



RF TEST REPORT

Applicant	Quectel Wireless Solutions Co., Ltd
FCC ID	XMR202008EG95NAXD
Product	LTE Module
Brand	Quectel
Model	EG95-NAXD
Report No.	R2006A0378-R6
Issue Date	August 25, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2019)/ FCC CFR47 Part 27C (2019)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	Refer to the original
2	Effective Isotropic Radiated power	27.50(d)(4)/27.50(b)(10) /27.50(c)(10)	Refer to the original
3	Occupied Bandwidth	2.1049	Refer to the original
4	Band Edge Compliance	27.53(h)/27.53(g)/27.53(f) /27.53(c)	Refer to the original
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	Refer to the original
6	Frequency Stability	2.1055 / 27.54	PASS
7	Spurious Emissions at Antenna Terminals	2.1051/27.53(h)/27.53(g)/27.53(f)	PASS
8	Radiates Spurious Emission	2.1051/27.53(h) /27.53(g) /27.53(f)	Refer to the original

Date of Testing: May 25, 2018 ~ June 27, 2018 and June 29, 2020 and August 21,2020

Note: PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

EG95-NAXD (Report No.: R2006A0378-R6) is a variant of the EG95-NAX (Report No.: R1907A0407-R6V1). Test values duplicated from Original for variant. There is only tested Frequency Stability and Spurious Emissions at Antenna Terminals for variant in this report. The detailed product change description please refers to the Statement letter EG95-NAX& EG95-NAXD.

EG95-NAX (Report No.: R1907A0407-R6V1) is a variant of the EG95-NA (Report No.: R1805A0249-R3).Test values duplicated from Original for variant. There is no test for variant in this report.

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 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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2 General Description of Equipment under Test

Client Information

Applicant	Quectel Wireless Solutions Co., Ltd
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

General information

EUT Description		
Model	EG95-NAXD	
IMEI	863071010199125	
Hardware Version	R1.0	
Software Version	EG95NAXDGAR07A01M1G	
Power Supply	External Power Supply	
Antenna Type	The EUT don't have standard Antenna, The Antenna used for testing in this report is the after-market accessory (Dipole Antenna)	
Antenna Gain	Frequency(MHz)	Gain(dBi)
	700	1.66
	710	3.26
	720	3.95
	780	4.45
	1720	1.94
	1740	2.0
Test Mode(s)	WCDMA Band IV; LTE Band 4; LTE Band 12, LTE Band 13;	
Test Modulation	(WCDMA) BPSK, QPSK,16QAM; (LTE)QPSK 16QAM;	
HSDPA UE Category	24	
HSUPA UE Category	6	
DC-HSDPA UE Category	24	
LTE Category	4	
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV:	25.63dBm
	LTE Band 4:	25.14dBm
	LTE Band 12:	19.7dBm
	LTE Band 13:	22.41Bm
Rated Power Supply Voltage:	3.8V	
Extreme Voltage	Minimum: 3.3V Maximum: 4.3V	
Extreme Temperature	Lowest: -40°C Highest: +85°C	



Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	WCDMA Band IV	1710 ~ 1755	2110 ~ 2155
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 12	699 ~ 716	729 ~ 746
	LTE Band 13	777 ~ 787	746 ~ 756
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 CFR47 Part 27C (2019)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2019)

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 position) 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 WCDMA/LTE is set based on the maximum RF Output Power.

The following testing in different Bandwidth is set to detail in the following table:

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

	Test items	Modes/Modulation
		WCDMA Band IV
Conducted Test cases	RF power output	RMC HSDPA/HSUPA DC-HSDPA
	Occupied Bandwidth	RMC
	Band Edge Compliance	RMC
	Peak-to-Average Power Ratio	RMC
	Frequency Stability	RMC
	Spurious Emissions at Antenna Terminals	RMC
Radiated Test cases	Effective Isotropic Radiated power	RMC
	Radiates Spurious Emission	RMC

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/12/13:

Test items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
Occupied Bandwidth	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	O	O	O
Band Edge Compliance	LTE 4	O	O	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 12	O	O	O	O	-	-	O	O	O	-	O	O	-	O
	LTE 13	-	-	O	O	-	-	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	O	O	O
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	O	O	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
Spurious Emissions at Antenna Terminals	LTE 4	O	O	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 12	O	O	O	O	-	-	O	-	O	-	-	O	O	O
	LTE 13	-	-	O	O	-	-	O	-	O	-	-	O	O	O
Radiates Spurious Emission	LTE 4	O	-	O	-	-	O	O	-	O	-	-	O	O	O
	LTE 12	O	-	O	O	-	-	O	-	O	-	-	O	O	O
	LTE 13	-	-	O	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

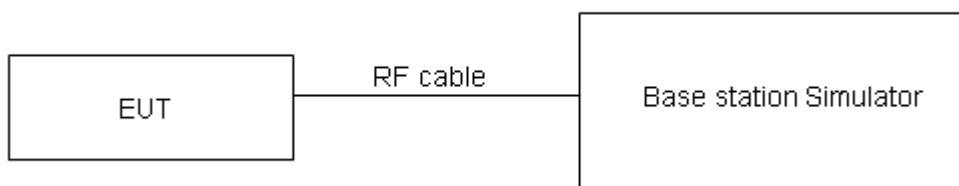
Ambient condition

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.

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.

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

WCDMA Band IV		AV Conducted Power(dBm)		
		Channel 1312	Channel 1413	Channel 1513
		1712.4 (MHz)	1732.6 (MHz)	1752.6(MHz)
RMC	12.2k	23.56	23.56	23.50
	64k	23.42	23.50	23.37
	144k	23.41	23.40	23.36
	384k	23.40	23.39	23.35
HSDPA	Sub - Test 1	22.76	22.81	22.71
	Sub - Test 2	22.86	22.77	22.73
	Sub - Test 3	22.85	22.77	22.72
	Sub - Test 4	22.85	22.78	22.68
HSUPA	Sub - Test 1	23.20	23.11	23.07
	Sub - Test 2	23.24	23.21	23.16
	Sub - Test 3	23.24	23.20	23.16
	Sub - Test 4	22.78	22.73	22.78
	Sub - Test 5	22.86	22.69	22.67
DC-HSDPA	Sub - Test 1	23.43	23.43	23.37
	Sub - Test 2	23.41	23.42	23.36
	Sub - Test 3	22.90	22.91	22.85
	Sub - Test 4	22.89	22.90	22.84

LTE Band 4				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
1.4MHz	QPSK	1	0	23.76	24.02	23.83
		1	2	23.56	23.92	23.99
		1	5	24.00	23.83	23.91
		3	0	23.82	23.68	23.89
		3	2	23.74	23.83	23.69
		3	3	23.89	23.86	23.75
		6	0	22.70	22.91	22.91
	16QAM	1	0	23.56	22.91	23.49
		1	2	23.60	22.88	23.32
		1	5	23.78	22.87	23.56
		3	0	22.60	22.68	22.92
		3	2	22.65	22.78	22.92
		3	3	22.71	22.89	22.83
		6	0	21.86	21.88	21.97
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	23.78	24.06	23.86
		1	7	23.59	23.97	24.03
		1	14	24.03	23.88	23.95
		8	0	22.92	22.80	23.02
		8	4	22.86	22.93	22.81
		8	7	22.99	22.97	22.85
		15	0	22.73	22.95	22.94
	16QAM	1	0	23.59	22.93	23.52
		1	7	23.63	22.93	23.36
		1	14	23.80	22.91	23.59
		8	0	21.71	21.81	22.04
		8	4	21.76	21.91	22.04
		8	7	21.81	22.01	21.96
		15	0	21.89	21.92	22.00
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	23.75	24.04	23.82
		1	13	23.57	23.93	24.00
		1	24	24.00	23.83	23.91
		12	0	22.89	22.75	22.98
		12	6	22.84	22.89	22.76
		12	13	22.97	22.95	22.81
		25	0	22.71	22.94	22.92



	16QAM	1	0	23.56	22.89	23.49
		1	13	23.60	22.91	23.33
		1	24	23.77	22.89	23.55
		12	0	21.69	21.77	22.01
		12	6	21.73	21.86	22.00
		12	13	21.78	21.96	21.92
		25	0	21.87	21.88	21.95
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	23.77	24.05	23.85
		1	25	23.60	23.98	24.04
		1	49	24.02	23.87	23.94
		25	0	22.92	22.80	23.02
		25	13	22.87	22.94	22.80
		25	25	22.99	22.99	22.86
		50	0	22.79	22.96	22.96
	16QAM	1	0	23.58	22.92	23.51
		1	25	23.63	22.95	23.36
		1	49	23.80	22.91	23.58
		25	0	21.72	21.82	22.05
		25	13	21.75	21.90	22.03
		25	25	21.81	22.01	21.96
		50	0	21.90	21.93	21.99
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	23.76	24.01	23.83
		1	38	23.58	23.97	24.01
		1	74	23.99	23.82	23.90
		36	0	22.90	22.76	22.99
		36	18	22.84	22.89	22.76
		36	39	22.96	22.96	22.82
		75	0	22.77	22.92	22.91
	16QAM	1	0	23.53	22.90	23.49
		1	38	23.61	22.92	23.34
		1	74	23.77	22.87	23.55
		36	0	21.69	21.80	22.02
		36	18	21.72	21.85	21.99
		36	39	21.79	21.97	21.93
		75	0	21.87	21.88	21.95
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	23.73	23.97	23.80
		1	50	23.57	23.93	23.99



		1	99	23.97	23.81	23.87
		50	0	22.87	22.71	22.95
		50	25	22.82	22.85	22.73
		50	50	22.93	22.91	22.78
		100	0	22.74	22.87	22.87
	16QAM	1	0	23.51	22.86	23.44
		1	50	23.57	22.90	23.30
		1	99	23.75	22.84	23.53
		50	0	21.66	21.76	21.99
		50	25	21.69	21.83	21.96
		50	50	21.76	21.92	21.89
		100	0	21.85	21.84	21.92

LTE Band 12				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23017/699.7	23095/707.5	23173/715.3
1.4MHz	QPSK	1	0	23.32	23.88	23.58
		1	2	23.55	23.70	23.50
		1	5	23.52	23.31	23.50
		3	0	23.62	23.54	23.59
		3	2	23.81	23.61	23.51
		3	3	23.57	23.51	23.66
		6	0	22.54	22.53	22.65
	16QAM	1	0	22.53	22.31	23.13
		1	2	23.19	22.33	23.60
		1	5	22.70	22.19	22.81
		3	0	22.53	22.59	22.69
		3	2	22.70	22.57	22.78
		3	3	22.57	22.51	22.80
		6	0	21.44	21.60	21.69
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23025/700.5	23095/707.5	23165/714.5
3MHz	QPSK	1	0	23.33	23.91	23.60
		1	7	23.59	23.76	23.55
		1	14	23.54	23.35	23.53
		8	0	22.72	22.66	22.72
		8	4	22.94	22.72	22.62
		8	7	22.67	22.64	22.77
		15	0	22.63	22.58	22.70
	16QAM	1	0	22.55	22.32	23.15
		1	7	23.22	22.40	23.64



		1	14	22.72	22.23	22.83
		8	0	21.65	21.73	21.82
		8	4	21.80	21.69	21.89
		8	7	21.67	21.63	21.93
		15	0	21.48	21.65	21.71
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23035/701.5	23095/707.5	23155/713.5
5MHz	QPSK	1	0	23.32	23.87	23.58
		1	13	23.57	23.75	23.52
		1	24	23.51	23.30	23.49
		12	0	22.70	22.62	22.69
		12	6	22.91	22.67	22.58
		12	13	22.64	22.61	22.73
		25	0	22.61	22.54	22.65
	16QAM	1	0	22.50	22.30	23.13
		1	13	23.20	22.37	23.62
		1	24	22.69	22.19	22.80
		12	0	21.62	21.71	21.79
		12	6	21.77	21.64	21.85
		12	13	21.65	21.59	21.90
		25	0	21.45	21.60	21.67
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23060/704	23095/707.5	23130/711
10MHz	QPSK	1	0	23.29	23.83	23.55
		1	25	23.56	23.71	23.50
		1	49	23.49	23.29	23.46
		25	0	22.67	22.57	22.65
		25	13	22.89	22.63	22.55
		25	25	22.61	22.56	22.69
		50	0	22.58	22.49	22.61
	16QAM	1	0	22.48	22.26	23.08
		1	25	23.16	22.35	23.58
		1	49	22.67	22.16	22.78
		25	0	21.59	21.67	21.76
		25	13	21.74	21.62	21.82
		25	25	21.62	21.54	21.86
		50	0	21.43	21.56	21.64

LTE Band 13				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23205/779.5	23230/782	23255/784.5
5MHz	QPSK	1	0	23.56	23.41	23.36
		1	13	23.31	23.60	23.58
		1	24	23.33	21.39	23.46
		12	0	22.58	22.49	22.43
		12	6	22.50	22.67	22.65
		12	13	22.49	22.60	22.54
		25	0	22.56	22.69	22.59
	16QAM	1	0	23.06	22.13	22.39
		1	13	22.75	22.11	22.39
		1	24	22.79	21.97	22.27
		12	0	21.35	21.40	21.55
		12	6	21.55	21.63	21.41
		12	13	21.36	21.44	21.33
		25	0	21.64	21.81	21.69
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				/	23230/782	/
10MHz	QPSK	1	0	/	23.61	/
		1	25	/	23.78	/
		1	49	/	23.44	/
		25	0	/	22.56	/
		25	13	/	22.52	/
		25	25	/	22.63	/
		50	0	/	22.69	/
	16QAM	1	0	/	22.82	/
		1	25	/	23.21	/
		1	49	/	22.87	/
		25	0	/	21.54	/
		25	13	/	21.50	/
		25	25	/	21.82	/
		50	0	/	21.62	/

5.2 Effective Isotropic Radiated Power

Ambient condition

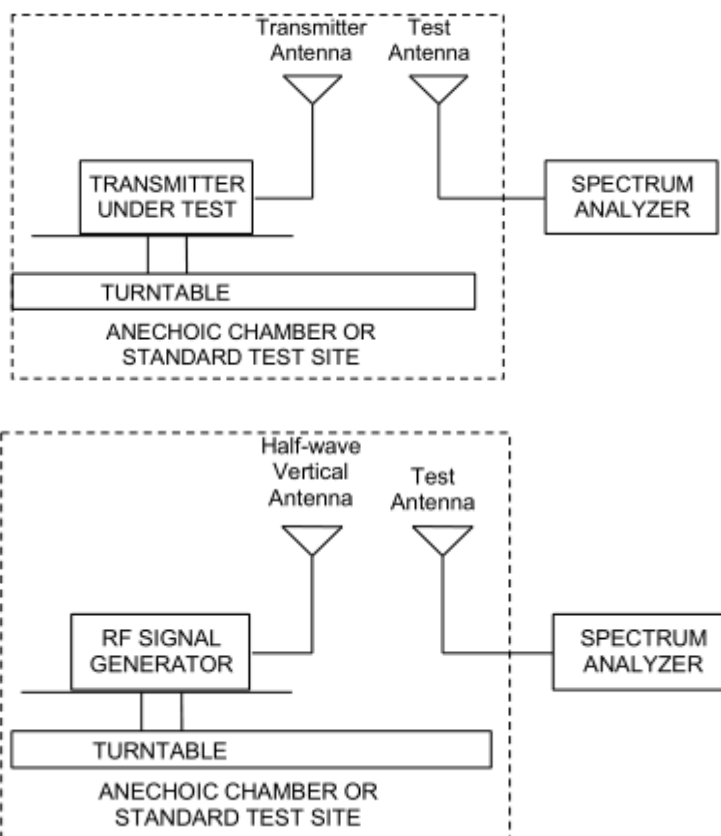
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI/TIA-603-E (2016).
 - 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. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
 - e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation: $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
 - 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:
 $ERP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBd)}$
 where: dBd refers to gain relative to an ideal dipole.
 $EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

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

Test setup



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

Limits

Rule Part 27.50(b) (10) specifies that “Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP”

Rule Part 27.50(c) (10) specifies that “Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP”

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Part 27.50(b)(10)Limit	$\leq 3 \text{ W}$ (34.77 dBm)
Part 27.50(c)(10)Limit	$\leq 3 \text{ W}$ (34.77 dBm)
Part 27.50(d)(4)Limit	$\leq 1 \text{ W}$ (30 dBm)

Measurement Uncertainty

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

Test Results

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

Mode	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
WCDMA Band IV	Low	1712.4	Horizontal	25.49	30	Pass
	Mid	1732.6	Horizontal	25.50	30	Pass
	High	1752.6	Horizontal	25.63	30	Pass

LTE Band 4						
Bandwidth	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.7	Horizontal	25.13	30	Pass
	Mid	1732.5	Horizontal	24.25	30	Pass
	High	1754.3	Horizontal	24.33	30	Pass
3 MHz (QPSK)	Low	1711.5	Horizontal	24.95	30	Pass
	Mid	1732.5	Horizontal	24.33	30	Pass
	High	1753.5	Horizontal	24.43	30	Pass
5 MHz (QPSK)	Low	1712.5	Horizontal	25.06	30	Pass
	Mid	1732.5	Horizontal	24.44	30	Pass
	High	1752.5	Horizontal	24.67	30	Pass
10 MHz (QPSK)	Low	1715	Horizontal	24.88	30	Pass
	Mid	1732.5	Horizontal	24.43	30	Pass
	High	1750	Horizontal	24.20	30	Pass
15 MHz (QPSK)	Low	1717.5	Horizontal	25.14	30	Pass
	Mid	1732.5	Horizontal	24.43	30	Pass
	High	1747.5	Horizontal	24.60	30	Pass
20 MHz (QPSK)	Low	1720	Horizontal	24.90	30	Pass
	Mid	1732.5	Horizontal	24.47	30	Pass
	High	1745	Horizontal	24.41	30	Pass
1.4 MHz (16QAM)	Low	1710.7	Horizontal	24.89	30	Pass
	Mid	1732.5	Horizontal	24.01	30	Pass
	High	1754.3	Horizontal	24.03	30	Pass
3 MHz (16QAM)	Low	1711.5	Horizontal	24.76	30	Pass
	Mid	1732.5	Horizontal	24.13	30	Pass
	High	1753.5	Horizontal	24.02	30	Pass
5 MHz (16QAM)	Low	1712.5	Horizontal	24.78	30	Pass
	Mid	1732.5	Horizontal	24.03	30	Pass
	High	1752.5	Horizontal	24.13	30	Pass
10 MHz (16QAM)	Low	1715	Horizontal	24.66	30	Pass
	Mid	1732.5	Horizontal	24.21	30	Pass
	High	1750	Horizontal	24.00	30	Pass



15 MHz (16QAM)	Low	1717.5	Horizontal	24.86	30	Pass
	Mid	1732.5	Horizontal	24.21	30	Pass
	High	1747.5	Horizontal	24.30	30	Pass
20 MHz (16QAM)	Low	1720	Horizontal	24.57	30	Pass
	Mid	1732.5	Horizontal	24.04	30	Pass
	High	1745	Horizontal	24.01	30	Pass

LTE Band 12						
Bandwidth	Channel	Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	699.7	Horizontal	19.20	34.77	Pass
	Mid	707.5	Horizontal	19.49	34.77	Pass
	High	715.3	Horizontal	19.70	34.77	Pass
3 MHz (QPSK)	Low	700.5	Horizontal	19.29	34.77	Pass
	Mid	707.5	Horizontal	19.57	34.77	Pass
	High	714.5	Horizontal	19.55	34.77	Pass
5 MHz (QPSK)	Low	701.5	Horizontal	19.31	34.77	Pass
	Mid	707.5	Horizontal	19.57	34.77	Pass
	High	713.5	Horizontal	19.41	34.77	Pass
10 MHz (QPSK)	Low	704	Horizontal	19.16	34.77	Pass
	Mid	707.5	Horizontal	19.44	34.77	Pass
	High	711	Horizontal	19.51	34.77	Pass
1.4 MHz (16QAM)	Low	699.7	Horizontal	18.63	34.77	Pass
	Mid	707.5	Horizontal	18.84	34.77	Pass
	High	715.3	Horizontal	19.06	34.77	Pass
3 MHz (16QAM)	Low	700.5	Horizontal	18.72	34.77	Pass
	Mid	707.5	Horizontal	18.98	34.77	Pass
	High	714.5	Horizontal	18.96	34.77	Pass
5 MHz (16QAM)	Low	701.5	Horizontal	18.82	34.77	Pass
	Mid	707.5	Horizontal	18.87	34.77	Pass
	High	713.5	Horizontal	18.52	34.77	Pass
10 MHz (16QAM)	Low	704	Horizontal	18.59	34.77	Pass
	Mid	707.5	Horizontal	18.81	34.77	Pass
	High	711	Horizontal	18.88	34.77	Pass



LTE Band 13						
Bandwidth	Channel	Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Conclusion
5MHz (QPSK)	Low	779.5	Horizontal	22.17	34.77	Pass
	Mid	782	Horizontal	21.87	34.77	Pass
	High	784.5	Horizontal	21.96	34.77	Pass
10MHz (QPSK)	Mid	782	Horizontal	22.41	34.77	Pass
5MHz (16QAM)	Low	779.5	Horizontal	21.82	34.77	Pass
	Mid	782	Horizontal	21.61	34.77	Pass
	High	784.5	Horizontal	21.73	34.77	Pass
10MHz (16QAM)	Mid	782	Horizontal	21.87	34.77	Pass

5.3 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 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.

RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/12 (1.4MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/12 (3MHz).

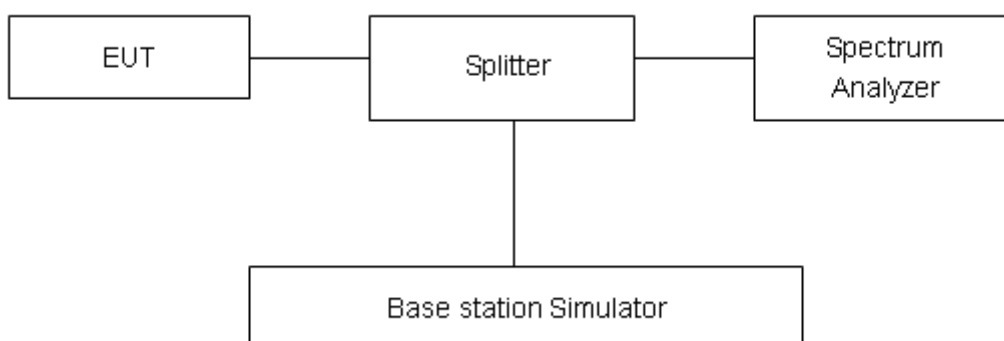
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/12/13 (5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/12/13 (10MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4 (15MHz/20MHz).

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

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

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

Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
WCDMA Band IV (RMC)	1312	1712.4	4.1071	4.678
	1413	1732.6	4.1193	4.679
	1513	1752.6	4.1284	4.703

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1274	1.337
			20175	1732.5	1.1077	1.315
			20393	1754.3	1.1108	1.335
		3	19965	1711.5	2.7345	3.04
			20175	1732.5	2.7353	3.064
			20385	1753.5	2.7424	3.034
		5	19975	1712.5	4.5308	5.03
			20175	1732.5	4.514	4.976
			20375	1752.5	4.5177	5.022
		10	20000	1715	9.0214	10.04
			20175	1732.5	9.0081	10.02
			20350	1750	9.0092	10.08
		15	20025	1717.5	13.474	14.7
			20175	1732.5	13.438	14.56
			20325	1747.5	13.431	14.61
		20	20050	1720	17.896	19.21
			20175	1732.5	17.911	19.04
			20300	1745	17.861	19.36
	16QAM	1.4	19957	1710.7	1.1224	1.35
			20175	1732.5	1.1055	1.309
			20393	1754.3	1.1183	1.342
		3	19965	1711.5	2.7288	3.066
			20175	1732.5	2.744	3.05
			20385	1753.5	2.7395	3.045
		5	19975	1712.5	4.5457	5.016
			20175	1732.5	4.5193	5.001
			20375	1752.5	4.5362	5.011
		10	20000	1715	9.0281	9.965
			20175	1732.5	9.0551	9.913



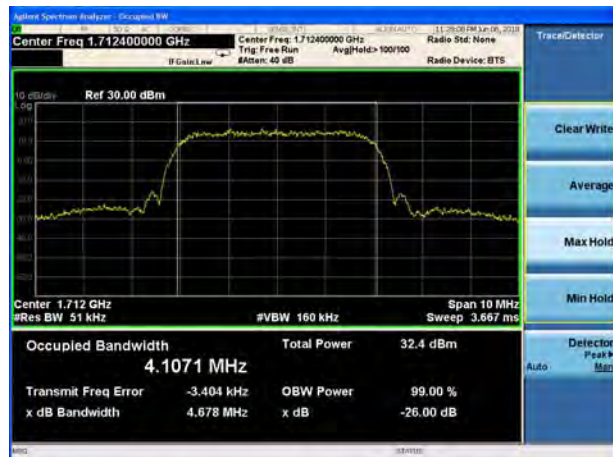
			20350	1750	9.0086	9.943
		15	20025	1717.5	13.428	14.69
			20175	1732.5	13.467	14.65
			20325	1747.5	13.447	14.66
			20050	1720	17.865	19.04
		20	20175	1732.5	17.91	19.22
			20300	1745	17.873	19.48

LTE Band 12						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	23017	699.7	1.1165	1.315
			23095	707.5	1.1136	1.335
			23173	715.3	1.1154	1.319
		3	23025	700.5	2.7422	3.059
			23095	707.5	2.7444	3.052
			23165	714.5	2.7392	3.072
		5	23035	701.5	4.5137	5.013
			23095	707.5	4.516	4.972
			23155	713.5	4.5174	5.013
		10	23060	704	9.0155	10.1
			23095	707.5	9.0102	10.03
			23130	711	9.0204	9.967
	16QAM	1.4	23017	699.7	1.1057	1.305
			23095	707.5	1.1087	1.343
			23173	715.3	1.1209	1.328
		3	23025	700.5	2.7444	3.083
			23095	707.5	2.7409	3.038
			23165	714.5	2.7411	3.053
		5	23035	701.5	4.5136	4.969
			23095	707.5	4.5062	4.964
			23155	713.5	4.5132	5.003
		10	23060	704	9.0129	10.01
			23095	707.5	8.9972	10.06
			23130	711	9.0348	10.03

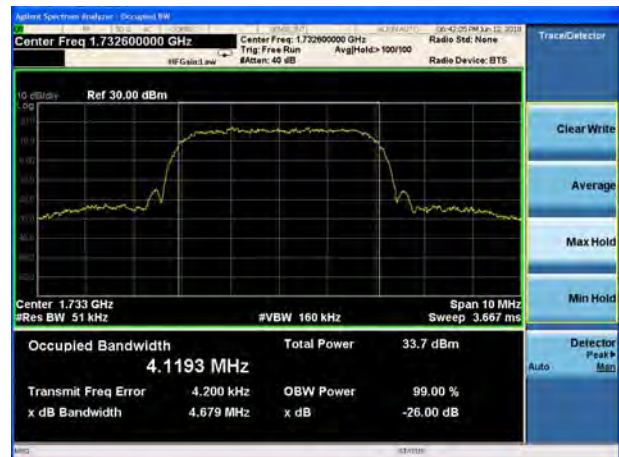
LTE Band 13						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	23205	779.5	4.4928	4.95
			23230	782	4.533	5.062
			23255	784.5	4.5082	4.948
		10	23230	782	9.035	10.05
	16QAM	5	23205	779.5	4.5002	4.973
			23230	782	4.5258	5.029
			23255	784.5	4.5057	4.978
		10	23230	782	9.0513	10.08



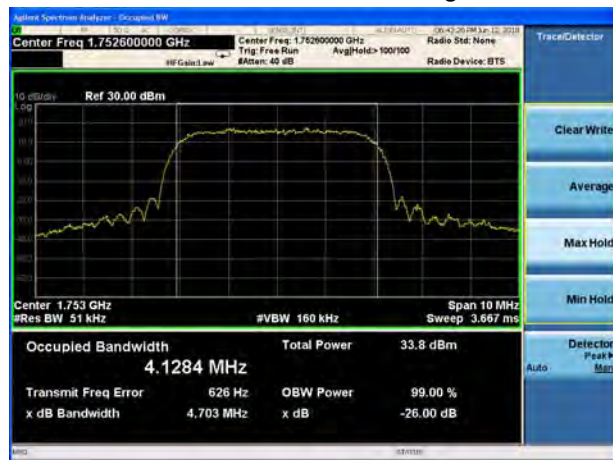
WCDMA Band IV CH-Low



WCDMA Band IV CH Middle



WCDMA Band IV CH High





LTE Band 4 QPSK 1.4MHz CH-Low



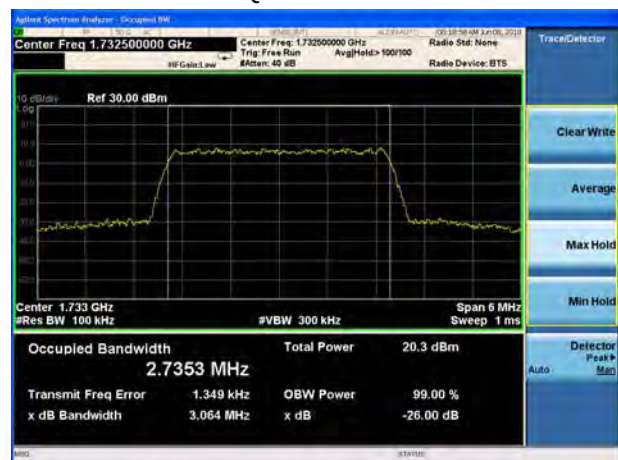
LTE Band 4 QPSK 3MHz CH-Low



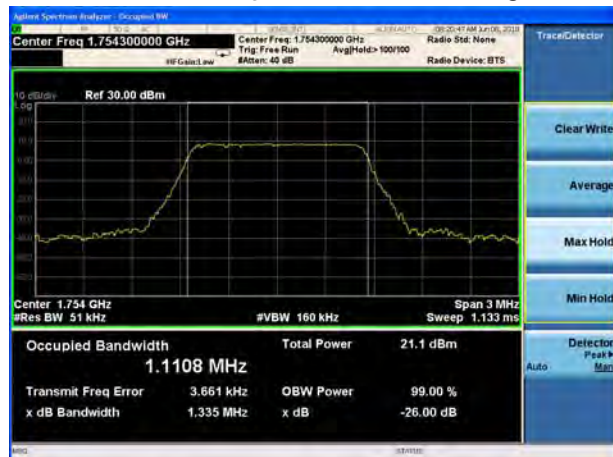
LTE Band 4 QPSK 1.4MHz CH-Middle



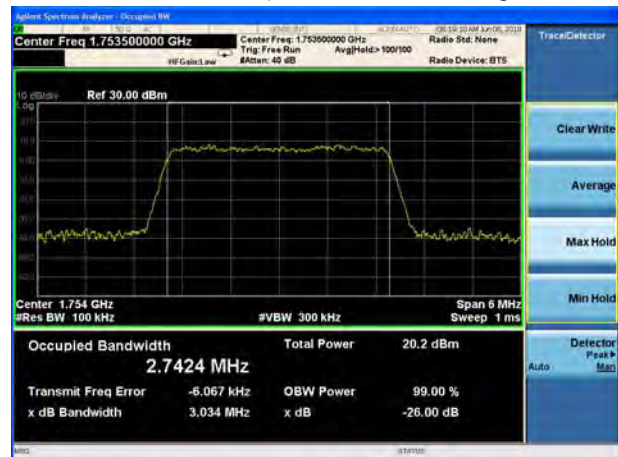
LTE Band 4 QPSK 3MHz CH-Middle



LTE Band 4 QPSK 1.4MHz CH-High

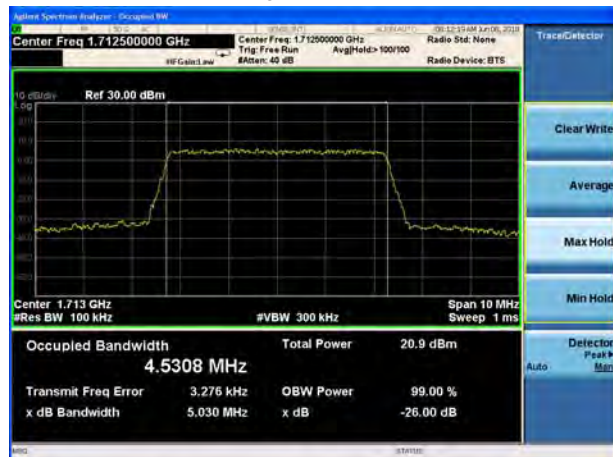


LTE Band 4 QPSK 3MHz CH-High

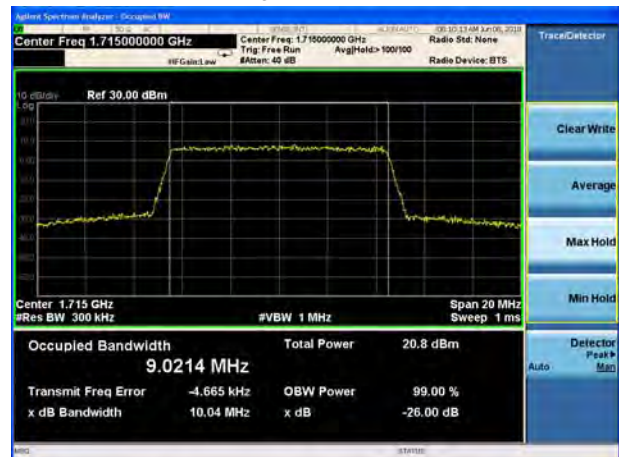




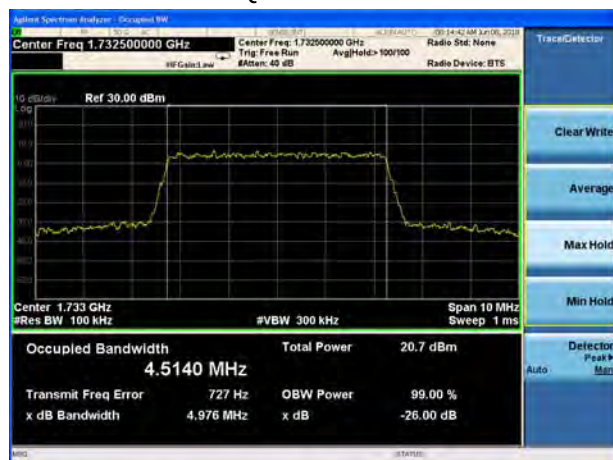
LTE Band 4 QPSK 5MHz CH-Low



LTE Band 4 QPSK 10MHz CH-Low



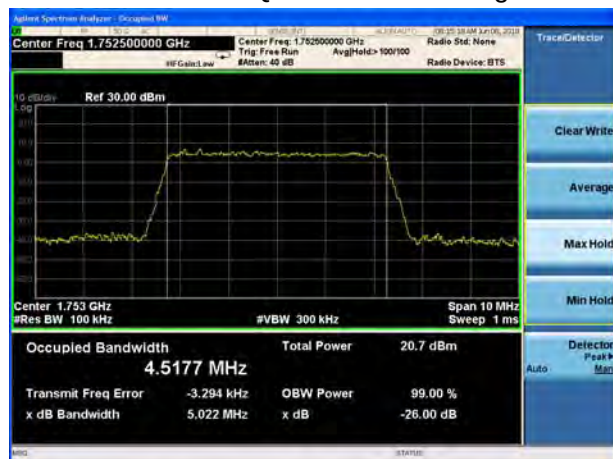
LTE Band 4 QPSK 5MHz CH-Middle



LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 QPSK 5MHz CH-High

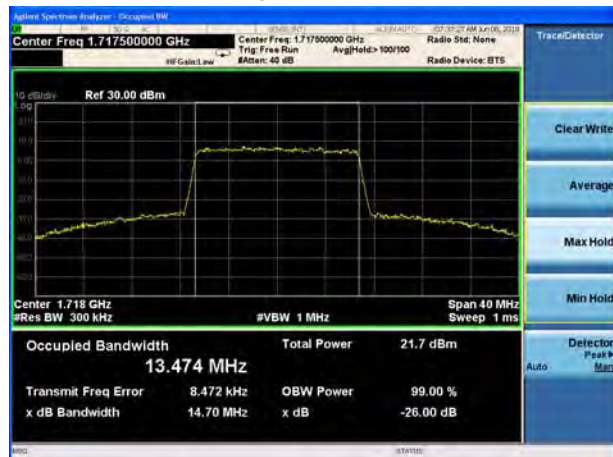


LTE Band 4 QPSK 10MHz CH-High

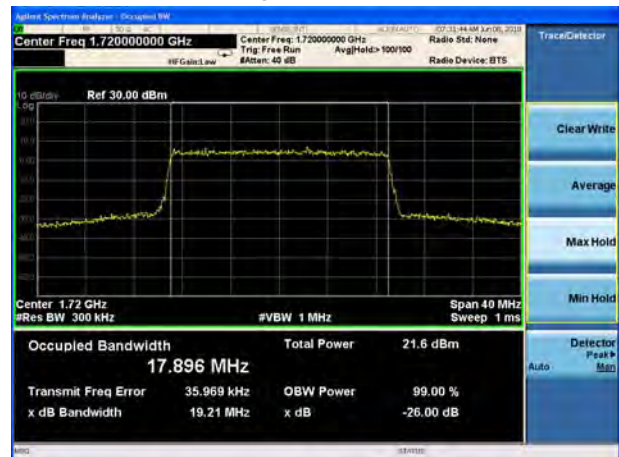




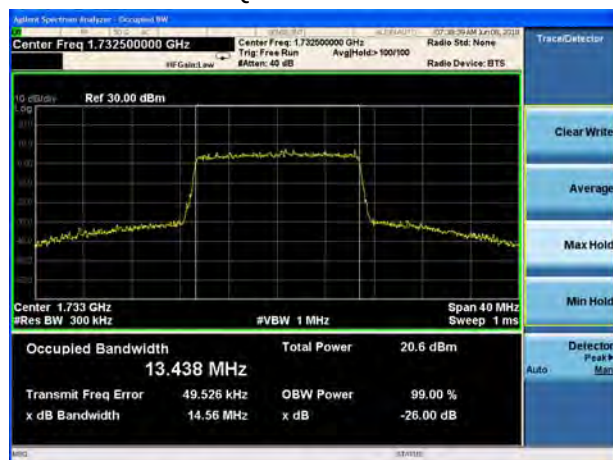
LTE Band 4 QPSK 15MHz CH-Low



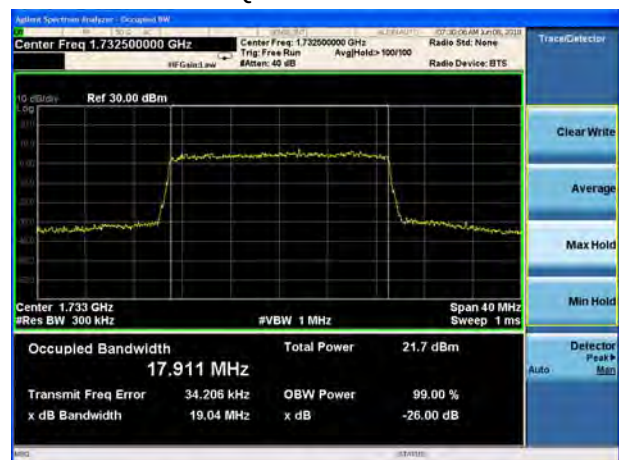
LTE Band 4 QPSK 20MHz CH-Low



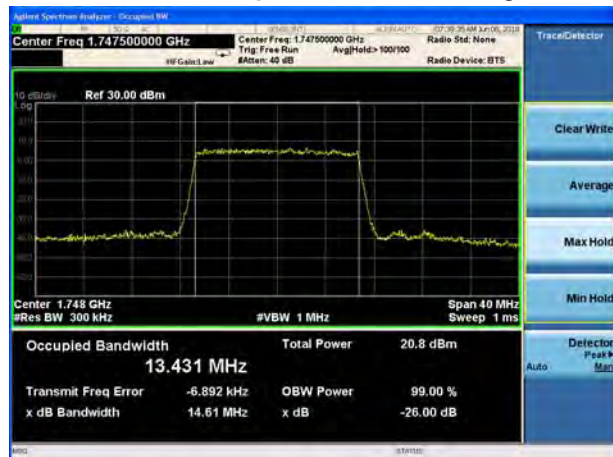
LTE Band 4 QPSK 15MHz CH-Middle



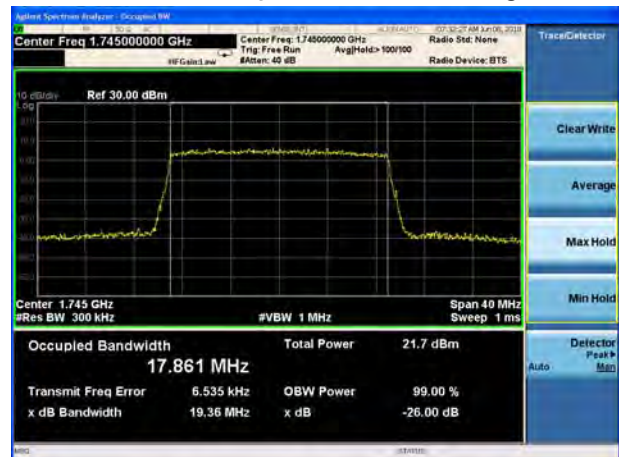
LTE Band 4 QPSK 20MHz CH-Middle



LTE Band 4 QPSK 15MHz CH-High

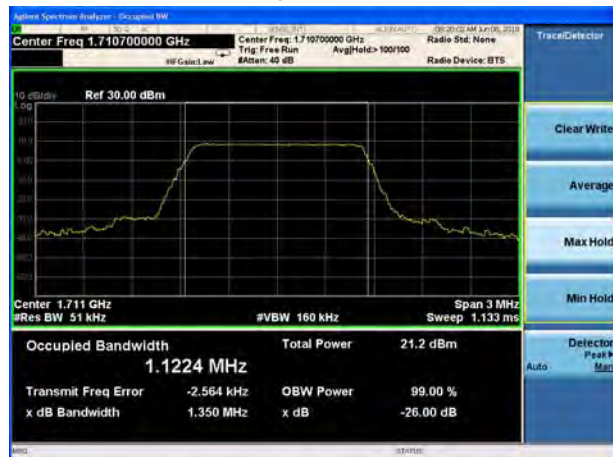


LTE Band 4 QPSK 20MHz CH-High

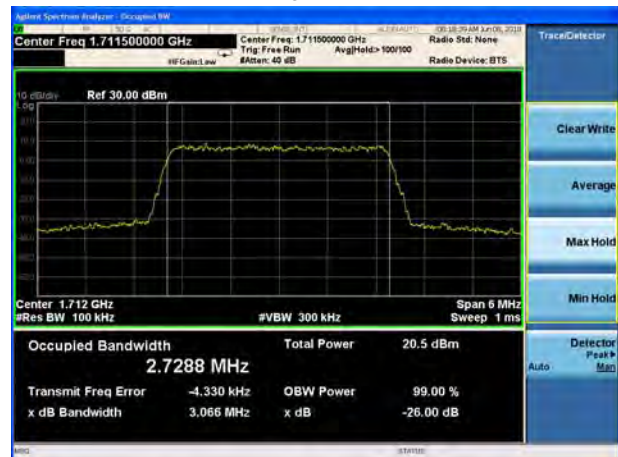




LTE Band 4 16QAM 1.4MHz CH-Low



LTE Band 4 16QAM 3MHz CH-Low



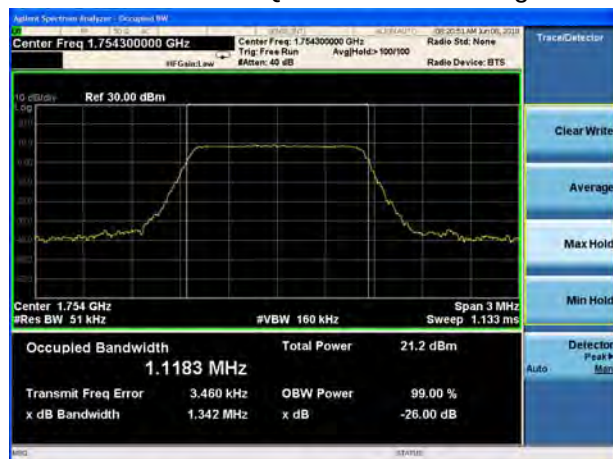
LTE Band 4 16QAM 1.4MHz CH-Middle



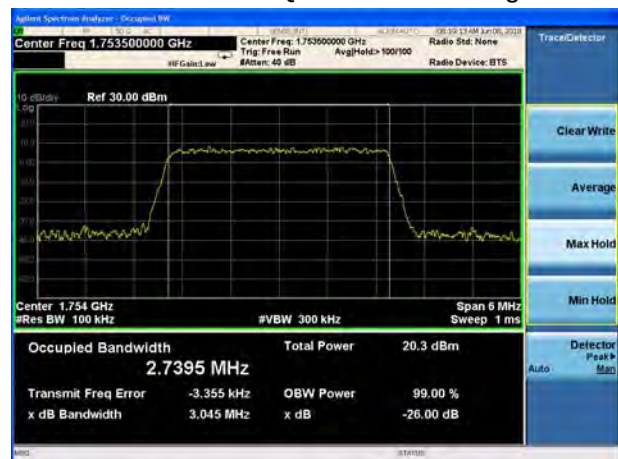
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LTE Band 4 16QAM 1.4MHz CH-High

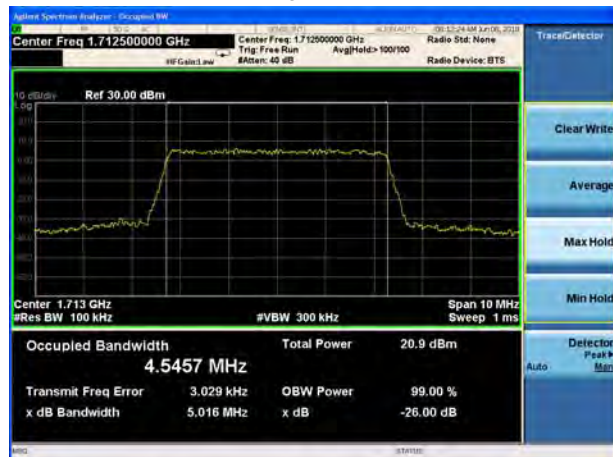


LTE Band 4 16QAM 3MHz CH-High

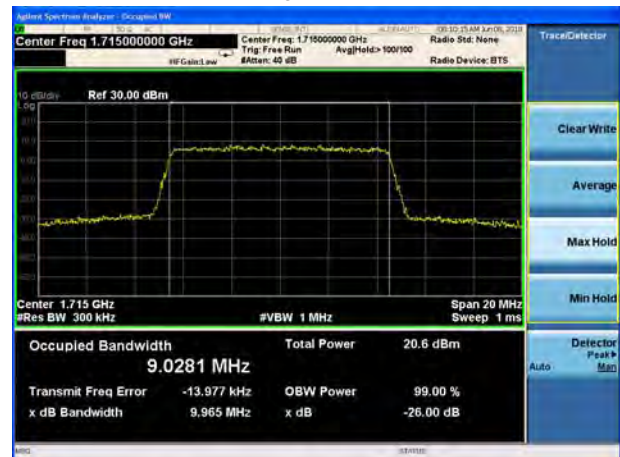




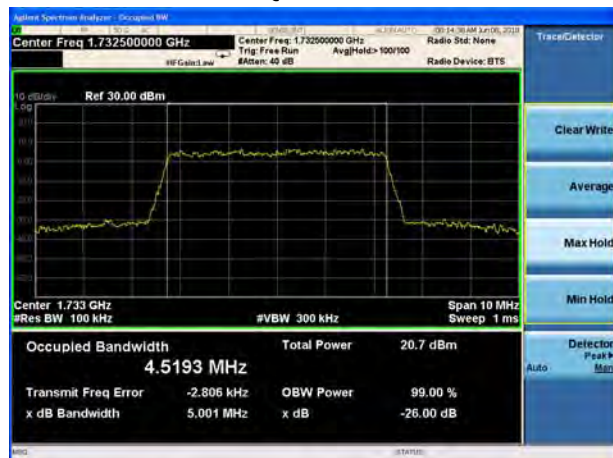
LTE Band 4 16QAM 5MHz CH-Low



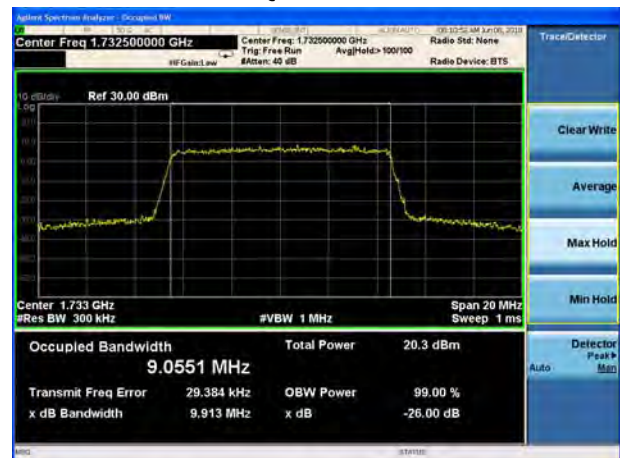
LTE Band 4 16QAM 10MHz CH-Low



LTE Band 4 16QAM 5MHz CH-Middle



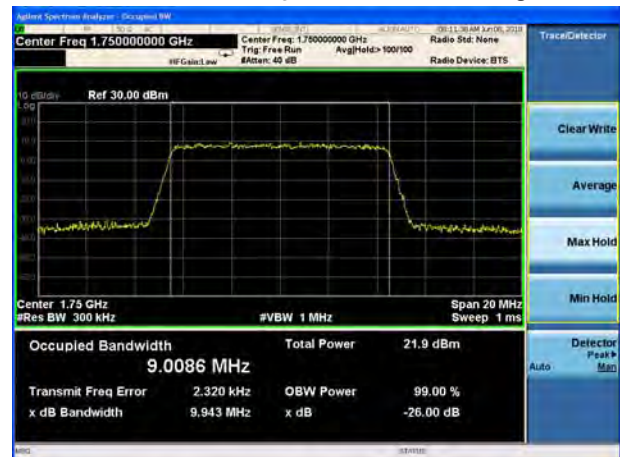
LTE Band 4 16QAM 10MHz CH-Middle



LTE Band 4 16QAM 5MHz CH-High

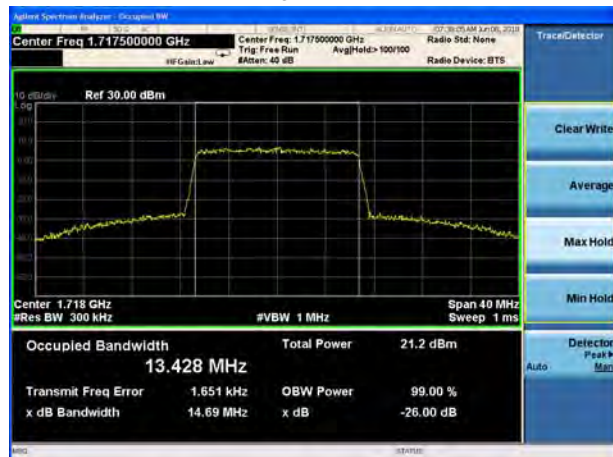


LTE Band 4 16QAM 10MHz CH-High

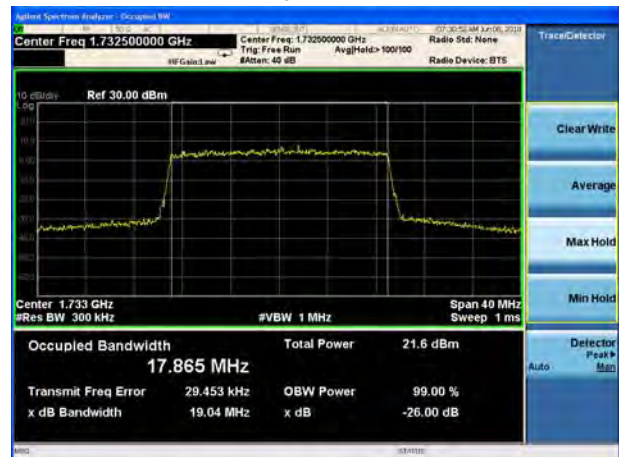




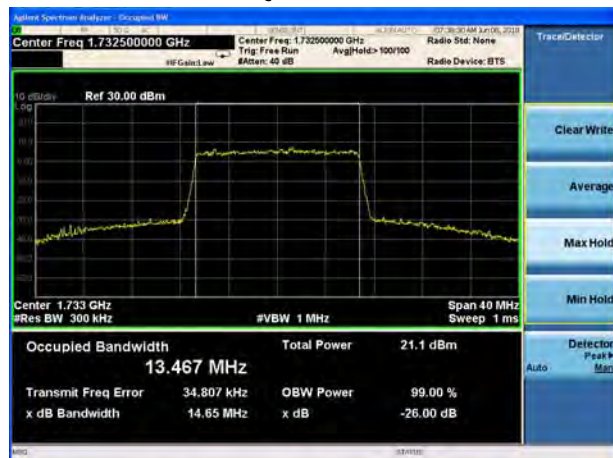
LTE Band 4 16QAM 15MHz CH-Low



LTE Band 4 16QAM 20MHz CH-Low



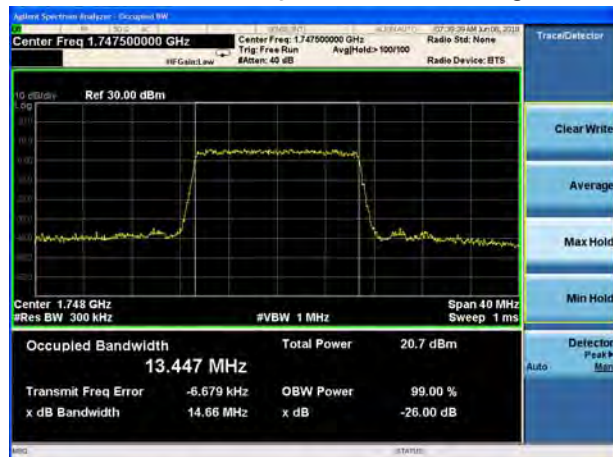
LTE Band 4 16QAM 15MHz CH-Middle



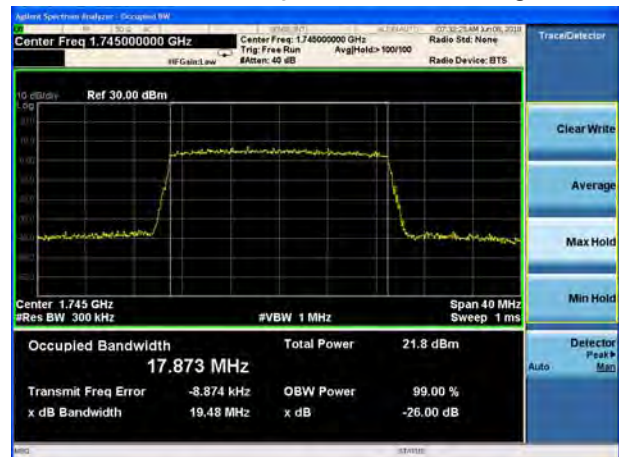
LTE Band 4 16QAM 20MHz CH-Middle



LTE Band 4 16QAM 15MHz CH-High



LTE Band 4 16QAM 20MHz CH-High





LTE Band 12 QPSK 1.4MHz CH-Low



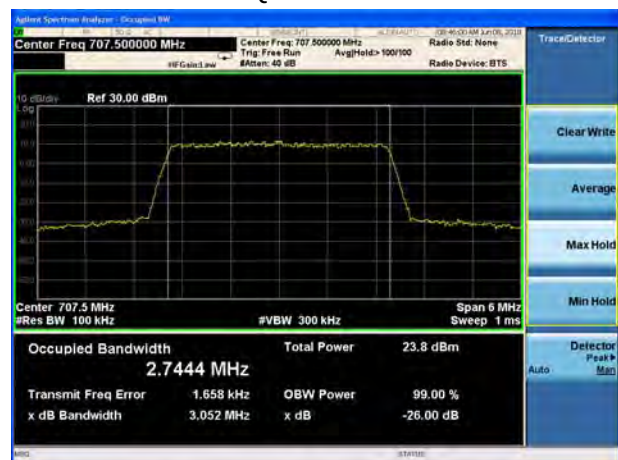
LTE Band 12 QPSK 3MHz CH-Low



LTE Band 12 QPSK 1.4MHz CH-Middle



LTE Band 12 QPSK 3MHz CH-Middle



LTE Band 12 QPSK 1.4MHz CH-High



LTE Band 12 QPSK 3MHz CH-High



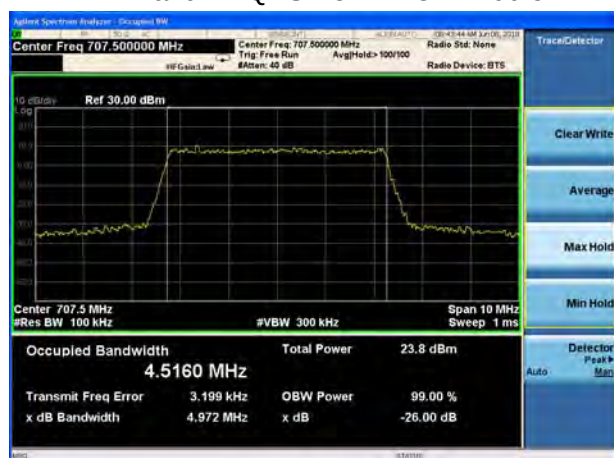
LTE Band 12 QPSK 5MHz CH-Low



LTE Band 12 QPSK 10MHz CH-Low



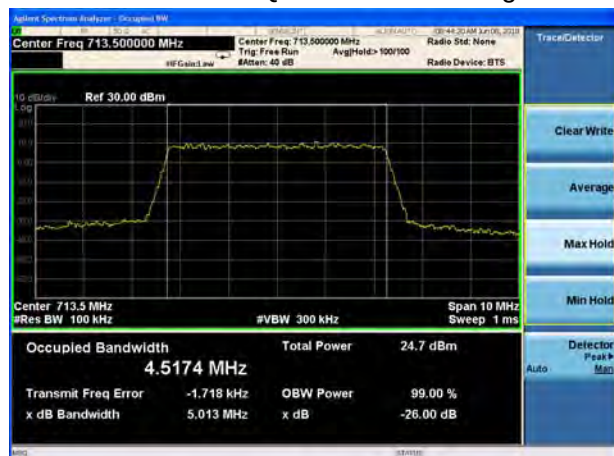
LTE Band 12 QPSK 5MHz CH-Middle



LTE Band 12 QPSK 10MHz CH-Middle



LTE Band 12 QPSK 5MHz CH-High



LTE Band 12 QPSK 10MHz CH-High

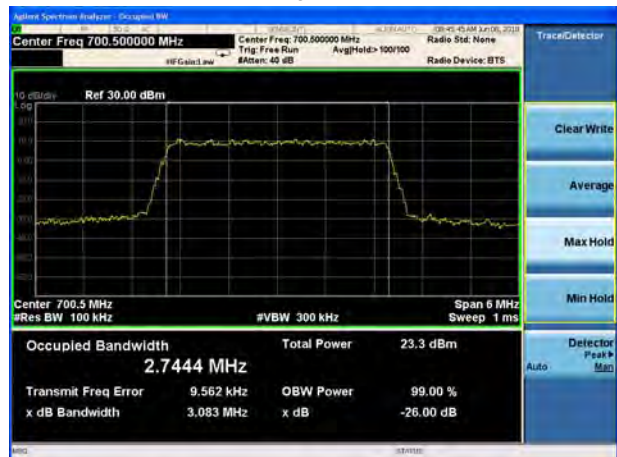




LTE Band 12 16QAM 1.4MHz CH-Low



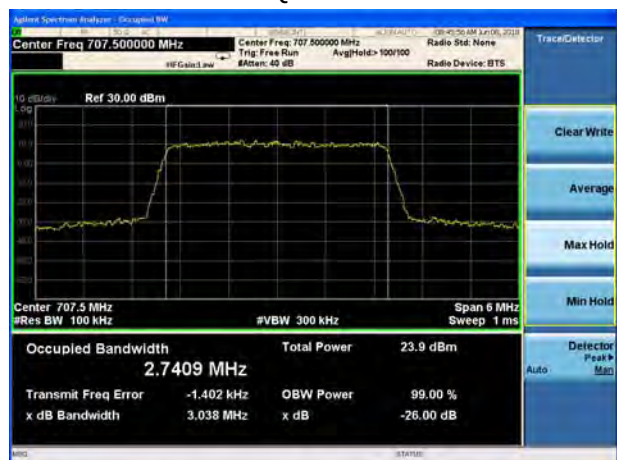
LTE Band 12 16QAM 3MHz CH-Low



LTE Band 12 16QAM 1.4MHz CH-Middle



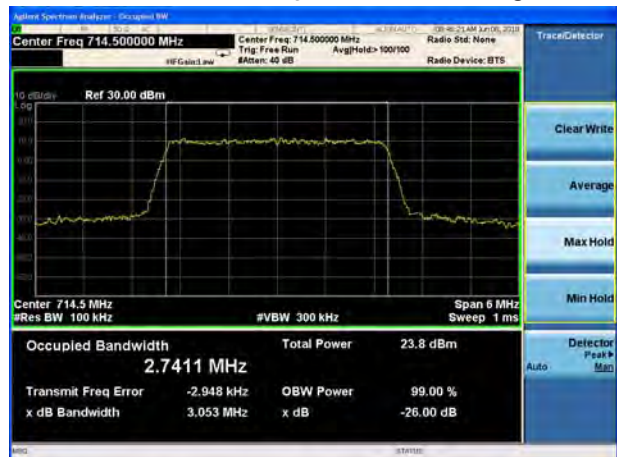
LTE Band 12 16QAM 3MHz CH-Middle



LTE Band 12 16QAM 1.4MHz CH-High

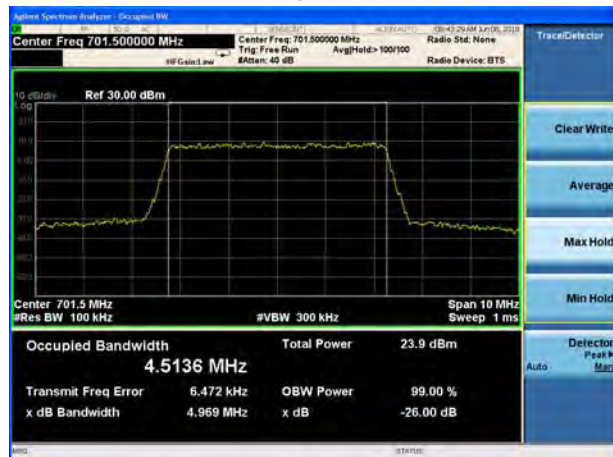


LTE Band 12 16QAM 3MHz CH-High





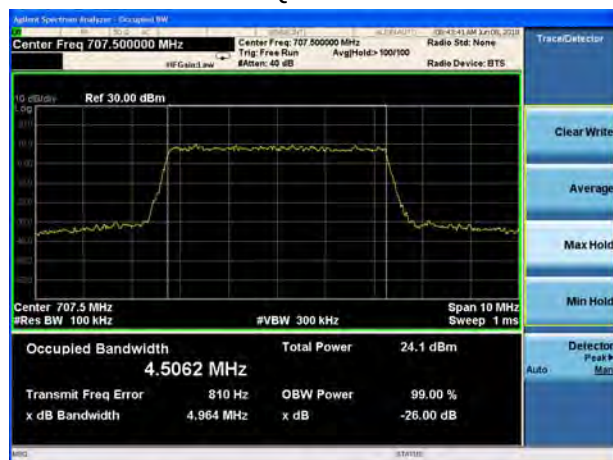
LTE Band 12 16QAM 5MHz CH-Low



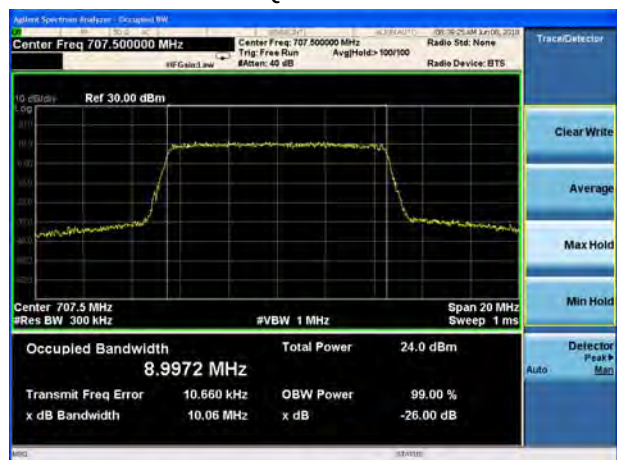
LTE Band 12 16QAM 10MHz CH-Low



LTE Band 12 16QAM 5MHz CH-Middle



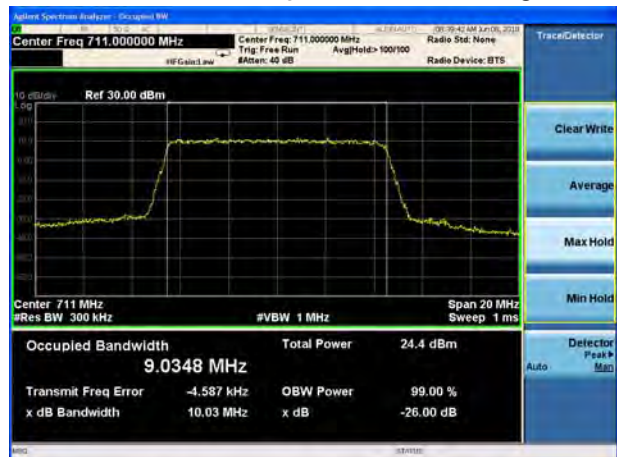
LTE Band 12 16QAM 10MHz CH-Middle



LTE Band 12 16QAM 5MHz CH-High

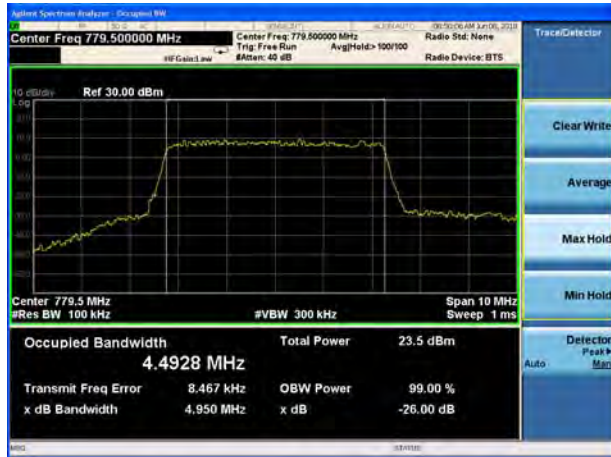


LTE Band 12 16QAM 10MHz CH-High

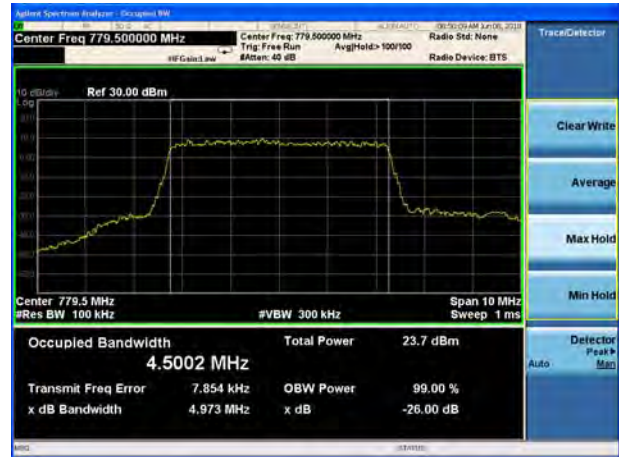




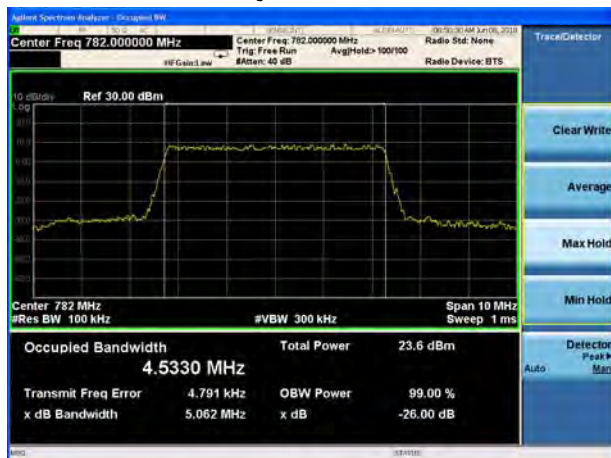
LTE Band 13 QPSK 5MHz CH-Low



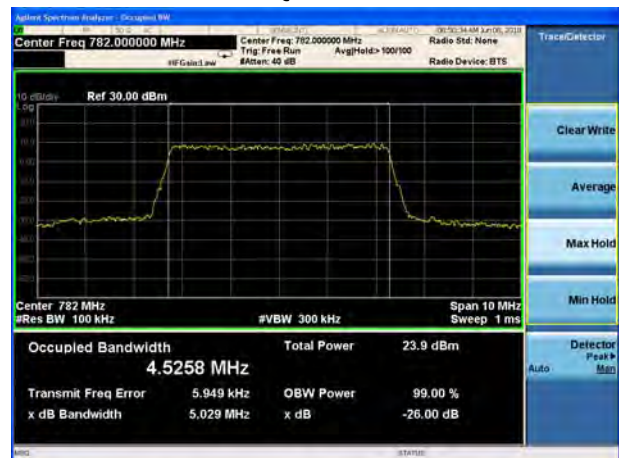
LTE Band 13 16QAM 5MHz CH-Low



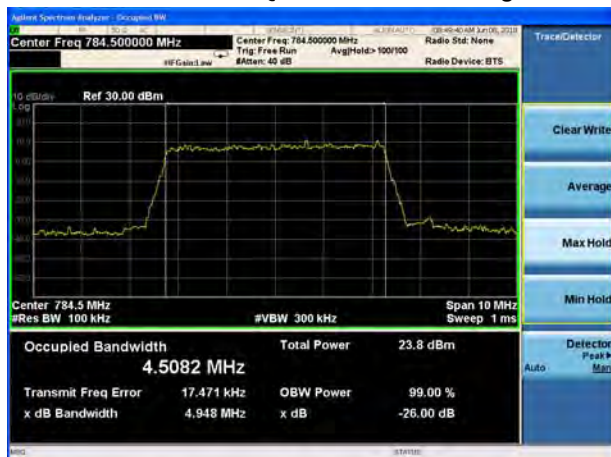
LTE Band 13 QPSK 5MHz CH-Middle



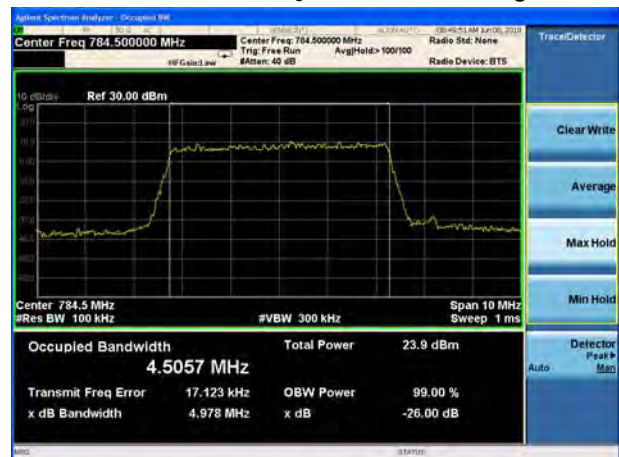
LTE Band 13 16QAM 5MHz CH-Middle



LTE Band 13 QPSK 5MHz CH-High



LTE Band 13 16QAM 5MHz CH-High





LTE Band 13 QPSK 10MHz CH-Middle



LTE Band 13 16QAM 10MHz CH-Middle



5.4 Band Edge Compliance

Ambient condition

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

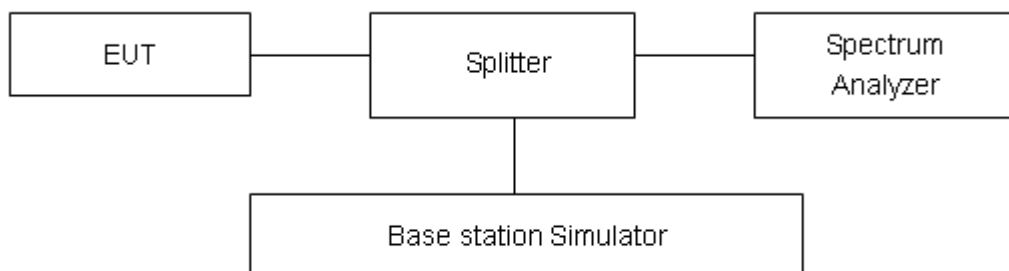
Method of Measurement

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 testing follows KDB 971168 D01 v03r01 Section 6.0

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.
RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4 (1.4MHz/3MHz).
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4 (5MHz).
RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4 (10MHz).
RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4(15MHz).
RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4(20MHz).
RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 12(1.4MHz/3MHz/5MHz/10MHz).
RBW is set to 6.8 kHz, VBW is set to $\geq 3 \times$ RBW for LTE Band 13 (763MHz~775MHz).
RBW is set to 100 kHz, VBW is set to $\geq 3 \times$ RBW for LTE Band 13 (775MHz~776.9MHz).
RBW is set to 30 kHz, VBW is set to $\geq 3 \times$ RBW for LTE Band 13 (776.9MHz~777MHz).
RBW is set to 30 kHz, VBW is set to $\geq 3 \times$ RBW for LTE Band 13 (787MHz~787.1MHz).
RBW is set to 100 kHz, VBW is set to $\geq 3 \times$ RBW for LTE Band 13 (787.1MHz~793MHz).
RBW is set to 6.8 kHz, VBW is set to $\geq 3 \times$ RBW for LTE Band 13 (793MHz~805MHz).
on spectrum analyzer.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

Test Setup



Limits

Rule Part 27.53(h)/ specifies that “ for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB”

Part 27.53(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

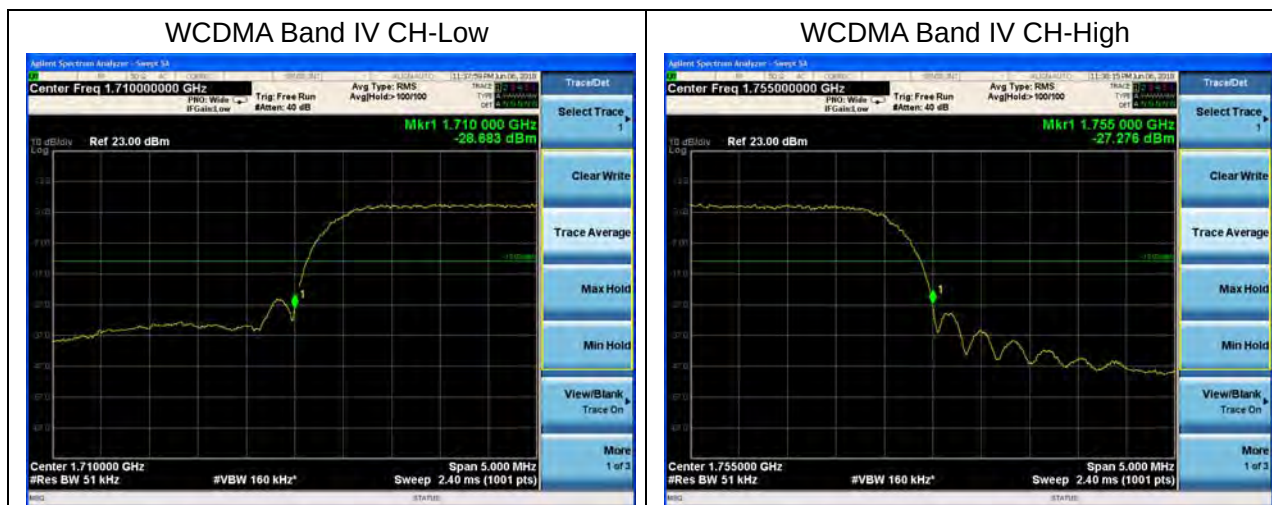
- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

Measurement Uncertainty

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

Test Result

All the test traces in the plots shows the test results clearly.





LTE Band 4 QPSK 1.4MHz CH-Low, 1 RB



LTE Band 4 QPSK 1.4MHz CH-High, 1 RB



LTE Band 4 QPSK 1.4MHz CH-Low, 100%RB



LTE Band 4 QPSK 1.4MHz CH-High, 100%RB



LTE Band 4 QPSK 3MHz CH-Low, 1 RB



LTE Band 4 QPSK 3MHz CH-High, 1 RB



LTE Band 4 QPSK 3MHz CH-Low, 100%RB



LTE Band 4 QPSK 3MHz CH-High, 100%RB



LTE Band 4 QPSK 5MHz CH-Low, 1 RB



LTE Band 4 QPSK 5MHz CH-High, 1 RB



LTE Band 4 QPSK 5MHz CH-Low, 100%RB



LTE Band 4 QPSK 5MHz CH-High, 100%RB





LTE Band 4 QPSK 10MHz CH-Low, 1 RB



LTE Band 4 QPSK 10MHz CH-High, 1 RB



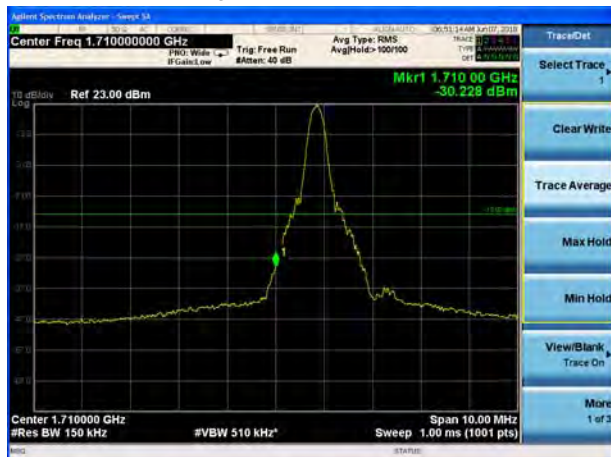
LTE Band 4 QPSK 10MHz CH-Low, 100%RB



LTE Band 4 QPSK 10MHz CH-High, 100%RB



LTE Band 4 QPSK 15MHz CH-Low, 1 RB



LTE Band 4 QPSK 15MHz CH-High, 1 RB





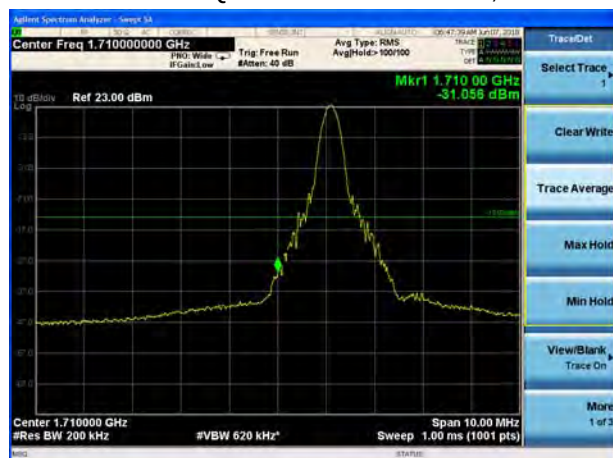
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



LTE Band 4 QPSK 15MHz CH-High, 100%RB



LTE Band 4 QPSK 20MHz CH-Low, 1 RB



LTE Band 4 QPSK 20MHz CH-High, 1 RB



LTE Band 4 QPSK 20MHz CH-Low, 100%RB



LTE Band 4 QPSK 20MHz CH-High, 100%RB



LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB



LTE Band 4 16QAM 1.4MHz CH-High, 100%RB



LTE Band 4 16QAM 3MHz CH-Low, 1 RB



LTE Band 4 16QAM 3MHz CH-High, 1 RB





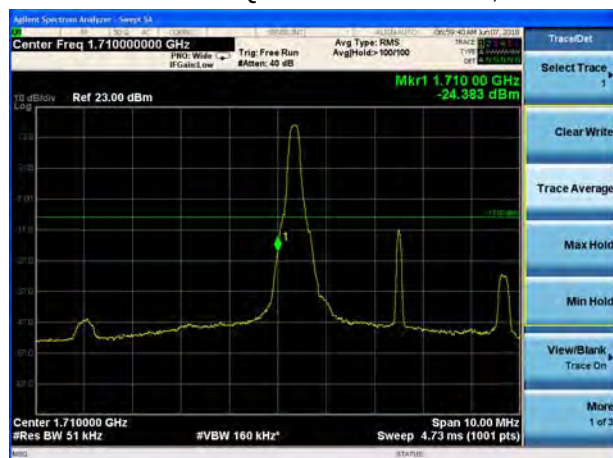
LTE Band 4 16QAM 3MHz CH-Low, 100%RB



LTE Band 4 16QAM 3MHz CH-High, 100%RB



LTE Band 4 16QAM 5MHz CH-Low, 1 RB



LTE Band 4 16QAM 5MHz CH-High, 1 RB



LTE Band 4 16QAM 5MHz CH-Low, 100%RB



LTE Band 4 16QAM 5MHz CH-High, 100%RB





LTE Band 4 16QAM 10MHz CH-Low, 1 RB



LTE Band 4 16QAM 10MHz CH-High, 1 RB



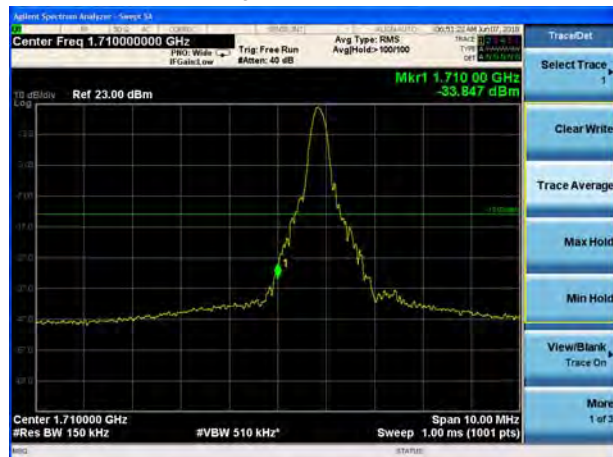
LTE Band 4 16QAM 10MHz CH-Low, 100%RB



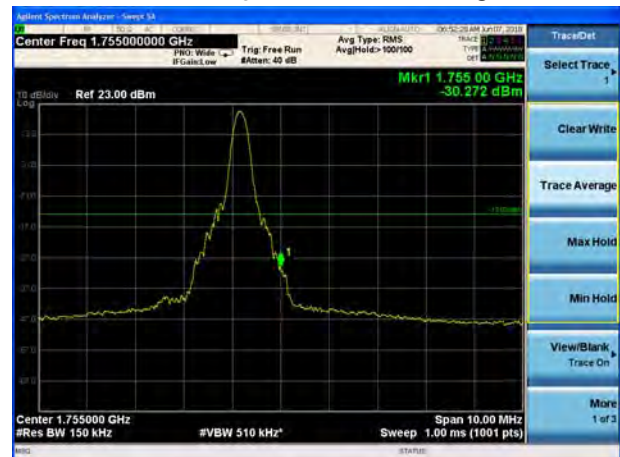
LTE Band 4 16QAM 10MHz CH-High, 100%RB



LTE Band 4 16QAM 15MHz CH-Low, 1 RB



LTE Band 4 16QAM 15MHz CH-High, 1 RB





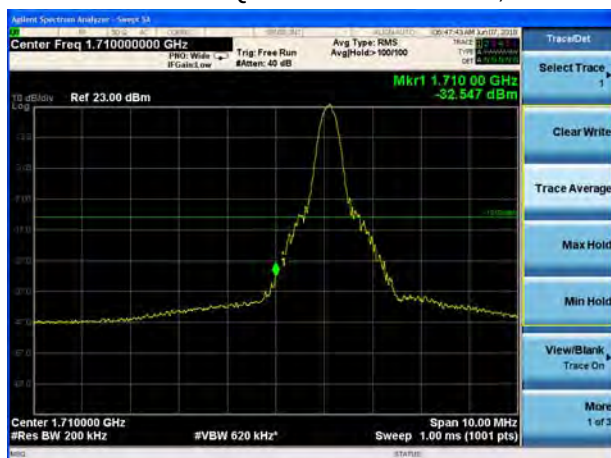
LTE Band 4 16QAM 15MHz CH-Low, 100%RB



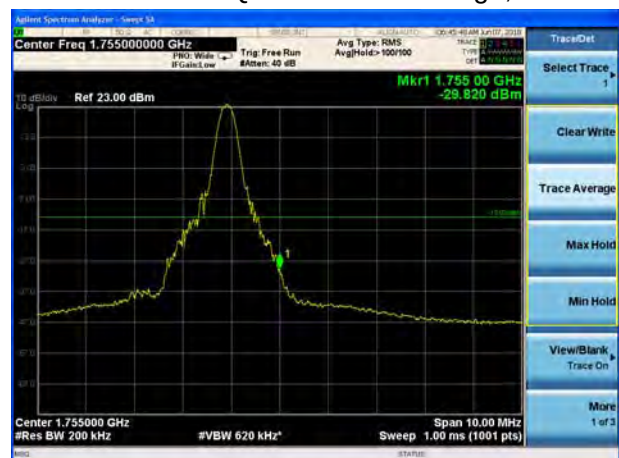
LTE Band 4 16QAM 15MHz CH-High, 100%RB



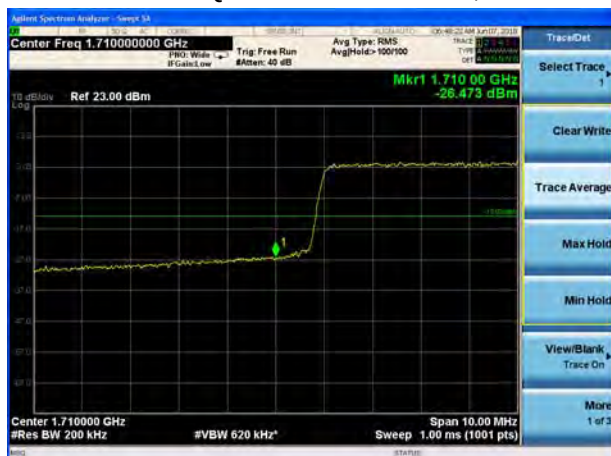
LTE Band 4 16QAM 20MHz CH-Low, 1 RB



LTE Band 4 16QAM 20MHz CH-High, 1 RB



LTE Band 4 16QAM 20MHz CH-Low, 100%RB



LTE Band 4 16QAM 20MHz CH-High, 100%RB

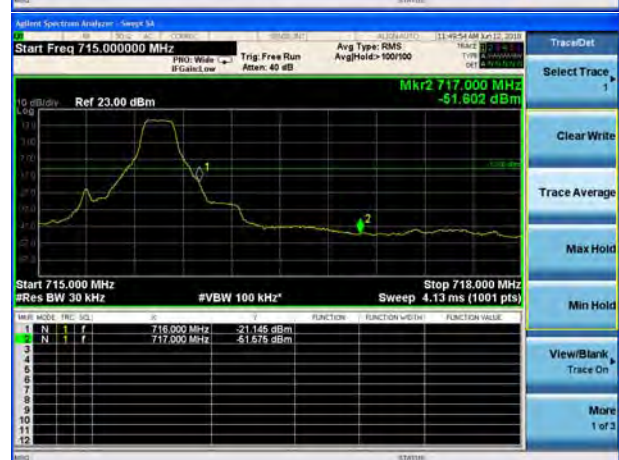




LTE Band 12 QPSK 1.4MHz CH-Low, 1 RB



LTE Band 12 QPSK 1.4MHz CH-High, 1 RB



LTE Band 12 QPSK 1.4MHz CH-Low, 100%RB

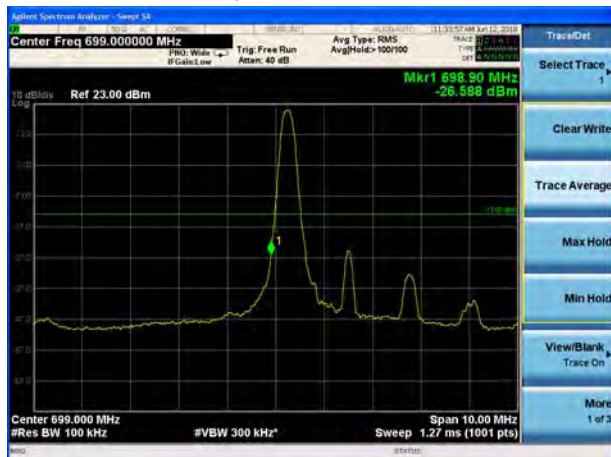


LTE Band 12 QPSK 1.4MHz CH-High, 100%RB

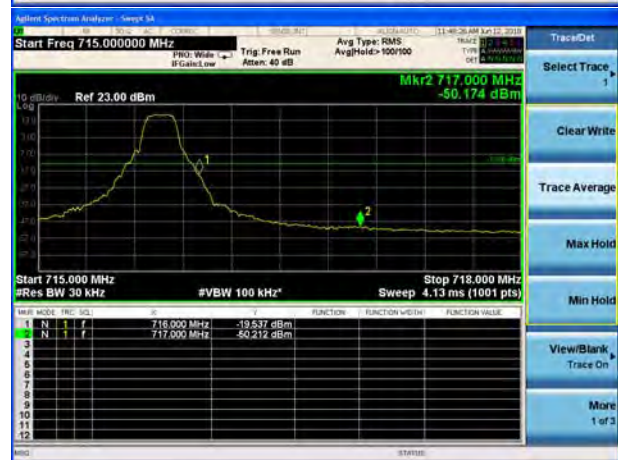




LTE Band 12 QPSK 3MHz CH-Low, 1 RB



LTE Band 12 QPSK 3MHz CH-High, 1 RB



LTE Band 12 QPSK 3MHz CH-Low, 100%RB



LTE Band 12 QPSK 3MHz CH-High, 100%RB

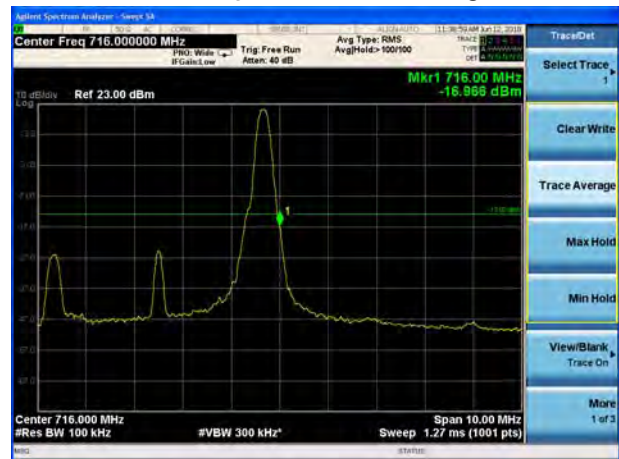




LTE Band 12 QPSK 5MHz CH-Low, 1 RB



LTE Band 12 QPSK 5MHz CH-High, 1 RB



LTE Band 12 QPSK 5MHz CH-Low, 100%RB

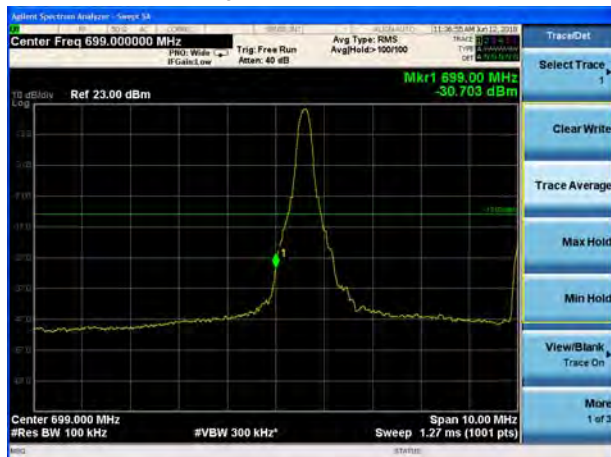


LTE Band 12 QPSK 5MHz CH-High, 100%RB

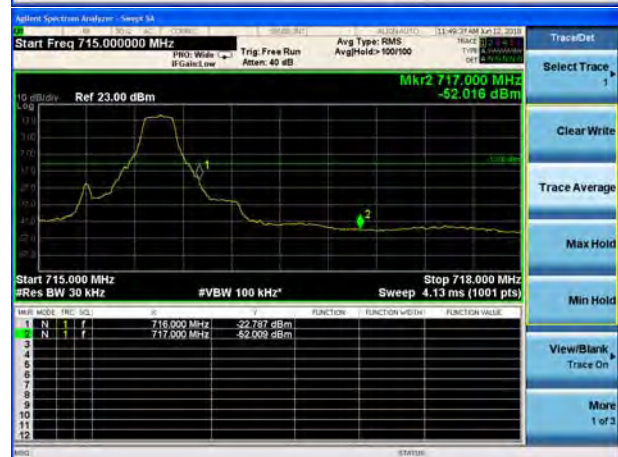
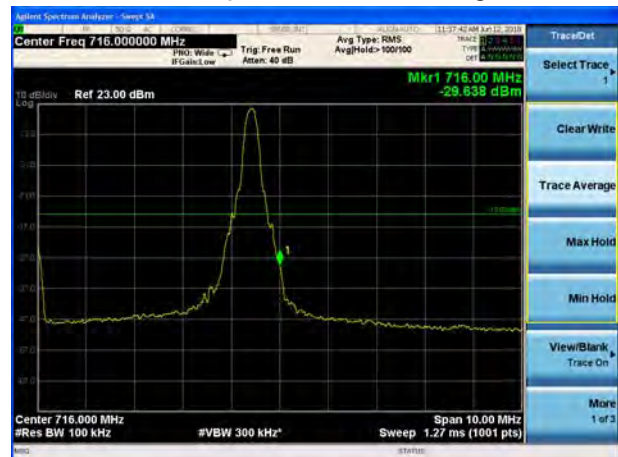




LTE Band 12 QPSK 10MHz CH-Low, 1 RB



LTE Band 12 QPSK 10MHz CH-High, 1 RB



LTE Band 12 QPSK 10MHz CH-Low, 100%RB



LTE Band 12 QPSK 10MHz CH-High, 100%RB





LTE Band 12 16QAM 1.4MHz CH-Low, 1 RB



LTE Band 12 16QAM 1.4MHz CH-High, 1 RB



LTE Band 12 16QAM 1.4MHz CH-Low, 100%RB

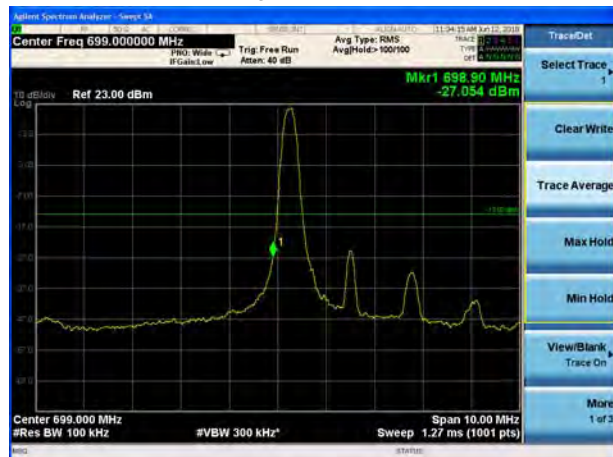


LTE Band 12 16QAM 1.4MHz CH-High, 100%RB





LTE Band 12 16QAM 3MHz CH-Low, 1 RB



LTE Band 12 16QAM 3MHz CH-High, 1 RB



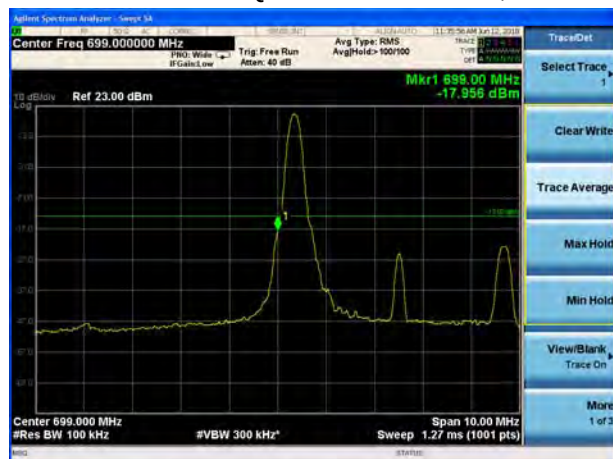
LTE Band 12 16QAM 3MHz CH-Low, 100%RB



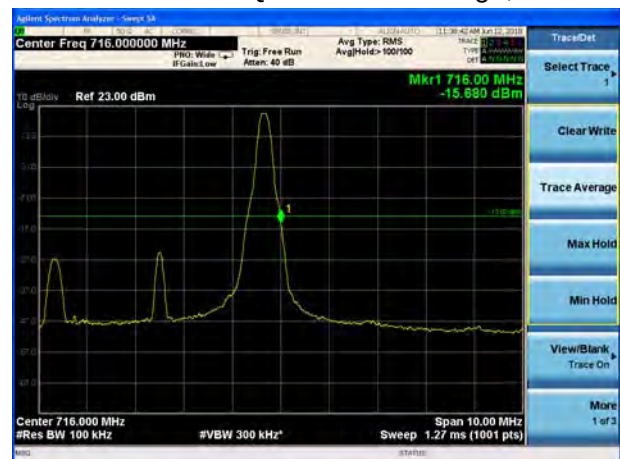
LTE Band 12 16QAM 3MHz CH-High, 100%RB



LTE Band 12 16QAM 5MHz CH-Low, 1 RB



LTE Band 12 16QAM 5MHz CH-High, 1 RB





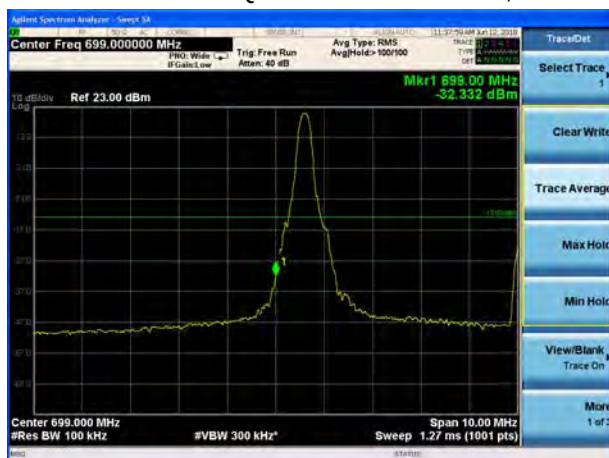
LTE Band 12 16QAM 5MHz CH-Low, 100%RB



LTE Band 12 16QAM 5MHz CH-High, 100%RB



LTE Band 12 16QAM 10MHz CH-Low, 1 RB



LTE Band 12 16QAM 10MHz CH-High, 1 RB



LTE Band 12 16QAM 10MHz CH-Low, 100%RB

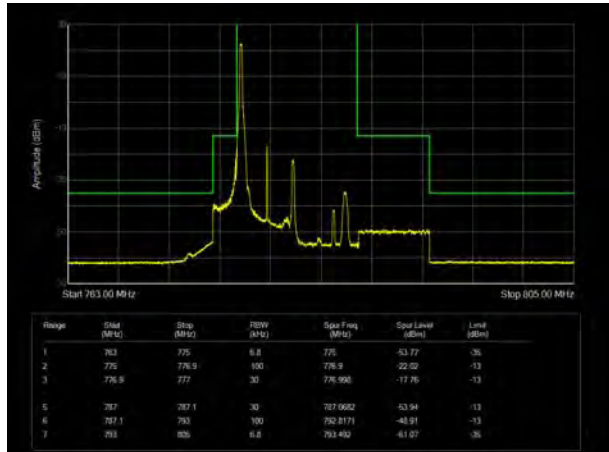


LTE Band 12 16QAM 10MHz CH-High, 100%RB

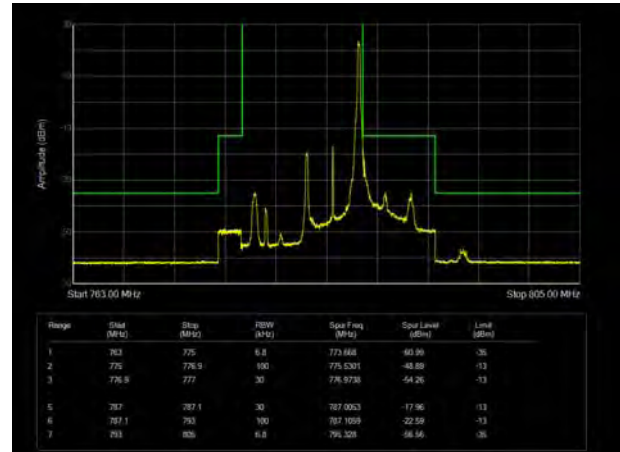




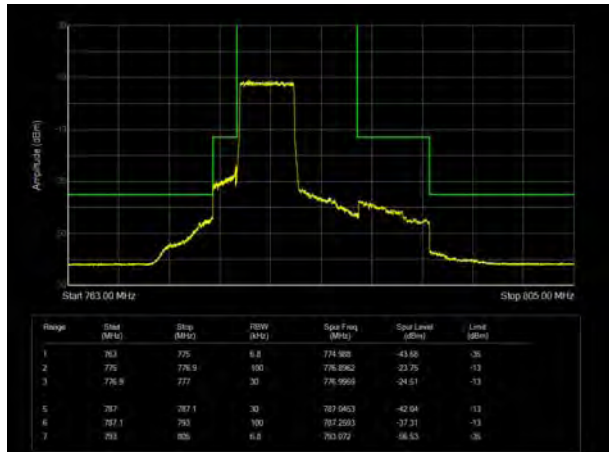
LTE Band 13 QPSK 5MHz CH-Low, 1 RB



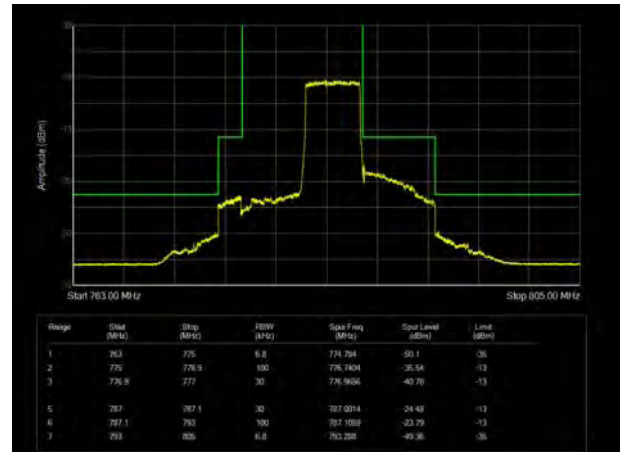
LTE Band 13 QPSK 5MHz CH-High, 1 RB



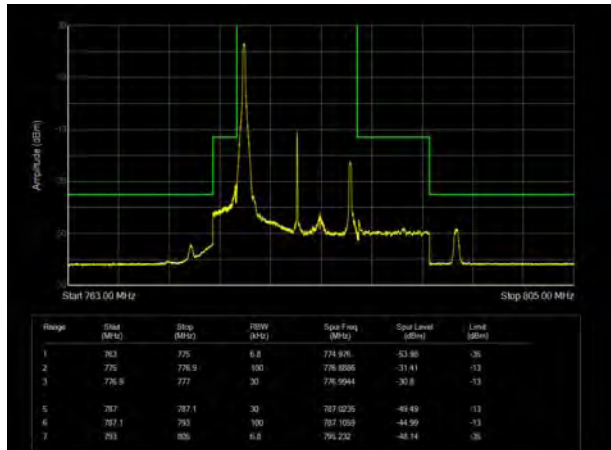
LTE Band 13 QPSK 5MHz CH-Low, 100%RB



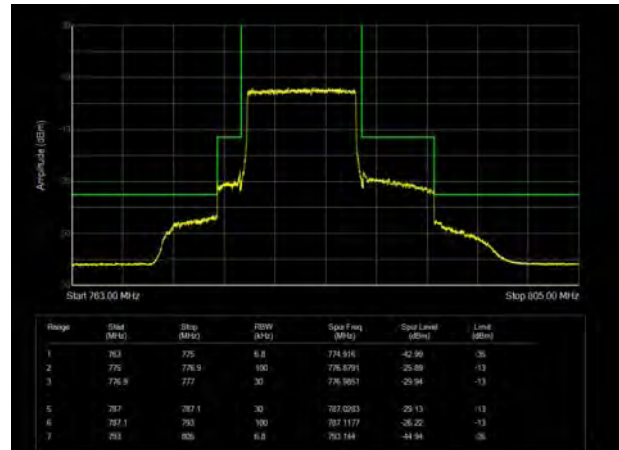
LTE Band 13 QPSK 5MHz CH-High, 100%RB



LTE Band 13 QPSK 10MHz CH-Low, 1 RB



LTE Band 13 QPSK 10MHz CH-Low, 100%RB



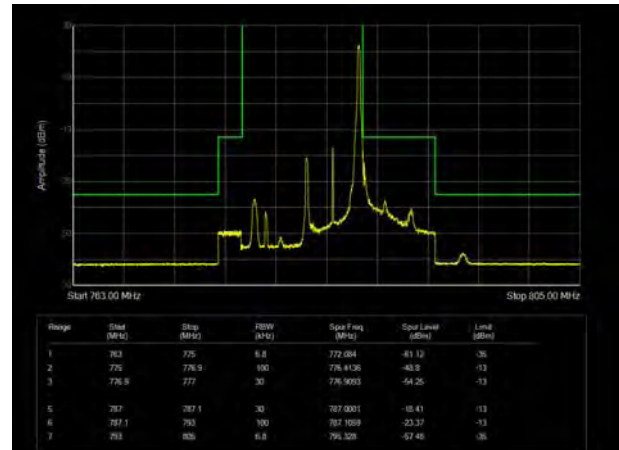
LTE Band 13 QPSK 10MHz CH- High, 1 RB



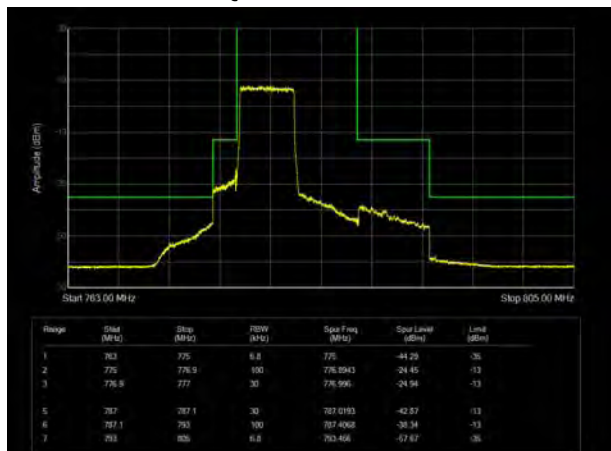
LTE Band 13 16QAM 5MHz CH-Low, 1 RB



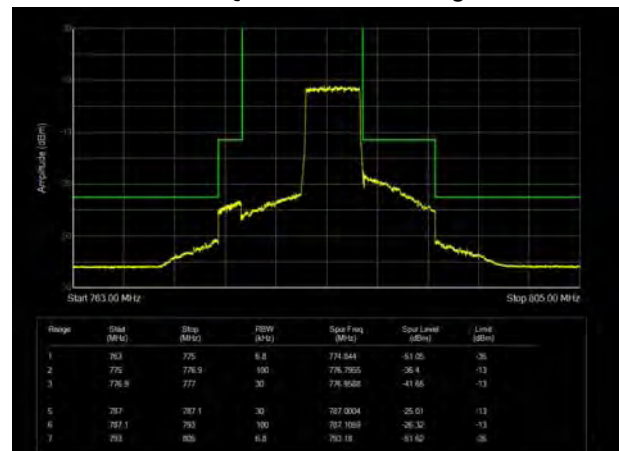
LTE Band 13 16QAM 5MHz CH-High, 1 RB



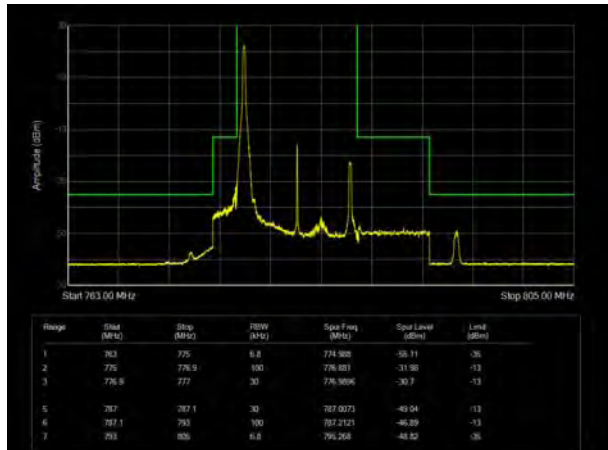
LTE Band 13 16QAM 5MHz CH-Low, 100%RB



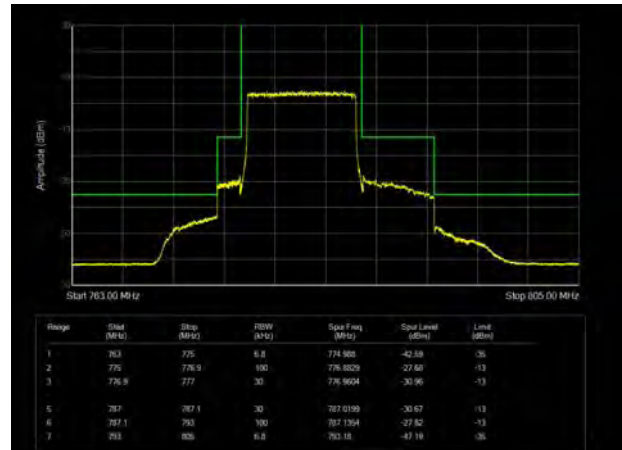
LTE Band 13 16QAM 5MHz CH-High, 100%RB



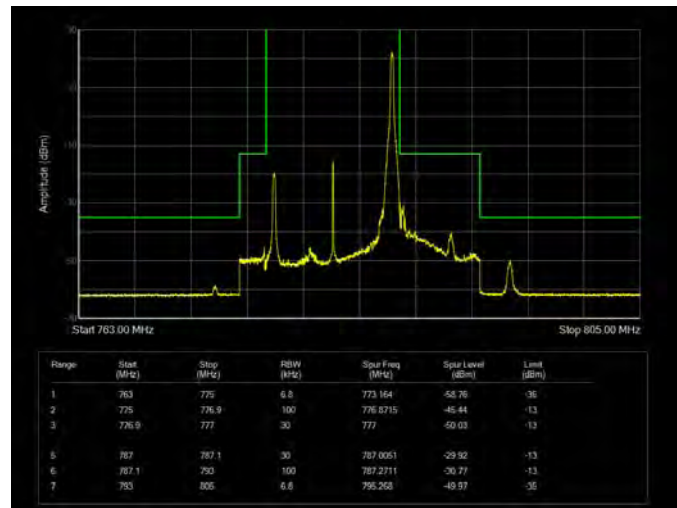
LTE Band 13 16QAM 10MHz CH-Low, 1 RB



LTE Band 13 16QAM 10MHz CH-Low, 100%RB



LTE Band 13 16QAM 10MHz CH-High, 1 RB



5.5 Peak-to-Average Power Ratio (PAPR)

Ambient condition

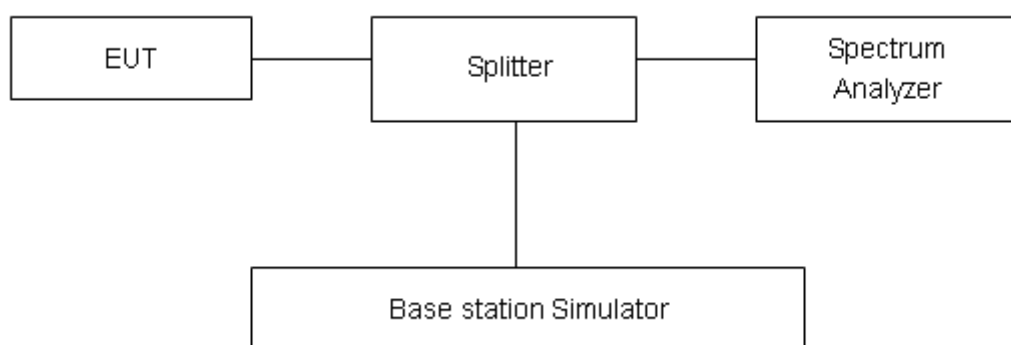
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

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

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

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

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

WCDMA Band IV	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
RMC	1312	1712.4	26.81	23.56	3.25	≤13	PASS
	1413	1732.6	26.91	23.56	3.35	≤13	PASS
	1513	1752.6	26.45	23.50	2.95	≤13	PASS

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	28.22	22.70	5.52	≤13	PASS
		20175	1732.5	28.42	22.91	5.51	≤13	PASS
		20393	1754.3	28.47	22.91	5.56	≤13	PASS
	3	19965	1711.5	28.01	22.73	5.28	≤13	PASS
		20175	1732.5	28.25	22.95	5.30	≤13	PASS
		20385	1753.5	28.29	22.94	5.35	≤13	PASS
	5	19975	1712.5	28.40	22.71	5.69	≤13	PASS
		20175	1732.5	28.58	22.94	5.64	≤13	PASS
		20375	1752.5	28.67	22.92	5.75	≤13	PASS
	10	20000	1715	28.11	22.79	5.32	≤13	PASS
		20175	1732.5	28.22	22.96	5.26	≤13	PASS
		20350	1750	28.33	22.96	5.37	≤13	PASS
	15	20025	1717.5	29.25	22.77	6.48	≤13	PASS
		20175	1732.5	29.40	22.92	6.48	≤13	PASS
		20325	1747.5	29.46	22.91	6.55	≤13	PASS
	20	20050	1720	29.08	22.74	6.34	≤13	PASS
		20175	1732.5	29.22	22.87	6.35	≤13	PASS
		20300	1745	29.33	22.87	6.46	≤13	PASS
16QAM	1.4	19957	1710.7	28.43	21.86	6.57	≤13	PASS
		20175	1732.5	28.41	21.88	6.53	≤13	PASS
		20393	1754.3	28.60	21.97	6.63	≤13	PASS
	3	19965	1711.5	28.26	21.89	6.37	≤13	PASS
		20175	1732.5	28.23	21.92	6.31	≤13	PASS
		20385	1753.5	28.45	22.00	6.45	≤13	PASS
	5	19975	1712.5	27.49	21.87	5.62	≤13	PASS
		20175	1732.5	27.95	21.88	6.07	≤13	PASS
		20375	1752.5	27.15	21.95	5.20	≤13	PASS
	10	20000	1715	28.33	21.90	6.43	≤13	PASS
		20175	1732.5	27.48	21.93	5.55	≤13	PASS
		20350	1750	27.23	21.99	5.24	≤13	PASS



	15	20025	1717.5	27.30	21.87	5.43	≤13	PASS
		20175	1732.5	27.85	21.88	5.97	≤13	PASS
		20325	1747.5	28.00	21.95	6.05	≤13	PASS
	20	20050	1720	28.72	21.85	6.87	≤13	PASS
		20175	1732.5	28.97	21.84	7.13	≤13	PASS
		20300	1745	27.97	21.92	6.05	≤13	PASS

LTE Band 12								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	23017	699.7	28.94	22.54	6.40	≤13	PASS
		23095	707.5	29.03	22.53	6.50	≤13	PASS
		23173	715.3	29.60	22.65	6.95	≤13	PASS
	3	23025	700.5	29.76	22.63	7.13	≤13	PASS
		23095	707.5	28.96	22.58	6.38	≤13	PASS
		23165	714.5	29.25	22.70	6.55	≤13	PASS
	5	23035	701.5	29.93	22.61	7.32	≤13	PASS
		23095	707.5	29.44	22.54	6.90	≤13	PASS
		23155	713.5	29.57	22.65	6.92	≤13	PASS
	10	23060	704	30.76	22.58	8.18	≤13	PASS
		23095	707.5	29.01	22.49	6.52	≤13	PASS
		23130	711	29.12	22.61	6.51	≤13	PASS
16QAM	1.4	23017	699.7	29.04	21.44	7.60	≤13	PASS
		23095	707.5	28.94	21.60	7.34	≤13	PASS
		23173	715.3	29.44	21.69	7.75	≤13	PASS
	3	23025	700.5	29.07	21.48	7.59	≤13	PASS
		23095	707.5	29.26	21.65	7.61	≤13	PASS
		23165	714.5	28.98	21.71	7.27	≤13	PASS
	5	23035	701.5	28.61	21.45	7.16	≤13	PASS
		23095	707.5	29.26	21.60	7.66	≤13	PASS
		23155	713.5	29.29	21.67	7.62	≤13	PASS
	10	23060	704	29.35	21.43	7.92	≤13	PASS
		23095	707.5	28.82	21.56	7.26	≤13	PASS
		23130	711	29.32	21.64	7.68	≤13	PASS

LTE Band 13								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	23205	779.5	29.29	22.56	6.73	≤13	PASS
		23230	782	30.23	22.69	7.54	≤13	PASS
		23255	784.5	29.60	22.59	7.01	≤13	PASS
	10	23230	782	28.56	22.69	5.87	≤13	PASS
16QAM	5	23205	779.5	27.98	21.64	6.34	≤13	PASS
		23230	782	28.08	21.81	6.27	≤13	PASS
		23255	784.5	28.74	21.69	7.05	≤13	PASS
	10	23230	782	28.46	21.62	6.84	≤13	PASS

5.6 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 -40°C to +85°C in 10°C step size.

(1) With all power removed, the temperature was decreased to -10°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 -40°C to +85°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

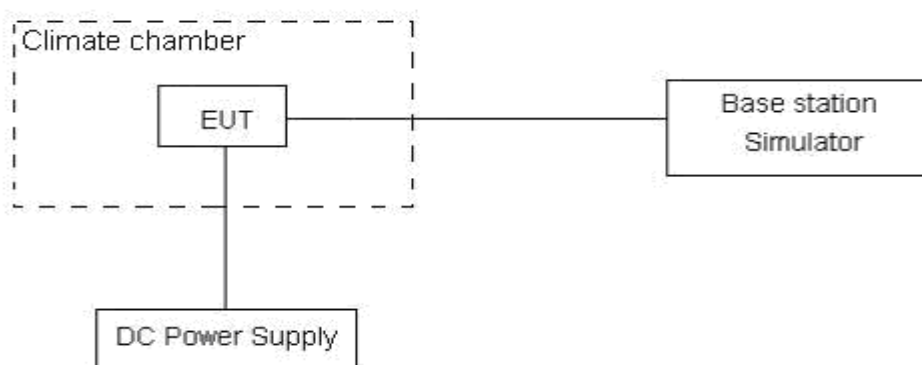
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 3.3 V and 4.3 V, with a nominal voltage of 3.8V.

Test setup



Limits

No specific frequency stability requirements in part 27.54

Measurement Uncertainty

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

Test Result

WCDMA Band IV						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25℃)	Normal	2.76	2.24	0.00147	0.00119	PASS
Extreme (85℃)		6.03	2.86	0.00321	0.00152	PASS
Extreme (80℃)		7.70	9.84	0.00409	0.00524	PASS
Extreme (70℃)		13.87	16.09	0.00738	0.00856	PASS
Extreme (60℃)		17.49	1.36	0.00930	0.00073	PASS
Extreme (50℃)		7.12	3.76	0.00379	0.00200	PASS
Extreme (40℃)		13.64	16.14	0.00725	0.00858	PASS
Extreme (30℃)		9.61	7.85	0.00511	0.00417	PASS
Extreme (20℃)		17.14	1.79	0.00912	0.00095	PASS
Extreme (10℃)		15.72	12.58	0.00836	0.00669	PASS
Extreme (0℃)		3.89	14.25	0.00207	0.00758	PASS
Extreme (-10℃)		14.92	13.75	0.00794	0.00731	PASS
Extreme (-20℃)		13.51	12.95	0.00719	0.00689	PASS
Extreme (-30℃)		13.35	14.73	0.00710	0.00783	PASS
Extreme (-40℃)		16.22	7.81	0.00863	0.00416	PASS
25℃	LV	12.05	5.67	0.00641	0.00301	PASS
	HV	16.47	12.62	0.00876	0.00671	PASS

LTE Band 4						
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	12.17	1.32	0.00647	0.00070	PASS
Extreme (85℃)		15.97	3.23	0.00849	0.00172	PASS
Extreme (80℃)		10.08	12.15	0.00536	0.00646	PASS
Extreme (70℃)		6.50	8.14	0.00346	0.00433	PASS
Extreme (60℃)		5.14	10.78	0.00273	0.00573	PASS
Extreme (50℃)		6.15	16.27	0.00327	0.00865	PASS
Extreme (40℃)		16.25	15.25	0.00864	0.00811	PASS
Extreme (30℃)		10.76	17.68	0.00572	0.00941	PASS
Extreme (20℃)		15.44	3.87	0.00821	0.00206	PASS
Extreme (10℃)		10.28	4.00	0.00547	0.00213	PASS
Extreme (0℃)		2.63	2.83	0.00140	0.00150	PASS
Extreme (-10℃)		6.98	7.36	0.00371	0.00392	PASS



Test Report		Report Test Results				
Extreme (-20℃)		12.82	9.58	0.00682	0.00510	PASS
Extreme (-30℃)		14.44	9.17	0.00768	0.00488	PASS
Extreme (-40℃)		3.69	10.42	0.00196	0.00555	PASS
25℃	LV	8.88	4.98	0.00472	0.00265	PASS
	HV	6.02	11.58	0.00320	0.00616	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz	16QAM	QPSK	16QAM	QPSK	
Temperature	Voltage					
Normal (25℃)	Normal	11.38	13.86	0.00605	0.00737	PASS
Extreme (85℃)		8.07	8.89	0.00429	0.00473	PASS
Extreme (80℃)		11.39	12.80	0.00606	0.00681	PASS
Extreme (70℃)		3.22	13.24	0.00171	0.00704	PASS
Extreme (60℃)		3.61	10.48	0.00192	0.00558	PASS
Extreme (50℃)		11.07	1.18	0.00589	0.00063	PASS
Extreme (40℃)		5.12	9.70	0.00272	0.00516	PASS
Extreme (30℃)		16.05	5.65	0.00854	0.00301	PASS
Extreme (20℃)		6.80	13.27	0.00362	0.00706	PASS
Extreme (10℃)		7.37	10.63	0.00392	0.00565	PASS
Extreme (0℃)		1.06	6.50	0.00056	0.00346	PASS
Extreme (-10℃)		3.23	3.00	0.00172	0.00159	PASS
Extreme (-20℃)		11.22	12.52	0.00597	0.00666	PASS
Extreme (-30℃)		9.18	12.85	0.00488	0.00683	PASS
Extreme (-40℃)		7.26	15.70	0.00386	0.00835	PASS
25℃	LV	4.96	6.35	0.00264	0.00338	PASS
	HV	16.69	17.97	0.00888	0.00956	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz	16QAM	QPSK	16QAM	QPSK	
Temperature	Voltage					
Normal (25℃)	Normal	1.71	3.74	0.00091	0.00199	PASS
Extreme (85℃)		12.18	1.36	0.00648	0.00072	PASS
Extreme (80℃)		7.58	15.55	0.00403	0.00827	PASS
Extreme (70℃)		1.13	15.19	0.00060	0.00808	PASS
Extreme (60℃)		4.18	9.12	0.00222	0.00485	PASS
Extreme (50℃)		9.23	11.55	0.00491	0.00614	PASS
Extreme (40℃)		12.25	12.90	0.00652	0.00686	PASS
Extreme (30℃)		6.11	14.22	0.00325	0.00756	PASS
Extreme (20℃)		7.43	14.95	0.00395	0.00795	PASS
Extreme (10℃)		14.23	13.15	0.00757	0.00699	PASS
Extreme (0℃)		15.42	5.89	0.00820	0.00313	PASS
Extreme (-10℃)		5.81	13.94	0.00309	0.00742	PASS



Test Report		Report Header Section				
Extreme (-20℃)		8.03	12.50	0.00427	0.00665	PASS
Extreme (-30℃)		10.77	16.79	0.00573	0.00893	PASS
Extreme (-40℃)		12.20	15.81	0.00649	0.00841	PASS
25℃	LV	12.52	14.83	0.00666	0.00789	PASS
	HV	1.79	1.21	0.00095	0.00064	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	6.77	14.05	0.00360	0.00747	PASS
Extreme (85℃)		1.89	2.85	0.00101	0.00151	PASS
Extreme (80℃)		2.37	14.32	0.00126	0.00762	PASS
Extreme (70℃)		12.07	8.72	0.00642	0.00464	PASS
Extreme (60℃)		2.88	17.90	0.00153	0.00952	PASS
Extreme (50℃)		1.32	11.55	0.00070	0.00614	PASS
Extreme (40℃)		7.37	1.25	0.00392	0.00067	PASS
Extreme (30℃)		13.26	6.21	0.00705	0.00330	PASS
Extreme (20℃)		3.82	15.35	0.00203	0.00817	PASS
Extreme (10℃)		8.15	14.12	0.00434	0.00751	PASS
Extreme (0℃)		17.02	5.73	0.00905	0.00305	PASS
Extreme (-10℃)		5.16	1.40	0.00275	0.00074	PASS
Extreme (-20℃)		4.59	12.36	0.00244	0.00657	PASS
Extreme (-30℃)		9.55	1.29	0.00508	0.00069	PASS
Extreme (-40℃)		17.87	12.59	0.00951	0.00670	PASS
25℃	LV	8.10	5.75	0.00431	0.00306	PASS
	HV	15.46	9.00	0.00822	0.00479	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	4.55	1.92	0.00242	0.00102	PASS
Extreme (85℃)		4.91	11.84	0.00261	0.00630	PASS
Extreme (80℃)		12.82	16.23	0.00682	0.00863	PASS
Extreme (70℃)		11.61	4.75	0.00618	0.00253	PASS
Extreme (60℃)		6.11	5.77	0.00325	0.00307	PASS
Extreme (50℃)		13.23	3.53	0.00704	0.00188	PASS
Extreme (40℃)		11.59	15.95	0.00616	0.00849	PASS
Extreme (30℃)		16.44	17.87	0.00874	0.00950	PASS
Extreme (20℃)		12.21	11.48	0.00649	0.00611	PASS
Extreme (10℃)		10.56	12.56	0.00562	0.00668	PASS
Extreme (0℃)		17.68	12.38	0.00940	0.00658	PASS
Extreme (-10℃)		4.84	15.48	0.00257	0.00824	PASS



Extreme (-20℃)			16.49	11.67	0.00877	0.00621	PASS	
Extreme (-30℃)			13.26	12.97	0.00705	0.00690	PASS	
Extreme (-40℃)			14.97	7.73	0.00796	0.00411	PASS	
25℃	LV		13.49	14.52	0.00717	0.00772	PASS	
	HV		9.43	5.76	0.00502	0.00307	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	10.74	15.44	0.00571	0.00821	PASS
Extreme (85℃)				5.83	1.30	0.00310	0.00069	PASS
Extreme (80℃)				7.42	4.62	0.00395	0.00246	PASS
Extreme (70℃)				11.08	10.59	0.00589	0.00563	PASS
Extreme (60℃)				8.85	4.61	0.00471	0.00245	PASS
Extreme (50℃)				8.58	9.40	0.00456	0.00500	PASS
Extreme (40℃)				2.99	3.48	0.00159	0.00185	PASS
Extreme (30℃)				11.10	11.34	0.00591	0.00603	PASS
Extreme (20℃)				5.47	10.77	0.00291	0.00573	PASS
Extreme (10℃)				10.34	6.73	0.00550	0.00358	PASS
Extreme (0℃)				12.70	12.63	0.00676	0.00672	PASS
Extreme (-10℃)				16.89	16.81	0.00899	0.00894	PASS
Extreme (-20℃)				8.34	15.86	0.00444	0.00844	PASS
Extreme (-30℃)				17.44	11.23	0.00928	0.00597	PASS
Extreme (-40℃)				4.62	15.45	0.00246	0.00822	PASS
25℃	LV		12.60	8.92	0.00670	0.00475	PASS	
	HV		15.45	8.03	0.00822	0.00427	PASS	

LTE Band 12						
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	1.07	6.38	0.00057	0.00340	PASS
Extreme (85℃)		2.86	12.63	0.00152	0.00672	PASS
Extreme (80℃)		5.43	2.06	0.00289	0.00109	PASS
Extreme (70℃)		7.06	15.90	0.00376	0.00846	PASS
Extreme (60℃)		16.11	5.73	0.00857	0.00305	PASS
Extreme (50℃)		12.75	12.41	0.00678	0.00660	PASS
Extreme (40℃)		3.11	15.98	0.00165	0.00850	PASS
Extreme (30℃)		2.80	16.92	0.00149	0.00900	PASS
Extreme (20℃)		1.85	3.61	0.00098	0.00192	PASS



Extreme (10℃)		1.56	11.55	0.00083	0.00615	PASS
Extreme (0℃)		1.71	1.87	0.00091	0.00100	PASS
Extreme (-10℃)		15.01	7.70	0.00798	0.00409	PASS
Extreme (-20℃)		16.20	16.72	0.00862	0.00889	PASS
Extreme (-30℃)		10.75	3.62	0.00572	0.00192	PASS
Extreme (-40℃)		7.67	3.87	0.00408	0.00206	PASS
25℃	LV	15.50	2.58	0.00825	0.00137	PASS
	HV	11.46	8.44	0.00610	0.00449	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	12.06	2.11	0.00642	0.00112	PASS
Extreme (85℃)		1.90	5.70	0.00101	0.00303	PASS
Extreme (80℃)		12.63	5.72	0.00672	0.00304	PASS
Extreme (70℃)		2.98	2.82	0.00159	0.00150	PASS
Extreme (60℃)		1.44	15.75	0.00076	0.00838	PASS
Extreme (50℃)		13.61	10.09	0.00724	0.00537	PASS
Extreme (40℃)		1.94	3.36	0.00103	0.00179	PASS
Extreme (30℃)		2.25	3.04	0.00119	0.00162	PASS
Extreme (20℃)		6.86	16.29	0.00365	0.00866	PASS
Extreme (10℃)		6.59	9.23	0.00351	0.00491	PASS
Extreme (0℃)		1.13	1.25	0.00060	0.00066	PASS
Extreme (-10℃)		9.14	17.16	0.00486	0.00913	PASS
Extreme (-20℃)		11.65	1.56	0.00619	0.00083	PASS
Extreme (-30℃)		6.62	7.58	0.00352	0.00403	PASS
Extreme (-40℃)		15.62	7.02	0.00831	0.00373	PASS
25℃	LV	13.53	17.45	0.00720	0.00928	PASS
	HV	9.87	7.53	0.00525	0.00401	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	12.59	12.25	0.00670	0.00652	PASS
Extreme (85℃)		6.66	16.71	0.00354	0.00889	PASS
Extreme (80℃)		5.73	17.28	0.00305	0.00919	PASS
Extreme (70℃)		17.08	8.50	0.00908	0.00452	PASS
Extreme (60℃)		7.85	4.53	0.00417	0.00241	PASS
Extreme (50℃)		5.13	7.99	0.00273	0.00425	PASS
Extreme (40℃)		12.00	4.57	0.00638	0.00243	PASS
Extreme (30℃)		8.99	16.53	0.00478	0.00879	PASS
Extreme (20℃)		11.05	13.00	0.00588	0.00691	PASS



Extreme (10℃)		16.78	7.33	0.00892	0.00390	PASS
Extreme (0℃)		2.75	7.24	0.00146	0.00385	PASS
Extreme (-10℃)		16.37	12.46	0.00871	0.00663	PASS
Extreme (-20℃)		6.26	3.50	0.00333	0.00186	PASS
Extreme (-30℃)		15.09	6.13	0.00803	0.00326	PASS
Extreme (-40℃)		2.11	16.30	0.00112	0.00867	PASS
25℃	LV	4.64	14.47	0.00247	0.00770	PASS
	HV	17.53	15.63	0.00932	0.00831	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	3.68	13.55	0.00196	0.00721	PASS
Extreme (85℃)		5.67	15.65	0.00301	0.00832	PASS
Extreme (80℃)		8.23	9.01	0.00438	0.00479	PASS
Extreme (70℃)		16.80	7.59	0.00894	0.00404	PASS
Extreme (60℃)		16.91	9.59	0.00899	0.00510	PASS
Extreme (50℃)		6.08	9.35	0.00324	0.00498	PASS
Extreme (40℃)		8.41	11.43	0.00447	0.00608	PASS
Extreme (30℃)		9.46	4.87	0.00503	0.00259	PASS
Extreme (20℃)		8.02	3.88	0.00427	0.00206	PASS
Extreme (10℃)		1.20	8.40	0.00064	0.00447	PASS
Extreme (0℃)		17.42	13.47	0.00926	0.00716	PASS
Extreme (-10℃)		15.65	10.30	0.00833	0.00548	PASS
Extreme (-20℃)		9.19	12.08	0.00489	0.00643	PASS
Extreme (-30℃)		12.11	5.33	0.00644	0.00284	PASS
Extreme (-40℃)		11.22	3.07	0.00597	0.00164	PASS
25℃	LV	15.85	9.59	0.00843	0.00510	PASS
	HV	8.33	9.79	0.00443	0.00521	PASS

LTE Band 13						
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	6.26	14.74	0.00333	0.00784	PASS
Extreme (85℃)		6.47	10.50	0.00344	0.00558	PASS
Extreme (80℃)		15.55	17.64	0.00827	0.00938	PASS
Extreme (70℃)		6.14	14.16	0.00326	0.00753	PASS
Extreme (60℃)		17.10	9.15	0.00910	0.00487	PASS
Extreme (50℃)		15.38	9.62	0.00818	0.00512	PASS
Extreme (40℃)		4.83	16.35	0.00257	0.00870	PASS



Extreme (30℃)		12.39	2.59	0.00659	0.00138	PASS
Extreme (20℃)		9.92	5.17	0.00528	0.00275	PASS
Extreme (10℃)		16.29	6.52	0.00866	0.00347	PASS
Extreme (0℃)		5.54	2.32	0.00295	0.00123	PASS
Extreme (-10℃)		15.21	17.75	0.00809	0.00944	PASS
Extreme (-20℃)		11.42	15.04	0.00607	0.00800	PASS
Extreme (-30℃)		17.26	8.23	0.00918	0.00438	PASS
Extreme (-40℃)		9.18	14.08	0.00488	0.00749	PASS
25℃	LV	9.88	4.21	0.00526	0.00224	PASS
	HV	4.28	8.83	0.00228	0.00470	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz					
Temperature	Voltage					
Normal (25℃)	Normal	16QAM	QPSK	16QAM	QPSK	PASS
Extreme (85℃)		5.81	3.40	0.00309	0.00181	PASS
Extreme (80℃)		13.47	11.46	0.00716	0.00610	PASS
Extreme (70℃)		16.93	13.70	0.00900	0.00729	PASS
Extreme (60℃)		4.78	8.14	0.00254	0.00433	PASS
Extreme (60℃)		6.18	12.37	0.00329	0.00658	PASS
Extreme (50℃)		4.68	5.89	0.00249	0.00313	PASS
Extreme (40℃)		3.10	4.94	0.00165	0.00263	PASS
Extreme (30℃)		9.13	10.32	0.00486	0.00549	PASS
Extreme (20℃)		14.31	6.35	0.00761	0.00338	PASS
Extreme (10℃)		4.25	1.76	0.00226	0.00094	PASS
Extreme (0℃)		14.64	14.61	0.00779	0.00777	PASS
Extreme (-10℃)		11.20	3.71	0.00596	0.00197	PASS
Extreme (-20℃)		2.52	10.23	0.00134	0.00544	PASS
Extreme (-30℃)		3.39	2.35	0.00180	0.00125	PASS
Extreme (-40℃)		13.14	2.88	0.00699	0.00153	PASS
25℃	LV	17.90	13.61	0.00952	0.00724	PASS
	HV	8.53	14.06	0.00454	0.00748	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz					
Temperature	Voltage					
Normal (25℃)	Normal	13.98	13.07	0.00744	0.00695	PASS
Extreme (85℃)		4.77	3.29	0.00254	0.00175	PASS
Extreme (80℃)		10.58	17.18	0.00563	0.00914	PASS
Extreme (70℃)		3.87	8.47	0.00206	0.00451	PASS
Extreme (60℃)		5.46	9.27	0.00290	0.00493	PASS
Extreme (50℃)		7.60	9.44	0.00404	0.00502	PASS
Extreme (40℃)		17.21	17.66	0.00915	0.00939	PASS



Extreme (30℃)		11.57	11.67	0.00615	0.00620	PASS
Extreme (20℃)		1.41	9.87	0.00075	0.00525	PASS
Extreme (10℃)		5.58	1.68	0.00297	0.00089	PASS
Extreme (0℃)		5.23	13.85	0.00278	0.00737	PASS
Extreme (-10℃)		8.70	3.27	0.00463	0.00174	PASS
Extreme (-20℃)		15.39	8.33	0.00818	0.00443	PASS
Extreme (-30℃)		17.12	7.55	0.00911	0.00401	PASS
Extreme (-40℃)		16.08	7.47	0.00855	0.00397	PASS
25℃	LV	8.62	5.92	0.00458	0.00315	PASS
	HV	7.93	11.04	0.00422	0.00587	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	16.39	15.04	0.00872	0.00800	PASS
Extreme (85℃)		13.58	3.35	0.00722	0.00178	PASS
Extreme (80℃)		2.40	17.58	0.00128	0.00935	PASS
Extreme (70℃)		1.32	5.17	0.00070	0.00275	PASS
Extreme (60℃)		17.02	6.21	0.00906	0.00330	PASS
Extreme (50℃)		11.44	9.51	0.00608	0.00506	PASS
Extreme (40℃)		8.54	6.54	0.00454	0.00348	PASS
Extreme (30℃)		15.42	16.50	0.00820	0.00878	PASS
Extreme (20℃)		6.11	11.52	0.00325	0.00613	PASS
Extreme (10℃)		17.85	4.75	0.00949	0.00253	PASS
Extreme (0℃)		5.79	7.48	0.00308	0.00398	PASS
Extreme (-10℃)		15.04	10.91	0.00800	0.00581	PASS
Extreme (-20℃)		3.38	2.82	0.00180	0.00150	PASS
Extreme (-30℃)		5.43	5.87	0.00289	0.00312	PASS
Extreme (-40℃)		15.54	11.31	0.00827	0.00602	PASS
25℃	LV	8.33	13.33	0.00443	0.00709	PASS
	HV	8.75	9.01	0.00465	0.00479	PASS

5.7 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)

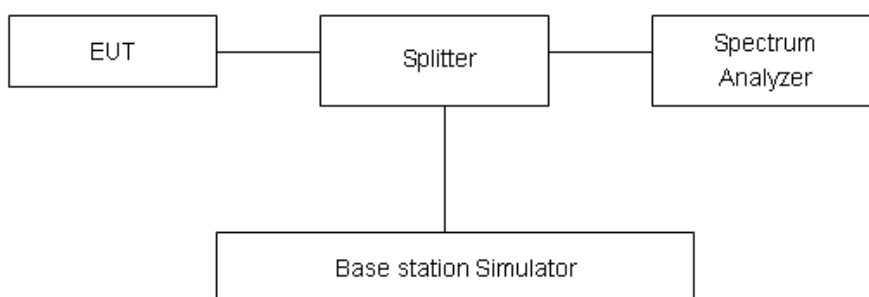
RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

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

Test setup



Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB..”

Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least



30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Part 27.53(h)/(g) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm
	Limit in the band 1559-1610 MHz	-40 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-18GHz	1.407 dB

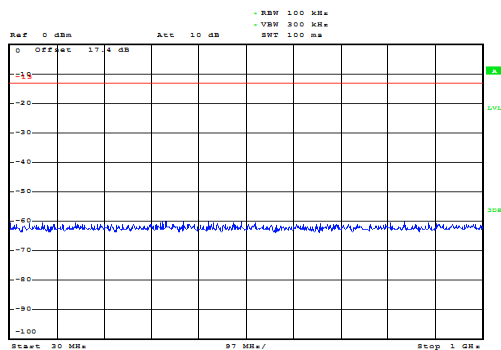
Test Result

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.

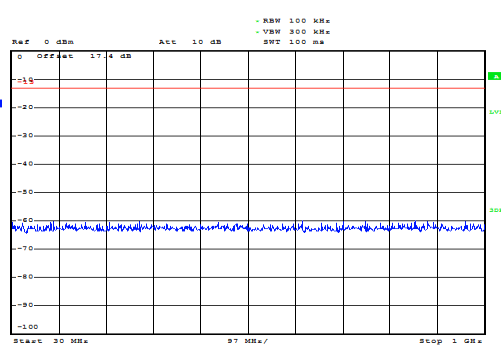
The signal beyond the limit is carrier.

Original

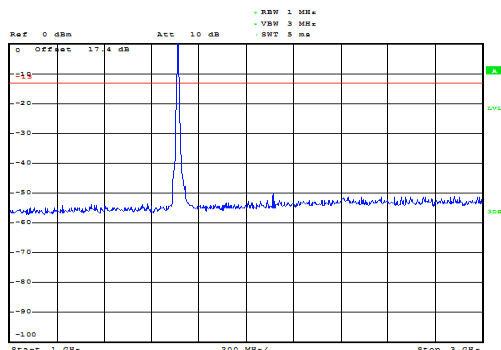
WCDMA Band IV CH-Low 30MHz~1GHz



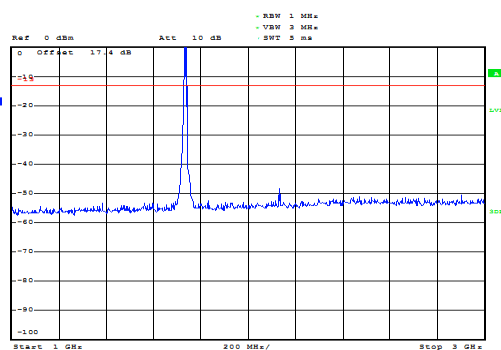
WCDMA Band IV CH-Middle 30MHz~1GHz



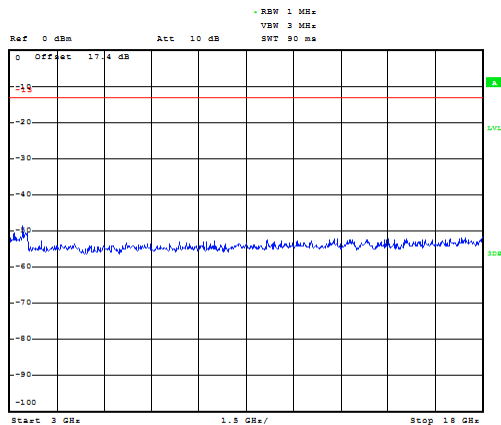
WCDMA Band IV CH-Low 1GHz~3GHz



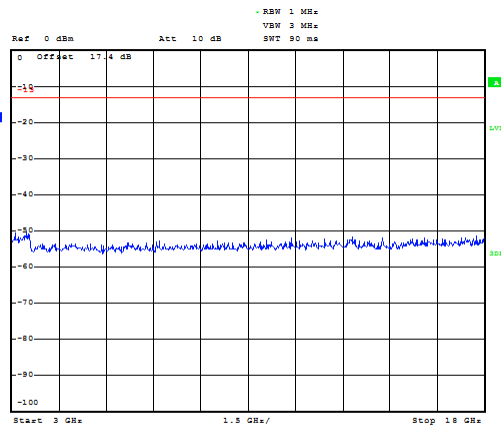
WCDMA Band IV CH-Middle 1GHz~3GHz



WCDMA Band IV CH-Low 3GHz~18GHz

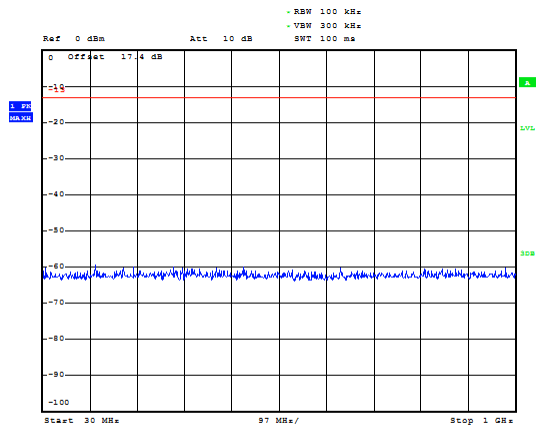


WCDMA Band IV CH-Middle 3GHz~18GHz

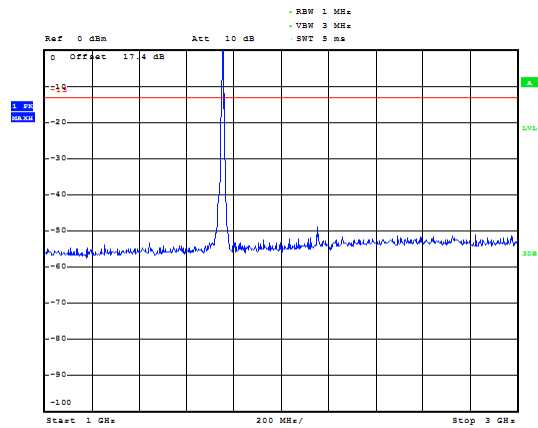




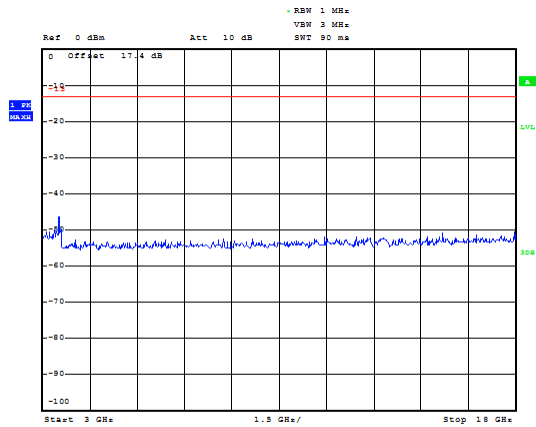
WCDMA Band IV CH-High 30MHz~1GHz



WCDMA Band IV CH-High 1GHz~3GHz



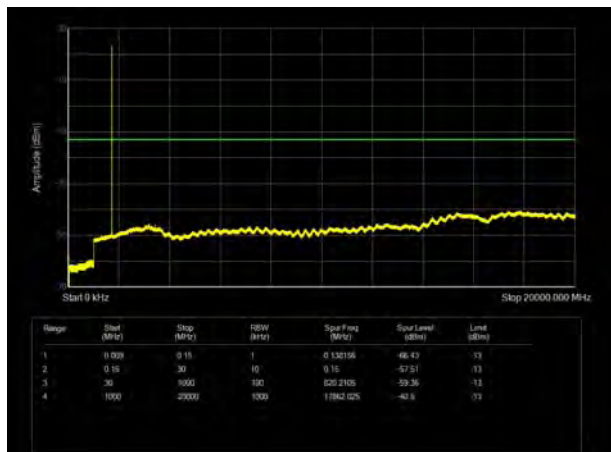
WCDMA Band IV CH-High 3GHz~18GHz



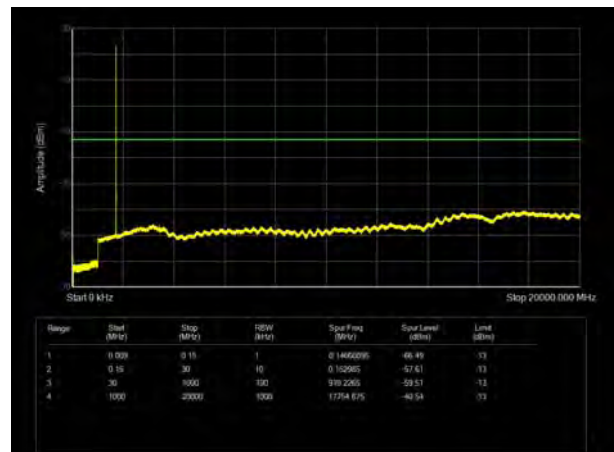


Variant

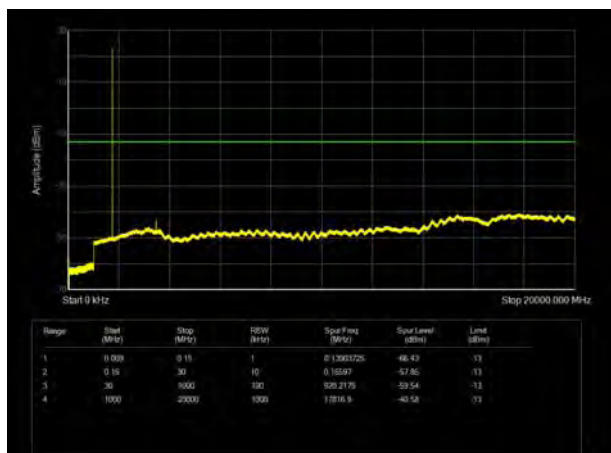
LTE Band 4 1.4MHz CH-Low 9kHz~20GHz



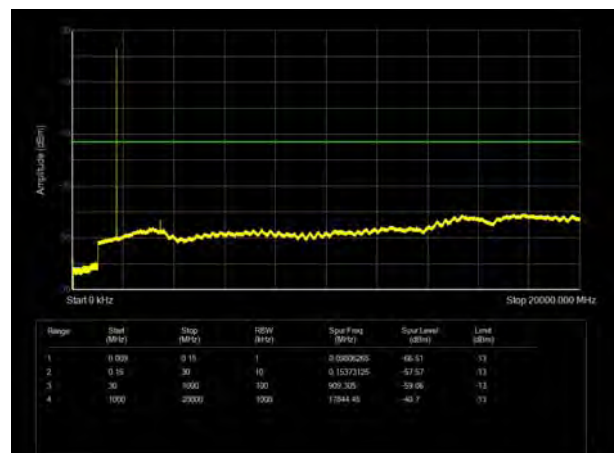
LTE Band 4 3MHz CH- Low 9kHz~20GHz



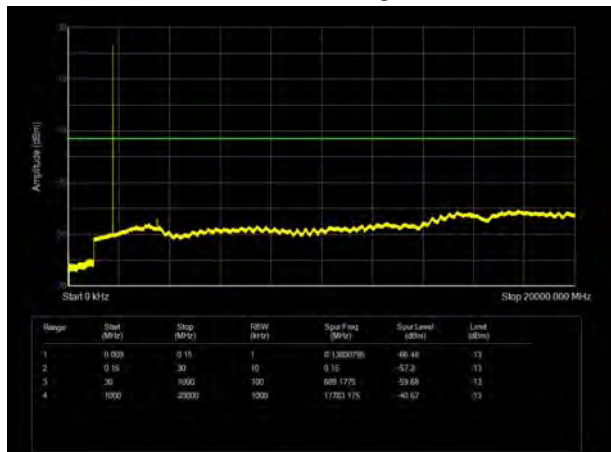
LTE Band 4 1.4MHz CH- Middle 9kHz~20GHz



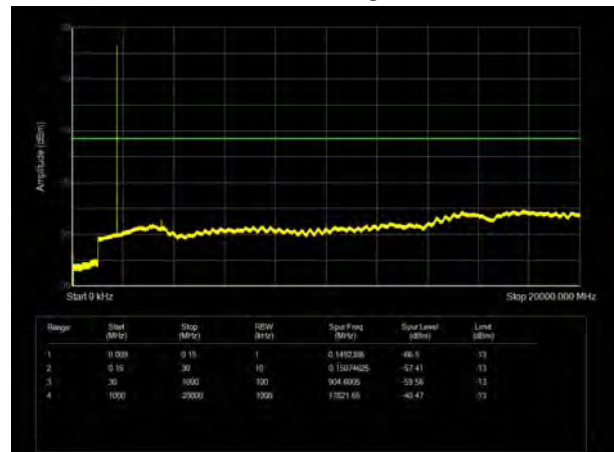
LTE Band 4 3MHz CH- Middle 9kHz~20GHz



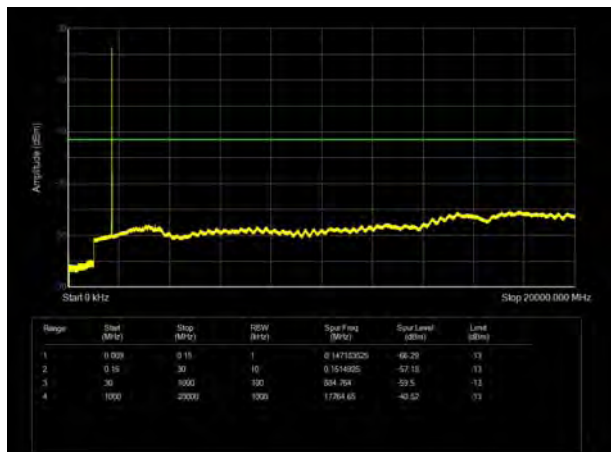
LTE Band 4 1.4MHz CH- High 9kHz~20GHz



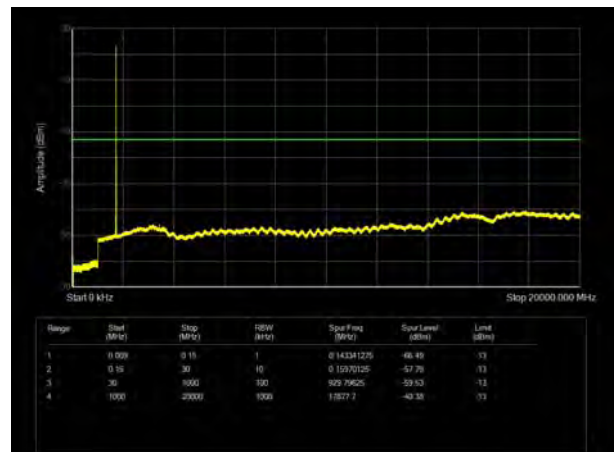
LTE Band 4 3MHz CH-High 9kHz~20GHz



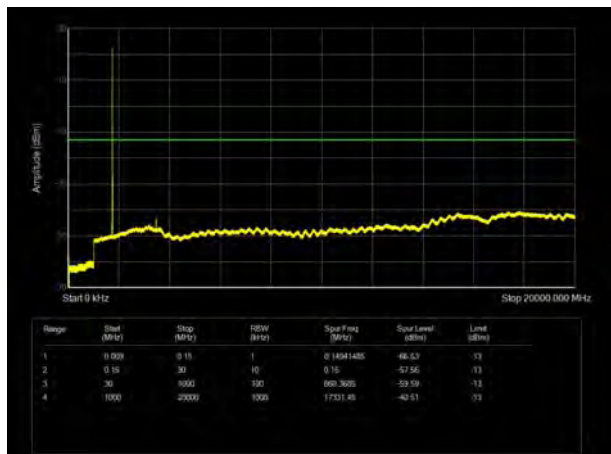
LTE Band 4 5MHz CH- Low 9kHz~20GHz



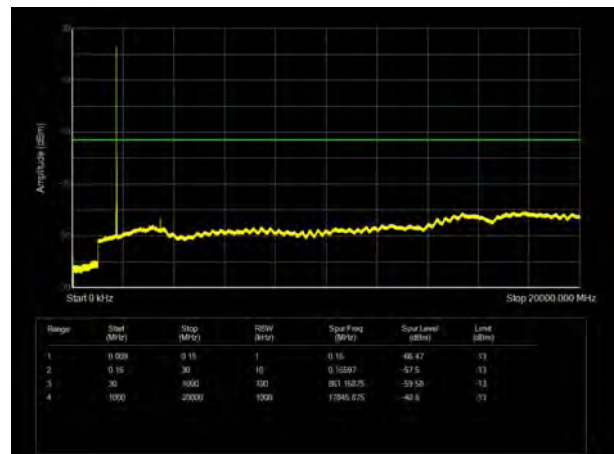
LTE Band 4 10MHz CH-Low 9kHz~20GHz



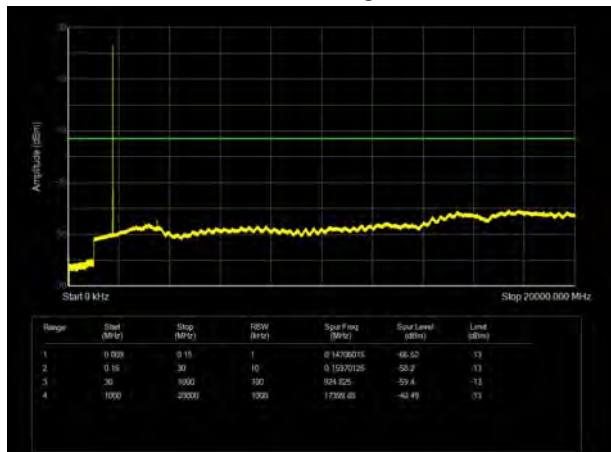
LTE Band 4 5MHz CH- Middle 9kHz~20GHz



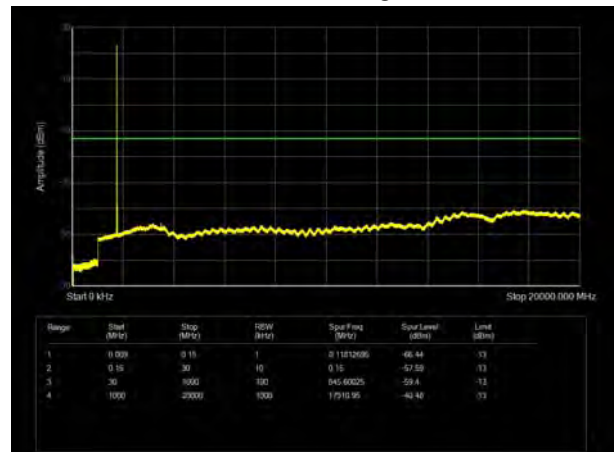
LTE Band 4 10MHz CH- Middle 9kHz~20GHz



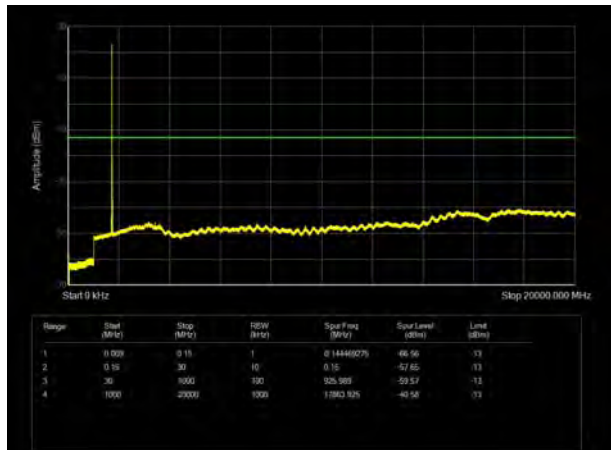
LTE Band 4 5MHz CH-High 9kHz~20GHz



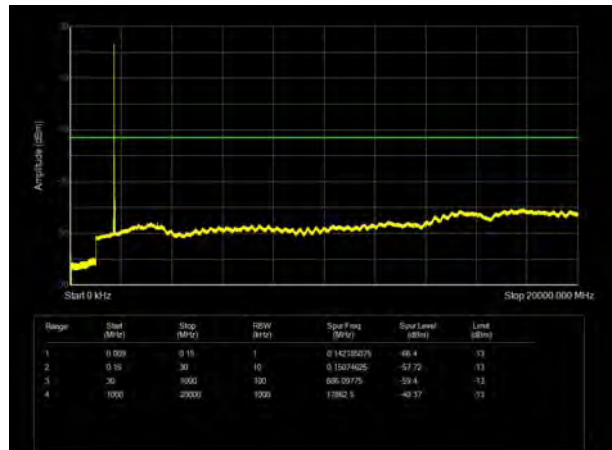
LTE Band 4 10MHz CH- High 9kHz~20GHz



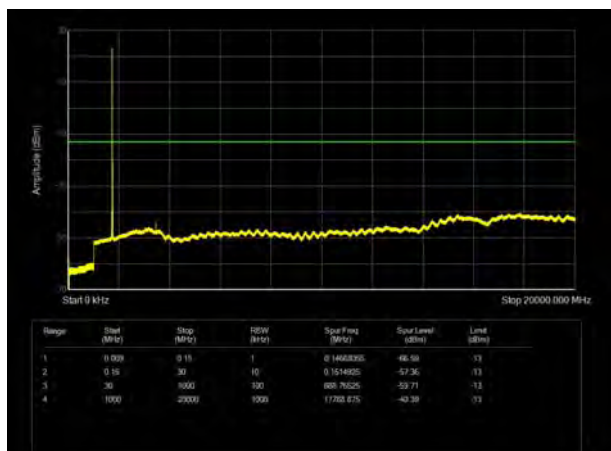
LTE Band 4 15MHz CH- Low 9kHz~20GHz



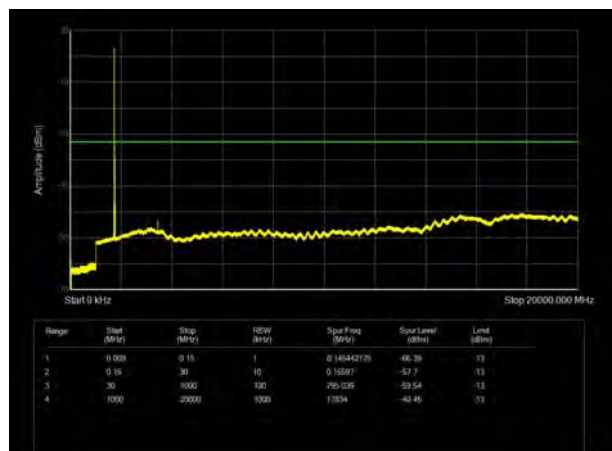
LTE Band 4 20MHz CH-Low 9kHz~20GHz



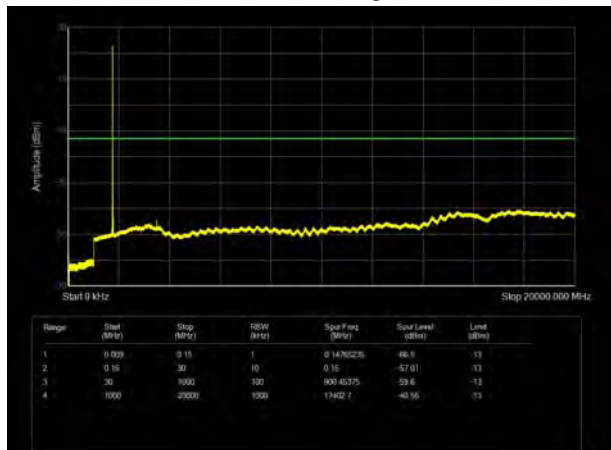
LTE Band 4 15MHz CH- Middle 9kHz~20GHz



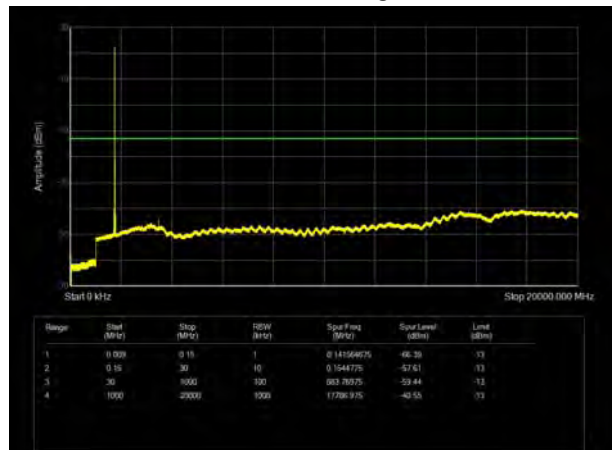
LTE Band 4 20MHz CH- Middle 9kHz~20GHz



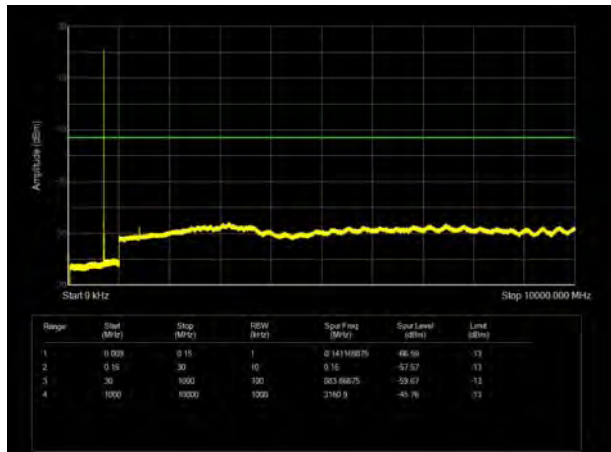
LTE Band 4 15MHz CH-High 9kHz~20GHz



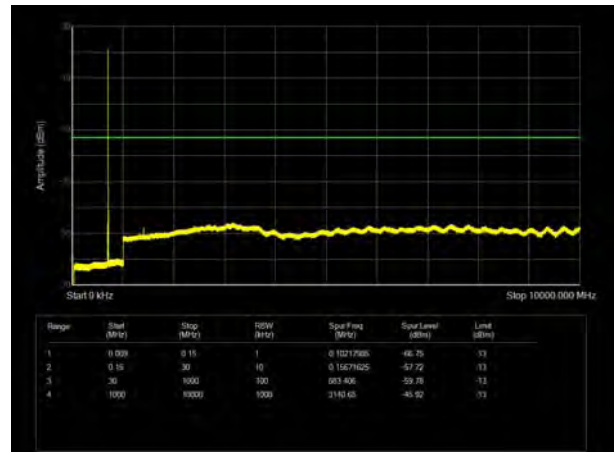
LTE Band 4 20MHz CH- High 9kHz~20GHz



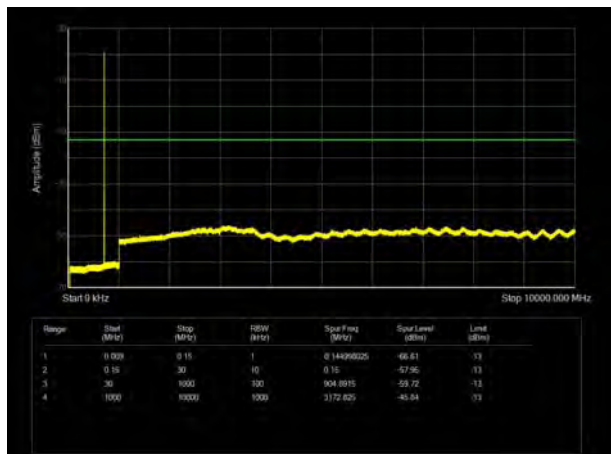
LTE Band 12 1.4MHz CH-Low 9kHz~10GHz



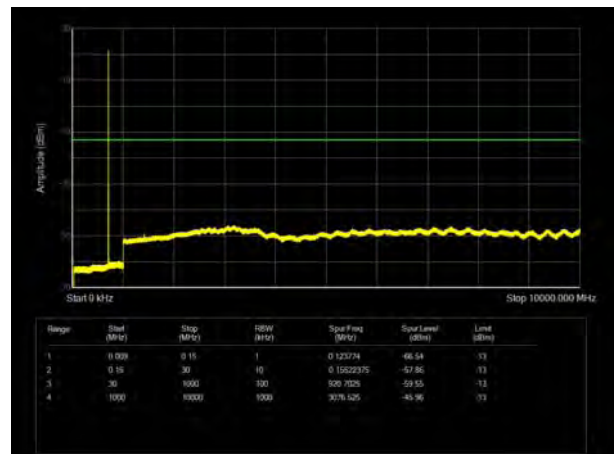
LTE Band 12 3MHz CH-Low 9kHz~10GHz



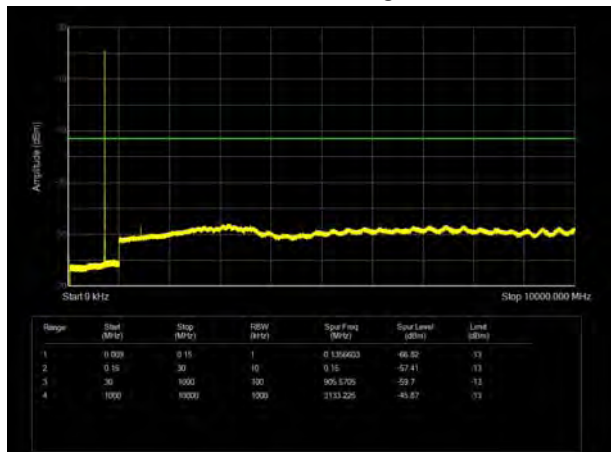
LTE Band 12 1.4MHz CH- Middle 9kHz~10GHz



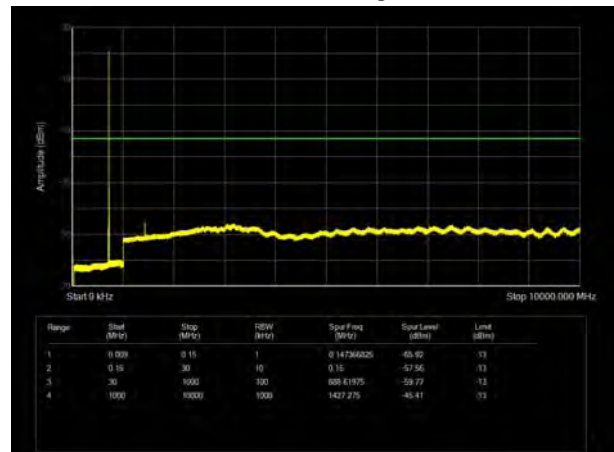
LTE Band 12 3MHz CH- Middle 9kHz~10GHz



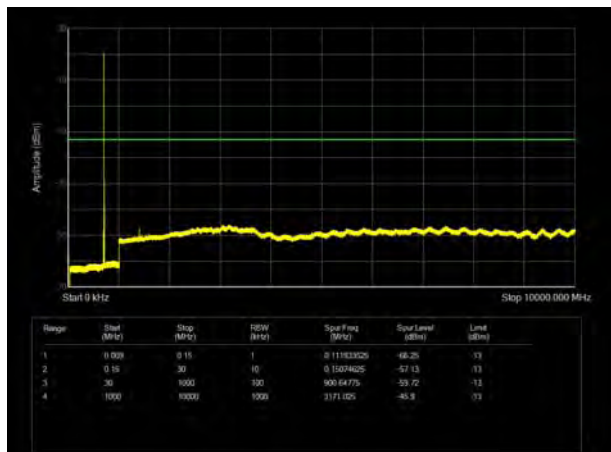
LTE Band 12 1.4MHz CH-High 9kHz~10GHz



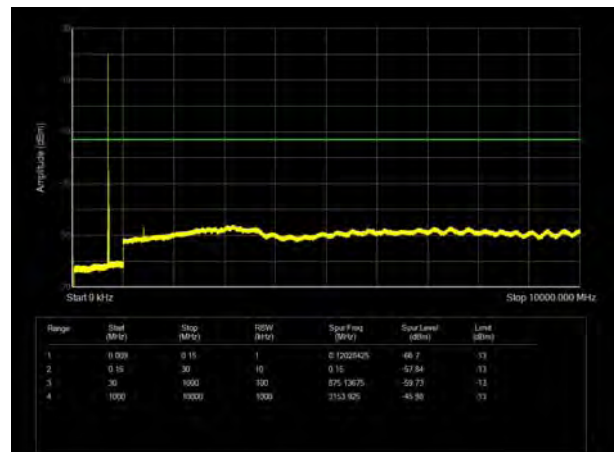
LTE Band 12 3MHz CH-High 9kHz~10GHz



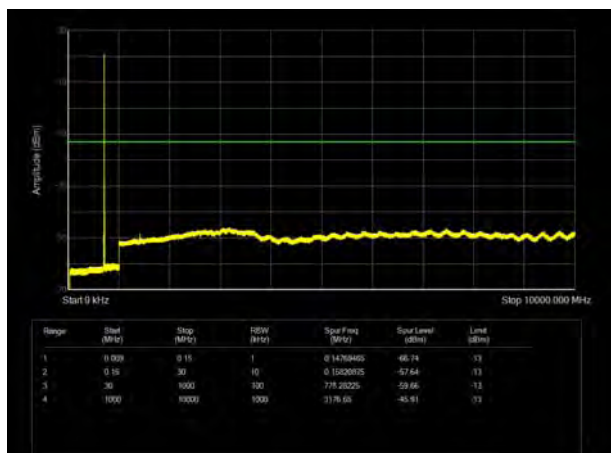
LTE Band 12 5MHz CH-Low 9kHz~10GHz



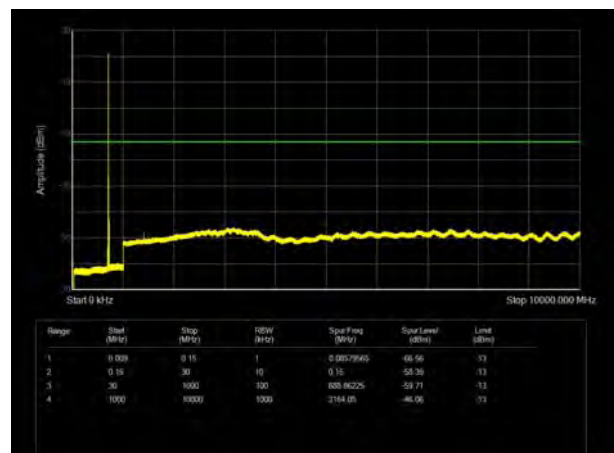
LTE Band 12 10MHz CH-Low 9kHz~10GHz



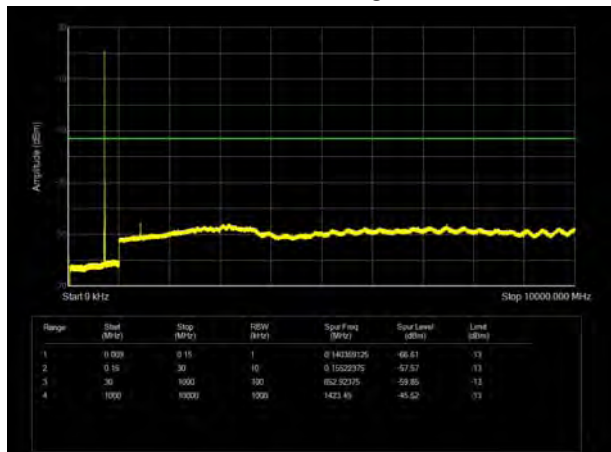
LTE Band 12 5MHz CH- Middle 9kHz~10GHz



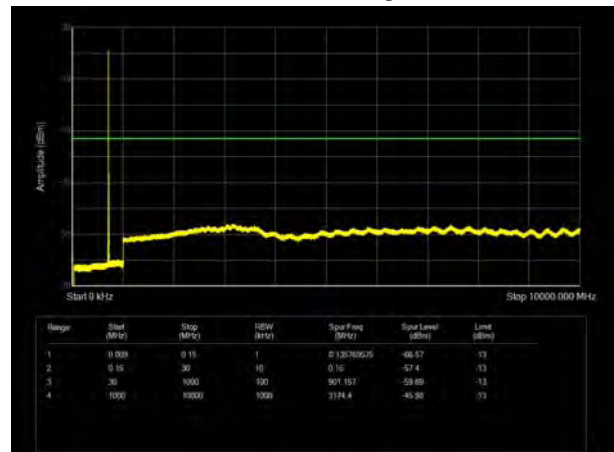
LTE Band 12 10MHz CH- Middle 9kHz~10GHz



LTE Band 12 5MHz CH-High 9kHz~10GHz

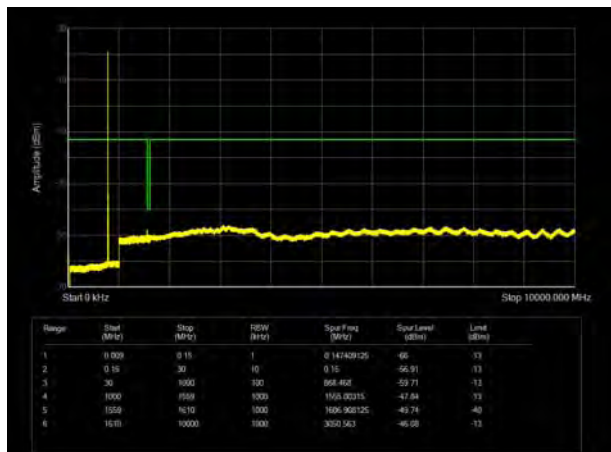


LTE Band 12 10MHz CH-High 9kHz~10GHz

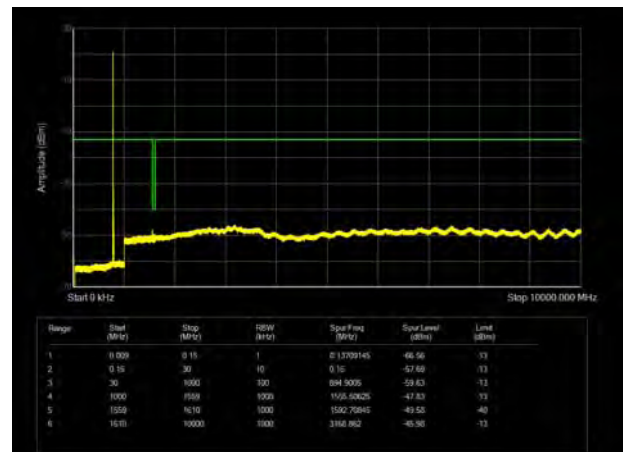




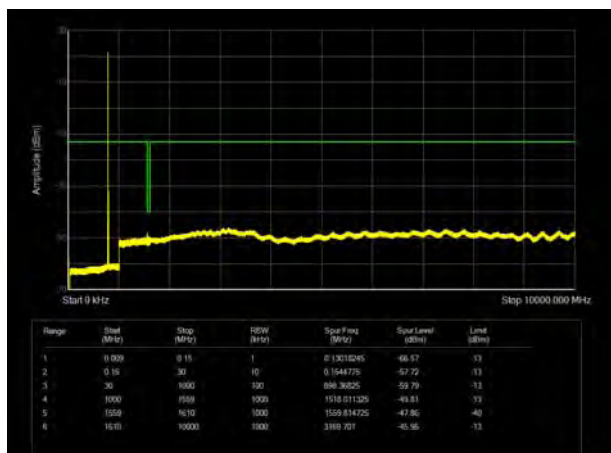
LTE Band 13 5MHz CH-Low 9kHz~10GHz



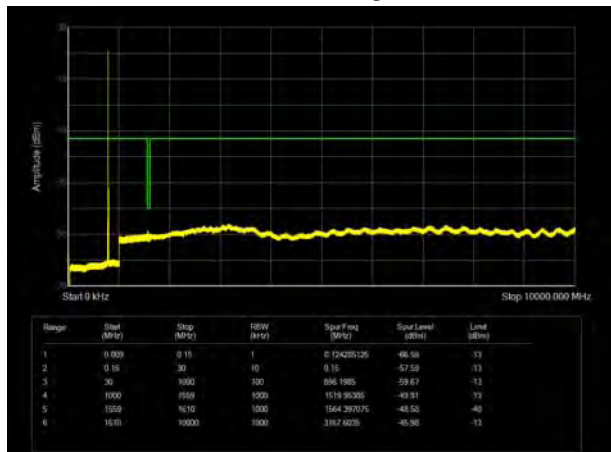
LTE Band 13 10MHz CH-Middle 9kHz~10GHz



LTE Band 13 5MHz CH-Middle 9kHz~10GHz



LTE Band 13 5MHz CH-High 9kHz~10GHz



5.8 Radiates Spurious Emission

Ambient condition

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

Method of Measurement

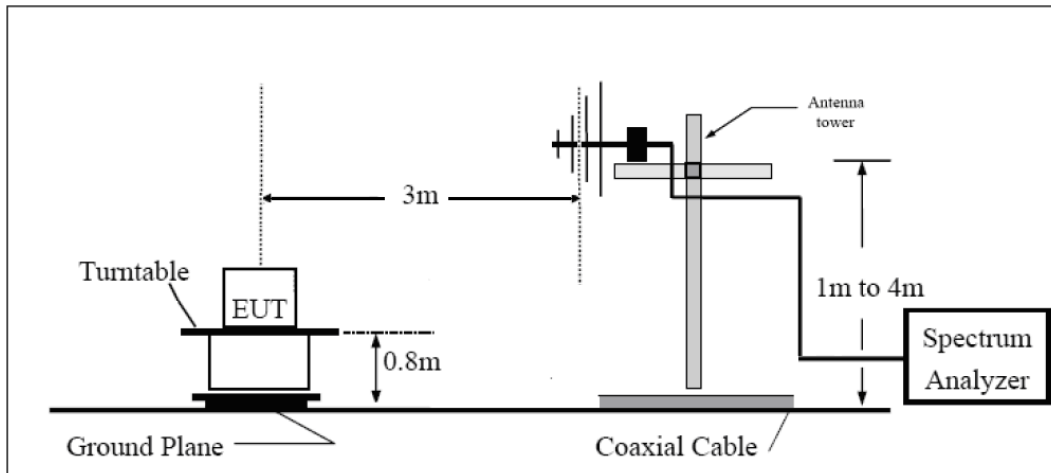
1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI/TIA-603-E (2016).
 2. The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. 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).
 3. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
 4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
 5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
 6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
 7. The measurement results are obtained as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
 The measurement results are amend as described below:

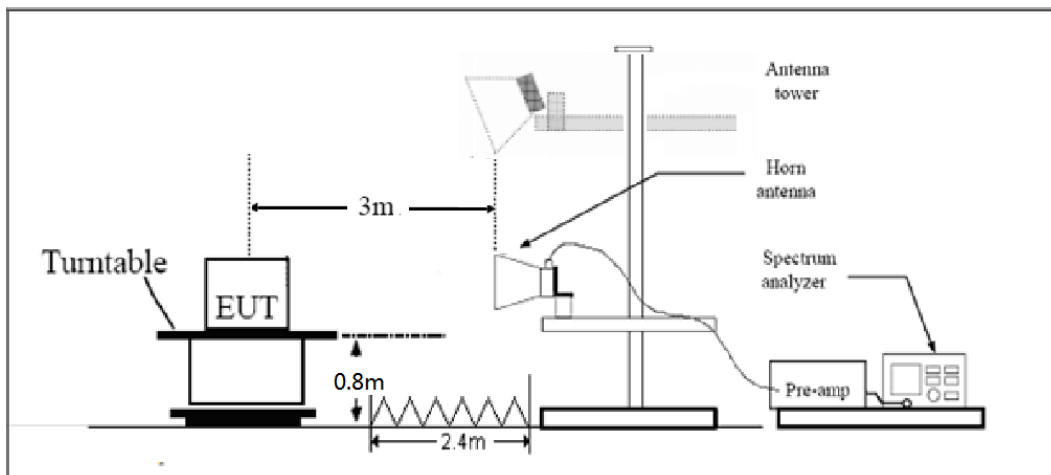
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
 8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.
- The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB..”

Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands



immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Part 27.53(h)(g) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm
	Limit in the band 1559-1610 MHz	-40 dBm

Measurement Uncertainty

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

Test Result

Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

WCDMA Band IV CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3424.8	-51.25	2.6	10.15	Horizontal	-43.7	-13.0	30.7	315
3	5137.2	-51.75	2.4	11.35	Horizontal	-42.8	-13.0	29.8	45
4	6850.1	-56.75	4.5	10.85	Horizontal	-50.4	-13.0	37.4	90
5	8562.0	-53.85	5.1	11.35	Horizontal	-47.6	-13.0	34.6	0
6	10274.4	-52.55	5.3	11.95	Horizontal	-45.9	-13.0	32.9	225
7	11986.8	-51.75	5.5	13.55	Horizontal	-43.7	-13.0	30.7	135
8	13699.2	-48.35	6.3	13.75	Horizontal	-40.9	-13.0	27.9	180
9	15411.6	-50.25	6.7	13.85	Horizontal	-43.1	-13.0	30.1	0
10	17124.0	-46.55	6.8	14.25	Horizontal	-39.1	-13.0	26.1	90

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 IV CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3462.8	-53.85	2.6	10.75	Horizontal	-45.7	-13.0	32.7	270
3	5201.3	-51.75	2.4	11.05	Horizontal	-43.1	-13.0	30.1	135
4	6925.1	-55.75	4.5	11.15	Horizontal	-49.1	-13.0	36.1	180
5	8663.0	-53.15	5.1	11.35	Horizontal	-46.9	-13.0	33.9	45
6	10395.6	-50.05	5.3	11.95	Horizontal	-43.4	-13.0	30.4	0
7	12128.2	-50.75	5.5	13.55	Horizontal	-42.7	-13.0	29.7	180
8	13860.8	-47.65	6.3	13.75	Horizontal	-40.2	-13.0	27.2	315
9	15593.4	-49.75	6.7	13.85	Horizontal	-42.6	-13.0	29.6	45
10	17326.0	-46.55	6.8	14.25	Horizontal	-39.1	-13.0	26.1	90

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 IV CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3503.3	-54.05	2.6	10.15	Horizontal	-46.5	-13.0	33.5	90
3	5254.1	-55.85	2.4	11.05	Horizontal	-47.2	-13.0	34.2	135
4	7010.4	-54.75	4.5	11.15	Horizontal	-48.1	-13.0	35.1	270
5	8763.0	-52.45	5.1	11.35	Horizontal	-46.2	-13.0	33.2	45
6	10515.6	-49.85	5.3	11.95	Horizontal	-43.2	-13.0	30.2	315
7	12268.2	-49.95	5.5	13.55	Horizontal	-41.9	-13.0	28.9	0
8	14020.8	-46.35	6.3	13.75	Horizontal	-38.9	-13.0	25.9	0
9	15773.4	-49.05	6.7	13.85	Horizontal	-41.9	-13.0	28.9	90
10	17526.0	-46.45	6.8	14.25	Horizontal	-39.0	-13.0	26.0	225

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 4 QPSK 1.4MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3421.4	-35.15	2.6	10.15	Horizontal	-27.6	-13.0	14.6	90
3	5131.1	-45.15	2.4	11.35	Horizontal	-36.2	-13.0	23.2	180
4	6842.8	-47.15	4.5	10.85	Horizontal	-40.8	-13.0	27.8	0
5	8553.5	-48.95	5.1	11.35	Horizontal	-42.7	-13.0	29.7	180
6	10264.2	-51.55	5.3	11.95	Horizontal	-44.9	-13.0	31.9	90
7	11974.9	-50.75	5.5	13.55	Horizontal	-42.7	-13.0	29.7	315
8	13685.6	-47.95	6.3	13.75	Horizontal	-40.5	-13.0	27.5	135
9	15396.3	-48.25	6.7	13.85	Horizontal	-41.1	-13.0	28.1	45
10	17107.0	-47.35	6.8	14.25	Horizontal	-39.9	-13.0	26.9	90

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 4 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3464.3	-39.95	2.6	10.75	Horizontal	-31.8	-13.0	18.8	225
3	5197.5	-48.85	2.4	11.05	Horizontal	-40.2	-13.0	27.2	135
4	6930.0	-53.75	4.5	11.15	Horizontal	-47.1	-13.0	34.1	370
5	8662.5	-47.35	5.1	11.35	Horizontal	-41.1	-13.0	28.1	0
6	10395.0	-50.15	5.3	11.95	Horizontal	-43.5	-13.0	30.5	0
7	12127.5	-50.45	5.5	13.55	Horizontal	-42.4	-13.0	29.4	180
8	13860.0	-47.65	6.3	13.75	Horizontal	-40.2	-13.0	27.2	90
9	15592.5	-48.15	6.7	13.85	Horizontal	-41.0	-13.0	28.0	315
10	17325.0	-47.25	6.8	14.25	Horizontal	-39.8	-13.0	26.8	135
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 4 QPSK 1.4MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3507.8	-44.45	2.6	10.15	Horizontal	-36.9	-13.0	23.9	45
3	5261.6	-50.35	2.4	11.05	Horizontal	-41.7	-13.0	28.7	90
4	7017.2	-48.35	4.5	11.15	Horizontal	-41.7	-13.0	28.7	135
5	8771.5	-50.65	5.1	11.35	Horizontal	-44.4	-13.0	31.4	370
6	10525.8	-49.55	5.3	11.95	Horizontal	-42.9	-13.0	29.9	0
7	12280.1	-50.35	5.5	13.55	Horizontal	-42.3	-13.0	29.3	0
8	14034.4	-46.55	6.3	13.75	Horizontal	-39.1	-13.0	26.1	180
9	15788.7	-47.35	6.7	13.85	Horizontal	-40.2	-13.0	27.2	90
10	17543.0	-46.85	6.8	14.25	Horizontal	-39.4	-13.0	26.4	315
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 4 QPSK 5MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3425.0	-35.35	2.6	10.15	Horizontal	-27.8	-13.0	14.8	135
3	5131.1	-45.35	2.4	11.35	Horizontal	-36.4	-13.0	23.4	370
4	6850.0	-48.05	4.5	10.85	Horizontal	-41.7	-13.0	28.7	315
5	8562.5	-48.85	5.1	11.35	Horizontal	-42.6	-13.0	29.6	45
6	10275.0	-50.75	5.3	11.95	Horizontal	-44.1	-13.0	31.1	90
7	11987.5	-49.85	5.5	13.55	Horizontal	-41.8	-13.0	28.8	135
8	13700.0	-47.15	6.3	13.75	Horizontal	-39.7	-13.0	26.7	370
9	15412.5	-48.65	6.7	13.85	Horizontal	-41.5	-13.0	28.5	0
10	17125.0	-46.95	6.8	14.25	Horizontal	-39.5	-13.0	26.5	45
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 4 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3460.5	-40.05	2.6	10.75	Horizontal	-31.9	-13.0	18.9	90
3	5191.5	-48.95	2.4	11.05	Horizontal	-40.3	-13.0	27.3	135
4	6930.0	-52.45	4.5	11.15	Horizontal	-45.8	-13.0	32.8	370
5	8662.5	-46.65	5.1	11.35	Horizontal	-40.4	-13.0	27.4	90
6	10395.0	-49.45	5.3	11.95	Horizontal	-42.8	-13.0	29.8	315
7	12127.5	-50.55	5.5	13.55	Horizontal	-42.5	-13.0	29.5	45
8	13860.0	-47.15	6.3	13.75	Horizontal	-39.7	-13.0	26.7	90
9	15592.5	-48.65	6.7	13.85	Horizontal	-41.5	-13.0	28.5	135
10	17325.0	-46.05	6.8	14.25	Horizontal	-38.6	-13.0	25.6	370
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 4 QPSK 5MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3500.6	-44.15	2.6	10.15	Horizontal	-36.6	-13.0	23.6	315
3	5250.8	-51.95	2.4	11.05	Horizontal	-43.3	-13.0	30.3	45
4	7010.0	-52.05	4.5	11.15	Horizontal	-45.4	-13.0	32.4	90
5	8762.5	-51.95	5.1	11.35	Horizontal	-45.7	-13.0	32.7	135
6	10515.0	-49.55	5.3	11.95	Horizontal	-42.9	-13.0	29.9	370
7	12267.5	-51.75	5.5	13.55	Horizontal	-43.7	-13.0	30.7	0
8	14020.0	-47.25	6.3	13.75	Horizontal	-39.8	-13.0	26.8	45
9	15772.5	-48.35	6.7	13.85	Horizontal	-41.2	-13.0	28.2	90
10	17525.0	-45.65	6.8	14.25	Horizontal	-38.2	-13.0	25.2	135

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 4 QPSK 20MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3421.9	-37.45	2.6	10.15	Horizontal	-29.9	-13.0	16.9	370
3	5133.0	-47.65	2.4	11.35	Horizontal	-38.7	-13.0	25.7	90
4	6880.0	-50.75	4.5	10.85	Horizontal	-44.4	-13.0	31.4	315
5	8600.0	-49.25	5.1	11.35	Horizontal	-43.0	-13.0	30.0	45
6	10320.0	-49.15	5.3	11.95	Horizontal	-42.5	-13.0	29.5	90
7	12040.0	-51.75	5.5	13.55	Horizontal	-43.7	-13.0	30.7	135
8	13760.0	-46.95	6.3	13.75	Horizontal	-39.5	-13.0	26.5	315
9	15480.0	-49.75	6.7	13.85	Horizontal	-42.6	-13.0	29.6	45
10	17200.0	-47.35	6.8	14.25	Horizontal	-39.9	-13.0	26.9	90

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 4 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3447.0	-38.35	2.6	10.75	Horizontal	-30.2	-13.0	17.2	135
3	5170.5	-47.45	2.4	11.05	Horizontal	-38.8	-13.0	25.8	370
4	6930.0	-50.65	4.5	11.15	Horizontal	-44.0	-13.0	31.0	0
5	8662.5	-49.85	5.1	11.35	Horizontal	-43.6	-13.0	30.6	45
6	10395.0	-49.05	5.3	11.95	Horizontal	-42.4	-13.0	29.4	90
7	12127.5	-51.45	5.5	13.55	Horizontal	-43.4	-13.0	30.4	135
8	13860.0	-46.75	6.3	13.75	Horizontal	-39.3	-13.0	26.3	45
9	15592.5	-50.05	6.7	13.85	Horizontal	-42.9	-13.0	29.9	90
10	17325.0	-47.25	6.8	14.25	Horizontal	-39.8	-13.0	26.8	135

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 4 QPSK 20MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3472.1	-38.85	2.6	10.15	Horizontal	-31.3	-13.0	18.3	315
3	5208.4	-48.15	2.4	11.05	Horizontal	-39.5	-13.0	26.5	45
4	6980.0	-50.85	4.5	11.15	Horizontal	-44.2	-13.0	31.2	90
5	8725.0	-48.25	5.1	11.35	Horizontal	-42.0	-13.0	29.0	135
6	10470.0	-48.75	5.3	11.95	Horizontal	-42.1	-13.0	29.1	370
7	12215.0	-50.55	5.5	13.55	Horizontal	-42.5	-13.0	29.5	0
8	13960.0	-46.85	6.3	13.75	Horizontal	-39.4	-13.0	26.4	45
9	15705.0	-48.75	6.7	13.85	Horizontal	-41.6	-13.0	28.6	135
10	17450.0	-46.65	6.8	14.25	Horizontal	-39.2	-13.0	26.2	370

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 12 QPSK 1.4MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1399.40	-56.30	2.00	10.15	Horizontal	-50.3	-13.0	37.3	315
3	2099.10	-60.20	2.50	11.35	Horizontal	-53.5	-13.0	40.5	45
4	2798.80	-59.00	4.20	10.85	Horizontal	-54.5	-13.0	41.5	45
5	3498.50	-59.80	5.20	11.35	Horizontal	-55.8	-13.0	42.8	135
6	4198.20	-59.40	5.50	11.95	Horizontal	-55.1	-13.0	42.1	135
7	4897.90	-60.00	5.70	13.55	Horizontal	-54.3	-13.0	41.3	370
8	5597.60	-58.20	6.30	13.75	Horizontal	-52.9	-13.0	39.9	90
9	6297.30	-55.90	6.80	13.85	Horizontal	-51.0	-13.0	38.0	315
10	6997.00	-54.00	6.90	14.25	Horizontal	-48.8	-13.0	35.8	45

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 12 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.00	-59.30	2.00	10.75	Horizontal	-52.7	-13.0	39.7	0
3	2122.50	-58.29	2.51	11.05	Horizontal	-51.9	-13.0	38.9	45
4	2830.00	-60.30	4.20	11.15	Horizontal	-55.5	-13.0	42.5	90
5	3537.50	-60.00	5.20	11.15	Horizontal	-56.2	-13.0	43.2	45
6	4245.00	-59.20	5.50	11.95	Horizontal	-54.9	-13.0	41.9	0
7	4952.50	-59.40	5.70	13.55	Horizontal	-53.7	-13.0	40.7	45
8	5660.00	-58.20	6.30	13.75	Horizontal	-52.9	-13.0	39.9	90
9	6367.50	-55.80	6.80	13.85	Horizontal	-50.9	-13.0	37.9	135
10	7075.00	-53.20	6.90	14.25	Horizontal	-48.0	-13.0	35.0	135

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 12 QPSK 1.4MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1430.60	-61.50	2.00	10.15	Horizontal	-55.5	-13.0	42.5	135
3	2145.90	-57.59	2.51	11.05	Horizontal	-51.2	-13.0	38.2	135
4	2861.20	-59.90	4.20	11.15	Horizontal	-55.1	-13.0	42.1	45
5	3576.50	-59.60	5.20	11.15	Horizontal	-55.8	-13.0	42.8	45
6	4291.80	-59.40	5.50	11.95	Horizontal	-55.1	-13.0	42.1	0
7	5007.10	-58.10	5.70	13.55	Horizontal	-52.4	-13.0	39.4	45
8	5722.40	-55.60	6.30	13.75	Horizontal	-50.3	-13.0	37.3	45
9	6437.70	-54.70	6.80	13.85	Horizontal	-49.8	-13.0	36.8	90
10	7153.00	-52.80	6.90	14.25	Horizontal	-47.6	-13.0	34.6	135

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 12 QPSK 5MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1403.00	-60.00	2.00	10.15	Horizontal	-54.0	-13.0	41.0	90
3	2104.50	-63.20	2.50	11.35	Horizontal	-56.5	-13.0	43.5	135
4	2806.00	-59.50	4.20	10.85	Horizontal	-55.0	-13.0	42.0	135
5	3507.50	-60.20	5.20	11.35	Horizontal	-56.2	-13.0	43.2	315
6	4209.00	-59.60	5.50	11.95	Horizontal	-55.3	-13.0	42.3	45
7	4910.50	-59.50	5.70	13.55	Horizontal	-53.8	-13.0	40.8	90
8	5612.00	-56.50	6.30	13.75	Horizontal	-51.2	-13.0	38.2	135
9	6313.50	-55.50	6.80	13.85	Horizontal	-50.6	-13.0	37.6	315
10	7015.00	-52.00	6.90	14.25	Horizontal	-46.8	-13.0	33.8	45

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 12 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.00	-60.80	2.00	10.75	Horizontal	-54.2	-13.0	41.2	370
3	2122.50	-61.79	2.51	11.05	Horizontal	-55.4	-13.0	42.4	90
4	2830.00	-60.70	4.20	11.15	Horizontal	-55.9	-13.0	42.9	315
5	3537.50	-60.10	5.20	11.15	Horizontal	-56.3	-13.0	43.3	90
6	4245.00	-59.30	5.50	11.95	Horizontal	-55.0	-13.0	42.0	135
7	4952.50	-59.20	5.70	13.55	Horizontal	-53.5	-13.0	40.5	315
8	5660.00	-58.40	6.30	13.75	Horizontal	-53.1	-13.0	40.1	45
9	6367.50	-55.20	6.80	13.85	Horizontal	-50.3	-13.0	37.3	0
10	7075.00	-51.80	6.90	14.25	Horizontal	-46.6	-13.0	33.6	45

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 12 QPSK 5MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1427.00	-60.90	2.00	10.15	Horizontal	-54.9	-13.0	41.9	45
3	2140.50	-61.89	2.51	11.05	Horizontal	-55.5	-13.0	42.5	90
4	2854.00	-58.50	4.20	11.15	Horizontal	-53.7	-13.0	40.7	315
5	3567.50	-59.50	5.20	11.15	Horizontal	-55.7	-13.0	42.7	45
6	4281.00	-58.90	5.50	11.95	Horizontal	-54.6	-13.0	41.6	90
7	4994.50	-58.50	5.70	13.55	Horizontal	-52.8	-13.0	39.8	135
8	5708.00	-56.60	6.30	13.75	Horizontal	-51.3	-13.0	38.3	315
9	6421.50	-54.70	6.80	13.85	Horizontal	-49.8	-13.0	36.8	45
10	7135.00	-51.40	6.90	14.25	Horizontal	-46.2	-13.0	33.2	90

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 12 QPSK 10MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1408.00	-55.70	2.00	10.15	Horizontal	-49.7	-13.0	36.7	45
3	2112.00	-59.69	2.51	11.35	Horizontal	-53.0	-13.0	40.0	90
4	2816.00	-59.50	4.20	10.85	Horizontal	-55.0	-13.0	42.0	135
5	3520.00	-60.20	5.20	11.35	Horizontal	-56.2	-13.0	43.2	135
6	4224.00	-59.60	5.50	11.95	Horizontal	-55.3	-13.0	42.3	315
7	4928.00	-58.10	5.70	13.55	Horizontal	-52.4	-13.0	39.4	45
8	5632.00	-58.70	6.30	13.75	Horizontal	-53.4	-13.0	40.4	0
9	6336.00	-55.50	6.80	13.85	Horizontal	-50.6	-13.0	37.6	45
10	7040.00	-53.00	6.90	14.25	Horizontal	-47.8	-13.0	34.8	90

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 12 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.00	-61.10	2.00	10.75	Horizontal	-54.5	-13.0	41.5	315
3	2122.50	-59.69	2.51	11.05	Horizontal	-53.3	-13.0	40.3	90
4	2830.00	-59.60	4.20	11.15	Horizontal	-54.8	-13.0	41.8	135
5	3537.50	-59.60	5.20	11.15	Horizontal	-55.8	-13.0	42.8	90
6	4245.00	-59.60	5.50	11.95	Horizontal	-55.3	-13.0	42.3	135
7	4952.50	-58.00	5.70	13.55	Horizontal	-52.3	-13.0	39.3	315
8	5660.00	-57.40	6.30	13.75	Horizontal	-52.1	-13.0	39.1	45
9	6367.50	-55.50	6.80	13.85	Horizontal	-50.6	-13.0	37.6	90
10	7075.00	-52.70	6.90	14.25	Horizontal	-47.5	-13.0	34.5	135

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 12 QPSK 10MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1422.00	-59.10	2.00	10.15	Horizontal	-53.1	-13.0	40.1	315
3	2133.00	-59.49	2.51	11.05	Horizontal	-53.1	-13.0	40.1	45
4	2844.00	-58.80	4.20	11.15	Horizontal	-54.0	-13.0	41.0	90
5	3555.00	-59.10	5.20	11.15	Horizontal	-55.3	-13.0	42.3	315
6	4266.00	-59.40	5.50	11.95	Horizontal	-55.1	-13.0	42.1	45
7	4977.00	-58.10	5.70	13.55	Horizontal	-52.4	-13.0	39.4	0
8	5688.00	-56.90	6.30	13.75	Horizontal	-51.6	-13.0	38.6	45
9	6399.00	-54.40	6.80	13.85	Horizontal	-49.5	-13.0	36.5	90
10	7110.00	-52.50	6.90	14.25	Horizontal	-47.3	-13.0	34.3	90

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 13 QPSK 5MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1555.8	-58.10	2.00	10.15	Horizontal	-52.1	-13.0	39.1	315
3	2338.5	-56.00	2.50	11.35	Horizontal	-49.3	-13.0	36.3	45
4	3118.0	-59.60	4.20	10.85	Horizontal	-55.1	-13.0	42.1	135
5	3897.5	-58.70	5.20	11.35	Horizontal	-54.7	-13.0	41.7	315
6	4677.0	-58.90	5.50	11.95	Horizontal	-54.6	-13.0	41.6	45
7	5456.5	-58.30	5.70	13.55	Horizontal	-52.6	-13.0	39.6	90
8	6236.0	-56.70	6.30	13.75	Horizontal	-51.4	-13.0	38.4	135
9	7015.5	-53.50	6.80	13.85	Horizontal	-48.6	-13.0	35.6	315
10	7795.0	-53.40	6.90	14.25	Horizontal	-48.2	-13.0	35.2	45

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 13 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1564.0	-59.90	2.00	10.75	Horizontal	-53.3	-40.0	13.3	0
Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
3	2346.0	-54.29	2.51	11.05	Horizontal	-47.9	-13.0	34.9	45
4	3128.0	-59.40	4.20	11.15	Horizontal	-54.6	-13.0	41.6	0
5	3910.0	-58.00	5.20	11.15	Horizontal	-54.2	-13.0	41.2	45
6	4692.0	-57.70	5.50	11.95	Horizontal	-53.4	-13.0	40.4	45
7	5474.0	-58.50	5.70	13.55	Horizontal	-52.8	-13.0	39.8	90
8	6256.0	-56.10	6.30	13.75	Horizontal	-50.8	-13.0	37.8	135
9	7038.0	-53.20	6.80	13.85	Horizontal	-48.3	-13.0	35.3	315
10	7820.0	-53.30	6.90	14.25	Horizontal	-48.1	-13.0	35.1	45
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 13 QPSK 5MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1569.0	-56.70	2.00	10.15	Horizontal	-50.7	-40.0	10.7	45
Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
3	2353.5	-56.59	2.51	11.05	Horizontal	-50.2	-13.0	37.2	90
4	3138.0	-59.10	4.20	11.15	Horizontal	-54.3	-13.0	41.3	90
5	3922.5	-57.90	5.20	11.15	Horizontal	-54.1	-13.0	41.1	135
6	4707.0	-55.90	5.50	11.95	Horizontal	-51.6	-13.0	38.6	315
7	5491.5	-56.20	5.70	13.55	Horizontal	-50.5	-13.0	37.5	45
8	6276.0	-55.60	6.30	13.75	Horizontal	-50.3	-13.0	37.3	0
9	7060.5	-53.10	6.80	13.85	Horizontal	-48.2	-13.0	35.2	45
10	7845.0	-53.10	6.90	14.25	Horizontal	-47.9	-13.0	34.9	45
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 13 QPSK 10MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1556.5	-55.50	2.00	10.15	Horizontal	-49.5	-13.0	36.5	135
3	2346.0	-51.29	2.51	11.35	Horizontal	-44.6	-13.0	31.6	315
4	3128.0	-59.10	4.20	10.85	Horizontal	-54.6	-13.0	41.6	90
5	3910.0	-58.10	5.20	11.35	Horizontal	-54.1	-13.0	41.1	135
6	4692.0	-57.10	5.50	11.95	Horizontal	-52.8	-13.0	39.8	315
7	5474.0	-57.40	5.70	13.55	Horizontal	-51.7	-13.0	38.7	90
8	6256.0	-57.60	6.30	13.75	Horizontal	-52.3	-13.0	39.3	135
9	7038.0	-53.50	6.80	13.85	Horizontal	-48.6	-13.0	35.6	315
10	7820.0	-53.40	6.90	14.25	Horizontal	-48.2	-13.0	35.2	45
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 13 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1555.3	-59.50	2.00	10.75	Horizontal	-52.9	-13.0	39.9	90
3	2346.0	-56.09	2.51	11.05	Horizontal	-49.7	-13.0	36.7	90
4	3128.0	-58.80	4.20	11.15	Horizontal	-54.0	-13.0	41.0	90
5	3910.0	-58.00	5.20	11.15	Horizontal	-54.2	-13.0	41.2	135
6	4692.0	-56.90	5.50	11.95	Horizontal	-52.6	-13.0	39.6	315
7	5474.0	-57.80	5.70	13.55	Horizontal	-52.1	-13.0	39.1	45
8	6256.0	-57.00	6.30	13.75	Horizontal	-51.7	-13.0	38.7	0
9	7038.0	-52.70	6.80	13.85	Horizontal	-47.8	-13.0	34.8	45
10	7820.0	-52.50	6.90	14.25	Horizontal	-47.3	-13.0	34.3	315
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 13 QPSK 10MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1564.0	-55.90	2.00	10.15	Horizontal	-49.9	-40.0	9.9	135
Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
3	2346.0	-51.29	2.51	11.05	Horizontal	-44.9	-13.0	31.9	315
4	3128.0	-59.00	4.20	11.15	Horizontal	-54.2	-13.0	41.2	45
5	3910.0	-57.60	5.20	11.15	Horizontal	-53.8	-13.0	40.8	45
6	4692.0	-56.90	5.50	11.95	Horizontal	-52.6	-13.0	39.6	0
7	5474.0	-57.80	5.70	13.55	Horizontal	-52.1	-13.0	39.1	45
8	6256.0	-56.50	6.30	13.75	Horizontal	-51.2	-13.0	38.2	90
9	7038.0	-52.80	6.80	13.85	Horizontal	-47.9	-13.0	34.9	135
10	7820.0	-52.40	6.90	14.25	Horizontal	-47.2	-13.0	34.2	135

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

Date of Testing: May 25, 2018 ~ June 27, 2018

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113645	2018-05-20	2019-05-19
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	2018-05-20	2019-05-19
Spectrum Analyzer	Key sight	N9010A	MY50210259	2018-05-20	2019-05-19
Signal Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
Signal generator	R&S	SMB 100A	102594	2018-05-20	2019-05-19
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2014-12-06	2019-12-05
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05
Horn Antenna	ETS-Lindgren	3160-09	00102643	2015-01-30	2020-01-29
Climatic Chamber	Re Ce	PT-30B	20101891	2015-07-18	2018-07-17
RF Cable	Agilent	SMA 15cm	0001	NA	NA
Preamplifier	R&S	SCU18	102327	2018-05-20	2019-05-19
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2018-05-20	2019-05-19
Software	R&S	EMC32	V 8.52.0	NA	NA



Date of Testing: June 29, 2020 and August 21, 2020

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2020-05-18	2021-05-17
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2020-05-18	2021-05-17
Signal Analyzer	R&S	FSV30	100815	2019-12-15	2020-12-14
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	102723	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2021-06-19
Horn Antenna	STEATITE	QSH-SL-26-40-K-15	16779	2017-07-20	2021-07-19
Signal generator	R&S	SMB 100A	102594	2020-05-18	2021-05-17
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preamplifier	R&S	SCU18	102327	2020-05-18	2021-05-17
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2020-05-18	2021-05-17
RF Cable	Agilent	SMA 15cm	0001	2020-06-12	2020-12-11
Software	R&S	EMC32	9.26.0	/	/

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