# TEST REPORT

**Report Number. :** R14639481-E2

| | | |
|---|---|---|
| **Applicant** | : | Sony Corporation<br>1-7-1 Konan Minato-ku<br>Tokyo, 108-0075, Japan |
| **FCC ID** | : | PY7-83376C |
| **EUT Description** | : | GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC |
| **Test Standard(s)** | : | FCC CFR 47 Part 2, Part 22, Part 24, and Part 27. |

**Date Of Issue:**
2023-03-23

**Prepared by:**
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CERT #0751.06

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 2023-03-13 | Initial Review | Noah Bennett |
| V2 | 2023-03-20 | TCB Feedback | Noah Bennett |
| V3 | 2023-03-23 | TCB Feedback Round 2 | Noah Bennett |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Sony Corporation
1-7-1 Konan Minato-ku
Tokyo, 108-0075, Japan

**EUT DESCRIPTION:** GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC

**SERIAL NUMBER:** QV7700ADFR,QV7700GGFR, QV7700C9FR, QV770017FA, QV7700HUFR

**SAMPLE RECEIPT DATE:** 2022-12-28, 2023-02-06 2023-02-09

**DATE TESTED:** 2023-02-24 to 2023-03-20

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 2 | Complies |
| CFR 47 Part 22 | Complies |
| CFR 47 Part 24 | Complies |
| CFR 47 Part 27 | Complies |

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released For
UL LLC. By:

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UL LLC

# 2. SUMMARY OF TEST RESULTS

This report contains data provided by the applicant which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer. Below is a list of the data provided by the customer:

1) Antenna gain and type (see section 6.4)
2) Cable loss (see section 6.2,8,9)
3) Supported bands and modulations (see section 6.5)

| Requirement Description | Band | Requirement Clause Number (FCC) | Result | Remarks |
|---|---|---|---|---|
| Effective Radiated Power | GSM850 | 22.913 (a)(5) | Compliant | None. |
| | 12 | 27.50 (c) (10) | | |
| Equivalent Isotropic Radiated Power | WCDMA4, LTE4 | 27.50 (d) (4) | | |
| | GSM1900, WCDMA2, LTE2 | 24.232 (b) (c) | | |
| **Requirement Description** | **Requirement Clause Number (FCC)** | | **Result** | **Remarks** |
| Occupied Bandwidth | 2.1049 | | Compliant | None. |
| Band Edge and Emission Mask | 2.1051, 22.917 (a), 24.238 (a), 27.53 (g), (h) | | | |
| Out of Band Emissions | 2.1051, 22.917 (a), 24.238 (a), 27.53 (g), (h) | | | |
| Frequency Stability | 2.1055, 22.355, 24.235, 27.54, | | | |
| Peak-to-Average Ratio | 22.913 (d), 27.50 (d) (5) | | | |
| Field Strength of Spurious Radiation | 2.1051, 22.917 (a), 24.238 (a), 27.53 (g),(h) | | | |

# 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 22, Part 24, and Part 27.
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01. Determining ERP and EIRP

# 4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

| | Address | ISED CABID | ISED Company Number | FCC Registration |
|---|---|---|---|---|
| ☒ | Building<br>2800 Suite Perimeter Park Dr. Suite B<br>Morrisville, NC 27560, U.S.A | US0067 | 27265 | 825374 |

# 5. DECISION RULES AND MEASUREMENT UNCERTAINTY

## 5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

## 5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement
uncertainty is not taken into account when stating conformity with a specified requirement.)

## 5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | $U_{Lab}$ |
|---|---|
| Radio Frequency (Spectrum Analyzer) | 141.2 Hz |
| Occupied Channel Bandwidth | 1.22% |
| RF output power, conducted | 1.3 dB (PK)<br>0.45 dB (AV) |
| Unwanted Emissions, conducted | 1.94 dB |
| All emissions, radiated | 6.01 dB |
| Temperature | 0.57°C |
| Humidity | 3.39% |
| DC Supply voltages | 1.70% |

Uncertainty figures are valid to a confidence level of 95%.

## 5.4. SAMPLE CALCULATION

**RADIATED EMISSIONS**

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

**MAINS CONDUCTED EMISSIONS**

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

# 6. EQUIPMENT UNDER TEST

## 6.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC. This report covers WWAN testing.

## 6.2. MAXIMUM OUTPUT POWER

**EIRP/ERP TEST PROCEDURE**

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted and ERP/EIRP output powers as follows:

**GSM MODES**

| **Part 22 850MHz** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency range (MHz) | Modulation | Conducted (Average) (dBm) | Antenna Gain (dBi) | Limit (W) | ERP | | 99% BW (kHz) | Emission Designator |
| | | | | | (dBm) | (W) | | |
| 824.2-848.8 | GPRS | 32.1 | -5.51 | 7.0 | 24.44 | 0.278 | 242.63 | 243KGXW |
| | EGPRS | 27.4 | | | 19.74 | 0.094 | 243.32 | 243KG7W |
| **Part 24 1900MHz** | | | | | | | | |
| Frequency range (MHz) | Modulation | Conducted (Average) (dBm) | Antenna Gain (dBi) | Limit (W) | EIRP | | 99% BW (kHz) | Emission Designator |
| | | | | | (dBm) | (W) | | |
| 1850.2-1909.8 | GPRS | 27.0 | -3.46 | 2.0 | 23.54 | 0.226 | 245.05 | 245KGXW |
| | EGPRS | 26.3 | | | 22.84 | 0.192 | 244.83 | 245KG7W |

**WCDMA MODE**

| **Part 24 - Band 2** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency range (MHz) | Modulation | Conducted (Average) (dBm) | Antenna Gain (dBi) | Limit (W) | EIRP | | 99% BW (kHz) | Emission Designator |
| | | | | | (dBm) | (W) | | |
| 1852.4-1907.6 | REL 99 | 18.80 | -3.46 | 2.0 | 15.34 | 0.034 | 4160 | 4M16F9W |
| | HSDPA | 17.80 | | | 14.34 | 0.027 | 4161 | 4M16F9W |
| **Part 27 - Band 4** | | | | | | | | |
| Frequency range (MHz) | Modulation | Conducted (Average) (dBm) | Antenna Gain (dBi) | Limit (W) | EIRP | | 99% BW (kHz) | Emission Designator |
| | | | | | (dBm) | (W) | | |
| 1712.4-1752.6 | REL 99 | 17.80 | -4.51 | 1.0 | 13.29 | 0.021 | 4158 | 4M16F9W |
| | HSDPA | 16.80 | | | 12.29 | 0.017 | 4161 | 4M16F9W |

## LTE BAND 2

| Part 24 | |
|---|---|
| EIRP Limit (W) | 2.00 |
| Antenna Gain (dBi) | -3.46 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 1.4 | QPSK | 1850.7 | 1909.3 | 19.1 | 15.64 | 0.037 | 1090 | 1M09G7W |
| | 16QAM | | | 19.4 | 15.94 | 0.039 | 1098 | 1M10D7W |
| 3.0 | QPSK | 1851.5 | 1908.5 | 19.2 | 15.74 | 0.037 | 2706 | 2M71G7W |
| | 16QAM | | | 19.5 | 16.04 | 0.040 | 2709 | 2M71D7W |
| 5.0 | QPSK | 1852.5 | 1907.5 | 19.2 | 15.74 | 0.037 | 4507 | 4M51G7W |
| | 16QAM | | | 19.6 | 16.14 | 0.041 | 4503 | 4M50D7W |
| 10.0 | QPSK | 1855.0 | 1905.0 | 19.2 | 15.74 | 0.037 | 8986 | 8M99G7W |
| | 16QAM | | | 19.5 | 16.04 | 0.040 | 8984 | 8M98D7W |
| 15.0 | QPSK | 1857.5 | 1902.5 | 19.1 | 15.64 | 0.037 | 13470 | 13M5G7W |
| | 16QAM | | | 19.4 | 15.94 | 0.039 | 13470 | 13M5D7W |
| 20.0 | QPSK | 1860.0 | 1900.0 | 19.1 | 15.64 | 0.037 | 17920 | 17M9G7W |
| | 16QAM | | | 19.5 | 16.04 | 0.040 | 17920 | 17M9D7W |

## LTE BAND 4

| Part 27 | |
|---|---|
| EIRP Limit (W) | 1.00 |
| Antenna Gain (dBi) | -4.51 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 1.4 | QPSK | 1710.7 | 1754.3 | 17.8 | 13.29 | 0.021 | 1093 | 1M09G7W |
| | 16QAM | | | 18.1 | 13.59 | 0.023 | 1093 | 1M09D7W |
| 3.0 | QPSK | 1711.5 | 1753.5 | 17.7 | 13.19 | 0.021 | 2700 | 2M70G7W |
| | 16QAM | | | 18.0 | 13.49 | 0.022 | 2707 | 2M71D7W |
| 5.0 | QPSK | 1712.5 | 1752.5 | 17.7 | 13.19 | 0.021 | 4495 | 4M50G7W |
| | 16QAM | | | 18.1 | 13.59 | 0.023 | 4503 | 4M50D7W |
| 10.0 | QPSK | 1715.0 | 1750.0 | 17.7 | 13.19 | 0.021 | 9010 | 9M01G7W |
| | 16QAM | | | 18.0 | 13.49 | 0.022 | 8997 | 9M00D7W |
| 15.0 | QPSK | 1717.5 | 1747.5 | 17.6 | 13.09 | 0.020 | 13490 | 13M5G7W |
| | 16QAM | | | 18.0 | 13.49 | 0.022 | 13480 | 13M5D7W |
| 20.0 | QPSK | 1720.0 | 1745.0 | 17.6 | 13.09 | 0.020 | 17940 | 17M9G7W |
| | 16QAM | | | 17.9 | 13.39 | 0.022 | 17980 | 18M0D7W |

**LTE BAND 12**

| Part 27 | |
|---|---|
| ERP Limit (W) | 3.00 |
| Antenna Gain (dBi) | -8.00 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 1.4 | QPSK | 699.7 | 715.3 | 20.70 | 10.55 | 0.011 | 1091 | 1M09G7W |
| | 16QAM | | | 21.10 | 10.95 | 0.012 | 1098 | 1M10D7W |
| 3.0 | QPSK | 700.5 | 714.5 | 20.80 | 10.65 | 0.012 | 2707 | 2M71G7W |
| | 16QAM | | | 21.10 | 10.95 | 0.012 | 2701 | 2M70D7W |
| 5.0 | QPSK | 701.5 | 713.5 | 20.80 | 10.65 | 0.012 | 4506 | 4M51G7W |
| | 16QAM | | | 21.20 | 11.05 | 0.013 | 4505 | 4M51D7W |
| 10.0 | QPSK | 704.0 | 711.0 | 20.80 | 10.65 | 0.012 | 8972 | 8M97G7W |
| | 16QAM | | | 21.10 | 10.95 | 0.012 | 8964 | 8M96D7W |

## 6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.79 for conducted samples, and 0.79 for radiated samples.

## 6.4. MAXIMUM ANTENNA GAIN

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

| LTE Bands | Frequency Range (MHz) | Main 1 Antenna Gain (dBi) | Main 2 Antenna Gain (dBi) |
|---|---|---|---|
| GSM850 | 824 – 849 | -5.51 | |
| GSM1900, WCDMA2, LTE2 | 1850 - 1910 | | -3.46 |
| LTE Band 12 | 699 – 716 | -8.00 | |
| WCDMA4, LTE Band 4 | 1710 – 1780 | | -4.51 |

## 6.5. WORST-CASE CONFIGURATION AND MODE

The EUT supports the following GSM, WCDMA, and LTE bands:
GSM850, GSM1900, WCDMA Band 2, WCDMA Band 4, LTE Band 2, LTE Band 4, LTE Band 12, and LTE Band 17.

LTE Band 17 (704-716MHz, 5/10MHz bandwidth) is covered by LTE Band 12 because it is a subset of LTE band 12 and they have the same output power.

The worst-case scenario for all measurements is based on conducted average power on different modulations. Output power measurements were measured on Rel 99, HSDPA and HSUPA for WCDMA, and QPSK, 16QAM, and 64QAM, modulations for LTE. It was found that Rel 99 and HSDPA were worst case for WCDMA, and QPSK and 16QAM were worst case for LTE. Therefore, all testing was done in these modes only.

The EUT was investigated in three orthogonal orientations X/Y/Z on both Low Band (Fundamental Below 1GHz) Mid Band (Fundamental between 1-3GHz) and High Band (Fundamental above 3GHz) for both the Main Antennas and the Sub antenna. For Sim Tx scans in which there are two or more Fc ranges with different WC orientations, scans were performed in both orientations, and the Worst-Case margin scan was reported as below:

| Band (Frequency) | Antenna | Orientation |
|---|---|---|
| Low Band (Fc<1GHz) | Main | Z |
| Mid Band (1GHz<Fc<3GHz) | | X |
| BT & 2.4 WLAN (For Sim Tx ) | BT C0/C1 | X |
| 5 WLAN (For Sim Tx) | WLAN Main | Y |

The EUT was tested while connected to AC Lines via charging cable and brick to represent worst case emissions.

Worst Case emissions from 9kHz-30Mhz, 30-1000MHz, and 18-26.5GHz were done on the modes with the highest conducted average power as follows:

| Technology | Band (Frequency) | Modulation |
|---|---|---|
| GSM | 850 | GPRS |
| WCDMA | Band 2 | Rel 99 |
| LTE | Band 12 | 16QAM |

The following scans were investigated for simultaneous transmission:

| Mode | Mode | Mode |
|---|---|---|
| LTE B4 1745MHz 20MHz RB1-0 | 2442MHz BT GFSK C0 | 5240MHz 11ax HE20 26T/0 MIMO |
| LTE B4 1745MHz 20MHz RB1-0 | 2442MHz BT GFSK C1 | 5240MHz 11ax HE20 26T/0 MIMO |
| LTE B4 1745MHz 20MHz RB1-0 | 2442MHz 11ax HE20 106T/54 MIMO | |
| LTE B4 1745MHz 20MHz RB1-0 | 5240MHz 11ax HE20 26T/0 MIMO | |
| LTE B12 704MHz 10MHz RB1-0 | 2462MHz 11ax HE20 106T/54 MIMO | |

## 6.6. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adaptor | Sony | XQZ-UC1 | 1821W34209742 | NA |
| Headphones | Sony | MDR-EX15AP | N/A | N/A |

**I/O CABLES**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length (m)** | **Remarks** |
| 1 | USB-C | 1 | USB-C | Shielded | <3m | XQZ-UB1 |
| 2 | Aux | 1 | AUX | Shielded | <3m | MDR-EX15AP |

**Test Setup**

The EUT was connected to a base station simulator and set to transmit at max power for GSM/WCDMA/LTE testing.

**Setup Diagram**

Please see R14639481-EP3 for Setup Diagrams and Setup Photos.

# 7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

**Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)**

| Equip. ID | Description | Manufacturer/Brand | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **0.009-30MHz** | | | | |
| 135144 | Active Loop Antenna | ETS-Lindgren | 6502 | 2023-01-17 | 2024-01-17 |
| | **30-1000 MHz** | | | | |
| AT0074 | Hybrid Broadband Antenna | Sunol Sciences Corp. | JB3 | 2022-09-07 | 2023-09-07 |
| | **1-18 GHz** | | | | |
| 206211 | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | 2022-03-21 | 2023-03-21 |
| | **Gain-Loss Chains** | | | | |
| 91975 | Gain-loss string: 0.009-30MHz | Various | Various | 2022-05-10 | 2023-05-10 |
| 91978 | Gain-loss string: 25-1000MHz | Various | Various | 2022-05-10 | 2023-05-10 |
| 91977 | Gain-loss string: 1-18GHz | Various | Various | 2022-05-10 | 2023-05-10 |
| | **Receiver & Software** | | | | |
| 197955 | Spectrum Analyzer | Rohde & Schwarz | ESW44 | 2022-03-08 | 2023-03-31 |
| SOFTEMI | EMI Software | UL | Version 9.5 (18 Oct 2021) | | |
| | **Additional Equipment used** | | | | |
| 210642 | Environmental Meter | Fisher Scientific | 15-077-963 s/n 210701942 | 2021-08-16 | 2023-08-16 |
| 200540 | Environmental Meter | Fisher Scientific | 15-077-963 s/n 181474409 | 2022-10-05 | 2023-10-05 |
| 213025 | Wideband Radio Communications Tester | Rohde and Schwarz | CMW500 | 2022-09-13 | 2023-09-13 |
| 208720 | Wideband Radio Communications Tester | Rohde and Schwarz | CMW500 | 2022-05-05 | 2023-05-05 |
| 169106 (BRF008) | 1710-1785MHz notch filter, 2W, $F_{high}$ = 9GHz | Micro-Tronics | BRM50713-01 | 2022-02-17 | 2023-02-28 |
| 82635 (HPF009) | 1GHz high-pass filter, 2W, $F_{high}$ =10GHz | Micro-Tronics | HPM17672 | 2022-02-17 | 2023-02-28 |
| 169108 (BRF010) | 1.85-1.97GHz notch filter, 2W, $F_{high}$ = 9GHz | Micro-Tronics | BRM50714-01 | 2022-02-17 | 2023-02-28 |

**Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)**

| Equip. ID | Description | Manufacturer/Brand | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **30-1000 MHz** | | | | |
| 90629 (AT0075) | Hybrid Broadband Antenna | Sunol Sciences Corp. | JB3 | 2023-01-06 | 2024-01-06 |
| | **1-18 GHz** | | | | |
| AT0067 | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | 2022-05-24 | 2023-05-24 |
| | **Gain-Loss Chains** | | | | |
| 207639 | Gain-loss string: 25-1000MHz | Various | Various | 2022-05-20 | 2023-05-20 |
| 207640 | Gain-loss string: 1-18GHz | Various | Various | 2022-05-20 | 2023-05-20 |
| | **Receiver & Software** | | | | |
| 197954 | Spectrum Analyzer | Rohde & Schwarz | ESW44 | 2023-02-02 | 2024-02-02 |
| SOFTEMI | EMI Software | UL | Version 9.5 (18 Oct 2021) | | |
| | **Additional Equipment used** | | | | |
| 21642 | Environmental Meter | Fisher Scientific | 15-077-963 (s/n 210701692) | 2021-08-16 | 2023-08-16 |
| 213025 | Wideband Radio Communications Tester | Rohde and Schwarz | CMW500 | 2022-09-13 | 2023-09-13 |
| 169108 (BRF010) | 1.85-1.97GHz notch filter, 2W, $F_{high}$ = 9GHz | Micro-Tronics | BRM50714-01 | 2022-02-17 | 2023-02-28 |
| 82635 (HPF009) | 1GHz high-pass filter, 2W, $F_{high}$ =10GHz | Micro-Tronics | HPM17672 | 2023-02-15 | 2024-02-29 |
| 169106 (BRF008) | 1710-1785MHz notch filter, 2W, $F_{high}$ = 9GHz | Micro-Tronics | BRM50713-01 | 2023-02-15 | 2024-02-29 |
| 150716 (LPF008) | DC-1000MHz low-pass filter | Pasternack | PE8720 | 2023-02-15 | 2024-02-29 |
| 77412 (BRF001) | 900MHz notch filter, 2W, $F_{high}$ =6GHz | Micro-Tronics | BRM50706 | 2023-02-15 | 2024-02-29 |

**Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 1)**

| Equip. ID | Description | Manufacturer | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **1-18 GHz** | | | | |

| Equip. ID | Description | Manufacturer | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| AT0072 | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | 2022-05-11 | 2023-05-11 |
| | **Gain-Loss Chains** | | | | |
| 91979 | Gain-loss string: 1-18GHz | Various | Various | 2022-12-02 | 2023-12-02 |
| | **Receiver & Software** | | | | |
| SA0026 | PXA Spectrum Analyzer | Keysight | N9030A | 2022-08-02 | 2023-08-02 |
| SOFTEMI | EMI Software | UL | Version 9.5 (18 Oct 2021) | | |
| | **Additional Equipment used** | | | | |
| 200539 | Environmental Meter | Fisher Scientific | 15-077-963 s/n 18474341 | 2022-10-05 | 2023-10-05 |
| 213025 | Wideband Radio Communications Tester | Rohde and Schwarz | CMW500 | 2022-09-13 | 2023-09-13 |
| 77836 (HPF004) | 1GHz high-pass filter, 2W, $F_{high}$ =18GHz | Micro-Tronics | HPM50115-01 | 2023-02-15 | 2024-02-29 |
| 169106 (BRF008) | 1710-1785MHz notch filter, 2W, $F_{high}$ = 9GHz | Micro-Tronics | BRM50713-01 | 2023-02-15 | 2024-02-29 |

**Test Equipment Used - Wireless Conducted Measurement Equipment**

| Equipment ID | Description | Manufacturer | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **Common Equipment** | | | | |
| | **Conducted Room 1** | | | | |
| 207726 | Temp/Humid Chamber | Thermotron | SM-32-8200 | 2023-01-20 | 2024-01-20 |
| HI0091 | Environmental Meter | Fisher Scientific | 15-077-963 | 2022-07-20 | 2023-07-20 |
| MY162176088 | DC Regulated Power Supply | Keysight | E3633A | NA | NA |
| SA0027 | Spectrum Analyzer | Keysight Technologies | N9030A | 2022-05-24 | 2023-05-24 |
| SA0020 | Spectrum Analyzer | Keysight Technologies | E4446A | 2022-06-08 | 2023-06-08 |
| 212967 | Wideband Radio Communications Tester | Rohde and Schwartz | CMW500 | 2022-12-14 | 2023-12-14 |
| 208721 | Wideband Radio Communications Tester | Rohde and Schwartz | CMW500 (SN 170194) | 2022-05-05 | 2023-05-05 |
| PWM001 (PRE0136343) | RF Power Meter | Keysight Technologies | N1912A | 2022-08-30 | 2023-08-30 |
| PWS005 | Peak and Avg Power Sensor, 50MHz to 18GHz | Keysight Technologies | N1921A | 2022-06-15 | 2023-06-15 |
| | **Additional Equipment used** | | | | |
| MM0166 | True RMS Multimeter | Agilent | U1232A | 2022-07-12 | 2023-07-12 |
| | **Attenuators** | | | | |
| 226559 | SMA Coaxial 10dB Attenuator 25MHz-18GHz | CentricRF | C18S2-10 | 2023-02-16 | 2024-02-16 |
| 226564 | SMA Coaxial 10dB Attenuator 25MHz-18GHz | CentricRF | C18S2-10 | 2023-02-16 | 2024-02-16 |
| 226560 | SMA Coaxial 10dB Attenuator 25MHz-18GHz | CentricRF | C18S2-10 | 2023-02-16 | 2024-02-16 |
| | **Cables** | | | | |
| CBL012 | Micro-Coax UTiFLEX Cable Assembly, Low Loss | Carlisle Interconnect Technologies | UFB293C-0-2400-300300 | 2023-01-05 | 2024-01-05 |
| CBL093 | Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz | Carlisle Interconnect Technologies | UFA147A-2-0360-200200 | 2022-08-24 | 2023-08-24 |
| CBL099 | Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2 | Carlisle Interconnect Technologies | UFA147A-0-0180-200200 | 2023-02-17 | 2024-02-17 |
| CBL105 | Micro-Coax UTiFLEX Cable Assembly, Low Loss | Carlisle Interconnect Technologies | UFB-197C-0-0160-300300 | 2023-02-17 | 2024-02-17 |
| | **Couplers** | | | | |
| CPL001 | Ultra-Wideband Directional Coupler 0.5-18GHz | Mini-Circuits | ZUDC10-183+ | 2023-02-17 | 2024-02-17 |

## TEST AND MEASURMENT EQUIPMENT NOTES:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

# 8. RF OUTPUT POWER VERIFICATION

## 8.1. GSM

**Using CMW500 Communication Test Set**

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press **Connection control** to choose the different menus
Press **RESET** > choose all to reset all settings

| | | |
|---|---|---|
| Connection | Press **Signal Off** to turn off the signal and change settings<br>Network Support > GSM+GPRS or GSM+EGPRS<br>Main Service > Packet Data<br>Service selection > Test Mode A – Auto Slot Config. Off | |
| MS Signal | Press Slot Config bottom on the right twice to select and change the number of time slots and power setting<br>> Slot configuration | > Uplink/Gamma<br>> 33 dBm for GPRS 850/900<br>> 27 dBm for EGPRS 850/900<br>> 30 dBm for GPRS1800/1900<br>> 26 dBm for EGPRS1800/1900 |
| BS Signal | Enter the same channel number for TCH channel (test channel) and BCCH channel | |
| | Frequency Offset > | + 0 Hz |
| | Mode > | BCCH and TCH |
| | BCCH Level > | -85 dBm (May need to adjust if link is not stable) |
| | BCCH Channel > | choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel] |
| | Channel Type > | Off |
| | P0 > | 4 dB |
| | Slot Config > | Unchanged (if already set under MS Signal) |
| | TCH > | Choose desired test channel |
| | Hopping > | Off |
| | Main Timeslot > | 3 (Default) |
| Network | Coding Scheme > | CS 1 (GPRS) and MCS5 (EGPRS) |
| | Bit Stream > | 2E9-1PSR Bit Pattern |
| AF/RF | Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input | |
| Connection | Press **Signal On** to turn on the signal and change settings | |

**RESULT**

## 8.1.1. GSM850

| Test Engineer ID: | 22797/44389 | Test Date: | 2023-03-08 | EUT Serial Number: | QV7700HUFR |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) | |
|---|---|---|---|---|---|---|
| | | | | | Measured | |
| | | | | | Burst Pwr | Frame Pwr |
| GPRS/EDGE (GMSK) | CS1 | 1 | 128 | 824.2 | 32.1 | 23.0 |
| | | | 190 | 836.6 | 32.3 | 23.3 |
| | | | 251 | 848.8 | 32.3 | 23.3 |
| | | 2 | 128 | 824.2 | 28.9 | 22.9 |
| | | | 190 | 836.6 | 29.0 | 23.0 |
| | | | 251 | 848.8 | 29.0 | 23.0 |
| | | 3 | 128 | 824.2 | 27.1 | 22.8 |
| | | | 190 | 836.6 | 27.4 | 23.2 |
| | | | 251 | 848.8 | 27.3 | 23.1 |
| | | 4 | 128 | 824.2 | 26.0 | 23.0 |
| | | | 190 | 836.6 | 26.2 | 23.1 |
| | | | 251 | 848.8 | 26.1 | 23.1 |
| EDGE (8PSK) | MCS5 | 1 | 128 | 824.2 | 26.7 | 17.7 |
| | | | 190 | 836.6 | 26.8 | 17.7 |
| | | | 251 | 848.8 | 26.7 | 17.7 |
| | | 2 | 128 | 824.2 | 24.0 | 17.9 |
| | | | 190 | 836.6 | 24.0 | 18.0 |
| | | | 251 | 848.8 | 24.0 | 17.9 |
| | | 3 | 128 | 824.2 | 22.1 | 17.9 |
| | | | 190 | 836.6 | 22.1 | 17.8 |
| | | | 251 | 848.8 | 22.1 | 17.8 |
| | | 4 | 128 | 824.2 | 21.1 | 18.1 |
| | | | 190 | 836.6 | 21.0 | 18.0 |
| | | | 251 | 848.8 | 21.0 | 18.0 |

## 8.1.2. GSM1900

| Test Engineer ID: | 22797/44389 | Test Date: | 2023-03-08 | EUT Serial Number: | QV7700HUFR |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) | |
|---|---|---|---|---|---|---|
| | | | | | Measured | |
| | | | | | Burst Pwr | Frame Pwr |
| GPRS/EDGE (GMSK) | CS1 | 1 | 512 | 1850.2 | 27.0 | 17.9 |
| | | | 661 | 1880.0 | 27.5 | 18.4 |
| | | | 810 | 1909.8 | 27.6 | 18.6 |
| | | 2 | 512 | 1850.2 | 24.0 | 17.9 |
| | | | 661 | 1880.0 | 24.1 | 18.1 |
| | | | 810 | 1909.8 | 24.3 | 18.3 |
| | | 3 | 512 | 1850.2 | 22.2 | 17.9 |
| | | | 661 | 1880.0 | 22.4 | 18.1 |
| | | | 810 | 1909.8 | 22.6 | 18.3 |
| | | 4 | 512 | 1850.2 | 21.1 | 18.0 |
| | | | 661 | 1880.0 | 21.1 | 18.1 |
| | | | 810 | 1909.8 | 21.4 | 18.4 |
| EDGE (8PSK) | MCS5 | 1 | 512 | 1850.2 | 26.1 | 17.0 |
| | | | 661 | 1880.0 | 26.2 | 17.1 |
| | | | 810 | 1909.8 | 26.4 | 17.4 |
| | | 2 | 512 | 1850.2 | 22.9 | 16.9 |
| | | | 661 | 1880.0 | 23.0 | 17.0 |
| | | | 810 | 1909.8 | 23.2 | 17.2 |
| | | 3 | 512 | 1850.2 | 21.0 | 16.8 |
| | | | 661 | 1880.0 | 21.3 | 17.1 |
| | | | 810 | 1909.8 | 21.5 | 17.2 |
| | | 4 | 512 | 1850.2 | 19.8 | 16.8 |
| | | | 661 | 1880.0 | 19.8 | 16.8 |
| | | | 810 | 1909.8 | 20.0 | 17.0 |

## 8.1.3. GSM850 DTM

| Test Engineer ID: | 22797/44389 | Test Date: | 2023-03-08 | EUT Serial Number: | QV7700HUFR |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | | | |
| | | | | | CS Burst Pwr | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr |
| GSM (Voice) + GPRS/EDGE (GMSK) | CS1 | 1 | 128 | 824.2 | 32.2 | | 23.2 | |
| | | | 190 | 836.6 | 32.3 | | 23.3 | |
| | | | 251 | 848.8 | 32.4 | | 23.4 | |
| | | 2 | 128 | 824.2 | 28.9 | 29.1 | 22.9 | 23.0 |
| | | | 190 | 836.6 | 29.1 | 29.2 | 23.0 | 23.1 |
| | | | 251 | 848.8 | 29.1 | 29.2 | 23.1 | 23.2 |
| | | 3 | 128 | 824.2 | 27.0 | 27.0 | 22.8 | 22.8 |
| | | | 190 | 836.6 | 27.2 | 27.2 | 23.0 | 22.9 |
| | | | 251 | 848.8 | 27.2 | 27.1 | 22.9 | 22.9 |
| GSM (Voice) + EDGE (8PSK) | MCS5 | 1 | 128 | 824.2 | 32.2 | | 23.2 | |
| | | | 190 | 836.6 | 32.3 | | 23.2 | |
| | | | 251 | 848.8 | 32.4 | | 23.4 | |
| | | 2 | 128 | 824.2 | 29.0 | 23.8 | 23.0 | 17.7 |
| | | | 190 | 836.6 | 29.1 | 23.8 | 23.1 | 17.8 |
| | | | 251 | 848.8 | 29.2 | 23.9 | 23.2 | 17.9 |
| | | 3 | 128 | 824.2 | 27.2 | 21.8 | 22.9 | 17.5 |
| | | | 190 | 836.6 | 27.2 | 21.9 | 23.0 | 17.6 |
| | | | 251 | 848.8 | 27.1 | 21.8 | 22.9 | 17.6 |

## 8.1.4. GSM1900 DTM

| Test Engineer ID: | 22797/44389 | Test Date: | 2023-03-08 | EUT Serial Number: | QV7700HUFR |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Normal Average Power (dBm) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | | | |
| | | | | | CS Burst Pwr | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr |
| GSM (Voice) + GPRS/EDGE (GMSK) | CS1 | 1 | 512 | 1850.2 | 27.2 | | 18.2 | |
| | | | 661 | 1880.0 | 27.5 | | 18.4 | |
| | | | 810 | 1909.8 | 27.5 | | 18.5 | |
| | | 2 | 512 | 1850.2 | 23.6 | 23.8 | 17.6 | 17.8 |
| | | | 661 | 1880.0 | 23.6 | 23.7 | 17.6 | 17.7 |
| | | | 810 | 1909.8 | 23.7 | 23.7 | 17.7 | 17.7 |
| | | 3 | 512 | 1850.2 | 21.8 | 21.9 | 17.6 | 17.6 |
| | | | 661 | 1880.0 | 22.2 | 22.2 | 18.0 | 17.9 |
| | | | 810 | 1909.8 | 22.5 | 22.5 | 18.3 | 18.3 |
| GSM (Voice) + EDGE (8PSK) | MCS5 | 1 | 512 | 1850.2 | 27.2 | | 18.2 | |
| | | | 661 | 1880.0 | 27.5 | | 18.4 | |
| | | | 810 | 1909.8 | 27.5 | | 18.5 | |
| | | 2 | 512 | 1850.2 | 23.8 | 23.2 | 17.8 | 17.1 |
| | | | 661 | 1880.0 | 23.8 | 23.1 | 17.7 | 17.1 |
| | | | 810 | 1909.8 | 23.9 | 23.1 | 17.9 | 17.1 |
| | | 3 | 512 | 1850.2 | 21.9 | 20.8 | 17.7 | 16.6 |
| | | | 661 | 1880.0 | 22.1 | 21.0 | 17.8 | 16.7 |
| | | | 810 | 1909.8 | 21.3 | 21.1 | 17.0 | 16.9 |

## 8.2. WCDMA

**TEST PROCEDURE**

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW ≥ RBW.≥ 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

**REL 99**

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

| Mode | Subtest | Rel99 |
|---|---|---|
| WCDMA General Settings | Loopback Mode | Test Mode 2 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | βc/βd | 8/15 |

**HSDPA REL 5**

The following 4 Sub-tests were completed according to Release 5 procedures in table C.10.1.4 of 3GPP TS 34.121-1 A summary of these settings are illustrated below:

**Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH**

| Sub-test | $\beta_c$ | $\beta_d$ | $\beta_d$ *(SF)* | $\beta_c/\beta_d$ | $\beta_{HS}$ *(Note1, Note 2)* | **CM** (dB) *(Note 3)* | **MPR** (dB) *(Note 3)* |
|---|---|---|---|---|---|---|---|
| 1 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 0.0 | 0.0 |
| 2 | 12/15 *(Note 4)* | 15/15 *(Note 4)* | 64 | 12/15 *(Note 4)* | 24/15 | 1.0 | 0.0 |
| 3 | 15/15 | 8/15 | 64 | 15/8 | 30/15 | 1.5 | 0.5 |
| 4 | 15/15 | 4/15 | 64 | 15/4 | 30/15 | 1.5 | 0.5 |

Note 1: $\Delta_{ACK}$, $\Delta_{NACK}$ and $\Delta_{CQI}$ = 30/15 with $\beta_{hs}$ = 30/15 * $\beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, $\Delta_{ACK}$ and $\Delta_{NACK}$ = 30/15 with $\beta_{hs}$ = 30/15 * $\beta_c$, and $\Delta_{CQI}$ = 24/15 with $\beta_{hs}$ = 24/15 * $\beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d$ =12/15, $\beta_{hs}/\beta_c$=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the $\beta_c/\beta_d$ ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c$ = 11/15 and $\beta_d$ = 15/15.

**HSPA REL 6 (HSDPA & HSUPA)**

The following 5 Sub-tests were completed according to Release 6 procedures in table C.11.1.3 of 3GPP TS 34.121-1. A summary of these settings are illustrated below:

**Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH**

| Sub-test | $\beta_c$ | $\beta_d$ | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ (Note1) | $\beta_{ec}$ | $\beta_{ed}$ (Note 4) (Note 5) | $\beta_{ed}$ (SF) | $\beta_{ed}$ (Codes) | CM (dB) (Note 2) | MPR (dB) (Note 2) (Note 6) | AG Index (Note 5) | E-TFCI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11/15 (Note 3) | 15/15 (Note 3) | 64 | 11/15 (Note 3) | 22/15 | 209/225 | 1309/225 | 4 | 1 | 1.0 | 0.0 | 20 | 75 |
| 2 | 6/15 | 15/15 | 64 | 6/15 | 12/15 | 12/15 | 94/75 | 4 | 1 | 3.0 | 2.0 | 12 | 67 |
| 3 | 15/15 | 9/15 | 64 | 15/9 | 30/15 | 30/15 | $\beta_{ed}1$: 47/15<br>$\beta_{ed}2$: 47/15 | 4<br>4 | 2 | 2.0 | 1.0 | 15 | 92 |
| 4 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 2/15 | 56/75 | 4 | 1 | 3.0 | 2.0 | 17 | 71 |
| 5 | 15/15 | 0 | - | - | 5/15 | 5/15 | 47/15 | 4 | 1 | 1.0 | 0.0 | 12 | 67 |

Note 1: For sub-test 1 to 4, $\Delta_{ACK}$, $\Delta_{NACK}$ and $\Delta_{CQI}$ = 30/15 with $\beta_{hs}$ = 30/15 * $\beta_c$. For sub-test 5, $\Delta_{ACK}$, $\Delta_{NACK}$ and $\Delta_{CQI}$ = 5/15 with $\beta_{hs}$ = 5/15 * $\beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d$ =12/15, $\beta_{hs}/\beta_c$=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the $\beta_c/\beta_d$ ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c$ = 10/15 and $\beta_d$ = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: $\beta_{ed}$ can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

**RESULT**

## 8.2.1. WCDMA BAND 2

| Test Engineer ID: | 27465/44389 | Test Date: | 2023-02-16 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

| Band | Mode | | UL Ch No. | Freq. (MHz) | MPR (dB) | Conducted Average Power (dBm) |
|---|---|---|---|---|---|---|
| | | | | | | ANT 1 |
| W-CDMA Band 2 (1900MHz) | Rel 99 | RMC, 12.2 kbps | 9262 | 1852.4 | N/A | 18.8 |
| | | | 9400 | 1880.0 | N/A | 18.8 |
| | | | 9538 | 1907.6 | N/A | **18.8** |
| | HSDPA | Subtest 1 | 9262 | 1852.4 | 0 | 17.8 |
| | | | 9400 | 1880.0 | 0 | 17.8 |
| | | | 9538 | 1907.6 | 0 | **17.8** |
| | | Subtest 2 | 9262 | 1852.4 | 0 | 17.8 |
| | | | 9400 | 1880.0 | 0 | 17.8 |
| | | | 9538 | 1907.6 | 0 | 17.8 |
| | | Subtest 3 | 9262 | 1852.4 | 0.5 | 17.3 |
| | | | 9400 | 1880.0 | 0.5 | 17.3 |
| | | | 9538 | 1907.6 | 0.5 | 17.3 |
| | | Subtest 4 | 9262 | 1852.4 | 0.5 | 17.5 |
| | | | 9400 | 1880.0 | 0.5 | 17.3 |
| | | | 9538 | 1907.6 | 0.5 | 17.3 |
| | HSPA (HSDPA & HSUPA) | Subtest 1 | 9262 | 1852.4 | 0 | 17.8 |
| | | | 9400 | 1880.0 | 0 | 17.8 |
| | | | 9538 | 1907.6 | 0 | 17.8 |
| | | Subtest 2 | 9262 | 1852.4 | 2 | 15.8 |
| | | | 9400 | 1880.0 | 2 | 15.8 |
| | | | 9538 | 1907.6 | 2 | 15.8 |
| | | Subtest 3 | 9262 | 1852.4 | 1 | 16.8 |
| | | | 9400 | 1880.0 | 1 | 16.8 |
| | | | 9538 | 1907.6 | 1 | 16.8 |
| | | Subtest 4 | 9262 | 1852.4 | 2 | 15.8 |
| | | | 9400 | 1880.0 | 2 | 15.8 |
| | | | 9538 | 1907.6 | 2 | 15.8 |
| | | Subtest 5 | 9262 | 1852.4 | 0 | 17.3 |
| | | | 9400 | 1880.0 | 0 | 17.4 |
| | | | 9538 | 1907.6 | 0 | 17.4 |

## 8.2.2. WCDMA BAND 4

| Test Engineer ID: | 27465/44389 | Test Date: | 2023-02-16 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

| Band | Mode | | UL Ch No. | Freq. (MHz) | MPR (dB) | Conducted Average Power (dBm) |
|---|---|---|---|---|---|---|
| | | | | | | ANT 1 |
| W-CDMA Band 4 (1700MHz) | Rel 99 | RMC, 12.2 kbps | 1312 | 1712.4 | N/A | 17.8 |
| | | | 1413 | 1732.6 | N/A | **17.8** |
| | | | 1513 | 1752.6 | N/A | **17.8** |
| | HSDPA | Subtest 1 | 1312 | 1712.4 | 0 | 16.8 |
| | | | 1413 | 1732.6 | 0 | **16.8** |
| | | | 1513 | 1752.6 | 0 | **16.8** |
| | | Subtest 2 | 1312 | 1712.4 | 0 | 16.8 |
| | | | 1413 | 1732.6 | 0 | 16.8 |
| | | | 1513 | 1752.6 | 0 | 16.8 |
| | | Subtest 3 | 1312 | 1712.4 | 0.5 | 16.5 |
| | | | 1413 | 1732.6 | 0.5 | 16.3 |
| | | | 1513 | 1752.6 | 0.5 | 16.3 |
| | | Subtest 4 | 1312 | 1712.4 | 0.5 | 16.3 |
| | | | 1413 | 1732.6 | 0.5 | 16.4 |
| | | | 1513 | 1752.6 | 0.5 | 16.4 |
| | HSPA (HSDPA & HSUPA) | Subtest 1 | 1312 | 1712.4 | 0 | 16.7 |
| | | | 1413 | 1732.6 | 0 | 16.8 |
| | | | 1513 | 1752.6 | 0 | 16.8 |
| | | Subtest 2 | 1312 | 1712.4 | 2 | 14.8 |
| | | | 1413 | 1732.6 | 2 | 14.8 |
| | | | 1513 | 1752.6 | 2 | 14.8 |
| | | Subtest 3 | 1312 | 1712.4 | 1 | 15.8 |
| | | | 1413 | 1732.6 | 1 | 15.8 |
| | | | 1513 | 1752.6 | 1 | 15.8 |
| | | Subtest 4 | 1312 | 1712.4 | 2 | 14.8 |
| | | | 1413 | 1732.6 | 2 | 14.8 |
| | | | 1513 | 1752.6 | 2 | 14.8 |
| | | Subtest 5 | 1312 | 1712.4 | 0 | 16.3 |
| | | | 1413 | 1732.6 | 0 | 16.4 |
| | | | 1513 | 1752.6 | 0 | 16.4 |

## 8.3. LTE

**CONDUCTED OUTPUT POWER MEASUREMENT PROCEDURE**

All LTE bands conducted average power is obtained from the CMW500 telecommunication test set.

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS136.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS136.101.

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3**

| Modulation | Channel bandwidth / Transmission bandwidth ($N_{RB}$) | | | | | | MPR (dB) |
|---|---|---|---|---|---|---|---|
| | 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | |
| QPSK | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 |
| 16 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 |
| 16 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 |
| 64 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 |
| 64 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 |
| 256 QAM | ≥ 1 | | | | | | ≤ 5 |

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS136.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”.

**Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)**

| Network Signalling value | Requirements (subclause) | E-UTRA Band | Channel bandwidth (MHz) | Resources Blocks ($N_{RB}$) | A-MPR (dB) |
|---|---|---|---|---|---|
| NS_01 | 6.6.2.1.1 | Table 5.5-1 | 1.4, 3, 5, 10, 15, 20 | Table 5.6-1 | N/A |
| NS_03 | 6.6.2.2.1 | 2, 4,10, 23, 25, 35, 36, 66, 70 | 3 | >5 | ≤ 1 |
| | | | 5 | >6 | ≤ 1 |
| | | | 10 | >6 | ≤ 1 |
| | | | 15 | >8 | ≤ 1 |
| | | | 20 | >10 | ≤ 1 |
| NS_04 | 6.6.2.2.2, 6.6.3.3.19 | 41 | 5, 10, 15, 20 | Table 6.2.4-4, Table 6.2.4-4a | |

**RESULTS**

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:

## 8.3.1. LTE BAND 2

| Test Engineer ID: | 28076/21193 | Test Date: | 2023-02-20 | EUT Serial Number: | QV770017FA |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE2 (1.4MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 18607 | 18900 | 19193 |
| | | | | 1850.7 MHz | 1880.0 MHz | 1909.3 MHz |
| 1.4 | QPSK | 1 | 0 | 19.1 | 18.9 | 18.8 |
| | | 1 | 2 | **19.1** | 19.0 | 18.9 |
| | | 1 | 5 | 19.1 | 19.0 | 18.9 |
| | | 3 | 0 | 19.1 | 19.0 | 18.8 |
| | | 3 | 1 | 19.1 | 19.0 | 18.8 |
| | | 3 | 2 | 19.1 | 19.0 | 18.8 |
| | | 6 | 0 | 19.1 | 19.0 | 18.8 |
| | 16QAM | 1 | 0 | 19.3 | 19.2 | 19.1 |
| | | 1 | 2 | **19.4** | 19.2 | 19.1 |
| | | 1 | 5 | 19.4 | 19.2 | 19.1 |
| | | 3 | 0 | 19.3 | 19.1 | 19.0 |
| | | 3 | 1 | 19.2 | 19.3 | 19.0 |
| | | 3 | 2 | 19.3 | 19.1 | 19.0 |
| | | 6 | 0 | 19.1 | 19.1 | 18.8 |
| | 64QAM | 1 | 0 | 19.4 | 19.2 | 19.1 |
| | | 1 | 2 | **19.4** | 19.3 | 19.2 |
| | | 1 | 5 | 19.4 | 19.2 | 19.1 |
| | | 3 | 0 | 19.3 | 19.2 | 19.0 |
| | | 3 | 1 | 19.3 | 19.2 | 19.0 |
| | | 3 | 2 | 19.3 | 19.3 | 19.0 |
| | | 6 | 0 | 18.1 | 18.0 | 17.7 |

**OUTPUT POWER FOR LTE2 (3MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 18615 | 18900 | 19185 |
| | | | | 1851.5 MHz | 1880.0 MHz | 1908.5 MHz |
| 3.0 | QPSK | 1 | 0 | 19.0 | 19.0 | 18.8 |
| | | 1 | 7 | 19.1 | 19.1 | 18.9 |
| | | 1 | 14 | 19.0 | 19.0 | 18.8 |
| | | 8 | 0 | **19.2** | 19.0 | 18.9 |
| | | 8 | 4 | 19.1 | 19.1 | 18.9 |
| | | 8 | 7 | 19.2 | 19.1 | 18.9 |
| | | 15 | 0 | 19.1 | 19.0 | 18.8 |
| | 16QAM | 1 | 0 | 19.4 | 19.3 | 19.2 |
| | | 1 | 7 | **19.5** | 19.5 | 19.3 |
| | | 1 | 14 | 19.4 | 19.3 | 19.2 |
| | | 8 | 0 | 19.2 | 19.1 | 18.9 |
| | | 8 | 4 | 19.2 | 19.2 | 18.9 |
| | | 8 | 7 | 19.2 | 19.2 | 18.9 |
| | | 15 | 0 | 19.2 | 19.0 | 18.8 |
| | 64QAM | 1 | 0 | 19.4 | 19.2 | 19.0 |
| | | 1 | 7 | **19.5** | 19.3 | 19.1 |
| | | 1 | 14 | 19.5 | 19.2 | 19.1 |
| | | 8 | 0 | 19.2 | 19.1 | 18.9 |
| | | 8 | 4 | 19.3 | 19.2 | 19.0 |
| | | 8 | 7 | 19.3 | 19.2 | 19.0 |
| | | 15 | 0 | 19.2 | 19.1 | 18.9 |

**OUTPUT POWER FOR LTE2 (5MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 18625 | 18900 | 19175 |
| | | | | 1852.5 MHz | 1880.0 MHz | 1907.5 MHz |
| 5.0 | QPSK | 1 | 0 | 19.1 | 19.0 | 18.8 |
| | | 1 | 12 | **19.2** | 19.2 | 18.9 |
| | | 1 | 24 | 19.1 | 19.0 | 18.8 |
| | | 12 | 0 | 19.2 | 19.0 | 18.9 |
| | | 12 | 6 | 19.2 | 19.0 | 18.9 |
| | | 12 | 11 | 19.2 | 19.1 | 18.8 |
| | | 25 | 0 | 19.2 | 19.0 | 18.9 |
| | 16QAM | 1 | 0 | 19.5 | 19.3 | 19.2 |
| | | 1 | 12 | **19.6** | 19.5 | 19.4 |
| | | 1 | 24 | 19.5 | 19.3 | 19.3 |
| | | 12 | 0 | 19.1 | 19.0 | 18.9 |
| | | 12 | 6 | 19.2 | 19.0 | 19.0 |
| | | 12 | 11 | 19.1 | 19.1 | 18.9 |
| | | 25 | 0 | 19.2 | 19.0 | 18.9 |
| | 64QAM | 1 | 0 | 19.5 | 19.3 | 19.2 |
| | | 1 | 12 | 19.6 | 19.4 | 19.3 |
| | | 1 | 24 | **19.6** | 19.3 | 19.2 |
| | | 12 | 0 | 19.3 | 19.2 | 19.0 |
| | | 12 | 6 | 19.3 | 19.3 | 19.0 |
| | | 12 | 11 | 19.3 | 19.3 | 19.0 |
| | | 25 | 0 | 19.2 | 19.1 | 18.9 |

**OUTPUT POWER FOR LTE2 (10MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 18650 | 18900 | 19150 |
| | | | | 1855.0 MHz | 1880.0 MHz | 1905.0 MHz |
| 10.0 | QPSK | 1 | 0 | 19.1 | 19.1 | 18.9 |
| | | 1 | 24 | 19.2 | 19.1 | 18.9 |
| | | 1 | 49 | 19.1 | 19.0 | 18.8 |
| | | 25 | 0 | 19.2 | 19.0 | 18.9 |
| | | 25 | 12 | **19.2** | 19.0 | 19.0 |
| | | 25 | 24 | 19.2 | 19.1 | 18.9 |
| | | 50 | 0 | 19.2 | 19.0 | 18.9 |
| | 16QAM | 1 | 0 | **19.5** | 19.5 | 19.3 |
| | | 1 | 24 | 19.5 | 19.4 | 19.2 |
| | | 1 | 49 | 19.4 | 19.4 | 19.3 |
| | | 25 | 0 | 19.2 | 19.0 | 19.0 |
| | | 25 | 12 | 19.2 | 19.0 | 19.0 |
| | | 25 | 24 | 19.2 | 19.1 | 19.0 |
| | | 50 | 0 | 19.2 | 19.0 | 19.0 |
| | 64QAM | 1 | 0 | 19.5 | 19.3 | 19.2 |
| | | 1 | 24 | **19.5** | 19.3 | 19.2 |
| | | 1 | 49 | 19.4 | 19.3 | 19.2 |
| | | 25 | 0 | 19.2 | 19.1 | 19.0 |
| | | 25 | 12 | 19.3 | 19.1 | 19.1 |
| | | 25 | 24 | 19.3 | 19.2 | 19.0 |
| | | 50 | 0 | 19.2 | 19.1 | 19.0 |

**OUTPUT POWER FOR LTE2 (15MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 18675 | 18900 | 19125 |
| | | | | 1857.5 MHz | 1880.0 MHz | 1902.5 MHz |
| 15.0 | QPSK | 1 | 0 | 19.0 | 18.9 | 18.8 |
| | | 1 | 37 | 19.0 | 19.0 | 18.8 |
| | | 1 | 74 | 19.0 | 18.9 | 18.7 |
| | | 36 | 0 | **19.1** | 18.9 | 18.8 |
| | | 36 | 16 | 19.1 | 18.9 | 18.9 |
| | | 36 | 35 | 19.1 | 19.0 | 18.9 |
| | | 75 | 0 | 19.0 | 18.9 | 18.8 |
| | 16QAM | 1 | 0 | 19.3 | 19.3 | 19.1 |
| | | 1 | 37 | 19.3 | 19.3 | 19.1 |
| | | 1 | 74 | **19.4** | 19.1 | 19.0 |
| | | 36 | 0 | 19.1 | 18.9 | 18.8 |
| | | 36 | 16 | 19.1 | 18.9 | 18.9 |
| | | 36 | 35 | 19.0 | 19.0 | 18.9 |
| | | 75 | 0 | 19.0 | 18.9 | 18.9 |
| | 64QAM | 1 | 0 | 19.3 | 19.3 | 19.0 |
| | | 1 | 37 | 19.3 | 19.2 | 19.1 |
| | | 1 | 74 | **19.4** | 19.2 | 18.9 |
| | | 36 | 0 | 19.1 | 19.0 | 18.8 |
| | | 36 | 16 | 19.1 | 18.9 | 18.9 |
| | | 36 | 35 | 19.1 | 19.0 | 18.9 |
| | | 75 | 0 | 19.1 | 18.9 | 18.8 |

**OUTPUT POWER FOR LTE2 (20MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 18700 | 18900 | 19100 |
| | | | | 1860.0 MHz | 1880.0 MHz | 1900.0 MHz |
| 20.0 | QPSK | 1 | 0 | 19.0 | 18.9 | 18.8 |
| | | 1 | 49 | 19.0 | 18.9 | 18.9 |
| | | 1 | 99 | 19.1 | 18.9 | 18.8 |
| | | 50 | 0 | 19.0 | 19.0 | 18.9 |
| | | 50 | 24 | **19.1** | 19.0 | 18.9 |
| | | 50 | 49 | 19.1 | 19.0 | 18.9 |
| | | 100 | 0 | 19.1 | 19.0 | 18.9 |
| | 16QAM | 1 | 0 | 19.2 | 19.3 | 19.1 |
| | | 1 | 49 | 19.3 | **19.5** | 19.3 |
| | | 1 | 99 | 19.2 | 19.3 | 19.2 |
| | | 50 | 0 | 19.0 | 18.9 | 18.9 |
| | | 50 | 24 | 19.1 | 18.9 | 18.9 |
| | | 50 | 49 | 19.1 | 19.0 | 18.9 |
| | | 100 | 0 | 19.1 | 18.9 | 18.9 |
| | 64QAM | 1 | 0 | 19.2 | 19.3 | 19.1 |
| | | 1 | 49 | 19.4 | **19.5** | 19.3 |
| | | 1 | 99 | 19.2 | 19.2 | 19.0 |
| | | 50 | 0 | 19.0 | 19.0 | 18.8 |
| | | 50 | 24 | 19.1 | 18.9 | 18.8 |
| | | 50 | 49 | 19.1 | 19.0 | 18.9 |
| | | 100 | 0 | 19.1 | 18.9 | 18.9 |

## 8.3.2. LTE BAND 4

| Test Engineer ID: | 27465/44389 | Test Date: | 2023-03-09<br>2023-03-10 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE4 (1.4MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 19957 | 20175 | 20393 |
| | | | | 1710.7 MHz | 1732.5 MHz | 1754.3 MHz |
| 1.4 | QPSK | 1 | 0 | 17.7 | 17.7 | 17.5 |
| | | 1 | 2 | **17.8** | 17.7 | 17.5 |
| | | 1 | 5 | 17.7 | 17.6 | 17.4 |
| | | 3 | 0 | 17.7 | 17.6 | 17.5 |
| | | 3 | 1 | 17.7 | 17.6 | 17.5 |
| | | 3 | 2 | 17.7 | 17.5 | 17.5 |
| | | 6 | 0 | 17.7 | 17.5 | 17.5 |
| | 16QAM | 1 | 0 | 18.1 | 17.9 | 17.8 |
| | | 1 | 2 | 18.1 | 17.9 | 17.9 |
| | | 1 | 5 | **18.1** | 17.9 | 17.9 |
| | | 3 | 0 | 17.9 | 17.7 | 17.7 |
| | | 3 | 1 | 17.9 | 17.7 | 17.7 |
| | | 3 | 2 | 17.9 | 17.7 | 17.6 |
| | | 6 | 0 | 17.8 | 17.6 | 17.5 |
| | 64QAM | 1 | 0 | 17.9 | 17.9 | 17.8 |
| | | 1 | 2 | **18.0** | 17.9 | 17.7 |
| | | 1 | 5 | 17.9 | 17.9 | 17.7 |
| | | 3 | 0 | 17.9 | 17.7 | 17.6 |
| | | 3 | 1 | 17.9 | 17.7 | 17.7 |
| | | 3 | 2 | 17.9 | 17.7 | 17.7 |
| | | 6 | 0 | 17.8 | 17.6 | 17.6 |

**OUTPUT POWER FOR LTE4 (3MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 19965 | 20175 | 20385 |
| | | | | 1711.5 MHz | 1732.5 MHz | 1753.5 MHz |
| 3.0 | QPSK | 1 | 0 | 17.6 | 17.5 | 17.5 |
| | | 1 | 7 | 17.7 | 17.7 | 17.6 |
| | | 1 | 14 | 17.6 | 17.5 | 17.4 |
| | | 8 | 0 | 17.7 | 17.6 | 17.5 |
| | | 8 | 4 | **17.7** | 17.6 | 17.6 |
| | | 8 | 7 | **17.7** | **17.7** | 17.6 |
| | | 15 | 0 | 17.7 | 17.5 | 17.5 |
| | 16QAM | 1 | 0 | 17.9 | 17.9 | 17.8 |
| | | 1 | 7 | 18.0 | **18.0** | 17.9 |
| | | 1 | 14 | 17.9 | 17.9 | 17.8 |
| | | 8 | 0 | 17.7 | 17.6 | 17.6 |
| | | 8 | 4 | 17.8 | 17.6 | 17.6 |
| | | 8 | 7 | 17.8 | 17.7 | 17.6 |
| | | 15 | 0 | 17.7 | 17.6 | 17.6 |
| | 64QAM | 1 | 0 | 17.8 | 17.8 | 17.7 |
| | | 1 | 7 | 17.8 | **17.9** | 17.7 |
| | | 1 | 14 | 17.8 | 17.8 | 17.7 |
| | | 8 | 0 | 17.7 | 17.7 | 17.6 |
| | | 8 | 4 | 17.7 | 17.7 | 17.7 |
| | | 8 | 7 | 17.7 | 17.8 | 17.6 |
| | | 15 | 0 | 17.8 | 17.6 | 17.6 |

**OUTPUT POWER FOR LTE4 (5MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 19975 | 20175 | 20375 |
| | | | | 1712.5 MHz | 1732.5 MHz | 1752.5 MHz |
| 5.0 | QPSK | 1 | 0 | 17.5 | 17.5 | 17.6 |
| | | 1 | 12 | 17.6 | 17.7 | **17.7** |
| | | 1 | 24 | 17.5 | 17.6 | 17.6 |
| | | 12 | 0 | 17.6 | 17.5 | 17.7 |
| | | 12 | 6 | 17.6 | 17.6 | 17.7 |
| | | 12 | 11 | 17.6 | 17.6 | 17.7 |
| | | 25 | 0 | 17.5 | 17.5 | 17.7 |
| | 16QAM | 1 | 0 | 17.9 | 18.0 | 17.9 |
| | | 1 | 12 | 18.0 | 18.0 | **18.1** |
| | | 1 | 24 | 17.9 | 17.9 | 18.0 |
| | | 12 | 0 | 17.6 | 17.4 | 17.8 |
| | | 12 | 6 | 17.6 | 17.5 | 17.8 |
| | | 12 | 11 | 17.6 | 17.5 | 17.8 |
| | | 25 | 0 | 17.5 | 17.6 | 17.7 |
| | 64QAM | 1 | 0 | 17.8 | 17.9 | 17.9 |
| | | 1 | 12 | 17.9 | **18.0** | **18.0** |
| | | 1 | 24 | 17.8 | 17.9 | 17.9 |
| | | 12 | 0 | 17.7 | 17.6 | 17.7 |
| | | 12 | 6 | 17.7 | 17.6 | 17.7 |
| | | 12 | 11 | 17.7 | 17.7 | 17.7 |
| | | 25 | 0 | 17.6 | 17.6 | 17.7 |

**OUTPUT POWER FOR LTE4 (10MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 20000 | 20175 | 20350 |
| | | | | 1715.0 MHz | 1732.5 MHz | 1750.0 MHz |
| 10.0 | QPSK | 1 | 0 | 17.6 | 17.5 | 17.6 |
| | | 1 | 24 | 17.5 | 17.6 | **17.7** |
| | | 1 | 49 | 17.5 | 17.6 | 17.6 |
| | | 25 | 0 | 17.6 | 17.6 | 17.6 |
| | | 25 | 12 | 17.6 | 17.6 | 17.6 |
| | | 25 | 24 | 17.6 | 17.6 | **17.7** |
| | | 50 | 0 | 17.6 | 17.6 | 17.6 |
| | 16QAM | 1 | 0 | 17.9 | 17.9 | **18.0** |
| | | 1 | 24 | 17.8 | 17.9 | 17.9 |
| | | 1 | 49 | 17.9 | 17.9 | 18.0 |
| | | 25 | 0 | 17.6 | 17.6 | 17.6 |
| | | 25 | 12 | 17.6 | 17.6 | 17.7 |
| | | 25 | 24 | 17.6 | 17.7 | 17.7 |
| | | 50 | 0 | 17.6 | 17.6 | 17.6 |
| | 64QAM | 1 | 0 | 17.8 | 17.9 | 17.9 |
| | | 1 | 24 | 17.8 | 17.9 | **18.0** |
| | | 1 | 49 | 17.8 | 18.0 | 18.0 |
| | | 25 | 0 | 17.6 | 17.6 | 17.7 |
| | | 25 | 12 | 17.6 | 17.6 | 17.7 |
| | | 25 | 24 | 17.6 | 17.7 | 17.8 |
| | | 50 | 0 | 17.6 | 17.6 | 17.6 |

**OUTPUT POWER FOR LTE4 (15MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 20025 | 20175 | 20325 |
| | | | | 1717.5 MHz | 1732.5 MHz | 1747.5 MHz |
| 15.0 | QPSK | 1 | 0 | 17.4 | 17.4 | 17.5 |
| | | 1 | 37 | 17.4 | 17.5 | 17.5 |
| | | 1 | 74 | 17.5 | 17.6 | 17.6 |
| | | 36 | 0 | 17.4 | 17.5 | 17.5 |
| | | 36 | 16 | 17.5 | 17.5 | **17.6** |
| | | 36 | 35 | 17.5 | 17.6 | **17.6** |
| | | 75 | 0 | 17.5 | 17.5 | 17.5 |
| | 16QAM | 1 | 0 | 17.6 | 17.6 | 17.7 |
| | | 1 | 37 | 17.7 | 17.8 | **18.0** |
| | | 1 | 74 | 17.7 | **18.0** | **18.0** |
| | | 36 | 0 | 17.4 | 17.5 | 17.5 |
| | | 36 | 16 | 17.5 | 17.5 | 17.6 |
| | | 36 | 35 | 17.5 | 17.6 | 17.6 |
| | | 75 | 0 | 17.5 | 17.5 | 17.5 |
| | 64QAM | 1 | 0 | 17.7 | 17.8 | 17.8 |
| | | 1 | 37 | 17.7 | 17.8 | 17.9 |
| | | 1 | 74 | 17.8 | **17.9** | **17.9** |
| | | 36 | 0 | 17.4 | 17.5 | 17.5 |
| | | 36 | 16 | 17.5 | 17.5 | 17.6 |
| | | 36 | 35 | 17.5 | 17.6 | 17.6 |
| | | 75 | 0 | 17.5 | 17.5 | 17.5 |

**OUTPUT POWER FOR LTE4 (20MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 20050 | 20175 | 20300 |
| | | | | 1720.0 MHz | 1732.5 MHz | 1745.0 MHz |
| 20.0 | QPSK | 1 | 0 | 17.5 | 17.5 | 17.6 |
| | | 1 | 49 | 17.4 | 17.5 | 17.5 |
| | | 1 | 99 | 17.5 | **17.6** | 17.6 |
| | | 50 | 0 | 17.4 | 17.5 | 17.5 |
| | | 50 | 24 | 17.5 | 17.5 | 17.6 |
| | | 50 | 49 | 17.5 | **17.6** | **17.6** |
| | | 100 | 0 | 17.5 | 17.5 | 17.5 |
| | 16QAM | 1 | 0 | 17.7 | 17.8 | 17.8 |
| | | 1 | 49 | 17.7 | **17.9** | 17.8 |
| | | 1 | 99 | 17.8 | 17.9 | 17.9 |
| | | 50 | 0 | 17.4 | 17.5 | 17.5 |
| | | 50 | 24 | 17.5 | 17.5 | 17.6 |
| | | 50 | 49 | 17.5 | 17.6 | 17.6 |
| | | 100 | 0 | 17.5 | 17.5 | 17.5 |
| | 64QAM | 1 | 0 | 17.7 | 17.7 | 17.8 |
| | | 1 | 49 | 17.8 | 17.8 | **17.8** |
| | | 1 | 99 | 17.8 | 17.8 | 17.8 |
| | | 50 | 0 | 17.4 | 17.5 | 17.5 |
| | | 50 | 24 | 17.5 | 17.5 | 17.6 |
| | | 50 | 49 | 17.5 | 17.6 | 17.6 |
| | | 100 | 0 | 17.5 | 17.5 | 17.5 |

## 8.3.3. LTE BAND 12

| Test Engineer ID: | 84740/44389 | Test Date: | 2023-03-08 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 12 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 23017 | 23095 | 23173 |
| | | | | 699.7 MHz | 707.5 MHz | 715.3 MHz |
| 1.4 | QPSK | 1 | 0 | 20.7 | 20.6 | 20.6 |
| | | 1 | 3 | 20.7 | 20.7 | 20.7 |
| | | 1 | 5 | 20.6 | 20.6 | 20.6 |
| | | 3 | 0 | 20.7 | 20.7 | 20.6 |
| | | 3 | 1 | 20.7 | 20.7 | 20.6 |
| | | 3 | 3 | **20.7** | 20.6 | 20.7 |
| | | 6 | 0 | 20.7 | 20.7 | 20.6 |
| | 16QAM | 1 | 0 | 20.9 | 21.0 | 20.9 |
| | | 1 | 3 | 20.9 | **21.1** | 21.0 |
| | | 1 | 5 | 20.9 | 21.0 | 21.0 |
| | | 3 | 0 | 20.9 | 20.9 | 20.8 |
| | | 3 | 1 | 20.9 | 20.8 | 20.8 |
| | | 3 | 3 | 20.9 | 20.9 | 20.8 |
| | | 6 | 0 | 20.8 | 20.7 | 20.7 |
| | 64QAM | 1 | 0 | 21.0 | 20.9 | 20.6 |
| | | 1 | 3 | **21.1** | 21.0 | 20.9 |
| | | 1 | 5 | 21.0 | 21.0 | 20.9 |
| | | 3 | 0 | 20.9 | 20.7 | 20.7 |
| | | 3 | 1 | 20.8 | 20.8 | 20.8 |
| | | 3 | 3 | 20.9 | 20.7 | 20.7 |
| | | 6 | 0 | 20.8 | 20.7 | 20.7 |

**OUTPUT POWER FOR LTE BAND 12 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 23025 | 23095 | 23165 |
| | | | | 700.5 MHz | 707.5 MHz | 714.5 MHz |
| 3.0 | QPSK | 1 | 0 | 20.6 | 20.6 | 20.6 |
| | | 1 | 7 | 20.8 | 20.7 | 20.7 |
| | | 1 | 14 | 20.6 | 20.6 | 20.5 |
| | | 8 | 0 | **20.8** | 20.6 | 20.6 |
| | | 8 | 4 | 20.7 | 20.6 | 20.7 |
| | | 8 | 7 | 20.8 | 20.7 | 20.7 |
| | | 15 | 0 | 20.7 | 20.7 | 20.5 |
| | 16QAM | 1 | 0 | 20.9 | 20.9 | 20.8 |
| | | 1 | 7 | **21.1** | 21.0 | 21.0 |
| | | 1 | 14 | 20.9 | 20.9 | 20.8 |
| | | 8 | 0 | 20.8 | 20.7 | 20.6 |
| | | 8 | 4 | 20.9 | 20.7 | 20.7 |
| | | 8 | 7 | 20.8 | 20.8 | 20.7 |
| | | 15 | 0 | 20.8 | 20.8 | 20.6 |
| | 64QAM | 1 | 0 | 21.0 | 20.9 | 20.8 |
| | | 1 | 7 | **21.0** | 21.0 | 20.9 |
| | | 1 | 14 | 20.9 | 20.9 | 20.8 |
| | | 8 | 0 | 20.8 | 20.7 | 20.6 |
| | | 8 | 4 | 20.9 | 20.7 | 20.7 |
| | | 8 | 7 | 20.8 | 20.8 | 20.7 |
| | | 15 | 0 | 20.8 | 20.7 | 20.6 |

**OUTPUT POWER FOR LTE BAND 12 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 23035 | 23095 | 23155 |
| | | | | 701.5 MHz | 707.5 MHz | 713.5 MHz |
| 5.0 | QPSK | 1 | 0 | 20.6 | 20.6 | 20.7 |
| | | 1 | 12 | 20.8 | 20.7 | **20.8** |
| | | 1 | 24 | 20.6 | 20.6 | 20.6 |
| | | 12 | 0 | 20.7 | 20.6 | 20.6 |
| | | 12 | 6 | 20.7 | 20.7 | 20.7 |
| | | 12 | 11 | 20.7 | 20.7 | 20.7 |
| | | 25 | 0 | 20.7 | 20.7 | 20.6 |
| | 16QAM | 1 | 0 | 21.0 | 21.0 | 21.0 |
| | | 1 | 12 | **21.2** | 21.1 | 21.1 |
| | | 1 | 24 | 21.1 | 21.0 | 21.0 |
| | | 12 | 0 | 20.7 | 20.6 | 20.6 |
| | | 12 | 6 | 20.7 | 20.7 | 20.6 |
| | | 12 | 11 | 20.7 | 20.7 | 20.7 |
| | | 25 | 0 | 20.8 | 20.7 | 20.6 |
| | 64QAM | 1 | 0 | 21.0 | 20.5 | 20.9 |
| | | 1 | 12 | **21.0** | 21.0 | 21.0 |
| | | 1 | 24 | 21.0 | 20.9 | 20.9 |
| | | 12 | 0 | 20.8 | 20.6 | 20.7 |
| | | 12 | 6 | 20.8 | 20.6 | 20.7 |
| | | 12 | 11 | 20.7 | 20.7 | 20.7 |
| | | 25 | 0 | 20.8 | 20.7 | 20.6 |

**OUTPUT POWER FOR LTE BAND 12 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 23060 | 23095 | 23130 |
| | | | | 704.0 MHz | 707.5 MHz | 711.0 MHz |
| 10.0 | QPSK | 1 | 0 | 20.7 | 20.7 | 20.7 |
| | | 1 | 24 | 20.7 | 20.7 | 20.7 |
| | | 1 | 49 | 20.6 | 20.6 | 20.6 |
| | | 25 | 0 | 20.7 | 20.7 | 20.6 |
| | | 25 | 12 | **20.8** | 20.7 | 20.7 |
| | | 25 | 24 | 20.7 | 20.7 | 20.7 |
| | | 50 | 0 | 20.7 | 20.7 | 20.7 |
| | 16QAM | 1 | 0 | **21.1** | 21.0 | 21.0 |
| | | 1 | 24 | 20.9 | 21.0 | 21.0 |
| | | 1 | 49 | 21.0 | 21.0 | 21.0 |
| | | 25 | 0 | 20.7 | 20.7 | 20.7 |
| | | 25 | 12 | 20.8 | 20.7 | 20.7 |
| | | 25 | 24 | 20.8 | 20.7 | 20.7 |
| | | 50 | 0 | 20.7 | 20.7 | 20.6 |
| | 64QAM | 1 | 0 | 21.0 | **21.0** | 20.9 |
| | | 1 | 24 | 20.9 | 20.9 | 20.9 |
| | | 1 | 49 | 20.9 | 20.9 | 20.8 |
| | | 25 | 0 | 20.7 | 20.6 | 20.6 |
| | | 25 | 12 | 20.8 | 20.7 | 20.7 |
| | | 25 | 24 | 20.7 | 20.6 | 20.7 |
| | | 50 | 0 | 20.8 | 20.7 | 20.7 |

# 9. CONDUCTED TEST RESULTS

## 9.1. OCCUPIED BANDWIDTH

**RULE PART(S)**

FCC: §2.1049

**LIMITS**

For reporting purposes only.

**TEST PROCEDURE**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

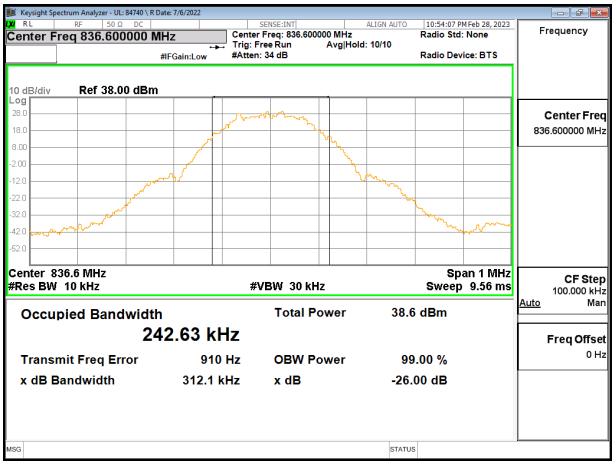
**RESULTS**

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested. Worst-case plots (highest bandwidth) are reported only.

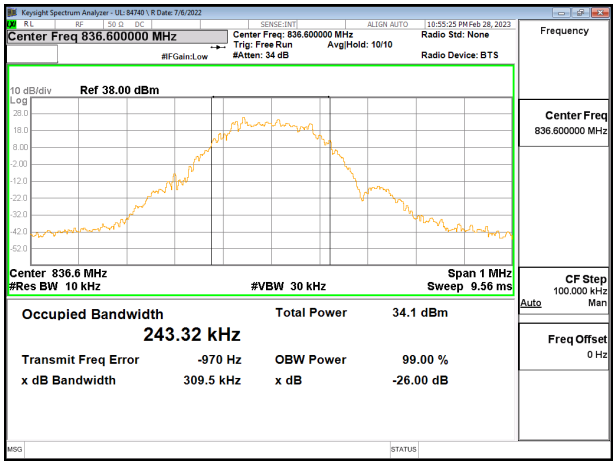
## 9.1.1. GSM

| Test Engineer ID: | 84740/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

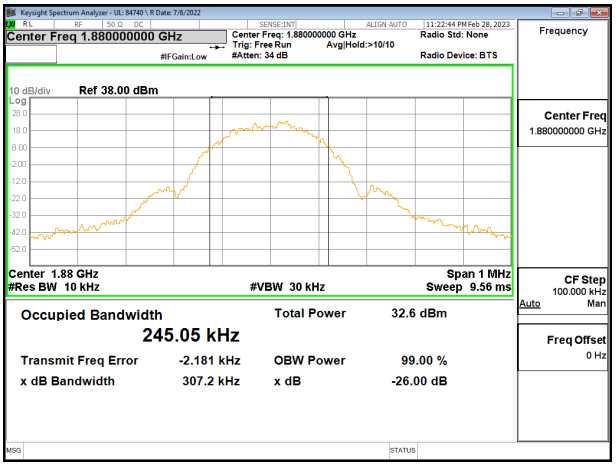
| Band | Modulation | Channel | f(MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| GSM850 | GPRS | 190 | 836.6 | 242.63 | 312.1 |
| | EGPRS | | | 243.32 | 309.5 |
| GSM1900 | GPRS | 661 | 1880.0 | 245.05 | 307.2 |
| | EGPRS | | | 244.83 | 320.0 |



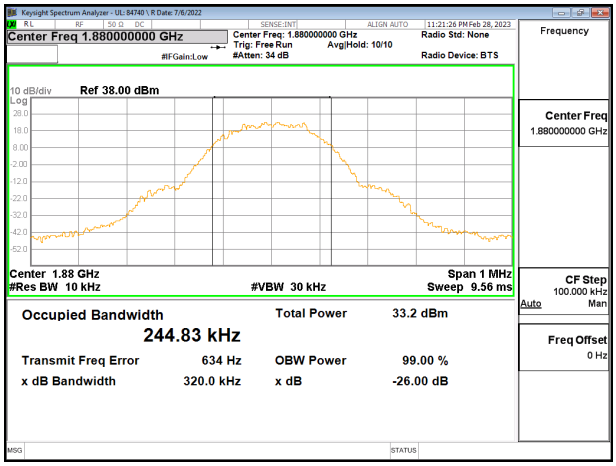
GSM850 GPRS MID Channel



GSM850 EGPRS MID Channel



GSM1900 GPRS MID Channel

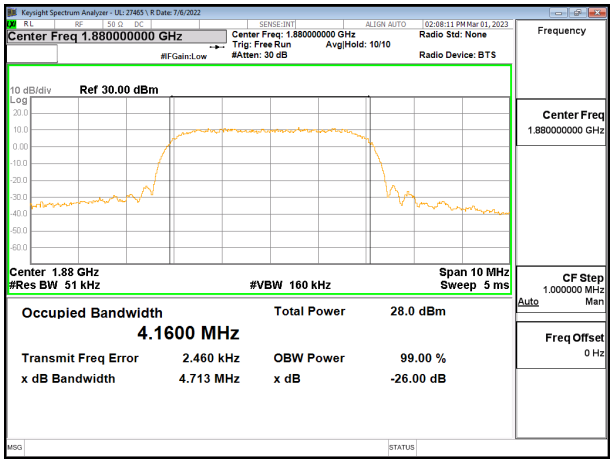


GSM1900 EGPRS MID Channel

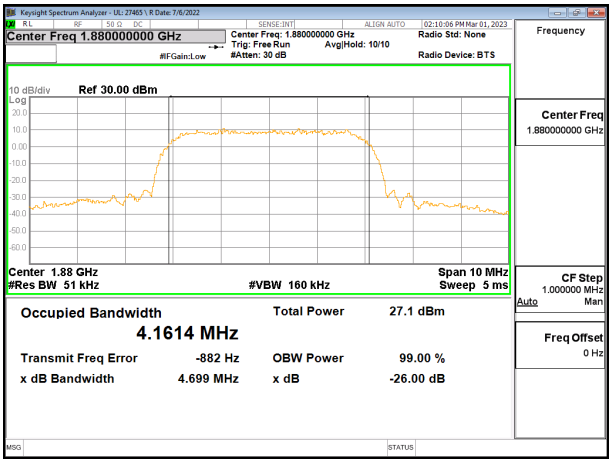
## 9.1.2. WCDMA

| Test Engineer ID: | 27465/44389 | Test Date: | 2023-03-01 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

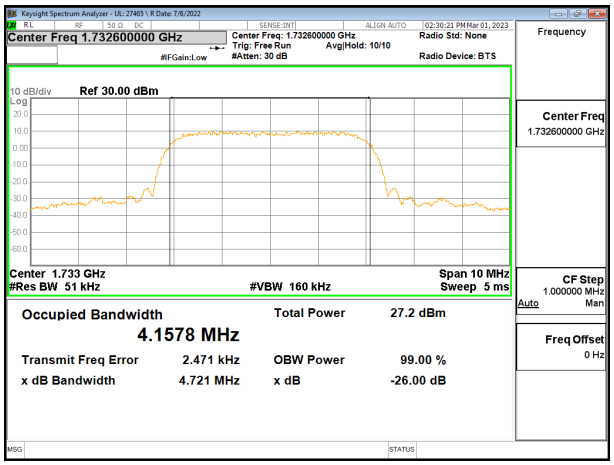
| Band | Modulation | Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| BAND2 | REL 99 | 9400 | 1880.0 | 4.160 | 4.713 |
| | HSDPA | | | 4.161 | 4.699 |
| BAND4 | REL 99 | 1413 | 1732.6 | 4.158 | 4.721 |
| | HSDPA | | | 4.161 | 4.692 |



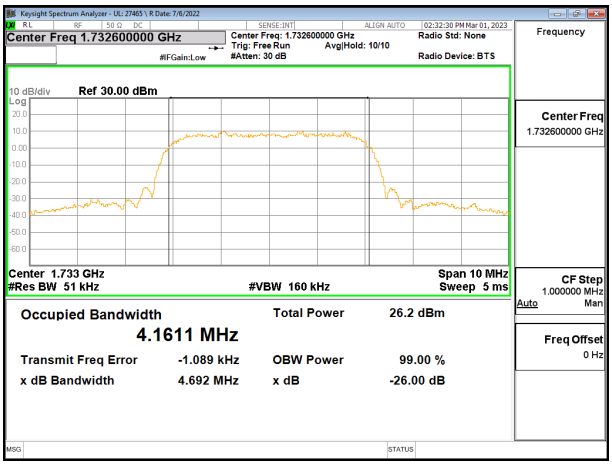

BAND 2 Rel 99 MID Channel




BAND 2 HSDPA MID Channel




BAND 4 Rel 99 MID Channel

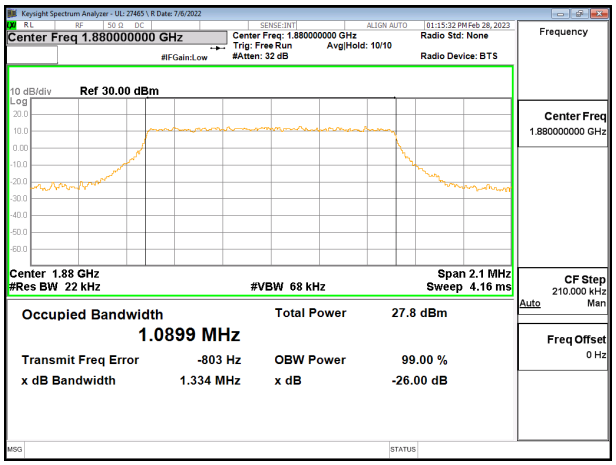



BAND 4 HSDPA MID Channel

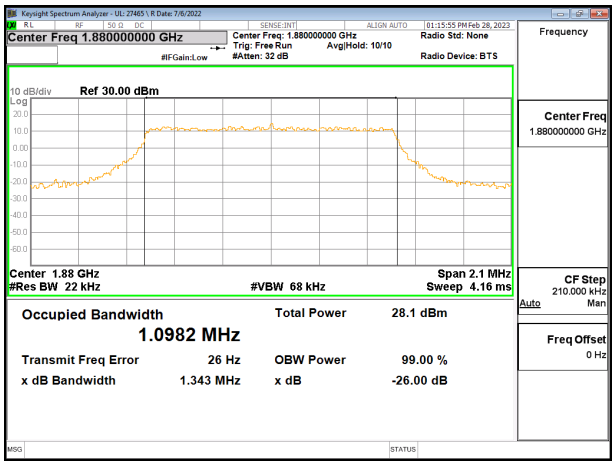
## 9.1.3. LTE2

| Test Engineer ID: | 27465/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

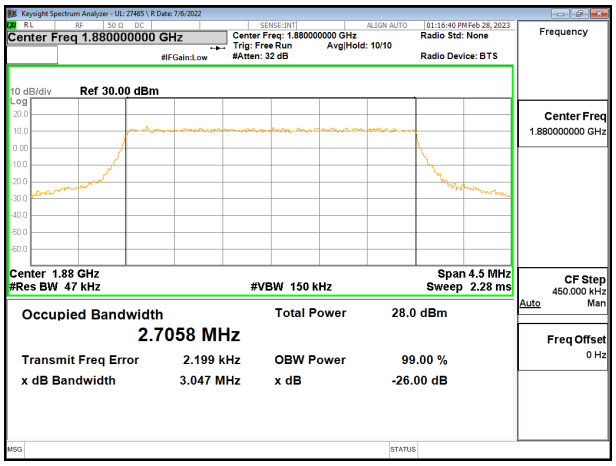
| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 2 | 1.4MHz, QPSK | 6/0 | 1880.0 | 1.090 | 1.334 |
| | 1.4MHz,16QAM | | | 1.098 | 1.343 |
| | 3MHz, QPSK | 15/0 | | 2.706 | 3.047 |
| | 3MHz, 16QAM | | | 2.709 | 3.086 |
| | 5MHz, QPSK | 25/0 | | 4.507 | 5.077 |
| | 5MHz, 16QAM | | | 4.503 | 5.112 |
| | 10MHz, QPSK | 50/0 | | 8.986 | 10.00 |
| | 10MHz, 16QAM | | | 8.984 | 10.01 |
| | 15MHz, QPSK | 75/0 | | 13.47 | 14.83 |
| | 15MHz, 16QAM | | | 13.47 | 14.78 |
| | 20MHz, QPSK | 100/0 | | 17.92 | 19.53 |
| | 20MHz, 16QAM | | | 17.92 | 19.61 |



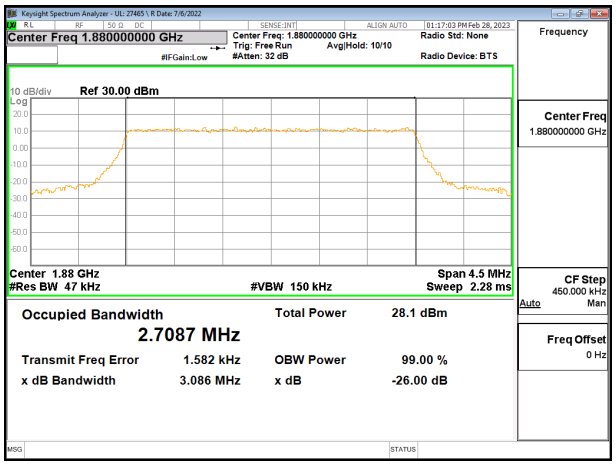

LTE2 1.4MHz QPSK MID Ch RB6-0



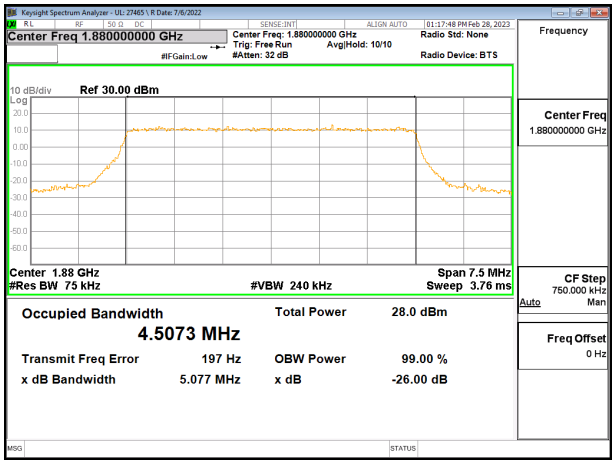

LTE2 1.4MHz 16QAM MID Ch RB6-0



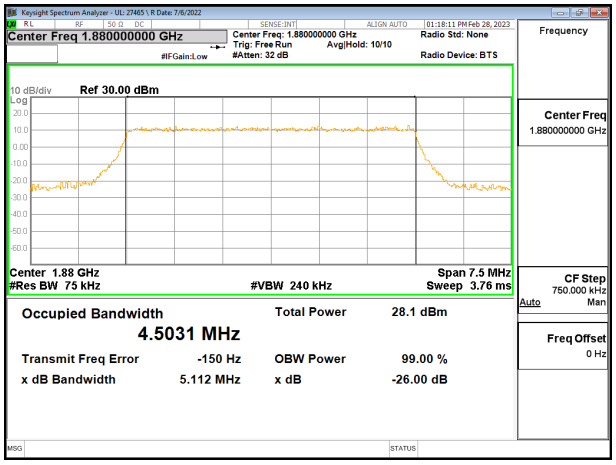

LTE2 3MHz QPSK MID Ch RB15-0



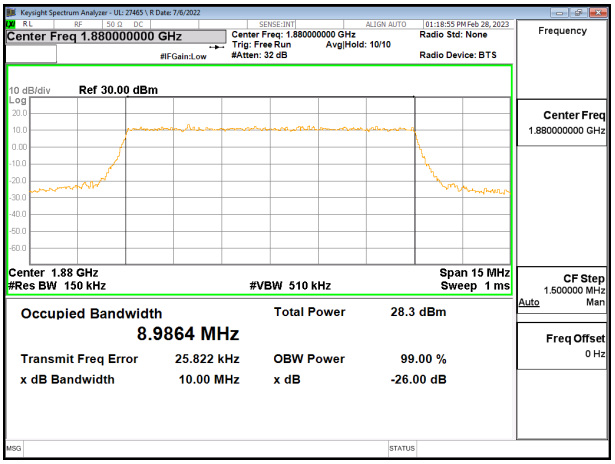

LTE2 3MHz 16QAM MID Ch RB15-0



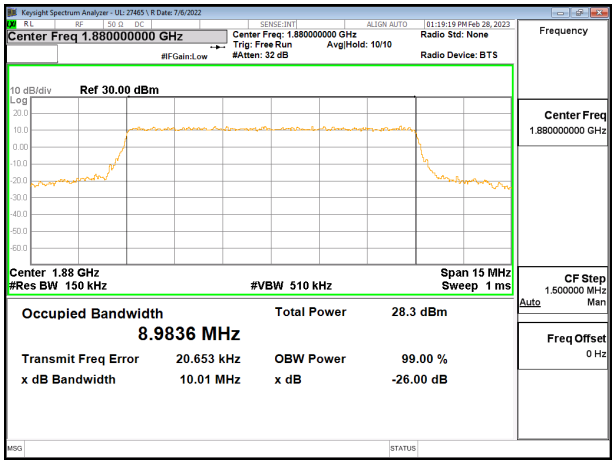

LTE2 5MHz QPSK MID Ch RB25-0



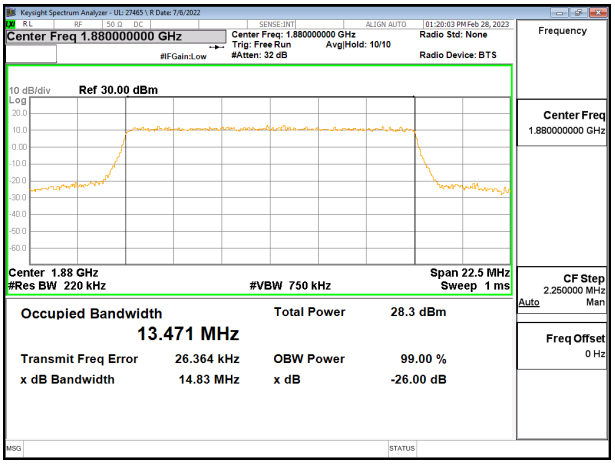

LTE2 5MHz 16QAM MID Ch RB25-0



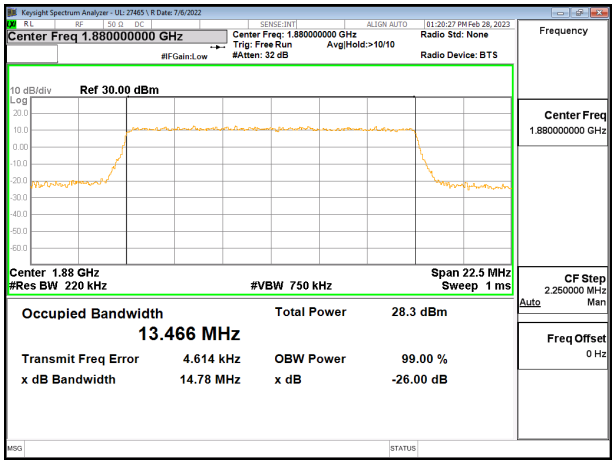

LTE2 10MHz QPSK MID Ch RB50-0



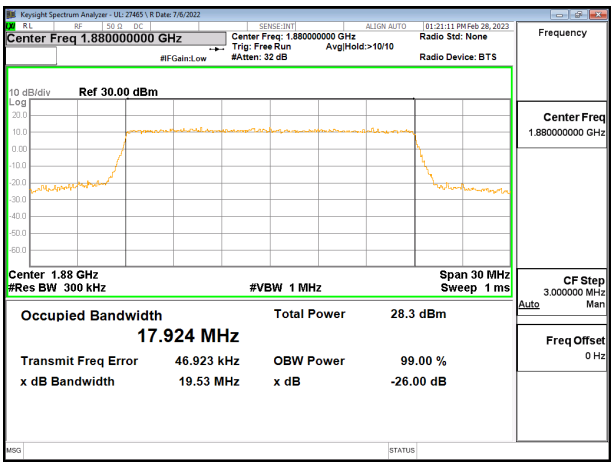

LTE2 10MHz 16QAM MID Ch RB50-0



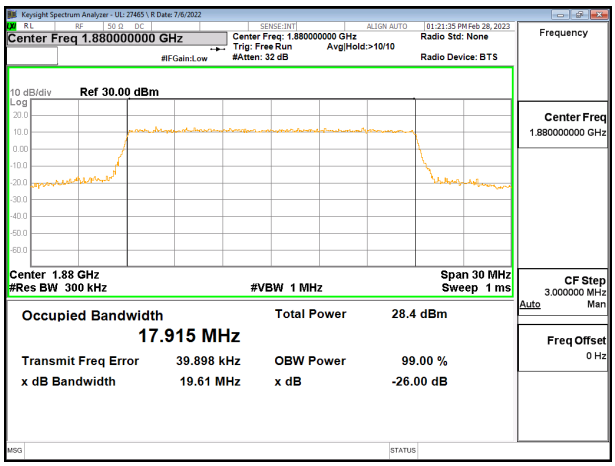

LTE2 15MHz QPSK MID Ch RB75-0




LTE2 15MHz 16QAM MID Ch RB75-0




LTE2 20MHz QPSK MID Ch RB50-24

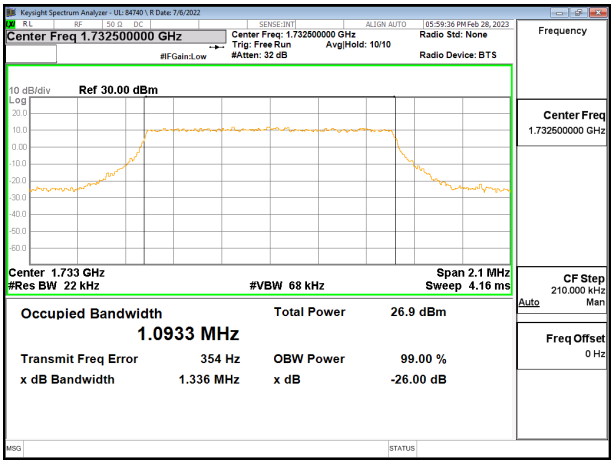



LTE2 20MHz 16QAM MID Ch RB50-24

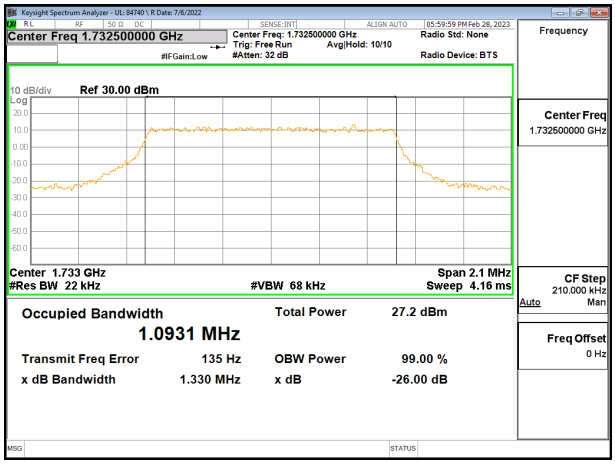
## 9.1.4. LTE4

| Test Engineer ID: | 84740/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

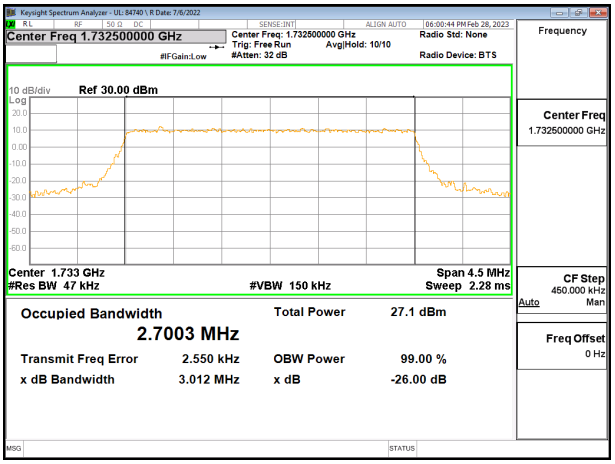
| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 4 | 1.4MHz, QPSK | 6/0 | 1732.5 | 1.093 | 1.336 |
| | 1.4MHz,16QAM | | | 1.093 | 1.330 |
| | 3MHz, QPSK | 15/0 | | 2.700 | 3.012 |
| | 3MHz, 16QAM | | | 2.707 | 3.071 |
| | 5MHz, QPSK | 25/0 | | 4.495 | 5.122 |
| | 5MHz, 16QAM | | | 4.503 | 5.068 |
| | 10MHz, QPSK | 50/0 | | 9.010 | 10.05 |
| | 10MHz, 16QAM | | | 8.997 | 9.952 |
| | 15MHz, QPSK | 75/0 | | 13.49 | 14.94 |
| | 15MHz, 16QAM | | | 13.48 | 14.81 |
| | 20MHz, QPSK | 100/0 | | 17.94 | 19.64 |
| | 20MHz, 16QAM | | | 17.98 | 19.72 |



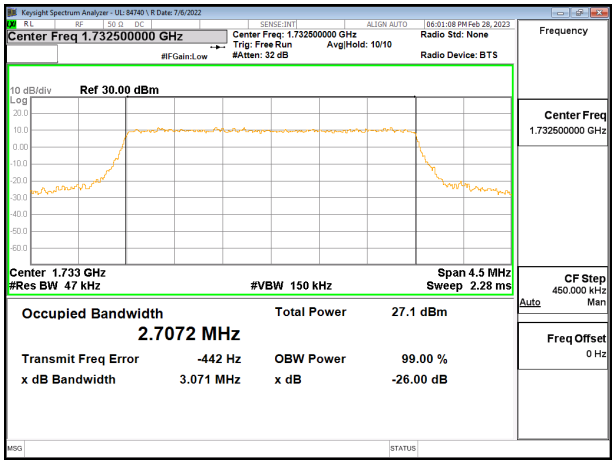

LTE4 1.4MHz QPSK MID Ch RB6-0



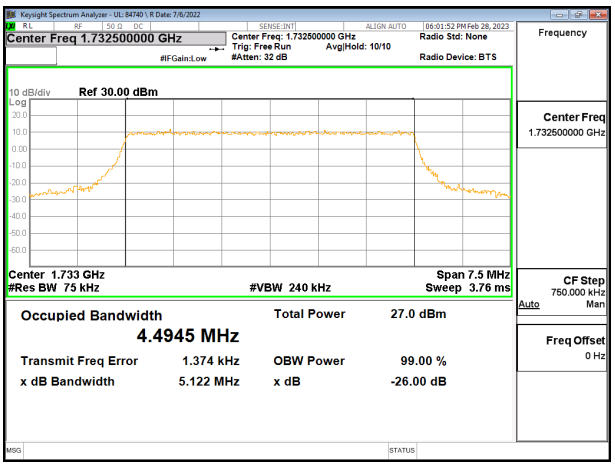

LTE4 1.4MHz 16QAM MID Ch RB6-0



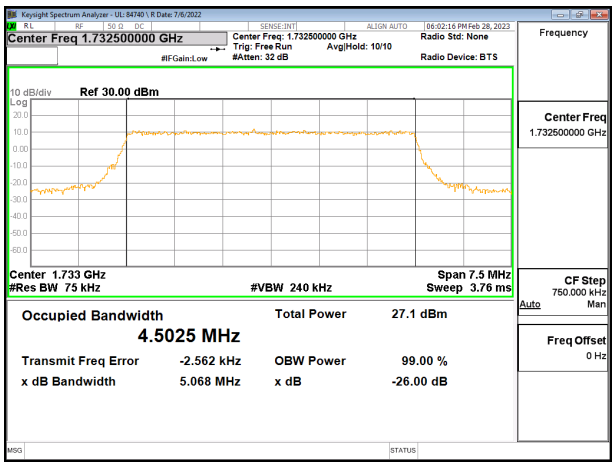

LTE4 3MHz QPSK MID Ch RB15-0



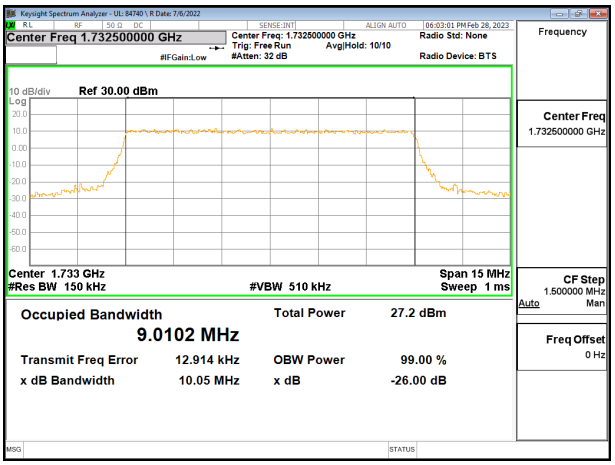

LTE4 3MHz 16QAM MID Ch RB15-0



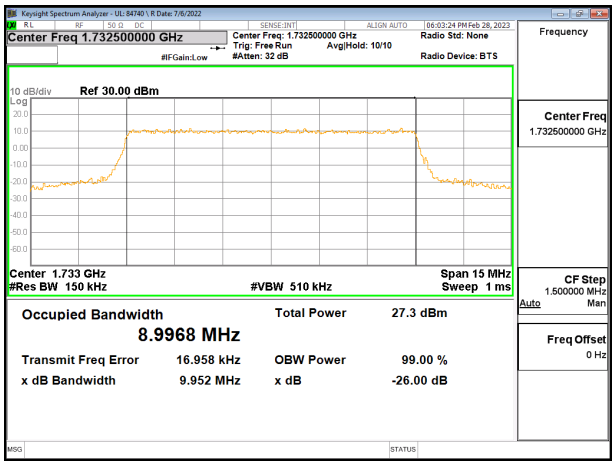

LTE4 5MHz QPSK MID Ch RB25-0



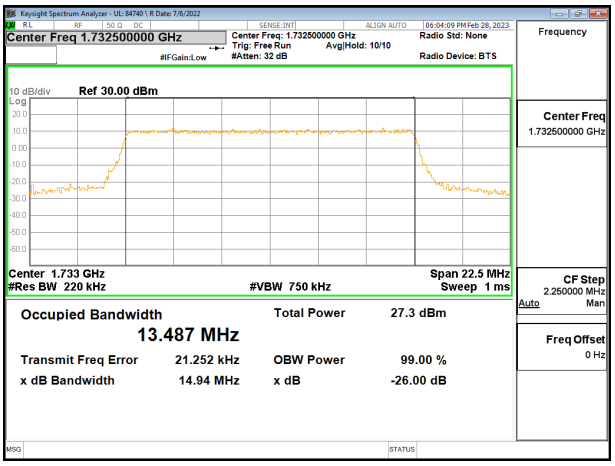

LTE4 5MHz 16QAM MID Ch RB25-0



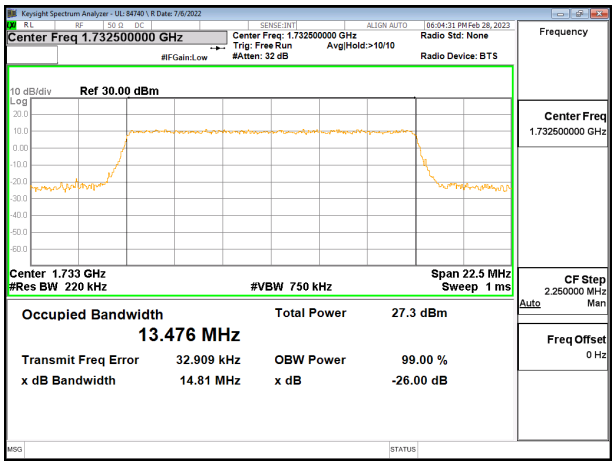

LTE4 10MHz QPSK MID Ch RB50-0



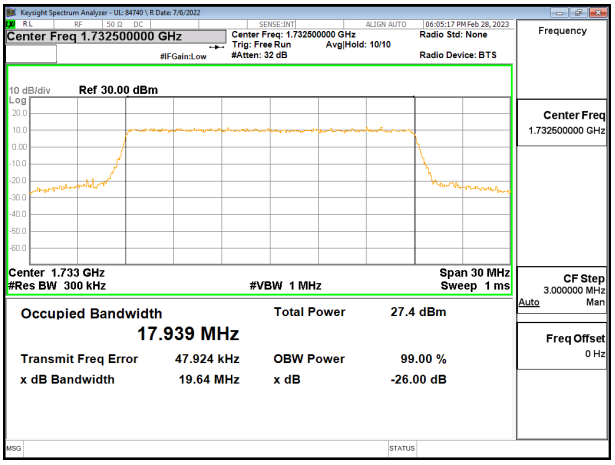

LTE4 10MHz 16QAM MID Ch RB50-0



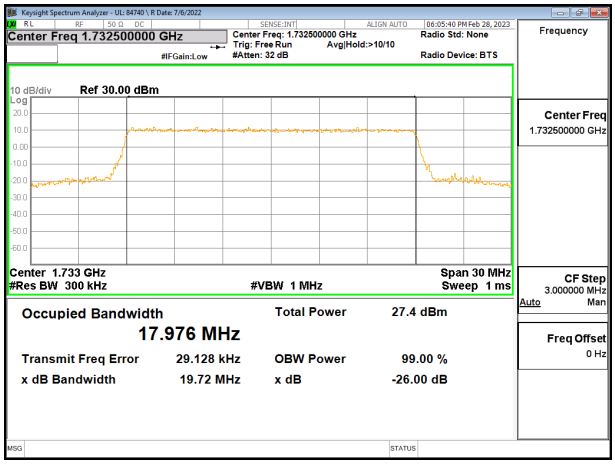

LTE4 15MHz QPSK MID Ch RB75-0




LTE4 15MHz 16QAM MID Ch RB75-0




LTE4 20MHz QPSK MID Ch RB100-0

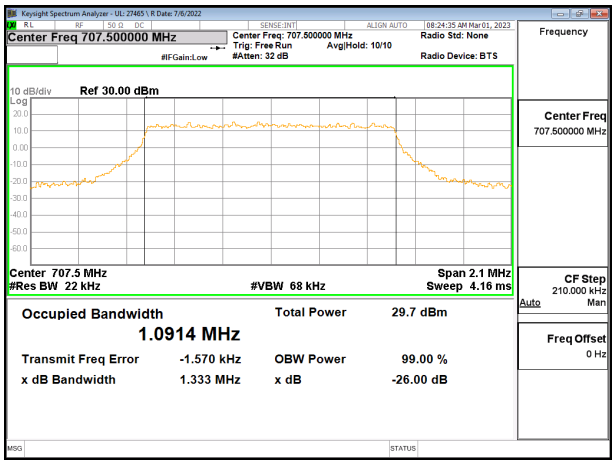



LTE4 20MHz 16QAM MID Ch RB100-0

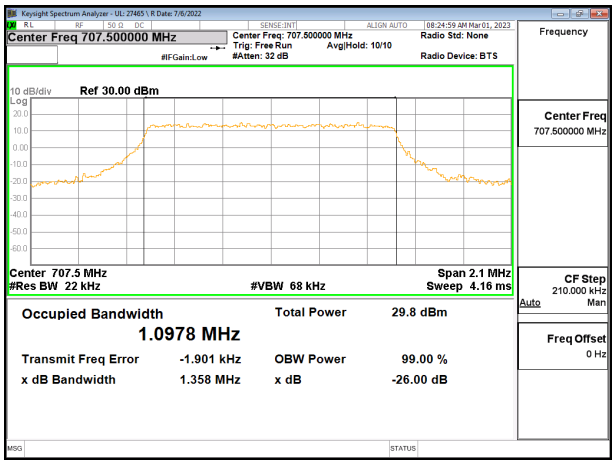
## 9.1.5. LTE12

| Test Engineer ID: | 27465/44389 | Test Date: | 2023-03-01 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|

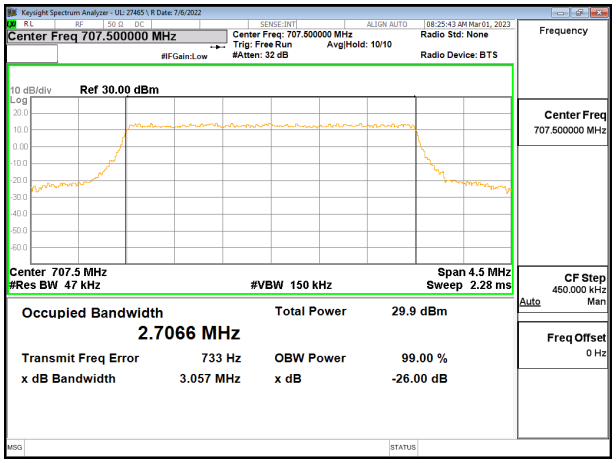
| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 12 | 1.4MHz, QPSK | 6/0 | 707.5 | 1.091 | 1.333 |
| | 1.4MHz,16QAM | | | 1.098 | 1.358 |
| | 3MHz, QPSK | 15/0 | | 2.707 | 3.057 |
| | 3MHz, 16QAM | | | 2.701 | 3.049 |
| | 5MHz, QPSK | 25/0 | | 4.506 | 5.137 |
| | 5MHz, 16QAM | | | 4.505 | 5.142 |
| | 10MHz, QPSK | 50/0 | | 8.972 | 9.953 |
| | 10MHz, 16QAM | | | 8.964 | 9.963 |



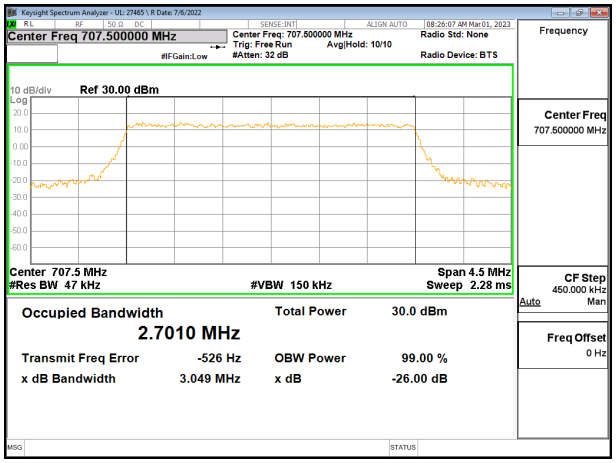

LTE12 1.4MHz QPSK MID Ch RB6-0



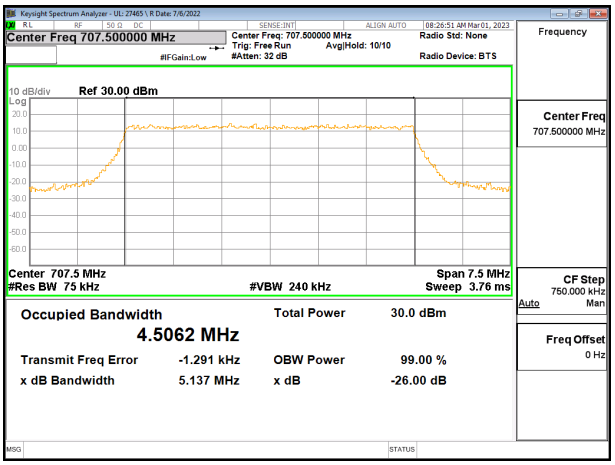

LTE12 1.4MHz 16QAM MID Ch RB6-0



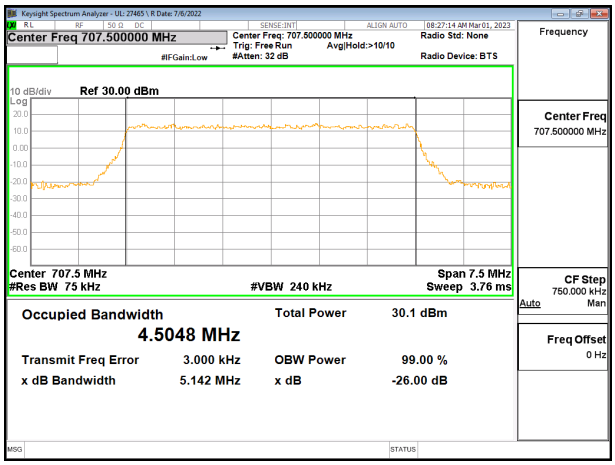

LTE12 3MHz QPSK MID Ch RB15-0



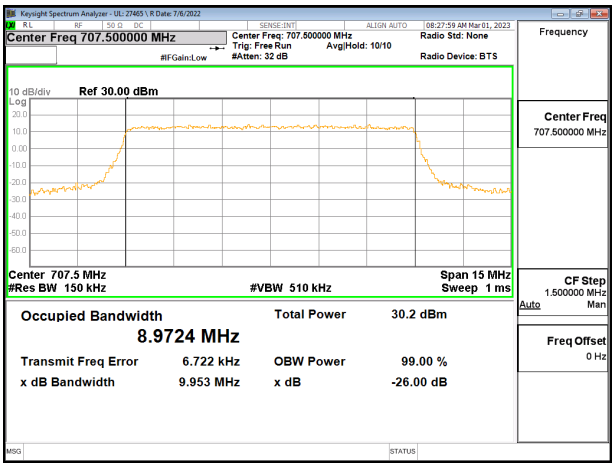

LTE12 3MHz 16QAM MID Ch RB15-0



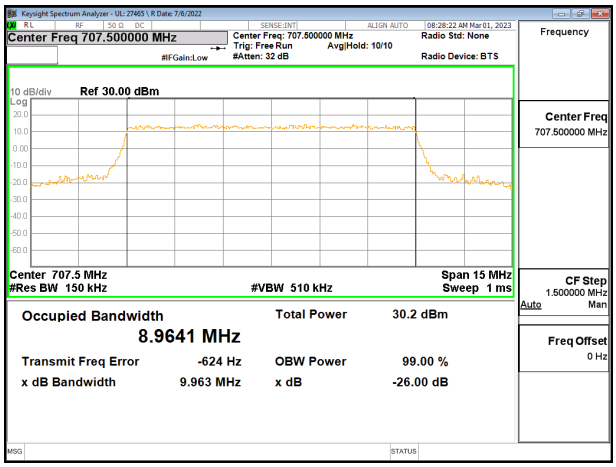

LTE12 5MHz QPSK MID Ch RB25-0




LTE12 5MHz 16QAM MID Ch RB25-0




LTE12 10MHz QPSK MID Ch RB50-0




LTE12 10MHz 16QAM MID Ch RB50-0

## 9.2. BAND EDGE AND EMISSION MASK

**TEST PROCEDURE**

The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

(i) Set the spectrum analyzer span to include the block edge frequency.
(ii) Set a marker to point the corresponding band edge frequency in each test case.
(iii) Set display line at -13 dBm
(iv) Set resolution bandwidth to at least 1% of emission bandwidth.

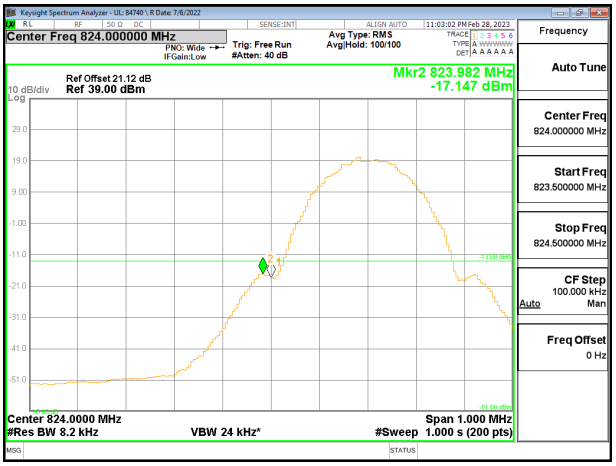
**RESULTS**

## 9.2.1. GSM850

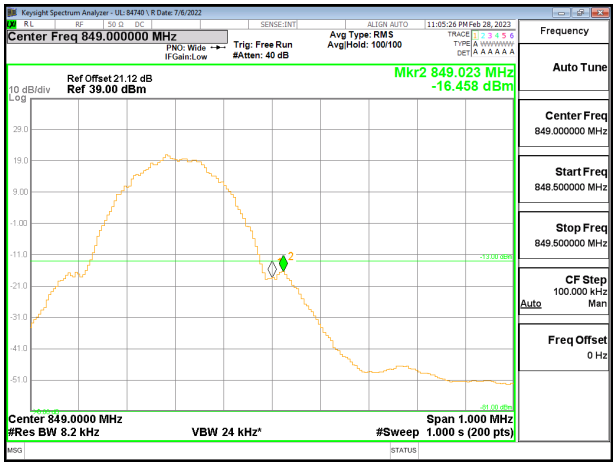
**LIMITS**

FCC: §22.917 (a)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

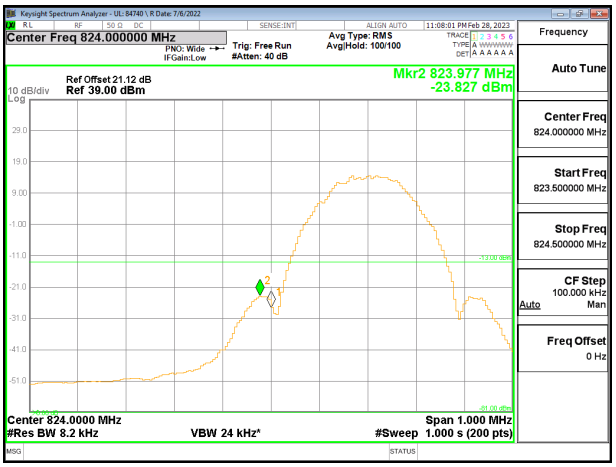
| Test Engineer ID: | 84740/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|



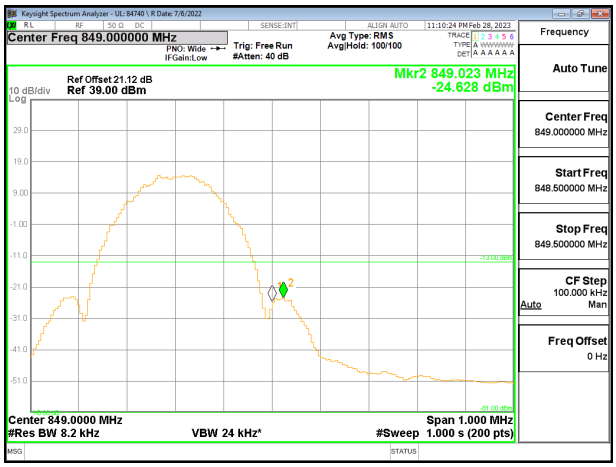
GSM850 GPRS LOW Channel



GSM850 GPRS HIGH Channel



GSM850 EGPRS LOW Channel



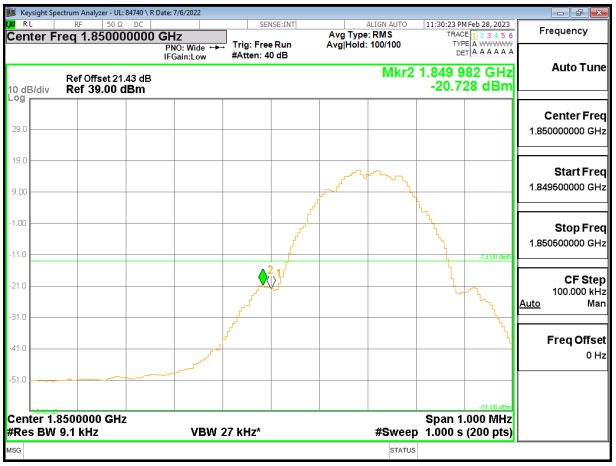
GSM850 EGPRS HIGH Channel

## 9.2.2. GSM1900

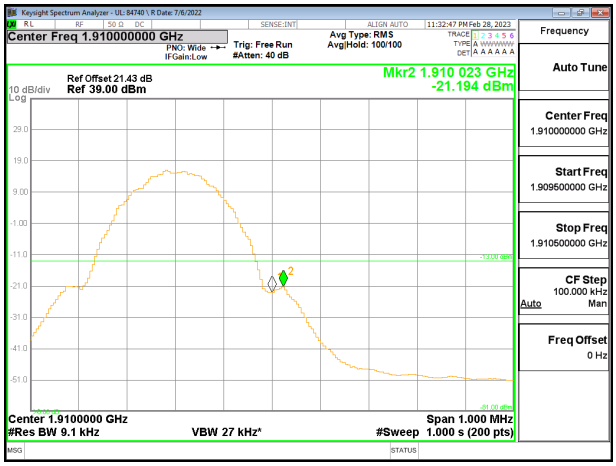
**LIMITS**

FCC: §24.238 (a)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

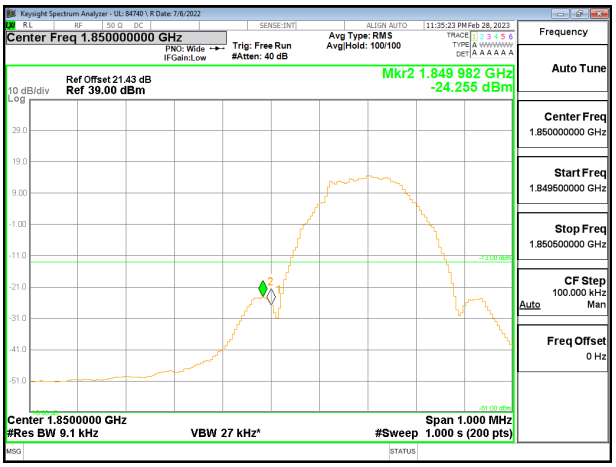
| Test Engineer ID: | 84740/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|



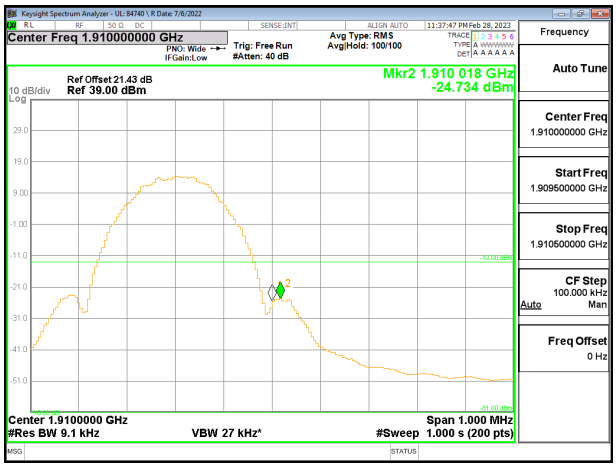

GSM1900 GPRS LOW Channel




GSM1900 GPRS HIGH Channel




GSM1900 EGPRS LOW Channel



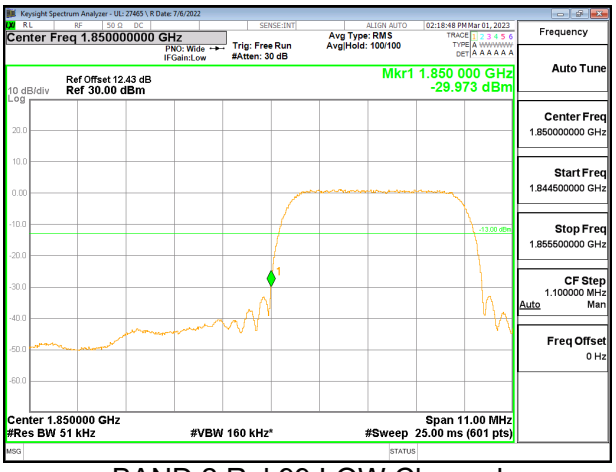

GSM1900 EGPRS HIGH Channel

## 9.2.3. WCMDA2

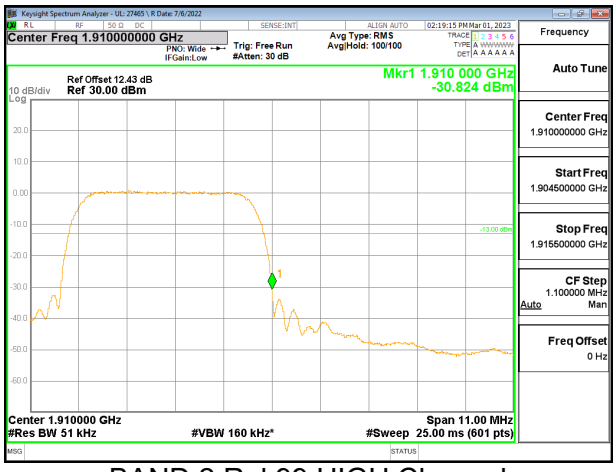
**LIMITS**

FCC: §24.238
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

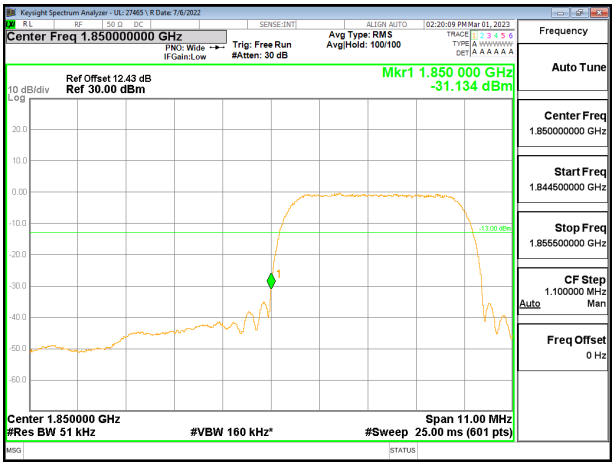
| Test Engineer ID: | 84740/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|



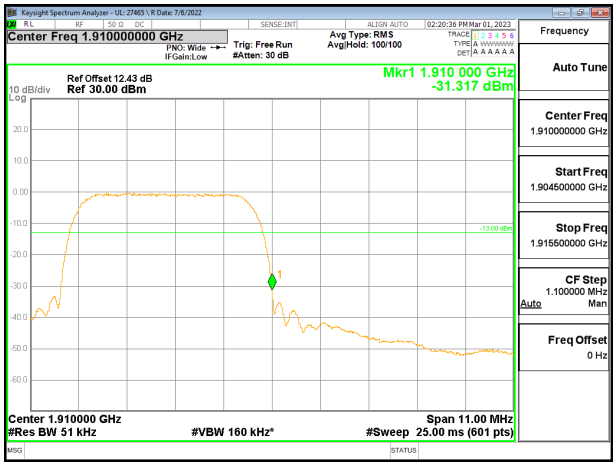

BAND 2 Rel 99 LOW Channel




BAND 2 Rel 99 HIGH Channel




BAND 2 HSDPA LOW Channel



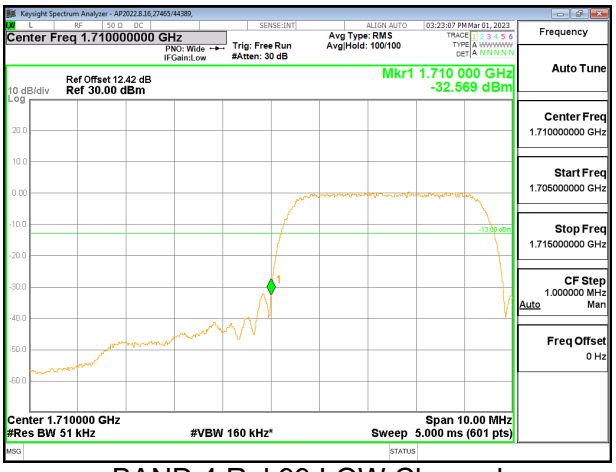

BAND 2 HSDPA HIGH Channel

## 9.2.4. WCDMA4

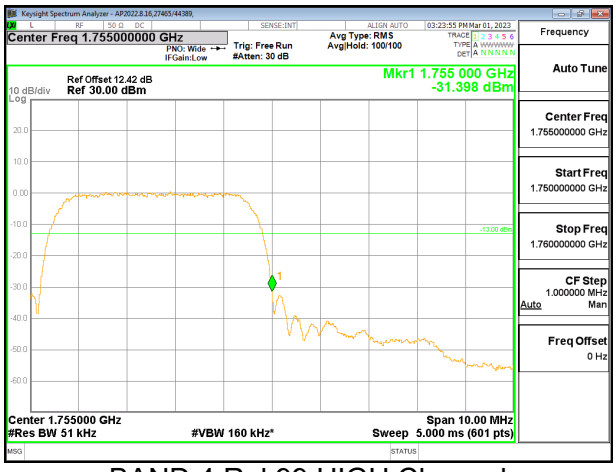
**LIMITS**

FCC: §27.53(h)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

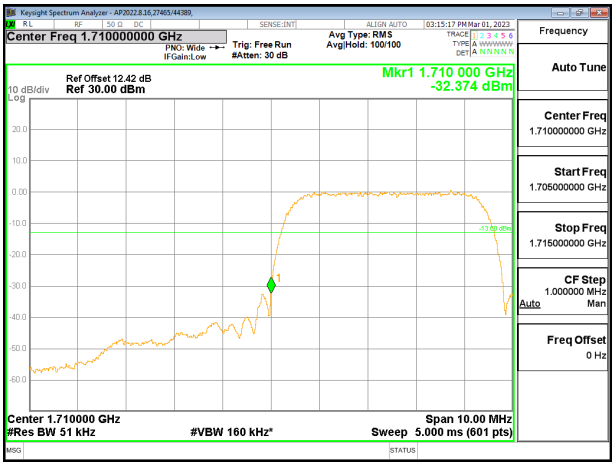
| Test Engineer ID: | 27465/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|



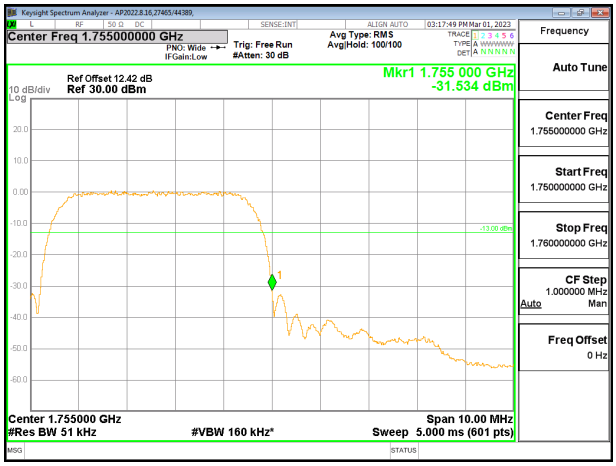

BAND 4 Rel 99 LOW Channel




BAND 4 Rel 99 HIGH Channel




BAND 4 HSDPA LOW Channel



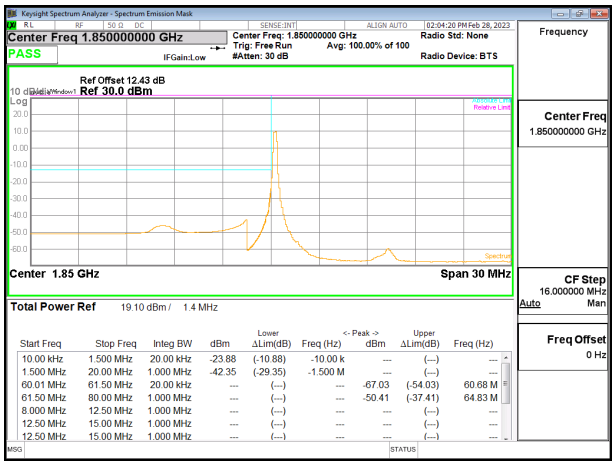

BAND 4 HSDPA HIGH Channel

## 9.2.5. LTE2

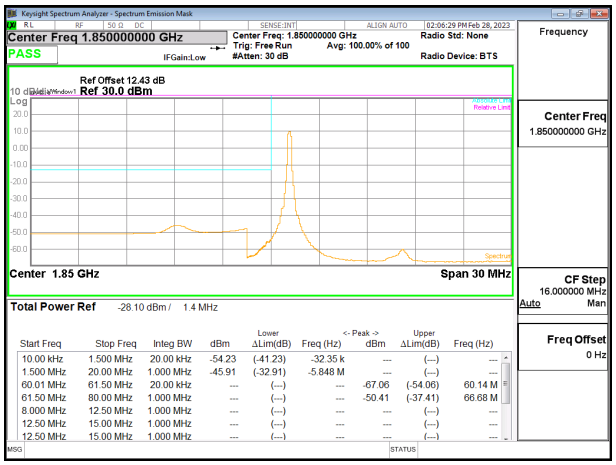
**LIMITS**

FCC: §24.238
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

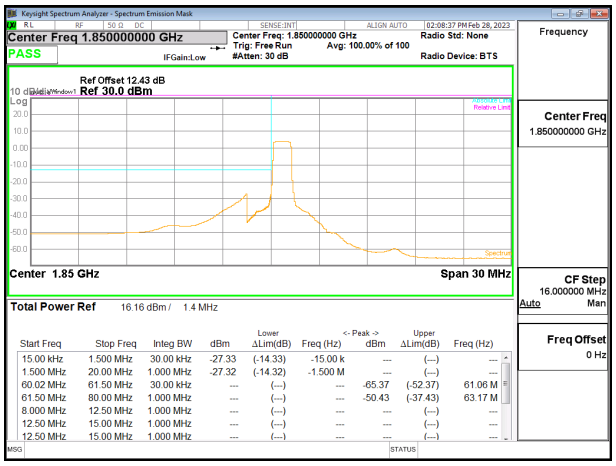
| Test Engineer ID: | 84740/44389 | Test Date: | 2023-02-28 | EUT Serial Number: | QV7700ADFR |
|---|---|---|---|---|---|



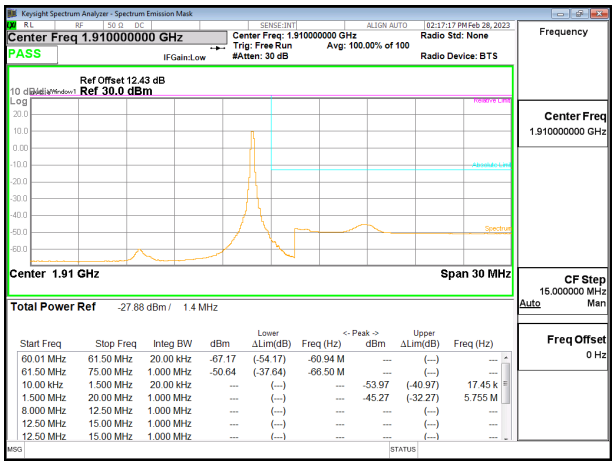

LTE2 1.4MHz QPSK LOW Ch RB1-0



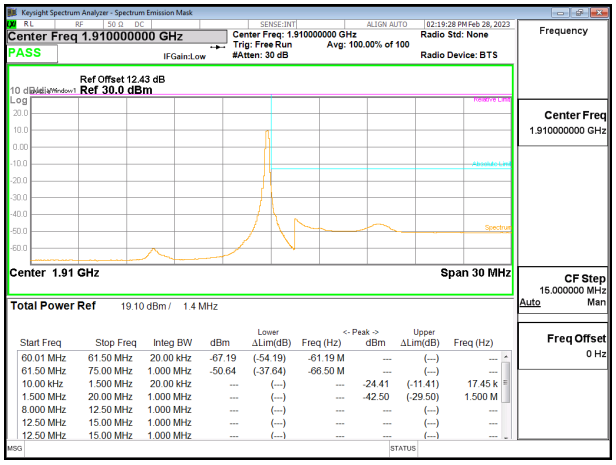

LTE2 1.4MHz QPSK LOW Ch RB1-5



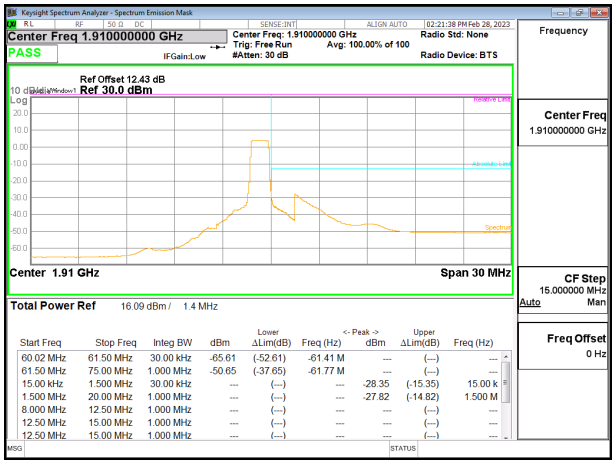

LTE2 1.4MHz QPSK LOW Ch RB6-0



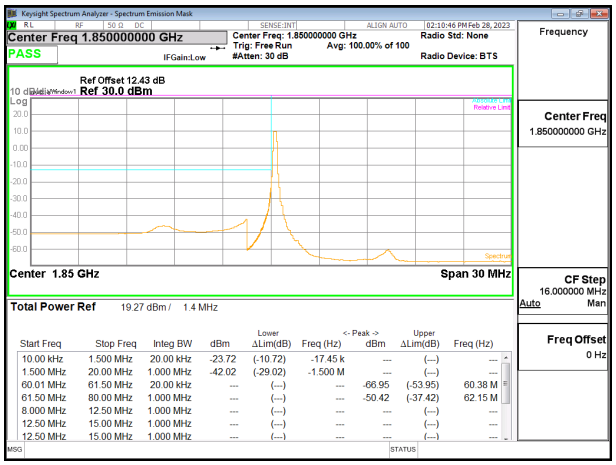

LTE2 1.4MHz QPSK HIGH Ch RB1-0



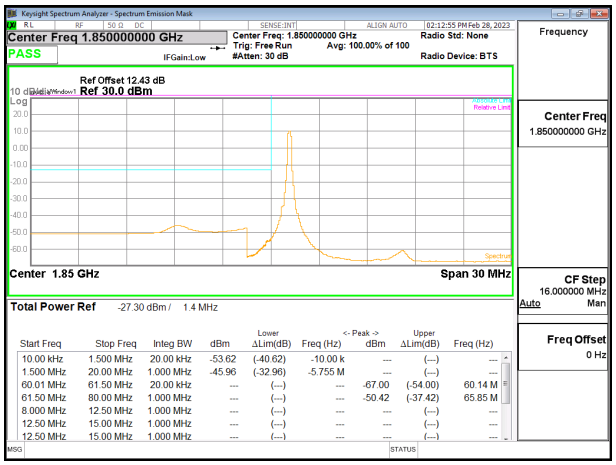

LTE2 1.4MHz QPSK HIGH Ch RB1-5



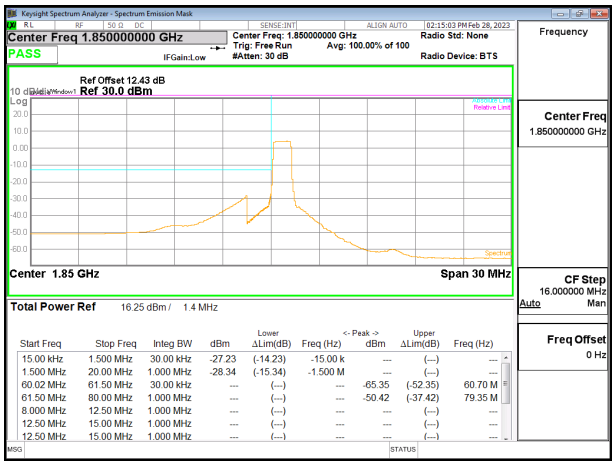

LTE2 1.4MHz QPSK HIGH Ch RB6-0



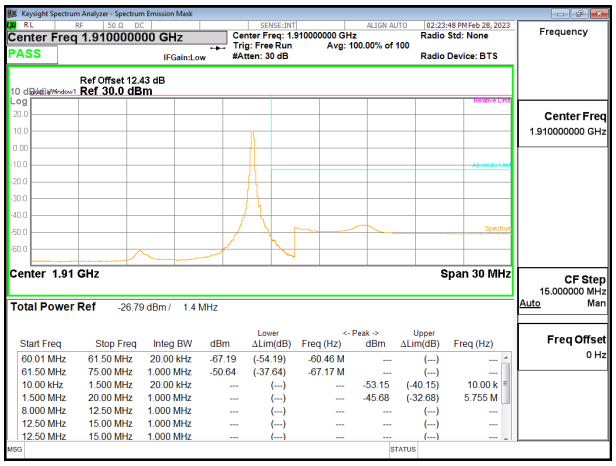

LTE2 1.4MHz 16QAM LOW Ch RB1-0



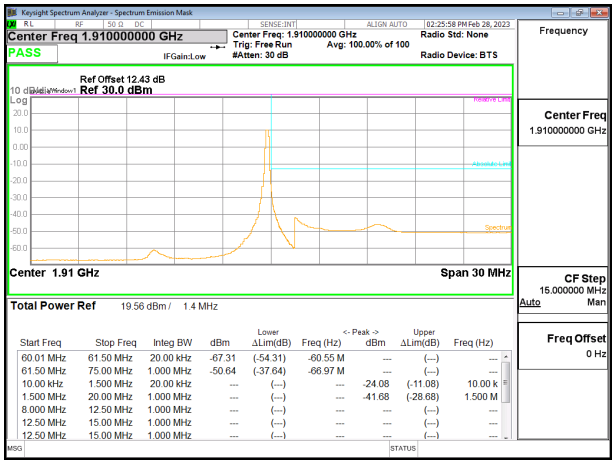

LTE2 1.4MHz 16QAM LOW Ch RB1-5



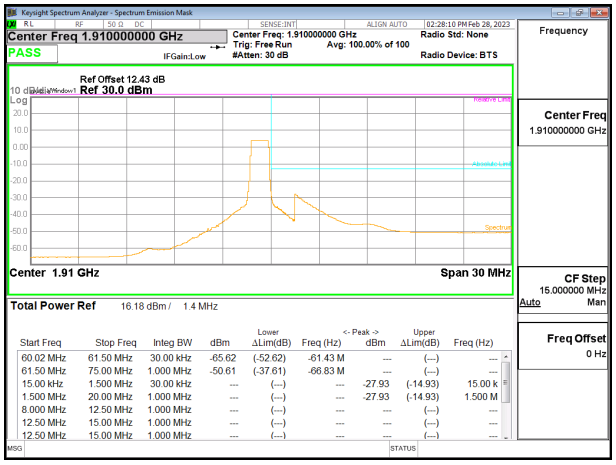

LTE2 1.4MHz 16QAM LOW Ch RB6-0



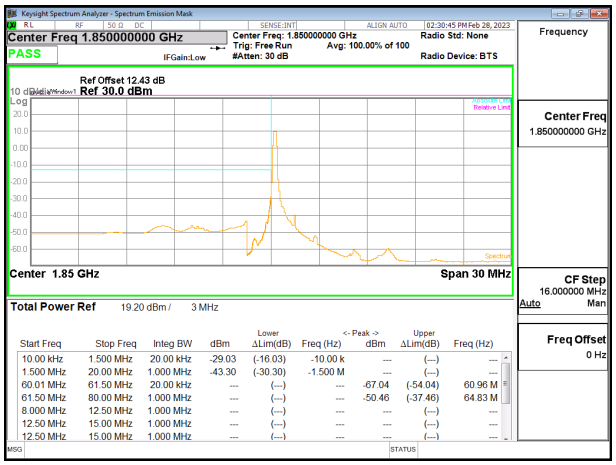

LTE2 1.4MHz 16QAM HIGH Ch RB1-0



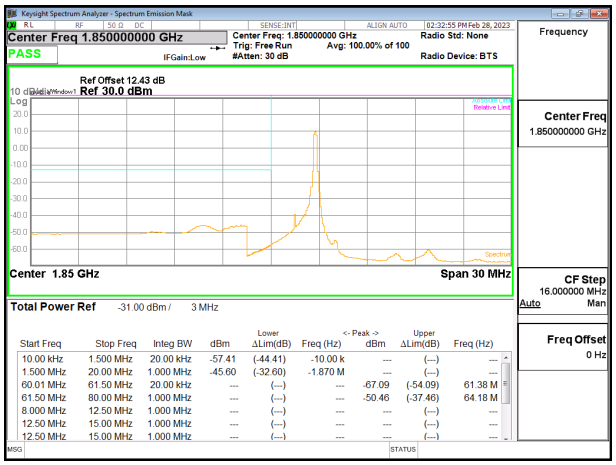

LTE2 1.4MHz 16QAM HIGH Ch RB1-5



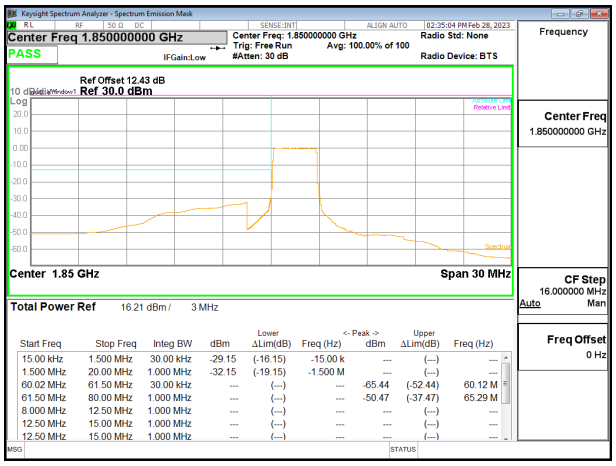

LTE2 1.4MHz 16QAM HIGH Ch RB6-0



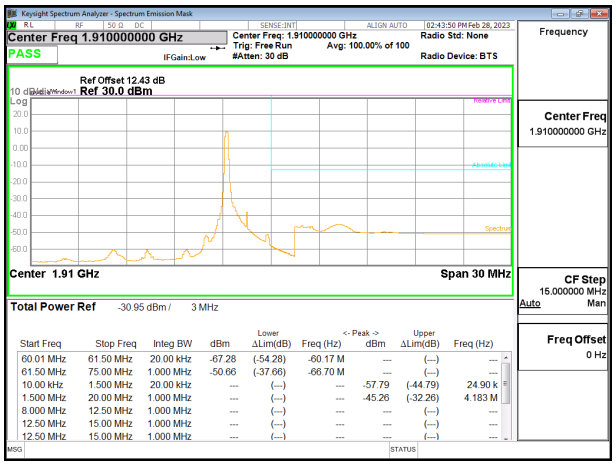

LTE2 3MHz QPSK LOW Ch RB1-0



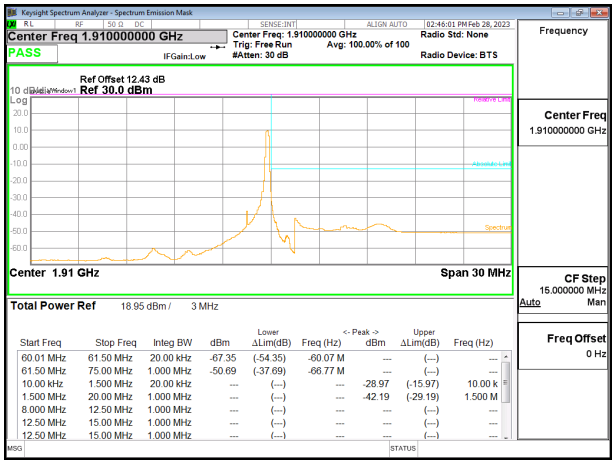

LTE2 3MHz QPSK LOW Ch RB1-14



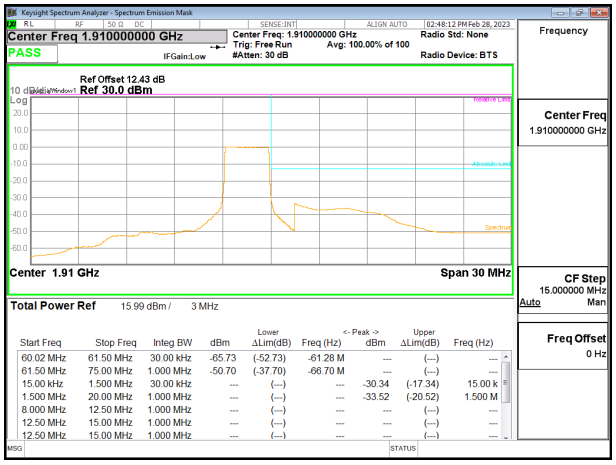

LTE2 3MHz QPSK LOW Ch RB15-0



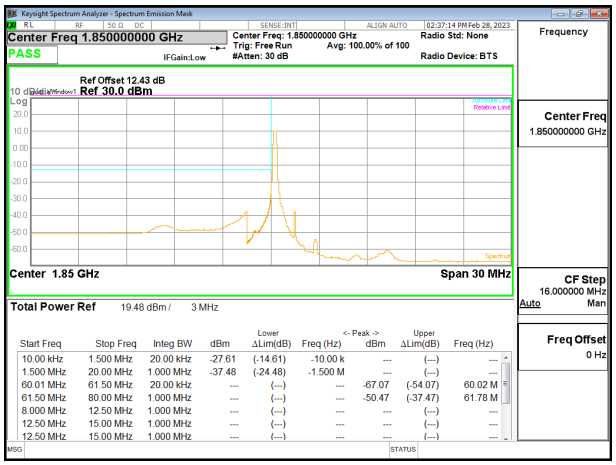

LTE2 3MHz QPSK HIGH Ch RB1-0



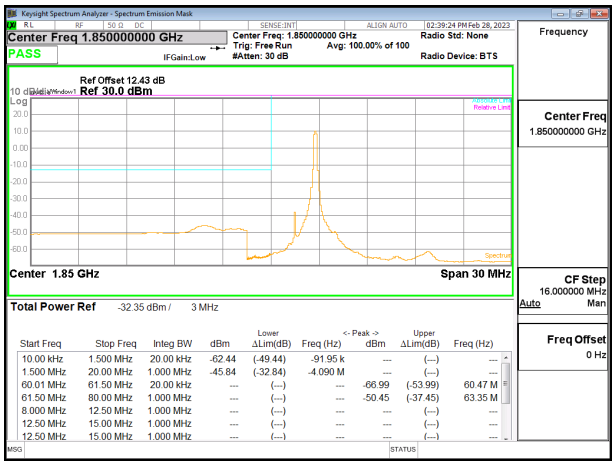

LTE2 3MHz QPSK HIGH Ch RB1-14



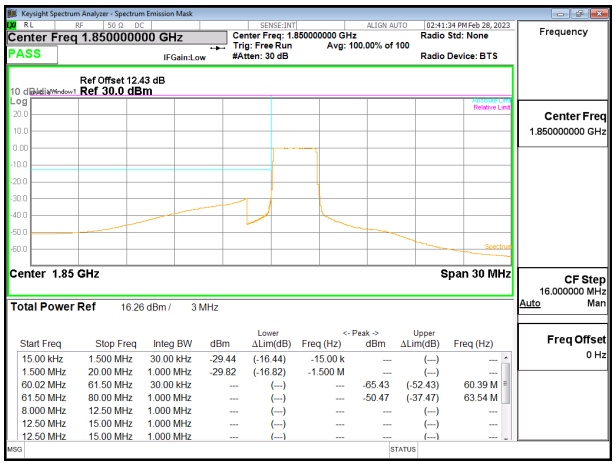

LTE2 3MHz QPSK HIGH Ch RB15-0



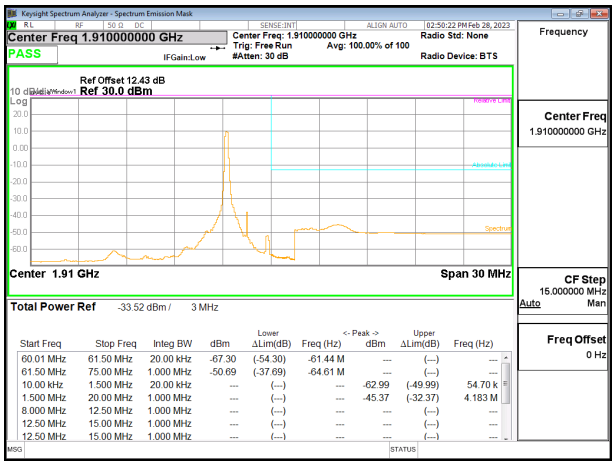

LTE2 3MHz 16QAM LOW Ch RB1-0



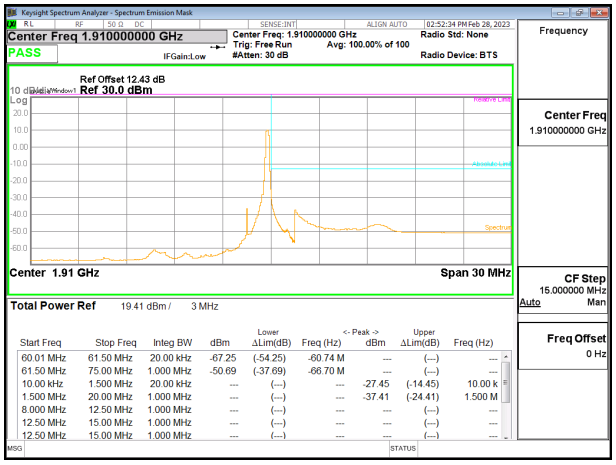

LTE2 3MHz 16QAM LOW Ch RB1-14



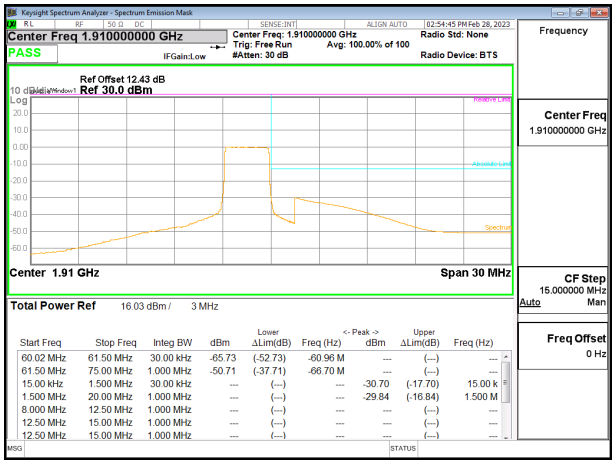

LTE2 3MHz 16QAM LOW Ch RB15-0




LTE2 3MHz 16QAM HIGH Ch RB1-0




LTE2 3MHz 16QAM HIGH Ch RB1-14




LTE2 3MHz 16QAM HIGH Ch RB15-0