



RF TEST REPORT

Applicant Xiaomi Communications Co., Ltd.
FCC ID 2AFZZ-RMSDG1
Product Mobile Phone
Brand MI
Model MDG1
Report No. RXA1710-0339RF06R1
Issue Date November 29, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2017)/ FCC CFR 47 Part 22H (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

| No. | Test Type | Clause in FCC rules | Verdict |
|-----|---|---------------------|---------|
| 1 | RF power output | 2.1046 | PASS |
| 2 | Effective Radiated Power | 22.913(a)(2) | PASS |
| 3 | Occupied Bandwidth | 2.1049 | PASS |
| 4 | Band Edge Compliance | 22.917(a) | PASS |
| 5 | Peak-to-Average Power Ratio | 22.913(d) | PASS |
| 6 | Frequency Stability | 22.355 | PASS |
| 7 | Spurious Emissions at Antenna Terminals | 22.917(a) | PASS |
| 8 | Radiates Spurious Emission | 22.917 (a) | PASS |

Date of Testing: October 18, 2017~ November 1, 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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2. General Description of Equipment under Test

Client Information

| | |
|----------------------|--|
| Applicant | Xiaomi Communications Co., Ltd. |
| Applicant address | The Rainbow City of China Resources, NO.68, Qinghe Middle Street, Haidian District, Beijing, China |
| Manufacturer | Xiaomi Communications Co., Ltd. |
| Manufacturer address | The Rainbow City of China Resources, NO.68, Qinghe Middle Street, Haidian District, Beijing, China |

General Information

| EUT Description | | | | | |
|------------------------------|---|-----------|-----------|--|--|
| Model | MDG1 | | | | |
| IMEI | SIM 1:865498030064281 SIM 2:865498030064828 | | | | |
| Hardware Version | P2 | | | | |
| Software Version | MIUI 9 | | | | |
| Power Supply | Battery/AC adapter | | | | |
| Antenna Type | Internal Antenna | | | | |
| Test Mode(s) | GSM 850: WCDMA Band V;LTE Band 5; | | | | |
| Test Modulation | (GSM)GMSK,8PSK; (WCDMA)QPSK; (LTE)QPSK 16QAM; | | | | |
| GPRS Multislot Class | 33 | | | | |
| EGPRS Multislot Class | 33 | | | | |
| HSDPA UE Category | 24 | | | | |
| HSUPA UE Category | 6 | | | | |
| DC-HSDPA UE Category | 24 | | | | |
| LTE Category | 4 | | | | |
| Maximum E.R.P. | GSM 850: | 26.71dBm | | | |
| | WCDMA Band V: | 17.27dm | | | |
| | LTE Band 5: | 17.17dBm | | | |
| Rated Power Supply Voltage | 3.85V | | | | |
| Extreme Voltage | Minimum: 3.6V Maximum: 4.35V | | | | |
| Extreme Temperature | Lowest: -10°C Highest: +55°C | | | | |
| Operating Frequency Range(s) | | | | | |
| | Band | Tx (MHz) | Rx (MHz) | | |
| | GSM850 | 824 ~ 849 | 869 ~ 894 | | |
| | WCDMA Band V | 824 ~ 849 | 869 ~ 894 | | |
| | LTE Band 5 | 824 ~ 849 | 869 ~ 894 | | |
| EUT Accessory | | | | | |
| Adapter-US | Manufacturer: Dongguan Aohai Power Technology Co., Ltd. Model: MDY-08-EZ | | | | |



| | |
|---|---|
| Battery | Manufacturer: SCUD (Fujian) Electronics Co., LTD Model: BN35 |
| USB Cable 1 | Manufacturer: KeLi Model: KLC-2639, 82cm |
| USB Cable 2 | Manufacturer: BROAD Model: 0US231XI0015, 82cm |
| 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:

FCC CFR47 Part 2 (2017)

FCC CFR 47 Part 22H (2017)

ANSI/TIA-603-D (2010)

KDB 971168 D01 Power Meas License Digital Systems v02r02



4. Test Configuration

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

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

All mode and data rates and positions were investigated. Subsequently, only the worst case emissions are reported.

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

Test modes are chosen to be reported as the worst case configuration below:

| | Test items | Modes/Modulation | |
|----------------------|---|--|--------------------------------|
| | | GSM 850 | WCDMA Band V |
| Conducted Test cases | RF power output | GSM GPRS EGPRS | RMC HSDPA/HSUPA DC-HSDPA |
| | Occupied Bandwidth | GSM GPRS(1Tx slot) EGPRS(1Tx slot) | RMC |
| | Band Edge Compliance | GSM GPRS(1Tx slot) EGPRS(1Tx slot) | RMC |
| | Peak-to-Average Power Ratio | GSM GPRS(1Tx slot) EGPRS(1Tx slot) | RMC |
| | Frequency Stability | GSM GPRS(1Tx slot) EGPRS(1Tx slot) | RMC |
| | Spurious Emissions at Antenna Terminals | GSM | RMC |
| Radiated Test cases | Effective Radiated Power | GSM GPRS(1Tx slot) EGPRS(1Tx slot) | RMC |
| | Radiates Spurious Emission | GSM | RMC |



Test modes are chosen as the worst case configuration below for LTE Band 5.

| Test items | Bandwidth (MHz) | | | | Modulation | | RB | | | Test Channel | | |
|---|---|---|---|----|------------|-------|----|-----|------|--------------|---|---|
| | 1.4 | 3 | 5 | 10 | QPSK | 16QAM | 1 | 50% | 100% | L | M | H |
| RF power output | O | O | O | O | O | O | O | O | O | O | O | O |
| Effective Isotropic Radiated power | O | O | O | O | O | O | - | - | O | O | O | O |
| Occupied Bandwidth | O | O | O | O | O | O | - | - | O | O | O | O |
| Band Edge Compliance | O | O | O | O | O | O | O | - | O | O | - | O |
| Peak-to-Average Power Ratio | O | O | O | O | O | O | - | - | O | O | O | O |
| Frequency Stability | O | O | O | O | O | O | - | - | O | - | O | - |
| Spurious Emissions at Antenna Terminals | O | O | O | O | O | - | O | - | - | O | O | O |
| Radiates Spurious Emission | 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

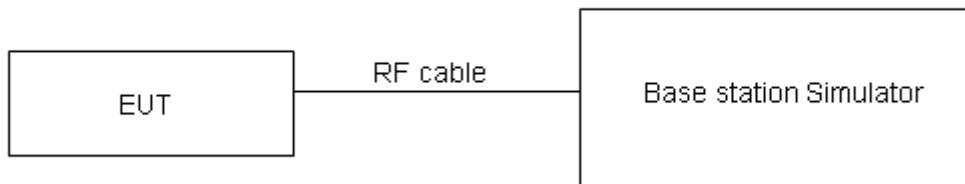
Ambient condition

| 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**

| GSM 850 | | Conducted Power(dBm) | | |
|-----------------|----------|----------------------|-------------|-------------|
| | | Channel 128 | Channel 190 | Channel 251 |
| | | 824.2 (MHz) | 836.6 (MHz) | 848.8 (MHz) |
| GSM | Results | 32.24 | 32.27 | 32.28 |
| GPRS (GMSK) | 1TXslot | 32.20 | 32.27 | 32.26 |
| | 2TXslots | 32.14 | 32.12 | 32.19 |
| | 3TXslots | 30.11 | 30.19 | 30.15 |
| | 4TXslots | 29.11 | 29.10 | 29.15 |
| EGPRS (GMSK) | 1TXslot | 32.19 | 32.20 | 32.22 |
| | 2TXslots | 32.12 | 32.10 | 32.13 |
| | 3TXslots | 30.18 | 30.09 | 30.14 |
| | 4TXslots | 29.11 | 29.00 | 29.02 |
| EGPRS (8PSK) | 1TXslot | 25.91 | 25.87 | 25.92 |
| | 2TXslots | 24.78 | 24.76 | 24.77 |
| | 3TXslots | 22.94 | 22.96 | 22.95 |
| | 4TXslots | 21.95 | 21.96 | 21.98 |

| WCDMA Band V | | Conducted Power(dBm) | | |
|--------------|--------------|----------------------|--------------|--------------|
| | | Channel 4132 | Channel 4183 | Channel 4233 |
| | | 826.4(MHz) | 836.6(MHz) | 846.6(MHz) |
| RMC | 12.2k | 22.93 | 23.00 | 23.01 |
| HSDPA | Sub - Test 1 | 22.21 | 22.07 | 22.10 |
| | Sub - Test 2 | 22.14 | 22.01 | 22.03 |
| | Sub - Test 3 | 21.54 | 21.46 | 21.51 |
| | Sub - Test 4 | 21.56 | 21.51 | 21.52 |
| HSUPA | Sub - Test 1 | 21.97 | 22.08 | 22.10 |
| | Sub - Test 2 | 21.59 | 21.62 | 21.66 |
| | Sub - Test 3 | 21.98 | 22.03 | 22.21 |
| | Sub - Test 4 | 22.08 | 21.97 | 22.03 |
| | Sub - Test 5 | 22.01 | 22.07 | 22.14 |
| DC-HSDPA | Sub - Test 1 | 22.13 | 22.00 | 21.96 |
| | Sub - Test 2 | 22.05 | 21.93 | 21.88 |
| | Sub - Test 3 | 21.44 | 21.37 | 21.35 |
| | Sub - Test 4 | 21.39 | 21.28 | 21.21 |
| HSPA+ | 16QAM | 20.82 | 20.84 | 20.87 |



| LTE Band 5 | | | | Conducted Power(dBm) | | |
|------------|------------|---------|-----------|------------------------|-------------|-------------|
| BW | Modulation | RB size | RB offset | Channel/Frequency(MHz) | | |
| | | | | 20407/824.7 | 20525/836.5 | 20643/848.3 |
| 1.4MHz | QPSK | 1 | 0 | 23.02 | 23.10 | 23.00 |
| | | 1 | 2 | 23.10 | 23.16 | 23.13 |
| | | 1 | 5 | 22.96 | 23.11 | 22.93 |
| | | 3 | 0 | 22.78 | 22.93 | 22.81 |
| | | 3 | 2 | 22.79 | 22.92 | 22.82 |
| | | 3 | 3 | 22.85 | 22.92 | 22.75 |
| | | 6 | 0 | 21.96 | 21.95 | 21.93 |
| | 16QAM | 1 | 0 | 21.89 | 21.90 | 21.76 |
| | | 1 | 2 | 21.88 | 21.88 | 21.90 |
| | | 1 | 5 | 21.74 | 21.71 | 21.67 |
| | | 3 | 0 | 21.64 | 21.85 | 21.89 |
| | | 3 | 2 | 21.62 | 21.98 | 21.84 |
| | | 3 | 3 | 21.85 | 21.91 | 21.85 |
| | | 6 | 0 | 20.99 | 20.88 | 20.91 |
| BW | Modulation | RB size | RB offset | Channel/Frequency(MHz) | | |
| | | | | 20415/825.5 | 20525/836.5 | 20635/847.5 |
| 3MHz | QPSK | 1 | 0 | 23.03 | 23.13 | 23.02 |
| | | 1 | 7 | 23.14 | 23.22 | 23.18 |
| | | 1 | 14 | 22.98 | 23.15 | 22.96 |
| | | 8 | 0 | 21.88 | 22.05 | 21.94 |
| | | 8 | 4 | 21.92 | 22.03 | 21.93 |
| | | 8 | 7 | 21.95 | 22.05 | 21.86 |
| | | 15 | 0 | 22.05 | 22.00 | 21.98 |
| | 16QAM | 1 | 0 | 21.91 | 21.91 | 21.78 |
| | | 1 | 7 | 21.91 | 21.95 | 21.94 |
| | | 1 | 14 | 21.76 | 21.75 | 21.69 |
| | | 8 | 0 | 20.76 | 20.99 | 21.02 |
| | | 8 | 4 | 20.72 | 21.10 | 20.95 |
| | | 8 | 7 | 20.95 | 21.03 | 20.98 |
| | | 15 | 0 | 21.03 | 20.93 | 20.93 |
| BW | Modulation | RB size | RB offset | Channel/Frequency(MHz) | | |
| | | | | 20425/826.5 | 20525/836.5 | 20625/846.5 |
| 5MHz | QPSK | 1 | 0 | 23.02 | 23.09 | 23.00 |



| | | | | | | | |
|-------|------------|---------|-----------|------------------------|-------------|-----------|-------|
| | | | 1 | 13 | 23.12 | 23.21 | 23.15 |
| | | | 1 | 24 | 22.95 | 23.10 | 22.92 |
| | | | 12 | 0 | 21.86 | 22.01 | 21.91 |
| | | | 12 | 6 | 21.89 | 21.98 | 21.89 |
| | | | 12 | 13 | 21.92 | 22.02 | 21.82 |
| | | | 25 | 0 | 22.03 | 21.96 | 21.93 |
| | | | 1 | 0 | 21.86 | 21.89 | 21.76 |
| | | | 1 | 13 | 21.89 | 21.92 | 21.92 |
| | | 16QAM | 1 | 24 | 21.73 | 21.71 | 21.66 |
| | | | 12 | 0 | 20.73 | 20.97 | 20.99 |
| | | | 12 | 6 | 20.69 | 21.05 | 20.91 |
| | | | 12 | 13 | 20.93 | 20.99 | 20.95 |
| | | | 25 | 0 | 21.00 | 20.88 | 20.89 |
| BW | Modulation | RB size | RB offset | Channel/Frequency(MHz) | | | |
| | | | | 20450/829 | 20525/836.5 | 20600/844 | |
| 10MHz | QPSK | 1 | 0 | 22.99 | 23.05 | 22.97 | |
| | | 1 | 25 | 23.11 | 23.17 | 23.13 | |
| | | 1 | 49 | 22.93 | 23.09 | 22.89 | |
| | | 25 | 0 | 21.83 | 21.96 | 21.87 | |
| | | 25 | 13 | 21.87 | 21.94 | 21.86 | |
| | | 25 | 25 | 21.89 | 21.97 | 21.78 | |
| | | 50 | 0 | 22.00 | 21.91 | 21.89 | |
| | 16QAM | 1 | 0 | 21.84 | 21.85 | 21.71 | |
| | | 1 | 25 | 21.85 | 21.90 | 21.88 | |
| | | 1 | 49 | 21.71 | 21.68 | 21.64 | |
| | | 25 | 0 | 20.70 | 20.93 | 20.96 | |
| | | 25 | 13 | 20.66 | 21.03 | 20.88 | |
| | | 25 | 25 | 20.90 | 20.94 | 20.91 | |
| | | 50 | 0 | 20.98 | 20.84 | 20.86 | |



5.2. Effective Radiated Power

Ambient condition

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

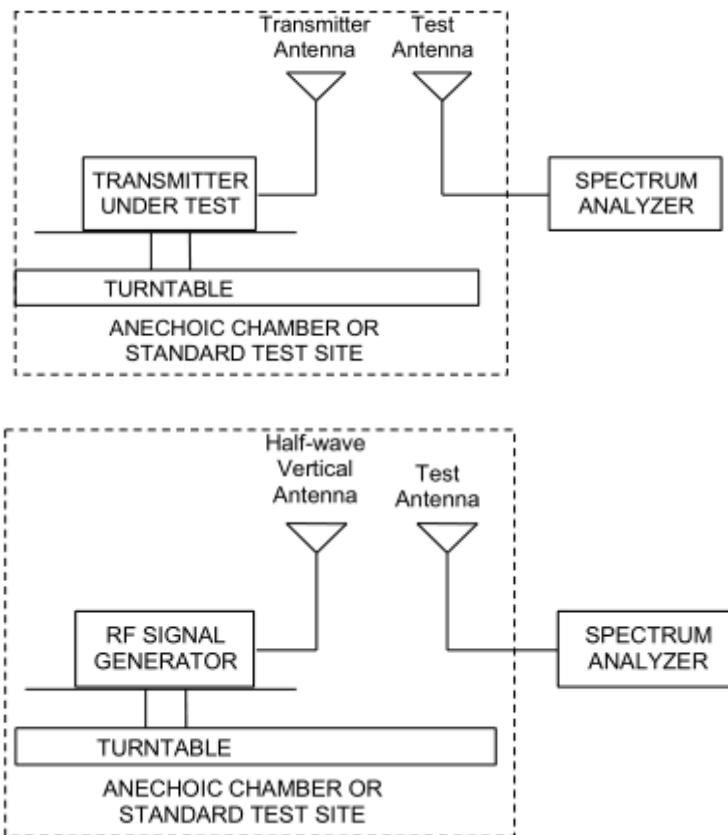
Methods of Measurement

The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI/TIA-603-D-2010.

- 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.
$$\text{LOSS} = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$$
- e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:
$$\text{ERP (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$$
- 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:
$$\text{ERP (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$$
where:dBi refers to gain relative to an ideal dipole.

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

Test setup



Limits

Rule Part 22.913(a) specifies that "Mobile/portable stations are limited to 7 watts ERP".

| | |
|-------|--|
| Limit | $\leq 7 \text{ W} \quad (38.45 \text{ dBm})$ |
|-------|--|

Measurement Uncertainty

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

**Test Results:**

The measurement is performed for both of 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 (dBi) | ERP (dBm) | Limit (dBm) | Conclusion |
|--------------|---------|-----------------|--------------|--------------------|-------------|--------------------|-----------|-------------|------------|
| GSM 850 | Low | 824.2 | Horizontal | -20.48 | -45.53 | 1.06 | 26.11 | 38.45 | Pass |
| | Mid | 836.6 | Horizontal | -20.32 | -45.38 | 1.24 | 26.31 | 38.45 | Pass |
| | High | 848.8 | Horizontal | -20.59 | -45.37 | 1.38 | 26.16 | 38.45 | Pass |
| GPRS 850 | Low | 824.2 | Horizontal | -20.18 | -45.53 | 1.06 | 26.41 | 38.45 | Pass |
| | Mid | 836.6 | Horizontal | -19.92 | -45.38 | 1.24 | 26.71 | 38.45 | Pass |
| | High | 848.8 | Horizontal | -20.09 | -45.37 | 1.38 | 26.66 | 38.45 | Pass |
| EGPRS 850 | Low | 824.2 | Horizontal | -23.26 | -45.53 | 1.06 | 23.33 | 38.45 | Pass |
| | Mid | 836.6 | Horizontal | -23.23 | -45.38 | 1.24 | 23.39 | 38.45 | Pass |
| | High | 848.8 | Horizontal | -23.95 | -45.37 | 1.38 | 22.81 | 38.45 | Pass |
| WCDMA Band V | Low | 826.4 | Horizontal | -29.54 | -45.44 | 1.13 | 17.02 | 38.45 | Pass |
| | Mid | 836.6 | Horizontal | -29.40 | -45.38 | 1.24 | 17.22 | 38.45 | Pass |
| | High | 846.6 | Horizontal | -29.46 | -45.38 | 1.35 | 17.27 | 38.45 | Pass |



| LTE Band 5 | | | | | | | | | |
|-----------------|---------|-----------------|--------------|--------------------|-------------|--------------------|-----------|-------------|------------|
| bandwidth | Channel | Frequency (MHz) | Polarization | Output Power (dBm) | Losses (dB) | Antenna Gain (dBi) | ERP (dBm) | Limit (dBm) | Conclusion |
| 1.4 MHz (QPSK) | Low | 824.7 | Horizontal | -32.56 | -47.29 | 1.06 | 15.79 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -32.39 | -47.15 | 1.24 | 16.00 | 38.45 | Pass |
| | High | 848.3 | Horizontal | -32.93 | -47.48 | 1.38 | 15.93 | 38.45 | Pass |
| 3 MHz (QPSK) | Low | 825.5 | Horizontal | -32.65 | -47.26 | 1.06 | 15.67 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -32.57 | -47.15 | 1.24 | 15.81 | 38.45 | Pass |
| | High | 847.5 | Horizontal | -33.14 | -47.44 | 1.38 | 15.68 | 38.45 | Pass |
| 5 MHz (QPSK) | Low | 826.5 | Horizontal | -34.70 | -47.24 | 1.13 | 13.66 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -34.63 | -47.15 | 1.24 | 13.76 | 38.45 | Pass |
| | High | 846.5 | Horizontal | -35.06 | -47.40 | 1.38 | 13.72 | 38.45 | Pass |
| 10 MHz (QPSK) | Low | 829 | Horizontal | -31.38 | -47.19 | 1.13 | 16.94 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -31.47 | -47.15 | 1.24 | 16.92 | 38.45 | Pass |
| | High | 844 | Horizontal | -31.44 | -47.29 | 1.33 | 17.17 | 38.45 | Pass |
| 1.4 MHz (16QAM) | Low | 824.7 | Horizontal | -32.85 | -47.29 | 1.06 | 15.51 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -32.63 | -47.15 | 1.24 | 15.76 | 38.45 | Pass |
| | High | 848.3 | Horizontal | -33.26 | -47.48 | 1.38 | 15.60 | 38.45 | Pass |
| 3 MHz (16QAM) | Low | 825.5 | Horizontal | -32.93 | -47.26 | 1.06 | 15.40 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -32.89 | -47.15 | 1.24 | 15.50 | 38.45 | Pass |
| | High | 847.5 | Horizontal | -33.48 | -47.44 | 1.38 | 15.35 | 38.45 | Pass |
| 5 MHz (16QAM) | Low | 826.5 | Horizontal | -35.02 | -47.24 | 1.13 | 13.35 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -34.93 | -47.15 | 1.24 | 13.46 | 38.45 | Pass |
| | High | 846.5 | Horizontal | -35.38 | -47.40 | 1.38 | 13.40 | 38.45 | Pass |
| 10 MHz (16QAM) | Low | 829 | Horizontal | -31.72 | -47.19 | 1.13 | 16.60 | 38.45 | Pass |
| | Mid | 836.5 | Horizontal | -31.84 | -47.15 | 1.24 | 16.55 | 38.45 | Pass |
| | High | 844 | Horizontal | -31.76 | -47.29 | 1.33 | 16.85 | 38.45 | Pass |

5.3. Occupied Bandwidth

Ambient condition

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

Method of Measurement

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

RBW is set to 3kHz, VBW is set to 10kHz for GSM 850,

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

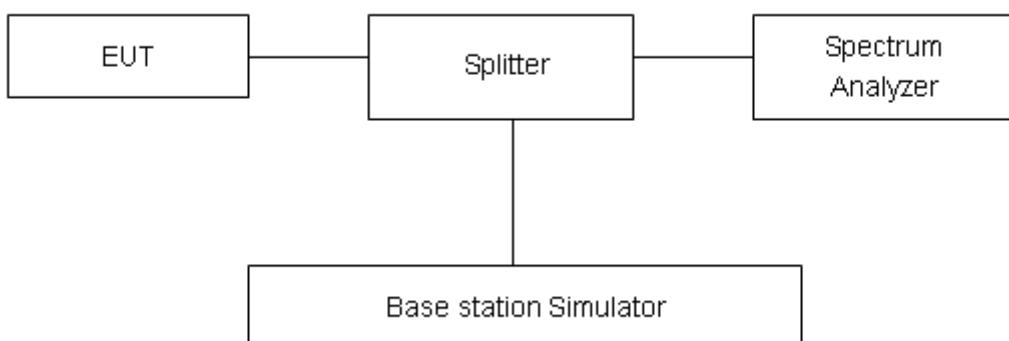
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 5 (1.4MHz),

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

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 5 (10MHz).

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

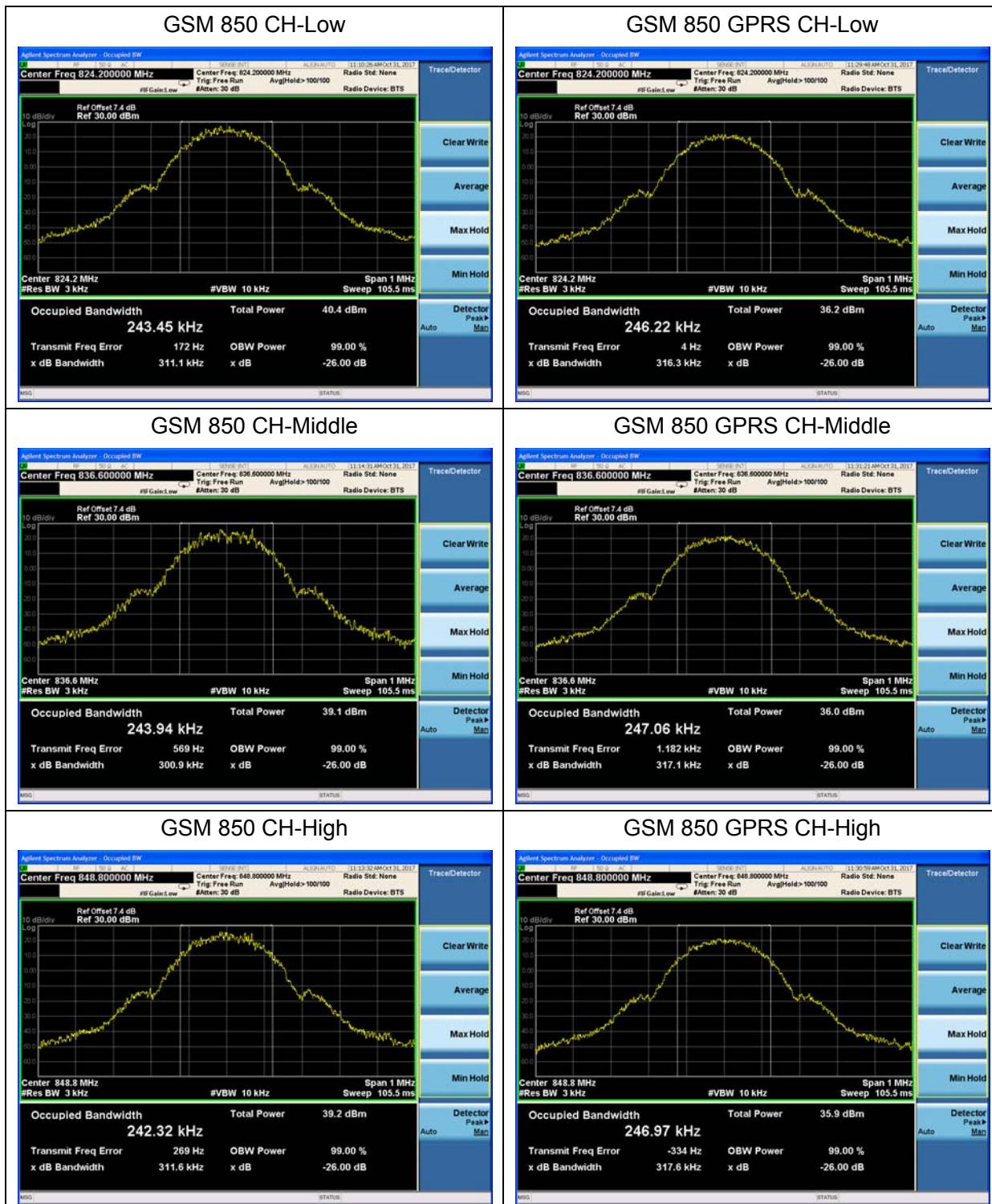
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 624\text{Hz}$.

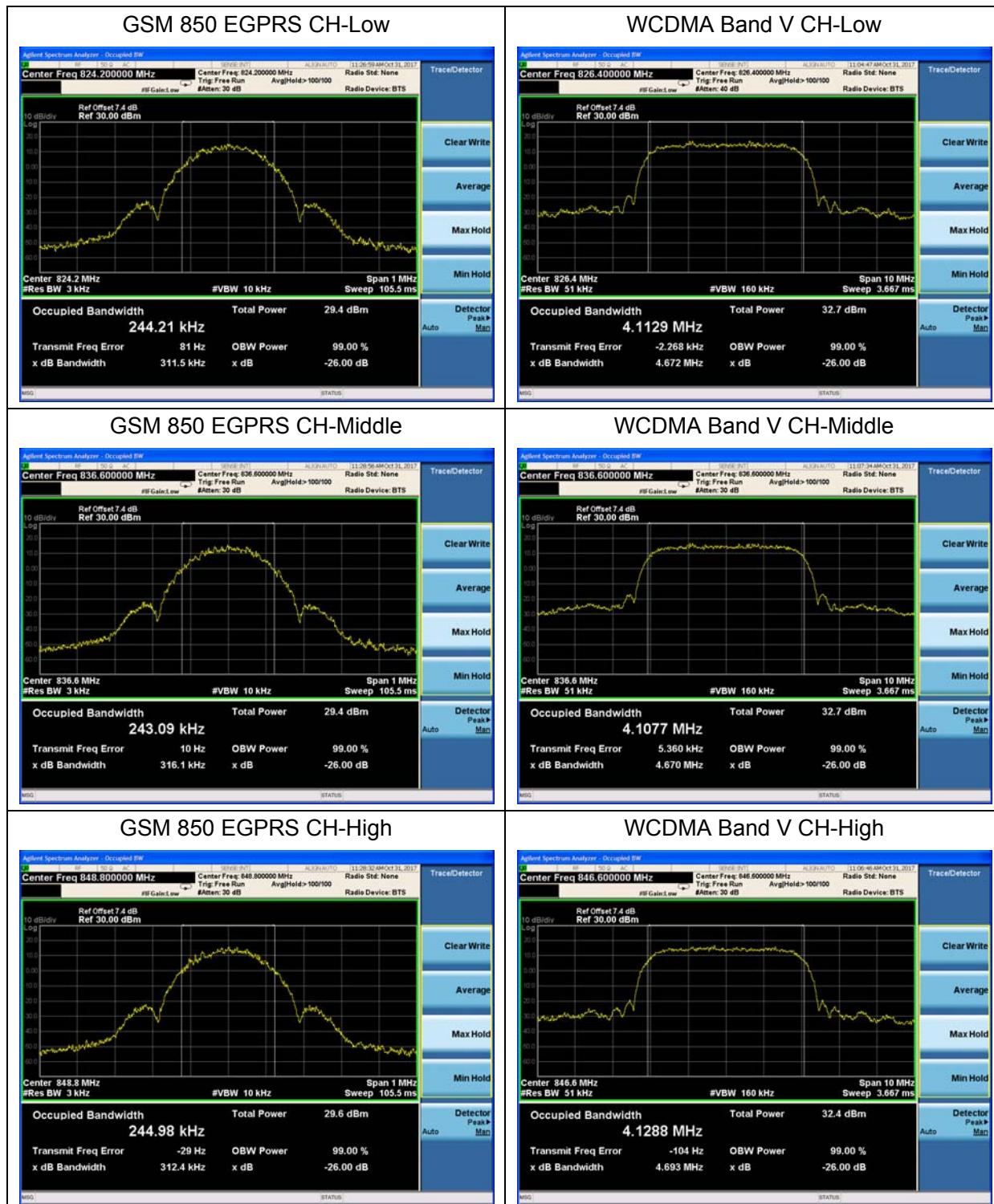
**Test Result**

| Mode | Channel | Frequency (MHz) | 99% Power Bandwidth (MHz) | -26dBc Bandwidth(MHz) |
|-----------------------------------|---------|-----------------|---------------------------|-----------------------|
| GSM 850 (GSM) | 128 | 824.2 | 0.24345 | 0.3111 |
| | 190 | 836.6 | 0.24394 | 0.3009 |
| | 251 | 848.8 | 0.24232 | 0.3116 |
| GPRS 850 (GMSK) | 128 | 824.2 | 0.24622 | 0.3163 |
| | 190 | 836.6 | 0.24706 | 0.3171 |
| | 251 | 848.8 | 0.24697 | 0.3176 |
| EGPRS 850 (8-PSK) | 128 | 824.2 | 0.24421 | 0.3115 |
| | 190 | 836.6 | 0.24309 | 0.3161 |
| | 251 | 848.8 | 0.24498 | 0.3124 |
| WCDMA Band V (RMC) | 4132 | 826.4 | 4.1129 | 4.672 |
| | 4183 | 836.6 | 4.1077 | 4.670 |
| | 4233 | 846.6 | 4.1288 | 4.693 |



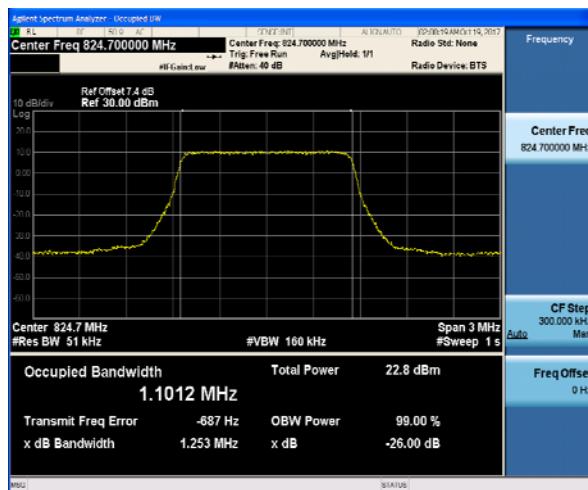
| LTE Band 5 | | | | | | |
|------------|------------|-----------------|---------|-----------------|--------------------------|-----------------------|
| RB | Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | 99% Power Bandwidth(MHz) | -26dBc Bandwidth(MHz) |
| 100% | QPSK | 1.4 | 20407 | 824.7 | 1.1012 | 1.253 |
| | | | 20525 | 836.5 | 1.1030 | 1.264 |
| | | | 20643 | 848.3 | 1.1024 | 1.260 |
| | | 3 | 20415 | 825.5 | 2.7155 | 2.953 |
| | | | 20525 | 836.5 | 2.7149 | 2.954 |
| | | | 20635 | 847.5 | 2.7150 | 2.954 |
| | | 5 | 20425 | 826.5 | 4.4726 | 4.809 |
| | | | 20525 | 836.5 | 4.4783 | 4.793 |
| | | | 20625 | 846.5 | 4.4781 | 4.814 |
| | 16QAM | 10 | 20450 | 829 | 9.0037 | 9.692 |
| | | | 20525 | 836.5 | 9.0174 | 9.703 |
| | | | 20600 | 844 | 8.9908 | 9.696 |
| | | 1.4 | 20407 | 824.7 | 1.1032 | 1.255 |
| | | | 20525 | 836.5 | 1.1016 | 1.252 |
| | | | 20643 | 848.3 | 1.1028 | 1.257 |
| | 16QAM | 3 | 20415 | 825.5 | 2.7158 | 2.955 |
| | | | 20525 | 836.5 | 2.7164 | 2.954 |
| | | | 20635 | 847.5 | 2.7191 | 2.962 |
| | | 5 | 20425 | 826.5 | 4.4762 | 4.792 |
| | | | 20525 | 836.5 | 4.4792 | 4.779 |
| | | | 20625 | 846.5 | 4.4792 | 4.805 |
| | 10 | 10 | 20450 | 829 | 8.9957 | 8.699 |
| | | | 20525 | 836.5 | 9.0114 | 9.708 |
| | | 20600 | 844 | 8.9875 | | 9.687 |



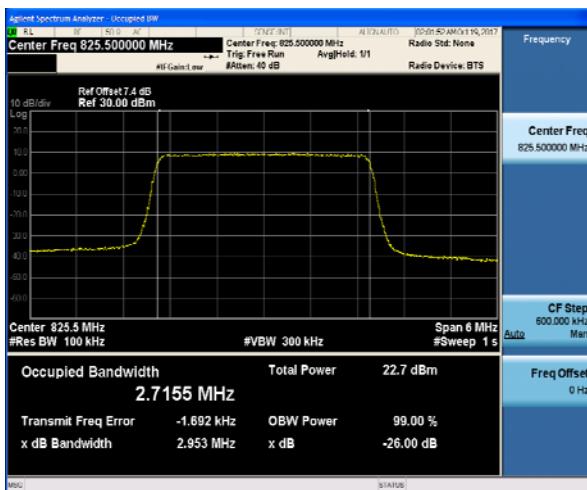




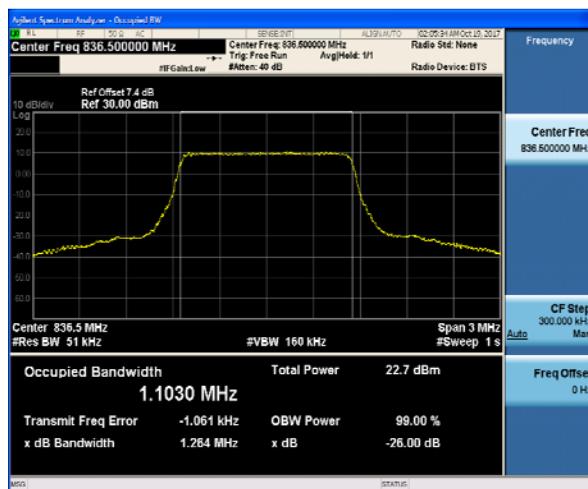
LTE Band 5 QPSK 1.4MHz CH-Low



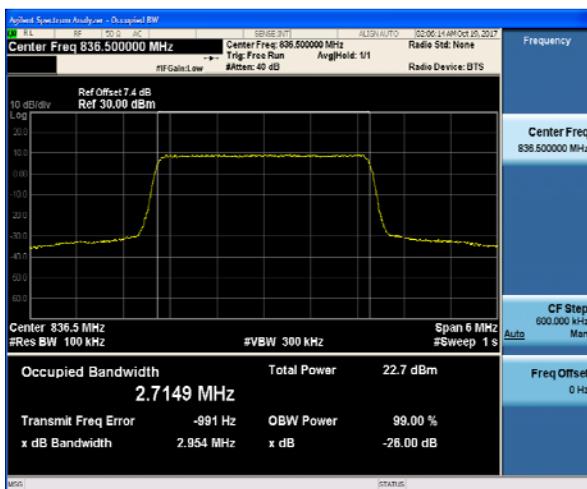
LTE Band 5 QPSK 3MHz CH-Low



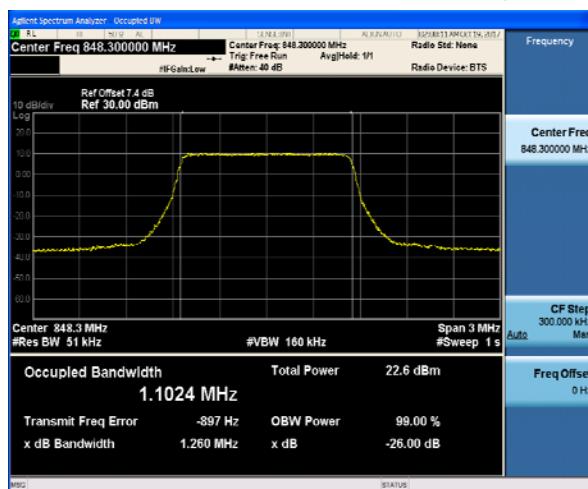
LTE Band 5 QPSK 1.4MHz CH-Middle



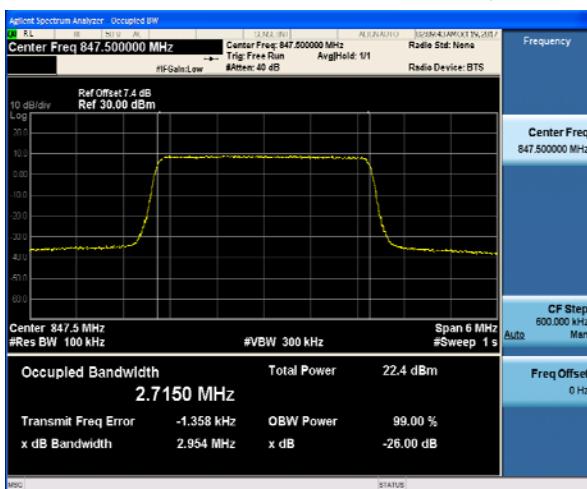
LTE Band 5 QPSK 3MHz CH-Middle



LTE Band 5 QPSK 1.4MHz CH-High

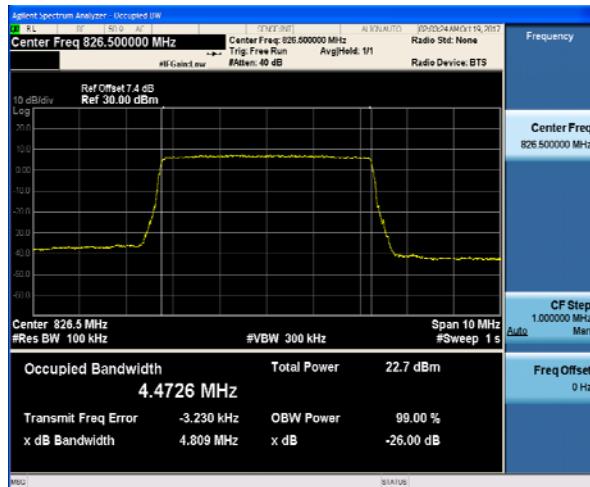


LTE Band 5 QPSK 3MHz CH-High

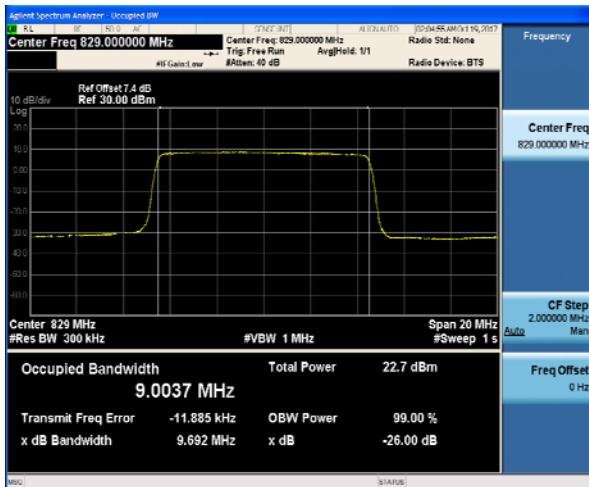




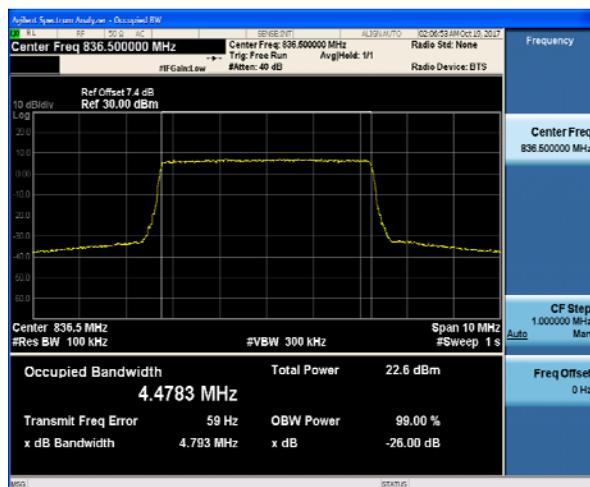
LTE Band 5 QPSK 5MHz CH-Low



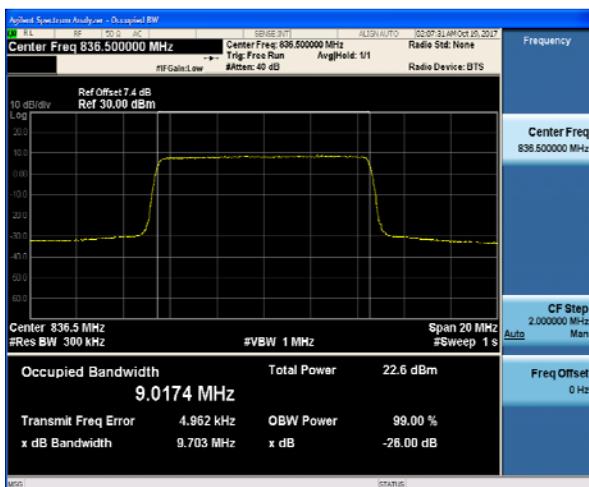
LTE Band 5 QPSK 10MHz CH-Low



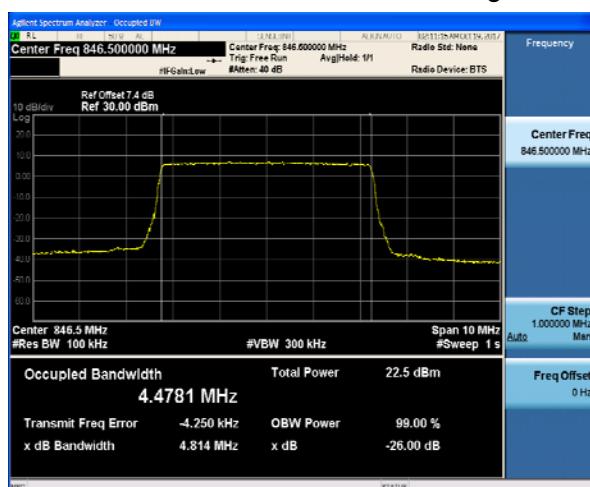
LTE Band 5 QPSK 5MHz CH-Middle



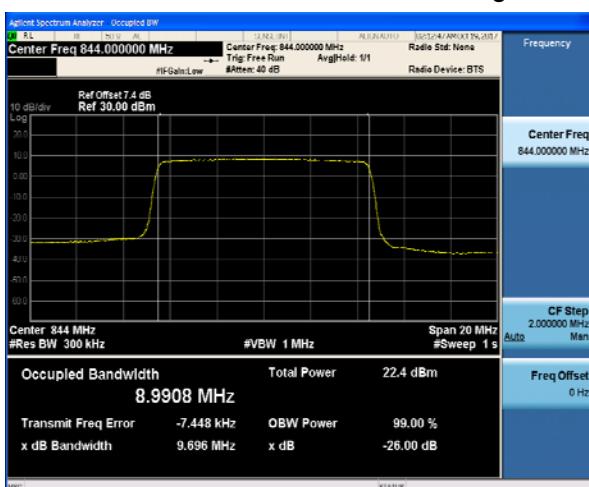
LTE Band 5 QPSK 10MHz CH-Middle



LTE Band 5 QPSK 5MHz CH-High

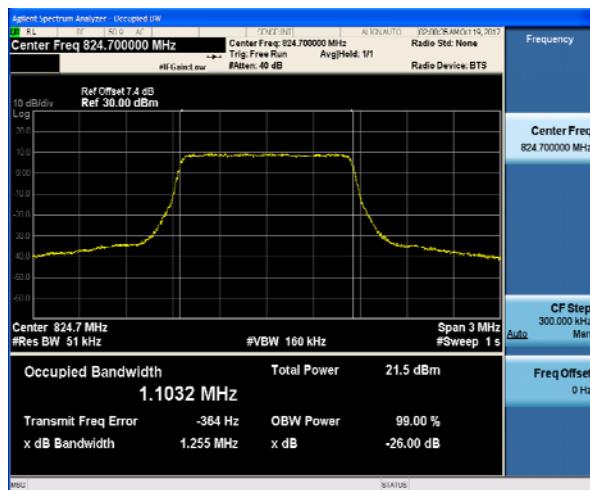


LTE Band 5 QPSK 10MHz CH-High

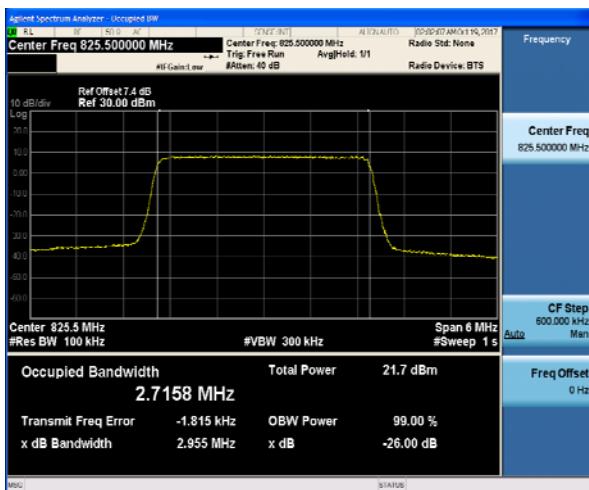




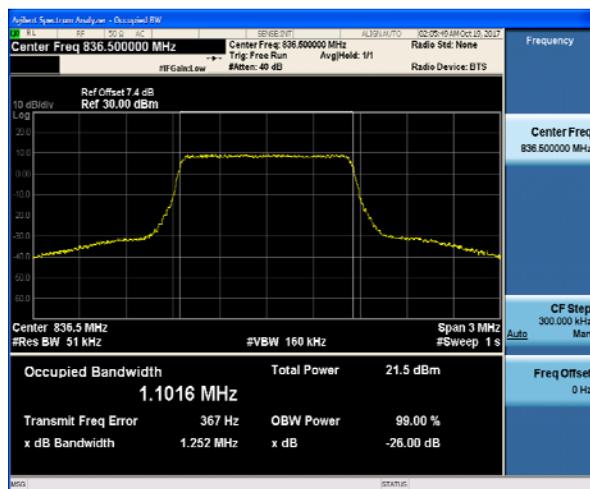
LTE Band 5 16QAM 1.4MHz CH-Low



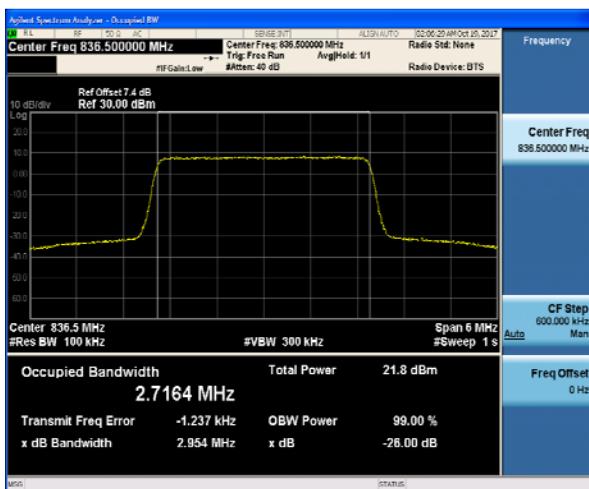
LTE Band 5 16QAM 3MHz CH-Low



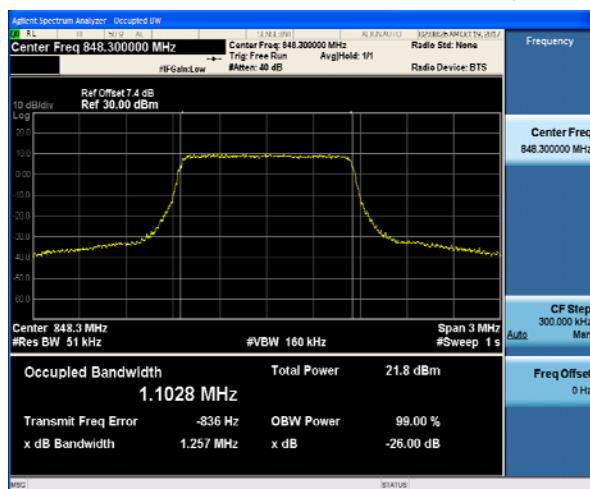
LTE Band 5 16QAM 1.4MHz CH-Middle



LTE Band 5 16QAM 3MHz CH-Middle



LTE Band 5 16QAM 1.4MHz CH-High



LTE Band 5 16QAM 3MHz CH-High

