



RF TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-ZTEBLADEA321
Product LTE/WCDMA/GSM (GPRS)
Multi-Mode Digital Mobile Phone
Model ZTE BLADE A321
/ ZTE BLADE A320SE
Report No. RXA1706-0187RF03
Issue Date July 13, 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.

Jiang peng Lan

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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(h)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h) /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(m)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h) /27.53(m)	PASS
Date of Testing: June 16, 2017~ July7, 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 (recognition number is 428261)

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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City: Shanghai
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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 A321 / ZTE BLADE A320SE		
IMEI	865984030000177		
Hardware Version:	ucuA		
Software Version:	GEN_LA_A321_V1.0		
Power Supply:	Battery/AC adapter		
Antenna Type:	Internal Antenna		
Test Mode(s):	WCDMA Band IV; LTE Band 4; LTE Band 7		
HSDPA UE Category:	24		
HSUPA UE Category:	6		
LTE Category	4		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV:	20.20dBm	
	LTE Band 4:	22.65dBm	
	LTE Band 7:	24.96dBm	
Rated Power Supply Voltage:	3.8V		
Extreme Voltage:	Minimum: 3.6V Maximum: 4.35V		
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
EUT Accessory			
Battery	Manufacturer: BYD		



	Model: Li3822T43P4h736040 Power Rating: DC 3.8V, 2200mAh, Li-ion
Adapter	Manufacturer: DOCOKOM Model: STC-A508A-Z
USB Cable	99cm Cable, Shielded
Note: 1. The information of the EUT is declared by the manufacturer.	

2.1 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 C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v02r02

3 Test Configuration

There is more than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report

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 (Z 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.

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

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
Effective Isotropic Radiated power	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
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
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
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
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	-	-	O	-	O	-
	LTE 7	-	-	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 7	-	-	O	O	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
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.														

4 Test Information

4.1 RF Power Output

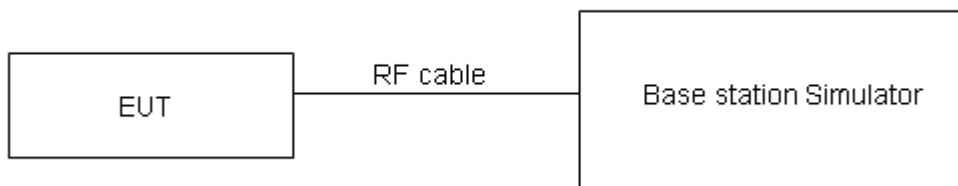
Ambient condition

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	22.63	22.71	22.64
	64k	22.49	22.65	22.51
	144k	22.48	22.55	22.50
	384k	22.47	22.54	22.49
HSDPA	Sub - Test 1	22.46	22.55	22.48
	Sub - Test 2	22.47	22.54	22.50
	Sub - Test 3	22.07	22.12	22.08
	Sub - Test 4	22.06	22.14	22.07
HSUPA	Sub - Test 1	22.55	22.63	22.56
	Sub - Test 2	20.71	20.79	20.72
	Sub - Test 3	21.53	21.61	21.54
	Sub - Test 4	20.72	20.80	20.73
	Sub - Test 5	22.51	22.59	22.52
DC-HSDPA	Sub - Test 1	22.50	22.58	22.51
	Sub - Test 2	22.48	22.57	22.50
	Sub - Test 3	21.97	22.06	21.99
	Sub - Test 4	21.96	22.05	21.98

Note:

- 1) The maximum RF Output Power numbers are marks in bold.
- 2) The following testing in RMC based on the maximum RF Output Power.

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	23.68	23.71	23.43
		1	2	23.48	23.38	23.55
		1	5	23.30	23.21	23.37
		3	0	23.18	23.12	23.27
		3	2	23.05	23.08	23.25
		3	3	23.07	22.99	23.13
		6	0	22.10	22.12	22.22
	16QAM	1	0	22.29	22.24	22.41
		1	2	22.20	22.11	22.15
		1	5	22.21	21.25	22.24
		3	0	22.00	22.15	22.28
		3	2	21.92	22.11	22.14
		3	3	21.90	21.95	22.10
		6	0	21.11	21.03	21.24
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	23.70	23.75	23.46
		1	7	23.51	23.43	23.59
		1	14	23.33	23.26	23.41
		8	0	22.28	22.24	22.40
		8	4	22.17	22.18	22.37
		8	7	22.17	22.10	22.23
		15	0	22.13	22.16	22.25
	16QAM	1	0	22.32	22.26	22.44
		1	7	22.23	22.16	22.19
		1	14	22.23	21.29	22.27
		8	0	21.11	21.28	21.40
		8	4	21.03	21.24	21.26
		8	7	21.00	21.07	21.23
		15	0	21.14	21.07	21.27
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	23.67	23.73	23.42
		1	13	23.49	23.39	23.56
		1	24	23.30	23.21	23.37
		12	0	22.25	22.19	22.36
		12	6	22.15	22.14	22.32
		12	13	22.15	22.08	22.19
		25	0	22.11	22.15	22.23



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
	16QAM	1	0	22.29	22.22	22.41
		1	13	22.20	22.14	22.16
		1	24	22.20	21.27	22.23
		12	0	21.09	21.24	21.37
		12	6	21.00	21.19	21.22
		12	13	20.97	21.02	21.19
		25	0	21.12	21.03	21.22
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
10MHz	QPSK	1	0	23.69	23.74	23.45
		1	25	23.52	23.44	23.60
		1	49	23.32	23.25	23.40
		25	0	22.28	22.24	22.40
		25	13	22.18	22.19	22.36
		25	25	22.17	22.12	22.24
		50	0	22.19	22.17	22.27
	16QAM	1	0	22.31	22.25	22.43
		1	25	22.23	22.18	22.19
		1	49	22.23	21.29	22.26
		25	0	21.12	21.29	21.41
		25	13	21.02	21.23	21.25
		25	25	21.00	21.07	21.23
		50	0	21.15	21.08	21.26
15MHz	QPSK	1	0	23.68	23.70	23.43
		1	38	23.50	23.43	23.57
		1	74	23.29	23.20	23.36
		36	0	22.26	22.20	22.37
		36	18	22.15	22.14	22.32
		36	39	22.14	22.09	22.20
		75	0	22.17	22.13	22.22
	16QAM	1	0	22.26	22.23	22.41
		1	38	22.21	22.15	22.17
		1	74	22.20	21.25	22.23
		36	0	21.09	21.27	21.38
		36	18	20.99	21.18	21.21
		36	39	20.98	21.03	21.20
		75	0	21.12	21.03	21.22
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	23.65	23.66	23.40
		1	50	23.49	23.39	23.55



		1	99	23.27	23.19	23.33
		50	0	22.23	22.15	22.33
		50	25	22.13	22.10	22.29
		50	50	22.11	22.04	22.16
		100	0	22.14	22.08	22.18
	16QAM	1	0	22.24	22.19	22.36
		1	50	22.17	22.13	22.13
		1	99	22.18	21.22	22.21
		50	0	21.06	21.23	21.35
		50	25	20.96	21.16	21.18
		50	50	20.95	20.98	21.16
		100	0	21.10	20.99	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	23.14	23.32	23.16
		1	13	23.19	23.24	23.23
		1	24	23.27	23.34	23.34
		12	0	22.32	22.39	22.31
		12	6	22.16	22.31	22.27
		12	13	22.19	22.20	22.19
		25	0	22.26	22.37	22.17
	16QAM	1	0	22.23	22.29	22.22
		1	13	22.38	22.20	22.28
		1	24	22.17	22.31	22.26
		12	0	21.34	21.29	21.24
		12	6	21.16	21.15	21.24
		12	13	21.09	21.18	21.25
		25	0	21.19	21.26	21.19
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
10MHz	QPSK	1	0	23.16	23.33	23.19
		1	25	23.22	23.29	23.27
		1	49	23.29	23.38	23.37
		25	0	22.35	22.44	22.35
		25	13	22.19	22.36	22.31
		25	25	22.21	22.24	22.24
		50	0	22.34	22.39	22.21
	16QAM	1	0	22.25	22.32	22.24



		1	25	22.41	22.24	22.31
		1	49	22.20	22.33	22.29
		25	0	21.37	21.34	21.28
		25	13	21.18	21.19	21.27
		25	25	21.12	21.23	21.29
		50	0	21.22	21.31	21.23
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20825/2507.5	21100/2535	21375/2562.5
15MHz	QPSK	1	0	23.15	23.29	23.17
		1	38	23.20	23.28	23.24
		1	74	23.26	23.33	23.33
		36	0	22.33	22.40	22.32
		36	18	22.16	22.31	22.27
		36	39	22.18	22.21	22.20
	16QAM	75	0	22.32	22.35	22.16
		1	0	22.20	22.30	22.22
		1	38	22.39	22.21	22.29
		1	74	22.17	22.29	22.26
		36	0	21.34	21.32	21.25
		36	18	21.15	21.14	21.23
		36	39	21.10	21.19	21.26
		75	0	21.19	21.26	21.19
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20850/2510	21100/2535	21350/2560
20MHz	QPSK	1	0	23.12	23.25	23.14
		1	50	23.19	23.24	23.22
		1	99	23.24	23.32	23.30
		50	0	22.30	22.35	22.28
		50	25	22.14	22.27	22.24
		50	50	22.15	22.16	22.16
		100	0	22.29	22.30	22.12
	16QAM	1	0	22.18	22.26	22.17
		1	50	22.35	22.19	22.25
		1	99	22.15	22.26	22.24
		50	0	21.31	21.28	21.22
		50	25	21.12	21.12	21.20
		50	50	21.07	21.14	21.22
		100	0	21.17	21.22	21.16

4.2 Effective Isotropic Radiated Power

Ambient condition

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

Methods of Measurement

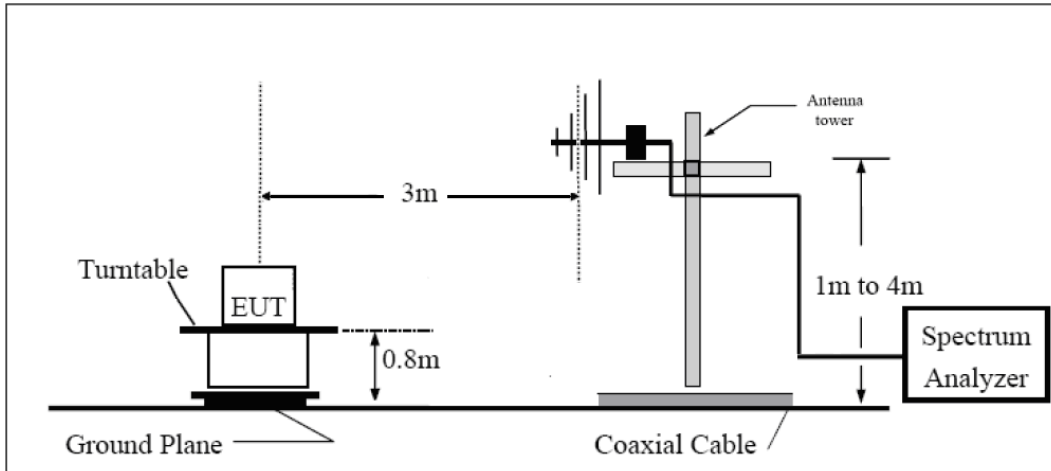
- The testing follows ANSI C63.26 (2015) Section 5.5.2.3.
- Above 30MHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
- A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
- The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAG) should be recorded after test.
- The measurement results are obtained as described below:

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

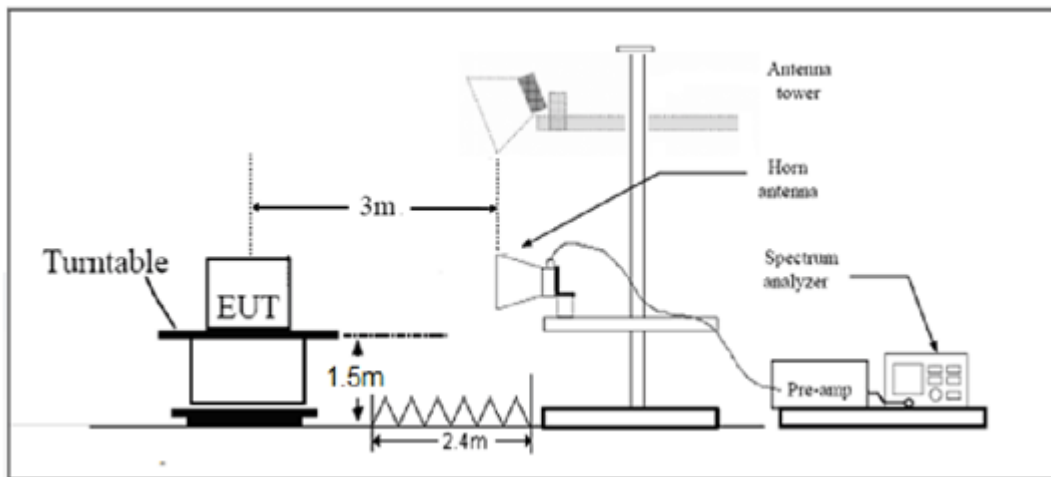
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
- This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

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

**Limits**

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(d)(4)Limit (EIRP)	$\leq 1 \text{ W}$ (30 dBm)
Part 27.50(h)(2) Limit (EIRP)	$\leq 2 \text{ W}$ (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

WCDMA Band IV							
Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	Conclusion
1712.4	H	-28.54	-45.44	0.00	1.82	18.71	Pass
1732.6	H	-28.68	-45.38	0.00	1.96	18.66	Pass
1752.6	H	-28.34	-45.38	0.00	1.93	18.96	Pass
1712.4	V	-27.40	-45.54	0.00	1.82	19.95	Pass
1732.6	V	-27.32	-45.46	0.00	1.96	20.09	Pass
1752.6	V	-27.21	-45.49	0.00	1.93	20.20	Pass

LTE Band 4								
Bandwidth	Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	Conclusion
1.4MHz (QPSK)	1710.7	H	-35.60	-54.30	0.00	1.44	20.14	Pass
	1732.5	H	-35.77	-54.32	0.00	1.57	20.11	Pass
	1754.3	H	-35.66	-54.10	0.00	1.72	20.16	Pass
	1710.7	V	-34.05	-54.35	0.00	1.44	21.74	Pass
	1732.5	V	-34.18	-54.41	0.00	1.57	21.80	Pass
	1754.3	V	-34.70	-54.52	0.00	1.72	21.54	Pass
1.4MHz (16QAM)	1710.7	H	-35.84	-54.30	0.00	1.44	19.89	Pass
	1732.5	H	-36.02	-54.32	0.00	1.57	19.86	Pass
	1754.3	H	-35.90	-54.10	0.00	1.72	19.91	Pass
	1710.7	V	-34.30	-54.35	0.00	1.44	21.49	Pass
	1732.5	V	-34.42	-54.41	0.00	1.57	21.55	Pass
	1754.3	V	-34.94	-54.52	0.00	1.72	21.29	Pass
3MHz (QPSK)	1711.5	H	-35.63	-54.33	0.00	1.44	20.14	Pass
	1732.5	H	-35.70	-54.32	0.00	1.57	20.18	Pass
	1753.5	H	-35.58	-54.11	0.00	1.72	20.25	Pass
	1711.5	V	-34.14	-54.35	0.00	1.44	21.65	Pass
	1732.5	V	-34.13	-54.41	0.00	1.57	21.85	Pass
	1753.5	V	-34.45	-54.48	0.00	1.72	21.75	Pass
3MHz (16QAM)	1711.5	H	-35.98	-54.33	0.00	1.44	19.79	Pass
	1732.5	H	-36.05	-54.32	0.00	1.57	19.83	Pass
	1753.5	H	-35.92	-54.11	0.00	1.72	19.90	Pass
	1711.5	V	-34.49	-54.35	0.00	1.44	21.30	Pass
	1732.5	V	-34.47	-54.41	0.00	1.57	21.50	Pass
	1753.5	V	-34.79	-54.48	0.00	1.72	21.40	Pass
5MHz (QPSK)	1712.5	H	-36.00	-54.34	0.00	1.44	19.78	Pass
	1732.5	H	-36.06	-54.32	0.00	1.57	19.82	Pass
	1752.5	H	-36.10	-54.13	0.00	1.72	19.74	Pass
	1712.5	V	-34.17	-54.38	0.00	1.44	21.65	Pass
	1732.5	V	-34.53	-54.41	0.00	1.57	21.45	Pass



	1752.5	V	-34.63	-54.47	0.00	1.72	21.56	Pass
5MHz (16QAM)	1712.5	H	-36.36	-54.34	0.00	1.44	19.41	Pass
	1732.5	H	-36.43	-54.32	0.00	1.57	19.45	Pass
	1752.5	H	-36.47	-54.13	0.00	1.72	19.37	Pass
	1712.5	V	-34.54	-54.38	0.00	1.44	21.28	Pass
	1732.5	V	-34.89	-54.41	0.00	1.57	21.08	Pass
	1752.5	V	-34.99	-54.47	0.00	1.72	21.19	Pass
	10MHz (QPSK)	1715	H	-35.43	-54.33	0.00	1.44	20.34
1732.5		H	-35.66	-54.32	0.00	1.57	20.22	Pass
1750		H	-35.66	-54.12	0.00	1.66	20.12	Pass
1715		V	-33.80	-54.32	0.00	1.44	21.96	Pass
1732.5		V	-34.01	-54.41	0.00	1.57	21.97	Pass
1750		V	-34.53	-54.52	0.00	1.66	21.65	Pass
10MHz (16QAM)	1715	H	-35.89	-54.33	0.00	1.44	19.88	Pass
	1732.5	H	-36.12	-54.32	0.00	1.57	19.76	Pass
	1750	H	-36.12	-54.12	0.00	1.66	19.66	Pass
	1715	V	-34.26	-54.32	0.00	1.44	21.50	Pass
	1732.5	V	-34.46	-54.41	0.00	1.57	21.51	Pass
	1750	V	-34.99	-54.52	0.00	1.66	21.19	Pass
15MHz (QPSK)	1717.5	H	-35.69	-54.35	0.00	1.49	20.14	Pass
	1732.5	H	-35.76	-54.32	0.00	1.57	20.12	Pass
	1747.5	H	-35.64	-54.17	0.00	1.66	20.19	Pass
	1717.5	V	-33.23	-54.39	0.00	1.49	22.65	Pass
	1732.5	V	-33.74	-54.41	0.00	1.57	22.24	Pass
	1747.5	V	-33.72	-54.51	0.00	1.66	22.45	Pass
15MHz (16QAM)	1717.5	H	-36.35	-54.35	0.00	1.49	19.49	Pass
	1732.5	H	-36.42	-54.32	0.00	1.57	19.47	Pass
	1747.5	H	-36.29	-54.17	0.00	1.66	19.54	Pass
	1717.5	V	-33.88	-54.39	0.00	1.49	22.00	Pass
	1732.5	V	-34.39	-54.41	0.00	1.57	21.59	Pass
	1747.5	V	-34.37	-54.51	0.00	1.66	21.80	Pass
20MHz (QPSK)	1720	H	-35.41	-54.37	0.00	1.49	20.45	Pass
	1732.5	H	-35.55	-54.32	0.00	1.57	20.33	Pass
	1745	H	-35.21	-54.23	0.00	1.63	20.65	Pass
	1720	V	-33.69	-54.44	0.00	1.49	22.24	Pass
	1732.5	V	-33.88	-54.41	0.00	1.57	22.10	Pass
	1745	V	-33.90	-54.59	0.00	1.63	22.32	Pass
20MHz (16QAM)	1720	H	-35.73	-54.37	0.00	1.49	20.12	Pass
	1732.5	H	-35.88	-54.32	0.00	1.57	20.00	Pass
	1745	H	-35.54	-54.23	0.00	1.63	20.32	Pass
	1720	V	-34.01	-54.44	0.00	1.49	21.91	Pass
	1732.5	V	-34.20	-54.41	0.00	1.57	21.77	Pass
	1745	V	-34.23	-54.59	0.00	1.63	21.99	Pass

LTE Band 7								
Band width	Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	Conclusion
5MHz (QPSK)	2502.5	H	-36.91	-59.64	0.00	1.81	24.54	Pass
	2535	H	-36.89	-59.72	0.00	1.81	24.64	Pass
	2567.5	H	-37.27	-59.98	0.00	1.83	24.54	Pass
	2502.5	V	-38.77	-59.31	0.00	1.81	22.35	Pass
	2535	V	-38.32	-59.11	0.00	1.81	22.60	Pass
	2567.5	V	-38.97	-59.59	0.00	1.83	22.45	Pass
5MHz (16QAM)	2502.5	H	-37.15	-59.64	0.00	1.81	24.30	Pass
	2535	H	-37.13	-59.72	0.00	1.81	24.40	Pass
	2567.5	H	-37.51	-59.98	0.00	1.83	24.30	Pass
	2502.5	V	-39.01	-59.31	0.00	1.81	22.11	Pass
	2535	V	-38.56	-59.11	0.00	1.81	22.36	Pass
	2567.5	V	-39.21	-59.59	0.00	1.83	22.21	Pass
10MHz (QPSK)	2505	H	-36.58	-59.61	0.00	1.82	24.85	Pass
	2535	H	-36.57	-59.72	0.00	1.81	24.96	Pass
	2565	H	-37.07	-60.02	0.00	1.81	24.76	Pass
	2505	V	-38.40	-59.33	0.00	1.82	22.75	Pass
	2535	V	-38.04	-59.11	0.00	1.81	22.88	Pass
	2565	V	-38.66	-59.59	0.00	1.81	22.74	Pass
10MHz (16QAM)	2505	H	-36.90	-59.61	0.00	1.82	24.53	Pass
	2535	H	-36.89	-59.72	0.00	1.81	24.64	Pass
	2565	H	-37.39	-60.02	0.00	1.81	24.44	Pass
	2505	V	-38.72	-59.33	0.00	1.82	22.43	Pass
	2535	V	-38.37	-59.11	0.00	1.81	22.56	Pass
	2565	V	-38.98	-59.59	0.00	1.81	22.42	Pass
15MHz (QPSK)	2507.5	H	-36.73	-59.71	0.00	1.80	24.78	Pass
	2535	H	-36.66	-59.72	0.00	1.81	24.87	Pass
	2562.5	H	-37.21	-60.08	0.00	1.82	24.69	Pass
	2507.5	V	-38.31	-59.29	0.00	1.80	22.78	Pass
	2535	V	-38.70	-59.72	0.00	1.81	22.83	Pass
	2562.5	V	-38.52	-59.46	0.00	1.82	22.76	Pass
15MHz (16QAM)	2507.5	H	-37.06	-59.71	0.00	1.80	24.45	Pass
	2535	H	-36.99	-59.72	0.00	1.81	24.54	Pass
	2562.5	H	-37.54	-60.08	0.00	1.82	24.36	Pass
	2507.5	V	-38.64	-59.29	0.00	1.80	22.45	Pass
	2535	V	-39.03	-59.72	0.00	1.81	22.50	Pass
	2562.5	V	-38.85	-59.46	0.00	1.82	22.43	Pass
20MHz (QPSK)	2510	H	-36.43	-59.52	0.00	1.77	24.86	Pass
	2535	H	-36.60	-59.72	0.00	1.81	24.93	Pass
	2560	H	-37.07	-60.01	0.00	1.82	24.76	Pass



	2510	V	-38.23	-59.09	0.00	1.77	22.63	Pass
	2535	V	-38.83	-59.72	0.00	1.81	22.70	Pass
	2560	V	-38.60	-59.52	0.00	1.82	22.74	Pass
20MHz (16QAM)	2510	H	-36.78	-59.52	0.00	1.77	24.51	Pass
	2535	H	-36.95	-59.72	0.00	1.81	24.58	Pass
	2560	H	-37.42	-60.01	0.00	1.82	24.41	Pass
	2510	V	-38.58	-59.09	0.00	1.77	22.28	Pass
	2535	V	-39.18	-59.72	0.00	1.81	22.35	Pass
	2560	V	-38.95	-59.52	0.00	1.82	22.39	Pass

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

4.3 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.

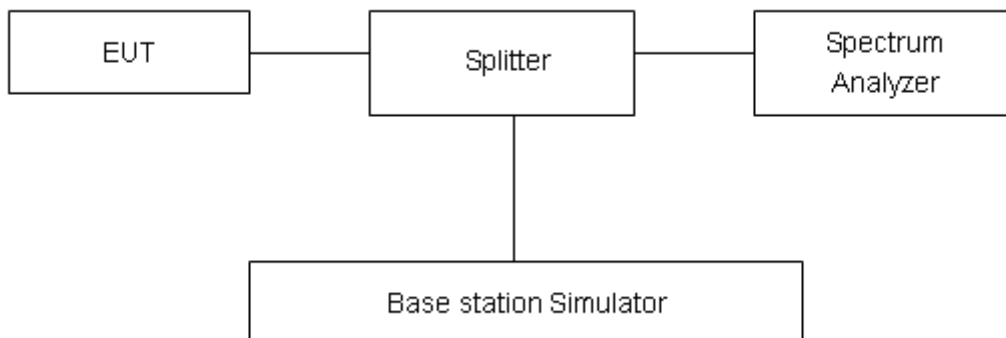
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/7 (1.4MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7 (3MHz/5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7 (10MHz/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	4.1566	4.721
	1638	2132.6	4.1453	4.702
	1738	2152.6	4.1568	4.705

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1217	1.339
			20175	1732.5	1.1262	1.364
			20393	1754.3	1.1379	1.344
		3	19965	1711.5	2.7463	3.067
			20175	1732.5	2.7552	3.060
			20385	1753.5	2.7490	3.076
		5	19975	1712.5	4.5238	5.035
			20175	1732.5	4.5413	5.019
			20375	1752.5	4.5198	4.998
		10	20000	1715	9.0583	10.15
			20175	1732.5	9.0503	10.08
			20350	1750	9.0232	10.12
		15	20025	1717.5	13.462	14.67
			20175	1732.5	13.526	14.82
			20325	1747.5	13.507	14.78
		20	20050	1720	17.897	19.47
			20175	1732.5	17.920	19.42
			20300	1745	17.929	19.27
	16QAM	1.4	19957	1710.7	1.1245	1.341
			20175	1732.5	1.1233	1.340
			20393	1754.3	1.1177	1.355
		3	19965	1711.5	2.7649	3.079
			20175	1732.5	2.7409	3.060
			20385	1753.5	2.7594	3.060
		5	19975	1712.5	4.5438	5.054
			20175	1732.5	4.5252	5.031
			20375	1752.5	4.5360	5.058
		10	20000	1715	9.0354	10.01
			20175	1732.5	9.0424	10.09
			20350	1750	9.0332	9.947
15	20025	1717.5	13.502	14.69		

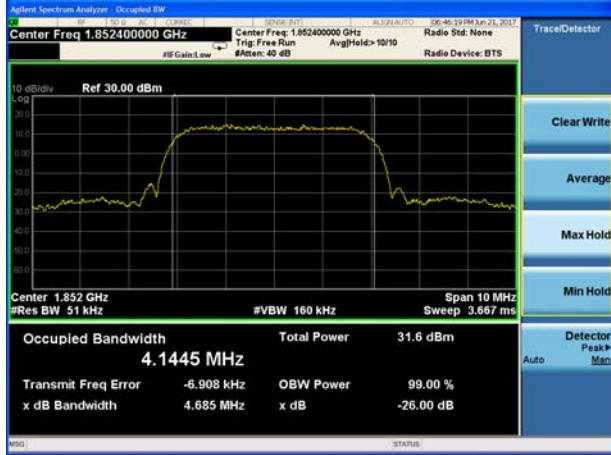


		20	20175	1732.5	13.493	14.75
			20325	1747.5	13.513	14.75
			20050	1720	17.879	19.34
			20175	1732.5	17.911	19.28
			20300	1745	18.002	19.39

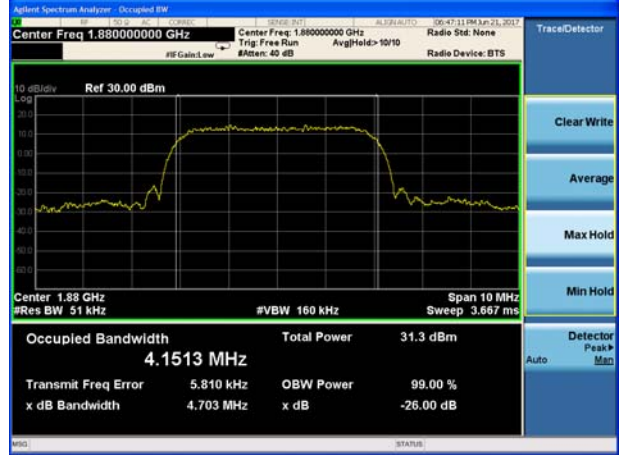
LTE Band 7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	20775	2502.5	4.5450	5.034
			21100	2535	4.5196	5.020
			21425	2567.5	4.5242	5.034
		10	20800	2505	9.0453	10.13
			21100	2535	9.0609	10.11
			21400	2565	9.0429	10.15
		15	20825	2507.5	13.464	14.72
			21100	2535	13.482	14.69
			21375	2562.5	13.508	14.75
		20	20850	2510	17.869	19.22
			21100	2535	17.966	19.57
			21350	2560	17.910	19.29
	16QAM	5	20775	2502.5	4.5155	5.007
			21100	2535	4.5472	5.059
			21425	2567.5	4.5203	5.017
		10	20800	2505	9.0594	10.02
			21100	2535	9.0466	10.08
			21400	2565	9.0475	10.05
		15	20825	2507.5	13.481	14.73
			21100	2535	13.522	14.83
			21375	2562.5	13.482	14.71
		20	20850	2510	17.909	19.35
			21100	2535	17.965	19.41
			21350	2560	17.929	19.44



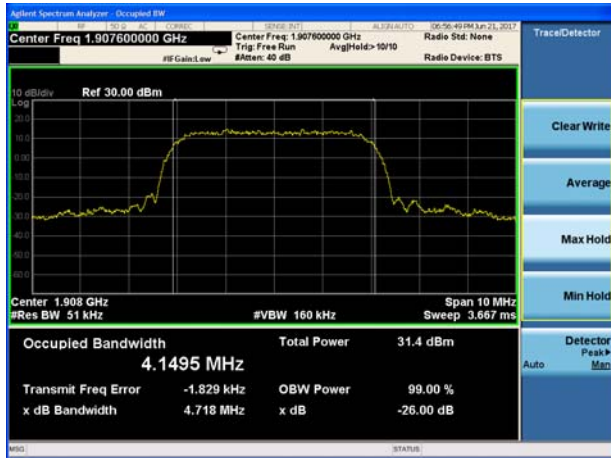
WCDMA Band IV CH-Low

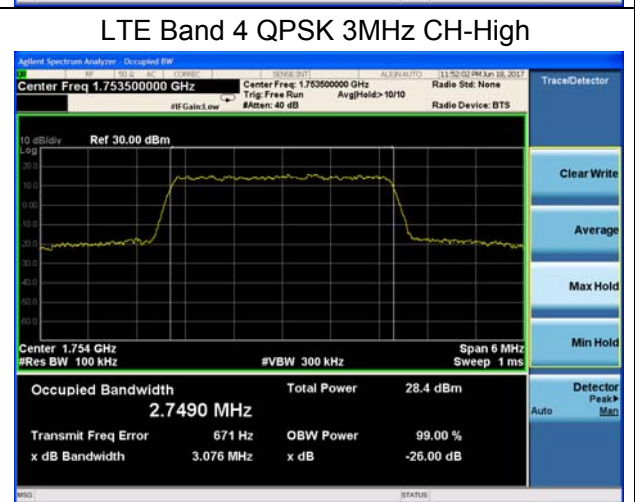
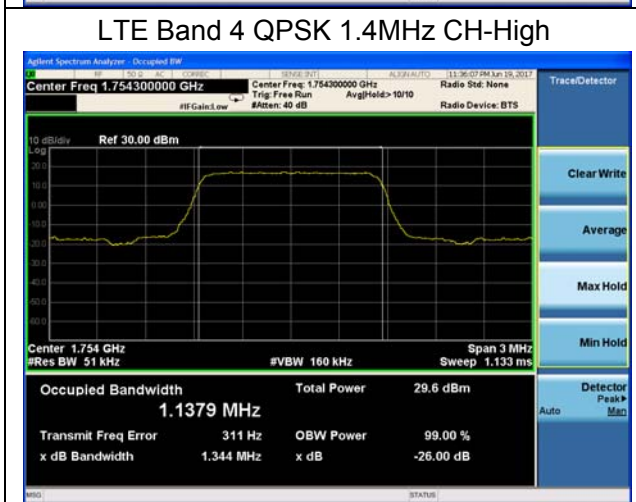
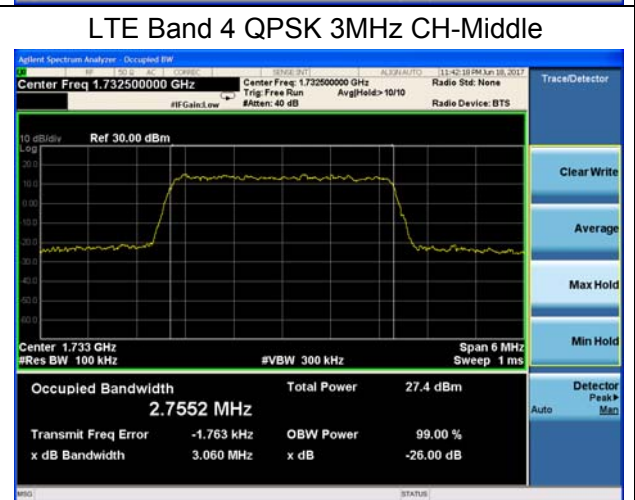
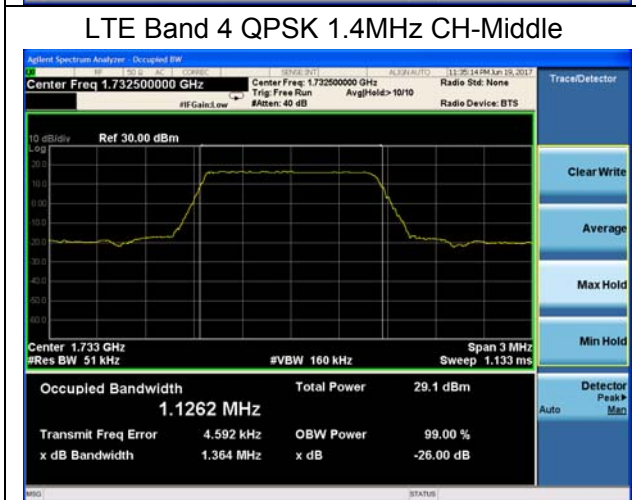
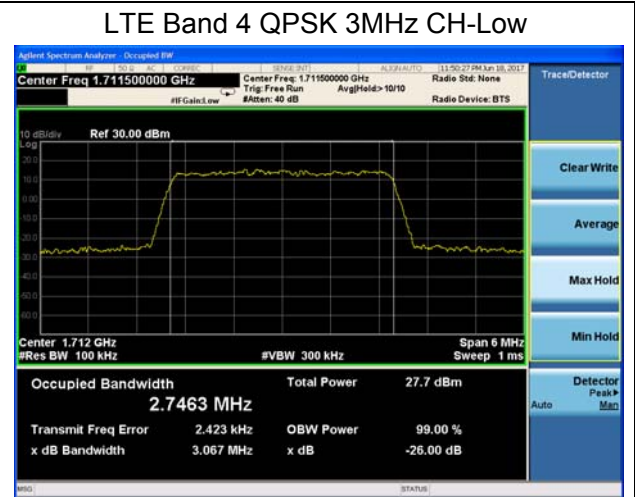
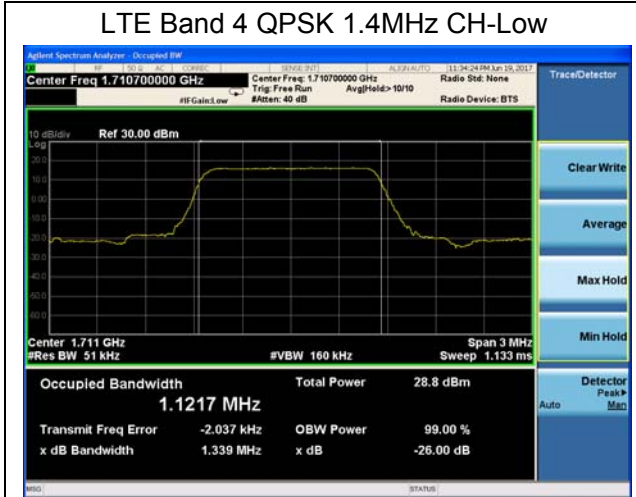


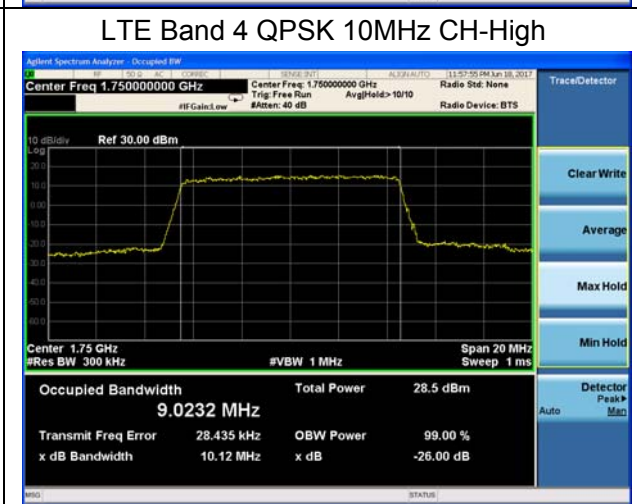
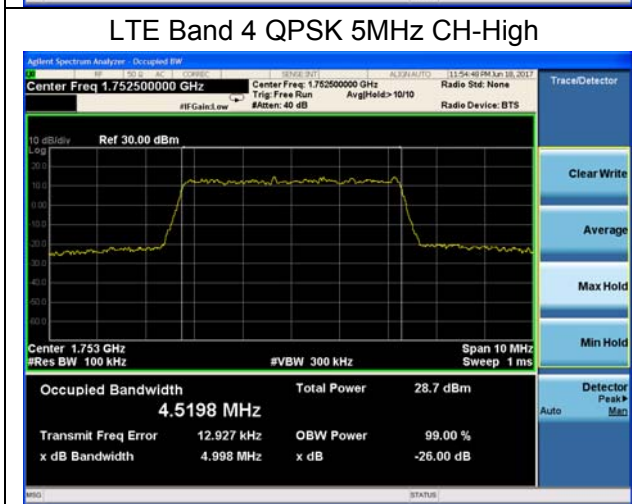
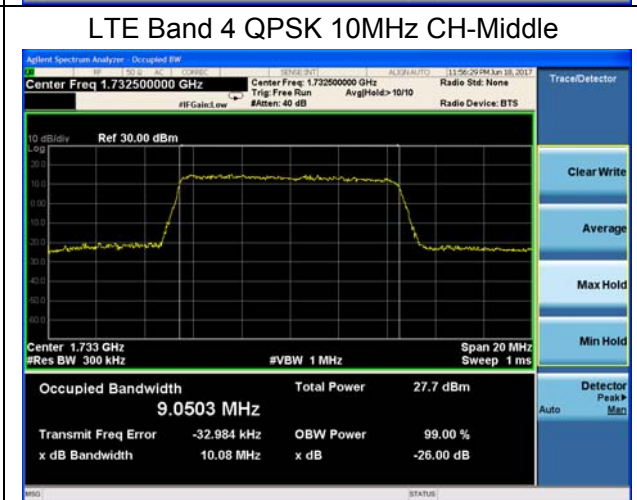
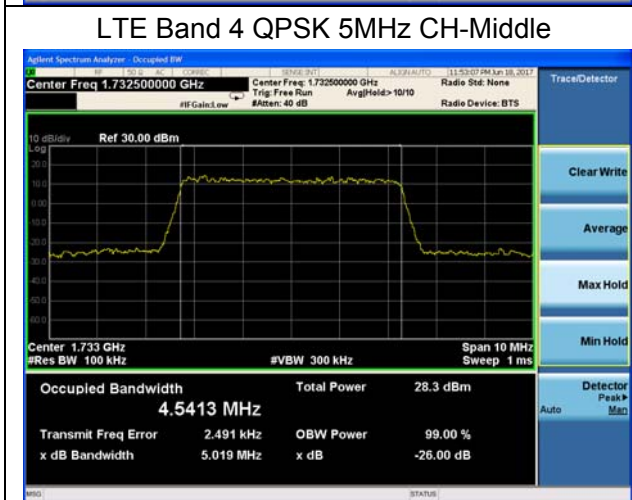
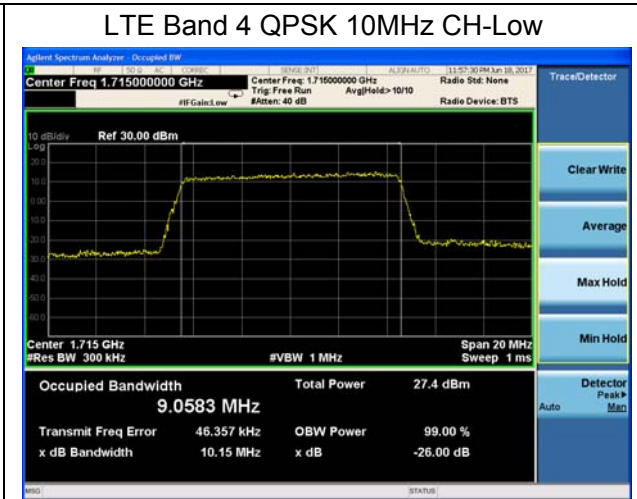
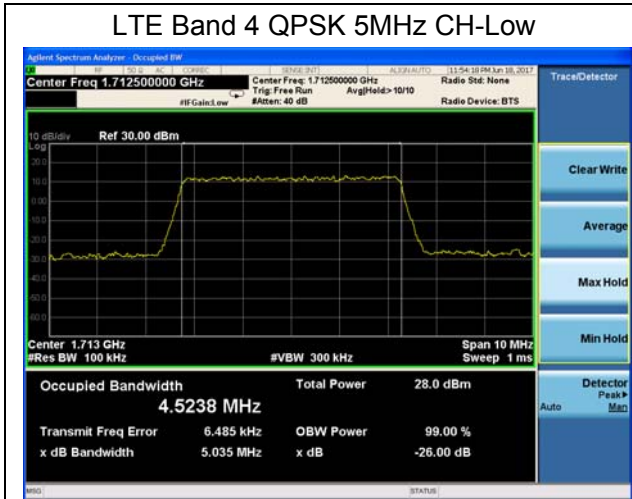
WCDMA Band IV CH Middle

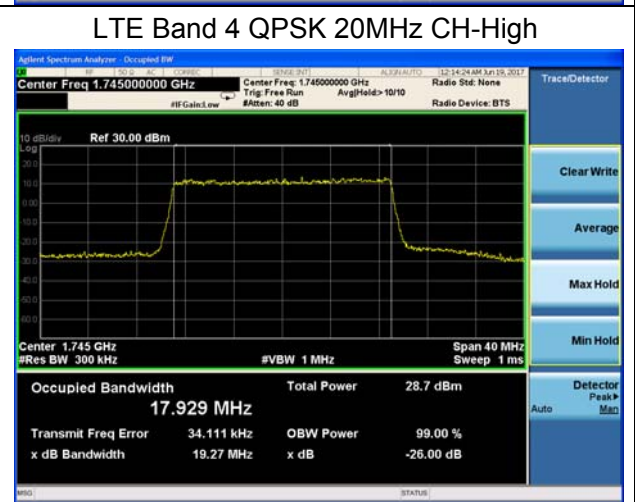
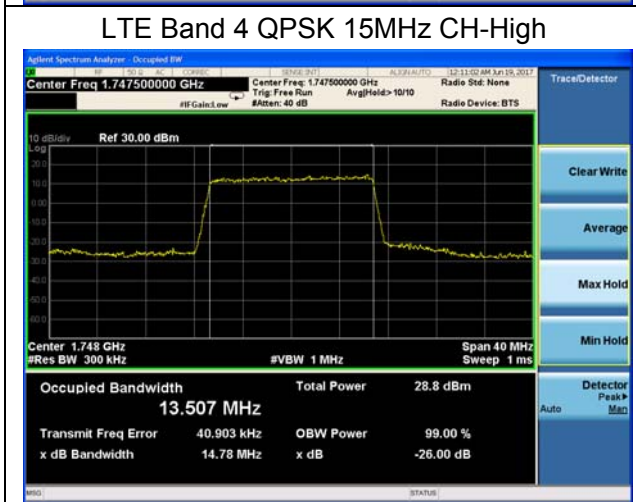
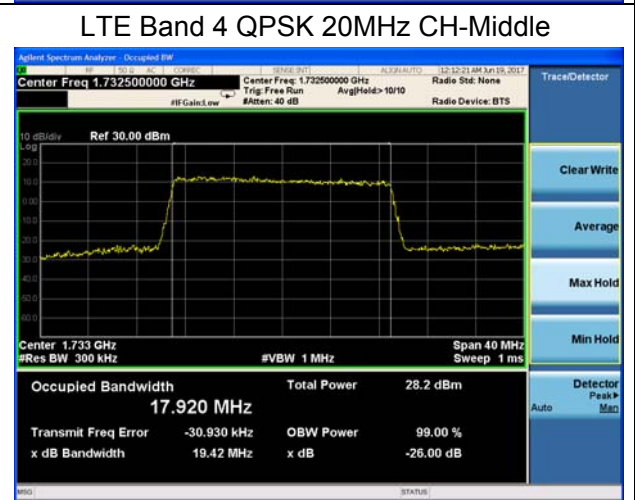
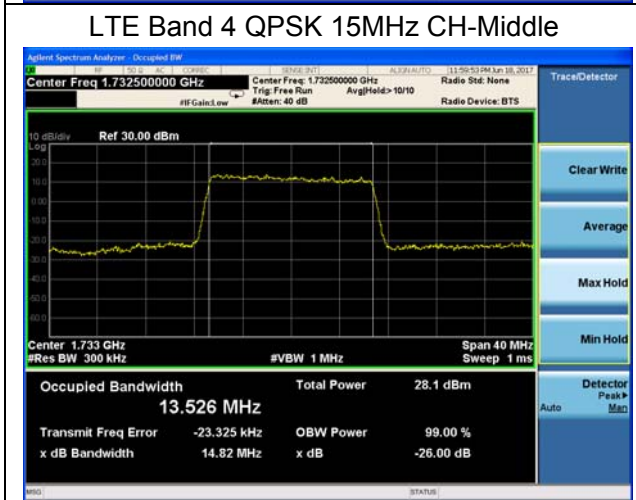
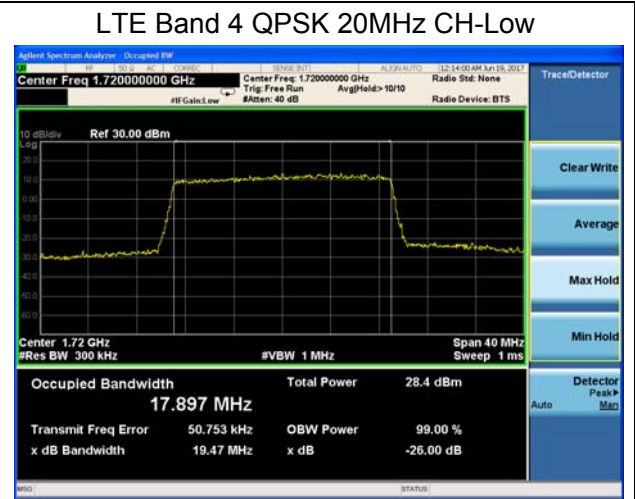
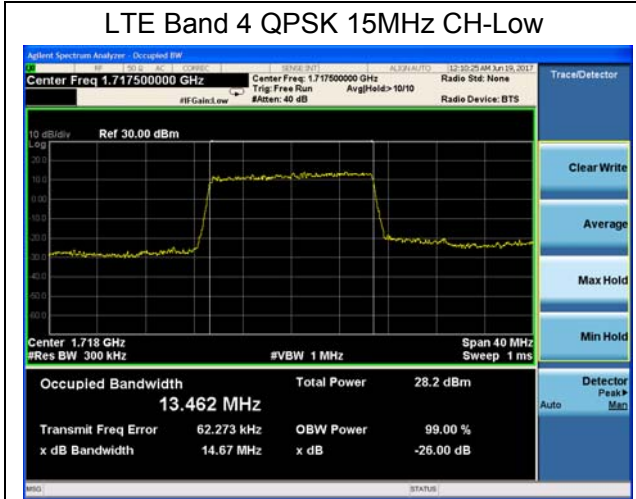


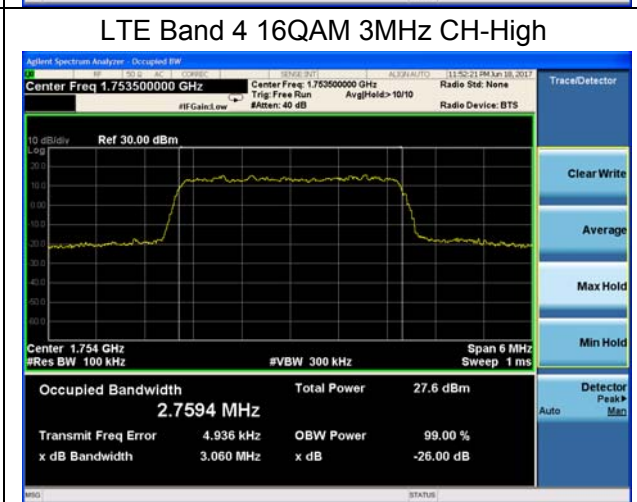
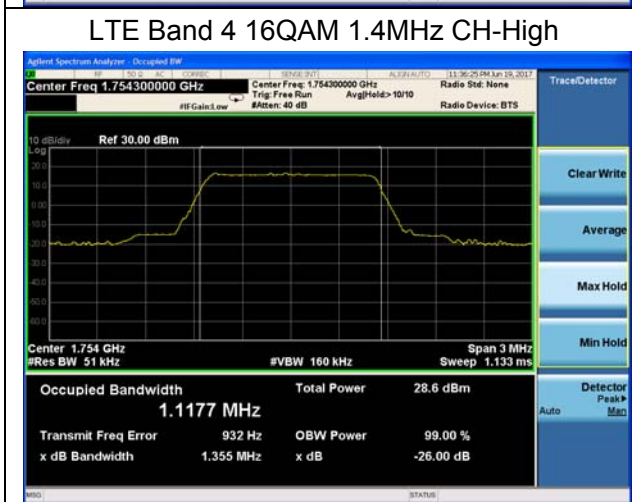
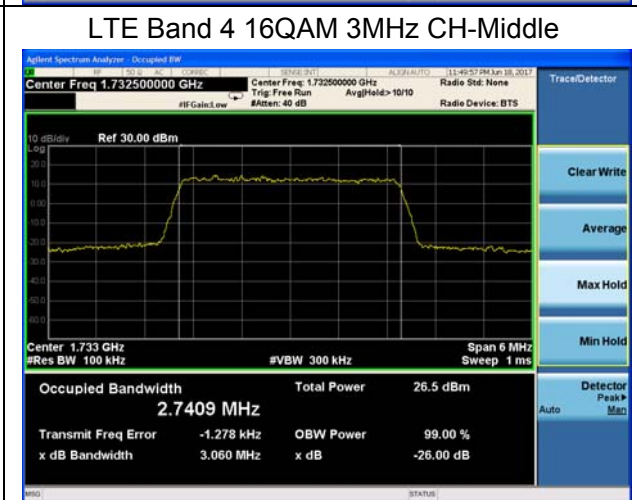
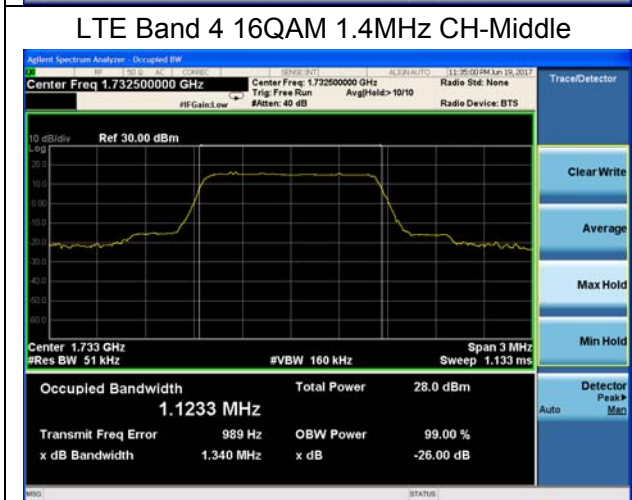
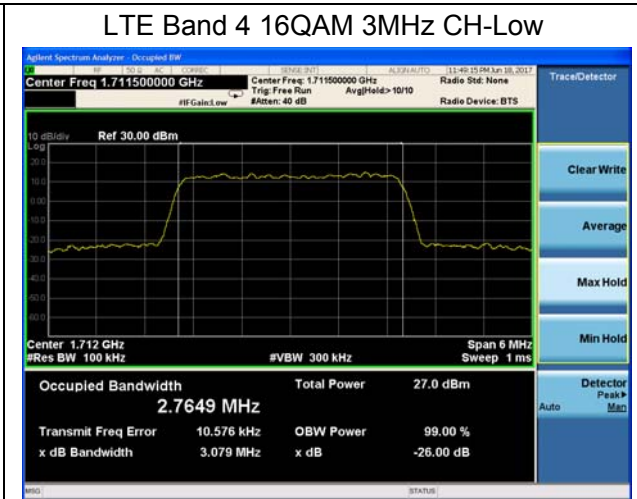
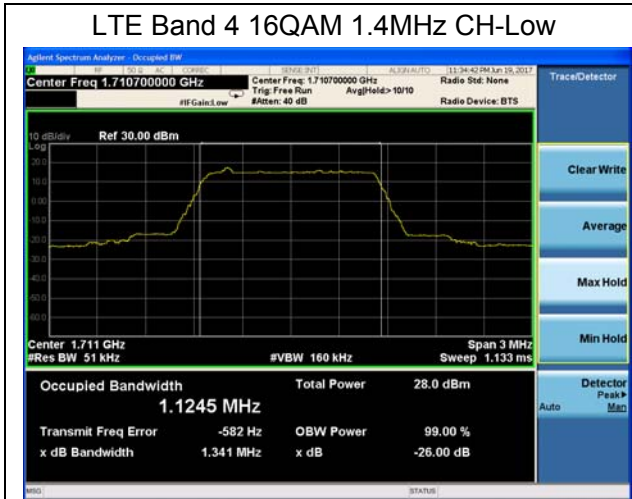
WCDMA Band IV CH High

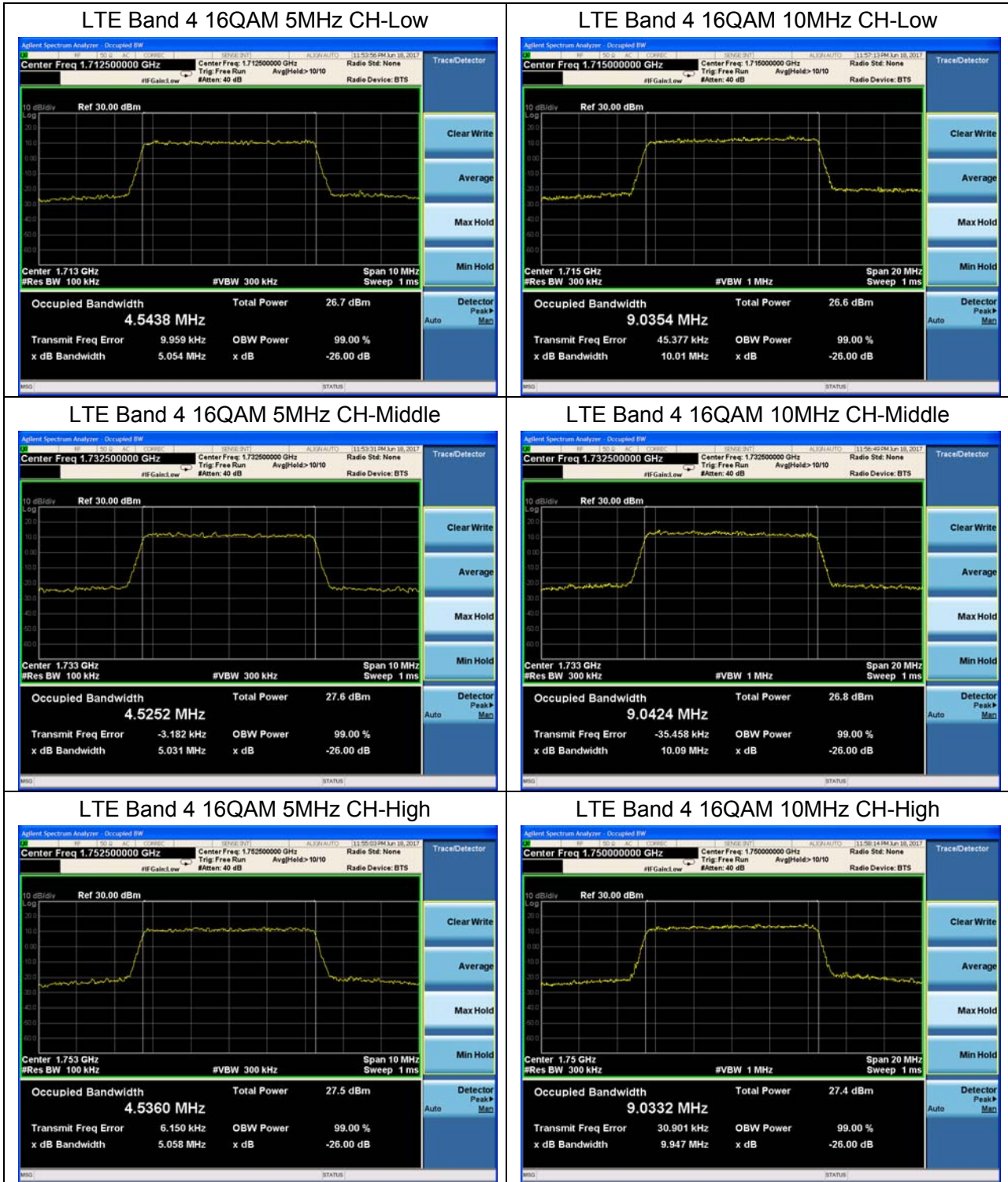


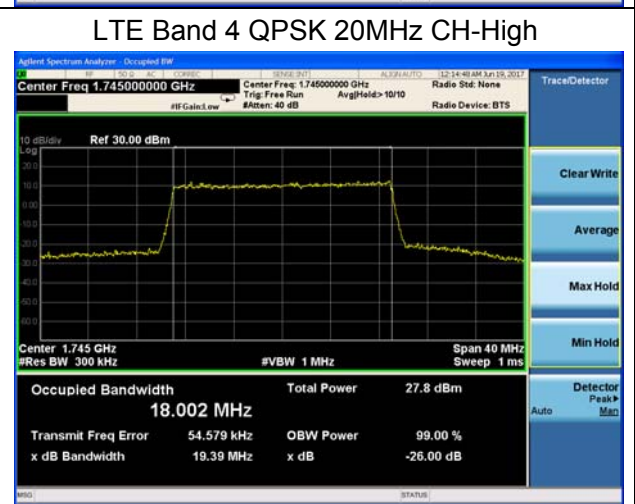
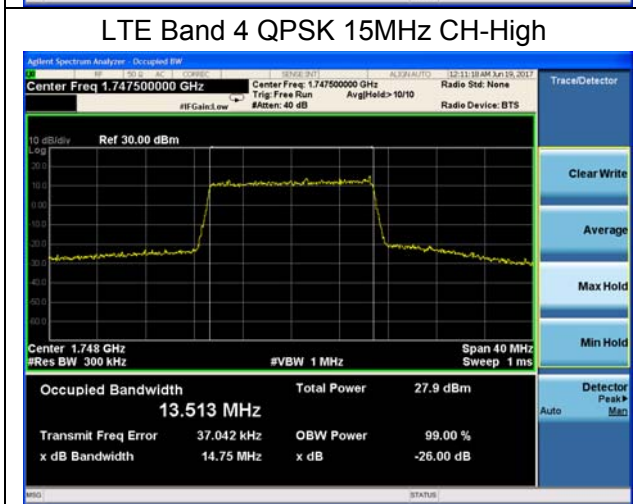
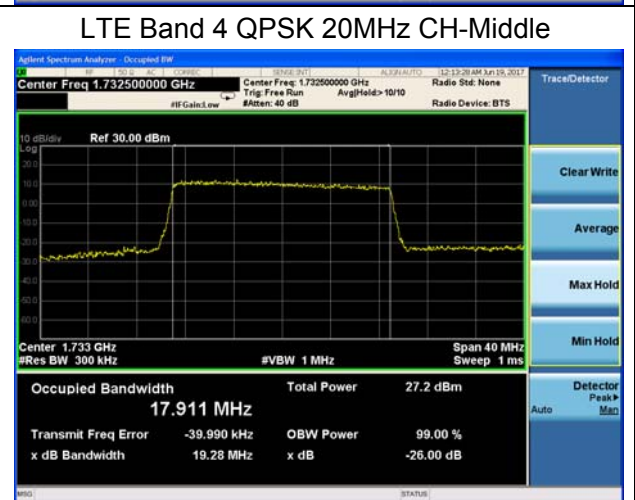
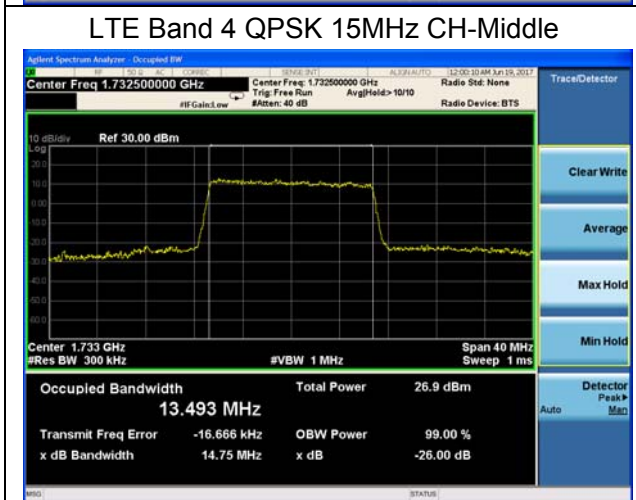
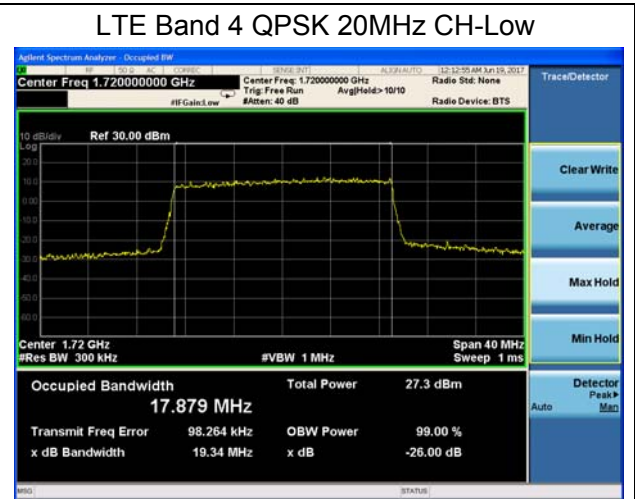
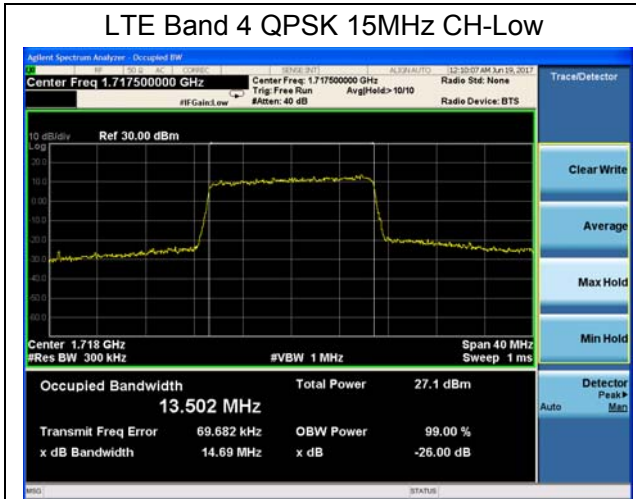


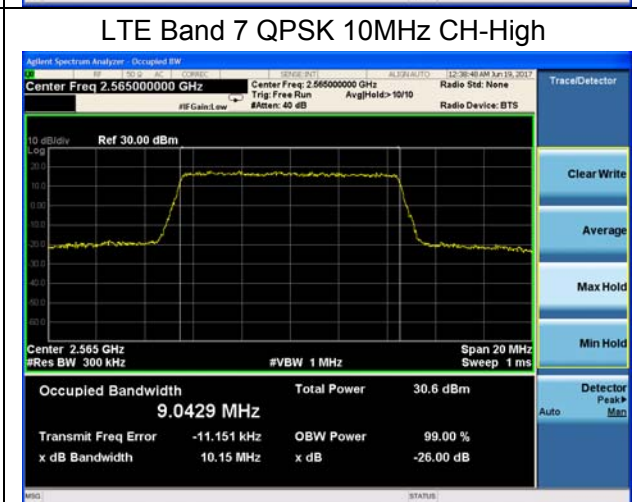
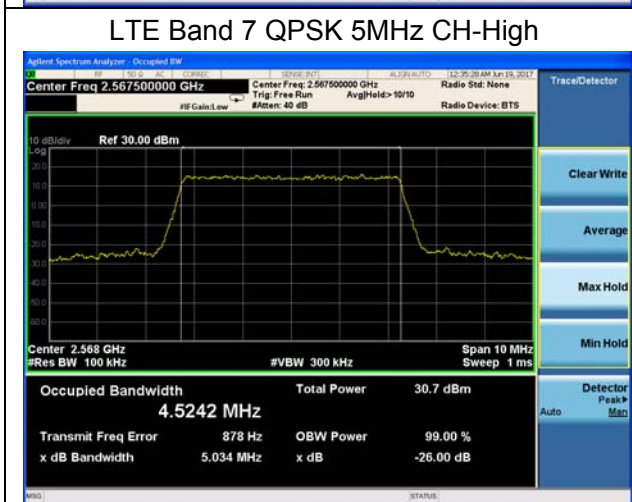
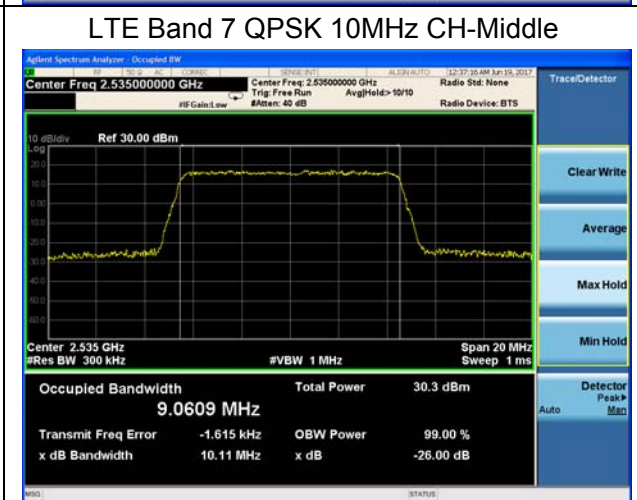
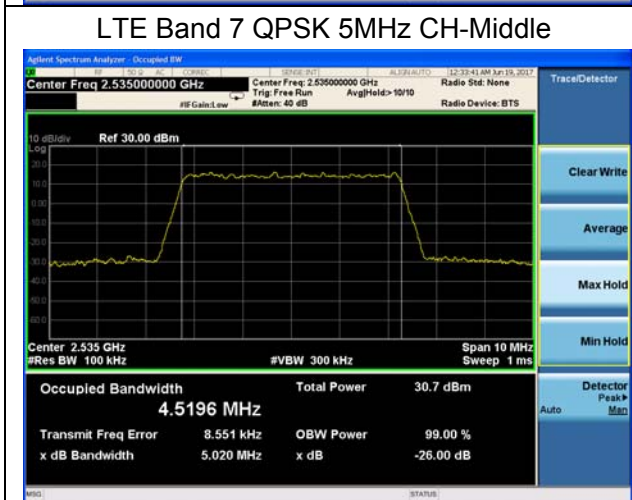
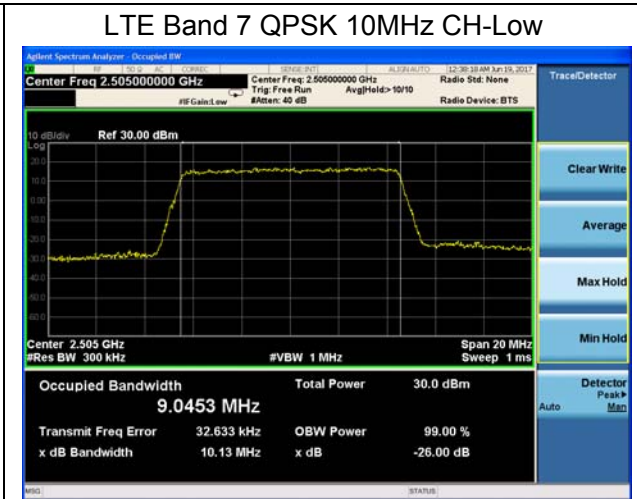
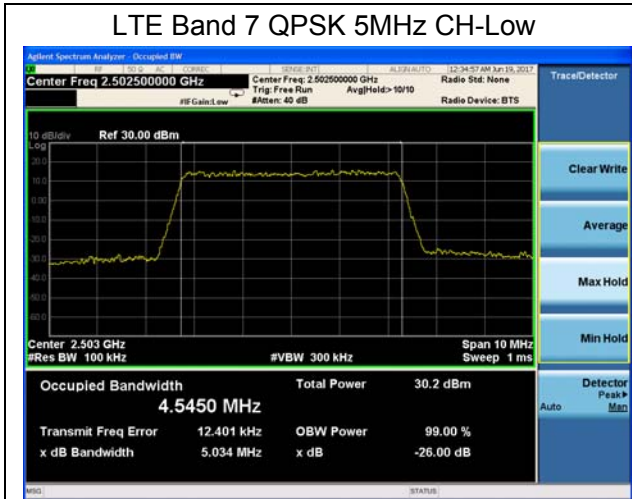


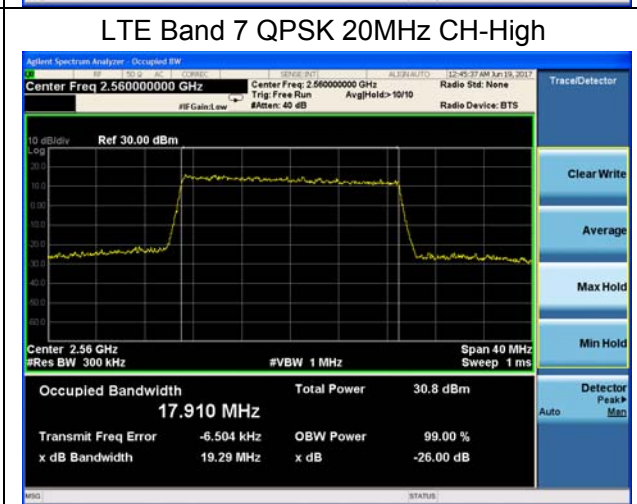
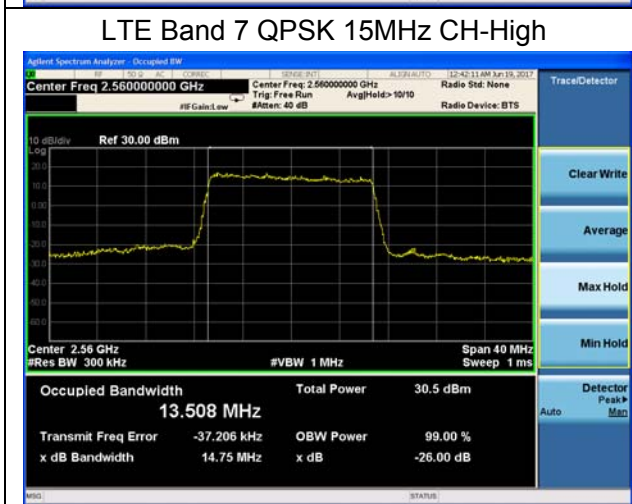
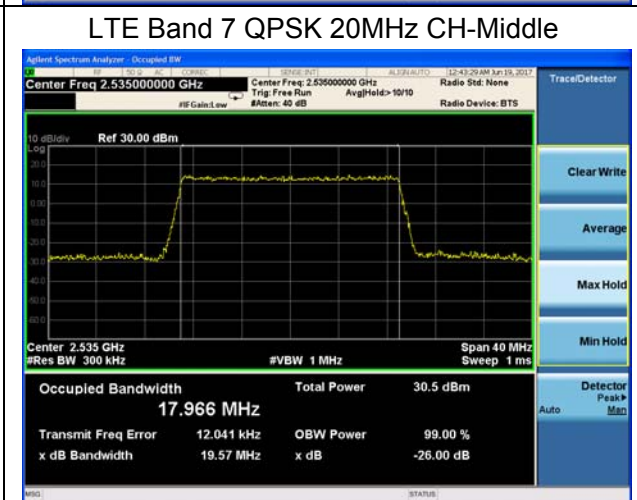
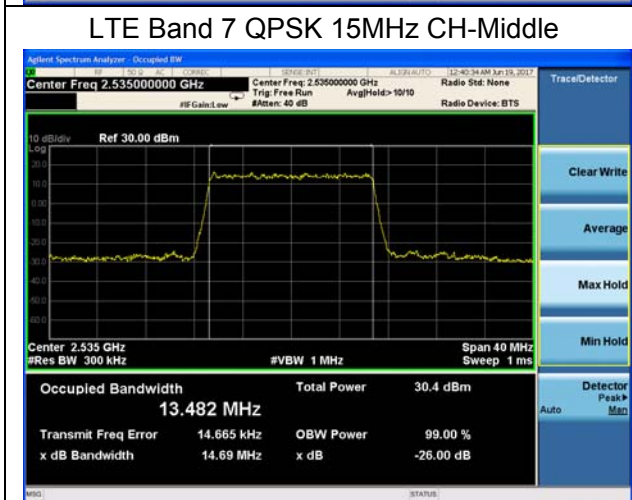
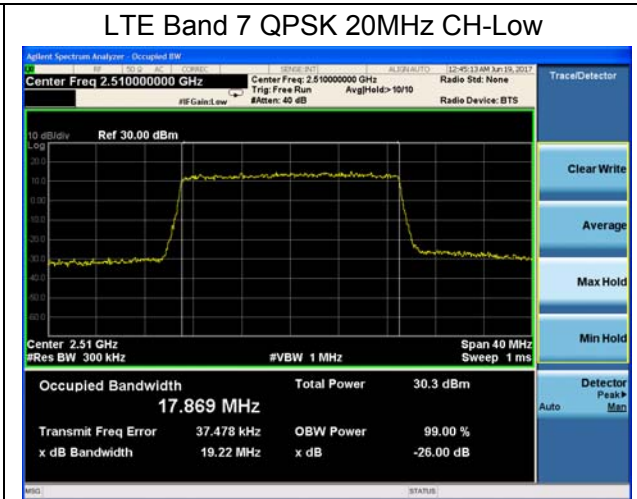
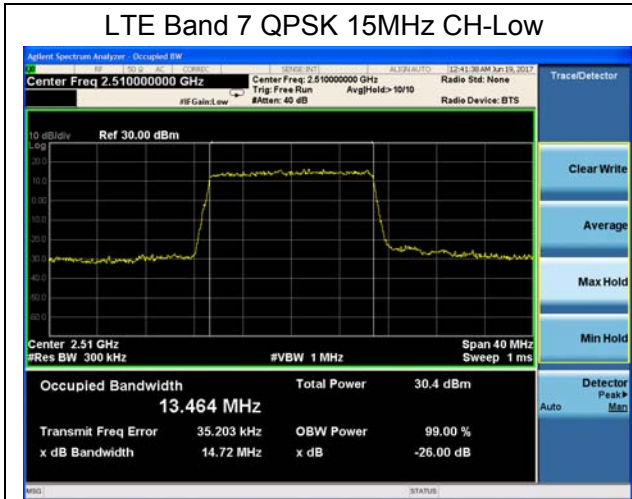


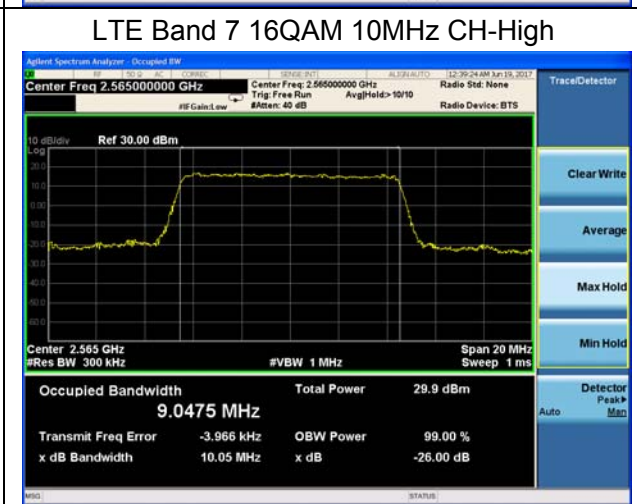
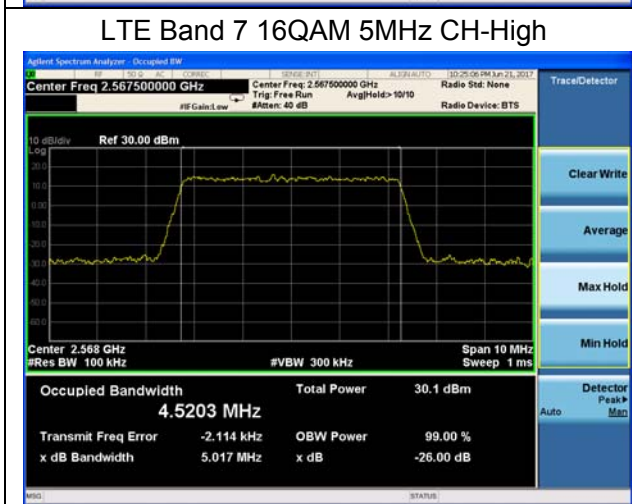
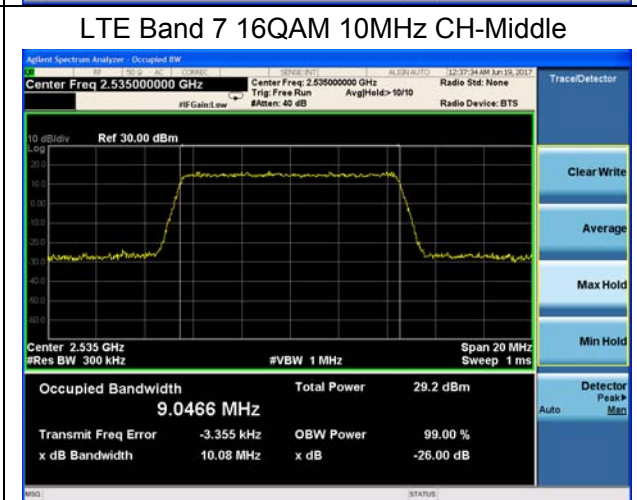
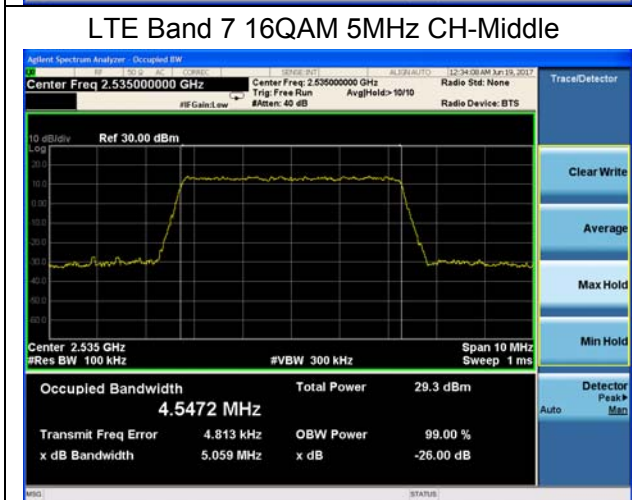
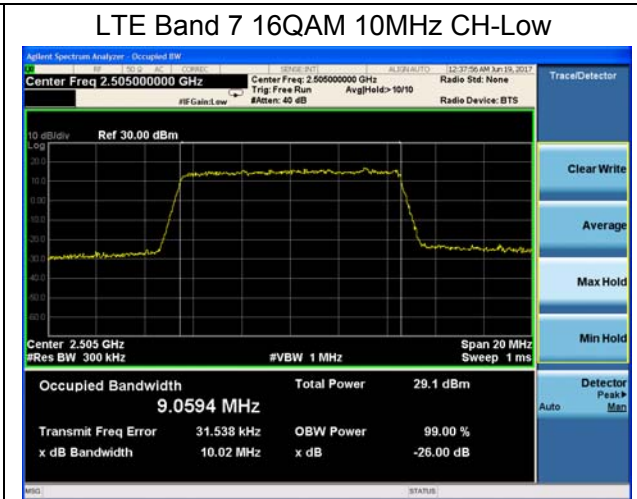
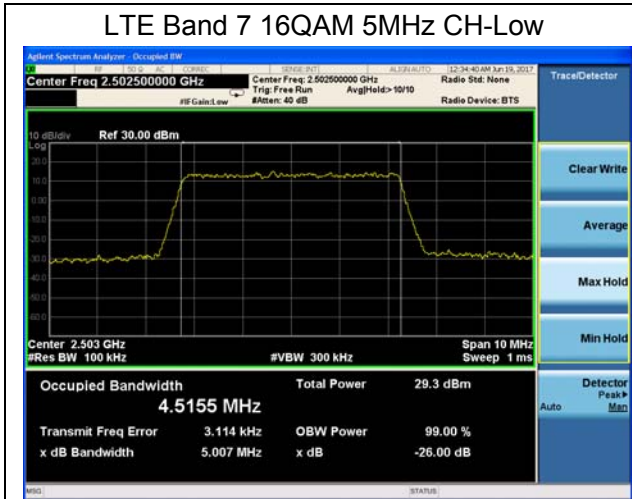


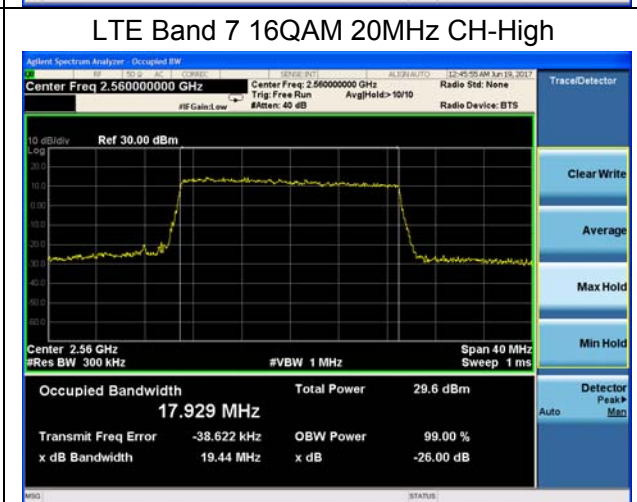
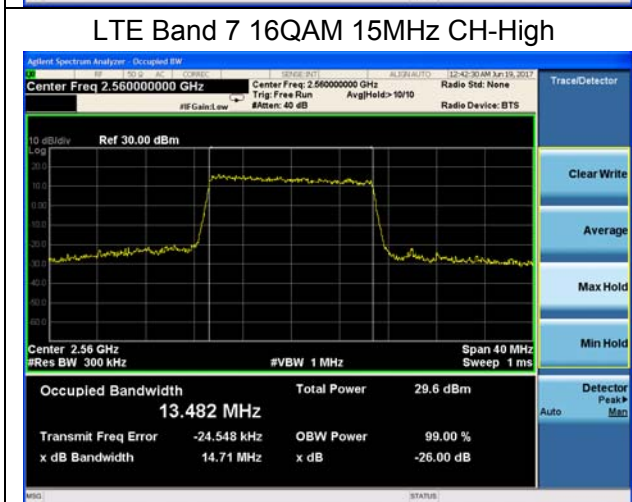
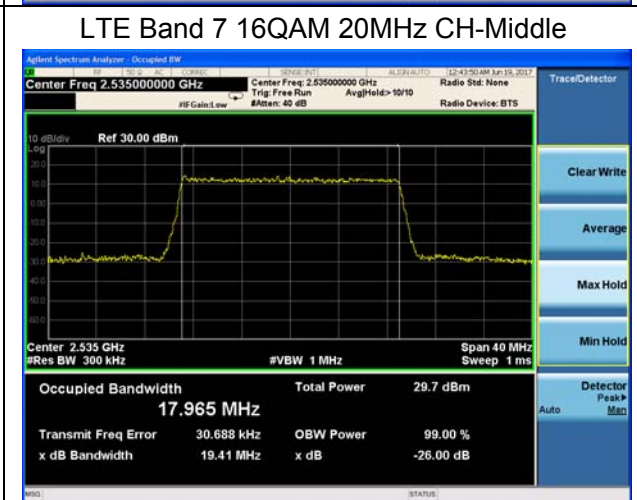
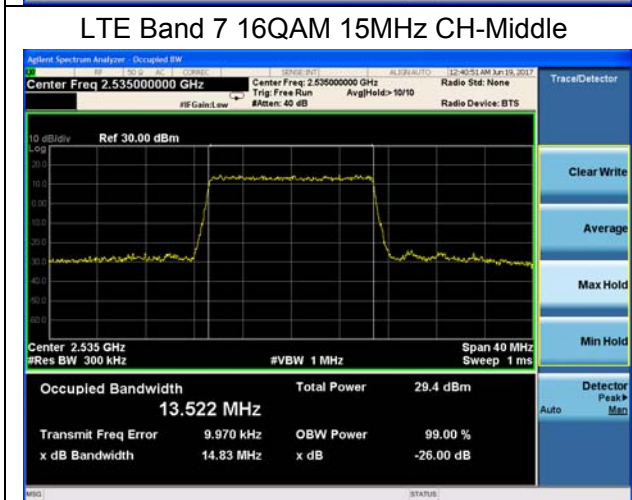
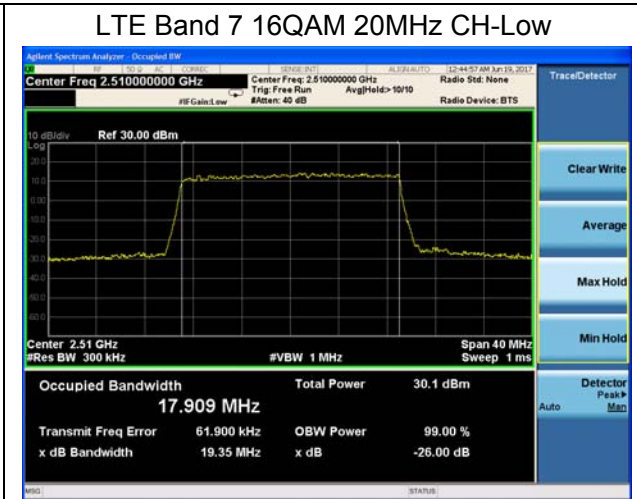
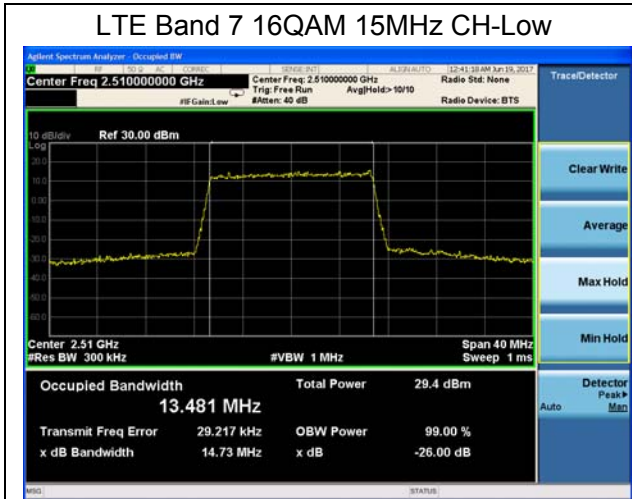












4.4 Band Edge Compliance

Ambient condition

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

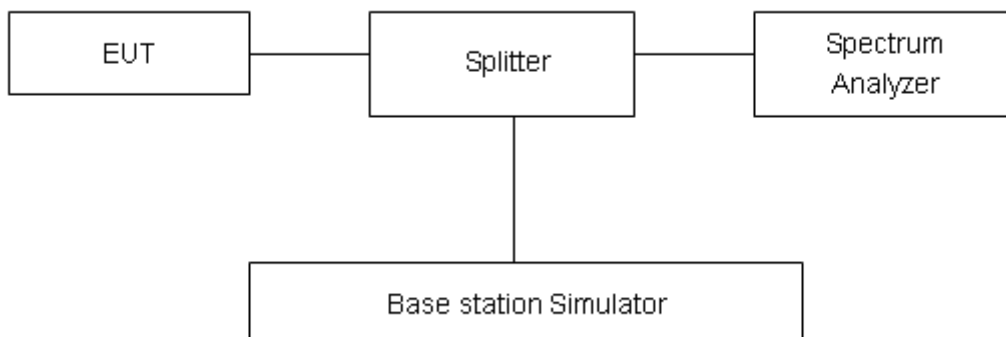
Method of Measurement

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 15 kHz, VBW is set to 51 kHz for LTE Band 4/7(1.4MHz).
 RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4/7(3MHz).
 RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/7 (5MHz).
 RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/7 (10MHz).
 RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4/7 (15MHz).
 RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4/7 (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)

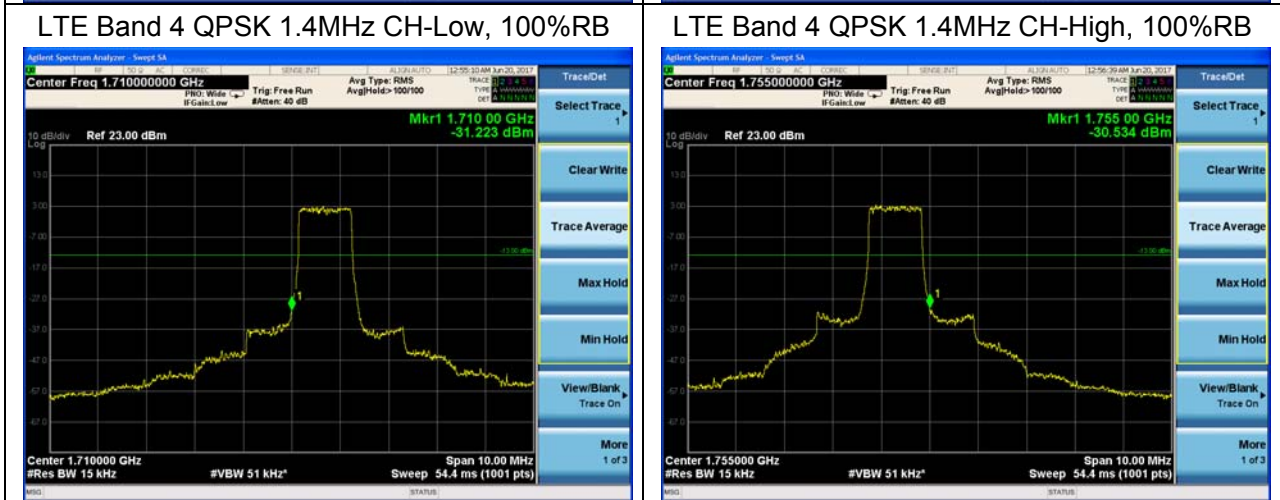
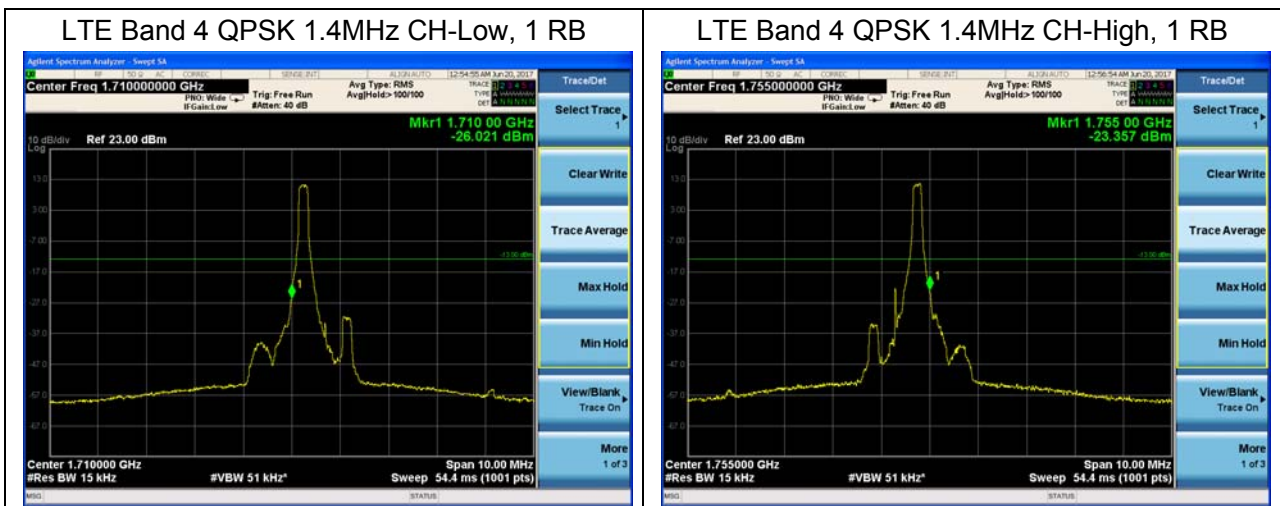
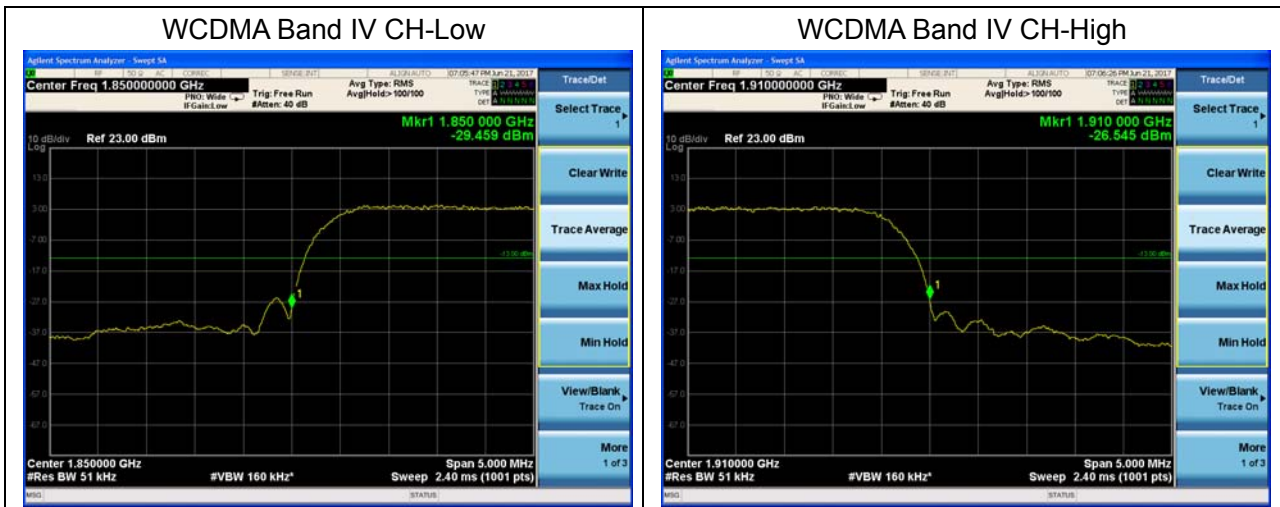
= $[30 + 10 \log (P)]$ (dBm) - $[43 + 10 \log(P)]$ (dB) = -13dBm.

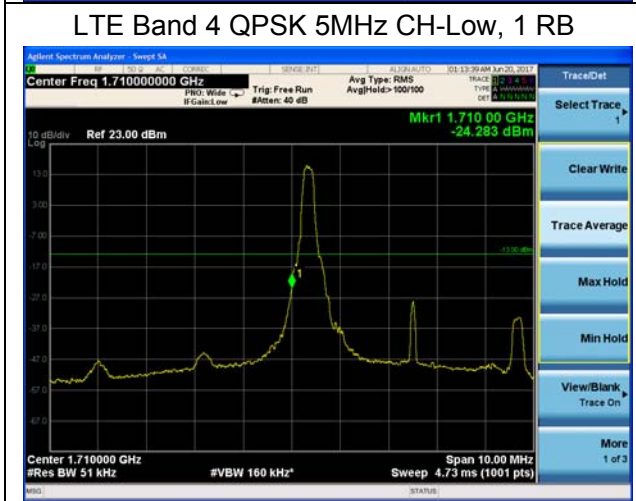
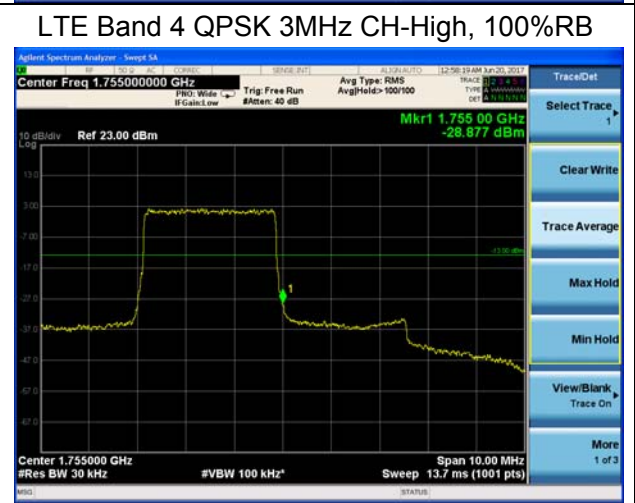
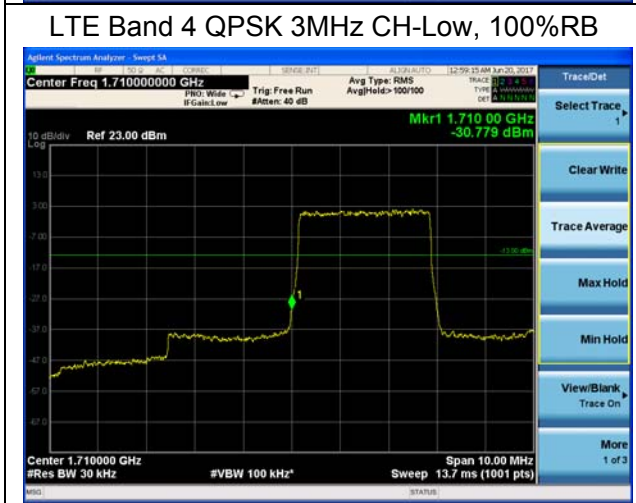
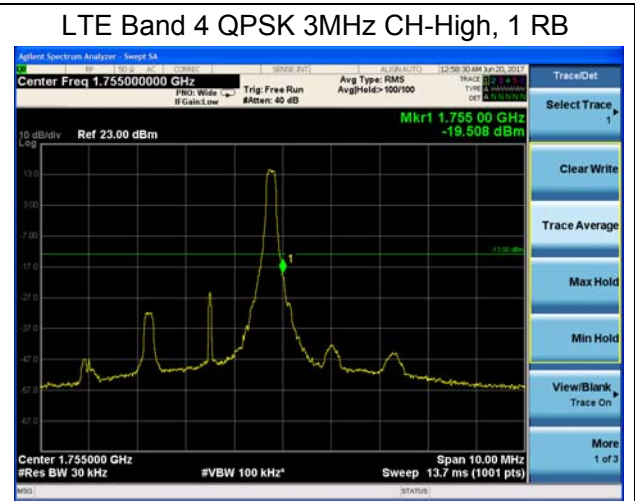
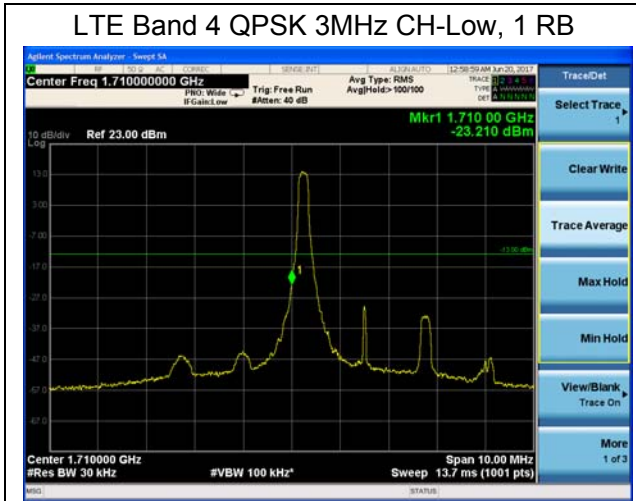
Measurement Uncertainty

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

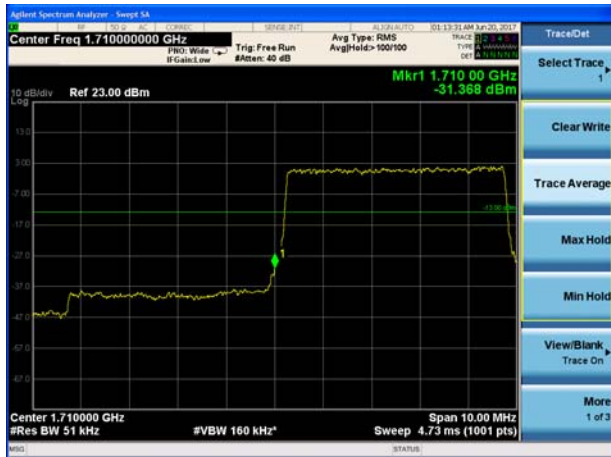
All the test traces in the plots shows the test results clearly.







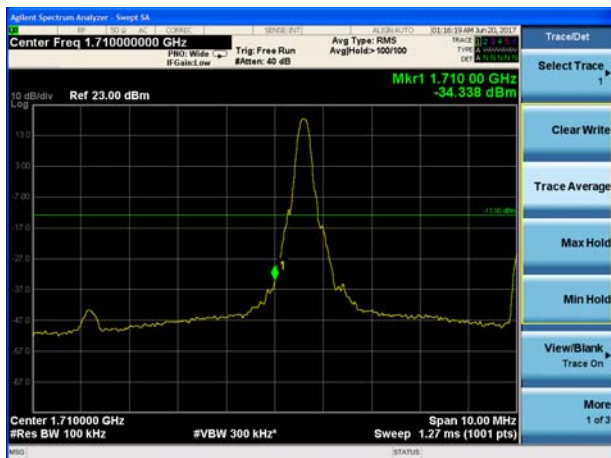
LTE Band 4 QPSK 5MHz CH-Low, 100%RB



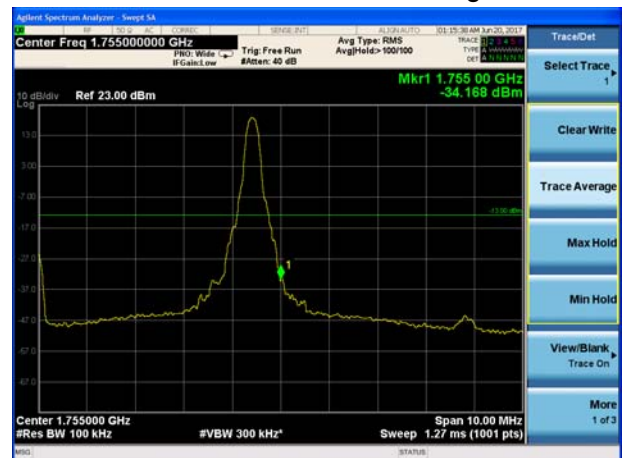
LTE Band 4 QPSK 5MHz CH-High, 100%RB



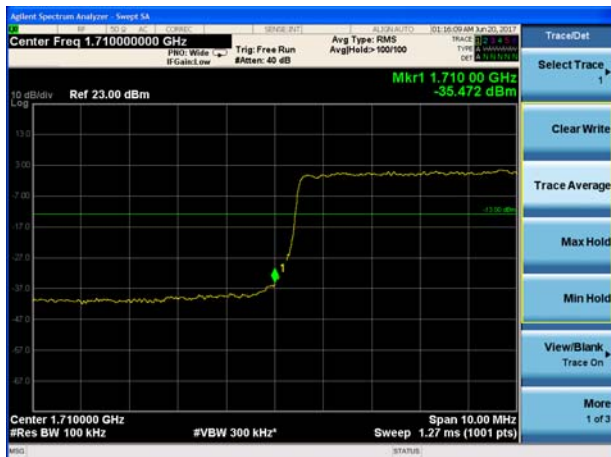
LTE Band 4 QPSK 10MHz CH-Low, 1 RB



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



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

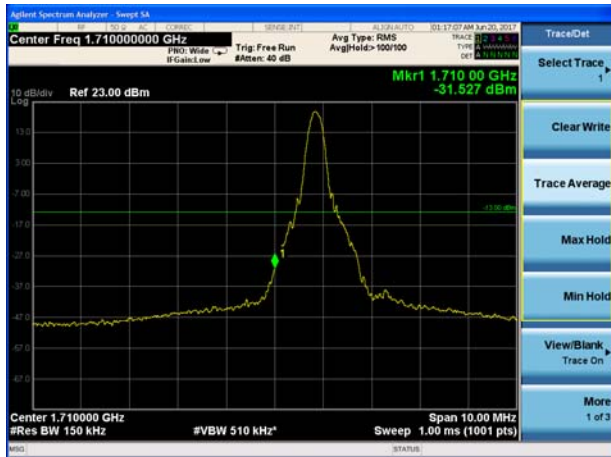


LTE Band 4 QPSK 10MHz CH-High, 100%RB

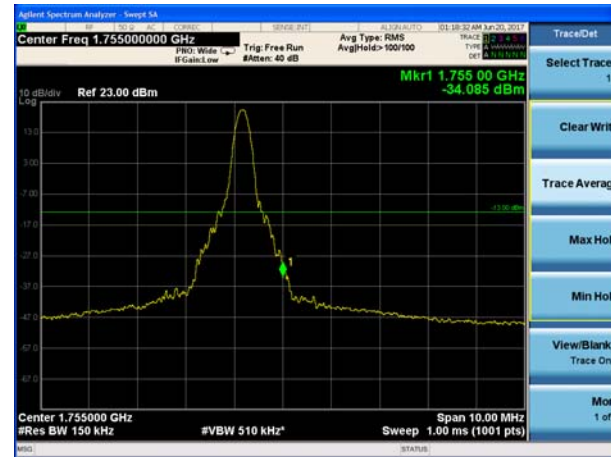




LTE Band 4 QPSK 15MHz CH-Low, 1 RB



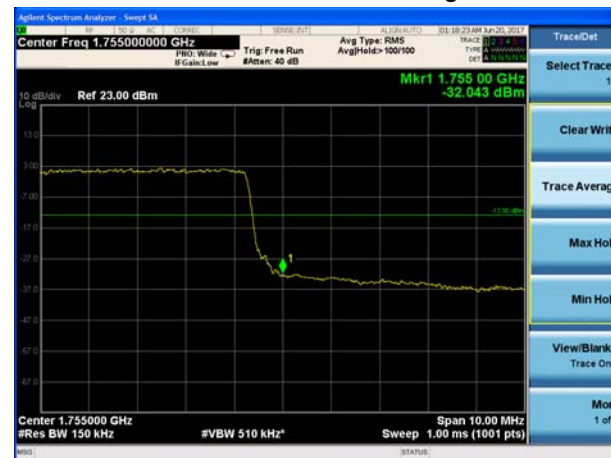
LTE Band 4 QPSK 15MHz CH-High, 1 RB



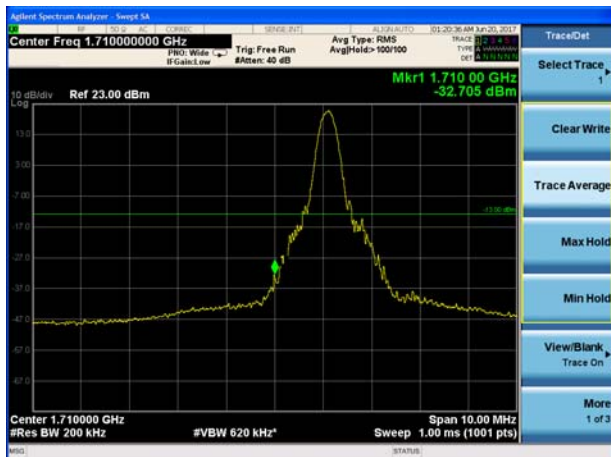
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



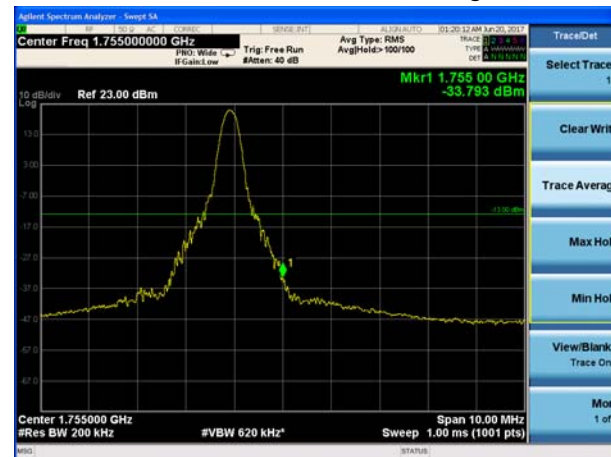
LTE Band 4 QPSK 15MHz CH-High, 100%RB



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

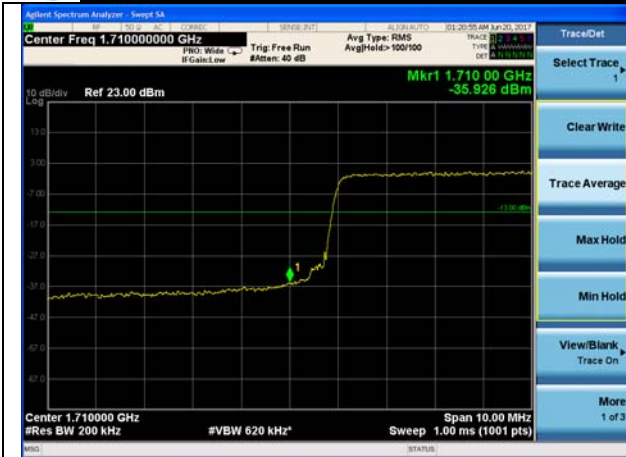


LTE Band 4 QPSK 20MHz CH-High, 1 RB



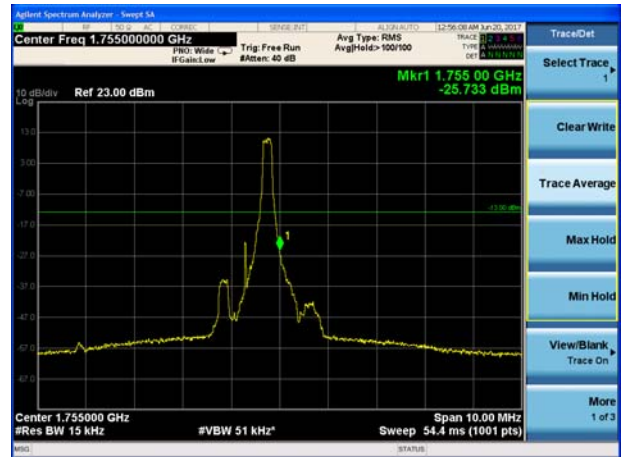
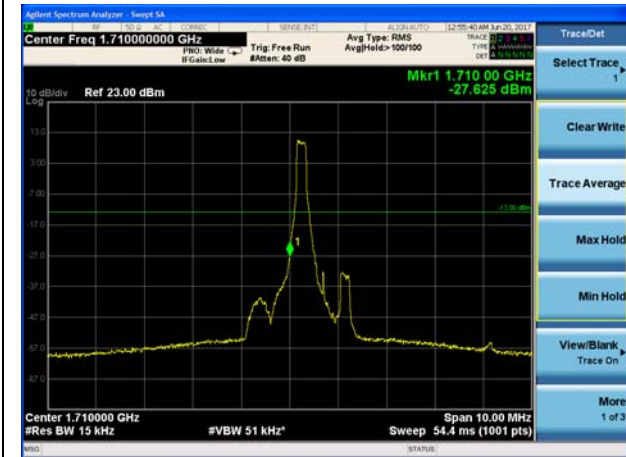
LTE Band 4 QPSK 20MHz CH-Low, 100%RB

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



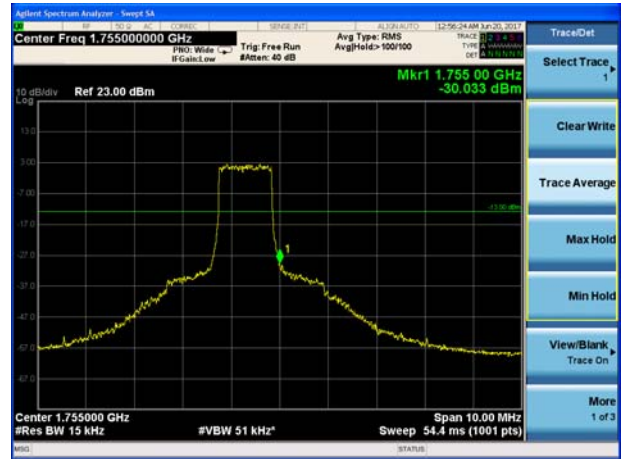
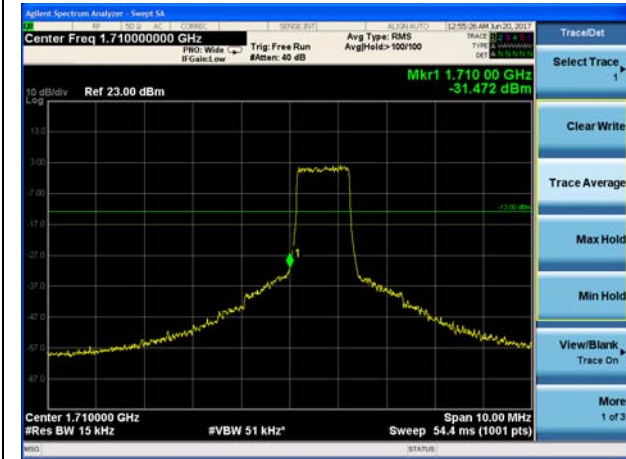
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB

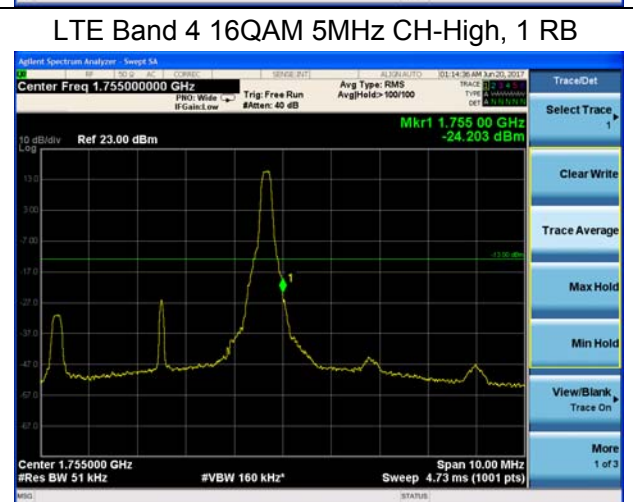
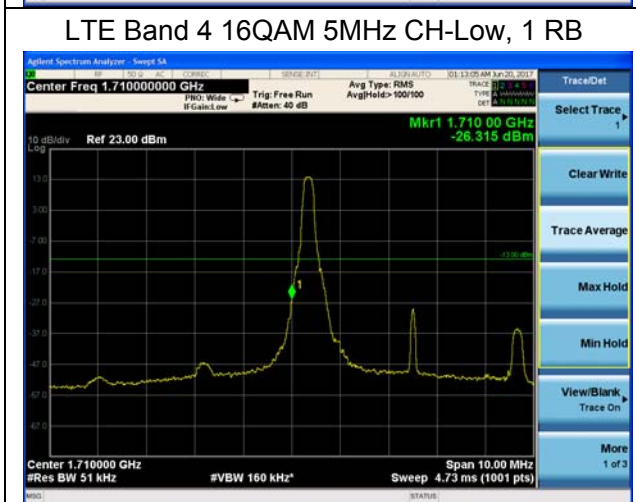
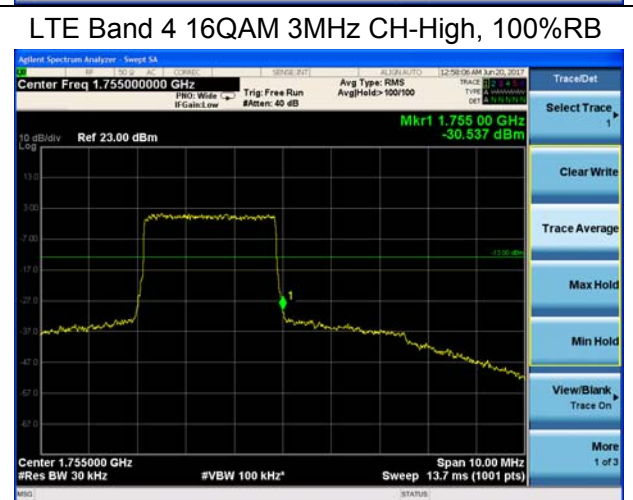
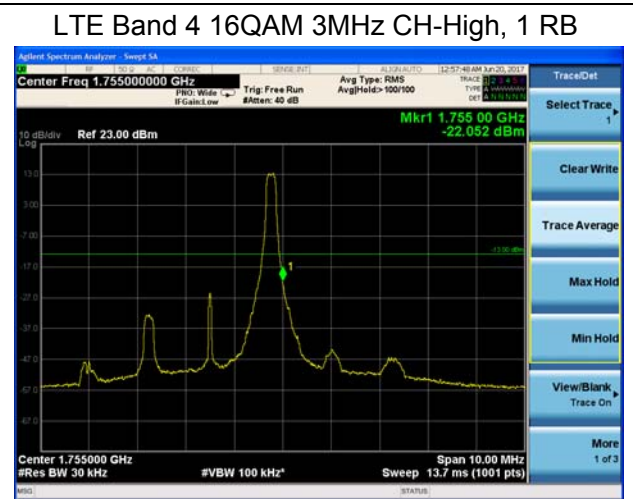
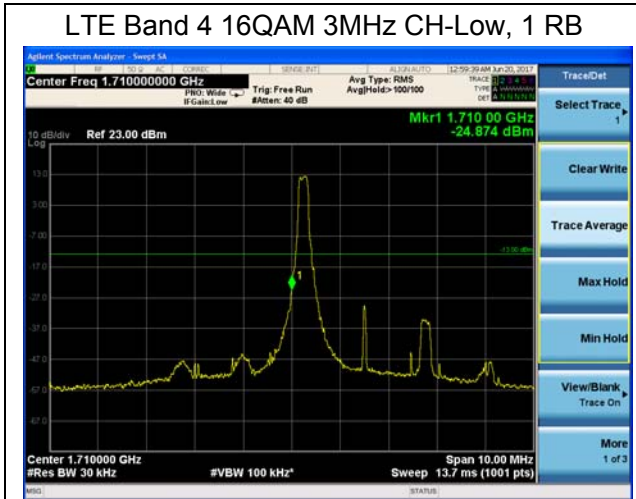
LTE Band 4 16QAM 1.4MHz CH-High, 1 RB

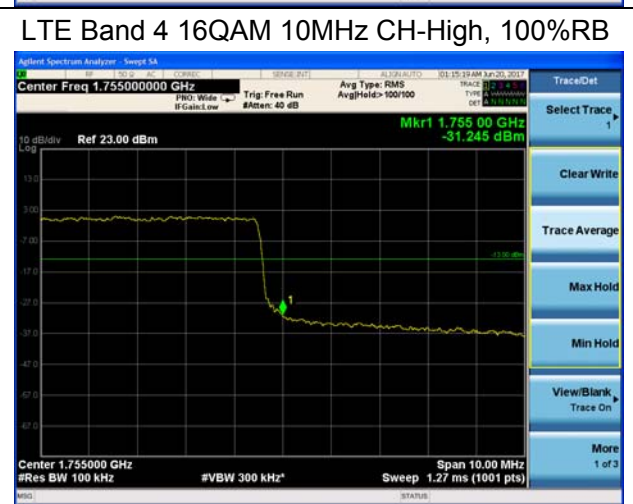
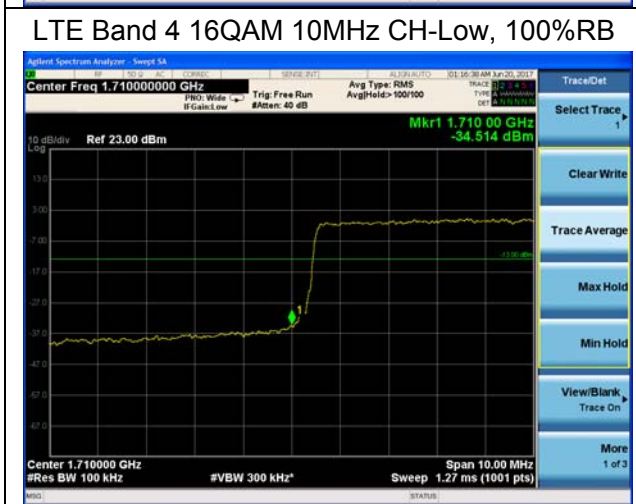
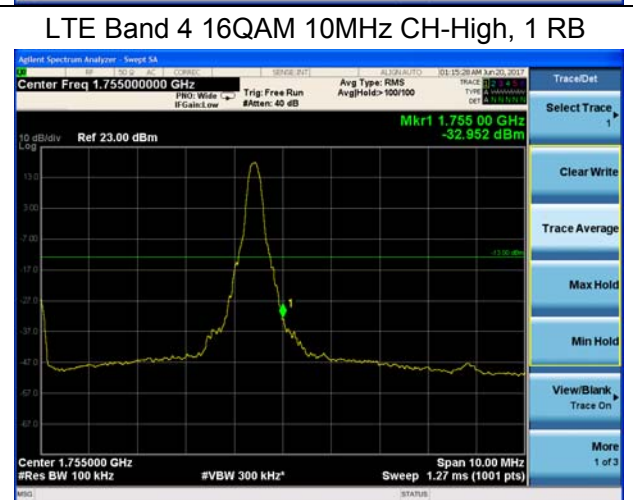
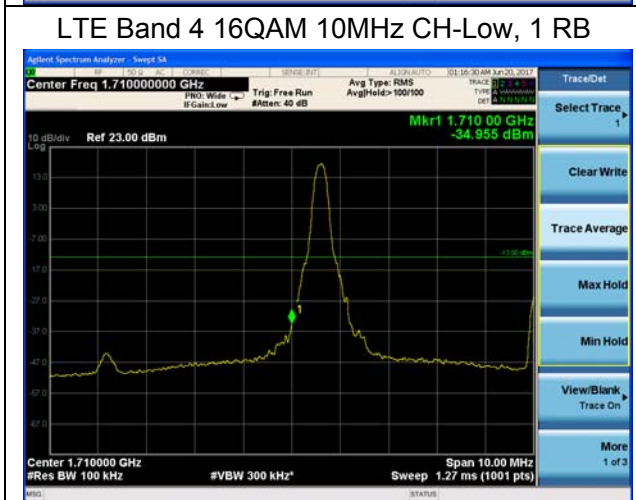
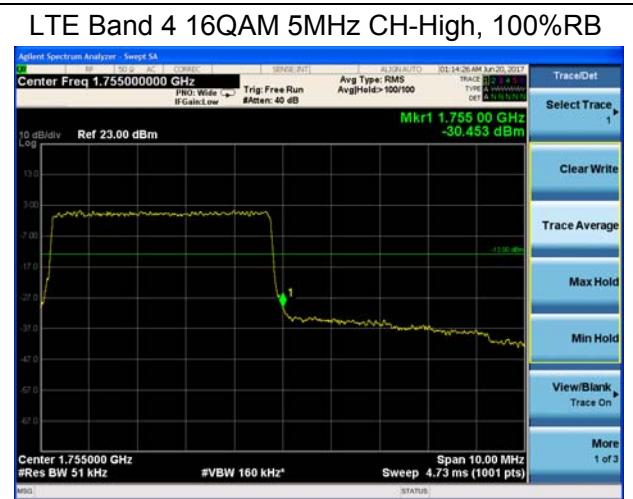
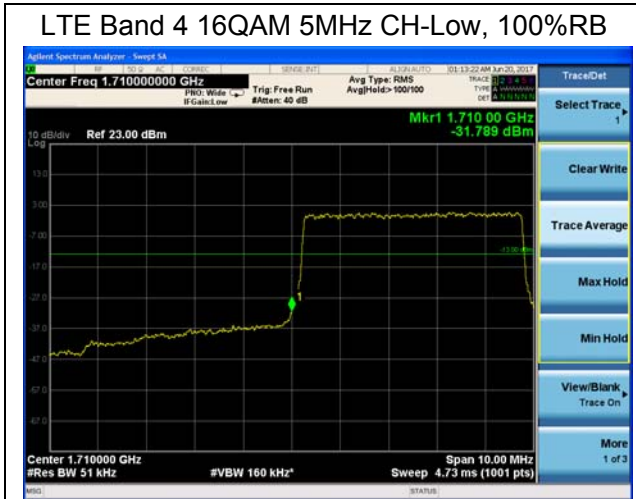


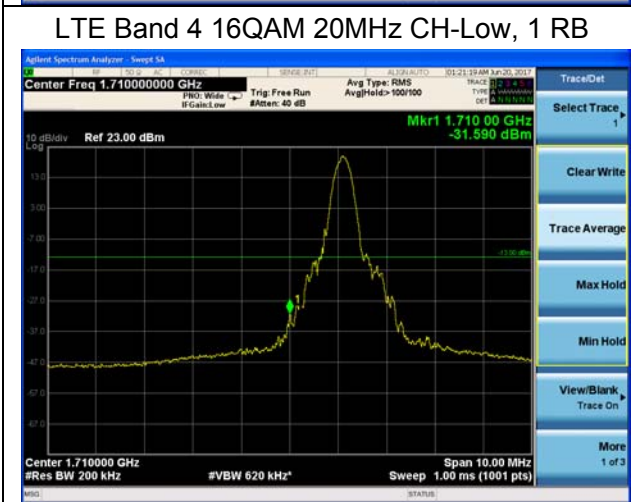
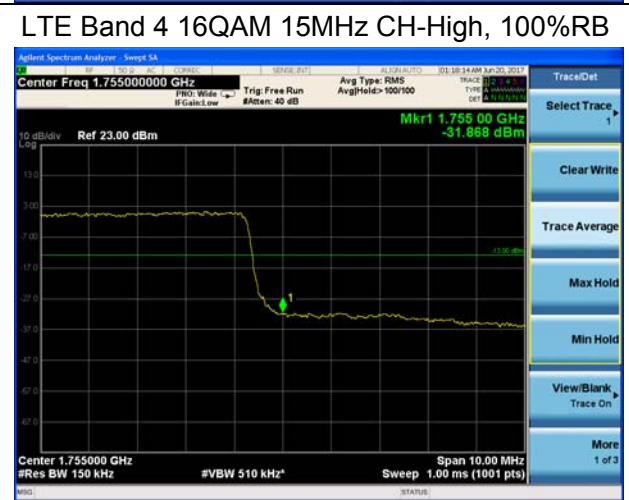
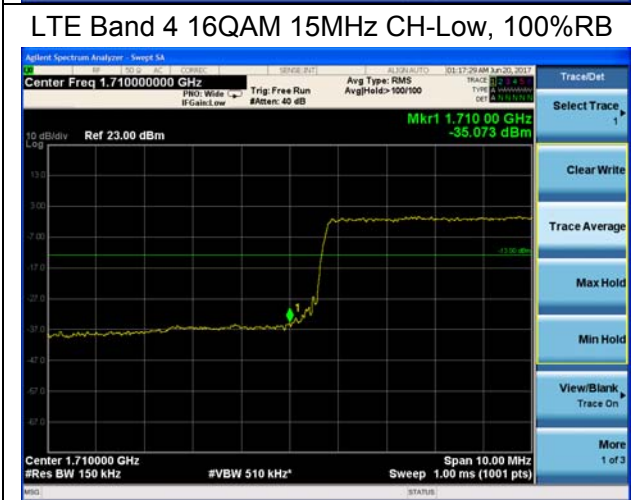
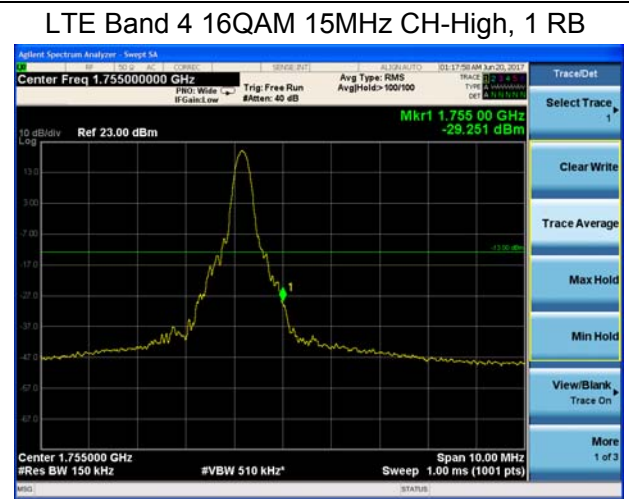
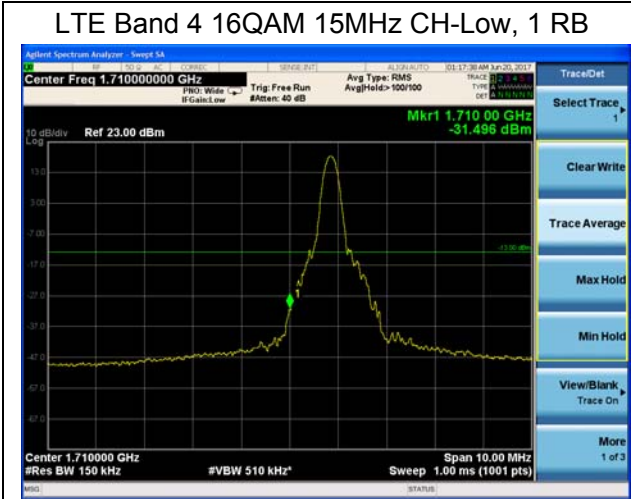
LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB

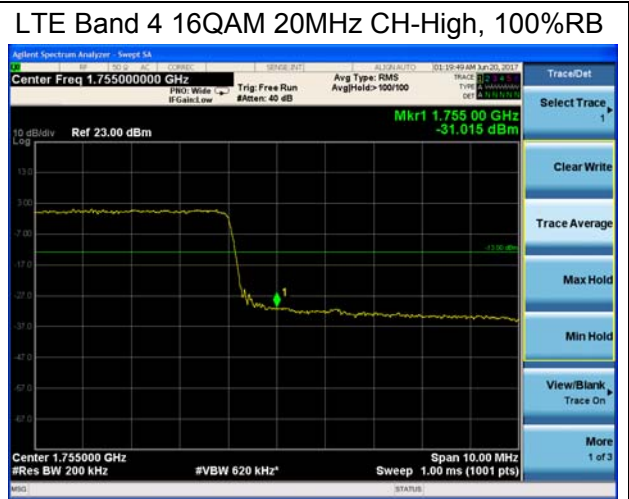
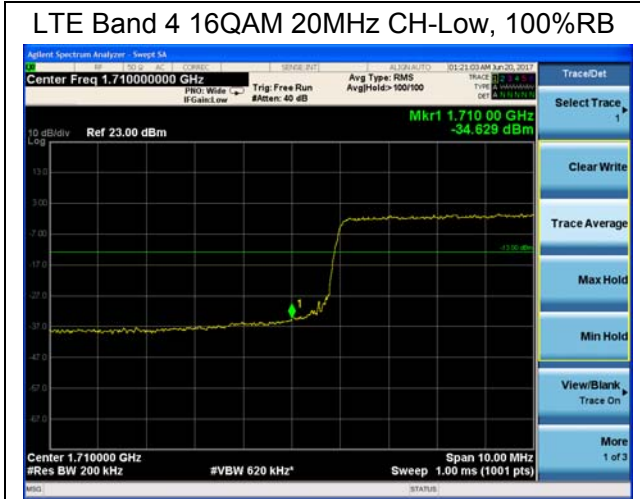
LTE Band 4 16QAM 1.4MHz CH-High, 100%RB





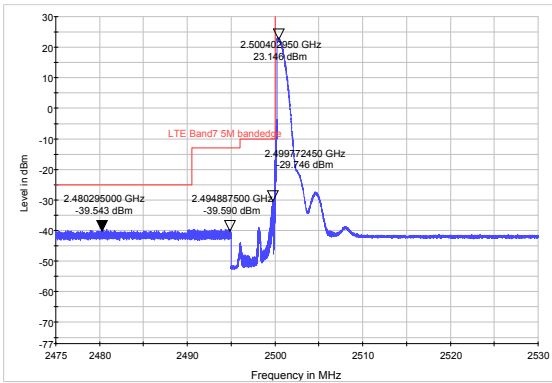




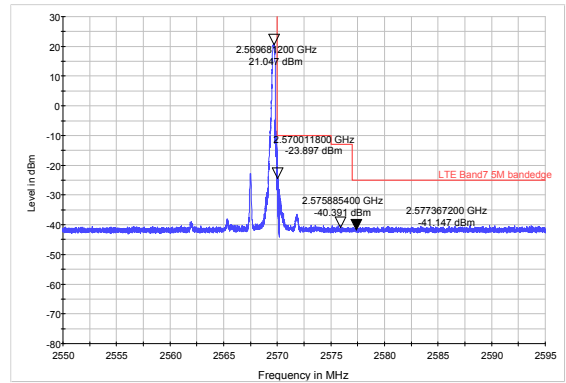




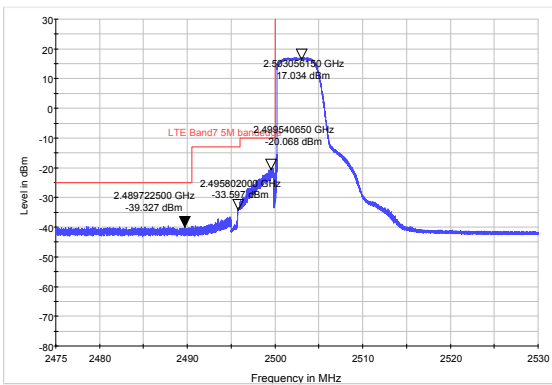
LTE Band 7 QPSK 5MHz CH-Low, 1 RB



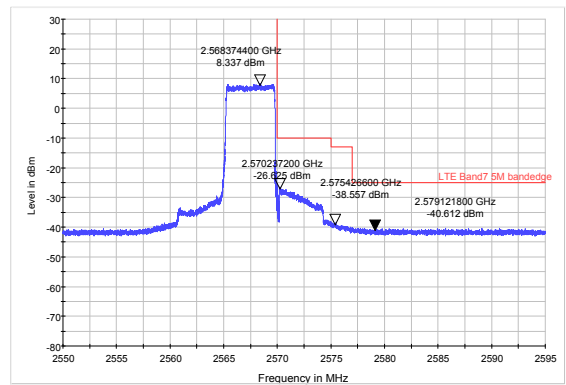
LTE Band 7 QPSK 5MHz CH-High, 1 RB



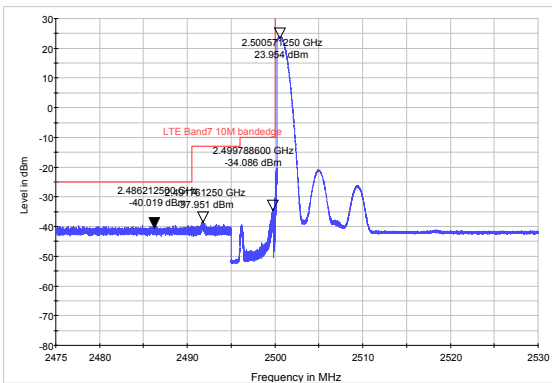
LTE Band 7 QPSK 5MHz CH-Low, 100%RB



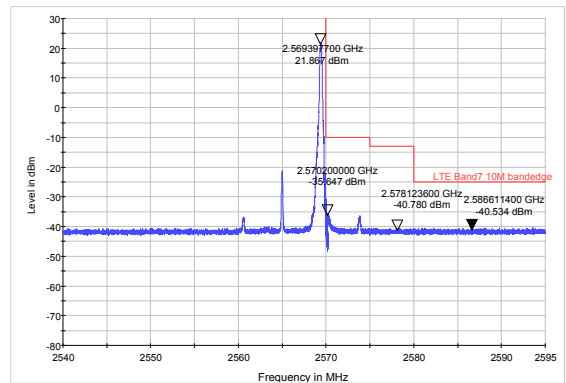
LTE Band 7 QPSK 5MHz CH-High, 100%RB



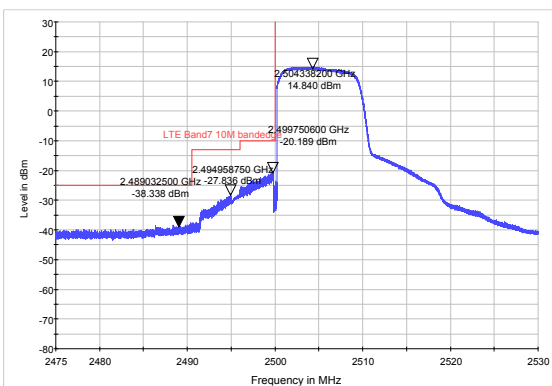
LTE Band 7 QPSK 10MHz CH-Low, 1 RB



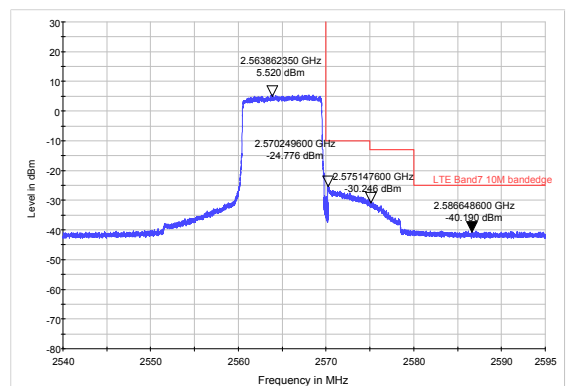
LTE Band 7 QPSK 10MHz CH-High, 1 RB



LTE Band 7 QPSK 10MHz CH-Low, 100%RB

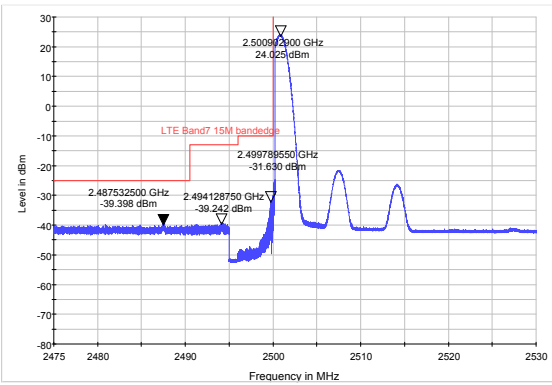


LTE Band 7 QPSK 10MHz CH-High, 100%RB

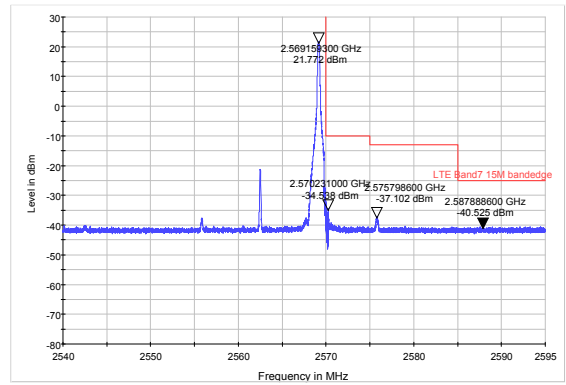




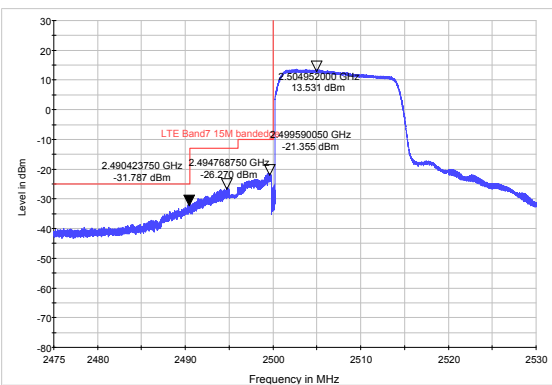
LTE Band 7 QPSK 15MHz CH-Low, 1 RB



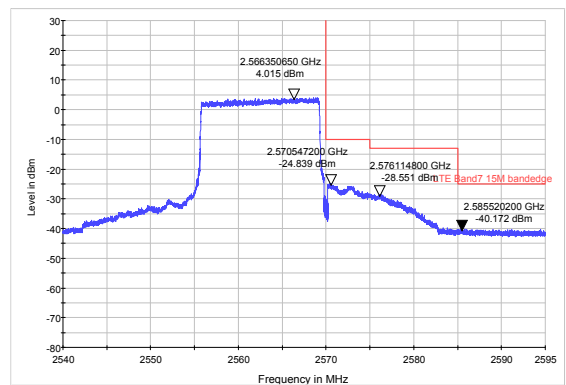
LTE Band 7 QPSK 15MHz CH-High, 1 RB



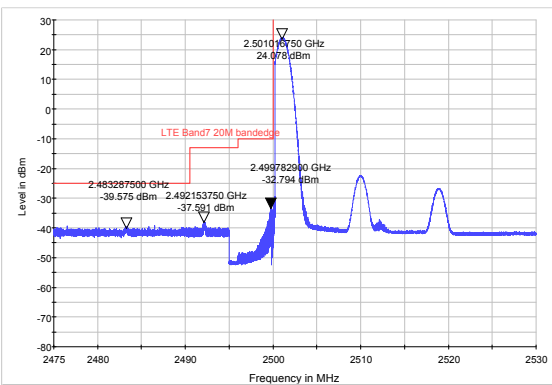
LTE Band 7 QPSK 15MHz CH-Low, 100%RB



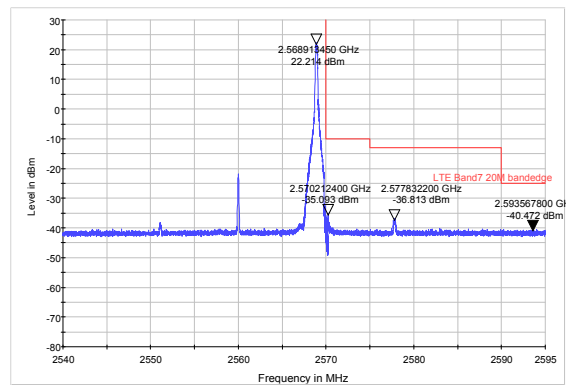
LTE Band 7 QPSK 15MHz CH-High, 100%RB



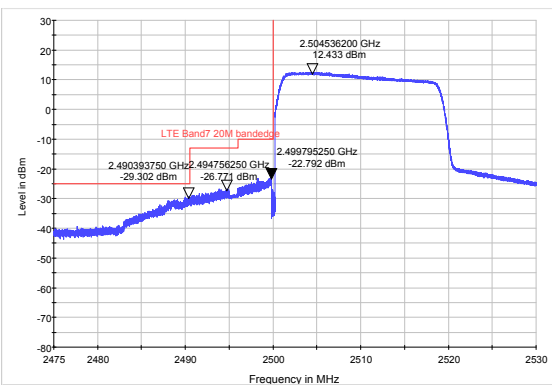
LTE Band 7 QPSK 20MHz CH-Low, 1 RB



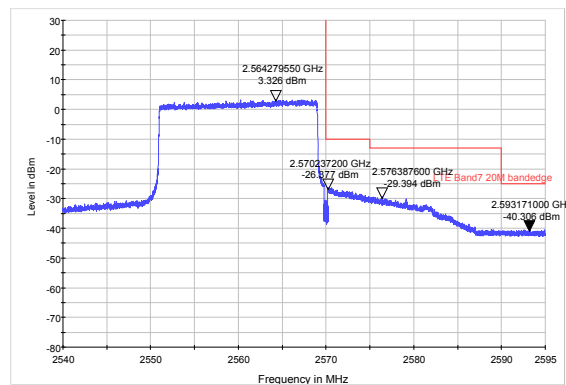
LTE Band 7 QPSK 20MHz CH-High, 1 RB



LTE Band 7 QPSK 20MHz CH-Low, 100%RB

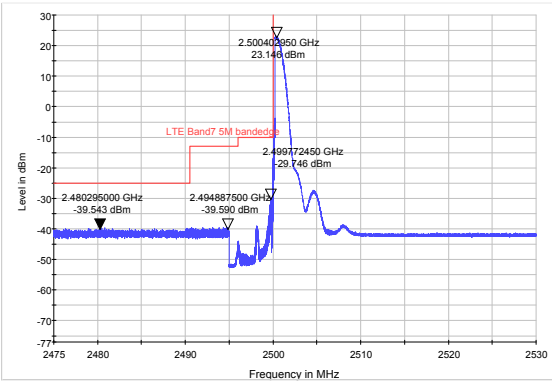


LTE Band 7 QPSK 20MHz CH-High, 100%RB

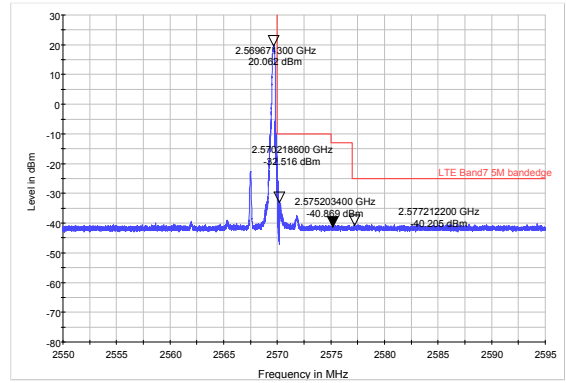




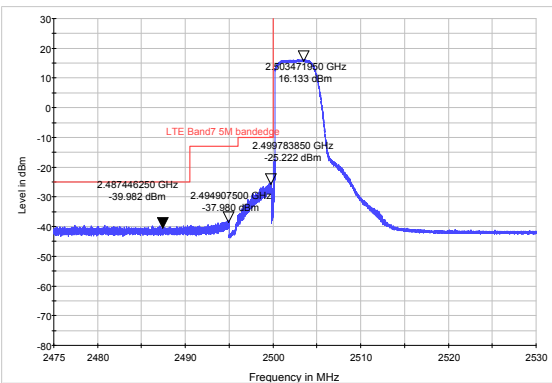
LTE Band 7 16QAM 5MHz CH-Low, 1 RB



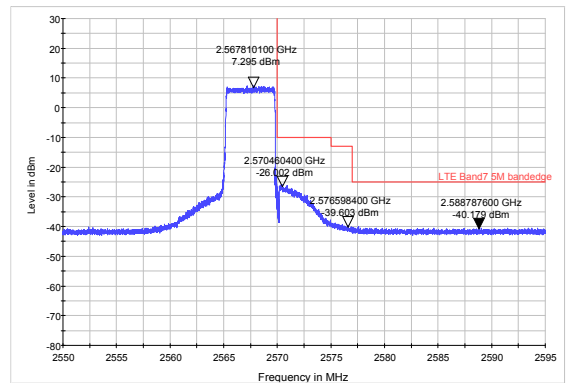
LTE Band 7 16QAM 5MHz CH-High, 1 RB



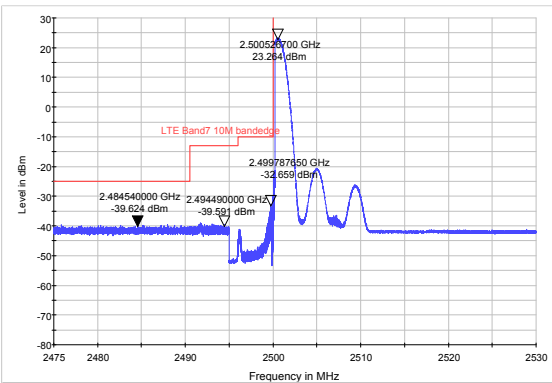
LTE Band 7 16QAM 5MHz CH-Low, 100%RB



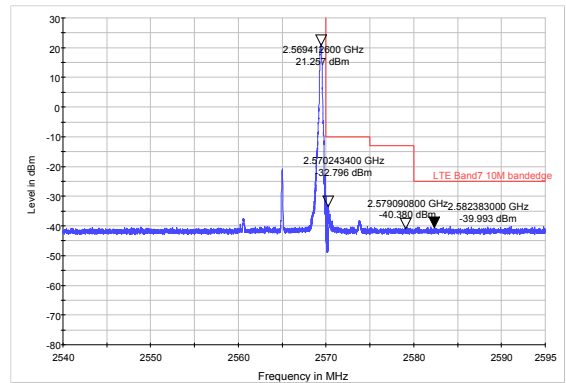
LTE Band 7 16QAM 5MHz CH-High, 100%RB



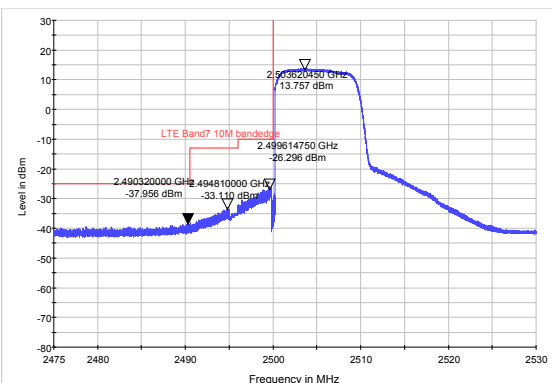
LTE Band 7 16QAM 10MHz CH-Low, 1 RB



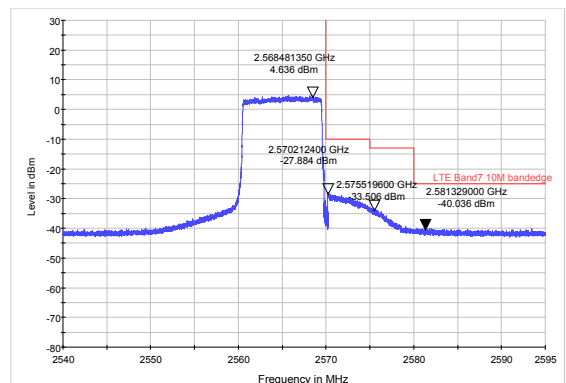
LTE Band 7 16QAM 10MHz CH-High, 1 RB



LTE Band 7 16QAM 10MHz CH-Low, 100%RB

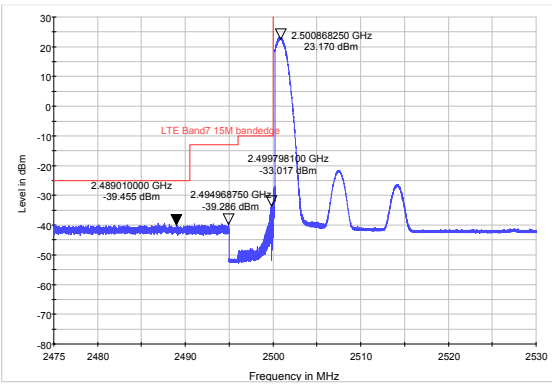


LTE Band 7 16QAM 10MHz CH-High, 100%RB

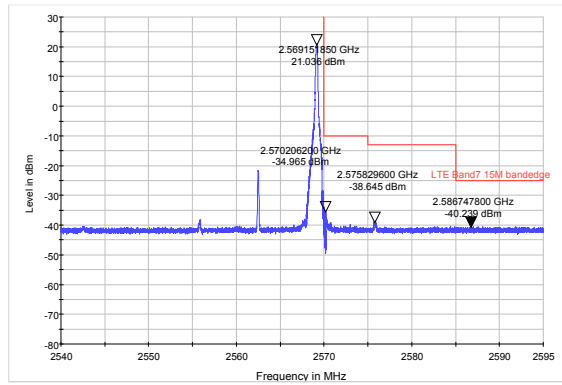




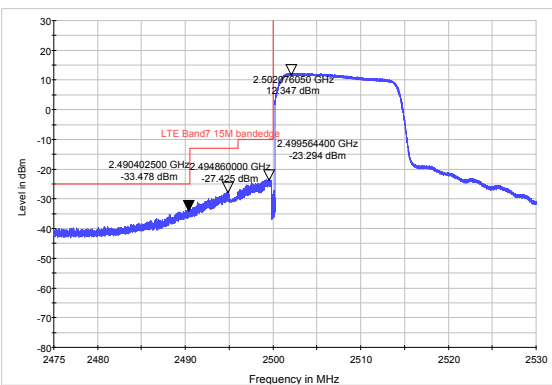
LTE Band 7 16QAM 15MHz CH-Low, 1 RB



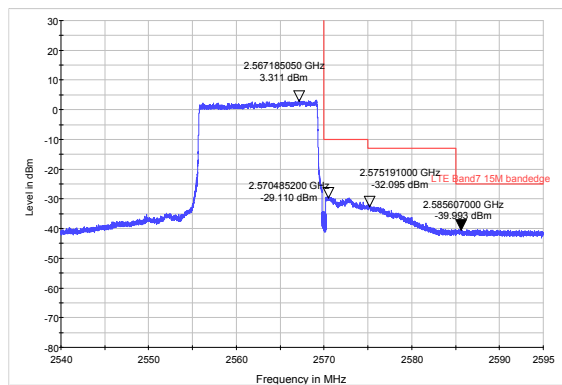
LTE Band 7 16QAM 15MHz CH-High, 1 RB



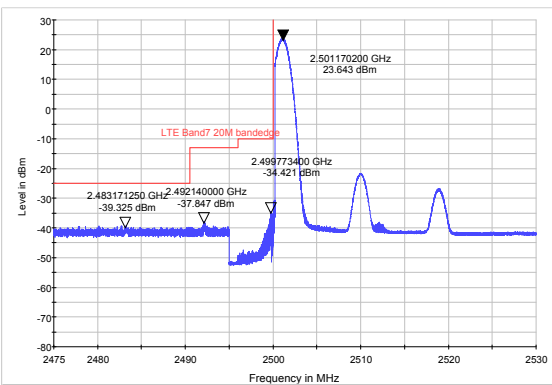
LTE Band 7 16QAM 15MHz CH-Low, 100%RB



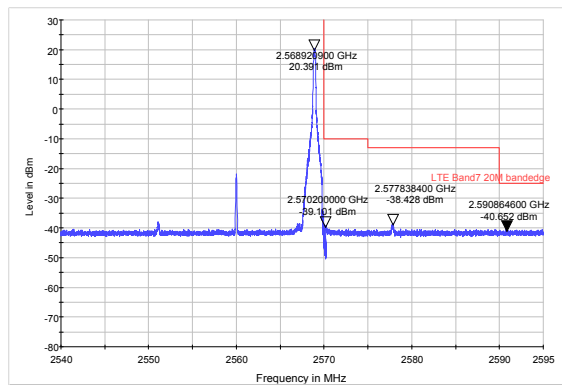
LTE Band 7 16QAM 15MHz CH-High, 100%RB



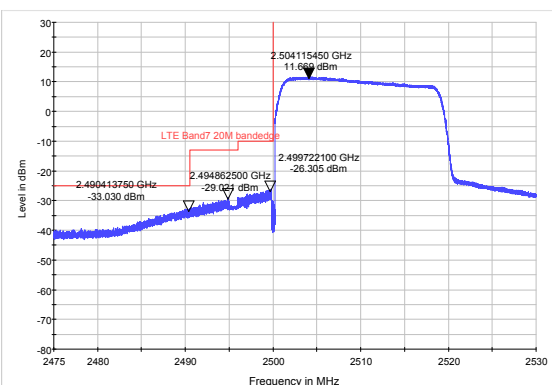
LTE Band 7 16QAM 20MHz CH-Low, 1 RB



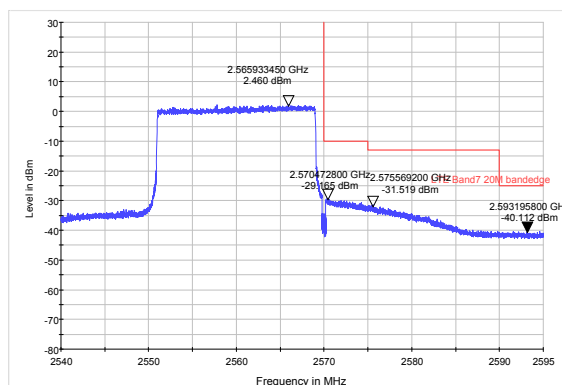
LTE Band 7 16QAM 20MHz CH-High, 1 RB



LTE Band 7 16QAM 20MHz CH-Low, 100%RB



LTE Band 7 16QAM 20MHz CH-High, 100%RB



4.5 Peak-to-Average Power Ratio (PAPR)

Ambient condition

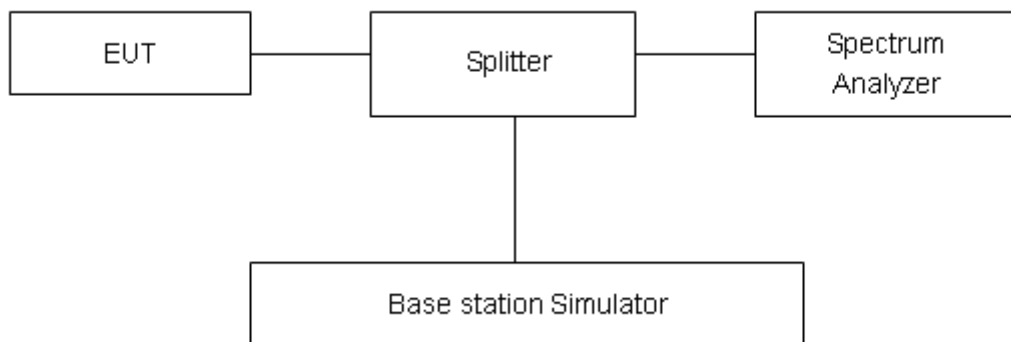
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

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

$$PAPR (dB) = Ppk (dBm) - PAvg (dBm).$$

Test Setup



Limits

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

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.4 dB.

Test Results

WCDMA Band IV	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
RMC	1312	1712.4	25.64	22.56	3.08	≤13	PASS
	1413	1732.6	25.57	22.50	3.07	≤13	PASS
	1513	1752.6	25.68	22.65	3.03	≤13	PASS

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	27.15	22.10	5.05	≤13	PASS
		20175	1732.5	26.91	22.12	4.79	≤13	PASS
		20393	1754.3	26.88	22.22	4.66	≤13	PASS
	3	19965	1711.5	27.25	22.13	5.12	≤13	PASS
		20175	1732.5	27.10	22.16	4.94	≤13	PASS
		20385	1753.5	27.07	22.25	4.82	≤13	PASS
	5	19975	1712.5	27.25	22.11	5.14	≤13	PASS
		20175	1732.5	27.13	22.15	4.98	≤13	PASS
		20375	1752.5	27.09	22.23	4.86	≤13	PASS
	10	20000	1715	27.24	22.19	5.05	≤13	PASS
		20175	1732.5	27.07	22.17	4.90	≤13	PASS
		20350	1750	27.23	22.27	4.96	≤13	PASS
	15	20025	1717.5	27.26	22.17	5.09	≤13	PASS
		20175	1732.5	27.13	22.13	5.00	≤13	PASS
		20325	1747.5	27.33	22.22	5.11	≤13	PASS
	20	20050	1720	26.95	22.14	4.81	≤13	PASS
		20175	1732.5	26.98	22.08	4.90	≤13	PASS
		20300	1745	27.25	22.18	5.07	≤13	PASS
16QAM	1.4	19957	1710.7	27.04	21.11	5.93	≤13	PASS
		20175	1732.5	26.67	21.03	5.64	≤13	PASS
		20393	1754.3	26.74	21.24	5.50	≤13	PASS
	3	19965	1711.5	27.12	21.14	5.98	≤13	PASS
		20175	1732.5	26.95	21.07	5.88	≤13	PASS
		20385	1753.5	27.00	21.27	5.73	≤13	PASS
	5	19975	1712.5	27.06	21.12	5.94	≤13	PASS
		20175	1732.5	26.83	21.03	5.80	≤13	PASS
		20375	1752.5	26.93	21.22	5.71	≤13	PASS
	10	20000	1715	27.04	21.15	5.89	≤13	PASS
		20175	1732.5	26.84	21.08	5.76	≤13	PASS
		20350	1750	27.10	21.26	5.84	≤13	PASS

	15	20025	1717.5	26.98	21.12	5.86	≤13	PASS
		20175	1732.5	26.83	21.03	5.80	≤13	PASS
		20325	1747.5	27.08	21.22	5.86	≤13	PASS
	20	20050	1720	26.80	21.10	5.70	≤13	PASS
		20175	1732.5	26.75	20.99	5.76	≤13	PASS
		20300	1745	27.10	21.19	5.91	≤13	PASS

LTE Band 7								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	20775	2502.5	27.29	22.26	5.03	≤13	PASS
		21100	2535	27.44	22.37	5.07	≤13	PASS
		21425	2567.5	27.05	22.17	4.88	≤13	PASS
	10	20800	2505	27.33	22.34	4.99	≤13	PASS
		21100	2535	27.41	22.39	5.02	≤13	PASS
		21400	2565	27.06	22.21	4.85	≤13	PASS
	15	20825	2507.5	27.38	22.32	5.06	≤13	PASS
		21100	2535	27.49	22.35	5.14	≤13	PASS
		21375	2562.5	27.01	22.16	4.85	≤13	PASS
	20	20850	2510	27.15	22.29	4.86	≤13	PASS
		21100	2535	27.38	22.30	5.08	≤13	PASS
		21350	2560	26.99	22.12	4.87	≤13	PASS
16QAM	5	20775	2502.5	27.02	21.19	5.83	≤13	PASS
		21100	2535	27.10	21.26	5.84	≤13	PASS
		21425	2567.5	26.87	21.19	5.68	≤13	PASS
	10	20800	2505	27.04	21.22	5.82	≤13	PASS
		21100	2535	27.14	21.31	5.83	≤13	PASS
		21400	2565	26.85	21.23	5.62	≤13	PASS
	15	20825	2507.5	27.06	21.19	5.87	≤13	PASS
		21100	2535	27.15	21.26	5.89	≤13	PASS
		21375	2562.5	26.82	21.19	5.63	≤13	PASS
	20	20850	2510	26.92	21.17	5.75	≤13	PASS
		21100	2535	27.09	21.22	5.87	≤13	PASS
		21350	2560	26.87	21.16	5.71	≤13	PASS