TEST REPORT

Test Report No. : UL-RPT-RP11241886JD07Y V4.0

Manufacturer	:	Apple Inc.
Model No.	:	A1779
FCC ID	:	BCG-E3086A
Technology	:	LTE – Band 30
Test Standard(s)	:	FCC Part 27 Subpart C

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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 4.0 supersedes all previous versions.

Date of Issue: 03 August 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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1. Customer Information

Company Name:	Apple Inc.
Address:	1 Infinite Loop Cupertino, CA 95014 U.S.A.

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR27
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 27 Subpart C (Miscellaneous Wireless Communication Services)
Site Registration:	209735
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	12 May 2016 to 10 July 2016

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
2.1046 / 27.50(a)(3)	Transmitter Output Power Spectral Density (EIRP)	Complied
2.1049	Transmitter Occupied Bandwidth	Complied
2.1053 / 27.53(a)(4)	Transmitter Radiated Spurious Emissions	Complied
2.1053 / 27.53(a)(4)	Transmitter Radiated Emissions at Band Edges	Complied
2.1053 / 27.53(a)(4)	Transmitter Radiated Emission Mask	Complied
2.1055 / 27.54	Transmitter Frequency Stability (Temperature and Voltage Variation)	Complied

2.3. Methods and Procedures

Reference:	ANSI/TIA-603-D-2010
Title:	Land Mobile FM or PM Communications Equipment Measurements and Performance Standards
Reference:	FCC KDB 971168 D01 v02r02, October 17 2014
Title:	Measurement Guidance for Certification of Licensed Digital Transmitters

2.4. Deviations from the Test Specification

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

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Apple
Model Name or Number:	A1779
Test Sample Serial Number:	C7CRF03ZH6GG
Test Sample IMEI:	358640070063996 *(Radiated LAT Sample #1)*
Hardware Version:	REV1.0
Software Version:	iOS: 14A241z BB FW: 0.16.04
FCC ID:	BCG-E3086A

Brand Name:	Apple
Model Name or Number:	A1779
Test Sample Serial Number:	C7CRG011H6DH
Test Sample IMEI:	358640070087480 *(Radiated LAT Sample #2)*
Hardware Version:	REV1.0
Software Version:	iOS: 14A241z BB FW: 0.16.04
FCC ID:	BCG-E3086A

Brand Name:	Apple
Model Name or Number:	A1779
Test Sample Serial Number:	C7CRR00EHCPX
Test Sample IMEI:	358640070038162 *(Radiated LAT Sample #3)*
Hardware Version:	REV1.0
Software Version:	iOS: 14A241z BB FW: 0.16.04
FCC ID:	BCG-E3086A

Brand Name:	Apple
Model Name or Number:	A1779
Test Sample Serial Number:	C7CRF01JH7X9
Test Sample IMEI:	358640070022890 *(Radiated UAT Sample #1)*
Hardware Version:	REV1.0
Software Version:	iOS: 14A241z BB FW: 0.16.04
FCC ID:	BCG-E3086A

Identification of Equipment Under Test (continued)

Brand Name:	Apple
Model Name or Number:	A1779
Test Sample Serial Number:	C7CRR00GHCPX
Test Sample IMEI:	358640070066106 *(Radiated UAT Sample #2)*
Hardware Version:	REV1.0
Software Version:	iOS: 14A241z BB FW: 0.16.04
FCC ID:	BCG-E3086A

Brand Name:	Apple
Model Name or Number:	A1779
Test Sample Serial Number:	C7CRR02THCPX
Test Sample IMEI:	358640070064218 *(Conducted Sample #1)*
Hardware Version Number:	REV1.0
Software Version Number:	iOS: 14A241z BB FW: 0.16.04
FCC ID:	BCG-E3086A

Brand Name:	Apple
Model Name or Number:	A1779
Test Sample Serial Number:	C7CRG02QH6DH *(Conducted Sample #2)*
Hardware Version Number:	REV1.0
Software Version Number:	iOS: 14A241z BB FW: 0.16.04
FCC ID:	BCG-E3086A

3.2. Description of EUT

The Equipment Under Test was a mobile phone with GSM/GPRS/EGPRS/UMTS/LTE/TD-SCDMA and CDMA technologies. It also supports IEEE 802.11a/b/g/n/ac, Bluetooth®, GPS and NFC. The rechargeable battery is not user accessible.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Tested Technology:	LTE Band 30			
Type of Equipment	Transceiver			
Channel Bandwidth:	5 & 10 MHz			
Modulation Type:	QPSK & 16QAM			
Duty Cycle:	100%			
Antenna Type:	Integral			
Antenna Gain (LAT):	-0.15 dBi			
Antenna Gain (UAT):	-0.3 dBi			
Power Supply Requirement(s):	Nominal	3.8 VDC		
	Minimum	3.5 VDC		
	Maximum	4.4 VDC		
Transmit Frequency Range:	2305 MHz to 2315 MHz			
Channels Tested:	**Channel Bandwidth (MHz)**		**N_{ul}**	**Frequency of Uplink (MHz)**
Bottom Channel	5		27685	2307.5
Middle Channel	All		27710	2310.0
Top Channel	5		27735	2312.5

3.5. Support Equipment

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

Description:	Laptop PC
Brand Name:	Dell
Model Name or Number:	Latitude E5410
Serial Number:	UL Asset No. 00763

Description:	USB diagnostic cable
Brand Name:	Not stated
Model Name or Number:	Kong
Serial Number:	202D5E

Description:	Personal Hands Free (PHF)
Brand Name:	Apple
Model Name or Number:	Apple Ear Plugs
Serial Number:	Not stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

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

4.2. Configuration and Peripherals

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

- The EUT was placed into a non-ui mode by using the teraterm application on a UL laptop PC. Instructions were provided by the customer to enable the baseband and radio *(Cellular_RSE_setup_V3.0.doc)*. This enabled the EUT to connect via a radiated link with the Rohde & Schwarz CMW 500 system simulator operating in transceiver mode. The CMW 500 was used to configure the EUT operating mode.
- The device contains two cellular antennas which do not transmit simultaneously.
    - LAT – Lower Antenna (Primary)
    - UAT – Upper Antenna (Secondary)

  Both antennas have been tested to demonstrate compliance.
- For the LAT conducted measurements, the RF conducted port was connected with an external RF cable, supplied by the customer.
- For the UAT conducted cellular measurements, the RF conducted port was exposed and extended with a short RF cable supplied by the customer.
- Conducted measurements at temperature and voltage extremes were performed using a conducted sample supplied by the customer. Short DC flying leads were connected internally to the device in place of the battery, and exited through a hole in the casing. These leads were then extended to a DC power supply for testing purposes.
- The EUT was placed in three orthogonal orientations X, Y and Z to determine the worst case orientation for radiated spurious emissions. The worst case orientation for both LAT and UAT was Z.
- Transmitter radiated spurious emissions tests were performed with the EUT set to transmit with a 10 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset. This was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and therefore it was deemed to be the worst case.
- The worst-case radiated emission among all accessories, is determined by the manufacturer to be with the headset connected. The compliance lab performed final testing only with the headset attached.
- Transmitter radiated spurious emissions tests were performed with the PHF connected to the EUT.

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	
		RB	Offset	RB	Offset	RB	Offset
5	25	1	0	1	24	25	0
10	50	1	0	1	49	50	0

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

Transmitter radiated spurious emissions tests were performed with the EUT set to transmit with a 10 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset. This was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and therefore it was deemed to be the worst case.

Transmitter Radiated Band Edge Emissions was tested with sub tests 1, 2 and 3 on all supported channel bandwidths using QPSK and 16-QAM modulations.

Transmitter Frequency Stability test was carried out with sub test 3, 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 Spectral Density (EIRP) - LAT

Test Summary:

Test Engineer:	Keith Tucker	**Test Dates:**	27 June 2016 & 28 June 2016
Test Sample IMEI:	358640070064218		

FCC Reference:	Parts 2.1046 & 27.50(a)(3)
Test Method Used:	FCC KDB 971168 Section 5.4.1

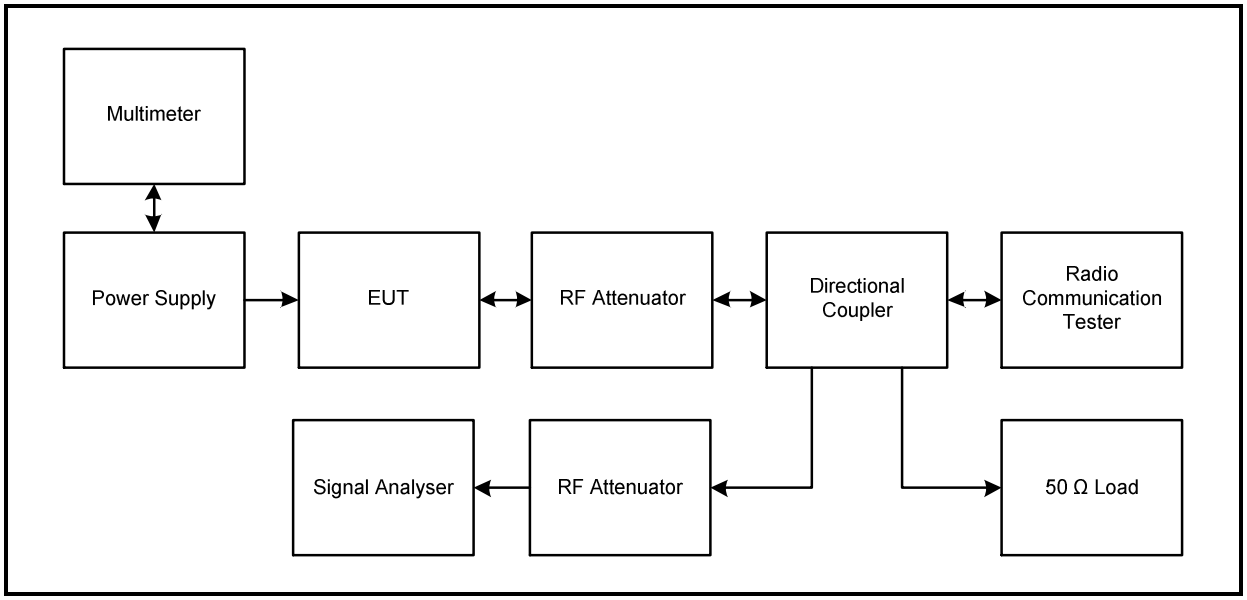
Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	46

Note(s):

1. The customer stated that the peak antenna gain is -0.15 dBi.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed.
3. The RF port of the EUT was connected to the power meter via RF cables, directional coupler and suitable attenuation. An RF level offset was entered on the signal analyser, to compensate for the signal path losses in these components.
4. As the EUT was transmitting continuously over the measurement period, the test method of FCC KDB 971168 Section 5.4.1 was used to determine transmitter output PSD. The span was set to approximately 3 times the OBW and the RBW was set to the specified reference bandwidth (5 MHz for LTE). An RMS detector was used with power averaging selected over at least 100 traces. A peak marker was used to determine the amplitude level.

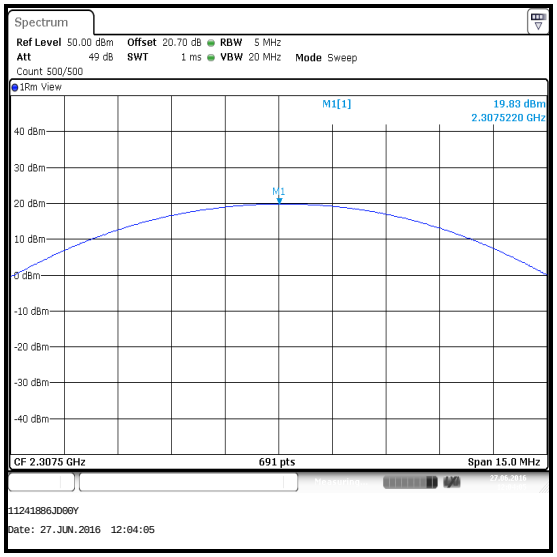
Test setup:



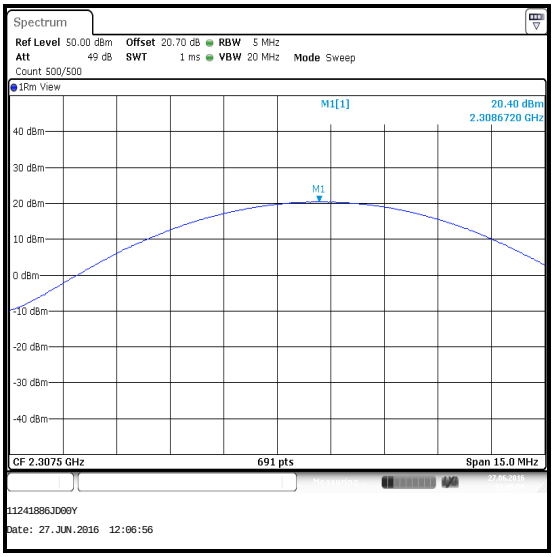
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

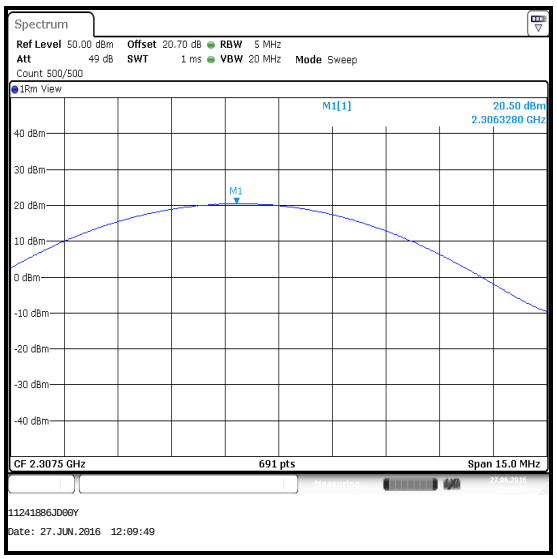
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	25	0	19.8	-0.15	19.65	24.0	4.35	Complied
2307.5	12	13	20.4	-0.15	20.25	24.0	3.75	Complied
2307.5	12	0	20.5	-0.15	20.35	24.0	3.65	Complied
2307.5	12	7	20.5	-0.15	20.35	24.0	3.65	Complied



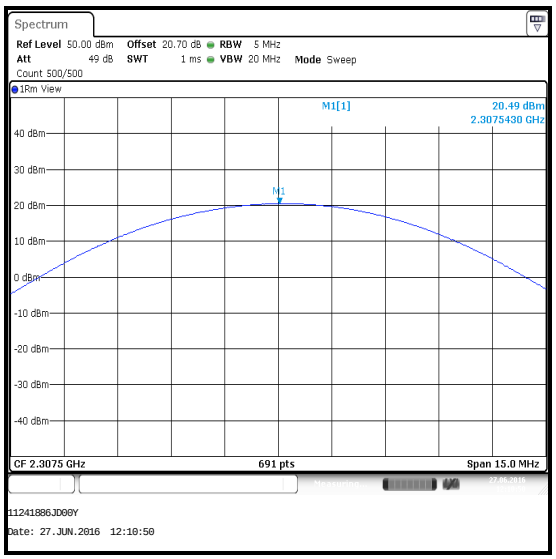
QPSK / 25 Resource Block (0 offset)



QPSK / 12 Resource Block (13 offset)



QPSK / 12 Resource Blocks (0 offset)

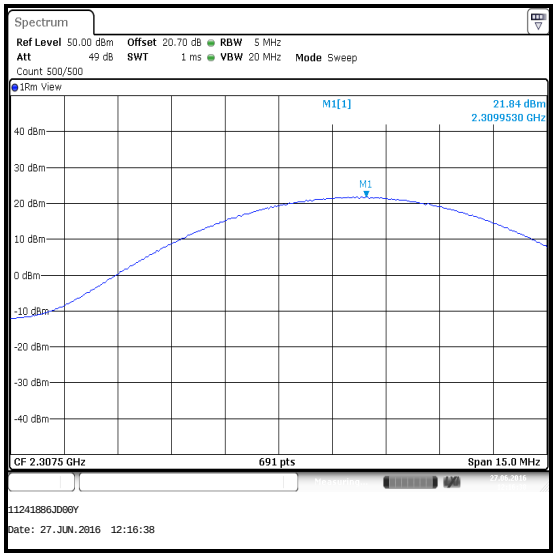


QPSK / 12 Resource Blocks (7 offset)

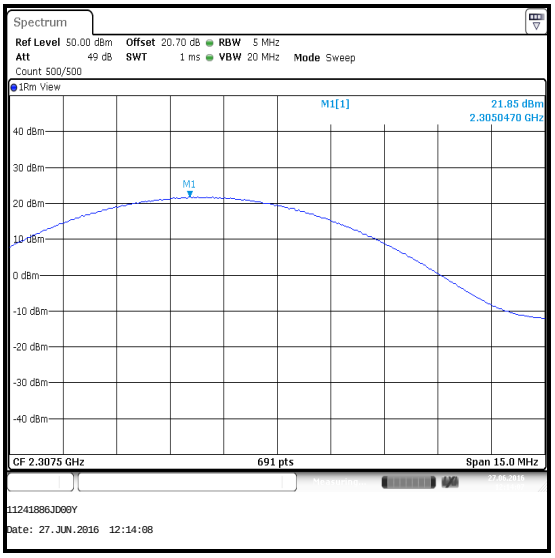
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

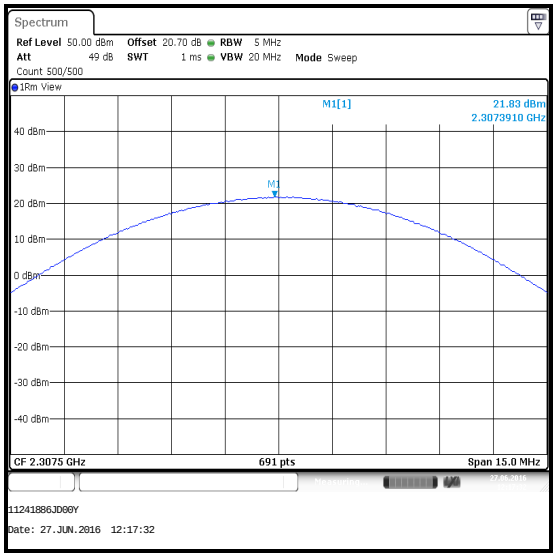
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	1	24	21.8	-0.15	21.65	24.0	2.35	Complied
2307.5	1	0	21.9	-0.15	21.75	24.0	2.25	Complied
2307.5	1	12	21.8	-0.15	21.65	24.0	2.35	Complied



QPSK / 1 Resource Block (24 offset)



QPSK / 1 Resource Block (0 offset)

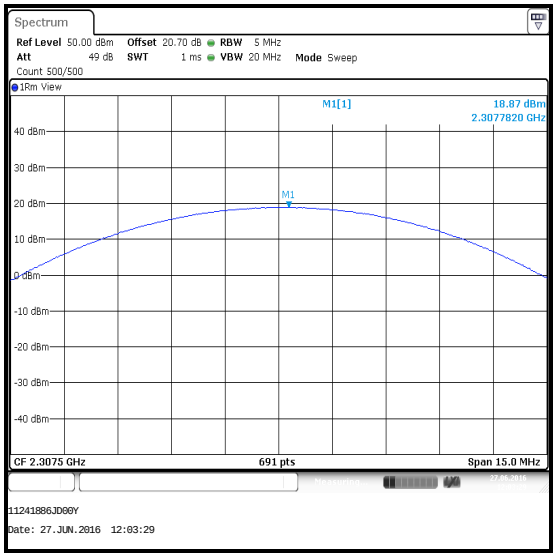


QPSK / 1 Resource Blocks (12 offset)

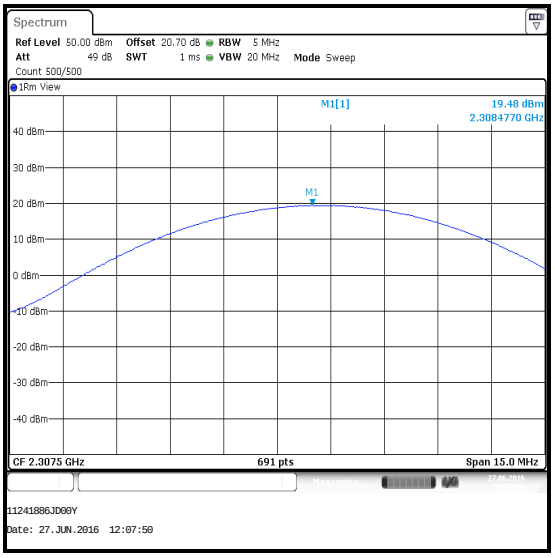
Transmitter Output Power Spectral Density (EIRP) (continued)

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

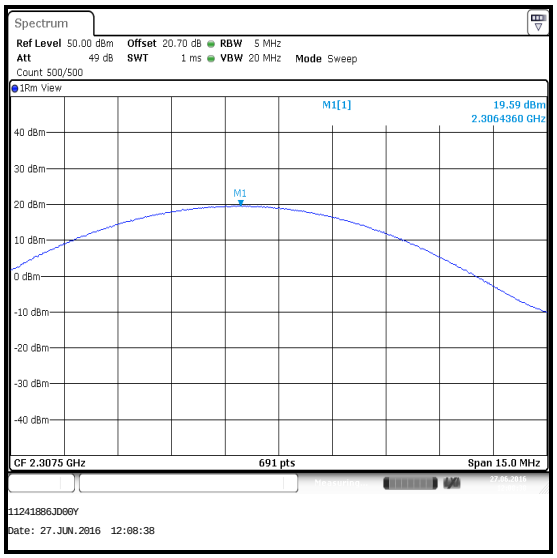
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	25	0	18.9	-0.15	18.75	24.0	5.25	Complied
2307.5	12	13	19.5	-0.15	19.35	24.0	4.65	Complied
2307.5	12	0	19.6	-0.15	19.45	24.0	4.55	Complied
2307.5	12	7	19.5	-0.15	19.35	24.0	4.65	Complied



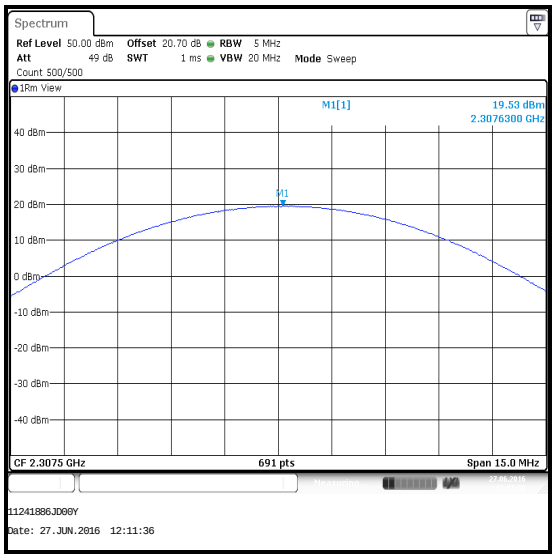
16QAM / 25 Resource Block (0 offset)



16QAM / 12 Resource Block (13 offset)



16QAM / 12 Resource Blocks (0 offset)

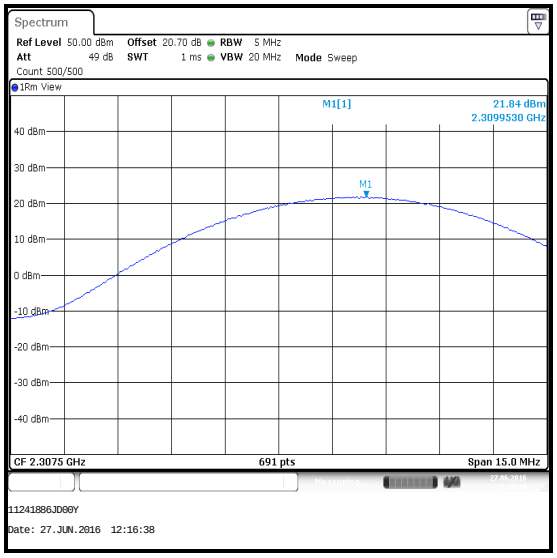


16QAM / 12 Resource Blocks (7 offset)

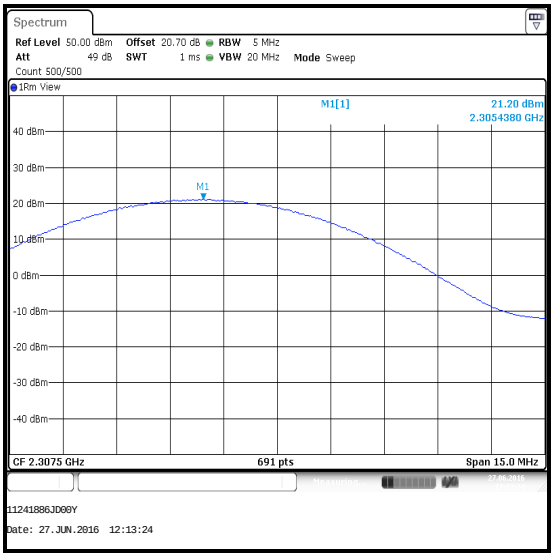
Transmitter Output Power Spectral Density (EIRP) (continued)

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

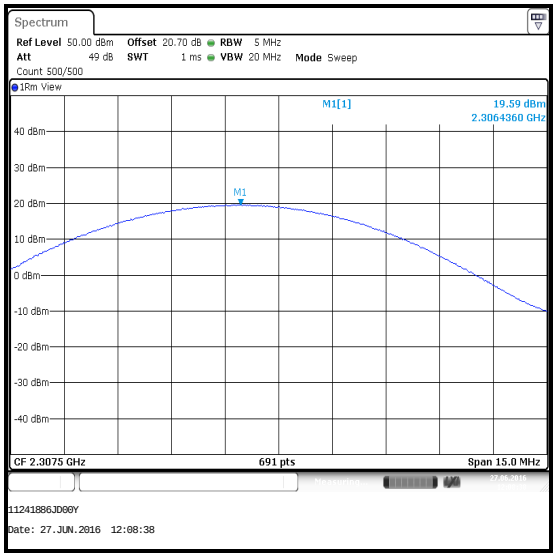
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	1	24	21.8	-0.15	21.65	24.0	2.35	Complied
2307.5	1	0	21.2	-0.15	21.05	24.0	2.95	Complied
2307.5	1	12	19.6	-0.15	19.45	24.0	4.55	Complied



16QAM / 1 Resource Block (24 offset)



16QAM / 1 Resource Block (0 offset)

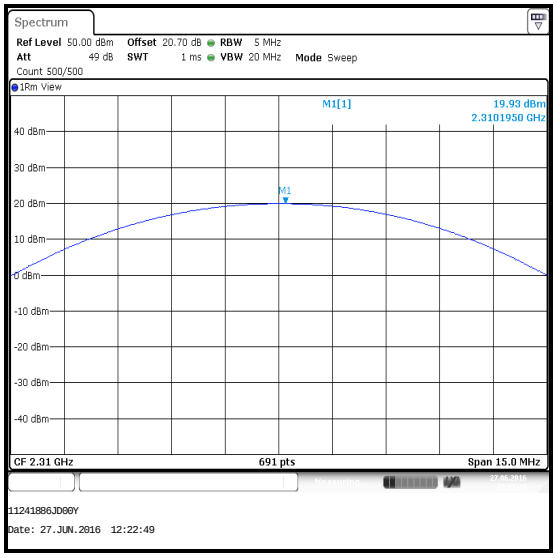


16QAM / 1 Resource Blocks (12 offset)

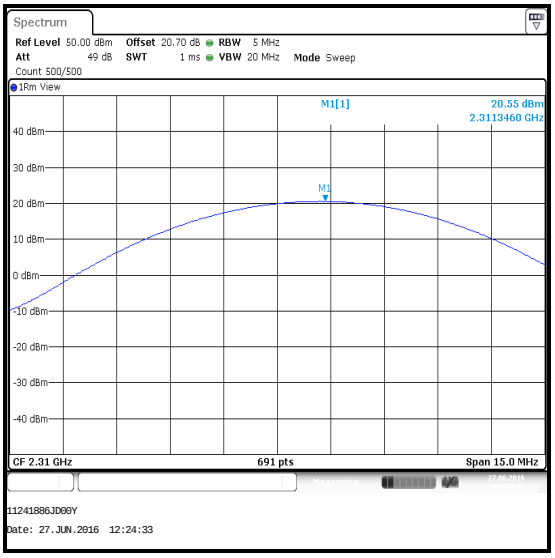
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

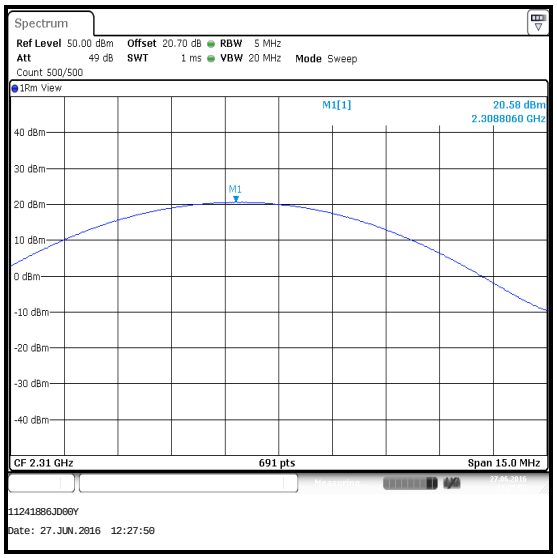
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	25	0	19.9	-0.15	19.75	24.0	4.25	Complied
2310.0	12	13	20.6	-0.15	20.45	24.0	3.55	Complied
2310.0	12	0	20.6	-0.15	20.45	24.0	3.55	Complied
2310.0	12	7	20.5	-0.15	20.35	24.0	3.65	Complied



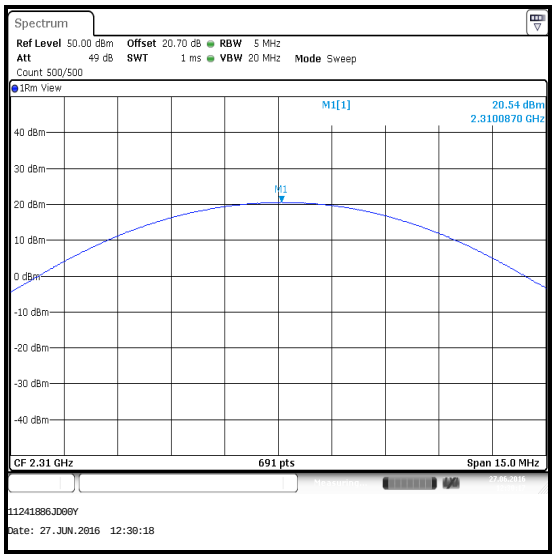
QPSK / 25 Resource Block (0 offset)



QPSK / 12 Resource Block (13 offset)



QPSK / 12 Resource Blocks (0 offset)

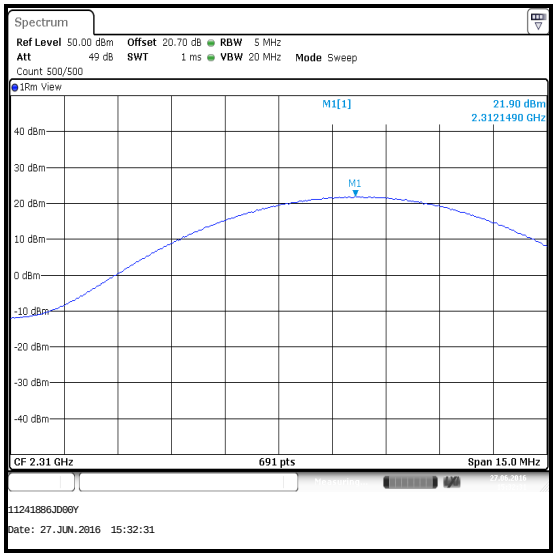


QPSK / 12 Resource Blocks (7 offset)

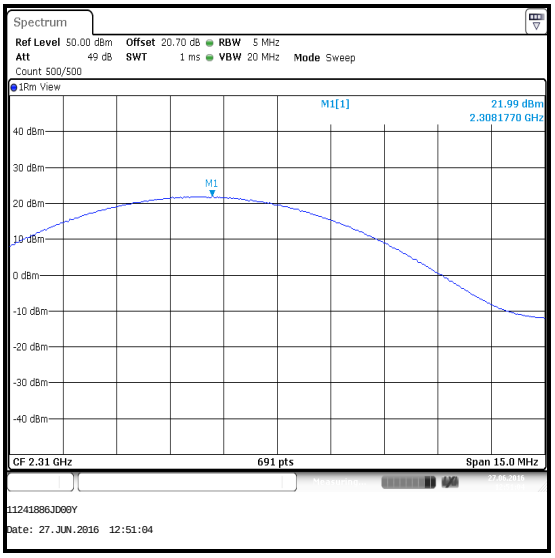
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

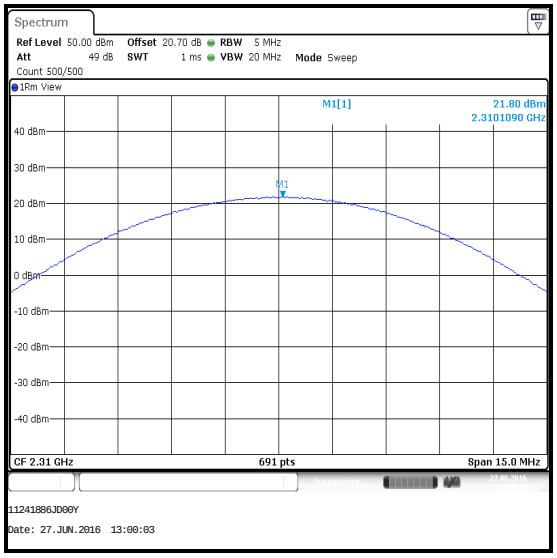
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	24	21.9	-0.15	21.75	24.0	2.25	Complied
2310.0	1	0	22.0	-0.15	21.85	24.0	2.15	Complied
2310.0	1	12	21.8	-0.15	21.65	24.0	2.35	Complied



QPSK / 1 Resource Block (24 offset)



QPSK / 1 Resource Block (0 offset)

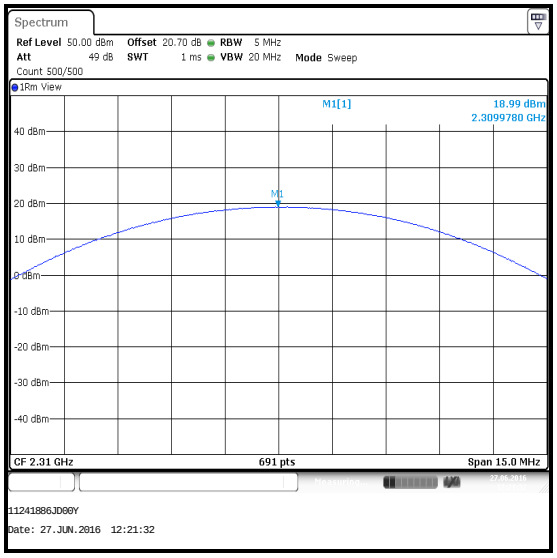


QPSK / 1 Resource Blocks (12 offset)

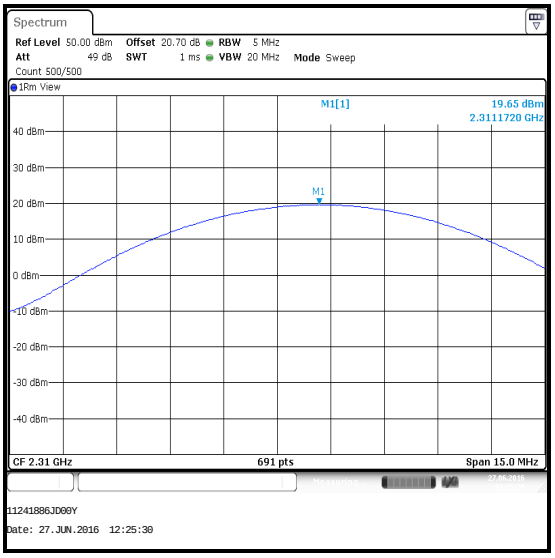
Transmitter Output Power Spectral Density (EIRP) (continued)

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

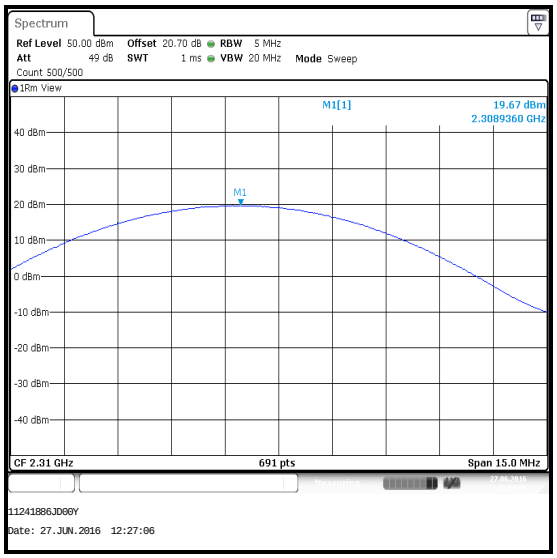
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	25	0	19.0	-0.15	18.85	24.0	5.15	Complied
2310.0	12	13	19.7	-0.15	19.55	24.0	4.45	Complied
2310.0	12	0	19.7	-0.15	19.55	24.0	4.45	Complied
2310.0	12	7	19.6	-0.15	19.45	24.0	4.55	Complied



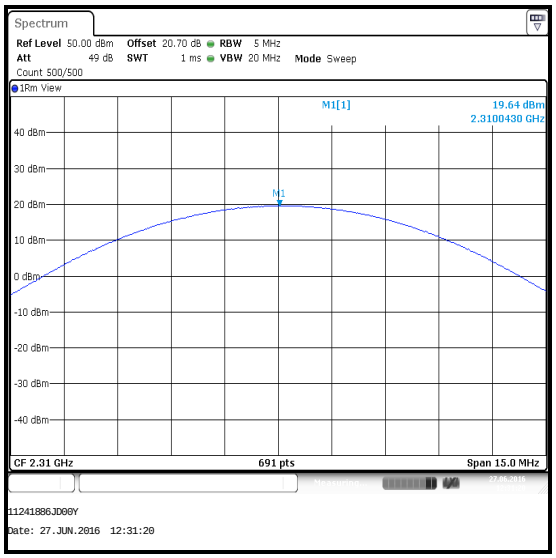
16QAM / 25 Resource Block (0 offset)



16QAM / 12 Resource Block (13 offset)



16QAM / 12 Resource Blocks (0 offset)

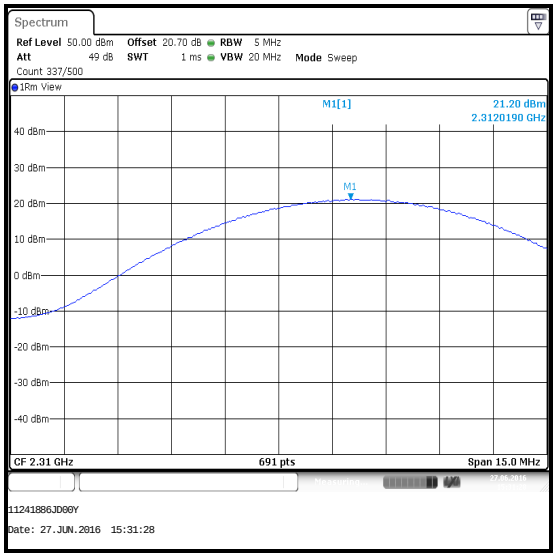


16QAM / 12 Resource Blocks (7 offset)

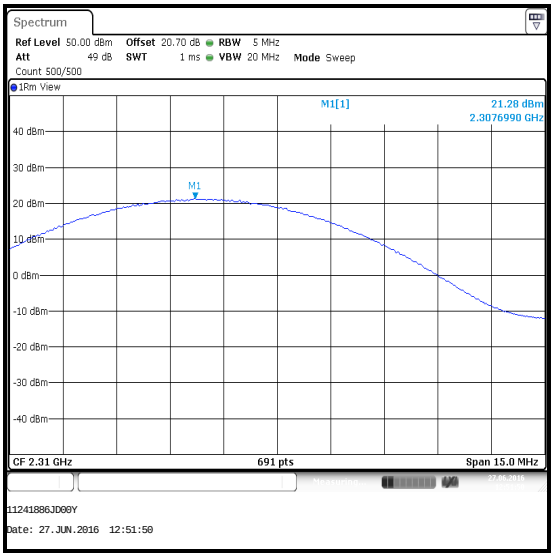
Transmitter Output Power Spectral Density (EIRP) (continued)

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

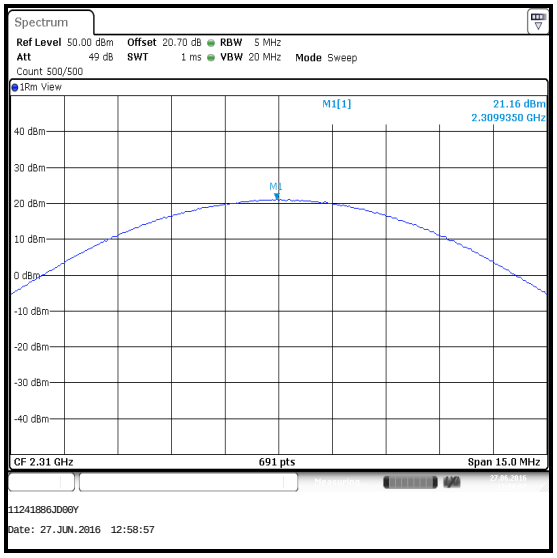
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	24	21.2	-0.15	21.05	24.0	2.95	Complied
2310.0	1	0	21.3	-0.15	21.15	24.0	2.85	Complied
2310.0	1	12	21.2	-0.15	21.05	24.0	2.95	Complied



16QAM / 1 Resource Block (24 offset)



16QAM / 1 Resource Block (0 offset)

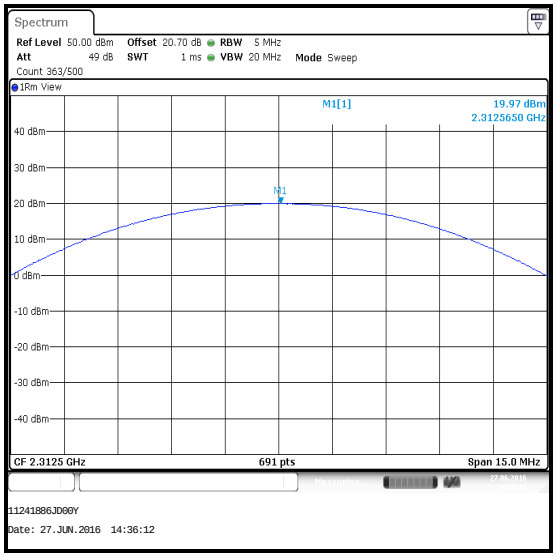


16QAM / 1 Resource Blocks (12 offset)

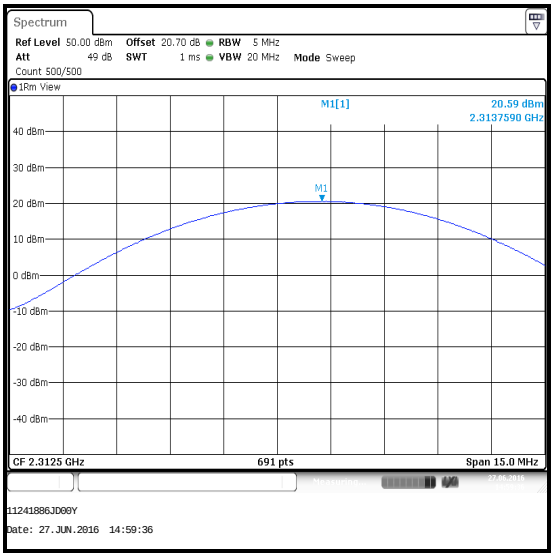
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

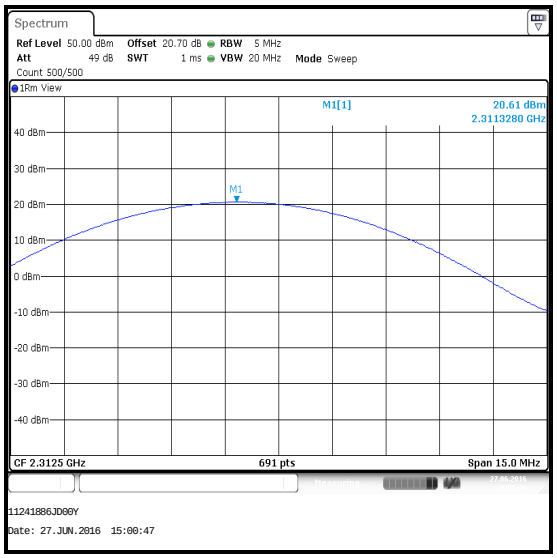
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	25	0	20.0	-0.15	19.85	24.0	4.15	Complied
2312.5	12	13	20.6	-0.15	20.45	24.0	3.55	Complied
2312.5	12	0	20.6	-0.15	20.45	24.0	3.55	Complied
2312.5	12	7	20.6	-0.15	20.45	24.0	3.55	Complied



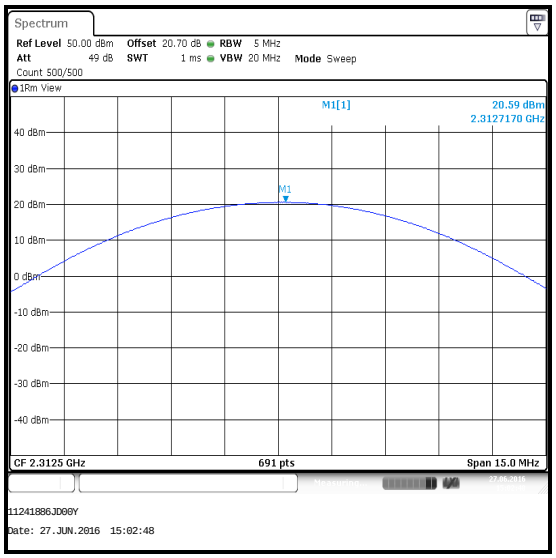
QPSK / 25 Resource Block (0 offset)



QPSK / 12 Resource Block (13 offset)



QPSK / 12 Resource Blocks (0 offset)

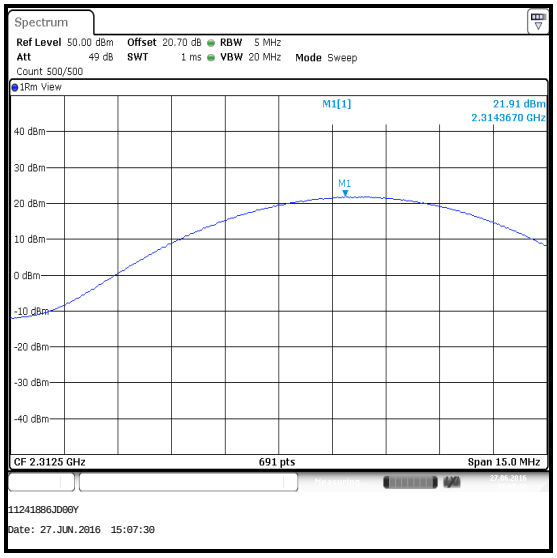


QPSK / 12 Resource Blocks (7 offset)

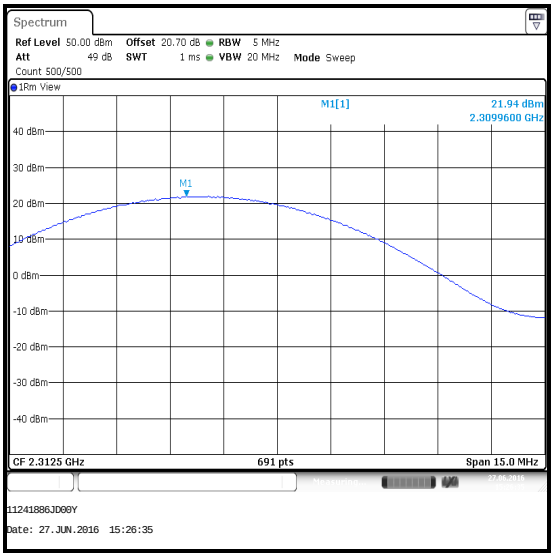
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

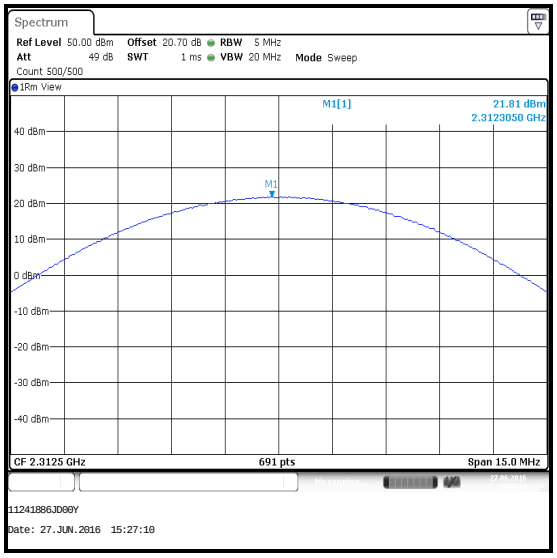
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	1	24	21.9	-0.15	21.75	24.0	2.25	Complied
2312.5	1	0	21.9	-0.15	21.75	24.0	2.25	Complied
2312.5	1	12	21.8	-0.15	21.65	24.0	2.35	Complied



QPSK / 1 Resource Block (24 offset)



QPSK / 1 Resource Block (0 offset)

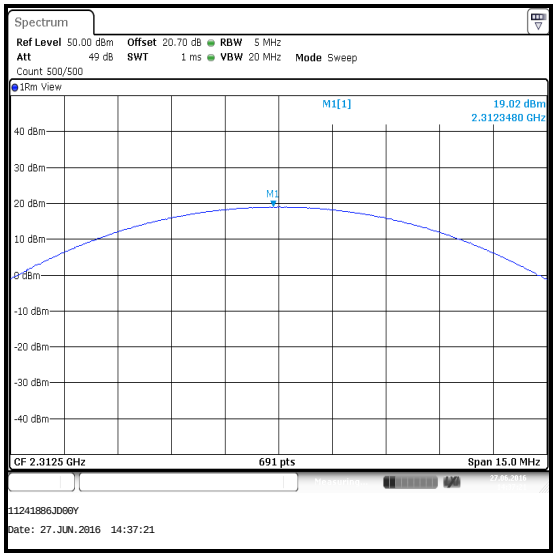


QPSK / 1 Resource Blocks (12 offset)

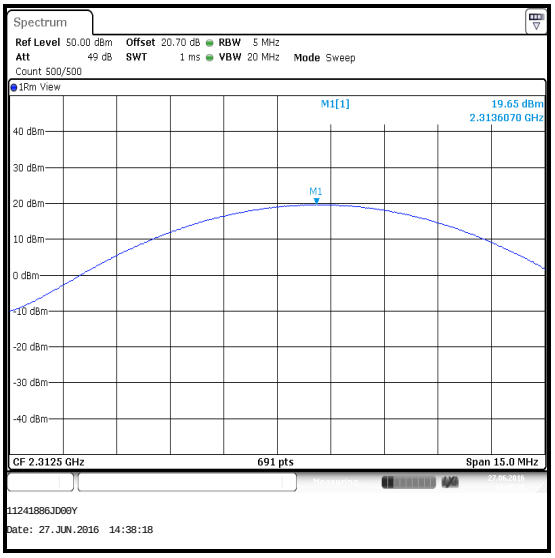
Transmitter Output Power Spectral Density (EIRP) (continued)

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

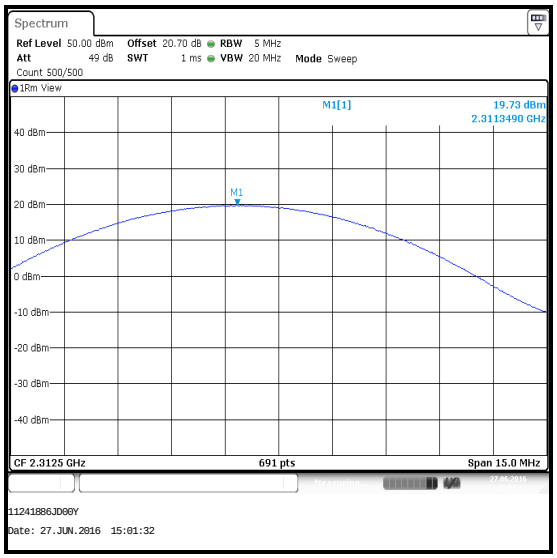
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	25	0	19.0	-0.15	18.85	24.0	5.15	Complied
2312.5	12	13	19.7	-0.15	19.55	24.0	4.45	Complied
2312.5	12	0	19.7	-0.15	19.55	24.0	4.45	Complied
2312.5	12	7	19.5	-0.15	19.35	24.0	4.65	Complied



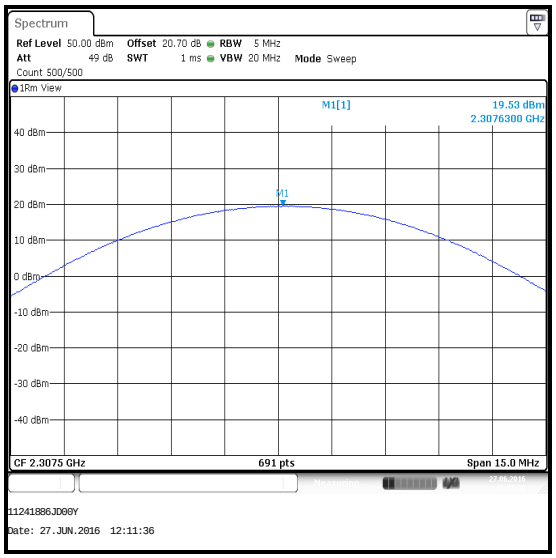
16QAM / 25 Resource Block (0 offset)



16QAM / 12 Resource Block (13 offset)



16QAM / 12 Resource Blocks (0 offset)

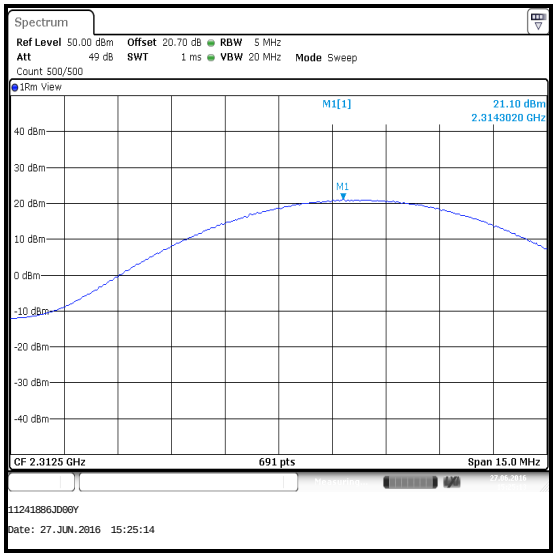


16QAM / 12 Resource Blocks (7 offset)

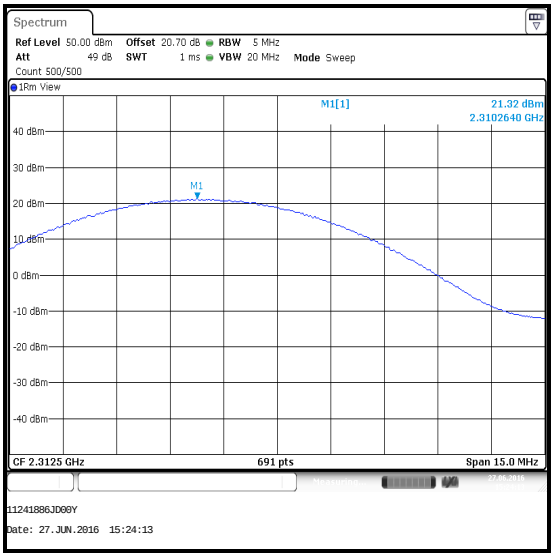
Transmitter Output Power Spectral Density (EIRP) (continued)

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

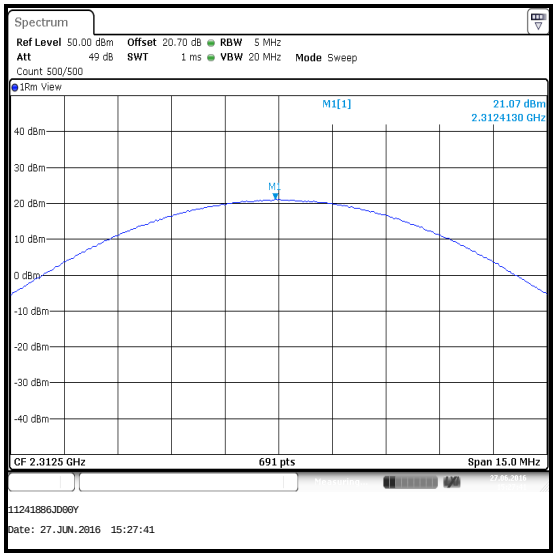
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	1	24	21.1	-0.15	20.95	24.0	3.05	Complied
2312.5	1	0	21.3	-0.15	21.15	24.0	2.85	Complied
2312.5	1	12	21.1	-0.15	20.95	24.0	3.05	Complied



16QAM / 1 Resource Block (24 offset)



16QAM / 1 Resource Block (0 offset)

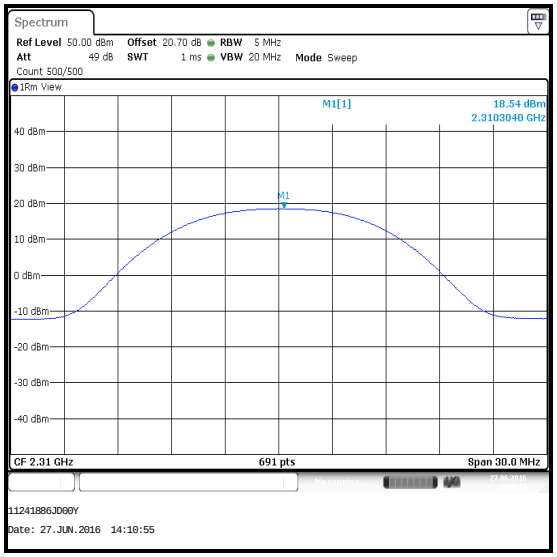


16QAM / 1 Resource Blocks (12 offset)

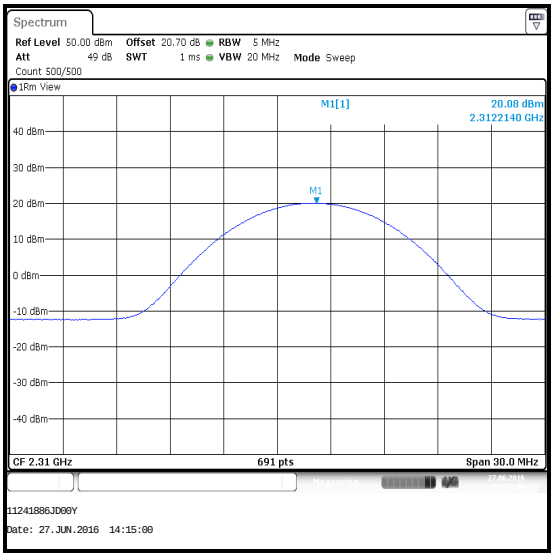
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

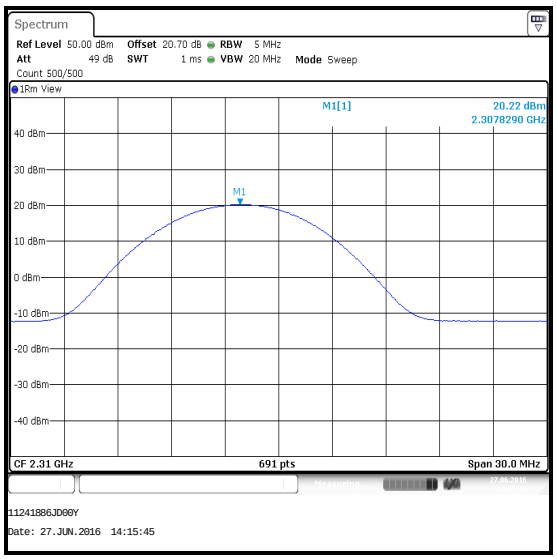
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	50	0	18.5	-0.15	18.35	24.0	5.65	Complied
2310.0	25	24	20.1	-0.15	19.95	24.0	4.05	Complied
2310.0	25	0	20.2	-0.15	20.05	24.0	3.95	Complied
2310.0	25	12	20.0	-0.15	19.85	24.0	4.15	Complied



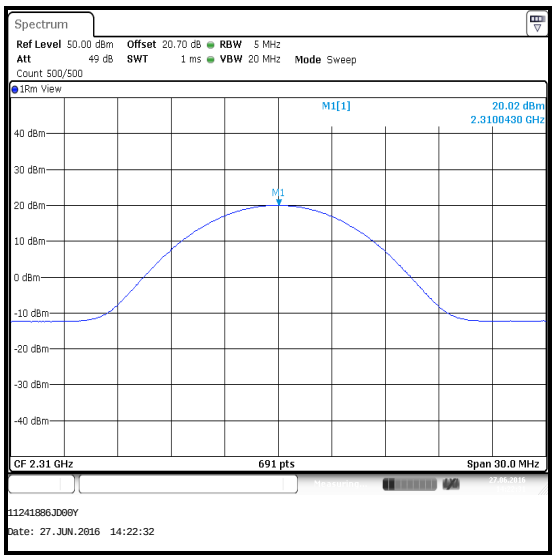
QPSK / 50 Resource Block (0 offset)



QPSK / 25 Resource Block (24 offset)



QPSK / 25 Resource Blocks (0 offset)

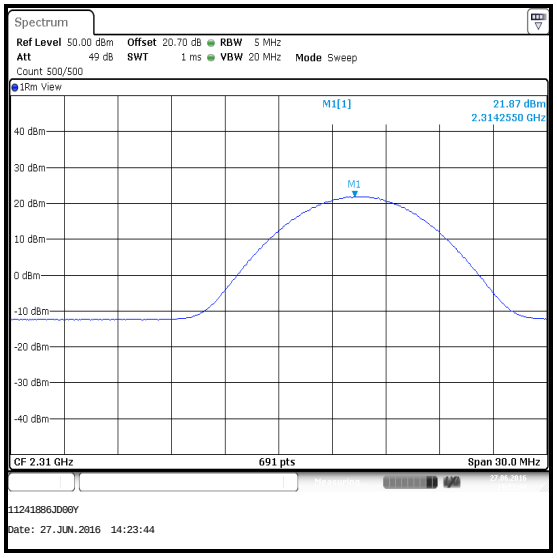


QPSK / 25 Resource Blocks (12 offset)

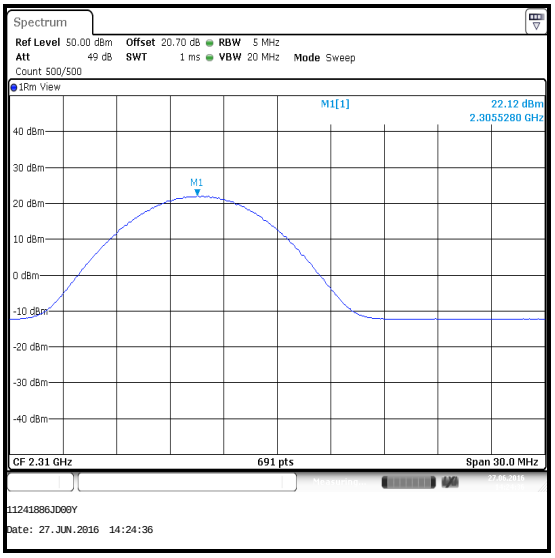
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

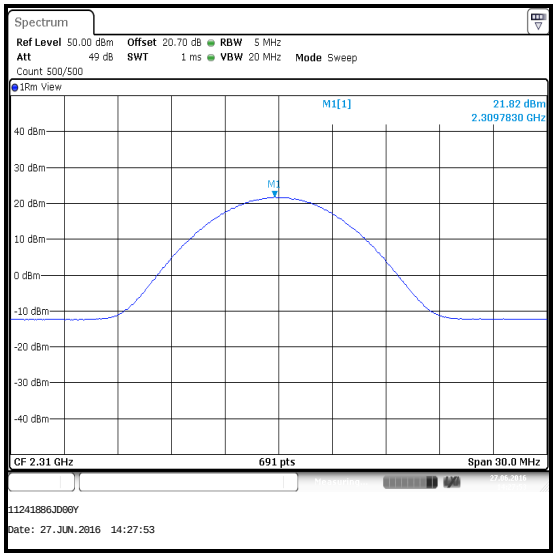
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	49	21.9	-0.15	21.75	24.0	2.25	Complied
2310.0	1	0	22.1	-0.15	21.95	24.0	2.05	Complied
2310.0	1	24	21.8	-0.15	21.65	24.0	2.35	Complied



QPSK / 1 Resource Block (49 offset)



QPSK / 1 Resource Block (0 offset)

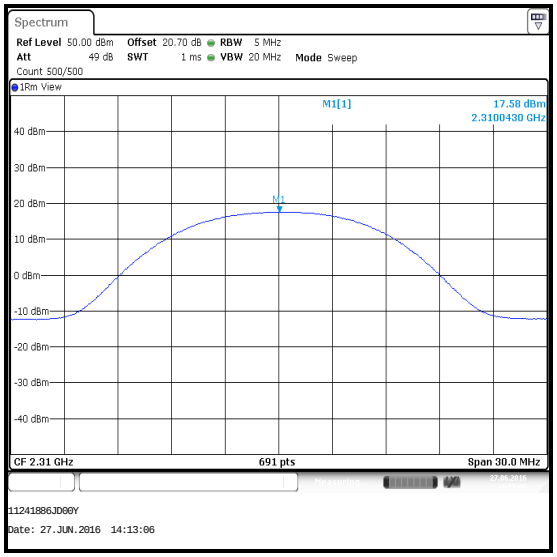


QPSK / 1 Resource Blocks (24 offset)

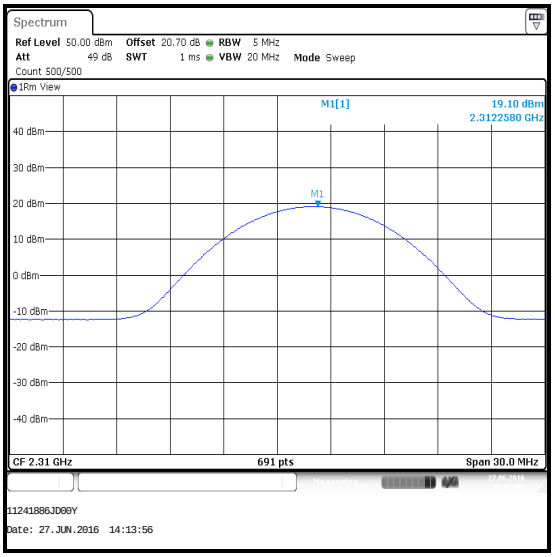
Transmitter Output Power Spectral Density (EIRP) (continued)

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

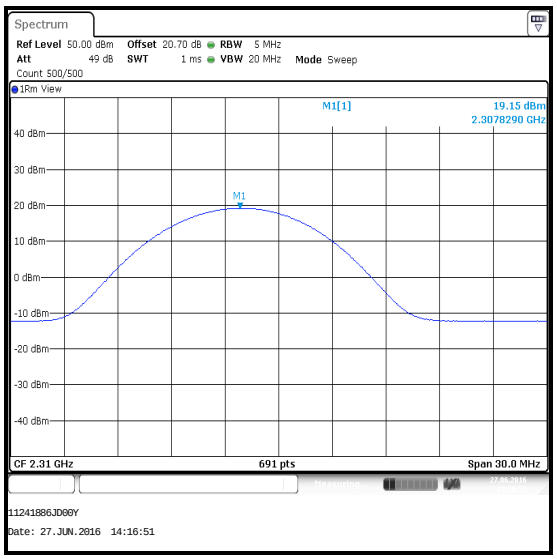
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	50	0	17.6	-0.15	17.45	24.0	6.55	Complied
2310.0	25	24	19.1	-0.15	18.95	24.0	5.05	Complied
2310.0	25	0	19.2	-0.15	19.05	24.0	4.95	Complied
2310.0	25	12	19.1	-0.15	18.95	24.0	5.05	Complied



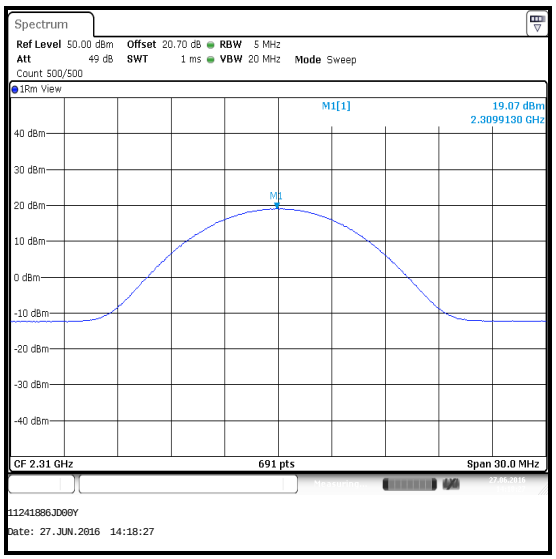
16QAM / 50 Resource Block (0 offset)



16QAM / 25 Resource Block (24 offset)



16QAM / 25 Resource Blocks (0 offset)

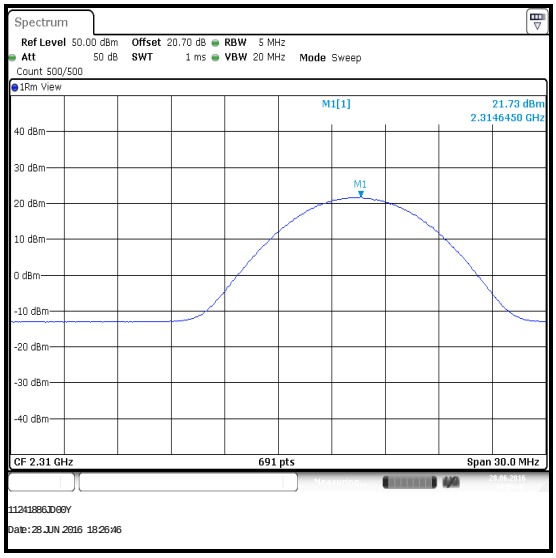


16QAM / 25 Resource Blocks (12 offset)

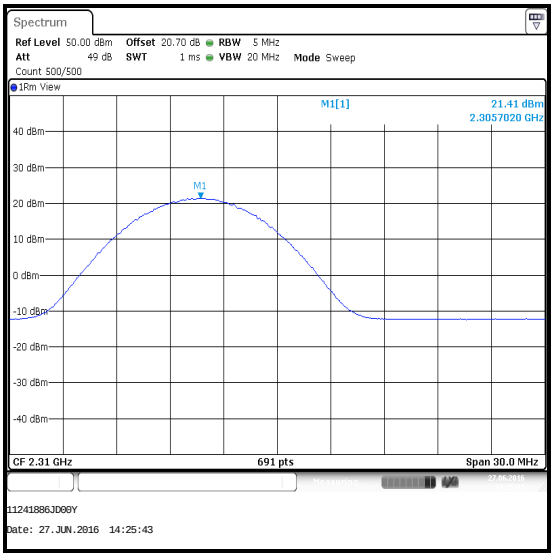
Transmitter Output Power Spectral Density (EIRP) (continued)

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

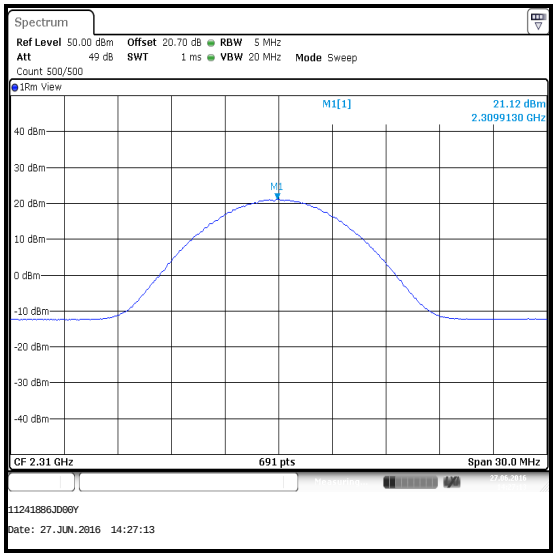
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	49	21.7	-0.15	21.55	24.0	2.45	Complied
2310.0	1	0	21.4	-0.15	21.25	24.0	2.75	Complied
2310.0	1	24	21.1	-0.15	20.95	24.0	3.05	Complied



16QAM / 1 Resource Block (49 offset)



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Blocks (24 offset)

Transmitter Output Power Spectral Density (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	Communications Tester	Rohde & Schwarz	CMW500	145923	05 Apr 2017	12
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	27 Jun 2017	12
M1883	Signal Analyser	Rohde & Schwarz	FSV30	103084	09 May 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	-
S0562	Power Supply	Thurlby Thandar	PL330QMD	054895	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	13 May 2017	12
G0628	Signal Generator	Rohde & Schwarz	SMBV100A	261847	25 Jan 2017	12
M1835	Signal Analyser	Rohde & Schwarz	FSV30	103050	26 Feb 2017	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	11 Apr 2018	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	15 Apr 2018	24

5.2.2. Transmitter Output Power Spectral Density (EIRP) - UAT

Test Summary:

Test Engineer:	Keith Tucker	**Test Date:**	30 June 2016
Test Sample IMEI:	358640070064218		

FCC Reference:	Parts 2.1046 & 27.50(a)(3)
Test Method Used:	FCC KDB 971168 Section 5.4.1

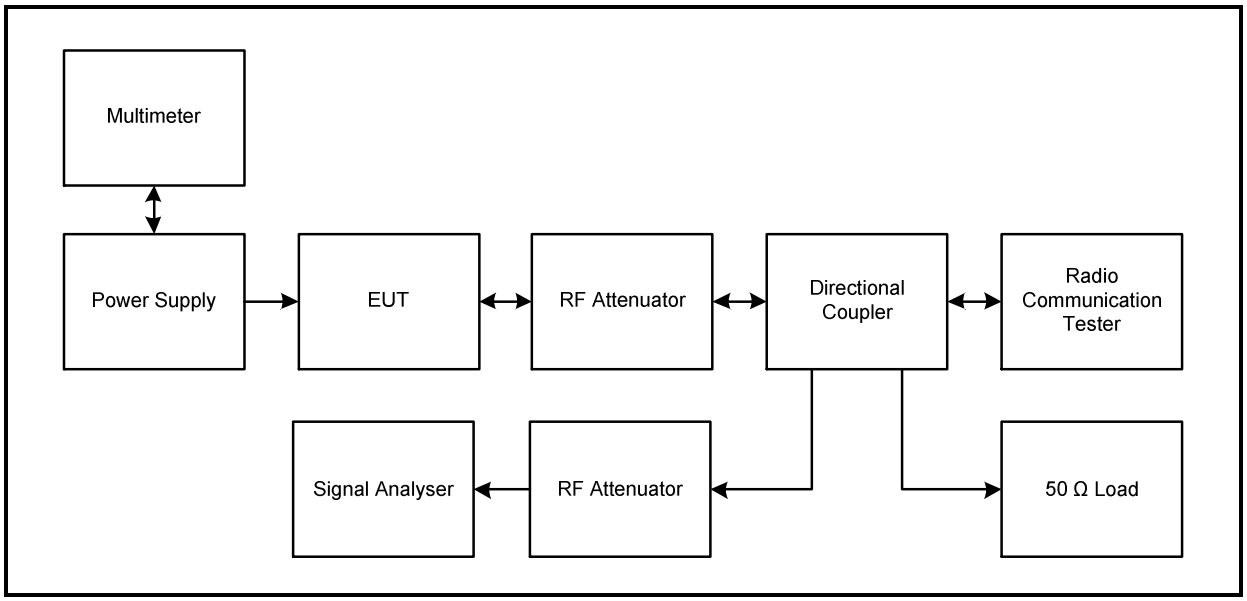
Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	47

Note(s):

1. The customer stated that the peak antenna gain is -0.3 dBi.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed.
3. The RF port of the EUT was connected to the power meter via RF cables, directional coupler and suitable attenuation. An RF level offset was entered on the signal analyser, to compensate for the signal path losses in these components.
4. As the EUT was transmitting continuously over the measurement period, the test method of FCC KDB 971168 Section 5.4.1 was used to determine transmitter output PSD. The span was set to approximately 3 times the OBW and the RBW was set to the specified reference bandwidth (5 MHz for LTE). An RMS detector was used with power averaging selected over at least 100 traces. A peak marker was used to determine the amplitude level.

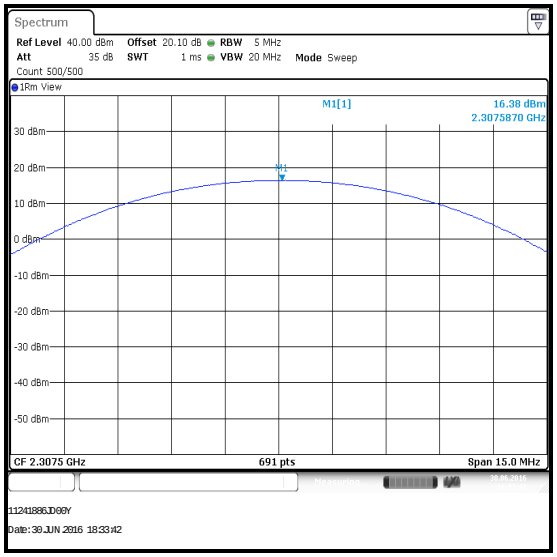
Test setup:



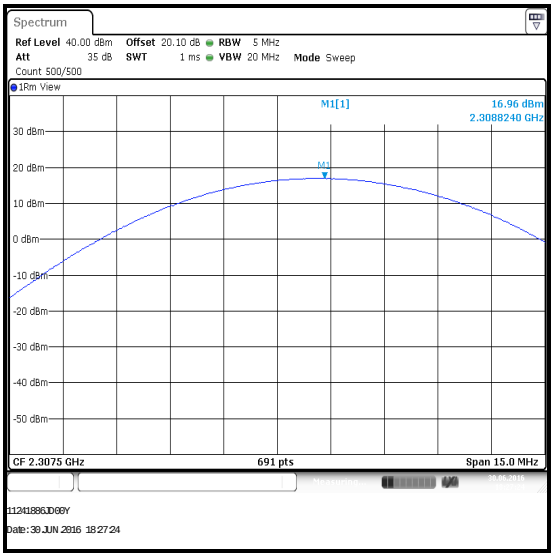
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

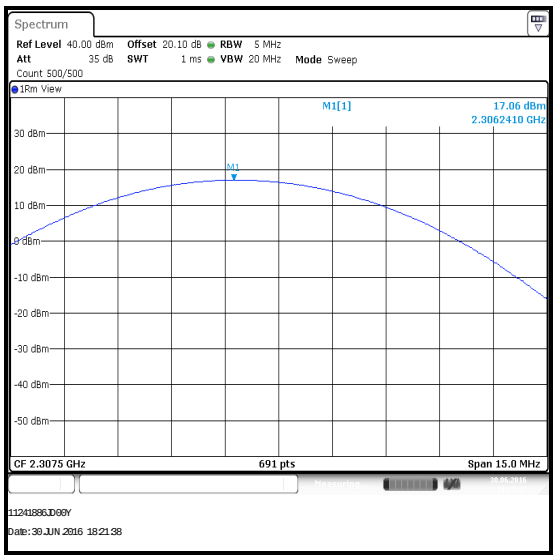
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	25	0	16.4	-0.3	16.1	24.0	7.9	Complied
2307.5	12	13	17.0	-0.3	16.7	24.0	7.3	Complied
2307.5	12	0	17.1	-0.3	16.8	24.0	7.2	Complied
2307.5	12	7	17.0	-0.3	16.7	24.0	7.3	Complied



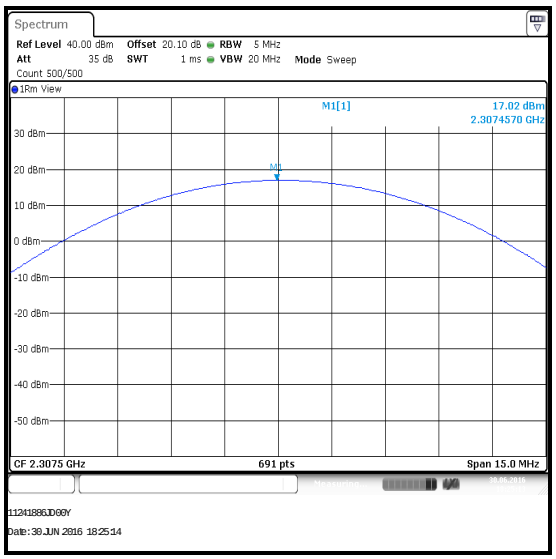
QPSK / 25 Resource Block (0 offset)



QPSK / 12 Resource Block (13 offset)



QPSK / 12 Resource Blocks (0 offset)

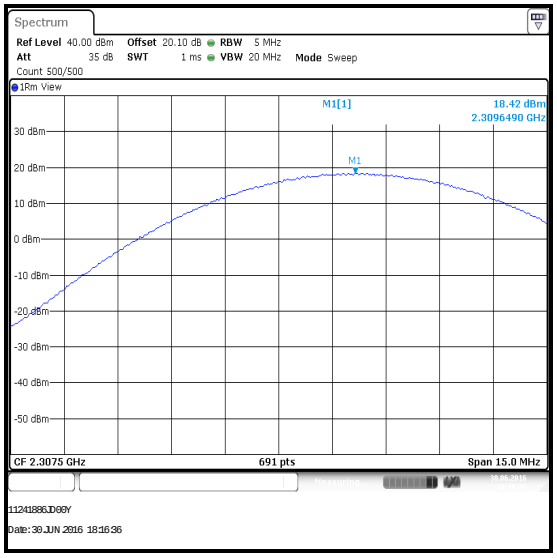


QPSK / 12 Resource Blocks (7 offset)

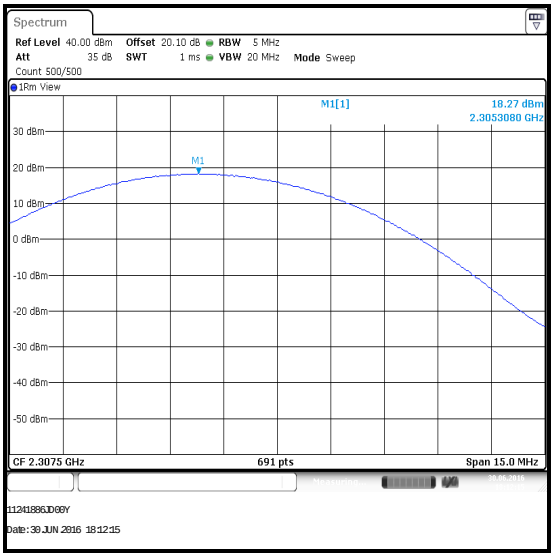
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

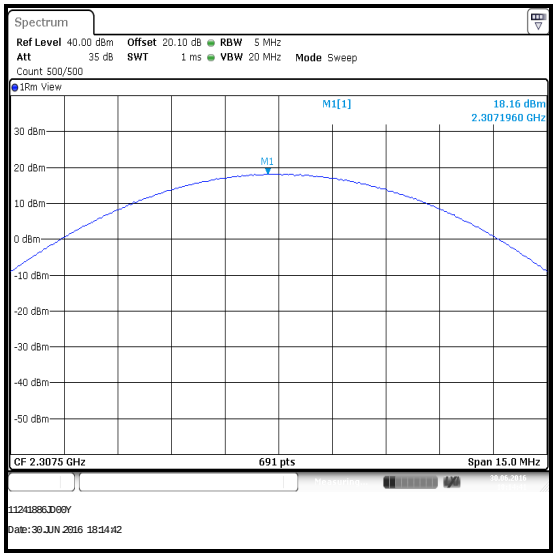
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	1	24	18.4	-0.3	18.1	24.0	5.9	Complied
2307.5	1	0	18.3	-0.3	18.0	24.0	6.0	Complied
2307.5	1	12	18.2	-0.3	17.9	24.0	6.1	Complied



QPSK / 1 Resource Block (24 offset)



QPSK / 1 Resource Block (0 offset)

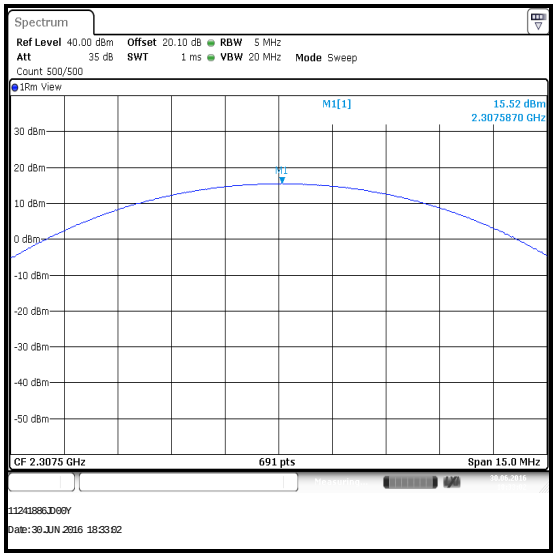


QPSK / 1 Resource Blocks (12 offset)

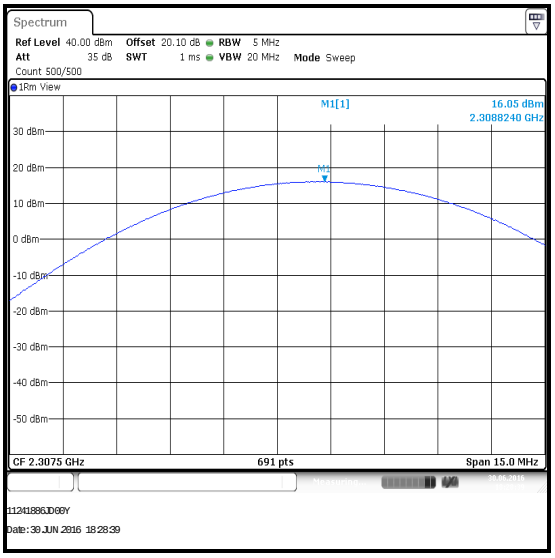
Transmitter Output Power Spectral Density (EIRP) (continued)

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

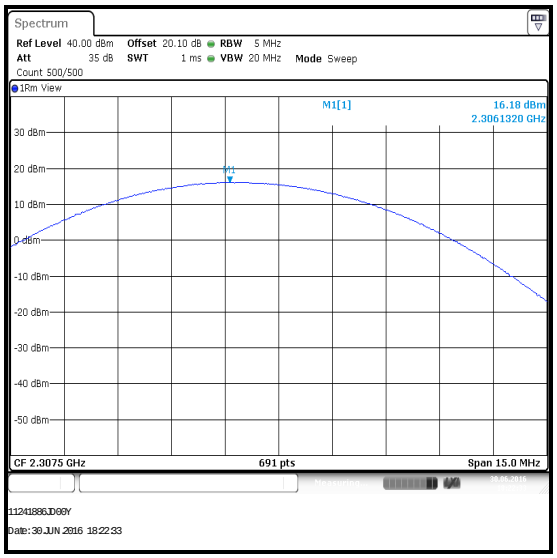
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	25	0	15.5	-0.3	15.2	24.0	8.8	Complied
2307.5	12	13	16.1	-0.3	15.8	24.0	8.2	Complied
2307.5	12	0	16.2	-0.3	15.9	24.0	8.1	Complied
2307.5	12	7	16.1	-0.3	15.8	24.0	8.2	Complied



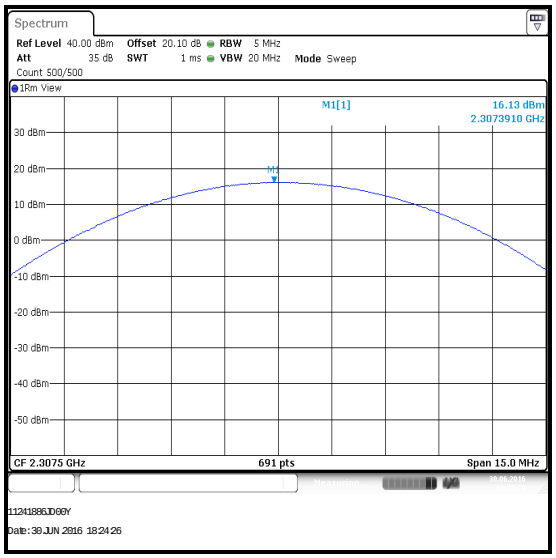
16QAM / 25 Resource Block (0 offset)



16QAM / 12 Resource Block (13 offset)



16QAM / 12 Resource Blocks (0 offset)

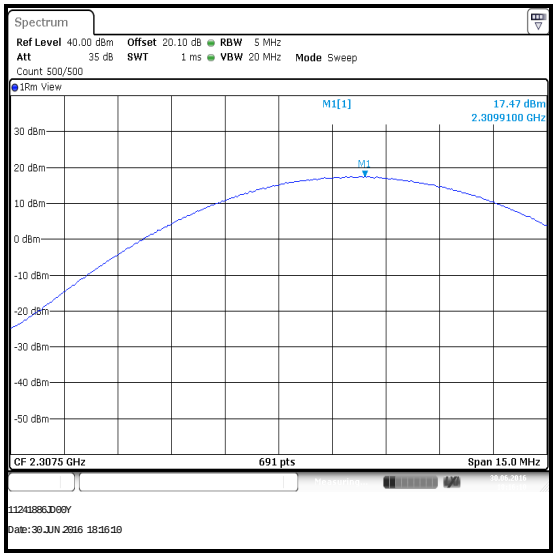


16QAM / 12 Resource Blocks (7 offset)

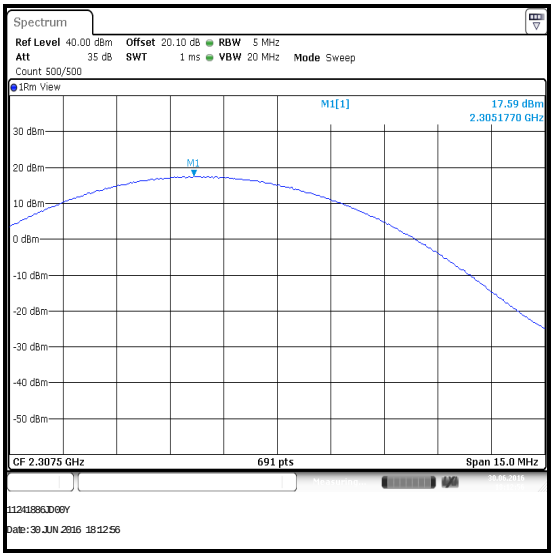
Transmitter Output Power Spectral Density (EIRP) (continued)

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

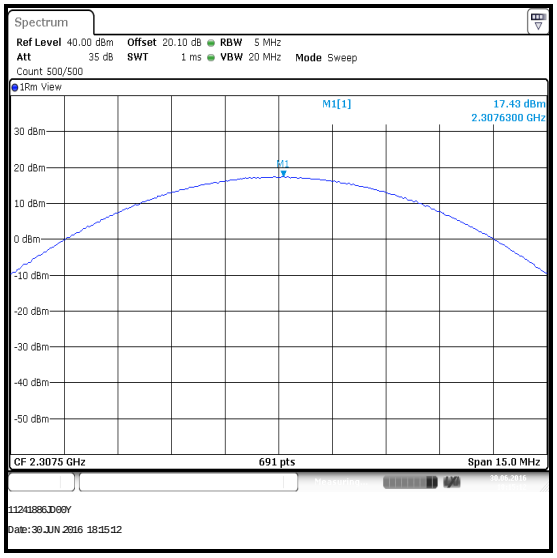
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2307.5	1	24	17.5	-0.3	17.2	24.0	6.8	Complied
2307.5	1	0	17.6	-0.3	17.3	24.0	6.7	Complied
2307.5	1	12	17.4	-0.3	17.1	24.0	6.9	Complied



16QAM / 1 Resource Block (24 offset)



16QAM / 1 Resource Block (0 offset)

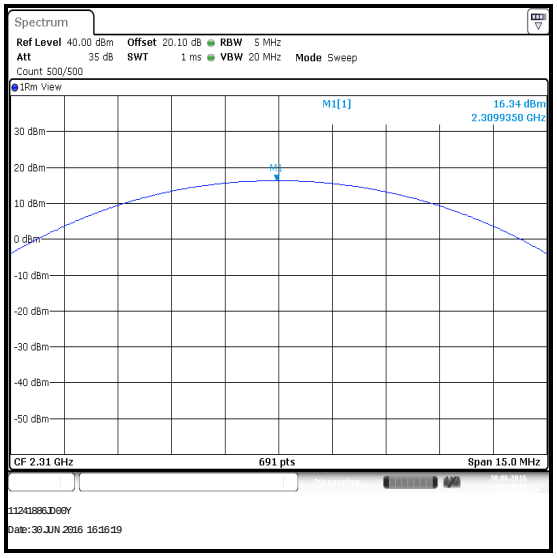


16QAM / 1 Resource Blocks (12 offset)

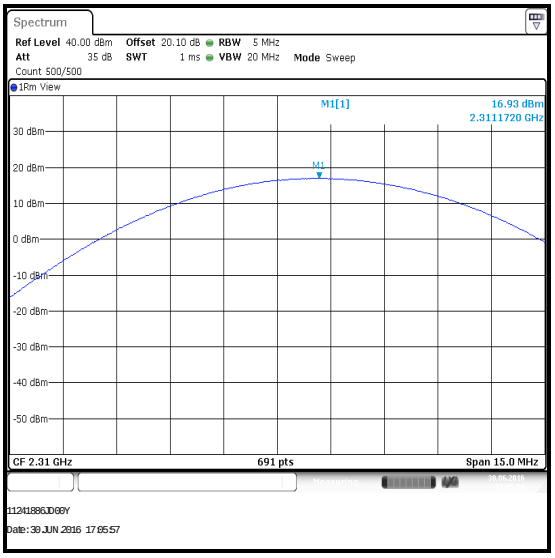
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

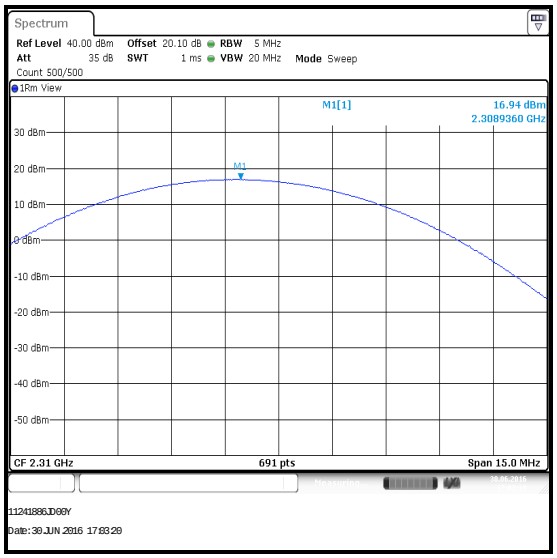
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	25	0	16.3	-0.3	16.0	24.0	8.0	Complied
2310.0	12	13	16.9	-0.3	16.6	24.0	7.4	Complied
2310.0	12	0	16.9	-0.3	16.6	24.0	7.4	Complied
2310.0	12	7	17.0	-0.3	16.7	24.0	7.3	Complied



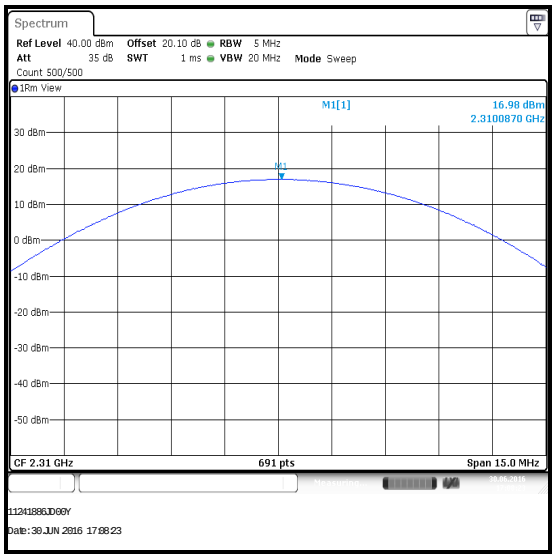
QPSK / 25 Resource Block (0 offset)



QPSK / 12 Resource Block (13 offset)



QPSK / 12 Resource Blocks (0 offset)

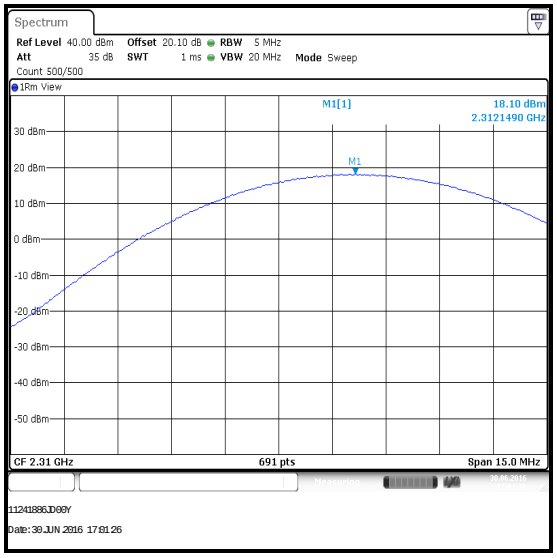


QPSK / 12 Resource Blocks (7 offset)

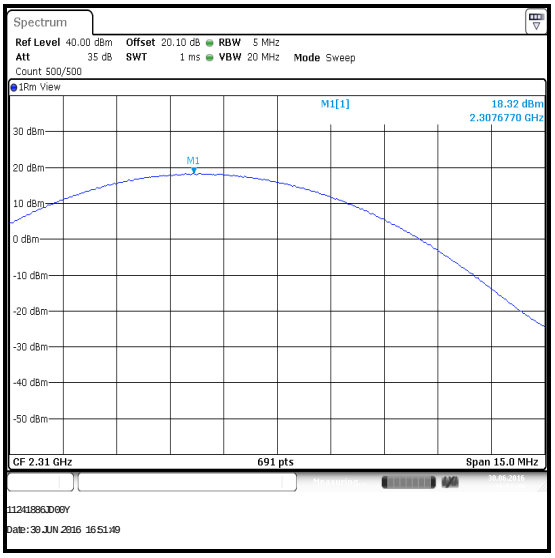
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

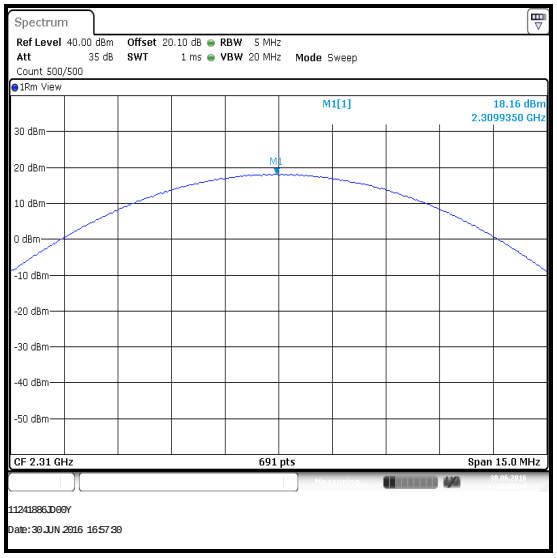
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	24	18.1	-0.3	17.8	24.0	6.2	Complied
2310.0	1	0	18.3	-0.3	18.0	24.0	6.0	Complied
2310.0	1	12	18.2	-0.3	17.9	24.0	6.1	Complied



QPSK / 1 Resource Block (24 offset)



QPSK / 1 Resource Block (0 offset)

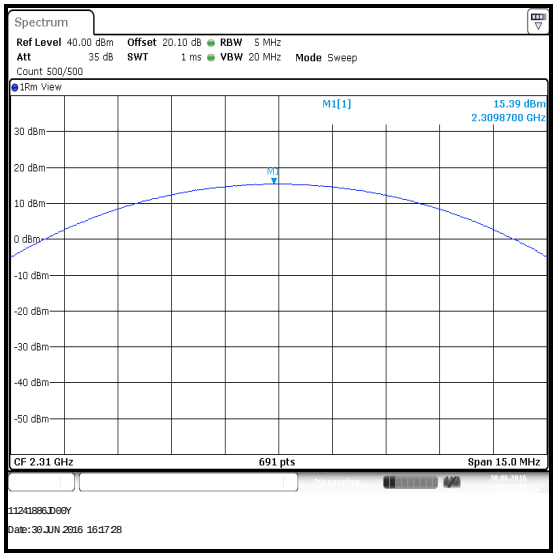


QPSK / 1 Resource Blocks (12 offset)

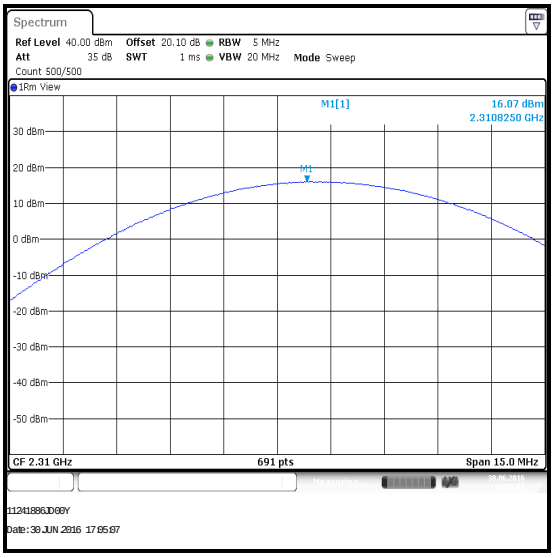
Transmitter Output Power Spectral Density (EIRP) (continued)

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

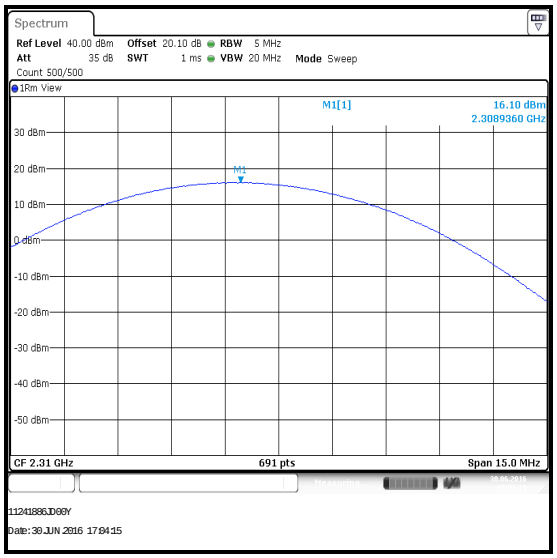
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	25	0	15.4	-0.3	15.1	24.0	8.9	Complied
2310.0	12	13	16.1	-0.3	15.8	24.0	8.2	Complied
2310.0	12	0	16.1	-0.3	15.8	24.0	8.2	Complied
2310.0	12	7	16.1	-0.3	15.8	24.0	8.2	Complied



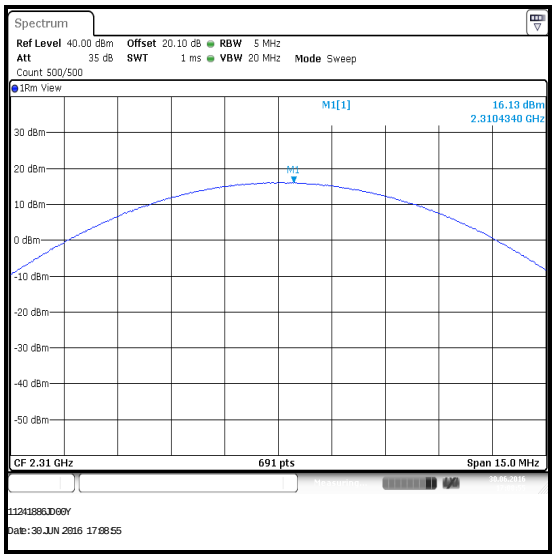
16QAM / 25 Resource Block (0 offset)



16QAM / 12 Resource Block (13 offset)



16QAM / 12 Resource Blocks (0 offset)

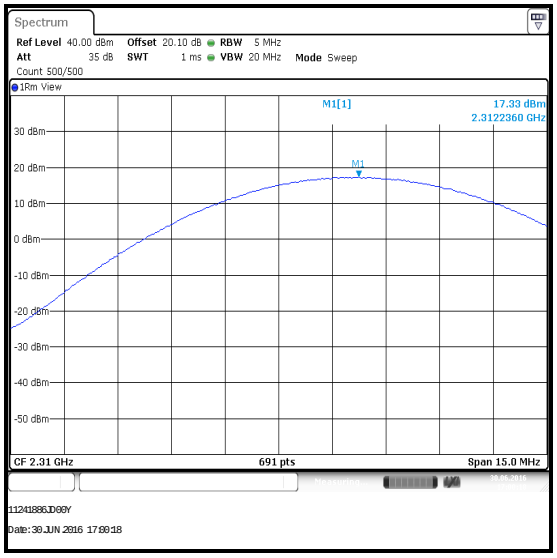


16QAM / 12 Resource Blocks (7 offset)

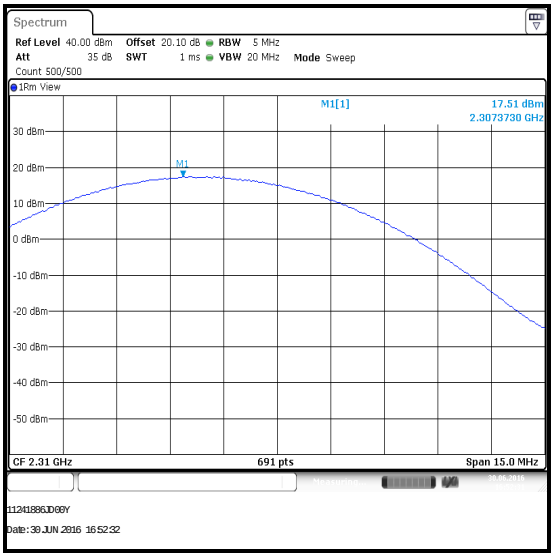
Transmitter Output Power Spectral Density (EIRP) (continued)

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

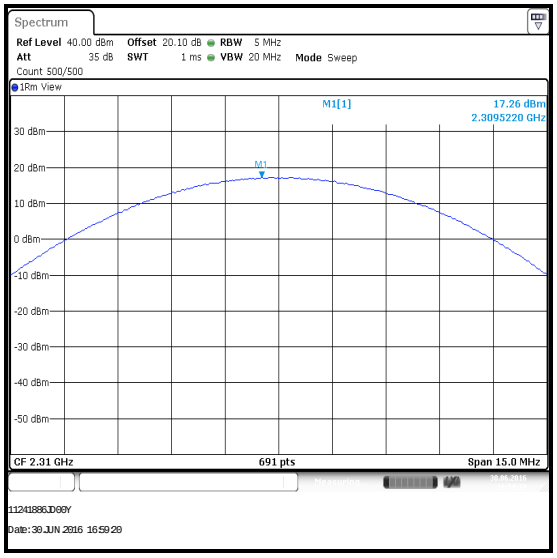
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	24	17.3	-0.3	17.0	24.0	7.0	Complied
2310.0	1	0	17.5	-0.3	17.2	24.0	6.8	Complied
2310.0	1	12	17.3	-0.3	17.0	24.0	7.0	Complied



16QAM / 1 Resource Block (24 offset)



16QAM / 1 Resource Block (0 offset)

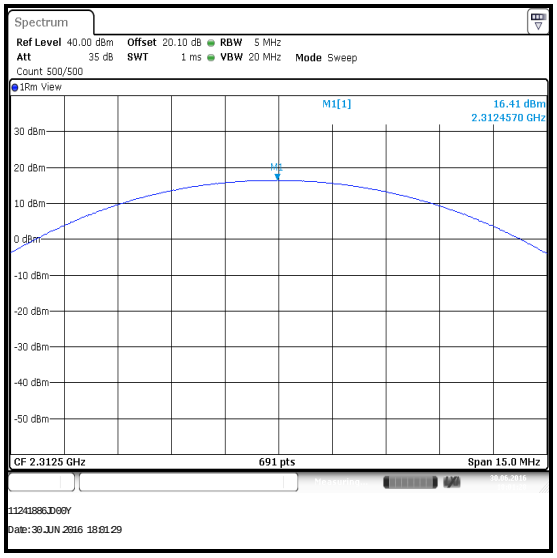


16QAM / 1 Resource Blocks (12 offset)

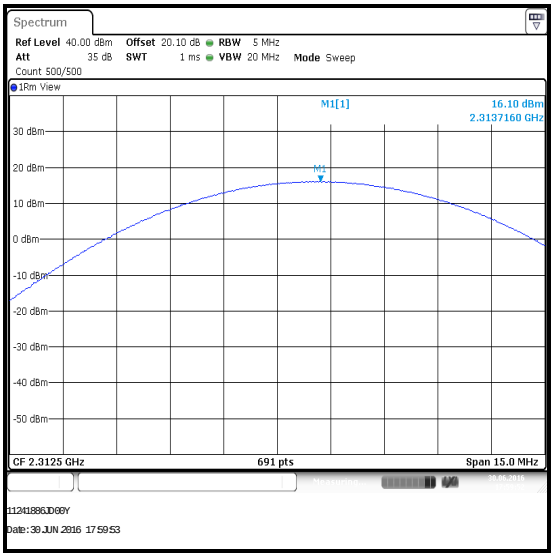
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

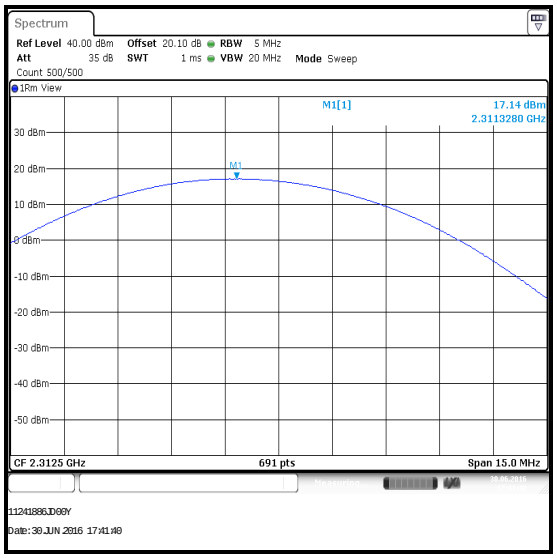
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	25	0	16.4	-0.3	16.1	24.0	7.9	Complied
2312.5	12	13	16.1	-0.3	15.8	24.0	8.2	Complied
2312.5	12	0	17.1	-0.3	16.8	24.0	7.2	Complied
2312.5	12	7	17.0	-0.3	16.7	24.0	7.3	Complied



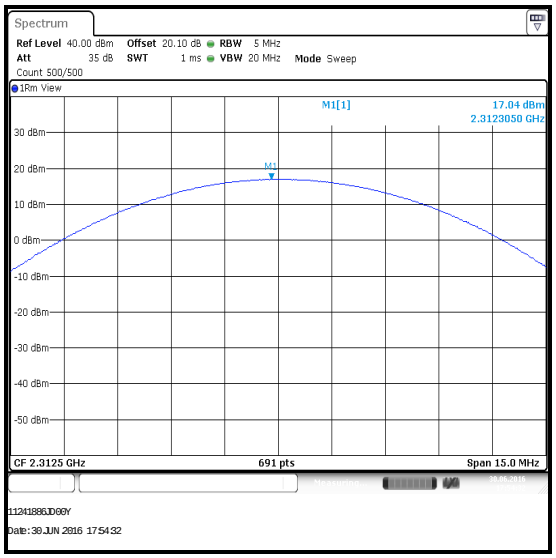
QPSK / 25 Resource Block (0 offset)



QPSK / 12 Resource Block (13 offset)



QPSK / 12 Resource Blocks (0 offset)

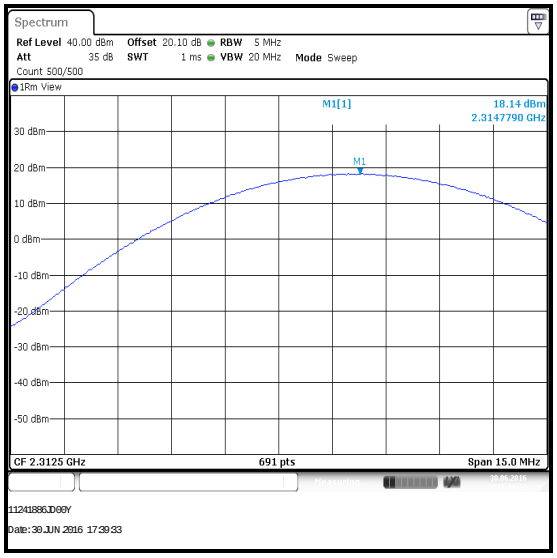


QPSK / 12 Resource Blocks (7 offset)

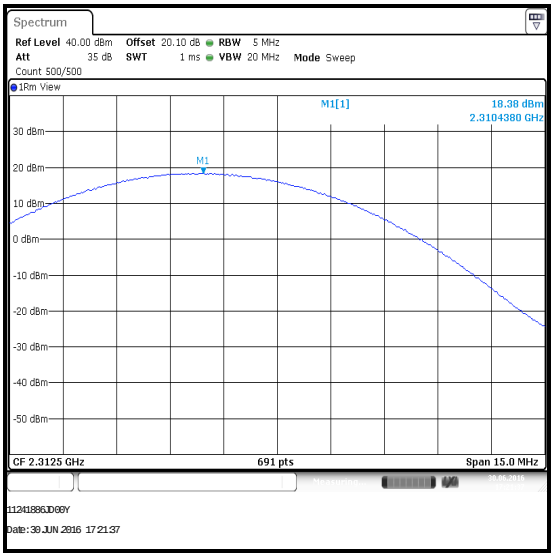
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

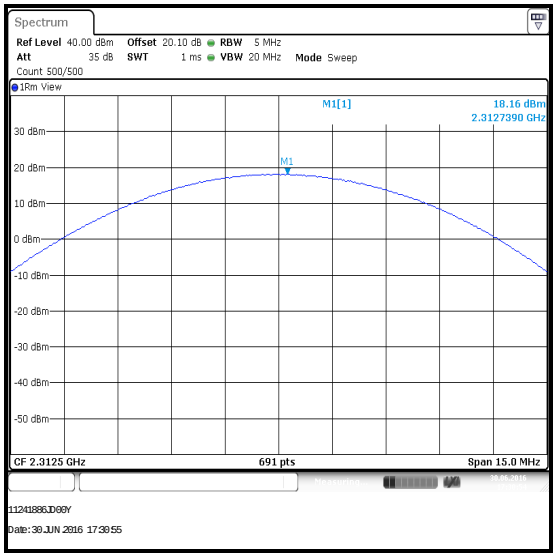
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	1	24	18.1	-0.3	17.8	24.0	6.2	Complied
2312.5	1	0	18.4	-0.3	18.1	24.0	5.9	Complied
2312.5	1	12	18.2	-0.3	17.9	24.0	6.1	Complied



QPSK / 1 Resource Block (24 offset)



QPSK / 1 Resource Block (0 offset)

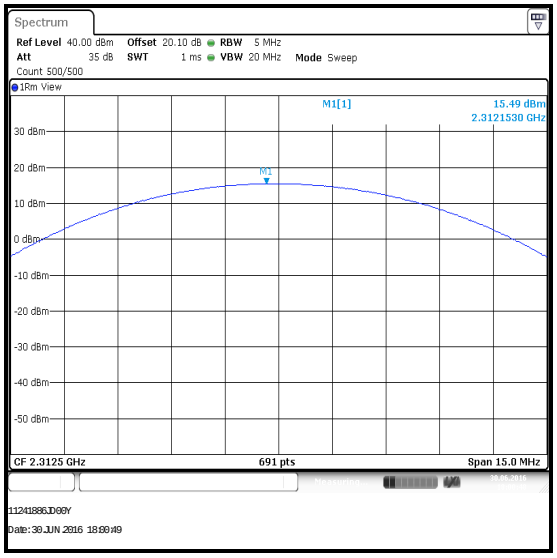


QPSK / 1 Resource Blocks (12 offset)

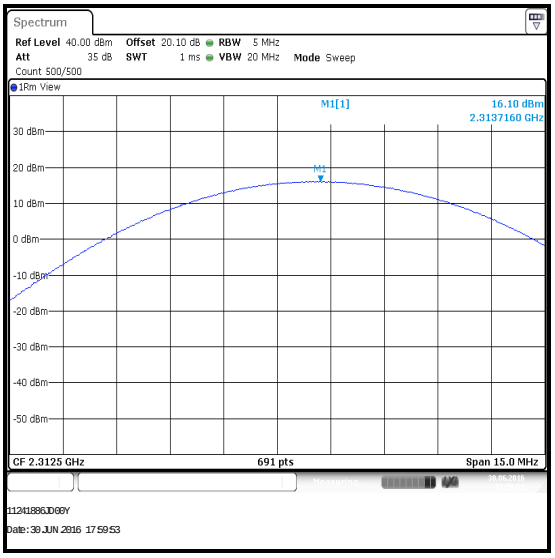
Transmitter Output Power Spectral Density (EIRP) (continued)

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

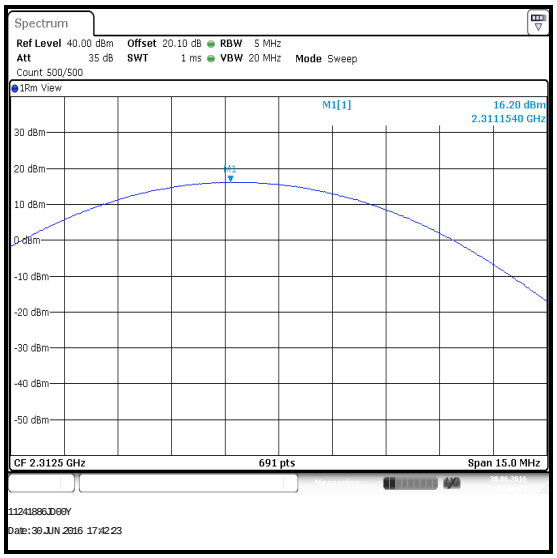
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	25	0	15.5	-0.3	15.2	24.0	8.8	Complied
2312.5	12	13	16.1	-0.3	15.8	24.0	8.2	Complied
2312.5	12	0	16.2	-0.3	15.9	24.0	8.1	Complied
2312.5	12	7	16.1	-0.3	15.8	24.0	8.2	Complied



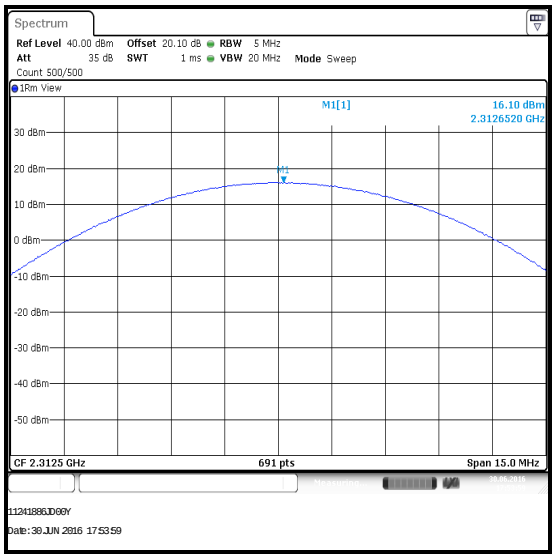
16QAM / 25 Resource Block (0 offset)



16QAM / 12 Resource Block (13 offset)



16QAM / 12 Resource Blocks (0 offset)

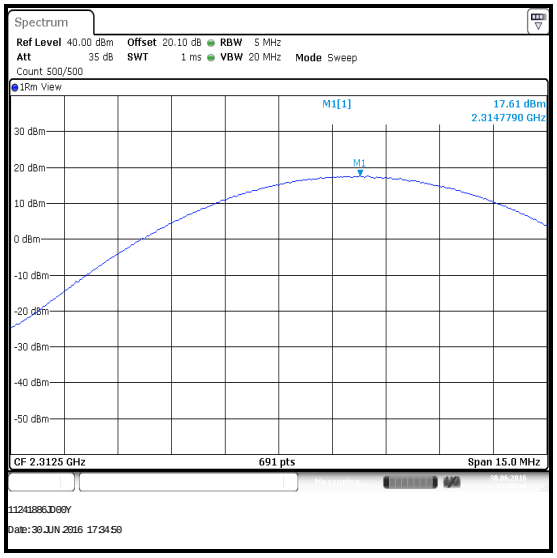


16QAM / 12 Resource Blocks (7 offset)

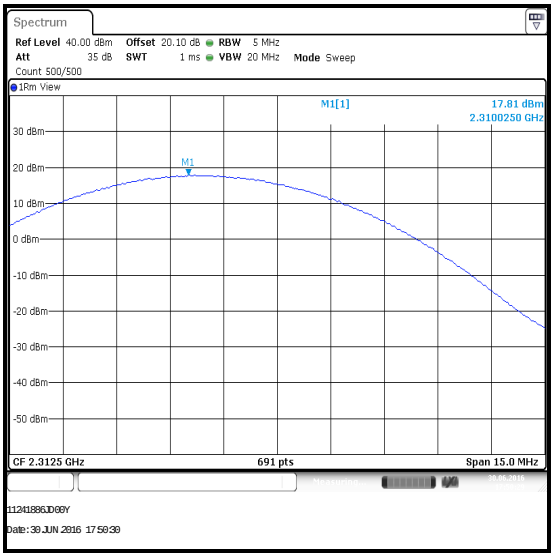
Transmitter Output Power Spectral Density (EIRP) (continued)

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

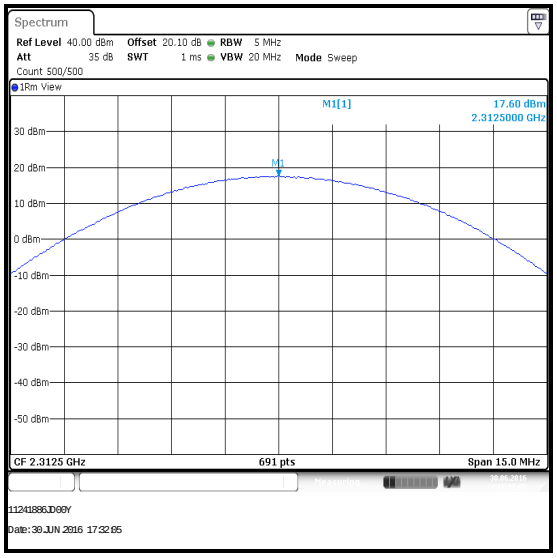
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2312.5	1	24	17.6	-0.3	17.3	24.0	6.7	Complied
2312.5	1	0	17.8	-0.3	17.5	24.0	6.5	Complied
2312.5	1	12	17.6	-0.3	17.3	24.0	6.7	Complied



16QAM / 1 Resource Block (24 offset)



16QAM / 1 Resource Block (0 offset)

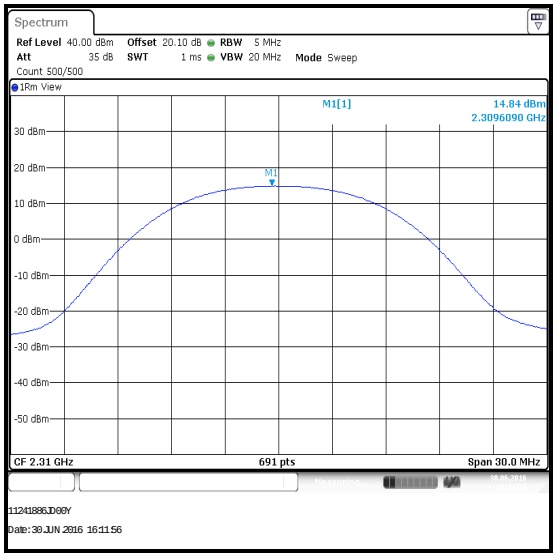


16QAM / 1 Resource Blocks (12 offset)

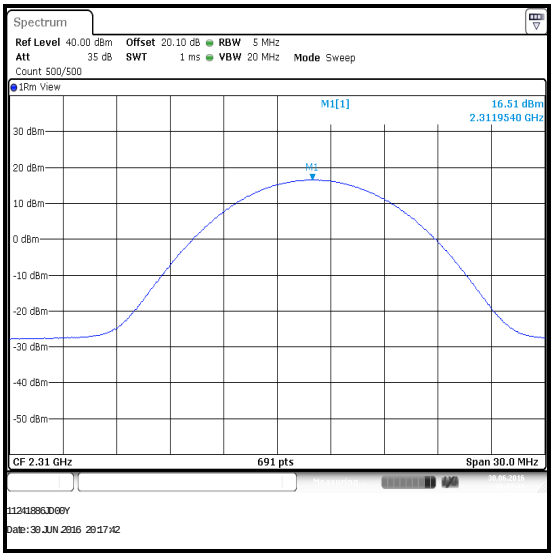
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

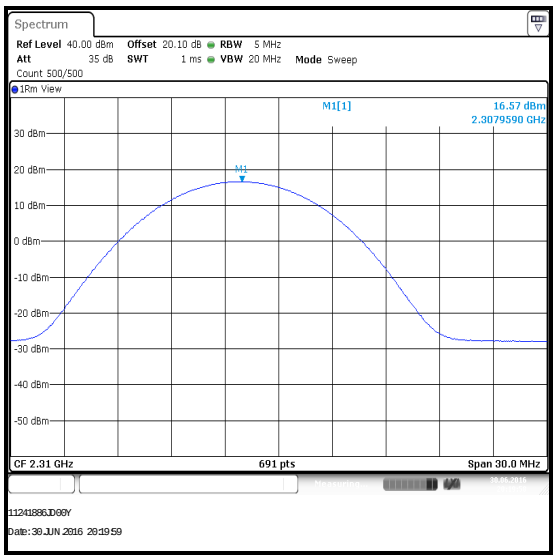
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	50	0	14.8	-0.3	14.5	24.0	9.5	Complied
2310.0	25	24	16.5	-0.3	16.2	24.0	7.8	Complied
2310.0	25	0	16.6	-0.3	16.3	24.0	7.7	Complied
2310.0	25	12	16.5	-0.3	16.2	24.0	7.8	Complied



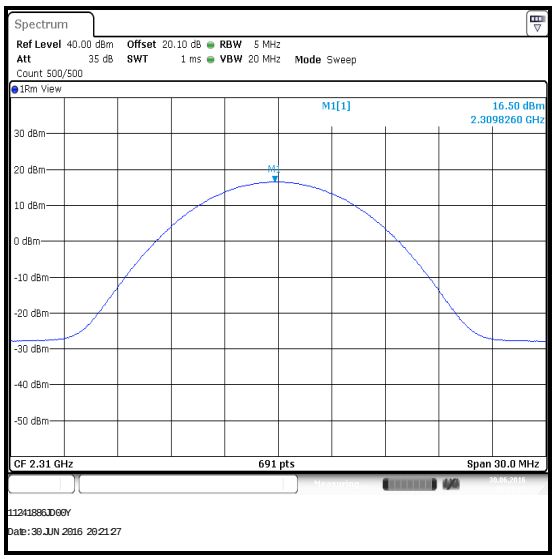
QPSK / 50 Resource Block (0 offset)



QPSK / 25 Resource Block (24 offset)



QPSK / 25 Resource Blocks (0 offset)

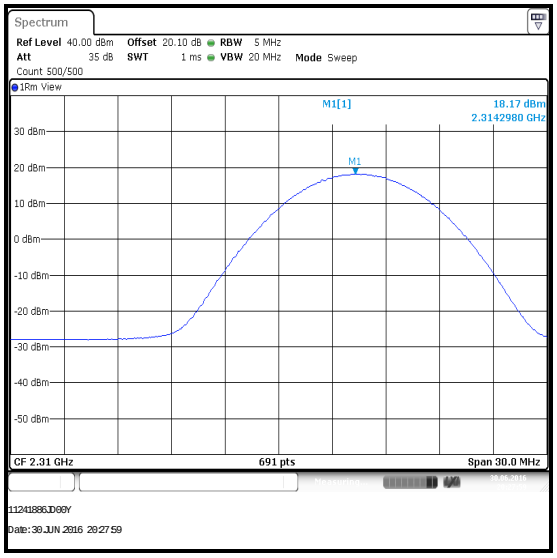


QPSK / 25 Resource Blocks (12 offset)

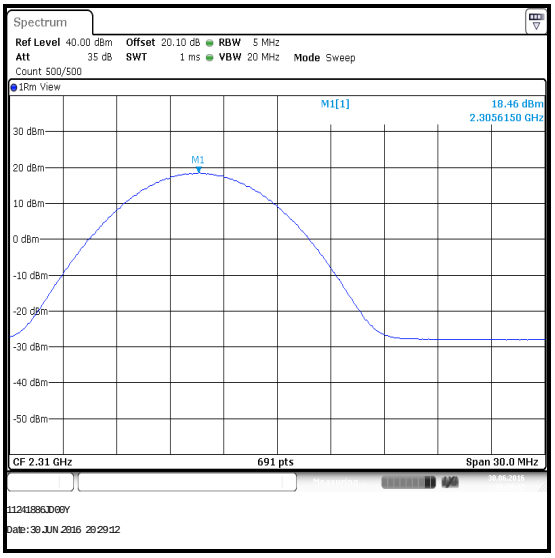
Transmitter Output Power Spectral Density (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

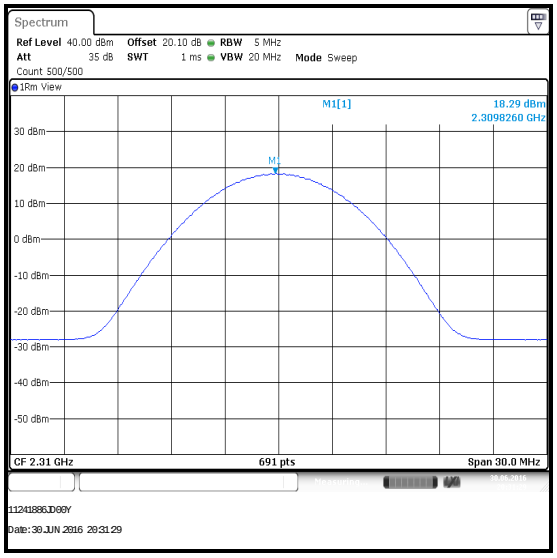
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	49	18.2	-0.3	17.9	24.0	6.1	Complied
2310.0	1	0	18.5	-0.3	18.2	24.0	5.8	Complied
2310.0	1	24	18.3	-0.3	18.0	24.0	6.0	Complied



QPSK / 1 Resource Block (49 offset)



QPSK / 1 Resource Block (0 offset)

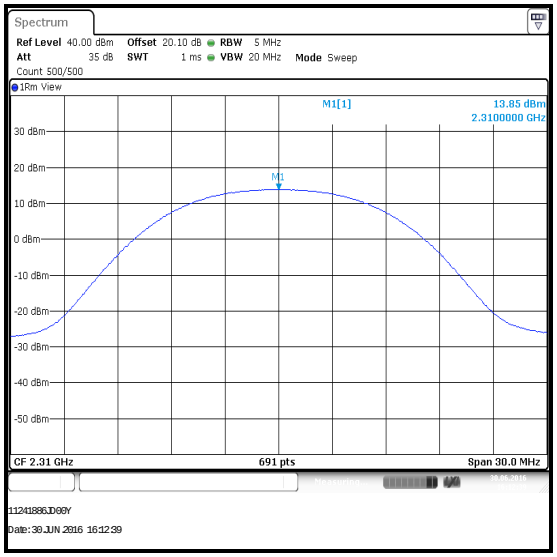


QPSK / 1 Resource Blocks (24 offset)

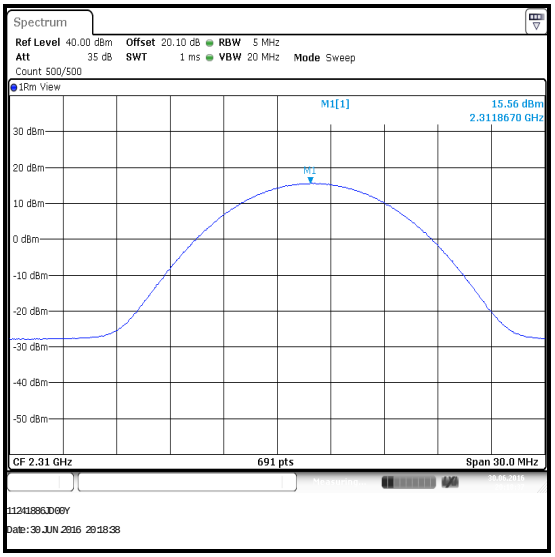
Transmitter Output Power Spectral Density (EIRP) (continued)

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

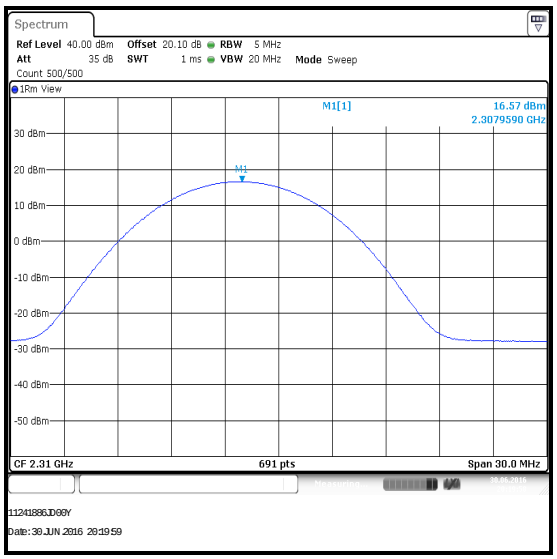
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	50	0	13.9	-0.3	13.6	24.0	10.5	Complied
2310.0	25	24	15.6	-0.3	15.3	24.0	8.7	Complied
2310.0	25	0	16.6	-0.3	16.3	24.0	7.7	Complied
2310.0	25	12	15.6	-0.3	15.3	24.0	8.7	Complied



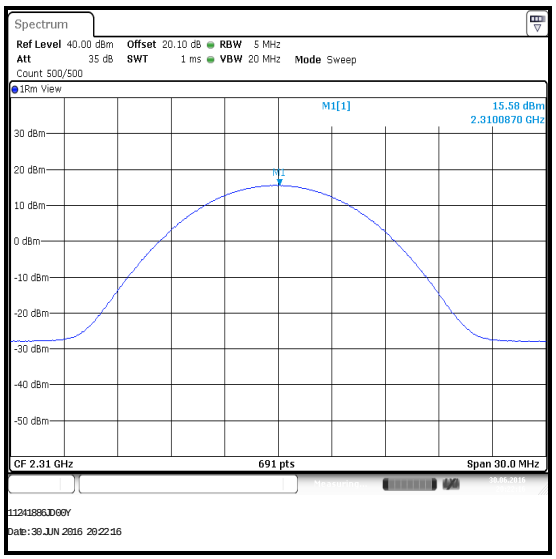
16QAM / 50 Resource Block (0 offset)



16QAM / 25 Resource Block (24 offset)



16QAM / 25 Resource Blocks (0 offset)

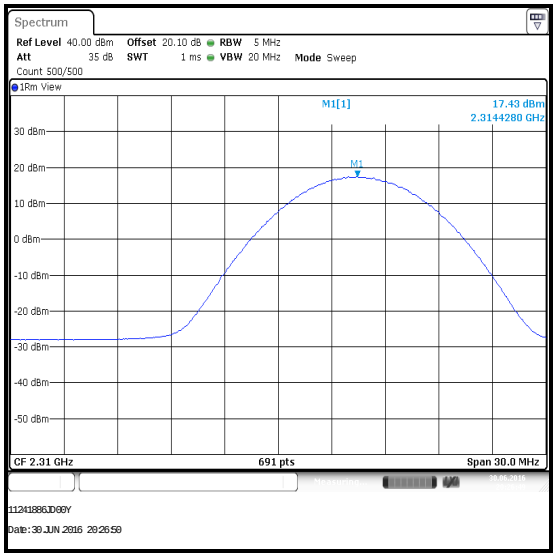


16QAM / 25 Resource Blocks (12 offset)

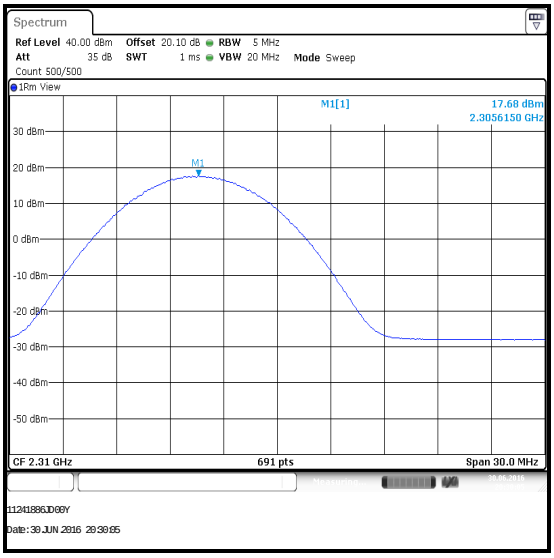
Transmitter Output Power Spectral Density (EIRP) (continued)

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

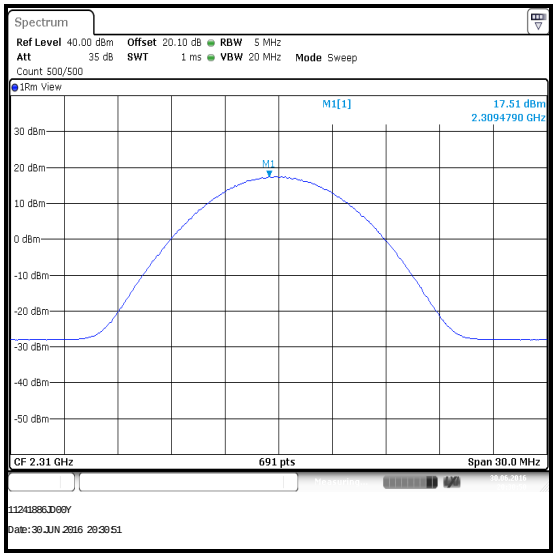
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted PSD (dBm/5 MHz)	Antenna Gain (dBi)	PSD EIRP (dBm/ 5 MHz)	EIRP Limit (dBm/ 5 MHz)	Margin (dB)	Result
2310.0	1	49	17.4	-0.3	17.1	24.0	6.9	Complied
2310.0	1	0	17.7	-0.3	17.4	24.0	6.6	Complied
2310.0	1	24	17.5	-0.3	17.2	24.0	6.8	Complied



16QAM / 1 Resource Block (49 offset)



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Blocks (24 offset)

Transmitter Output Power Spectral Density (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	Communications Tester	Rohde & Schwarz	CMW500	145923	05 Apr 2017	12
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	27 Jun 2017	12
M1883	Signal Analyser	Rohde & Schwarz	FSV30	103084	09 May 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	-
S0562	Power Supply	Thurlby Thandar	PL330QMD	054895	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	13 May 2017	12
G0628	Signal Generator	Rohde & Schwarz	SMBV100A	261847	25 Jan 2017	12
M1835	Signal Analyser	Rohde & Schwarz	FSV30	103050	26 Feb 2017	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	11 Apr 2018	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	15 Apr 2018	24

5.2.3. Transmitter Occupied Bandwidth

Test Summary:

Test Engineer:	Keith Tucker	**Test Date:**	22 June 2016
Test Sample IMEI:	358640070064218		

FCC Reference:	Part 2.1049
Test Method Used:	KDB 971168 Section 4.2

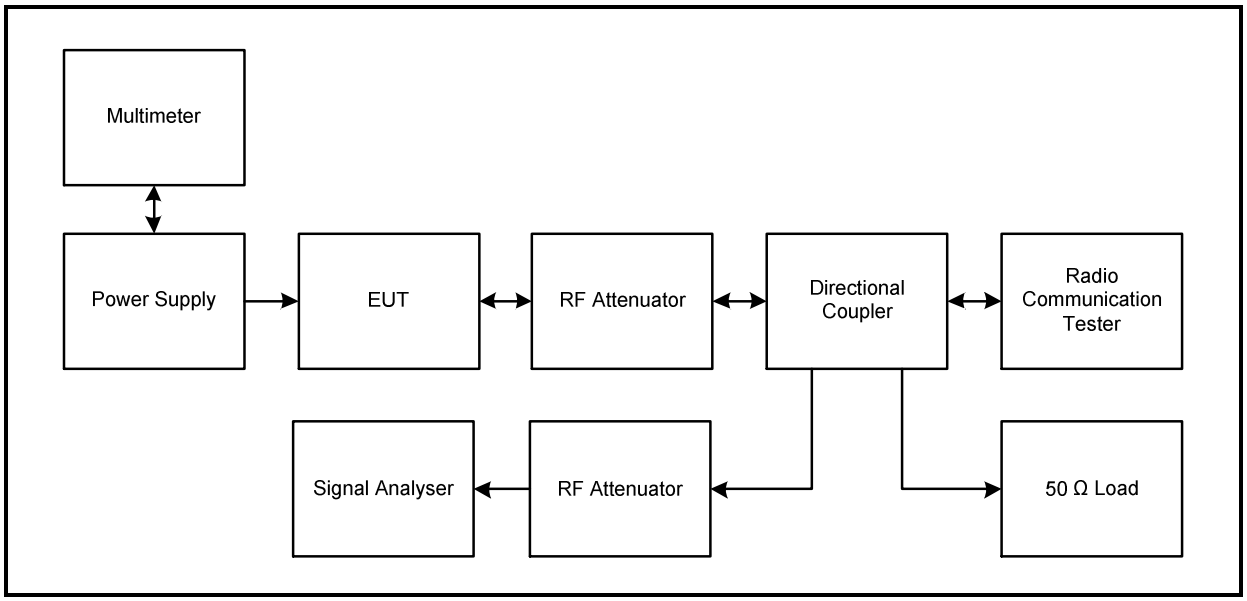
Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	56

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.

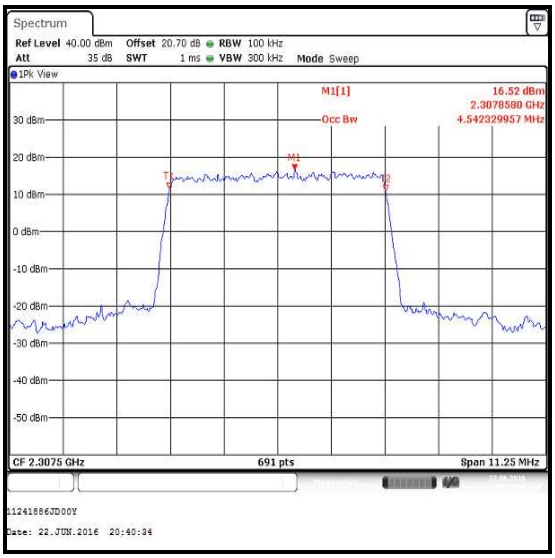
Test setup:



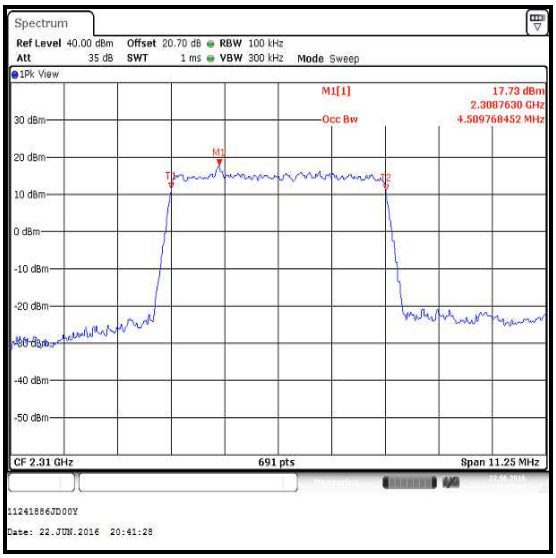
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / QPSK

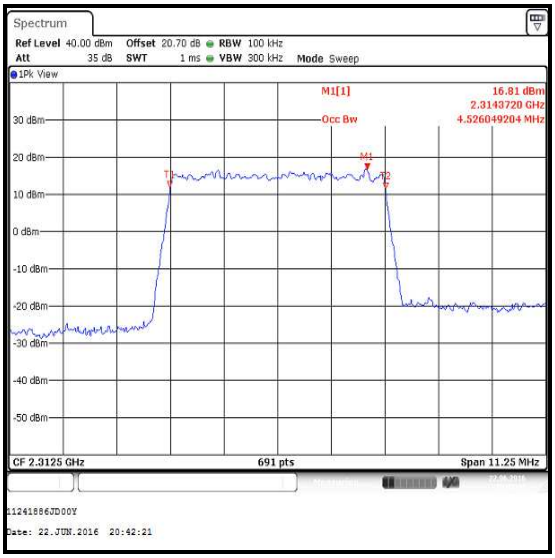
Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	25	0	100	300	4.542
Middle	25	0	100	300	4.510
Top	25	0	100	300	4.526



Bottom Channel / QPSK



Middle Channel / QPSK

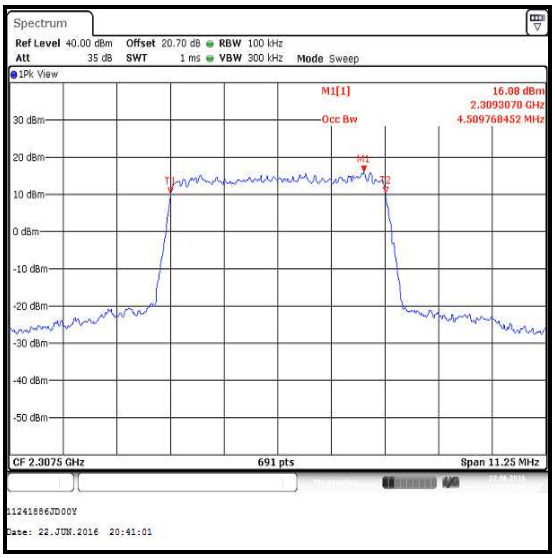


Top Channel / QPSK

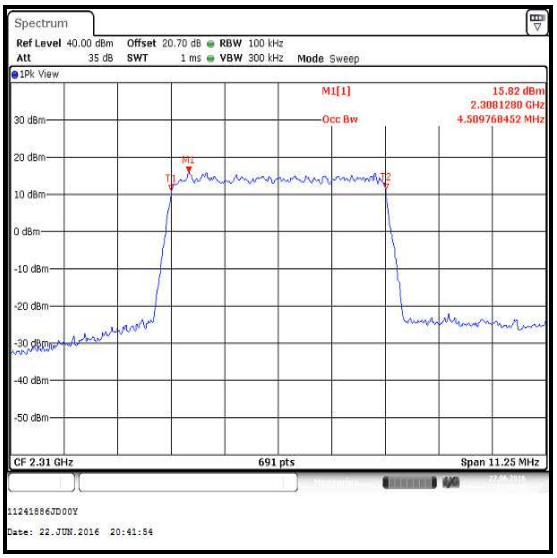
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

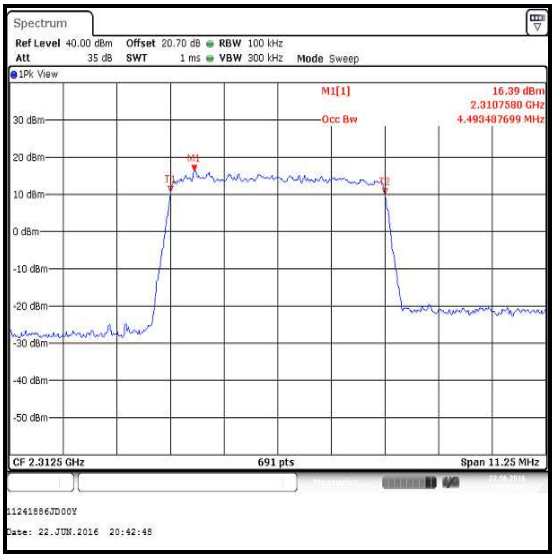
Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	25	0	100	300	4.510
Middle	25	0	100	300	4.510
Top	25	0	100	300	4.493



Bottom Channel / 16QAM



Middle Channel / 16QAM

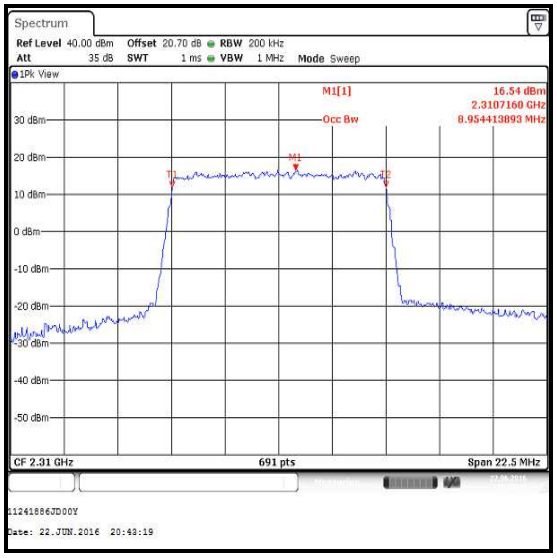


Top Channel / 16QAM

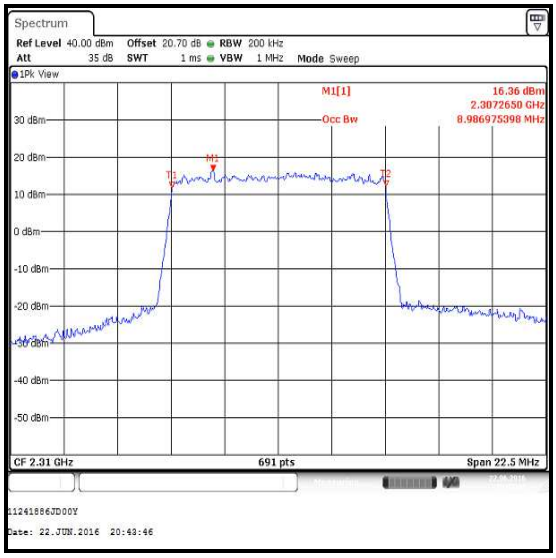
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel

Modulation	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
QPSK	50	0	200	1000	8.954
16QAM	50	0	200	1000	8.987



Middle Channel / QPSK



Middle Channel / 16QAM

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
M1996	Signal Analyser	Rohde & Schwarz	FSV13	100975	02 Mar 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 839	Calibrated before use	-
S0562	Power Supply	Thurlby Thandar	PL330QMD	054895	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	26 May 2016	12
G0628	Signal Generator	Rohde & Schwarz	SMBV100A	261847	25 Jan 2017	12

5.2.4. Transmitter Radiated Spurious Emissions – LAT

Test Summary:

Test Engineers:	Georgios Vrezas & Nick Steele	**Test Date:**	10 July 2016
Test Sample IMEI:	358640070063996		

FCC Reference:	Parts 2.1053 & 27.53(a)(4)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 2.1053
Frequency Range:	30 MHz to 24 GHz
Configuration:	10 MHz, QPSK, 1RB, 0 Offset

Environmental Conditions:

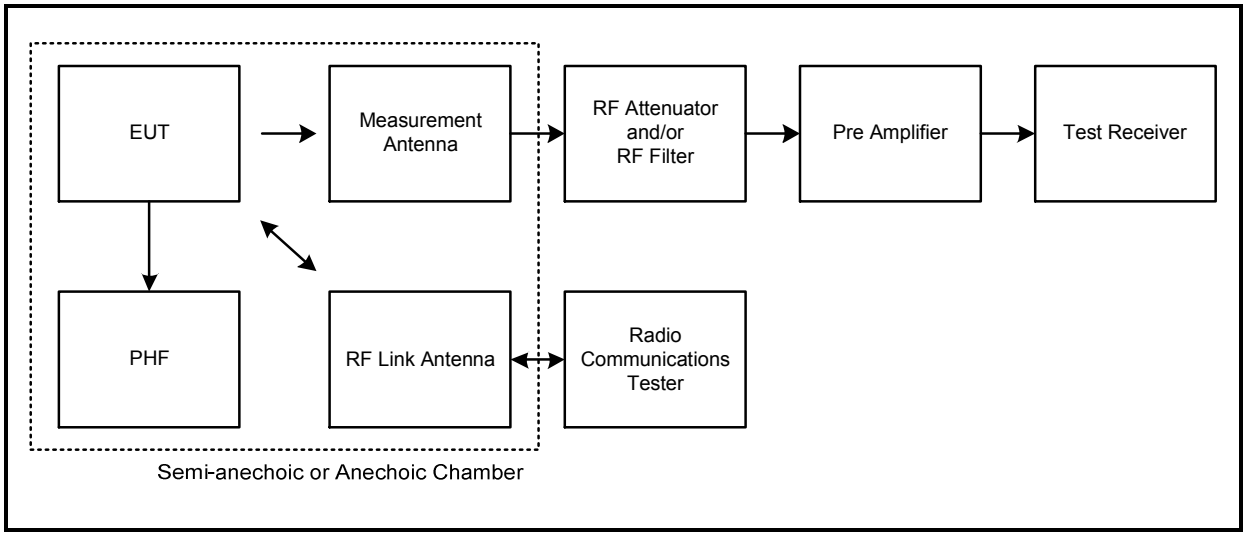
Temperature (°C):	25 to 26
Relative Humidity (%):	39 to 49

Note(s):

1. The EUT was set to transmit with a 10 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and was therefore deemed to be the worst case.
2. The emission seen on the 1 GHz to 3 GHz plot at approximately 2310 MHz is the EUT carrier.
3. No spurious emissions were detected above the measurement system noise floor therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Middle channel results are recorded in this report and are representative of bottom and top channel results which are held on the UL IT server and available for inspection on request.
5. Pre-scan measurements below 1 GHz are performed on separate plots with different transducer factors for vertical and horizontal polarisation. The pre-scan plot for 30 MHz to 1 GHz in this test report is for vertical only. All other plots are stored on the company server and are available if required.
6. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
7. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT.
8. Radiated spurious emission testing between 150 kHz and 30 MHz was performed for support of the NFC test report. No spurious emissions were observed above the noise floor of the measurement system.

Transmitter Radiated Spurious Emissions – LAT (continued)

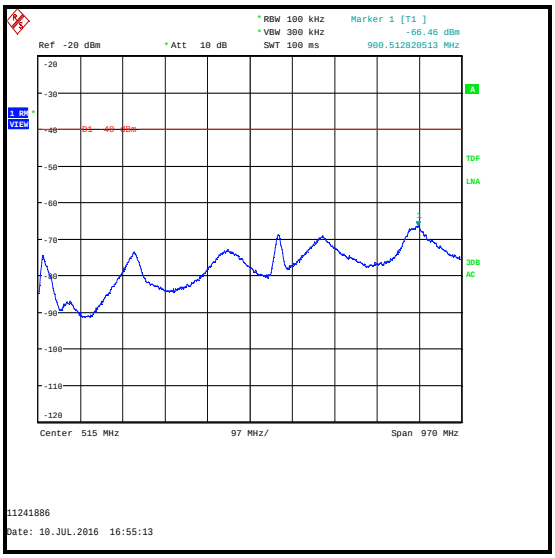
Test setup for radiated measurements:

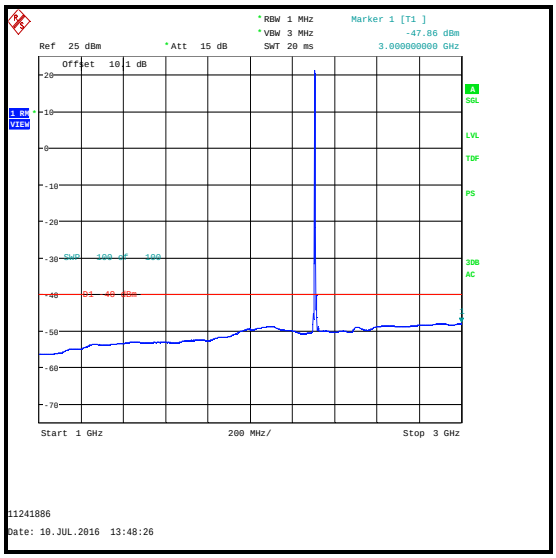


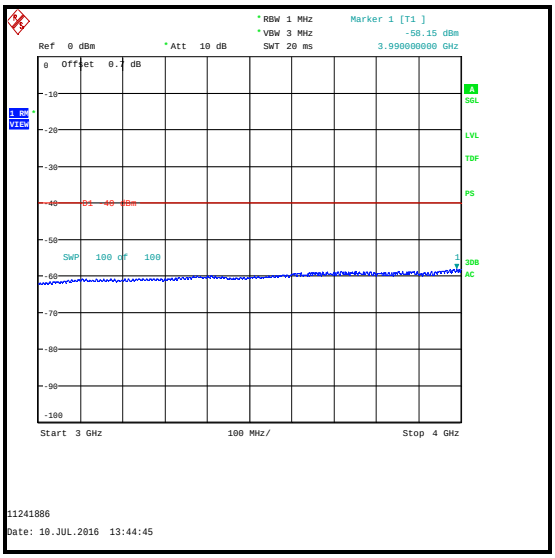
Results: Middle Channel

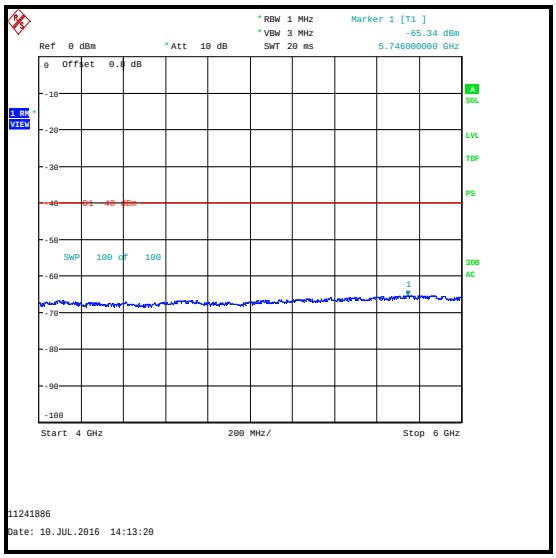
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
3000.000	-47.9	-40.0	7.9	Complied

Transmitter Radiated Spurious Emissions – LAT (continued)

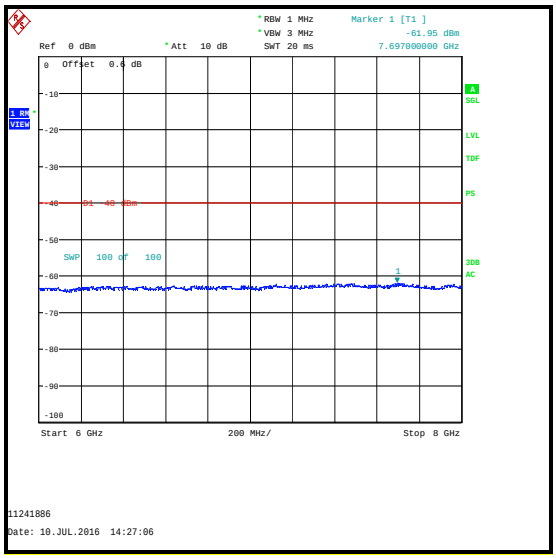


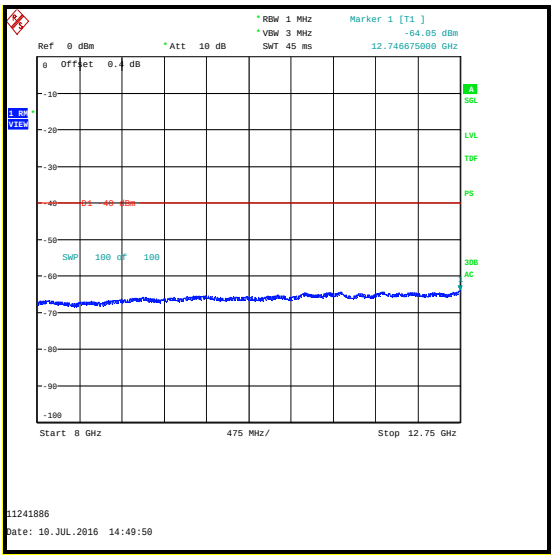


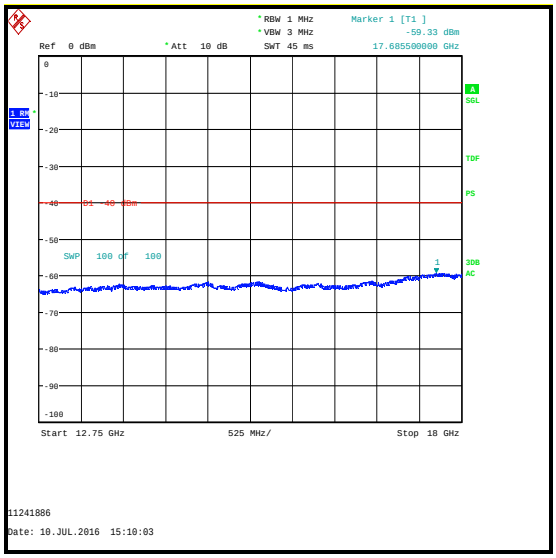


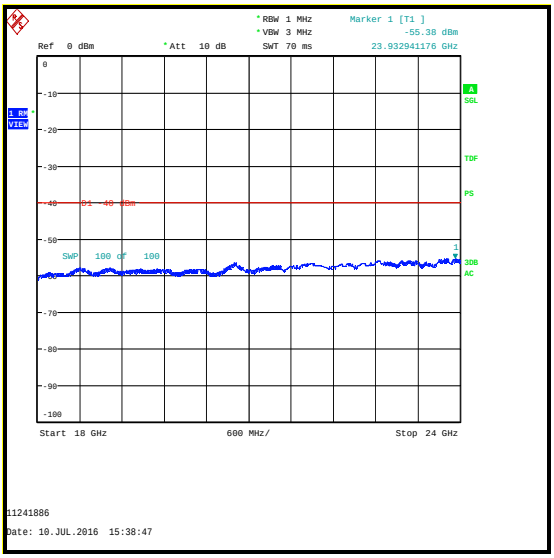


Transmitter Radiated Spurious Emissions – LAT (continued)









Transmitter Radiated Spurious Emissions – LAT (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	07 Apr 2017	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	02 Apr 2017	12
K0002	3m RSE Chamber	Rainford	N/A	N/A	21 Dec 2016	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 Mar 2017	12
A1818	Antenna	EMCO	3115	00075692	17 Dec 2016	12
A253	Antenna	Flann Microwave	12240-20	128	17 Dec 2016	12
A254	Antenna	Flann Microwave	14240-20	139	17 Dec 2016	12
A255	Antenna	Flann Microwave	16240-20	519	17 Dec 2016	12
A256	Antenna	Flann Microwave	18240-20	400	17 Dec 2016	12
A436	Antenna	Flann Microwave	20240-20	330	19 Dec 2016	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	26 Apr 2017	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	26 Apr 2017	12

5.2.5. Transmitter Radiated Spurious Emissions – UAT

Test Summary:

Test Engineers:	Georgios Vrezas & Nick Steele	**Test Date:**	10 July 2016
Test Sample IMEI:	358640070066106		

FCC Reference:	Parts 2.1053 & 27.53(a)(4)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 2.1053
Frequency Range:	30 MHz to 24 GHz
Configuration:	10 MHz, QPSK, 1RB, 0 Offset

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	38 to 43

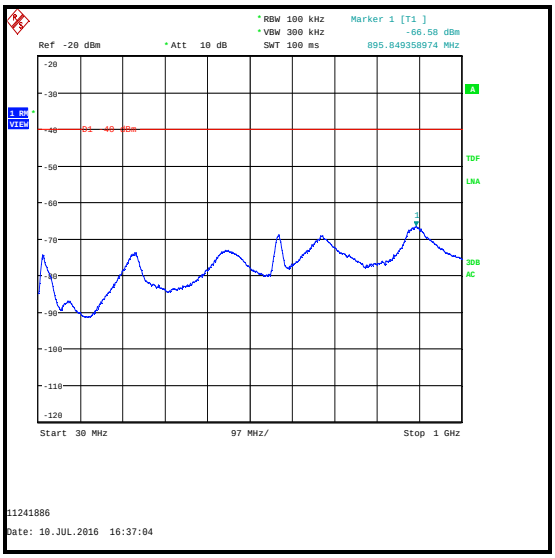
Note(s):

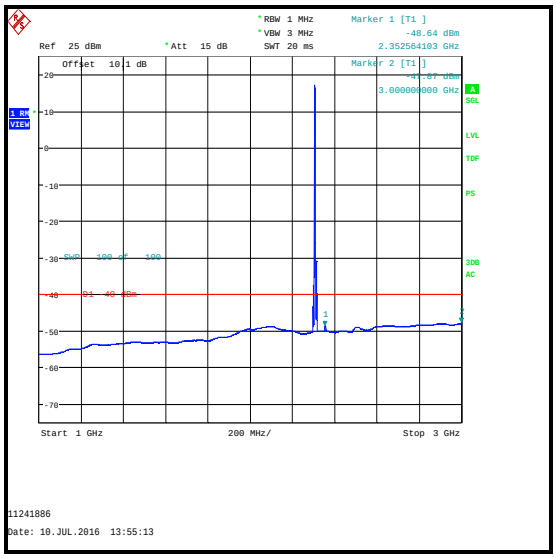
1. The EUT was set to transmit with a 10 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and was therefore deemed to be the worst case.
2. The emission seen on the 1 GHz to 3 GHz plot at approximately 2310 MHz is the EUT carrier.
3. No spurious emissions were detected above the measurement system noise floor therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Middle channel results are recorded in this report and are representative of bottom and top channel results which are held on the UL IT server and available for inspection on request.
5. Pre-scan measurements below 1 GHz are performed on separate plots with different transducer factors for vertical and horizontal polarisation. The pre-scan plot for 30 MHz to 1 GHz in this test report is for vertical only. All other plots are stored on the company server and are available if required.
6. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
7. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT.
8. Radiated spurious emission testing between 150 kHz and 30 MHz was performed for support of the NFC test report. No spurious emissions were observed above the noise floor of the measurement system.

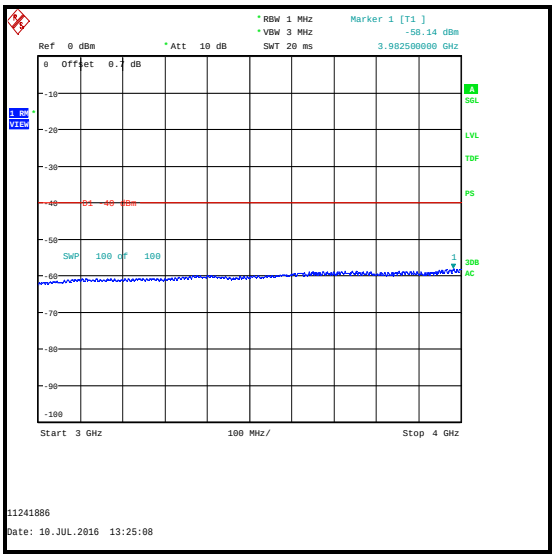
Results: Middle Channel

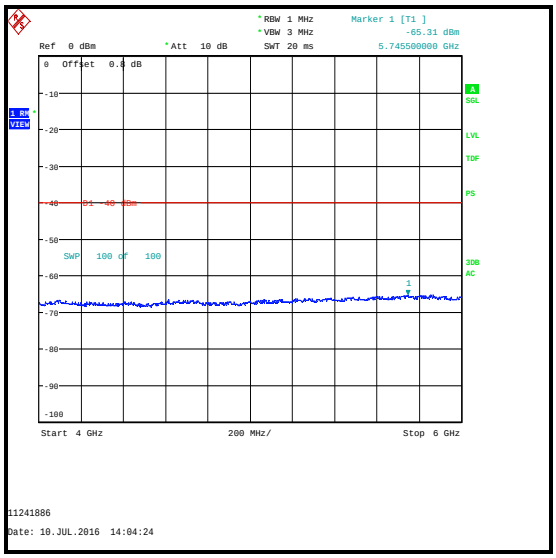
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
3000.000	-47.1	-40.0	7.1	Complied

Transmitter Radiated Spurious Emissions – UAT (continued)

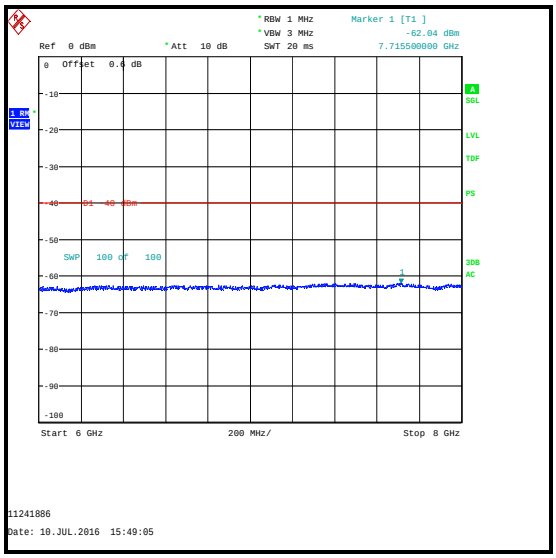


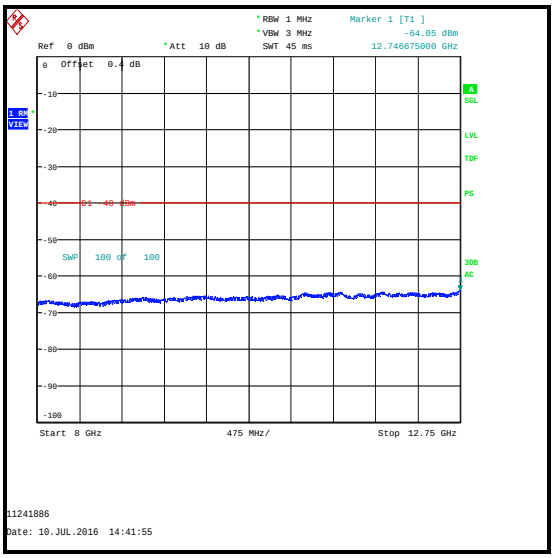


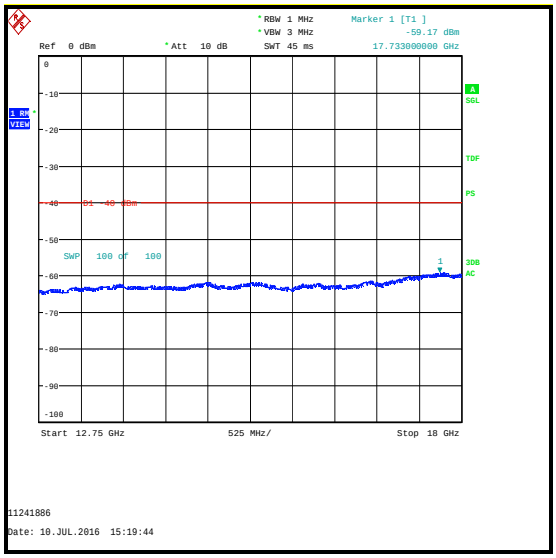


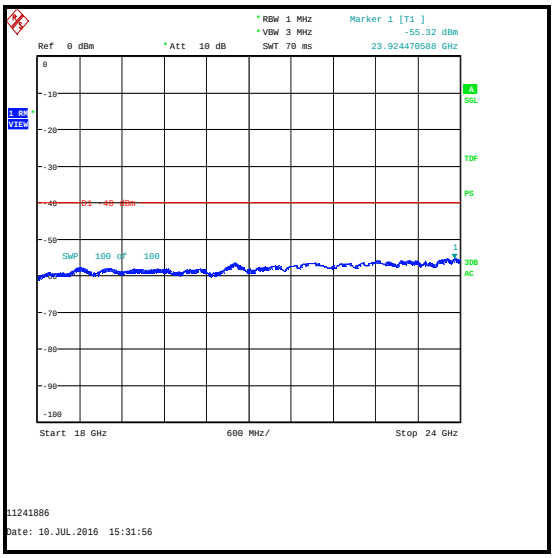


Transmitter Out of Band Radiated Emissions – UAT (continued)









Transmitter Out of Band Radiated Emissions – UAT (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	07 Apr 2017	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	02 Apr 2017	12
K0002	3m RSE Chamber	Rainford	N/A	N/A	21 Dec 2016	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 Mar 2017	12
A1818	Antenna	EMCO	3115	00075692	17 Dec 2016	12
A253	Antenna	Flann Microwave	12240-20	128	17 Dec 2016	12
A254	Antenna	Flann Microwave	14240-20	139	17 Dec 2016	12
A255	Antenna	Flann Microwave	16240-20	519	17 Dec 2016	12
A256	Antenna	Flann Microwave	18240-20	400	17 Dec 2016	12
A436	Antenna	Flann Microwave	20240-20	330	19 Dec 2016	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	26 Apr 2017	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	26 Apr 2017	12

5.2.6. Transmitter Radiated Emissions at Band Edges - LAT

Test Summary:

David Doyle	Nick Steele	**Test Date:**	29 June 2016
Test Sample IMEI:	358640070087480		

FCC Reference:	Parts 2.1053 & 27.53(a)(4)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 27.53

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	40

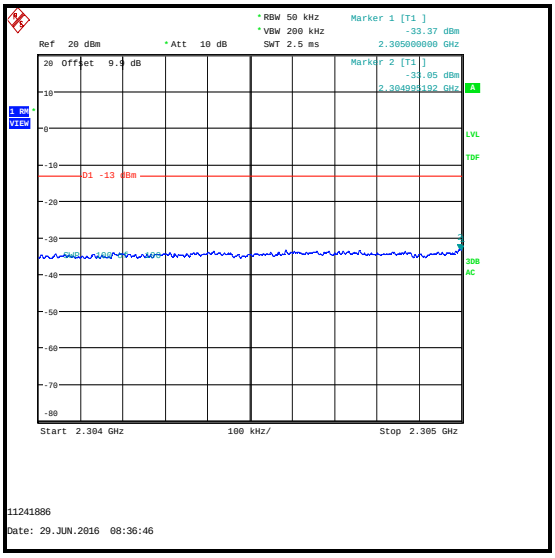
Note(s):

1. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with the resource blocks settings as detailed in section 4.3 of this report.
2. Measurements were performed in a fully anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT.
3. 5 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 50 kHz (>1% of the emission bandwidth) and video bandwidth of 200 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
4. 10 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 100 kHz (>1% of the emission bandwidth) and video bandwidth of 300 kHz (three times the resolution bandwidth).

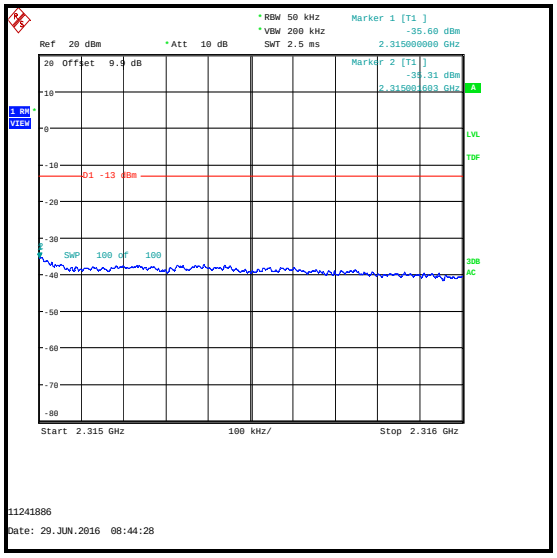
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.999	25	0	-33.1	-13.0	20.1	Complied
2305	25	0	-33.4	-13.0	20.4	Complied
2315	25	0	-35.6	-13.0	22.6	Complied
2315.002	25	0	-35.3	-13.0	22.3	Complied



QPSK / Lower Band Edge

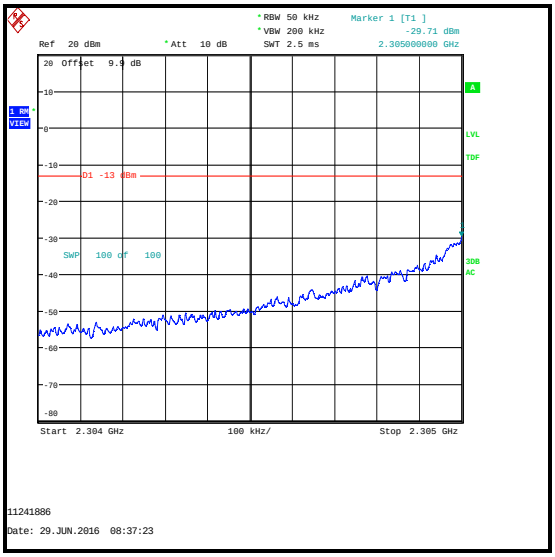


QPSK / Upper Band Edge

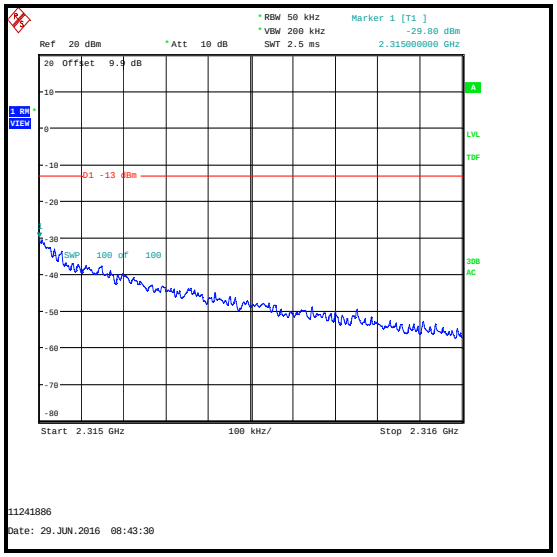
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / QPSK

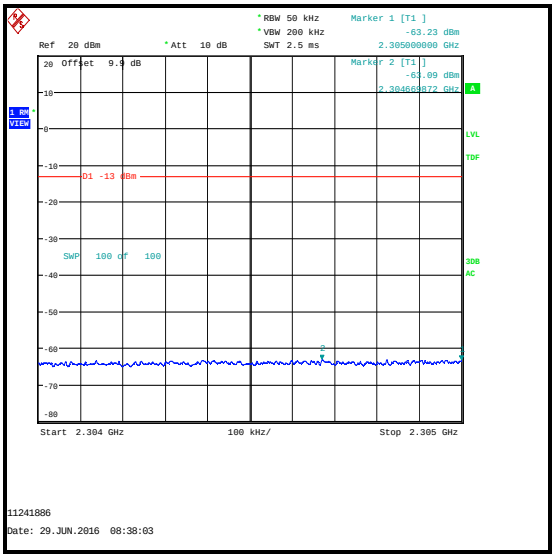
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2305	1	0	-29.7	-13.0	16.7	Complied
2315	1	24	-29.8	-13.0	16.8	Complied
2305	1	24	-63.2	-13.0	50.2	Complied
2315	1	0	-63.7	-13.0	50.7	Complied



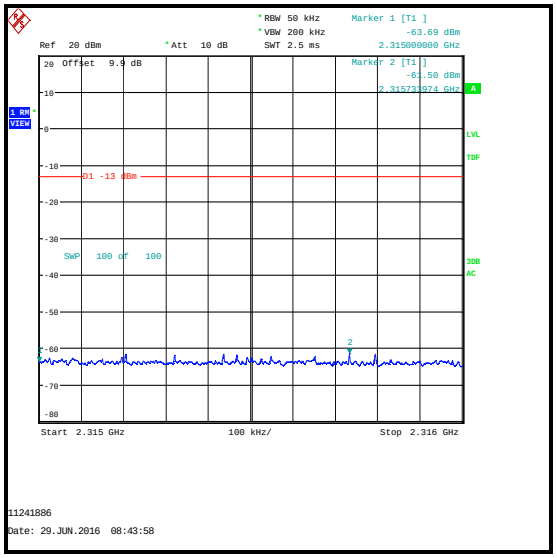
QPSK / 1 RB 0 Offset / Lower Band Edge



QPSK / 1 RB 24 Offset / Upper Band Edge



QPSK / 1 RB 24 Offset / Lower Band Edge

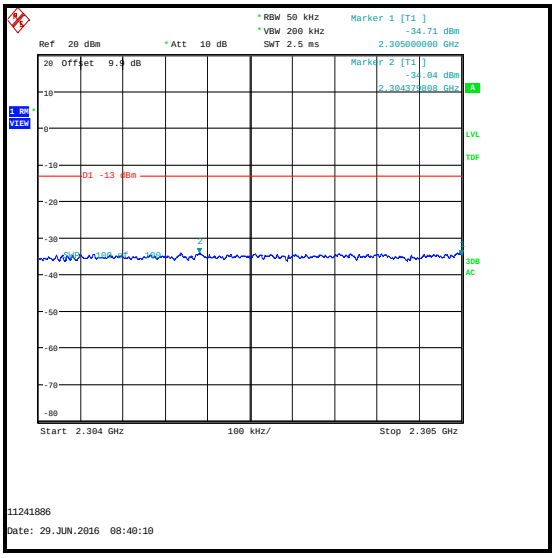


QPSK / 1 RB 0 Offset / Upper Band Edge

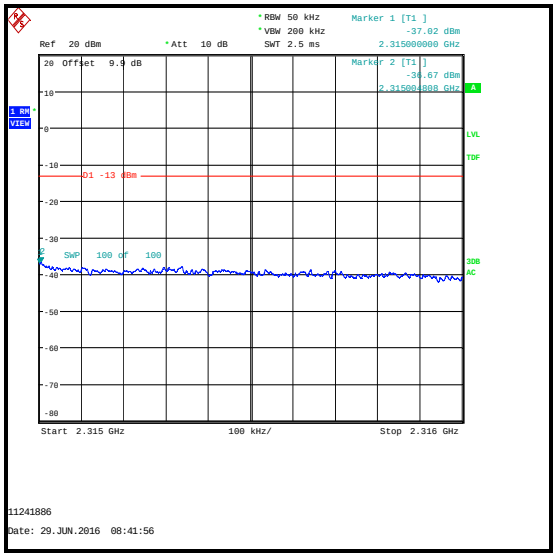
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.380	25	0	-34.0	-13.0	21.0	Complied
2305	25	0	-34.7	-13.0	21.7	Complied
2315	25	0	-37.0	-13.0	24.0	Complied
2315.005	25	0	-36.7	-13.0	23.7	Complied



16QAM / Lower Band Edge

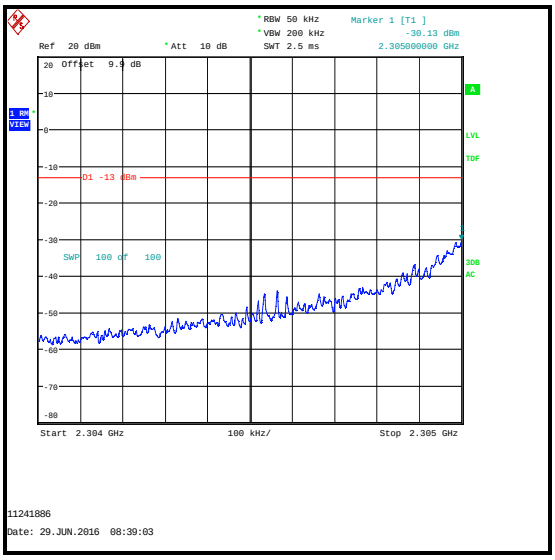


16QAM / Upper Band Edge

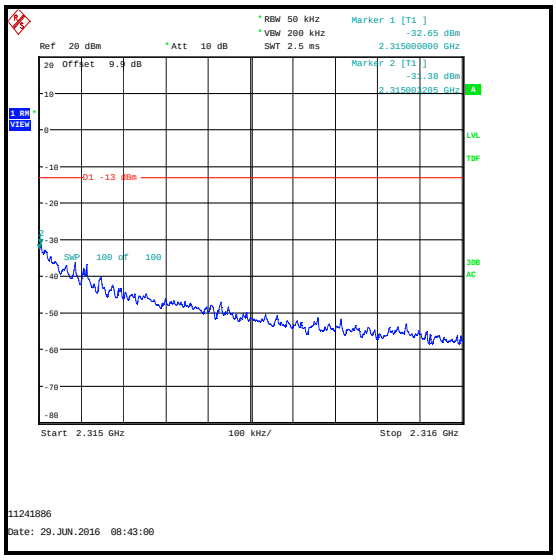
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

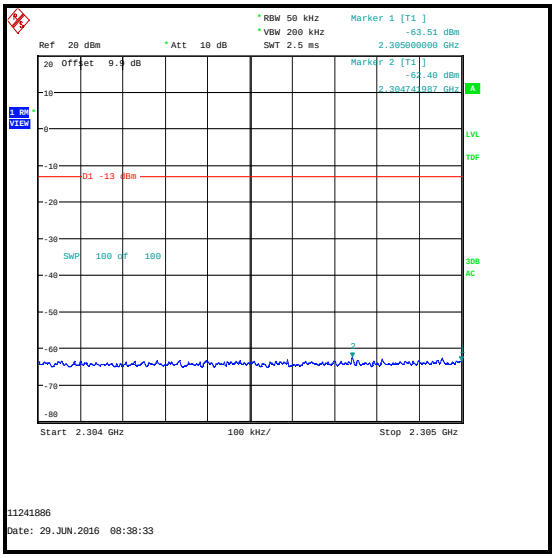
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2305	1	0	-30.1	-13.0	17.1	Complied
2315	1	24	-32.7	-13.0	19.7	Complied
2315.003	1	24	-31.4	-13.0	18.4	Complied
2305	1	24	-63.5	-13.0	50.5	Complied
2315	1	0	-63.8	-13.0	50.8	Complied



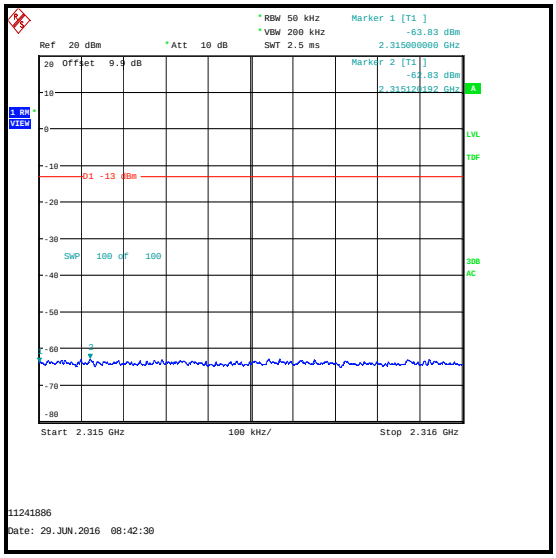
16QAM / 1 RB 0 Offset / Lower Band Edge



16QAM / 1 RB 24 Offset / Upper Band Edge



16QAM / 1 RB 24 Offset / Lower Band Edge

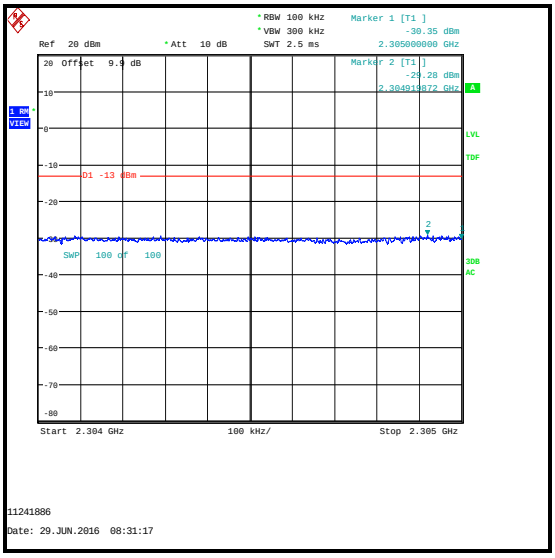


16QAM / 1 RB 0 Offset / Upper Band Edge

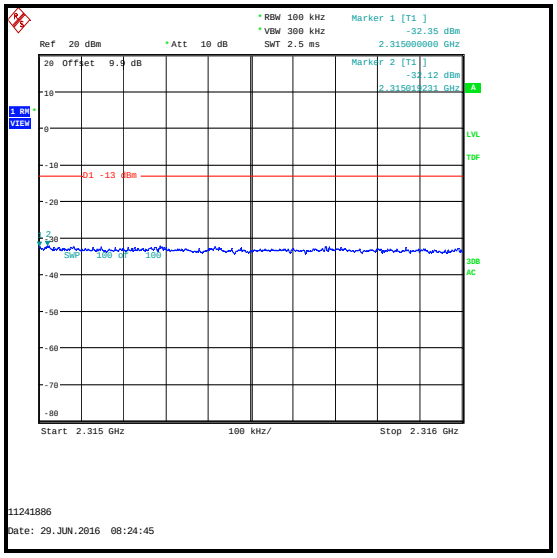
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.920	50	0	-29.3	-13.0	16.3	Complied
2305	50	0	-30.4	-13.0	17.4	Complied
2315	50	0	-32.4	-13.0	19.4	Complied
2315.019	50	0	-32.1	-13.0	19.1	Complied



QPSK / Lower Band Edge

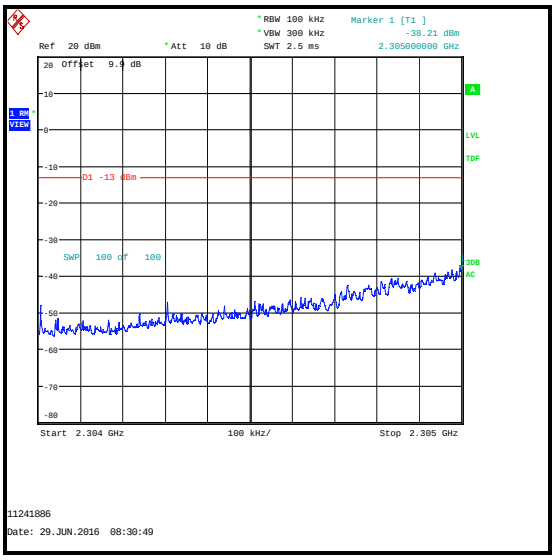


QPSK / Upper Band Edge

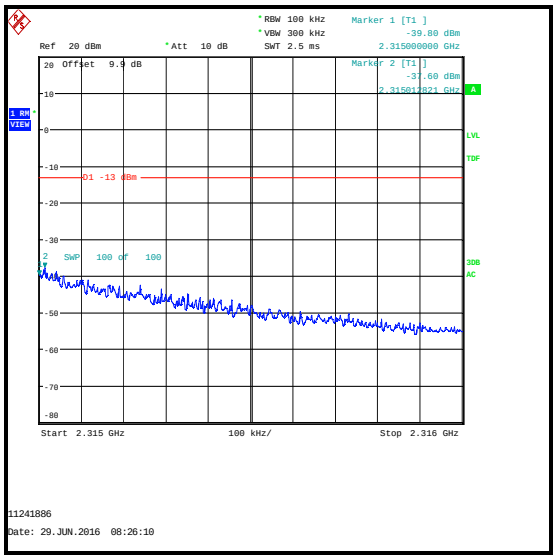
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / QPSK

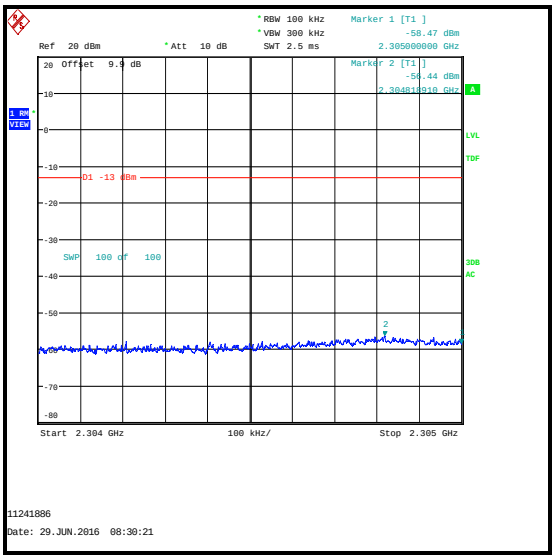
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2305	1	0	-38.2	-13.0	25.2	Complied
2315	1	49	-39.8	-13.0	26.8	Complied
2315.013	1	49	-37.6	-13.0	24.6	Complied
2305	1	49	-58.5	-13.0	45.5	Complied
2315	1	0	-58.7	-13.0	45.7	Complied



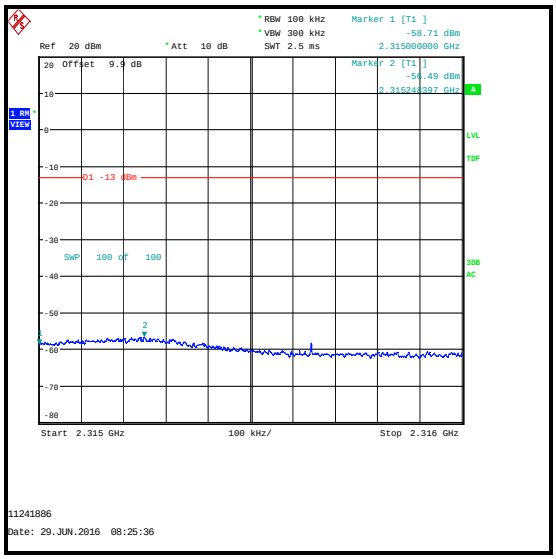
QPSK / 1 RB 0 Offset / Lower Band Edge



QPSK / 1 RB 49 Offset / Upper Band Edge



QPSK / 1 RB 49 Offset / Lower Band Edge

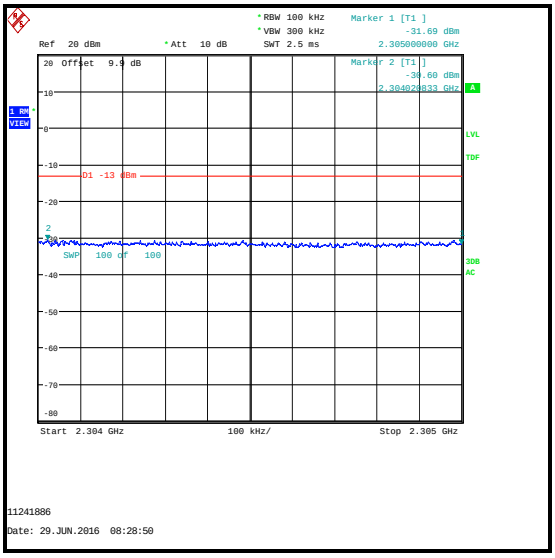


QPSK / 1 RB 0 Offset / Upper Band Edge

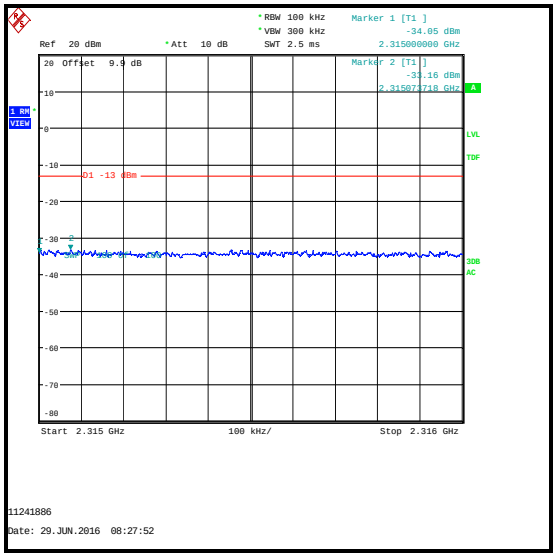
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.021	50	0	-30.6	-13.0	17.6	Complied
2305	50	0	-31.7	-13.0	28.7	Complied
2315	50	0	-34.1	-13.0	21.1	Complied
2315.074	50	0	-33.2	-13.0	20.2	Complied



16QAM / Lower Band Edge

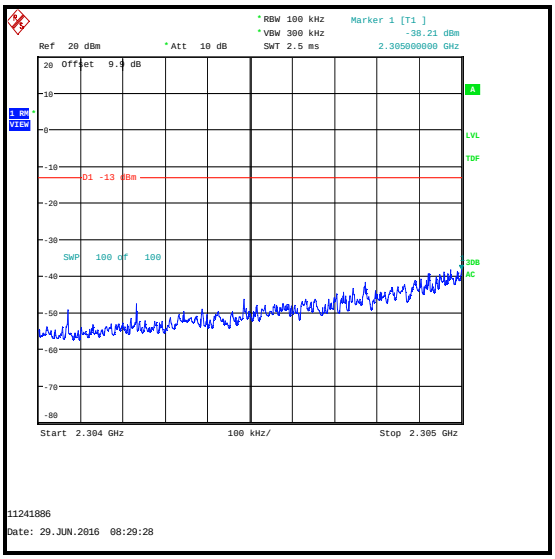


16QAM / Upper Band Edge

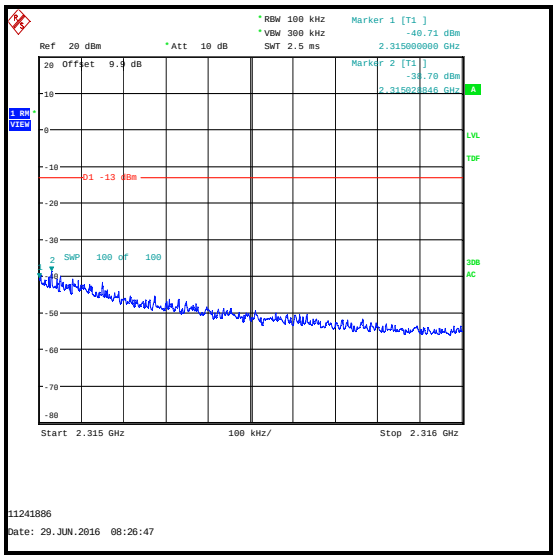
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / 16QAM

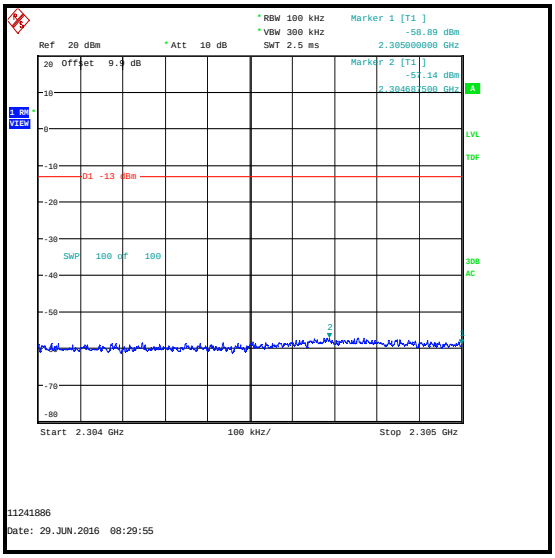
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2305	1	0	-38.2	-13.0	25.2	Complied
2315	1	49	-40.7	-13.0	27.7	Complied
2315.029	1	49	-38.7	-13.0	25.7	Complied
2305	1	49	-58.9	-13.0	45.9	Complied
2315	1	0	-59.5	-13.0	46.5	Complied



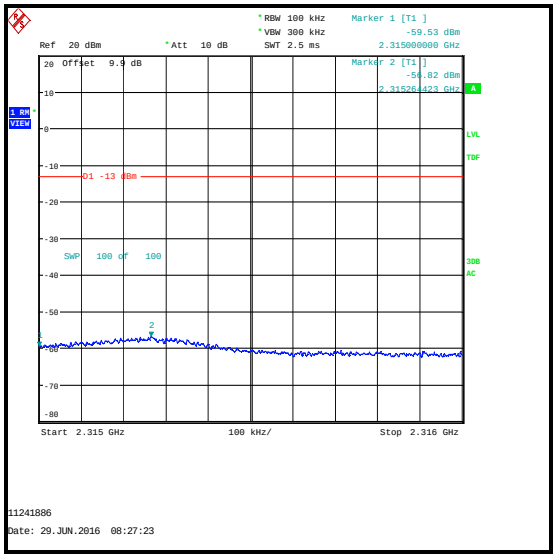
16QAM / 1 RB 0 Offset / Lower Band Edge



16QAM / 1 RB 49 Offset / Upper Band Edge



16QAM / 1 RB 49 Offset / Lower Band Edge



16QAM / 1 RB 0 Offset / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2863	Pre-Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B	07 Apr 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12

5.2.7. Transmitter Radiated Emissions at Band Edges - UAT

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	29 June 2016
Test Sample IMEI:	358640070022890		

FCC Reference:	Parts 2.1053 & 27.53(a)(4)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 27.53

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	40

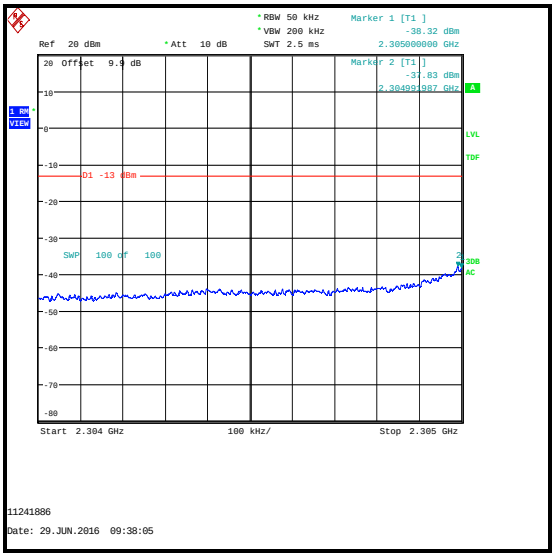
Note(s):

1. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with the resource blocks settings as detailed in section 4.3 of this report.
2. Measurements were performed in a fully anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT.
3. 5 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 50 kHz (>1% of the emission bandwidth) and video bandwidth of 200 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
4. 10 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 100 kHz (>1% of the emission bandwidth) and video bandwidth of 300 kHz (three times the resolution bandwidth).

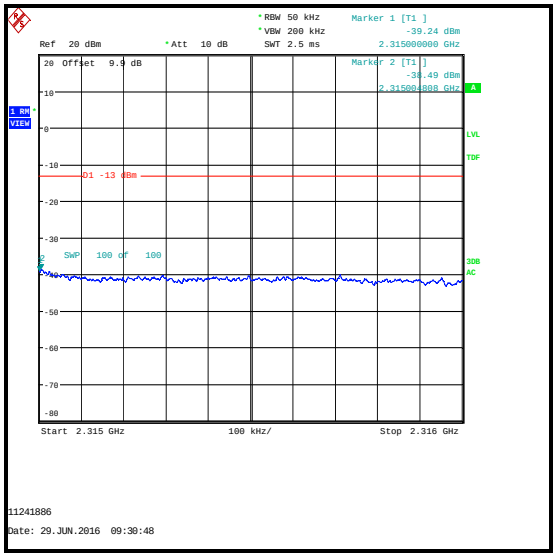
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.992	25	0	-37.8	-13.0	34.8	Complied
2305	25	0	-38.3	-13.0	25.3	Complied
2315	25	0	-39.2	-13.0	26.2	Complied
2315.005	25	0	-38.5	-13.0	25.5	Complied



QPSK / Lower Band Edge

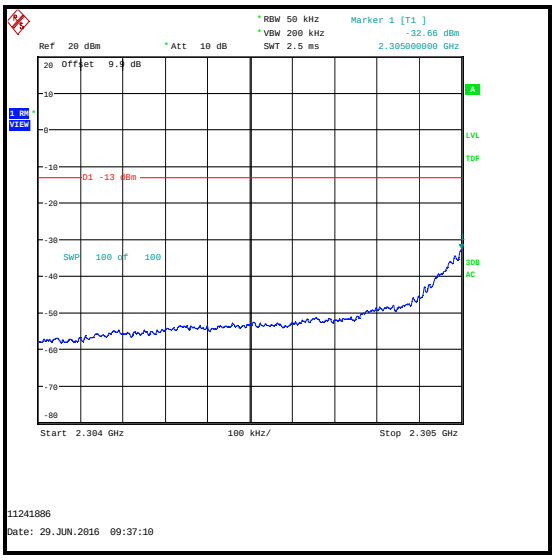


QPSK / Upper Band Edge

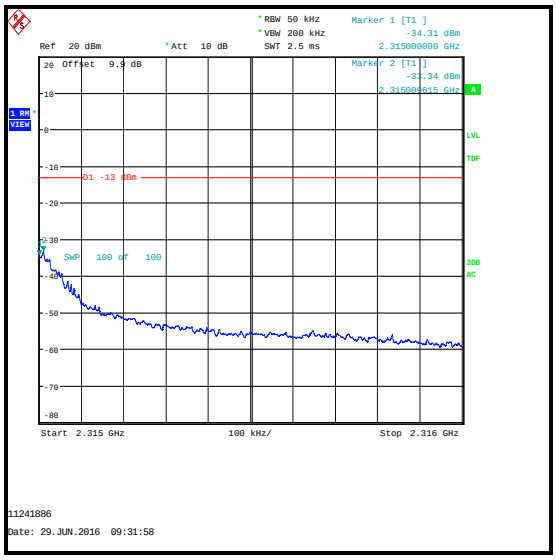
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / QPSK

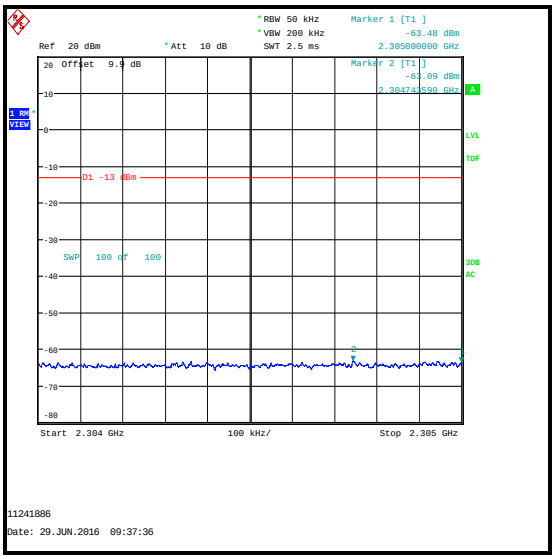
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2305	1	0	-32.7	-13.0	19.7	Complied
2315	1	24	-34.3	-13.0	21.3	Complied
2315.010	1	24	-33.3	-13.0	20.3	Complied
2305	1	24	-63.5	-13.0	50.5	Complied
2315	1	0	-64.2	-13.0	51.2	Complied



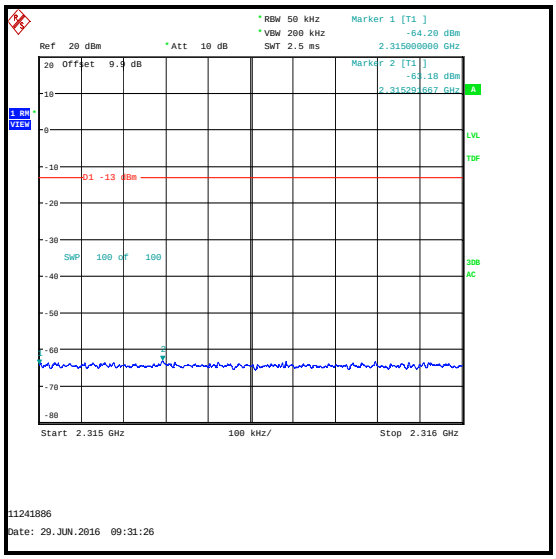
QPSK / 1 RB 0 Offset / Lower Band Edge



QPSK / 1 RB 24 Offset / Upper Band Edge



QPSK / 1 RB 24 Offset / Lower Band Edge

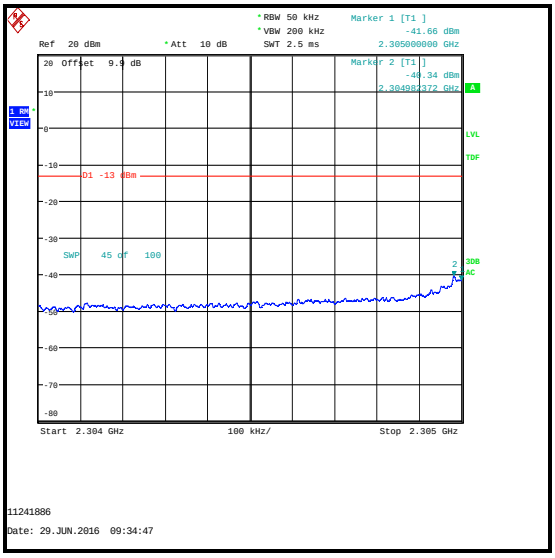


QPSK / 1 RB 0 Offset / Upper Band Edge

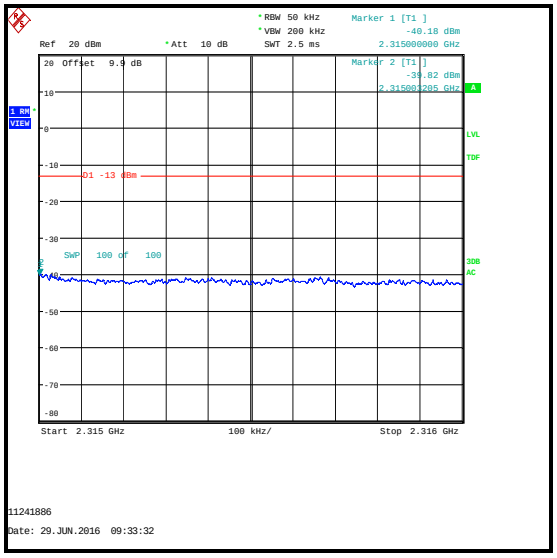
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.982	25	0	-40.3	-13.0	27.3	Complied
2305	25	0	-41.7	-13.0	28.7	Complied
2315	25	0	-40.2	-13.0	27.2	Complied
2315.003	25	0	-39.8	-13.0	26.8	Complied



16QAM / Lower Band Edge

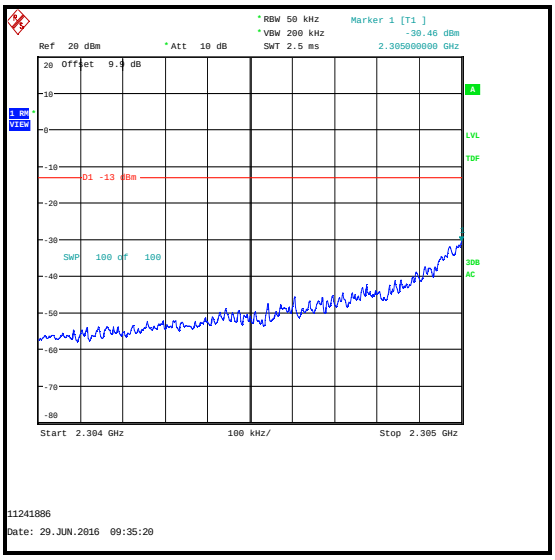


16QAM / Upper Band Edge

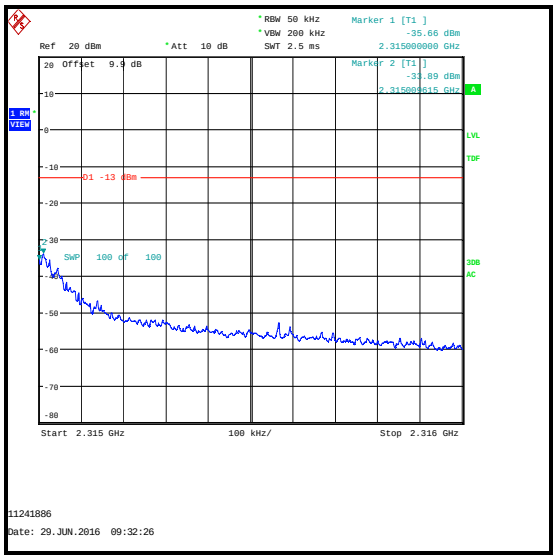
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

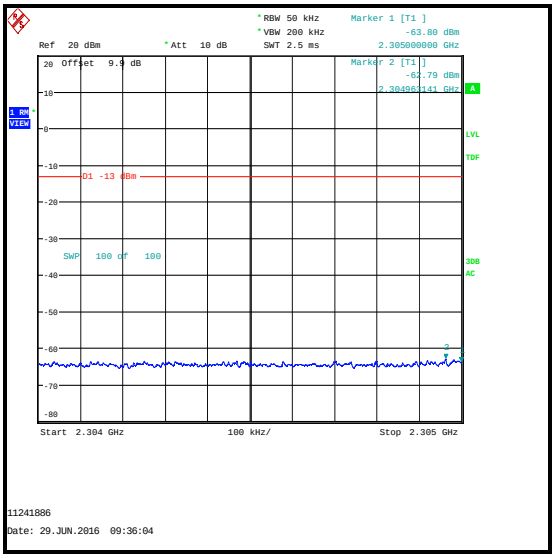
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2305	1	0	-30.5	-13.0	17.5	Complied
2315	1	24	-35.7	-13.0	22.7	Complied
2315.010	1	24	-33.9	-13.0	20.9	Complied
2305	1	24	-63.8	-13.0	50.8	Complied
2315	1	0	-63.4	-13.0	50.4	Complied



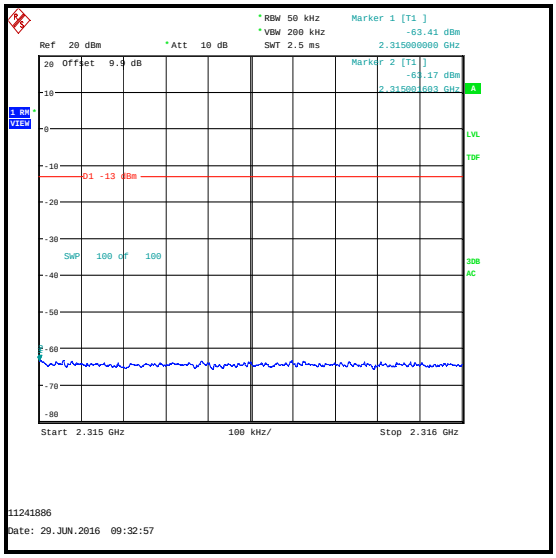
16QAM / 1 RB 0 Offset / Lower Band Edge



16QAM / 1 RB 24 Offset / Upper Band Edge



16QAM / 1 RB 24 Offset / Lower Band Edge

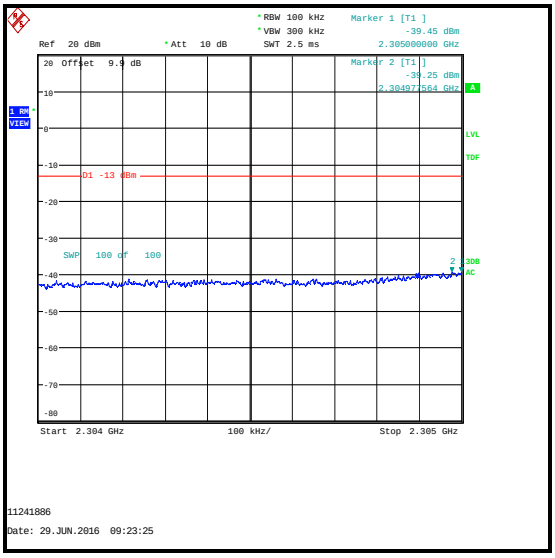


16QAM / 1 RB 0 Offset / Upper Band Edge

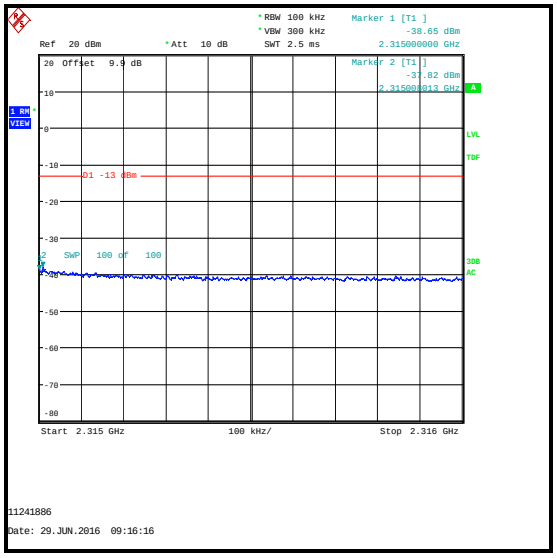
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.978	50	0	-39.3	-13.0	26.3	Complied
2305	50	0	-39.5	-13.0	26.5	Complied
2315	50	0	-38.7	-13.0	25.7	Complied
2315.008	50	0	-37.8	-13.0	24.8	Complied



QPSK / Lower Band Edge

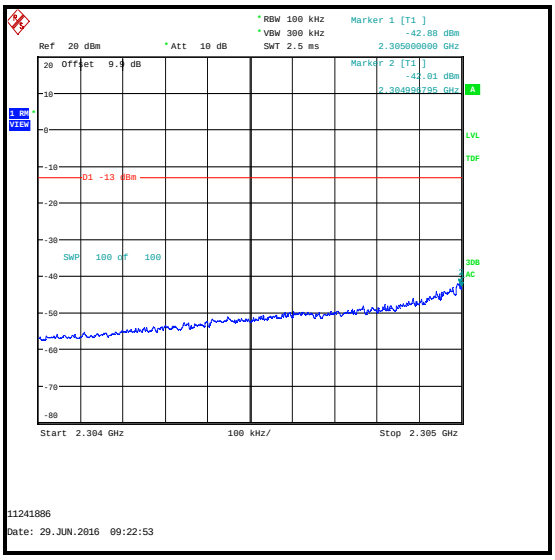


QPSK / Upper Band Edge

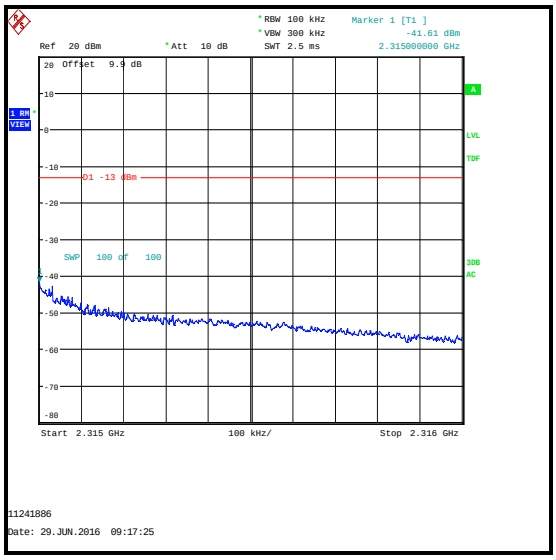
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / QPSK

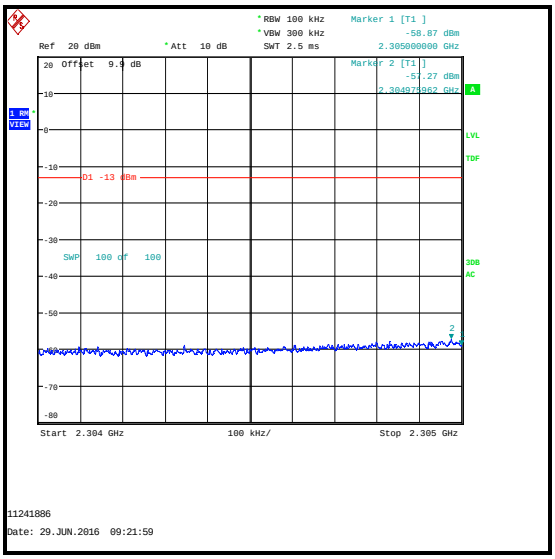
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.997	1	0	-42.0	-13.0	29.0	Complied
2305	1	0	-42.9	-13.0	29.9	Complied
2315	1	49	-41.6	-13.0	28.6	Complied
2305	1	49	-58.9	-13.0	45.9	Complied
2315	1	0	-59.0	-13.0	46.6	Complied



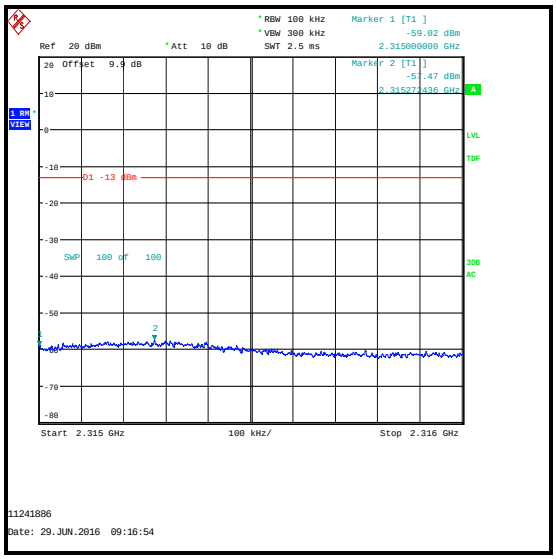
QPSK / 1 RB 0 Offset / Lower Band Edge



QPSK / 1 RB 49 Offset / Upper Band Edge



QPSK / 1 RB 49 Offset / Lower Band Edge

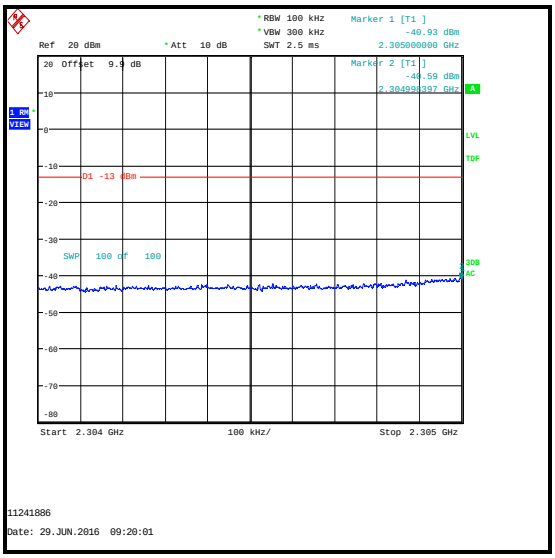


QPSK / 1 RB 0 Offset / Upper Band Edge

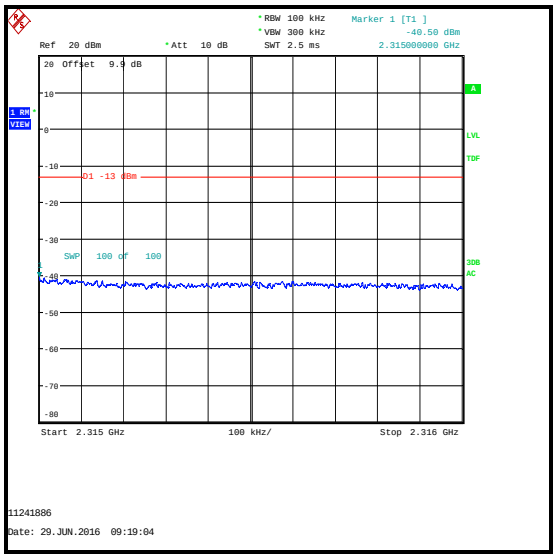
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.998	50	0	-40.6	-13.0	27.6	Complied
2305	50	0	-40.9	-13.0	27.9	Complied
2315	50	0	-40.5	-13.0	27.5	Complied



16QAM / Lower Band Edge



16QAM / Upper Band Edge

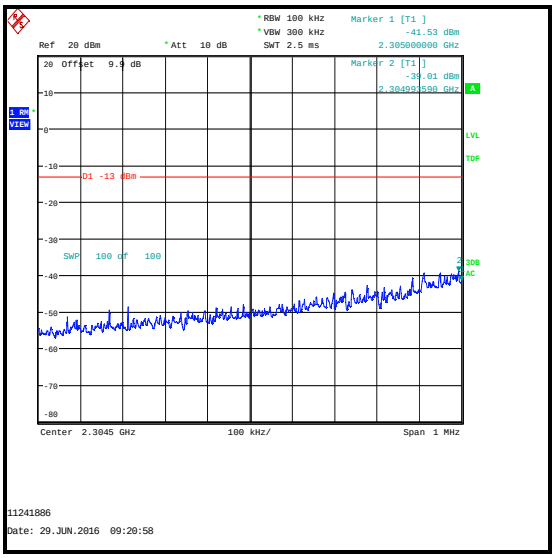
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / 16QAM

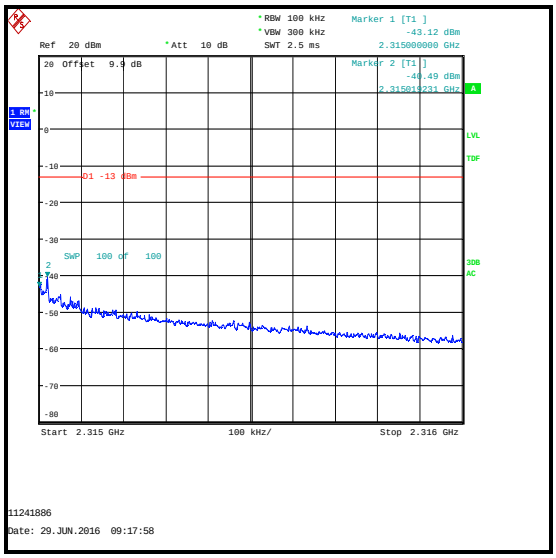
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304.994	1	0	-39.0	-13.0	26.0	Complied
2305	1	0	-41.5	-13.0	28.5	Complied
2315	1	49	-43.1	-13.0	30.1	Complied
2315.019	1	49	-40.5	-13.0	27.5	Complied
2305	1	49	-58.6	-13.0	45.6	Complied
2315	1	0	-60.2	-13.0	47.2	Complied

Transmitter Radiated Emissions at Band Edges (continued)

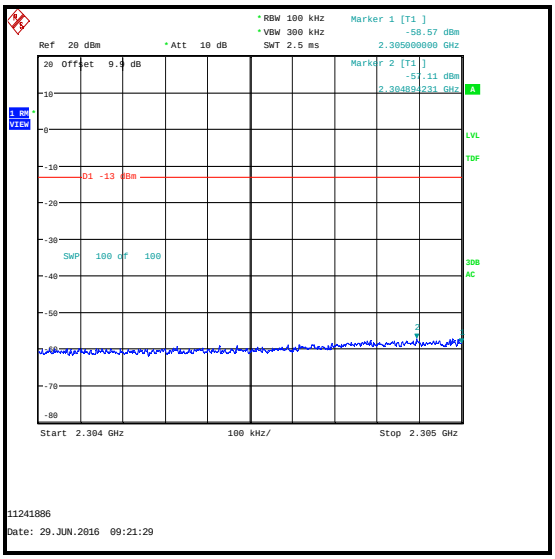
Results: 10 MHz Channel Bandwidth / 16QAM



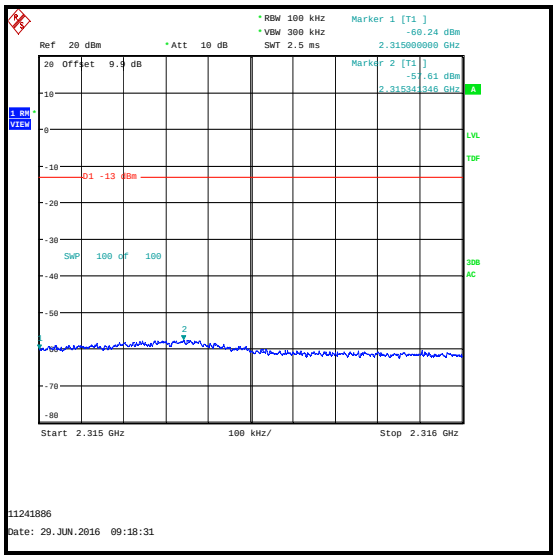
16QAM / 1 RB 0 Offset / Lower Band Edge



16QAM / 1 RB 49 Offset / Upper Band Edge



16QAM / 1 RB 49 Offset / Lower Band Edge



16QAM / 1 RB 0 Offset / Upper Band Edge

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2863	Pre-Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B	07 Apr 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12

5.2.8. Transmitter Radiated Emission Mask – LAT

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	07 July 2016
Test Sample IMEI:	358640070038162		

FCC Reference:	Parts 2.1053 & 27.53(a)(4)
Test Method Used:	KDB 971168 Section 6 referencing FCC Part 27.53 & notes below

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	35

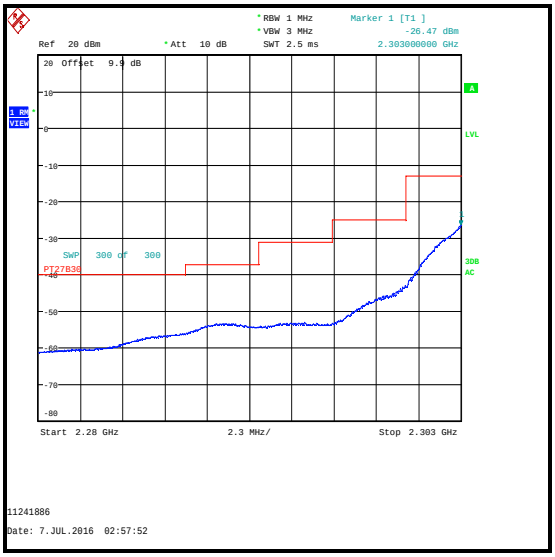
Note(s):

1. Measurements were performed with the EUT transmitting QPSK and 16QAM modulation schemes, with resource block settings stated in section 4.3.
2. The plots of this section illustrate the radiated emissions at band edges, at frequencies below 2304 MHz and above 2316 MHz. Compliance in the frequency ranges 2304 – 2305 MHz and 2315 – 2516 MHz are shown in section 5.2.6 of this report.
3. In accordance with 27.53(a)(5), a narrower resolution bandwidth is allowed to be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz. The channel power function of the spectrum analyser was used where necessary.
4. * Integrated level (dBm)

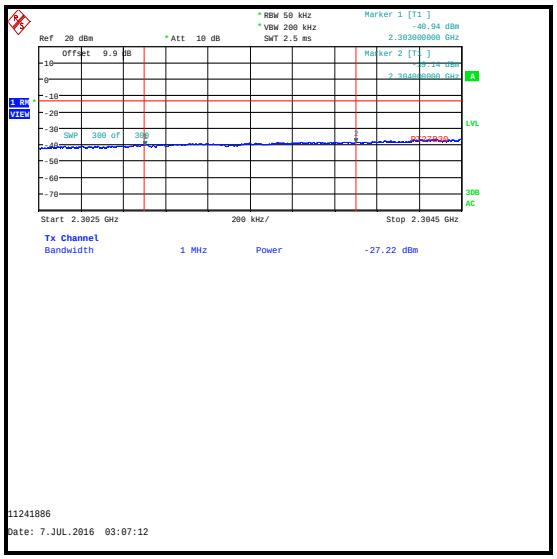
Transmitter Radiated Emission Mask – LAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

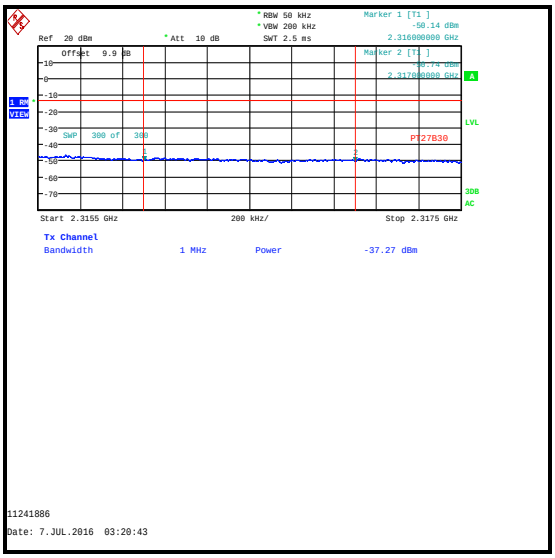
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	25	0	-26.5	-13.0	13.5	Complied
2303 to 2304	25	0	-27.2*	-13.0	14.2	Complied
2316 to 2317	25	0	-37.2*	-13.0	27.2	Complied
2317	25	0	-25.8	-13.0	12.8	Complied



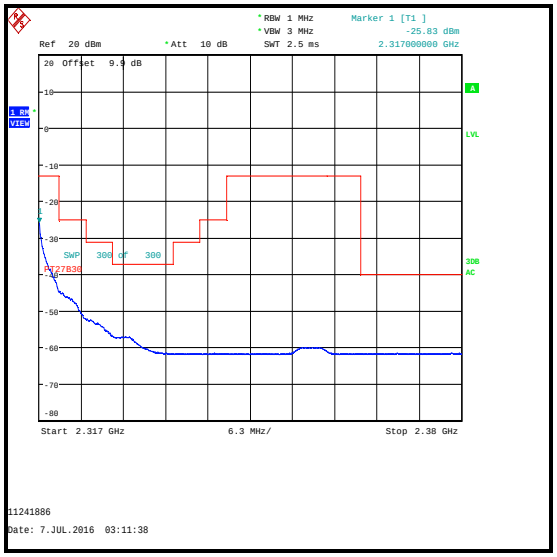
QPSK / 25 RB 0 Offset/ 2280 to 2303 MHz



QPSK / 25 RB 0 Offset / 2303 to 2304 MHz / Integrated level



QPSK / 25 RB 0 Offset / 2316 to 2317 MHz / Integrated level

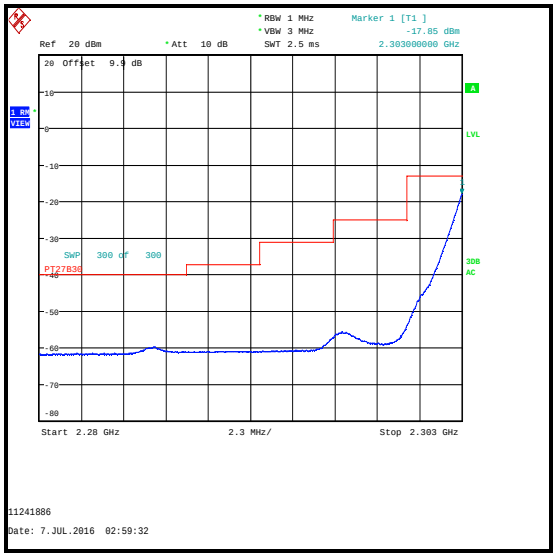


QPSK / 25 RB 0 Offset/ 2317 to 2380 MHz

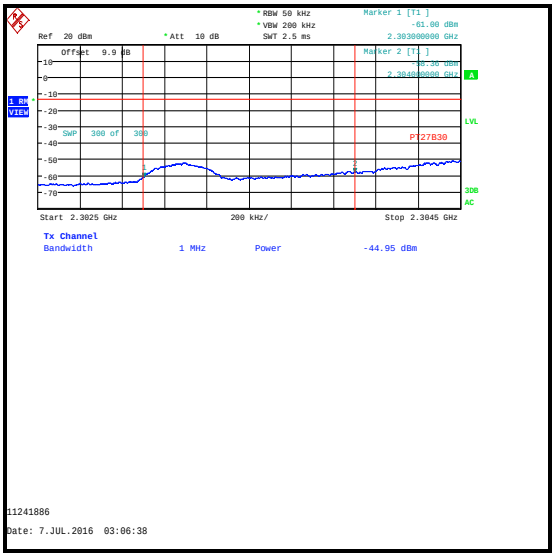
Transmitter Radiated Emission Mask – LAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

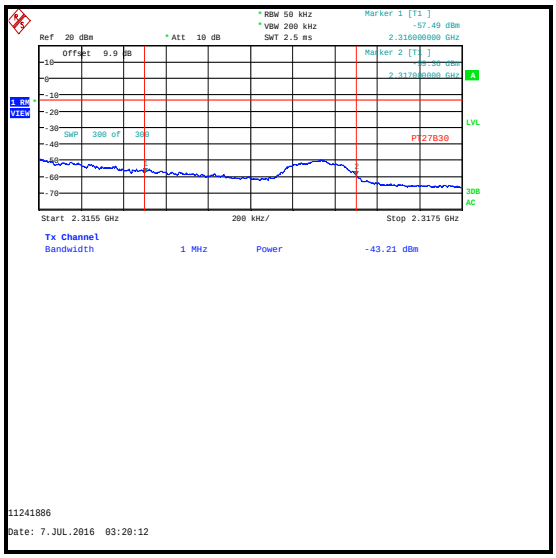
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-17.9	-13.0	4.9	Complied
2303-2304	1	0	-45.0*	-13.0	32.0	Complied
2316-2317	1	24	-43.2*	-13.0	30.2	Complied
2317	1	24	-15.0	-13.0	2.0	Complied



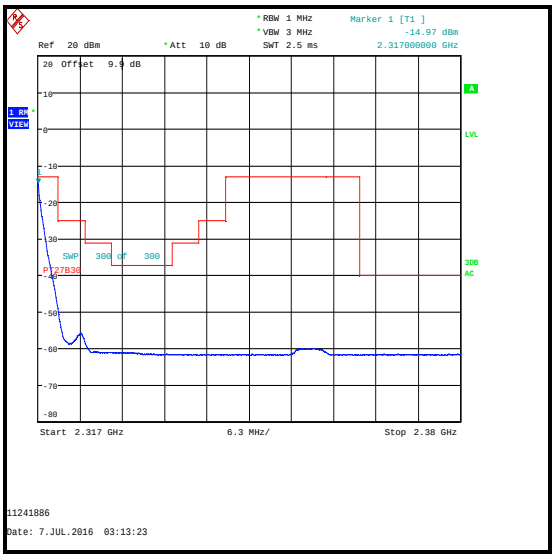
QPSK / 1 RB 0 Offset / 2280 to 2303 MHz



QPSK / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



QPSK / 1 RB 24 Offset / 2316 to 2317 MHz / Integrated level

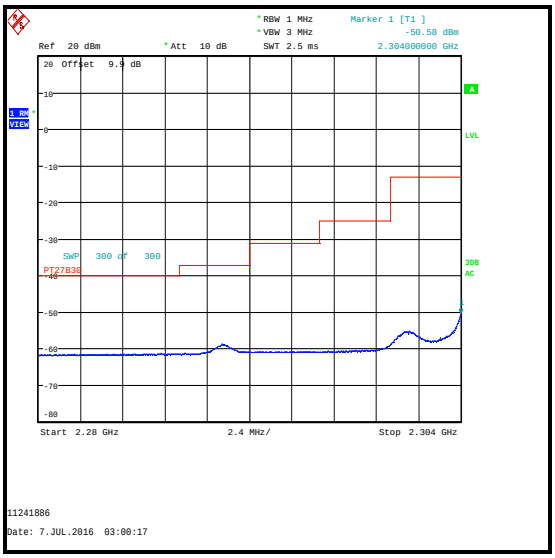


QPSK / 1 RB 24 Offset / 2317 to 2380 MHz

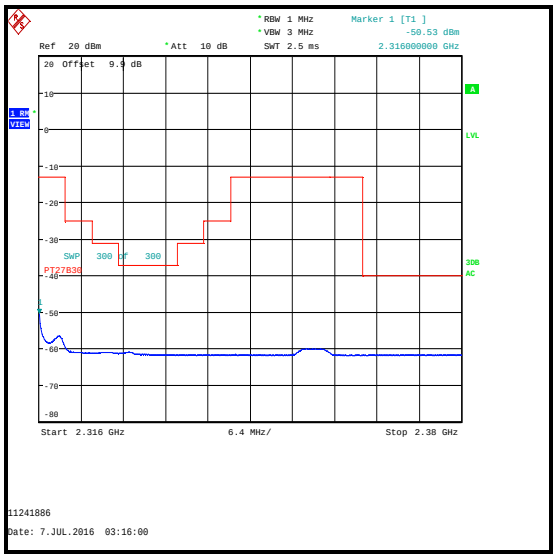
Transmitter Radiated Emission Mask – LAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	1	24	-50.6	-13.0	37.6	Complied
2316	1	0	-50.5	-13.0	37.5	Complied



QPSK / 1 RB 24 Offset / 2280 to 2304 MHz

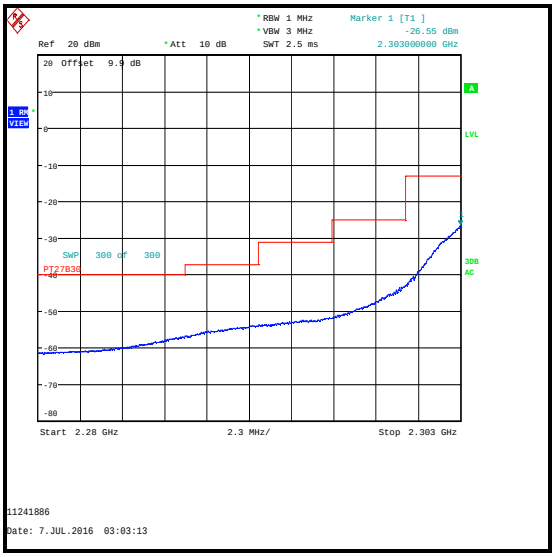


QPSK / 1 RB 0 Offset / 2316 to 2380 MHz

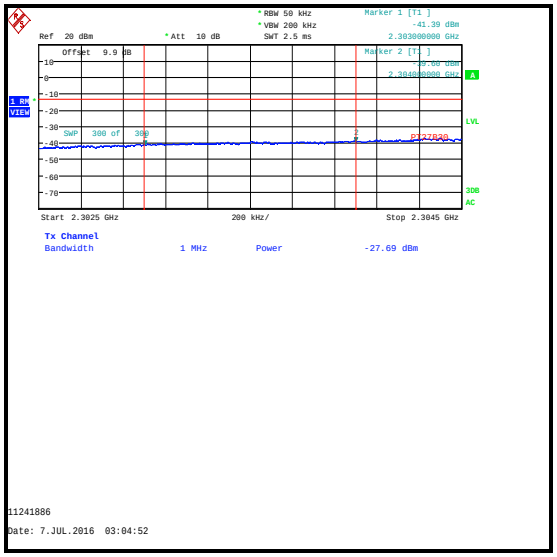
Transmitter Radiated Emission Mask – LAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

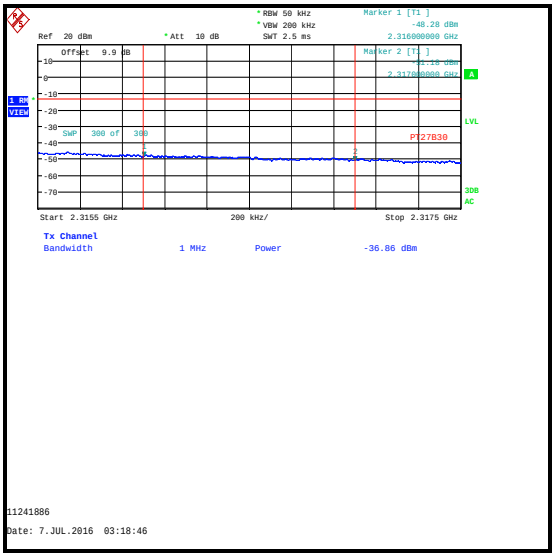
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	25	0	-26.6	-13.0	13.6	Complied
2303 to 2304	25	0	-27.7*	-13.0	14.7	Complied
2316 to 2317	25	0	-36.9*	-13.0	23.9	Complied
2317	25	0	-27.1	-13.0	14.1	Complied



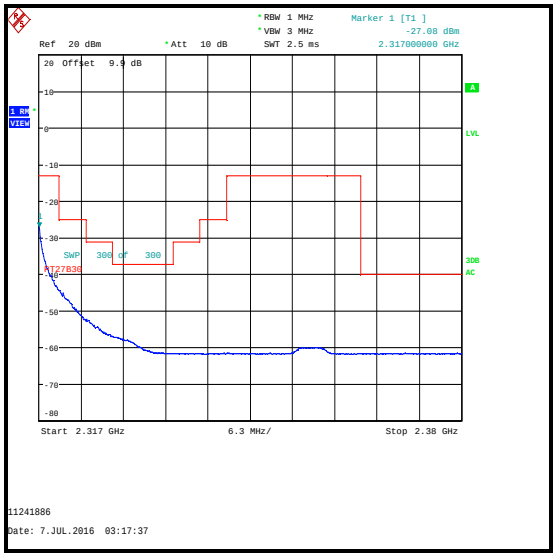
16QAM / 25 RB 0 Offset/ 2280 to 2303 MHz



16QAM / 25 RB 0 Offset / 2303 to 2304 MHz / Integrated level



16QAM / 25 RB 0 Offset / 2316 to 2317 MHz / Integrated level

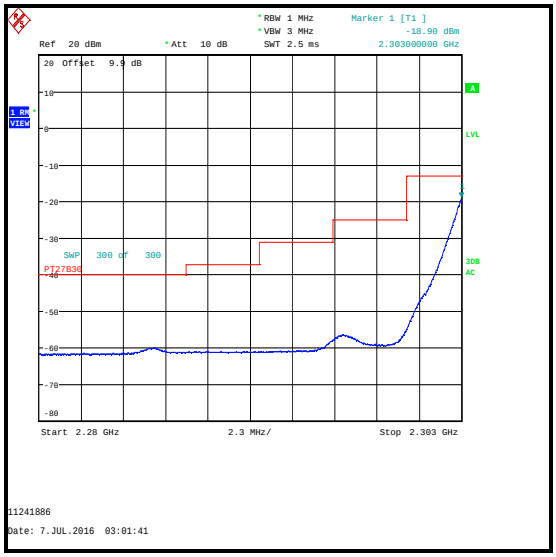


16QAM / 25 RB 0 Offset/ 2317 to 2380 MHz

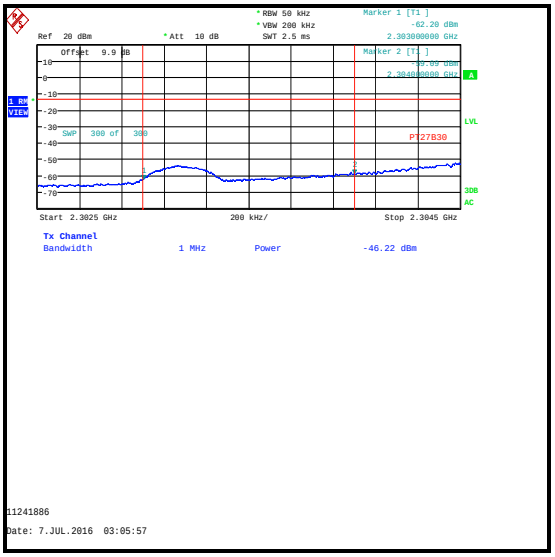
Transmitter Radiated Emission Mask – LAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

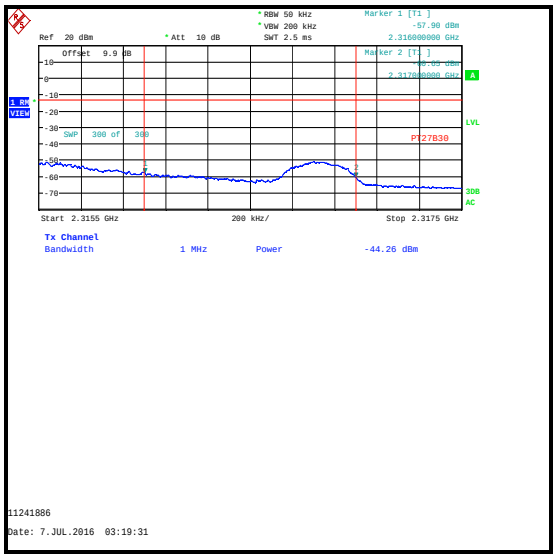
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-18.9	-13.0	5.9	Complied
2303-2304	1	0	-46.2*	-13.0	33.2	Complied
2316-2317	1	24	-44.3*	-13.0	31.4	Complied
2317	1	24	-15.7	-13.0	2.7	Complied



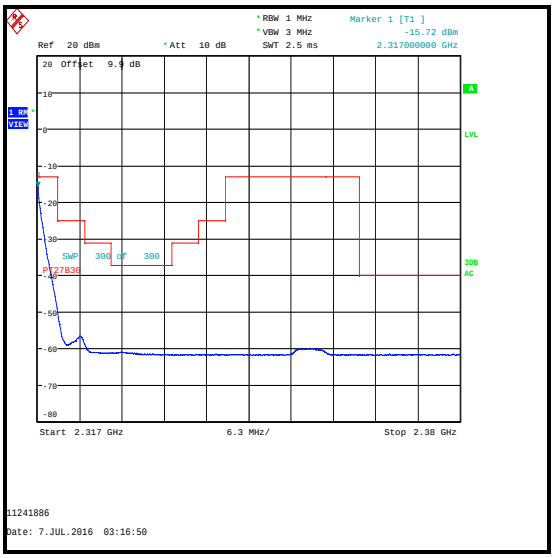
16QAM / 1 RB 0 Offset / 2280 to 2303 MHz



16QAM / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



16QAM / 1 RB 24 Offset / 2316 to 2317 MHz / Integrated level

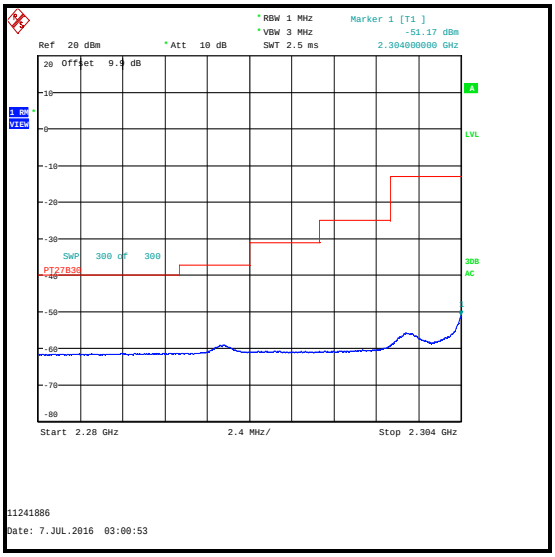


16QAM / 1 RB 24 Offset / 2317 to 2380 MHz

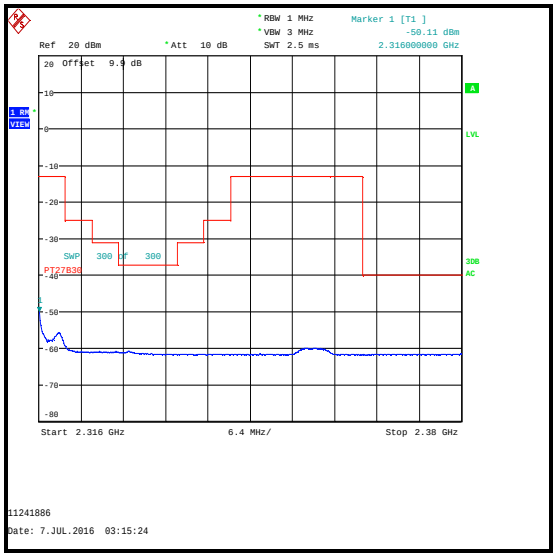
Transmitter Radiated Emission Mask – LAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	1	24	-51.2	-13.0	38.2	Complied
2316	1	0	-50.1	-13.0	37.1	Complied



16QAM / 1 RB 24 Offset / 2280 to 2304 MHz

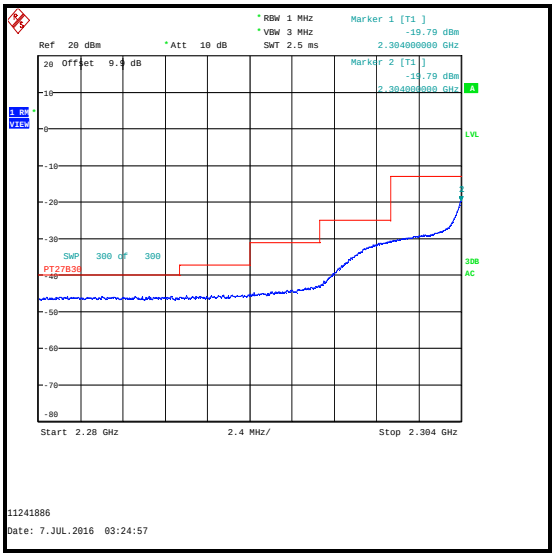


16QAM / 1 RB 0 Offset / 2316 to 2380 MHz

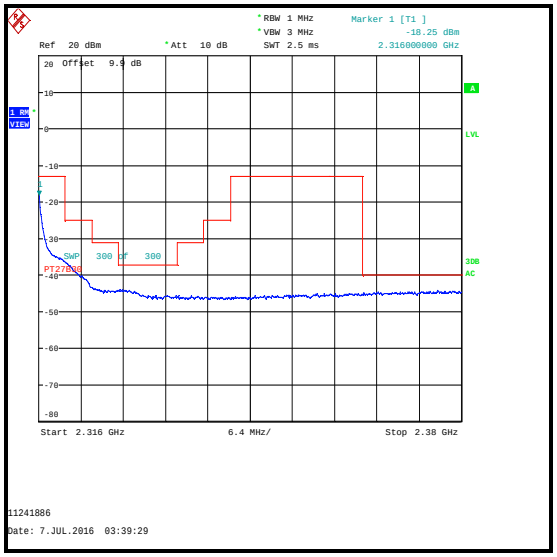
Transmitter Radiated Emission Mask – LAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	50	0	-19.8	-13.0	6.8	Complied
2316	50	0	-18.3	-13.0	5.3	Complied



QPSK / 50 RB 0 Offset/ 2280 to 2304 MHz

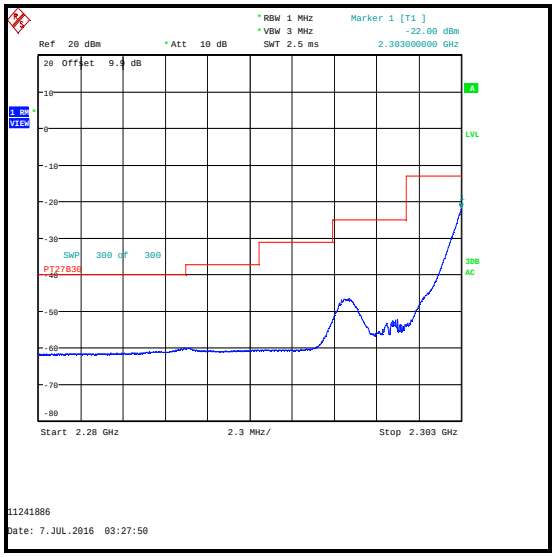


QPSK / 50 RB 0 Offset/ 2316 to 2380 MHz

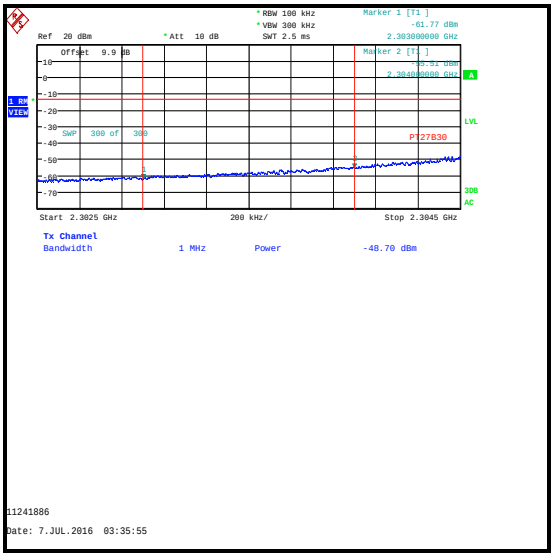
Transmitter Radiated Emission Mask – LAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

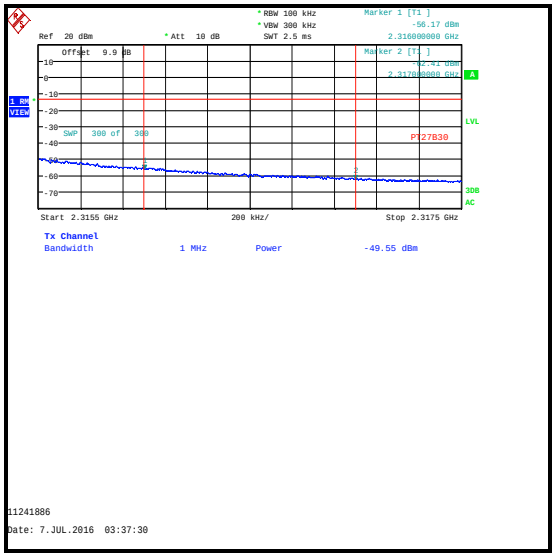
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-22.0	-13.0	9.0	
2303-2304	1	0	-48.7*	-13.0	35.7	
2316-2317	1	49	-49.6*	-13.0	36.6	
2317	1	49	-18.7	-13.0	5.7	



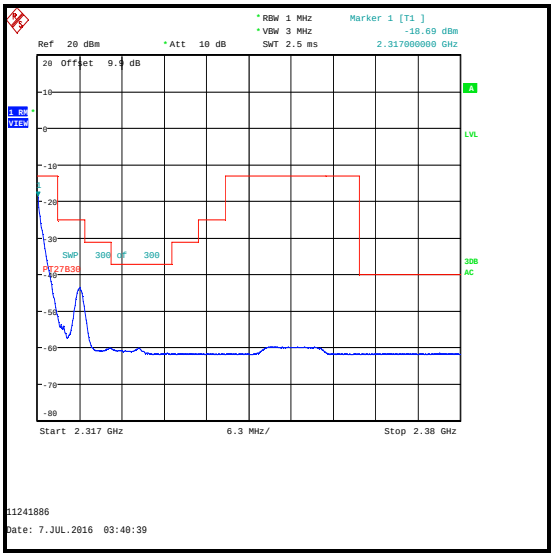
QPSK / 1 RB 0 Offset / 2280 to 2303 MHz



QPSK / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



QPSK / 1 RB 49 Offset / 2316 to 2317 MHz / Integrated level

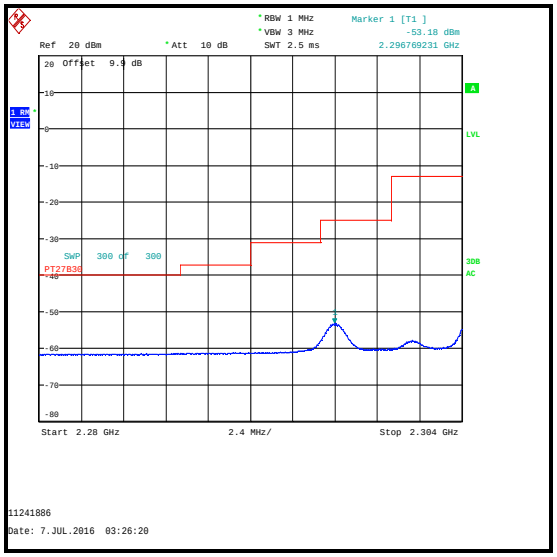


QPSK / 1 RB 49 Offset / 2317 to 2380 MHz

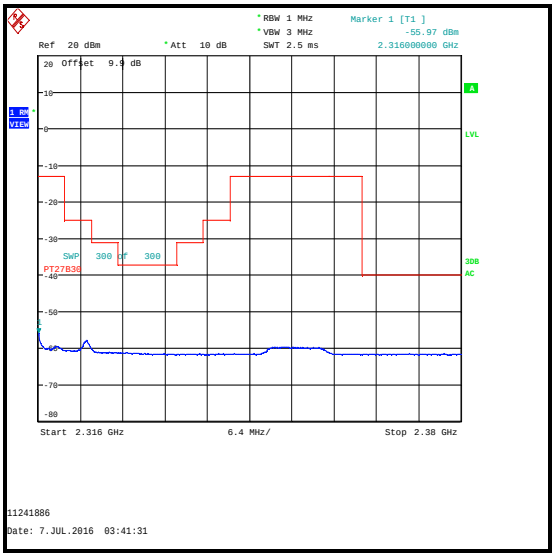
Transmitter Radiated Emission Mask – LAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2296.769	1	49	-53.2	-25.0	28.2	Complied
2316	1	0	-56.0	-13.0	43.0	Complied



QPSK / 1 RB 49 Offset / 2280 to 2304 MHz

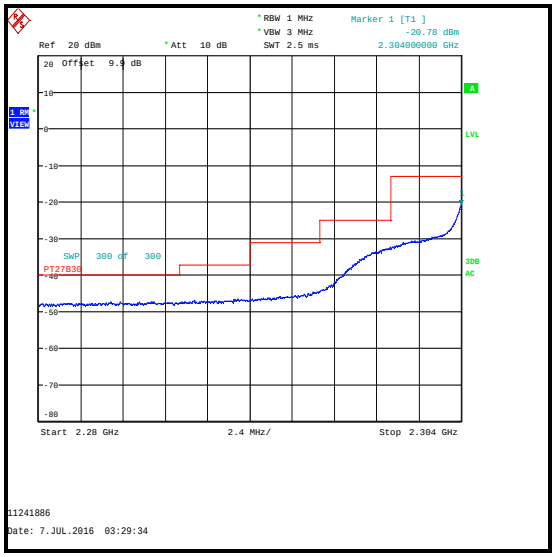


QPSK / 1 RB 0 Offset / 2316 to 2380 MHz

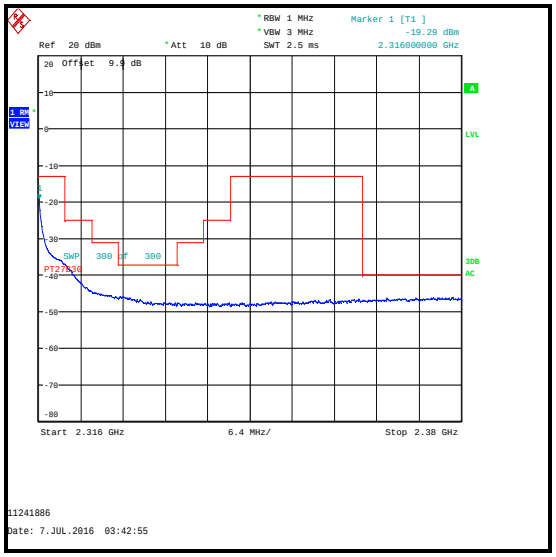
Transmitter Radiated Emission Mask – LAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	50	0	-20.8	-13.0	7.8	Complied
2316	50	0	-19.3	-13.0	6.3	Complied



16QAM / 50 RB 0 Offset/ 2280 to 2304 MHz

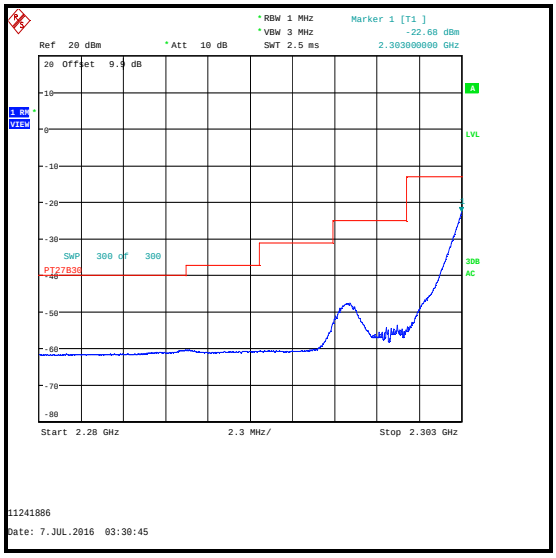


16QAM / 50 RB 0 Offset/ 2316 to 2380 MHz

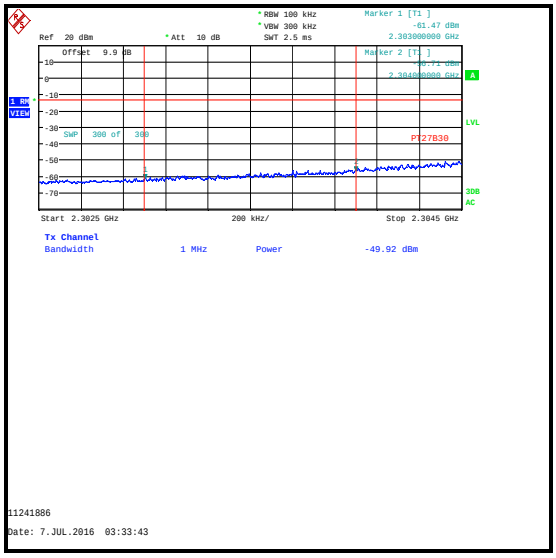
Transmitter Radiated Emission Mask – LAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

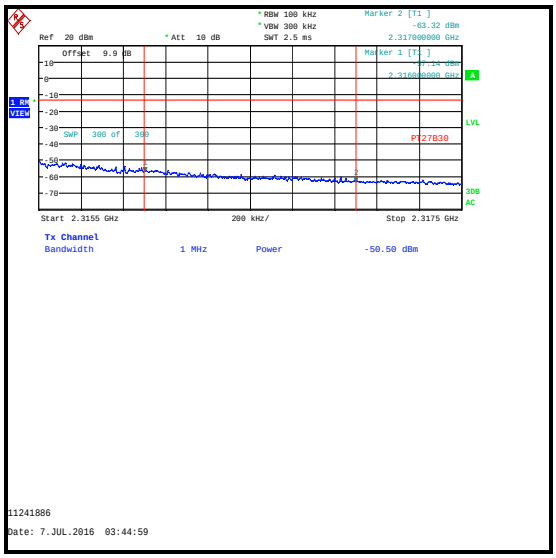
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-22.7	-13.0	9.7	Complied
2303-2304	1	0	-49.9*	-13.0	36.9	Complied
2316-2317	1	49	-50.5*	-13.0	37.5	Complied
2317	1	49	-19.6	-13.0	6.6	Complied



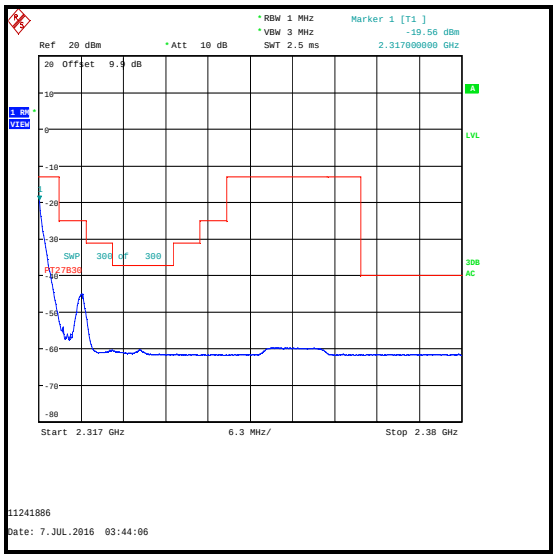
16QAM / 1 RB 0 Offset / 2280 to 2303 MHz



16QAM / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



16QAM / 1 RB 49 Offset / 2316 to 2317 MHz / Integrated level

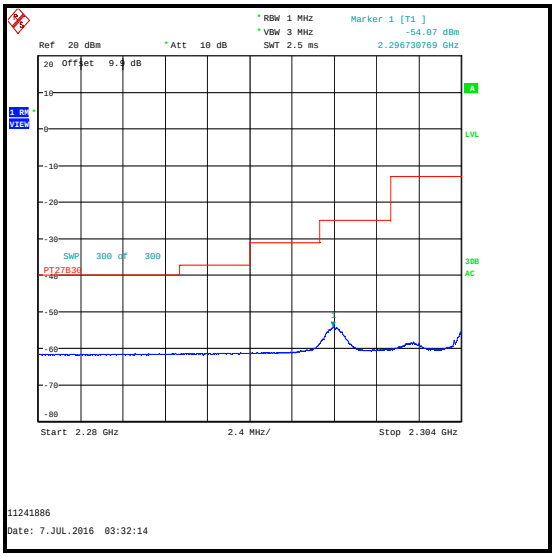


16QAM / 1 RB 49 Offset / 2317 to 2380 MHz

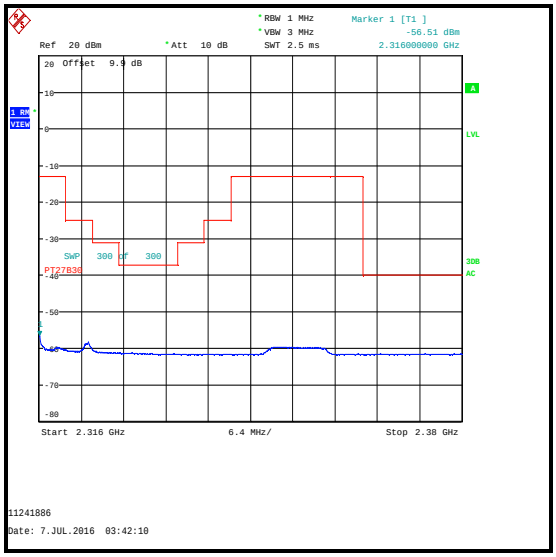
Transmitter Radiated Emission Mask – LAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2296.731	1	49	-54.1	-25.0	29.1	Complied
2316	1	0	-56.5	-13.0	43.5	Complied



16QAM / 1 RB 49 Offset / 2280 to 2304 MHz



16QAM / 1 RB 0 Offset / 2316 to 2380 MHz

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2863	Pre-Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B	07 Apr 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12
A032	Antenna	EMCO	3115	2874	01 Mar 2019	36
A2937	Attenuator	AtlanTecRF	AN18W5-06	208147#1	23 May 2017	12
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	09 May 2017	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	11 Apr 2018	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	15 Apr 2018	24

5.2.9. Transmitter Radiated Emission Mask – UAT

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	06 July 2016 & 07 July 2016
Test Sample IMEI:	358640070066106		

FCC Reference:	Parts 2.1053 & 27.53(a)(4)
Test Method Used:	KDB 971168 Section 6 referencing FCC Part 27.53 & notes below

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	34 to 35

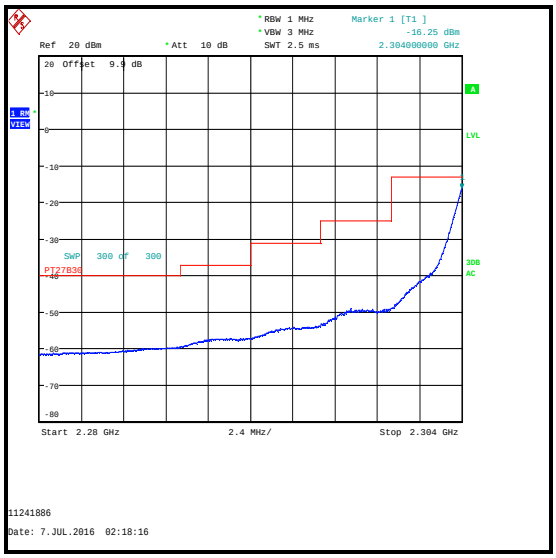
Note(s):

1. Measurements were performed with the EUT transmitting QPSK and 16QAM modulation schemes, with resource block settings stated in section 4.3.
2. The plots of this section illustrate the radiated emissions at band edges, at frequencies below 2304 MHz and above 2316 MHz. Compliance in the frequency ranges 2304 – 2305 MHz and 2315 – 2516 MHz are shown in section 5.2.7 of this report.
3. In accordance with 27.53(a)(5), a narrower resolution bandwidth is allowed to be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz. The channel power function of the spectrum analyser was used where necessary.
4. * Integrated level (dBm)

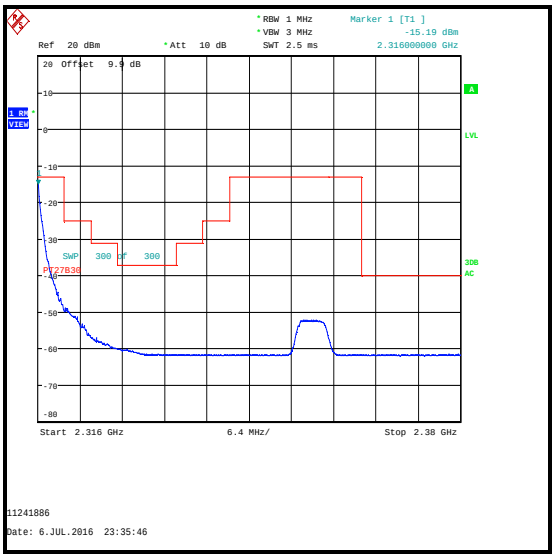
Transmitter Radiated Emission Mask – UAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	25	0	-16.3	-13.0	3.3	Complied
2316	25	0	-15.2	-13.0	2.2	Complied



QPSK / 25 RB 0 Offset/ 2280 to 2304 MHz

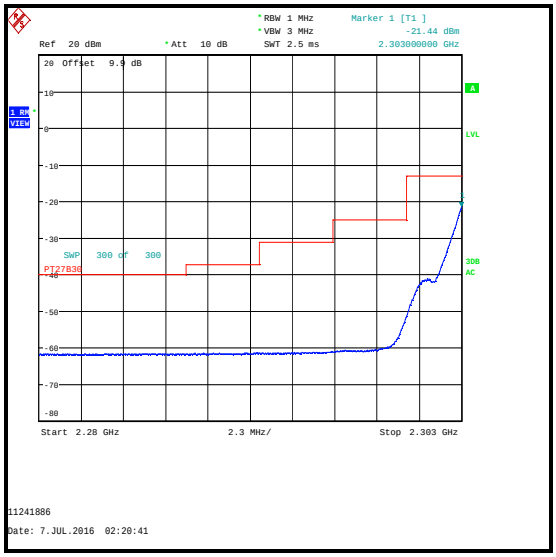


QPSK / 25 RB 0 Offset/ 2316 to 2380 MHz

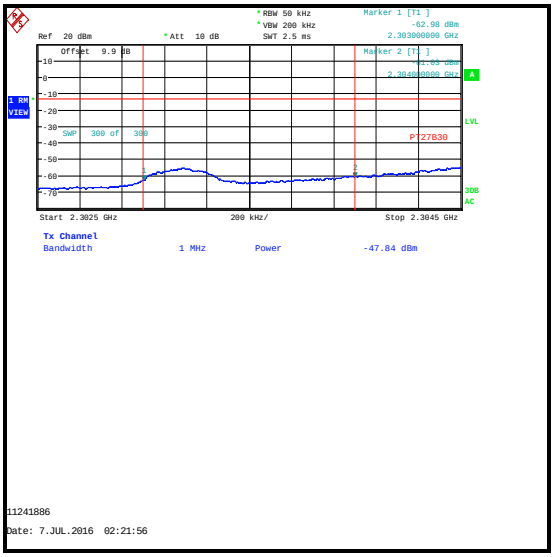
Transmitter Radiated Emission Mask – UAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

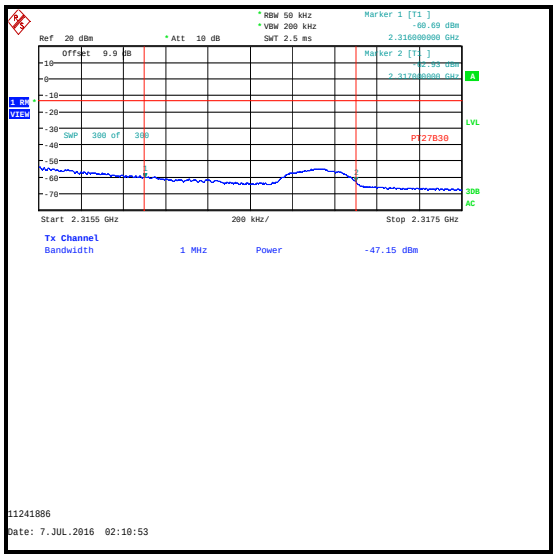
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-21.4	-13.0	8.4	Complied
2303-2304	1	0	-47.8*	-13.0	34.8	Complied
2316-2317	1	24	-47.2*	-13.0	34.2	Complied
2317	1	24	-19.1	-13.0	6.1	Complied



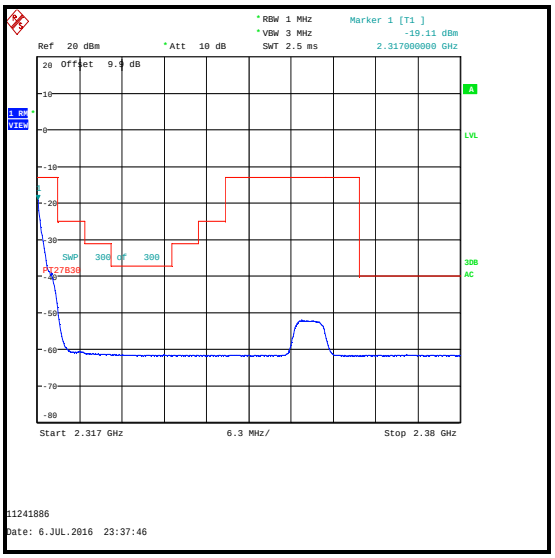
QPSK / 1 RB 0 Offset / 2280 to 2303 MHz



QPSK / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



QPSK / 1 RB 24 Offset / 2316 to 2317 MHz / Integrated level

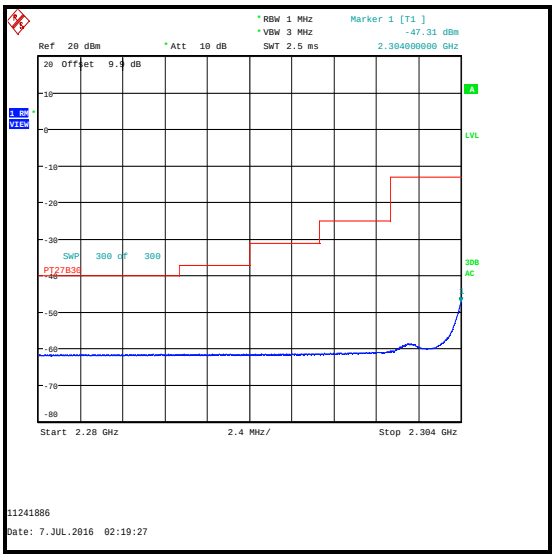


QPSK / 1 RB 24 Offset / 2317 to 2380 MHz

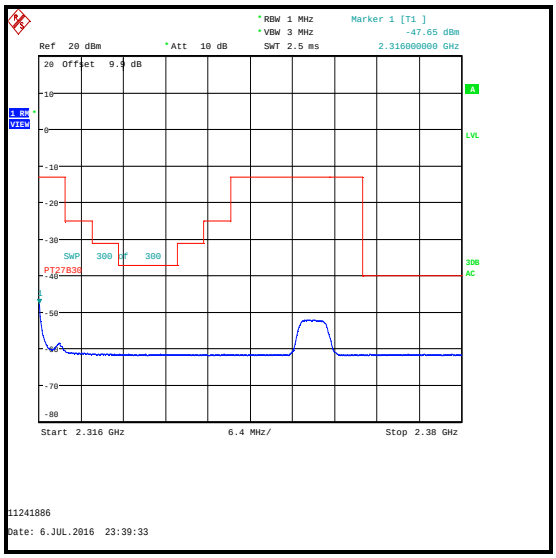
Transmitter Radiated Emission Mask – UAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	1	24	-47.3	-13.0	34.3	Complied
2316	1	0	-47.7	-13.0	34.7	Complied



QPSK / 1 RB 24 Offset / 2280 to 2304 MHz

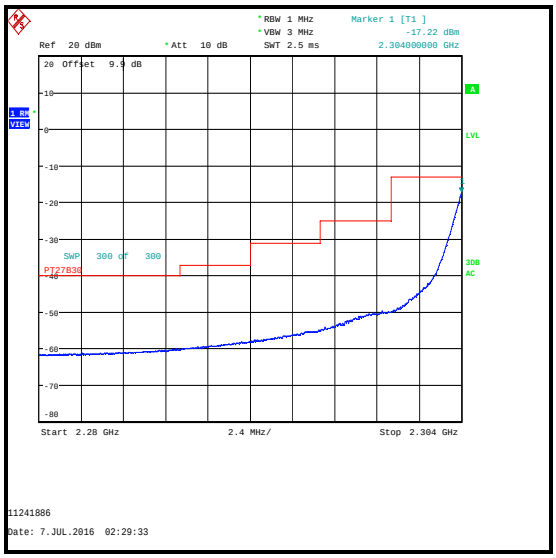


QPSK / 1 RB 0 Offset / 2316 to 2380 MHz

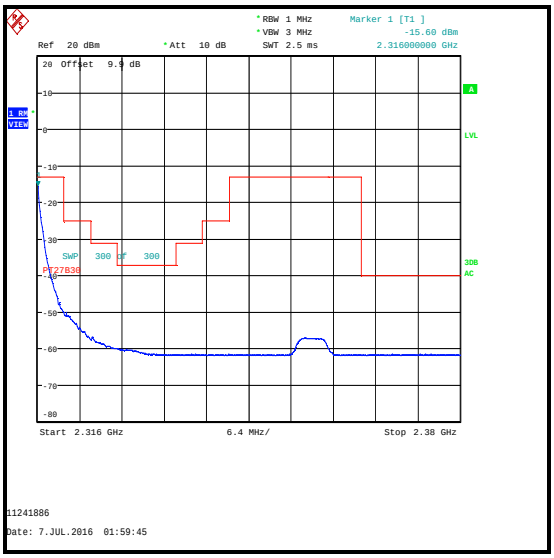
Transmitter Radiated Emission Mask – UAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	25	0	-17.2	-13.0	4.2	Complied
2316	25	0	-15.6	-13.0	2.6	Complied



16QAM / 25 RB 0 Offset/ 2280 to 2304 MHz

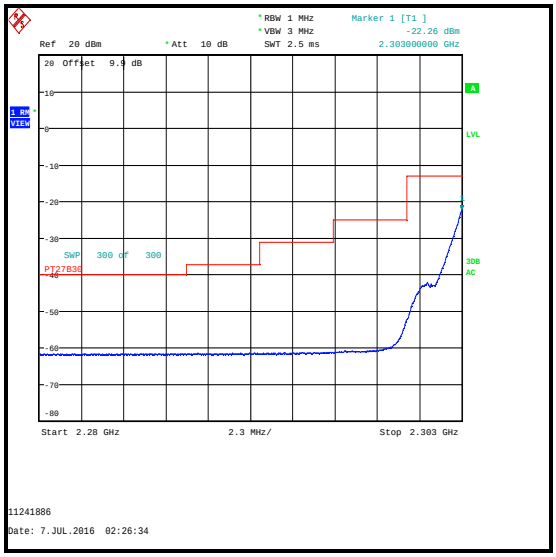


16QAM / 25 RB 0 Offset/ 2316 to 2380 MHz

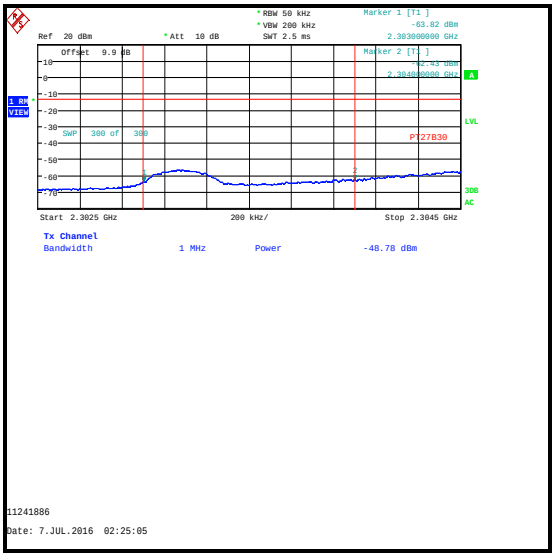
Transmitter Radiated Emission Mask – UAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

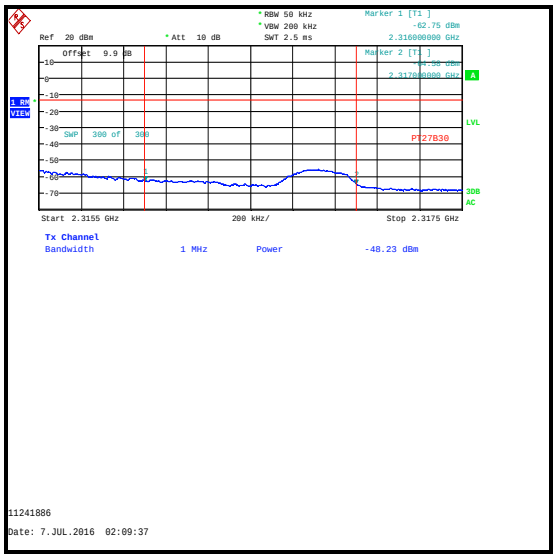
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-22.3	-13.0	9.3	Complied
2303-2304	1	0	-48.8*	-13.0	35.8	Complied
2316-2317	1	24	-48.2*	-13.0	35.2	Complied
2317	1	24	-18.5	-13.0	5.5	Complied



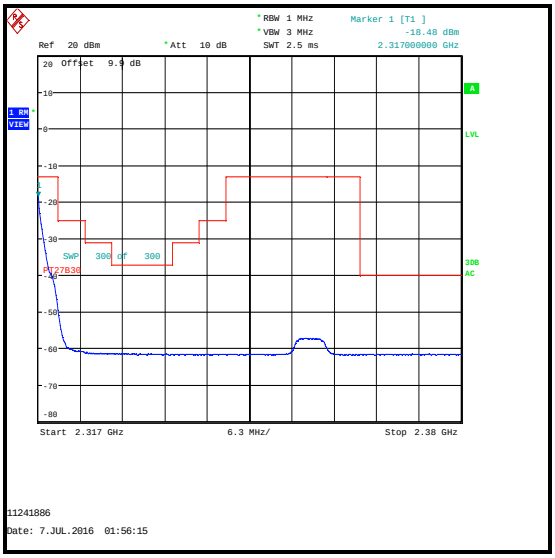
16QAM / 1 RB 0 Offset / 2280 to 2303 MHz



16QAM / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



16QAM / 1 RB 24 Offset / 2316 to 2317 MHz / Integrated level

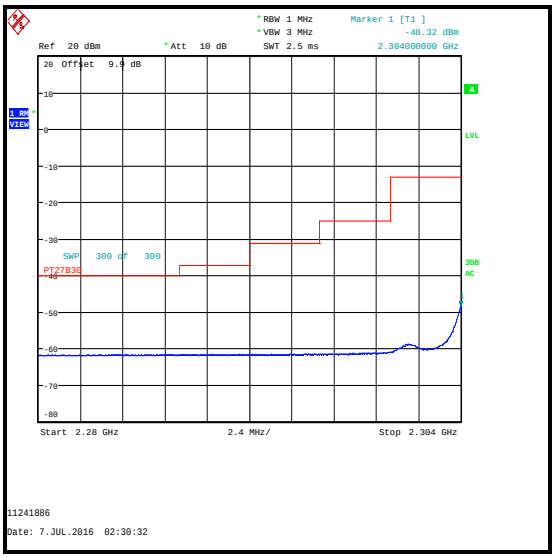


16QAM / 1 RB 24 Offset / 2317 to 2380 MHz

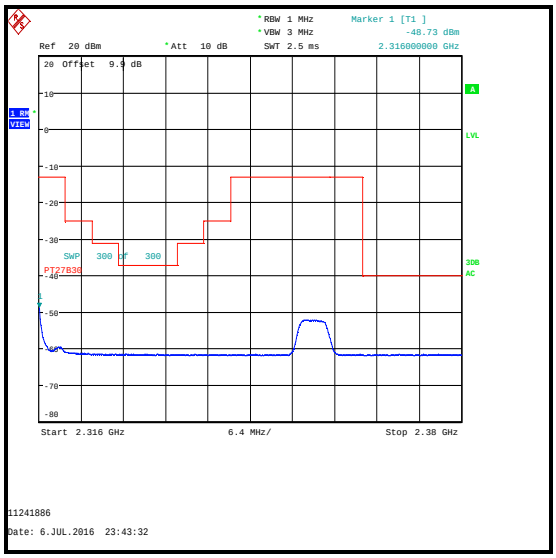
Transmitter Radiated Emission Mask – UAT (continued)

Results: 5 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	1	24	-48.3	-13.0	35.3	Complied
2316	1	0	-48.7	-13.0	35.7	Complied



16QAM / 1 RB 24 Offset / 2280 to 2304 MHz

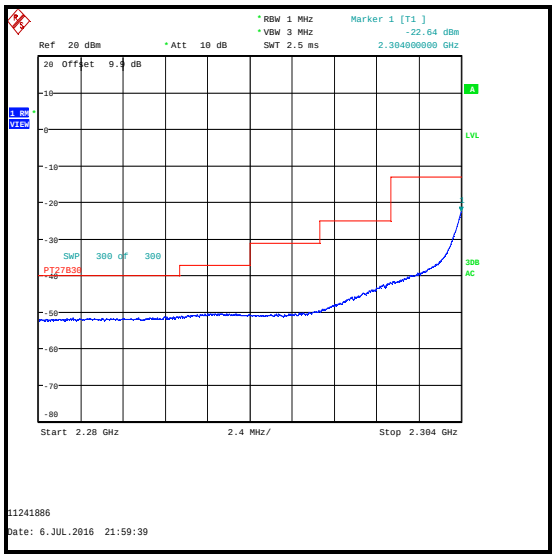


16QAM / 1 RB 0 Offset / 2316 to 2380 MHz

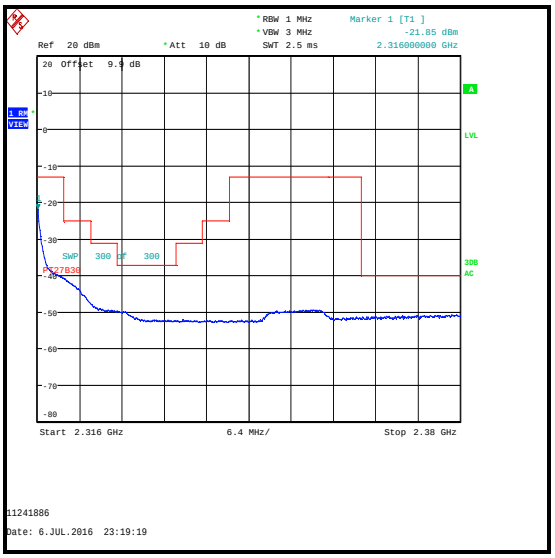
Transmitter Radiated Emission Mask – UAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	50	0	-22.6	-13.0	9.6	Complied
2316	50	0	-21.9	-13.0	8.9	Complied



QPSK / 50 RB 0 Offset/ 2280 to 2304 MHz

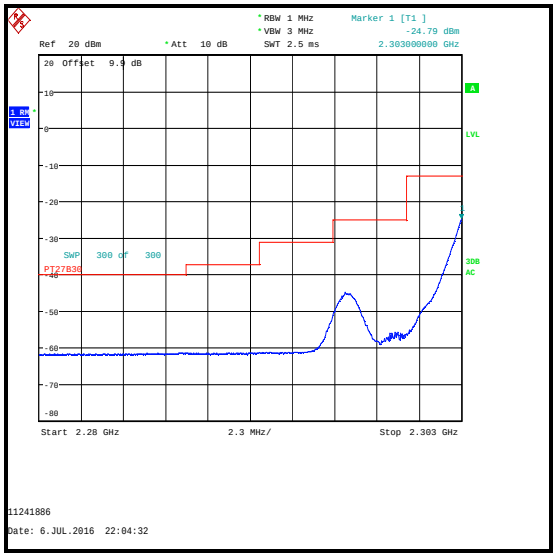


QPSK / 50 RB 0 Offset/ 2316 to 2380 MHz

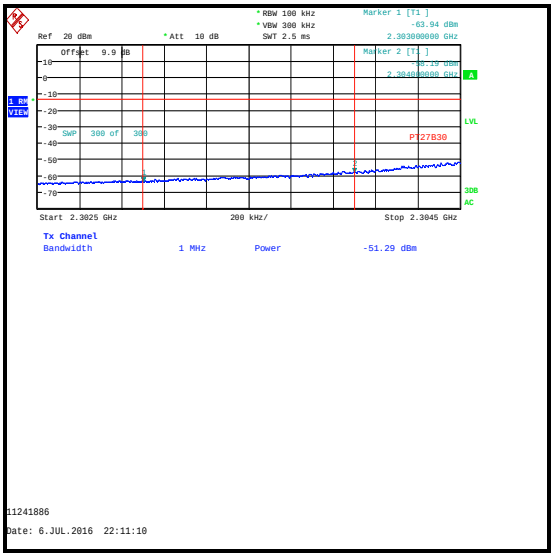
Transmitter Radiated Emission Mask – UAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

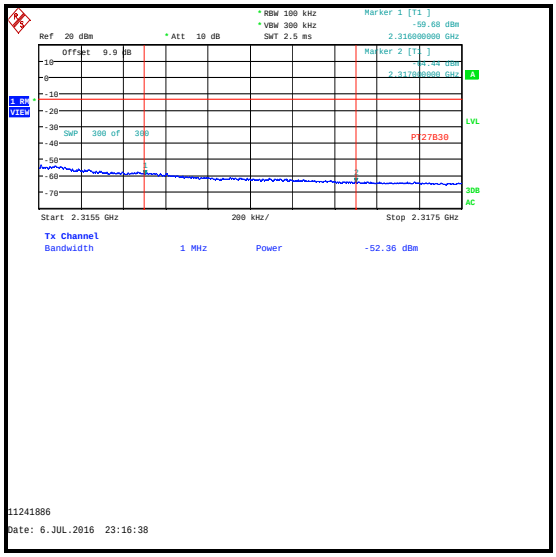
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-24.8	-13.0	11.8	Complied
2303-2304	1	0	-51.3*	-13.0	38.3	Complied
2316-2317	1	49	-52.4*	-13.0	39.4	Complied
2317	1	49	-21.8	-13.0	8.8	Complied



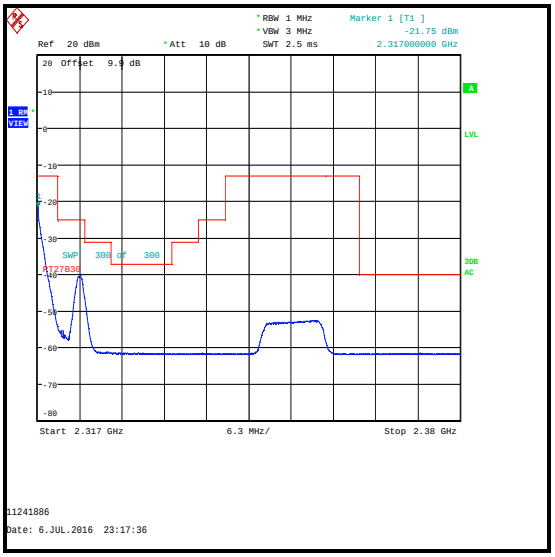
QPSK / 1 RB 0 Offset / 2280 to 2303 MHz



QPSK / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



QPSK / 1 RB 49 Offset / 2316 to 2317 MHz / Integrated level

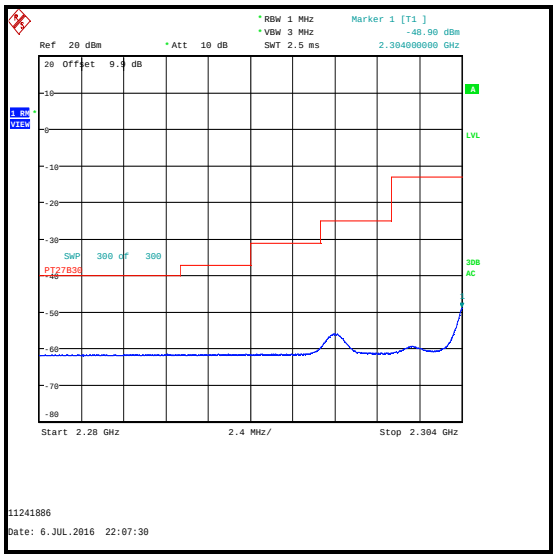


QPSK / 1 RB 49 Offset / 2317 to 2380 MHz

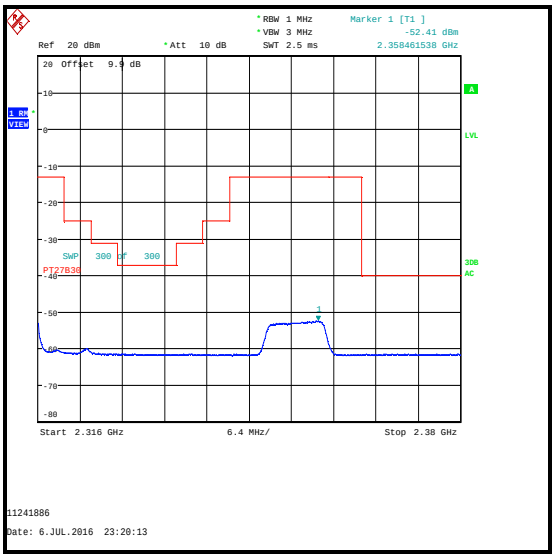
Transmitter Radiated Emission Mask – UAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	1	49	-48.9	-13.0	35.9	Complied
2358.462	1	0	-52.4	-13.0	39.4	Complied



QPSK / 1 RB 49 Offset / 2280 to 2304 MHz

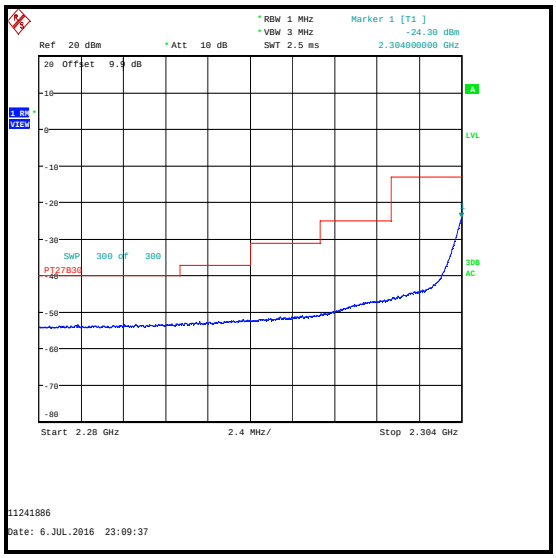


QPSK / 1 RB 0 Offset / 2316 to 2380 MHz

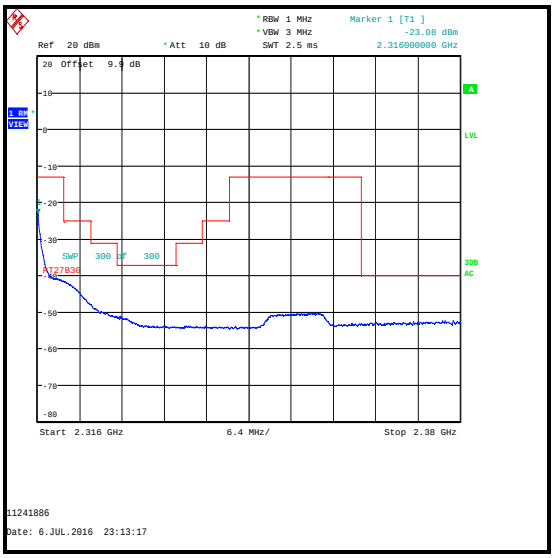
Transmitter Radiated Emission Mask – UAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	50	0	-24.3	-13.0	11.3	Complied
2316	50	0	-23.1	-13.0	10.1	Complied



16QAM / 50 RB 0 Offset/ 2280 to 2304 MHz

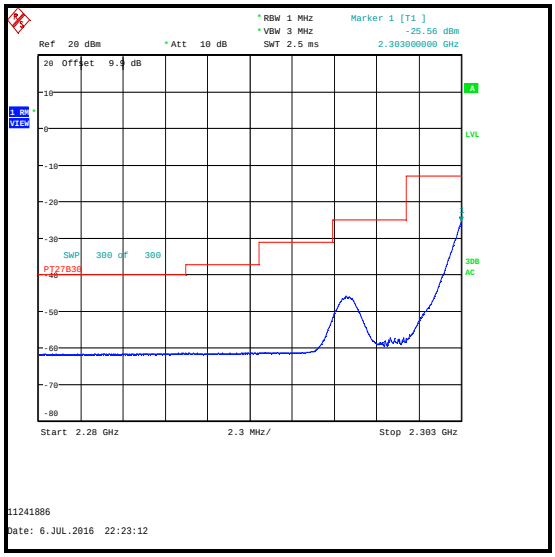


16QAM / 50 RB 0 Offset/ 2316 to 2380 MHz

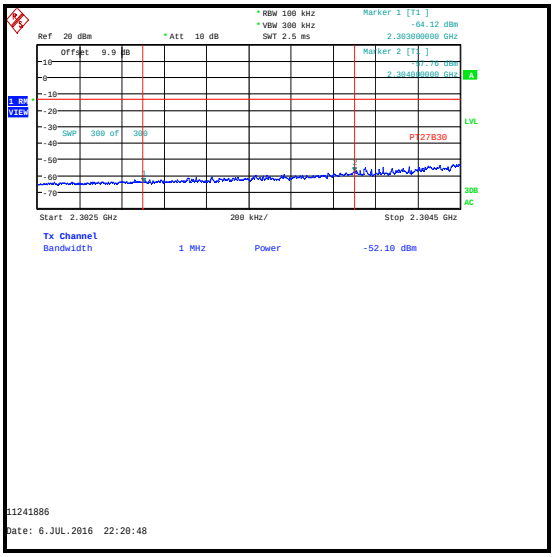
Transmitter Radiated Emission Mask – UAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

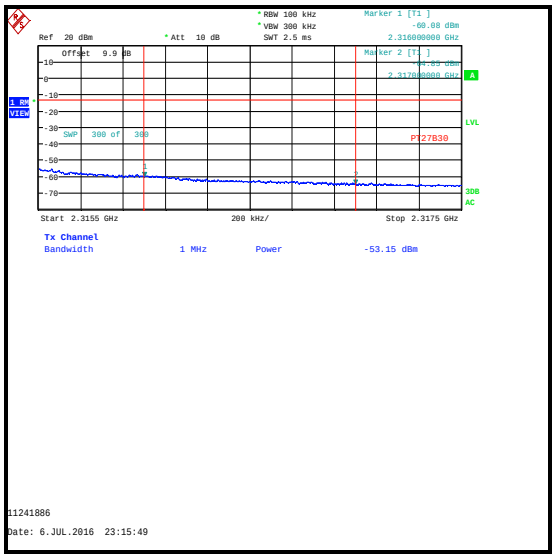
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2303	1	0	-25.6	-13.0	12.6	Complied
2303-2304	1	0	-52.1*	-13.0	39.1	Complied
2316-2317	1	49	-53.2*	-13.0	50.2	Complied
2317	1	49	-22.5	-13.0	9.5	Complied



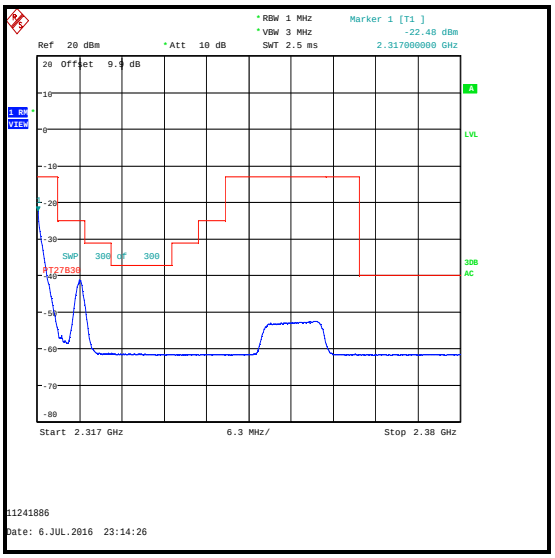
16QAM / 1 RB 0 Offset / 2280 to 2303 MHz



16QAM / 1 RB 0 Offset / 2303 to 2304 MHz / Integrated level



16QAM / 1 RB 49 Offset / 2316 to 2317 MHz / Integrated level

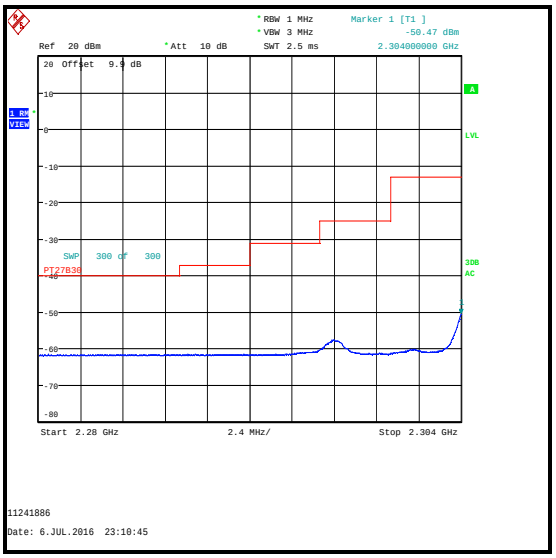


16QAM / 1 RB 49 Offset / 2317 to 2380 MHz

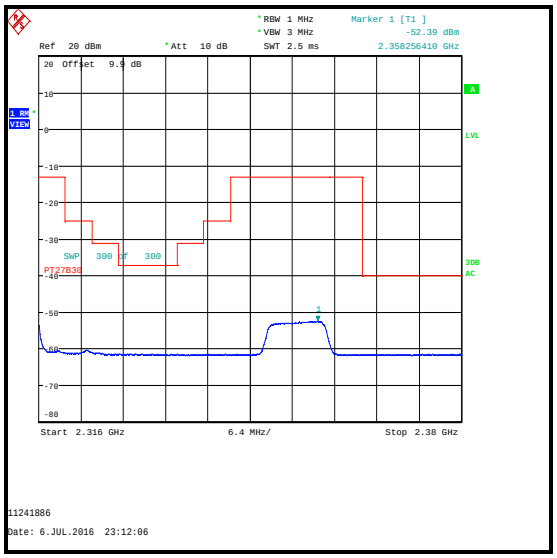
Transmitter Radiated Emission Mask – UAT (continued)

Results: 10 MHz Channel Bandwidth / 2280 to 2304 MHz & 2316 to 2380 MHz / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2304	1	49	-50.5	-13.0	37.5	Complied
2358.256	1	0	-52.4	-13.0	39.4	Complied



16QAM / 1 RB 49 Offset / 2280 to 2304 MHz



16QAM / 1 RB 0 Offset / 2316 to 2380 MHz

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2863	Pre-Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B	07 Apr 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12
A032	Antenna	EMCO	3115	2874	01 Mar 2019	36
A2937	Attenuator	AtlanTecRF	AN18W5-06	208147#1	23 May 2017	12
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	09 May 2017	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	11 Apr 2018	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	15 Apr 2018	24

5.2.10. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

Test Engineer:	Stefan Ho	**Test Date:**	12 May 2016
Test Sample Serial Number:	C7CRG02QH6DH		

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

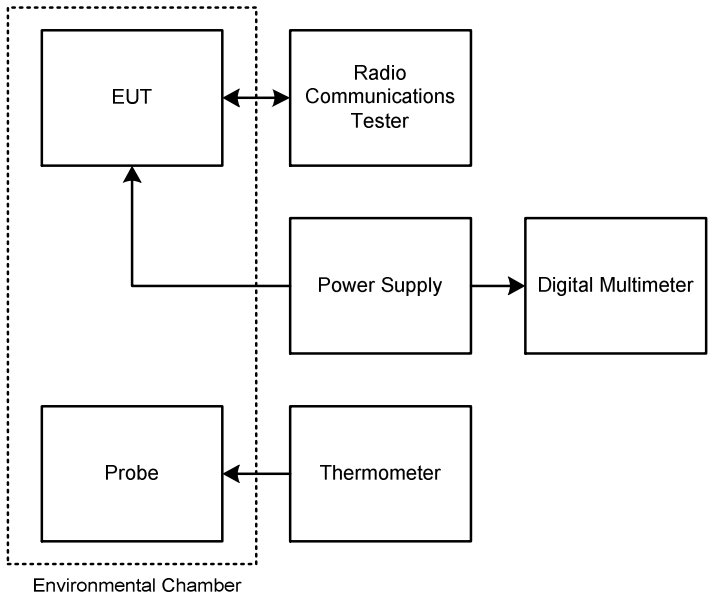
Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	43

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 3.8 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 (2307.5 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	9	2307.500009	2305	2.500009	Complied
-20	14	2307.499986	2305	2.499986	Complied
-10	10	2307.500010	2305	2.500010	Complied
0	12	2307.500012	2305	2.500012	Complied
10	9	2307.500009	2305	2.500009	Complied
20	8	2307.500008	2305	2.500008	Complied
30	4	2307.500004	2305	2.500004	Complied
40	10	2307.500010	2305	2.500010	Complied
50	25	2307.500025	2305	2.500025	Complied

Results: Top Channel (2312.5 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	8	2312.500008	2315	2.499992	Complied
-20	10	2312.500010	2315	2.499990	Complied
-10	16	2312.499984	2315	2.500016	Complied
0	6	2312.500006	2315	2.499994	Complied
10	7	2312.500007	2315	2.499993	Complied
20	7	2312.499993	2315	2.500007	Complied
30	9	2312.500009	2315	2.499991	Complied
40	9	2312.500009	2315	2.499991	Complied
50	31	2312.500031	2315	2.499969	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	02 Apr 2017	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW 500	145923	05 Apr 2017	12
M1674	Environmental Chamber	Espec Corporation	SU-241	90213139	Calibrated before use	-
M1642	Thermometer	Fluke	52II	18890119	25 Apr 2017	12
S0576	DC power supply	TTI	PL330QMD	066701	Calibrated before use	-
M122	Multimeter	Fluke	77	64910017	21 Apr 2017	12

5.2.11. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

Test Engineer:	Stefan Ho	**Test Date:**	12 May 2016
Test Sample Serial Number:	C7CRG02QH6DH		

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

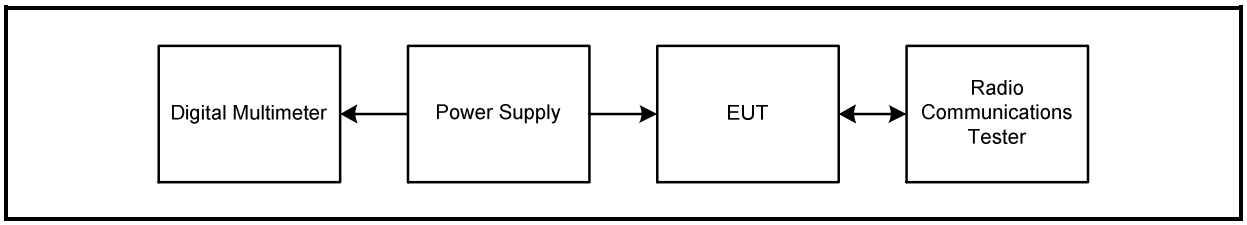
Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	43

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 (2307.5 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	8	2307.500008	2305	2.500008	Complied
4.2	7	2307.500007	2305	2.500007	Complied

Results: Top Channel (2312.5 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	7	2312.500007	2315	2.499993	Complied
4.2	6	2312.500006	2315	2.499994	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	02 Apr 2017	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW 500	145923	05 Apr 2017	12
S0576	DC power supply	TTI	PL330QMD	066701	Calibrated before use	-
M122	Multimeter	Fluke	77	64910017	21 Apr 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”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Output Power	2305 to 2315 MHz	95%	±1.13 dB
Frequency Stability	2305 to 2315 MHz	95%	±23 Hz
Occupied Bandwidth	2305 to 2315 MHz	95%	±3.92 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 24 GHz	95%	±2.94 dB

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

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	**Clause**	**Details**
1.0	-	-	Initial Version
2.0	-	-	Updates as requested by the TCB
3.0	-	-	Updates as requested by the TCB
4.0	-	-	Updates as requested by the TCB

--- END OF REPORT ---