



RF TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-BLADEV9
Product LTE/WCDMA/GSM (GPRS)
Multi-Mode Digital Mobile Phone
Model ZTE BLADE V9/ZTE BLADE V0901
Report No. R1803A0088-R3
Issue Date April 13, 2018

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.

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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: December 11, 2017 ~ January 2, 2018 and March 8, 2018 ~ April 7, 2018			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			

1 Test Laboratory

1.1 Notes of the Test Report

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

1.2 Test facility

CNAS (accreditation number: L2264)

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

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

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

IC (recognition number is 8510A)

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

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

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

A2LA (Certificate Number: 3857.01)

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

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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City: Shanghai
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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 V9/ZTE BLADE V0901		
IMEI/MEID/SN	867098030002394		
Hardware Version	udxC		
Software Version	MVS_CL_V9_V1.1		
Flash	3+32		
Power Supply	Battery/AC adapter		
Antenna Type	Internal Antenna		
Test Mode(s)	WCDMA Band IV; LTE Band 4, LTE Band 7		
Test Modulation	(WCDMA)QPSK; (LTE)QPSK 16QAM ;		
HSDPA UE Category	24		
HSUPA UE Category	8		
LTE Category	6		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV:	22.73dBm	
	LTE Band 4:	20.92 dBm	
	LTE Band 7:	19.77 dBm	
Rated Power Supply Voltage:	3.85V		
Extreme Voltage	Minimum: 3.4V Maximum: 4.4V		
Extreme Temperature	Lowest: -30°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			
Adapter 1	Manufacturer: Salcomp (Shenzhen) Co., Ltd. Model: STC-A521A-Z		
Adapter 2	Manufacture: SHENZHEN RUIJING INDUSTRIAL CO LTD		



	Model : STC-A521A-Z
Battery	Manufacturer: Zhongshan Tianmao Battery Co., Ltd Model: Li3931T44P8h806139
Earphone	Manufacturer: GoerTek Inc Model: HA3-6
USB Extend Cable 1	Manufacturer: LUXSHARE-ICT 100cm Cable, Shielded
USB Extend Cable 2	Manufacturer: kingpower-tech 100cm Cable, Shielded
Note: 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-E (2016)

KDB 971168 D01 Power Meas License Digital Systems v03

4 Test Configuration

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

5 Test Case Results

5.1 RF Power Output

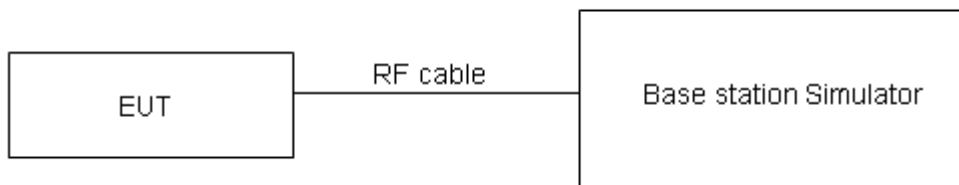
Ambient condition

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

Methods of Measurement

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

Test Setup



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

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

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

Test Results

WCDMA Band IV		Conducted Power(dBm)		
		Channel 1312	Channel 1413	Channel 1513
		1712.4(MHz)	1732.6(MHz)	1752.6(MHz)
RMC		22.56	22.54	22.38
HSDPA	Sub - Test 1	22.15	21.93	22.09
	Sub - Test 2	22.16	21.91	22.04
	Sub - Test 3	21.67	21.39	21.23
	Sub - Test 4	21.69	21.38	21.31
HSUPA	Sub - Test 1	22.17	21.84	22.05
	Sub - Test 2	22.23	21.90	22.09
	Sub - Test 3	21.66	21.42	21.40
	Sub - Test 4	22.19	21.89	22.11
	Sub - Test 5	22.16	21.88	22.08
DC-HSDPA	Sub - Test 1	22.09	21.88	22.05
	Sub - Test 2	22.11	21.87	22.01
	Sub - Test 3	21.65	21.35	21.22
	Sub - Test 4	21.66	21.32	21.29
HSPA+	16QAM	20.40	20.40	20.22

LTE Band 4				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
1.4MHz	QPSK	1	0	22.98	22.89	22.80
		1	2	23.01	22.86	22.92
		1	5	22.89	22.67	22.71
		3	0	22.98	22.95	22.78
		3	2	22.91	22.94	22.83
		3	3	22.85	22.64	22.66
		6	0	21.80	21.88	21.90
	16QAM	1	0	22.13	21.99	21.88
		1	2	22.16	22.05	22.11
		1	5	22.07	21.91	21.91
		3	0	21.91	21.98	21.82
		3	2	21.95	21.96	21.79
		3	3	21.75	21.74	21.78
		6	0	20.93	20.96	20.90

Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	23.00	22.93	22.83
		1	7	23.04	22.91	22.96
		1	14	22.92	22.72	22.75
		8	0	22.08	22.07	21.91
		8	4	22.03	22.04	21.95
		8	7	21.95	21.75	21.76
		15	0	21.83	21.92	21.93
	16QAM	1	0	22.16	22.01	21.91
		1	7	22.19	22.10	22.15
		1	14	22.09	21.95	21.94
		8	0	21.02	21.11	20.94
		8	4	21.06	21.09	20.91
		8	7	20.85	20.86	20.91
		15	0	20.96	21.00	20.93
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.97	22.91	22.79
		1	13	23.02	22.87	22.93
		1	24	22.89	22.67	22.71
		12	0	22.05	22.02	21.87
		12	6	22.01	22.00	21.90
		12	13	21.93	21.73	21.72
		25	0	21.81	21.91	21.91
	16QAM	1	0	22.13	21.97	21.88
		1	13	22.16	22.08	22.12
		1	24	22.06	21.93	21.90
		12	0	21.00	21.07	20.91
		12	6	21.03	21.04	20.87
		12	13	20.82	20.81	20.87
		25	0	20.94	20.96	20.88
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	22.99	22.92	22.82
		1	25	23.05	22.92	22.97
		1	49	22.91	22.71	22.74
		25	0	22.08	22.07	21.91
		25	13	22.04	22.05	21.94
		25	25	21.95	21.77	21.77
		50	0	21.89	21.93	21.95
	16QAM	1	0	22.15	22.00	21.90
		1	25	22.19	22.12	22.15

		1	49	22.09	21.95	21.93
		25	0	21.03	21.12	20.95
		25	13	21.05	21.08	20.90
		25	25	20.85	20.86	20.91
		50	0	20.97	21.01	20.92
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	22.98	22.88	22.80
		1	38	23.03	22.91	22.94
		1	74	22.88	22.66	22.70
		36	0	22.06	22.03	21.88
		36	18	22.01	22.00	21.90
		36	39	21.92	21.74	21.73
		75	0	21.87	21.89	21.90
	16QAM	1	0	22.10	21.98	21.88
		1	38	22.17	22.09	22.13
		1	74	22.06	21.91	21.90
		36	0	21.00	21.10	20.92
		36	18	21.02	21.03	20.86
		36	39	20.83	20.82	20.88
		75	0	20.94	20.96	20.88
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	22.95	22.84	22.77
		1	50	23.12	22.87	22.92
		1	99	22.86	22.65	22.67
		50	0	22.03	21.98	21.84
		50	25	21.99	21.96	21.87
		50	50	21.89	21.69	21.69
		100	0	21.84	21.84	21.86
	16QAM	1	0	22.08	21.94	21.83
		1	50	22.13	22.07	22.09
		1	99	22.04	21.88	21.88
		50	0	20.97	21.06	20.89
		50	25	20.99	21.01	20.83
		50	50	20.80	20.77	20.84
		100	0	20.92	20.92	20.85

LTE 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	23.74	23.37	23.40
		1	13	23.79	23.38	23.45
		1	24	23.48	23.23	23.57
		12	0	22.69	22.42	22.60
		12	6	22.73	22.45	22.56
		12	13	22.61	22.44	22.62
		25	0	22.63	22.44	22.59
	16QAM	1	0	22.53	22.36	22.27
		1	13	22.56	22.42	22.50
		1	24	22.62	22.31	22.53
		12	0	21.76	21.36	21.64
		12	6	21.73	21.37	21.65
		12	13	21.68	21.42	21.61
		25	0	21.71	21.43	21.60
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	23.76	23.38	23.43
		1	25	23.82	23.43	23.49
		1	49	23.50	23.27	23.60
		25	0	22.72	22.47	22.64
		25	13	22.76	22.50	22.60
		25	25	22.63	22.48	22.67
		50	0	22.71	22.46	22.63
	16QAM	1	0	22.55	22.39	22.29
		1	25	22.59	22.46	22.53
		1	49	22.65	22.33	22.56
		25	0	21.79	21.41	21.68
		25	13	21.75	21.41	21.68
		25	25	21.71	21.47	21.65
		50	0	21.74	21.48	21.64
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20825/2507.5	21100/2535	21375/2562.5
15MHz	QPSK	1	0	23.75	23.34	23.41
		1	38	23.80	23.42	23.46
		1	74	23.47	23.22	23.56
		36	0	22.70	22.43	22.61
		36	18	22.73	22.45	22.56
		36	39	22.60	22.45	22.63
		75	0	22.69	22.42	22.58



	16QAM	1	0	22.50	22.37	22.27
		1	38	22.57	22.43	22.51
		1	74	22.62	22.29	22.53
		36	0	21.76	21.39	21.65
		36	18	21.72	21.36	21.64
		36	39	21.69	21.43	21.62
		75	0	21.71	21.43	21.60
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20850/2510	21100/2535	21350/2560
20MHz	QPSK	1	0	23.72	23.30	23.38
		1	50	23.79	23.38	23.44
		1	99	23.45	23.21	23.53
		50	0	22.67	22.38	22.57
		50	25	22.71	22.41	22.53
		50	50	22.57	22.40	22.59
		100	0	22.66	22.37	22.54
	16QAM	1	0	22.48	22.33	22.22
		1	50	22.53	22.41	22.47
		1	99	22.60	22.26	22.51
		50	0	21.73	21.35	21.62
		50	25	21.69	21.34	21.61
		50	50	21.66	21.38	21.58
		100	0	21.69	21.39	21.57

5.2 Effective Isotropic Radiated Power

Ambient condition

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

Methods of Measurement

1. The testing follows FCC KDB 971168 D01 v03 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: $ERP \text{ (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$

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

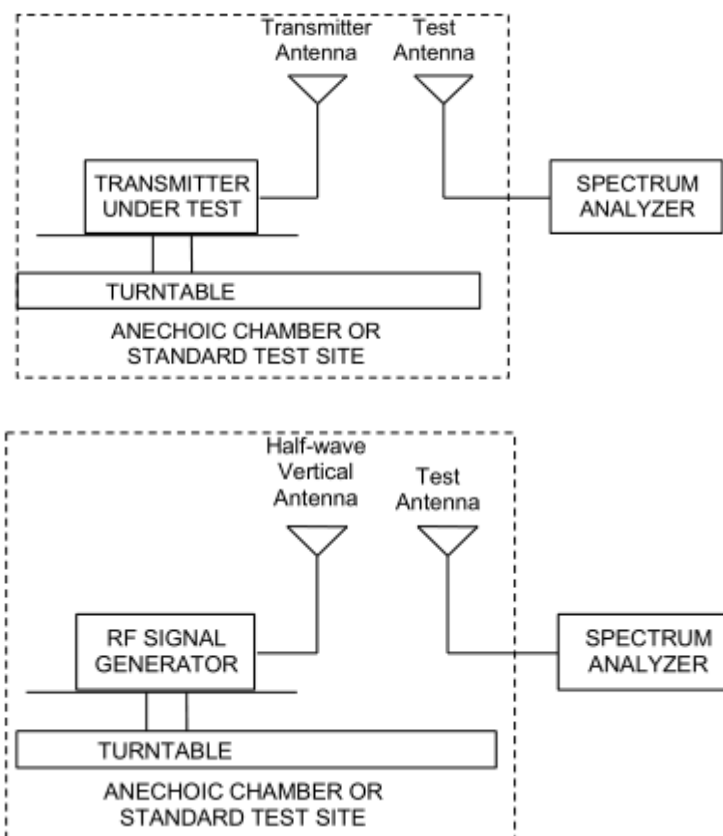
g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and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

$$ERP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBd)}$$

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(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)	≤ 1 W (30 dBm)
Part 27.50(h)(2) Limit (EIRP)	≤ 2 W (33 dBm)

Measurement Uncertainty

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

Test Results

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

Mode	Channel	Frequency (MHz)	Polarization	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Conclusion
WCDMA Band IV	Low	1712.4	Horizontal	-24.53	-45.44	1.82	22.73	30	Pass
	Mid	1732.6	Horizontal	-25.36	-45.38	1.96	21.98	30	Pass
	High	1752.6	Horizontal	-26.02	-45.38	1.93	21.29	30	Pass

LTE Band 4									
Bandwidth	Channel	Frequency (MHz)	Polarization	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.70	Horizontal	-36.87	-54.30	1.44	18.86	30	Pass
	Mid	1732.50	Horizontal	-35.42	-54.32	1.57	20.46	30	Pass
	High	1754.30	Horizontal	-36.15	-54.10	1.72	19.66	30	Pass
3 MHz (QPSK)	Low	1711.50	Horizontal	-36.61	-54.35	1.44	19.18	30	Pass
	Mid	1732.50	Horizontal	-35.20	-54.41	1.57	20.78	30	Pass
	High	1753.50	Horizontal	-36.22	-54.48	1.72	19.98	30	Pass
5 MHz (QPSK)	Low	1712.50	Horizontal	-36.46	-54.34	1.44	19.32	30	Pass
	Mid	1732.50	Horizontal	-34.96	-54.32	1.57	20.92	30	Pass
	High	1752.50	Horizontal	-35.72	-54.13	1.72	20.12	30	Pass
10 MHz (QPSK)	Low	1715.00	Horizontal	-37.11	-54.32	1.44	18.65	30	Pass
	Mid	1732.50	Horizontal	-35.73	-54.41	1.57	20.25	30	Pass
	High	1750.00	Horizontal	-36.73	-54.52	1.66	19.45	30	Pass
15 MHz (QPSK)	Low	1717.50	Horizontal	-36.95	-54.35	1.49	18.88	30	Pass
	Mid	1732.50	Horizontal	-35.40	-54.32	1.57	20.48	30	Pass
	High	1747.50	Horizontal	-36.15	-54.17	1.66	19.68	30	Pass
20 MHz (QPSK)	Low	1720.00	Horizontal	-37.40	-54.44	1.49	18.53	30	Pass
	Mid	1732.50	Horizontal	-35.85	-54.41	1.57	20.13	30	Pass
	High	1745.00	Horizontal	-36.89	-54.59	1.63	19.33	30	Pass
1.4 MHz (16QAM)	Low	1710.70	Horizontal	-37.05	-54.30	1.44	18.69	30	Pass
	Mid	1732.50	Horizontal	-35.60	-54.32	1.57	20.29	30	Pass
	High	1754.30	Horizontal	-36.33	-54.10	1.72	19.49	30	Pass
3 MHz (16QAM)	Low	1711.50	Horizontal	-36.79	-54.35	1.44	19.00	30	Pass
	Mid	1732.50	Horizontal	-35.38	-54.41	1.57	20.60	30	Pass
	High	1753.50	Horizontal	-36.40	-54.48	1.72	19.80	30	Pass
5 MHz (16QAM)	Low	1712.50	Horizontal	-36.64	-54.34	1.44	19.14	30	Pass
	Mid	1732.50	Horizontal	-35.14	-54.32	1.57	20.74	30	Pass
	High	1752.50	Horizontal	-35.90	-54.13	1.72	19.94	30	Pass
10 MHz (16QAM)	Low	1715.00	Horizontal	-37.29	-54.32	1.44	18.47	30	Pass
	Mid	1732.50	Horizontal	-35.90	-54.41	1.57	20.07	30	Pass



15 MHz (16QAM)	High	1750.00	Horizontal	-36.91	-54.52	1.66	19.27	30	Pass
	Low	1717.50	Horizontal	-37.13	-54.35	1.49	18.70	30	Pass
	Mid	1732.50	Horizontal	-35.58	-54.32	1.57	20.30	30	Pass
	High	1747.50	Horizontal	-36.33	-54.17	1.66	19.50	30	Pass
20 MHz (16QAM)	Low	1720.00	Horizontal	-37.58	-54.44	1.49	18.35	30	Pass
	Mid	1732.50	Horizontal	-36.03	-54.41	1.57	19.95	30	Pass
	High	1745.00	Horizontal	-37.07	-54.59	1.63	19.15	30	Pass

LTE Band 7

Band width	Channel	Frequency (MHz)	Polarization	Output Power (dBm)	Losses (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Conclusion
5 MHz (QPSK)	Low	2502.50	Horizontal	-41.81	-59.64	1.81	19.64	33	Pass
	Mid	2535.00	Horizontal	-42.27	-59.72	1.81	19.26	33	Pass
	High	2567.50	Horizontal	-42.50	-59.98	1.83	19.31	33	Pass
10 MHz (QPSK)	Low	2505.00	Horizontal	-42.22	-59.61	1.82	19.21	33	Pass
	Mid	2535.00	Horizontal	-42.39	-59.72	1.81	19.14	33	Pass
	High	2565.00	Horizontal	-42.59	-60.02	1.81	19.24	33	Pass
15 MHz (QPSK)	Low	2507.50	Horizontal	-41.55	-59.29	1.80	19.54	33	Pass
	Mid	2535.00	Horizontal	-42.18	-59.72	1.81	19.35	33	Pass
	High	2562.50	Horizontal	-41.51	-59.46	1.82	19.77	33	Pass
20 MHz (QPSK)	Low	2510.00	Horizontal	-41.91	-59.52	1.77	19.38	33	Pass
	Mid	2535.00	Horizontal	-42.10	-59.72	1.81	19.43	33	Pass
	High	2560.00	Horizontal	-42.62	-60.01	1.82	19.21	33	Pass
5 MHz (16QAM)	Low	2502.50	Horizontal	-41.96	-59.64	1.81	19.49	33	Pass
	Mid	2535.00	Horizontal	-42.42	-59.72	1.81	19.11	33	Pass
	High	2567.50	Horizontal	-42.65	-59.98	1.83	19.16	33	Pass
10 MHz (16QAM)	Low	2505.00	Horizontal	-42.36	-59.61	1.82	19.07	33	Pass
	Mid	2535.00	Horizontal	-42.54	-59.72	1.81	18.99	33	Pass
	High	2565.00	Horizontal	-42.74	-60.02	1.81	19.09	33	Pass
15 MHz (16QAM)	Low	2507.50	Horizontal	-41.69	-59.29	1.80	19.40	33	Pass
	Mid	2535.00	Horizontal	-42.33	-59.72	1.81	19.20	33	Pass
	High	2562.50	Horizontal	-41.66	-59.46	1.82	19.62	33	Pass
20 MHz (16QAM)	Low	2510.00	Horizontal	-42.06	-59.52	1.77	19.23	33	Pass
	Mid	2535.00	Horizontal	-42.25	-59.72	1.81	19.28	33	Pass
	High	2560.00	Horizontal	-42.77	-60.01	1.82	19.06	33	Pass

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 (1.4MHz).

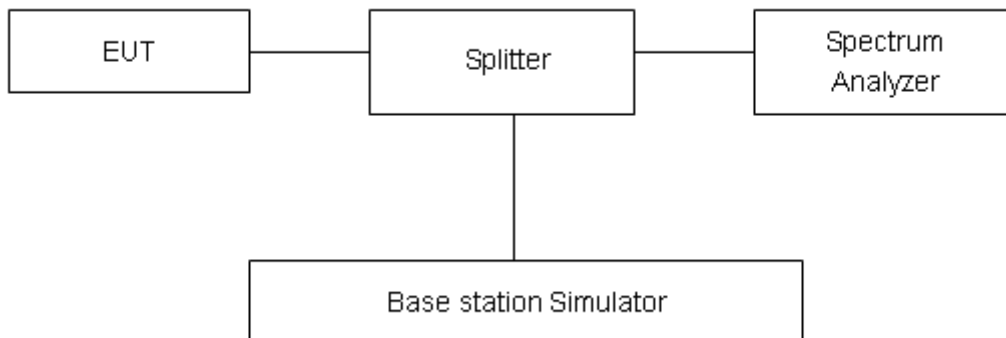
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4 (3MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7 (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 $k = 2$, $U=624\text{Hz}$.

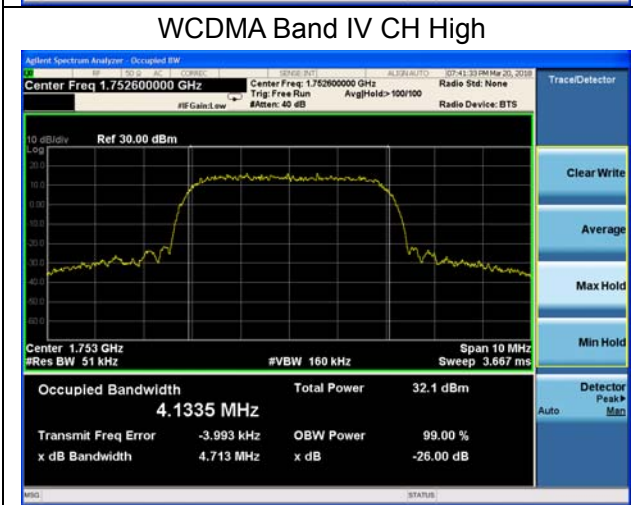
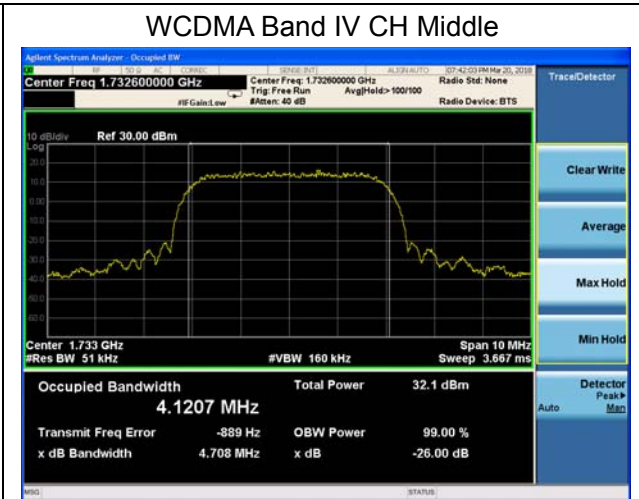
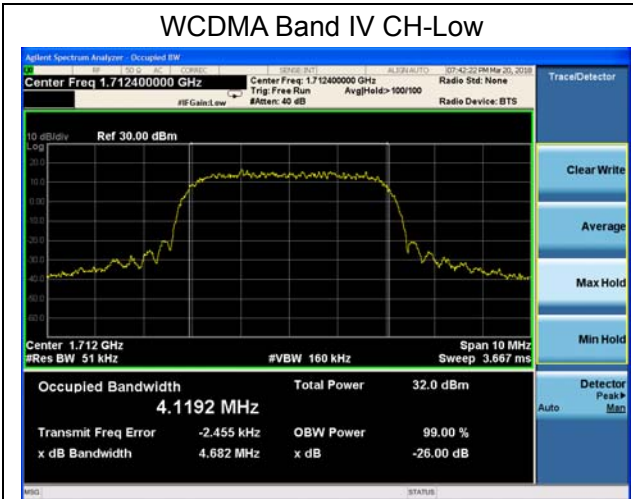
Test Result

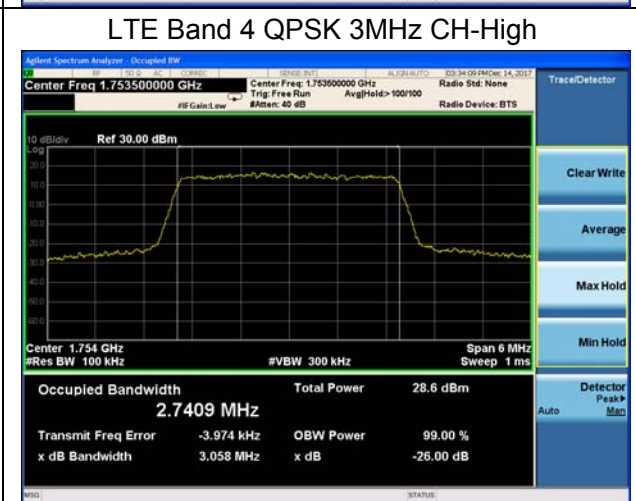
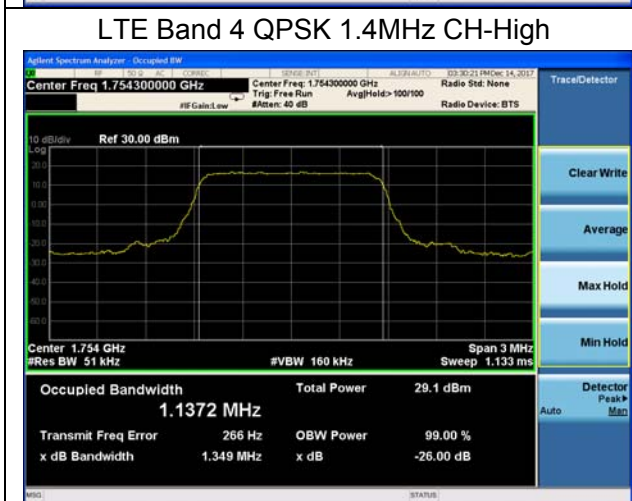
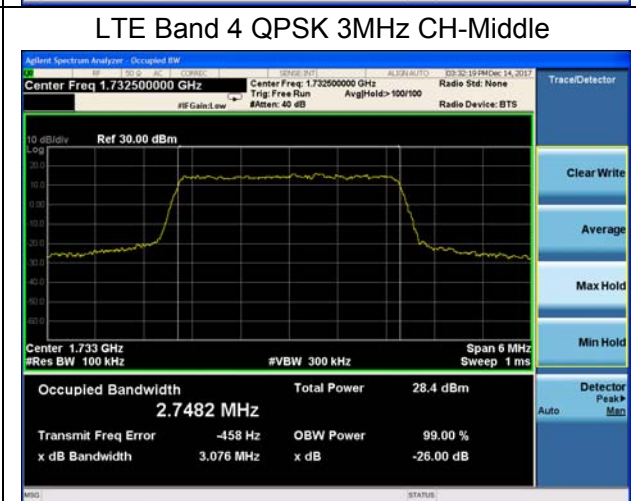
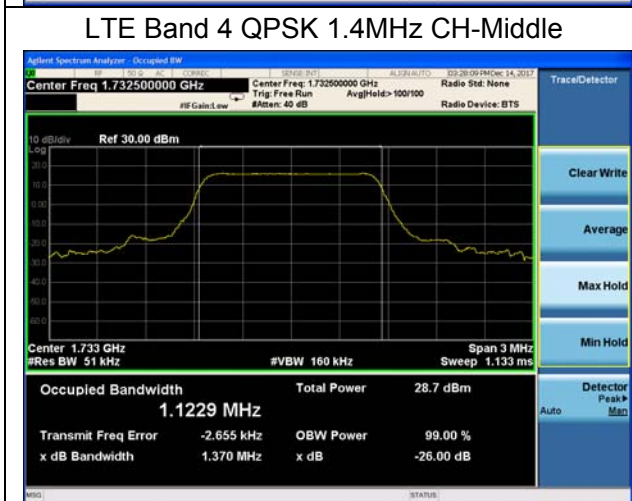
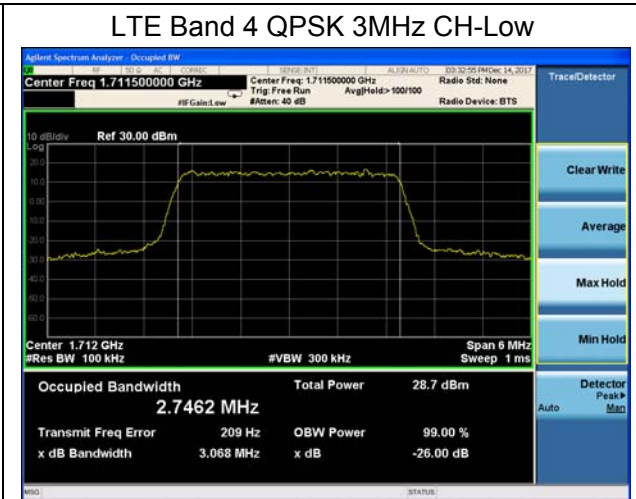
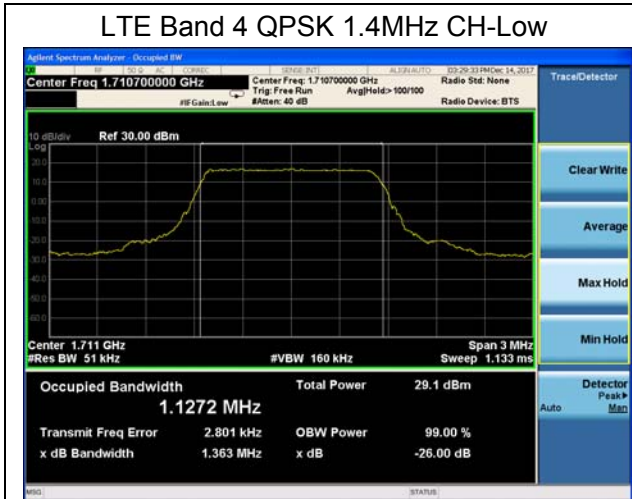
Mode	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
WCDMA Band IV (RMC)	1312	1712.4	4.1192	4.682
	1413	1732.6	4.1207	4.708
	1513	1752.6	4.1335	4.713

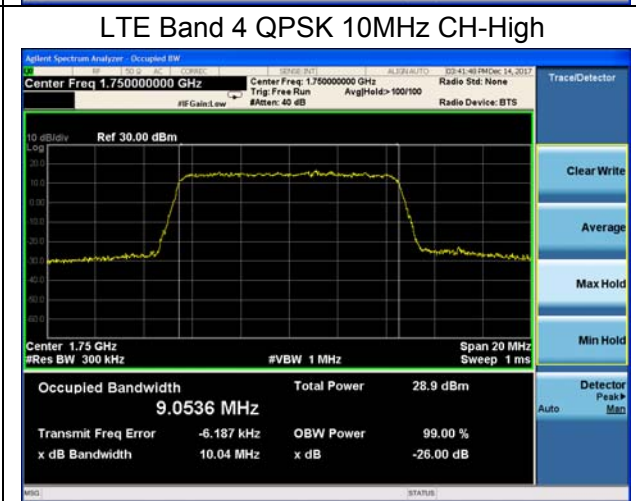
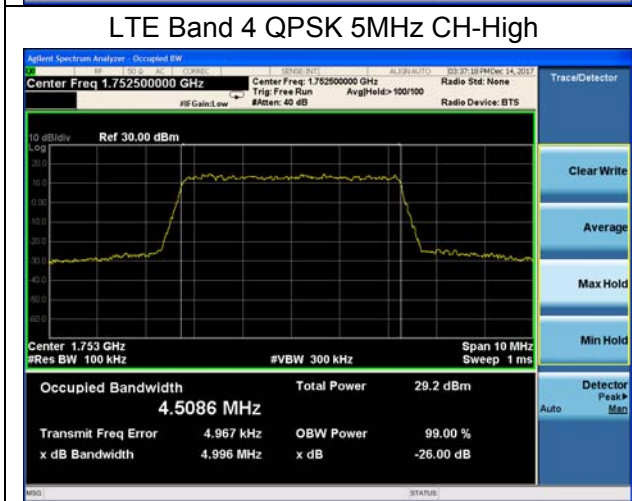
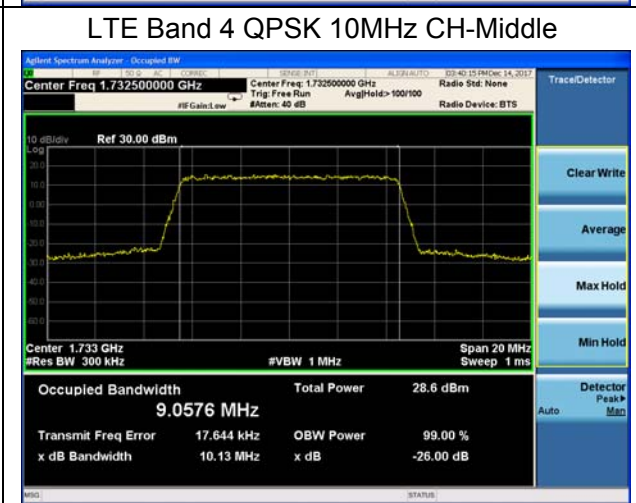
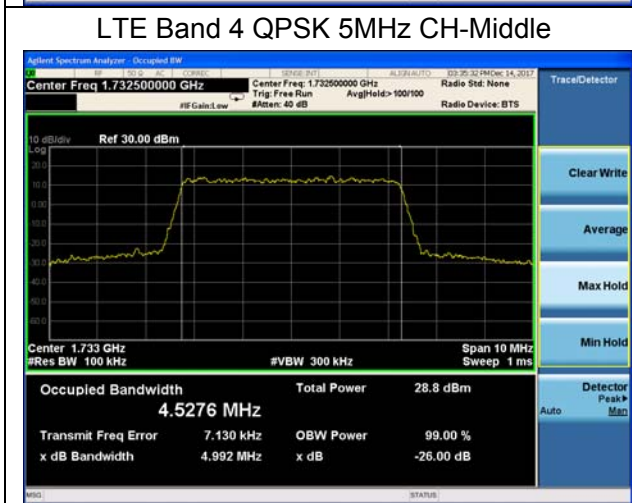
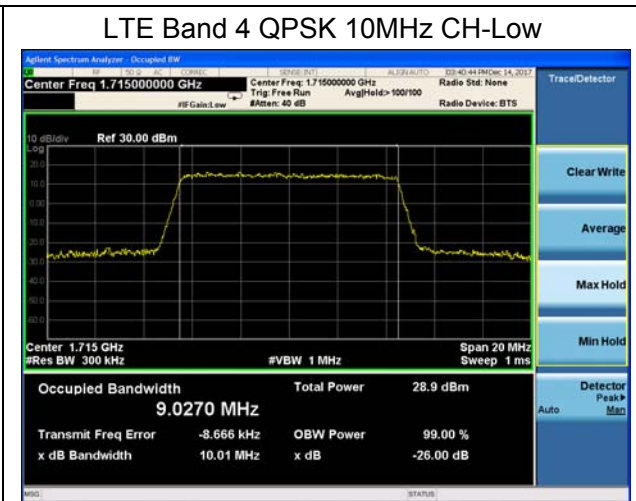
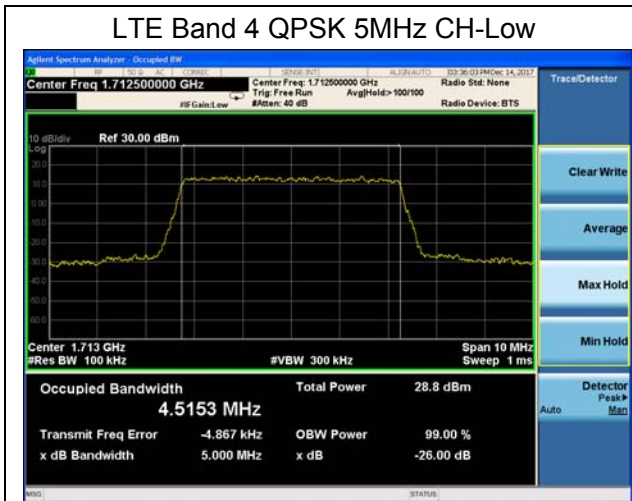
LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.127	1.363
			20175	1732.5	1.123	1.370
			20393	1754.3	1.137	1.349
		3	19965	1711.5	2.746	3.068
			20175	1732.5	2.748	3.076
			20385	1753.5	2.741	3.058
		5	19975	1712.5	4.515	5.000
			20175	1732.5	4.528	4.992
			20375	1752.5	4.509	4.996
		10	20000	1715	9.027	10.010
			20175	1732.5	9.058	10.130
			20350	1750	9.054	10.040
		15	20025	1717.5	13.485	14.730
			20175	1732.5	13.516	14.840
			20325	1747.5	13.434	14.730
		20	20050	1720	17.905	19.320
			20175	1732.5	17.886	19.350
			20300	1745	17.891	19.540
	16QAM	1.4	19957	1710.7	1.127	1.341
			20175	1732.5	1.132	1.362
			20393	1754.3	1.120	1.352
		3	19965	1711.5	2.737	3.054
			20175	1732.5	2.736	3.047
			20385	1753.5	2.738	3.063
		5	19975	1712.5	4.529	5.014
			20175	1732.5	4.506	5.012
			20375	1752.5	4.531	5.057
		10	20000	1715	9.030	9.995
			20175	1732.5	9.066	10.000

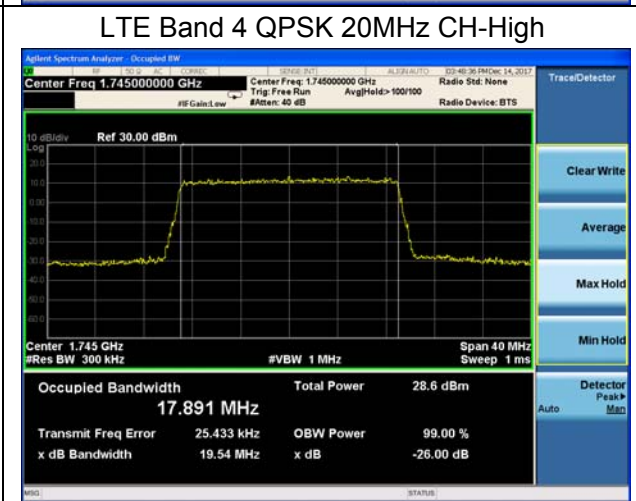
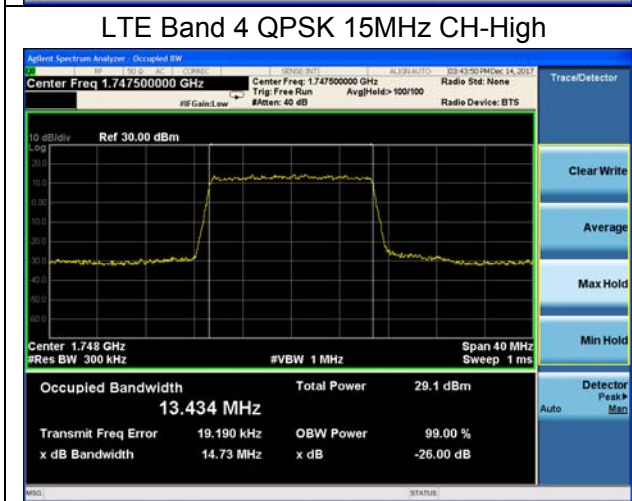
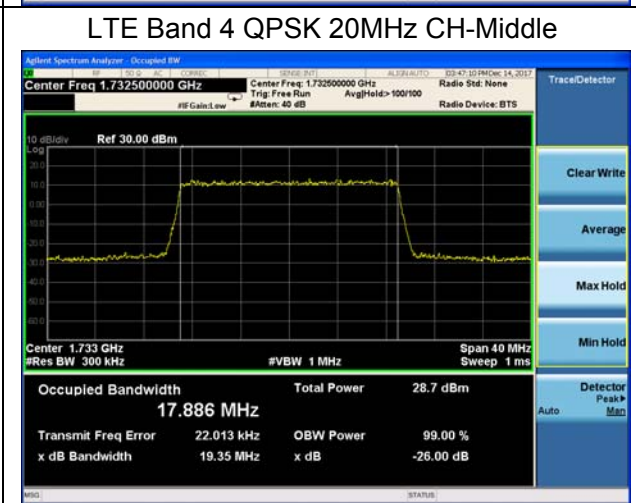
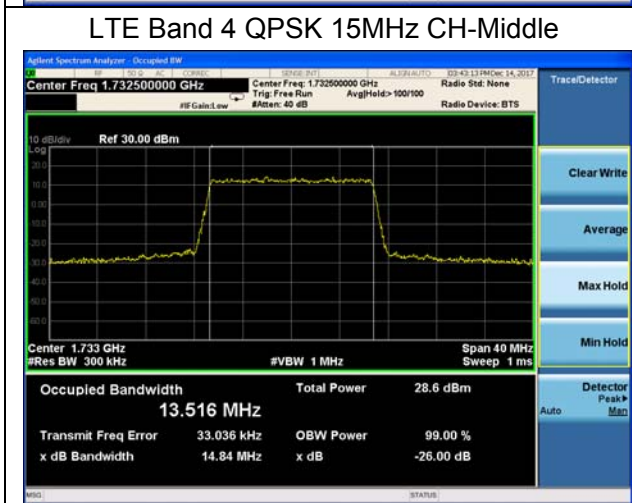
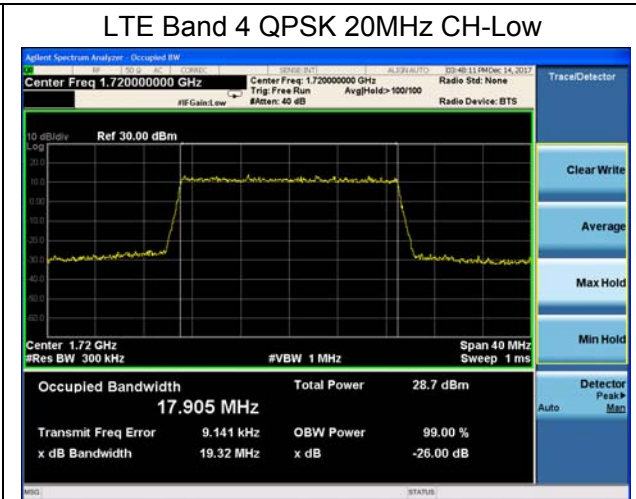
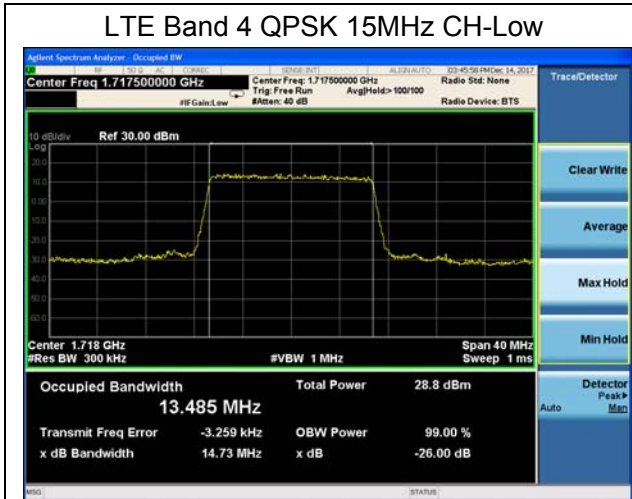
		20350	1750	9.001	10.040
	15	20025	1717.5	13.495	14.800
		20175	1732.5	13.503	14.770
		20325	1747.5	13.472	14.730
	20	20050	1720	17.925	19.520
		20175	1732.5	17.936	19.400
		20300	1745	17.889	19.230

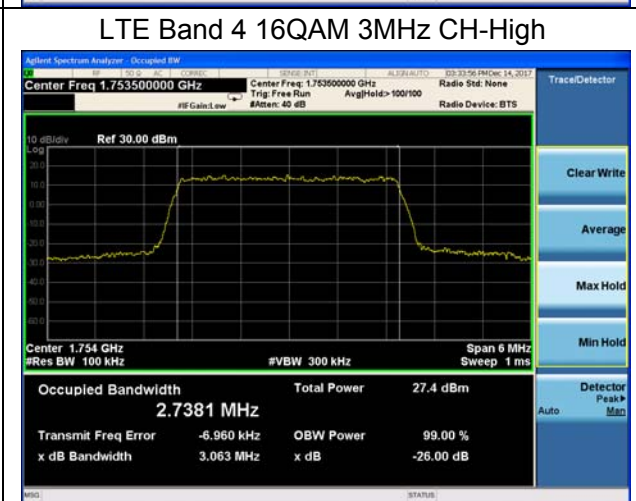
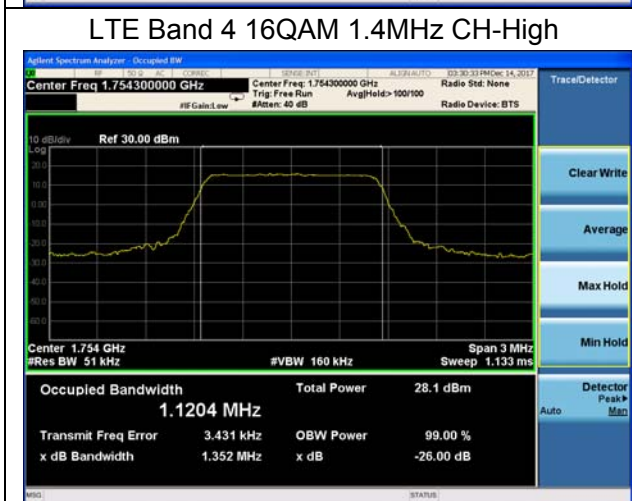
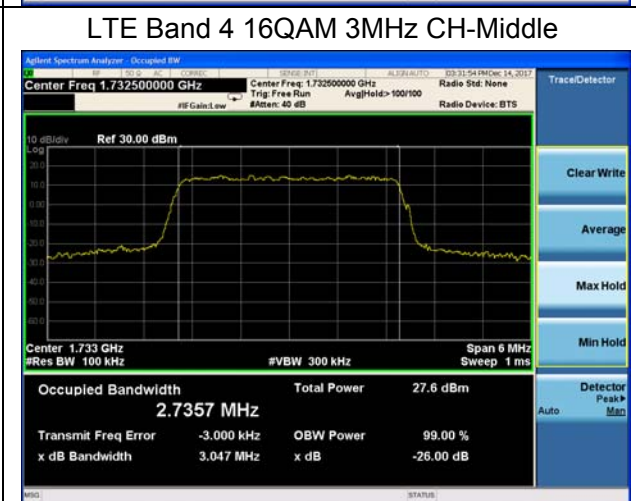
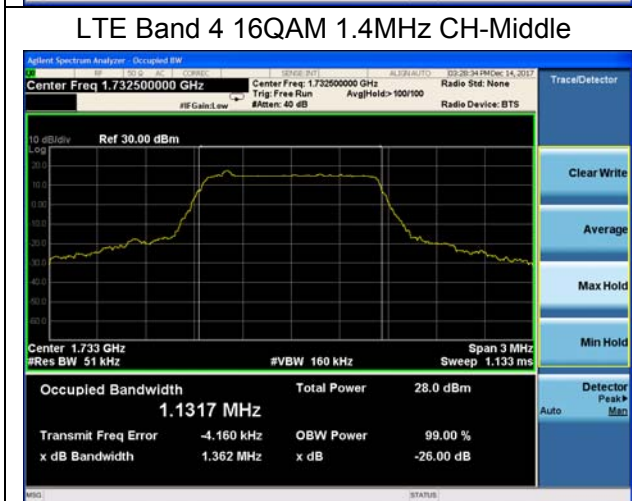
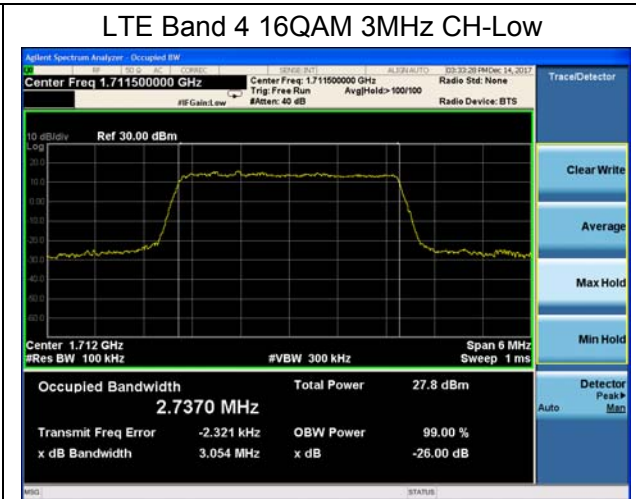
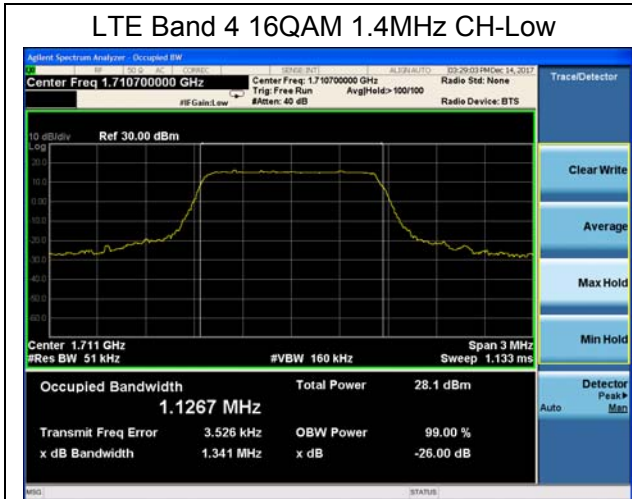
LTE Band 7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	20775	2502.5	4.504	5.004
			21100	2535	4.511	5.039
			21425	2567.5	4.517	5.005
		10	20800	2505	9.014	10.100
			21100	2535	9.047	10.150
			21400	2565	9.052	10.090
		15	20825	2507.5	13.438	14.720
			21100	2535	13.480	14.620
			21375	2562.5	13.464	14.780
		20	20850	2510	17.840	19.210
			21100	2535	17.928	19.340
			21350	2560	17.948	19.570
	16QAM	5	20775	2502.5	4.521	5.050
			21100	2535	4.528	5.045
			21425	2567.5	4.513	5.018
		10	20800	2505	9.015	10.040
			21100	2535	9.056	10.020
			21400	2565	9.043	10.120
		15	20825	2507.5	13.452	14.620
			21100	2535	13.471	14.720
			21375	2562.5	13.506	14.750
		20	20850	2510	17.909	19.470
			21100	2535	17.923	19.390
			21350	2560	17.928	19.310

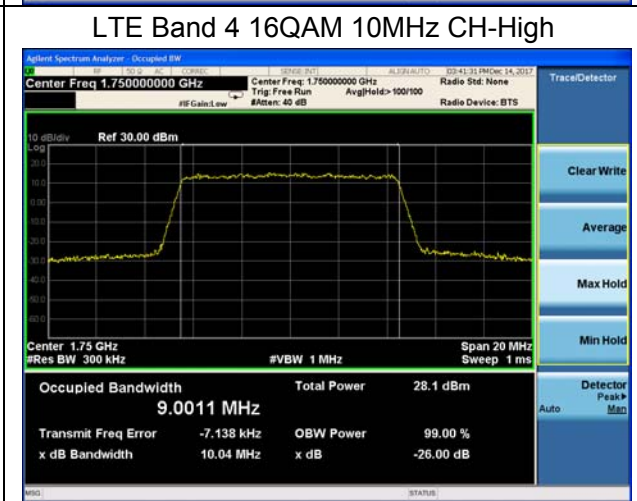
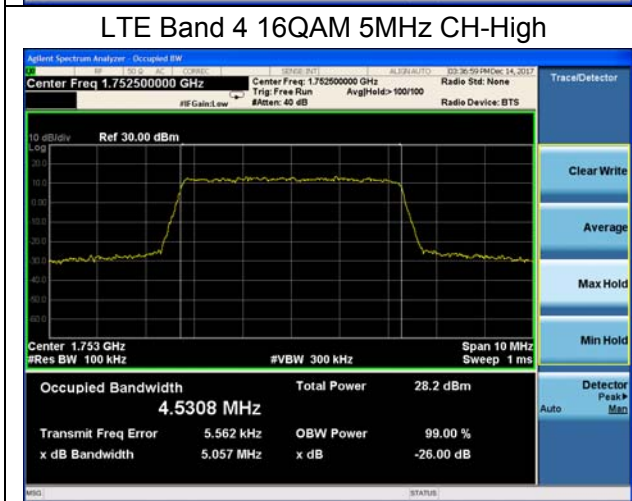
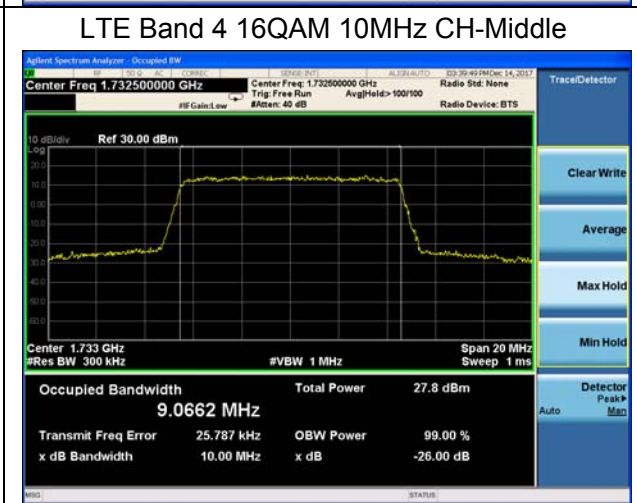
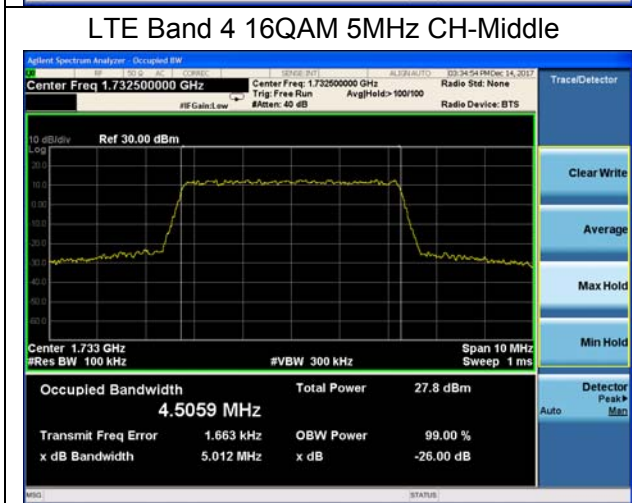
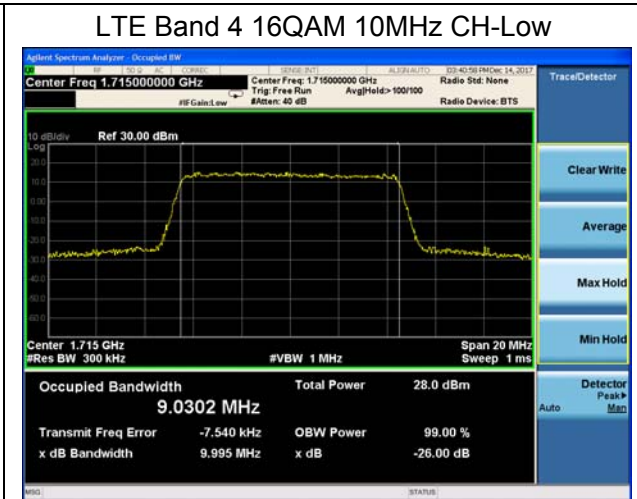
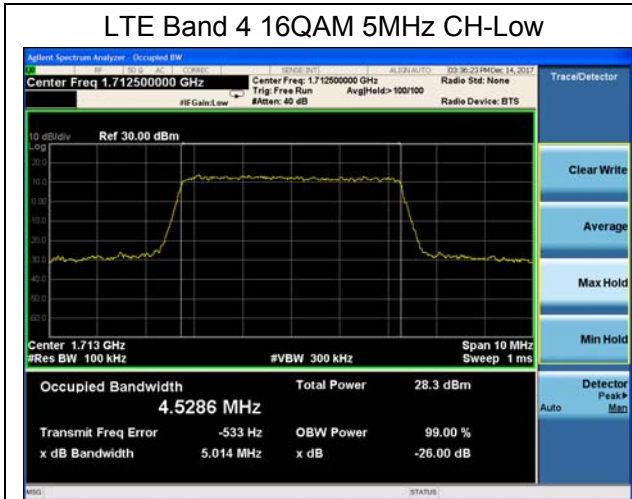


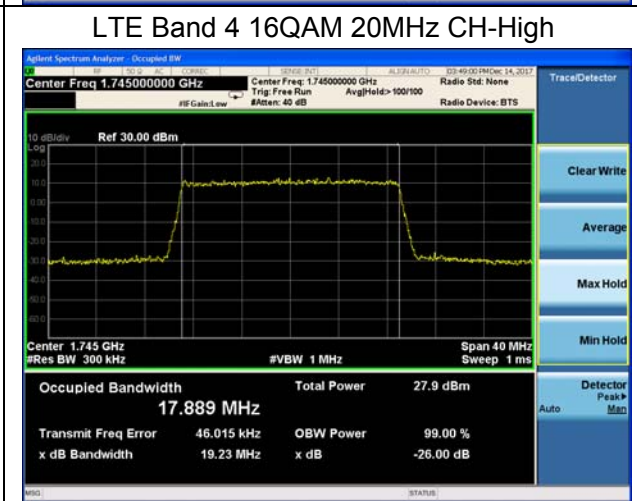
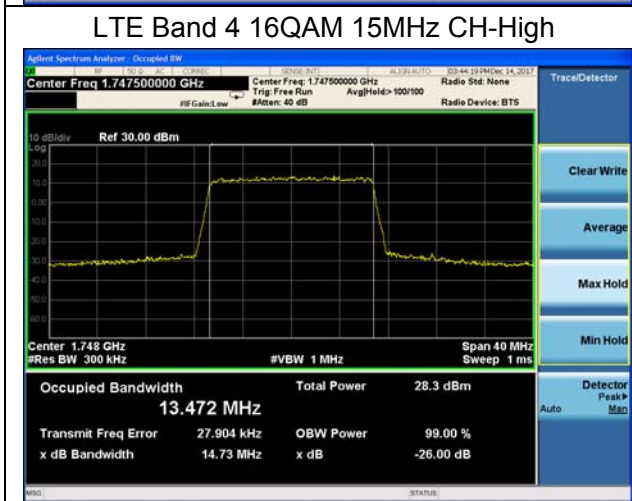
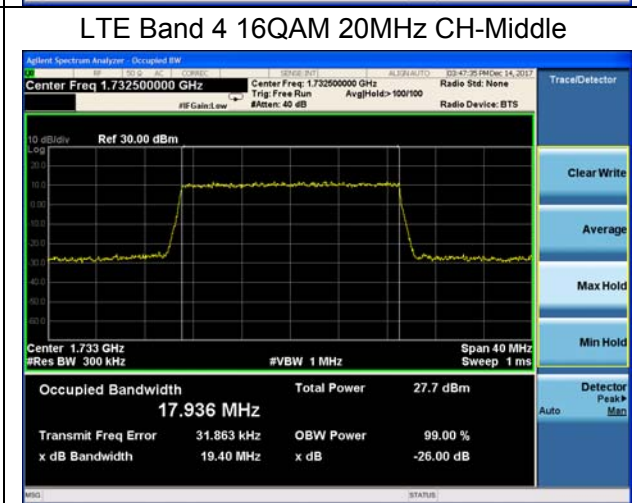
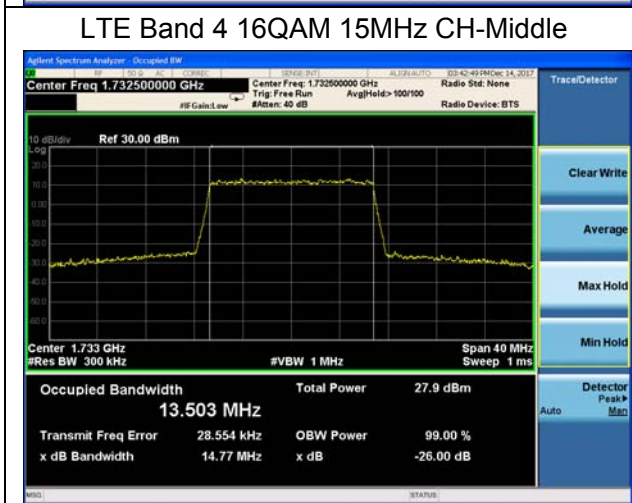
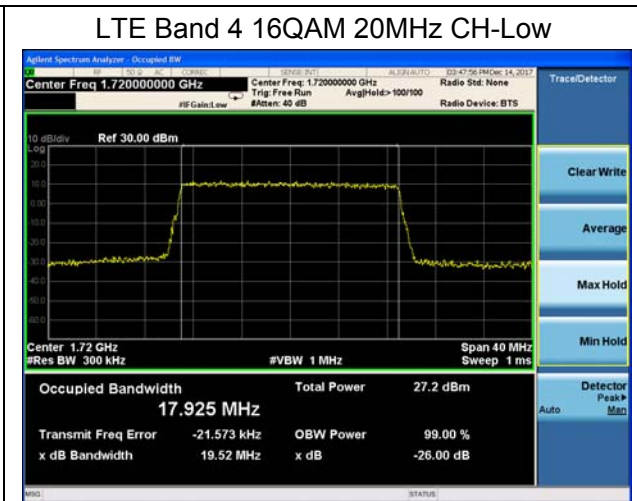
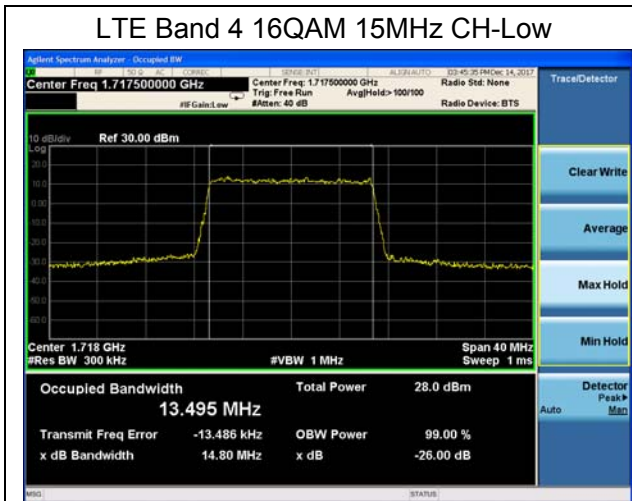


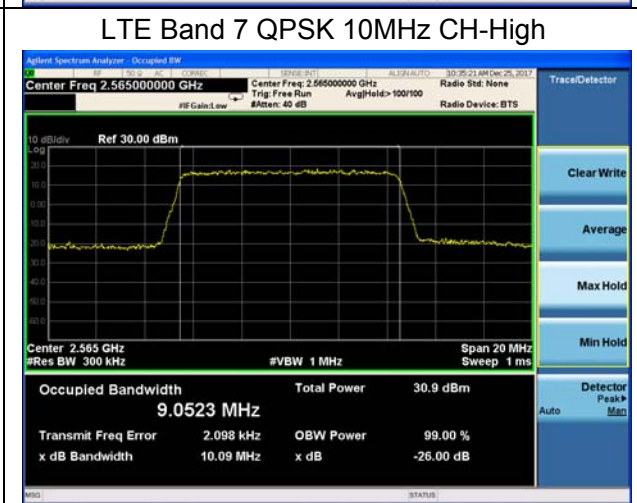
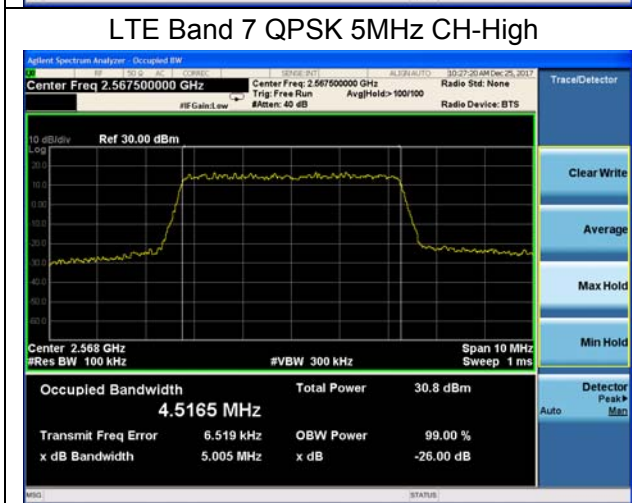
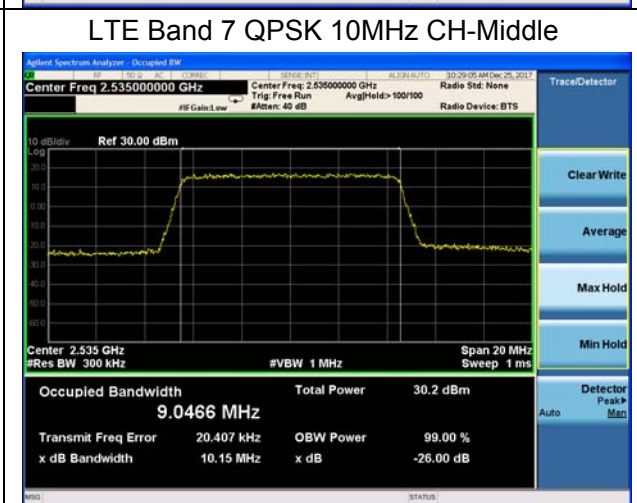
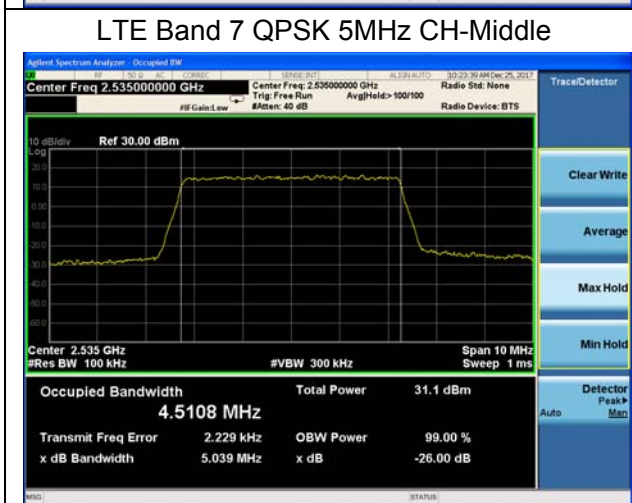
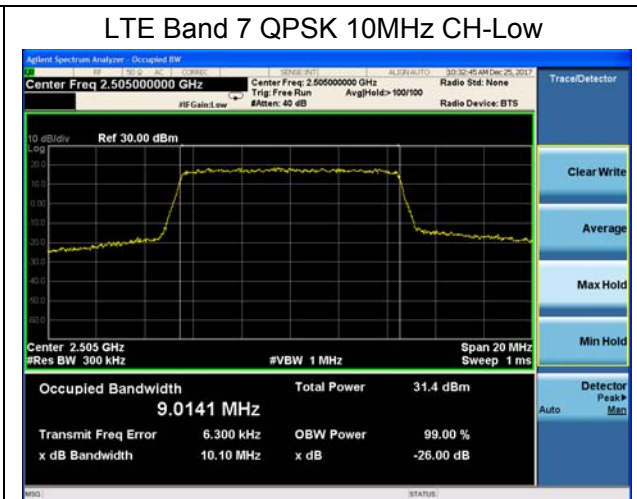
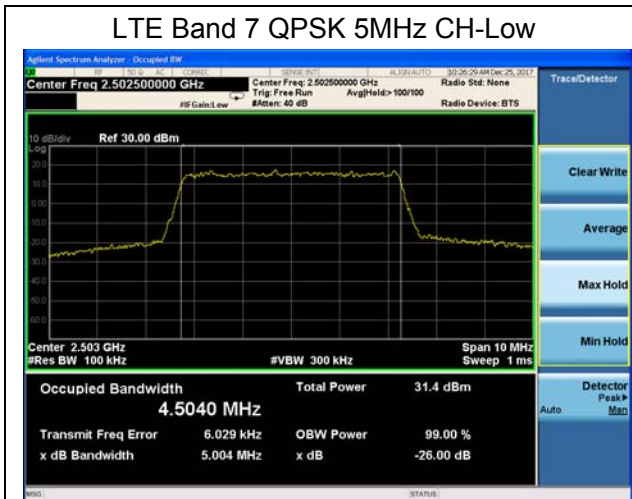


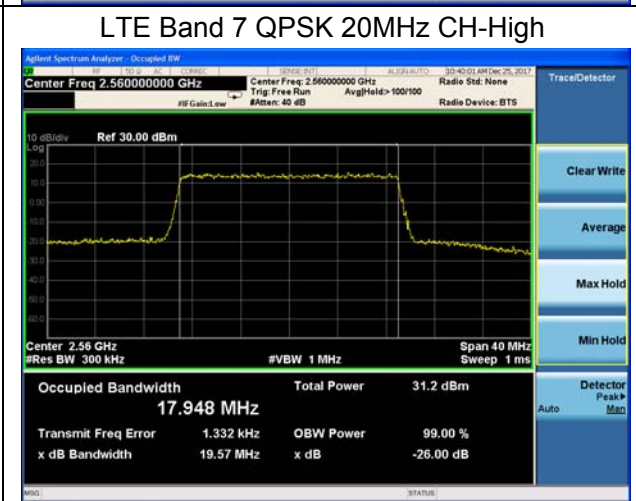
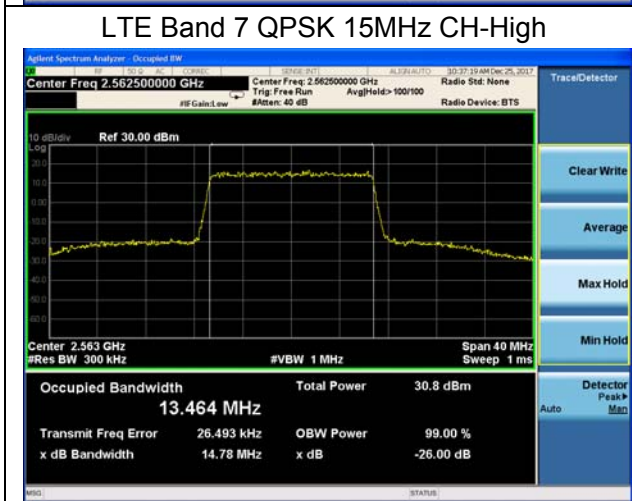
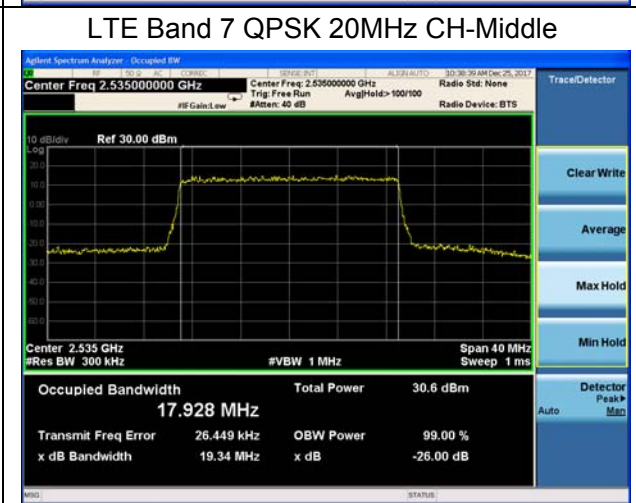
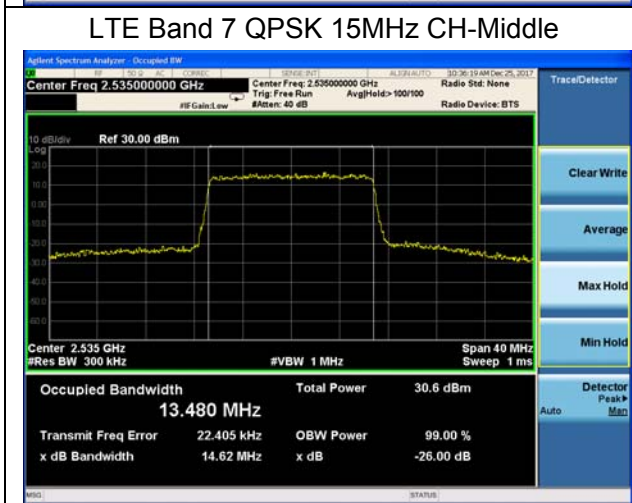
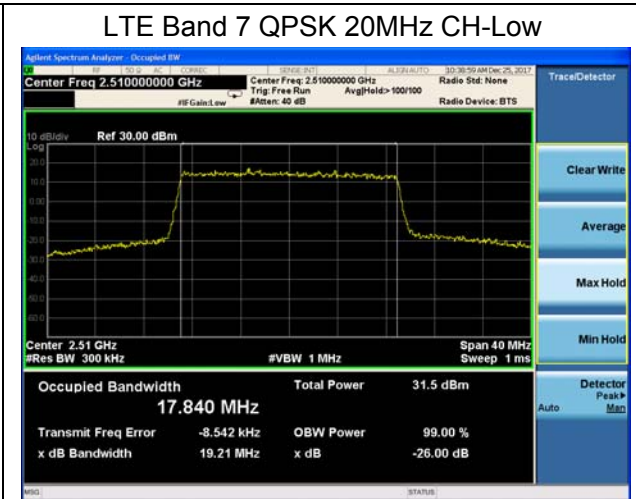
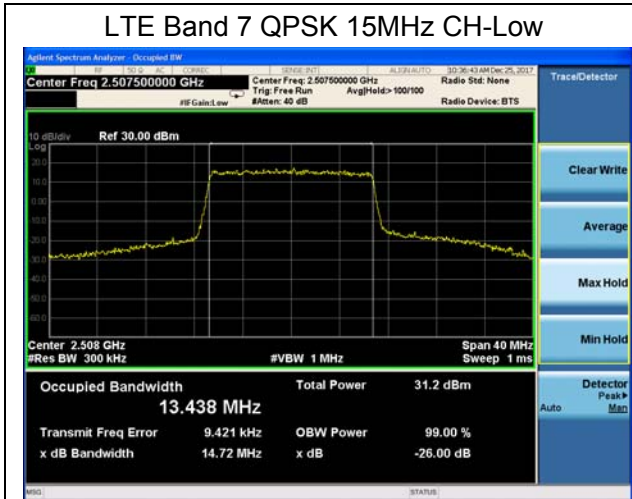


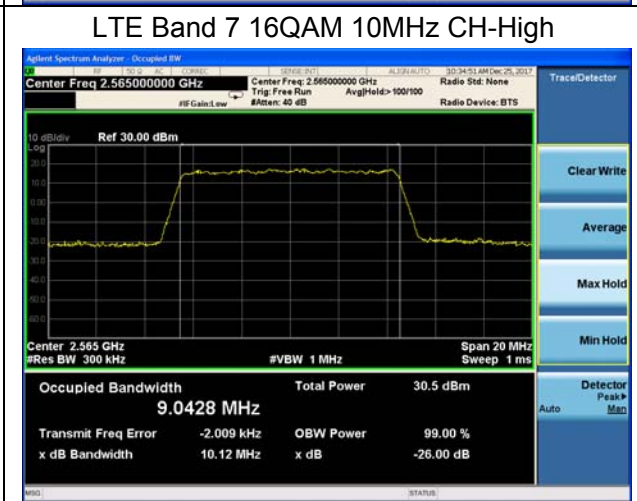
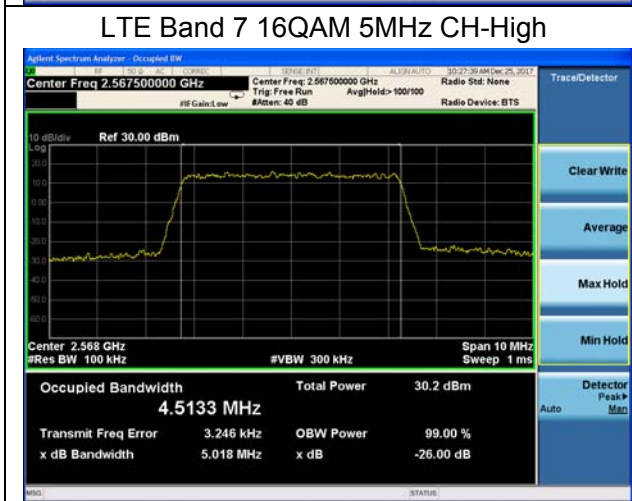
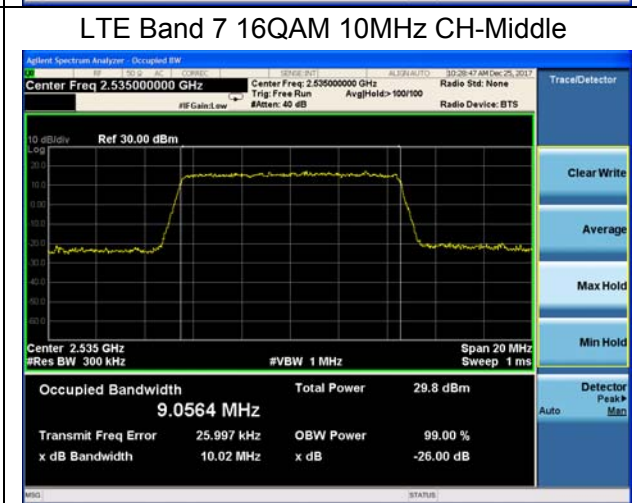
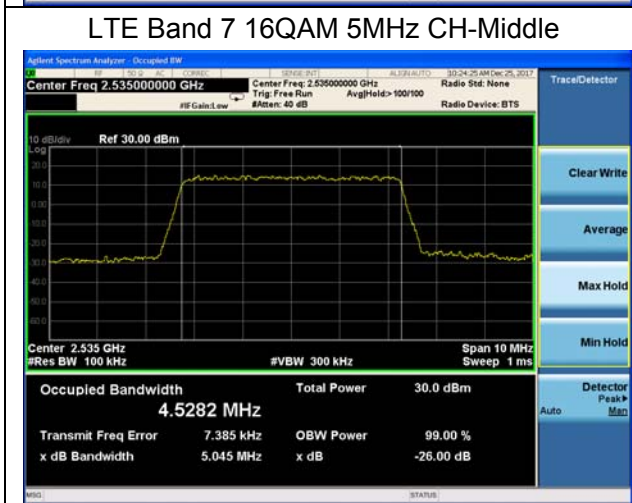
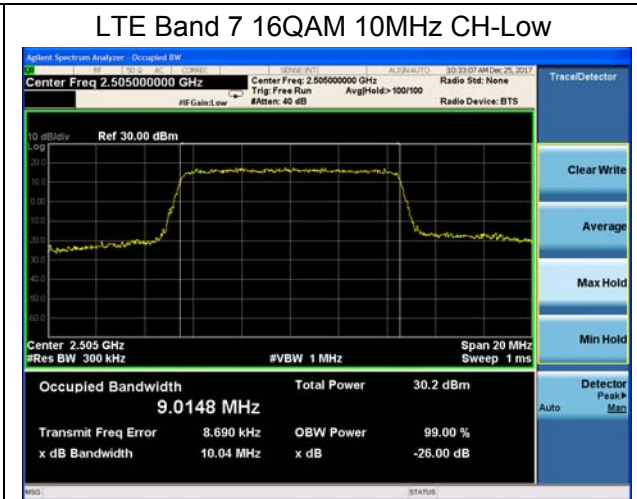
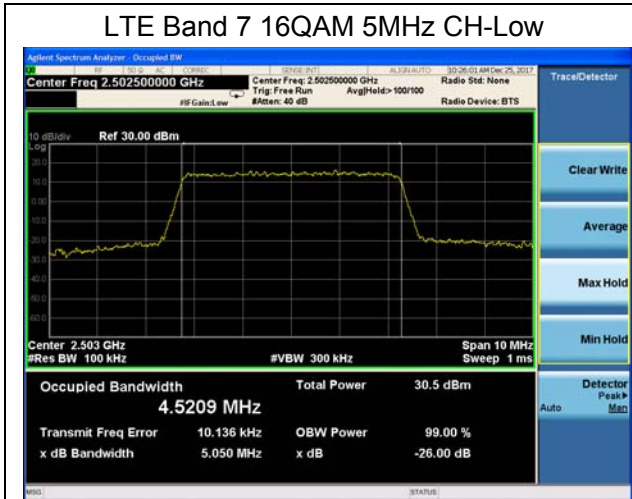


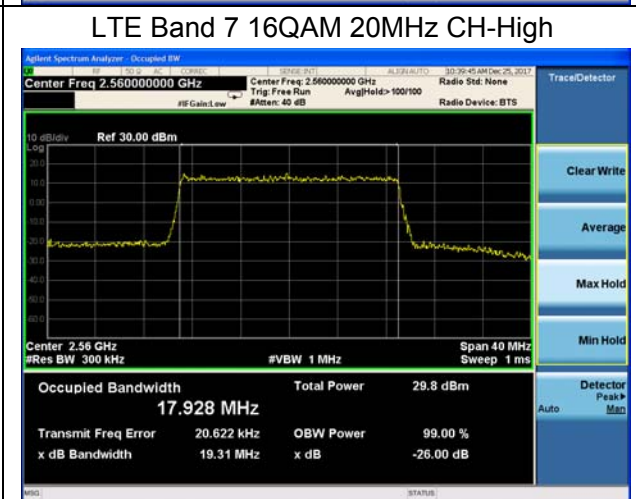
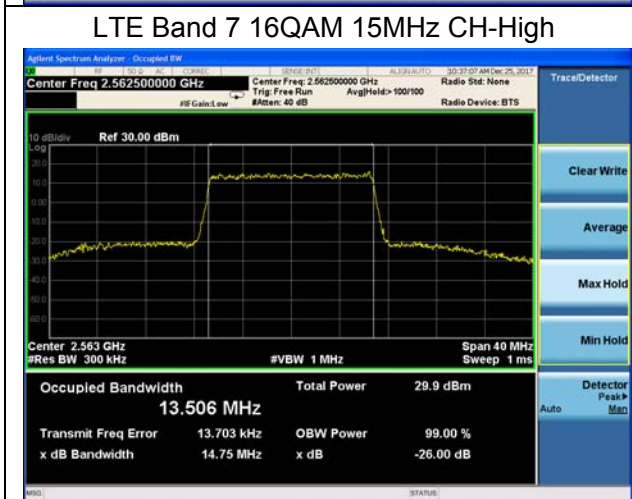
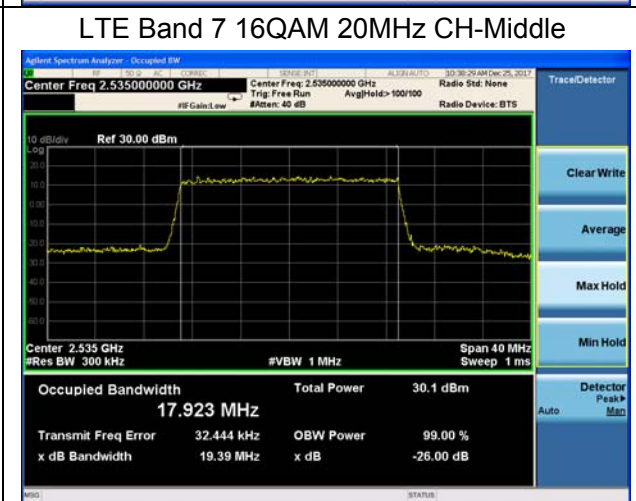
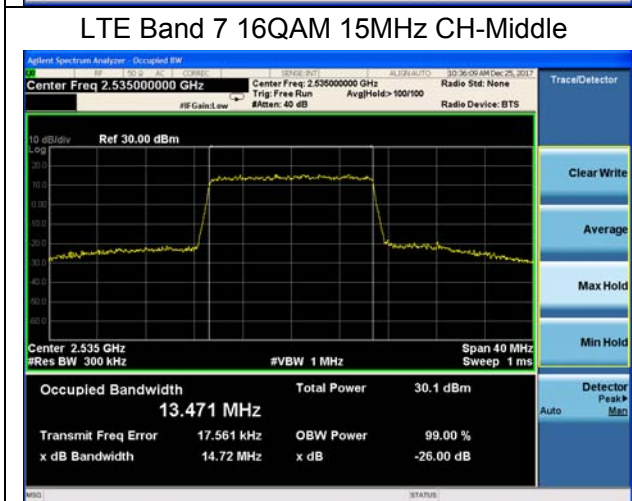
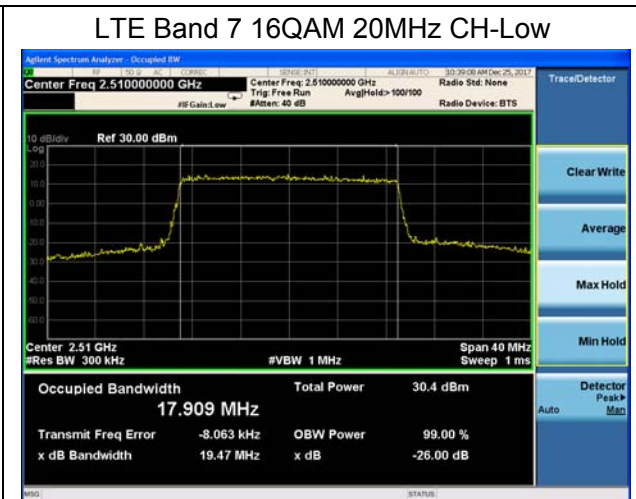
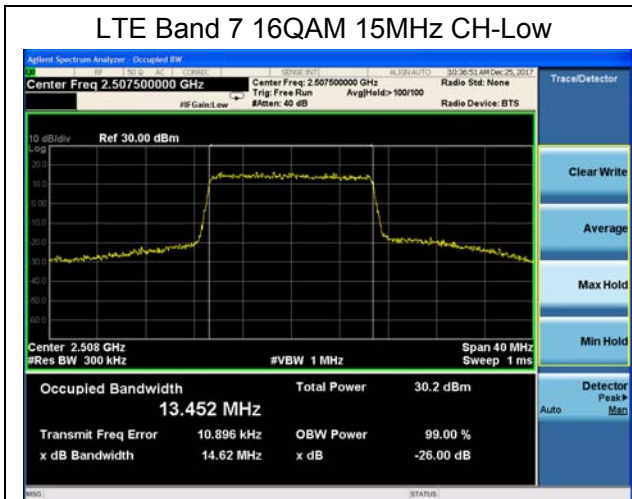












5.4 Band Edge Compliance

Ambient condition

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

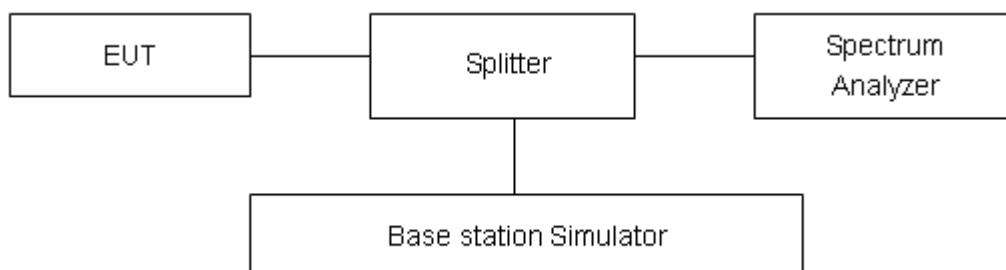
Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured.

The testing follows KDB 971168 D01 v03 Section 6.0

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.
RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 4 (1.4MHz).
RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4 (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(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:

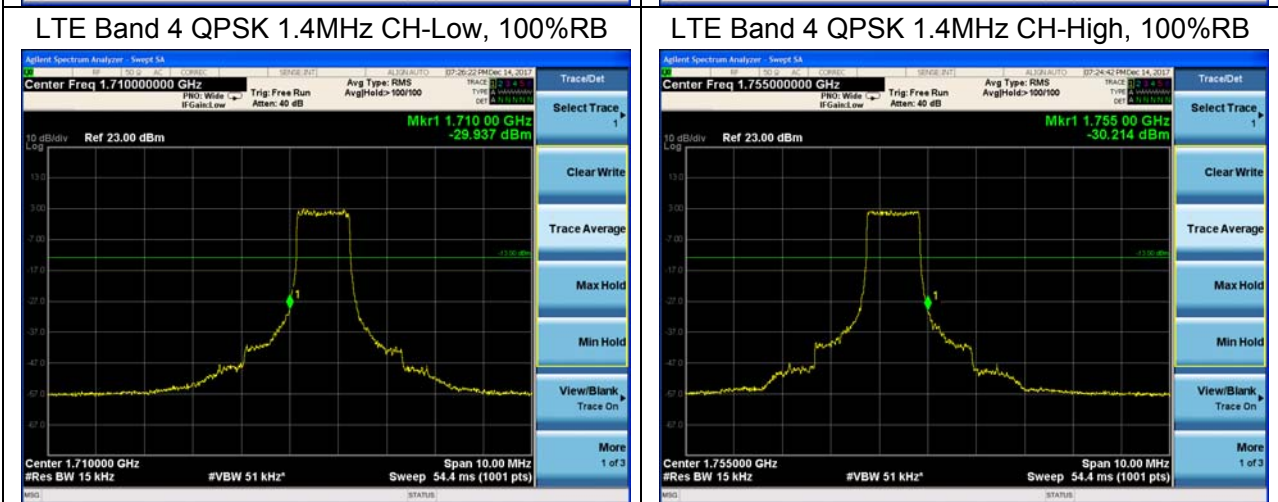
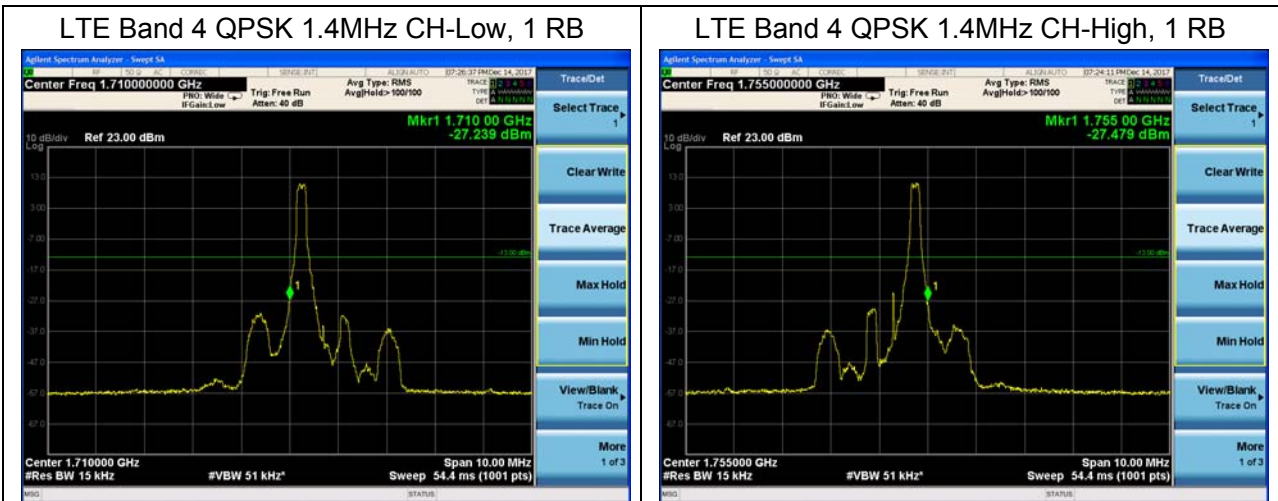
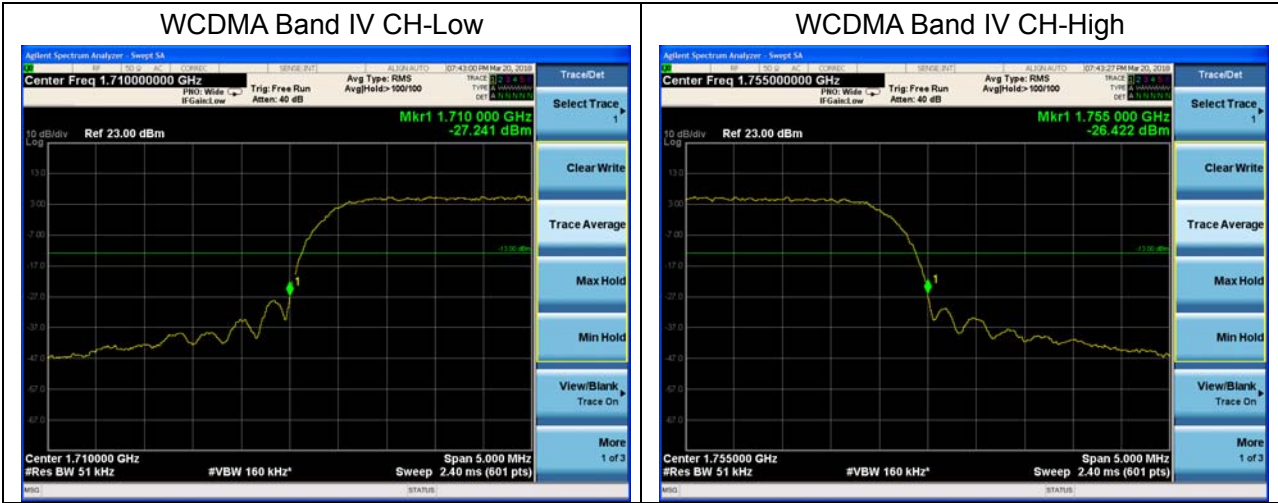
The limit line is derived from $43 + 10 \log (P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10 \log (P)]$ (dB)
= $[30 + 10 \log (P)]$ (dBm) - $[43 + 10 \log (P)]$ (dB) = -13dBm.

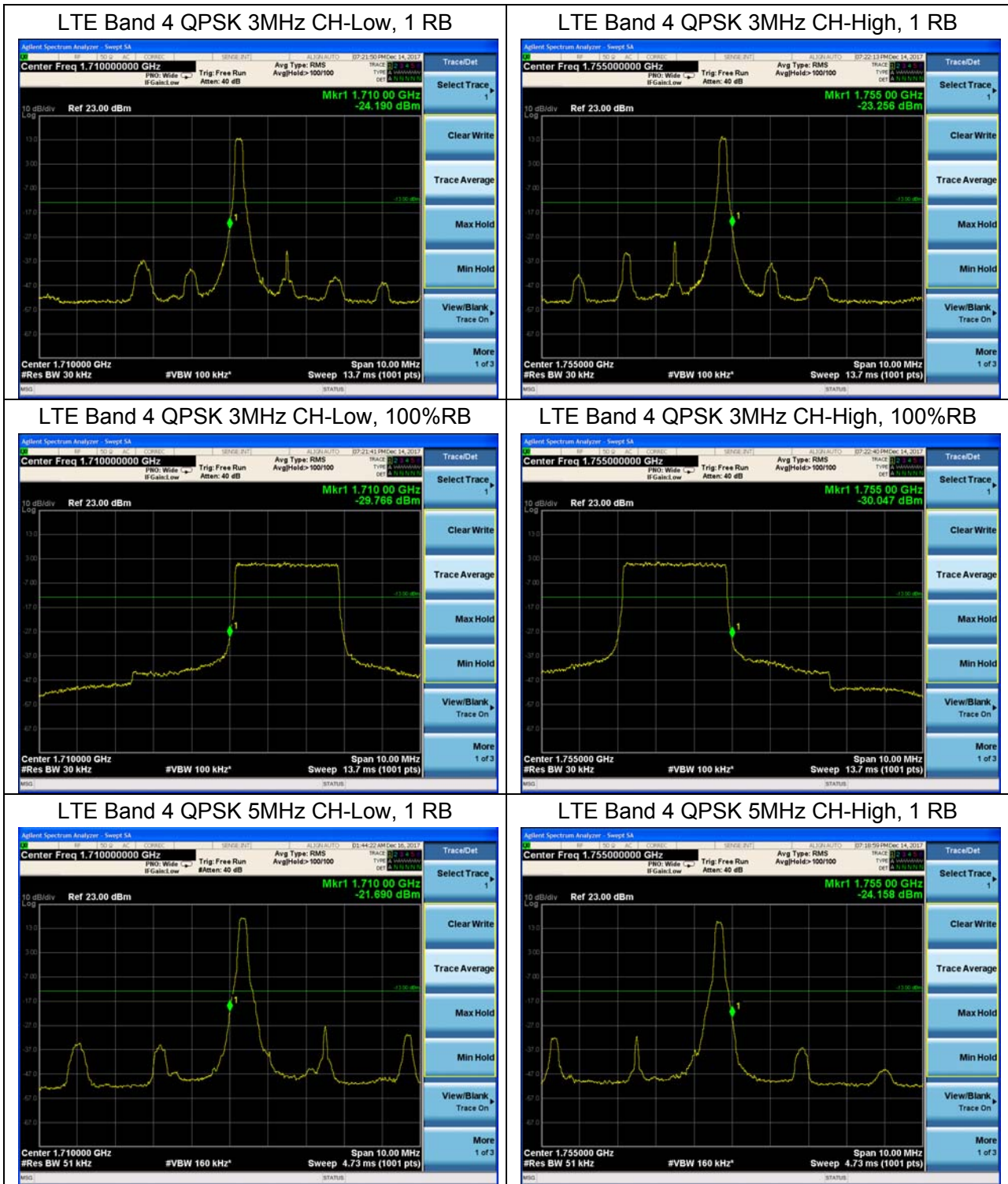
Measurement Uncertainty

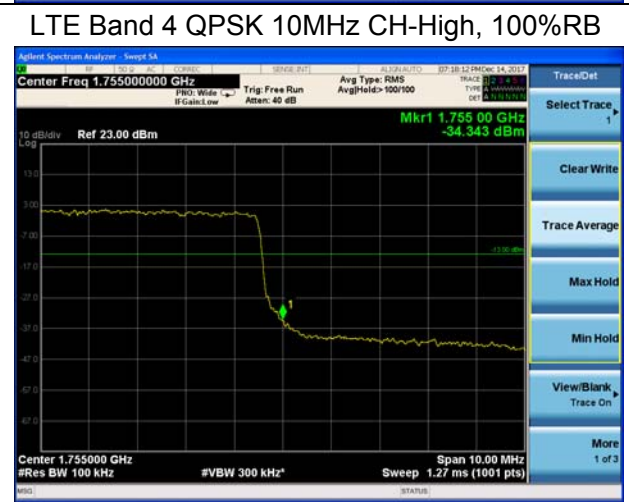
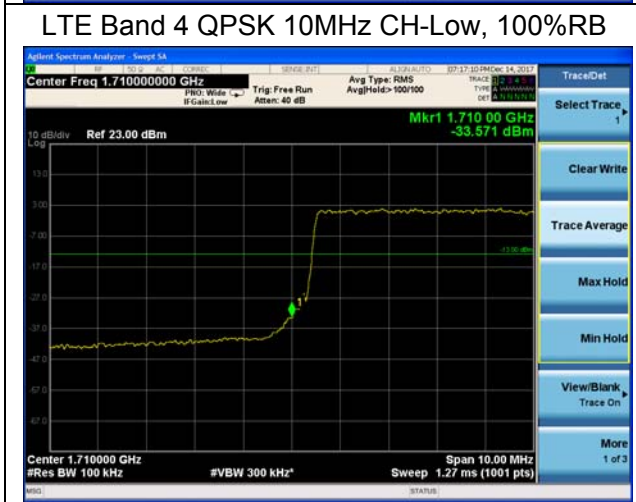
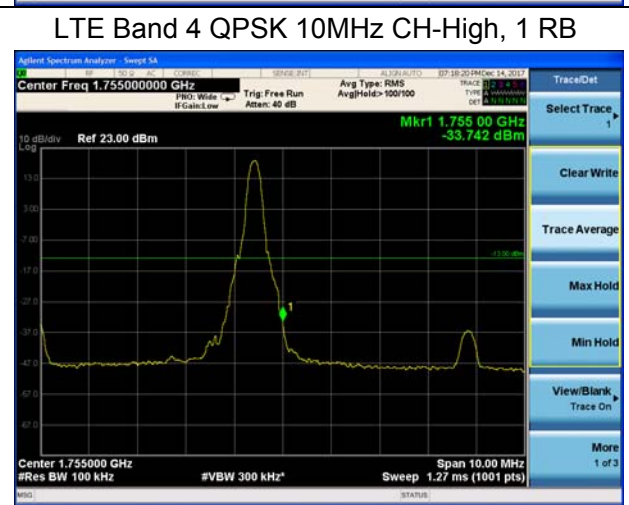
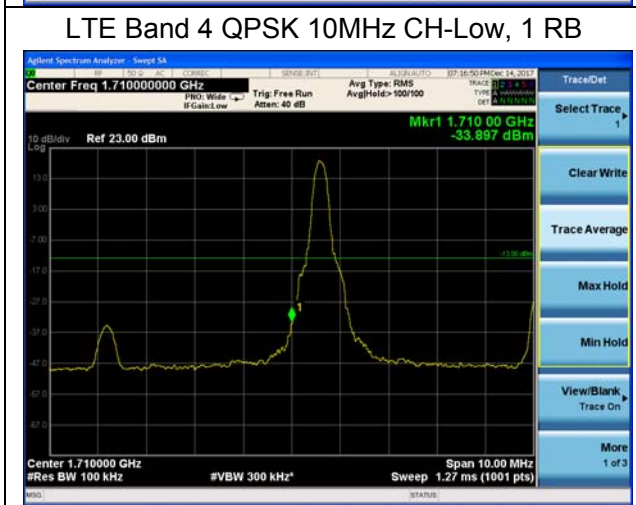
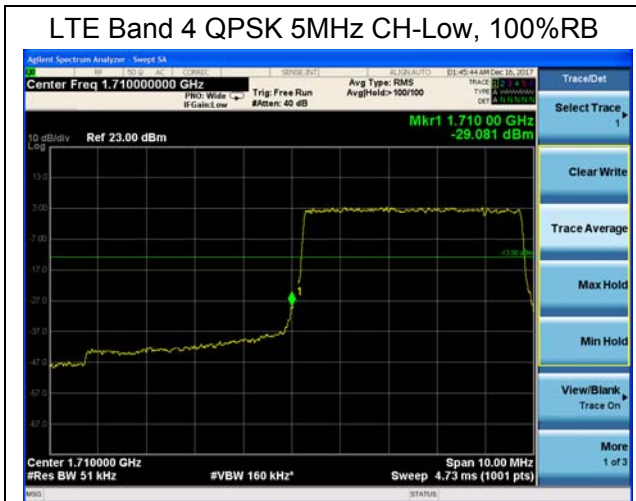
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684$ dB.

Test Result

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

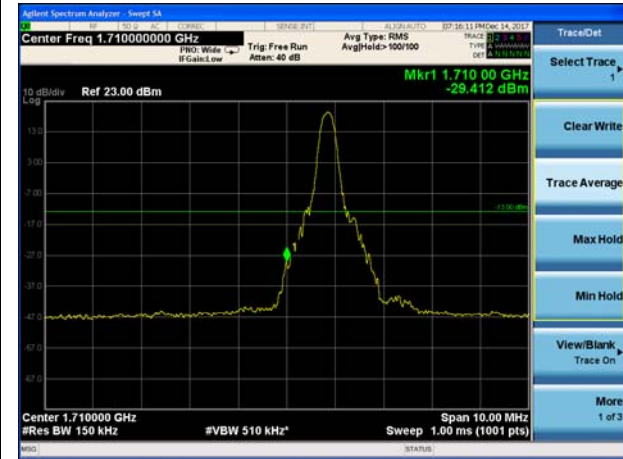




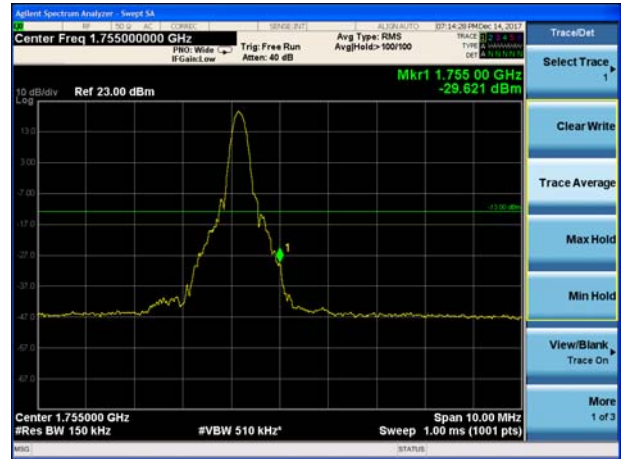




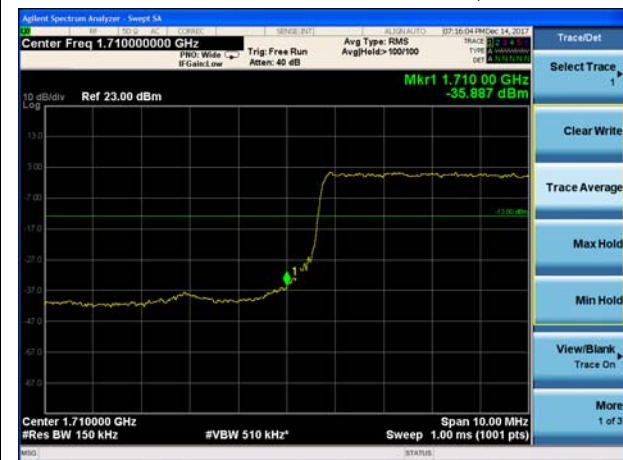
LTE Band 4 QPSK 15MHz CH-Low, 1 RB



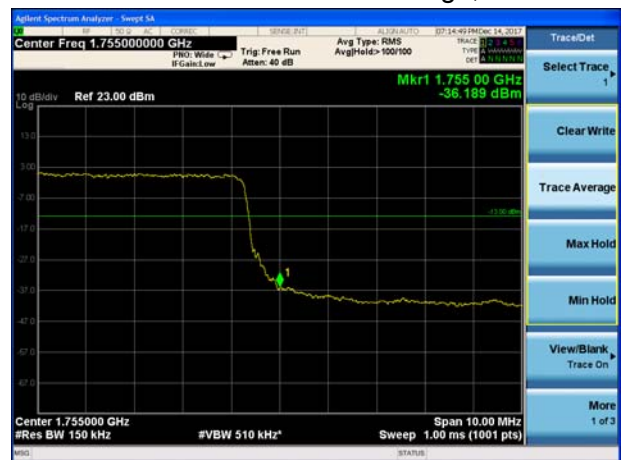
LTE Band 4 QPSK 15MHz CH-High, 1 RB



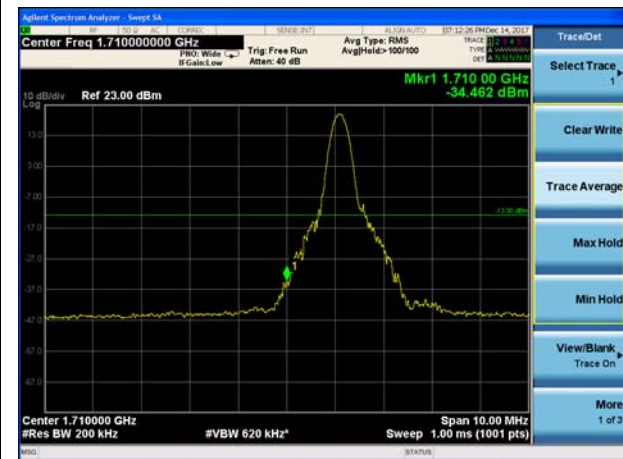
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



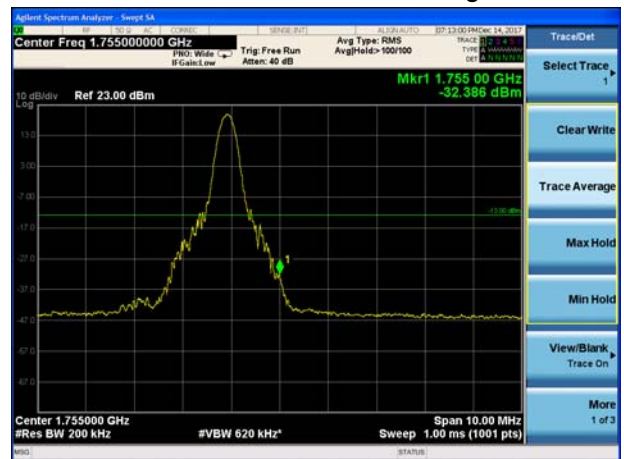
LTE Band 4 QPSK 15MHz CH-High, 100%RB



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



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





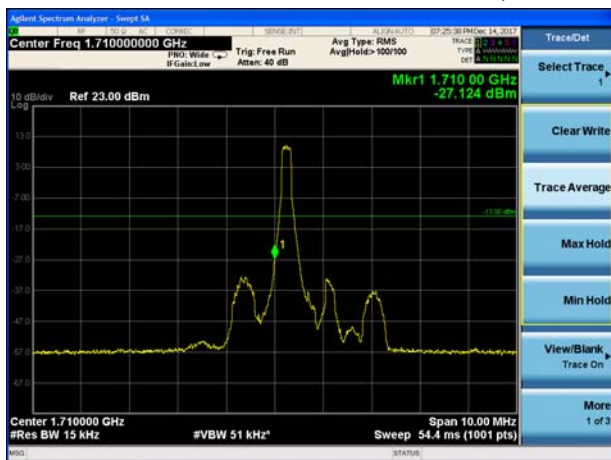
LTE Band 4 QPSK 20MHz CH-Low, 100%RB



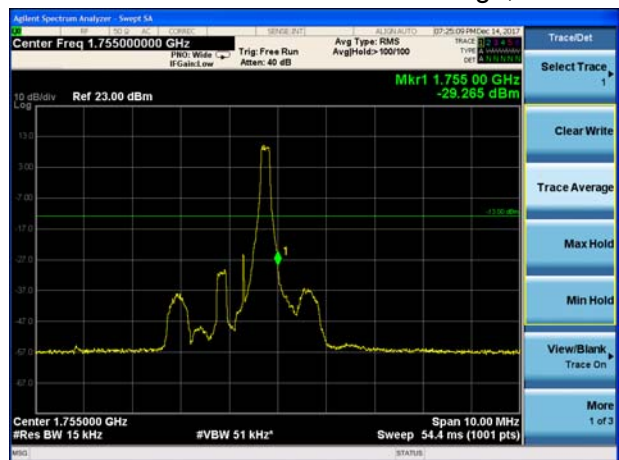
LTE Band 4 QPSK 20MHz CH-High, 100%RB



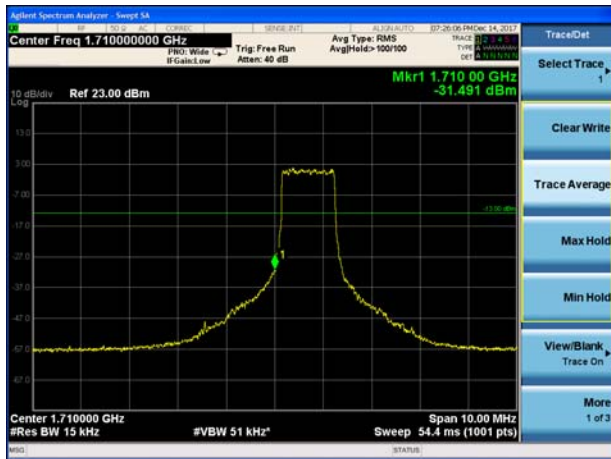
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



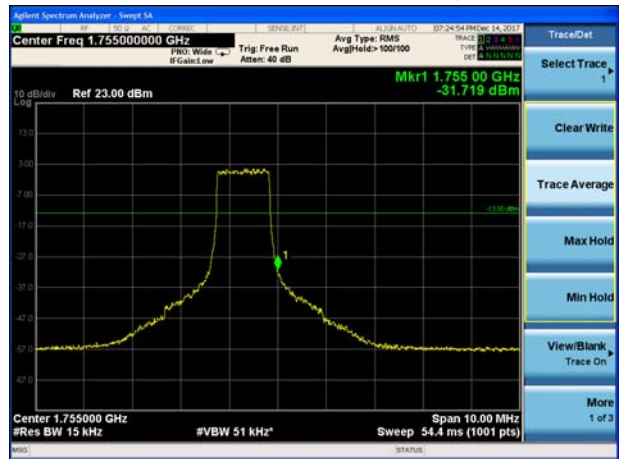
LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



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

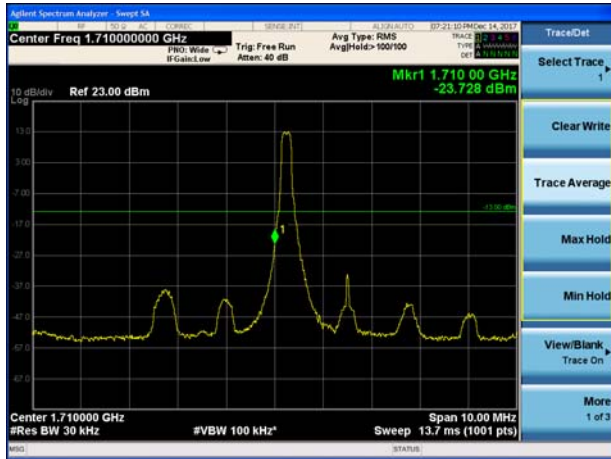


LTE Band 4 16QAM 1.4MHz CH-High, 100%RB

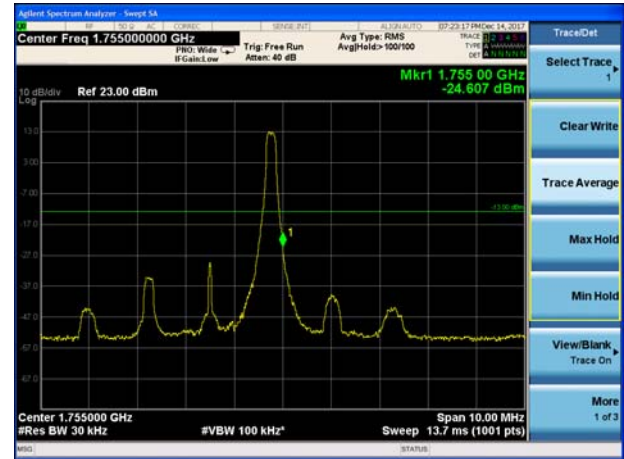




LTE Band 4 16QAM 3MHz CH-Low, 1 RB



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



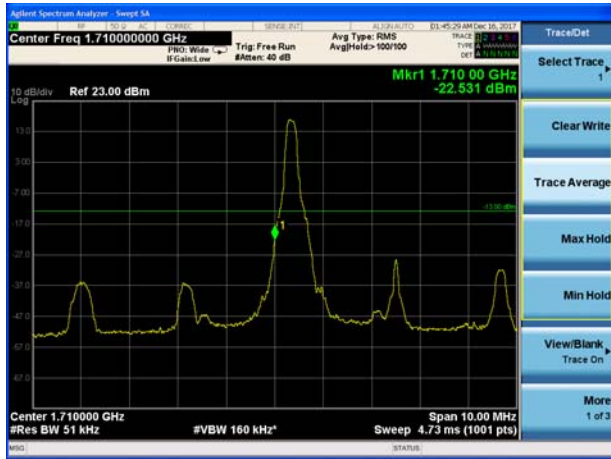
LTE Band 4 16QAM 3MHz CH-Low, 100%RB



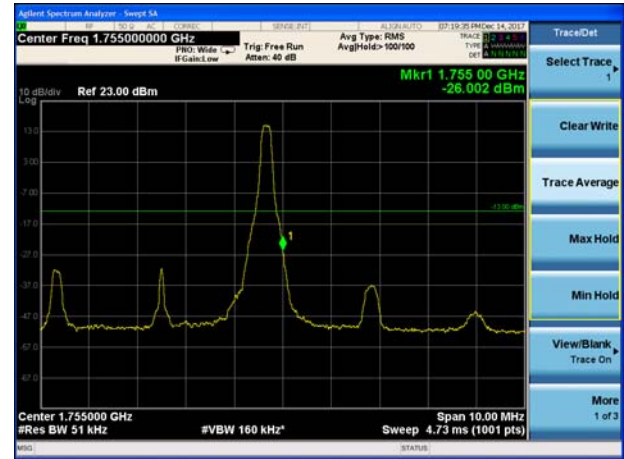
LTE Band 4 16QAM 3MHz CH-High, 100%RB

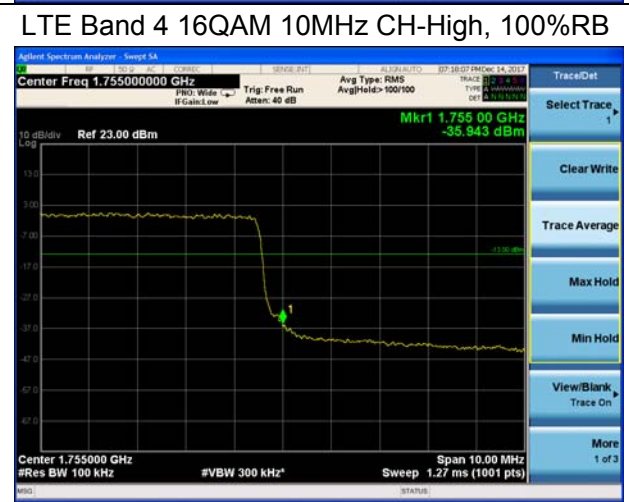
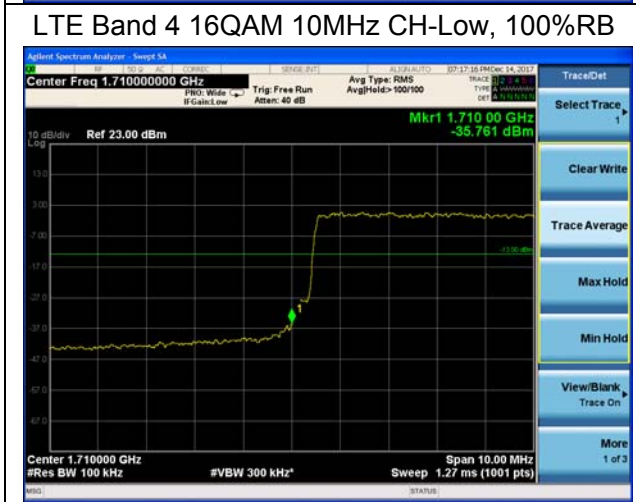
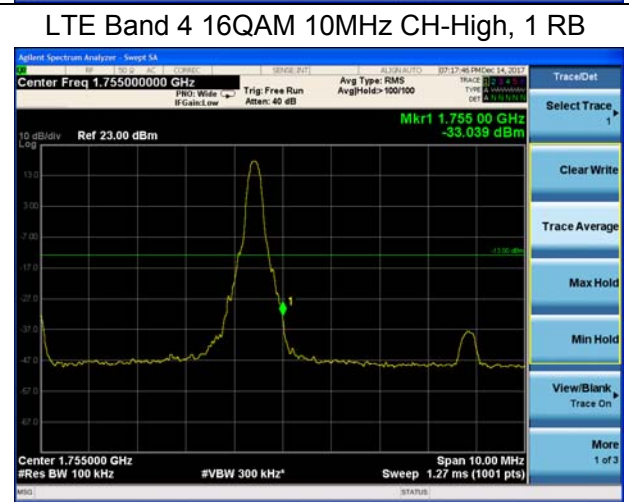
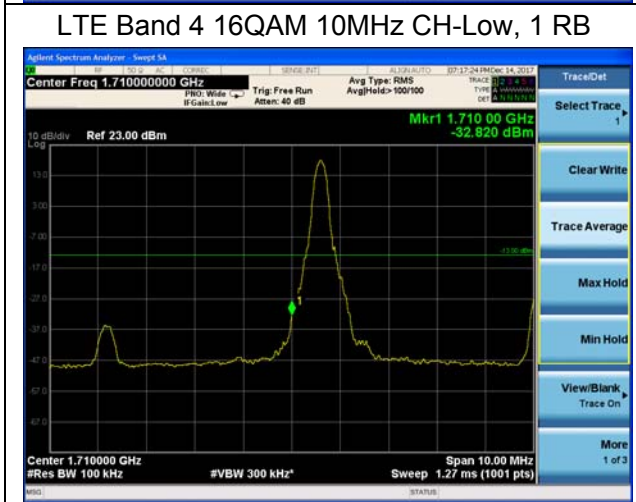
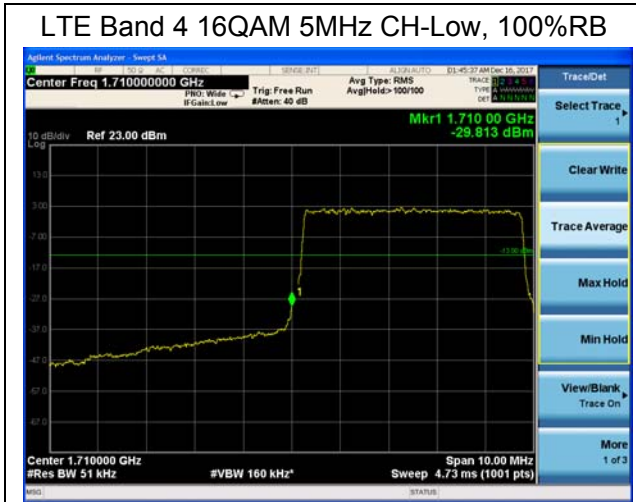


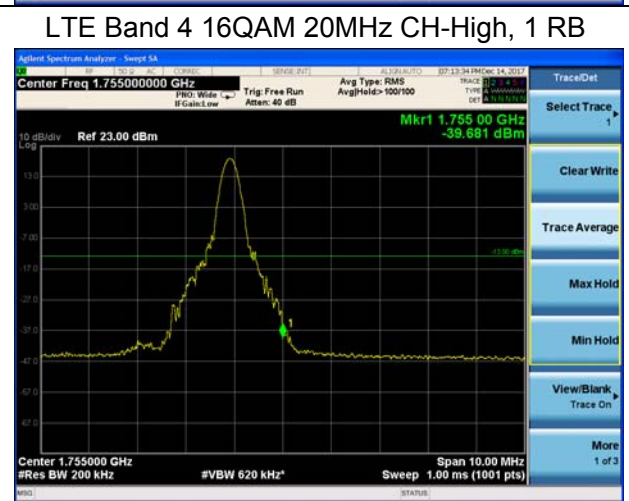
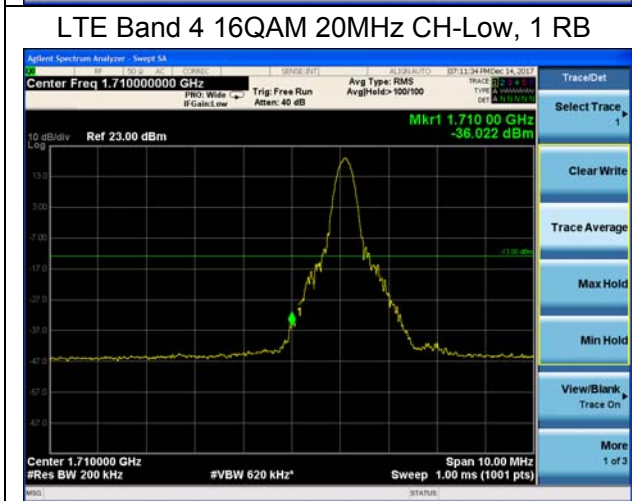
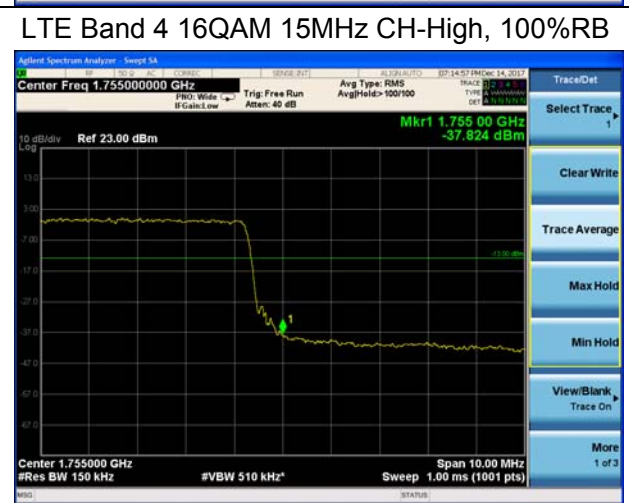
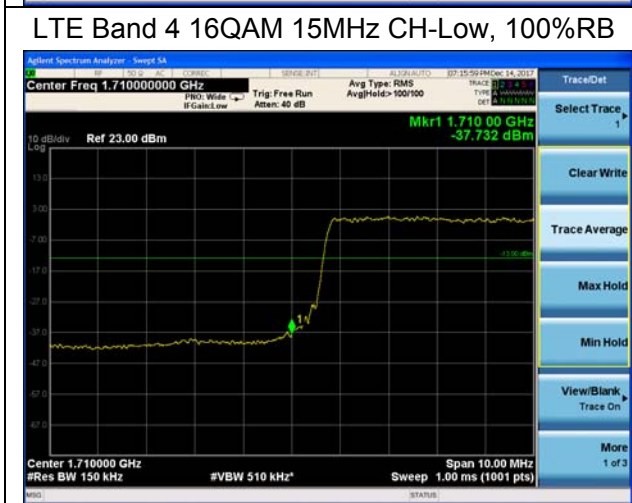
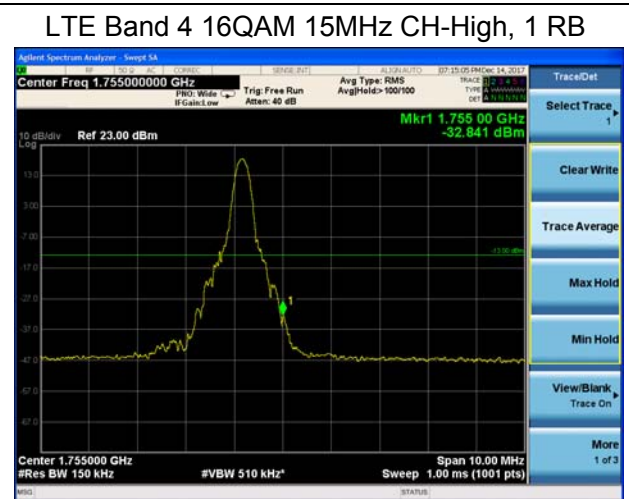
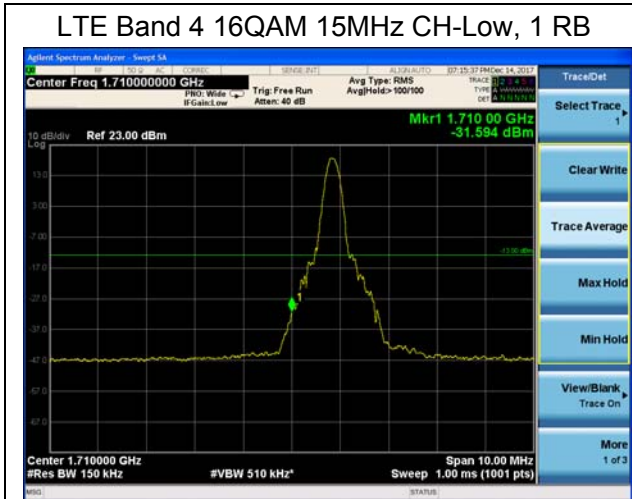
LTE Band 4 16QAM 5MHz CH-Low, 1 RB

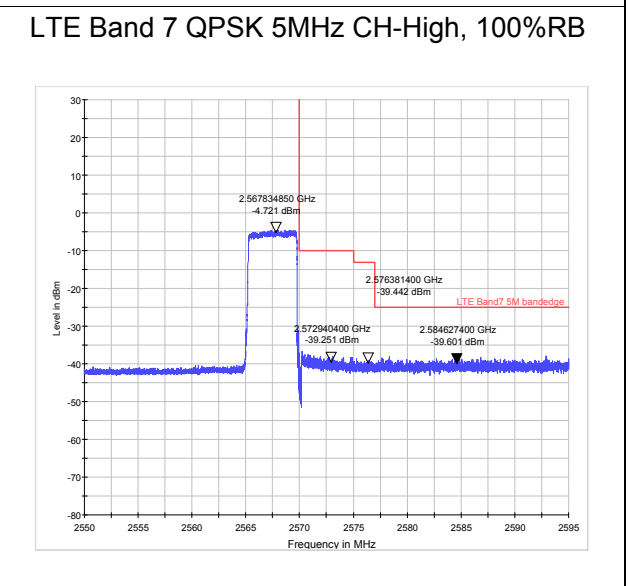
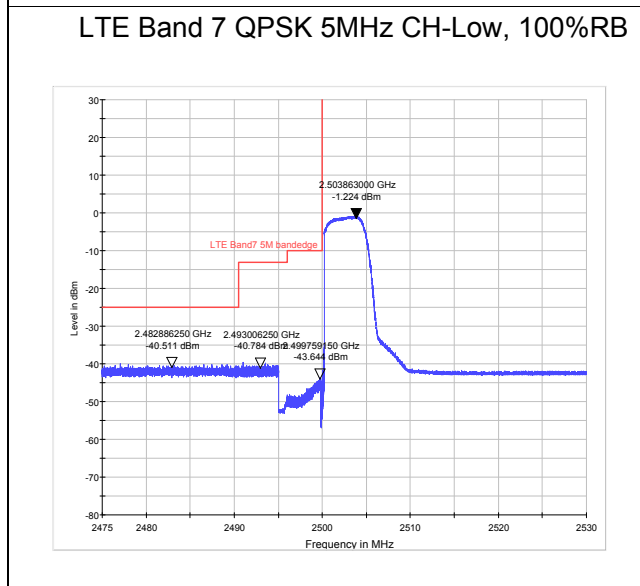
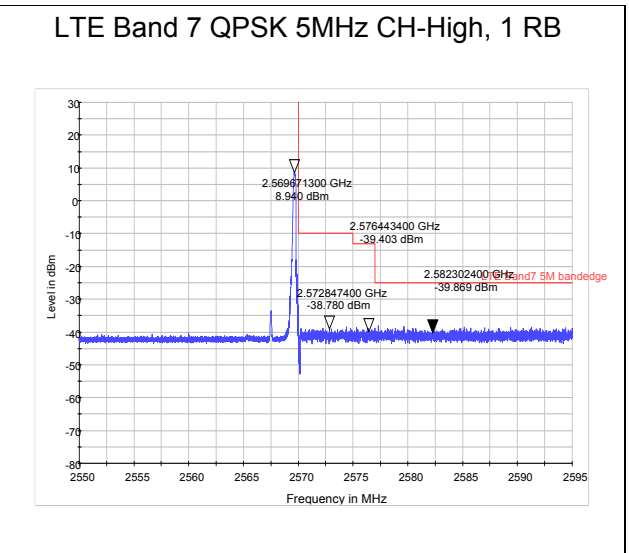
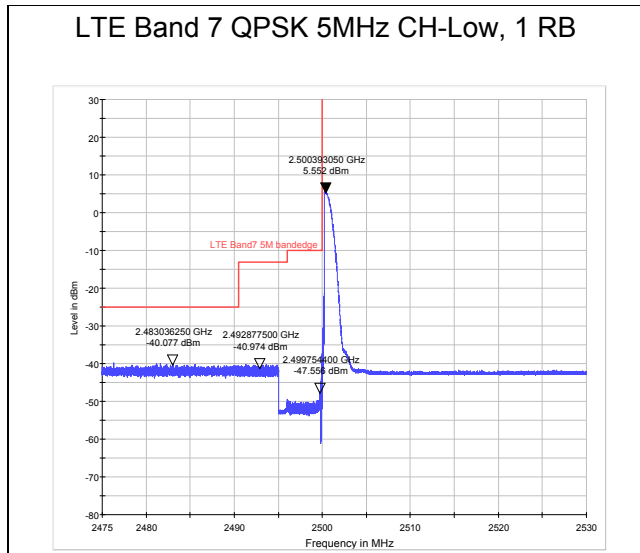
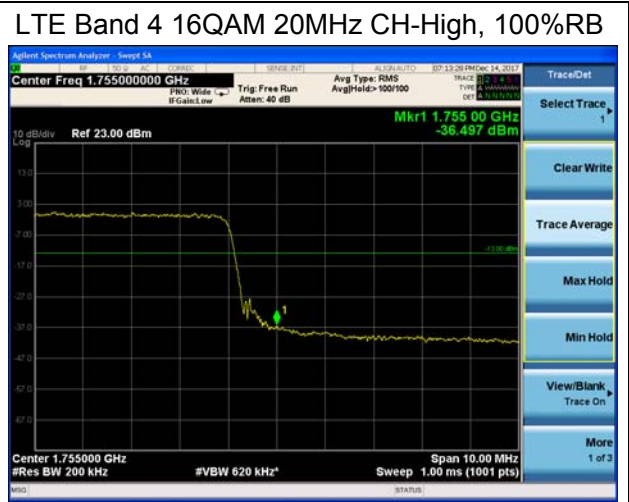
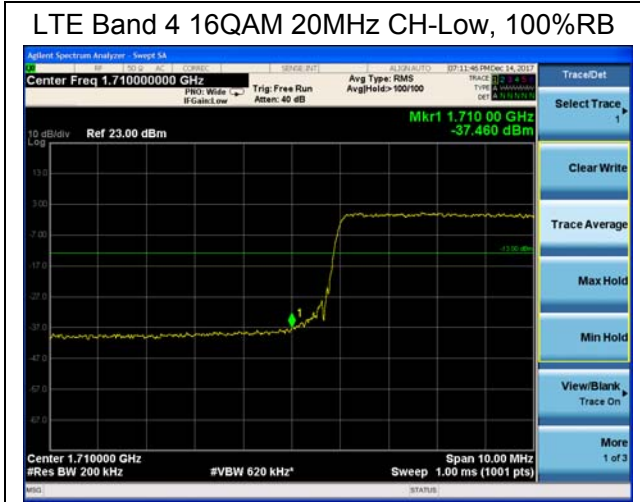


LTE Band 4 16QAM 5MHz CH-High, 1 RB



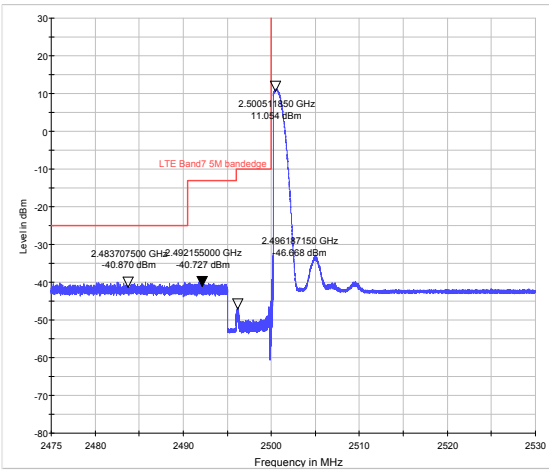




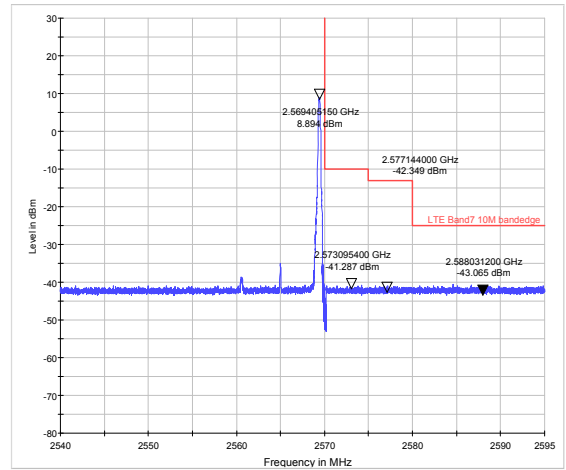




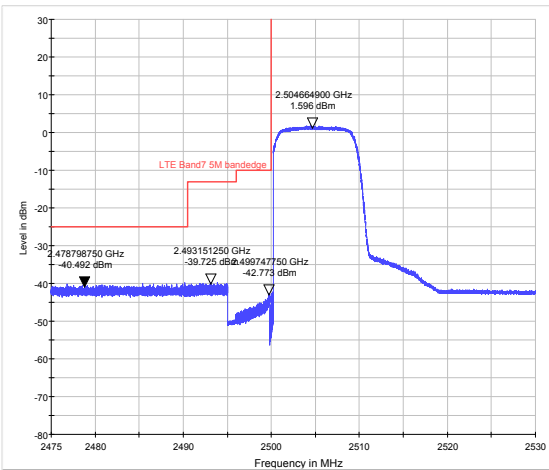
LTE Band 7 QPSK 10MHz CH-Low, 1 RB



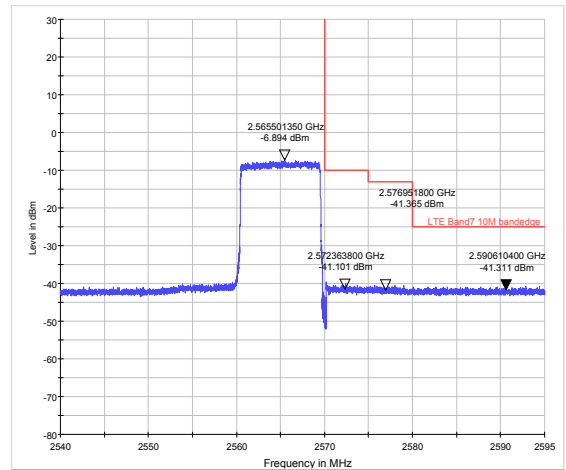
LTE Band 7 QPSK 10MHz CH-High, 1 RB



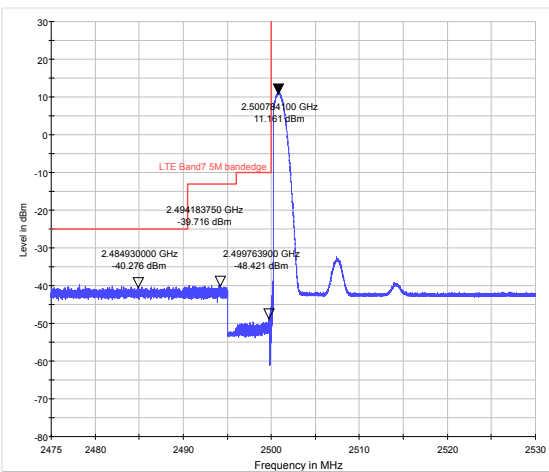
LTE Band 7 QPSK 10MHz CH-Low, 100%RB



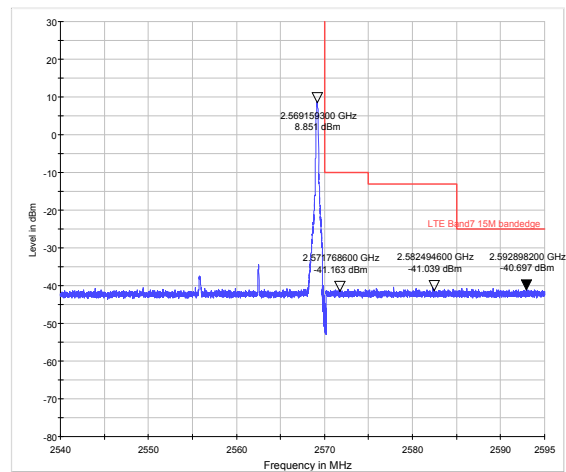
LTE Band 7 QPSK 10MHz CH-High, 100%RB



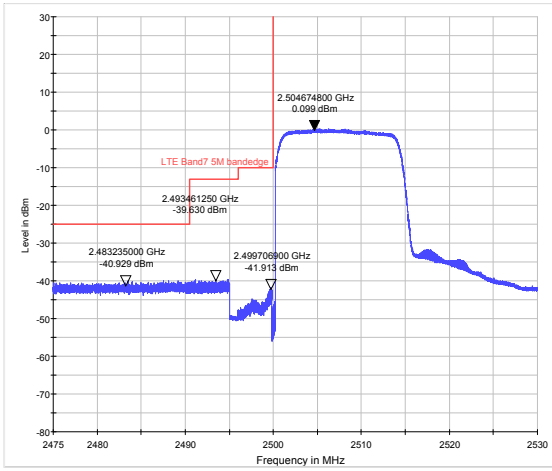
LTE Band 7 QPSK 15MHz CH-Low, 1 RB



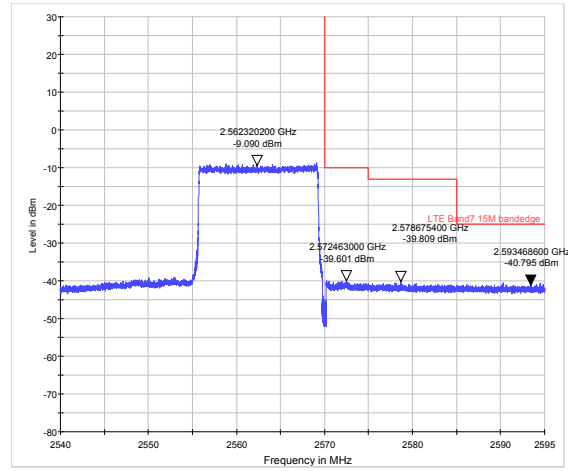
LTE Band 7 QPSK 15MHz CH-High, 1 RB



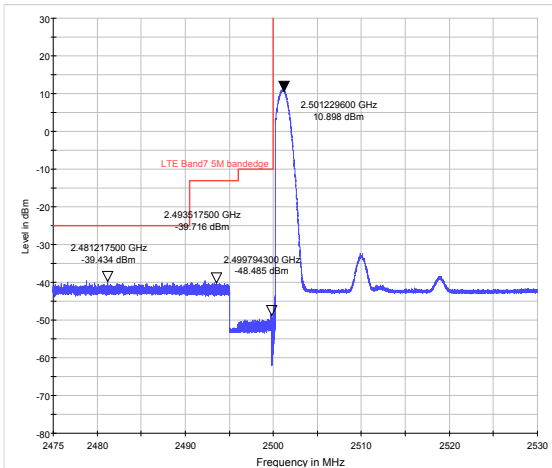
LTE Band 7 QPSK 15MHz CH-Low, 100%RB



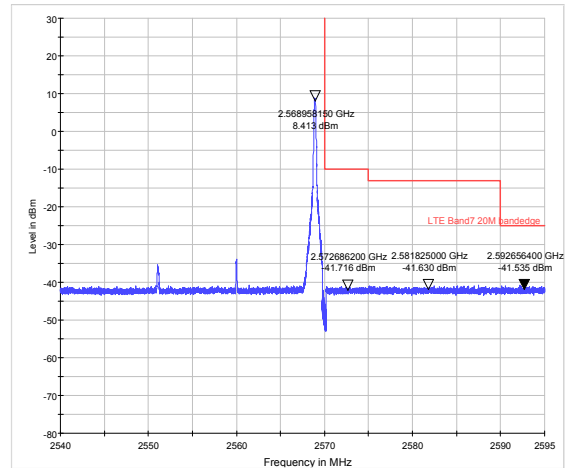
LTE Band 7 QPSK 15MHz CH-High, 100%RB



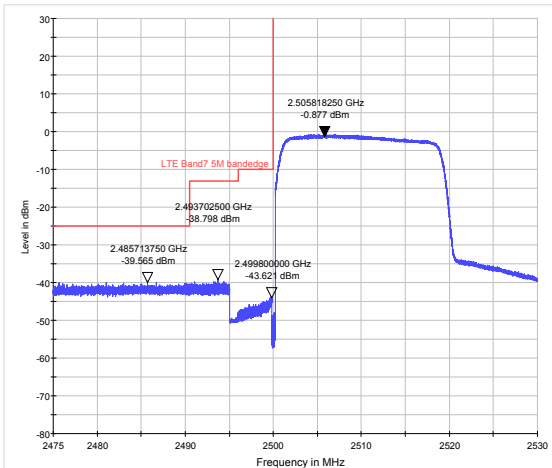
LTE Band 7 QPSK 20MHz CH-Low, 1 RB



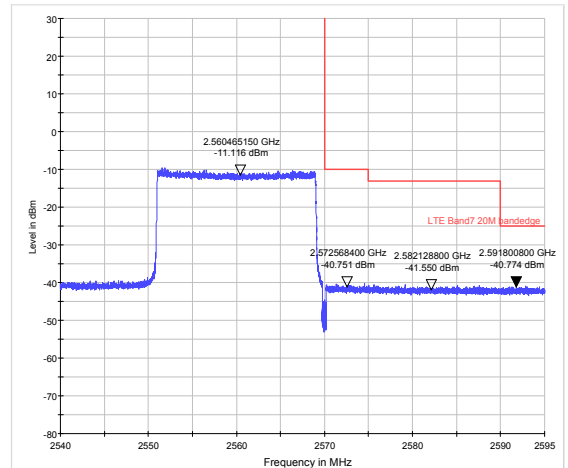
LTE Band 7 QPSK 20MHz CH-High, 1 RB



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

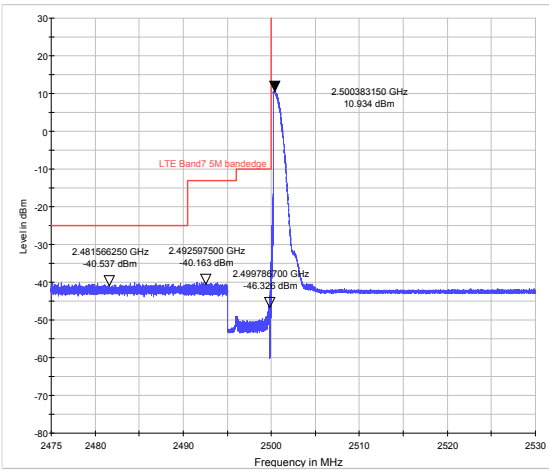


LTE Band 7 QPSK 20MHz CH-High, 100%RB

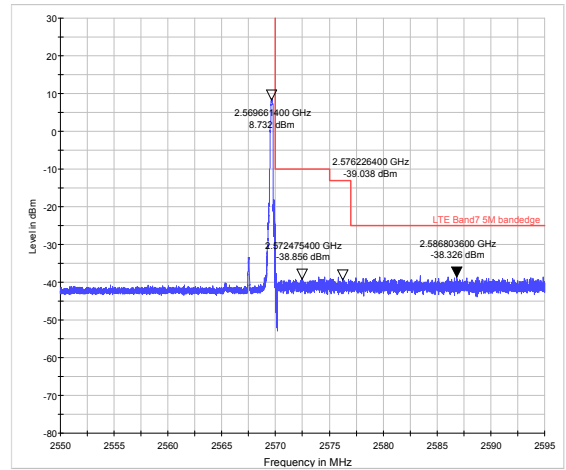




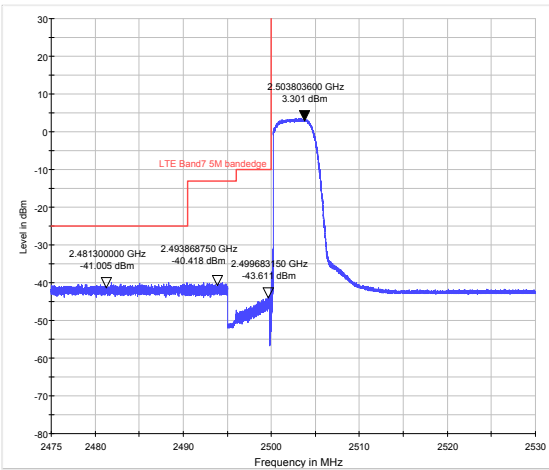
LTE Band 7 16QAM 5MHz CH-Low, 1 RB



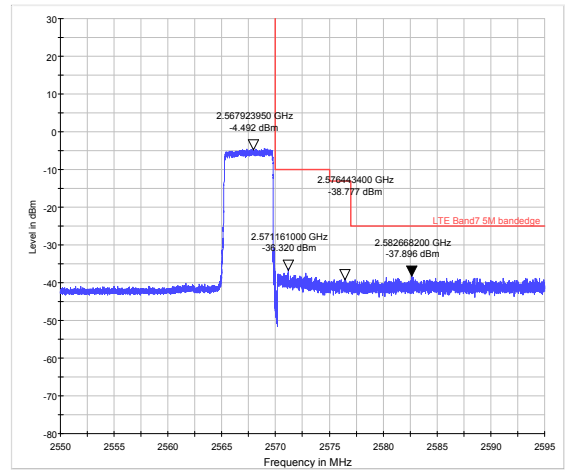
LTE Band 7 16QAM 5MHz CH-High, 1 RB



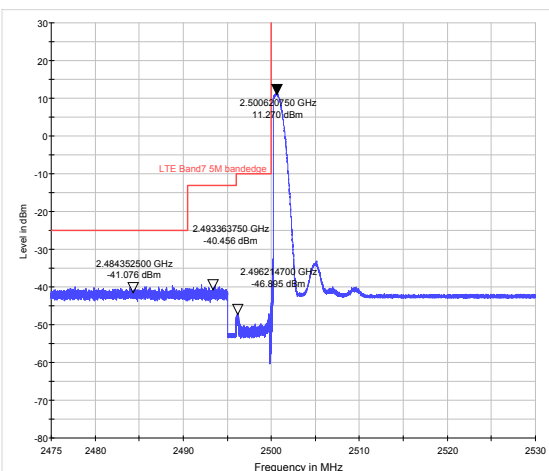
LTE Band 7 16QAM 5MHz CH-Low, 100%RB



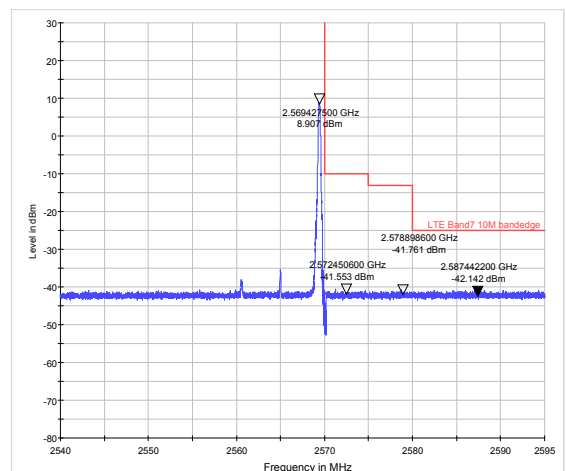
LTE Band 7 16QAM 5MHz CH-High, 100%RB



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

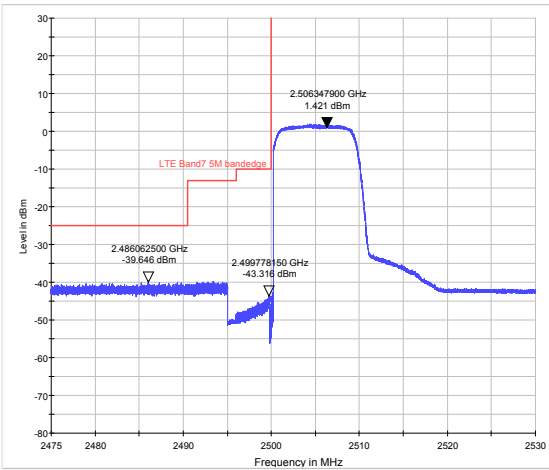


LTE Band 7 16QAM 10MHz CH-High, 1 RB

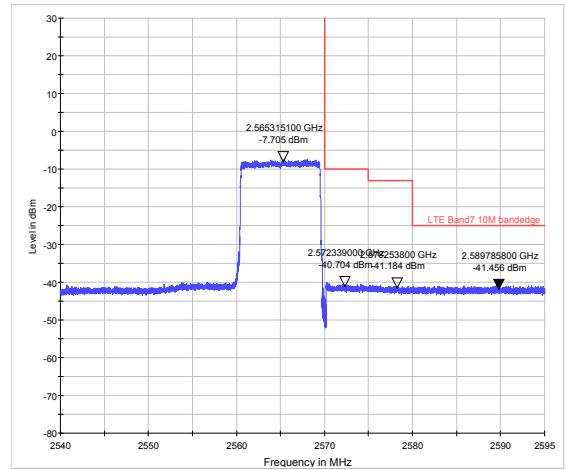




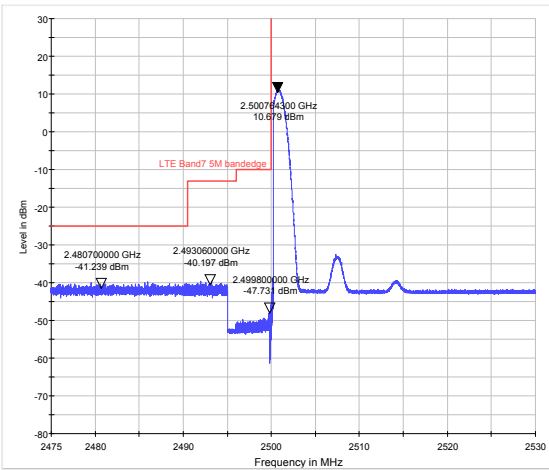
LTE Band 7 16QAM 10MHz CH-Low, 100%RB



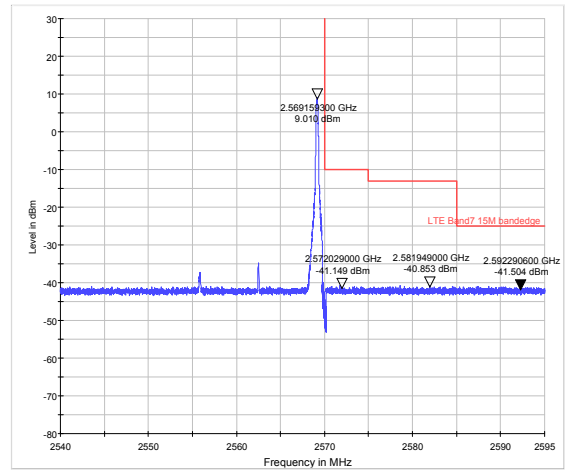
LTE Band 7 16QAM 10MHz CH-High, 100%RB



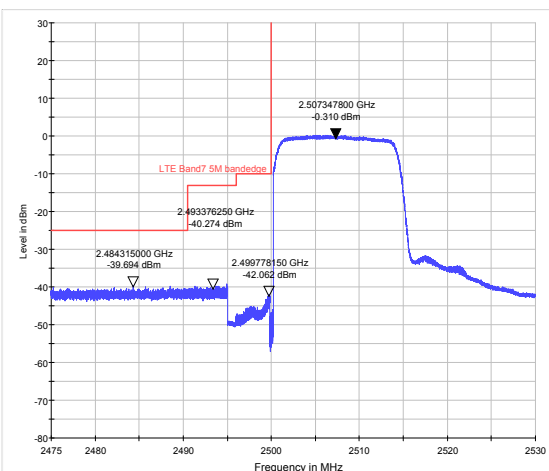
LTE Band 7 16QAM 15MHz CH-Low, 1 RB



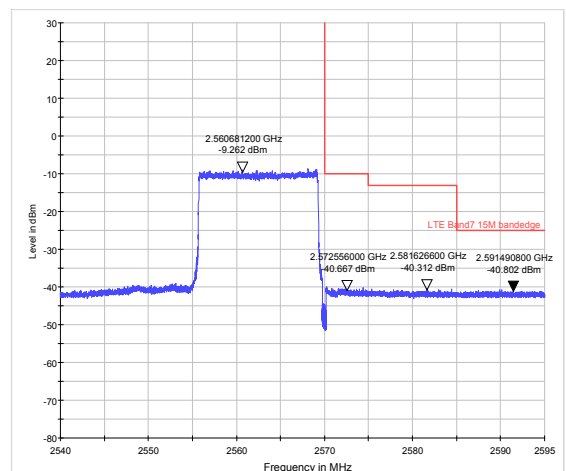
LTE Band 7 16QAM 15MHz CH-High, 1 RB



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

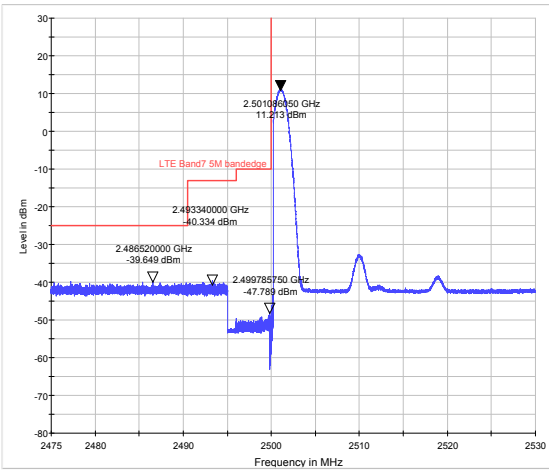


LTE Band 7 16QAM 15MHz CH-High, 100%RB

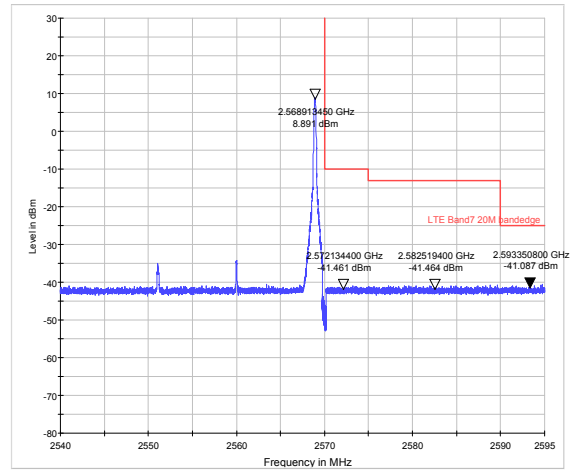




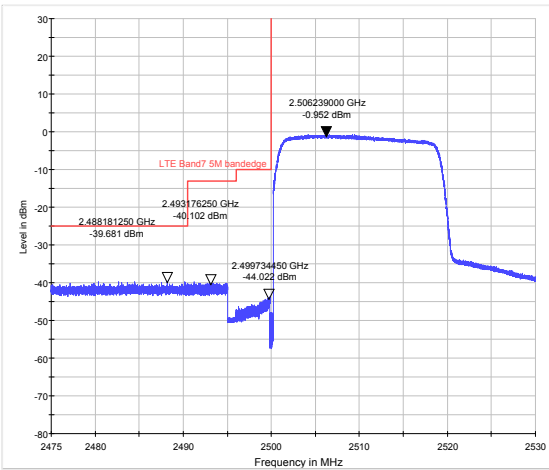
LTE Band 7 16QAM 20MHz CH-Low, 1 RB



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

