# TEST REPORT

**Report Number:** R15175160-E1

| | | |
|---|---|---|
| **Applicant** | : | Sony Corporation<br>1-7-1 Konan Minato-Ku<br>Tokyo, 108-0075, Japan |
| **FCC ID** | : | PY7-27433F |
| **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:**
2024-04-12

**Prepared by:**
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ACCREDITED
CERT #0751.06

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 2024-04-12 | Initial Review | Noah Bennett |

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# 1. ATTESTATION OF TEST RESULTS

| | |
|---|---|
| **COMPANY NAME:** | Sony Corporation<br>1-7-1 Konan Minato-Ku<br>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 NUMBERS:** | QV77004EL3, QV7700BLLD, QV7700CDLD |
| **SAMPLE RECEIPT DATE:** | 2024-02-19 |
| **DATE TESTED:** | 2024-03-27 to 2024-04-11 |

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| FCC CFR 47 Part 2, Part 22, Part 24, 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. This report must not be used by the client to claim product certification, approval, or endorsement by a2La, NIST, or any agency of the U.S. government.

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# 2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer 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. EUT Cable loss (see section 8)
3. Supported bands, bandwidths, modulations, power settings, and MPR configurations. (section 6.5)

| Requirement Description | Band | Requirement Clause Number (FCC) | Result | Remarks |
|---|---|---|---|---|
| Effective Radiated Power | 5 | 22.913 (a)(5) | Complies | N/A |
| | 12 | 27.50 (c) (10) | Complies | N/A |
| | 13 | 27.50 (b) (10) | Complies | N/A |
| | 17 | 27.50 (c) (10) | Complies | N/A |
| Equivalent Isotropic Radiated Power | 2, 25 | 24.232 (c) | Complies | N/A |
| | 4, 66 | 27.50 (d) (4) | Complies | N/A |
| | 41 | 27.50 (h) (2) | Complies | N/A |

| Requirement Description | Requirement Clause Number (FCC) | Result | Remarks |
|---|---|---|---|
| Occupied Bandwidth | 2.1049 | Complies | N/A |
| Band Edge and Emission Mask | 2.1051, 22.917 (a), 24.238 (a), 27.53 (h), 27.53 (m)(4) & (m)(6), 27.53 (g), 27.53 (c) (f), | Complies | N/A |
| Out of Band Emissions | | Complies | N/A |
| Frequency Stability | 2.1055, 22.355, 24.235, 27.54 | Complies | N/A |
| Peak-to-Average Ratio | 22.913 (d), 24.232(d), 27.50(d)(5), | Complies | N/A |
| Field Strength of Spurious Radiation | 2.1051, 22.917 (a), 24.238 (a), 27.53 (h), 27.53 (m)(4) & (m)(6), 27.53 (g), 27.53 (c) (f), | Complies | N/A |

# 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, 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, Certificate Number 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) |
| Power Spectral Density, conducted | 2.47 dB |
| Unwanted Emissions, conducted | 1.94 dB |
| All emissions, radiated | 6.01 dB |
| Conducted Emissions (0.150-30MHz) - LISN | 3.40 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

# 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 test report covers the WWAN radio portion of the EUT.

The EUT supports the following WWAN Bands and their antenna configurations:

| WWAN Bands | Main 1 Antenna | Main 2 Antenna |
|---|---|---|
| GSM1900, WCDMA2, LTE Band 2 | - | Y |
| WCDMA4, LTE Band 4 | - | Y |
| GSM850, WCDMA5, LTE Band 5 | Y | - |
| LTE Band 12 | Y | - |
| LTE Band 13 | Y | - |
| LTE Band 17 | Y | - |
| LTE Band 25 | - | Y |
| LTE Band 41 | - | Y |
| LTE Band 66 | - | Y |

## 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 | 33.10 | -5.31 | 7.0 | 25.64 | 0.366 | 245.71 | 246KGXW |
| | EGPRS | 27.60 | | | 20.14 | 0.103 | 252.4 | 252KG7W |

**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 | 28.20 | -3.49 | 2.0 | 24.71 | 0.296 | 240.77 | 241KGXW |
| | EGPRS | 26.30 | | | 22.81 | 0.191 | 245.74 | 246KG7W |

## WCDMA MODE

| Part 22 Band 5 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency range (MHz) | Modulation | Conducted (Average) (dBm) | Antenna Gain (dBi) | Limit (W) | ERP | | 99% BW (kHz) | Emission Designator |
| | | | | | (dBm) | (W) | | |
| 826.4-846.6 | REL 99 | 22.53 | -5.31 | 7.0 | 15.07 | 0.032 | 4141.3 | 4M14F9W |
| | HSUPA | 21.57 | | | 14.11 | 0.026 | 4140.3 | 4M14F9W |
| **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 | -3.49 | 2.0 | 15.31 | 0.034 | 4153.3 | 4M15F9W |
| | HSDPA | 18.68 | | | 15.19 | 0.033 | 4172.8 | 4M17F9W |
| **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 | 20.53 | -2.88 | 1.0 | 17.65 | 0.058 | 4177.1 | 4M18F9W |
| | HSUPA | 20.46 | | | 17.58 | 0.057 | 4150.1 | 4M15F9W |

## LTE BAND 5

| Part 22H | |
|---|---|
| ERP Limit (W) | 7.00 |
| Antenna Gain (dBi) | -5.31 |

| 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 | 824.7 | 848.3 | 21.29 | 13.83 | 0.024 | 1093.8 | 1M09G7W |
| | 64QAM | | | 21.65 | 14.19 | 0.026 | 1102.4 | 1M10D7W |
| 3.0 | QPSK | 825.5 | 847.5 | 21.40 | 13.94 | 0.025 | 2705.3 | 2M71G7W |
| | 16QAM | | | 21.82 | 14.36 | 0.027 | 2706.5 | 2M71D7W |
| 5.0 | QPSK | 826.5 | 846.5 | 21.43 | 13.97 | 0.025 | 4495.8 | 4M50G7W |
| | 16QAM | | | 21.79 | 14.33 | 0.027 | 4469.1 | 4M47D7W |
| 10.0 | QPSK | 829.0 | 844.0 | 21.35 | 13.89 | 0.024 | 8970.4 | 8M97G7W |
| | 16QAM | | | 21.69 | 14.23 | 0.026 | 8982.9 | 8M98D7W |

## LTE BAND 12

| Part 27 | |
|---|---|
| ERP Limit (W) | 3.00 |
| Antenna Gain (dBi) | -5.15 |

| 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 | 21.08 | 13.78 | 0.024 | 1091 | 1M09G7W |
| | 16QAM | | | 21.40 | 14.10 | 0.026 | 1097 | 1M10D7W |
| 3.0 | QPSK | 700.5 | 714.5 | 21.16 | 13.86 | 0.024 | 2709.7 | 2M71G7W |
| | 16QAM | | | 21.47 | 14.17 | 0.026 | 2706.8 | 2M71D7W |
| 5.0 | QPSK | 701.5 | 713.5 | 21.16 | 13.86 | 0.024 | 4504.5 | 4M50G7W |
| | 16QAM | | | 21.50 | 14.20 | 0.026 | 4491.6 | 4M49D7W |
| 10.0 | QPSK | 704.0 | 711.0 | 21.14 | 13.84 | 0.024 | 8975.2 | 8M98G7W |
| | 64QAM | | | 21.39 | 14.09 | 0.026 | 8967.9 | 8M97D7W |

**LTE BAND 13**

| Part 27 | |
|---|---|
| ERP Limit (W) | 3.00 |
| Antenna Gain (dBi) | -4.52 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 5.0 | QPSK | 779.5 | 784.5 | 21.27 | 14.60 | 0.029 | 4502.4 | 4M50G7W |
| | 16QAM | | | 21.36 | 14.69 | 0.029 | 4509 | 4M51D7W |
| 10.0 | QPSK | 782.0 | 782.0 | 21.01 | 14.34 | 0.027 | 8957.9 | 8M96G7W |
| | 64QAM | | | 21.25 | 14.58 | 0.029 | 8966.4 | 8M97D7W |

**LTE BAND 25**

| Part 24 | |
|---|---|
| EIRP Limit (W) | 2.00 |
| Antenna Gain (dBi) | -3.49 |

| 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 | 1914.3 | 18.08 | 14.59 | 0.029 | 1092.6 | 1M09G7W |
| | 64QAM | | | 18.43 | 14.94 | 0.031 | 1098.1 | 1M10D7W |
| 3.0 | QPSK | 1851.5 | 1913.5 | 18.12 | 14.63 | 0.029 | 2703.3 | 2M70G7W |
| | 16QAM | | | 18.45 | 14.96 | 0.031 | 2706.1 | 2M71D7W |
| 5.0 | QPSK | 1852.5 | 1912.5 | 18.18 | 14.69 | 0.029 | 4503.5 | 4M50G7W |
| | 16QAM | | | 18.56 | 15.07 | 0.032 | 4507.6 | 4M51D7W |
| 10.0 | QPSK | 1855.0 | 1910.0 | 18.16 | 14.67 | 0.029 | 8991.6 | 8M99G7W |
| | 64QAM | | | 18.42 | 14.93 | 0.031 | 8980.2 | 8M98D7W |
| 15.0 | QPSK | 1857.5 | 1907.5 | 18.17 | 14.68 | 0.029 | 13463 | 13M5G7W |
| | 64QAM | | | 18.40 | 14.91 | 0.031 | 13471 | 13M5D7W |
| 20.0 | QPSK | 1860.0 | 1905.0 | 18.23 | 14.74 | 0.030 | 17945 | 17M9G7W |
| | 64QAM | | | 18.55 | 15.06 | 0.032 | 17938 | 17M9D7W |

**LTE BAND 41**

| Part 27 | |
|---|---|
| EIRP Limit (W) | 2.00 |
| Antenna Gain (dBi) | -1.17 |

| Bandwidth (MHz) | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
|---|---|---|---|---|---|---|---|---|
| 5.0 | QPSK | 2498.5 | 2687.5 | 18.51 | 17.34 | 0.054 | 4493.1 | 4M49G7W |
| | 16QAM | | | 18.64 | 17.47 | 0.056 | 4503.3 | 4M50D7W |
| 10.0 | QPSK | 2501.0 | 2685.0 | 18.56 | 17.39 | 0.055 | 8974.4 | 8M97G7W |
| | 16QAM | | | 18.60 | 17.43 | 0.055 | 8979.1 | 8M98D7W |
| 15.0 | QPSK | 2503.5 | 2682.5 | 18.53 | 17.36 | 0.054 | 13440 | 13M4G7W |
| | 64QAM | | | 18.57 | 17.40 | 0.055 | 13462 | 13M5D7W |
| 20.0 | QPSK | 2506.0 | 2680.0 | 18.55 | 17.38 | 0.055 | 17962 | 18M0G7W |
| | 16QAM | | | 18.62 | 17.45 | 0.056 | 17957 | 18M0D7W |

**LTE BAND 66**

| Part 27 | |
|---|---|
| EIRP Limit (W) | 1.00 |
| Antenna Gain (dBi) | -2.88 |

| 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 | 1779.3 | 20.06 | 17.18 | 0.052 | 1087.5 | 1M09G7W |
| | 64QAM | | | 20.41 | 17.53 | 0.057 | 1094.9 | 1M09D7W |
| 3.0 | QPSK | 1711.5 | 1778.5 | 20.12 | 17.24 | 0.053 | 2705.4 | 2M71G7W |
| | 64QAM | | | 20.41 | 17.53 | 0.057 | 2710.5 | 2M71D7W |
| 5.0 | QPSK | 1712.5 | 1777.5 | 20.09 | 17.21 | 0.053 | 4491.6 | 4M49G7W |
| | 16QAM | | | 20.47 | 17.59 | 0.057 | 4505.5 | 4M51D7W |
| 10.0 | QPSK | 1715.0 | 1775.0 | 20.01 | 17.13 | 0.052 | 8986.2 | 8M99G7W |
| | 64QAM | | | 20.31 | 17.43 | 0.055 | 8979.1 | 8M98D7W |
| 15.0 | QPSK | 1717.5 | 1772.5 | 19.99 | 17.11 | 0.051 | 13482 | 13M5G7W |
| | 16QAM | | | 20.28 | 17.40 | 0.055 | 13478 | 13M5D7W |
| 20.0 | QPSK | 1720.0 | 1770.0 | 20.03 | 17.15 | 0.052 | 17947 | 17M9G7W |
| | 64QAM | | | 20.41 | 17.53 | 0.057 | 17932 | 17M9D7W |

## 6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.555 for conducted samples and 0.553 for radiated samples.

## 6.4. MAXIMUM ANTENNA GAIN

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

| WWAN Bands | Frequency Range (MHz) | Main 1 Antenna Gain (dBi) | Main 2 Antenna Gain (dBi) |
|---|---|---|---|
| LTE Band 5, WCDMA V, GSM850 | 824 – 849 | -5.31 | - |
| LTE Band 12/17 | 699 – 716 | -5.15 | - |
| LTE Band 13 | 777 – 787 | -4.52 | - |
| LTE Band 2/25, WCDMA2, GSM1900 | 1850 - 1915 | - | -3.49 |
| LTE Band 41 | 2496 – 2690 | - | -1.17 |
| LTE Band 4/66, WCDMA4 | 1710 – 1780 | - | -2.88 |

## 6.5. WORST-CASE CONFIGURATION AND MODE

LTE Band 2 (1850-1910MHz) is covered by LTE Band 25 because it is a subset of LTE band 25 and they have same output power and supported bandwidths.

LTE Band 4 (1710-1755MHz, 5/10/15/20MHz bandwidth) is covered by LTE Band 66 because it is a subset of LTE band 66 and they have same output power.

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 an engineering evaluation made on conducted average power on different modulations found during pretesting. Output power measurements were measured on GPRS and EGPRS for GSM, Rel.99, HSDPA, HSUPA, and DC-HSDPA for WCDMA, and QPSK, 16QAM, and 64QAM modulations for LTE. The modulations with the highest output power were selected as worst-case.

Conducted tests were performed on the worst-case antenna port per band, with spot check tests performed on all other antennas with lower output power. Only the worst-case conducted antenna port band data is reported. Full Radiated Emissions Testing on each antenna was performed and reported. For testing purposes, test data in section 9 and 10 was set at or above target power for all bands.

The following is the worst-case antenna port, for Conducted Output Power:

| LTE and 5G NR Bands | Worst-case Antenna port for Conducted output power | Worst-case Modulation for Conducted Output Power as tested |
|---|---|---|
| GSM1900<br>WCDMA 2<br>LTE BAND 25 | Main 2 | GPRS (GSM)<br>Rel. 99 (WCDMA)<br>16QAM (LTE) |
| GSM850<br>WCDMA 5<br>LTE BAND 5 | Main 1 | GPRS (GSM)<br>Rel. 99 (WCDMA)<br>16QAM (LTE) |
| LTE BAND 12 | Main 1 | 16QAM |
| LTE BAND 13 | Main 1 | 16QAM |
| LTE BAND 41 | Main 2 | 16QAM |
| WCDMA 4<br>LTE BAND 66 | Main 2 | Rel. 99 (WCDMA)<br>16QAM (LTE) |

The EUT was investigated in three orthogonal orientations X/Y/Z on both Low Band (Fundamental Below 1GHz) and Mid Band (Fundamental between 1-3GHz) over all antennas to find the worst-case orientation. For Simultaneous Tx scans in which there are two or more $F_c$ ranges with different worst-case orientations, scans were performed in the orientation with the highest output power, and sufficient margin was added to cover other orientations.

The following is the worst-case orientations:

| WWAN Bands | Main **1** **Antenna** | Main **2** **Antenna** |
|---|---|---|
| Low Band ($F_c$ <1GHz) | Y | - |
| Mid Band (1GHz < $F_c$ < 3GHz) | - | X |

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

Radiated Emission tests were performed on the lowest order modulation, at the highest BW configuration, at the lowest RB configuration to maximize emissions.

Worst Case emissions from 9kHz-30Mhz, 30-1000MHz, 18-26.5GHz, and 26.5GHz-40GHz were done on the modes with the highest conducted average power. This test data is reported in section 10.2, which shows worst case emissions per antenna.

Simultaneous transmission was also investigated for various configurations that yielded the highest power, and least separation in frequencies as a worst-case scenario.

The following scans were investigated for simultaneous transmission:

| Scan # | Mode | Mode | Mode |
|---|---|---|---|
| 1 | LTE B66 QPSK, 20M, RB1-49, 1745MHz (Main2) | BT GFSK C0 2441MHz | WLAN UNII-1 11ax HE20 26T RU4 MCS0 5240MHz (CH 48) MIMO |
| 2 | LTE B66 QPSK, 20M, RB1-49, 1745MHz [(Main2) | BT GFSK C1 2441MHz | WLAN UNII-1 11ax HE20 26T RU4 MCS0 5240MHz (CH 48) MIMO |
| 3 | LTE B66 QPSK, 20M, RB1-49, 1745MHz (Main2) | 2442MHz 11g 6Mbps MIMO | - |
| 4 | LTE B41 PC3, QPSK, 20M, RB1-49, 2620MHz (Main 2) | WLAN UNII-5 11ax HE40 484T RU65 MCS0 6365MHz (CH 83) MIMO | - |
| 6 | LTE B12 QPSK, 10M, RB1-24, 704MHz (Main1) | 2462MHz 11g 6Mbps MIMO | - |

## 6.6. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adaptor | Sony | XQZ-UC1 | 3223W09206247 | NA |
| Headphones | Sony | MDR-EX15AP | NA | NA |

**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 | |

**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**

See R15175160-EP1 for Setup Photos and Setup Diagrams

# 7. TEST AND MEASUREMENT EQUIPMENT

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

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

| Equipment ID | Description | Manufacturer | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **Common Equipment** | | | | |
| | **Conducted Room 1** | | | | |
| 90416 | Spectrum Analyzer | Keysight Technologies | N9030A | 2023-06-09 | 2024-06-30 |
| 179892 | Environmental Meter | Fisher Scientific | 15-077-963 | 2023-07-26 | 2024-06-31 |
| 76022 | DC Regulated Power Supply | CircuitSpecialists.Com | CSI3005X5 | NA | NA |
| | **Conducted Room 2** | | | | |
| 238710 | Environmental Meter | Fisher Scientific | 15-077-963 | 2023-06-27 | 2024-06-27 |
| 76021 | DC Regulated Power Supply | CircuitSpecialists.Com | CSI3005X5 | NA | NA |
| | **Additional Equipment** | | | | |
| 208721 | Wideband Radio Communications Tester | Rohde and Schwarz | CMW500 | 2023-06-06 | 2024-06-06 |
| 212967 | Wideband Radio Communications Tester | Rohde and Schwarz | CMW500 | 2024-01-03 | 2025-01-03 |

**Test Equipment Used - Wireless Conducted Attenuators, Cables, and Couplers**

| Equipment ID | Description | Manufacturer | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **Attenuators** | | | | |
| 226552 | SMA Coaxial 10dB Attenuator 25MHz-18GHz | CentricRF | C18S2-10 | 2024-03-01 | 2025-03-01 |
| 226562 | SMA Coaxial 20dB Attenuator 25MHz-18GHz | CentricRF | C18S2-20 | 2024-03-01 | 2025-03-01 |
| 226559 | SMA Coaxial 10dB Attenuator 25MHz-18GHz | CentricRF | C18S2-10 | 2024-03-01 | 2025-03-01 |
| | **Cables** | | | | |
| CBL034 | SMA Cable | Sucoflex | 104PEA | 2023-11-29 | 2024-11-29 |
| CBL091 | Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz | Sucoflex | UFA147A-2-0360-200200 | 2024-03-01 | 2025-03-01 |
| 246507 | 25MHz-18GHz, SMA, 6FT | Pasternack | PE341-72 | 2024-03-26 | 2025-03-26 |
| CBL246259 | SMA Male to SMA Male Cable – 24” | Pasternack | PE336-24 | 2024-03-19 | 2025-03-19 |
| CBL010<br>245309 | SMA Male to SMA Male Cable - 36" | Huber+Suhner | Sucoflex 104PEA | 2023-02-17<br>2024-03-01 | 2024-02-29<br>2025-03-01 |
| | **Couplers** | | | | |
| 238020 | Ultra-Wideband Directional Coupler 0.5-18GHz | Mini-Circuits | ZUDC10-183+ | 2023-07-12 | 2024-07-12 |
| 238018 | Ultra-Wideband Directional Coupler 0.5-18GHz | Mini-Circuits | ZUDC10-183+ | 2023-07-13 | 2024-07-13 |

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

| Equip. ID | Description | Manufacturer | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **0.009-30MHz** | | | | |
| 135144 | Active Loop Antenna | ETS-Lindgren | 6502 | 2024-01-24 | 2025-01-24 |
| | **30-1000 MHz** | | | | |
| 90629 | Hybrid Broadband Antenna | Sunol Sciences Corp. | JB3 | 2024-01-30 | 2026-01-30 |
| | **1-18 GHz** | | | | |
| 135143 | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | 2024-02-07 | 2026-02-07 |
| | **18-40 GHz** | | | | |
| 204704 | Horn Antenna, 18-26.5GHz | Com-Power | AH-826 | 2023-07-20 | 2025-07-20 |
| 204705 | Horn Antenna, 26-40GHz | Com-Power | AH-640 | 2023-07-20 | 2025-07-20 |
| | **Gain-Loss Chains** | | | | |
| 91974 | Gain-loss string: 0.009-30MHz | Various | Various | 2023-05-16 | 2024-05-16 |
| 91976 | Gain-loss string: 25-1000MHz | Various | Various | 2023-05-16 | 2024-05-16 |
| 91979 | Gain-loss string: 1-18GHz | Various | Various | 2023-05-16 | 2024-05-16 |
| 135999 | Gain-loss string: 18-40GHz | Various | Various | 2023-05-16 | 2024-05-16 |
| | **Receiver & Software** | | | | |
| 206496 | Spectrum Analyzer | Rohde & Schwarz | ESW44 | 2023-07-19 | 2024-07-19 |
| 81018 | Spectrum Analyzer | Agilent | E4446A | 2023-08-01 | 2024-08-01 |
| SOFTEMI | EMI Software | UL | Version 9.5 (18 Oct 2021) | | |
| | **Additional Equipment used** | | | | |
| 241205 | Environmental Meter | Fisher Scientific | 15-077-963 | 2023-09-05 | 2025-09-05 |
| 212967 | Wideband Radio Communications Tester | Rohde and Schwarz | CMW500 | 2024-01-03 | 2025-01-03 |
| PS216 | AC Power Source | Elgar | CW2501M | NA | NA |
| 150716 (LPF008) | DC-1000MHz low-pass filter | Pasternack | PE8720 | 2024-03-04 | 2025-03-04 |
| 77412 (BRF001) | 900MHz notch filter, 2W, Fhigh =6GHz | Micro-Tronics | BRM50706 | 2024-03-04 | 2025-03-04 |
| 198917 | 1GHz high-pass filter, 2W, Fhigh =18GHz | Micro-Tronics | HPM18129-02 | 2024-03-01 | 2025-03-01 |
| 169107 (BRF009) | 1.8-2.0GHz notch filter, 2W, Fhigh = 9GHz | Micro-Tronics | BRM50707-01 | 2024-03-01 | 2025-03-01 |
| 169106 (BRF008) | 1710-1785MHz notch filter, 2W, Fhigh = 9GHz | Micro-Tronics | BRM50713-01 | 2024-03-01 | 2025-03-01 |
| 169108 (BRF010) | 1.85-1.97GHz notch filter, 2W, Fhigh = 9GHz | Micro-Tronics | BRM50714-01 | 2024-03-01 | 2025-03-01 |

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

| Equip. ID | Description | Manufacturer/Brand | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **1-18 GHz** | | | | |
| 89509 | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | 2023-05-23 | 2025-05-23 |
| | **Gain-Loss Chains** | | | | |
| 207640 | Gain-loss string: 1-18GHz | Various | Various | 2023-05-17 | 2024-05-17 |
| | **Receiver & Software** | | | | |
| 197955 | Spectrum Analyzer | Rohde & Schwarz | ESW44 | 2023-04-10 | 2024-04-10 |
| SOFTEMI | EMI Software | UL | Version 9.5 (18 Oct 2021) | | |
| | **Additional Equipment used** | | | | |
| 241204 | Environmental Meter | Fisher Scientific | 15-077-963 | 2023-09-05 | 2025-09-05 |
| 231408 (BRF011) | 2.495-2.690GHz notch filter, 2W, Fhigh = 18GHz | Micro-Tronics | BRM50709-01 | 2024-03-01 | 2025-03-01 |
| 169106 (BRF008) | 1710-1785MHz notch filter, 2W, Fhigh = 9GHz | Micro-Tronics | BRM50713-01 | 2024-03-01 | 2025-03-01 |
| 207620 | Wideband Radio Communications Tester | Anritsu | MT8821C | 2022-07-03 | 2023-07-03 |
| PS216 | AC Power Source | Elgar | CW2501M | NA | NA |

**NOTES:**

1. * Testing is completed before the equipment's expiration date.
2. 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 | |
| | > 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: | 22797/85502 | Test Date: | 4/1/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Maximum Average Power (dBm) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | | Tune-up Limit | |
| | | | | | Burst Pwr | Frame Pwr | Burst Pwr | Frame Pwr |
| GPRS/EDGE (GMSK) | CS1 | 1 | 128 | 824.2 | 33.1 | 24.1 | 33.5 | 24.5 |
| | | | 190 | 836.6 | 32.8 | 23.7 | | |
| | | | 251 | 848.8 | 32.7 | 23.7 | | |
| | | 2 | 128 | 824.2 | 29.6 | 23.6 | 30.5 | 24.5 |
| | | | 190 | 836.6 | 29.5 | 23.5 | | |
| | | | 251 | 848.8 | 29.8 | 23.8 | | |
| | | 3 | 128 | 824.2 | 27.8 | 23.6 | 28.7 | 24.4 |
| | | | 190 | 836.6 | 27.9 | 23.6 | | |
| | | | 251 | 848.8 | 27.8 | 23.6 | | |
| | | 4 | 128 | 824.2 | 26.5 | 23.4 | 27.5 | **24.5** |
| | | | 190 | 836.6 | 26.8 | 23.8 | | |
| | | | 251 | 848.8 | 26.8 | 23.8 | | |
| EDGE (8PSK) | MCS5 | 1 | 128 | 824.2 | 27.4 | 18.4 | 28.0 | 19.0 |
| | | | 190 | 836.6 | 27.5 | 18.5 | | |
| | | | 251 | 848.8 | 27.6 | 18.5 | | |
| | | 2 | 128 | 824.2 | 24.2 | 18.2 | 25.0 | 19.0 |
| | | | 190 | 836.6 | 24.3 | 18.3 | | |
| | | | 251 | 848.8 | 24.3 | 18.3 | | |
| | | 3 | 128 | 824.2 | 22.4 | 18.1 | 23.2 | 18.9 |
| | | | 190 | 836.6 | 22.4 | 18.2 | | |
| | | | 251 | 848.8 | 22.5 | 18.2 | | |
| | | 4 | 128 | 824.2 | 21.2 | 18.2 | 22.0 | 19.0 |
| | | | 190 | 836.6 | 21.3 | 18.3 | | |
| | | | 251 | 848.8 | 21.4 | 18.3 | | |

## 8.1.2. GSM850 DTM

| Test Engineer ID: | 22797/85502 | Test Date: | 4/1/2024<br>4/5/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Maximum Average Power (dBm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | | | | Tune-up Limit | | | |
| | | | | | CS Burst Pwr | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr | CS Burst Pwr | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr |
| GSM (Voice) + GPRS/EDGE (GMSK) | CS1 | 1 | 128 | 824.2 | 33.1 | | 24.1 | | 33.5 | | 24.5 | |
| | | | 190 | 836.6 | 32.8 | | 23.7 | | | | | |
| | | | 251 | 848.8 | 32.7 | | 23.7 | | | | | |
| | | 2 | 128 | 824.2 | 29.6 | 29.3 | 23.6 | 23.2 | 30.5 | 30.5 | **24.5** | **24.5** |
| | | | 190 | 836.6 | 29.5 | 28.9 | 23.5 | 22.9 | | | | |
| | | | 251 | 848.8 | 29.8 | 29.2 | 23.8 | 23.1 | | | | |
| | | 3 | 128 | 824.2 | 27.8 | 27.2 | 23.6 | 22.9 | 28.7 | 28.7 | 24.4 | 24.4 |
| | | | 190 | 836.6 | 27.9 | 27.3 | 23.6 | 23.1 | | | | |
| | | | 251 | 848.8 | 27.8 | 27.1 | 23.6 | 22.9 | | | | |
| GSM (Voice) + EDGE (8PSK) | MCS5 | 1 | 128 | 824.2 | 33.1 | | 24.1 | | 33.5 | | 24.5 | |
| | | | 190 | 836.6 | 32.8 | | 23.7 | | | | | |
| | | | 251 | 848.8 | 32.7 | | 23.7 | | | | | |
| | | 2 | 128 | 824.2 | 29.6 | 24.0 | 23.6 | 18.0 | 30.5 | 25.0 | **24.5** | 19.0 |
| | | | 190 | 836.6 | 29.5 | 23.5 | 23.5 | 17.5 | | | | |
| | | | 251 | 848.8 | 29.8 | 23.8 | 23.8 | 17.8 | | | | |
| | | 3 | 128 | 824.2 | 27.8 | 21.2 | 23.6 | 16.9 | 28.7 | 23.2 | 24.4 | 18.9 |
| | | | 190 | 836.6 | 27.9 | 22.0 | 23.6 | 17.7 | | | | |
| | | | 251 | 848.8 | 27.8 | 22.0 | 23.6 | 17.8 | | | | |

## 8.1.3. GSM1900

| Test Engineer ID: | 22797/85502 | Test Date: | 4/1/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Maximum Average Power (dBm) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | | Tune-up Limit | |
| | | | | | Burst Pwr | Frame Pwr | Burst Pwr | Frame Pwr |
| GPRS/EDGE (GMSK) | CS1 | 1 | 512 | 1850.2 | 27.6 | 18.6 | 29.0 | 20.0 |
| | | | 661 | 1880.0 | 27.4 | 18.4 | | |
| | | | 810 | 1909.8 | 28.2 | 19.1 | | |
| | | 2 | 512 | 1850.2 | 24.9 | 18.8 | 26.0 | 20.0 |
| | | | 661 | 1880.0 | 24.9 | 18.8 | | |
| | | | 810 | 1909.8 | 25.4 | 19.3 | | |
| | | 3 | 512 | 1850.2 | 23.1 | 18.8 | 24.2 | 19.9 |
| | | | 661 | 1880.0 | 23.2 | 19.0 | | |
| | | | 810 | 1909.8 | 23.6 | 19.4 | | |
| | | 4 | 512 | 1850.2 | 21.8 | 18.8 | 23.0 | **20.0** |
| | | | 661 | 1880.0 | 22.1 | 19.0 | | |
| | | | 810 | 1909.8 | 22.6 | 19.6 | | |
| EDGE (8PSK) | MCS5 | 1 | 512 | 1850.2 | 25.8 | 16.8 | 27.0 | 18.0 |
| | | | 661 | 1880.0 | 26.0 | 16.9 | | |
| | | | 810 | 1909.8 | 26.3 | 17.3 | | |
| | | 2 | 512 | 1850.2 | 23.2 | 17.1 | 24.0 | 18.0 |
| | | | 661 | 1880.0 | 23.2 | 17.2 | | |
| | | | 810 | 1909.8 | 23.7 | 17.7 | | |
| | | 3 | 512 | 1850.2 | 21.4 | 17.1 | 22.2 | 17.9 |
| | | | 661 | 1880.0 | 21.7 | 17.5 | | |
| | | | 810 | 1909.8 | 22.2 | 17.9 | | |
| | | 4 | 512 | 1850.2 | 19.9 | 16.9 | 21.0 | 18.0 |
| | | | 661 | 1880.0 | 20.3 | 17.3 | | |
| | | | 810 | 1909.8 | 20.8 | 17.8 | | |

## 8.1.4. GSM1900 DTM

| Test Engineer ID: | 22797/85502 | Test Date: | 4/1/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Mode | Coding Scheme | Time Slots | Ch No. | Freq. (MHz) | Maximum Average Power (dBm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Measured | | | | Tune-up Limit | | | |
| | | | | | CS Burst Pwr | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr | CS Burst Pwr | PS Burst Pwr | CS Frame Pwr | PS Frame Pwr |
| GSM (Voice) + GPRS/EDGE (GMSK) | CS1 | 1 | 512 | 1850.2 | 27.6 | | 18.6 | | 29.0 | | 20.0 | |
| | | | 661 | 1880.0 | 27.4 | | 18.4 | | | | | |
| | | | 810 | 1909.8 | 28.2 | | 19.1 | | | | | |
| | | 2 | 512 | 1850.2 | 24.9 | 24.4 | 18.8 | 18.4 | 26.0 | 26.0 | **20.0** | **20.0** |
| | | | 661 | 1880.0 | 24.9 | 24.5 | 18.8 | 18.4 | | | | |
| | | | 810 | 1909.8 | 25.4 | 24.8 | 19.3 | 18.8 | | | | |
| | | 3 | 512 | 1850.2 | 23.1 | 24.1 | 18.8 | 19.8 | 24.2 | 24.2 | 19.9 | 19.9 |
| | | | 661 | 1880.0 | 23.2 | 22.2 | 19.0 | 17.9 | | | | |
| | | | 810 | 1909.8 | 23.6 | 22.8 | 19.4 | 18.5 | | | | |
| GSM (Voice) + EDGE (8PSK) | MCS5 | 1 | 512 | 1850.2 | 27.6 | | 18.6 | | 29.0 | | 20.0 | |
| | | | 661 | 1880.0 | 27.4 | | 18.4 | | | | | |
| | | | 810 | 1909.8 | 28.2 | | 19.1 | | | | | |
| | | 2 | 512 | 1850.2 | 24.9 | 22.4 | 18.8 | 16.3 | 26.0 | 24.0 | **20.0** | 18.0 |
| | | | 661 | 1880.0 | 24.9 | 22.4 | 18.8 | 16.4 | | | | |
| | | | 810 | 1909.8 | 25.4 | 23.0 | 19.3 | 16.9 | | | | |
| | | 3 | 512 | 1850.2 | 23.1 | 20.2 | 18.8 | 16.0 | 24.2 | 22.2 | 19.9 | 17.9 |
| | | | 661 | 1880.0 | 23.2 | 20.4 | 19.0 | 16.2 | | | | |
| | | | 810 | 1909.8 | 23.6 | 20.8 | 19.4 | 16.5 | | | | |

## 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.

**DUAL CARRIER HSDPA (DC-HSDPA (REL 8, CAT 24)**

The following 4 Sub-tests were for DC-HSDPA were completed according to Release 8 procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of these settings are illustrated below:

**Table C.8.1.12: Fixed Reference Channel H-Set 12**

| Parameter | Unit | Value |
|---|---|---|
| Nominal Avg. Inf. Bit Rate | kbps | 60 |
| Inter-TTI Distance | TTI's | 1 |
| Number of HARQ Processes | Processes | 6 |
| Information Bit Payload ( $N_{INF}$ ) | Bits | 120 |
| Number Code Blocks | Blocks | 1 |
| Binary Channel Bits Per TTI | Bits | 960 |
| Total Available SML's in UE | SML's | 19200 |
| Number of SML's per HARQ Proc. | SML's | 3200 |
| Coding Rate | | 0.15 |
| Number of Physical Channel Codes | Codes | 1 |
| Modulation | | QPSK |

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.

Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

**RESULT**

## 8.2.1. WCDMA BAND 2

| Test Engineer ID: | 33499/84740<br>22797/85502 | Test Date: | 3/28/2024<br>4/5/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| 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 | 18.61 |
| | | | 9400 | 1880.0 | N/A | 18.63 |
| | | | 9538 | 1907.6 | N/A | **18.80** |
| | HSDPA | Subtest 1 | 9262 | 1852.4 | 0 | 18.01 |
| | | | 9400 | 1880.0 | 0 | 18.42 |
| | | | 9538 | 1907.6 | 0 | **18.68** |
| | | Subtest 2 | 9262 | 1852.4 | 0 | 17.56 |
| | | | 9400 | 1880.0 | 0 | 17.63 |
| | | | 9538 | 1907.6 | 0 | 17.81 |
| | | Subtest 3 | 9262 | 1852.4 | 0.5 | 17.14 |
| | | | 9400 | 1880.0 | 0.5 | 17.13 |
| | | | 9538 | 1907.6 | 0.5 | 17.30 |
| | | Subtest 4 | 9262 | 1852.4 | 0.5 | 17.11 |
| | | | 9400 | 1880.0 | 0.5 | 17.14 |
| | | | 9538 | 1907.6 | 0.5 | 17.32 |
| | HSPA (HSDPA & HSUPA) | Subtest 1 | 9262 | 1852.4 | 0 | 18.31 |
| | | | 9400 | 1880.0 | 0 | 18.22 |
| | | | 9538 | 1907.6 | 0 | 18.61 |
| | | Subtest 2 | 9262 | 1852.4 | 2 | 16.48 |
| | | | 9400 | 1880.0 | 2 | 16.37 |
| | | | 9538 | 1907.6 | 2 | 16.54 |
| | | Subtest 3 | 9262 | 1852.4 | 1 | 17.51 |
| | | | 9400 | 1880.0 | 1 | 17.43 |
| | | | 9538 | 1907.6 | 1 | 17.66 |
| | | Subtest 4 | 9262 | 1852.4 | 2 | 16.49 |
| | | | 9400 | 1880.0 | 2 | 16.44 |
| | | | 9538 | 1907.6 | 2 | 16.67 |
| | | Subtest 5 | 9262 | 1852.4 | 0 | 18.45 |
| | | | 9400 | 1880.0 | 0 | 18.45 |
| | | | 9538 | 1907.6 | 0 | 18.67 |
| | DC-HSDPA | Subtest 1 | 9262 | 1852.4 | 0 | 17.60 |
| | | | 9400 | 1880.0 | 0 | 17.63 |
| | | | 9538 | 1907.6 | 0 | 17.82 |
| | | Subtest 2 | 9262 | 1852.4 | 0 | 17.58 |
| | | | 9400 | 1880.0 | 0 | 17.62 |
| | | | 9538 | 1907.6 | 0 | 17.85 |
| | | Subtest 3 | 9262 | 1852.4 | 0.5 | 17.86 |
| | | | 9400 | 1880.0 | 0.5 | 17.15 |
| | | | 9538 | 1907.6 | 0.5 | 17.35 |
| | | Subtest 4 | 9262 | 1852.4 | 0.5 | 17.13 |
| | | | 9400 | 1880.0 | 0.5 | 17.15 |

## 8.2.2. WCDMA BAND 4

| Test Engineer ID: | 33499/84740 22797/85502 | Test Date: | 3/28/2024 4/5/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| 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 | 20.40 |
| | | | 1413 | 1732.6 | N/A | 20.47 |
| | | | 1513 | 1752.6 | N/A | **20.53** |
| | HSDPA | Subtest 1 | 1312 | 1712.4 | 0 | 20.11 |
| | | | 1413 | 1732.6 | 0 | **20.46** |
| | | | 1513 | 1752.6 | 0 | 20.00 |
| | | Subtest 2 | 1312 | 1712.4 | 0 | 19.42 |
| | | | 1413 | 1732.6 | 0 | 19.48 |
| | | | 1513 | 1752.6 | 0 | 19.53 |
| | | Subtest 3 | 1312 | 1712.4 | 0.5 | 18.91 |
| | | | 1413 | 1732.6 | 0.5 | 18.98 |
| | | | 1513 | 1752.6 | 0.5 | 19.05 |
| | | Subtest 4 | 1312 | 1712.4 | 0.5 | 18.94 |
| | | | 1413 | 1732.6 | 0.5 | 18.97 |
| | | | 1513 | 1752.6 | 0.5 | 19.03 |
| | HSPA (HSDPA & HSUPA) | Subtest 1 | 1312 | 1712.4 | 0 | 20.39 |
| | | | 1413 | 1732.6 | 0 | 20.34 |
| | | | 1513 | 1752.6 | 0 | 20.37 |
| | | Subtest 2 | 1312 | 1712.4 | 2 | 18.50 |
| | | | 1413 | 1732.6 | 2 | 18.36 |
| | | | 1513 | 1752.6 | 2 | 18.93 |
| | | Subtest 3 | 1312 | 1712.4 | 1 | 19.53 |
| | | | 1413 | 1732.6 | 1 | 19.38 |
| | | | 1513 | 1752.6 | 1 | 19.39 |
| | | Subtest 4 | 1312 | 1712.4 | 2 | 18.41 |
| | | | 1413 | 1732.6 | 2 | 18.36 |
| | | | 1513 | 1752.6 | 2 | 18.37 |
| | | Subtest 5 | 1312 | 1712.4 | 0 | 20.38 |
| | | | 1413 | 1732.6 | 0 | 20.39 |
| | | | 1513 | 1752.6 | 0 | 20.42 |
| | DC-HSDPA | Subtest 1 | 1312 | 1712.4 | 0 | 19.49 |
| | | | 1413 | 1732.6 | 0 | 19.59 |
| | | | 1513 | 1752.6 | 0 | 19.58 |
| | | Subtest 2 | 1312 | 1712.4 | 0 | 19.47 |
| | | | 1413 | 1732.6 | 0 | 19.52 |
| | | | 1513 | 1752.6 | 0 | 19.62 |
| | | Subtest 3 | 1312 | 1712.4 | 0.5 | 18.99 |
| | | | 1413 | 1732.6 | 0.5 | 19.05 |
| | | | 1513 | 1752.6 | 0.5 | 19.09 |
| | | Subtest 4 | 1312 | 1712.4 | 0.5 | 19.01 |
| | | | 1413 | 1732.6 | 0.5 | 19.08 |
| | | | 1513 | 1752.6 | 0.5 | 19.11 |

## 8.2.3. WCDMA BAND 5

| Test Engineer ID: | 33499/84740 | Test Date: | 3/28/2024 | Sample SN: | QV7700BLLD |
|---|---|---|---|---|---|

| Band | Mode | | UL Ch No. | Freq. (MHz) | MPR (dB) | Conducted Average Power (dBm) |
|---|---|---|---|---|---|---|
| | | | | | | ANT 1 |
| W-CDMA Band 5 (850MHz) | Rel 99 | RMC, 12.2 kbps | 4132 | 826.4 | N/A | 22.51 |
| | | | 4183 | 836.6 | N/A | 22.49 |
| | | | 4233 | 846.6 | N/A | **22.53** |
| | HSDPA | Subtest 1 | 4132 | 826.4 | 0 | 21.50 |
| | | | 4183 | 836.6 | 0 | 21.51 |
| | | | 4233 | 846.6 | 0 | 21.53 |
| | | Subtest 2 | 4132 | 826.4 | 0 | 21.51 |
| | | | 4183 | 836.6 | 0 | 21.51 |
| | | | 4233 | 846.6 | 0 | **21.57** |
| | | Subtest 3 | 4132 | 826.4 | 0.5 | 21.01 |
| | | | 4183 | 836.6 | 0.5 | 21.02 |
| | | | 4233 | 846.6 | 0.5 | 21.04 |
| | | Subtest 4 | 4132 | 826.4 | 0.5 | 20.99 |
| | | | 4183 | 836.6 | 0.5 | 21.00 |
| | | | 4233 | 846.6 | 0.5 | 21.03 |
| | HSPA (HSDPA & HSUPA) | Subtest 1 | 4132 | 826.4 | 0 | 21.44 |
| | | | 4183 | 836.6 | 0 | 21.47 |
| | | | 4233 | 846.6 | 0 | 21.35 |
| | | Subtest 2 | 4132 | 826.4 | 2 | 19.44 |
| | | | 4183 | 836.6 | 2 | 19.43 |
| | | | 4233 | 846.6 | 2 | 19.33 |
| | | Subtest 3 | 4132 | 826.4 | 1 | 20.29 |
| | | | 4183 | 836.6 | 1 | 20.42 |
| | | | 4233 | 846.6 | 1 | 20.31 |
| | | Subtest 4 | 4132 | 826.4 | 2 | 19.55 |
| | | | 4183 | 836.6 | 2 | 19.46 |
| | | | 4233 | 846.6 | 2 | 19.32 |
| | | Subtest 5 | 4132 | 826.4 | 0 | 21.46 |
| | | | 4183 | 836.6 | 0 | 21.45 |
| | | | 4233 | 846.6 | 0 | 21.33 |
| | DC-HSDPA | Subtest 1 | 4132 | 826.4 | 0 | 21.49 |
| | | | 4183 | 836.6 | 0 | 21.51 |
| | | | 4233 | 846.6 | 0 | 21.52 |
| | | Subtest 2 | 4132 | 826.4 | 0 | 21.52 |
| | | | 4183 | 836.6 | 0 | 21.52 |
| | | | 4233 | 846.6 | 0 | 21.52 |
| | | Subtest 3 | 4132 | 826.4 | 0.5 | 21.01 |
| | | | 4183 | 836.6 | 0.5 | 20.99 |
| | | | 4233 | 846.6 | 0.5 | 21.02 |
| | | Subtest 4 | 4132 | 826.4 | 0.5 | 20.99 |
| | | | 4183 | 836.6 | 0.5 | 20.99 |
| | | | 4233 | 846.6 | 0.5 | 21.04 |

## 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 TS 36.101 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 TS 36.101.

**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 following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS 38.521-1 specification.

The allowed MPR for SRS, PUCCH formats 0, 1, 3 and 4, and PRACH shall be as specified for QPSK modulated DFTs-OFDM of equivalent RB allocation. The allowed MPR for PUCCH format 2 shall be as specified for QPSK modulated CP-OFDM of equivalent RB allocation.

**Table 6.2.2.3-1: Maximum power reduction (MPR) for power class 3**

| Modulation | | MPR (dB) | | |
|---|---|---|---|---|
| | | Edge RB allocations | Outer RB allocations | Inner RB allocations |
| DFT-s-OFDM | Pi/2 BPSK | ≤ 3.5[1] | ≤ 1.2[1] | ≤ 0.2[1] |
| | | ≤ 0.5[2] | | 0[2] |
| | Pi/2 BPSK w Pi/2 BPSK DMRS | ≤ 0.5[2] | 0[2] | |
| | QPSK | ≤ 1 | | 0 |
| | 16 QAM | ≤ 2 | | ≤ 1 |
| | 64 QAM | ≤ 2.5 | | |
| | 256 QAM | ≤ 4.5 | | |
| CP-OFDM | QPSK | ≤ 3 | | ≤ 1.5 |
| | 16 QAM | ≤ 3 | | ≤ 2 |
| | 64 QAM | ≤ 3.5 | | |
| | 256 QAM | ≤ 6.5 | | |

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0dB MPR is 26dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40% of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

**AVERAGE OUTPUT POWER TEST PROCEDURE**

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with directional coupler connected to a power meter via wideband average power sensor. Gated average output power was read directly from power meter.

**PEAK OUTPUT POWER TEST PROCEDURE**

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with directional coupler connected to a power meter via wideband peak power sensor. Peak output power was read directly from power meter.

**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 5

| Test Engineer ID: | 33499/84740 | Test Date: | 3/27/2024 | Sample SN: | QV7700BLLD |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 5 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 20407 | 20525 | 20643 |
| | | | | 824.7 MHz | 836.5 MHz | 848.3 MHz |
| 1.4 | QPSK | 1 | 0 | 21.20 | 21.28 | 21.21 |
| | | 1 | 3 | 21.17 | 21.27 | 21.16 |
| | | 1 | 5 | 21.18 | **21.29** | 21.22 |
| | | 3 | 0 | 21.15 | 21.20 | 21.22 |
| | | 3 | 1 | 21.15 | 21.19 | 21.17 |
| | | 3 | 3 | 21.16 | 21.24 | 21.17 |
| | | 6 | 0 | 21.19 | 21.22 | 21.24 |
| | 16QAM | 1 | 0 | 21.54 | 21.54 | 21.46 |
| | | 1 | 3 | 21.57 | 21.50 | 21.41 |
| | | 1 | 5 | 21.55 | **21.60** | 21.47 |
| | | 3 | 0 | 21.32 | 21.41 | 21.34 |
| | | 3 | 1 | 21.32 | 21.40 | 21.36 |
| | | 3 | 3 | 21.33 | 21.43 | 21.38 |
| | | 6 | 0 | 21.29 | 21.33 | 21.33 |
| | 64QAM | 1 | 0 | 21.57 | 21.47 | 21.57 |
| | | 1 | 3 | 21.57 | 21.52 | **21.65** |
| | | 1 | 5 | 21.52 | 21.50 | 21.57 |
| | | 3 | 0 | 21.39 | 21.43 | 21.43 |
| | | 3 | 1 | 21.37 | 21.42 | 21.40 |
| | | 3 | 3 | 21.36 | 21.47 | 21.41 |
| | | 6 | 0 | 21.24 | 21.40 | 21.34 |

**OUTPUT POWER FOR LTE BAND 5 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 20415 | 20525 | 20635 |
| | | | | 825.5 MHz | 836.5 MHz | 847.5 MHz |
| 3.0 | QPSK | 1 | 0 | 21.23 | 21.28 | 21.28 |
| | | 1 | 7 | 21.31 | 21.37 | 21.38 |
| | | 1 | 14 | 21.24 | 21.34 | 21.25 |
| | | 8 | 0 | 21.34 | 21.34 | 21.30 |
| | | 8 | 4 | 21.32 | 21.31 | 21.30 |
| | | 8 | 7 | 21.33 | **21.40** | 21.28 |
| | | 15 | 0 | 21.33 | 21.31 | 21.26 |
| | 16QAM | 1 | 0 | 21.59 | 21.71 | 21.61 |
| | | 1 | 7 | 21.65 | **21.82** | 21.64 |
| | | 1 | 14 | 21.52 | 21.78 | 21.55 |
| | | 8 | 0 | 21.37 | 21.44 | 21.36 |
| | | 8 | 4 | 21.40 | 21.41 | 21.38 |
| | | 8 | 7 | 21.37 | 21.48 | 21.37 |
| | | 15 | 0 | 21.33 | 21.35 | 21.31 |
| | 64QAM | 1 | 0 | 21.54 | 21.63 | 21.49 |
| | | 1 | 7 | 21.60 | **21.72** | 21.60 |
| | | 1 | 14 | 21.53 | 21.65 | 21.43 |
| | | 8 | 0 | 21.41 | 21.42 | 21.39 |
| | | 8 | 4 | 21.42 | 21.44 | 21.42 |
| | | 8 | 7 | 21.38 | 21.51 | 21.40 |
| | | 15 | 0 | 21.36 | 21.34 | 21.34 |

**OUTPUT POWER FOR LTE BAND 5 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | ANT 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 20425 | 20525 | 20625 |
| | | | | 826.5 MHz | 836.5 MHz | 846.5 MHz |
| 5.0 | QPSK | 1 | 0 | 21.33 | **21.43** | 21.34 |
| | | 1 | 12 | 21.26 | 21.33 | 21.28 |
| | | 1 | 24 | 21.29 | 21.36 | 21.32 |
| | | 12 | 0 | 21.30 | 21.33 | 21.30 |
| | | 12 | 6 | 21.36 | 21.32 | 21.32 |
| | | 12 | 11 | 21.32 | 21.34 | 21.32 |
| | | 25 | 0 | 21.28 | 21.28 | 21.28 |
| | 16QAM | 1 | 0 | 21.67 | 21.77 | **21.79** |
| | | 1 | 12 | 21.63 | 21.69 | 21.71 |
| | | 1 | 24 | 21.60 | 21.72 | 21.74 |
| | | 12 | 0 | 21.29 | 21.34 | 21.45 |
| | | 12 | 6 | 21.39 | 21.34 | 21.45 |
| | | 12 | 11 | 21.35 | 21.41 | 21.48 |
| | | 25 | 0 | 21.33 | 21.37 | 21.28 |
| | 64QAM | 1 | 0 | 21.58 | 21.61 | 21.63 |
| | | 1 | 12 | 21.60 | 21.62 | **21.72** |
| | | 1 | 24 | 21.58 | 21.60 | 21.70 |
| | | 12 | 0 | 21.35 | 21.41 | 21.41 |
| | | 12 | 6 | 21.40 | 21.41 | 21.46 |
| | | 12 | 11 | 21.36 | 21.46 | 21.48 |
| | | 25 | 0 | 21.37 | 21.36 | 21.32 |

**OUTPUT POWER FOR LTE BAND 5 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 20450 | 20525 | 20600 |
| | | | | 829.0 MHz | 836.5 MHz | 844.0 MHz |
| 10.0 | QPSK | 1 | 0 | 21.26 | 21.33 | 21.32 |
| | | 1 | 24 | 21.33 | 21.32 | 21.29 |
| | | 1 | 49 | 21.23 | 21.30 | 21.27 |
| | | 25 | 0 | 21.29 | 21.30 | 21.29 |
| | | 25 | 12 | **21.35** | 21.31 | 21.29 |
| | | 25 | 24 | 21.32 | **21.35** | 21.33 |
| | | 50 | 0 | 21.32 | 21.29 | 21.28 |
| | 16QAM | 1 | 0 | 21.57 | 21.64 | **21.69** |
| | | 1 | 24 | 21.45 | 21.65 | 21.66 |
| | | 1 | 49 | 21.47 | **21.69** | 21.53 |
| | | 25 | 0 | 21.34 | 21.31 | 21.33 |
| | | 25 | 12 | 21.43 | 21.35 | 21.34 |
| | | 25 | 24 | 21.37 | 21.38 | 21.38 |
| | | 50 | 0 | 21.36 | 21.32 | 21.28 |
| | 64QAM | 1 | 0 | 21.58 | 21.62 | 21.54 |
| | | 1 | 24 | 21.57 | **21.69** | 21.55 |
| | | 1 | 49 | 21.53 | 21.58 | 21.47 |
| | | 25 | 0 | 21.29 | 21.35 | 21.37 |
| | | 25 | 12 | 21.37 | 21.36 | 21.33 |
| | | 25 | 24 | 21.34 | 21.40 | 21.43 |
| | | 50 | 0 | 21.36 | 21.33 | 21.37 |

## 8.3.2. LTE BAND 12

| Test Engineer ID: | 22797/85502 | Test Date: | 3/28/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

**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 | 21.03 | 20.99 | 21.03 |
| | | 1 | 3 | 20.95 | 21.01 | 21.03 |
| | | 1 | 5 | 20.98 | 21.04 | 21.06 |
| | | 3 | 0 | 21.00 | 20.97 | 21.01 |
| | | 3 | 1 | 20.99 | 20.92 | 21.04 |
| | | 3 | 3 | 20.98 | 20.97 | 21.03 |
| | | 6 | 0 | 21.02 | 20.98 | **21.08** |
| | 16QAM | 1 | 0 | 21.22 | 21.20 | **21.40** |
| | | 1 | 3 | 21.16 | 21.25 | 21.36 |
| | | 1 | 5 | 21.19 | 21.27 | 21.34 |
| | | 3 | 0 | 21.14 | 21.14 | 21.17 |
| | | 3 | 1 | 21.13 | 21.08 | 21.15 |
| | | 3 | 3 | 21.12 | 21.16 | 21.18 |
| | | 6 | 0 | 21.09 | 21.06 | 21.10 |
| | 64QAM | 1 | 0 | 21.33 | 21.30 | 21.37 |
| | | 1 | 3 | 21.27 | 21.34 | 21.36 |
| | | 1 | 5 | 21.27 | 21.34 | **21.39** |
| | | 3 | 0 | 21.14 | 21.18 | 21.20 |
| | | 3 | 1 | 21.16 | 21.16 | 21.17 |
| | | 3 | 3 | 21.14 | 21.17 | 21.16 |
| | | 6 | 0 | 21.02 | 21.08 | 21.11 |

**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 | 21.04 | 21.05 | 21.10 |
| | | 1 | 7 | 21.15 | **21.16** | 21.15 |
| | | 1 | 14 | 21.01 | 21.00 | 21.04 |
| | | 8 | 0 | 21.10 | 21.02 | 21.08 |
| | | 8 | 4 | 21.10 | 21.03 | 21.11 |
| | | 8 | 7 | 21.06 | 21.02 | 21.11 |
| | | 15 | 0 | 21.06 | 21.03 | 21.11 |
| | 16QAM | 1 | 0 | 21.33 | 21.40 | 21.33 |
| | | 1 | 7 | 21.45 | **21.47** | 21.44 |
| | | 1 | 14 | 21.27 | 21.33 | 21.35 |
| | | 8 | 0 | 21.13 | 21.09 | 21.18 |
| | | 8 | 4 | 21.14 | 21.14 | 21.18 |
| | | 8 | 7 | 21.15 | 21.10 | 21.19 |
| | | 15 | 0 | 21.10 | 21.06 | 21.11 |
| | 64QAM | 1 | 0 | 21.31 | 21.29 | 21.37 |
| | | 1 | 7 | 21.42 | 21.43 | **21.46** |
| | | 1 | 14 | 21.26 | 21.29 | 21.31 |
| | | 8 | 0 | 21.20 | 21.04 | 21.20 |
| | | 8 | 4 | 21.19 | 21.08 | 21.22 |
| | | 8 | 7 | 21.22 | 21.03 | 21.25 |
| | | 15 | 0 | 21.12 | 21.05 | 21.13 |

**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 | 21.12 | 21.15 | 21.09 |
| | | 1 | 12 | **21.16** | **21.16** | 21.14 |
| | | 1 | 24 | 21.04 | 21.08 | 21.13 |
| | | 12 | 0 | 21.03 | 21.06 | 21.13 |
| | | 12 | 6 | 21.15 | 21.06 | 21.11 |
| | | 12 | 11 | 21.08 | 21.04 | 21.11 |
| | | 25 | 0 | 21.06 | 21.06 | 21.11 |
| | 16QAM | 1 | 0 | 21.49 | 21.42 | 21.42 |
| | | 1 | 12 | **21.50** | 21.44 | 21.40 |
| | | 1 | 24 | 21.40 | 21.42 | 21.48 |
| | | 12 | 0 | 21.04 | 21.08 | 21.24 |
| | | 12 | 6 | 21.12 | 21.06 | 21.28 |
| | | 12 | 11 | 21.07 | 21.02 | 21.25 |
| | | 25 | 0 | 21.11 | 21.08 | 21.14 |
| | 64QAM | 1 | 0 | 21.32 | 21.42 | 21.42 |
| | | 1 | 12 | 21.40 | **21.46** | 21.41 |
| | | 1 | 24 | 21.26 | 21.37 | 21.43 |
| | | 12 | 0 | 21.09 | 21.06 | 21.11 |
| | | 12 | 6 | 21.18 | 21.11 | 21.12 |
| | | 12 | 11 | 21.13 | 21.06 | 21.10 |
| | | 25 | 0 | 21.12 | 21.08 | 21.12 |

**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 | 21.09 | 21.00 | 21.08 |
| | | 1 | 24 | 21.05 | 21.07 | 21.06 |
| | | 1 | 49 | 21.06 | 21.05 | 21.09 |
| | | 25 | 0 | 21.01 | 21.06 | 21.00 |
| | | 25 | 12 | 21.10 | 21.06 | 21.13 |
| | | 25 | 24 | 21.09 | 21.12 | **21.14** |
| | | 50 | 0 | 21.11 | 21.02 | 21.11 |
| | 16QAM | 1 | 0 | 21.30 | 21.27 | 21.22 |
| | | 1 | 24 | 21.26 | 21.27 | **21.31** |
| | | 1 | 49 | 21.26 | 21.26 | 21.23 |
| | | 25 | 0 | 21.07 | 21.09 | 21.07 |
| | | 25 | 12 | 21.15 | 21.09 | 21.15 |
| | | 25 | 24 | 21.15 | 21.15 | 21.16 |
| | | 50 | 0 | 21.13 | 21.02 | 21.12 |
| | 64QAM | 1 | 0 | 21.28 | 21.35 | 21.38 |
| | | 1 | 24 | 21.32 | **21.39** | 21.32 |
| | | 1 | 49 | 21.32 | 21.38 | 21.30 |
| | | 25 | 0 | 21.06 | 21.08 | 21.04 |
| | | 25 | 12 | 21.15 | 21.09 | 21.16 |
| | | 25 | 24 | 21.12 | 21.14 | 21.16 |
| | | 50 | 0 | 21.10 | 21.07 | 21.14 |

## 8.3.3. LTE BAND 13

| Test Engineer ID: | 22797/85502 | Test Date: | 3/28/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 13 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 23205 | 23230 | 23255 |
| | | | | 779.5 MHz | 782.0 MHz | 784.5 MHz |
| 5.0 | QPSK | 1 | 0 | **21.27** | 21.01 | 21.04 |
| | | 1 | 12 | 20.97 | 21.03 | 21.10 |
| | | 1 | 24 | 20.99 | 21.02 | 21.03 |
| | | 12 | 0 | 20.91 | 20.94 | 20.95 |
| | | 12 | 6 | 21.03 | 21.01 | 20.95 |
| | | 12 | 11 | 20.97 | 21.02 | 20.99 |
| | | 25 | 0 | 20.97 | 20.92 | 20.90 |
| | 16QAM | 1 | 0 | 21.33 | 21.34 | **21.36** |
| | | 1 | 12 | 21.34 | 21.33 | 21.35 |
| | | 1 | 24 | 21.31 | 21.35 | 21.35 |
| | | 12 | 0 | 20.90 | 20.98 | 21.03 |
| | | 12 | 6 | 21.02 | 21.00 | 21.07 |
| | | 12 | 11 | 20.98 | 21.07 | 21.08 |
| | | 25 | 0 | 21.00 | 20.93 | 20.97 |
| | 64QAM | 1 | 0 | 21.16 | 21.16 | 21.23 |
| | | 1 | 12 | 21.18 | 21.23 | 21.23 |
| | | 1 | 24 | 21.24 | 21.22 | **21.34** |
| | | 12 | 0 | 20.88 | 20.84 | 20.98 |
| | | 12 | 6 | 21.02 | 20.86 | 21.01 |
| | | 12 | 11 | 20.96 | 20.88 | 21.06 |
| | | 25 | 0 | 20.96 | 20.91 | 20.90 |

**OUTPUT POWER FOR LTE BAND 13 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | N/A | 23230 | N/A |
| | | | | N/A | 782.0 MHz | N/A |
| 10.0 | QPSK | 1 | 0 | | 20.96 | |
| | | 1 | 24 | | 20.99 | |
| | | 1 | 49 | | 20.97 | |
| | | 25 | 0 | | 20.99 | |
| | | 25 | 12 | | 20.98 | |
| | | 25 | 24 | | **21.01** | |
| | | 50 | 0 | | 20.96 | |
| | 16QAM | 1 | 0 | | 21.15 | |
| | | 1 | 24 | | 21.17 | |
| | | 1 | 49 | | **21.21** | |
| | | 25 | 0 | | 20.97 | |
| | | 25 | 12 | | 21.01 | |
| | | 25 | 24 | | 21.05 | |
| | | 50 | 0 | | 20.96 | |
| | 64QAM | 1 | 0 | | 21.20 | |
| | | 1 | 24 | | **21.25** | |
| | | 1 | 49 | | 21.22 | |
| | | 25 | 0 | | 20.97 | |
| | | 25 | 12 | | 20.95 | |
| | | 25 | 24 | | 21.00 | |
| | | 50 | 0 | | 20.94 | |

## 8.3.4. LTE BAND 25

| Test Engineer ID: | 22797/85502 | Test Date: | 04/01/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 25 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 26047 | 26365 | 26683 |
| | | | | 1850.7 MHz | 1882.5 MHz | 1914.3 MHz |
| 1.4 | QPSK | 1 | 0 | 18.04 | 18.00 | 18.04 |
| | | 1 | 3 | 18.05 | 17.95 | 18.03 |
| | | 1 | 5 | 18.05 | 17.99 | 18.06 |
| | | 3 | 0 | 18.04 | 17.95 | **18.08** |
| | | 3 | 1 | 18.05 | 17.97 | 18.02 |
| | | 3 | 3 | 18.05 | 17.95 | 18.03 |
| | | 6 | 0 | **18.08** | 18.00 | **18.08** |
| | 16QAM | 1 | 0 | 18.29 | 18.19 | **18.40** |
| | | 1 | 3 | 18.23 | 18.22 | 18.39 |
| | | 1 | 5 | 18.27 | 18.18 | 18.39 |
| | | 3 | 0 | 18.15 | 18.16 | 18.19 |
| | | 3 | 1 | 18.16 | 18.15 | 18.20 |
| | | 3 | 3 | 18.17 | 18.12 | 18.18 |
| | | 6 | 0 | 18.14 | 18.11 | 18.12 |
| | 64QAM | 1 | 0 | **18.43** | 18.36 | 18.29 |
| | | 1 | 3 | 18.40 | 18.36 | 18.32 |
| | | 1 | 5 | 18.36 | 18.32 | 18.33 |
| | | 3 | 0 | 18.19 | 18.12 | 18.18 |
| | | 3 | 1 | 18.20 | 18.14 | 18.17 |
| | | 3 | 3 | 18.22 | 18.18 | 18.14 |
| | | 6 | 0 | 18.20 | 18.15 | 18.11 |

**OUTPUT POWER FOR LTE BAND 25 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 26055 | 26365 | 26675 |
| | | | | 1851.5 MHz | 1882.5 MHz | 1913.5 MHz |
| 3.0 | QPSK | 1 | 0 | 18.07 | 17.98 | 18.03 |
| | | 1 | 8 | 18.09 | 18.09 | **18.12** |
| | | 1 | 14 | 18.02 | 17.92 | 18.00 |
| | | 8 | 0 | 18.11 | 18.04 | 18.01 |
| | | 8 | 4 | 18.11 | 18.03 | 18.03 |
| | | 8 | 7 | 18.10 | 18.02 | 18.09 |
| | | 15 | 0 | 18.09 | 18.01 | 18.02 |
| | 16QAM | 1 | 0 | 18.36 | 18.22 | 18.38 |
| | | 1 | 8 | **18.45** | 18.38 | 18.42 |
| | | 1 | 14 | 18.34 | 18.26 | 18.31 |
| | | 8 | 0 | 18.14 | 18.08 | 18.10 |
| | | 8 | 4 | 18.18 | 18.08 | 18.08 |
| | | 8 | 7 | 18.15 | 18.06 | 18.17 |
| | | 15 | 0 | 18.09 | 18.02 | 18.00 |
| | 64QAM | 1 | 0 | 18.20 | 18.24 | 18.19 |
| | | 1 | 8 | 18.38 | **18.39** | 18.37 |
| | | 1 | 14 | 18.25 | 18.25 | 18.27 |
| | | 8 | 0 | 18.18 | 18.12 | 18.11 |
| | | 8 | 4 | 18.15 | 18.12 | 18.15 |
| | | 8 | 7 | 18.16 | 18.15 | 18.21 |
| | | 15 | 0 | 18.13 | 18.08 | 18.04 |

**OUTPUT POWER FOR LTE BAND 25 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 26065 | 26365 | 26665 |
| | | | | 1852.5 MHz | 1882.5 MHz | 1912.5 MHz |
| 5.0 | QPSK | 1 | 0 | **18.18** | 18.07 | 18.12 |
| | | 1 | 12 | 18.10 | 17.98 | 18.07 |
| | | 1 | 24 | 18.17 | 18.10 | 18.13 |
| | | 12 | 0 | 18.17 | 17.98 | 18.08 |
| | | 12 | 7 | **18.18** | 18.07 | 18.14 |
| | | 12 | 13 | 18.11 | 18.06 | 18.12 |
| | | 25 | 0 | 18.13 | 18.02 | 18.13 |
| | 16QAM | 1 | 0 | 18.45 | 18.48 | 18.40 |
| | | 1 | 12 | 18.43 | 18.32 | 18.41 |
| | | 1 | 24 | 18.44 | 18.38 | **18.56** |
| | | 12 | 0 | 18.21 | 17.98 | 18.19 |
| | | 12 | 7 | 18.19 | 18.05 | 18.22 |
| | | 12 | 13 | 18.14 | 18.05 | 18.19 |
| | | 25 | 0 | 18.10 | 18.05 | 18.14 |
| | 64QAM | 1 | 0 | **18.47** | 18.32 | 18.33 |
| | | 1 | 12 | 18.38 | 18.22 | 18.36 |
| | | 1 | 24 | 18.37 | 18.25 | 18.43 |
| | | 12 | 0 | 18.19 | 18.06 | 18.04 |
| | | 12 | 7 | 18.17 | 18.14 | 18.10 |
| | | 12 | 13 | 18.15 | 18.12 | 18.09 |
| | | 25 | 0 | 18.19 | 18.05 | 18.14 |

**OUTPUT POWER FOR LTE BAND 25 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 26090 | 26365 | 26640 |
| | | | | 1855 MHz | 1882.5 MHz | 1910 MHz |
| 10.0 | QPSK | 1 | 0 | 18.07 | 17.94 | 18.08 |
| | | 1 | 25 | 18.14 | 18.06 | 18.07 |
| | | 1 | 49 | 18.03 | 17.97 | 18.05 |
| | | 25 | 0 | 18.11 | 17.94 | 18.06 |
| | | 25 | 12 | 18.14 | 18.04 | 18.05 |
| | | 25 | 25 | **18.16** | 18.06 | 18.12 |
| | | 50 | 0 | 18.11 | 18.08 | 18.06 |
| | 16QAM | 1 | 0 | 18.26 | 18.14 | **18.31** |
| | | 1 | 25 | 18.24 | 18.22 | 18.30 |
| | | 1 | 49 | 18.23 | 18.22 | 18.22 |
| | | 25 | 0 | 18.11 | 17.93 | 18.08 |
| | | 25 | 12 | 18.15 | 18.04 | 18.09 |
| | | 25 | 25 | 18.15 | 18.07 | 18.14 |
| | | 50 | 0 | 18.13 | 18.04 | 18.05 |
| | 64QAM | 1 | 0 | 18.27 | 18.18 | **18.42** |
| | | 1 | 25 | 18.38 | 18.30 | 18.37 |
| | | 1 | 49 | 18.25 | 18.23 | 18.33 |
| | | 25 | 0 | 18.18 | 17.98 | 18.10 |
| | | 25 | 12 | 18.20 | 18.09 | 18.11 |
| | | 25 | 25 | 18.18 | 18.09 | 18.13 |
| | | 50 | 0 | 18.20 | 18.07 | 18.05 |

**OUTPUT POWER FOR LTE BAND 25 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 26115 | 26365 | 26615 |
| | | | | 1857.5 MHz | 1882.5 MHz | 1907.5 MHz |
| 15.0 | QPSK | 1 | 0 | 18.06 | 17.94 | 18.10 |
| | | 1 | 37 | 18.06 | 17.99 | 18.12 |
| | | 1 | 74 | 18.01 | 18.08 | 18.10 |
| | | 36 | 0 | 18.05 | 17.96 | 18.08 |
| | | 36 | 20 | 18.14 | 18.07 | **18.17** |
| | | 36 | 39 | 18.12 | 18.10 | 18.15 |
| | | 75 | 0 | 18.09 | 18.02 | 18.12 |
| | 16QAM | 1 | 0 | **18.36** | 18.14 | 18.34 |
| | | 1 | 37 | 18.33 | 18.21 | 18.35 |
| | | 1 | 74 | 18.21 | 18.28 | 18.31 |
| | | 36 | 0 | 18.06 | 17.96 | 18.10 |
| | | 36 | 20 | 18.14 | 18.08 | 18.18 |
| | | 36 | 39 | 18.12 | 18.08 | 18.15 |
| | | 75 | 0 | 18.10 | 18.03 | 18.16 |
| | 64QAM | 1 | 0 | 18.39 | 18.22 | 18.35 |
| | | 1 | 37 | **18.40** | 18.28 | 18.31 |
| | | 1 | 74 | 18.29 | 18.28 | 18.26 |
| | | 36 | 0 | 18.09 | 17.97 | 18.11 |
| | | 36 | 20 | 18.18 | 18.11 | 18.17 |
| | | 36 | 39 | 18.16 | 18.11 | 18.15 |
| | | 75 | 0 | 18.15 | 18.06 | 18.15 |

**OUTPUT POWER FOR LTE BAND 25 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 26140 | 26365 | 26590 |
| | | | | 1860 MHz | 1882.5 MHz | 1905 MHz |
| 20.0 | QPSK | 1 | 0 | 18.06 | 17.93 | 18.09 |
| | | 1 | 49 | 18.13 | 18.03 | 18.16 |
| | | 1 | 99 | 18.04 | 18.10 | 18.09 |
| | | 50 | 0 | 18.11 | 17.98 | 18.15 |
| | | 50 | 24 | 18.15 | 18.11 | 18.17 |
| | | 50 | 50 | 18.13 | 18.14 | **18.23** |
| | | 100 | 0 | 18.10 | 18.04 | 18.12 |
| | 16QAM | 1 | 0 | 18.29 | 18.20 | **18.42** |
| | | 1 | 49 | 18.29 | 18.27 | 18.40 |
| | | 1 | 99 | 18.26 | 18.30 | 18.32 |
| | | 50 | 0 | 18.09 | 18.00 | 18.16 |
| | | 50 | 24 | 18.16 | 18.10 | 18.17 |
| | | 50 | 50 | 18.13 | 18.15 | 18.22 |
| | | 100 | 0 | 18.09 | 18.06 | 18.10 |
| | 64QAM | 1 | 0 | 18.39 | 18.30 | 18.51 |
| | | 1 | 49 | 18.46 | 18.34 | **18.55** |
| | | 1 | 99 | 18.40 | 18.45 | 18.45 |
| | | 50 | 0 | 18.15 | 18.05 | 18.18 |
| | | 50 | 24 | 18.18 | 18.11 | 18.13 |
| | | 50 | 50 | 18.14 | 18.16 | 18.19 |
| | | 100 | 0 | 18.13 | 18.11 | 18.10 |

## 8.3.5. LTE BAND 41

| Test Engineer ID: | 33499/84740 | Test Date: | 3/272024 | Sample SN: | QV7700BLLD |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 41 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 Conducted Average (dBm) | | |
|---|---|---|---|---|---|---|
| | | | | 39675 | 40620 | 41565 |
| | | | | 2498.5 | 2593 MHz | 2687.5 |
| 5.0 | QPSK | 1 | 0 | 18.42 | 18.47 | 18.37 |
| | | 1 | 12 | 18.44 | 18.50 | 18.35 |
| | | 1 | 24 | 18.48 | 18.48 | 18.24 |
| | | 12 | 0 | 18.49 | 18.46 | 18.24 |
| | | 12 | 6 | **18.51** | 18.47 | 18.25 |
| | | 12 | 11 | 18.48 | **18.51** | 18.27 |
| | | 25 | 0 | 18.46 | 18.41 | 18.20 |
| | 16QAM | 1 | 0 | 18.50 | 18.58 | 18.30 |
| | | 1 | 12 | 18.56 | **18.64** | 18.34 |
| | | 1 | 24 | 18.44 | 18.53 | 18.25 |
| | | 12 | 0 | 18.52 | 18.43 | 18.27 |
| | | 12 | 6 | 18.56 | 18.42 | 18.29 |
| | | 12 | 11 | 18.55 | 18.48 | 18.35 |
| | | 25 | 0 | 18.50 | 18.45 | 18.27 |
| | 64QAM | 1 | 0 | 18.53 | 18.51 | 18.33 |
| | | 1 | 12 | 18.57 | **18.62** | 18.37 |
| | | 1 | 24 | 18.50 | 18.54 | 18.28 |
| | | 12 | 0 | 18.49 | 18.50 | 18.26 |
| | | 12 | 6 | 18.50 | 18.52 | 18.27 |
| | | 12 | 11 | 18.49 | 18.56 | 18.30 |
| | | 25 | 0 | 18.52 | 18.46 | 18.25 |

**OUTPUT POWER FOR LTE BAND 41 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 27900 | 40620 | 41540 |
| | | | | 2501.0 | 2593 MHz | 2685.0 |
| 10.0 | QPSK | 1 | 0 | 18.52 | 18.45 | 18.26 |
| | | 1 | 24 | 18.45 | 18.48 | 18.37 |
| | | 1 | 49 | 18.45 | 18.49 | 18.19 |
| | | 25 | 0 | 18.46 | 18.43 | 18.25 |
| | | 25 | 12 | **18.56** | 18.44 | 18.35 |
| | | 25 | 24 | 18.51 | 18.54 | 18.30 |
| | | 50 | 0 | 18.52 | 18.42 | 18.32 |
| | 16QAM | 1 | 0 | 18.56 | 18.53 | 18.36 |
| | | 1 | 24 | **18.60** | 18.58 | 18.37 |
| | | 1 | 49 | 18.55 | 18.56 | 18.34 |
| | | 25 | 0 | 18.47 | 18.50 | 18.29 |
| | | 25 | 12 | 18.58 | 18.51 | 18.37 |
| | | 25 | 24 | 18.56 | 18.58 | 18.35 |
| | | 50 | 0 | 18.54 | 18.44 | 18.34 |
| | 64QAM | 1 | 0 | 18.44 | 18.45 | 18.41 |
| | | 1 | 24 | 18.53 | **18.60** | 18.32 |
| | | 1 | 49 | 18.57 | 18.51 | 18.29 |
| | | 25 | 0 | 18.48 | 18.46 | 18.34 |
| | | 25 | 12 | 18.59 | 18.49 | 18.40 |
| | | 25 | 24 | 18.55 | 18.54 | 18.37 |
| | | 50 | 0 | 18.55 | 18.46 | 18.39 |

**OUTPUT POWER FOR LTE BAND 41 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 39725 | 40620 | 41515 |
| | | | | 2503.5 | 2593 MHz | 2682.5 |
| 15.0 | QPSK | 1 | 0 | 18.49 | 18.38 | 18.34 |
| | | 1 | 37 | 18.49 | 18.50 | 18.34 |
| | | 1 | 74 | 18.42 | 18.43 | 18.24 |
| | | 36 | 0 | 18.42 | 18.38 | 18.28 |
| | | 36 | 16 | **18.53** | 18.41 | 18.30 |
| | | 36 | 35 | 18.51 | 18.47 | 18.33 |
| | | 75 | 0 | 18.47 | 18.36 | 18.23 |
| | 16QAM | 1 | 0 | 18.48 | 18.36 | 18.32 |
| | | 1 | 37 | 18.52 | 18.54 | 18.40 |
| | | 1 | 74 | 18.53 | 18.41 | 18.28 |
| | | 36 | 0 | 18.46 | 18.43 | 18.32 |
| | | 36 | 16 | **18.56** | 18.46 | 18.31 |
| | | 36 | 35 | 18.55 | 18.51 | 18.36 |
| | | 75 | 0 | 18.53 | 18.41 | 18.27 |
| | 64QAM | 1 | 0 | 18.50 | 18.37 | 18.30 |
| | | 1 | 37 | **18.57** | 18.53 | 18.34 |
| | | 1 | 74 | 18.48 | 18.50 | 18.22 |
| | | 36 | 0 | 18.47 | 18.41 | 18.33 |
| | | 36 | 16 | **18.57** | 18.45 | 18.33 |
| | | 36 | 35 | 18.55 | 18.52 | 18.36 |
| | | 75 | 0 | 18.54 | 18.41 | 18.32 |

**OUTPUT POWER FOR LTE BAND 41 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 39750 | 40620 | 41490 |
| | | | | 2506 MHz | 2593 MHz | 2680 MHz |
| 20.0 | QPSK | 1 | 0 | 18.51 | 18.32 | 18.32 |
| | | 1 | 49 | 18.49 | 18.51 | 18.38 |
| | | 1 | 99 | 18.47 | 18.36 | 18.20 |
| | | 50 | 0 | 18.46 | 18.39 | 18.34 |
| | | 50 | 24 | **18.55** | 18.45 | 18.43 |
| | | 50 | 49 | **18.55** | 18.51 | 18.34 |
| | | 100 | 0 | 18.54 | 18.39 | 18.33 |
| | 16QAM | 1 | 0 | 18.55 | 18.44 | 18.43 |
| | | 1 | 49 | 18.57 | **18.62** | 18.47 |
| | | 1 | 99 | 18.58 | 18.50 | 18.29 |
| | | 50 | 0 | 18.51 | 18.42 | 18.34 |
| | | 50 | 24 | 18.60 | 18.48 | 18.43 |
| | | 50 | 49 | 18.58 | 18.51 | 18.38 |
| | | 100 | 0 | 18.54 | 18.42 | 18.39 |
| | 64QAM | 1 | 0 | 18.50 | 18.48 | 18.35 |
| | | 1 | 49 | 18.54 | **18.61** | 18.52 |
| | | 1 | 99 | 18.54 | 18.56 | 18.32 |
| | | 50 | 0 | 18.48 | 18.42 | 18.36 |
| | | 50 | 24 | 18.58 | 18.45 | 18.45 |
| | | 50 | 49 | 18.56 | 18.52 | 18.38 |
| | | 100 | 0 | 18.53 | 18.44 | 18.39 |

## 8.3.6. LTE BAND 66

| Test Engineer ID: | 33499/84740<br>22797/85502 | Test Date: | 3/28/2024<br>4/5/2024 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

**OUTPUT POWER FOR LTE BAND 66 (1.4 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Main 2 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 131979 | 132322 | 132665 |
| | | | | 1710.7 MHz | 1745.0 MHz | 1779.3 MHz |
| 1.4 | QPSK | 1 | 0 | 19.94 | 20.04 | 19.95 |
| | | 1 | 3 | 19.98 | 20.03 | 19.90 |
| | | 1 | 5 | 19.94 | 20.03 | 19.91 |
| | | 3 | 0 | 19.94 | 19.99 | 19.88 |
| | | 3 | 1 | 19.94 | 20.01 | 19.85 |
| | | 3 | 3 | 19.92 | 19.98 | 19.86 |
| | | 6 | 0 | 19.98 | **20.06** | 19.91 |
| | 16QAM | 1 | 0 | 20.08 | **20.23** | 20.08 |
| | | 1 | 3 | 20.12 | 20.22 | 20.07 |
| | | 1 | 5 | 20.14 | 20.22 | 20.07 |
| | | 3 | 0 | 20.03 | 20.14 | 20.03 |
| | | 3 | 1 | 20.08 | 20.13 | 20.03 |
| | | 3 | 3 | 20.03 | 20.08 | 20.03 |
| | | 6 | 0 | 19.95 | 20.12 | 20.02 |
| | 64QAM | 1 | 0 | 20.25 | 20.36 | 20.26 |
| | | 1 | 3 | 20.27 | **20.41** | 20.26 |
| | | 1 | 5 | 20.28 | 20.32 | 20.25 |
| | | 3 | 0 | 20.14 | 20.19 | 20.11 |
| | | 3 | 1 | 20.16 | 20.22 | 20.10 |
| | | 3 | 3 | 20.16 | 20.20 | 20.15 |
| | | 6 | 0 | 20.11 | 20.21 | 20.04 |

**OUTPUT POWER FOR LTE BAND 66 (3.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Main 2 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 131987 | 132322 | 132657 |
| | | | | 1711.5 MHz | 1745.0 MHz | 1778.5 MHz |
| 3.0 | QPSK | 1 | 0 | 19.92 | 20.03 | 19.88 |
| | | 1 | 7 | 20.02 | 20.11 | 20.05 |
| | | 1 | 14 | 19.93 | 20.00 | 19.89 |
| | | 8 | 0 | 20.01 | 20.07 | 19.94 |
| | | 8 | 4 | 20.04 | 20.11 | 19.96 |
| | | 8 | 7 | 20.04 | **20.12** | 19.95 |
| | | 15 | 0 | 20.02 | 20.09 | 19.95 |
| | 16QAM | 1 | 0 | 20.09 | 20.14 | 20.05 |
| | | 1 | 7 | 20.21 | **20.23** | 20.18 |
| | | 1 | 14 | 20.08 | 20.13 | 20.07 |
| | | 8 | 0 | 20.09 | 20.16 | 20.03 |
| | | 8 | 4 | 20.11 | 20.19 | 20.05 |
| | | 8 | 7 | 20.12 | 20.16 | 20.02 |
| | | 15 | 0 | 20.04 | 20.14 | 20.02 |
| | 64QAM | 1 | 0 | 20.15 | 20.25 | 20.17 |
| | | 1 | 7 | 20.36 | **20.41** | 20.32 |
| | | 1 | 14 | 20.19 | 20.32 | 20.17 |
| | | 8 | 0 | 20.15 | 20.22 | 20.14 |
| | | 8 | 4 | 20.18 | 20.26 | 20.17 |
| | | 8 | 7 | 20.19 | 20.28 | 20.18 |
| | | 15 | 0 | 20.12 | 20.18 | 20.09 |

**OUTPUT POWER FOR LTE BAND 66 (5.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Main 2 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 131997 | 132322 | 132647 |
| | | | | 1712.5 MHz | 1745.0 MHz | 1777.5 MHz |
| 5.0 | QPSK | 1 | 0 | 19.90 | 20.05 | 19.92 |
| | | 1 | 12 | 19.97 | **20.09** | 19.94 |
| | | 1 | 24 | 19.91 | 19.99 | 19.95 |
| | | 12 | 0 | 19.93 | 19.92 | 19.91 |
| | | 12 | 6 | 19.98 | 20.07 | 19.96 |
| | | 12 | 11 | 19.99 | 20.05 | 19.93 |
| | | 25 | 0 | 19.94 | 19.92 | 19.88 |
| | 16QAM | 1 | 0 | 20.36 | 20.31 | 20.29 |
| | | 1 | 12 | 20.38 | 20.41 | 20.28 |
| | | 1 | 24 | **20.47** | 20.39 | 20.33 |
| | | 12 | 0 | 20.04 | 19.98 | 20.00 |
| | | 12 | 6 | 20.11 | 20.11 | 20.06 |
| | | 12 | 11 | 20.03 | 20.10 | 20.03 |
| | | 25 | 0 | 20.00 | 19.97 | 19.93 |
| | 64QAM | 1 | 0 | 20.10 | 20.31 | 20.31 |
| | | 1 | 12 | 20.24 | **20.34** | **20.34** |
| | | 1 | 24 | 20.21 | 20.30 | 20.29 |
| | | 12 | 0 | 20.08 | 19.98 | 20.01 |
| | | 12 | 6 | 20.13 | 20.13 | 20.08 |
| | | 12 | 11 | 20.10 | 20.07 | 20.04 |
| | | 25 | 0 | 20.00 | 19.99 | 20.01 |

**OUTPUT POWER FOR LTE BAND 66 (10.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Ant 1 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 132022 | 132322 | 132622 |
| | | | | 1715.0 MHz | 1745.0 MHz | 1775.0 MHz |
| 10.0 | QPSK | 1 | 0 | 19.82 | 19.92 | 19.87 |
| | | 1 | 24 | 19.99 | **20.01** | 19.93 |
| | | 1 | 49 | 19.90 | 19.92 | 19.79 |
| | | 25 | 0 | 19.87 | 19.96 | 19.94 |
| | | 25 | 12 | 19.97 | 19.99 | 19.95 |
| | | 25 | 24 | **20.01** | 19.96 | 19.94 |
| | | 50 | 0 | 19.95 | 19.94 | 19.93 |
| | 16QAM | 1 | 0 | 19.98 | 20.17 | 20.04 |
| | | 1 | 24 | 20.14 | **20.23** | 20.08 |
| | | 1 | 49 | 20.09 | 20.15 | 20.06 |
| | | 25 | 0 | 19.94 | 20.00 | 19.93 |
| | | 25 | 12 | 20.07 | 20.00 | 19.96 |
| | | 25 | 24 | 20.06 | 20.07 | 19.95 |
| | | 50 | 0 | 19.98 | 19.98 | 19.95 |
| | 64QAM | 1 | 0 | 20.12 | **20.31** | 20.18 |
| | | 1 | 24 | 20.17 | **20.31** | 20.18 |
| | | 1 | 49 | 20.22 | 20.24 | 20.10 |
| | | 25 | 0 | 19.91 | 20.00 | 20.02 |
| | | 25 | 12 | 20.05 | 20.03 | 20.03 |
| | | 25 | 24 | 20.05 | 20.00 | 20.02 |
| | | 50 | 0 | 20.00 | 20.00 | 20.02 |

**OUTPUT POWER FOR LTE BAND 66 (15.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Main 2 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 132047 | 132322 | 132597 |
| | | | | 1717.5 MHz | 1745.0 MHz | 1772.5 MHz |
| 15.0 | QPSK | 1 | 0 | 19.88 | **19.99** | 19.92 |
| | | 1 | 37 | 19.98 | 19.98 | 19.81 |
| | | 1 | 74 | 19.93 | 19.95 | 19.82 |
| | | 36 | 0 | 19.93 | 19.92 | 19.93 |
| | | 36 | 16 | **19.99** | 19.93 | 19.90 |
| | | 36 | 35 | 19.98 | 19.94 | 19.88 |
| | | 75 | 0 | 19.93 | 19.88 | 19.84 |
| | 16QAM | 1 | 0 | 20.09 | 20.26 | 20.18 |
| | | 1 | 37 | 20.21 | **20.28** | 20.09 |
| | | 1 | 74 | 20.18 | 20.16 | 20.06 |
| | | 36 | 0 | 19.99 | 19.96 | 19.95 |
| | | 36 | 16 | 20.02 | 19.97 | 19.95 |
| | | 36 | 35 | 20.03 | 19.96 | 19.95 |
| | | 75 | 0 | 20.00 | 19.95 | 19.90 |
| | 64QAM | 1 | 0 | 20.13 | **20.27** | 20.25 |
| | | 1 | 37 | 20.22 | **20.27** | 20.23 |
| | | 1 | 74 | 20.22 | **20.27** | 20.22 |
| | | 36 | 0 | 20.03 | 20.00 | 20.05 |
| | | 36 | 16 | 20.09 | 20.02 | 20.03 |
| | | 36 | 35 | 20.10 | 20.02 | 20.01 |
| | | 75 | 0 | 20.05 | 19.99 | 19.99 |

**OUTPUT POWER FOR LTE BAND 66 (20.0 MHz)**

| Bandwidth (MHz) | Modulation | RB Allocation | RB Offset | Main 2 | | |
|---|---|---|---|---|---|---|
| | | | | Conducted Average (dBm) | | |
| | | | | 132072 | 132322 | 132572 |
| | | | | 1720.0 MHz | 1745.0 MHz | 1770.0 MHz |
| 20.0 | QPSK | 1 | 0 | 19.82 | 19.93 | 19.92 |
| | | 1 | 49 | 19.99 | 19.94 | 19.90 |
| | | 1 | 99 | 19.91 | 19.92 | 19.86 |
| | | 50 | 0 | 19.88 | 19.96 | 19.97 |
| | | 50 | 24 | **20.03** | 19.96 | 19.92 |
| | | 50 | 49 | **20.03** | 19.94 | 19.79 |
| | | 100 | 0 | 19.98 | 19.92 | 19.91 |
| | 16QAM | 1 | 0 | 20.07 | 20.20 | **20.25** |
| | | 1 | 49 | 20.24 | 20.22 | 20.16 |
| | | 1 | 99 | 20.18 | 20.21 | 20.08 |
| | | 50 | 0 | 19.93 | 19.97 | 19.97 |
| | | 50 | 24 | 20.06 | 19.98 | 19.95 |
| | | 50 | 49 | 20.04 | 19.99 | 19.79 |
| | | 100 | 0 | 20.00 | 19.95 | 19.91 |
| | 64QAM | 1 | 0 | 20.24 | 20.36 | 20.39 |
| | | 1 | 49 | 20.40 | **20.41** | 20.33 |
| | | 1 | 99 | 20.30 | 20.39 | 20.26 |
| | | 50 | 0 | 19.96 | 19.99 | 20.02 |
| | | 50 | 24 | 20.09 | 20.02 | 20.01 |
| | | 50 | 49 | 20.05 | 20.00 | 19.89 |
| | | 100 | 0 | 20.04 | 19.98 | 19.99 |

# 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.

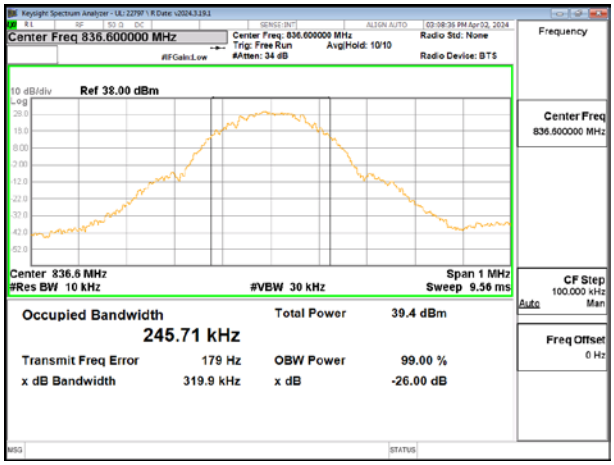
**RESULTS**

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.

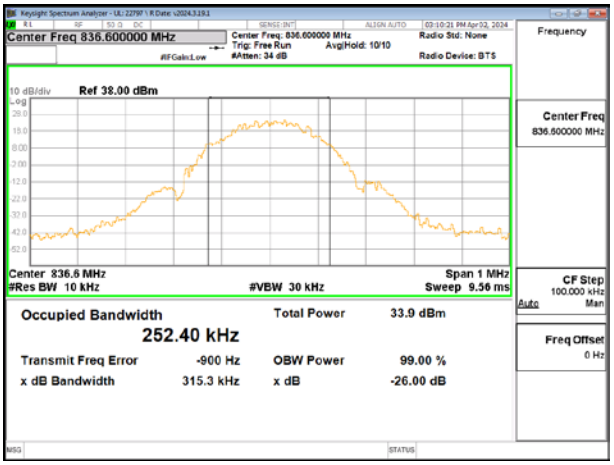
## 9.1.1. GSM

| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24<br>04-02-24 | EUT Serial Number: | QV77004EL3 |
|---|---|---|---|---|---|

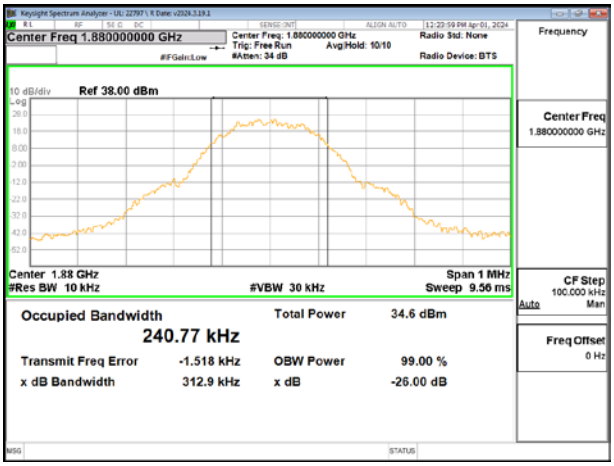
| Band | Modulation | Channel | f(MHz) | 99% BW (KHz) | -26dB BW (KHz) |
|---|---|---|---|---|---|
| GSM850 | GPRS | 190 | 836.6 | 245.71 | 319.9 |
| | EGPRS | | | 252.4 | 315.3 |
| GSM1900 | GPRS | 661 | 1880.0 | 240.77 | 312.9 |
| | EGPRS | | | 245.74 | 311.7 |



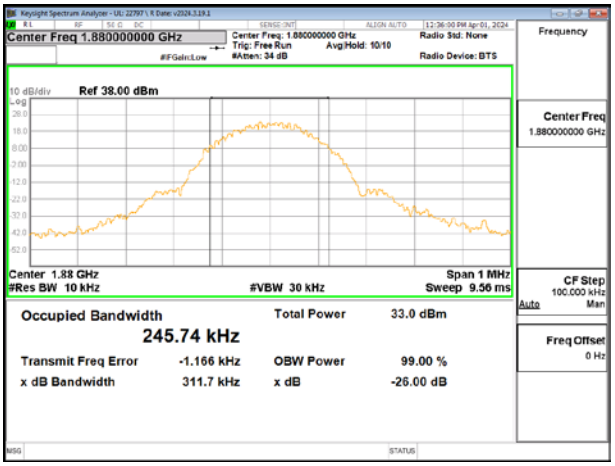

GSM850 GPRS MID Channel




GSM850 EGPRS MID Channel




GSM1900 GPRS MID Channel

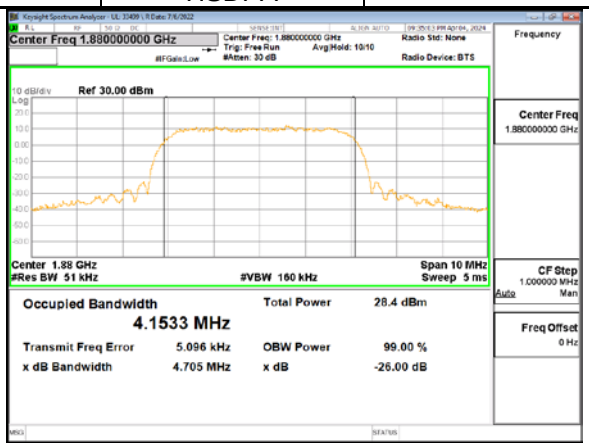



GSM1900 EGPRS MID Channel

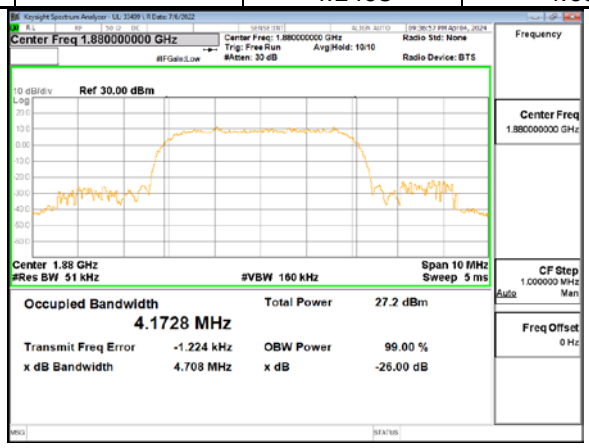
## 9.1.2. WCDMA

| Test Engineer ID: | 33499/84740 | Test Date: | 04-04-24 | EUT Serial Number: | QV77004EL3 |
|---|---|---|---|---|---|

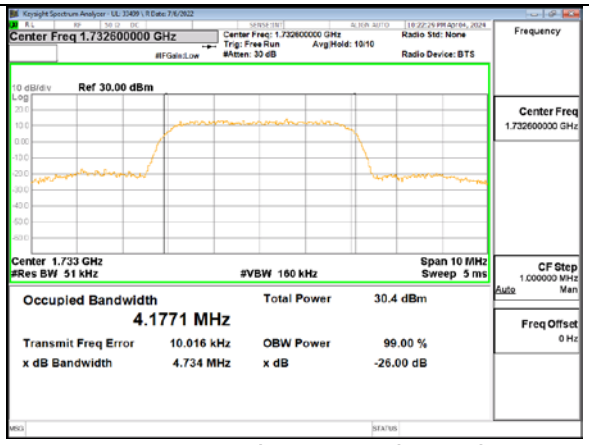
| Band | Modulation | Channel | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| BAND2 | REL 99 | 9800 | 1880.0 | 4.1533 | 4.705 |
| | HSDPA | | | 4.1728 | 4.708 |
| BAND4 | REL 99 | 1638 | 1732.6 | 4.1771 | 4.734 |
| | HSDPA | | | 4.1501 | 4.726 |
| BAND5 | REL 99 | 4408 | 836.6 | 4.1413 | 4.704 |
| | HSDPA | | | 4.1403 | 4.694 |



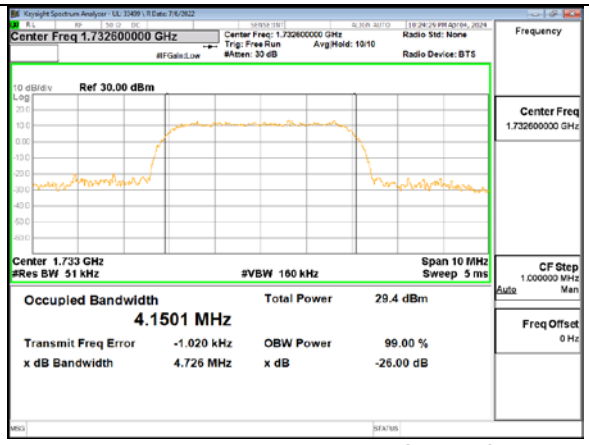

BAND 2 Rel 99 MID Channel



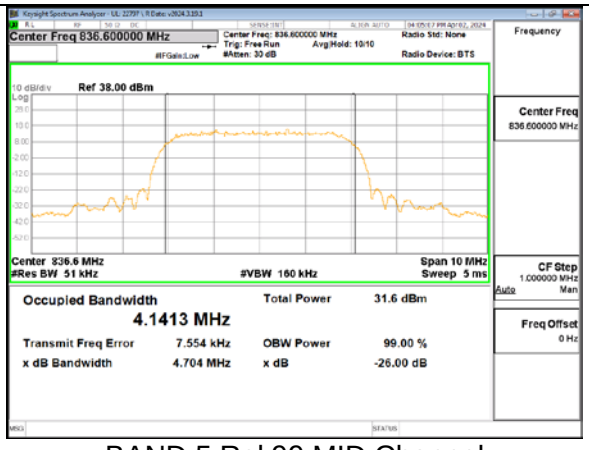

BAND 2 HSDPA MID Channel



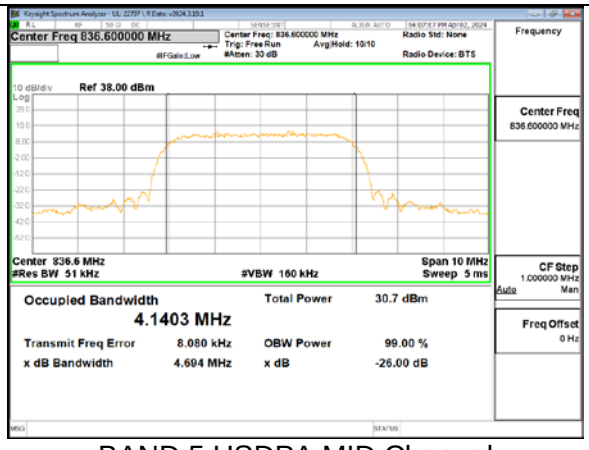

BAND 4 Rel 99 MID Channel




BAND 4 HSDPA MID Channel




BAND 5 Rel 99 MID Channel

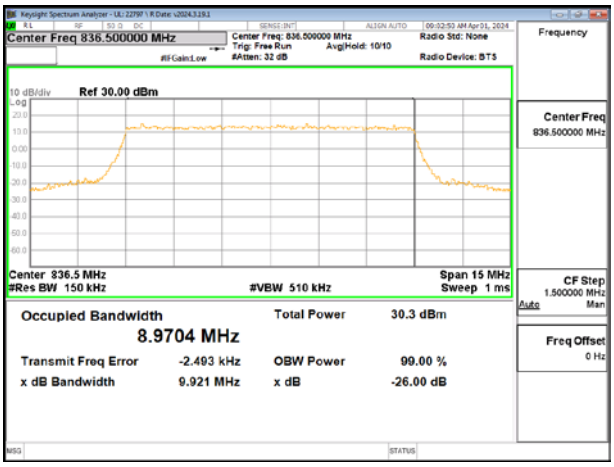



BAND 5 HSDPA MID Channel

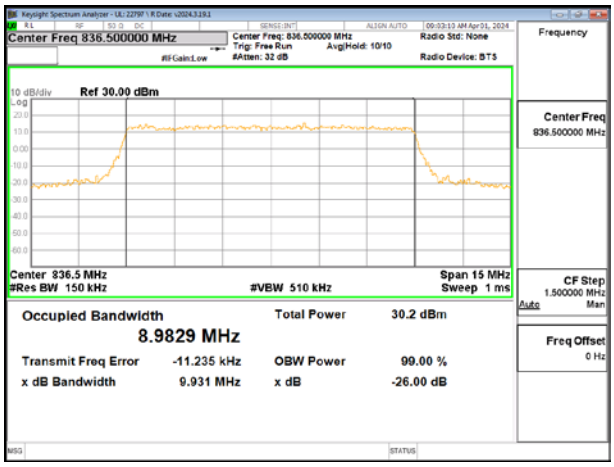
## 9.1.3. LTE5

| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 5 | 1.4MHz, QPSK | 6/0 | 836.5 | 1.0938 | 1.369 |
| | 1.4MHz,16QAM | | | 1.1024 | 1.414 |
| | 3MHz, QPSK | 15/0 | | 2.7053 | 3.051 |
| | 3MHz, 16QAM | | | 2.7065 | 3.050 |
| | 5MHz, QPSK | 25/0 | | 4.4958 | 5.068 |
| | 5MHz, 16QAM | | | 4.4691 | 4.939 |
| | 10MHz, QPSK | 50/0 | | 8.9704 | 9.921 |
| | 10MHz, 16QAM | | | 8.9829 | 9.931 |




LTE5 10MHz QPSK MID Ch RB50-0

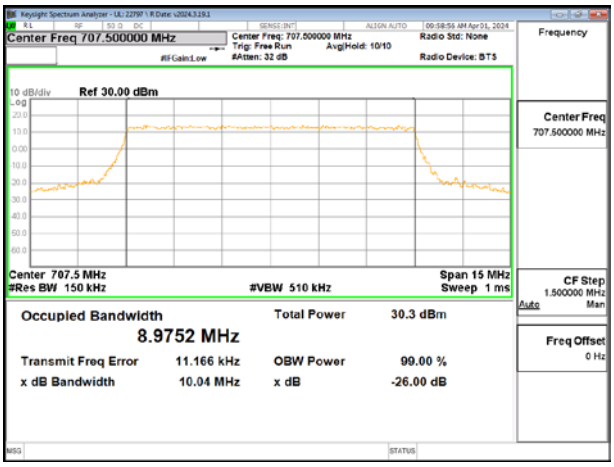



LTE5 10MHz 16QAM MID Ch RB50-0

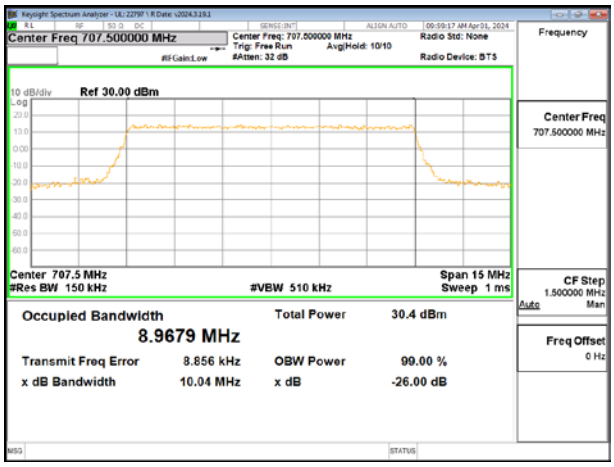
## 9.1.4. LTE12

| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 12 | 1.4MHz, QPSK | 6/0 | 707.5 | 1.0910 | 1.402 |
| | 1.4MHz,16QAM | | | 1.0970 | 1.440 |
| | 3MHz, QPSK | 15/0 | | 2.7097 | 3.038 |
| | 3MHz, 16QAM | | | 2.7068 | 3.059 |
| | 5MHz, QPSK | 25/0 | | 4.5045 | 5.117 |
| | 5MHz, 16QAM | | | 4.4916 | 5.049 |
| | 10MHz, QPSK | 50/0 | | 8.9752 | 10.04 |
| | 10MHz, 16QAM | | | 8.9679 | 10.04 |




LTE12 10MHz QPSK MID Ch RB50-0

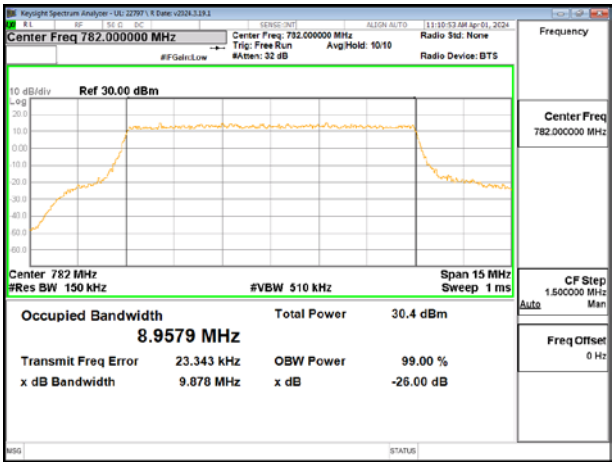



LTE12 10MHz 16QAM MID Ch RB50-0

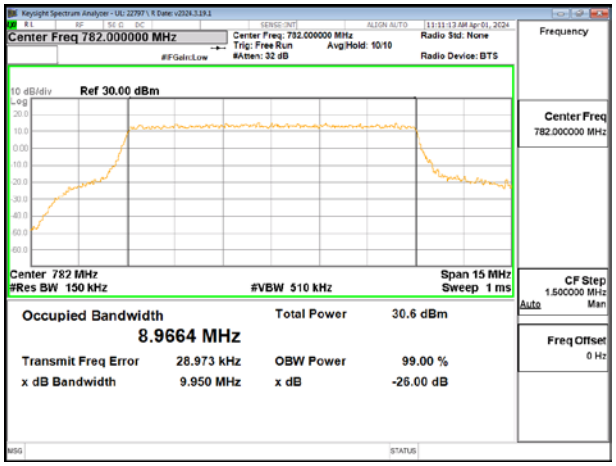
## 9.1.5. LTE13

| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 13 | 5MHz, QPSK | 25/0 | 782 | 4.5024 | 5.100 |
| | 5MHz, 16QAM | | | 4.509 | 5.119 |
| | 10MHz, QPSK | 50/0 | | 8.9579 | 9.878 |
| | 10MHz, 16QAM | | | 8.9664 | 9.950 |




LTE13 10MHz QPSK MID Ch RB50-0

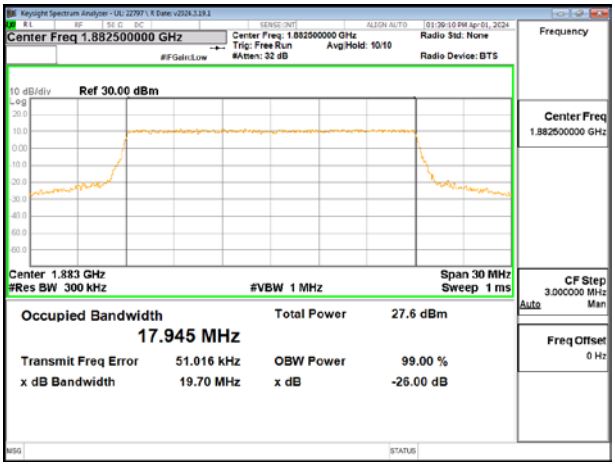



LTE13 10MHz 16QAM MID Ch RB50-0

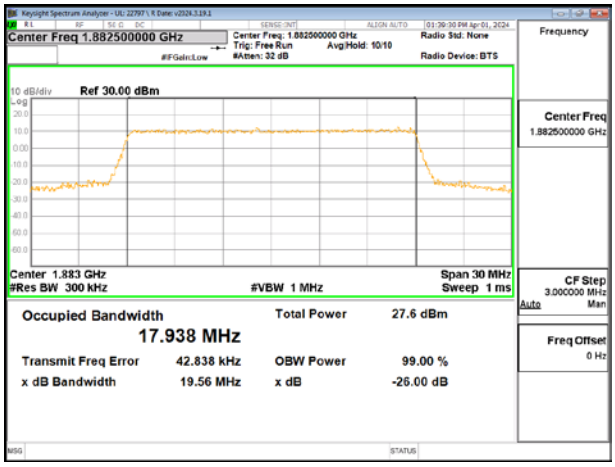
## 9.1.6. LTE25

| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 25 | 1.4MHz, QPSK | 6/0 | 1882.5 | 1.0926 | 1.340 |
| | 1.4MHz,16QAM | | | 1.0981 | 1.465 |
| | 3MHz, QPSK | 15/0 | | 2.7033 | 3.036 |
| | 3MHz, 16QAM | | | 2.7061 | 3.116 |
| | 5MHz, QPSK | 25/0 | | 4.5035 | 5.174 |
| | 5MHz, 16QAM | | | 4.5076 | 5.163 |
| | 10MHz, QPSK | 50/0 | | 8.9916 | 9.922 |
| | 10MHz, 16QAM | | | 8.9802 | 9.948 |
| | 15MHz, QPSK | 75/0 | | 13.463 | 15.00 |
| | 15MHz, 16QAM | | | 13.471 | 14.73 |
| | 20MHz, QPSK | 100/0 | | 17.945 | 19.70 |
| | 20MHz, 16QAM | | | 17.938 | 19.56 |




LTE25 20MHz QPSK MID Ch RB100-0

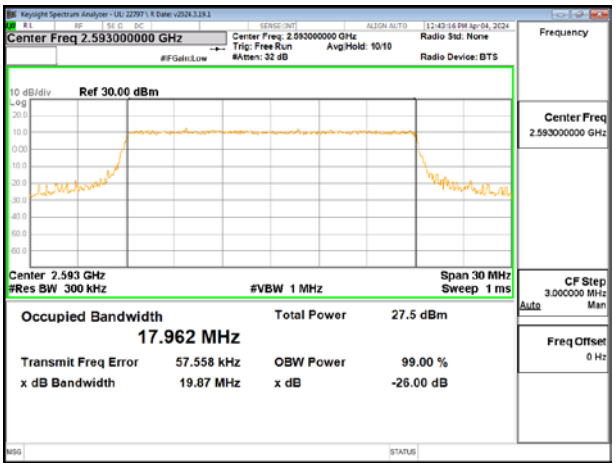



LTE25 20MHz 16QAM MID Ch RB100-0

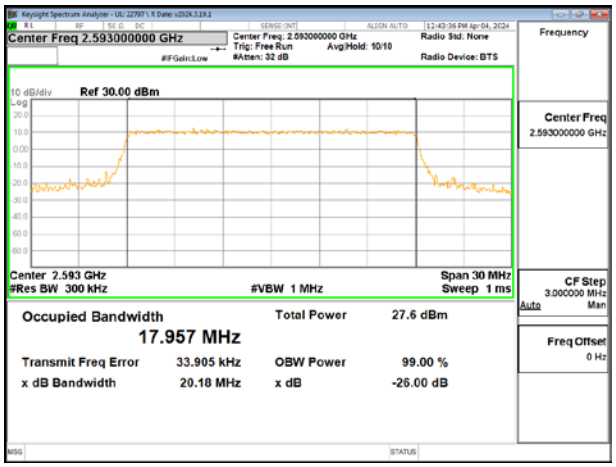
## 9.1.7. LTE41

| Test Engineer ID: | 22797/85502 | Test Date: | 04-04-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 41 | 5MHz, QPSK | 25/0 | 2593.0 | 4.4931 | 5.084 |
| | 5MHz, 16QAM | | | 4.5033 | 5.115 |
| | 10MHz, QPSK | 50/0 | | 8.9744 | 9.926 |
| | 10MHz, 16QAM | | | 8.9791 | 9.961 |
| | 15MHz, QPSK | 75/0 | | 13.440 | 15.65 |
| | 15MHz, 16QAM | | | 13.462 | 15.04 |
| | 20MHz, QPSK | 100/0 | | 17.962 | 19.87 |
| | 20MHz, 16QAM | | | 17.957 | 20.18 |




LTE41 20MHz QPSK MID Ch RB100-0

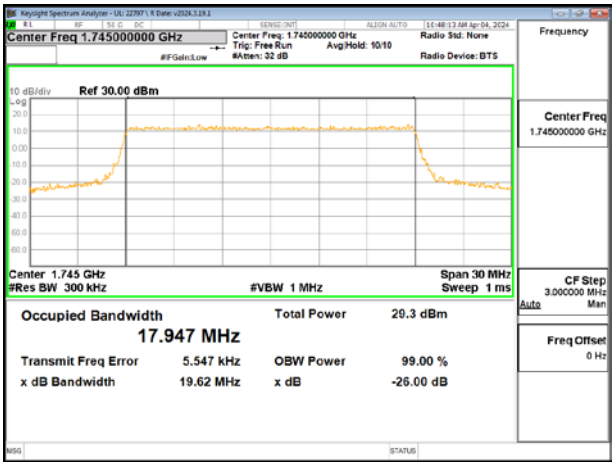



LTE41 20MHz 16QAM MID Ch RB100-0

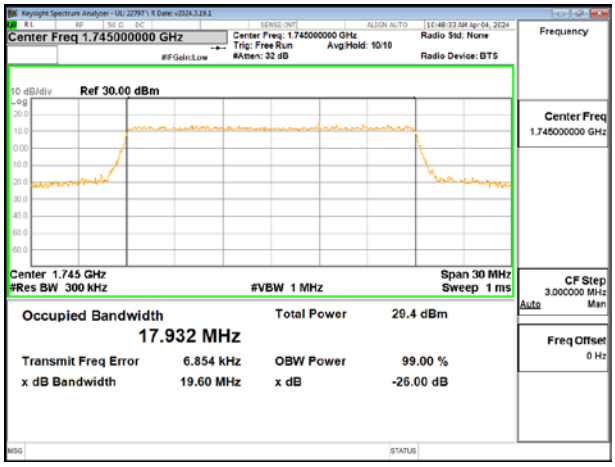
## 9.1.8. LTE66

| Test Engineer ID: | 22797/85502 | Test Date: | 04-04-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|

| Band | Mode | RB Allocation/RB Offset | f(MHz) | 99% BW (MHz) | -26dB BW (MHz) |
|---|---|---|---|---|---|
| LTE BAND 66 | 1.4MHz, QPSK | 6/0 | 1745.0 | 1.0875 | 1.360 |
| | 1.4MHz,16QAM | | | 1.0949 | 1.350 |
| | 3MHz, QPSK | 15/0 | | 2.7054 | 3.030 |
| | 3MHz, 16QAM | | | 2.7105 | 3.074 |
| | 5MHz, QPSK | 25/0 | | 4.4916 | 5.093 |
| | 5MHz, 16QAM | | | 4.5055 | 5.120 |
| | 10MHz, QPSK | 50/0 | | 8.9862 | 9.975 |
| | 10MHz, 16QAM | | | 8.9791 | 9.951 |
| | 15MHz, QPSK | 75/0 | | 13.482 | 14.80 |
| | 15MHz, 16QAM | | | 13.478 | 14.79 |
| | 20MHz, QPSK | 100/0 | | 17.947 | 19.62 |
| | 20MHz, 16QAM | | | 17.932 | 19.60 |




LTE66 20MHz QPSK MID Ch RB100-0




LTE66 20MHz 16QAM MID Ch RB100-0

## 9.2. OUT OF BAND EMISSIONS

**LIMITS**

FCC: §22.917 (a), 24.238 (a), 27.53 (h), 27.53 (m)(4) & (m)(6), 27.53 (g)
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

FCC: §27.53 (c), (f)
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts. The band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotopically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.
Note: Radiated data in section 9.1.6 confirms a compliance for the emissions in GPS 1559 - 1610 MHz band were wideband emissions therefore the - 40dBm / MHz limit was used.

**TEST PROCEDURE**

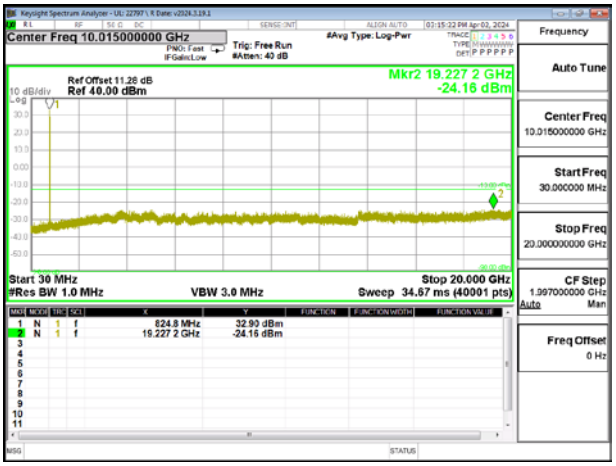
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.
For each out of band emissions measurement:

(i) Set display line at -13 dBm, -25dBm according to the band Limit
(ii) Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

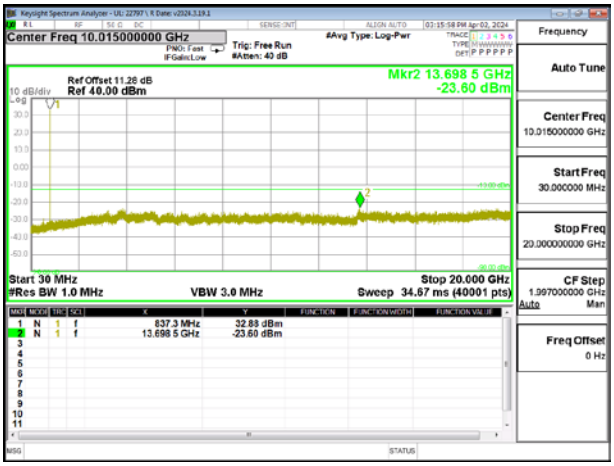
**RESULTS**

## 9.2.1. GSM GSM850

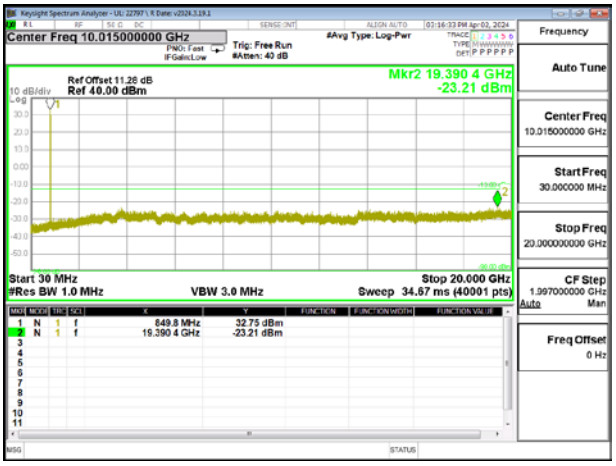
| Test Engineer ID: | 22797/85502 | Test Date: | 04-02-24 | EUT Serial Number: | QV77004EL3 |
|---|---|---|---|---|---|




GSM850 GPRS LOW Channel




GSM850 GPRS MID Channel




GSM850 GPRS HIGH Channel

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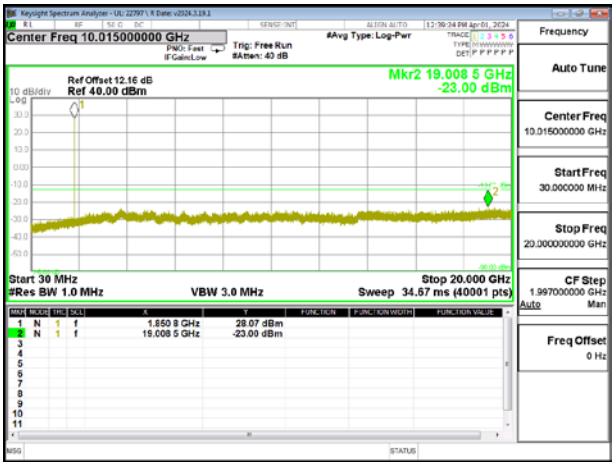
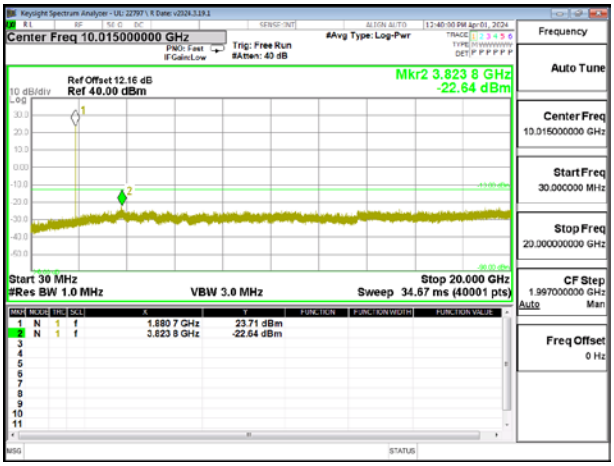
## 9.2.2. GSM GSM1900

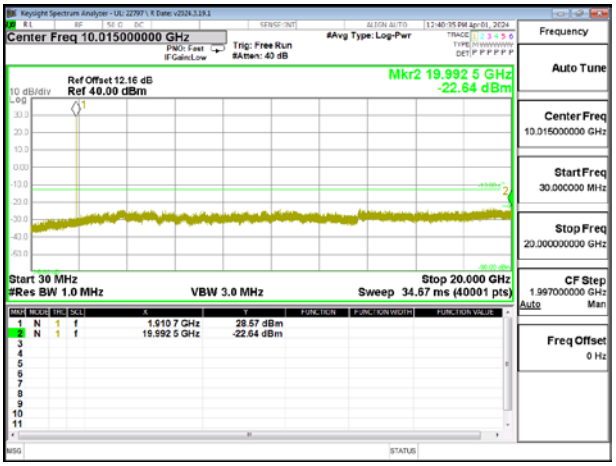
| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | EUT Serial Number: | QV77004EL3 |
|---|---|---|---|---|---|




GSM1900 GPRS LOW Channel




GSM1900 GPRS MID Channel




GSM1900 GPRS HIGH Channel

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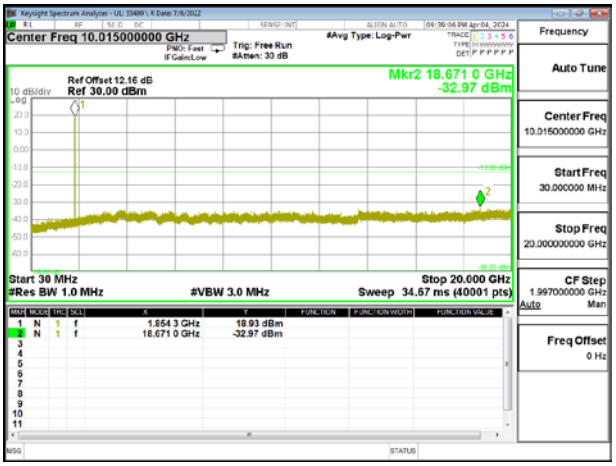
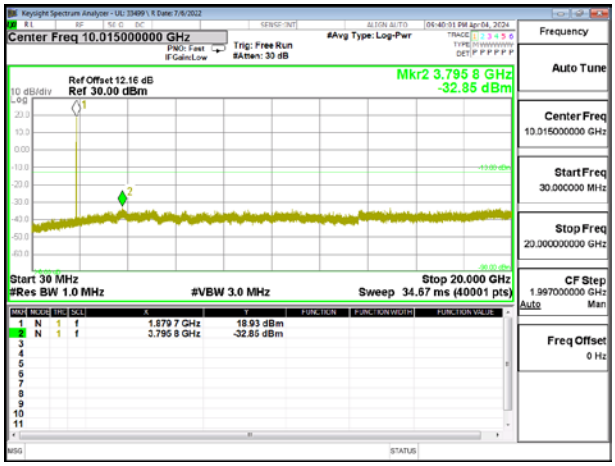
## 9.2.3. WCDMA BAND 2

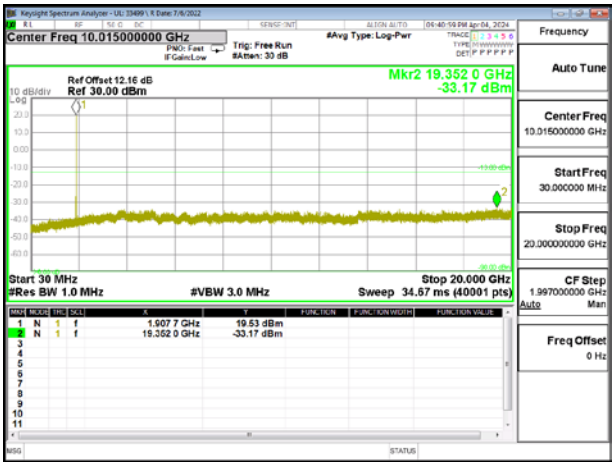
| Test Engineer ID: | 33499/84740 | Test Date: | 04-04-24 | EUT Serial Number: | QV77004EL3 |
|---|---|---|---|---|---|




BAND 2 Rel 99 LOW Channel




BAND 2 Rel 99 MID Channel




BAND 2 Rel 99 HIGH Channel

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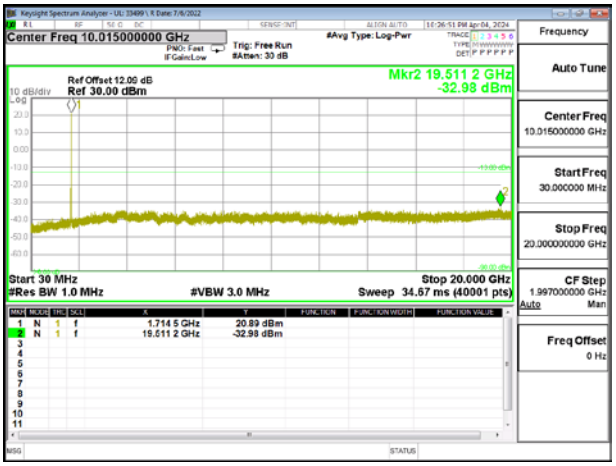
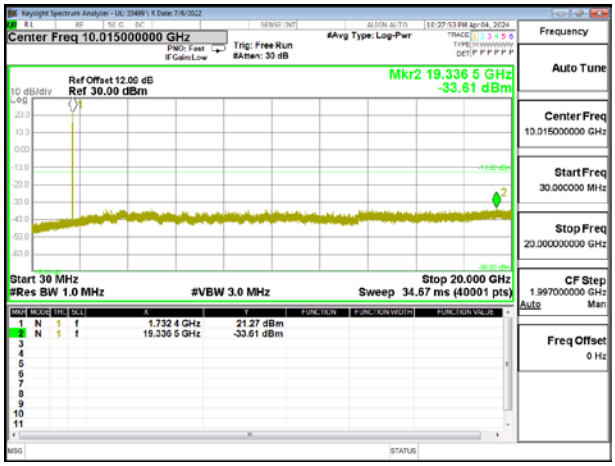
## 9.2.4. WCDMA BAND 4

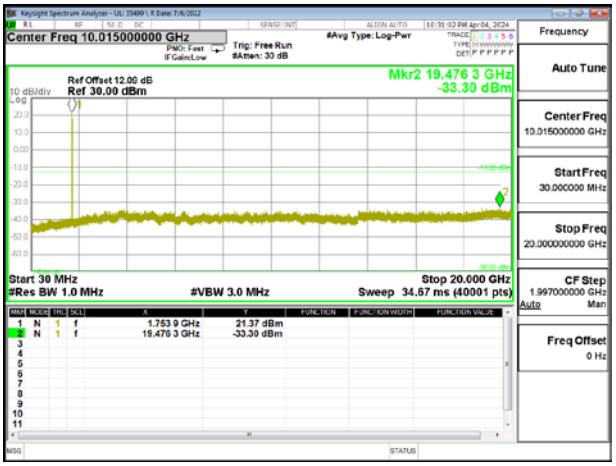
| Test Engineer ID: | 33499/84740 | Test Date: | 04-04-24 | EUT Serial Number: | QV77004EL3 |
|---|---|---|---|---|---|




BAND 4 Rel 99 LOW Channel




BAND 4 Rel 99 MID Channel




BAND 4 Rel 99 HIGH Channel

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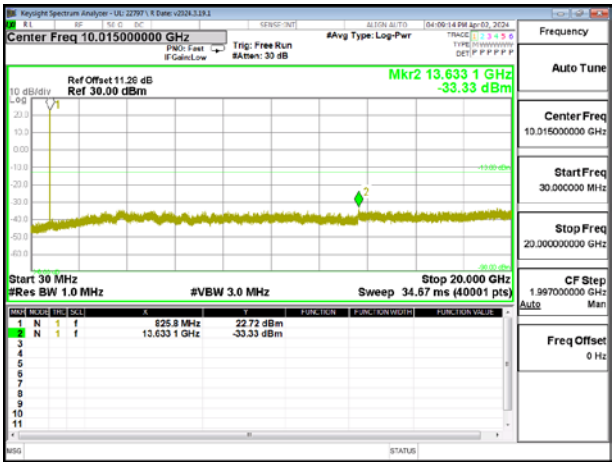
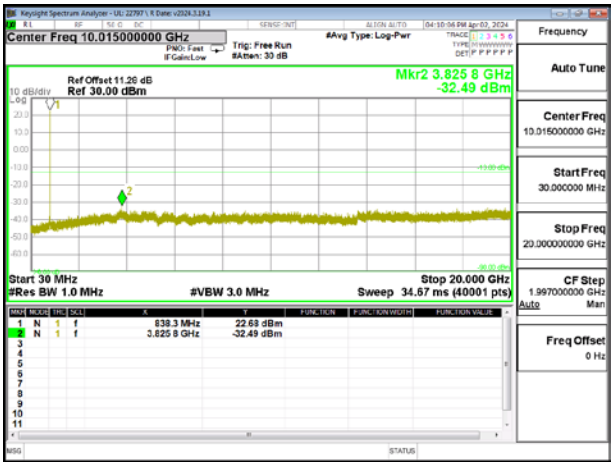
## 9.2.5. WCDMA BAND 5

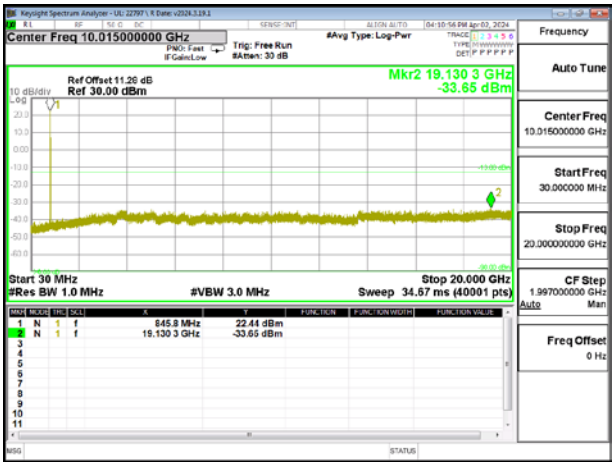
| Test Engineer ID: | 22797/85502 | Test Date: | 04-02-24 | EUT Serial Number: | QV77004EL3 |
|---|---|---|---|---|---|




BAND 5 Rel 99 LOW Channel




BAND 5 Rel 99 MID Channel




BAND 5 Rel 99 HIGH Channel

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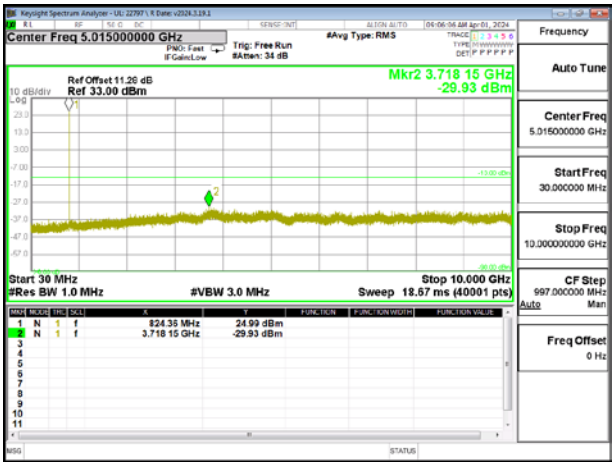
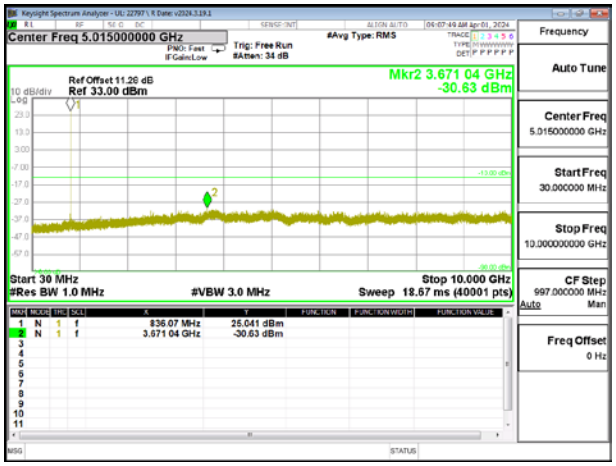
## 9.2.6. LTE5

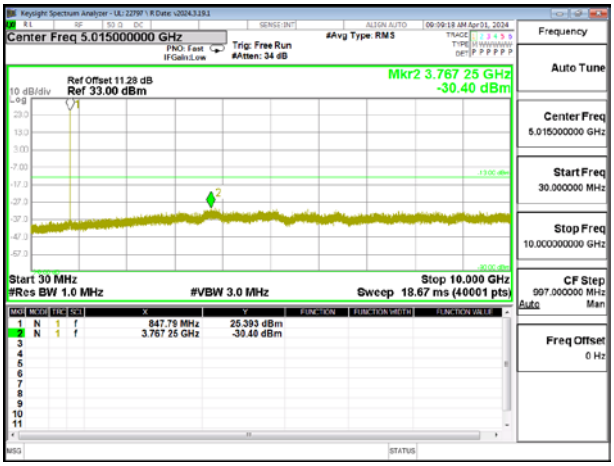
| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|



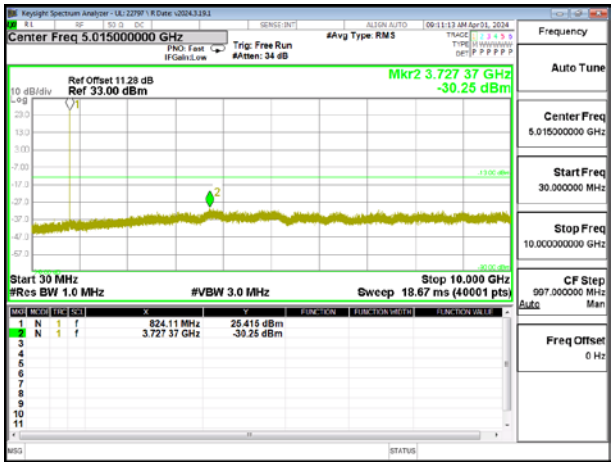

LTE5 1.4MHz 16QAM LOW Ch RB1-0



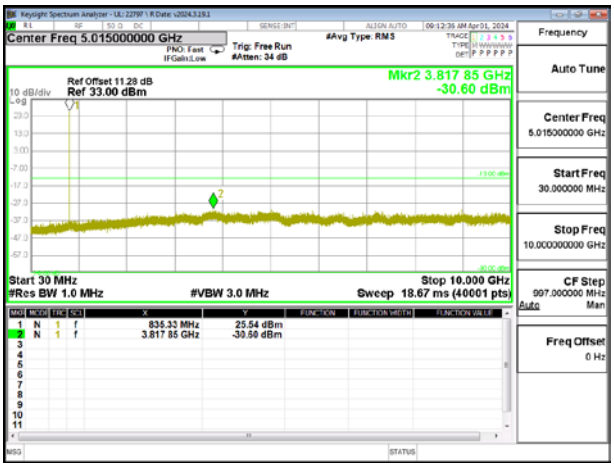

LTE5 1.4MHz 16QAM MID Ch RB1-0



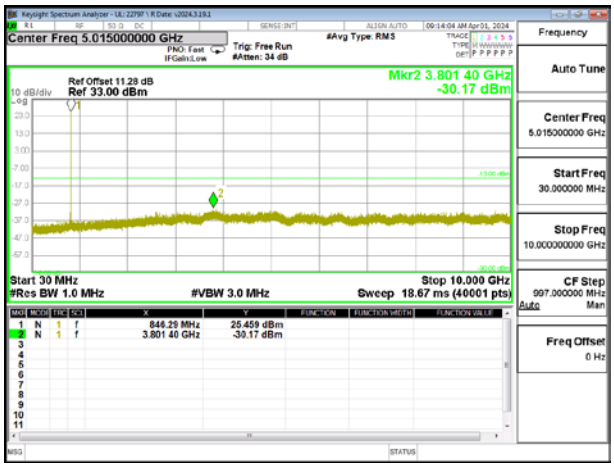

LTE5 1.4MHz 16QAM HIGH Ch RB1-0



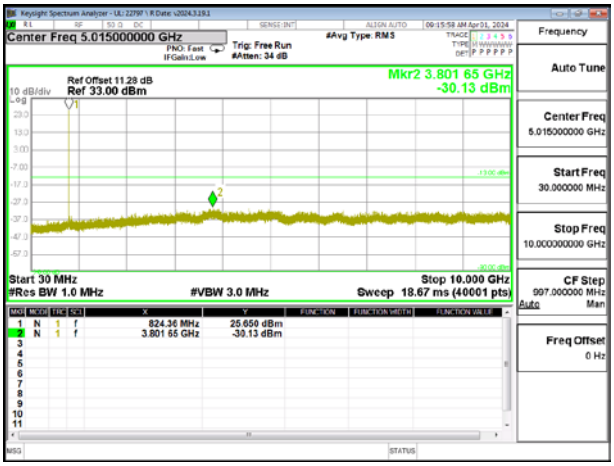

LTE5 3MHz 16QAM LOW Ch RB1-0



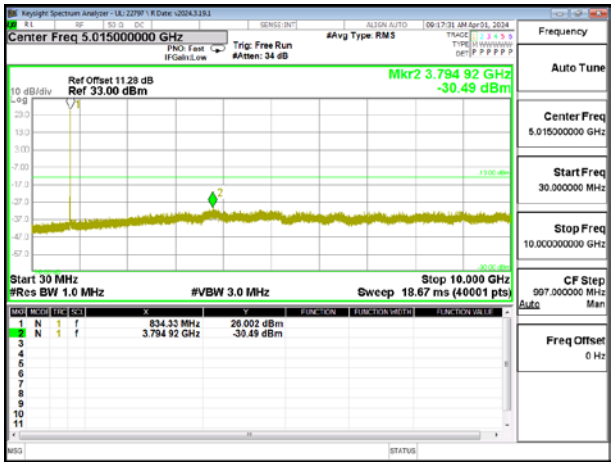

LTE5 3MHz 16QAM MID Ch RB1-0



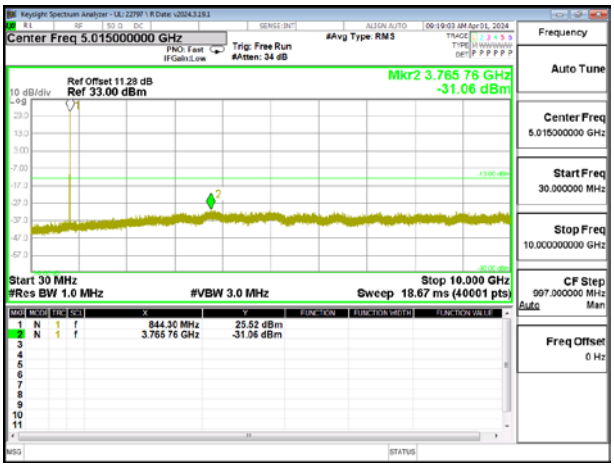

LTE5 3MHz 16QAM HIGH Ch RB1-0



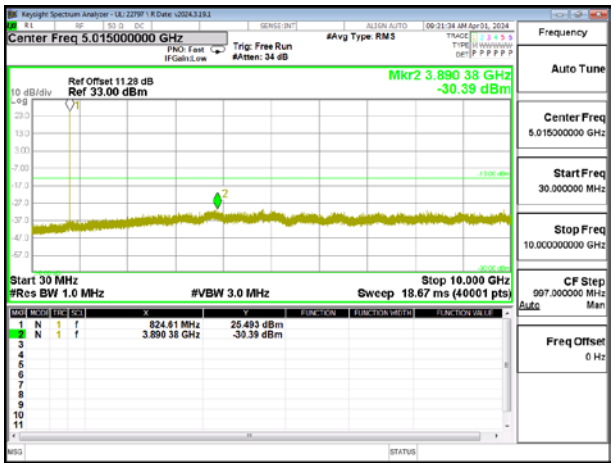

LTE5 5MHz 16QAM LOW Ch RB1-0



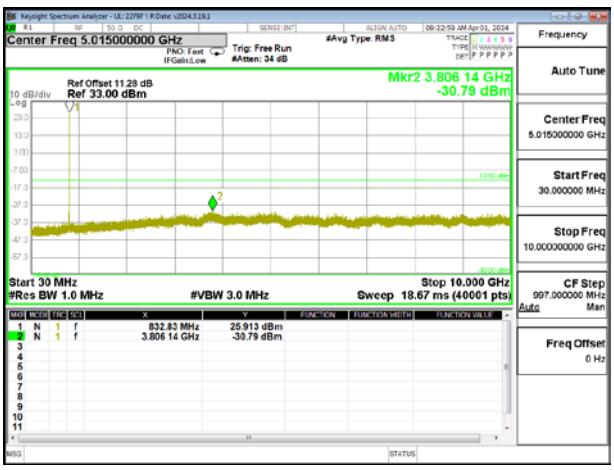

LTE5 5MHz 16QAM MID Ch RB1-0



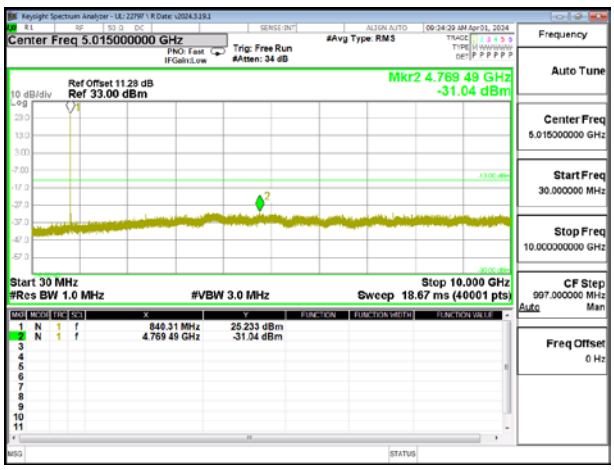

LTE5 5MHz 16QAM HIGH Ch RB1-0




LTE5 10MHz 16QAM LOW Ch RB1-0



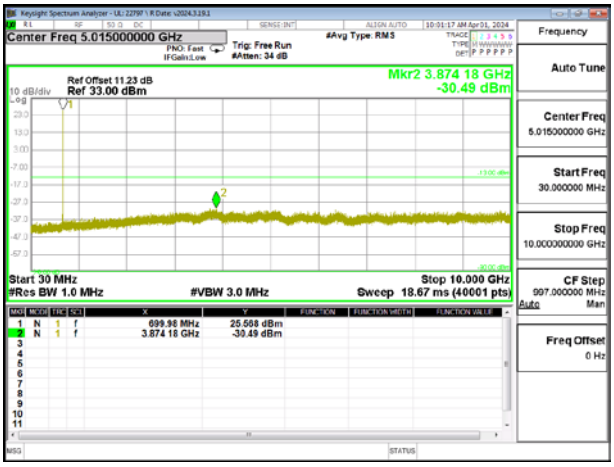

LTE5 10MHz 16QAM MID Ch RB1-0



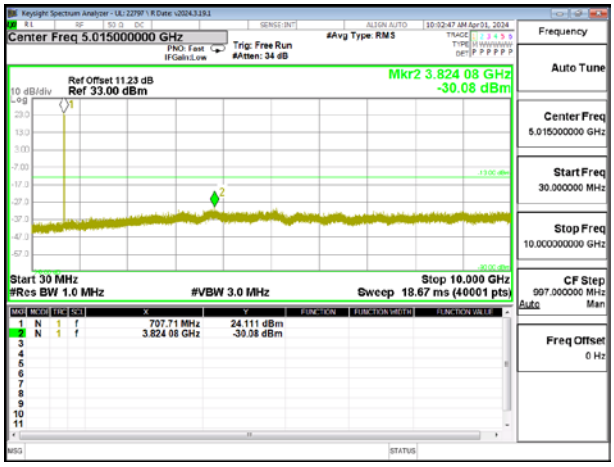

LTE5 10MHz 16QAM HIGH Ch RB1-0

## 9.2.7. LTE12

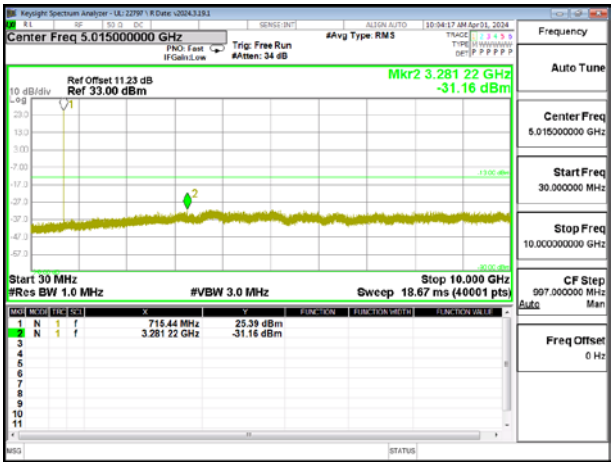
| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|



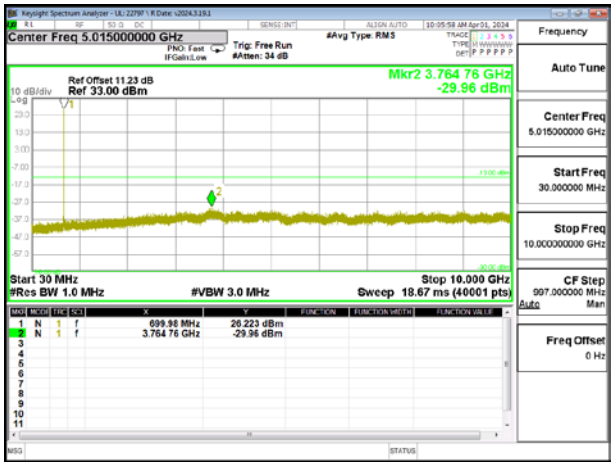

LTE12 1.4MHz 16QAM LOW Ch RB1-0



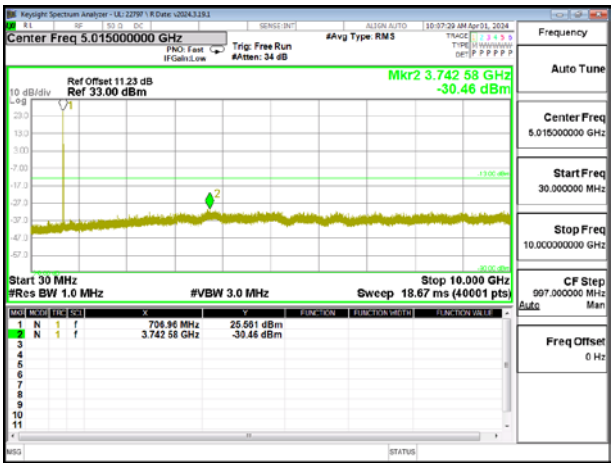

LTE12 1.4MHz 16QAM MID Ch RB1-0



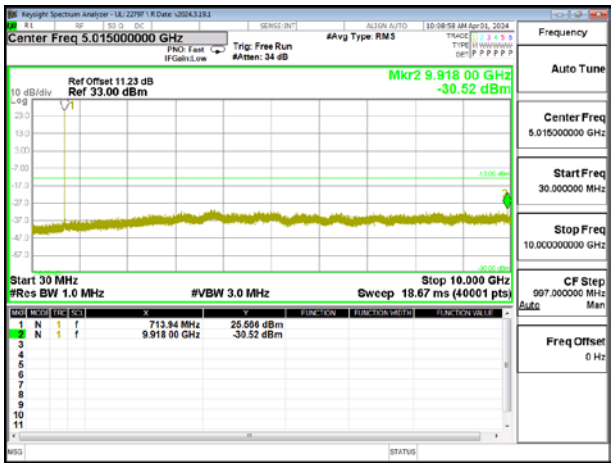

LTE12 1.4MHz 16QAM HIGH Ch RB1-0



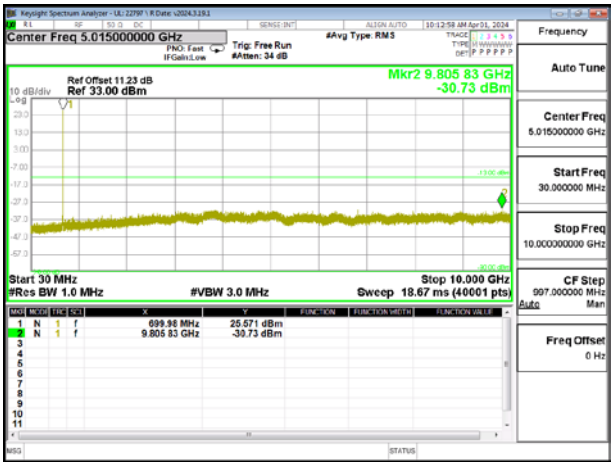

LTE12 3MHz 16QAM LOW Ch RB1-0



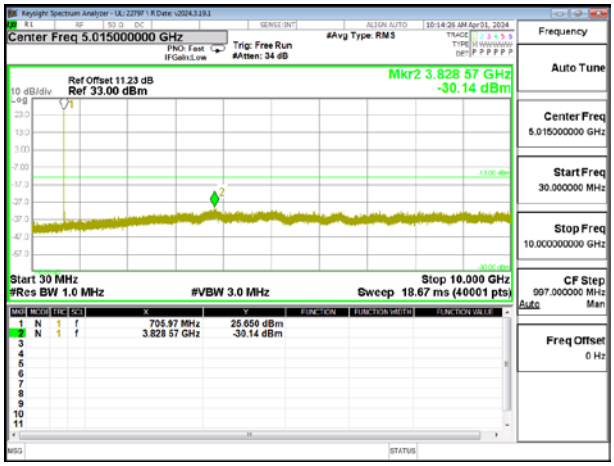

LTE12 3MHz 16QAM MID Ch RB1-0



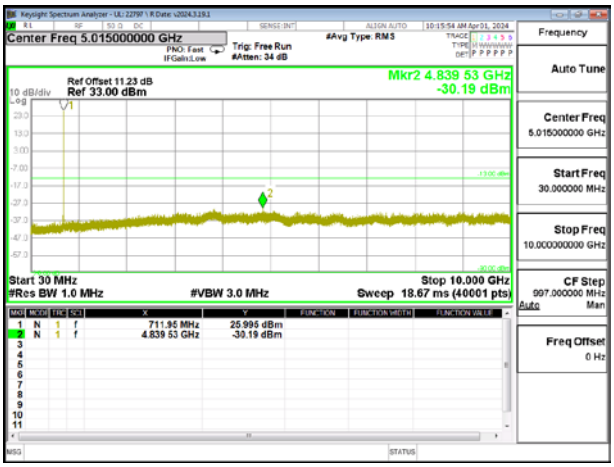

LTE12 3MHz 16QAM HIGH Ch RB1-0



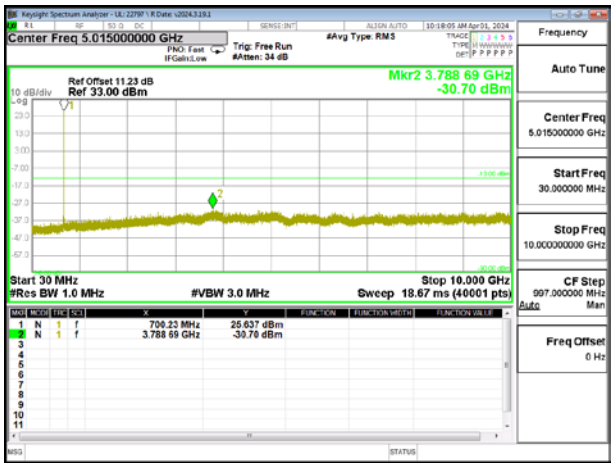

LTE12 5MHz 16QAM LOW Ch RB1-0



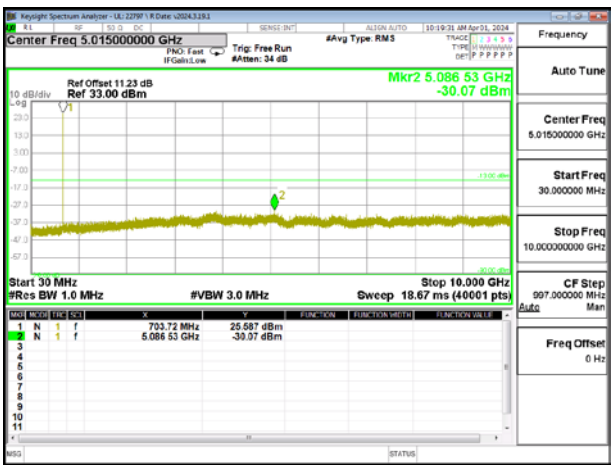

LTE12 5MHz 16QAM MID Ch RB1-0



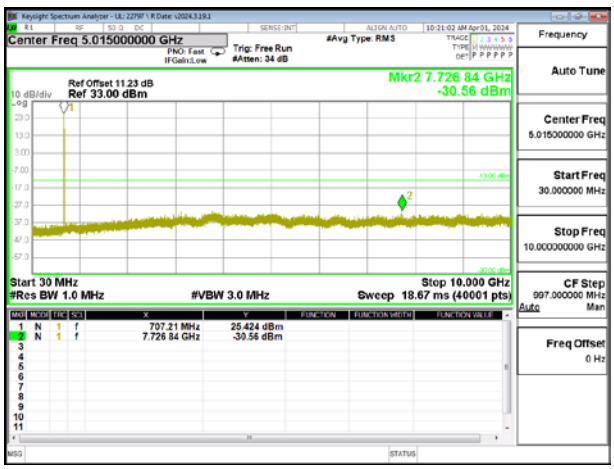

LTE12 5MHz 16QAM HIGH Ch RB1-0




LTE12 10MHz 16QAM LOW Ch RB1-0



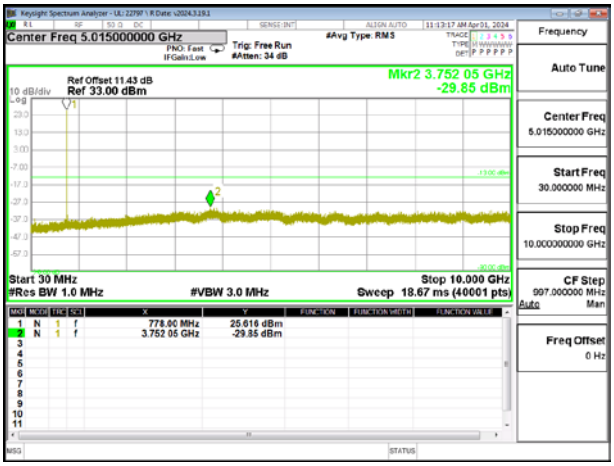

LTE12 10MHz 16QAM MID Ch RB1-0



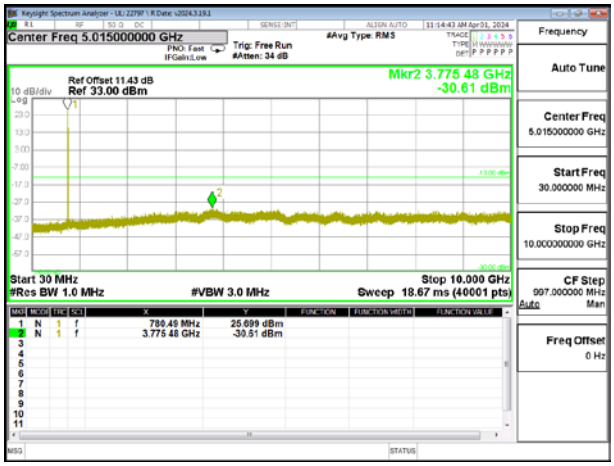

LTE12 10MHz 16QAM HIGH Ch RB1-0

## 9.2.8. LTE13

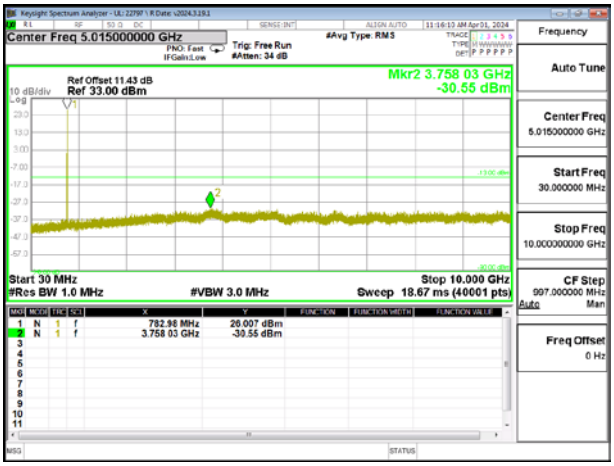
| Test Engineer ID: | 22797/85502 | Test Date: | 04-01-24 | Sample SN: | QV77004EL3 |
|---|---|---|---|---|---|



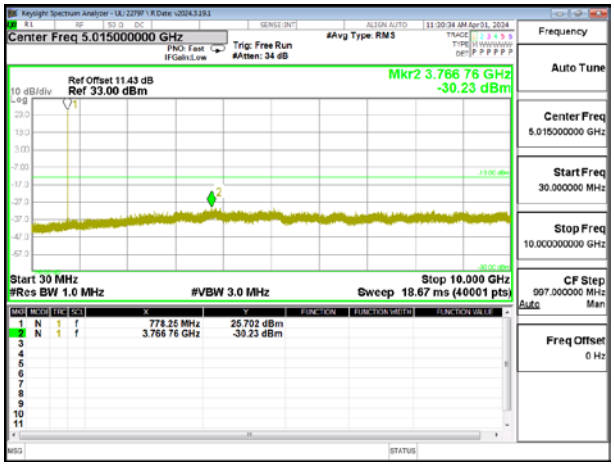

LTE13 5MHz 16QAM LOW Ch RB1-0




LTE13 5MHz 16QAM MID Ch RB1-0




LTE13 5MHz 16QAM HIGH Ch RB1-0




LTE13 10MHz 16QAM MID Ch RB1-0