# TEST REPORT

## Test Report No. : UL-RPT-RP10407443JD10C V2.0

| | | |
|---|---|---|
| **Manufacturer** | : | Apple Inc. |
| **Model No.** | : | A1600 |
| **FCC ID** | : | BCGA1600 |
| **Technology.** | : | LTE – Band 4 |
| **Test Standard(s)** | : | FCC Part 27 Subpart C |

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 2.0 supersedes all previous versions.

**Date of Issue:** 14 September 2014

**Checked by:**

Sarah Williams
Engineer, Radio Laboratory

**Issued by :**

pp

John Newell
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This laboratory is accredited by UKAS. The tests reported herein have been performed in accordance with its' terms of accreditation.

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# 1. Customer Information

| | |
|---|---|
| **Company Name:** | Apple Inc. |
| **Address:** | 1 Infinite Loop<br>Cupertino, CA 95014<br>U.S.A. |

# 2. Summary of Testing

## 2.1. General Information

| | |
|---|---|
| **Specification Reference:** | 47CFR27 |
| **Specification Title:** | Code of Federal Regulations Volume 47 (Telecommunications):<br>Part 27 Subpart C (Miscellaneous Wireless Communication Services) |
| **Site Registration:** | 209735 |
| **Location of Testing:** | UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park,<br>Basingstoke, Hampshire, RG24 8AH, United Kingdom |
| **Test Dates:** | 09 July 2014 to 14 September 2014 |

## 2.2. Summary of Test Results

| FCC Reference (47CFR) | Measurement | Result |
|---|---|---|
| 2.1046 / 27.50(d)(4) | Transmitter Output Power (EIRP) | ✓ |
| 2.1049 | Transmitter Occupied Bandwidth | ✓ |
| 2.1053 / 27.53(h)(1) | Transmitter Radiated Spurious Emissions | ✓ |
| 2.1053 / 27.53(h)(1) | Transmitter Radiated Emissions at Band Edges | ✓ |
| 2.1055 / 27.54 | Transmitter Frequency Stability<br>(Temperature and Voltage Variation) | ✓ |

Key to Results

✓ **= Complied** ✗ **= Did not comply**

## 2.3. Methods and Procedures

| | |
|---|---|
| **Reference:** | ANSI/TIA-603-C-2004 |
| **Title:** | Land Mobile Communications Equipment, Measurements and performance Standards |
| **Reference:** | FCC KDB 971168 D01 v02r01, 7 June 2013 |
| **Title:** | Measurement Guidance for Certification of Licensed Digital Transmitters |

## 2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

# 3. Equipment Under Test (EUT)

## 3.1. Identification of Equipment Under Test (EUT)

| | |
|---|---|
| **Brand Name:** | Apple |
| **Model Name or Number:** | A1600 |
| **Test Sample IMEI:** | 352025060238798 *(Radiated Sample)* |
| **Hardware Version Number:** | REV1.0 |
| **Software Version Number:** | iOS 12A314<br>BB: 3.08.08 |
| **FCC ID:** | BCGA1600 |

| | |
|---|---|
| **Brand Name:** | Apple |
| **Model Name or Number:** | A1600 |
| **Test Sample IMEI:** | 352025060274538 *(Conducted Sample)* |
| **Hardware Version Number:** | REV1.0 |
| **Software Version Number:** | iOS 12A314<br>BB: 3.08.08 |
| **FCC ID:** | BCGA1600 |

## 3.2. Description of EUT

The Equipment Under Test was a tablet with GSM/GPRS/EGPRS/UMTS/LTE and CDMA technologies. It also supports IEEE 802.11a/b/g/n (MIMO 2x2) and *Bluetooth*®. The rechargeable battery is not user accessible.

## 3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

## 3.4. Additional Information Related to Testing

| | | | |
|---|---|---|---|
| **Tested Technology:** | LTE Band 4 | | |
| **Type of Equipment** | Transceiver | | |
| **Channel Bandwidth(s):** | 1.4, 3, 5, 10, 15 & 20 MHz | | |
| **Modulation Type:** | QPSK & 16QAM | | |
| **Duty Cycle:** | 100% | | |
| **Antenna Gain:** | 1.47 dBi | | |
| **Power Supply Requirement:** | Nominal | 3.8 V | |
| | Minimum | 3.4 V | |
| | Maximum | 4.2 V | |
| **Transmit Frequency Range:** | 1710 MHz to 1755 MHz | | |
| **Channels Tested:** | **Channel Bandwidth** | **$N_{ul}$** | **Frequency of Uplink (MHz)** |
| **Bottom Channel** | 1.4 | 19957 | 1710.7 |
| | 3 | 19965 | 1711.5 |
| | 5 | 19975 | 1712.5 |
| | 10 | 20000 | 1715.0 |
| | 15 | 20025 | 1717.5 |
| | 20 | 20050 | 1720.0 |
| **Middle Channel** | All | 20175 | 1732.5 |
| **Top Channel** | 1.4 | 20393 | 1754.3 |
| | 3 | 20385 | 1753.5 |
| | 5 | 20375 | 1752.5 |
| | 10 | 20350 | 1750.0 |
| | 15 | 20325 | 1747.5 |
| | 20 | 20300 | 1745.0 |

## 3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

| | |
|---|---|
| **Brand Name:** | Dell |
| **Description:** | Laptop computer |
| **Model Name or Number:** | Inspiron |
| **Serial Number:** | Asset RFI00788 |

| | |
|---|---|
| **Brand Name:** | Not stated |
| **Description:** | USB Diagnostic cable |
| **Model Name or Number:** | Not stated |
| **Serial Number:** | Not stated |

| | |
|---|---|
| **Brand Name:** | Apple |
| **Description:** | Test Laptop |
| **Model Name or Number:** | MacBook Pro |
| **Serial Number:** | C2QLQ03XF9F2 |

| | |
|---|---|
| **Brand Name:** | Apple |
| **Description:** | USB Cable |
| **Model Name or Number:** | A1480 |
| **Serial Number:** | Not stated |

| | |
|---|---|
| **Brand Name:** | Apple |
| **Description:** | USB Charger |
| **Model Name or Number:** | A1399 |
| **Serial Number:** | Not stated |

| | |
|---|---|
| **Brand Name:** | Apple |
| **Description:** | PHF |
| **Model Name or Number:** | Apple Ear Plugs |
| **Serial Number:** | Not stated |

# 4. Operation and Monitoring of the EUT during Testing

## 4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Transmit Mode - The EUT was set to transmit with maximum output power using the required channel bandwidth. QPSK and 16QAM modulations were both tested, with Resource Block allocation as detailed in section 4.3.

## 4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- The EUT was connected to a Rohde and Schwarz CMW500 LTE system simulator, operating in a transceiver mode.
- Transmitter radiated spurious emissions tests were performed with the EUT set to transmit with a 15 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset. This was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.
- Transmitter radiated spurious emissions tests were performed with the AC Charger and PHF connected to the EUT as this was found to be the worst case during pre-scans. All the accessories were individually connected and measurements made during the pre-scans to determine the worst case combination.
- Conducted measurements at temperature and voltage extremes were performed using a conducted sample supplied by the customer. Short 4-wire DC flying leads were connected internally to the device in place of the battery, and exited through a hole in the casing. These leads were then extended to a DC power supply for testing purposes.
- For conducted cellular measurements, the RF conducted port was created by removing a micro connector from the pcb antenna and extending it with a short flexible microstrip supplied by the customer. This microstrip exited the device through a hole in the casing and was terminated in a proprietary micro-coax to SMA adaptor.
- The conducted sample with IMEI 352025060274538 was used for frequency stability, occupied bandwidth and power measurements.
- The radiated sample with IMEI 352025060238798 was used for all radiated measurements.

## 4.3. Resource Block Allocation

| Channel Bandwidth (MHz) | Maximum No. of Resource Blocks | Resource Block / Offset Number | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Sub Test 1 | | Sub Test 2 | | Sub Test 3 | | Sub Test 4 | |
| | | RB | Offset | RB | Offset | RB | Offset | RB | Offset |
| 1.4 | 6 | 1 | 0 | 1 | 5 | 3 | 2 | 6 | 0 |
| 3 | 15 | 1 | 0 | 1 | 14 | 8 | 4 | 15 | 0 |
| 5 | 25 | 1 | 0 | 1 | 24 | 12 | 6 | 25 | 0 |
| 10 | 50 | 1 | 0 | 1 | 49 | 25 | 12 | 50 | 0 |
| 15 | 75 | 1 | 0 | 1 | 74 | 36 | 18 | 75 | 0 |
| 20 | 100 | 1 | 0 | 1 | 99 | 50 | 25 | 100 | 0 |

Transmitter Output Power was carried out using sub tests 1, 2, 3 and 4, with both QPSK and 16QAM modulation schemes.

Transmitter Occupied Bandwidth was carried out using sub tests 3 and 4, for both QPSK and 16QAM modulation schemes.

Transmitter Radiated Emissions testing was carried out using sub test 1, with a 15 MHz channel bandwidth and QPSK modulation scheme, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.

Transmitter Radiated Band Edge Emissions was tested with sub test 4 on all supported channel bandwidths using QPSK and 16-QAM modulations with the maximum resource blocks settings.

Transmitter Frequency Stability test was carried out with sub test 4, with a channel bandwidth of 1.4 MHz only.

# 5. Measurements, Examinations and Derived Results

## 5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6* for Measurement Uncertainty details.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

## 5.2. Test Results

### 5.2.1. Transmitter Output Power (EIRP)

**Test Summary:**

| | | | |
|---|---|---|---|
| **Test Engineer:** | Keith Tucker | **Test Date:** | 28 July 2014 |
| **Test Sample IMEI:** | 352025060274538 | | |

| | |
|---|---|
| **FCC Reference:** | Parts 2.1046 & 27.50(d)(4) |
| **Test Method Used:** | As detailed in FCC KDB 971168 Section 5.2.3 |

**Environmental Conditions:**

| | |
|---|---|
| **Temperature (℃):** | 25 |
| **Relative Humidity (%):** | 44 |

**Note(s):**

1. The customer stated that the antenna gain is 1.47 dBi.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed in section 4.3 of this report.

**Transmitter Output Power (EIRP) (continued)**

**Results: 1.4 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1710.7 | 6 | 0 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |
| 1710.7 | 3 | 2 | 22.3 | 1.47 | 23.77 | 30.0 | 6.23 | Complied |
| 1710.7 | 1 | 0 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |
| 1710.7 | 1 | 5 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |

**Results: 1.4 MHz Channel Bandwidth / Bottom Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1710.7 | 6 | 0 | 20.4 | 1.47 | 21.87 | 30.0 | 8.13 | Complied |
| 1710.7 | 3 | 2 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |
| 1710.7 | 1 | 0 | 21.2 | 1.47 | 22.67 | 30.0 | 7.33 | Complied |
| 1710.7 | 1 | 5 | 21.3 | 1.47 | 22.77 | 30.0 | 7.23 | Complied |

**Results: 1.4 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 6 | 0 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1732.5 | 3 | 2 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |
| 1732.5 | 1 | 0 | 22.8 | 1.47 | 24.27 | 30.0 | 5.73 | Complied |
| 1732.5 | 1 | 5 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |

**Results: 1.4 MHz Channel Bandwidth / Middle Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 6 | 0 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1732.5 | 3 | 2 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1732.5 | 1 | 0 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |
| 1732.5 | 1 | 5 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 1.4 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1754.3 | 6 | 0 | 21.2 | 1.47 | 22.67 | 30.0 | 7.33 | Complied |
| 1754.3 | 3 | 2 | 22.1 | 1.47 | 23.57 | 30.0 | 6.43 | Complied |
| 1754.3 | 1 | 0 | 22.3 | 1.47 | 23.77 | 30.0 | 6.23 | Complied |
| 1754.3 | 1 | 5 | 22.3 | 1.47 | 23.77 | 30.0 | 6.23 | Complied |

**Results: 1.4 MHz Channel Bandwidth / Top Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1754.3 | 6 | 0 | 20.4 | 1.47 | 21.87 | 30.0 | 8.13 | Complied |
| 1754.3 | 3 | 2 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |
| 1754.3 | 1 | 0 | 21.2 | 1.47 | 22.67 | 30.0 | 7.33 | Complied |
| 1754.3 | 1 | 5 | 21.2 | 1.47 | 22.67 | 30.0 | 7.33 | Complied |

**Results: 3 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1711.5 | 15 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1711.5 | 8 | 4 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1711.5 | 1 | 0 | 22.6 | 1.47 | 24.07 | 30.0 | 5.93 | Complied |
| 1711.5 | 1 | 14 | 22.5 | 1.47 | 23.97 | 30.0 | 6.03 | Complied |

**Results: 3 MHz Channel Bandwidth / Bottom Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1711.5 | 15 | 0 | 20.6 | 1.47 | 22.07 | 30.0 | 7.93 | Complied |
| 1711.5 | 8 | 4 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1711.5 | 1 | 0 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |
| 1711.5 | 1 | 14 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 3 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 15 | 0 | 21.9 | 1.47 | 23.37 | 30.0 | 6.63 | Complied |
| 1732.5 | 8 | 4 | 22.0 | 1.47 | 23.47 | 30.0 | 6.53 | Complied |
| 1732.5 | 1 | 0 | 22.8 | 1.47 | 24.27 | 30.0 | 5.73 | Complied |
| 1732.5 | 1 | 14 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |

**Results: 3 MHz Channel Bandwidth / Middle Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 15 | 0 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1732.5 | 8 | 4 | 20.9 | 1.47 | 22.37 | 30.0 | 7.63 | Complied |
| 1732.5 | 1 | 0 | 21.9 | 1.47 | 23.37 | 30.0 | 6.63 | Complied |
| 1732.5 | 1 | 14 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |

**Results: 3 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1753.5 | 15 | 0 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |
| 1753.5 | 8 | 4 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |
| 1753.5 | 1 | 0 | 22.5 | 1.47 | 23.97 | 30.0 | 6.03 | Complied |
| 1753.5 | 1 | 14 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |

**Results: 3 MHz Channel Bandwidth / Top Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1753.5 | 15 | 0 | 20.5 | 1.47 | 21.97 | 30.0 | 8.03 | Complied |
| 1753.5 | 8 | 4 | 20.5 | 1.47 | 21.97 | 30.0 | 8.03 | Complied |
| 1753.5 | 1 | 0 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |
| 1753.5 | 1 | 14 | 21.3 | 1.47 | 22.77 | 30.0 | 7.23 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1712.5 | 25 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1712.5 | 12 | 6 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1712.5 | 1 | 0 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |
| 1712.5 | 1 | 24 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |

**Results: 5 MHz Channel Bandwidth / Bottom Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1712.5 | 25 | 0 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1712.5 | 12 | 6 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1712.5 | 1 | 0 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |
| 1712.5 | 1 | 24 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |

**Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 25 | 0 | 21.9 | 1.47 | 23.37 | 30.0 | 6.63 | Complied |
| 1732.5 | 12 | 6 | 21.9 | 1.47 | 23.37 | 30.0 | 6.63 | Complied |
| 1732.5 | 1 | 0 | 22.8 | 1.47 | 24.27 | 30.0 | 5.73 | Complied |
| 1732.5 | 1 | 24 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |

**Results: 5 MHz Channel Bandwidth / Middle Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 25 | 0 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1732.5 | 12 | 6 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1732.5 | 1 | 0 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |
| 1732.5 | 1 | 24 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 5 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1752.5 | 25 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1752.5 | 12 | 6 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1752.5 | 1 | 0 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |
| 1752.5 | 1 | 24 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |

**Results: 5 MHz Channel Bandwidth / Top Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1752.5 | 25 | 0 | 20.5 | 1.47 | 21.97 | 30.0 | 8.03 | Complied |
| 1752.5 | 12 | 6 | 20.5 | 1.47 | 21.97 | 30.0 | 8.03 | Complied |
| 1752.5 | 1 | 0 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |
| 1752.5 | 1 | 24 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |

**Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1715.0 | 50 | 0 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |
| 1715.0 | 25 | 12 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |
| 1715.0 | 1 | 0 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |
| 1715.0 | 1 | 49 | 22.8 | 1.47 | 24.27 | 30.0 | 5.73 | Complied |

**Results: 10 MHz Channel Bandwidth / Bottom Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1715.0 | 50 | 0 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1715.0 | 25 | 12 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1715.0 | 1 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1715.0 | 1 | 49 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 50 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1732.5 | 25 | 12 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |
| 1732.5 | 1 | 0 | 22.8 | 1.47 | 24.27 | 30.0 | 5.73 | Complied |
| 1732.5 | 1 | 49 | 22.6 | 1.47 | 24.07 | 30.0 | 5.93 | Complied |

**Results: 10 MHz Channel Bandwidth / Middle Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 50 | 0 | 20.6 | 1.47 | 22.07 | 30.0 | 7.93 | Complied |
| 1732.5 | 25 | 12 | 20.8 | 1.47 | 22.27 | 30.0 | 7.73 | Complied |
| 1732.5 | 1 | 0 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1732.5 | 1 | 49 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |

**Results: 10 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1750.0 | 50 | 0 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |
| 1750.0 | 25 | 12 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1750.0 | 1 | 0 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |
| 1750.0 | 1 | 49 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |

**Results: 10 MHz Channel Bandwidth / Top Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1750.0 | 50 | 0 | 20.4 | 1.47 | 21.87 | 30.0 | 8.13 | Complied |
| 1750.0 | 25 | 12 | 20.5 | 1.47 | 21.97 | 30.0 | 8.03 | Complied |
| 1750.0 | 1 | 0 | 21.3 | 1.47 | 22.77 | 30.0 | 7.23 | Complied |
| 1750.0 | 1 | 49 | 21.3 | 1.47 | 22.77 | 30.0 | 7.23 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 15 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1717.5 | 75 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1717.5 | 36 | 18 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1717.5 | 1 | 0 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |
| 1717.5 | 1 | 74 | 22.8 | 1.47 | 24.27 | 30.0 | 5.73 | Complied |

**Results: 15 MHz Channel Bandwidth / Bottom Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1717.5 | 75 | 0 | 20.6 | 1.47 | 22.07 | 30.0 | 7.93 | Complied |
| 1717.5 | 36 | 18 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1717.5 | 1 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1717.5 | 1 | 74 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |

**Results: 15 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 75 | 0 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |
| 1732.5 | 36 | 18 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1732.5 | 1 | 0 | 23.0 | 1.47 | 24.47 | 30.0 | 5.53 | Complied |
| 1732.5 | 1 | 74 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |

**Results: 15 MHz Channel Bandwidth / Middle Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 75 | 0 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1732.5 | 36 | 18 | 20.8 | 1.47 | 22.27 | 30.0 | 7.73 | Complied |
| 1732.5 | 1 | 0 | 21.9 | 1.47 | 23.37 | 30.0 | 6.63 | Complied |
| 1732.5 | 1 | 74 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 15 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1747.5 | 75 | 0 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |
| 1747.5 | 36 | 18 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |
| 1747.5 | 1 | 0 | 22.6 | 1.47 | 24.07 | 30.0 | 5.93 | Complied |
| 1747.5 | 1 | 74 | 22.4 | 1.47 | 23.87 | 30.0 | 6.13 | Complied |

**Results: 15 MHz Channel Bandwidth / Top Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1747.5 | 75 | 0 | 20.4 | 1.47 | 21.87 | 30.0 | 8.13 | Complied |
| 1747.5 | 36 | 18 | 20.4 | 1.47 | 21.87 | 30.0 | 8.13 | Complied |
| 1747.5 | 1 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1747.5 | 1 | 74 | 21.4 | 1.47 | 22.87 | 30.0 | 7.13 | Complied |

**Results: 20 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1720.0 | 100 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1720.0 | 50 | 25 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1720.0 | 1 | 0 | 22.8 | 1.47 | 24.27 | 30.0 | 5.73 | Complied |
| 1720.0 | 1 | 99 | 22.9 | 1.47 | 24.37 | 30.0 | 5.63 | Complied |

**Results: 20 MHz Channel Bandwidth / Bottom Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1720.0 | 100 | 0 | 20.8 | 1.47 | 22.27 | 30.0 | 7.73 | Complied |
| 1720.0 | 50 | 25 | 20.8 | 1.47 | 22.27 | 30.0 | 7.73 | Complied |
| 1720.0 | 1 | 0 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1720.0 | 1 | 99 | 21.9 | 1.47 | 23.37 | 30.0 | 6.63 | Complied |

**Transmitter Output Power (EIRP) (continued)**

**Results: 20 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 100 | 0 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1732.5 | 50 | 25 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1732.5 | 1 | 0 | 22.9 | 1.47 | 24.37 | 30.0 | 5.63 | Complied |
| 1732.5 | 1 | 99 | 22.6 | 1.47 | 24.07 | 30.0 | 5.93 | Complied |

**Results: 20 MHz Channel Bandwidth / Middle Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1732.5 | 100 | 0 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1732.5 | 50 | 25 | 20.7 | 1.47 | 22.17 | 30.0 | 7.83 | Complied |
| 1732.5 | 1 | 0 | 21.8 | 1.47 | 23.27 | 30.0 | 6.73 | Complied |
| 1732.5 | 1 | 99 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |

**Results: 20 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1745.0 | 100 | 0 | 21.7 | 1.47 | 23.17 | 30.0 | 6.83 | Complied |
| 1745.0 | 50 | 25 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |
| 1745.0 | 1 | 0 | 22.7 | 1.47 | 24.17 | 30.0 | 5.83 | Complied |
| 1745.0 | 1 | 99 | 22.5 | 1.47 | 23.97 | 30.0 | 6.03 | Complied |

**Results: 20 MHz Channel Bandwidth / Top Channel / 16QAM**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Conducted RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|---|---|
| 1745.0 | 100 | 0 | 20.6 | 1.47 | 22.07 | 30.0 | 7.93 | Complied |
| 1745.0 | 50 | 25 | 20.5 | 1.47 | 21.97 | 30.0 | 8.03 | Complied |
| 1745.0 | 1 | 0 | 21.6 | 1.47 | 23.07 | 30.0 | 6.93 | Complied |
| 1745.0 | 1 | 99 | 21.5 | 1.47 | 22.97 | 30.0 | 7.03 | Complied |

## Transmitter Output Power (EIRP) (continued)

## Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|---|---|---|---|---|---|---|
| M1658 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| M1871 | Power Meter | Agilent | N1911A | MY45100338 | 28 May 2015 | 12 |
| M1872 | Wideband Power Sensor | Agilent | N1921A | MY45241950 | 08 Oct 2014 | 12 |
| S0537 | DC Power Supply | TTi | EL302D | 249928 | Calibrated before use | - |
| M1251 | Digital Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |
| A2535 | Directional Coupler | AtlanTec RF | CDC-003060-20 | 14041701719 | Calibrated before use | - |
| A2508 | Attenuator | AtlanTec RF | AN18-10 | 821846#3 | Calibrated before use | - |
| A539 | Power Splitter | Rohde & Schwarz | RVZ | 22441 | Calibrated before use | - |

### 5.2.2. Transmitter Occupied Bandwidth

**Test Summary:**

| | | | |
|---|---|---|---|
| **Test Engineer:** | Keith Tucker | **Test Date:** | 18 July 2014 |
| **Test Sample IMEI:** | 352025060274538 | | |

| | |
|---|---|
| **FCC Reference:** | Part 2.1049 |
| **Test Method Used:** | As detailed in KDB 971168 Section 4.2 |

**Environmental Conditions:**

| | |
|---|---|
| **Temperature (℃):** | 23 |
| **Relative Humidity (%):** | 38 |

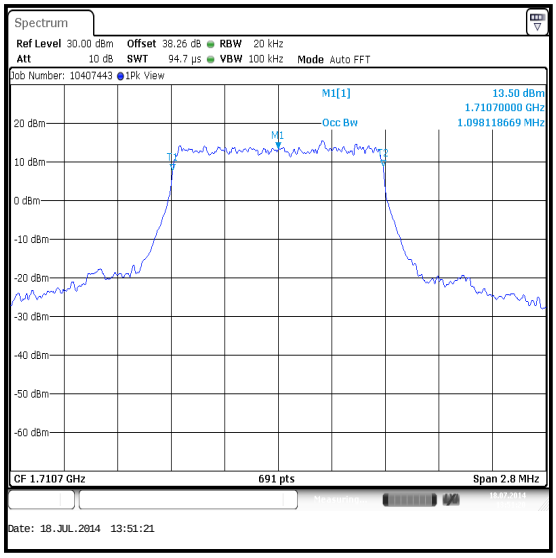
**Note(s):**

1. Occupied bandwidth (99% bandwidth) was measured using a test receiver occupied bandwidth function.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed in section 4.3 of this report.
3. The test receiver was connected to the RF port on the EUT using suitable attenuation and RF cable.

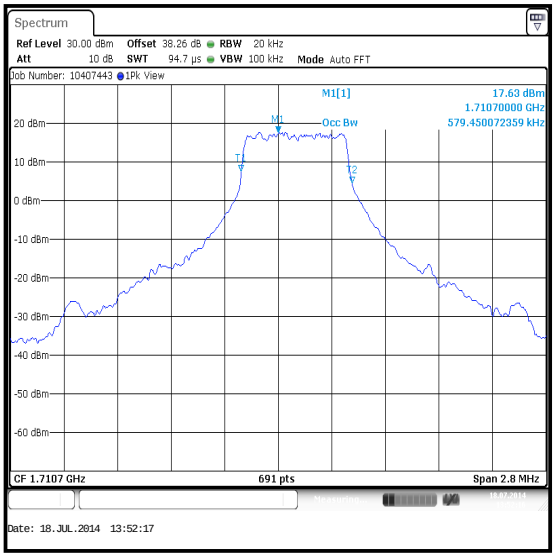
## Transmitter Occupied Bandwidth (continued)

## Results: 1.4 MHz Channel Bandwidth / Bottom Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1710.7 | 6 | 0 | 20 | 100 | 1.098 |
| 1710.7 | 3 | 2 | 20 | 100 | 0.579 |




QPSK / 6 Resource Blocks (0 Offset)

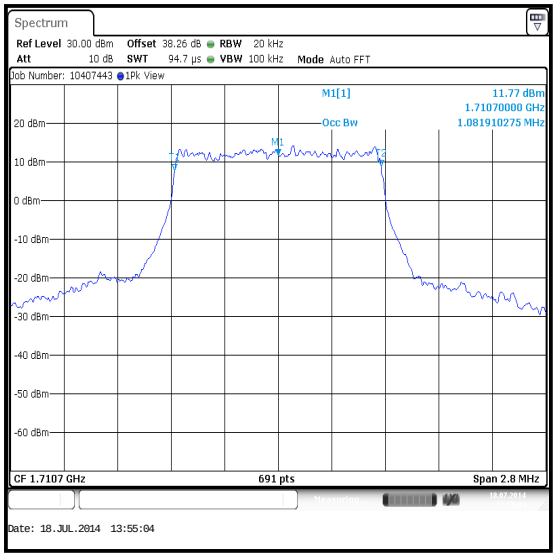



QPSK / 3 Resource Blocks (2 Offset)

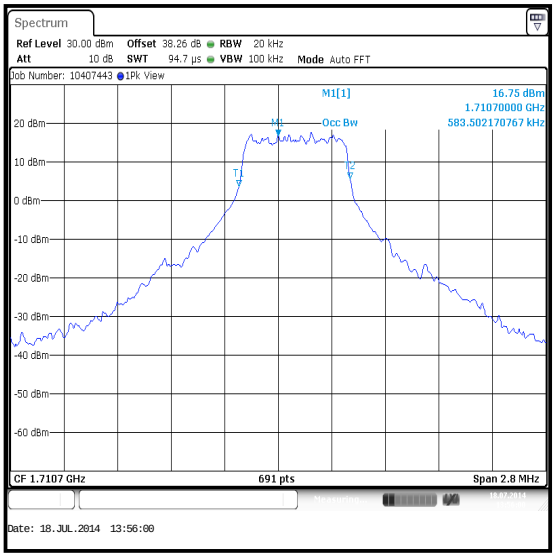
## Transmitter Occupied Bandwidth (continued)

## Results: 1.4 MHz Channel Bandwidth / Bottom Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1710.7 | 6 | 0 | 20 | 100 | 1.082 |
| 1710.7 | 3 | 2 | 20 | 100 | 0.584 |




**16QAM / 6 Resource Blocks (0 Offset)**

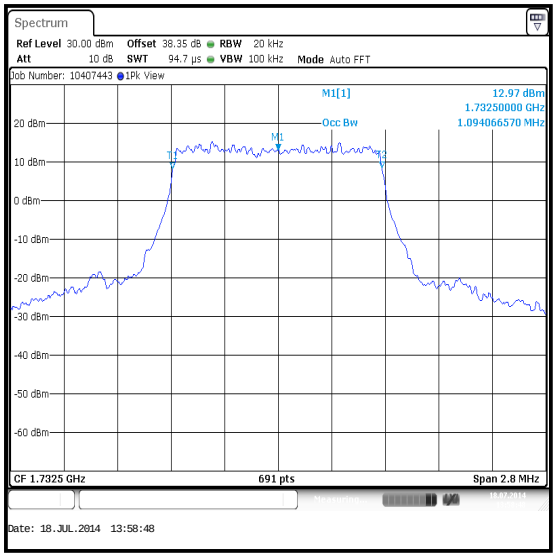



**16QAM / 3 Resource Blocks (2 Offset)**

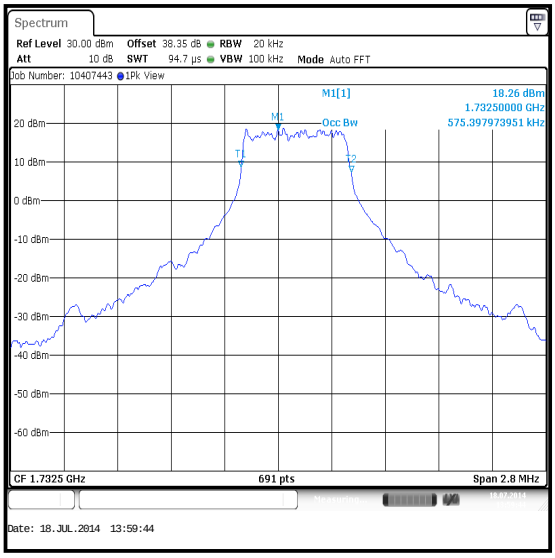
## Transmitter Occupied Bandwidth (continued)

## Results: 1.4 MHz Channel Bandwidth / Middle Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 6 | 0 | 20 | 100 | 1.094 |
| 1732.5 | 3 | 2 | 20 | 100 | 0.575 |




**QPSK / 6 Resource Blocks (0 Offset)**

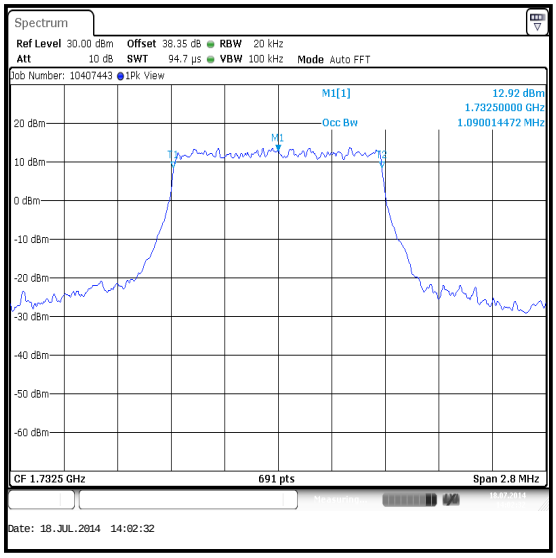



**QPSK / 3 Resource Blocks (2 Offset)**

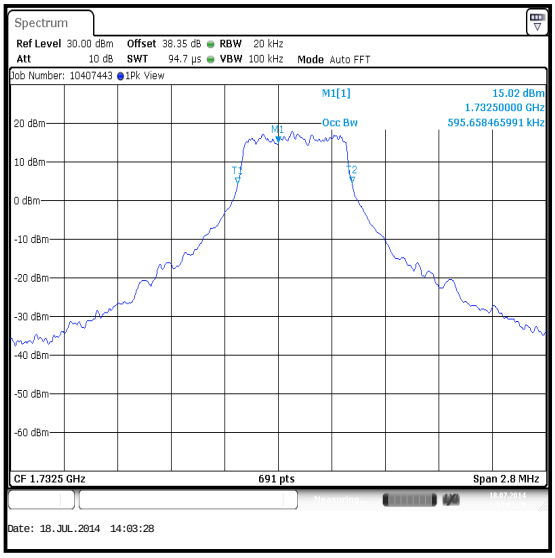
## Transmitter Occupied Bandwidth (continued)

## Results: 1.4 MHz Channel Bandwidth / Middle Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 6 | 0 | 20 | 100 | 1.090 |
| 1732.5 | 3 | 2 | 20 | 100 | 0.596 |




16QAM / 6 Resource Blocks (0 Offset)

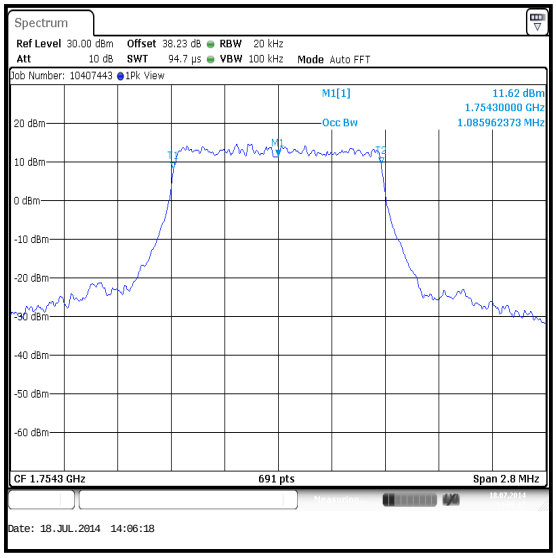



16QAM / 3 Resource Blocks (2 Offset)

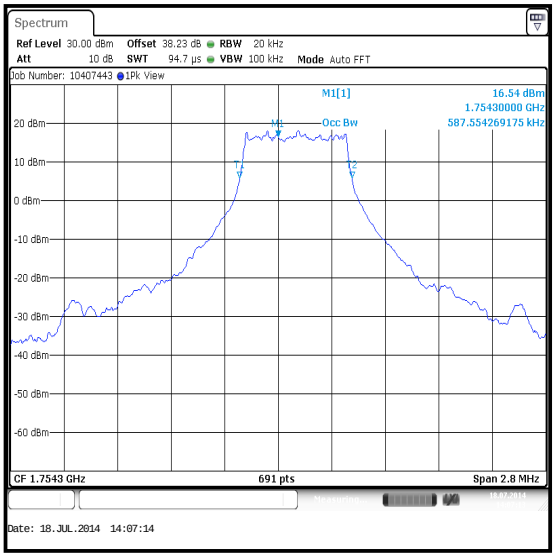
## Transmitter Occupied Bandwidth (continued)

## Results: 1.4 MHz Channel Bandwidth / Top Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1754.3 | 6 | 0 | 20 | 100 | 1.086 |
| 1754.3 | 3 | 2 | 20 | 100 | 0.588 |




QPSK / 6 Resource Blocks (0 Offset)

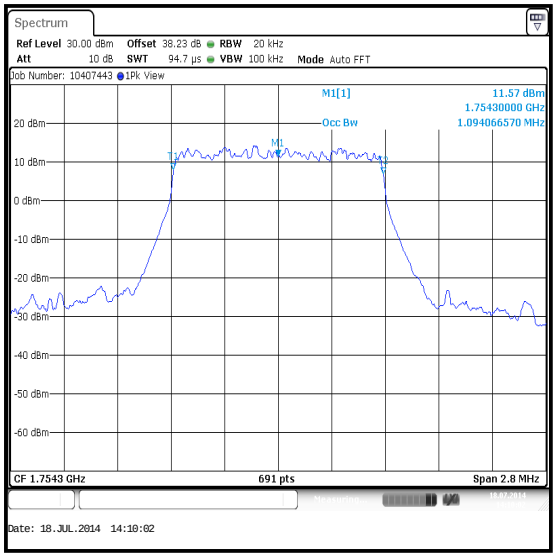



QPSK / 3 Resource Blocks (2 Offset)

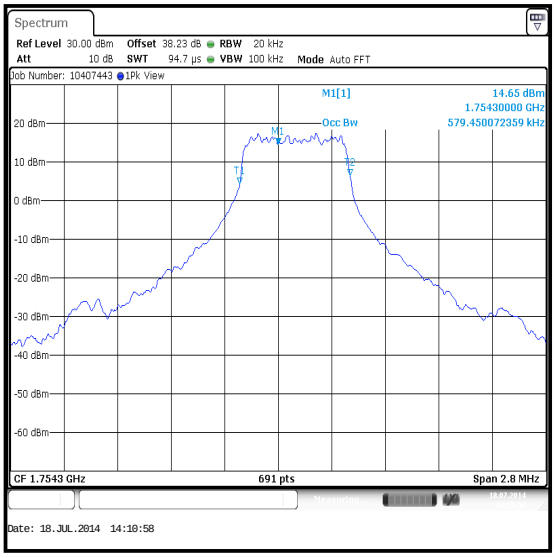
## Transmitter Occupied Bandwidth (continued)

## Results: 1.4 MHz Channel Bandwidth / Top Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1754.3 | 6 | 0 | 20 | 100 | 1.094 |
| 1754.3 | 3 | 2 | 20 | 100 | 0.579 |




16QAM / 6 Resource Blocks (0 Offset)

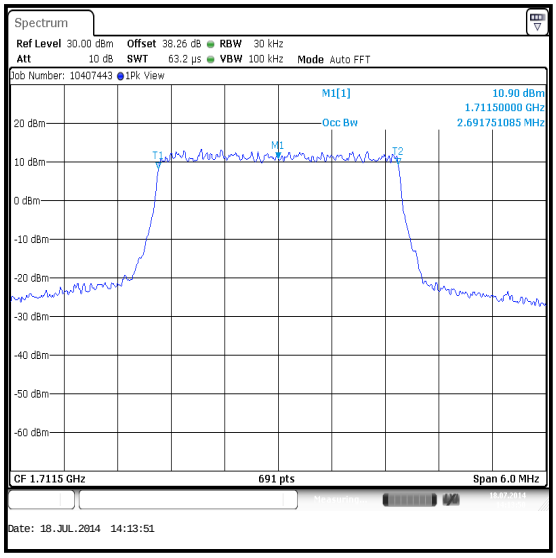



16QAM / 3 Resource Blocks (2 Offset)

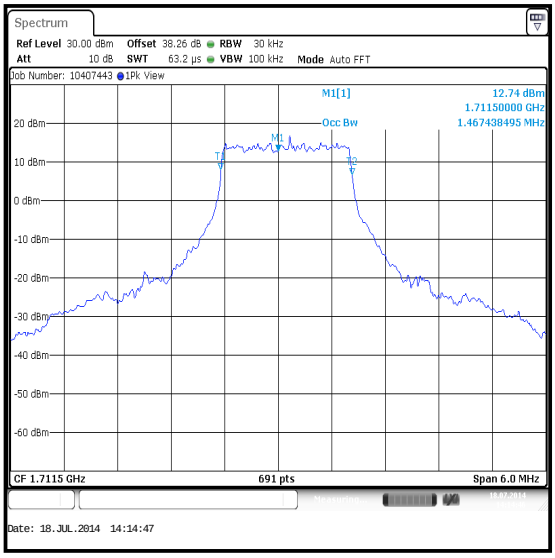
## Transmitter Occupied Bandwidth (continued)

## Results: 3 MHz Channel Bandwidth / Bottom Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1711.5 | 15 | 0 | 30 | 100 | 2.692 |
| 1711.5 | 8 | 4 | 30 | 100 | 1.467 |




QPSK / 15 Resource Blocks (0 Offset)

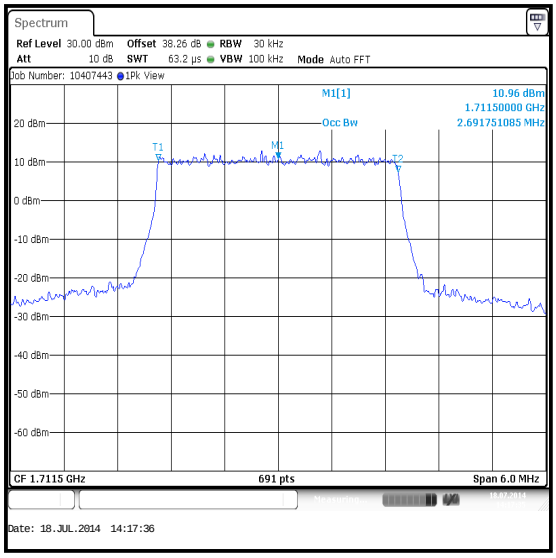



QPSK / 8 Resource Blocks (4 Offset)

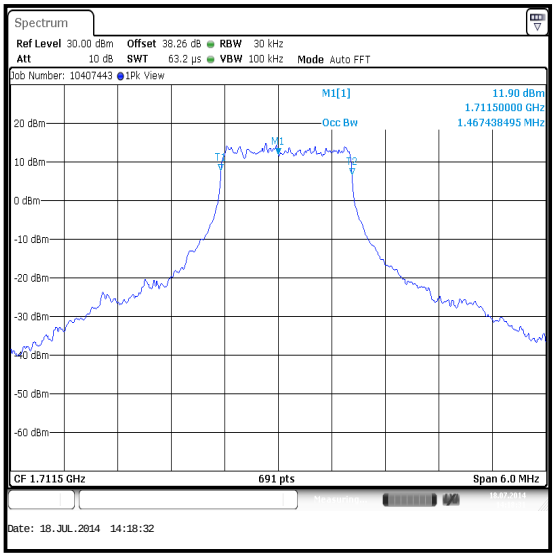
## Transmitter Occupied Bandwidth (continued)

## Results: 3 MHz Channel Bandwidth / Bottom Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1711.5 | 15 | 0 | 30 | 100 | 2.692 |
| 1711.5 | 8 | 4 | 30 | 100 | 1.467 |




**16QAM / 15 Resource Blocks (0 Offset)**

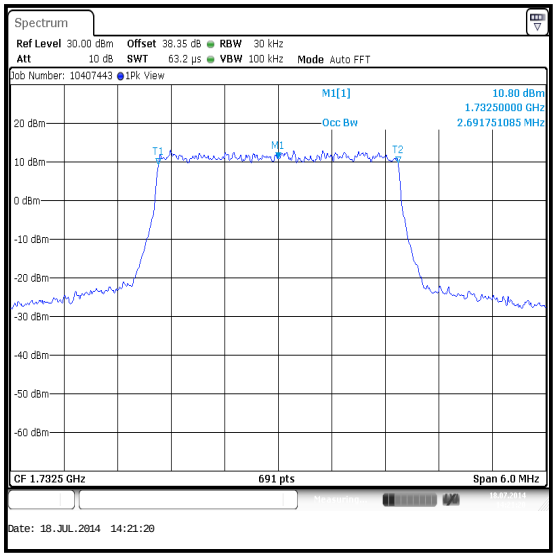



**16QAM / 8 Resource Blocks (4 Offset)**

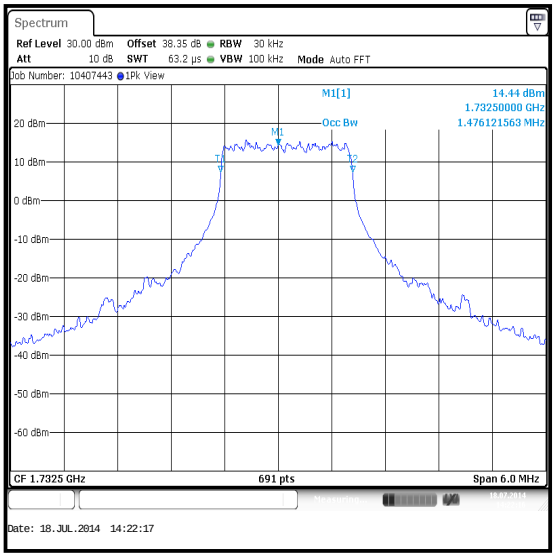
## Transmitter Occupied Bandwidth (continued)

## Results: 3 MHz Channel Bandwidth / Middle Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 15 | 0 | 30 | 100 | 2.692 |
| 1732.5 | 8 | 4 | 30 | 100 | 1.476 |




**QPSK / 15 Resource Blocks (0 Offset)**

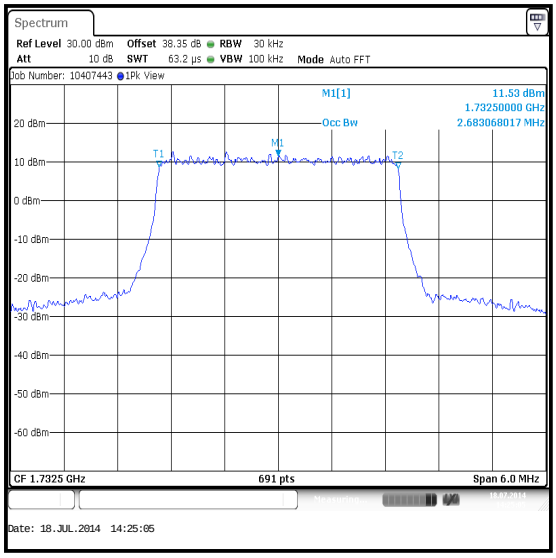



**QPSK / 8 Resource Blocks (4 Offset)**

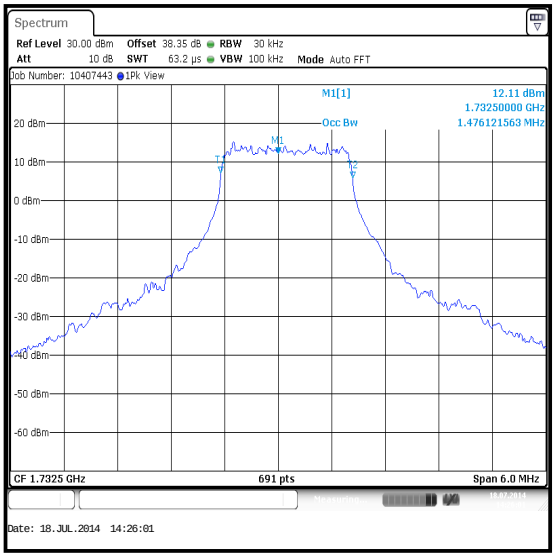
## Transmitter Occupied Bandwidth (continued)

## Results: 3 MHz Channel Bandwidth / Middle Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 15 | 0 | 30 | 100 | 2.683 |
| 1732.5 | 8 | 4 | 30 | 100 | 1.476 |




**16QAM / 15 Resource Blocks (0 Offset)**

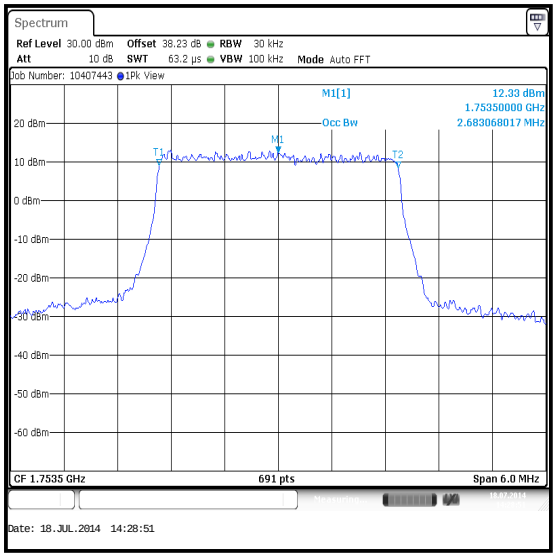



**16QAM / 8 Resource Blocks (4 Offset)**

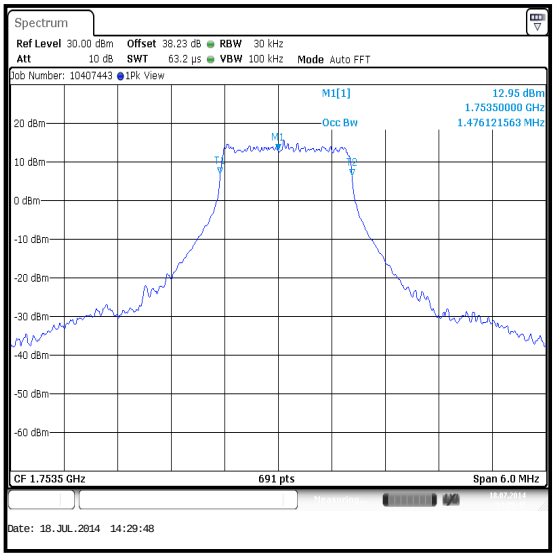
## Transmitter Occupied Bandwidth (continued)

## Results: 3 MHz Channel Bandwidth / Top Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1753.5 | 15 | 0 | 30 | 100 | 2.683 |
| 1753.5 | 8 | 4 | 30 | 100 | 1.476 |




**QPSK / 15 Resource Blocks (0 Offset)**

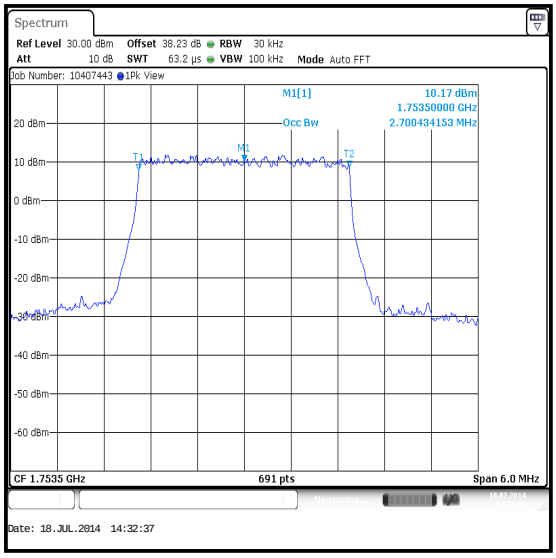



**QPSK / 8 Resource Blocks (4 Offset)**

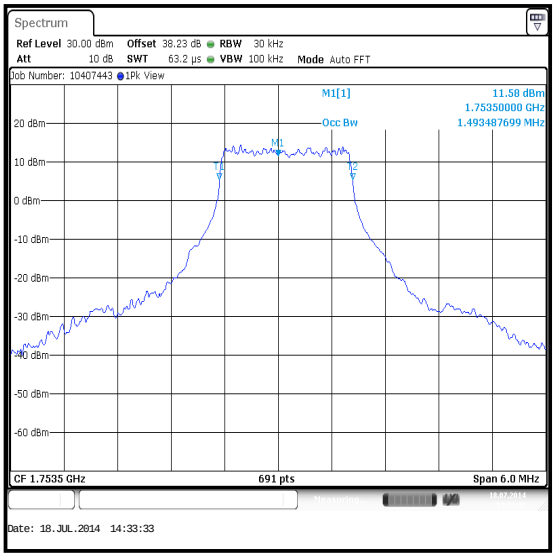
## Transmitter Occupied Bandwidth (continued)

## Results: 3 MHz Channel Bandwidth / Top Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1753.5 | 15 | 0 | 30 | 100 | 2.700 |
| 1753.5 | 8 | 4 | 30 | 100 | 1.493 |




16QAM / 15 Resource Blocks (0 Offset)

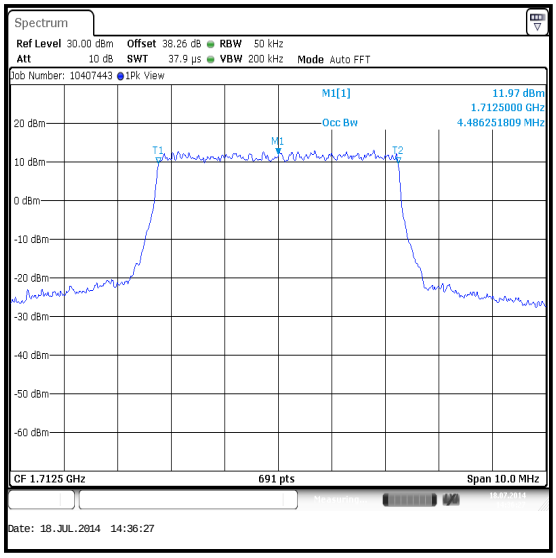



16QAM / 8 Resource Blocks (4 Offset)

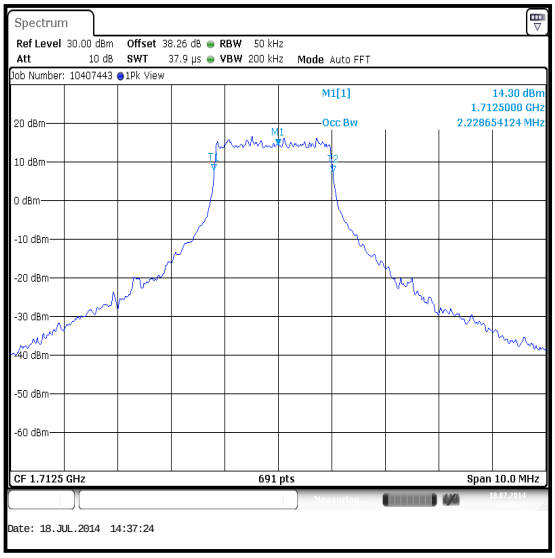
## Transmitter Occupied Bandwidth (continued)

## Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1712.5 | 25 | 0 | 50 | 200 | 4.486 |
| 1712.5 | 12 | 6 | 50 | 200 | 2.229 |




QPSK / 25 Resource Blocks (0 Offset)

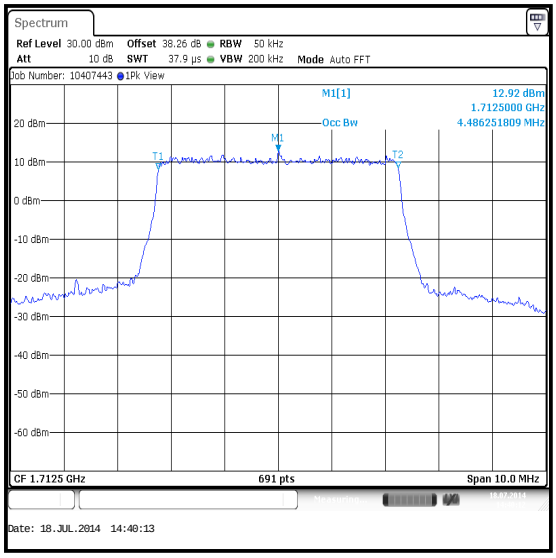



QPSK / 12 Resource Blocks (6 Offset)

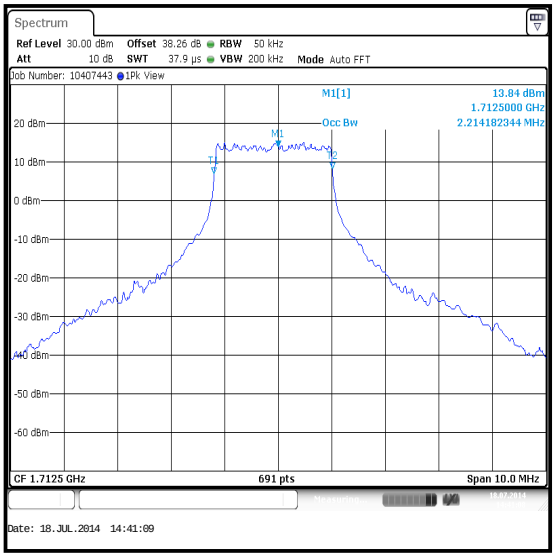
## Transmitter Occupied Bandwidth (continued)

## Results: 5 MHz Channel Bandwidth / Bottom Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1712.5 | 25 | 0 | 50 | 200 | 4.486 |
| 1712.5 | 12 | 6 | 50 | 200 | 2.214 |




**16QAM / 25 Resource Blocks (0 Offset)**

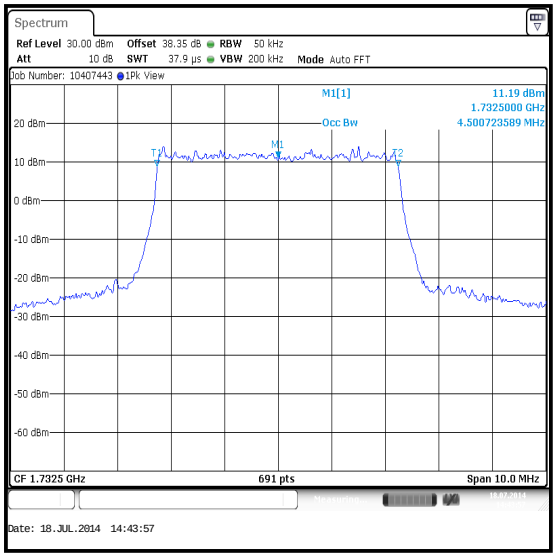



**16QAM / 12 Resource Blocks (6 Offset)**

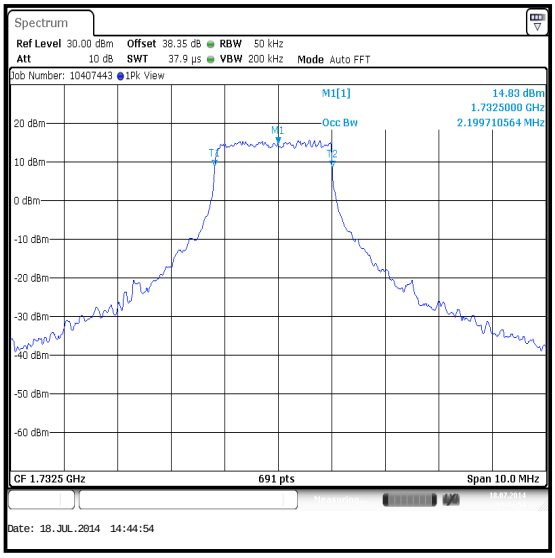
## Transmitter Occupied Bandwidth (continued)

## Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 25 | 0 | 50 | 200 | 4.501 |
| 1732.5 | 12 | 6 | 50 | 200 | 2.200 |




**QPSK / 25 Resource Blocks (0 Offset)**

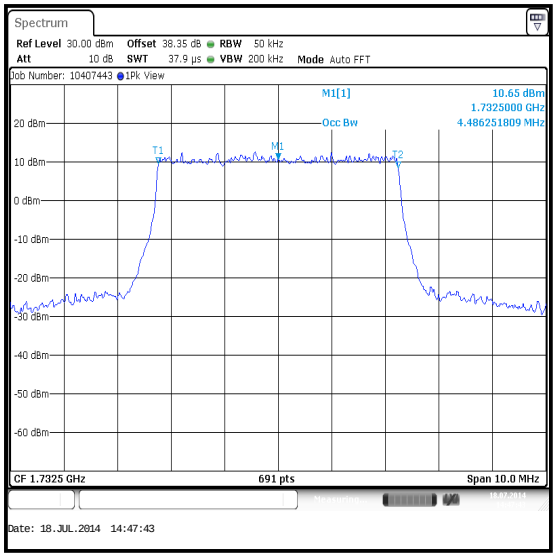



**QPSK / 12 Resource Blocks (6 Offset)**

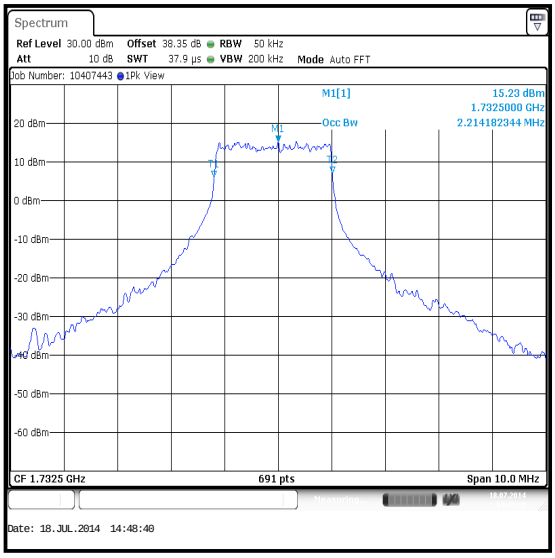
## Transmitter Occupied Bandwidth (continued)

## Results: 5 MHz Channel Bandwidth / Middle Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 25 | 0 | 50 | 200 | 4.486 |
| 1732.5 | 12 | 6 | 50 | 200 | 2.214 |




16QAM / 25 Resource Blocks (0 Offset)

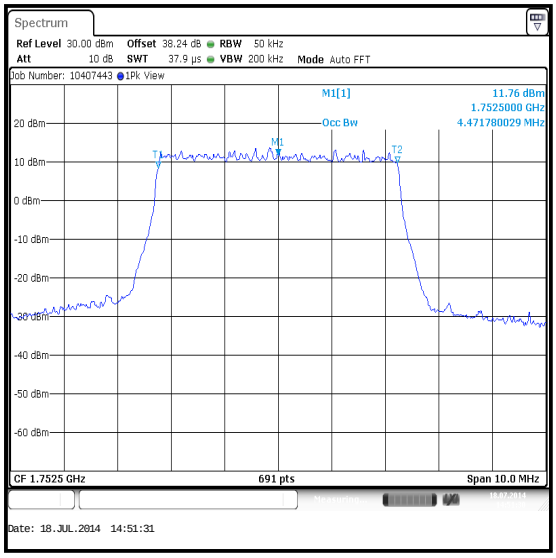



16QAM / 12 Resource Blocks (6 Offset)

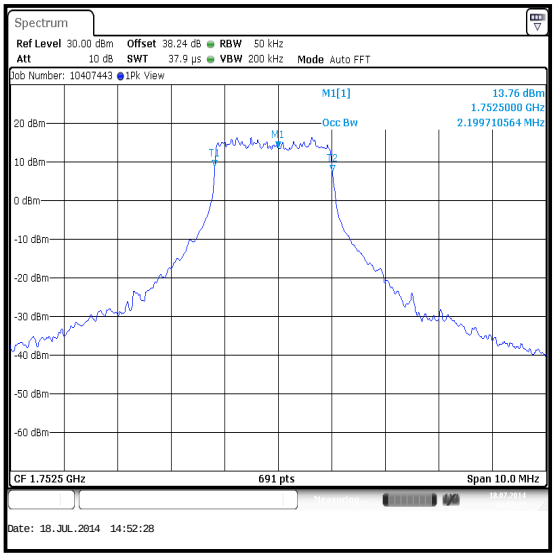
## Transmitter Occupied Bandwidth (continued)

## Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1752.5 | 25 | 0 | 50 | 200 | 4.472 |
| 1752.5 | 12 | 6 | 50 | 200 | 2.200 |




**QPSK / 25 Resource Blocks (0 Offset)**

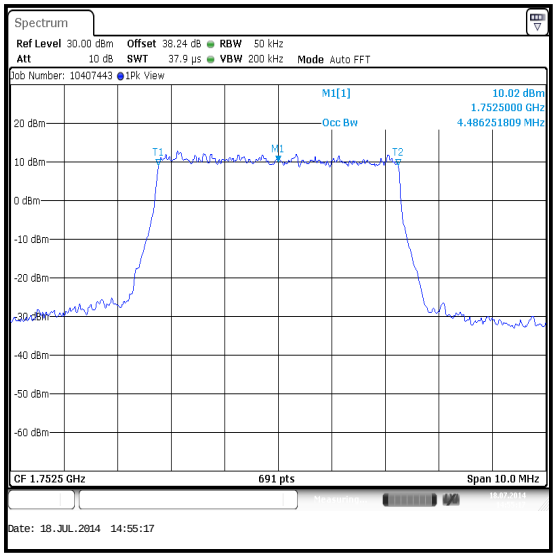



**QPSK / 12 Resource Blocks (6 Offset)**

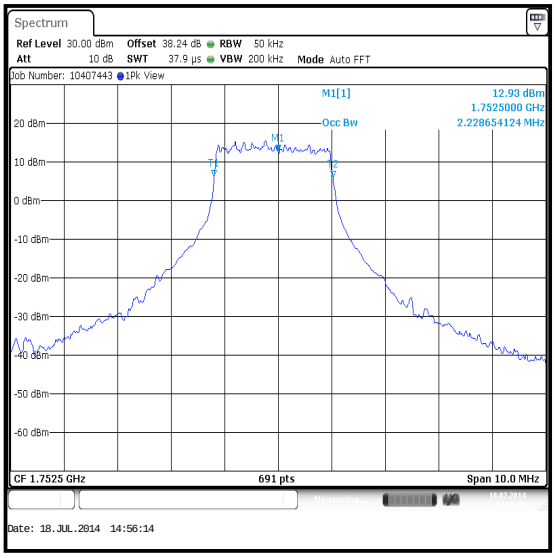
## Transmitter Occupied Bandwidth (continued)

## Results: 5 MHz Channel Bandwidth / Top Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1752.5 | 25 | 0 | 50 | 200 | 4.486 |
| 1752.5 | 12 | 6 | 50 | 200 | 2.229 |




16QAM / 25 Resource Blocks (0 Offset)

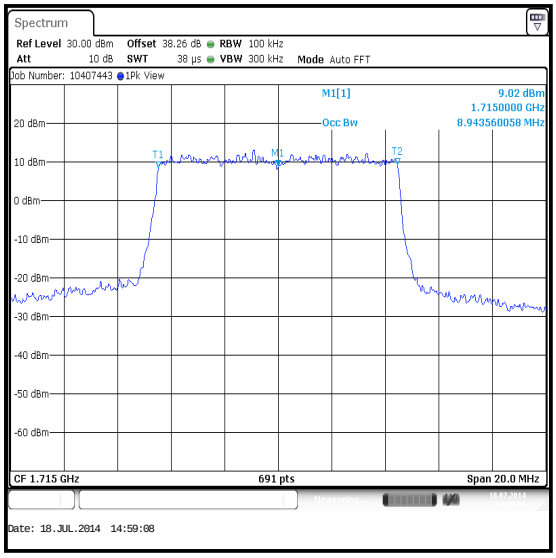



16QAM / 12 Resource Blocks (6 Offset)

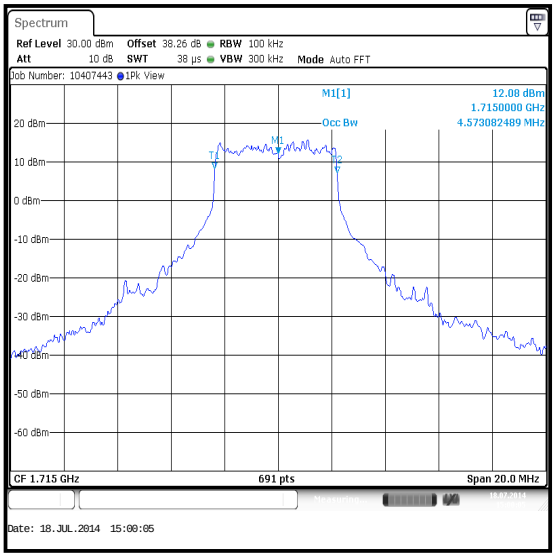
## Transmitter Occupied Bandwidth (continued)

## Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1715.0 | 50 | 0 | 100 | 300 | 8.944 |
| 1715.0 | 25 | 12 | 100 | 300 | 4.573 |




**QPSK / 50 Resource Blocks (0 Offset)**

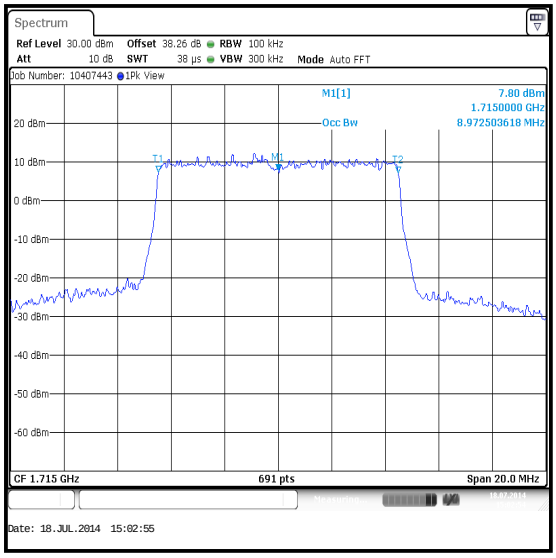



**QPSK / 25 Resource Blocks (12 Offset)**

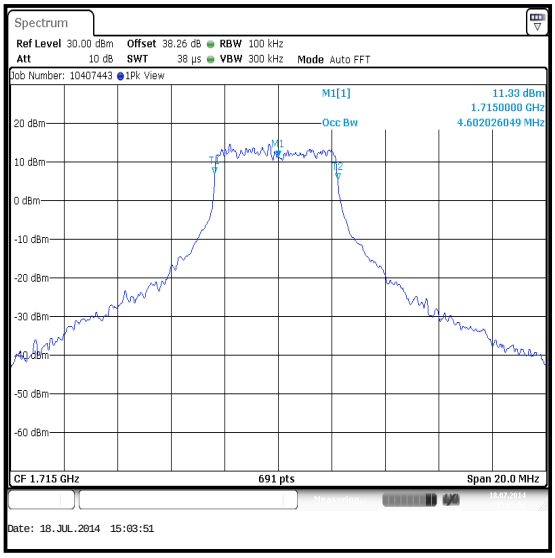
## Transmitter Occupied Bandwidth (continued)

## Results: 10 MHz Channel Bandwidth / Bottom Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1715.0 | 50 | 0 | 100 | 300 | 8.973 |
| 1715.0 | 25 | 12 | 100 | 300 | 4.602 |




**16QAM / 50 Resource Blocks (0 Offset)**

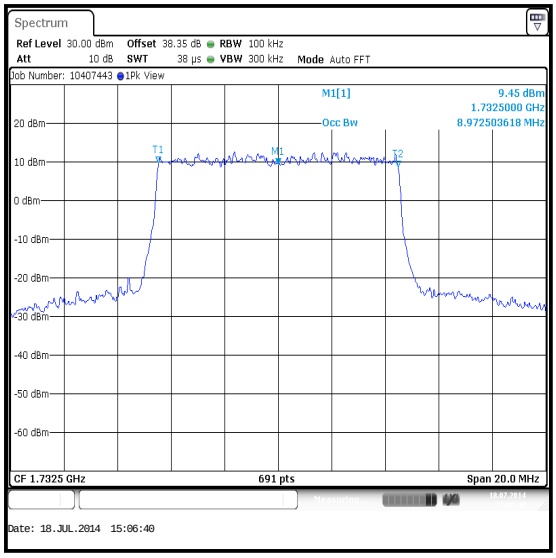



**16QAM / 25 Resource Blocks (12 Offset)**

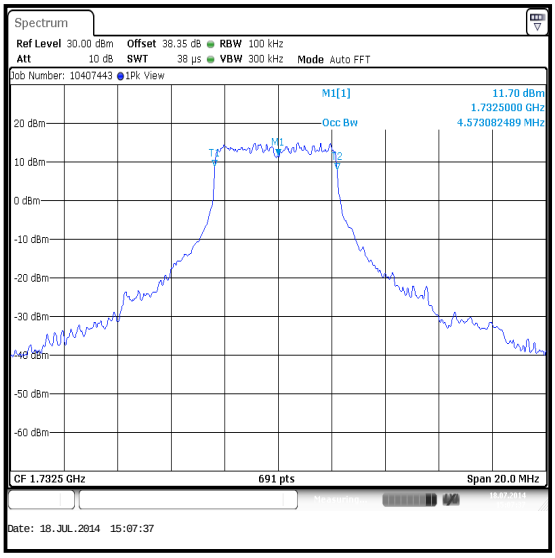
## Transmitter Occupied Bandwidth (continued)

## Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 50 | 0 | 100 | 300 | 8.973 |
| 1732.5 | 25 | 12 | 100 | 300 | 4.573 |




QPSK / 50 Resource Blocks (0 Offset)

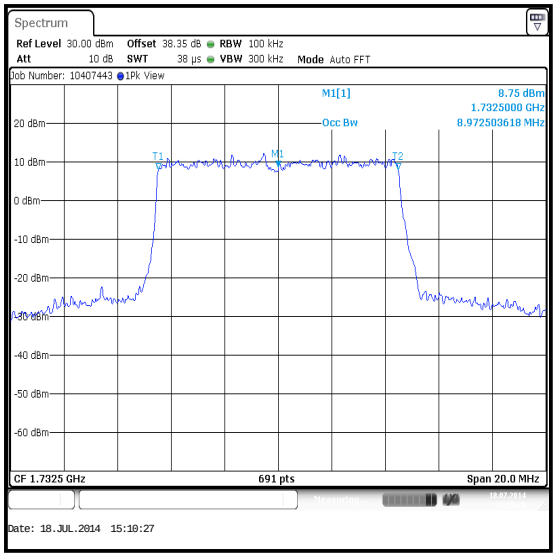



QPSK / 25 Resource Blocks (12 Offset)

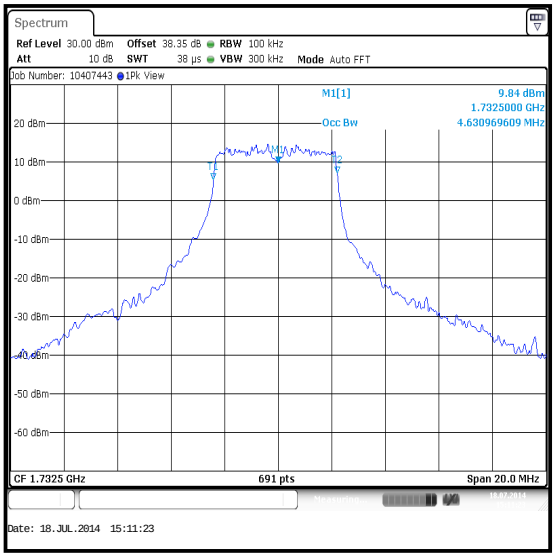
## Transmitter Occupied Bandwidth (continued)

## Results: 10 MHz Channel Bandwidth / Middle Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 50 | 0 | 100 | 300 | 8.973 |
| 1732.5 | 25 | 12 | 100 | 300 | 4.631 |




16QAM / 50 Resource Blocks (0 Offset)

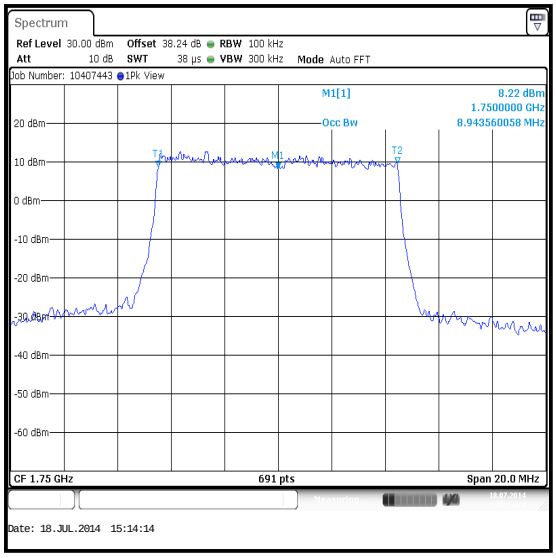



16QAM / 25 Resource Blocks (12 Offset)

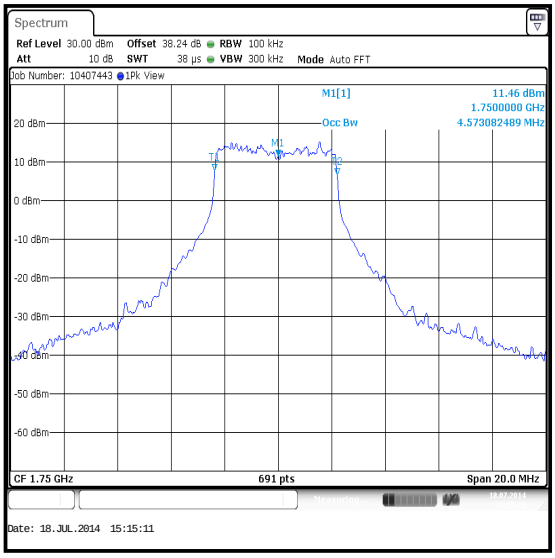
## Transmitter Occupied Bandwidth (continued)

## Results: 10 MHz Channel Bandwidth / Top Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1750.0 | 50 | 0 | 100 | 300 | 8.944 |
| 1750.0 | 25 | 12 | 100 | 300 | 4.573 |




**QPSK / 50 Resource Blocks (0 Offset)**

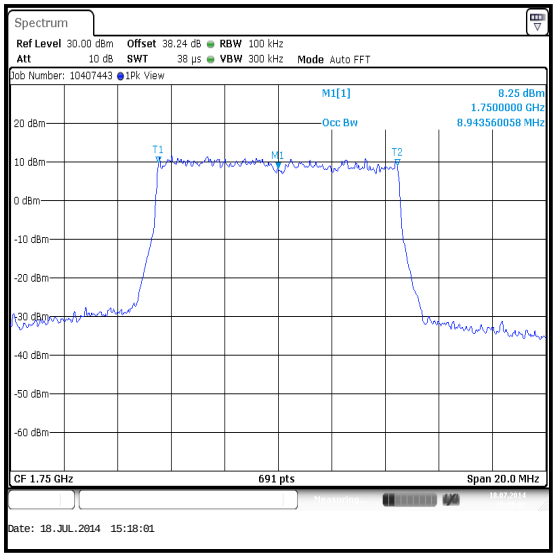



**QPSK / 25 Resource Blocks (12 Offset)**

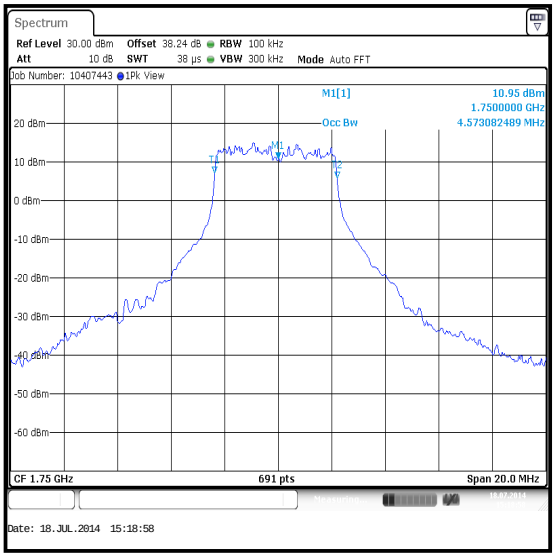
## Transmitter Occupied Bandwidth (continued)

## Results: 10 MHz Channel Bandwidth / Top Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1750.0 | 50 | 0 | 100 | 300 | 8.944 |
| 1750.0 | 25 | 12 | 100 | 300 | 4.573 |




**16QAM / 50 Resource Blocks (0 Offset)**

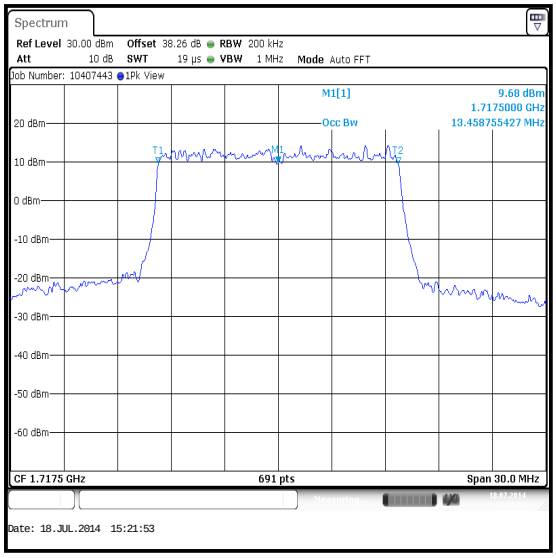



**16QAM / 25 Resource Blocks (12 Offset)**

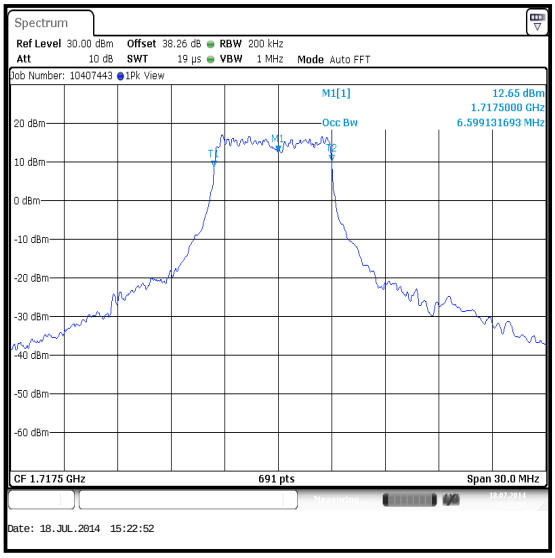
## Transmitter Occupied Bandwidth (continued)

## Results: 15 MHz Channel Bandwidth / Bottom Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1717.5 | 75 | 0 | 200 | 1000 | 13.459 |
| 1717.5 | 36 | 18 | 200 | 1000 | 6.599 |




**QPSK / 75 Resource Blocks (0 Offset)**

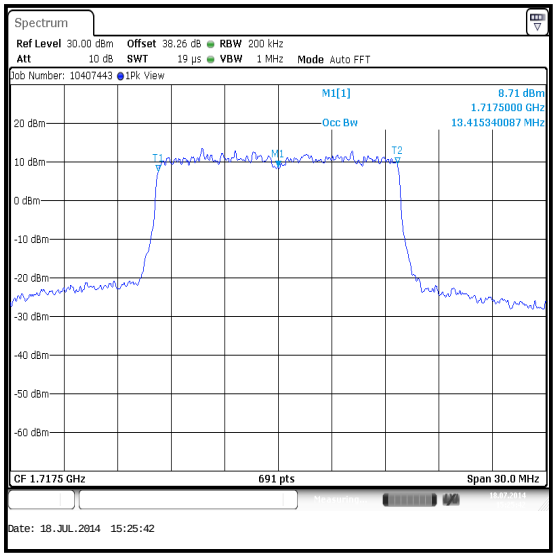



**QPSK / 36 Resource Blocks (18 Offset)**

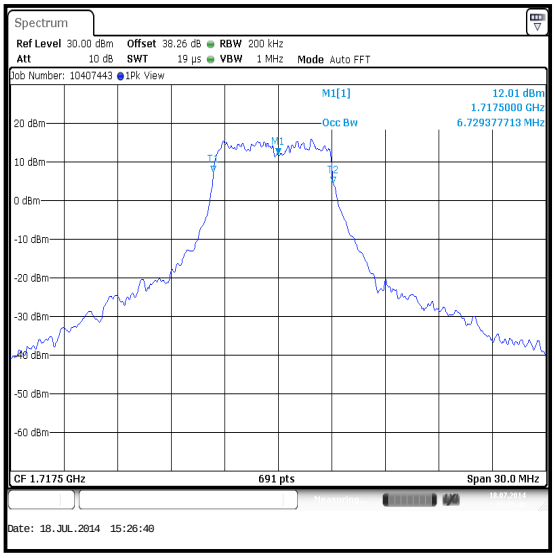
## Transmitter Occupied Bandwidth (continued)

## Results: 15 MHz Channel Bandwidth / Bottom Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1717.5 | 75 | 0 | 200 | 1000 | 13.415 |
| 1717.5 | 36 | 18 | 200 | 1000 | 6.729 |




16QAM / 75 Resource Blocks (0 Offset)

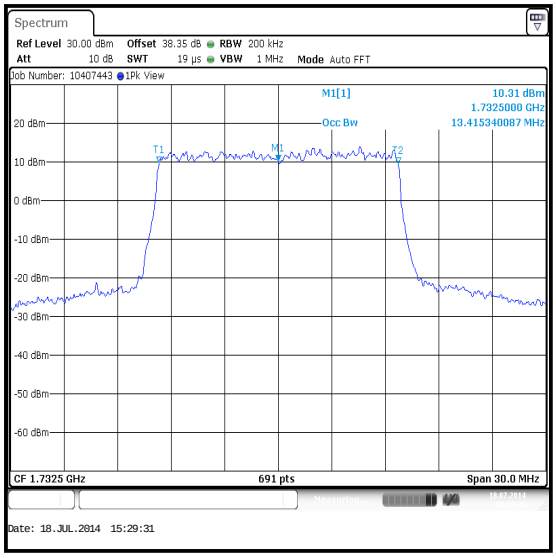



16QAM / 36 Resource Blocks (18 Offset)

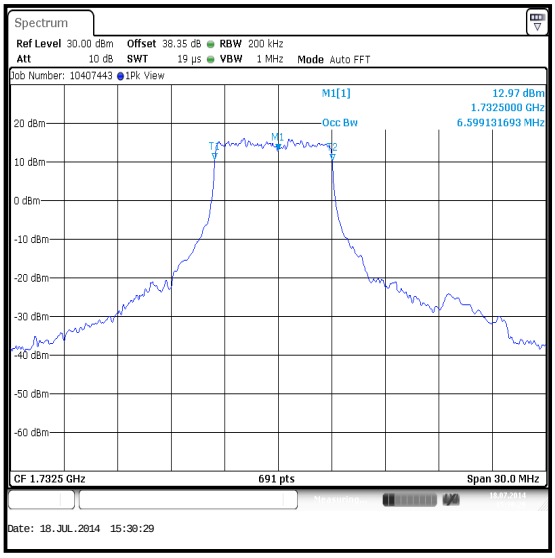
## Transmitter Occupied Bandwidth (continued)

## Results: 15 MHz Channel Bandwidth / Middle Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 75 | 0 | 200 | 1000 | 13.415 |
| 1732.5 | 36 | 18 | 200 | 1000 | 6.599 |




**QPSK / 75 Resource Blocks (0 Offset)**

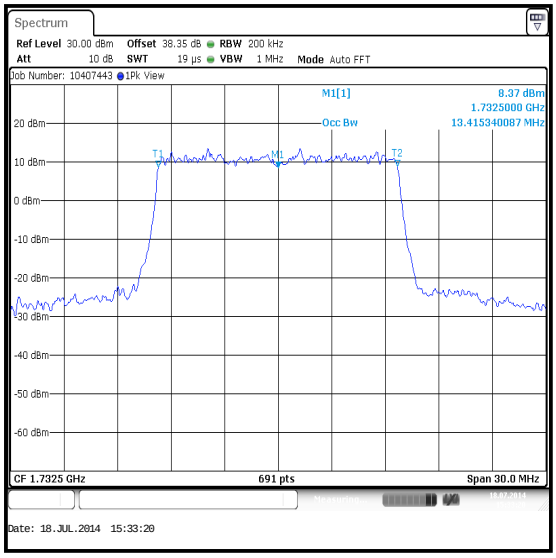



**QPSK / 36 Resource Blocks (18 Offset)**

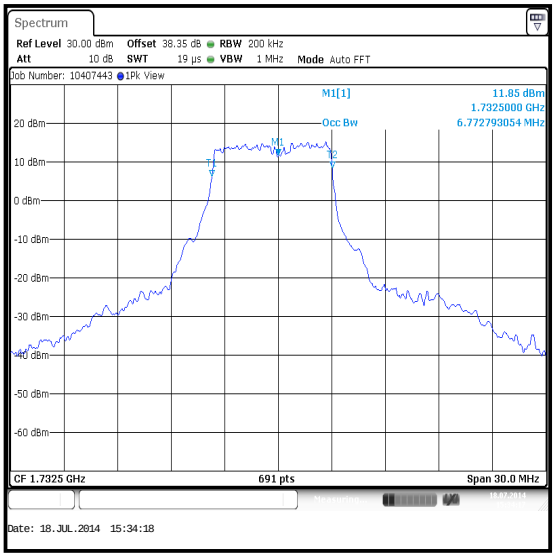
## Transmitter Occupied Bandwidth (continued)

## Results: 15 MHz Channel Bandwidth / Middle Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 75 | 0 | 200 | 1000 | 13.415 |
| 1732.5 | 36 | 18 | 200 | 1000 | 6.773 |




**16QAM / 75 Resource Blocks (0 Offset)**

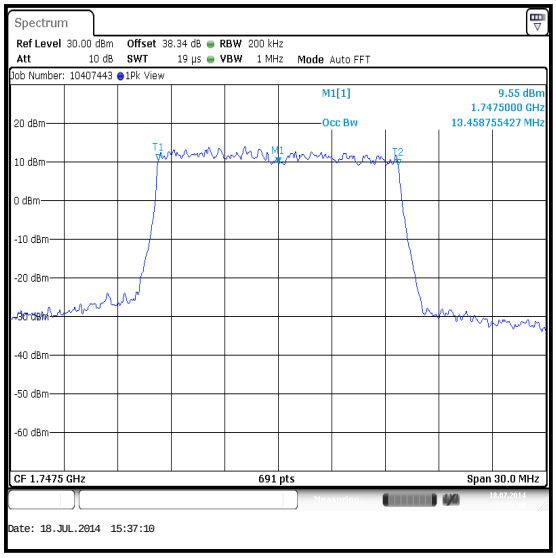



**16QAM / 36 Resource Blocks (18 Offset)**

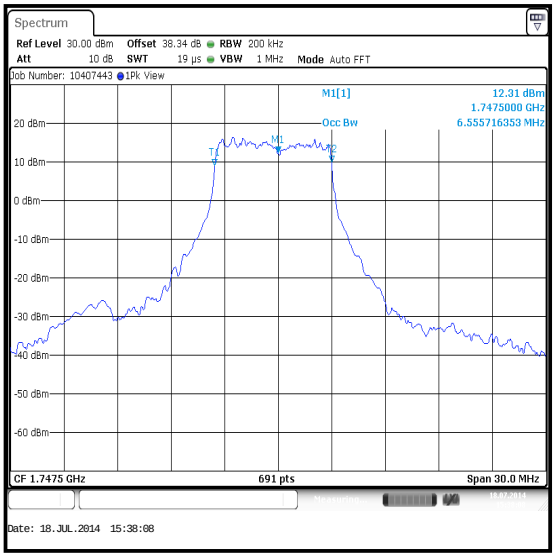
## Transmitter Occupied Bandwidth (continued)

## Results: 15 MHz Channel Bandwidth / Top Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1747.5 | 75 | 0 | 200 | 1000 | 13.459 |
| 1747.5 | 36 | 18 | 200 | 1000 | 6.556 |




QPSK / 75 Resource Blocks (0 Offset)

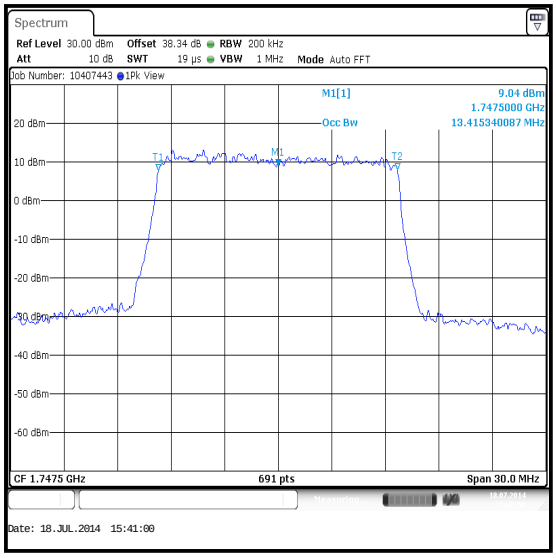



QPSK / 36 Resource Blocks (18 Offset)

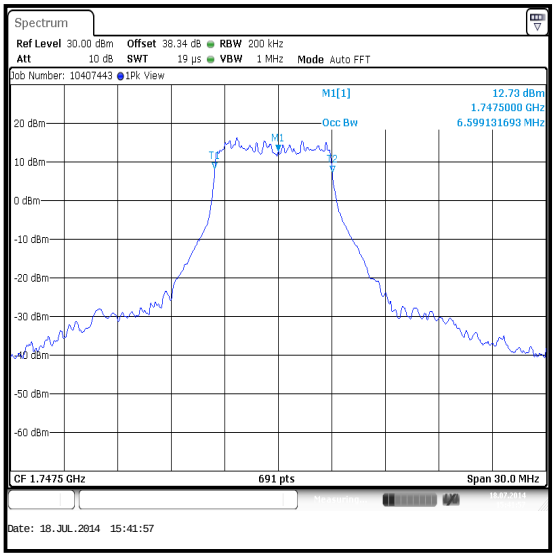
## Transmitter Occupied Bandwidth (continued)

## Results: 15 MHz Channel Bandwidth / Top Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1747.5 | 75 | 0 | 200 | 1000 | 13.415 |
| 1747.5 | 36 | 18 | 200 | 1000 | 6.599 |




16QAM / 75 Resource Blocks (0 Offset)

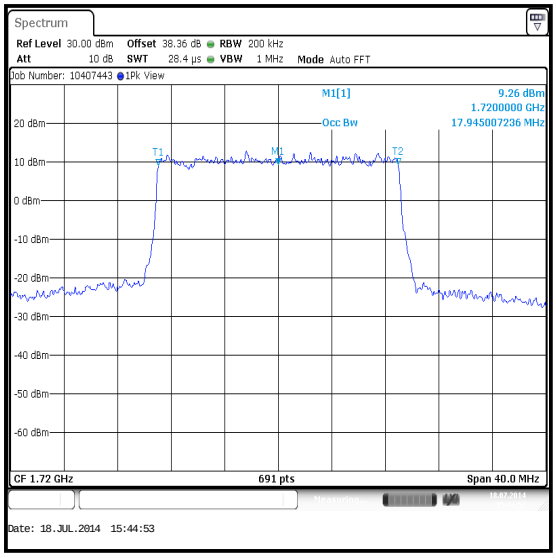



16QAM / 36 Resource Blocks (18 Offset)

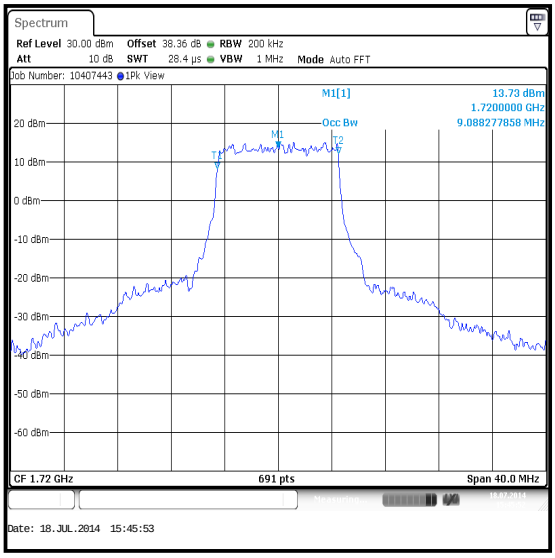
## Transmitter Occupied Bandwidth (continued)

## Results: 20 MHz Channel Bandwidth / Bottom Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1720.0 | 100 | 0 | 200 | 1000 | 17.945 |
| 1720.0 | 50 | 25 | 200 | 1000 | 9.088 |




**QPSK / 100 Resource Blocks (0 Offset)**

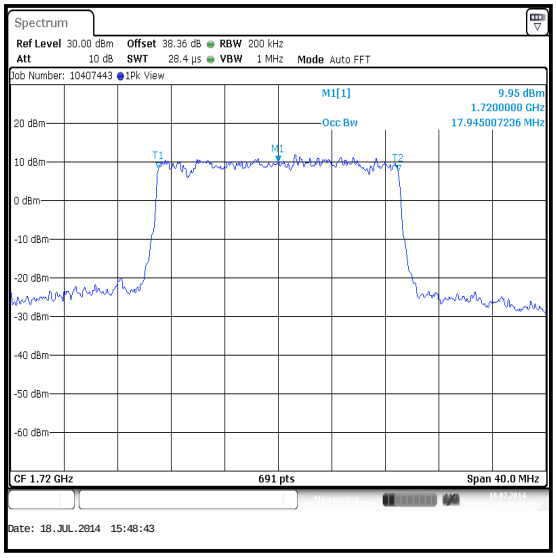



**QPSK / 50 Resource Blocks (25 Offset)**

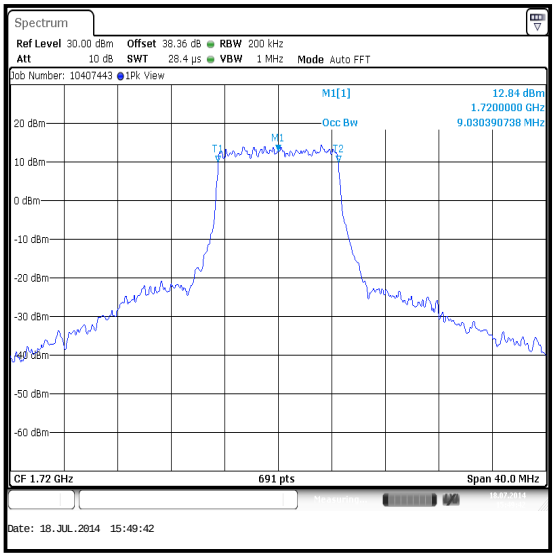
## Transmitter Occupied Bandwidth (continued)

## Results: 20 MHz Channel Bandwidth / Bottom Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1720.0 | 100 | 0 | 200 | 1000 | 17.945 |
| 1720.0 | 50 | 25 | 200 | 1000 | 9.030 |




16QAM / 100 Resource Blocks (0 Offset)

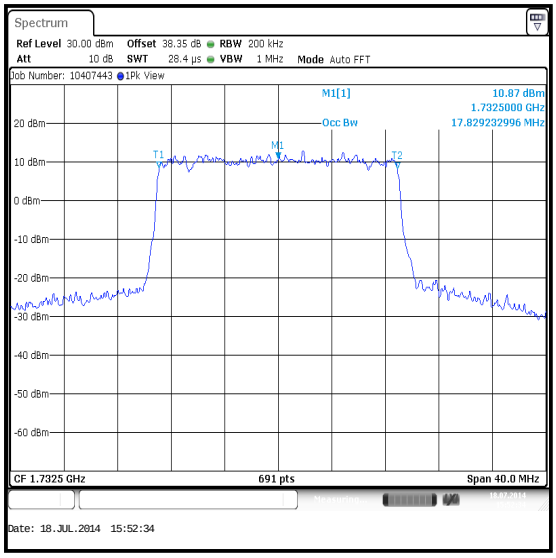



16QAM / 50 Resource Blocks (25 Offset)

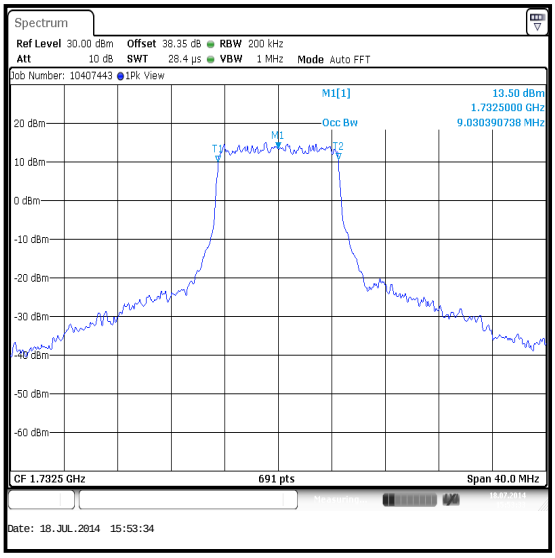
## Transmitter Occupied Bandwidth (continued)

## Results: 20 MHz Channel Bandwidth / Middle Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 100 | 0 | 200 | 1000 | 17.829 |
| 1732.5 | 50 | 25 | 200 | 1000 | 9.030 |




QPSK / 100 Resource Blocks (0 Offset)

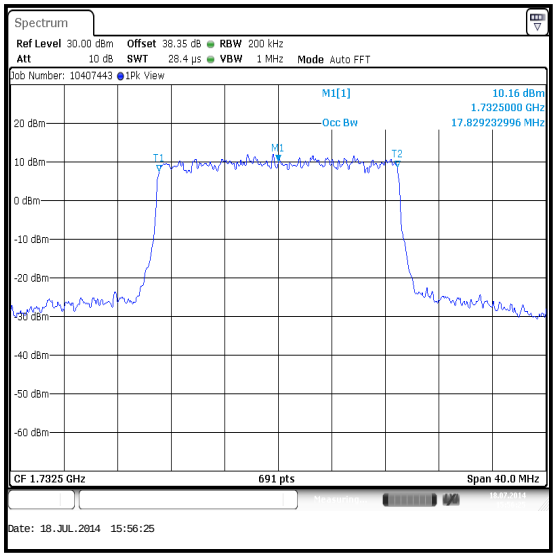



QPSK / 50 Resource Blocks (25 Offset)

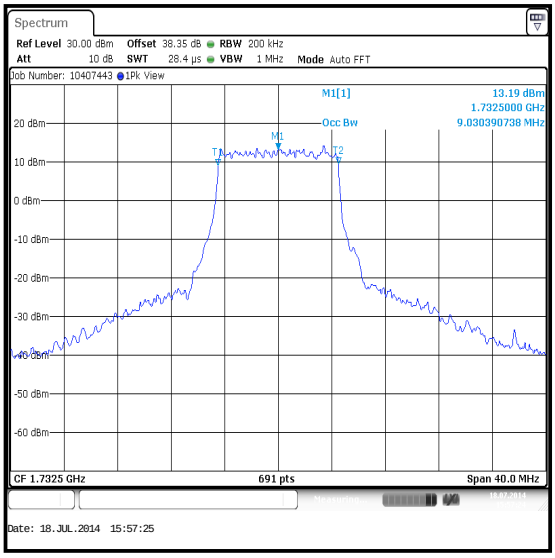
## Transmitter Occupied Bandwidth (continued)

## Results: 20 MHz Channel Bandwidth / Middle Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1732.5 | 100 | 0 | 200 | 1000 | 17.829 |
| 1732.5 | 50 | 25 | 200 | 1000 | 9.030 |




**16QAM / 100 Resource Blocks (0 Offset)**

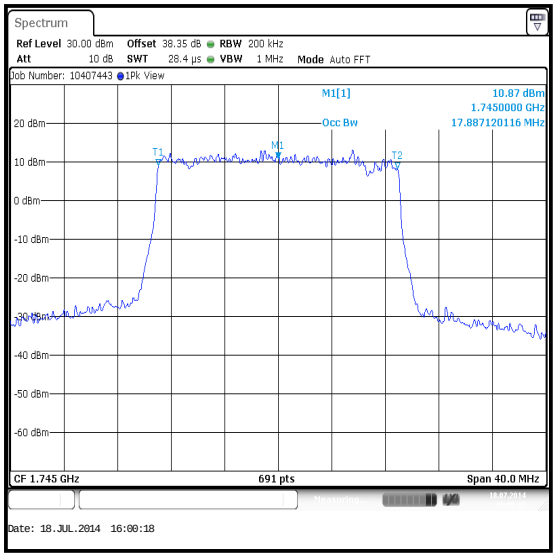



**16QAM / 50 Resource Blocks (25 Offset)**

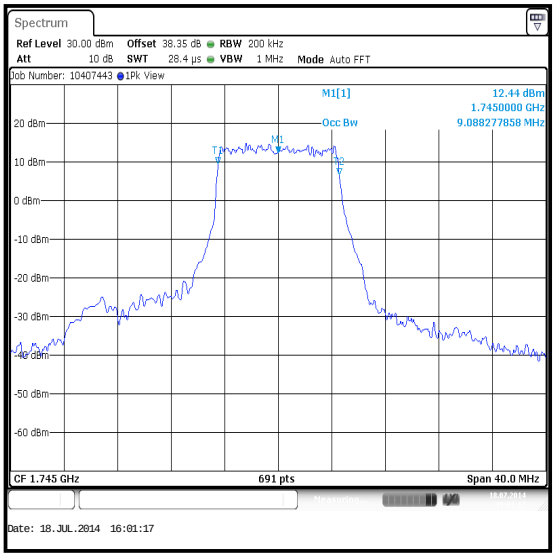
## Transmitter Occupied Bandwidth (continued)

## Results: 20 MHz Channel Bandwidth / Top Channel / QPSK

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1745.0 | 100 | 0 | 200 | 1000 | 17.887 |
| 1745.0 | 50 | 25 | 200 | 1000 | 9.088 |




**QPSK / 100 Resource Blocks (0 Offset)**

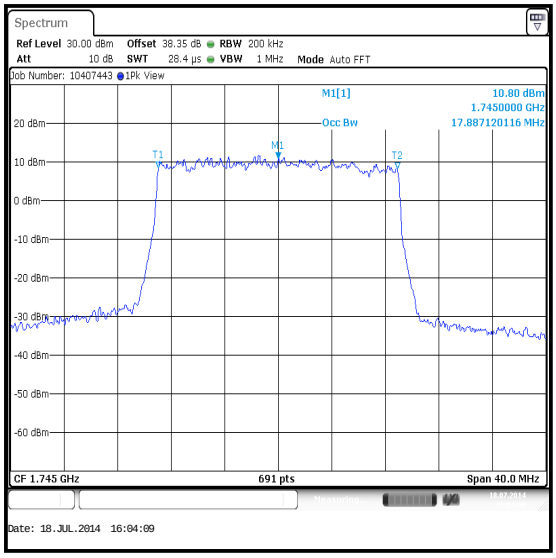



**QPSK / 50 Resource Blocks (25 Offset)**

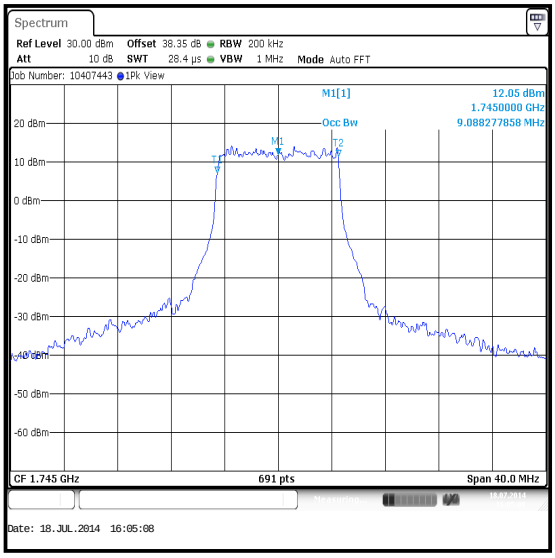
## Transmitter Occupied Bandwidth (continued)

## Results: 20 MHz Channel Bandwidth / Top Channel / 16QAM

| Frequency (MHz) | Resource Blocks | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---|---|---|---|---|---|
| 1745.0 | 100 | 0 | 200 | 1000 | 17.887 |
| 1745.0 | 50 | 25 | 200 | 1000 | 9.088 |




16QAM / 100 Resource Blocks (0 Offset)




16QAM / 50 Resource Blocks (25 Offset)

## Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|---|---|---|---|---|---|---|
| M1658 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| L1127 | Signal Analyser | Rohde & Schwarz | FSV13 | 100863 | 24 Apr 2015 | 12 |
| S0537 | DC Power Supply | TTi | EL302D | 249928 | Calibrated before use | - |
| M1251 | Digital Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |
| A2535 | Directional Coupler | AtlanTec RF | CDC-003060-20 | 14041701719 | Calibrated before use | - |
| A2508 | Attenuator | AtlanTec RF | AN18-10 | 821846#3 | Calibrated before use | - |
| A539 | Power Splitter | Rohde & Schwarz | RVZ | 22441 | Calibrated before use | - |

## 5.2.3. Transmitter Radiated Spurious Emissions

### Test Summary:

| | | | |
|---|---|---|---|
| **Test Engineer:** | Andrew Edwards | **Test Dates:** | 31 July 2014 & 01 August 2014 |
| **Test Sample IMEI:** | 352025060238798 | | |

| | |
|---|---|
| **FCC Reference:** | Parts 2.1053 & 27.53(h)(1) |
| **Test Method Used:** | As detailed in KDB 971168 Section 6.1 referencing FCC Part 2.1053 |
| **Frequency Range:** | 30 MHz to 18 GHz |
| **Configuration:** | 15 MHz, QPSK, 1RB, 0 Offset |

### Environmental Conditions:

| | |
|---|---|
| **Temperature (℃):** | 23 to 27 |
| **Relative Humidity (%):** | 28 to 48 |

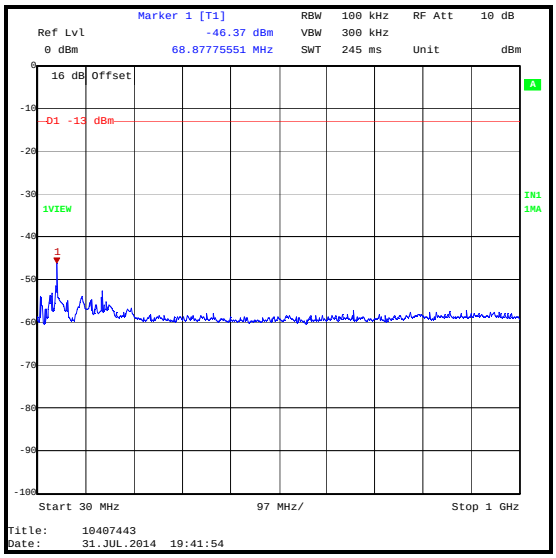
### Note(s):

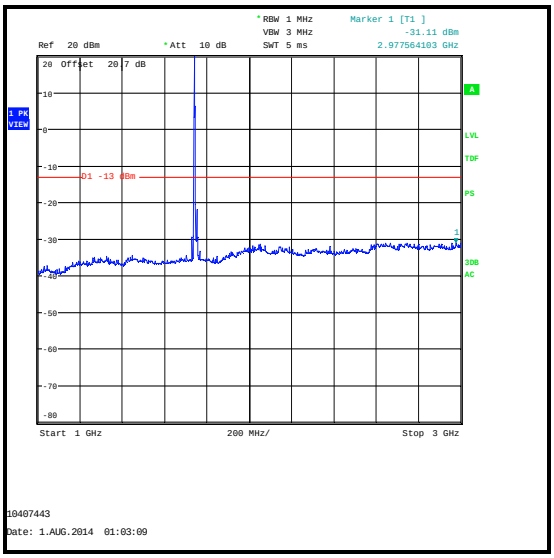
1. The EUT was set to transmit with a 15 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.
2. The emission seen on the 1 GHz to 3 GHz plot at approximately 1747.5 MHz is the EUT carrier.
3. All emissions shown on the pre-scan plots were investigated. Final measurements were made using appropriate RF filters and attenuators where required. All emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient, therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

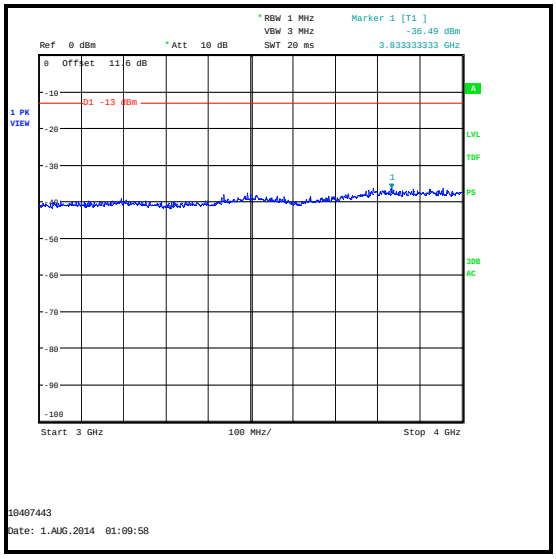
### Results:

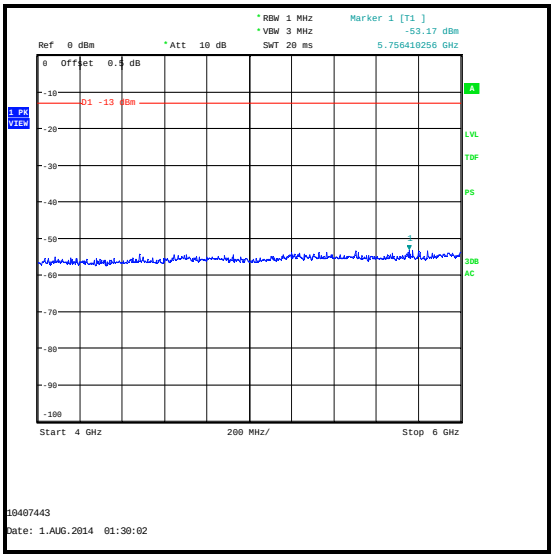
| Frequency (MHz) | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|
| 2977.564 | -31.1 | -13.0 | 18.1 | Complied |

## Transmitter Out of Band Radiated Emissions (continued)

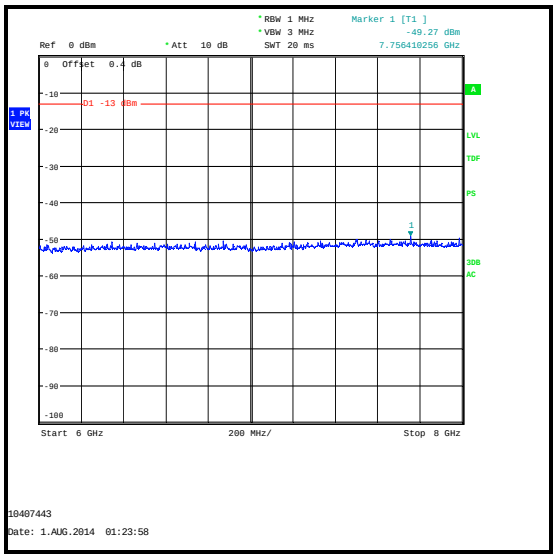


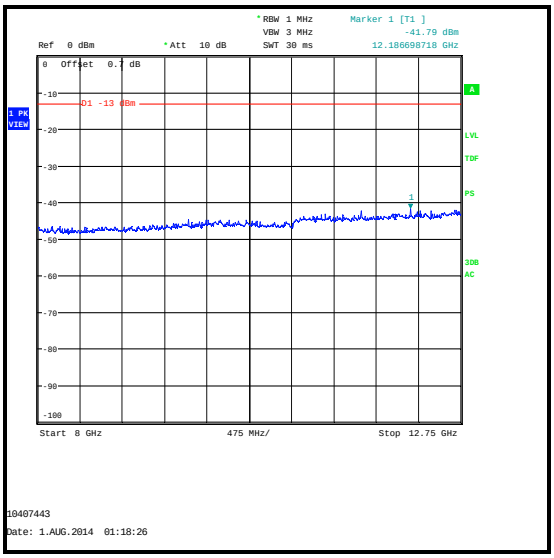



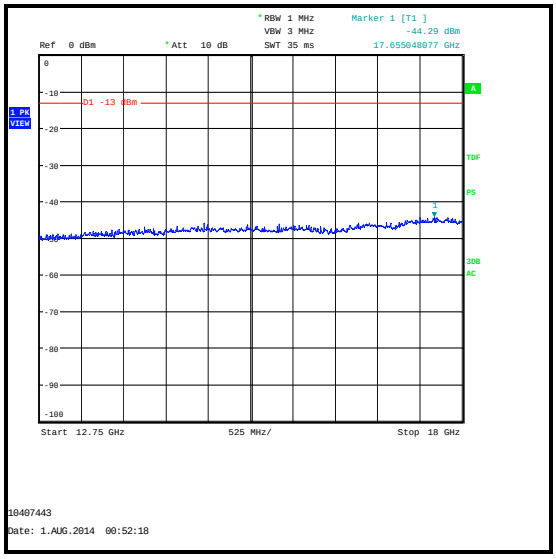



## Transmitter Out of Band Radiated Emissions (continued)



**Transmitter Out of Band Radiated Emissions (continued)**

**Test Equipment Used:**

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|---|---|---|---|---|---|---|
| M1622 | Thermohygrometer | JM Handelspunkt | 30.5015.06 | Not stated | 31 Dec 2014 | 12 |
| K0001 | 5m RSE Chamber | Rainford EMC | N/A | N/A | 26 Nov 2014 | 12 |
| M1273 | Test Receiver | Rohde & Schwarz | ESIB26 | 100275 | 15 Feb 2015 | 12 |
| G0543 | Amplifier | Sonoma | 310N | 230801 | 19 Aug 2014 | 3 |
| A490 | Antenna | Chase | CBL6111A | 1590 | 29 Apr 2015 | 12 |
| A1834 | Attenuator | Hewlett Packard | 8491B | 10444 | 15 Nov 2014 | 12 |
| M1656 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | Not stated | 14 Mar 2015 | 12 |
| K0002 | 3m RSE Chamber | Rainford EMC | N/A | N/A | 14 Nov 2014 | 12 |
| M1874 | Test Receiver | Rohde & Schwarz | ESU26 | 100553 | 13 May 2015 | 12 |
| A1534 | Pre Amplifier | Hewlett Packard | 8449B | 3008A00405 | 18 May 2015 | 12 |
| A1818 | Antenna | EMCO | 3115 | 00075692 | 14 Nov 2014 | 12 |
| A253 | Antenna | Flann Microwave | 12240-20 | 128 | 14 Nov 2014 | 12 |
| A254 | Antenna | Flann Microwave | 14240-20 | 139 | 14 Nov 2014 | 12 |
| A255 | Antenna | Flann Microwave | 16240-20 | 519 | 14 Nov 2014 | 12 |
| A256 | Antenna | Flann Microwave | 18240-20 | 400 | 14 Nov 2014 | 12 |
| A1393 | Attenuator | Huber & Suhner | 6820.17.B | 757456 | 02 May 2015 | 12 |
| A1396 | Attenuator | Huber & Suhner | 6810.17.B | 757987 | 02 May 2015 | 12 |
| A1975 | High Pass Filter | AtlanTecRF | AFH-03000 | 090424010 | 12 Apr 2015 | 12 |

## 5.2.4. Transmitter Radiated Emissions at Band Edges

### Test Summary:

| | | | |
|---|---|---|---|
| **Test Engineers:** | Andrew Edwards & Nick Steele | **Test Dates:** | 16 July 2014 & 14 September 2014 |
| **Test Sample IMEI:** | 352025060238798 | | |

| | |
|---|---|
| **FCC Reference:** | Parts 2.1053 & 27.53(h)(1) |
| **Test Method Used:** | As detailed in KDB 971168 Section 6.1 referencing FCC Part 27.53 |

### Environmental Conditions:

| | |
|---|---|
| **Temperature (℃):** | 24 |
| **Relative Humidity (%):** | 35 to 50 |

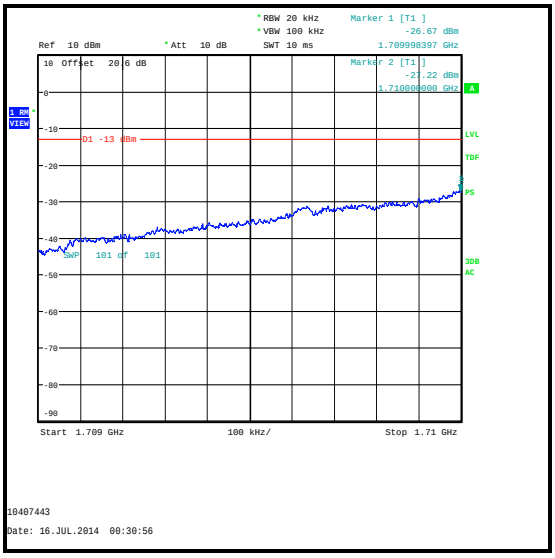
### Note(s):

1. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with the maximum resource blocks settings.
2. Measurements were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor in line with the EUT.
3. 1.4 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 20 kHz (>1% of 1.45 MHz, the widest 26 dB emission bandwidth) and video bandwidth 100 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
4. 3 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 30 kHz (1% of 3 MHz, the widest 26 dB emission bandwidth) and video bandwidth 100 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
5. 5 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 50 kHz (1% of 5 MHz, the widest 26 dB emission bandwidth) and video bandwidth 200 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
6. 10 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 100 kHz (>1% of 9.9 MHz, the widest 26 dB emission bandwidth) and video bandwidth 300 kHz (three times the resolution bandwidth).
7. 15 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 200 kHz (>1% of 14.9 MHz, the widest 26 dB emission bandwidth) and video bandwidth 1 MHz (as close to > three times the resolution bandwidth as the test receiver allowed).
8. 20 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 200 kHz (1% of 20 MHz, the widest 26 dB emission bandwidth) and video bandwidth 1 MHz (as close to > three times the resolution bandwidth as the test receiver allowed).

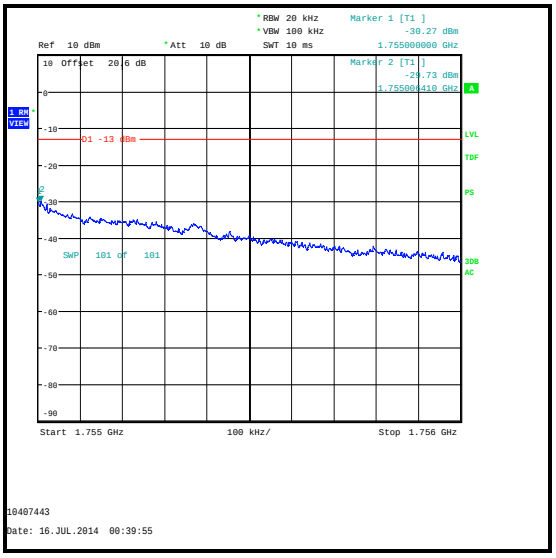
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 1.4 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.998 | 6 | 0 | -26.7 | -13.0 | 13.7 | Complied |
| 1710 | 6 | 0 | -27.2 | -13.0 | 14.2 | Complied |
| 1755 | 6 | 0 | -30.3 | -13.0 | 17.3 | Complied |
| 1755.006 | 6 | 0 | -29.7 | -13.0 | 16.7 | Complied |




**QPSK / Lower Band Edge**

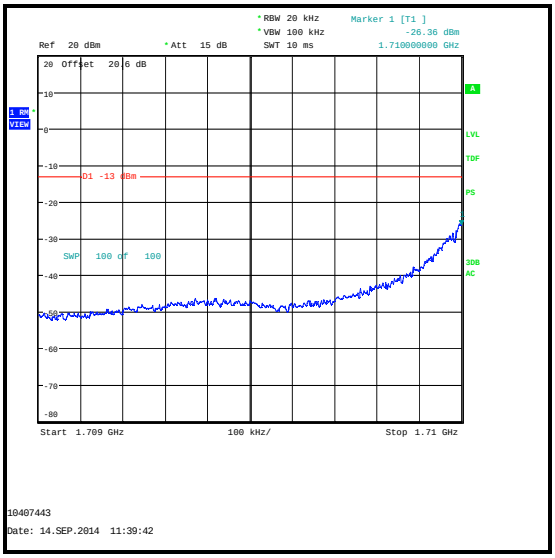



**QPSK / Upper Band Edge**

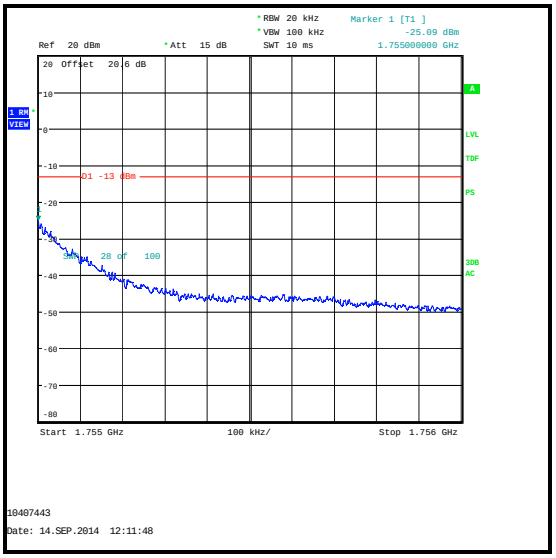
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 1.4 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -26.4 | -13.0 | 13.4 | Complied |
| 1755 | 1 | 5 | -25.1 | -13.0 | 12.1 | Complied |




QPSK / Lower Band Edge

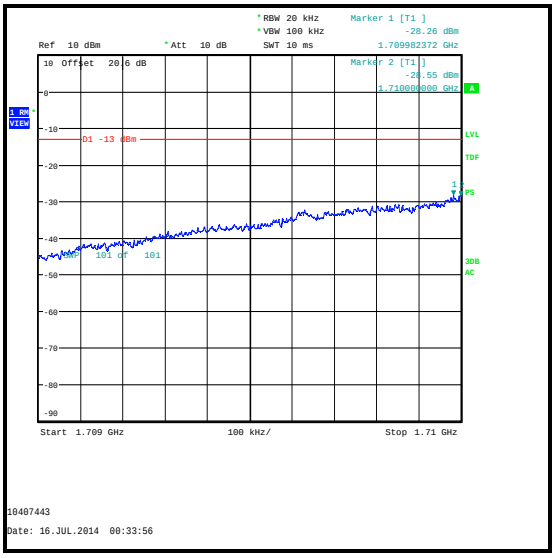



QPSK / Upper Band Edge

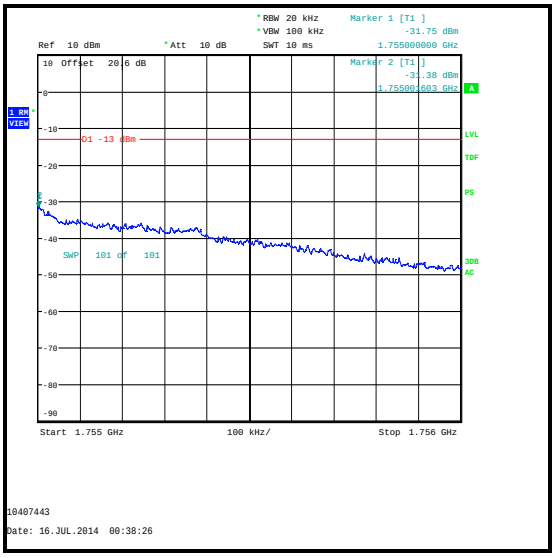
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 1.4 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.982 | 6 | 0 | -28.3 | -13.0 | 15.3 | Complied |
| 1710 | 6 | 0 | -28.6 | -13.0 | 15.6 | Complied |
| 1755 | 6 | 0 | -31.8 | -13.0 | 18.8 | Complied |
| 1755.002 | 6 | 0 | -31.4 | -13.0 | 18.4 | Complied |




**16QAM / Lower Band Edge**

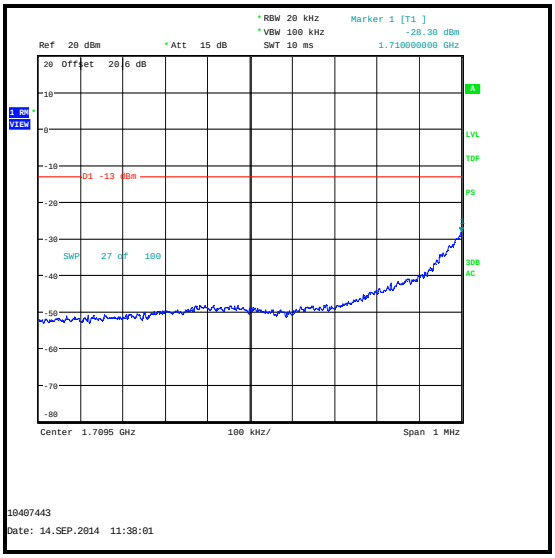



**16QAM / Upper Band Edge**

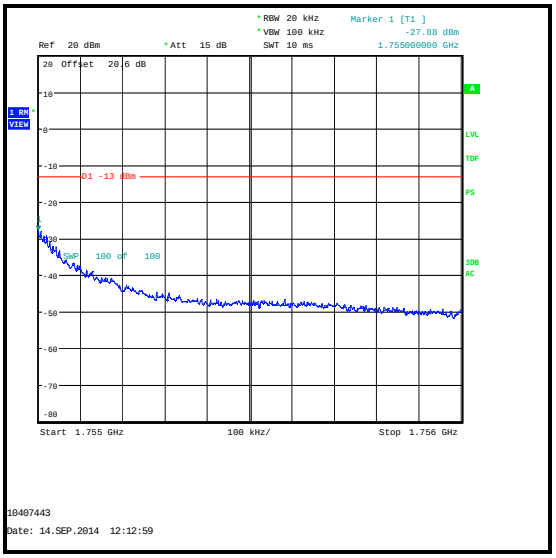
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 1.4 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -28.3 | -13.0 | 15.3 | Complied |
| 1755 | 1 | 5 | -27.9 | -13.0 | 14.9 | Complied |




16QAM / Lower Band Edge

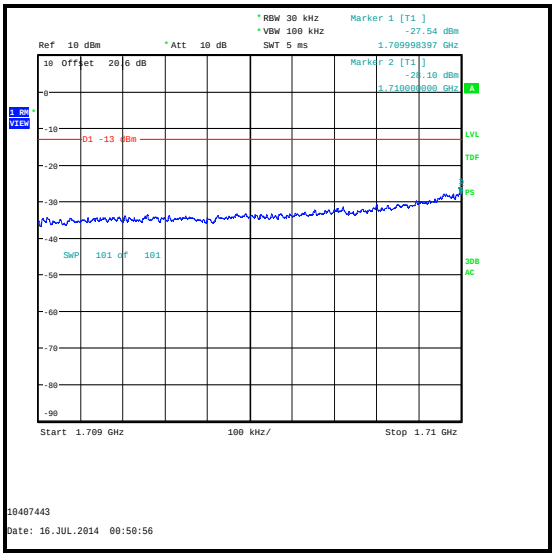



16QAM / Upper Band Edge

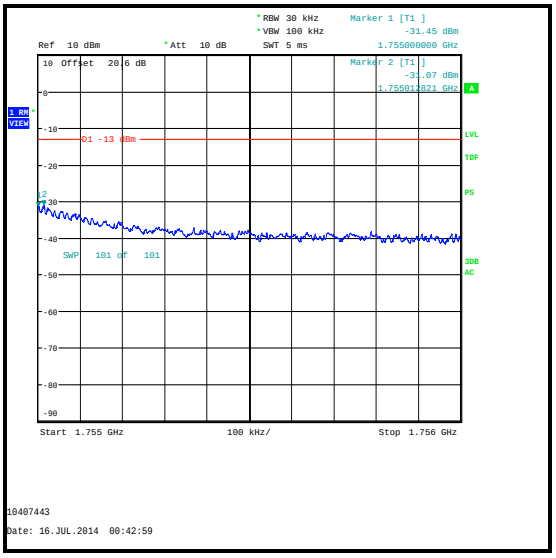
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 3 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.998 | 15 | 0 | -27.5 | -13.0 | 14.5 | Complied |
| 1710 | 15 | 0 | -28.1 | -13.0 | 15.1 | Complied |
| 1755 | 15 | 0 | -31.5 | -13.0 | 18.5 | Complied |
| 1755.013 | 15 | 0 | -31.1 | -13.0 | 18.1 | Complied |




**QPSK / Lower Band Edge**

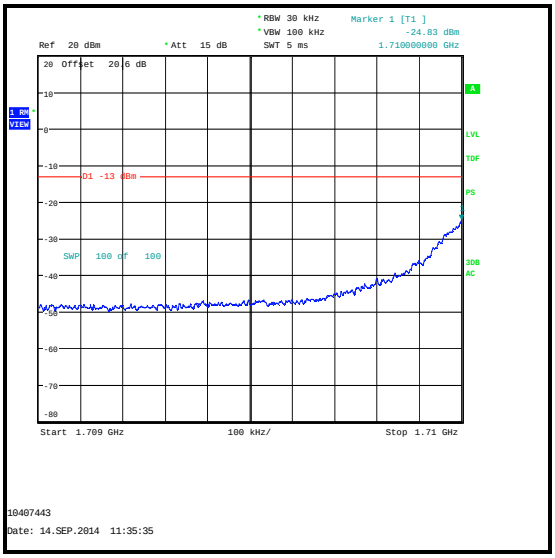



**QPSK / Upper Band Edge**

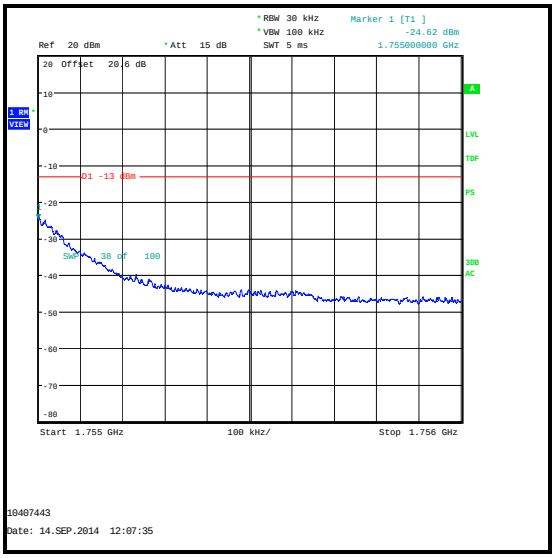
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 3 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -24.8 | -13.0 | 11.8 | Complied |
| 1755 | 1 | 14 | -24.6 | -13.0 | 11.6 | Complied |




**QPSK / Lower Band Edge**

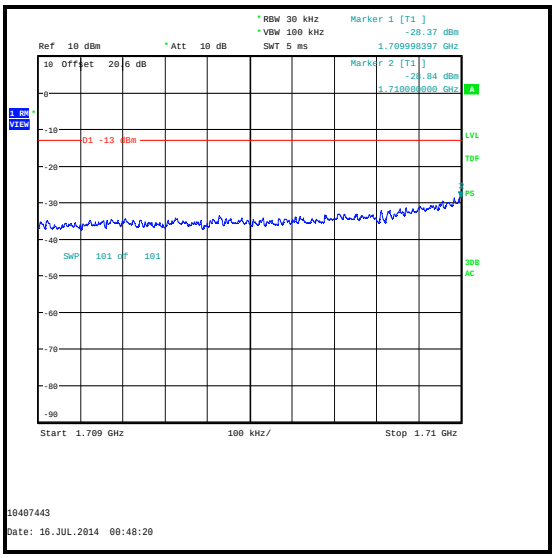



**QPSK / Upper Band Edge**

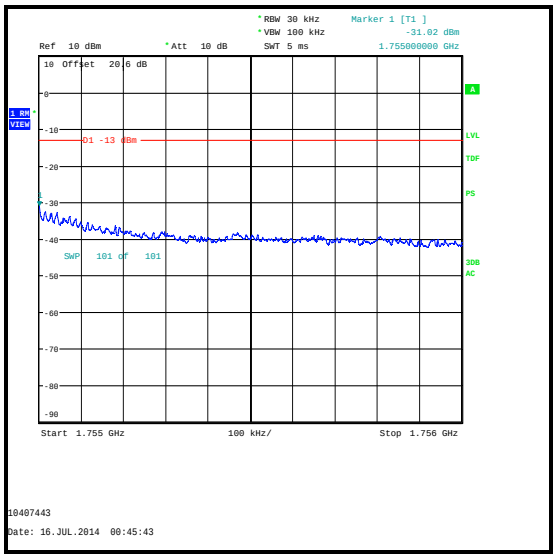
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 3 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.998 | 15 | 0 | -28.4 | -13.0 | 15.4 | Complied |
| 1710 | 15 | 0 | -28.8 | -13.0 | 15.8 | Complied |
| 1755 | 15 | 0 | -31.0 | -13.0 | 18.0 | Complied |




**16QAM / Lower Band Edge**

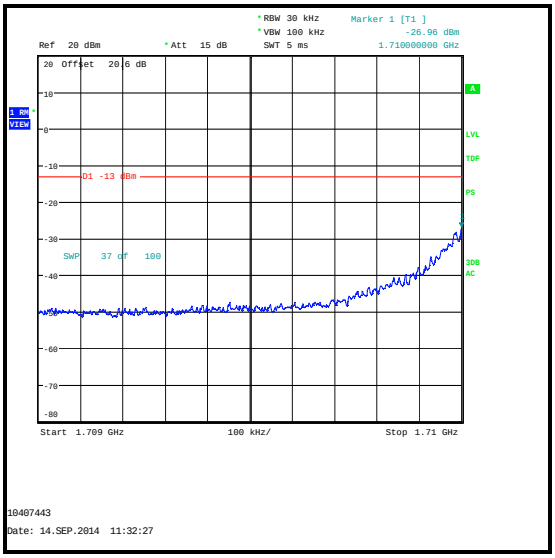



**16QAM / Upper Band Edge**

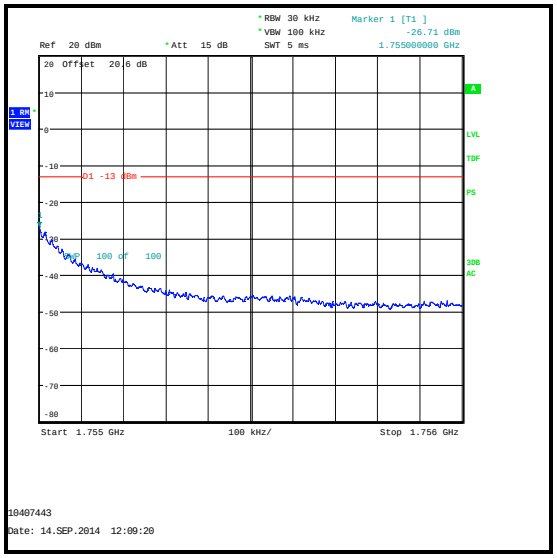
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 3 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -27.0 | -13.0 | 14.0 | Complied |
| 1755 | 1 | 14 | -26.7 | -13.0 | 13.7 | Complied |




**16QAM / Lower Band Edge**

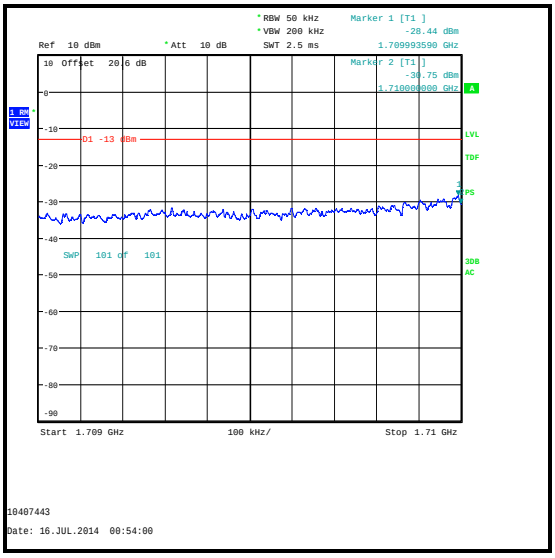



**16QAM / Upper Band Edge**

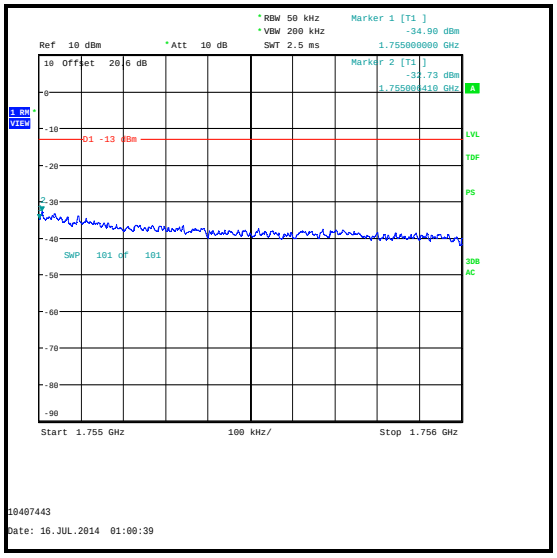
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 5 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.994 | 25 | 0 | -28.4 | -13.0 | 15.4 | Complied |
| 1710 | 25 | 0 | -30.8 | -13.0 | 17.8 | Complied |
| 1755 | 25 | 0 | -34.9 | -13.0 | 21.9 | Complied |
| 1755.006 | 25 | 0 | -32.7 | -13.0 | 19.7 | Complied |




**QPSK / Lower Band Edge**

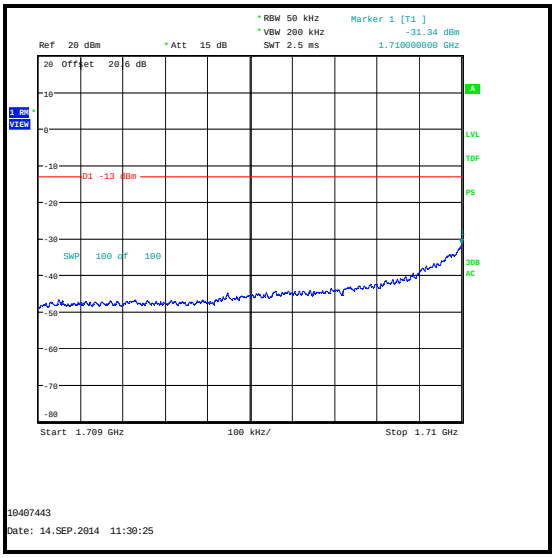



**QPSK / Upper Band Edge**

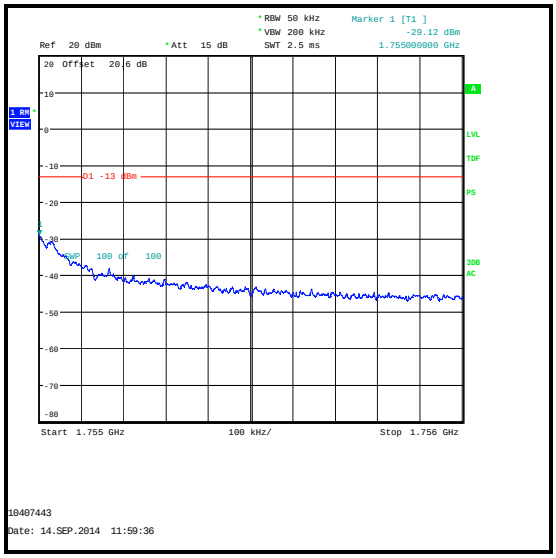
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 5 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -31.3 | -13.0 | 18.3 | Complied |
| 1755 | 1 | 24 | -29.1 | -13.0 | 16.1 | Complied |




QPSK / Lower Band Edge

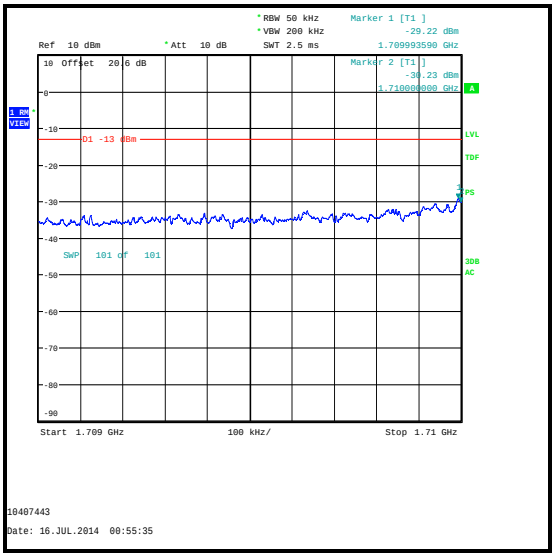



QPSK / Upper Band Edge

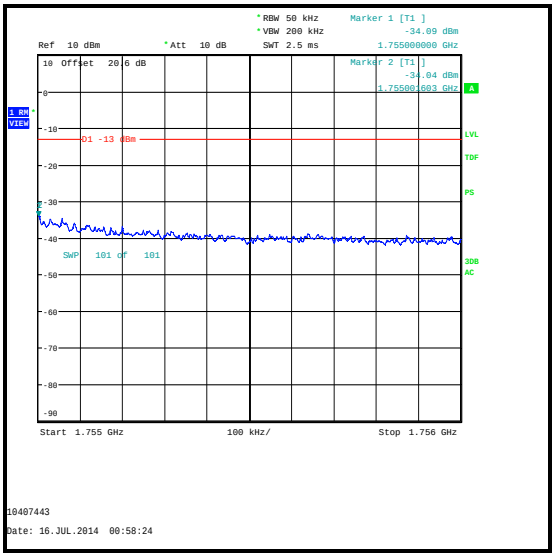
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 5 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.994 | 25 | 0 | -29.2 | -13.0 | 16.2 | Complied |
| 1710 | 25 | 0 | -30.2 | -13.0 | 17.2 | Complied |
| 1755 | 25 | 0 | -34.1 | -13.0 | 21.1 | Complied |
| 1755.002 | 25 | 0 | -34.0 | -13.0 | 21.0 | Complied |




**16QAM / Lower Band Edge**

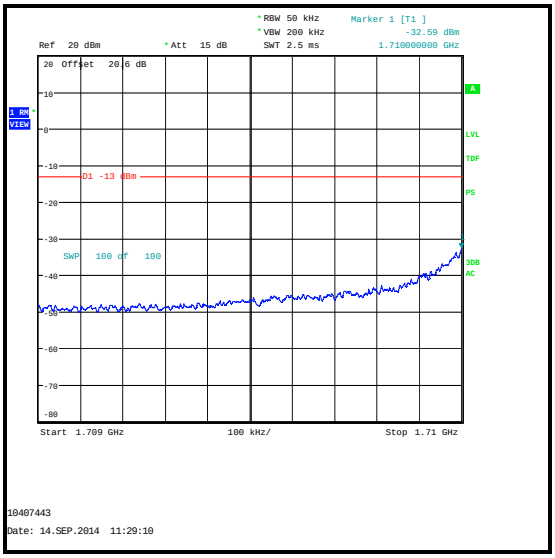



**16QAM / Upper Band Edge**

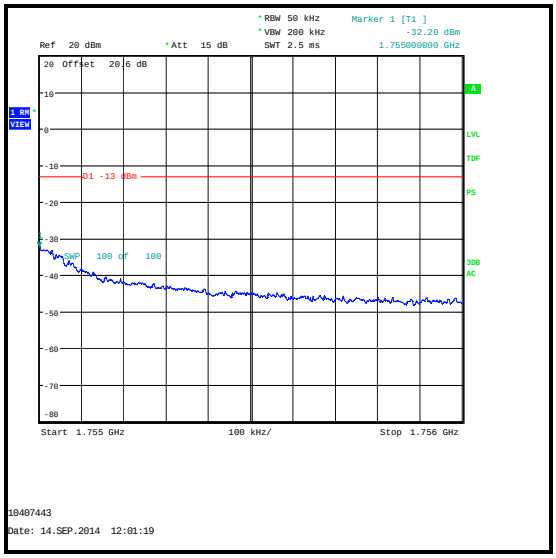
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 5 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -32.6 | -13.0 | 19.6 | Complied |
| 1755 | 1 | 24 | -32.2 | -13.0 | 19.2 | Complied |




**16QAM / Lower Band Edge**

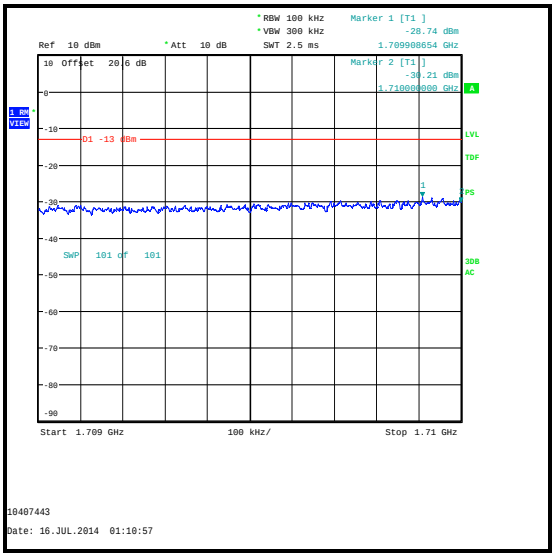



**16QAM / Upper Band Edge**

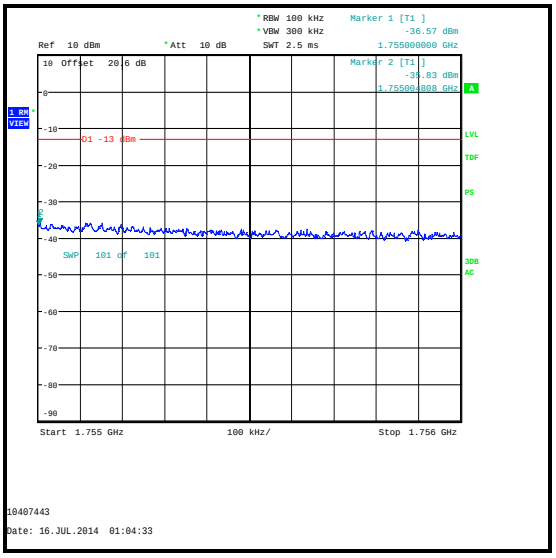
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 10 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.909 | 50 | 0 | -28.7 | -13.0 | 15.7 | Complied |
| 1710 | 50 | 0 | -30.2 | -13.0 | 17.2 | Complied |
| 1755 | 50 | 0 | -36.6 | -13.0 | 23.6 | Complied |
| 1755.005 | 50 | 0 | -35.8 | -13.0 | 22.8 | Complied |




**QPSK / Lower Band Edge**

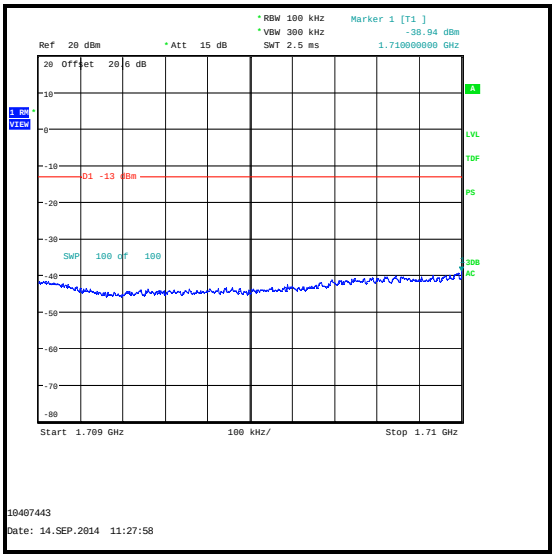



**QPSK / Upper Band Edge**

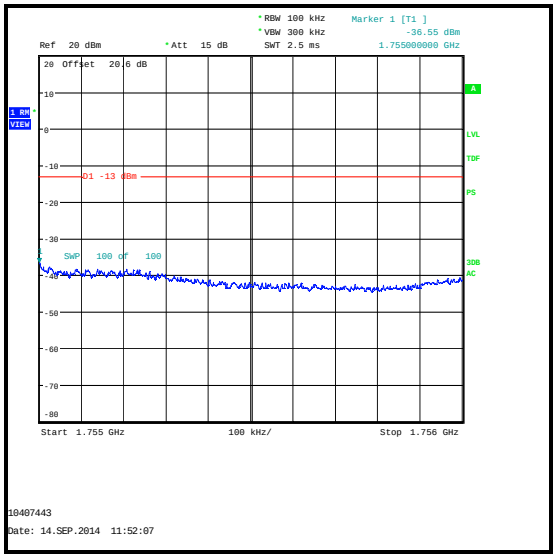
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 10 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -38.9 | -13.0 | 25.9 | Complied |
| 1755 | 1 | 49 | -36.6 | -13.0 | 23.6 | Complied |




QPSK / Lower Band Edge

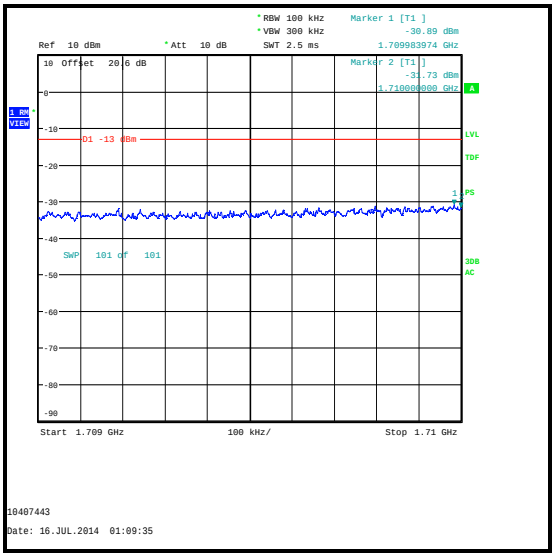



QPSK / Upper Band Edge

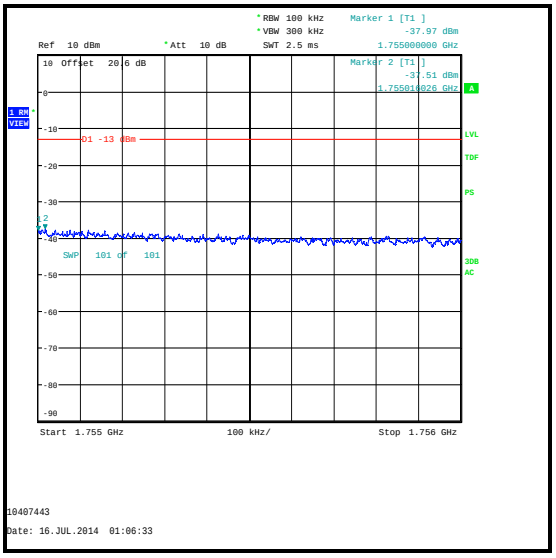
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 10 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.984 | 50 | 0 | -30.9 | -13.0 | 17.9 | Complied |
| 1710 | 50 | 0 | -31.7 | -13.0 | 18.7 | Complied |
| 1755 | 50 | 0 | -38.0 | -13.0 | 25.0 | Complied |
| 1755.016 | 50 | 0 | -37.5 | -13.0 | 24.5 | Complied |




**16QAM / Lower Band Edge**

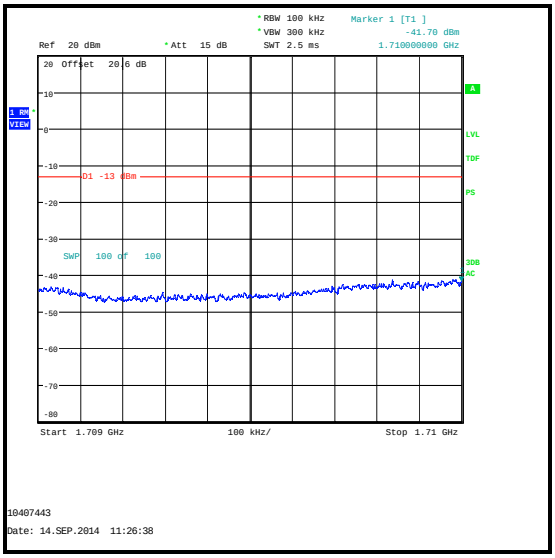



**16QAM / Upper Band Edge**

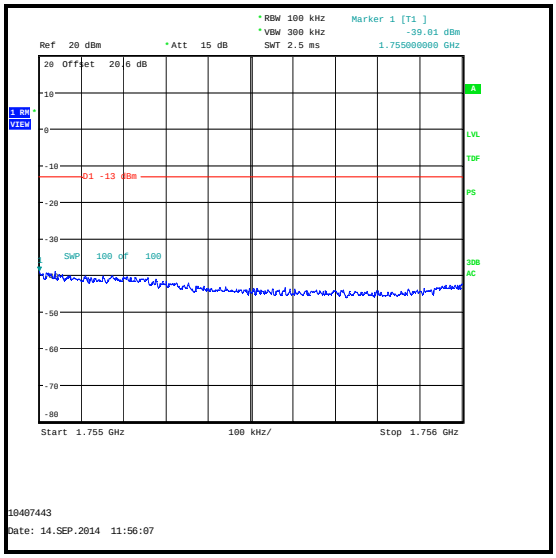
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 10 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -41.7 | -13.0 | 28.7 | Complied |
| 1755 | 1 | 49 | -39.0 | -13.0 | 26.0 | Complied |




**16QAM / Lower Band Edge**

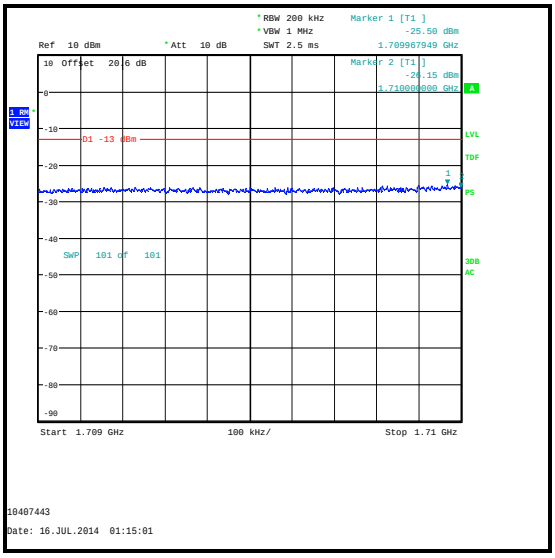



**16QAM / Upper Band Edge**

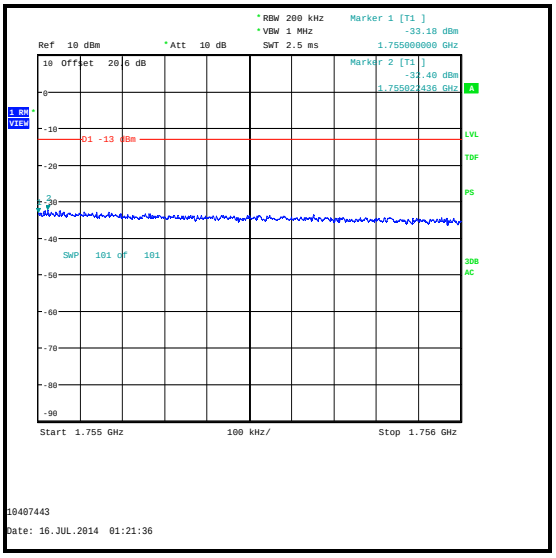
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 15 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.968 | 75 | 0 | -25.5 | -13.0 | 12.5 | Complied |
| 1710 | 75 | 0 | -26.2 | -13.0 | 13.2 | Complied |
| 1755 | 75 | 0 | -33.2 | -13.0 | 20.2 | Complied |
| 1755.022 | 75 | 0 | -32.4 | -13.0 | 19.4 | Complied |




**QPSK / Lower Band Edge**

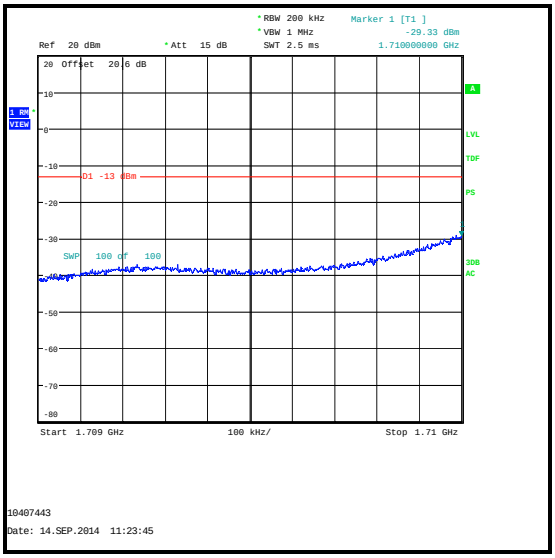



**QPSK / Upper Band Edge**

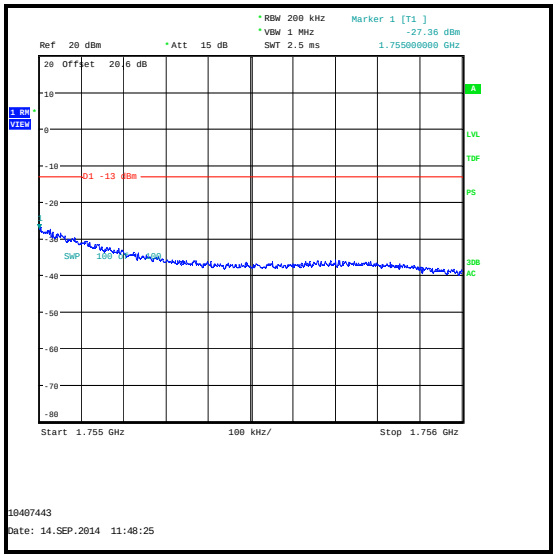
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 15 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -29.3 | -13.0 | 16.3 | Complied |
| 1755 | 1 | 74 | -27.4 | -13.0 | 14.4 | Complied |




**QPSK / Lower Band Edge**

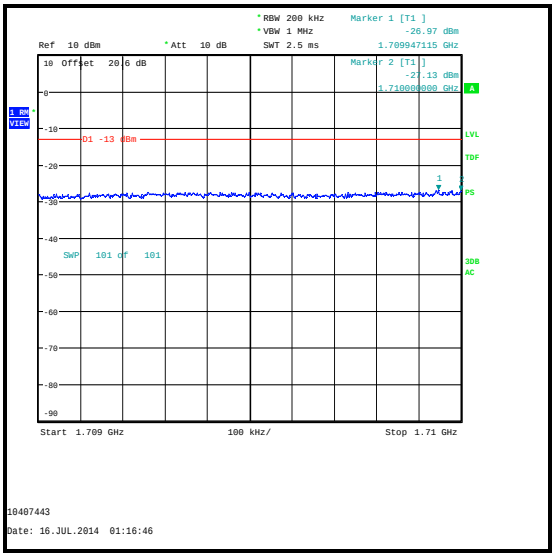



**QPSK / Upper Band Edge**

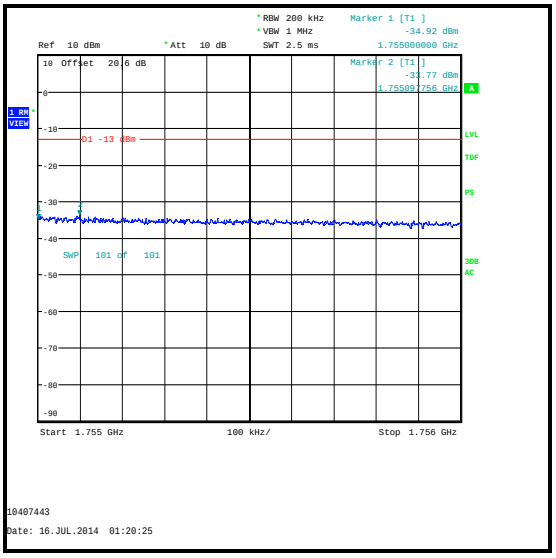
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 15 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.947 | 75 | 0 | -27.0 | -13.0 | 14.0 | Complied |
| 1710 | 75 | 0 | -27.1 | -13.0 | 14.1 | Complied |
| 1755 | 75 | 0 | -34.9 | -13.0 | 21.9 | Complied |
| 1755.098 | 75 | 0 | -33.8 | -13.0 | 20.8 | Complied |




**16QAM / Lower Band Edge**

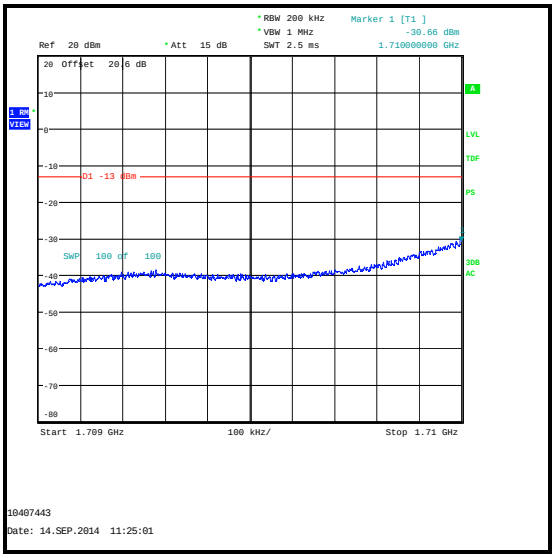



**16QAM / Upper Band Edge**

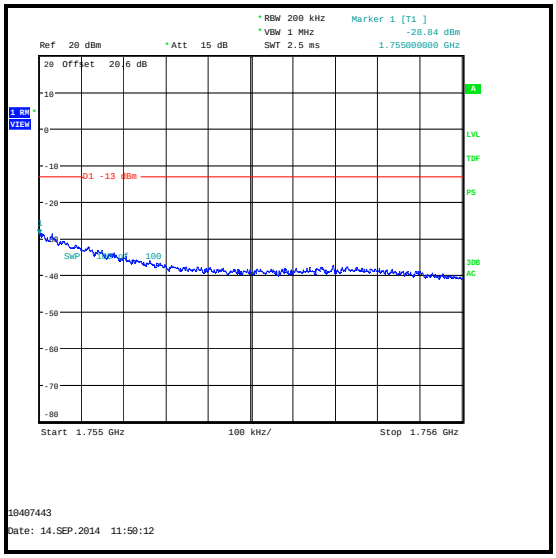
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 15 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -30.7 | -13.0 | 17.7 | Complied |
| 1755 | 1 | 74 | -28.8 | -13.0 | 15.8 | Complied |




**16QAM / Lower Band Edge**

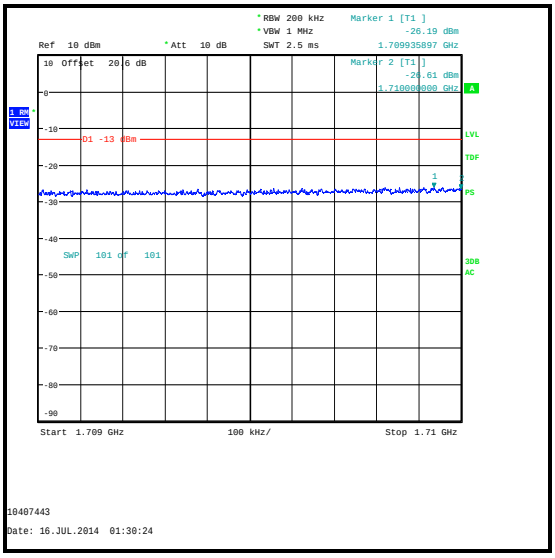



**16QAM / Upper Band Edge**

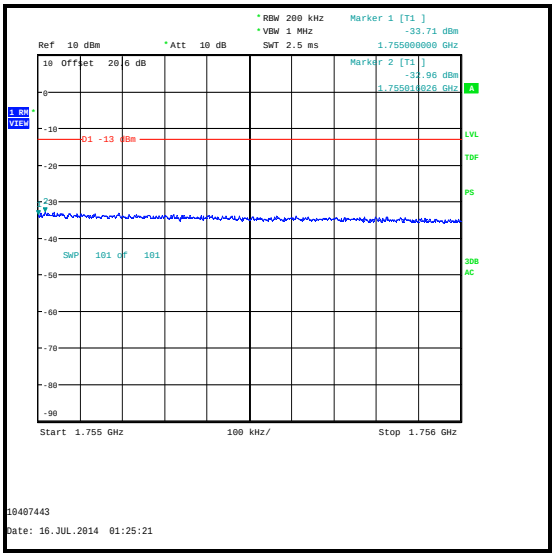
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 20 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.936 | 100 | 0 | -26.2 | -13.0 | 13.2 | Complied |
| 1710 | 100 | 0 | -26.6 | -13.0 | 13.6 | Complied |
| 1755 | 100 | 0 | -33.7 | -13.0 | 20.7 | Complied |
| 1755.016 | 100 | 0 | -33.0 | -13.0 | 20.0 | Complied |




**QPSK / Lower Band Edge**

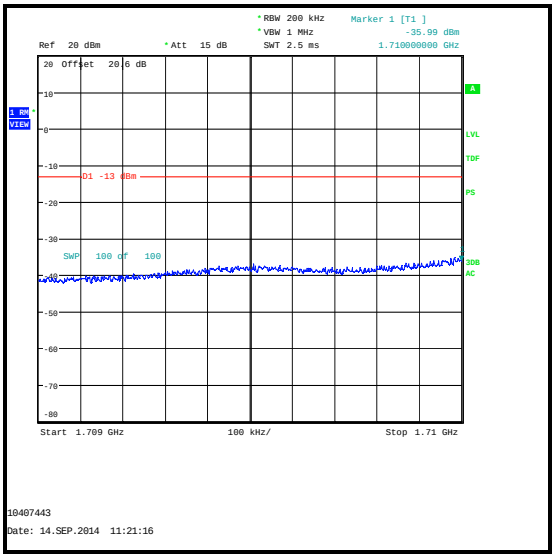



**QPSK / Upper Band Edge**

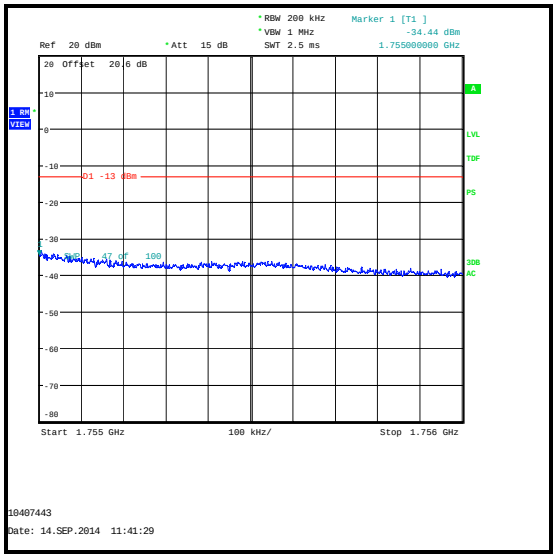
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 20 MHz Channel Bandwidth / QPSK

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -36.0 | -13.0 | 23.0 | Complied |
| 1755 | 1 | 99 | -34.4 | -13.0 | 21.4 | Complied |




QPSK / Lower Band Edge

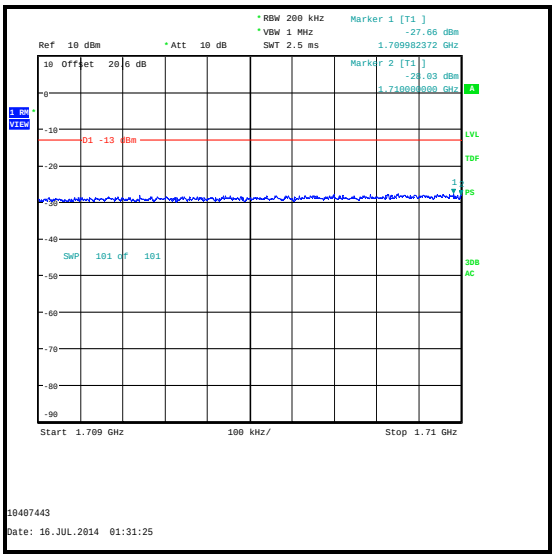



QPSK / Upper Band Edge

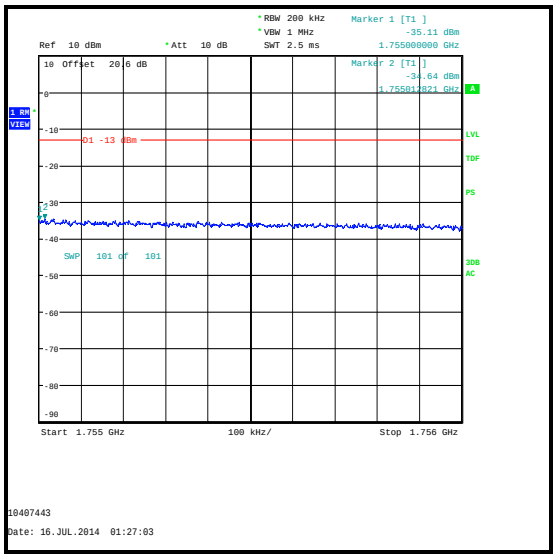
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 20 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1709.982 | 100 | 0 | -27.7 | -13.0 | 14.7 | Complied |
| 1710 | 100 | 0 | -28.0 | -13.0 | 15.0 | Complied |
| 1755 | 100 | 0 | -35.1 | -13.0 | 22.1 | Complied |
| 1755.013 | 100 | 0 | -34.6 | -13.0 | 21.6 | Complied |




**16QAM / Lower Band Edge**

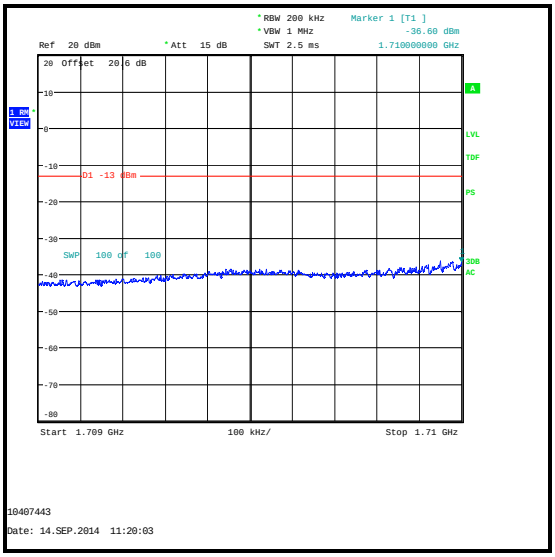



**16QAM / Upper Band Edge**

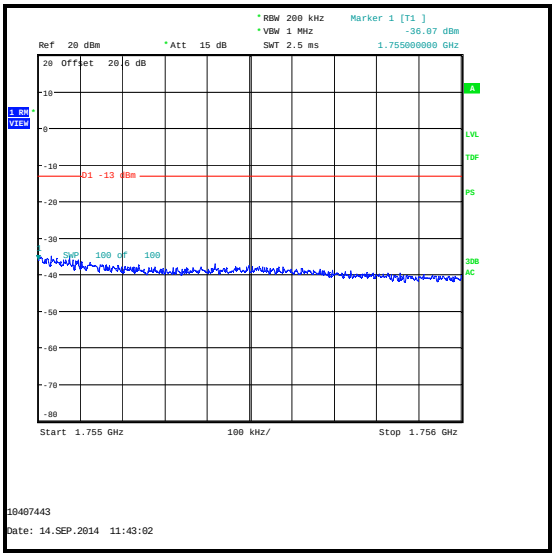
## Transmitter Radiated Emissions at Band Edges (continued)

## Results: 20 MHz Channel Bandwidth / 16QAM

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | Emission Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|---|---|---|---|---|---|---|
| 1710 | 1 | 0 | -36.6 | -13.0 | 23.6 | Complied |
| 1755 | 1 | 99 | -36.1 | -13.0 | 23.1 | Complied |




**16QAM / Lower Band Edge**




**16QAM / Upper Band Edge**

## Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|---|---|---|---|---|---|---|
| M1656 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | Not stated | 14 Mar 2015 | 12 |
| K0002 | 3m RSE Chamber | Rainford | N/A | N/A | 14 Nov 2014 | 12 |
| M1874 | Test Receiver | Rohde & Schwarz | ESU26 | 100553 | 13 May 2015 | 12 |
| A1534 | Pre-Amplifier | Hewlett Packard | 8449B | 3008A00405 | 18 May 2015 | 12 |
| A1818 | Antenna | EMCO | 3115 | 00075692 | 14 Nov 2014 | 12 |
| A1396 | Attenuator | Huber & Suhner | 6820.17.B | 757456 | 02 May 2015 | 12 |

## 5.2.5. Transmitter Frequency Stability (Temperature Variation)

### Test Summary:

| | | | |
|---|---|---|---|
| **Test Engineer:** | Keith Tucker | **Test Dates:** | 09 July 2014 &<br>10 July 2014 |
| **Test Sample IMEI:** | 352025060274538 | | |

| | |
|---|---|
| **FCC Reference:** | Parts 2.1055 & 27.54 |
| **Test Method Used:** | As detailed in KDB 971168 Section 9.0 referencing<br>ANSI TIA-603-C-2004 Section 2.2.2 and FCC Part 2.1055 |

### Environmental Conditions:

| | |
|---|---|
| **Temperature (℃):** | 22 to 23 |
| **Relative Humidity (%):** | 38 to 49 |

### Note(s):

1. Flying leads were connected internally to the EUT in place of the battery. These leads were extended and connected to a bench power supply, set at the EUT nominal voltage.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

## Transmitter Frequency Stability (Temperature Variation) (continued)

### Results: Bottom Channel (1710.7 MHz)

| Temperature (ºC) | Frequency Error (Hz) | Measured Frequency (MHz) | Lower Band Edge Limit (MHz) | Margin (MHz) | Result |
|---|---|---|---|---|---|
| -30 | 14 | 1710.699986 | 1710.0 | 0.699986 | Complied |
| -20 | 14 | 1710.699986 | 1710.0 | 0.699986 | Complied |
| -10 | 13 | 1710.699987 | 1710.0 | 0.699987 | Complied |
| 0 | 15 | 1710.699985 | 1710.0 | 0.699985 | Complied |
| 10 | 13 | 1710.699987 | 1710.0 | 0.699987 | Complied |
| 20 | 14 | 1710.699986 | 1710.0 | 0.699986 | Complied |
| 30 | 16 | 1710.699984 | 1710.0 | 0.699984 | Complied |
| 40 | 16 | 1710.699984 | 1710.0 | 0.699984 | Complied |
| 50 | 15 | 1710.699985 | 1710.0 | 0.699985 | Complied |

### Results: Top Channel (1754.3 MHz)

| Temperature (ºC) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result |
|---|---|---|---|---|---|
| -30 | 13 | 1754.299987 | 1755.0 | 0.700013 | Complied |
| -20 | 11 | 1754.299989 | 1755.0 | 0.700011 | Complied |
| -10 | 11 | 1754.299989 | 1755.0 | 0.700011 | Complied |
| 0 | 11 | 1754.299989 | 1755.0 | 0.700011 | Complied |
| 10 | 14 | 1754.299986 | 1755.0 | 0.700014 | Complied |
| 20 | 12 | 1754.299988 | 1755.0 | 0.700012 | Complied |
| 30 | 14 | 1754.299986 | 1755.0 | 0.700014 | Complied |
| 40 | 15 | 1754.299985 | 1755.0 | 0.700015 | Complied |
| 50 | 12 | 1754.299988 | 1755.0 | 0.700012 | Complied |

### Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|---|---|---|---|---|---|---|
| M1658 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| M1870 | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500 | 145919 | 05 May 2015 | 12 |
| G088 | Dual DC power supply | Thurlby Thandar | CPX200 | 100700 | Calibrated before use | - |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |
| M1643 | Thermometer | Fluke | 52II | 18890136 | 07 Apr 2015 | 12 |
| E013 | Environmental Chamber | Sanyo | MTH-4200PR | none | Calibrated before use | - |

## 5.2.6. Transmitter Frequency Stability (Voltage Variation)

### Test Summary:

| | | | |
|---|---|---|---|
| **Test Engineer:** | Keith Tucker | **Test Dates:** | 09 July 2014 & 10 July 2014 |
| **Test Sample IMEI:** | 352025060274538 | | |

| | |
|---|---|
| **FCC Reference:** | Parts 2.1055 & 27.54 |
| **Test Method Used:** | As detailed in KDB 971168 Section 9.0 referencing ANSI TIA-603-C-2004 Section 2.2.2 and FCC Part 2.1055 |

### Environmental Conditions:

| | |
|---|---|
| **Temperature (℃):** | 22 to 23 |
| **Relative Humidity (%):** | 38 to 49 |

### Note(s):

1. Flying leads were connected internally to the EUT in place of the battery. These leads were extended and connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter

### Results: Bottom Channel (1710.7 MHz)

| Supply Voltage (V) | Frequency Error (Hz) | Measured Frequency (MHz) | Lower Band Edge Limit (MHz) | Margin (MHz) | Result |
|---|---|---|---|---|---|
| 3.4 | 16 | 1710.699984 | 1710.0 | 0.699984 | Complied |
| 4.2 | 15 | 1710.699985 | 1710.0 | 0.699985 | Complied |

### Results: Top Channel (1754.3 MHz)

| Supply Voltage (V) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result |
|---|---|---|---|---|---|
| 3.4 | 13 | 1754.299987 | 1755.0 | 0.700013 | Complied |
| 4.2 | 13 | 1754.299987 | 1755.0 | 0.700013 | Complied |

**Transmitter Frequency Stability (Voltage Variation) (continued)**

**Test Equipment Used:**

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|---|---|---|---|---|---|---|
| M1658 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| M1870 | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500 | 145919 | 05 May 2015 | 12 |
| G088 | Dual DC power supply | Thurlby Thandar | CPX200 | 100700 | Calibrated before use | - |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |

# 6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

| Measurement Type | Range | Confidence Level (%) | Calculated Uncertainty |
|---|---|---|---|
| Conducted Output Power | 1710 to 1755 MHz | 95% | ±0.76 dB |
| Frequency Stability | 1710 to 1755 MHz | 95% | ±23 Hz |
| Occupied Bandwidth | 1710 to 1755 MHz | 95% | ±3.92 % |
| Radiated Spurious Emissions | 30 MHz to 1 GHz | 95% | ±5.65 dB |
| Radiated Spurious Emissions | 1 GHz to 18 GHz | 95% | ±2.94 dB |

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

# 7. Report Revision History

| Version Number | Revision Details | | |
|---|---|---|---|
| | **Page No(s)** | **Clause** | **Details** |
| 1.0 | - | - | Initial Version |
| 2.0 | - | - | Admin updates<br>Additional Radiated Band Edge measurements |

--- END OF REPORT ---