RF TEST REPORT

Applicant	Quectel Wireless Solutions Co., Ltd
FCC ID	XMR201903EG61NA
Product	LTE Cat 1 Module
Brand	Quectel
Model	EG61-NA
Marketing	Quectel EG61-NA
Report No.	R1901A0050-R2
Issue Date	March 6, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2018)/ FCC CFR47 Part 27C (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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

TA Technology (Shanghai) Co., Ltd.

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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	27.50(d)(4)/27.50(b)(10)/27.50(c)(10)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h)/27.53(g) /27.53(f) /27.53(c)	PASS
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
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	2.1053 /27.53(h) /27.53(g) /27.53(f)	PASS
Date of Testing: February 1, 2019 ~ February 25, 2019			
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.			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 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	7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China
Manufacturer	Quectel Wireless Solutions Co., Ltd
Manufacturer address	7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China

General information

EUT Description			
Model	EG61-NA		
IMEI	865505040005284		
Hardware Version	R1.0		
Software Version	EG61NAGAR07A03M2G		
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	4dBi		
Test Mode(s)	WCDMA Band IV; LTE Band 4/12/13/66/71;		
Test Modulation	(WCDMA)QPSK; (LTE)QPSK 16QAM;		
HSDPA UE Category	8		
HSUPA UE Category	6		
DC-HSDPA UE Category	8		
LTE Category	1		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV:	25.21dBm	
	LTE Band 4:	25.64dBm	
	LTE Band 12:	21.28dBm	
	LTE Band 13:	23.39dBm	
	LTE Band 66:	25.77dBm	
	LTE Band 71	21.90dBm	
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
	LTE Band 66	1710 ~ 1780	2110 ~ 2200
	LTE Band 71	663 ~ 698	617 ~ 652
Note: 1. The information of the EUT is declared by the manufacturer. 2.For LTE, 16QAM only supports 20%RB.			

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 2 (2018)

FCC CFR47 Part 27C (2018)

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4 Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, vertical polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.
Subsequently, only the worst case emissions are reported.
The following testing in WCDMA/LTE is set based on the maximum RF Output Power.

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

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

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/12/13/66/71:

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
	LTE 66	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 71	-	-	O	O	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
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 66	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 71	-	-	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	-
	LTE 12	O	O	O	O	-	-	O	O	O	-	O	-	O	-
	LTE 13	-	-	O	O	-	-	O	O	O	-	O	-	O	-
	LTE 66	O	O	O	O	O	O	O	O	O	-	O	-	O	-
	LTE 71	-	-	O	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
	LTE 66	O	O	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 71	-	-	O	O	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
	LTE 66	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 71	-	-	O	O	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
	LTE 66	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 71	-	-	O	O	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
	LTE 66	O	O	O	O	O	O	O	-	O	-	-	O	O	O

	LTE 71	-	-	O	O	O	O	O	-	O	-	-	O	O	O
Radiates Spurious Emission	LTE 4	-	-	-	-	-	O	O	-	O	-	-	O	O	O
	LTE 12	-	-	-	O	-	-	O	-	O	-	-	O	O	O
	LTE 13	-	-	-	O	-	-	O	-	O	-	-	O	O	O
	LTE 66	-	-	-	-	-	O	O	-	O	-	-	O	O	O
	LTE 71	-	-	-	-	-	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

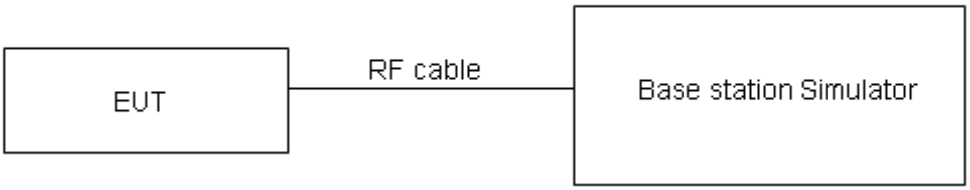
Ambient condition

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	23.18	23.17	23.19
	64k	23.16	23.15	23.18
	144k	23.15	23.14	23.15
	384k	23.13	23.11	23.14
DC-HSDPA	Sub - Test 1	22.52	22.53	22.53
	Sub - Test 2	22.51	22.52	22.52
	Sub - Test 3	22.09	22.01	22.03
	Sub - Test 4	22.08	22.00	22.02

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	23.06	23.08	22.97
		1	2	23.35	23.10	23.21
		1	5	23.16	22.94	22.76
		3	0	22.22	22.02	22.08
		3	2	22.19	23.07	22.12
		3	3	22.23	22.11	22.16
		6	0	22.24	22.10	22.16
	16QAM	1	0	22.20	22.37	22.88
		1	2	22.02	22.72	23.05
		1	5	22.23	22.52	22.77
		3	0	21.06	21.19	21.15
		3	2	21.02	21.22	21.10
		3	3	20.92	21.25	20.99
		6	0	21.39	21.29	21.41
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	23.08	23.11	23.00
		1	7	23.38	23.15	23.25
		1	14	23.18	22.98	22.79
		8	0	22.25	22.07	22.12
		8	4	22.22	23.12	22.16
		8	7	22.26	22.15	22.21
		15	0	22.32	22.12	22.20
	16QAM	1	0	22.25	22.40	22.90
		1	7	22.05	22.76	23.08
		1	14	22.26	22.54	22.80
		8	0	21.09	21.24	21.19
		8	4	21.04	21.26	21.13
		8	7	20.95	21.30	21.03
		15	0	21.37	21.25	21.36
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	23.07	23.07	22.98
		1	13	23.36	23.14	23.22
		1	24	23.15	22.93	22.75
		12	0	22.23	22.03	22.09
		12	6	22.19	23.07	22.14
		12	13	22.22	22.12	22.17
		25	0	22.30	22.08	22.15

	16QAM	1	0	22.20	22.38	22.88
		1	13	22.03	22.73	23.06
		1	24	22.23	22.50	22.77
		12	0	21.06	21.22	21.16
		12	6	21.01	21.21	21.09
		12	13	20.93	21.26	21.00
		25	0	21.35	21.21	21.33
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	23.04	23.03	22.95
		1	25	23.35	23.10	23.20
		1	49	23.13	22.92	22.72
		25	0	22.20	21.98	22.05
		25	13	22.17	23.03	22.09
		25	25	22.19	22.07	22.13
		50	0	22.27	22.03	22.11
	16QAM	1	0	22.18	22.34	22.83
		1	25	21.99	22.71	23.02
		1	49	22.21	22.47	22.75
		25	0	21.03	21.18	21.13
		25	13	20.98	21.19	21.06
		25	25	20.90	21.21	20.96
		50	0	/	/	/
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	23.03	22.99	22.93
		1	38	23.33	23.09	23.17
		1	74	23.10	22.87	22.68
		36	0	22.18	21.94	22.02
		36	18	22.14	22.98	22.09
		36	39	22.16	22.04	22.02
		75	0	22.25	21.99	22.06
	16QAM	1	0	22.13	22.32	22.81
		1	38	21.97	22.68	23.00
		1	74	22.18	22.43	22.72
		36	0	/	/	/
		36	18	/	/	/
		36	39	/	/	/
		75	0	/	/	/
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	23.00	22.95	22.90
		1	50	23.32	23.05	23.15

		1	99	23.08	22.86	22.65
		50	0	22.15	21.89	21.98
		50	25	22.12	22.94	22.06
		50	50	22.13	21.99	22.05
		100	0	22.22	21.94	22.02
	16QAM	1	0	22.11	22.28	22.76
		1	50	21.93	22.66	22.96
		1	99	22.16	22.40	22.70
		50	0	/	/	/
		50	25	/	/	/
		50	50	/	/	/
		100	0	/	/	/

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	23.34	23.36	23.28
		1	2	23.20	23.42	23.55
		1	5	23.16	23.37	23.43
		3	0	23.41	23.23	23.46
		3	2	23.33	23.08	23.36
		3	3	23.29	23.12	23.32
		6	0	22.35	22.26	22.31
	16QAM	1	0	22.84	22.07	21.79
		1	2	23.01	22.33	22.36
		1	5	22.91	22.26	21.74
		3	0	22.59	22.28	22.37
		3	2	22.42	22.25	22.33
		3	3	22.38	22.09	22.26
		6	0	21.53	21.22	21.12
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23025/700.5	23095/707.5	23165/714.5
3MHz	QPSK	1	0	23.34	23.32	23.02
		1	7	23.23	23.13	23.20
		1	14	23.09	22.98	23.09
		8	0	22.25	22.29	22.28
		8	4	22.26	22.23	22.31
		8	7	22.22	22.21	22.36
		15	0	22.18	22.23	22.27
	16QAM	1	0	22.92	22.66	21.87
		1	7	22.84	22.59	22.48
		1	14	22.88	22.38	22.50

		8	0	21.42	21.34	20.99
		8	4	21.38	21.33	21.22
		8	7	21.39	21.30	21.26
		15	0	21.38	21.34	21.17
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23035/701.5	23095/707.5	23155/713.5
5MHz	QPSK	1	0	23.12	23.23	23.03
		1	13	23.15	23.38	23.22
		1	24	23.20	23.04	23.21
		12	0	22.20	22.29	22.11
		12	6	22.23	22.25	22.16
		12	13	22.18	22.24	22.19
		25	0	22.19	22.20	22.21
	16QAM	1	0	22.43	22.03	22.27
		1	13	22.41	21.74	21.95
		1	24	22.56	21.59	21.77
		12	0	21.14	21.18	20.90
		12	6	21.09	21.16	21.01
		12	13	21.03	21.07	21.12
		25	0	21.06	21.29	21.06
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23060/704	23095/707.5	23130/711
10MHz	QPSK	1	0	23.12	23.17	23.11
		1	25	23.32	23.31	23.16
		1	49	23.13	23.06	23.19
		25	0	22.16	22.26	22.23
		25	13	22.25	22.21	22.18
		25	25	22.35	22.22	22.10
		50	0	22.28	22.29	22.17
	16QAM	1	0	22.51	22.71	22.03
		1	25	23.02	23.28	22.16
		1	49	22.39	22.77	21.85
		25	0	21.34	21.36	21.37
		25	13	21.31	21.28	21.25
		25	25	23.27	21.07	21.19
		50	0	/	/	/

LTE Band 13				**AV Conducted Power(dBm)**		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23205/779.5	23230/782	23255/784.5
5MHz	QPSK	1	0	23.00	23.20	23.18
		1	13	23.18	23.13	23.19
		1	24	23.36	23.15	23.16

		12	0	22.22	22.12	22.28
		12	6	22.18	22.15	22.24
		12	13	22.19	22.17	22.16
		25	0	22.21	22.20	22.26
	16QAM	1	0	22.31	22.61	22.20
		1	13	22.13	22.65	22.06
		1	24	22.06	22.60	21.85
		12	0	21.14	21.15	21.09
		12	6	21.17	21.19	21.12
		12	13	21.25	21.20	21.10
		25	0	21.23	21.24	21.35
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				/	23230/782	/
10MHz	QPSK	1	0	/	22.93	/
		1	25	/	23.22	/
		1	49	/	23.10	/
		25	0	/	22.12	/
		25	13	/	22.13	/
		25	25	/	22.16	/
		50	0	/	22.05	/
	16QAM	1	0	/	22.49	/
		1	25	/	22.74	/
		1	49	/	22.23	/
		25	0	/	21.15	/
		25	13	/	21.09	/
		25	25	/	21.04	/
		50	0	/	/	/

LTE Band 66				**AV Conducted Power(dBm)**		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				131979	132322	132665
1.4MHz	QPSK	1	0	23.12	22.95	22.78
		1	2	23.07	22.94	23.26
		1	5	22.95	22.85	22.66
		3	0	22.05	22.14	21.96
		3	2	22.02	22.07	21.91
		3	3	22.00	21.87	21.82
		6	0	22.03	21.96	22.01
	16QAM	1	0	22.35	22.53	21.78
		1	2	23.12	22.70	22.40
		1	5	22.77	22.19	21.91
		3	0	21.13	21.07	21.04

		3	2	21.16	21.05	21.00
		3	3	21.00	21.02	20.94
		6	0	21.23	21.28	21.18
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				131987	132322	132657
3MHz	QPSK	1	0	23.13	22.98	22.80
		1	7	23.11	23.00	23.31
		1	14	22.97	22.89	22.69
		8	0	22.10	22.24	22.07
		8	4	22.13	22.16	22.00
		8	7	22.08	21.98	21.91
		15	0	22.11	22.01	22.06
	16QAM	1	0	22.37	22.54	21.80
		1	7	23.15	22.77	22.44
		1	14	22.79	22.23	21.93
		8	0	21.23	21.19	21.15
		8	4	21.22	21.17	21.09
		8	7	21.08	21.14	21.05
		15	0	21.20	21.25	21.12
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				131997	132322	132647
5MHz	QPSK	1	0	23.12	22.94	22.78
		1	13	23.09	22.99	23.28
		1	24	22.99	22.84	22.65
		12	0	22.08	22.20	22.04
		12	6	22.10	22.11	21.96
		12	13	22.05	21.95	21.87
		25	0	22.09	21.97	22.01
	16QAM	1	0	22.32	22.52	21.78
		1	13	23.13	22.74	22.42
		1	24	22.76	22.19	21.90
		12	0	21.20	21.17	21.12
		12	6	21.19	21.10	21.05
		12	13	21.06	21.12	21.04
		25	0	21.18	21.21	21.11
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				132022	132322	132622
10MHz	QPSK	1	0	23.09	22.90	22.75
		1	25	23.08	22.95	23.26
		1	49	22.92	22.83	22.62
		25	0	22.05	22.15	22.00
		25	13	22.08	22.07	21.93
		25	25	22.02	21.90	21.83

		50	0	22.06	21.92	21.97
	16QAM	1	0	22.30	22.48	21.73
		1	25	23.09	22.72	22.38
		1	49	22.74	22.16	21.88
		25	0	21.17	21.13	21.09
		25	13	21.16	21.08	21.02
		25	25	21.03	21.05	20.98
		50	0	/	/	/
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				132047	132322	132597
15MHz	QPSK	1	0	23.08	23.11	23.02
		1	38	23.31	23.19	23.00
		1	74	22.73	22.80	22.63
		36	0	22.11	22.06	21.90
		36	18	22.08	22.03	21.91
		36	39	22.06	22.02	21.95
		75	0	22.19	22.09	21.92
	16QAM	1	0	22.17	21.87	22.46
		1	38	22.69	22.26	22.85
		1	74	22.25	21.52	22.16
		36	0	/	/	/
		36	18	/	/	/
		36	39	/	/	/
		75	0	/	/	/
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				132072	132322	132572
20MHz	QPSK	1	0	23.05	23.07	22.56
		1	50	23.30	23.15	22.98
		1	99	22.71	22.79	22.60
		50	0	22.08	22.01	21.86
		50	25	22.06	21.99	21.88
		50	50	22.03	21.97	21.91
		100	0	22.16	22.04	21.88
	16QAM	1	0	22.15	21.83	22.41
		1	50	22.65	22.24	22.81
		1	99	22.23	21.49	22.14
		50	0	/	/	/
		50	25	/	/	/
		50	50	/	/	/
		100	0	/	/	/

LTE Band 71				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				133147/665.5	133297/680.5	133447/695.5
5MHz	QPSK	1	0	23.05	23.06	23.09
		1	13	23.07	22.96	23.00
		1	24	22.98	22.92	22.96
		12	0	21.99	22.06	22.00
		12	6	22.05	22.08	22.10
		12	13	22.07	22.12	22.03
		25	0	21.98	22.00	22.05
	16QAM	1	0	21.51	22.63	21.83
		1	13	21.46	22.54	21.55
		1	24	21.45	22.56	21.67
		12	0	21.05	20.90	20.95
		12	6	20.97	20.93	21.03
		12	13	20.94	20.88	21.06
		25	0	21.16	20.97	20.92
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				133172/668	133297/680.5	133422/693
10MHz	QPSK	1	0	23.15	22.98	23.04
		1	25	23.26	22.93	23.25
		1	49	23.27	23.07	23.12
		25	0	22.02	22.15	22.26
		25	13	22.04	22.14	22.19
		25	25	22.27	22.21	22.16
		50	0	22.16	22.14	22.26
	16QAM	1	0	22.73	22.55	22.13
		1	25	22.94	22.49	22.44
		1	49	22.60	22.70	21.31
		25	0	20.96	21.01	21.10
		25	13	21.26	21.08	21.12
		25	25	21.33	21.15	21.14
		50	0	/	/	/
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				133197/670.5	133297/680.5	133397/690.5
15MHz	QPSK	1	0	23.14	22.94	23.02
		1	38	23.25	22.92	23.22
		1	74	23.24	23.02	23.08
		36	0	22.00	22.11	22.23
		36	18	22.01	22.09	22.15

		36	39	22.24	22.18	22.12
		75	0	22.14	22.10	22.21
	16QAM	1	0	22.68	22.53	22.11
		1	38	22.92	22.46	22.42
		1	74	22.57	22.66	21.28
		36	0	/	/	/
		36	18	/	/	/
		36	39	/	/	/
		75	0	/	/	/
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				133222/673	133322/683	133372/688
20MHz	QPSK	1	0	23.11	22.90	22.99
		1	50	23.24	22.88	23.20
		1	99	23.22	23.01	23.05
		50	0	21.97	22.06	22.19
		50	25	21.99	22.05	22.12
		50	50	22.21	22.13	22.08
		100	0	22.11	22.05	22.17
	16QAM	1	0	22.66	22.49	22.06
		1	50	22.88	22.44	22.38
		1	99	22.55	22.63	21.26
		50	0	/	/	/
		50	25	/	/	/
		50	50	/	/	/
		100	0	/	/	/

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 C63.26 (2015).

a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.

b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).

c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.

d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.LOSS = Generator Output Power (dBm) – Analyzer reading (dBm)

e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:ERP (dBm) = LVL (dBm) + LOSS (dB)

f) The maximum ERP is the maximum value determined in the preceding step.

g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:

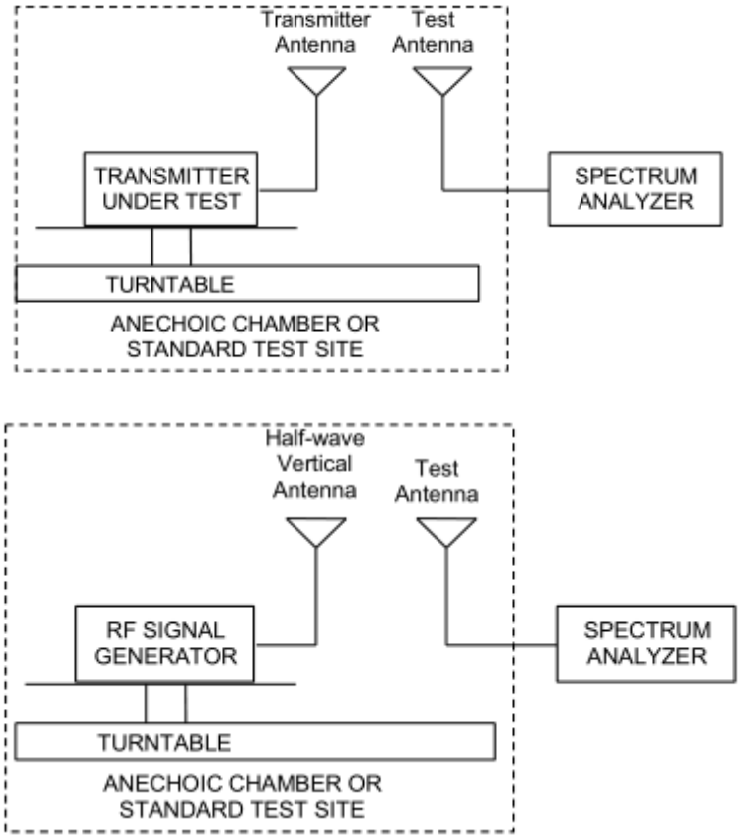
EIRP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBi)

where:dBd refers to gain relative to an ideal dipole.

EIRP (dBm) = ERP (dBm) + 2.15 (dB.)

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

Test setup



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	≤ 3 W (34.77 dBm)
Part 27.50(c)(10)Limit	≤ 3 W (34.77 dBm)
Part 27.50(d)(4)Limit	≤ 1 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 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	Vertical	24.32	30	Pass
	Mid	1732.6	Vertical	24.88	30	Pass
	High	1752.6	Vertical	25.21	30	Pass

LTE Band 4						
Bandwidth	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.7	Vertical	25.20	30	Pass
	Mid	1732.5	Vertical	25.38	30	Pass
	High	1754.3	Vertical	25.57	30	Pass
3 MHz (QPSK)	Low	1711.5	Vertical	25.31	30	Pass
	Mid	1732.5	Vertical	25.48	30	Pass
	High	1753.5	Vertical	25.39	30	Pass
5 MHz (QPSK)	Low	1712.5	Vertical	25.21	30	Pass
	Mid	1732.5	Vertical	25.33	30	Pass
	High	1752.5	Vertical	25.61	30	Pass
10 MHz (QPSK)	Low	1715	Vertical	25.29	30	Pass
	Mid	1732.5	Vertical	25.27	30	Pass
	High	1750	Vertical	25.62	30	Pass
15 MHz (QPSK)	Low	1717.5	Vertical	25.18	30	Pass
	Mid	1732.5	Vertical	25.32	30	Pass
	High	1747.5	Vertical	25.44	30	Pass
20 MHz (QPSK)	Low	1720	Vertical	25.45	30	Pass
	Mid	1732.5	Vertical	25.64	30	Pass
	High	1745	Vertical	25.41	30	Pass
1.4 MHz (16QAM)	Low	1710.7	Vertical	24.91	30	Pass
	Mid	1732.5	Vertical	25.11	30	Pass
	High	1754.3	Vertical	25.19	30	Pass
3 MHz (16QAM)	Low	1711.5	Vertical	25.03	30	Pass
	Mid	1732.5	Vertical	25.14	30	Pass
	High	1753.5	Vertical	25.09	30	Pass
5 MHz (16QAM)	Low	1712.5	Vertical	24.78	30	Pass
	Mid	1732.5	Vertical	25.03	30	Pass
	High	1752.5	Vertical	25.18	30	Pass
10 MHz (16QAM)	Low	1715	Vertical	24.98	30	Pass
	Mid	1732.5	Vertical	25.02	30	Pass
	High	1750	Vertical	25.34	30	Pass
15 MHz	Low	1717.5	Vertical	24.78	30	Pass

(16QAM)	Mid	1732.5	Vertical	24.89	30	Pass
	High	1747.5	Vertical	25.03	30	Pass
20 MHz (16QAM)	Low	1720	Vertical	25.13	30	Pass
	Mid	1732.5	Vertical	25.32	30	Pass
	High	1745	Vertical	25.15	30	Pass

LTE Band 12						
Bandwidth	**Channel**	**Frequency (MHz)**	**Polarization**	**ERP (dBm)**	**Limit (dBm)**	**Conclusion**
1.4 MHz (QPSK)	Low	699.7	Vertical	20.34	34.77	Pass
	Mid	707.5	Vertical	20.62	34.77	Pass
	High	715.3	Vertical	21.28	34.77	Pass
3 MHz (QPSK)	Low	700.5	Vertical	20.16	34.77	Pass
	Mid	707.5	Vertical	20.64	34.77	Pass
	High	714.5	Vertical	20.87	34.77	Pass
5 MHz (QPSK)	Low	701.5	Vertical	20.39	34.77	Pass
	Mid	707.5	Vertical	20.73	34.77	Pass
	High	713.5	Vertical	20.88	34.77	Pass
10 MHz (QPSK)	Low	704	Vertical	19.94	34.77	Pass
	Mid	707.5	Vertical	20.29	34.77	Pass
	High	711	Vertical	20.40	34.77	Pass
1.4 MHz (16QAM)	Low	699.7	Vertical	19.95	34.77	Pass
	Mid	707.5	Vertical	20.17	34.77	Pass
	High	715.3	Vertical	21.00	34.77	Pass
3 MHz (16QAM)	Low	700.5	Vertical	19.93	34.77	Pass
	Mid	707.5	Vertical	20.26	34.77	Pass
	High	714.5	Vertical	20.72	34.77	Pass
5 MHz (16QAM)	Low	701.5	Vertical	20.08	34.77	Pass
	Mid	707.5	Vertical	20.39	34.77	Pass
	High	713.5	Vertical	20.61	34.77	Pass
10 MHz (16QAM)	Low	704	Vertical	19.61	34.77	Pass
	Mid	707.5	Vertical	19.87	34.77	Pass
	High	711	Vertical	19.96	34.77	Pass

LTE Band 13						
Bandwidth	Channel	Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Conclusion
5MHz (QPSK)	Low	779.5	Vertical	23.04	34.77	Pass
	Mid	782	Vertical	23.16	34.77	Pass
	High	784.5	Vertical	23.39	34.77	Pass
10MHz (QPSK)	Mid	782	Vertical	23.06	34.77	Pass
5MHz (16QAM)	Low	779.5	Vertical	22.71	34.77	Pass
	Mid	782	Vertical	22.92	34.77	Pass
	High	784.5	Vertical	23.02	34.77	Pass
10MHz (16QAM)	Mid	782	Vertical	22.73	34.77	Pass

LTE Band 66						
Band width	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.70	Vertical	25.53	30	Pass
	Mid	1745.00	Vertical	24.97	30	Pass
	High	1779.30	Vertical	24.11	30	Pass
3 MHz (QPSK)	Low	1711.50	Vertical	25.66	30	Pass
	Mid	1745.00	Vertical	24.87	30	Pass
	High	1778.50	Vertical	24.53	30	Pass
5 MHz (QPSK)	Low	1712.50	Vertical	25.71	30	Pass
	Mid	1745.00	Vertical	25.32	30	Pass
	High	1777.50	Vertical	24.67	30	Pass
10 MHz (QPSK)	Low	1715.00	Vertical	25.77	30	Pass
	Mid	1745.00	Vertical	24.50	30	Pass
	High	1775.00	Vertical	24.44	30	Pass
15 MHz (QPSK)	Low	1717.50	Vertical	25.58	30	Pass
	Mid	1745.00	Vertical	25.03	30	Pass
	High	1772.50	Vertical	24.19	30	Pass
20 MHz (QPSK)	Low	1720.00	Vertical	25.64	30	Pass
	Mid	1745.00	Vertical	25.03	30	Pass
	High	1770.00	Vertical	24.32	30	Pass
1.4 MHz (16QAM)	Low	1710.70	Vertical	25.11	30	Pass
	Mid	1745.00	Vertical	24.42	30	Pass
	High	1779.30	Vertical	23.59	30	Pass
3 MHz (16QAM)	Low	1711.50	Vertical	25.14	30	Pass
	Mid	1745.00	Vertical	24.35	30	Pass
	High	1778.50	Vertical	24.02	30	Pass

5 MHz (16QAM)	Low	1712.50	Vertical	25.21	30	Pass
	Mid	1745.00	Vertical	24.89	30	Pass
	High	1777.50	Vertical	24.16	30	Pass
10 MHz (16QAM)	Low	1715.00	Vertical	25.19	30	Pass
	Mid	1745.00	Vertical	24.13	30	Pass
	High	1775.00	Vertical	23.98	30	Pass
15 MHz (16QAM)	Low	1717.50	Vertical	24.99	30	Pass
	Mid	1745.00	Vertical	24.36	30	Pass
	High	1772.50	Vertical	23.84	30	Pass
20 MHz (16QAM)	Low	1720.00	Vertical	25.12	30	Pass
	Mid	1745.00	Vertical	24.63	30	Pass
	High	1770.00	Vertical	23.87	30	Pass

LTE Band 71						
Bandwidth	**Channel**	**Frequency (MHz)**	**Polarization**	**ERP (dBm)**	**Limit (dBm)**	**Conclusion**
5 MHz (QPSK)	Low	665.5	Vertical	20.63	34.77	Pass
	Mid	680.5	Vertical	21.19	34.77	Pass
	High	695.5	Vertical	21.74	34.77	Pass
10 MHz (QPSK)	Low	668	Vertical	20.46	34.77	Pass
	Mid	680.5	Vertical	21.24	34.77	Pass
	High	693	Vertical	21.46	34.77	Pass
15 MHz (QPSK)	Low	670.5	Vertical	20.74	34.77	Pass
	Mid	680.5	Vertical	21.48	34.77	Pass
	High	690.5	Vertical	21.90	34.77	Pass
20 MHz (QPSK)	Low	673	Vertical	20.19	34.77	Pass
	Mid	683	Vertical	20.80	34.77	Pass
	High	688	Vertical	21.23	34.77	Pass
5 MHz (16QAM)	Low	665.5	Vertical	20.02	34.77	Pass
	Mid	680.5	Vertical	20.74	34.77	Pass
	High	695.5	Vertical	21.36	34.77	Pass
10 MHz (16QAM)	Low	668	Vertical	20.09	34.77	Pass
	Mid	680.5	Vertical	20.74	34.77	Pass
	High	693	Vertical	21.03	34.77	Pass
15 MHz (16QAM)	Low	670.5	Vertical	20.42	34.77	Pass
	Mid	680.5	Vertical	21.00	34.77	Pass
	High	690.5	Vertical	21.61	34.77	Pass
20 MHz (16QAM)	Low	673	Vertical	19.87	34.77	Pass
	Mid	683	Vertical	20.33	34.77	Pass
	High	688	Vertical	20.82	34.77	Pass

5.3 Occupied Bandwidth

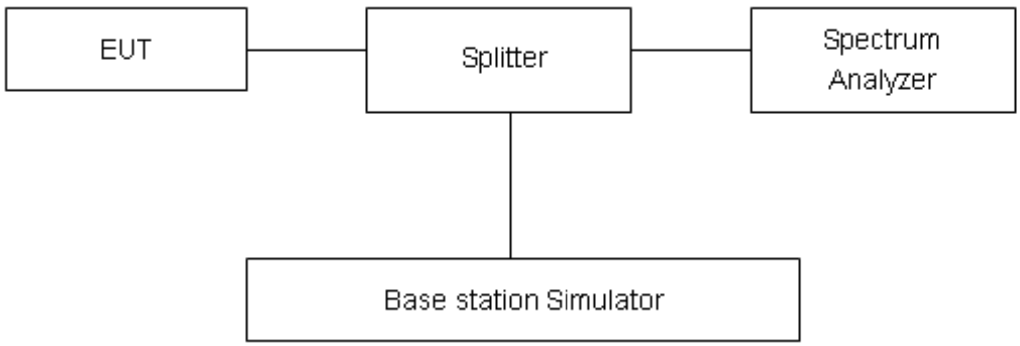
Ambient condition

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 4/12/66 (1.4MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/12/66 (3MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/12/13/66/71 (5MHz).
RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/12/13/66/71 (10MHz).
RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/66/71 (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=624Hz.

Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
WCDMA Band IV (RMC)	1312	1712.4	4.1352	4.653
	1413	1732.6	4.1169	4.667
	1513	1752.6	4.1282	4.688

LTE Band 4					
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
QPSK	1.4	19957	1710.7	1.1207	1.344
		20175	1732.5	1.1174	1.330
		20393	1754.3	1.1279	1.332
	3	19965	1711.5	2.7418	3.043
		20175	1732.5	2.7501	3.061
		20385	1753.5	2.7427	3.043
	5	19975	1712.5	4.5220	4.987
		20175	1732.5	4.5198	5.004
		20375	1752.5	4.5098	4.966
	10	20000	1715	9.0109	10.040
		20175	1732.5	9.0001	9.984
		20350	1750	9.0310	10.080
	15	20025	1717.5	13.468	14.73
		20175	1732.5	13.417	14.66
		20325	1747.5	13.451	14.65
	20	20050	1720	17.88	19.15
		20175	1732.5	17.832	19.29
		20300	1745	17.870	19.28
16QAM	1.4	19957	1710.7	1.1262	1.346
		20175	1732.5	1.1159	1.326
		20393	1754.3	1.1159	1.351
	3	19965	1711.5	2.7304	3.025
		20175	1732.5	2.7350	3.047
		20385	1753.5	2.7287	3.058
	5	19975	1712.5	4.5125	5.003
		20175	1732.5	4.5269	5.032
		20375	1752.5	4.5205	5.032
	10	20000	1715	0.8801	1.204
		20175	1732.5	0.8701	1.168

		20350	1750	0.8963	1.225
	15	20025	1717.5	1.1441	1.598
		20175	1732.5	1.1164	1.577
		20325	1747.5	1.1119	1.580
	20	20050	1720	1.2342	1.700
		20175	1732.5	1.1443	1.664
		20300	1745	1.2787	1.785

LTE Band 12					
Modulation	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
QPSK	1.4	23017	699.7	1.1131	1.335
		23095	707.5	1.1208	1.337
		23173	715.3	1.1245	1.325
	3	23025	700.5	2.7460	3.072
		23095	707.5	2.7488	3.051
		23165	714.5	2.7451	3.053
	5	23035	701.5	4.5375	5.003
		23095	707.5	4.5064	5.001
		23155	713.5	4.5108	5.029
	10	23060	704	9.0408	10.01
		23095	707.5	8.9730	9.929
		23130	711	9.0486	10.01
16QAM	1.4	23017	699.7	1.1223	1.322
		23095	707.5	1.1128	1.313
		23173	715.3	1.1129	1.338
	3	23025	700.5	2.7332	3.048
		23095	707.5	2.7288	3.035
		23165	714.5	2.7405	3.067
	5	23035	701.5	4.5118	4.986
		23095	707.5	4.5119	5.002
		23155	713.5	4.5391	5.025
	10	23060	704	0.8593	1.164
		23095	707.5	0.8407	1.133
		23130	711	0.8659	1.188

LTE Band 13					
Modulation	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
QPSK	5	23205	779.5	4.5343	5.004

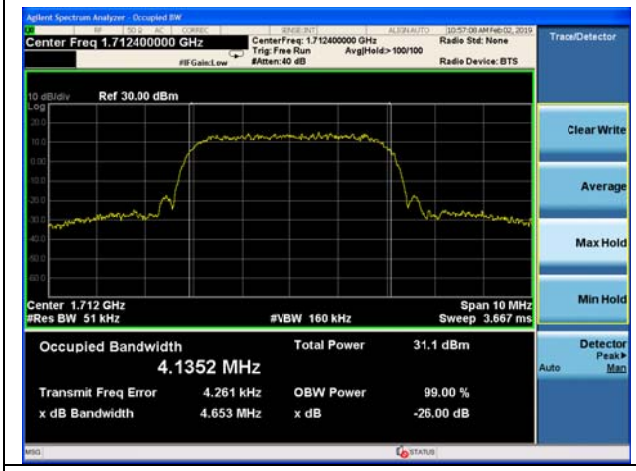
		23230	782	4.5114	5.004
		23255	784.5	4.4948	4.973
	10	23230	782	9.0288	10.03
16QAM	5	23205	779.5	4.5213	4.999
		23230	782	4.5341	5.033
		23255	784.5	4.5355	5.02
	10	23230	782	0.8873	1.215

LTE Band 66					
Modulation	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
QPSK	1.4	131979	1710.7	1.1194	1.327
		132322	1745	1.1141	1.356
		132665	1779.3	1.1327	1.350
	3	131987	1711.5	2.7431	3.060
		132322	1745	2.7404	3.040
		132657	1778.5	2.7400	3.051
	5	131997	1712.5	4.5360	5.016
		132322	1745	4.5227	5.016
		132647	1777.5	4.5160	4.988
	10	132022	1715	9.0370	10.150
		132322	1745	9.0238	9.912
		132622	1775	9.0380	10.010
	15	132047	1717.5	13.459	14.630
		132322	1745	13.447	14.730
		132597	1772.5	13.423	14.620
	20	132072	1720	17.891	19.130
		132322	1745	17.836	19.230
		132572	1770	17.811	19.330
16QAM	1.4	131979	1710.7	1.1247	1.341
		132322	1745	1.1187	1.331
		132665	1779.3	1.1169	1.325
	3	131987	1711.5	2.7412	3.056
		132322	1745	2.7364	3.064
		132657	1778.5	2.7292	3.043
	5	131997	1712.5	4.5122	4.984
		132322	1745	4.5281	5.018
		132647	1777.5	4.5357	4.985
	10	132022	1715	0.8700	1.223

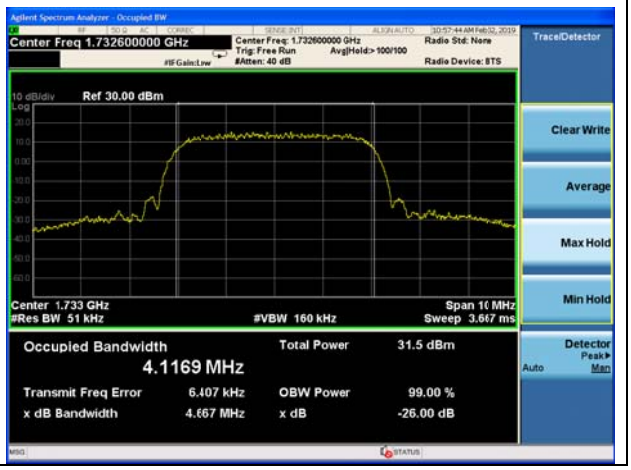
		132322	1745	0.8751	1.190
		132622	1775	0.8726	1.176
	15	132047	1717.5	1.1262	1.587
		132322	1745	1.1054	1.517
		132597	1772.5	1.0978	1.579
	20	132072	1720	1.2444	1.714
		132322	1745	1.1927	1.717
		132572	1770	1.2464	1.766

LTE Band 71					
Modulation	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
QPSK	5	133147	665.5	4.5075	4.991
		133297	680.5	4.5121	4.990
		133447	695.5	4.5126	4.949
	10	133172	668	9.0249	10.110
		133297	680.5	9.0000	10.010
		133422	693	9.0445	10.010
	15	133197	670.5	13.4630	14.710
		133297	680.5	13.4110	14.660
		133397	690.5	13.4640	14.630
	20	133222	673	17.8640	19.220
		133322	683	17.8430	19.400
		133372	688	17.8820	19.250
16QAM	5	133147	665.5	4.5022	5.007
		133297	680.5	4.5360	5.037
		133447	695.5	4.5326	5.048
	10	133172	668	0.9041	1.231
		133297	680.5	0.8588	1.150
		133422	693	0.9007	1.226
	15	133197	670.5	1.1155	1.585
		133297	680.5	1.0974	1.557
		133397	690.5	1.1295	1.584
	20	133222	673	1.2246	1.823
		133322	683	1.2375	1.737
		133372	688	1.2250	1.737

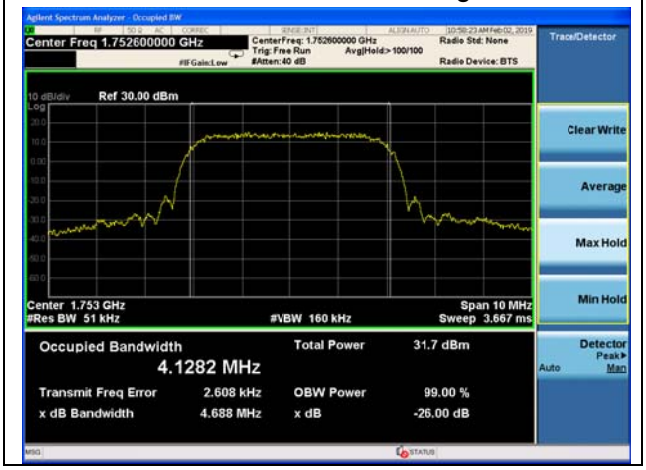
WCDMA Band IV CH-Low



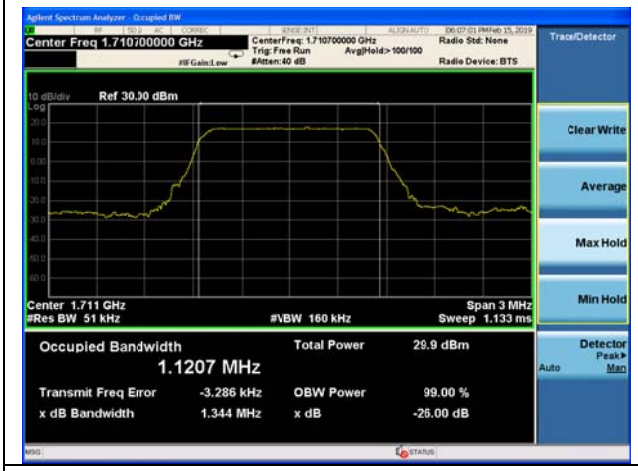
WCDMA Band IV CH Middle



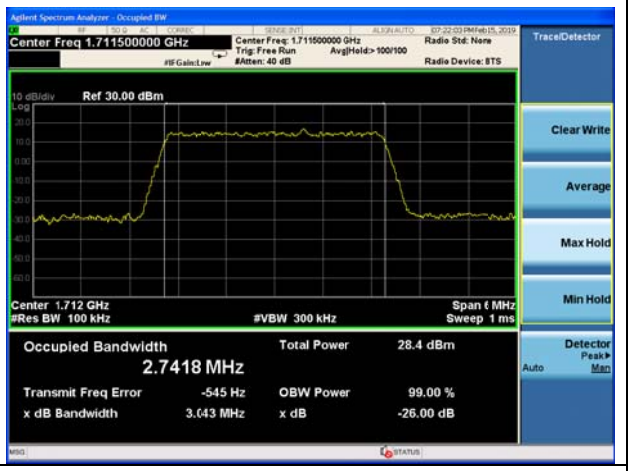
WCDMA Band IV CH High



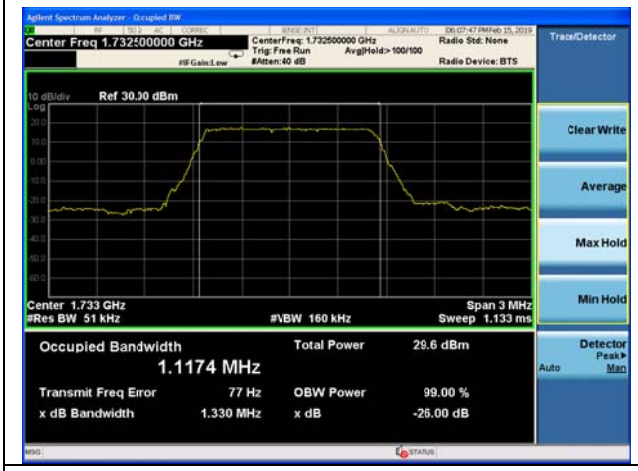
LTE Band 4 QPSK 1.4MHz CH-Low



LTE Band 4 QPSK 3MHz CH-Low

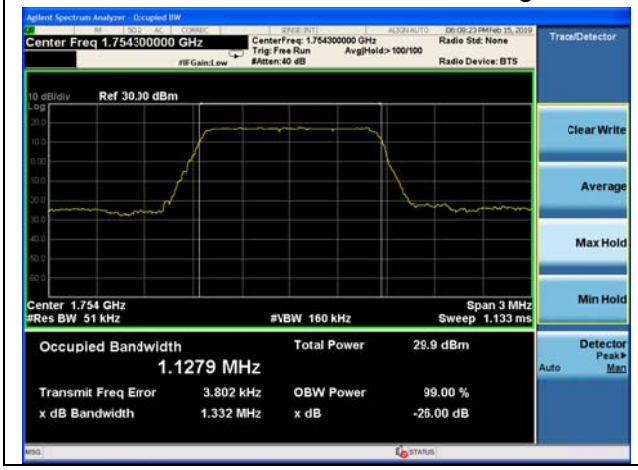


LTE Band 4 QPSK 1.4MHz CH-Middle

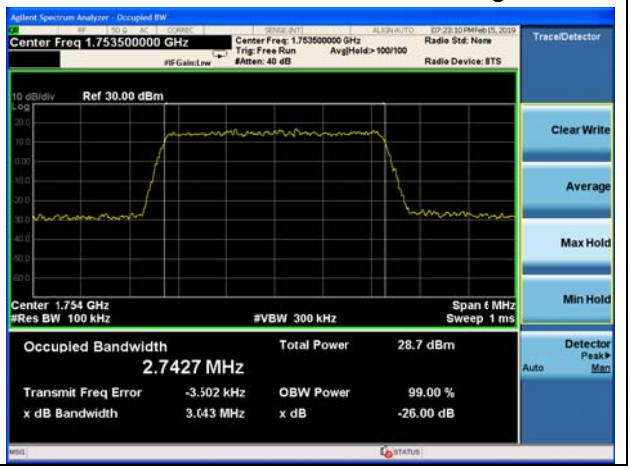


LTE Band 4 QPSK 3MHz CH-Middle

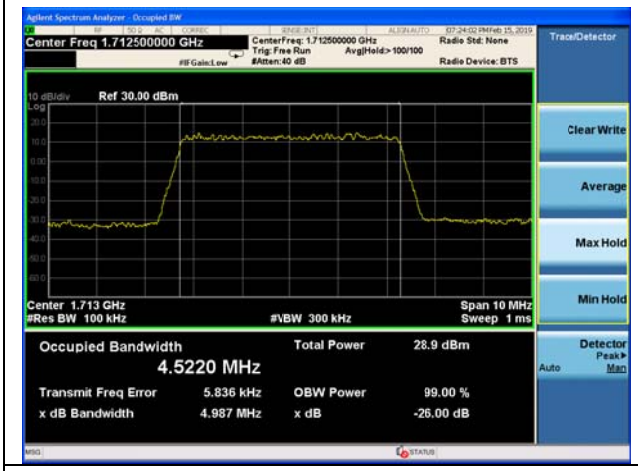
LTE Band 4 QPSK 1.4MHz CH-High



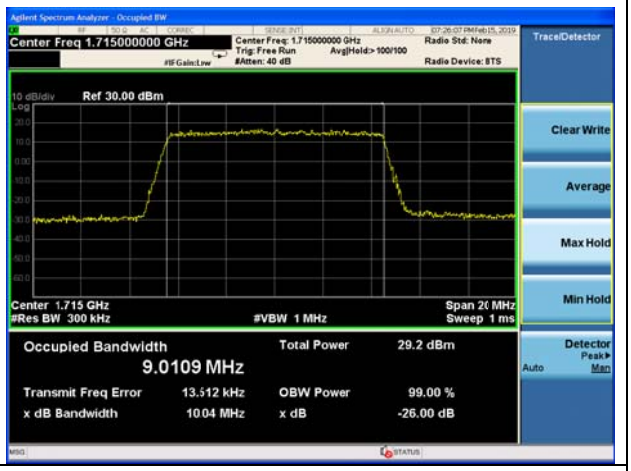
LTE Band 4 QPSK 3MHz CH-High



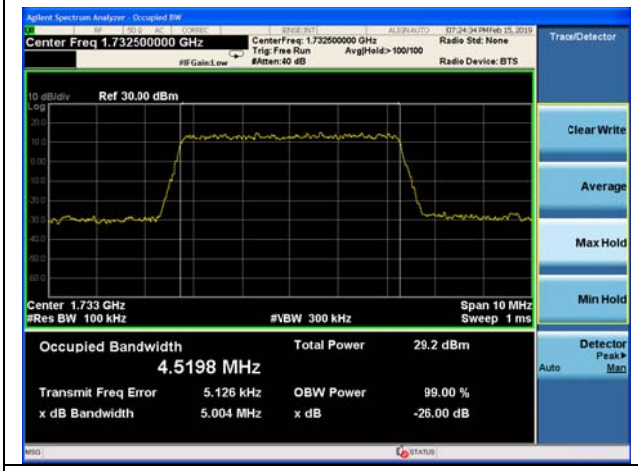
LTE Band 4 QPSK 5MHz CH-Low



LTE Band 4 QPSK 10MHz CH-Low

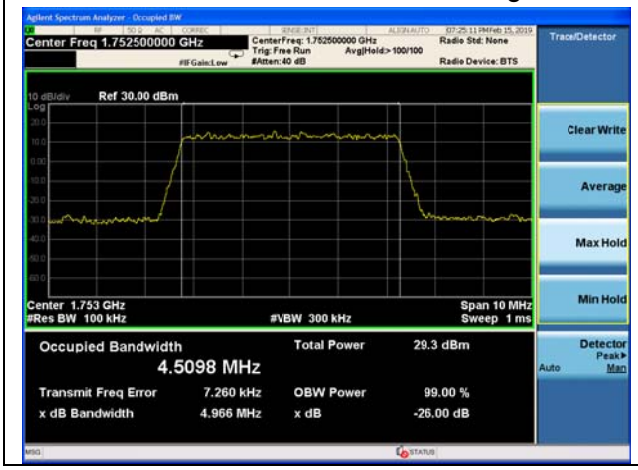


LTE Band 4 QPSK 5MHz CH-Middle



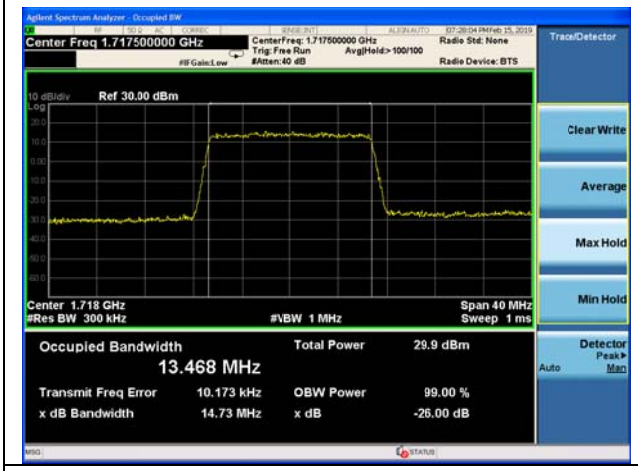
LTE Band 4 QPSK 10MHz CH-Middle

LTE Band 4 QPSK 5MHz CH-High

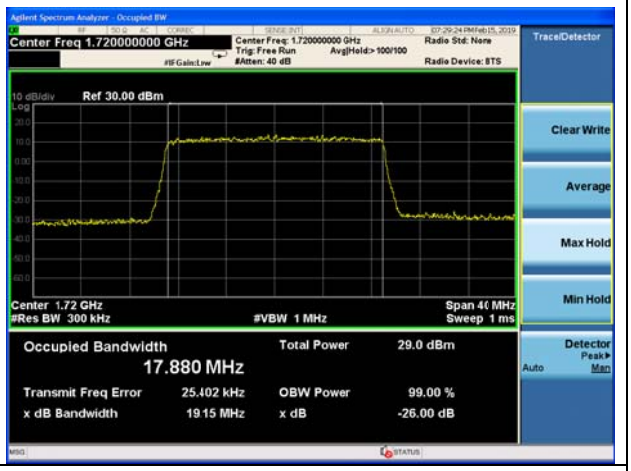


LTE Band 4 QPSK 10MHz CH-High

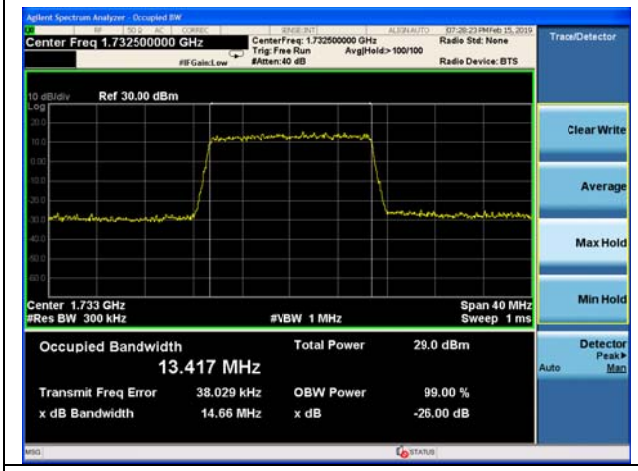
LTE Band 4 QPSK 15MHz CH-Low



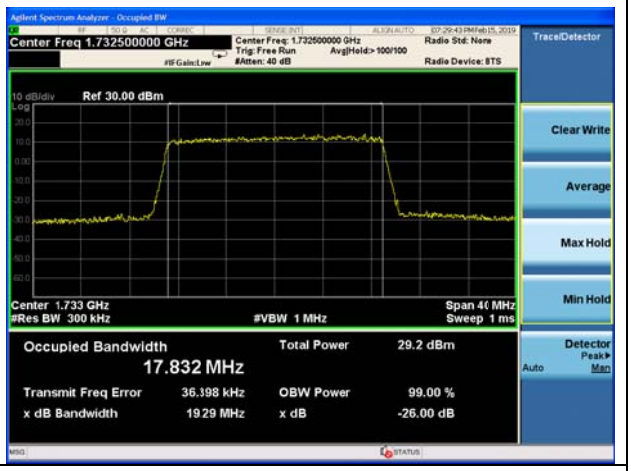
LTE Band 4 QPSK 20MHz CH-Low



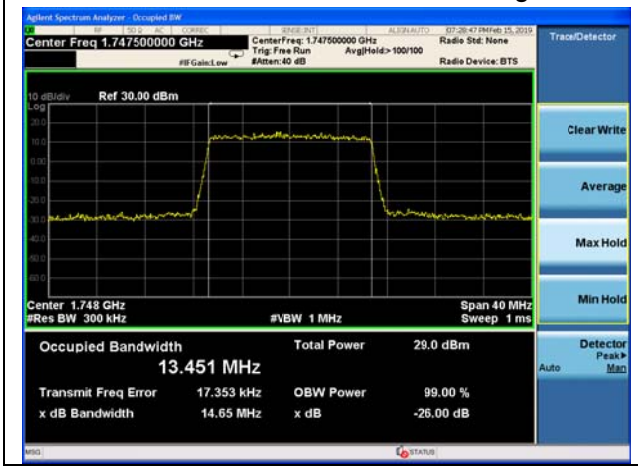
LTE Band 4 QPSK 15MHz CH-Middle



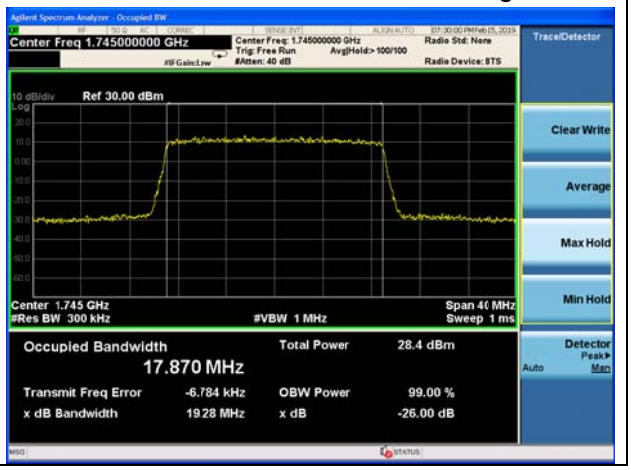
LTE Band 4 QPSK 20MHz CH-Middle



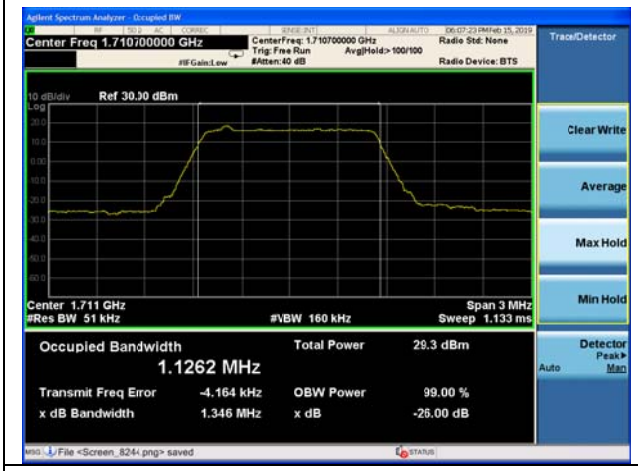
LTE Band 4 QPSK 15MHz CH-High



LTE Band 4 QPSK 20MHz CH-High

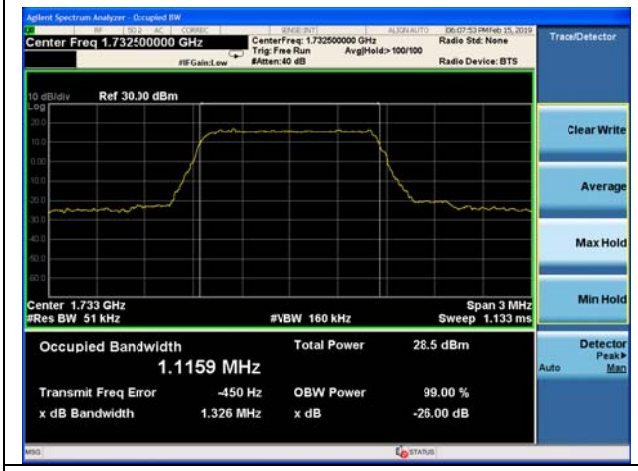


LTE Band 4 16QAM 1.4MHz CH-Low

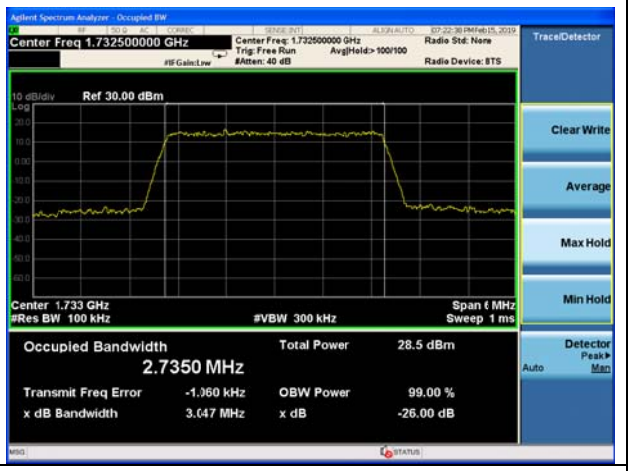


LTE Band 4 16QAM 3MHz CH-Low

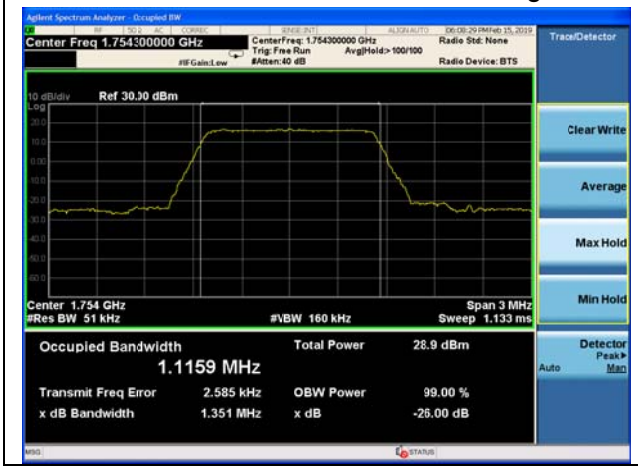
LTE Band 4 16QAM 1.4MHz CH-Middle



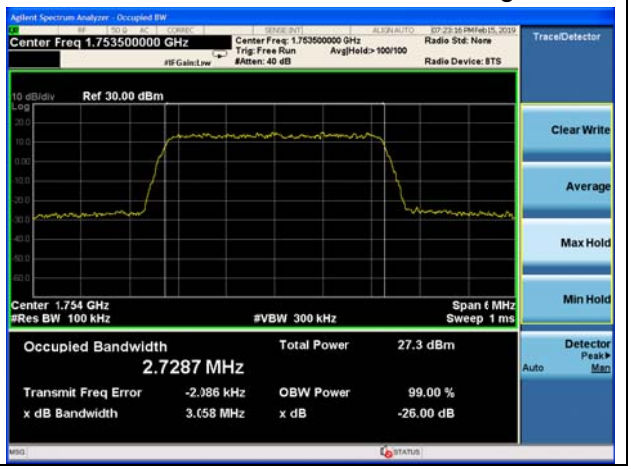
LTE Band 4 16QAM 3MHz CH-Middle



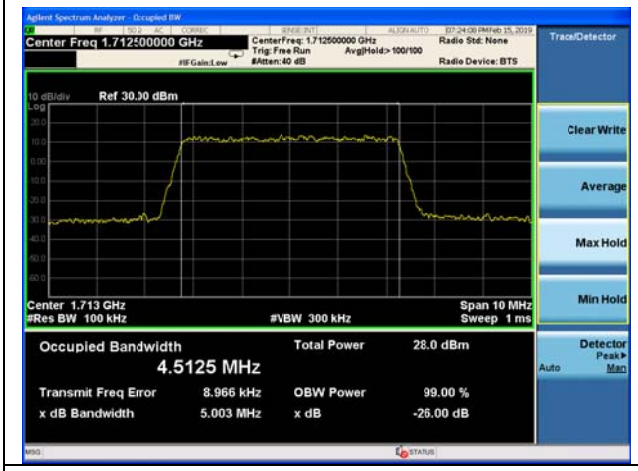
LTE Band 4 16QAM 1.4MHz CH-High



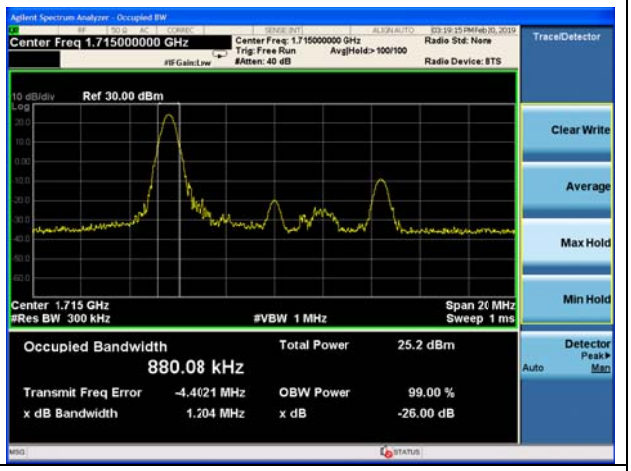
LTE Band 4 16QAM 3MHz CH-High



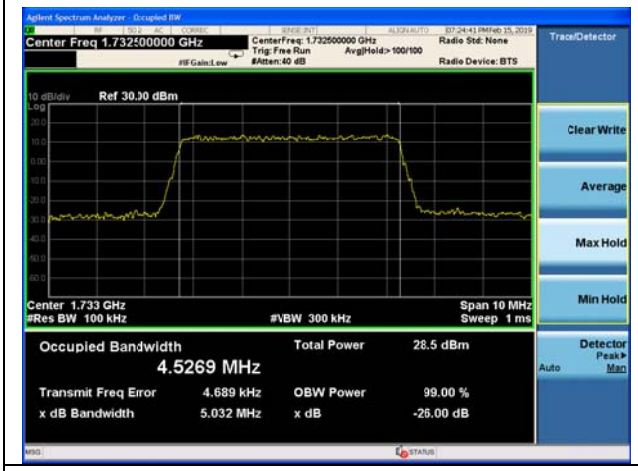
LTE Band 4 16QAM 5MHz CH-Low



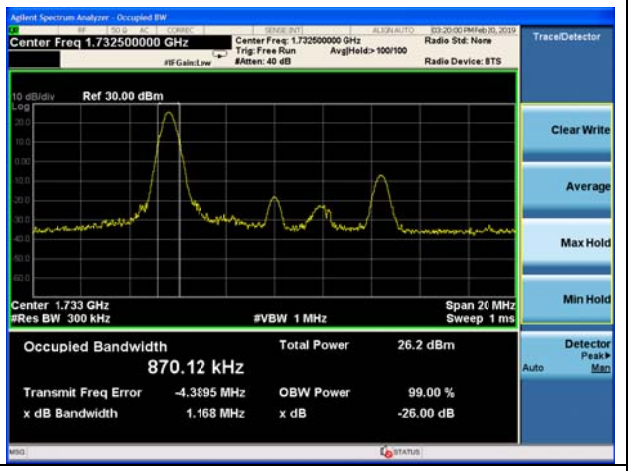
LTE Band 4 16QAM 10MHz CH-Low



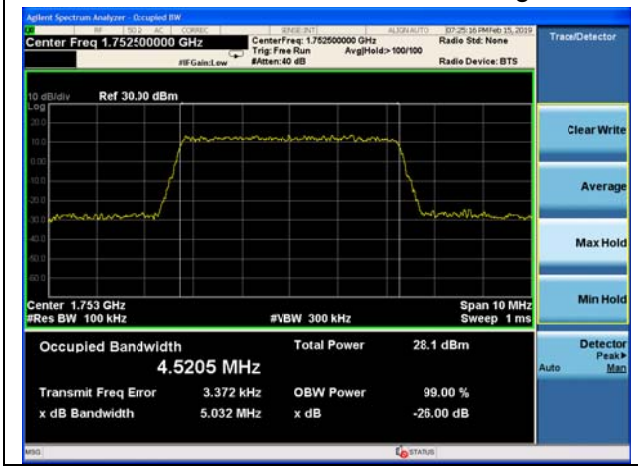
LTE Band 4 16QAM 5MHz CH-Middle



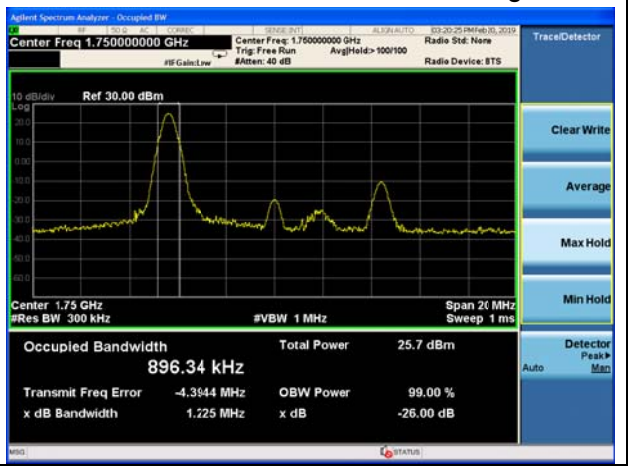
LTE Band 4 16QAM 10MHz CH-Middle



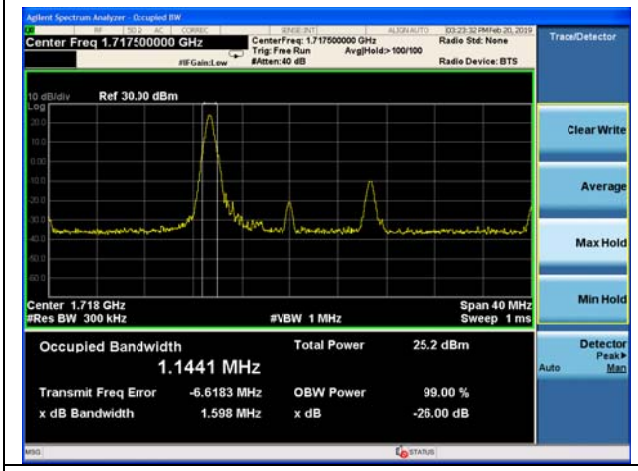
LTE Band 4 16QAM 5MHz CH-High



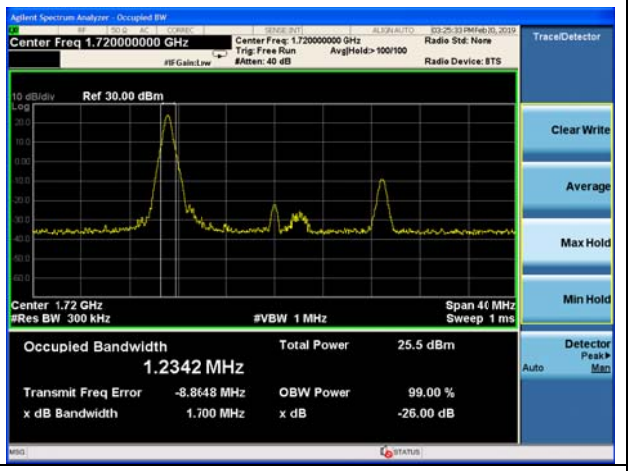
LTE Band 4 16QAM 10MHz CH-High



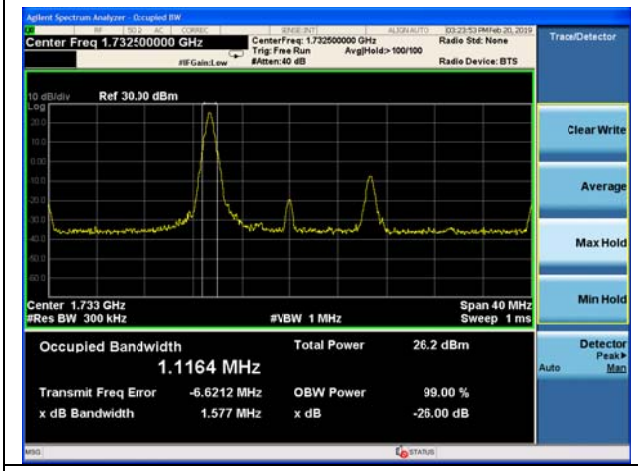
LTE Band 4 16QAM 15MHz CH-Low



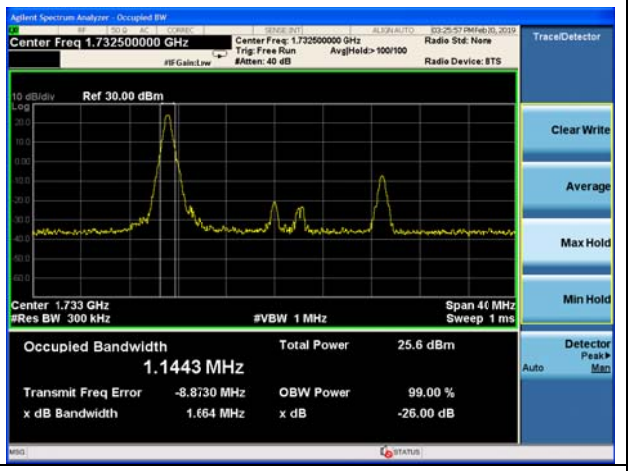
LTE Band 4 16QAM 20MHz CH-Low



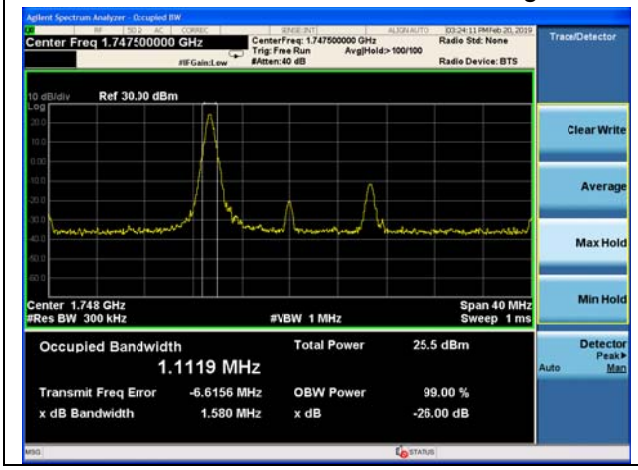
LTE Band 4 16QAM 15MHz CH-Middle



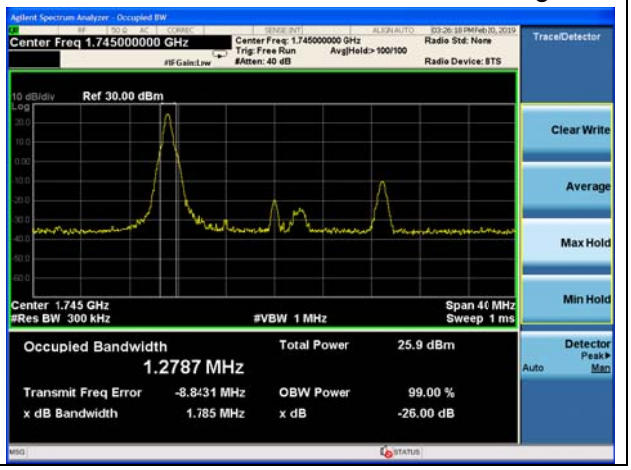
LTE Band 4 16QAM 20MHz CH-Middle



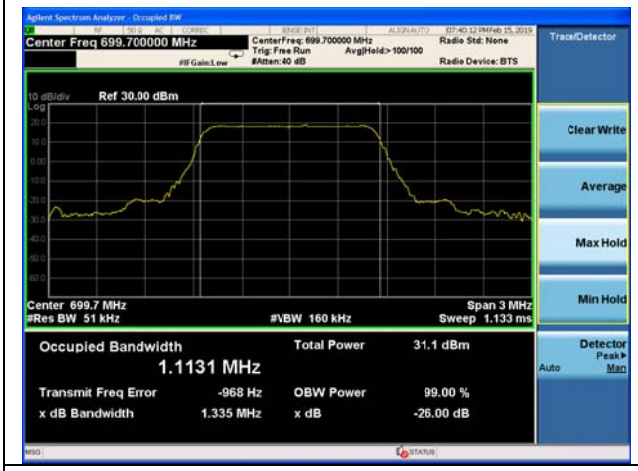
LTE Band 4 16QAM 15MHz CH-High



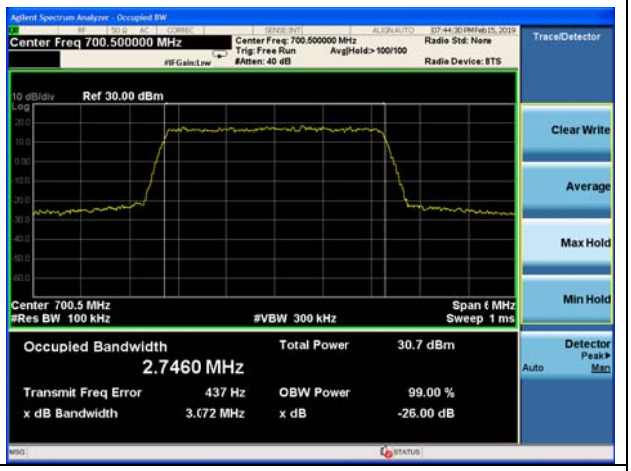
LTE Band 4 16QAM1RB 20MHz CH-High



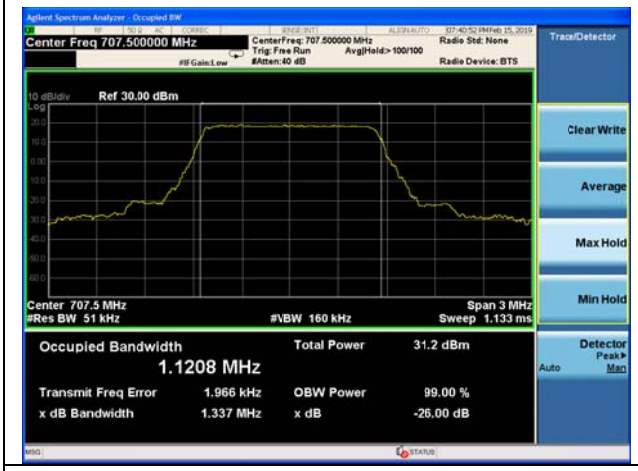
LTE Band 12 QPSK 1.4MHz CH-Low



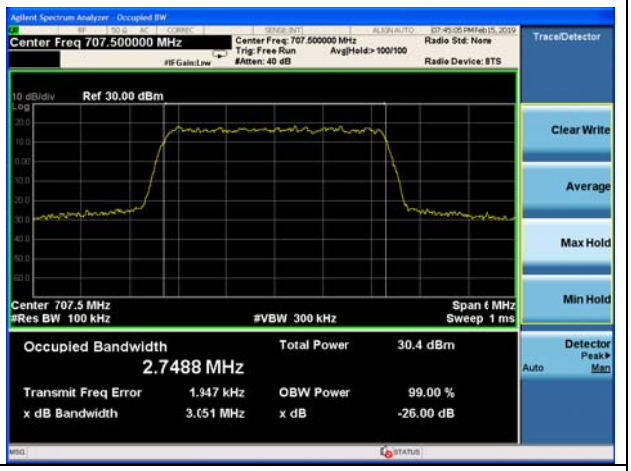
LTE Band 12 QPSK 3MHz CH-Low



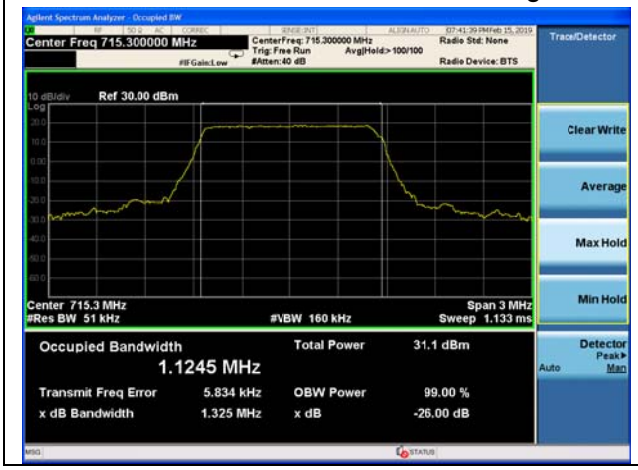
LTE Band 12 QPSK 1.4MHz CH-Middle



LTE Band 12 QPSK 3MHz CH-Middle

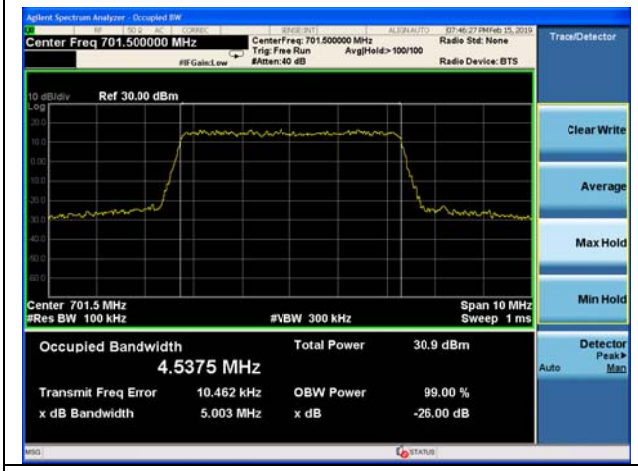


LTE Band 12 QPSK 1.4MHz CH-High



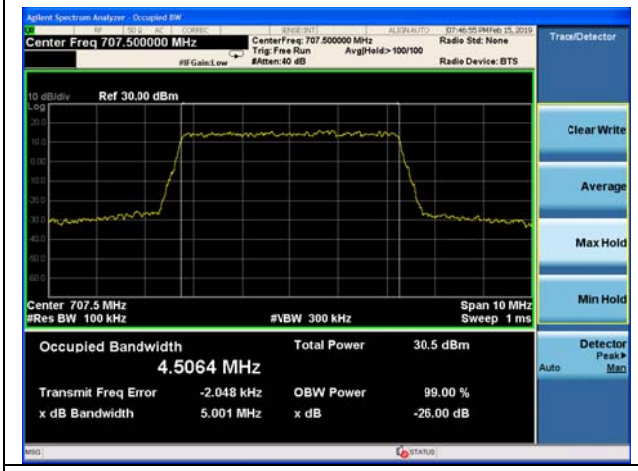
LTE Band 12 QPSK 3MHz CH-High

LTE Band 12 QPSK 5MHz CH-Low



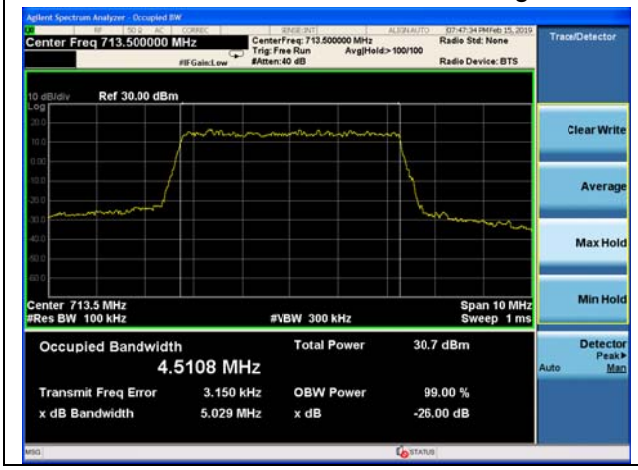
LTE Band 12 QPSK 10MHz CH-Low

LTE Band 12 QPSK 5MHz CH-Middle



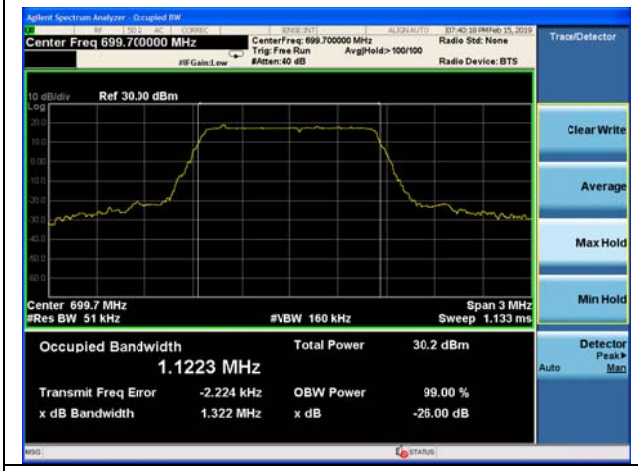
LTE Band 12 QPSK 10MHz CH-Middle

LTE Band 12 QPSK 5MHz CH-High



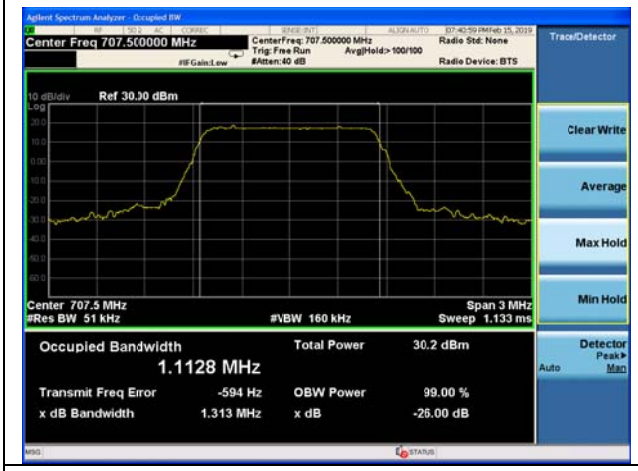
LTE Band 12 QPSK 10MHz CH-High

LTE Band 12 16QAM 1.4MHz CH-Low

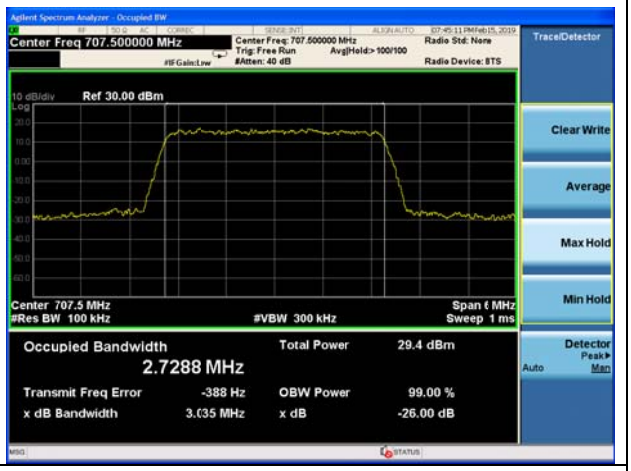


LTE Band 12 16QAM 3MHz CH-Low

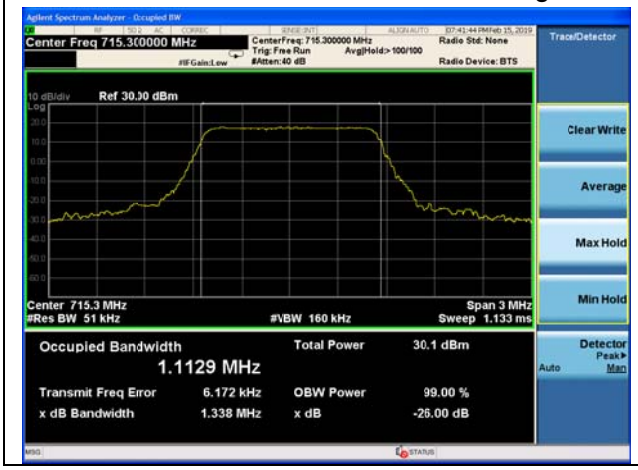
LTE Band 12 16QAM 1.4MHz CH-Middle



LTE Band 12 16QAM 3MHz CH-Middle

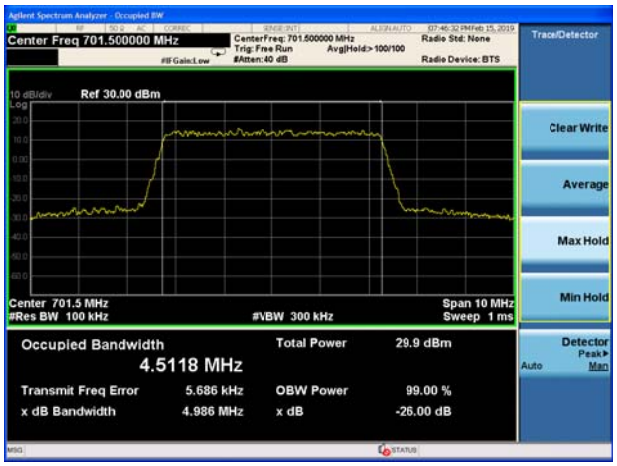


LTE Band 12 16QAM 1.4MHz CH-High

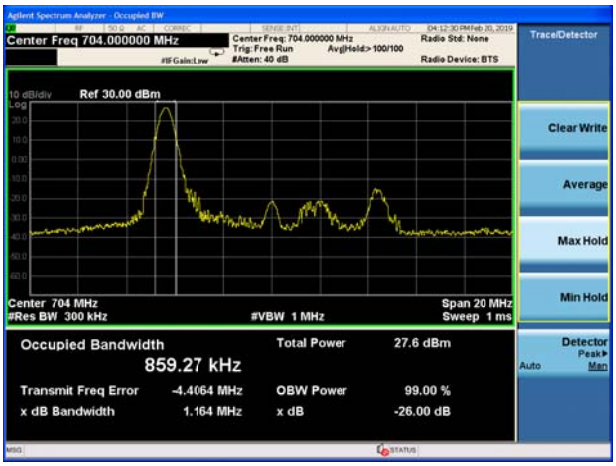


LTE Band 12 16QAM 3MHz CH-High

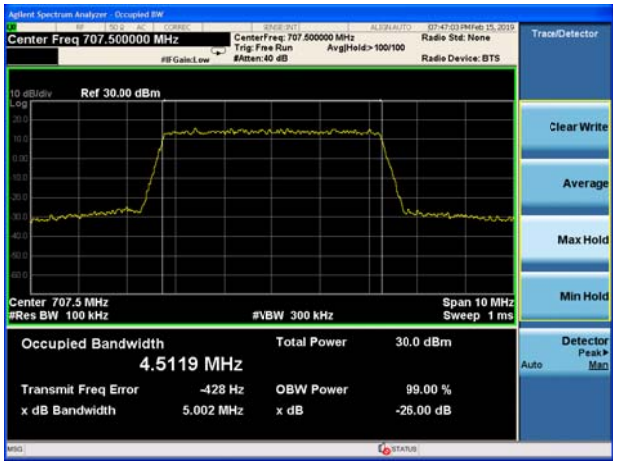
LTE Band 12 16QAM 5MHz CH-Low



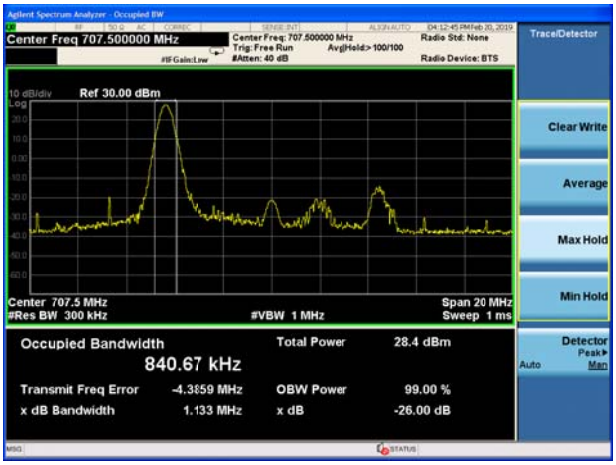
LTE Band 12 16QAM 10MHz CH-Low



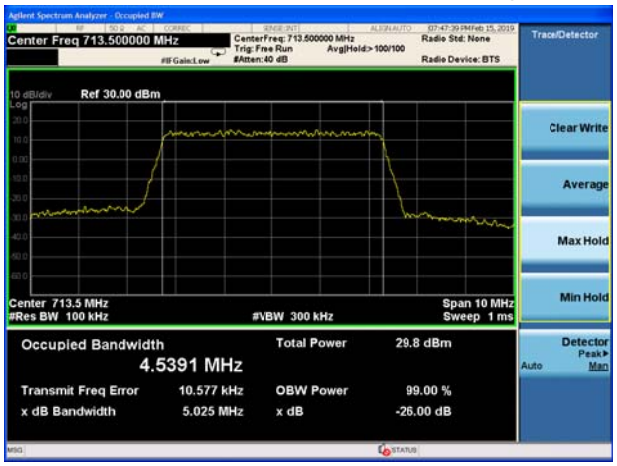
LTE Band 12 16QAM 5MHz CH-Middle



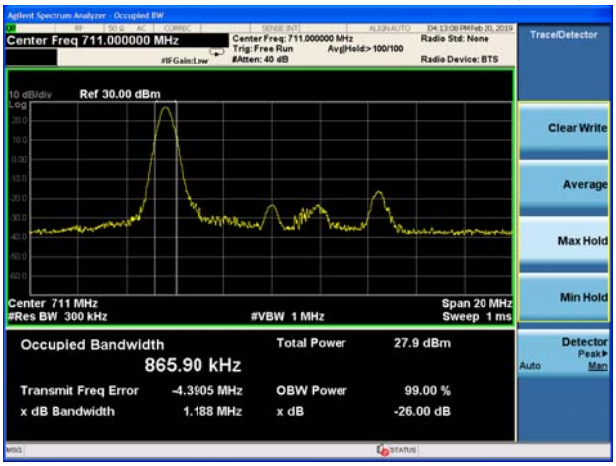
LTE Band 12 16QAM 10MHz CH-Middle



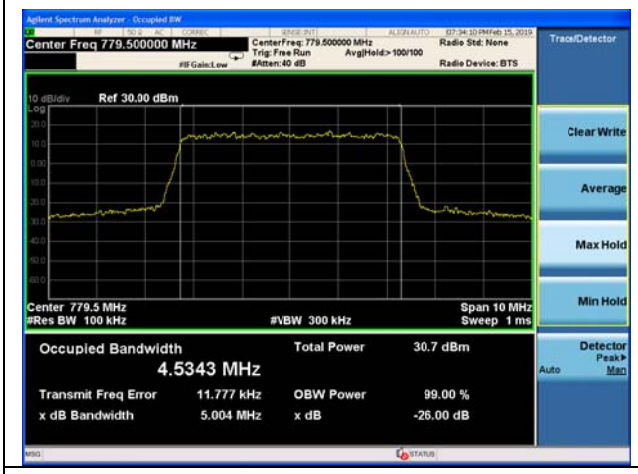
LTE Band 12 16QAM 5MHz CH-High



LTE Band 12 16QAM 10MHz CH-High

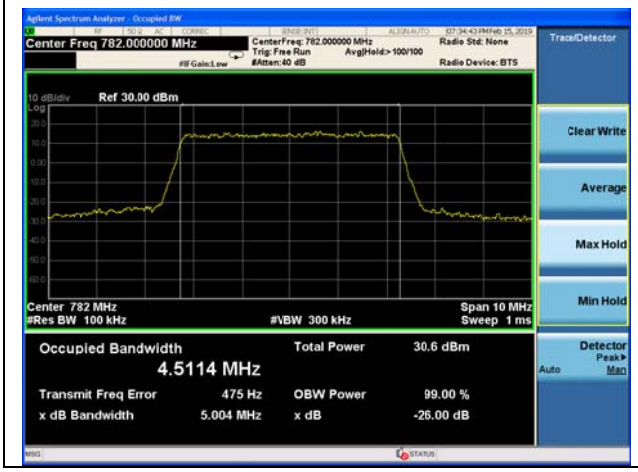


LTE Band 13 QPSK 5MHz CH-Low



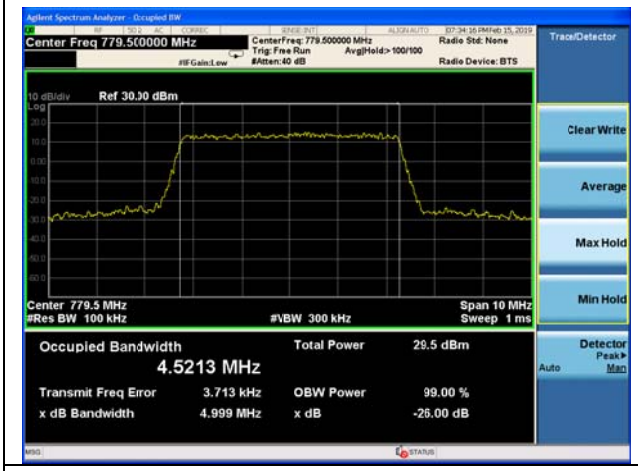
LTE Band 13 QPSK 10MHz CH-Middle

LTE Band 13 QPSK 5MHz CH-Middle

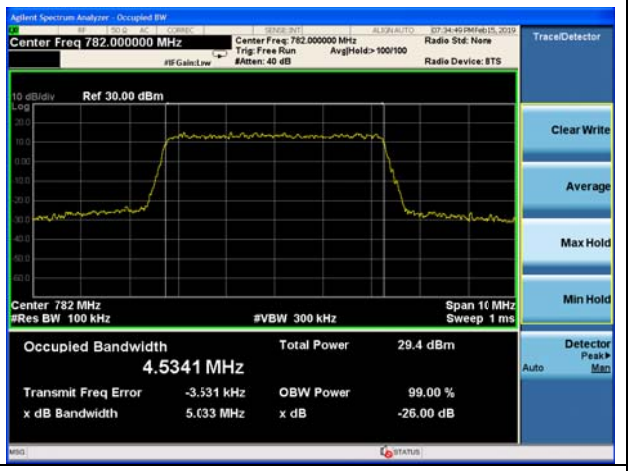


LTE Band 13 QPSK 5MHz CH-High

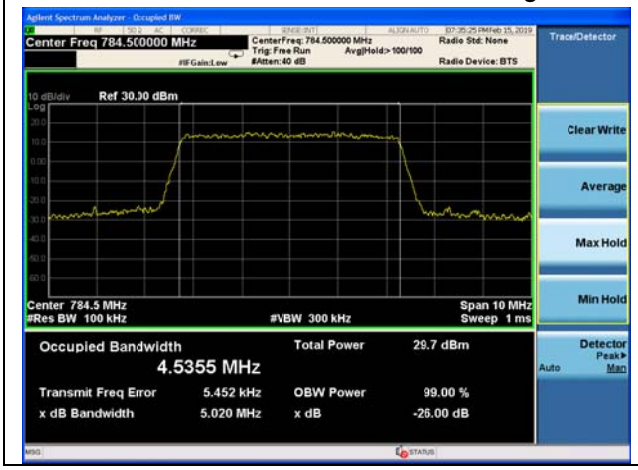
LTE Band 13 16QAM 5MHz CH-Low



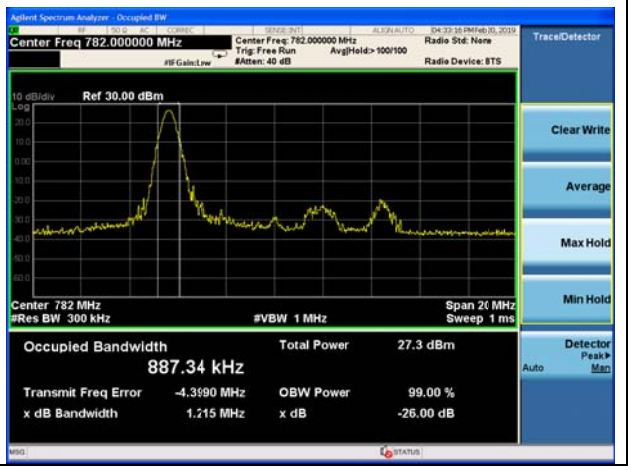
LTE Band 13 16QAM 5MHz CH-Middle



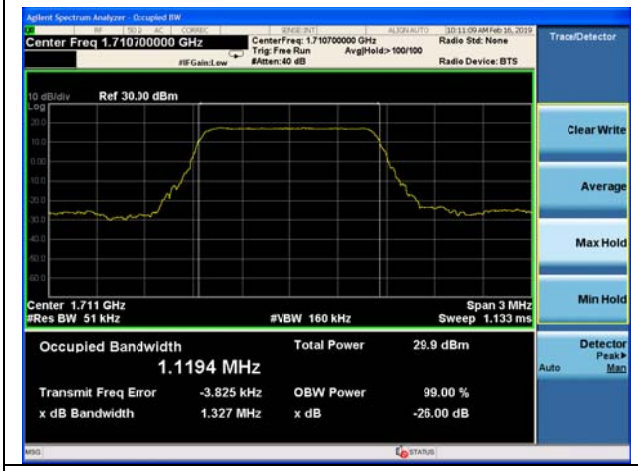
LTE Band 13 16QAM 5MHz CH-High



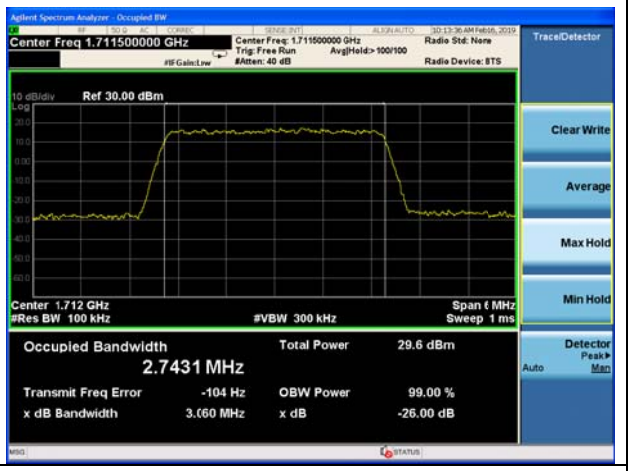
LTE Band 13 16QAM 10MHz CH-Middle



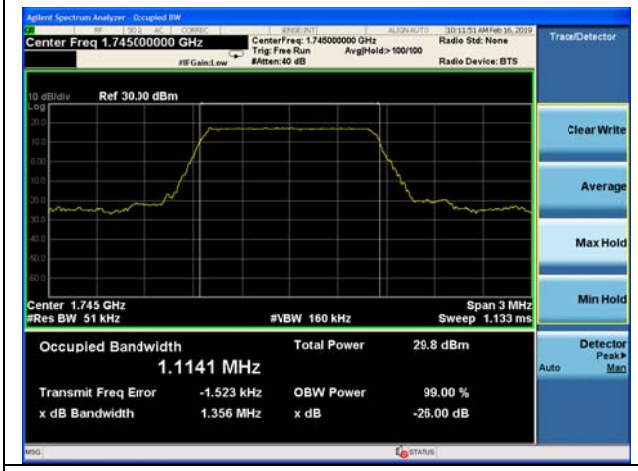
LTE Band 66 QPSK 1.4MHz CH-Low



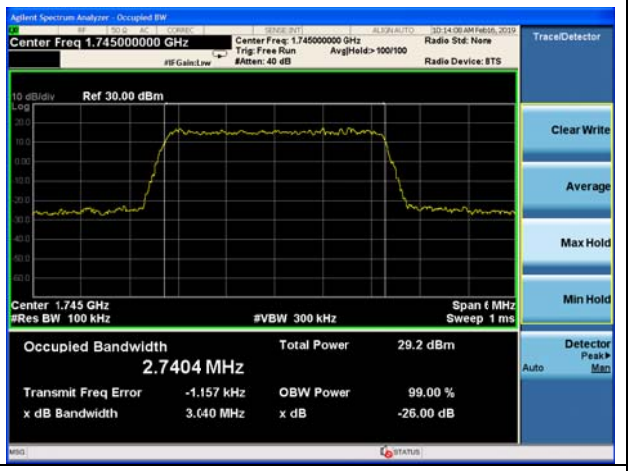
LTE Band 66 QPSK 3MHz CH-Low



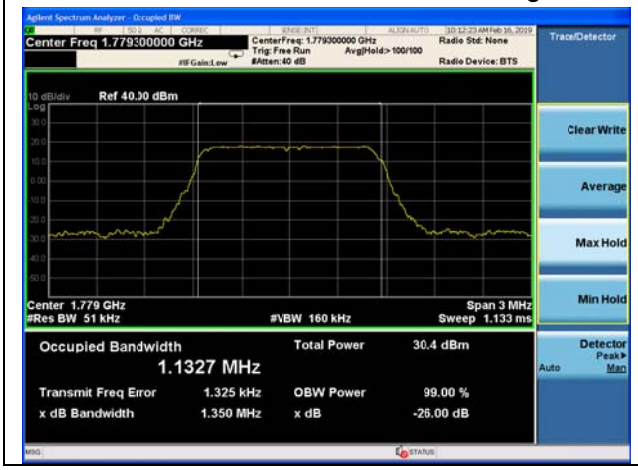
LTE Band 66 QPSK 1.4MHz CH-Middle



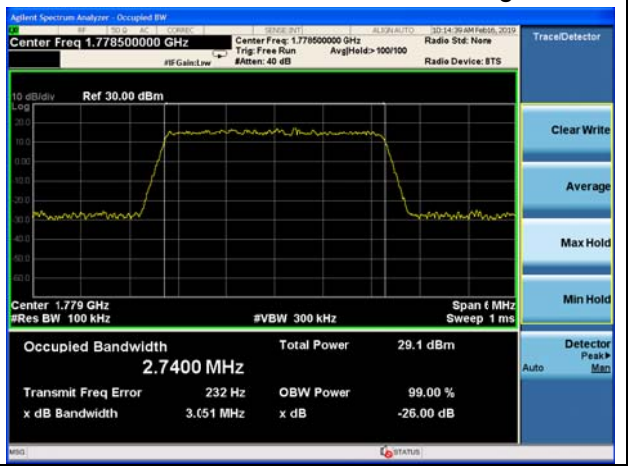
LTE Band 66 QPSK 3MHz CH-Middle



LTE Band 66 QPSK 1.4MHz CH-High



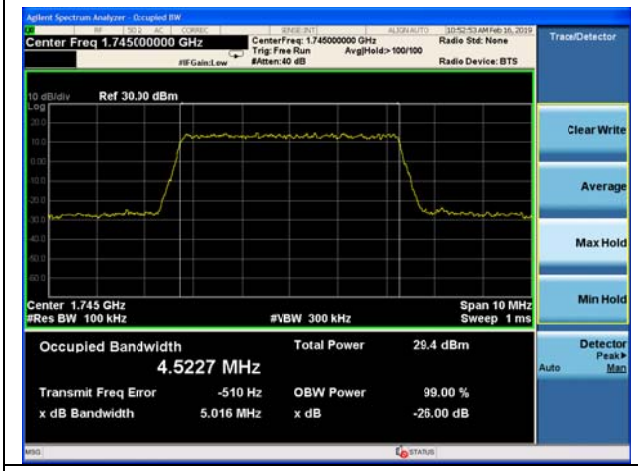
LTE Band 66 QPSK 3MHz CH-High



LTE Band 66 QPSK 5MHz CH-Low

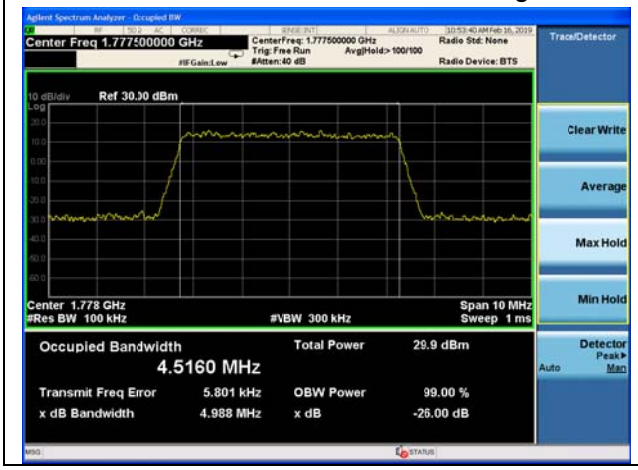
LTE Band 66 QPSK 10MHz CH-Low

LTE Band 66 QPSK 5MHz CH-Middle



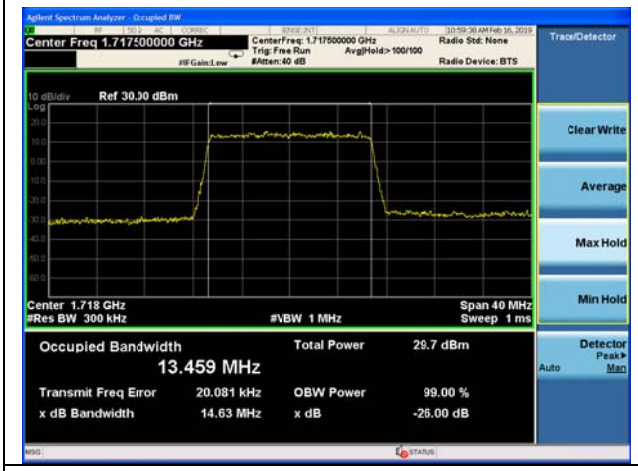
LTE Band 66 QPSK 10MHz CH-Middle

LTE Band 66 QPSK 5MHz CH-High

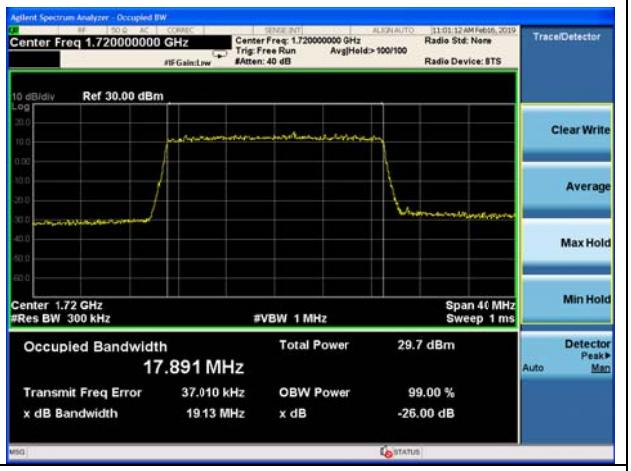


LTE Band 66 QPSK 10MHz CH-High

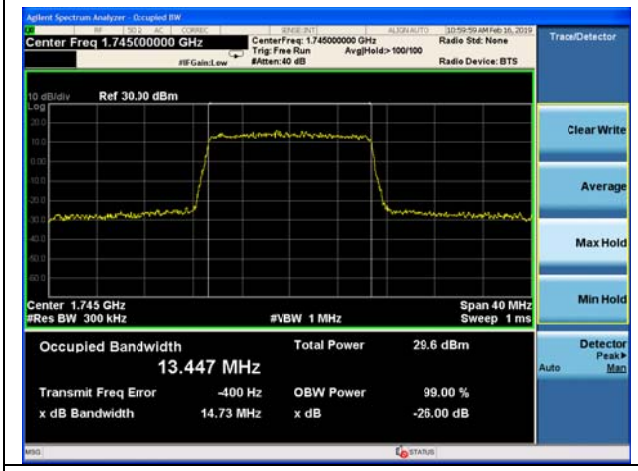
LTE Band 66 QPSK 15MHz CH-Low



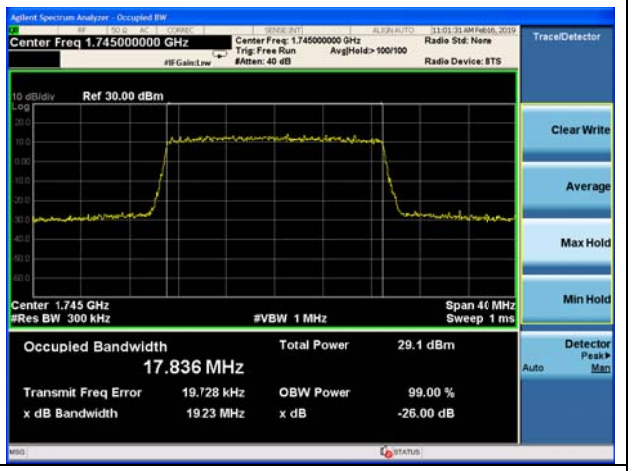
LTE Band 66 QPSK 20MHz CH-Low



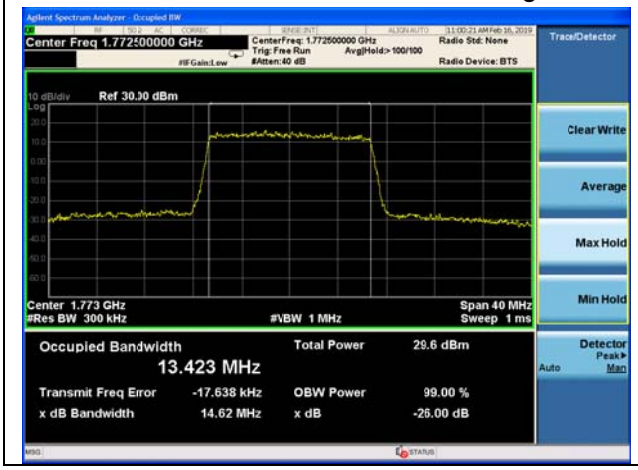
LTE Band 66 QPSK 15MHz CH-Middle



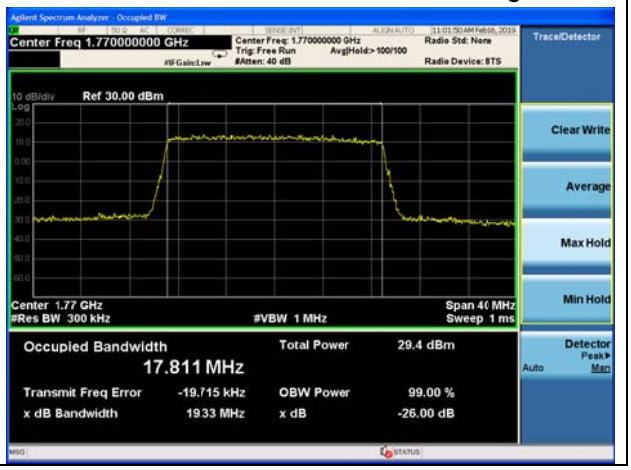
LTE Band 66 QPSK 20MHz CH-Middle



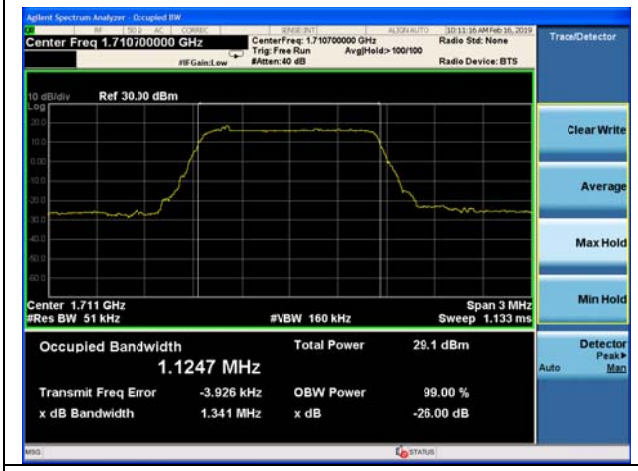
LTE Band 66 QPSK 15MHz CH-High



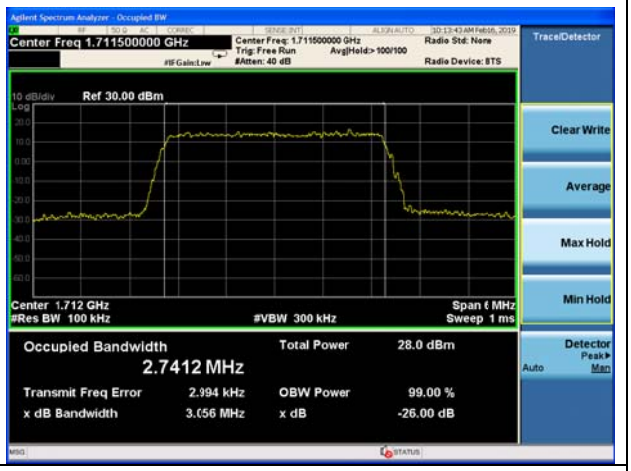
LTE Band 66 QPSK 20MHz CH-High



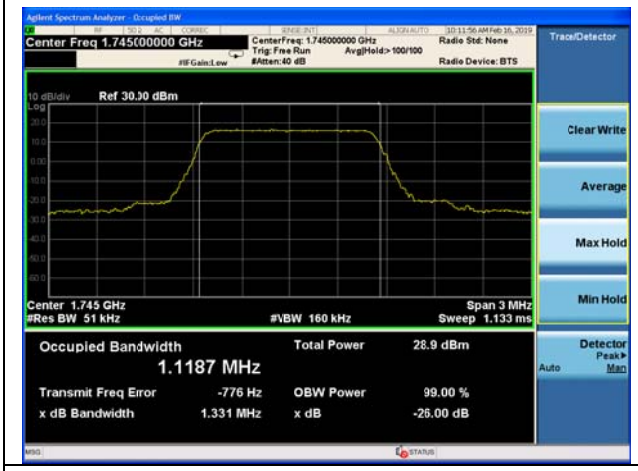
LTE Band 66 16QAM 1.4MHz CH-Low



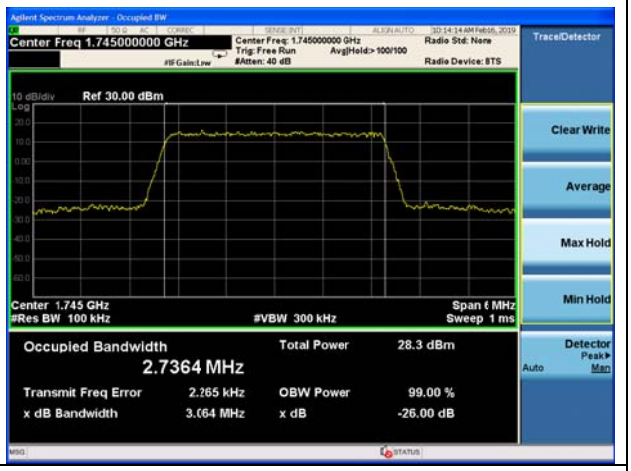
LTE Band 66 16QAM 3MHz CH-Low



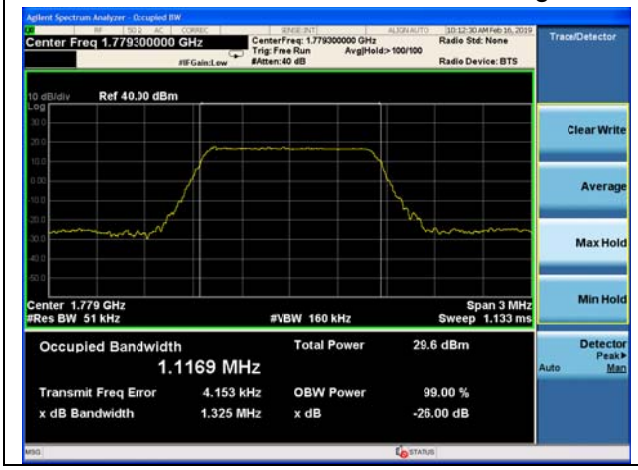
LTE Band 66 16QAM 1.4MHz CH-Middle



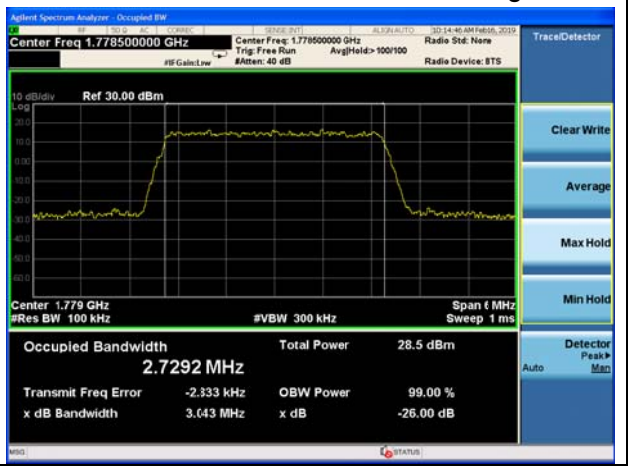
LTE Band 66 16QAM 3MHz CH-Middle



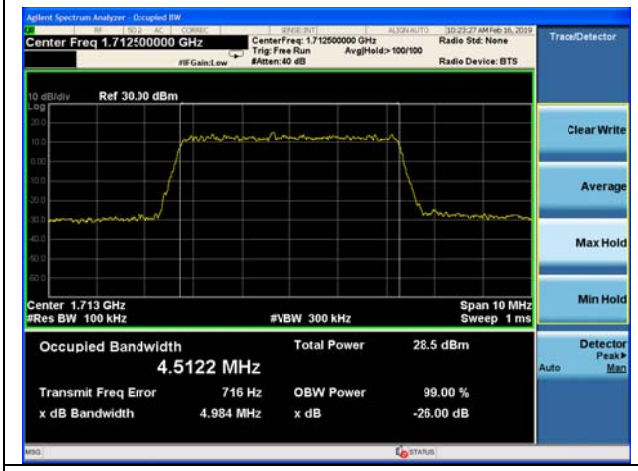
LTE Band 66 16QAM 1.4MHz CH-High



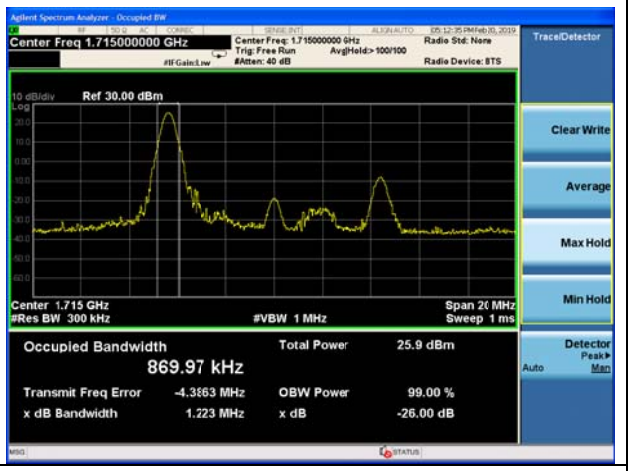
LTE Band 66 16QAM 3MHz CH-High



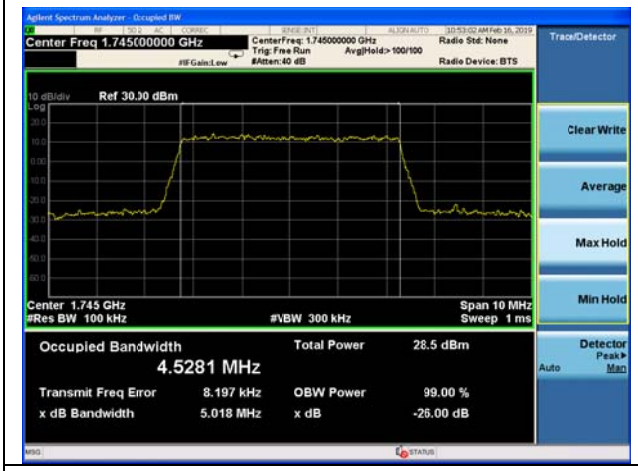
LTE Band 66 16QAM 5MHz CH-Low



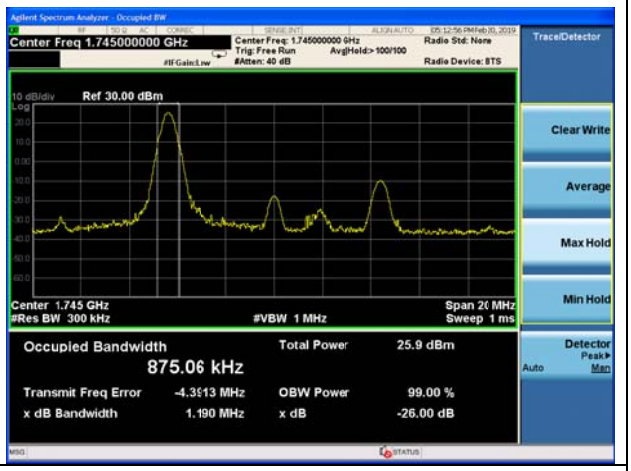
LTE Band 66 16QAM 10MHz CH-Low



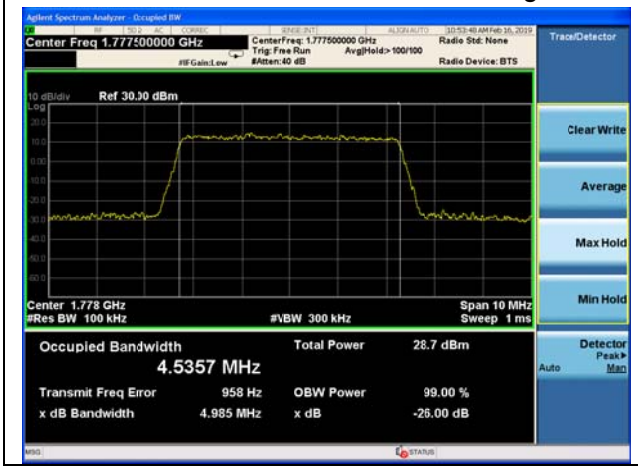
LTE Band 66 16QAM 5MHz CH-Middle



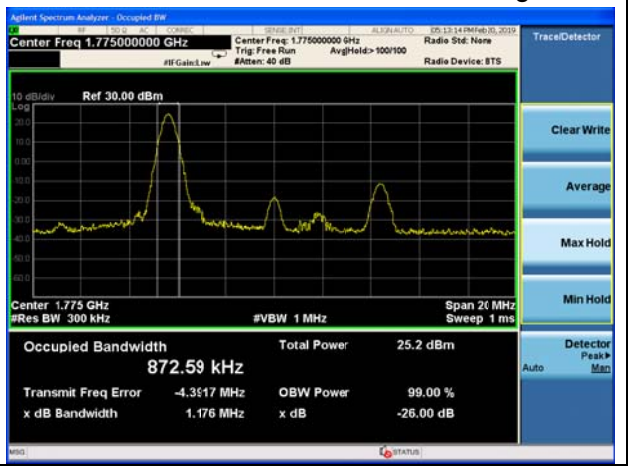
LTE Band 66 16QAM 10MHz CH-Middle



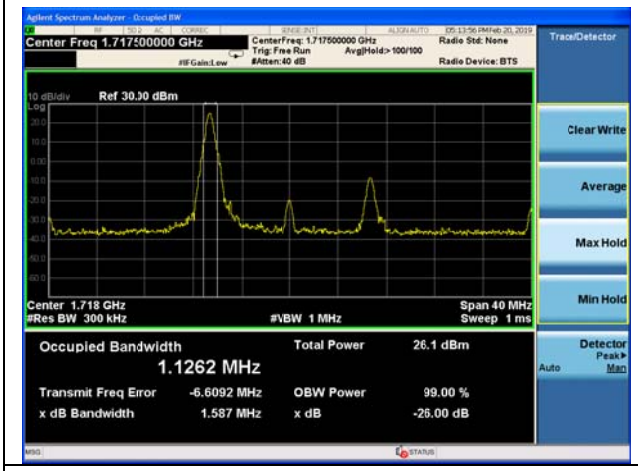
LTE Band 66 16QAM 5MHz CH-High



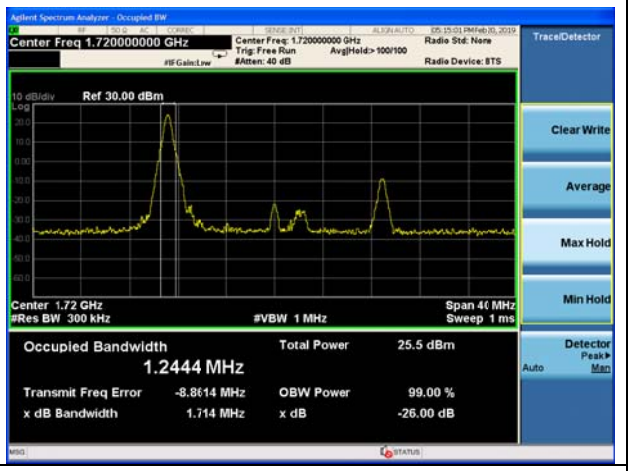
LTE Band 66 16QAM 10MHz CH-High



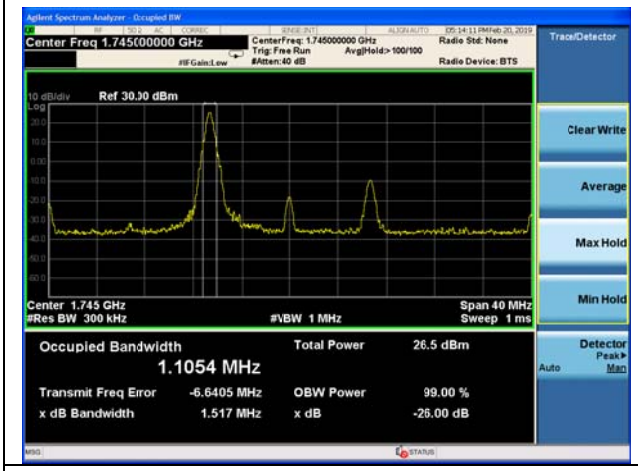
LTE Band 66 16QAM 15MHz CH-Low



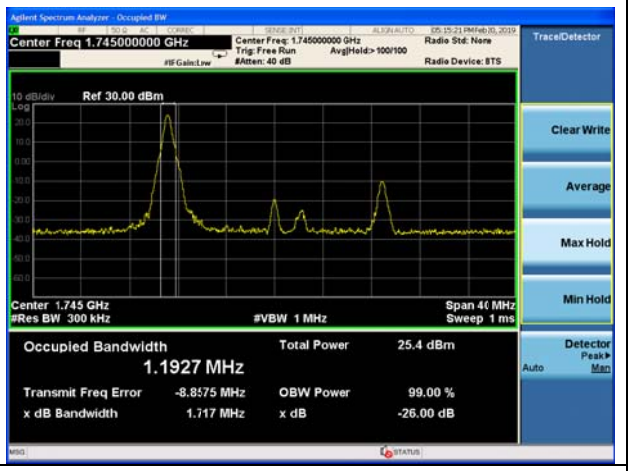
LTE Band 66 16QAM 20MHz CH-Low



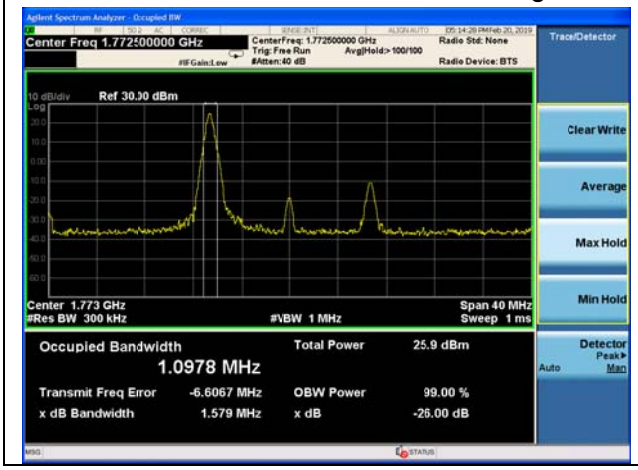
LTE Band 66 16QAM 15MHz CH-Middle



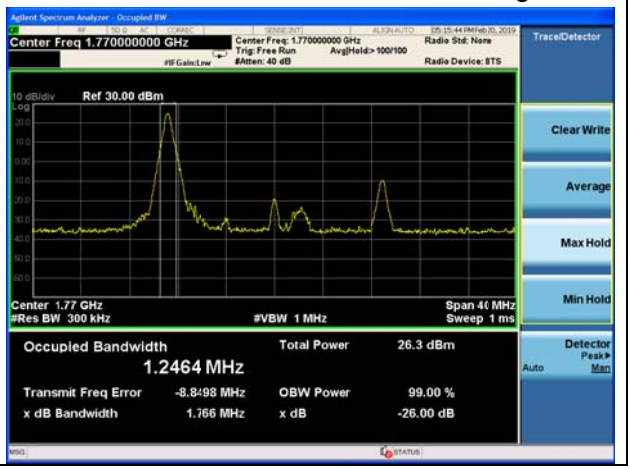
LTE Band 66 16QAM 20MHz CH-Middle



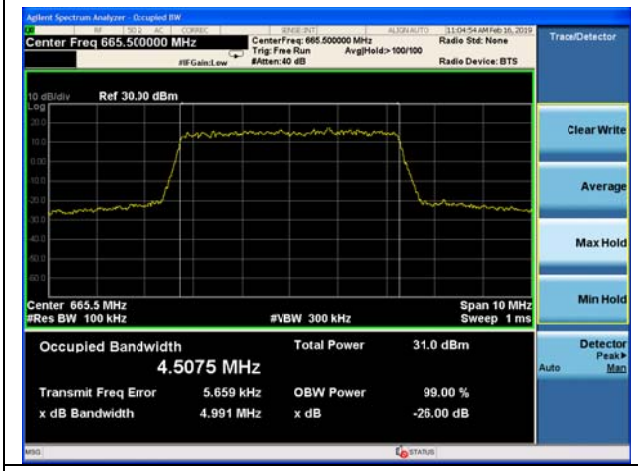
LTE Band 66 16QAM 15MHz CH-High



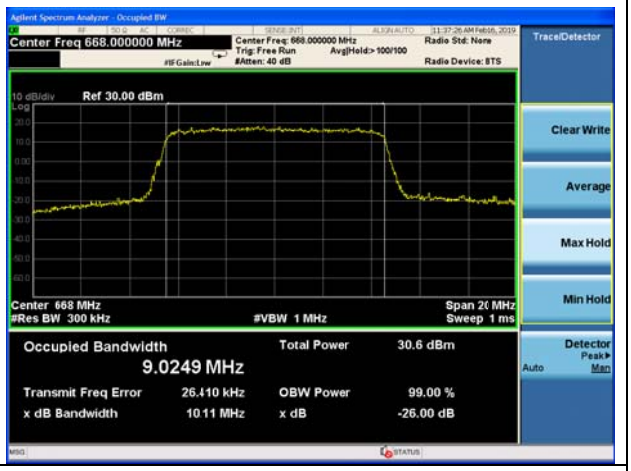
LTE Band 66 16QAM 20MHz CH-High



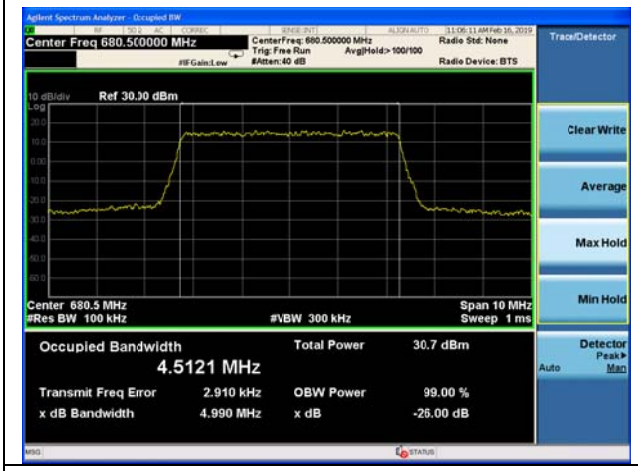
LTE Band 71 QPSK 5MHz CH-Low



LTE Band 71 QPSK 10MHz CH-Low

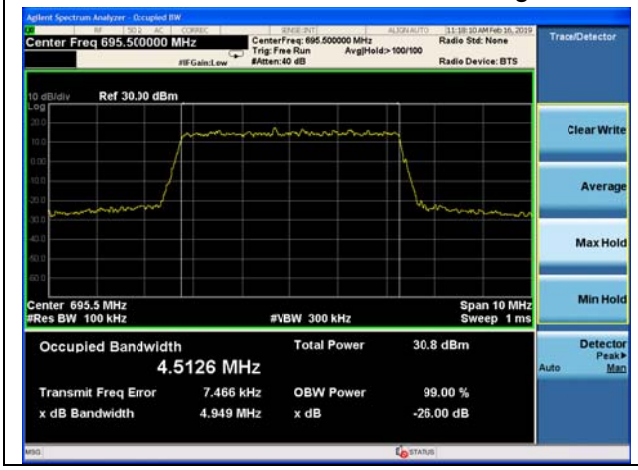


LTE Band 71 QPSK 5MHz CH-Middle



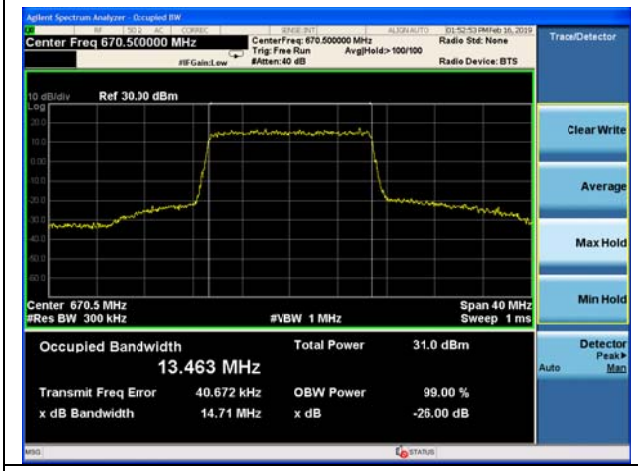
LTE Band 71 QPSK 10MHz CH-Middle

LTE Band 71 QPSK 5MHz CH-High

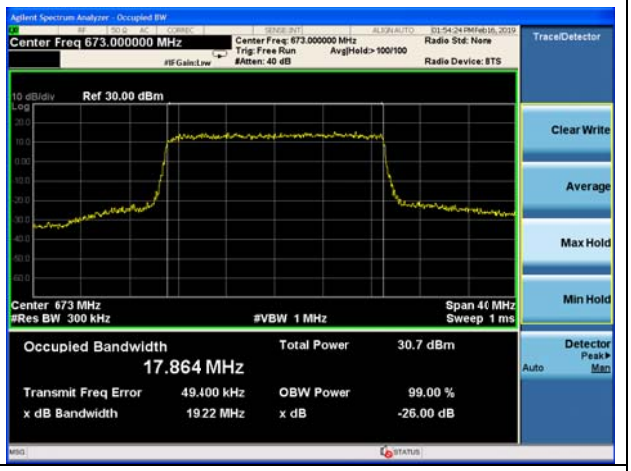


LTE Band 71 QPSK 10MHz CH-High

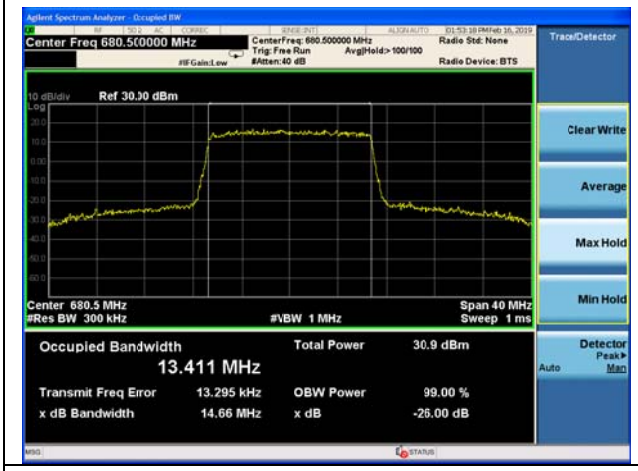
LTE Band 71 QPSK 15MHz CH-Low



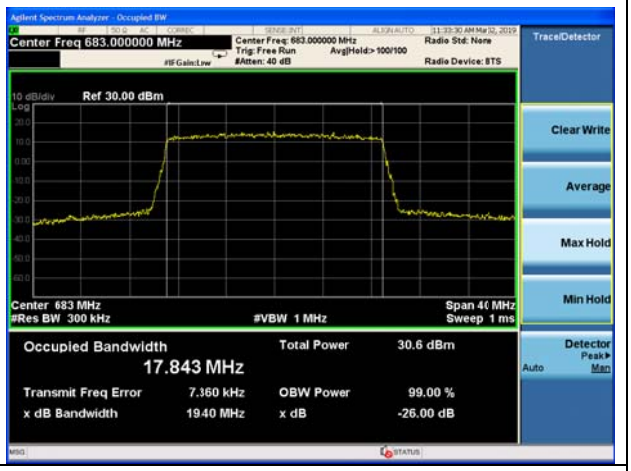
LTE Band 71 QPSK 20MHz CH-Low



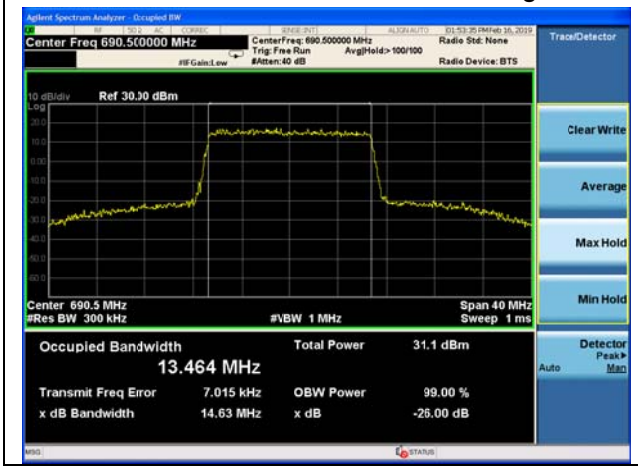
LTE Band 71 QPSK 15MHz CH-Middle



LTE Band 71 QPSK 20MHz CH-Middle



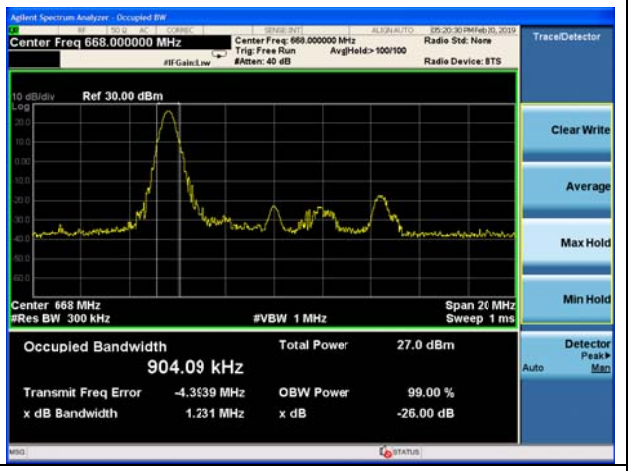
LTE Band 71 QPSK 15MHz CH-High



LTE Band 71 QPSK 20MHz CH-High

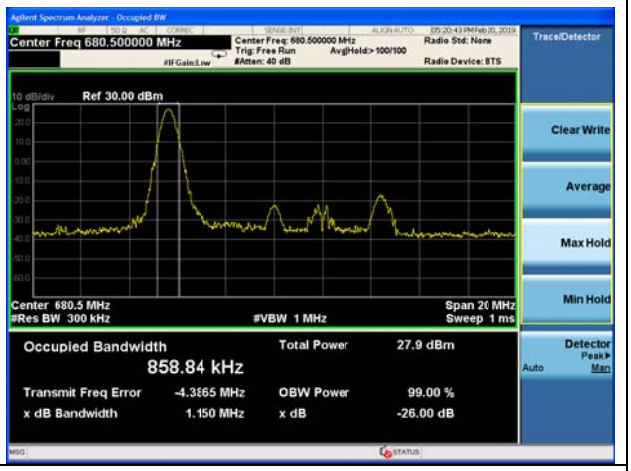
LTE Band 71 16QAM 5MHz CH-Low

LTE Band 71 16QAM 10MHz CH-Low

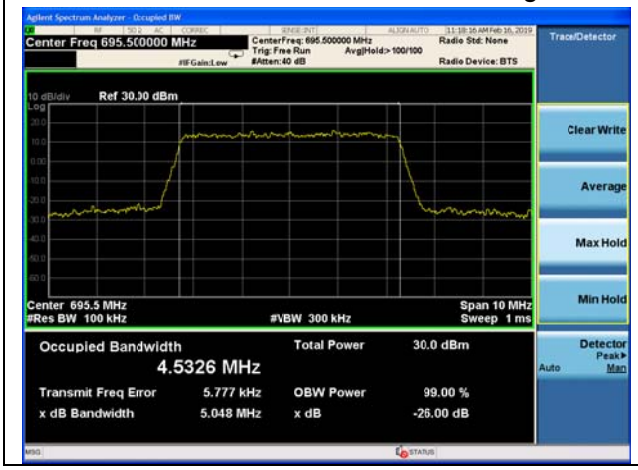


LTE Band 71 16QAM 5MHz CH-Middle

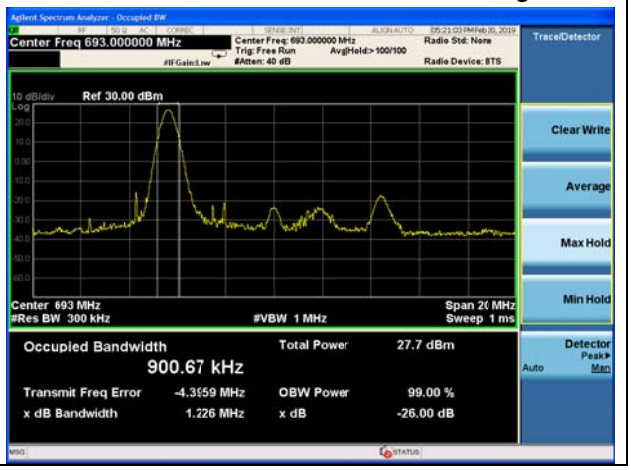
LTE Band 71 16QAM 10MHz CH-Middle



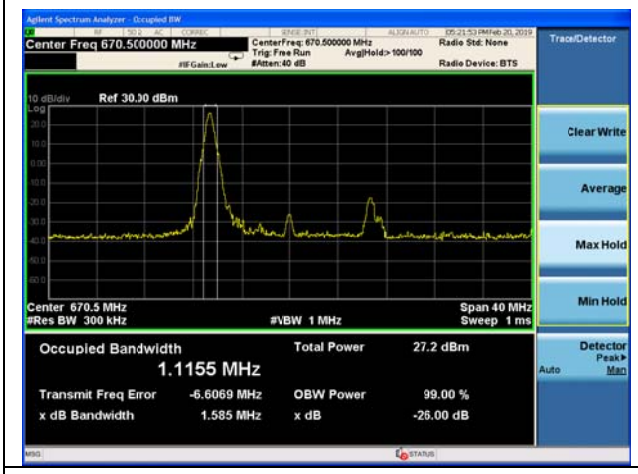
LTE Band 71 16QAM 5MHz CH-High



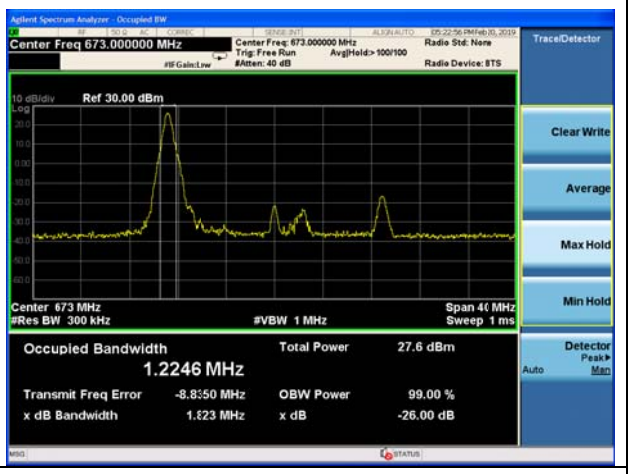
LTE Band 71 16QAM 10MHz CH-High



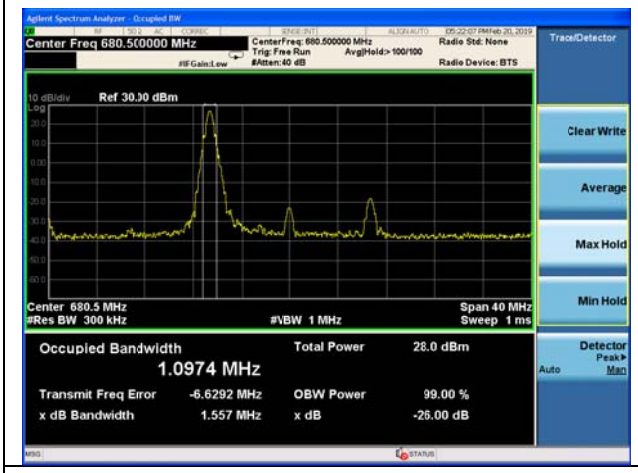
LTE Band 71 16QAM 15MHz CH-Low



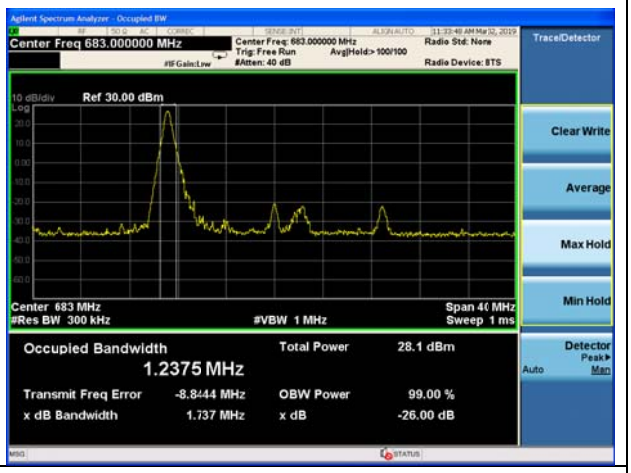
LTE Band 71 16QAM 20MHz CH-Low



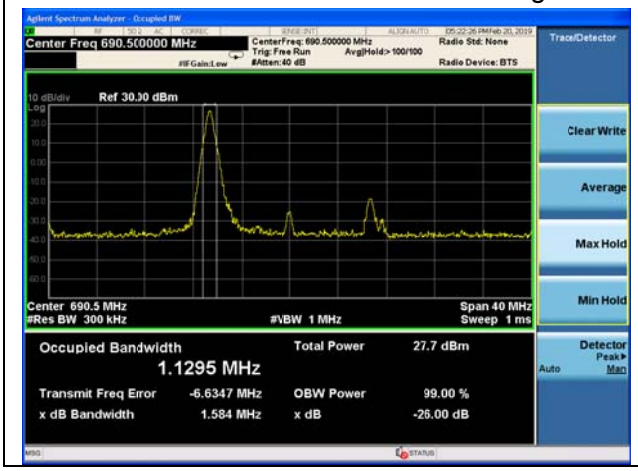
LTE Band 71 16QAM 15MHz CH-Middle



LTE Band 71 16QAM 20MHz CH-Middle



LTE Band 71 16QAM 15MHz CH-High



LTE Band 71 16QAM 20MHz CH-High

5.4 Band Edge Compliance

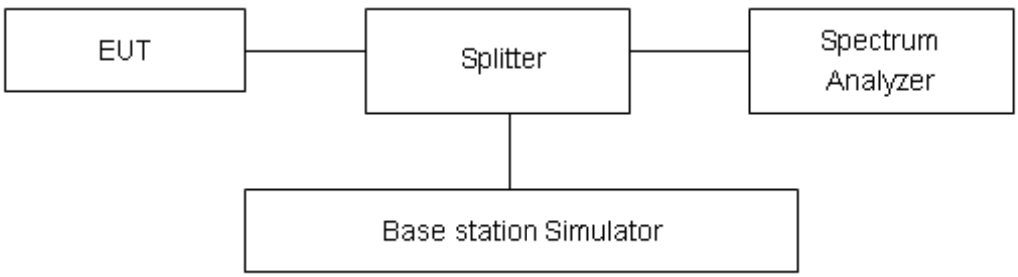
Ambient condition

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 15 kHz, VBW is set to 51 kHz for LTE Band 4/66 (1.4MHz).
RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4/66 (3MHz).
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/66/71 (5MHz).
RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/66/71 (10MHz).
RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4/66 (15MHz).
RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4/66 (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 10 kHz, VBW is set to 30 kHz for LTE Band 13 (763MHz~775MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 13 (775MHz~777MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 13 (787MHz~793MHz).
RBW is set to 10 kHz, VBW is set to 30 kHz 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"

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 (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=0.684dB.

Test Result

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

WCDMA Band IV CH-Low	WCDMA Band IV CH-High