



# TEST REPORT

**Test Report No. : UL-RPT-RP11066287JD17A**

**Manufacturer** : Flextronics International Sweden AB  
**Model No.** : SR0020-W  
**FCC ID** : 2AIP8I  
**Technology** : LTE - Band 26  
**Test Standard(s)** : FCC Parts 22.355 & 22.913(a)(2)

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 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 8200 Schaffhausen Switzerland

### **1.2. Manufacturer Information**

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

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR22
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 22 Subpart H (Public Mobile Services)
<b>Site Registration:</b>	209735
<b>Location of Testing:</b>	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
<b>Test Dates:</b>	05 May 2016 to 13 May 2016

### **2.2. Summary of Test Results**

FCC Reference (47CFR)	Measurement	Result
Part 22.913(a)(2)	Transmitter Output Power (ERP)	✓
Part 2.1049	Transmitter Occupied Bandwidth	✓
Part 22.355 / 2.1055	Transmitter Frequency Stability (Temperature and Voltage Variation)	✓
<b>Key to Results</b>		
✓ = 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 Name or Number:</b>	SR0020-W
<b>Test Sample Serial Number:</b>	0108 ( <i>Conducted Sample #1</i> )
<b>Test Sample IMEI:</b>	357232070003189
<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

<b>Brand Name:</b>	SOLARIN
<b>Model Name:</b>	SR0020-W
<b>Test Sample Serial Number:</b>	0030 ( <i>Conducted sample #2</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 26		
<b>Type of Equipment</b>	Transceiver		
<b>Channel Bandwidth:</b>	1.4, 3, 5, 10 & 15 MHz		
<b>Modulation Type:</b>	QPSK & 16QAM		
<b>Duty Cycle:</b>	100 %		
<b>Antenna Type:</b>	Integral		
<b>Antenna Gain:</b>	-2.96 dBi		
<b>Power Supply Requirement(s):</b>	Nominal	3.9 VDC	
	Minimum	3.5 VDC	
	Maximum	4.4 VDC	
<b>Transmit Frequency Range:</b>	824 MHz to 849 MHz		
Channels Tested:	Channel Bandwidth (MHz)	N <sub>ul</sub>	Frequency of Uplink (MHz)
*FCC (47CFR) Part 22 Boundary Channel	All	26790	824.0
<b>Bottom Channel</b>	1.4	26797	824.7
	3	26805	825.5
	5	26815	826.5
	10	26840	829.0
	15	26865	831.5
<b>Middle Channel</b>	All	26915	836.5
<b>Top Channel</b>	1.4	27033	848.3
	3	27025	847.5
	5	27015	846.5
	10	26990	844.0
	15	26965	841.5

**Note:**

\*Based on the information contained in *Interim Guidance for Equipment Authorization of Devices with Channel Bandwidths Combined Across Two Contiguous Service Rule Allocations* OET/Lab/EACB, June 6, 2013, all supported emissions were tested on 824.0 MHz as the boundary frequency between FCC Rule Part 90-S and Rule Part 22-H. As Rule Part 22-H has the more onerous limits, the boundary emissions have been tested against this, and are included in this report only.

### **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 tested in the following configuration(s):

- 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 #2.

### **4.3. Resource Block Allocation**

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

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 1.4 MHz only.

## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

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

#### **Test Summary:**

Test Engineer:	Keith Tucker	Test Date:	13 May 2016
Test Sample IMEI:	357232070003163		

FCC Reference:	Part 22.913(a)(2)
Test Method Used:	KDB 971168 Section 2.2 footnote 1 & Notes below

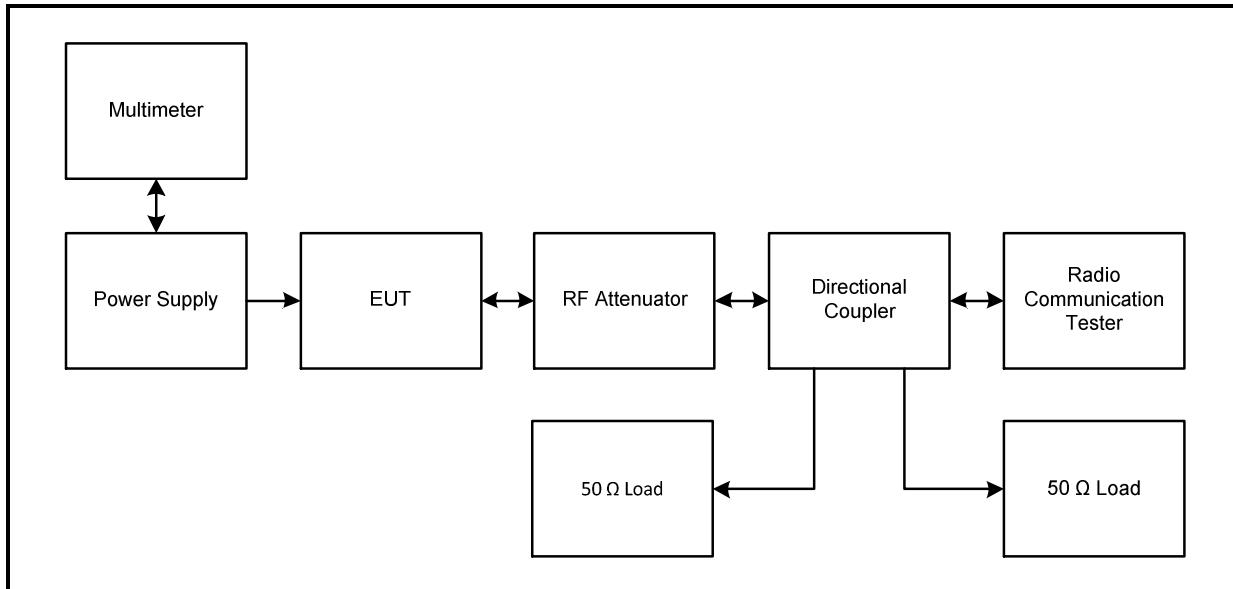
#### **Environmental Conditions:**

Temperature (°C):	24
Relative Humidity (%):	44

#### **Note(s):**

1. The customer stated that the EUT has a maximum antenna gain of -2.96 dBi. As the limit is ERP, the gain in dBi has been converted to dBd. The dBd gain figure has been calculated as:  
$$-2.96 \text{ dBi} - 2.15 \text{ dB} = -5.11 \text{ dBd}$$
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 (ERP) (continued)****Results: 1.4 MHz Channel Bandwidth / Boundary Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	6	0	21.85	-5.11	16.74	38.45	21.71	Complied
824.0	3	2	23.08	-5.11	17.97	38.45	20.48	Complied
824.0	1	0	23.75	-5.11	18.64	38.45	19.81	Complied
824.0	1	5	23.86	-5.11	18.75	38.45	19.70	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	6	0	20.94	-5.11	15.83	38.45	22.62	Complied
824.0	3	2	22.09	-5.11	16.98	38.45	21.47	Complied
824.0	1	0	22.16	-5.11	17.05	38.45	21.40	Complied
824.0	1	5	22.16	-5.11	17.05	38.45	21.40	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.7	6	0	21.82	-5.11	16.71	38.45	21.74	Complied
824.7	3	2	23.15	-5.11	18.04	38.45	20.41	Complied
824.7	1	0	23.77	-5.11	18.66	38.45	19.79	Complied
824.7	1	5	23.76	-5.11	18.65	38.45	19.80	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.7	6	0	20.84	-5.11	15.73	38.45	22.72	Complied
824.7	3	2	22.09	-5.11	16.98	38.45	21.47	Complied
824.7	1	0	22.15	-5.11	17.04	38.45	21.41	Complied
824.7	1	5	22.24	-5.11	17.13	38.45	21.32	Complied

**Transmitter Output Power (ERP) (continued)****Results: 1.4 MHz Channel Bandwidth / Middle Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	6	0	21.73	-5.11	16.62	38.45	21.83	Complied
836.5	3	2	23.00	-5.11	17.89	38.45	20.56	Complied
836.5	1	0	23.31	-5.11	18.20	38.45	20.25	Complied
836.5	1	5	23.32	-5.11	18.21	38.45	20.24	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	6	0	20.81	-5.11	15.70	38.45	22.75	Complied
836.5	3	2	22.00	-5.11	16.89	38.45	21.56	Complied
836.5	1	0	22.36	-5.11	17.25	38.45	21.20	Complied
836.5	1	5	22.28	-5.11	17.17	38.45	21.28	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
848.3	6	0	21.69	-5.11	16.58	38.45	21.87	Complied
848.3	3	2	22.84	-5.11	17.73	38.45	20.72	Complied
848.3	1	0	23.03	-5.11	17.92	38.45	20.53	Complied
848.3	1	5	22.99	-5.11	17.88	38.45	20.57	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
848.3	6	0	20.74	-5.11	15.63	38.45	22.82	Complied
848.3	3	2	22.25	-5.11	17.14	38.45	21.31	Complied
848.3	1	0	22.18	-5.11	17.07	38.45	21.38	Complied
848.3	1	5	22.15	-5.11	17.04	38.45	21.41	Complied

**Transmitter Output Power (ERP) (continued)****Results: 3 MHz Channel Bandwidth / Boundary Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	15	0	21.97	-5.11	16.86	38.45	21.59	Complied
824.0	8	4	21.99	-5.11	16.88	38.45	21.57	Complied
824.0	1	0	23.59	-5.11	18.48	38.45	19.97	Complied
824.0	1	14	23.28	-5.11	18.17	38.45	20.28	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	15	0	21.01	-5.11	15.90	38.45	22.55	Complied
824.0	8	4	21.00	-5.11	15.89	38.45	22.56	Complied
824.0	1	0	22.06	-5.11	16.95	38.45	21.50	Complied
824.0	1	14	22.10	-5.11	16.99	38.45	21.46	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
825.5	15	0	21.90	-5.11	16.79	38.45	21.66	Complied
825.5	8	4	21.92	-5.11	16.81	38.45	21.64	Complied
825.5	1	0	23.77	-5.11	18.66	38.45	19.79	Complied
825.5	1	14	23.24	-5.11	18.13	38.45	20.32	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
825.5	15	0	20.91	-5.11	15.80	38.45	22.65	Complied
825.5	8	4	20.90	-5.11	15.79	38.45	22.66	Complied
825.5	1	0	22.11	-5.11	17.00	38.45	21.45	Complied
825.5	1	14	22.19	-5.11	17.08	38.45	21.37	Complied

**Transmitter Output Power (ERP) (continued)****Results: 3 MHz Channel Bandwidth / Middle Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	15	0	21.85	-5.11	16.74	38.45	21.71	Complied
836.5	8	4	21.85	-5.11	16.74	38.45	21.71	Complied
836.5	1	0	23.07	-5.11	17.96	38.45	20.49	Complied
836.5	1	14	23.00	-5.11	17.89	38.45	20.56	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	15	0	20.85	-5.11	15.74	38.45	22.71	Complied
836.5	8	4	20.95	-5.11	15.84	38.45	22.61	Complied
836.5	1	0	22.93	-5.11	17.82	38.45	20.63	Complied
836.5	1	14	22.41	-5.11	17.30	38.45	21.15	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
847.5	15	0	21.78	-5.11	16.67	38.45	21.78	Complied
847.5	8	4	21.86	-5.11	16.75	38.45	21.70	Complied
847.5	1	0	22.89	-5.11	17.78	38.45	20.67	Complied
847.5	1	14	22.94	-5.11	17.83	38.45	20.62	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
847.5	15	0	20.79	-5.11	15.68	38.45	22.77	Complied
847.5	8	4	20.98	-5.11	15.87	38.45	22.58	Complied
847.5	1	0	22.79	-5.11	17.68	38.45	20.77	Complied
847.5	1	14	22.81	-5.11	17.70	38.45	20.75	Complied

**Transmitter Output Power (ERP) (continued)****Results: 5 MHz Channel Bandwidth / Boundary Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	25	0	21.94	-5.11	16.83	38.45	21.62	Complied
824.0	12	6	21.93	-5.11	16.82	38.45	21.63	Complied
824.0	1	0	23.32	-5.11	18.21	38.45	20.24	Complied
824.0	1	24	23.11	-5.11	18.00	38.45	20.45	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	25	0	20.89	-5.11	15.78	38.45	22.67	Complied
824.0	12	6	21.00	-5.11	15.89	38.45	22.56	Complied
824.0	1	0	22.60	-5.11	17.49	38.45	20.96	Complied
824.0	1	24	22.51	-5.11	17.40	38.45	21.05	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
826.5	25	0	21.91	-5.11	16.80	38.45	21.65	Complied
826.5	12	6	21.96	-5.11	16.85	38.45	21.60	Complied
826.5	1	0	23.13	-5.11	18.02	38.45	20.43	Complied
826.5	1	24	23.22	-5.11	18.11	38.45	20.34	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
826.5	25	0	20.93	-5.11	15.82	38.45	22.63	Complied
826.5	12	6	21.01	-5.11	15.90	38.45	22.55	Complied
826.5	1	0	22.51	-5.11	17.40	38.45	21.05	Complied
826.5	1	24	22.52	-5.11	17.41	38.45	21.04	Complied

**Transmitter Output Power (ERP) (continued)****Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	25	0	21.77	-5.11	16.66	38.45	21.79	Complied
836.5	12	6	21.88	-5.11	16.77	38.45	21.68	Complied
836.5	1	0	23.13	-5.11	18.02	38.45	20.43	Complied
836.5	1	24	22.87	-5.11	17.76	38.45	20.69	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	25	0	20.82	-5.11	15.71	38.45	22.74	Complied
836.5	12	6	20.88	-5.11	15.77	38.45	22.68	Complied
836.5	1	0	22.16	-5.11	17.05	38.45	21.40	Complied
836.5	1	24	21.96	-5.11	16.85	38.45	21.60	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
846.5	25	0	21.74	-5.11	16.63	38.45	21.82	Complied
846.5	12	6	21.82	-5.11	16.71	38.45	21.74	Complied
846.5	1	0	23.13	-5.11	18.02	38.45	20.43	Complied
846.5	1	24	22.94	-5.11	17.83	38.45	20.62	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
846.5	25	0	20.76	-5.11	15.65	38.45	22.80	Complied
846.5	12	6	20.70	-5.11	15.59	38.45	22.86	Complied
846.5	1	0	21.99	-5.11	16.88	38.45	21.57	Complied
846.5	1	24	22.02	-5.11	16.91	38.45	21.54	Complied

**Transmitter Output Power (ERP) (continued)****Results: 10 MHz Channel Bandwidth / Boundary Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	50	0	21.92	-5.11	16.81	38.45	21.64	Complied
824.0	25	12	21.97	-5.11	16.86	38.45	21.59	Complied
824.0	1	0	23.17	-5.11	18.06	38.45	20.39	Complied
824.0	1	49	22.96	-5.11	17.85	38.45	20.60	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	50	0	20.84	-5.11	15.73	38.45	22.72	Complied
824.0	25	12	21.02	-5.11	15.91	38.45	22.54	Complied
824.0	1	0	22.14	-5.11	17.03	38.45	21.42	Complied
824.0	1	49	22.25	-5.11	17.14	38.45	21.31	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
829.0	50	0	21.89	-5.11	16.78	38.45	21.67	Complied
829.0	25	12	21.97	-5.11	16.86	38.45	21.59	Complied
829.0	1	0	23.06	-5.11	17.95	38.45	20.50	Complied
829.0	1	49	22.81	-5.11	17.70	38.45	20.75	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
829.0	50	0	20.89	-5.11	15.78	38.45	22.67	Complied
829.0	25	12	21.05	-5.11	15.94	38.45	22.51	Complied
829.0	1	0	22.12	-5.11	17.01	38.45	21.44	Complied
829.0	1	49	22.17	-5.11	17.06	38.45	21.39	Complied

**Transmitter Output Power (ERP) (continued)****Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	50	0	21.83	-5.11	16.72	38.45	21.73	Complied
836.5	25	12	21.75	-5.11	16.64	38.45	21.81	Complied
836.5	1	0	23.20	-5.11	18.09	38.45	20.36	Complied
836.5	1	49	23.08	-5.11	17.97	38.45	20.48	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	50	0	20.80	-5.11	15.69	38.45	22.76	Complied
836.5	25	12	20.81	-5.11	15.70	38.45	22.75	Complied
836.5	1	0	22.83	-5.11	17.72	38.45	20.73	Complied
836.5	1	49	22.55	-5.11	17.44	38.45	21.01	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
844.0	50	0	21.75	-5.11	16.64	38.45	21.81	Complied
844.0	25	12	21.85	-5.11	16.74	38.45	21.71	Complied
844.0	1	0	23.16	-5.11	18.05	38.45	20.40	Complied
844.0	1	49	23.23	-5.11	18.12	38.45	20.33	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
844.0	50	0	20.79	-5.11	15.68	38.45	22.77	Complied
844.0	25	12	20.97	-5.11	15.86	38.45	22.59	Complied
844.0	1	0	22.47	-5.11	17.36	38.45	21.09	Complied
844.0	1	49	22.31	-5.11	17.20	38.45	21.25	Complied

**Transmitter Output Power (ERP) (continued)****Results: 15 MHz Channel Bandwidth / Boundary Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	75	0	22.14	-5.11	17.03	38.45	21.42	Complied
824.0	36	18	22.18	-5.11	17.07	38.45	21.38	Complied
824.0	1	0	23.70	-5.11	18.59	38.45	19.86	Complied
824.0	1	74	23.09	-5.11	17.98	38.45	20.47	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
824.0	75	0	21.12	-5.11	16.01	38.45	22.44	Complied
824.0	36	18	21.17	-5.11	16.06	38.45	22.39	Complied
824.0	1	0	23.28	-5.11	18.17	38.45	20.28	Complied
824.0	1	74	22.74	-5.11	17.63	38.45	20.82	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
831.5	75	0	21.98	-5.11	16.87	38.45	21.58	Complied
831.5	36	18	22.08	-5.11	16.97	38.45	21.48	Complied
831.5	1	0	23.84	-5.11	18.73	38.45	19.72	Complied
831.5	1	74	23.33	-5.11	18.22	38.45	20.23	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
831.5	75	0	21.03	-5.11	15.92	38.45	22.53	Complied
831.5	36	18	21.11	-5.11	16.00	38.45	22.45	Complied
831.5	1	0	23.39	-5.11	18.28	38.45	20.17	Complied
831.5	1	74	22.69	-5.11	17.58	38.45	20.87	Complied

**Transmitter Output Power (ERP) (continued)****Results: 15 MHz Channel Bandwidth / Middle Channel / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	75	0	21.86	-5.11	16.75	38.45	21.70	Complied
836.5	36	18	21.99	-5.11	16.88	38.45	21.57	Complied
836.5	1	0	24.02	-5.11	18.91	38.45	19.54	Complied
836.5	1	74	23.16	-5.11	18.05	38.45	20.40	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	75	0	20.84	-5.11	15.73	38.45	22.72	Complied
836.5	36	18	20.98	-5.11	15.87	38.45	22.58	Complied
836.5	1	0	22.51	-5.11	17.40	38.45	21.05	Complied
836.5	1	74	22.04	-5.11	16.93	38.45	21.52	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
841.5	75	0	21.89	-5.11	16.78	38.45	21.67	Complied
841.5	36	18	21.93	-5.11	16.82	38.45	21.63	Complied
841.5	1	0	23.14	-5.11	18.03	38.45	20.42	Complied
841.5	1	74	22.80	-5.11	17.69	38.45	20.76	Complied

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
841.5	75	0	20.85	-5.11	15.74	38.45	22.71	Complied
841.5	36	18	20.97	-5.11	15.86	38.45	22.59	Complied
841.5	1	0	22.85	-5.11	17.74	38.45	20.71	Complied
841.5	1	74	22.50	-5.11	17.39	38.45	21.06	Complied

**Transmitter Output Power (ERP) (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 Occupied Bandwidth**

#### **Test Summary:**

<b>Test Engineer:</b>	Keith Tucker	<b>Test Date:</b>	13 May 2016
<b>Test Sample IMEI:</b>	357232070003163		

<b>FCC Reference:</b>	Part 2.1049
<b>Test Method Used:</b>	KBD 971168 Section 4.2

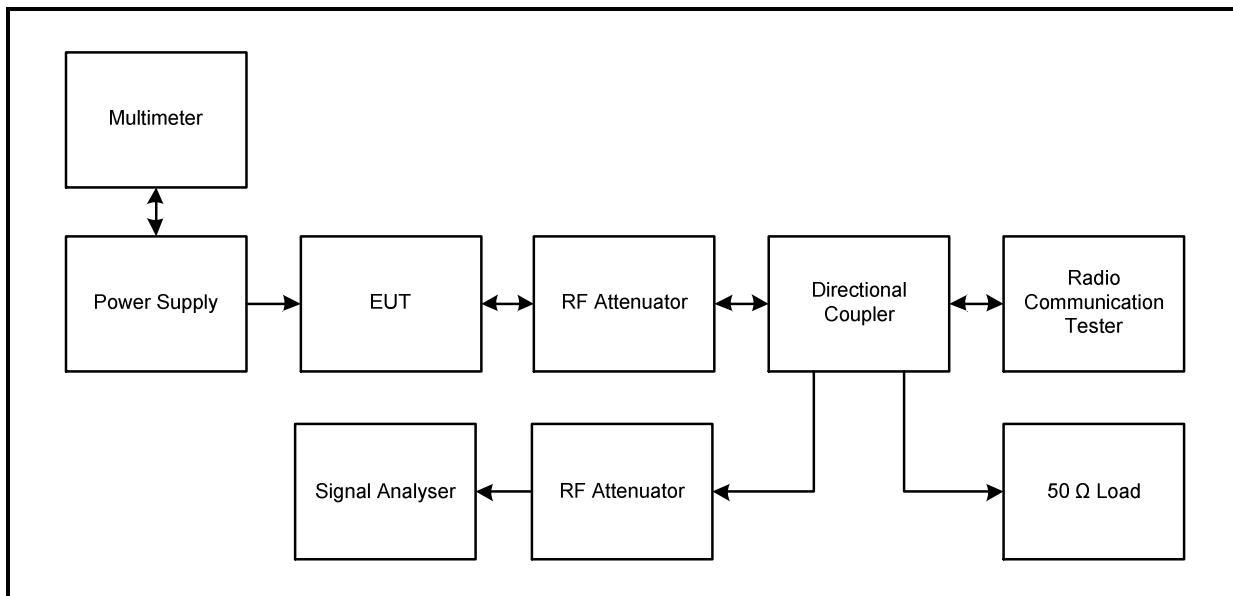
#### **Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	44

#### **Note(s):**

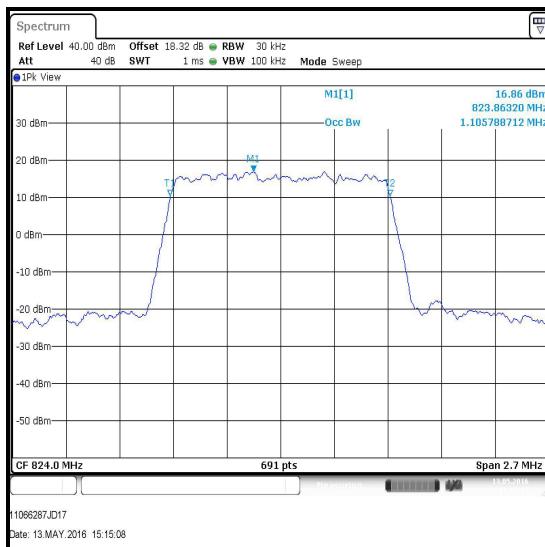
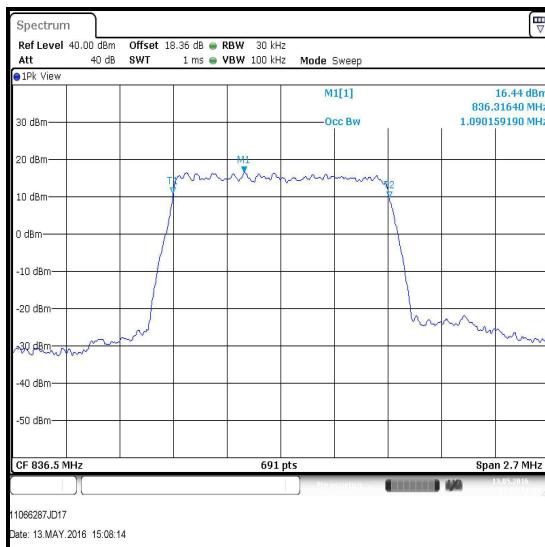
1. Occupied bandwidth (99% bandwidth) was measured using a signal analyser occupied bandwidth function.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed in section 4.3 of this report.
3. The RF port of the EUT was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

#### **Test setup:**



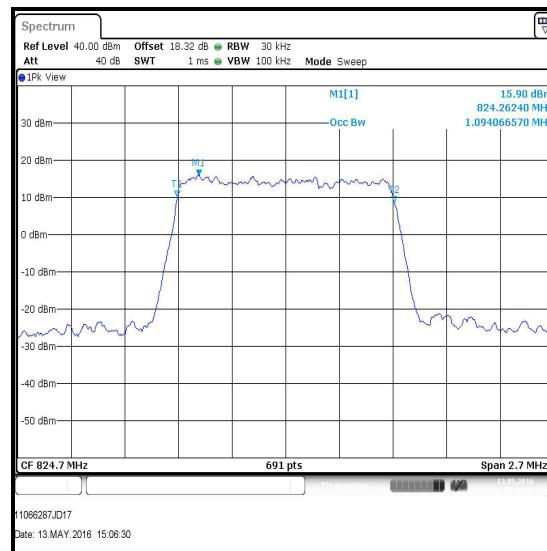
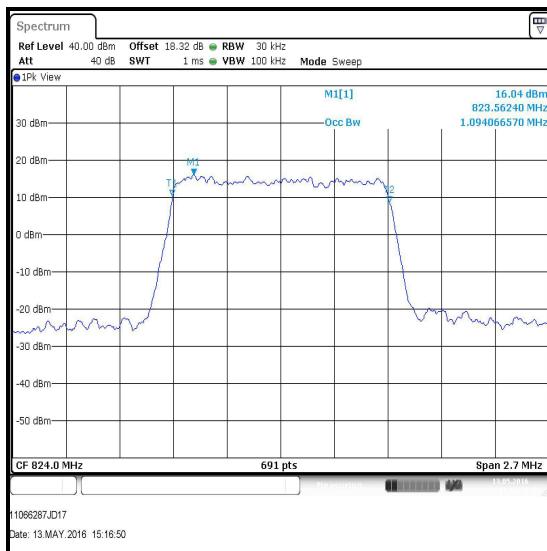
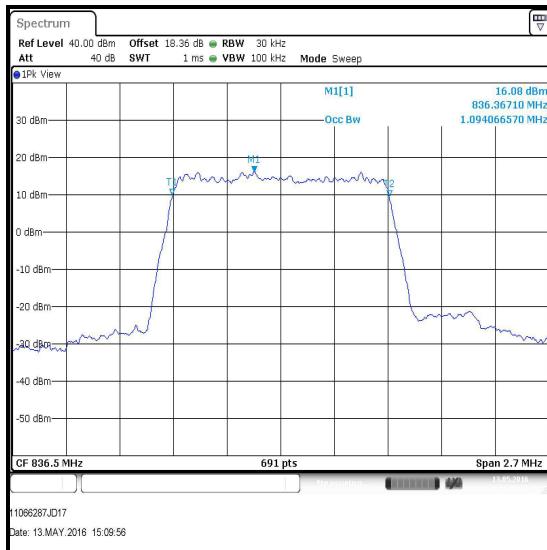
**Transmitter Occupied Bandwidth (continued)****Results: 1.4 MHz Channel Bandwidth / QPSK**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Boundary	6	0	30	100	1.106
Bottom	6	0	30	100	1.106
Middle	6	0	30	100	1.090
Top	6	0	30	100	1.098

**Boundary Channel / QPSK****Middle Channel / QPSK****Bottom Channel / QPSK****Top Channel / QPSK**

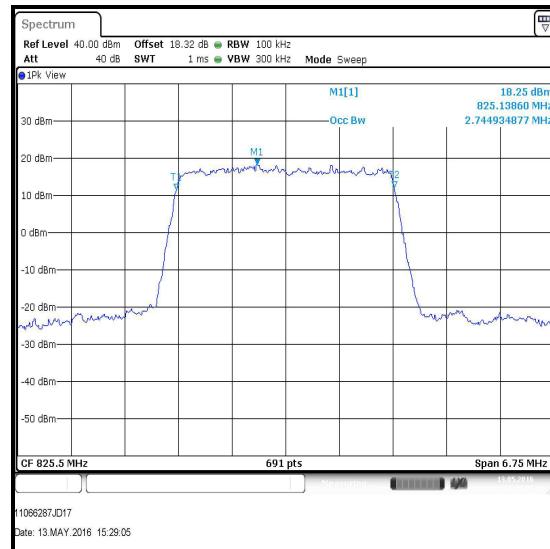
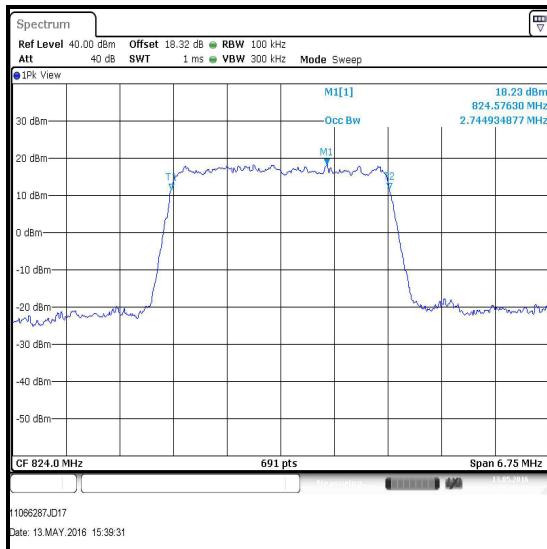
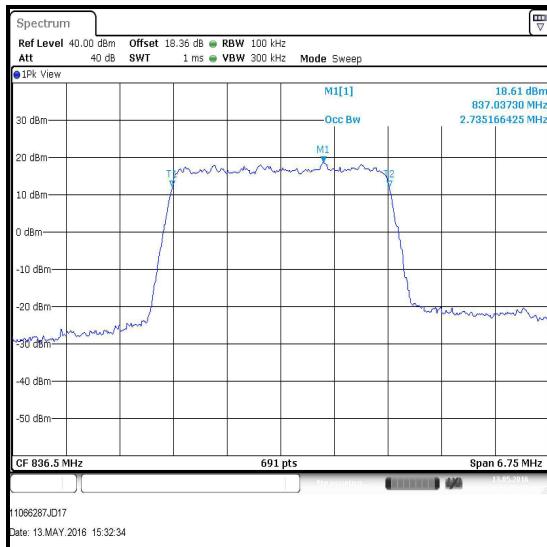
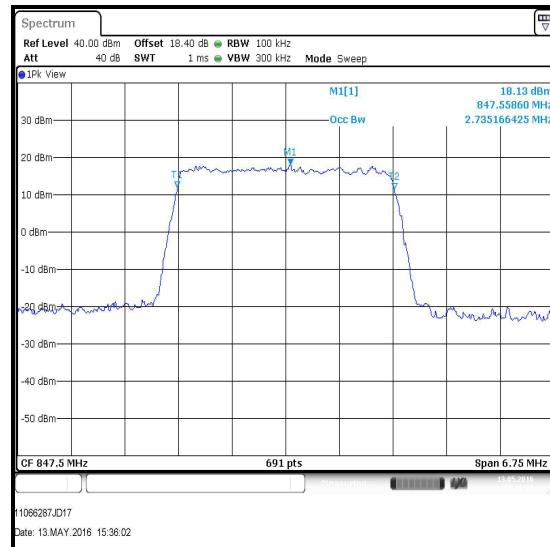
**Transmitter Occupied Bandwidth (continued)****Results: 1.4 MHz Channel Bandwidth / 16QAM**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Boundary	6	0	30	100	1.094
Bottom	6	0	30	100	1.094
Middle	6	0	30	100	1.094
Top	6	0	30	100	1.094

**Boundary Channel / 16QAM****Bottom Channel / 16QAM****Middle Channel / 16QAM****Top Channel / 16QAM**

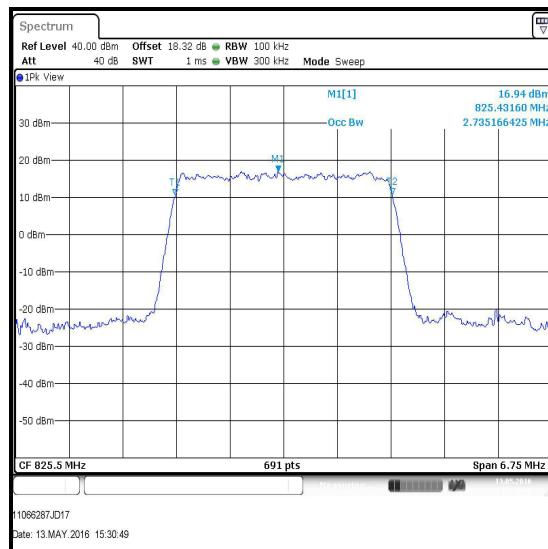
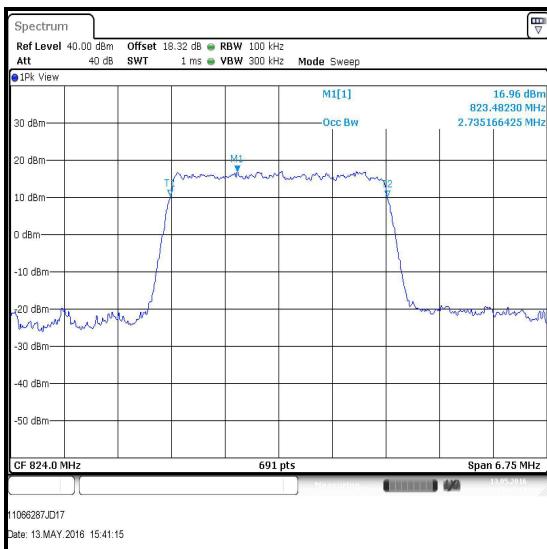
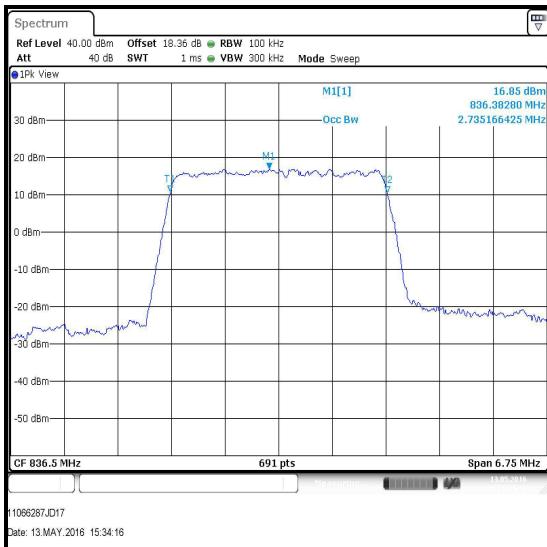
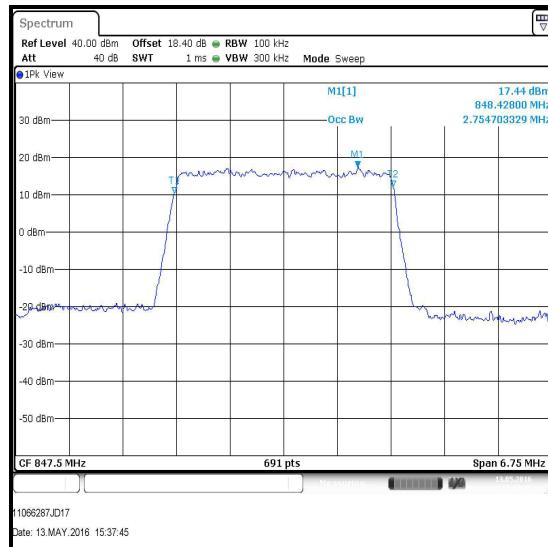
**Transmitter Occupied Bandwidth (continued)****Results: 3 MHz Channel Bandwidth / QPSK**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Boundary	15	0	100	300	2.745
Bottom	15	0	100	300	2.745
Middle	15	0	100	300	2.735
Top	15	0	100	300	2.735

**Boundary Channel / QPSK****Bottom Channel / QPSK****Middle Channel / QPSK****Top Channel / QPSK**

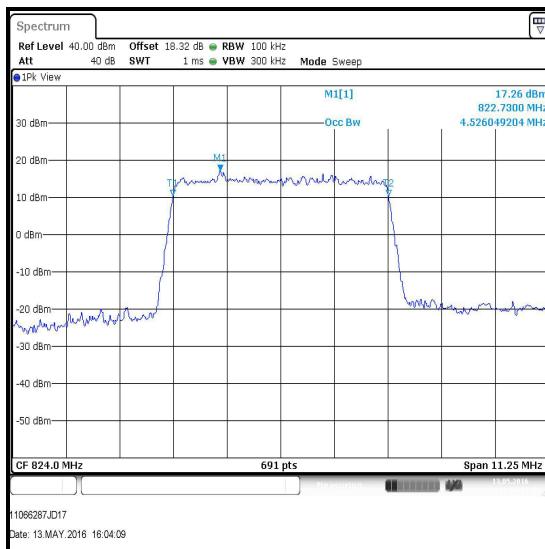
**Transmitter Occupied Bandwidth (continued)****Results: 3 MHz Channel Bandwidth / 16QAM**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Boundary	15	0	100	300	2.735
Bottom	15	0	100	300	2.735
Middle	15	0	100	300	2.735
Top	15	0	100	300	2.755

**Boundary Channel / 16QAM****Bottom Channel / 16QAM****Middle Channel / 16QAM****Top Channel / 16QAM**

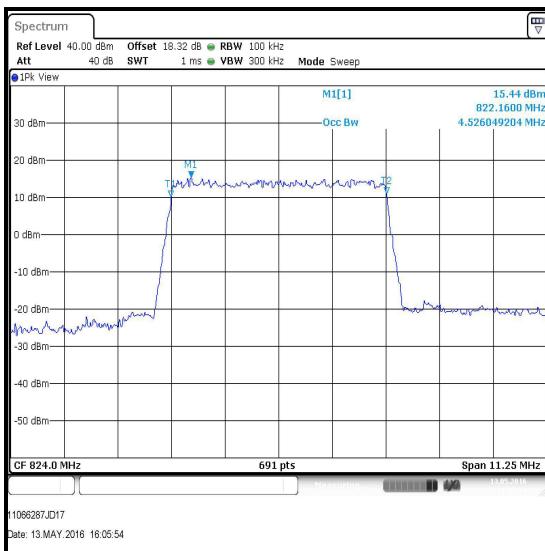
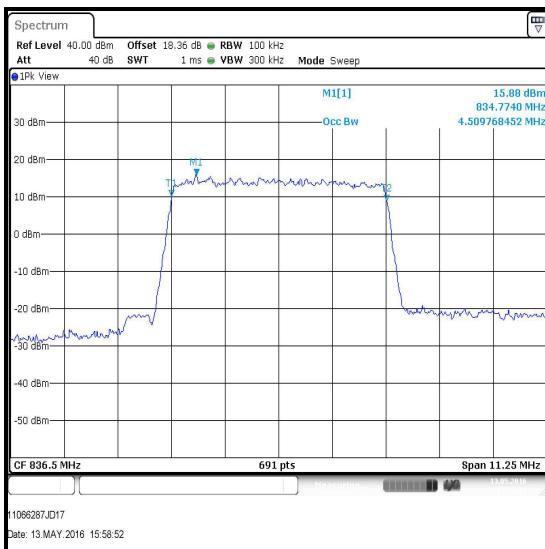
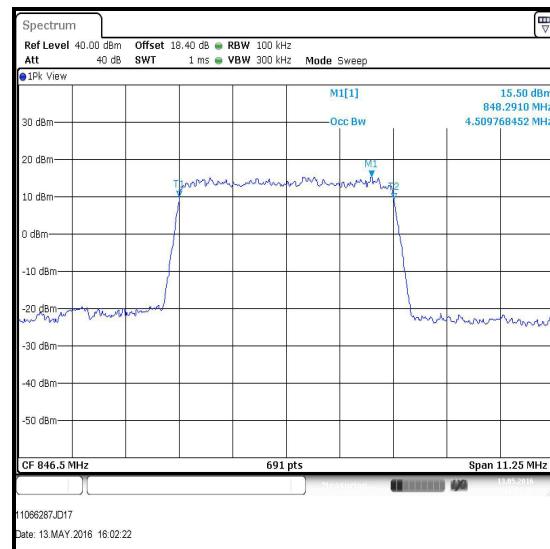
**Transmitter Occupied Bandwidth (continued)****Results: 5 MHz Channel Bandwidth / QPSK**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Boundary	25	0	100	300	4.526
Bottom	25	0	100	300	4.510
Middle	25	0	100	300	4.526
Top	25	0	100	300	4.559

**Boundary Channel / QPSK****Middle Channel / QPSK****Bottom Channel / QPSK****Top Channel / QPSK**

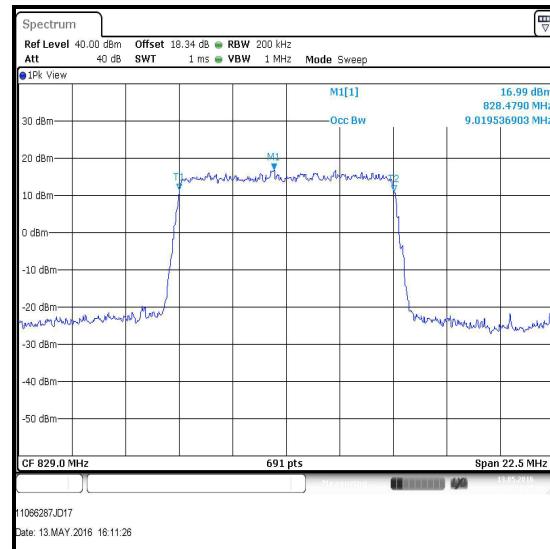
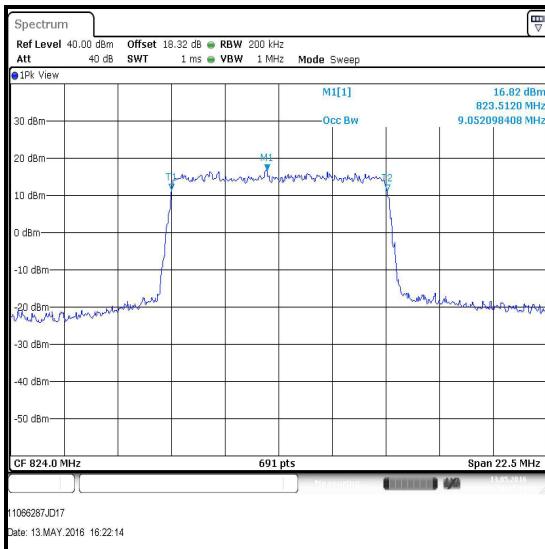
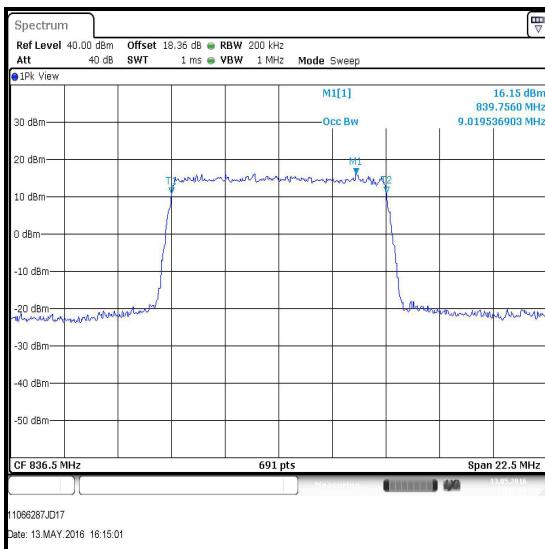
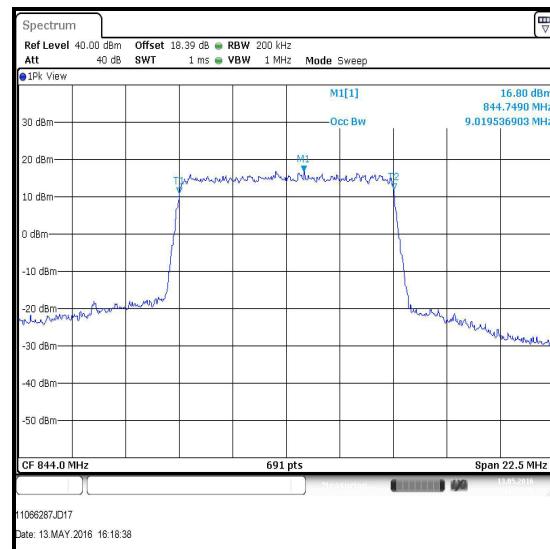
**Transmitter Occupied Bandwidth (continued)****Results: 5 MHz Channel Bandwidth / 16QAM**

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

**Boundary Channel / 16QAM****Bottom Channel / 16QAM****Middle Channel / 16QAM****Top Channel / 16QAM**

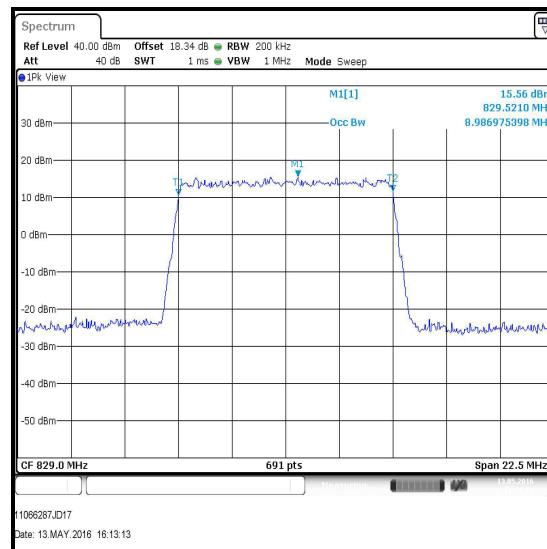
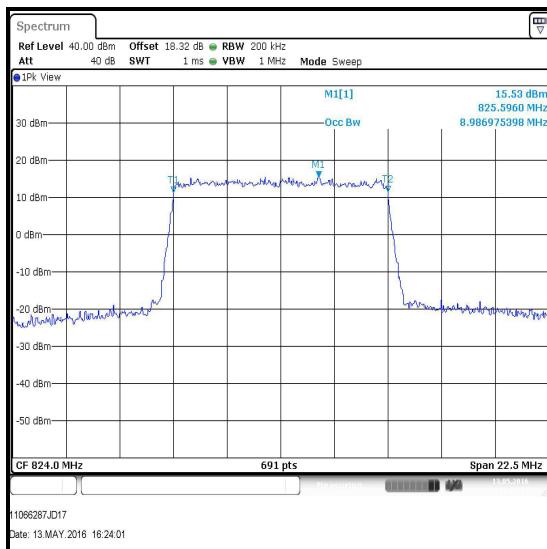
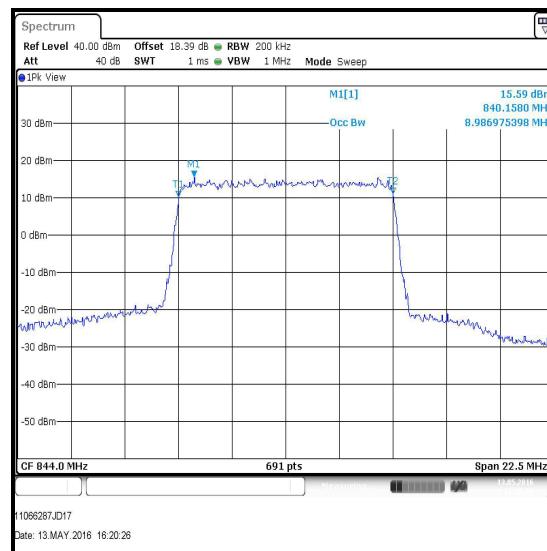
**Transmitter Occupied Bandwidth (continued)****Results: 10 MHz Channel Bandwidth / QPSK**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Boundary	50	0	200	1000	9.052
Bottom	50	0	200	1000	9.020
Middle	50	0	200	1000	9.020
Top	50	0	200	1000	9.020

**Boundary Channel / QPSK****Middle Channel / QPSK****Bottom Channel / QPSK****Top Channel / QPSK**

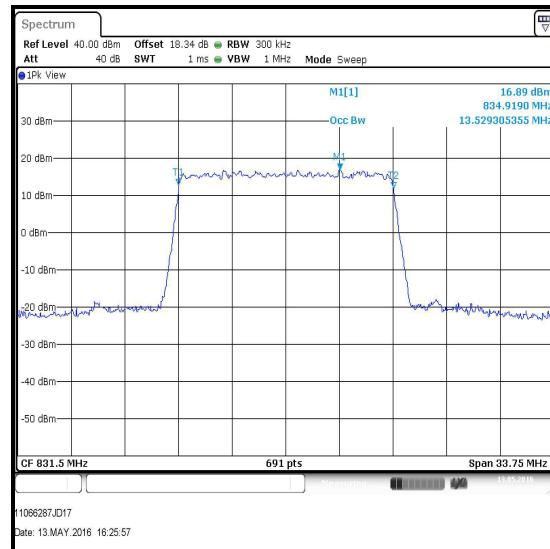
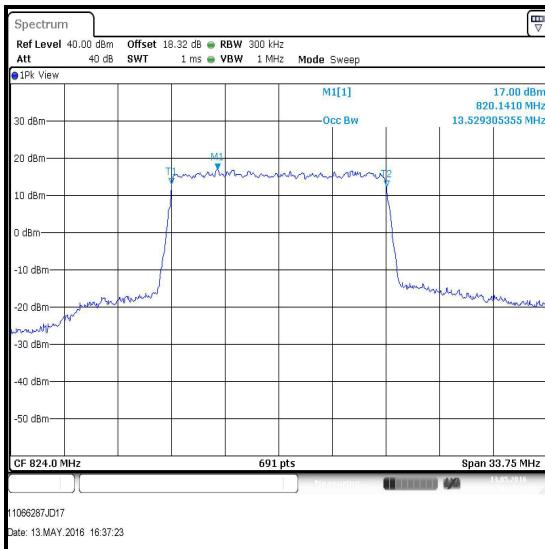
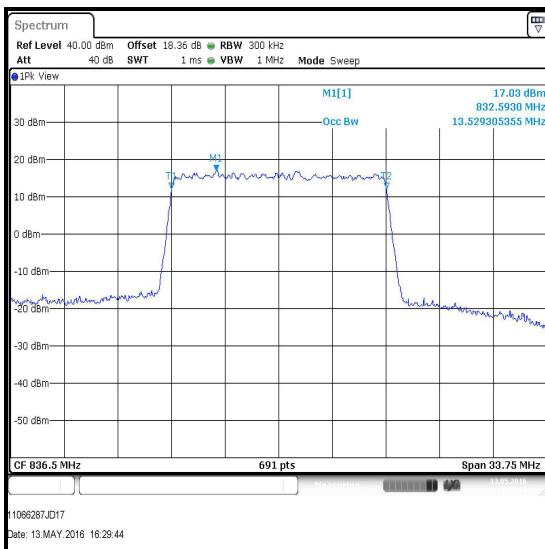
**Transmitter Occupied Bandwidth (continued)****Results: 10 MHz Channel Bandwidth / 16QAM**

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

**Boundary Channel / 16QAM****Middle Channel / 16QAM****Bottom Channel / 16QAM****Top Channel / 16QAM**

**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)
Boundary	75	0	300	1000	13.529
Bottom	75	0	300	1000	13.529
Middle	75	0	300	1000	13.529
Top	75	0	300	1000	13.480

**Boundary Channel / QPSK****Middle Channel / QPSK****Bottom Channel / QPSK****Top Channel / QPSK**