



RF TEST REPORT

Applicant ZTE Corporation

FCC ID SRQ-ZTEBLADEV8Q

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

Model ZTE BLADE V0840 / ZTE BLADE V8Q /
BLADE V8Q

Report No. RXA1708-0309RF03R1

Issue Date October 17, 2017

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

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(b)(10) /27.50(c)(10) /27.50(h)(2) | PASS |
| 3 | Occupied Bandwidth | 2.1049 | PASS |
| 4 | Band Edge Compliance | 27.53(h) /27.53(g) /27.53(m) | PASS |
| 5 | Peak-to-Average Power Ratio | 27.50(d)/KDB971168 D01(5.7) | PASS |
| 6 | Frequency Stability | 2.1055 / 27.54 | PASS |
| 7 | Spurious Emissions at Antenna Terminals | 2.1051 27.53(h) /27.53(g) /27.53(m) | PASS |
| 8 | Radiates Spurious Emission | 2.1053 /27.53(h) /27.53(g) /27.53(m) /27.53(f) | PASS |
| Date of Testing: August 31, 2017~ September 22, 2017 | | | |
| Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. | | | |

1 Test Laboratory

1.1 Notes of the Test Report

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

1.2 Test facility

CNAS (accreditation number: L2264)

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

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

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

IC (recognition number is 8510A)

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

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

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

A2LA (Certificate Number: 3857.01)

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

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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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 V0840 / ZTE BLADE V8Q / BLADE V8Q | | |
| Product IMEI: | 866032030009910 | | |
| Hardware Version: | MBV1.0 | | |
| Software Version: | GEN_ZTE_V0840_V1.0 | | |
| Power Supply: | Battery/AC adapter | | |
| Antenna Type: | Internal Antenna | | |
| Test Mode(s): | WCDMA Band IV; LTE Band 4; LTE Band 7; LTE Band 12, LTE Band 17; | | |
| HSDPA UE Category: | 24 | | |
| HSUPA UE Category: | 6 | | |
| LTE Category | R10 | | |
| Maximum E.I.R.P./ E.R.P. | WCDMA Band IV: | 23.83dBm | |
| | LTE Band 4: | 23.72dBm | |
| | LTE Band 7: | 22.46dBm | |
| | LTE Band 12: | 17.48dBm | |
| | LTE Band 17: | 17.43dBm | |
| Rated Power Supply Voltage: | 3.85V | | |
| Extreme Voltage: | Minimum: 3.6V Maximum: 4.4V | | |
| Extreme Temperature: | Lowest: -10°C Highest: +55°C | | |
| Operating Frequency Range(s) | Mode | Tx (MHz) | Rx (MHz) |
| | WCDMA Band IV | 1710 ~ 1755 | 2110 ~ 2155 |
| | LTE Band 4 | 1710 ~ 1755 | 2110 ~ 2155 |
| | LTE Band 7 | 2500 ~ 2570 | 2620 ~ 2690 |
| | LTE Band 12 | 699 ~ 716 | 729 ~ 746 |
| | LTE Band 17 | 704 ~ 716 | 734 ~ 746 |
| EUT Accessory | | | |
| Adapter 1 | Manufacturer: SHENZHEN RUIJING INDUSTRIAL CO LTD | | |



| | |
|--|---|
| | RUIJING Model: STC-A51A-Z |
| Adapter 2 | Manufacturer:Jiangsu Chenyang Electronics Co., Ltd. Model:STC-A51A-Z |
| Adapter 3 | Manufacturer:DONGGUAN AOHAJ POWER TECHNOLOGY CO., LTD. Model:STC-A51A-Z |
| Adapter 4 | Manufacturer: SHENZHEN RUIJING INDUSTRIAL CO LTD RUIJING Model: STC-A51A-A |
| Adapter 5 | Manufacturer:Jiangsu Chenyang Electronics Co., Ltd. Model: STC-A51A-A |
| Battery | Manufacturer: Zhongshan tianmao battery co., ltd Model: Li3825T43P3h736037 Power Rating: DC 3.8V, 2500mAh, Li-ion |
| Earphone | Manufacturer: GoerTek Inc Model: HMZ17-CTIA-3.5 |
| USB Extend Cable 1 | Manufacturer:Chuan electronics co., ltd SN:080410500049 |
| USB Extend Cable 2 | Manufacturer:KoEY Huaxing electronics co., ltd SN:080410500049 |
| Note: 1. The information of the EUT is declared by the manufacturer. | |

3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC CFR47 Part 2 (2017)

FCC CFR47 Part 27C (2017)

ANSI/TIA-603-D (2010)

KDB 971168 D01 Power Meas License Digital Systems v02r02

4 Test Configuration

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

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in WCDMA/LTE is set based on the maximum RF Output Power.

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

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

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

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

| Test items | Modes | Bandwidth (MHz) | | | | | | Modulation | | RB | | | Test Channel | | |
|---|---|-----------------|---|---|----|----|----|------------|-------|----|-----|------|--------------|---|---|
| | | 1.4 | 3 | 5 | 10 | 15 | 20 | QPSK | 16QAM | 1 | 50% | 100% | L | M | H |
| RF power output | LTE 4 | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| | LTE 7 | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| | LTE 12 | O | O | O | O | - | - | O | O | O | O | O | O | O | O |
| | LTE 17 | - | - | O | O | - | - | O | O | O | O | O | O | O | O |
| Effective Isotropic Radiated power | LTE 4 | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| | LTE 7 | - | - | O | O | O | O | O | O | O | O | O | O | O | O |
| | LTE 12 | O | O | O | O | - | - | O | O | O | O | O | O | O | O |
| | LTE 17 | - | - | O | O | - | - | O | O | O | O | O | O | O | O |
| Occupied Bandwidth | LTE 4 | O | O | O | O | O | O | O | O | - | - | O | O | O | O |
| | LTE 7 | - | - | O | O | O | O | O | O | - | - | O | O | O | O |
| | LTE 12 | O | O | O | O | - | - | O | O | - | - | O | O | O | O |
| | LTE 17 | - | - | O | O | - | - | O | O | - | - | O | O | O | O |
| Band Edge Compliance | LTE 4 | O | O | O | O | O | O | O | O | O | - | O | O | - | O |
| | LTE 7 | - | - | O | O | O | O | O | O | O | - | O | O | - | O |
| | LTE 12 | O | O | O | O | - | - | O | O | O | - | O | O | - | O |
| | LTE 17 | - | - | O | O | - | - | O | O | O | - | O | O | - | O |
| Peak-to-Average Power Ratio | LTE 4 | O | O | O | O | O | O | O | O | - | - | O | O | O | O |
| | LTE 7 | - | - | O | O | O | O | O | O | - | - | O | O | O | O |
| | LTE 12 | O | O | O | O | - | - | O | O | - | - | O | O | O | O |
| | LTE 17 | - | - | O | O | - | - | O | O | - | - | O | O | O | O |
| Frequency Stability | LTE 4 | O | O | O | O | O | O | O | O | - | - | O | - | O | - |
| | LTE 7 | - | - | O | O | O | O | O | O | - | - | O | - | O | - |
| | LTE 12 | O | O | O | O | - | - | O | O | - | - | O | - | O | - |
| | LTE 17 | - | - | O | O | - | - | O | O | - | - | O | - | O | - |
| Spurious Emissions at Antenna Terminals | LTE 4 | O | O | O | O | O | O | O | - | O | - | - | O | O | O |
| | LTE 7 | - | - | O | O | O | O | O | - | O | - | - | O | O | O |
| | LTE 12 | O | O | O | O | - | - | O | - | O | - | - | O | O | O |
| | LTE 17 | - | - | O | O | - | - | O | - | O | - | - | O | O | O |
| Radiates Spurious Emission | LTE 4 | O | O | O | O | O | O | O | - | O | - | - | O | O | O |
| | LTE 7 | - | - | O | O | O | O | O | - | O | - | - | O | O | O |
| | LTE 12 | O | O | O | O | - | - | O | - | O | - | - | O | O | O |
| | LTE 17 | - | - | O | O | - | - | O | - | O | - | - | O | O | O |
| Note | 1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing. | | | | | | | | | | | | | | |

5 Test Information

5.1 RF Power Output

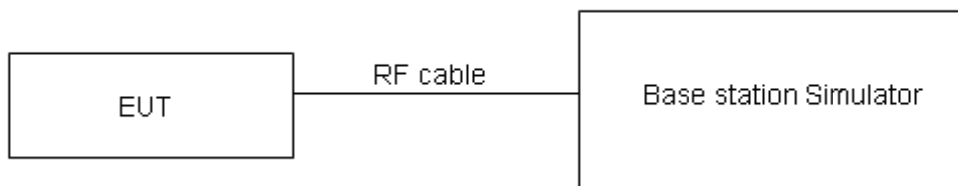
Ambient condition

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

Methods of Measurement

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

Test Setup



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

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

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

Test Results

| WCDMA Band IV | | AV Conducted Power(dBm) | | |
|-----------------|--------------|-------------------------|--------------|--------------|
| | | Channel 1312 | Channel 1413 | Channel 1513 |
| | | 1712.4 (MHz) | 1732.6 (MHz) | 1752.6(MHz) |
| RMC | | 23.06 | 23.11 | 23.20 |
| HSDPA | Sub - Test 1 | 22.89 | 22.95 | 23.04 |
| | Sub - Test 2 | 22.90 | 22.94 | 23.06 |
| | Sub - Test 3 | 22.50 | 22.52 | 22.64 |
| | Sub - Test 4 | 22.49 | 22.54 | 22.63 |
| HSUPA | Sub - Test 1 | 22.98 | 23.03 | 23.12 |
| | Sub - Test 2 | 21.14 | 21.19 | 21.28 |
| | Sub - Test 3 | 21.96 | 22.01 | 22.10 |
| | Sub - Test 4 | 21.15 | 21.20 | 21.29 |
| | Sub - Test 5 | 22.94 | 22.99 | 23.08 |
| DC-HSDPA | Sub - Test 1 | 22.93 | 22.98 | 23.07 |
| | Sub - Test 2 | 22.91 | 22.97 | 23.06 |
| | Sub - Test 3 | 22.40 | 22.46 | 22.55 |
| | Sub - Test 4 | 22.39 | 22.45 | 22.54 |

| LTE TDD Band 4 | | | | AV Conducted Power(dBm) | | |
|----------------|------------|---------|-----------|-------------------------|--------------|--------------|
| Bandwidth | Modulation | RB size | RB offset | Channel/Frequency (MHz) | | |
| | | | | 19957/1710.7 | 20175/1732.5 | 20393/1754.3 |
| 1.4MHz | QPSK | 1 | 0 | 22.98 | 23.03 | 23.21 |
| | | 1 | 2 | 23.16 | 23.16 | 23.41 |
| | | 1 | 5 | 22.99 | 22.97 | 23.26 |
| | | 3 | 0 | 23.09 | 23.10 | 23.27 |
| | | 3 | 2 | 23.14 | 23.12 | 23.26 |
| | | 3 | 3 | 23.11 | 23.09 | 23.31 |
| | | 6 | 0 | 22.19 | 21.94 | 22.04 |
| | 16QAM | 1 | 0 | 22.48 | 22.44 | 22.71 |
| | | 1 | 2 | 22.64 | 22.57 | 22.81 |
| | | 1 | 5 | 22.52 | 22.52 | 22.74 |
| | | 3 | 0 | 22.38 | 22.39 | 22.58 |
| | | 3 | 2 | 22.43 | 22.33 | 22.57 |
| | | 3 | 3 | 22.29 | 22.37 | 22.62 |
| | | 6 | 0 | 21.07 | 21.01 | 21.10 |
| Bandwidth | Modulation | RB size | RB offset | Channel/Frequency (MHz) | | |
| | | | | 19965/1711.5 | 20175/1732.5 | 20385/1753.5 |
| 3MHz | QPSK | 1 | 0 | 23.29 | 23.28 | 23.78 |
| | | 1 | 7 | 23.52 | 23.50 | 23.59 |
| | | 1 | 14 | 23.32 | 23.12 | 23.79 |
| | | 8 | 0 | 22.42 | 22.35 | 22.57 |
| | | 8 | 4 | 22.29 | 22.36 | 22.33 |
| | | 8 | 7 | 22.30 | 22.13 | 22.22 |
| | | 15 | 0 | 22.28 | 22.20 | 22.30 |
| | 16QAM | 1 | 0 | 22.38 | 22.21 | 22.21 |
| | | 1 | 7 | 22.33 | 22.15 | 22.29 |
| | | 1 | 14 | 22.15 | 21.84 | 22.26 |
| | | 8 | 0 | 21.37 | 21.23 | 21.39 |
| | | 8 | 4 | 21.43 | 21.37 | 21.39 |
| | | 8 | 7 | 21.23 | 21.22 | 21.28 |
| | | 15 | 0 | 21.36 | 21.17 | 21.27 |
| Bandwidth | Modulation | RB size | RB offset | Channel/Frequency (MHz) | | |
| | | | | 19975/1712.5 | 20175/1732.5 | 20375/1752.5 |
| 5MHz | QPSK | 1 | 0 | 23.26 | 23.26 | 23.74 |
| | | 1 | 13 | 23.50 | 23.46 | 23.56 |
| | | 1 | 24 | 23.29 | 23.07 | 23.75 |
| | | 12 | 0 | 22.39 | 22.30 | 22.53 |
| | | 12 | 6 | 22.27 | 22.32 | 22.28 |
| | | 12 | 13 | 22.28 | 22.11 | 22.18 |
| | | 25 | 0 | 22.26 | 22.19 | 22.28 |



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



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

Note:

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

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



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

| LTE FDD Band 12 | | | | AV Conducted Power(dBm) | | |
|-----------------|------------|---------|-----------|-------------------------|-------------|-------------|
| Bandwidth | Modulation | RB size | RB offset | Channel/Frequency (MHz) | | |
| | | | | 23017/699.7 | 23095/707.5 | 23173/715.3 |
| 1.4MHz | QPSK | 1 | 0 | 22.38 | 22.11 | 22.35 |
| | | 1 | 2 | 22.51 | 22.32 | 22.42 |
| | | 1 | 5 | 22.29 | 22.25 | 22.30 |
| | | 3 | 0 | 22.37 | 22.18 | 22.35 |
| | | 3 | 2 | 22.39 | 22.31 | 22.43 |
| | | 3 | 3 | 22.34 | 22.27 | 22.36 |
| | | 6 | 0 | 21.40 | 21.32 | 21.39 |
| | 16QAM | 1 | 0 | 21.74 | 21.42 | 21.85 |
| | | 1 | 2 | 21.88 | 21.81 | 21.96 |
| | | 1 | 5 | 21.35 | 21.74 | 21.67 |
| | | 3 | 0 | 21.44 | 21.45 | 21.65 |
| | | 3 | 2 | 21.46 | 21.48 | 21.72 |
| | | 3 | 3 | 21.41 | 21.56 | 21.64 |
| | | 6 | 0 | 20.49 | 20.57 | 20.40 |
| Bandwidth | Modulation | RB size | RB offset | Channel/Frequency (MHz) | | |
| | | | | 23025/700.5 | 23095/707.5 | 23165/714.5 |
| 3MHz | QPSK | 1 | 0 | 22.43 | 22.39 | 22.39 |
| | | 1 | 7 | 22.56 | 22.52 | 22.60 |
| | | 1 | 14 | 22.48 | 22.44 | 22.39 |
| | | 8 | 0 | 21.31 | 21.42 | 21.43 |
| | | 8 | 4 | 21.33 | 21.54 | 21.37 |
| | | 8 | 7 | 21.43 | 21.49 | 21.50 |
| | | 15 | 0 | 21.39 | 21.47 | 21.49 |
| | 16QAM | 1 | 0 | 20.90 | 20.83 | 20.93 |
| | | 1 | 7 | 20.99 | 20.74 | 20.81 |
| | | 1 | 14 | 20.78 | 20.89 | 20.82 |
| | | 8 | 0 | 20.40 | 20.31 | 20.36 |
| | | 8 | 4 | 20.53 | 20.39 | 20.32 |
| | | 8 | 7 | 20.41 | 20.51 | 20.22 |
| | | 15 | 0 | 20.36 | 20.32 | 20.16 |
| Bandwidth | Modulation | RB size | RB offset | Channel/Frequency (MHz) | | |
| | | | | 23035/701.5 | 23095/707.5 | 23155/713.5 |
| 5MHz | QPSK | 1 | 0 | 22.42 | 22.35 | 22.37 |
| | | 1 | 13 | 22.54 | 22.51 | 22.57 |
| | | 1 | 24 | 22.45 | 22.39 | 22.35 |
| | | 12 | 0 | 21.29 | 21.38 | 21.40 |
| | | 12 | 6 | 21.30 | 21.49 | 21.33 |
| | | 12 | 13 | 21.40 | 21.46 | 21.46 |
| | | 25 | 0 | 21.37 | 21.43 | 21.44 |



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

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



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

5.2 Effective Isotropic Radiated Power

Ambient condition

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

Methods of Measurement

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and **ANSI/TIA-603-E-2016**.

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

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

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

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

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

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

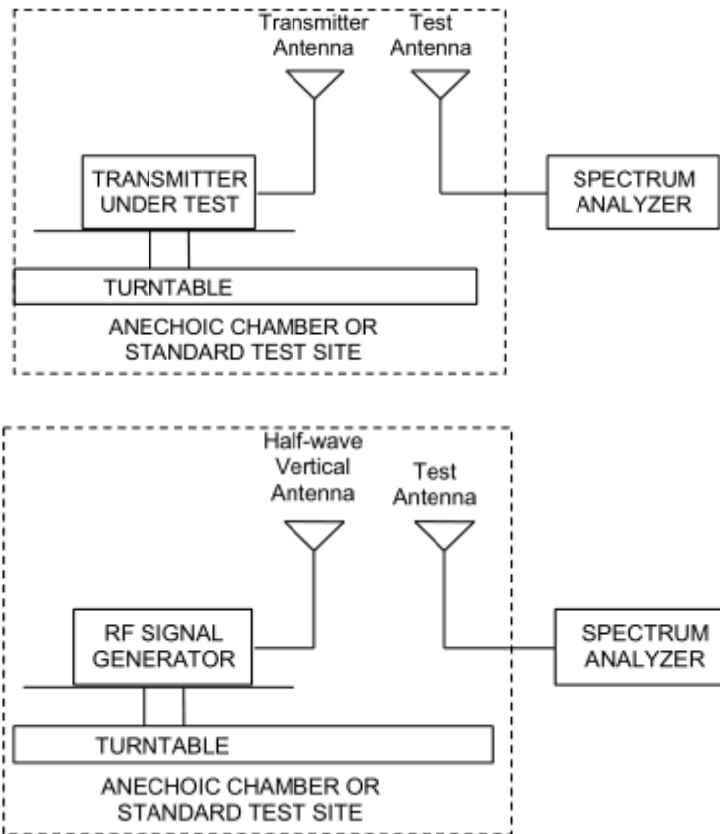
g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and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

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

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

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

Test setup



Note: Area side:2.4mX3.6m

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

**Limits**

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

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

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

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

| | |
|---|-------------------|
| Part 27.50(b)(10)Limit (ERP) -LTE 13 | ≤ 3 W (34.77 dBm) |
| Part 27.50(c)(10)Limit (ERP) -LTE 12/17 | ≤ 3 W (34.77 dBm) |
| Part 27.50(d)(4)Limit (EIRP) -LTE 4 | ≤ 1 W (30 dBm) |
| Part 27.50(h)(2) Limit (EIRP)-LTE 7/41 | ≤ 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 H and V antenna Polarization, and only the data of worst mode is recorded in this report.

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

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



| | | | | | | | |
|---|------------|--------|--------|--------|------|-------|------|
| (16QAM) | Horizontal | 1732.5 | -33.09 | -54.41 | 1.57 | 22.89 | Pass |
| | Horizontal | 1750 | -32.90 | -54.52 | 1.66 | 23.28 | Pass |
| 15 MHz (16QAM) | Horizontal | 1717.5 | -32.79 | -54.35 | 1.49 | 23.04 | Pass |
| | Horizontal | 1732.5 | -33.18 | -54.32 | 1.57 | 22.70 | Pass |
| | Horizontal | 1747.5 | -33.14 | -54.17 | 1.66 | 22.69 | Pass |
| 20 MHz (16QAM) | Horizontal | 1720 | -32.76 | -54.44 | 1.49 | 23.17 | Pass |
| | Horizontal | 1732.5 | -33.30 | -54.41 | 1.57 | 22.68 | Pass |
| | Horizontal | 1745 | -33.15 | -54.59 | 1.63 | 23.07 | Pass |
| Note: The worst emission was found in the antenna is Horizontal position. | | | | | | | |

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



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

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



| LTE Band 17 | | | | | | | |
|---------------|----------------------|-----------------|--------------------|-------------|--------------------|-----------|------------|
| Bandwidth | Antenna Polarization | Frequency (MHz) | Output Power (dBm) | Losses (dB) | Antenna Gain (dBd) | ERP (dBm) | Conclusion |
| 5MHz (QPSK) | Horizontal | 706.5 | -31.96 | -47.47 | 1.92 | 17.43 | Pass |
| | Horizontal | 710 | -32.45 | -47.75 | 1.90 | 17.21 | Pass |
| | Horizontal | 713.5 | -32.37 | -47.72 | 1.91 | 17.25 | Pass |
| 10MHz (QPSK) | Horizontal | 711 | -32.09 | -47.49 | 1.91 | 17.30 | Pass |
| 5MHz (16QAM) | Horizontal | 706.5 | -32.32 | -47.49 | 1.90 | 17.08 | Pass |
| | Horizontal | 710 | -32.26 | -47.48 | 1.90 | 17.13 | Pass |
| | Horizontal | 713.5 | -32.11 | -47.47 | 1.92 | 17.28 | Pass |
| 10MHz (16QAM) | Horizontal | 711 | -32.60 | -47.75 | 1.90 | 17.06 | Pass |

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

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

5.3 Occupied Bandwidth

Ambient condition

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

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

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

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

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

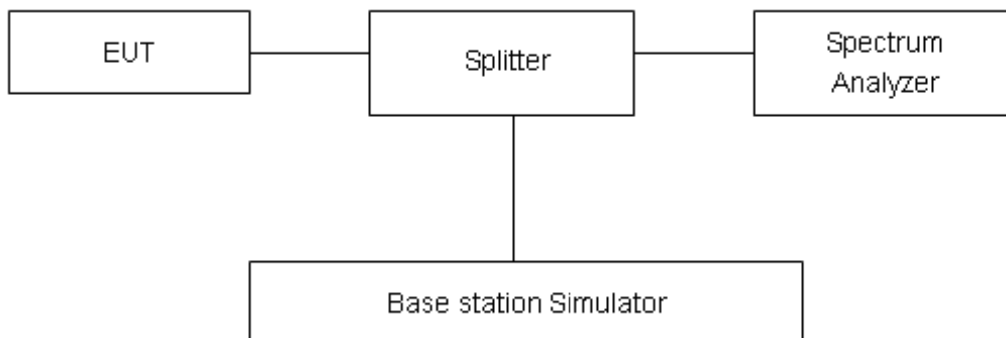
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7/12/17 (5MHz).

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

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7 (15MHz/20MHz).

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

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

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

Test Result

| Mode | Channel | Frequency (MHz) | 99% Power Bandwidth(MHz) | -26dBc Bandwidth(MHz) |
|---------------------|---------|-----------------|--------------------------|-----------------------|
| WCDMA Band IV (RMC) | 1537 | 2112.4 | 4.1382 | 4.708 |
| | 1638 | 2132.6 | 4.1177 | 4.678 |
| | 1738 | 2152.6 | 4.1326 | 4.712 |

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



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

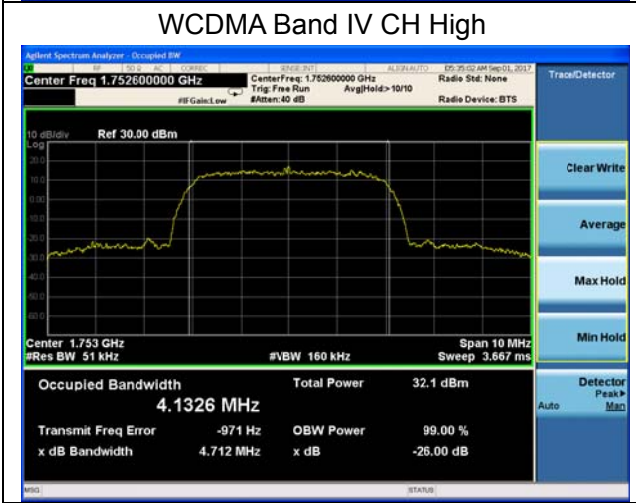
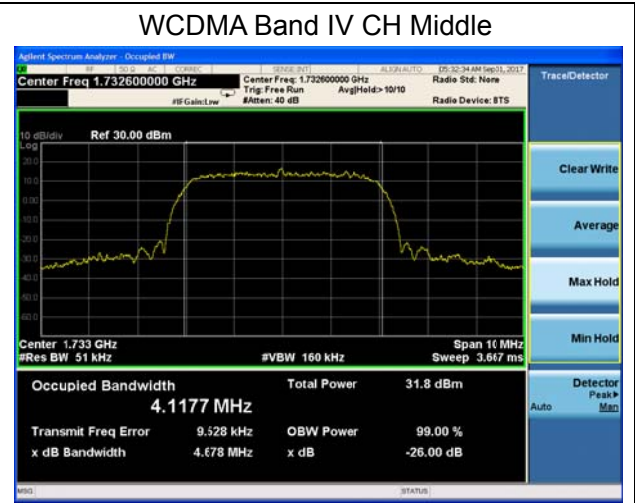
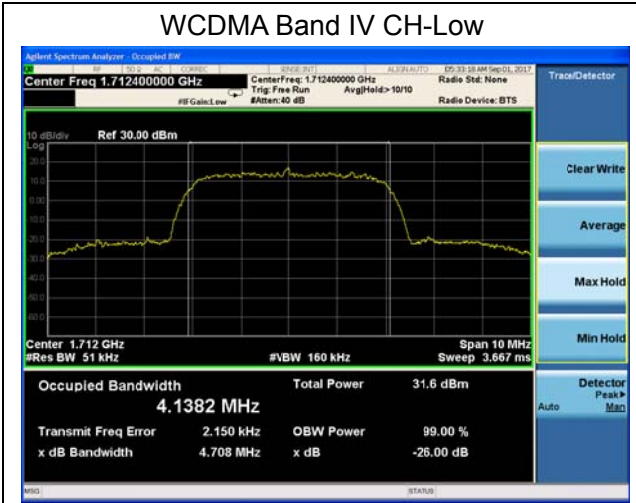
| LTE Band 7 | | | | | | |
|------------|------------|-----------------|---------|-----------------|--------------------------|-----------------------|
| RB | Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Power Bandwidth(MHz) | -26dBc Bandwidth(MHz) |
| 100% | QPSK | 5 | 20775 | 2502.5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

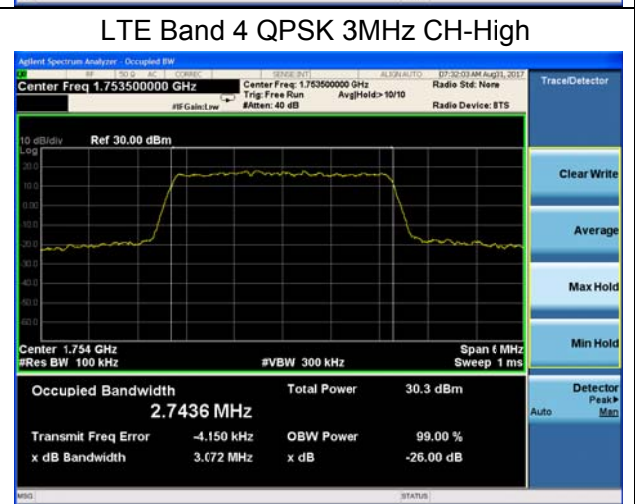
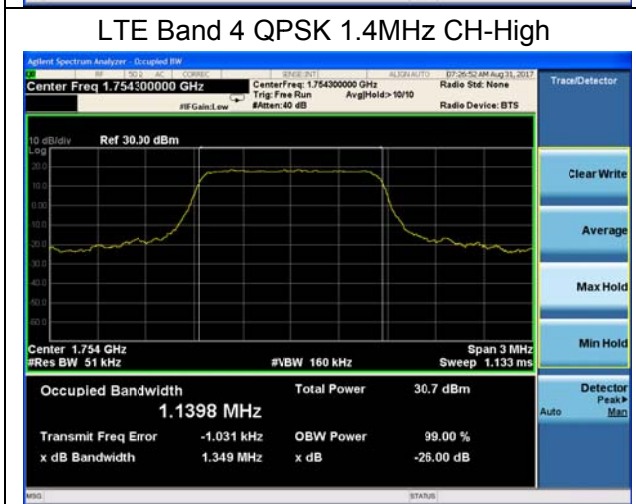
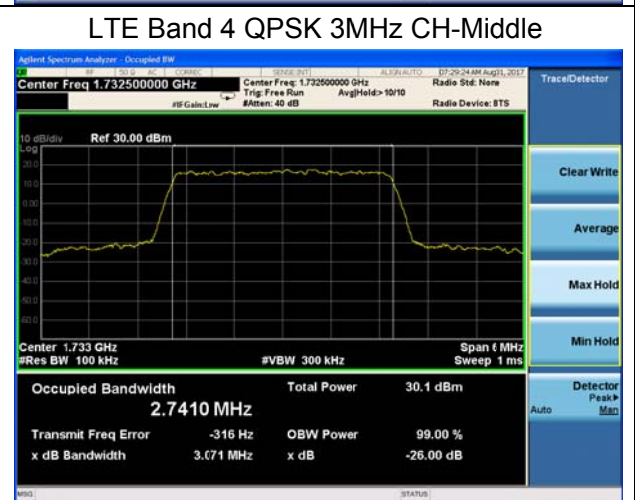
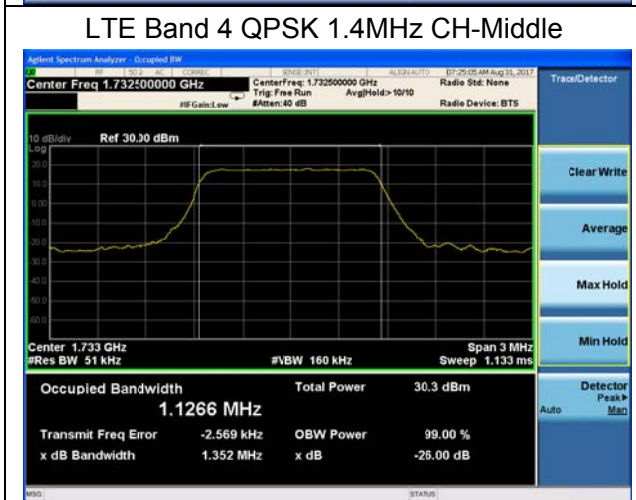
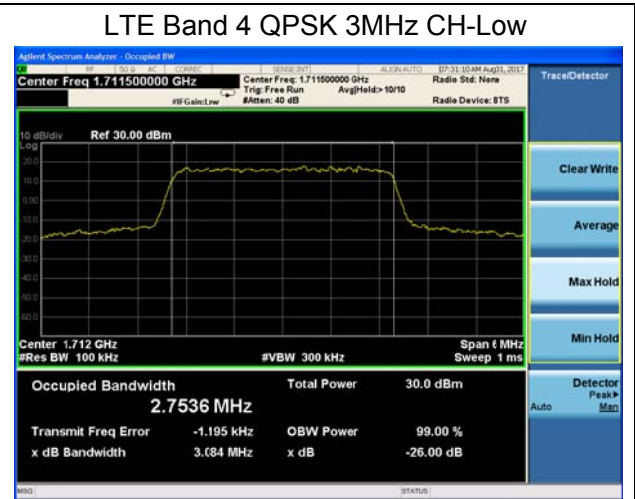
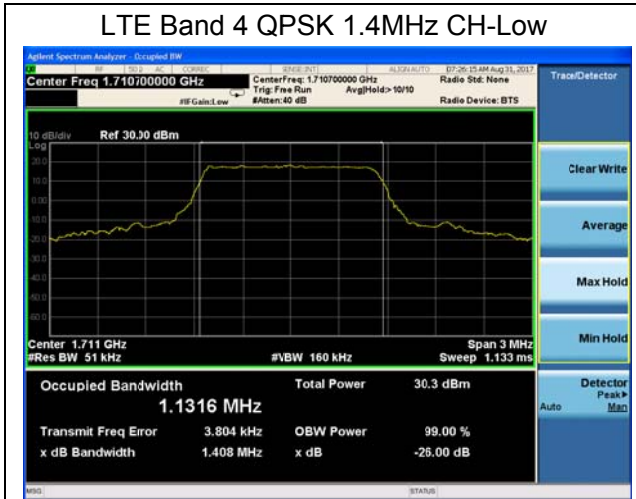
| LTE Band 12 | | | | | | |
|-------------|------------|-----------------|---------|-----------------|--------------------------|-----------------------|
| RB | Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Power Bandwidth(MHz) | -26dBc Bandwidth(MHz) |
| 100% | QPSK | 1.4 | 23017 |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

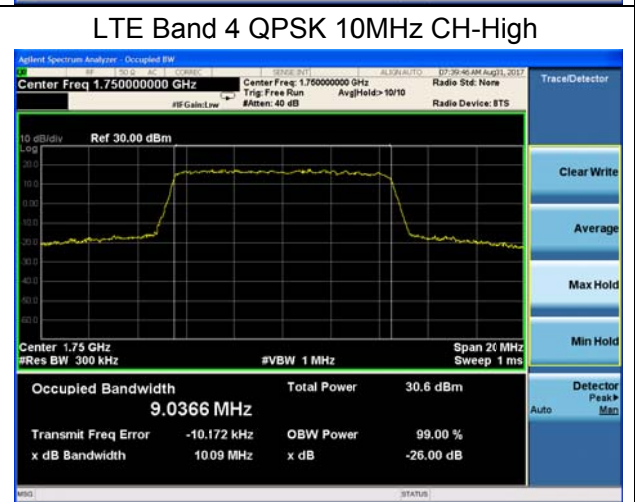
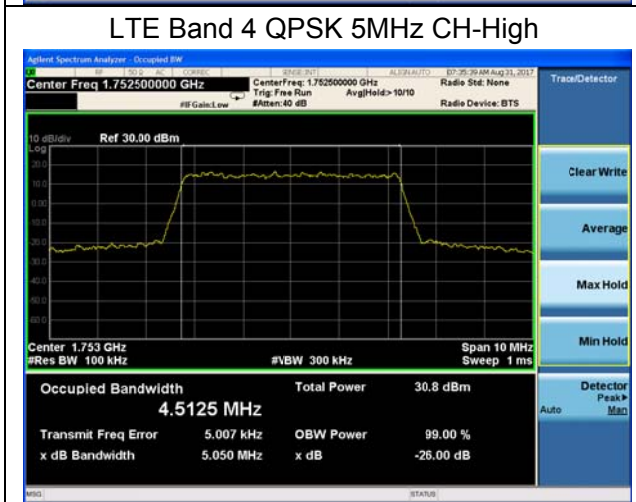
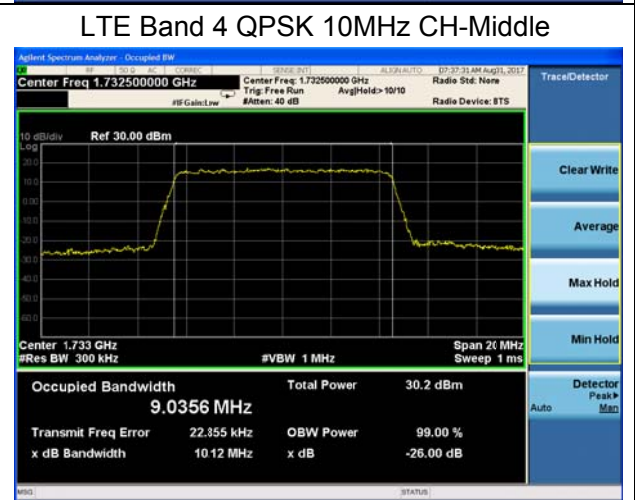
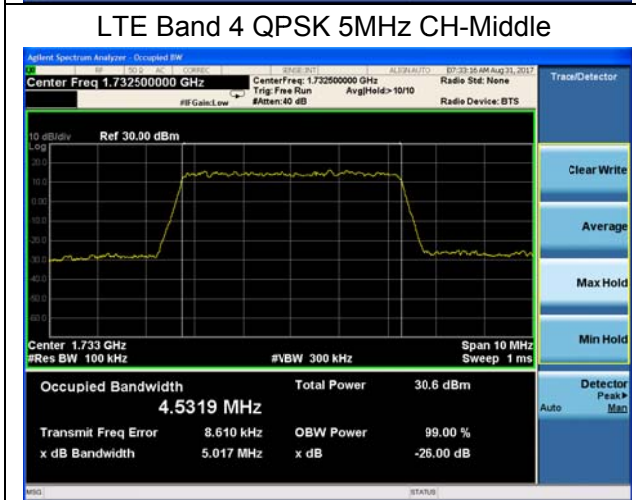
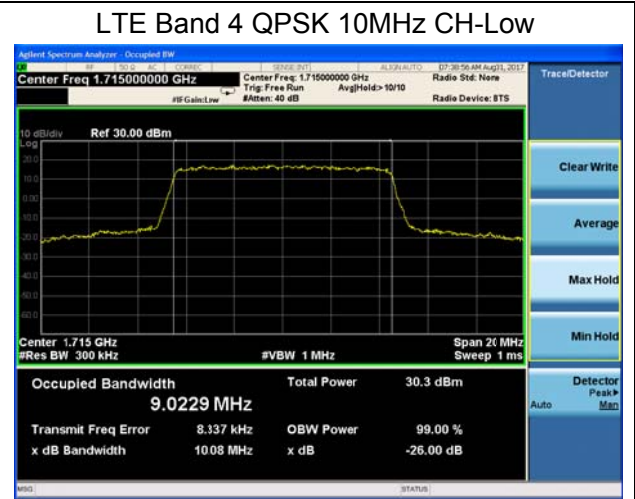
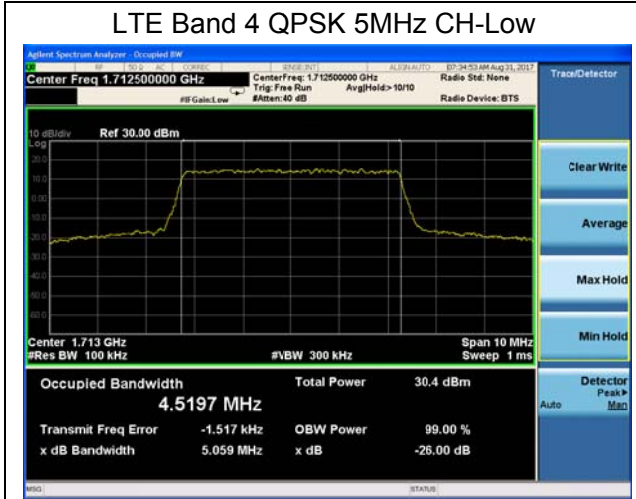


| | | | | | | | |
|--|----|-------|-------|-------|--------|--------|-------|
| | | 3 | 23173 | 715.3 | 1.1324 | 1.335 | |
| | | | 23025 | 700.5 | 2.7418 | 3.06 | |
| | | | 23095 | 707.5 | 2.7418 | 3.072 | |
| | | 5 | 23165 | 714.5 | 2.7409 | 3.067 | |
| | | | 23035 | 701.5 | 4.5117 | 5.031 | |
| | |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

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

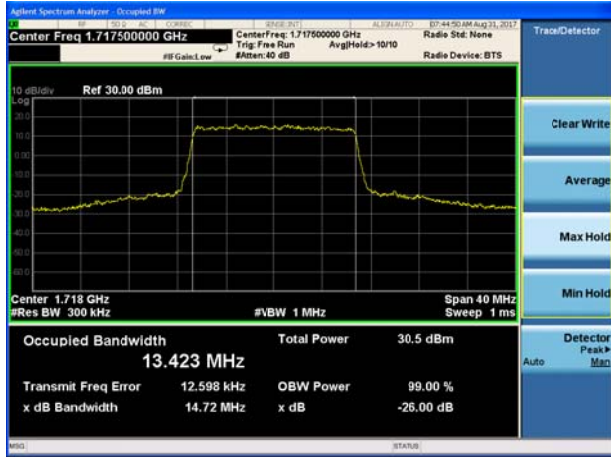




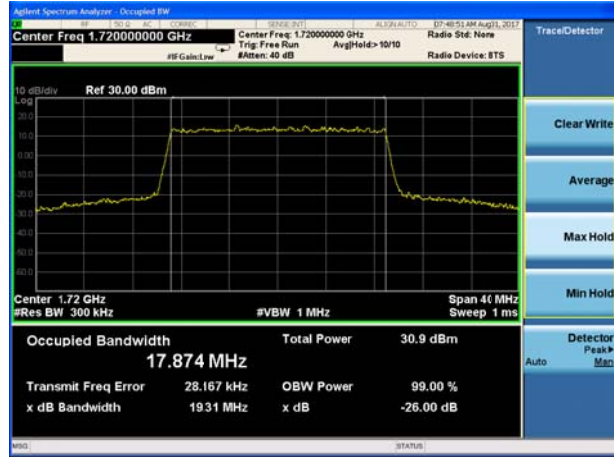




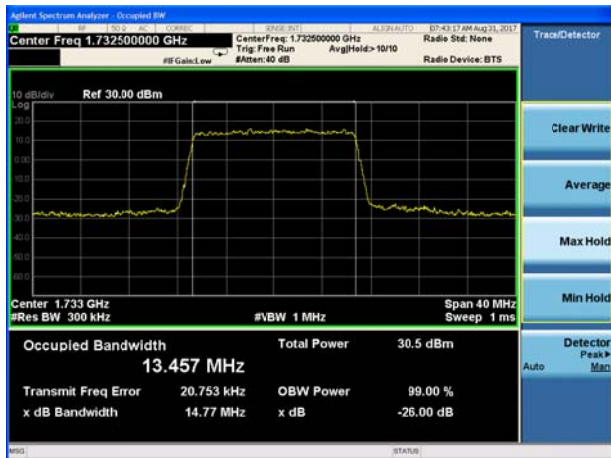
LTE Band 4 QPSK 15MHz CH-Low



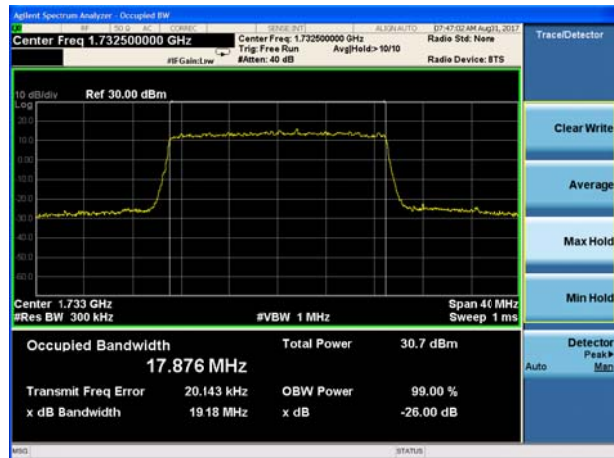
LTE Band 4 QPSK 20MHz CH-Low



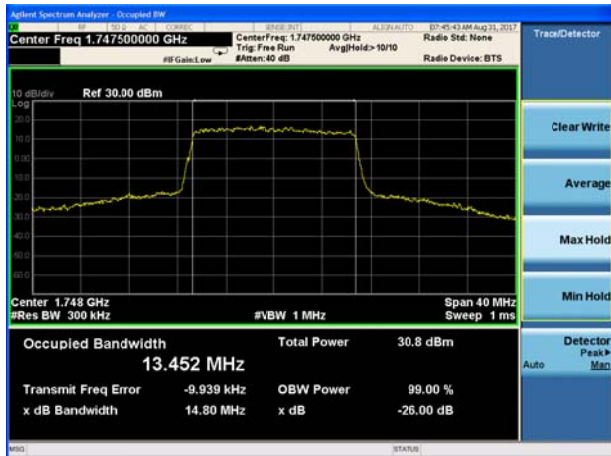
LTE Band 4 QPSK 15MHz CH-Middle



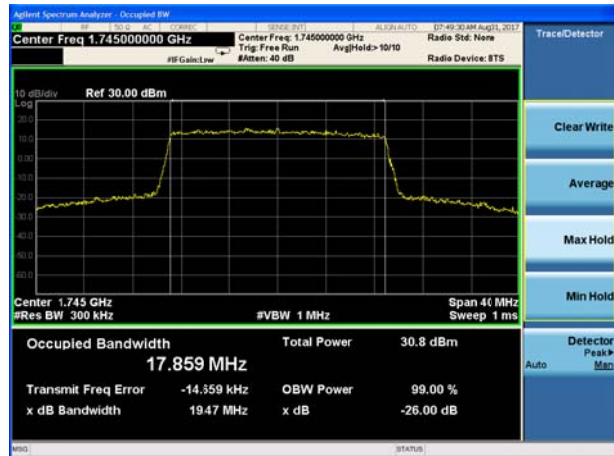
LTE Band 4 QPSK 20MHz CH-Middle

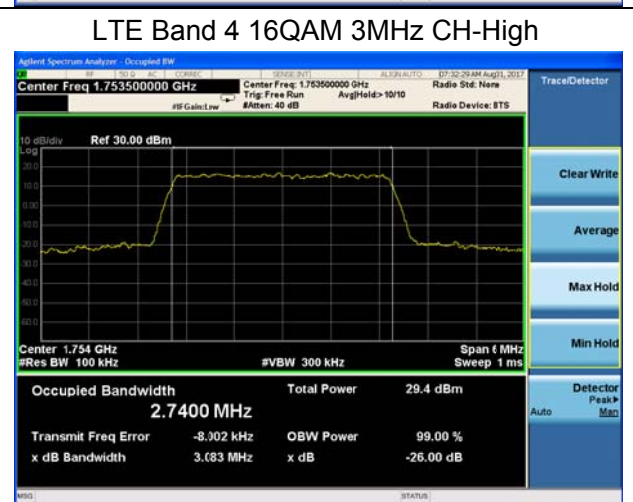
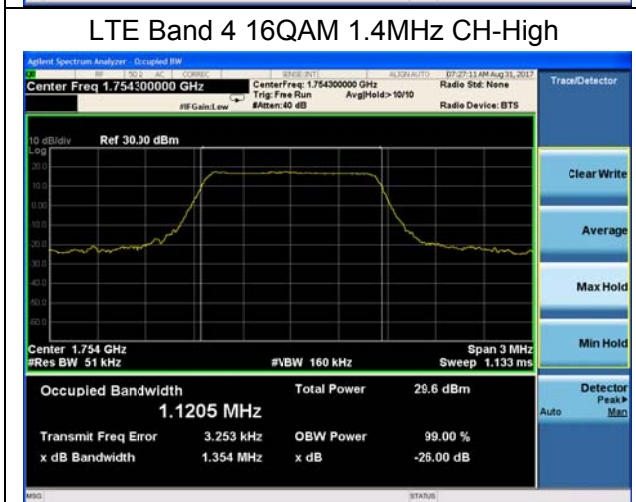
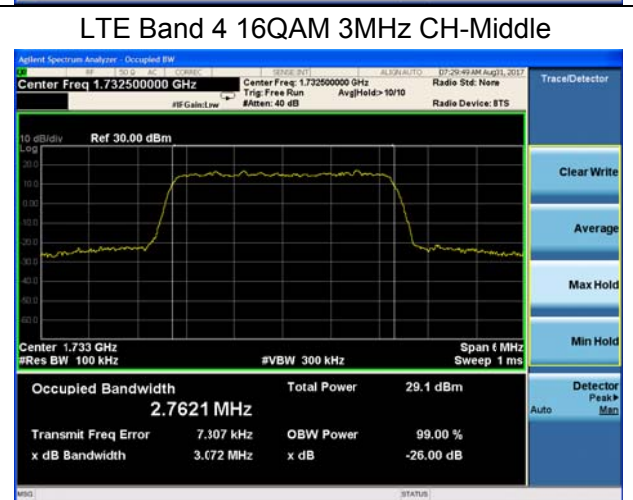
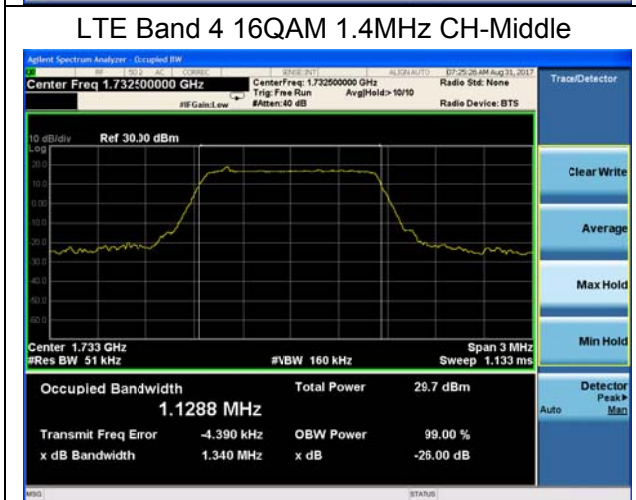
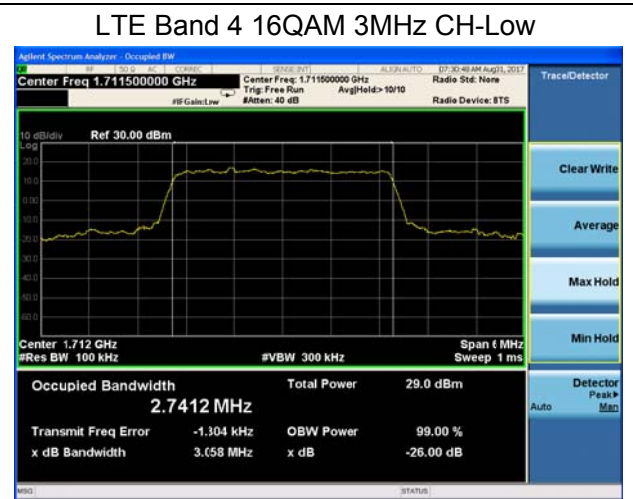
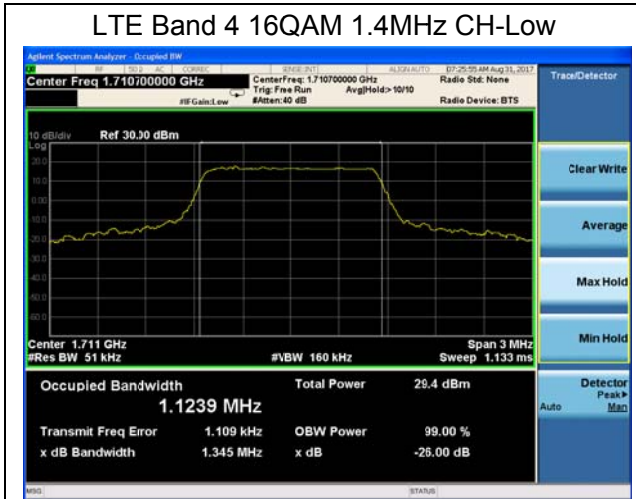


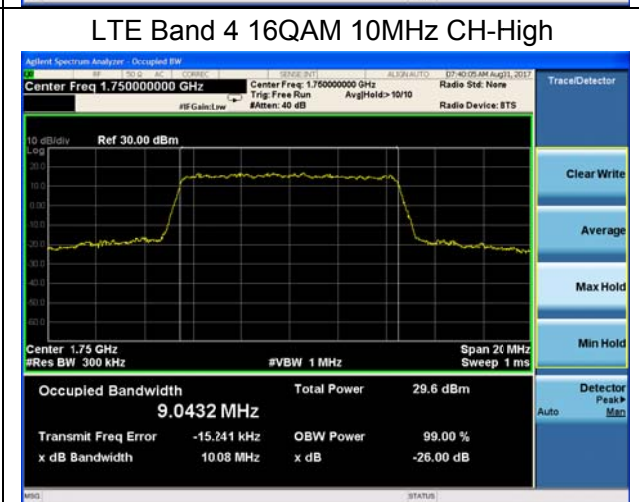
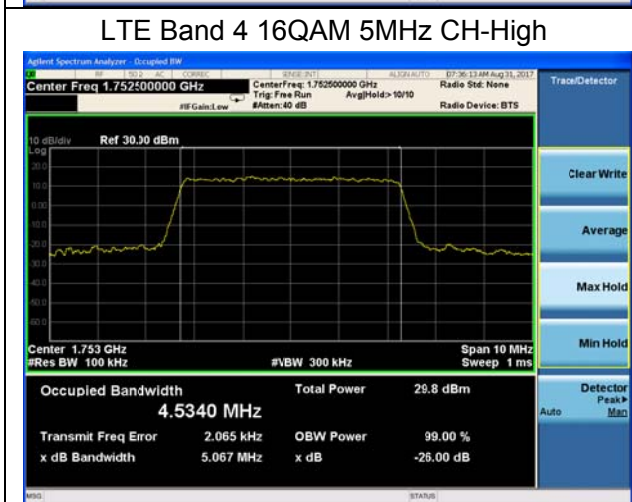
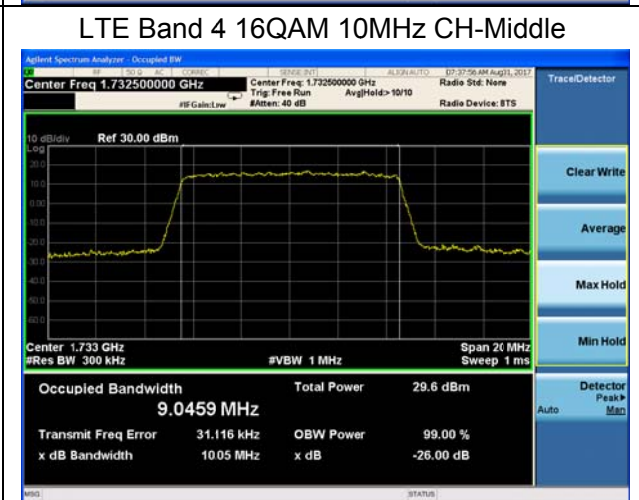
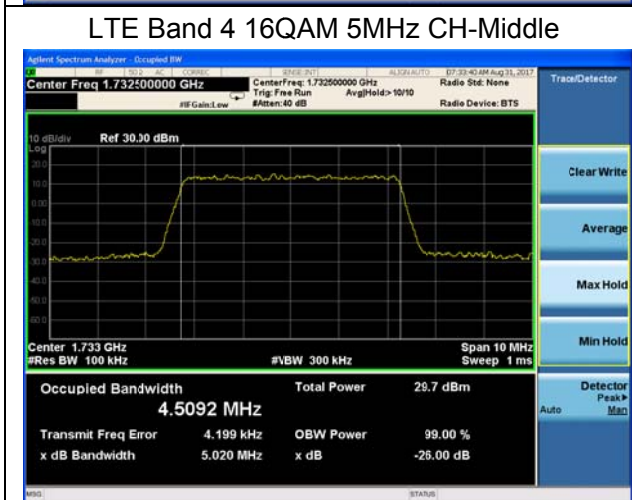
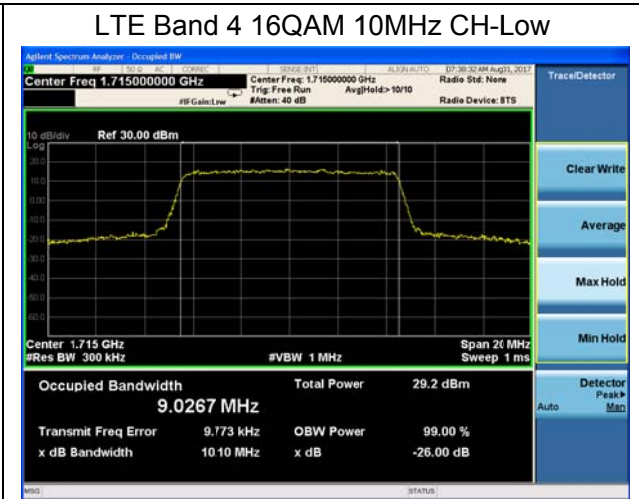
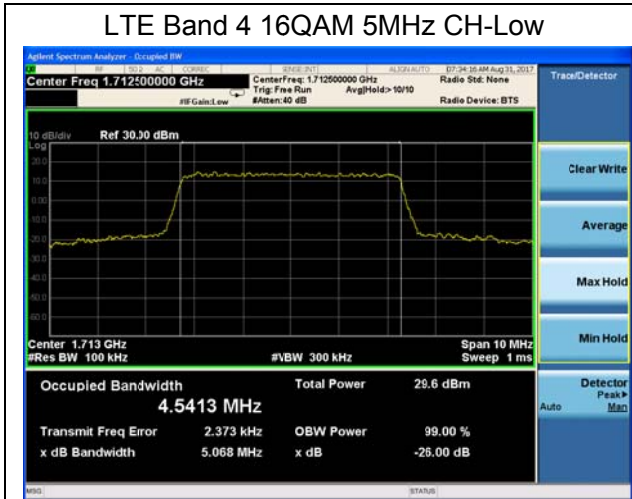
LTE Band 4 QPSK 15MHz CH-High

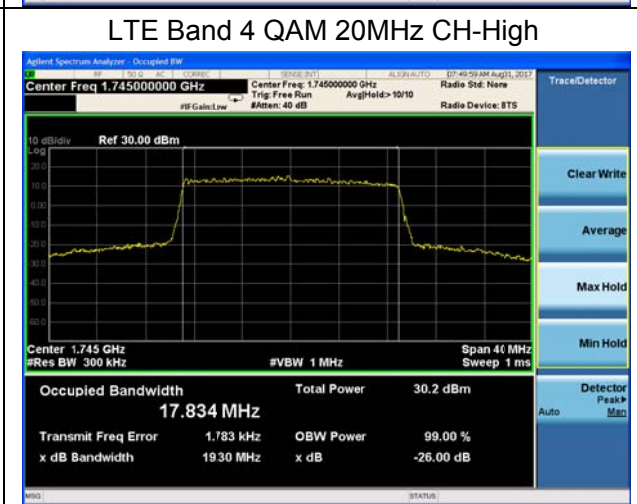
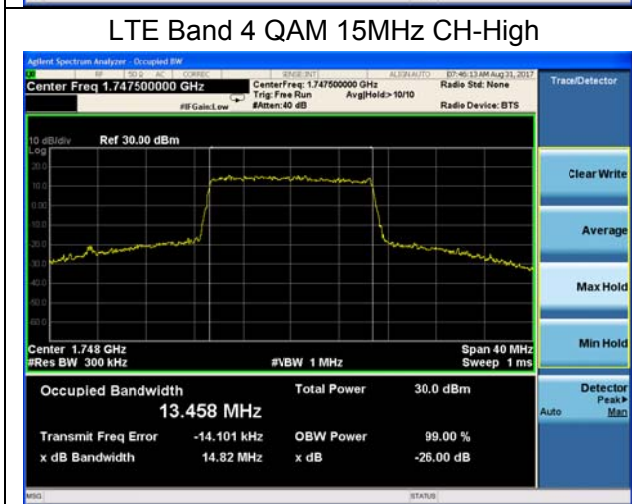
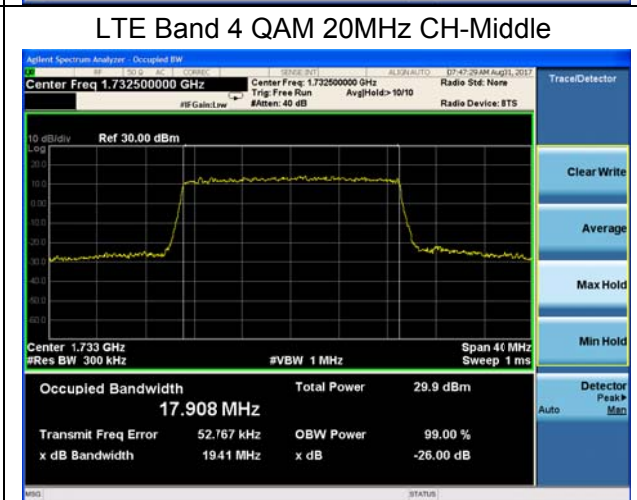
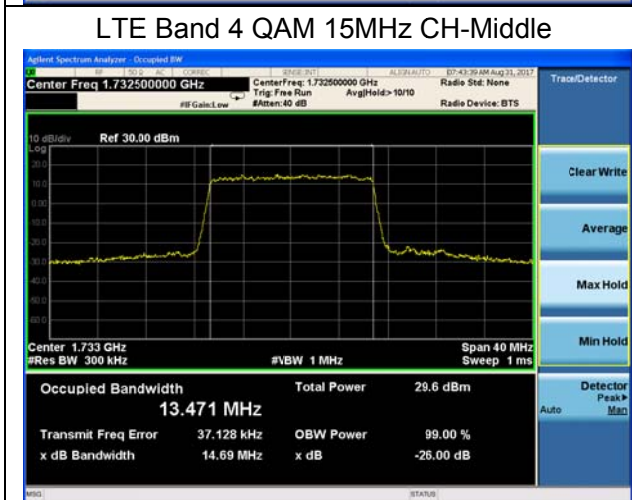
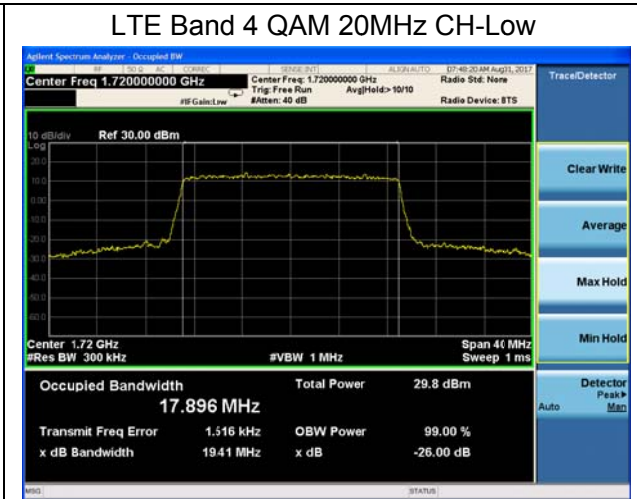
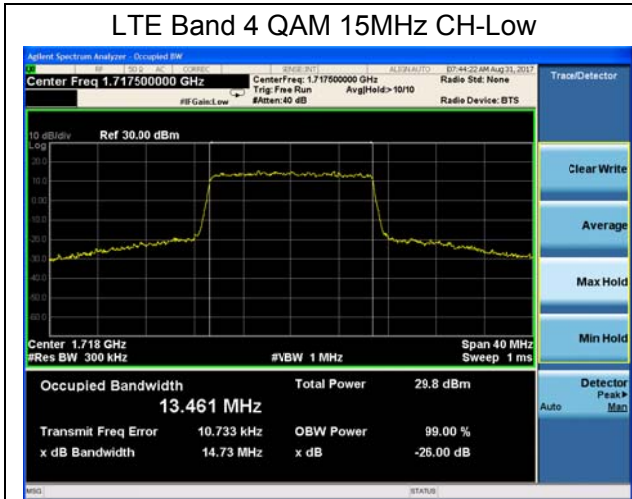


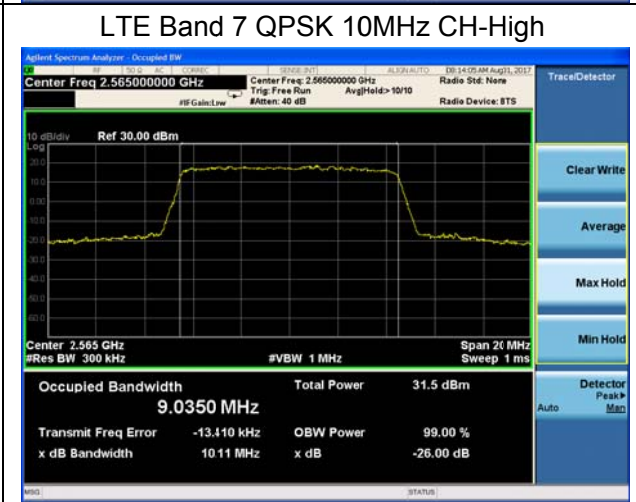
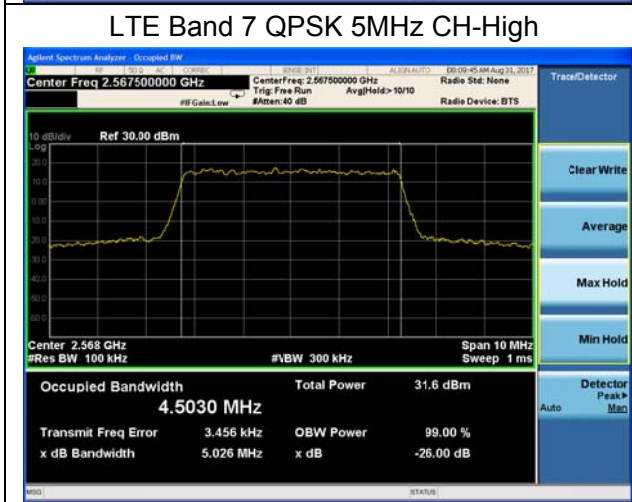
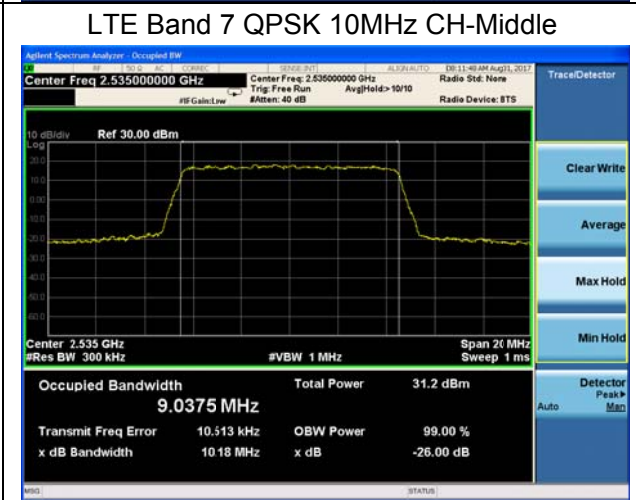
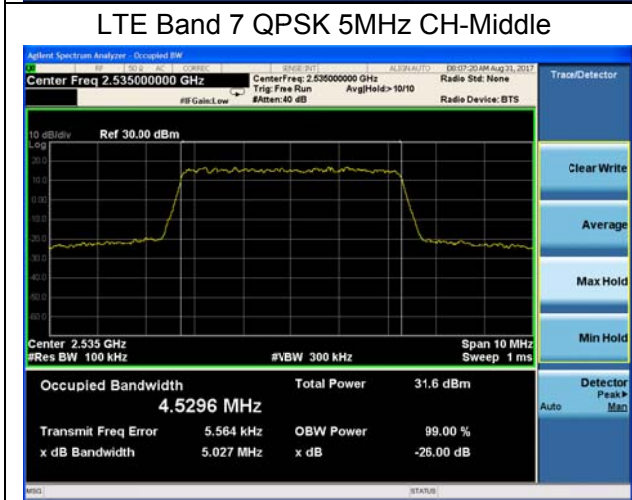
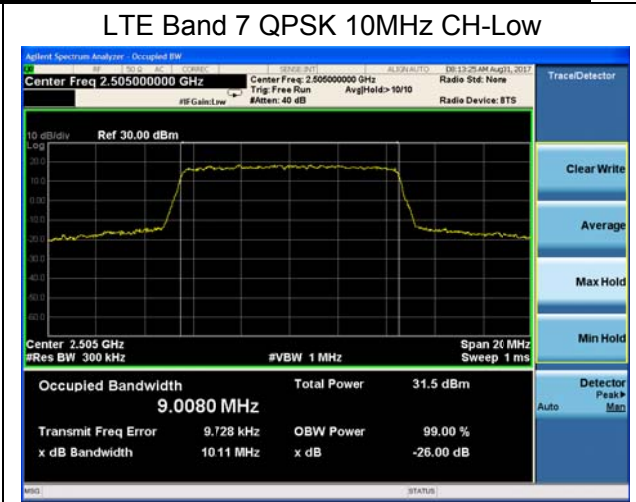
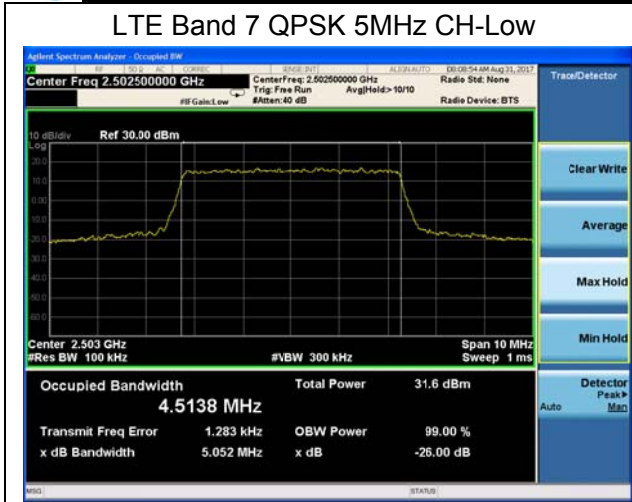
LTE Band 4 QPSK 20MHz CH-High

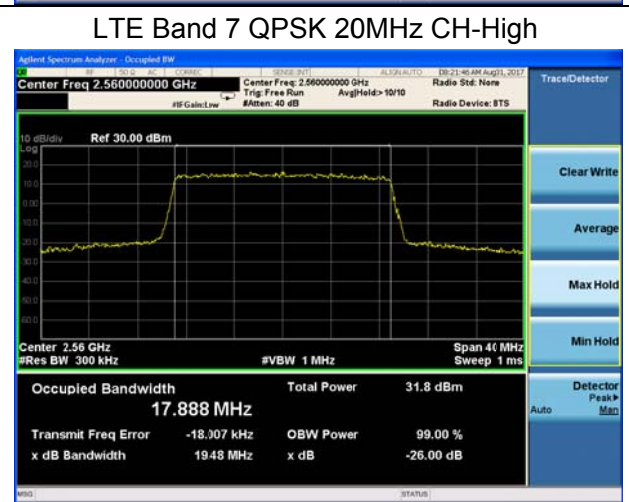
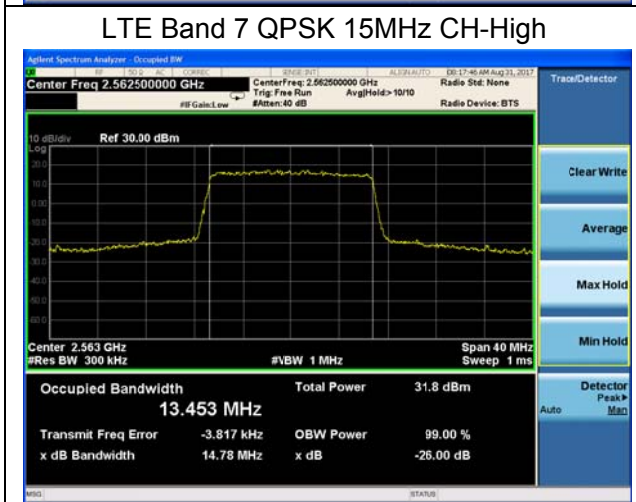
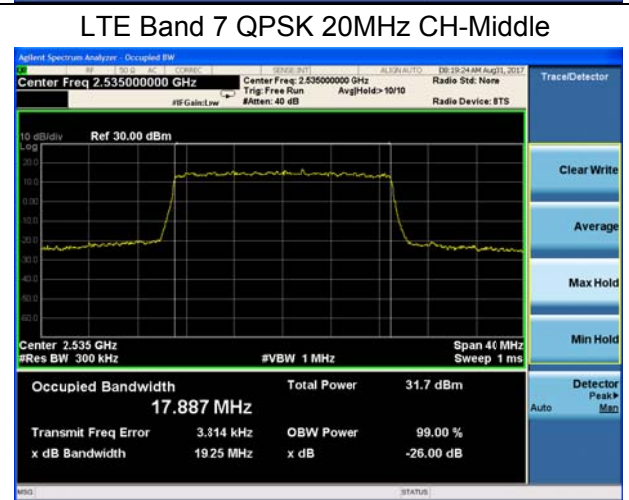
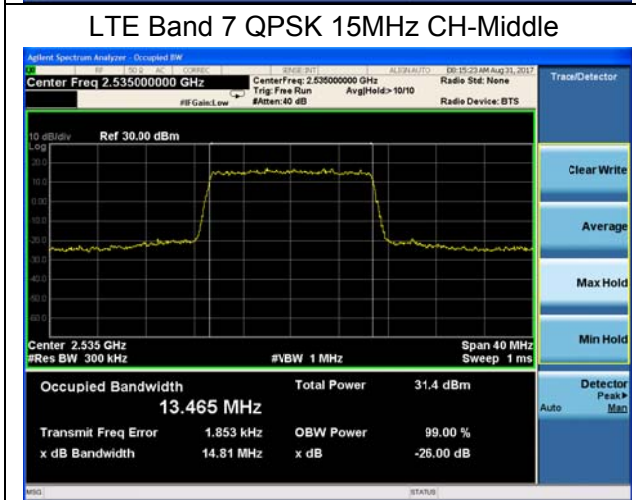
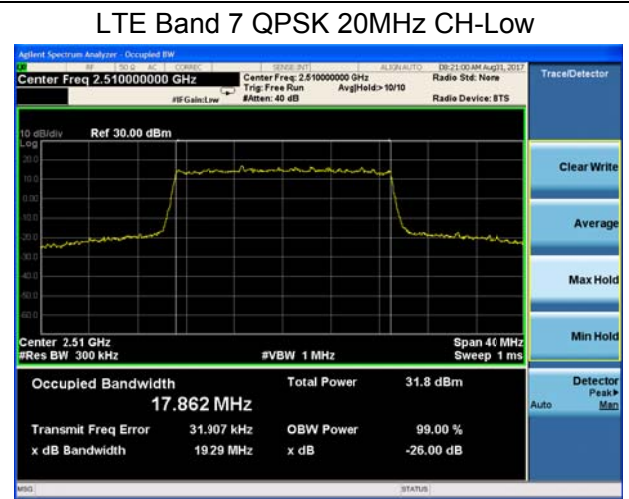
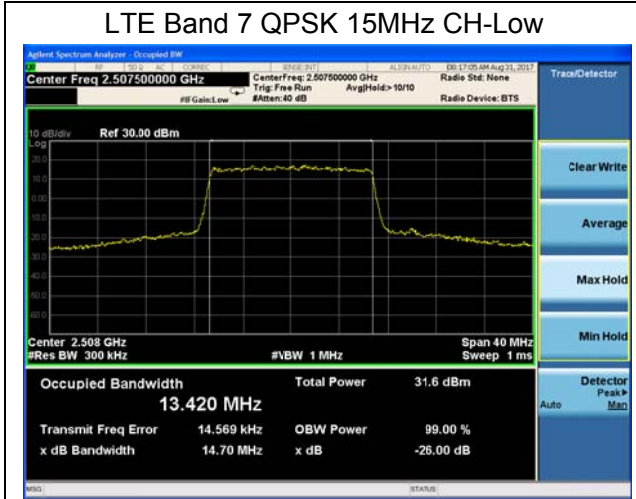


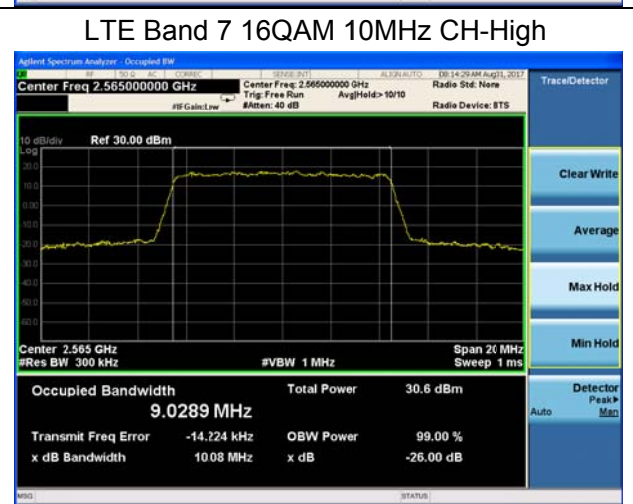
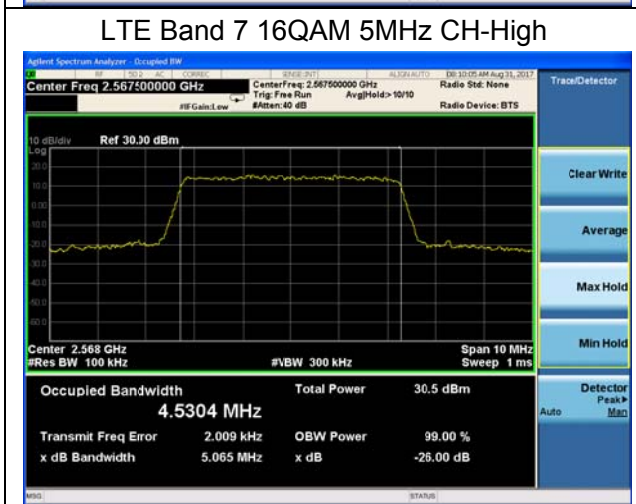
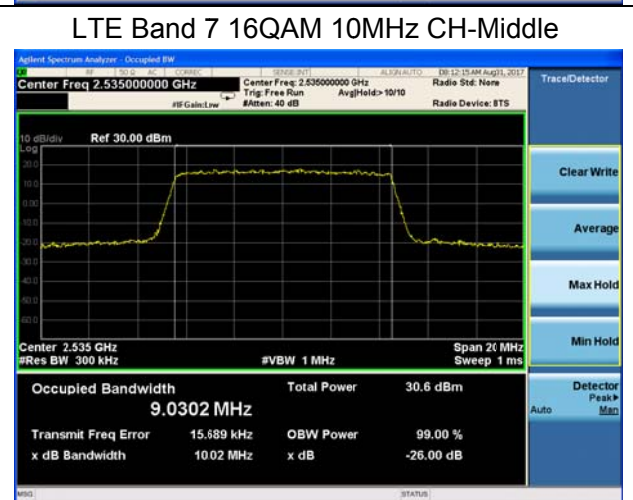
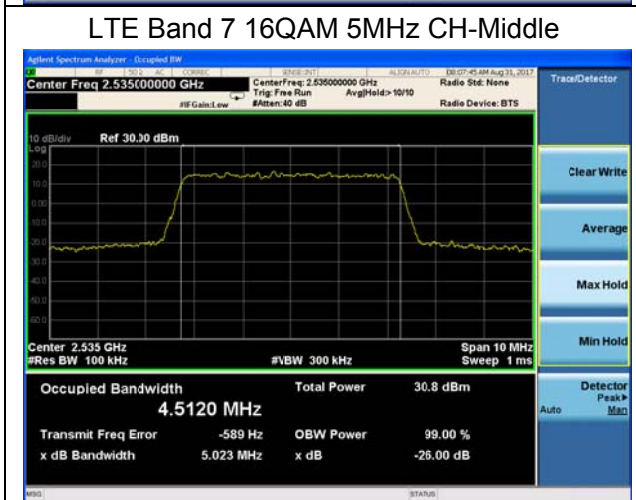
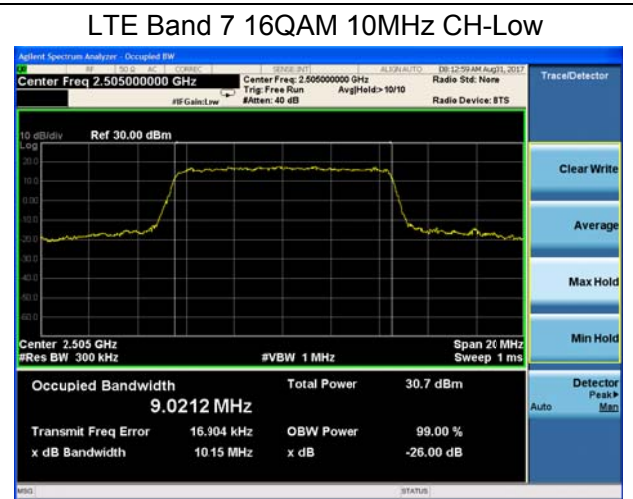
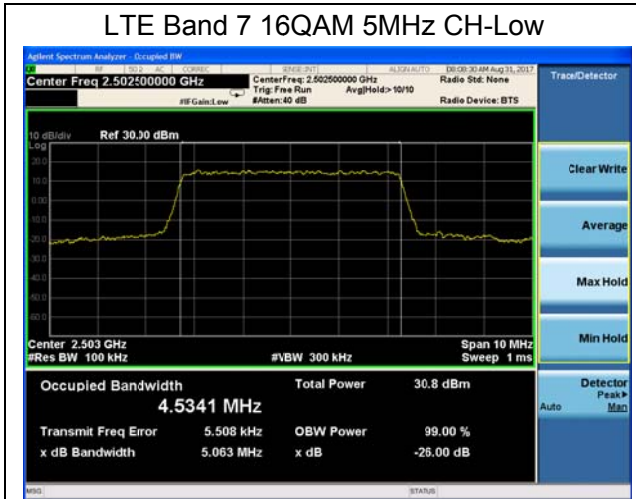


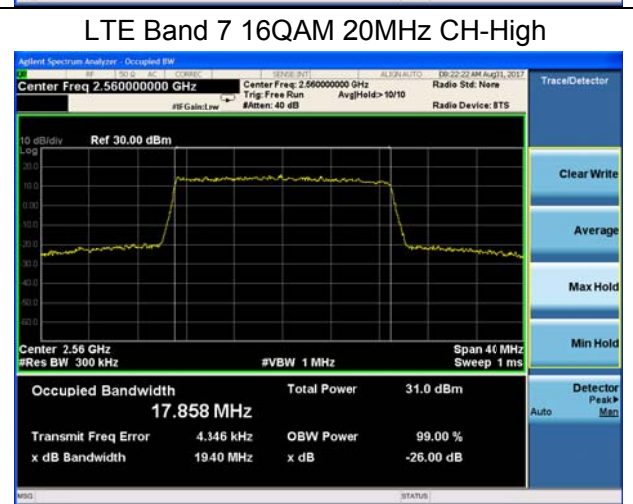
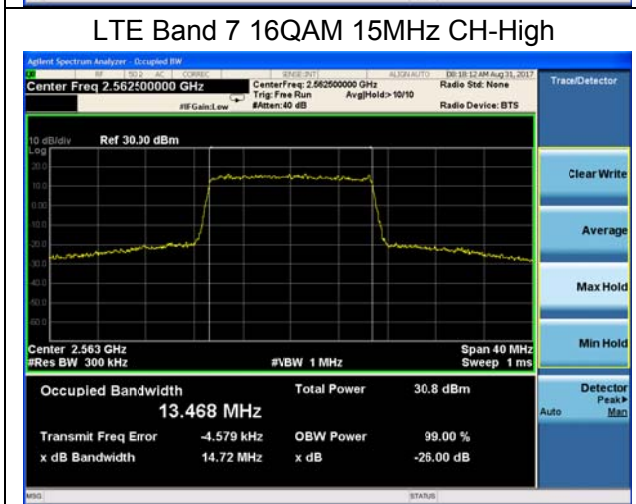
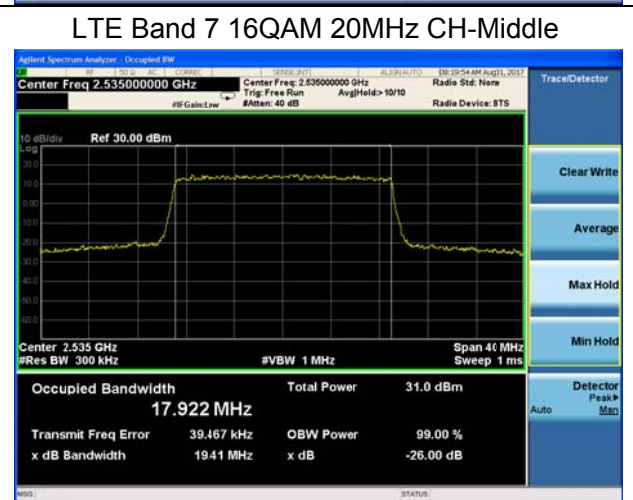
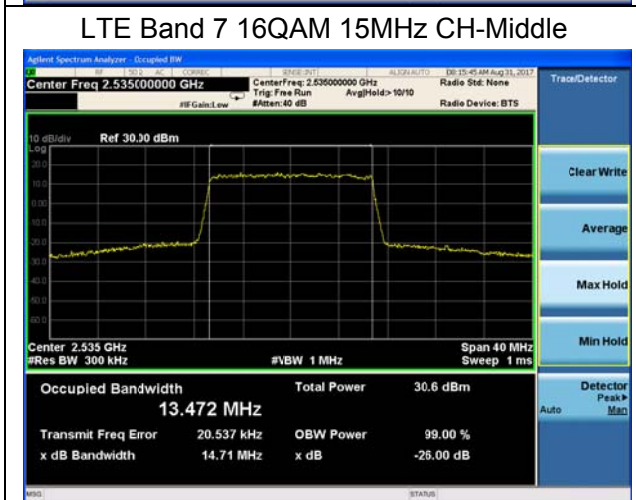
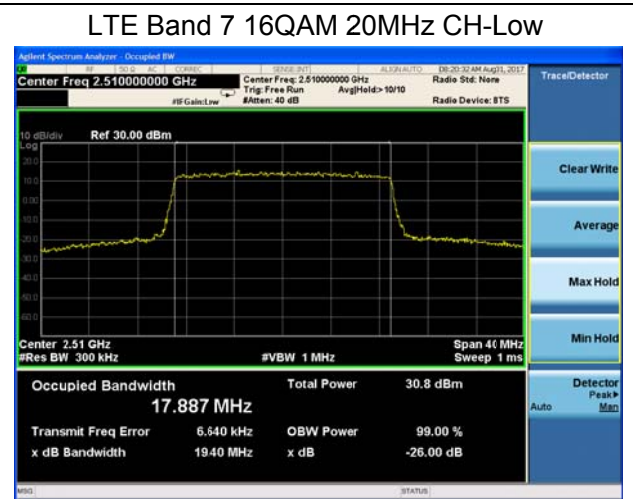
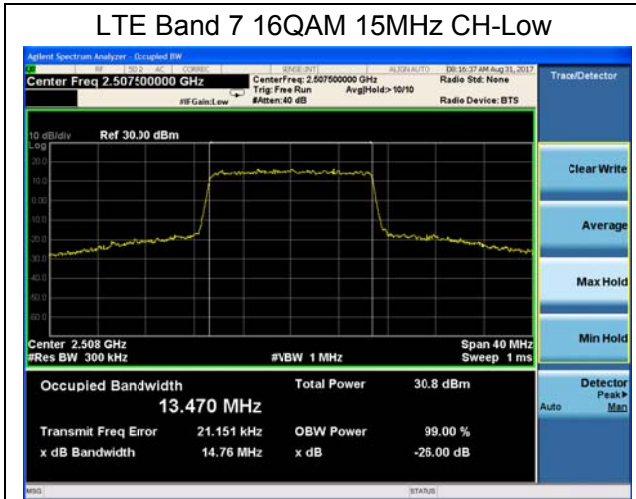


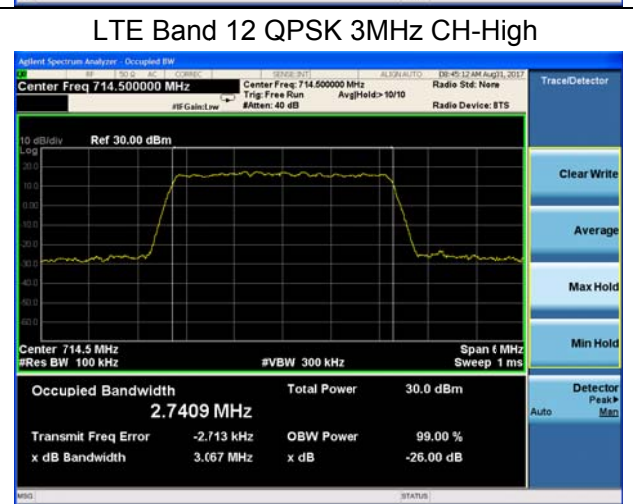
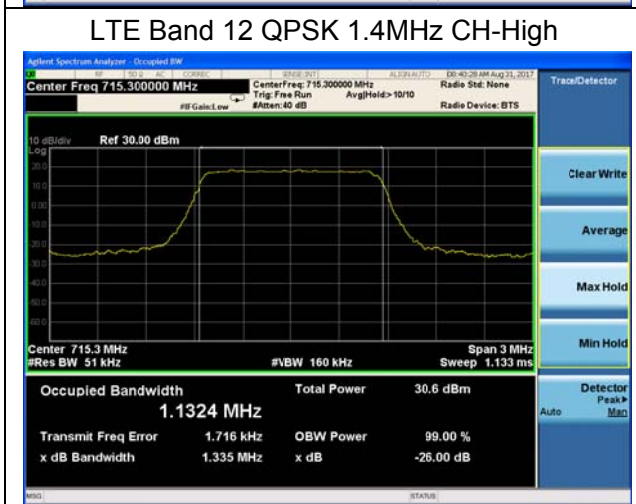
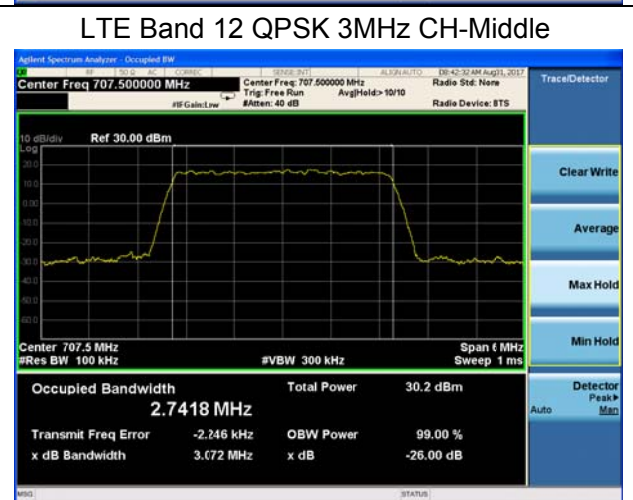
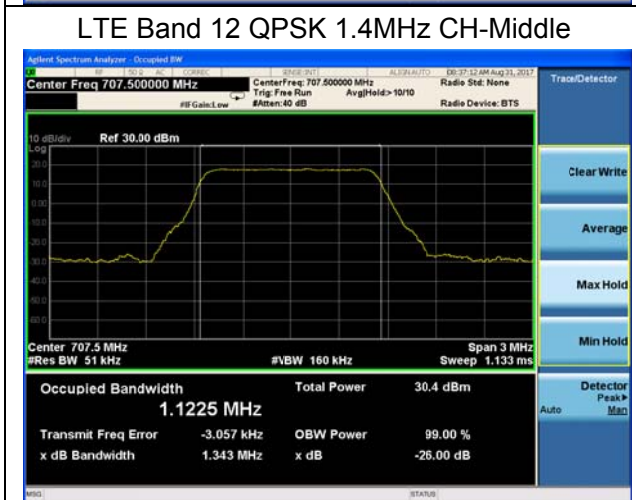
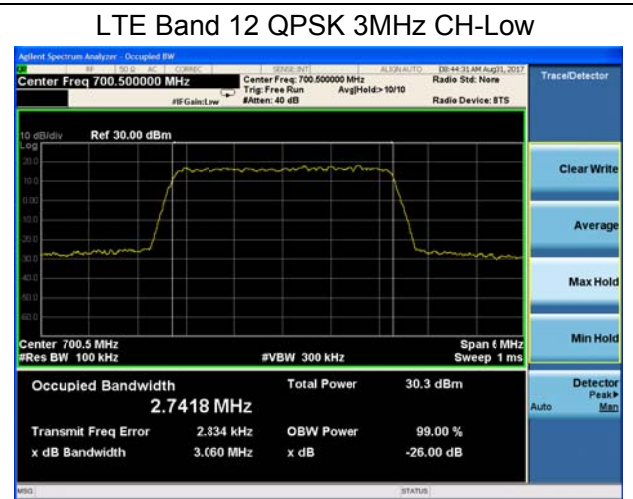
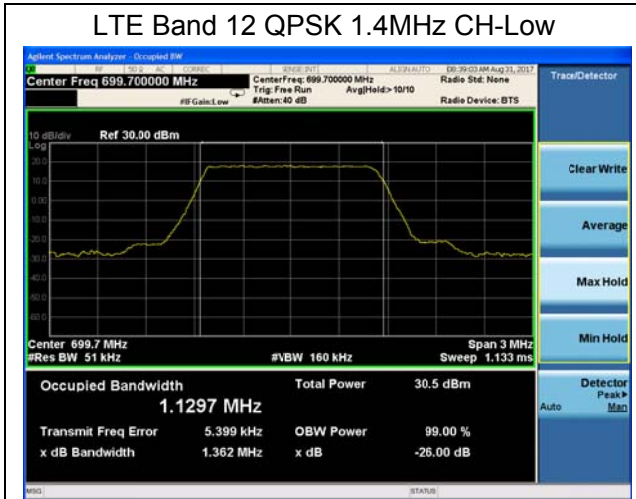


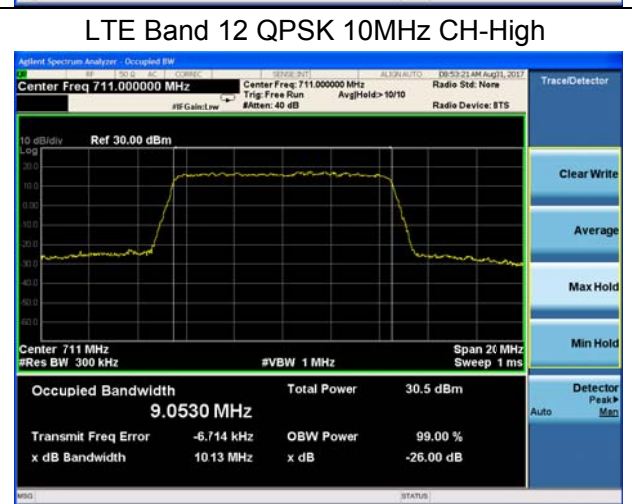
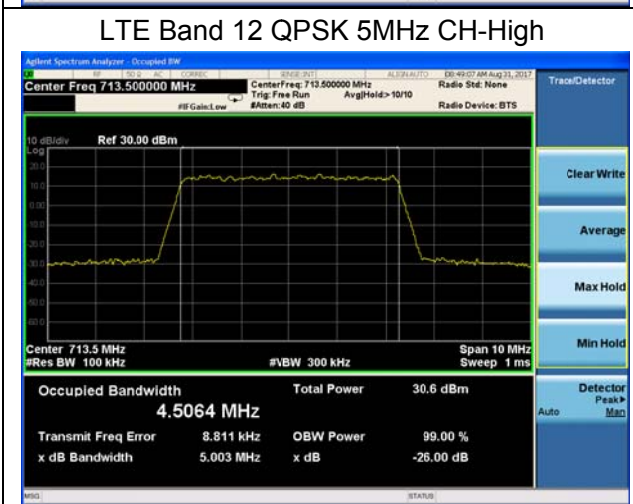
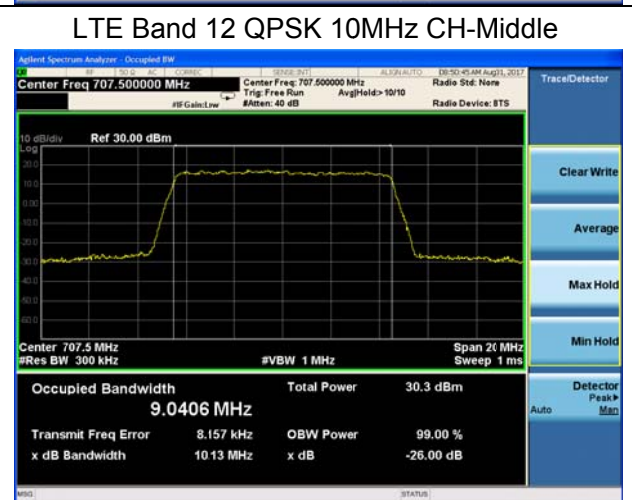
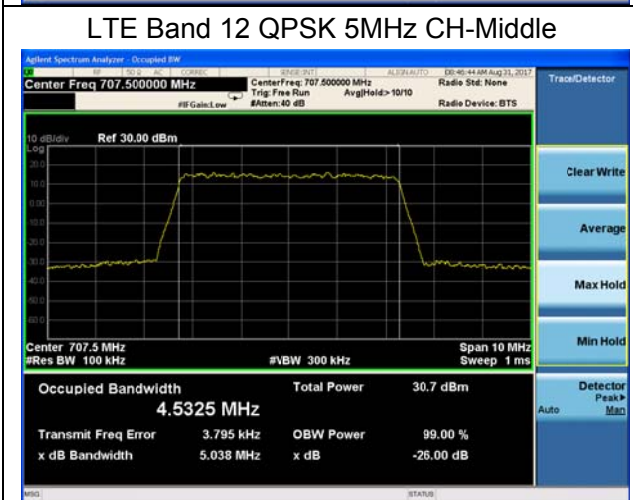
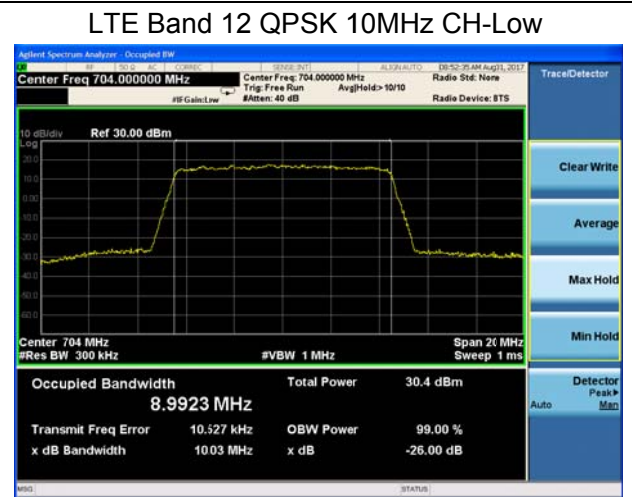
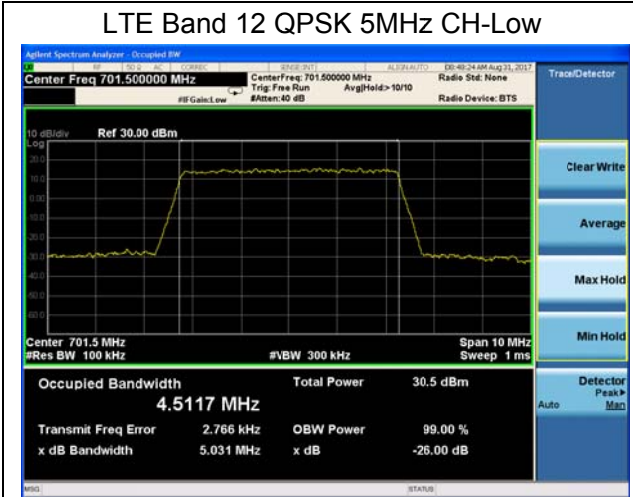


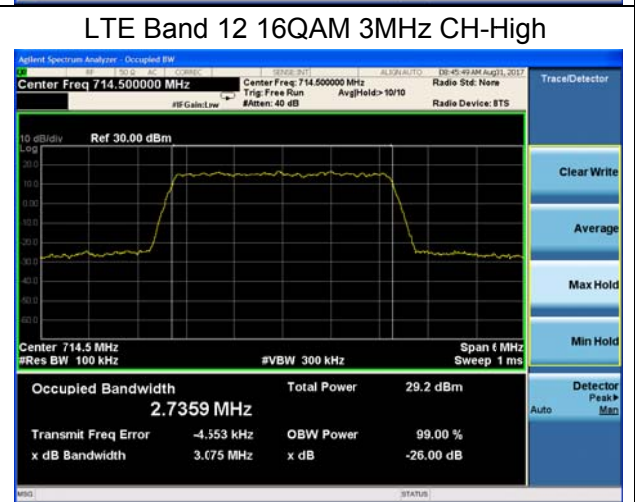
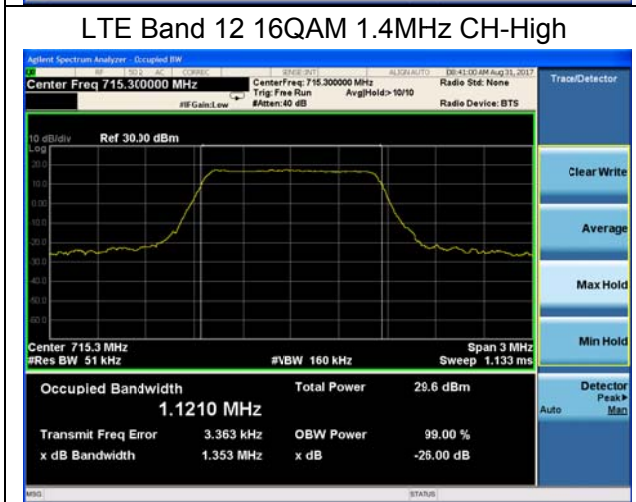
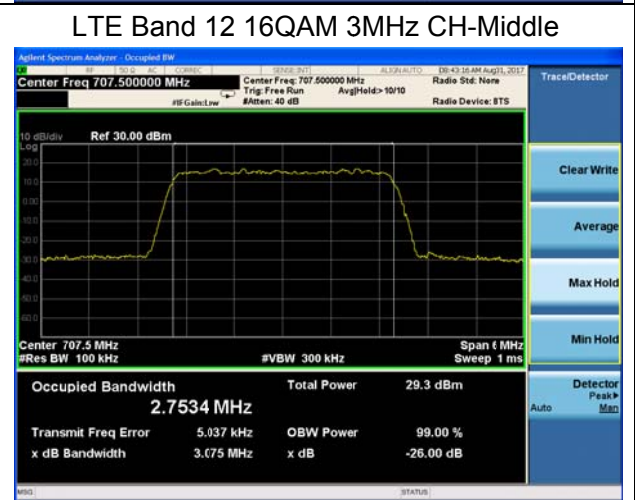
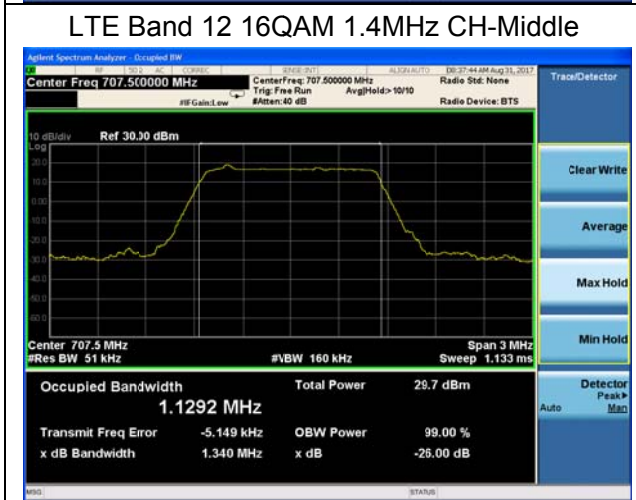
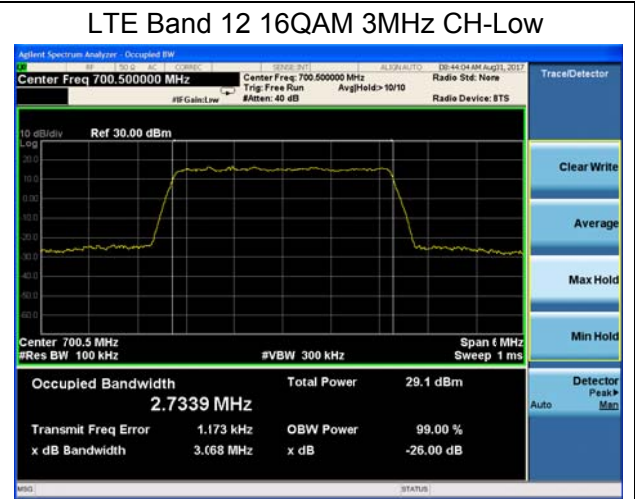
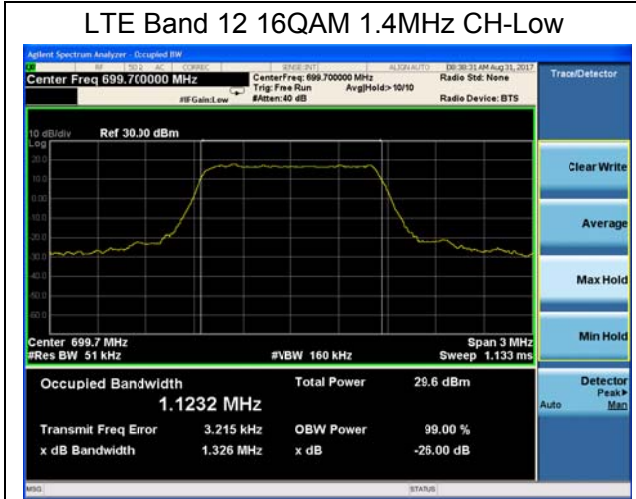






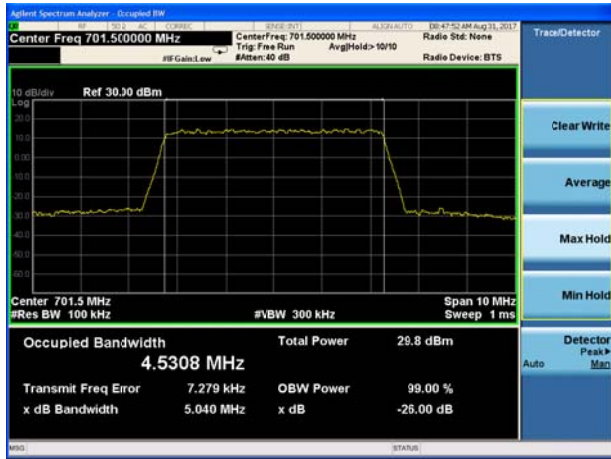








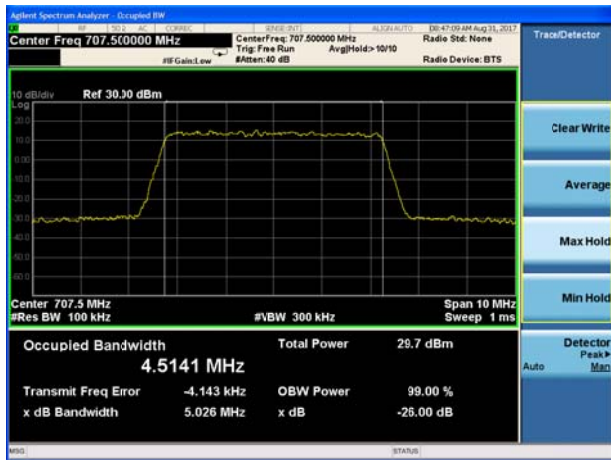
LTE Band 12 16QAM 5MHz CH-Low



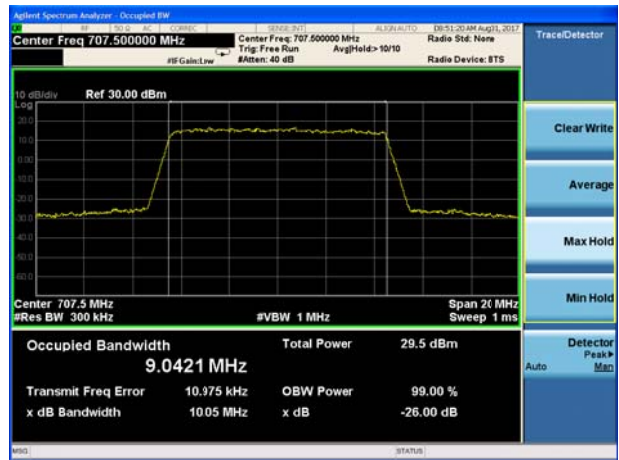
LTE Band 12 16QAM 10MHz CH-Low



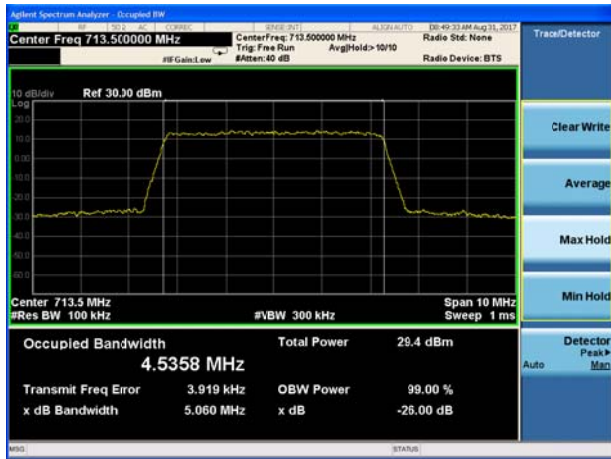
LTE Band 12 16QAM 5MHz CH-Middle



LTE Band 12 16QAM 10MHz CH-Middle



LTE Band 12 16QAM 5MHz CH-High

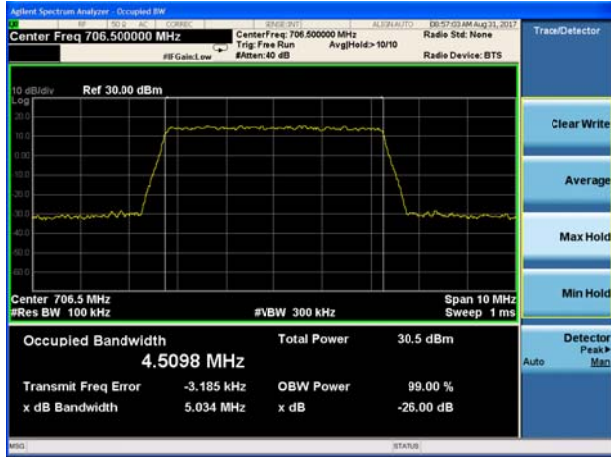


LTE Band 12 16QAM 10MHz CH-High





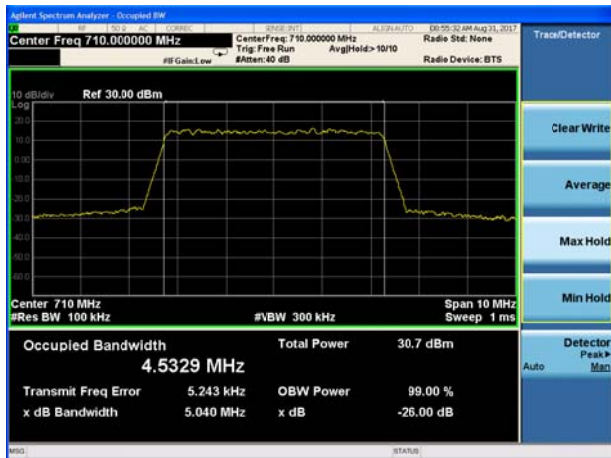
LTE Band 17 QPSK 5MHz CH-Low



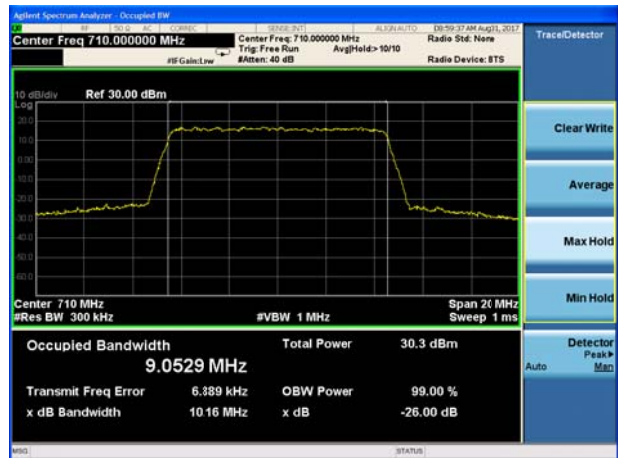
LTE Band 17 QPSK 10MHz CH-Low



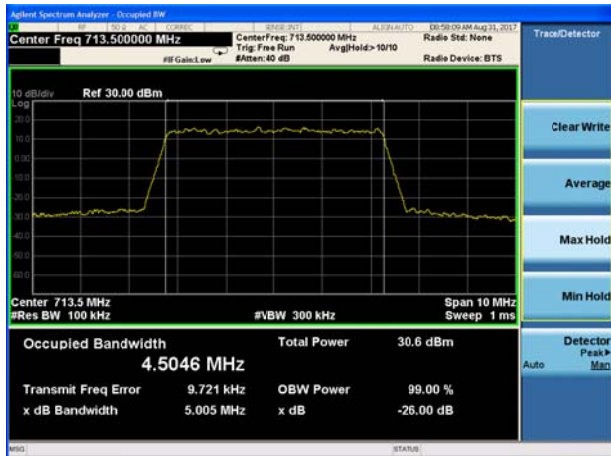
LTE Band 17 QPSK 5MHz CH-Middle



LTE Band 17 QPSK 10MHz CH-Middle

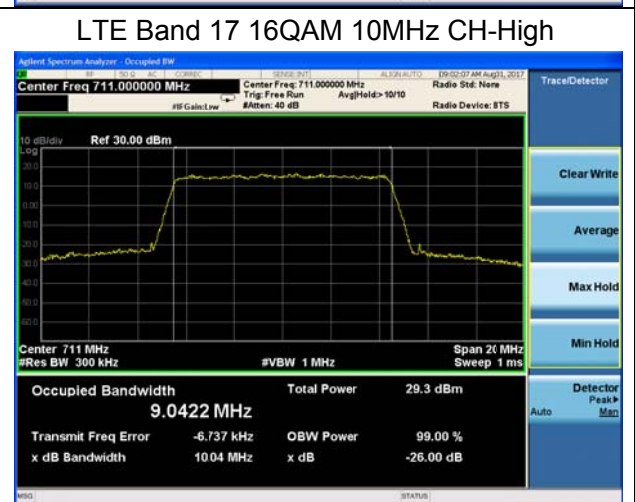
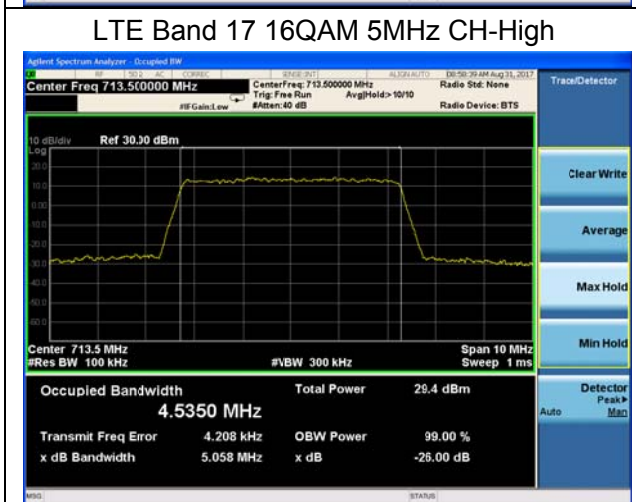
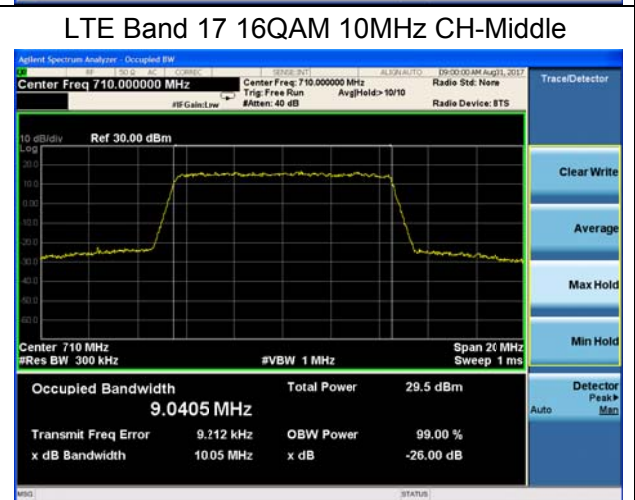
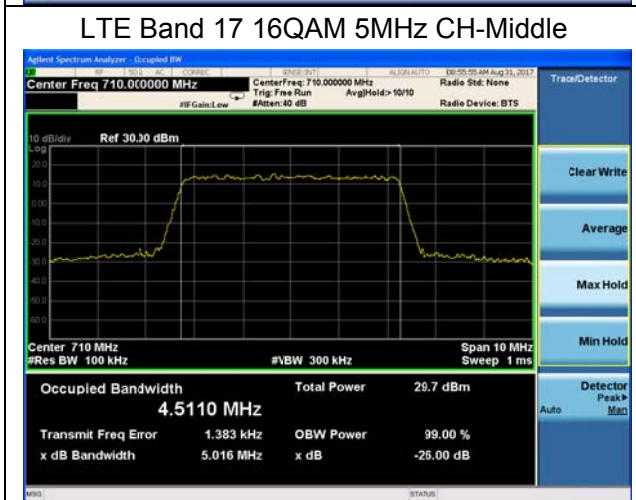
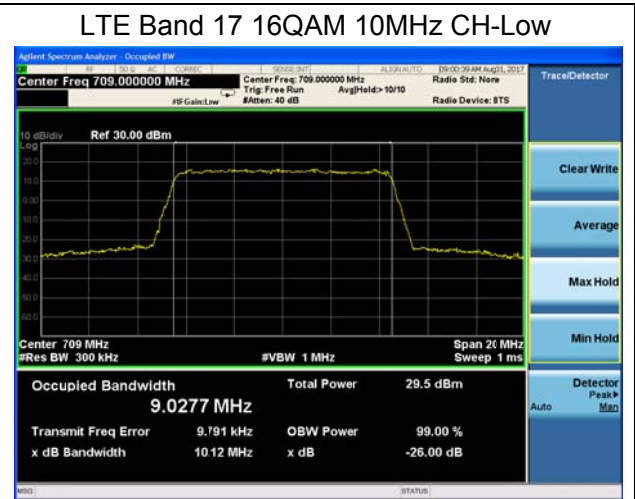
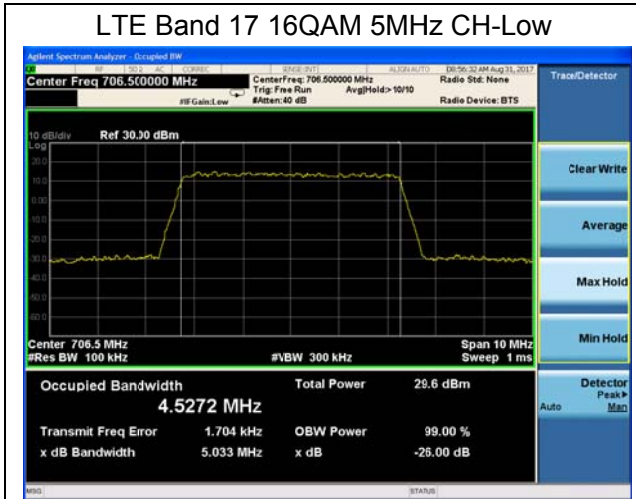


LTE Band 17 QPSK 5MHz CH-High



LTE Band 17 QPSK 10MHz CH-High





5.4 Band Edge Compliance

Ambient condition

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

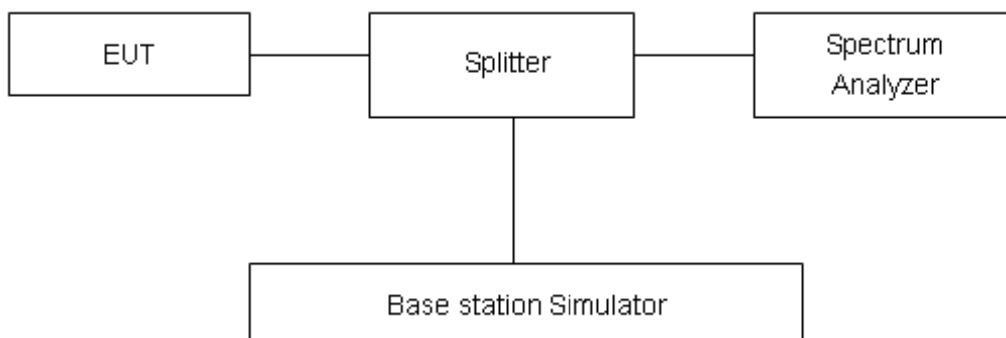
Method of Measurement

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

The testing follows KDB 971168 v02r02 Section 6.0

- 1.The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. For LTE Band 41 Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
 RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.
 RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/12 (1.4MHz).
 RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/12 (3MHz).
 RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/7/12/17 (5MHz).
 RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7/12/17 (10MHz).
 RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7 (15MHz/20MHz).on spectrum analyzer.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

Test Setup



Limits

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

Part 27.53(g) specifies that “ For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log_{10} (P)$ dB.”

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

Example:

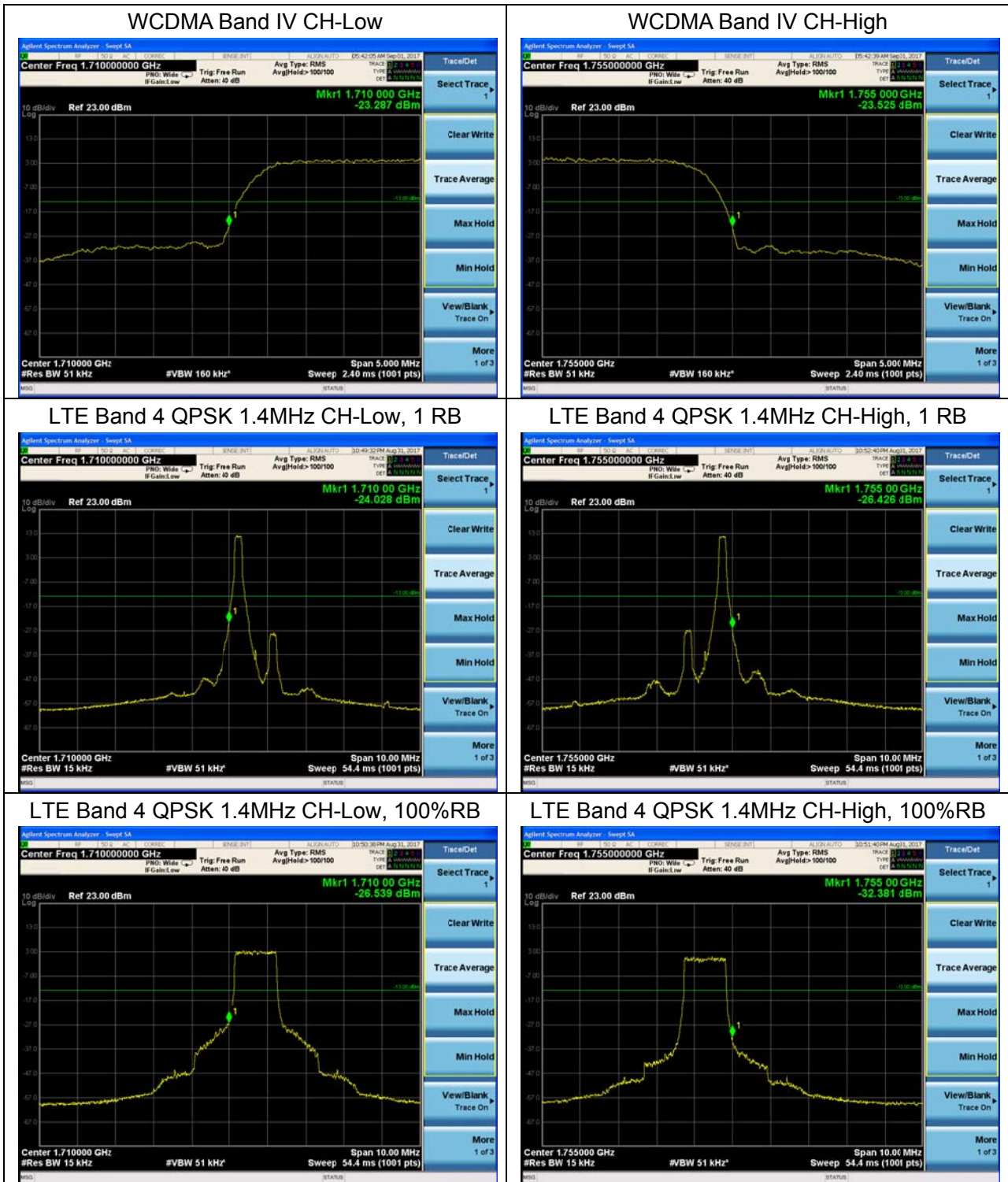
The limit line is derived from $43 + 10 \log (P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10 \log(P)]$ (dB)
 $= [30 + 10 \log (P)]$ (dBm) - $[43 + 10 \log(P)]$ (dB) = -13dBm.

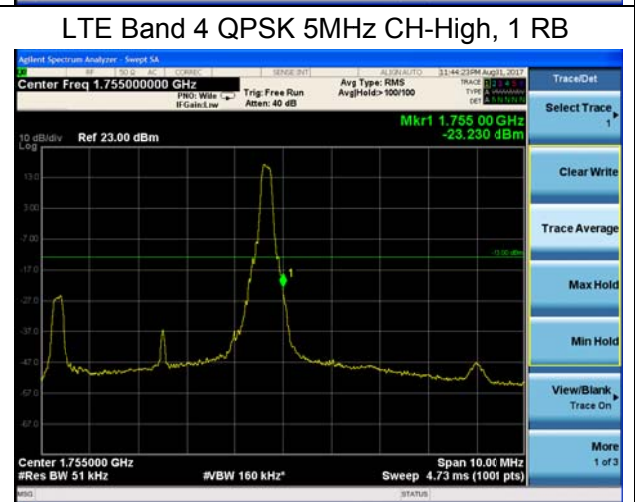
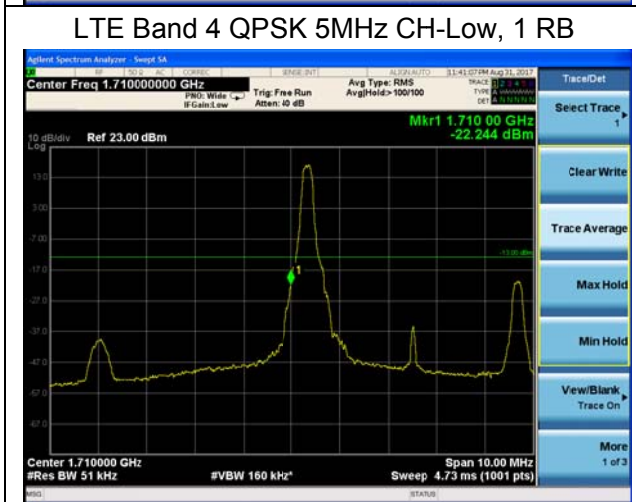
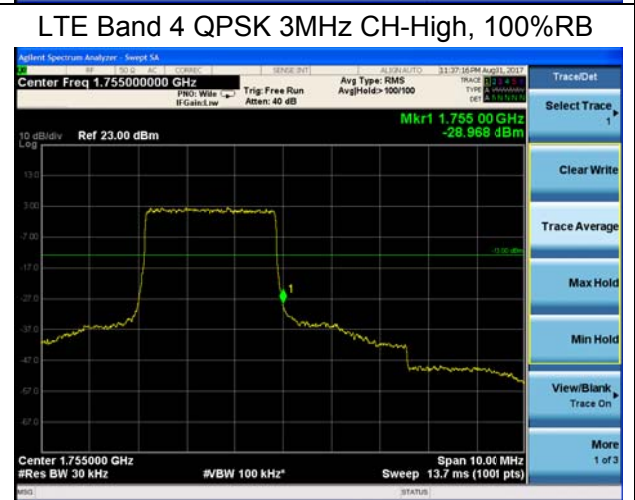
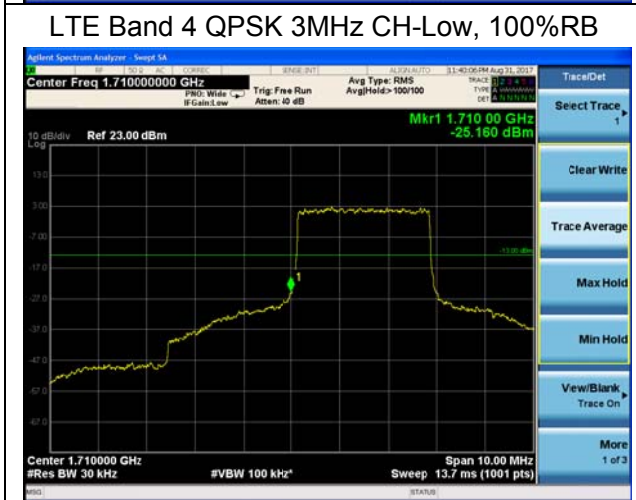
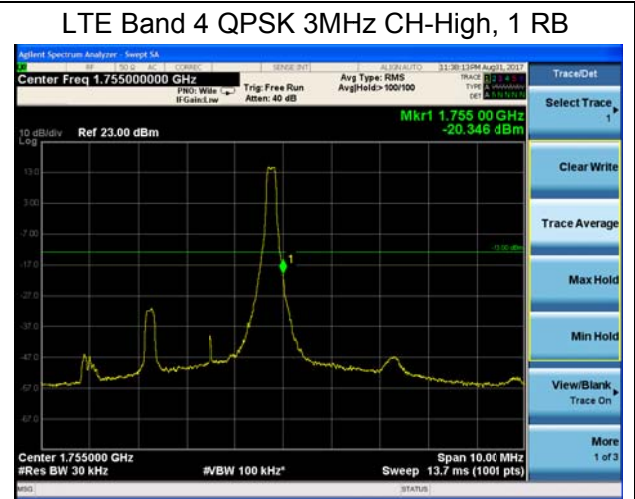
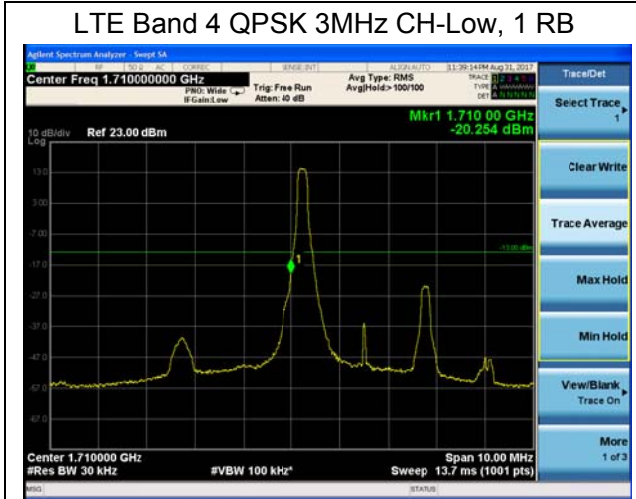
Measurement Uncertainty

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

Test Result

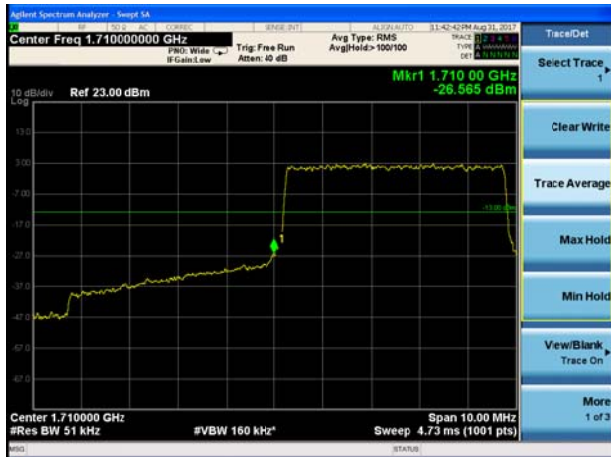
All the test traces in the plots shows the test results clearly.







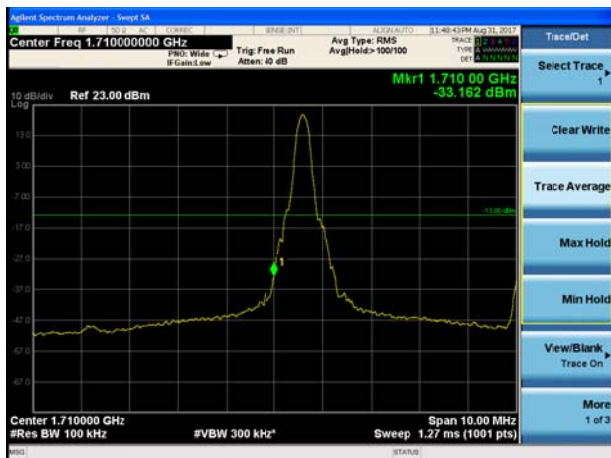
LTE Band 4 QPSK 5MHz CH-Low, 100%RB



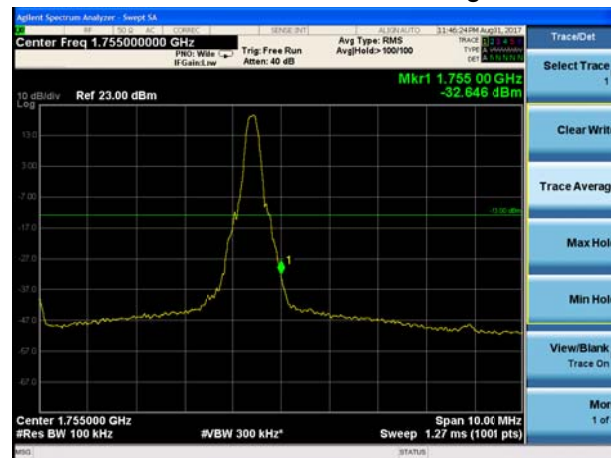
LTE Band 4 QPSK 5MHz CH-High, 100%RB



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

