



# TEST REPORT

**Test Report No. : UL-RPT-RP11066287JD20A**

**Manufacturer** : Flextronics International Sweden AB  
**Model No.** : SR0020-W  
**FCC ID** : 2AIP8I  
**Technology** : LTE – Band 7  
**Test Standard(s)** : FCC Parts 27.50(h)(2), 27.50(d)(5) & 27.54

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 1.0

**Date of Issue:** 25 June 2016

**Checked by:**

Sarah Williams  
Engineer, Radio Laboratory

**Company Signatory:**

Steven White  
Service Lead, Radio Laboratory  
UL VS LTD



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

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## UL VS LTD

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## **1. Customer/Manufacturer Information**

### **1.1. Customer Information**

|                      |   |
|----------------------|---|
| <b>Company Name:</b> | Sirin Labs AG   |
| <b>Address:</b>      | Muhlentalstrasse 2<br>8200<br>Schaffhausen<br>Switzerland |

### **1.2. Manufacturer Information**







|                           |  |
|---------------------------|--|
| <b>Manufacturer Name:</b> | Flextronics International Sweden AB              |
| <b>Address:</b>           | Datalinjen 3A<br>SE – 583 30 Linköping<br>Sweden |

## 2. Summary of Testing

### 2.1. General Information

|                                 |  |
|---------------------------------|--|
| <b>Specification Reference:</b> | 47CFR27  |
| <b>Specification Title:</b>     | Code of Federal Regulations Volume 47 (Telecommunications):<br>Part 27 Subpart C (Miscellaneous Wireless Communication Services) |
| <b>Site Registration:</b>       | 209735   |
| <b>Location of Testing:</b>     | UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park,<br>Basingstoke, Hampshire, RG24 8AH, United Kingdom               |
| <b>Test Dates:</b>              | 14 May 2016 to 13 June 2016  |

### 2.2. Summary of Test Results

| FCC Reference (47CFR)   | Measurement  | Result  |
|---|--|---|
| 2.1046 / 27.50(h)(2)  | Transmitter Output Power (EIRP)  |  |
| 27.50(d)(5)   | Transmitter Peak-To-Average Ratio (PAR)                                |  |
| 2.1049  | Transmitter Occupied Bandwidth   |  |
| 2.1055 / 27.54  | Transmitter Frequency Stability<br>(Temperature and Voltage Variation) |  |
| Key to Results<br> = Complied  = Did not comply |  |   |

### 2.3. Methods and Procedures

|                   |   |
|-------------------|---|
| <b>Reference:</b> | ANSI/TIA-603-D-2010   |
| <b>Title:</b>     | Land Mobile FM or PM Communications Equipment, Measurements and performance Standards |
| <b>Reference:</b> | FCC KDB 971168 D01 v02r02, October 17 2014  |
| <b>Title:</b>     | 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)**

|                                   |   |
|-----------------------------------|---|
| <b>Brand Name:</b>                | SOLARIN                                 |
| <b>Model Number:</b>              | SR0020-W                                |
| <b>Test Sample Serial Number:</b> | 0030 ( <i>Conducted Sample</i> )        |
| <b>Test Sample IMEI:</b>          | 357232070003163                         |
| <b>Hardware Version:</b>          | TP1                                     |
| <b>Software Version:</b>          | LRC1TA.1.0.2.3                          |
| <b>Handset Cover Material:</b>    | Technical leather with titanium coating |
| <b>FCC ID:</b>                    | 2AIP8I                                  |

#### **3.2. Description of EUT**

The equipment under test was a Mobile device supporting Cellular, WLAN, BT, BTLE, RFID & GPS Technologies.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

**3.4. Additional Information Related to Testing**

|                                  |                                |                       |                                  |
|----------------------------------|--------------------------------|-----------------------|----------------------------------|
| <b>Tested Technology:</b>        | LTE Band 7                     |                       |                                  |
| <b>Type of Equipment</b>         | Transceiver                    |                       |                                  |
| <b>Channel Bandwidth:</b>        | 5 MHz, 10 MHz, 15 MHz & 20 MHz |                       |                                  |
| <b>Modulation Type:</b>          | QPSK & 16QAM                   |                       |                                  |
| <b>Duty Cycle:</b>               | 100%                           |                       |                                  |
| <b>Antenna Type:</b>             | Integral                       |                       |                                  |
| <b>Antenna Gain:</b>             | -2.77 dBi                      |                       |                                  |
| <b>Power Supply Requirement:</b> | Nominal                        | 3.9 VDC               |                                  |
|                                  | Minimum                        | 3.5 VDC               |                                  |
|                                  | Maximum                        | 4.4 VDC               |                                  |
| <b>Transmit Frequency Range:</b> | 2500 MHz to 2570 MHz           |                       |                                  |
| <b>Channels Tested:</b>          | <b>Channel Bandwidth (MHz)</b> | <b>N<sub>ul</sub></b> | <b>Frequency of Uplink (MHz)</b> |
| <b>Bottom Channel</b>            | 5                              | 20775                 | 2502.5                           |
|                                  | 10                             | 20800                 | 2505.0                           |
|                                  | 15                             | 20825                 | 2507.5                           |
|                                  | 20                             | 20850                 | 2510.0                           |
| <b>Middle Channel</b>            | All                            | 21100                 | 2535.0                           |
| <b>Top Channel</b>               | 5                              | 21425                 | 2567.5                           |
|                                  | 10                             | 21400                 | 2565.0                           |
|                                  | 15                             | 21375                 | 2562.5                           |
|                                  | 20                             | 21350                 | 2560.0                           |

**3.5. Support Equipment**

No support equipment was used for the tests shown in this report.

## **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 connected to a Rohde and Schwarz CMW500 LTE system simulator, operating in a transceiver mode.
- Conducted measurements 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 exiting through a hole in the casing. These leads were then extended through a connector interface to a laboratory DC power supply.
- For conducted cellular measurements, the EUT RF conducted port was a temporary SMA connector that was connected internally in place of the pcb antenna. The loss of the internal connection to the connector was accounted for in calculations.
- For the conducted tests in this report, the antenna port measured was identified by the manufacturer as Antenna #1.

### **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 |
| 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 test 4, for both QPSK and 16QAM modulation schemes.

Transmitter Frequency Stability test was carried out with sub test 4, with a channel bandwidth of 5 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:**

|                          |                 |                   |             |
|--------------------------|-----------------|-------------------|-------------|
| <b>Test Engineer:</b>    | Keith Tucker    | <b>Test Date:</b> | 14 May 2016 |
| <b>Test Sample IMEI:</b> | 357232070003163 |                   |             |

|                          |   |
|--------------------------|---|
| <b>FCC Reference:</b>    | Parts 2.1046 & 27.50(h)(2)                      |
| <b>Test Method Used:</b> | KDB 971168 Section 2.2 footnote 1 & Notes below |

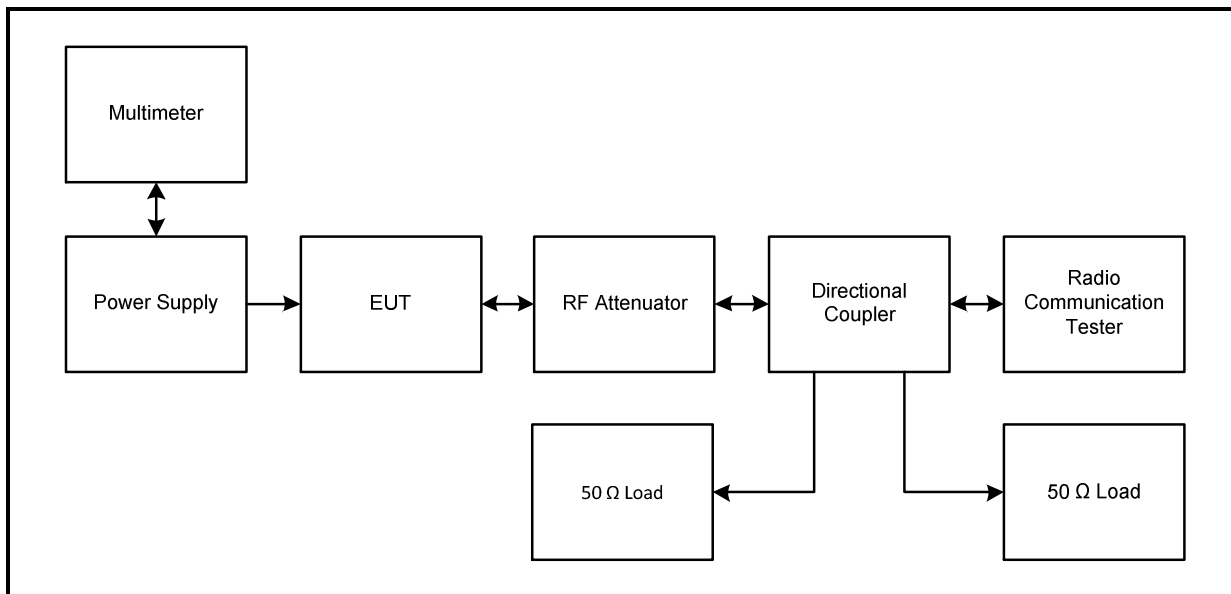
**Environmental Conditions:**

|                               |    |
|-------------------------------|----|
| <b>Temperature (°C):</b>      | 24 |
| <b>Relative Humidity (%):</b> | 46 |

**Note(s):**

1. The customer stated that the antenna gain is -2.8 dBi.
2. Conducted average power was measured using a calibrated Rohde and Schwarz CMW 500 Wideband Radio Communication Tester.
3. 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.

**Test setup:**



**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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2502.5          | 25                | 0                     | 19.2                     | -2.8               | 16.4       | 33.0             | 16.6        | Complied |
| 2502.5          | 12                | 6                     | 19.2                     | -2.8               | 16.4       | 33.0             | 16.6        | Complied |
| 2502.5          | 1                 | 0                     | 20.2                     | -2.8               | 17.4       | 33.0             | 15.6        | Complied |
| 2502.5          | 1                 | 24                    | 20.1                     | -2.8               | 17.3       | 33.0             | 15.7        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2502.5          | 25                | 0                     | 18.2                     | -2.8               | 15.4       | 33.0             | 17.6        | Complied |
| 2502.5          | 12                | 6                     | 18.3                     | -2.8               | 15.5       | 33.0             | 17.5        | Complied |
| 2502.5          | 1                 | 0                     | 19.6                     | -2.8               | 16.8       | 33.0             | 16.2        | Complied |
| 2502.5          | 1                 | 24                    | 19.5                     | -2.8               | 16.7       | 33.0             | 16.3        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 25                | 0                     | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 12                | 6                     | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 1                 | 0                     | 20.9                     | -2.8               | 18.1       | 33.0             | 14.9        | Complied |
| 2535.0          | 1                 | 24                    | 20.5                     | -2.8               | 17.7       | 33.0             | 15.3        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 25                | 0                     | 18.7                     | -2.8               | 15.9       | 33.0             | 17.1        | Complied |
| 2535.0          | 12                | 6                     | 18.7                     | -2.8               | 15.9       | 33.0             | 17.1        | Complied |
| 2535.0          | 1                 | 0                     | 20.0                     | -2.8               | 17.2       | 33.0             | 15.8        | Complied |
| 2535.0          | 1                 | 24                    | 19.5                     | -2.8               | 16.7       | 33.0             | 16.3        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2567.5          | 25                | 0                     | 19.1                     | -2.8               | 16.3       | 33.0             | 16.7        | Complied |
| 2567.5          | 12                | 6                     | 19.1                     | -2.8               | 16.3       | 33.0             | 16.7        | Complied |
| 2567.5          | 1                 | 0                     | 20.4                     | -2.8               | 17.6       | 33.0             | 15.4        | Complied |
| 2567.5          | 1                 | 24                    | 20.0                     | -2.8               | 17.2       | 33.0             | 15.8        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2567.5          | 25                | 0                     | 18.0                     | -2.8               | 15.2       | 33.0             | 17.8        | Complied |
| 2567.5          | 12                | 6                     | 18.1                     | -2.8               | 15.3       | 33.0             | 17.7        | Complied |
| 2567.5          | 1                 | 0                     | 19.2                     | -2.8               | 16.4       | 33.0             | 16.6        | Complied |
| 2567.5          | 1                 | 24                    | 18.9                     | -2.8               | 16.1       | 33.0             | 16.9        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2505.0          | 50                | 0                     | 19.3                     | -2.8               | 16.5       | 33.0             | 16.5        | Complied |
| 2505.0          | 25                | 12                    | 19.3                     | -2.8               | 16.5       | 33.0             | 16.5        | Complied |
| 2505.0          | 1                 | 0                     | 20.3                     | -2.8               | 17.5       | 33.0             | 15.5        | Complied |
| 2505.0          | 1                 | 49                    | 20.4                     | -2.8               | 17.6       | 33.0             | 15.4        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2505.0          | 50                | 0                     | 18.3                     | -2.8               | 15.5       | 33.0             | 17.5        | Complied |
| 2505.0          | 25                | 12                    | 18.3                     | -2.8               | 15.5       | 33.0             | 17.5        | Complied |
| 2505.0          | 1                 | 0                     | 19.4                     | -2.8               | 16.6       | 33.0             | 16.4        | Complied |
| 2505.0          | 1                 | 49                    | 19.5                     | -2.8               | 16.7       | 33.0             | 16.3        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 50                | 0                     | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 25                | 12                    | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 1                 | 0                     | 20.9                     | -2.8               | 18.1       | 33.0             | 14.9        | Complied |
| 2535.0          | 1                 | 49                    | 20.2                     | -2.8               | 17.4       | 33.0             | 15.6        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 50                | 0                     | 18.7                     | -2.8               | 15.9       | 33.0             | 17.1        | Complied |
| 2535.0          | 25                | 12                    | 18.8                     | -2.8               | 16.0       | 33.0             | 17.0        | Complied |
| 2535.0          | 1                 | 0                     | 20.2                     | -2.8               | 17.4       | 33.0             | 15.6        | Complied |
| 2535.0          | 1                 | 49                    | 19.5                     | -2.8               | 16.7       | 33.0             | 16.3        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2565.0          | 50                | 0                     | 19.2                     | -2.8               | 16.4       | 33.0             | 16.6        | Complied |
| 2565.0          | 25                | 12                    | 19.2                     | -2.8               | 16.4       | 33.0             | 16.6        | Complied |
| 2565.0          | 1                 | 0                     | 20.5                     | -2.8               | 17.7       | 33.0             | 15.3        | Complied |
| 2565.0          | 1                 | 49                    | 19.8                     | -2.8               | 17.0       | 33.0             | 16.0        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2565.0          | 50                | 0                     | 18.2                     | -2.8               | 15.4       | 33.0             | 17.6        | Complied |
| 2565.0          | 25                | 12                    | 18.2                     | -2.8               | 15.4       | 33.0             | 17.6        | Complied |
| 2565.0          | 1                 | 0                     | 20.1                     | -2.8               | 17.3       | 33.0             | 15.7        | Complied |
| 2565.0          | 1                 | 49                    | 19.4                     | -2.8               | 16.6       | 33.0             | 16.4        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2507.5          | 75                | 0                     | 19.5                     | -2.8               | 16.7       | 33.0             | 16.3        | Complied |
| 2507.5          | 36                | 18                    | 19.4                     | -2.8               | 16.6       | 33.0             | 16.4        | Complied |
| 2507.5          | 1                 | 0                     | 20.5                     | -2.8               | 17.7       | 33.0             | 15.3        | Complied |
| 2507.5          | 1                 | 74                    | 21.1                     | -2.8               | 18.3       | 33.0             | 14.7        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2507.5          | 75                | 0                     | 18.5                     | -2.8               | 15.7       | 33.0             | 17.3        | Complied |
| 2507.5          | 36                | 18                    | 18.4                     | -2.8               | 15.6       | 33.0             | 17.4        | Complied |
| 2507.5          | 1                 | 0                     | 19.6                     | -2.8               | 16.8       | 33.0             | 16.2        | Complied |
| 2507.5          | 1                 | 74                    | 20.2                     | -2.8               | 17.4       | 33.0             | 15.6        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 75                | 0                     | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 36                | 18                    | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 1                 | 0                     | 21.0                     | -2.8               | 18.2       | 33.0             | 14.8        | Complied |
| 2535.0          | 1                 | 74                    | 20.4                     | -2.8               | 17.6       | 33.0             | 15.4        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 75                | 0                     | 18.7                     | -2.8               | 15.9       | 33.0             | 17.1        | Complied |
| 2535.0          | 36                | 18                    | 18.8                     | -2.8               | 16.0       | 33.0             | 17.0        | Complied |
| 2535.0          | 1                 | 0                     | 20.6                     | -2.8               | 17.8       | 33.0             | 15.2        | Complied |
| 2535.0          | 1                 | 74                    | 19.9                     | -2.8               | 17.1       | 33.0             | 15.9        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2562.5          | 75                | 0                     | 19.4                     | -2.8               | 16.6       | 33.0             | 16.4        | Complied |
| 2562.5          | 36                | 18                    | 19.5                     | -2.8               | 16.7       | 33.0             | 16.3        | Complied |
| 2562.5          | 1                 | 0                     | 20.7                     | -2.8               | 17.9       | 33.0             | 15.1        | Complied |
| 2562.5          | 1                 | 74                    | 20.0                     | -2.8               | 17.2       | 33.0             | 15.8        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2562.5          | 75                | 0                     | 18.4                     | -2.8               | 15.6       | 33.0             | 17.4        | Complied |
| 2562.5          | 36                | 18                    | 18.5                     | -2.8               | 15.7       | 33.0             | 17.3        | Complied |
| 2562.5          | 1                 | 0                     | 20.3                     | -2.8               | 17.5       | 33.0             | 15.5        | Complied |
| 2562.5          | 1                 | 74                    | 19.6                     | -2.8               | 16.8       | 33.0             | 16.2        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2510.0          | 100               | 0                     | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2510.0          | 50                | 25                    | 19.6                     | -2.8               | 16.8       | 33.0             | 16.2        | Complied |
| 2510.0          | 1                 | 0                     | 20.4                     | -2.8               | 17.6       | 33.0             | 15.4        | Complied |
| 2510.0          | 1                 | 99                    | 20.5                     | -2.8               | 17.7       | 33.0             | 15.3        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2510.0          | 100               | 0                     | 18.6                     | -2.8               | 15.8       | 33.0             | 17.2        | Complied |
| 2510.0          | 50                | 25                    | 18.6                     | -2.8               | 15.8       | 33.0             | 17.2        | Complied |
| 2510.0          | 1                 | 0                     | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2510.0          | 1                 | 99                    | 19.8                     | -2.8               | 17.0       | 33.0             | 16.0        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 100               | 0                     | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 50                | 25                    | 19.7                     | -2.8               | 16.9       | 33.0             | 16.1        | Complied |
| 2535.0          | 1                 | 0                     | 20.9                     | -2.8               | 18.1       | 33.0             | 14.9        | Complied |
| 2535.0          | 1                 | 99                    | 20.3                     | -2.8               | 17.5       | 33.0             | 15.5        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2535.0          | 100               | 0                     | 18.7                     | -2.8               | 15.9       | 33.0             | 17.1        | Complied |
| 2535.0          | 50                | 25                    | 18.7                     | -2.8               | 15.9       | 33.0             | 17.1        | Complied |
| 2535.0          | 1                 | 0                     | 20.7                     | -2.8               | 17.9       | 33.0             | 15.1        | Complied |
| 2535.0          | 1                 | 99                    | 19.8                     | -2.8               | 17.0       | 33.0             | 16.0        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2560.0          | 100               | 0                     | 19.4                     | -2.8               | 16.6       | 33.0             | 16.4        | Complied |
| 2560.0          | 50                | 25                    | 19.5                     | -2.8               | 16.7       | 33.0             | 16.3        | Complied |
| 2560.0          | 1                 | 0                     | 20.6                     | -2.8               | 17.8       | 33.0             | 15.2        | Complied |
| 2560.0          | 1                 | 99                    | 20.0                     | -2.8               | 17.2       | 33.0             | 15.8        | 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   |
|-----------------|-------------------|-----------------------|--------------------------|--------------------|------------|------------------|-------------|----------|
| 2560.0          | 100               | 0                     | 18.4                     | -2.8               | 15.6       | 33.0             | 17.4        | Complied |
| 2560.0          | 50                | 25                    | 18.5                     | -2.8               | 15.7       | 33.0             | 17.3        | Complied |
| 2560.0          | 1                 | 0                     | 20.0                     | -2.8               | 17.2       | 33.0             | 15.8        | Complied |
| 2560.0          | 1                 | 99                    | 19.4                     | -2.8               | 16.6       | 33.0             | 16.4        | Complied |



**Transmitter Output Power (EIRP) (continued)****Test Equipment Used:**

| Asset No. | Instrument                  | Manufacturer    | Type No.      | Serial No.  | Date Calibration Due  | Cal. Interval (Months) |
|-----------|-----------------------------|-----------------|---------------|-------------|-----------------------|------------------------|
| M2002     | Thermohygrometer            | Testo           | 608-H1        | 45041825    | 02 Apr 2017           | 12                     |
| M1869     | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500        | 145923      | 05 Apr 2017           | 12                     |
| A2845     | Attenuator                  | Radiall         | R411.806.121  | 24325927    | Calibrated before use | -                      |
| A2844     | Attenuator                  | Radiall         | R411.803.121  | 23404066    | Calibrated before use | -                      |
| A2504     | Directional Coupler         | AtlanTecRF      | CDC-003060-10 | 13122501839 | Calibrated before use | -                      |
| S0577     | Power Supply                | TTi             | CPX400S       | 436670      | Calibrated before use | -                      |
| M1269     | Multimeter                  | Fluke           | 179           | 90250210    | 26 May 2016           | 12                     |
| M1835     | Signal Analyser             | Rohde & Schwarz | FSV30         | 103050      | 26 Feb 2017           | 12                     |

**5.2.2. Transmitter Peak-To-Average Ratio (PAR)****Test Summary:**

|                          |                 |                   |             |
|--------------------------|-----------------|-------------------|-------------|
| <b>Test Engineer:</b>    | Keith Tucker    | <b>Test Date:</b> | 14 May 2016 |
| <b>Test Sample IMEI:</b> | 357232070003163 |                   |             |

|                          |                          |
|--------------------------|--------------------------|
| <b>FCC Reference:</b>    | Part 27.50(d)(5)         |
| <b>Test Method Used:</b> | KDB 971168 Section 5.7.2 |

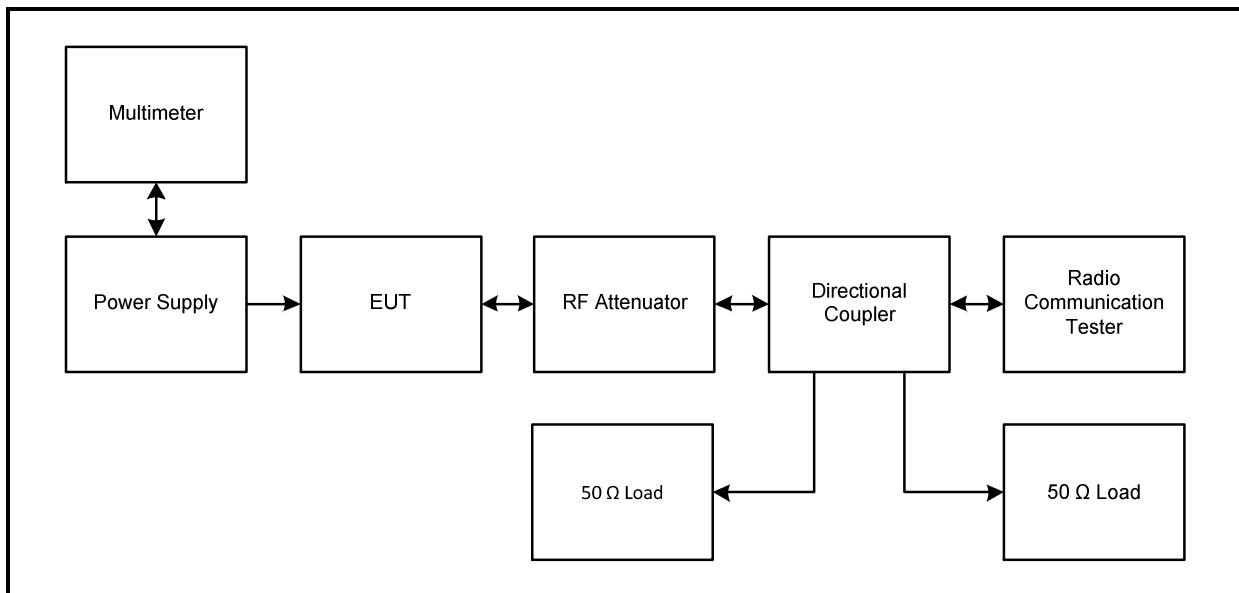
**Environmental Conditions:**

|                               |    |
|-------------------------------|----|
| <b>Temperature (°C):</b>      | 24 |
| <b>Relative Humidity (%):</b> | 46 |

**Note(s):**

1. The peak ( $P_{Pk}$ ) and average ( $P_{Avg}$ ) power were measured using the internal power measurement function of a calibrated Rohde and Schwarz CMW 500 Wideband Radio Communication Tester in accordance with current Rohde and Schwarz application notes.
2. The PAPR was determined using the following calculation:

$$PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).$$

**Test setup:**

**Transmitter Peak-To-Average Ratio (PAR) (continued)****Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2502.5          | 25                | 0                     | 24.5                  | 19.2                   | 5.3      | 13.0             | 7.7         | Complied |
| 2502.5          | 12                | 6                     | 23.9                  | 19.2                   | 4.7      | 13.0             | 8.3         | Complied |
| 2502.5          | 1                 | 0                     | 23.8                  | 20.2                   | 3.6      | 13.0             | 9.4         | Complied |
| 2502.5          | 1                 | 24                    | 23.7                  | 20.1                   | 3.6      | 13.0             | 9.4         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2502.5          | 25                | 0                     | 24.4                  | 18.2                   | 6.2      | 13.0             | 6.8         | Complied |
| 2502.5          | 12                | 6                     | 23.9                  | 18.3                   | 5.6      | 13.0             | 7.4         | Complied |
| 2502.5          | 1                 | 0                     | 23.8                  | 19.6                   | 4.2      | 13.0             | 8.8         | Complied |
| 2502.5          | 1                 | 24                    | 23.7                  | 19.5                   | 4.2      | 13.0             | 8.8         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 25                | 0                     | 25.0                  | 19.7                   | 5.3      | 13.0             | 7.7         | Complied |
| 2535.0          | 12                | 6                     | 24.4                  | 19.7                   | 4.7      | 13.0             | 8.3         | Complied |
| 2535.0          | 1                 | 0                     | 24.5                  | 20.9                   | 3.6      | 13.0             | 9.4         | Complied |
| 2535.0          | 1                 | 24                    | 24.1                  | 20.5                   | 3.6      | 13.0             | 9.4         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 25                | 0                     | 24.7                  | 18.7                   | 6.0      | 13.0             | 7.0         | Complied |
| 2535.0          | 12                | 6                     | 24.5                  | 18.7                   | 5.8      | 13.0             | 7.2         | Complied |
| 2535.0          | 1                 | 0                     | 24.5                  | 20.0                   | 4.5      | 13.0             | 8.5         | Complied |
| 2535.0          | 1                 | 24                    | 24.1                  | 19.5                   | 4.6      | 13.0             | 8.4         | Complied |

**Transmitter Peak-To-Average Ratio (PAR) (continued)****Results: 5 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2567.5          | 25                | 0                     | 24.4                  | 19.1                   | 5.3      | 13.0             | 7.7         | Complied |
| 2567.5          | 12                | 6                     | 23.9                  | 19.1                   | 4.8      | 13.0             | 8.2         | Complied |
| 2567.5          | 1                 | 0                     | 23.8                  | 20.4                   | 3.4      | 13.0             | 9.6         | Complied |
| 2567.5          | 1                 | 24                    | 23.5                  | 20.0                   | 3.5      | 13.0             | 9.5         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2567.5          | 25                | 0                     | 24.5                  | 18.0                   | 6.5      | 13.0             | 6.5         | Complied |
| 2567.5          | 12                | 6                     | 23.9                  | 18.1                   | 5.8      | 13.0             | 7.2         | Complied |
| 2567.5          | 1                 | 0                     | 23.9                  | 19.2                   | 4.7      | 13.0             | 8.3         | Complied |
| 2567.5          | 1                 | 24                    | 23.5                  | 18.9                   | 4.6      | 13.0             | 8.4         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2505.0          | 50                | 0                     | 24.7                  | 19.3                   | 5.4      | 13.0             | 7.6         | Complied |
| 2505.0          | 25                | 12                    | 24.2                  | 19.3                   | 4.9      | 13.0             | 8.1         | Complied |
| 2505.0          | 1                 | 0                     | 24.1                  | 20.3                   | 3.8      | 13.0             | 9.2         | Complied |
| 2505.0          | 1                 | 49                    | 24.3                  | 20.4                   | 3.9      | 13.0             | 9.1         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2505.0          | 50                | 0                     | 24.7                  | 18.3                   | 6.4      | 13.0             | 6.6         | Complied |
| 2505.0          | 25                | 12                    | 24.2                  | 18.3                   | 5.9      | 13.0             | 7.1         | Complied |
| 2505.0          | 1                 | 0                     | 24.0                  | 19.4                   | 4.6      | 13.0             | 8.4         | Complied |
| 2505.0          | 1                 | 49                    | 24.3                  | 19.5                   | 4.8      | 13.0             | 8.2         | Complied |

**Transmitter Peak-To-Average Ratio (PAR) (continued)****Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 50                | 0                     | 25.0                  | 19.7                   | 5.3      | 13.0             | 7.7         | Complied |
| 2535.0          | 25                | 12                    | 24.7                  | 19.7                   | 5.0      | 13.0             | 8.0         | Complied |
| 2535.0          | 1                 | 0                     | 24.8                  | 20.9                   | 3.9      | 13.0             | 9.1         | Complied |
| 2535.0          | 1                 | 49                    | 24.1                  | 20.2                   | 3.9      | 13.0             | 9.1         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 50                | 0                     | 25.1                  | 18.7                   | 6.4      | 13.0             | 6.6         | Complied |
| 2535.0          | 25                | 12                    | 24.7                  | 18.8                   | 5.9      | 13.0             | 7.1         | Complied |
| 2535.0          | 1                 | 0                     | 24.8                  | 20.2                   | 4.6      | 13.0             | 8.4         | Complied |
| 2535.0          | 1                 | 49                    | 24.1                  | 19.5                   | 4.6      | 13.0             | 8.4         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2565.0          | 50                | 0                     | 24.8                  | 19.2                   | 5.6      | 13.0             | 7.4         | Complied |
| 2565.0          | 25                | 12                    | 24.2                  | 19.2                   | 5.0      | 13.0             | 8.0         | Complied |
| 2565.0          | 1                 | 0                     | 24.4                  | 20.5                   | 3.9      | 13.0             | 9.1         | Complied |
| 2565.0          | 1                 | 49                    | 23.7                  | 19.8                   | 3.9      | 13.0             | 9.1         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2565.0          | 50                | 0                     | 24.7                  | 18.2                   | 6.5      | 13.0             | 6.5         | Complied |
| 2565.0          | 25                | 12                    | 24.1                  | 18.2                   | 5.9      | 13.0             | 7.1         | Complied |
| 2565.0          | 1                 | 0                     | 24.3                  | 20.1                   | 4.2      | 13.0             | 8.8         | Complied |
| 2565.0          | 1                 | 49                    | 23.7                  | 19.4                   | 4.3      | 13.0             | 8.7         | Complied |

**Transmitter Peak-To-Average Ratio (PAR) (continued)****Results: 15 MHz Channel Bandwidth / Bottom Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2507.5          | 75                | 0                     | 25.3                  | 19.5                   | 5.8      | 13.0             | 7.2         | Complied |
| 2507.5          | 36                | 18                    | 24.7                  | 19.4                   | 5.3      | 13.0             | 7.7         | Complied |
| 2507.5          | 1                 | 0                     | 24.5                  | 20.5                   | 4.0      | 13.0             | 9.0         | Complied |
| 2507.5          | 1                 | 74                    | 25.1                  | 21.1                   | 4.0      | 13.0             | 9.0         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2507.5          | 75                | 0                     | 25.1                  | 18.5                   | 6.6      | 13.0             | 6.4         | Complied |
| 2507.5          | 36                | 18                    | 24.6                  | 18.4                   | 6.2      | 13.0             | 6.8         | Complied |
| 2507.5          | 1                 | 0                     | 24.4                  | 19.6                   | 4.8      | 13.0             | 8.2         | Complied |
| 2507.5          | 1                 | 74                    | 25.1                  | 20.2                   | 4.9      | 13.0             | 8.1         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 75                | 0                     | 25.4                  | 19.7                   | 5.7      | 13.0             | 7.3         | Complied |
| 2535.0          | 36                | 18                    | 24.8                  | 19.7                   | 5.1      | 13.0             | 7.9         | Complied |
| 2535.0          | 1                 | 0                     | 25.4                  | 21.0                   | 4.4      | 13.0             | 8.6         | Complied |
| 2535.0          | 1                 | 74                    | 24.4                  | 20.4                   | 4.0      | 13.0             | 9.0         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 75                | 0                     | 25.1                  | 18.7                   | 6.4      | 13.0             | 6.6         | Complied |
| 2535.0          | 36                | 18                    | 24.7                  | 18.8                   | 5.9      | 13.0             | 7.1         | Complied |
| 2535.0          | 1                 | 0                     | 25.3                  | 20.6                   | 4.7      | 13.0             | 8.3         | Complied |
| 2535.0          | 1                 | 74                    | 24.4                  | 19.9                   | 4.5      | 13.0             | 8.5         | Complied |

**Transmitter Peak-To-Average Ratio (PAR) (continued)****Results: 15 MHz Channel Bandwidth / Top Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2562.5          | 75                | 0                     | 25.3                  | 19.4                   | 5.9      | 13.0             | 7.1         | Complied |
| 2562.5          | 36                | 18                    | 24.6                  | 19.5                   | 5.1      | 13.0             | 7.9         | Complied |
| 2562.5          | 1                 | 0                     | 24.7                  | 20.7                   | 4.0      | 13.0             | 9.0         | Complied |
| 2562.5          | 1                 | 74                    | 24.1                  | 20.0                   | 4.1      | 13.0             | 8.9         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2562.5          | 75                | 0                     | 25.0                  | 18.4                   | 6.6      | 13.0             | 6.4         | Complied |
| 2562.5          | 36                | 18                    | 24.6                  | 18.5                   | 6.1      | 13.0             | 6.9         | Complied |
| 2562.5          | 1                 | 0                     | 24.8                  | 20.3                   | 4.5      | 13.0             | 8.5         | Complied |
| 2562.5          | 1                 | 74                    | 24.0                  | 19.6                   | 4.4      | 13.0             | 8.6         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2510.0          | 100               | 0                     | 25.2                  | 19.7                   | 5.5      | 13.0             | 7.5         | Complied |
| 2510.0          | 50                | 25                    | 24.5                  | 19.6                   | 4.9      | 13.0             | 8.1         | Complied |
| 2510.0          | 1                 | 0                     | 23.9                  | 20.4                   | 3.5      | 13.0             | 9.5         | Complied |
| 2510.0          | 1                 | 99                    | 25.0                  | 20.5                   | 4.5      | 13.0             | 8.5         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2510.0          | 100               | 0                     | 25.0                  | 18.6                   | 6.4      | 13.0             | 6.6         | Complied |
| 2510.0          | 50                | 25                    | 24.4                  | 18.6                   | 5.8      | 13.0             | 7.2         | Complied |
| 2510.0          | 1                 | 0                     | 23.9                  | 19.7                   | 4.2      | 13.0             | 8.8         | Complied |
| 2510.0          | 1                 | 99                    | 25.0                  | 19.8                   | 5.2      | 13.0             | 7.8         | Complied |

**Transmitter Peak-To-Average Ratio (PAR) (continued)****Results: 20 MHz Channel Bandwidth / Middle Channel / QPSK**

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 100               | 0                     | 25.4                  | 19.7                   | 5.7      | 13.0             | 7.3         | Complied |
| 2535.0          | 50                | 25                    | 24.9                  | 19.7                   | 5.2      | 13.0             | 7.8         | Complied |
| 2535.0          | 1                 | 0                     | 25.6                  | 20.9                   | 4.7      | 13.0             | 8.3         | Complied |
| 2535.0          | 1                 | 99                    | 24.5                  | 20.3                   | 4.2      | 13.0             | 8.8         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2535.0          | 100               | 0                     | 25.4                  | 18.7                   | 6.7      | 13.0             | 6.3         | Complied |
| 2535.0          | 50                | 25                    | 25.0                  | 18.7                   | 6.3      | 13.0             | 6.7         | Complied |
| 2535.0          | 1                 | 0                     | 25.6                  | 20.7                   | 4.9      | 13.0             | 8.1         | Complied |
| 2535.0          | 1                 | 99                    | 24.6                  | 19.8                   | 4.8      | 13.0             | 8.2         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2560.0          | 100               | 0                     | 25.2                  | 19.4                   | 5.8      | 13.0             | 7.2         | Complied |
| 2560.0          | 50                | 25                    | 24.8                  | 19.5                   | 5.3      | 13.0             | 7.7         | Complied |
| 2560.0          | 1                 | 0                     | 24.7                  | 20.6                   | 4.1      | 13.0             | 8.9         | Complied |
| 2560.0          | 1                 | 99                    | 24.2                  | 20.0                   | 4.2      | 13.0             | 8.8         | Complied |

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

| Frequency (MHz) | Resource Block(s) | Resource Block Offset | P <sub>Pk</sub> (dBm) | P <sub>Avg</sub> (dBm) | PAR (dB) | Ratio Limit (dB) | Margin (dB) | Result   |
|-----------------|-------------------|-----------------------|-----------------------|------------------------|----------|------------------|-------------|----------|
| 2560.0          | 100               | 0                     | 24.9                  | 18.4                   | 6.5      | 13.0             | 6.5         | Complied |
| 2560.0          | 50                | 25                    | 24.8                  | 18.5                   | 6.3      | 13.0             | 6.7         | Complied |
| 2560.0          | 1                 | 0                     | 24.7                  | 20.0                   | 4.7      | 13.0             | 8.3         | Complied |
| 2560.0          | 1                 | 99                    | 24.2                  | 19.4                   | 4.8      | 13.0             | 8.2         | Complied |



**Transmitter Peak-To-Average Ratio (PAR) (continued)****Test Equipment Used:**

| <b>Asset No.</b> | <b>Instrument</b>           | <b>Manufacturer</b> | <b>Type No.</b> | <b>Serial No.</b> | <b>Date Calibration Due</b> | <b>Cal. Interval (Months)</b> |
|------------------|-----------------------------|---------------------|-----------------|-------------------|-----------------------------|-------------------------------|
| M2002            | Thermohygrometer            | Testo               | 608-H1          | 45041825          | 02 Apr 2017                 | 12                            |
| M1869            | Wideband Radio Comms Tester | Rohde & Schwarz     | CMW500          | 145923            | 05 Apr 2017                 | 12                            |
| A2845            | Attenuator                  | Radiall             | R411.806.121    | 24325927          | Calibrated before use       | -                             |
| A2844            | Attenuator                  | Radiall             | R411.803.121    | 23404066          | Calibrated before use       | -                             |
| A2504            | Directional Coupler         | AtlanTecRF          | CDC-003060-10   | 13122501<br>839   | Calibrated before use       | -                             |
| S0577            | Power Supply                | TTi                 | CPX400S         | 436670            | Calibrated before use       | -                             |
| M1269            | Multimeter                  | Fluke               | 179             | 90250210          | 26 May 2016                 | 12                            |
| M1835            | Signal Analyser             | Rohde & Schwarz     | FSV30           | 103050            | 26 Feb 2017                 | 12                            |

**5.2.3. Transmitter Occupied Bandwidth**

**Test Summary:**

|                          |                 |                   |             |
|--------------------------|-----------------|-------------------|-------------|
| <b>Test Engineer:</b>    | Keith Tucker    | <b>Test Date:</b> | 14 May 2016 |
| <b>Test Sample IMEI:</b> | 357232070003163 |                   |             |

|                          |                        |
|--------------------------|------------------------|
| <b>FCC Reference:</b>    | Part 2.1049            |
| <b>Test Method Used:</b> | KDB 971168 Section 4.2 |

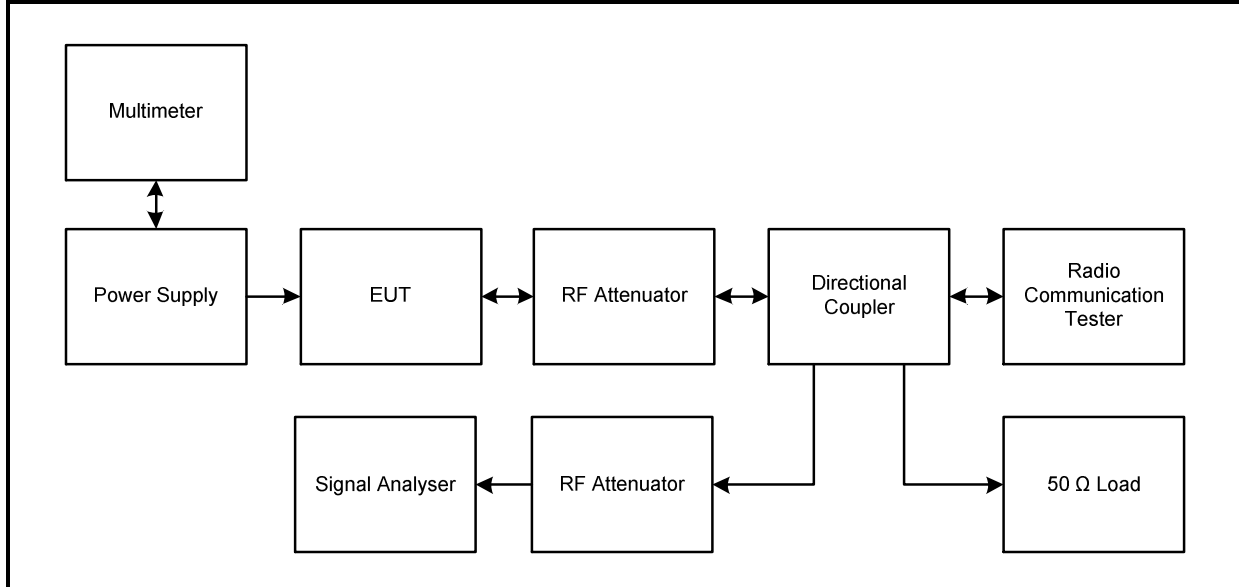
**Environmental Conditions:**

|                               |    |
|-------------------------------|----|
| <b>Temperature (°C):</b>      | 24 |
| <b>Relative Humidity (%):</b> | 46 |

**Note(s):**

1. Occupied bandwidth (99% bandwidth) was measured using a signal analyser 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 RF port of the EUT was connected to the signal analyser via RF cables, directional coupler and suitable attenuation.

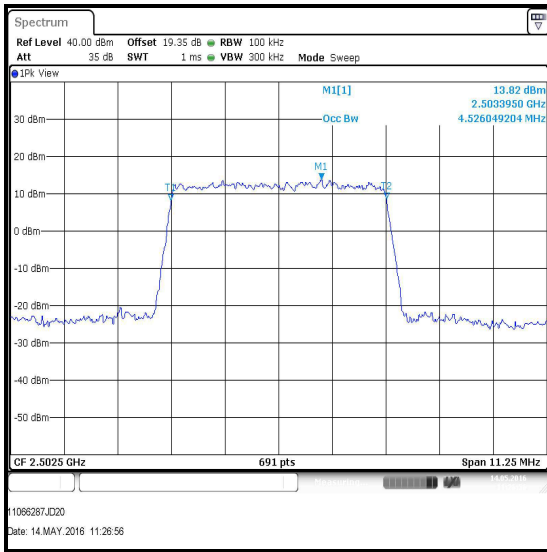
**Test setup:**



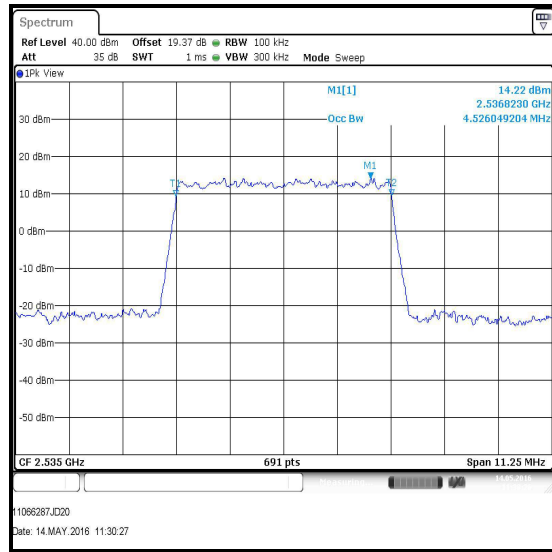
**Transmitter Occupied Bandwidth (continued)**

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

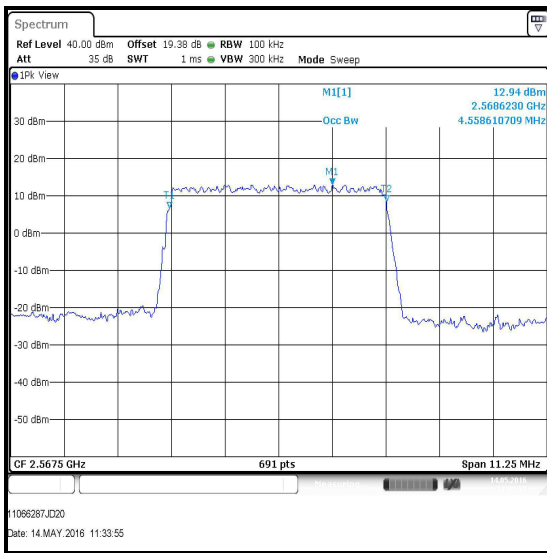
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 25                | 0                     | 100                        | 300                   | 4.526                    |
| Middle  | 25                | 0                     | 100                        | 300                   | 4.526                    |
| Top     | 25                | 0                     | 100                        | 300                   | 4.559                    |



**Bottom Channel / QPSK**



**Middle Channel / QPSK**

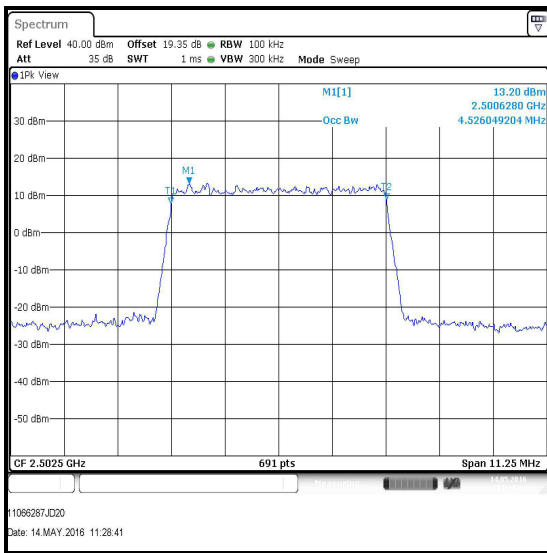


**Top Channel / QPSK**

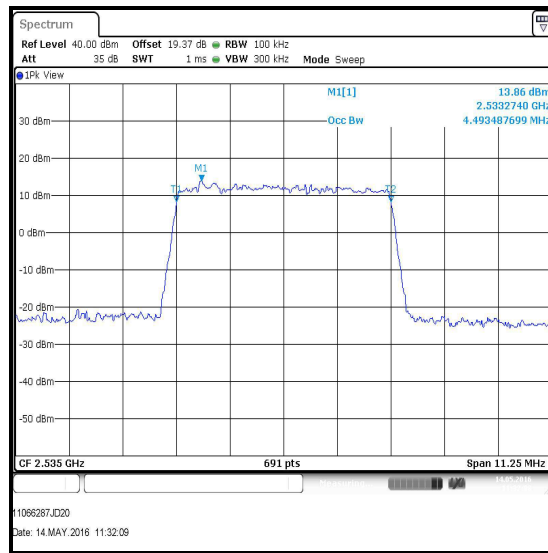
**Transmitter Occupied Bandwidth (continued)**

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

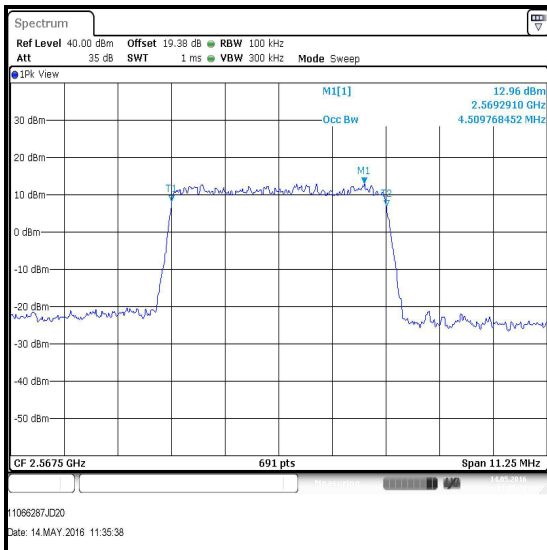
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 25                | 0                     | 100                        | 300                   | 4.526                    |
| Middle  | 25                | 0                     | 100                        | 300                   | 4.493                    |
| Top     | 25                | 0                     | 100                        | 300                   | 4.510                    |



**Bottom Channel / 16QAM**



**Middle Channel / 16QAM**

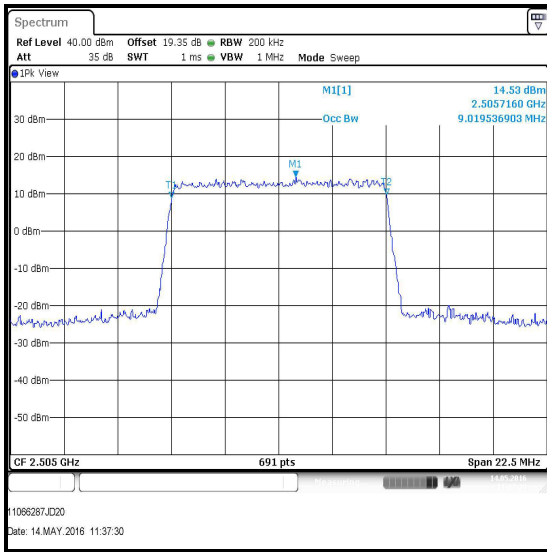


**Top Channel / 16QAM**

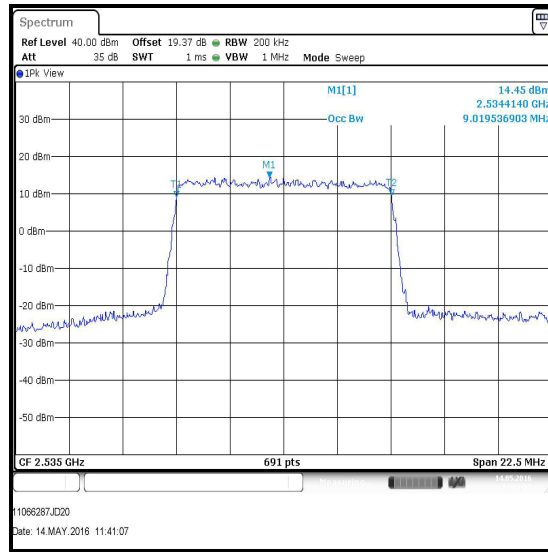
**Transmitter Occupied Bandwidth (continued)**

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

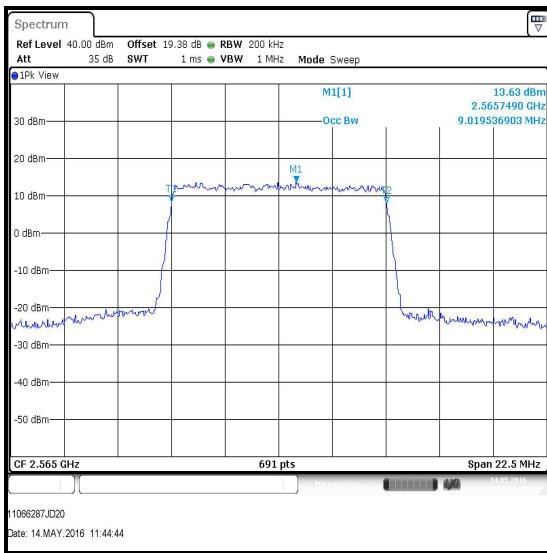
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 50                | 0                     | 200                        | 1000                  | 9.020                    |
| Middle  | 50                | 0                     | 200                        | 1000                  | 9.020                    |
| Top     | 50                | 0                     | 200                        | 1000                  | 9.020                    |



**Bottom Channel / QPSK**



**Middle Channel / QPSK**

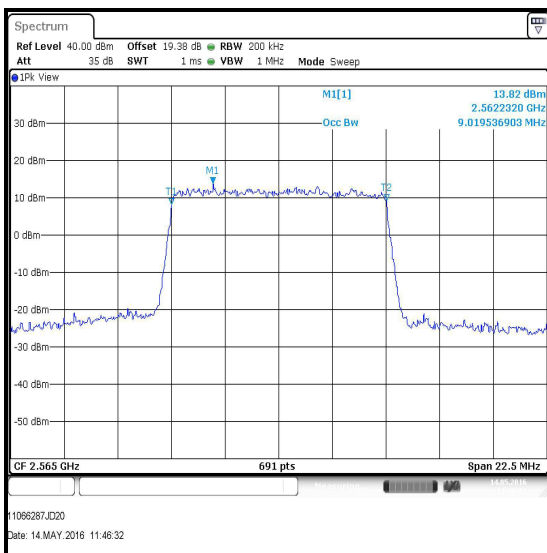
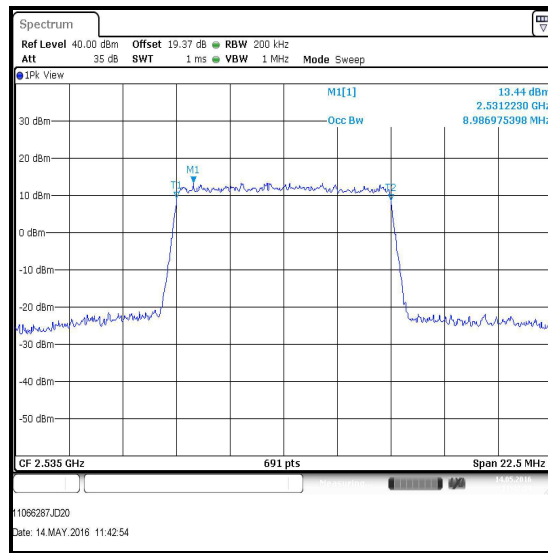
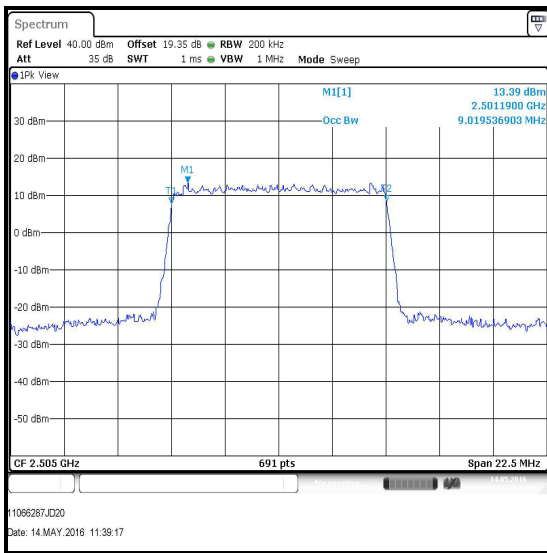


**Top Channel / QPSK**

**Transmitter Occupied Bandwidth (continued)**

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

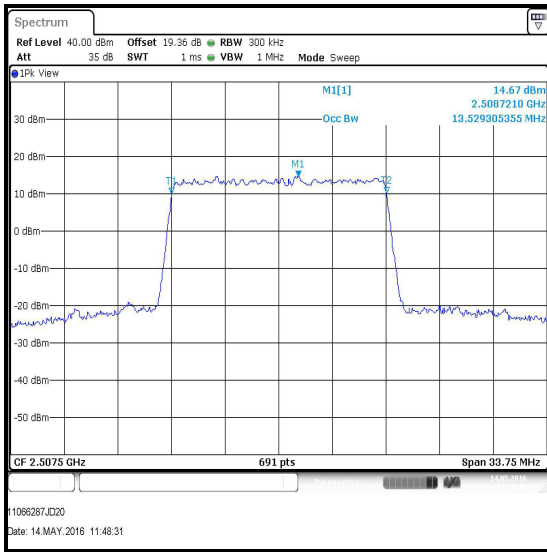
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 50                | 0                     | 200                        | 1000                  | 9.020                    |
| Middle  | 50                | 0                     | 200                        | 1000                  | 8.987                    |
| Top     | 50                | 0                     | 200                        | 1000                  | 9.020                    |



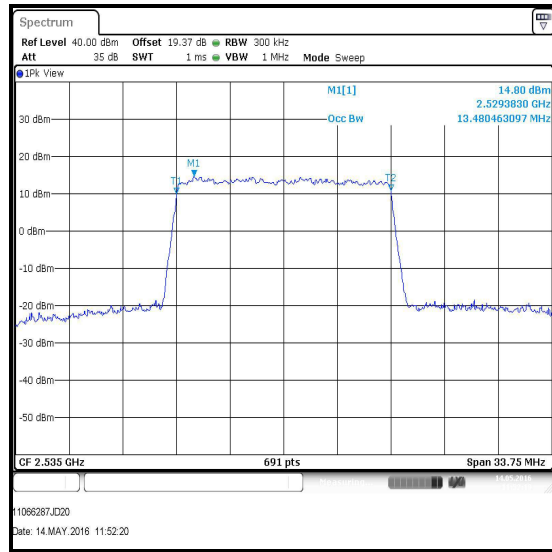
**Transmitter Occupied Bandwidth (continued)**

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

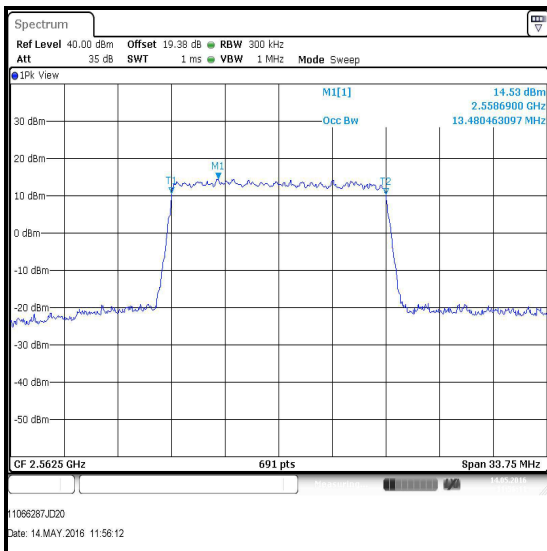
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 75                | 0                     | 300                        | 1000                  | 13.529                   |
| Middle  | 75                | 0                     | 300                        | 1000                  | 13.480                   |
| Top     | 75                | 0                     | 300                        | 1000                  | 13.480                   |



**Bottom Channel / QPSK**



**Middle Channel / QPSK**

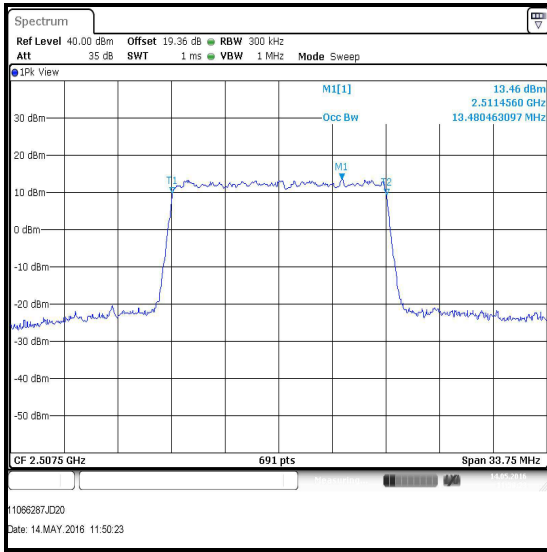


**Top Channel / QPSK**

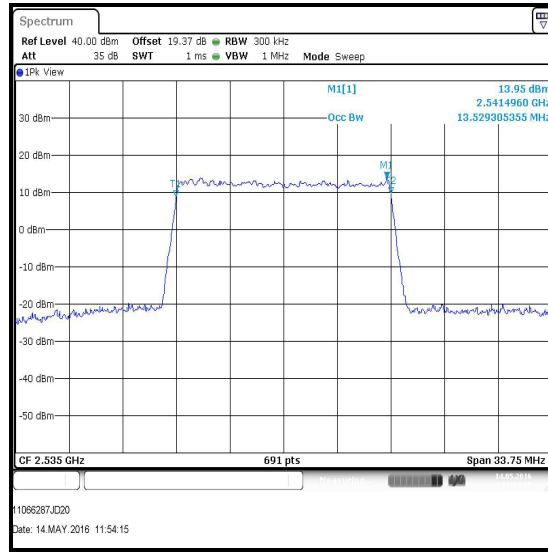
**Transmitter Occupied Bandwidth (continued)**

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

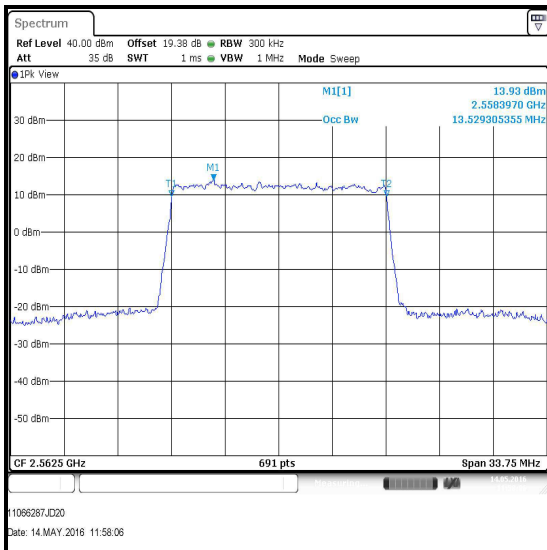
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 75                | 0                     | 300                        | 1000                  | 13.480                   |
| Middle  | 75                | 0                     | 300                        | 1000                  | 13.529                   |
| Top     | 75                | 0                     | 300                        | 1000                  | 13.529                   |



**Bottom Channel / 16QAM**



**Middle Channel / 16QAM**



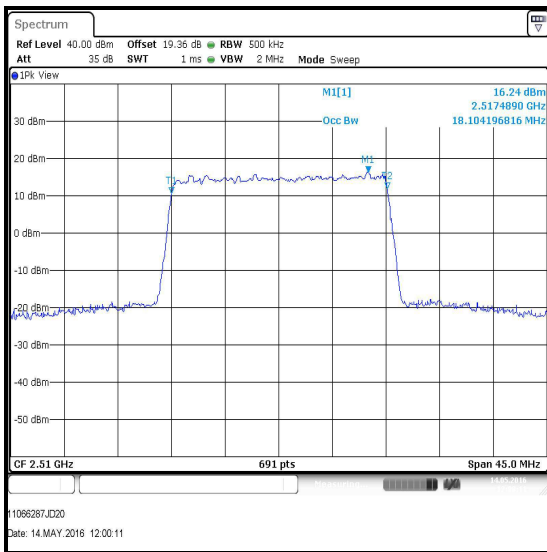
**Top Channel / 16QAM**



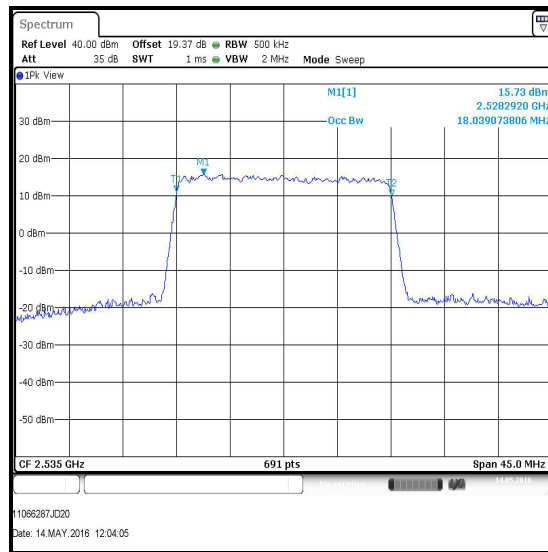
**Transmitter Occupied Bandwidth (continued)**

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

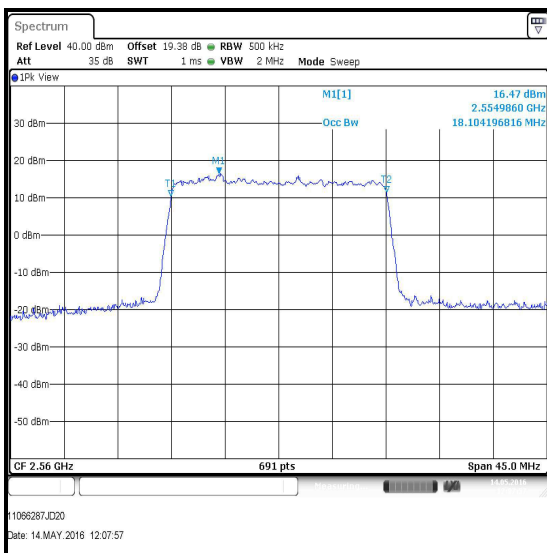
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 100               | 0                     | 500                        | 2000                  | 18.104                   |
| Middle  | 100               | 0                     | 500                        | 2000                  | 18.039                   |
| Top     | 100               | 0                     | 500                        | 2000                  | 18.104                   |



**Bottom Channel / QPSK**



**Middle Channel / QPSK**

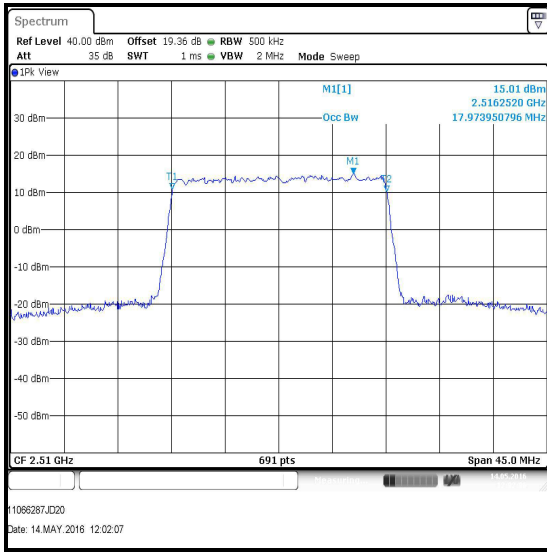


**Top Channel / QPSK**

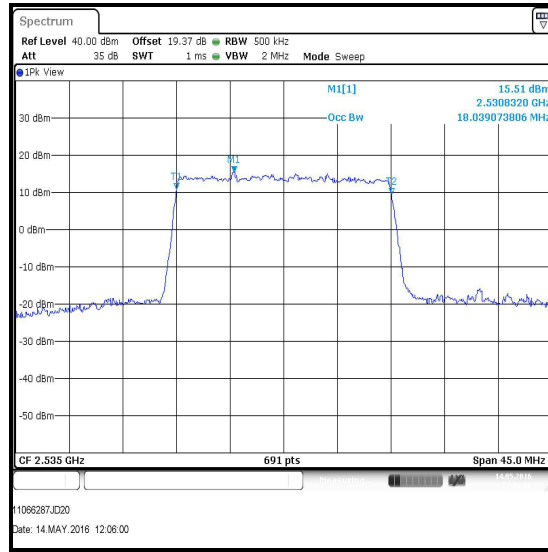
**Transmitter Occupied Bandwidth (continued)**

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

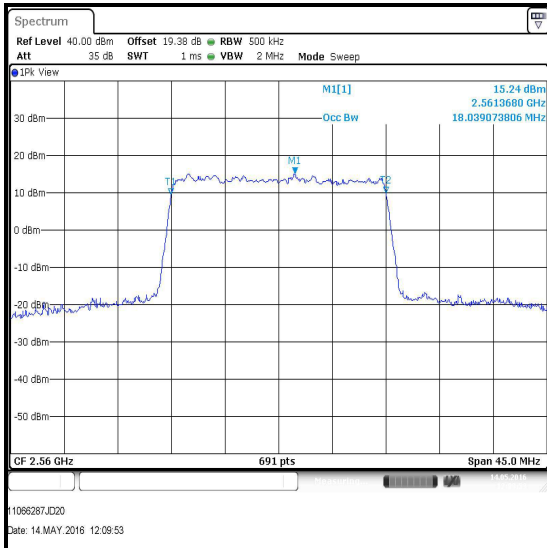
| Channel | Resource Block(s) | Resource Block Offset | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Occupied Bandwidth (MHz) |
|---------|-------------------|-----------------------|----------------------------|-----------------------|--------------------------|
| Bottom  | 100               | 0                     | 500                        | 2000                  | 17.974                   |
| Middle  | 100               | 0                     | 500                        | 2000                  | 18.039                   |
| Top     | 100               | 0                     | 500                        | 2000                  | 18.039                   |



**Bottom Channel / 16QAM**



**Middle Channel / 16QAM**



**Top Channel / 16QAM**

**Transmitter Occupied Bandwidth (continued)****Test Equipment Used:**

| Asset No. | Instrument                  | Manufacturer    | Type No.      | Serial No.  | Date Calibration Due  | Cal. Interval (Months) |
|-----------|-----------------------------|-----------------|---------------|-------------|-----------------------|------------------------|
| M2002     | Thermohygrometer            | Testo           | 608-H1        | 45041825    | 02 Apr 2017           | 12                     |
| M1869     | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500        | 145923      | 05 Apr 2017           | 12                     |
| A2845     | Attenuator                  | Radiall         | R411.806.121  | 24325927    | Calibrated before use | -                      |
| A2844     | Attenuator                  | Radiall         | R411.803.121  | 23404066    | Calibrated before use | -                      |
| A2504     | Directional Coupler         | AtlanTecRF      | CDC-003060-10 | 13122501839 | Calibrated before use | -                      |
| S0577     | Power Supply                | TTi             | CPX400S       | 436670      | Calibrated before use | -                      |
| M1269     | Multimeter                  | Fluke           | 179           | 90250210    | 26 May 2016           | 12                     |
| M1835     | Signal Analyser             | Rohde & Schwarz | FSV30         | 103050      | 26 Feb 2017           | 12                     |

**5.2.4. Transmitter Frequency Stability (Temperature Variation)**

**Test Summary:**

|                          |                 |                   |              |
|--------------------------|-----------------|-------------------|--------------|
| <b>Test Engineer:</b>    | Stefan Ho       | <b>Test Date:</b> | 13 June 2016 |
| <b>Test Sample IMEI:</b> | 357232070003163 |                   |              |

|                          |  |
|--------------------------|--|
| <b>FCC Reference:</b>    | Parts 2.1055 & 27.54   |
| <b>Test Method Used:</b> | KDB 971168 Section 9.0 referencing ANSI TIA-603-D-2010 Section 2.2.2 and FCC Part 2.1055 |

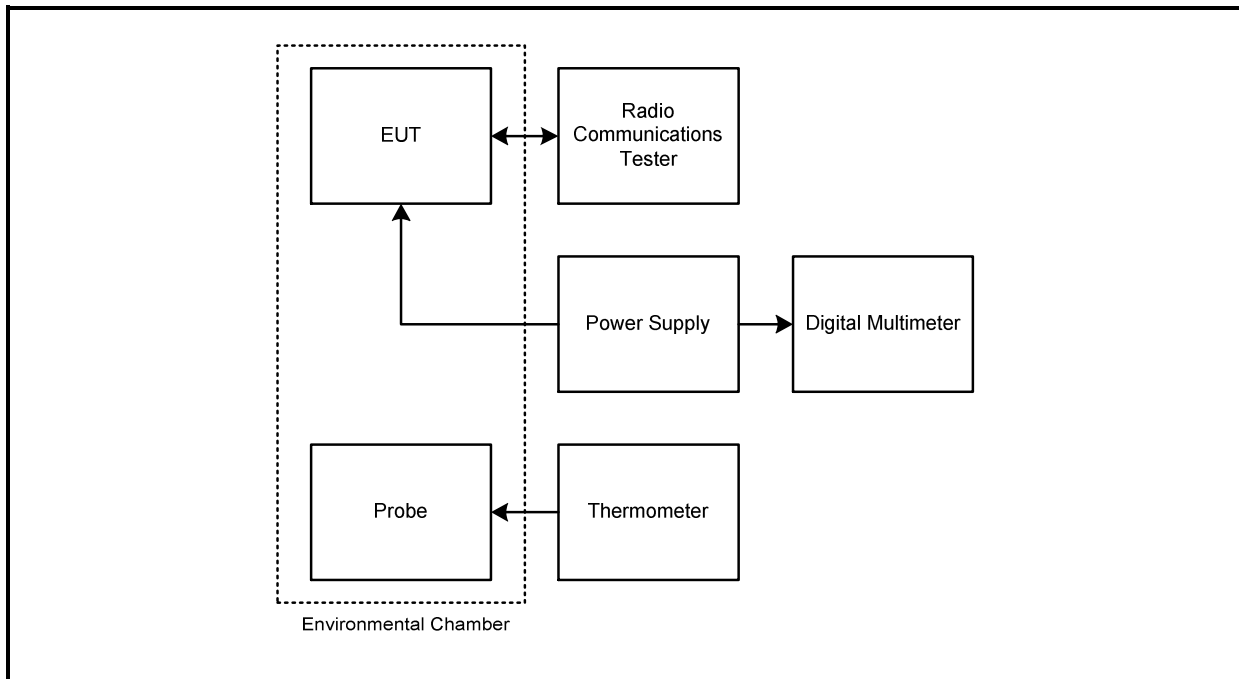
**Environmental Conditions:**

|                               |    |
|-------------------------------|----|
| <b>Temperature (°C):</b>      | 21 |
| <b>Relative Humidity (%):</b> | 53 |

**Note(s):**

1. Flying leads were connected internally to the EUT in place of the battery. These leads extended and connected to a bench power supply at the nominal voltage of 3.9 V.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and 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.

**Test setup:**



**Transmitter Frequency Stability (Temperature Variation) (continued)****Results: Bottom Channel (2502.5 MHz)**

| Temperature (°C) | Frequency Error (Hz) | Measured Frequency (MHz) | Lower Band Edge Limit (MHz) | Margin (MHz) | Result   |
|------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| -30              | 9                    | 2502.500009              | 2500                        | 2.500009     | Complied |
| -20              | 10                   | 2502.500010              | 2500                        | 2.500010     | Complied |
| -10              | 10                   | 2502.500010              | 2500                        | 2.500010     | Complied |
| 0                | 9                    | 2502.500009              | 2500                        | 2.500009     | Complied |
| 10               | 10                   | 2502.500010              | 2500                        | 2.500010     | Complied |
| 20               | 9                    | 2502.500009              | 2500                        | 2.500009     | Complied |
| 30               | 11                   | 2502.499989              | 2500                        | 2.499989     | Complied |
| 40               | 9                    | 2502.500009              | 2500                        | 2.500009     | Complied |
| 50               | 8                    | 2502.500008              | 2500                        | 2.500008     | Complied |

**Results: Top Channel (2567.5 MHz)**

| Temperature (°C) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result   |
|------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| -30              | 8                    | 2567.500008              | 2570                        | 2.499992     | Complied |
| -20              | 9                    | 2567.500009              | 2570                        | 2.499991     | Complied |
| -10              | 8                    | 2567.500008              | 2570                        | 2.499992     | Complied |
| 0                | 8                    | 2567.500008              | 2570                        | 2.499992     | Complied |
| 10               | 9                    | 2567.499991              | 2570                        | 2.500009     | Complied |
| 20               | 8                    | 2567.500008              | 2570                        | 2.499992     | Complied |
| 30               | 8                    | 2567.500008              | 2570                        | 2.499992     | Complied |
| 40               | 10                   | 2567.499990              | 2570                        | 2.500010     | Complied |
| 50               | 7                    | 2567.500007              | 2570                        | 2.499993     | Complied |

**Test Equipment Used:**

| Asset No. | Instrument                  | Manufacturer    | Type No. | Serial No. | Date Calibration Due  | Cal. Interval (Months) |
|-----------|-----------------------------|-----------------|----------|------------|-----------------------|------------------------|
| M2002     | Thermohygrometer            | Testo           | 608-H1   | 45041825   | 02 Apr 2017           | 12                     |
| M1815     | Environmental Chamber       | Votsch/Heraeus  | VT4002   | 521/83083  | Calibrated before use | -                      |
| M1642     | Thermometer                 | Fluke           | 52II     | 18890119   | 25 Apr 2017           | 12                     |
| S0577     | DC power supply             | TTI             | CPX-400S | 436670     | Calibrated before use | -                      |
| M1869     | Wideband Radio Comms Tester | Rohde & Schwarz | CMW 500  | 145923     | 05 Apr 2017           | 12                     |
| M1269     | Multimeter                  | Fluke           | 179      | 90250210   | 13 May 2017           | 12                     |

**5.2.5. Transmitter Frequency Stability (Voltage Variation)**

**Test Summary:**

|                          |                 |                   |              |
|--------------------------|-----------------|-------------------|--------------|
| <b>Test Engineer:</b>    | Stefan Ho       | <b>Test Date:</b> | 13 June 2016 |
| <b>Test Sample IMEI:</b> | 357232070003163 |                   |              |

|                          |   |
|--------------------------|---|
| <b>FCC Reference:</b>    | Parts 2.1055 & 27.54  |
| <b>Test Method Used:</b> | KDB 971168 Section 9.0 referencing<br>ANSI TIA-603-D-2010 Section 2.2.2 and FCC Part 2.1055 |

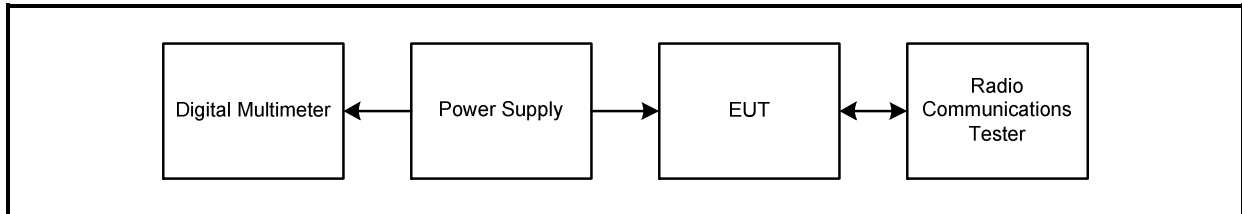
**Environmental Conditions:**

|                               |    |
|-------------------------------|----|
| <b>Temperature (°C):</b>      | 21 |
| <b>Relative Humidity (%):</b> | 53 |

**Note(s):**

1. Flying leads were connected internally to the EUT in place of the battery. These leads extended and connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and 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.

**Test setup:**



**Transmitter Frequency Stability (Voltage Variation) (continued)****Results: Bottom Channel (2502.5 MHz)**

| Supply Voltage (V) | Frequency Error (Hz) | Measured Frequency (MHz) | Lower Band Edge Limit (MHz) | Margin (MHz) | Result   |
|--------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| 3.5                | 11                   | 2502.499989              | 2500                        | 2.499989     | Complied |
| 4.4                | 10                   | 2502.500010              | 2500                        | 2.500010     | Complied |

**Results: Top Channel (2567.5 MHz)**

| Supply Voltage (V) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result   |
|--------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| 3.5                | 8                    | 2567.500008              | 2570                        | 2.499992     | Complied |
| 4.4                | 10                   | 2567.500010              | 2570                        | 2.499990     | Complied |

**Test Equipment Used:**

| Asset No. | Instrument                  | Manufacturer    | Type No. | Serial No. | Date Calibration Due  | Cal. Interval (Months) |
|-----------|-----------------------------|-----------------|----------|------------|-----------------------|------------------------|
| M2002     | Thermohygrometer            | Testo           | 608-H1   | 45041825   | 02 Apr 2017           | 12                     |
| S0577     | DC power supply             | TTI             | CPX-400S | 436670     | Calibrated before use | -                      |
| M1869     | Wideband Radio Comms Tester | Rohde & Schwarz | CMW 500  | 145923     | 05 Apr 2017           | 12                     |
| M1269     | Multimeter                  | Fluke           | 179      | 90250210   | 13 May 2017           | 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".

| <b>Measurement Type</b> | <b>Range</b>     | <b>Confidence Level (%)</b> | <b>Calculated Uncertainty</b> |
|-------------------------|------------------|-----------------------------|-------------------------------|
| Conducted Output Power  | 2500 to 2570 MHz | 95%                         | $\pm 1.36$ dB                 |
| Frequency Stability     | 2500 to 2570 MHz | 95%                         | $\pm 23$ Hz                   |
| Occupied Bandwidth      | 2500 to 2570 MHz | 95%                         | $\pm 3.92$ %                  |

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 |

--- END OF REPORT ---