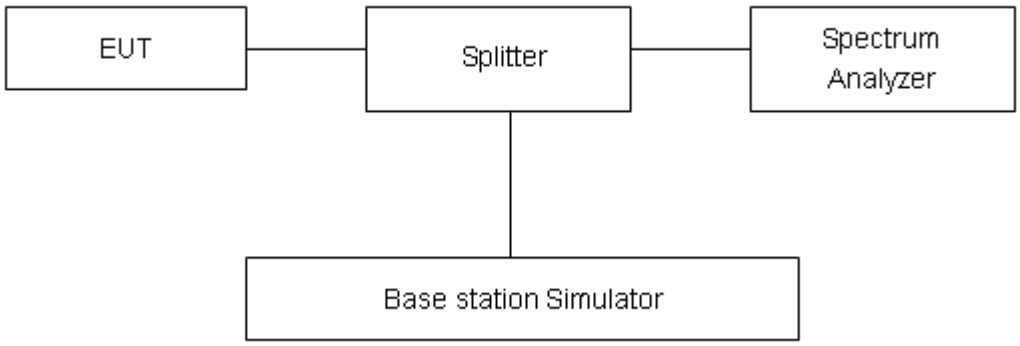
Ambient condition

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
GPRS 1900 (GMSK)	512	1850.2	30.36	27.95	2.41	≤13	PASS
	661	1880	30.36	28.01	2.35	≤13	PASS
	810	1909.8	30.27	27.65	2.62	≤13	PASS
EGPRS 1900 (8-PSK)	512	1850.2	28.46	25.34	3.12	≤13	PASS
	661	1880	28.91	25.56	3.35	≤13	PASS
	810	1909.8	28.28	25.03	3.25	≤13	PASS
WCDMA Band II (RMC)	9262	1852.4	23.96	20.89	3.07	≤13	PASS
	9400	1880	23.82	20.56	3.26	≤13	PASS
	9538	1907.6	23.85	20.64	3.21	≤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	25.42	20.10	5.32	≤13	PASS
		18900	1880.0	25.76	20.28	5.48	≤13	PASS
		19193	1909.3	25.64	20.22	5.42	≤13	PASS
	3	18615	1851.5	25.56	20.21	5.35	≤13	PASS
		18900	1880	25.87	20.29	5.58	≤13	PASS
		19185	1908.5	25.75	20.20	5.55	≤13	PASS
	5	18625	1852.5	25.43	20.20	5.23	≤13	PASS
		18900	1880	26.01	20.35	5.66	≤13	PASS
		19175	1907.5	25.90	20.26	5.64	≤13	PASS
	10	18650	1855	25.25	20.09	5.16	≤13	PASS
		18900	1880	26.12	20.34	5.78	≤13	PASS
		19150	1905	26.03	20.18	5.85	≤13	PASS
	15	18675	1857.5	25.48	20.10	5.38	≤13	PASS
		18900	1880	26.34	20.40	5.94	≤13	PASS
		19125	1902.5	26.15	20.30	5.85	≤13	PASS
	20	18700	1860	25.53	20.23	5.30	≤13	PASS
		18900	1880	26.16	20.41	5.75	≤13	PASS
		19100	1900	25.73	20.29	5.44	≤13	PASS
16QAM	1.4	18607	1850.7	25.25	19.10	6.15	≤13	PASS
		18900	1880.0	25.88	19.52	6.36	≤13	PASS
		19193	1909.3	25.65	19.33	6.32	≤13	PASS
	3	18615	1851.5	25.18	19.06	6.12	≤13	PASS
		18900	1880	25.95	19.51	6.44	≤13	PASS
		19185	1908.5	25.69	19.27	6.42	≤13	PASS
	5	18625	1852.5	25.29	19.26	6.03	≤13	PASS
		18900	1880	25.97	19.52	6.45	≤13	PASS
		19175	1907.5	25.80	19.35	6.45	≤13	PASS
	10	18650	1855	25.10	19.14	5.96	≤13	PASS
		18900	1880	26.01	19.42	6.59	≤13	PASS
		19150	1905	25.89	19.20	6.69	≤13	PASS
	15	18675	1857.5	25.30	19.19	6.11	≤13	PASS
		18900	1880	26.15	19.46	6.69	≤13	PASS
		19125	1902.5	25.83	19.25	6.58	≤13	PASS
	20	18700	1860	25.48	19.32	6.16	≤13	PASS
		18900	1880	25.85	19.27	6.58	≤13	PASS
		19100	1900	25.67	19.35	6.32	≤13	PASS

5.5. Frequency Stability

Ambient condition

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

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +60°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 +60°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

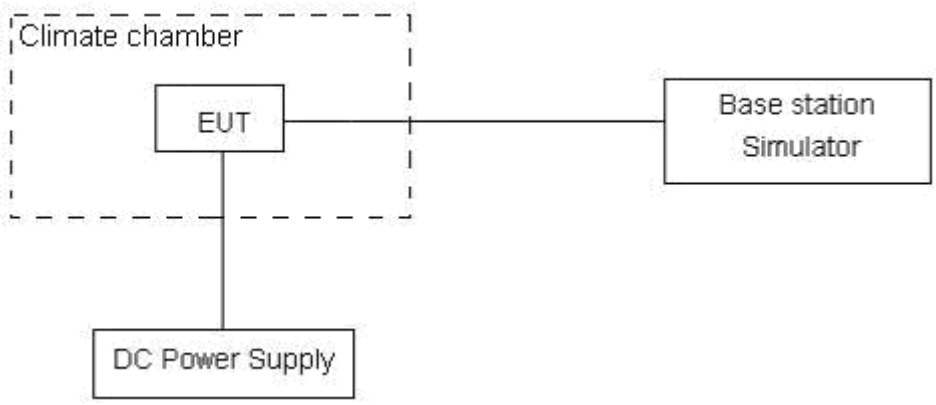
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage 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 22.8 V and 25.2 V, with a nominal voltage of 24V.

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	10.93	8.82	0.00581	0.00469	PASS
Extreme（60℃）		6.07	12.80	0.00323	0.00681	PASS
Extreme（50℃）		14.53	14.82	0.00773	0.00788	PASS
Extreme（40℃）		7.64	10.05	0.00406	0.00535	PASS
Extreme（30℃）		15.44	7.98	0.00821	0.00424	PASS
Extreme（20℃）		5.14	16.20	0.00273	0.00862	PASS
Extreme（10℃）		5.92	1.65	0.00315	0.00088	PASS
Extreme（0℃）		4.96	10.73	0.00264	0.00571	PASS
Extreme（-10℃）		17.56	14.17	0.00934	0.00754	PASS
Extreme（-20℃）		7.93	14.61	0.00422	0.00777	PASS
Extreme（-30℃）		3.18	15.53	0.00169	0.00826	PASS
25℃	LV	1.38	7.30	0.00073	0.00388	PASS
	HV	16.64	7.32	0.00885	0.00390	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	2.96	14.46	0.00157	0.00769	PASS
Extreme（60℃）		3.40	17.22	0.00181	0.00916	PASS
Extreme（50℃）		15.93	3.65	0.00847	0.00194	PASS
Extreme（40℃）		17.49	9.60	0.00930	0.00511	PASS
Extreme（30℃）		13.55	1.42	0.00721	0.00075	PASS
Extreme（20℃）		17.52	8.25	0.00932	0.00439	PASS
Extreme（10℃）		3.83	12.20	0.00204	0.00649	PASS
Extreme（0℃）		1.97	12.76	0.00105	0.00679	PASS
Extreme（-10℃）		2.07	9.29	0.00110	0.00494	PASS
Extreme（-20℃）		14.78	3.46	0.00786	0.00184	PASS
Extreme（-30℃）		4.92	1.17	0.00262	0.00062	PASS
25℃	LV	8.13	7.48	0.00432	0.00398	PASS
	HV	10.24	10.53	0.00544	0.00560	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	2.98	3.73	0.00159	0.00199	PASS
Extreme（60℃）		4.84	13.77	0.00258	0.00732	PASS
Extreme（50℃）		5.47	7.37	0.00291	0.00392	PASS
Extreme（40℃）		7.96	2.24	0.00423	0.00119	PASS
Extreme（30℃）		2.43	17.38	0.00129	0.00925	PASS
Extreme（20℃）		3.56	13.45	0.00189	0.00715	PASS
Extreme（10℃）		6.40	4.54	0.00340	0.00241	PASS
Extreme（0℃）		5.03	6.69	0.00267	0.00356	PASS
Extreme（-10℃）		8.55	8.63	0.00455	0.00459	PASS
Extreme（-20℃）		3.00	2.35	0.00160	0.00125	PASS
Extreme（-30℃）		10.62	2.36	0.00565	0.00126	PASS
25℃	LV	13.36	17.97	0.00711	0.00956	PASS
	HV	13.75	3.44	0.00731	0.00183	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	10.35	10.08	0.00550	0.00536	PASS
Extreme（60℃）		3.37	6.99	0.00179	0.00372	PASS
Extreme（50℃）		8.84	13.23	0.00470	0.00704	PASS
Extreme（40℃）		15.88	1.42	0.00845	0.00076	PASS
Extreme（30℃）		9.50	2.70	0.00505	0.00144	PASS
Extreme（20℃）		8.17	13.81	0.00435	0.00734	PASS
Extreme（10℃）		14.70	4.72	0.00782	0.00251	PASS
Extreme（0℃）		17.13	10.15	0.00911	0.00540	PASS
Extreme（-10℃）		9.58	4.62	0.00510	0.00246	PASS
Extreme（-20℃）		17.13	10.10	0.00911	0.00537	PASS
Extreme（-30℃）		9.27	15.03	0.00493	0.00800	PASS
25℃	LV	2.61	11.26	0.00139	0.00599	PASS
	HV	8.67	12.21	0.00461	0.00650	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	13.57	13.29	0.00722	0.00707	PASS
Extreme（60℃）		4.64	6.93	0.00247	0.00369	PASS

Extreme（50℃）		5.72	15.88	0.00304	0.00845	PASS
Extreme（40℃）		16.74	3.52	0.00890	0.00187	PASS
Extreme（30℃）		13.02	1.20	0.00693	0.00064	PASS
Extreme（20℃）		16.66	15.63	0.00886	0.00832	PASS
Extreme（10℃）		5.46	3.66	0.00291	0.00195	PASS
Extreme（0℃）		3.61	9.05	0.00192	0.00482	PASS
Extreme（-10℃）		12.50	1.75	0.00665	0.00093	PASS
Extreme（-20℃）		15.85	11.98	0.00843	0.00637	PASS
Extreme（-30℃）		14.08	3.50	0.00749	0.00186	PASS
25℃	LV	8.62	14.32	0.00459	0.00762	PASS
	HV	14.60	9.51	0.00777	0.00506	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℃）		12.79	7.69	0.00680	0.00409	PASS
Extreme（60℃）		7.21	4.06	0.00384	0.00216	PASS
Extreme（50℃）		4.45	13.79	0.00237	0.00733	PASS
Extreme（40℃）		15.23	8.54	0.00810	0.00454	PASS
Extreme（30℃）		17.71	4.20	0.00942	0.00223	PASS
Extreme（20℃）	Normal	12.15	3.35	0.00646	0.00178	PASS
Extreme（10℃）		17.07	3.20	0.00908	0.00170	PASS
Extreme（0℃）		9.15	10.25	0.00487	0.00545	PASS
Extreme（-10℃）		6.29	5.77	0.00334	0.00307	PASS
Extreme（-20℃）		11.34	11.87	0.00603	0.00632	PASS
Extreme（-30℃）		8.48	5.65	0.00451	0.00300	PASS
25℃	LV	10.56	10.23	0.00562	0.00544	PASS
	HV	9.04	7.08	0.00481	0.00377	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℃）		6.54	6.26	0.00348	0.00333	PASS
Extreme（60℃）		2.97	14.15	0.00158	0.00753	PASS
Extreme（50℃）		7.34	5.62	0.00391	0.00299	PASS
Extreme（40℃）		1.11	14.34	0.00059	0.00763	PASS
Extreme（30℃）		8.74	17.73	0.00465	0.00943	PASS
Extreme（20℃）	Normal	15.87	15.21	0.00844	0.00809	PASS
Extreme（10℃）		8.20	6.31	0.00436	0.00336	PASS
Extreme（0℃）		17.59	17.72	0.00936	0.00942	PASS
Extreme（-10℃）		11.93	6.43	0.00635	0.00342	PASS
Extreme（-20℃）		15.04	2.16	0.00800	0.00115	PASS

Extreme（-30℃）		9.47	1.84	0.00504	0.00098	PASS
25℃	LV	11.81	10.83	0.00628	0.00576	PASS
	HV	6.20	6.58	0.00330	0.00350	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	9.93	14.79	0.00528	0.00787	PASS
Extreme（60℃）		5.74	10.23	0.00306	0.00544	PASS
Extreme（50℃）		13.41	7.32	0.00713	0.00390	PASS
Extreme（40℃）		2.91	15.70	0.00155	0.00835	PASS
Extreme（30℃）		15.30	4.52	0.00814	0.00240	PASS
Extreme（20℃）		2.78	6.01	0.00148	0.00320	PASS
Extreme（10℃）		13.17	15.46	0.00700	0.00822	PASS
Extreme（0℃）		10.68	10.77	0.00568	0.00573	PASS
Extreme（-10℃）		14.15	15.42	0.00753	0.00820	PASS
Extreme（-20℃）		13.42	14.02	0.00714	0.00746	PASS
Extreme（-30℃）		17.88	5.27	0.00951	0.00280	PASS
25℃	LV	5.92	10.16	0.00315	0.00541	PASS
	HV	3.32	17.59	0.00177	0.00935	PASS

5.6. Spurious Emissions at Antenna Terminals

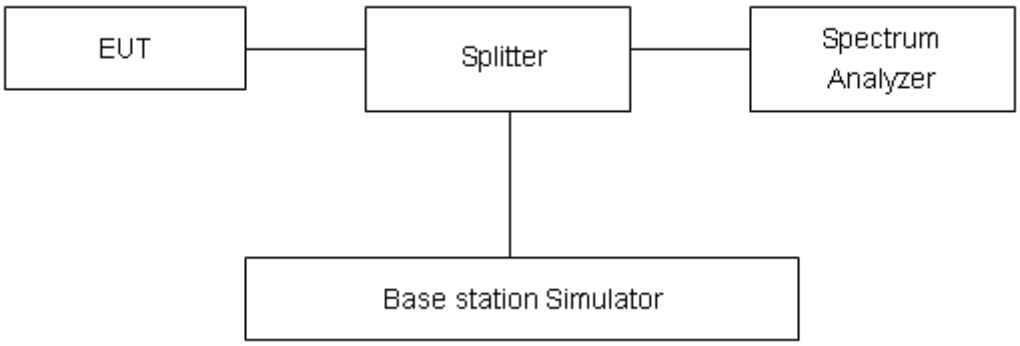
Ambient condition

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.
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.

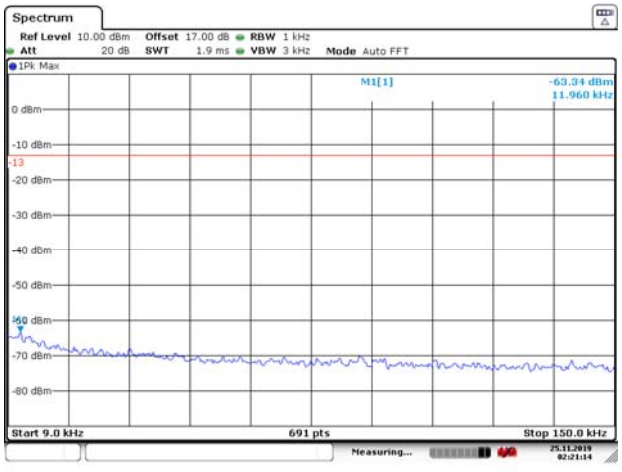
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

Test Result

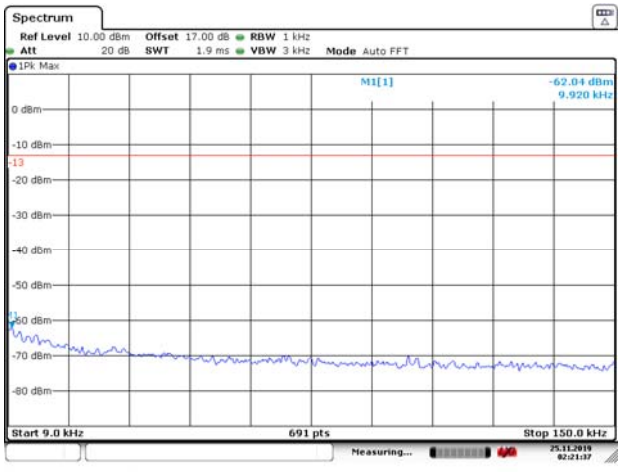
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

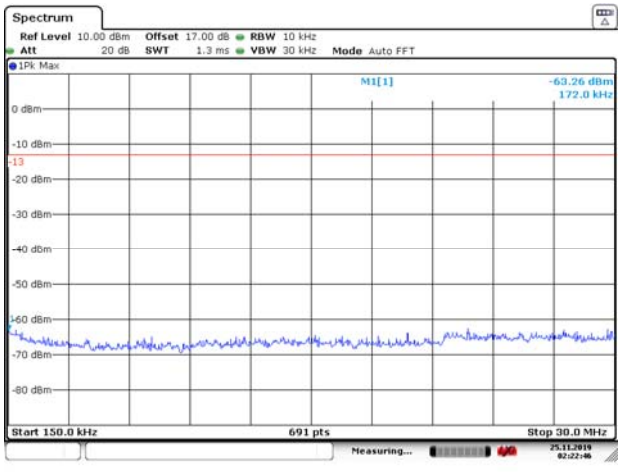
GPRS 1900 CH-Low 9kHz ~ 150kHz



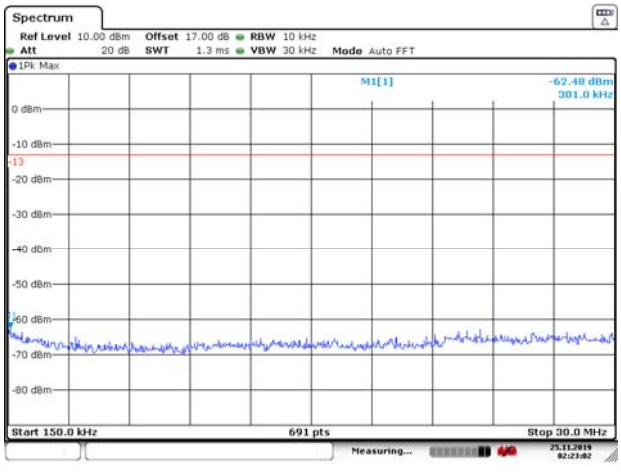
GPRS 1900 CH- Middle 9kHz ~ 150kHz



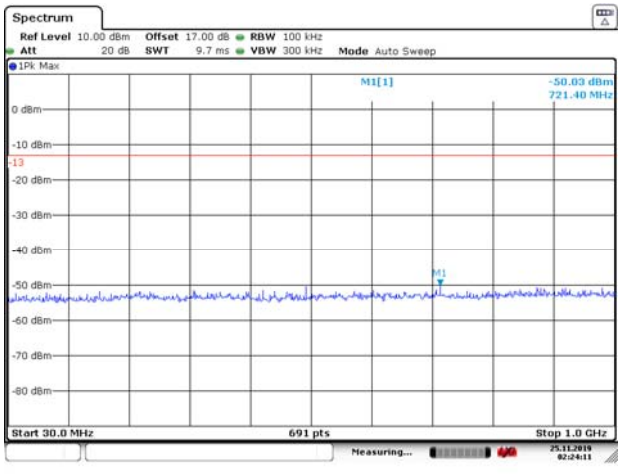
GPRS 1900 CH-Low 150kHz ~ 30MHz



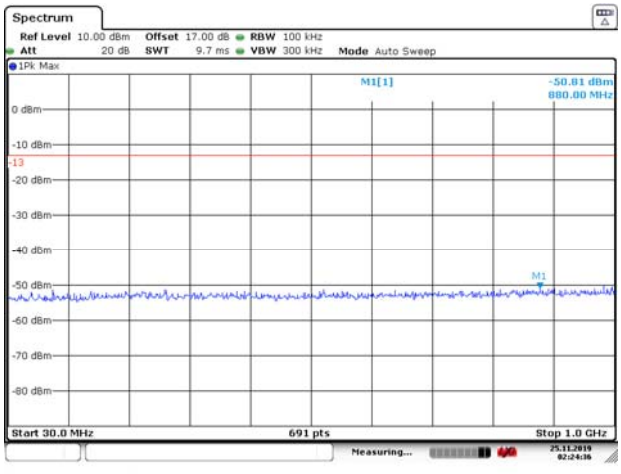
GPRS 1900 CH- Middle 150kHz ~ 30MHz



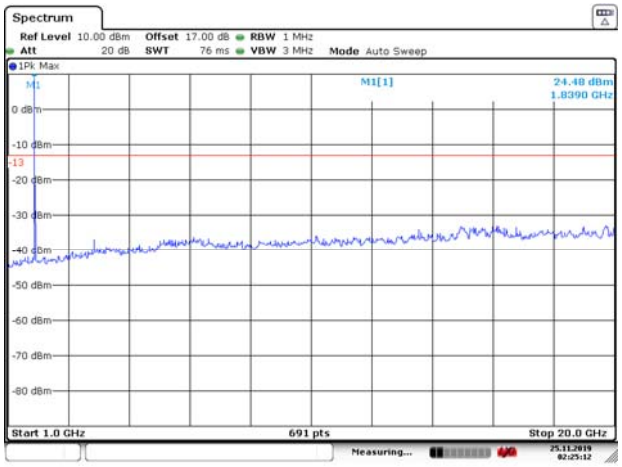
GPRS 1900 CH-Low 30MHz ~ 1GHz



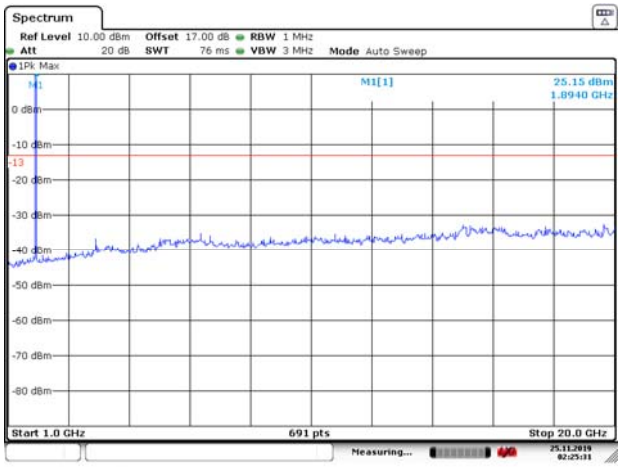
GPRS 1900 CH- Middle 30MHz ~ 1GHz



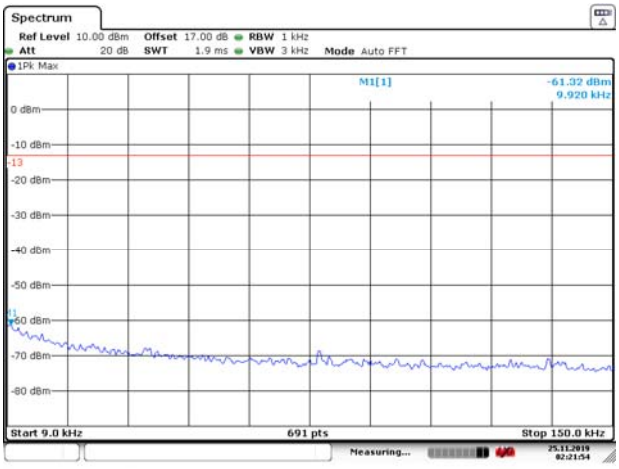
GPRS 1900 CH-Low 1GHz ~ 20GHz



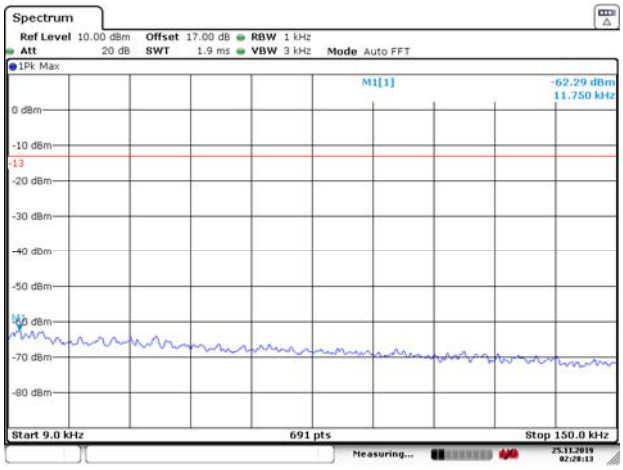
GPRS 1900 CH- Middle 1GHz ~ 20GHz



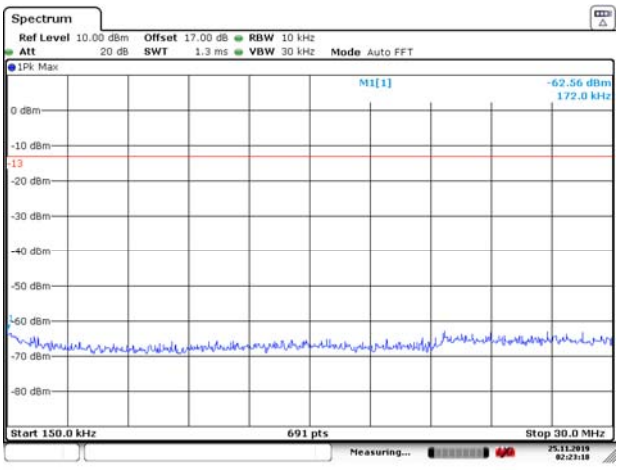
GPRS 1900 CH-High 9kHz ~ 150kHz



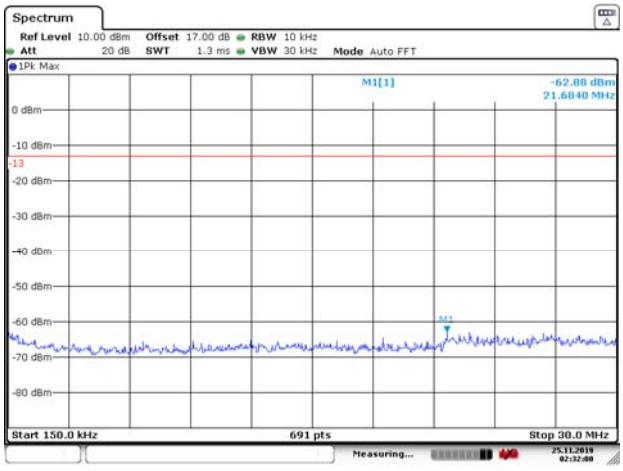
EGPRS 1900 CH-Low 9kHz ~ 150kHz



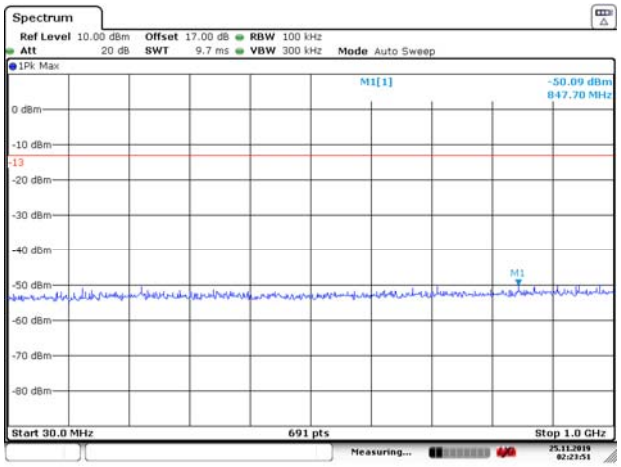
GPRS 1900 CH-High 150kHz ~ 30MHz



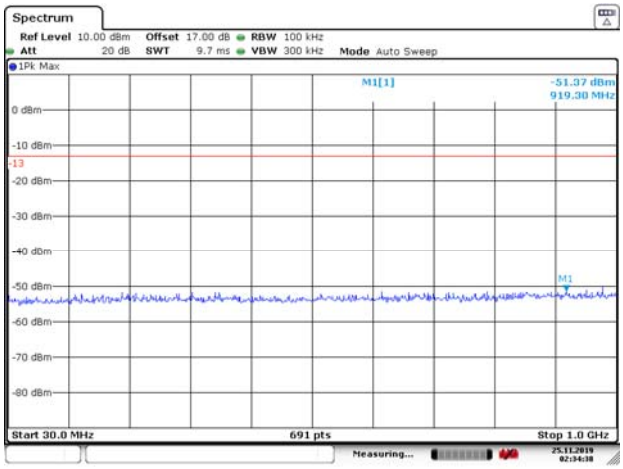
EGPRS 1900 CH-Low 150kHz ~ 30MHz



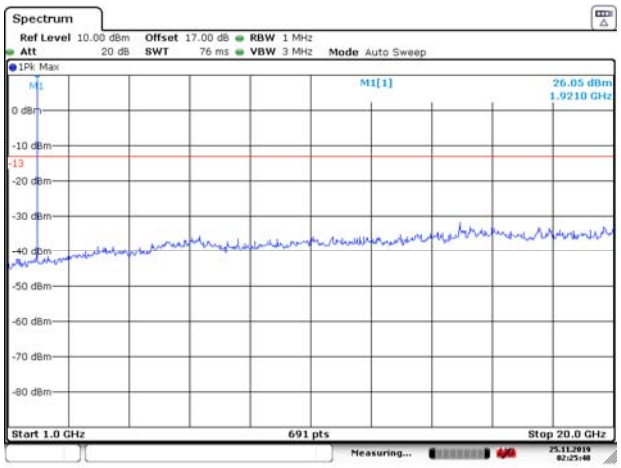
GPRS 1900 CH-High 30MHz ~ 1GHz



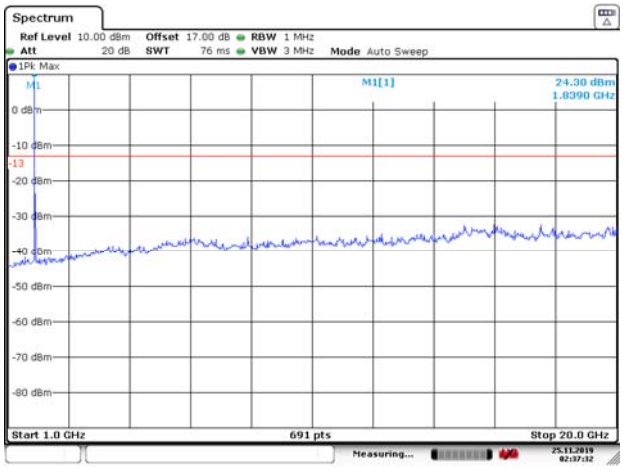
EGPRS 1900 CH-Low 30MHz ~ 1GHz



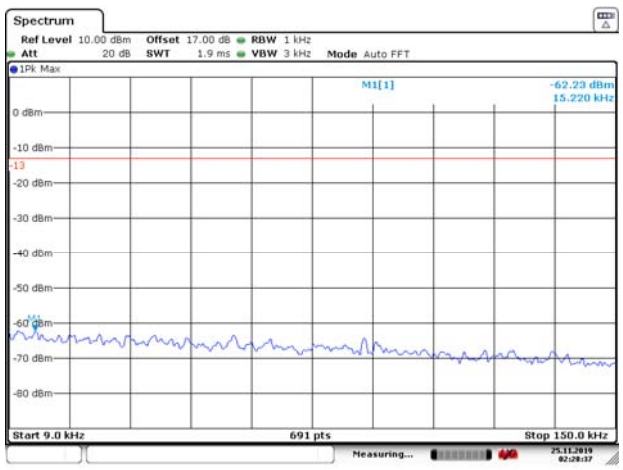
GPRS 1900 CH-High 1GHz ~ 20GHz



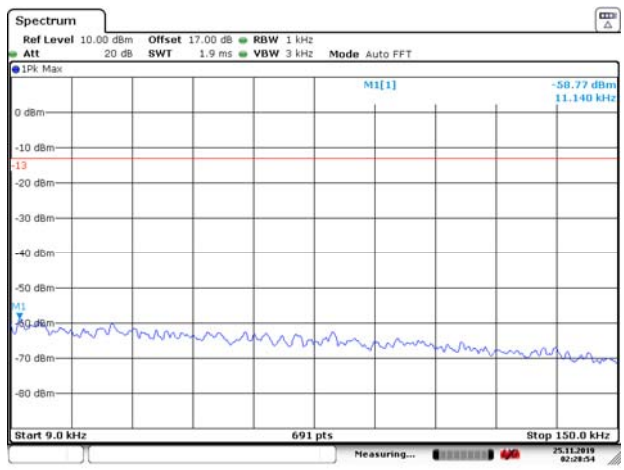
EGPRS 1900 CH-Low 1GHz ~ 20GHz



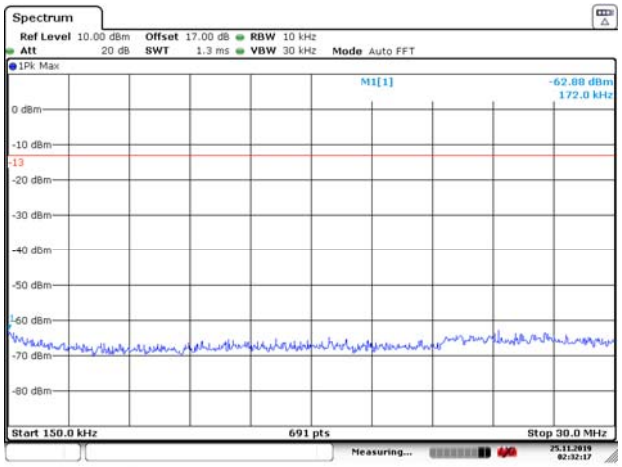
EGPRS 1900 CH- Middle 9kHz ~ 150kHz



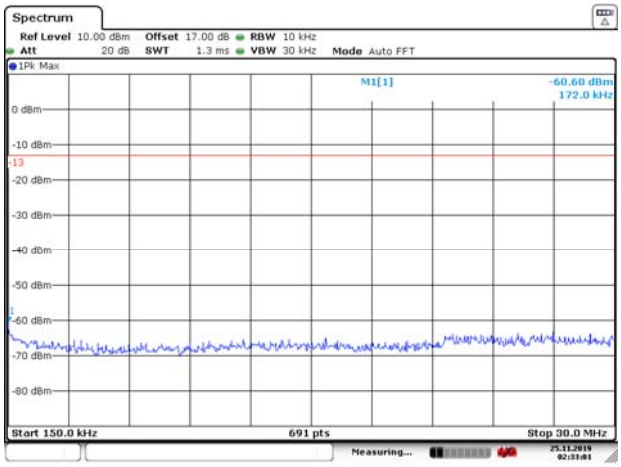
EGPRS 1900 CH-High 9kHz ~ 150kHz



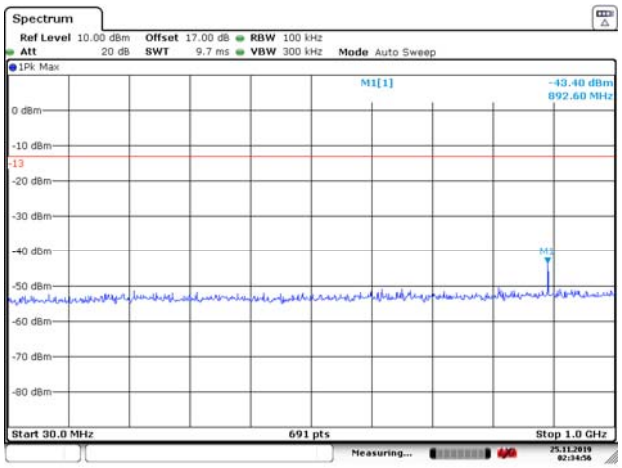
EGPRS 1900 CH- Middle 150kHz ~ 30MHz



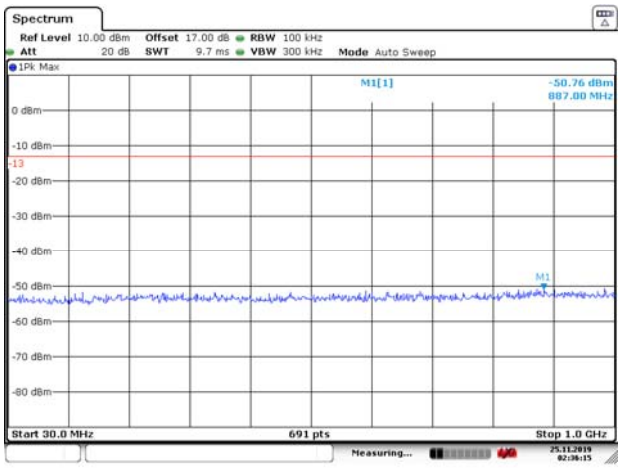
EGPRS 1900 CH-High 150kHz ~ 30MHz



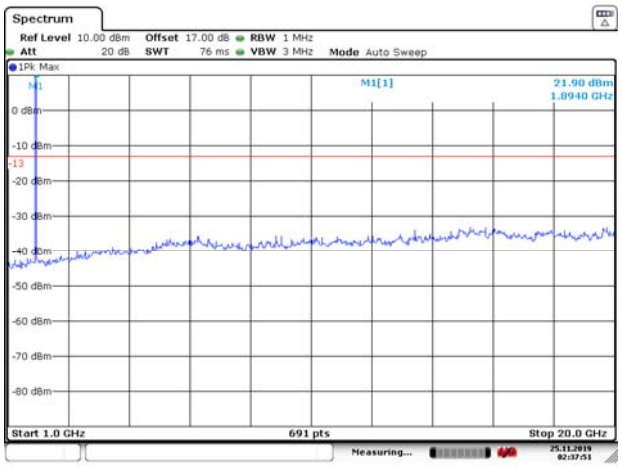
EGPRS 1900 CH- Middle 30MHz ~ 1GHz



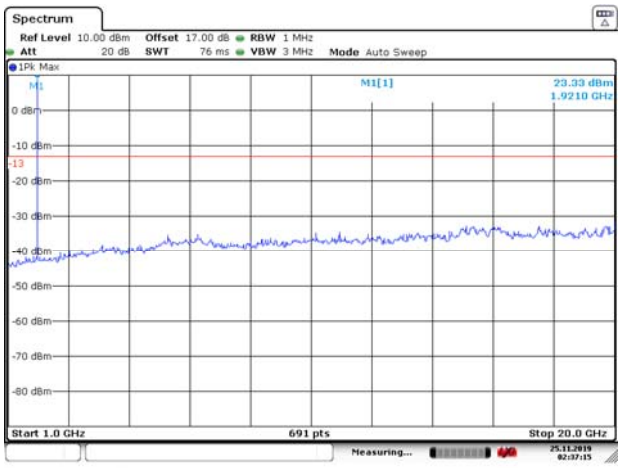
EGPRS 1900 CH-High 30MHz ~ 1GHz



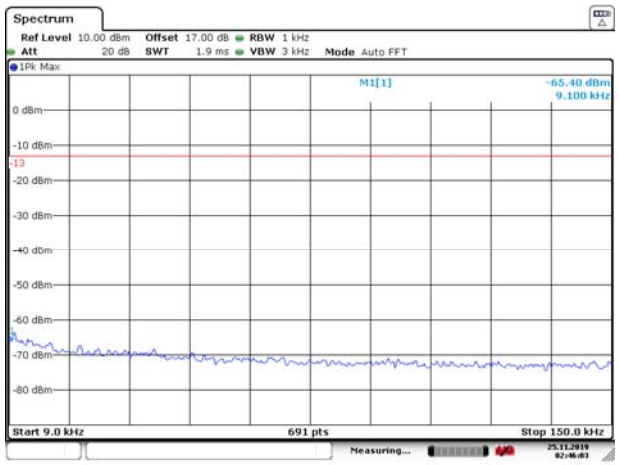
EGPRS 1900 CH- Middle 1GHz ~ 20GHz



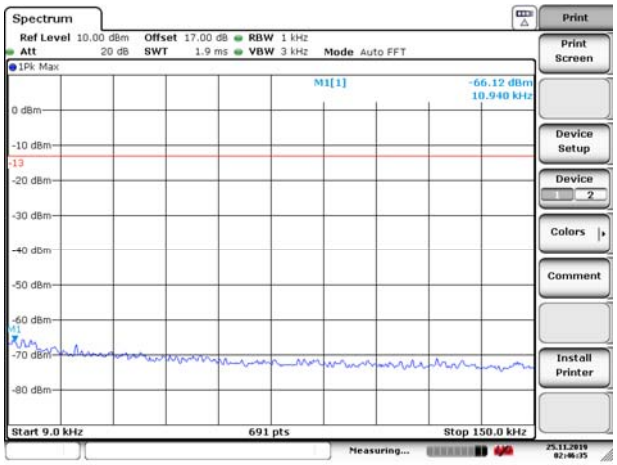
EGPRS 1900 CH-High 1GHz ~ 20GHz



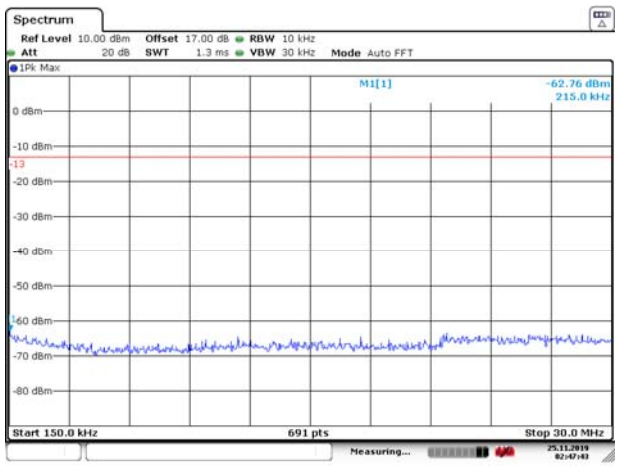
WCDMA BAND II CH-Low 9kHz ~ 150kHz



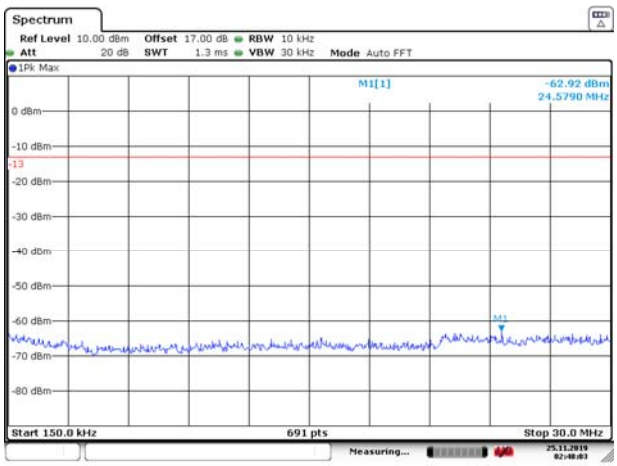
WCDMA BAND II CH- Middle 9kHz ~ 150kHz



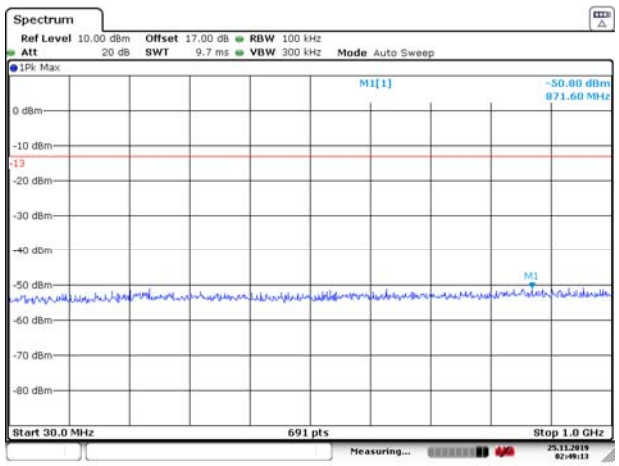
WCDMA BAND II CH-Low 150kHz ~ 30MHz



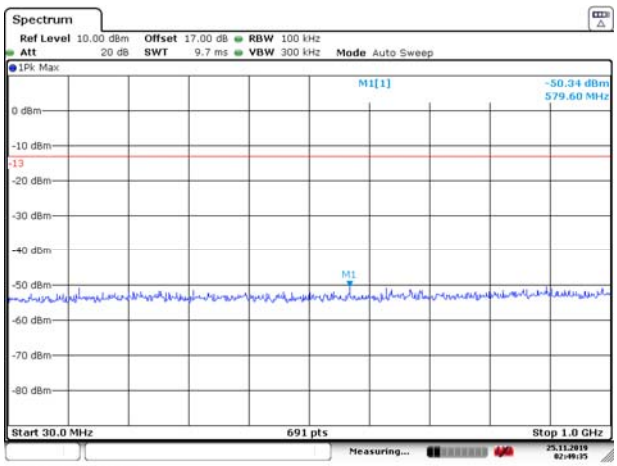
WCDMA BAND II CH- Middle 150kHz ~ 30MHz



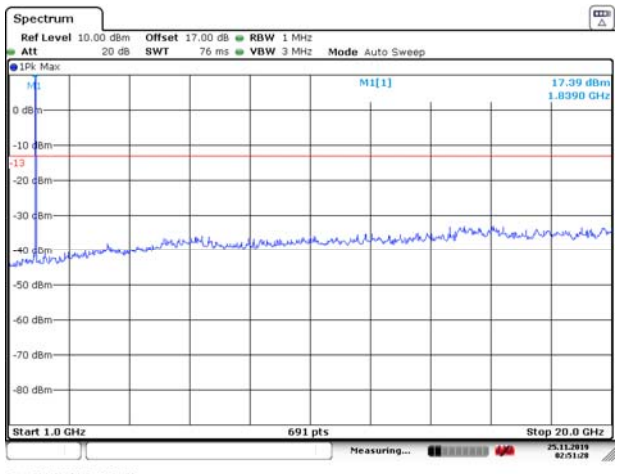
WCDMA BAND II CH-Low 30MHz ~ 1GHz



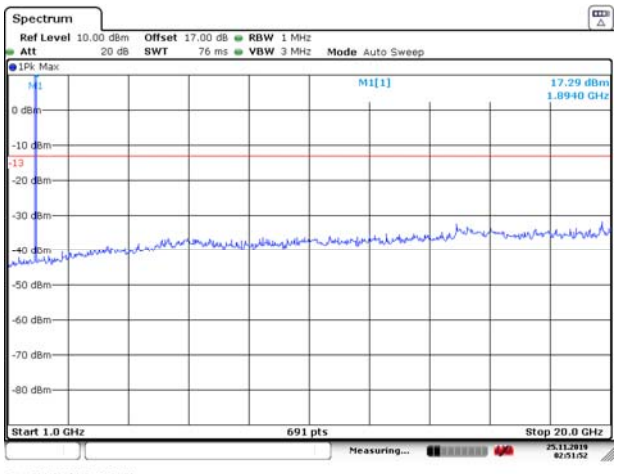
WCDMA BAND II CH- Middle 30MHz ~ 1GHz



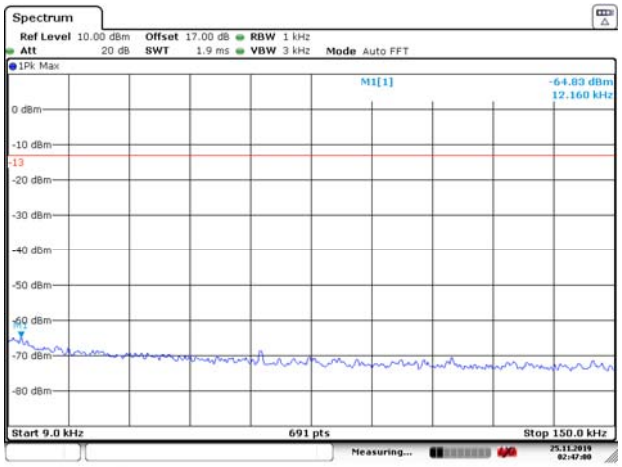
WCDMA BAND II CH-Low 1GHz ~ 20GHz



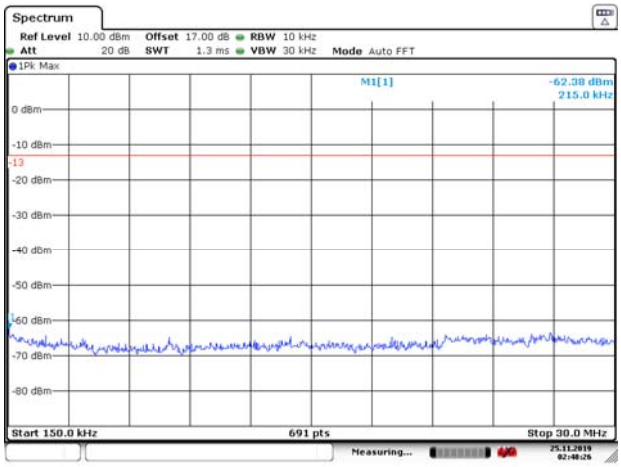
WCDMA BAND II CH- Middle 1GHz ~ 20GHz



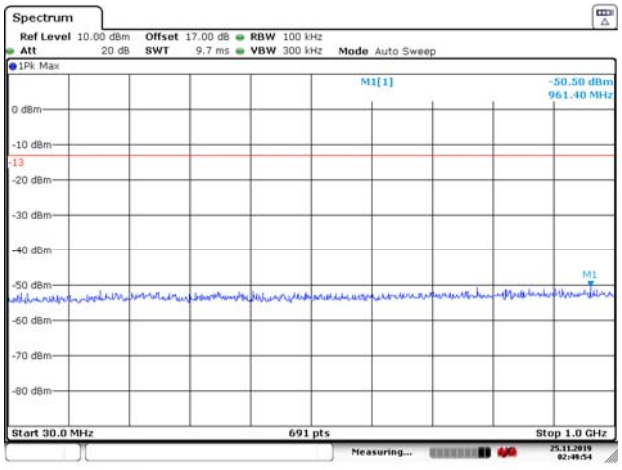
WCDMA BAND II CH-High 9kHz ~ 150kHz



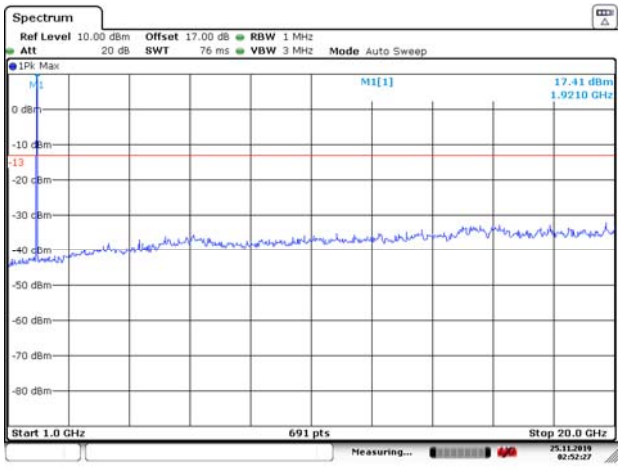
WCDMA BAND II CH-High 150kHz ~ 30MHz



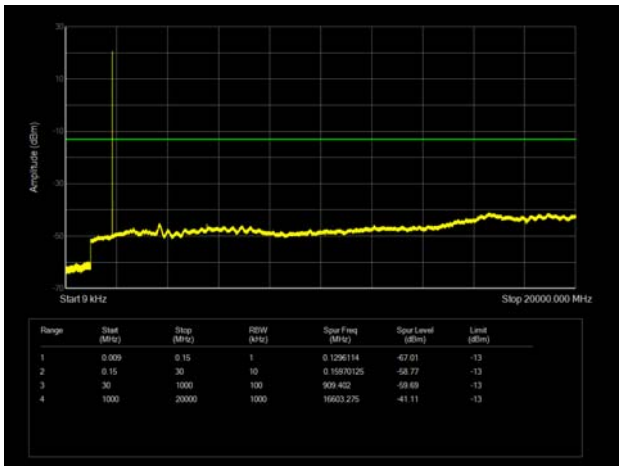
WCDMA BAND II CH-High 30MHz ~ 1GHz



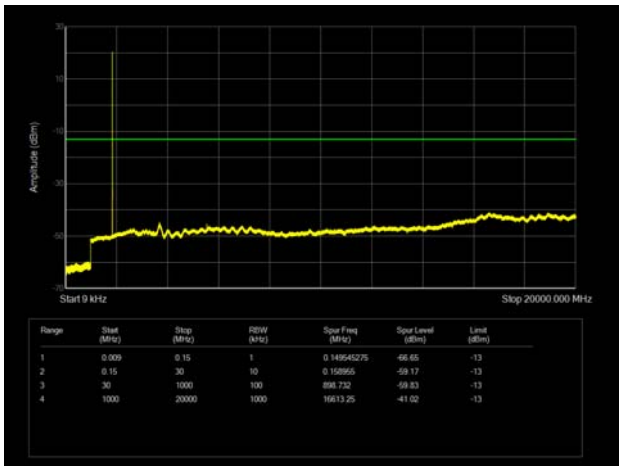
WCDMA BAND II CH-High 1GHz ~ 20GHz



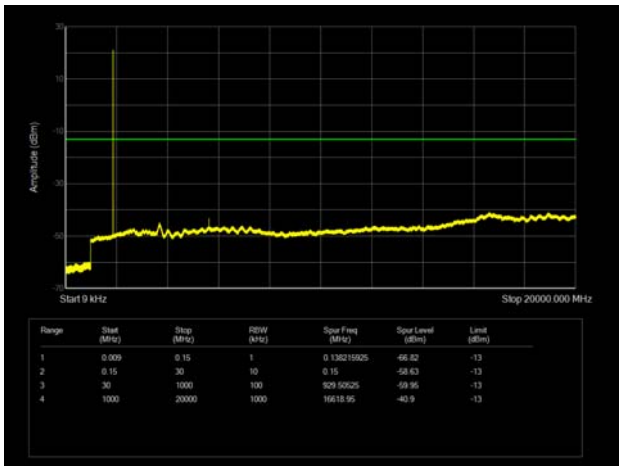
LTE Band 2 1.4MHz CH-Low 9kHz~20GHz



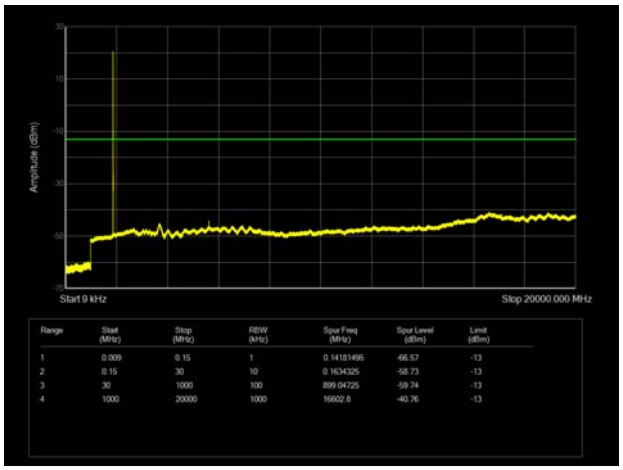
LTE Band 2 3MHz CH-Low 9kHz~20GHz



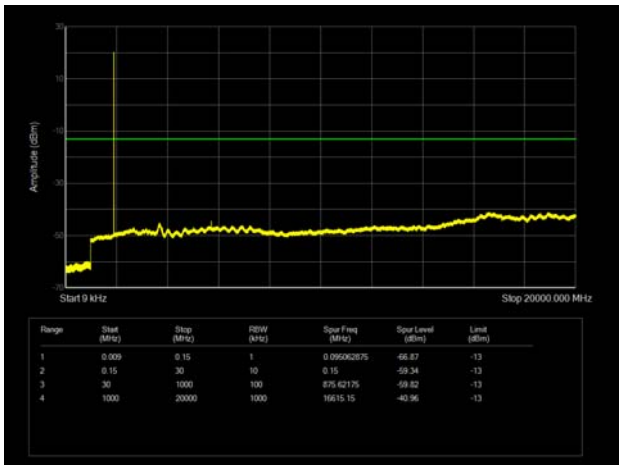
LTE Band 2 1.4MHz CH-Middle 9kHz~20GHz



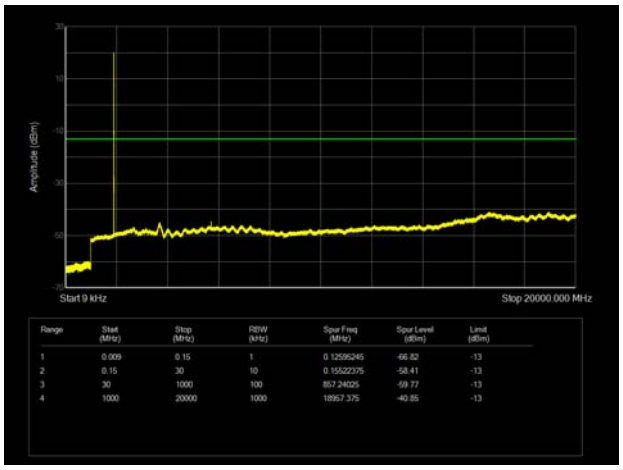
LTE Band 2 3MHz CH-Middle 9kHz~20GHz



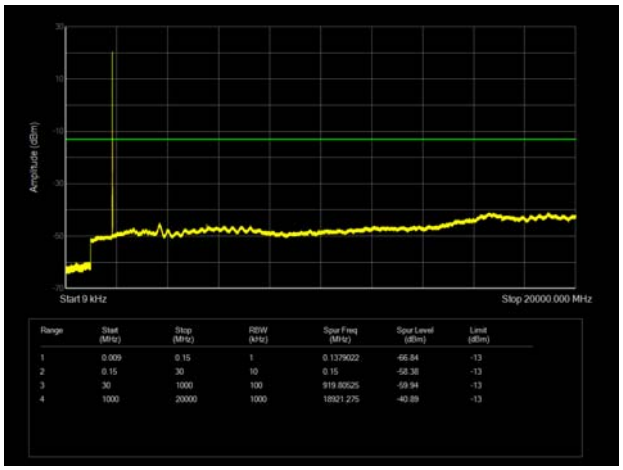
LTE Band 2 1.4MHz CH-High 9kHz~20GHz



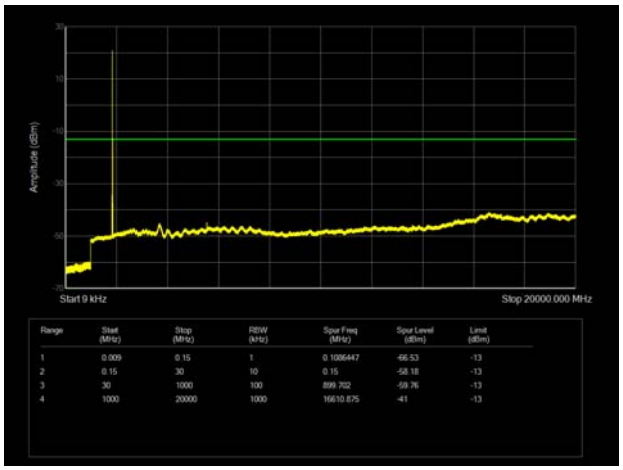
LTE Band 2 3MHz CH-High 9kHz~20GHz



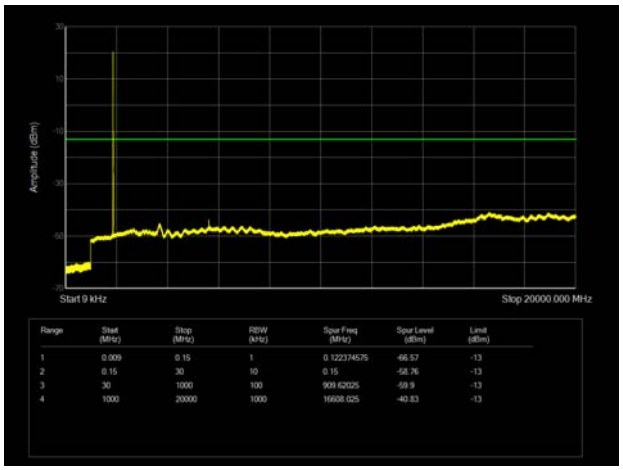
LTE Band 2 5MHz CH-Low 9kHz~20GHz



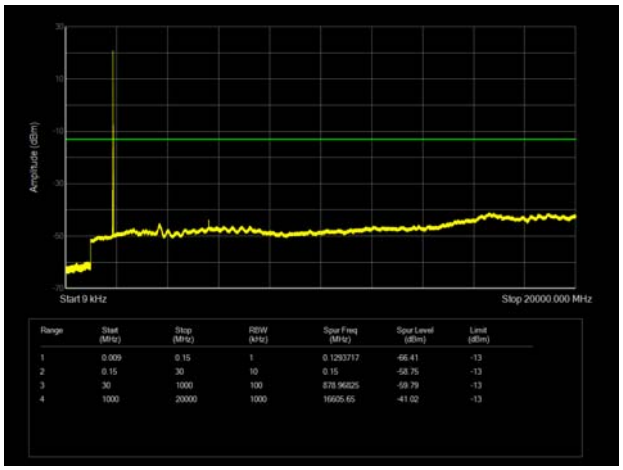
LTE Band 2 10MHz CH-Low 9kHz~20GHz



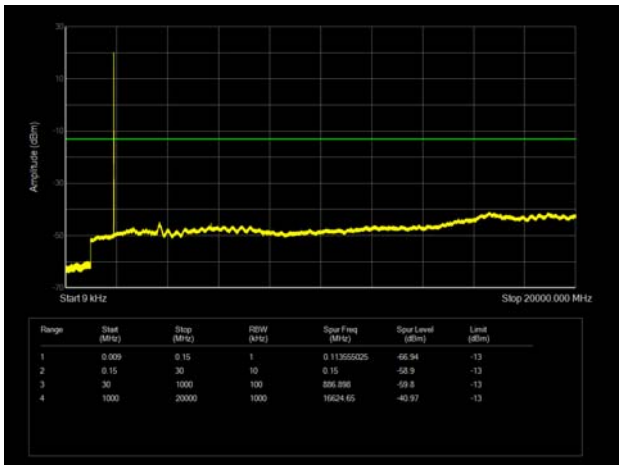
LTE Band 2 5MHz CH-Middle 9kHz~20GHz



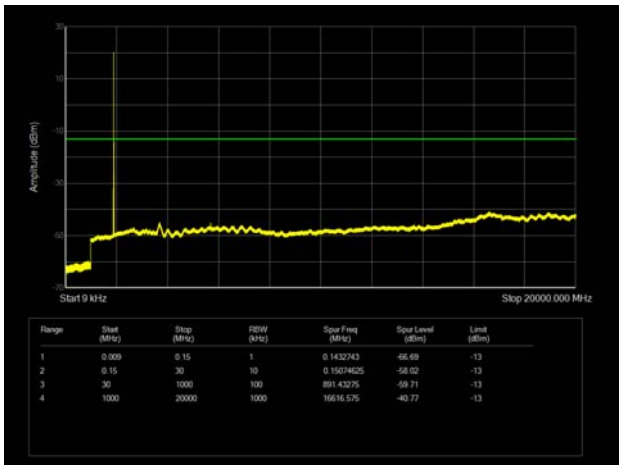
LTE Band 2 10MHz CH-Middle 9kHz~20GHz



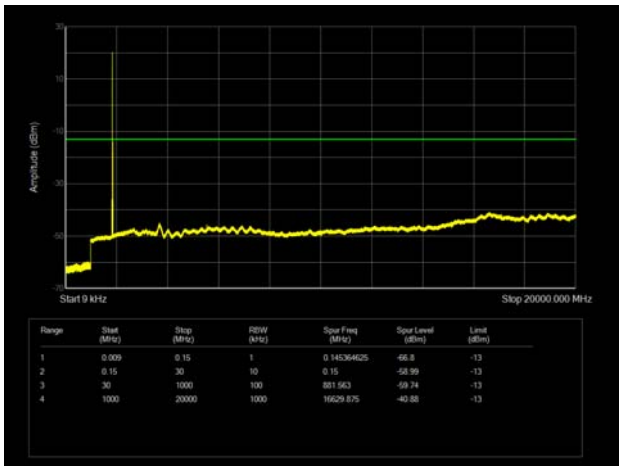
LTE Band 2 5MHz CH-High 9kHz~20GHz



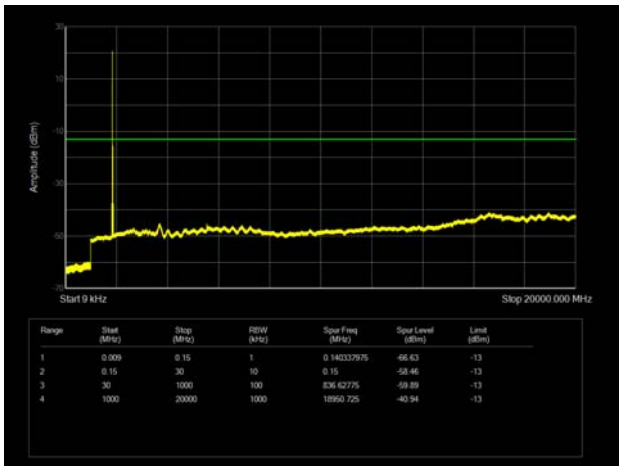
LTE Band 2 10MHz CH-High 9kHz~20GHz



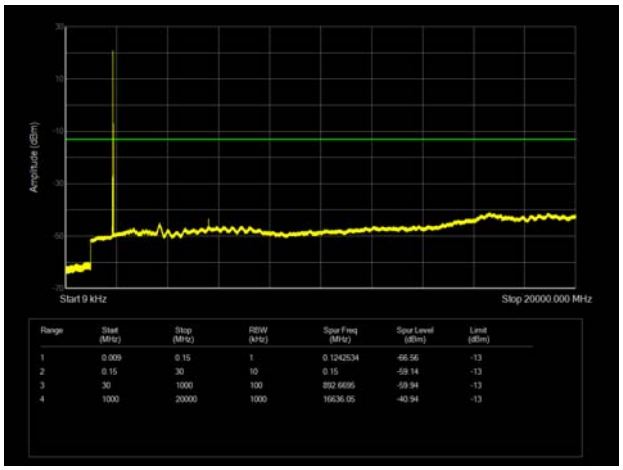
LTE Band 2 15MHz CH-Low 9kHz~20GHz



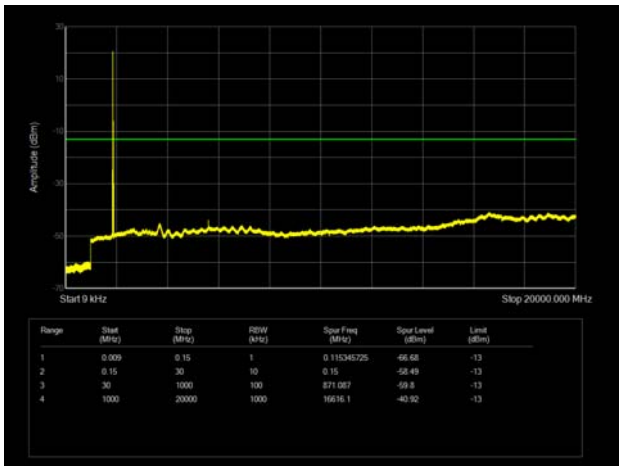
LTE Band 2 20MHz CH-Low 9kHz~20GHz



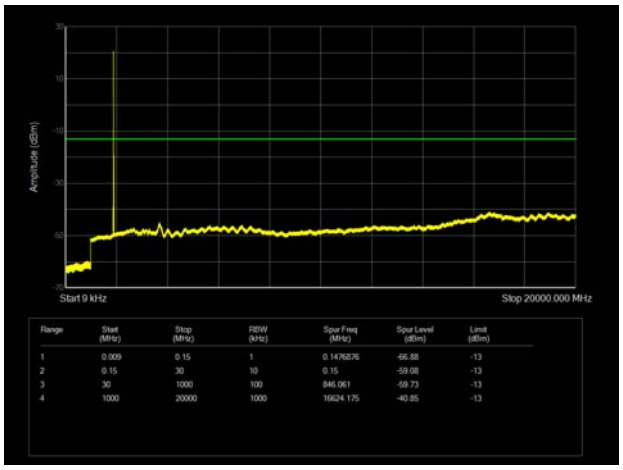
LTE Band 2 15MHz CH-Middle 9kHz~20GHz



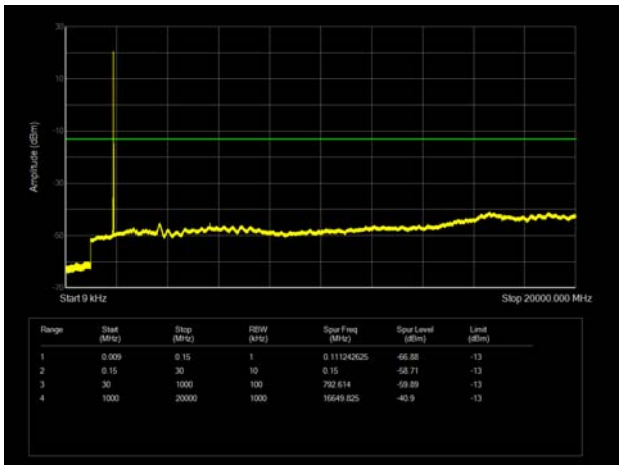
LTE Band 2 20MHz CH-Middle 9kHz~20GHz



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



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



5.7. Radiates Spurious Emission

Ambient condition

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

Method of Measurement

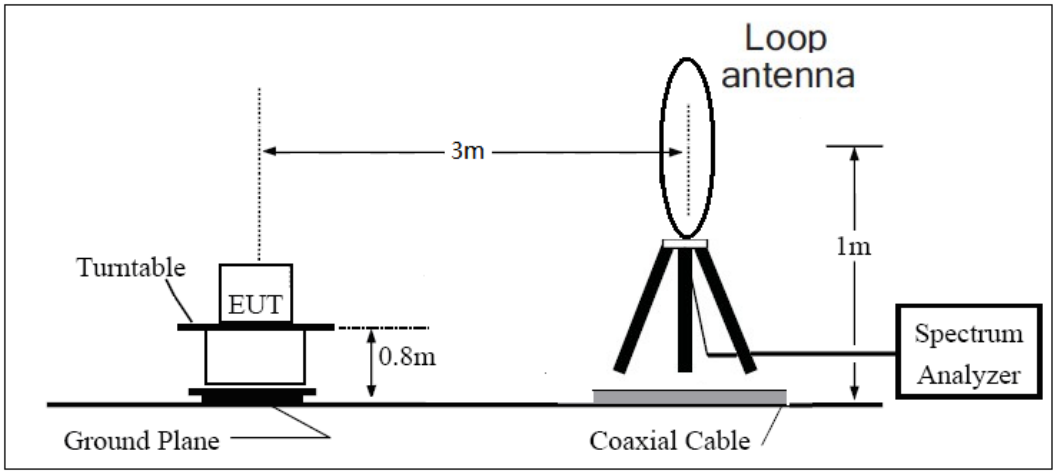
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:
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 dBi)

and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

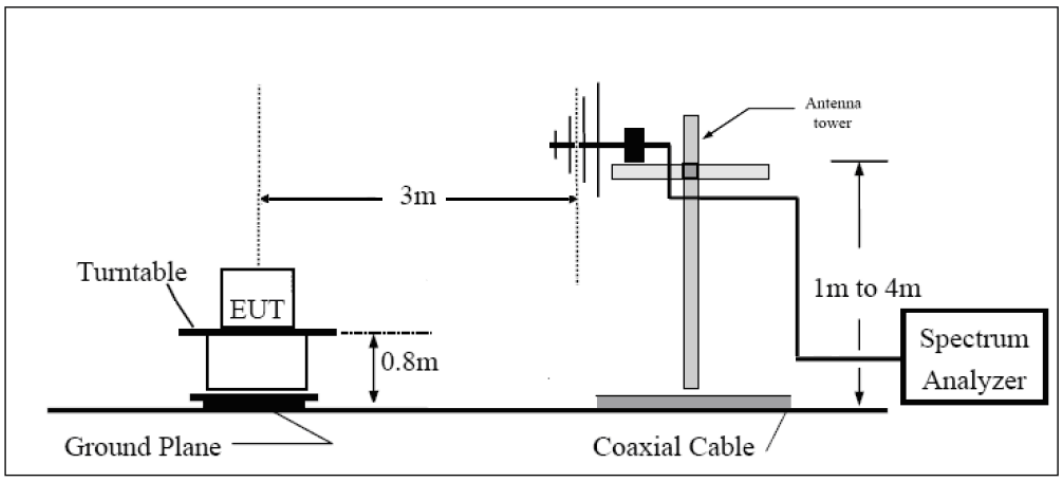
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

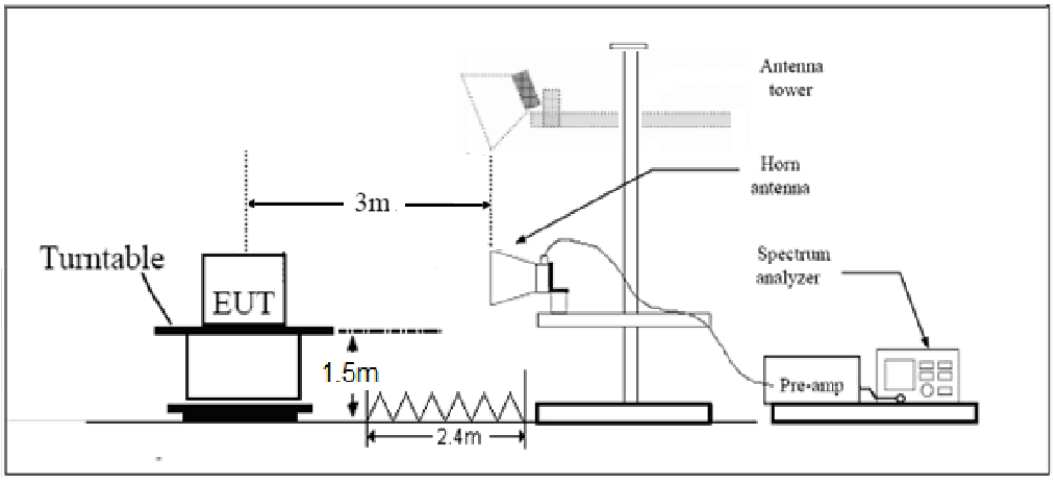
9KHz ~ 30MHz



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.

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	3760.0	-52.00	5.10	11.05	Horizontal	-46.05	-13.00	33.05	135
3	5640.0	-51.75	5.42	12.65	Horizontal	-44.52	-13.00	31.52	270
4	7520.0	-54.95	6.70	13.85	Horizontal	-47.80	-13.00	34.80	90
5	9400.0	-53.53	7.01	14.75	Horizontal	-45.79	-13.00	32.79	225
6	11280.0	-51.38	7.48	15.95	Horizontal	-42.91	-13.00	29.91	180
7	13160.0	-49.59	7.51	16.55	Horizontal	-40.55	-13.00	27.55	0
8	15040.0	-49.12	8.24	15.35	Horizontal	-42.01	-13.00	29.01	315
9	16920.0	-42.31	8.41	14.95	Horizontal	-35.77	-13.00	22.77	45
10	18800.0	-	-	-	-	-	-	-	-
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	3760.0	-54.11	5.10	11.05	Horizontal	-48.16	-13.00	35.16	270
3	5640.0	-47.99	5.42	12.65	Horizontal	-40.76	-13.00	27.76	225
4	7520.0	-54.94	6.70	13.85	Horizontal	-47.79	-13.00	34.79	315
5	9400.0	-53.68	7.01	14.75	Horizontal	-45.94	-13.00	32.94	90
6	11280.0	-52.61	7.48	15.95	Horizontal	-44.14	-13.00	31.14	180
7	13160.0	-50.85	7.51	16.55	Horizontal	-41.81	-13.00	28.81	0
8	15040.0	-48.86	8.24	15.35	Horizontal	-41.75	-13.00	28.75	135
9	16920.0	-45.56	8.41	14.95	Horizontal	-39.02	-13.00	26.02	45
10	18800.0	-	-	-	-	-	-	-	-
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	3759.0	-59.51	5.10	11.05	Horizontal	-53.56	-13.00	40.56	0
3	5638.9	-47.68	5.42	12.65	Horizontal	-40.45	-13.00	27.45	90
4	7520.0	-62.28	6.70	13.85	Horizontal	-55.13	-13.00	42.13	135
5	9400.0	-61.17	7.01	14.75	Horizontal	-53.43	-13.00	40.43	180
6	11280.0	-64.56	7.48	15.95	Horizontal	-56.09	-13.00	43.09	315
7	13160.0	-64.59	7.51	16.55	Horizontal	-55.55	-13.00	42.55	45
8	15040.0	-62.16	8.24	15.35	Horizontal	-55.05	-13.00	42.05	270
9	16920.0	-60.72	8.41	14.95	Horizontal	-54.18	-13.00	41.18	225
10	18800.0	-	-	-	-	-	-	-	-
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	3755.6	-59.13	5.10	11.05	Horizontal	-53.18	-13.00	40.18	180
3	5633.6	-47.86	5.42	12.65	Horizontal	-40.63	-13.00	27.63	90
4	7520.0	-62.78	6.70	13.85	Horizontal	-55.63	-13.00	42.63	0
5	9400.0	-61.82	7.01	14.75	Horizontal	-54.08	-13.00	41.08	45
6	11280.0	-64.92	7.48	15.95	Horizontal	-56.45	-13.00	43.45	315
7	13160.0	-64.51	7.51	16.55	Horizontal	-55.47	-13.00	42.47	135
8	15040.0	-63.53	8.24	15.35	Horizontal	-56.42	-13.00	43.42	0
9	16920.0	-61.36	8.41	14.95	Horizontal	-54.82	-13.00	41.82	90
10	18800.0	-	-	-	-	-	-	-	-
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	3742.1	-58.96	5.10	11.05	Horizontal	-53.01	-13.00	40.01	45
3	5613.4	-48.20	5.42	12.65	Horizontal	-40.97	-13.00	27.97	315
4	7484.6	-62.82	6.70	13.85	Horizontal	-55.67	-13.00	42.67	180
5	9400.0	-61.76	7.01	14.75	Horizontal	-54.02	-13.00	41.02	90
6	11280.0	-64.73	7.48	15.95	Horizontal	-56.26	-13.00	43.26	0
7	13160.0	-64.58	7.51	16.55	Horizontal	-55.54	-13.00	42.54	270
8	15040.0	-61.50	8.24	15.35	Horizontal	-54.39	-13.00	41.39	45
9	16920.0	-61.20	8.41	14.95	Horizontal	-54.66	-13.00	41.66	180
10	18800.0	-	-	-	-	-	-	-	-
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMU200	118133	2019-05-19	2020-05-18
Base Station Simulator	R&S	CMW500	113824	2019-05-19	2020-05-18
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2019-05-19	2020-05-18
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2019-05-19	2020-05-18
Signal Analyzer	R&S	FSV30	100815	2018-12-16	2019-12-15
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Signal generator	R&S	SMB 100A	102594	2019-05-19	2020-05-18
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preampflier	R&S	SCU18	102327	2019-05-19	2020-05-18
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2019-05-19	2020-05-18
RF Cable	Agilent	SMA 15cm	0001	2019-06-14	2019-12-13
Software	R&S	EMC32	9.26.0	/	/

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