TEST REPORT

Test Report No. : UL-RPT-RP10014948JD07A

Manufacturer	:	Sony Mobile Communications AB
Type No.	:	PM-0450-BV
FCC ID	:	PY7PM-0450
Technology	:	LTE – Band 7
Test Standard(s)	:	FCC Part 27 Subpart C

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 1.0

Date of Issue: 22 July 2013

Checked by:

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WiSE Laboratory Engineer

Issued by :

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Group Quality Manager, WiSE
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ilac-MRA UKAS TESTING 0644

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

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1. Customer Information

Company Name:	Sony Mobile Communications AB
Address:	Nya Vattentornet Lund SE-221 88 Sweden

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR27
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 27 Subpart C (Miscellaneous Wireless Communication Services)
Site Registration:	FCC: 209735
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	01 July 2013 to 18 July 2013

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
2.1046 / 27.50(h)(2)	Transmitter Output Power (EIRP)	✓
2.1049	Transmitter Occupied Bandwidth	✓
2.1053 / 27.53(m)(4)	Transmitter Radiated Spurious Emissions	✓
2.1053 / 27.53(m)(4)	Transmitter Radiated Emissions at Band Edges	✓
2.1053 / 27.53(m)(4)	Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz	✓
2.1055 / 27.54	Transmitter Frequency Stability (Temperature and Voltage Variation)	✓

Key to Results

✓ **= Complied** ✗ **= Did not comply**

2.3. Methods and Procedures

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

2.4. Deviations from the Test Specification

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

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Sony
IMEI:	004402451217222 *(Radiated Sample)*
Serial Number:	CB5124TU35
Hardware Version Number:	AP2
Software Version Number:	14.1.G.1.241
FCC ID:	PY7PM-0450

Brand Name:	Sony
IMEI:	004402451215481 *(Conducted Sample #1)*
Serial Number:	CB5124TU0Y
Hardware Version Number:	AP2
Software Version Number:	14.1.G.1.241
FCC ID:	PY7PM-0450

Brand Name:	Sony
IMEI:	004402451226637 *(Conducted Sample #2)*
Serial Number:	CB5124VWHC
Hardware Version Number:	AP2
Software Version Number:	14.1.G.1.241
FCC ID:	PY7PM-0450

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

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

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

Identification of Equipment Under Test (EUT) (continued)

Brand Name:	Sony
Description:	Magnetic Plug
Model Name or Number:	EC801

Brand Name:	Sony
Description:	USB cable
Model Name or Number:	EC21

Brand Name:	Sony
Description:	PHF
Model Name or Number:	MH750

3.2. Description of EUT

The equipment under test (EUT) is a model of GSM/UMTS/LTE mobile phone with integrated antenna and inbuilt Li-Polymer battery.
The EUT supports GSM 850/900/1800/1900MHz bands, WCDMA FDD bands 1/2/4/5/8 and LTE FDD bands 1/2/3/4/5/7/8/20. It also supports GPRS service with multi-slots class 33 and EGPRS service with multi-slots class 33 too. The HSDPA and HSUPA features are also supported. It has MP3, camera, FM radio, USB memory, GPS receiver, NFC, Mobile High-Definition Link (MHL), Bluetooth (EDR and Bluetooth 4.0), WLAN (802.11 a/b/g/n/ac) and Wi-Fi hotspot functions.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Tested Technology:	LTE Band 7		
Type of Equipment	Transceiver		
Channel Bandwidth:	5 MHz, 10 MHz, 15 MHz & 20 MHz		
Modulation Type:	QPSK & 16QAM		
Duty Cycle:	100%		
Antenna Gain:	-3.0 dBi		
Power Supply Requirement:	Nominal	3.8 V	
Transmit Frequency Range:	2500 MHz to 2570 MHz		
Channels Tested:	**Channel Bandwidth**	**N_{ul}**	**Frequency of Uplink (MHz)**
Bottom Channel	5	20775	2502.5
	10	20800	2505.0
	15	20825	2507.5
	20	20850	2510.0
Middle Channel	All	21100	2535.0
Top Channel	5	21425	2567.5
	10	21400	2565.0
	15	21375	2562.5
	20	21350	2560.0

3.5. Support Equipment

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

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

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

Brand Name:	Not marked or stated
Description:	Voltage variation jig
Model Name or Number:	Not marked or stated
Serial Number:	310119

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

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

4.2. Configuration and Peripherals

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

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

  Pre-scans below 1 GHz were performed in both configurations 1 and 2, with final measurements limited to the configuration which provided worst case results. Pre-scans above 1 GHz were performed in the configuration that employed the most accessories (Configuration 1), with any final measurements being performed in both configurations.
- Transmitter radiated spurious emissions tests were performed with the EUT was set to transmit with a 20 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset. This was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.
- The EUT was supplied with an RF conducted port and external RF cable, to allow conducted measurements to be performed where necessary.
- Testing at temperature and voltage extremes was performed using a voltage variation jig and adaptor supplied by the Customer. The adaptor plugs onto the handset in place of the battery connector.
- The voltage variation jig and adaptor were used for conducted measurements set at the nominal voltage.
- The conducted sample with IMEI 004402451215481 was used for frequency stability measurements.
- The conducted sample with IMEI 004402451226637 was used for conducted output power and occupied bandwidth measurements.
- The radiated sample with IMEI 004402451217222 was used for all radiated measurements.

4.3. Resource Block Allocation

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

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

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

Transmitter Radiated Emissions testing was carried out using sub test 1, with a 20 MHz channel bandwidth and QPSK modulation scheme, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.

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

Transmitter Radiated Band Edge +/- 5.5 MHz Emissions was tested with sub tests 1, 2 and 4 on all supported channel bandwidths, using QPSK and 16QAM modulations. These sub-bands were selected as they include the resource block allocations closest to the edge of the bands.

Transmitter Frequency Stability test was carried out with sub test 4, with a channel bandwidth of 5 MHz only.

5. Measurements, Examinations and Derived Results

5.1. General Comments

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

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

5.2. Test Results

5.2.1. Transmitter Output Power (EIRP)

Test Summary:

Test Engineer:	Ben Mercer	**Test Date:**	09 July 2013
Test Sample IMEI:	004402451226637		

FCC Reference:	Parts 2.1046 & 27.50(h)(2)
Test Method Used:	As detailed in FCC KDB 971168 D01 Section 5.2.1

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	38

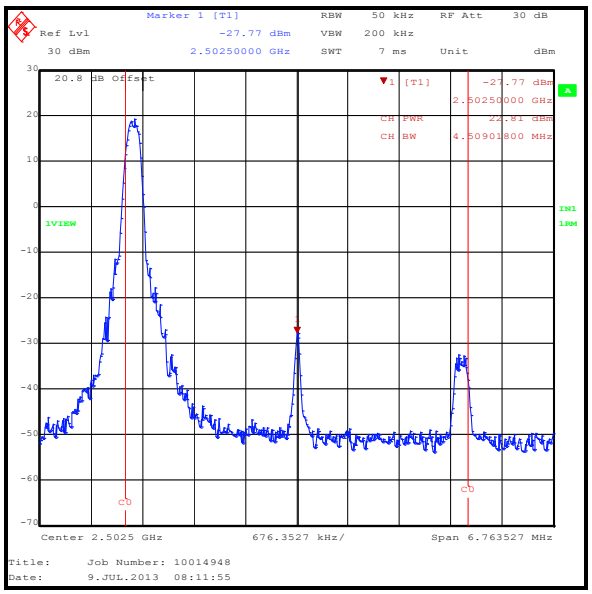
Note(s):

1. The Customer stated that the antenna gain is -3.0 dBi.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed in section 4.3 of this report.

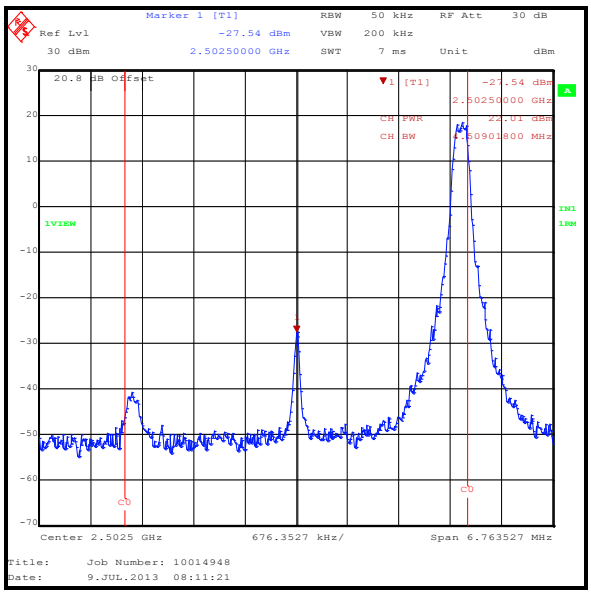
Transmitter Output Power (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

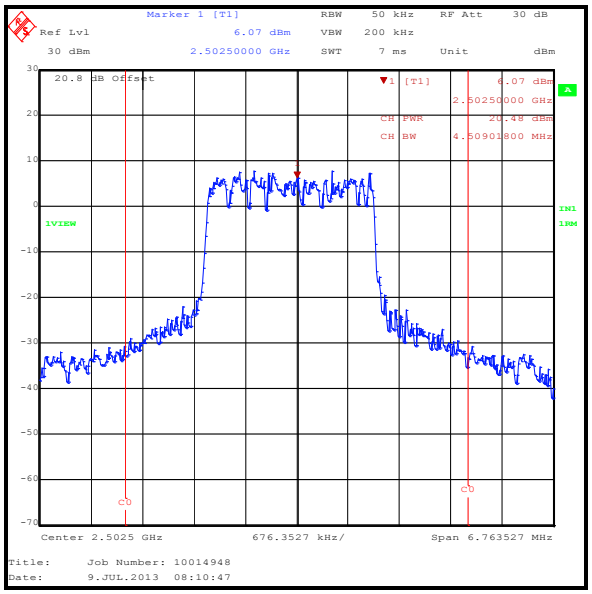
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2502.5	1	0	22.8	-3.0	19.8	33.0	13.2	Complied
2502.5	1	24	22.0	-3.0	19.0	33.0	14.0	Complied
2502.5	12	6	20.5	-3.0	17.5	33.0	15.5	Complied
2502.5	25	0	20.3	-3.0	17.3	33.0	15.7	Complied



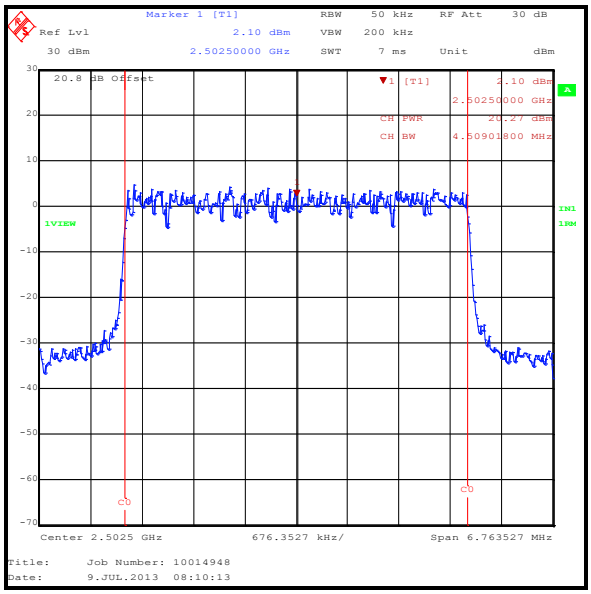
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (24 offset)



QPSK / 12 Resource Blocks (6 offset)

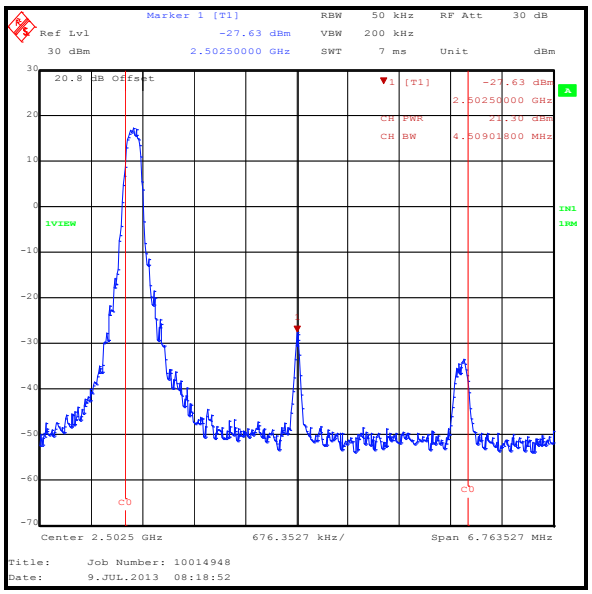


QPSK / 25 Resource Blocks (0 offset)

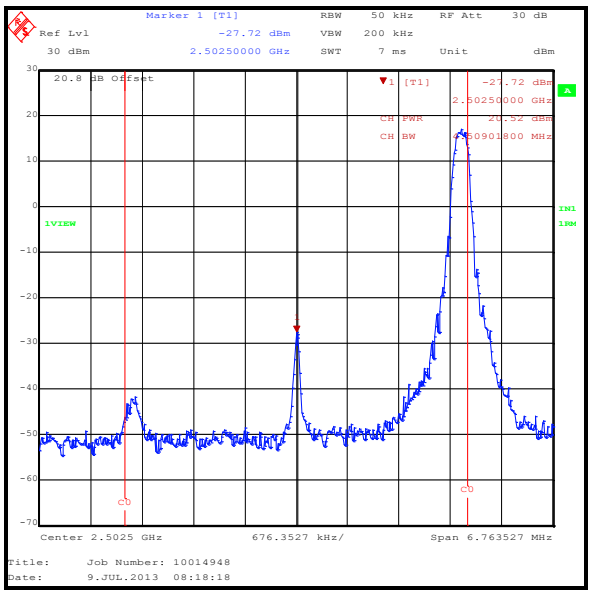
Transmitter Output Power (EIRP) (continued)

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

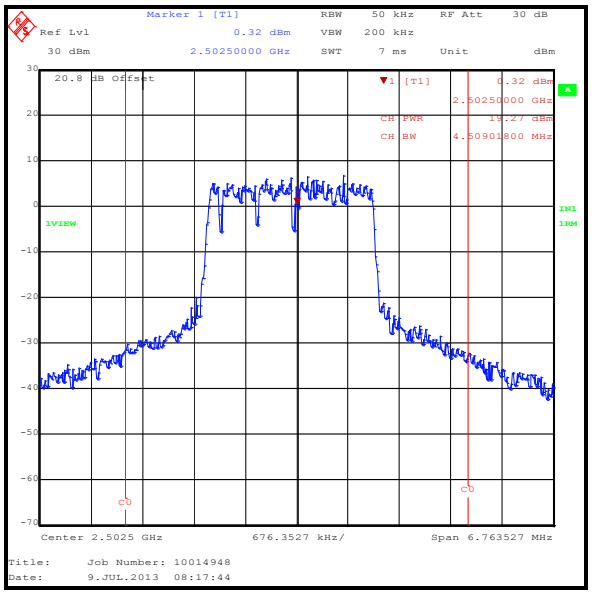
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2502.5	1	0	21.3	-3.0	18.3	33.0	14.7	Complied
2502.5	1	24	20.5	-3.0	17.5	33.0	15.5	Complied
2502.5	12	6	19.3	-3.0	16.3	33.0	16.7	Complied
2502.5	25	0	19.3	-3.0	16.3	33.0	16.7	Complied



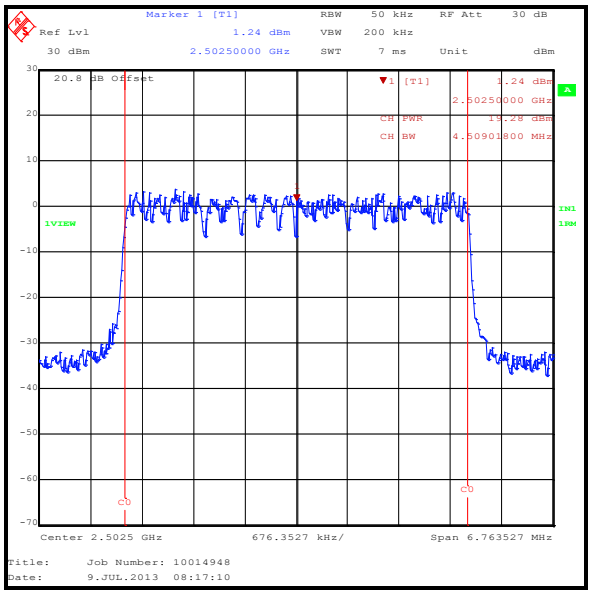
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (24 offset)



16QAM / 12 Resource Blocks (6 offset)

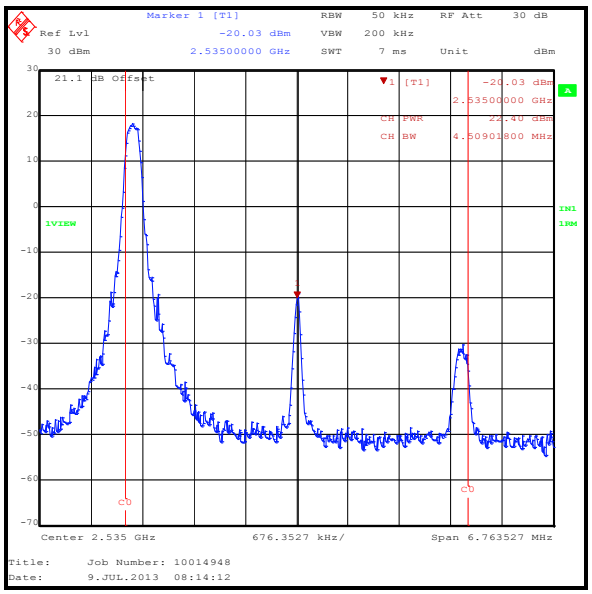


16QAM / 25 Resource Blocks (0 offset)

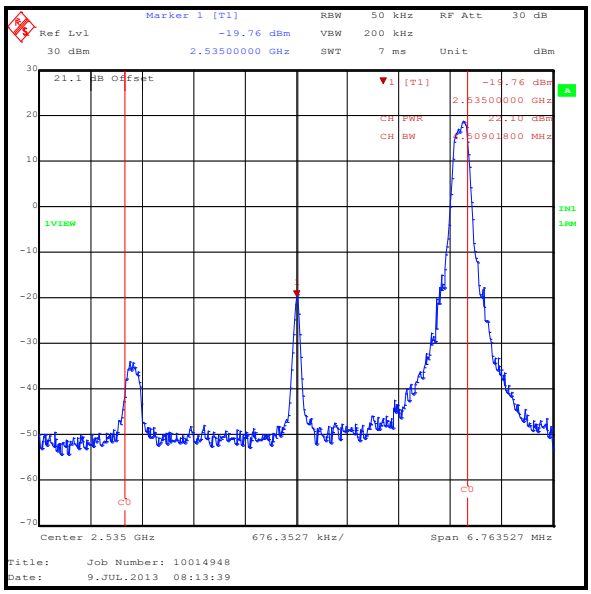
Transmitter Output Power (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

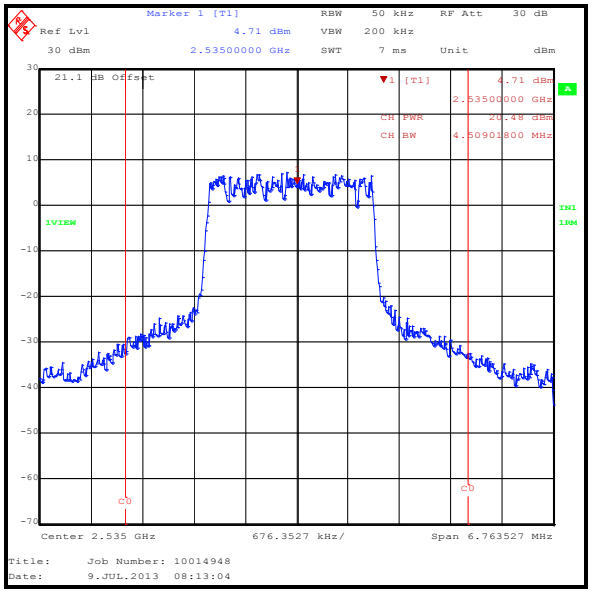
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	22.4	-3.0	19.4	33.0	13.6	Complied
2535	1	24	22.1	-3.0	19.1	33.0	13.9	Complied
2535	12	6	20.5	-3.0	17.5	33.0	15.5	Complied
2535	25	0	20.4	-3.0	17.4	33.0	15.6	Complied



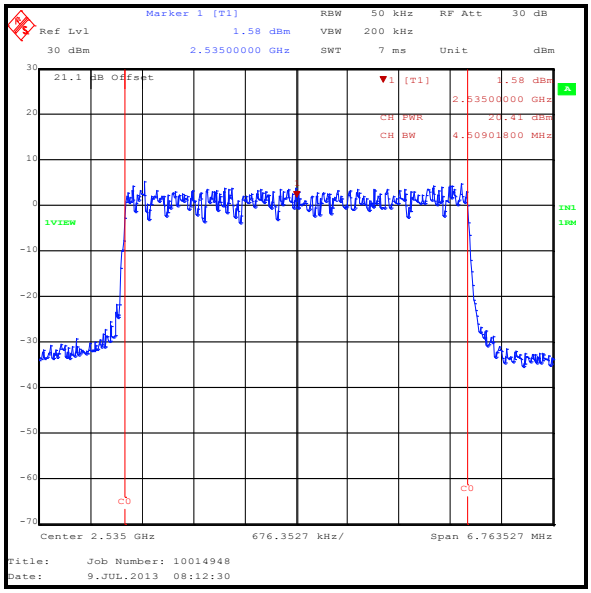
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (24 offset)



QPSK / 12 Resource Blocks (6 offset)

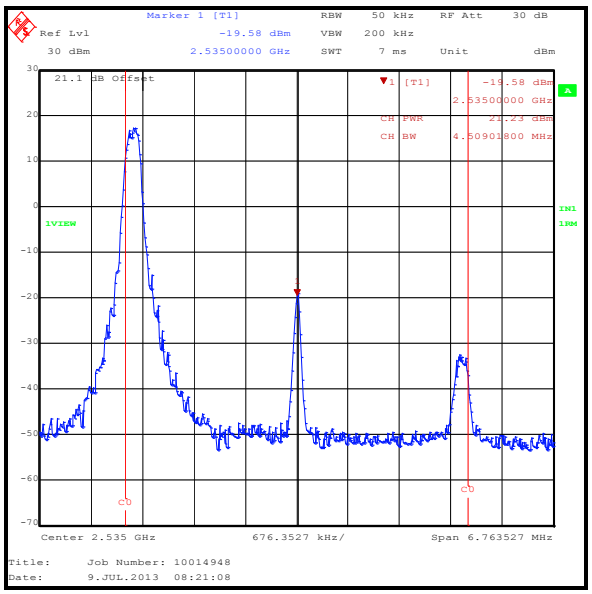


QPSK / 25 Resource Blocks (0 offset)

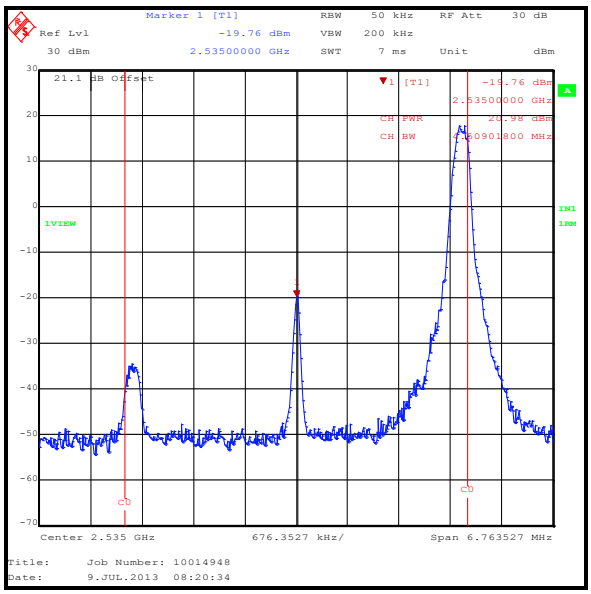
Transmitter Output Power (EIRP) (continued)

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

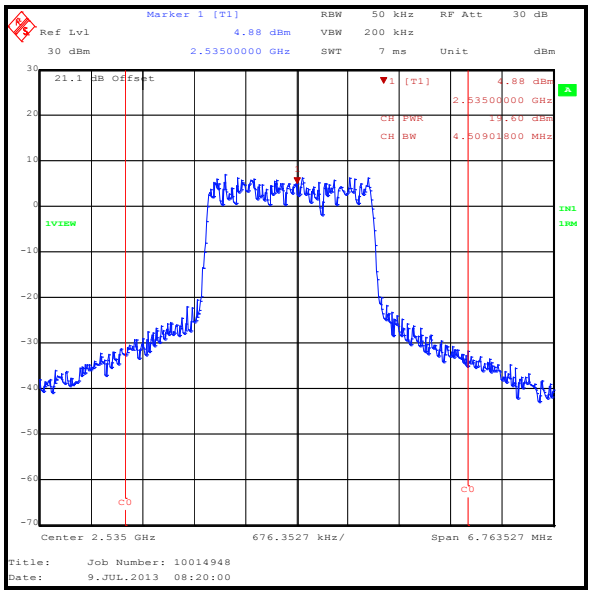
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	21.2	-3.0	18.2	33.0	14.8	Complied
2535	1	24	21.0	-3.0	18.0	33.0	15.0	Complied
2535	12	6	19.6	-3.0	16.6	33.0	16.4	Complied
2535	25	0	19.3	-3.0	16.3	33.0	16.7	Complied



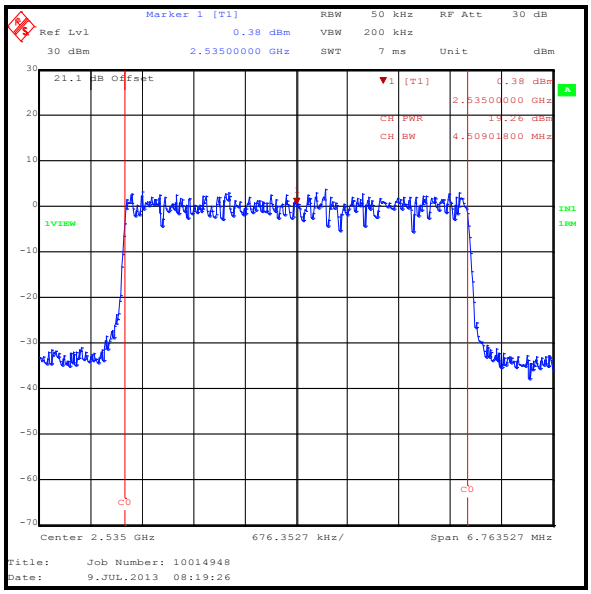
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (24 offset)



16QAM / 12 Resource Blocks (6 offset)

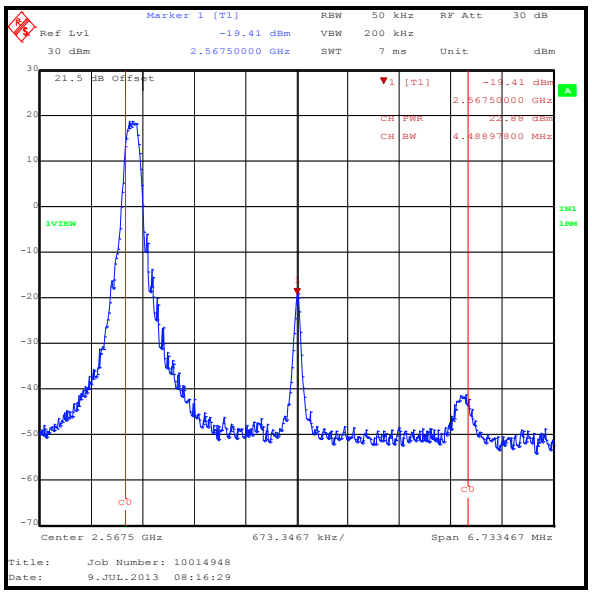


16QAM / 25 Resource Blocks (0 offset)

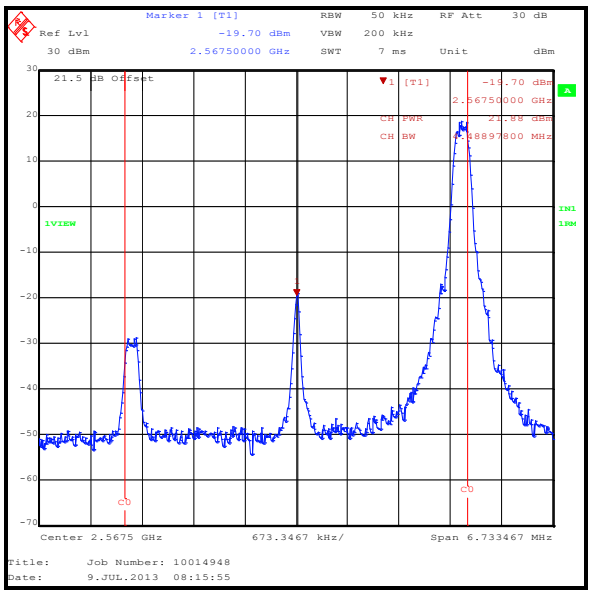
Transmitter Output Power (EIRP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

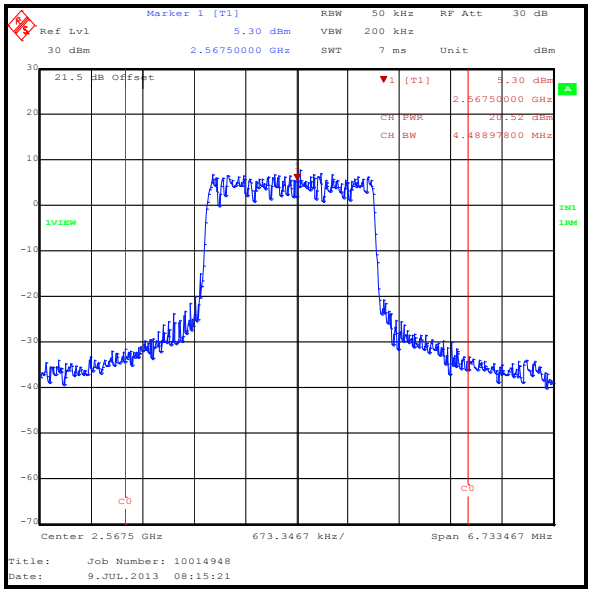
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2567.5	1	0	22.9	-3.0	19.9	33.0	13.1	Complied
2567.5	1	24	21.9	-3.0	18.9	33.0	14.1	Complied
2567.5	12	6	20.5	-3.0	17.5	33.0	15.5	Complied
2567.5	25	0	20.4	-3.0	17.4	33.0	15.6	Complied



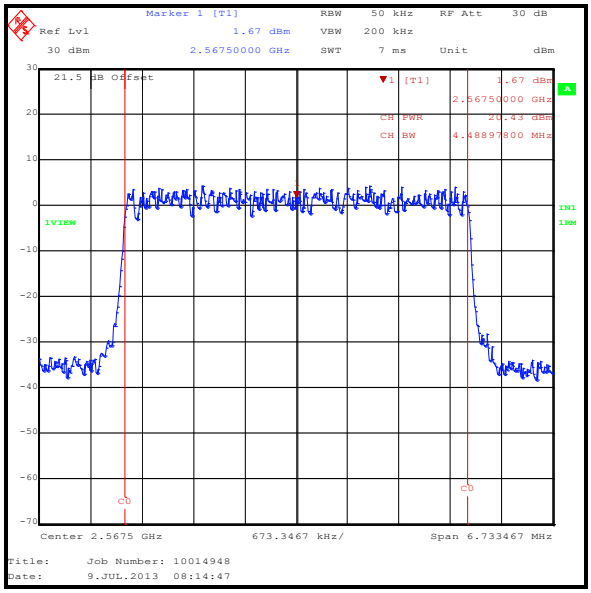
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (24 offset)



QPSK / 12 Resource Blocks (6 offset)

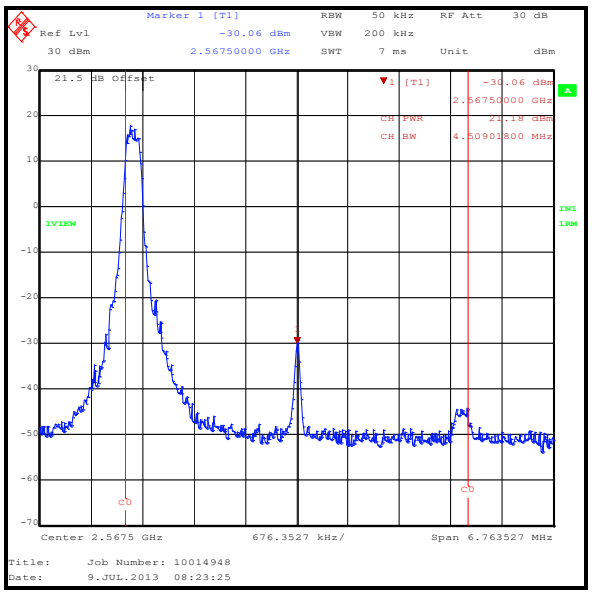


QPSK / 25 Resource Blocks (0 offset)

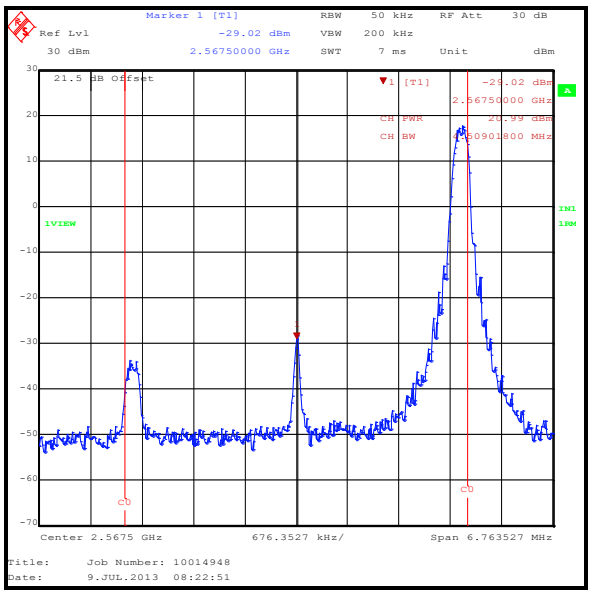
Transmitter Output Power (EIRP) (continued)

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

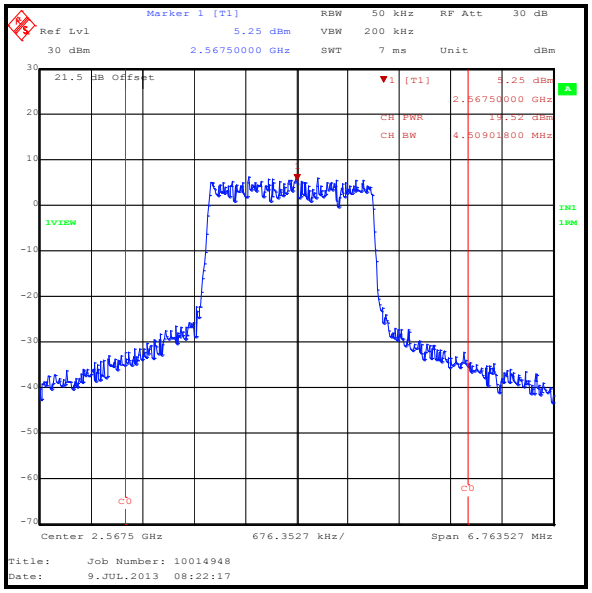
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2567.5	1	0	21.2	-3.0	18.2	33.0	14.8	Complied
2567.5	1	24	21.0	-3.0	18.0	33.0	15.0	Complied
2567.5	12	6	19.5	-3.0	16.5	33.0	16.5	Complied
2567.5	25	0	19.4	-3.0	16.4	33.0	16.6	Complied



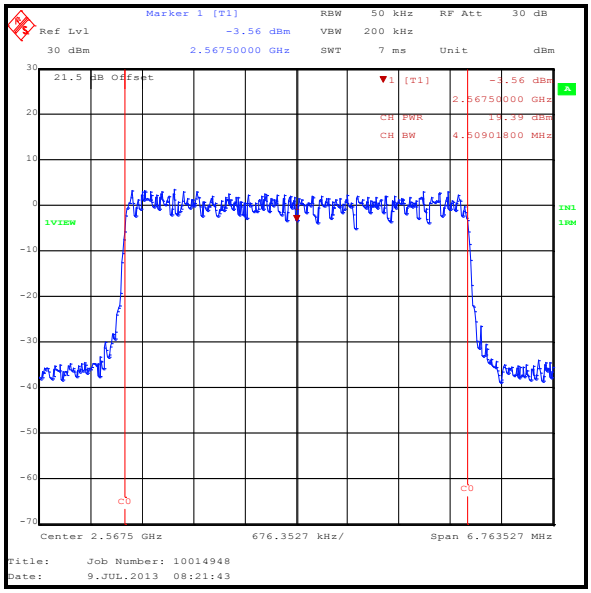
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (24 offset)



16QAM / 12 Resource Blocks (6 offset)

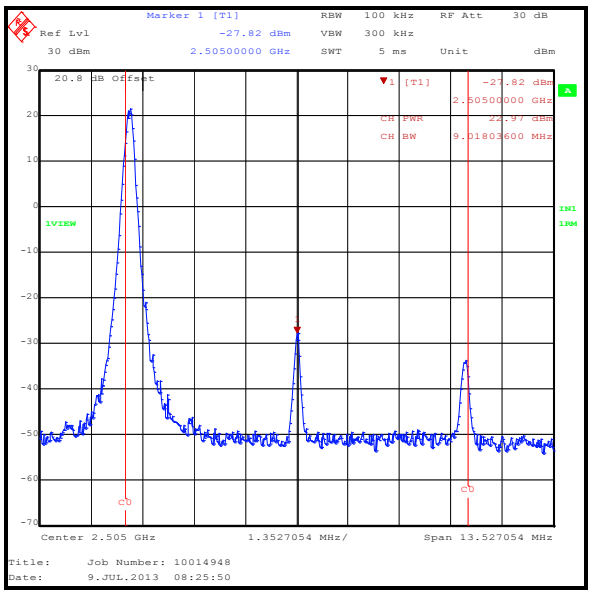


16QAM / 25 Resource Blocks (0 offset)

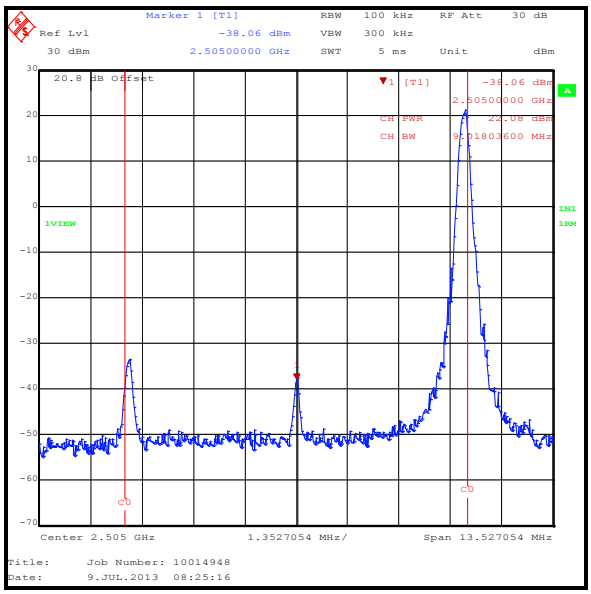
Transmitter Output Power (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK

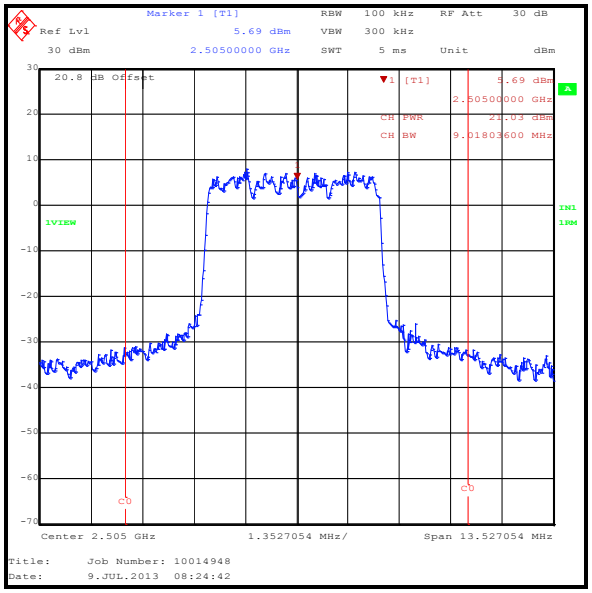
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2505	1	0	23.0	-3.0	20.0	33.0	13.0	Complied
2505	1	49	22.1	-3.0	19.1	33.0	13.9	Complied
2505	25	12	21.0	-3.0	18.0	33.0	15.0	Complied
2505	50	0	20.9	-3.0	17.9	33.0	15.1	Complied



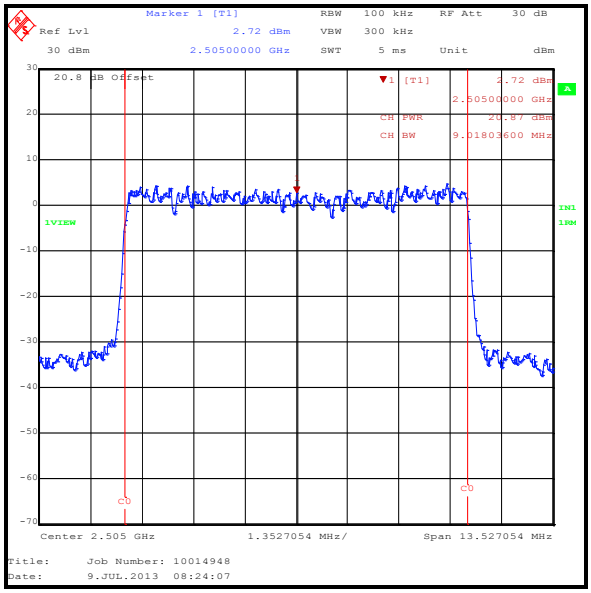
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (49 offset)



QPSK / 25 Resource Blocks (12 offset)

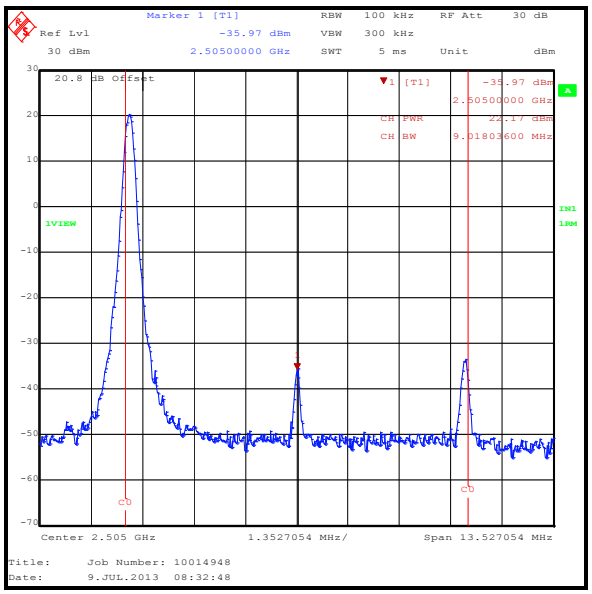


QPSK / 50 Resource Blocks (0 offset)

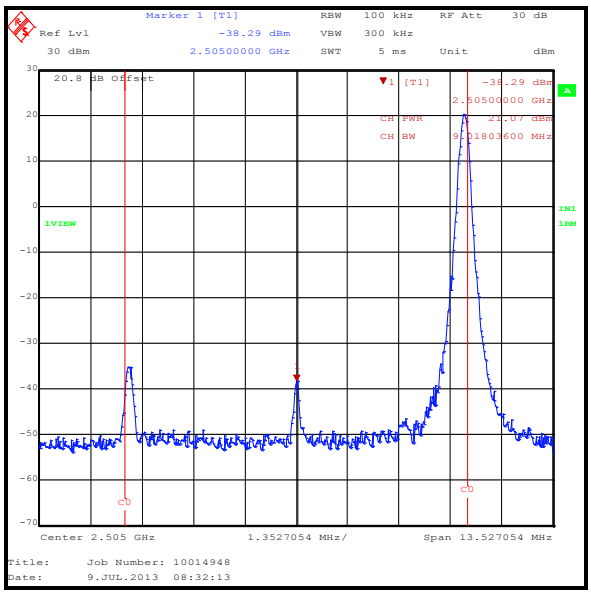
Transmitter Output Power (EIRP) (continued)

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

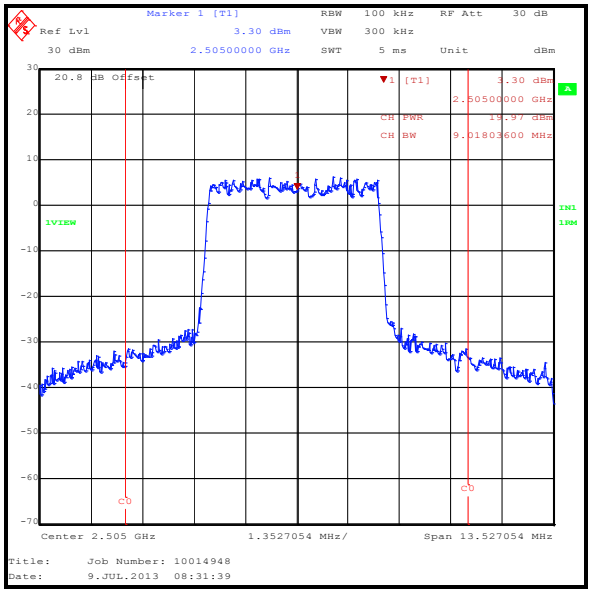
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2505	1	0	22.2	-3.0	19.2	33.0	13.8	Complied
2505	1	49	21.1	-3.0	18.1	33.0	14.9	Complied
2505	25	12	20.0	-3.0	17.0	33.0	16.0	Complied
2505	50	0	19.8	-3.0	16.8	33.0	16.2	Complied



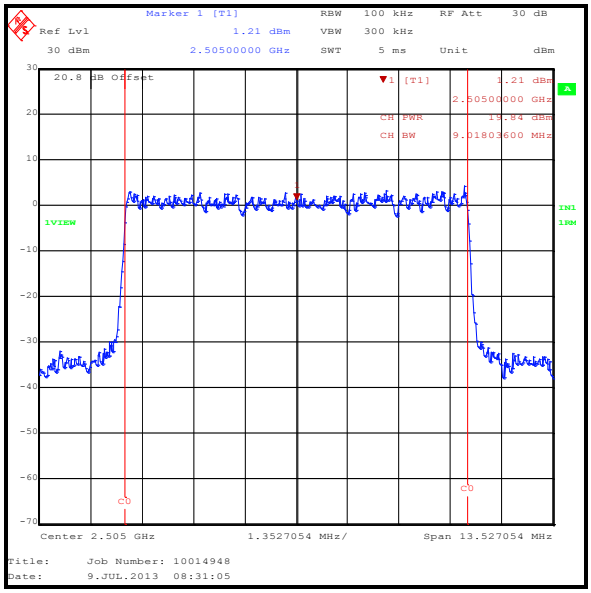
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (49 offset)



16QAM / 25 Resource Blocks (12 offset)

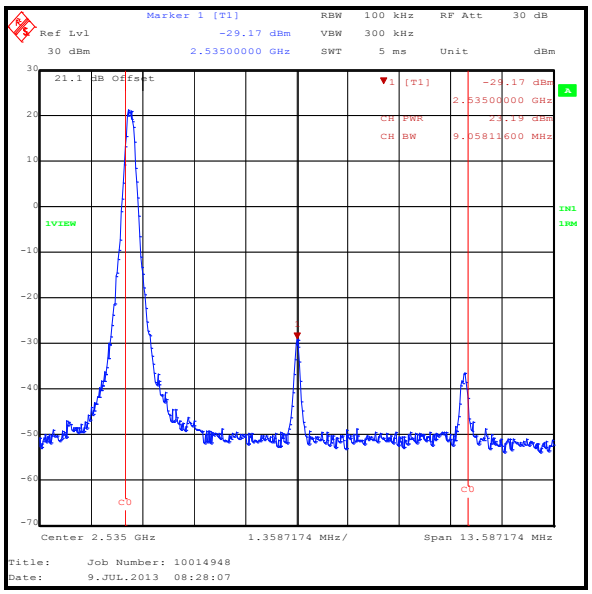


16QAM / 50 Resource Blocks (0 offset)

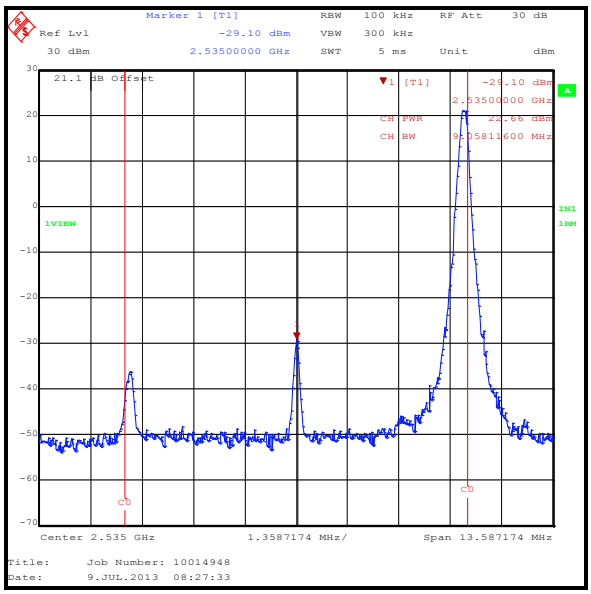
Transmitter Output Power (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

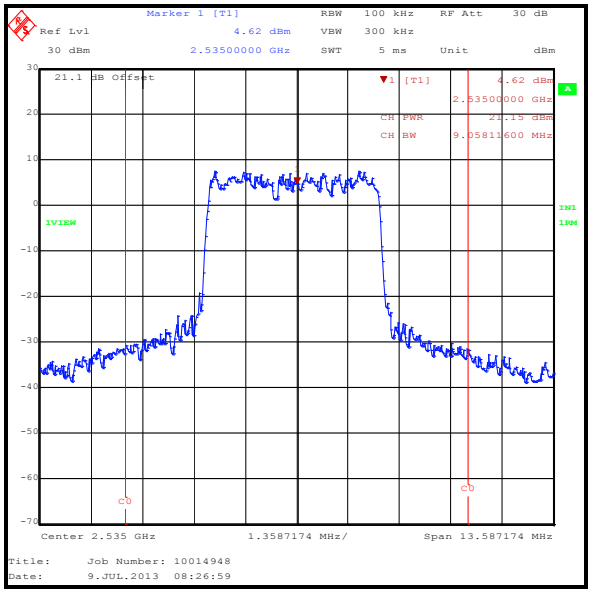
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	23.2	-3.0	20.2	33.0	12.8	Complied
2535	1	49	22.7	-3.0	19.7	33.0	13.3	Complied
2535	25	12	21.2	-3.0	18.2	33.0	14.8	Complied
2535	50	0	21.1	-3.0	18.1	33.0	14.9	Complied



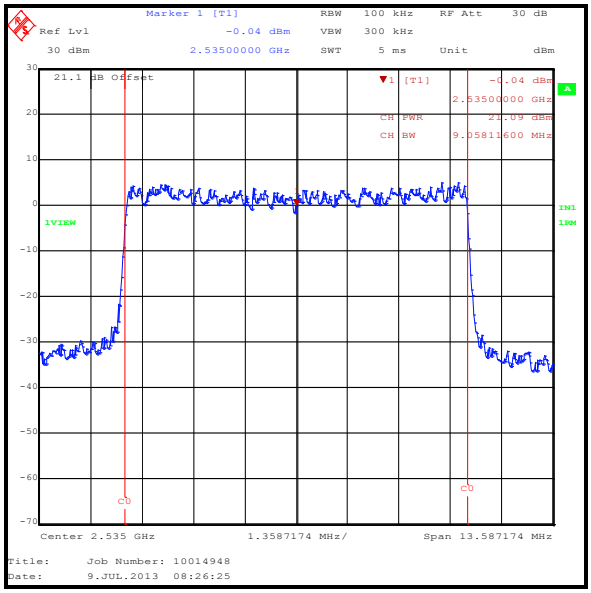
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (49 offset)



QPSK / 25 Resource Blocks (12 offset)

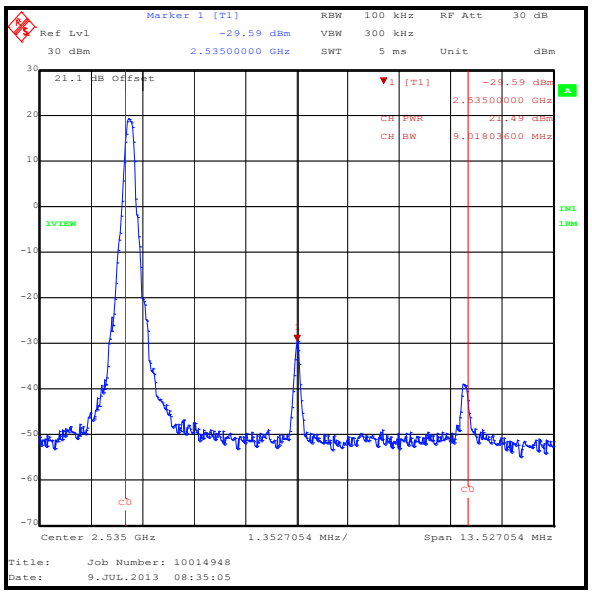


QPSK / 50 Resource Blocks (0 offset)

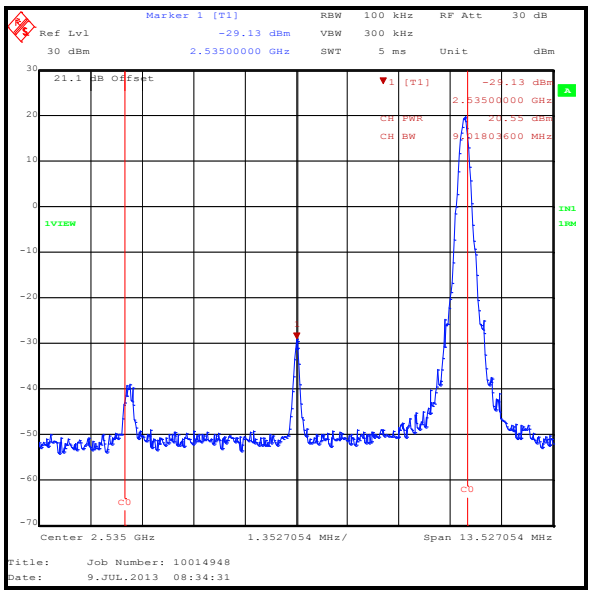
Transmitter Output Power (EIRP) (continued)

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

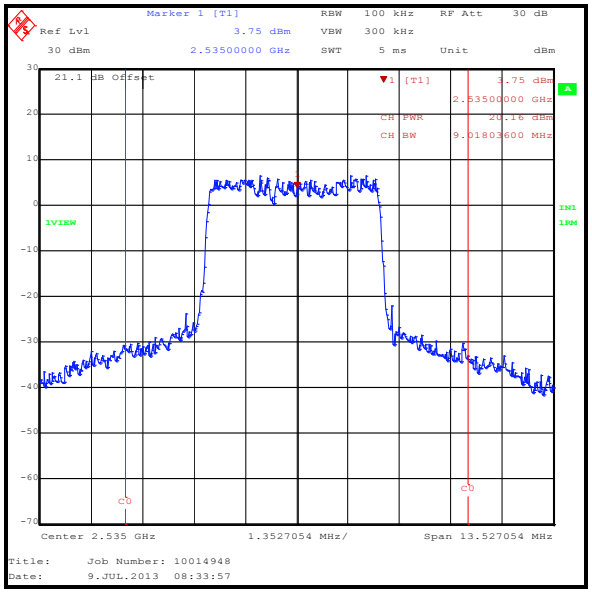
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	21.5	-3.0	18.5	33.0	14.5	Complied
2535	1	49	20.6	-3.0	17.6	33.0	15.4	Complied
2535	25	12	20.2	-3.0	17.2	33.0	15.8	Complied
2535	50	0	20.0	-3.0	17.0	33.0	16.0	Complied



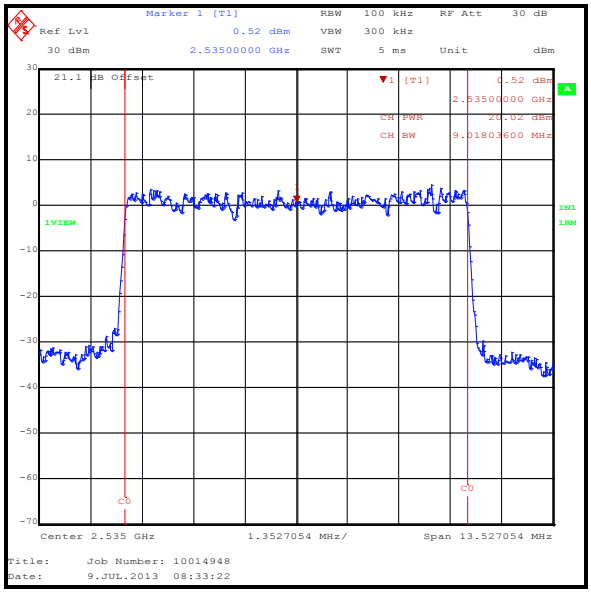
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (49 offset)



16QAM / 25 Resource Blocks (12 offset)

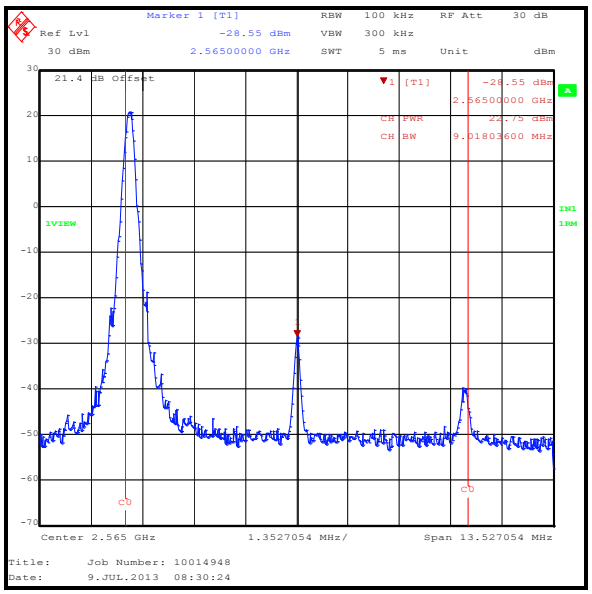


16QAM / 50 Resource Blocks (0 offset)

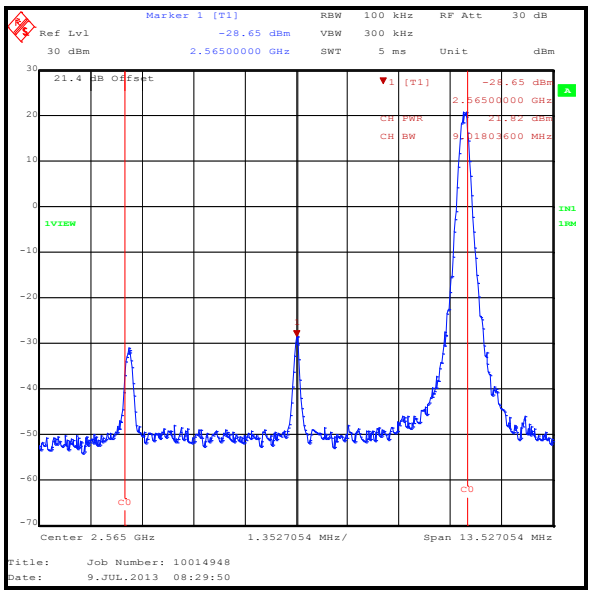
Transmitter Output Power (EIRP) (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / QPSK

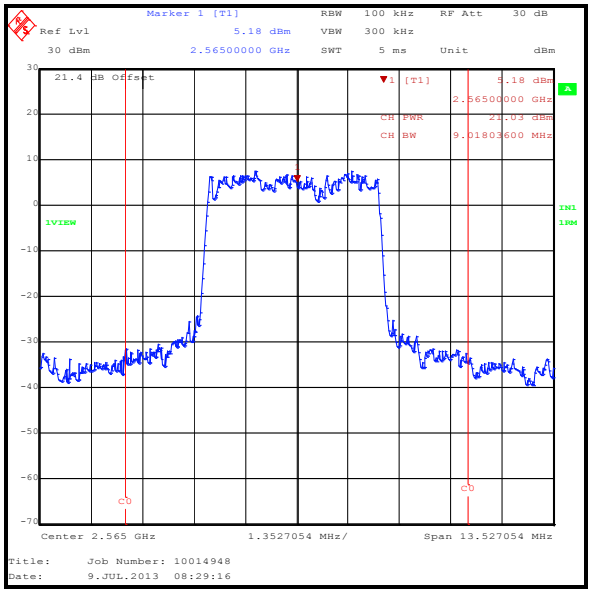
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2565	1	0	22.8	-3.0	19.8	33.0	13.2	Complied
2565	1	49	21.8	-3.0	18.8	33.0	14.2	Complied
2565	25	12	21.0	-3.0	18.0	33.0	15.0	Complied
2565	50	0	21.1	-3.0	18.1	33.0	14.9	Complied



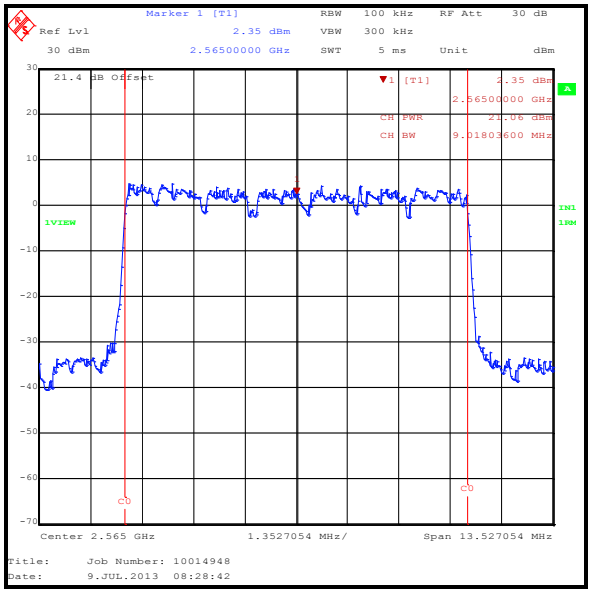
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (49 offset)



QPSK / 25 Resource Blocks (12 offset)

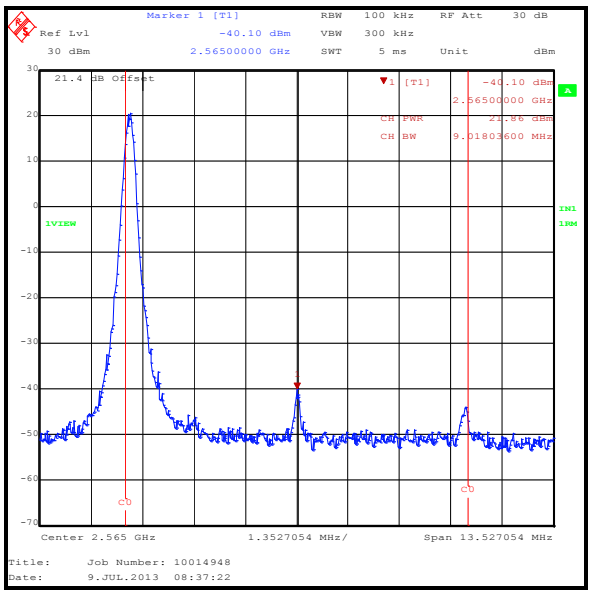


QPSK / 50 Resource Blocks (0 offset)

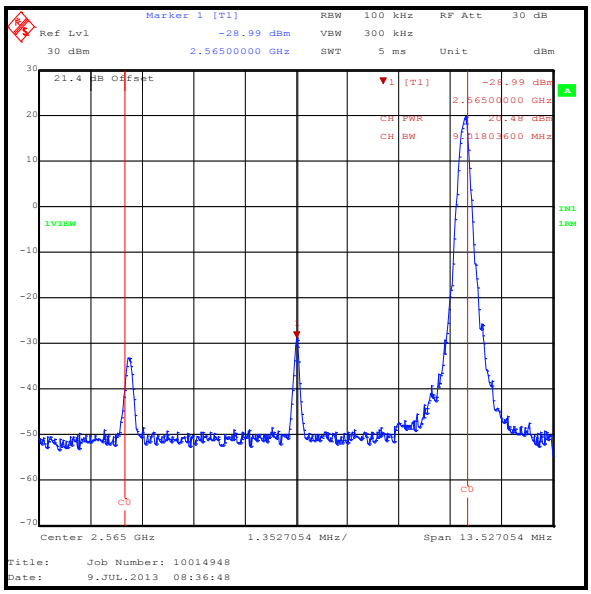
Transmitter Output Power (EIRP) (continued)

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

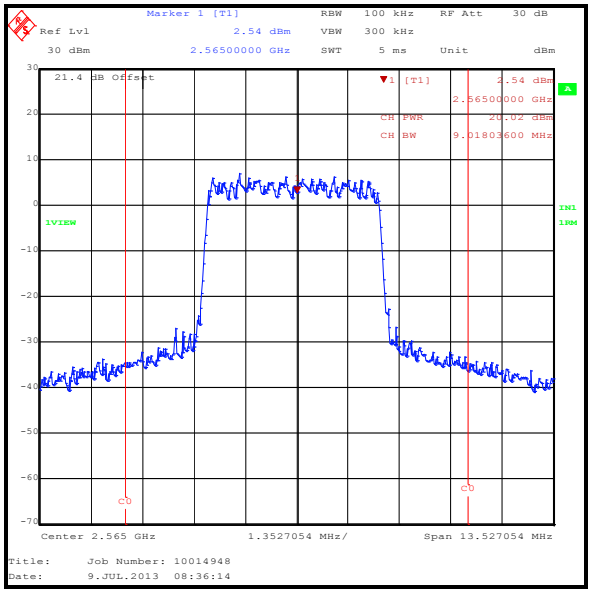
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2565	1	0	21.9	-3.0	18.9	33.0	14.1	Complied
2565	1	49	20.5	-3.0	17.5	33.0	15.5	Complied
2565	25	12	20.0	-3.0	17.0	33.0	16.0	Complied
2565	50	0	20.1	-3.0	17.1	33.0	15.9	Complied



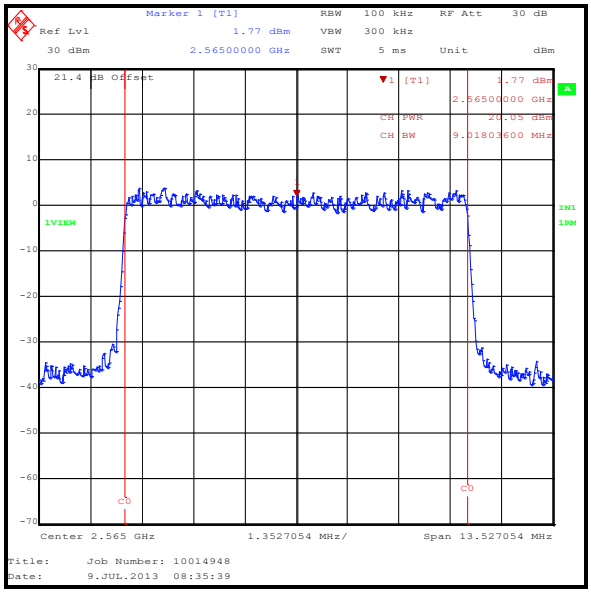
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (49 offset)



16QAM / 25 Resource Blocks (12 offset)

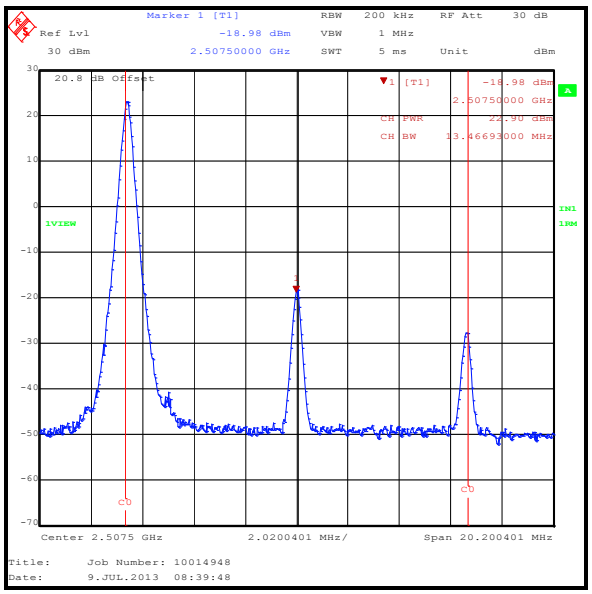


16QAM / 50 Resource Blocks (0 offset)

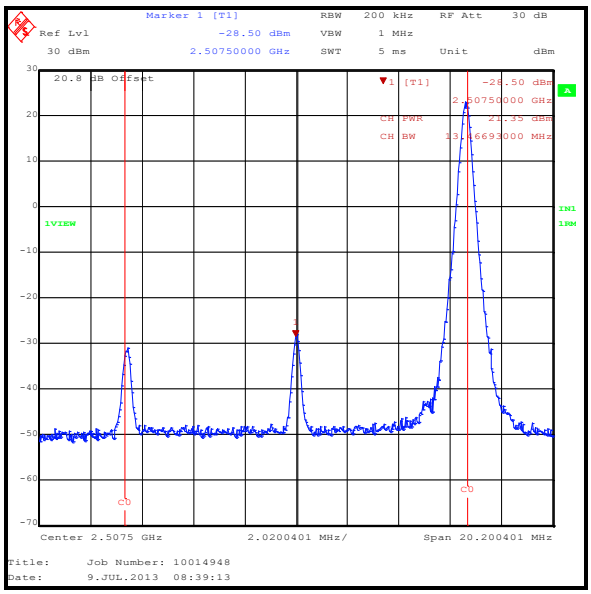
Transmitter Output Power (EIRP) (continued)

Results: 15 MHz Channel Bandwidth / Bottom Channel / QPSK

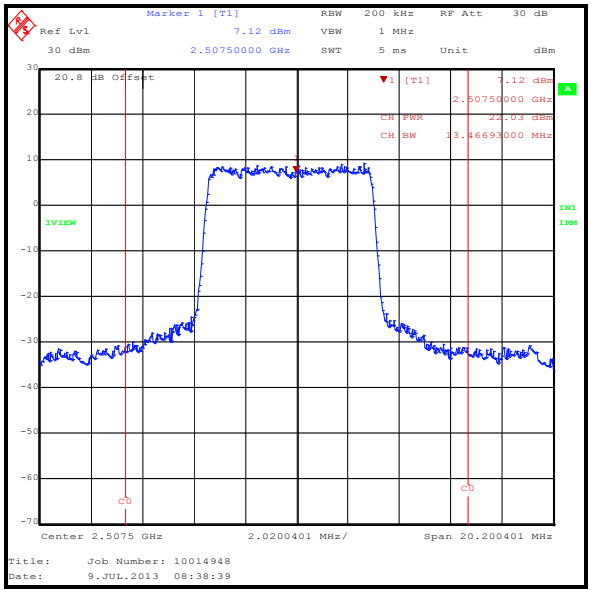
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2507.5	1	0	22.9	-3.0	19.9	33.0	13.1	Complied
2507.5	1	74	21.4	-3.0	18.4	33.0	14.6	Complied
2507.5	36	18	22.0	-3.0	19.0	33.0	14.0	Complied
2507.5	75	0	22.0	-3.0	19.0	33.0	14.0	Complied



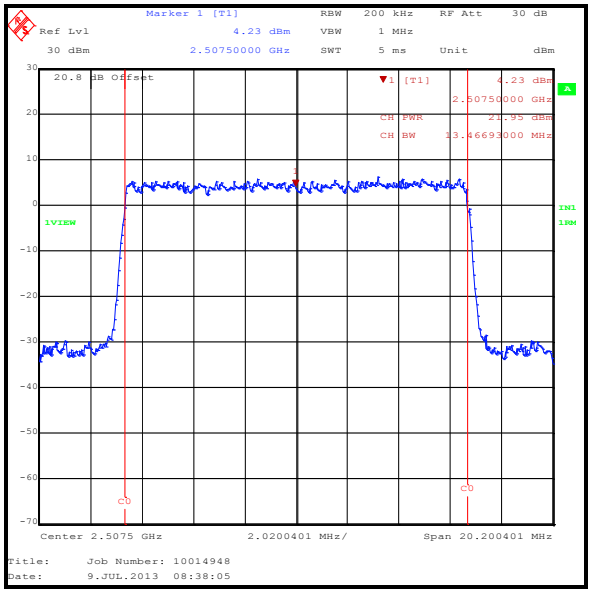
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (74 offset)



QPSK / 36 Resource Blocks (18 offset)

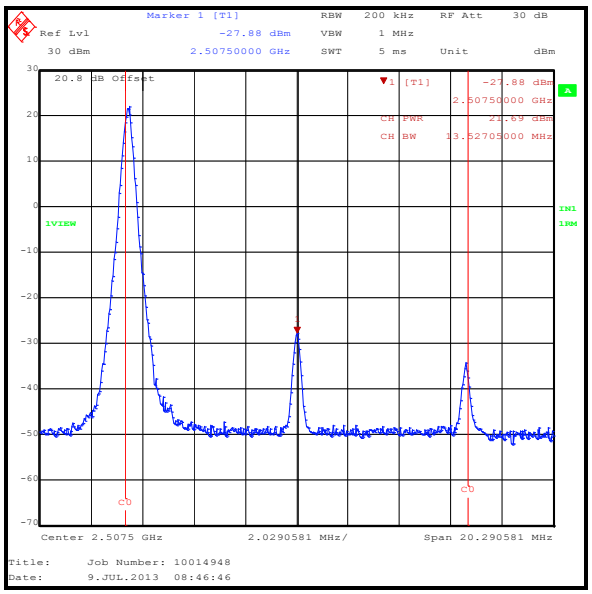


QPSK / 75 Resource Blocks (0 offset)

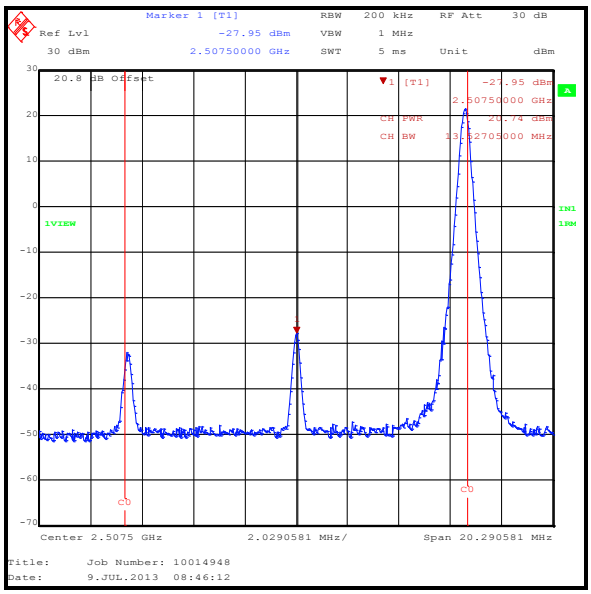
Transmitter Output Power (EIRP) (continued)

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

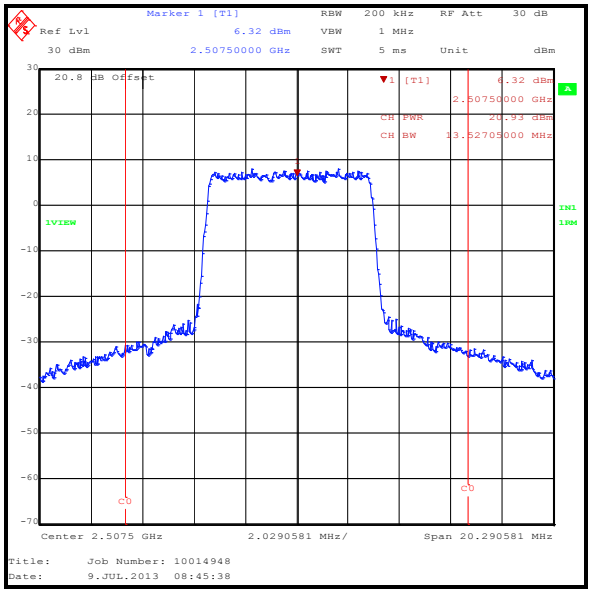
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2507.5	1	0	21.7	-3.0	18.7	33.0	14.3	Complied
2507.5	1	74	20.7	-3.0	17.7	33.0	15.3	Complied
2507.5	36	18	20.9	-3.0	17.9	33.0	15.1	Complied
2507.5	75	0	20.9	-3.0	17.9	33.0	15.1	Complied



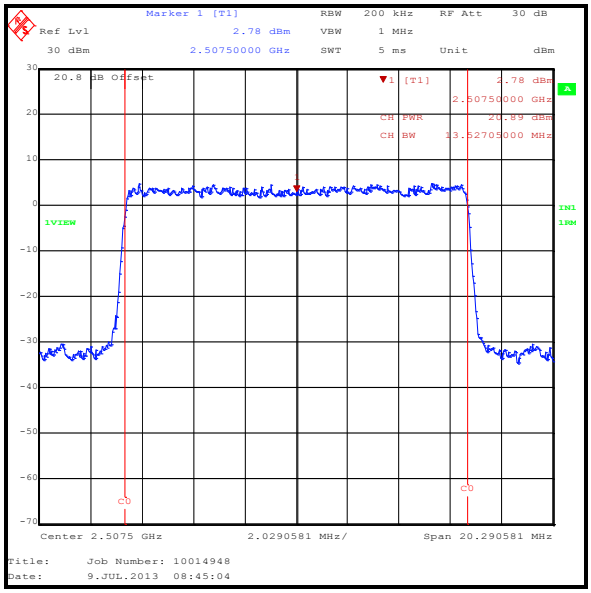
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (74 offset)



16QAM / 36 Resource Blocks (18 offset)

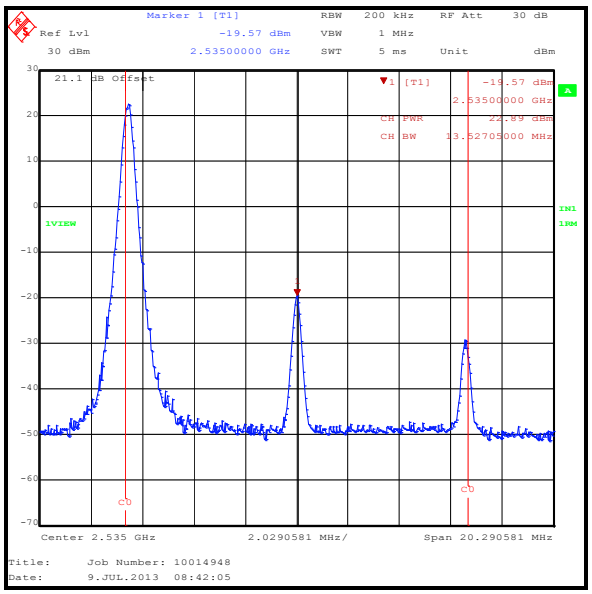


16QAM / 75 Resource Blocks (0 offset)

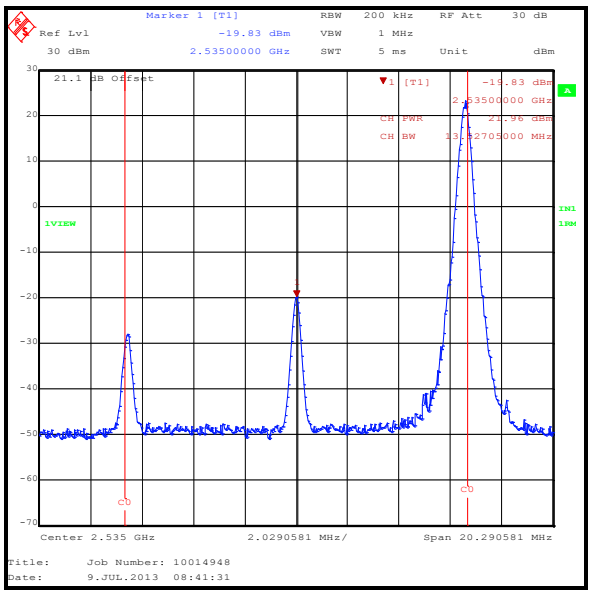
Transmitter Output Power (EIRP) (continued)

Results: 15 MHz Channel Bandwidth / Middle Channel / QPSK

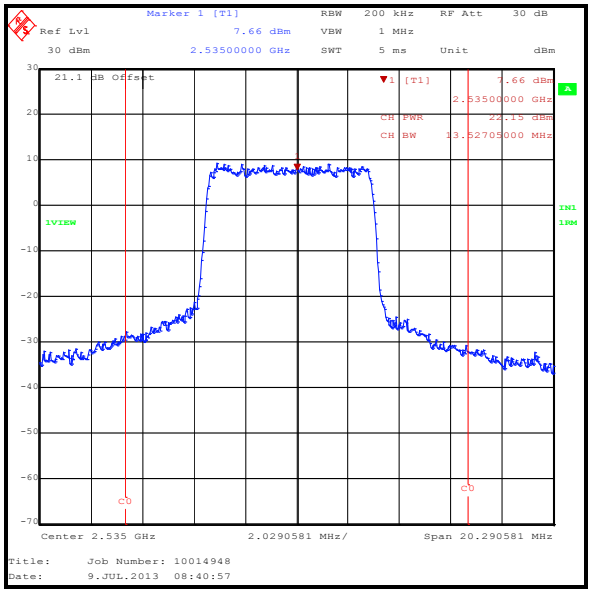
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	22.9	-3.0	19.9	33.0	13.1	Complied
2535	1	74	22.0	-3.0	19.0	33.0	14.0	Complied
2535	36	18	22.2	-3.0	19.2	33.0	13.8	Complied
2535	75	0	22.0	-3.0	19.0	33.0	14.0	Complied



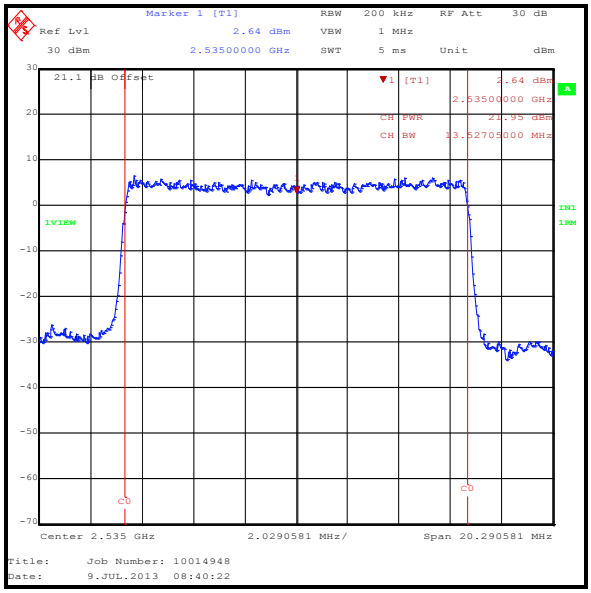
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (74 offset)



QPSK / 36 Resource Blocks (18 offset)

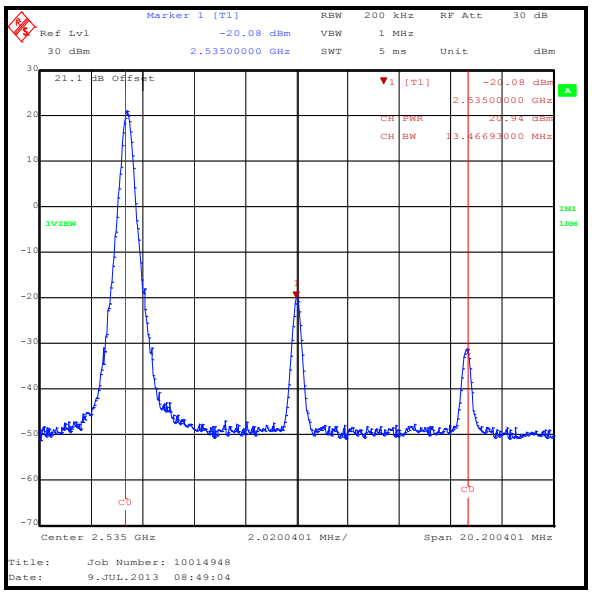


QPSK / 75 Resource Blocks (0 offset)

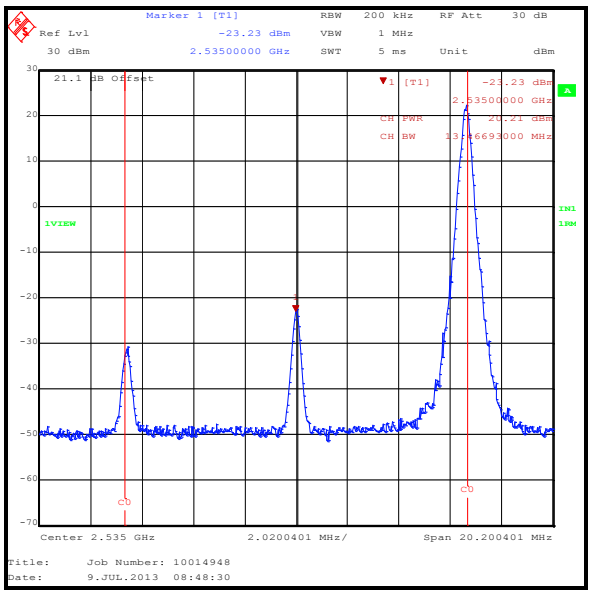
Transmitter Output Power (EIRP) (continued)

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

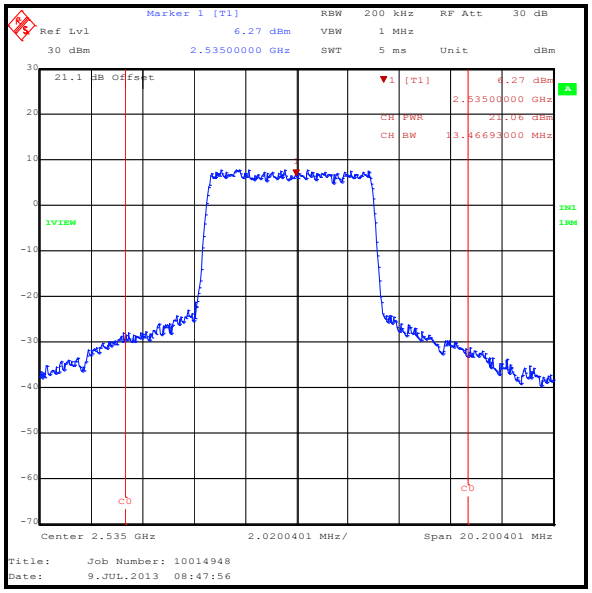
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	20.9	-3.0	17.9	33.0	15.1	Complied
2535	1	74	20.2	-3.0	17.2	33.0	15.8	Complied
2535	36	18	21.1	-3.0	18.1	33.0	14.9	Complied
2535	75	0	21.0	-3.0	18.0	33.0	15.0	Complied



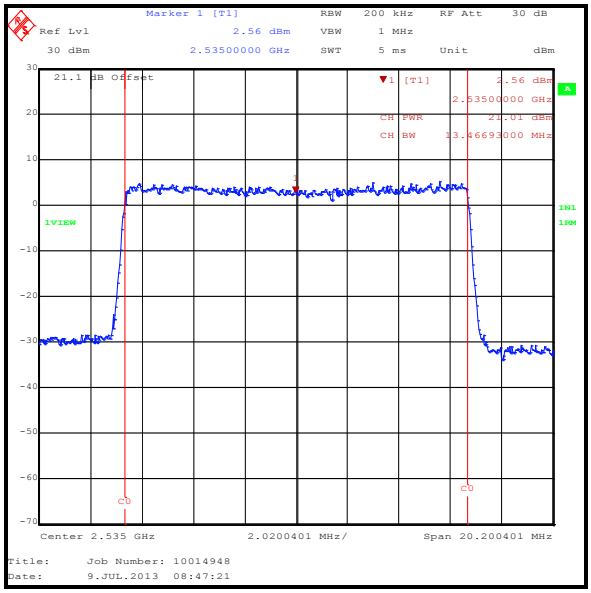
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (74 offset)



16QAM / 36 Resource Blocks (18 offset)

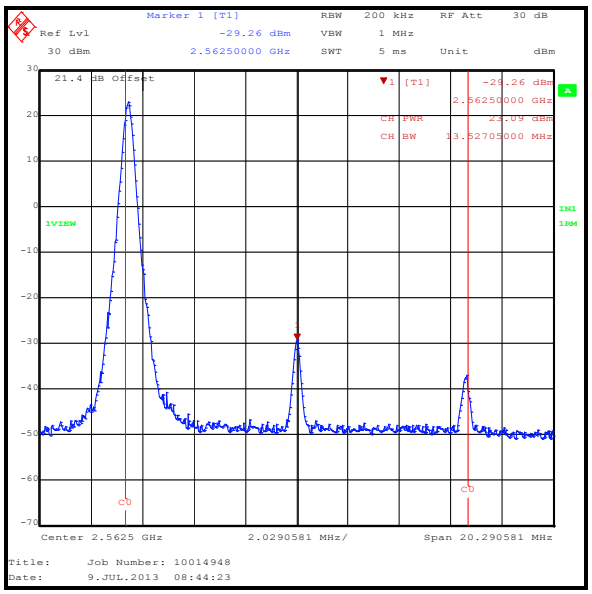


16QAM / 75 Resource Blocks (0 offset)

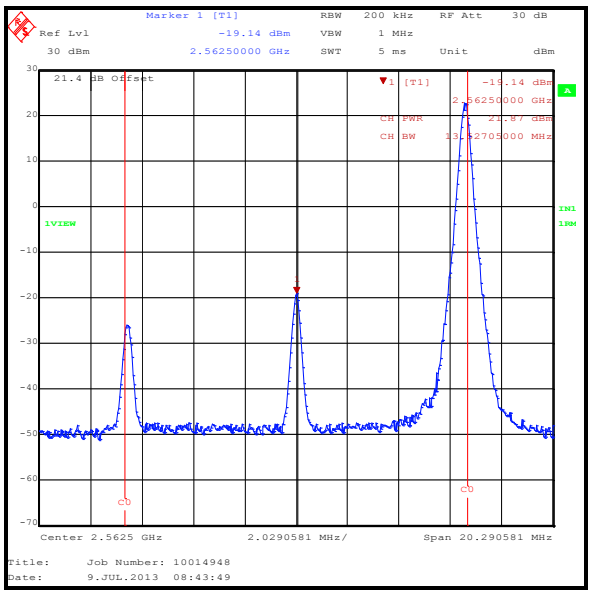
Transmitter Output Power (EIRP) (continued)

Results: 15 MHz Channel Bandwidth / Top Channel / QPSK

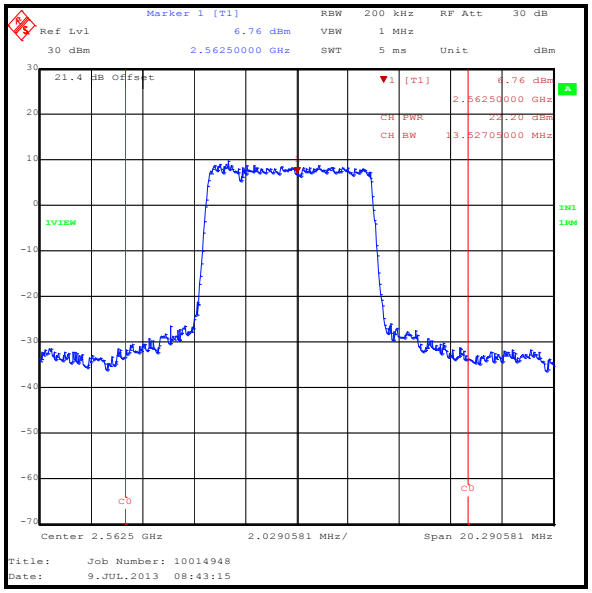
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2562.5	1	0	23.1	-3.0	20.1	33.0	12.9	Complied
2562.5	1	74	21.9	-3.0	18.9	33.0	14.1	Complied
2562.5	36	18	22.2	-3.0	19.2	33.0	13.8	Complied
2562.5	75	0	22.1	-3.0	19.1	33.0	13.9	Complied



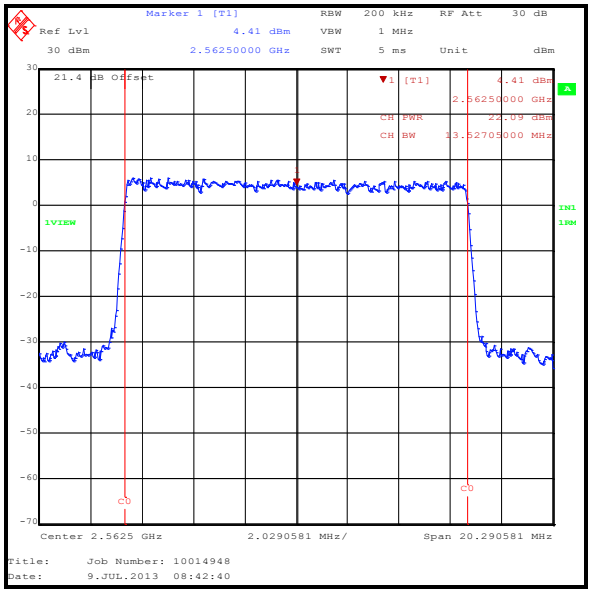
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (74 offset)



QPSK / 36 Resource Blocks (18 offset)

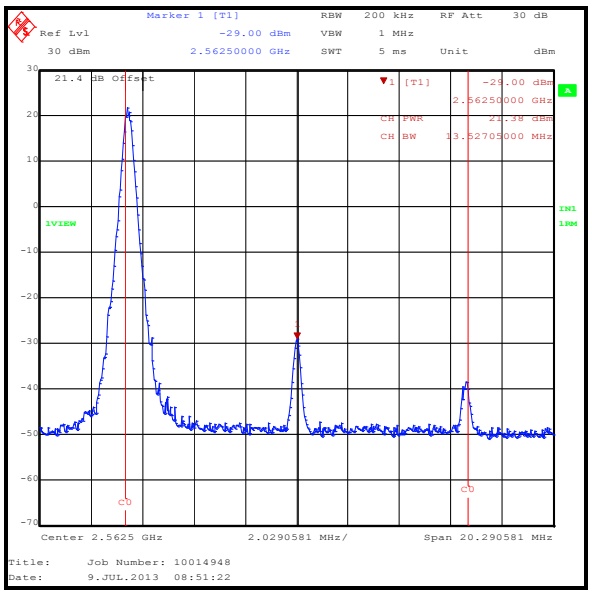


QPSK / 75 Resource Blocks (0 offset)

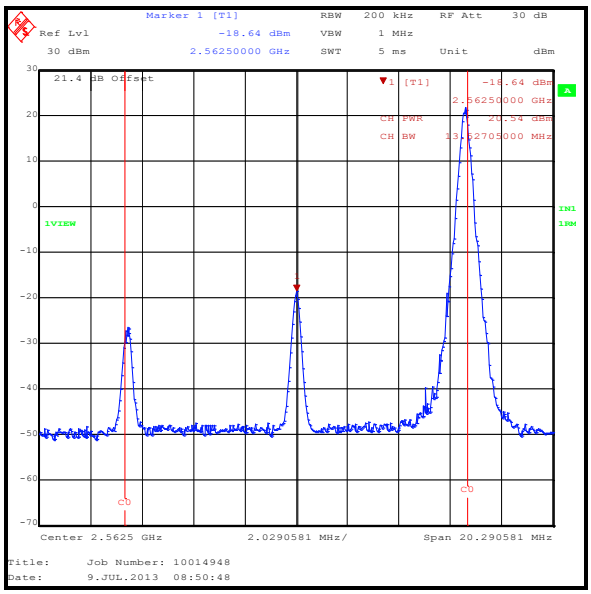
Transmitter Output Power (EIRP) (continued)

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

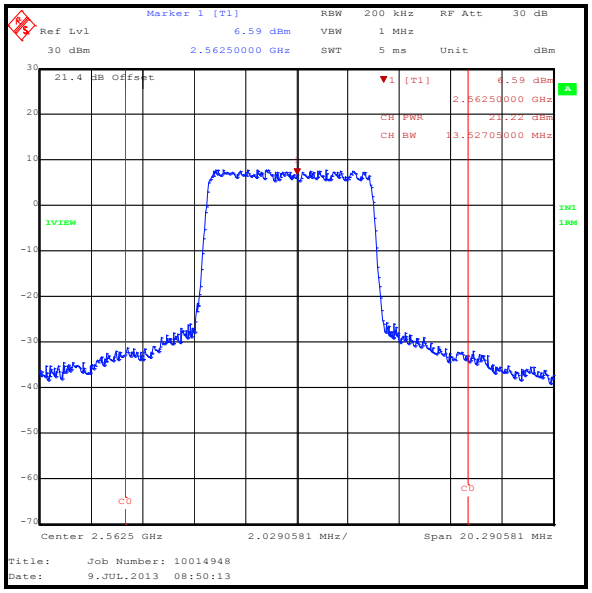
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2562.5	1	0	21.4	-3.0	18.4	33.0	14.6	Complied
2562.5	1	74	20.5	-3.0	17.5	33.0	15.5	Complied
2562.5	36	18	21.2	-3.0	18.2	33.0	14.8	Complied
2562.5	75	0	21.1	-3.0	18.1	33.0	14.9	Complied



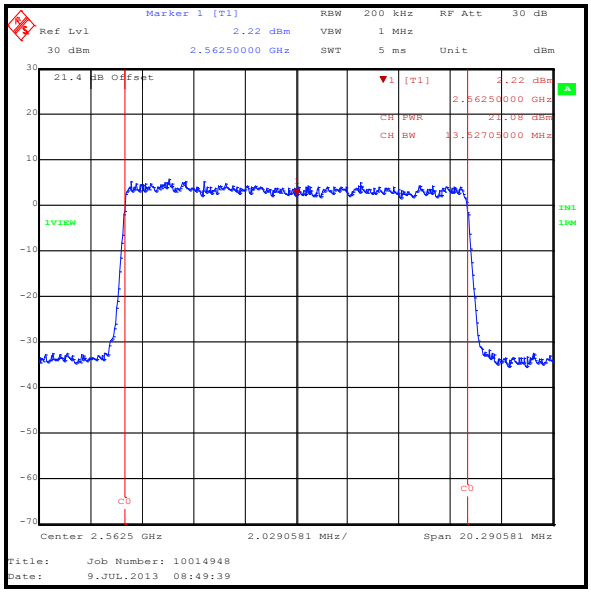
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (74 offset)



16QAM / 36 Resource Blocks (18 offset)

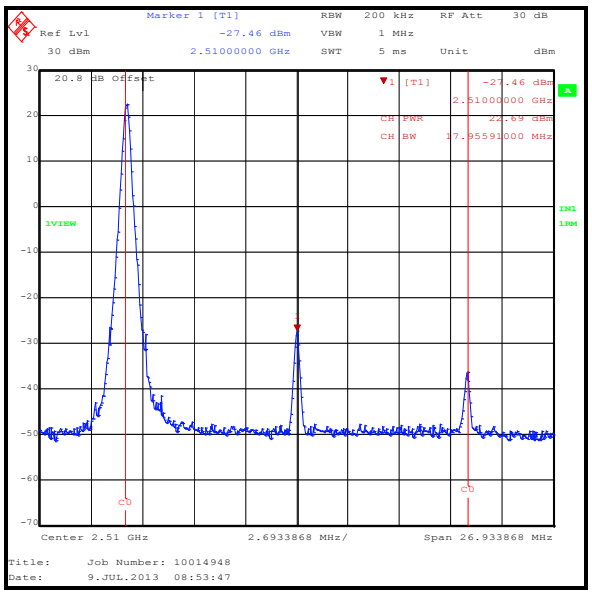


16QAM / 75 Resource Blocks (0 offset)

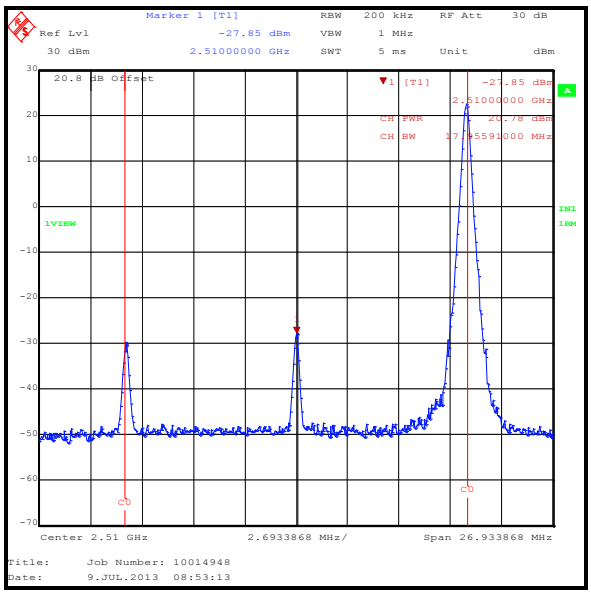
Transmitter Output Power (EIRP) (continued)

Results: 20 MHz Channel Bandwidth / Bottom Channel / QPSK

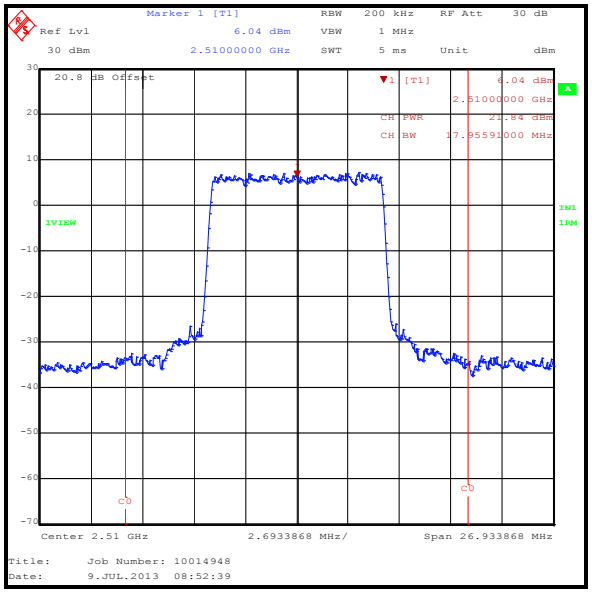
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2510	1	0	22.7	-3.0	19.7	33.0	13.3	Complied
2510	1	99	20.8	-3.0	17.8	33.0	15.2	Complied
2510	50	25	21.8	-3.0	18.8	33.0	14.2	Complied
2510	100	0	22.0	-3.0	19.0	33.0	14.0	Complied



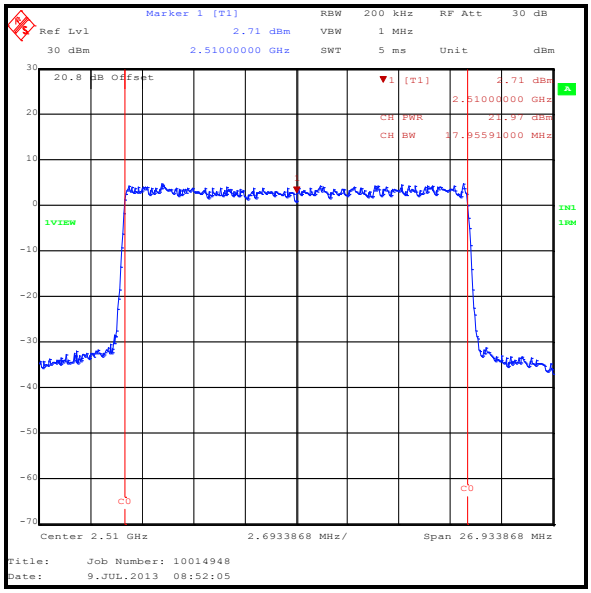
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (99 offset)



QPSK / 50 Resource Blocks (25 offset)

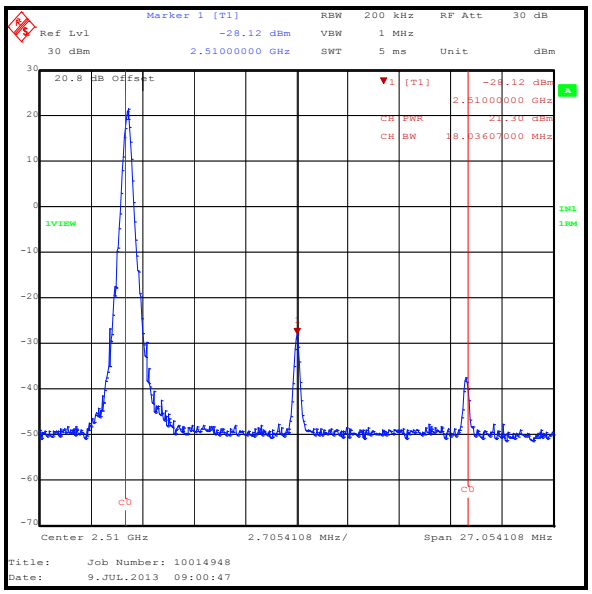


QPSK / 100 Resource Blocks (0 offset)

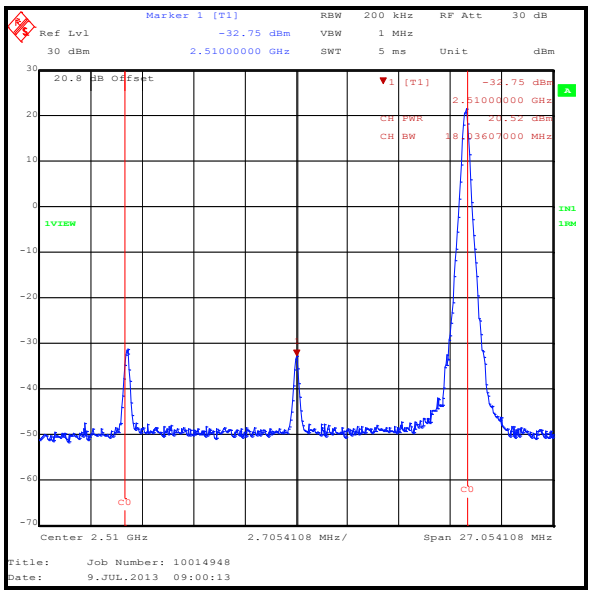
Transmitter Output Power (EIRP) (continued)

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

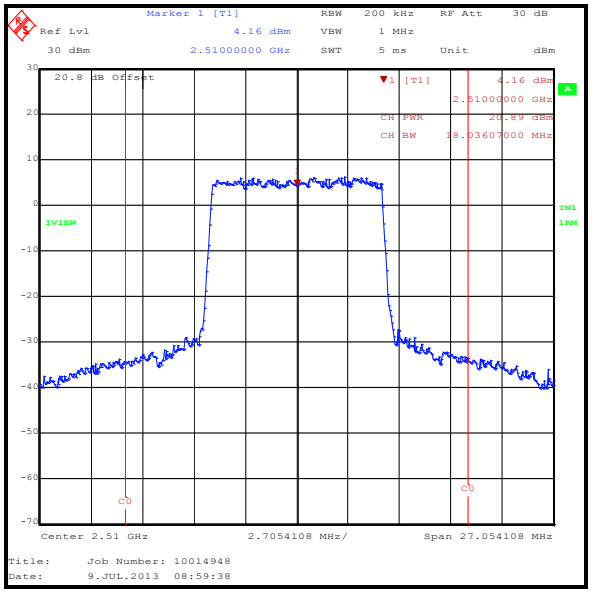
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2510	1	0	21.3	-3.0	18.3	33.0	14.7	Complied
2510	1	99	20.5	-3.0	17.5	33.0	15.5	Complied
2510	50	25	20.9	-3.0	17.9	33.0	15.1	Complied
2510	100	0	20.9	-3.0	17.9	33.0	15.1	Complied



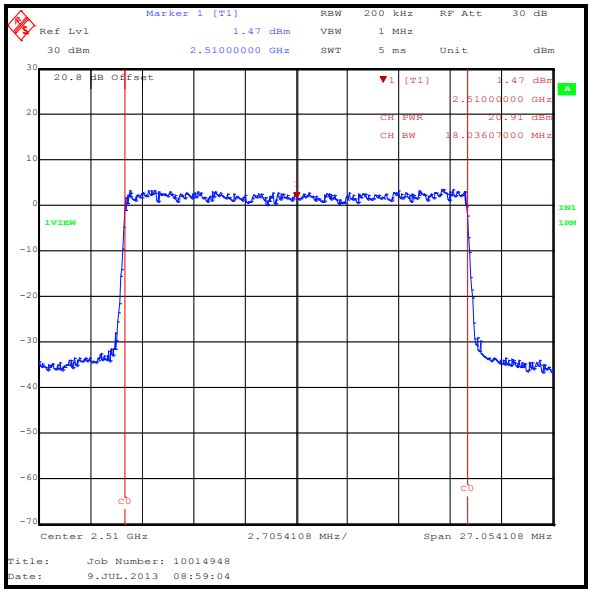
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (99 offset)



16QAM / 50 Resource Blocks (25 offset)

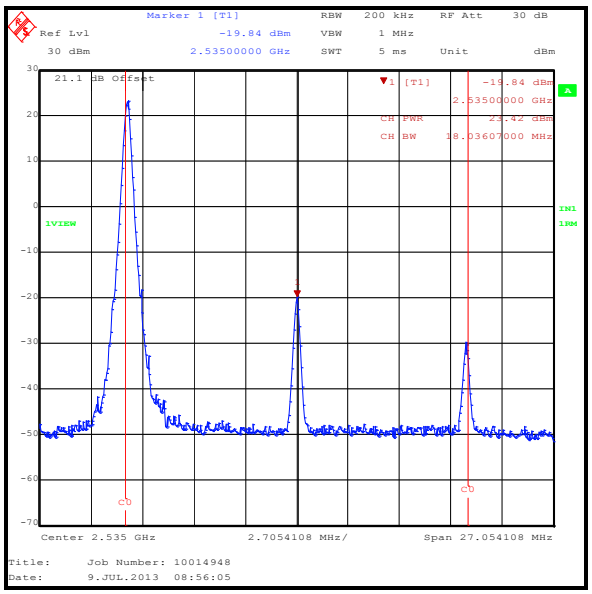


16QAM / 100 Resource Blocks (0 offset)

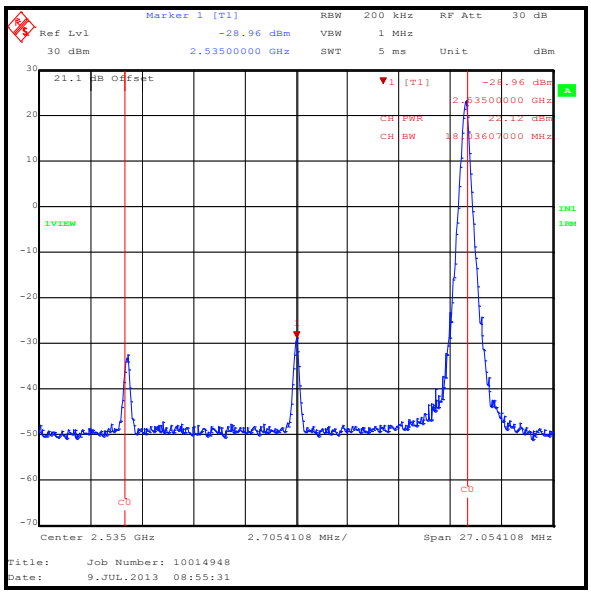
Transmitter Output Power (EIRP) (continued)

Results: 20 MHz Channel Bandwidth / Middle Channel / QPSK

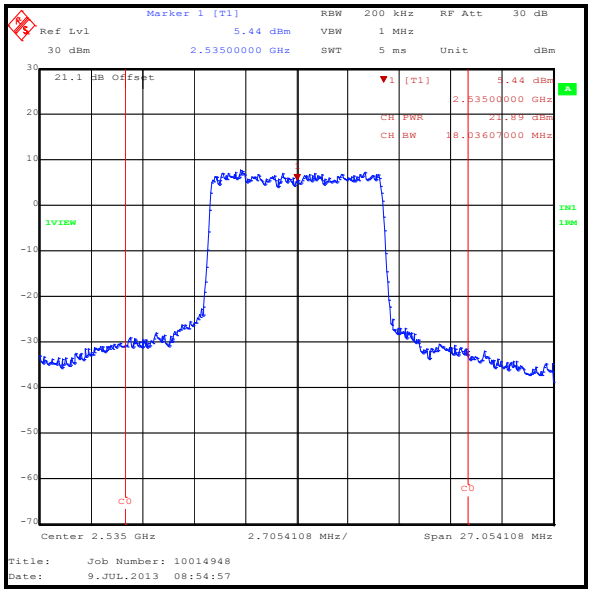
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	23.4	-3.0	20.4	33.0	12.6	Complied
2535	1	99	22.1	-3.0	19.1	33.0	13.9	Complied
2535	50	25	21.9	-3.0	18.9	33.0	14.1	Complied
2535	100	0	22.0	-3.0	19.0	33.0	14.0	Complied



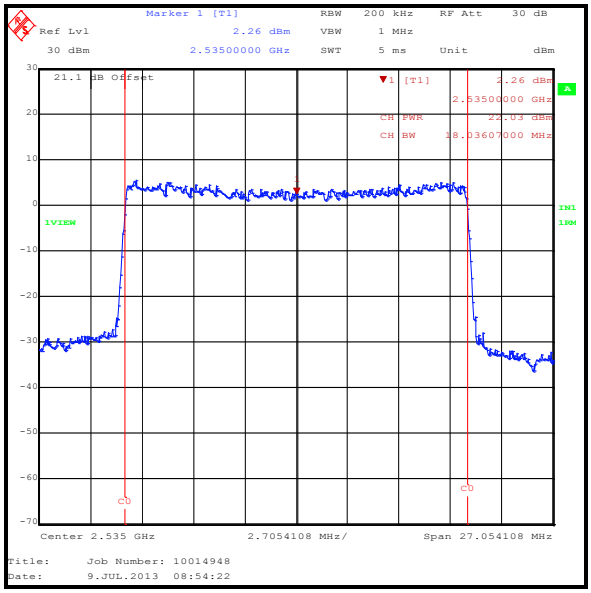
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (99 offset)



QPSK / 50 Resource Blocks (25 offset)

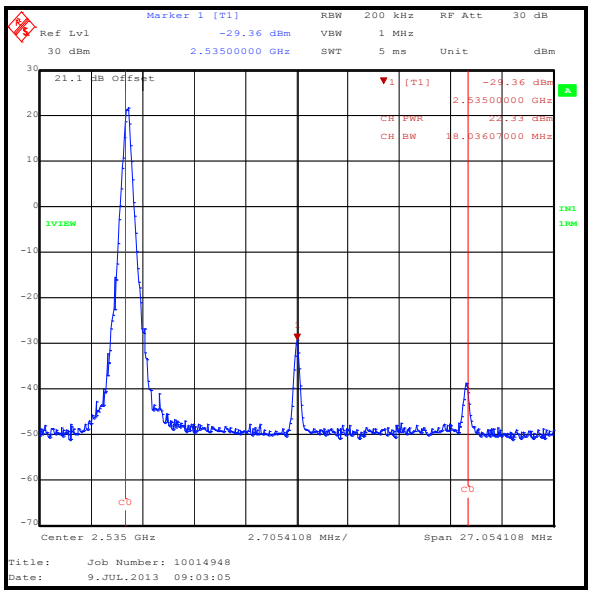


QPSK / 100 Resource Blocks (0 offset)

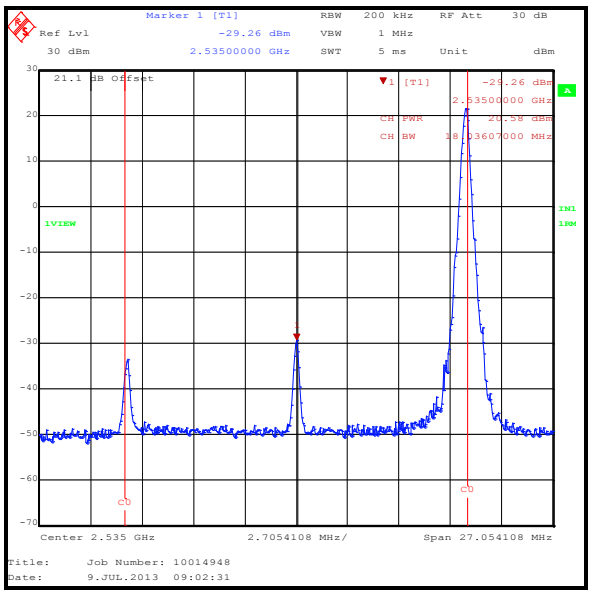
Transmitter Output Power (EIRP) (continued)

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

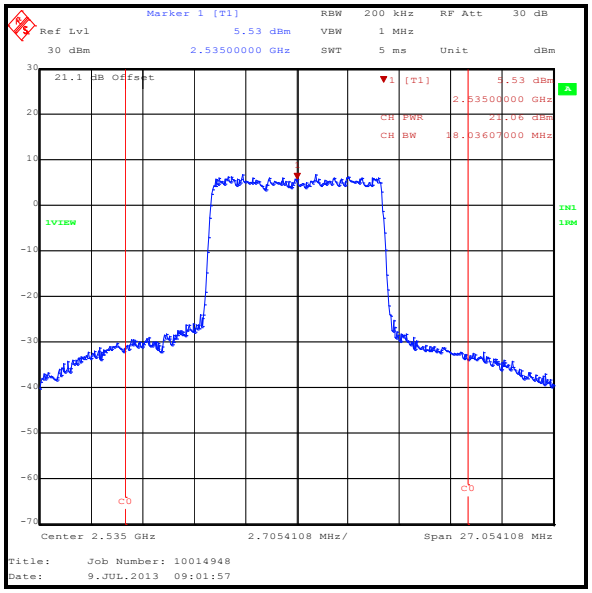
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2535	1	0	22.3	-3.0	19.3	33.0	13.7	Complied
2535	1	99	20.6	-3.0	17.6	33.0	15.4	Complied
2535	50	25	21.1	-3.0	18.1	33.0	14.9	Complied
2535	100	0	21.0	-3.0	18.0	33.0	15.0	Complied



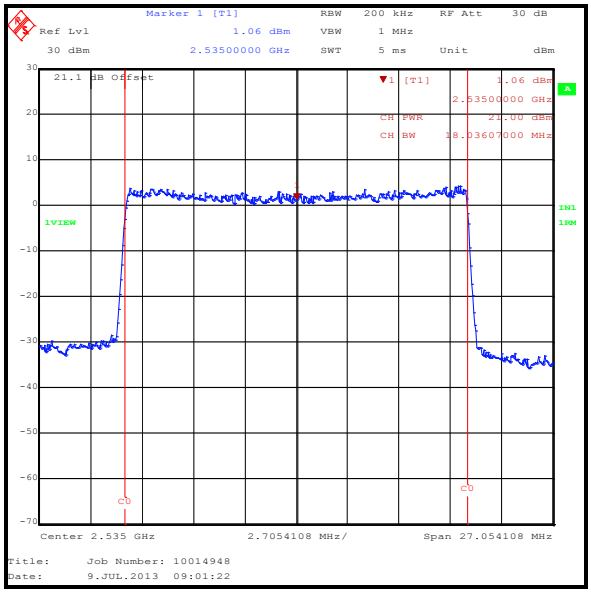
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (99 offset)



16QAM / 50 Resource Blocks (25 offset)

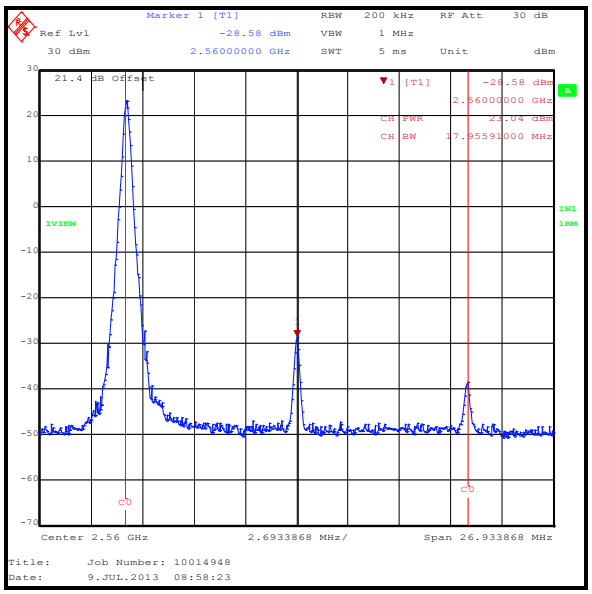


16QAM / 100 Resource Blocks (0 offset)

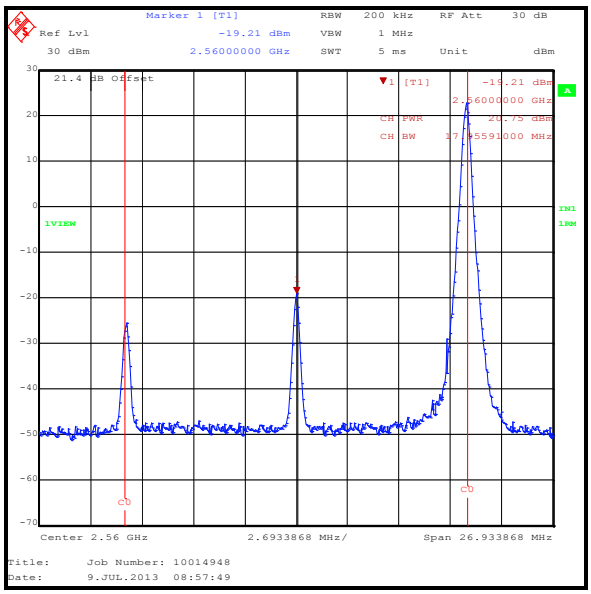
Transmitter Output Power (EIRP) (continued)

Results: 20 MHz Channel Bandwidth / Top Channel / QPSK

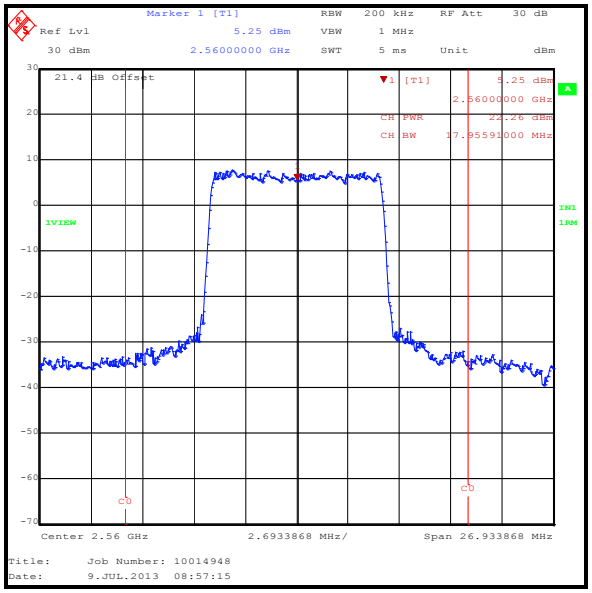
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2560	1	0	23.0	-3.0	20.0	33.0	13.0	Complied
2560	1	99	20.8	-3.0	17.8	33.0	15.2	Complied
2560	50	25	22.3	-3.0	19.3	33.0	13.7	Complied
2560	100	0	22.2	-3.0	19.2	33.0	13.8	Complied



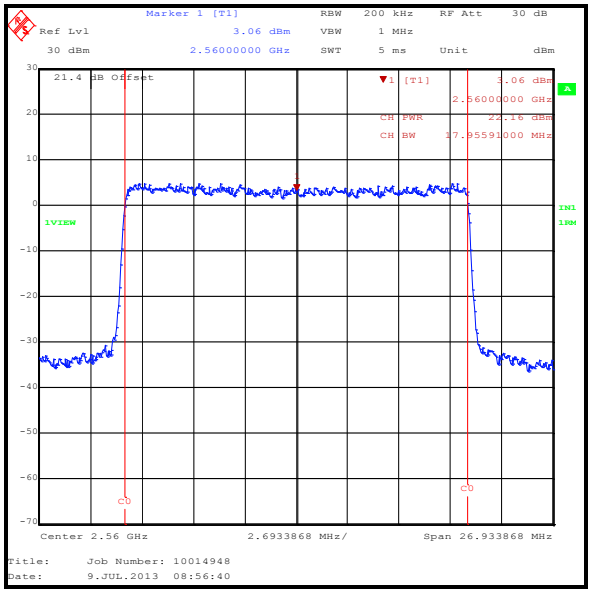
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (99 offset)



QPSK / 50 Resource Blocks (25 offset)

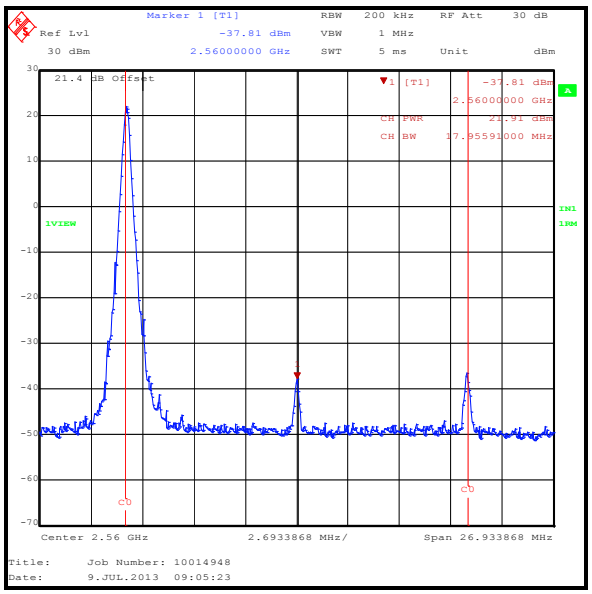


QPSK / 100 Resource Blocks (0 offset)

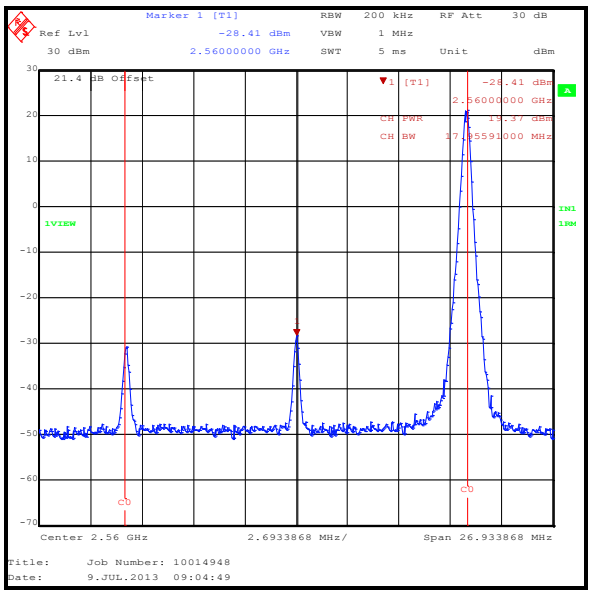
Transmitter Output Power (EIRP) (continued)

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

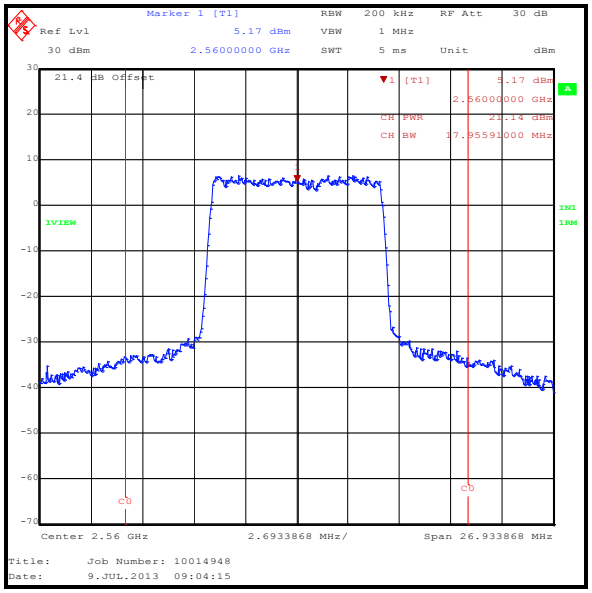
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
2560	1	0	21.9	-3.0	18.9	33.0	14.1	Complied
2560	1	99	19.4	-3.0	16.4	33.0	16.6	Complied
2560	50	25	21.1	-3.0	18.1	33.0	14.9	Complied
2560	100	0	21.2	-3.0	18.2	33.0	14.8	Complied



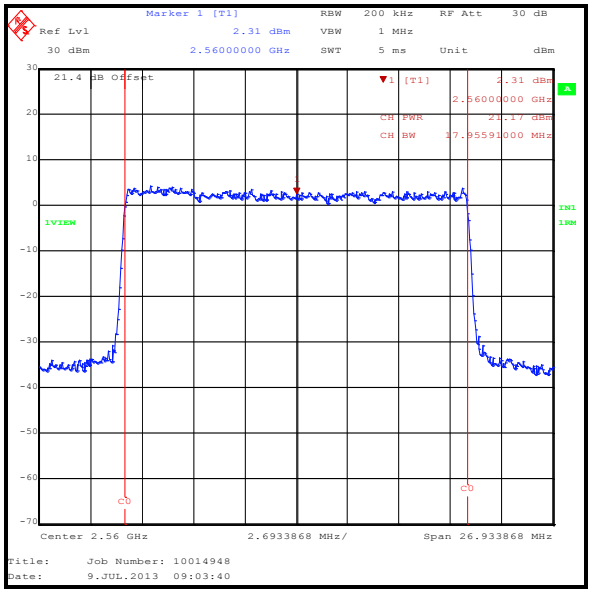
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (99 offset)



16QAM / 50 Resource Blocks (25 offset)



16QAM / 100 Resource Blocks (0 offset)

Transmitter Output Power (EIRP) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1379	Test Receiver	Rhode & Schwarz	ESIB 7	100330	15 Oct 2013	12
A1096	Directional Coupler	MIDISCO	MDC6223W 20	None stated	Calibrated before use	-
S0523	DC Power Supply	TTi	PL320	224235	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12
M1267	Thermal Power Sensor	Rhode & Schwarz	NRV-Z52	100155	14 May 2014	12
M199	Power Meter	Rhode & Schwarz	NRVS	827023/075	15 May 2014	12
M1021	Signal Generator	Rhode & Schwarz	SMP02	833286/004	05 Feb 2014	12

5.2.2. Transmitter Occupied Bandwidth

Test Summary:

Test Engineer:	Ben Mercer	**Test Date:**	01 July 2013
Test Sample IMEI:	004402451215481		

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

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	39

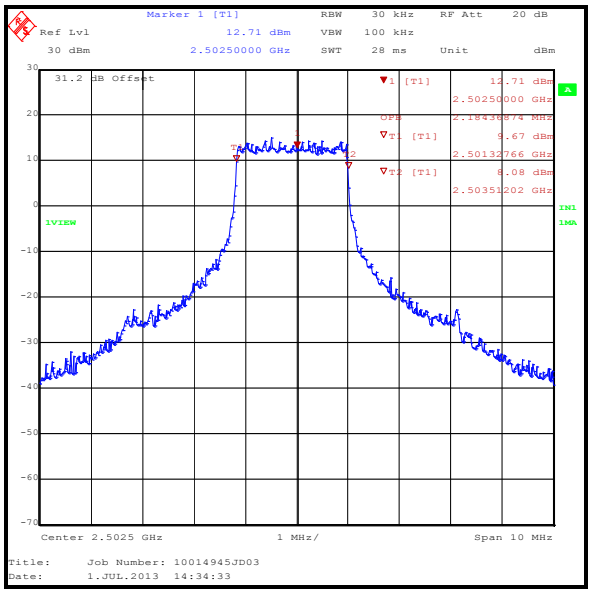
Note(s):

1. Occupied bandwidth (99% bandwidth) was measured using a test receiver occupied bandwidth function.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource block settings as detailed in section 4.3 of this report.

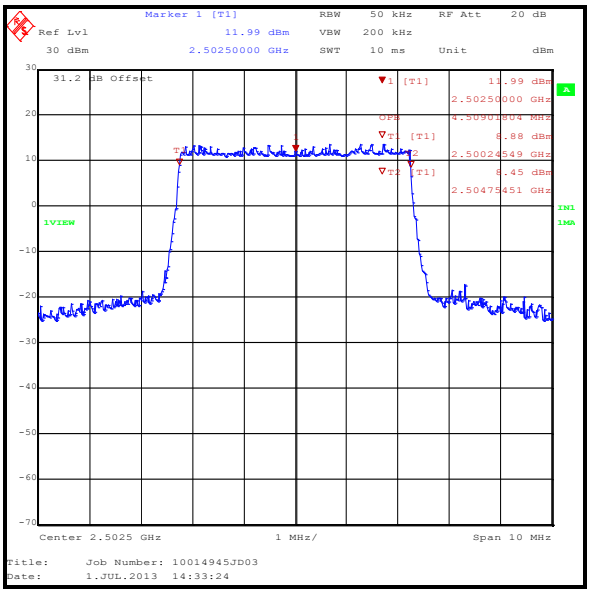
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2502.5	12	6	30	100	2.184
2502.5	25	0	50	200	4.509



QPSK / 12 Resource Blocks (6 offset)

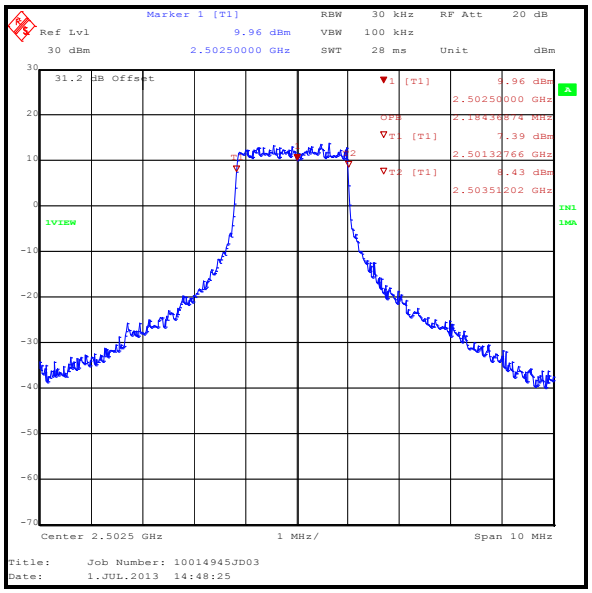


QPSK / 25 Resource Blocks (0 offset)

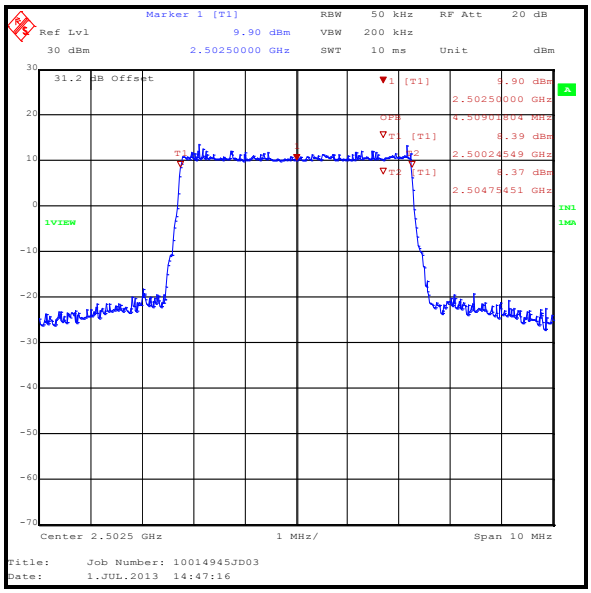
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2502.5	12	6	30	100	2.184
2502.5	25	0	50	200	4.509



16QAM / 12 Resource Blocks (6 offset)

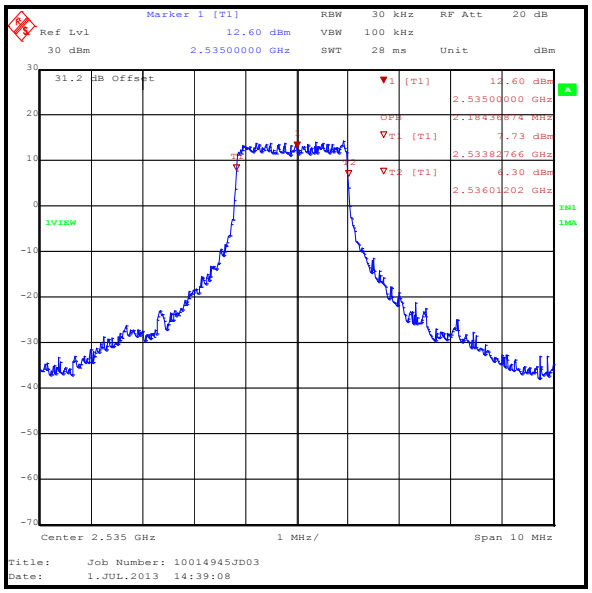


16QAM / 25 Resource Blocks (0 offset)

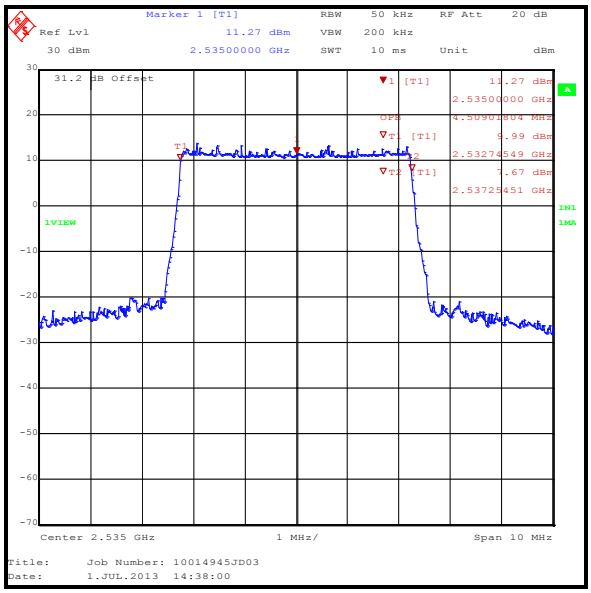
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	12	6	30	100	2.184
2535	25	0	50	200	4.509



QPSK / 12 Resource Blocks (6 offset)

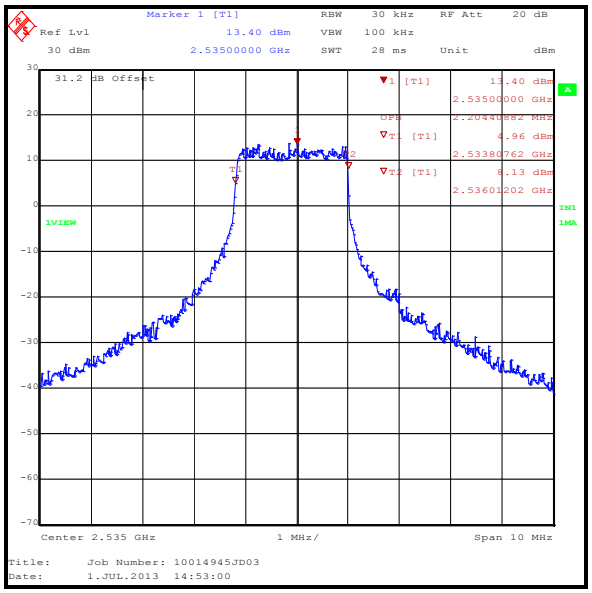


QPSK / 25 Resource Blocks (0 offset)

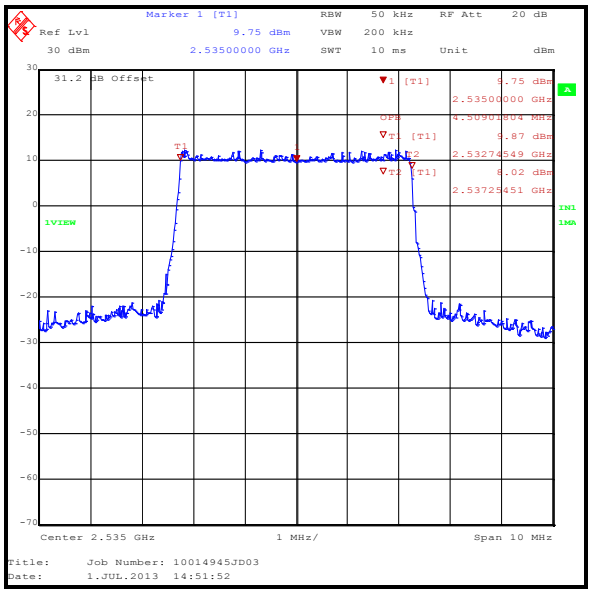
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	12	6	30	100	2.204
2535	25	0	50	200	4.509



16QAM / 12 Resource Blocks (6 offset)

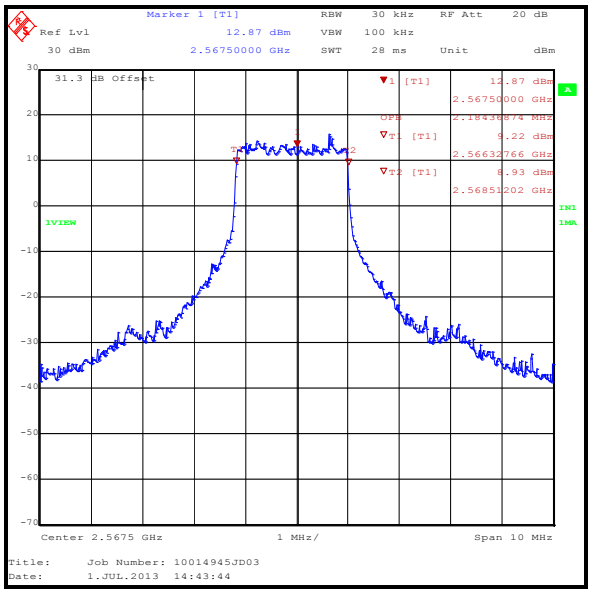


16QAM / 25 Resource Blocks (0 offset)

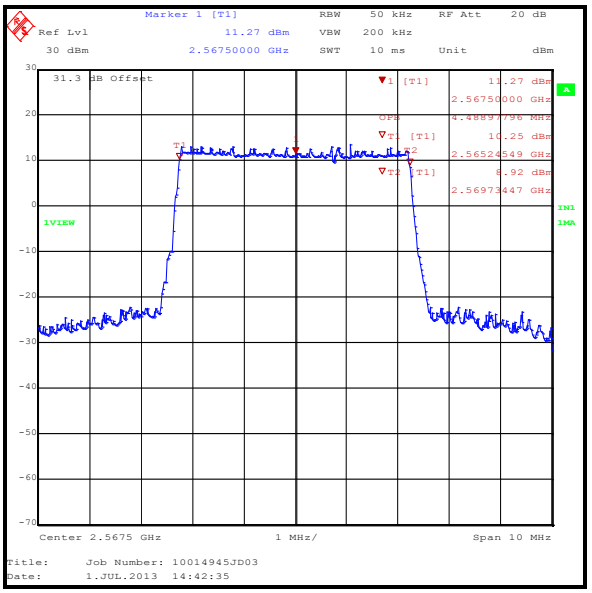
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2567.5	12	6	30	100	2.184
2567.5	25	0	50	200	4.489



QPSK / 12 Resource Blocks (6 offset)

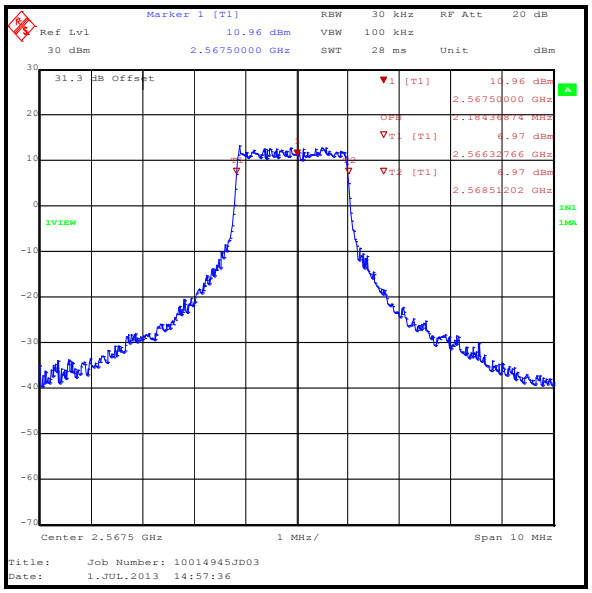


QPSK / 25 Resource Blocks (0 offset)

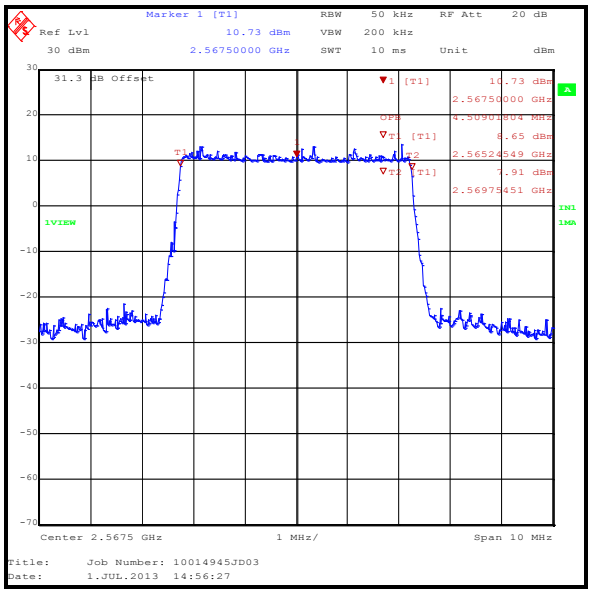
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2567.5	12	6	30	100	2.184
2567.5	25	0	50	200	4.509



16QAM / 12 Resource Blocks (6 offset)

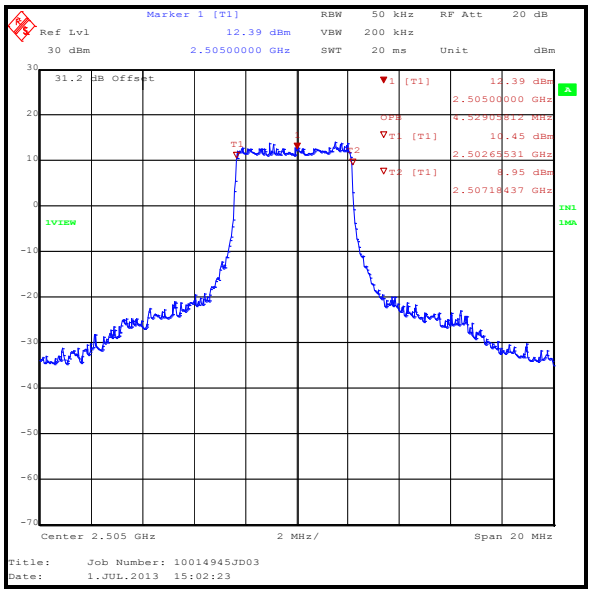


16QAM / 25 Resource Blocks (0 offset)

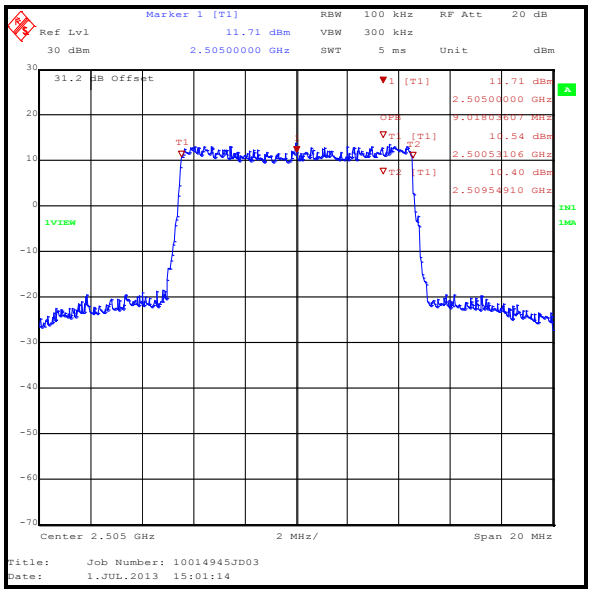
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2505	25	12	50	200	4.529
2505	50	0	100	300	9.018



QPSK / 25 Resource Blocks (12 offset)

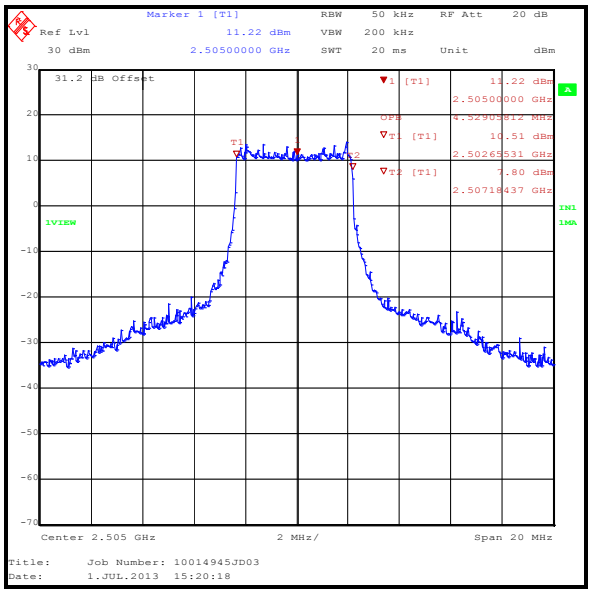


QPSK / 50 Resource Blocks (0 offset)

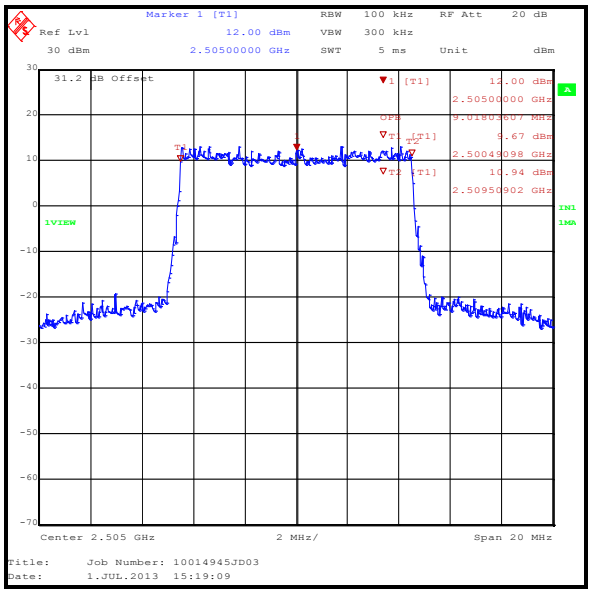
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2505	25	12	50	200	4.529
2505	50	0	100	300	9.018



16QAM / 25 Resource Blocks (12 offset)

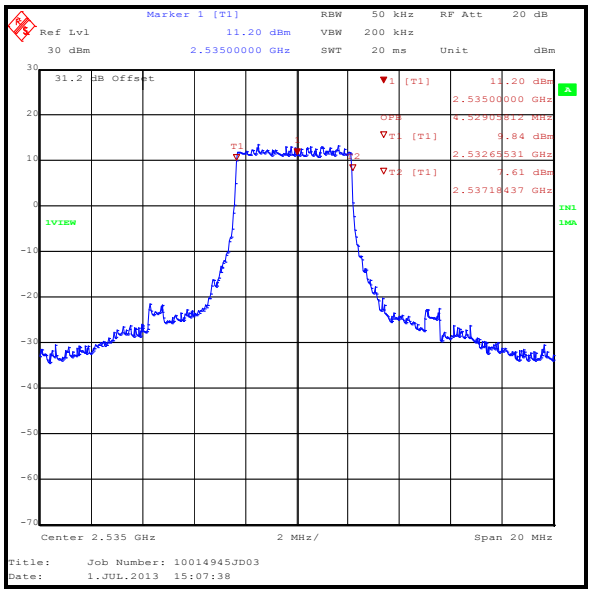


16QAM / 50 Resource Blocks (0 offset)

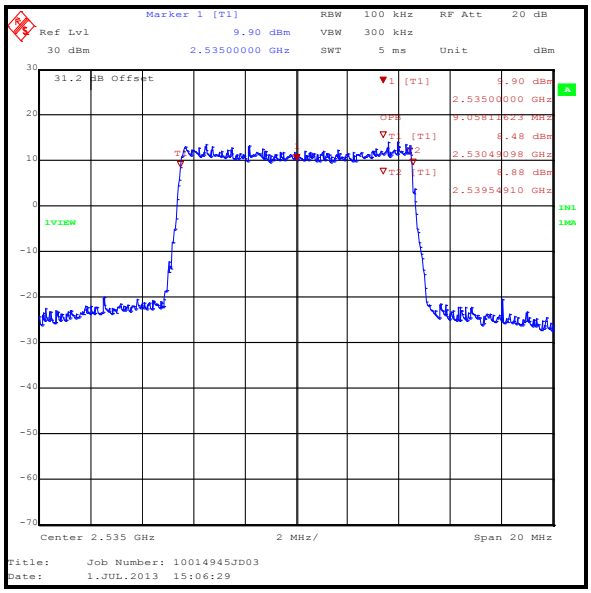
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	25	12	50	200	4.529
2535	50	0	100	300	9.058



QPSK / 25 Resource Blocks (12 offset)

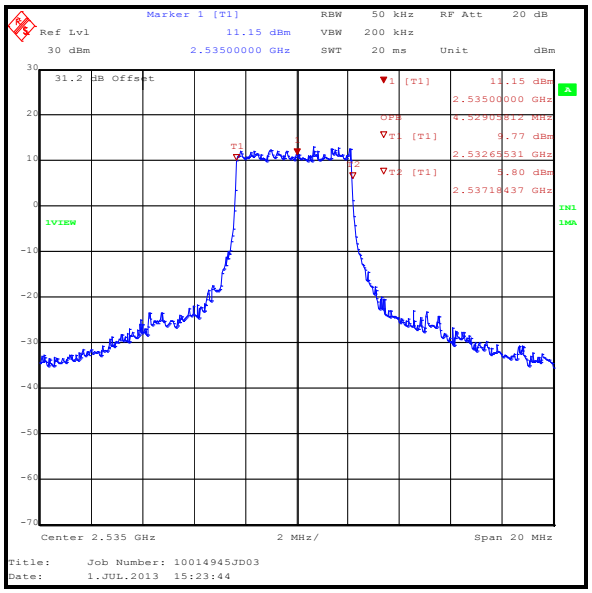


QPSK / 50 Resource Blocks (0 offset)

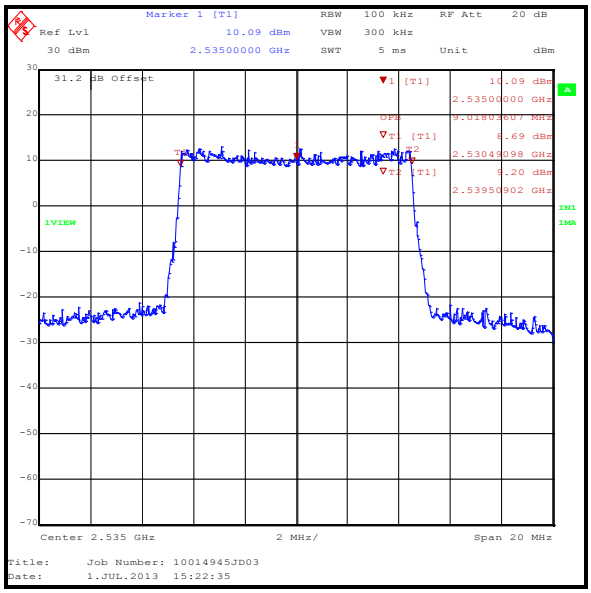
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	25	12	50	200	4.529
2535	50	0	100	300	9.018



16QAM / 25 Resource Blocks (12 offset)

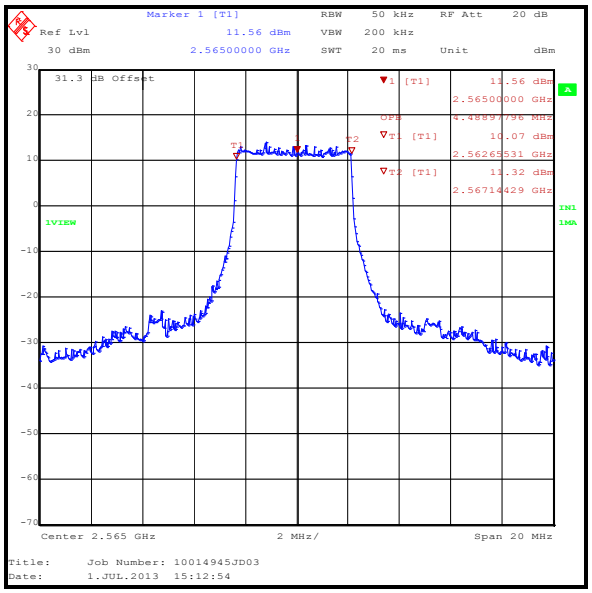


16QAM / 50 Resource Blocks (0 offset)

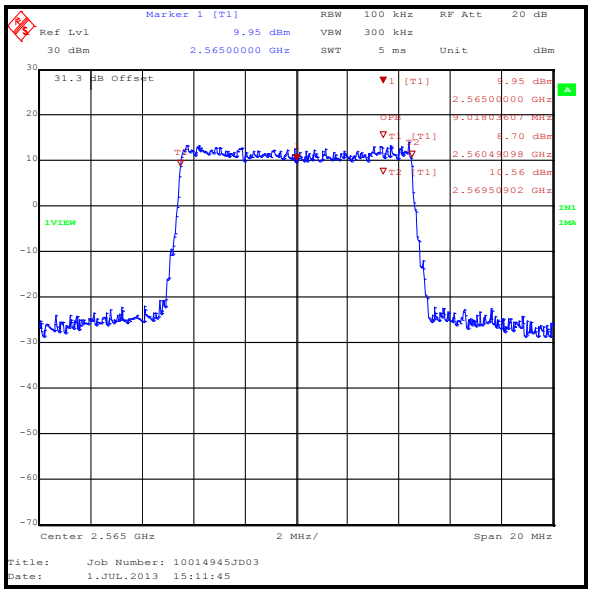
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2565	25	12	50	200	4.489
2565	50	0	100	300	9.018



QPSK / 25 Resource Blocks (12 offset)

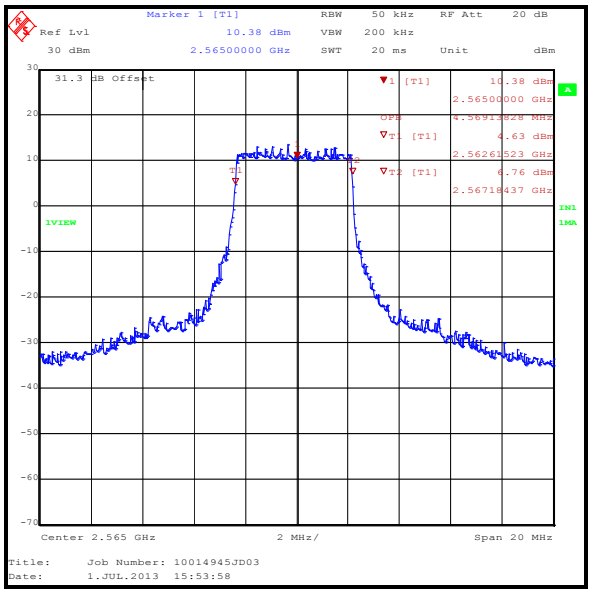


QPSK / 50 Resource Blocks (0 offset)

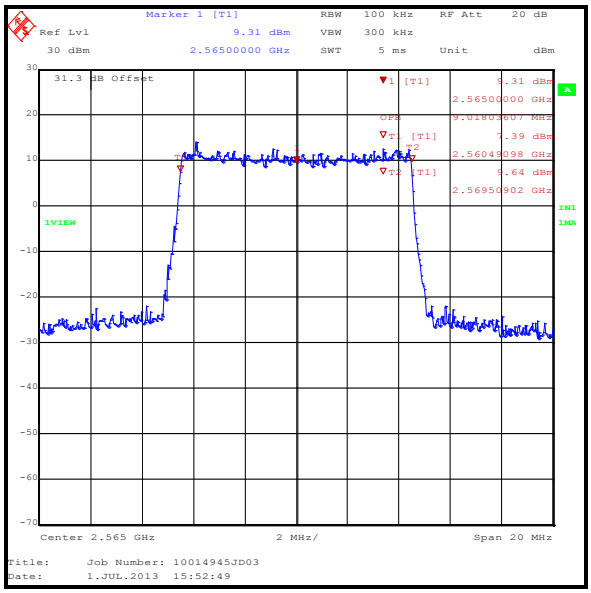
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2565	25	12	50	200	4.569
2565	50	0	100	300	9.018



16QAM / 25 Resource Blocks (12 offset)

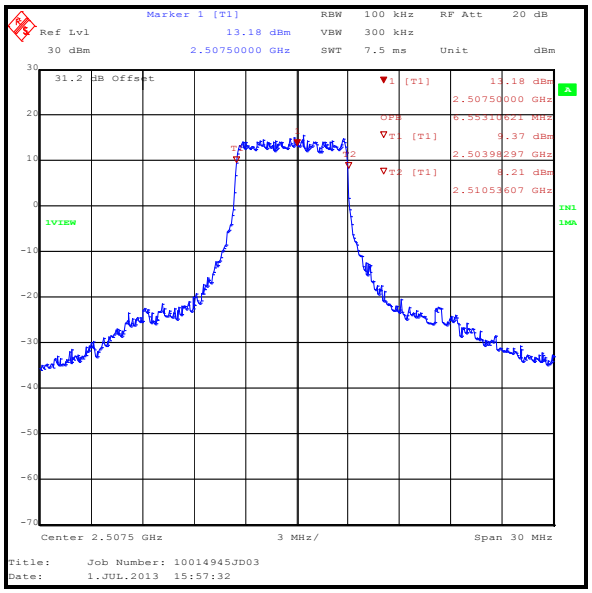


16QAM / 50 Resource Blocks (0 offset)

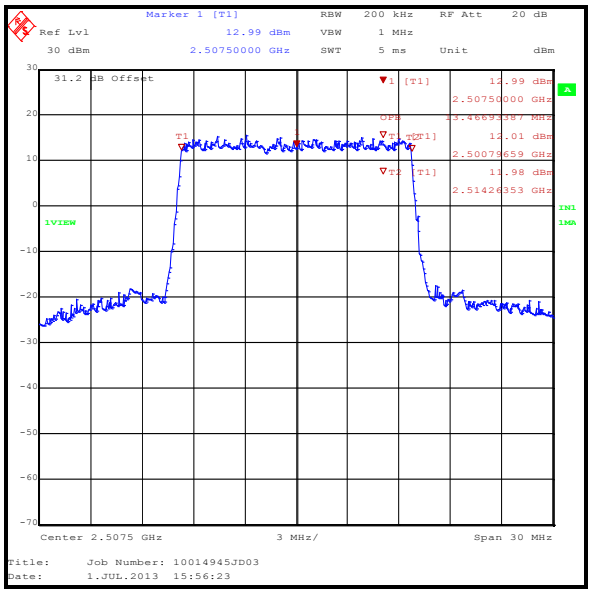
Transmitter Occupied Bandwidth (continued)

Results: 15 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2507.5	36	18	100	300	6.553
2507.5	75	0	200	1000	13.467



QPSK / 36 Resource Blocks (18 offset)

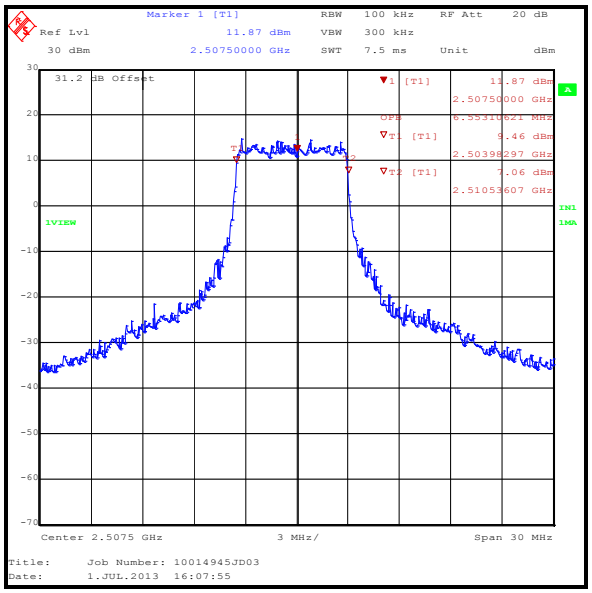


QPSK / 75 Resource Blocks (0 offset)

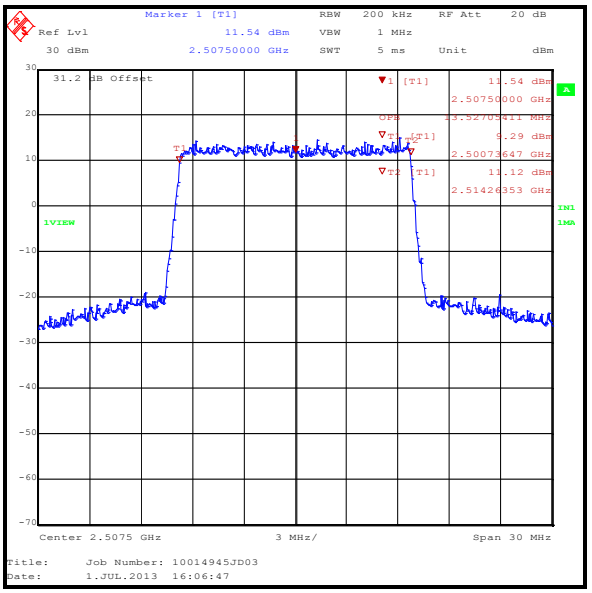
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2507.5	36	18	100	300	6.553
2507.5	75	0	200	1000	13.527



16QAM / 36 Resource Blocks (18 offset)

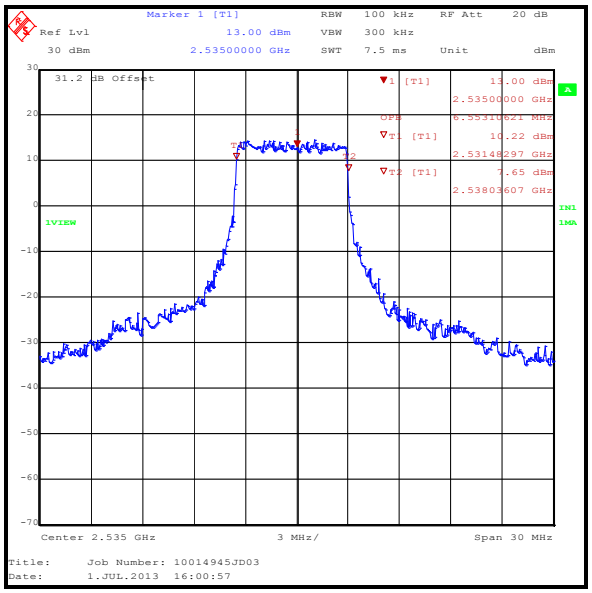


16QAM / 75 Resource Blocks (0 offset)

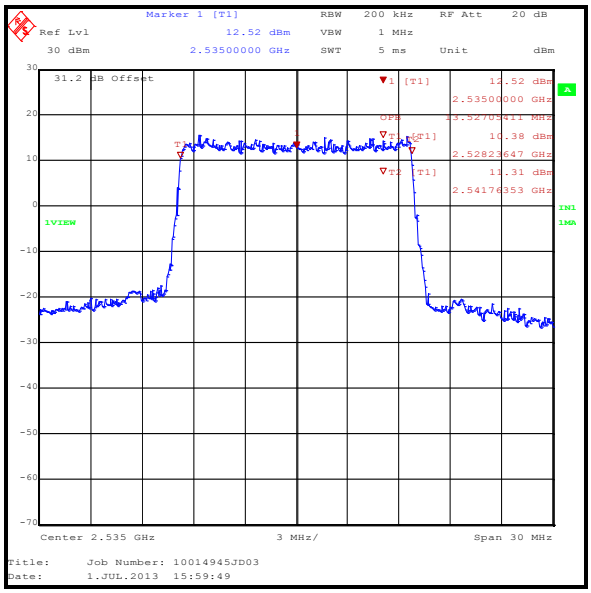
Transmitter Occupied Bandwidth (continued)

Results: 15 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	36	18	100	300	6.553
2535	75	0	200	1000	13.527



QPSK / 36 Resource Blocks (18 offset)

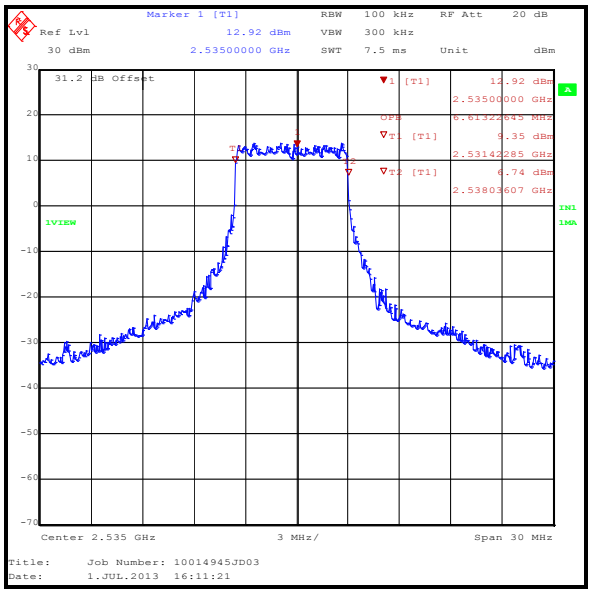


QPSK / 75 Resource Blocks (0 offset)

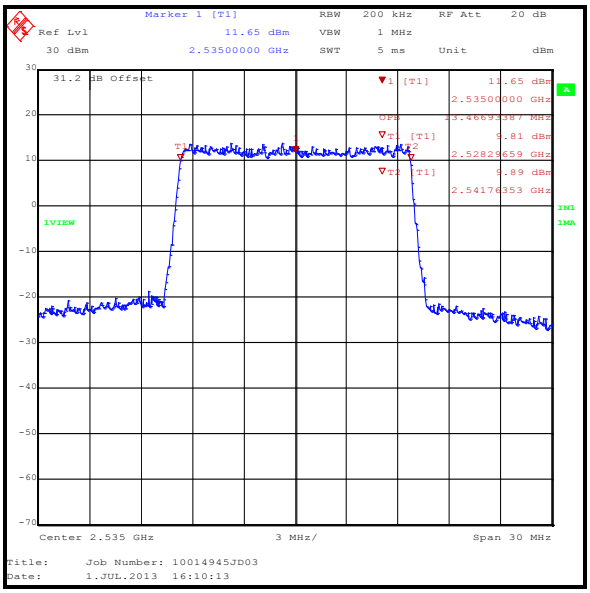
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	36	18	100	300	6.613
2535	75	0	200	1000	13.467



16QAM / 36 Resource Blocks (18 offset)

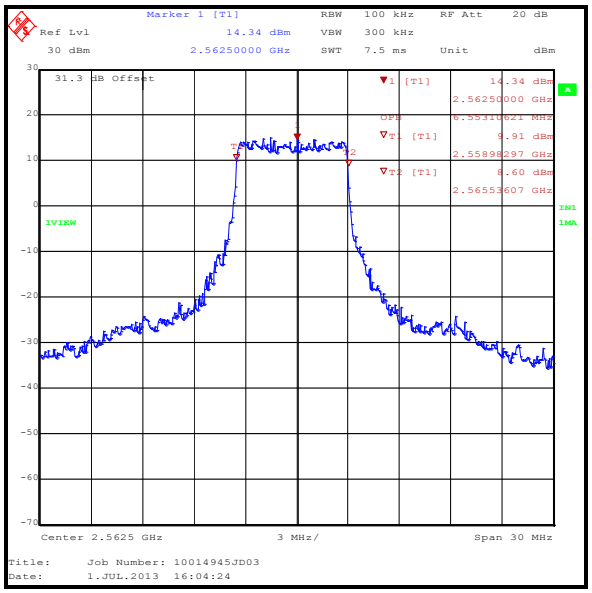


16QAM / 75 Resource Blocks (0 offset)

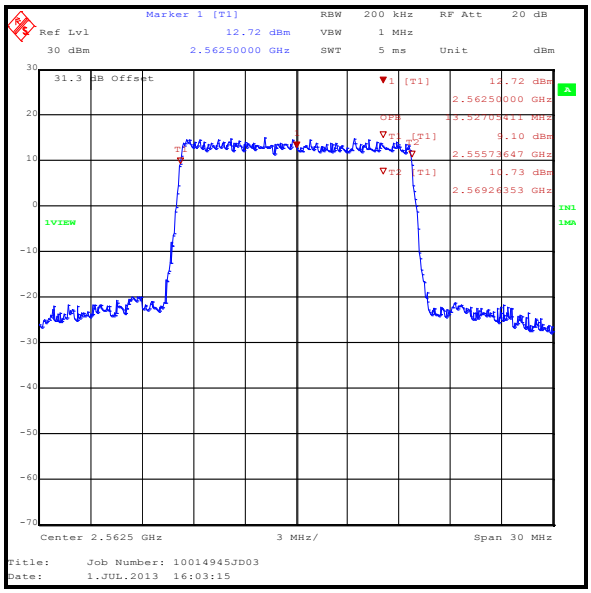
Transmitter Occupied Bandwidth (continued)

Results: 15 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2562.5	36	18	100	300	6.553
2562.5	75	0	200	1000	13.527



QPSK / 36 Resource Blocks (18 offset)

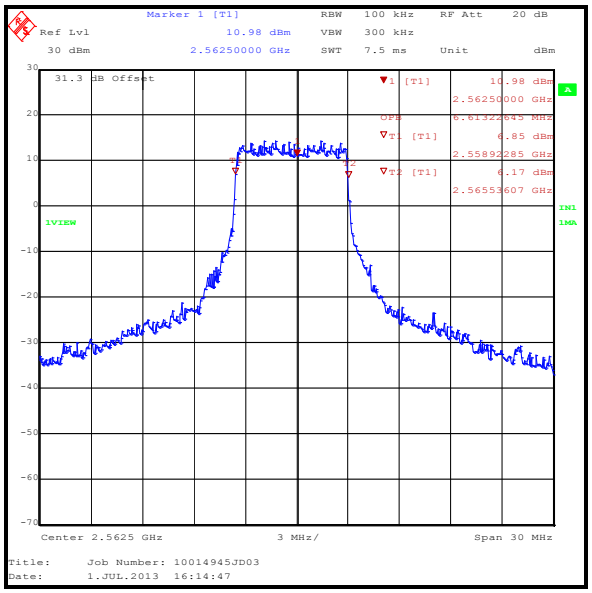


QPSK / 75 Resource Blocks (0 offset)

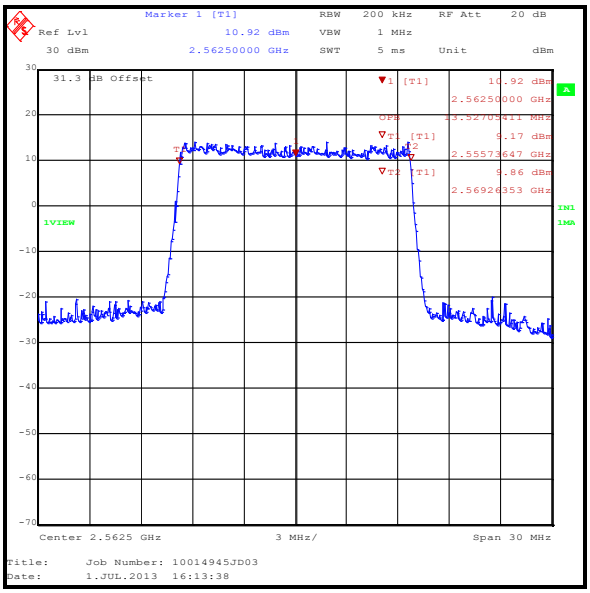
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2562.5	36	18	100	300	6.613
2562.5	75	0	200	1000	13.527



16QAM / 36 Resource Blocks (18 offset)

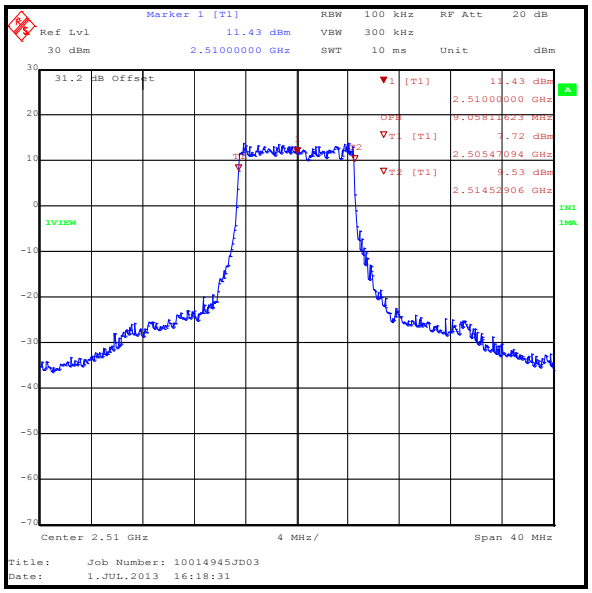


16QAM / 75 Resource Blocks (0 offset)

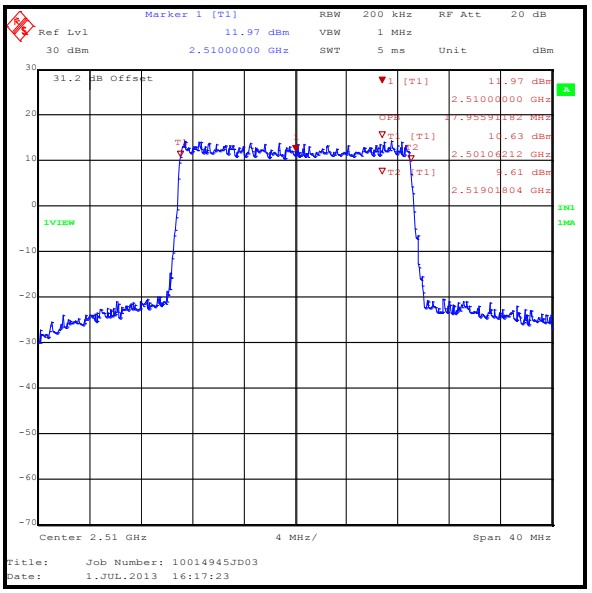
Transmitter Occupied Bandwidth (continued)

Results: 20 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2510	50	25	100	300	9.058
2510	100	0	200	1000	17.956



QPSK / 50 Resource Blocks (25 offset)

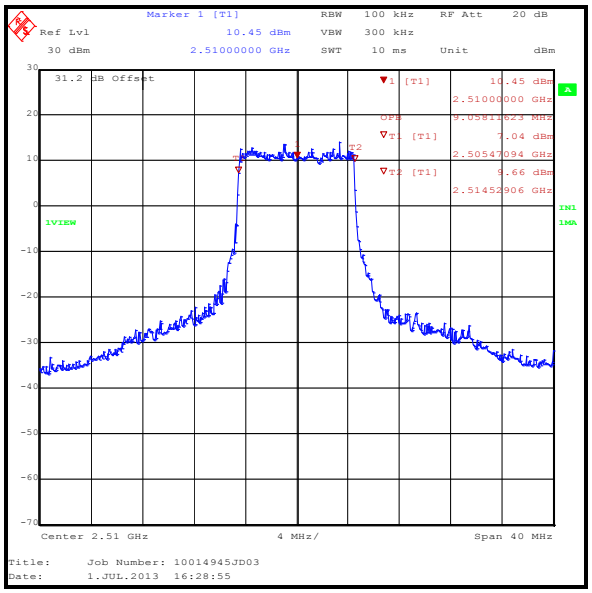


QPSK / 100 Resource Blocks (0 offset)

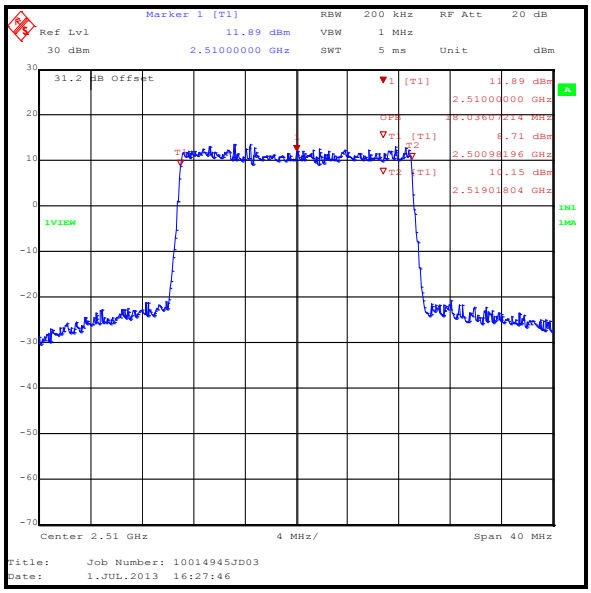
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2510	50	25	100	300	9.058
2510	100	0	200	1000	18.036



16QAM / 50 Resource Blocks (25 offset)

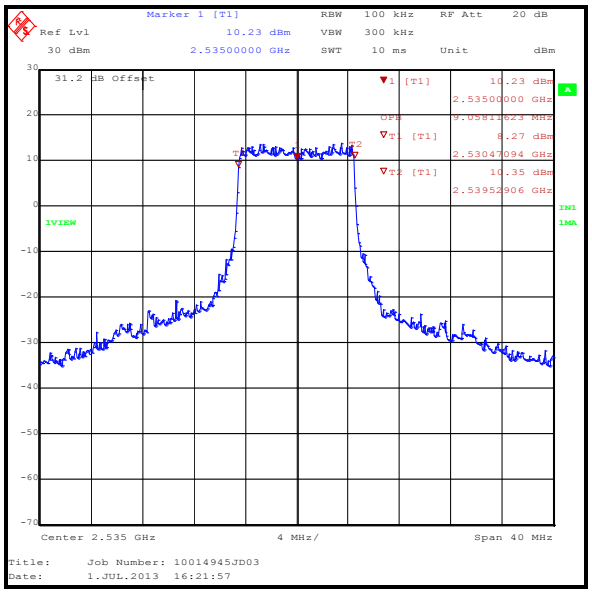


16QAM / 100 Resource Blocks (0 offset)

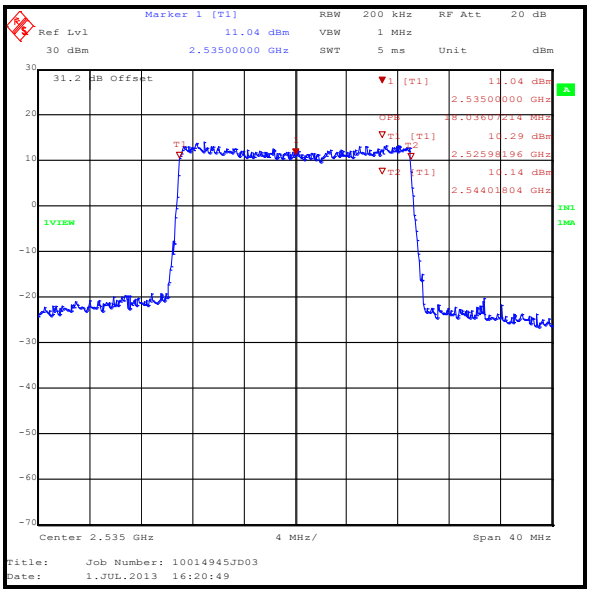
Transmitter Occupied Bandwidth (continued)

Results: 20 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	50	25	100	300	9.058
2535	100	0	200	1000	18.036



QPSK / 50 Resource Blocks (25 offset)

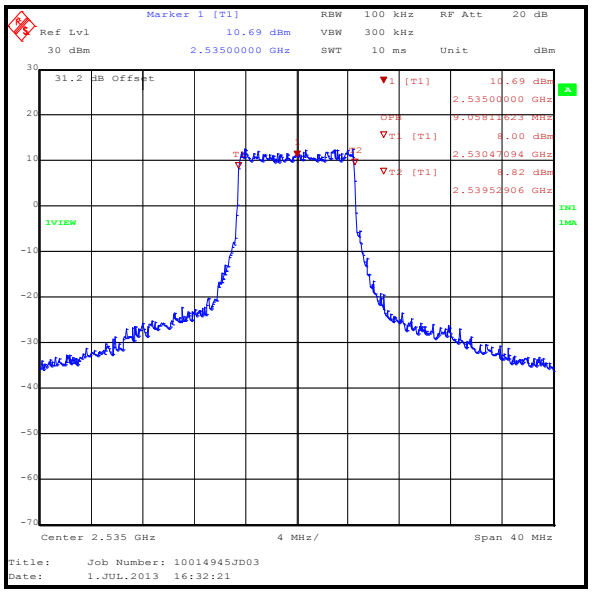


QPSK / 100 Resource Blocks (0 offset)

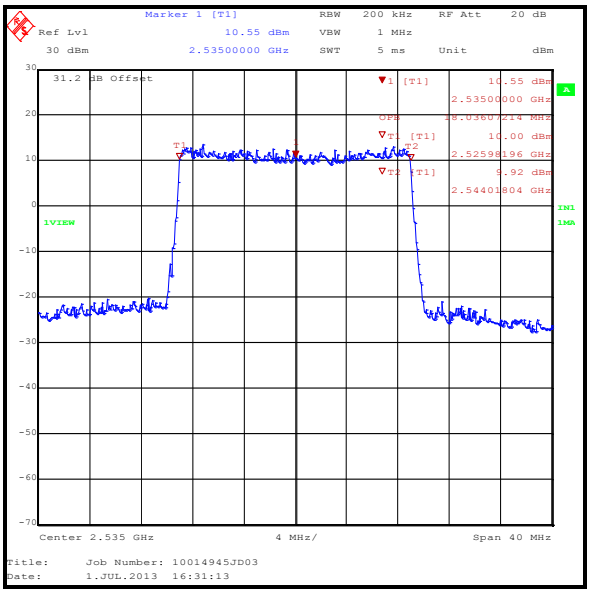
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2535	50	25	100	300	9.058
2535	100	0	200	1000	18.036



16QAM / 50 Resource Blocks (25 offset)

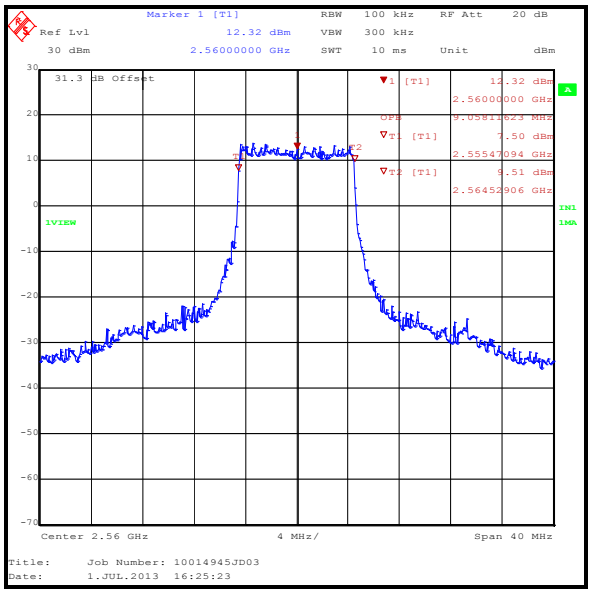


16QAM / 100 Resource Blocks (0 offset)

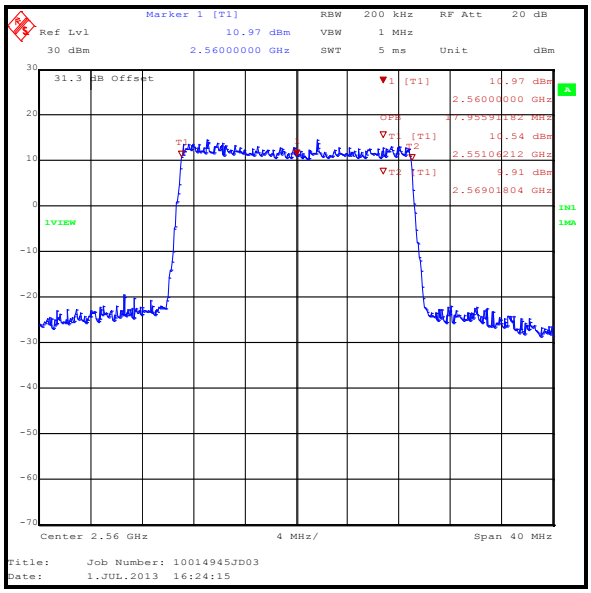
Transmitter Occupied Bandwidth (continued)

Results: 20 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2560	50	25	100	300	9.058
2560	100	0	200	1000	17.956



QPSK / 50 Resource Blocks (25 offset)

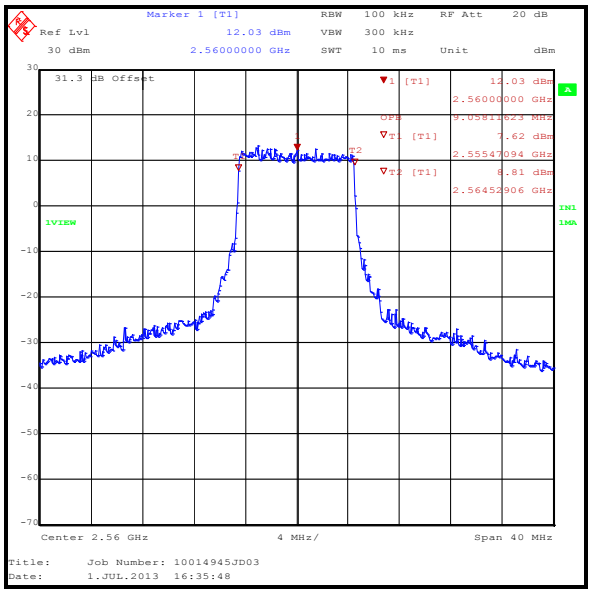


QPSK / 100 Resource Blocks (0 offset)

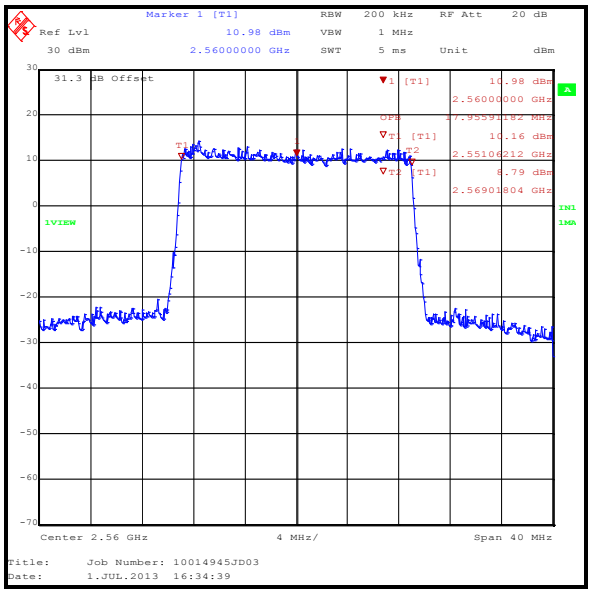
Transmitter Occupied Bandwidth (continued)

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

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
2560	50	25	100	300	9.058
2560	100	0	200	1000	17.956



16QAM / 50 Resource Blocks (25 offset)



16QAM / 100 Resource Blocks (0 offset)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
L1014	Test Receiver	Rhode & Schwarz	ESIB 40	100014	10 May 2014	12
A1368	Directional Coupler	Pasternack	PE2214-10	None	Calibrated before use	-
A2143	Attenuator	AtlanTecRF	AN18-20	081120-23	10 May 2014	12
S0523	DC Power Supply	TTi	PL320	224235	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12

5.2.3. Transmitter Radiated Spurious Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Dates:**	06 July 2013 & 07 July 2013
Test Sample IMEI:	004402451217222		

FCC Reference:	Parts 2.1053 & 27.53(m)(4)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 2.1053
Frequency Range:	30 MHz to 26 GHz
Configuration:	20 MHz QPSK, 1RB, 0 Offset

Environmental Conditions:

Temperature (°C):	22 to 26
Relative Humidity (%):	40 to 43

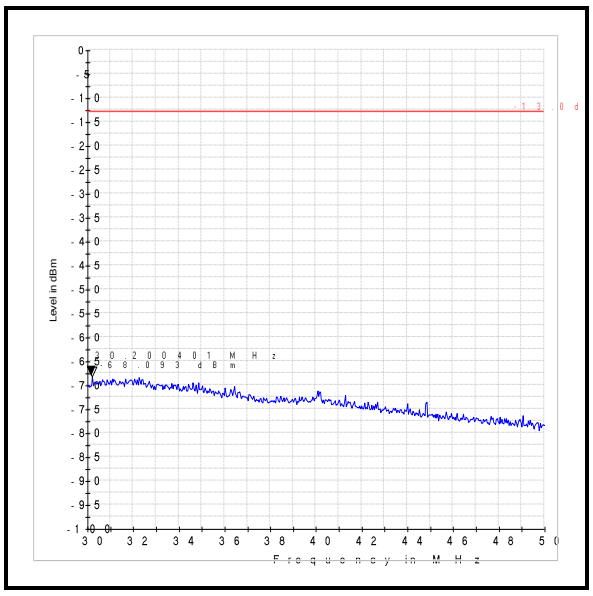
Note(s):

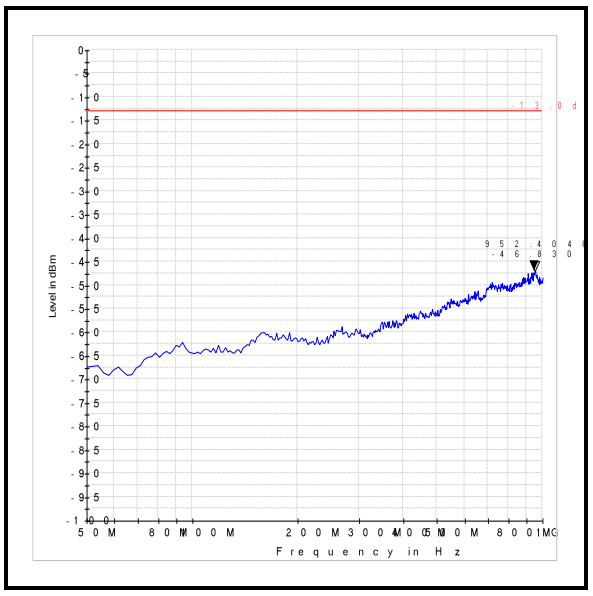
1. The EUT was set to transmit with a 20 MHz channel bandwidth, QPSK modulation applied and 1 resource block with 0 offset, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.
2. Pre-scans have been taken with a limit line set at -13 dBm. In accordance with 27.53(m)(4), the results table has a limit of -25 dBm.
3. The emission seen on the 1 GHz to 3 GHz plot at approximately 2562.5 MHz is the EUT carrier.
4. No spurious emissions were detected above the measurement system noise floor therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
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.

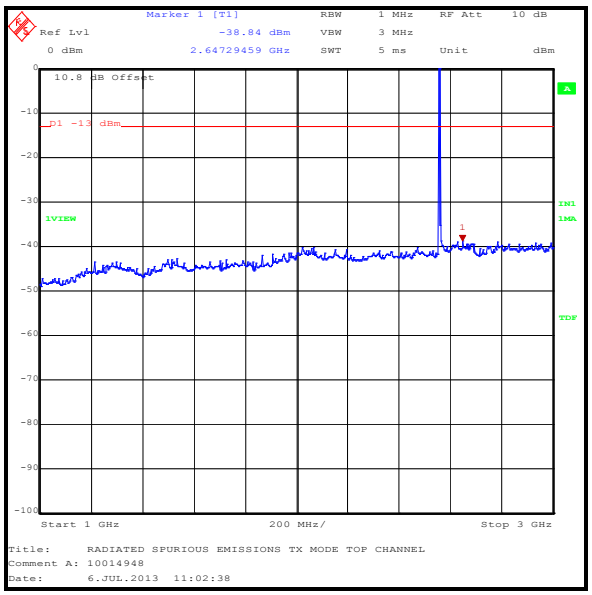
Results:

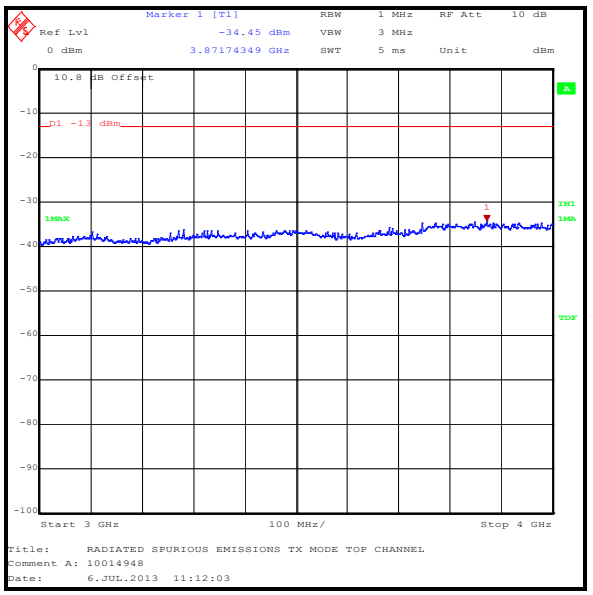
Frequency (MHz)	Antenna Polarisation	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
20821.643	Vertical	-34.2	-25.0	9.2	Complied

Transmitter Radiated Spurious Emissions (continued)

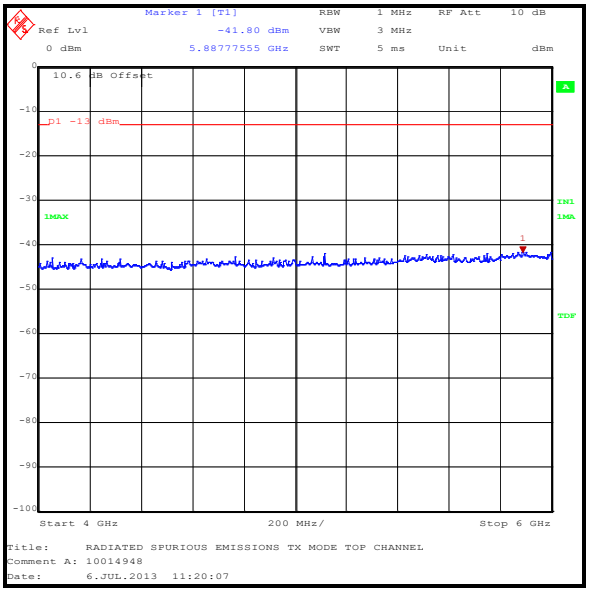


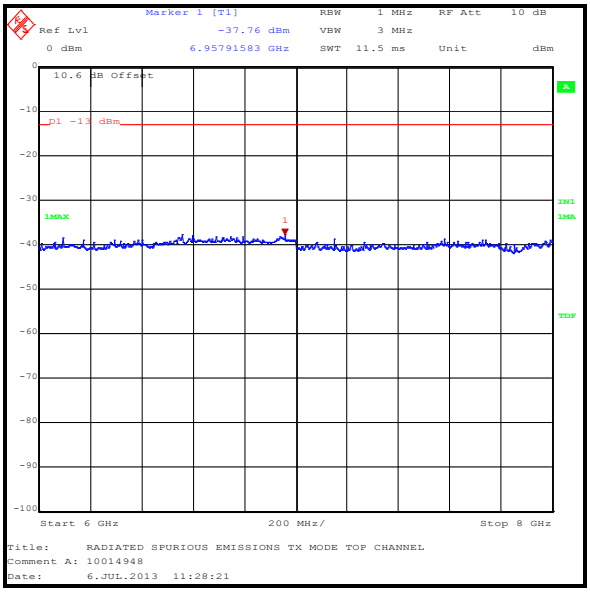


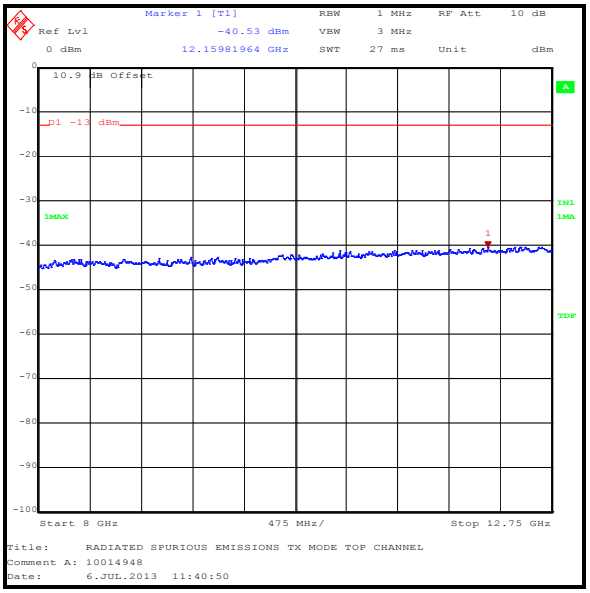


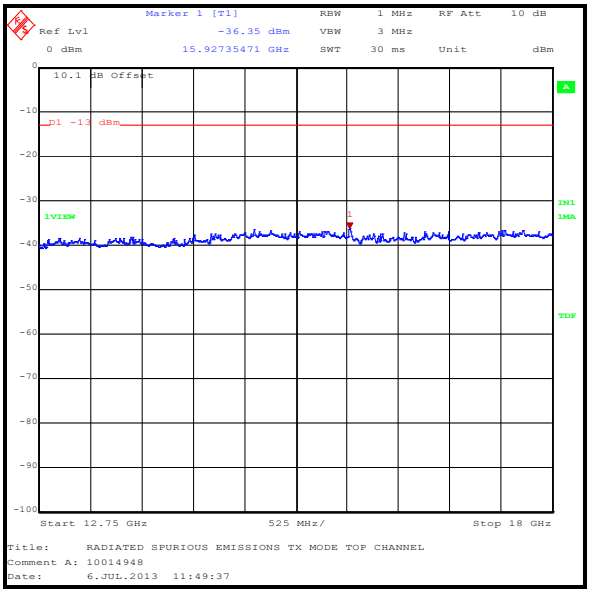


Transmitter Radiated Spurious Emissions (continued)

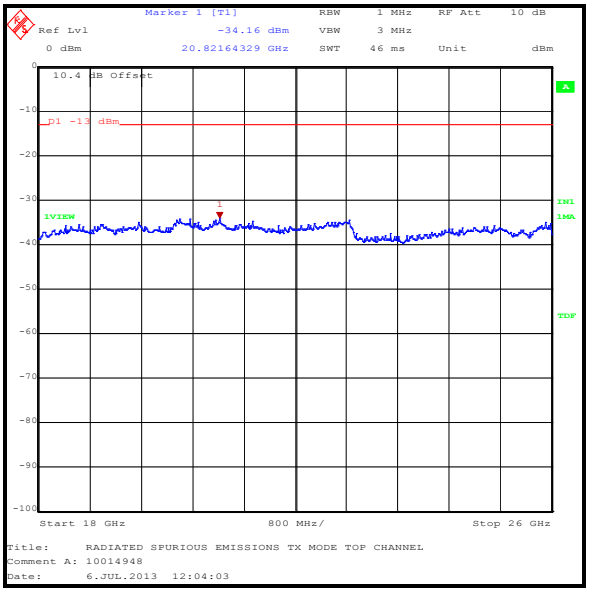








Transmitter Radiated Spurious Emissions (continued)



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	24 Oct 2013	12
G0543	Amplifier	Sonoma	310N	230801	05 Oct 2013	3
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	07 Feb 2014	12
A1834	Attenuator	Hewlett Packard	8491B	10444	27 Jan 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	10 May 2014	12
A490	Antenna	Chase	CBL6111A	1590	09 Apr 2014	12
M1656	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	04 Nov 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	04 Nov 2013	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
A253	Antenna	Flann Microwave	12240-20	128	04 Nov 2013	12
A254	Antenna	Flann Microwave	14240-20	139	04 Nov 2013	12
A255	Antenna	Flann Microwave	16240-20	519	04 Nov 2013	12
A256	Antenna	Flann Microwave	18240-20	400	04 Nov 2013	12
A436	Antenna	Flann Microwave	20240-20	330	04 Nov 2013	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	19 Apr 2014	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	10 May 2014	12

5.2.4. Transmitter Radiated Emissions at Band Edges

Test Summary:

Test Engineer:	Mark Percival	**Test Dates:**	04 July 2013 & 12 July 2013
Test Sample IMEI:	004402451217222		

FCC Reference:	Parts 2.1053 and 27.53(m)(4)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 27.53

Environmental Conditions:

Temperature (°C):	21 to 22
Relative Humidity (%):	44 to 51

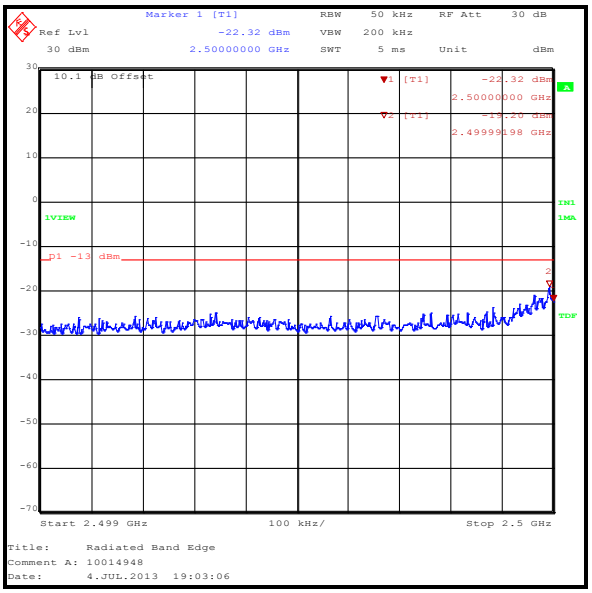
Note(s):

1. Measurements were performed with the EUT transmitting QPSK and 16QAM modulation schemes and maximum resource block allocation.

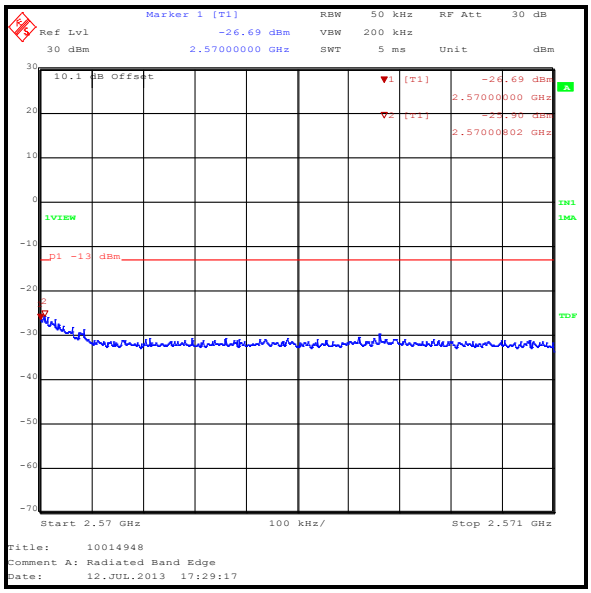
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.992	25	0	-19.2	-13.0	6.2	Complied
2500	25	0	-22.3	-13.0	9.3	Complied
2570	25	0	-26.7	-13.0	13.7	Complied
2570.008	25	0	-25.9	-13.0	12.9	Complied



QPSK / Lower Band Edge

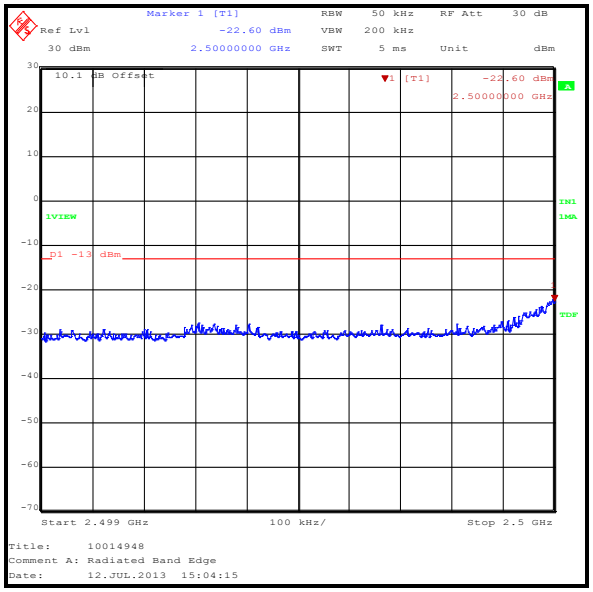


QPSK / Upper Band Edge

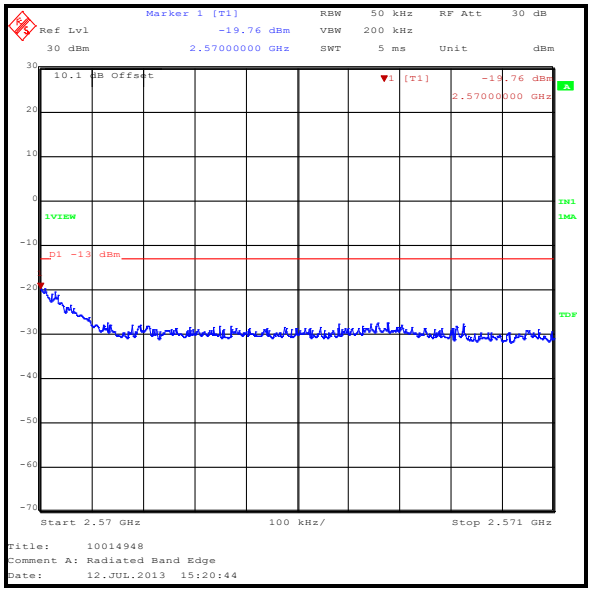
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2500	25	0	-22.6	-13.0	9.6	Complied
2570	25	0	-19.8	-13.0	6.8	Complied



16QAM / Lower Band Edge

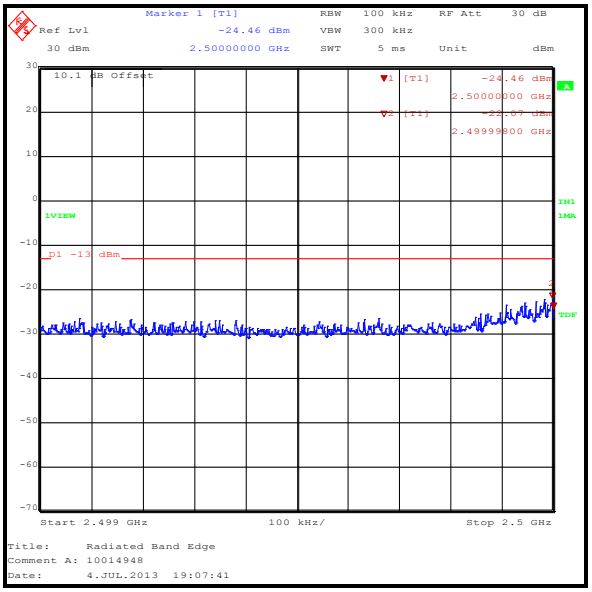


16QAM / Upper Band Edge

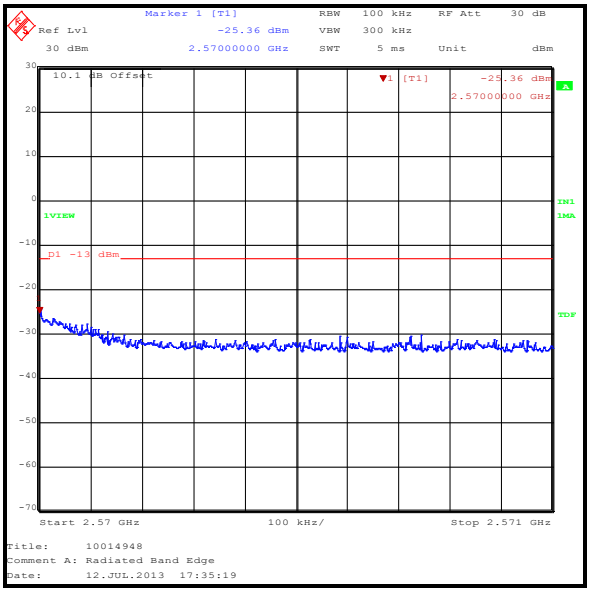
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.998	50	0	-22.1	-13.0	9.1	Complied
2500	50	0	-24.5	-13.0	11.5	Complied
2570	50	0	-25.4	-13.0	12.4	Complied



QPSK / Lower Band Edge

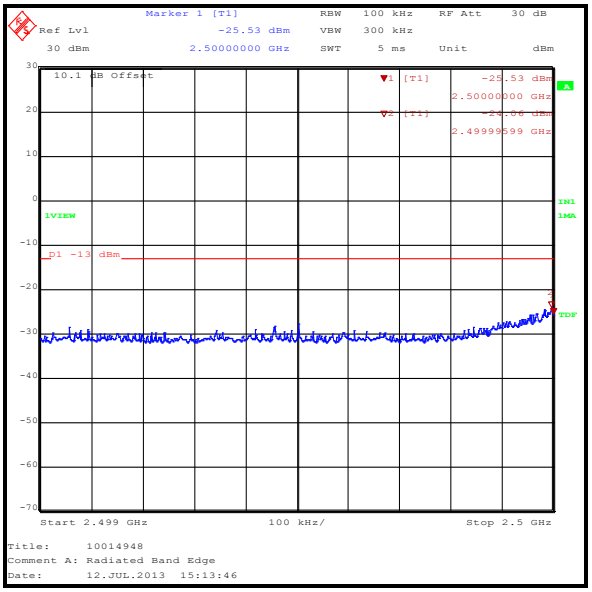


QPSK / Upper Band Edge

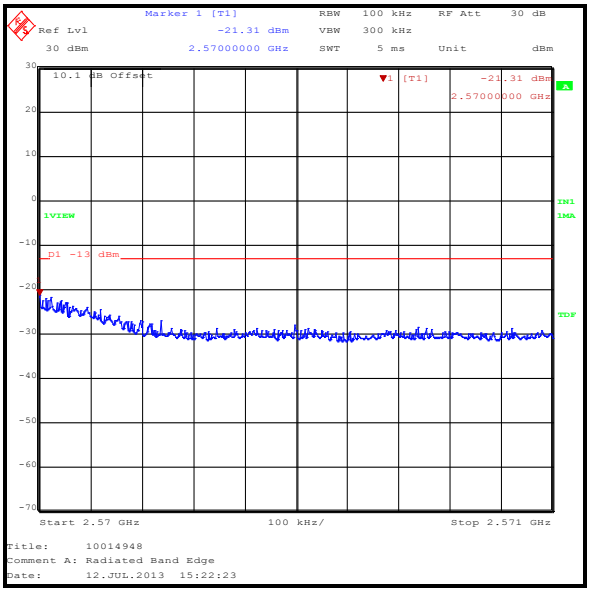
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.996	50	0	-24.1	-13.0	11.1	Complied
2500	50	0	-25.5	-13.0	12.5	Complied
2570	50	0	-21.3	-13.0	8.3	Complied



16QAM / Lower Band Edge

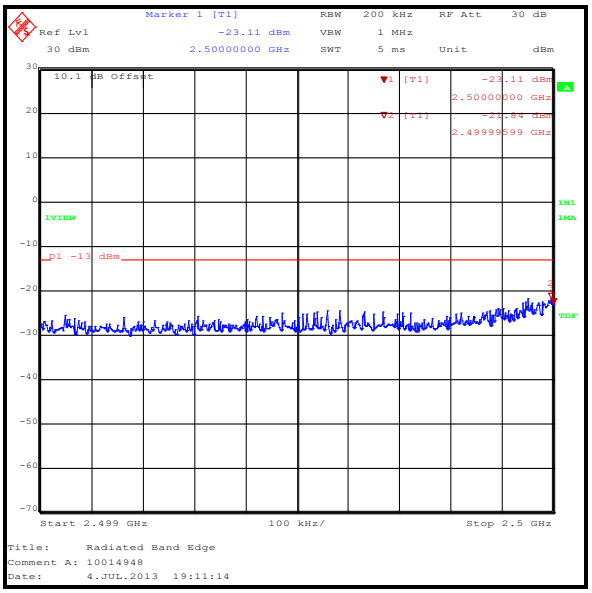


16QAM / Upper Band Edge

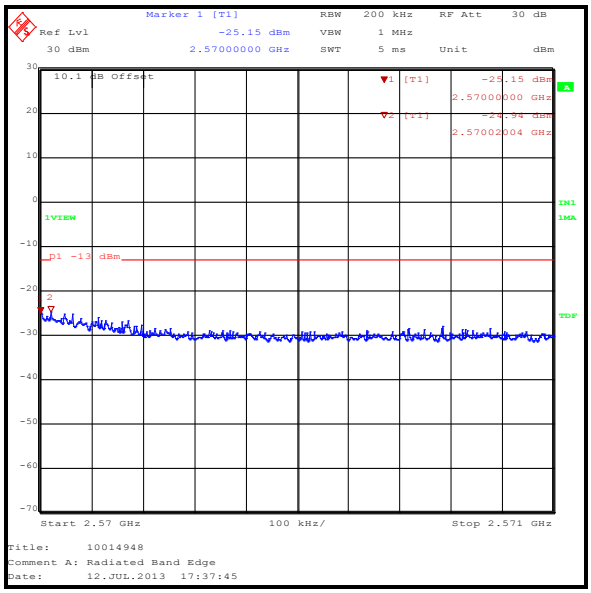
Transmitter Radiated Emissions at Band Edges (continued)

Results: 15 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.996	75	0	-21.8	-13.0	8.8	Complied
2500	75	0	-23.1	-13.0	10.1	Complied
2570	75	0	-25.2	-13.0	12.2	Complied
2570.020	75	0	-25.0	-13.0	12.0	Complied



QPSK / Lower Band Edge

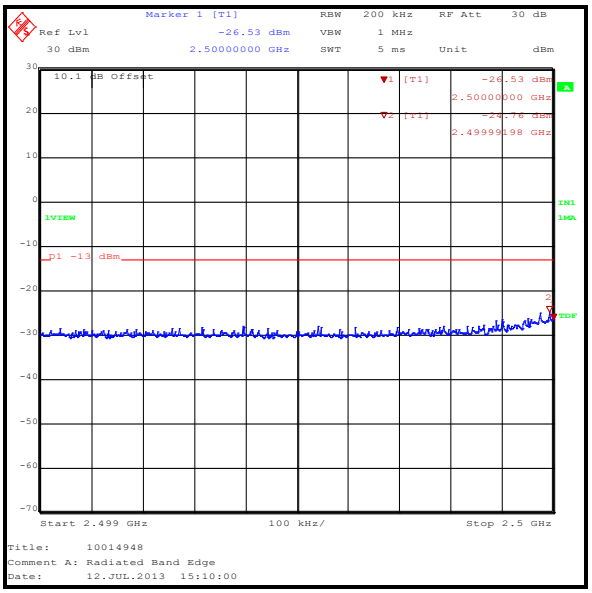


QPSK / Upper Band Edge

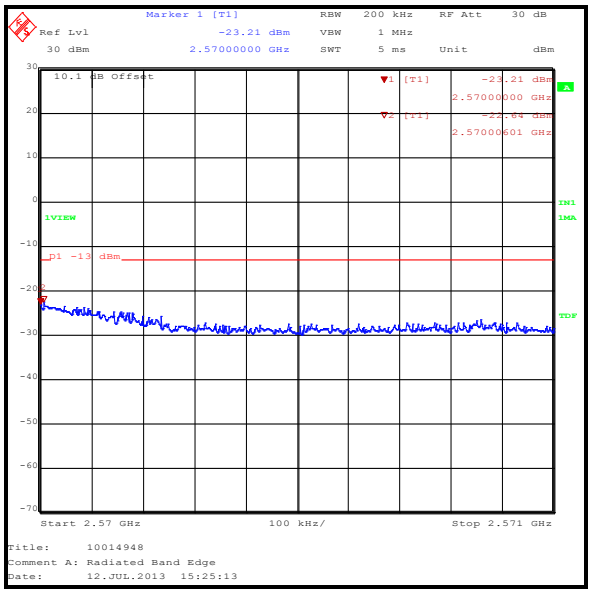
Transmitter Radiated Emissions at Band Edges (continued)

Results: 15 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.992	75	0	-24.8	-13.0	11.8	Complied
2500	75	0	-26.5	-13.0	13.5	Complied
2570	75	0	-23.2	-13.0	10.2	Complied
2570.006	75	0	-22.6	-13.0	9.6	Complied



16QAM / Lower Band Edge

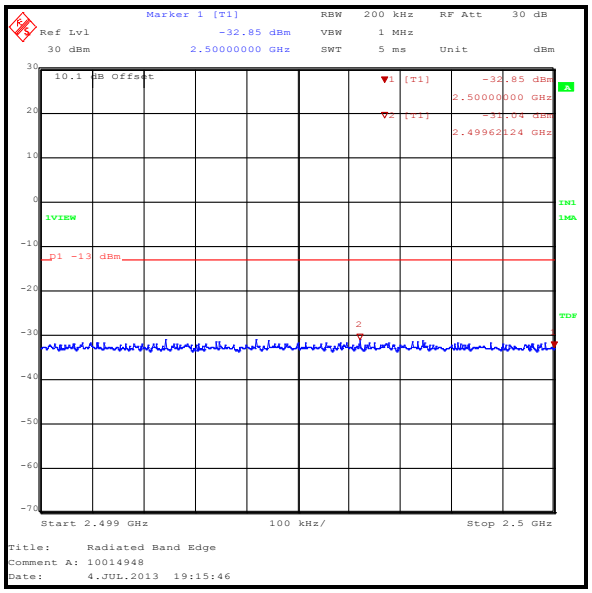


16QAM / Upper Band Edge

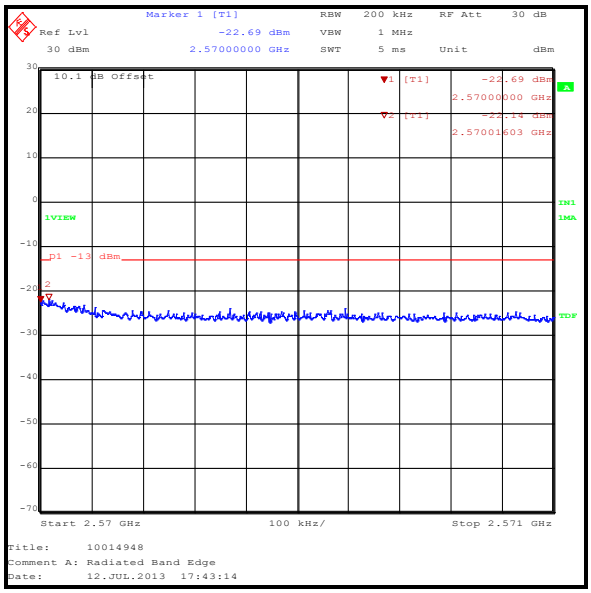
Transmitter Radiated Emissions at Band Edges (continued)

Results: 20 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.621	100	0	-31.0	-13.0	18.0	Complied
2500	100	0	-32.9	-13.0	19.9	Complied
2570	100	0	-22.7	-13.0	9.7	Complied
2570.016	100	0	-22.1	-13.0	9.1	Complied



QPSK / Lower Band Edge

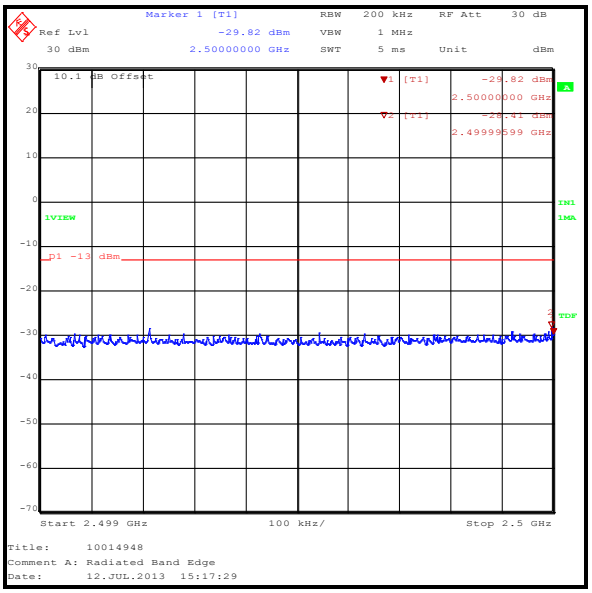


QPSK / Upper Band Edge

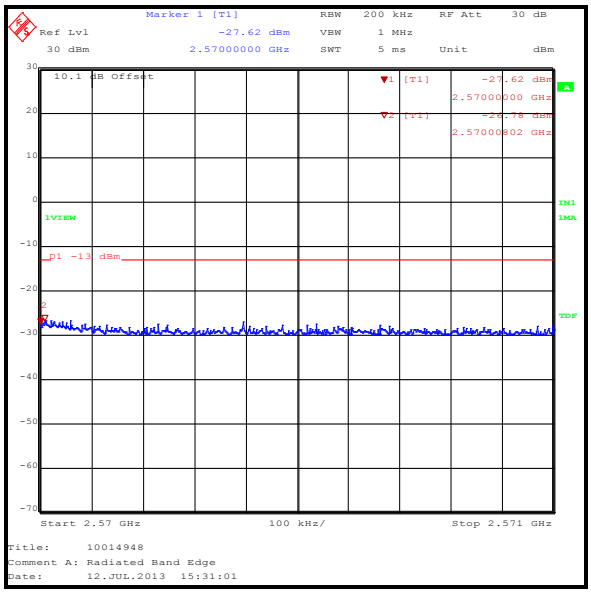
Transmitter Radiated Emissions at Band Edges (continued)

Results: 20 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.996	100	0	-28.4	-13.0	15.4	Complied
2500	100	0	-29.8	-13.0	16.8	Complied
2570	100	0	-27.6	-13.0	14.6	Complied
2570.008	100	0	-26.8	-13.0	13.8	Complied



16QAM / Lower Band Edge



16QAM / Upper Band Edge

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
K0002	3m RSE Chamber	Rainford	N/A	N/A	04 Nov 2013	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	04 Nov 2013	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	10 May 2014	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12

5.2.5. Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	18 July 2013
Test Sample IMEI:	004402451217222		

FCC Reference:	Parts 2.1053 and 27.53(m)(4)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 27.53 & KDB 971168 D01 Section 6.0

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	41

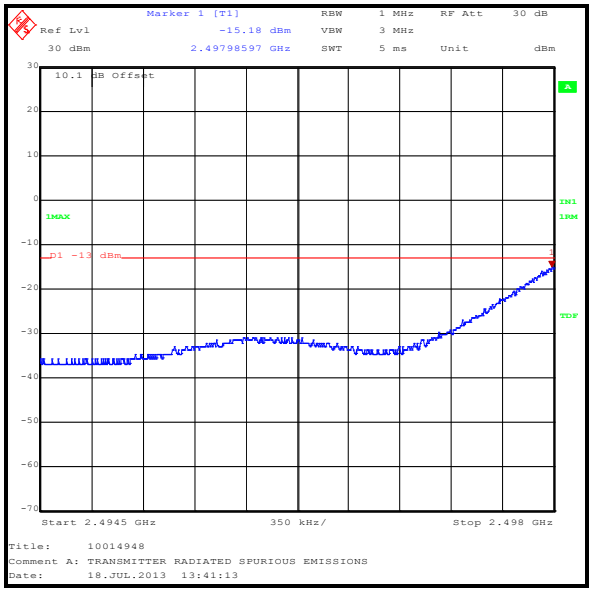
Note(s):

1. Measurements were performed with the EUT transmitting QPSK and 16QAM modulation schemes, with resource block settings stated in section 4.3.
2. As per KDB 971168 D01, section 6.0 paragraph 4, it was necessary to relax the reference bandwidth to increase the measurement accuracy in the ranges 2498 MHz to 2499 MHz and 2571 MHz to 2572 MHz. The spectrum analyser was centred 50 kHz above the lower frequency of the band being measured. This is the first 100 kHz strip to be measured. The resolution bandwidth was set to 100 kHz, 1/10 of the original bandwidth. The frequency span set to 0 Hz which ensured there would be little to no interference from the adjacent 100 kHz blocks.
3. The maximum power in mW was obtained from the first 100 kHz strip and recorded. The centre frequency was then incremented by 100 kHz to centre it on the 100 kHz strip above and immediately adjacent to the first 100 kHz strip where the power in mW was also recorded. The procedure was then repeated for all ten strips. The ten linear results noted as mW/100 kHz were summed to give a total power in terms of mW/MHz. The power was then converted into Log terms dBm/MHz using the formula *dBm = 10*Log(mW)*.

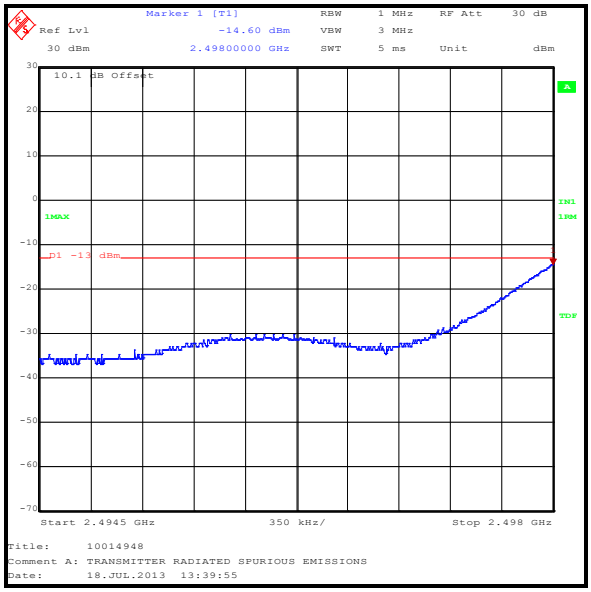
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 5 MHz Channel Bandwidth / 2494.5 MHz to 2498 MHz / Sub-test 1

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2497.986	QPSK	1	0	-15.2	-13.0	2.2	Complied
2498.000	16QAM	1	0	-14.6	-13.0	1.6	Complied



QPSK



16QAM

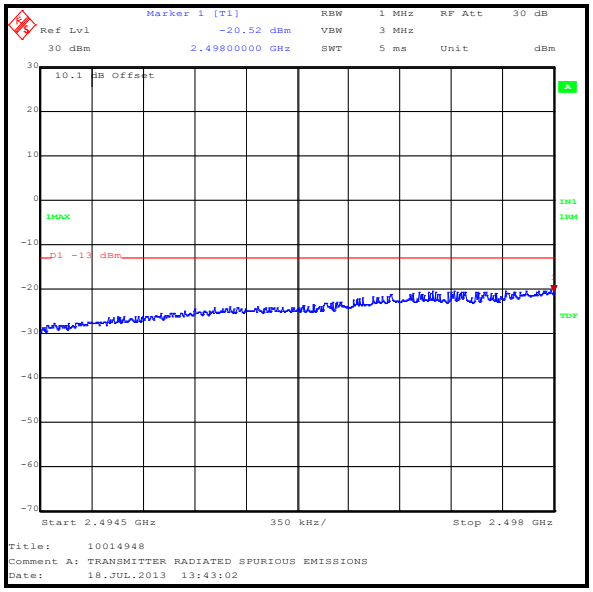
Results: 5 MHz Channel Bandwidth / 2498 MHz to 2499 MHz / Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498 to 2499	QPSK	1	0	-23.1	-13.0	10.1	Complied
2498 to 2499	16QAM	1	0	-19.5	-13.0	6.5	Complied

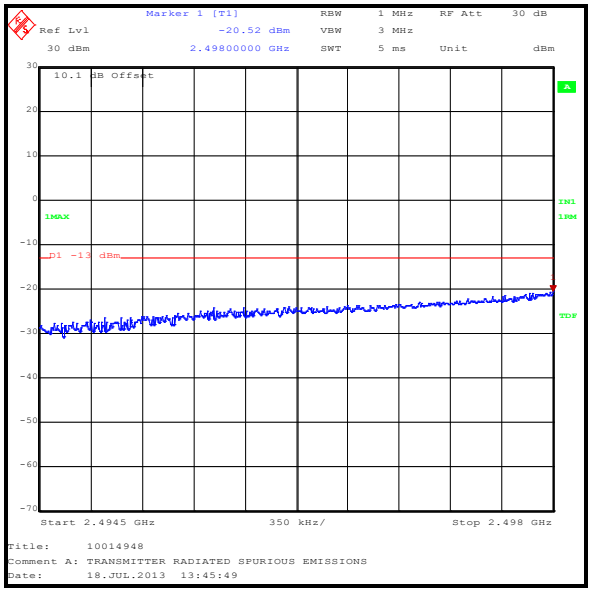
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 5 MHz Channel Bandwidth / 2494.5 MHz to 2498 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Blocks	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498.000	QPSK	25	0	-20.5	-13.0	7.5	Complied
2498.000	16QAM	25	0	-20.5	-13.0	7.5	Complied



QPSK



16QAM

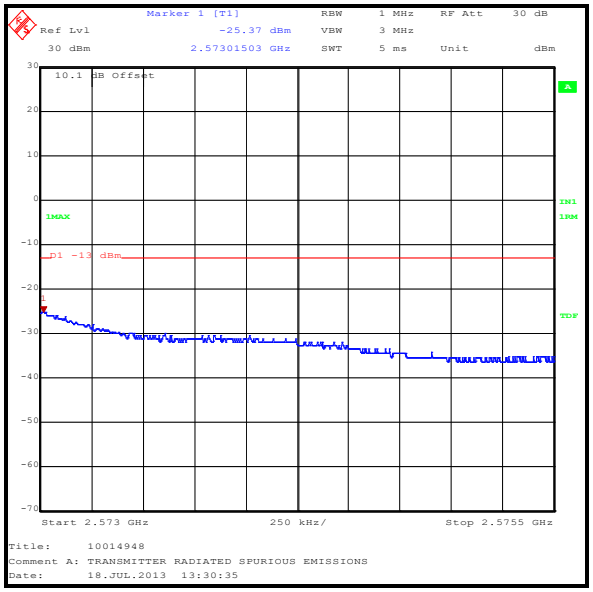
Results: 5 MHz Channel Bandwidth / 2498 MHz to 2499 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498 to 2499	QPSK	25	0	-16.5	-13.0	3.5	Complied
2498 to 2499	16QAM	25	0	-16.8	-13.0	3.8	Complied

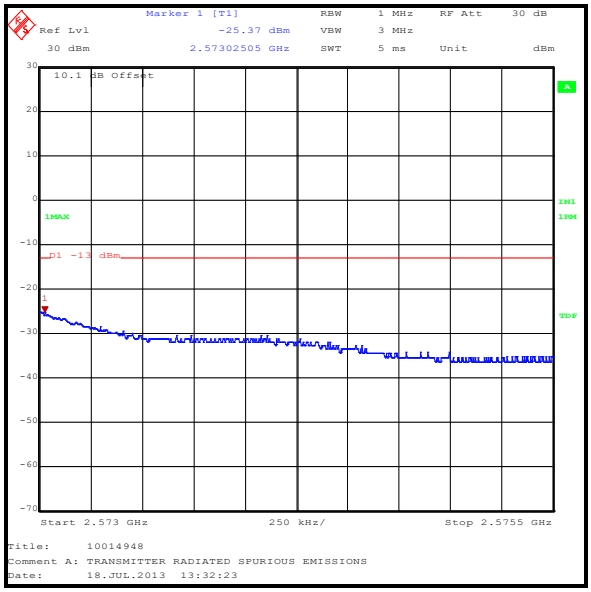
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 5 MHz Channel Bandwidth / 2573 MHz to 2575.5 MHz / Sub-test 2

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2573.015	QPSK	1	24	-25.4	-13.0	12.4	Complied
2573.025	16QAM	1	24	-25.4	-13.0	12.4	Complied



QPSK



16QAM

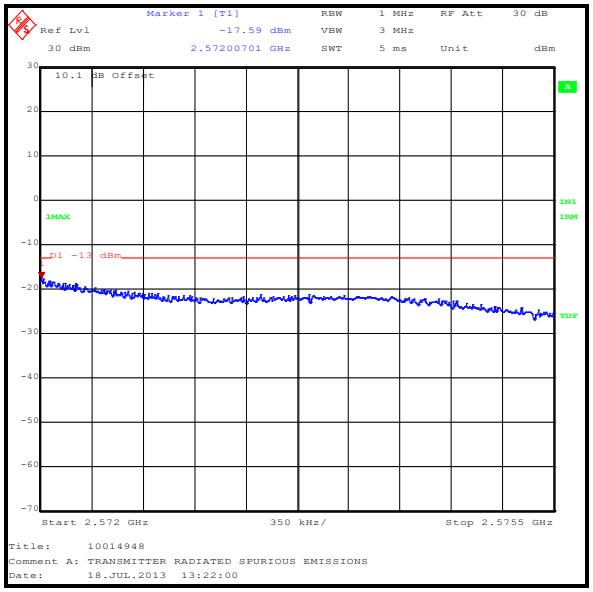
Results: 5 MHz Channel Bandwidth / 2571 MHz to 2573 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571 to 2572	QPSK	1	24	-17.3	-13.0	4.3	Complied
2572 to 2573	QPSK	1	24	-36.4	-13.0	23.4	Complied
2571 to 2572	16QAM	1	24	-16.7	-13.0	3.7	Complied
2572 to 2573	16QAM	1	24	-36.8	-13.0	23.8	Complied

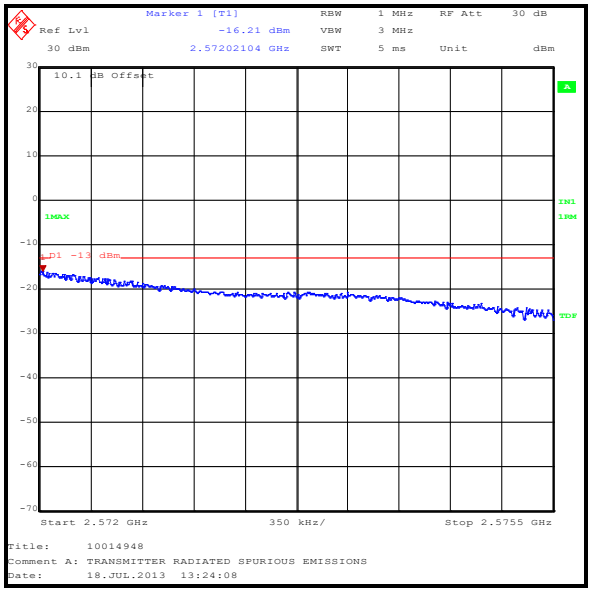
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 5 MHz Channel Bandwidth / 2572 MHz to 2575.5 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2572.007	QPSK	25	0	-17.6	-13.0	4.6	Complied
2572.021	16QAM	25	0	-16.2	-13.0	3.2	Complied



QPSK



16QAM

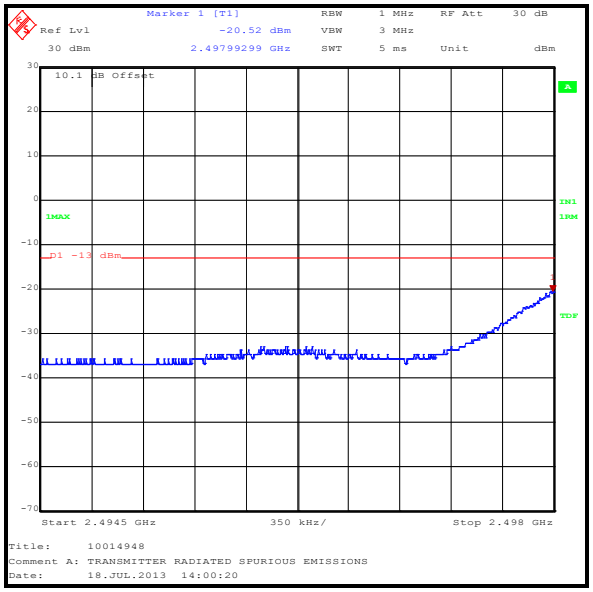
Results: 5 MHz Channel Bandwidth / 2571 MHz to 2572 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571 to 2572	QPSK	25	0	-16.1	-13.0	3.1	Complied
2571 to 2572	16QAM	25	0	-15.2	-13.0	2.2	Complied

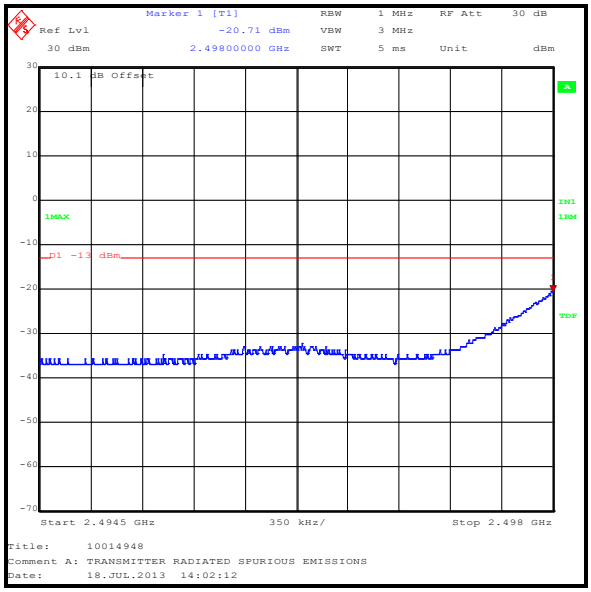
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 10 MHz Channel Bandwidth / 2494.5 MHz to 2498 MHz / Sub-test 1

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2497.993	QPSK	1	0	-20.5	-13.0	7.5	Complied
2498.000	16QAM	1	0	-20.7	-13.0	7.3	Complied



QPSK



16QAM

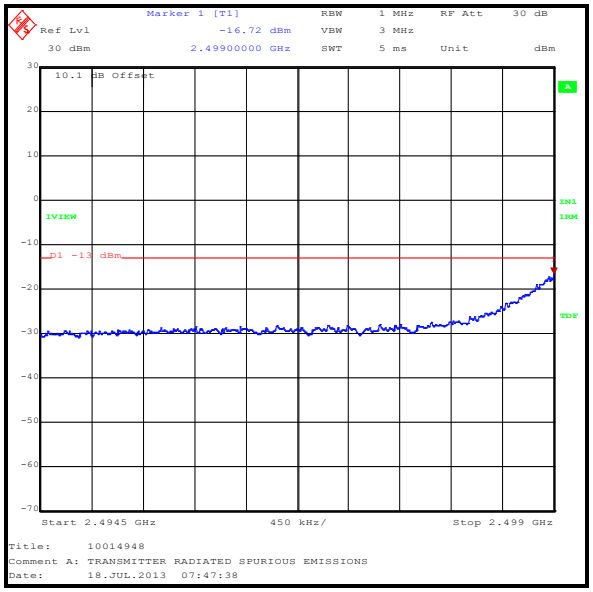
Results: 10 MHz Channel Bandwidth / 2498 MHz to 2499 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498 to 2499	QPSK	1	0	-33.3	-13.0	20.3	Complied
2498 to 2499	16QAM	1	0	-33.9	-13.0	20.6	Complied

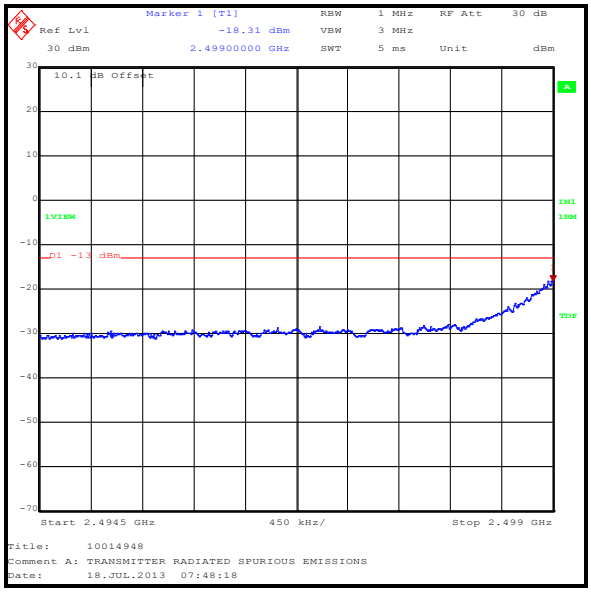
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 10 MHz Channel Bandwidth / 2494.5 MHz to 2499 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.0	QPSK	50	0	-16.7	-13.0	3.7	Complied
2499.0	16QAM	50	0	-18.3	-13.0	5.3	Complied



QPSK

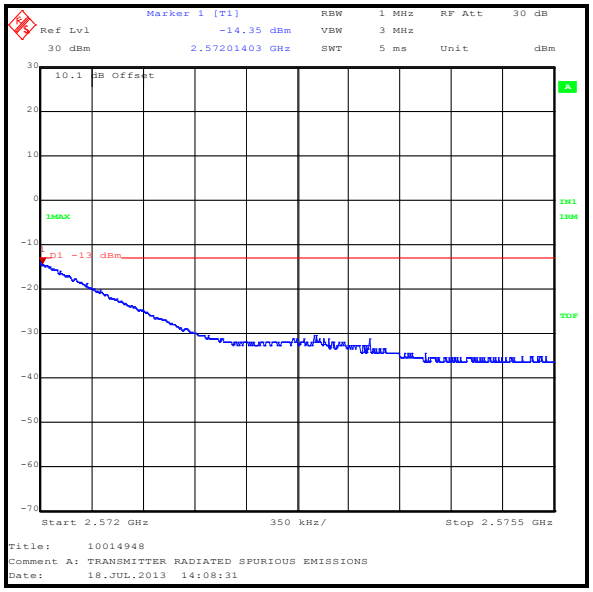


16QAM

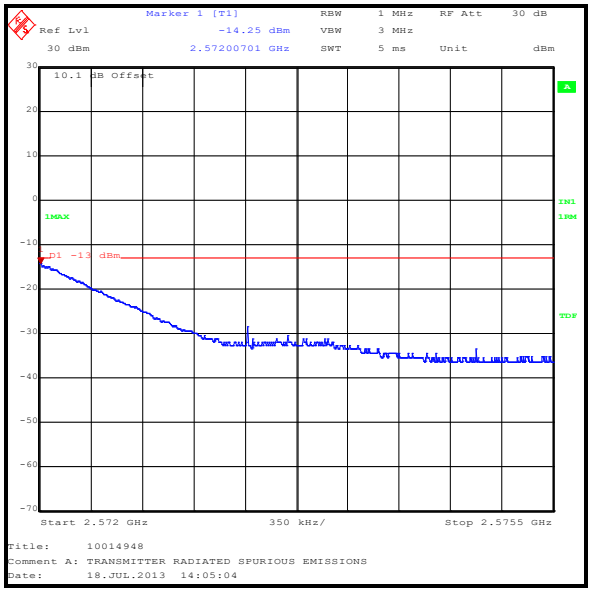
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 10 MHz Channel Bandwidth / 2572 MHz to 2575.5 MHz / Sub-test 2

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2572.014	QPSK	1	49	-14.4	-13.0	1.4	Complied
2572.007	16QAM	1	49	-14.3	-13.0	1.3	Complied



QPSK



16QAM

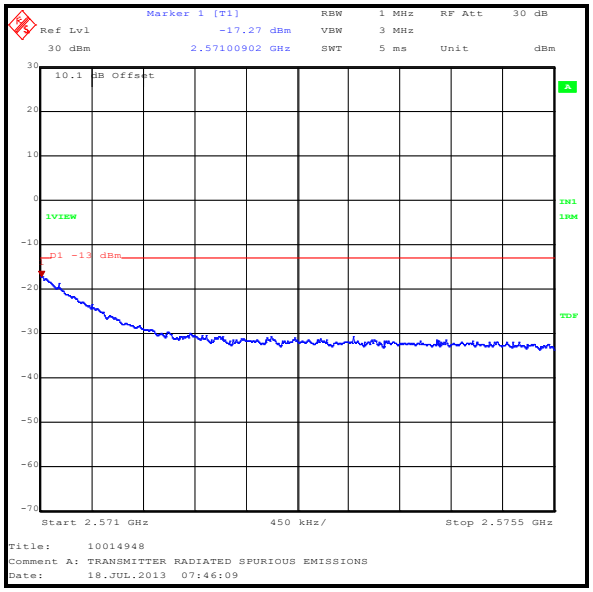
Results: 10 MHz Channel Bandwidth / 2571 MHz to 2572 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571 to 2572	QPSK	1	49	-30.1	-13.0	17.1	Complied
2571 to 2572	16QAM	1	49	-31.0	-13.0	18.0	Complied

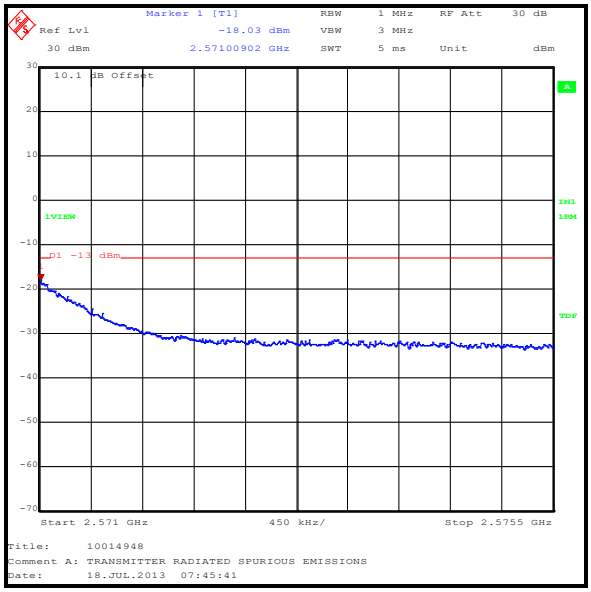
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 10 MHz Channel Bandwidth / 2571 MHz to 2575.5 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571.009	QPSK	50	0	-17.3	-13.0	4.3	Complied
2571.009	16QAM	50	0	-18.0	-13.0	5.0	Complied



QPSK

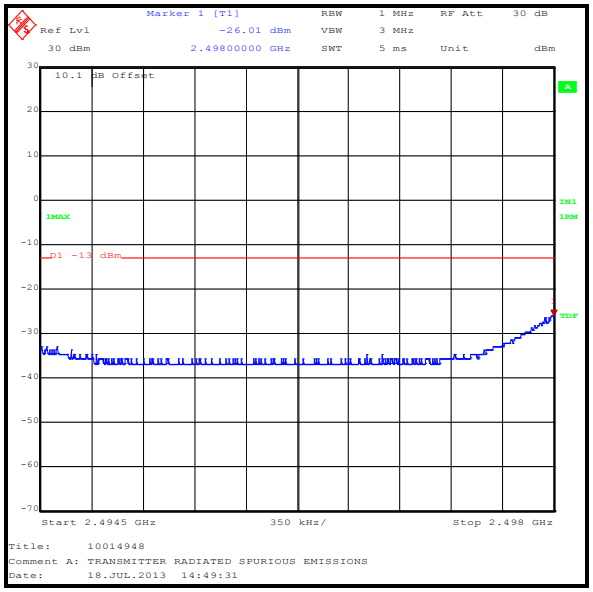


16QAM

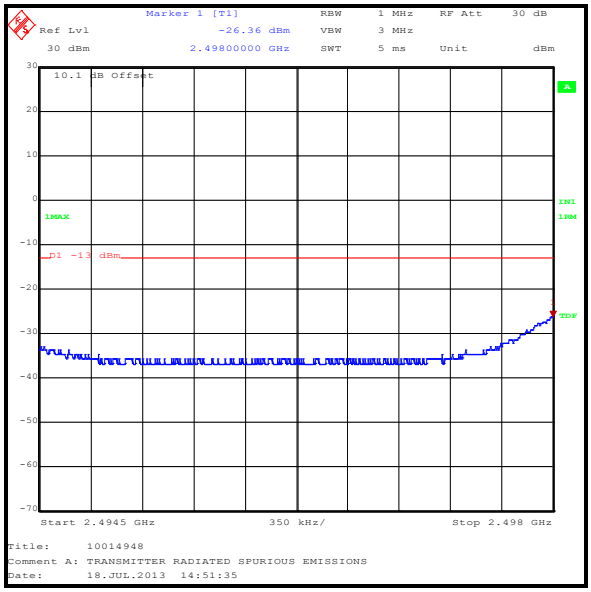
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 15 MHz Channel Bandwidth / 2494.5 MHz to 2498 MHz / Sub-test 1

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498.000	QPSK	1	0	-26.0	-13.0	13.0	Complied
2498.000	16QAM	1	0	-26.4	-13.0	13.4	Complied



QPSK



16QAM

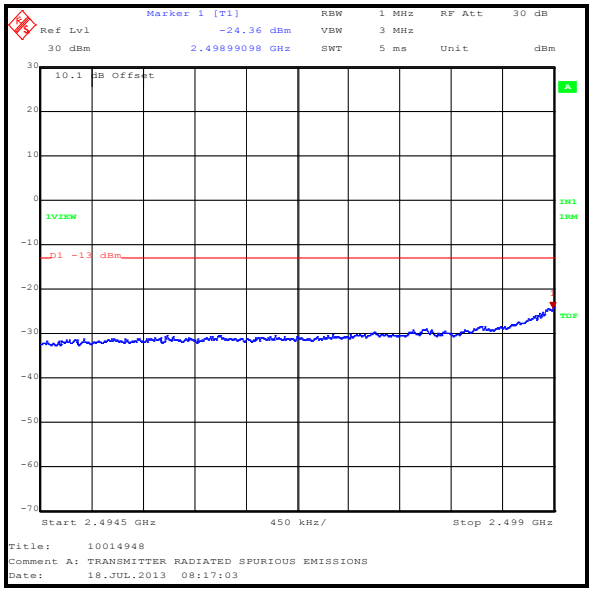
Results: 15 MHz Channel Bandwidth / 2498 MHz to 2499 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498 to 2499	QPSK	1	0	-26.2	-13.0	13.2	Complied
2498 to 2499	16QAM	1	0	-22.5	-13.0	9.5	Complied

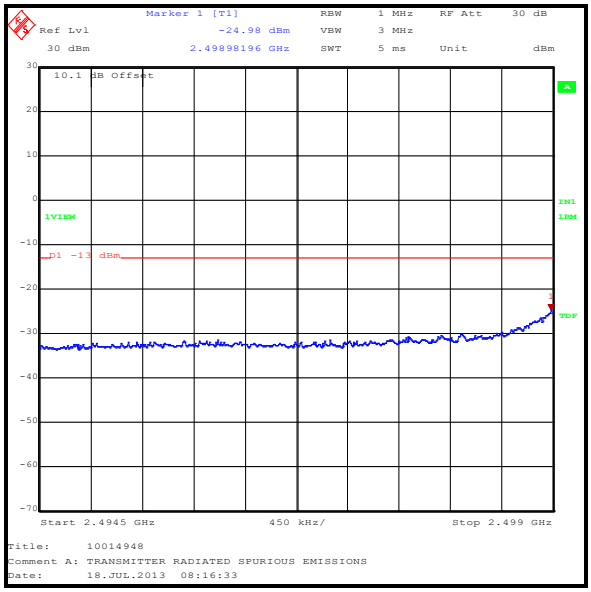
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 15 MHz Channel Bandwidth / 2494.5 MHz to 2499 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498.991	QPSK	75	0	-24.4	-13.0	11.4	Complied
2498.982	16QAM	75	0	-25.0	-13.0	12.0	Complied



QPSK

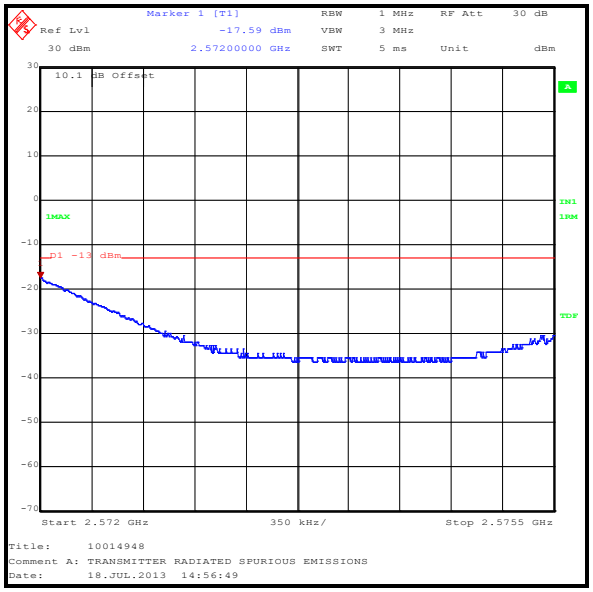


16QAM

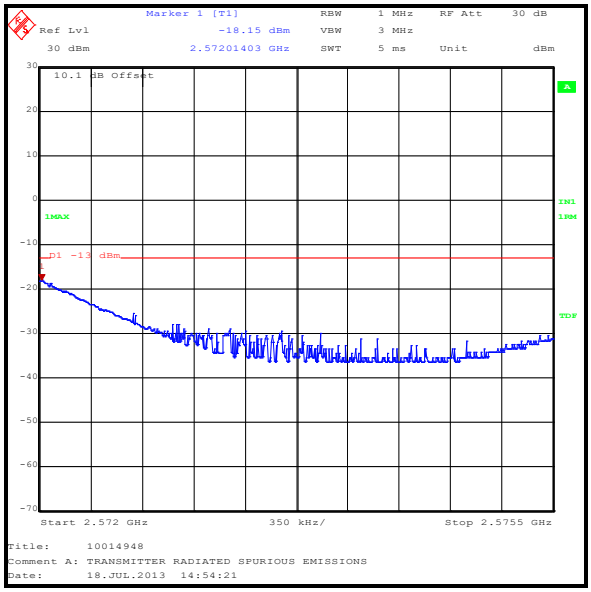
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 15 MHz Channel Bandwidth / 2572 MHz to 2575.5 MHz / Sub-test 2

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2572.000	QPSK	1	74	-17.6	-13.0	4.6	Complied
2572.014	16QAM	1	74	-18.2	-13.0	5.2	Complied



QPSK / Upper Band Edge



16QAM / Upper Band Edge

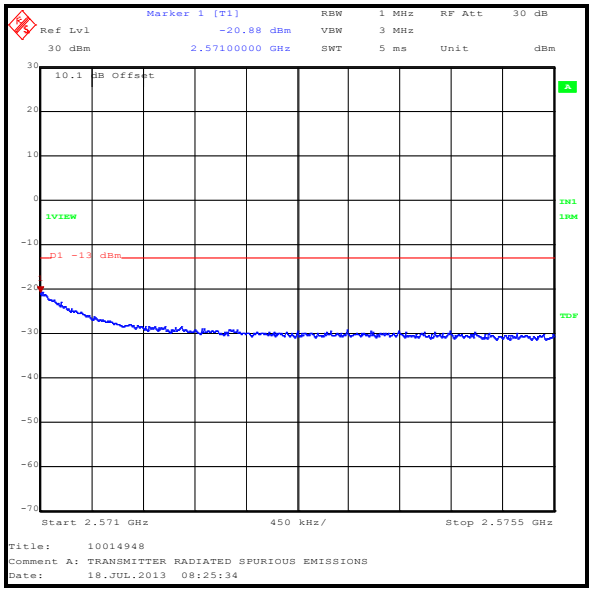
Results: 15 MHz Channel Bandwidth / 2571 MHz to 2572 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571 to 2572	QPSK	1	74	-27.7	-13.0	14.7	Complied
2571 to 2572	16QAM	1	74	-28.3	-13.0	15.3	Complied

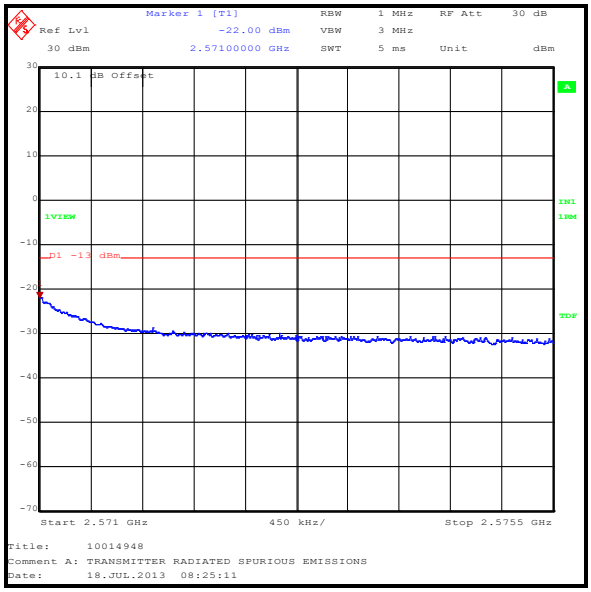
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 15 MHz Channel Bandwidth / 2572 MHz to 2575.5 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571.000	QPSK	75	0	-20.9	-13.0	7.9	Complied
2571.000	16QAM	75	0	-22.0	-13.0	9.0	Complied



QPSK

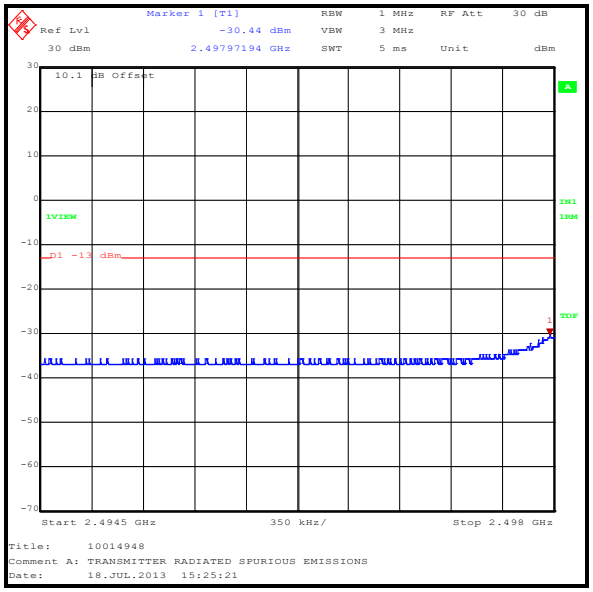


16QAM

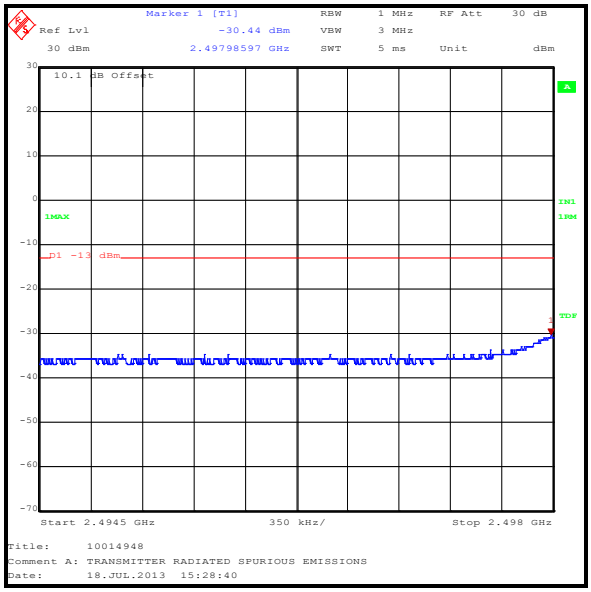
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 20 MHz Channel Bandwidth / 2494.5 MHz to 2498 MHz / Sub-test 1

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2497.972	QPSK	1	0	-30.4	-13.0	17.4	Complied
2497.986	16QAM	1	0	-30.4	-13.0	17.4	Complied



QPSK



16QAM

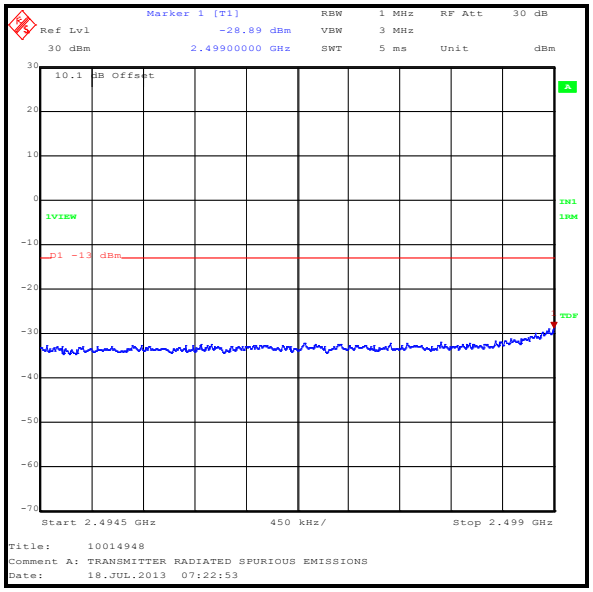
Results: 20 MHz Channel Bandwidth / 2498 MHz to 2499 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2498 to 2499	QPSK	1	0	-29.0	-13.0	16.0	Complied
2498 to 2499	16QAM	1	0	-33.2	-13.0	20.2	Complied

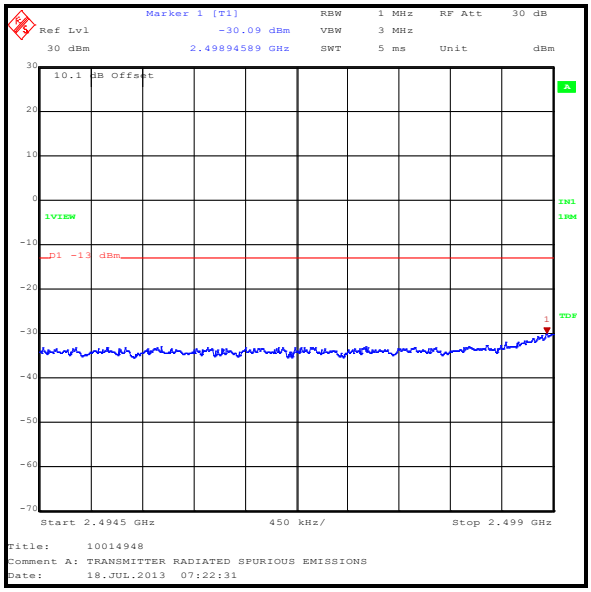
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 20 MHz Channel Bandwidth / 2494.5 MHz to 2499 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2499.000	QPSK	100	0	-28.9	-13.0	15.9	Complied
2498.946	16QAM	100	0	-30.1	-13.0	17.1	Complied



QPSK

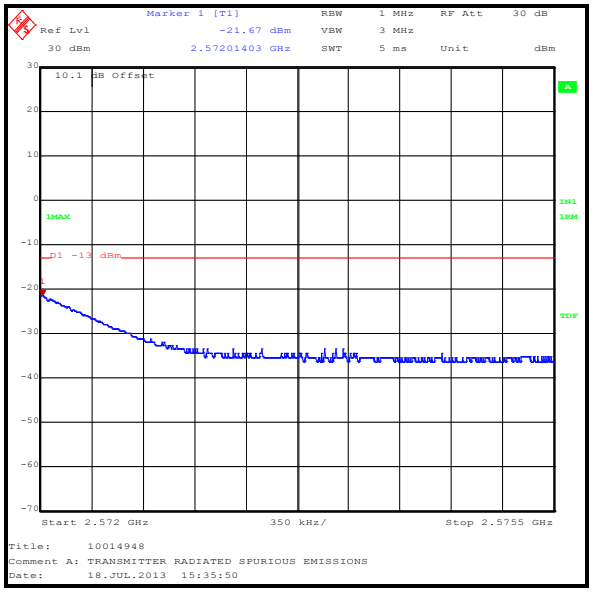


16QAM

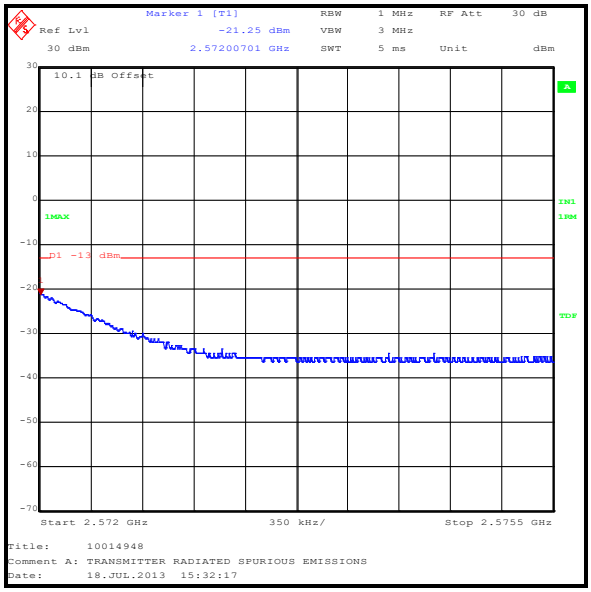
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 20 MHz Channel Bandwidth / 2572 MHz to 2575.5 MHz / Sub-test 2

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2572.014	QPSK	1	99	-21.7	-13.0	8.7	Complied
2572.007	16QAM	1	99	-21.3	-13.0	8.3	Complied



QPSK



16QAM

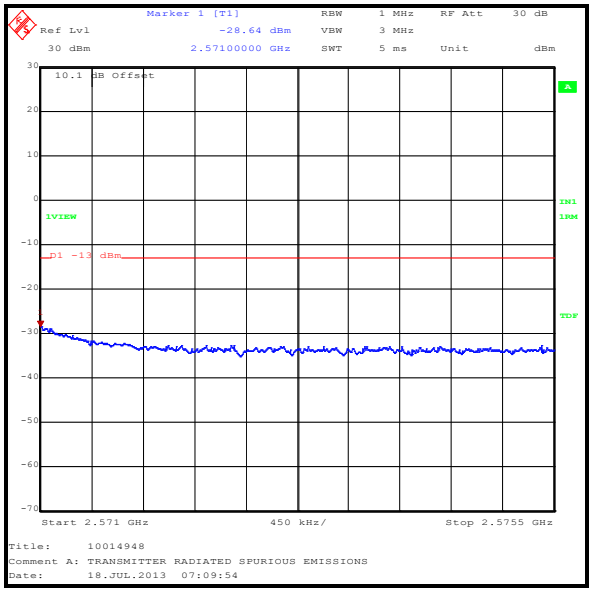
Results: 20 MHz Channel Bandwidth / 2571 MHz to 2572 MHz Integrated Result

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Integrated Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571 to 2572	QPSK	1	99	-30.5	-13.0	17.5	Complied
2571 to 2572	16QAM	1	99	-29.5	-13.0	16.5	Complied

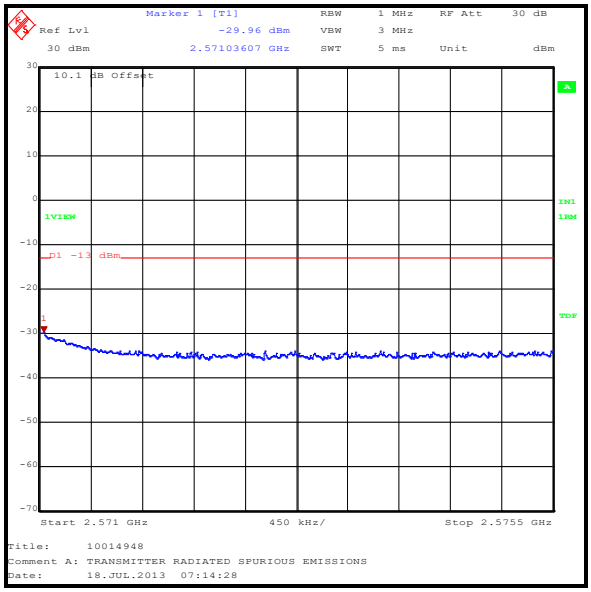
Transmitter Radiated Emissions at Band Edges +/- 5.5 MHz (continued)

Results: 20 MHz Channel Bandwidth / 2571 MHz to 2575.5 MHz / Sub-test 4

Frequency (MHz)	Modulation Scheme	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2571.000	QPSK	100	0	-28.6	-13.0	15.6	Complied
2571.036	16QAM	100	0	-30.0	-13.0	17.0	Complied



QPSK



16QAM

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
K0002	3m RSE Chamber	Rainford	N/A	N/A	04 Nov 2013	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	04 Nov 2013	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	10 May 2014	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12

5.2.6. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

Test Engineers:	Graeme Morris & Nick Steele	**Test Dates:**	04 July 2013 & 05 July 2013
Test Sample IMEI:	004402451215481		

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

Environmental Conditions:

Temperature (°C):	22 to 24
Relative Humidity (%):	35 to 37

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via a bench power supply.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

Transmitter Frequency Stability (Temperature Variation) (continued)

Results: Bottom Channel (2502.5 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	32	2502.499968	2500	2.499968	Complied
-20	33	2502.499967	2500	2.499967	Complied
-10	35	2502.499965	2500	2.499965	Complied
0	31	2502.499969	2500	2.499969	Complied
10	31	2502.499969	2500	2.499969	Complied
20	36	2502.499964	2500	2.499964	Complied
30	33	2502.499967	2500	2.499967	Complied
40	34	2502.499966	2500	2.499966	Complied
50	33	2502.499967	2500	2.499967	Complied

Results: Top Channel (2567.5 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	24	2567.500024	2570	2.499976	Complied
-20	27	2567.500027	2570	2.499973	Complied
-10	24	2567.500024	2570	2.499976	Complied
0	29	2567.500029	2570	2.499971	Complied
10	25	2567.500025	2570	2.499975	Complied
20	33	2567.500033	2570	2.499967	Complied
30	26	2567.500026	2570	2.499974	Complied
40	30	2567.500030	2570	2.499970	Complied
50	29	2567.500029	2570	2.499971	Complied

Transmitter Frequency Stability (Temperature Variation) (Continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1752	Radio Comms Tester	Rohde & Schwarz	CMW 500	139551	19 Jun 2014	12
E0513	Environmental Chamber	TAS	LT600 Series 3	23900506	Calibrated before use	-
M1643	Thermometer	Fluke	52II	18890136	19 Mar 2014	12
S0557	DC power supply	TTI	EL303R	395819	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12

5.2.7. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

Test Engineers:	Graeme Morris & Nick Steele	**Test Dates:**	04 July 2013 & 05 July 2013
Test Sample IMEI:	004402451215481		

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

Environmental Conditions:

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

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via a bench power supply.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

Results: Bottom Channel (2502.5 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.6	32	2502.499968	2500	2.499968	Complied
4.2	34	2502.499966	2500	2.499966	Complied

Results: Top Channel (2567.5 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.6	25	2567.500025	2570	2.499975	Complied
4.2	34	2567.500034	2570	2.499966	Complied

Transmitter Frequency Stability (Voltage Variation)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1752	Radio Comms Tester	Rohde & Schwarz	CMW 500	139551	19 Jun 2014	12
E0513	Environmental Chamber	TAS	LT600 Series 3	23900506	Calibrated before use	-
M1643	Thermometer	Fluke	52II	18890136	19 Mar 2014	12
S0557	DC power supply	TTI	EL303R	395819	Calibrated before use	-

6. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Output Power	2500 to 2570 MHz	95%	±1.13 dB
Frequency Stability	2500 to 2570 MHz	95%	±0.92 ppm
Occupied Bandwidth	2500 to 2570 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 26 GHz	95%	±2.94 dB

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

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	**Clause**	**Details**
1.0	-	-	Initial Version