




TEST REPORT


Test Report No. : UL-RPT-RP10295122JD04C V2.0

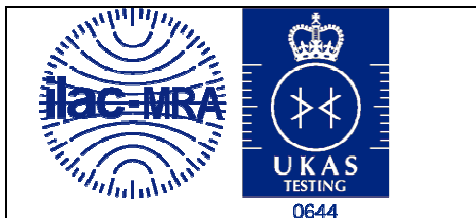
Manufacturer : Sony Mobile Communications Inc.
FCC ID : PY7PM-0801
Technology. : LTE – Band 4
Test Standard(s) : FCC Part 27 Subpart C

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

Date of Issue: 01 August 2014

Checked by: 
Sarah Williams
Engineer, Radio Laboratory

Issued by : 
pp
John Newell
Group Quality Manager,
Basingstoke,
UL VS LTD



This laboratory is accredited by UKAS.
The tests reported herein have been
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of accreditation.

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1. Customer Information








Company Name:	Sony Mobile Communications Inc.
Address:	Nya Vattentornet Mobilvägen 10 Lund 22188 Sweden

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:	27 May 2014 to 03 June 2014

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
2.1046 / 27.50(d)(4)	Transmitter Output Power (EIRP)	
2.1049	Transmitter Occupied Bandwidth	
2.1053 / 27.53(g)(1)	Transmitter Radiated Spurious Emissions	
2.1053 / 27.53(g)(1)	Transmitter Radiated Emissions at Band Edges	
2.1055 / 27.54	Transmitter Frequency Stability (Temperature and Voltage Variation)	
Key to Results  = Complied  = Did not comply		

2.3. Methods and Procedures

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

2.4. Deviations from the Test Specification

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

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Sony
IMEI:	004402452750650 (<i>Radiated sample</i>)
Test Sample Serial Number:	CB5A1Z13WN
Hardware Version Number:	A
Software Version Number:	23.0.A.0.204
FCC ID:	PY7PM-0801

Brand Name:	Sony
IMEI:	004402452751252 (<i>Conducted sample with RF port</i>)
Test Sample Serial Number:	CB5A1Z1S0C
Hardware Version Number:	A
Software Version Number:	23.0.A.0.204
FCC ID:	PY7PM-0801

Brand Name:	Sony
Description:	AC Charger
Model Name or Number:	EP880

Brand Name:	Generic
Description:	MHL Cable
Model Name or Number:	Not marked

Brand Name:	Sony
Description:	MHL Adaptor
Model Name or Number:	IM750

Brand Name:	Sony
Description:	USB Cable
Model Name or Number:	EC803

Brand Name:	Sony
Description:	Deskstand
Model Name or Number:	DK43

Identification of Equipment Under Test (EUT) (continued)

Brand Name:	Sony
Description:	PHF
Model Name or Number:	MH410c

3.2. Description of EUT

The equipment under test (EUT) was a GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac + NFC & ANT+.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Tested Technology:	LTE Band 4		
Type of Equipment	Transceiver		
Channel Bandwidth(s):	1.4, 3, 5, 10, 15 & 20 MHz		
Modulation Type:	QPSK & 16QAM		
Duty Cycle:	100%		
Antenna Gain:	0.85 dBi		
Power Supply Requirement:	Nominal	3.8 VDC	
	Minimum	3.42 VDC	
	Maximum	4.18 VDC	
Transmit Frequency Range:	1710 MHz to 1755 MHz		
Channels Tested:	Channel Bandwidth	N_{ul}	Frequency of Uplink (MHz)
Bottom Channel	1.4	19957	1710.7
	3	19965	1711.5
	5	19975	1712.5
	10	20000	1715.0
	15	20025	1717.5
	20	20050	1720.0
Middle Channel	All	20175	1732.5
Top Channel	1.4	20393	1754.3
	3	20385	1753.5
	5	20375	1752.5
	10	20350	1750.0
	15	20325	1747.5
	20	20300	1745.0

3.5. Support Equipment

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

Description:	2 GB Micro SD Card
Brand Name:	SanDisk
Model Name or Number:	Not marked

Description:	22" High Definition Television
Brand Name:	Logik
Model Name or Number:	L22FE12A
Serial Number:	1309020661

Description:	Voltage variation jig
Brand Name:	Not marked
Model Name or Number:	Not marked
Serial Number:	Not marked

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

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

4.2. Configuration and Peripherals

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

- The EUT was connected to a Rohde and Schwarz CMW500 LTE system simulator, operating in a transceiver mode.
- Transmitter radiated spurious emission tests were performed with the following configurations, employing all available accessories:
 - Configuration 1 – Handset with the AC charger, USB Cable, MHL cable (terminated in to a television), MHL adaptor and PHF.
 - Configuration 2 – Handset with the AC charger, USB Cable, Deskstand and PHF.

Pre-scans below 1 GHz were performed in both configurations 1 and 2, with final measurements limited to the configuration which provided worst case results. Pre-scans above 1 GHz were performed in the configuration that employed the most accessories (Configuration 1), with any final measurements being performed in both configurations.

- 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, as this mode emits the highest transmit output power level, it was deemed to be the worst case.
- The EUT was supplied with an RF conducted port and external RF connector, to allow conducted measurements to be performed where necessary.
- Testing at temperature and voltage extremes was performed using a voltage variation jig and adaptor supplied by the customer. The adaptor plugs onto the handset in place of the battery connector.
- The voltage variation jig and adaptor were used for conducted measurements set at the nominal voltage.
- The conducted sample with IMEI 004402452751252 was used for occupied bandwidth, average power and frequency stability measurements.
- The radiated sample with IMEI 004402452750650 was used for all radiated measurements.

4.3. Resource Block Allocation

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

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

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

Transmitter Radiated Emissions testing was carried out using sub test 1, with a 10 MHz channel bandwidth and QPSK modulation scheme, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.

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

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

5. Measurements, Examinations and Derived Results

5.1. General Comments

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

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

5.2. Test Results

5.2.1. Transmitter Output Power (EIRP)

Test Summary:

Test Engineer:	Ben Mercer	Test Date:	27 May 2014
Test Sample IMEI:	004402452751252		

FCC Reference:	Parts 2.1046 & 27.50(d)(4)
Test Method Used:	As detailed in FCC KDB 971168 Section 5.2.1

Environmental Conditions:

Temperature (°C):	23 to 26
Relative Humidity (%):	41 to 43

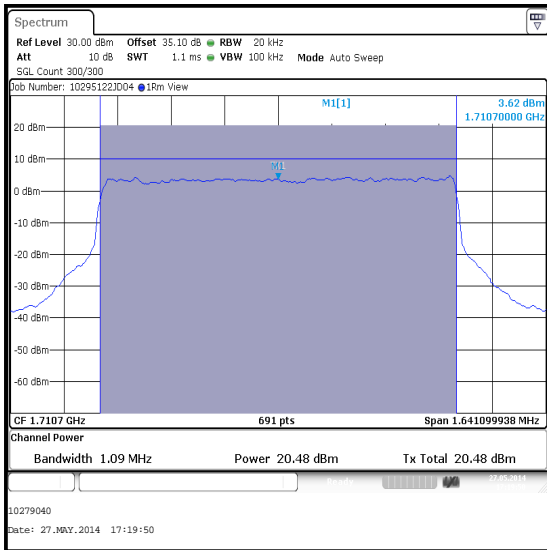
Note(s):

1. The customer stated that the antenna gain is 0.85 dBi.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed in section 4.3 of this report.
3. The spectrum analyser's channel power function was used to integrate across the occupied bandwidth. The resolution bandwidth was set to between 1-5% of the occupied bandwidth and the video bandwidth was set to at least 3 times the resolution bandwidth. An RMS detector was used, sweep time was set to auto and the trace was averaged over at least 100 traces. The span was set to at least 1.5 times the occupied bandwidth. The channel power results are recorded in the tables below.
4. The RF port of the EUT was connected to the spectrum analyser via RF cables, directional coupler and suitable attenuation. An RF level offset was entered on the spectrum analyser, to compensate for the signal path losses in these components.

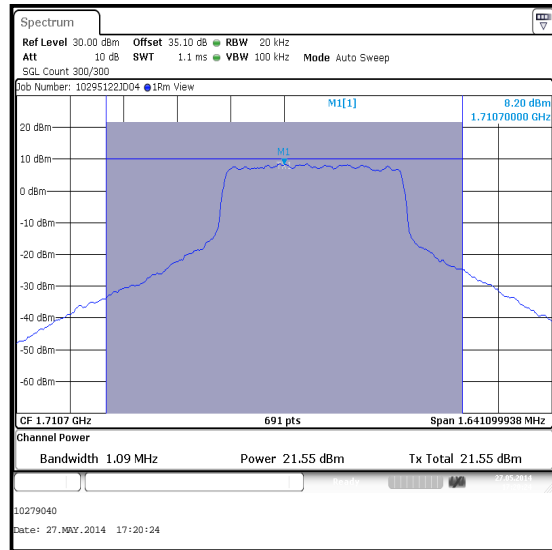
Transmitter Output Power (EIRP) (continued)

Results: 1.4 MHz Channel Bandwidth / Bottom Channel / QPSK

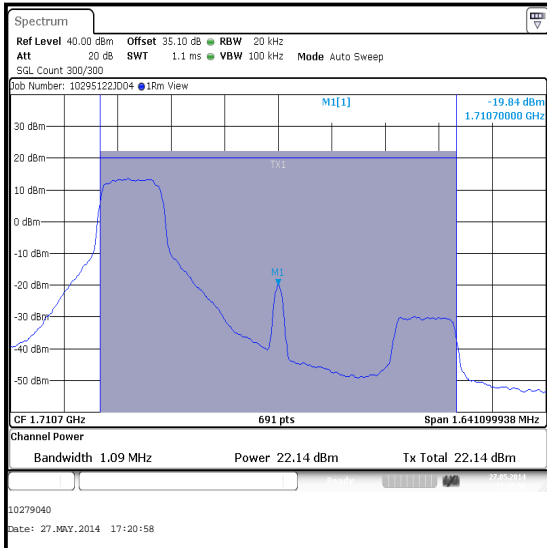
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1710.7	6	0	20.5	0.85	21.35	30.0	8.65	Complied
1710.7	3	2	21.6	0.85	22.45	30.0	7.55	Complied
1710.7	1	0	22.1	0.85	22.95	30.0	7.05	Complied
1710.7	1	5	22.2	0.85	23.05	30.0	6.95	Complied



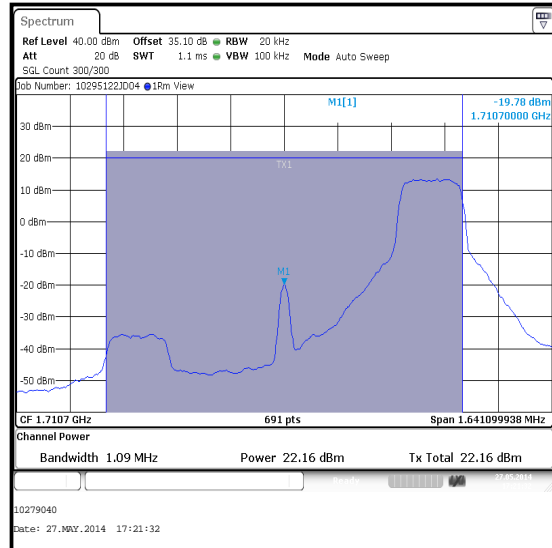
QPSK / 6 Resource Blocks (0 Offset)



QPSK / 3 Resource Blocks (2 Offset)



QPSK / 1 Resource Block (0 Offset)

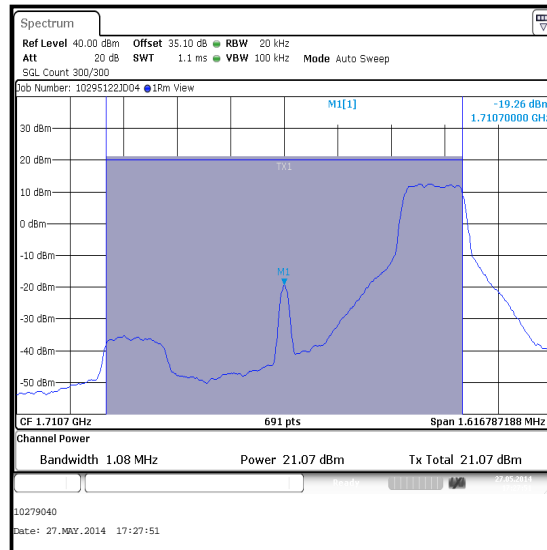
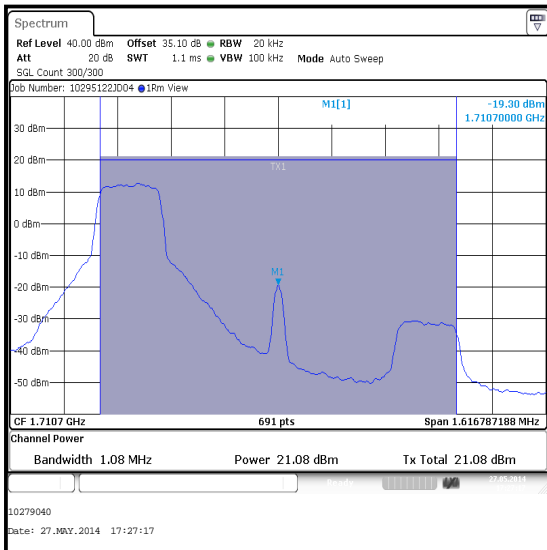
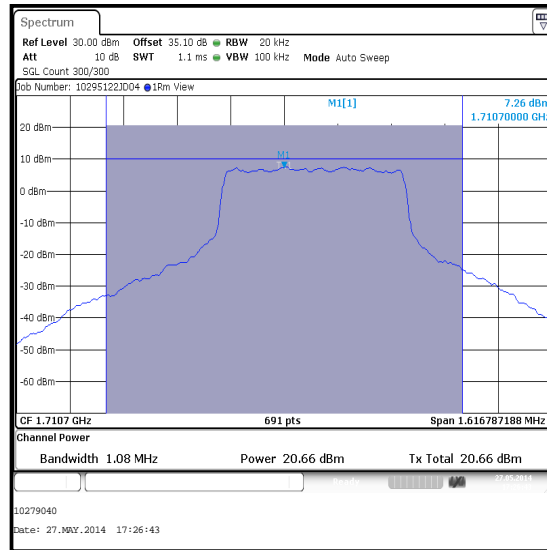
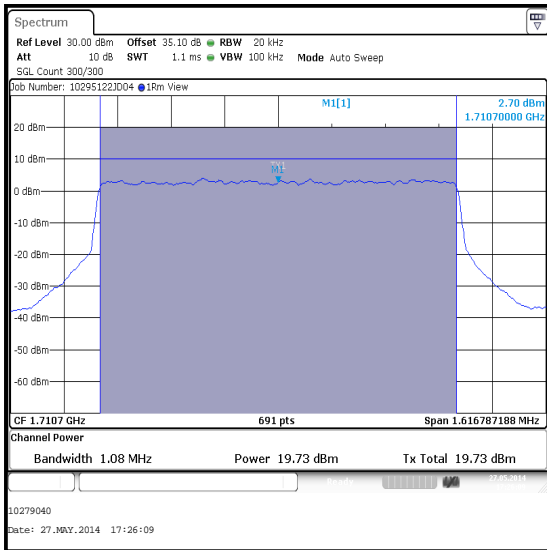


QPSK / 1 Resource Block (5 Offset)

Transmitter Output Power (EIRP) (continued)

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

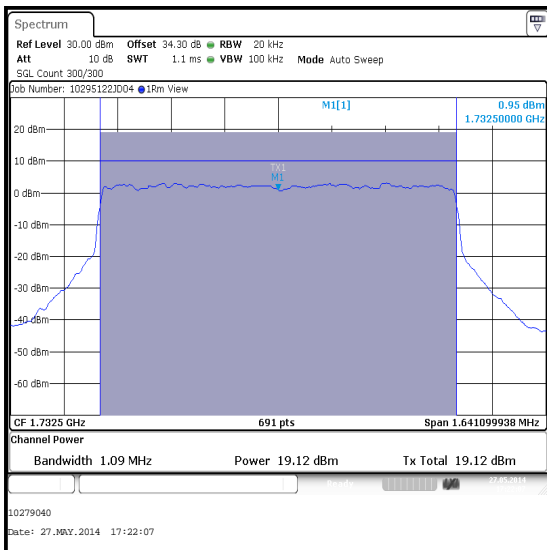
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1710.7	6	0	19.7	0.85	20.55	30.0	9.45	Complied
1710.7	3	2	20.7	0.85	21.55	30.0	8.45	Complied
1710.7	1	0	21.1	0.85	21.95	30.0	8.05	Complied
1710.7	1	5	21.1	0.85	21.95	30.0	8.05	Complied



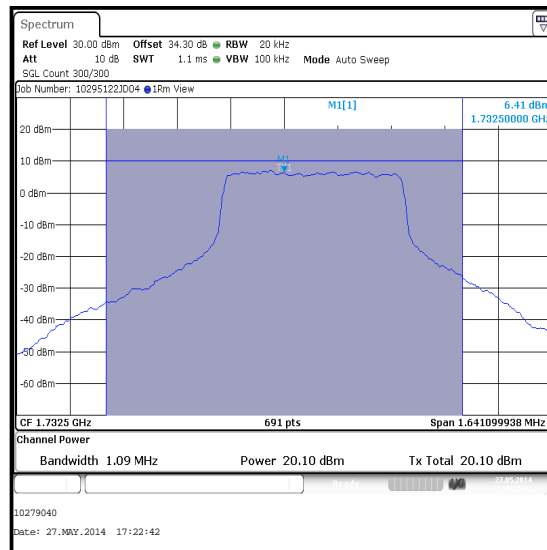
Transmitter Output Power (EIRP) (continued)

Results: 1.4 MHz Channel Bandwidth / Middle Channel / QPSK

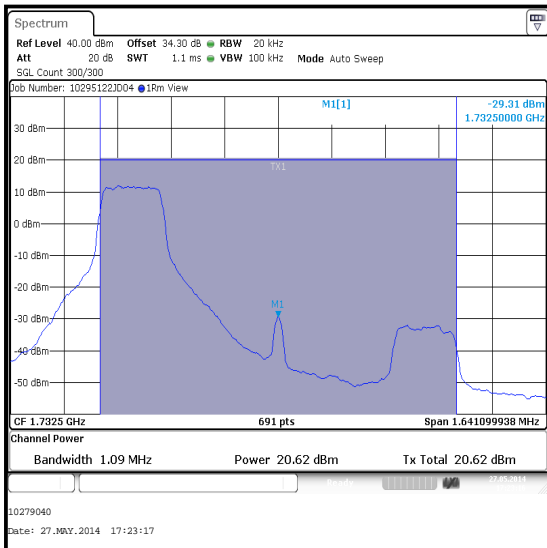
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	6	0	19.1	0.85	19.95	30.0	10.05	Complied
1732.5	3	2	20.1	0.85	20.95	30.0	9.05	Complied
1732.5	1	0	20.6	0.85	21.45	30.0	8.55	Complied
1732.5	1	5	20.4	0.85	21.25	30.0	8.75	Complied



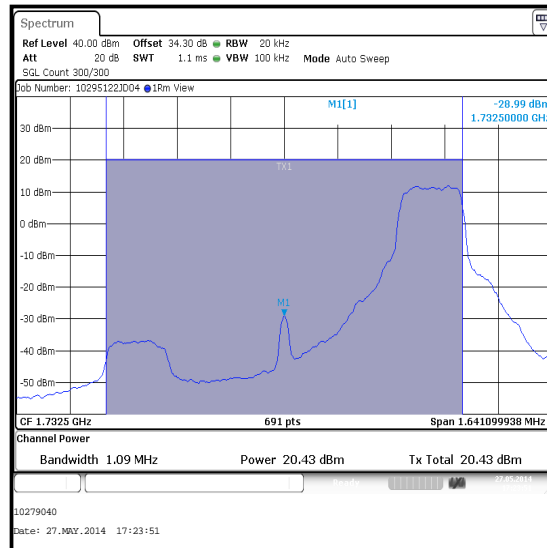
QPSK / 6 Resource Blocks (0 Offset)



QPSK / 3 Resource Blocks (2 Offset)



QPSK / 1 Resource Block (0 Offset)

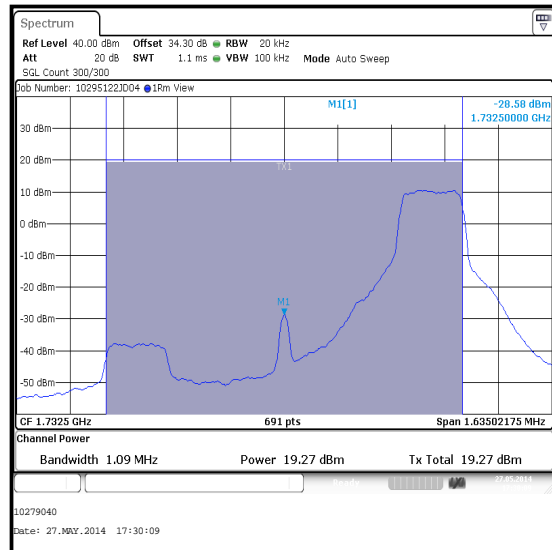
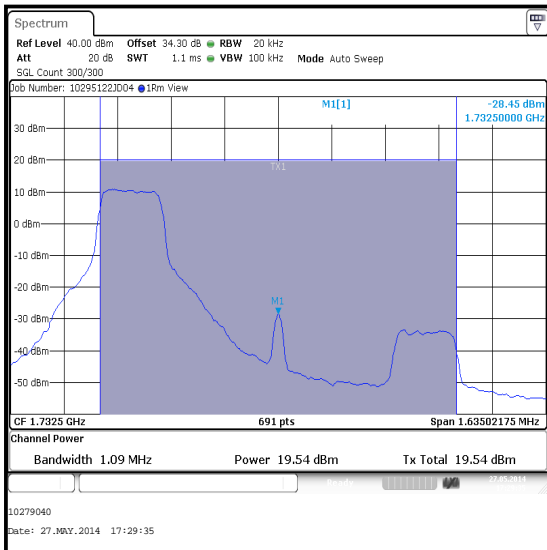
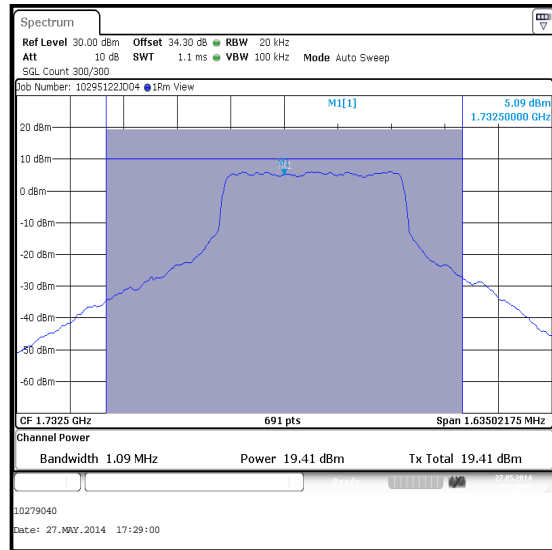
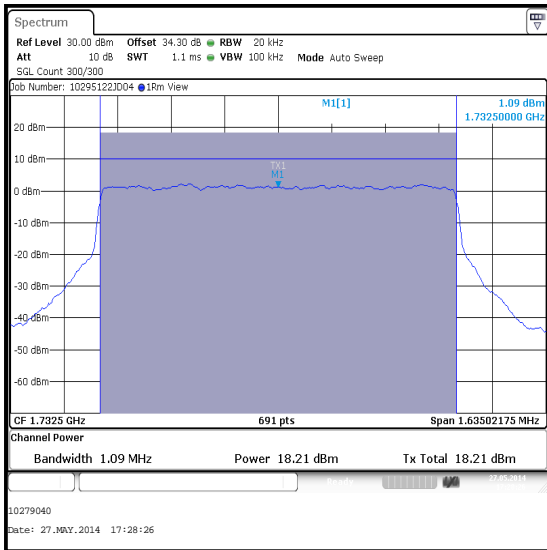


QPSK / 1 Resource Block (5 Offset)

Transmitter Output Power (EIRP) (continued)

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

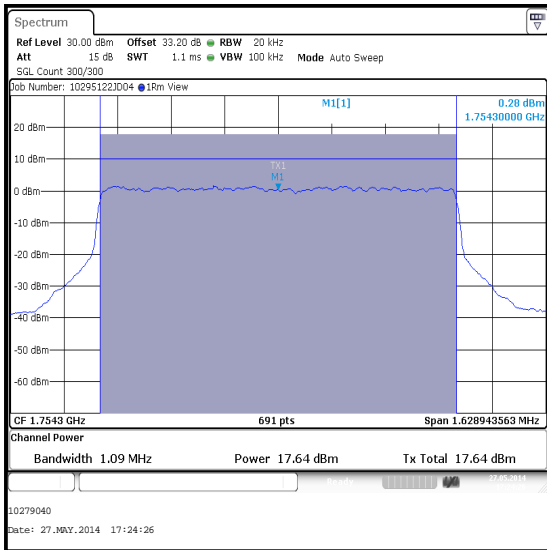
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	6	0	18.2	0.85	19.05	30.0	10.95	Complied
1732.5	3	2	19.4	0.85	20.25	30.0	9.75	Complied
1732.5	1	0	19.5	0.85	20.35	30.0	9.65	Complied
1732.5	1	5	19.3	0.85	20.15	30.0	9.85	Complied



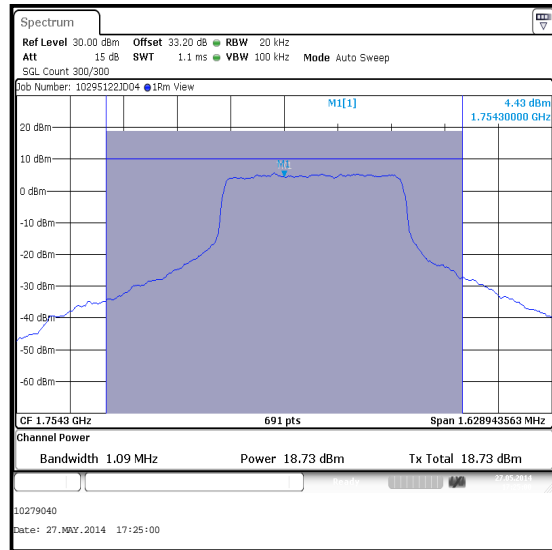
Transmitter Output Power (EIRP) (continued)

Results: 1.4 MHz Channel Bandwidth / Top Channel / QPSK

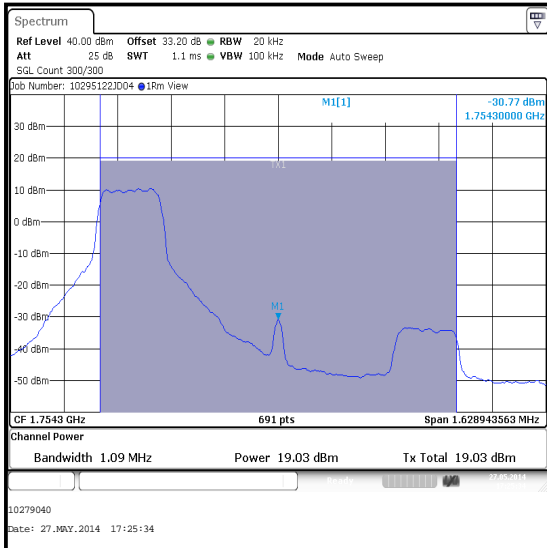
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1754.3	6	0	17.6	0.85	18.45	30.0	11.55	Complied
1754.3	3	2	18.7	0.85	19.55	30.0	10.45	Complied
1754.3	1	0	19.0	0.85	19.85	30.0	10.15	Complied
1754.3	1	5	19.1	0.85	19.95	30.0	10.05	Complied



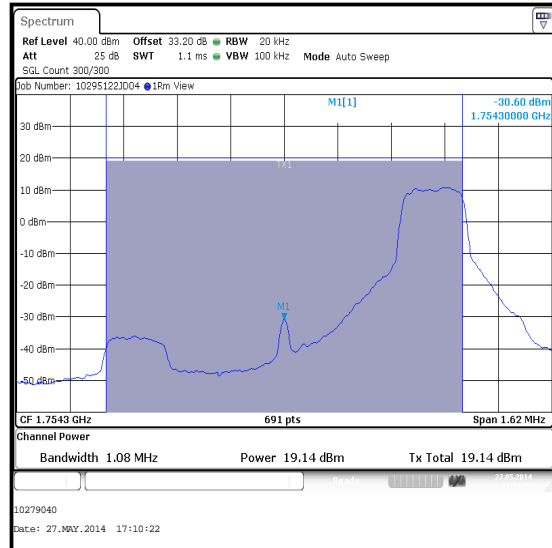
QPSK / 6 Resource Blocks (0 Offset)



QPSK / 3 Resource Blocks (2 Offset)



QPSK / 1 Resource Block (0 Offset)

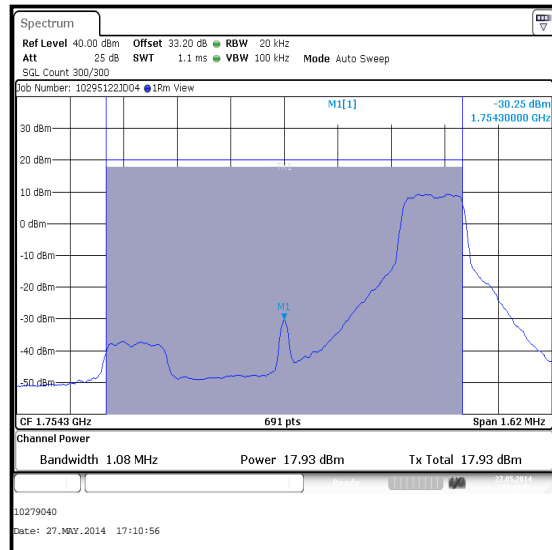
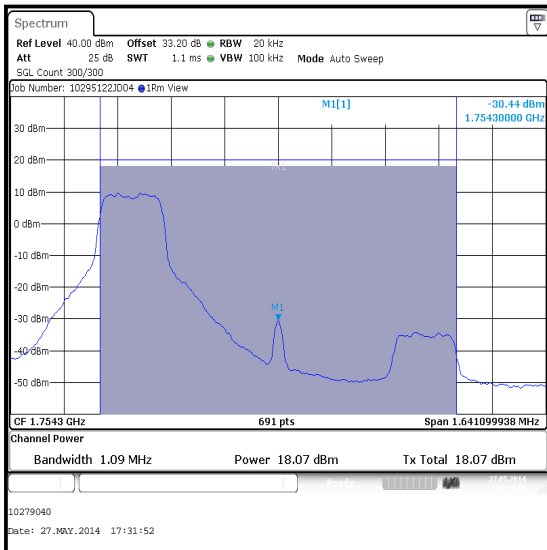
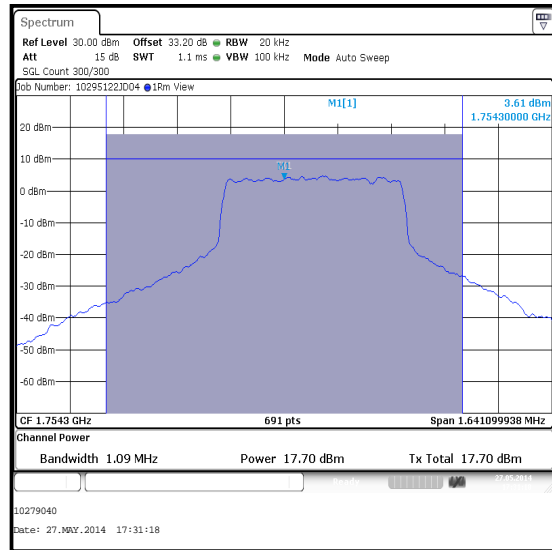
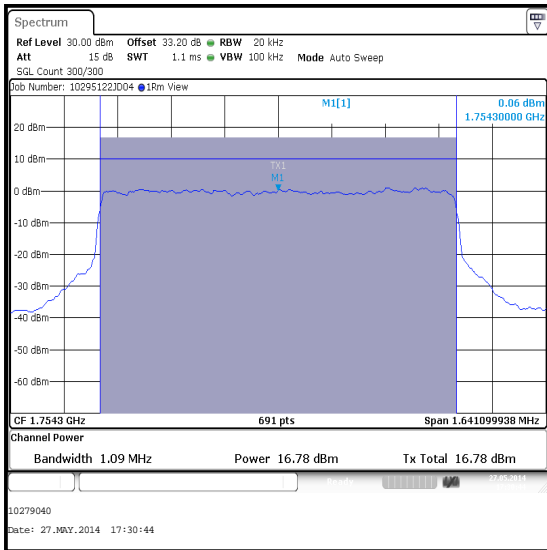


QPSK / 1 Resource Block (5 Offset)

Transmitter Output Power (EIRP) (continued)

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

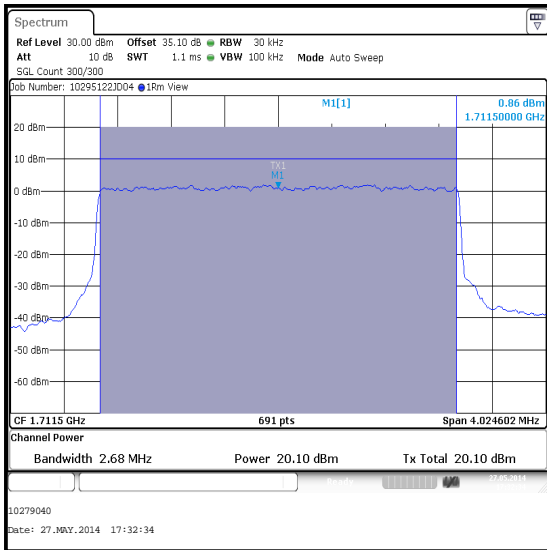
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1754.3	6	0	16.8	0.85	17.65	30.0	12.35	Complied
1754.3	3	2	17.7	0.85	18.55	30.0	11.45	Complied
1754.3	1	0	18.1	0.85	18.95	30.0	11.05	Complied
1754.3	1	5	17.9	0.85	18.75	30.0	11.25	Complied



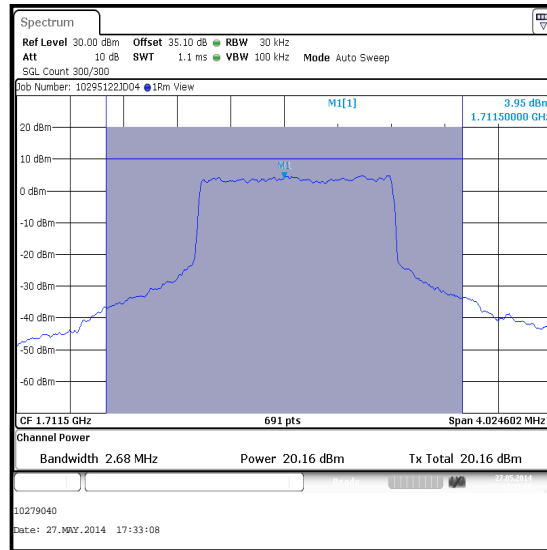
Transmitter Output Power (EIRP) (continued)

Results: 3 MHz Channel Bandwidth / Bottom Channel / QPSK

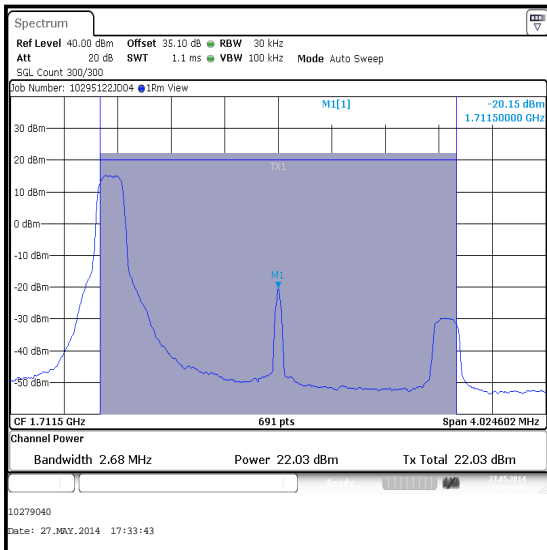
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1711.5	15	0	20.1	0.85	20.95	30.0	9.05	Complied
1711.5	8	4	20.2	0.85	21.05	30.0	8.95	Complied
1711.5	1	0	22.0	0.85	22.85	30.0	7.15	Complied
1711.5	1	14	22.2	0.85	23.05	30.0	6.95	Complied



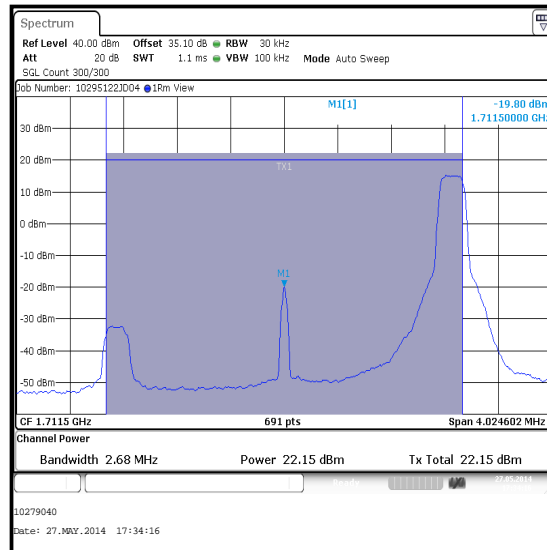
QPSK / 15 Resource Blocks (0 Offset)



QPSK / 8 Resource Blocks (4 Offset)



QPSK / 1 Resource Block (0 Offset)

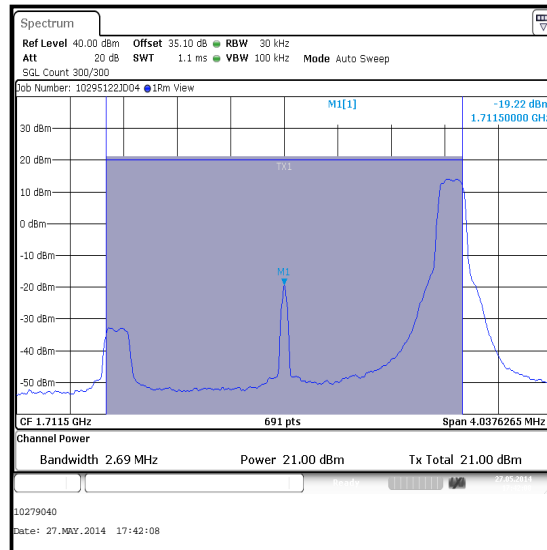
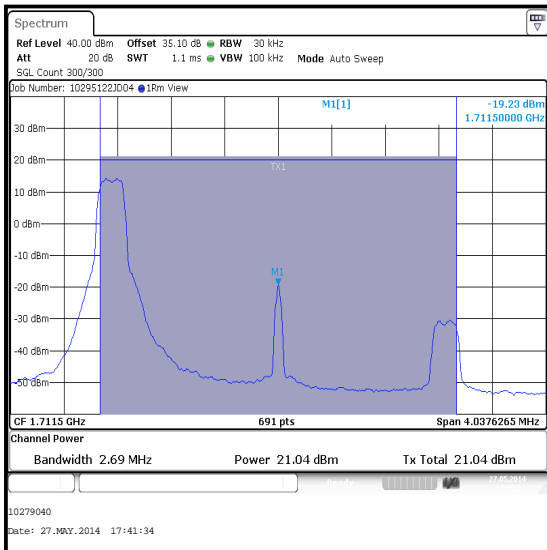
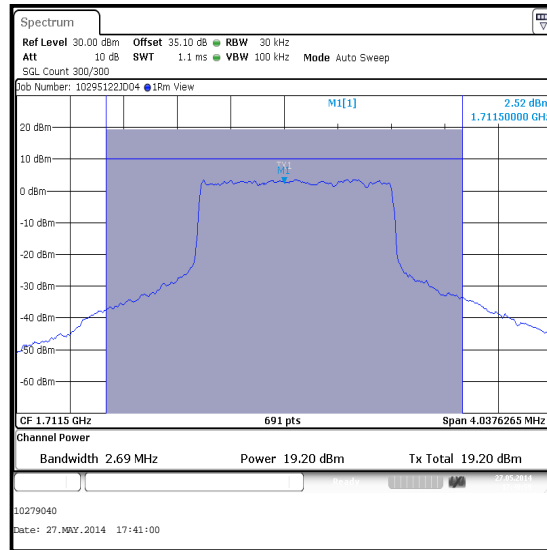
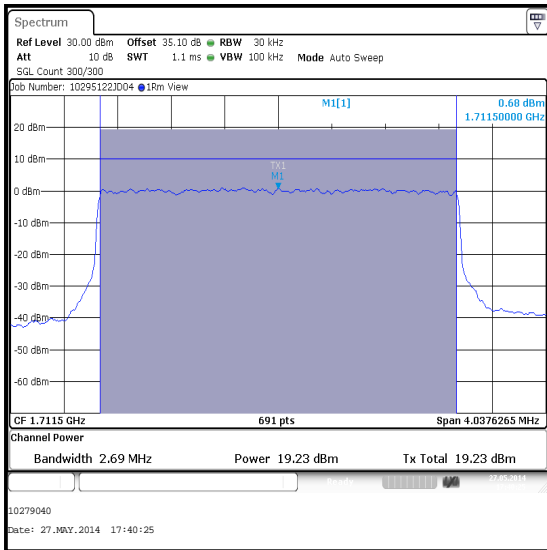


QPSK / 1 Resource Block (14 Offset)

Transmitter Output Power (EIRP) (continued)

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

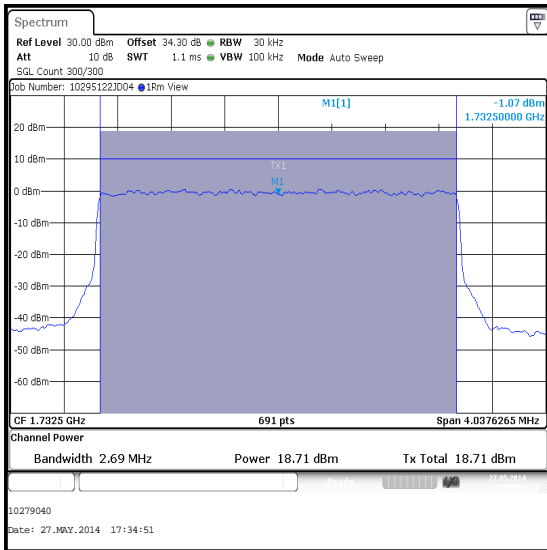
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1711.5	15	0	19.2	0.85	20.05	30.0	9.95	Complied
1711.5	8	4	19.2	0.85	20.05	30.0	9.95	Complied
1711.5	1	0	21.0	0.85	21.85	30.0	8.15	Complied
1711.5	1	14	21.0	0.85	21.85	30.0	8.15	Complied



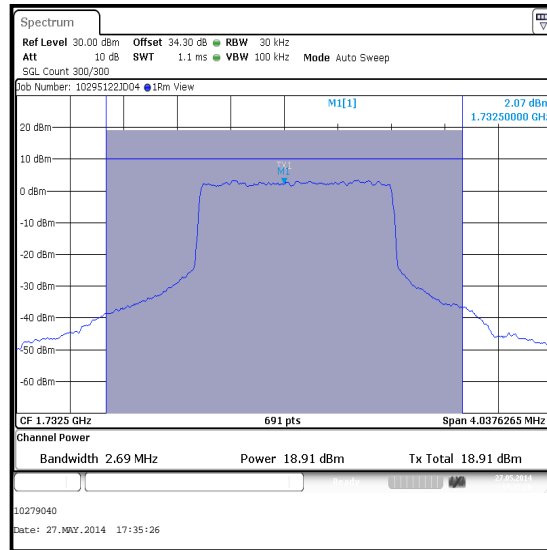
Transmitter Output Power (EIRP) (continued)

Results: 3 MHz Channel Bandwidth / Middle Channel / QPSK

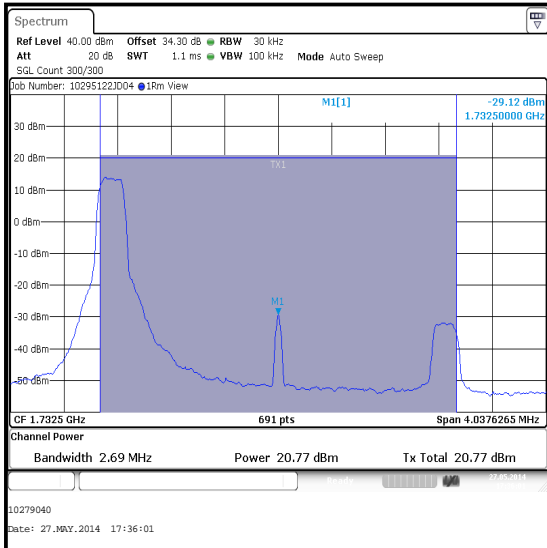
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	15	0	18.7	0.85	19.55	30.0	10.45	Complied
1732.5	8	4	18.9	0.85	19.75	30.0	10.25	Complied
1732.5	1	0	20.8	0.85	21.65	30.0	8.35	Complied
1732.5	1	14	20.6	0.85	21.45	30.0	8.55	Complied



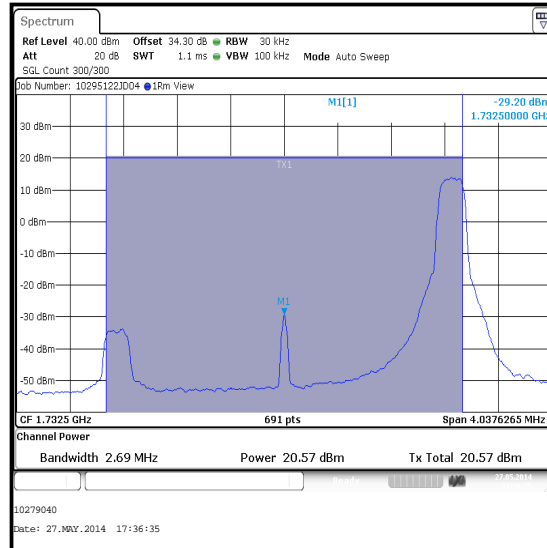
QPSK / 15 Resource Blocks (0 Offset)



QPSK / 8 Resource Blocks (4 Offset)



QPSK / 1 Resource Block (0 Offset)

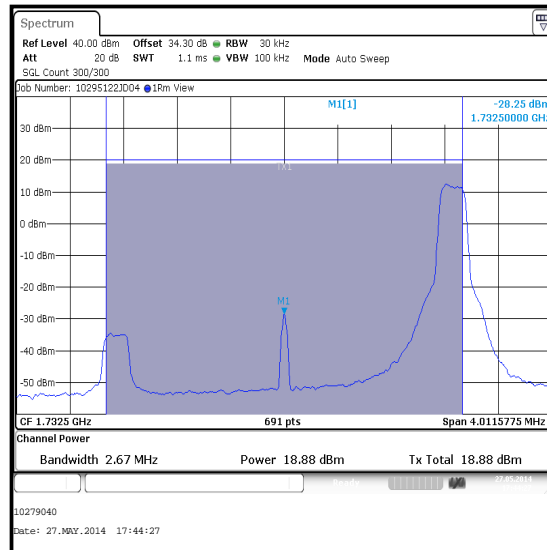
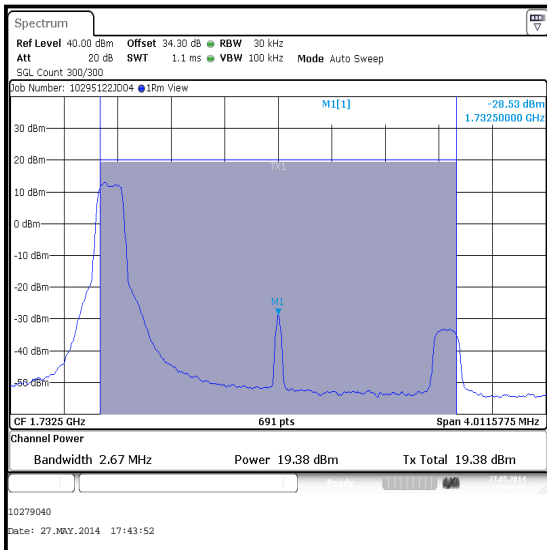
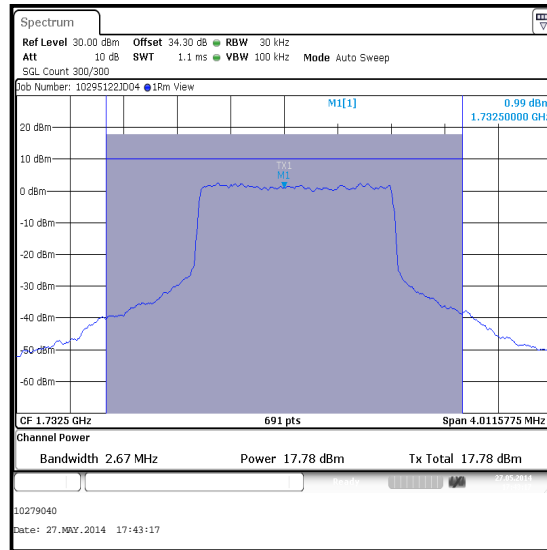
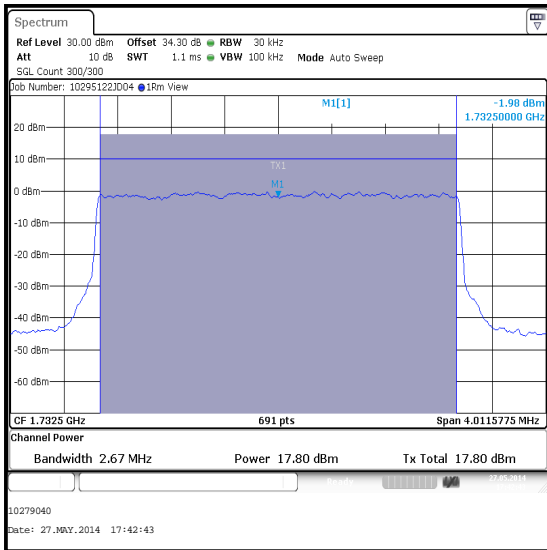


QPSK / 1 Resource Block (14 Offset)

Transmitter Output Power (EIRP) (continued)

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

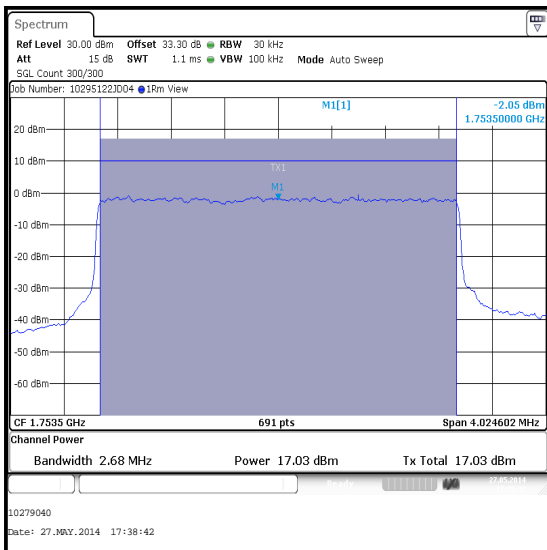
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	15	0	17.8	0.85	18.65	30.0	11.35	Complied
1732.5	8	4	17.8	0.85	18.65	30.0	11.35	Complied
1732.5	1	0	19.4	0.85	20.25	30.0	9.75	Complied
1732.5	1	14	18.9	0.85	19.75	30.0	10.25	Complied



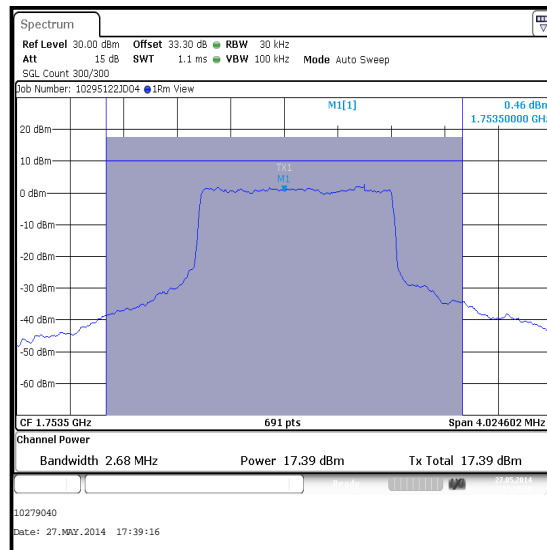
Transmitter Output Power (EIRP) (continued)

Results: 3 MHz Channel Bandwidth / Top Channel / QPSK

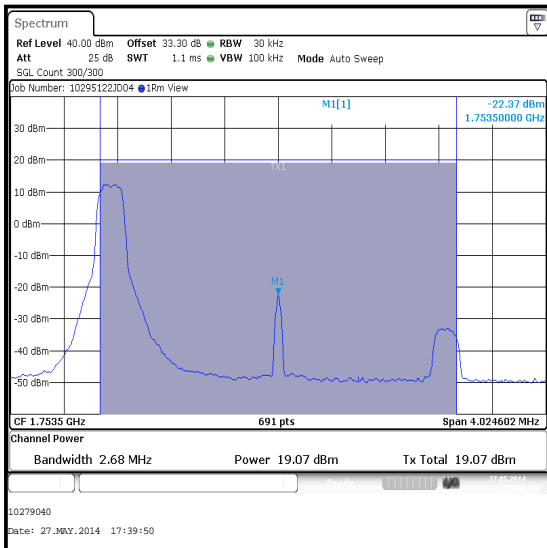
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1753.5	15	0	17.0	0.85	17.85	30.0	12.15	Complied
1753.5	8	4	17.4	0.85	18.25	30.0	11.75	Complied
1753.5	1	0	19.1	0.85	19.95	30.0	10.05	Complied
1753.5	1	14	19.5	0.85	20.35	30.0	9.65	Complied



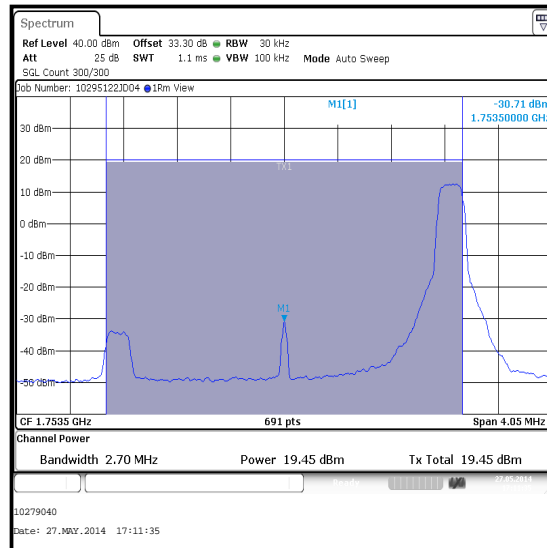
QPSK / 15 Resource Blocks (0 Offset)



QPSK / 8 Resource Blocks (4 Offset)



QPSK / 1 Resource Block (0 Offset)

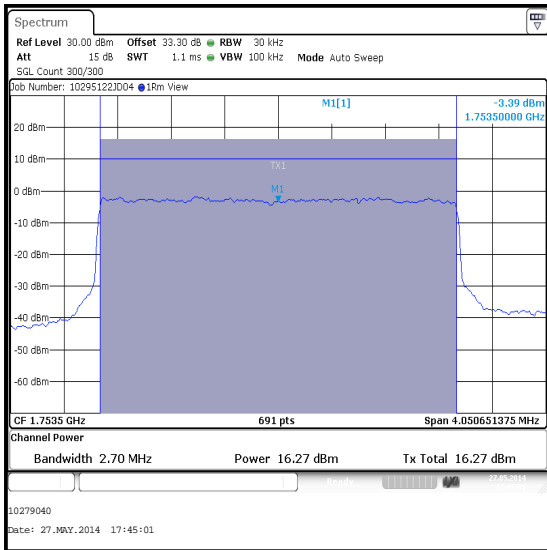


QPSK / 1 Resource Block (14 Offset)

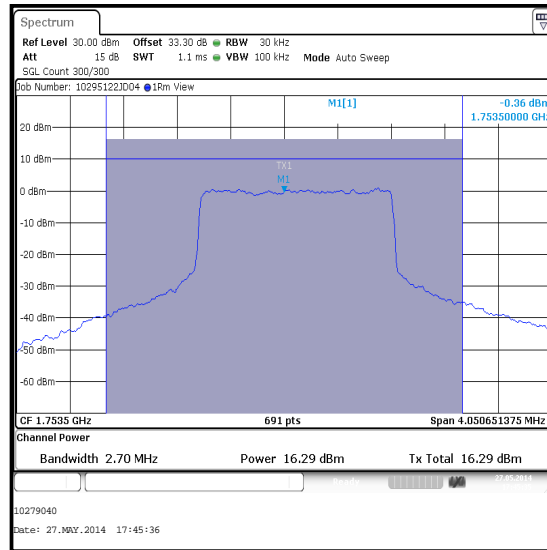
Transmitter Output Power (EIRP) (continued)

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

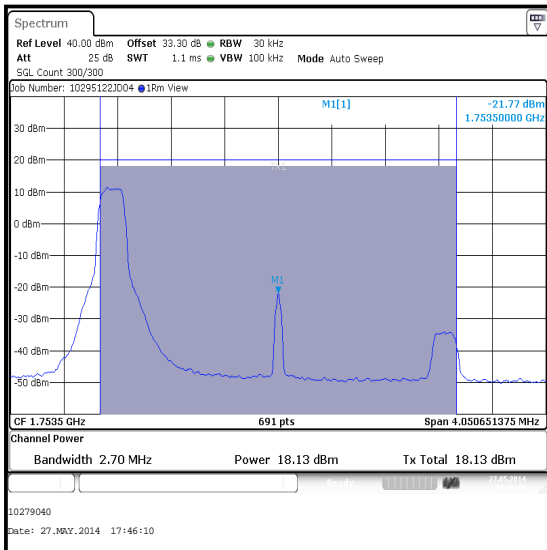
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1753.5	15	0	16.3	0.85	17.15	30.0	12.85	Complied
1753.5	8	4	16.3	0.85	17.15	30.0	12.85	Complied
1753.5	1	0	18.1	0.85	18.95	30.0	11.05	Complied
1753.5	1	14	18.0	0.85	18.85	30.0	11.15	Complied



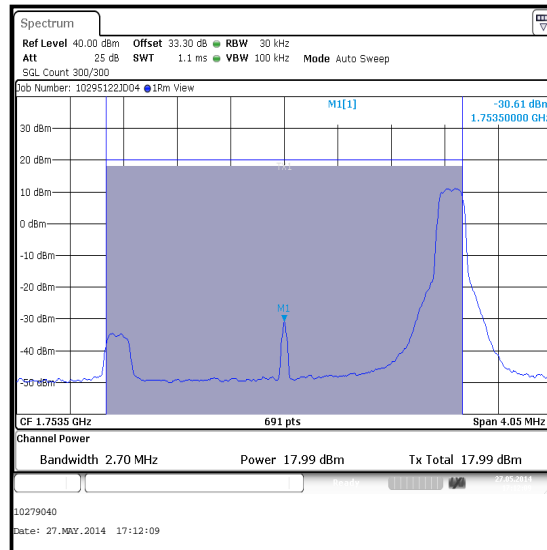
16QAM / 15 Resource Blocks (0 Offset)



16QAM / 8 Resource Blocks (4 Offset)



16QAM / 1 Resource Block (0 Offset)

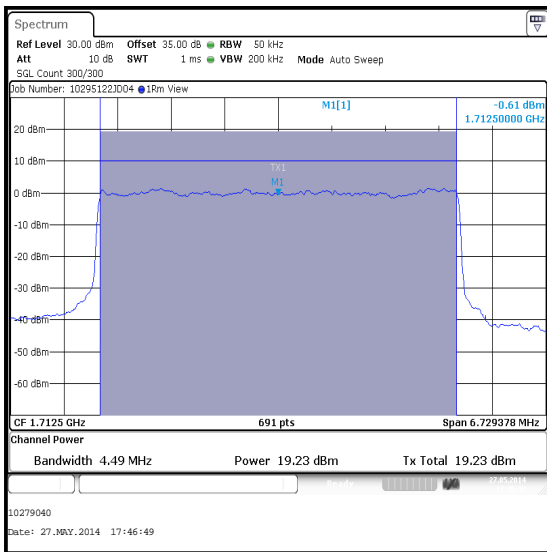


16QAM / 1 Resource Block (14 Offset)

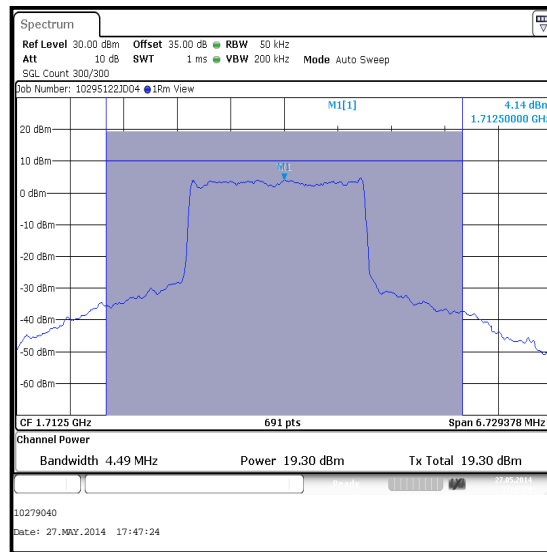
Transmitter Output Power (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

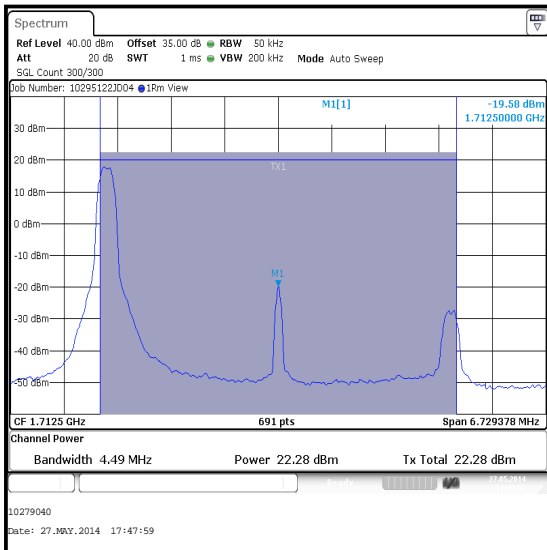
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1712.5	25	0	19.2	0.85	20.05	30.0	9.95	Complied
1712.5	12	6	19.3	0.85	20.15	30.0	9.85	Complied
1712.5	1	0	22.3	0.85	23.15	30.0	6.85	Complied
1712.5	1	24	22.2	0.85	23.05	30.0	6.95	Complied



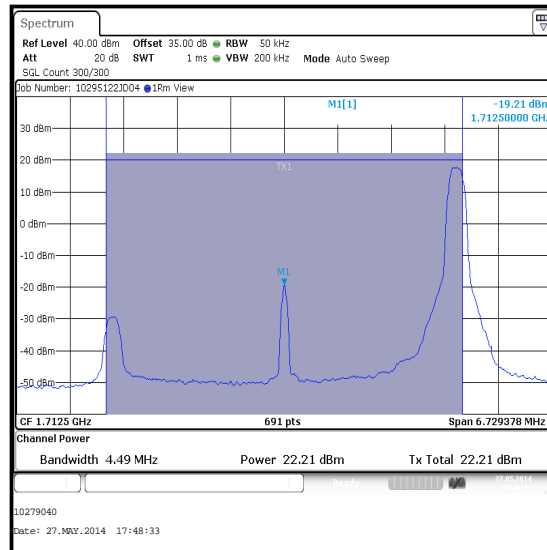
QPSK / 25 Resource Blocks (0 Offset)



QPSK / 12 Resource Blocks (6 Offset)



QPSK / 1 Resource Block (0 Offset)

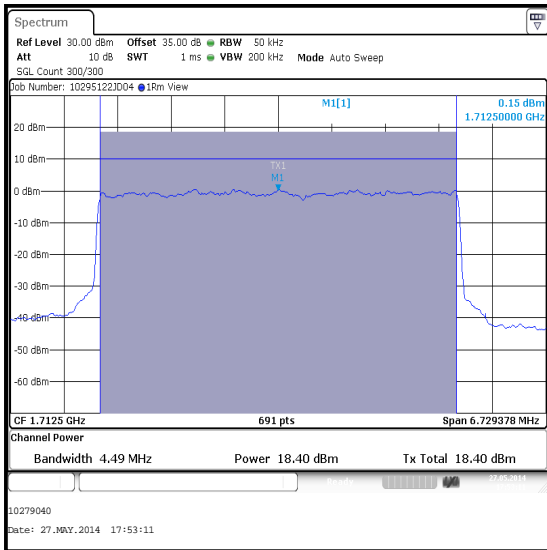


QPSK / 1 Resource Block (24 Offset)

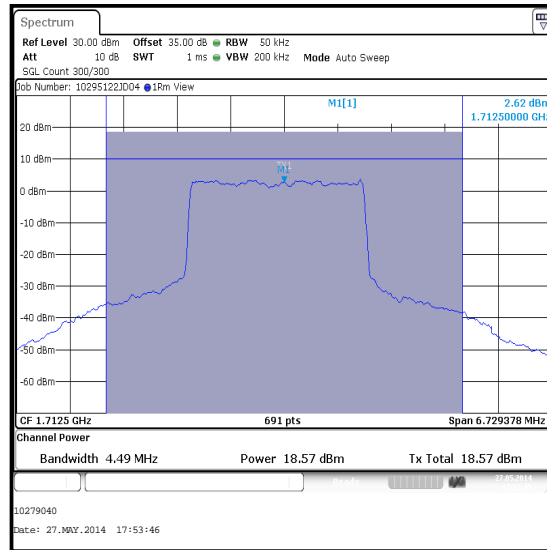
Transmitter Output Power (EIRP) (continued)

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

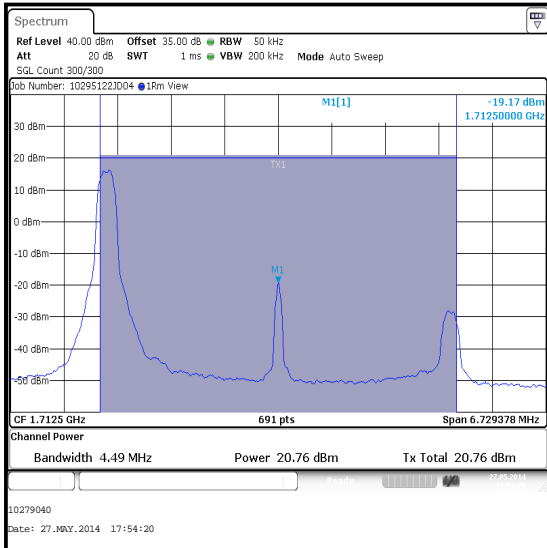
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1712.5	25	0	18.4	0.85	19.25	30.0	10.75	Complied
1712.5	12	6	18.6	0.85	19.45	30.0	10.55	Complied
1712.5	1	0	20.8	0.85	21.65	30.0	8.35	Complied
1712.5	1	24	20.8	0.85	21.65	30.0	8.35	Complied



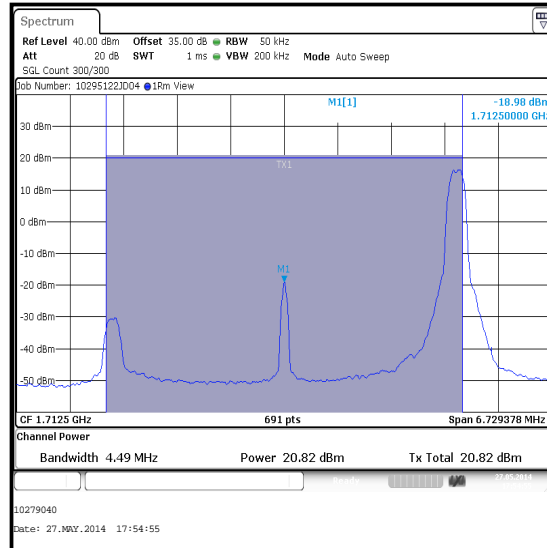
16QAM / 25 Resource Blocks (0 Offset)



16QAM / 12 Resource Blocks (6 Offset)



16QAM / 1 Resource Block (0 Offset)

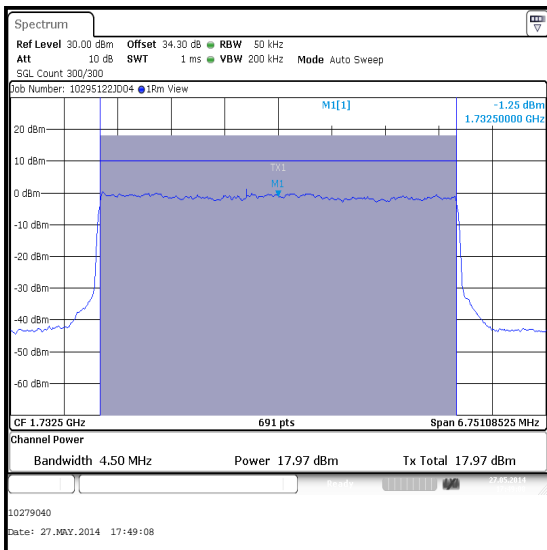


16QAM / 1 Resource Block (24 Offset)

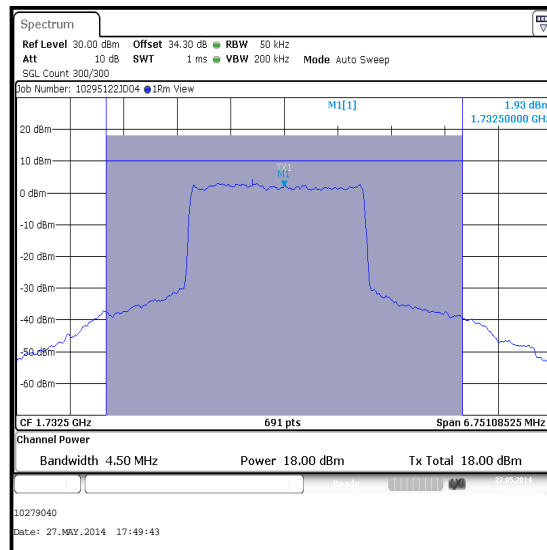
Transmitter Output Power (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

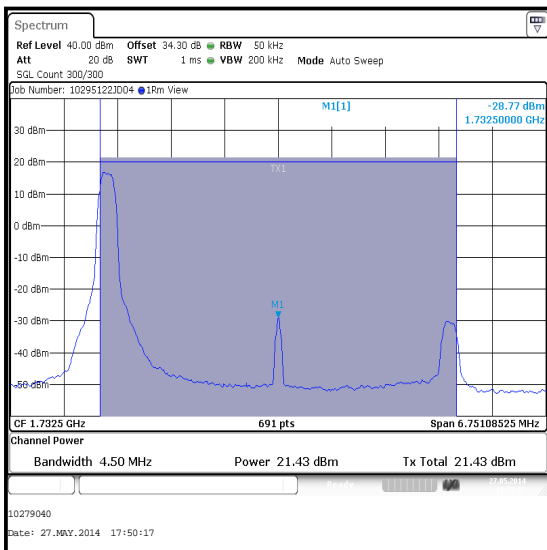
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	25	0	18.0	0.85	18.85	30.0	11.15	Complied
1732.5	12	6	18.0	0.85	18.85	30.0	11.15	Complied
1732.5	1	0	21.4	0.85	22.25	30.0	7.75	Complied
1732.5	1	24	20.6	0.85	21.45	30.0	8.55	Complied



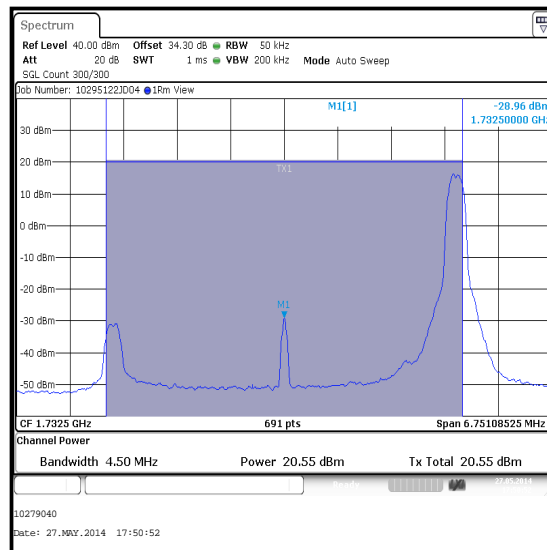
QPSK / 25 Resource Blocks (0 Offset)



QPSK / 12 Resource Blocks (6 Offset)



QPSK / 1 Resource Block (0 Offset)

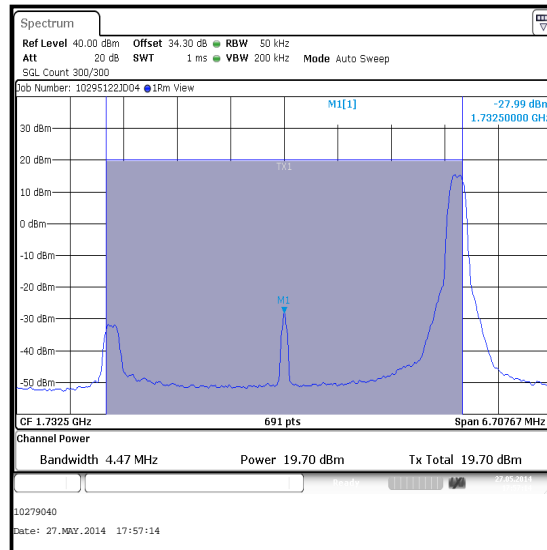
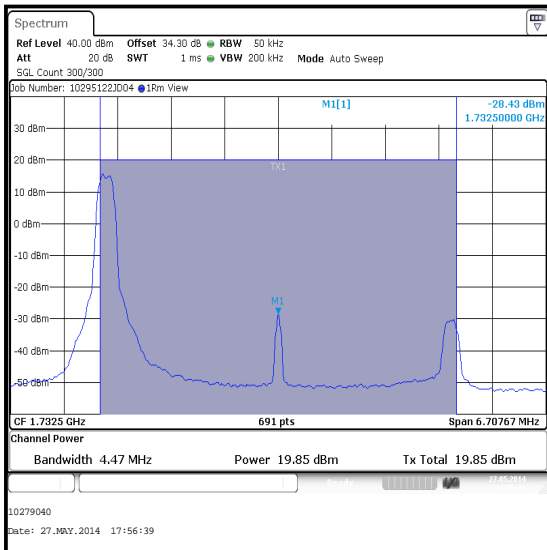
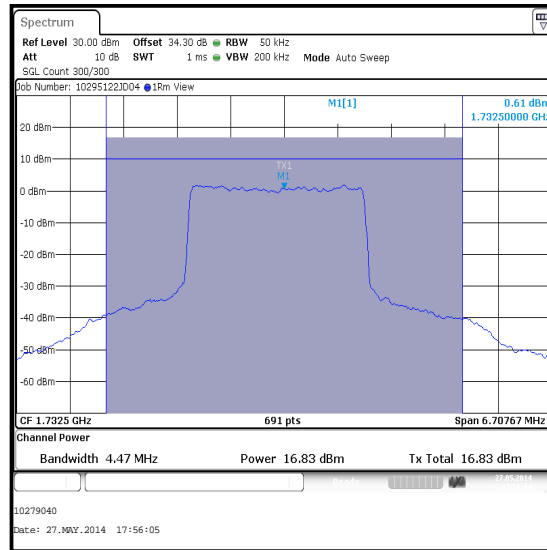
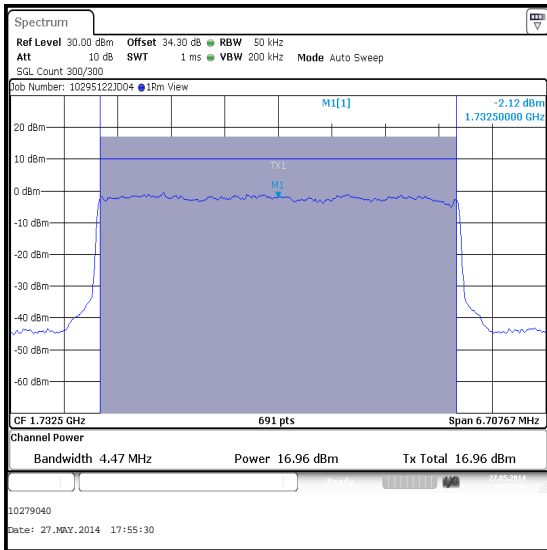


QPSK / 1 Resource Block (24 Offset)

Transmitter Output Power (EIRP) (continued)

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

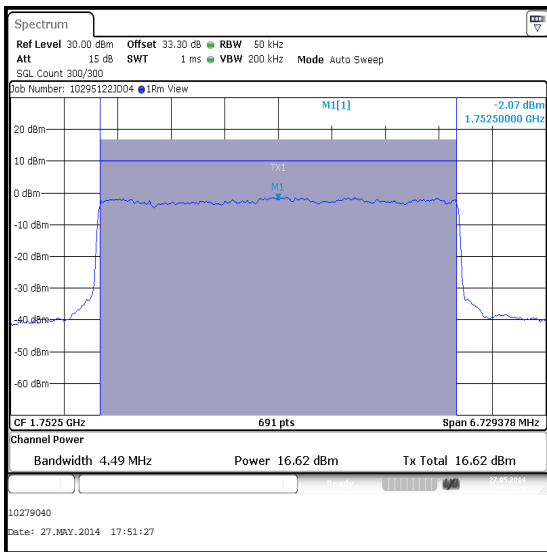
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	25	0	17.0	0.85	17.85	30.0	12.15	Complied
1732.5	12	6	16.8	0.85	17.65	30.0	12.35	Complied
1732.5	1	0	19.9	0.85	20.75	30.0	9.25	Complied
1732.5	1	24	19.7	0.85	20.55	30.0	9.45	Complied



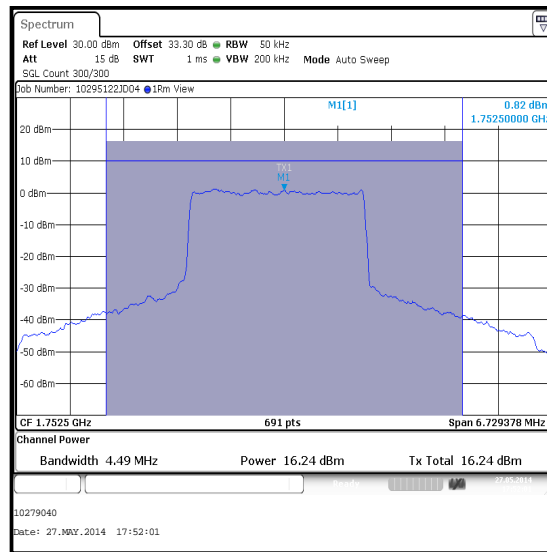
Transmitter Output Power (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

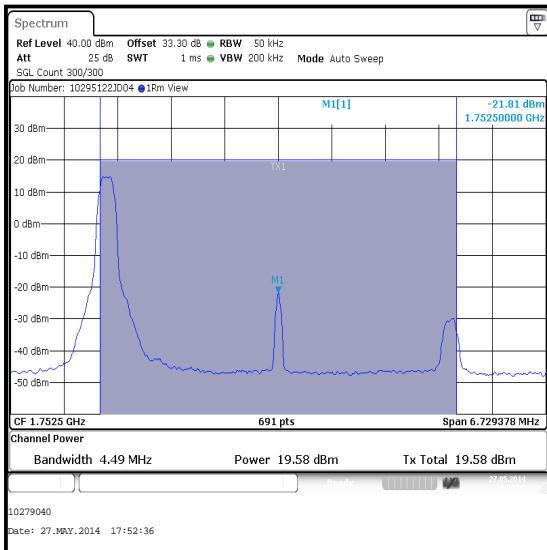
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1752.5	25	0	16.6	0.85	17.45	30.0	12.55	Complied
1752.5	12	6	16.2	0.85	17.05	30.0	12.95	Complied
1752.5	1	0	19.6	0.85	20.45	30.0	9.55	Complied
1752.5	1	24	19.3	0.85	20.15	30.0	9.85	Complied



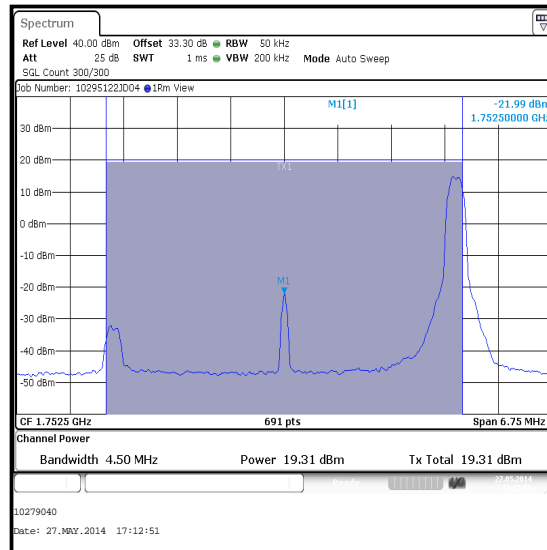
QPSK / 25 Resource Blocks (0 Offset)



QPSK / 12 Resource Blocks (6 Offset)



QPSK / 1 Resource Block (0 Offset)

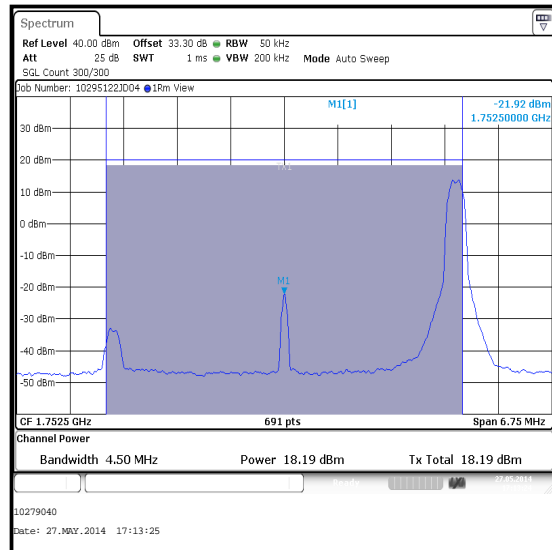
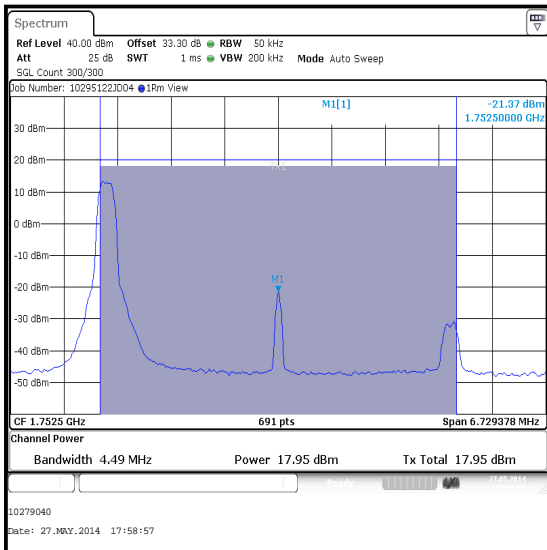
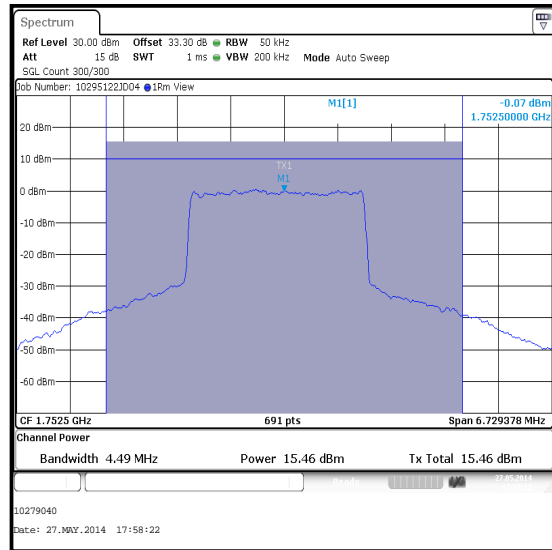
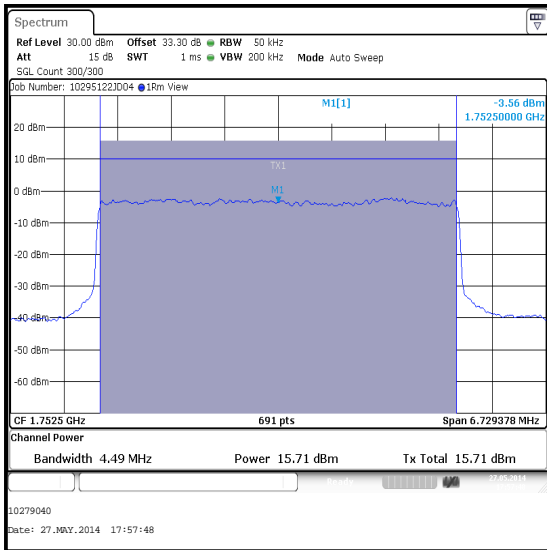


QPSK / 1 Resource Block (24 Offset)

Transmitter Output Power (EIRP) (continued)

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

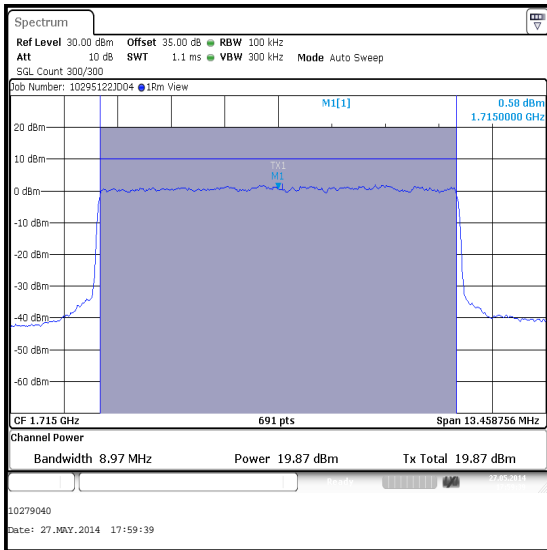
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1752.5	25	0	15.7	0.85	16.55	30.0	13.45	Complied
1752.5	12	6	15.5	0.85	16.35	30.0	13.65	Complied
1752.5	1	0	18.0	0.85	18.85	30.0	11.15	Complied
1752.5	1	24	18.2	0.85	19.05	30.0	10.95	Complied



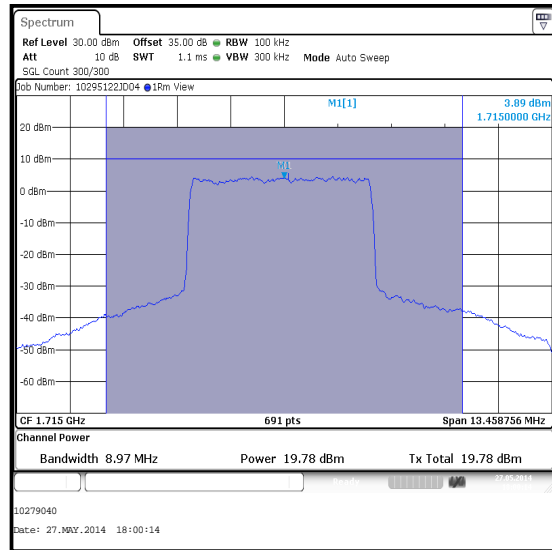
Transmitter Output Power (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK

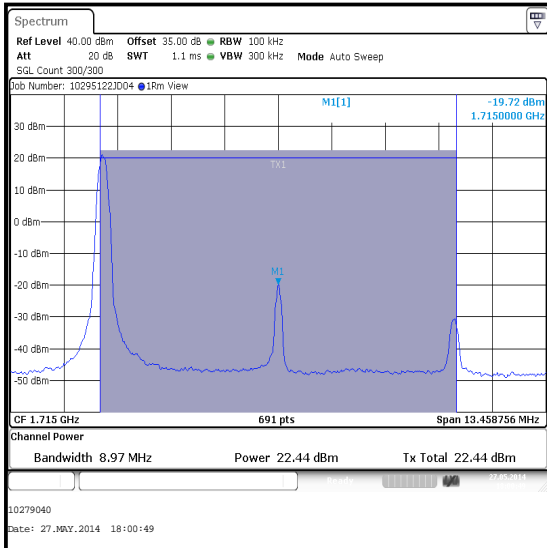
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1715.0	50	0	19.9	0.85	20.75	30.0	9.25	Complied
1715.0	25	12	19.8	0.85	20.65	30.0	9.35	Complied
1715.0	1	0	22.4	0.85	23.25	30.0	6.75	Complied
1715.0	1	49	22.1	0.85	22.95	30.0	7.05	Complied



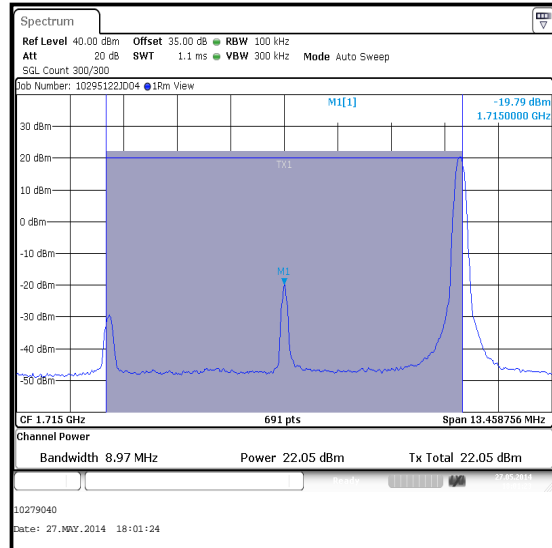
QPSK / 50 Resource Blocks (0 Offset)



QPSK / 25 Resource Blocks (12 Offset)



QPSK / 1 Resource Block (0 Offset)

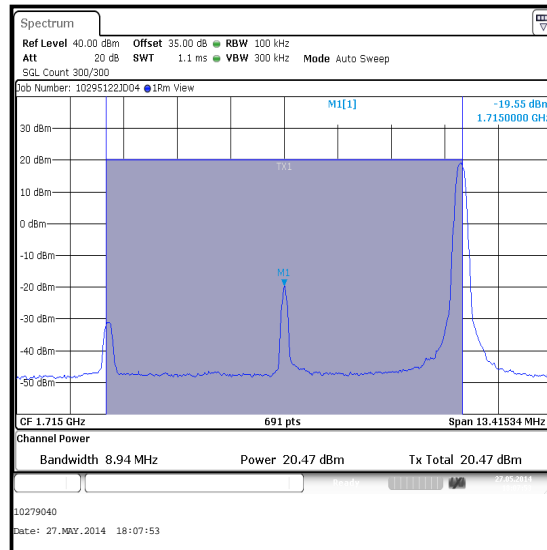
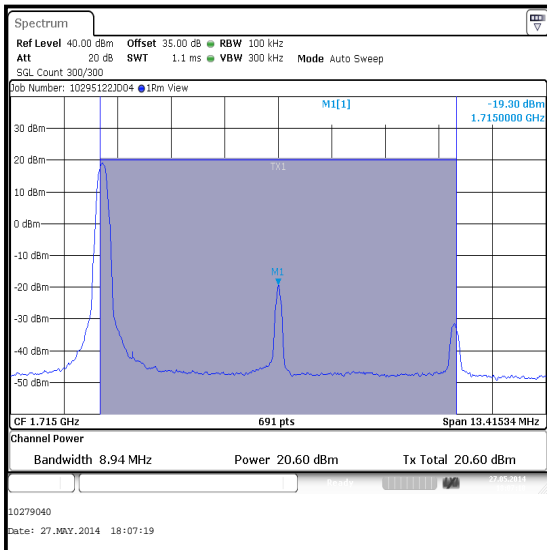
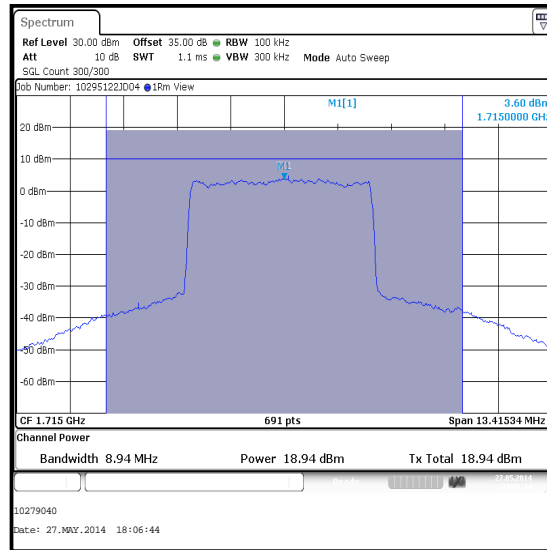
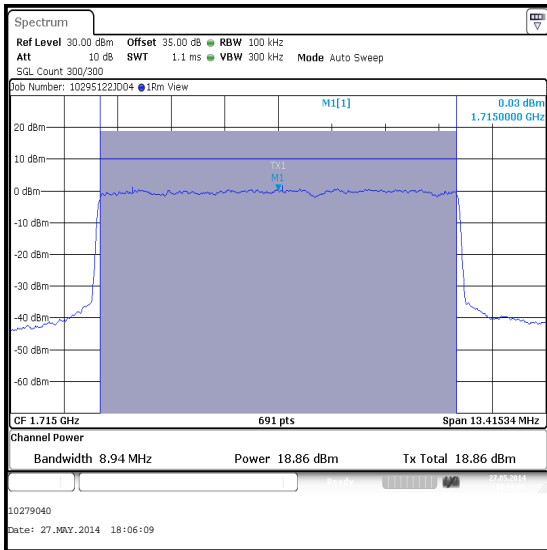


QPSK / 1 Resource Block (49 Offset)

Transmitter Output Power (EIRP) (continued)

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

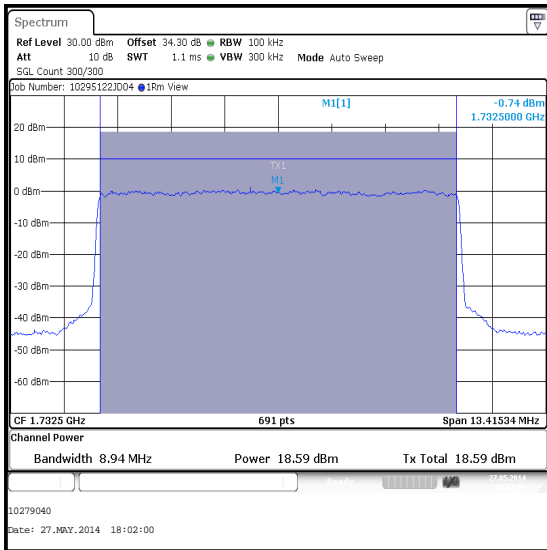
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1715.0	50	0	18.9	0.85	19.75	30.0	10.25	Complied
1715.0	25	12	18.9	0.85	19.75	30.0	10.25	Complied
1715.0	1	0	20.6	0.85	21.45	30.0	8.55	Complied
1715.0	1	49	20.5	0.85	21.35	30.0	8.65	Complied



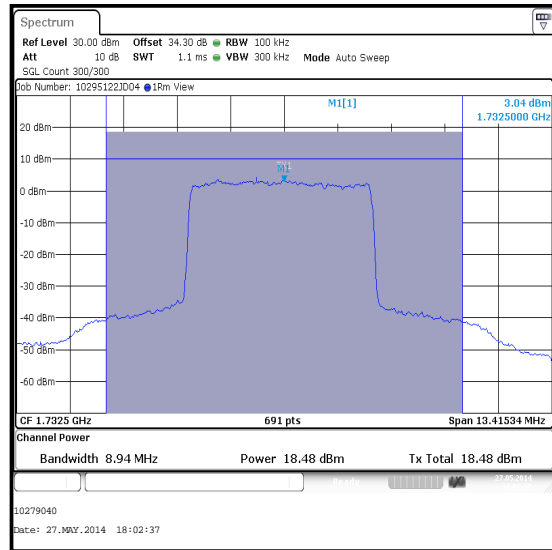
Transmitter Output Power (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

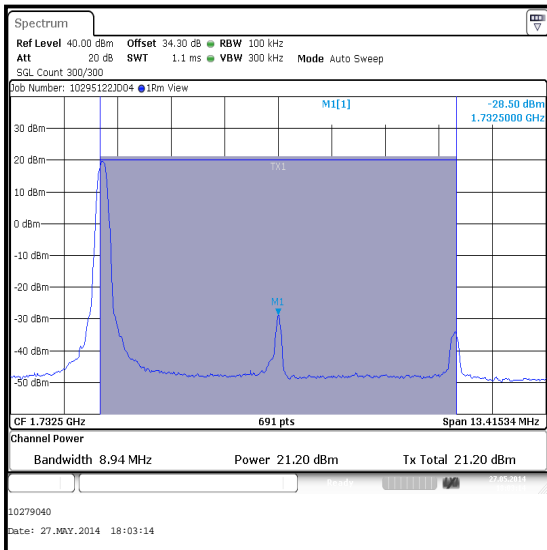
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	50	0	18.6	0.85	19.45	30.0	10.55	Complied
1732.5	25	12	18.5	0.85	19.35	30.0	10.65	Complied
1732.5	1	0	21.2	0.85	22.05	30.0	7.95	Complied
1732.5	1	49	20.7	0.85	21.55	30.0	8.45	Complied



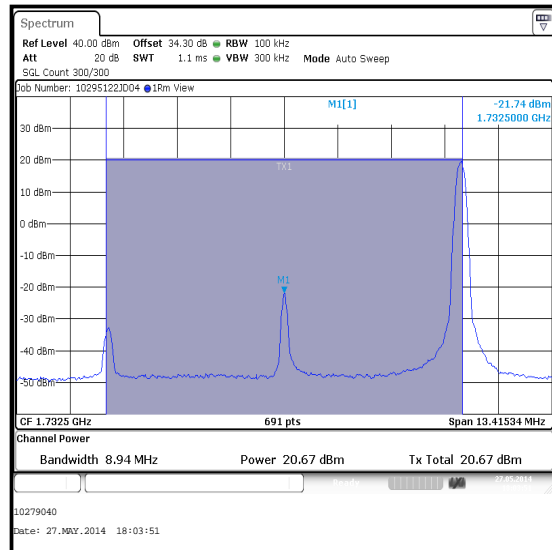
QPSK / 50 Resource Blocks (0 Offset)



QPSK / 25 Resource Blocks (12 Offset)



QPSK / 1 Resource Block (0 Offset)

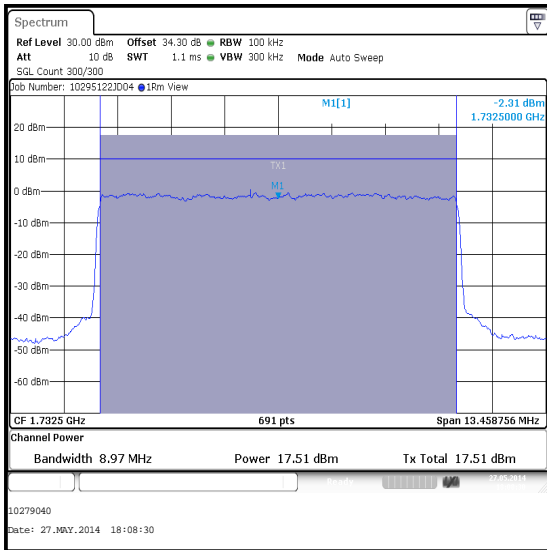


QPSK / 1 Resource Block (49 Offset)

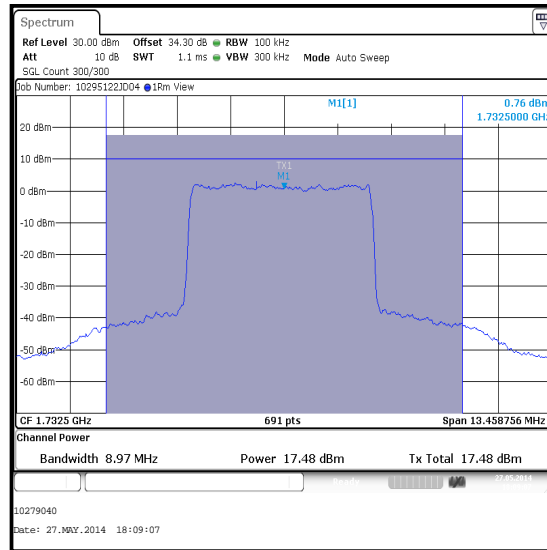
Transmitter Output Power (EIRP) (continued)

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

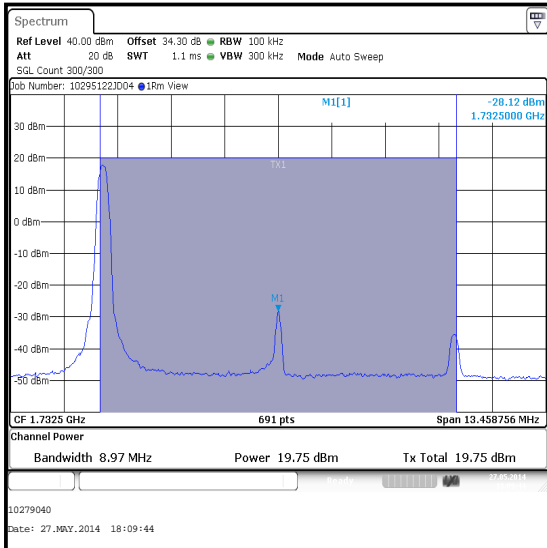
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	50	0	17.5	0.85	18.35	30.0	11.65	Complied
1732.5	25	12	17.5	0.85	18.35	30.0	11.65	Complied
1732.5	1	0	19.8	0.85	20.65	30.0	9.35	Complied
1732.5	1	49	19.1	0.85	19.95	30.0	10.05	Complied



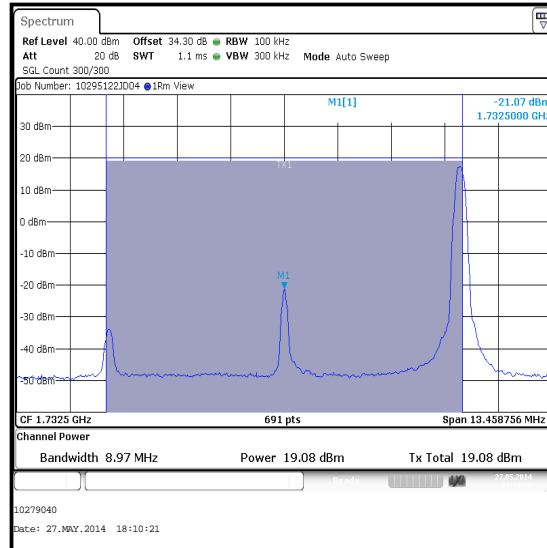
16QAM / 50 Resource Blocks (0 Offset)



16QAM / 25 Resource Blocks (12 Offset)



16QAM / 1 Resource Block (0 Offset)

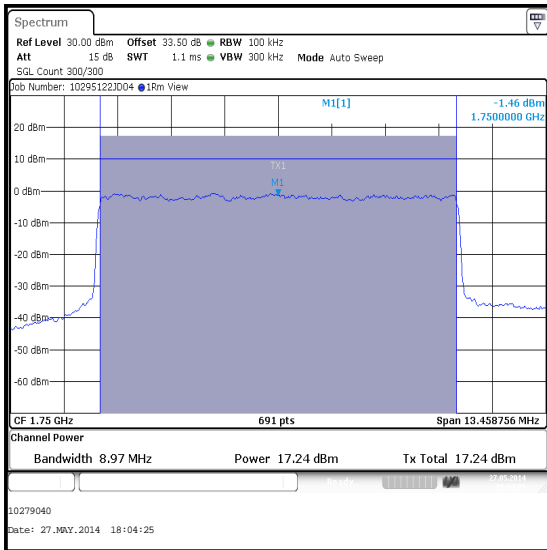


16QAM / 1 Resource Block (49 Offset)

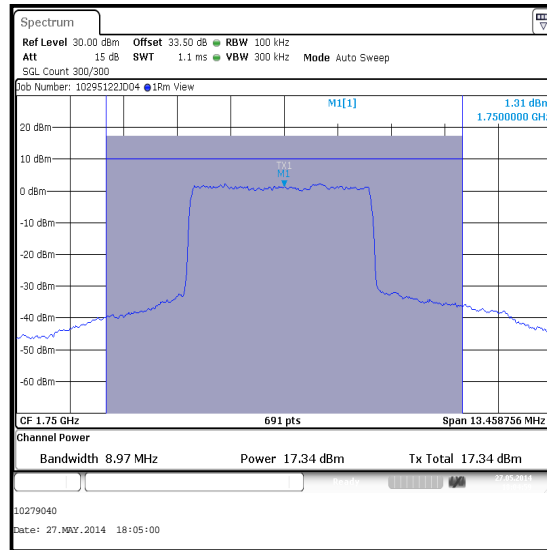
Transmitter Output Power (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / QPSK

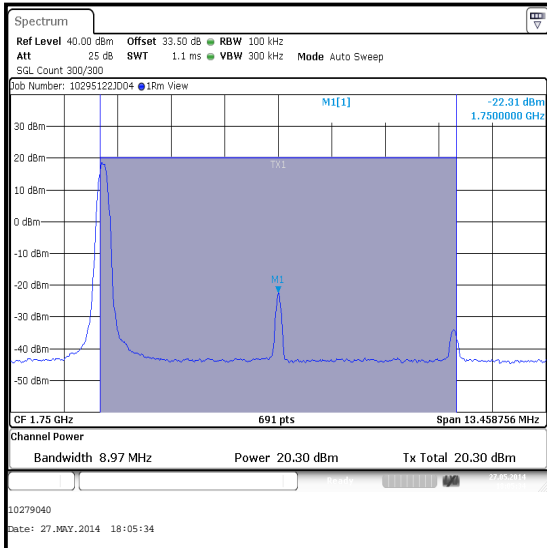
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1750.0	50	0	17.2	0.85	18.05	30.0	11.95	Complied
1750.0	25	12	17.3	0.85	18.15	30.0	11.85	Complied
1750.0	1	0	20.3	0.85	21.15	30.0	8.85	Complied
1750.0	1	49	19.6	0.85	20.45	30.0	9.55	Complied



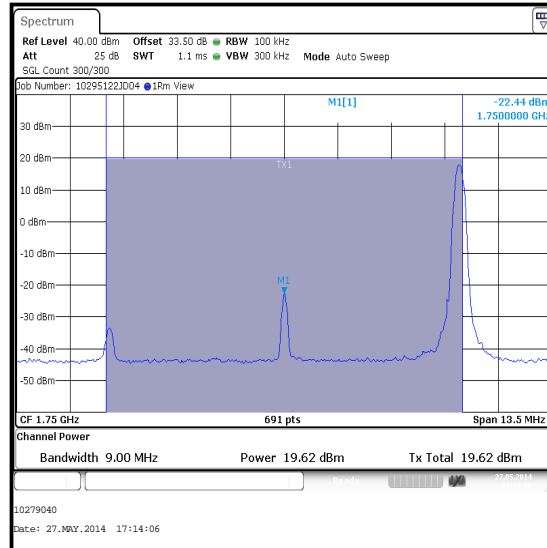
QPSK / 50 Resource Blocks (0 Offset)



QPSK / 25 Resource Blocks (12 Offset)



QPSK / 1 Resource Block (0 Offset)

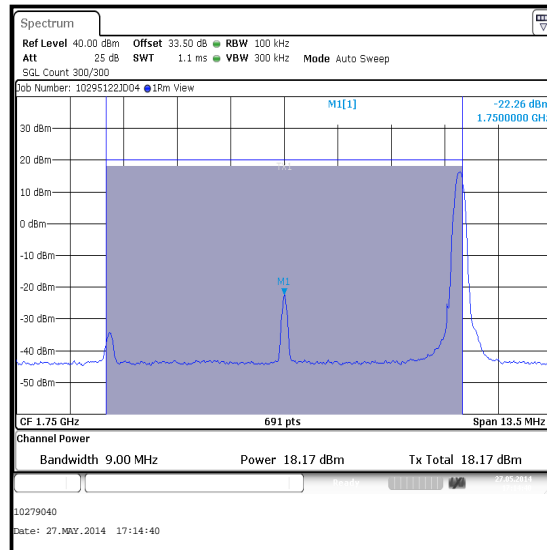
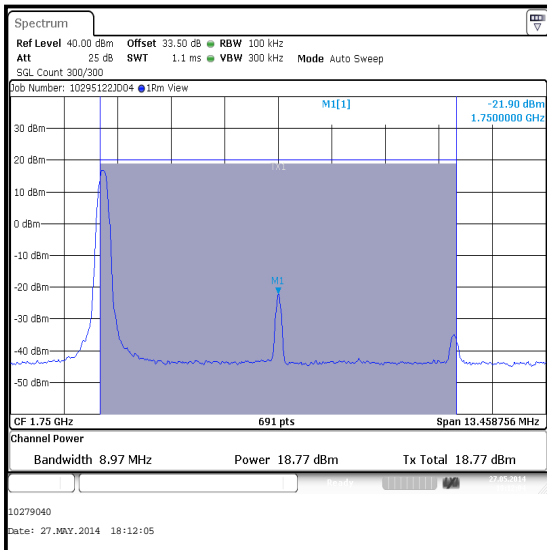
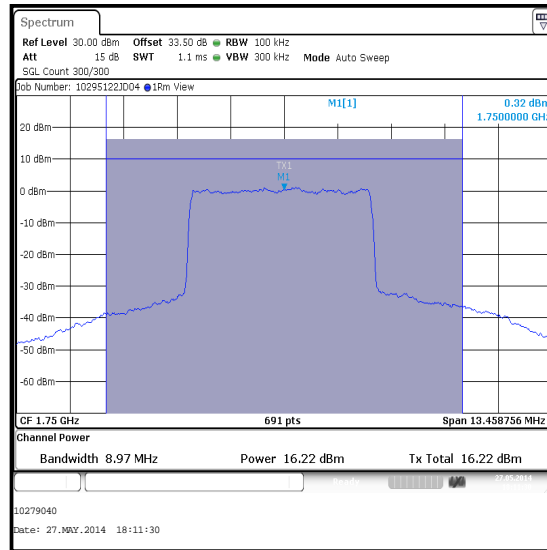
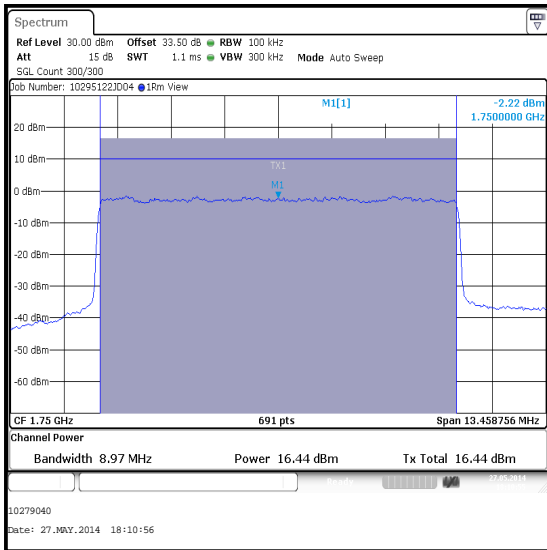


QPSK / 1 Resource Block (49 Offset)

Transmitter Output Power (EIRP) (continued)

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

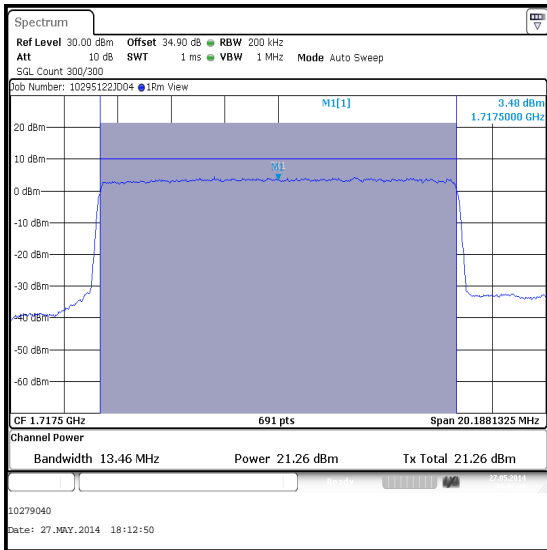
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1750.0	50	0	16.4	0.85	17.25	30.0	12.75	Complied
1750.0	25	12	16.2	0.85	17.05	30.0	12.95	Complied
1750.0	1	0	18.8	0.85	19.65	30.0	10.35	Complied
1750.0	1	49	18.2	0.85	19.05	30.0	10.95	Complied



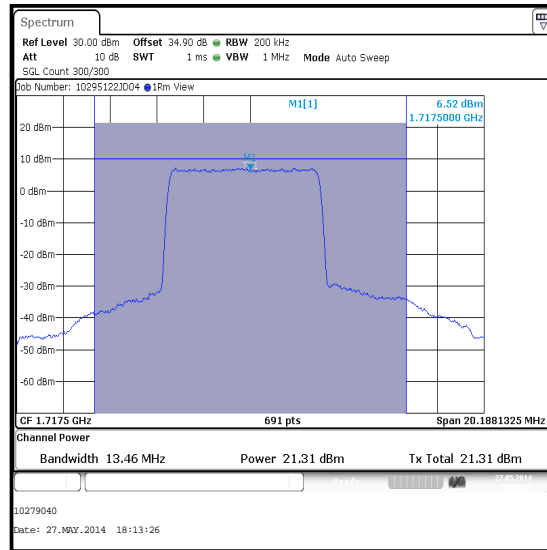
Transmitter Output Power (EIRP) (continued)

Results: 15 MHz Channel Bandwidth / Bottom Channel / QPSK

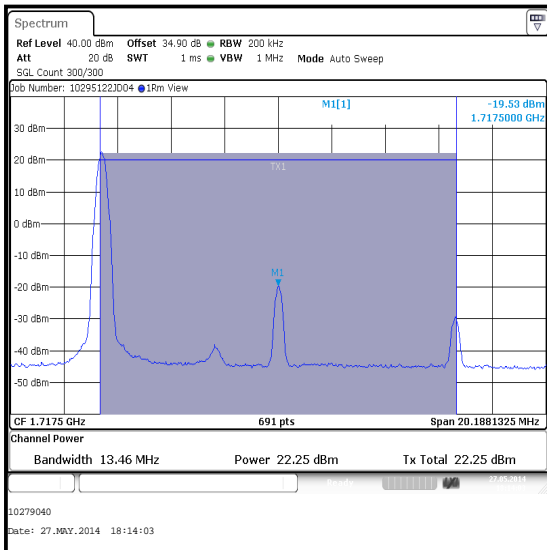
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1717.5	75	0	21.3	0.85	22.15	30.0	7.85	Complied
1717.5	36	18	21.3	0.85	22.15	30.0	7.85	Complied
1717.5	1	0	22.3	0.85	23.15	30.0	6.85	Complied
1717.5	1	74	21.5	0.85	22.35	30.0	7.65	Complied



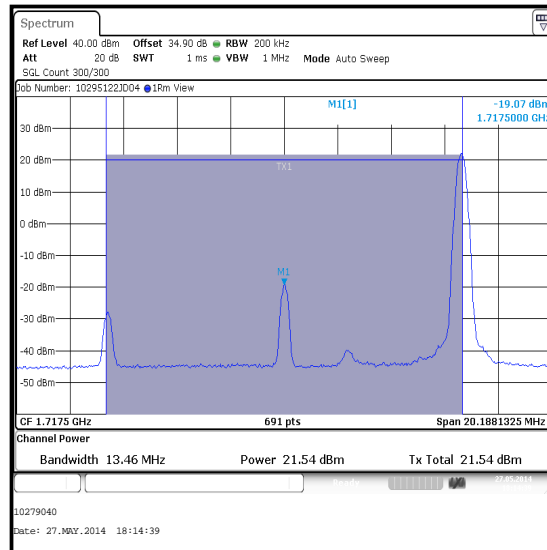
QPSK / 75 Resource Blocks (0 Offset)



QPSK / 36 Resource Blocks (18 Offset)



QPSK / 1 Resource Block (0 Offset)

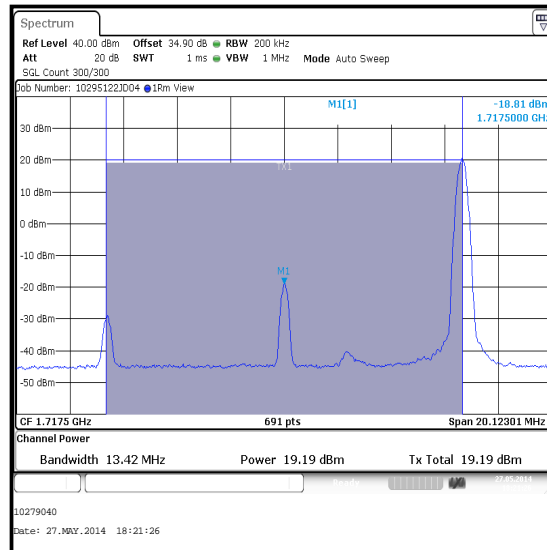
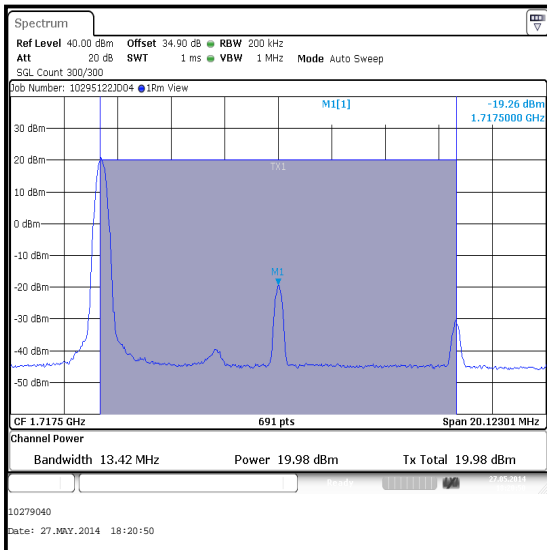
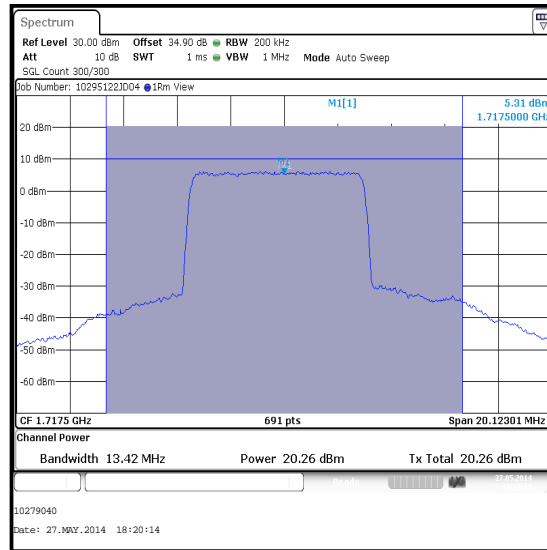
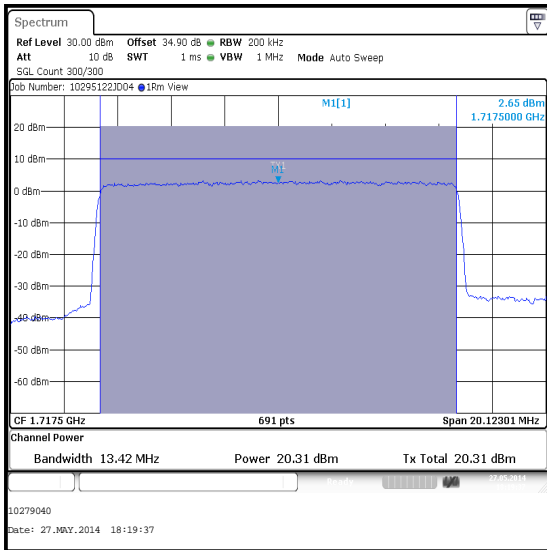


QPSK / 1 Resource Block (74 Offset)

Transmitter Output Power (EIRP) (continued)

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

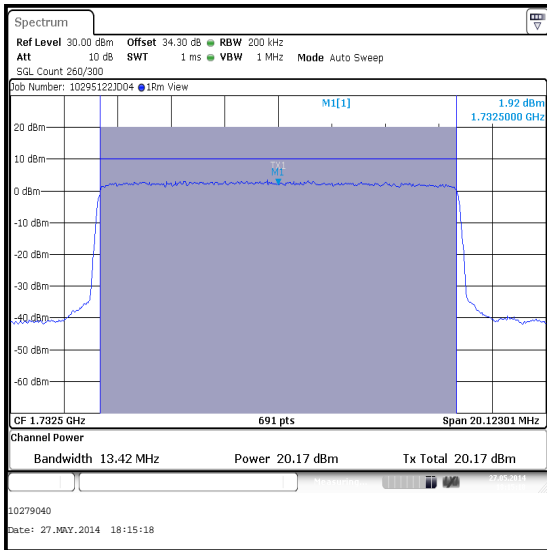
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1717.5	75	0	20.3	0.85	21.15	30.0	8.85	Complied
1717.5	36	18	20.3	0.85	21.15	30.0	8.85	Complied
1717.5	1	0	20.0	0.85	20.85	30.0	9.15	Complied
1717.5	1	74	19.2	0.85	20.05	30.0	9.95	Complied



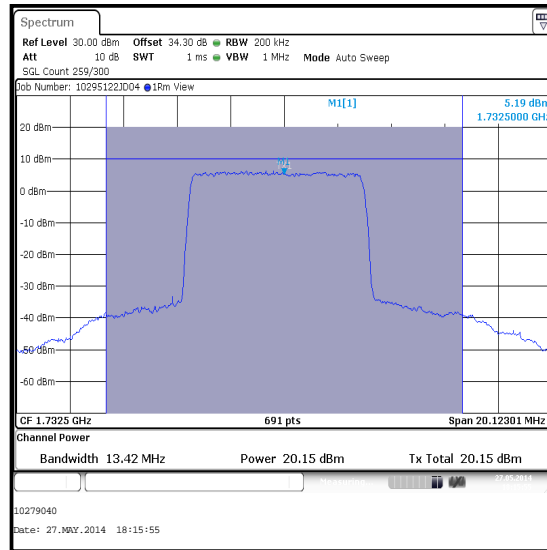
Transmitter Output Power (EIRP) (continued)

Results: 15 MHz Channel Bandwidth / Middle Channel / QPSK

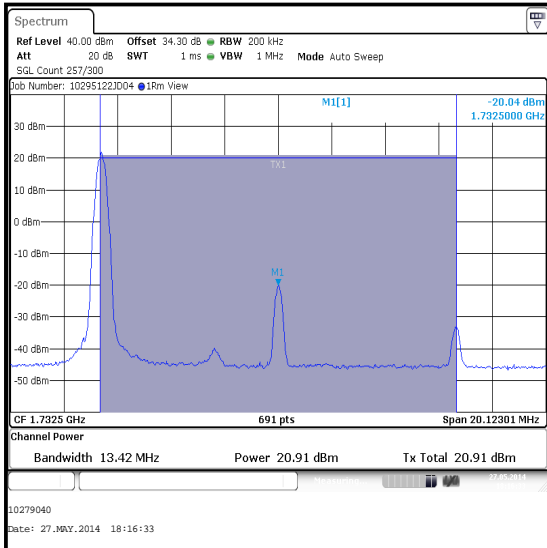
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	75	0	20.2	0.85	21.05	30.0	8.95	Complied
1732.5	36	18	20.2	0.85	21.05	30.0	8.95	Complied
1732.5	1	0	20.9	0.85	21.75	30.0	8.25	Complied
1732.5	1	74	19.9	0.85	20.75	30.0	9.25	Complied



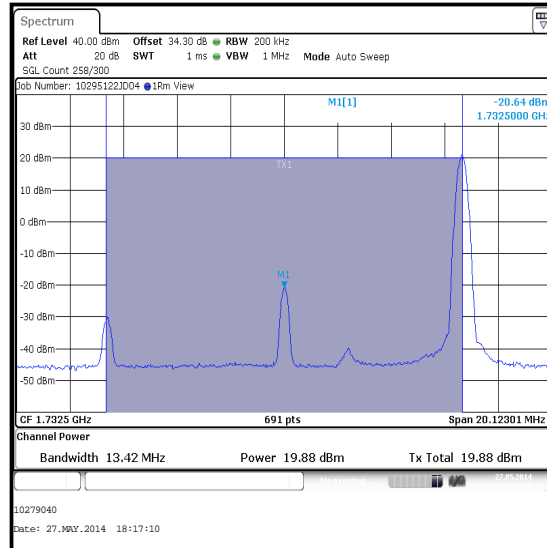
QPSK / 75 Resource Blocks (0 Offset)



QPSK / 36 Resource Blocks (18 Offset)



QPSK / 1 Resource Block (0 Offset)

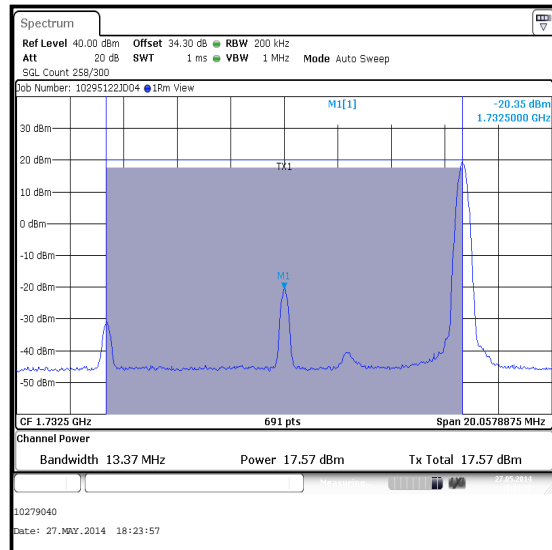
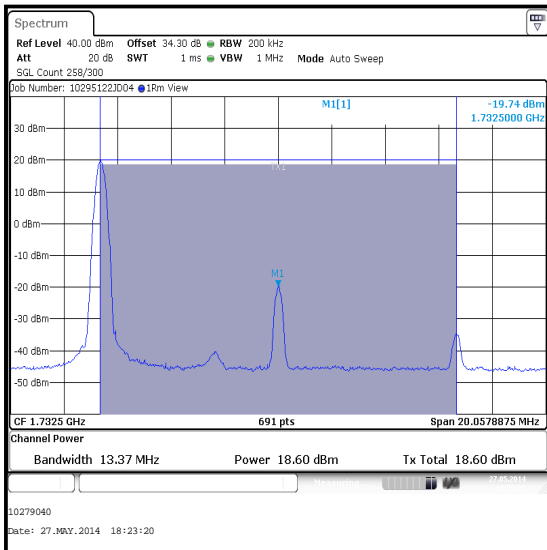
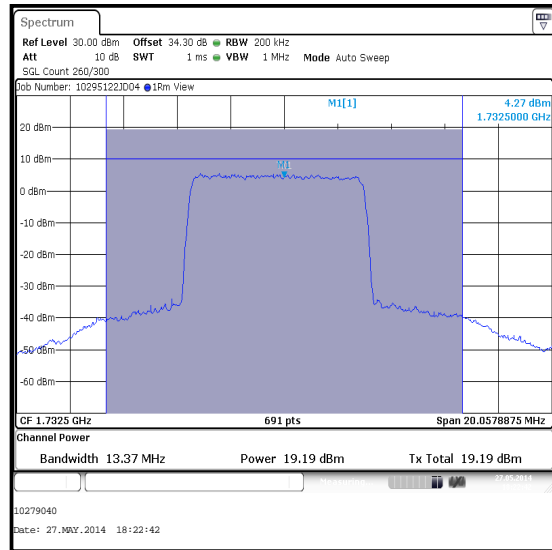
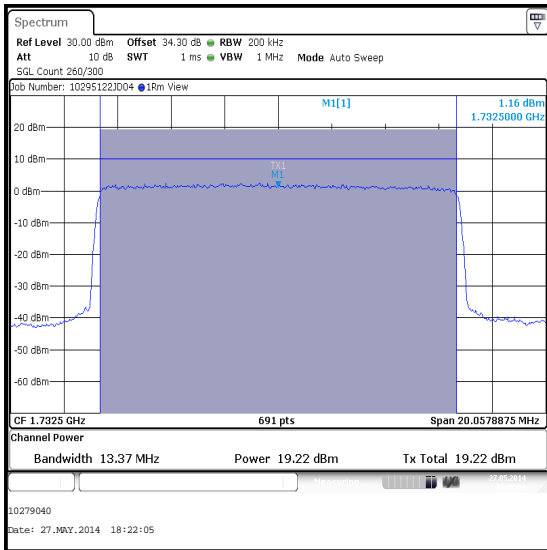


QPSK / 1 Resource Block (74 Offset)

Transmitter Output Power (EIRP) (continued)

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

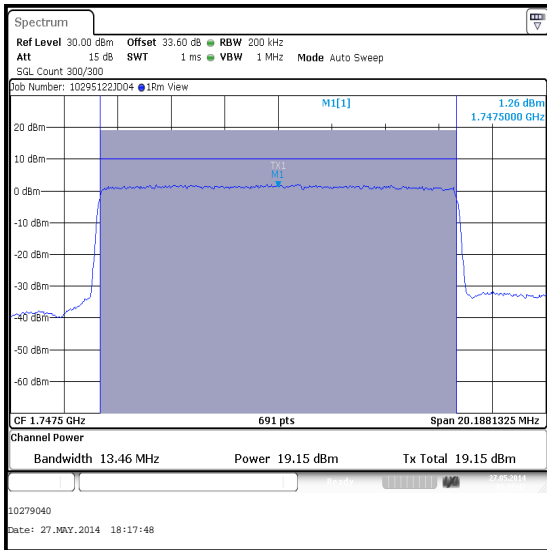
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	75	0	19.2	0.85	20.05	30.0	9.95	Complied
1732.5	36	18	19.2	0.85	20.05	30.0	9.95	Complied
1732.5	1	0	18.6	0.85	19.45	30.0	10.55	Complied
1732.5	1	74	17.6	0.85	18.45	30.0	11.55	Complied



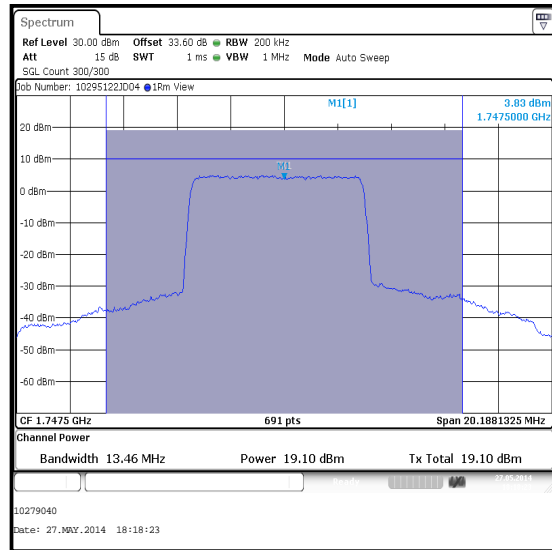
Transmitter Output Power (EIRP) (continued)

Results: 15 MHz Channel Bandwidth / Top Channel / QPSK

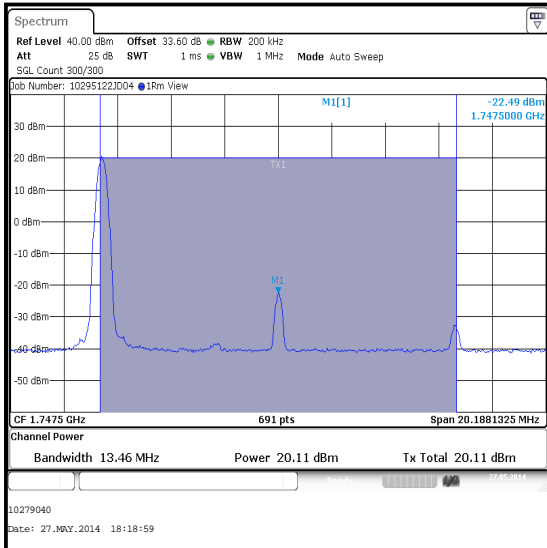
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1747.5	75	0	19.2	0.85	20.05	30.0	9.95	Complied
1747.5	36	18	19.1	0.85	19.95	30.0	10.05	Complied
1747.5	1	0	20.1	0.85	20.95	30.0	9.05	Complied
1747.5	1	74	19.5	0.85	20.35	30.0	9.65	Complied



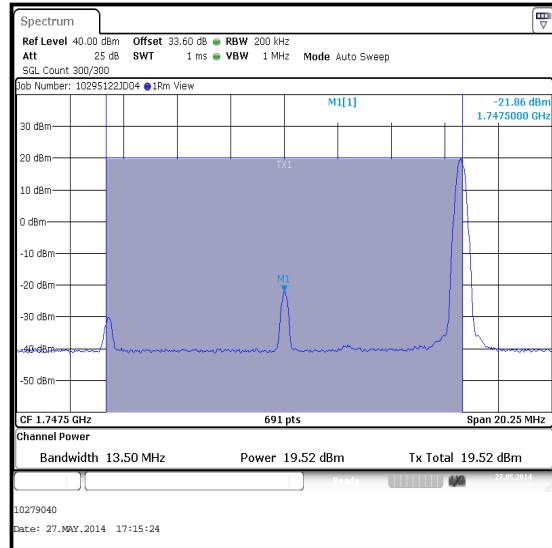
QPSK / 75 Resource Blocks (0 Offset)



QPSK / 36 Resource Blocks (18 Offset)



QPSK / 1 Resource Block (0 Offset)

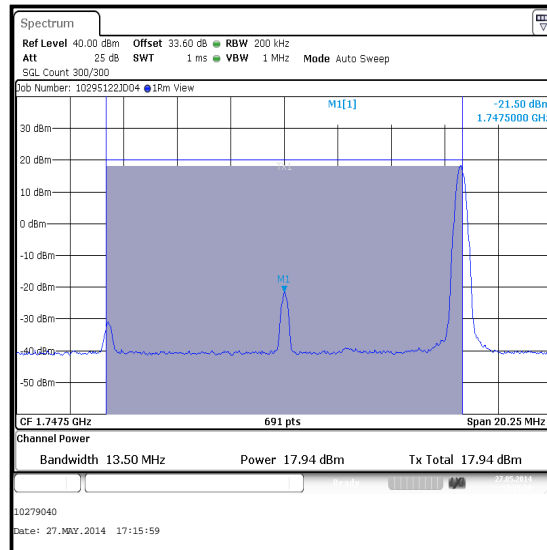
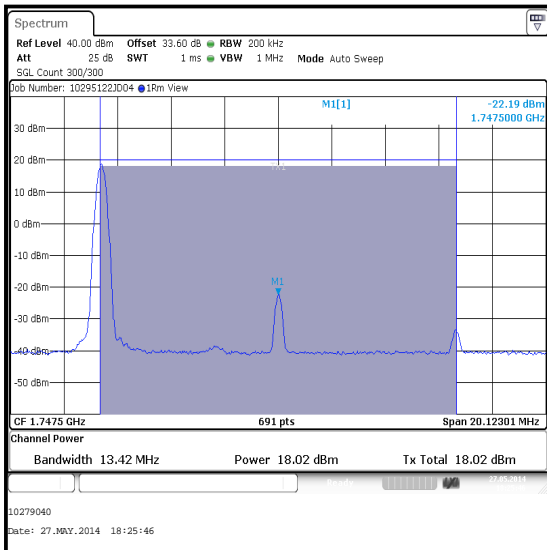
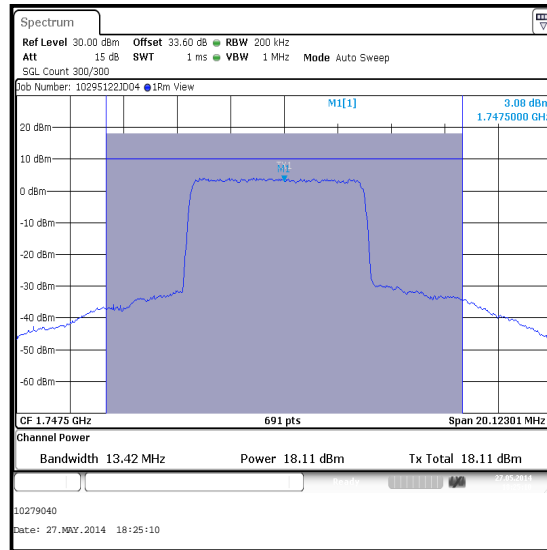
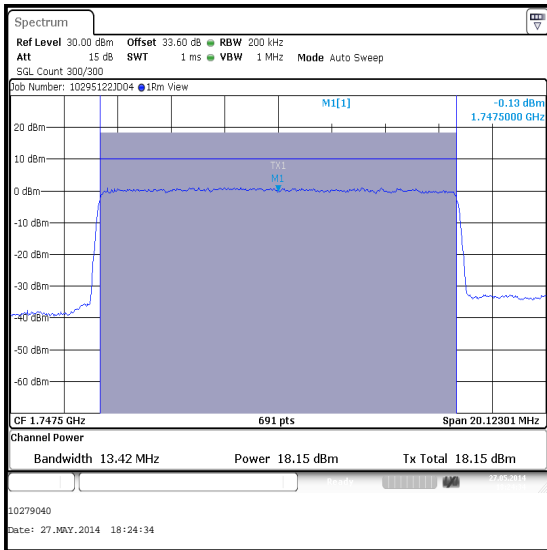


QPSK / 1 Resource Block (74 Offset)

Transmitter Output Power (EIRP) (continued)

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

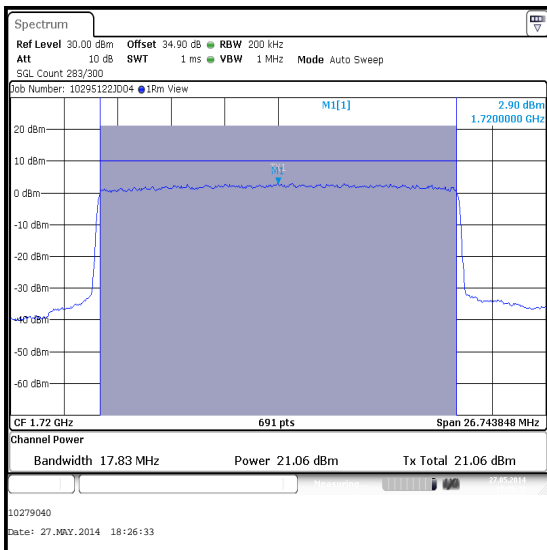
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1747.5	75	0	18.2	0.85	19.05	30.0	10.95	Complied
1747.5	36	18	18.1	0.85	18.95	30.0	11.05	Complied
1747.5	1	0	18.0	0.85	18.85	30.0	11.15	Complied
1747.5	1	74	17.9	0.85	18.75	30.0	11.25	Complied



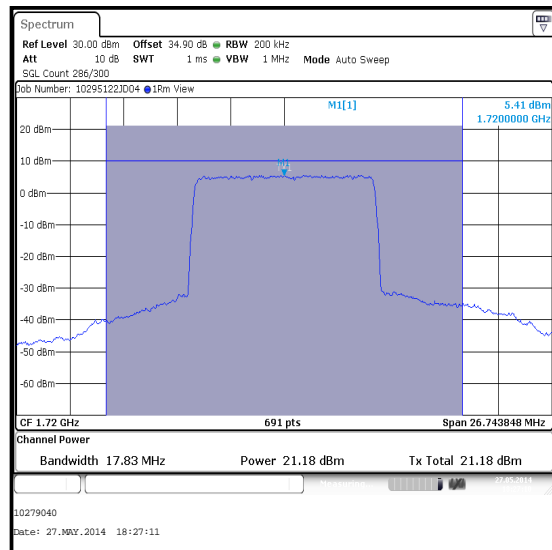
Transmitter Output Power (EIRP) (continued)

Results: 20 MHz Channel Bandwidth / Bottom Channel / QPSK

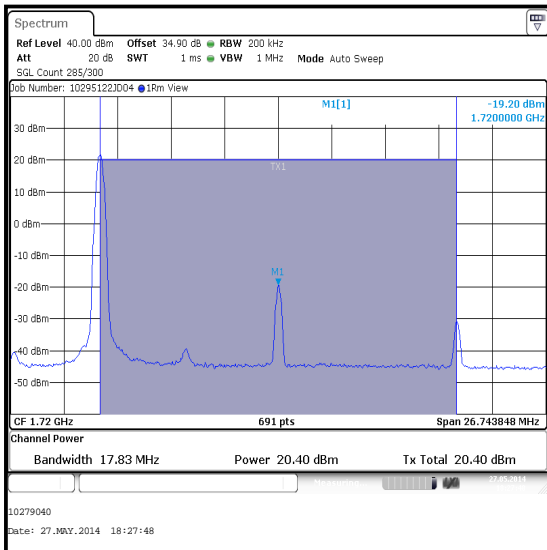
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1720.0	100	0	21.1	0.85	21.95	30.0	8.05	Complied
1720.0	50	25	21.2	0.85	22.05	30.0	7.95	Complied
1720.0	1	0	20.4	0.85	21.25	30.0	8.75	Complied
1720.0	1	99	19.2	0.85	20.05	30.0	9.95	Complied



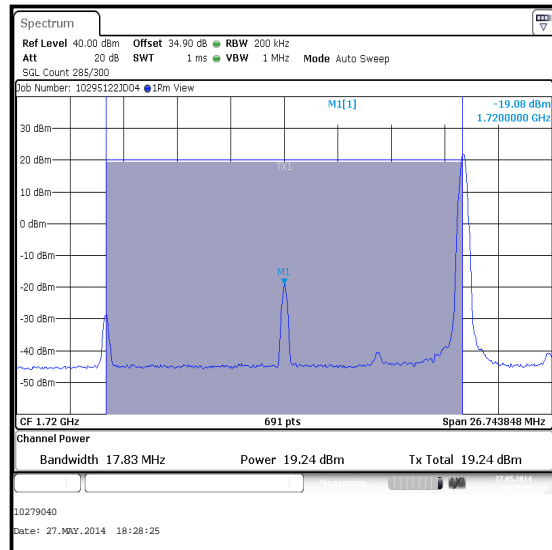
QPSK / 100 Resource Blocks (0 Offset)



QPSK / 50 Resource Blocks (25 Offset)



QPSK / 1 Resource Block (0 Offset)

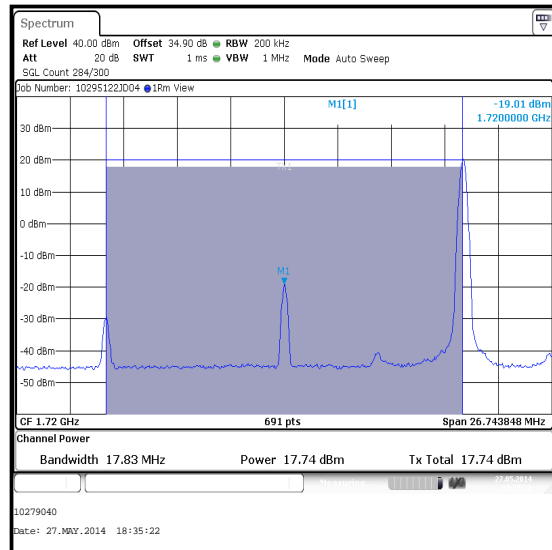
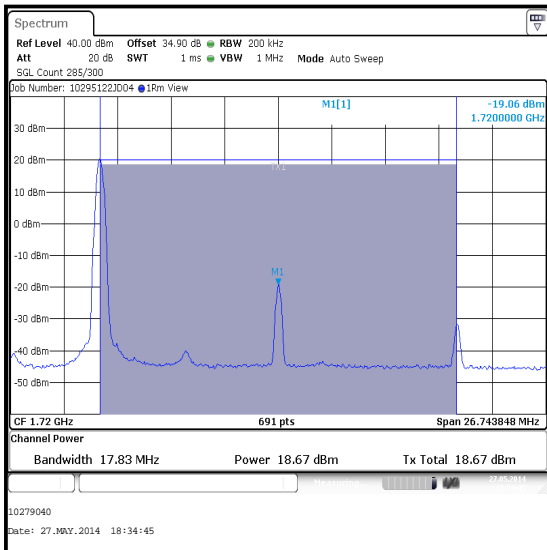
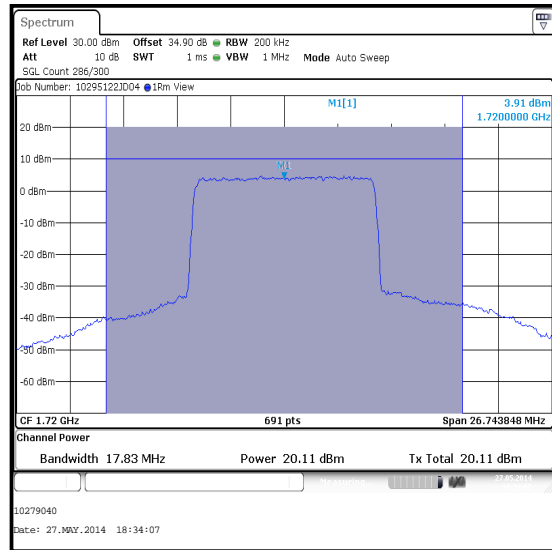
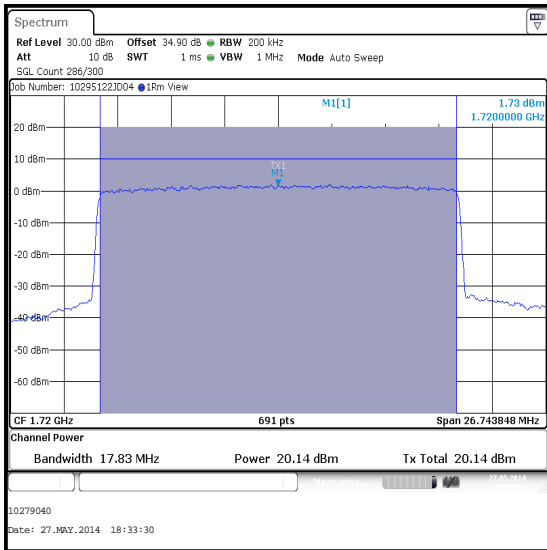


QPSK / 1 Resource Block (99 Offset)

Transmitter Output Power (EIRP) (continued)

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

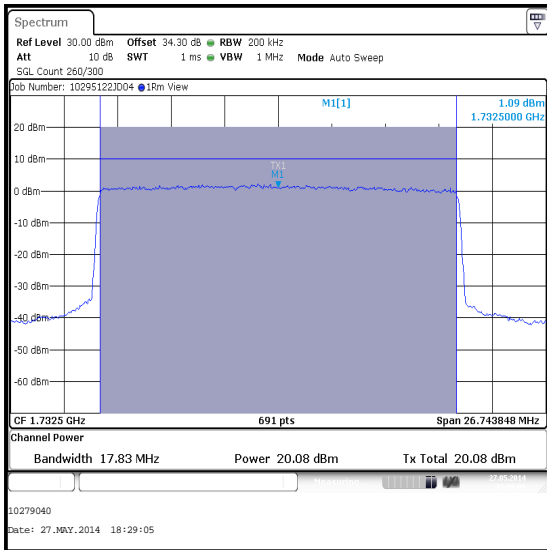
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1720.0	100	0	20.1	0.85	20.95	30.0	9.05	Complied
1720.0	50	25	20.1	0.85	20.95	30.0	9.05	Complied
1720.0	1	0	18.7	0.85	19.55	30.0	10.45	Complied
1720.0	1	99	17.7	0.85	18.55	30.0	11.45	Complied



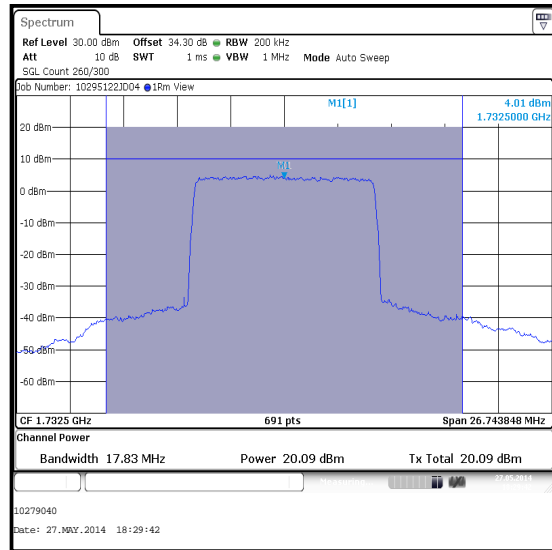
Transmitter Output Power (EIRP) (continued)

Results: 20 MHz Channel Bandwidth / Middle Channel / QPSK

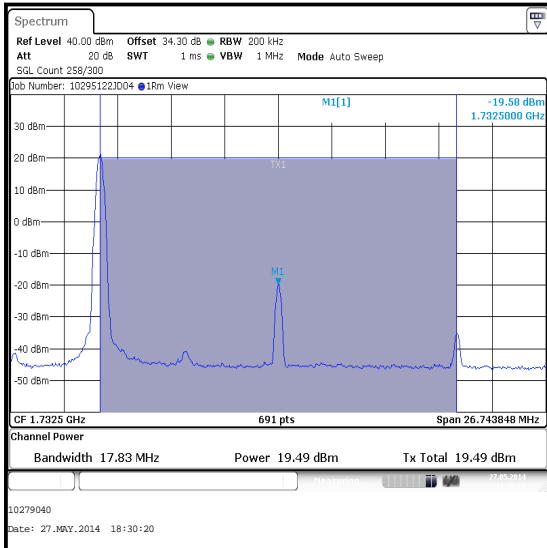
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	100	0	20.1	0.85	20.95	30.0	9.05	Complied
1732.5	50	25	20.1	0.85	20.95	30.0	9.05	Complied
1732.5	1	0	19.5	0.85	20.35	30.0	9.65	Complied
1732.5	1	99	18.2	0.85	19.05	30.0	10.95	Complied



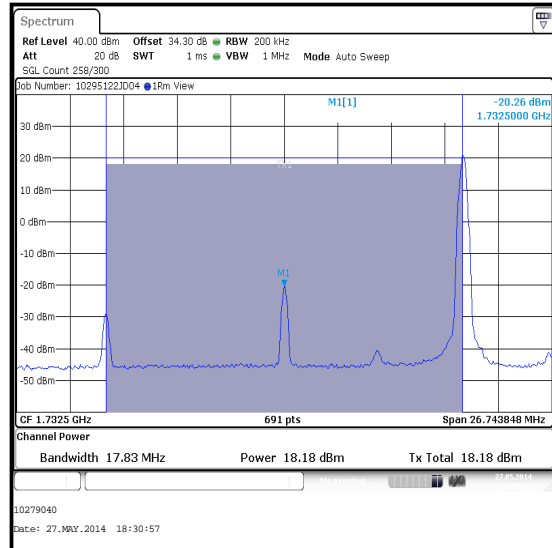
QPSK / 100 Resource Blocks (0 Offset)



QPSK / 50 Resource Blocks (25 Offset)



QPSK / 1 Resource Block (0 Offset)

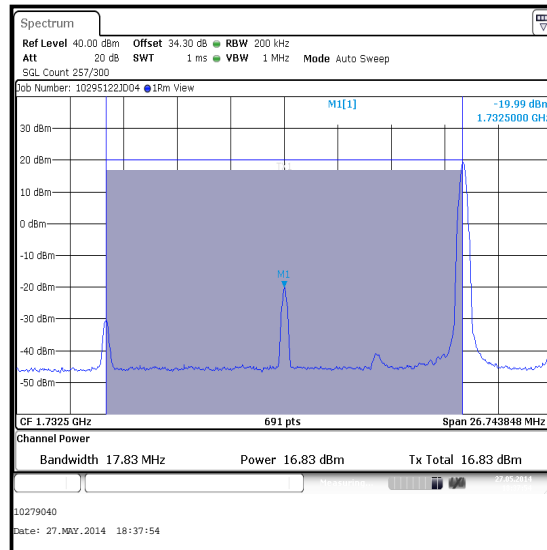
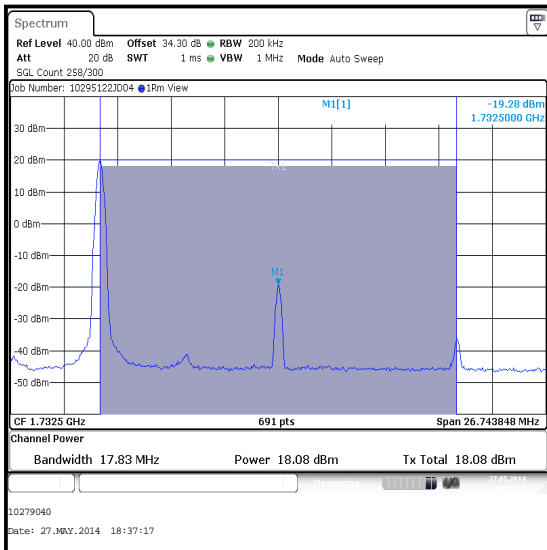
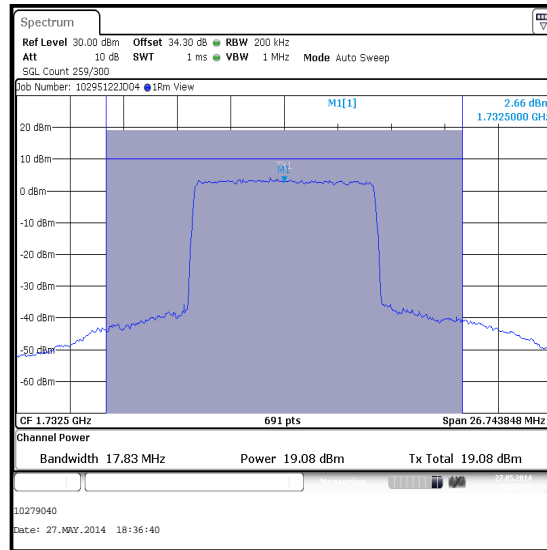
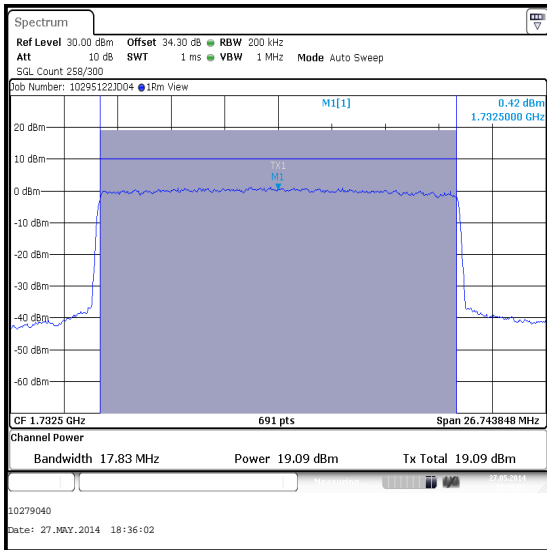


QPSK / 1 Resource Block (99 Offset)

Transmitter Output Power (EIRP) (continued)

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

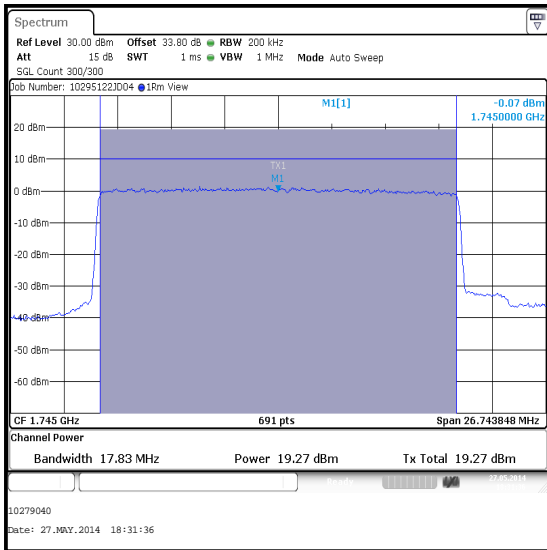
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1732.5	100	0	19.1	0.85	19.95	30.0	10.05	Complied
1732.5	50	25	19.1	0.85	19.95	30.0	10.05	Complied
1732.5	1	0	18.1	0.85	18.95	30.0	11.05	Complied
1732.5	1	99	16.8	0.85	17.65	30.0	12.35	Complied



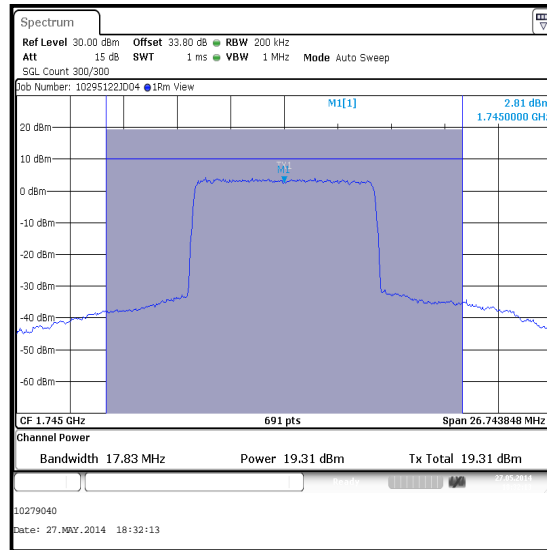
Transmitter Output Power (EIRP) (continued)

Results: 20 MHz Channel Bandwidth / Top Channel / QPSK

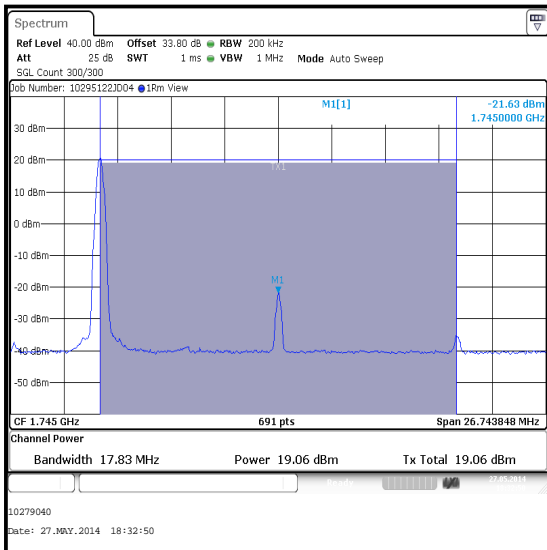
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1745.0	100	0	19.3	0.85	20.15	30.0	9.85	Complied
1745.0	50	25	19.3	0.85	20.15	30.0	9.85	Complied
1745.0	1	0	19.1	0.85	19.95	30.0	10.05	Complied
1745.0	1	99	19.2	0.85	20.05	30.0	9.95	Complied



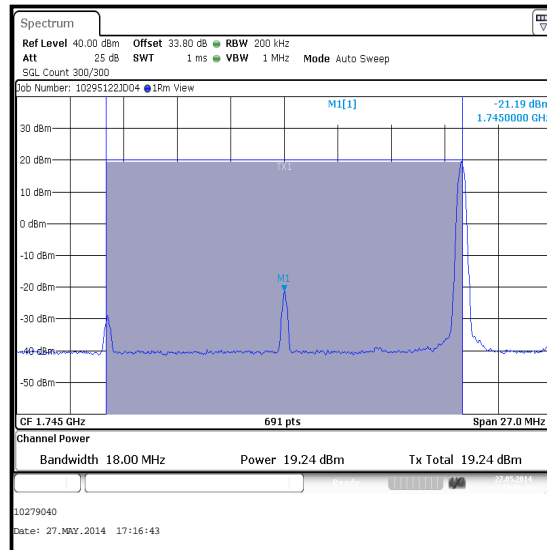
QPSK / 100 Resource Blocks (0 Offset)



QPSK / 50 Resource Blocks (25 Offset)



QPSK / 1 Resource Block (0 Offset)

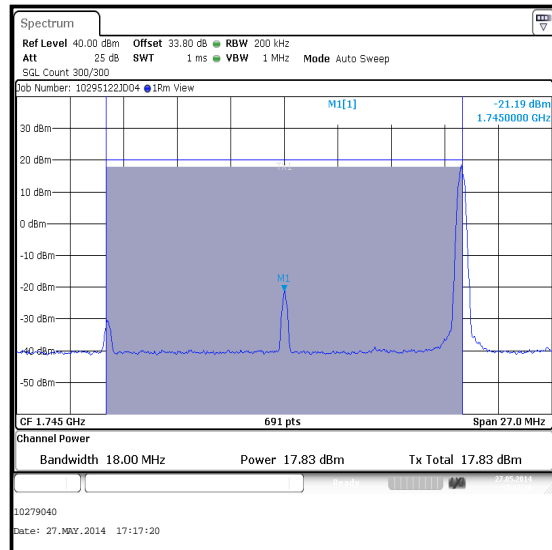
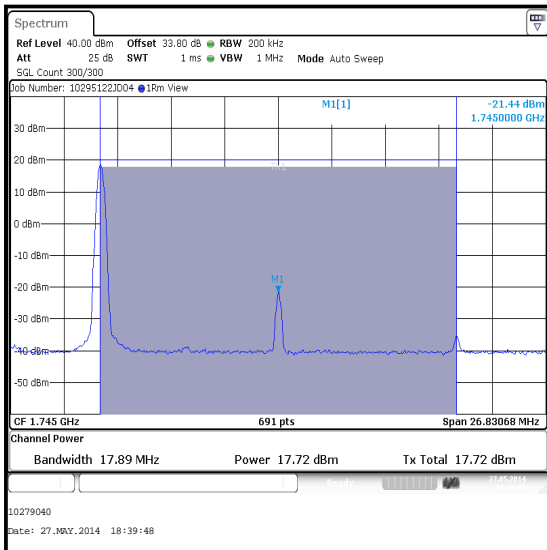
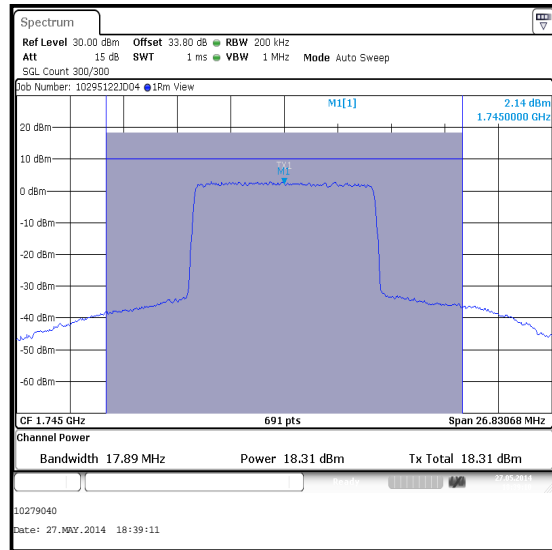
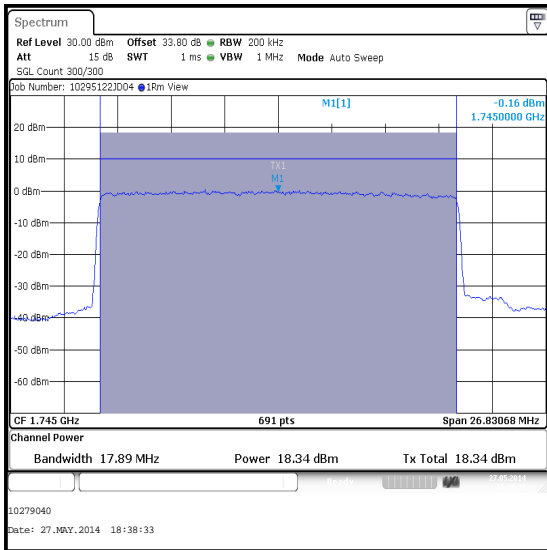


QPSK / 1 Resource Block (99 Offset)

Transmitter Output Power (EIRP) (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
1745.0	100	0	18.3	0.85	19.15	30.0	10.85	Complied
1745.0	50	25	18.3	0.85	19.15	30.0	10.85	Complied
1745.0	1	0	17.7	0.85	18.55	30.0	11.45	Complied
1745.0	1	99	17.8	0.85	18.65	30.0	11.35	Complied



Transmitter Output Power (EIRP) (continued)**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	14 Mar 2015	12
L1128	Signal Analyser	Rohde & Schwarz	FSV13	101835	25 April 2015	12
A2535	Directional Coupler	AtlanTecRF	CDC-003060-20	14041701719	Calibrated before use	-
A2508	Attenuator	AtlanTecRF	AN18-10	821846#3	Calibrated before use	-
S0537	DC Power Supply	TTi	EL302D	249928	Calibrated before use	-
M1251	Digital Multimeter	Fluke	175	8717019	19 May 2015	12
G0608	Signal Generator	Rohde & Schwarz	SMIQ 06B	838341/033	14 Feb 2015	12
M1009	Power Meter	Hewlett Packard	437B	3125U13706	04 Feb 2015	12
M1592	Power Sensor	Hewlett Packard	8487A	3318A02094	28 Aug 2014	12

5.2.2. Transmitter Occupied Bandwidth**Test Summary:**

Test Engineer:	Ben Mercer	Test Date:	27 May 2014
Test Sample IMEI:	004402452751252		

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

Environmental Conditions:

Temperature (°C):	23 to 26
Relative Humidity (%):	41 to 43

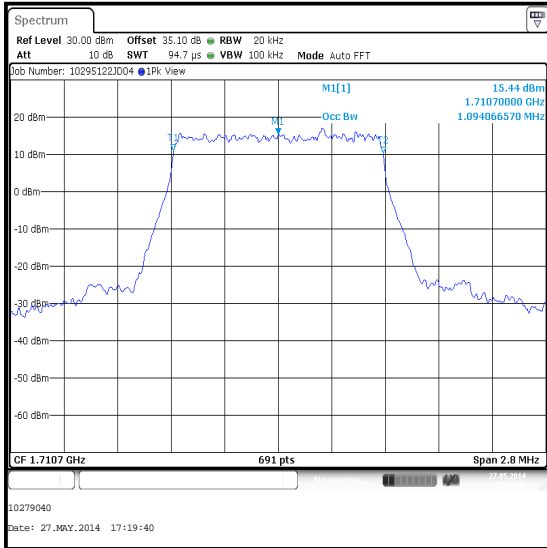
Note(s):

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

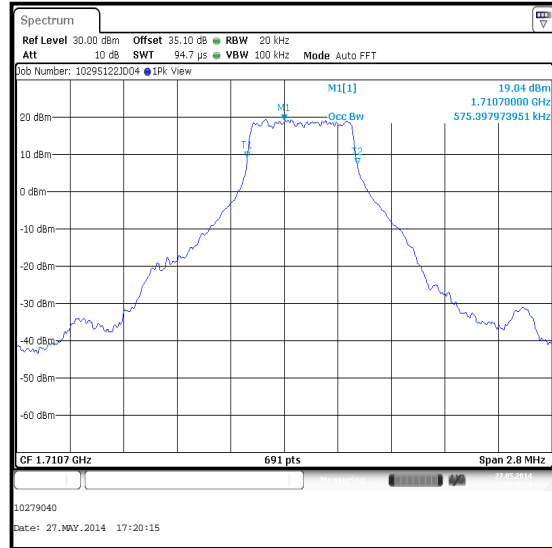
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1710.7	6	0	20	100	1.094
1710.7	3	2	20	100	0.575



QPSK / 6 Resource Blocks (0 Offset)

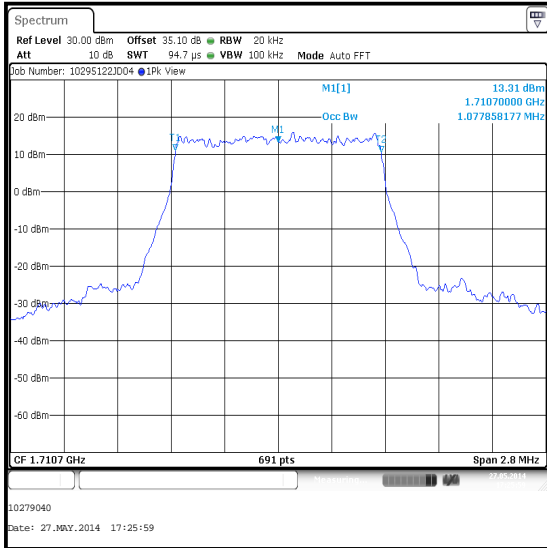


QPSK / 3 Resource Blocks (2 Offset)

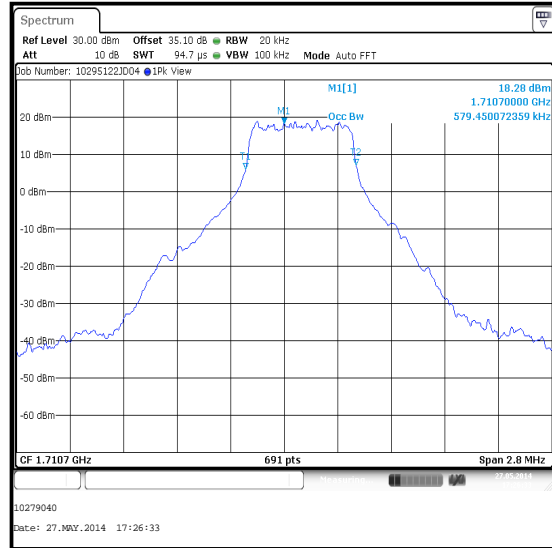
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1710.7	6	0	20	100	1.078
1710.7	3	2	20	100	0.579



16QAM / 6 Resource Blocks (0 Offset)

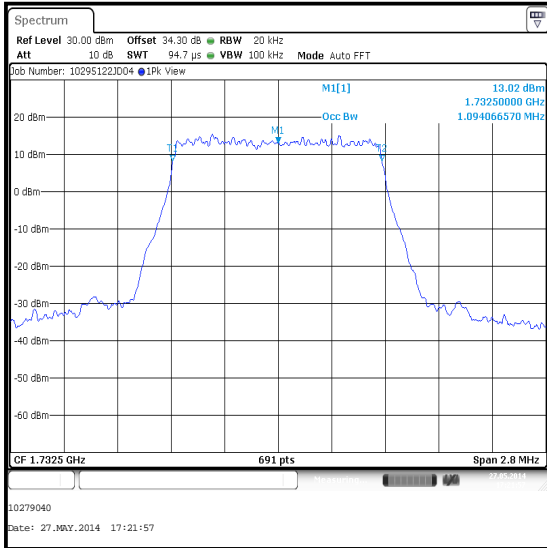


16QAM / 3 Resource Blocks (2 Offset)

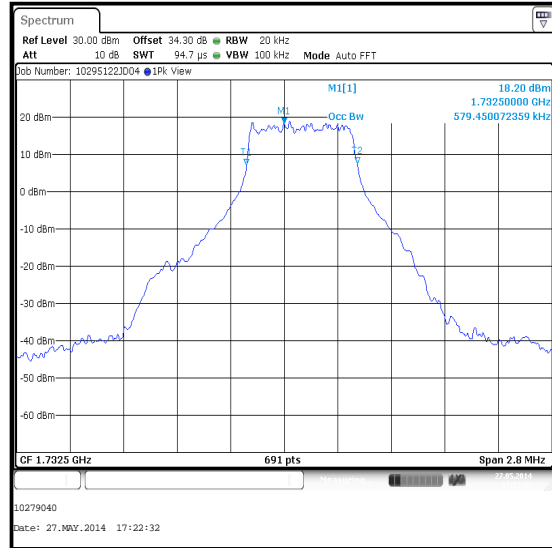
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	6	0	20	100	1.094
1732.5	3	2	20	100	0.579



QPSK / 6 Resource Blocks (0 Offset)

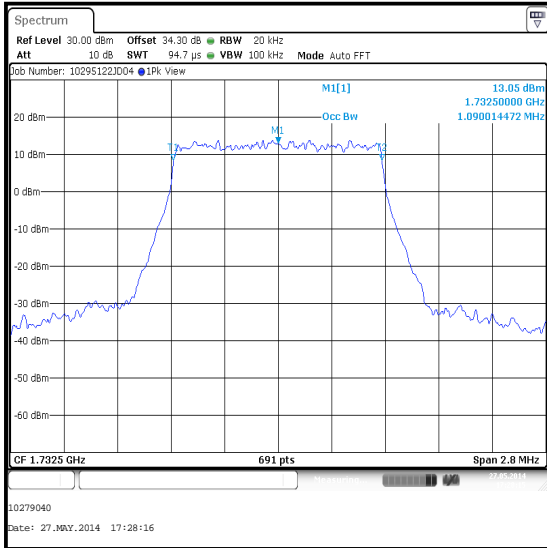


QPSK / 3 Resource Blocks (2 Offset)

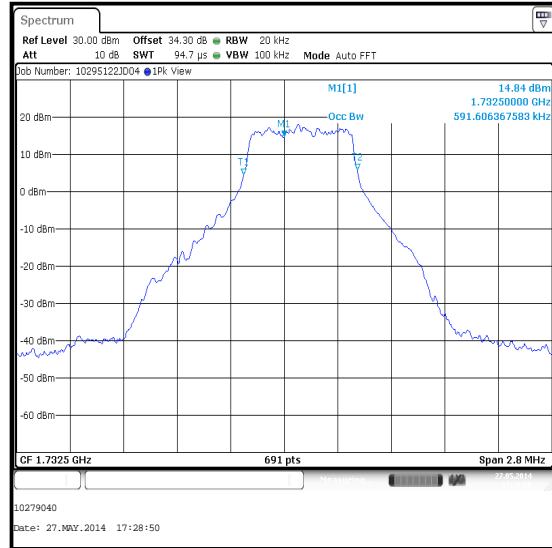
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	6	0	20	100	1.090
1732.5	3	2	20	100	0.592



16QAM / 6 Resource Blocks (0 Offset)

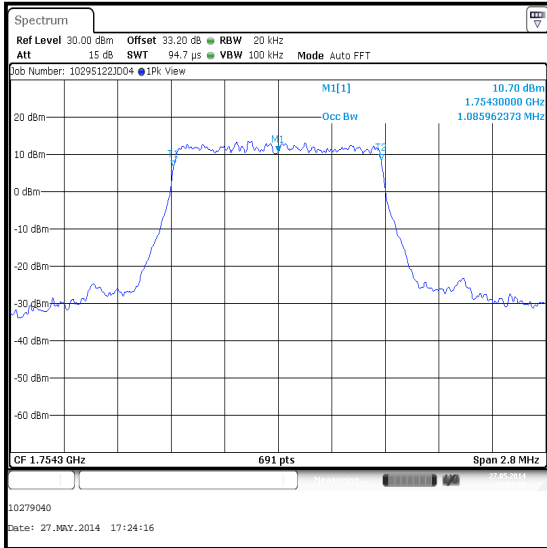


16QAM / 3 Resource Blocks (2 Offset)

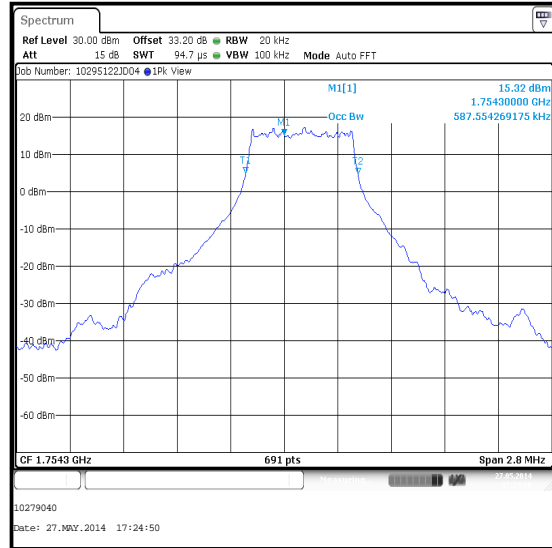
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Top Channel / QPSK

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



QPSK / 6 Resource Blocks (0 Offset)

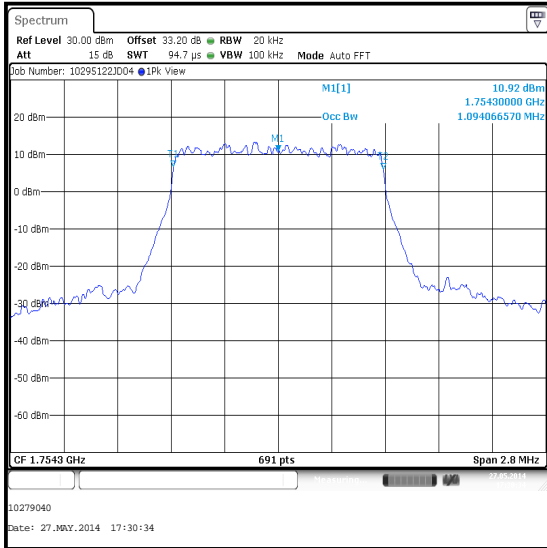


QPSK / 3 Resource Blocks (2 Offset)

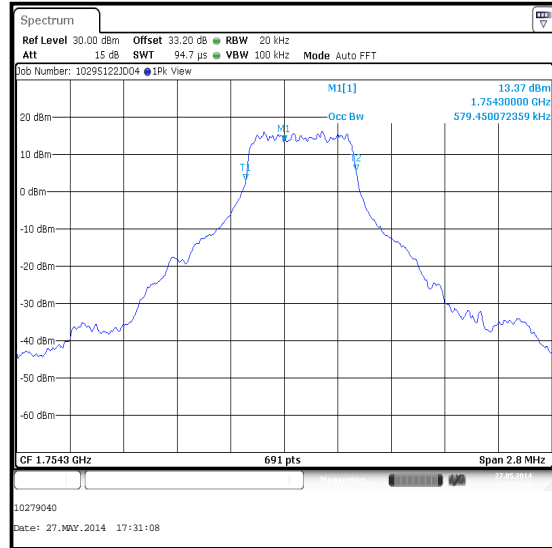
Transmitter Occupied Bandwidth (continued)

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

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



16QAM / 6 Resource Blocks (0 Offset)

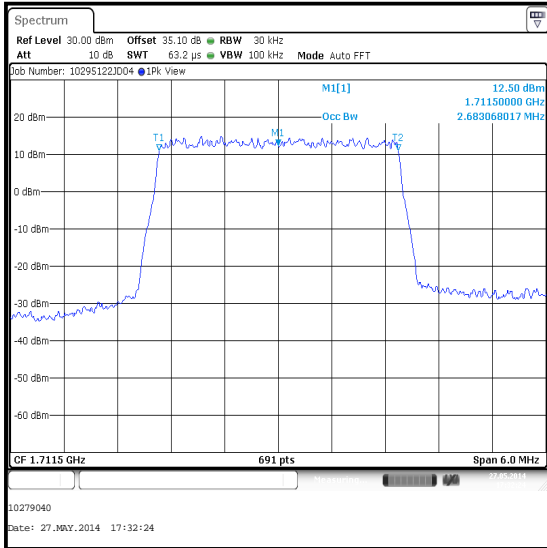


16QAM / 3 Resource Blocks (2 Offset)

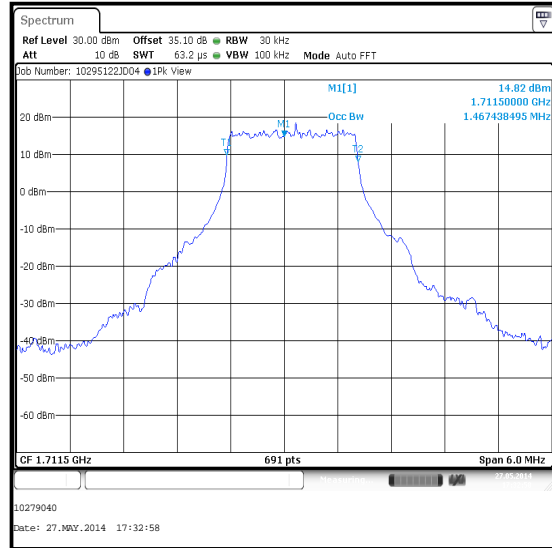
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1711.5	15	0	30	100	2.683
1711.5	8	4	30	100	1.467



QPSK / 15 Resource Blocks (0 Offset)

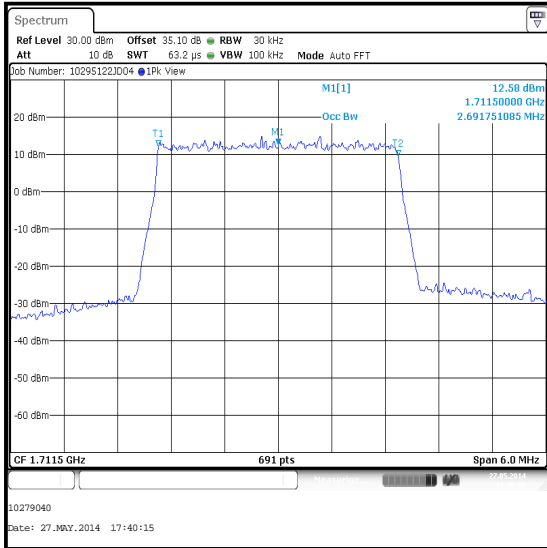


QPSK / 8 Resource Blocks (4 Offset)

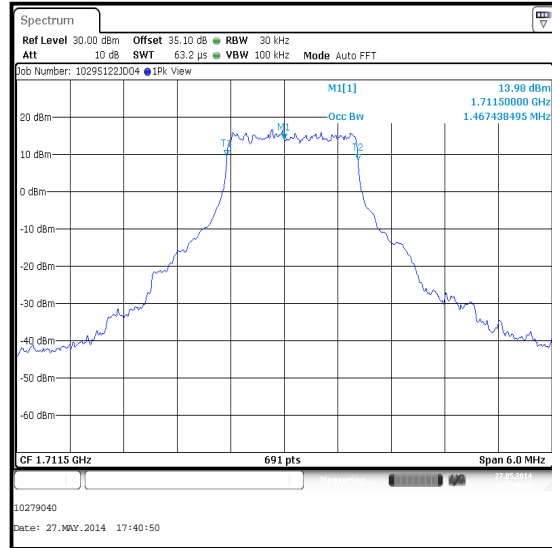
Transmitter Occupied Bandwidth (continued)

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

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



16QAM / 15 Resource Blocks (0 Offset)

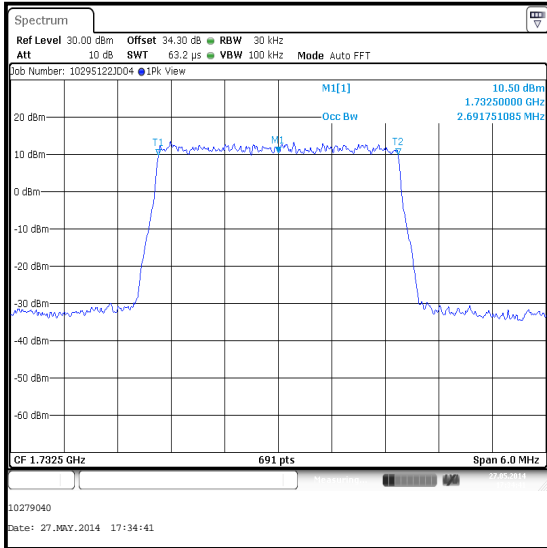


16QAM / 8 Resource Blocks (4 Offset)

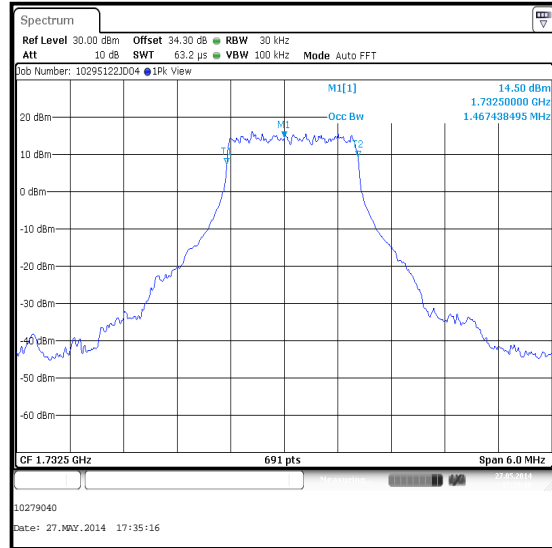
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	15	0	30	100	2.692
1732.5	8	4	30	100	1.467



QPSK / 15 Resource Blocks (0 Offset)

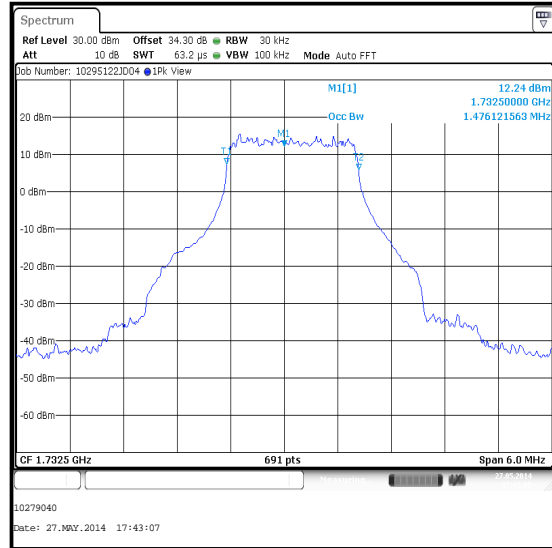
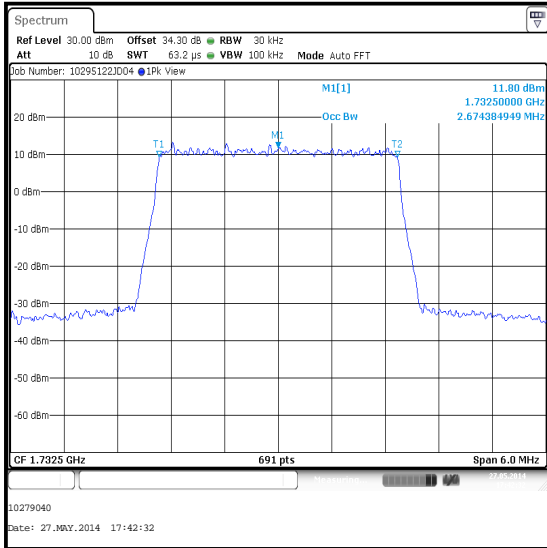


QPSK / 8 Resource Blocks (4 Offset)

Transmitter Occupied Bandwidth (continued)

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

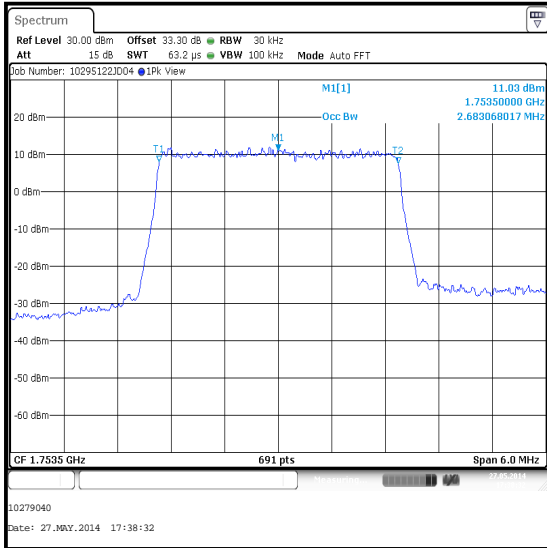
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	15	0	30	100	2.674
1732.5	8	4	30	100	1.476



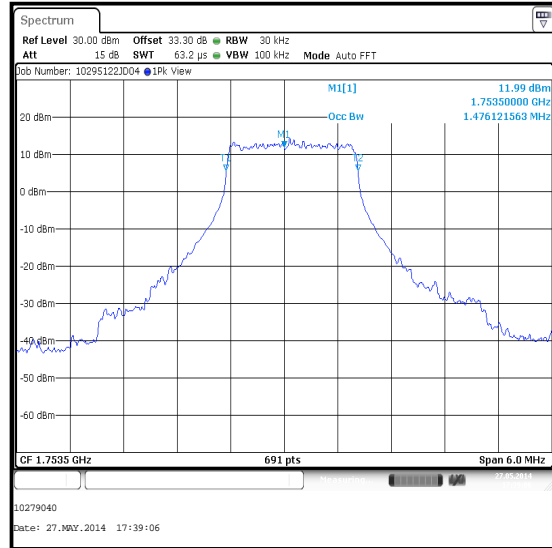
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Top Channel / QPSK

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



QPSK / 15 Resource Blocks (0 Offset)

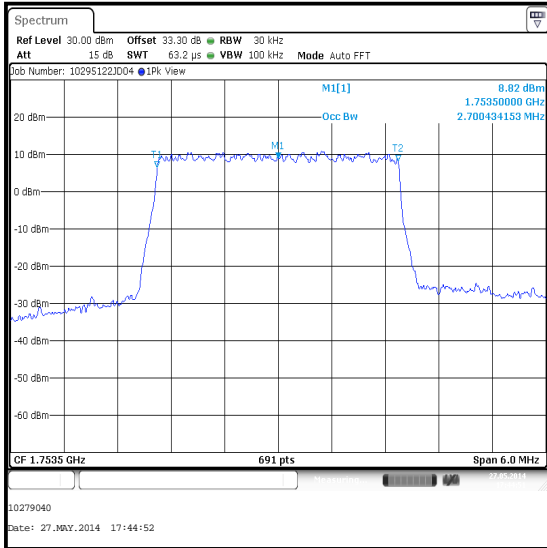


QPSK / 8 Resource Blocks (4 Offset)

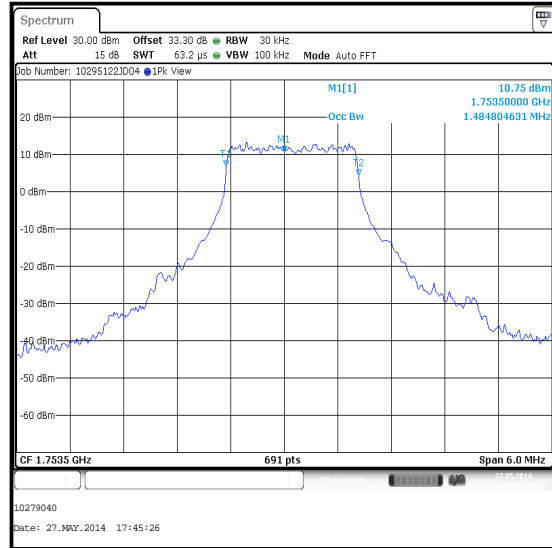
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1753.5	15	0	30	100	2.700
1753.5	8	4	30	100	1.485



16QAM / 15 Resource Blocks (0 Offset)

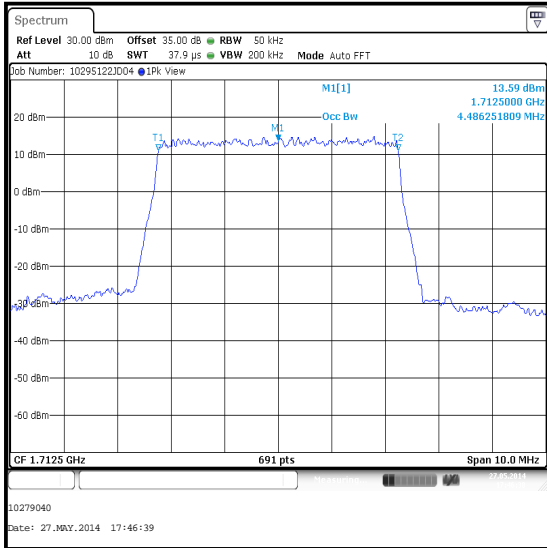


16QAM / 8 Resource Blocks (4 Offset)

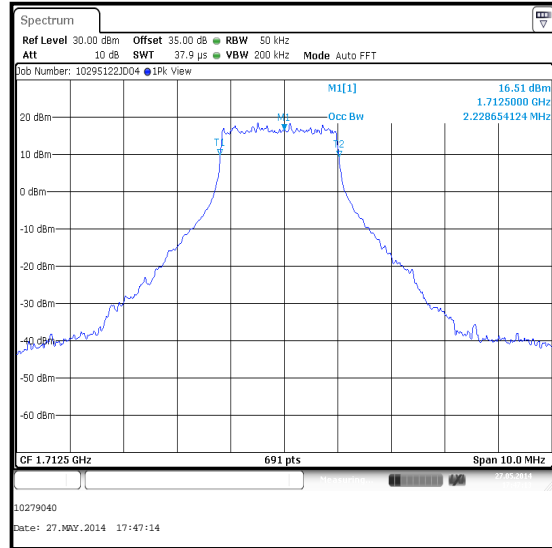
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

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



QPSK / 25 Resource Blocks (0 Offset)

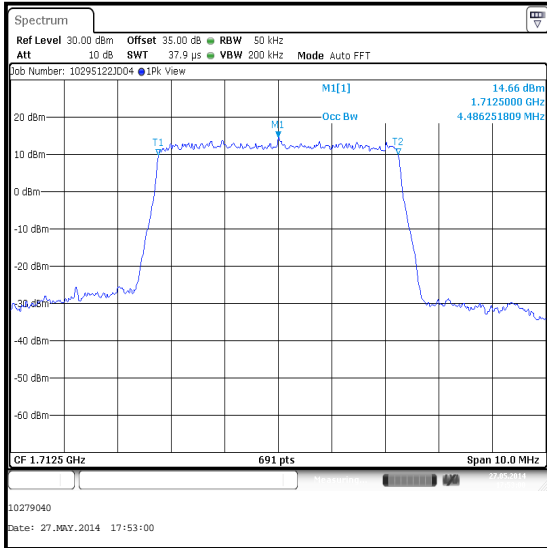


QPSK / 12 Resource Blocks (6 Offset)

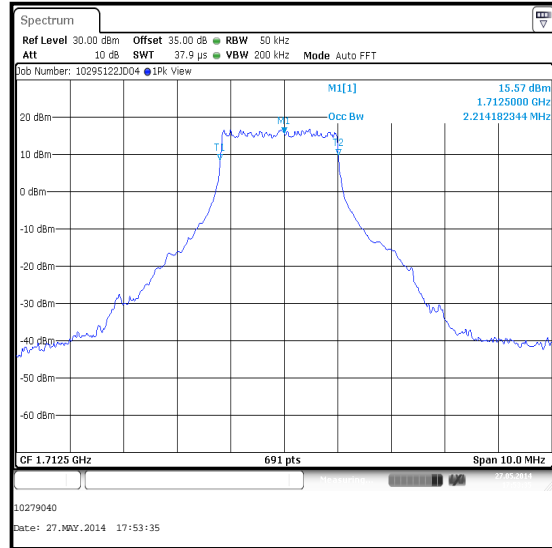
Transmitter Occupied Bandwidth (continued)

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

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



16QAM / 25 Resource Blocks (0 Offset)

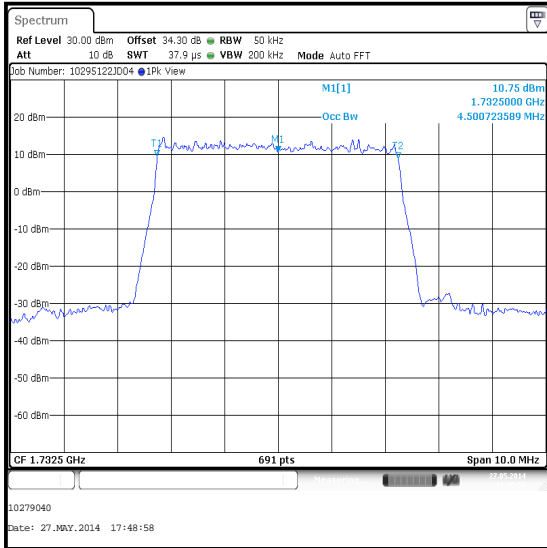


16QAM / 12 Resource Blocks (6 Offset)

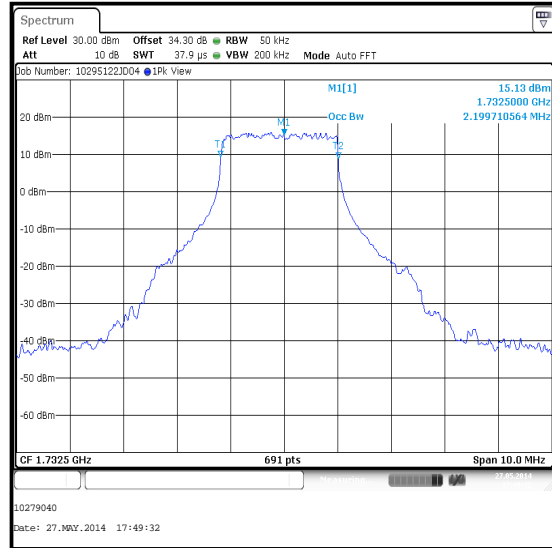
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

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



QPSK / 25 Resource Blocks (0 Offset)

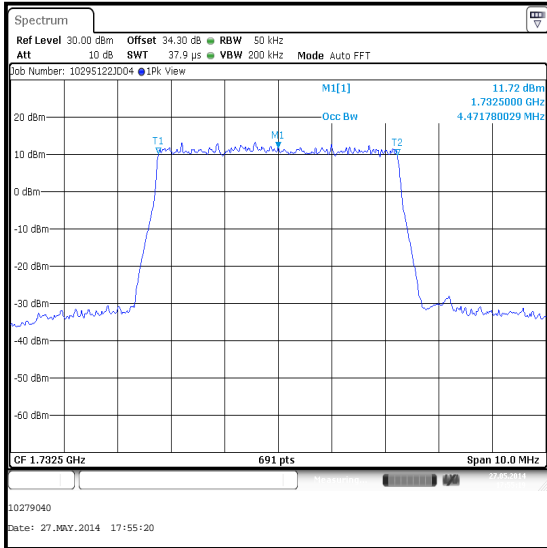


QPSK / 12 Resource Blocks (6 Offset)

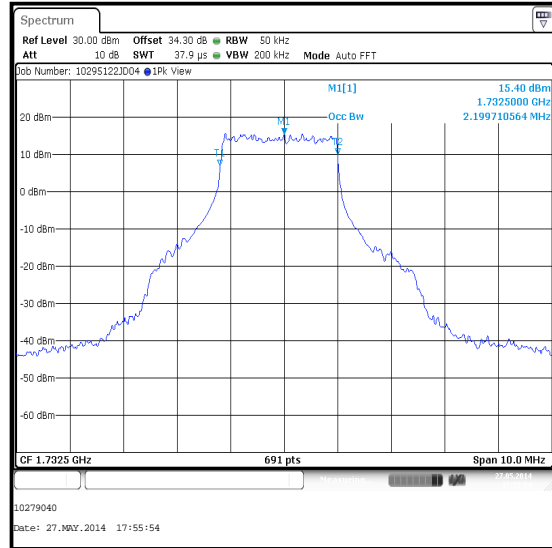
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	25	0	50	200	4.472
1732.5	12	6	50	200	2.200



16QAM / 25 Resource Blocks (0 Offset)

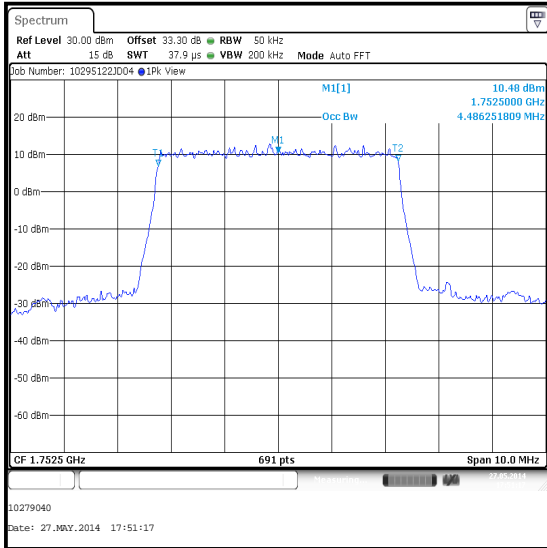


16QAM / 12 Resource Blocks (6 Offset)

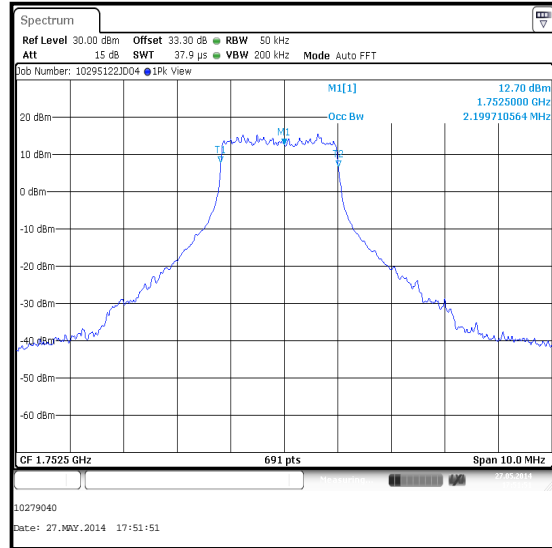
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1752.5	25	0	50	200	4.486
1752.5	12	6	50	200	2.200



QPSK / 25 Resource Blocks (0 Offset)

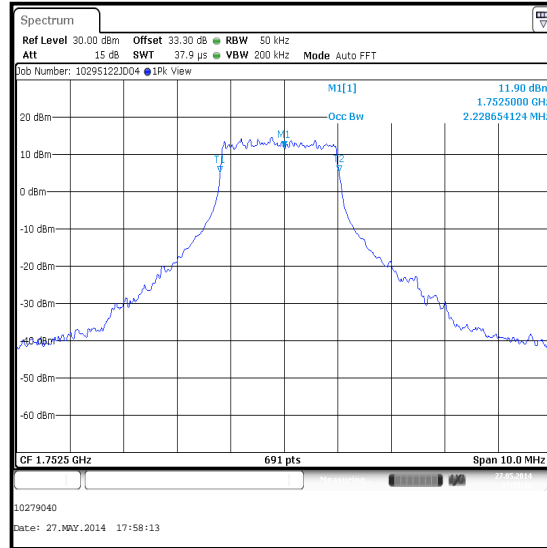
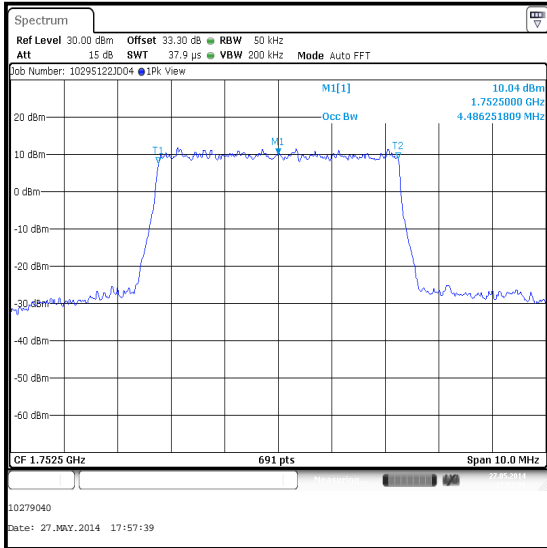


QPSK / 12 Resource Blocks (6 Offset)

Transmitter Occupied Bandwidth (continued)

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

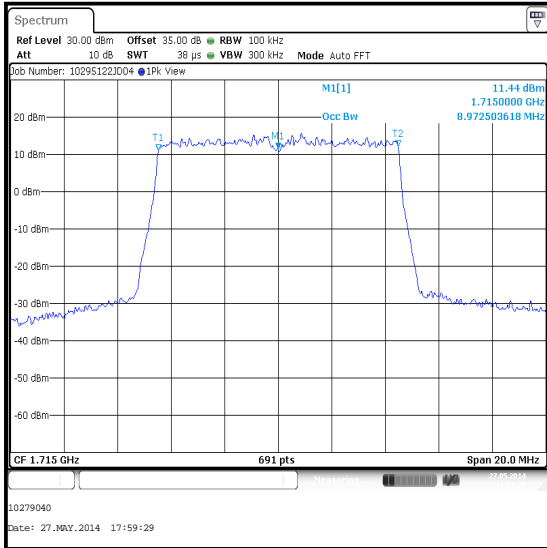
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1752.5	25	0	50	200	4.486
1752.5	12	6	50	200	2.229



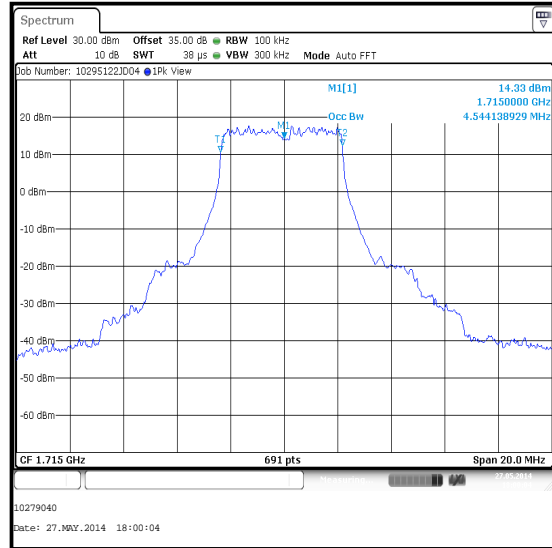
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1715.0	50	0	100	300	8.973
1715.0	25	12	100	300	4.544



QPSK / 50 Resource Blocks (0 Offset)

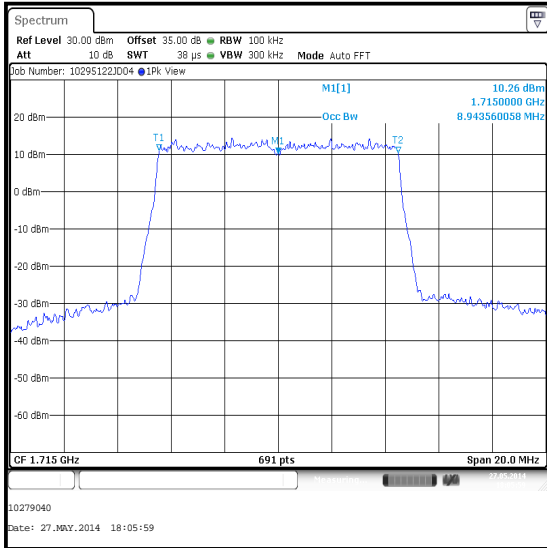


QPSK / 25 Resource Blocks (12 Offset)

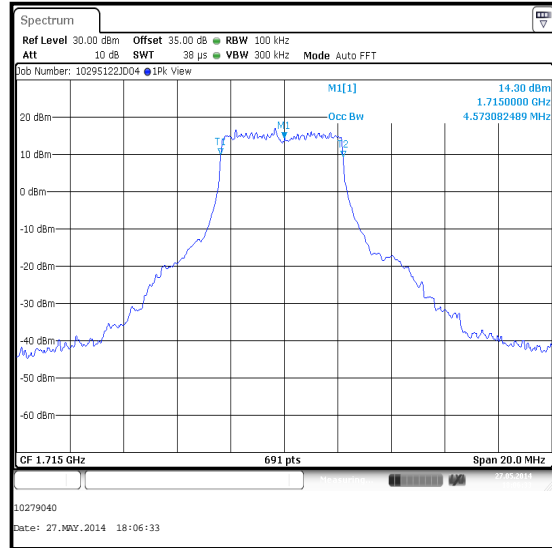
Transmitter Occupied Bandwidth (continued)

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

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



16QAM / 50 Resource Blocks (0 Offset)

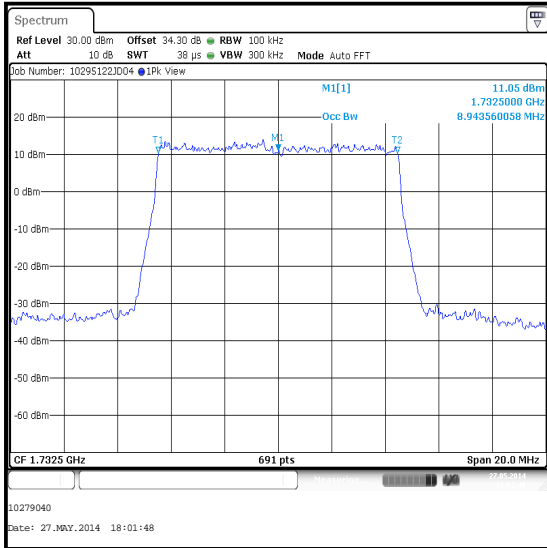


16QAM / 25 Resource Blocks (12 Offset)

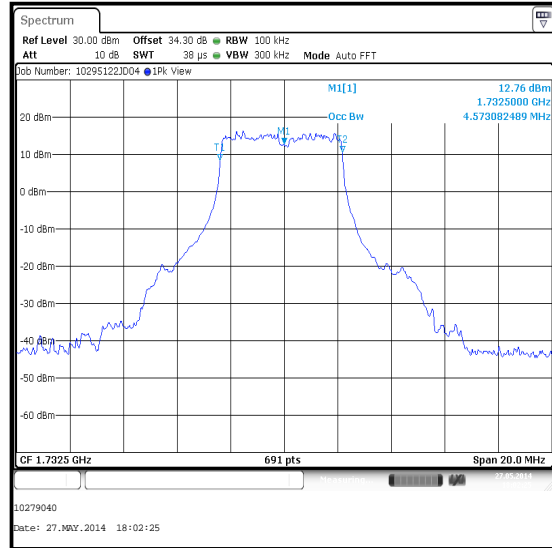
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	50	0	100	300	8.944
1732.5	25	12	100	300	4.573



QPSK / 50 Resource Blocks (0 Offset)

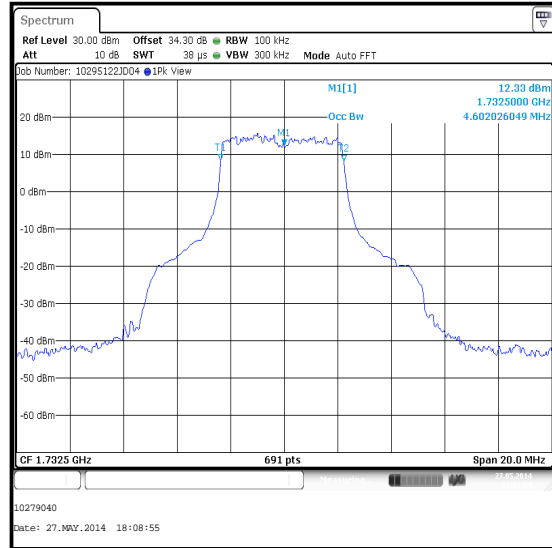
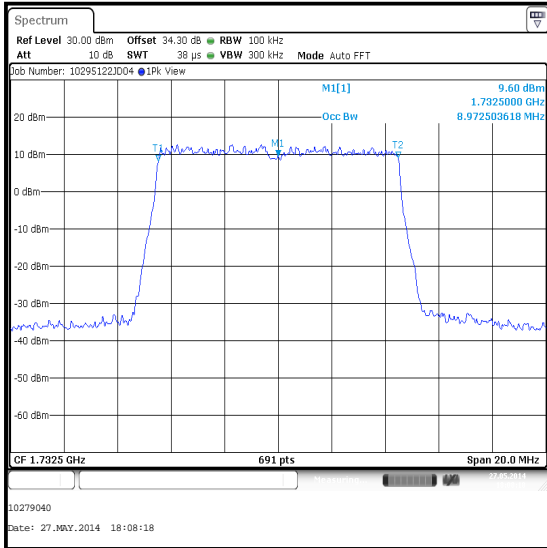


QPSK / 25 Resource Blocks (12 Offset)

Transmitter Occupied Bandwidth (continued)

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

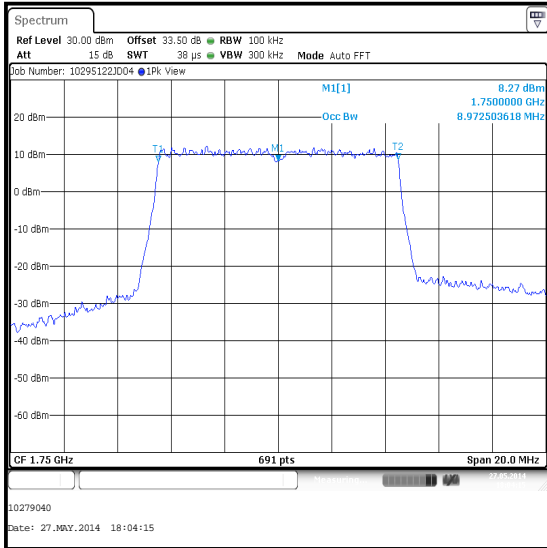
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	50	0	100	300	8.973
1732.5	25	12	100	300	4.602



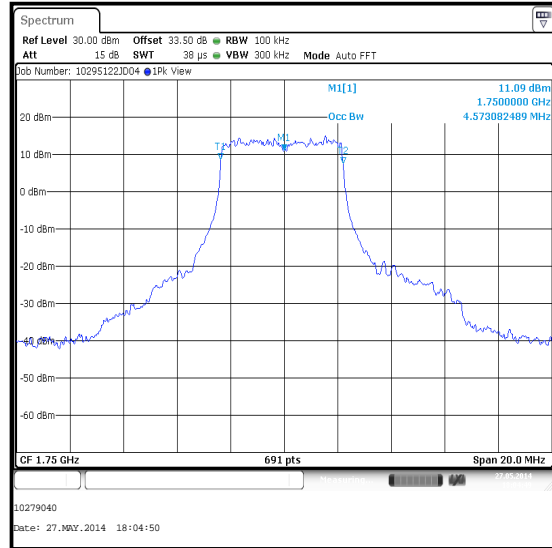
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1750.0	50	0	100	300	8.973
1750.0	25	12	100	300	4.573



QPSK / 50 Resource Blocks (0 Offset)

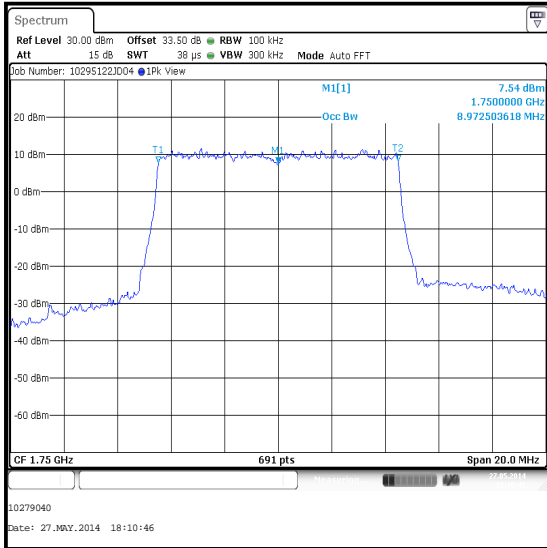


QPSK / 25 Resource Blocks (12 Offset)

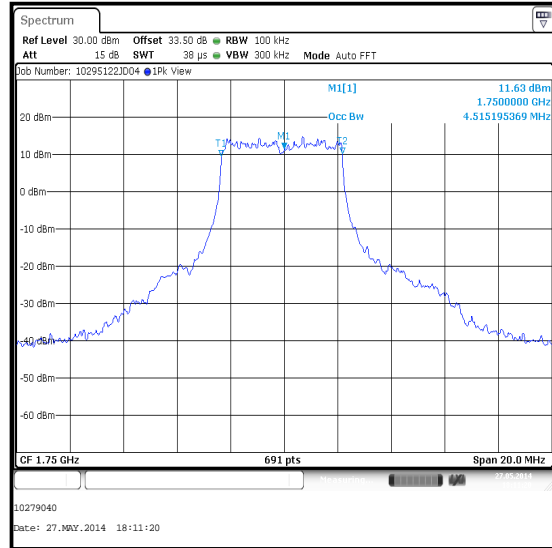
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1750.0	50	0	100	300	8.973
1750.0	25	12	100	300	4.515



16QAM / 50 Resource Blocks (0 Offset)

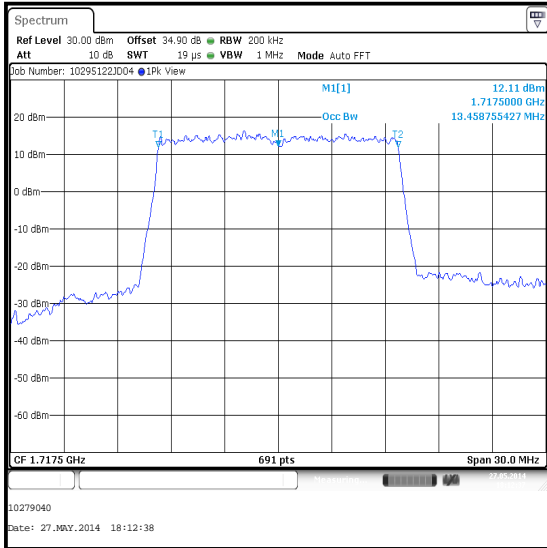


16QAM / 25 Resource Blocks (12 Offset)

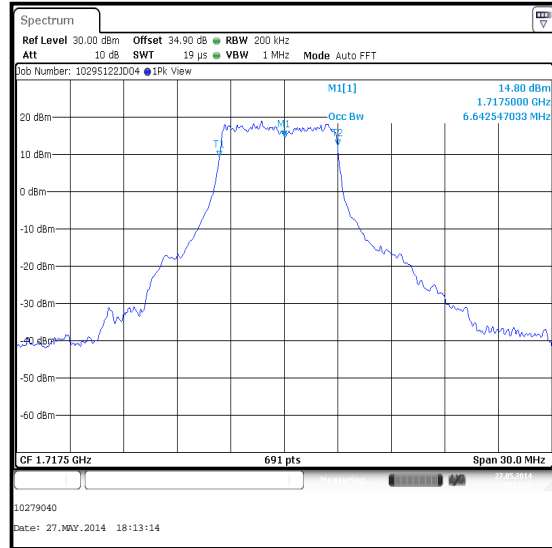
Transmitter Occupied Bandwidth (continued)

Results: 15 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1717.5	75	0	200	1000	13.459
1717.5	36	18	200	1000	6.643



QPSK / 75 Resource Blocks (0 Offset)

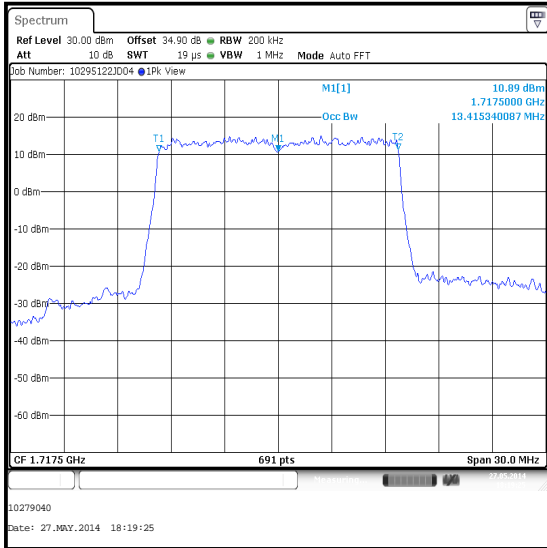


QPSK / 36 Resource Blocks (18 Offset)

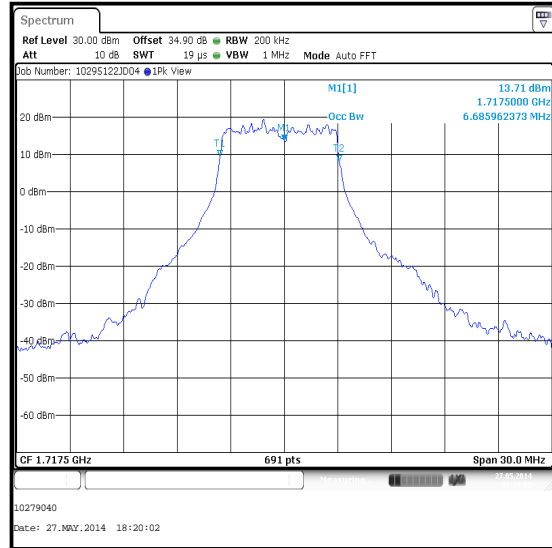
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1717.5	75	0	200	1000	13.415
1717.5	36	18	200	1000	6.686



16QAM / 75 Resource Blocks (0 Offset)

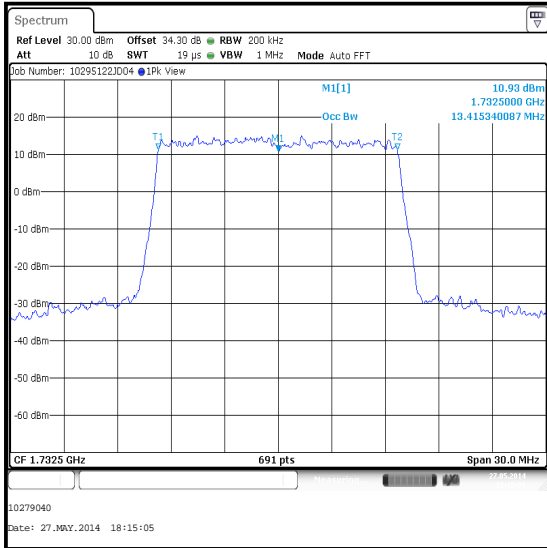


16QAM / 36 Resource Blocks (18 Offset)

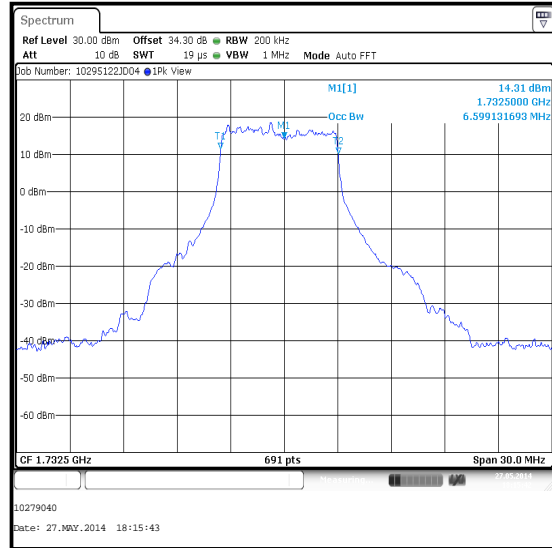
Transmitter Occupied Bandwidth (continued)

Results: 15 MHz Channel Bandwidth / Middle Channel / QPSK

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



QPSK / 75 Resource Blocks (0 Offset)

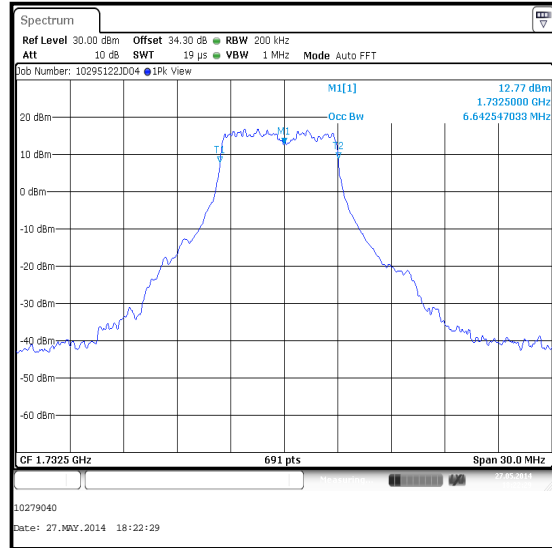
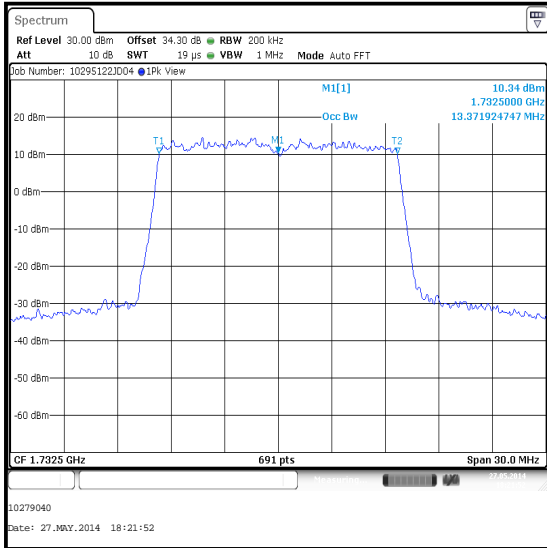


QPSK / 36 Resource Blocks (18 Offset)

Transmitter Occupied Bandwidth (continued)

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

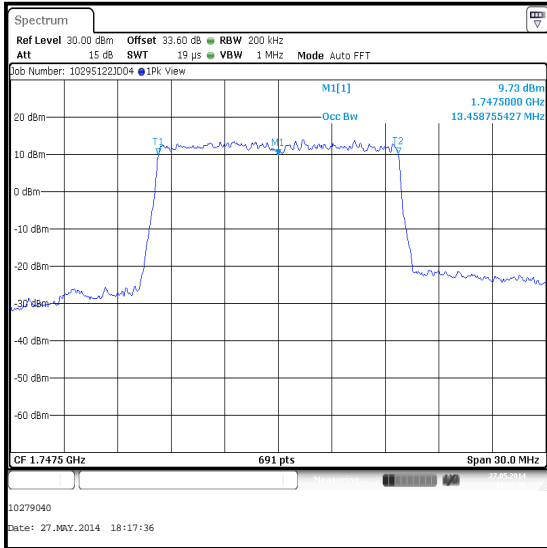
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	75	0	200	1000	13.372
1732.5	36	18	200	1000	6.643



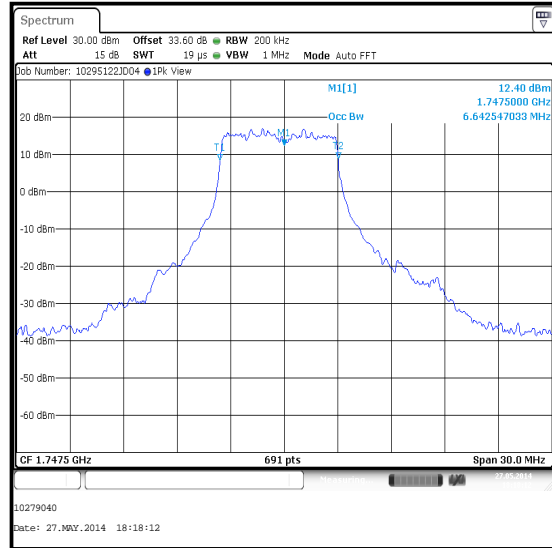
Transmitter Occupied Bandwidth (continued)

Results: 15 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1747.5	75	0	200	1000	13.459
1747.5	36	18	200	1000	6.643



QPSK / 75 Resource Blocks (0 Offset)

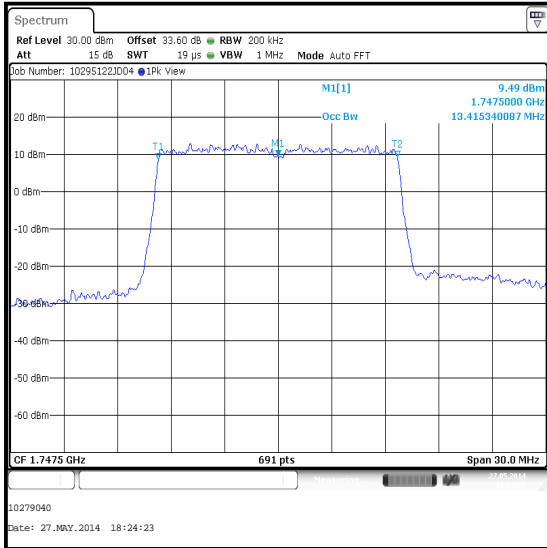


QPSK / 36 Resource Blocks (18 Offset)

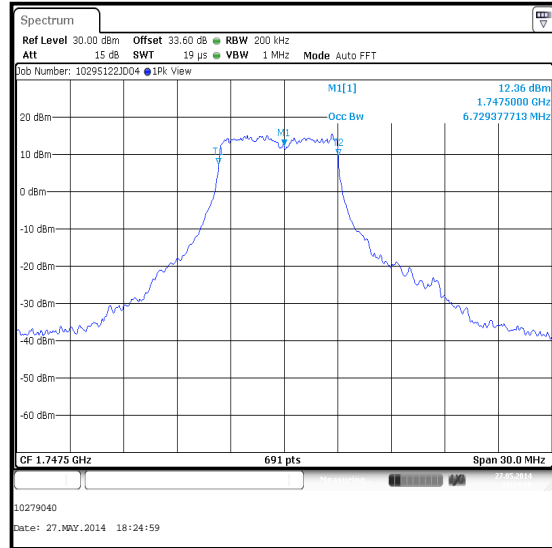
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1747.5	75	0	200	1000	13.415
1747.5	36	18	200	1000	6.729



16QAM / 75 Resource Blocks (0 Offset)

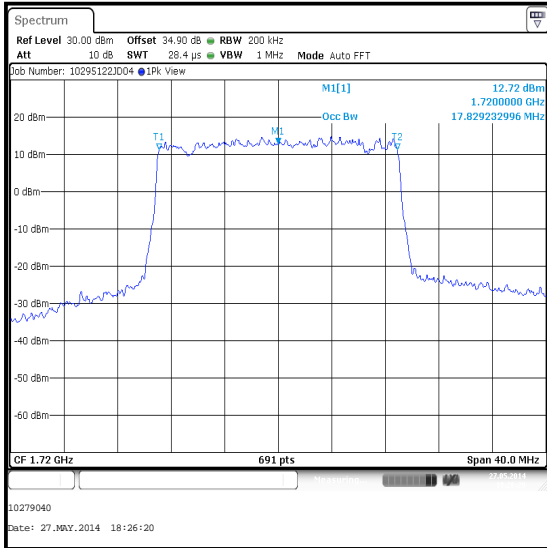


16QAM / 36 Resource Blocks (18 Offset)

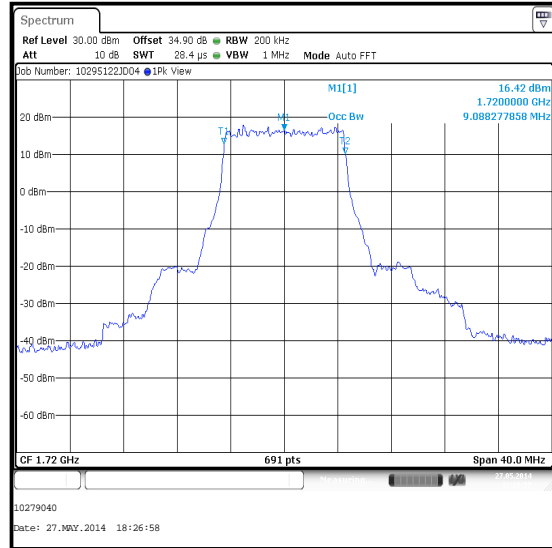
Transmitter Occupied Bandwidth (continued)

Results: 20 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1720.0	100	0	200	1000	17.829
1720.0	50	25	200	1000	9.088



QPSK / 100 Resource Blocks (0 Offset)

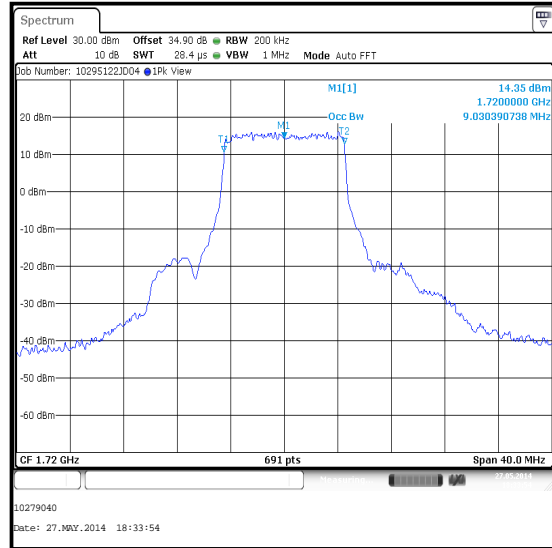
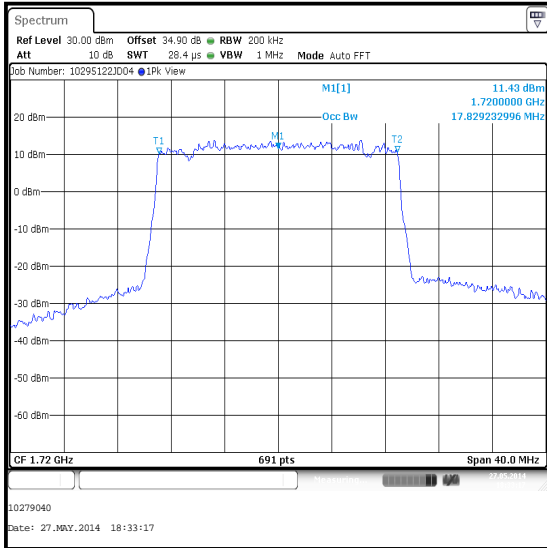


QPSK / 50 Resource Blocks (25 Offset)

Transmitter Occupied Bandwidth (continued)

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

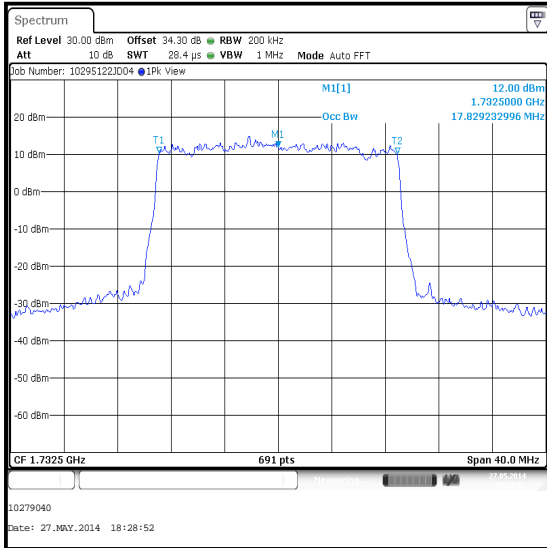
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1720.0	100	0	200	1000	17.829
1720.0	50	25	200	1000	9.030



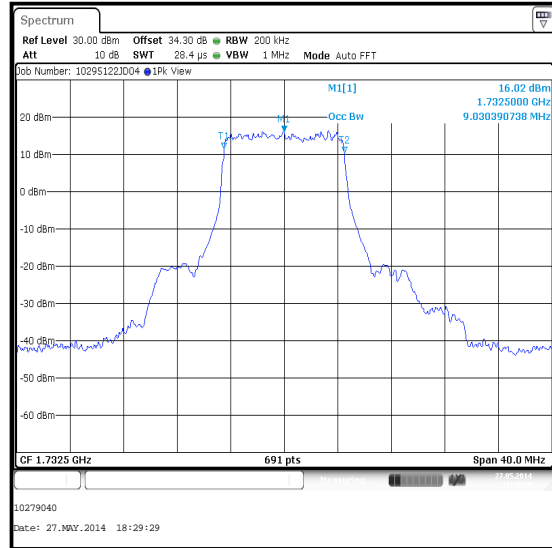
Transmitter Occupied Bandwidth (continued)

Results: 20 MHz Channel Bandwidth / Middle Channel / QPSK

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



QPSK / 100 Resource Blocks (0 Offset)

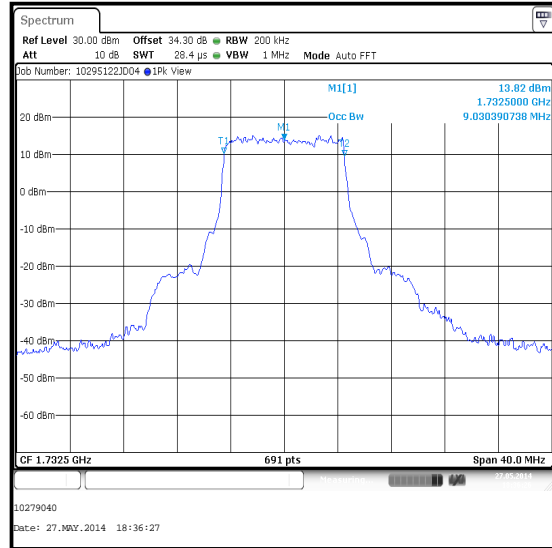
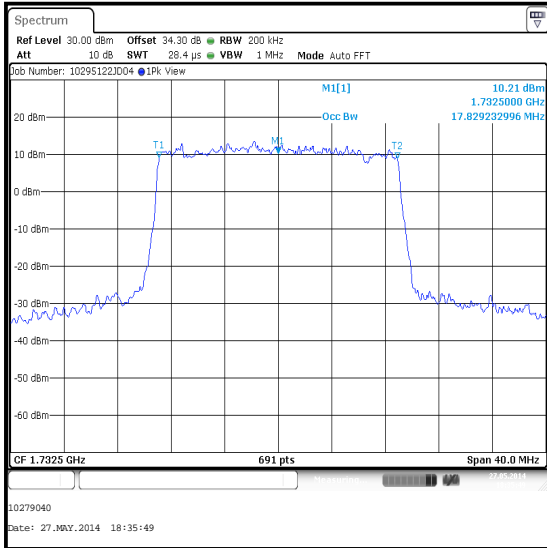


QPSK / 50 Resource Blocks (25 Offset)

Transmitter Occupied Bandwidth (continued)

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

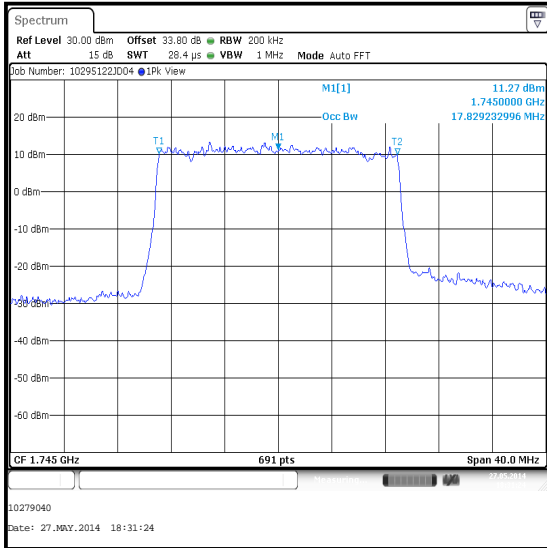
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1732.5	100	0	200	1000	17.829
1732.5	50	25	200	1000	9.030



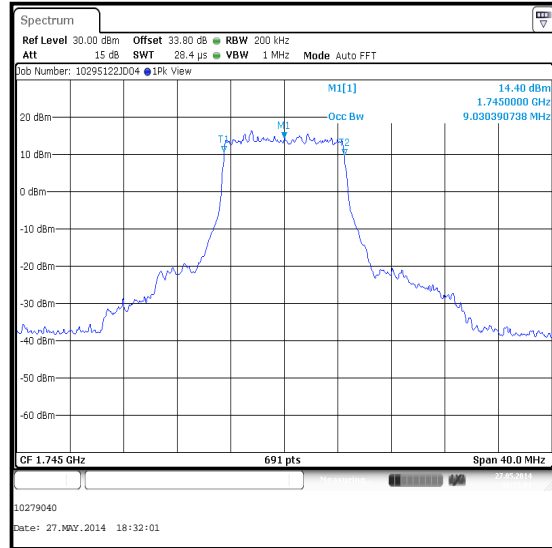
Transmitter Occupied Bandwidth (continued)

Results: 20 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1745.0	100	0	200	1000	17.829
1745.0	50	25	200	1000	9.030



QPSK / 100 Resource Blocks (0 Offset)

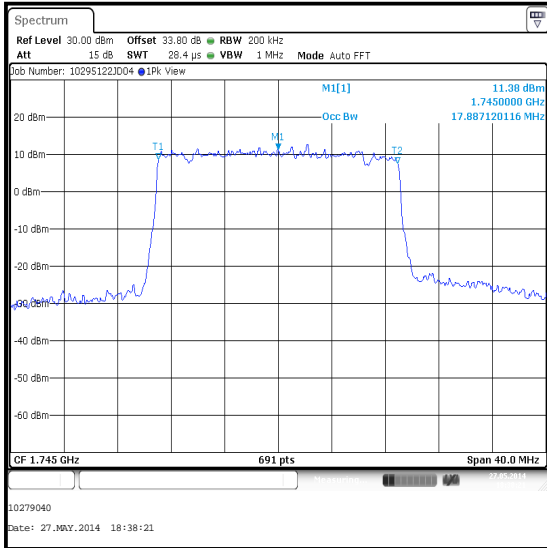


QPSK / 50 Resource Blocks (25 Offset)

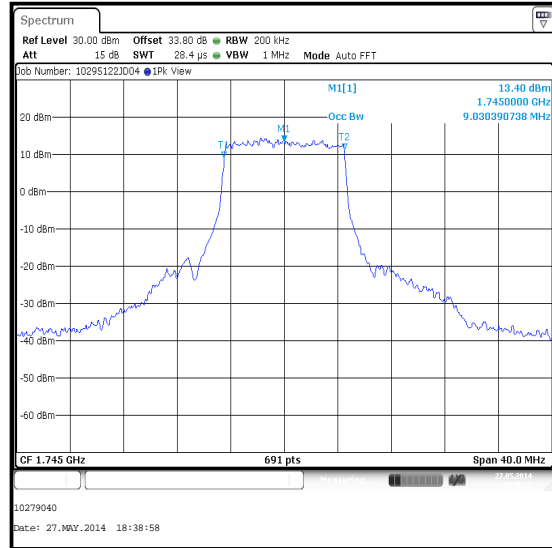
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
1745.0	100	0	200	1000	17.887
1745.0	50	25	200	1000	9.030



16QAM / 100 Resource Blocks (0 Offset)



16QAM / 50 Resource Blocks (25 Offset)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	14 Mar 2015	12
L1128	Signal Analyser	Rohde & Schwarz	FSV13	101835	25 April 2015	12
A2535	Directional Coupler	AtlanTecRF	CDC-003060-20	14041701719	Calibrated before use	-
A2508	Attenuator	AtlanTecRF	AN18-10	821846#3	Calibrated before use	-
S0537	DC Power Supply	TTi	EL302D	249928	Calibrated before use	-
M1251	Digital Multimeter	Fluke	175	8717019	19 May 2015	12
G0608	Signal Generator	Rohde & Schwarz	SMIQ 06B	838341/033	14 Feb 2015	12
M1009	Power Meter	Hewlett Packard	437B	3125U13706	04 Feb 2015	12
M1592	Power Sensor	Hewlett Packard	8487A	3318A02094	28 Aug 2014	12

5.2.3. Transmitter Radiated Spurious Emissions**Test Summary:**

Test Engineers:	Nick Steele & Andrew Edwards	Test Dates:	28 May 2014 & 03 June 2014
Test Sample IMEI:	004402452750650		

FCC Reference:	Parts 2.1053 & 27.53(g)(1)
Test Method Used:	As detailed in KDB 971168 Section 6.1 referencing FCC Part 2.1053
Frequency Range:	30 MHz to 18 GHz
Configuration:	10 MHz, QPSK, 1RB, 0 Offset

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	35 to 42

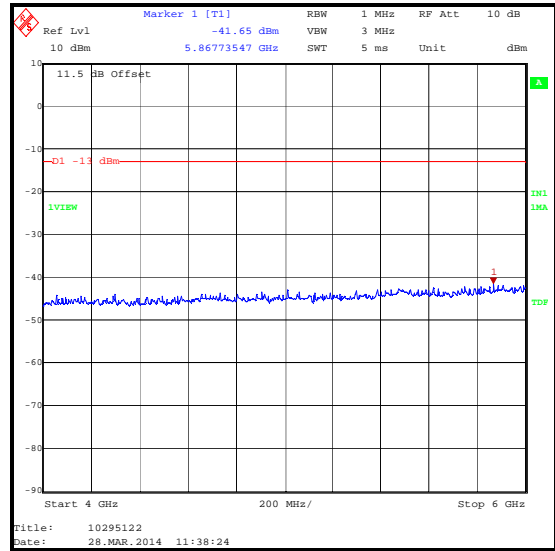
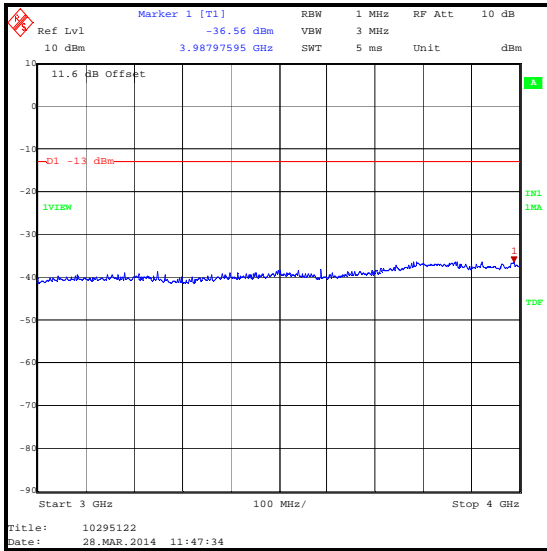
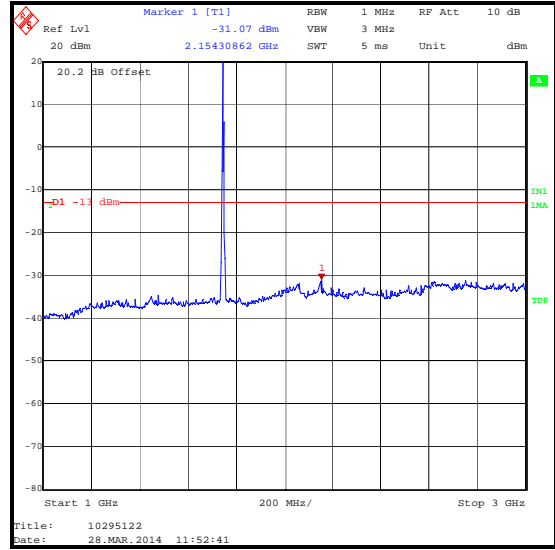
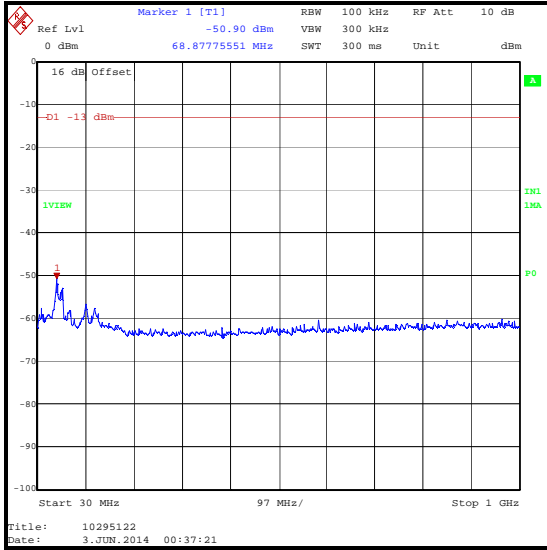
Note(s):

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, as this mode emits the highest transmit output power level, it was deemed to be the worst case.
2. The emission seen on the 1 GHz to 3 GHz plot at approximately 1750 MHz is the EUT carrier.
3. All emissions shown on the pre-scan plots were investigated. Final measurements were made using appropriate RF filters and attenuators where required. All emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient, therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
6. All plots above 1 GHz have an incorrect date. All plots were taken on 28th May 2014.

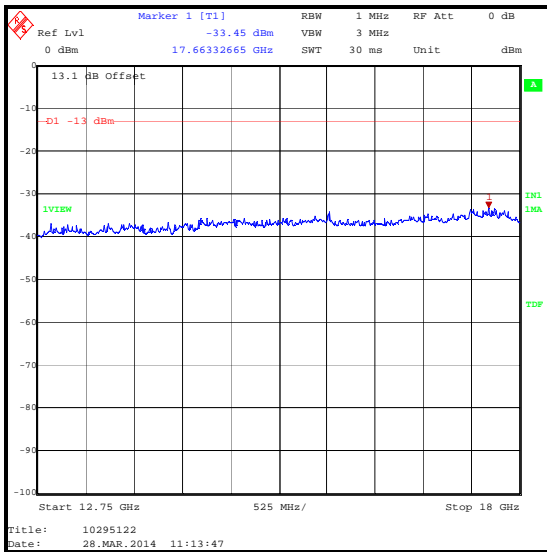
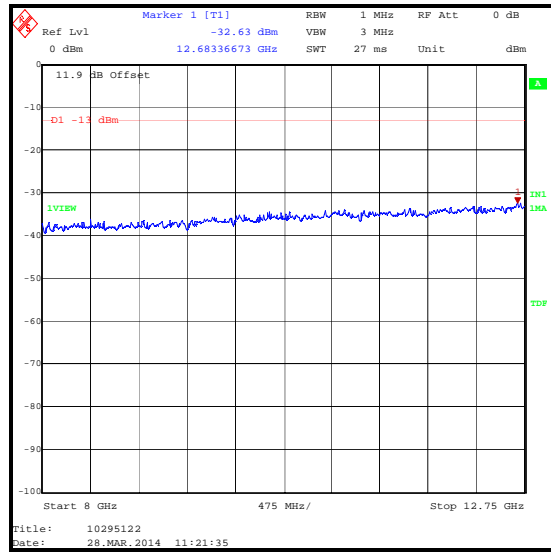
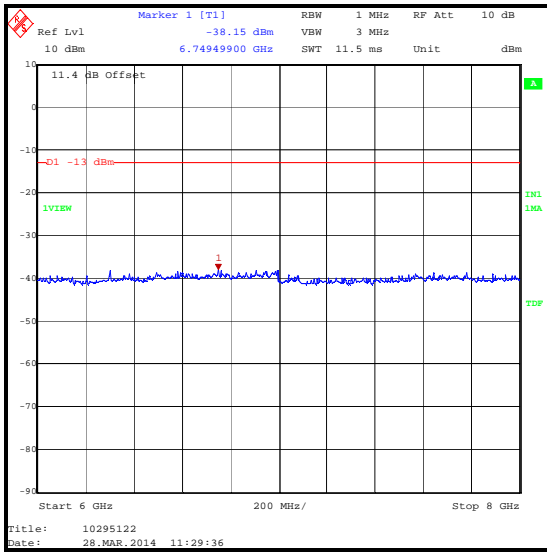
Results: Top Channel

Frequency (MHz)	Antenna Polarisation	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2154.309	Vertical	-31.1	-13.0	18.1	Complied

Transmitter Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	15 Feb 2015	12
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	12
G0543	Amplifier	Sonoma	310N	230801	19 Aug 2014	3
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	01 Oct 2014	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A254	Antenna	Flann Microwave	142240-20	139	14 Nov 2014	12
A255	Antenna	Flann Microwave	16240-20	519	14 Nov 2014	12
A256	Antenna	Flann Microwave	18240-20	400	14 Nov 2014	12
A436	Antenna	Flann Microwave	20240-20	330	14 Nov 2014	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	02 May 2015	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	12 Apr 2015	12

5.2.4. Transmitter Radiated Emissions at Band Edges**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	28 May 2014
Test Sample IMEI:	004402452750650		

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

Environmental Conditions:

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

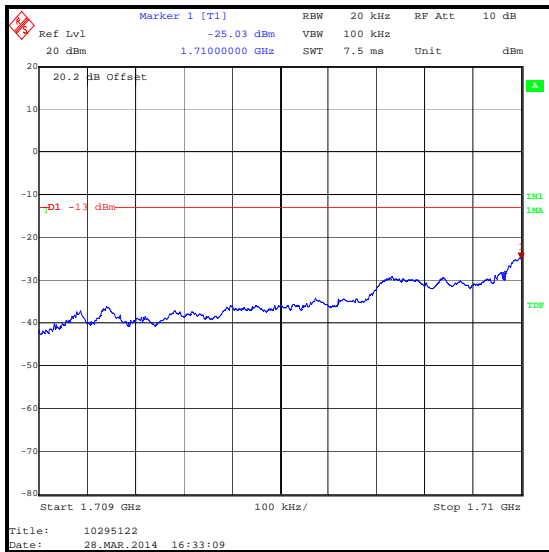
Note(s):

1. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with the maximum resource blocks settings as detailed in section 4.3 of this report.
2. All plots have an incorrect date. All plots were taken on 28th May 2014.

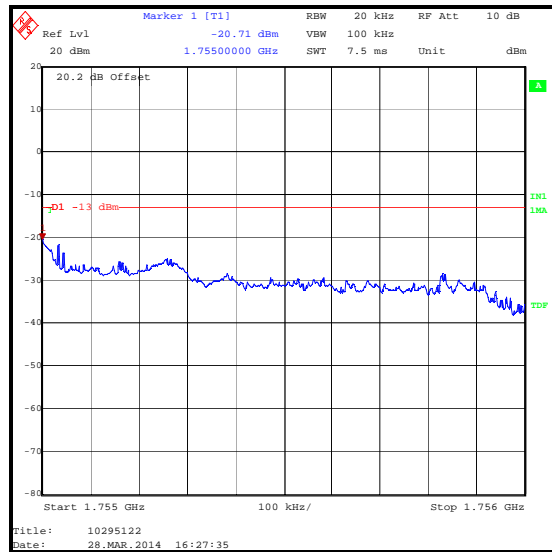
Transmitter Radiated Emissions at Band Edges (continued)

Results: 1.4 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	6	0	-25.0	-13.0	12.0	Complied
1755	6	0	-20.7	-13.0	7.7	Complied



QPSK / Lower Band Edge

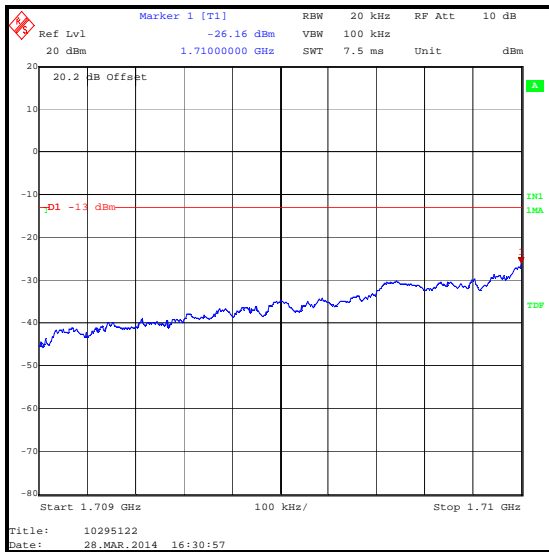


QPSK / Upper Band Edge

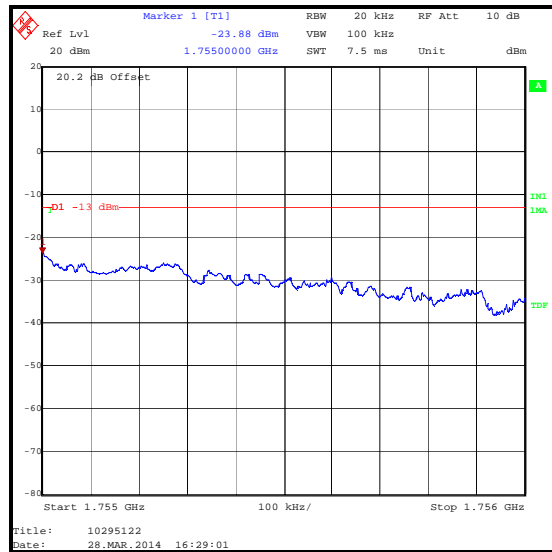
Transmitter Radiated Emissions at Band Edges (continued)

Results: 1.4 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	6	0	-26.2	-13.0	13.2	Complied
1755	6	0	-23.9	-13.0	10.9	Complied



16QAM / Lower Band Edge

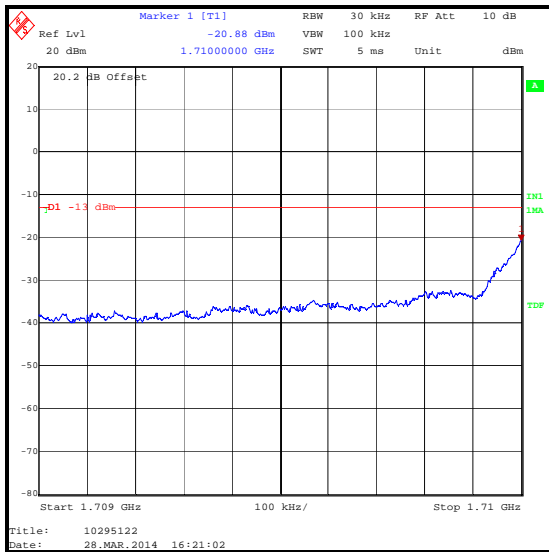


16QAM / Upper Band Edge

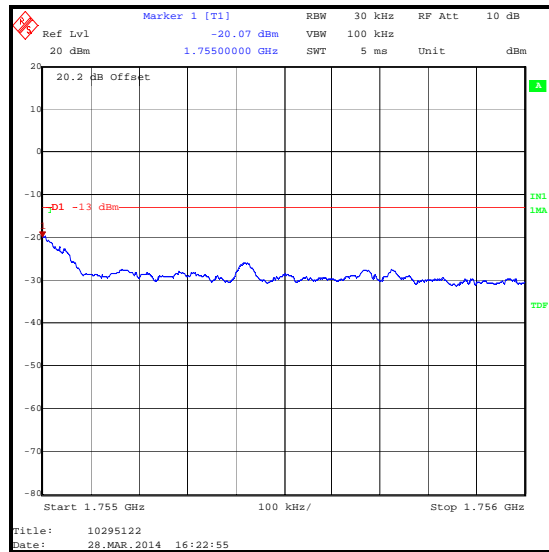
Transmitter Radiated Emissions at Band Edges (continued)

Results: 3 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	15	0	-20.9	-13.0	7.9	Complied
1755	15	0	-20.1	-13.0	7.1	Complied



QPSK / Lower Band Edge

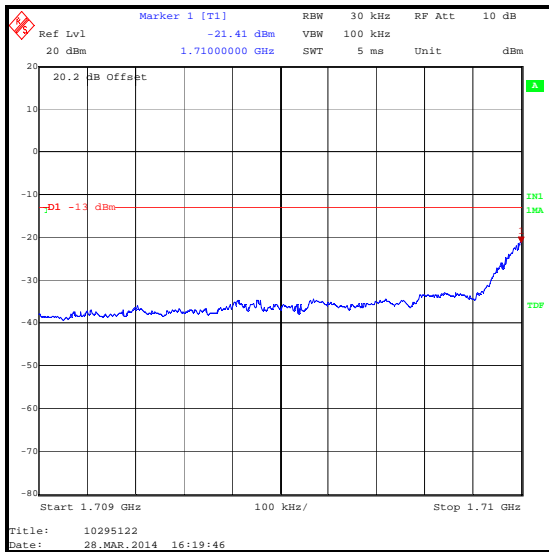


QPSK / Upper Band Edge

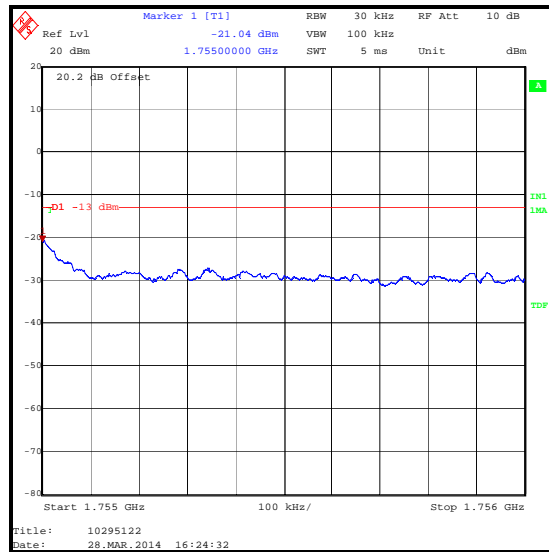
Transmitter Radiated Emissions at Band Edges (continued)

Results: 3 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	15	0	-21.4	-13.0	8.4	Complied
1755	15	0	-21.0	-13.0	8.0	Complied



16QAM / Lower Band Edge

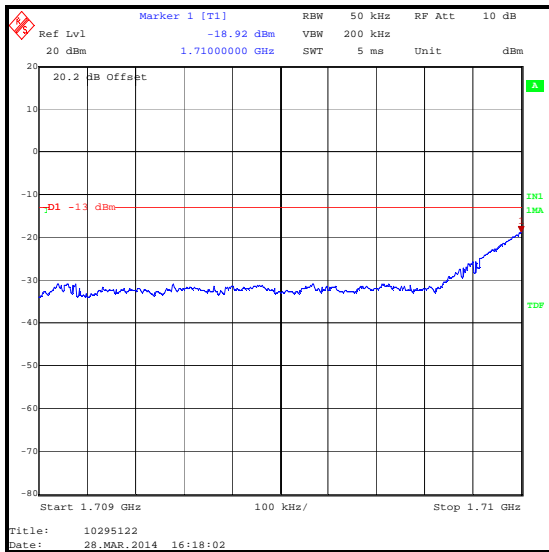


16QAM / Upper Band Edge

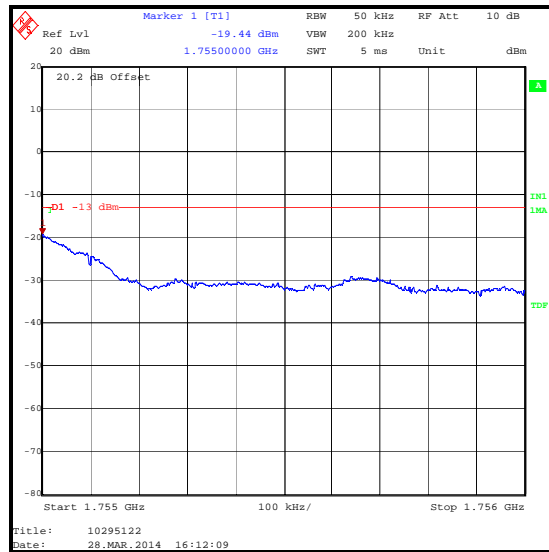
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	25	0	-18.9	-13.0	5.9	Complied
1755	25	0	-19.4	-13.0	6.4	Complied



QPSK / Lower Band Edge

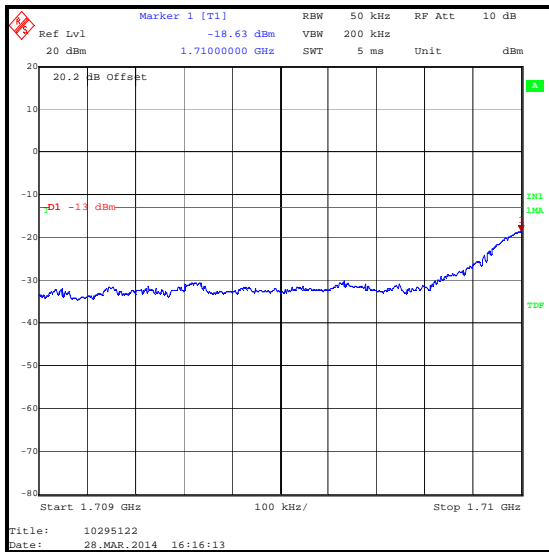


QPSK / Upper Band Edge

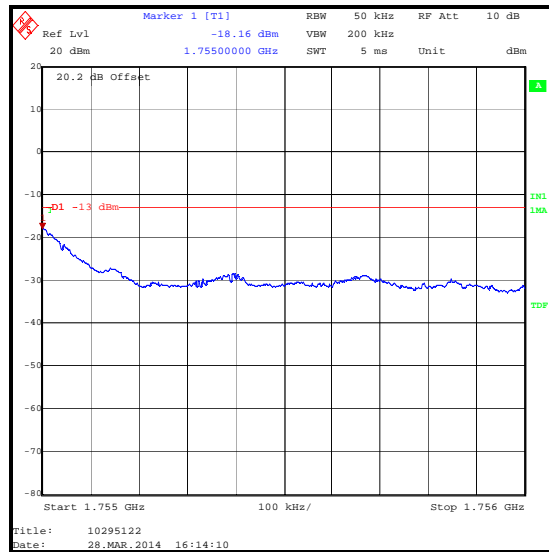
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	25	0	-18.6	-13.0	5.6	Complied
1755	25	0	-18.2	-13.0	5.2	Complied



16QAM / Lower Band Edge

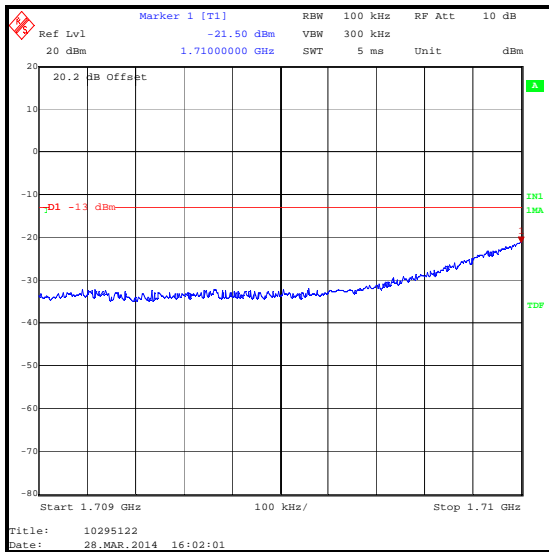


16QAM / Upper Band Edge

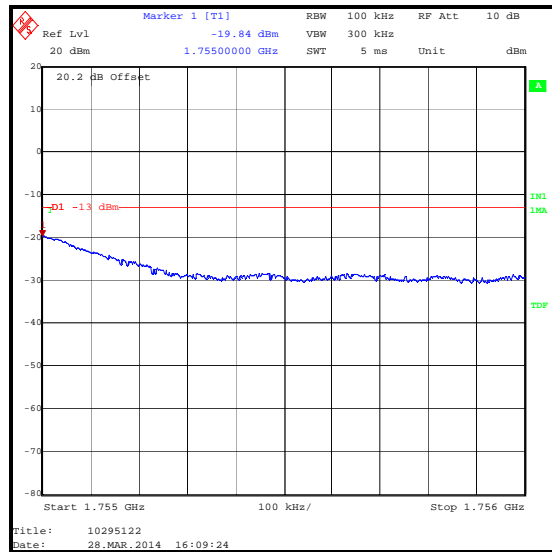
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	50	0	-21.5	-13.0	8.5	Complied
1755	50	0	-19.8	-13.0	6.8	Complied



QPSK / Lower Band Edge

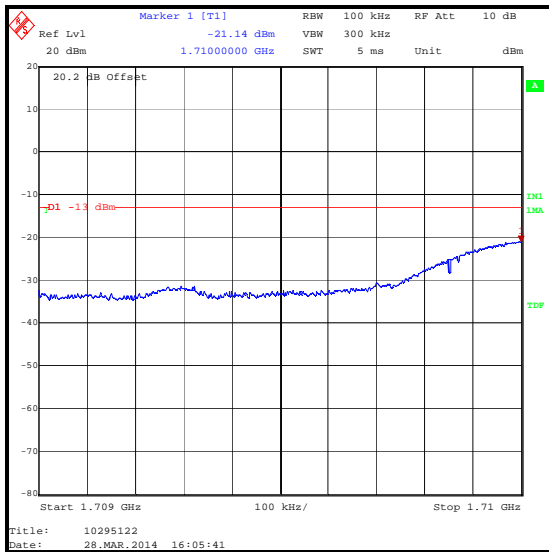


QPSK / Upper Band Edge

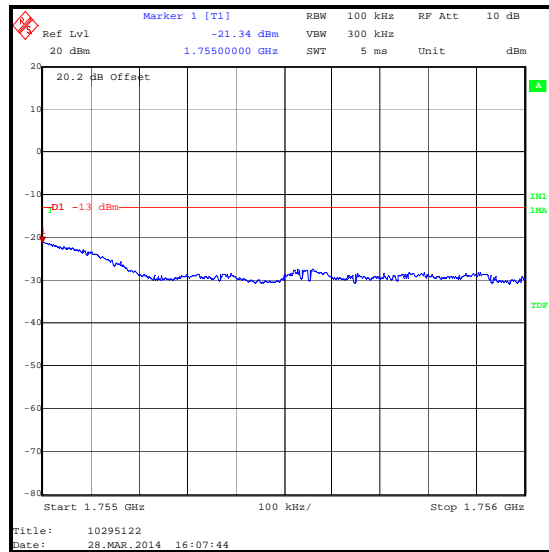
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	50	0	-21.1	-13.0	8.1	Complied
1755	50	0	-21.3	-13.0	8.3	Complied



16QAM / Lower Band Edge

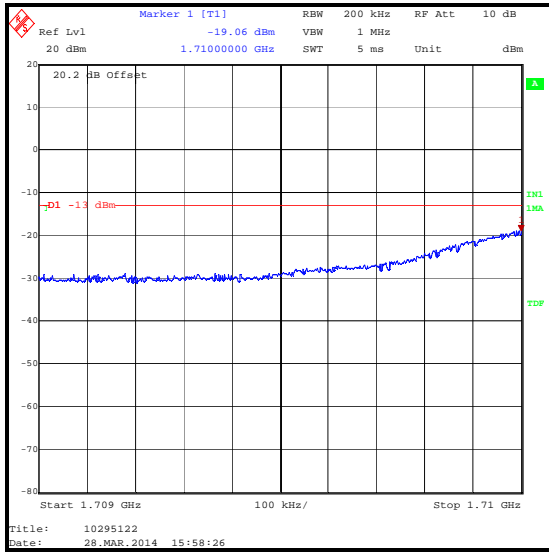


16QAM / Upper Band Edge

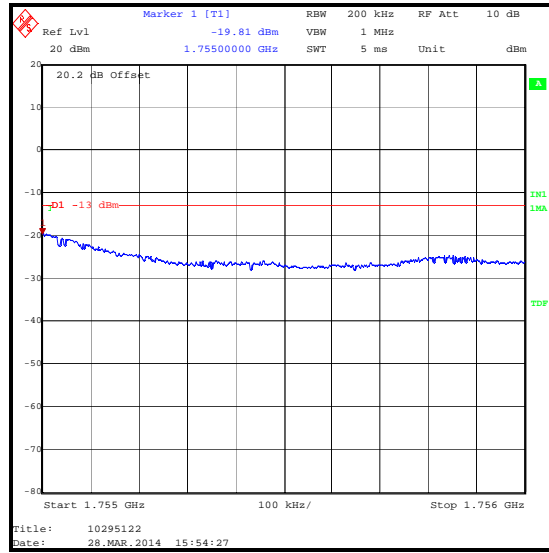
Transmitter Radiated Emissions at Band Edges (continued)

Results: 15 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	75	0	-19.1	-13.0	6.1	Complied
1755	75	0	-19.8	-13.0	6.8	Complied



QPSK / Lower Band Edge

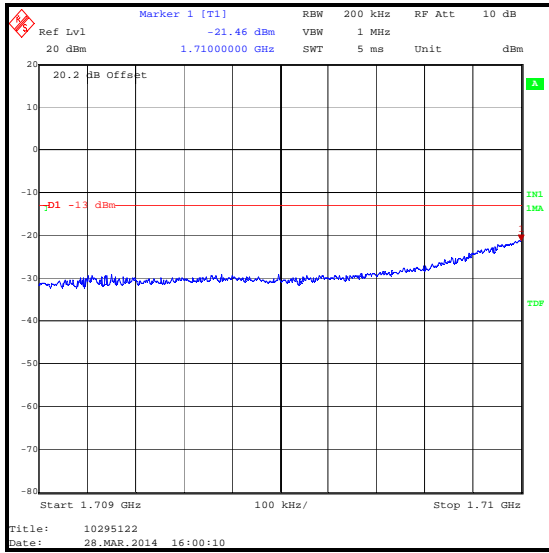


QPSK / Upper Band Edge

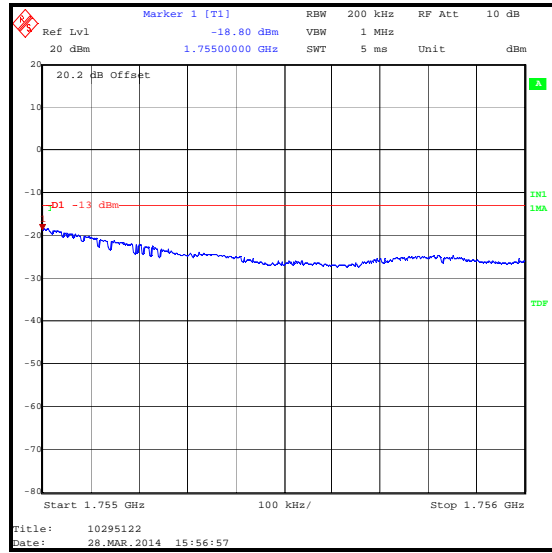
Transmitter Radiated Emissions at Band Edges (continued)

Results: 15 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	75	0	-21.5	-13.0	8.5	Complied
1755	75	0	-18.8	-13.0	5.8	Complied



16QAM / Lower Band Edge

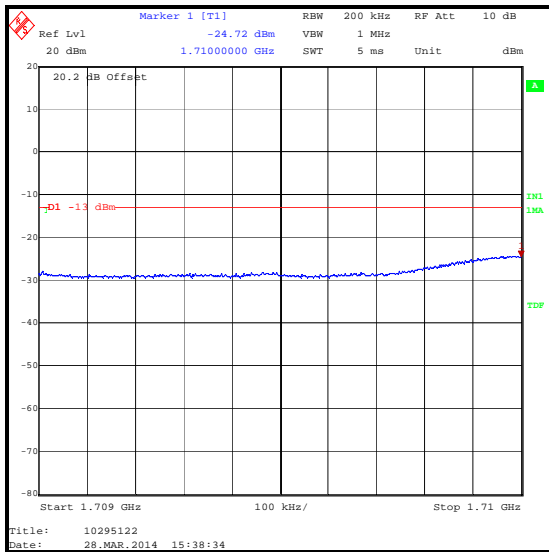


16QAM / Upper Band Edge

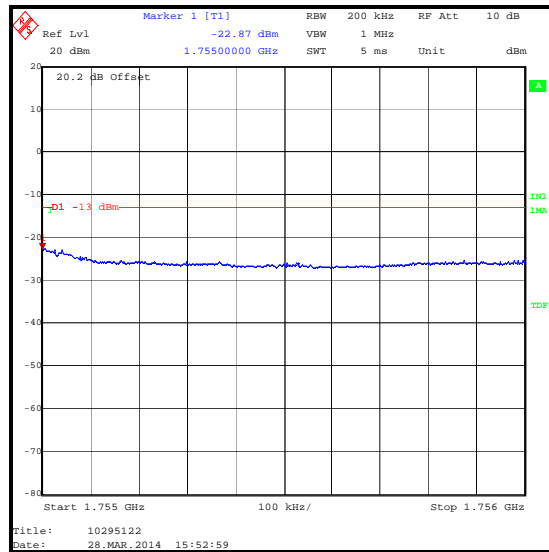
Transmitter Radiated Emissions at Band Edges (continued)

Results: 20 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	100	0	-24.7	-13.0	11.7	Complied
1755	100	0	-22.9	-13.0	9.9	Complied



QPSK / Lower Band Edge

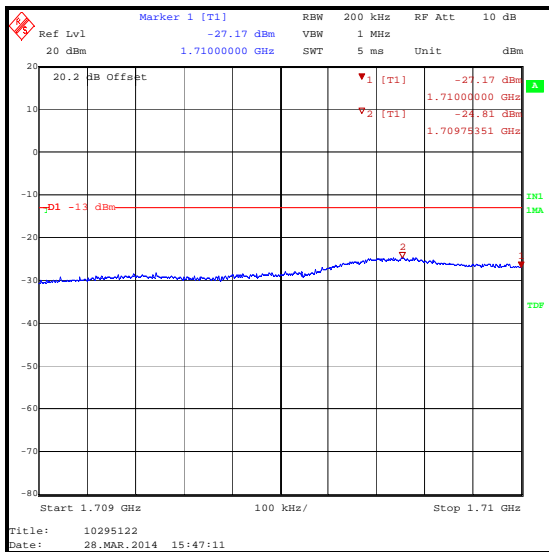


QPSK / Upper Band Edge

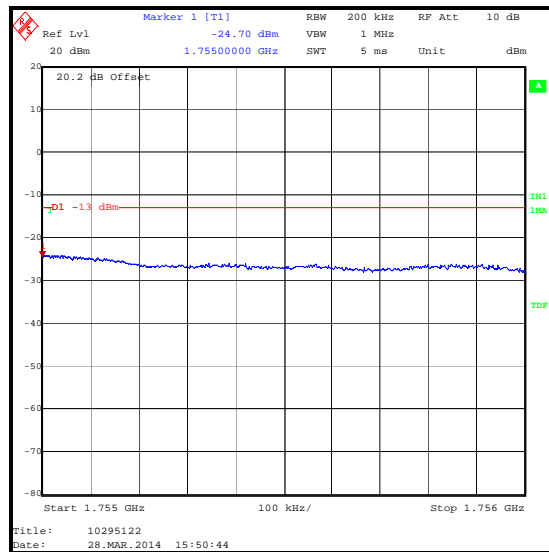
Transmitter Radiated Emissions at Band Edges (continued)

Results: 20 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1709.754	100	0	-24.8	-13.0	11.8	Complied
1710	100	0	-27.2	-13.0	14.2	Complied
1755	100	0	-24.7	-13.0	11.7	Complied



16QAM / Lower Band Edge



16QAM / Upper Band Edge

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	01 Oct 2014	12

5.2.5. Transmitter Frequency Stability (Temperature Variation)**Test Summary:**

Test Engineer:	Keith Tucker	Test Date:	02 June 2014
Test Sample IMEI:	004402452751252		

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

Environmental Conditions:

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

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via 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.

Transmitter Frequency Stability (Temperature Variation) (continued)**Results: Bottom Channel (1710.7 MHz)**

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	10	1710.700010	1710	0.700010	Complied
-20	11	1710.700011	1710	0.700011	Complied
-10	10	1710.700010	1710	0.700010	Complied
0	10	1710.700010	1710	0.700010	Complied
10	8	1710.700008	1710	0.700008	Complied
20	10	1710.700010	1710	0.700010	Complied
30	8	1710.699992	1710	0.699992	Complied
40	10	1710.699990	1710	0.699990	Complied
50	9	1710.700009	1710	0.700009	Complied

Results: Top Channel (1754.3 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	11	1754.300011	1755	0.699989	Complied
-20	12	1754.300012	1755	0.699988	Complied
-10	10	1754.300010	1755	0.699990	Complied
0	11	1754.300011	1755	0.699989	Complied
10	9	1754.300009	1755	0.699991	Complied
20	10	1754.299990	1755	0.700010	Complied
30	9	1754.300009	1755	0.699991	Complied
40	9	1754.300009	1755	0.699991	Complied
50	8	1754.299992	1755	0.700008	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohyrometer	JM Handelpunkt	30.5015.13	None stated	14 Mar 2015	12
M1870	Wideband Radio Comms Tester	Rohde & Schwarz	CMW500	145919	05 May 2015	12
E0513	Environmental Chamber	TAS	LT600 Series 3	23900506	Calibrated before use	-
M1249	Thermometer	Fluke	52II	88800049	02 May 2015	12
S021	Dual DC power supply	TTi	CPX200	061034	Calibrated before use	-
M1251	Multimeter	Fluke	175	89170179	19 May 2015	12

5.2.6. Transmitter Frequency Stability (Voltage Variation)**Test Summary:**

Test Engineer:	Keith Tucker	Test Date:	02 June 2014
Test Sample IMEI:	004402452751252		

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

Environmental Conditions:

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

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via 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.

Results: Bottom Channel (1710.7 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.42	10	1710.700010	1710	0.700010	Complied
4.18	10	1710.700010	1710	0.700010	Complied

Results: Top Channel (1754.3 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
3.42	9	1754.300009	1755	0.699991	Complied
4.18	9	1754.300009	1755	0.699991	Complied

Transmitter Frequency Stability (Voltage Variation) (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	14 Mar 2015	12
M1870	Wideband Radio Comms Tester	Rohde & Schwarz	CMW500	145919	05 May 2015	12
S021	Dual DC power supply	TTi	CPX200	061034	Calibrated before use	-
M1251	Multimeter	Fluke	175	89170179	19 May 2015	12

6. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Output Power	1710 to 1755 MHz	95%	±1.13 dB
Frequency Stability	1710 to 1755 MHz	95%	±23 Hz
Occupied Bandwidth	1710 to 1755 MHz	95%	±3.92 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 18 GHz	95%	±2.94 dB

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

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	-	-	EUT Description update

--- END OF REPORT ---