

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: PTP250



FCC ID: QWP5X250

IC Certification Number: 109AO5X250

To: FCC Part 15.407: 2010 Subpart E, RSS-210 Issue 8 December 2010
and RSS-Gen Issue 3 December 2010

Test Report Serial No:
RFI-RPT-RP82386JD01A V3.0

Version 3.0 Supersedes All Previous Versions

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:		
Checked By:	Ian Watch	
Signature:		
Date of Issue:	07 October 2011	

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1. Customer Information

















Company Name:	Motorola
Address:	Unit B2/3, Linhay Business Park Eastern Road Ashburton Devon TQ13 7UP United Kingdom

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.407
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart E (Unlicensed National Information Infrastructure Devices) - Section 15.407
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
Specification Reference:	Industry Canada RSS-GEN Issue 3 December 2010
Specification Title:	General Requirements and Information for the Certification of Radio communication Equipment
Specification Reference:	Industry Canada RSS-210 Issue 8 December 2010
Specification Title:	Low-power Licence-exempt Radio communication Devices (All Frequency Bands): Category I Equipment.
Site Registration:	FCC: 209735; Industry Canada: 3245B-2
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	18 July 2011 to 27 July 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.207	RSS-Gen 7.2.4	Transmitter AC Conducted Emissions	
Part 15.407(a)(1)	N/A	Transmitter 26 dB Bandwidth	
N/A	RSS-Gen 4.6.1 / RSS-210 A9.2	Transmitter 99% Bandwidth	
Part 15.407(a)(2)	N/A	Transmitter Maximum Peak Output Power (+23 dBi gain integral antenna)	
Part 15.407(a)(2)	N/A	Transmitter Maximum Peak Output Power (+26 dBi gain external)	
N/A	RSS-210 A9.2(3)	Transmitter Maximum Equivalent Isotropically Radiated Power (+23 dBi gain integral antenna)	
N/A	RSS-210 A9.2(3)	Transmitter Maximum Equivalent Isotropically Radiated Power (+26 dBi gain external antenna)	
Part 15.407(a)(5)	RSS-210 A9.2(3)	Transmitter Power Spectral Density (+23 dBi gain integral antenna)	
Part 15.407(a)(5)	RSS-210 A9.2(3)	Transmitter Power Spectral Density (+26 dBi gain external antenna)	
Part 15.407(a)(6)	N/A	Transmitter Peak Excursion	
Part 15.407(b)(3) Part 15.209(a)	RSS-Gen 4.9 RSS-210 A9.2(3)	Transmitter Out of Band Radiated Emissions (+23dBi gain integral antenna)	
Part 15.407(b)(3) Part 15.209(a)	RSS-Gen 4.9 RSS-210 A9.2(3)	Transmitter Out of Band Radiated Emissions (+29 dBi gain external antenna)	
Part 15.407(b)(3) Part 15.209(a)	RSS-Gen 4.9 / RSS- 210 A9.2(3)	Transmitter Band Edge Conducted Emissions	
Part 15.407(h)(1)	RSS-210 A9.2(3)	Transmit Power Control (TPC) ³	
Key to Results			
 = Complied  = Did not comply			

Note(s):

1. Transmitter frequency stability tests were not performed. These tests have been declared as compliant by the Customer.
2. The EUT was unable to operate in the band 5600-5650 MHz, as declared by the Customer.
3. The EUT had a maximum e.i.r.p. greater than 500 mW and therefore was required to implement TPC (in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 Watt).
4. Transmitter Conducted Emissions tests were not performed as per the FCC KDB 559091 which states "The correct method for determining compliance with the undesirable emission limits of 15.407(b) requires radiated emission measurements. Compliance with EIRP limits is determined by calculation using the measured field strengths and compliance with the field strength limits of 15.209 and 15.205 is determined directly from the measured field strengths. At this time the Commission is considering ways of determining compliance with some of the limits with conducted measurements."
5. The results of the testing of the DFS requirements of Part 15.407 will be presented as a separate report.
6. Tests were performed in accordance with Motorola Regulatory Test Plan, phn-2360 000v003.

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Reference:	ANSI C63.10 (2009)
Title:	American National Standard for Testing Unlicensed Wireless Devices

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:	Motorola
Model Name or Number:	PTP250
Serial Number:	00:04:56:41:92:20
Hardware Version Number:	01
Software Version Number:	B_223_ACTON
FCC ID:	QWP5X250
IC Certification Number:	109AO5X250

Description:	Power Supply Unit
Brand Name:	Motorola
Model Name or Number:	Hi Power POE Injector
Serial Number:	D09526441000665A01

Description:	Power Supply Unit
Brand Name:	Motorola
Model Name or Number:	PIDU Plus
Serial Number:	0925092798

Description:	Power Supply Unit
Brand Name:	PowerDsine
Model Name or Number:	9001GR/AC
Serial Number:	11016561000000480

3.2. Description of EUT

The equipment under test was a microwave fixed link system operating in the 5.47 GHz to 5.725 GHz band.

3.3. Modifications Incorporated in the EUT

Transmitter Maximum Peak Output Power (integral antenna with +23 dBi gain) was tested using the power mode '4.5dBm mode'. To ensure full compliance, the power mode was later reduced to '4.0dBm mode' for all other tests referencing the +23 dBi antenna. Transmit Maximum Output Power was not retested under '4.0dBm mode' as it had already demonstrated compliance under the higher powered '4.5dBm mode'.

The power mode '4.0dBm mode' is the setting which will be supplied with these units.

All tests referencing the +26 dBi antenna or the +29 dBi antenna were completed under the '1.0dBm mode' with no modification.

3.4. Additional Information Related to Testing

Technology Tested:	Unlicensed National Information Infrastructure Devices (U-NII) / License-exempt local area network (LE-LAN)	
Type of Unit:	Transceiver	
Modulation:	OFDM	
Data Rate:	IEEE 802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps (20 MHz Bandwidth) IEEE 802.11n: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps (40 MHz Bandwidth)	
Maximum Antenna Gain:	+26 dBi	
Power Supply Requirement(s):	120 VAC 60 Hz	
Transmit / Receive Frequency Range:	5470 to 5725 MHz (excluding 5600 – 5650 MHz)	
Transmit / Receive Channels Tested at 20 MHz Bandwidth setting:	Channel ID	Channel Frequency (MHz)
	Bottom	5485
	Middle	5580
	Top	5710
Transmit / Receive Channels Tested at 40 MHz Bandwidth setting:	Channel ID	Channel Frequency (MHz)
	Bottom	5500
	Middle	5550
	Top	5695

3.5. Support Equipment

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

Description:	Slave ODU Point To Point Microwave Link
Brand Name:	Motorola
Model Name or Number:	PTP250
Serial Number:	00 04 56 41 94 A0

Description:	Laptop running ART V2.0.2X
Brand Name:	HP
Model Name or Number:	Elite Book 8530W
Serial Number:	Not recorded

Description:	Antenna (integral) +23dBi
Brand Name:	Motorola
Model Name or Number:	PHN1669
Serial Number:	08591

Description:	Antenna (external) +29 dBi
Brand Name:	Radio Waves
Model Name or Number:	2 foot diameter Parabolic, SP2-5.2
Serial Number:	1818

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated:

- As a master device only.
- Operating on the bottom, middle or top channel, as per each test case requirement:
 - In 20 MHz channel bandwidth mode from 5485 MHz to 5710 MHz
 - In 40 MHz channel bandwidth mode from 5500 MHz to 5695 MHz
 - Note: The EUT was capable of transmitting outside the range of the 802.11n standard channel numbers and therefore all references to transmissions are made in reference to their channel frequency only.
- Measurements were taken from the vertical antenna port unless otherwise stated. The horizontal antenna port was checked against a selection of vertical antenna measurements to ensure results would be the same.
- 802.11n data rates were supported, but 802.11a data rates were not supported in this band.
- The EUT was tested exclusively in the transceiver mode only as the device was unable to operate in a standby/receive only mode.
- The device was tested under two separate power levels to demonstrate compliance with two individual antenna types:
 - Integral antenna (referenced in this document as +23 dBi antenna)
 - Maximum antenna gain of +23 dBi applied
 - Power mode setting of '4.0dBm mode'
 - External antenna (referenced in this document as +26 dBi antenna)
 - Maximum antenna gain of +26 dBi applied
 - Power mode setting of '1.0dBm mode'
- The device was tested with two different antenna types during the 'Transmitter Out of Band Radiated Emissions (5470 to 5725 MHz)' test to demonstrate compliance with individual antenna types
 - Integral with a gain of +23 dBi flat panel antenna
 - Power mode setting of '4.0dBm mode'
 - External with a gain of +29 dBi parabolic antenna
 - The EUT was tested using the +29 dBi antenna of the same type as the specified +26 dBi antenna. This was done to ensure worst case conditions for any emission measured.
 - Power mode setting of '1.0dBm mode'

4.2. Configuration and Peripherals

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

- For conducted antenna measurements: The antenna ports gave access to horizontal and vertical antenna connections.
- For radiated antenna measurements with +23 dBi antenna: Both antenna ports were connected to the integral antenna, which was fitted by replacing the back plate of the EUT and directly connecting the flat plate antenna.
- For radiated antenna measurements with +29 dBi gain parabolic dish antenna: Both antenna ports were connected externally to the external antenna. Vertical and horizontal ports were connected via separate cabling.
- A laptop PC with bespoke software (ART V2.0.2X) was used to configure the EUT into its' required transmission modes.
- The EUT supports connection to three types of AC/DC power converters. Transmitter AC conducted emissions tests were performed on all three power converters:
 - 9001GR/AC
 - PIDU Plus
 - Hi Power POE Injector
- All other Transmitter AC conducted tests were performed using the 9001GR/AC variant power supply as this was highlighted to be the most used variant.

5. Measurements, Examinations and Derived Results

5.1. General Comments

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

5.2. Test Results**5.2.1. Transmitter AC Conducted Spurious Emissions****Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	27 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.207
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	30

Transmit Mode AC Conducted Spurious Emissions (continued)**Results: Quasi Peak Live - 9001GR/AC power supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.173	Live	47.9	64.8	16.9	Complied
0.213	Live	42.1	63.1	21.0	Complied
0.393	Live	41.9	58.0	16.1	Complied
10.149	Live	35.5	60.0	24.5	Complied
15.657	Live	33.6	60.0	26.4	Complied

Results: Average Live - 9001GR/AC power supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.173	Live	38.0	54.8	16.8	Complied
0.218	Live	32.9	52.9	20.0	Complied
0.389	Live	35.2	48.1	12.9	Complied
28.563	Live	30.9	50.0	19.1	Complied

Results: Quasi Peak Neutral - 9001GR/AC power supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.168	Neutral	49.0	65.1	16.1	Complied
0.213	Neutral	42.4	63.1	20.7	Complied
0.438	Neutral	39.6	57.1	17.5	Complied
28.685	Neutral	37.7	60.0	22.3	Complied

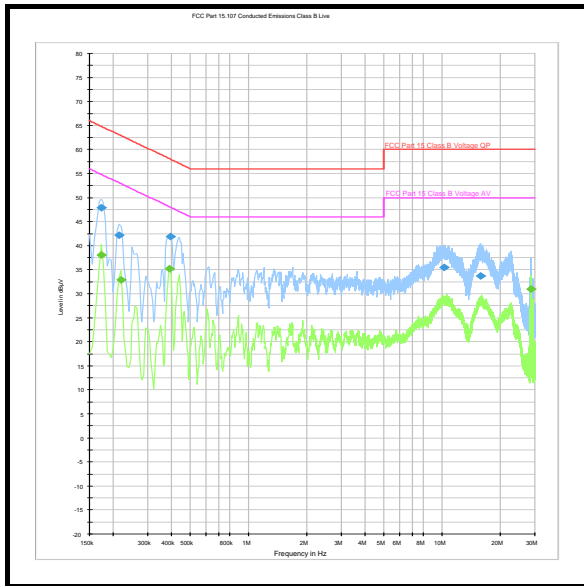
Results: Average Neutral - 9001GR/AC power supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.168	Neutral	35.7	55.1	19.4	Complied
0.218	Neutral	31.3	52.9	21.6	Complied
0.434	Neutral	31.5	47.2	15.7	Complied
28.685	Neutral	35.0	50.0	15.0	Complied

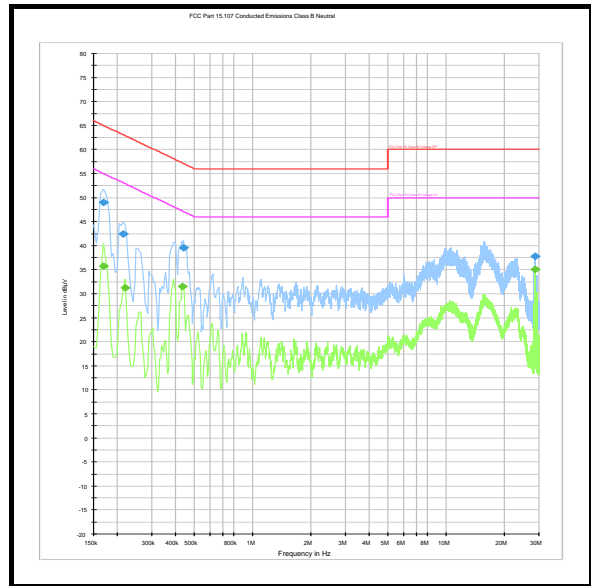
Note(s):

1. All other emissions were at least 20dB below the relevant spurious emissions limit.

Transmit Mode AC Conducted Spurious Emissions (continued)



Live - 9001GR/AC power supply



Neutral - 9001GR/AC power supply

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmit Mode AC Conducted Spurious Emissions (continued)**Results: Quasi Peak Live - PIDU Plus power supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.182	Live	54.7	64.4	9.7	Complied
0.245	Live	49.4	61.9	12.5	Complied
0.303	Live	43.7	60.2	16.5	Complied
0.362	Live	38.3	58.7	20.4	Complied
1.217	Live	36.7	56.0	19.3	Complied
1.518	Live	29.3	56.0	26.7	Complied
1.824	Live	29.9	56.0	26.1	Complied

Results: Average Live - PIDU Plus power supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.182	Live	45.2	54.4	9.2	Complied
0.245	Live	44.5	51.9	7.4	Complied
0.303	Live	41.6	50.2	8.6	Complied
0.366	Live	40.8	48.6	7.8	Complied
0.974	Live	36.4	46.0	9.6	Complied
1.217	Live	35.9	46.0	10.1	Complied
1.518	Live	27.5	46.0	18.5	Complied
2.067	Live	26.3	46.0	19.7	Complied

Transmit Mode AC Conducted Spurious Emissions (continued)**Results: Quasi Peak Neutral - PIDU Plus power supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.182	Neutral	54.6	64.4	9.8	Complied
0.240	Neutral	47.2	62.1	14.9	Complied
0.303	Neutral	41.4	60.2	18.8	Complied
0.362	Neutral	39.9	58.7	18.8	Complied
1.208	Neutral	33.6	56.0	22.4	Complied
1.509	Neutral	29.1	56.0	26.9	Complied
1.752	Neutral	29.1	56.0	26.9	Complied
2.292	Neutral	12.9	56.0	43.1	Complied

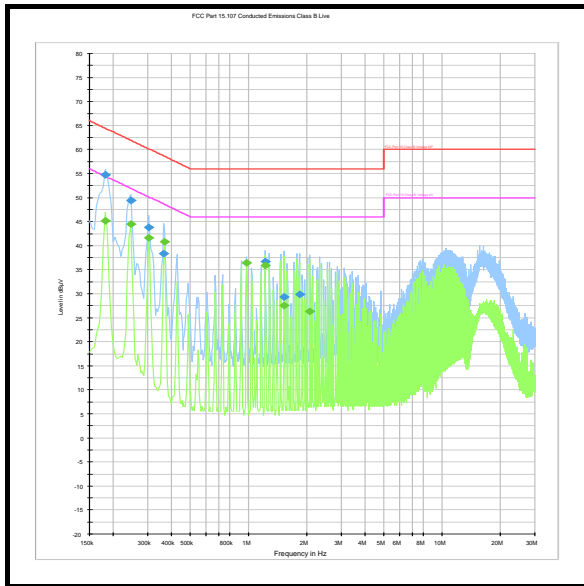
Results: Average Neutral - PIDU Plus power supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.182	Neutral	44.8	54.4	9.6	Complied
0.965	Neutral	31.0	46.0	15.0	Complied
1.208	Neutral	33.2	46.0	12.8	Complied
1.446	Neutral	21.0	46.0	25.0	Complied
1.748	Neutral	16.2	46.0	29.8	Complied
2.049	Neutral	10.9	46.0	35.1	Complied
2.292	Neutral	10.4	46.0	35.6	Complied

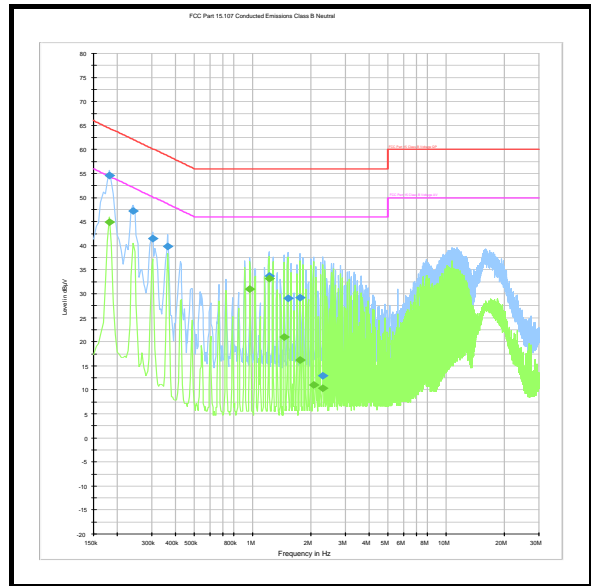
Note(s):

1. All other emissions were at least 20 dB below the relevant spurious emissions limit.

Transmit Mode AC Conducted Spurious Emissions (continued)



Live - PIDU Plus power supply



Neutral - PIDU Plus power supply

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmit Mode AC Conducted Spurious Emissions (continued)**Results: Quasi Peak Live - Hi Power POE Injector power supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.213	Live	48.7	63.1	14.4	Complied
1.896	Live	33.4	56.0	22.6	Complied
2.130	Live	34.2	56.0	21.8	Complied
2.225	Live	40.1	56.0	15.9	Complied
2.337	Live	43.1	56.0	12.9	Complied
2.486	Live	30.2	56.0	25.8	Complied
2.549	Live	44.3	56.0	11.7	Complied

Results: Average Live - Hi Power POE Injector power supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.213	Live	37.9	53.1	15.2	Complied
0.321	Live	37.0	49.7	12.7	Complied
0.425	Live	34.0	47.4	13.4	Complied
0.533	Live	32.0	46.0	14.0	Complied
2.225	Live	28.7	46.0	17.3	Complied
2.450	Live	26.7	46.0	19.3	Complied
2.675	Live	29.1	46.0	16.9	Complied

Transmit Mode AC Conducted Spurious Emissions (continued)**Results: Quasi Peak Neutral - Hi Power POE Injector power supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.213	Neutral	44.6	63.1	18.5	Complied
1.892	Neutral	36.1	56.0	19.9	Complied
2.211	Neutral	41.3	56.0	14.7	Complied
2.315	Neutral	45.1	56.0	10.9	Complied
2.441	Neutral	40.3	56.0	15.7	Complied
2.539	Neutral	43.4	56.0	12.6	Complied

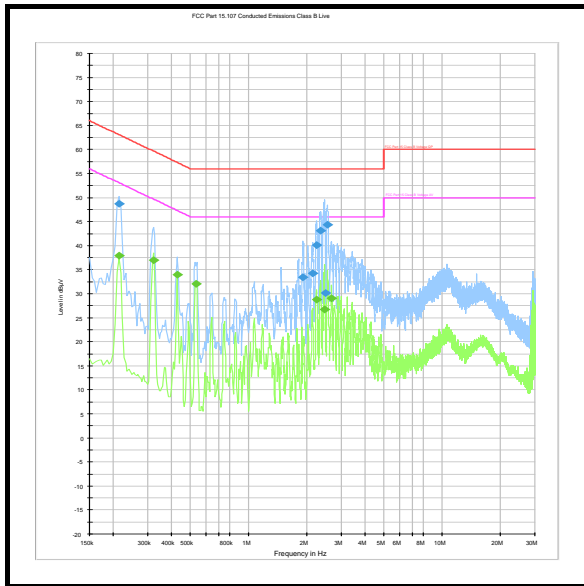
Results: Average Neutral - Hi Power POE Injector power supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.213	Neutral	37.6	53.1	15.5	Complied
0.317	Neutral	37.3	49.8	12.5	Complied
0.528	Neutral	37.0	46.0	9.0	Complied
2.319	Neutral	30.4	46.0	15.6	Complied
2.414	Neutral	33.1	46.0	12.9	Complied
2.540	Neutral	29.9	46.0	16.1	Complied

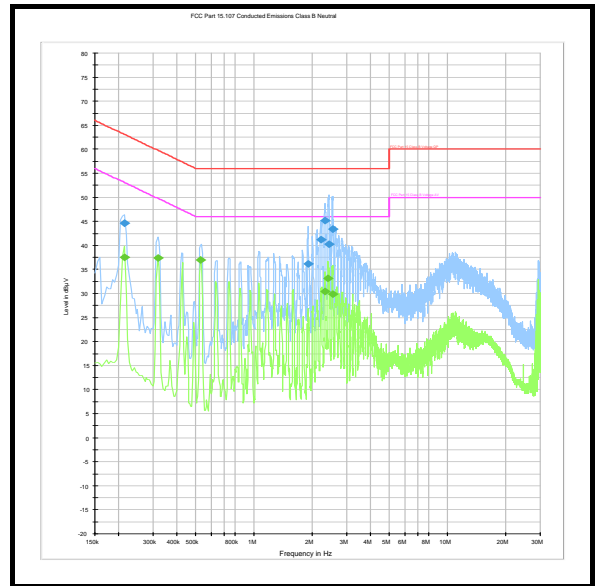
Note(s):

1. All other emissions were at least 20dB below the relevant spurious emissions limit.

Transmit Mode AC Conducted Spurious Emissions (continued)



Live - Hi Power POE Injector power supply



Neutral - Hi Power POE Injector power supply

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.2.2. Transmitter 26 dB Bandwidth**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	18 July 2011 & 19 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(a)(1) / 15.403(i)
Test Method Used:	A spectrum analyzer employing a peak detector function was used to perform this measurement. The measurement bandwidth was approximately 1% or greater than the emission bandwidth and the 26 dBc bandwidth reported. Tested in accordance with method detailed in Public Notice DA-02-2138 for emission bandwidth.

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	30

Results: 20 MHz

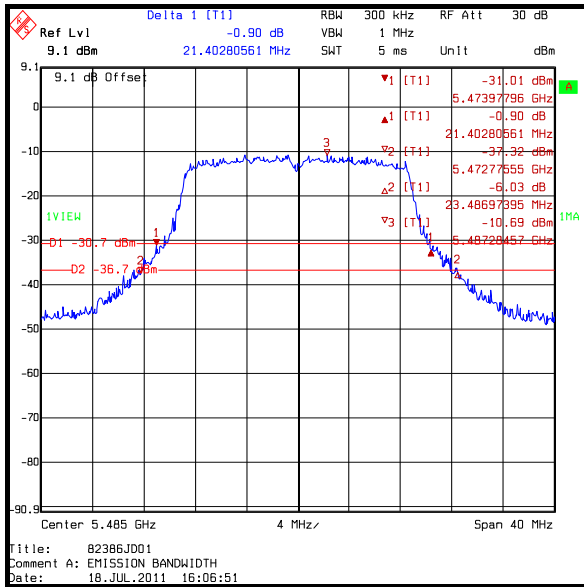
Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	26 dB Emission Bandwidth (MHz)
Bottom	5485	BPSK	6.5	23.487
Middle	5580	BPSK	6.5	22.846
Top	5710	BPSK	6.5	22.525
Bottom	5485	QPSK	19.5	22.415
Middle	5580	QPSK	19.5	22.124
Top	5710	QPSK	19.5	21.563
Bottom	5485	16QAM	39	22.445
Middle	5580	16QAM	39	21.964
Top	5710	16QAM	39	22.605
Bottom	5485	64QAM	65	22.285
Middle	5580	64QAM	65	22.124
Top	5710	64QAM	65	22.285

Note(s):

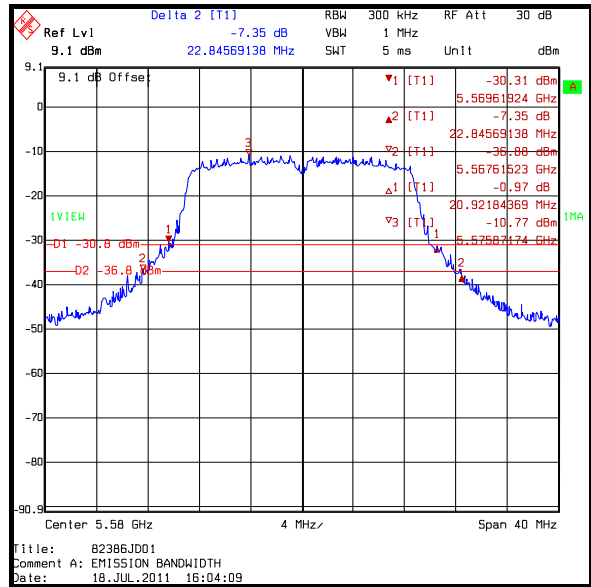
- On the plots, marker 2 and delta marker 2 are used to show the 26 dB bandwidth. Marker 3 was used to demonstrate the peak value and therefore show the limit line as being -26 dB from this.
- All bandwidths were checked on the vertical port and presented in the results table. Spot checks were also made for 64QAM on the horizontal port, these results are included for reference as plots only.

Transmitter 26 dB Emission Bandwidth (continued)

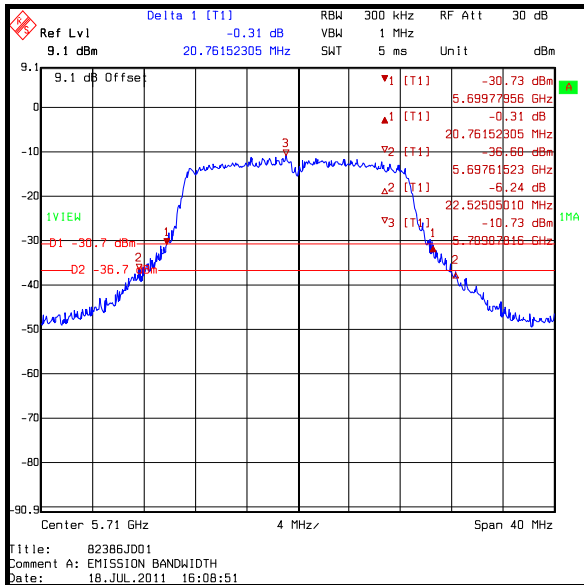
Plots: 20 MHz / V port / 802.11n / 6.5 Mbps



Bottom Channel



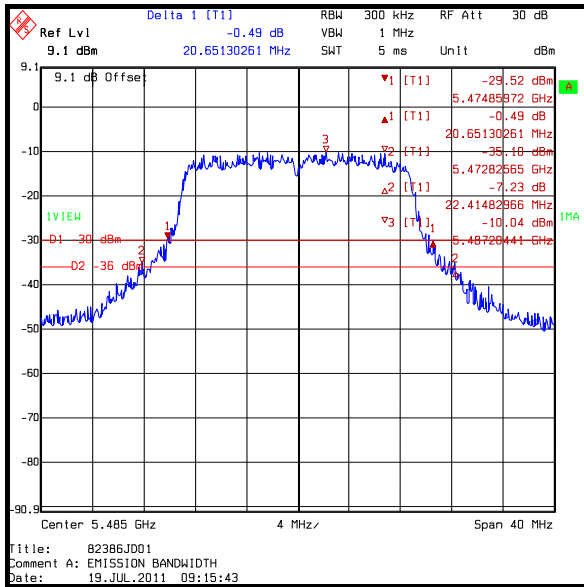
Middle Channel



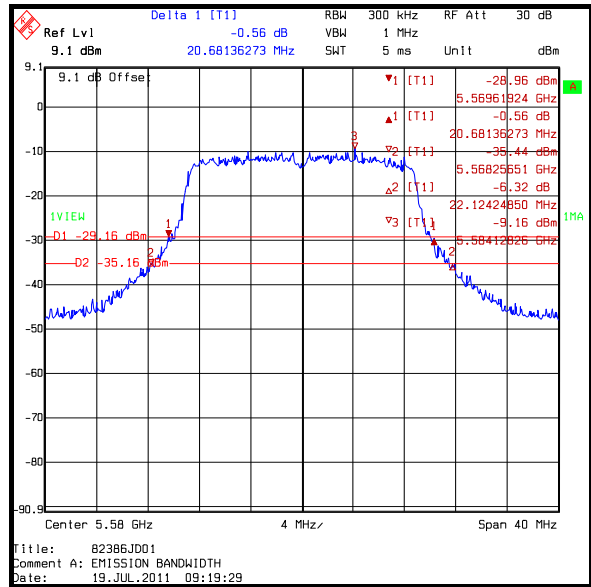
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

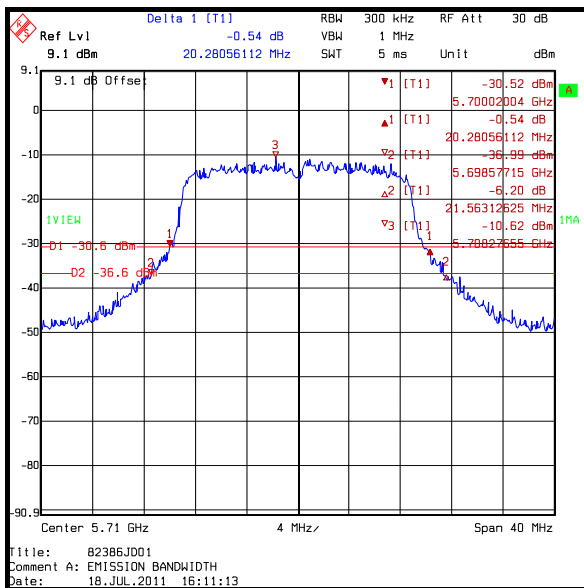
Plots: 20 MHz / V port / 802.11n / 19.5 Mbps



Bottom Channel



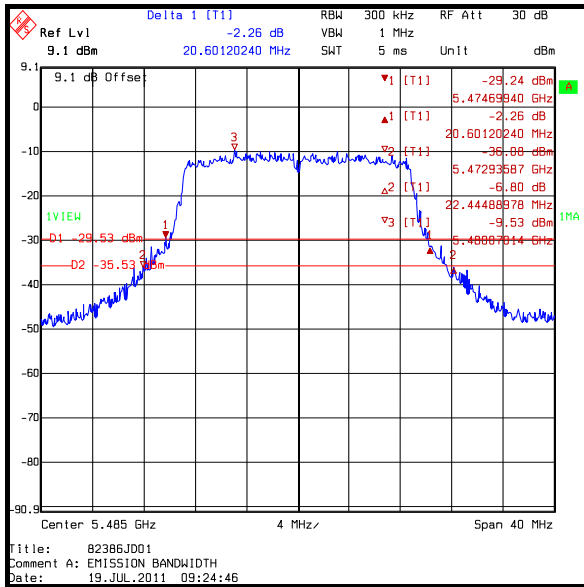
Middle Channel



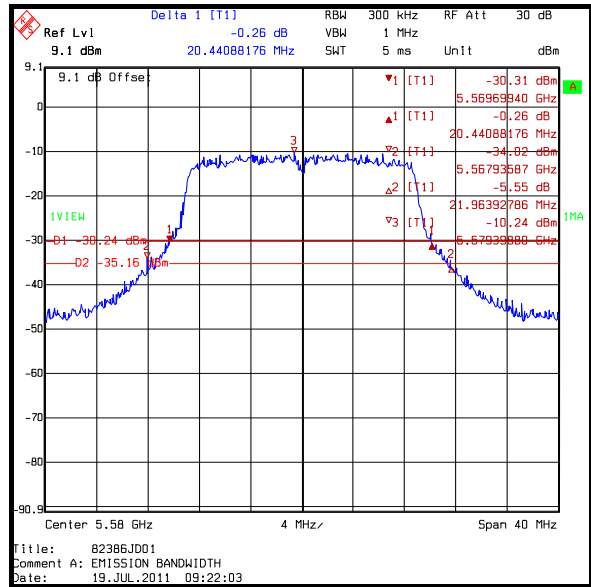
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

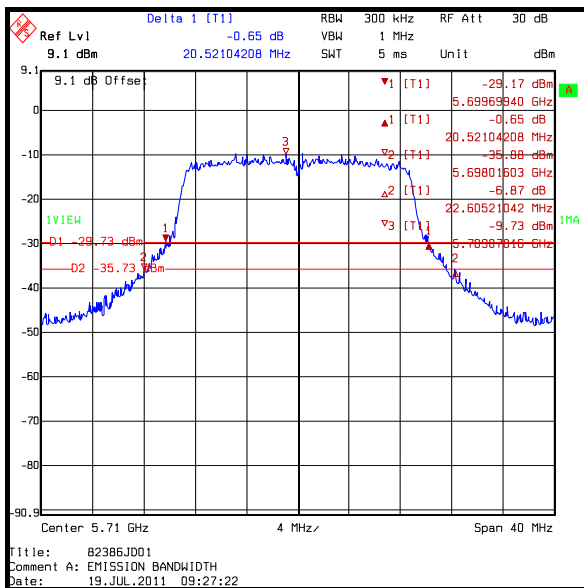
Plots: 20 MHz / V port / 802.11n / 39 Mbps



Bottom Channel



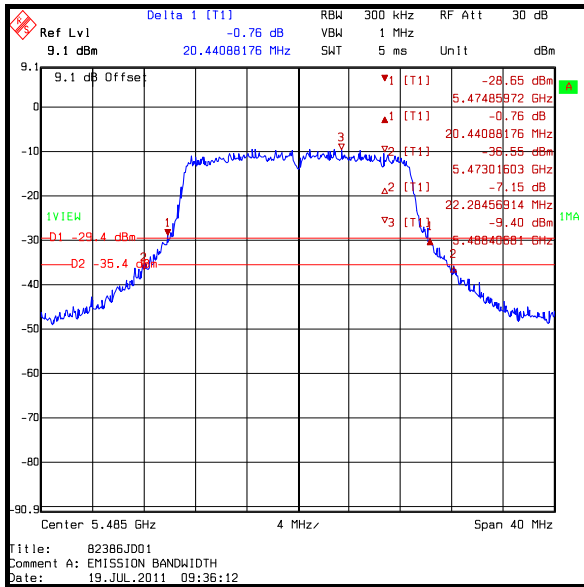
Middle Channel



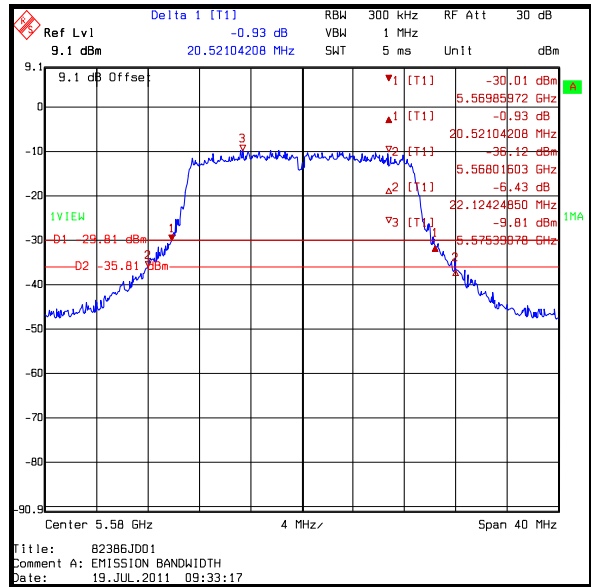
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

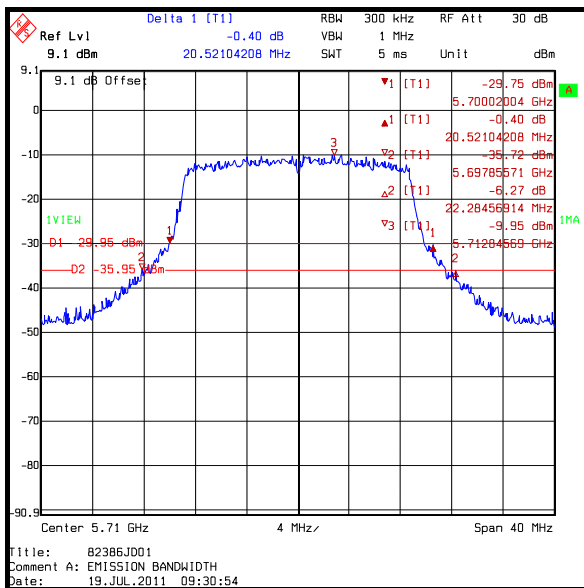
Plots: 20 MHz / V port / 802.11n / 65 Mbps



Bottom Channel



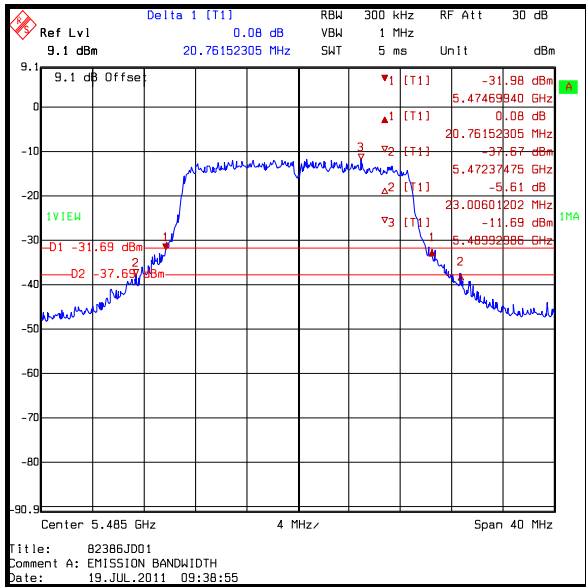
Middle Channel



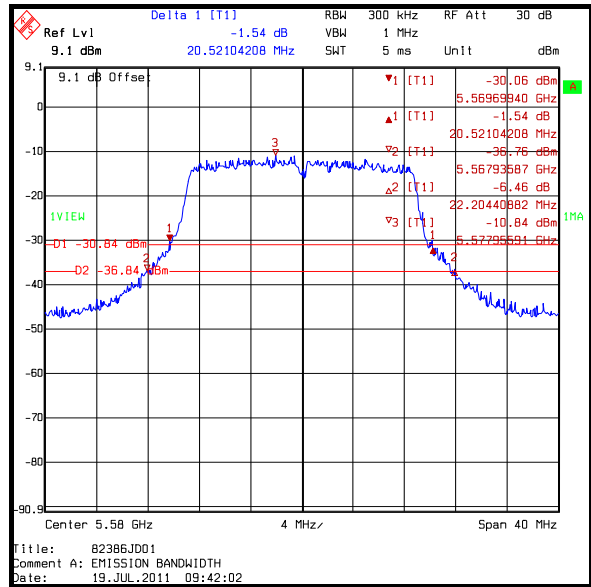
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

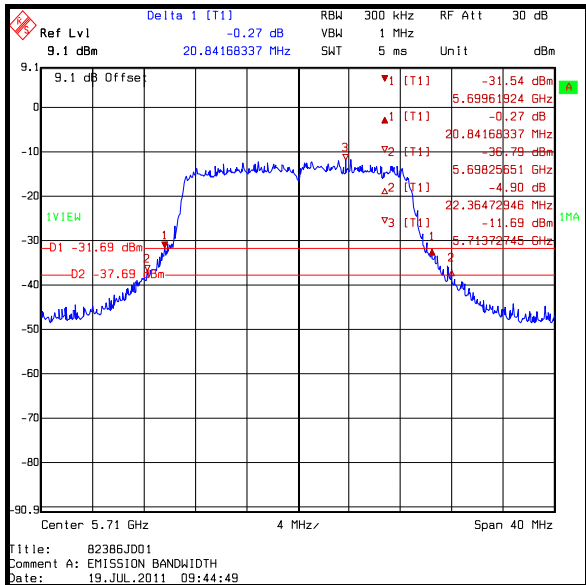
Plots: 20 MHz / H port / 802.11n / 65 Mbps



Bottom Channel



Middle Channel



Top Channel

Transmitter 26 dB Emission Bandwidth (continued)**Results: 40 MHz**

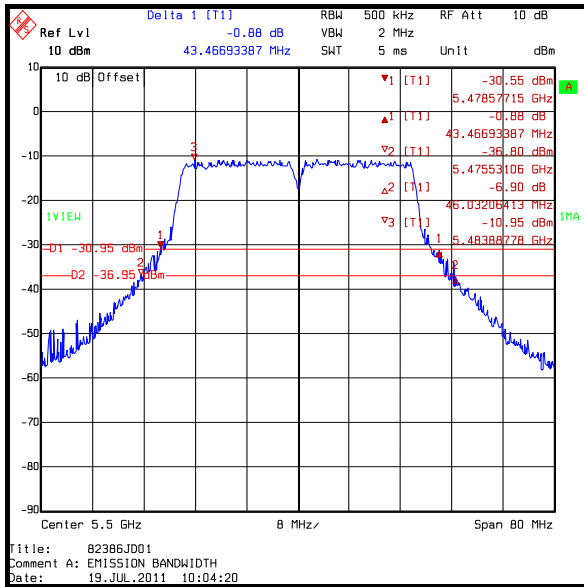
Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	26 dB Emission Bandwidth (MHz)
Bottom	5500	BPSK	13.5	46.032
Middle	5550	BPSK	13.5	45.230
Top	5695	BPSK	13.5	44.890
Bottom	5500	QPSK	40.5	43.627
Middle	5550	QPSK	40.5	43.447
Top	5695	QPSK	40.5	43.447
Bottom	5500	16QAM	81	43.307
Middle	5550	16QAM	81	43.607
Top	5695	16QAM	81	43.768
Bottom	5500	64QAM	135	43.467
Middle	5550	64QAM	135	43.607
Top	5695	64QAM	135	43.447

Note(s):

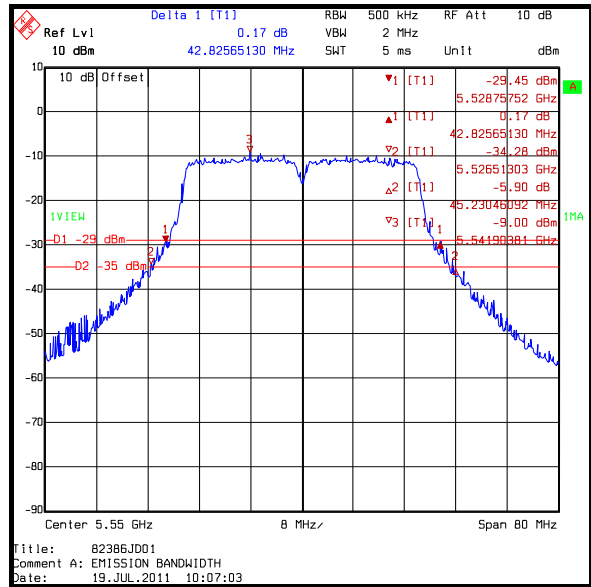
1. On the plots, marker 2 and delta marker 2 are used to show the 26 dB bandwidth. Marker 3 is used to demonstrate the peak value and therefore show the limit line as being -26 dB from this.
2. All bandwidths were checked on the vertical port and presented in the results table. Spot checks were made for BPSK on the horizontal port, These results are included for reference as plots only.

Transmitter 26 dB Emission Bandwidth (continued)

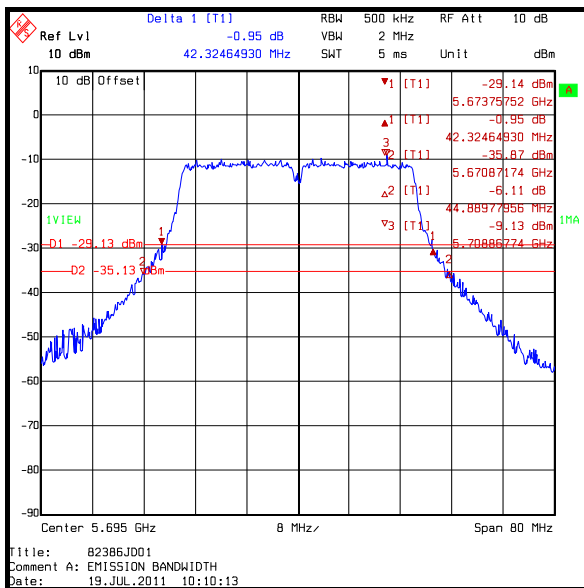
Plots: 40 MHz / V port / 802.11n / 13.5 Mbps



Bottom Channel



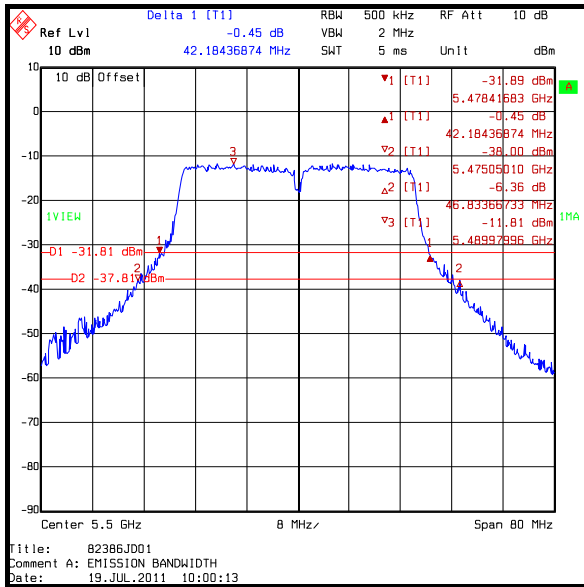
Middle Channel



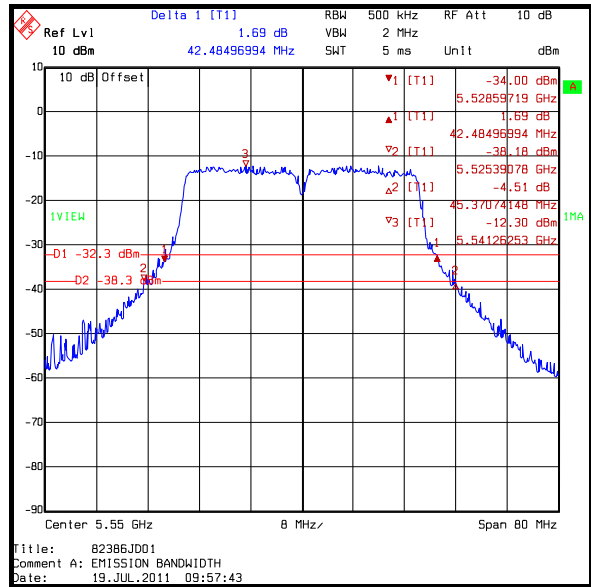
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

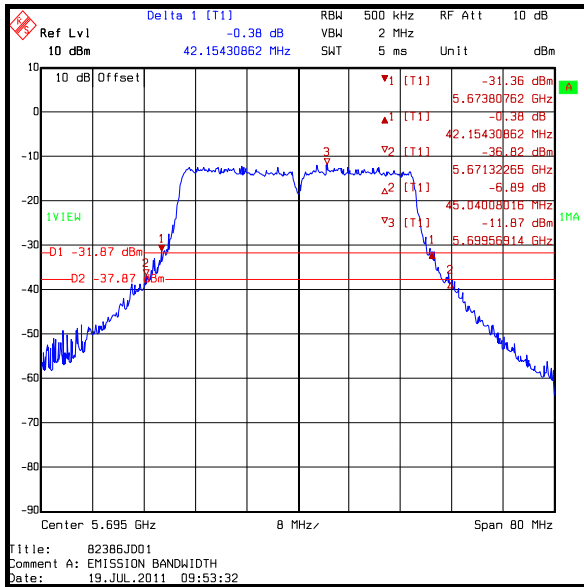
Plots: 40 MHz / H port / 802.11n / 13.5 Mbps



Bottom Channel



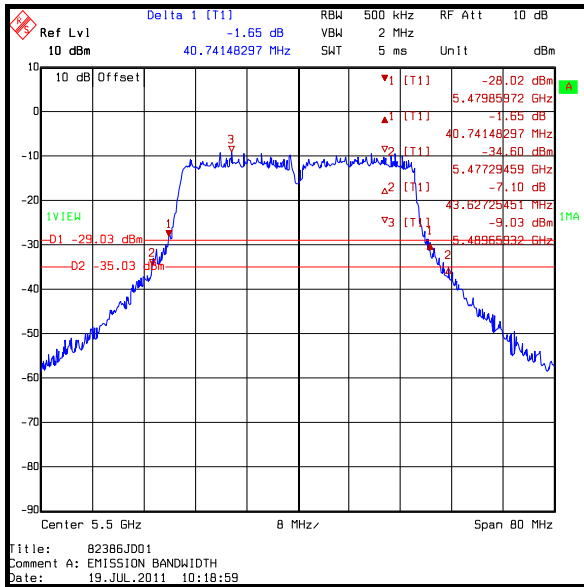
Middle Channel



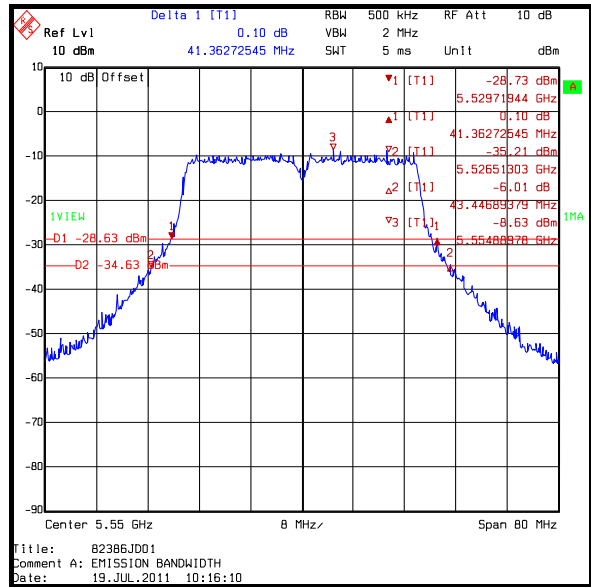
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

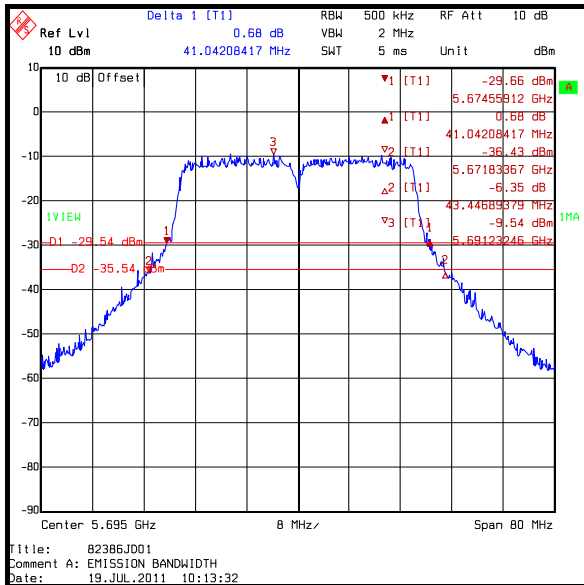
Plots: 40.5 MHz / V port / 802.11n / 40.5 Mbps



Bottom Channel



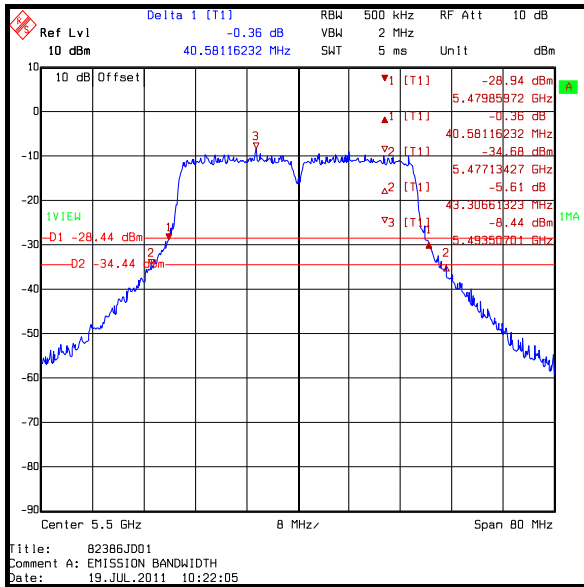
Middle Channel



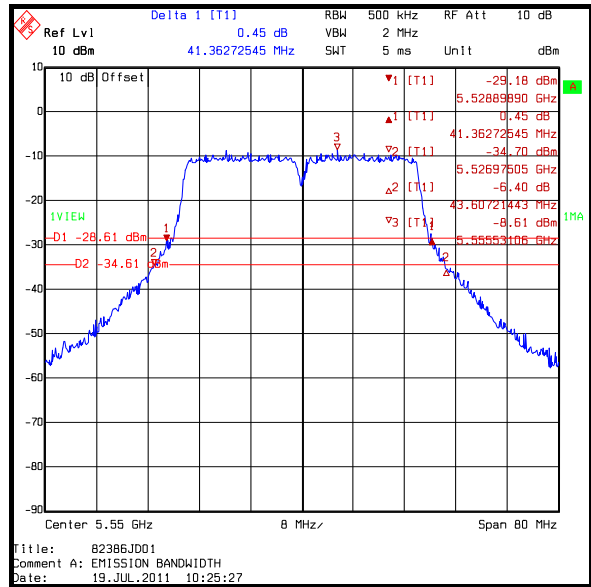
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

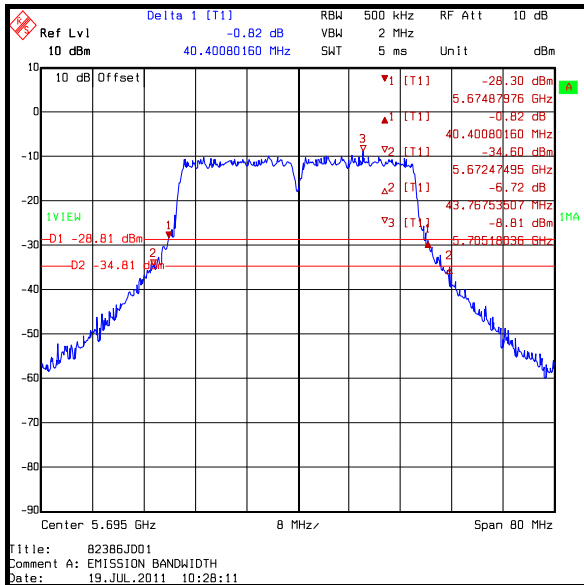
Plots: 40 MHz / V port / 802.11n / 81 Mbps



Bottom Channel



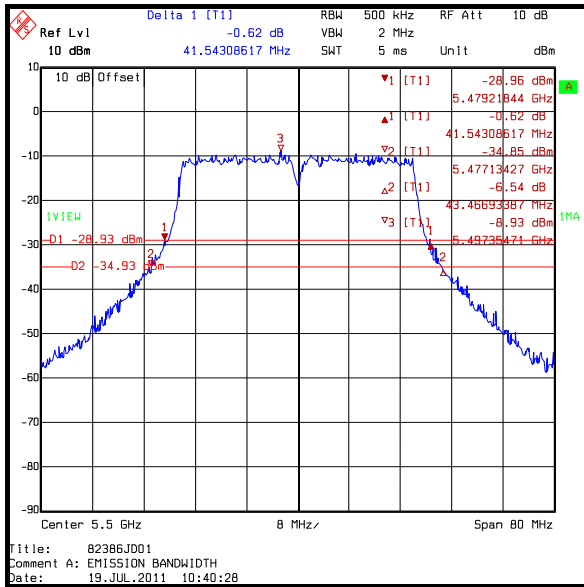
Middle Channel



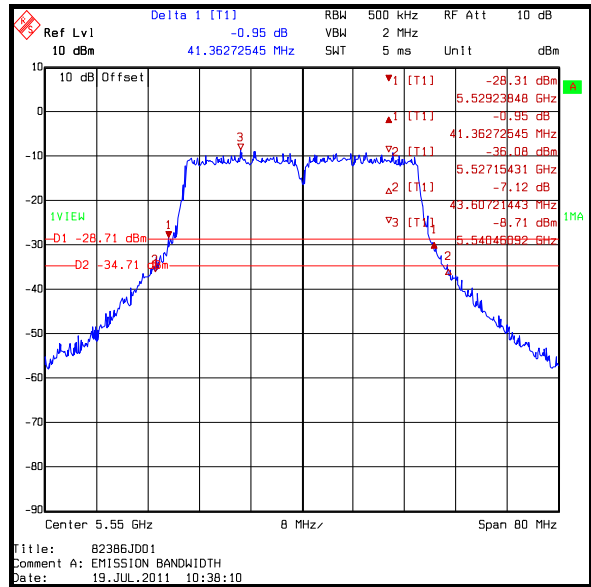
Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

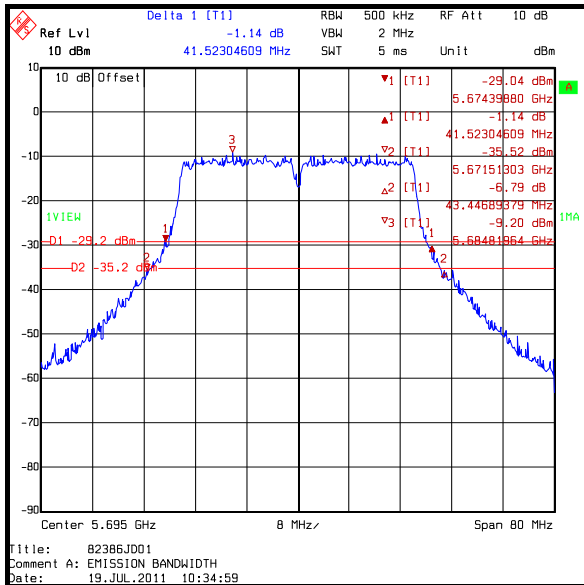
Plots: 40 MHz / V port / 802.11n / 135 Mbps



Bottom Channel



Middle Channel



Top Channel

5.2.3. Transmitter 99% Emission Bandwidth**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	18 July 2011 & 19 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

Industry Canada Reference:	RSS-Gen 4.6.1 / RSS-210 A9.2
Test Method Used:	As detailed in RSS-Gen 4.6.1 Note: RBW was set to a maximum of 1% of the 26 dB emission bandwidth or the next highest bandwidth up that the spectrum analyser supported

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	30

Results: 20 MHz

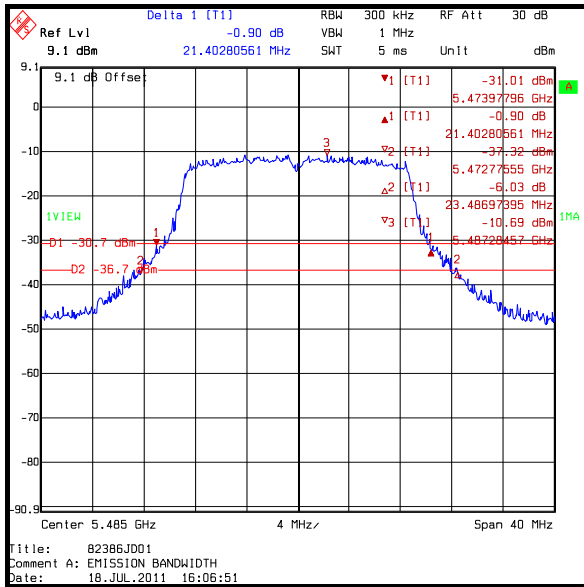
Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	99% Emission Bandwidth (MHz)
Bottom	5485	BPSK	6.5	21.403
Middle	5580	BPSK	6.5	20.922
Top	5710	BPSK	6.5	20.762
Bottom	5485	QPSK	19.5	20.651
Middle	5580	QPSK	19.5	20.681
Top	5710	QPSK	19.5	20.281
Bottom	5485	16QAM	39	20.601
Middle	5580	16QAM	39	20.441
Top	5710	16QAM	39	20.521
Bottom	5485	64QAM	65	20.441
Middle	5580	64QAM	65	20.521
Top	5710	64QAM	65	20.521

Note(s):

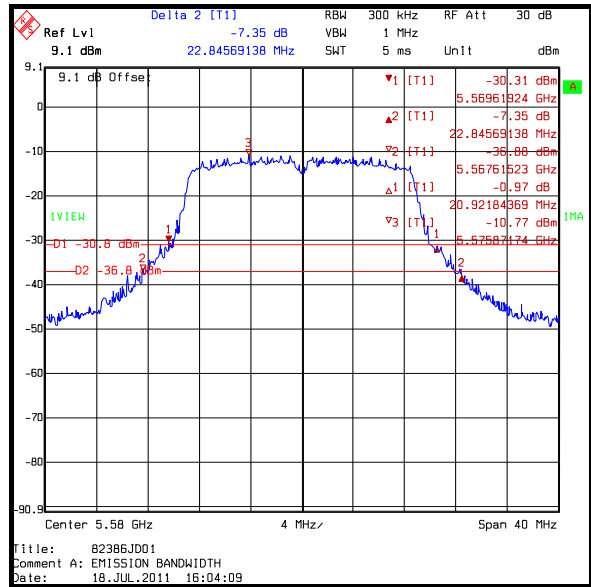
1. The 99% bandwidth measurement was made using the 20 dB measurement method. On the plots, marker 1 and delta marker 1 are used to show this 20 dB bandwidth. Marker 3 is used to demonstrate the peak value and therefore show the limit line as being -20 dB from this.
2. All bandwidths were checked on the vertical port and presented in the results table. Spot checks were made for 64QAM on the horizontal port, These results are included for reference as plots only.

Transmitter 99% Emission Bandwidth (continued)

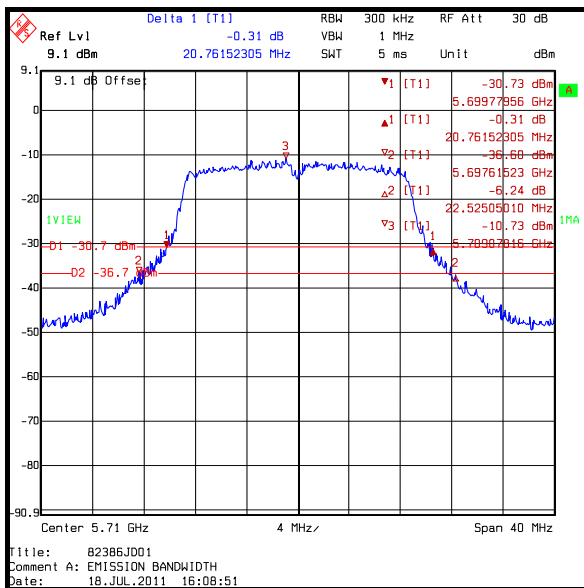
Plots: 20 MHz / V port / 802.11n / 6.5 Mbps



Bottom Channel



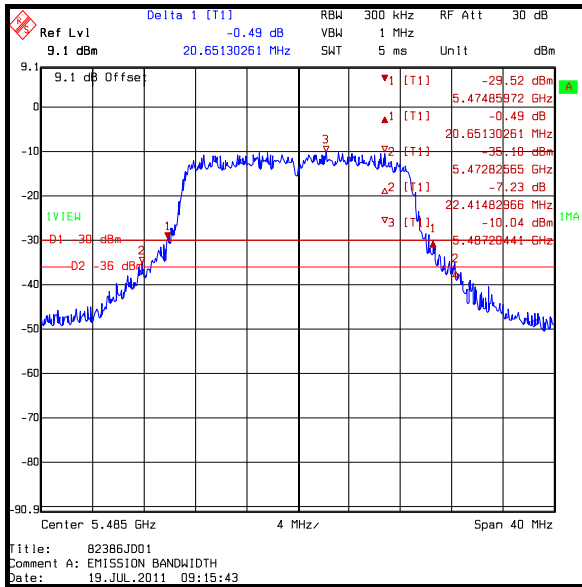
Middle Channel



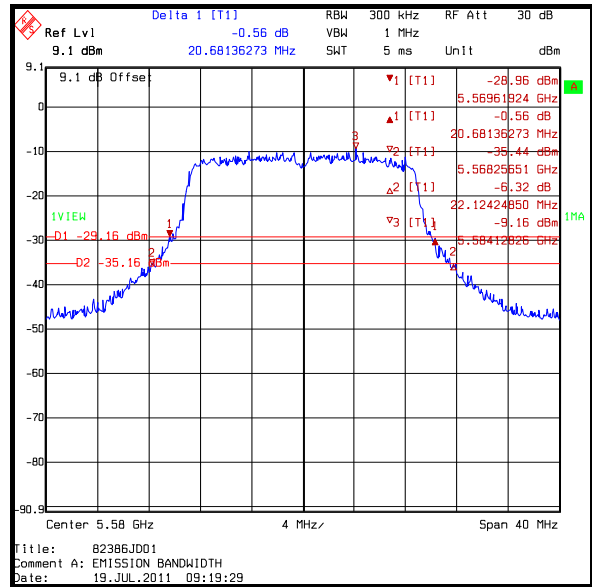
Top Channel

Transmitter 99% Emission Bandwidth (continued)

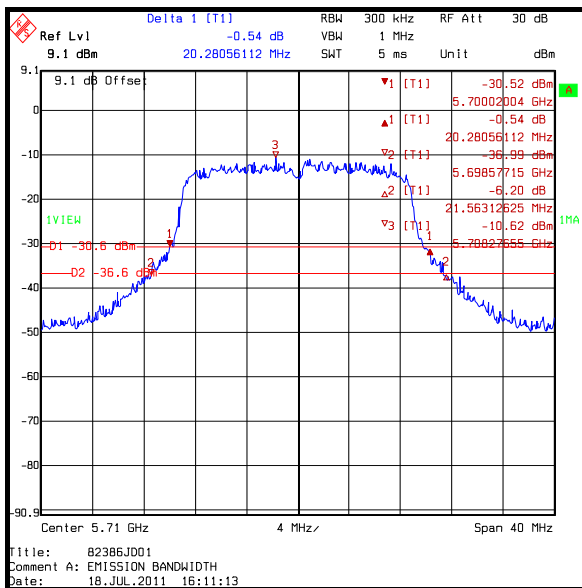
Plots: 20 MHz / V port / 802.11n / 19.5 Mbps



Bottom Channel



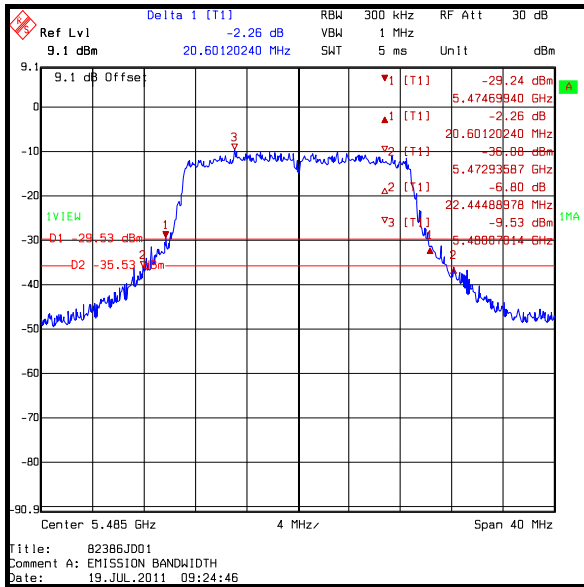
Middle Channel



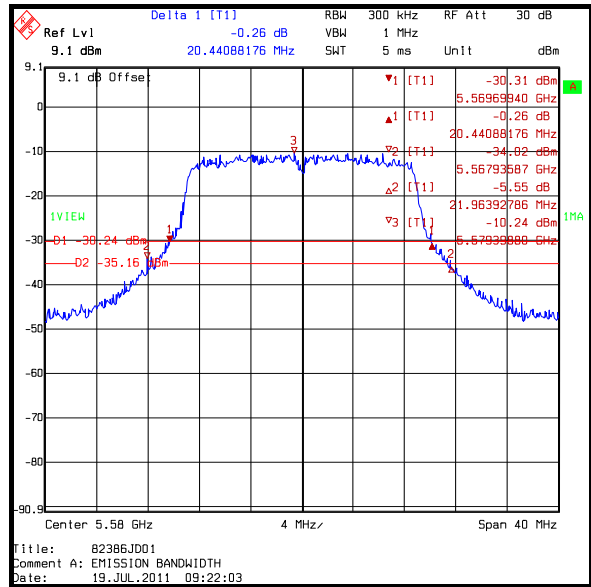
Top Channel

Transmitter 99% Emission Bandwidth (continued)

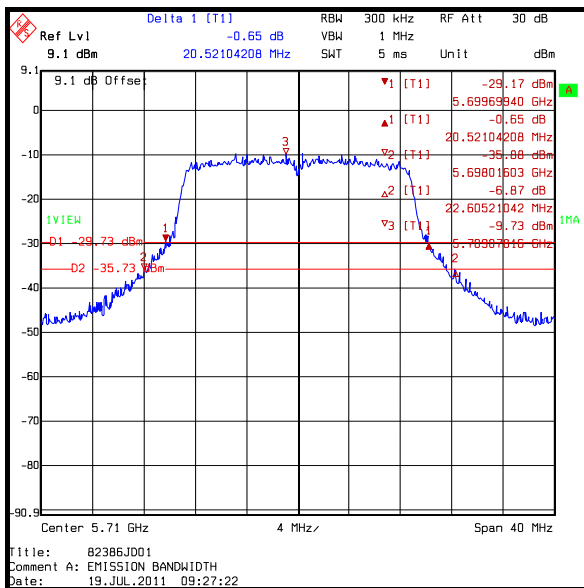
Plots: 20 MHz / V port / 802.11n / 39 Mbps



Bottom Channel



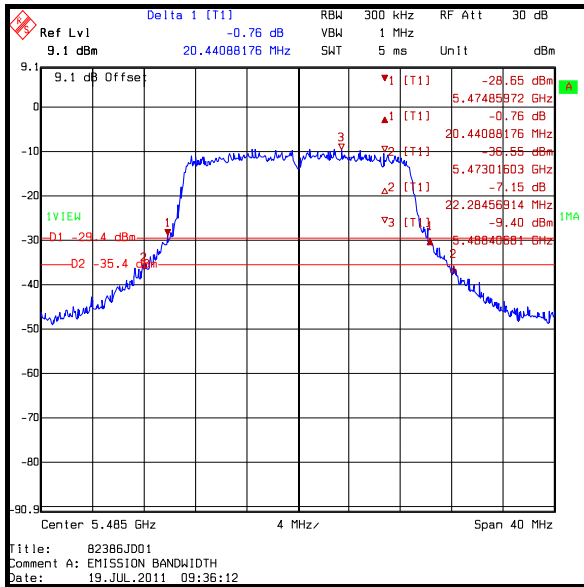
Middle Channel



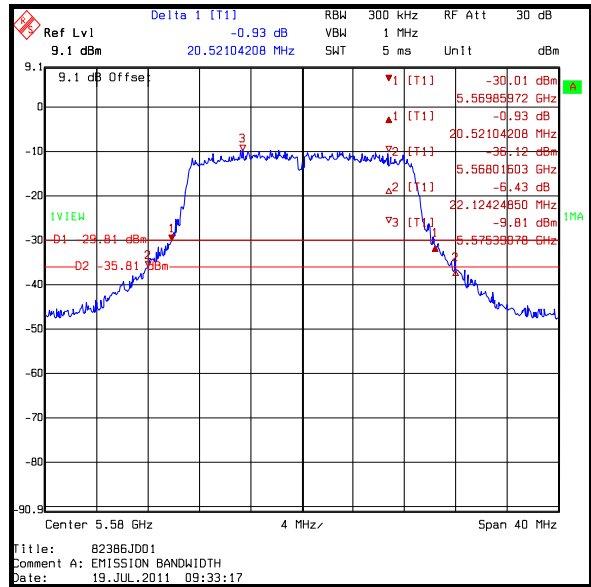
Top Channel

Transmitter 99% Emission Bandwidth (continued)

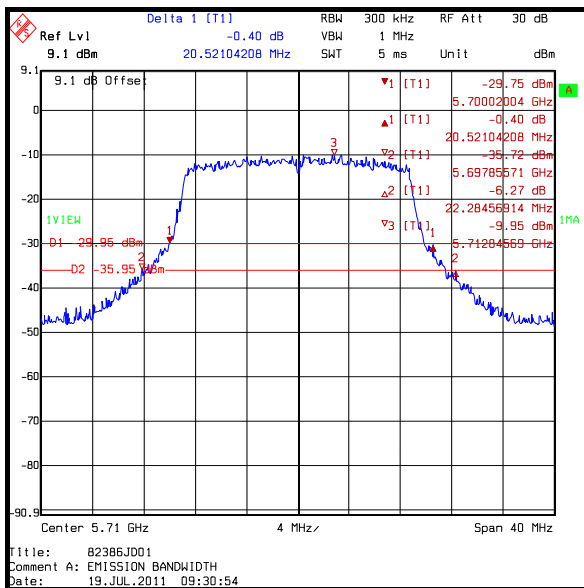
Plots: 20 MHz / V port / 802.11n / 65 Mbps



Bottom Channel



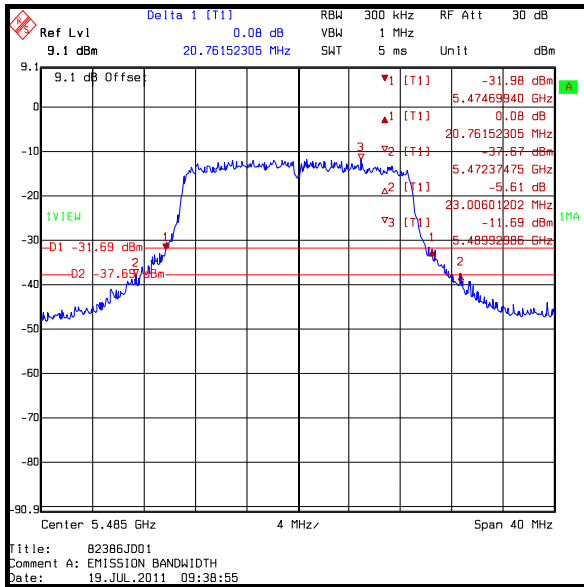
Middle Channel



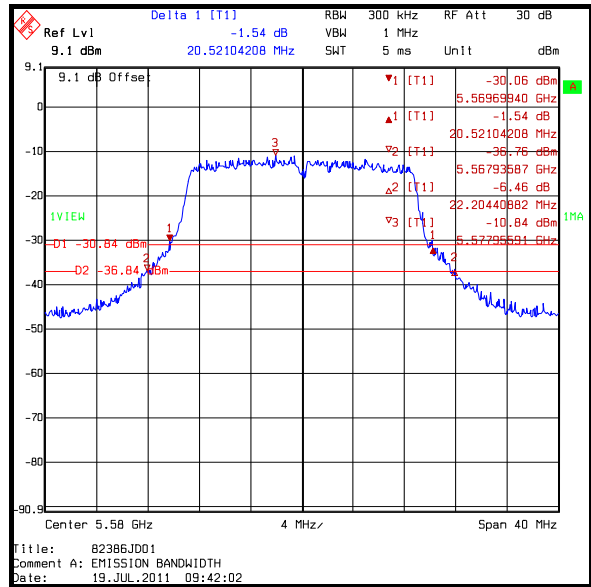
Top Channel

Transmitter 99% Emission Bandwidth (continued)

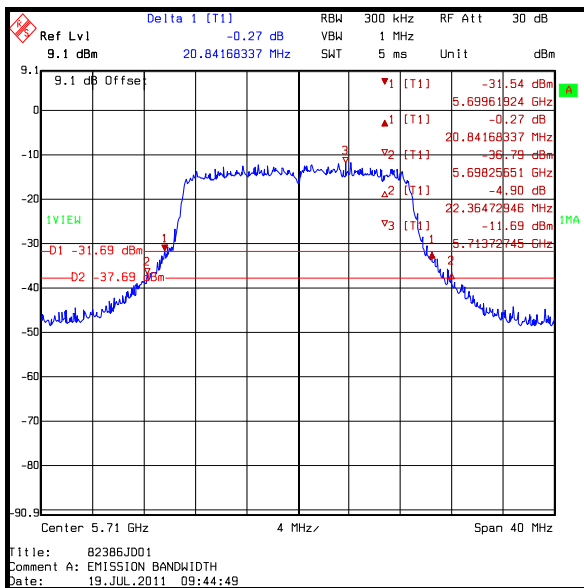
Plots: 20 MHz / H port / 802.11n / 65 Mbps



Bottom Channel



Middle Channel



Top Channel

Transmitter 99% Emission Bandwidth (continued)**Results: 40 MHz**

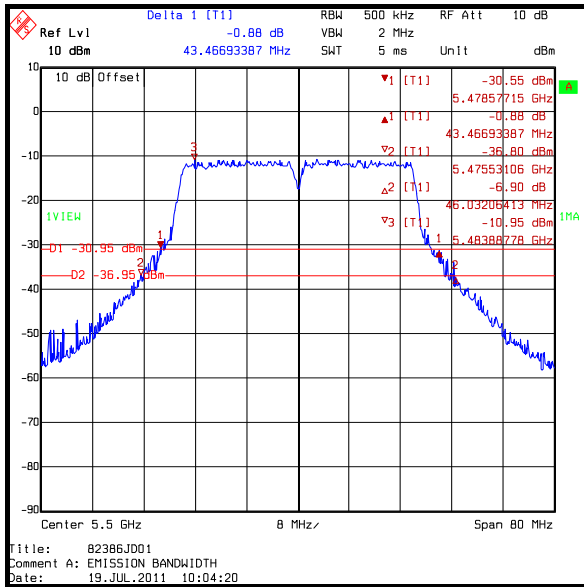
Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	99% Emission Bandwidth (MHz)
Bottom	5500	BPSK	13.5	43.467
Middle	5550	BPSK	13.5	42.826
Top	5695	BPSK	13.5	42.325
Bottom	5500	QPSK	40.5	40.741
Middle	5550	QPSK	40.5	41.363
Top	5695	QPSK	40.5	41.042
Bottom	5500	16QAM	81	40.581
Middle	5550	16QAM	81	41.363
Top	5695	16QAM	81	40.401
Bottom	5500	64QAM	135	41.543
Middle	5550	64QAM	135	41.363
Top	5695	64QAM	135	41.523

Note(s):

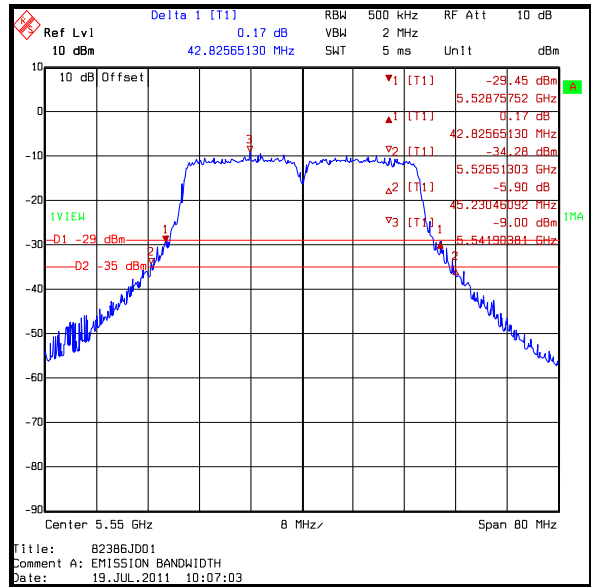
1. The 99% bandwidth measurement was made using the 20 dB measurement method. On the plots, marker 1 and delta marker 1 are used to show this 20 dB bandwidth. Marker 3 is used to demonstrate the peak value and therefore show the limit line as being -20 dB from this.
2. All bandwidths were checked on the vertical port and presented in the results table. Spot checks were made for BPSK on the horizontal port, These results are included for reference as plots only.

Transmitter 99% Emission Bandwidth (continued)

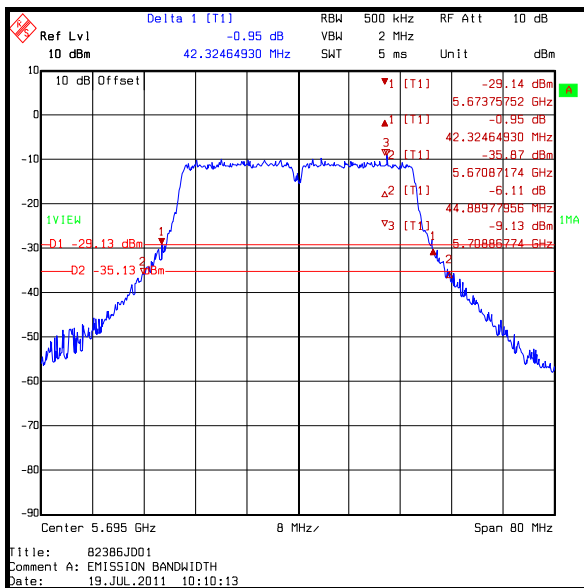
Plots: 40 MHz / V port / 802.11n / 13.5 Mbps



Bottom Channel



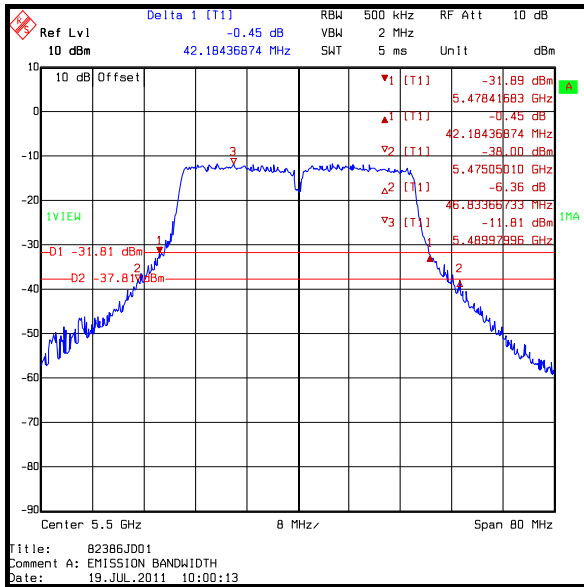
Middle Channel



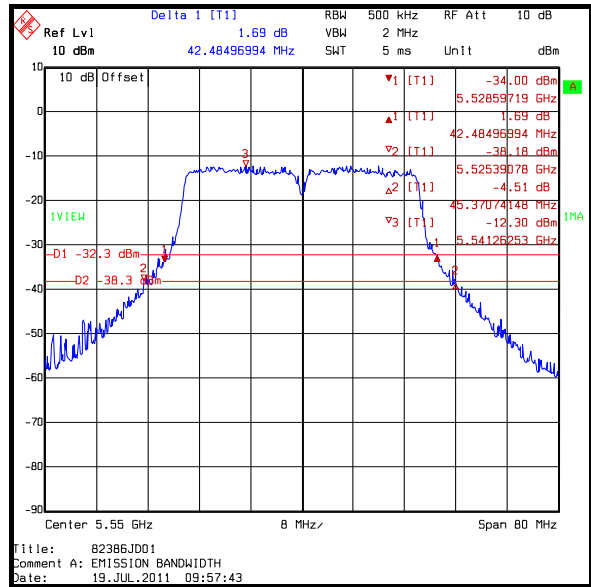
Top Channel

Transmitter 99% Emission Bandwidth (continued)

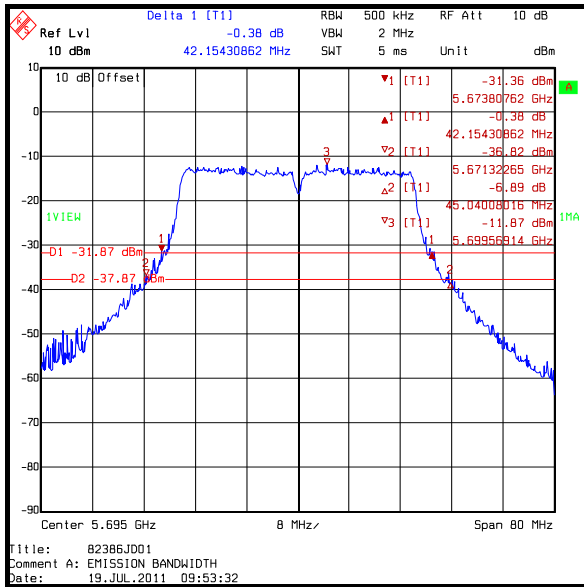
Plots: 40 MHz / H port / 802.11n / 13.5 Mbps



Bottom Channel



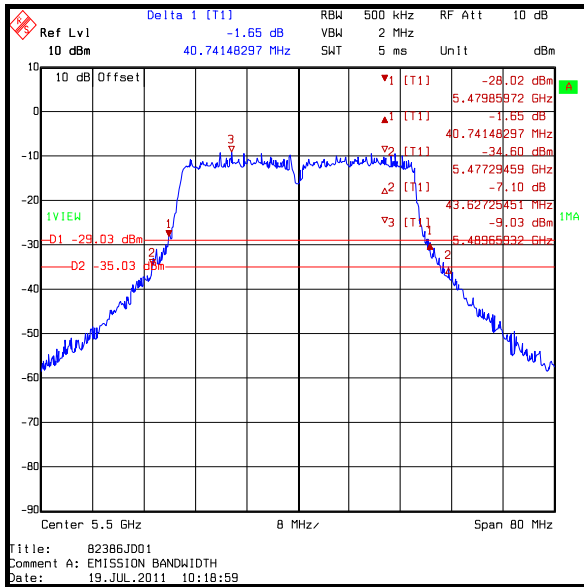
Middle



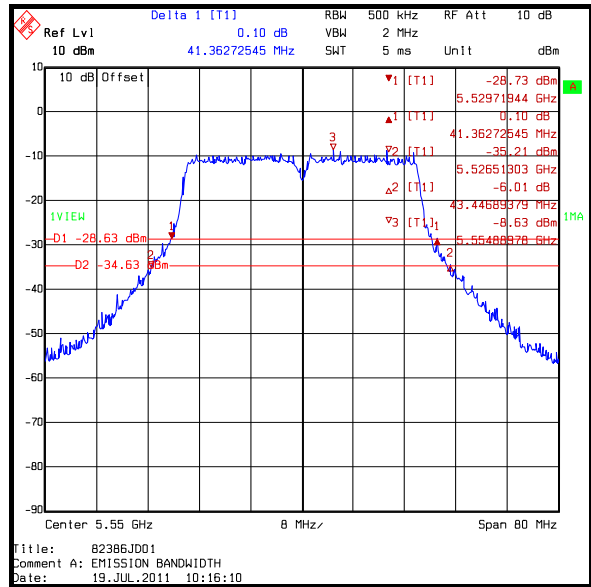
Top Channel

Transmitter 99% Emission Bandwidth (continued)

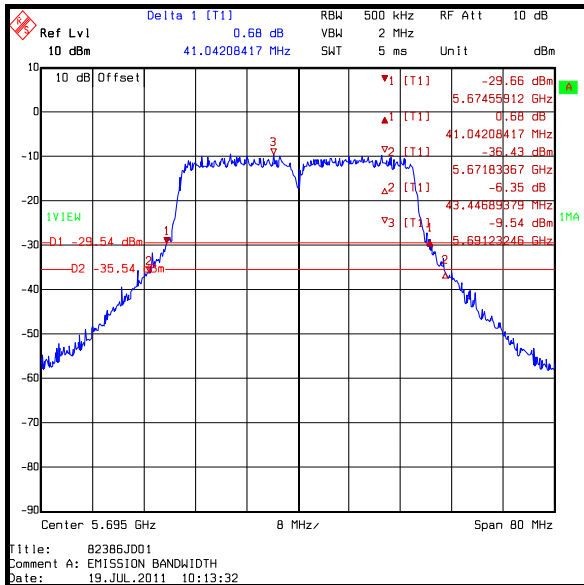
Plots: 40 MHz / V port / 802.11n / 40.5 Mbps



Bottom Channel



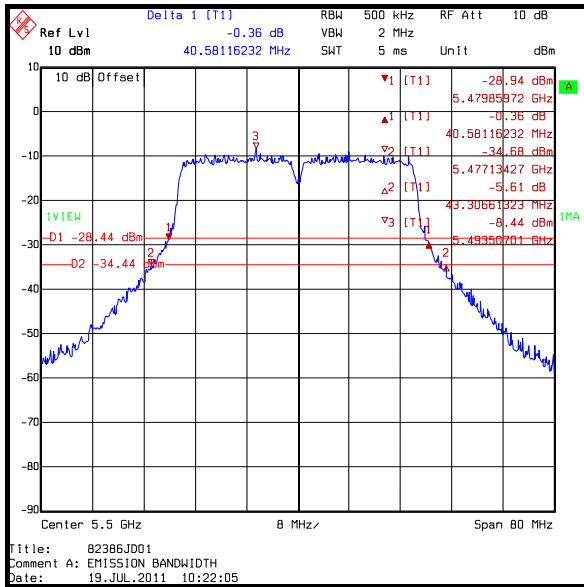
Middle Channel



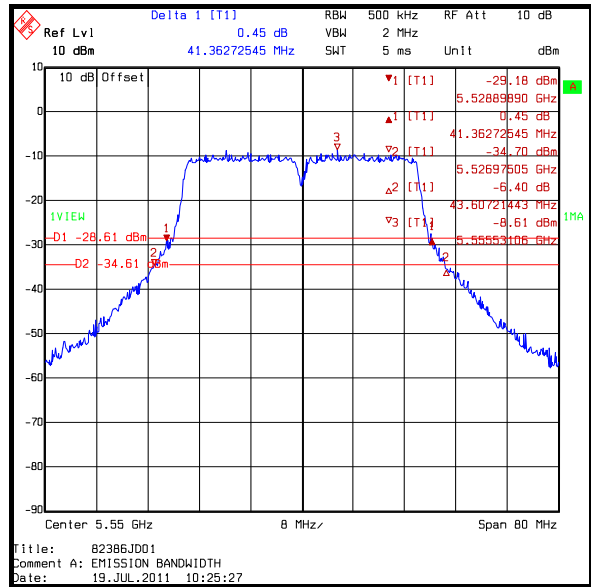
Top Channel

Transmitter 99% Emission Bandwidth (continued)

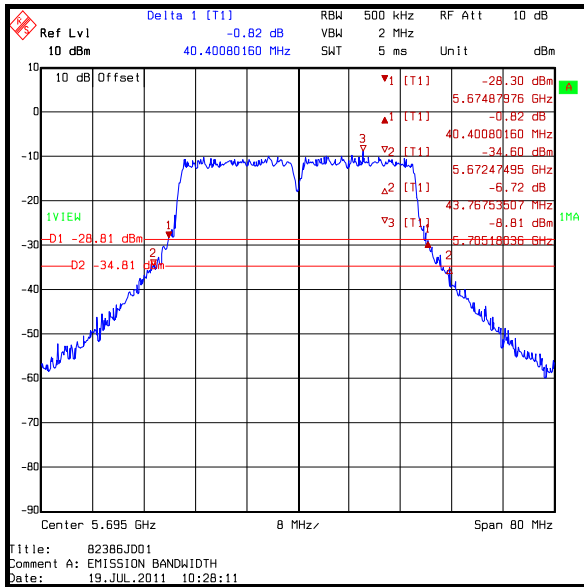
Plots: 40 MHz / V port / 802.11n / 81 Mbps



Bottom Channel



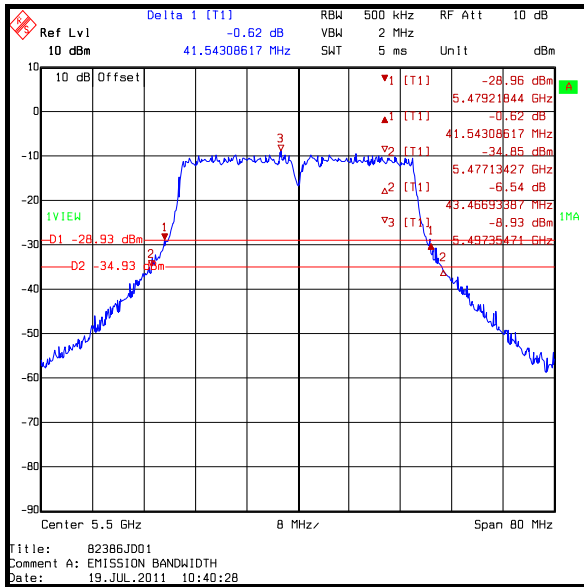
Middle Channel



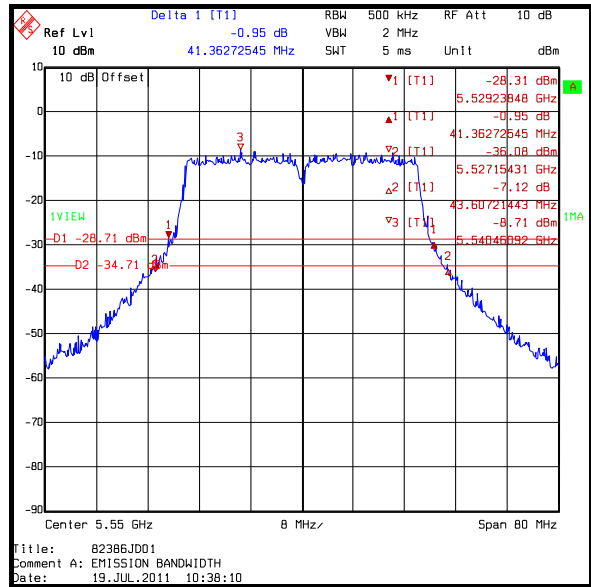
Top Channel

Transmitter 99% Emission Bandwidth (continued)

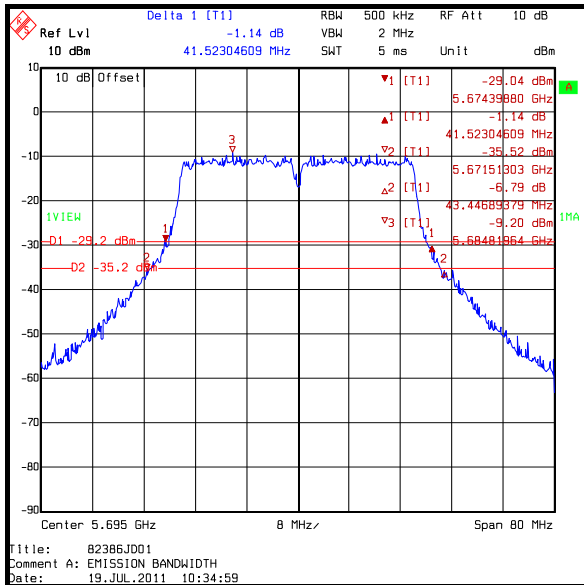
Plots: 40 MHz / V port / 802.11n / 135 Mbps



Bottom Channel



Middle Channel



Top Channel

5.2.4. Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	19 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Reference:	FCC 15.407(a)(2)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 3

Environmental Conditions:

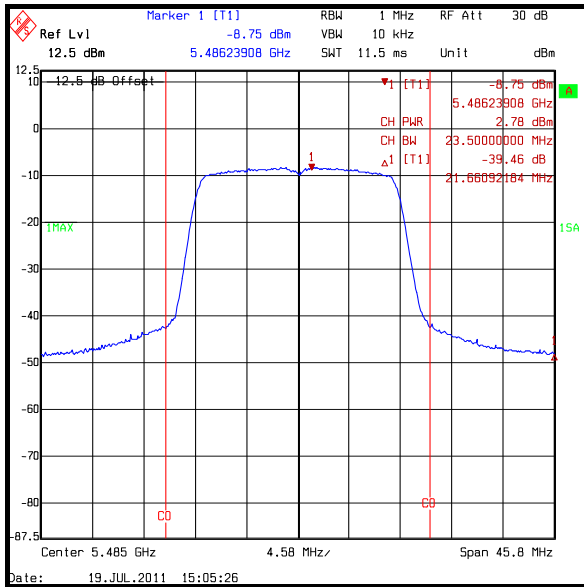
Temperature (°C):	30
Relative Humidity (%):	28

Results: 20 MHz

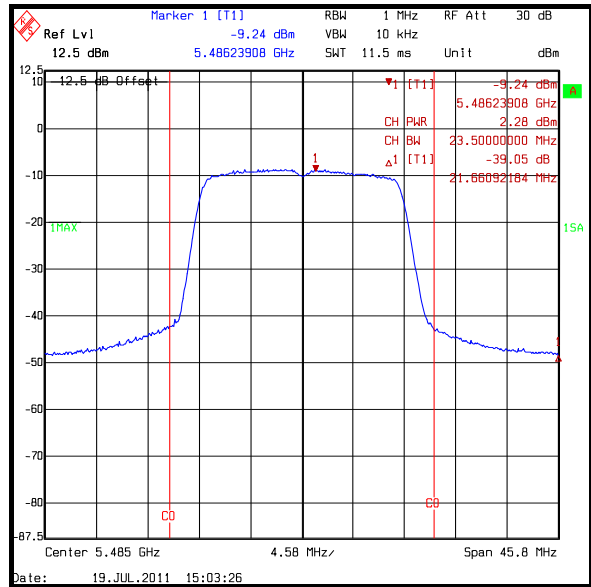
Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	6.5	2.8	2.3	5.5	7.0	1.5	Complied
Middle	BPSK	6.5	3.7	1.8	5.8	7.0	1.2	Complied
Top	BPSK	6.5	3.1	2.4	5.8	7.0	1.2	Complied
Bottom	QPSK	19.5	3.3	2.3	5.8	7.0	1.2	Complied
Middle	QPSK	19.5	3.4	1.7	5.6	7.0	1.4	Complied
Top	QPSK	19.5	3.6	1.5	5.7	7.0	1.3	Complied
Bottom	16QAM	39	3.3	2.0	5.7	7.0	1.3	Complied
Middle	16QAM	39	3.2	2.2	5.7	7.0	1.3	Complied
Top	16QAM	39	3.3	1.7	5.6	7.0	1.4	Complied
Bottom	64QAM	65	2.9	2.5	5.7	7.0	1.3	Complied
Middle	64QAM	65	3.3	2.2	5.8	7.0	1.2	Complied
Top	64QAM	65	3.0	1.9	5.5	7.0	1.5	Complied

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

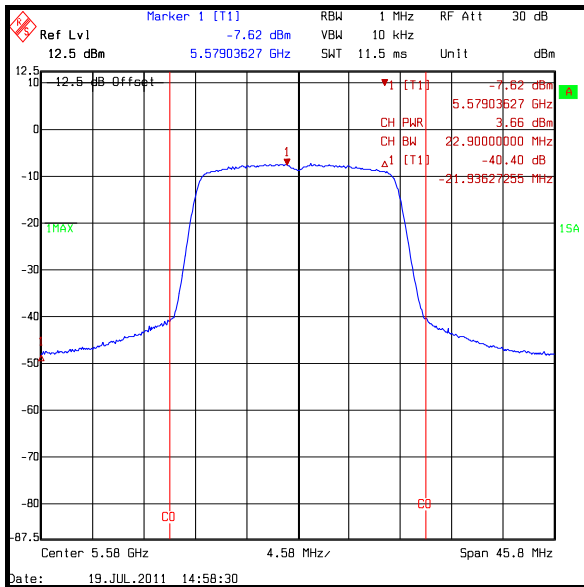
Results: 20 MHz / BPSK / 6.5 Mbps



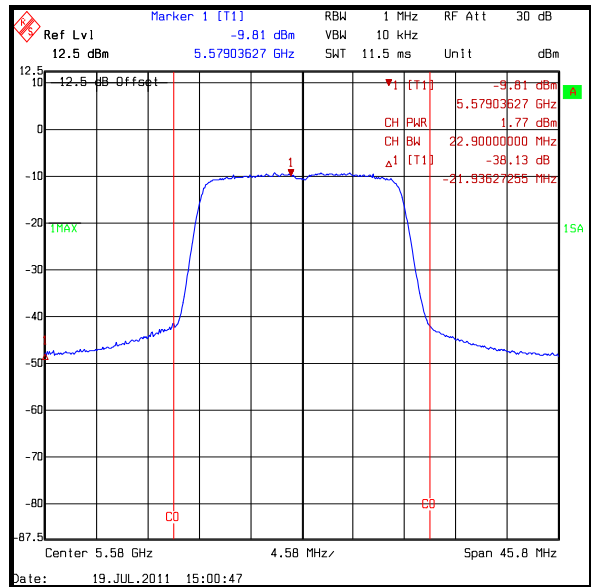
Bottom Channel / V port



Bottom Channel / H port



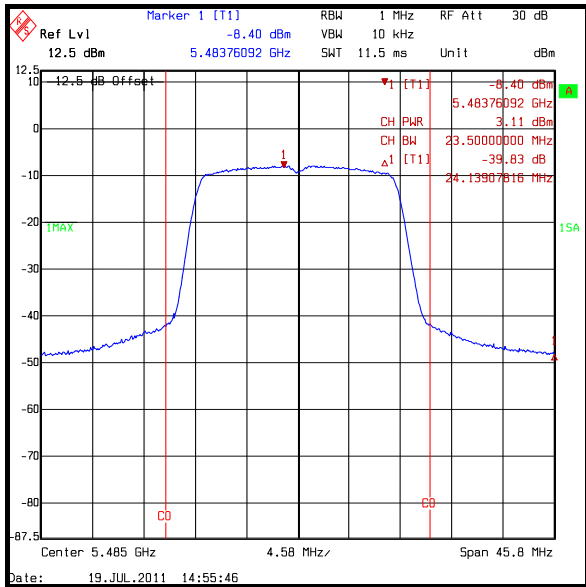
Middle Channel / V port



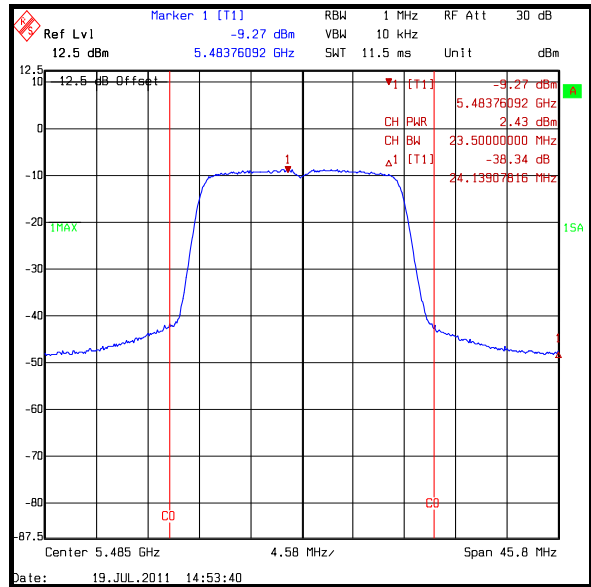
Middle Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 20 MHz / BPSK / 6.5 Mbps



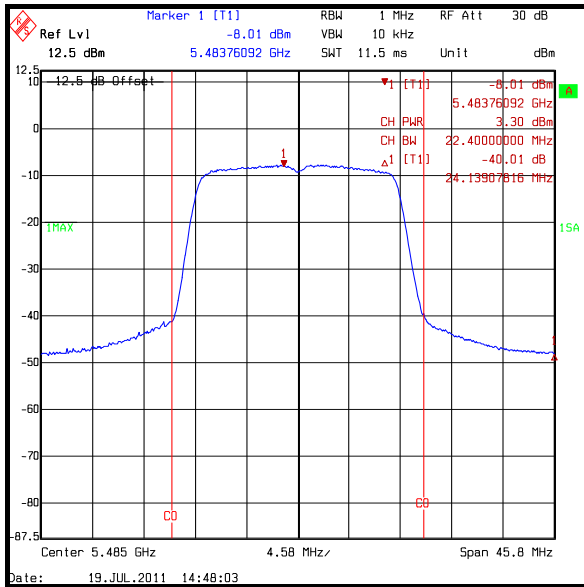
Top Channel / V port



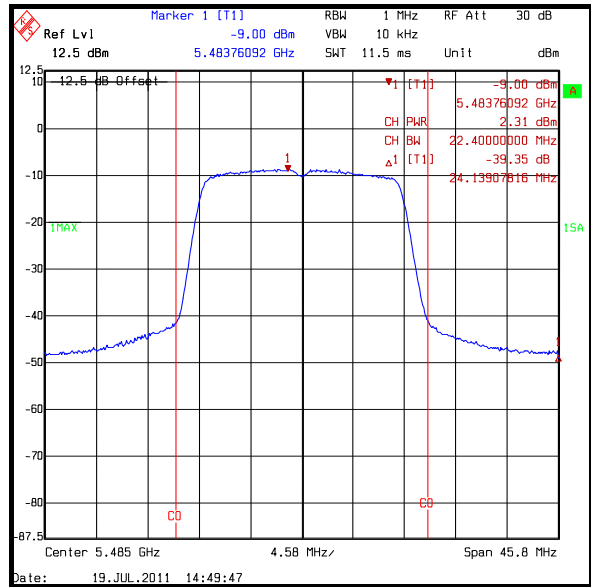
Top Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

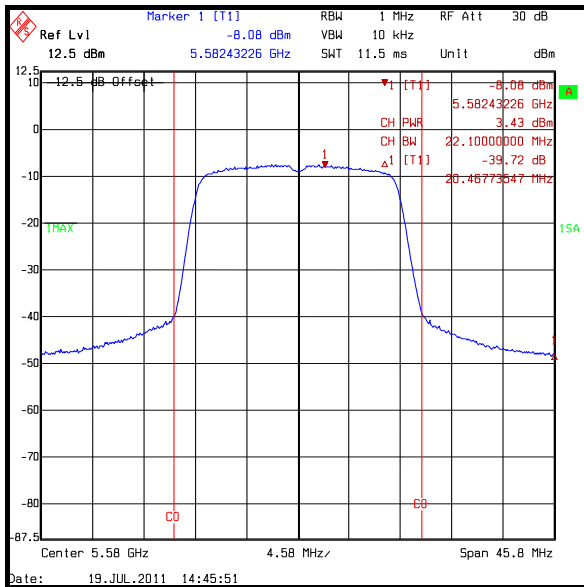
Results: 20 MHz / QPSK / 19.5 Mbps



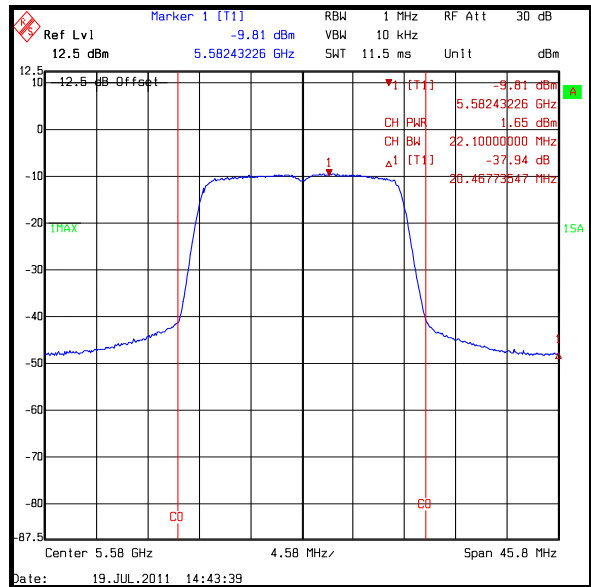
Bottom Channel / V port



Bottom Channel / H port



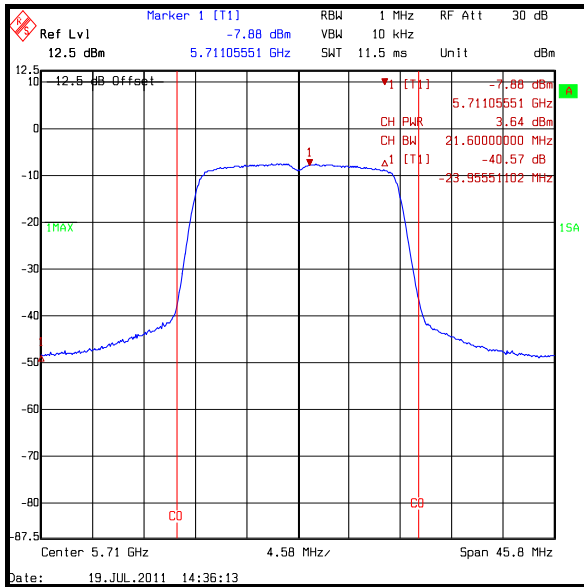
Middle Channel / V port



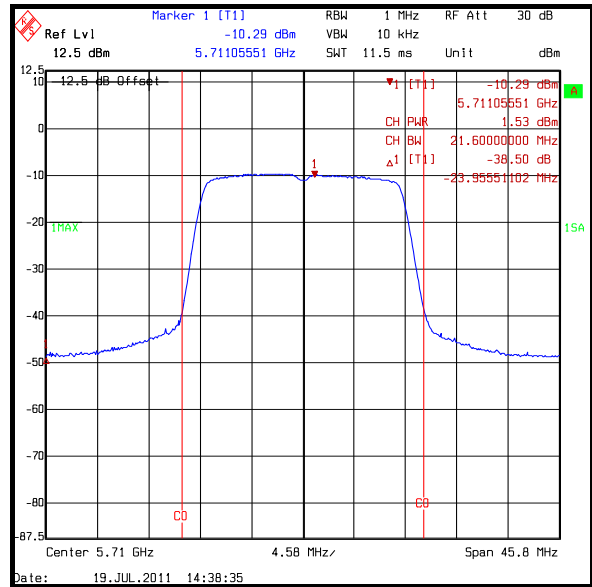
Middle Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 20 MHz / QPSK / 19.5 Mbps



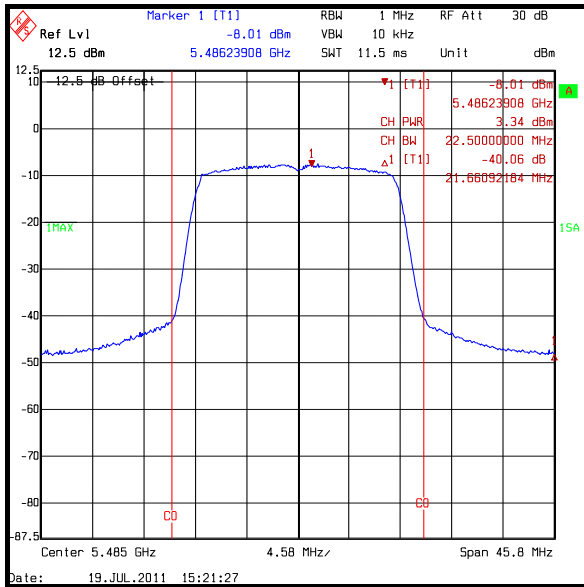
Top Channel / V port



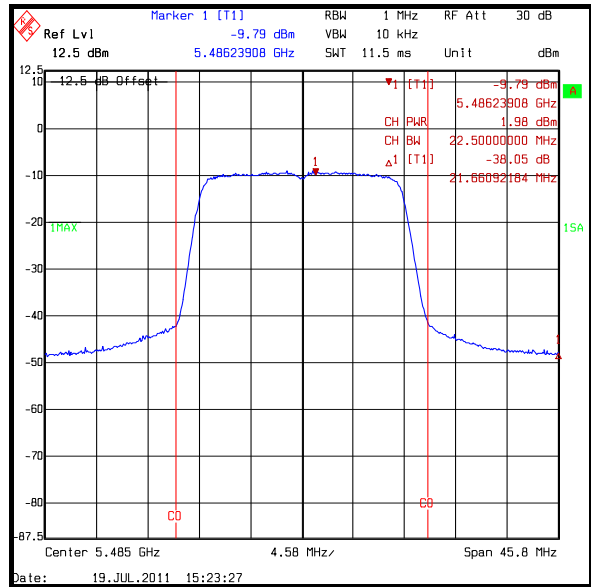
Top Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

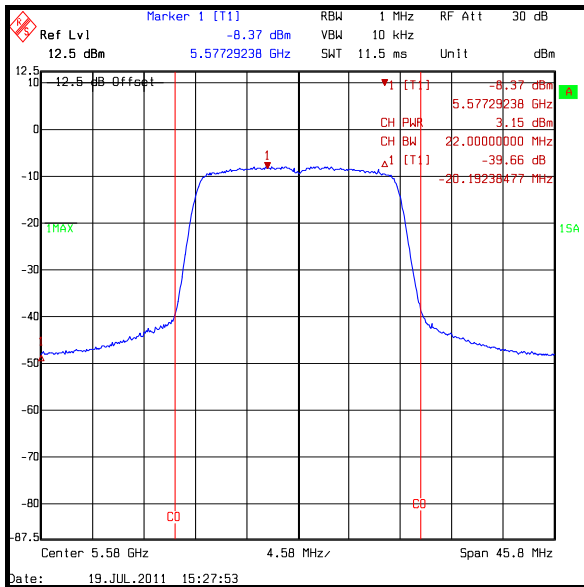
Results: 20 MHz / 16QAM / 39 Mbps



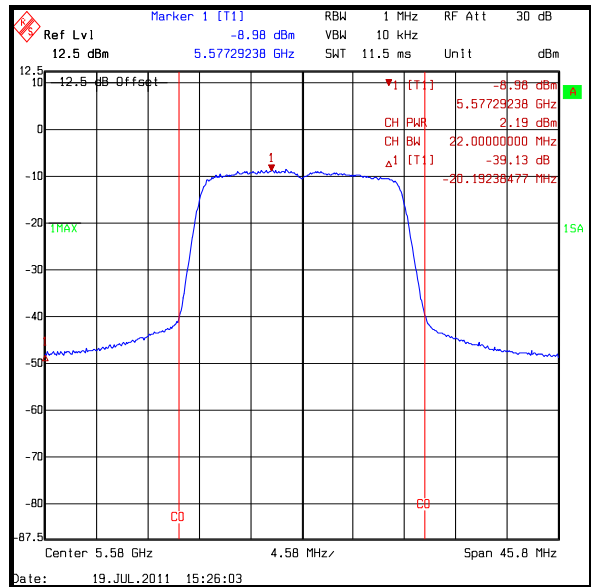
Bottom Channel / V port



Bottom Channel / H port



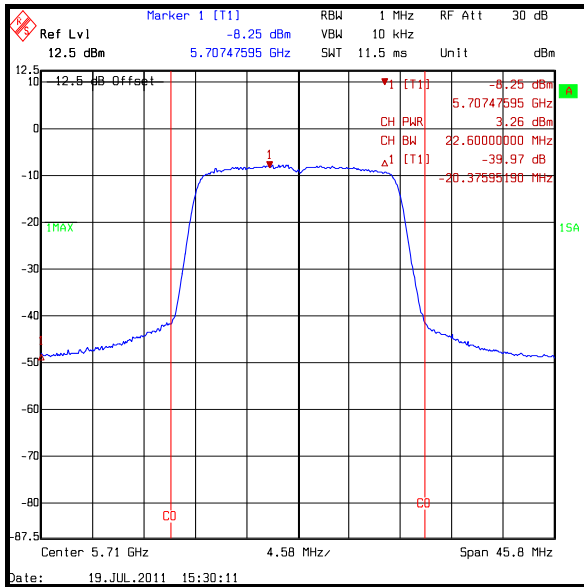
Middle Channel / V port



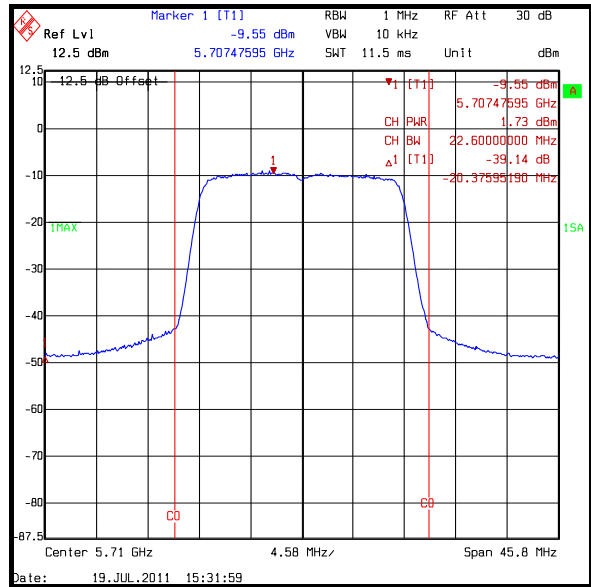
Middle Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 20 MHz / 16QAM / 39 Mbps



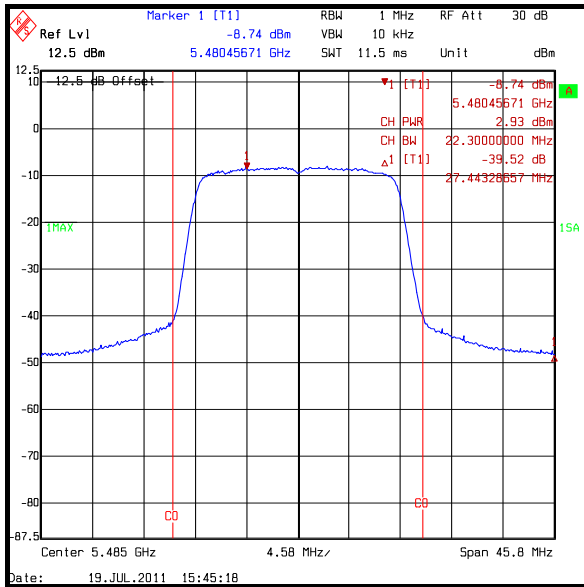
Top Channel – V port



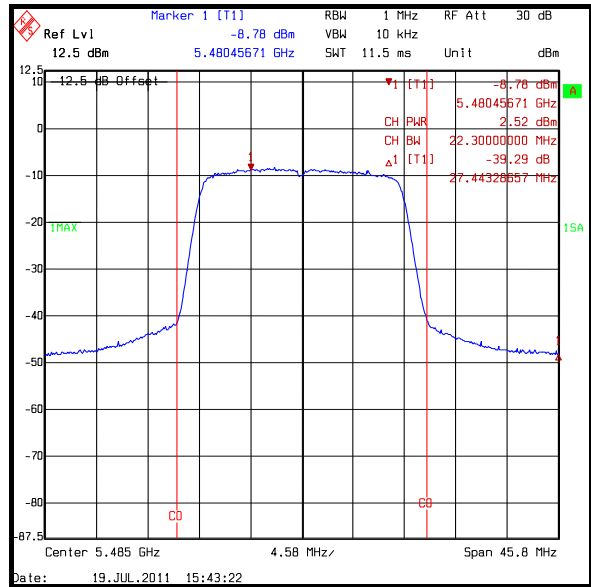
Top Channel – H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

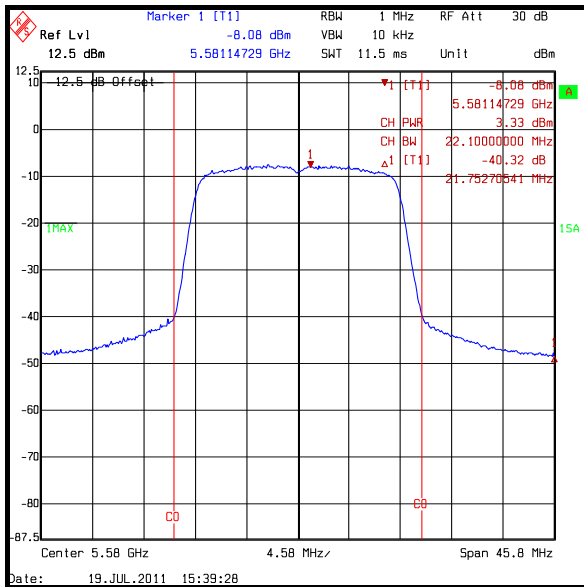
Results: 20 MHz / 64QAM / 65 Mbps



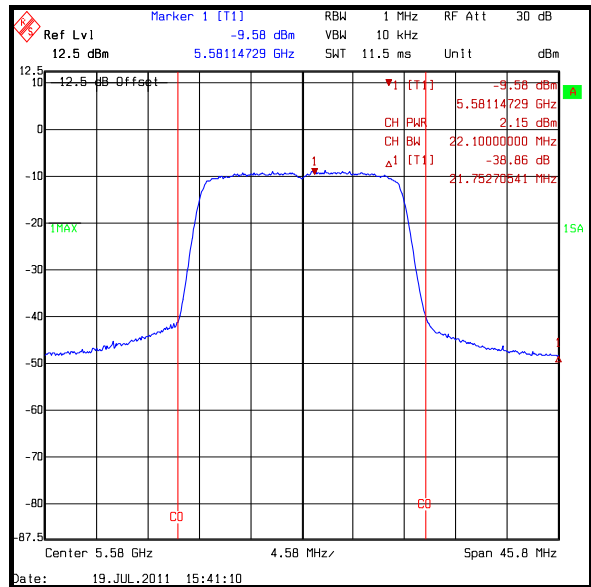
Bottom Channel / V port



Bottom Channel / H port



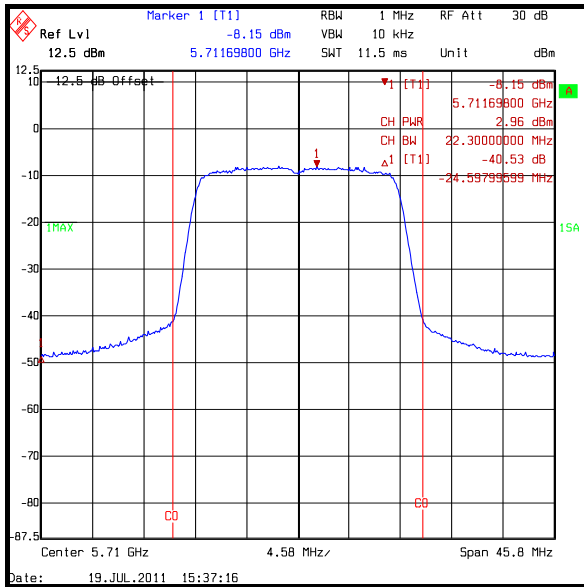
Middle Channel / V port



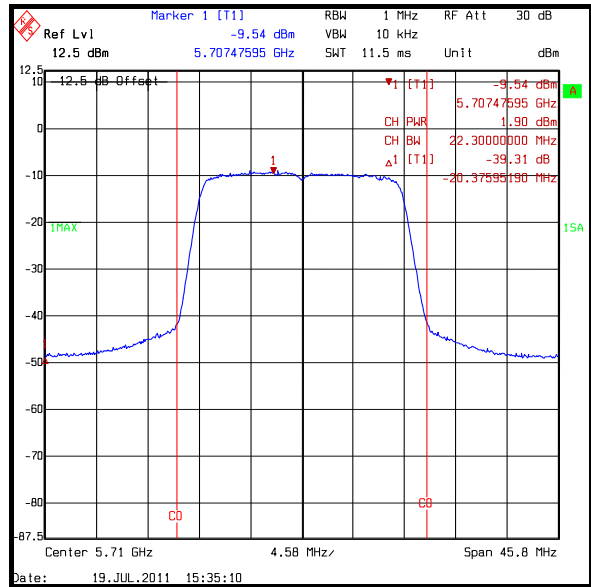
Middle Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 20 MHz / 64QAM / 65 Mbps



Top Channel / V port



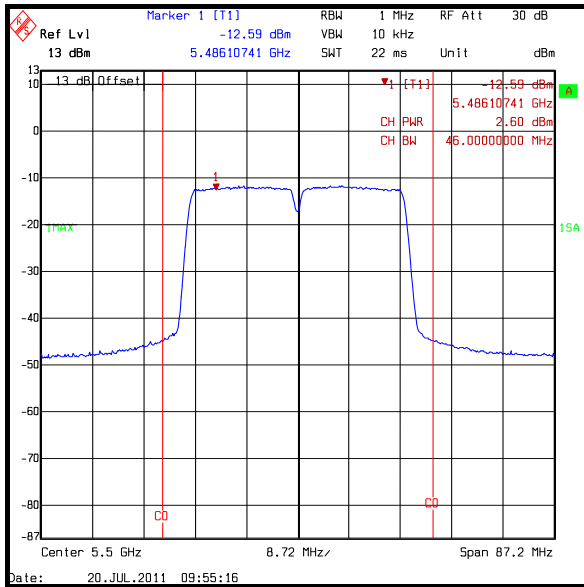
Top Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)**Results: 40 MHz**

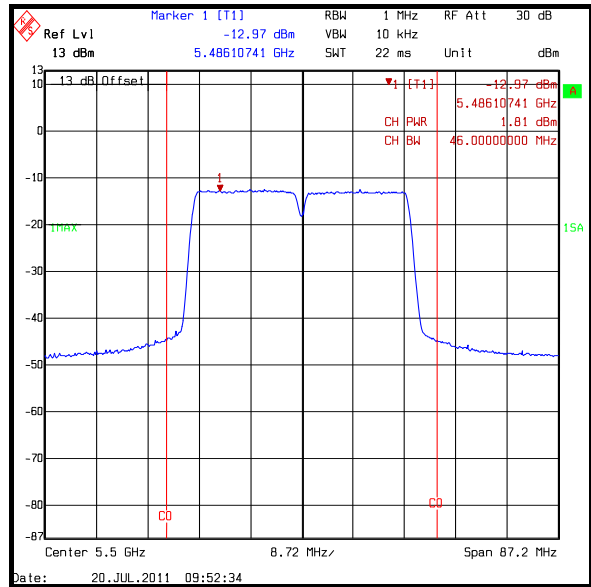
Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	13.5	2.6	1.8	5.2	7.0	1.8	Complied
Middle	BPSK	13.5	3.6	1.9	5.8	7.0	1.2	Complied
Top	BPSK	13.5	4.4	2.3	6.5	7.0	0.5	Complied
Bottom	QPSK	40.5	2.7	2.2	5.4	7.0	1.6	Complied
Middle	QPSK	40.5	3.1	2.2	5.7	7.0	1.3	Complied
Top	QPSK	40.5	4.1	2.1	6.2	7.0	0.8	Complied
Bottom	16QAM	81	2.9	2.3	5.6	7.0	1.4	Complied
Middle	16QAM	81	3.4	2.4	6.0	7.0	1.0	Complied
Top	16QAM	81	4.1	2.2	6.3	7.0	0.7	Complied
Bottom	64QAM	135	3.1	2.2	5.7	7.0	1.3	Complied
Middle	64QAM	135	3.2	2.7	5.9	7.0	1.1	Complied
Top	64QAM	135	4.2	2.2	6.3	7.0	0.7	Complied

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

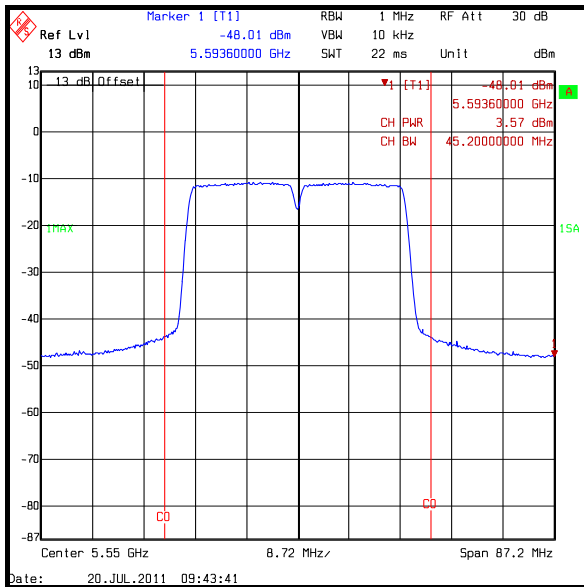
Results: 40 MHz / BPSK / 13.5 Mbps



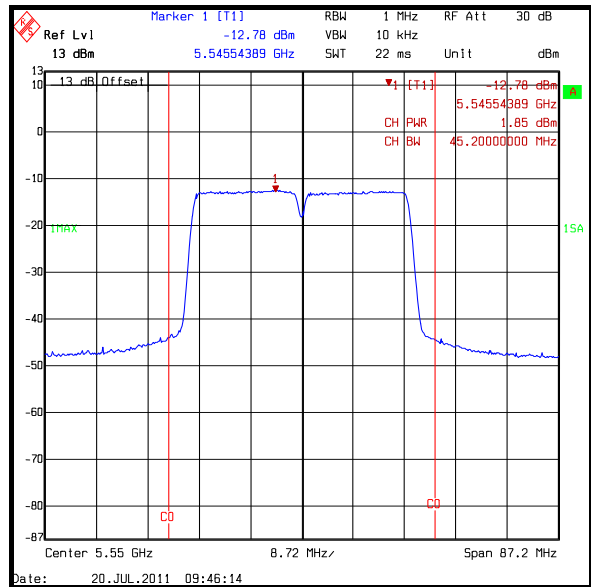
Bottom Channel / V port



Bottom Channel / H port



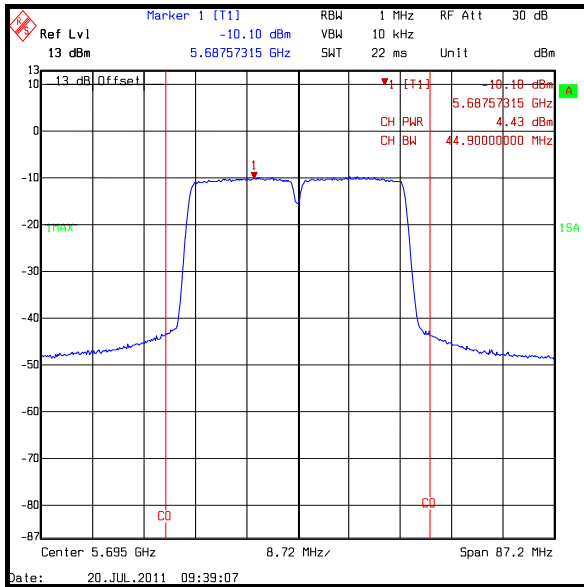
Middle Channel / V port



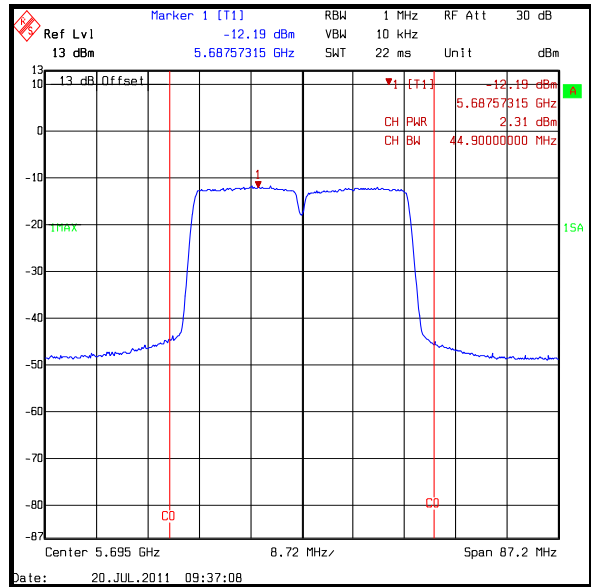
Middle Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 40 MHz / BPSK / 13.5 Mbps



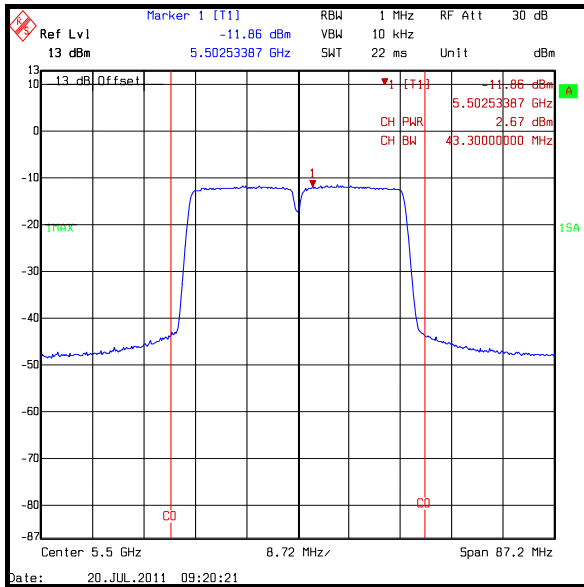
Top Channel / V port



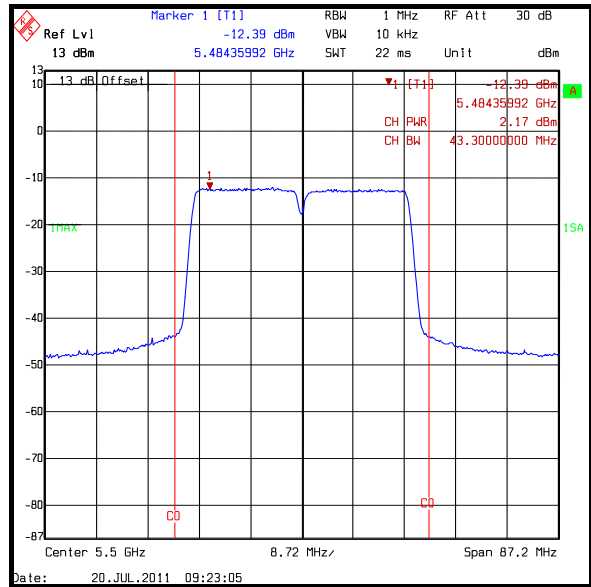
Top Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

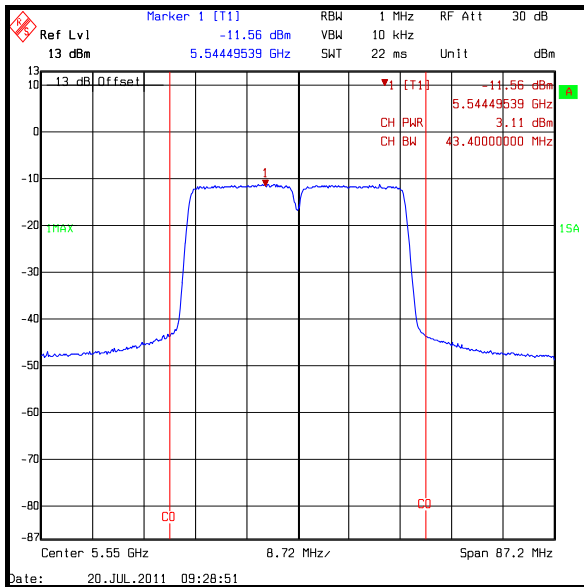
Results: 40 MHz / QPSK / 40.5 Mbps



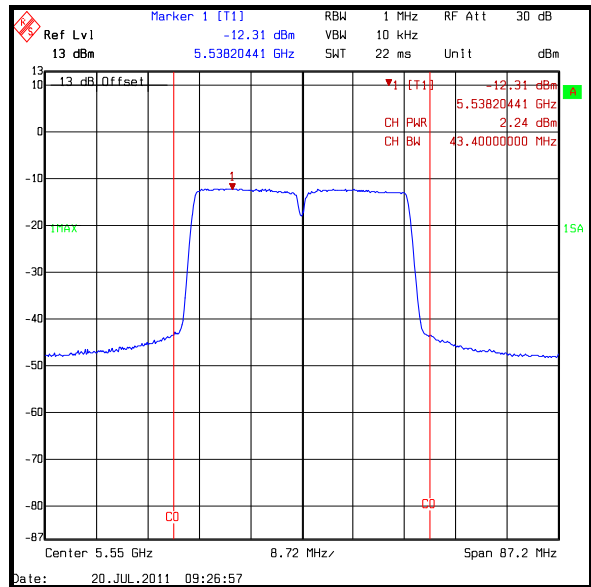
Bottom Channel / V port



Bottom Channel / H port



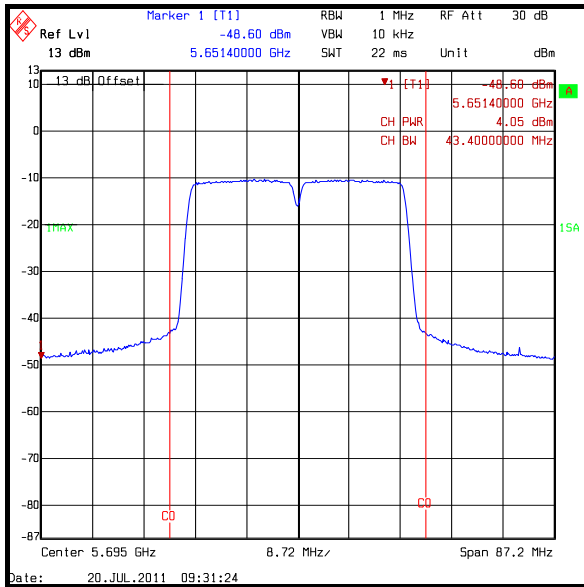
Middle Channel / V port



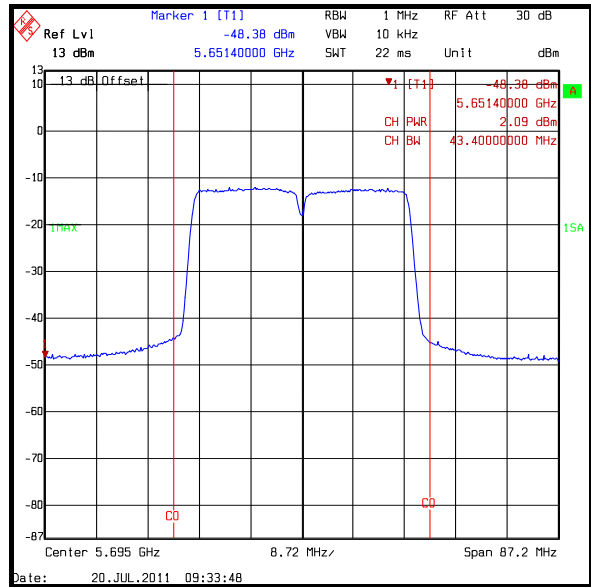
Middle / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 40 MHz / QPSK / 40.5 Mbps



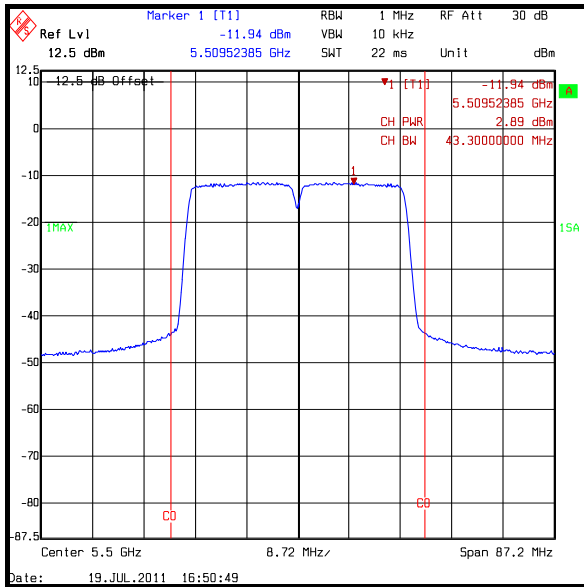
Top Channel / V port



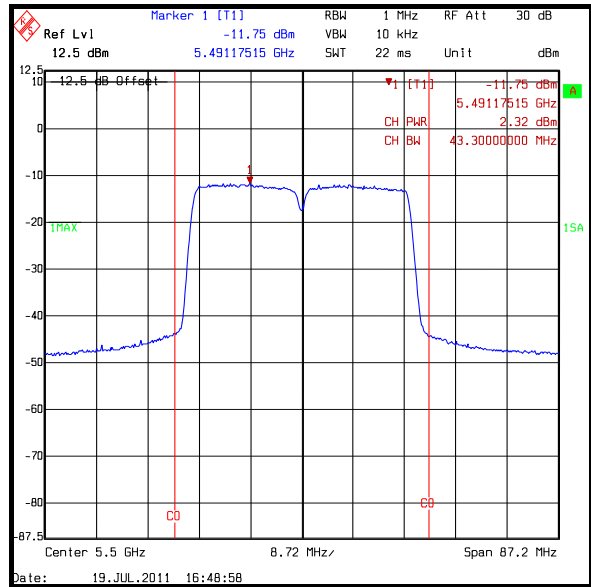
Top Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

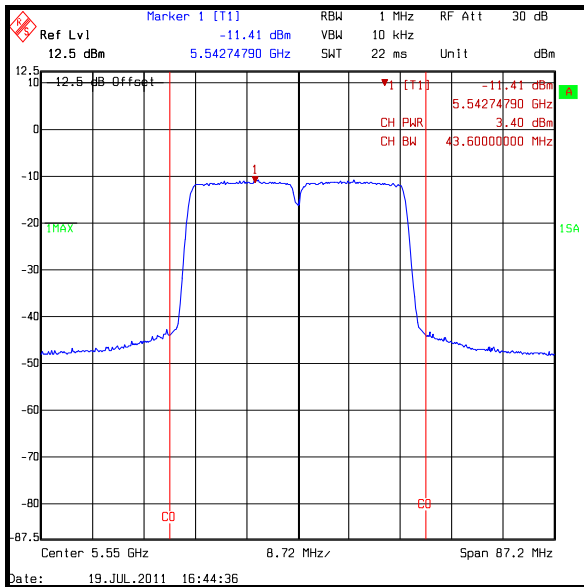
Results: 40 MHz / 16QAM / 81 Mbps



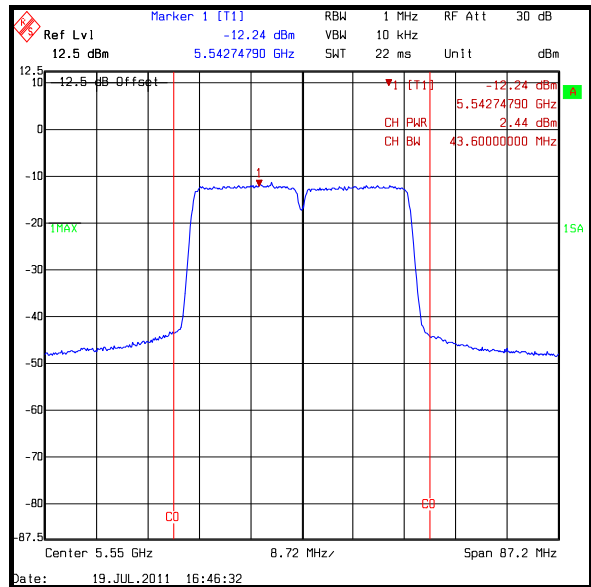
Bottom Channel / V port



Bottom Channel / H port



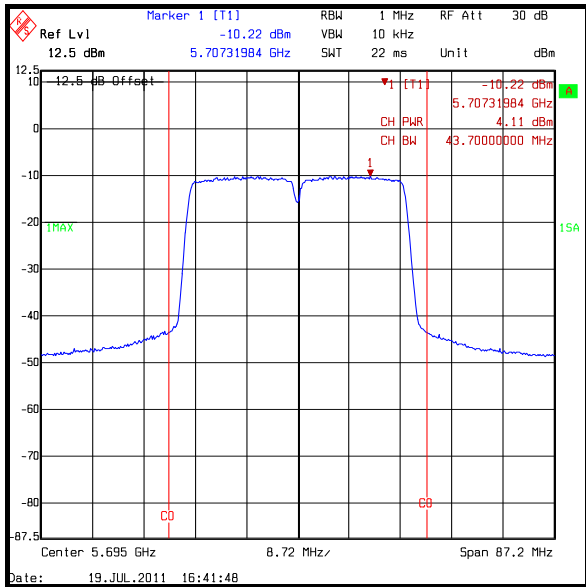
Middle Channel / V port



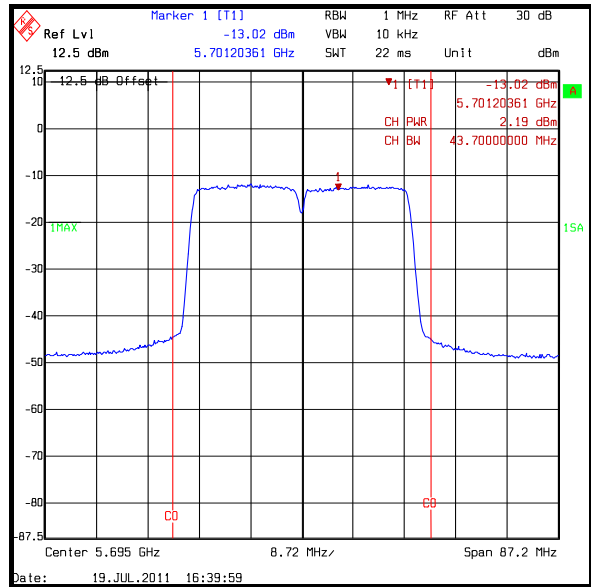
Middle Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 40 MHz / 16QAM / 81 Mbps



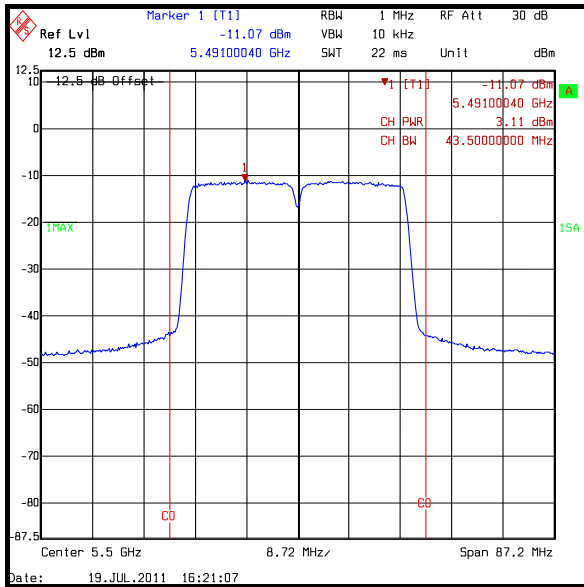
Top Channel / V port



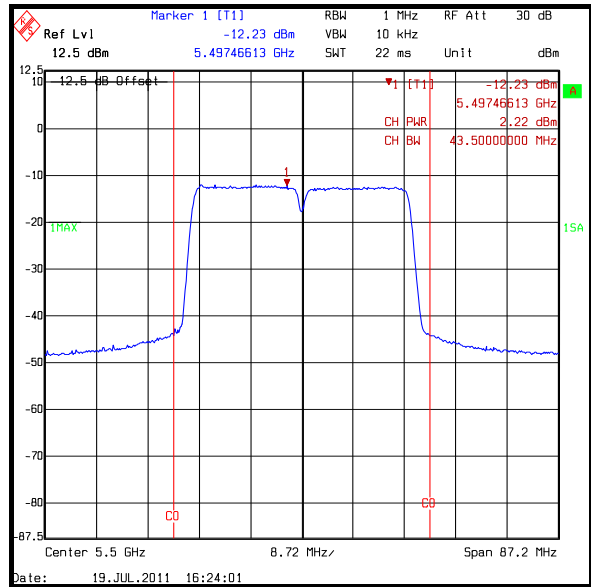
Top Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

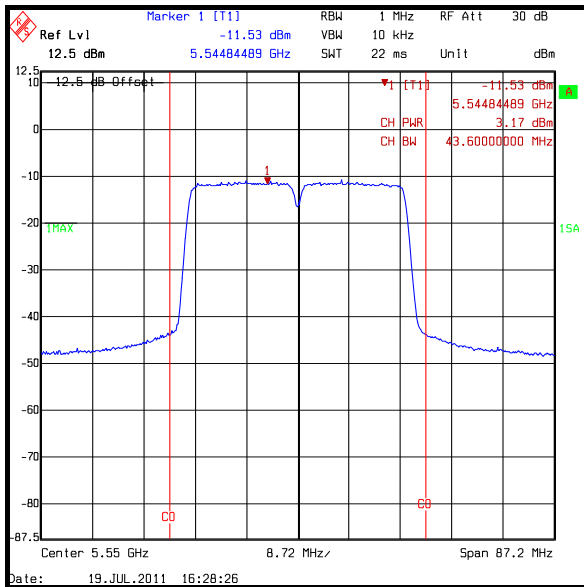
Results: 40 MHz / 64QAM / 135 Mbps



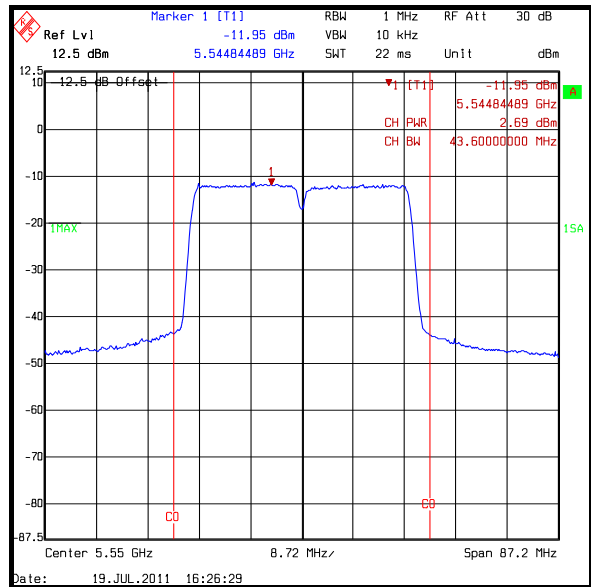
Bottom Channel / V port



Bottom Channel / H port



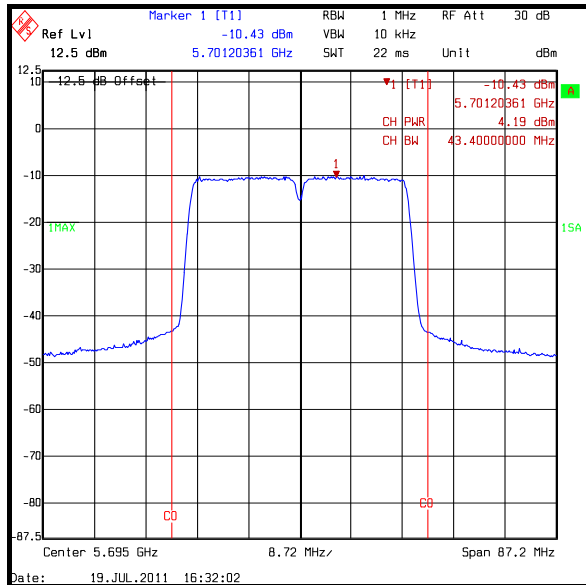
Middle Channel / V port



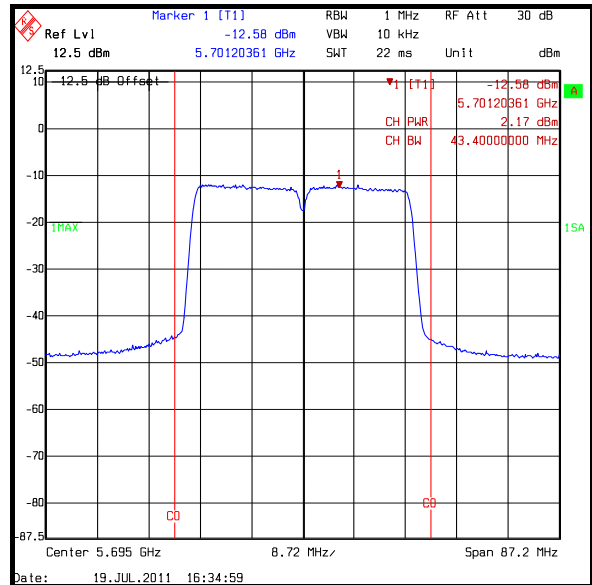
Middle Channel / H port

Transmitter Maximum Peak Output Power with +23 dBi gain integral antenna (continued)

Results: 40 MHz / 64QAM / 135 Mbps



Top Channel / V port



Top Channel / H port

Note(s):

1. All 26 dB bandwidth measurements were 20 MHz or greater. Therefore the limit of 24 dBm (250 mW) applies to all measurements.
2. As a maximum antenna gain of +23 dBi was applied to these measurements, the conducted power limits are shown as 17 dB lower than their absolute value as stated in the specification (which are based on a 6 dBi antenna gain). Extrapolating against a limit of 24 dBm will give a value of 24 dBm -17 dB = 7 dBm.
3. This test was completed with a power setting of '4.5 dBm mode'. Please refer to Section 3.3 Modifications Incorporated in the EUT, for further details. This test was not repeated in this lower powered mode at the Customer's request as it had already met the requirement when operating in a higher power mode.

Limit

For the 5.35-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operating shall not exceed the lesser of 250mW (24dBm) or $11 \text{ dBm} + 10_{10} \text{ Log (B)}$ where B is the 26 dB emission bandwidth in MHz.

If transmitting antennas of directional gain greater than 6 dBi are used, both maximum conducted output power and the peak spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.5. Transmitter Maximum Peak Output Power with +26 dBi gain external antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	22 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Reference:	FCC 15.407(a)(2)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 3

Environmental Conditions:

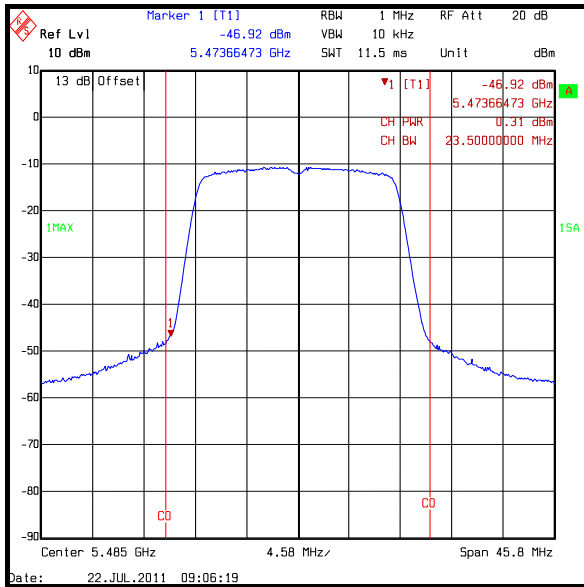
Temperature (°C):	27
Relative Humidity (%):	30

Results: 20 MHz

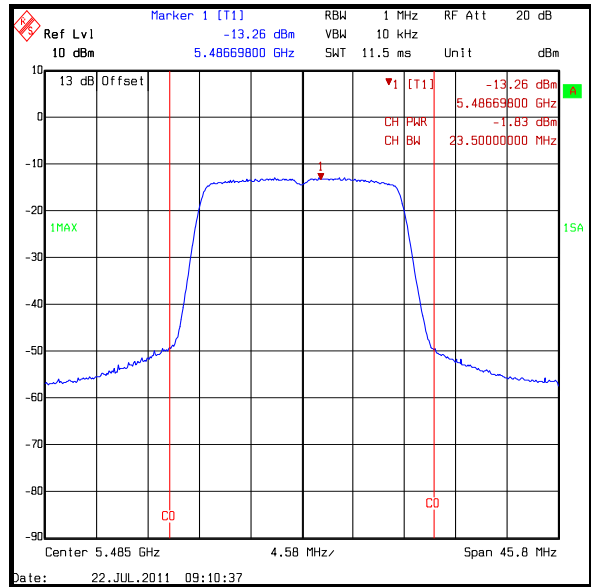
Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	16.5	0.3	-1.8	2.4	4.0	1.6	Complied
Middle	BPSK	16.5	-0.6	-1.5	2.0	4.0	2.0	Complied
Top	BPSK	16.5	-1.2	-3.9	0.7	4.0	3.3	Complied
Bottom	QPSK	19.5	-0.7	-2.1	1.7	4.0	2.3	Complied
Middle	QPSK	19.5	-0.9	-2.4	1.4	4.0	2.6	Complied
Top	QPSK	19.5	-1.7	-4.1	0.3	4.0	3.7	Complied
Bottom	16QAM	39	-0.1	-1.9	2.1	4.0	1.9	Complied
Middle	16QAM	39	-1.0	-1.7	1.7	4.0	2.3	Complied
Top	16QAM	39	-1.5	-4.0	0.5	4.0	3.5	Complied
Bottom	64QAM	65	-0.2	-1.8	2.1	4.0	1.9	Complied
Middle	64QAM	65	-0.6	-2.2	1.7	4.0	2.3	Complied
Top	64QAM	65	-1.5	-4.1	0.4	4.0	3.6	Complied

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

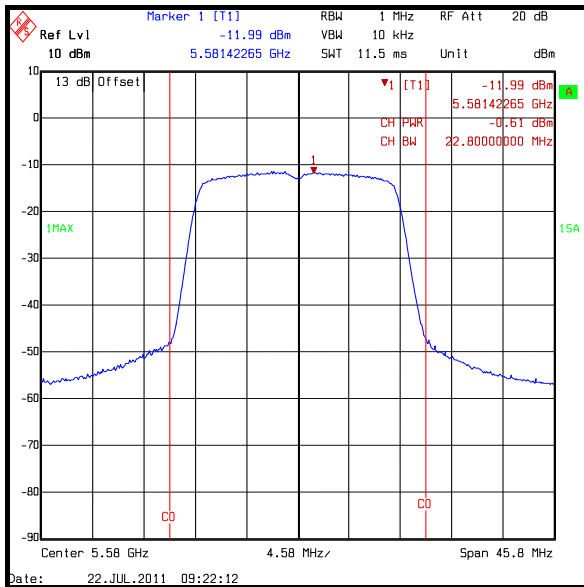
Results: 20 MHz / BPSK / 16.5 Mbps



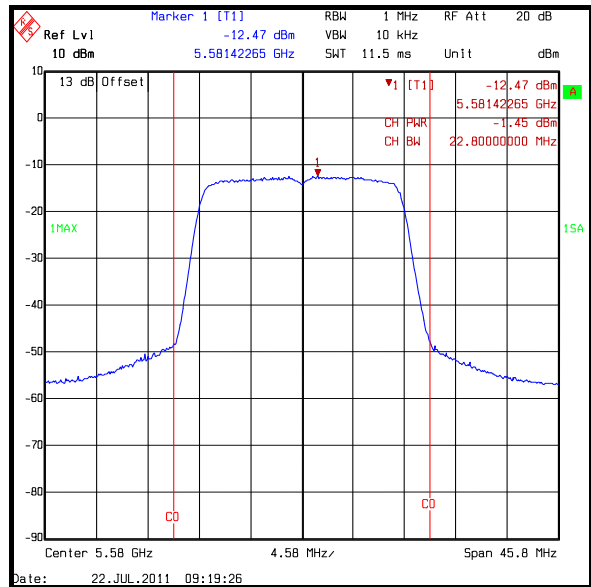
Bottom Channel / V port



Bottom Channel / H port



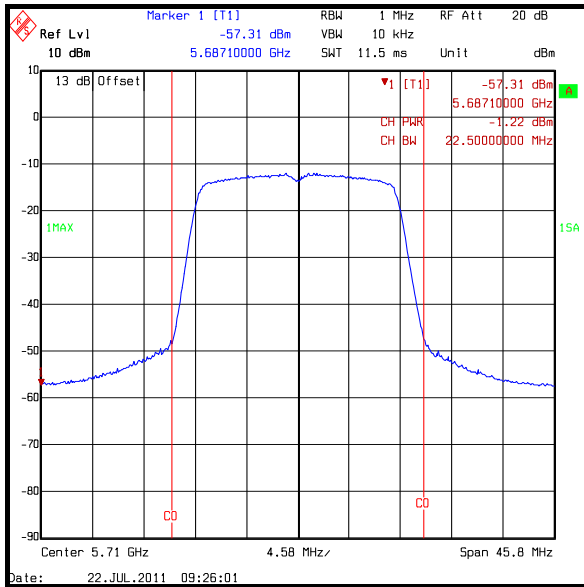
Middle Channel / V port



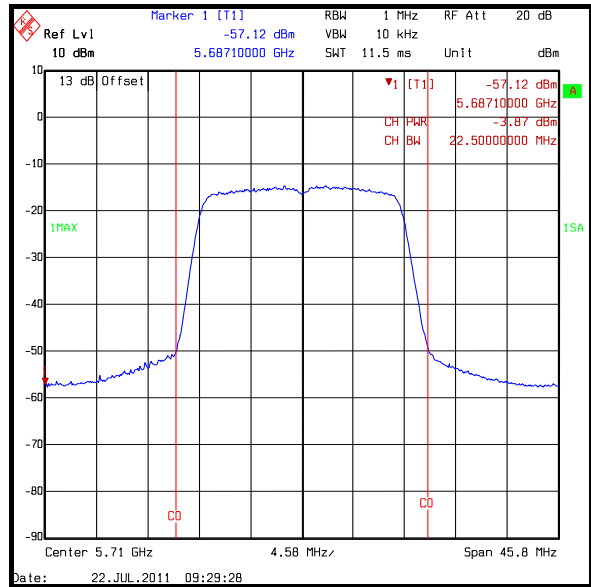
Middle Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

Results: 20 MHz / BPSK / 16.5 Mbps



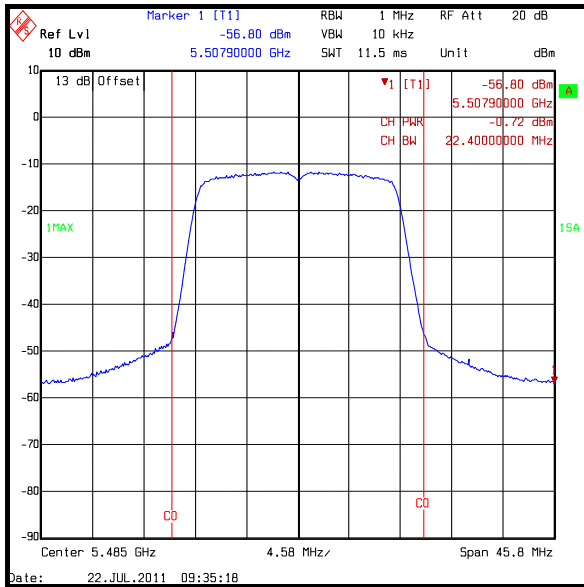
Top Channel / V port



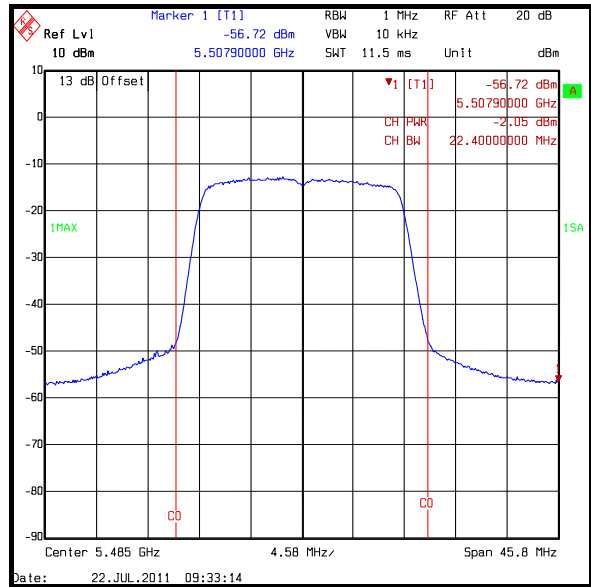
Top Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

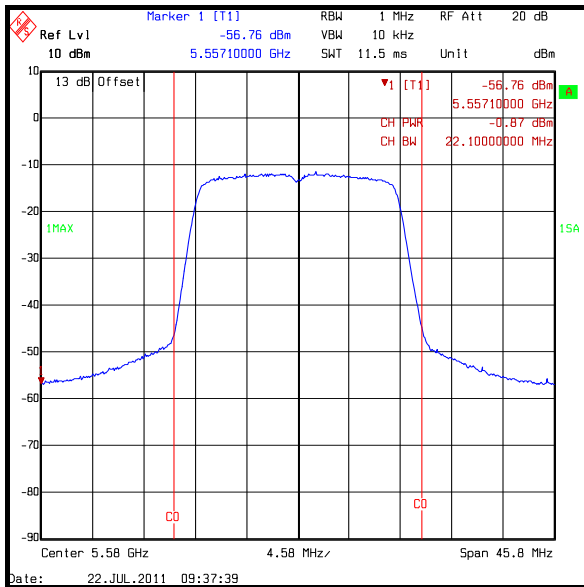
Results: 20 MHz / QPSK / 19.5 Mbps



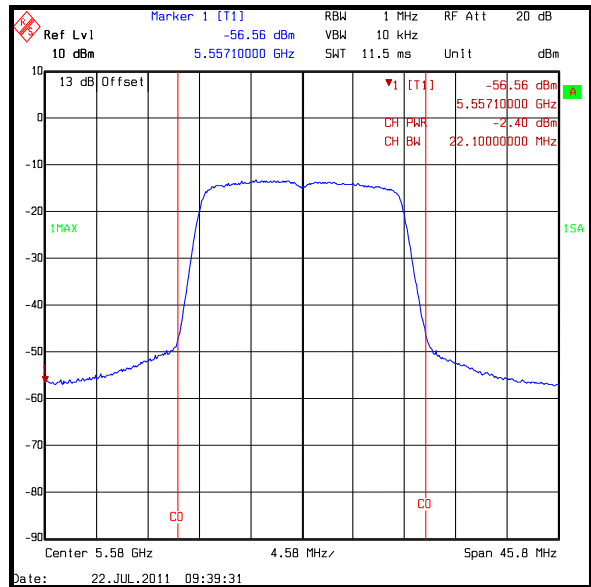
Bottom Channel / V port



Bottom Channel / H port



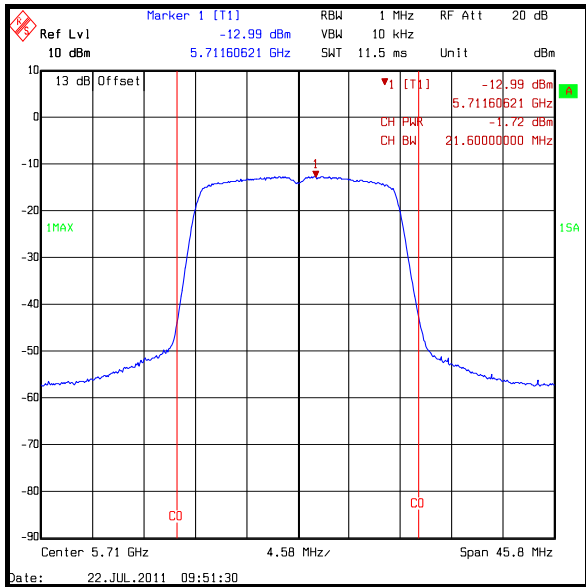
Middle Channel / V port



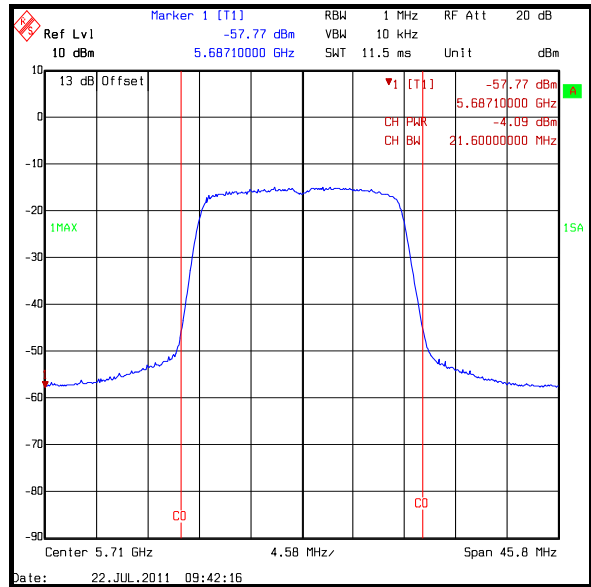
Middle Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

Results: 20 MHz / QPSK / 19.5 Mbps



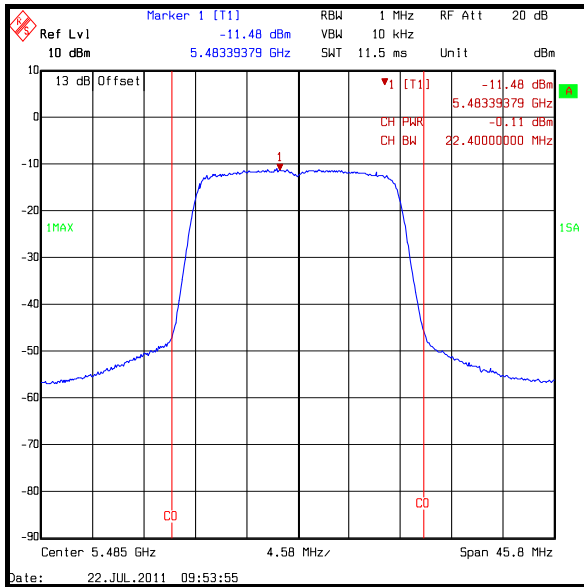
Top Channel / V port



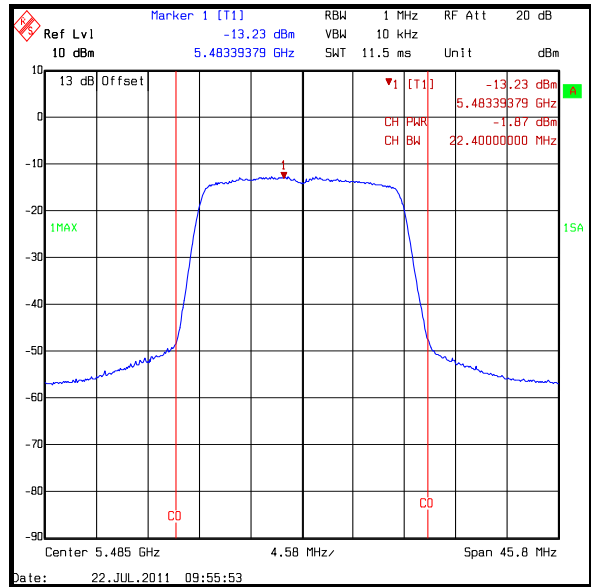
Top Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

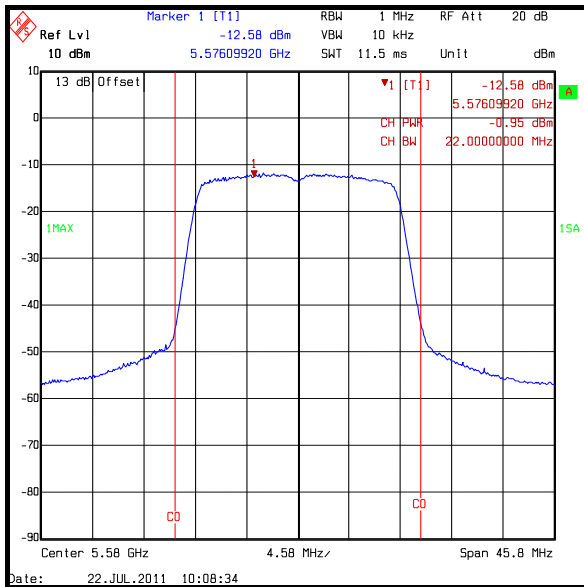
Results: 20 MHz / 16QAM / 39 Mbps



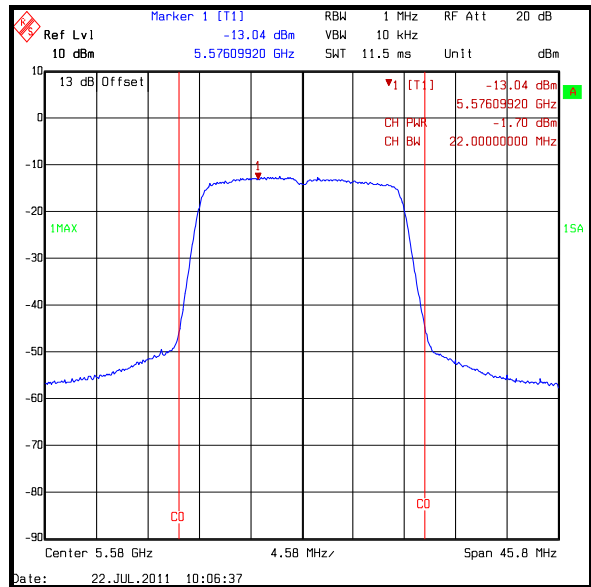
Bottom / V port



Bottom / H port



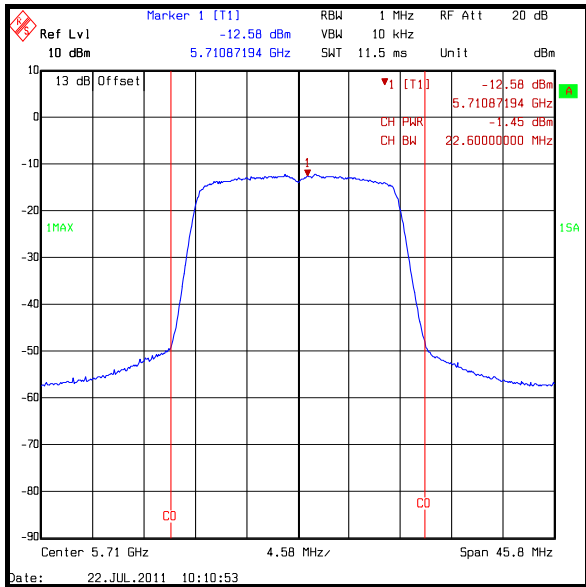
Middle / V port



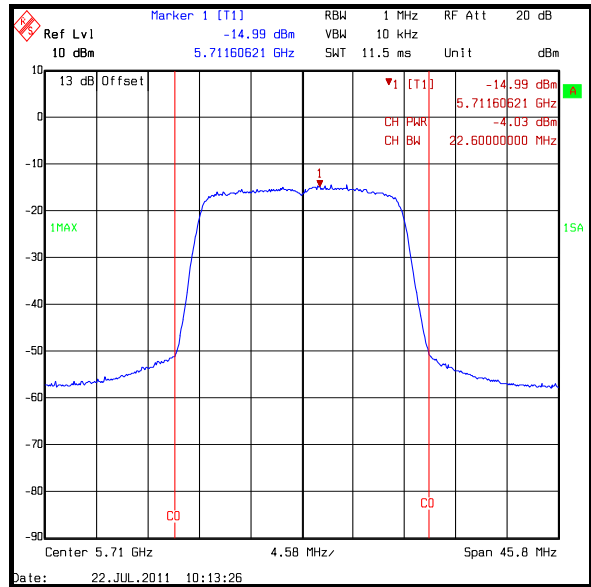
Middle / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

Results: 20 MHz / 16QAM / 39 Mbps



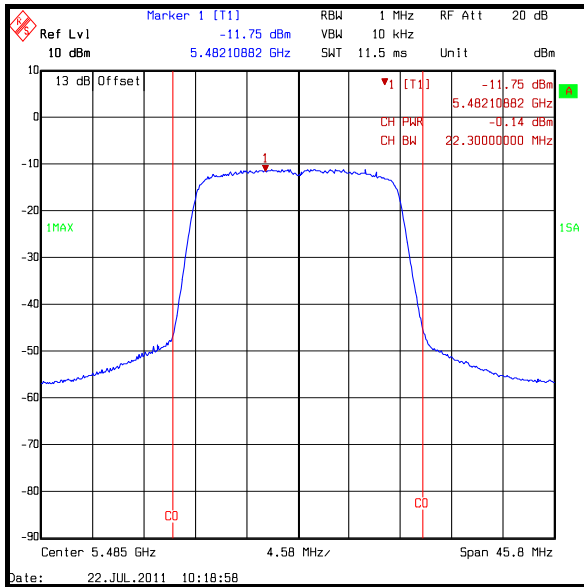
Top Channel / V port



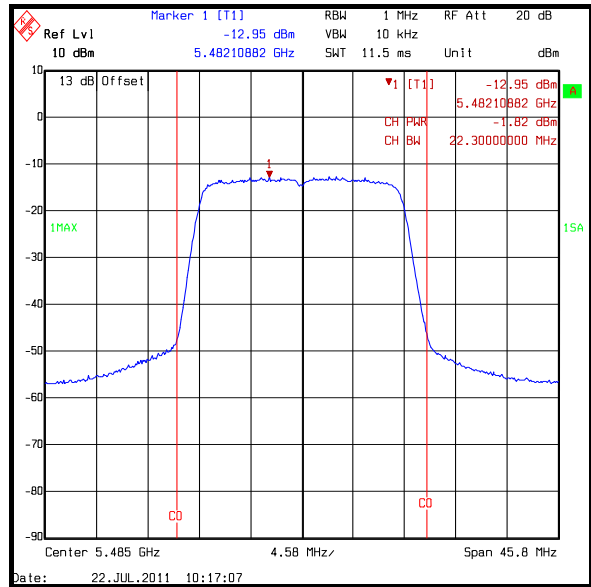
Top Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

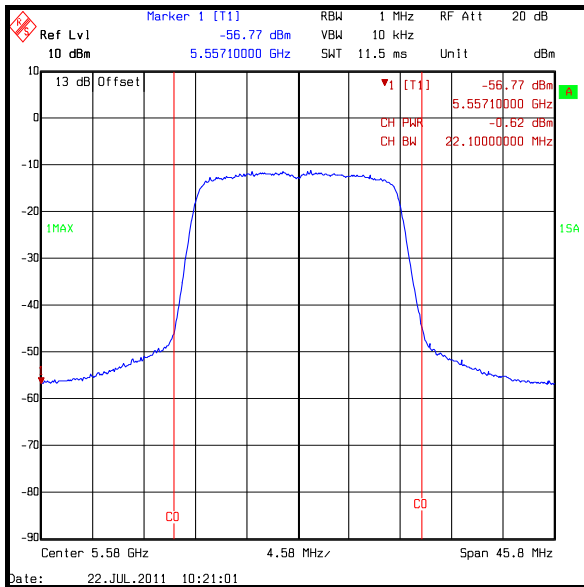
Results: 20 MHz / 64QAM / 65 Mbps



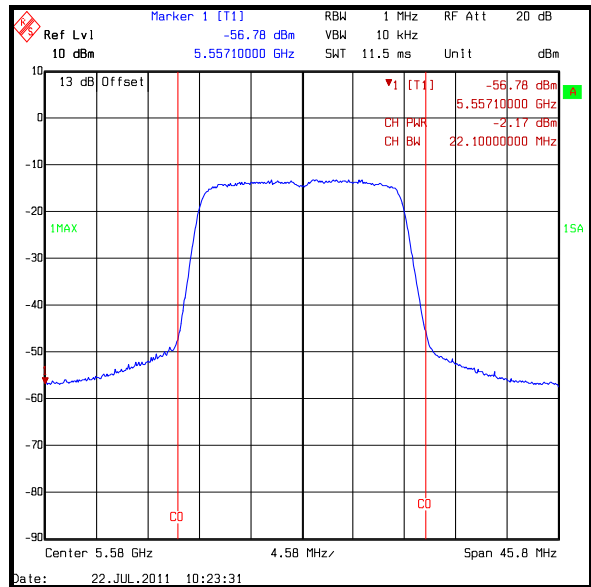
Bottom Channel / V port



Bottom Channel / H port



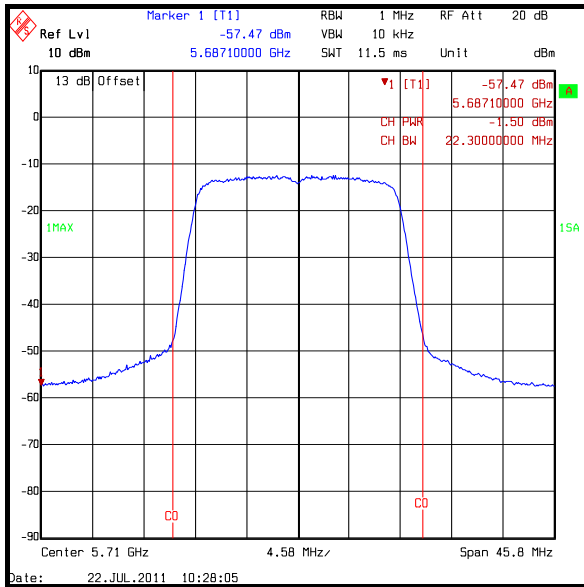
Middle / V port



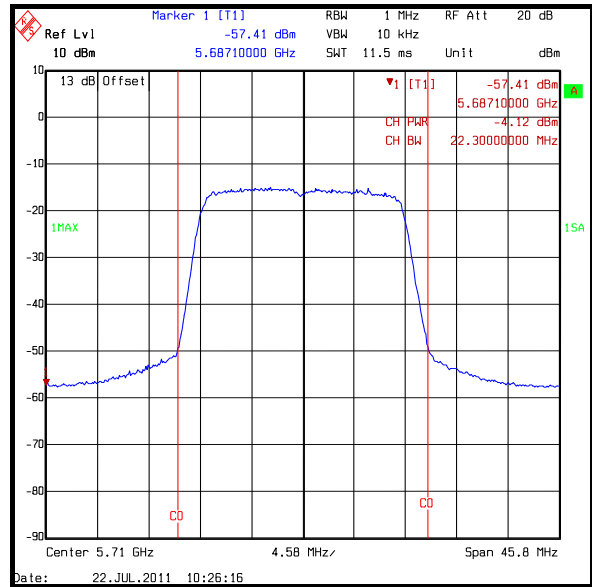
Middle / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

Results: 20 MHz / 64QAM / 65 Mbps



Top Channel / V port



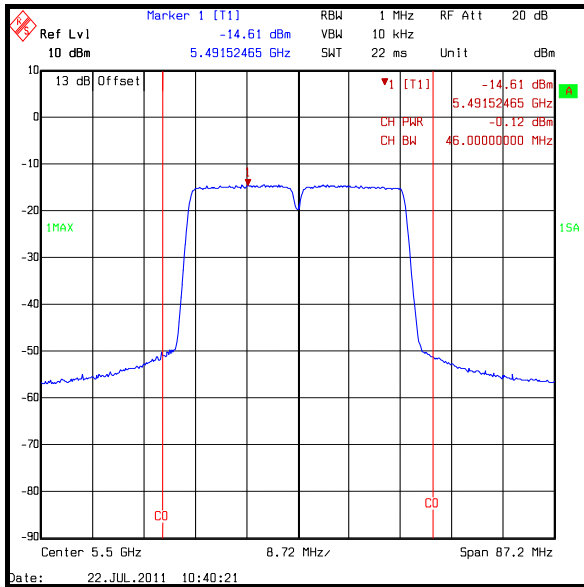
Top Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)**Results: 40 MHz**

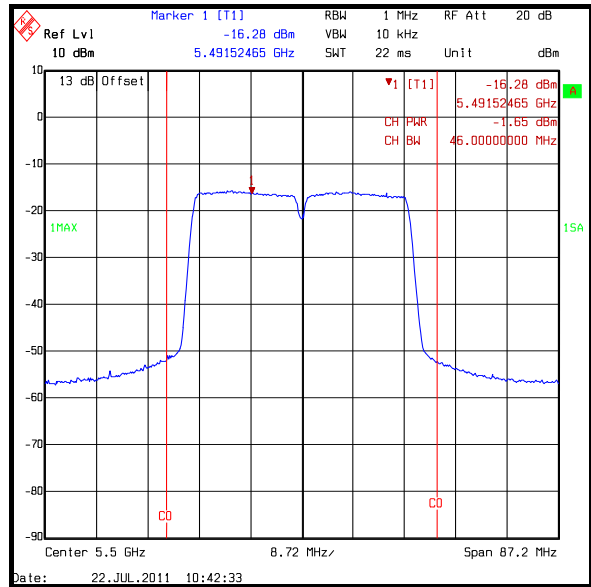
Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	13.5	-0.1	-1.7	2.2	4.0	1.8	Complied
Middle	BPSK	13.5	-0.3	-2.1	1.9	4.0	2.1	Complied
Top	BPSK	13.5	-0.1	-2.6	1.8	4.0	2.2	Complied
Bottom	QPSK	40.5	-0.4	-1.8	1.9	4.0	2.1	Complied
Middle	QPSK	40.5	-0.2	-2.4	1.8	4.0	2.2	Complied
Top	QPSK	40.5	-0.2	-2.4	1.9	4.0	2.1	Complied
Bottom	16QAM	81	0.0	-1.7	2.2	4.0	1.8	Complied
Middle	16QAM	81	-0.3	-2.0	1.9	4.0	2.1	Complied
Top	16QAM	81	-0.1	-2.4	1.9	4.0	2.1	Complied
Bottom	64QAM	135	-0.5	-1.5	2.1	4.0	1.9	Complied
Middle	64QAM	135	-0.4	-2.4	1.7	4.0	2.3	Complied
Top	64QAM	135	-0.2	-2.4	1.8	4.0	2.2	Complied

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

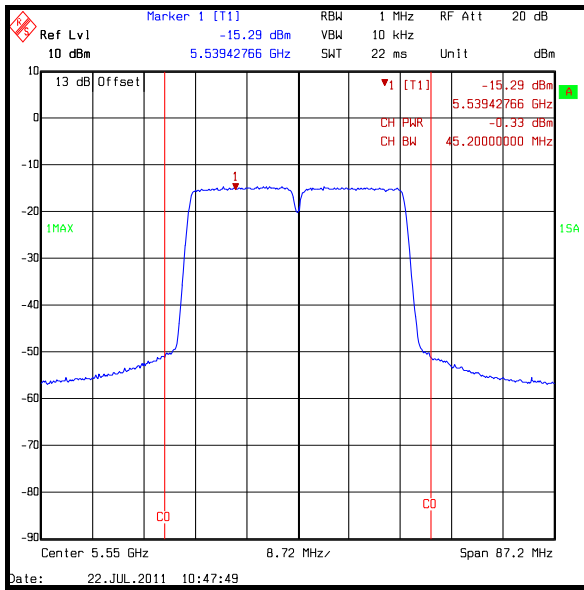
Results: 40 MHz / BPSK / 13.5 Mbps



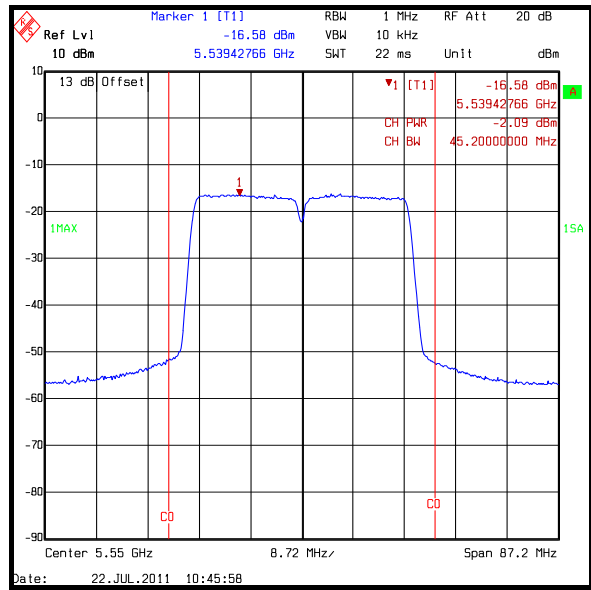
Bottom Channel / V port



Bottom Channel / H port



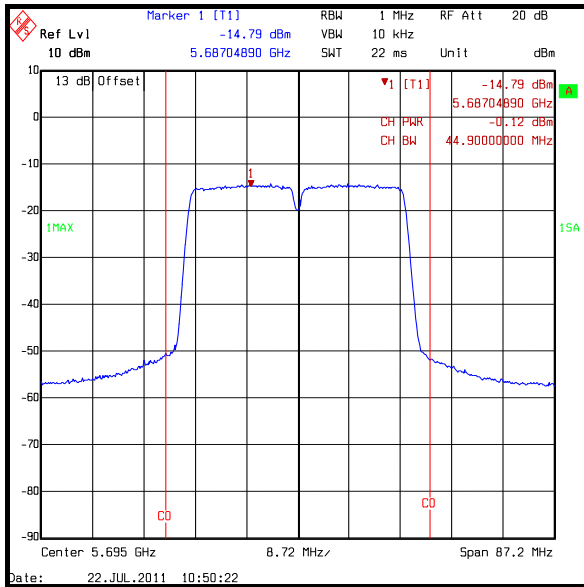
Middle Channel / V port



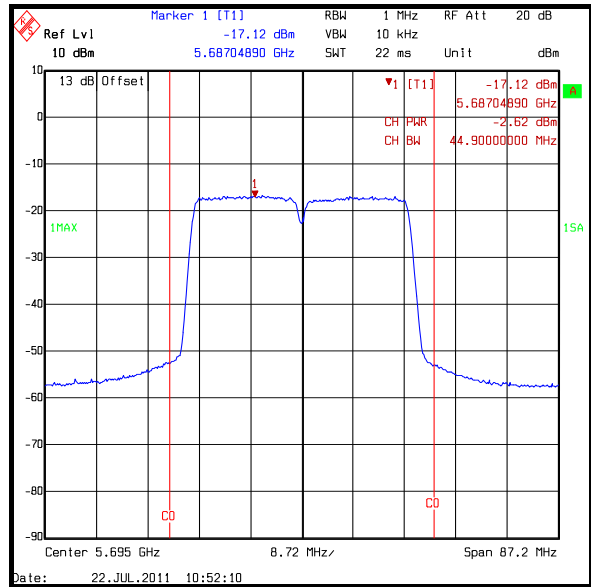
Middle / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

Results: 40 MHz / BPSK / 13.5 Mbps



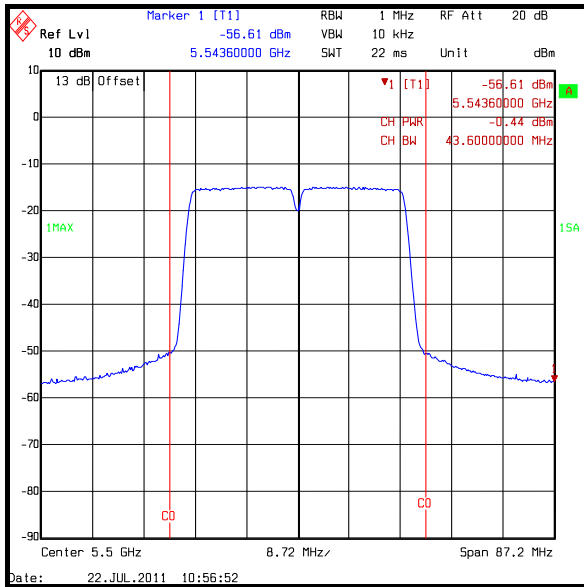
Top Channel / V port



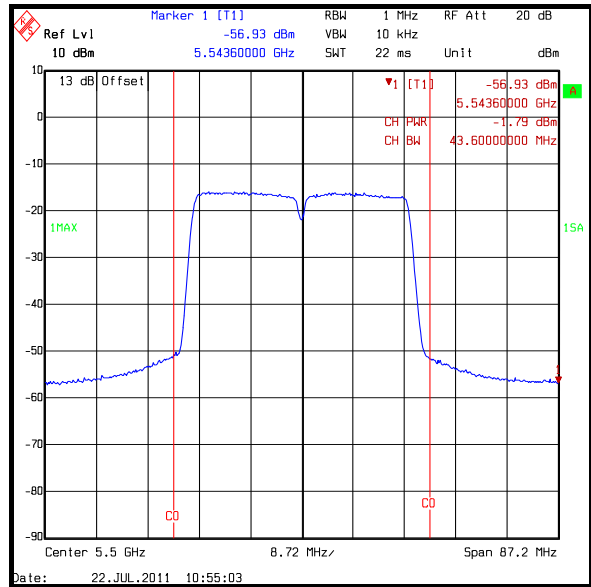
Top Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

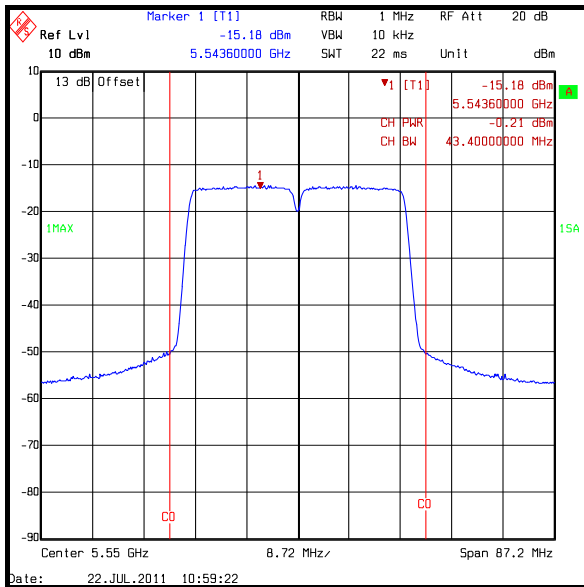
Results: 40 MHz / QPSK / 40.5 Mbps



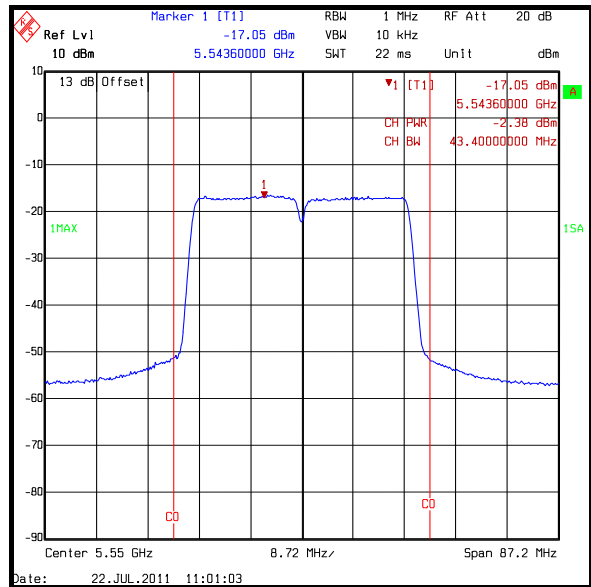
Bottom Channel / V port



Bottom Channel / H port



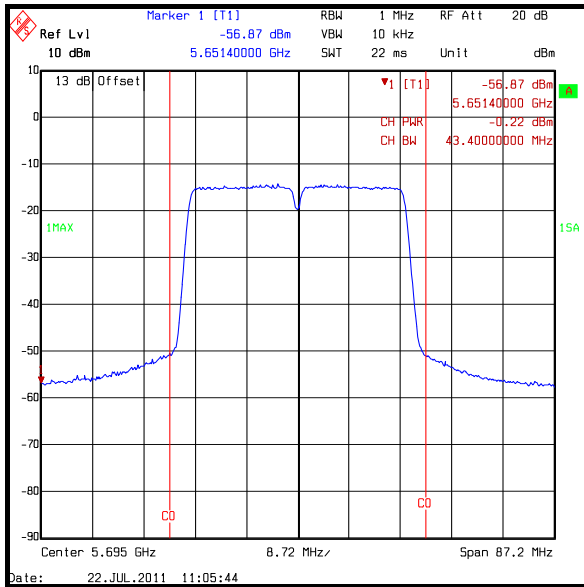
Middle / V port



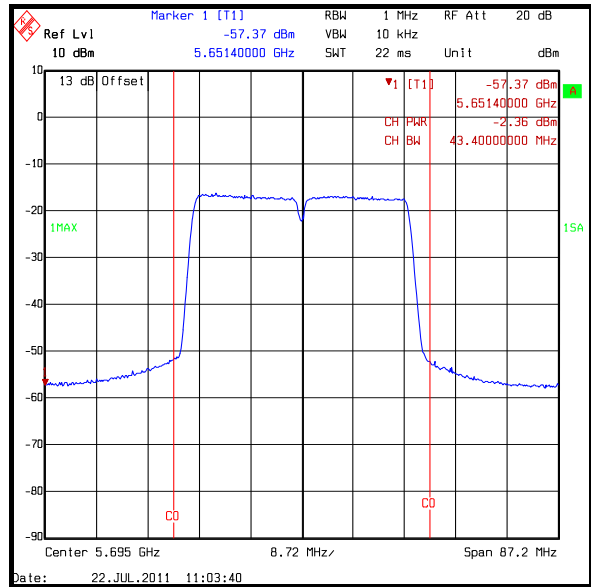
Middle / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

Results: 40 MHz / QPSK / 40.5 Mbps



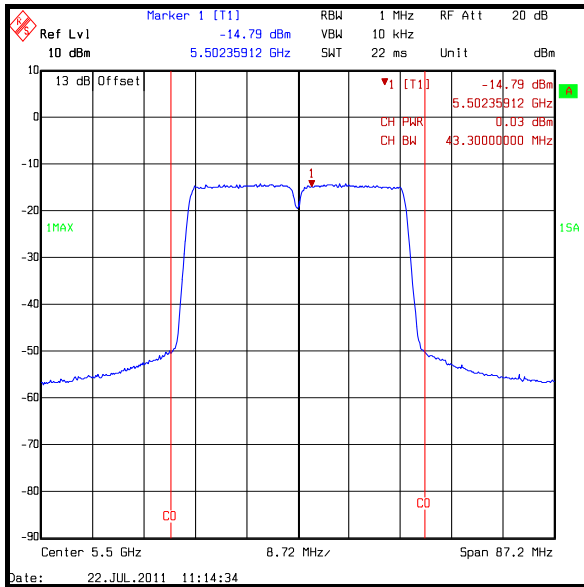
Top Channel / V port



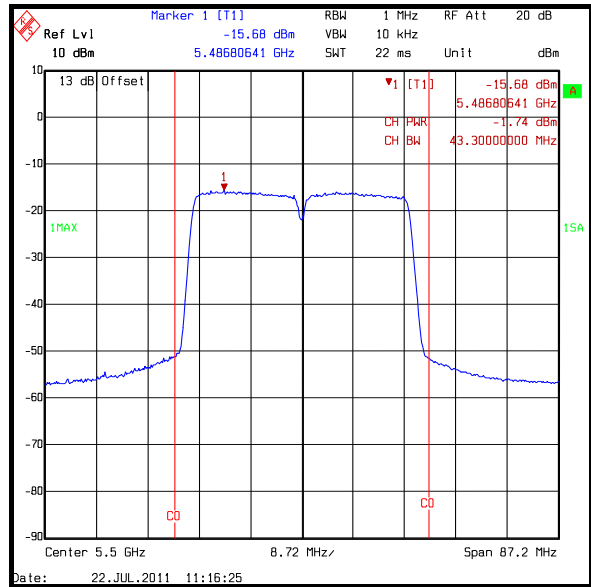
Top Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

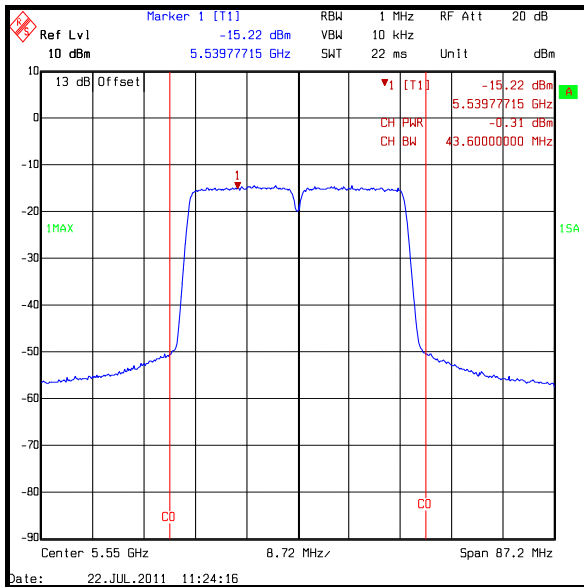
Results: 40 MHz / 16QAM / 81 Mbps



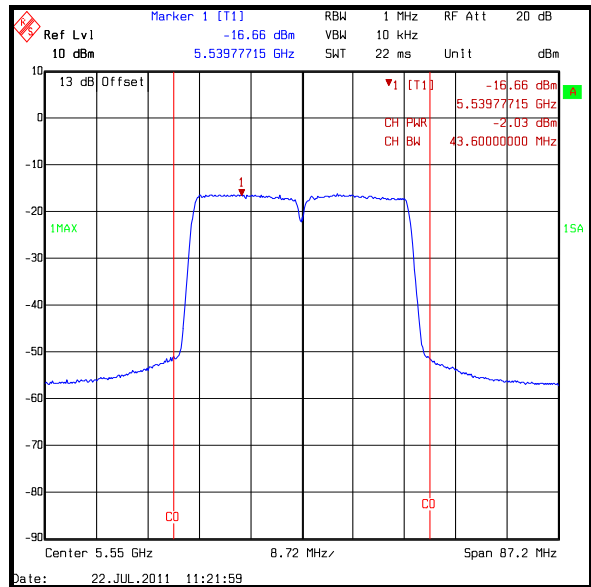
Bottom Channel / V port



Bottom Channel / H port

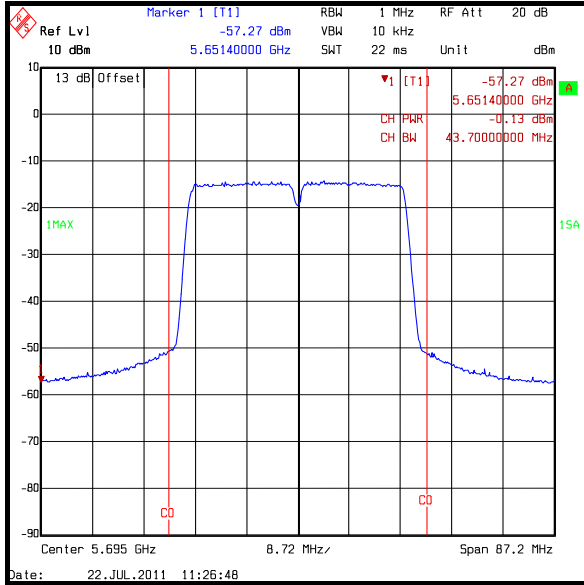


Middle / V port

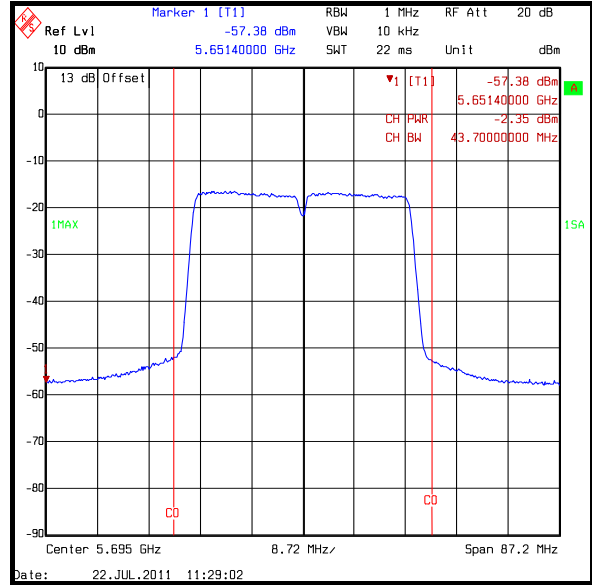


Middle / H port

**Transmitter Maximum Peak Output Power with +26 dBi gain external antenna
(continued)Results: 40 MHz / 16QAM / 81 Mbps**



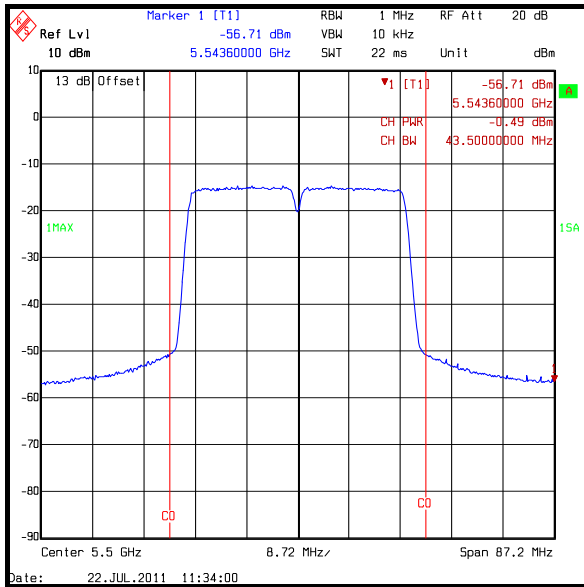
Top Channel / V port



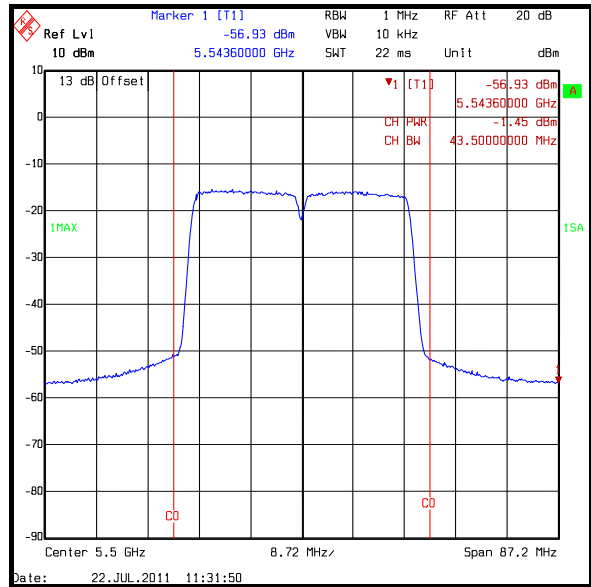
Top Channel / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

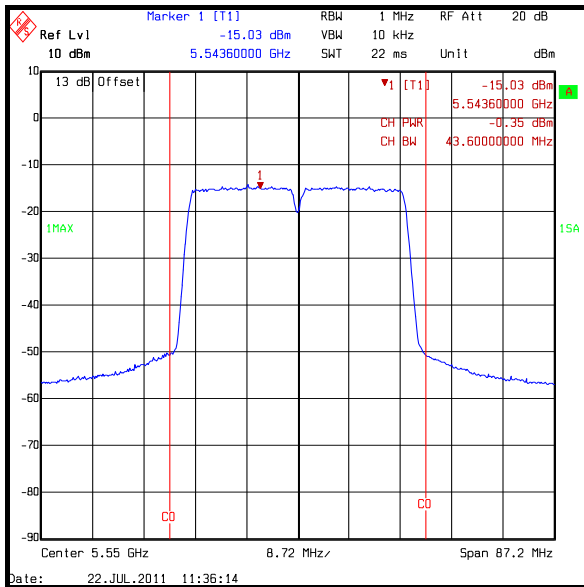
Results: 40 MHz / 64QAM / 135 Mbps



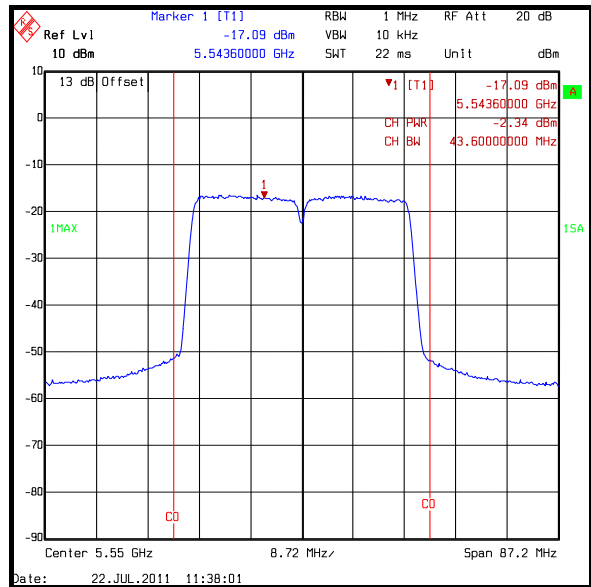
Bottom Channel / V port



Bottom Channel / H port



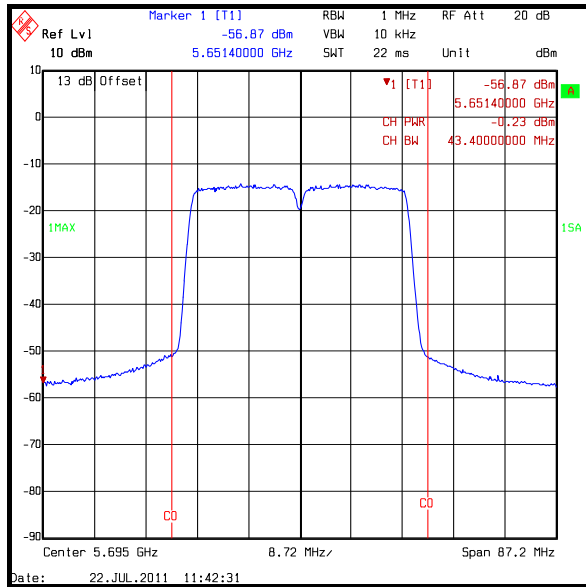
Middle / V port



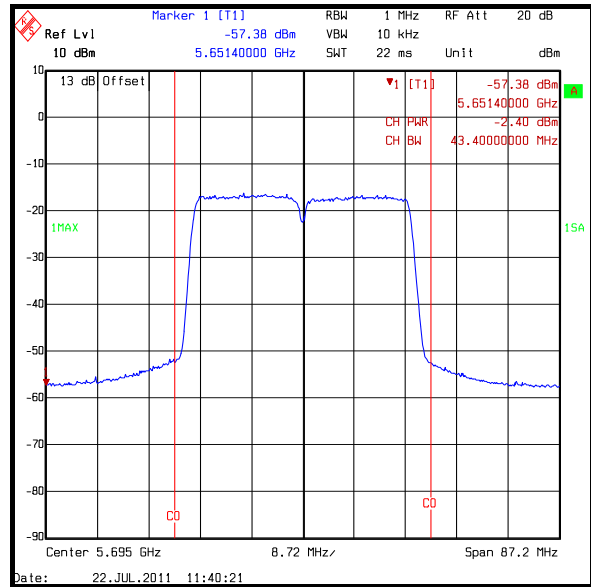
Middle / H port

Transmitter Maximum Peak Output Power with +26 dBi gain external antenna (continued)

Results: 40 MHz / 64QAM / 135 Mbps



Top Channel / V port



Top Channel / H port

Note(s):

1. All 26 dB bandwidth measurements were 20 MHz or greater. Therefore the limit of 24 dBm (250 mW) applies to all measurements.
2. As a maximum antenna gain of +26 dBi was applied to these measurements, the conducted power limits are shown as 20 dB lower than their absolute value as stated in the specification (which are based on a 6 dBi antenna gain). Extrapolating against a limit of 24 dBm will give a value of 24 dBm - 20 dB = 4 dBm.

Limit

For the 5.35-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operating shall not exceed the lesser of 250 mW (24 dBm) or $11 \text{ dBm} + 10 \log_{10}(B)$ where B is the 26 dB emission bandwidth in MHz.

If transmitting antennas of directional gain greater than 6 dBi are used, both maximum conducted output power and the peak spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.6. Transmitter Maximum EIRP with +23 dBi gain integral antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	19 July 2011 & 20 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

RSS Reference:	RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 3

Environmental Conditions:

Temperature (°C):	30
Relative Humidity (%):	28

Results: 20 MHz

Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	6.5	2.8	2.3	28.5	30.0	1.5	Complied
Middle	BPSK	6.5	3.7	1.8	28.8	30.0	1.2	Complied
Top	BPSK	6.5	3.1	2.4	28.8	30.0	1.2	Complied
Bottom	QPSK	19.5	3.3	2.3	28.8	30.0	1.2	Complied
Middle	QPSK	19.5	3.4	1.7	28.6	30.0	1.4	Complied
Top	QPSK	19.5	3.6	1.5	28.7	30.0	1.3	Complied
Bottom	16QAM	39	3.3	2.0	28.7	30.0	1.3	Complied
Middle	16QAM	39	3.2	2.2	28.7	30.0	1.3	Complied
Top	16QAM	39	3.3	2.5	28.6	30.0	1.4	Complied
Bottom	64QAM	65	2.9	2.5	28.7	30.0	1.3	Complied
Middle	64QAM	65	3.3	2.2	28.8	30.0	1.2	Complied
Top	64QAM	65	3.0	1.9	28.5	30.0	1.5	Complied

Transmitter Maximum EIRP with +23 dBi gain integral antenna (continued)**Results: 40 MHz**

Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	13.5	2.8	2.3	28.5	30.0	1.5	Complied
Middle	BPSK	13.5	3.7	1.8	28.8	30.0	1.2	Complied
Top	BPSK	13.5	3.1	2.4	28.8	30.0	1.2	Complied
Bottom	QPSK	40.5	3.3	2.3	28.8	30.0	1.2	Complied
Middle	QPSK	40.5	3.4	1.7	28.6	30.0	1.4	Complied
Top	QPSK	40.5	3.6	2.4	28.7	30.0	1.3	Complied
Bottom	16QAM	81	2.9	2.3	28.6	30.0	1.4	Complied
Middle	16QAM	81	3.4	2.4	29.0	30.0	1.0	Complied
Top	16QAM	81	4.1	2.2	29.3	30.0	0.7	Complied
Bottom	64QAM	135	3.1	2.2	28.7	30.0	1.3	Complied
Middle	64QAM	135	3.2	2.7	28.9	30.0	1.1	Complied
Top	64QAM	135	4.2	2.2	29.3	30.0	0.7	Complied

Note(s):

1. All 26 dB bandwidth measurements were 20 MHz or greater. Therefore the limit of 30 dBm (1.0 Watt) is applied to all measurements.
2. To calculate these results, a maximum antenna gain (based in the use of the 23 dBi integral antenna) of +23 dBi was applied to the aggregate conducted measurements made under Section 5.2.3 of this report.
3. This test was completed with a power setting of '4.5 dBm mode'. Refer to Section 3.3, Modifications Incorporated in the EUT, for further details. This test was not repeated in the lower powered mode at the Customer's request as it had already met the requirement when operating in a higher power mode.
4. An EUT power setting of '4.0dBm mode' was used during the test.

Limit

The maximum e.i.r.p. shall not exceed 1.0 Watt (30 dBm) or $17 + 10 \log_{10}(B)$ dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

5.2.7. Transmitter Maximum EIRP with +26 dBi gain external antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	22 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

RSS Reference:	RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 3

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	30

Results: 20 MHz

Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	6.5	0.3	-1.8	28.4	30.0	1.6	Complied
Middle	BPSK	6.5	-0.6	-1.5	28.0	30.0	2.0	Complied
Top	BPSK	6.5	-1.2	-3.9	26.7	30.0	3.3	Complied
Bottom	QPSK	19.5	-0.7	-2.1	27.7	30.0	2.3	Complied
Middle	QPSK	19.5	-0.9	-2.4	27.4	30.0	2.6	Complied
Top	QPSK	19.5	-1.7	-4.1	26.3	30.0	3.7	Complied
Bottom	16QAM	39	-0.1	-1.9	28.1	30.0	1.9	Complied
Middle	16QAM	39	-1.0	-1.7	27.7	30.0	2.3	Complied
Top	16QAM	39	-1.5	-4.0	26.5	30.0	3.5	Complied
Bottom	64QAM	65	-0.2	-1.8	28.1	30.0	1.9	Complied
Middle	64QAM	65	-0.6	-2.2	27.7	30.0	2.3	Complied
Top	64QAM	65	-1.5	-4.1	26.4	30.0	3.6	Complied

Transmitter Maximum EIRP with +26 dBi gain external antenna (continued)**Results: 40 MHz**

Channel	Mod. Scheme	Data Rate (Mbps)	Conducted Power V Port (dBm)	Conducted Power H Port (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	13.5	-0.1	-1.7	28.2	30.0	1.8	Complied
Middle	BPSK	13.5	-0.3	-2.1	27.9	30.0	2.1	Complied
Top	BPSK	13.5	-0.1	-2.6	27.8	30.0	2.2	Complied
Bottom	QPSK	40.5	-0.4	-1.8	27.9	30.0	2.1	Complied
Middle	QPSK	40.5	-0.2	-2.4	27.8	30.0	2.2	Complied
Top	QPSK	40.5	-0.2	-2.4	27.9	30.0	2.1	Complied
Bottom	16QAM	81	0.0	-1.7	28.2	30.0	1.8	Complied
Middle	16QAM	81	-0.3	-2.0	27.9	30.0	2.1	Complied
Top	16QAM	81	-0.1	-2.4	27.9	30.0	2.1	Complied
Bottom	64QAM	135	-0.5	-1.5	28.1	30.0	1.9	Complied
Middle	64QAM	135	-0.4	-2.4	27.7	30.0	2.3	Complied
Top	64QAM	135	-0.2	-2.4	27.8	30.0	2.2	Complied

Note(s):

1. All 26 dB bandwidth measurements were 20 MHz or greater. This means that the limit of 30 dBm (1.0 Watt) is applied to all measurements.
2. To calculate these results, a maximum antenna gain (based in the use of the 26 dBi external antenna) of +26 dBi was applied to the aggregate conducted measurements made under Section 5.2.4 of this test report.
3. An EUT power setting of '1.0dBm mode' was used during the test.

Limit

The maximum e.i.r.p. shall not exceed 1.0 Watt (30 dBm) or $17 + 10 \log_{10}(B)$ dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

5.2.8. Transmitter Power Spectral Density with +23 dBi gain internal antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	20 July 2011 & 21 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(a)(5) and RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.11.1.2.2 Method 2

Environmental Conditions:

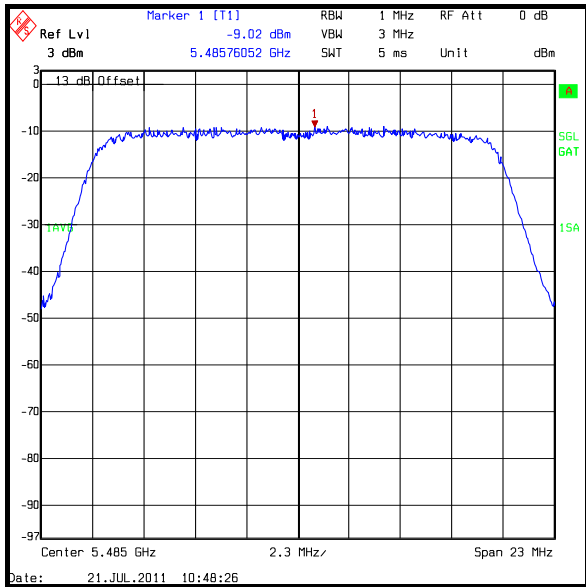
Temperature (°C):	28
Relative Humidity (%):	24

Results: 20 MHz

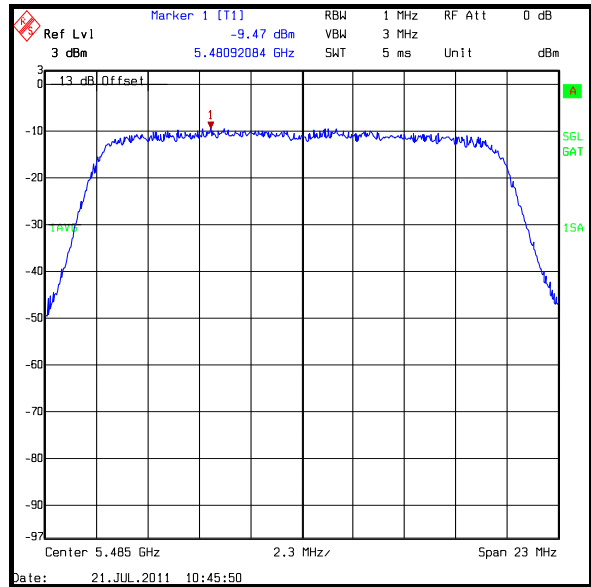
Channel	Mod.	Data Rate (Mbps)	PSD V Port (dBm/MHz)	PSD H Port (dBm/MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	BPSK	6.5	-9.0	-9.5	-6.2	-6.0	0.2	Complied
Middle	BPSK	6.5	-8.7	-10.1	-6.3	-6.0	0.3	Complied
Top	BPSK	6.5	-9.3	-10.3	-6.8	-6.0	0.8	Complied
Bottom	QPSK	19.5	-8.6	-9.9	-6.2	-6.0	0.2	Complied
Middle	QPSK	19.5	-9.1	-10.1	-6.6	-6.0	0.6	Complied
Top	QPSK	19.5	-8.7	-10.4	-6.4	-6.0	0.4	Complied
Bottom	16QAM	39	-9.0	-9.3	-6.1	-6.0	0.1	Complied
Middle	16QAM	39	-8.6	-10.0	-6.3	-6.0	0.3	Complied
Top	16QAM	39	-9.3	-10.0	-6.7	-6.0	0.7	Complied
Bottom	64QAM	65	-8.8	-9.6	-6.2	-6.0	0.2	Complied
Middle	64QAM	65	-9.0	-9.7	-6.3	-6.0	0.3	Complied
Top	64QAM	65	-8.9	-10.3	-6.5	-6.0	0.5	Complied

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

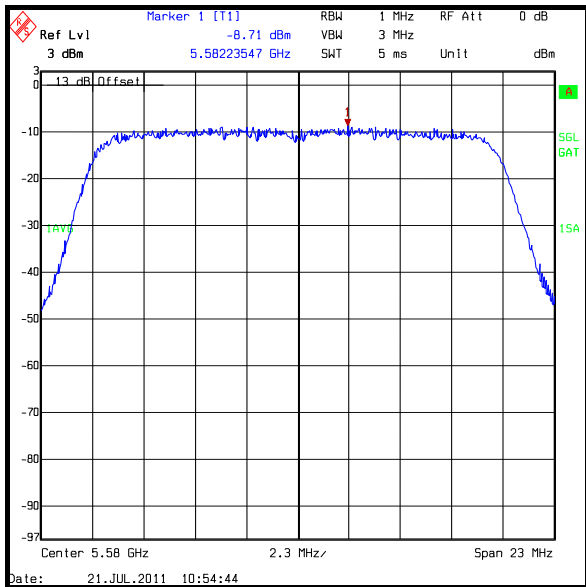
Results: 20 MHz / BPSK / 6.5 Mbps



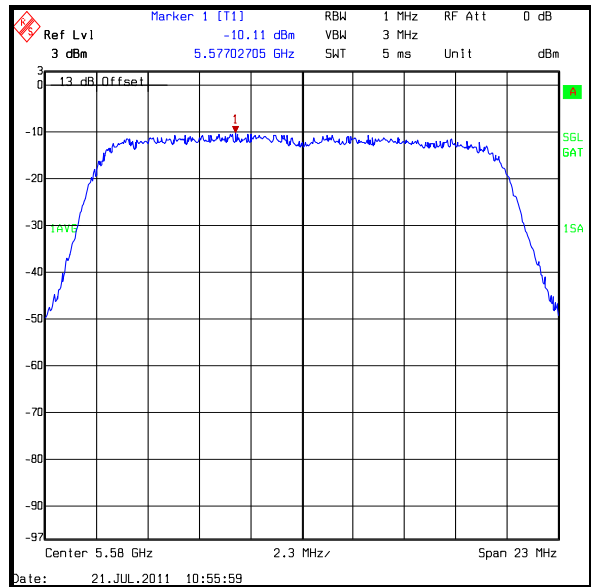
Bottom Channel / V port



Bottom Channel / H port



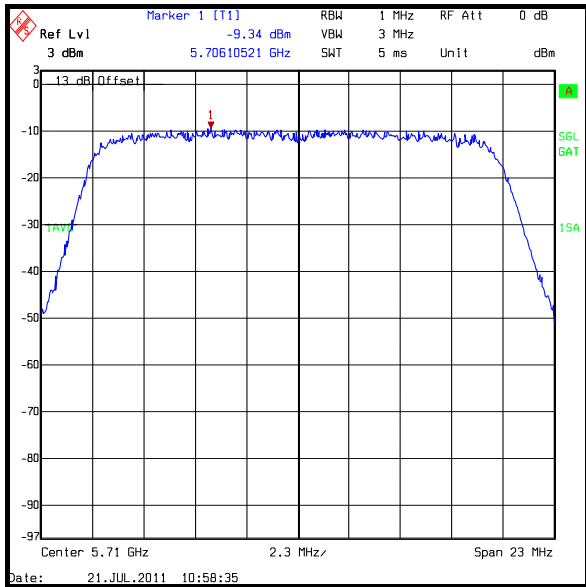
Middle Channel / V port



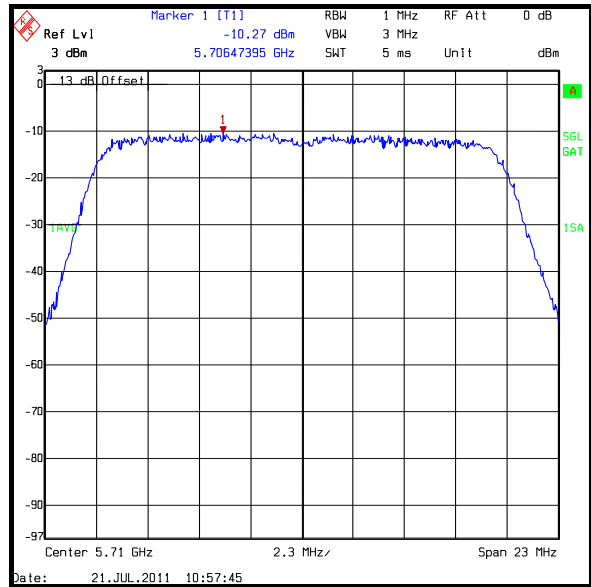
Middle / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

Results: 20 MHz / BPSK / 6.5 Mbps



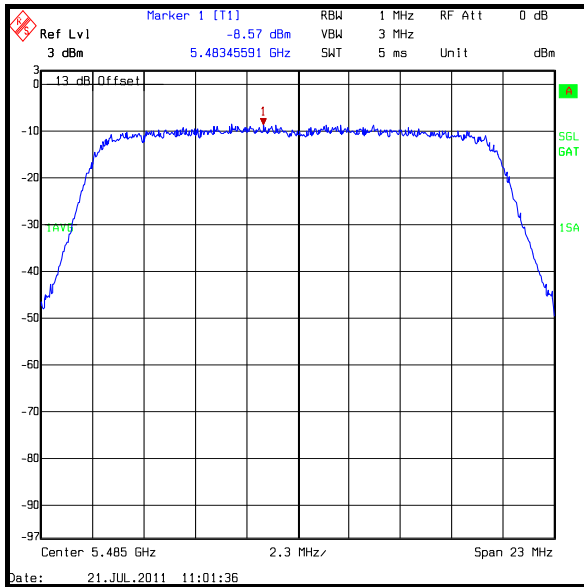
Top Channel / V port



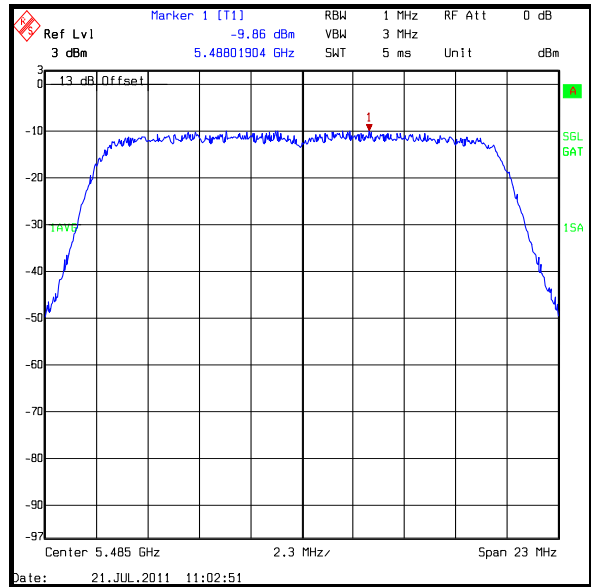
Top Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

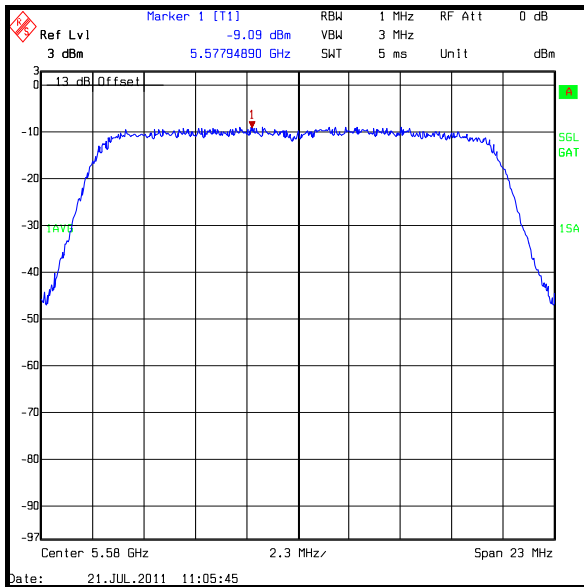
Results: 20 MHz / QPSK / 19.5 Mbps



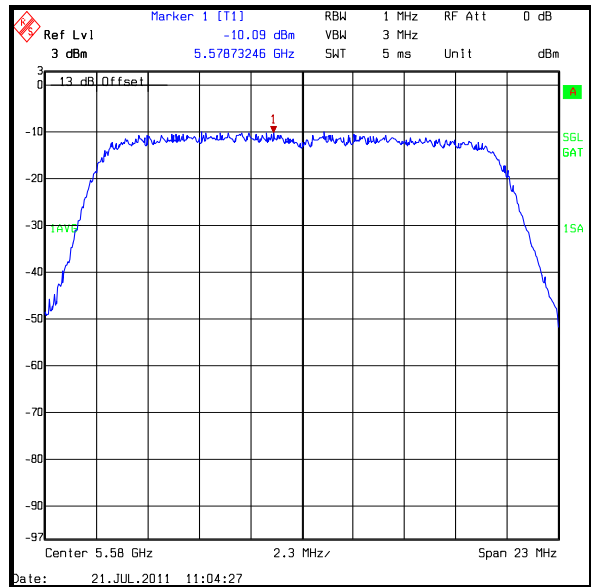
Bottom Channel / V port



Bottom Channel / H port



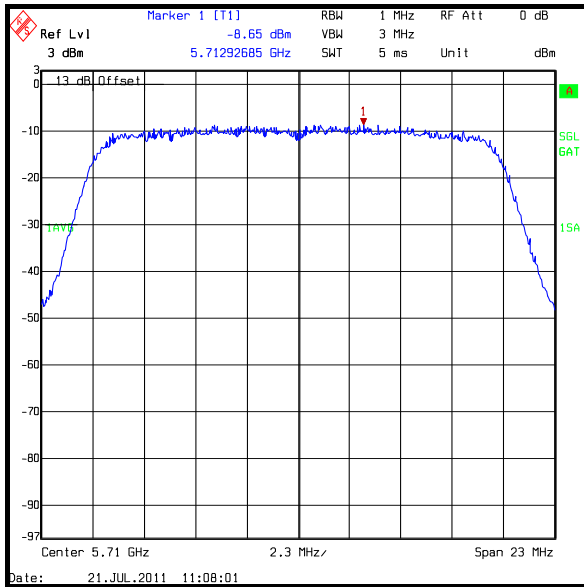
Middle / V port



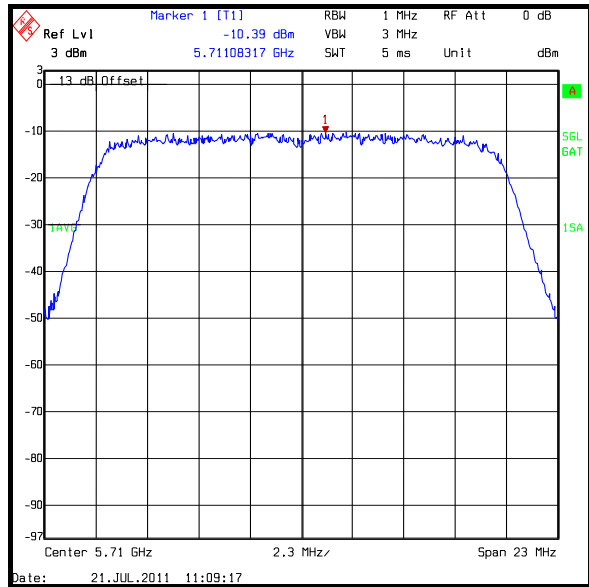
Middle Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

Results: 20 MHz / QPSK / 19.5 Mbps



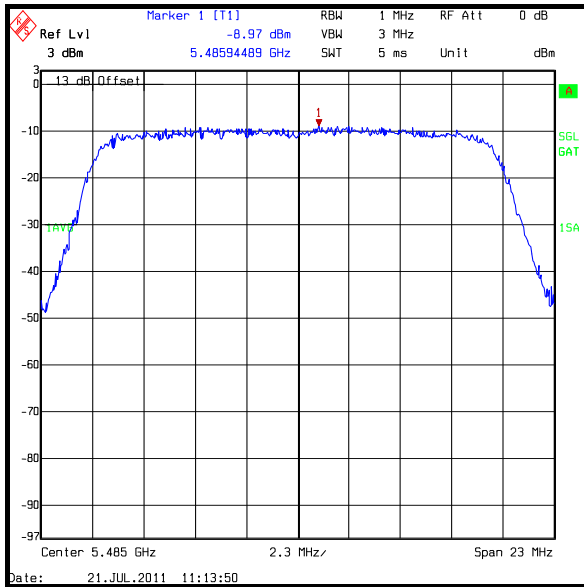
Top Channel / V port



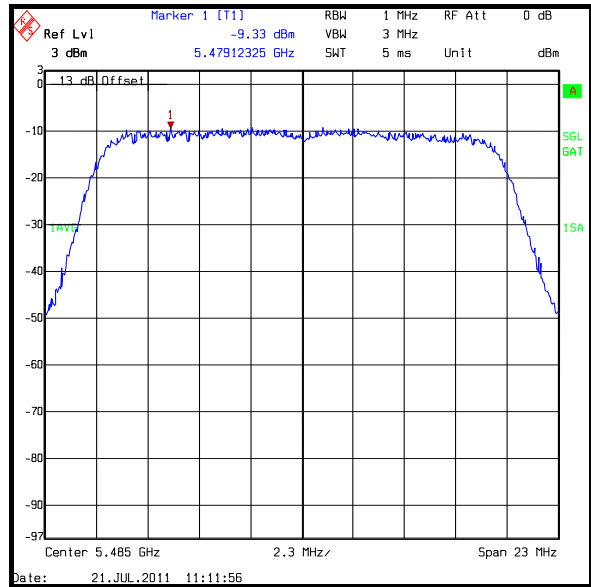
Top Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

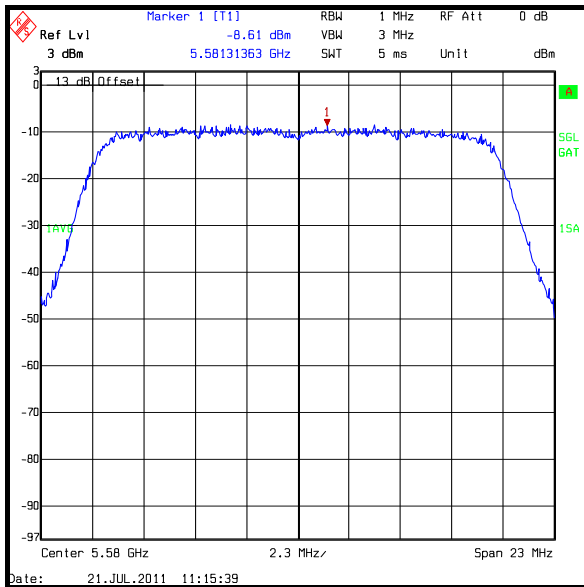
Results: 20 MHz / 16QAM / 39 Mbps



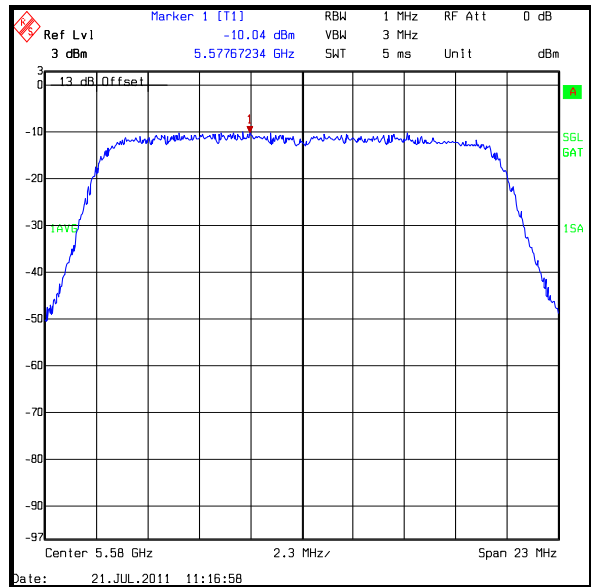
Bottom Channel / V port



Bottom Channel / H port



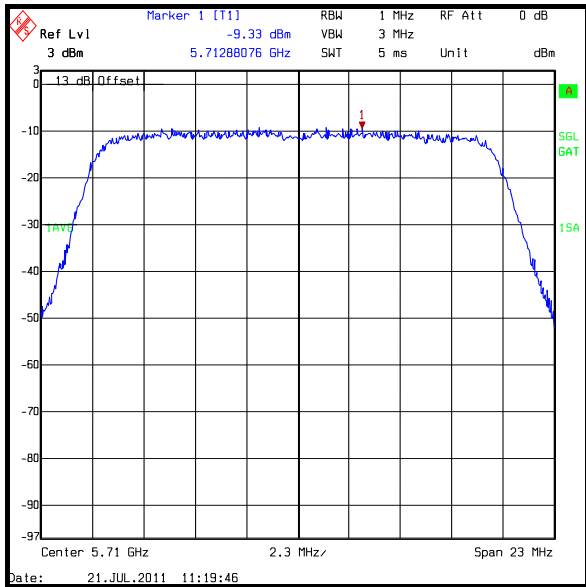
Middle Channel / V port



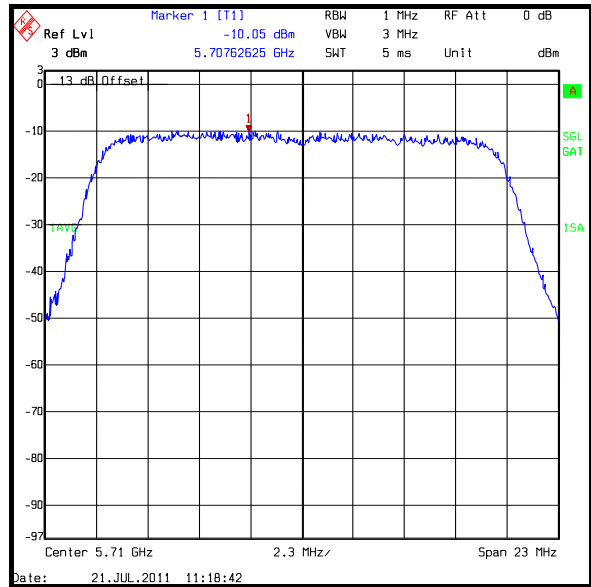
Middle Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

Results: 20 MHz / 16QAM / 39 Mbps



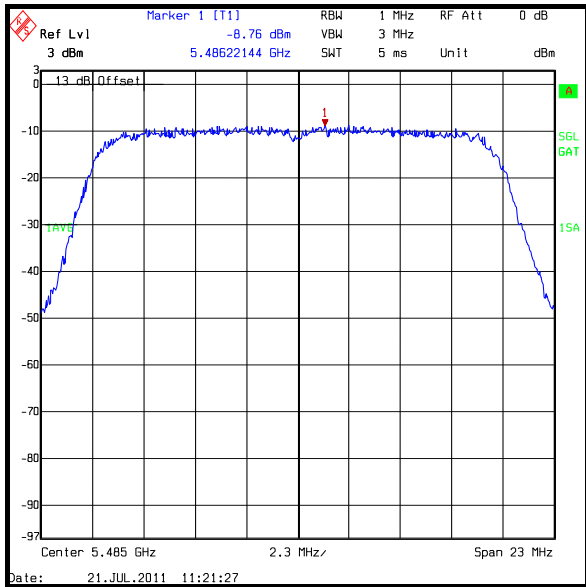
Top Channel / V port



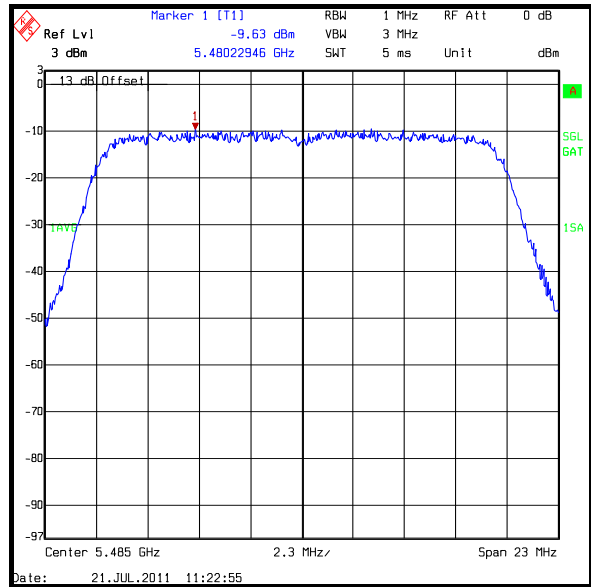
Top Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

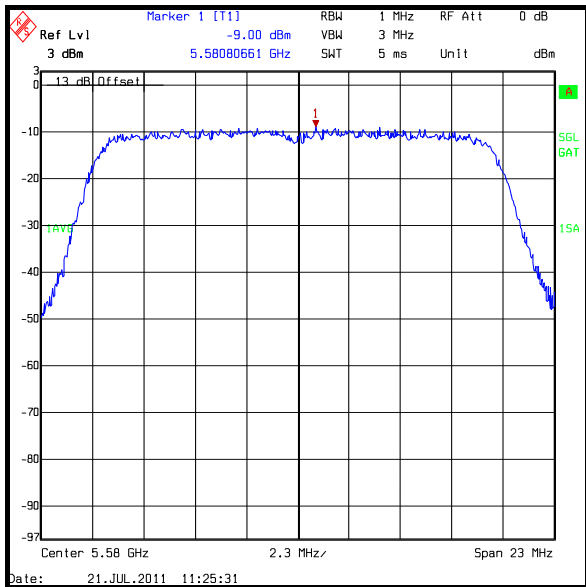
Results: 20 MHz / 64QAM / 65 Mbps



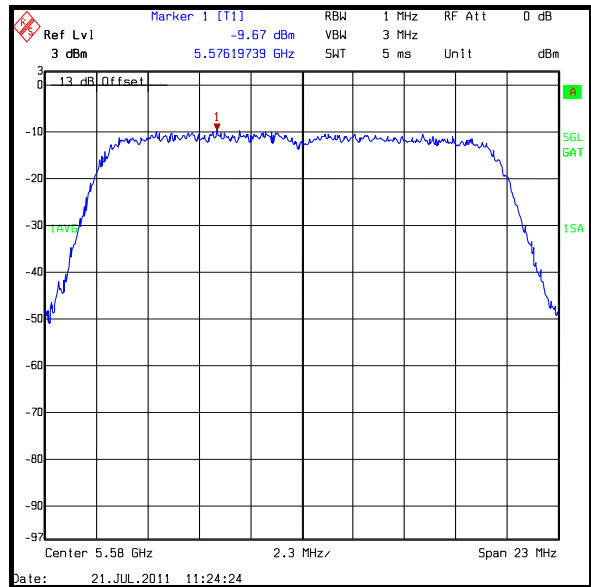
Bottom Channel / V port



Bottom Channel / H port



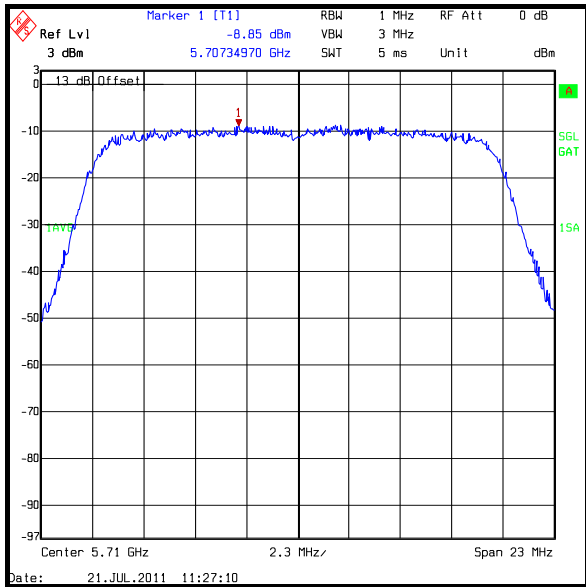
Middle Channel / V port



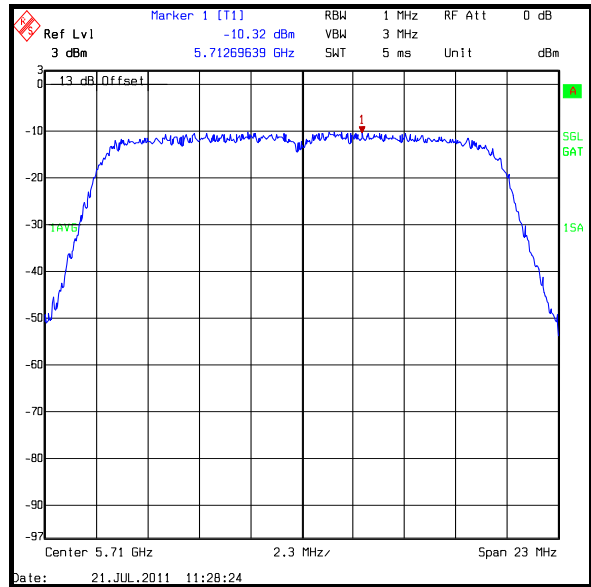
Middle Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

Results: 20 MHz / 64QAM / 65 Mbps



Top Channel / V port



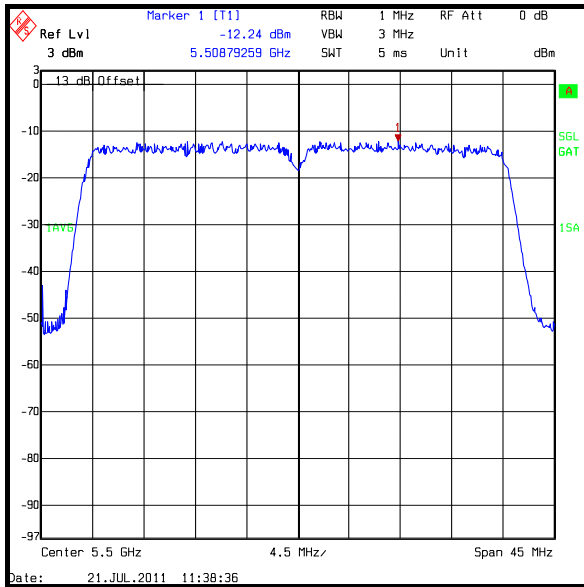
Top Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)**Results – 40 MHz**

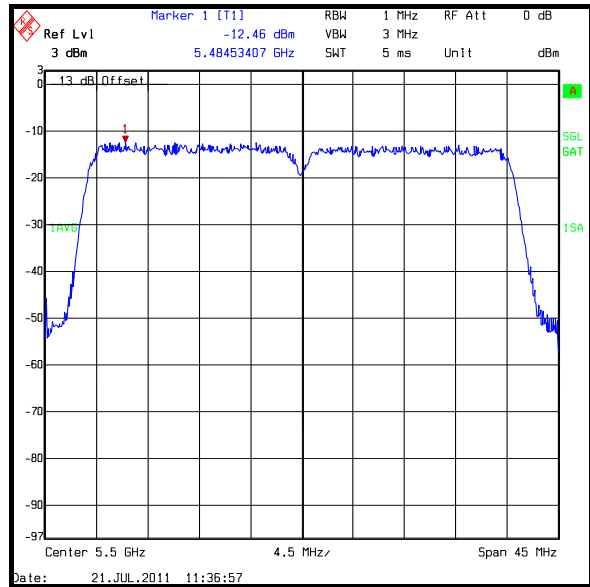
Channel	Mod.	Data Rate (Mbps)	PSD V Port (dBm/MHz)	PSD H Port (dBm/MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	BPSK	13.5	-12.2	-12.5	-9.3	-6.0	3.3	Complied
Middle	BPSK	13.5	-11.5	-12.3	-8.9	-6.0	2.9	Complied
Top	BPSK	13.5	-10.2	-12.6	-8.2	-6.0	2.2	Complied
Bottom	QPSK	40.5	-10.8	-12.1	-8.4	-6.0	2.4	Complied
Middle	QPSK	40.5	-10.3	-11.6	-7.9	-6.0	1.9	Complied
Top	QPSK	40.5	-8.5	-12.4	-7.0	-6.0	1.0	Complied
Bottom	16QAM	81	-10.7	-11.2	-7.9	-6.0	1.9	Complied
Middle	16QAM	81	-9.8	-13.2	-8.2	-6.0	2.2	Complied
Top	16QAM	81	-9.6	-12.3	-7.7	-6.0	1.7	Complied
Bottom	64QAM	135	-10.5	-12.1	-8.2	-6.0	2.2	Complied
Middle	64QAM	135	-9.4	-12.8	-7.8	-6.0	1.8	Complied
Top	64QAM	135	-9.1	-12.2	-7.4	-6.0	1.4	Complied

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

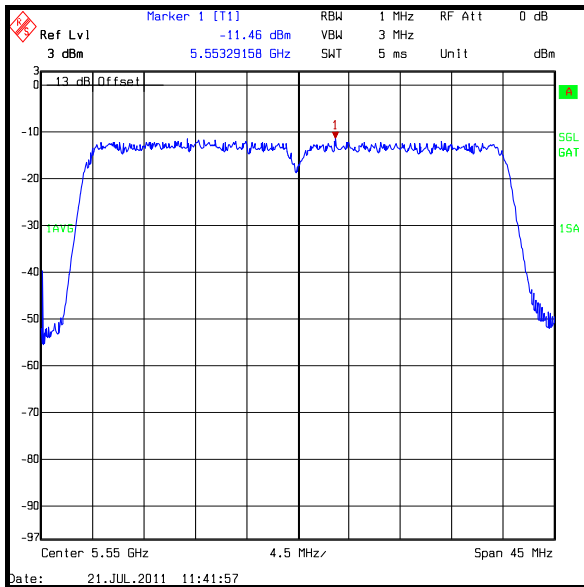
Results: 40 MHz / BPSK / 13.5 Mbps



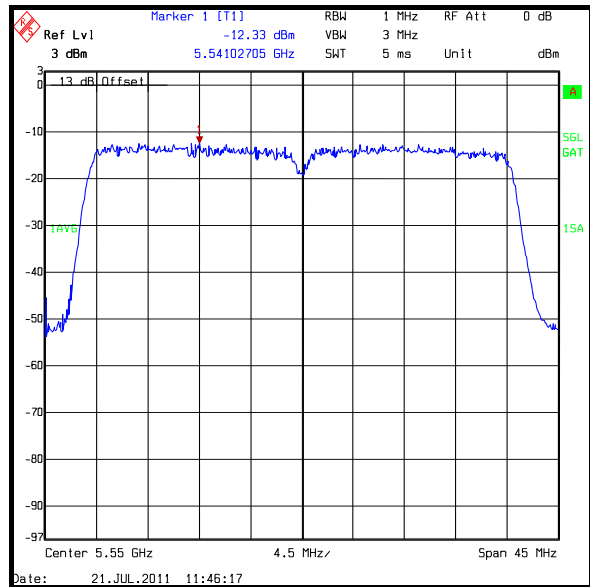
Bottom Channel / V port



Bottom Channel / H port



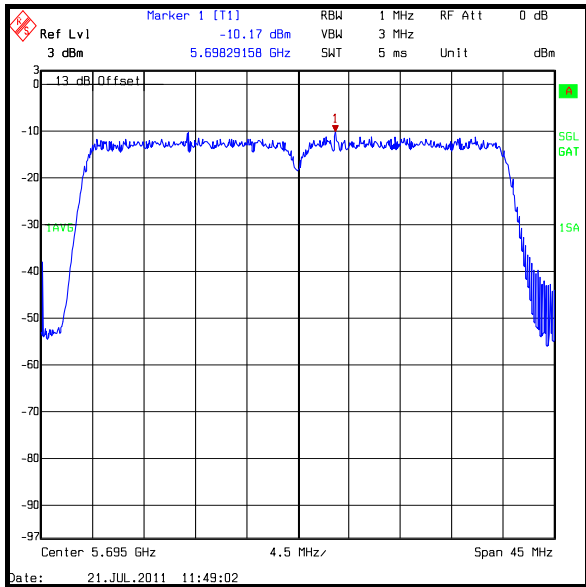
Middle Channel / V port



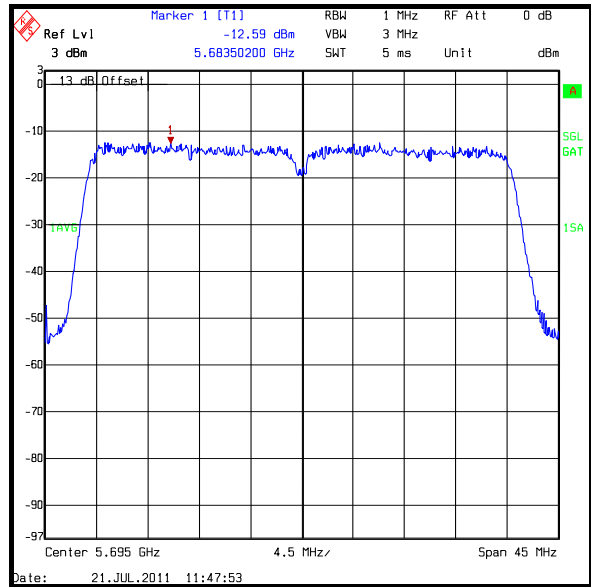
Middle / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

Results: 40 MHz / BPSK / 13.5 Mbps



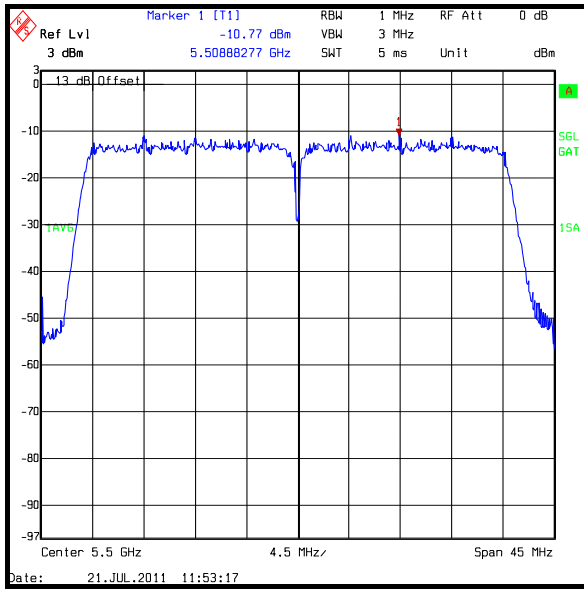
Top Channel / V port



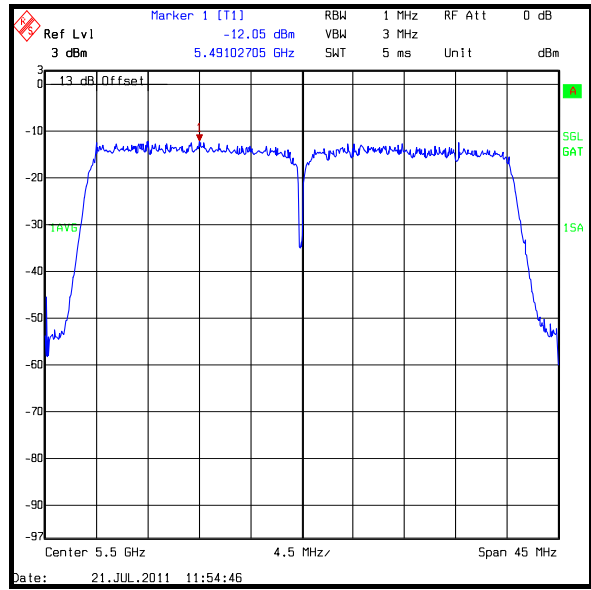
Top Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

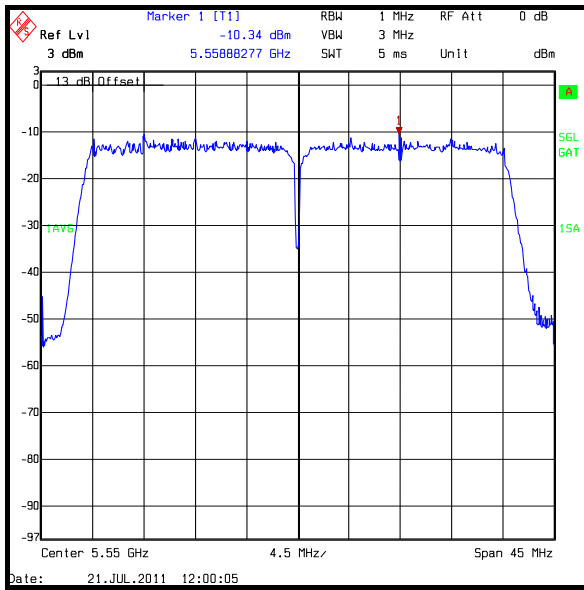
Results: 40 MHz / QPSK / 40.5 Mbps



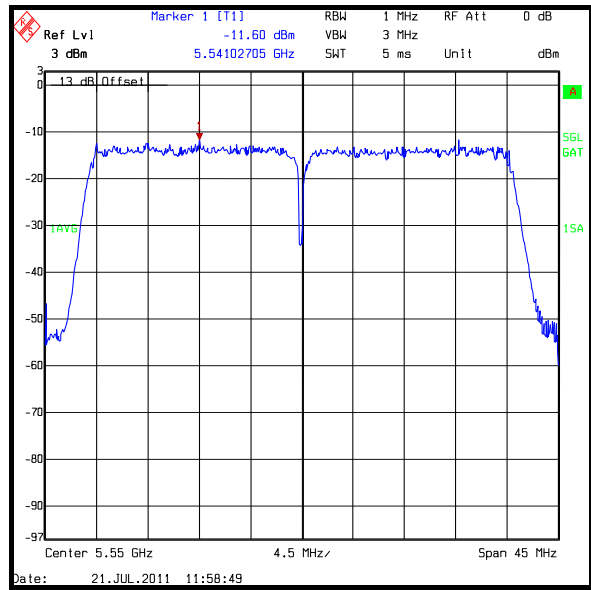
Bottom Channel / V port



Bottom Channel / H port



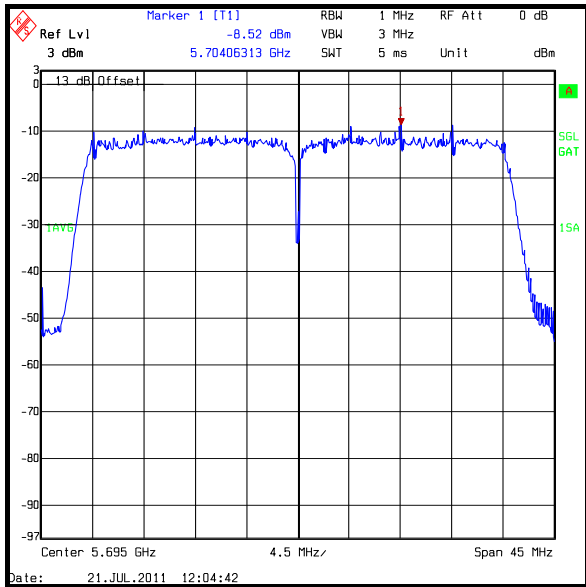
Middle Channel / V port



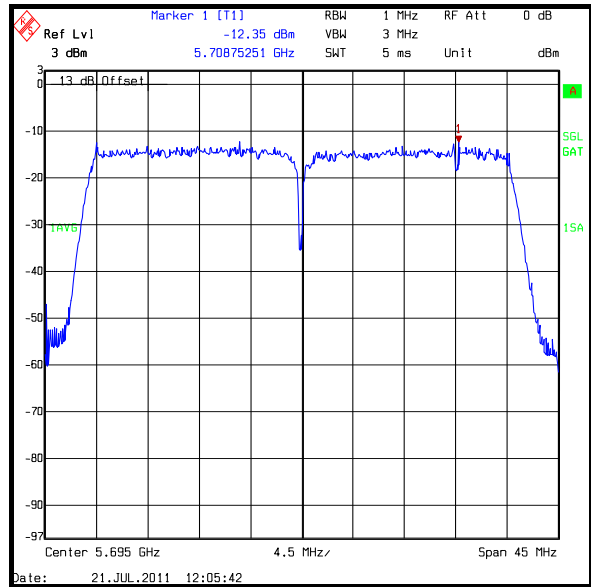
Middle Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

Results: 40 MHz / QPSK / 40.5 Mbps



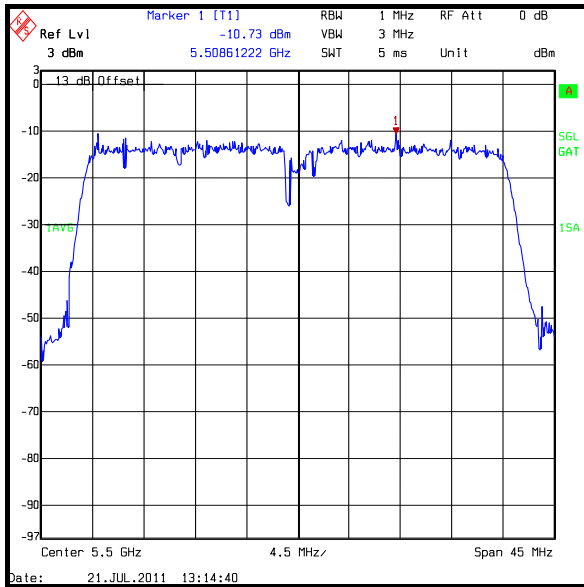
Top Channel / V port



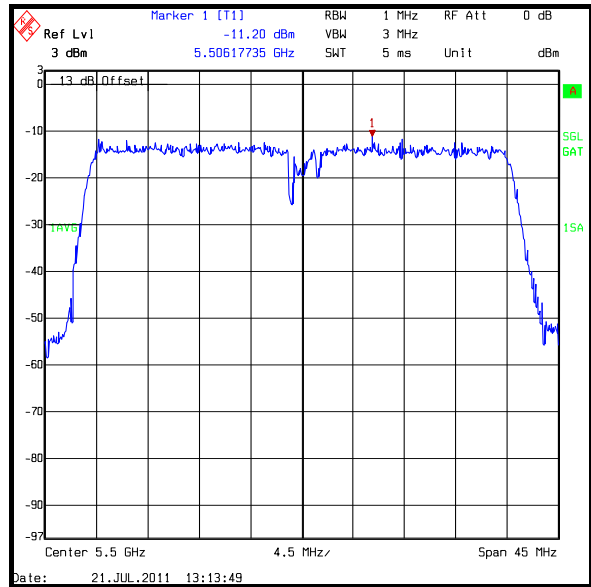
Top Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

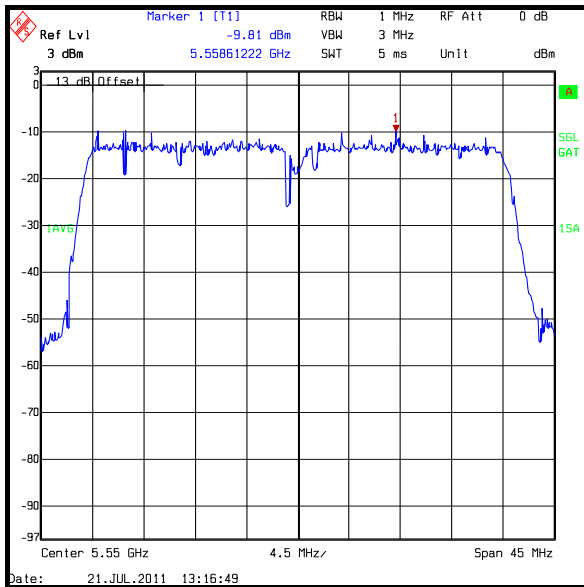
Results: 40 MHz / 16QAM / 81 Mbps



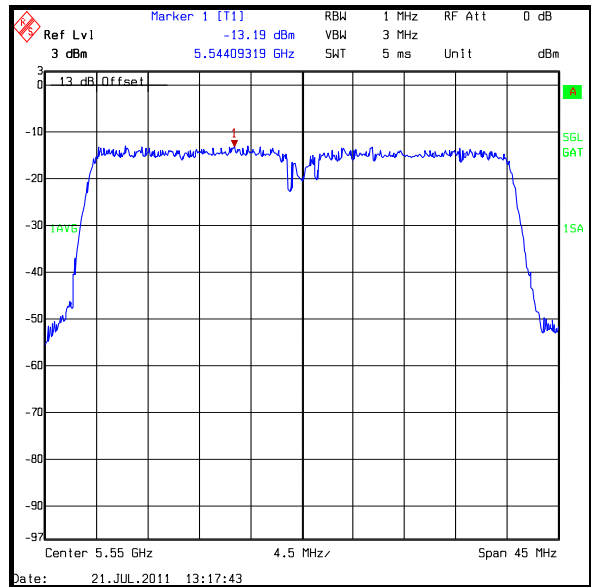
Bottom Channel / V port



Bottom Channel / H port



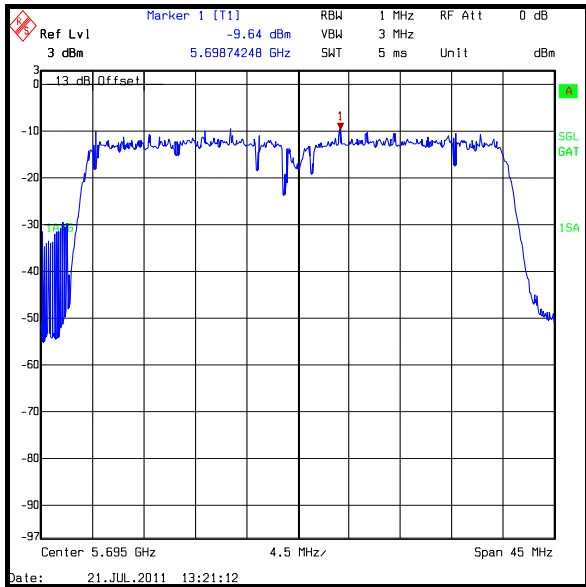
Middle Channel / V port



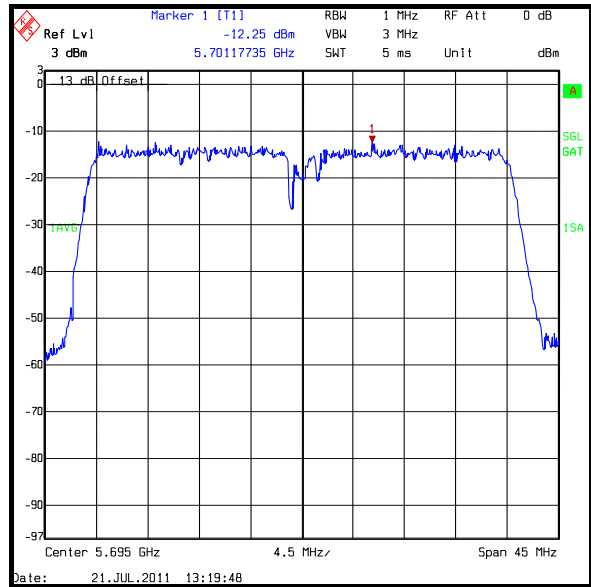
Middle Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)

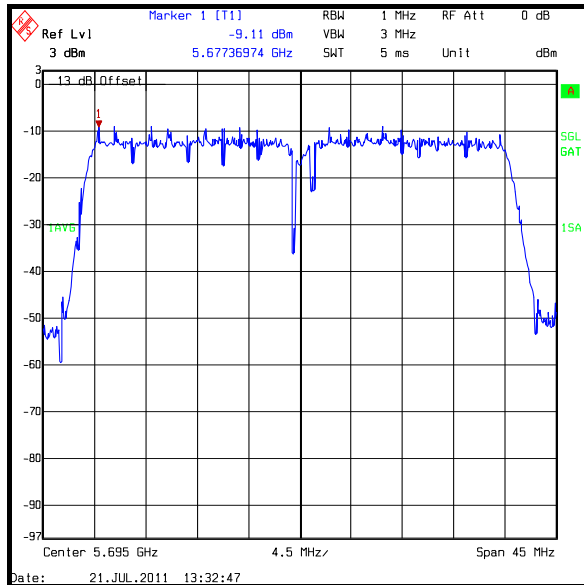
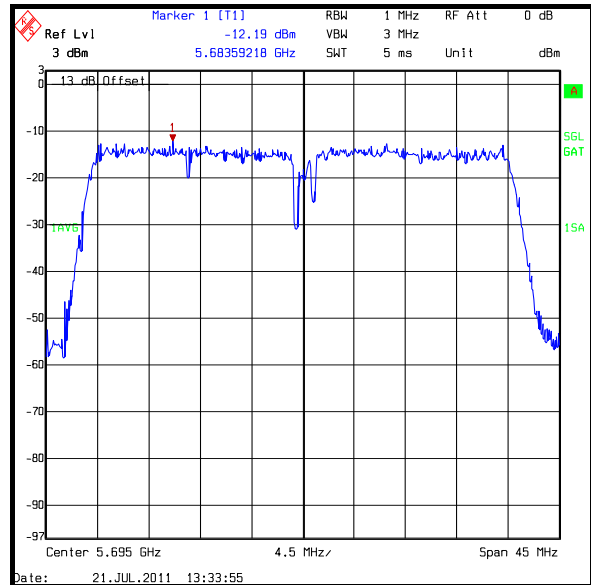
Results: 40 MHz / 16QAM / 81 Mbps



Top Channel / V port



Top Channel / H port

Transmitter Power Spectral Density with +23 dBi gain integral antenna (continued)**Results: 40 MHz / 64QAM / 135 Mbps****Top Channel / V port****Top Channel / H port****Note(s):**

1. A maximum antenna gain of +23 dBi was applied. Therefore the conducted power limits are shown as 17 dB lower than their absolute values (which are based on a 6 dBi antenna gain).
2. Gated measurements were performed in accordance with ANSI C63.4 Section 6.11.1.2.2 Method 2.
3. The antenna gain was taken into consideration when calculating the PSD limit.
4. This test was completed with a power setting of '1.0 dBm mode'.

Limit

The peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both maximum conducted output power and the peak spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.9. Transmitter Power Spectral Density with +26 dBi gain external antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	21 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(a)(5) and RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.11.1.2.2 Method 2

Environmental Conditions:

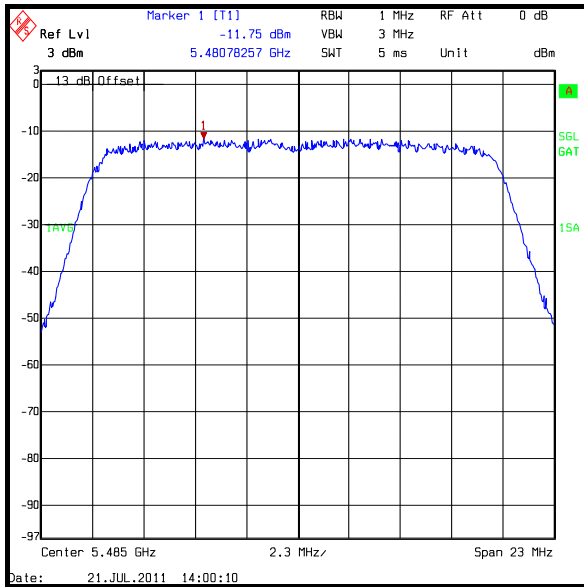
Temperature (°C):	31
Relative Humidity (%):	25

Results: 20 MHz

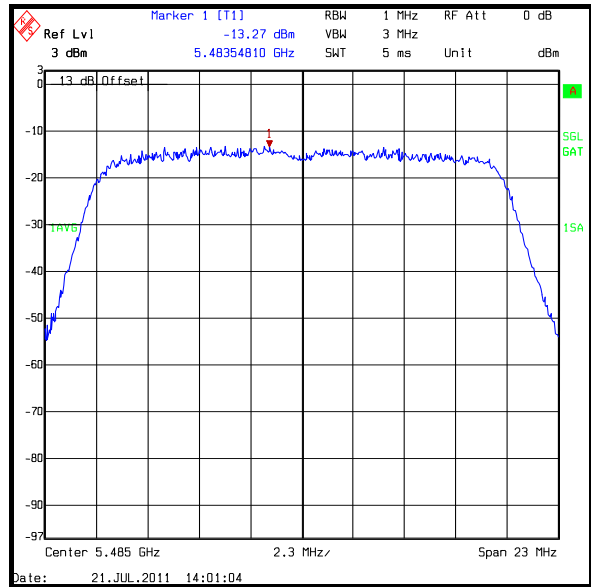
Channel	Mod.	Data Rate (Mbps)	PSD V Port (dBm/MHz)	PSD H Port (dBm/MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	BPSK	6.5	-11.8	-13.3	-9.4	-9.0	0.4	Complied
Middle	BPSK	6.5	-12.3	-13.3	-9.8	-9.0	0.8	Complied
Top	BPSK	6.5	-12.9	-15.5	-11.0	-9.0	2.0	Complied
Bottom	QPSK	19.5	-11.7	-13.1	-9.3	-9.0	0.3	Complied
Middle	QPSK	19.5	-12.3	-13.5	-9.8	-9.0	0.8	Complied
Top	QPSK	19.5	-13.3	-15.3	-11.1	-9.0	2.1	Complied
Bottom	16QAM	39	-11.7	-13.2	-9.4	-9.0	0.4	Complied
Middle	16QAM	39	-12.2	-12.9	-9.5	-9.0	0.5	Complied
Top	16QAM	39	-13.4	-16.0	-11.5	-9.0	2.5	Complied
Bottom	64QAM	65	-11.7	-13.3	-9.4	-9.0	0.4	Complied
Middle	64QAM	65	-12.2	-13.4	-9.8	-9.0	0.8	Complied
Top	64QAM	65	-13.7	-15.2	-11.4	-9.0	2.4	Complied

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

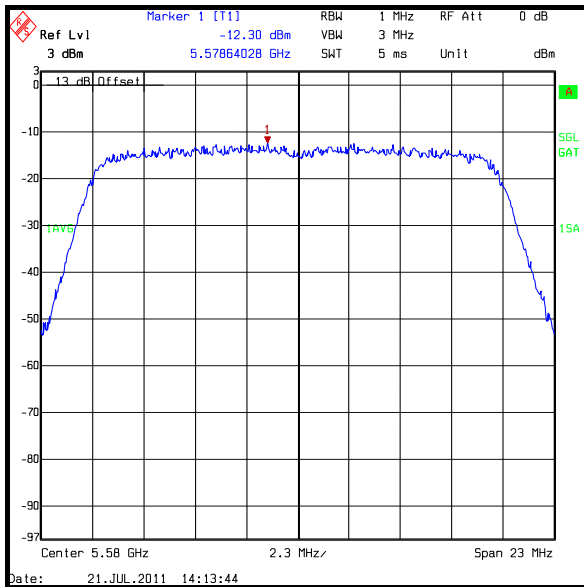
Results: 20 MHz / BPSK / 6.5 Mbps



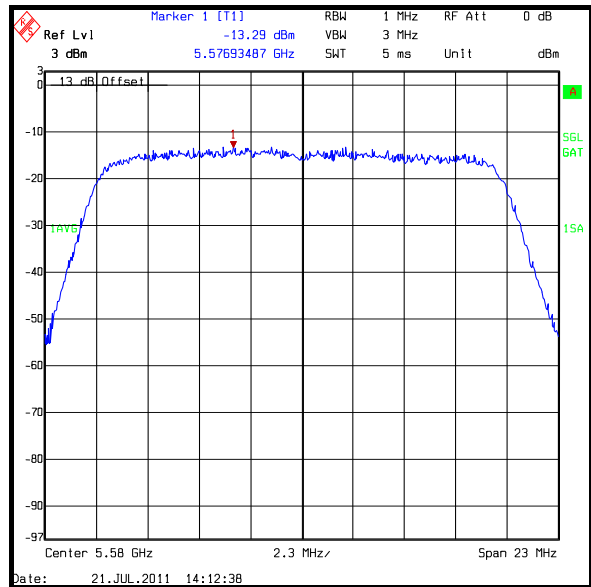
Bottom Channel / V port



Bottom Channel / H port



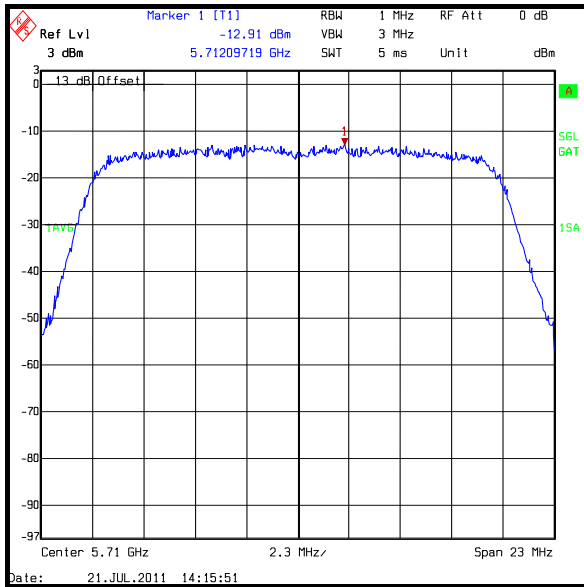
Middle Channel / V port



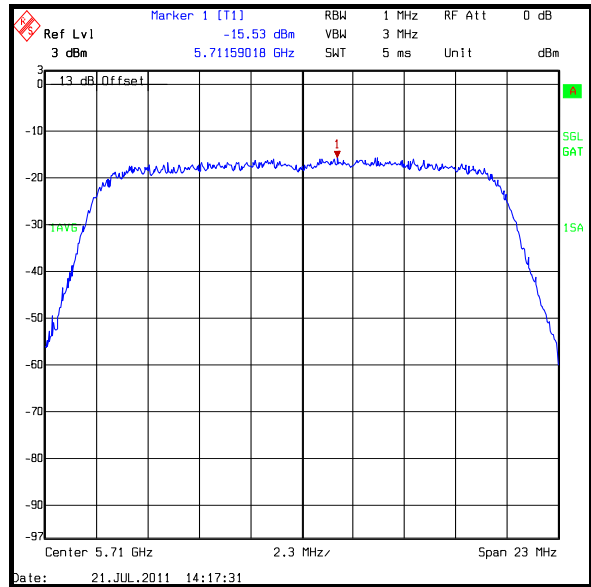
Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

Results: 20 MHz / BPSK / 6.5 Mbps



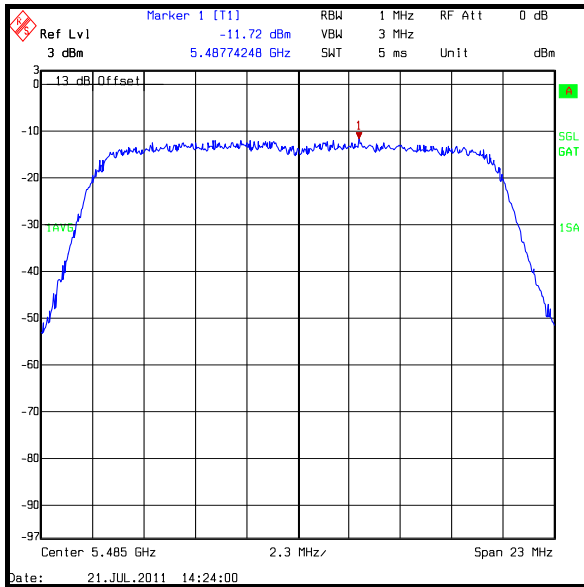
Top Channel / V port



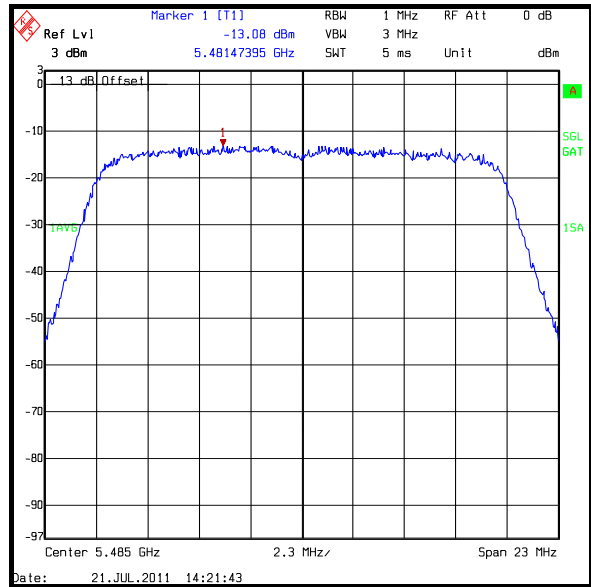
Top Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

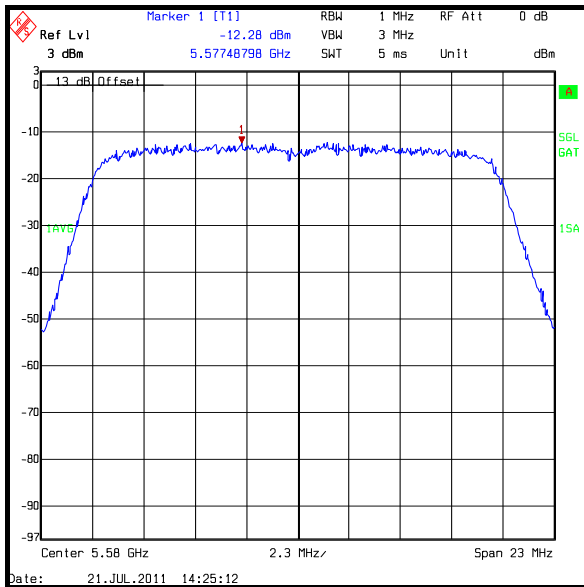
Results: 20 MHz / QPSK / 19.5 Mbps



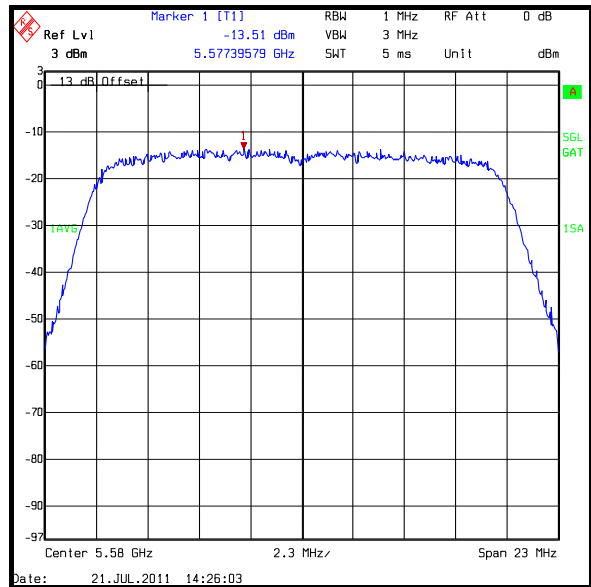
Bottom Channel / V port



Bottom Channel / H port



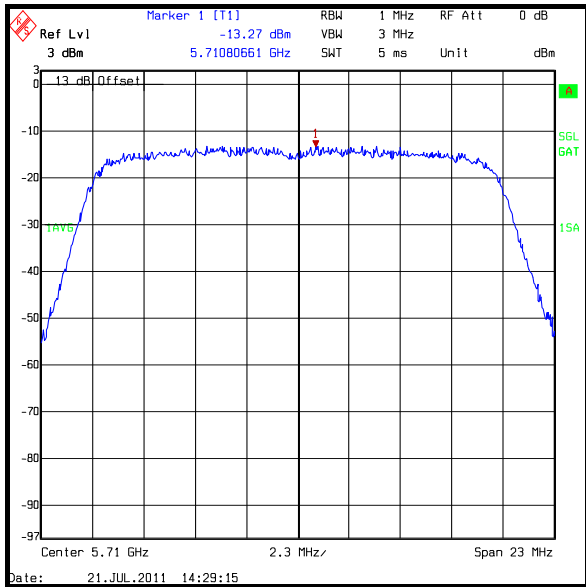
Middle Channel / V port



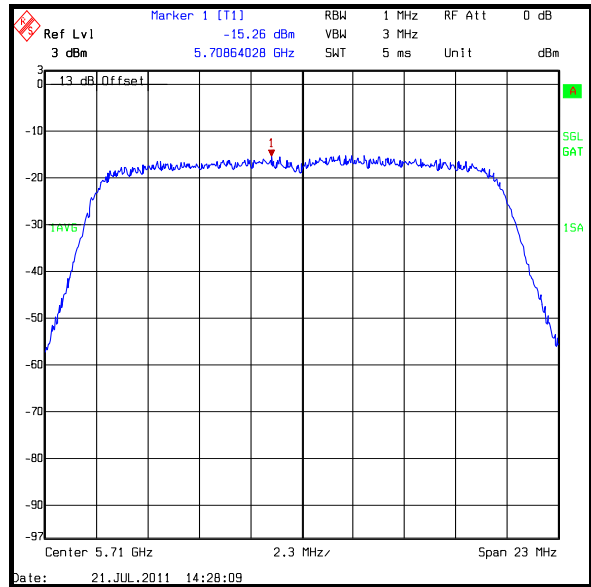
Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

Results: 20 MHz / QPSK / 19.5 Mbps



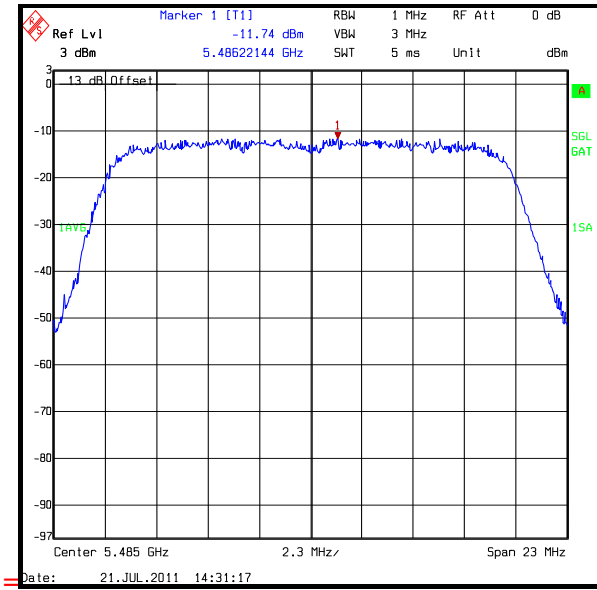
Top Channel / V port



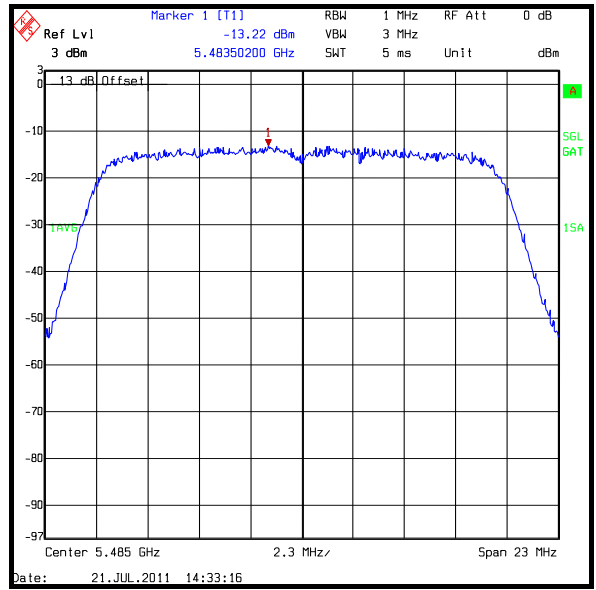
Top Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

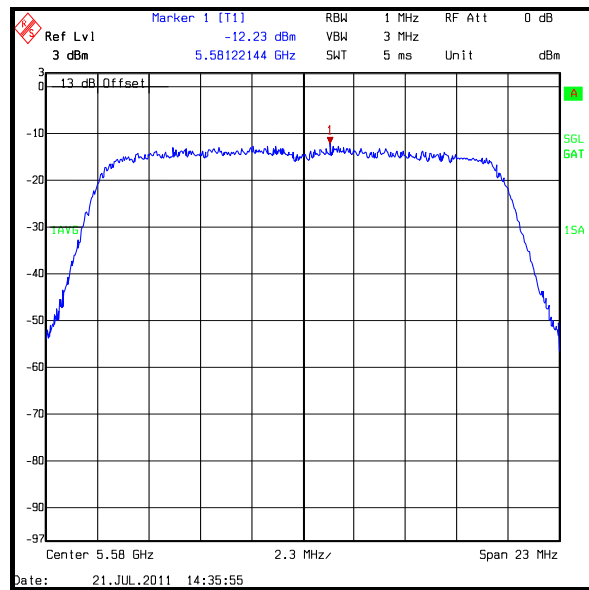
Results: 20 MHz / 16QAM / 39 Mbps



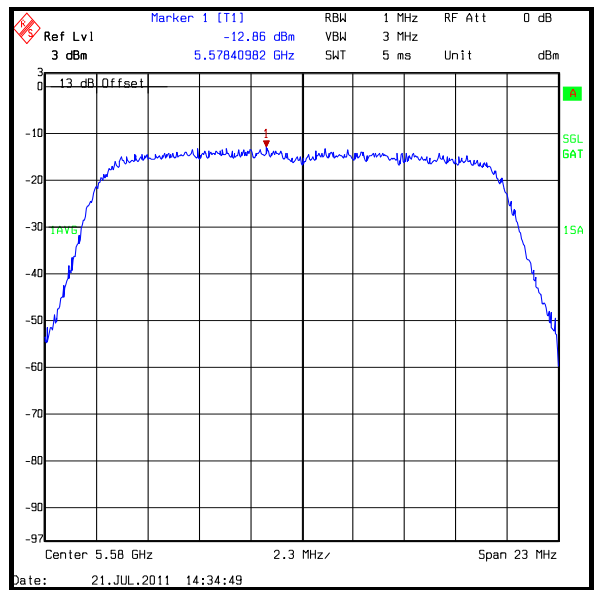
Bottom Channel / V port



Bottom Channel / H port



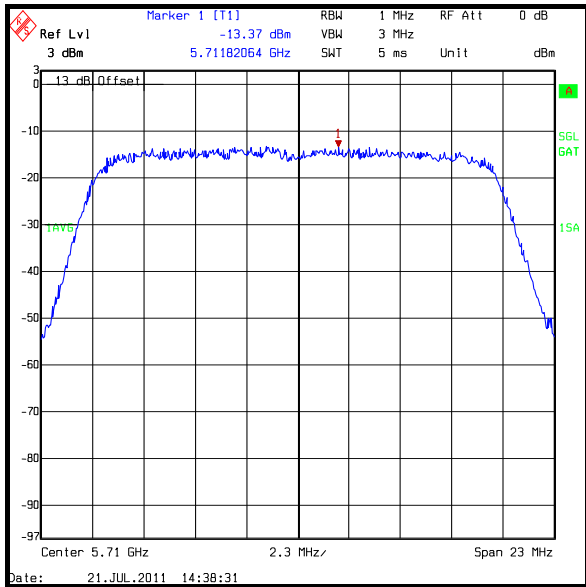
Middle Channel / V port



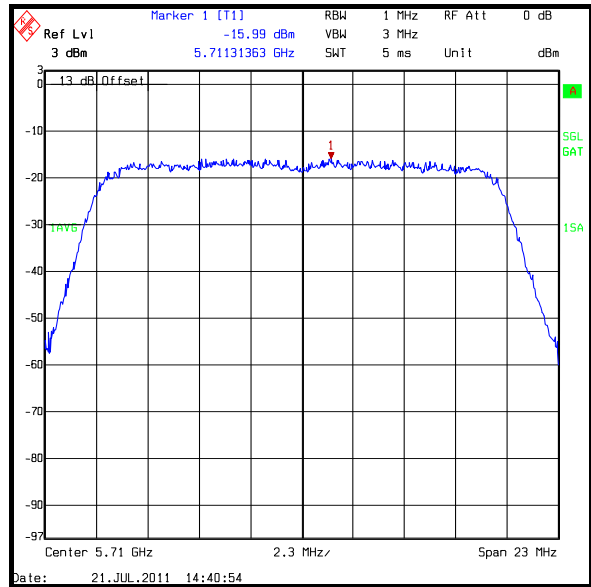
Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

Results: 20 MHz / 16QAM / 39 Mbps



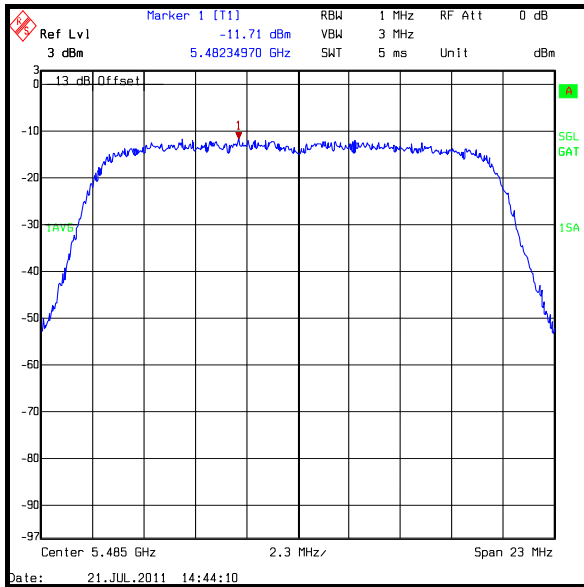
Top Channel / V port



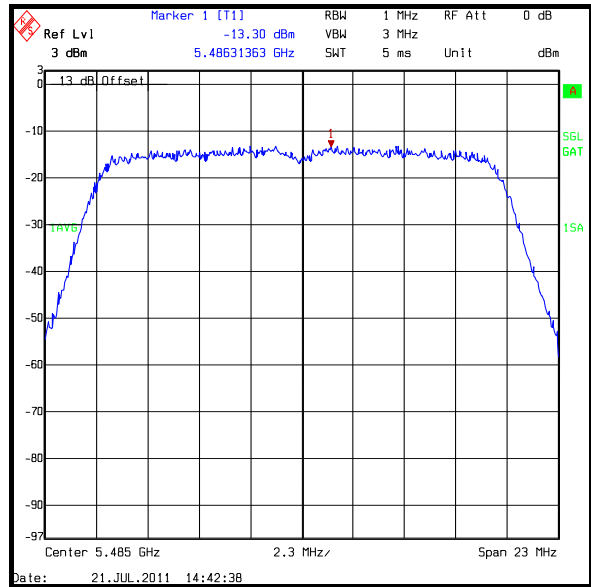
Top Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

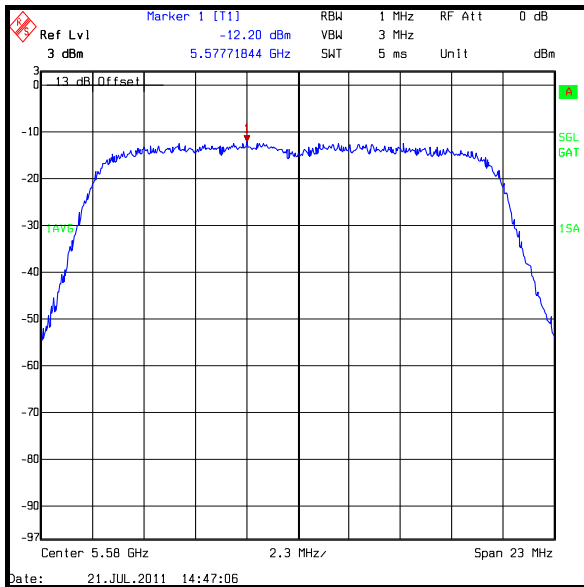
Results: 20 MHz / 64QAM / 65 Mbps



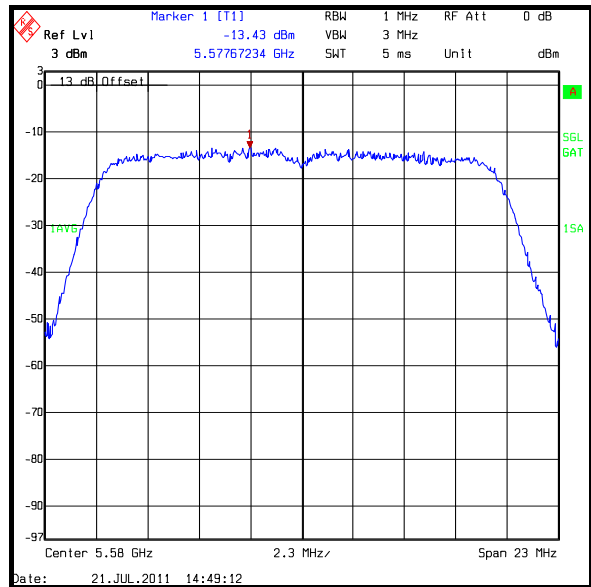
Bottom Channel / V port



Bottom Channel / H port



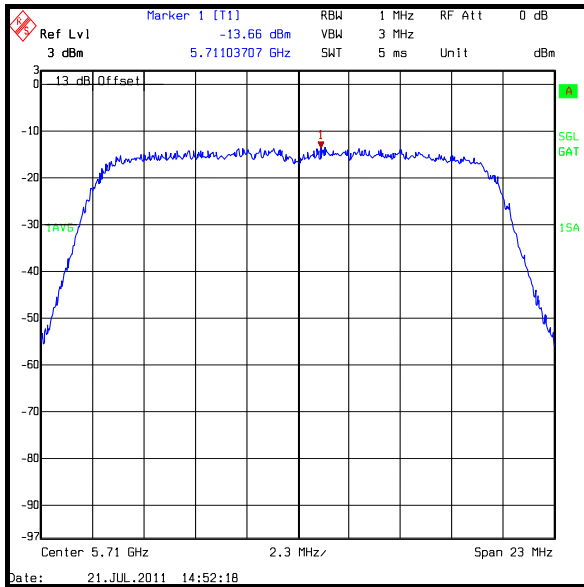
Middle Channel / V port



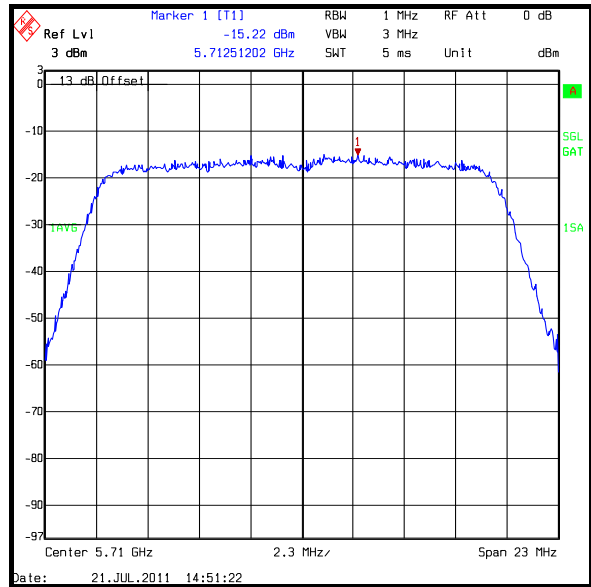
Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

Results: 20 MHz / 64QAM / 65 Mbps



Top Channel / V port



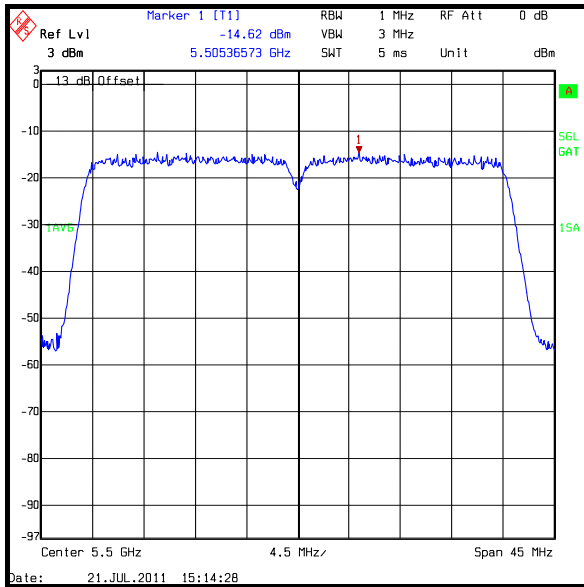
Top Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)**Results: 40 MHz**

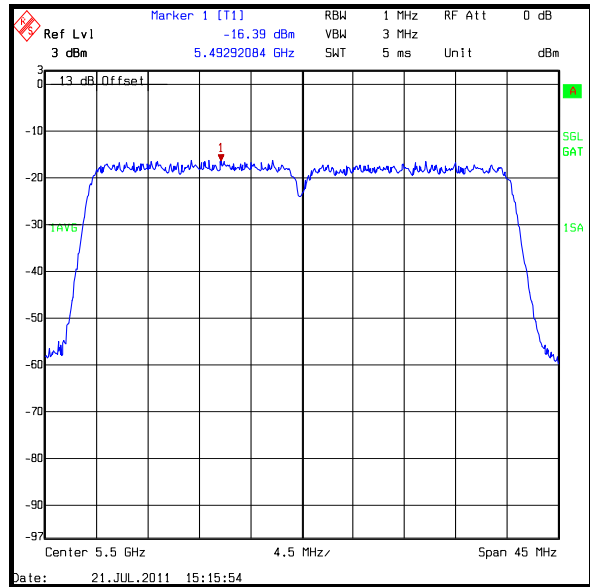
Channel	Mod.	Data Rate (Mbps)	PSD V Port (dBm/MHz)	PSD H Port (dBm/MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	BPSK	13.5	-14.6	-16.4	-12.4	-9.0	3.4	Complied
Middle	BPSK	13.5	-15.2	-16.9	-12.7	-9.0	3.7	Complied
Top	BPSK	13.5	-15.4	-17.0	-13.1	-9.0	4.1	Complied
Bottom	QPSK	40.5	-14.9	-15.5	-12.2	-9.0	3.2	Complied
Middle	QPSK	40.5	-14.8	-16.8	-12.6	-9.0	3.6	Complied
Top	QPSK	40.5	-15.5	-16.9	-13.1	-9.0	4.1	Complied
Bottom	16QAM	81	-14.6	-16.0	-12.2	-9.0	3.2	Complied
Middle	16QAM	81	-15.2	-16.5	-12.8	-9.0	3.8	Complied
Top	16QAM	81	-15.6	-17.0	-13.2	-9.0	4.2	Complied
Bottom	64QAM	135	-14.6	-16.0	-12.2	-9.0	3.2	Complied
Middle	64QAM	135	-14.6	-16.6	-12.5	-9.0	3.5	Complied
Top	64QAM	135	-15.8	-16.9	-13.3	-9.0	4.3	Complied

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

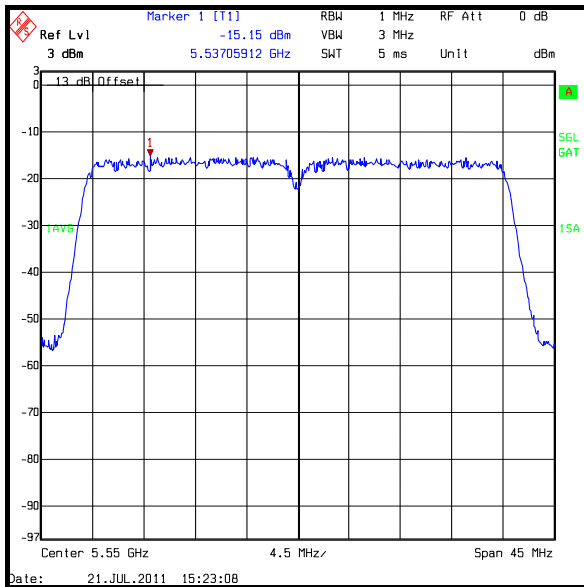
Results: 40 MHz / BPSK / 13.5 Mbps



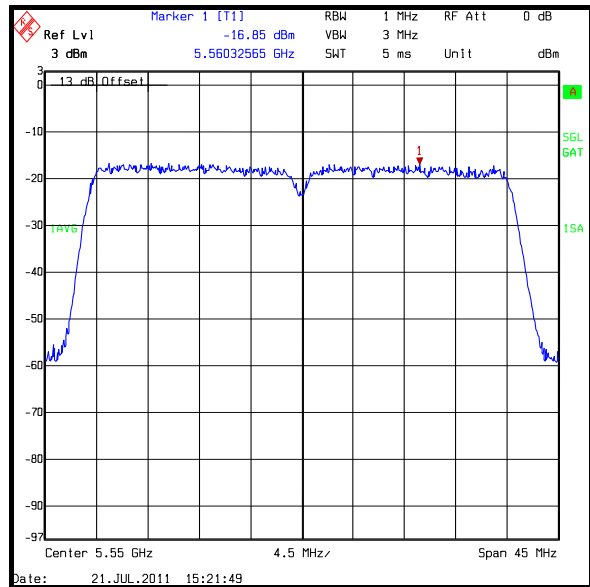
Bottom Channel / V port



Bottom Channel / H port



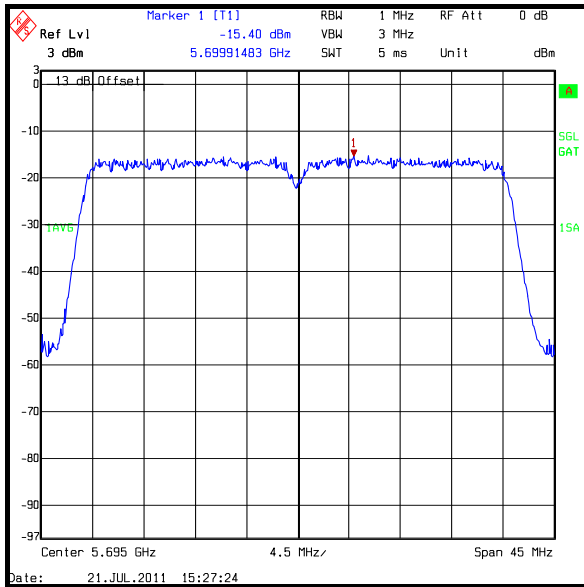
Middle Channel / V port



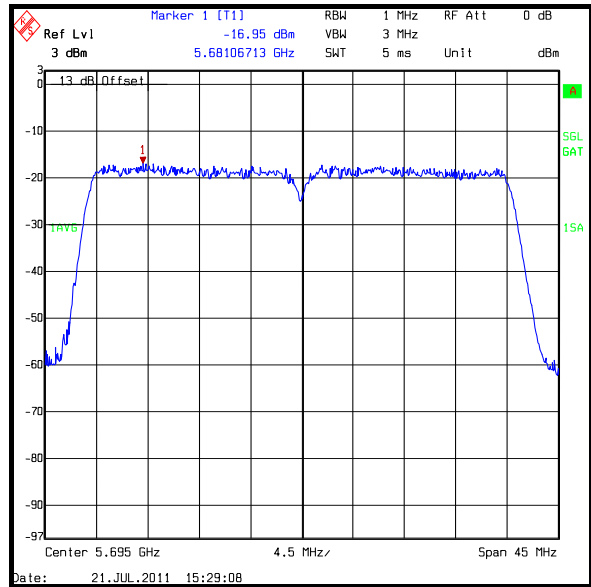
Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

Results: 40 MHz / BPSK / 13.5 Mbps



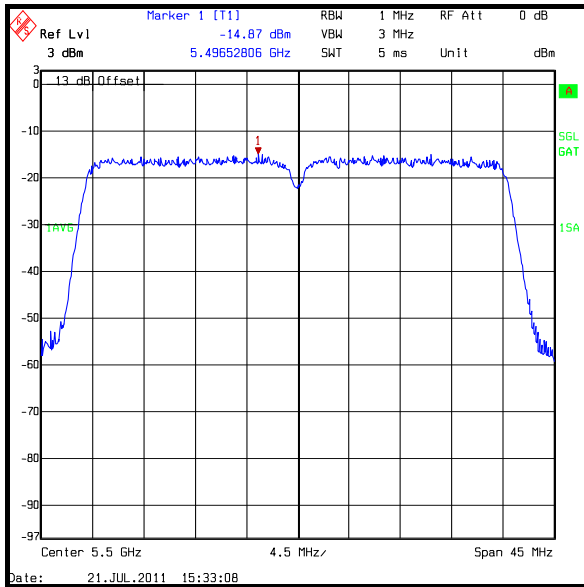
Top Channel / V port



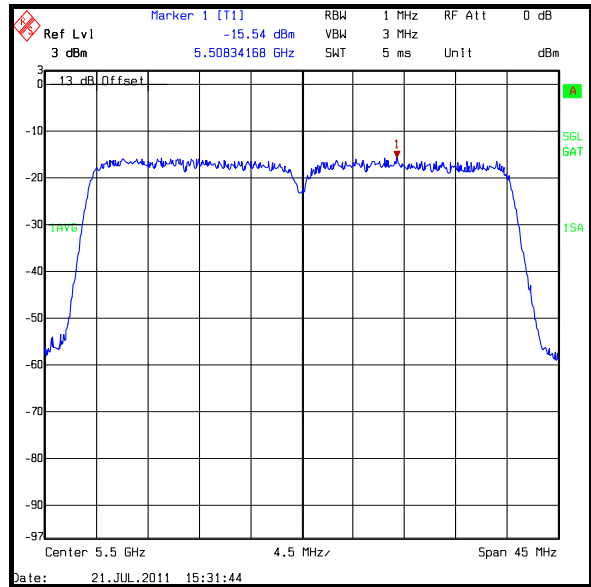
Top Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

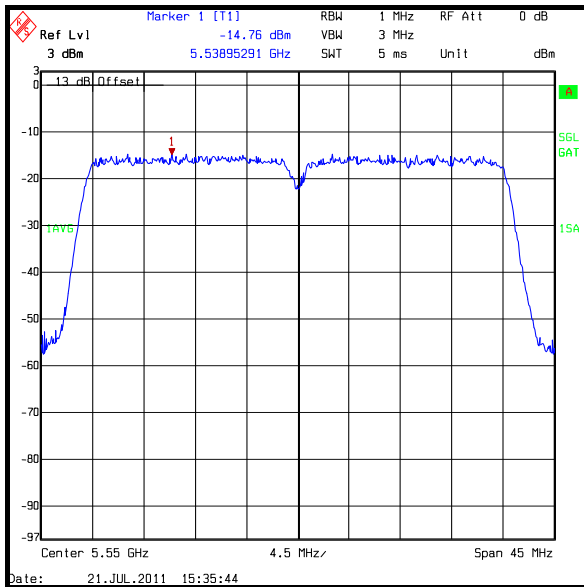
Results: 40 MHz / QPSK / 40.5 Mbps



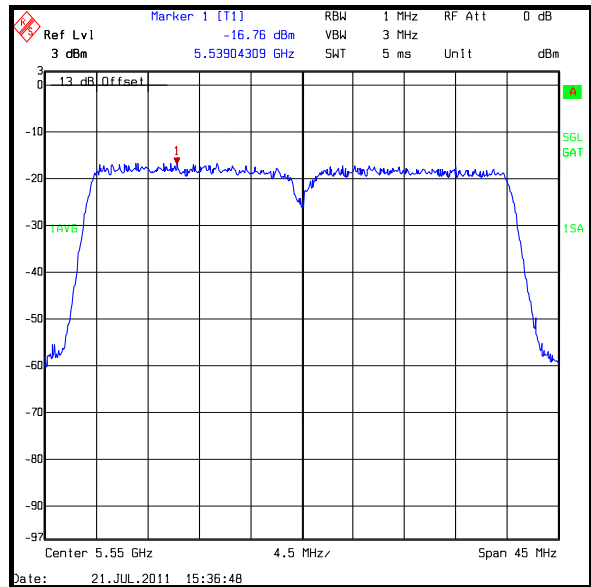
Bottom Channel / V port



Bottom Channel / H port



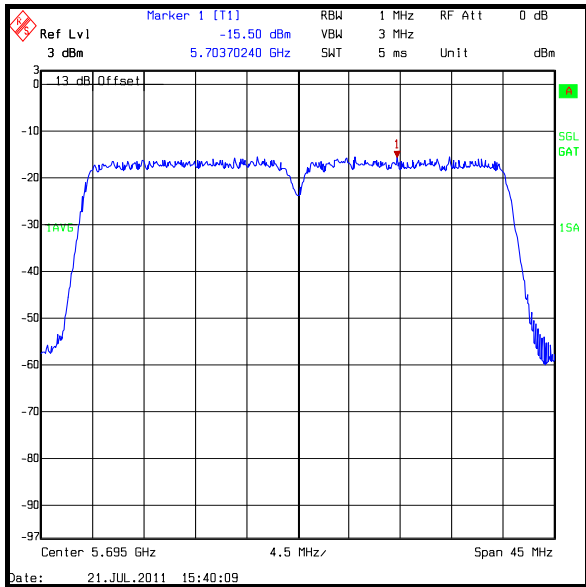
Middle Channel / V port



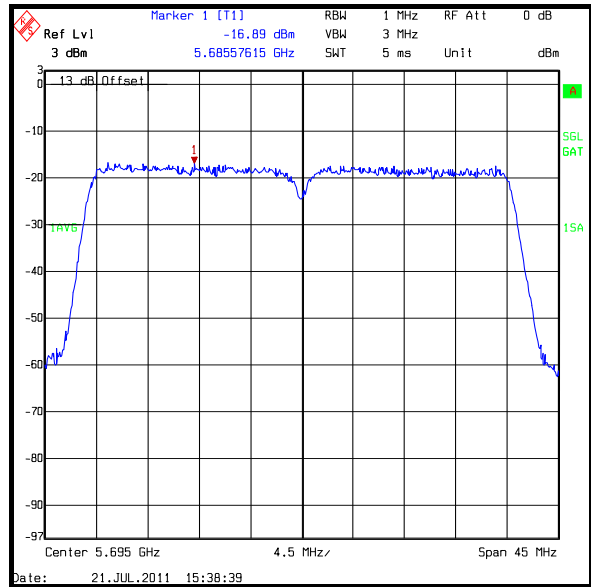
Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

Results: 40 MHz / QPSK / 40.5 Mbps



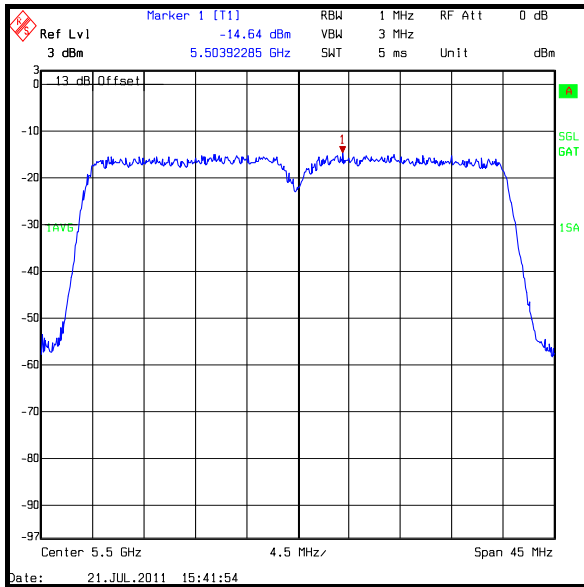
Top Channel / V port



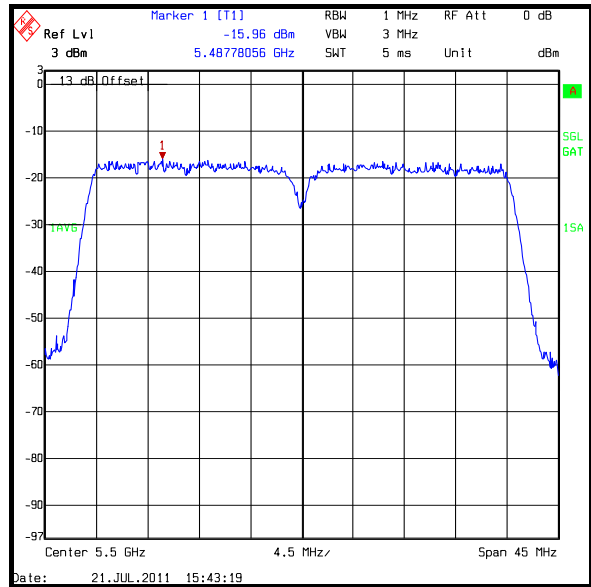
Top Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

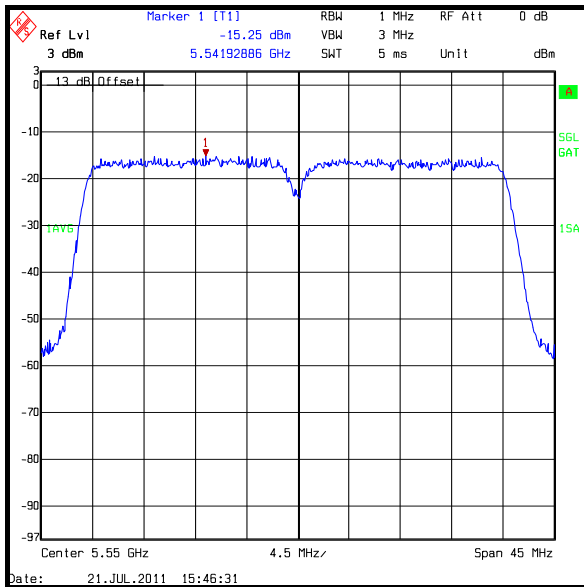
Results: 40 MHz / 16QAM / 81 Mbps



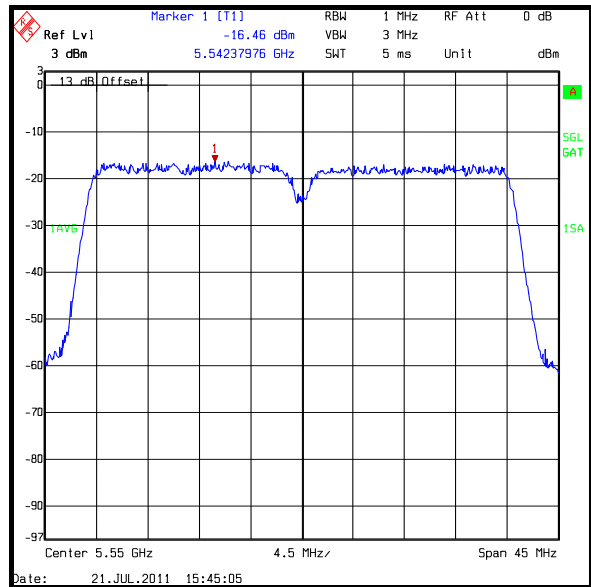
Bottom Channel / V port



Bottom Channel / H port



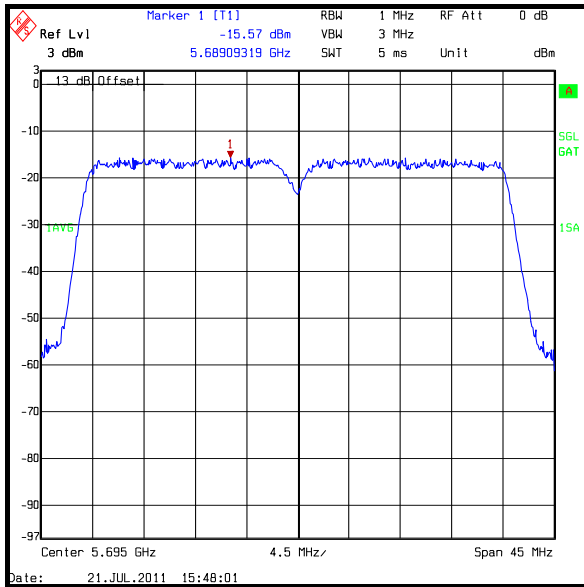
Middle Channel / V port



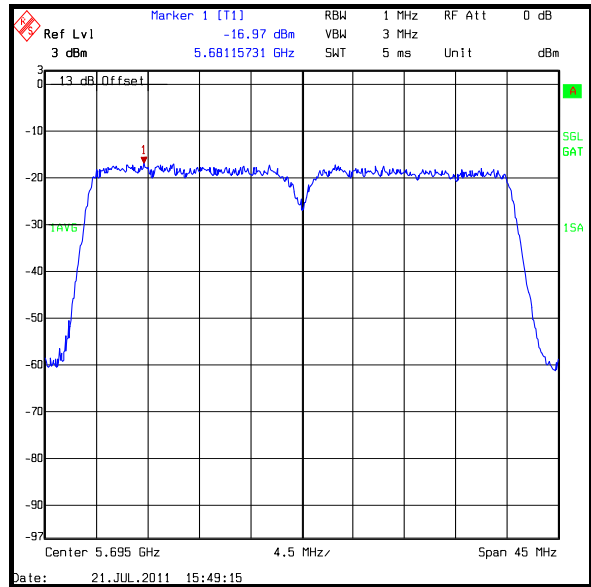
Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

Results: 40 MHz / 16QAM / 81 Mbps



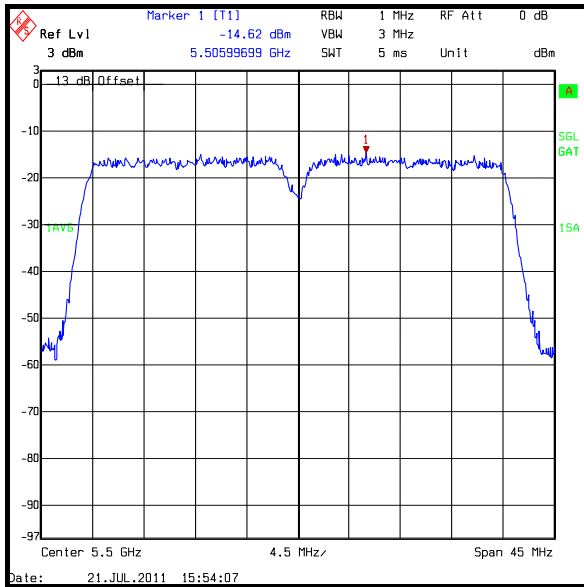
Top Channel / V port



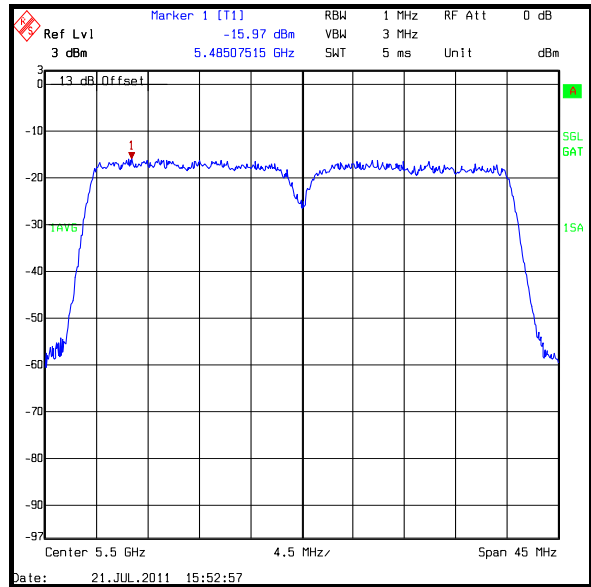
Top Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)

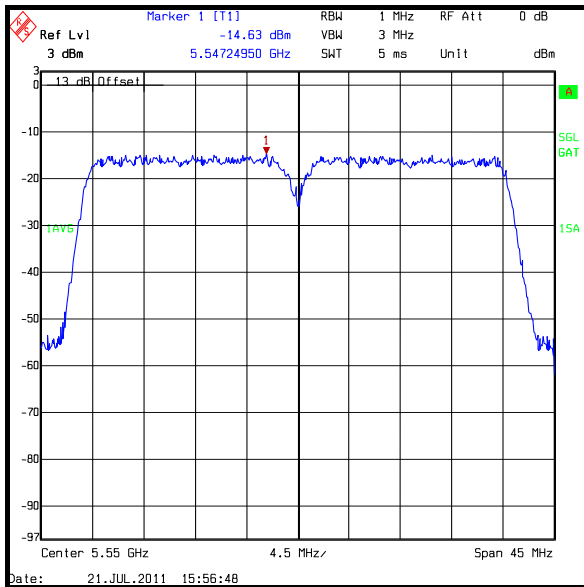
Results: 40 MHz / 64QAM / 135 Mbps



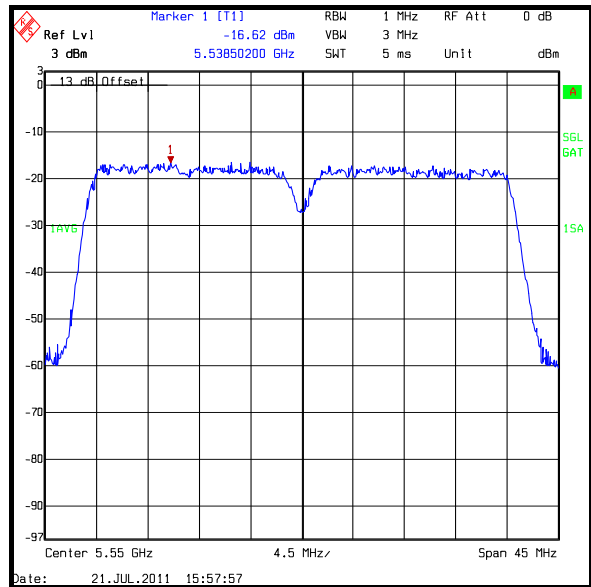
Bottom Channel / V port



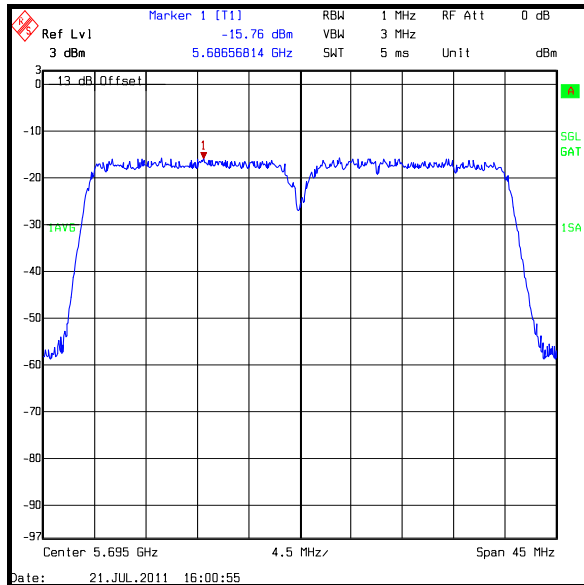
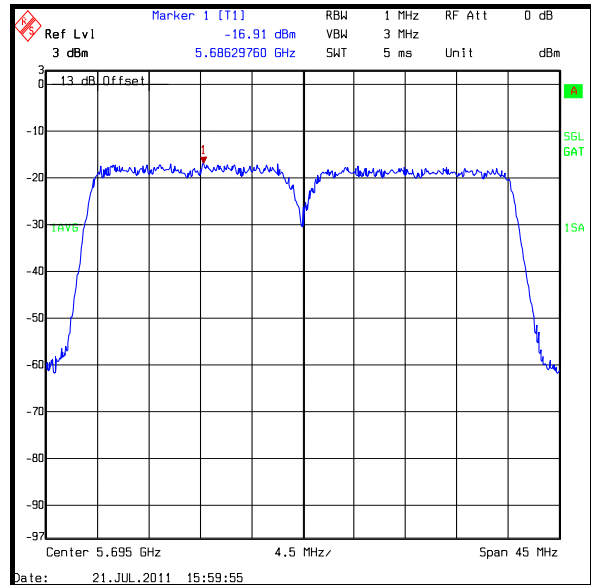
Bottom Channel / H port



Middle Channel / V port



Middle Channel / H port

Transmitter Power Spectral Density with +26 dBi gain external antenna (continued)**Results: 40 MHz / 64QAM / 135 Mbps****Top Channel / V port****Top Channel / H port****Note(s):**

1. A maximum antenna gain of +26 dBi was applied, and therefore the conducted power limits are shown as 20 dB lower than their absolute values (which are based on a 6 dBi antenna gain).
2. Gated measurements were performed in accordance with ANSI C63.4 Section 6.11.1.2.2 Method 2.
3. The antenna gain was taken into consideration when calculating the PSD limit.
4. This test was completed with a power setting of '4.0 dBm mode'.

Limit

The peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both maximum conducted output power and the peak spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.10. Transmitter Peak Excursion**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	22 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(a)(6)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.4

Environmental Conditions:

Temperature (°C):	30
Relative Humidity (%):	22

Results: 20 MHz / V port

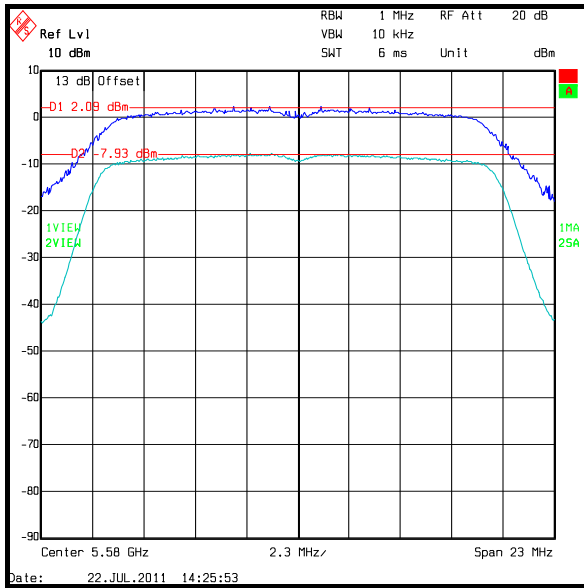
Channel	Mod. Scheme	Data Rate (Mbps)	Trace 1 Level (dBm)	Trace 2 Level (dBm)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Middle	BPSK	9	2.1	-7.9	10.0	13.0	3.0	Complied
Middle	QPSK	19.5	2.3	-8.1	10.4	13.0	2.6	Complied
Middle	16QAM	39	2.5	-7.8	10.3	13.0	2.7	Complied
Middle	64QAM	65	2.8	-7.4	10.2	13.0	2.8	Complied

Results: 20 MHz / H port

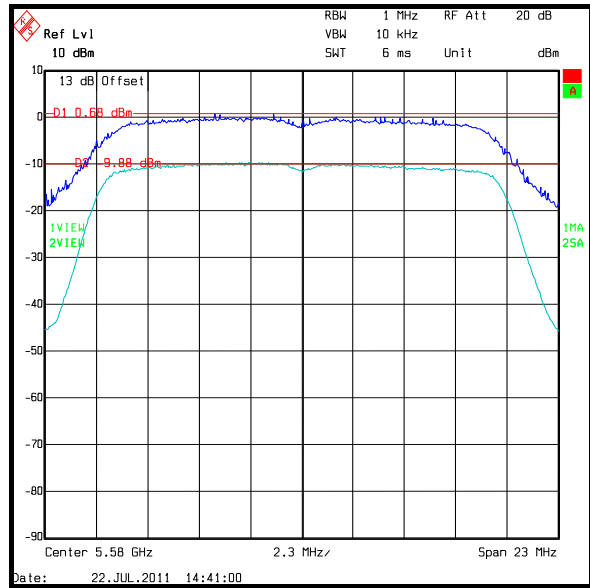
Channel	Mod. Scheme	Data Rate (Mbps)	Trace 1 Level (dBm)	Trace 2 Level (dBm)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Middle	BPSK	9	-1.1	-11.4	10.2	13.0	2.8	Complied
Middle	QPSK	19.5	-0.3	-11.5	11.2	13.0	1.8	Complied
Middle	16QAM	39	-0.2	-11.0	10.8	13.0	2.2	Complied
Middle	64QAM	65	0.3	-10.9	11.1	13.0	1.9	Complied

Transmitter Peak Excursion (continued)

Results: 20 MHz / BPSK / 9 Mbps

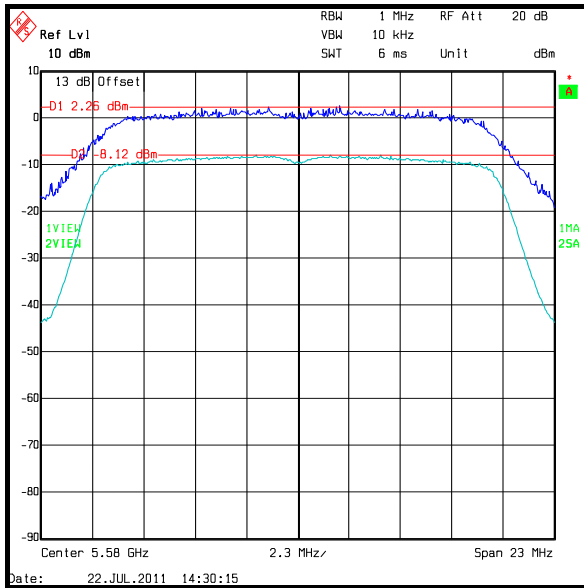


Middle Channel / V port

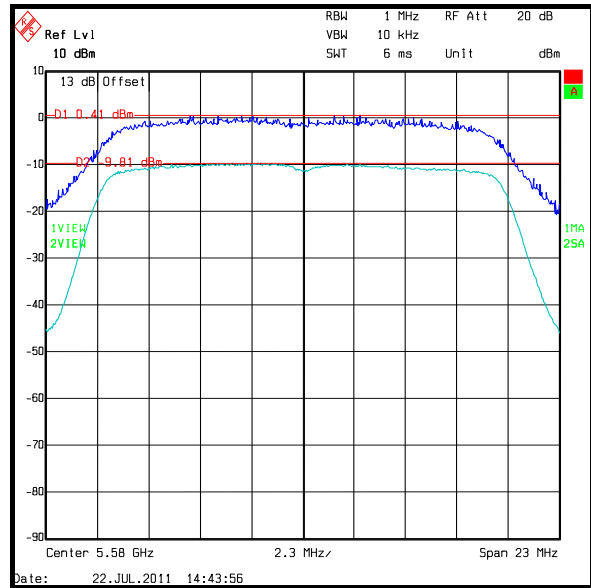


Middle Channel / H port

Results: 20 MHz / QPSK / 19.5 Mbps



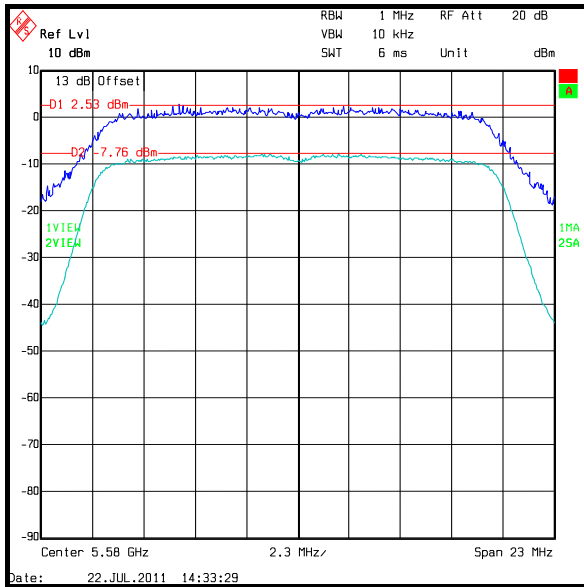
Middle Channel / V port



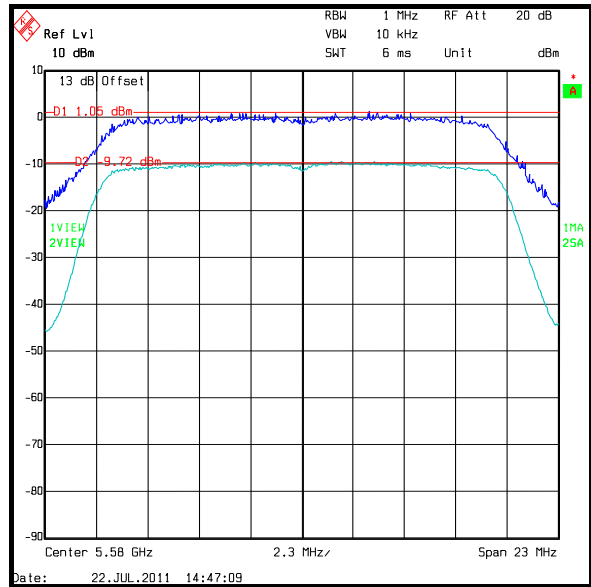
Middle / H port

Transmitter Peak Excursion (continued)

Results: 20 MHz / 16QAM / 39 Mbps

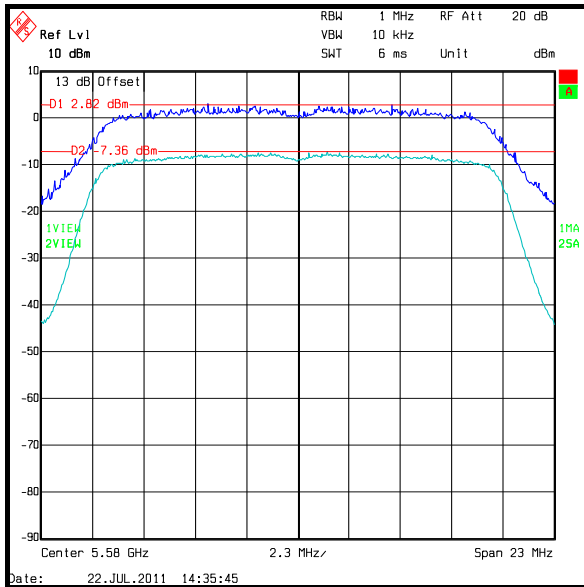


Middle Channel – V port

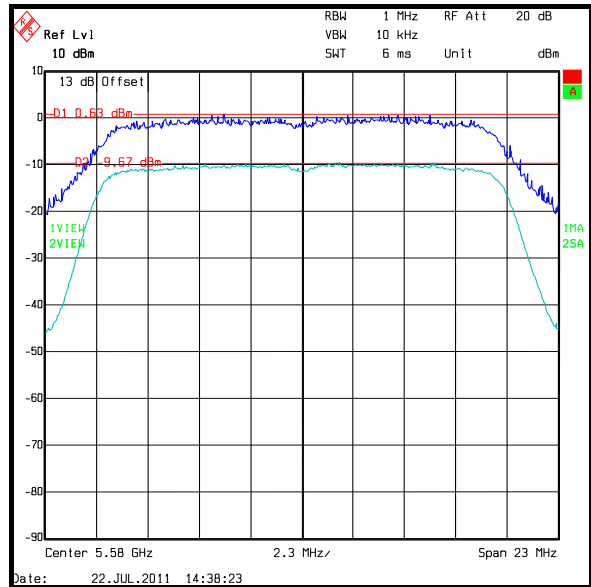


Middle Channel – H port

Results: 20 MHz / 64QAM / 65 Mbps



Middle Channel – V port



Middle Channel – H port

Transmitter Peak Excursion (continued)**Results: 40 MHz / V port**

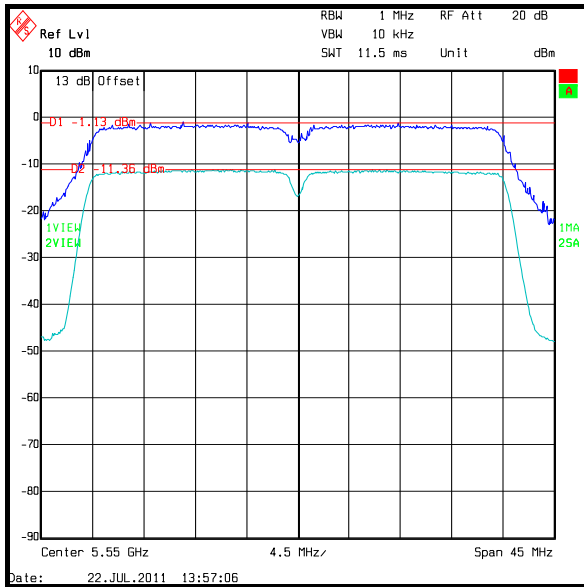
Channel	Mod. Scheme	Data Rate (Mbps)	Trace 1 Level (dBm)	Trace 2 Level (dBm)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Middle	BPSK	13.5	0.7	-9.9	10.6	13.0	2.4	Complied
Middle	QPSK	40.5	0.4	-9.8	10.2	13.0	2.8	Complied
Middle	16QAM	81	1.0	-9.7	10.8	13.0	2.2	Complied
Middle	64QAM	135	0.6	-9.7	10.3	13.0	2.7	Complied

Results: 40 MHz / H port

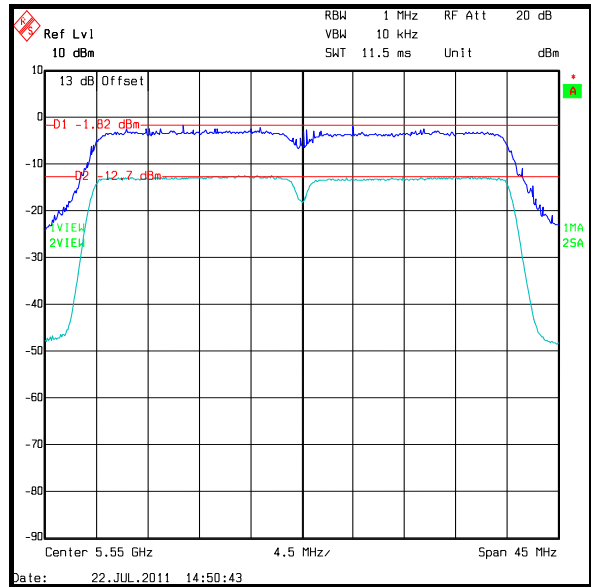
Channel	Mod. Scheme	Data Rate (Mbps)	Trace 1 Level (dBm)	Trace 2 Level (dBm)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Middle	BPSK	13.5	-1.8	-12.7	10.9	13.0	2.1	Complied
Middle	QPSK	40.5	-1.9	-12.8	10.9	13.0	2.1	Complied
Middle	16QAM	81	-1.0	-12.3	11.3	13.0	1.7	Complied
Middle	64QAM	135	-1.0	-12.3	11.3	13.0	1.7	Complied

Transmitter Peak Excursion (continued)

Results: 40 MHz / BPSK / 13.5 Mbps

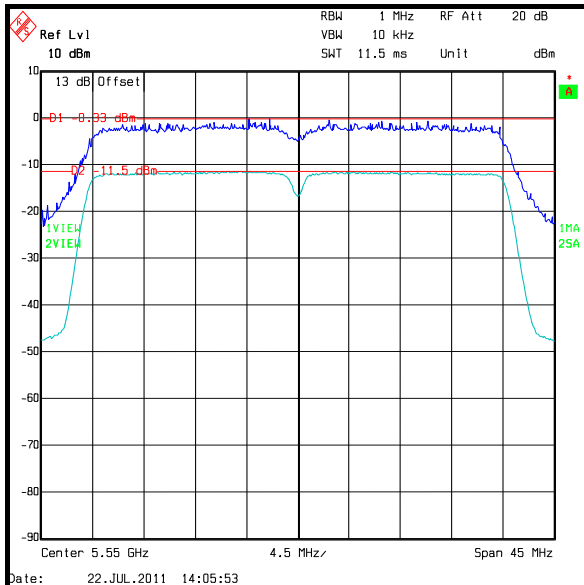


Middle Channel / V port

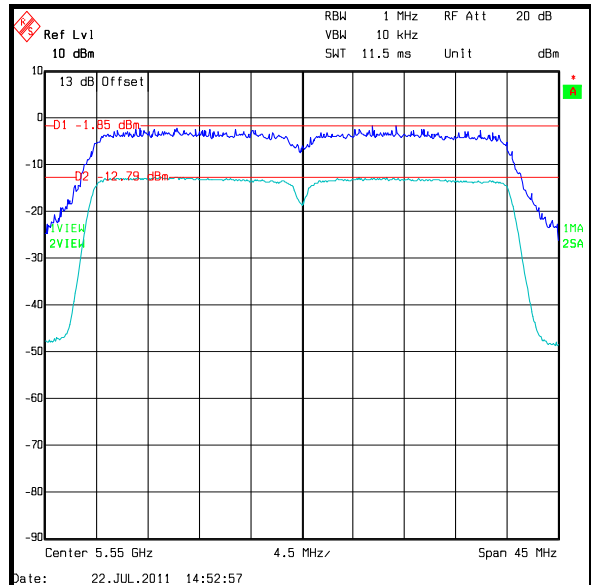


Middle Channel / H port

Results: 40 MHz / QPSK / 40.5 Mbps



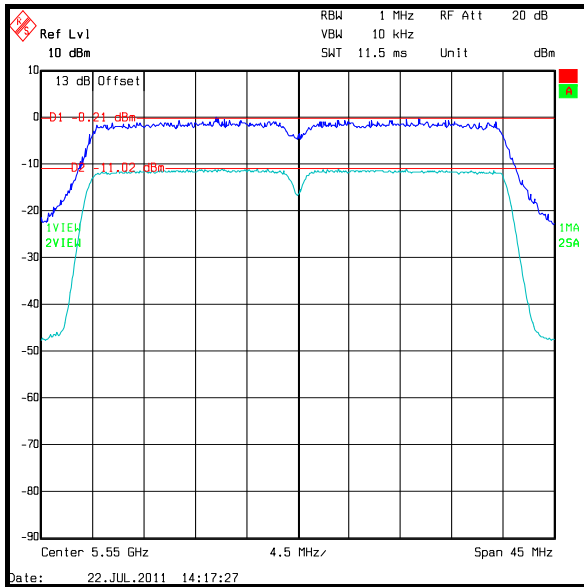
Middle Channel / V port



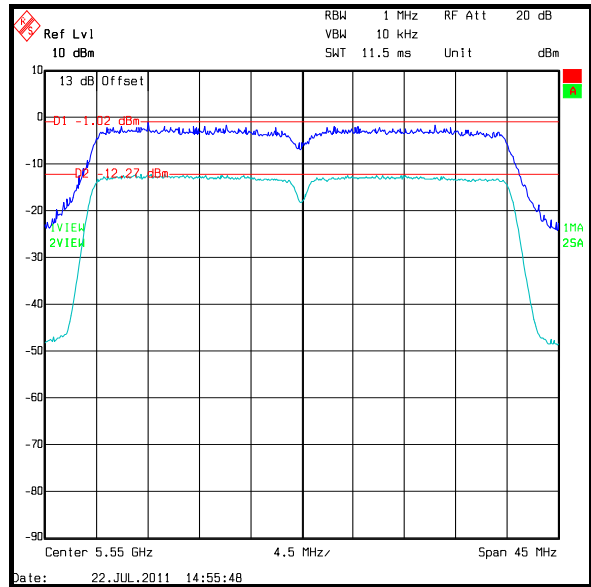
Middle Channel / H port

Transmitter Peak Excursion (continued)

Results: 40 MHz / 16QAM / 81 Mbps

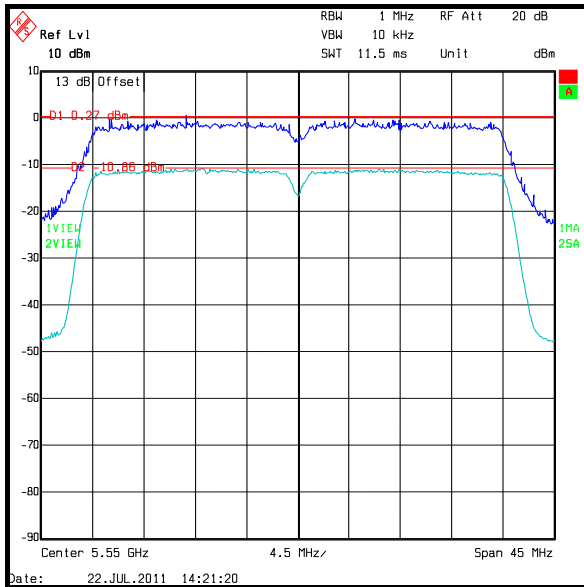


Middle Channel / V port

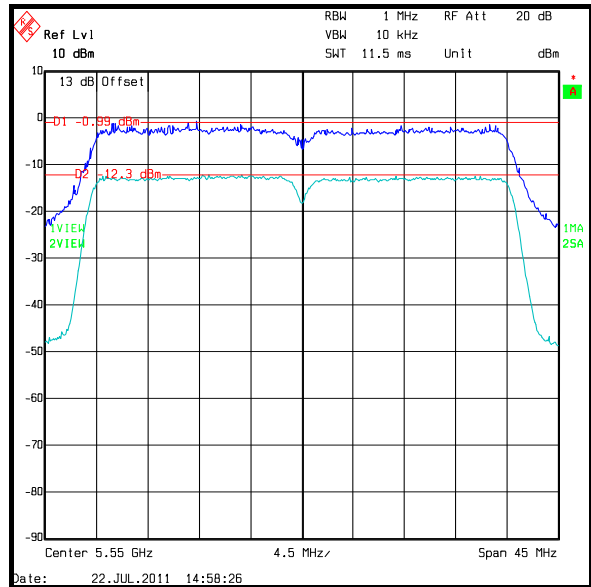


Middle Channel / H port

Results: 40 MHz / 64QAM / 135 Mbps



Middle Channel / V port



Middle Channel / H port

Transmitter Peak Excursion (continued)**Note(s):**

1. Only the centre frequency for each U-NII band is required to be tested as detailed in ANSI C63.10 Section 6.10.4.2 (d).
2. The test was performed in accordance with C63.10 Section 6.10.4 using a Rohde & Schwarz FSEM30 spectrum analyser. Two overlaid measurements were made with different measurement bandwidth settings and detectors as required by the test procedure. Due to the limitations of the spectrum analyser, an error was shown at the top right of the screen traces as a red square. This is not a measurement error, only a warning on the spectrum analyser that differing measurement bandwidths and detectors were used on two traces shown on the screen.
3. In accordance with ANSI C63.10 Section 6.10.4.2 (e)(2)(ii), the second trace was created using a sample detector as the peak conducted output power measurements were made with a sample detector.

Limit

The ratio of the peak excursion of the modulation envelope (measured using a spectrum analyser max hold function) to the maximum conducted output power (measured as specified in ANSI C63.10 Section 6.10.4.2) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

5.2.11. Transmitter Out of Band Radiated Emissions with +23 dBi integral antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	27 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(b)(3) / 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	30

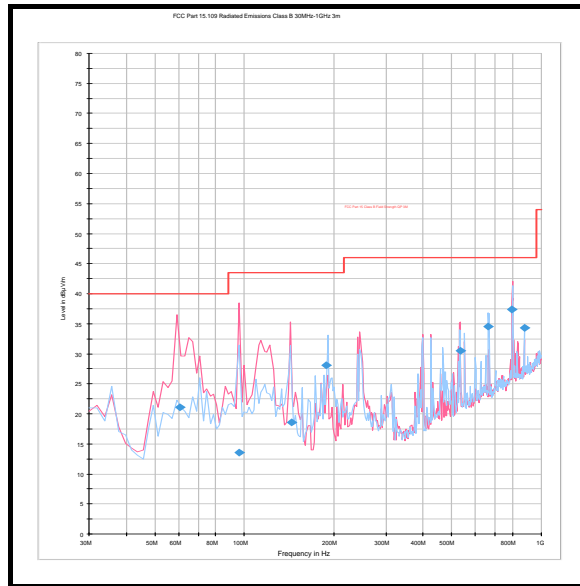
Results: 40 MHz / BPSK / 13.5 Mbps / Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
60.818	Vertical	21.1	40.0	18.9	Complied
96.010	Vertical	13.5	43.5	30.0	Complied
144.001	Vertical	18.6	43.5	24.9	Complied
189.097	Horizontal	28.0	43.5	15.5	Complied
533.240	Vertical	30.4	46.0	15.6	Complied
663.626	Horizontal	34.5	46.0	11.5	Complied
796.186	Vertical	37.4	46.0	8.6	Complied
874.971	Horizontal	34.4	46.0	11.6	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
3. All other emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. The EUT was tested whilst fitted with the integral antenna.

Transmitter Out of Band Radiated Emissions with +23 dBi integral antenna (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Transmitter Out of Band Radiated Emissions with +23 dBi gain integral antenna (continued)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	26 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(b)(3) / 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	30

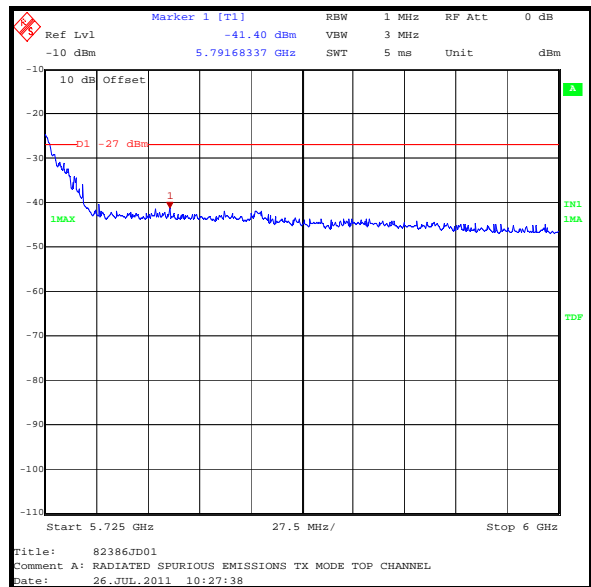
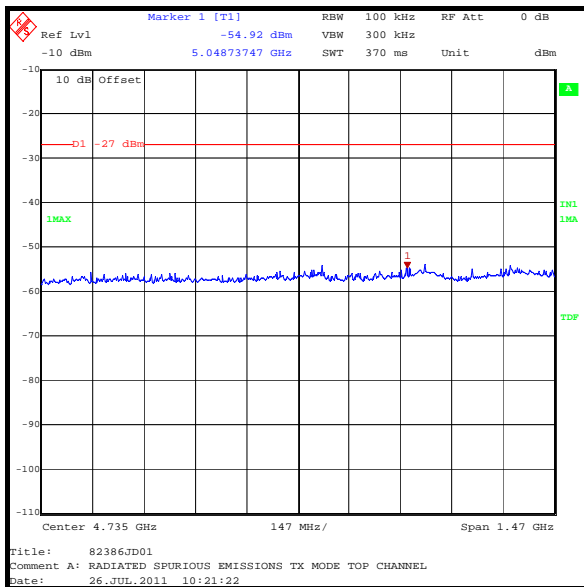
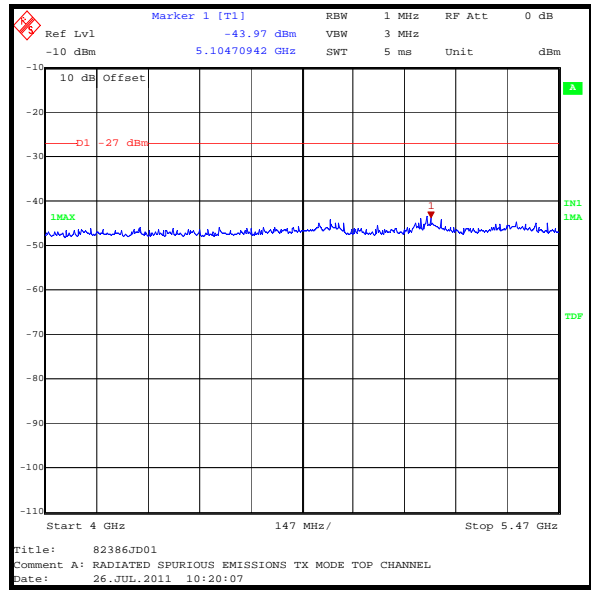
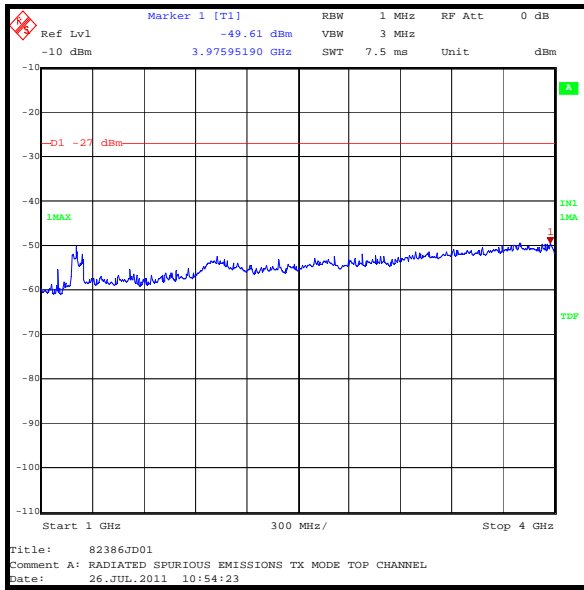
Results: 40 MHz / BPSK / 13.5 Mbps / Top Channel

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5791.683	Vertical	-41.4	-27.0	14.4	Complied

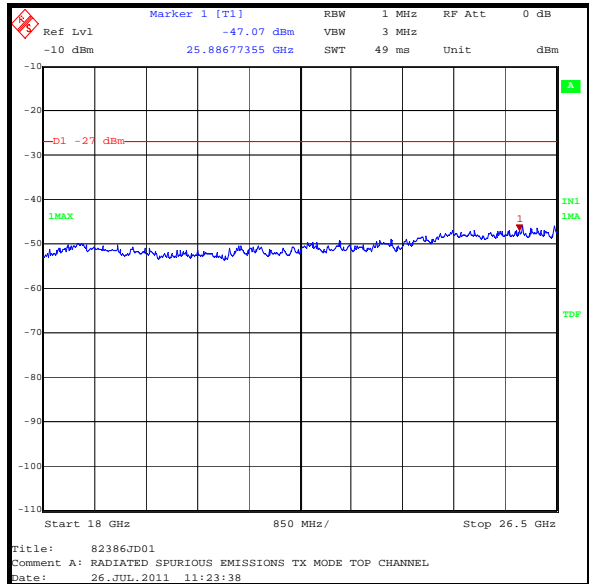
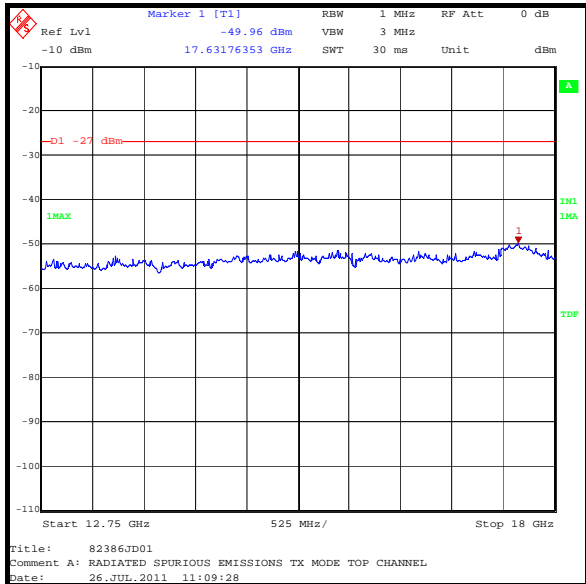
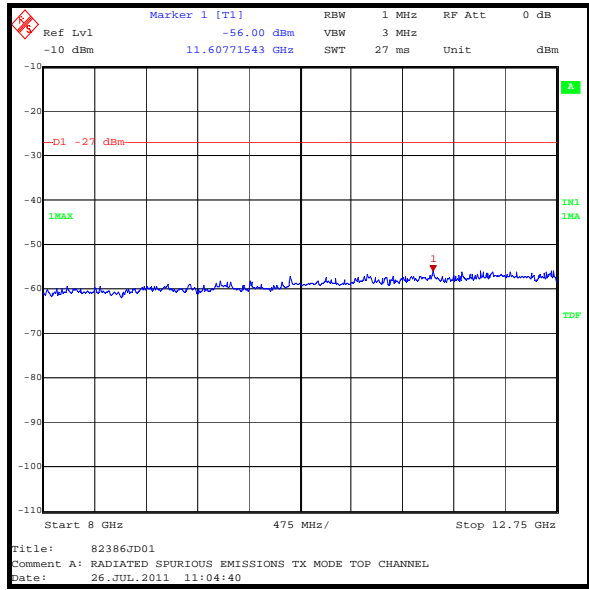
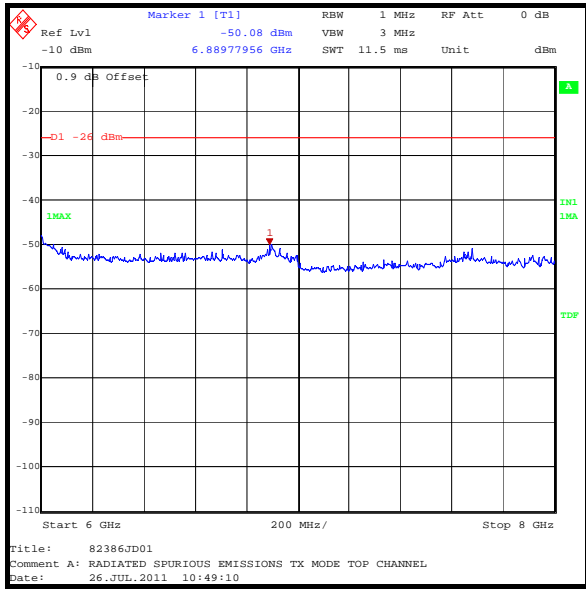
Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. Measurements were performed to 40 GHz in accordance with Part 15.33(a)(1).
3. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI 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 (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. The Customer requested inclusion of a pre-scan plot over the 4 GHz to 5.47 GHz frequency range which encompasses a restricted band close to the band of operation. The pre-scan was performed using a 100 kHz measurement bandwidth.
6. The 5.725 GHz to 6 GHz plot shows a non-compliance adjacent to the upper band edge with the EUT transmitting on the top channel. This was further investigated during the band edge measurements and found to be compliant.

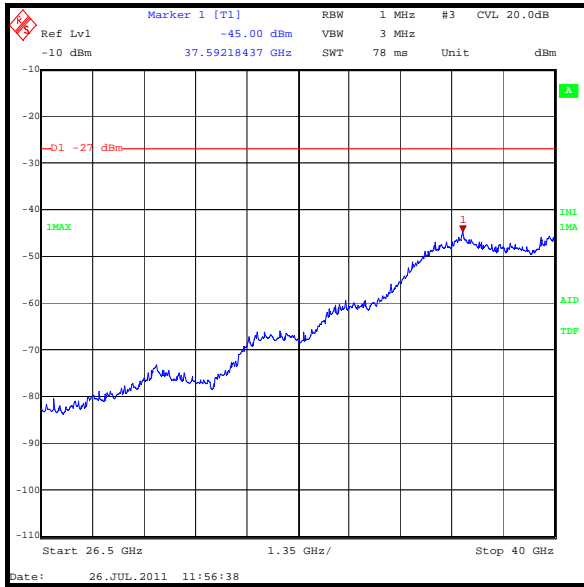
Transmitter Out of Band Radiated Emissions with +23 dBi gain integral antenna (continued)



Transmitter Out of Band Radiated Emissions with +23dBi gain integral antenna (continued)



Transmitter Out of Band Radiated Emissions with +23 dBi integral antenna (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Limit

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz

5.2.12. Transmitter Out of Band Radiated Emissions with +29 dBi gain external antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	27 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(b)(3) / 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	30

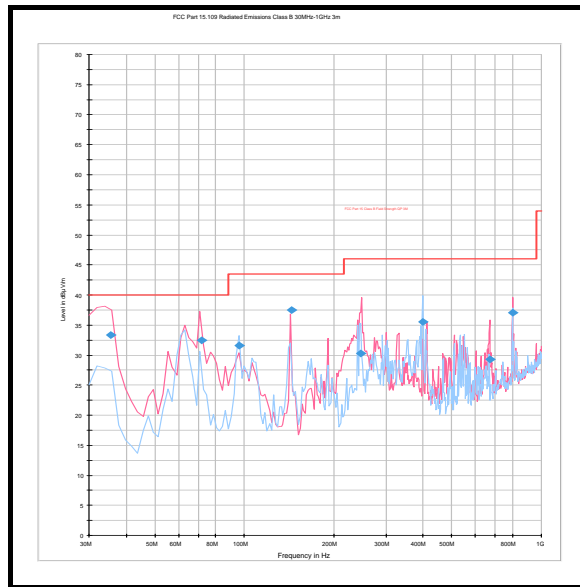
Results: 40 MHz / BPSK / 13.5 Mbps / Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
35.489	Vertical	33.4	40.0	6.6	Complied
71.981	Vertical	32.5	40.0	7.5	Complied
95.982	Horizontal	31.6	43.5	11.9	Complied
144.001	Vertical	37.5	43.5	6.0	Complied
245.402	Vertical	30.3	46.0	15.7	Complied
399.430	Horizontal	35.5	46.0	10.5	Complied
669.149	Vertical	29.3	46.0	16.7	Complied
800.131	Vertical	37.1	46.0	8.9	Complied

Note(s):

- The antenna supplied for use in this test by the Customer was a +29 dBi parabolic antenna with a 2 foot reflector as compared to the 1.5 foot maximum reflector size of the specified +26 dBi parabolic antenna. The EUT was tested using the 2 foot diameter antenna and '1.0dBm mode' power setting. This was done to ensure worst case conditions for any emission measured.
- The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
- The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
- All other emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system.
- Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI 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.
- The EUT was tested whilst fitted with the external antenna.

Transmitter Out of Band Radiated Emissions with +29 dBi gain external antenna
(continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Transmitter Out of Band Radiated Emissions with +29 dBi gain external antenna (continued)

Test Summary:

Test Engineer:	Crawford Lindsay	Test Date:	26 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC Part:	15.407(b)(3) / 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	30

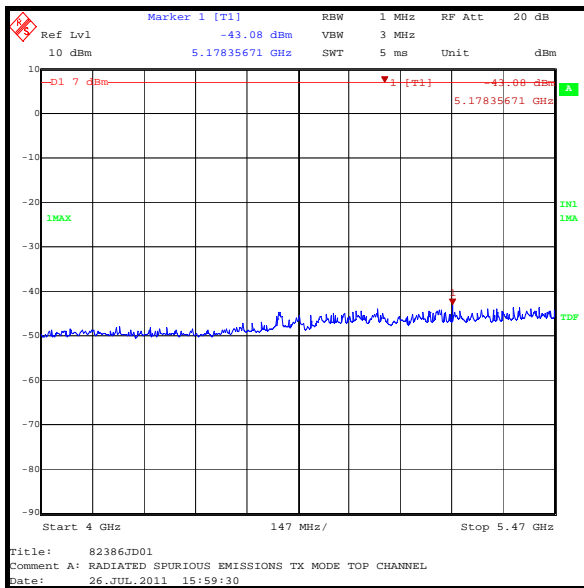
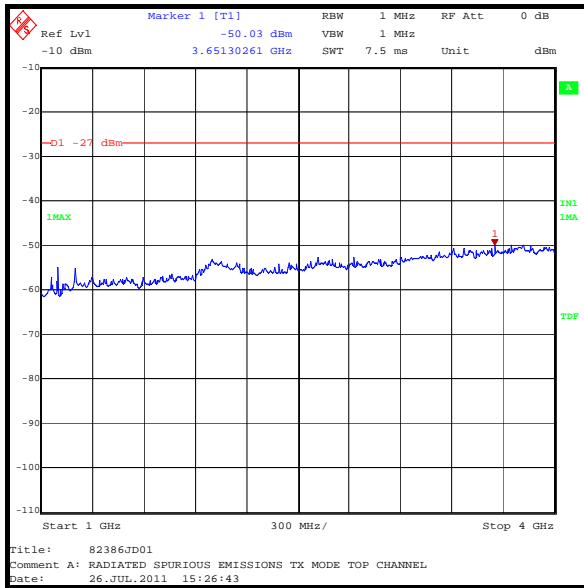
Results: 40 MHz / BPSK / 13.5 Mbps / Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB/m)	Limit (dBm)	Margin (dB)	Result
25954.910	Vertical	-46.5	-27.0	19.5	Complied

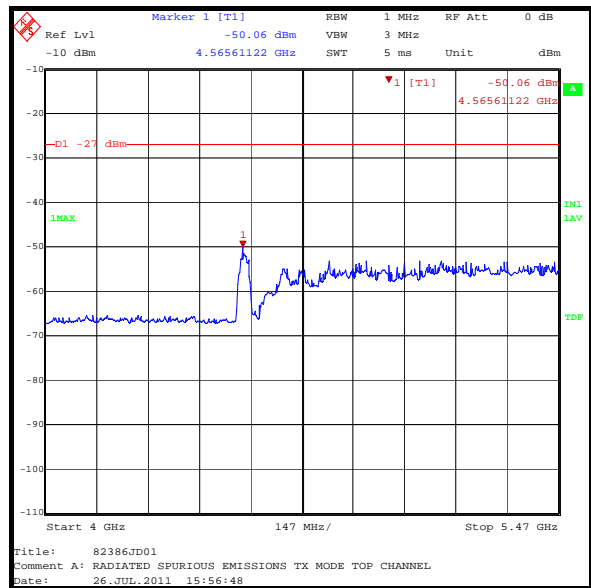
Note(s):

1. The antenna supplied for use in this test by the Customer was a +29 dBi gain parabolic antenna with 2 foot reflector as compared to the 1.5 foot maximum reflector size of the specified +26 dBi gain parabolic antenna. The EUT was tested using the 2 foot diameter antenna and '1.0dBm mode' power setting. This was done to ensure worst case conditions for any emission measured.
2. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
3. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit. If the measurement could not achieve sufficient clearance from the noise floor then individual plots of peak measurement against peak limit and average measurement against average limit are presented.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI 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 (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. The Customer requested inclusion of a pre-scan plot over the 4 GHz to 5.47 GHz frequency range which encompasses a restricted band close to the band of operation. The pre-scan was performed using a 100 kHz measurement bandwidth.

**Transmitter Out of Band Radiated Emissions with +29 dBi gain external antenna
(continued)**

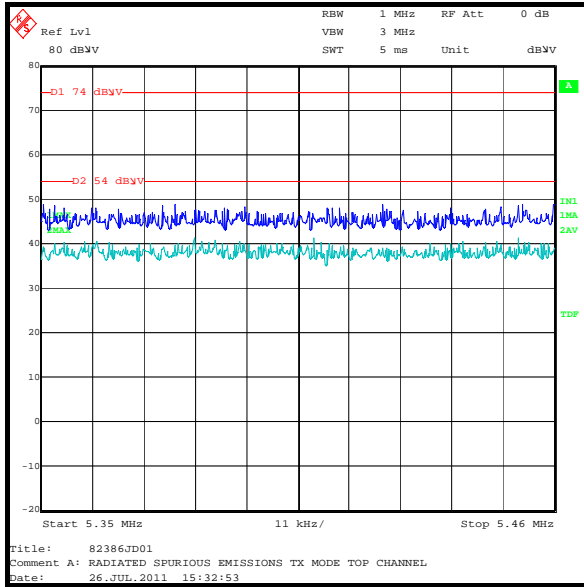


Peak Detector

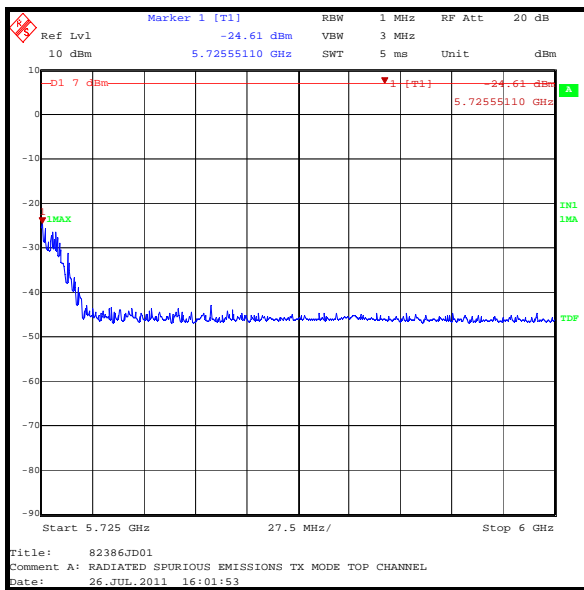


Average Detector

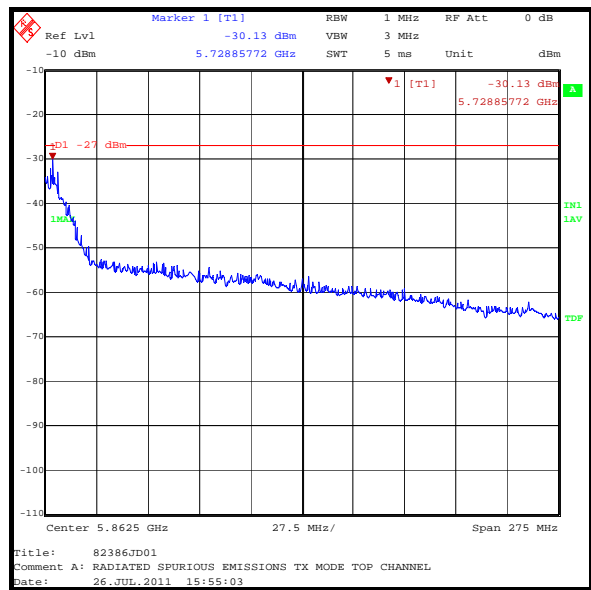
**Transmitter Out of Band Radiated Emissions with +29 dBi gain external antenna
(continued)**



Restricted Band

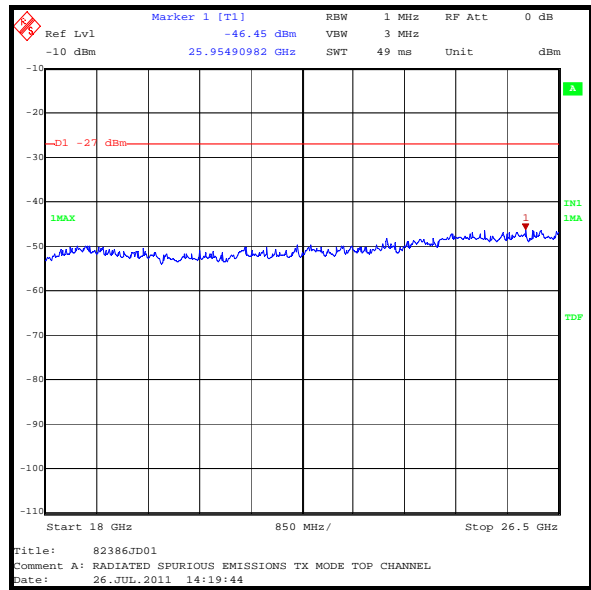
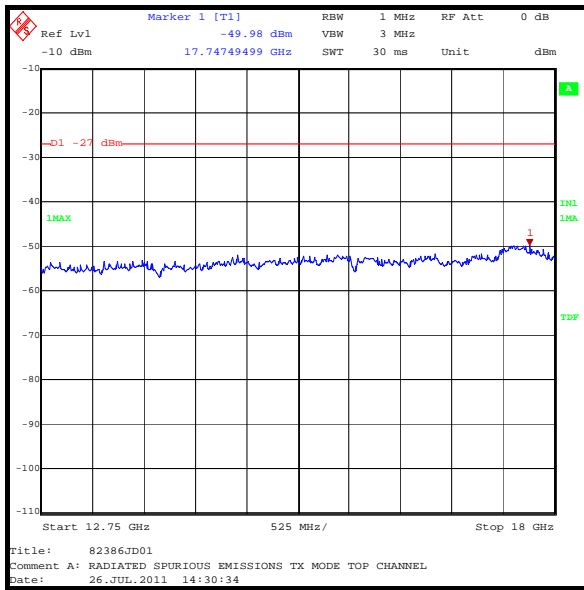
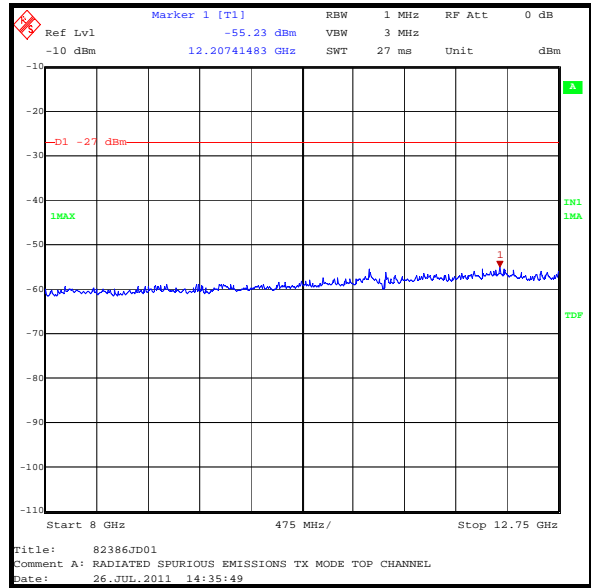
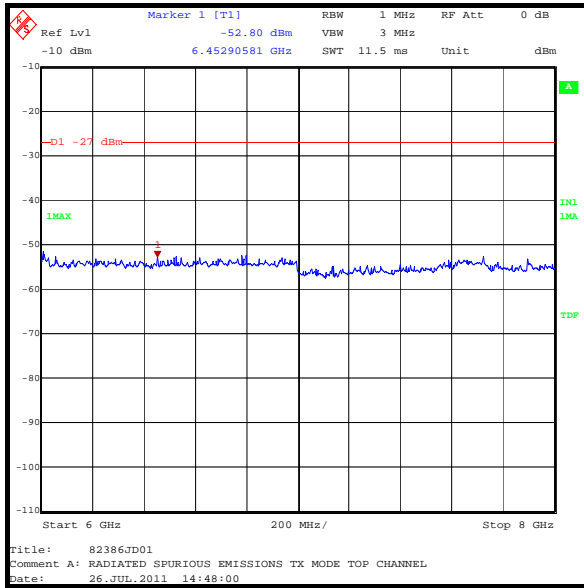


Peak Detector

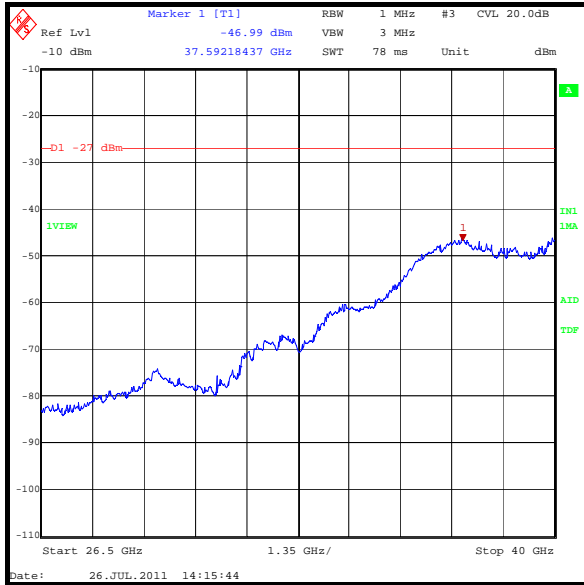


Average Detector

Transmitter Out of Band Radiated Emissions with +29 dBi gain external antenna (continued)



**Transmitter Out of Band Radiated Emissions with +29 dBi gain external antenna
(continued)**



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Limit

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz

5.2.13. Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	25 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC/IC Part:	15.407(b)(3) and RSS-Gen 4.9 / RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2 referencing FCC Part 15.407(b)(5) and 15.407(b)(7)

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	25

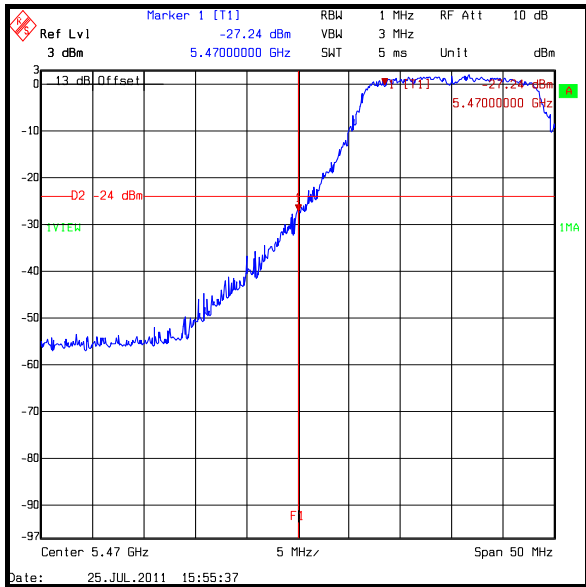
Results: Peak Detector / 20 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5485	BPSK	6.5	-27.2	-24.0	3.2	Complied
5710	BPSK	6.5	-27.5	-24.0	3.5	Complied
5485	QPSK	19.5	-26.0	-24.0	2.0	Complied
5710	QPSK	19.5	-27.6	-24.0	3.6	Complied
5485	16QAM	39	-29.3	-24.0	5.3	Complied
5710	16QAM	39	-29.1	-24.0	5.1	Complied
5485	64QAM	65	-28.8	-24.0	4.8	Complied
5710	64QAM	65	-30.1	-24.0	6.1	Complied

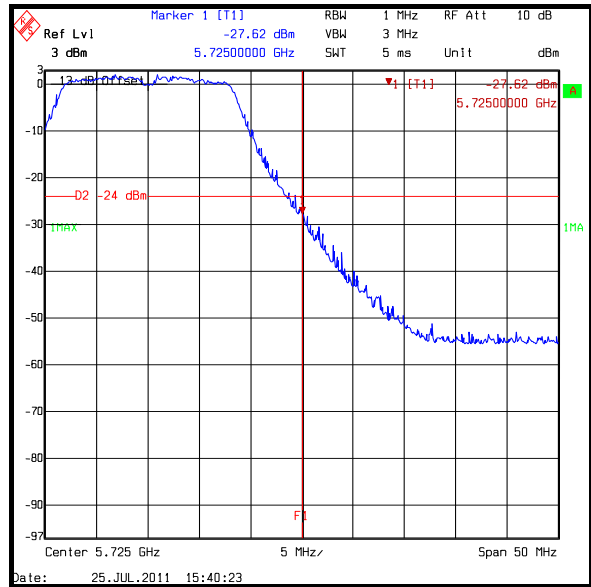
Results: Average Detector / 20 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5485	BPSK	6.5	-50.6	-44.0	6.6	Complied
5710	BPSK	6.5	-45.8	-44.0	1.8	Complied
5485	QPSK	19.5	-51.3	-44.0	7.3	Complied
5710	QPSK	19.5	-45.6	-44.0	1.6	Complied
5485	16QAM	39	-50.1	-44.0	6.1	Complied
5710	16QAM	39	-45.8	-44.0	1.8	Complied
5485	64QAM	65	-50.6	-44.0	6.6	Complied
5710	64QAM	65	-45.6	-44.0	1.6	Complied

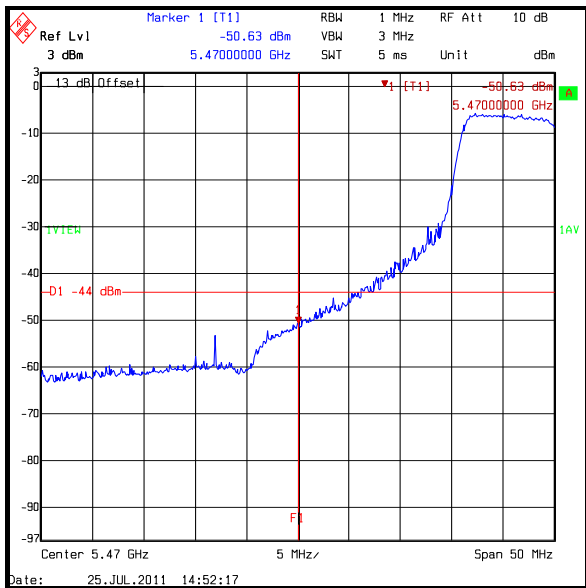
**Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)**



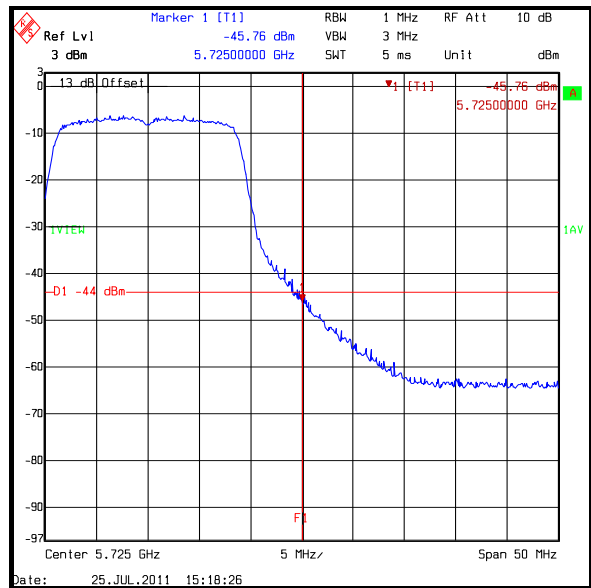
Lower Band Edge / Peak Measurement / 6.5 Mbps



Upper Band Edge Peak Measurement / 6.5 Mbps

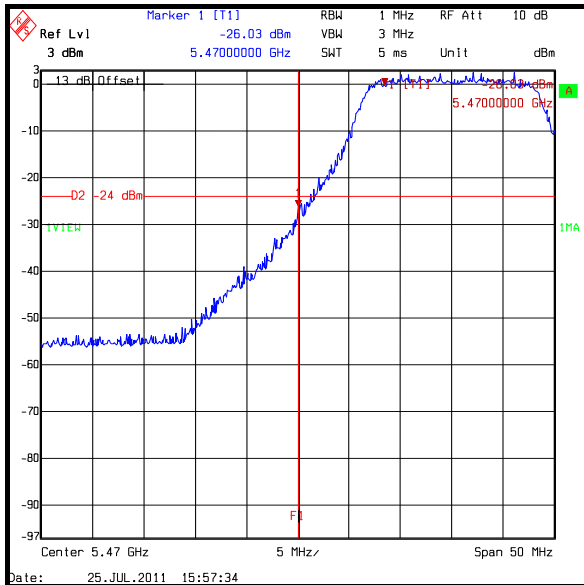


**Lower Band Edge Average Measurement /
6.5 Mbps**

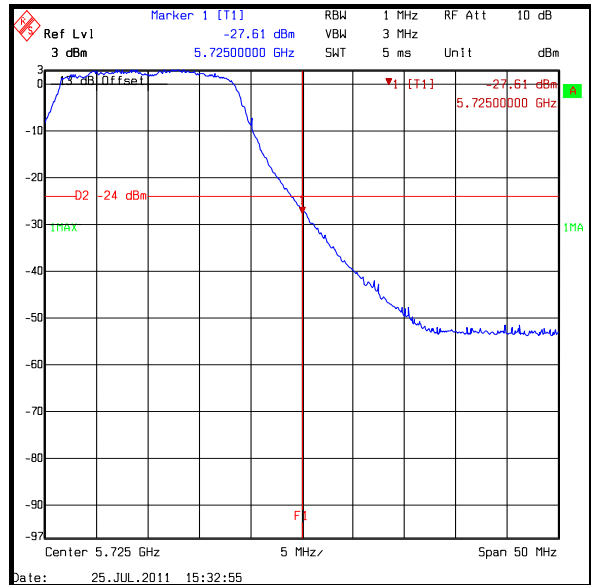


**Upper Band Edge Average Measurement /
6.5 Mbps**

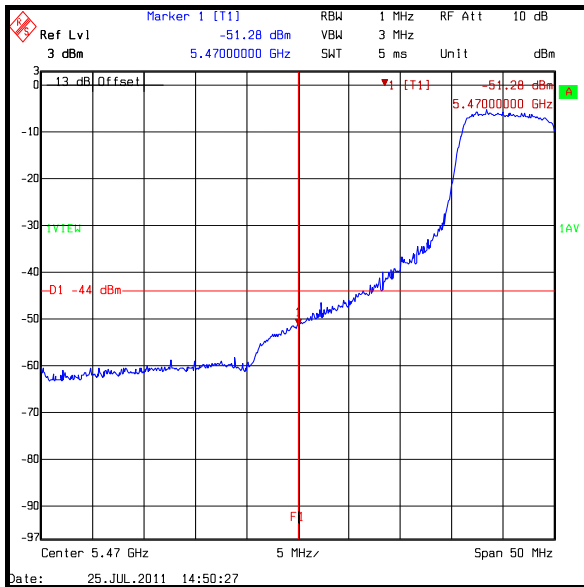
**Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)**



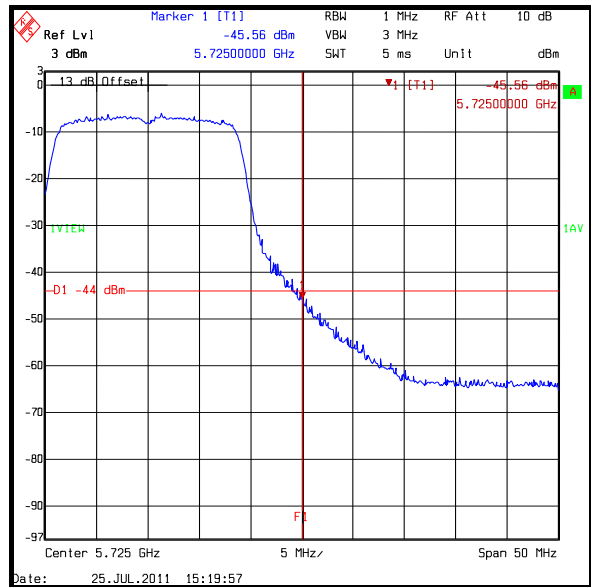
**Lower Band Edge Peak Measurement /
19.5 Mbps**



**Upper Band Edge Peak Measurement /
19.5 Mbps**

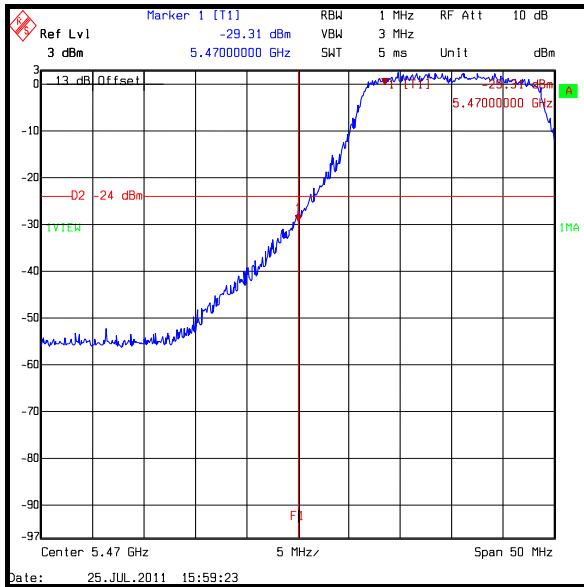


**Lower Band Edge Average Measurement /
19.5 Mbps**

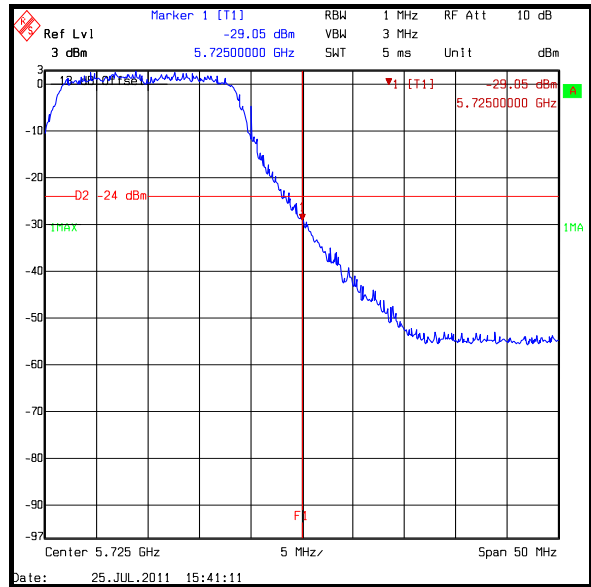


**Upper Band Edge Average Measurement /
19.5 Mbps**

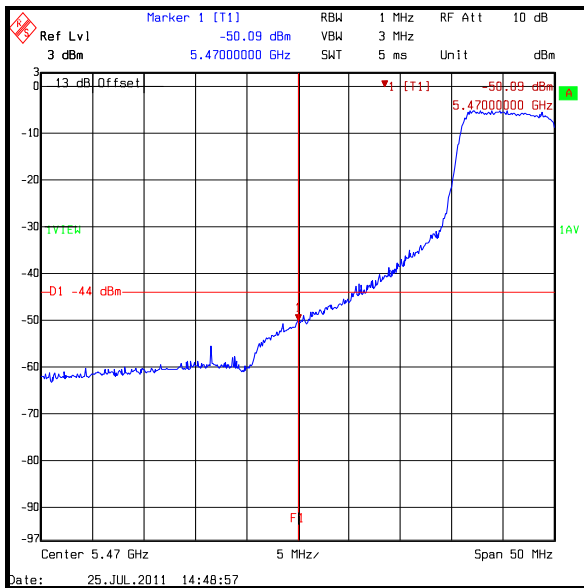
Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna (continued)



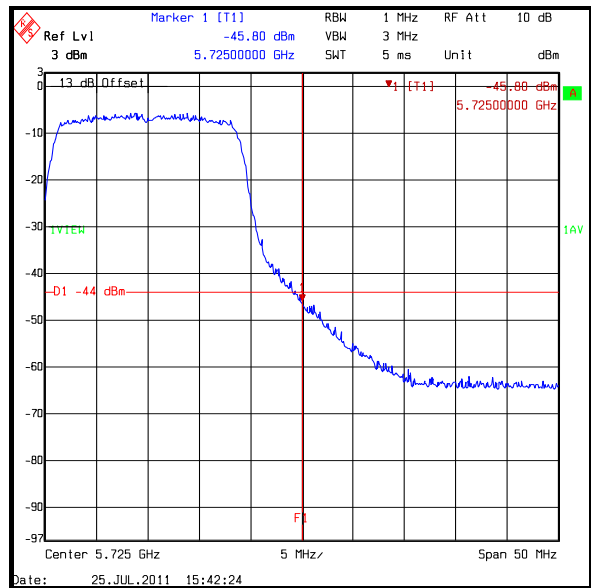
Lower Band Edge Peak Measurement / 39 Mbps



Upper Band Edge Peak Measurement / 39 Mbps

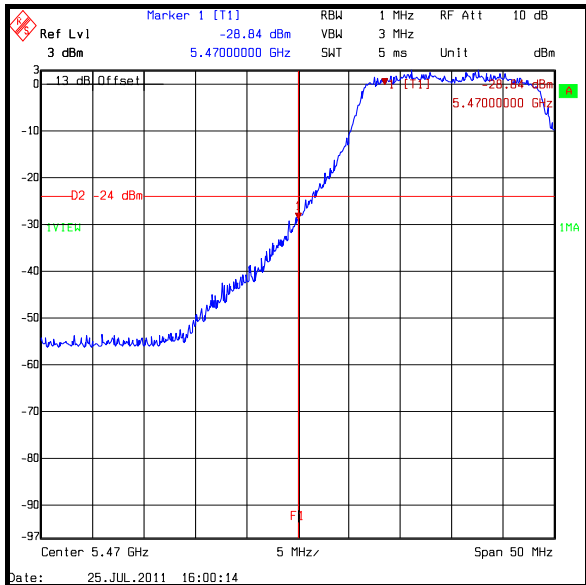


Lower Band Edge Average Measurement / 39 Mbps

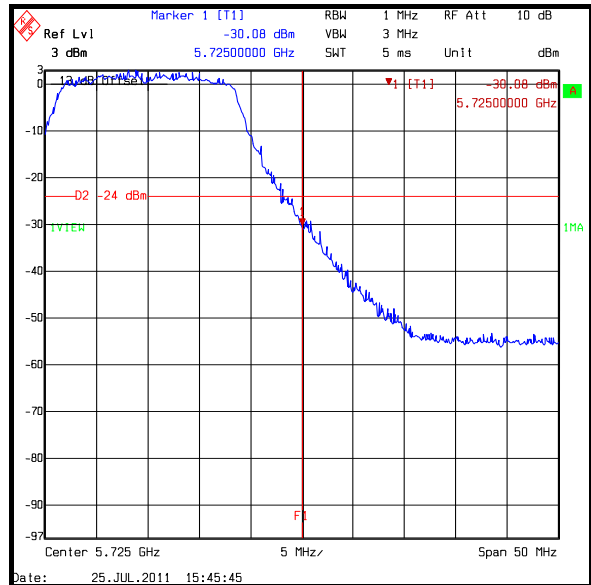


Upper Band Edge Average Measurement / 39 Mbps

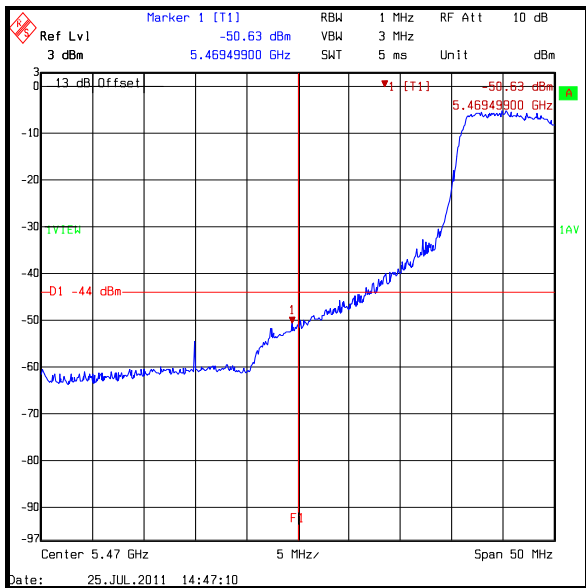
**Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)**



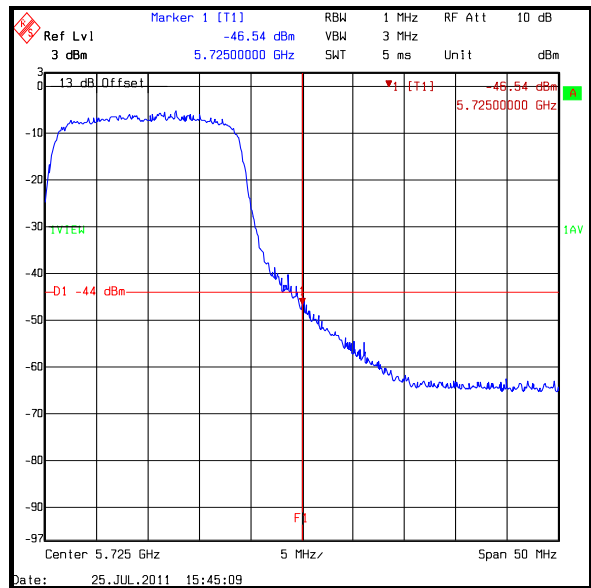
Lower Band Edge Peak Measurement / 64 Mbps



Upper Band Edge Peak Measurement / 64 Mbps



Lower Band Edge Average Measurement / 64 Mbps



Upper Band Edge Average Measurement / 64 Mbps

Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)

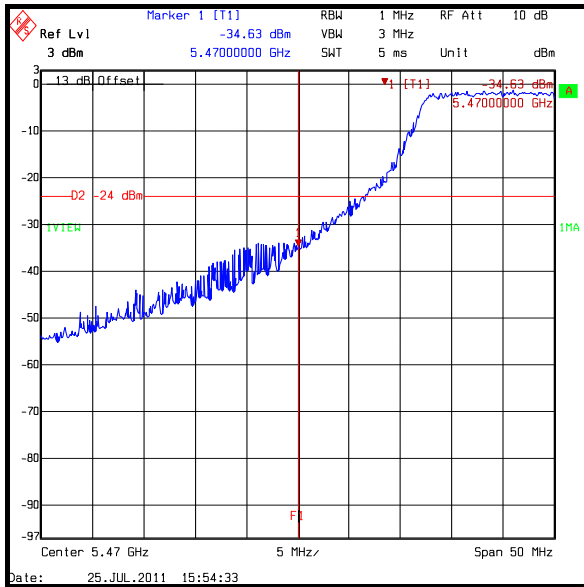
Results: Peak Detector / 40 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5500	BPSK	13.5	-34.6	-24.0	10.6	Complied
5695	BPSK	13.5	-33.9	-24.0	9.9	Complied
5500	QPSK	40.5	-35.9	-24.0	11.9	Complied
5695	QPSK	40.5	-35.8	-24.0	11.8	Complied
5500	16QAM	81	-35.2	-24.0	11.2	Complied
5695	16QAM	81	-35.2	-24.0	11.2	Complied
5500	64QAM	135	-34.0	-24.0	10.0	Complied
5695	64QAM	135	-35.4	-24.0	11.4	Complied

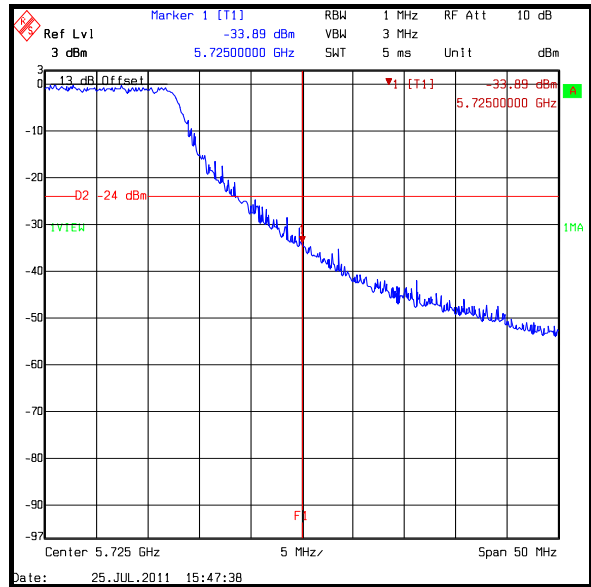
Results: Average Detector / 40 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5500	BPSK	13.5	-47.4	-44.0	3.4	Complied
5695	BPSK	13.5	-48.7	-44.0	4.7	Complied
5500	QPSK	40.5	-47.5	-44.0	3.5	Complied
5695	QPSK	40.5	-48.4	-44.0	4.4	Complied
5500	16QAM	81	-50.8	-44.0	6.8	Complied
5695	16QAM	81	-49.2	-44.0	5.2	Complied
5500	64QAM	135	-50.1	-44.0	6.1	Complied
5695	64QAM	135	-48.3	-44.0	4.3	Complied

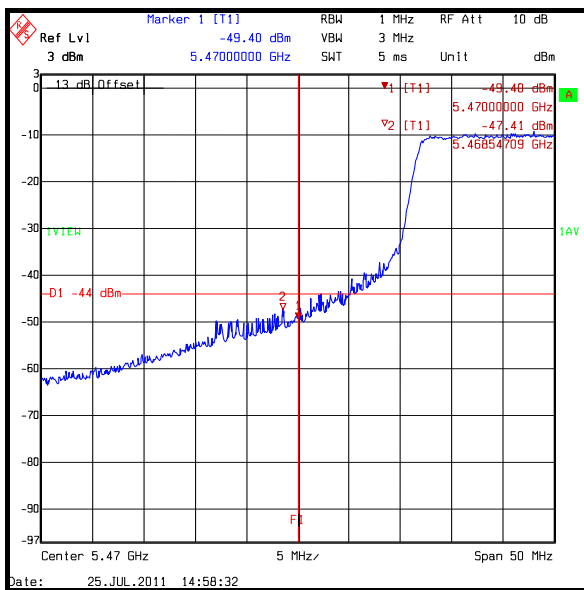
**Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)**



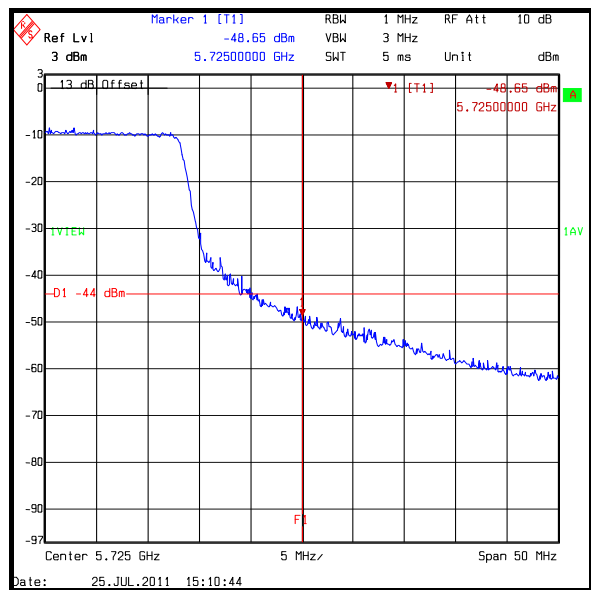
**Lower Band Edge Peak Measurement
802.11n/13.5Mbps**



**Upper Band Edge Peak Measurement
802.11n/13.5Mbps**

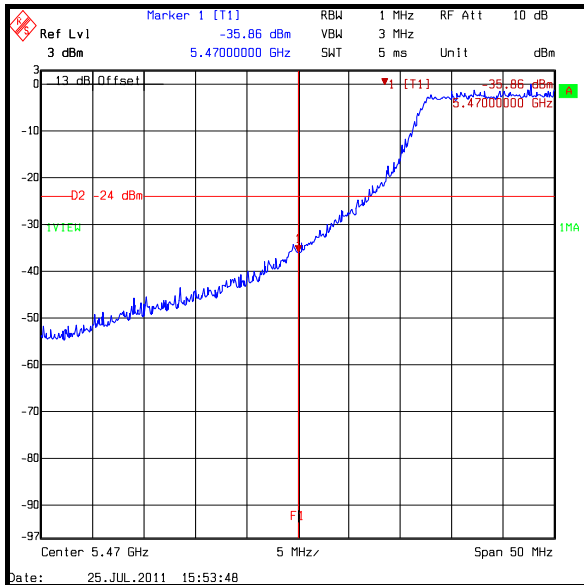


**Lower Band Edge Average Measurement
802.11n/13.5Mbps**

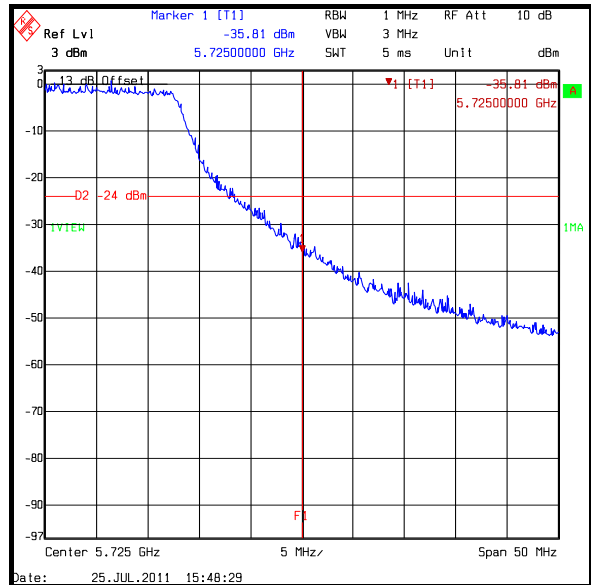


**Upper Band Edge Average Measurement
802.11n/13.5Mbps**

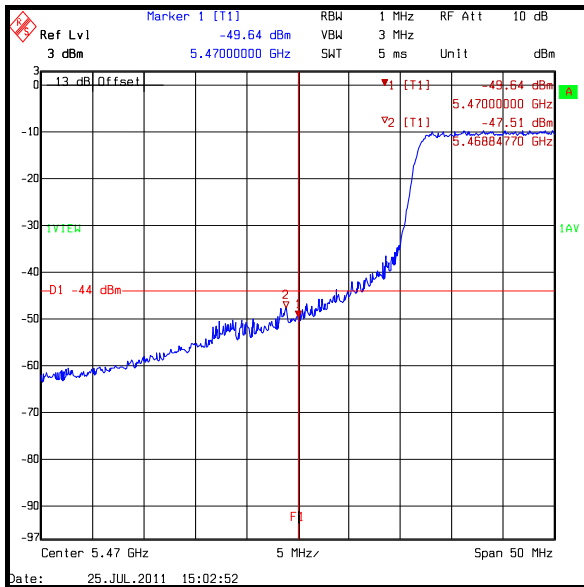
**Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)**



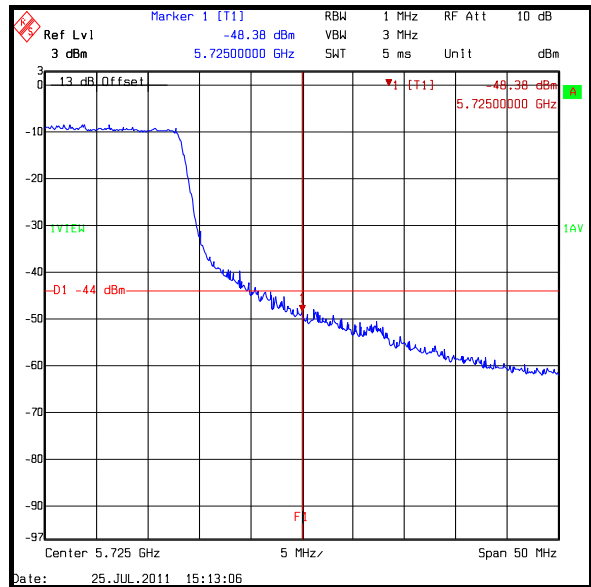
**Lower Band Edge Peak Measurement
802.11n/40.5Mbps**



**Upper Band Edge Peak Measurement
802.11n/40.5Mbps**

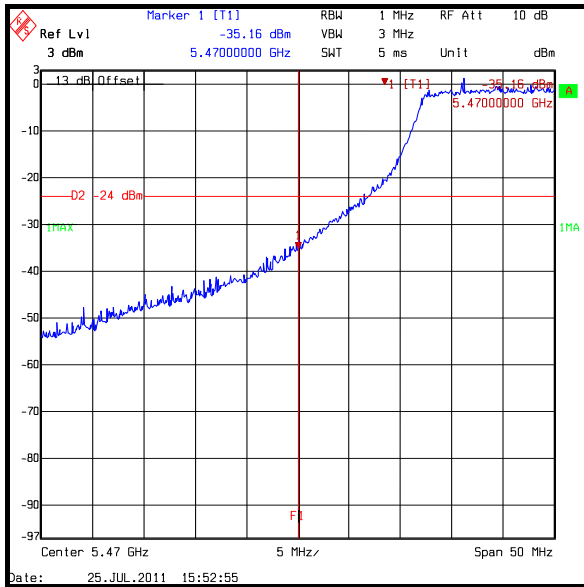


**Lower Band Edge Average Measurement
802.11n/40.5Mbps**

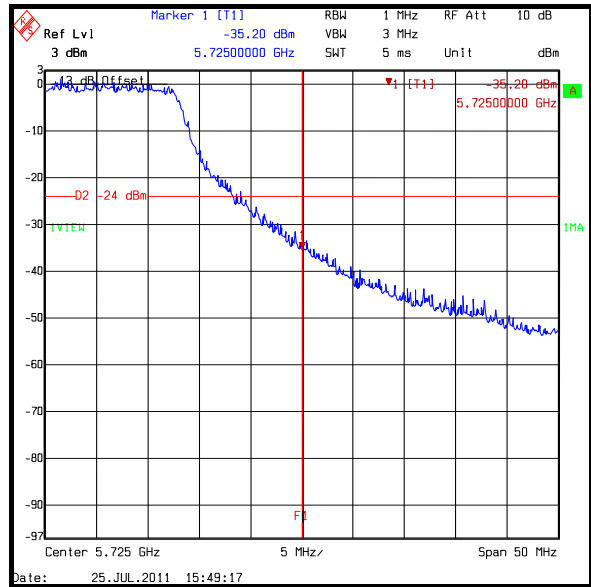


**Upper Band Edge Average Measurement
802.11n/40.5Mbps**

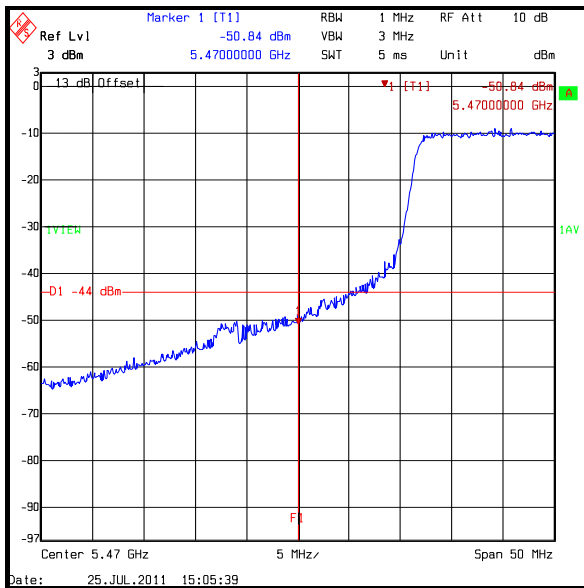
**Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)**



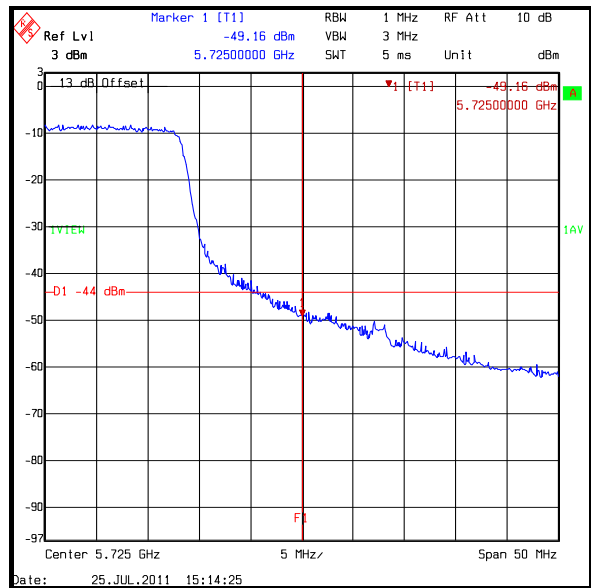
Lower Band Edge Peak Measurement / 81 Mbps



Upper Band Edge Peak Measurement / 81 Mbps

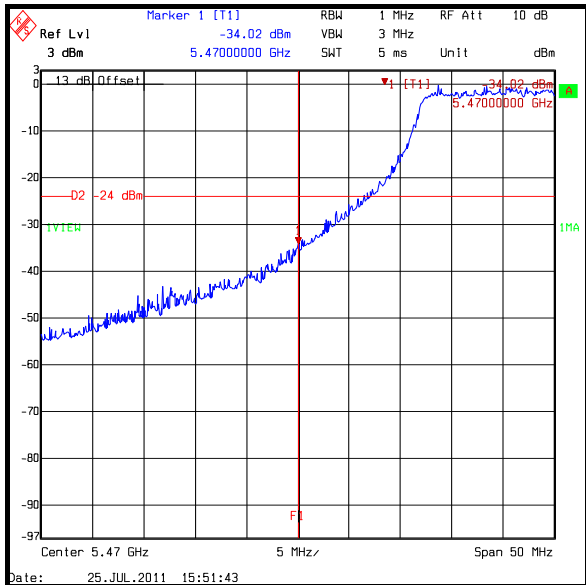


Lower Band Edge Average Measurement / 81 Mbps

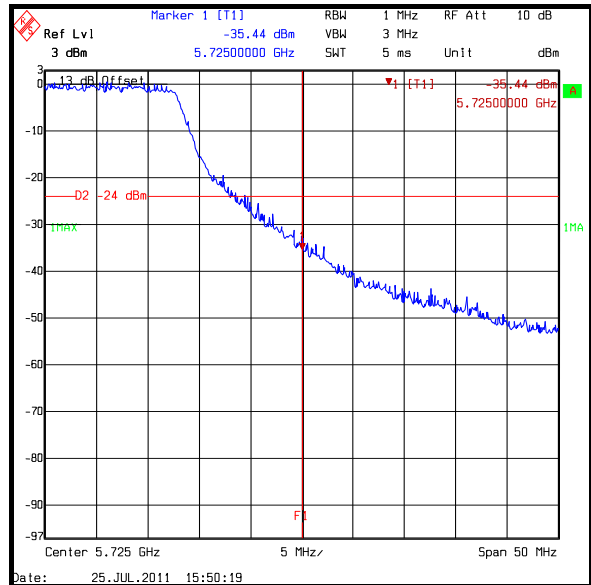


Upper Band Edge Average Measurement / 81 Mbps

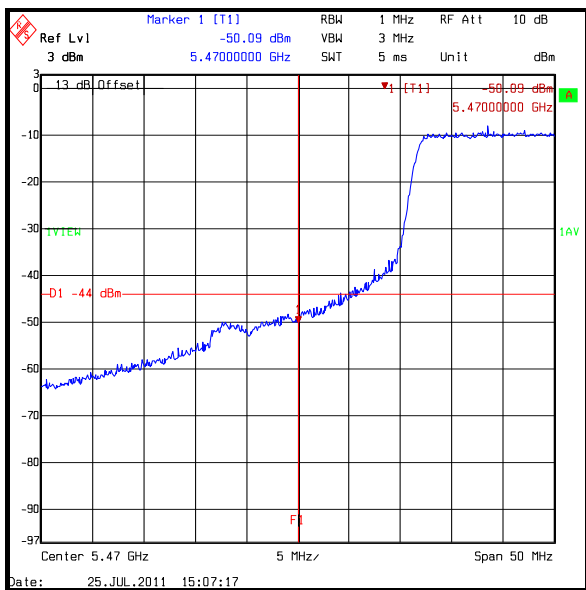
**Transmitter Band Edge Conducted Emissions with +23 dBi gain integral antenna
(continued)**



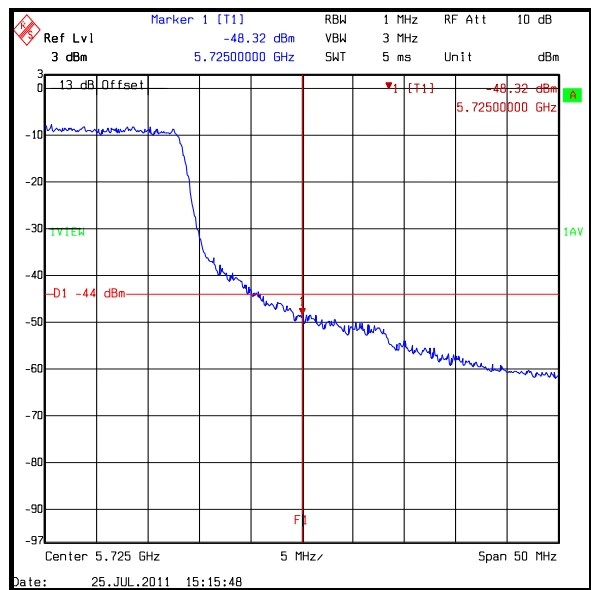
Lower Band Edge Peak Measurement / 135 Mbps



Upper Band Edge Peak Measurement / 135 Mbps



Lower Band Edge Average Measurement / 135 Mbps



Upper Band Edge Average Measurement / 135 Mbps

Note(s):

1. Pre-scans were performed on the V antenna port only as the H antenna port is electrically identical. The H port was spot checked to verify this.
2. -27dBm/MHz is the EIRP limit assuming a 0 dBi gain antenna. The declared antenna gain is 23 dBi and 6 dBi is the allowed antenna gain before conducted power requires reduction. The limit was therefore calculated as $-27 \text{ dBm} - 23 \text{ dBi} + 6 \text{ dBi} = -44 \text{ dBm/MHz}$

Limit:

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

5.2.14. Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	25 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC/IC Part:	15.407(b)(3) and RSS-Gen 4.9 / RSS-210 A9.2(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2 referencing FCC Part 15.407(b)(5) and 15.407(b)(7)

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	25

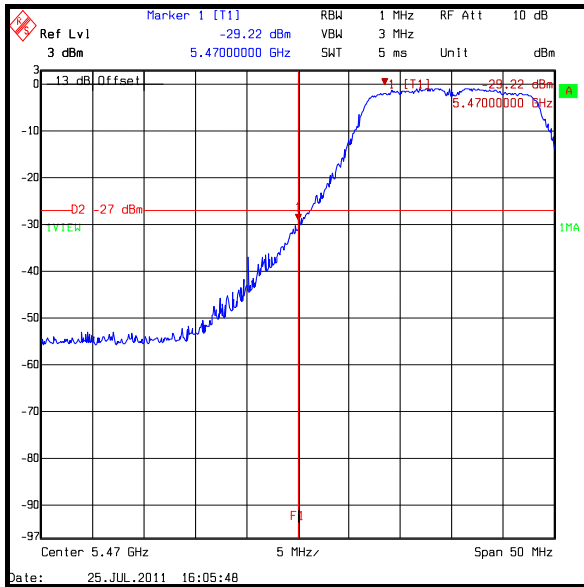
Results: Peak Detector / 20 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5485	BPSK	6.5	-29.2	-27.0	2.2	Complied
5710	BPSK	6.5	-33.0	-27.0	6.0	Complied
5485	QPSK	19.5	-31.7	-27.0	4.7	Complied
5710	QPSK	19.5	-33.6	-27.0	6.6	Complied
5485	16QAM	39	-32.1	-27.0	5.1	Complied
5710	16QAM	39	-33.0	-27.0	6.0	Complied
5485	64QAM	65	-32.5	-27.0	5.5	Complied
5710	64QAM	65	-32.2	-27.0	5.2	Complied

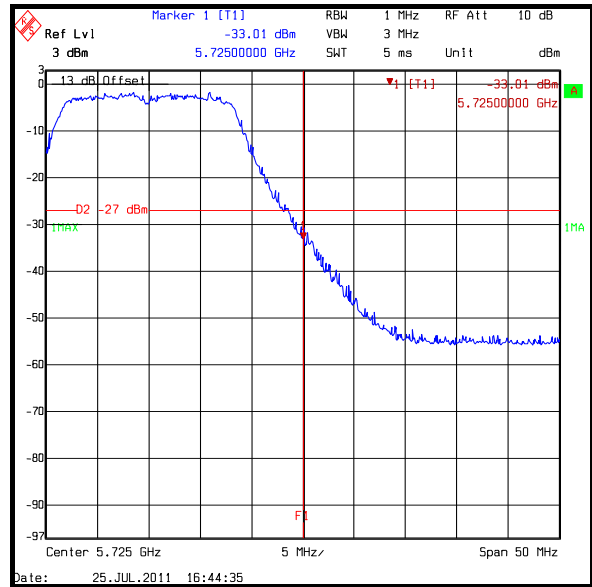
Results: Average Detector / 20 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5485	BPSK	6.5	-47.4	-47.0	0.4	Complied
5710	BPSK	6.5	-51.6	-47.0	4.6	Complied
5485	QPSK	19.5	-48.7	-47.0	1.7	Complied
5710	QPSK	19.5	-51.1	-47.0	4.1	Complied
5485	16QAM	39	-47.7	-47.0	0.7	Complied
5710	16QAM	39	-50.7	-47.0	3.7	Complied
5485	64QAM	65	-48.7	-47.0	1.7	Complied
5710	64QAM	65	-51.4	-47.0	4.4	Complied

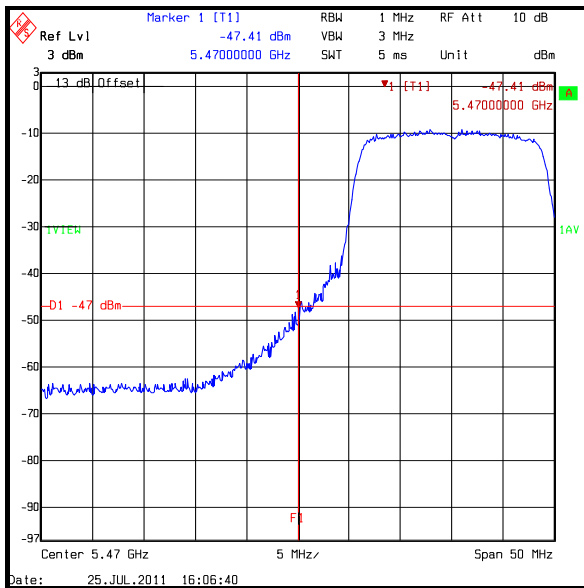
**Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)**



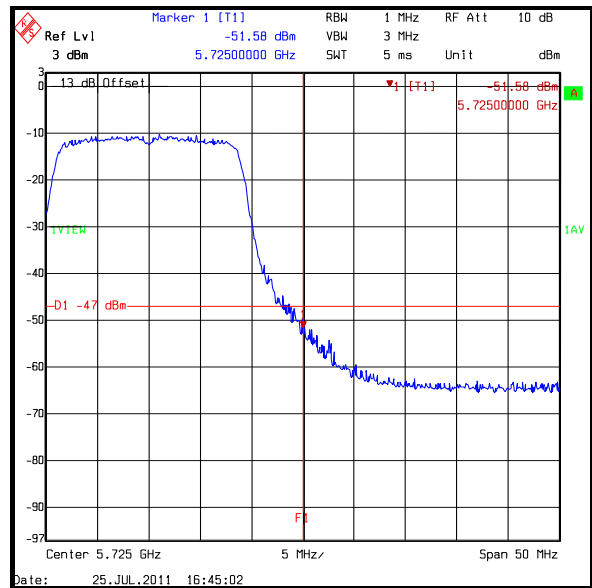
Lower Band Edge Peak Measurement / 6.5 Mbps



Upper Band Edge Peak Measurement / 6.5 Mbps

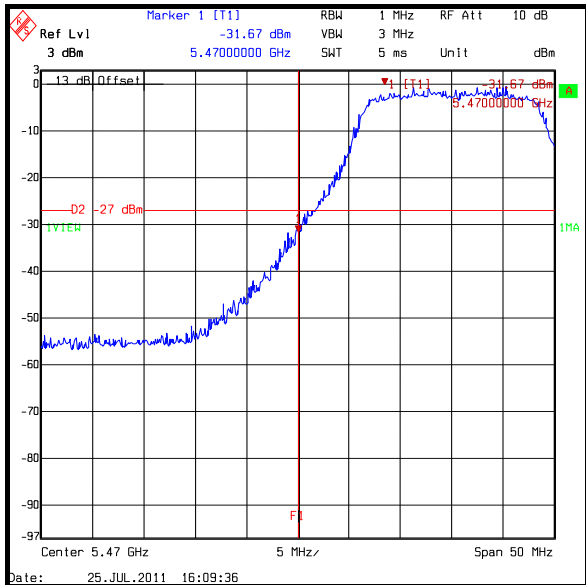


Lower Band Edge Average Measurement / 6.5 Mbps

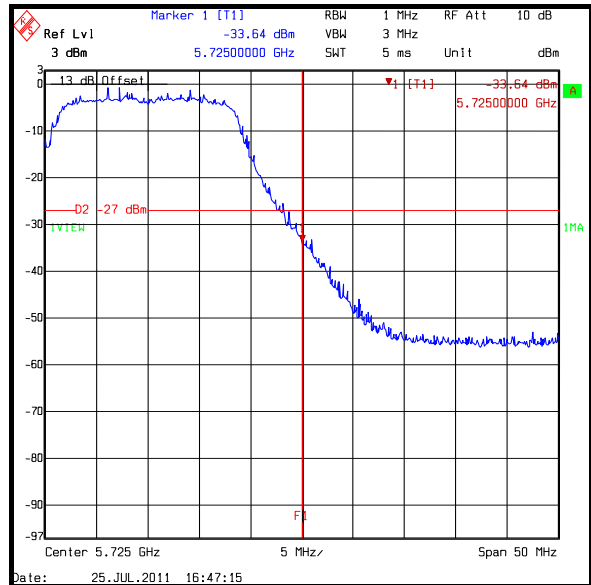


Upper Band Edge Average Measurement / 6.5 Mbps

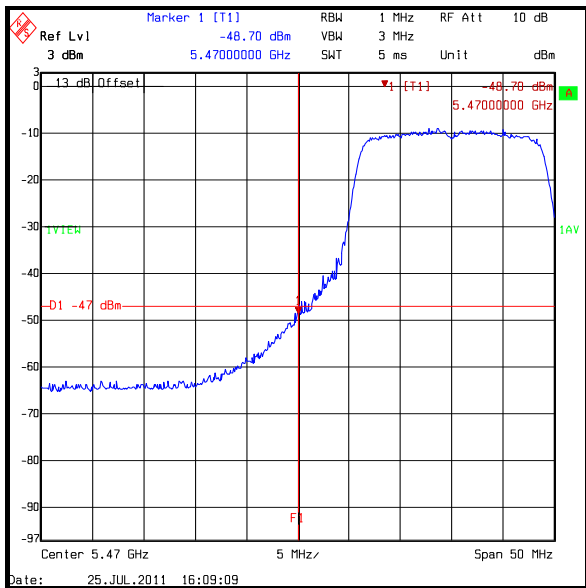
**Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)**



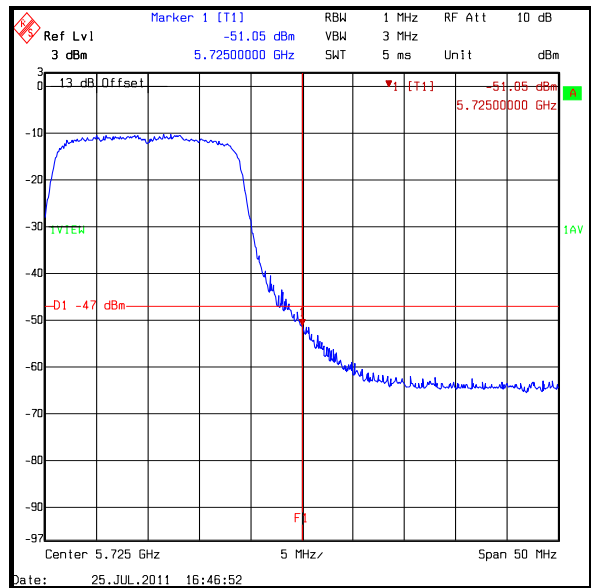
Lower Band Edge Peak Measurement / 19.5 Mbps



Upper Band Edge Peak Measurement / 19.5 Mbps

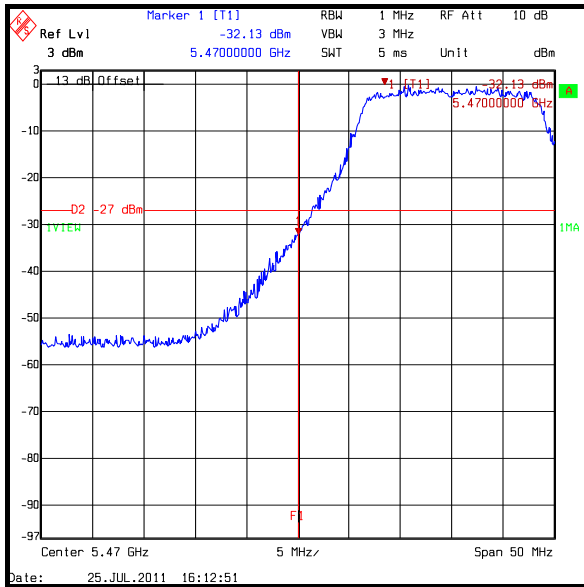


**Lower Band Edge Average Measurement /
19.5 Mbps**

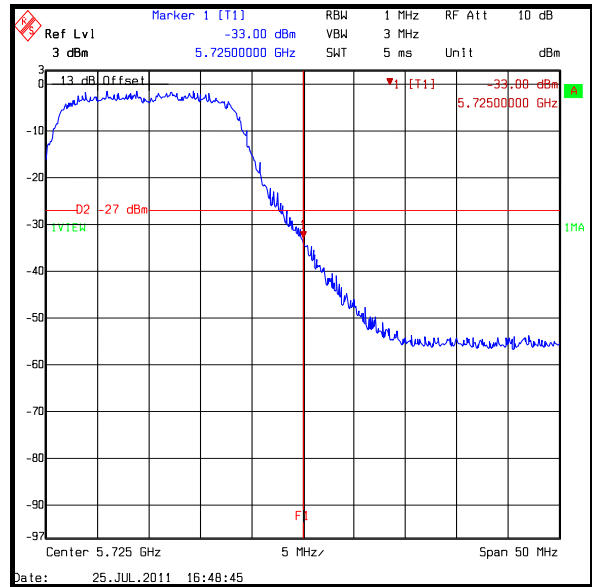


**Upper Band Edge Average Measurement /
19.5 Mbps**

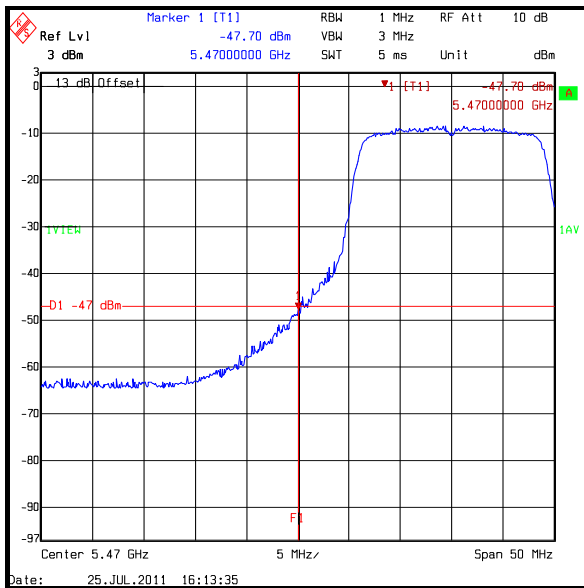
**Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)**



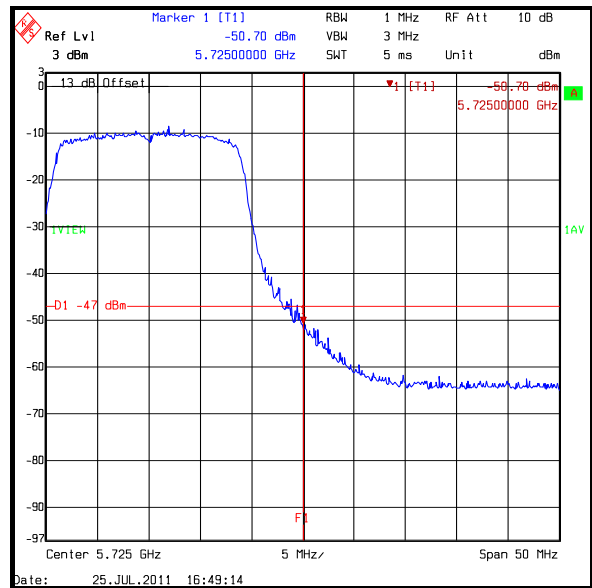
Lower Band Edge Peak Measurement / 39 Mbps



Upper Band Edge Peak Measurement / 39 Mbps

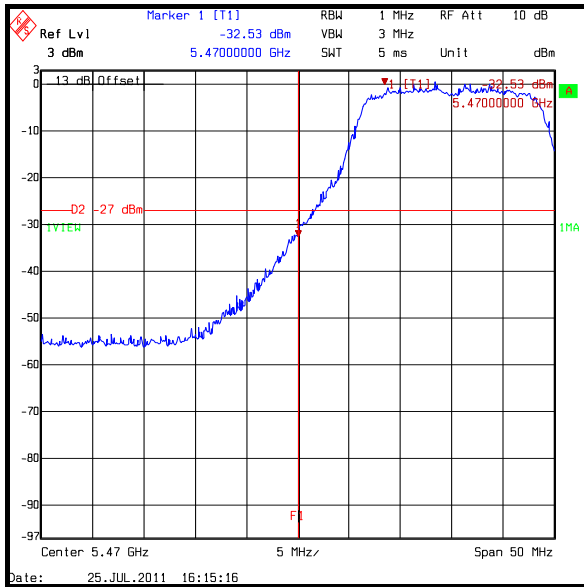


Lower Band Edge Average Measurement / 39 Mbps

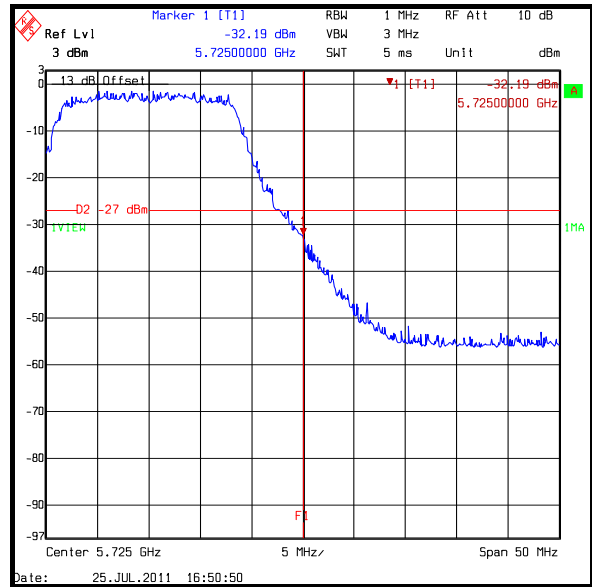


Upper Band Edge Average Measurement / 39 Mbps

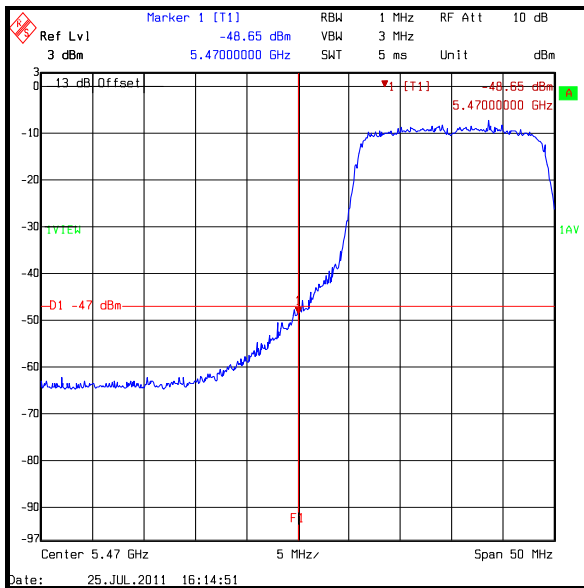
**Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)**



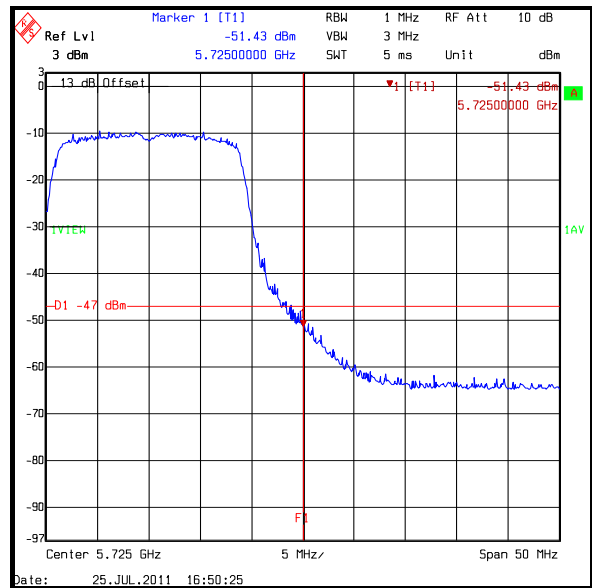
Lower Band Edge Peak Measurement / 64 Mbps



Upper Band Edge Peak Measurement / 64 Mbps



Lower Band Edge Average Measurement / 64 Mbps



Upper Band Edge Average Measurement / 64 Mbps

Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)

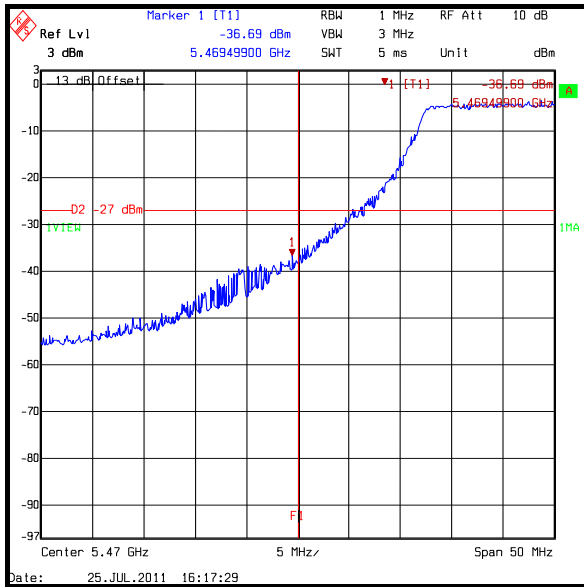
Results: Peak Detector / 40 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5500	BPSK	13.5	-36.7	-27.0	9.7	Complied
5695	BPSK	13.5	-39.4	-27.0	12.4	Complied
5500	QPSK	40.5	-38.1	-27.0	11.1	Complied
5695	QPSK	40.5	-38.6	-27.0	11.6	Complied
5500	16QAM	81	-37.2	-27.0	10.2	Complied
5695	16QAM	81	-36.5	-27.0	9.5	Complied
5500	64QAM	135	-37.0	-27.0	10.0	Complied
5695	64QAM	135	-38.4	-27.0	11.4	Complied

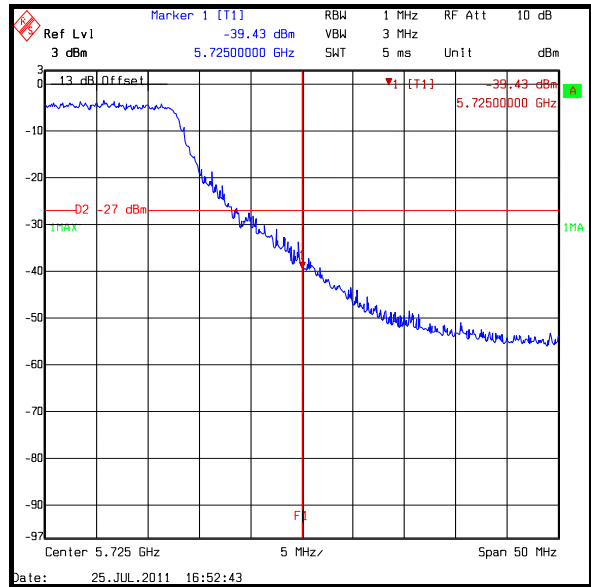
Results: Average Detector / 20 MHz

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5500	BPSK	13.5	-52.1	-47.0	5.1	Complied
5695	BPSK	13.5	-53.6	-47.0	6.6	Complied
5500	QPSK	40.5	-54.3	-47.0	7.3	Complied
5695	QPSK	40.5	-54.2	-47.0	7.2	Complied
5500	16QAM	81	-53.7	-47.0	6.7	Complied
5695	16QAM	81	-54.3	-47.0	7.3	Complied
5500	64QAM	135	-53.3	-47.0	6.3	Complied
5695	64QAM	135	-53.9	-47.0	6.9	Complied

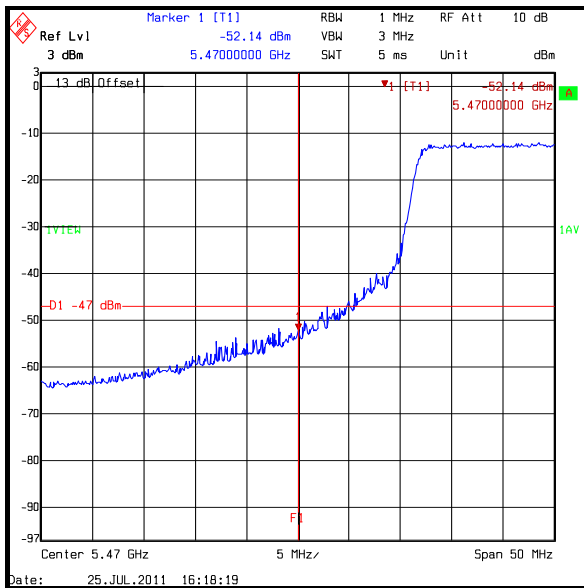
**Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)**



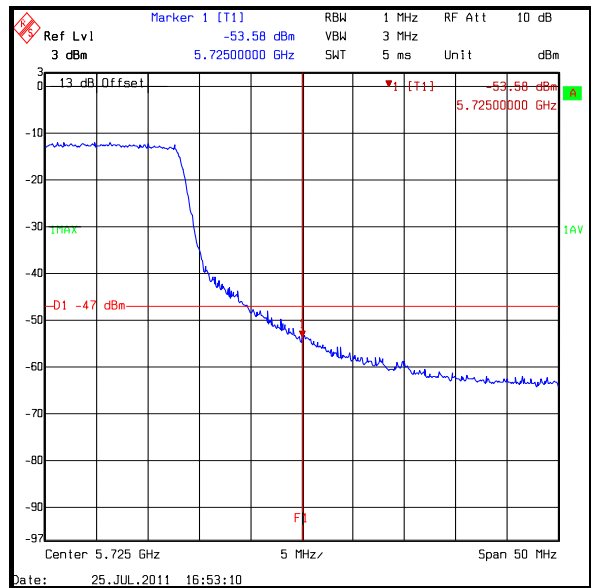
Lower Band Edge Peak Measurement / 13.5 Mbps



Upper Band Edge Peak Measurement / 13.5 Mbps

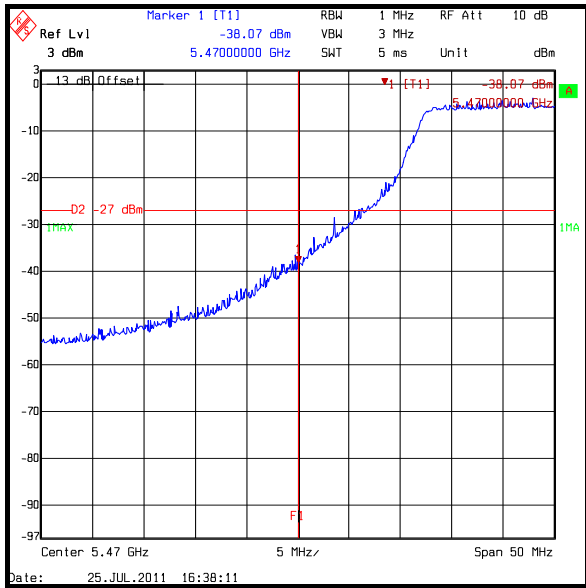


Lower Band Edge Average Measurement / 13.5 Mbps

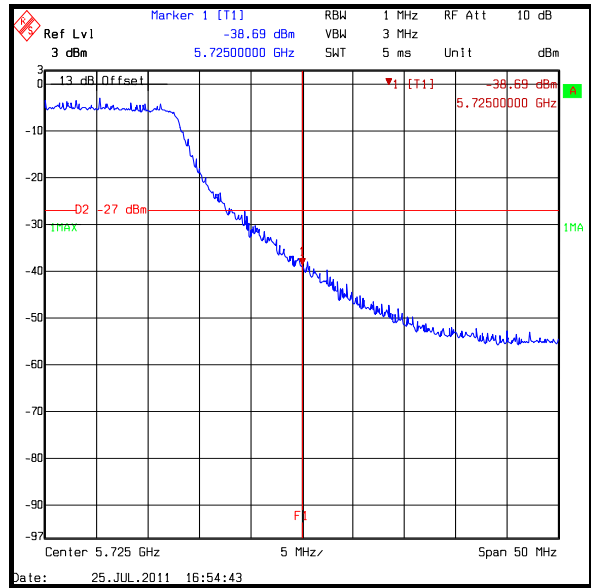


Upper Band Edge Average Measurement / 13.5 Mbps

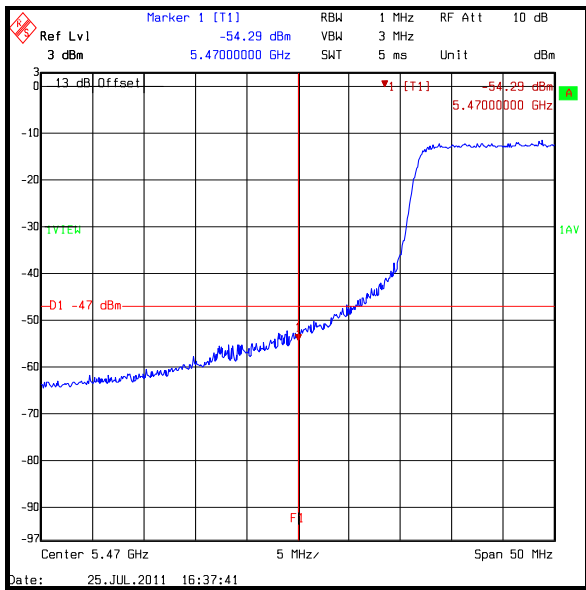
**Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)**



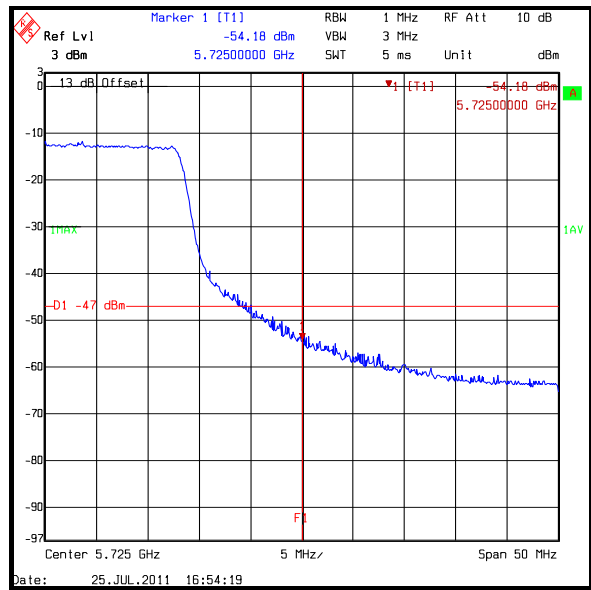
Lower Band Edge Peak Measurement / 40.5 Mbps



Upper Band Edge Peak Measurement / 40.5 Mbps

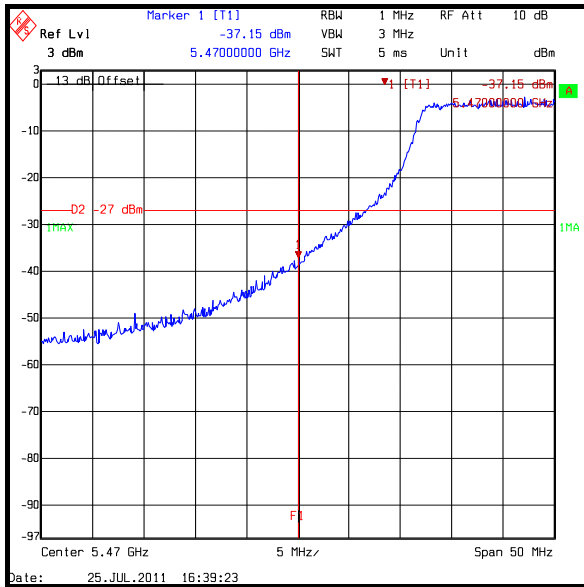


**Lower Band Edge Average Measurement /
40.5 Mbps**

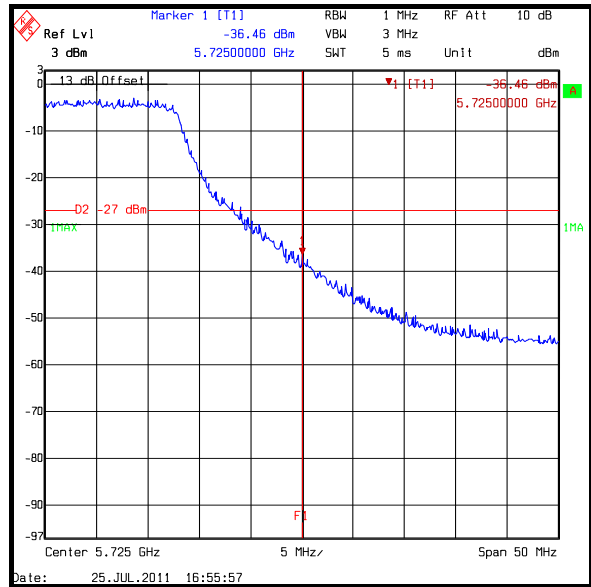


**Upper Band Edge Average Measurement /
40.5 Mbps**

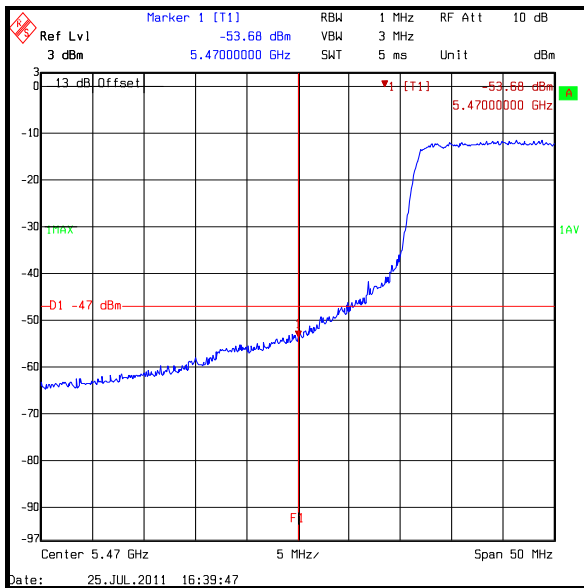
**Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna
(continued)**



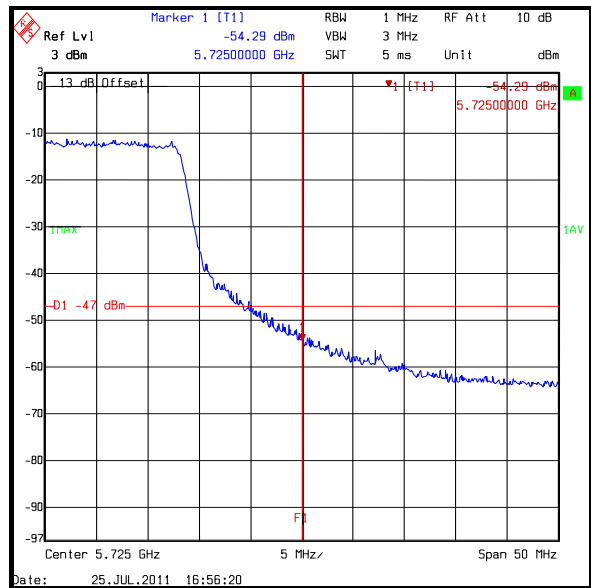
Lower Band Edge Peak Measurement / 81 Mbps



Upper Band Edge Peak Measurement / 81 Mbps

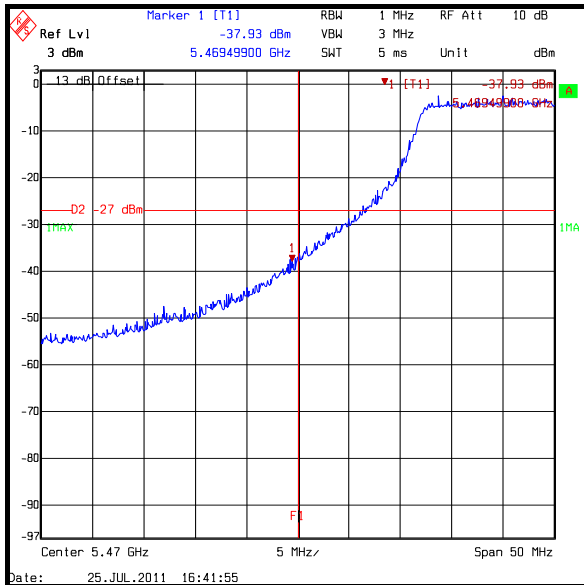


Lower Band Edge Average Measurement / 81 Mbps

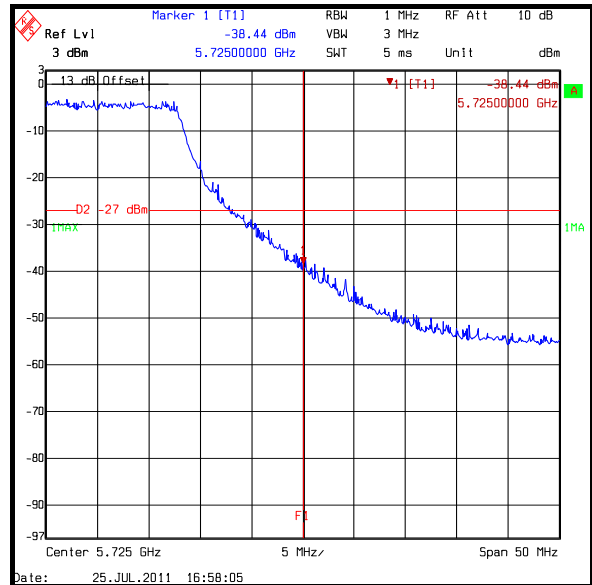


Upper Band Edge Average Measurement / 81 Mbps

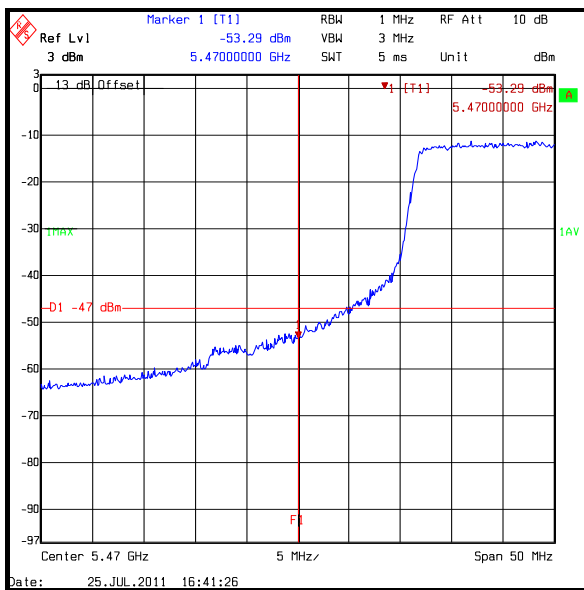
Transmitter Band Edge Conducted Emissions with +26 dBi gain external antenna (continued)



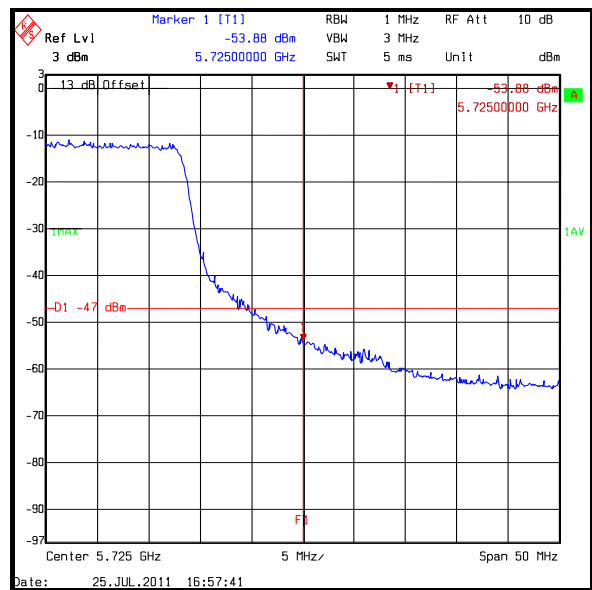
Lower Band Edge Peak Measurement / 135 Mbps



Upper Band Edge Peak Measurement / 135 Mbps



Lower Band Edge Average Measurement / 135 Mbps



Upper Band Edge Average Measurement / 135 Mbps

Note(s):

1. Prescans were performed on the V antenna port only as the H antenna port is electrically identical. The H port was spot checked to verify this.
2. -27dBm/MHz is the EIRP limit assuming a 0 dBi gain antenna. The declared antenna gain is 26 dBi and 6 dBi is the allowed antenna gain before conducted power requires reduction. The limit was therefore calculated as $-27 \text{ dBm} - 26 \text{ dBi} + 6 \text{ dBi} = -47 \text{ dBm/MHz}$. The peak limit is 20 dB higher than the average limit (-27 dBm).

Limit:

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

5.2.15. Transmit Power Control (TPC)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	25 July 2011
Test Sample Serial No:	00:04:56:41:92:20		

FCC/IC Part:	15.407(h)(1)
Test Method Used:	Refer to Test Method below

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	25

Test Method

No formal test method is suggested. Testing was undertaken to confirm TPC operation to meet the limit within the limitations of TPC as implemented by this device.

The EUT was seen to lower its power level of transmission during periods of no attenuation and dynamically raise its power as attenuation was applied and its received signal was degraded.

A variable attenuator was used to vary the amount of received signal the master EUT was receiving from the slave transmitter.

The EUT was able to be set to power levels of 6 dB less than the two power levels under consideration of '4.0dBm mode' and '1.0dBm mode'.

Results:

1. A TPC mechanism was verified as being implemented.
2. The 6 dB power range performance was verified on a calibrated spectrum analyser.

Note(s):

1. The system has an e.i.r.p. of > 500 mW and therefore a TPC mechanism was required.

Limits:

Transmit Power Control (TPC). UNII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The UNII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

6. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Radiated Maximum Peak Output Power	5470 to 5725 MHz	95%	±2.94 dB
Conducted Maximum Peak Output Power	5470 to 5725 MHz	95%	±0.27 dB
Spectral Power Density	5470 to 5725 MHz	95%	±2.94 dB
26 dB & 99% Bandwidth	5470 to 5725 MHz	95%	±0.92 ppm
Conducted Spurious Emissions	5 GHz to 6 GHz	95%	±0.27 dB
Radiated Spurious Emissions	30 MHz to 40 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002	02 Jun 2012	12
A1391	Attenuator	Huber & Suhner	757987	6810.17.B	09 Feb 2012	12
A1393	Attenuator	Huber & Suhner	757456	6820.17.B	08 Jul 2012	12
A1785	LNA	Farran	FLNA-28-30	FTL 6483	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1829	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100671	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	26 Jul 2012	12
A1997	Attenuator	Huber & Suhner	6810.17.B	301749	09 Feb 2012	12
A203	Antenna	Flann	22240-20	343	11 May 2013	36
A253	Antenna	Flann	12240-20	128	05 Sep 2011	12
A254	Antenna	Flann	14240-20	139	05 Sep 2011	12
A255	Antenna	Flann	16240-20	519	05 Sep 2011	12
A256	Antenna	Flann	18240-20	400	05 Sep 2011	12
A366	Isolator	MRI	FRR-400	169	Calibrated before use	-
A436	Antenna	Flann	20240-20	330	05 Sep 2011	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	05 Apr 2012	12
G0543	Amplifier	Sonoma	310N	230801	Calibrated before use	-
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
M1021	Signal Generator	Rohde & Schwarz	SMP02	833286/004	01 Dec 2011	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	29 Jun 2012	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	03 Dec 2011	12
M1267	Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	100155	17 May 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12

NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.