



RF TEST REPORT

Applicant ZTE Corporation

FCC ID SRQ-ZTEBLADEV8Q

Product LTE/WCDMA/GSM (GPRS) Multi-Mode
Digital Mobile Phone

Model ZTE BLADE V0840 / ZTE BLADE V8Q /
BLADE V8Q

Report No. RXA1708-0309RF03R1

Issue Date October 17, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2017)/ FCC CFR47 Part 27C (2017)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Jiangpeng Lan

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

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

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

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

Table of Contents

1	Test Laboratory.....	4
1.1	Notes of the Test Report	4
1.2	Test facility	4
1.3	Testing Location.....	5
2	General Description of Equipment under Test.....	6
3	Applied Standards	8
4	Test Configuration	9
5	Test Information.....	11
5.1	RF Power Output	11
5.2	Effective Isotropic Radiated Power	20
5.3	Occupied Bandwidth	27
5.4	Band Edge Compliance	48
5.5	Peak-to-Average Power Ratio (PAPR)	72
5.6	Frequency Stability.....	77
5.7	Spurious Emissions at Antenna Terminals	84
5.8	Radiates Spurious Emission	108
6	Main Test Instruments	137
ANNEX A:	EUT Appearance and Test Setup	138
A.1	EUT Appearance.....	138
A.2	Test Setup.....	142

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) /27.50(h)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h) /27.53(g) /27.53(m)	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(m)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h) /27.53(g) /27.53(m) /27.53(f)	PASS
Date of Testing: August 31, 2017~ September 22, 2017			
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. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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

2 General Description of Equipment under Test

Client Information

Applicant	ZTE Corporation
Applicant address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Manufacturer	ZTE Corporation
Manufacturer address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

General information

EUT Description			
Model:	ZTE BLADE V0840 / ZTE BLADE V8Q / BLADE V8Q		
Product IMEI:	866032030009910		
Hardware Version:	MBV1.0		
Software Version:	GEN_ZTE_V0840_V1.0		
Power Supply:	Battery/AC adapter		
Antenna Type:	Internal Antenna		
Test Mode(s):	WCDMA Band IV; LTE Band 4; LTE Band 7; LTE Band 12, LTE Band 17;		
HSDPA UE Category:	24		
HSUPA UE Category:	6		
LTE Category	R10		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV:	23.83dBm	
	LTE Band 4:	23.72dBm	
	LTE Band 7:	22.46dBm	
	LTE Band 12:	17.48dBm	
	LTE Band 17:	17.43dBm	
Rated Power Supply Voltage:	3.85V		
Extreme Voltage:	Minimum: 3.6V Maximum: 4.4V		
Extreme Temperature:	Lowest: -10°C Highest: +55°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 7	2500 ~ 2570	2620 ~ 2690
	LTE Band 12	699 ~ 716	729 ~ 746
	LTE Band 17	704 ~ 716	734 ~ 746
EUT Accessory			
Adapter 1	Manufacturer: SHENZHEN RUIJING INDUSTRIAL CO LTD		



	RUIJING Model: STC-A51A-Z
Adapter 2	Manufacturer:Jiangsu Chenyang Electronics Co., Ltd. Model:STC-A51A-Z
Adapter 3	Manufacturer:DONGGUAN AOHA1 POWER TECHNOLOGY CO., LTD. Model:STC-A51A-Z
Adapter 4	Manufacturer: SHENZHEN RUIJING INDUSTRIAL CO LTD RUIJING Model: STC-A51A-A
Adapter 5	Manufacturer:Jiangsu Chenyang Electronics Co., Ltd. Model: STC-A51A-A
Battery	Manufacturer: Zhongshan tianmao battery co., ltd Model: Li3825T43P3h736037 Power Rating: DC 3.8V, 2500mAh, Li-ion
Earphone	Manufacturer: GoerTek Inc Model: HMZ17-CTIA-3.5
USB Extend Cable 1	Manufacturer:Chuan electronics co., ltd SN:080410500049
USB Extend Cable 2	Manufacturer:KoEY Huaxing electronics co., ltd SN:080410500049
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 2 (2017)

FCC CFR47 Part 27C (2017)

ANSI/TIA-603-D (2010)

KDB 971168 D01 Power Meas License Digital Systems v02r02

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 EUT in position (Z axis, vertical polarization) and Receiver antenna horizontal polarization 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
Conducted Test cases	RF power output	WCDMA Band IV	RMC/HSDPA/HSUPA/DC-HSDPA
	Effective Isotropic Radiated power	WCDMA Band IV	RMC
	Occupied Bandwidth	WCDMA Band IV	RMC
	Band Edge Compliance	WCDMA Band IV	RMC
	Peak-to-Average Power Ratio	WCDMA Band IV	RMC
	Frequency Stability	WCDMA Band IV	RMC
	Spurious Emissions at Antenna Terminals	WCDMA Band IV	RMC
Radiated Test cases	Radiates Spurious Emission	WCDMA Band IV	RMC

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/7/12/17:

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 7	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 17	-	-	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 7	-	-	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 17	-	-	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 7	-	-	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 17	-	-	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 7	-	-	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 12	O	O	O	O	-	-	O	O	O	-	O	O	-	O
	LTE 17	-	-	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 7	-	-	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
	LTE 17	-	-	O	O	-	-	O	O	-	-	O	O	O	O
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	-	-	O	-	O	-
	LTE 7	-	-	O	O	O	O	O	O	-	-	O	-	O	-
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	-	O	-
	LTE 17	-	-	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 7	-	-	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 12	O	O	O	O	-	-	O	-	O	-	-	O	O	O
	LTE 17	-	-	O	O	-	-	O	-	O	-	-	O	O	O
Radiates Spurious Emission	LTE 4	O	O	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 7	-	-	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 12	O	O	O	O	-	-	O	-	O	-	-	O	O	O
	LTE 17	-	-	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 Information

5.1 RF Power Output

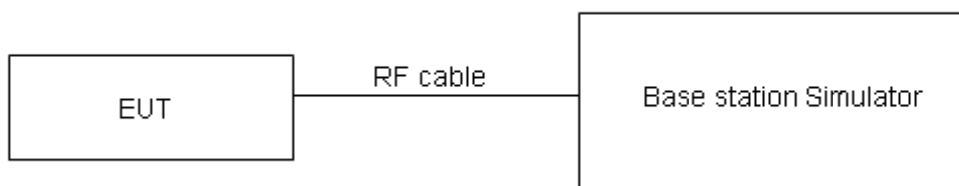
Ambient condition

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		23.06	23.11	23.20
HSDPA	Sub - Test 1	22.89	22.95	23.04
	Sub - Test 2	22.90	22.94	23.06
	Sub - Test 3	22.50	22.52	22.64
	Sub - Test 4	22.49	22.54	22.63
HSUPA	Sub - Test 1	22.98	23.03	23.12
	Sub - Test 2	21.14	21.19	21.28
	Sub - Test 3	21.96	22.01	22.10
	Sub - Test 4	21.15	21.20	21.29
	Sub - Test 5	22.94	22.99	23.08
DC-HSDPA	Sub - Test 1	22.93	22.98	23.07
	Sub - Test 2	22.91	22.97	23.06
	Sub - Test 3	22.40	22.46	22.55
	Sub - Test 4	22.39	22.45	22.54

LTE TDD 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	22.98	23.03	23.21
		1	2	23.16	23.16	23.41
		1	5	22.99	22.97	23.26
		3	0	23.09	23.10	23.27
		3	2	23.14	23.12	23.26
		3	3	23.11	23.09	23.31
		6	0	22.19	21.94	22.04
	16QAM	1	0	22.48	22.44	22.71
		1	2	22.64	22.57	22.81
		1	5	22.52	22.52	22.74
		3	0	22.38	22.39	22.58
		3	2	22.43	22.33	22.57
		3	3	22.29	22.37	22.62
		6	0	21.07	21.01	21.10
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	23.29	23.28	23.78
		1	7	23.52	23.50	23.59
		1	14	23.32	23.12	23.79
		8	0	22.42	22.35	22.57
		8	4	22.29	22.36	22.33
		8	7	22.30	22.13	22.22
		15	0	22.28	22.20	22.30
	16QAM	1	0	22.38	22.21	22.21
		1	7	22.33	22.15	22.29
		1	14	22.15	21.84	22.26
		8	0	21.37	21.23	21.39
		8	4	21.43	21.37	21.39
		8	7	21.23	21.22	21.28
		15	0	21.36	21.17	21.27
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	23.26	23.26	23.74
		1	13	23.50	23.46	23.56
		1	24	23.29	23.07	23.75
		12	0	22.39	22.30	22.53
		12	6	22.27	22.32	22.28
		12	13	22.28	22.11	22.18
		25	0	22.26	22.19	22.28



	16QAM	1	0	22.35	22.17	22.18
		1	13	22.30	22.13	22.26
		1	24	22.12	21.82	22.22
		12	0	21.35	21.19	21.36
		12	6	21.40	21.32	21.35
		12	13	21.20	21.17	21.24
		25	0	21.34	21.13	21.22
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	23.28	23.27	23.77
		1	25	23.53	23.51	23.60
		1	49	23.31	23.11	23.78
		25	0	22.42	22.35	22.57
		25	13	22.30	22.37	22.32
		25	25	22.30	22.15	22.23
		50	0	22.34	22.21	22.32
	16QAM	1	0	22.37	22.20	22.20
		1	25	22.33	22.17	22.29
		1	49	22.15	21.84	22.25
		25	0	21.38	21.24	21.40
		25	13	21.42	21.36	21.38
		25	25	21.23	21.22	21.28
		50	0	21.37	21.18	21.26
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	23.27	23.23	23.75
		1	38	23.51	23.50	23.57
		1	74	23.28	23.06	23.74
		36	0	22.40	22.31	22.54
		36	18	22.27	22.32	22.28
		36	39	22.27	22.12	22.19
		75	0	22.32	22.17	22.27
	16QAM	1	0	22.32	22.18	22.18
		1	38	22.31	22.14	22.27
		1	74	22.12	21.80	22.22
		36	0	21.35	21.22	21.37
		36	18	21.39	21.31	21.34
		36	39	21.21	21.18	21.25
		75	0	21.34	21.13	21.22
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	23.24	23.19	23.72
		1	50	23.50	23.46	23.55



		1	99	23.26	23.05	23.71
		50	0	22.37	22.26	22.50
		50	25	22.25	22.28	22.25
		50	50	22.24	22.07	22.15
		100	0	22.29	22.12	22.23
	16QAM	1	0	22.30	22.14	22.13
		1	50	22.27	22.12	22.23
		1	99	22.10	21.77	22.20
		50	0	21.32	21.18	21.34
		50	25	21.36	21.29	21.31
		50	50	21.18	21.13	21.21
		100	0	21.32	21.09	21.19

Note:

1) The following testing in worst case based on the maximum RF Output Power.

LTE FDD Band 7				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20775/2502.5	21100/2535	21425/2567.5
5MHz	QPSK	1	0	22.63	22.83	22.93
		1	13	23.06	23.11	22.97
		1	24	22.94	22.96	23.05
		12	0	21.86	21.90	21.89
		12	6	21.83	21.89	21.90
		12	13	21.87	21.84	21.88
		25	0	21.82	21.98	21.92
	16QAM	1	0	21.90	21.77	21.85
		1	13	21.77	21.74	21.89
		1	24	21.55	21.59	21.47
		12	0	20.76	20.80	20.84
		12	6	20.81	20.84	20.85
		12	13	20.84	20.84	20.82
		25	0	20.78	20.88	20.94
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	22.65	22.84	22.96
		1	25	23.09	23.16	23.01
		1	49	22.96	23.00	23.08
		25	0	21.89	21.95	21.93
		25	13	21.86	21.94	21.94
		25	25	21.89	21.88	21.93
		50	0	21.90	22.00	21.96
	16QAM	1	0	21.92	21.80	21.87



		1	25	21.80	21.78	21.92
		1	49	21.58	21.61	21.50
		25	0	20.79	20.85	20.88
		25	13	20.83	20.88	20.88
		25	25	20.87	20.89	20.86
		50	0	20.81	20.93	20.98
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20825/2507.5	21100/2535	21375/2562.5
15MHz	QPSK	1	0	22.64	22.80	22.94
		1	38	23.07	23.15	22.98
		1	74	22.93	22.95	23.04
		36	0	21.87	21.91	21.90
		36	18	21.83	21.89	21.90
		36	39	21.86	21.85	21.89
		75	0	21.88	21.96	21.91
	16QAM	1	0	21.87	21.78	21.85
		1	38	21.78	21.75	21.90
		1	74	21.55	21.57	21.47
		36	0	20.76	20.83	20.85
		36	18	20.80	20.83	20.84
		36	39	20.85	20.85	20.83
		75	0	20.78	20.88	20.94
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20850/2510	21100/2535	21350/2560
20MHz	QPSK	1	0	22.61	22.76	22.91
		1	50	23.06	23.11	22.96
		1	99	22.91	22.94	23.01
		50	0	21.84	21.86	21.86
		50	25	21.81	21.85	21.87
		50	50	21.83	21.80	21.85
		100	0	21.85	21.91	21.87
	16QAM	1	0	21.85	21.74	21.80
		1	50	21.74	21.73	21.86
		1	99	21.53	21.54	21.45
		50	0	20.73	20.79	20.82
		50	25	20.77	20.81	20.81
		50	50	20.82	20.80	20.79
		100	0	20.76	20.84	20.91

LTE FDD 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	22.38	22.11	22.35
		1	2	22.51	22.32	22.42
		1	5	22.29	22.25	22.30
		3	0	22.37	22.18	22.35
		3	2	22.39	22.31	22.43
		3	3	22.34	22.27	22.36
		6	0	21.40	21.32	21.39
	16QAM	1	0	21.74	21.42	21.85
		1	2	21.88	21.81	21.96
		1	5	21.35	21.74	21.67
		3	0	21.44	21.45	21.65
		3	2	21.46	21.48	21.72
		3	3	21.41	21.56	21.64
		6	0	20.49	20.57	20.40
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23025/700.5	23095/707.5	23165/714.5
3MHz	QPSK	1	0	22.43	22.39	22.39
		1	7	22.56	22.52	22.60
		1	14	22.48	22.44	22.39
		8	0	21.31	21.42	21.43
		8	4	21.33	21.54	21.37
		8	7	21.43	21.49	21.50
		15	0	21.39	21.47	21.49
	16QAM	1	0	20.90	20.83	20.93
		1	7	20.99	20.74	20.81
		1	14	20.78	20.89	20.82
		8	0	20.40	20.31	20.36
		8	4	20.53	20.39	20.32
		8	7	20.41	20.51	20.22
		15	0	20.36	20.32	20.16
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23035/701.5	23095/707.5	23155/713.5
5MHz	QPSK	1	0	22.42	22.35	22.37
		1	13	22.54	22.51	22.57
		1	24	22.45	22.39	22.35
		12	0	21.29	21.38	21.40
		12	6	21.30	21.49	21.33
		12	13	21.40	21.46	21.46
		25	0	21.37	21.43	21.44



	16QAM	1	0	20.85	20.81	20.91
		1	13	20.97	20.71	20.79
		1	24	20.75	20.85	20.79
		12	0	20.37	20.29	20.33
		12	6	20.50	20.34	20.28
		12	13	20.39	20.47	20.19
		25	0	20.33	20.27	20.12
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23060/704	23095/707.5	23130/711
10MHz	QPSK	1	0	22.39	22.31	22.34
		1	25	22.53	22.47	22.55
		1	49	22.43	22.38	22.32
		25	0	21.26	21.33	21.36
		25	13	21.28	21.45	21.30
		25	25	21.37	21.41	21.42
		50	0	21.34	21.38	21.40
	16QAM	1	0	20.83	20.77	20.86
		1	25	20.93	20.69	20.75
		1	49	20.73	20.82	20.77
		25	0	20.34	20.25	20.30
		25	13	20.47	20.32	20.25
		25	25	20.36	20.42	20.15
		50	0	20.31	20.23	20.09

LTE FDD Band 17				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23755/706.5	23790/710	23825/713.5
5MHz	QPSK	1	0	22.58	22.36	22.55
		1	13	22.60	22.62	20.59
		1	24	22.53	22.42	22.43
		12	0	21.54	21.49	21.44
		12	6	21.43	21.35	21.36
		12	13	21.48	21.40	21.43
		25	0	21.36	21.35	21.44
	16QAM	1	0	20.79	20.77	20.62
		1	13	21.02	20.84	20.83
		1	24	21.01	20.81	20.75
		12	0	20.52	20.22	20.45
		12	6	20.30	20.42	20.36
		12	13	20.32	20.44	20.44
		25	0	20.46	20.51	20.53
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		



				23780/709	23790/710	23800/711
10MHz	QPSK	1	0	22.55	22.32	22.52
		1	25	22.59	22.58	20.57
		1	49	22.51	22.41	22.40
		25	0	21.51	21.44	21.40
		25	13	21.41	21.31	21.33
		25	25	21.45	21.35	21.39
		50	0	21.33	21.30	21.40
	16QAM	1	0	20.77	20.73	20.57
		1	25	20.98	20.82	20.79
		1	49	20.99	20.78	20.73
		25	0	20.49	20.18	20.42
		25	13	20.27	20.40	20.33
		25	25	20.29	20.39	20.40
		50	0	20.44	20.47	20.50

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 v02r02 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.

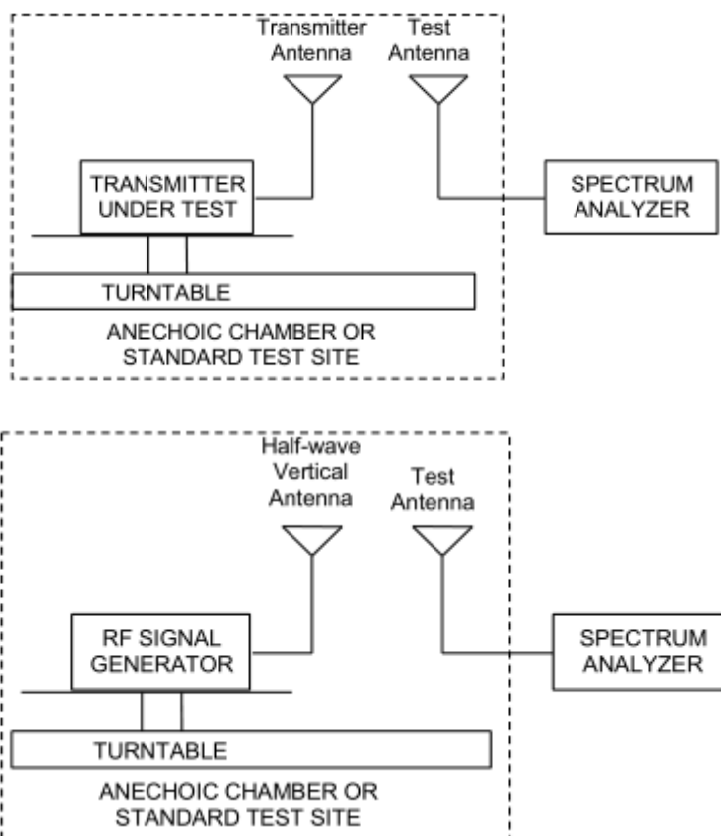
g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and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

$$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$$

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”

Rule Part 27.50(h) (2) specifies that “Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.”

Part 27.50(b)(10)Limit (ERP) -LTE 13	$\leq 3 \text{ W}$ (34.77 dBm)
Part 27.50(c)(10)Limit (ERP) -LTE 12/17	$\leq 3 \text{ W}$ (34.77 dBm)
Part 27.50(d)(4)Limit (EIRP) -LTE 4	$\leq 1 \text{ W}$ (30 dBm)
Part 27.50(h)(2) Limit (EIRP)-LTE 7/41	$\leq 2 \text{ W}$ (33 dBm)

Measurement Uncertainty

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

Test Results

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

Mode	Antenna Polarization	Frequency (MHz)	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Conclusion
WCDMA Band IV	Horizontal	1712.4	-23.65	-45.44	1.82	23.61	Pass
	Horizontal	1732.6	-23.69	-45.38	1.96	23.65	Pass
	Horizontal	1752.6	-23.48	-45.38	1.93	23.83	Pass

LTE Band 4							
Bandwidth	Antenna Polarization	Frequency (MHz)	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Conclusion
1.4 MHz (QPSK)	Horizontal	1710.7	-32.14	-54.30	1.44	23.60	Pass
	Horizontal	1732.5	-32.62	-54.32	1.57	23.26	Pass
	Horizontal	1754.3	-32.57	-54.10	1.72	23.24	Pass
3 MHz (QPSK)	Horizontal	1711.5	-32.07	-54.35	1.44	23.72	Pass
	Horizontal	1732.5	-32.74	-54.41	1.57	23.23	Pass
	Horizontal	1753.5	-32.57	-54.48	1.72	23.63	Pass
5 MHz (QPSK)	Horizontal	1712.5	-32.31	-54.34	1.44	23.47	Pass
	Horizontal	1732.5	-32.75	-54.32	1.57	23.14	Pass
	Horizontal	1752.5	-32.72	-54.13	1.72	23.12	Pass
10 MHz (QPSK)	Horizontal	1715	-32.16	-54.32	1.44	23.60	Pass
	Horizontal	1732.5	-32.87	-54.41	1.57	23.11	Pass
	Horizontal	1750	-32.68	-54.52	1.66	23.50	Pass
15 MHz (QPSK)	Horizontal	1717.5	-32.57	-54.35	1.49	23.26	Pass
	Horizontal	1732.5	-32.96	-54.32	1.57	22.92	Pass
	Horizontal	1747.5	-32.92	-54.17	1.66	22.91	Pass
20 MHz (QPSK)	Horizontal	1720	-32.54	-54.44	1.49	23.38	Pass
	Horizontal	1732.5	-33.08	-54.41	1.57	22.89	Pass
	Horizontal	1745	-32.93	-54.59	1.63	23.29	Pass
1.4 MHz (16QAM)	Horizontal	1710.7	-32.36	-54.30	1.44	23.38	Pass
	Horizontal	1732.5	-32.84	-54.32	1.57	23.04	Pass
	Horizontal	1754.3	-32.79	-54.10	1.72	23.03	Pass
3 MHz (16QAM)	Horizontal	1711.5	-32.29	-54.35	1.44	23.50	Pass
	Horizontal	1732.5	-32.96	-54.41	1.57	23.01	Pass
	Horizontal	1753.5	-32.79	-54.48	1.72	23.41	Pass
5 MHz (16QAM)	Horizontal	1712.5	-32.52	-54.34	1.44	23.26	Pass
	Horizontal	1732.5	-32.96	-54.32	1.57	22.92	Pass
	Horizontal	1752.5	-32.94	-54.13	1.72	22.90	Pass
10 MHz	Horizontal	1715	-32.38	-54.32	1.44	23.38	Pass



(16QAM)	Horizontal	1732.5	-33.09	-54.41	1.57	22.89	Pass
	Horizontal	1750	-32.90	-54.52	1.66	23.28	Pass
15 MHz (16QAM)	Horizontal	1717.5	-32.79	-54.35	1.49	23.04	Pass
	Horizontal	1732.5	-33.18	-54.32	1.57	22.70	Pass
	Horizontal	1747.5	-33.14	-54.17	1.66	22.69	Pass
20 MHz (16QAM)	Horizontal	1720	-32.76	-54.44	1.49	23.17	Pass
	Horizontal	1732.5	-33.30	-54.41	1.57	22.68	Pass
	Horizontal	1745	-33.15	-54.59	1.63	23.07	Pass

Note: The worst emission was found in the antenna is Horizontal position.

LTE Band 7							
Band width	Antenna Polarization	Frequency (MHz)	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Conclusion
5 MHz (QPSK)	Horizontal	2502.5	-38.99	-59.64	1.81	22.46	Pass
	Horizontal	2535	-39.76	-59.72	1.81	21.77	Pass
	Horizontal	2567.5	-39.42	-59.98	1.83	22.39	Pass
10 MHz (QPSK)	Horizontal	2505	-39.12	-59.61	1.82	22.31	Pass
	Horizontal	2535	-39.92	-59.72	1.81	21.61	Pass
	Horizontal	2565	-39.59	-60.02	1.81	22.24	Pass
15 MHz (QPSK)	Horizontal	2507.5	-38.78	-59.29	1.80	22.31	Pass
	Horizontal	2535	-39.92	-59.72	1.81	21.61	Pass
	Horizontal	2562.5	-39.04	-59.46	1.82	22.24	Pass
20 MHz (QPSK)	Horizontal	2510	-39.14	-59.52	1.77	22.15	Pass
	Horizontal	2535	-40.07	-59.72	1.81	21.46	Pass
	Horizontal	2560	-39.75	-60.01	1.82	22.08	Pass
5 MHz (16QAM)	Horizontal	2502.5	-39.14	-59.64	1.81	22.31	Pass
	Horizontal	2535	-39.91	-59.72	1.81	21.62	Pass
	Horizontal	2567.5	-39.56	-59.98	1.83	22.25	Pass
10 MHz (16QAM)	Horizontal	2505	-39.27	-59.61	1.82	22.16	Pass
	Horizontal	2535	-40.06	-59.72	1.81	21.47	Pass
	Horizontal	2565	-39.74	-60.02	1.81	22.09	Pass
15 MHz (16QAM)	Horizontal	2507.5	-38.93	-59.29	1.80	22.16	Pass
	Horizontal	2535	-40.06	-59.72	1.81	21.47	Pass
	Horizontal	2562.5	-39.19	-59.46	1.82	22.09	Pass
20 MHz (16QAM)	Horizontal	2510	-39.28	-59.52	1.77	22.01	Pass
	Horizontal	2535	-40.22	-59.72	1.81	21.31	Pass
	Horizontal	2560	-39.89	-60.01	1.82	21.94	Pass

Note: The worst emission was found in the antenna is Horizontal position.



LTE Band 12							
andwidth	Antenna Polarization	Frequency (MHz)	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	ERP (dBm)	Conclusion
1.4 MHz (QPSK)	Horizontal	699.7	-33.72	-49.12	2.04	17.45	Pass
	Horizontal	707.5	-34.15	-49.39	2.03	17.27	Pass
	Horizontal	715.3	-34.27	-49.76	1.99	17.48	Pass
3 MHz (QPSK)	Horizontal	700.5	-33.69	-48.94	2.04	17.29	Pass
	Horizontal	707.5	-34.04	-49.12	2.03	17.12	Pass
	Horizontal	714.5	-34.05	-49.37	2.00	17.32	Pass
5 MHz (QPSK)	Horizontal	701.5	-33.92	-49.17	2.04	17.30	Pass
	Horizontal	707.5	-34.30	-49.39	2.03	17.13	Pass
	Horizontal	713.5	-34.39	-49.72	2.01	17.33	Pass
10 MHz (QPSK)	Horizontal	704	-33.90	-49.00	2.04	17.14	Pass
	Horizontal	707.5	-34.19	-49.12	2.03	16.97	Pass
	Horizontal	711	-34.17	-49.33	2.02	17.17	Pass
1.4 MHz (16QAM)	Horizontal	699.7	-33.91	-49.12	2.04	17.25	Pass
	Horizontal	707.5	-34.35	-49.39	2.03	17.08	Pass
	Horizontal	715.3	-34.47	-49.76	1.99	17.28	Pass
3 MHz (16QAM)	Horizontal	700.5	-33.89	-48.94	2.04	17.09	Pass
	Horizontal	707.5	-34.24	-49.12	2.03	16.92	Pass
	Horizontal	714.5	-34.25	-49.37	2.00	17.12	Pass
5 MHz (16QAM)	Horizontal	701.5	-34.12	-49.17	2.04	17.10	Pass
	Horizontal	707.5	-34.50	-49.39	2.03	16.93	Pass
	Horizontal	713.5	-34.59	-49.72	2.01	17.13	Pass
10 MHz (16QAM)	Horizontal	704	-34.10	-49.00	2.04	16.94	Pass
	Horizontal	707.5	-34.39	-49.12	2.03	16.77	Pass
	Horizontal	711	-34.37	-49.33	2.02	16.98	Pass
Note: The worst emission was found in the antenna is Horizontal position.							



LTE Band 17							
Bandwidth	Antenna Polarization	Frequency (MHz)	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	ERP (dBm)	Conclusion
5MHz (QPSK)	Horizontal	706.5	-31.96	-47.47	1.92	17.43	Pass
	Horizontal	710	-32.45	-47.75	1.90	17.21	Pass
	Horizontal	713.5	-32.37	-47.72	1.91	17.25	Pass
10MHz (QPSK)	Horizontal	711	-32.09	-47.49	1.91	17.30	Pass
5MHz (16QAM)	Horizontal	706.5	-32.32	-47.49	1.90	17.08	Pass
	Horizontal	710	-32.26	-47.48	1.90	17.13	Pass
	Horizontal	713.5	-32.11	-47.47	1.92	17.28	Pass
10MHz (16QAM)	Horizontal	711	-32.60	-47.75	1.90	17.06	Pass
Note: The worst emission was found in the antenna is Horizontal position.							

Note: 1. EIRP= E.R.P+2.15

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).

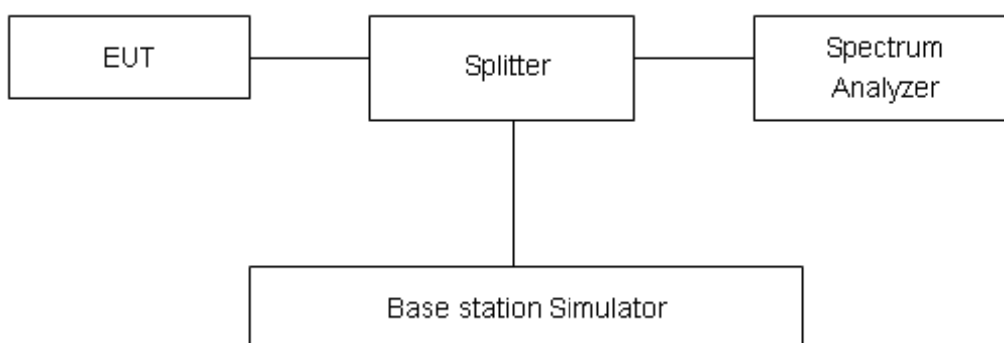
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7/12/17 (5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/12/17 (10MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7 (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)	1537	2112.4	4.1382	4.708
	1638	2132.6	4.1177	4.678
	1738	2152.6	4.1326	4.712

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1316	1.408
			20175	1732.5	1.1266	1.352
			20393	1754.3	1.1398	1.349
		3	19965	1711.5	2.7536	3.084
			20175	1732.5	2.741	3.071
			20385	1753.5	2.7436	3.072
		5	19975	1712.5	4.5197	5.059
			20175	1732.5	4.5319	5.017
			20375	1752.5	4.5125	5.05
		10	20000	1715.0	9.0229	10.08
			20175	1732.5	9.0356	10.12
			20350	1750.0	9.0366	10.09
		15	20025	1717.5	13.423	14.72
			20175	1732.5	13.457	14.77
			20325	1747.5	13.452	14.8
		20	20050	1720.0	17.874	19.31
			20175	1732.5	17.876	19.18
			20300	1745.0	17.859	19.47
	16QAM	1.4	19957	1710.7	1.1239	1.345
			20175	1732.5	1.1288	1.34
			20393	1754.3	1.1205	1.354
		3	19965	1711.5	2.7412	3.058
			20175	1732.5	2.7621	3.072
			20385	1753.5	2.74	3.083
		5	19975	1712.5	4.5413	5.068
			20175	1732.5	4.5092	5.02
			20375	1752.5	4.534	5.067
		10	20000	1715.0	9.0267	10.1
			20175	1732.5	9.0459	10.05



		20350	1750.0	9.0432	10.08
	15	20025	1717.5	13.461	14.73
		20175	1732.5	13.471	14.69
		20325	1747.5	13.458	14.82
	20	20050	1720.0	17.896	19.41
		20175	1732.5	17.908	19.41
		20300	1745.0	17.834	19.3

LTE Band 7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	20775	2502.5	4.5138	5.052
			21100	2535.0	4.5296	5.027
			21425	2567.5	4.503	5.026
		10	20800	2505.0	9.008	10.11
			21100	2535.0	9.0375	10.18
			21400	2565.0	9.035	10.11
		15	20825	2507.5	13.42	14.7
			21100	2535.0	13.465	14.81
			21375	2562.5	13.453	14.78
		20	20850	2510.0	17.862	19.29
			21100	2535.0	17.887	19.25
			21350	2560.0	17.888	19.48
	16QAM	5	20775	2502.5	4.5341	5.063
			21100	2535.0	4.512	5.023
			21425	2567.5	4.5304	5.065
		10	20800	2505.0	9.0212	10.15
			21100	2535.0	9.0302	10.02
			21400	2565.0	9.0289	10.08
		15	20825	2507.5	13.47	14.76
			21100	2535.0	13.472	14.71
			21375	2562.5	13.468	14.72
		20	20850	2510.0	17.887	19.4
			21100	2535.0	17.922	19.41
			21350	2560.0	17.858	19.4

LTE Band 12						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	23017	699.7	1.1297	1.362
			23095	707.5	1.1225	1.343

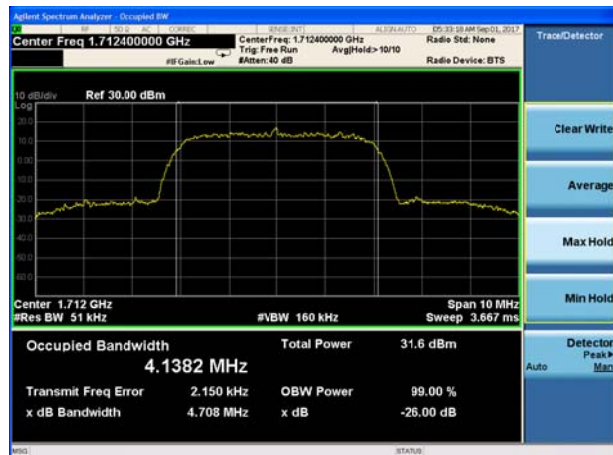


		3	23173	715.3	1.1324	1.335
			23025	700.5	2.7418	3.06
			23095	707.5	2.7418	3.072
			23165	714.5	2.7409	3.067
		5	23035	701.5	4.5117	5.031
			23095	707.5	4.5325	5.038
			23155	713.5	4.5064	5.003
		10	23060	704.0	8.9923	10.03
			23095	707.5	9.0406	10.13
			23130	711.0	9.053	10.13
	16QAM	1.4	23017	699.7	1.1232	1.326
			23095	707.5	1.1292	1.34
			23173	715.3	1.121	1.353
		3	23025	700.5	2.7339	3.068
			23095	707.5	2.7534	3.075
			23165	714.5	2.7359	3.075
		5	23035	701.5	4.5308	5.04
			23095	707.5	4.5141	5.026
			23155	713.5	4.5358	5.06
		10	23060	704.0	8.9982	10.03
			23095	707.5	9.0421	10.05
			23130	711.0	9.0419	10.06

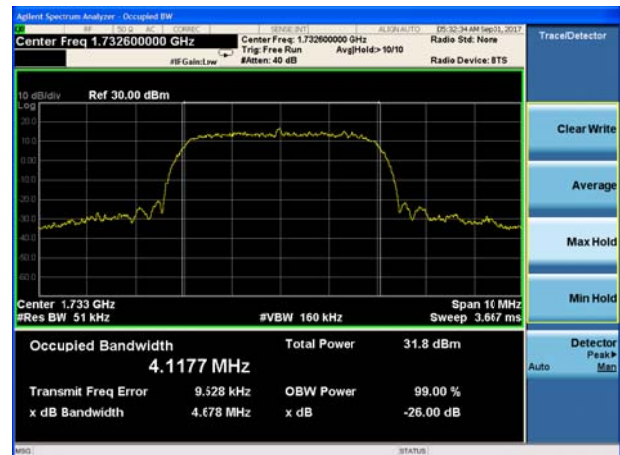
LTE Band 17						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(kHz)	-26dBc Bandwidth(kHz)
100%	QPSK	5	23755	706.5	4.5098	5.034
			23790	710.0	4.5329	5.04
			23825	713.5	4.5046	5.005
		10	23780	709.0	9.0163	10.04
			23790	710.0	9.0529	10.16
			23800	711.0	9.0451	10.09
	16QAM	5	23755	706.5	4.5272	5.033
			23790	710.0	4.511	5.016
			23825	713.5	4.535	5.058
		10	23780	709.0	9.0277	10.12
			23790	710.0	9.0405	10.05
			23800	711.0	9.0422	10.04



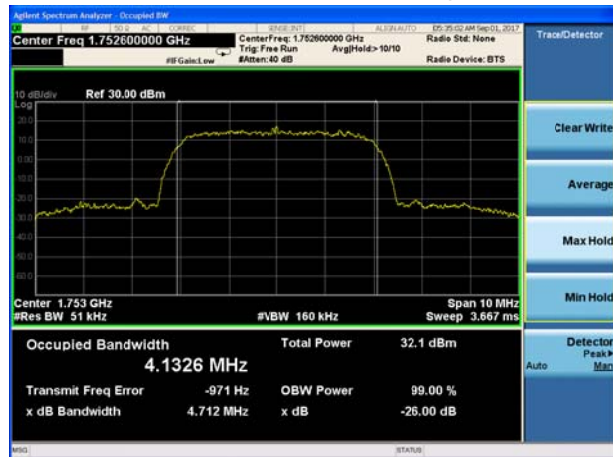
WCDMA Band IV CH-Low



WCDMA Band IV CH Middle



WCDMA Band IV CH High





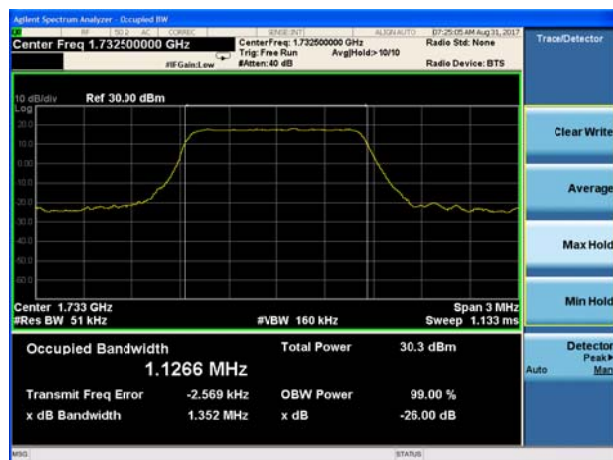
LTE Band 4 QPSK 1.4MHz CH-Low



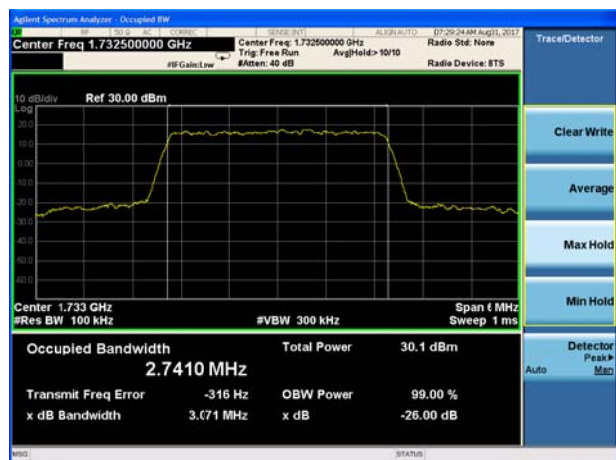
LTE Band 4 QPSK 3MHz CH-Low



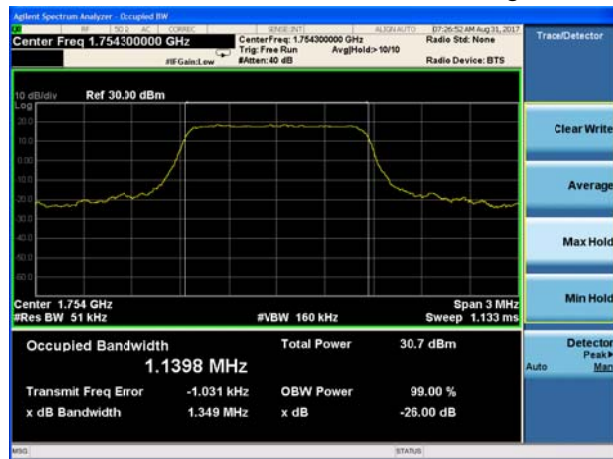
LTE Band 4 QPSK 1.4MHz CH-Middle



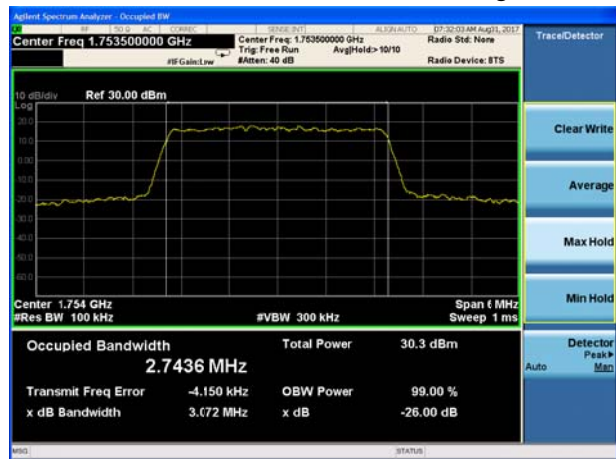
LTE Band 4 QPSK 3MHz CH-Middle



LTE Band 4 QPSK 1.4MHz CH-High

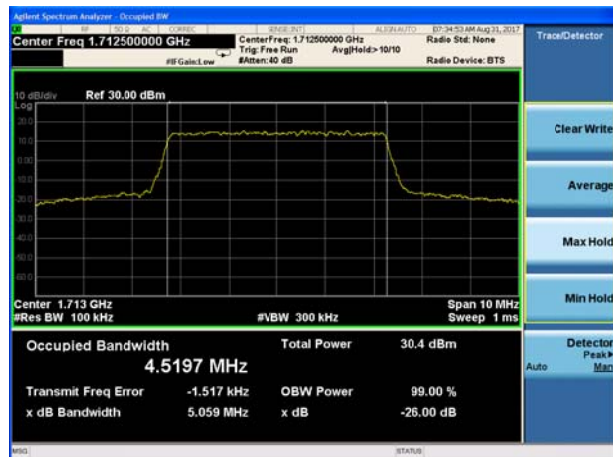


LTE Band 4 QPSK 3MHz CH-High





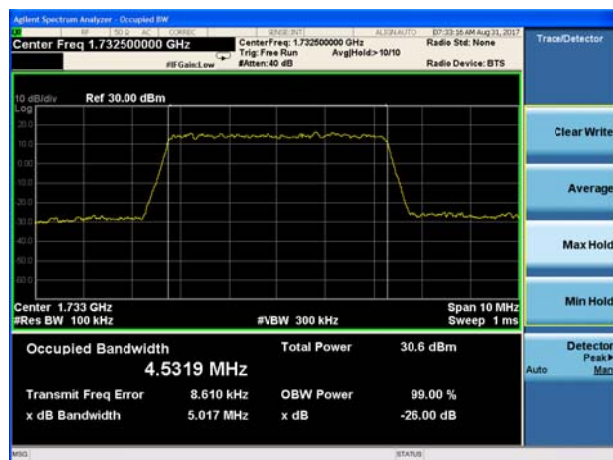
LTE Band 4 QPSK 5MHz CH-Low



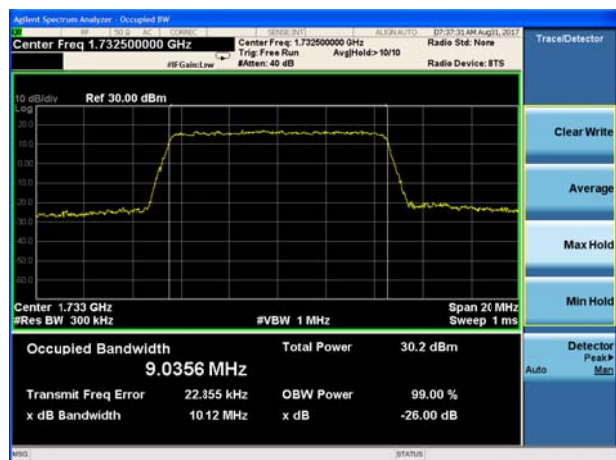
LTE Band 4 QPSK 10MHz CH-Low



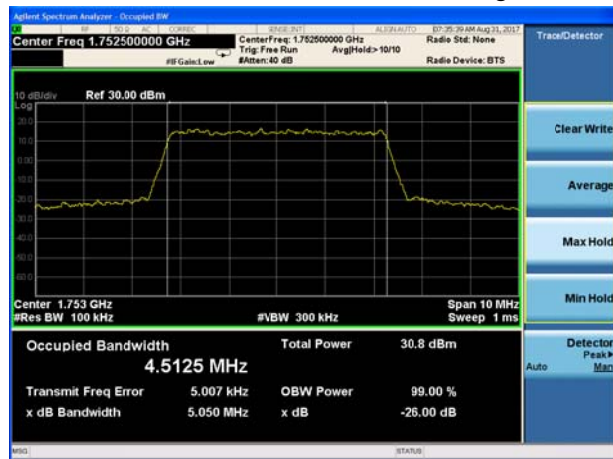
LTE Band 4 QPSK 5MHz CH-Middle



LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 QPSK 5MHz CH-High

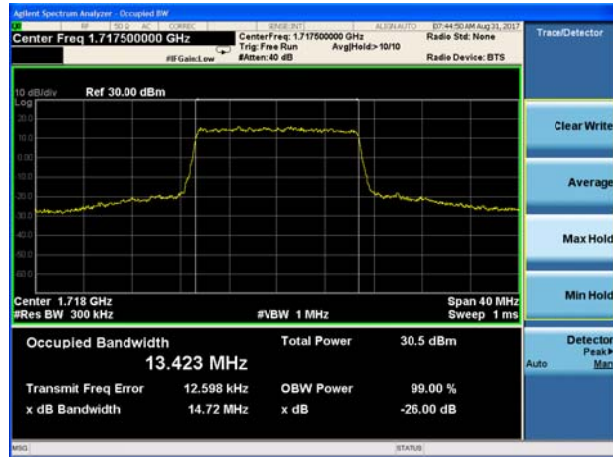


LTE Band 4 QPSK 10MHz CH-High

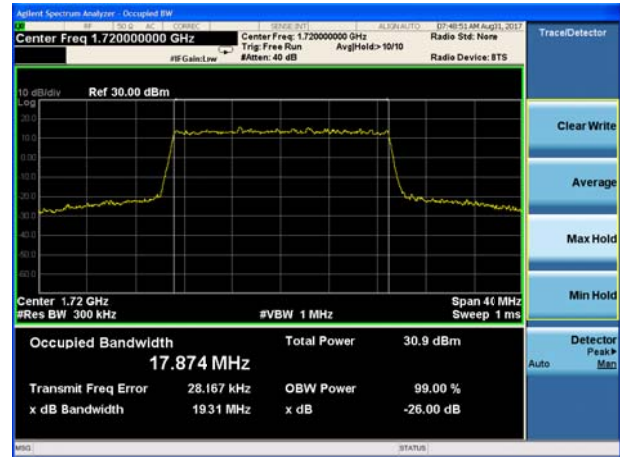




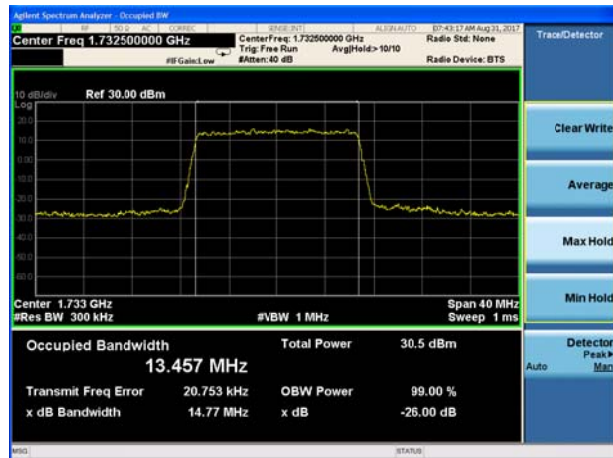
LTE Band 4 QPSK 15MHz CH-Low



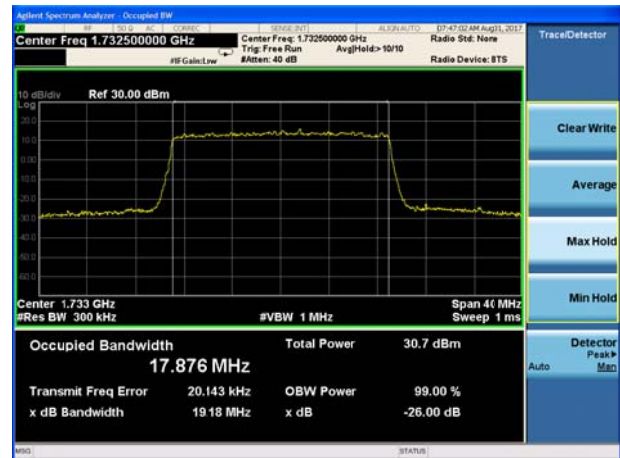
LTE Band 4 QPSK 20MHz CH-Low



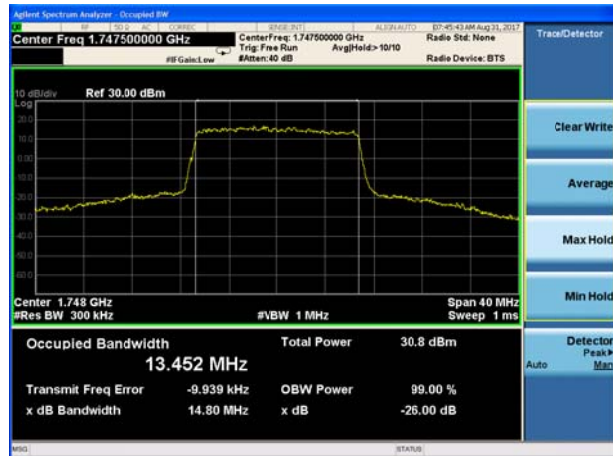
LTE Band 4 QPSK 15MHz CH-Middle



LTE Band 4 QPSK 20MHz CH-Middle



LTE Band 4 QPSK 15MHz CH-High

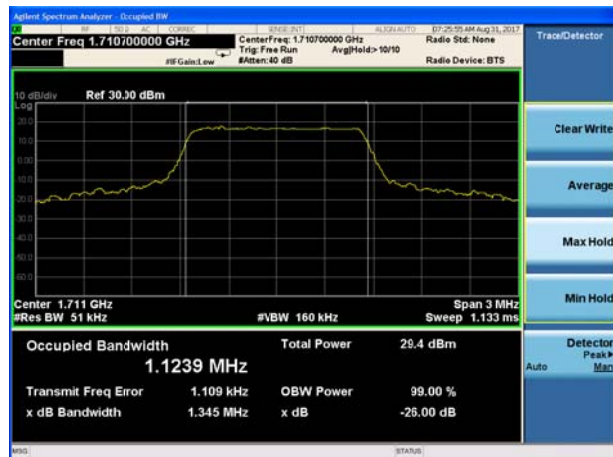


LTE Band 4 QPSK 20MHz CH-High

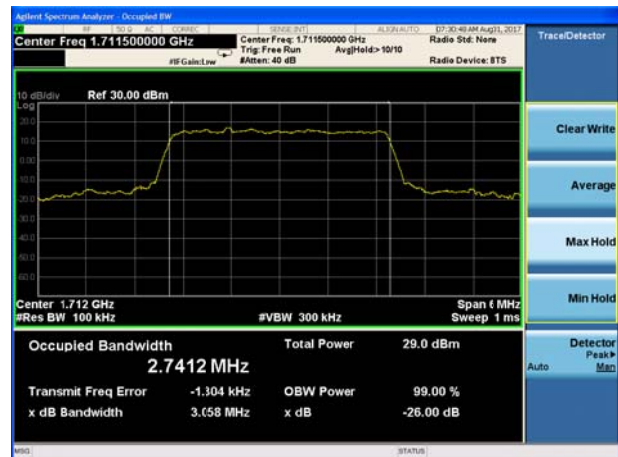




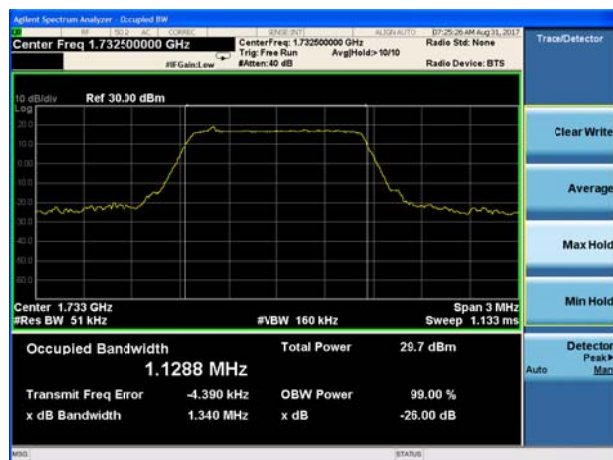
LTE Band 4 16QAM 1.4MHz CH-Low



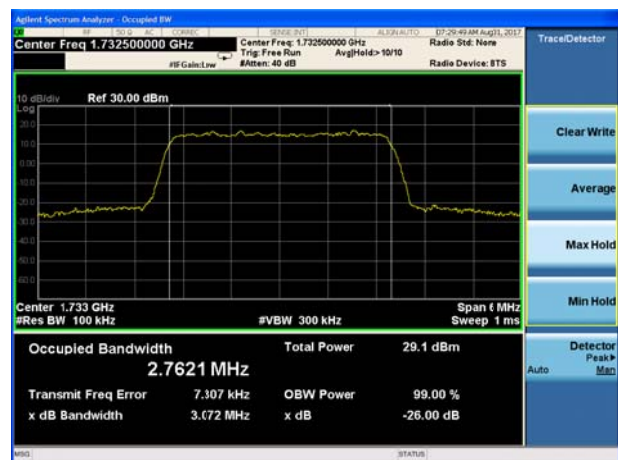
LTE Band 4 16QAM 3MHz CH-Low



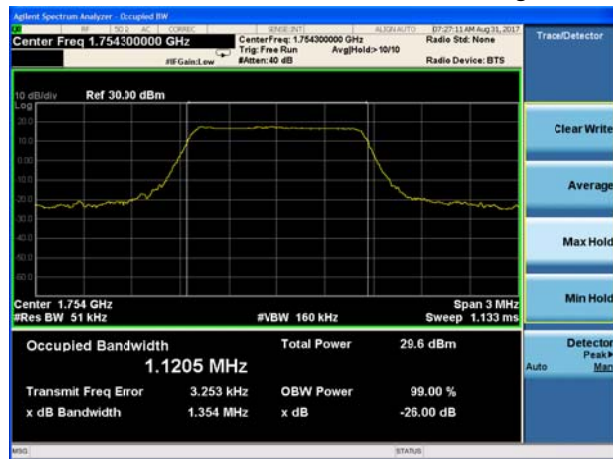
LTE Band 4 16QAM 1.4MHz CH-Middle



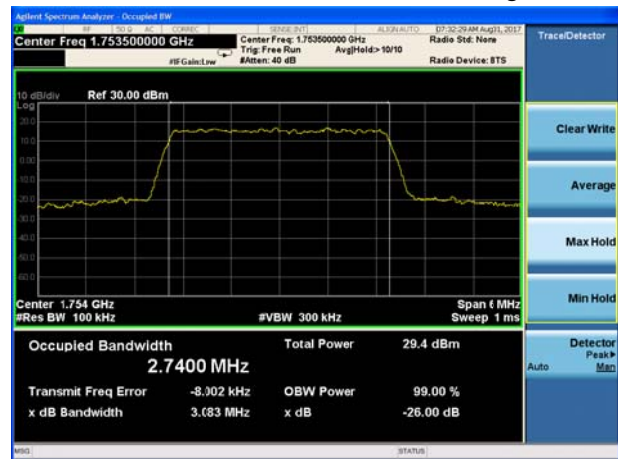
LTE Band 4 16QAM 3MHz CH-Middle



LTE Band 4 16QAM 1.4MHz CH-High

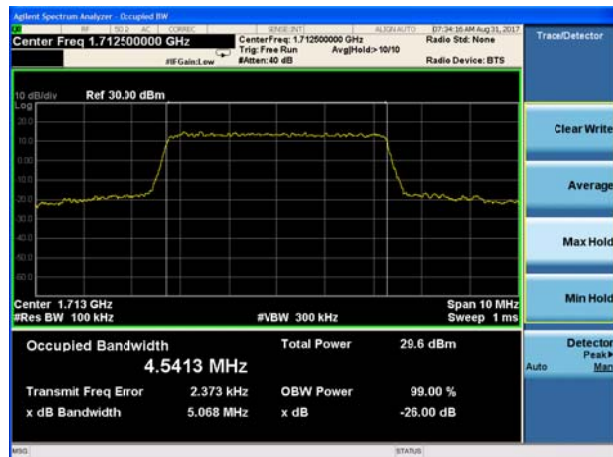


LTE Band 4 16QAM 3MHz CH-High





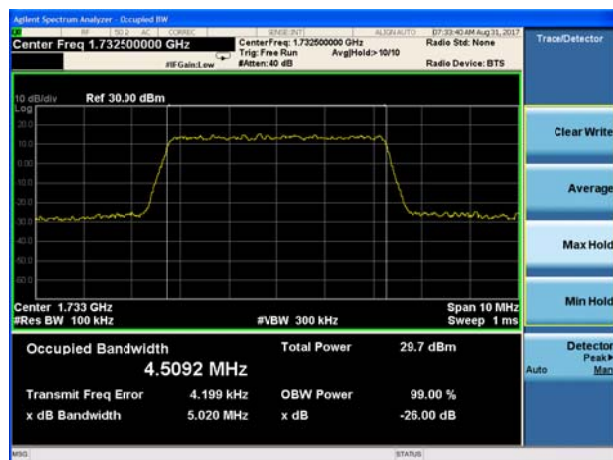
LTE Band 4 16QAM 5MHz CH-Low



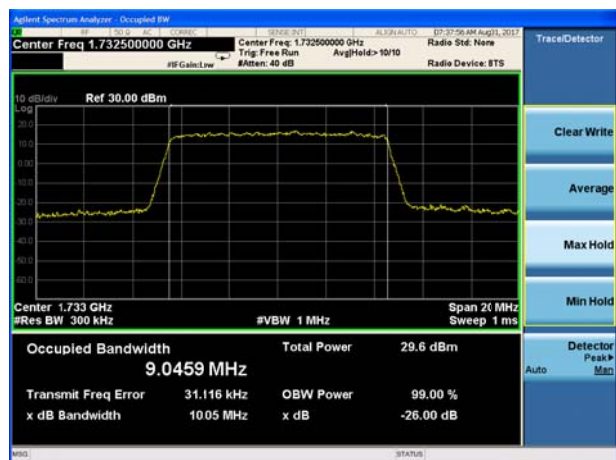
LTE Band 4 16QAM 10MHz CH-Low



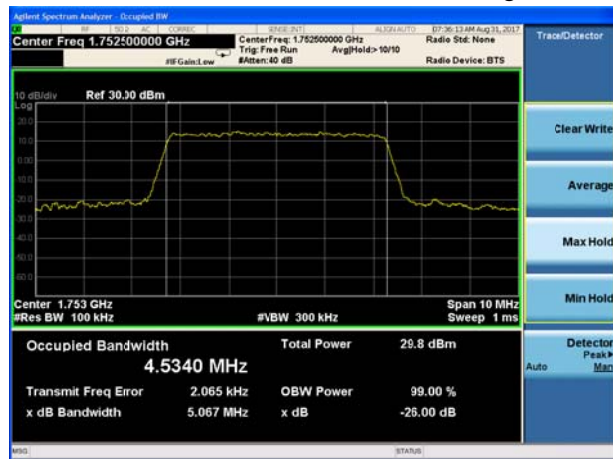
LTE Band 4 16QAM 5MHz CH-Middle



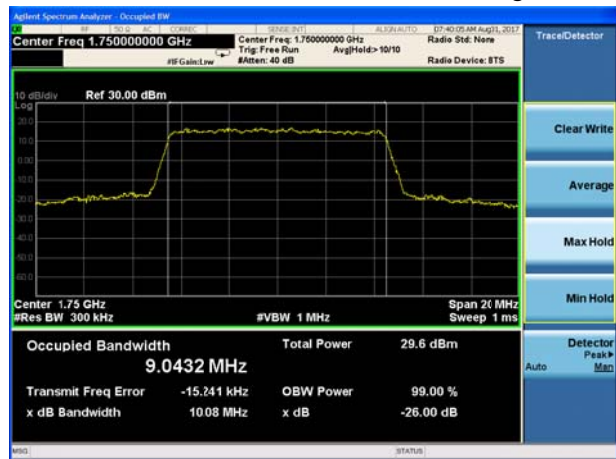
LTE Band 4 16QAM 10MHz CH-Middle



LTE Band 4 16QAM 5MHz CH-High

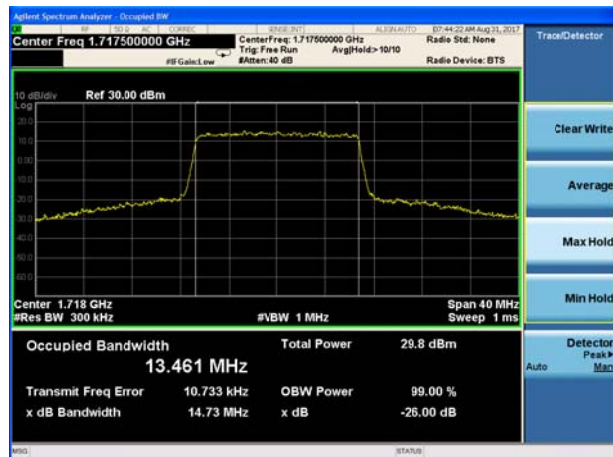


LTE Band 4 16QAM 10MHz CH-High

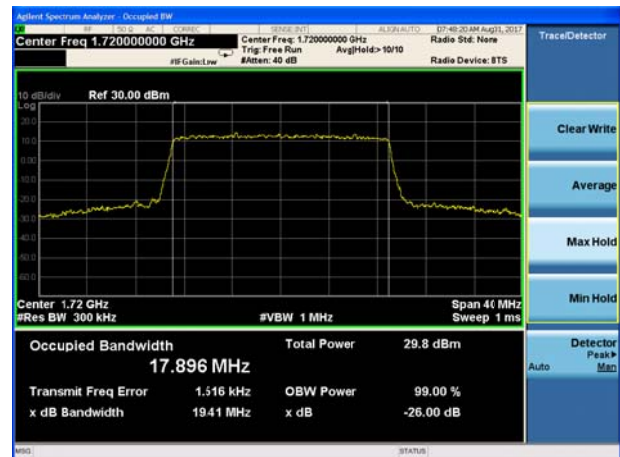




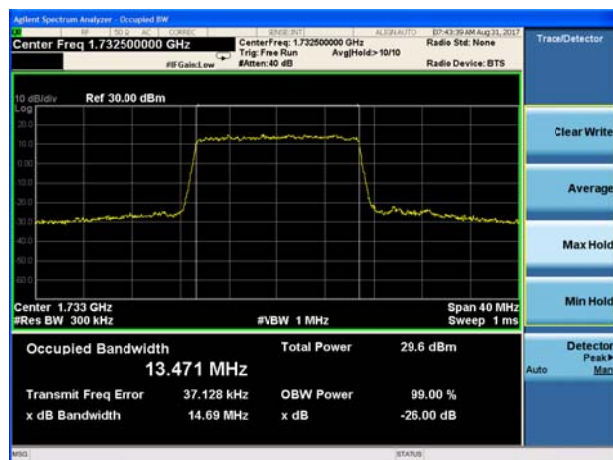
LTE Band 4 QAM 15MHz CH-Low



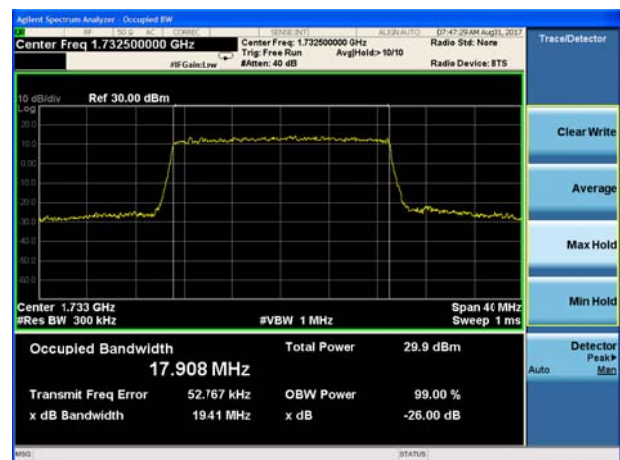
LTE Band 4 QAM 20MHz CH-Low



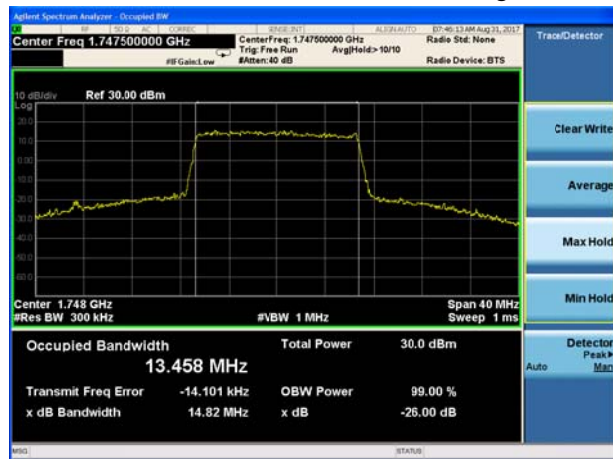
LTE Band 4 QAM 15MHz CH-Middle



LTE Band 4 QAM 20MHz CH-Middle



LTE Band 4 QAM 15MHz CH-High

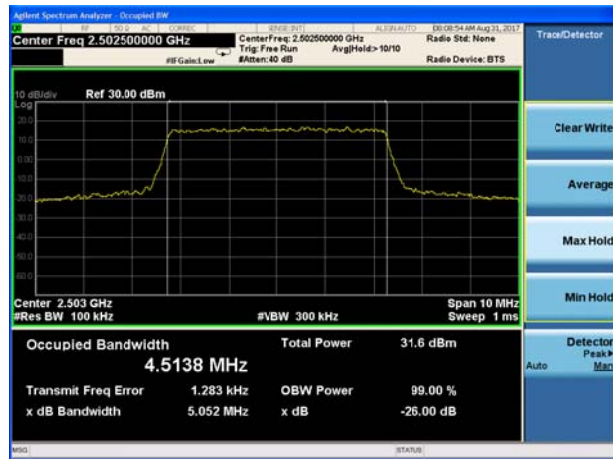


LTE Band 4 QAM 20MHz CH-High





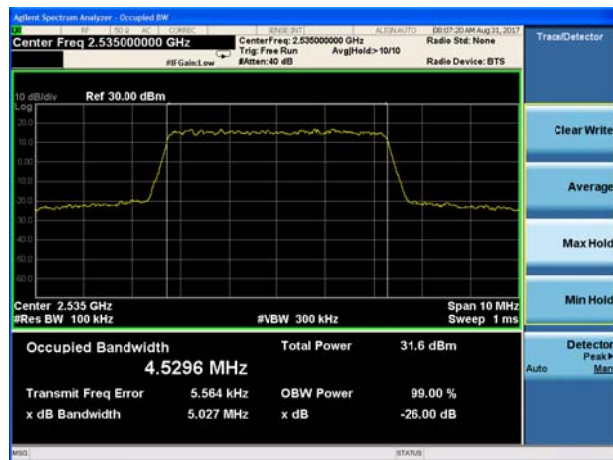
LTE Band 7 QPSK 5MHz CH-Low



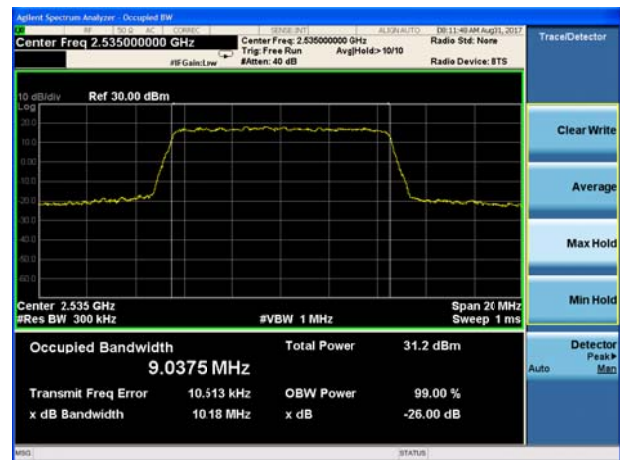
LTE Band 7 QPSK 10MHz CH-Low



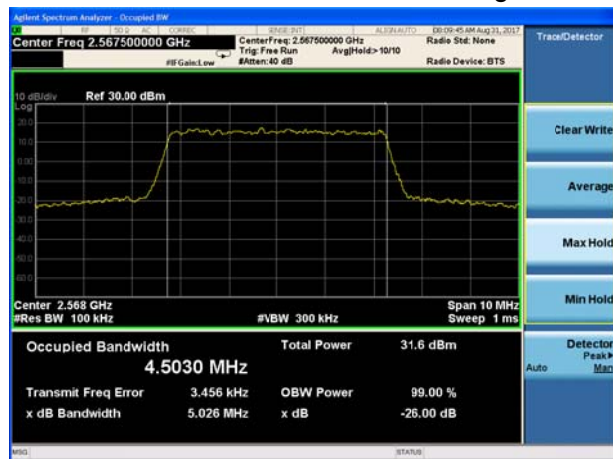
LTE Band 7 QPSK 5MHz CH-Middle



LTE Band 7 QPSK 10MHz CH-Middle



LTE Band 7 QPSK 5MHz CH-High

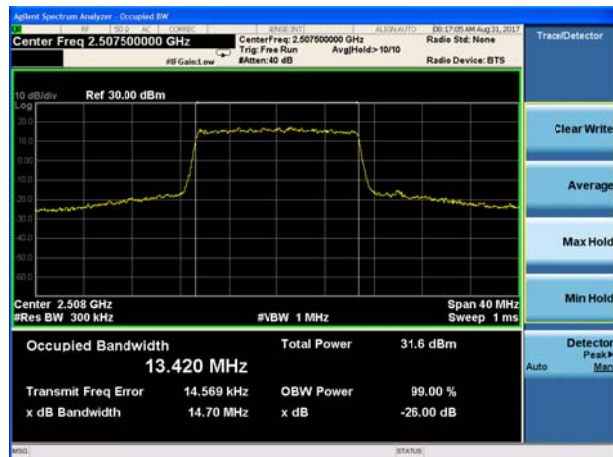


LTE Band 7 QPSK 10MHz CH-High

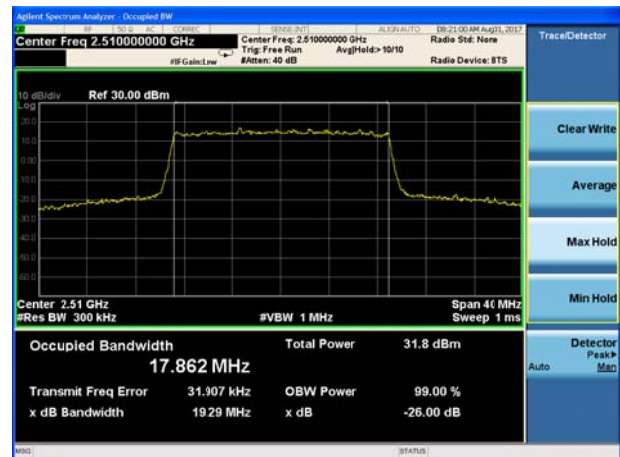




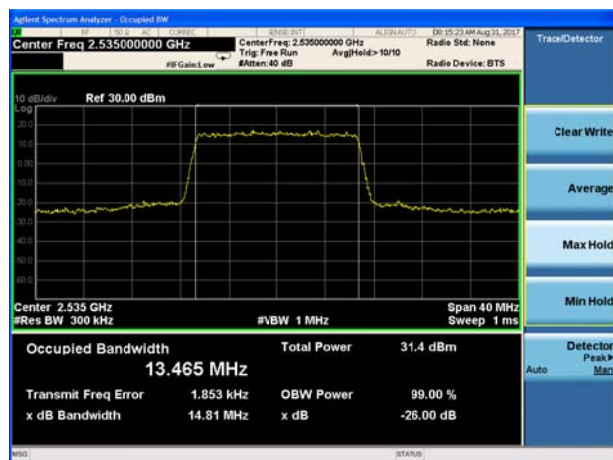
LTE Band 7 QPSK 15MHz CH-Low



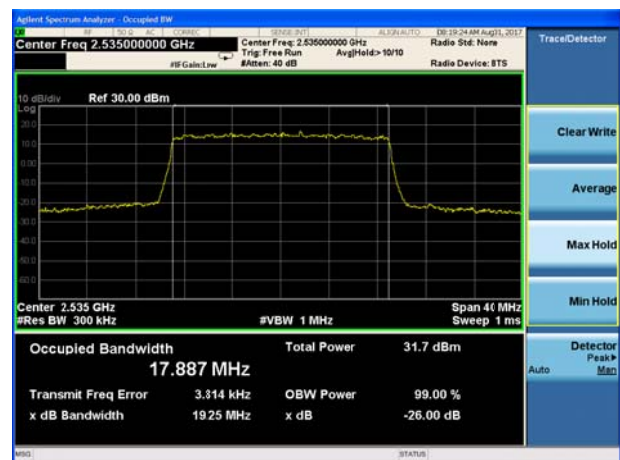
LTE Band 7 QPSK 20MHz CH-Low



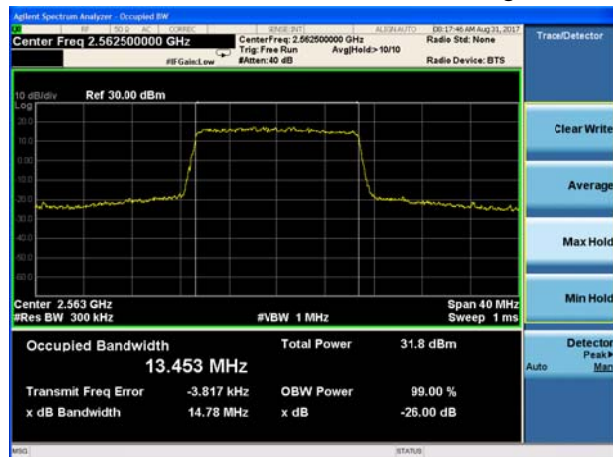
LTE Band 7 QPSK 15MHz CH-Middle



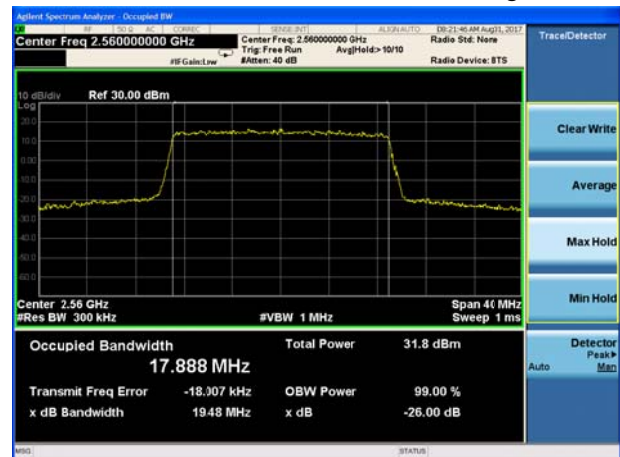
LTE Band 7 QPSK 20MHz CH-Middle



LTE Band 7 QPSK 15MHz CH-High



LTE Band 7 QPSK 20MHz CH-High

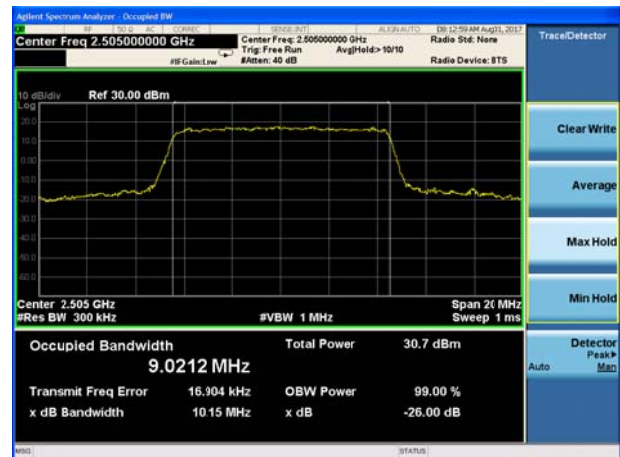




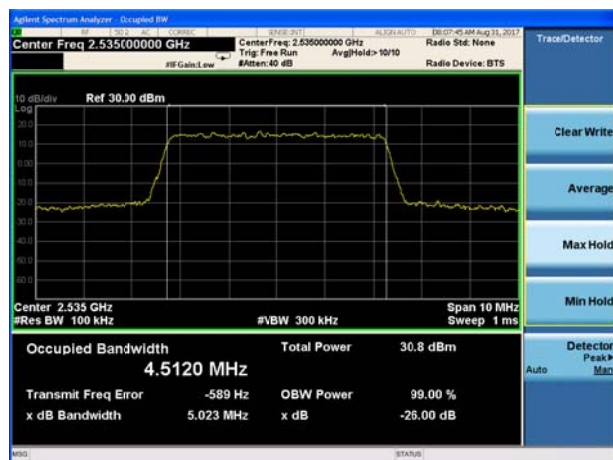
LTE Band 7 16QAM 5MHz CH-Low



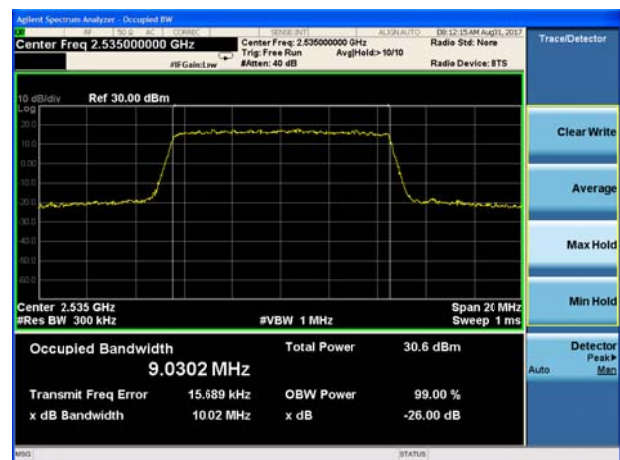
LTE Band 7 16QAM 10MHz CH-Low



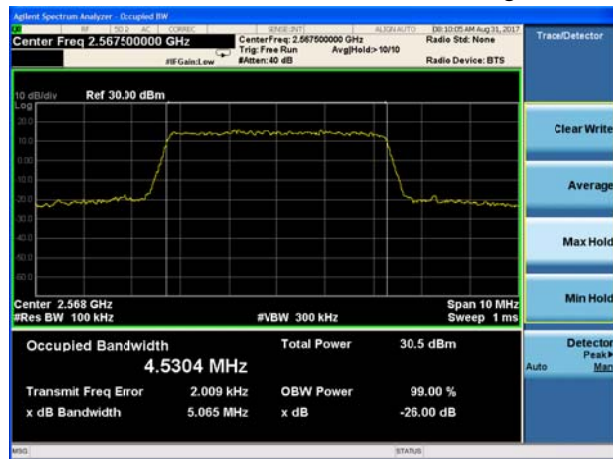
LTE Band 7 16QAM 5MHz CH-Middle



LTE Band 7 16QAM 10MHz CH-Middle



LTE Band 7 16QAM 5MHz CH-High

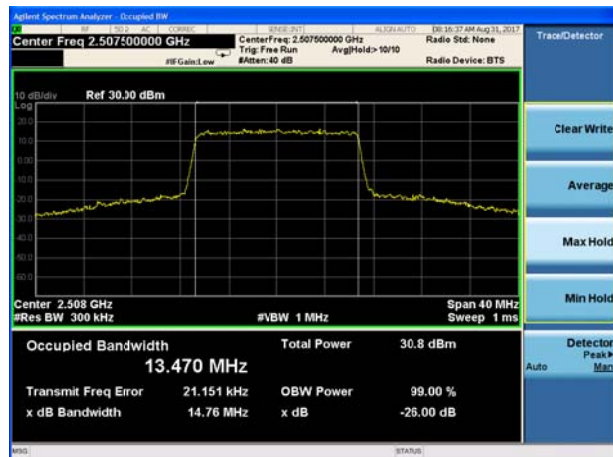


LTE Band 7 16QAM 10MHz CH-High

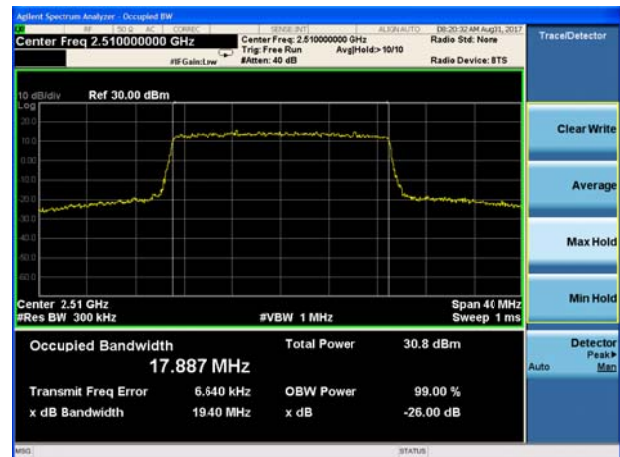




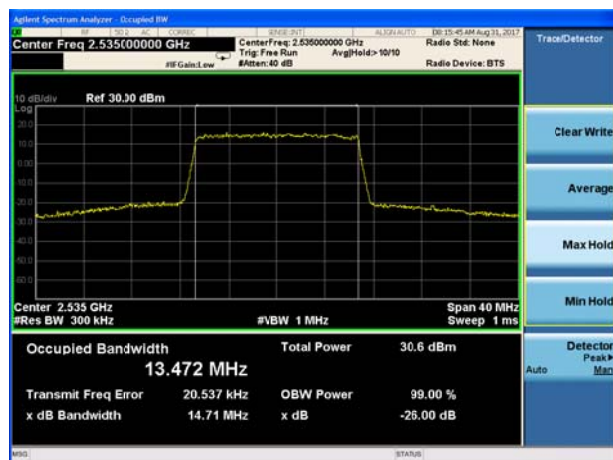
LTE Band 7 16QAM 15MHz CH-Low



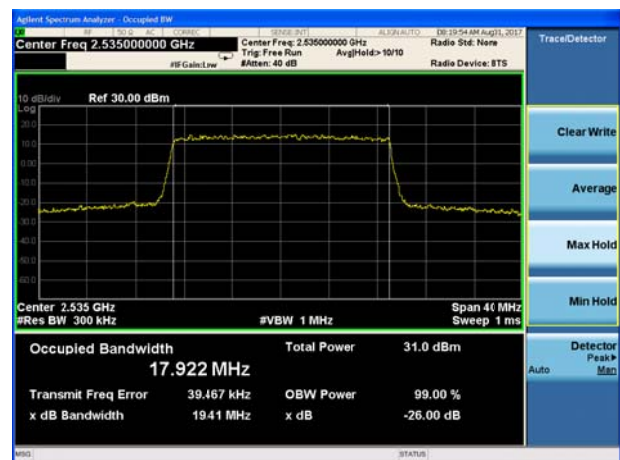
LTE Band 7 16QAM 20MHz CH-Low



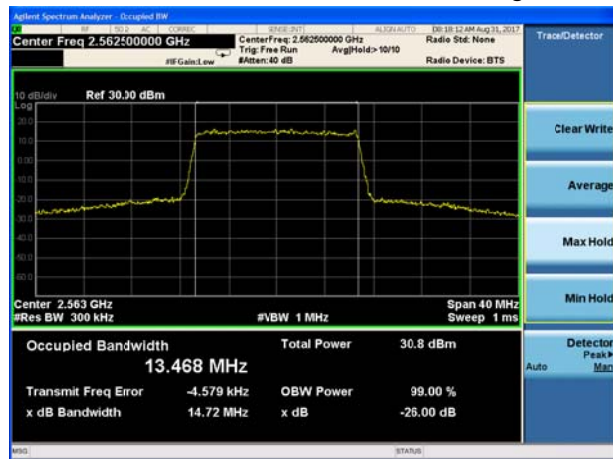
LTE Band 7 16QAM 15MHz CH-Middle



LTE Band 7 16QAM 20MHz CH-Middle



LTE Band 7 16QAM 15MHz CH-High



LTE Band 7 16QAM 20MHz CH-High

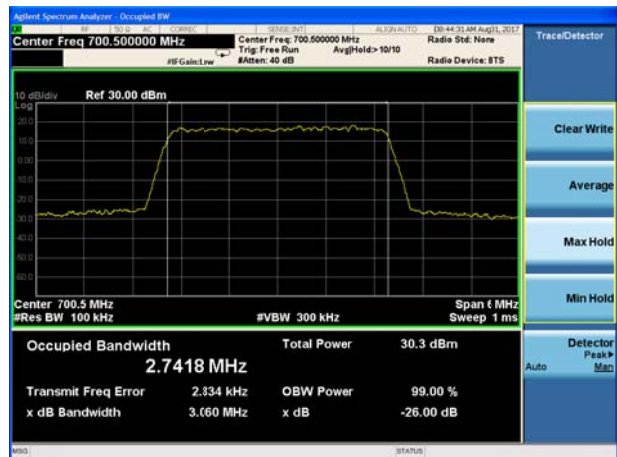




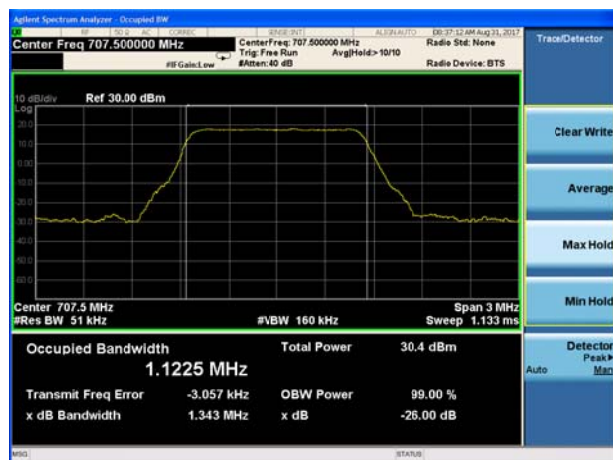
LTE Band 12 QPSK 1.4MHz CH-Low



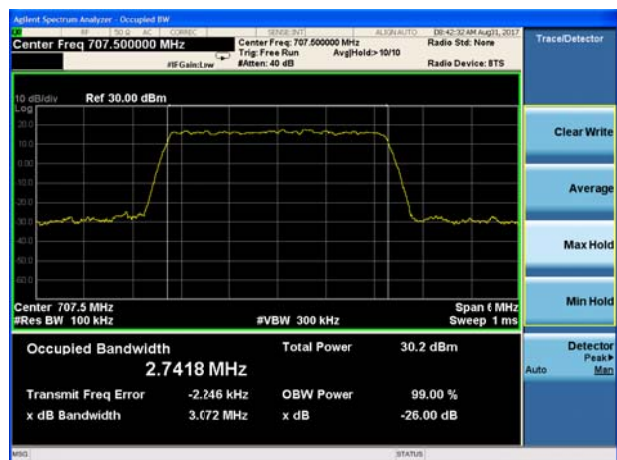
LTE Band 12 QPSK 3MHz CH-Low



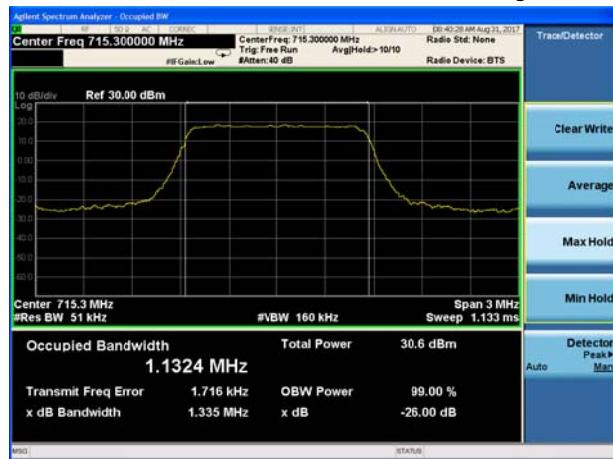
LTE Band 12 QPSK 1.4MHz CH-Middle



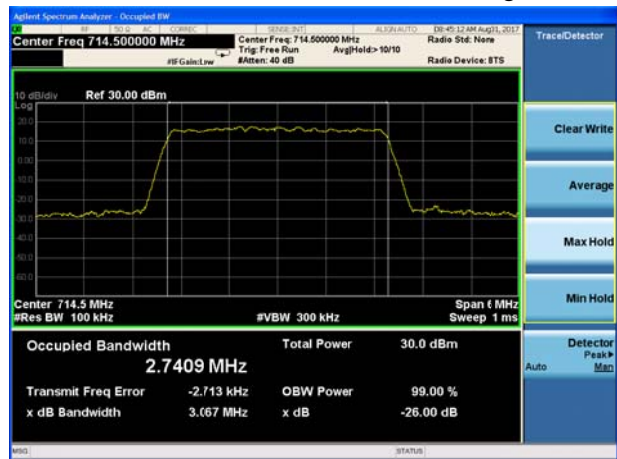
LTE Band 12 QPSK 3MHz CH-Middle



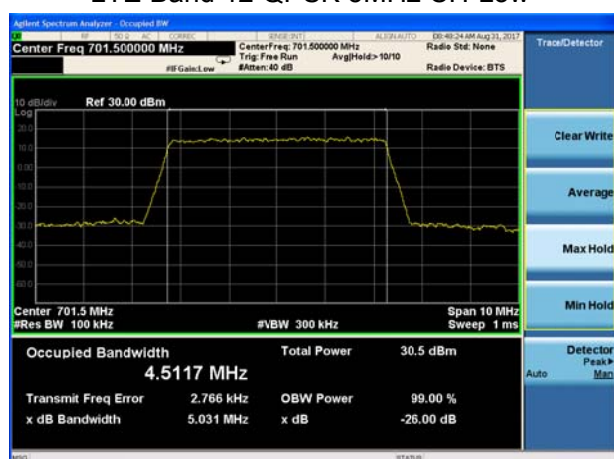
LTE Band 12 QPSK 1.4MHz CH-High



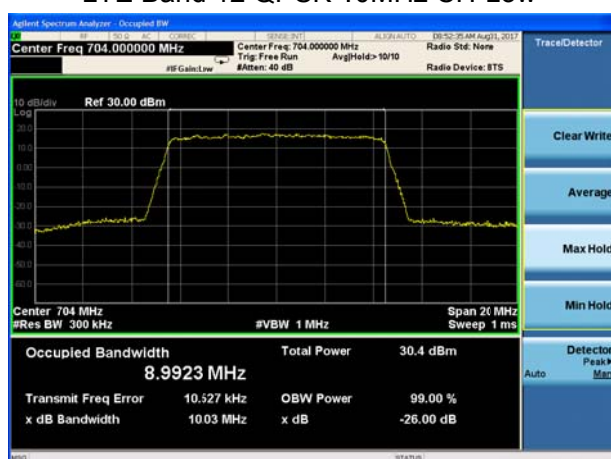
LTE Band 12 QPSK 3MHz CH-High



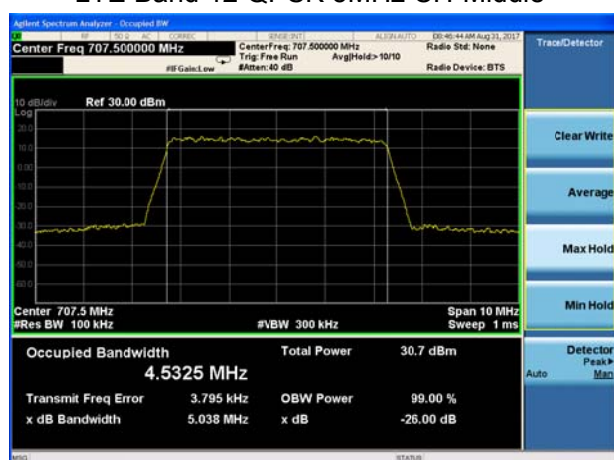
LTE Band 12 QPSK 5MHz CH-Low



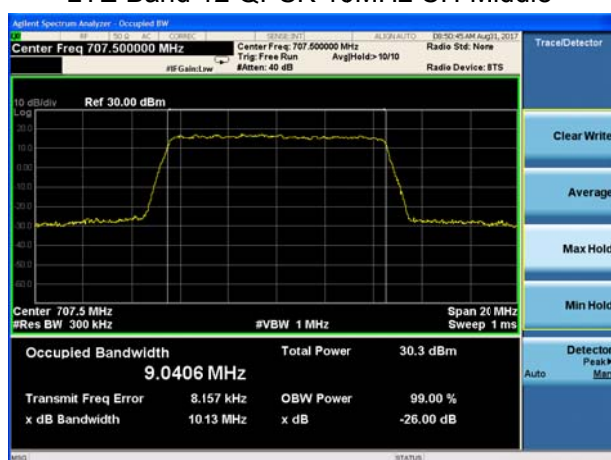
LTE Band 12 QPSK 10MHz CH-Low



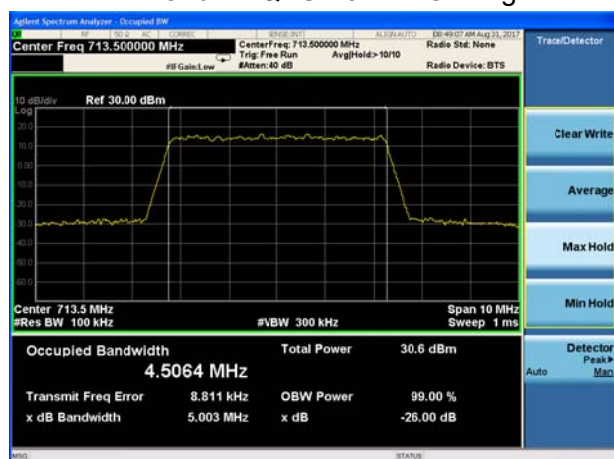
LTE Band 12 QPSK 5MHz CH-Middle



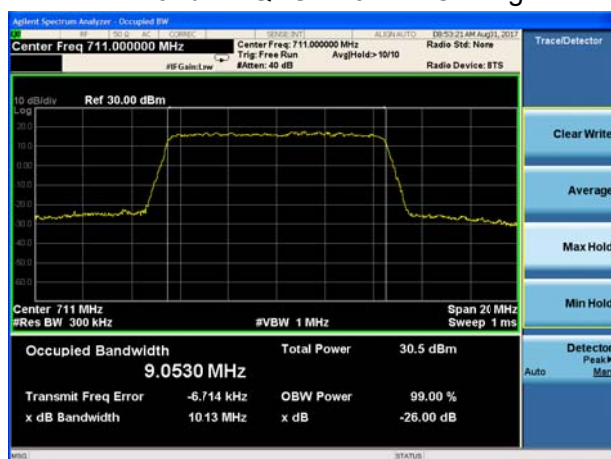
LTE Band 12 QPSK 10MHz CH-Middle



LTE Band 12 QPSK 5MHz CH-High



LTE Band 12 QPSK 10MHz CH-High

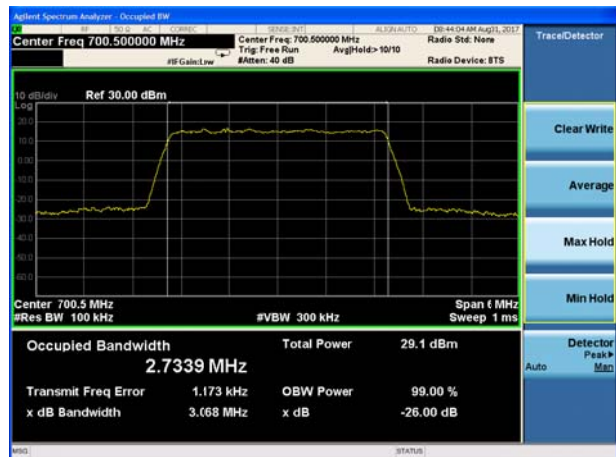




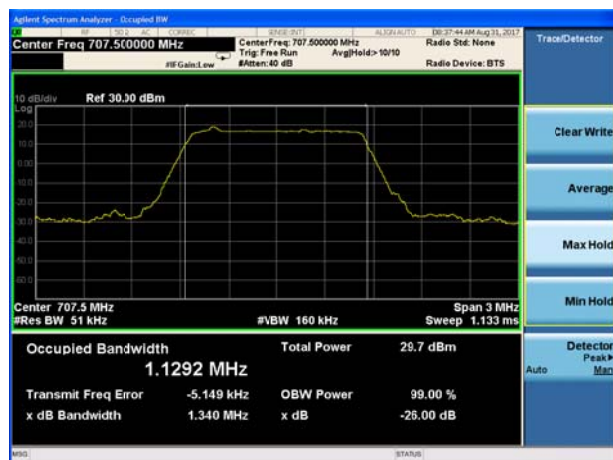
LTE Band 12 16QAM 1.4MHz CH-Low



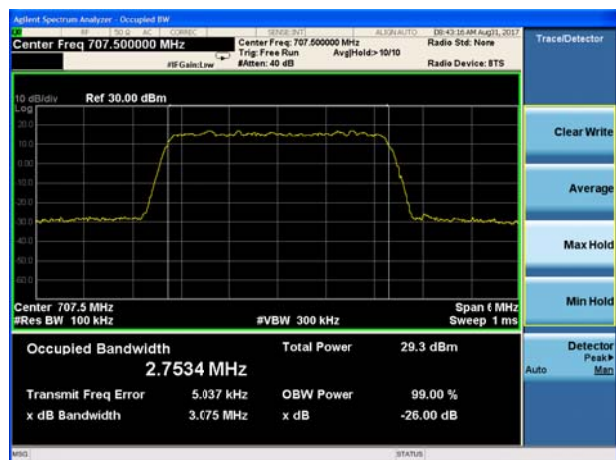
LTE Band 12 16QAM 3MHz CH-Low



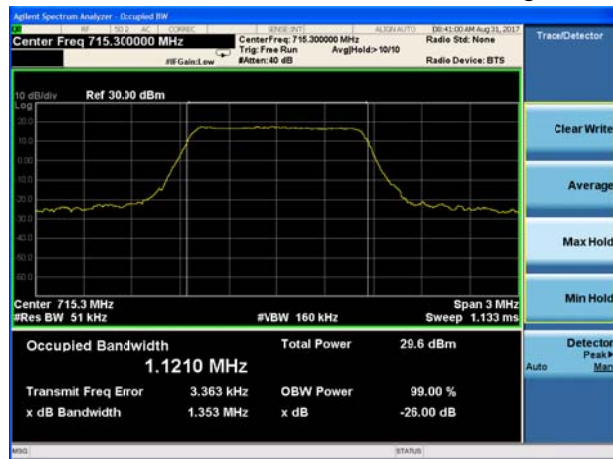
LTE Band 12 16QAM 1.4MHz CH-Middle



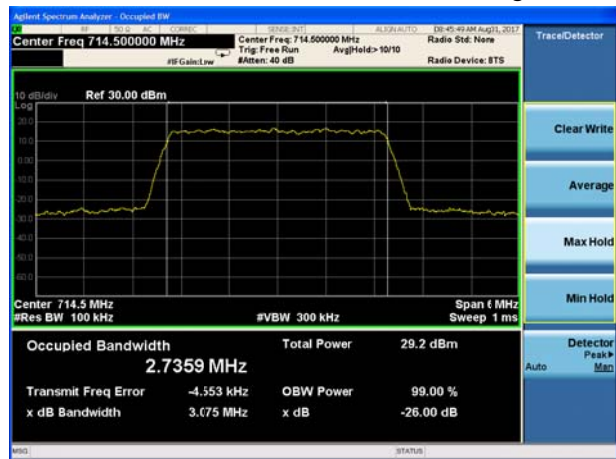
LTE Band 12 16QAM 3MHz CH-Middle



LTE Band 12 16QAM 1.4MHz CH-High

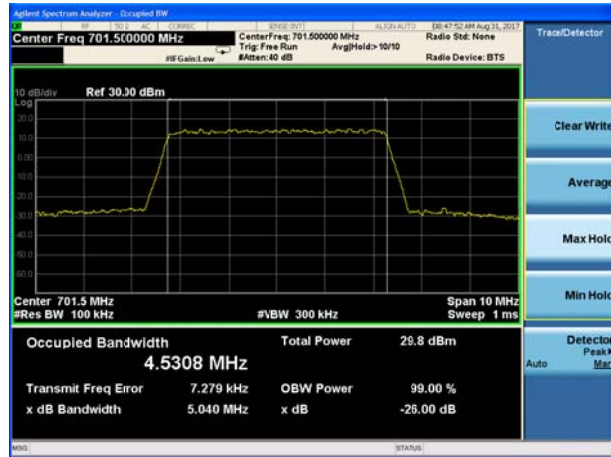


LTE Band 12 16QAM 3MHz CH-High

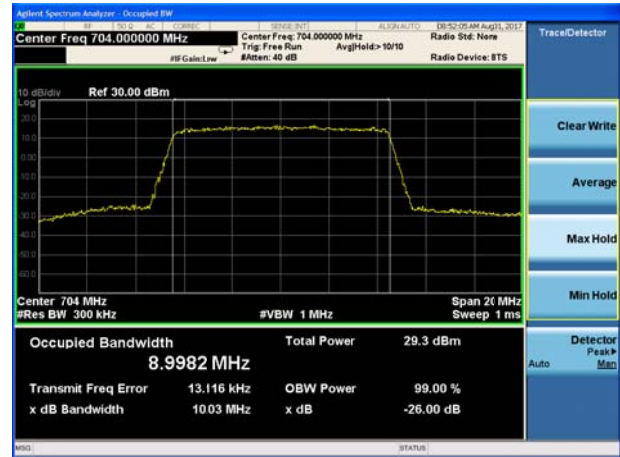




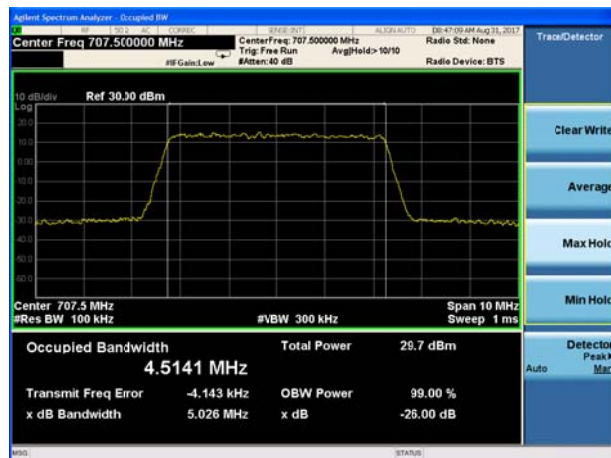
LTE Band 12 16QAM 5MHz CH-Low



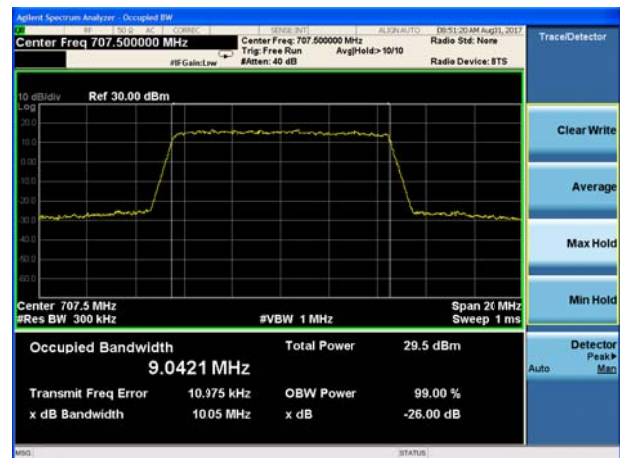
LTE Band 12 16QAM 10MHz CH-Low



LTE Band 12 16QAM 5MHz CH-Middle



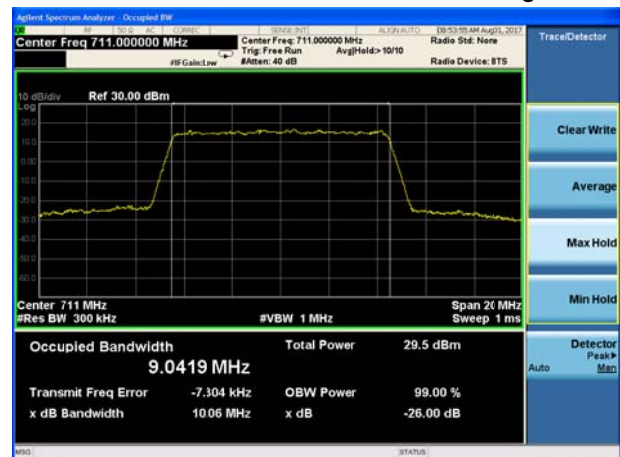
LTE Band 12 16QAM 10MHz CH-Middle



LTE Band 12 16QAM 5MHz CH-High

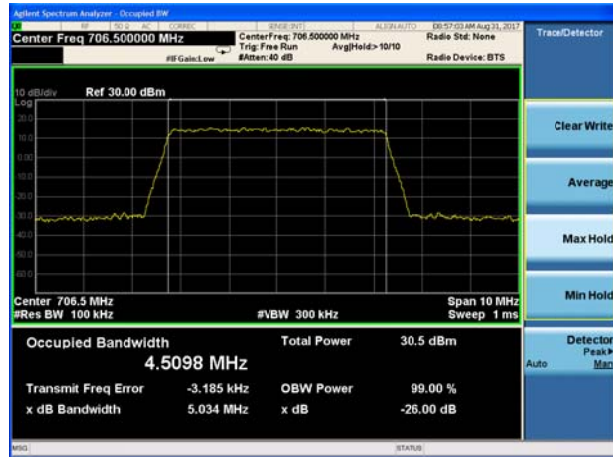


LTE Band 12 16QAM 10MHz CH-High





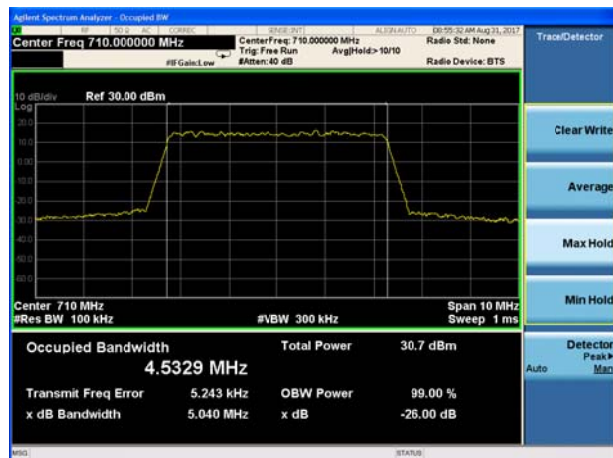
LTE Band 17 QPSK 5MHz CH-Low



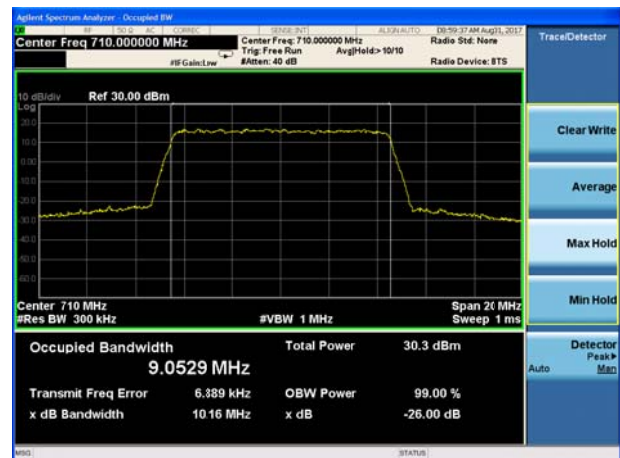
LTE Band 17 QPSK 10MHz CH-Low



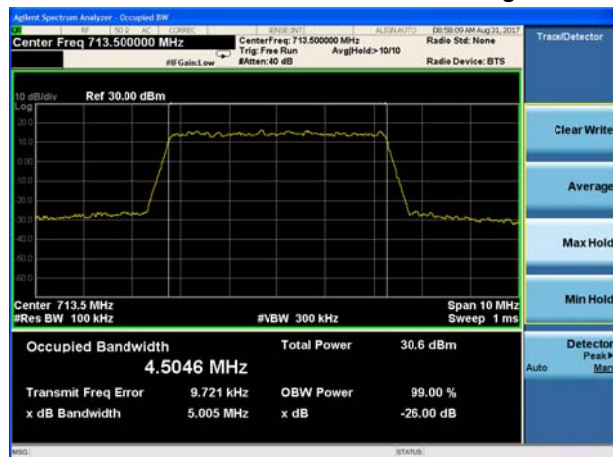
LTE Band 17 QPSK 5MHz CH-Middle



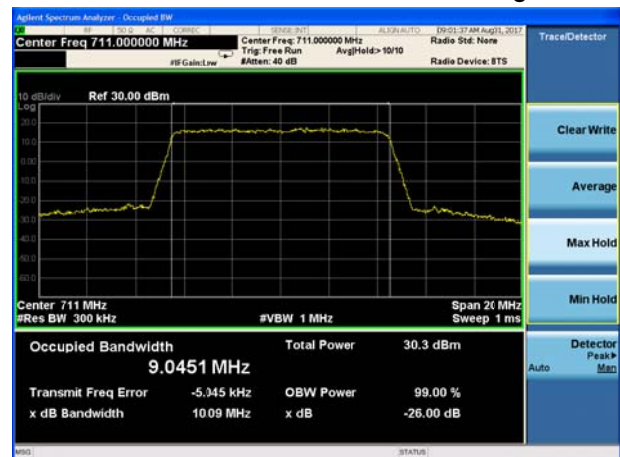
LTE Band 17 QPSK 10MHz CH-Middle



LTE Band 17 QPSK 5MHz CH-High

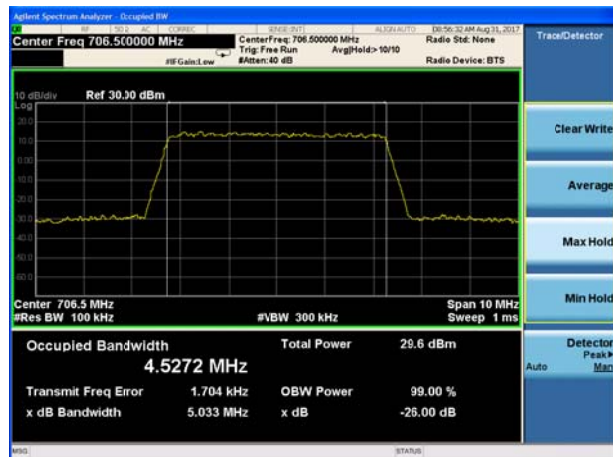


LTE Band 17 QPSK 10MHz CH-High





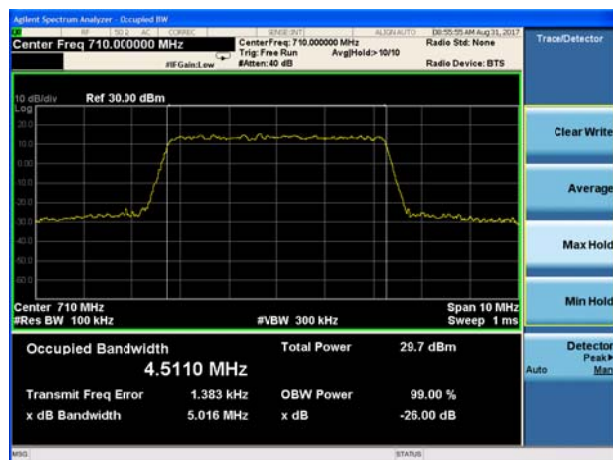
LTE Band 17 16QAM 5MHz CH-Low



LTE Band 17 16QAM 10MHz CH-Low



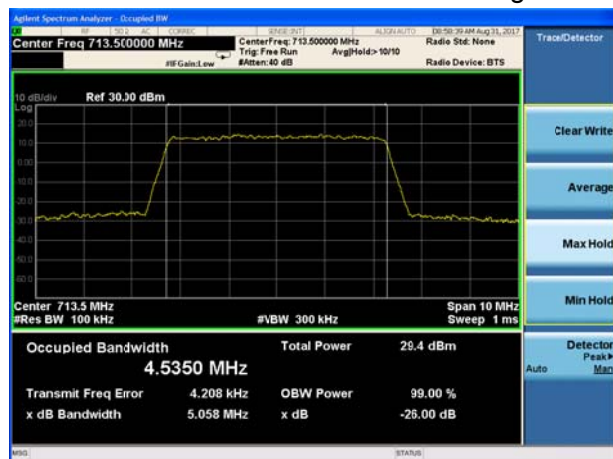
LTE Band 17 16QAM 5MHz CH-Middle



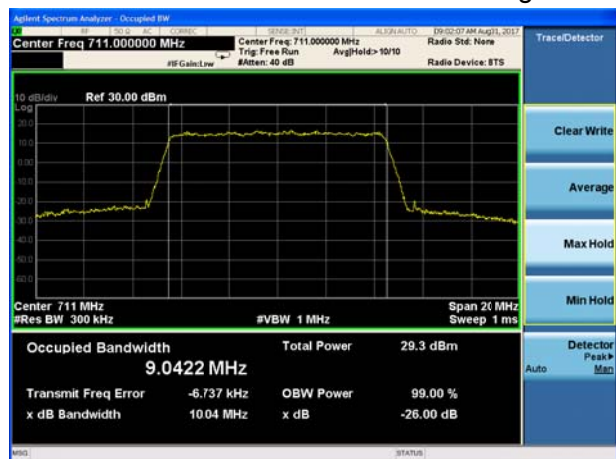
LTE Band 17 16QAM 10MHz CH-Middle



LTE Band 17 16QAM 5MHz CH-High



LTE Band 17 16QAM 10MHz CH-High



5.4 Band Edge Compliance

Ambient condition

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

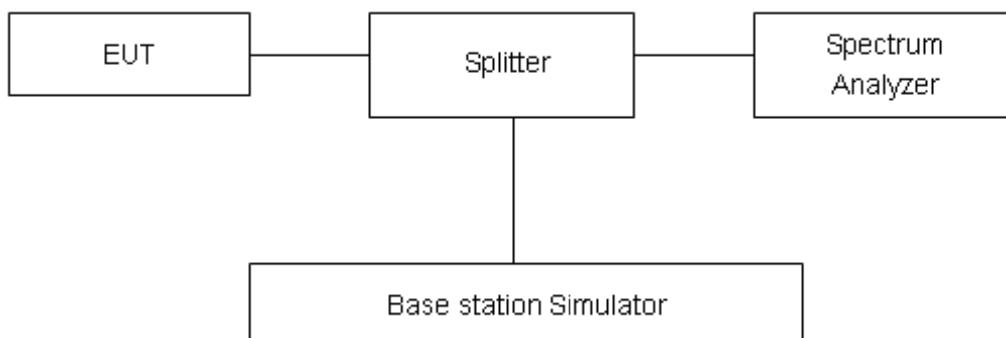
Method of Measurement

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 v02r02 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. For LTE Band 41 Set RBW $\geq$ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
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 300kHz for LTE Band 4/12 (3MHz).
RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/7/12/17 (5MHz).
RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/12/17 (10MHz).
RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7 (15MHz/20MHz).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) specifies that “ For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log_{10} (P)$ dB.”

Part 27.53(m) (4)/ specifies that “for BRS and EBS stations. For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section. In addition, the attenuation factor shall not be less that $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Example:

The limit line is derived from $43 + 10 \log (P)$ dB below the transmitter power P(Watts)

= P(W)- $[43 + 10 \log (P)]$ (dB)

= $[30 + 10 \log (P)]$ (dBm) - $[43 + 10 \log (P)]$ (dB) = -13dBm.

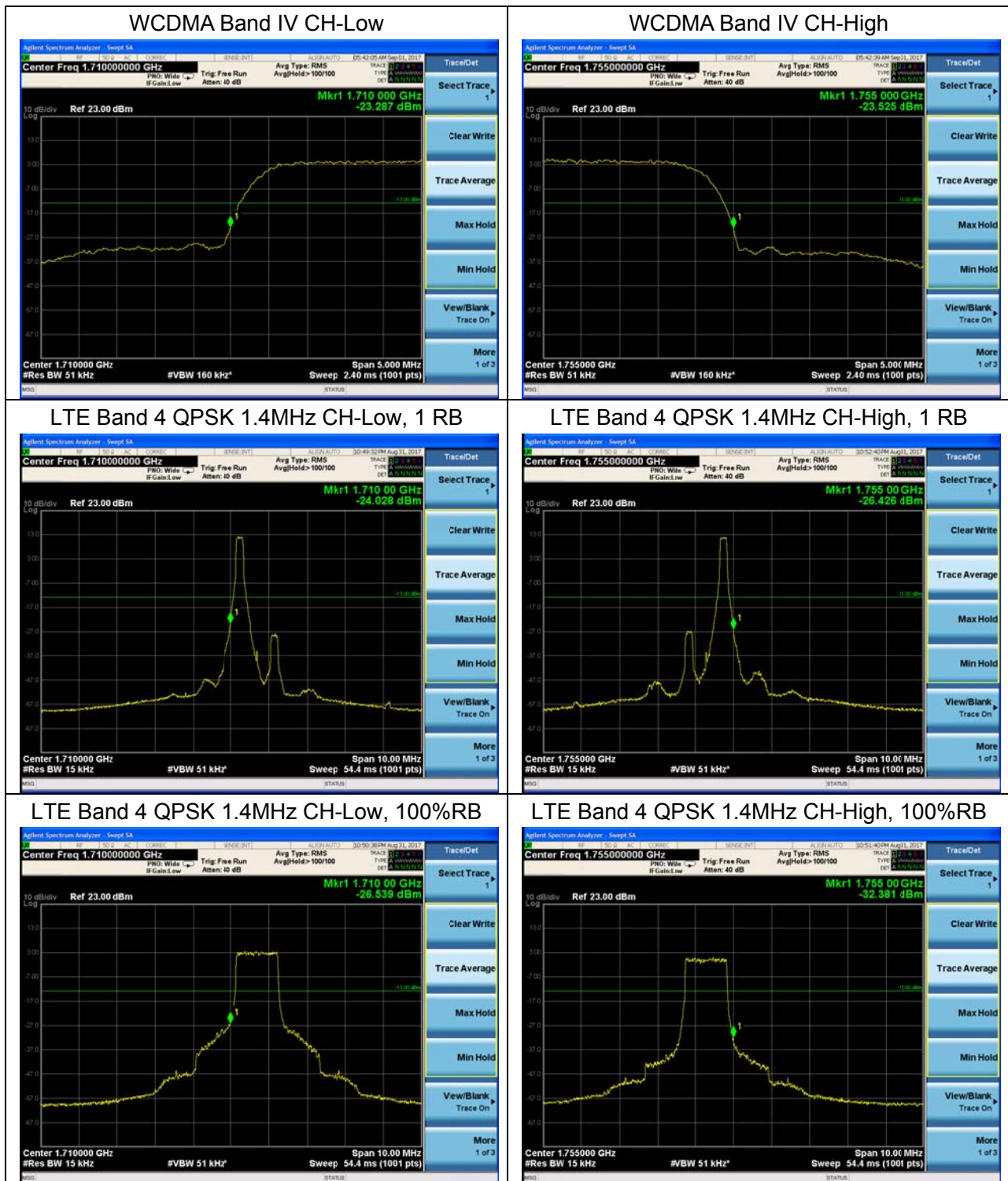
Measurement Uncertainty

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.

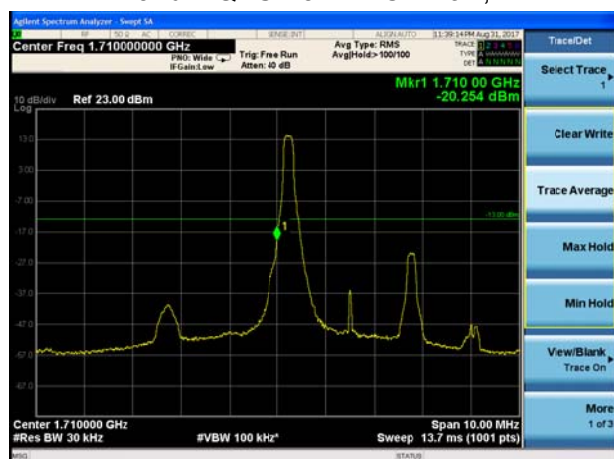


Test Result

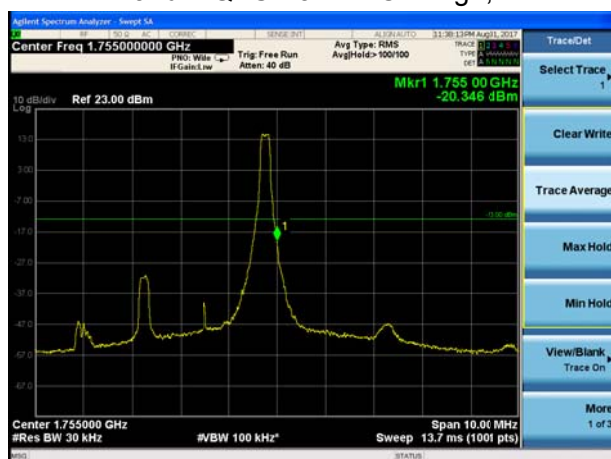
All the test traces in the plots shows the test results clearly.



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



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



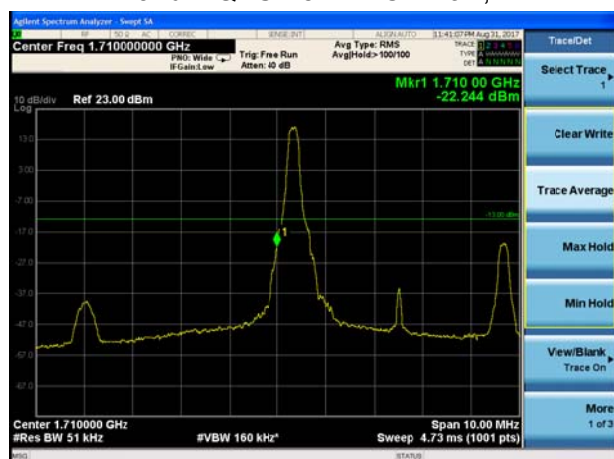
LTE Band 4 QPSK 3MHz CH-Low, 100%RB



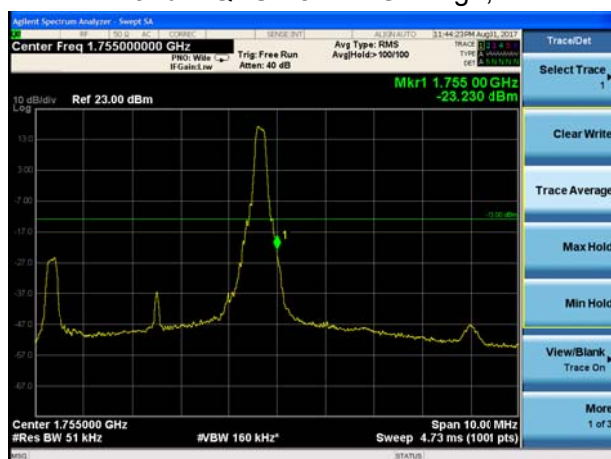
LTE Band 4 QPSK 3MHz CH-High, 100%RB



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

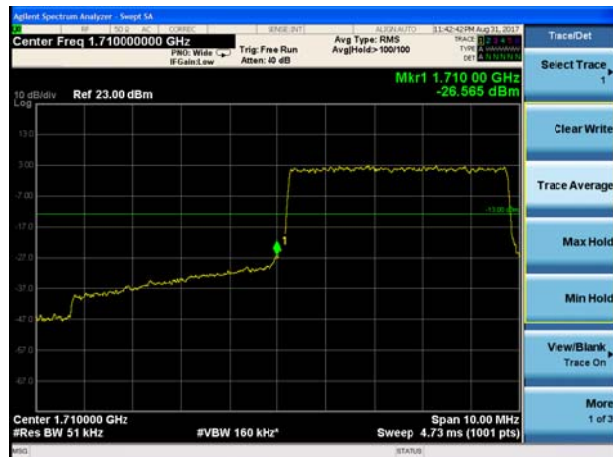


LTE Band 4 QPSK 5MHz CH-High, 1 RB





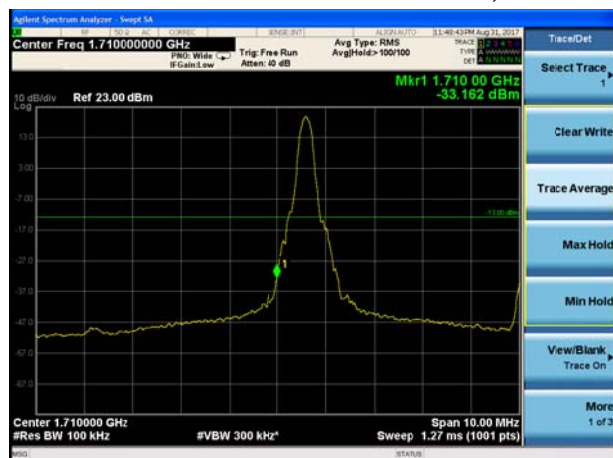
LTE Band 4 QPSK 5MHz CH-Low, 100%RB



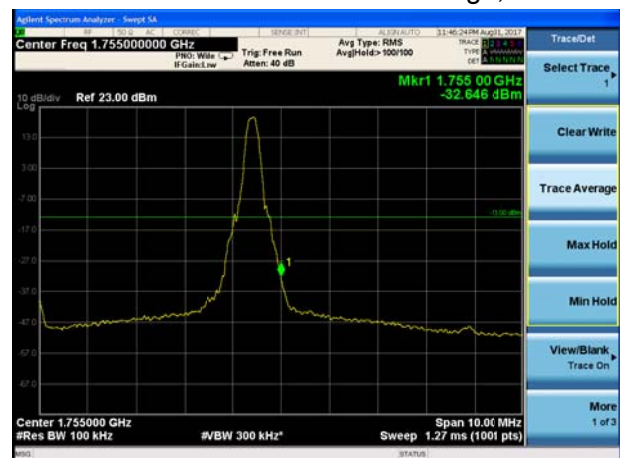
LTE Band 4 QPSK 5MHz CH-High, 100%RB



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

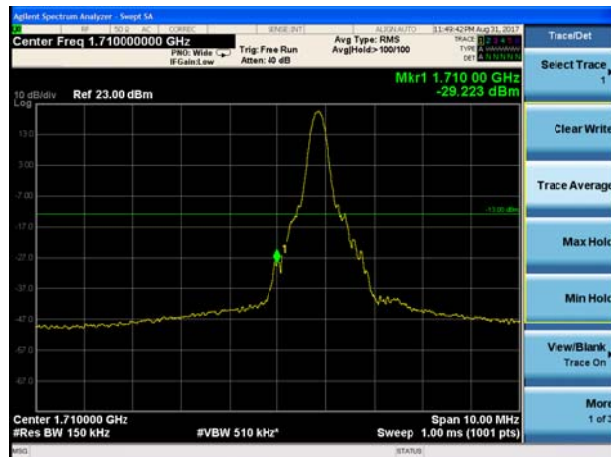


LTE Band 4 QPSK 10MHz CH-High, 100%RB

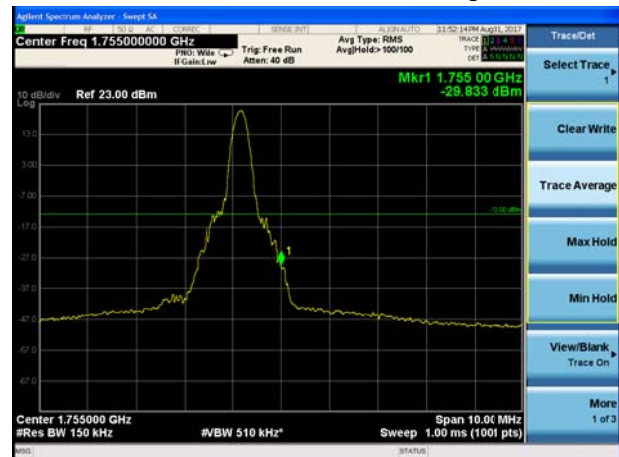




LTE Band 4 QPSK 15MHz CH-Low, 1 RB



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



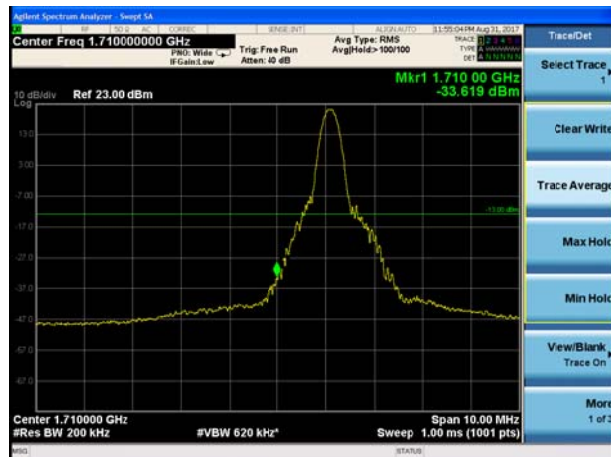
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



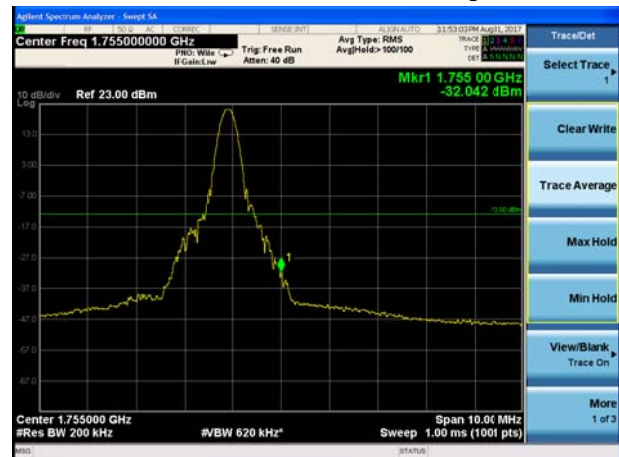
LTE Band 4 QPSK 15MHz CH-High, 100%RB



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

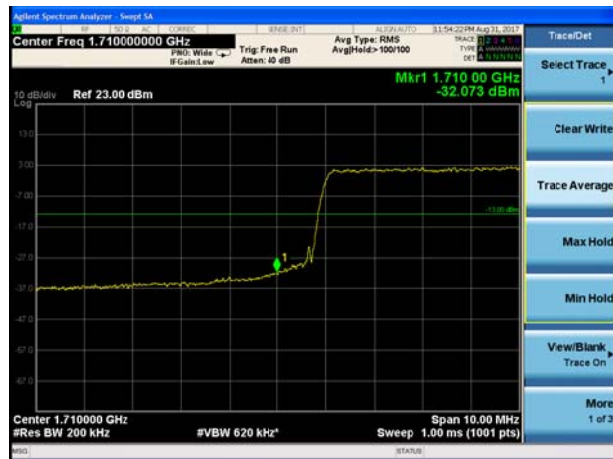


LTE Band 4 QPSK 20MHz CH-High, 1 RB





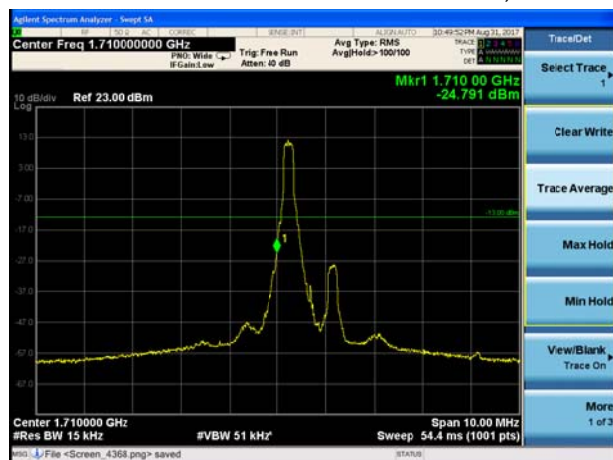
LTE Band 4 QPSK 20MHz CH-Low, 100%RB



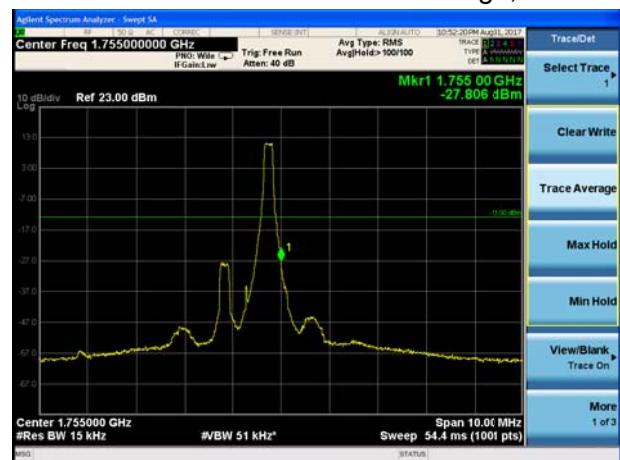
LTE Band 4 QPSK 20MHz CH-High, 100%RB



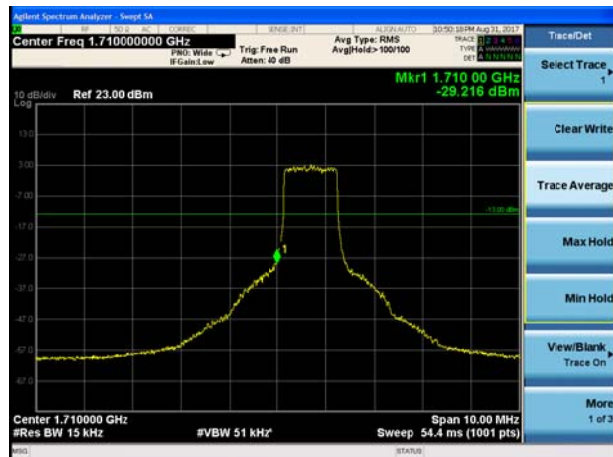
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



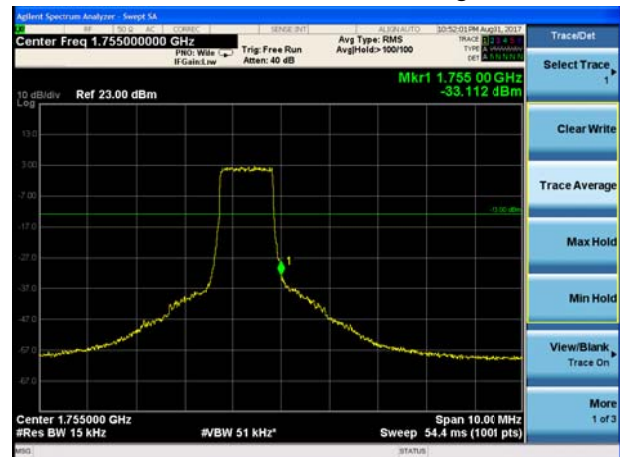
LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



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

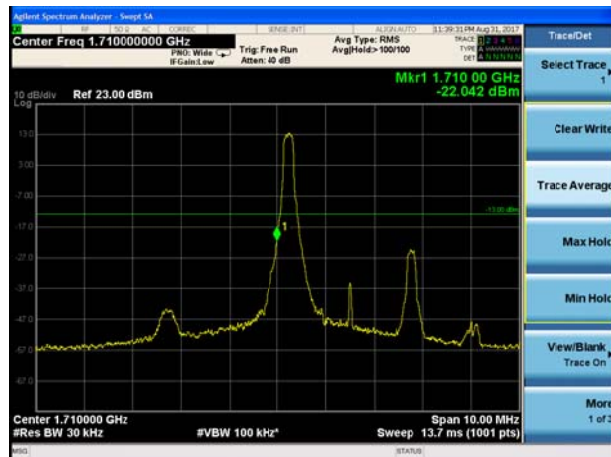


LTE Band 4 16QAM 1.4MHz CH-High, 100%RB

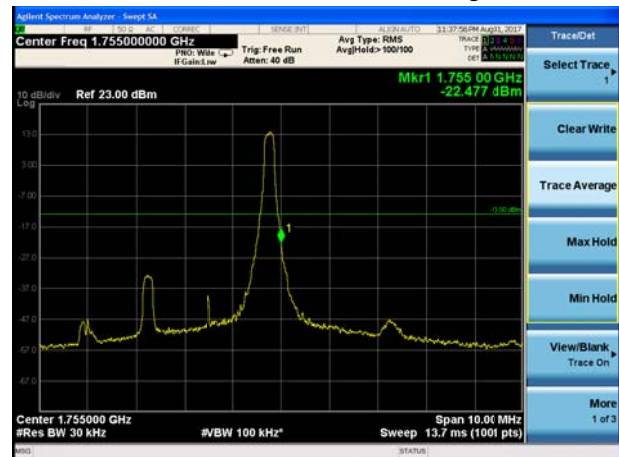




LTE Band 4 16QAM 3MHz CH-Low, 1 RB



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



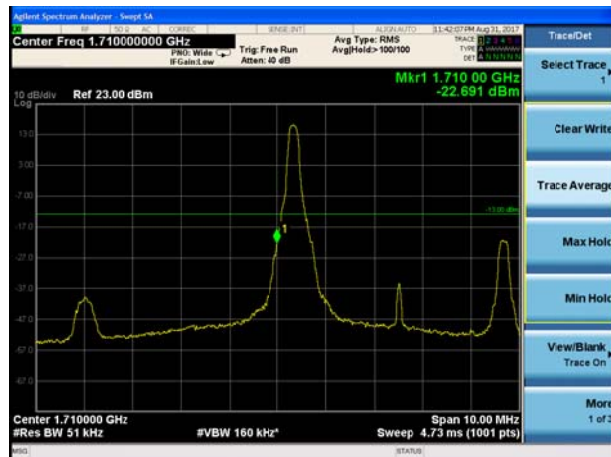
LTE Band 4 16QAM 3MHz CH-Low, 100%RB



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

