



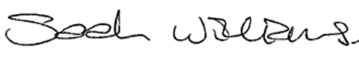
TEST REPORT


Test Report No. : UL-RPT-RP10135420JD01A V2.0

Manufacturer : General Dynamics Broadband UK Ltd
Model No. : AMW
FCC ID : PKTPEMAMW1
Technology : LTE Band 14, 5 MHz & 10 MHz Channel Bandwidth
Test Standard(s) : Second Report and Order FCC 13-137, FCC Parts 90.210(n), 90.539(e), 90.542(a)(6), 90.542(a)(7), 90.543(c), 90.543(e)(2) & 90.543(f).

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

Date of Issue: 01 April 2014

Checked by: 
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Engineer, Radio Laboratory

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

UL VS LTD

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1. Customer Information













Company Name:	General Dynamics Broadband UK Ltd
Address:	Unit 7 Greenways Business Park Bellinger Close Chippenham Wilts SN15 1BN United Kingdom

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR90
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 90 Private Land Mobile Radio Services. Subpart R Regulations Governing the Licensing and Use of Frequencies in the 763-775 and 793-805 MHz Bands
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:	04 February 2014 to 11 March 2014

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
90.542(a)(6) / 2.1046	Transmitter Carrier Output Power and Effective Radiated Power (ERP)	
2.1049	Transmitter Occupied Bandwidth	
90.210(n) / 2.1051	Transmitter Conducted Emission Mask	
90.543(c) / 2.1051	Transmitter Conducted Emissions	
90.543(e)(2) / 2.1051	Transmitter Conducted Emissions Limitations	
90.543(c) / 2.1051	Transmitter Conducted Band Edge Emissions	
90.543(c) / 2.1053	Transmitter Radiated Emissions	
90.543(e)(2) / 90.543(f) / 2.1053	Transmitter Radiated Emissions Limitations	
90.543(c) / 2.1053	Transmitter Radiated Band Edge Emissions	
90.539(e) / 2.1055	Transmitter Frequency Stability	
Key to Results		
 = Complied  = Did not comply		

2.3. Methods and Procedures

Reference:	ANSI/TIA-603-C-2004
Title:	Land Mobile FM or PM – Communications Equipment – Measurement and Performance Standards.
Reference:	KDB 971168 D01 v02r01 June 7, 2013
Title:	Measurement Guidance for Certification of Licensed Digital Transmitters
Reference:	FCC 13-137
Title:	Second report and order, released October 28, 2013

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:	General Dynamics Broadband
Model Name or Number:	AMW
Test Sample Serial Number:	AMWGB40001F12
Test Sample IMEI:	359519040010122
Hardware Version Number:	Pass 1
Software Version Number:	Release 4
FCC ID Number:	PKTPEMAMW1

3.2. Description of EUT

The equipment under test was an LTE PCI Express Mini Modem.

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		
Type of Equipment	PCI Express mini module		
Modulation Type:	QPSK & 16QAM		
Duty Cycle:	100 %		
Antenna Type:	Proprietary		
Antenna Gain:	2.5 dBi		
Power Supply Requirement:	Nominal	3.3 V	
	Minimum	3.0 V	
	Maximum	3.6 V	
Channel Bandwidth:	5 MHz		
Transmit Frequency Range:	788 MHz to 798 MHz		
Transmit Channels Tested:	Channel	N_{ul}	Frequency (MHz)
	Bottom	23305	790.5
	Middle	23330	793.0
	Top	23355	795.5
Channel Bandwidth:	10 MHz		
Transmit Frequency Range:	788 MHz to 798 MHz		
Transmit Channels Tested:	Channel	N_{ul}	Channel Frequency (MHz)
	Single	23330	793.0

3.5. Support Equipment

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

Description:	UE PEM V1 NG Adaptor Board
Brand Name:	IPWireless
Model Name or Number:	AAF Pass3
Serial Number:	AAFk838000V32

Description:	UE PEM V1 NG Adaptor Board – Voltage Variation
Brand Name:	IPWireless
Model Name or Number:	AAF Pass2
Serial Number:	EEMS 022530 0004

Description:	Laptop PC
Brand Name:	Toshiba
Model Name or Number:	Satellite Pro A100
Serial Number:	67070971Q

Description:	Antenna
Brand Name:	None
Model Name or Number:	OA-LTE-06-01-IPW
Serial Number:	Not stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Transmit Mode – The EUT was set to transmit with maximum output power using 5 MHz and 10 MHz channel bandwidths. QPSK and 16QAM modulations were both tested. For 5 MHz channel bandwidth, Resource Block settings of 1 and 25 were tested. For 10 MHz channel bandwidth, Resource Block settings of 1 and 50 were tested. For a single Resource Block, testing was carried out on starting block numbers of 1 and 25 for 5 MHz channel bandwidth, 1 and 50 for 10 MHz channel bandwidth.

4.2. Configuration and Peripherals

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

- The EUT was connected to the UE PEM V1 NG Adaptor Board, for all tests.
- The EUT was controlled from via a laptop PC, using bespoke software supplied by the customer.
- The EUT was connected to a test laptop by using a USB extension cable and the laptop was connected to 120 VAC 60 Hz AC supply.
- The EUT has two U.FL connector ports, the customer supplied two short U.FL to SMA connectors, to allow conducted measurements to be performed where necessary.
- The EUT was connected to a Rohde & Schwarz CMW500 LTE system simulator, operating in a transceiver mode.
- The EUT has a main RF port and a Receiver Diversity port. Transmitter testing was performed on the main RF port which is a transmit and receive port. The diversity port was terminated for all bench testing.
- For radiated emissions testing, the customer supplied two OA-LTE-06-01-IPW antenna's, which were connected to the main and diversity ports. The antenna gain was declared as 2.5 dBi.
- The customer supplied a modified UE PEM V1NG Adaptor Board, which allowed voltage variation directly to the PEM, this was used for Transmitter Frequency Stability Voltage Variation testing only.

5. Measurements, Examinations and Derived Results

5.1. General Comments

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

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

5.2. Test Results

5.2.1. Transmitter Carrier Output Power and Effective Radiated Power (ERP)

Test Summary:

Test Engineer:	Nick Steele	Test Dates:	06 February 2014 & 10 March 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.542(a)(6) and 2.1046
Test Method Used:	As detailed in KDB 971168 D01 Section 5.2.1

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	40 to 49

Note(s):

- For 5 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 25. For single resource blocks, measurements were performed with the starting of blocks 1 and 25.
- For 10 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 50. For single resource blocks, measurements were performed with the starting of blocks 1 and 50.
- The customer stated an antenna gain of 8.9 dBi. As the limit is an ERP limit, the gain in dBi has been converted to dBd. The dBd was calculated as:

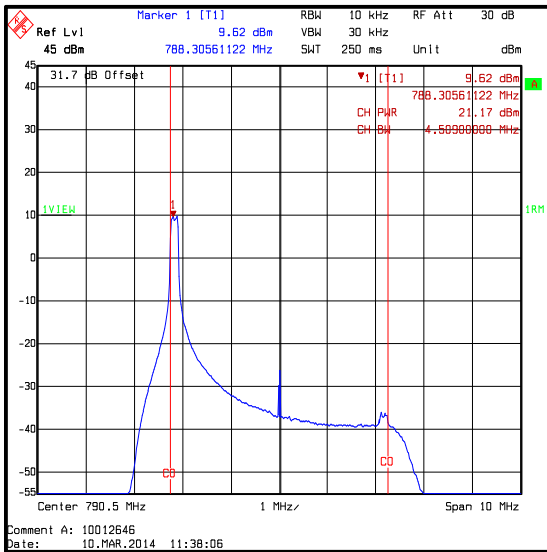
$$8.9 \text{ dBi} - 2.15 \text{ dB} = 6.75 \text{ dBd.}$$

- The plots for measurements performed on the 11th March have an incorrect job number.

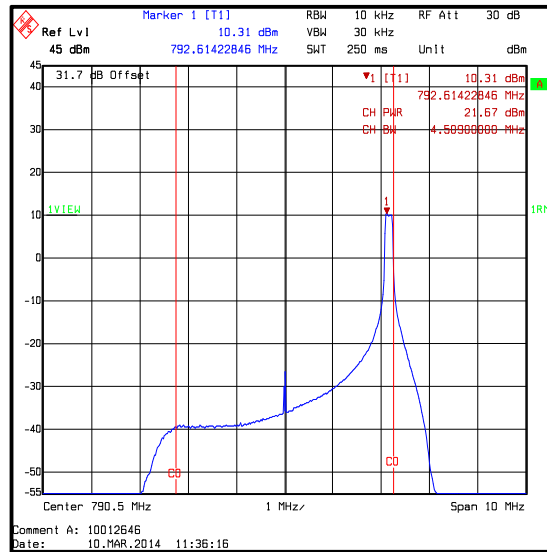
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

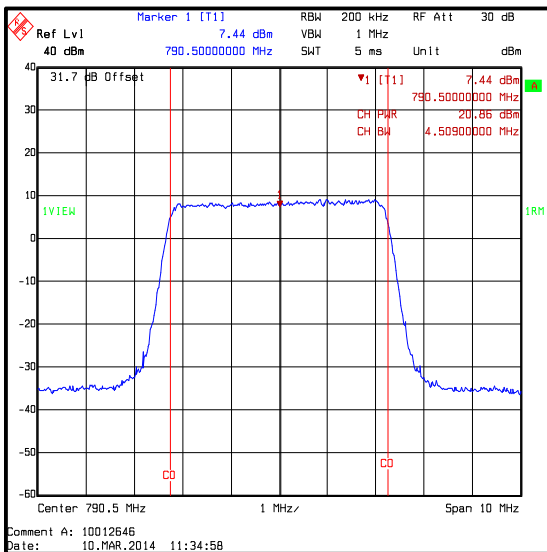
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
790.5	1	0	21.2	6.75	27.95	44.77	16.82	Complied
790.5	1	25	21.7	6.75	28.45	44.77	16.32	Complied
790.5	25	0	20.9	6.75	27.65	44.77	17.12	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

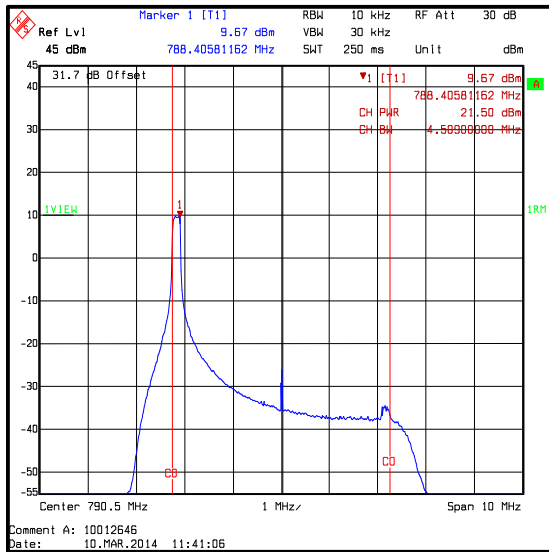


QPSK / 25 Resource Blocks

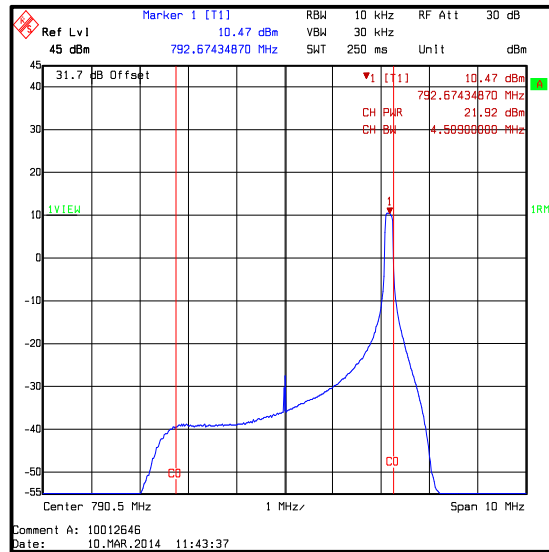
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

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

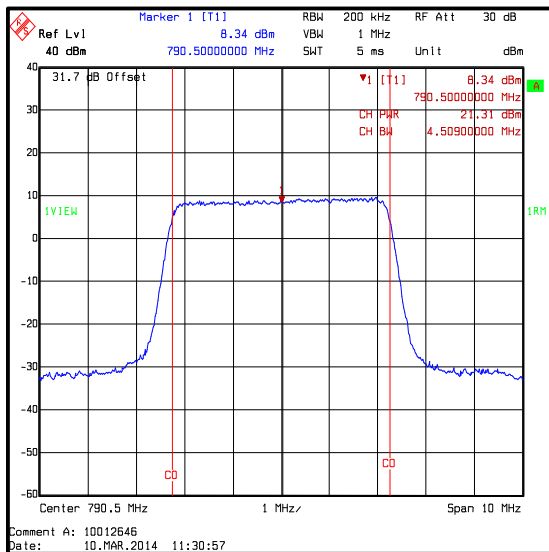
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
790.5	1	0	21.5	6.75	28.25	44.77	16.52	Complied
790.5	1	25	21.9	6.75	28.65	44.77	16.12	Complied
790.5	25	0	21.3	6.75	28.05	44.77	16.72	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

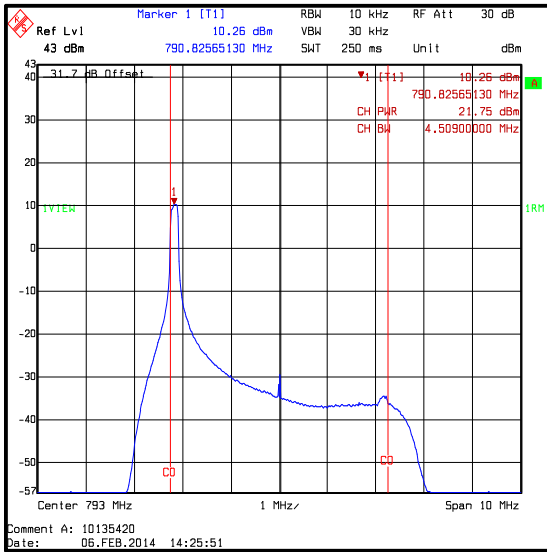


16QAM / 25 Resource Blocks

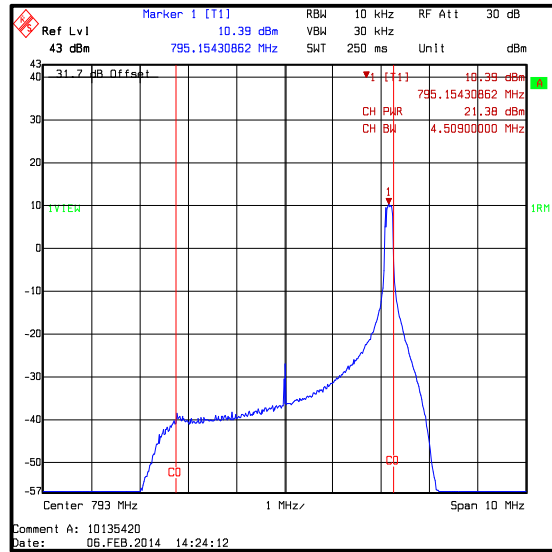
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

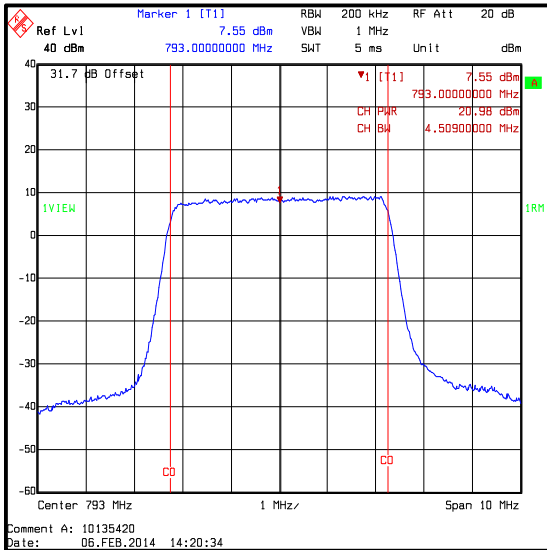
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
793.0	1	0	21.8	6.75	28.55	44.77	16.22	Complied
793.0	1	25	21.4	6.75	28.15	44.77	16.62	Complied
793.0	25	0	21.0	6.75	27.75	44.77	17.02	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

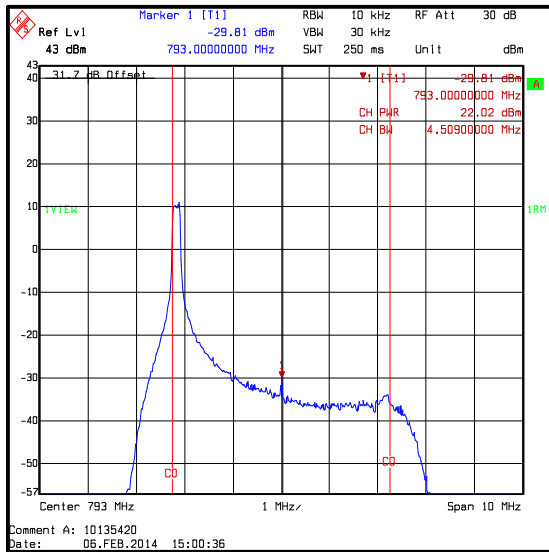


QPSK / 25 Resource Blocks

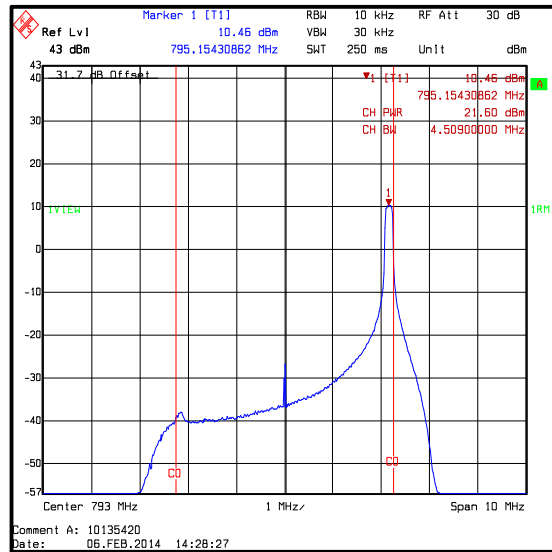
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

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

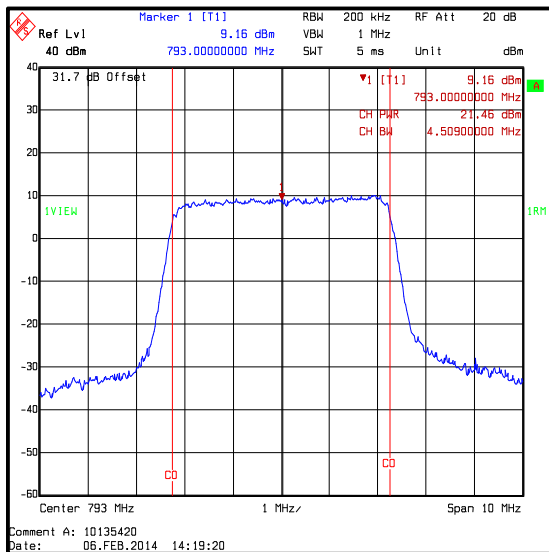
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
793.0	1	0	22.0	6.75	28.75	44.77	16.02	Complied
793.0	1	25	21.6	6.75	28.35	44.77	16.42	Complied
793.0	25	0	21.5	6.75	28.25	44.77	16.52	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

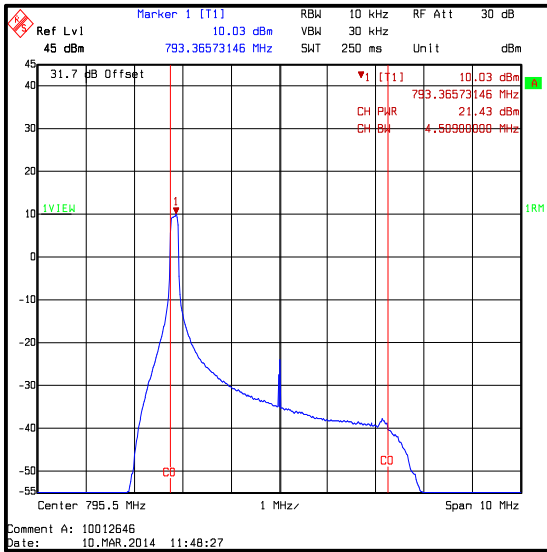


16QAM / 25 Resource Blocks

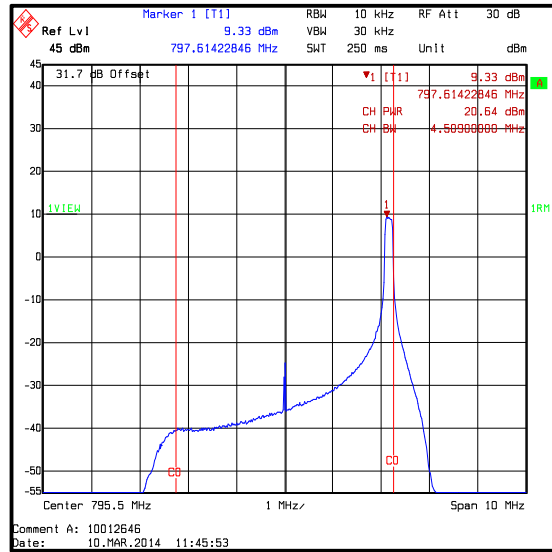
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

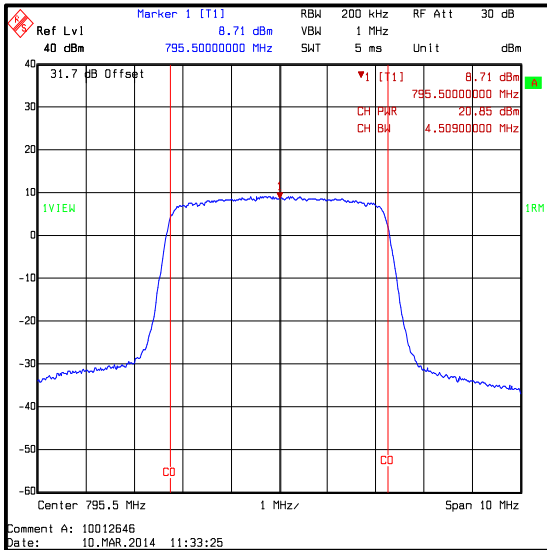
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
795.5	1	0	21.4	6.75	28.15	44.77	16.62	Complied
795.5	1	25	20.6	6.75	27.35	44.77	17.42	Complied
795.5	25	0	20.9	6.75	27.65	44.77	17.12	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

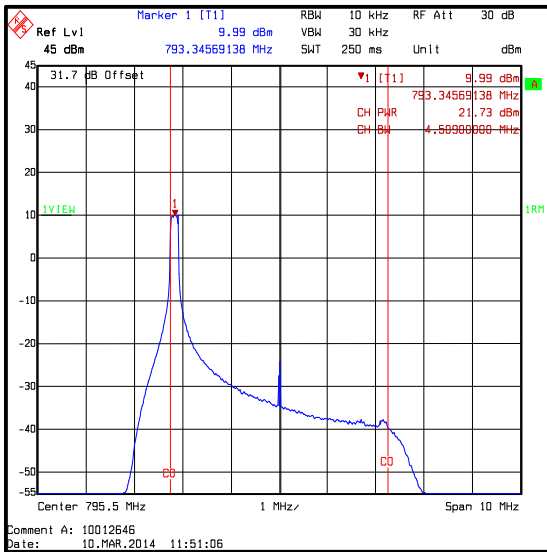


QPSK / 25 Resource Blocks

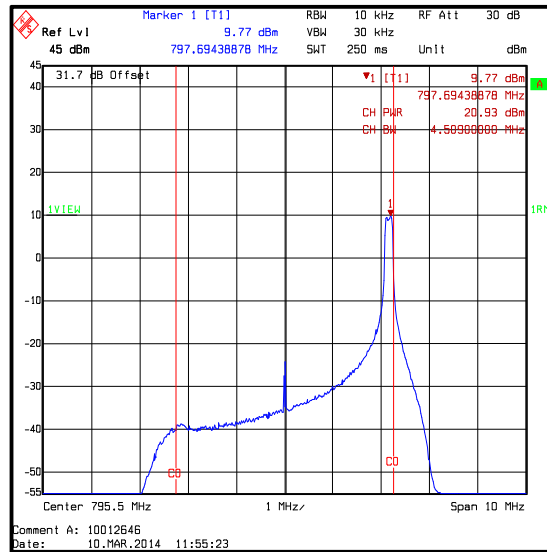
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

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

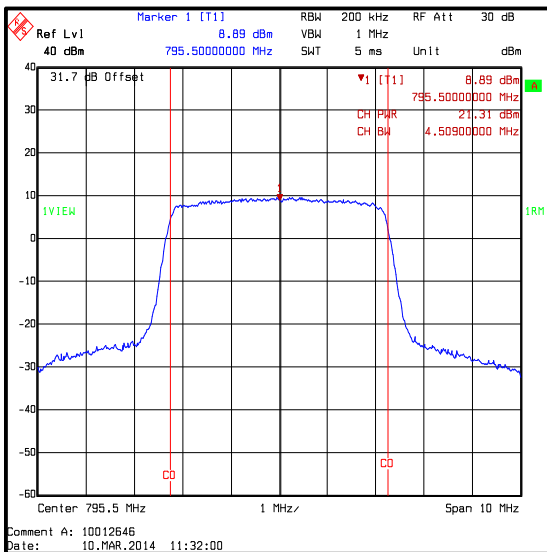
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
795.5	1	0	21.7	6.75	28.45	44.77	16.32	Complied
795.5	1	25	20.9	6.75	27.65	44.77	17.12	Complied
795.5	25	0	21.3	6.75	28.05	44.77	16.72	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

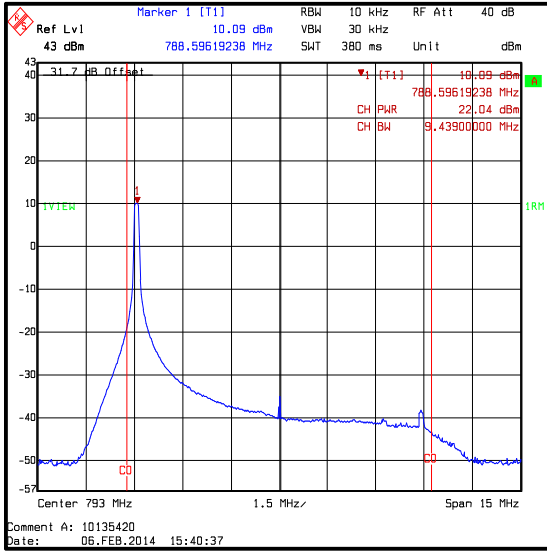


16QAM / 25 Resource Blocks

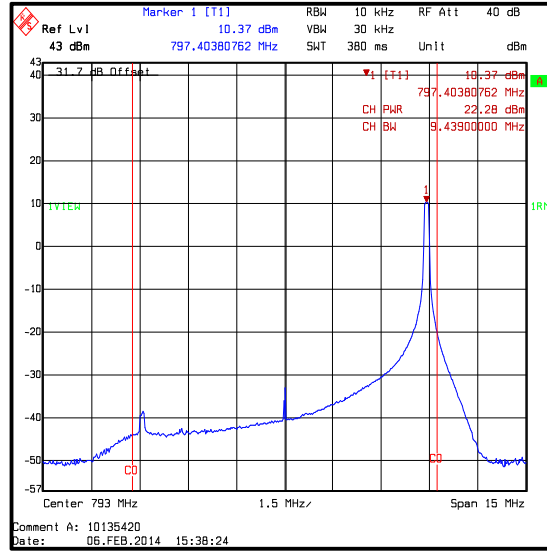
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

Results: 10 MHz Channel Bandwidth / Single Channel / QPSK

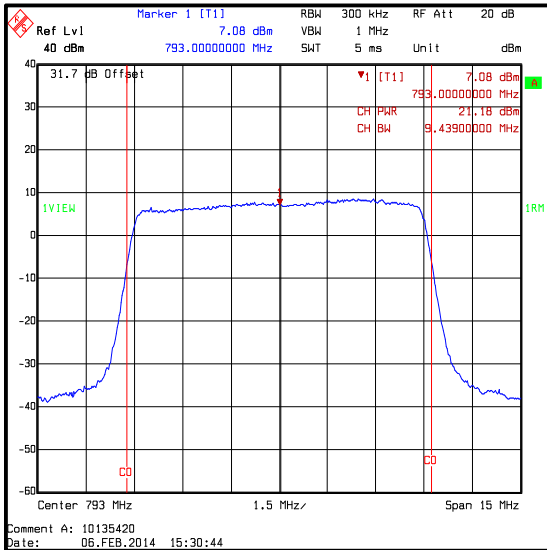
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
793.0	1	0	22.0	6.75	28.75	44.77	16.02	Complied
793.0	1	50	22.3	6.75	29.05	44.77	15.72	Complied
793.0	50	0	21.2	6.75	27.95	44.77	16.82	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

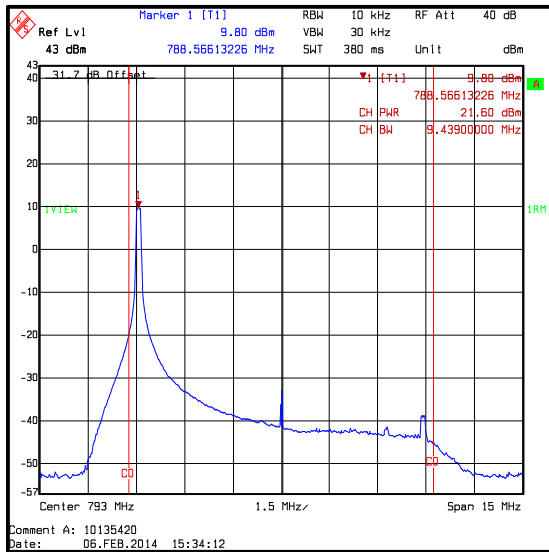


QPSK / 50 Resource Blocks

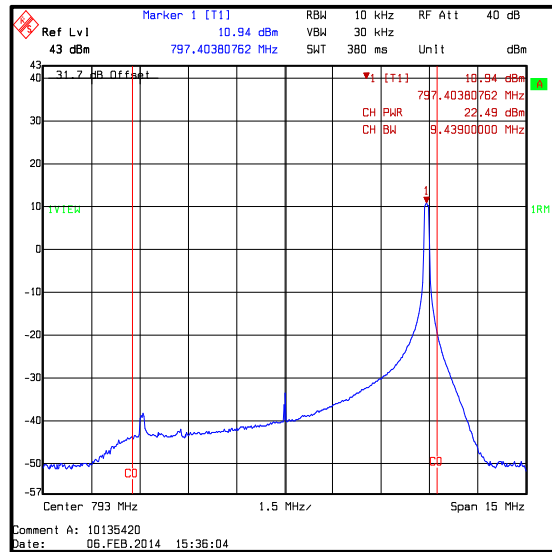
Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)

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

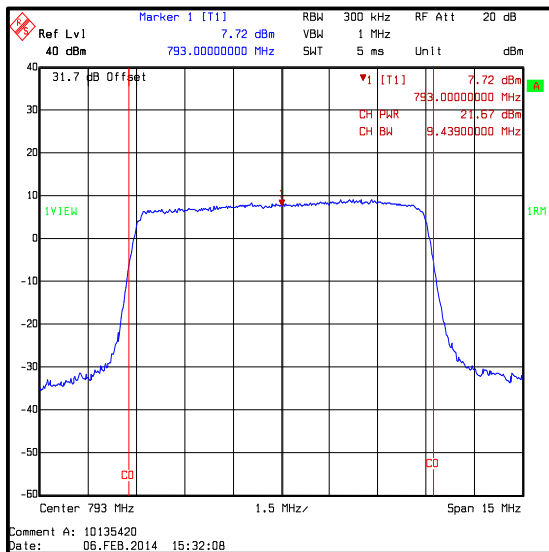
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
793.0	1	0	21.6	6.75	28.35	44.77	16.42	Complied
793.0	1	50	22.5	6.75	29.25	44.77	15.52	Complied
793.0	50	0	21.7	6.75	28.45	44.77	16.32	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)



16QAM / 50 Resource Blocks

Transmitter Carrier Output Power and Effective Radiated Power (ERP) (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	19 Aug 2014	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None stated	Calibrated before use	-
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	25 Jun 2014	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12

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

Test Engineer:	Nick Steele	Test Dates:	06 February 2014 & 10 March 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Part 2.1049
Test Method Used:	As detailed in KDB 971168 D01 Section 4.2

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	40 to 49

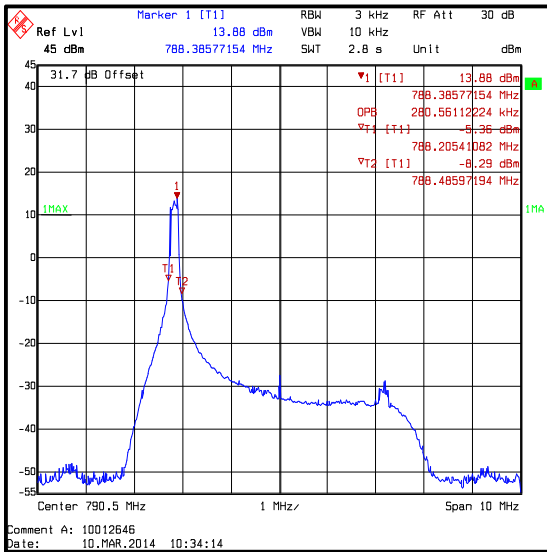
Note(s):

1. For 5 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 25. For single resource blocks, measurements were performed with the block starting of blocks 1 and 25.
2. For 10 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 50. For single resource blocks, measurements were performed with the block starting of blocks 1 and 50.
3. The plots for measurements performed on the 11th March have an incorrect job number.

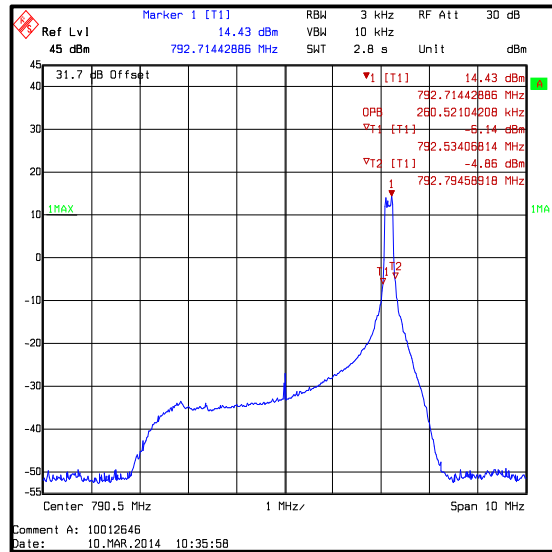
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

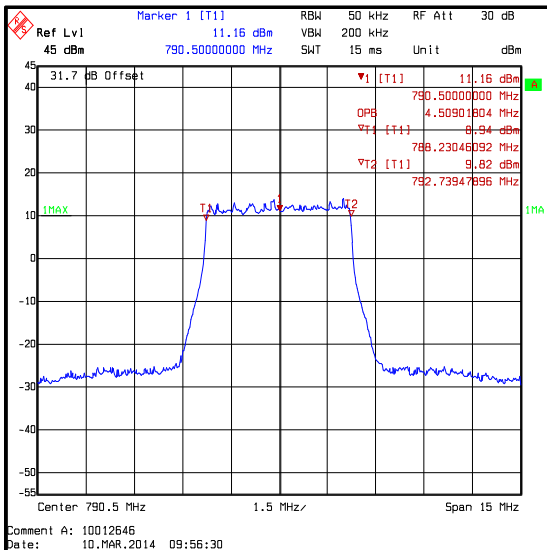
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
790.5	1	0	3	10	0.281
790.5	1	25	3	10	0.281
790.5	25	0	50	200	4.509



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

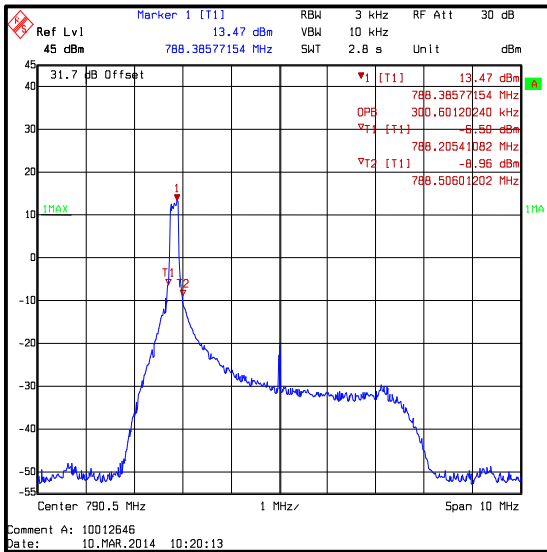


QPSK / 25 Resource Blocks

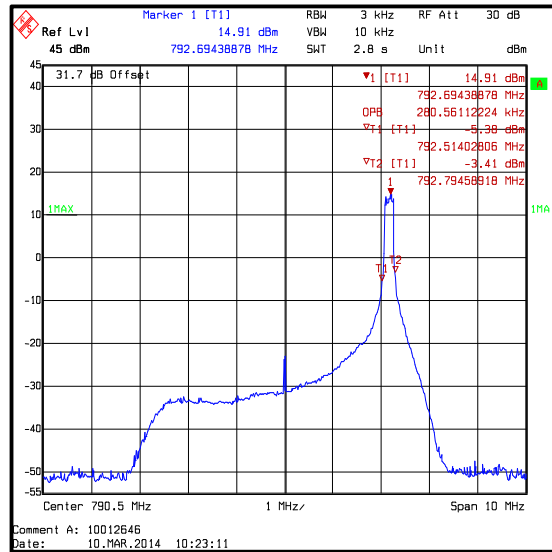
Transmitter Occupied Bandwidth (continued)

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

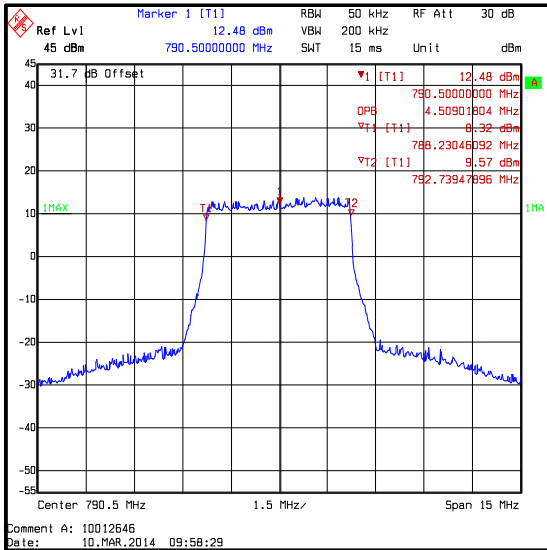
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
790.5	1	0	3	10	0.301
790.5	1	25	3	10	0.281
790.5	25	0	50	200	4.509



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

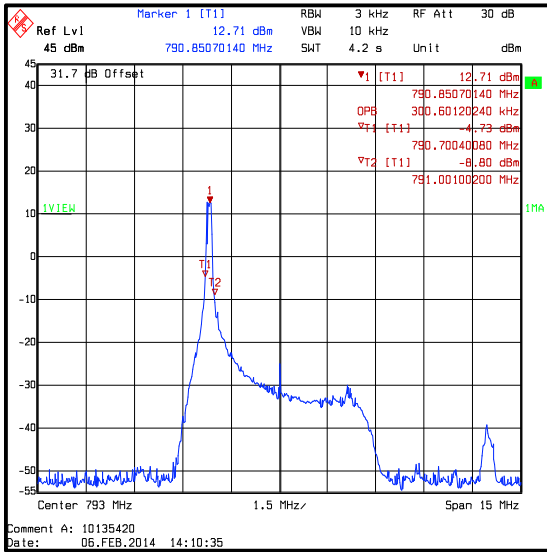


16QAM / 25 Resource Blocks

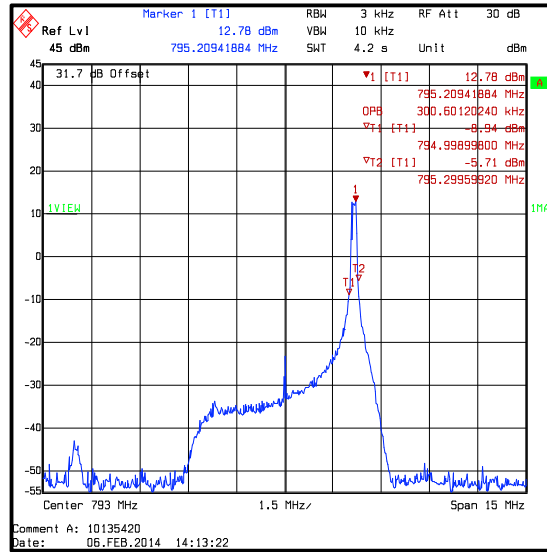
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

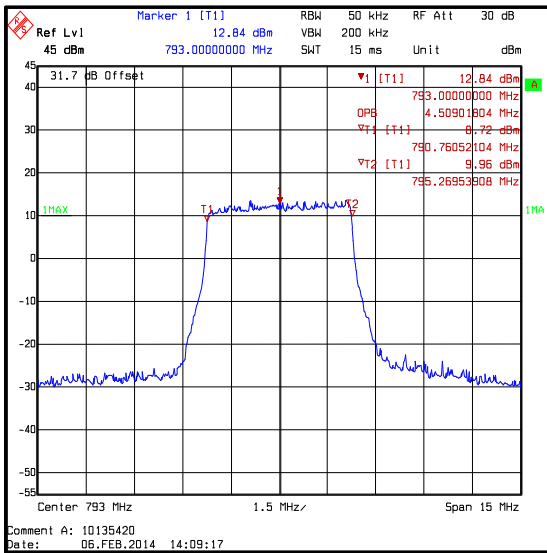
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
793.0	1	0	3	10	0.301
793.0	1	25	3	10	0.301
793.0	25	0	50	200	4.509



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

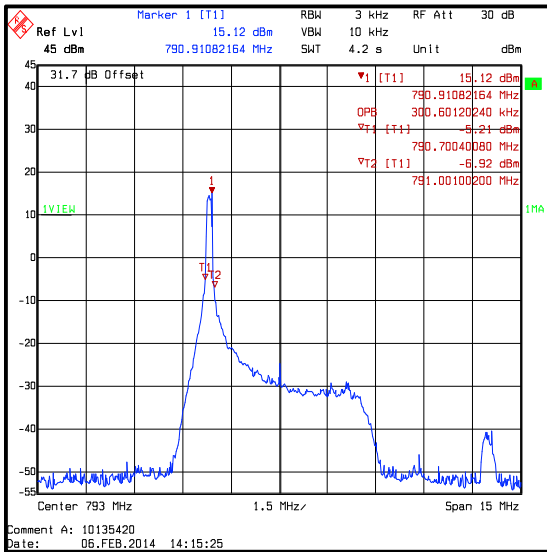


QPSK / 25 Resource Blocks

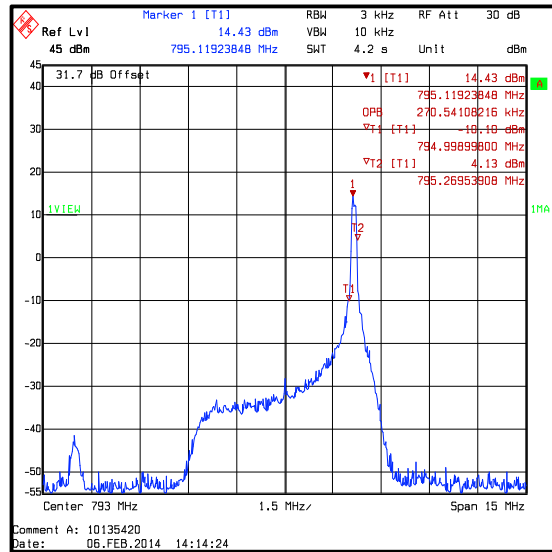
Transmitter Occupied Bandwidth (continued)

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

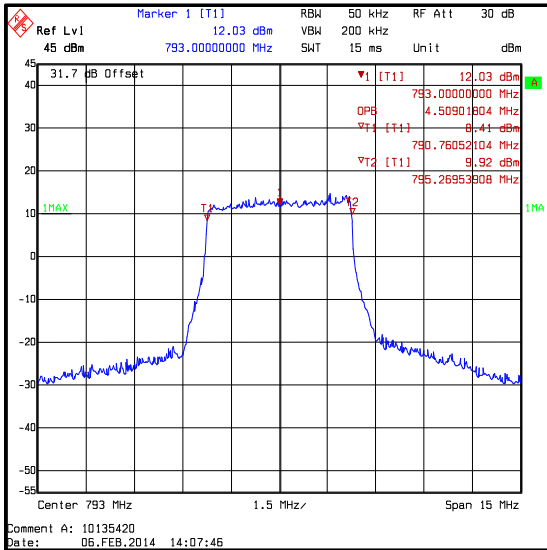
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
793.0	1	0	3	10	0.301
793.0	1	25	3	10	0.271
793.0	25	0	50	200	4.509



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

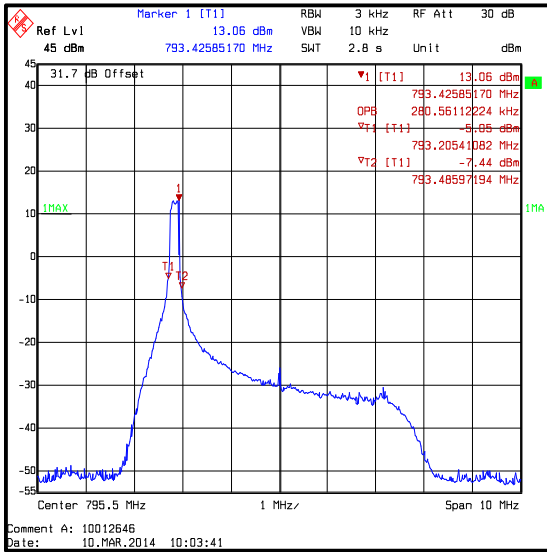


16QAM / 25 Resource Blocks

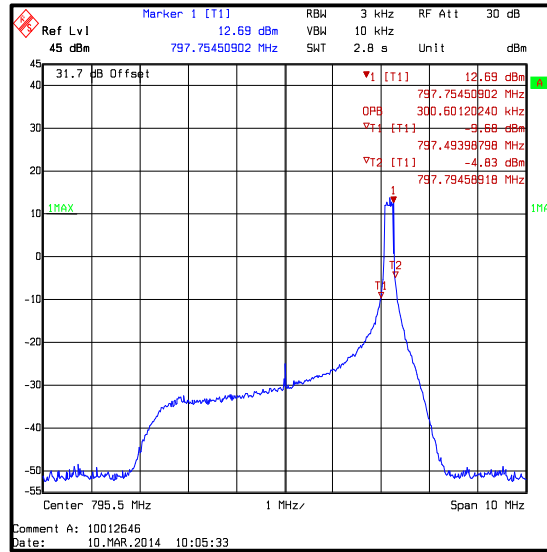
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

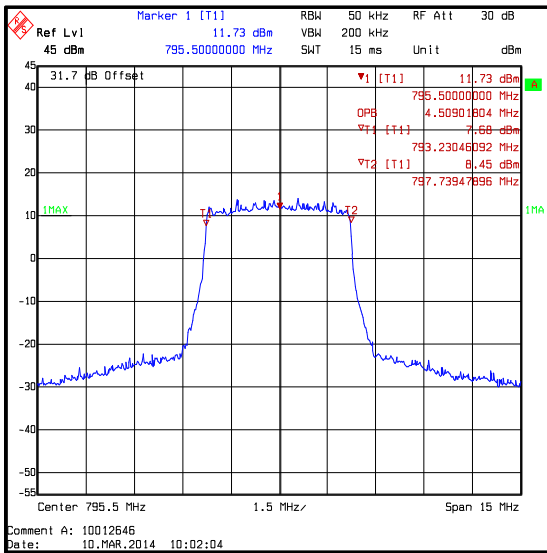
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
795.5	1	0	3	10	0.281
795.5	1	25	3	10	0.301
795.5	25	0	50	200	4.509



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

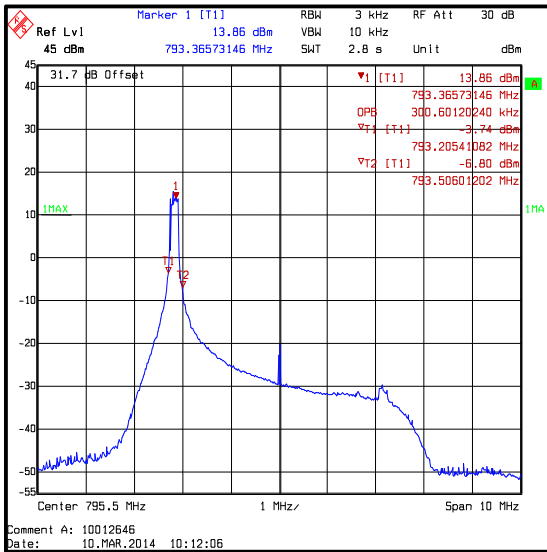


QPSK / 25 Resource Blocks

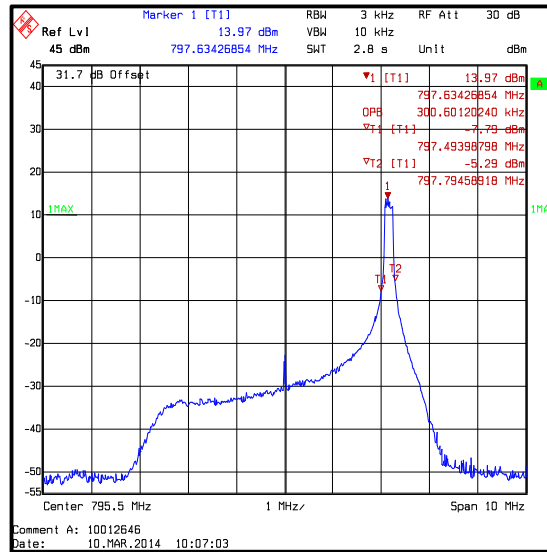
Transmitter Occupied Bandwidth (continued)

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

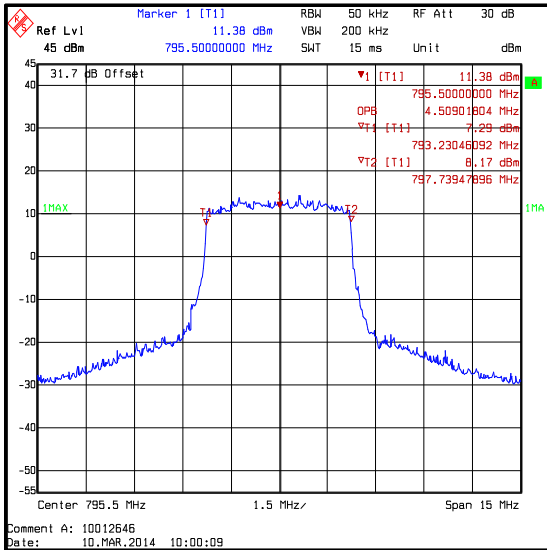
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
795.5	1	0	3	10	0.301
795.5	1	25	3	10	0.301
795.5	25	0	50	200	4.509



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

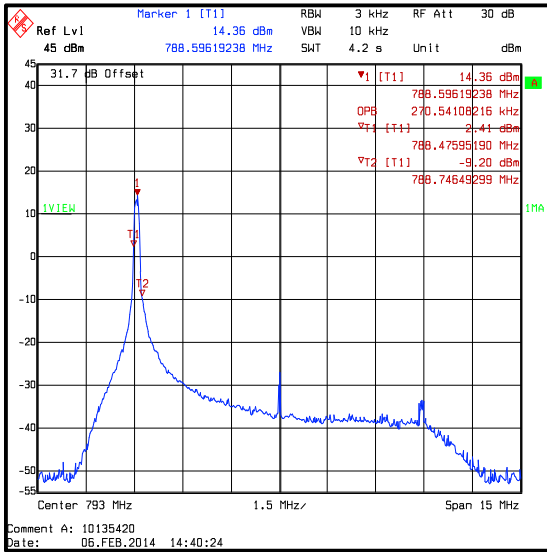


16QAM / 25 Resource Blocks

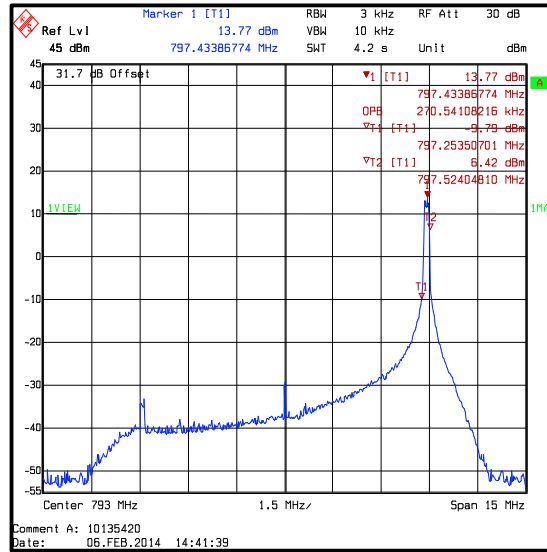
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Single Channel / QPSK

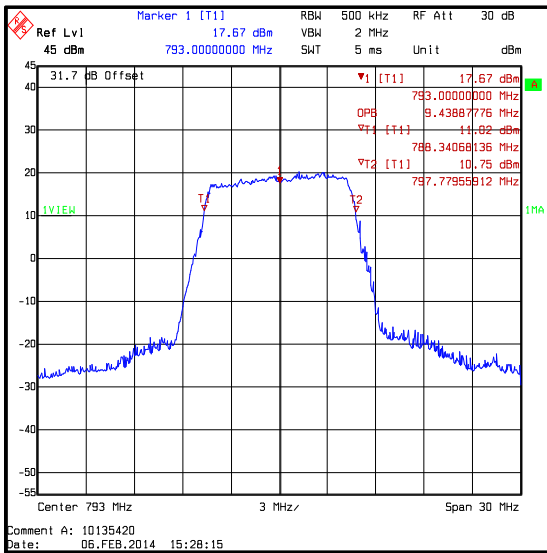
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
793.0	1	0	3	10	0.271
793.0	1	50	3	10	0.271
793.0	50	0	500	2000	9.439



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

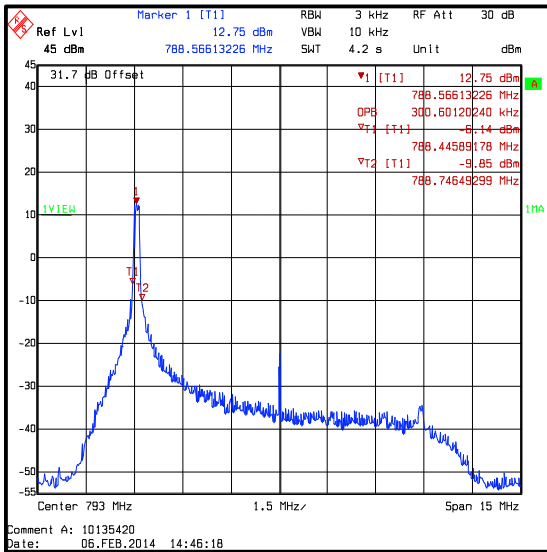


QPSK / 50 Resource Blocks

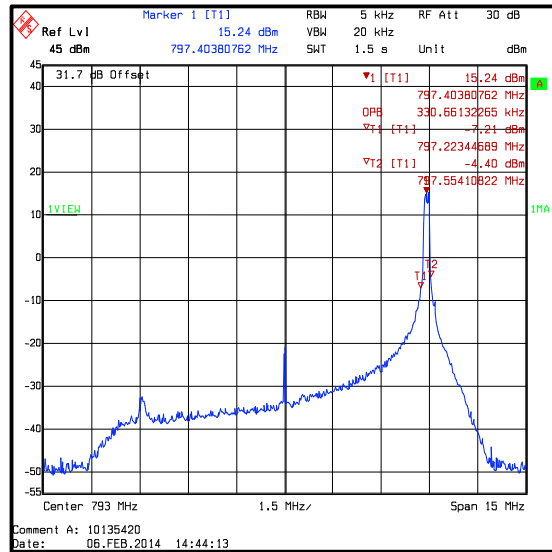
Transmitter Occupied Bandwidth (continued)

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

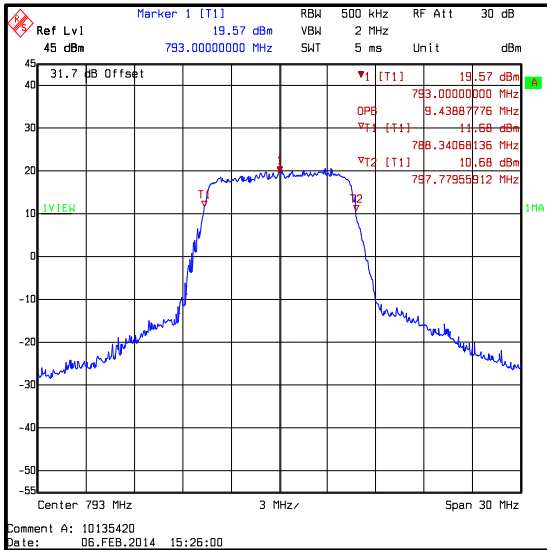
Frequency	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
793.0	1	0	3	10	0.301
793.0	1	50	5	20	0.331
793.0	50	0	500	2000	9.439



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)



16QAM / 50 Resource Blocks

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

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	19 Aug 2014	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None stated	Calibrated before use	-

5.2.3. Transmitter Conducted Emission Mask**Test Summary:**

Test Engineer:	Nick Steele	Test Dates:	06 February 2014 & 10 March 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.210(n) and 2.1051
Test Method Used:	As detailed in KDB 971168 D01 Section 6.0 with deviations as specified in Part 90.210

Environmental Conditions:

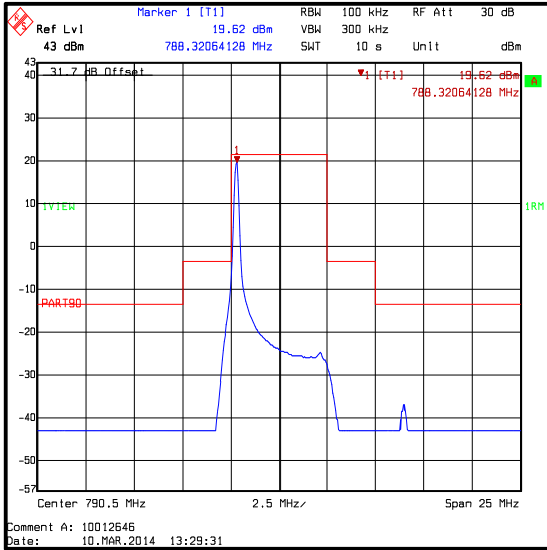
Temperature (°C):	22 to 23
Relative Humidity (%):	40 to 49

Note(s):

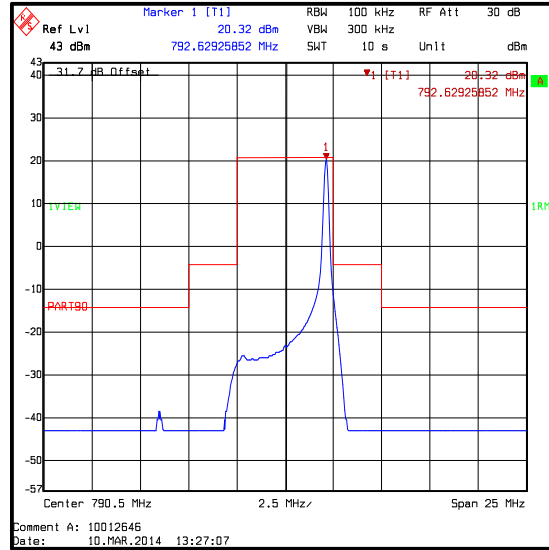
1. The measurement was performed with the EUT antenna port coupled to a spectrum analyser via suitable attenuation and cable. The power of the modulated signal was measured on a spectrum analyser using an RMS detector and 10 second sweep time in order to maximise the level.
2. For 5 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 25. For single resource blocks, measurements were performed with the block starting of blocks 1 and 25.
3. For 10 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 50. For single resource blocks, measurements were performed with the block starting of blocks 1 and 50.
4. Part 90.210 emissions mask B was applied to all measurements.
5. As the EUT is unable to produce a full power un-modulated carrier, the mask was referenced to the total power contained in the channel bandwidth.
6. The plots for measurements performed on the 11th March have an incorrect job number.

Transmitter Conducted Emission Mask (continued)

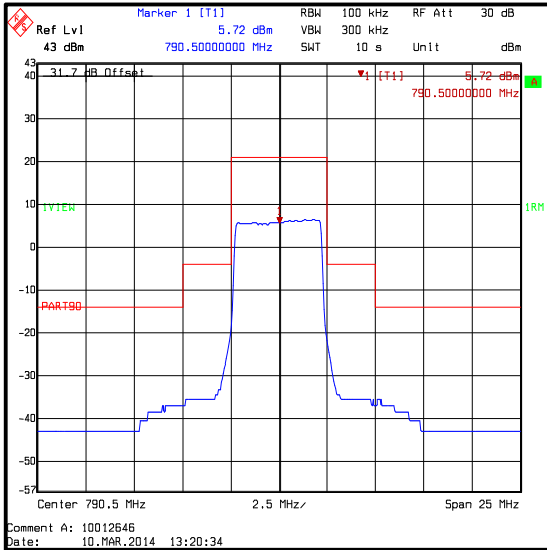
Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK



QPSK / 1 Resource Block (0 offset)



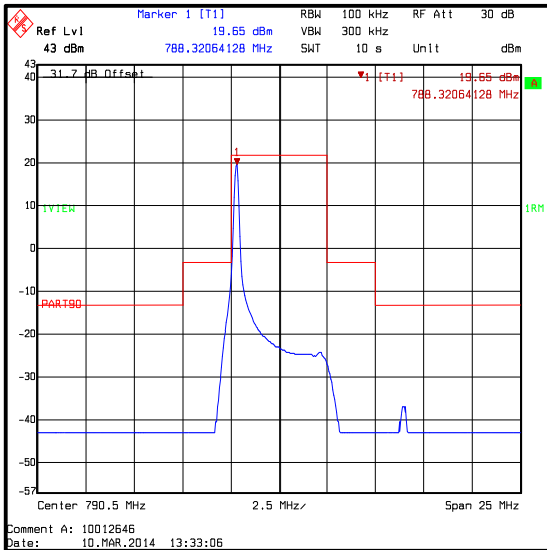
QPSK / 1 Resource Block (25 offset)



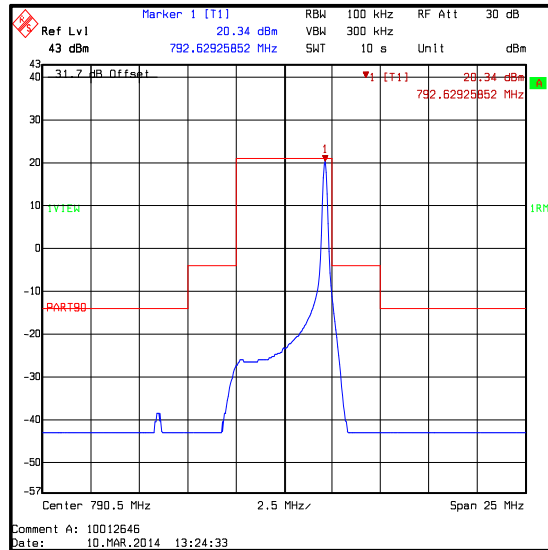
QPSK / 25 Resource Blocks

Transmitter Conducted Emission Mask (continued)

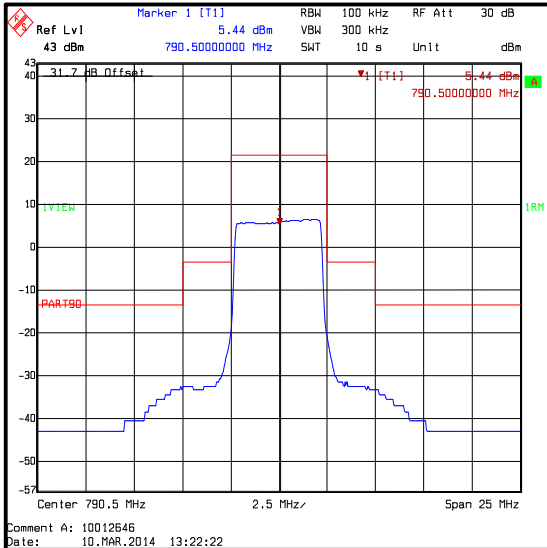
Results: 5 MHz Channel Bandwidth / Bottom Channel / 16QAM



16QAM / 1 Resource Block (0 offset)



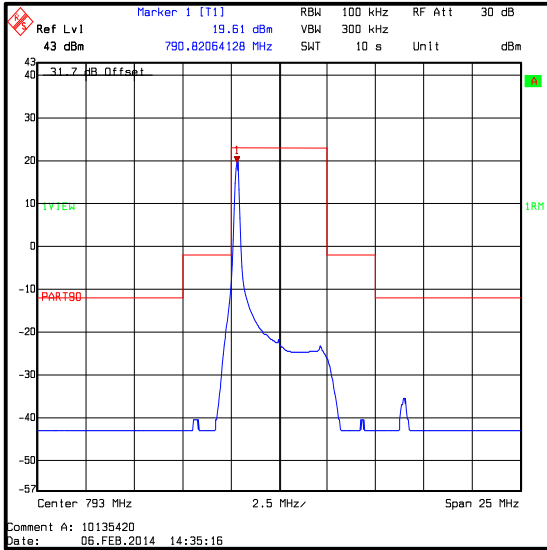
16QAM / 1 Resource Block (25 offset)



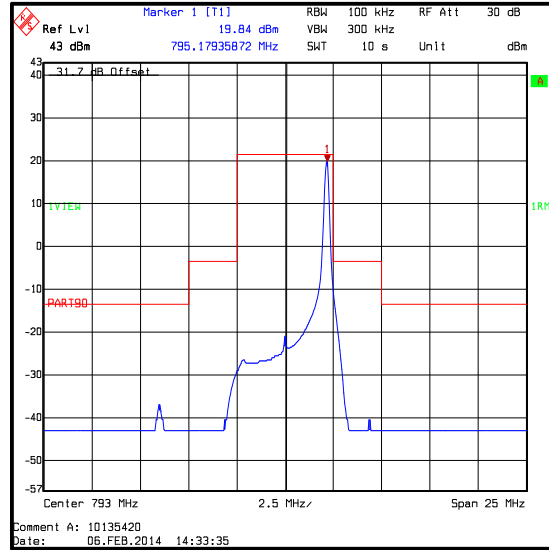
16QAM / 25 Resource Blocks

Transmitter Conducted Emission Mask (continued)

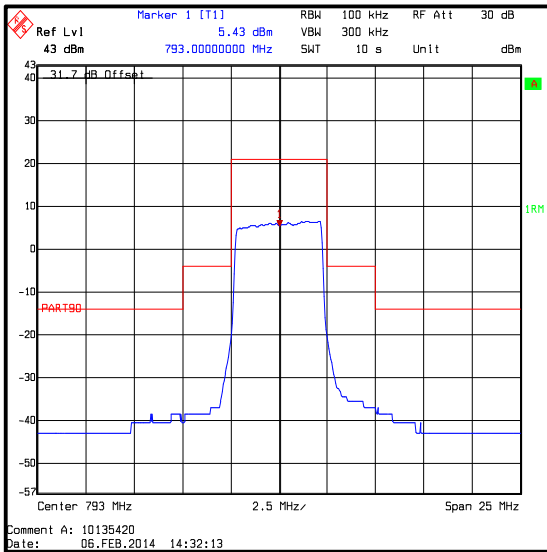
Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK



QPSK / 1 Resource Block (0 offset)



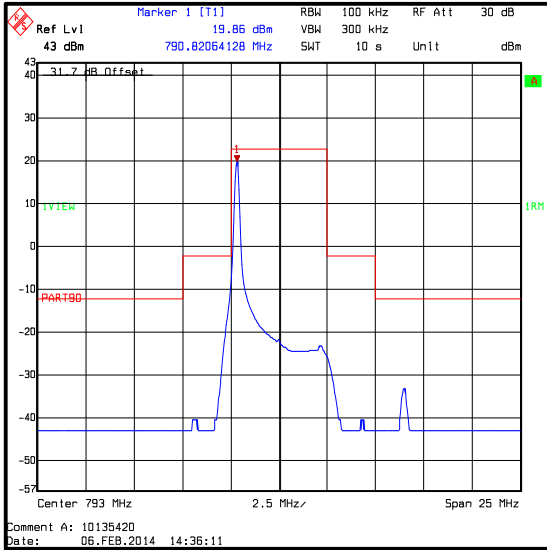
QPSK / 1 Resource Block (25 offset)



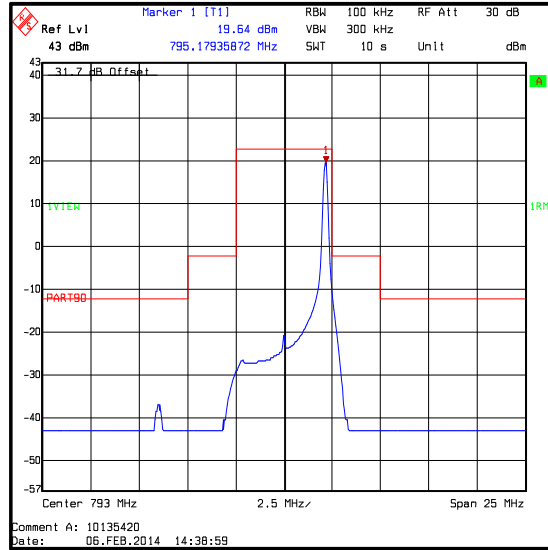
QPSK / 25 Resource Blocks

Transmitter Conducted Emission Mask (continued)

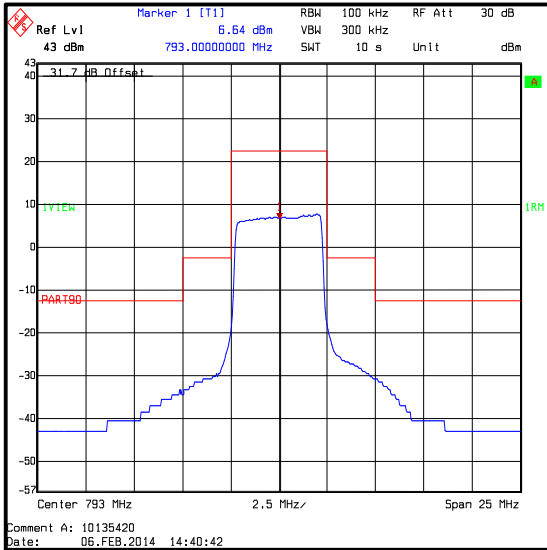
Results: 5 MHz Channel Bandwidth / Middle Channel / 16QAM



16QAM / 1 Resource Block (0 offset)



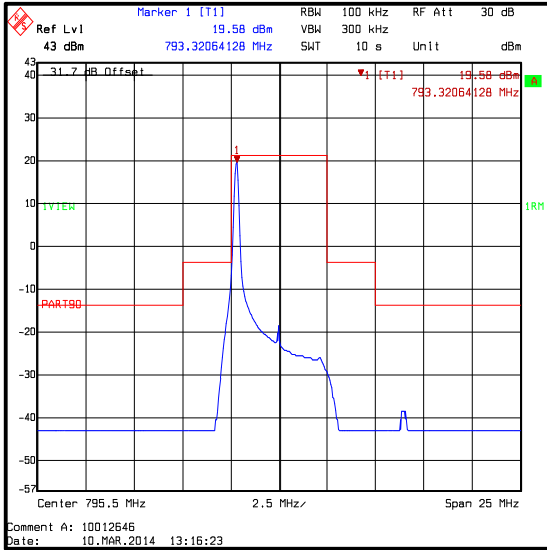
16QAM / 1 Resource Block (25 offset)



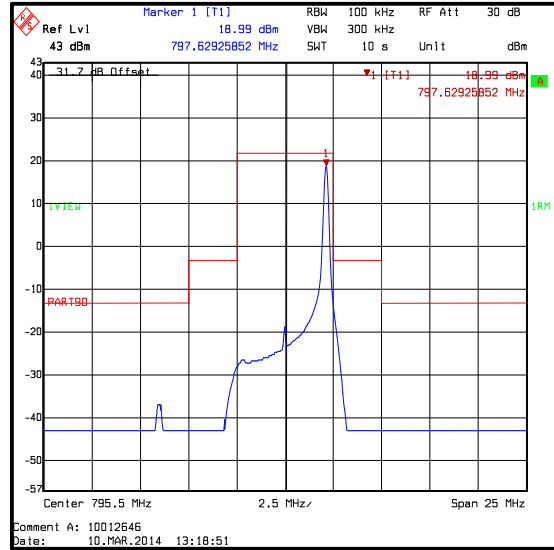
16QAM / 25 Resource Blocks

Transmitter Conducted Emission Mask (continued)

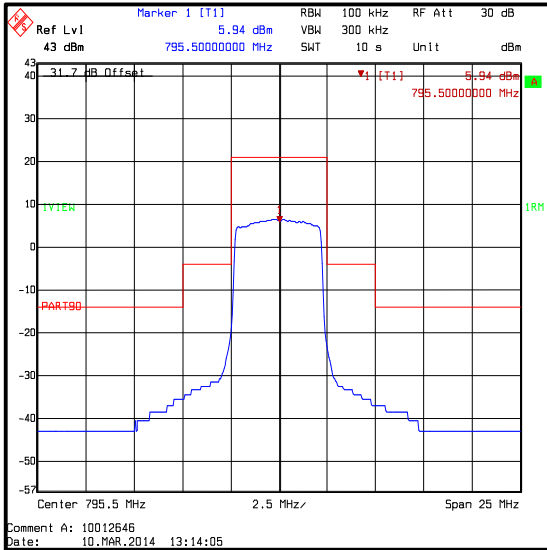
Results: 5 MHz Channel Bandwidth / Top Channel / QPSK



QPSK / 1 Resource Block (0 offset)



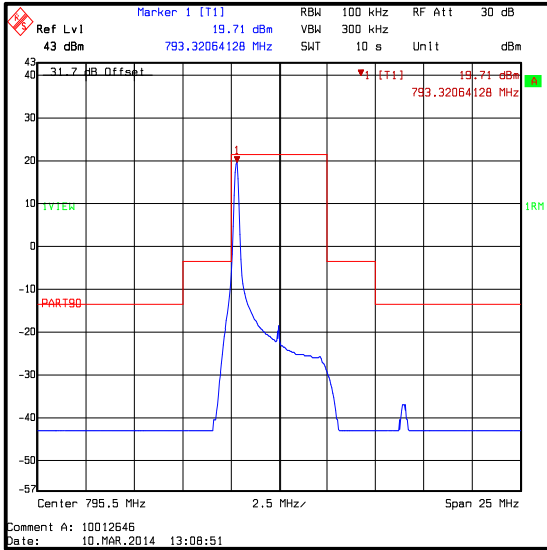
QPSK / 1 Resource Block (25 offset)



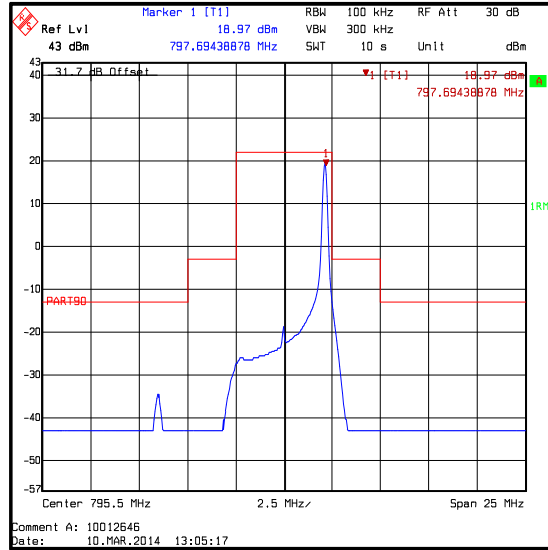
QPSK / 25 Resource Blocks

Transmitter Conducted Emission Mask (continued)

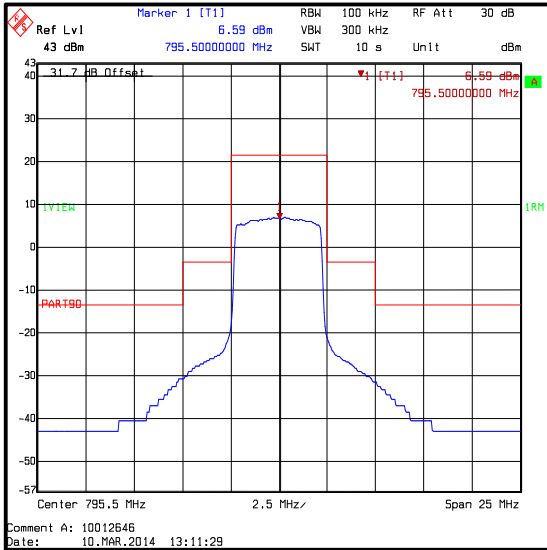
Results: 5 MHz Channel Bandwidth / Top Channel / 16QAM



16QAM / 1 Resource Block (0 offset)



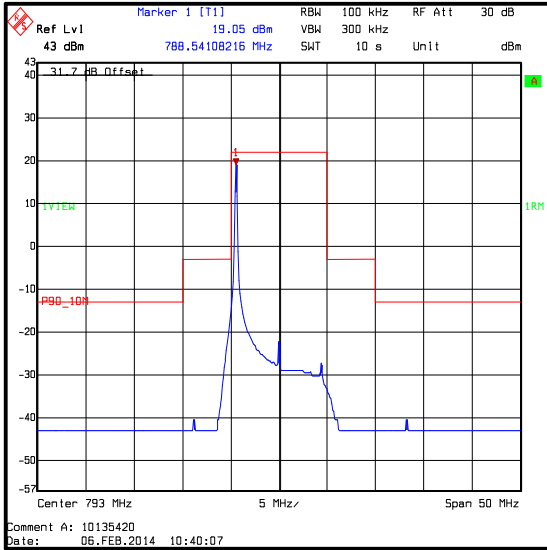
16QAM / 1 Resource Block (25 offset)



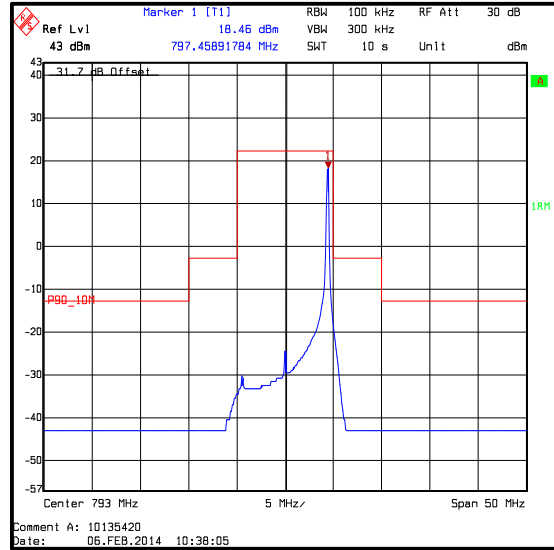
16QAM / 25 Resource Blocks

Transmitter Conducted Emission Mask (continued)

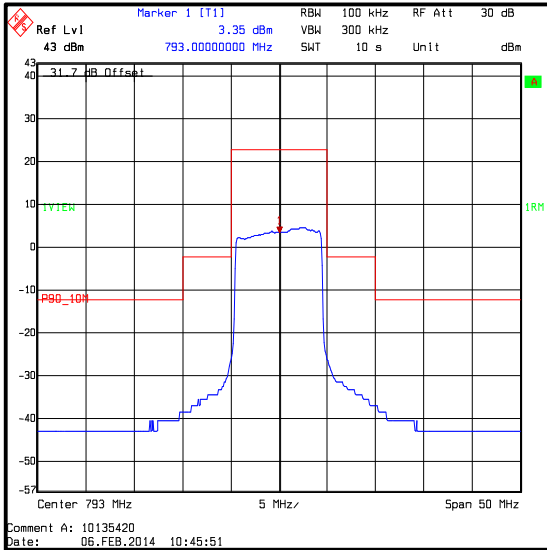
Results: 10 MHz Channel Bandwidth / Single Channel / QPSK



QPSK / 1 Resource Block (0 offset)



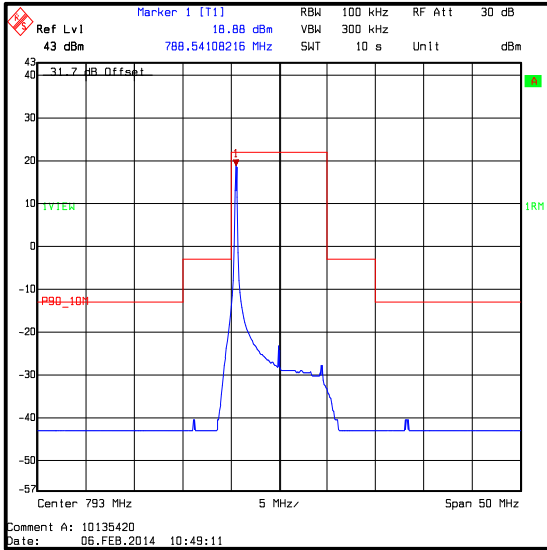
QPSK / 1 Resource Block (50 offset)



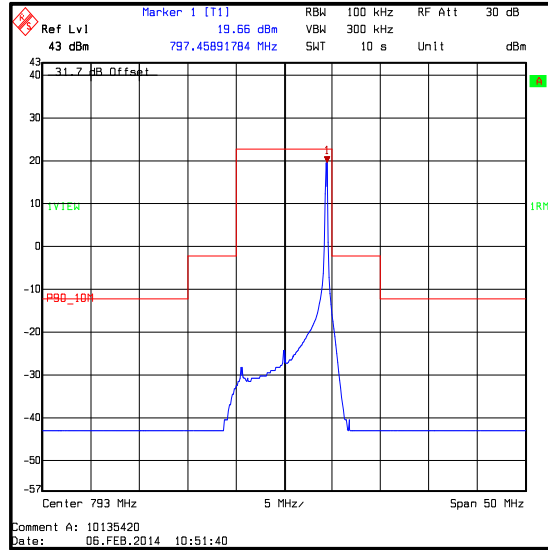
QPSK / 50 Resource Blocks

Transmitter Conducted Emission Mask (continued)

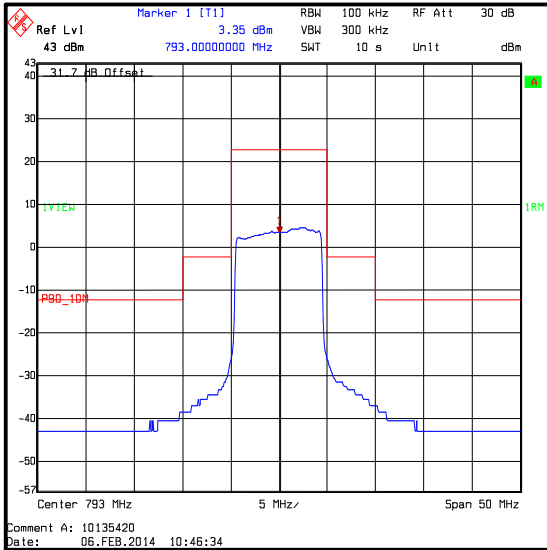
Results: 10 MHz Channel Bandwidth / Single Channel / 16QAM



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)



16QAM / 50 Resource Blocks

Transmitter Conducted Emission Mask (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	19 Aug 2014	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None stated	Calibrated before use	-
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	25 Jun 2014	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12

5.2.4. Transmitter Conducted Emissions**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	07 February 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.543(c) and 2.1051
Test Method Used:	As detailed in KDB 971168 D01 Section 6.0 referencing FCC Part 2.1051
Frequency Range:	9 kHz to 8 GHz

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	43

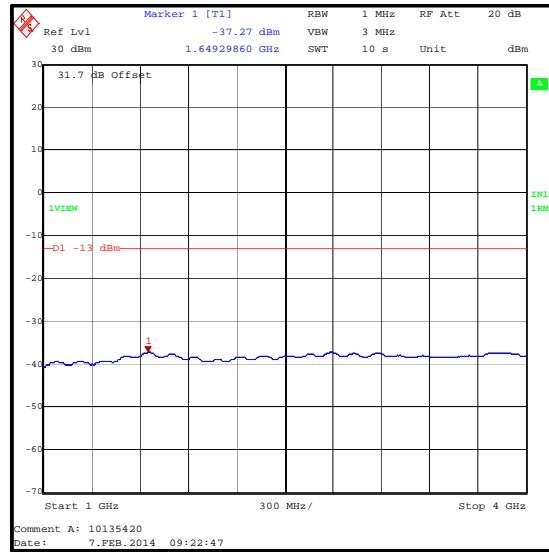
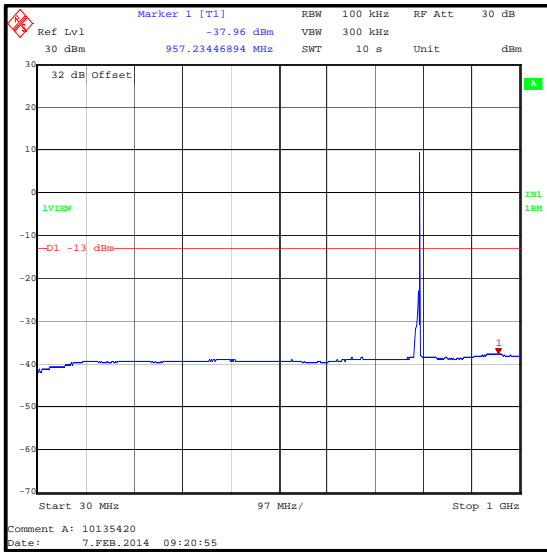
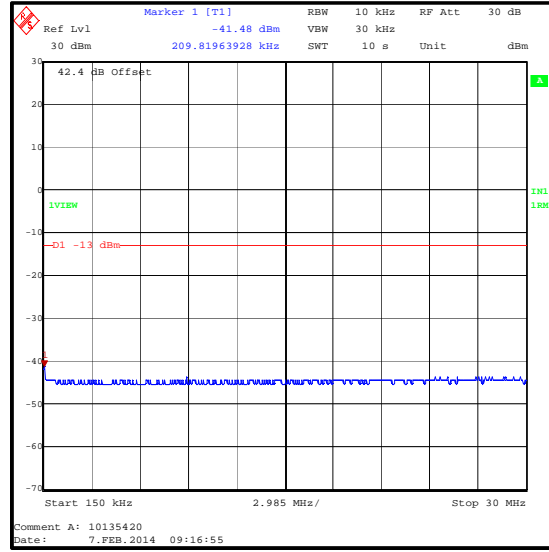
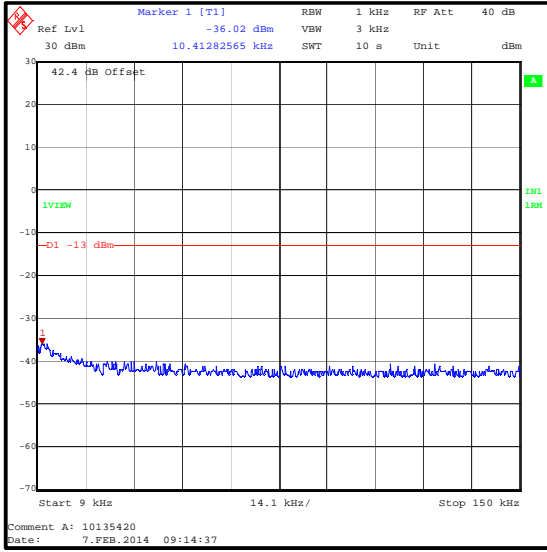
Note(s):

1. Pre scans were performed with the EUT transmitting with a 10 MHz channel bandwidth with 16QAM modulation applied, as this was found to produce the highest output power level and therefore deemed worst case.
2. Pre-scans were performed with the EUT transmitting at maximum power on the top channel.
3. The EUT was transmitting using 16QAM Modulation scheme, with 1 resource block offset at 49, as this produced the highest power level and was therefore deemed worst case.
4. All emissions were >20 dB below the applicable limit or below the level of the noise floor of the measuring receiver, therefore the highest level of noise floor has been recorded in the table below.

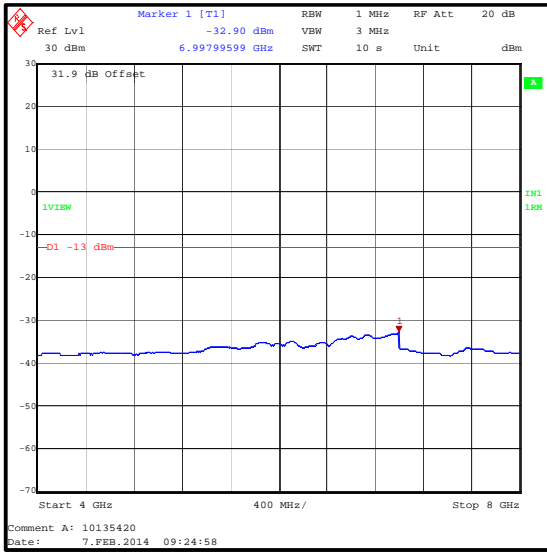
Results: 10 MHz Channel Bandwidth / Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
6997.996	-32.9	-13.0	19.9	Complied

Transmitter Conducted Emissions (continued)



Transmitter Conducted Emissions (continued)



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohyrometer	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB 26	100046K	01 Oct 2014	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None stated	Calibrated before use	-
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	25 Jun 2014	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12

5.2.5. Transmitter Conducted Emissions Limitations**Test Summary:**

Test Engineer:	Nick Steele	Test Dates:	04 February 2014, 07 February 2014 & 10 March 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.543(c)(2) and 2.1051
Test Method Used:	As detailed in KDB 971168 D01 Section 6.0 referencing FCC Part 2.1051
Frequency Ranges:	769 MHz to 775 MHz 799 MHz to 805 MHz

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	41 to 49

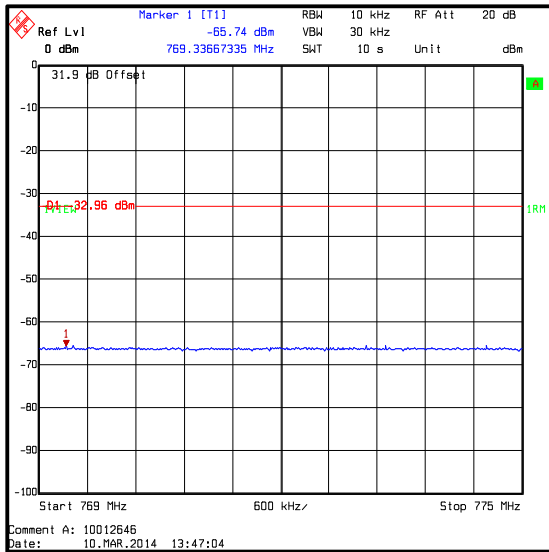
Note(s):

- For 5 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 25. For single resource blocks, measurements were performed with the block starting of blocks 1 and 25.
- For 10 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 50. For single resource blocks, measurements were performed with the block starting of blocks 1 and 50.
- All other emissions were >20 dB below the applicable limit or below the level of the noise floor of the measuring receiver.
- The limit for 90.543(c)(2) is $65 + 10\log_{10}(P) = -35$ dBm in a 6.25 kHz bandwidth. As it was not possible to set the resolution bandwidth on the test equipment, the bandwidth was set to 10 kHz. The limit was adjusted by $10\log_{10}(10\text{ kHz} / 6.25\text{ kHz}) = 2.04$ dB. The limit shown in the plots for the 769 MHz to 799 MHz and 799 MHz to 805 MHz bands was set to $-35\text{ dBm} + 2.04\text{ dB} = -32.96\text{ dBm}$.
- The plots for measurements performed on the 11th March have an incorrect job number.

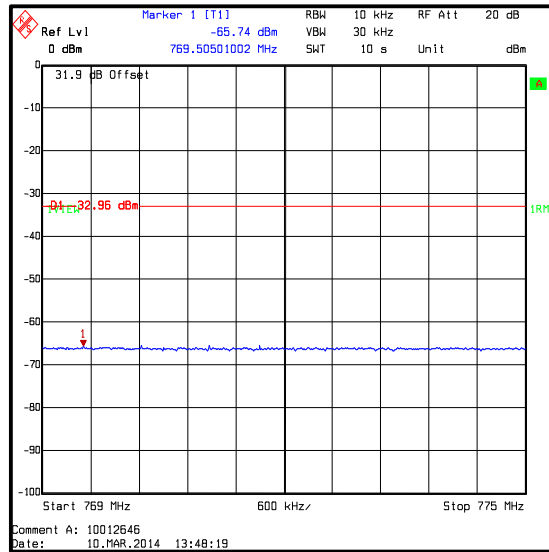
Transmitter Conducted Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / QPSK / Bottom Channel)

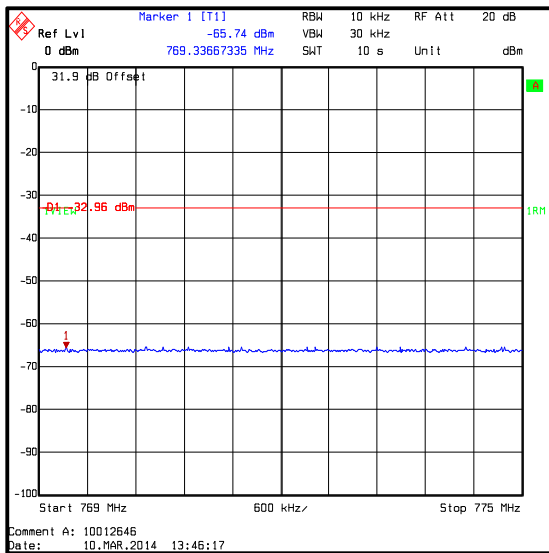
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
769.337	1	0	-65.74	-32.96	32.78	Complied
769.505	1	25	-65.74	-32.96	32.78	Complied
769.337	25	0	-65.74	-32.96	32.78	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

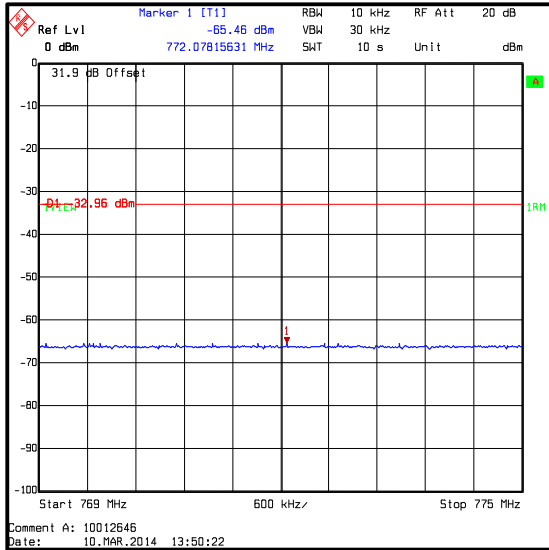


QPSK / 25 Resource Blocks

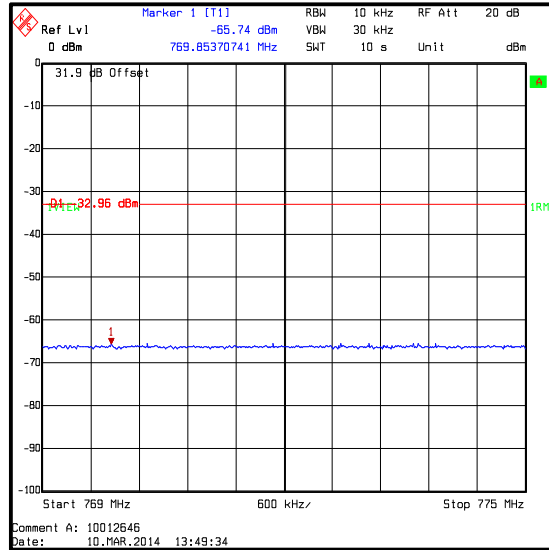
Transmitter Conducted Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / 16QAM / Bottom Channel)

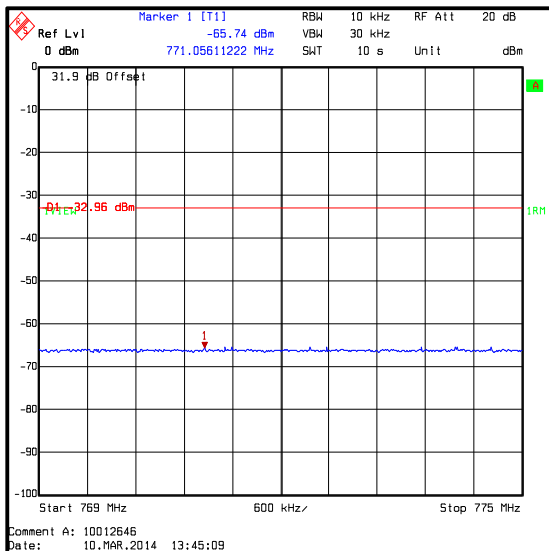
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
772.078	1	0	-65.46	-32.96	32.50	Complied
769.854	1	25	-65.74	-32.96	32.78	Complied
771.056	25	0	-65.74	-32.96	32.78	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

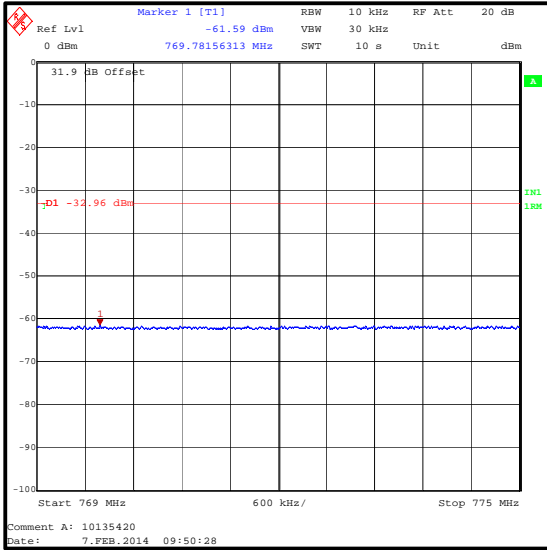


16QAM / 25 Resource Blocks

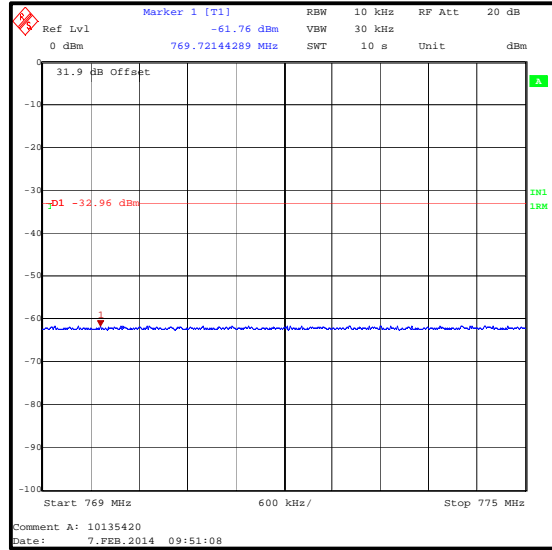
Transmitter Conducted Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / QPSK/ Middle Channel)

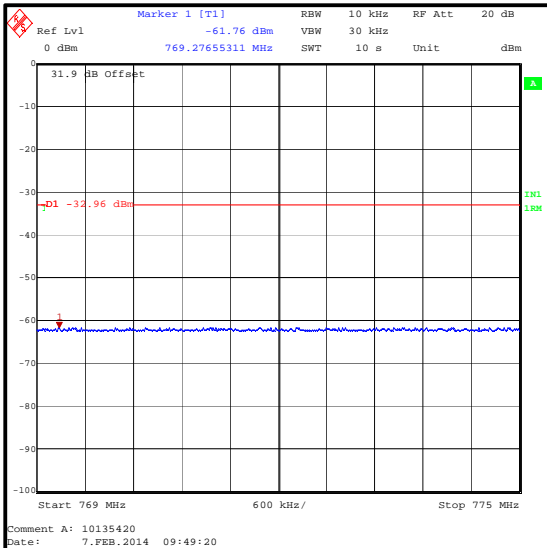
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
769.782	1	0	-61.59	-32.96	28.63	Complied
769.721	1	25	-61.76	-32.96	28.80	Complied
769.277	25	0	-61.76	-32.96	28.80	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

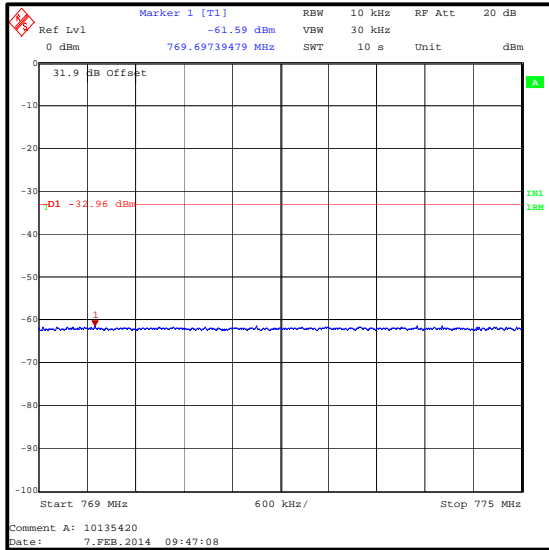


QPSK / 25 Resource Blocks

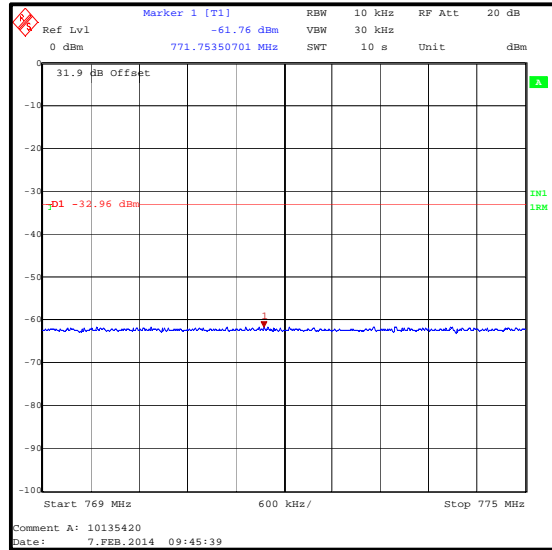
Transmitter Conducted Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / 16QAM / Middle Channel)

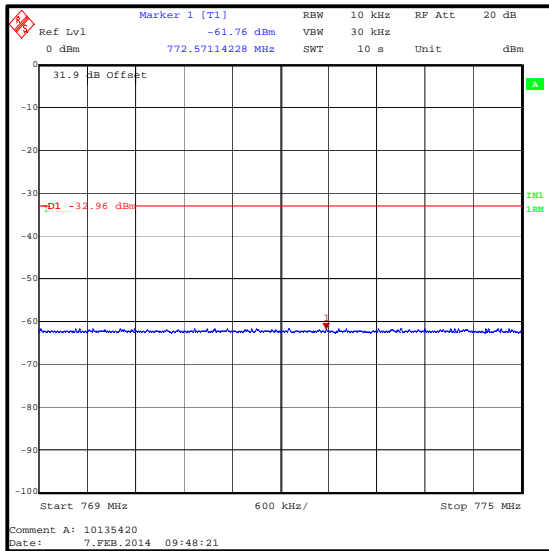
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
769.697	1	0	-61.59	-32.96	28.63	Complied
771.754	1	25	-61.76	-32.96	28.80	Complied
772.571	25	0	-61.76	-32.96	28.80	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

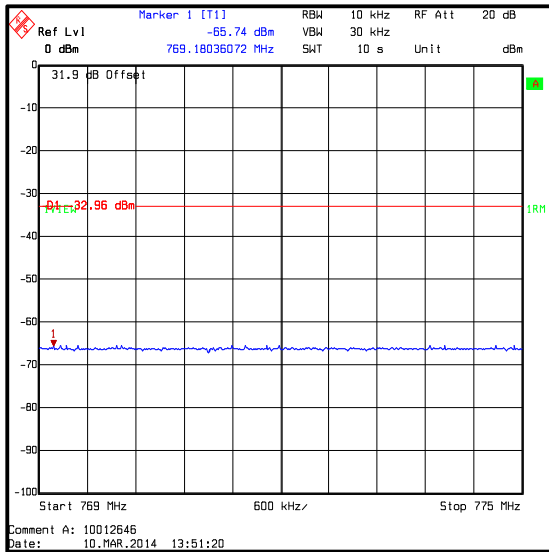


16QAM / 25 Resource Blocks

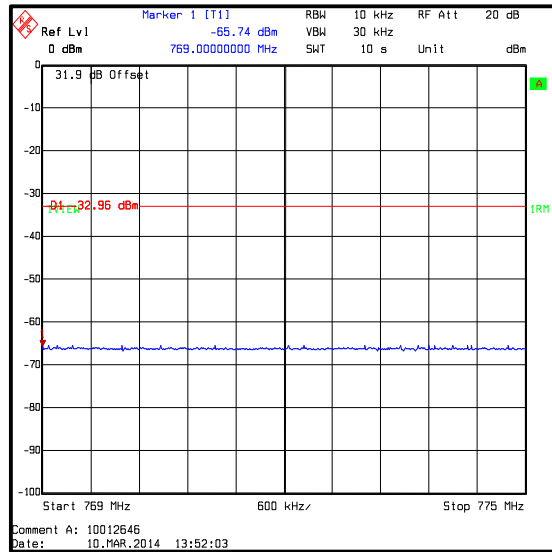
Transmitter Conducted Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / 16QAM / Top Channel)

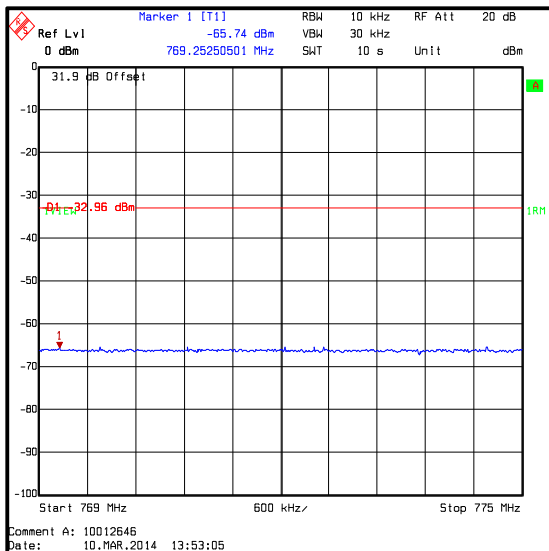
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
769.180	1	0	-65.74	-32.96	32.78	Complied
769.000	1	25	-65.74	-32.96	32.78	Complied
769.253	25	0	-65.74	-32.96	32.78	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

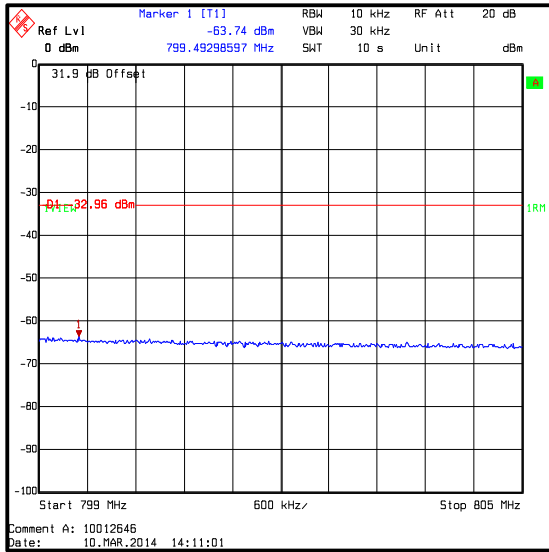


16QAM / 25 Resource Blocks

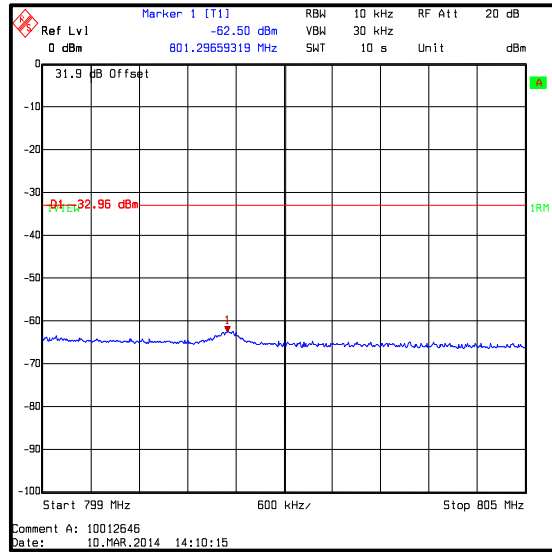
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / QPSK / Bottom Channel)

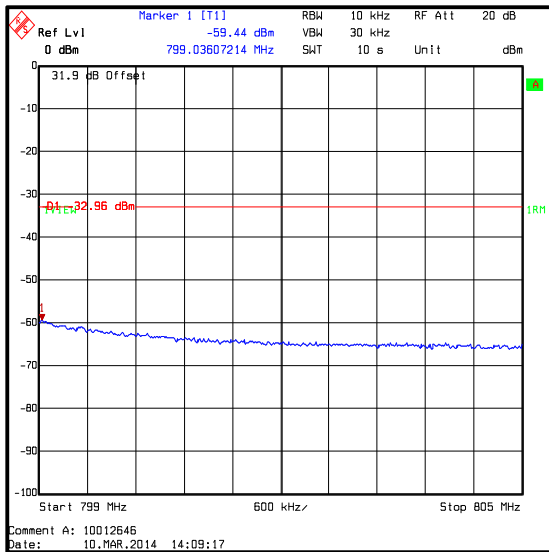
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.493	1	0	-63.74	-32.96	30.78	Complied
801.297	1	25	-62.50	-32.96	29.54	Complied
799.036	25	0	-59.44	-32.96	26.48	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

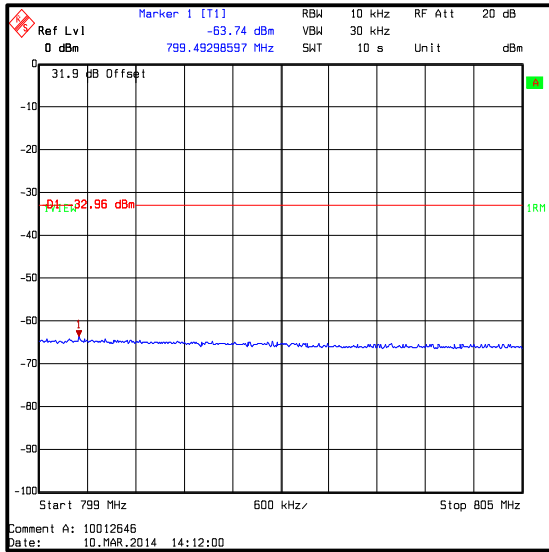


QPSK / 25 Resource Blocks

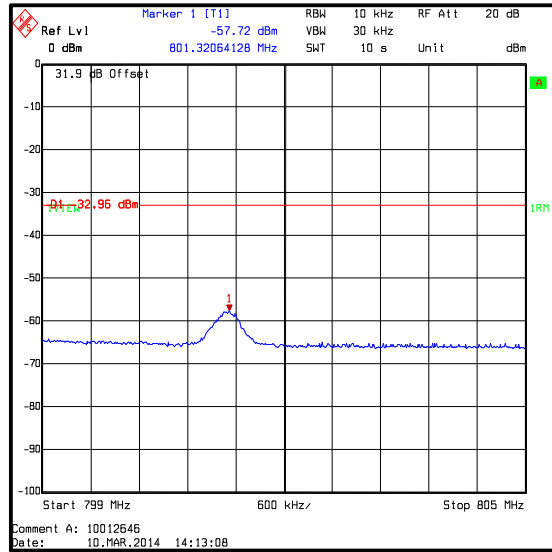
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / 16QAM / Bottom Channel)

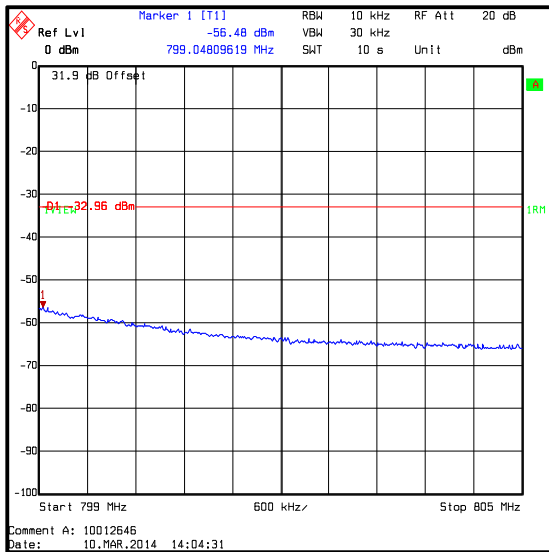
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.493	1	0	-63.74	-32.96	30.78	Complied
801.321	1	25	-57.72	-32.96	24.76	Complied
799.048	25	0	-56.48	-32.96	23.52	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

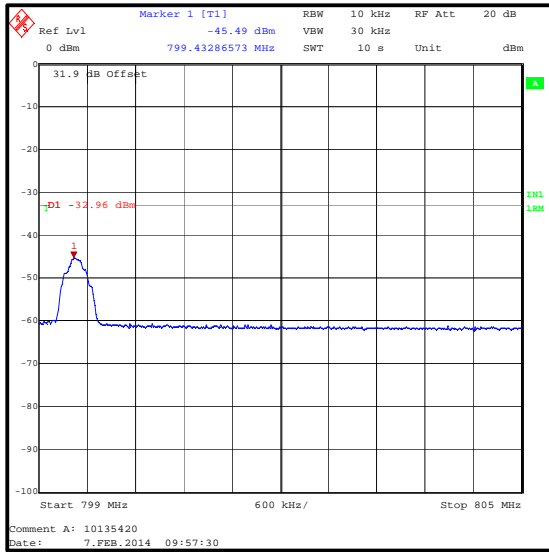


16QAM / 25 Resource Blocks

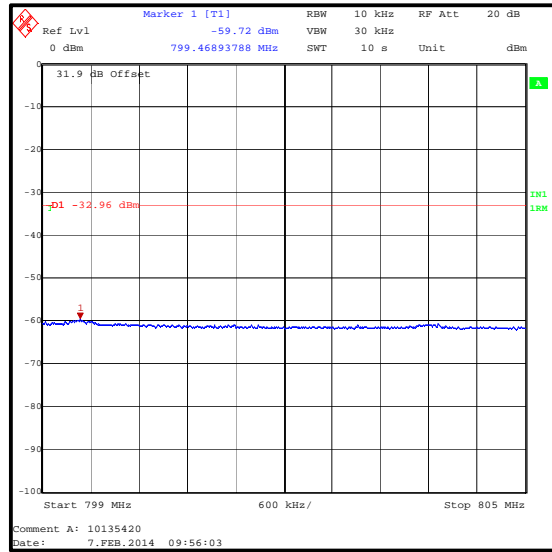
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / QPSK / Middle Channel)

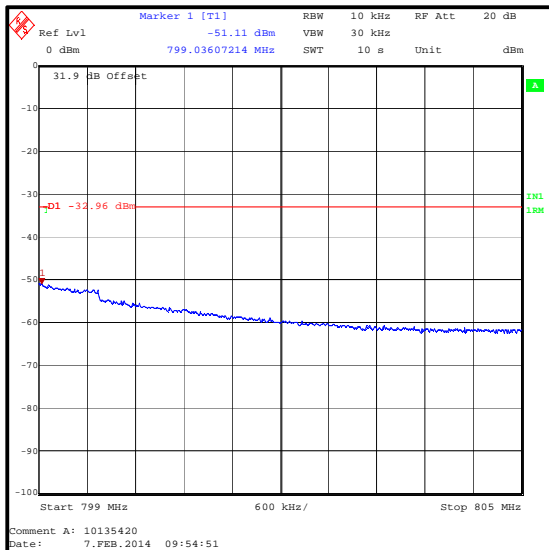
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.433	1	0	-45.49	-32.96	12.53	Complied
799.469	1	25	-59.72	-32.96	26.76	Complied
799.036	25	0	-51.11	-32.96	18.15	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

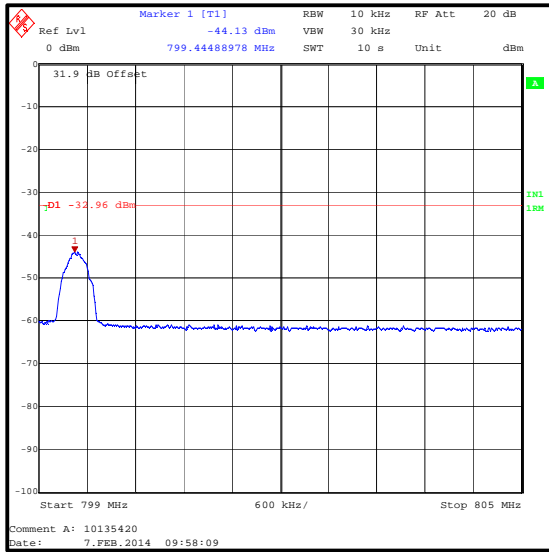


QPSK / 25 Resource Blocks

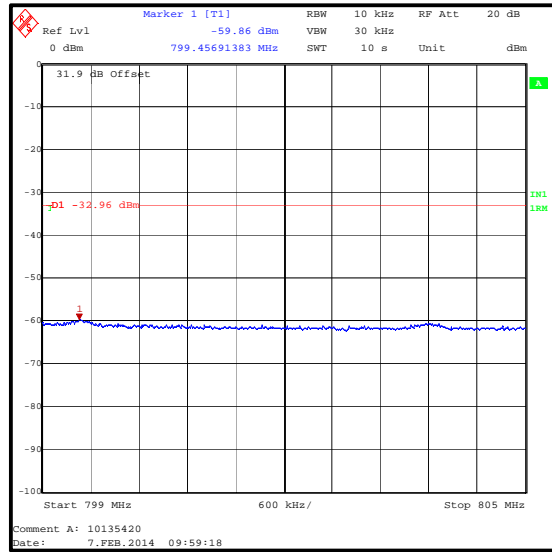
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / 16QAM / Middle Channel)

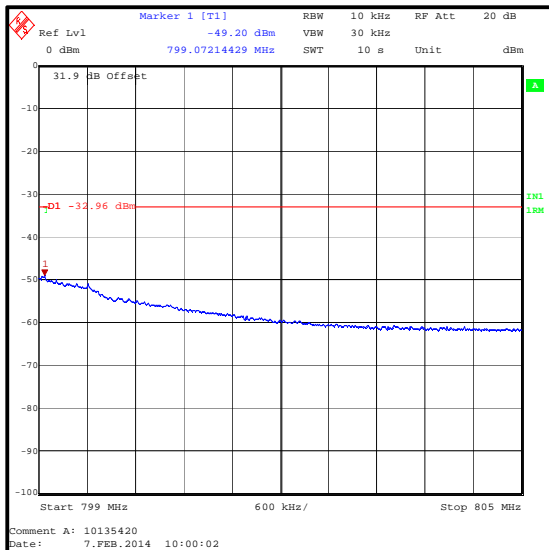
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.445	1	0	-44.13	-32.96	11.17	Complied
799.457	1	25	-59.86	-32.96	26.90	Complied
799.072	25	0	-49.20	-32.96	16.24	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

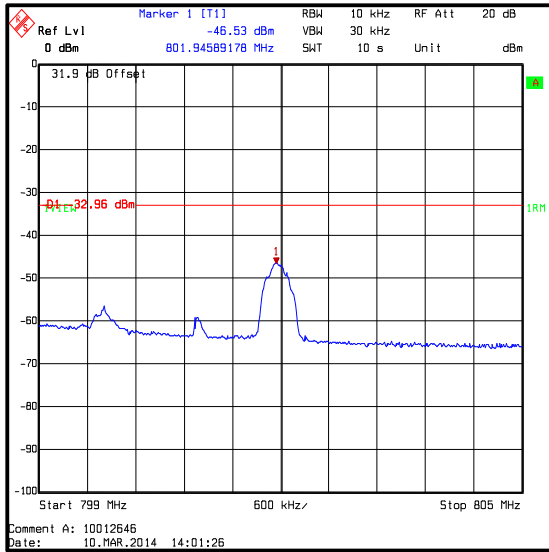


16QAM / 25 Resource Blocks

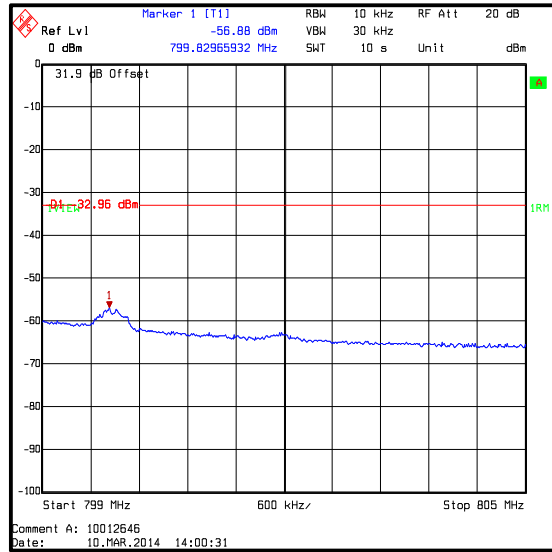
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / QPSK / Top Channel)

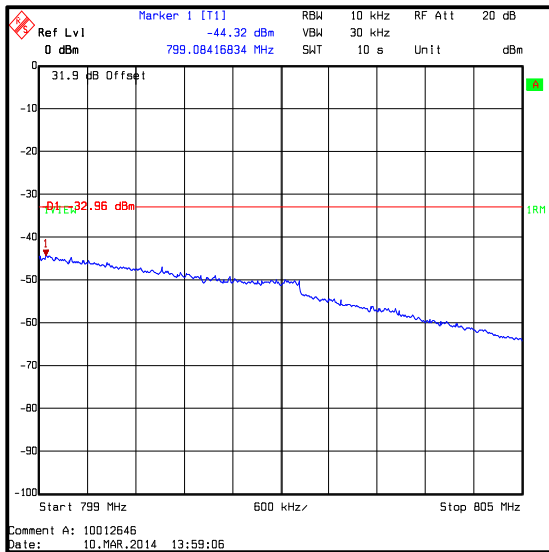
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
801.946	1	0	-46.53	-32.96	13.57	Complied
799.830	1	25	-56.88	-32.96	23.92	Complied
799.084	25	0	-44.32	-32.96	11.36	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

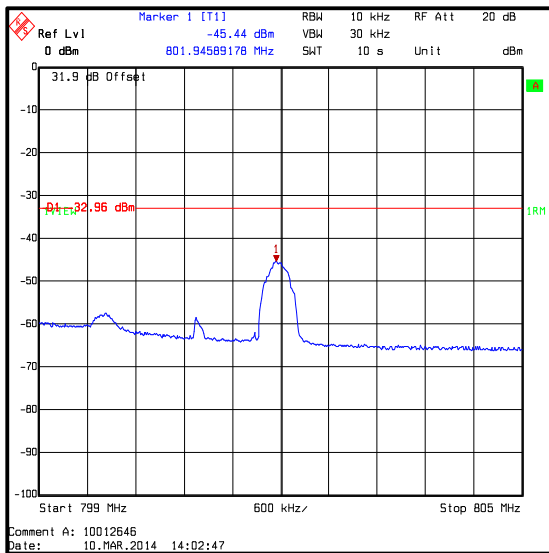


QPSK / 25 Resource Blocks

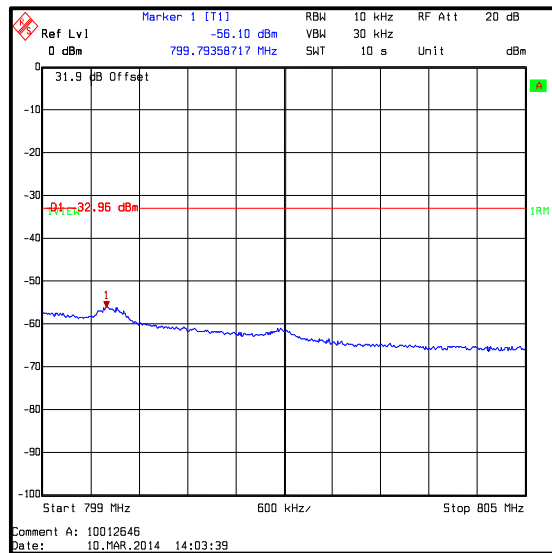
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / 16QAM / Top Channel)

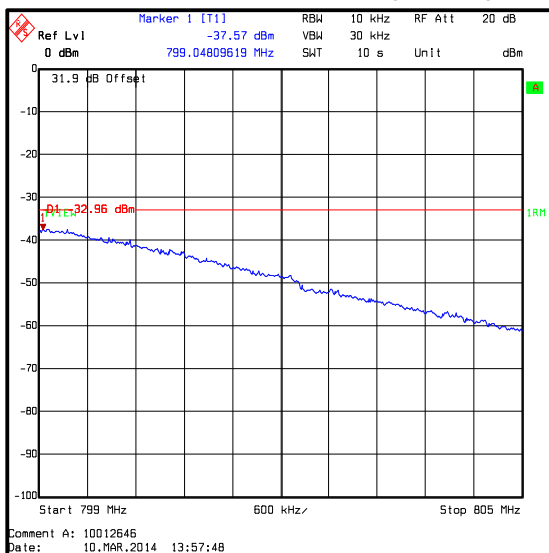
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
801.946	1	0	-45.44	-32.96	12.48	Complied
799.794	1	25	-56.10	-32.96	23.14	Complied
799.048	25	0	-37.57	-32.96	4.61	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

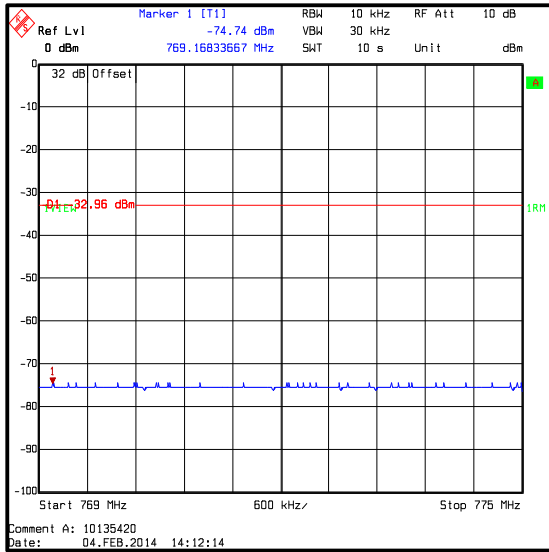


16QAM / 25 Resource Blocks

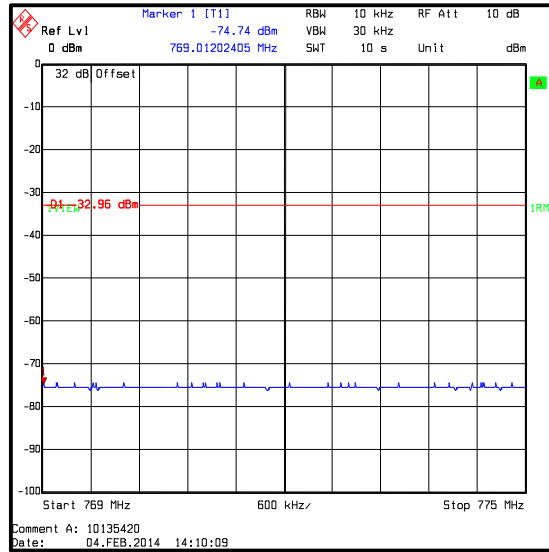
Transmitter Conducted Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (10 MHz Channel Bandwidth / QPSK / Single Channel)

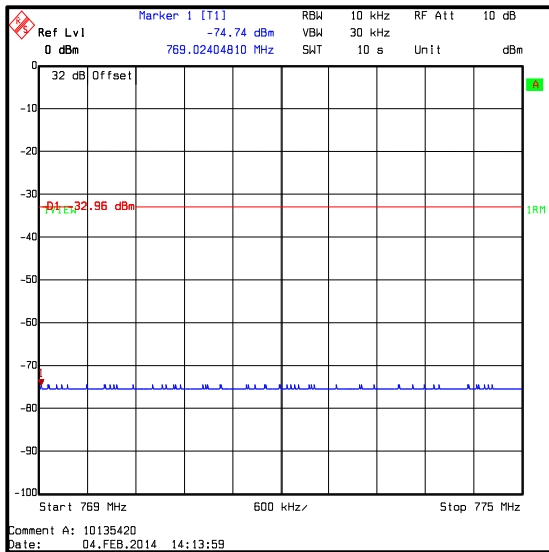
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
769.168	1	0	-74.74	-32.96	41.78	Complied
769.012	1	50	-74.74	-32.96	41.78	Complied
769.024	50	0	-74.74	-32.96	41.78	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

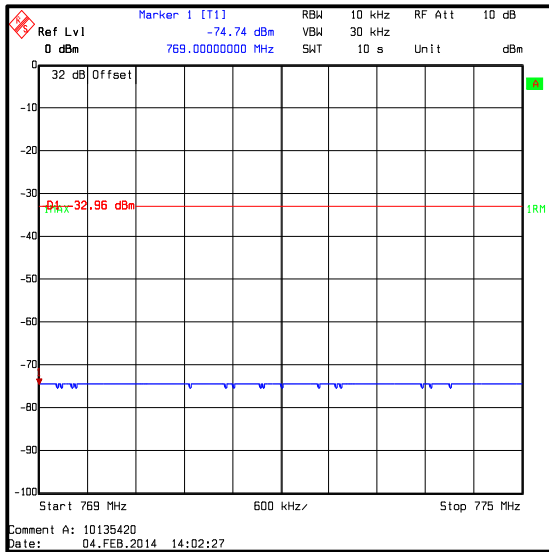


QPSK / 50 Resource Blocks

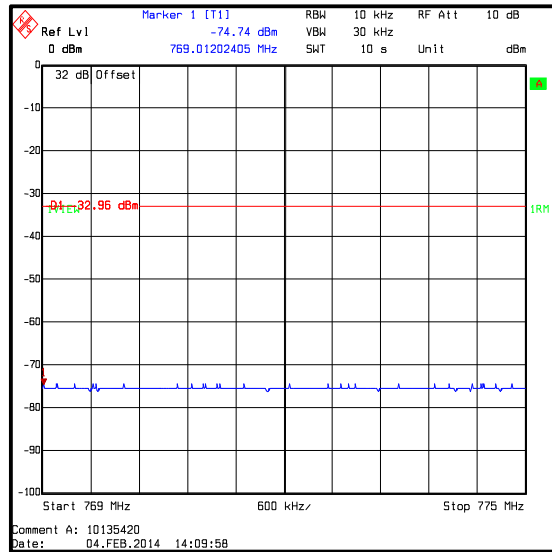
Transmitter Conducted Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (10 MHz Channel Bandwidth / 16QAM / Single Channel)

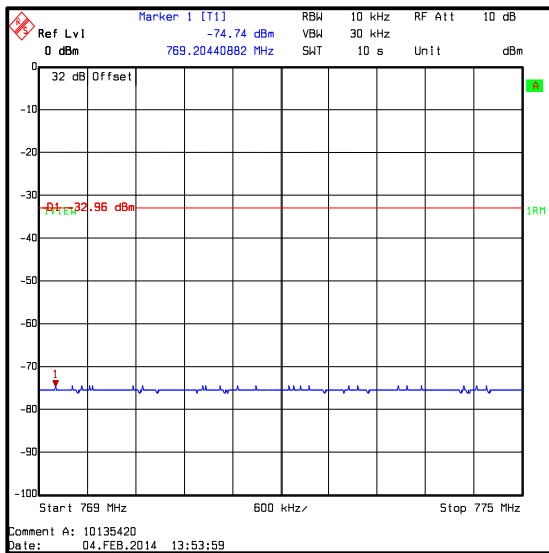
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
769.000	1	0	-74.74	-32.96	41.78	Complied
769.012	1	50	-74.74	-32.96	41.78	Complied
769.204	50	0	-74.74	-32.96	41.78	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)

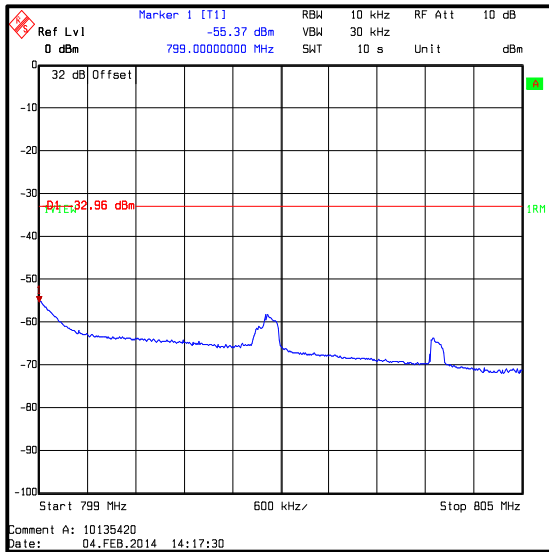


16QAM / 50 Resource Blocks

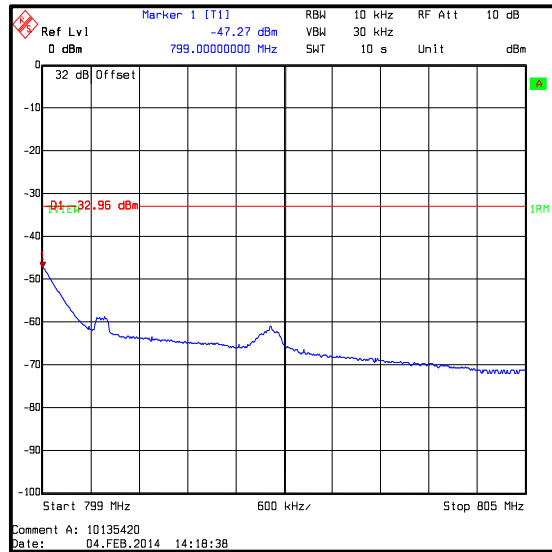
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (10 MHz Channel Bandwidth / QPSK / Single Channel)

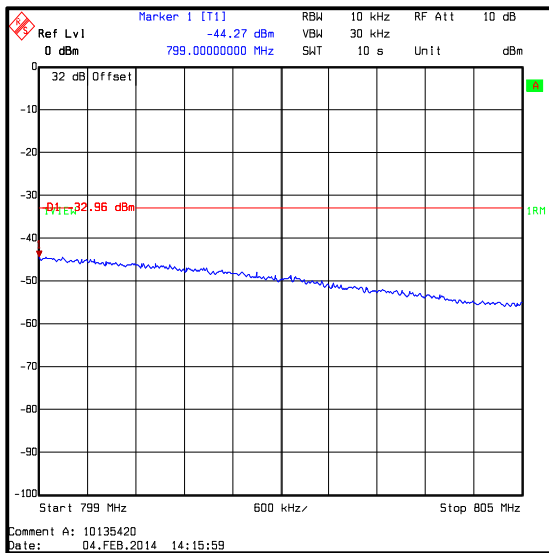
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.000	1	0	-55.37	-32.96	22.41	Complied
799.000	1	50	-47.27	-32.96	14.31	Complied
799.000	50	0	-44.27	-32.96	11.31	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

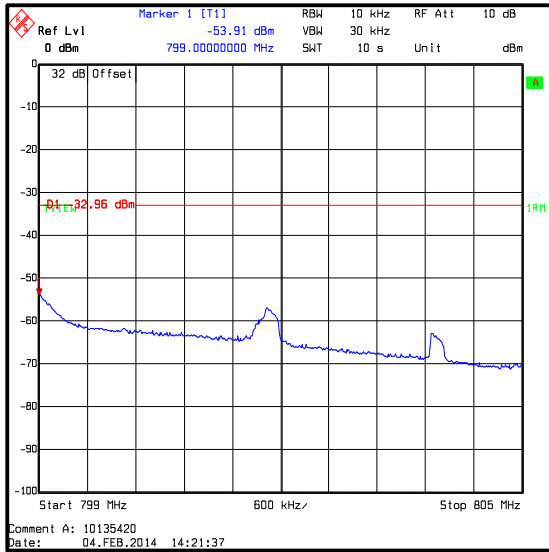


QPSK / 50 Resource Blocks

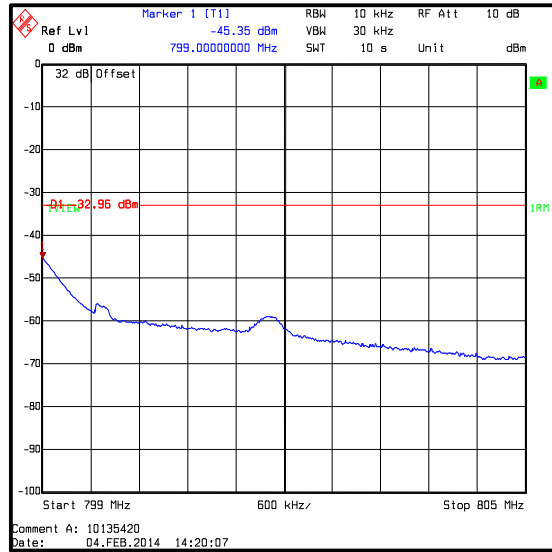
Transmitter Conducted Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (10 MHz Channel Bandwidth / 16QAM / Single Channel)

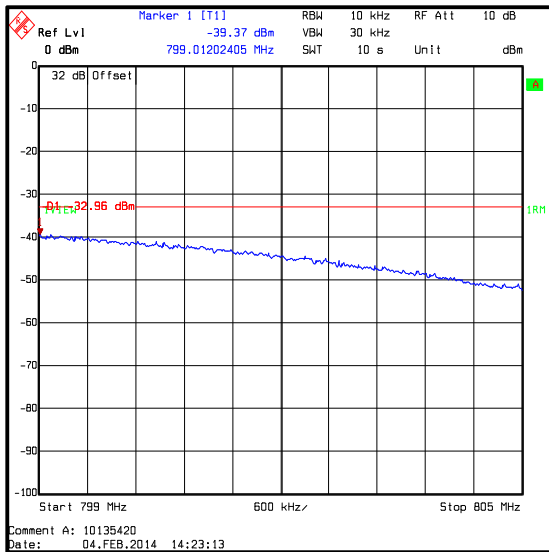
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.000	1	0	-53.91	-32.96	20.95	Complied
799.000	1	50	-45.35	-32.96	12.39	Complied
799.000	50	0	-39.37	-32.96	6.41	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)



16QAM / 50 Resource Blocks

Transmitter Conducted Emissions Limitations (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	19 Aug 2014	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	01 Oct 2014	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None stated	Calibrated before use	-
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	25 Jun 2014	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12
A148	High Pass Filter	Filtronic	5H036	32218	17 May 2015	24

5.2.6. Transmitter Conducted Emissions at Band Edge**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	06 February 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.543(c) and 2.1051
Test Method Used:	As detailed in KDB 971168 D01 Section 6.0 referencing FCC Part 2.1051

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	41

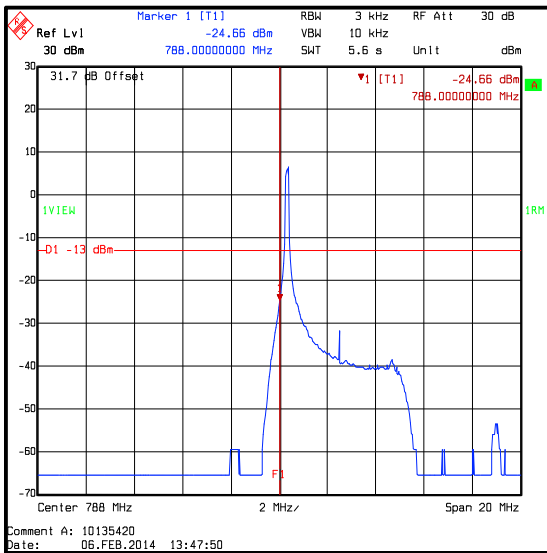
Note(s):

1. For 5 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 25. For single resource blocks, measurements were performed with the block starting of blocks of 1 for the lower band edge and 25 for the upper band edge.
2. For 10 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 50. For single resource blocks, measurements were performed with the block starting of blocks of 1 for the lower band edge and 50 for the upper band edge.
3. Resolution bandwidths were set between 1% and 5% of the measured occupied bandwidth.

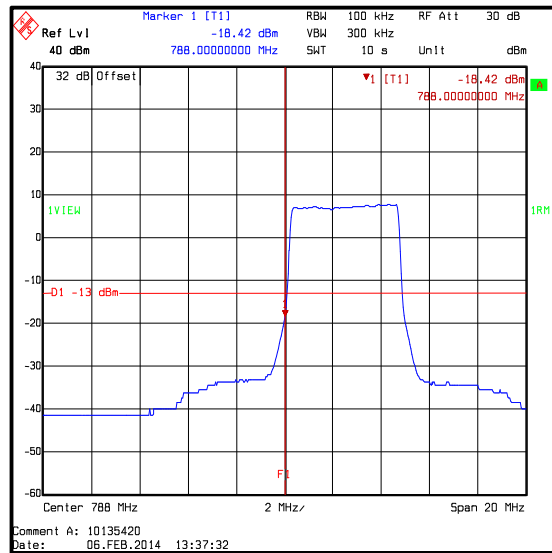
Transmitter Conducted Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel

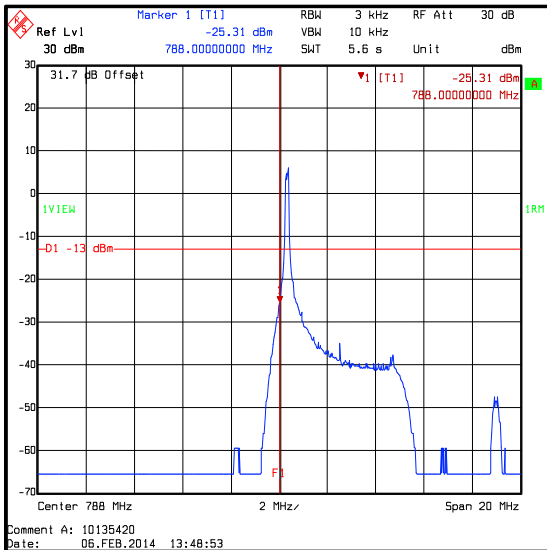
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Modulation	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
788	1	0	QPSK	-24.7	-13.0	11.7	Complied
788	25	0	QPSK	-18.4	-13.0	5.4	Complied
788	1	0	16QAM	-25.3	-13.0	12.3	Complied
788	25	0	16QAM	-19.6	-13.0	6.6	Complied



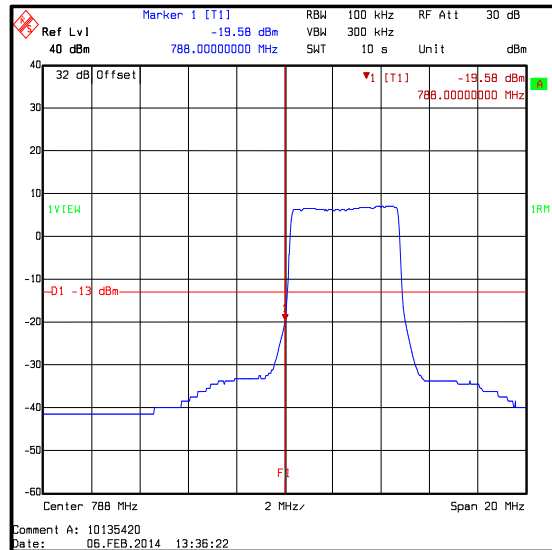
QPSK / 1 Resource Block (0 offset)



QPSK / 25 Resource Blocks



16QAM / 1 Resource Block (0 offset)

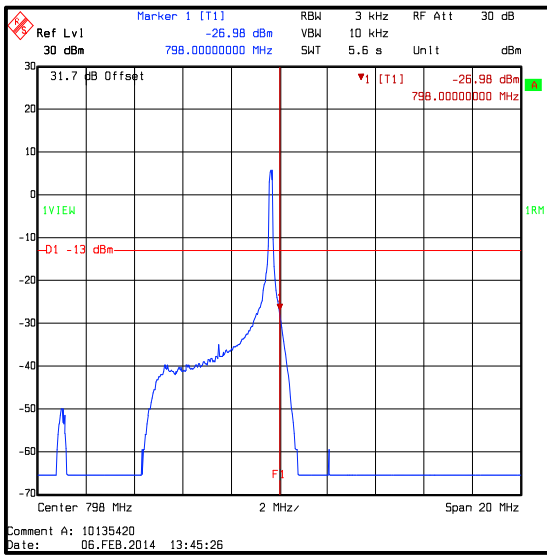


16QAM / 25 Resource Blocks

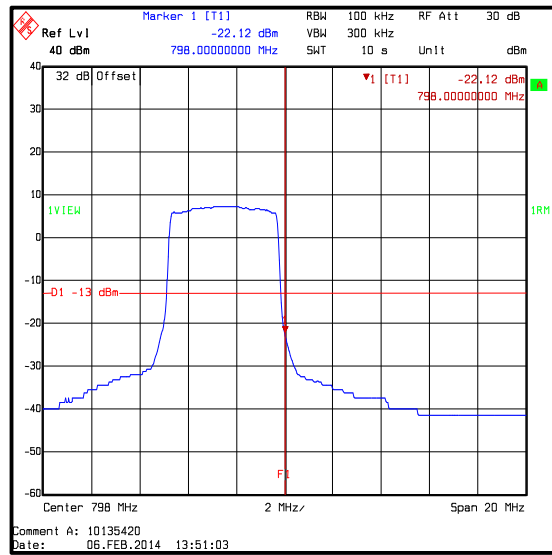
Transmitter Conducted Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / Top Channel

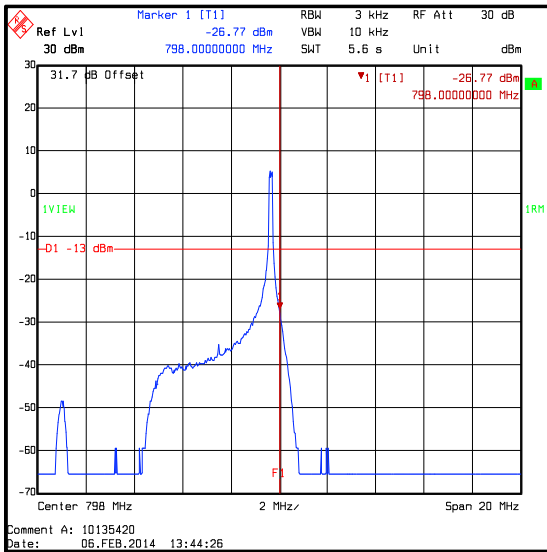
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Modulation	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
798	1	25	QPSK	-27.0	-13.0	14.0	Complied
798	25	0	QPSK	-22.1	-13.0	9.1	Complied
798	1	25	16QAM	-26.8	-13.0	13.8	Complied
798	25	0	16QAM	-22.1	-13.0	9.1	Complied



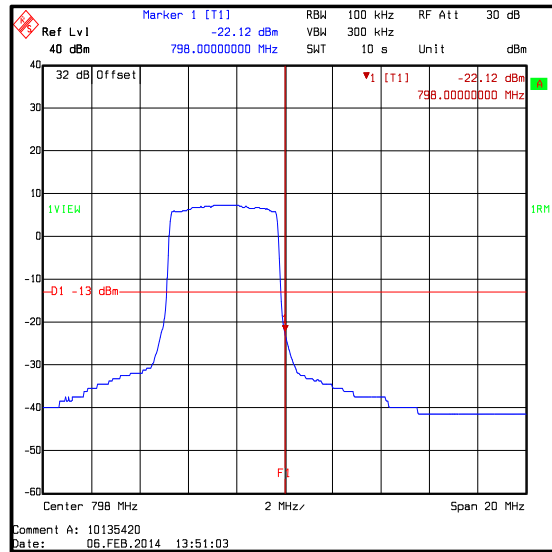
QPSK / 1 Resource Block (25 offset)



QPSK / 25 Resource Blocks



16QAM / 1 Resource Block (25 offset)

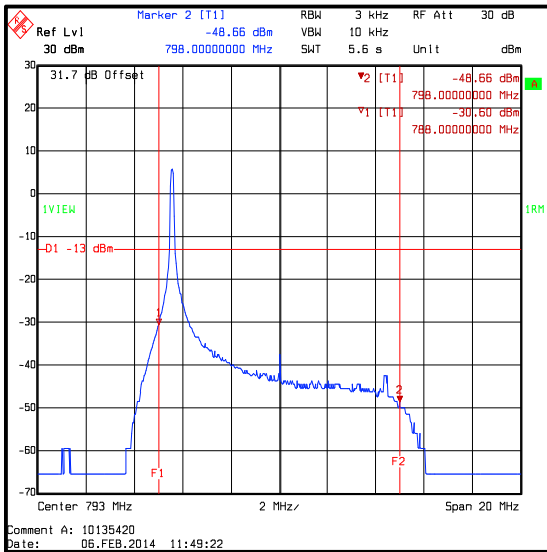


16QAM / 25 Resource Blocks

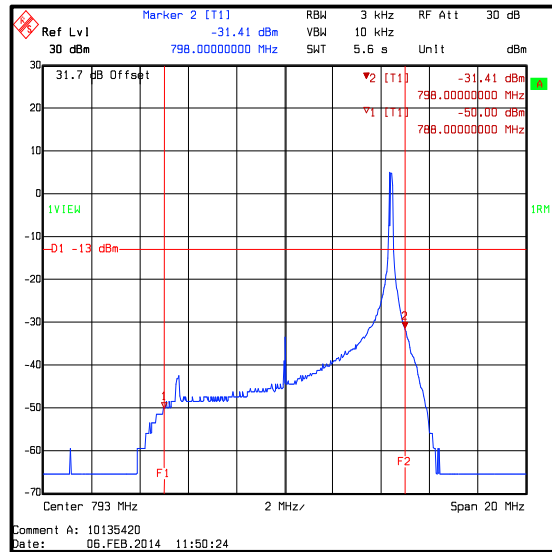
Transmitter Conducted Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / Single Channel / QPSK

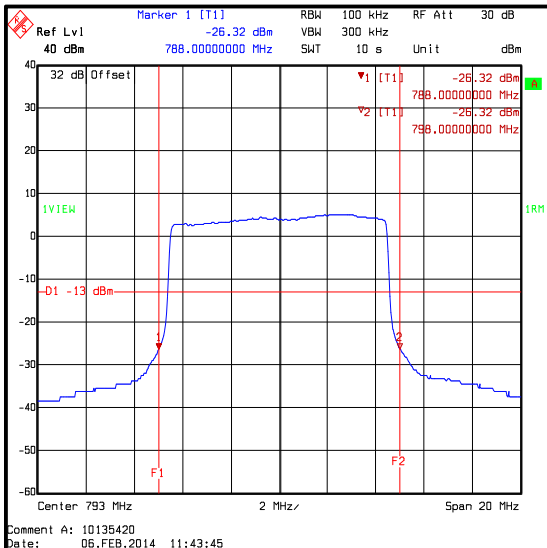
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
788	1	0	-30.6	-13.0	17.6	Complied
798	1	0	-48.7	-13.0	35.7	Complied
788	1	50	-50.0	-13.0	37.0	Complied
798	1	50	-31.4	-13.0	18.4	Complied
788	50	0	-26.3	-13.0	13.3	Complied
798	50	0	-26.3	-13.0	13.3	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

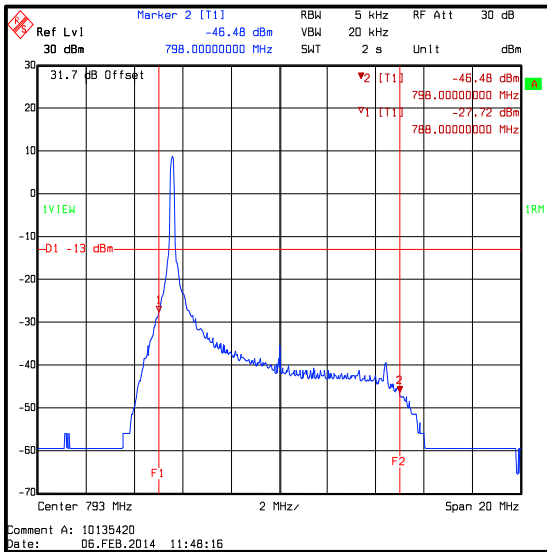


QPSK / Resource Block 50

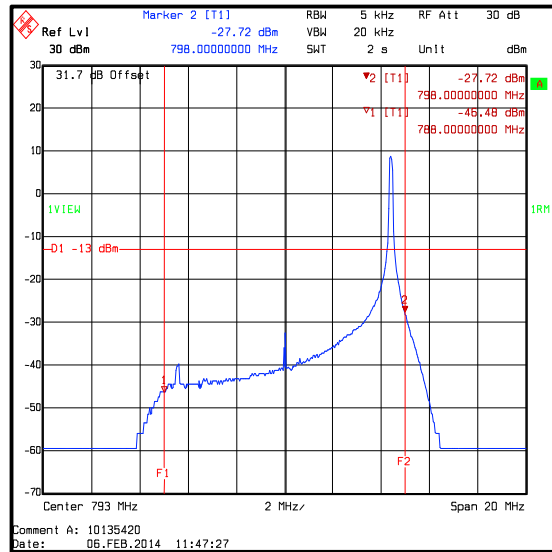
Transmitter Conducted Emissions at Band Edges (continued)

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

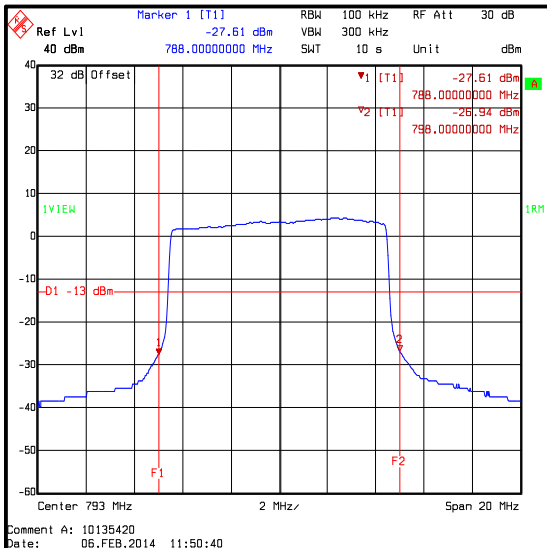
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
788	1	0	-27.7	-13.0	14.7	Complied
798	1	0	-46.5	-13.0	33.5	Complied
788	1	50	-46.5	-13.0	33.5	Complied
798	1	50	-27.7	-13.0	14.7	Complied
788	50	0	-27.6	-13.0	14.6	Complied
798	50	0	-26.9	-13.0	13.9	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)



16QAM / Resource Block 50

Transmitter Conducted Emissions at Band Edges (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	19 Aug 2014	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None stated	Calibrated before use	-
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	25 Jun 2014	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12

5.2.7. Transmitter Radiated Emissions**Test Summary:**

Test Engineer:	Nick Steele	Test Dates:	07 February 2014 & 11 February 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.543(e) and 2.1053
Test Method Used:	As detailed in KDB 971168 D01 Section 5.8. referencing FCC Part 2.1053
Frequency Range:	30 MHz to 8 GHz

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	32

Note(s):

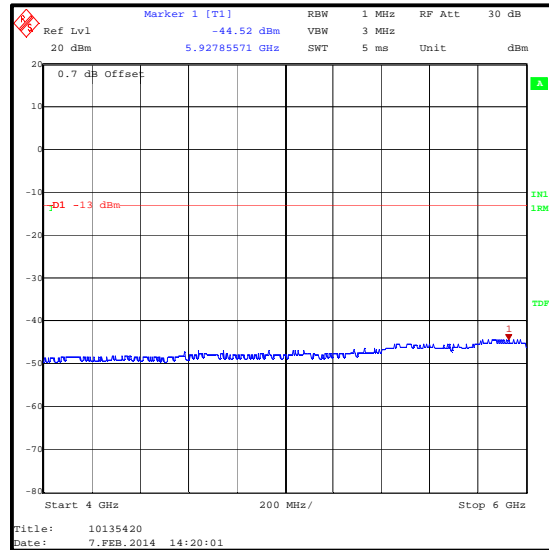
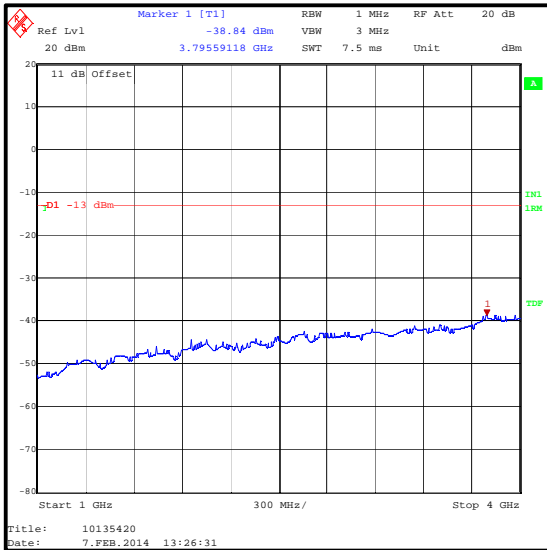
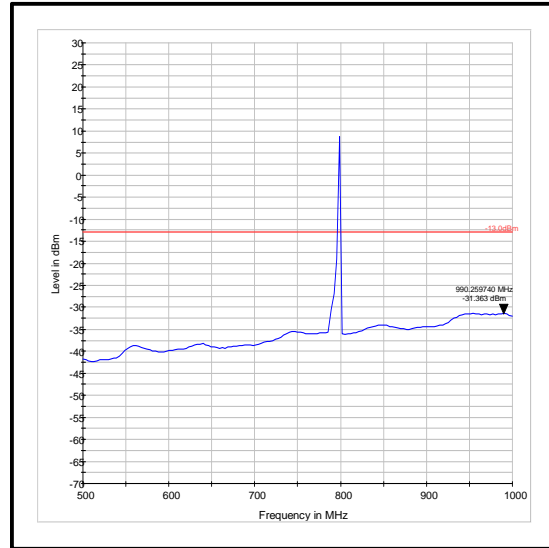
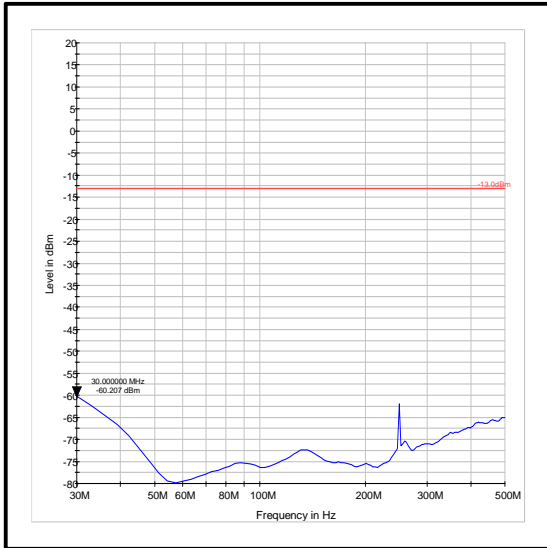
1. The EUT was set to transmit on 10 MHz channel bandwidth using 16QAM Modulation scheme, with 1 resource block offset at 49, as this produced the highest power level and was therefore deemed worst case
2. For radiated emissions testing, the customer supplied two OA-LTE-06-01-IPW antennas', which were connected to the main and diversity ports. The antenna gain was declared as 2.5 dBi.
3. The emission seen on the 30 MHz to 1 GHz plot at approximately 793.0 MHz is the EUT carrier.
4. All other emissions were at least 20 dB below the specification limit or below the measurement system noise floor.
5. 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.
6. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results:

Frequency (MHz)	Antenna Polarisation	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
990.260	Vertical	-31.4	-13.0	18.4	Complied

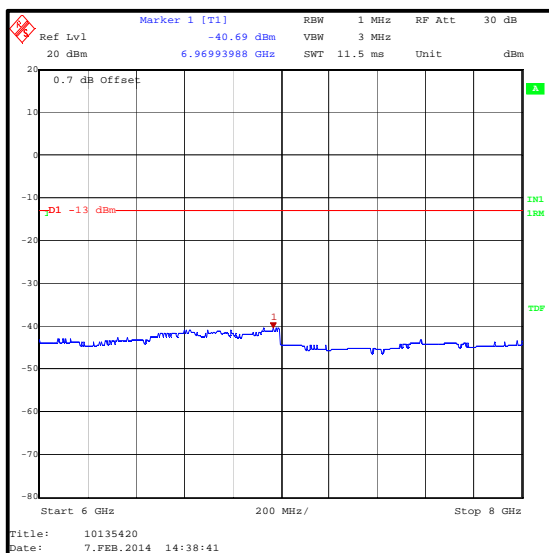
Transmitter Radiated Emissions (continued)

Results: 10 MHz Channel Bandwidth



Transmitter Radiated Emissions (continued)

Results: 10 MHz Channel Bandwidth



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
G0543	Pre Amplifier	Sonoma Instrument Co.	310N	230801	15 Feb 2014	3
A1834	Attenuator	Hewlett Packard	8941B	10444	15 Nov 2014	12
A490	Antenna	Chase	CBL6111A	1590	09 Apr 2014	12
A1998	Attenuator	Huber & Suhner	6820.17.B	07101	05 Apr 2014	12
A1999	Attenuator	Huber & Suhner	6820.17.B	07101	05 Apr 2014	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	01 Oct 2014	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	14 Nov 2014	12
A1975	High pass filter	AtanTecRF	AFH-03000	080424010	19 Apr 2014	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A254	Antenna	Flann Microwave	14240-20	139	14 Nov 2014	12

5.2.8. Transmitter Radiated Emissions Limitations**Test Summary:**

Test Engineer:	Nick Steele	Test Dates:	07 February 2014, 11 February 2014 & 11 March 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.543(e)(2), 90.543(f) and 2.1053
Test Method Used:	As detailed in KDB 971168 D01 Section 5.8. referencing FCC Part 2.1053
Frequency Ranges:	769 MHz to 775 MHz 799 MHz to 805 MHz 1559 MHz to 1610 MHz

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	32

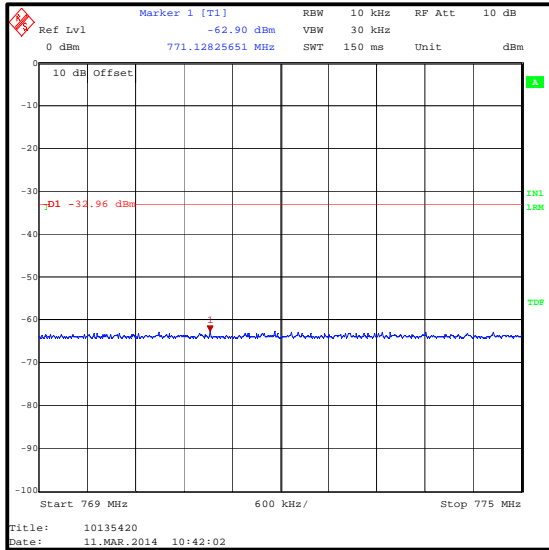
Note(s):

- For radiated emissions testing, the customer supplied two OA-LTE-06-01-IPW antenna's, which were connected to the main and diversity ports. The antenna gain was declared as 2.5 dBi.
- For 5 MHz channel bandwidth the measurements were performed with the EUT transmitting on the middle channel with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 25. For single resource blocks, measurements were performed with the block starting of blocks 0 and 24.
- For 10 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 50. For single resource blocks, measurements were performed with the block starting of blocks 0 and 49.
- All other emissions were >20 dB below the applicable limit or below the level of the noise floor of the measuring receiver.
- The limit for 90.543(e)(2) is $65 + 10\log_{10}(P) = -35$ dBm in a 6.25 kHz bandwidth. As it was not possible to set the resolution bandwidth on the test equipment, the bandwidth was set to 10 kHz. The limit was adjusted by $10\log_{10}(10\text{ kHz} / 6.25\text{ kHz}) = 2.04$ dB. The limit shown in the plots for the 769 MHz to 799 MHz and 799 MHz to 805 MHz bands was set to $-35\text{ dBm} + 2.04\text{ dB} = -32.96\text{ dBm}$.
- The limit for 90.543(f) states emissions in the band 1559 MHz to 1610 MHz shall be limited to -70 dBW/MHz (-40 dBm) equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP (-50 dBm) for discrete emissions of less than 700 Hz bandwidth.
- 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.
- 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.

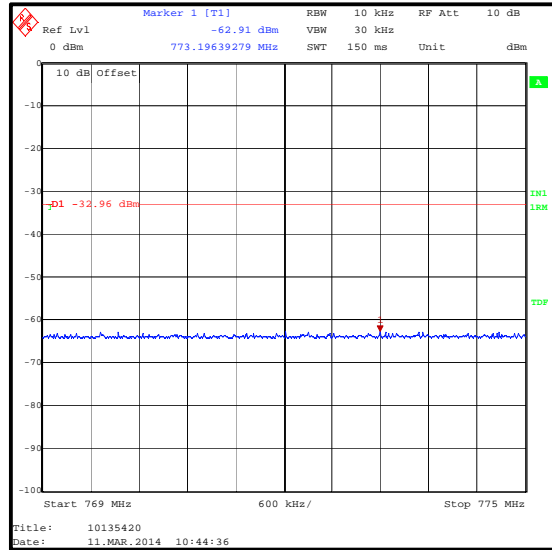
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / QPSK / Bottom Channel)

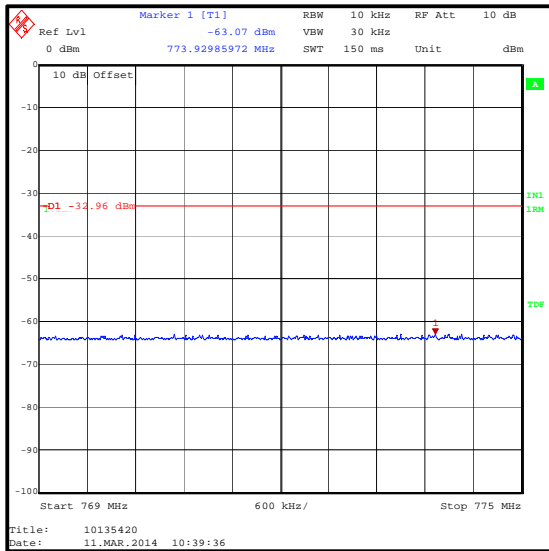
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
771.128	1	0	-62.90	-32.96	29.94	Complied
773.196	1	25	-62.91	-32.96	29.95	Complied
773.930	25	0	-63.07	-32.96	30.11	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

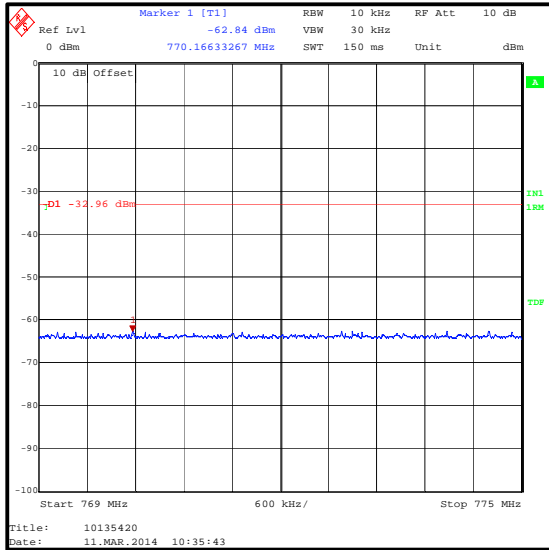


QPSK / 25 Resource Blocks

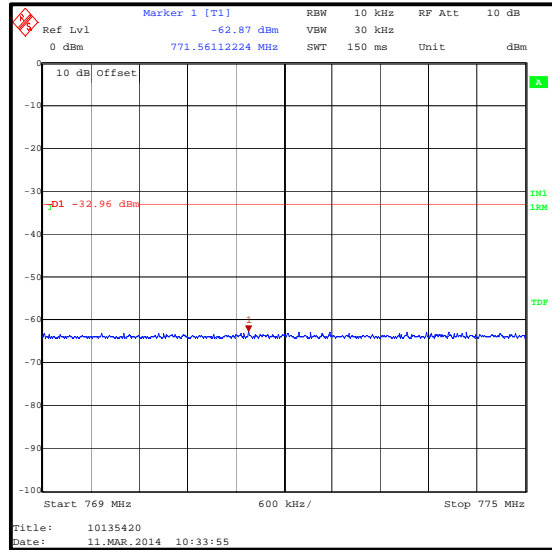
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / 16QAM / Bottom Channel)

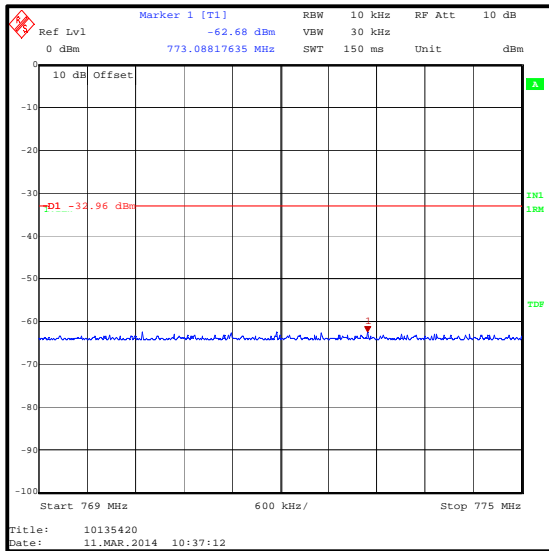
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
770.166	1	0	-62.84	-32.96	29.88	Complied
771.561	1	25	-62.87	-32.96	29.91	Complied
773.088	25	0	-62.68	-32.96	29.72	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

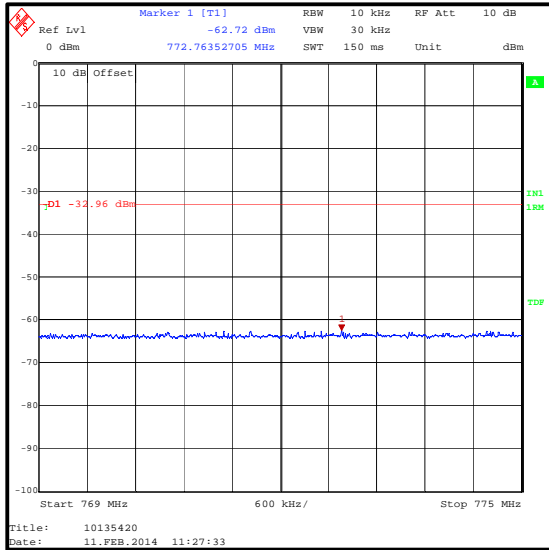


16QAM / 25 Resource Blocks

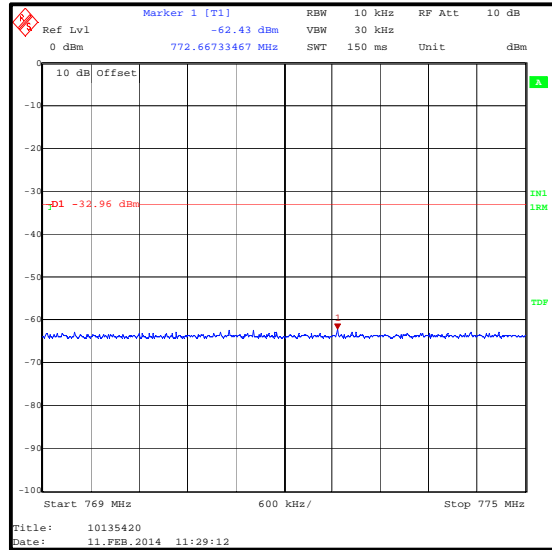
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / QPSK / Middle Channel)

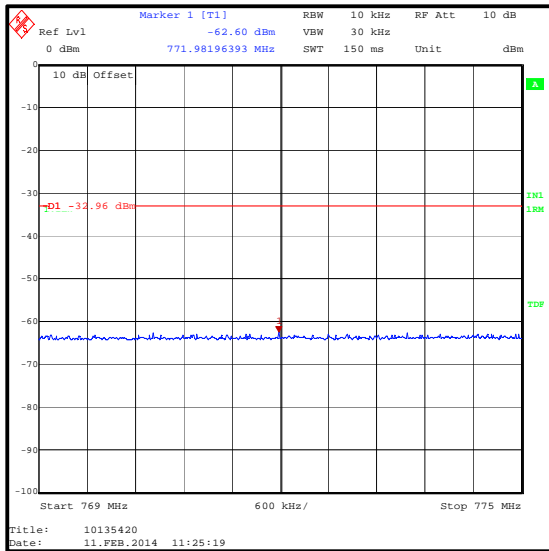
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
772.764	1	0	-62.72	-32.96	29.76	Complied
772.667	1	25	-62.43	-32.96	29.47	Complied
771.982	25	0	-62.60	-32.96	29.64	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

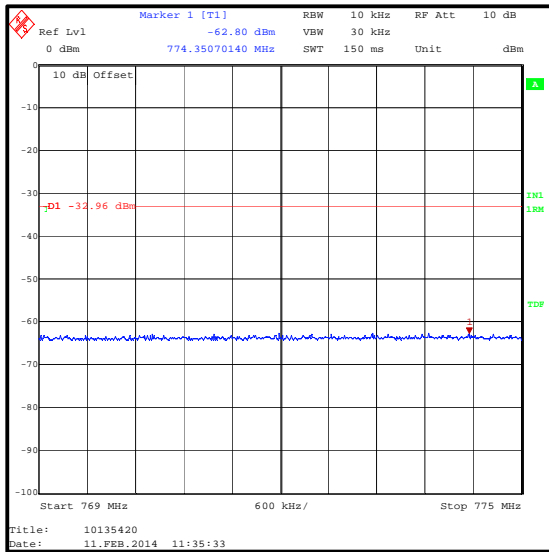


QPSK / 25 Resource Blocks

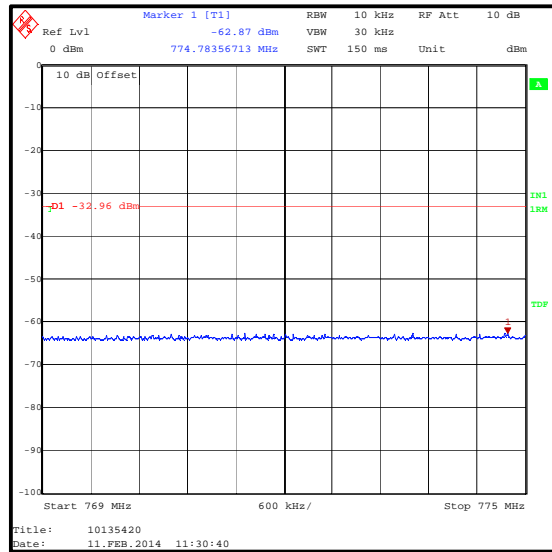
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / 16QAM / Middle Channel)

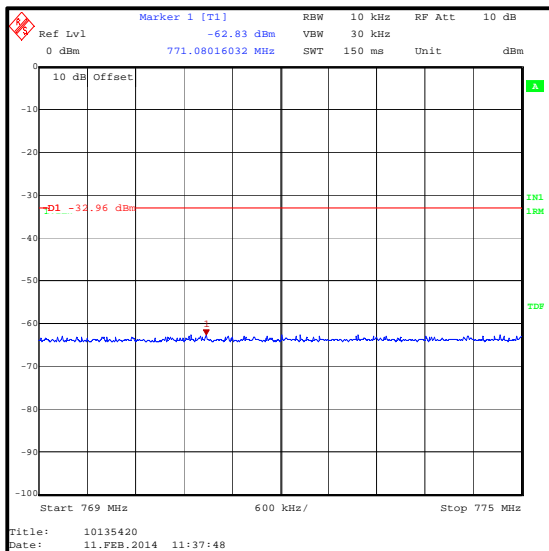
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
774.351	1	0	-62.80	-32.96	29.84	Complied
774.784	1	25	-62.87	-32.96	29.91	Complied
771.080	25	0	-62.83	-32.96	29.87	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

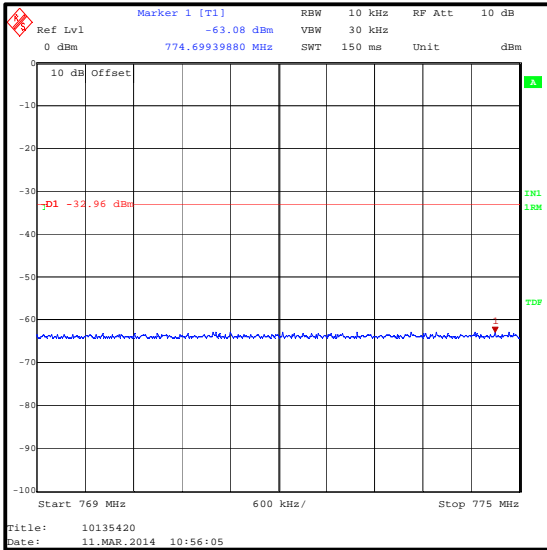


16QAM / 25 Resource Blocks

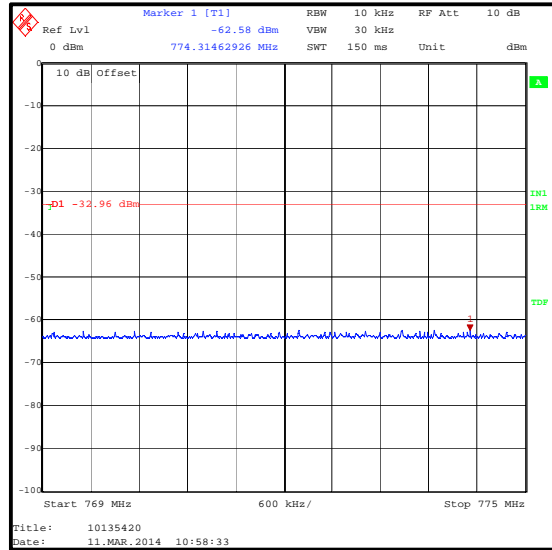
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / QPSK / Top Channel)

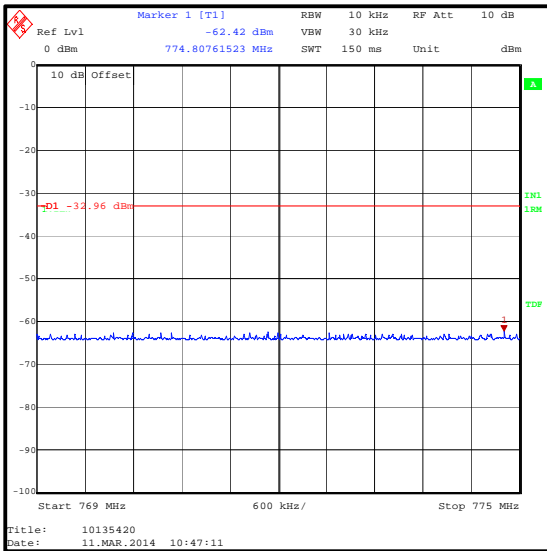
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
774.699	1	0	-63.08	-32.96	30.12	Complied
774.315	1	25	-62.58	-32.96	29.62	Complied
774.808	25	0	-62.42	-32.96	29.46	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

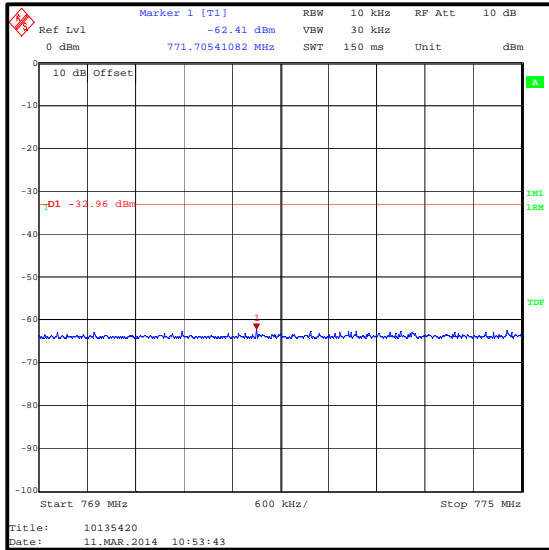


QPSK / 25 Resource Blocks

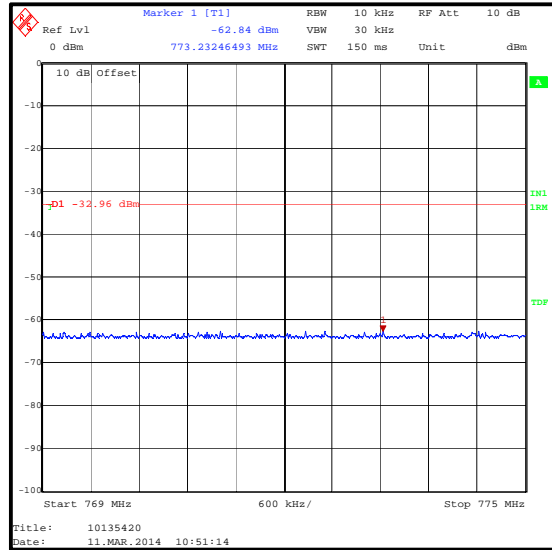
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (5 MHz Channel Bandwidth / 16QAM / Top Channel)

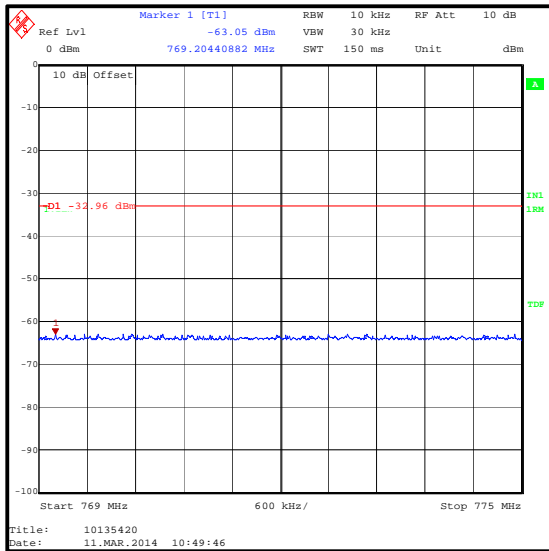
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
771.705	1	0	-62.41	-32.96	29.45	Complied
773.232	1	25	-62.84	-32.96	29.88	Complied
769.204	25	0	-63.05	-32.96	30.09	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

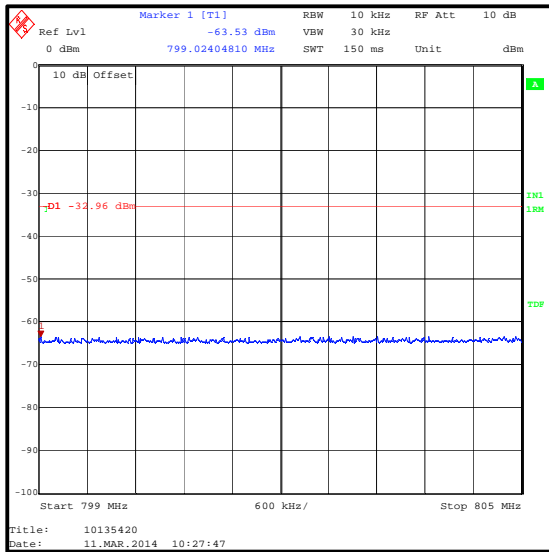


16QAM / 25 Resource Blocks

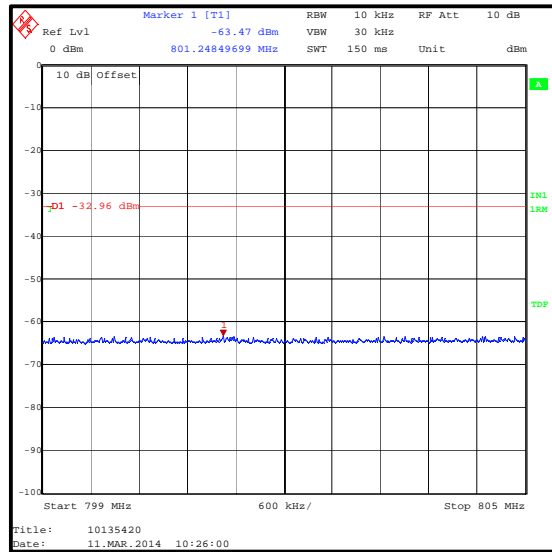
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / QPSK / Bottom Channel)

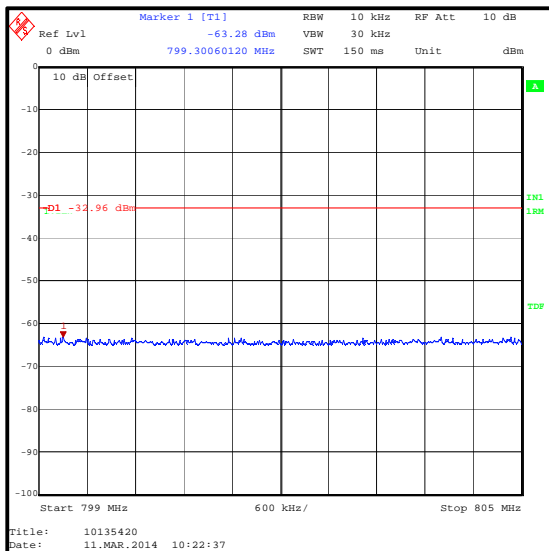
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.024	1	0	-63.53	-32.96	30.57	Complied
801.248	1	25	-63.47	-32.96	30.51	Complied
799.301	25	0	-63.28	-32.96	30.32	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

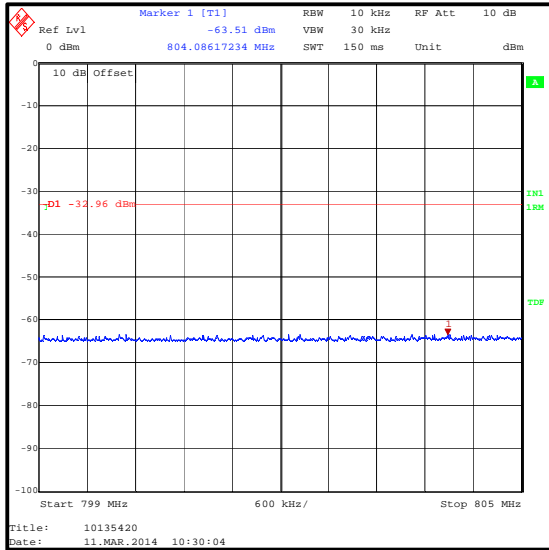


QPSK / 25 Resource Blocks

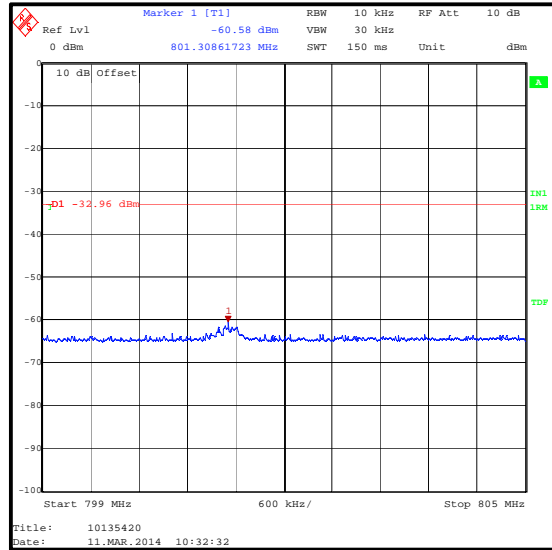
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / 16QAM / Bottom Channel)

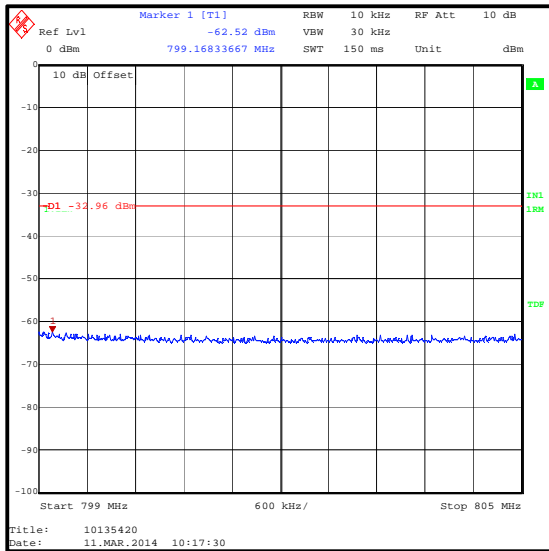
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
804.086	1	0	-63.51	-32.96	30.55	Complied
801.309	1	25	-60.58	-32.96	27.62	Complied
799.168	25	0	-62.52	-32.96	29.56	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

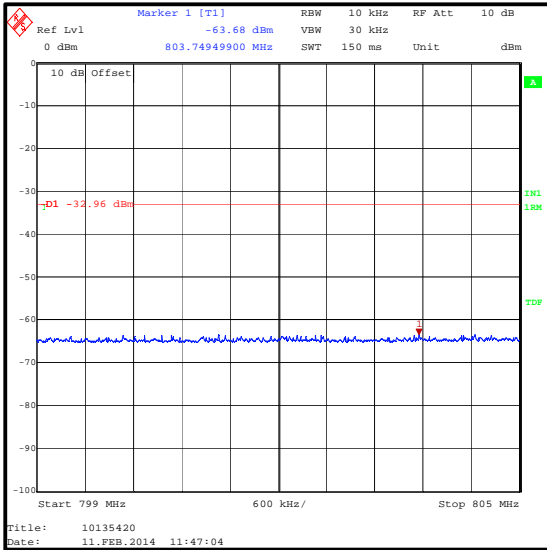


16QAM / 25 Resource Blocks

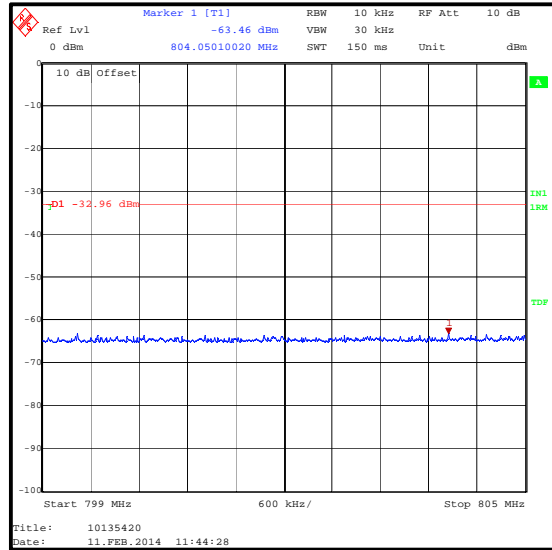
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / QPSK / Middle Channel)

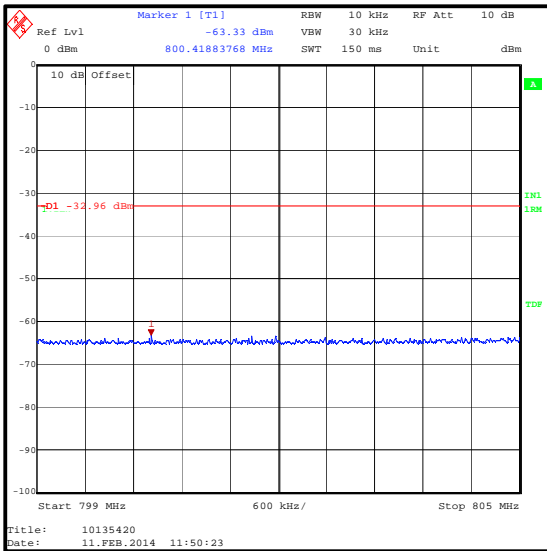
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
803.749	1	0	-63.68	-32.96	30.72	Complied
804.050	1	25	-63.46	-32.96	30.50	Complied
800.419	25	0	-63.33	-32.96	30.37	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

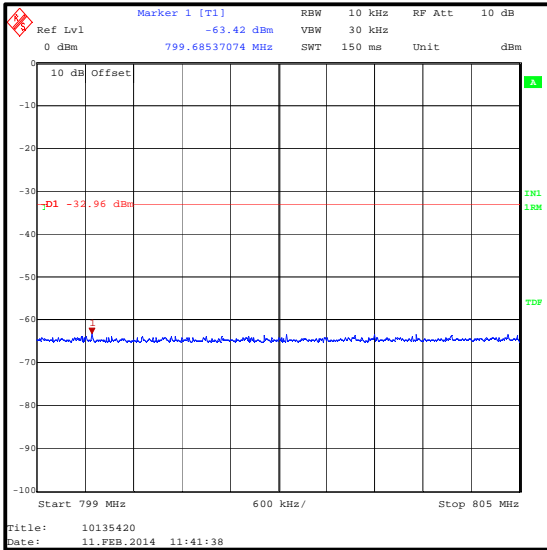


QPSK / 25 Resource Blocks

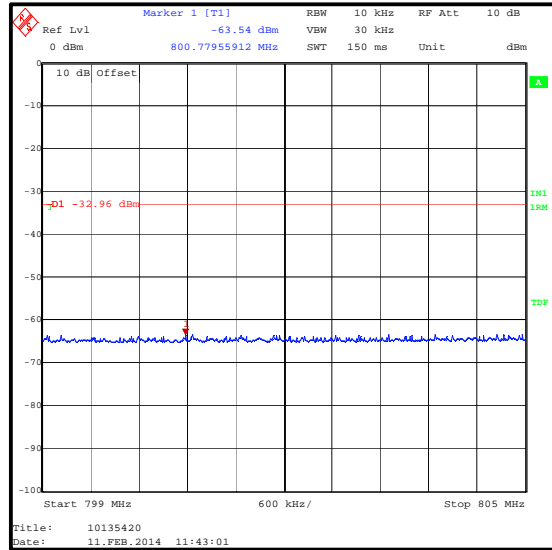
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / 16QAM / Middle Channel)

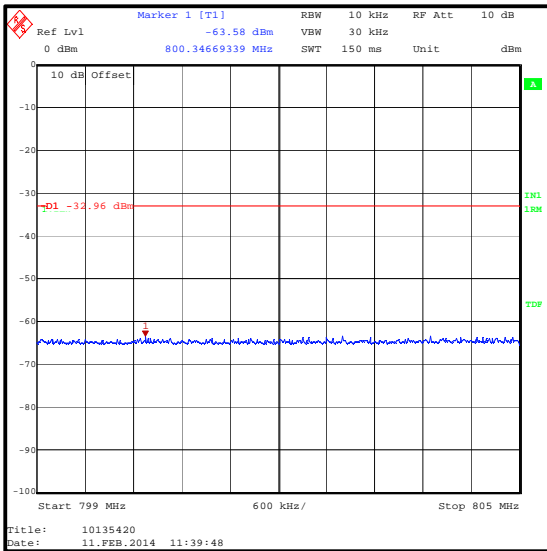
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.685	1	0	-63.42	-32.96	30.46	Complied
800.780	1	25	-63.54	-32.96	30.58	Complied
800.347	25	0	-63.58	-32.96	30.62	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

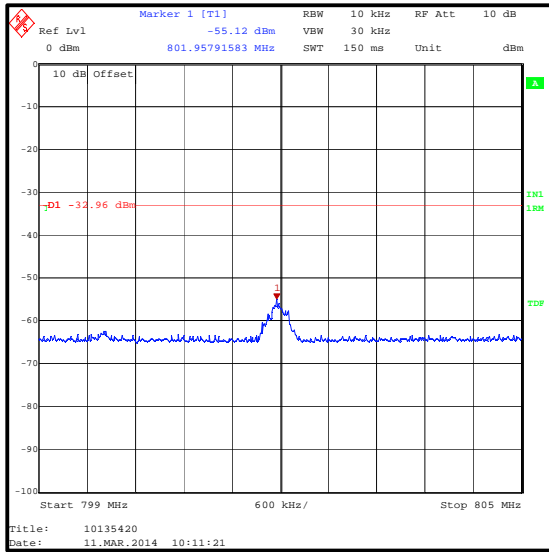


16QAM / 25 Resource Blocks

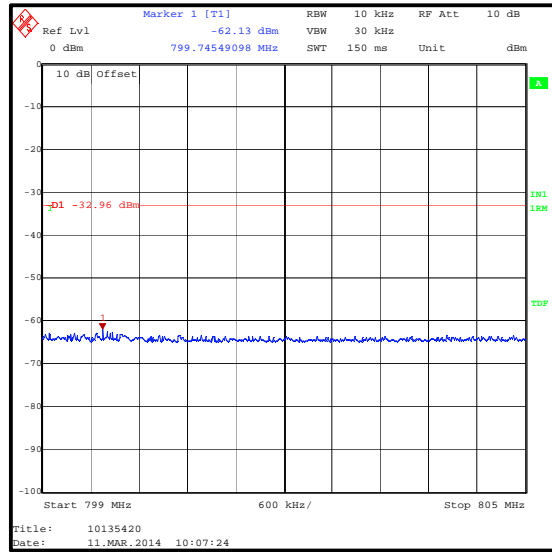
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / QPSK / Top Channel)

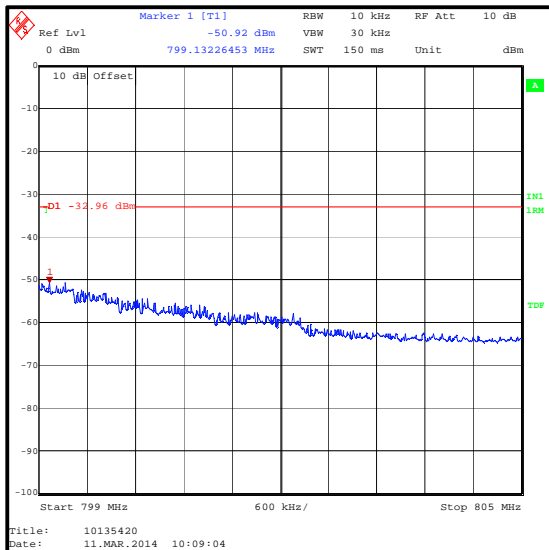
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
801.958	1	0	-55.12	-32.96	22.16	Complied
799.745	1	25	-62.13	-32.96	29.17	Complied
799.132	25	0	-50.92	-32.96	17.96	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

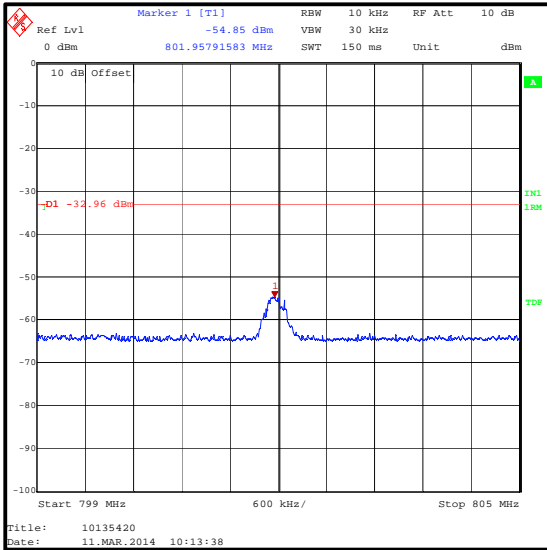


QPSK / 25 Resource Blocks

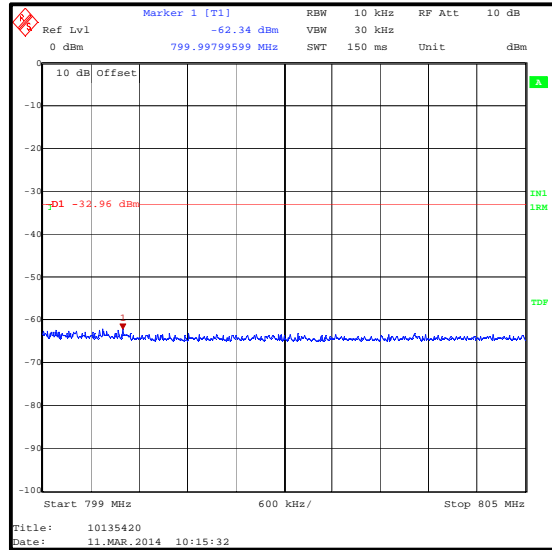
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (5 MHz Channel Bandwidth / 16QAM / Top Channel)

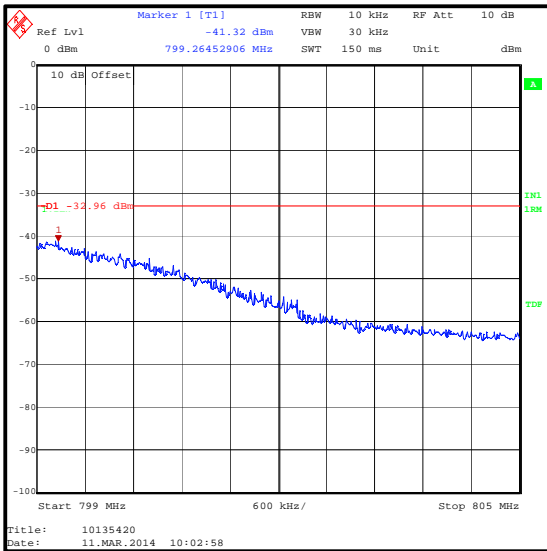
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
801.958	1	0	-54.85	-32.96	21.89	Complied
799.998	1	25	-62.34	-32.96	29.38	Complied
799.265	25	0	-41.32	-32.96	8.36	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

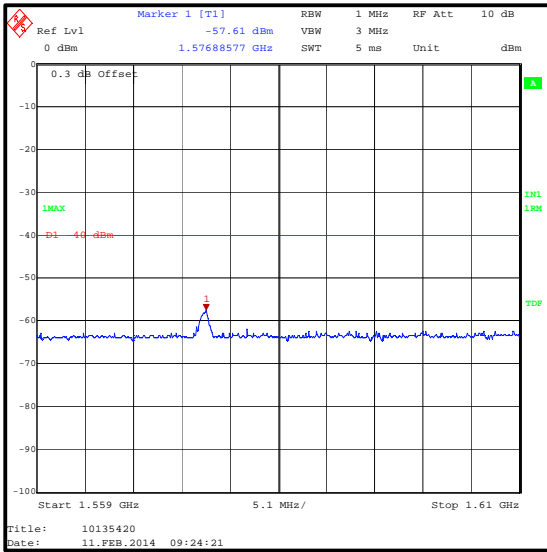


16QAM / 25 Resource Blocks

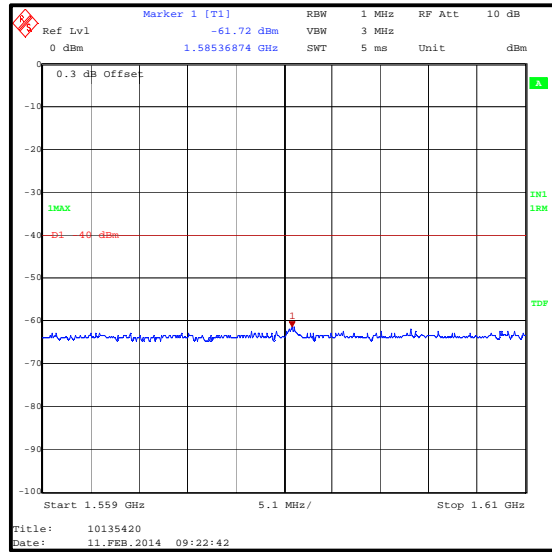
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (5 MHz Channel Bandwidth / QPSK / Bottom Channel)

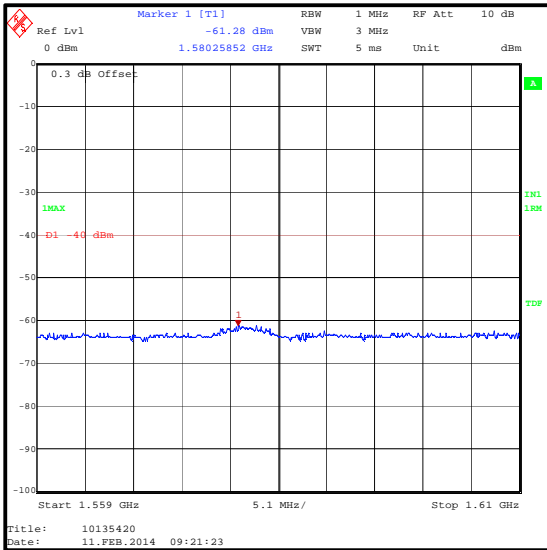
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1576.886	1	0	-57.61	-40.0	17.61	Complied
1585.369	1	25	-61.72	-40.0	21.72	Complied
1580.259	25	0	-61.28	-40.0	21.28	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

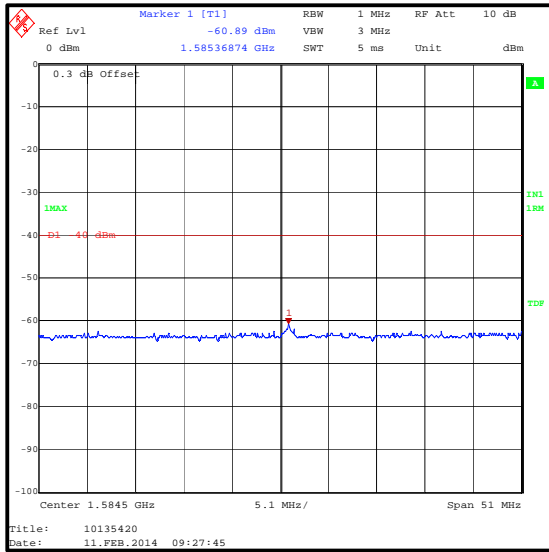


QPSK / 25 Resource Blocks

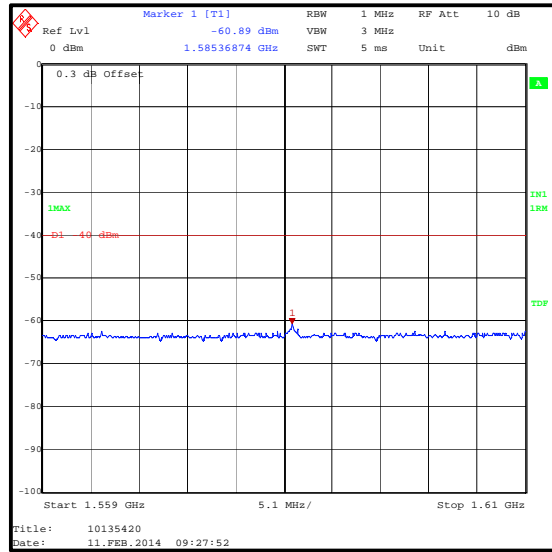
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (5 MHz Channel Bandwidth / 16QAM / Bottom Channel)

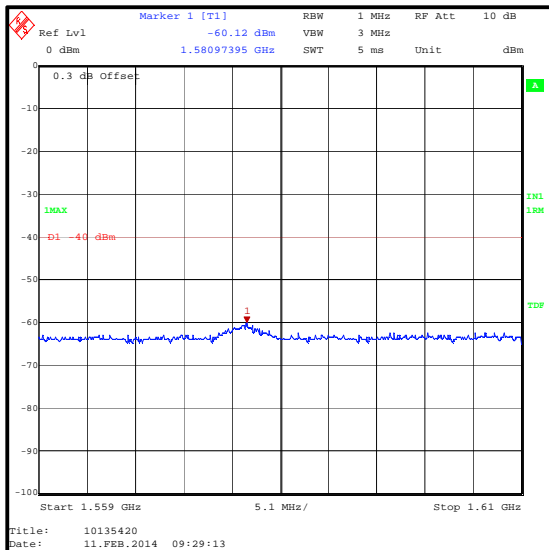
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1585.369	1	0	-60.89	-40.0	20.89	Complied
1585.369	1	25	-60.89	-40.0	20.89	Complied
1580.974	25	0	-60.12	-40.0	20.12	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

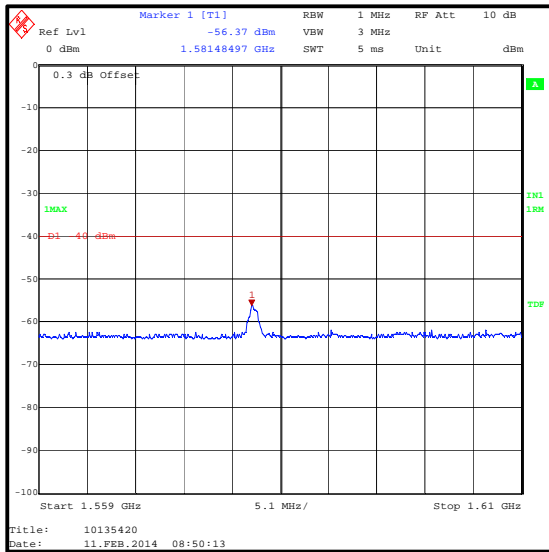


16QAM / 25 Resource Blocks

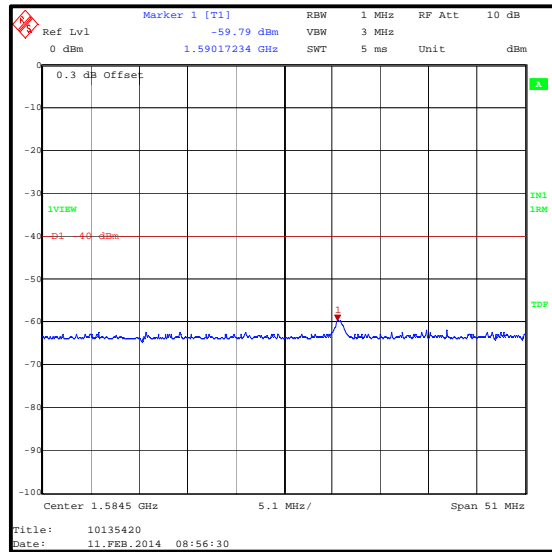
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (5 MHz Channel Bandwidth / QPSK / Middle Channel)

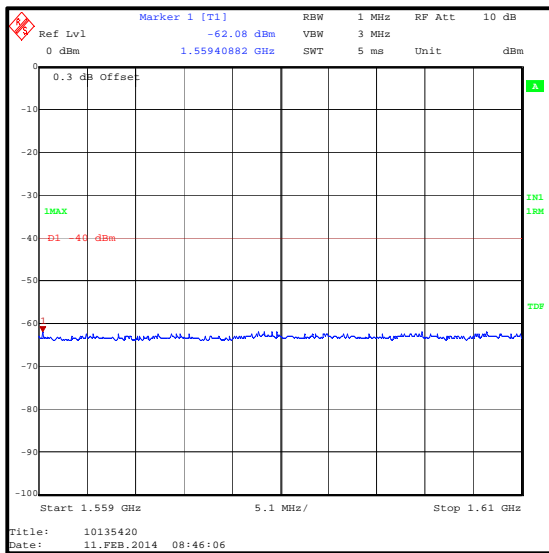
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1581.485	1	0	-56.4	-40.0	16.4	Complied
1590.172	1	25	-59.8	-40.0	19.8	Complied
1559.409	25	0	-62.1	-40.0	22.1	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

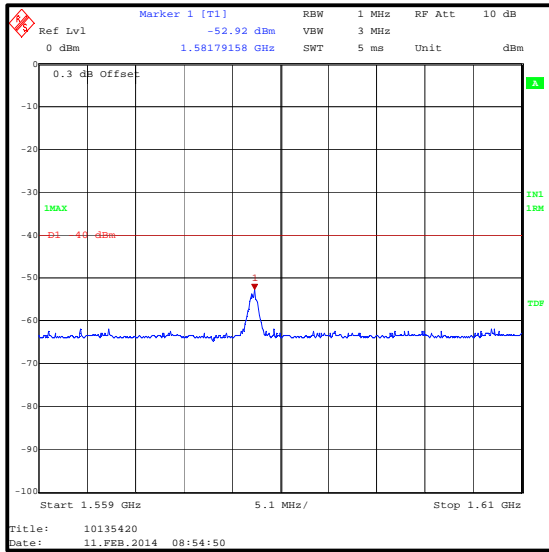


QPSK / 25 Resource Blocks

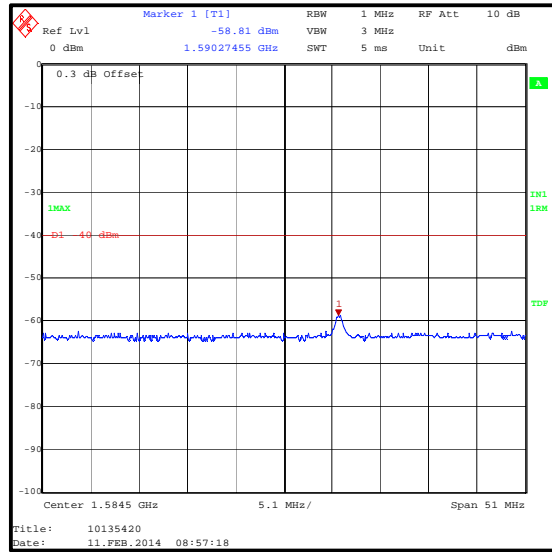
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (5 MHz Channel Bandwidth / 16QAM / Middle Channel)

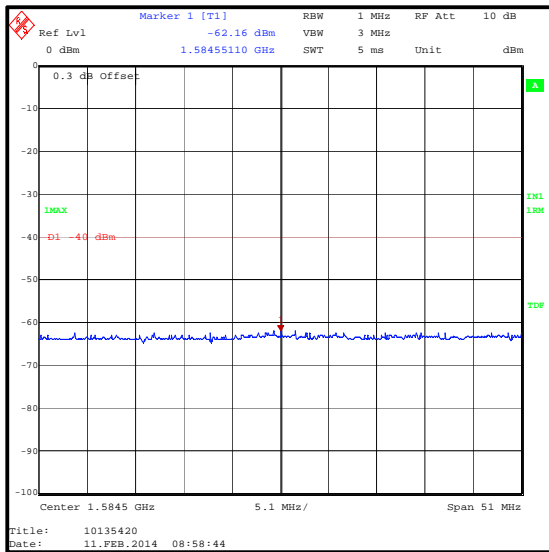
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1581.792	1	0	-52.9	-40.0	12.9	Complied
1590.275	1	25	-58.8	-40.0	18.8	Complied
1584.551	25	0	-62.2	-40.0	22.2	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

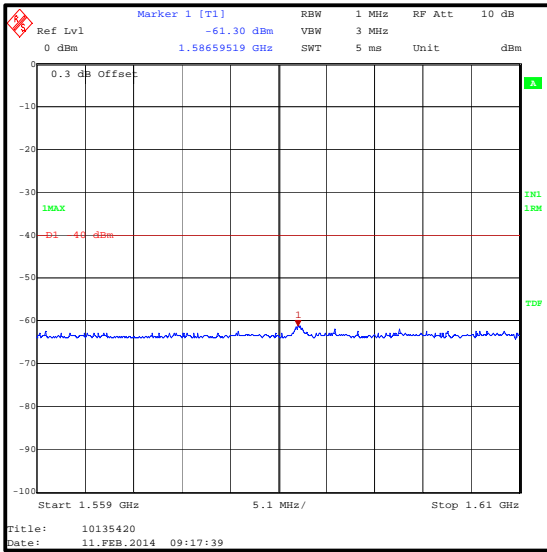


16QAM / 25 Resource Blocks

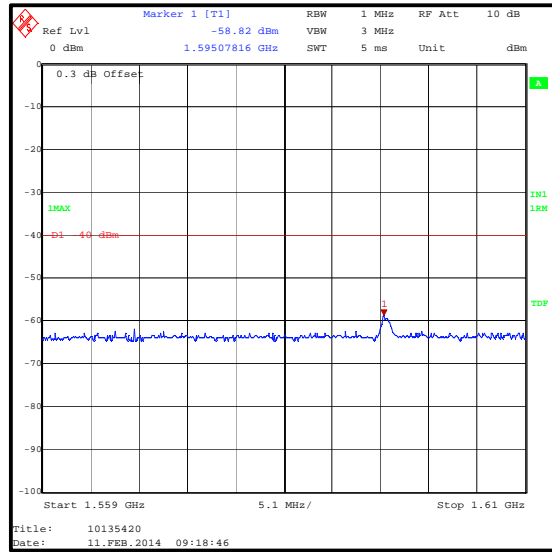
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (5 MHz Channel Bandwidth / QPSK / Top Channel)

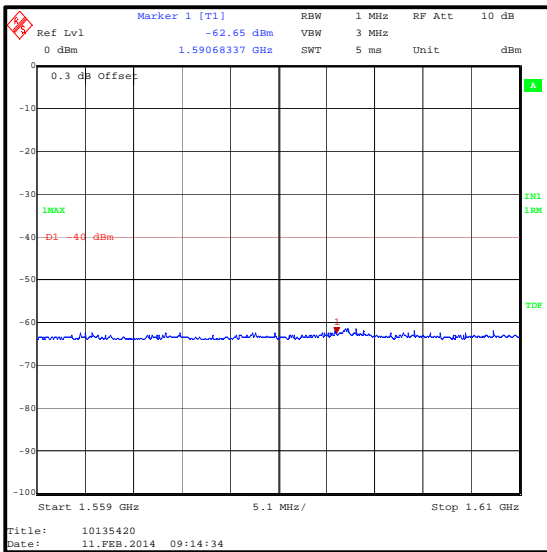
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1586.595	1	0	-61.30	-40.0	21.30	Complied
1595.078	1	25	-58.82	-40.0	18.82	Complied
1590.683	25	0	-62.65	-40.0	22.65	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

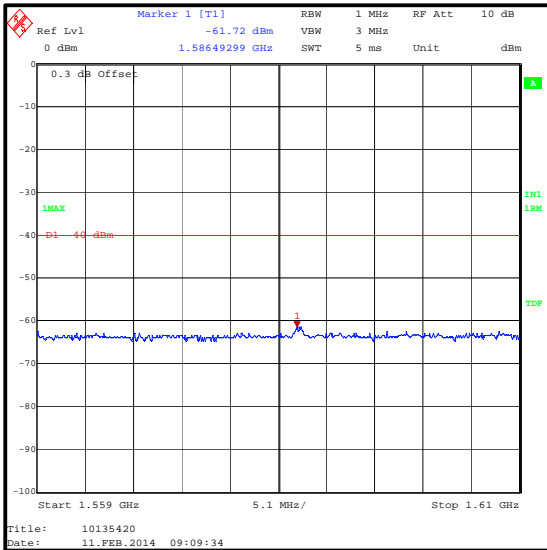


QPSK / 25 Resource Blocks

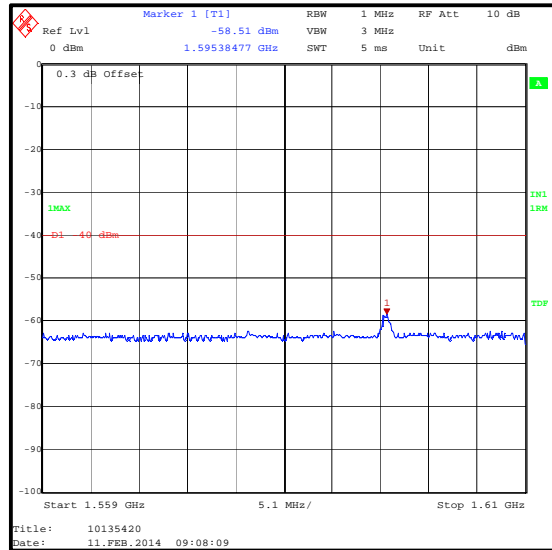
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (5 MHz Channel Bandwidth / 16QAM / Top Channel)

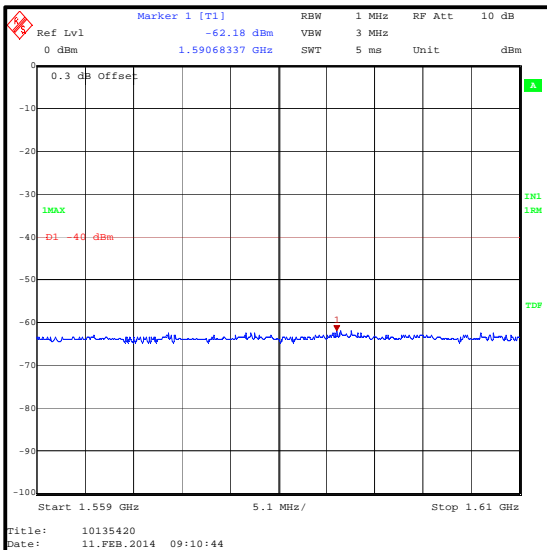
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1586.493	1	0	-61.72	-40.0	21.72	Complied
1595.385	1	25	-58.51	-40.0	18.51	Complied
1590.683	25	0	-62.18	-40.0	22.18	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

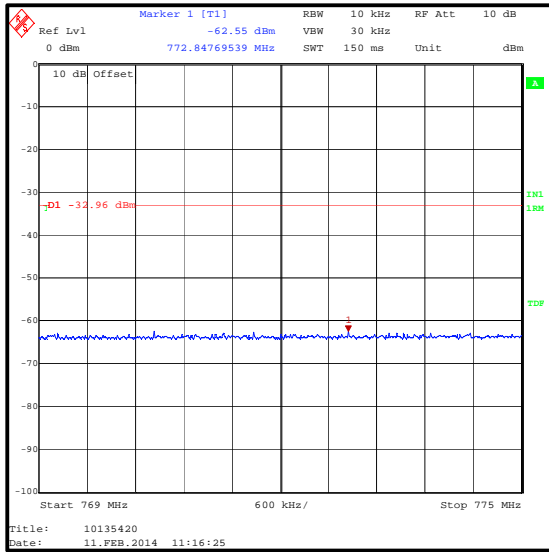


16QAM / 25 Resource Blocks

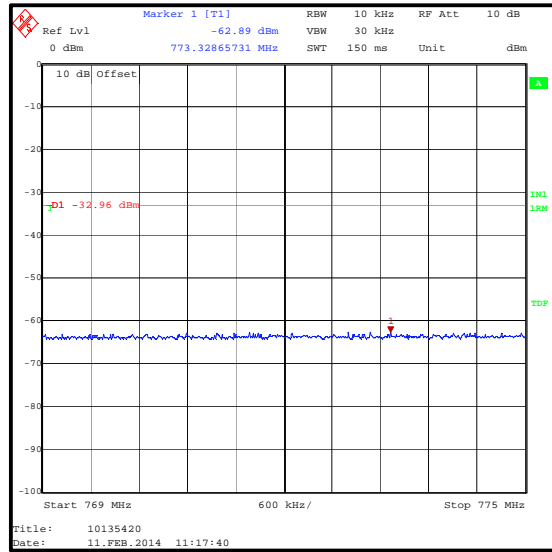
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (10 MHz Channel Bandwidth / QPSK / Single Channel)

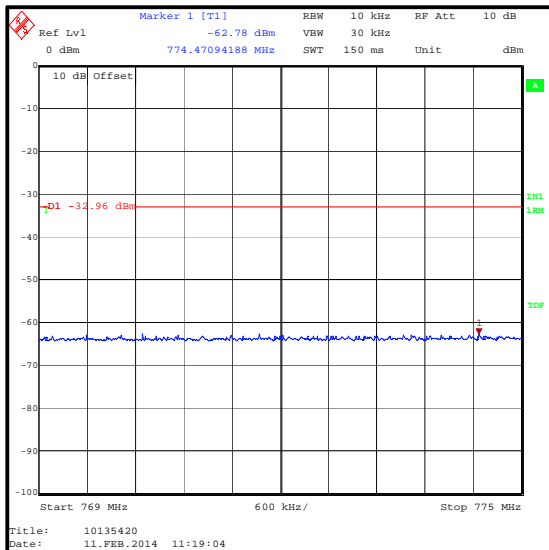
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
772.848	1	0	-62.55	-32.96	29.59	Complied
773.329	1	50	-62.89	-32.96	29.93	Complied
774.471	50	0	-62.78	-32.96	29.82	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

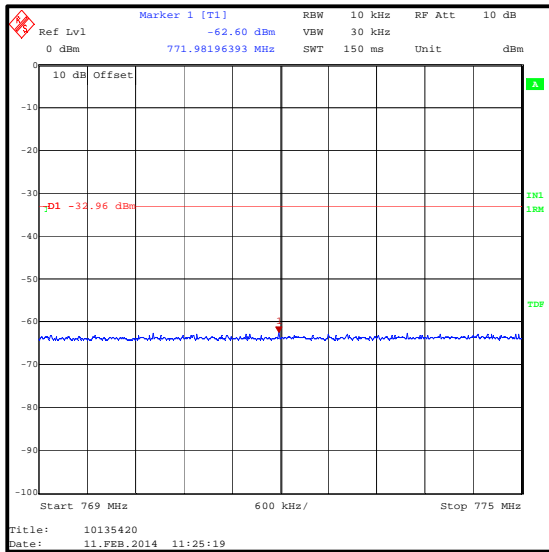


QPSK / 50 Resource Blocks

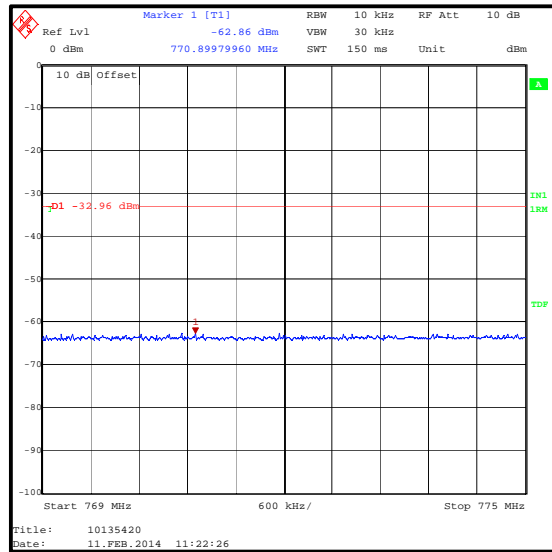
Transmitter Radiated Emissions Limitations (continued)

Results: 769 MHz to 775 MHz (10 MHz Channel Bandwidth / 16QAM / Single Channel)

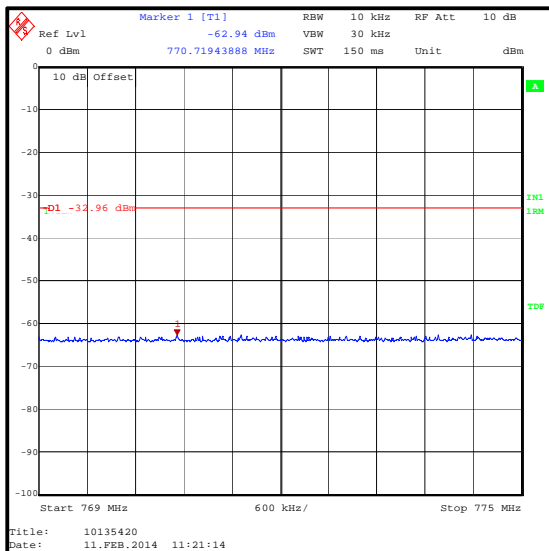
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
771.982	1	0	-60.60	-32.96	27.64	Complied
770.900	1	50	-62.86	-32.96	29.90	Complied
770.719	50	0	-62.94	-32.96	29.98	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)

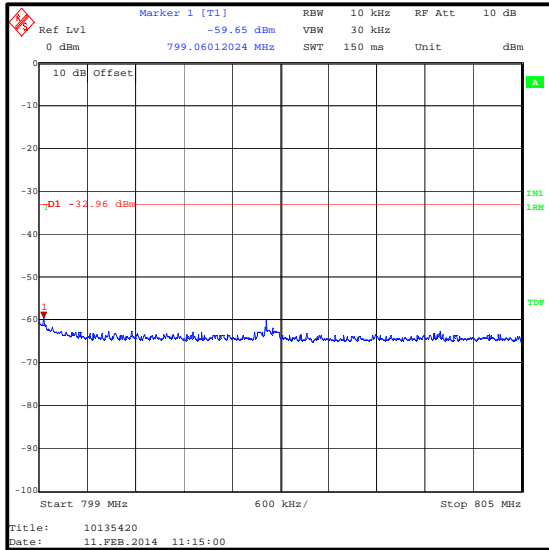


16QAM / 50 Resource Blocks

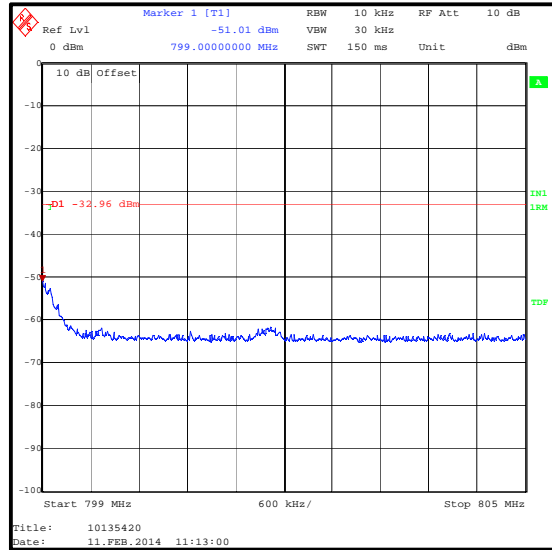
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (10 MHz Channel Bandwidth / QPSK / Single Channel)

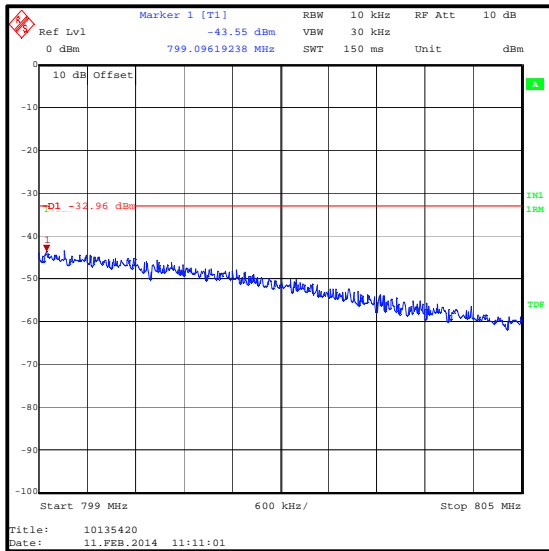
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.060	1	0	-59.65	-32.96	26.69	Complied
799.000	1	50	-51.01	-32.96	18.05	Complied
799.096	50	0	-43.55	-32.96	10.59	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

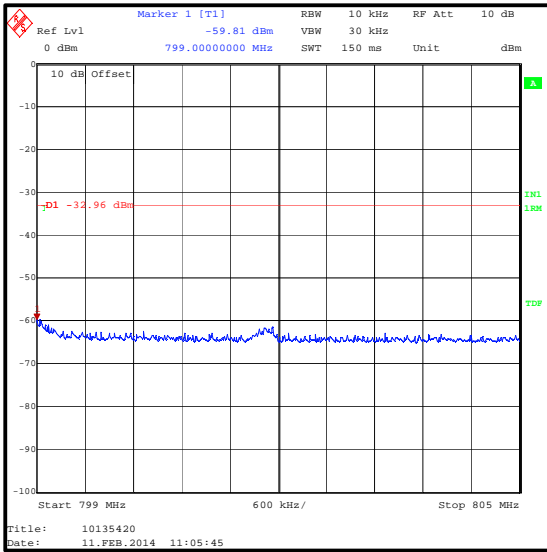


QPSK / 50 Resource Blocks

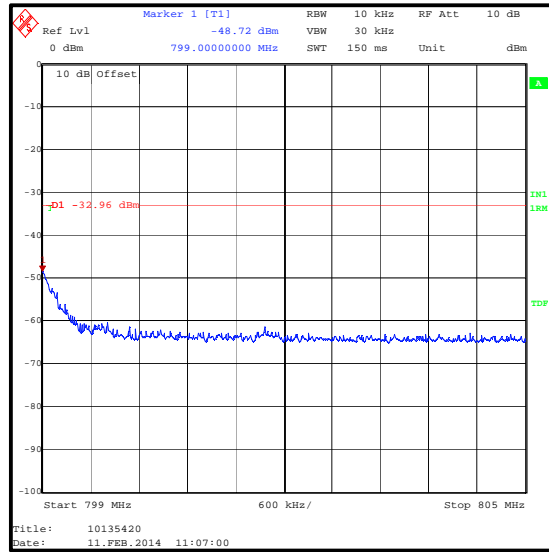
Transmitter Radiated Emissions Limitations (continued)

Results: 799 MHz to 805 MHz (10 MHz Channel Bandwidth / 16QAM / Single Channel)

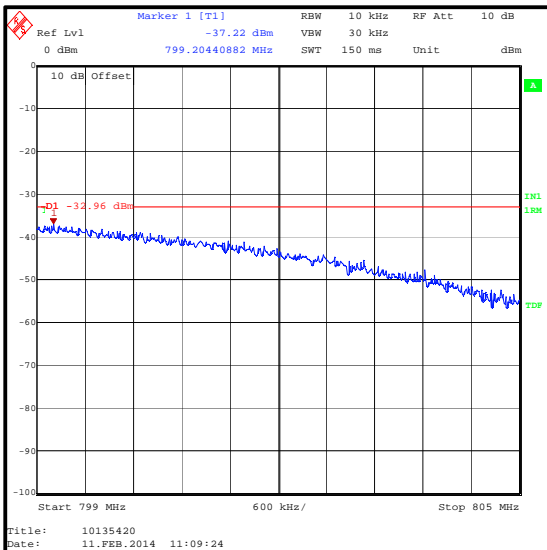
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
799.000	1	0	-59.81	-32.96	26.85	Complied
799.000	1	50	-48.72	-32.96	15.76	Complied
799.204	50	0	-37.22	-32.96	4.26	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)

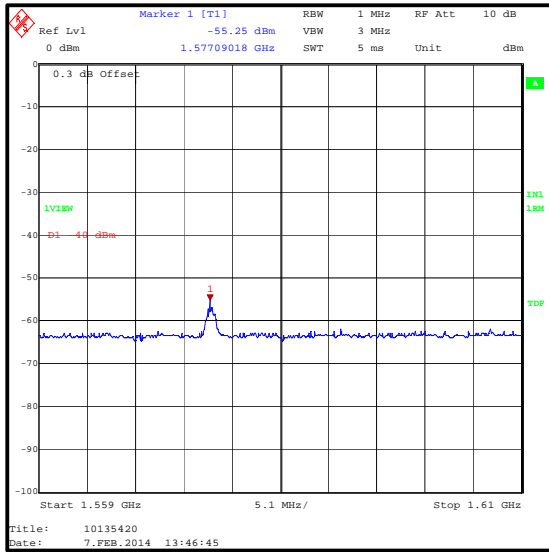


16QAM / 50 Resource Blocks

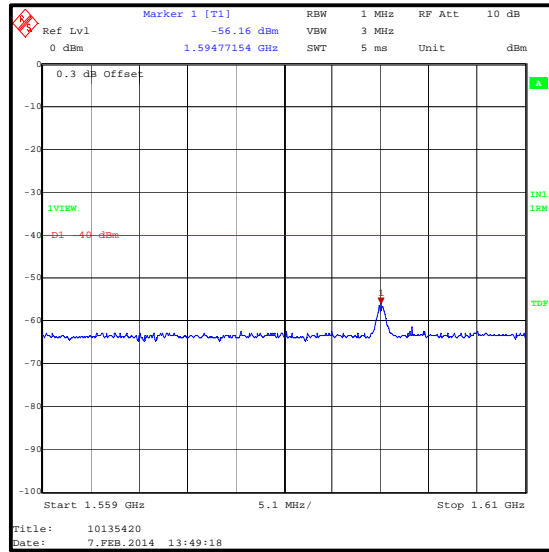
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (10 MHz Channel Bandwidth / QPSK / Single Channel)

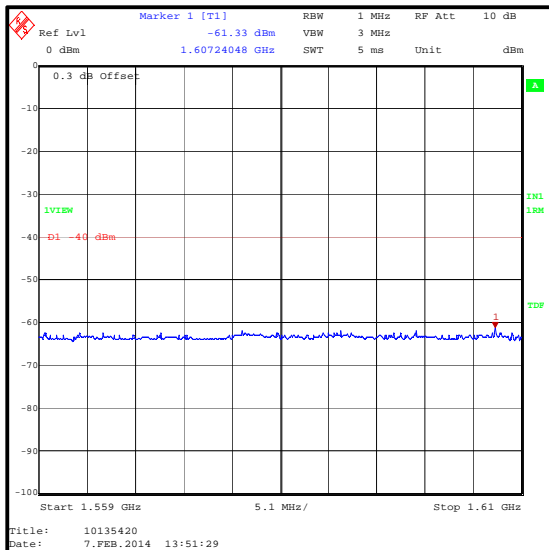
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1577.090	1	0	-55.3	-40.0	15.3	Complied
1594.772	1	50	-56.2	-40.0	16.2	Complied
1607.240	50	0	-61.3	-40.0	21.3	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

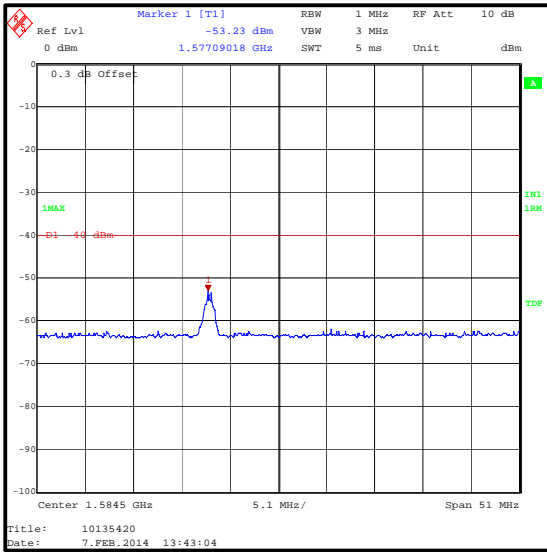


QPSK / 50 Resource Blocks

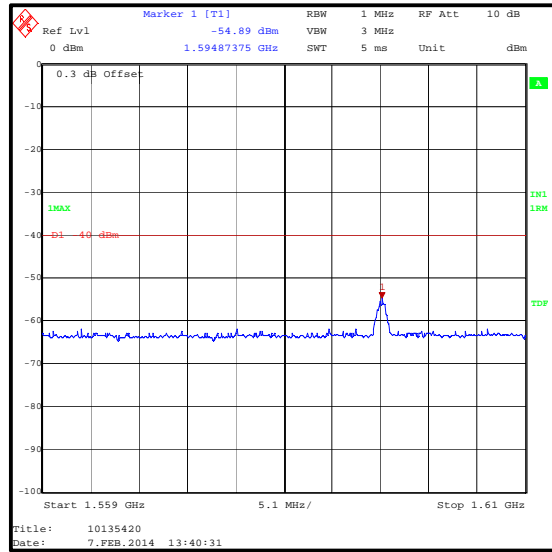
Transmitter Radiated Emissions Limitations (continued)

Results: 1559 MHz to 1610 MHz (10 MHz Channel Bandwidth / 16QAM / Single Channel)

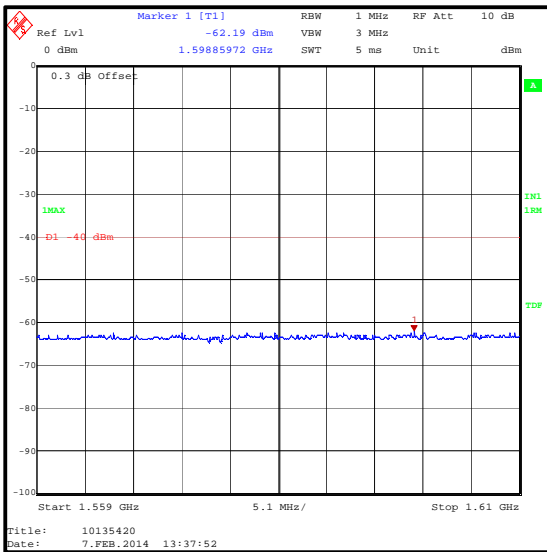
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1577.090	1	0	-53.2	-40.0	13.2	Complied
1594.874	1	50	-54.9	-40.0	14.9	Complied
1598.860	50	0	-62.2	-40.0	22.2	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)



16QAM / 50 Resource Blocks

Transmitter Radiated Emissions Limitations (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelpunkt	30.5015.06	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
G0543	Pre Amplifier	Sonoma Instrument Co.	310N	230801	15 Feb 2014	3
A1834	Attenuator	Hewlett Packard	8941B	10444	15 Nov 2014	12
A490	Antenna	Chase	CBL6111A	1590	09 Apr 2014	12
A1998	Attenuator	Huber & Suhner	6820.17.B	07101	05 Apr 2014	12
A1999	Attenuator	Huber & Suhner	6820.17.B	07101	05 Apr 2014	12
M1656	Thermohygrometer	JM Handelpunkt	30.5015.06	None stated	24 May 2014	12
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	14 Nov 2014	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A148	High Pass Filter	Filtronic	5H036	32218	17 May 2015	24

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

Test Engineer:	Nick Steele	Test Date:	11 February 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.543(e) and 2.1053
Test Method Used:	As detailed in KDB 971168 D01 Section 5.8. referencing FCC Part 2.1053

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	32

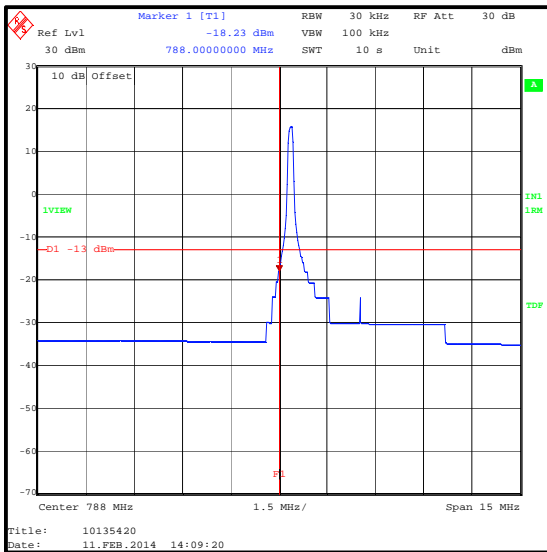
Note(s):

1. For radiated emissions testing, the customer supplied two OA-LTE-06-01-IPW antenna's, which were connected to the main and diversity ports. The antenna gain was declared as 2.5 dBi.
2. For 5 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 25. For single resource blocks, measurements were performed with the block starting of blocks 1 and 25.
3. For 10 MHz channel bandwidth the measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks of 1 and 50. For single resource blocks, measurements were performed with the block starting of blocks 1 and 50.
4. For measurements performed using a single resource block, as per 90.543(5), in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz was employed.

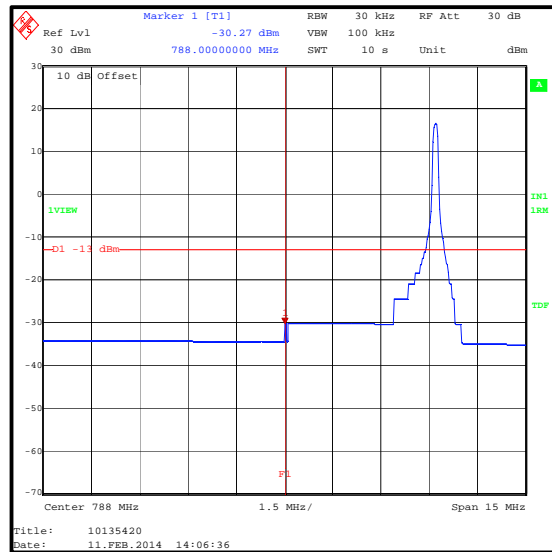
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

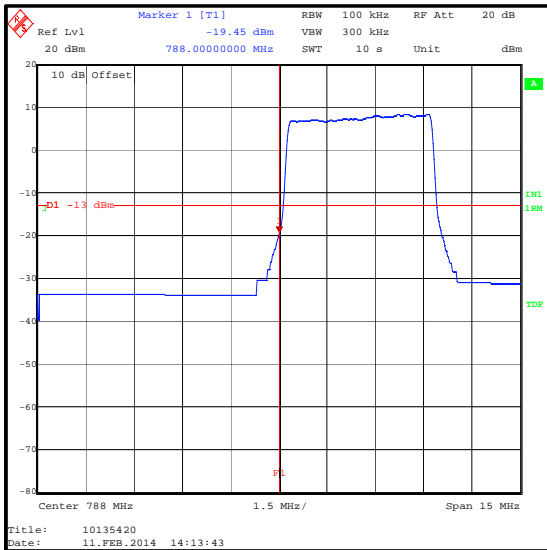
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
788	1	0	-18.2	-13.0	5.2	Complied
788	1	25	-30.3	-13.0	17.3	Complied
788	25	0	-19.5	-13.0	6.5	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

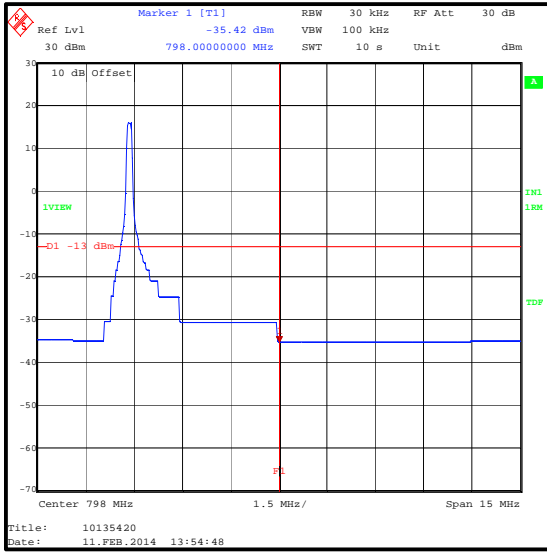


QPSK / Resource Block 25

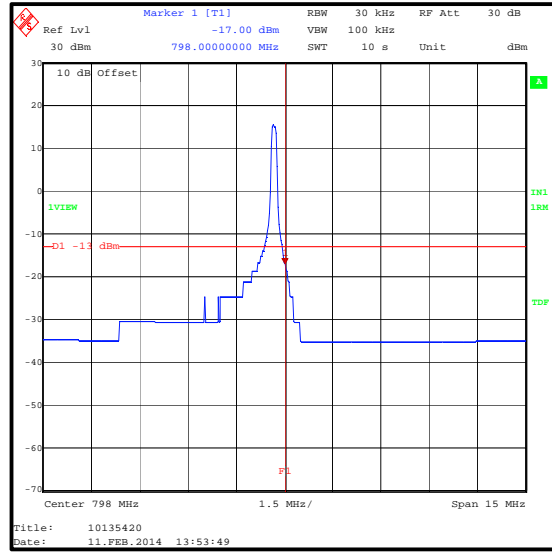
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

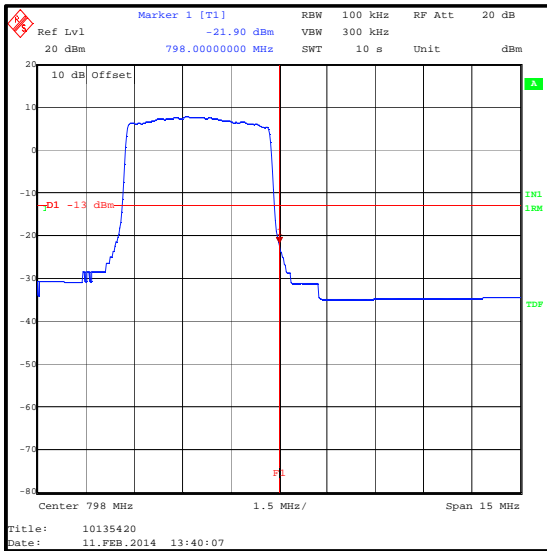
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
798	1	0	-35.4	-13.0	22.4	Complied
798	1	25	-17.0	-13.0	4.0	Complied
798	25	0	-21.9	-13.0	8.9	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (25 offset)

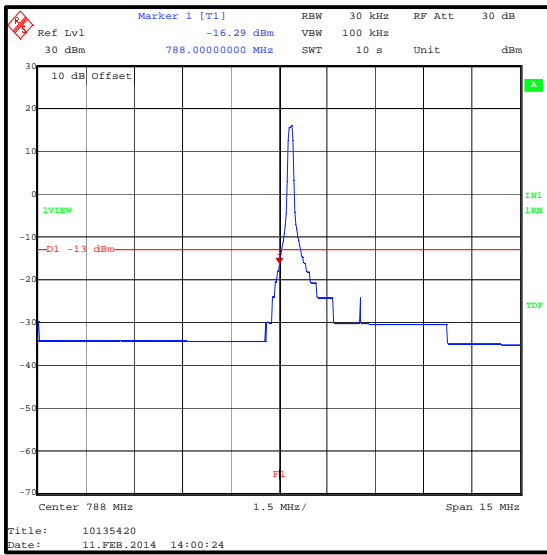


QPSK / Resource Block 25

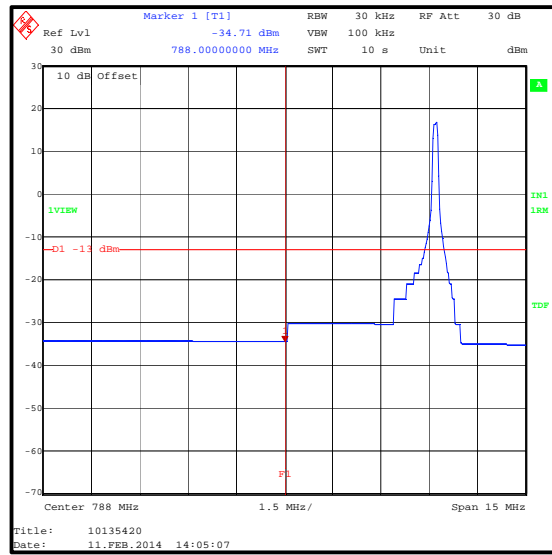
Transmitter Radiated Emissions at Band Edges (continued)

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

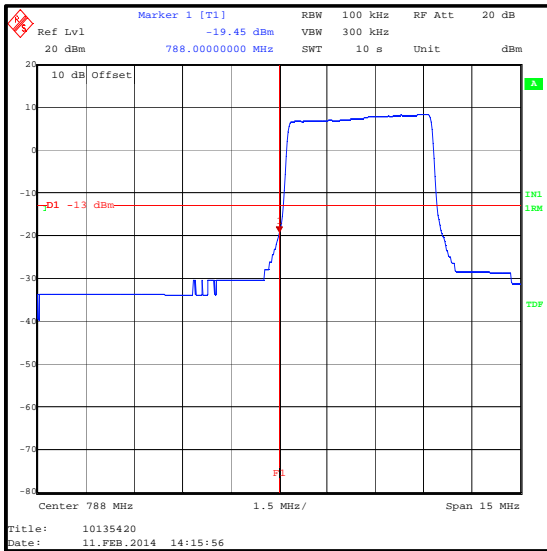
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
793	1	0	-16.3	-13.0	3.3	Complied
793	1	25	-34.7	-13.0	21.7	Complied
793	25	0	-19.5	-13.0	6.5	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

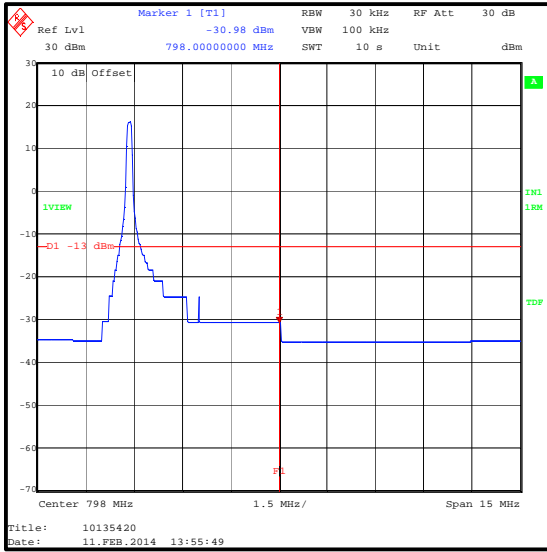


16QAM / Resource Block 25

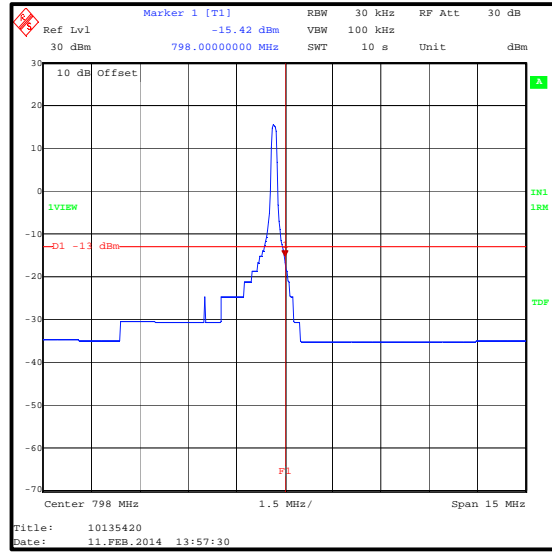
Transmitter Radiated Emissions at Band Edges (continued)

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

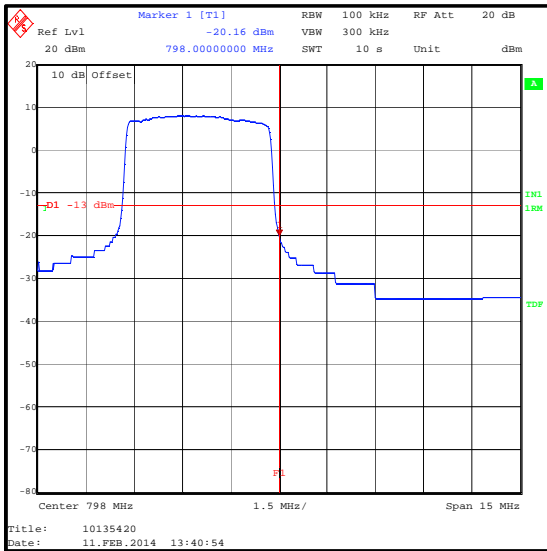
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
798	1	0	-31.0	-13.0	18.0	Complied
798	1	25	-15.4	-13.0	2.4	Complied
798	25	0	-20.2	-13.0	7.2	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (25 offset)

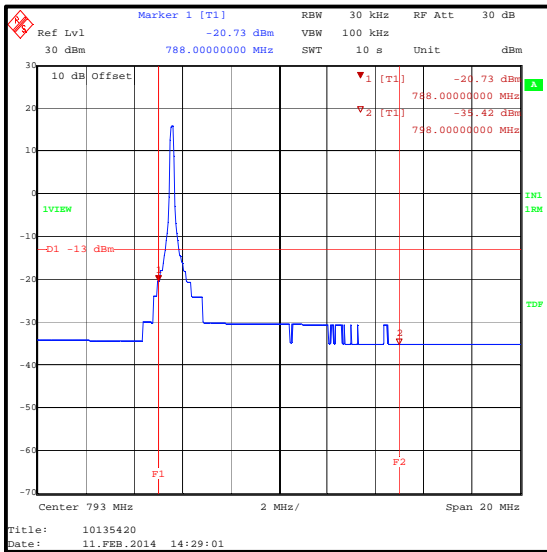


16QAM / Resource Block 25

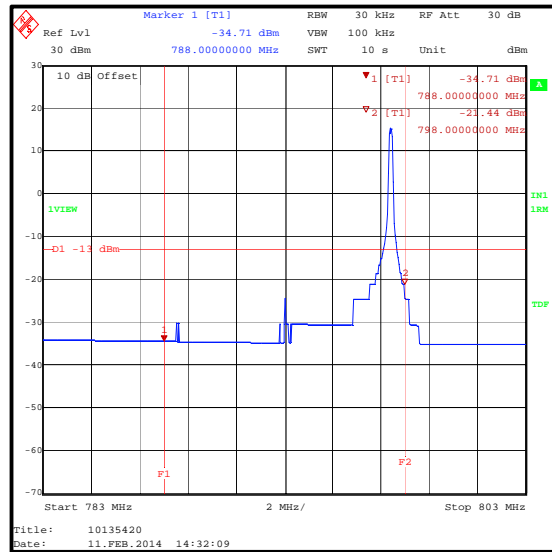
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / Single Channel / QPSK

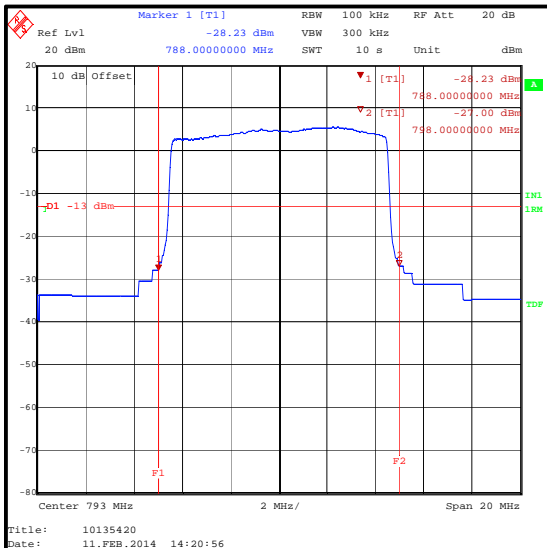
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
788	1	0	-20.7	-13.0	7.7	Complied
798	1	0	-35.4	-13.0	22.4	Complied
788	1	50	-34.7	-13.0	21.7	Complied
798	1	50	-21.4	-13.0	8.4	Complied
788	50	0	-28.2	-13.0	15.2	Complied
798	50	0	-27.0	-13.0	14.0	Complied



QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (50 offset)

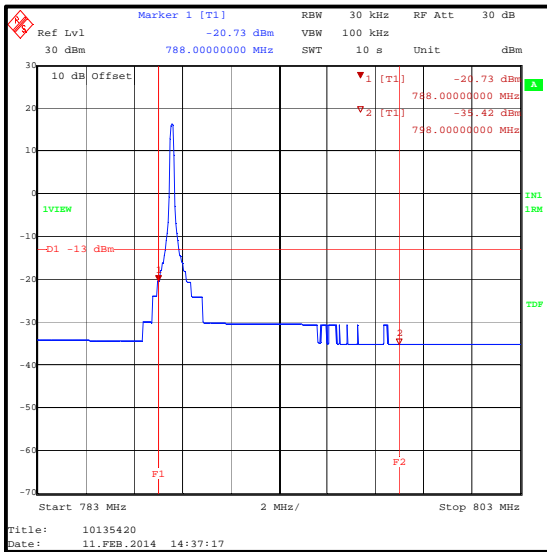


QPSK / Resource Block 50

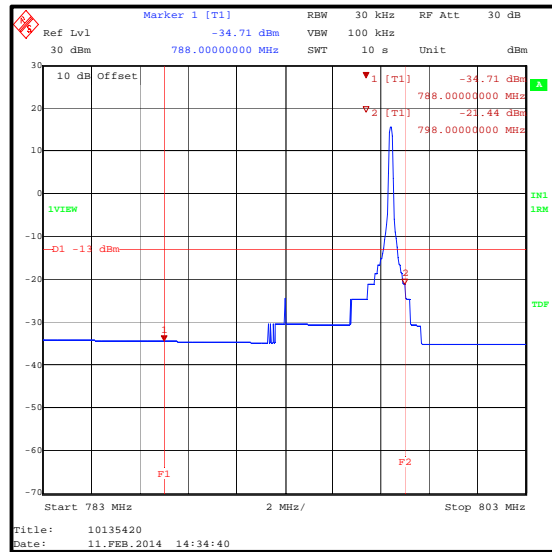
Transmitter Radiated Emissions at Band Edges (continued)

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

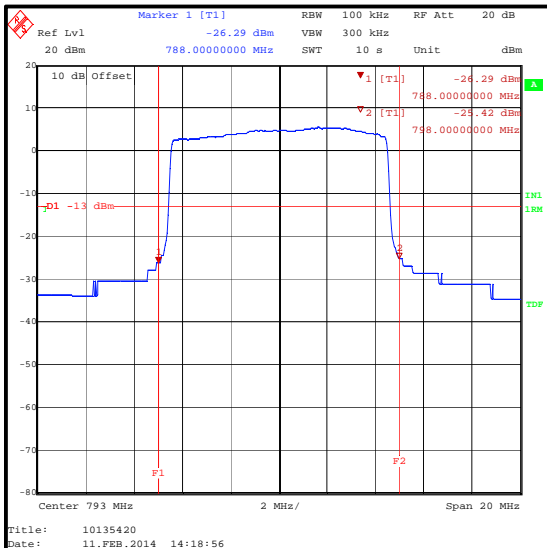
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
788	1	0	-20.7	-13.0	7.7	Complied
798	1	0	-35.4	-13.0	22.4	Complied
788	1	50	-34.7	-13.0	21.7	Complied
798	1	50	-21.4	-13.0	8.4	Complied
788	50	0	-26.3	-13.0	13.3	Complied
798	50	0	-25.4	-13.0	12.4	Complied



16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (50 offset)



16QAM / Resource Block 50

Transmitter Radiated Emissions at Band Edges (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
G0543	Pre Amplifier	Sonoma Instrument Co.	310N	230801	15 Feb 2014	3
A1834	Attenuator	Hewlett Packard	8941B	10444	15 Nov 2014	12
A490	Antenna	Chase	CBL6111A	1590	09 Apr 2014	12
A1998	Attenuator	Huber & Suhner	6820.17.B	07101	05 Apr 2014	12
A1999	Attenuator	Huber & Suhner	6820.17.B	07101	05 Apr 2014	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.06	None stated	24 May 2014	12
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
A288	Antenna	Chase	CBL6111A	1589	20 Aug 2014	12

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

Test Engineer:	Nick Steele	Test Date:	05 February 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	Parts 90.539(e) and 2.1055
Test Method Used:	As detailed in KDB 971168 D01 Section 9.0 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	37

Note(s):

1. Temperature was monitored throughout the test with a calibrated digital thermometer.
2. Measurements were made using a Rohde & Schwarz CMW 500 Wideband Radio Communication Tester.

Transmitter Frequency Stability (Temperature Variation) (continued)**Results:**

Temperature (°C)	Time after Start-up					
	0 minutes (MHz)	1 minute (MHz)	2 minutes (MHz)	3 minutes (MHz)	4 minutes (MHz)	5 minutes (MHz)
-30	793.000002	793.000003	792.999995	792.999991	793.000005	793.000002
-20	792.999993	793.000003	793.000012	793.000003	793.000002	793.000004
-10	792.999991	793.000010	792.999997	793.000001	792.999998	792.999996
0	793.000005	793.000003	793.000005	793.000001	792.999998	792.999997
10	793.000003	793.000010	793.000002	793.000003	793.000001	793.000003
20	792.999998	792.999996	793.000005	792.999993	792.999991	792.999994
30	792.999993	793.000011	793.000008	793.000007	793.000003	793.000008
40	793.000006	793.000000	793.000006	793.000003	793.000004	792.999997
50	792.999996	793.000003	792.999998	792.999994	792.999998	792.999996

Temperature (°C)	Time after Start-up				
	6 minutes (MHz)	7 minutes (MHz)	8 minutes (MHz)	9 minutes (MHz)	10 minutes (MHz)
-30	792.999998	792.999996	792.999993	792.999997	792.999997
-20	792.999998	792.999997	792.999997	792.999996	792.999995
-10	792.999994	792.999997	792.999998	792.999999	792.999997
0	793.000000	792.999997	793.000003	793.000004	793.000006
10	793.000006	793.000010	793.000007	793.000006	793.000003
20	792.999996	792.999990	792.999992	792.999995	792.999993
30	793.000009	793.000003	792.999998	792.999996	792.999997
40	792.999996	792.999997	792.999995	793.000000	793.000001
50	792.999992	792.999995	792.999992	792.999990	792.999992

Frequency with Worst Case Deviation (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
793.000012	12	0.015	1.250	1.235	Complied

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

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1658	Radio Comms Tester	Rohde & Schwarz	CMW 500	1201.0002K5 0-117255-XP	21 Aug 2014	12
E013	Environmental Chamber	Sanyo	MTH-4200PR	None stated	Calibrated before use	-
M1643	Thermometer	Fluke	52II	18890136	01 Mar 2014	12
G088	DC Power Supply	Thurlby Thandar	CPX200	100700	Calibrated before use	-
M1229	Multimeter	Fluke	179	87640015	26 Jun 2014	12

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

Test Engineer:	Nick Steele	Test Date:	05 February 2014
Test Sample Serial Number:	AMWGB40001F12		

FCC Reference:	90.539(e) and 2.1055
Test Method Used:	As detailed in KDB 971168 D01 Section 9.0 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	37

Note(s):

1. Voltage was monitored throughout the test with a calibrated digital voltmeter.
2. Measurements were made using a Rohde & Schwarz CMW 500 Wideband Radio Communication Tester.

Results:

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.0	792.999997	3	0.004	1.250	1.246	Complied
3.6	792.999999	1	0.001	1.250	1.249	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	24 May 2014	12
M1658	Radio Comms Tester	Rohde & Schwarz	CMW 500	1201.0002K5 0-117255-XP	21 Aug 2014	12
G088	DC Power Supply	Thurlby Thandar	CPX200	100700	Calibrated before use	-
M1229	Multimeter	Fluke	179	87640015	26 Jun 2014	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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±4.69 dB
Occupied Bandwidth	788 MHz to 798 MHz	95%	±3.92 %
Conducted Carrier Output Power	788 MHz to 798 MHz	95%	±1.13 dB
Transmitter Conducted Emissions Mask	788 MHz to 798 MHz	95%	±2.62 dB
Conducted Emissions	9 kHz to 8 GHz	95%	±2.62 dB
Radiated Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Emissions	1 GHz to 8 GHz	95%	±2.94 dB
Frequency Stability	793 MHz to 798 MHz	95%	±0.92 ppm

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	-	-	Antenna gain updated in section 5.2.1

--- END OF REPORT ---