



TEST REPORT

Test Report No. : UL-RPT-RP93037JD22A V2.0

Manufacturer : Cambium Networks Ltd
Model No. : PTP 50650 Integrated ODU
PTP 50650 Connectorized ODU
FCC ID : QWP-50650
Test Standard(s) : FCC Parts 15.209(a), 15.403(i) & 15.407

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2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 2.0 supersedes all previous versions.

Date of Issue: 10 June 2014

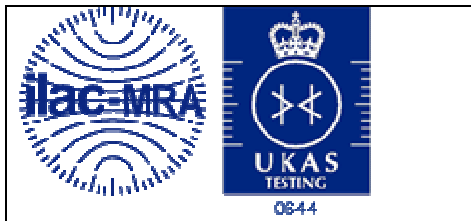
Checked by:

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Engineer, Radio Laboratory

Issued by :

pp

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UL VS LTD



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

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1. Customer Information








Company Name:	Cambium Networks Ltd
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:	47CFR15.403 and 47CFR15.407
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart E (Unlicensed National Information Infrastructure Devices) – Sections 15.403 and 15.407
Specification Reference:	47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.209
Site Registration:	FCC: 209735
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	19 May 2014 to 02 June 2014

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.403(i)	Transmitter 26 dB Emission Bandwidth	
Part 15.407(a)(1)	Transmitter Maximum Conducted Output Power	
Part 15.407(a)(1)	Transmitter Maximum Power Spectral Density	
Part 15.407(b)(1)/ 15.209(a)	Transmitter Out of Band Radiated Emissions	
Part 15.407(b)(1)/ 15.209(a)	Transmitter Band Edge Radiated Emissions	
Part 15.407(g)	Transmitter Frequency Stability (Temperature & Voltage Variation)	Note 1
Key to Results  = Complied  = Did not comply		

Note(s):

1. Frequency stability is better than 10 ppm, which ensures that the signal remains in the allocated bands under all operational conditions stated in the user manual.

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
Reference:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v01, June 6 2014
Title:	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E

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 specifications identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Cambium Networks Ltd
Model Name or Number:	PTP50650 Connectorized ODU
Hardware Version:	Production Revision 4
Software Version:	50650-G7-B1477
Serial Number:	0004565017A7
FCC ID:	QWP-50650

Brand Name:	Cambium Networks Ltd
Model Name or Number:	PTP50650 Connectorized ODU
Hardware Version:	Production Revision 4
Software Version:	50650-G7-B1477
Serial Number:	0004565000C2
FCC ID:	QWP-50650

3.2. Description of EUT

The Equipment Under Test was a fixed radio transceiver operating in the 5150-5250 MHz band. The EUT is available in two configurations:

1. Connectorised with two external antenna ports. Cambium Part No. C050065B002A.
2. Integrated flat plate antenna. Cambium Part No. C050065B001A (23 dBi antenna version) / Cambium Part No. C050065B015A (19 dBi antenna version) .

Power is provided by a PoE supply.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:		Unlicensed National Information Infrastructure (U-NII)				
Type of Unit:		Microwave fixed radio link transceiver				
Modes/Modulation:		ACQ, BPSK, QPSK, 16QAM, 64QAM, 256QAM				
Power Supply Requirement(s):		Nominal	PoE supply input 120 VAC 60 Hz. PoE output 48 VDC.			
Maximum Conducted Output Power:		18.8 dBm (when used in conjunction with 4' parabolic antenna)				
Frequency Range:		5150 MHz to 5250 MHz / Parabolic Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest High Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest High Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5156	5193	5200	5247	5247
	10	5158	5162	5200	5245	5245
	15	5161	5171	5200	5242	5242
	20	5162	5176	5200	5240	5240
	30	5168	5185	5200	5235	5235
	40	5172	5191	5200	5230	5230
	45	5176	5191	5200	5225	5225

Frequency Range:		5150 MHz to 5250 MHz / Flat Plate Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest High Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest High Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5156	5157	5200	5247	5247
	10	5158	5164	5200	5245	5245
	15	5161	5169	5200	5242	5242
	20	5162	5175	5200	5420	5240
	30	5168	5187	5200	5235	5235
	40	5172	5200	5200	5230	5230
	45	5176	5205	5205	5225	5225

Additional Information Related to Testing (continued)

Frequency Range:		5150 MHz to 5250 MHz / Sectorised Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest High Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest High Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5156	5156	5200	5247	5247
	10	5158	5158	5200	5245	5245
	15	5161	5161	5200	5242	5242
	20	5162	5162	5200	5240	5240
	30	5168	5168	5200	5235	5235
	40	5172	5172	5200	5230	5230
	45	5176	5176	5200	5225	5225

Frequency Range:		5150 MHz to 5250 MHz / Omnidirectional Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest High Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest High Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5156	5156	5200	5247	5247
	10	5158	5158	5200	5245	5245
	15	5161	5161	5200	5242	5242
	20	5162	5162	5200	5240	5240
	30	5168	5168	5200	5235	5235
	40	5172	5172	5200	5230	5230
	45	5176	5176	5200	5225	5225

Note(s):

The EUT is unable to operate at full power and remain compliant on some lower, mid and upper channels. Power has been reduced on some channels. 'Lowest High Pwr. Channel' and 'Highest High Pwr. Channel' in the tables above show the lowest and highest channel frequencies that the EUT can operate at full power and remain compliant. Power settings used for testing are shown in Section 4.2 of this test report.

3.5. Support Equipment

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

Description:	Dual Polarised Plate Antenna
Brand Name:	MARS
Model Name or Number:	MA-WS54-50R
Serial Number:	5010

Description:	4 ft Parabolic Dual Polarised Antenna
Brand Name:	Andrews
Model Name or Number:	PX4F-52-N7A/A
Serial Number:	13US460418309

Description:	Sectorised antenna (17 dBi Gain). Dual Polarised
Brand Name:	Laird Technologies
Model Name or Number:	ANT, AP Sector, VER&HOR POL, 5.4-6.0GHZ, 65 DEG 17 dBi
Serial Number:	0512120160

Description:	Omnidirectional antenna (13 dBi Gain). Dual Polarised Antenna
Brand Name:	KP Performance Antennas
Model Name or Number:	KPPA-5.7-DPOMA
Serial Number:	Not marked or stated

Description:	1 metre RF cable N male–N male (Quantity 2)
Brand Name:	Times Microwave Systems
Model Name or Number:	LMR-200
Serial Number:	Not marked or stated

Description:	PoE Power supply
Brand Name:	Cambium Networks
Model Name or Number:	E100109B G
Serial Number:	1330005291

3.6. Antenna

The table below lists the antennas that the manufacturer intends to use with this product when operating in the 5150-5250 band:

Type	Stated Gain (dBi)	Manufacturer	Antenna Name	Used for Testing	Note
Dual polarised plate	19.0	MARS	MA-EM56-DP-19CM	-	1
Dual polarised plate	23.0	MARS	MA-WS54-50R	X	-
4 ft Parabolic Dual Polarised	34.5	Andrews	PX4F-52-N7A/A	X	2
60° Sectorised	17.0	Laird	ANT, AP Sector	X	2
90° Sectorised	17.0	Laird	ANT, AP Sector	-	1
Omnidirectional	13.0	KP	KPPA-5.7-DPOMA	X	2,3

X = This antenna was used for testing purposes

Note(s):

1. This antenna has the same gain or less gain and is of the same type as the antenna that was tested. Therefore it was not tested.
2. Used in conjunction with two 1 metre RF cables having an individual insertion loss of 1.5 dB across the operating bands.
3. This antenna has the lowest gain.

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Continuously transmitting at maximum power with >99% duty cycle in test mode on the required channels as required using the supported modulation types and Acquisition (ACQ) mode.

4.2. Configuration and Peripherals

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

- A laptop PC was used to configure the EUT via the PoE power supply and Ethernet cables.
- Radiated spurious emissions tests. The antenna and ODU under test were mounted on a metal or plastic pole using the supplied mounting hardware in a typical user configuration. The antenna was positioned so that the centre point was at a height of 1.5 metres above the test chamber floor. The EUT was positioned as close to 1.5 metres above the test chamber floor as the antenna mounting brackets allowed. The supplied one metre RF cables were used to connect the EUT to the antenna.
- Power settings used are as shown on the following pages of this section.
- No receiver or idle mode tests were performed as the EUT constantly transmits and receives. It does not have a dedicated receive or idle mode.
- DC Power was provided through a PoE supply. The input to the power supply was connected to a 120 VAC 60 Hz single phase supply.

Power settings used during testing

'LCF' in the tables below indicates the power setting on the lowest channels. 'Mid Ch' in the tables below indicates the power setting on the middle channels. 'HCF' indicates the power setting on the highest channels. Corresponding channel frequencies are shown in Section 3.4 of this report.

Power Settings Used For Testing / 4' Parabolic Antenna

The tables below show the EUT power settings that were used during testing for each channel bandwidth and modulation type when the EUT was tested with the parabolic antenna.

Ch. BW	BPSK			QPSK			16QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	4	13	13	4	13	13	4	13	13
10	3	13	16	3	13	16	3	13	16
15	3	13	18	3	13	18	3	13	18
20	3	14	19	3	14	19	3	14	19
30	3	14	20	3	14	20	3	14	20
40	3	8	19	3	8	19	3	8	19
45	2	6	19	2	6	19	2	6	19

Ch. BW	64QAM			256QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	4	13	13	4	13	13
10	3	13	16	3	13	16
15	3	13	18	3	13	18
20	3	14	19	3	14	19
30	3	14	20	3	14	20
40	3	8	19	3	8	19
45	2	6	19	2	6	19

Power Settings Used For Testing / Plate Antenna

The tables below show the EUT power settings that were used during testing for each channel bandwidth and modulation type when the EUT was tested with the plate antenna.

Ch. BW	BPSK			QPSK			16QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	3	10	10	3	10	10	3	10	10
10	0	8	8	0	8	8	0	8	8
15	0	14	14	0	14	14	0	14	14
20	0	13	13	0	13	13	0	13	13
30	1	12	13	1	12	13	1	12	13
40	1	7	14	1	7	14	1	7	14
45	0	7	13	0	7	13	0	7	13

Ch. BW	64QAM			256QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	3	10	10	3	10	10
10	0	8	8	0	8	8
15	0	14	14	0	14	14
20	0	13	13	0	13	13
30	1	12	13	1	12	13
40	1	7	14	1	7	14
45	0	7	13	0	7	13

Power Settings Used For Testing / Sectorised Antenna

The tables below show the EUT power settings that were used during testing for each channel bandwidth and modulation type when the EUT was tested with the sectorised antenna.

Ch. BW	BPSK			QPSK			16QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	9	9	9	9	9	9	9	9	9
10	8	8	8	8	8	8	8	8	8
15	7	7	7	7	7	7	7	7	7
20	7	7	7	7	7	7	7	7	7
30	8	8	8	8	8	8	8	8	8
40	5	5	5	5	5	5	5	5	5
45	6	6	6	6	6	6	6	6	6

Ch. BW	64QAM			256QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	9	9	9	9	9	9
10	8	8	8	8	8	8
15	7	7	7	7	7	7
20	7	7	7	7	7	7
30	8	8	8	8	8	8
40	5	5	5	5	5	5
45	6	6	6	6	6	6

Power Settings Used For Testing / Omnidirectional Antenna

The tables below show the EUT power settings that were used during testing for each channel bandwidth and modulation type when the EUT was tested with the omnidirectional antenna.

Ch. BW	BPSK			QPSK			16QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	13	13	13	13	13	13	13	13	13
10	13	13	13	13	13	13	13	13	13
15	13	13	13	13	13	13	13	13	13
20	13	13	13	13	13	13	13	13	13
30	14	14	14	14	14	14	14	14	14
40	13	13	13	13	13	13	13	13	13
45	14	14	14	14	14	14	14	14	14

Ch. BW	64QAM			256QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	13	13	13	13	13	13
10	13	13	13	13	13	13
15	13	13	13	13	13	13
20	13	13	13	13	13	13
30	14	14	14	14	14	14
40	13	13	13	13	13	13
45	14	14	14	14	14	14

5. Measurements, Examinations and Derived Results

5.1. General Comments

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

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

5.2. Test Results

5.2.1. Transmitter 26 dB Emission Bandwidth

Test Summary:

Test Engineer:	Ian Watch	Test Dates:	29 May 2014 to 02 June 2014
Test Sample Serial Number:	0004565017A7		

FCC Reference:	Part 15.403(i)
Test Method Used:	FCC KDB 789033 Section II.C.1 and Notes below

Environmental Conditions:

Temperature (°C):	24 to 26
Relative Humidity (%):	35 to 38

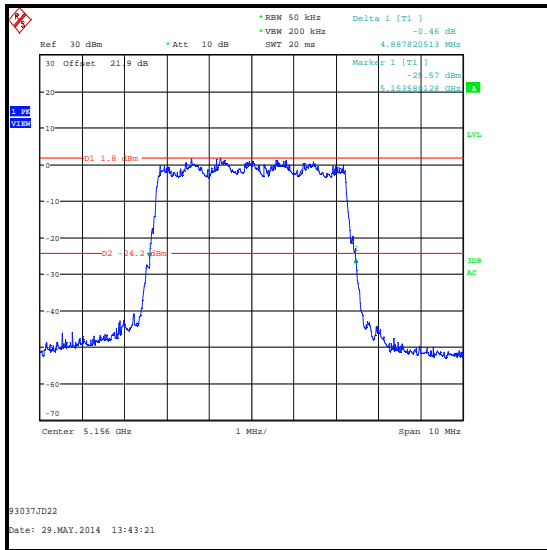
Note(s):

1. All configurations supported by the EUT were initially investigated on one channel. The modes that produced the widest bandwidth and therefore deemed worst case were:
 - 5 MHz channel bandwidth – BPSK
 - 10 MHz channel bandwidth – QPSK
 - 15 MHz channel bandwidth – BPSK
 - 20 MHz channel bandwidth – QPSK
 - 30 MHz channel bandwidth – QPSK
 - 40 MHz channel bandwidth – QPSK
 - 45 MHz channel bandwidth – QPSK
2. Plots for all configurations are archived on the test laboratory IT server and available for inspection upon request.
3. The test receiver was connected to the RF port on the EUT using suitable attenuation and RF cable.
4. Final measurements were performed in each supported operating band using the above configurations on the bottom, middle and top channels. Both RF ports show identical characteristics. The spectrum analyser was connected to the H port for all final measurements.
5. The spectrum analyser video bandwidth was set to three times the resolution bandwidth or as close to \geq three times the resolution bandwidth as the instrument would allow.

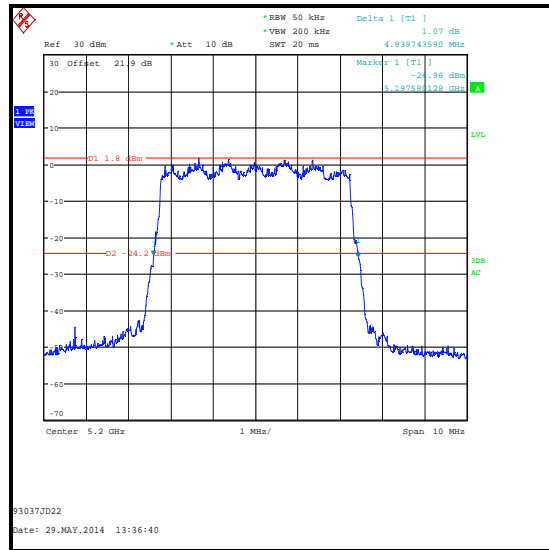
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.15-5.25 GHz band / 5 MHz Channel / BPSK / H Port

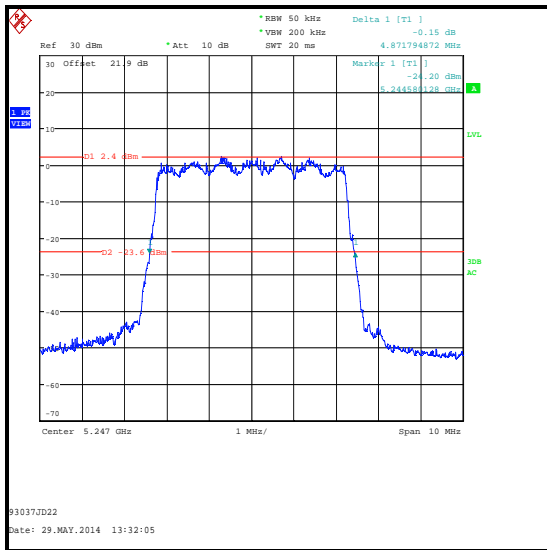
Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5156	BPSK	50	200	4.888
Middle	5200	BPSK	50	200	4.840
Top	5247	BPSK	50	200	4.872



Bottom Channel



Middle Channel

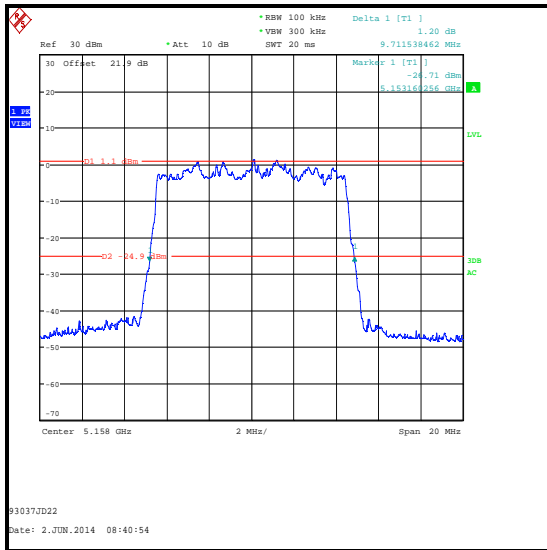


Top Channel

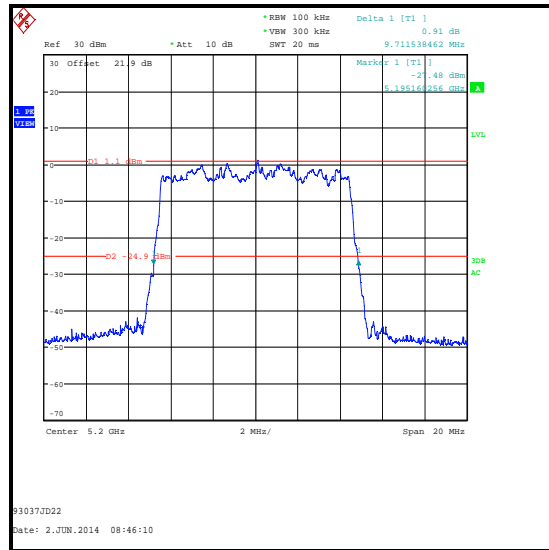
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.15-5.25 GHz band / 10 MHz Channel / QPSK / H Port

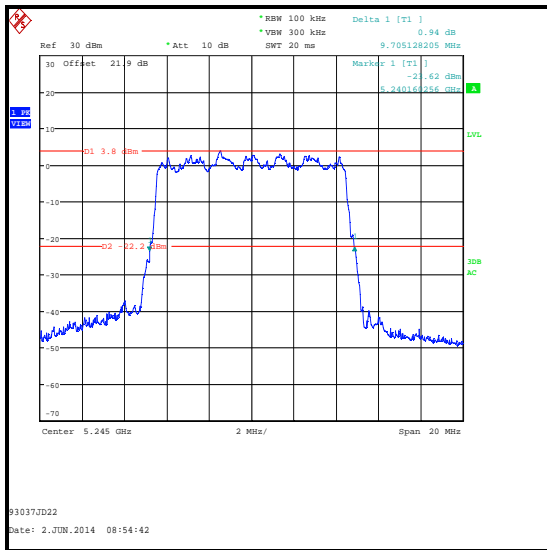
Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5158	QPSK	100	300	9.712
Middle	5200	QPSK	100	300	9.712
Top	5245	QPSK	100	300	9.705



Bottom Channel



Middle Channel

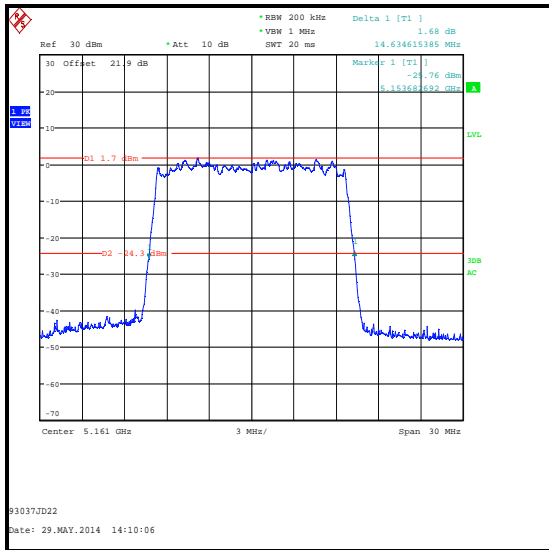


Top Channel

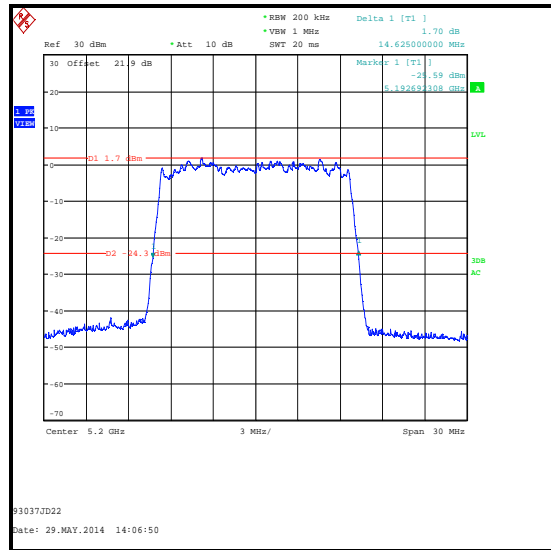
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.15-5.25 GHz band / 15 MHz Channel / BPSK / H Port

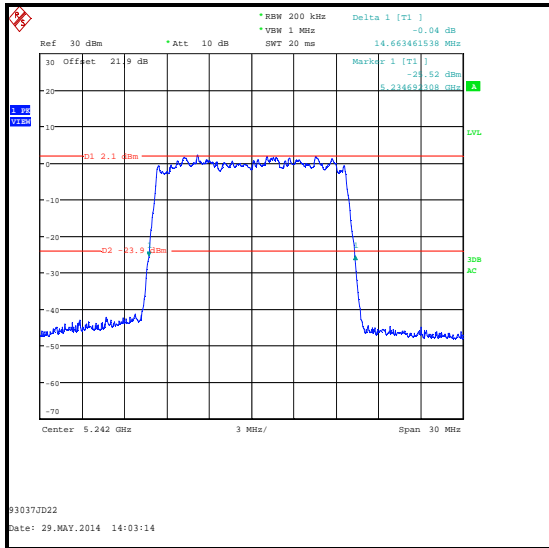
Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5161	BPSK	200	1000	14.635
Middle	5200	BPSK	200	1000	14.625
Top	5242	BPSK	200	1000	14.663



Bottom Channel



Middle Channel

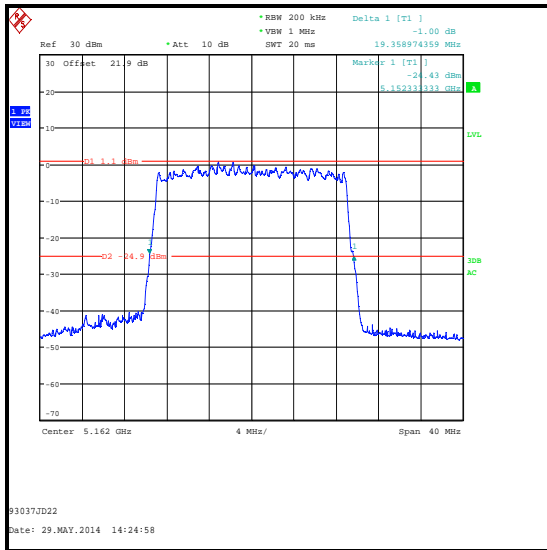


Top Channel

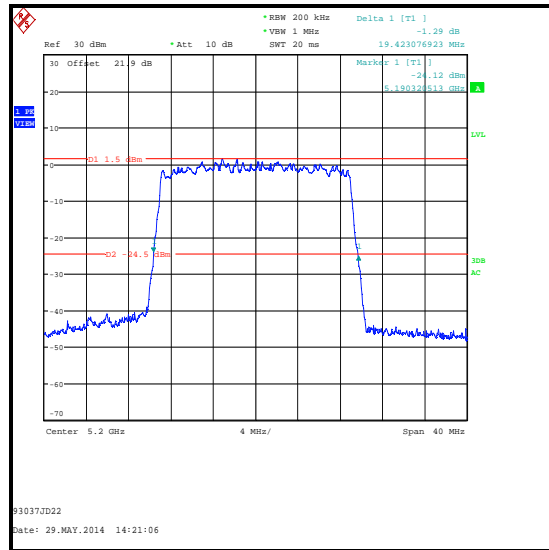
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.15-5.25 GHz band / 20 MHz Channel / QPSK/ H Port

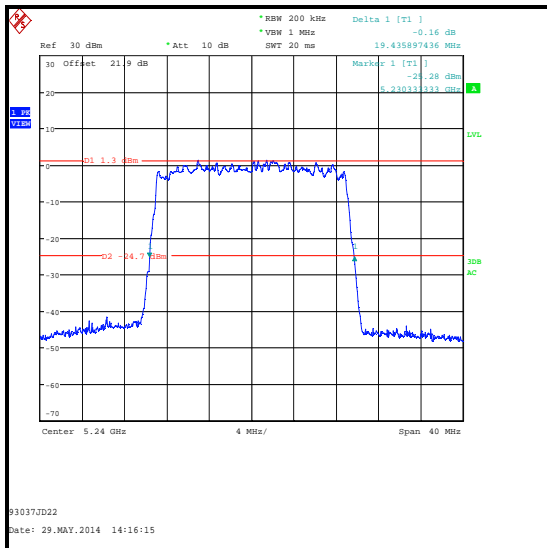
Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5162	QPSK	200	1000	19.359
Middle	5200	QPSK	200	1000	19.423
Top	5240	QPSK	200	1000	19.436



Bottom Channel



Middle Channel



Top Channel

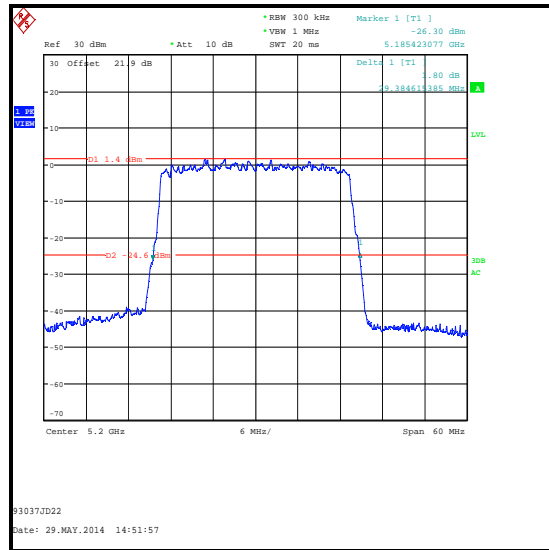
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.15-5.25 GHz band / 30 MHz Channel / QPSK / H Port

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5168	QPSK	300	1000	29.404
Middle	5200	QPSK	300	1000	29.385
Top	5235	QPSK	300	1000	29.423



Bottom Channel



Middle Channel

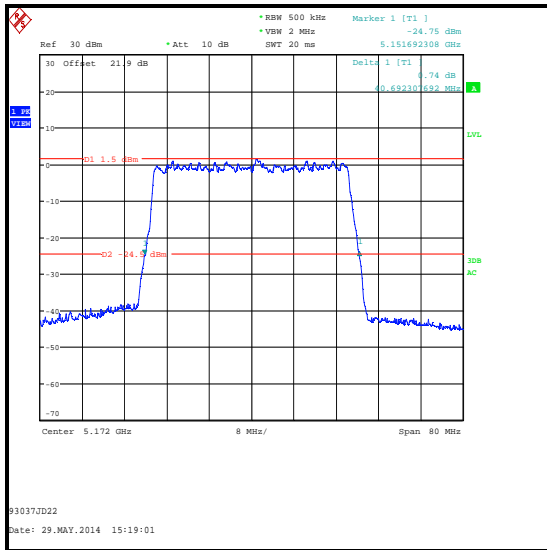


Top Channel

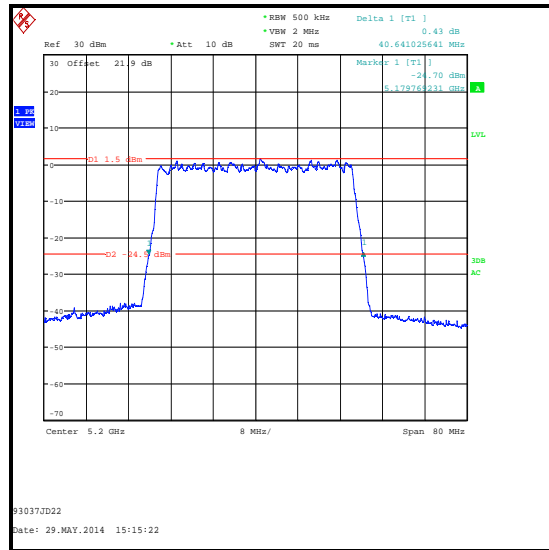
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.15-5.25 GHz band / 40 MHz Channel / QPSK / H Port

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5172	QPSK	500	2000	40.692
Middle	5200	QPSK	500	2000	40.641
Top	5230	QPSK	500	2000	40.859



Bottom Channel



Middle Channel

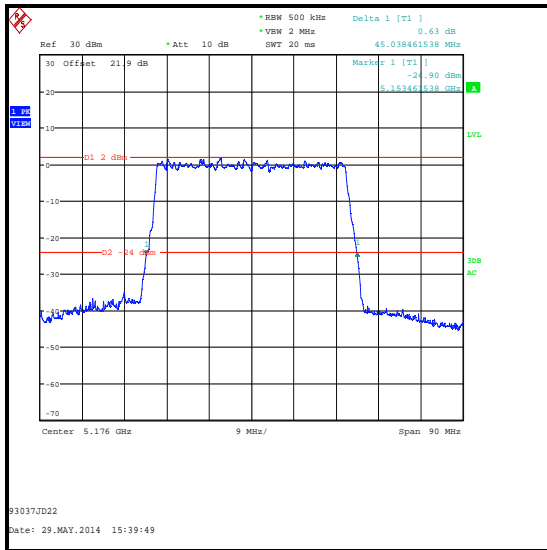


Top Channel

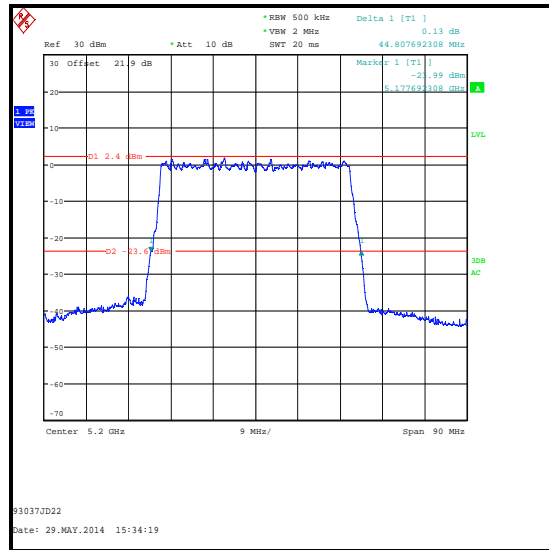
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.15-5.25 GHz band / 45 MHz Channel / QPSK / H Port

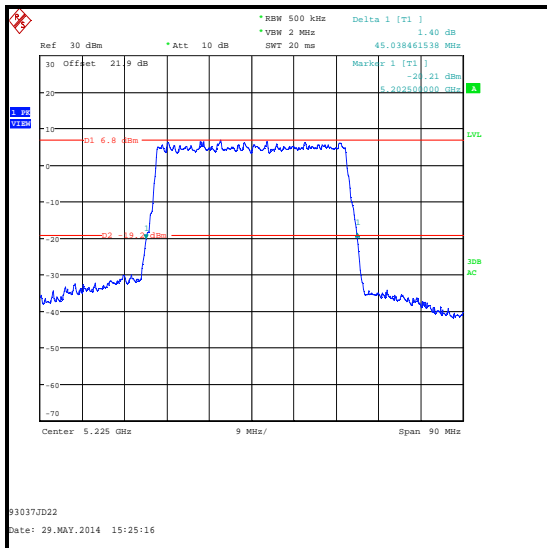
Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5176	QPSK	500	2000	45.038
Middle	5200	QPSK	500	2000	44.808
Top	5225	QPSK	500	2000	45.038



Bottom Channel



Middle Channel



Top Channel

Transmitter 26 dB Emission Bandwidth (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A2143	Attenuator	AtlanTecRF	AN18-20	081120-23	Calibrated Before Use	-
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	13 Mar 2015	12
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12

5.2.2. Transmitter Maximum Conducted Output Power**Test Summary:**

Test Engineer:	Ian Watch	Test Date:	30 May 2014
Test Sample Serial Number:	0004565017A7		

FCC Reference:	Part 15.407(a)(1)
Test Method Used:	FCC KDB 789033 Section II.E.3.a) Method PM and Notes below

Environmental Conditions:

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

Note(s):

- Tests were performed with the EUT transmitting at its maximum power control level for the 4' parabolic antenna, the sectorised antenna and the omnidirectional antenna. The EUT was transmitting with >99% duty cycle. Various other antennas can be used and the manufacturer stated that they will reduce the maximum configurable output power by the amount in dB that the directional gain of the antenna exceeds 6 dBi for point-to-multipoint antennas and 23 dBi for point-to-point antennas. The three different types of antenna tested have different conducted output power limits.
- The maximum conducted output power limit for the parabolic antenna (point-to-point) was recalculated as:

$$34.5 \text{ dBi (antenna gain)} - 1.5 \text{ dB (cable loss)} = 33.0 \text{ dBi}$$

$$\text{Gain above 23 dBi} = 10 \text{ dB}$$

$$30 \text{ dBm (limit)} - 10 \text{ dB} = 20 \text{ dBm}$$

$$\text{The 30 dBm limit was reduced by 10 dB to 20 dBm}$$
- The maximum conducted output power limit for the sectorised antenna (point-to-multipoint) was recalculated as:

$$17 \text{ dBi (antenna gain)} - 1.5 \text{ dB (cable loss)} = 15.5 \text{ dBi}$$

$$\text{Gain above 6 dBi} = 9.5 \text{ dB}$$

$$30 \text{ dBm (limit)} - 9.5 \text{ dB} = 20.5 \text{ dBm}$$

$$\text{The 30 dBm limit was reduced by 9.5 dB to 20.5 dBm}$$
- The maximum conducted output power limit for the omnidirectional antenna (point-to-multipoint) was recalculated as:

$$13 \text{ dBi (antenna gain)} - 1.5 \text{ dB (cable loss)} = 11.5 \text{ dBi}$$

$$\text{Gain above 6 dBi} = 5.5 \text{ dB}$$

$$30 \text{ dBm (limit)} - 5.5 \text{ dB} = 24.5 \text{ dBm}$$

$$\text{The 30 dBm limit was reduced by 5.5 dB to 24.5 dBm}$$
- All supported modes and channel widths were initially investigated on one channel. The mode that produced the highest conducted power was 256QAM for 5 MHz and 45 MHz channels. BPSK modulation produced the highest conducted output power in all other channel bandwidths. Final measurements were performed using 256QAM and BPSK on the bottom, middle and top channels in all supported channel bandwidths.
- A power meter and associated power sensor were connected to each RF port on the EUT using suitable attenuation. The attenuators were calibrated before use and an RF level offset was entered on the power meters to compensate for the attenuation. The measurement results for both ports were linearly combined and compared to the applicable limit to obtain the margin

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Results: 5 MHz Channel / 256QAM / Parabolic Antenna**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	0.3	0.4	3.4	20.0	16.6	Complied
Middle	9.1	9.1	12.1	20.0	7.9	Complied
Top	9.1	8.9	12.0	20.0	8.0	Complied

Results: 5 MHz Channel / 256QAM / Sectorised Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	4.5	4.6	7.6	20.5	12.9	Complied
Middle	4.7	4.7	7.7	20.5	12.8	Complied
Top	4.8	4.7	7.8	20.5	12.7	Complied

Results: 5 MHz Channel / 256QAM / Omnidirectional Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	8.7	8.8	11.8	24.5	12.7	Complied
Middle	9.1	9.1	12.1	24.5	12.4	Complied
Top	9.1	8.9	12.0	24.5	12.5	Complied

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Results: 10 MHz Channel / BPSK / Parabolic Antenna**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	0.0	-0.1	3.0	20.0	17.0	Complied
Middle	8.6	8.6	11.6	20.0	8.4	Complied
Top	11.9	11.8	14.9	20.0	5.1	Complied

Results: 10 MHz Channel / BPSK / Sectorised Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	4.5	4.3	7.4	20.5	13.1	Complied
Middle	4.1	4.2	7.1	20.5	13.4	Complied
Top	3.6	3.7	6.7	20.5	13.8	Complied

Results: 10 MHz Channel / BPSK / Omnidirectional Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	9.3	9.2	12.3	24.5	12.2	Complied
Middle	8.6	8.6	11.6	24.5	12.9	Complied
Top	8.4	8.5	11.5	24.5	13.0	Complied

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Results: 15 MHz Channel / BPSK / Parabolic Antenna**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	0.2	0.0	3.1	20.0	16.9	Complied
Middle	9.2	9.3	12.3	20.0	7.7	Complied
Top	13.6	13.7	16.7	20.0	3.3	Complied

Results: 15 MHz Channel / BPSK / Sectorised Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	3.4	3.3	6.4	20.5	14.1	Complied
Middle	3.2	3.1	6.2	20.5	14.3	Complied
Top	3.2	3.0	6.1	20.5	14.4	Complied

Results: 15 MHz Channel / BPSK / Omnidirectional Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	9.1	9.2	12.2	24.5	12.3	Complied
Middle	9.2	9.3	12.3	24.5	12.2	Complied
Top	9.0	8.8	11.9	24.5	12.6	Complied

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Results: 20 MHz Channel / BPSK / Parabolic Antenna**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	0.2	0.1	3.1	20.0	16.9	Complied
Middle	10.1	10.1	13.1	20.0	6.9	Complied
Top	14.4	14.5	17.5	20.0	2.5	Complied

Results: 20 MHz Channel / BPSK / Sectorised Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	3.1	3.2	6.2	20.5	14.3	Complied
Middle	3.2	3.1	6.2	20.5	14.3	Complied
Top	3.2	3.0	6.1	20.5	14.4	Complied

Results: 20 MHz Channel / BPSK / Omnidirectional Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	9.1	9.1	12.1	24.5	12.4	Complied
Middle	8.8	8.8	11.8	24.5	12.7	Complied
Top	8.8	8.8	11.8	24.5	12.7	Complied

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Results: 30 MHz Channel / BPSK / Parabolic Antenna**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	-0.3	-0.3	2.7	20.0	17.3	Complied
Middle	10.0	9.9	13.0	20.0	7.0	Complied
Top	15.7	15.8	18.8	20.0	1.2	Complied

Results: 30 MHz Channel / BPSK / Sectorised Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	3.4	3.3	6.4	20.5	14.1	Complied
Middle	4.1	4.0	7.1	20.5	13.4	Complied
Top	4.1	4.0	7.1	20.5	13.4	Complied

Results: 30 MHz Channel / BPSK / Omnidirectional Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	9.9	9.8	12.9	24.5	11.6	Complied
Middle	10.0	9.9	13.0	24.5	11.5	Complied
Top	9.9	9.8	12.9	24.5	11.6	Complied

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Results: 40 MHz Channel / BPSK / Parabolic Antenna**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	-0.3	-0.3	2.7	20.0	17.3	Complied
Middle	4.1	4.1	7.1	20.0	12.9	Complied
Top	14.7	14.8	17.8	20.0	2.2	Complied

Results: 40 MHz Channel / BPSK / Sectorised Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	1.3	1.4	4.4	20.5	16.1	Complied
Middle	1.2	1.4	4.3	20.5	16.2	Complied
Top	1.1	1.2	4.2	20.5	16.3	Complied

Results: 40 MHz Channel / BPSK / Omnidirectional Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	8.9	8.9	11.9	24.5	12.6	Complied
Middle	8.9	8.9	11.9	24.5	12.6	Complied
Top	8.9	8.9	11.9	24.5	12.6	Complied

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Results: 45 MHz Channel / 256QAM / Parabolic Antenna**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	-1.1	-1.3	1.8	20.0	18.2	Complied
Middle	2.2	2.3	5.3	20.0	14.7	Complied
Top	15.0	14.9	18.0	20.0	2.0	Complied

Results: 45 MHz Channel / 256QAM / Sectorised Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	2.2	2.4	5.3	20.5	15.2	Complied
Middle	2.2	2.3	5.3	20.5	15.2	Complied
Top	1.8	2.0	4.9	20.5	15.6	Complied

Results: 45 MHz Channel / 256QAM / Omnidirectional Antenna

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	10.0	10.0	13.0	24.5	11.5	Complied
Middle	10.0	10.0	13.0	24.5	11.5	Complied
Top	10.0	10.0	13.0	24.5	11.5	Complied

Transmitter Maximum Output Power (5.15-5.25 GHz band) (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
G0607	Signal Generator	Rohde & Schwarz	SMU 200A	100943	18 Jul 2016	36
A2142	Attenuator	AtlanTec RF	AN18-20	081120-23	Calibrated Before Use	-
A2143	Attenuator	AtlanTec RF	AN18-20	081120-23	Calibrated Before Use	-
M283	Power Sensor	HP	8487A	3318A03241	01 May 2015	12
M1009	Power Meter	HP	437B	3215U13706	04 Feb 2015	12
M1435	Power Meter	HP	437B	3215U14631	30 Apr 2015	12
M1175	Power Sensor	HP	8487A	2942A10299	26 Sep 2014	12
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12

5.2.3. Transmitter Maximum Power Spectral Density**Test Summary:**

Test Engineer:	Ian Watch	Test Dates:	27 May 2014 to 29 May 2014
Test Sample Serial Number:	0004565017A7		

FCC Reference:	Part 15.407(a)(1)
Test Method Used:	FCC KDB 789033 II.F referencing KDB 789033 II.E.2.b Method SA-1 and Notes below

Environmental Conditions:

Temperature (°C):	23 to 27
Relative Humidity (%):	36 to 42

Note(s):

- Tests were performed with the EUT transmitting at its maximum power control level for the 4' parabolic antenna, the sectorised antenna and the omnidirectional antenna. The EUT was transmitting with >99% duty cycle. Various other antennas can be used and the manufacturer will reduce the maximum configurable output power by the amount in dB that the directional gain of the antenna exceeds 6 dBi for point-to-multipoint antennas and 23 dBi for point-to-point antennas. The three different types of antenna tested have different PPSD limits.
- The maximum power spectral density limit for the parabolic antenna (highest gain, point-to-point) was recalculated as:

$$34.5 \text{ dBi (antenna gain)} - 1.5 \text{ dB (cable loss)} = 33.0 \text{ dBi}$$

$$\text{Gain above 23 dBi} = 10 \text{ dB}$$

$$17 \text{ dBm/MHz (limit)} - 10 \text{ dB} = 7 \text{ dBm/MHz}$$

The 17 dBm/MHz PSD limit was reduced by 10 dB to 7 dBm/MHz
- The maximum power spectral density limit for the sectorised antenna (point-to-multipoint) was recalculated as:

$$17 \text{ dBi (antenna gain)} - 1.5 \text{ dB (cable loss)} = 15.5 \text{ dBi}$$

$$\text{Gain above 6 dBi} = 9.5 \text{ dB}$$

$$17 \text{ dBm/MHz (limit)} - 9.5 \text{ dB} = 7.5 \text{ dBm/MHz}$$

The 17 dBm/MHz PSD limit was reduced by 9.5 dB to 7.5 dBm/MHz
- The maximum power spectral density limit for the omnidirectional antenna (point-to-multipoint) was recalculated as:

$$13 \text{ dBi (antenna gain)} - 1.5 \text{ dB (cable loss)} = 11.5 \text{ dBi}$$

$$\text{Gain above 6 dBi} = 5.5 \text{ dB}$$

$$17 \text{ dBm/MHz (limit)} - 5.5 \text{ dB} = 11.5 \text{ dBm/MHz}$$

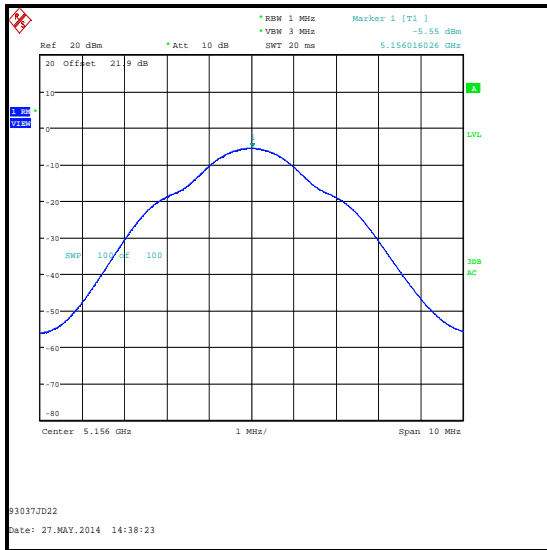
The 17 dBm/MHz PSD limit was reduced by 5.5 dB to 11.5 dBm/MHz
- All supported modes and channel widths were initially investigated on one channel. The mode that produced the highest maximum power spectral density was 256QAM. Final measurements were performed using 256QAM and acquisition mode (ACQ) on the bottom, middle and top channels in all supported channel bandwidths. Maximum power spectral density was measured on both RF ports. The results were linearly combined and compared to the limit to obtain the margin. Although the EUT transmits ACQ mode at a fixed, reduced power compared with all other modes, the ACQ maximum power spectral density was found to be similar to or higher than some modulation types.
- The spectrum analyser was connected to each RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the spectrum analyser to compensate for the loss of the attenuator and RF cable.

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

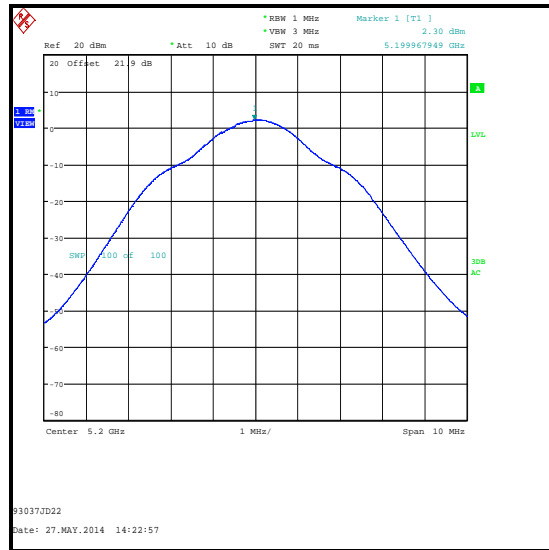
Results: Parabolic Antenna / 5 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-5.5	-4.6	-2.0	7.0	9.0	Complied
Middle	2.3	2.5	5.4	7.0	1.6	Complied
Top	2.7	2.4	5.5	7.0	1.5	Complied

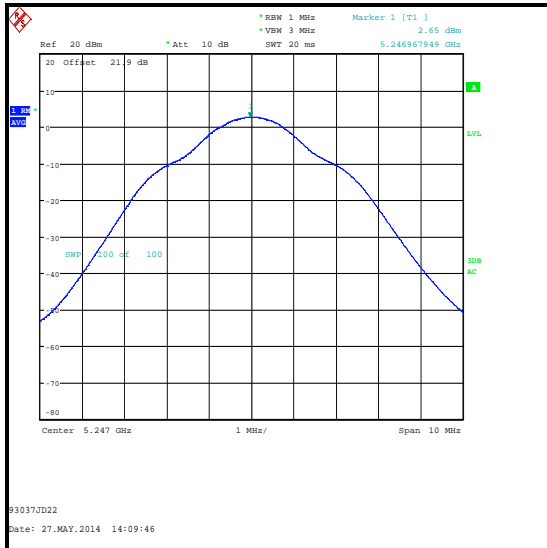
H Port



Bottom Channel



Middle Channel

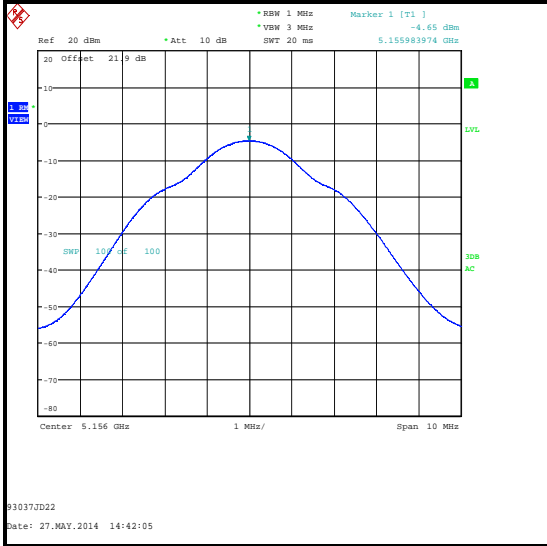


Top Channel

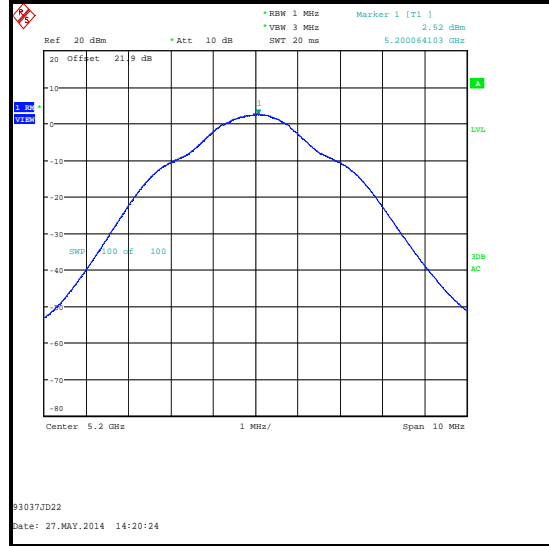
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 5 MHz Channel / ACQ

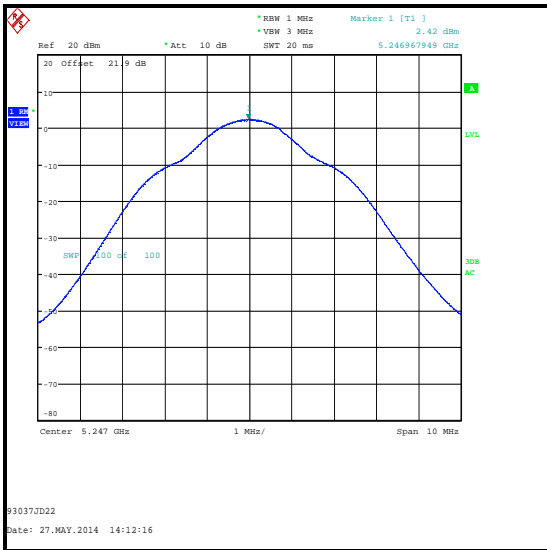
V Port



Bottom Channel



Middle Channel



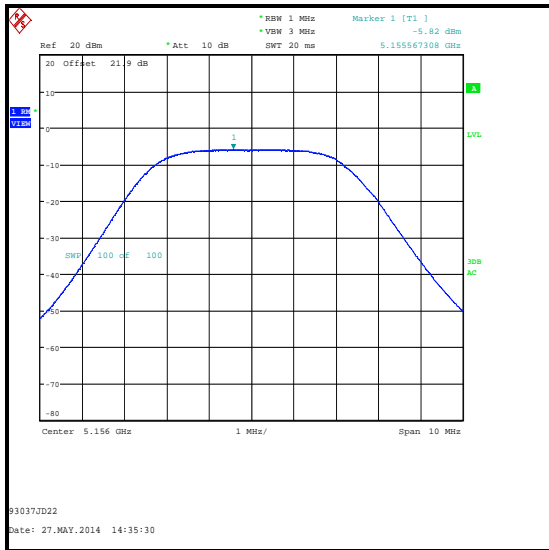
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

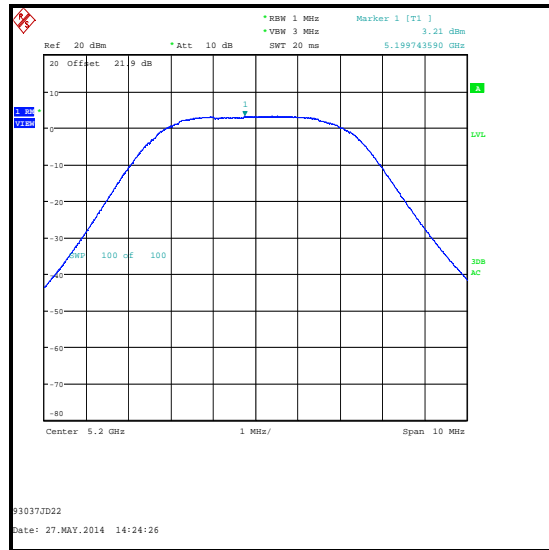
Results: Parabolic Antenna / 5 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-5.8	-5.1	-2.4	7.0	9.4	Complied
Middle	3.2	3.2	6.2	7.0	0.8	Complied
Top	2.8	3.3	6.0	7.0	1.0	Complied

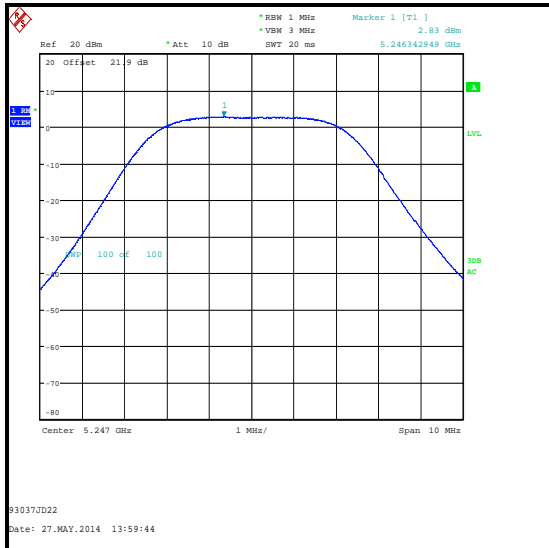
H Port



Bottom Channel



Middle Channel

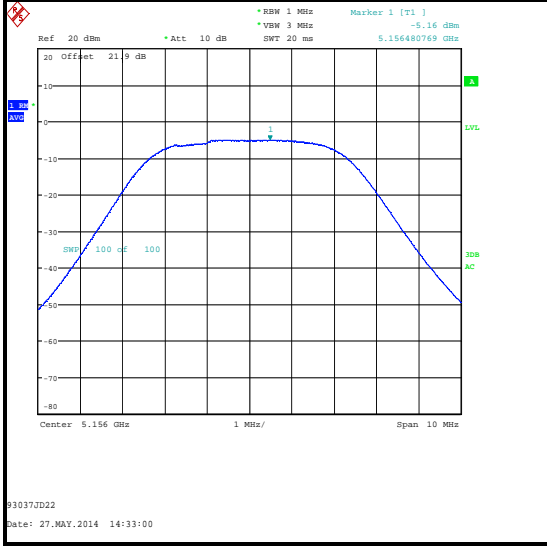


Top Channel

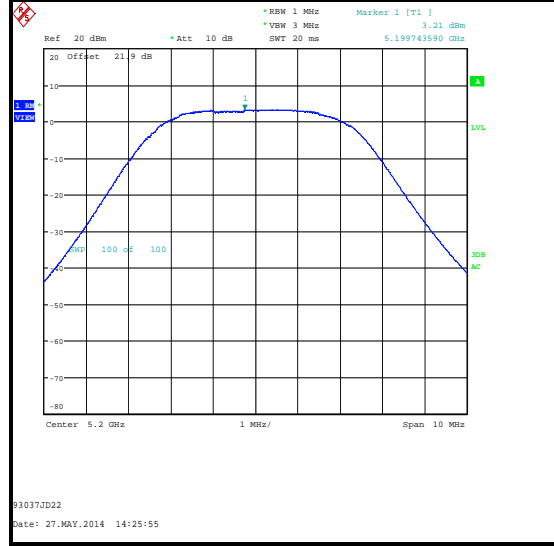
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 5 MHz Channel / 256QAM

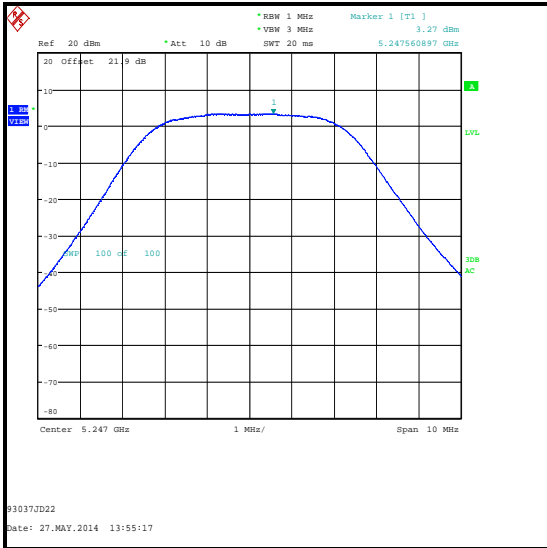
V Port



Bottom Channel



Middle Channel



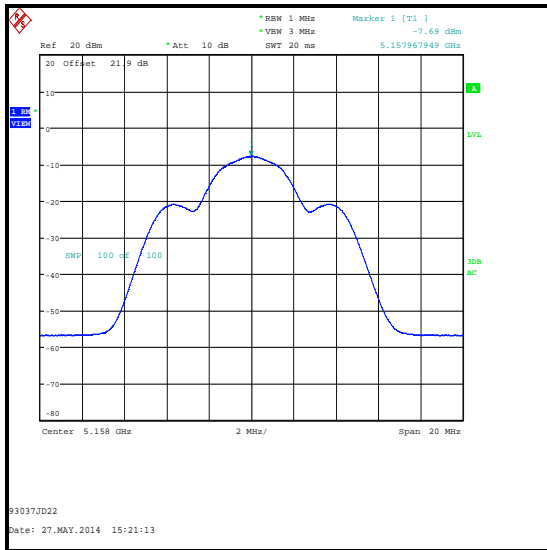
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

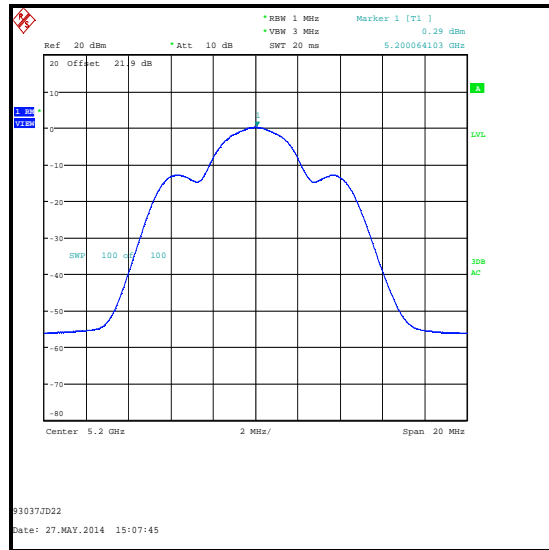
Results: Parabolic Antenna / 10 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-7.6	-8.1	-4.8	7.0	11.8	Complied
Middle	0.3	0.7	3.5	7.0	3.5	Complied
Top	2.9	3.6	6.3	7.0	0.7	Complied

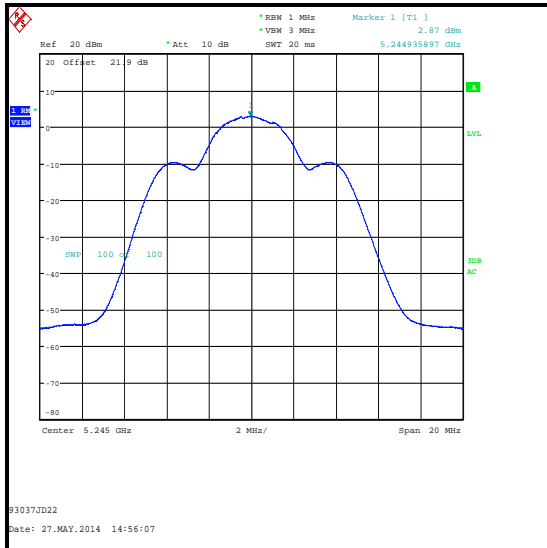
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 10 MHz Channel / ACQ

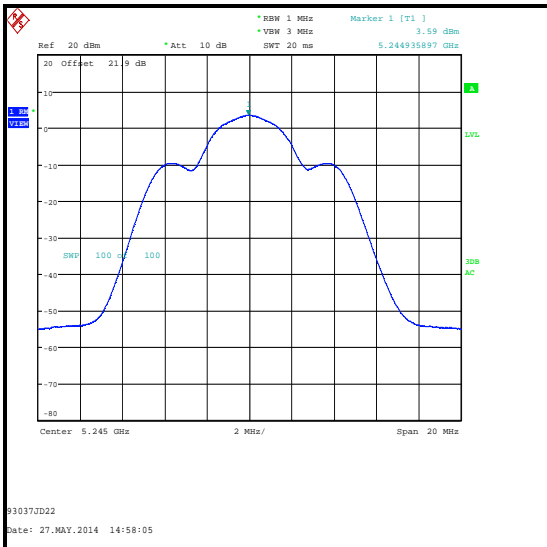
V Port



Bottom Channel



Middle Channel



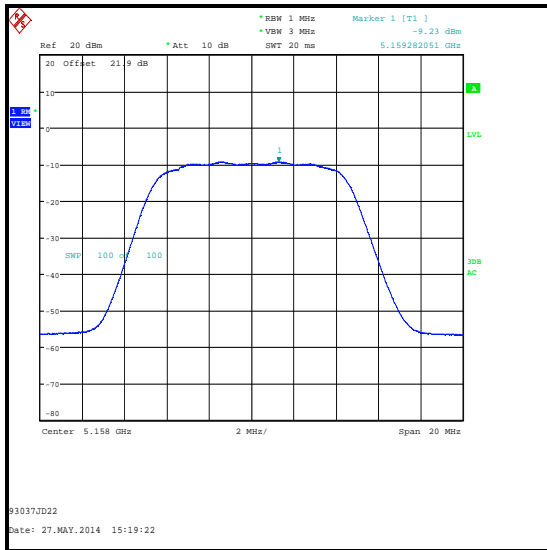
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

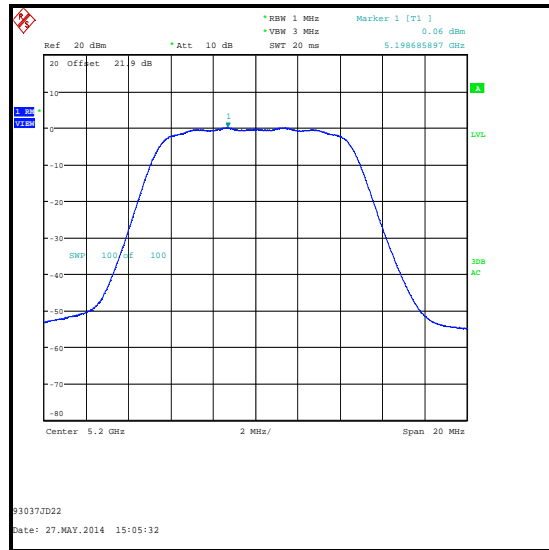
Results: Parabolic Antenna / 10 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-9.2	-8.0	-5.5	7.0	12.5	Complied
Middle	0.1	1.0	3.5	7.0	3.5	Complied
Top	2.9	3.8	6.4	7.0	0.6	Complied

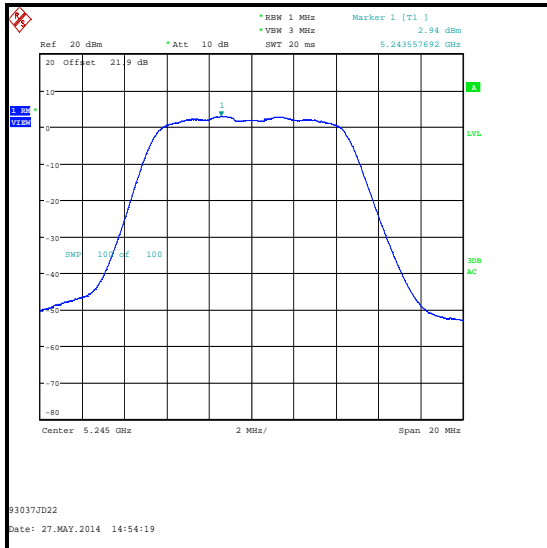
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 10 MHz Channel / 256QAM

V Port



Bottom Channel



Middle Channel



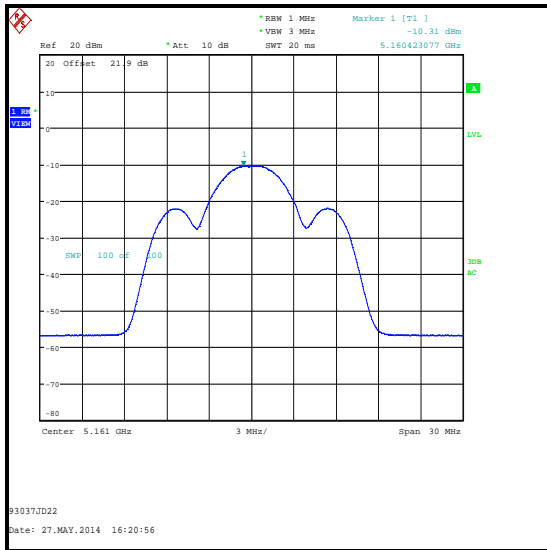
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

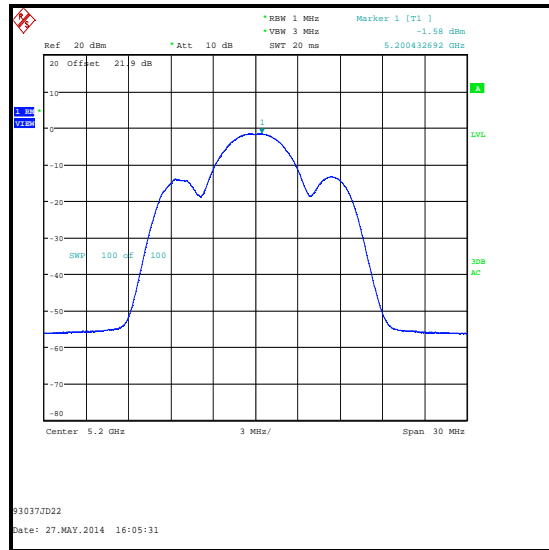
Results: Parabolic Antenna / 15 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-10.3	-9.9	-7.1	7.0	14.1	Complied
Middle	-1.5	-1.3	1.6	7.0	5.4	Complied
Top	3.3	3.5	6.4	7.0	0.6	Complied

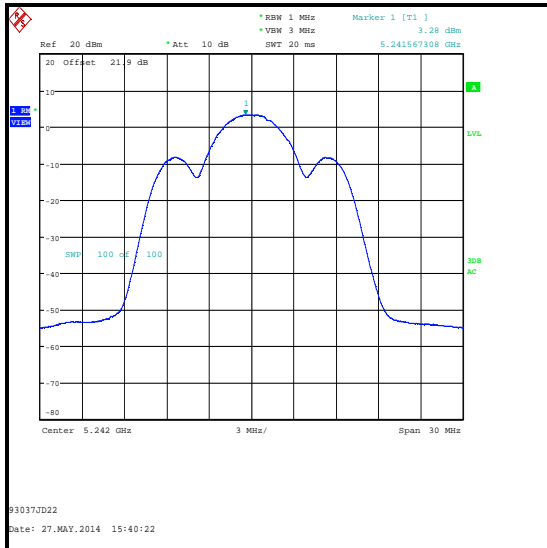
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 15 MHz Channel / ACQ

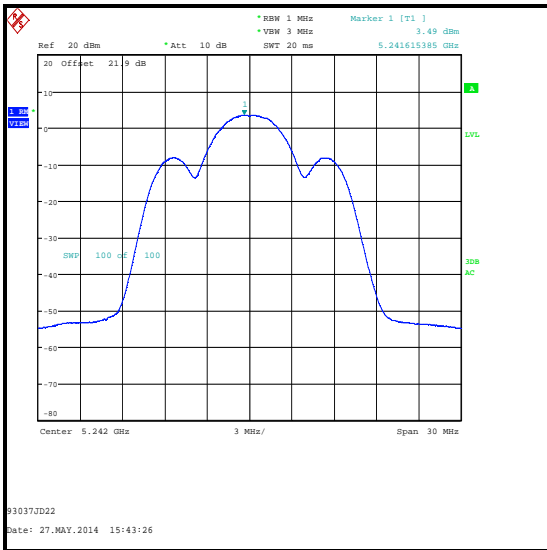
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

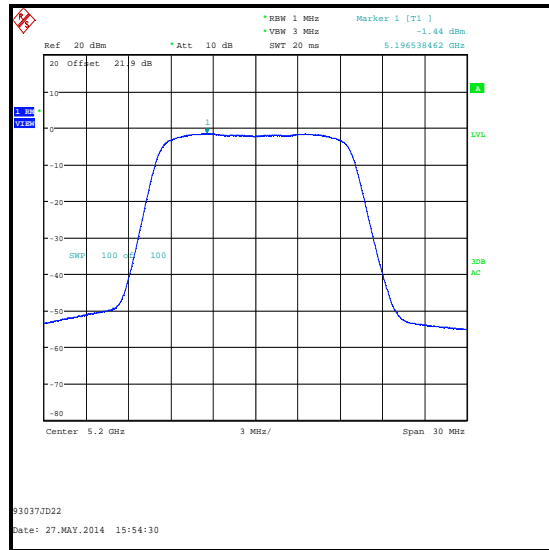
Results: Parabolic Antenna / 15 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-11.1	-10.6	-7.8	7.0	14.8	Complied
Middle	-1.4	-1.2	1.7	7.0	5.3	Complied
Top	3.1	3.6	6.3	7.0	0.7	Complied

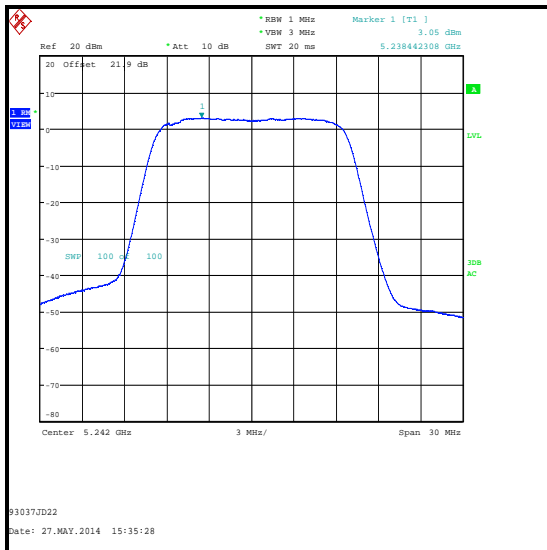
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 15 MHz Channel / 256QAM

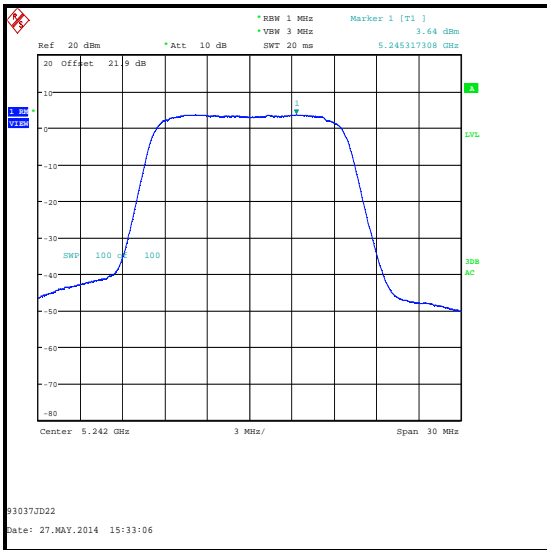
V Port



Bottom Channel



Middle Channel



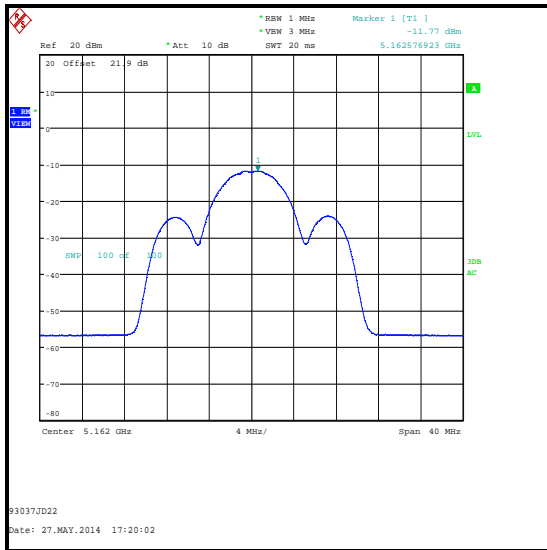
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

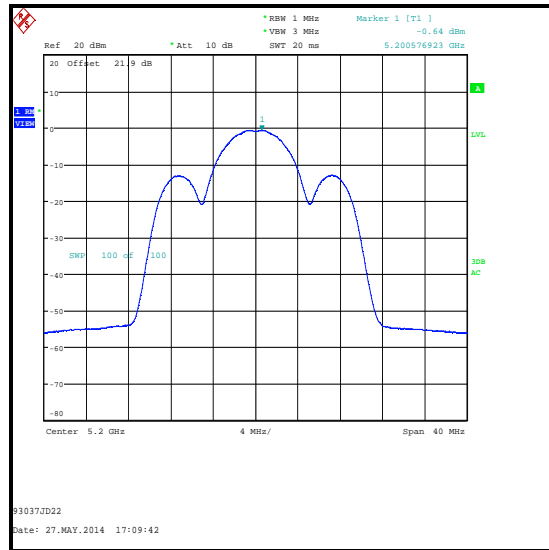
Results: Parabolic Antenna / 20 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-11.7	-10.8	-8.2	7.0	15.2	Complied
Middle	-0.6	-1.1	2.2	7.0	4.8	Complied
Top	3.1	2.9	6.0	7.0	1.0	Complied

H Port



Bottom Channel



Middle Channel

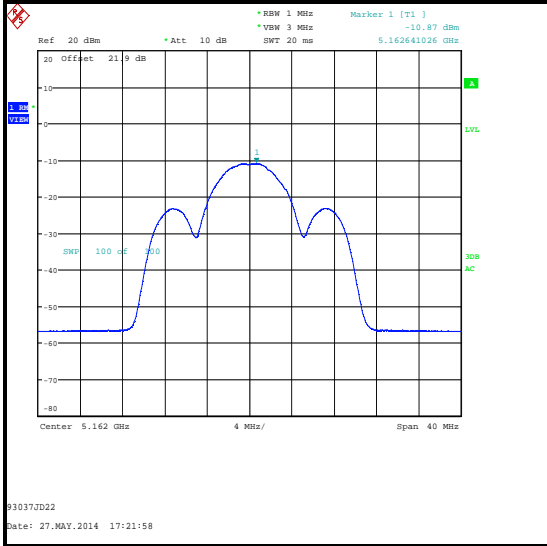


Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 20 MHz Channel / ACQ

V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 20 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-12.7	-12.3	-9.5	7.0	16.5	Complied
Middle	-2.2	-1.3	1.3	7.0	5.7	Complied
Top	3.0	3.2	6.1	7.0	0.9	Complied

H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 20 MHz Channel / 256QAM

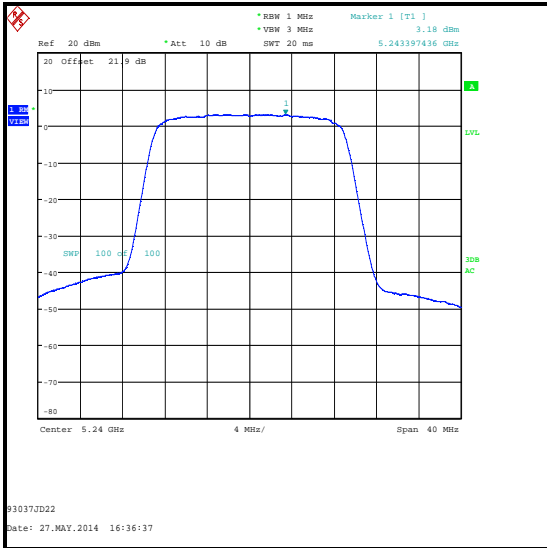
V Port



Bottom Channel



Middle Channel



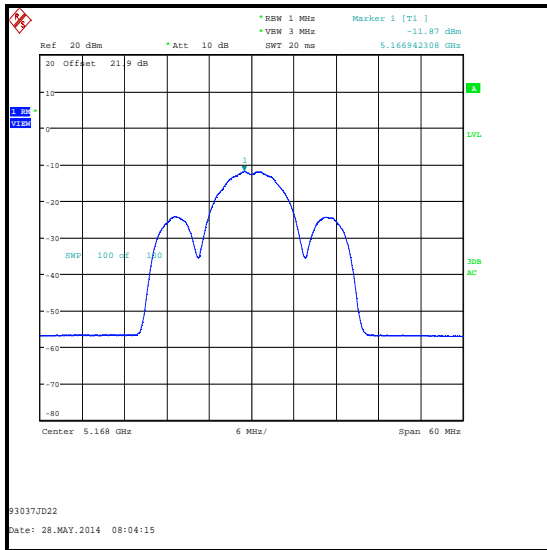
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

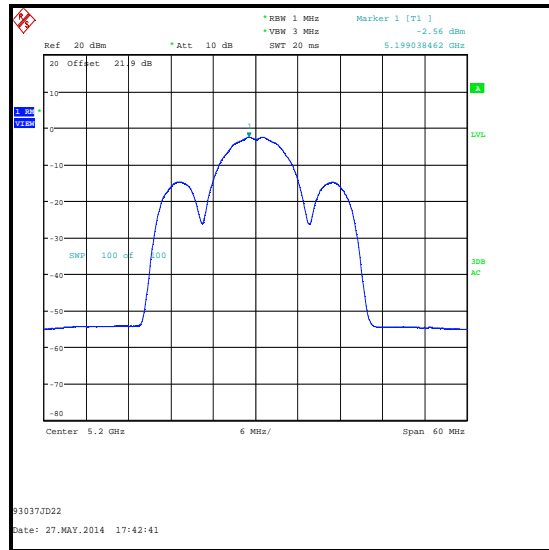
Results: Parabolic Antenna / 30 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-11.8	-11.6	-8.7	7.0	15.7	Complied
Middle	-2.5	-2.5	0.5	7.0	6.5	Complied
Top	2.8	3.0	5.9	7.0	1.1	Complied

H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 30 MHz Channel / ACQ

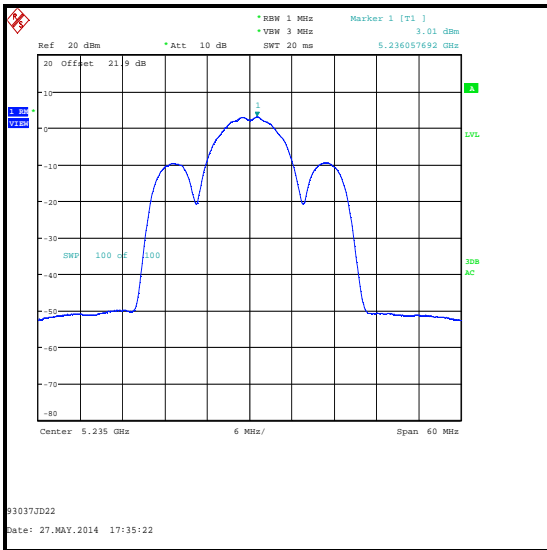
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 30 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-13.5	-14.1	-10.8	7.0	17.8	Complied
Middle	-3.0	-3.8	-0.4	7.0	7.4	Complied
Top	1.6	2.0	4.8	7.0	2.2	Complied

H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 30 MHz Channel / 256QAM

V Port



Bottom Channel



Middle Channel



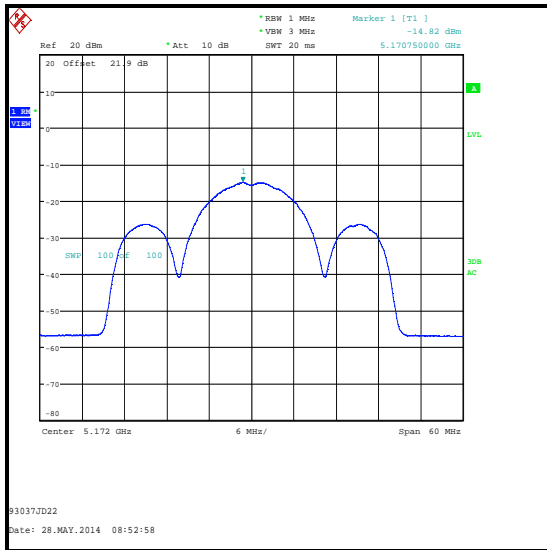
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

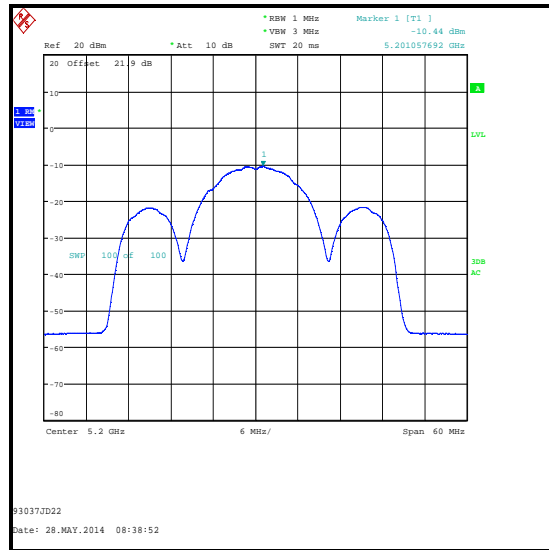
Results: Parabolic Antenna / 40 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-14.8	-14.1	-11.4	7.0	18.4	Complied
Middle	-10.4	-9.5	-6.9	7.0	13.9	Complied
Top	0.6	1.1	3.9	7.0	3.1	Complied

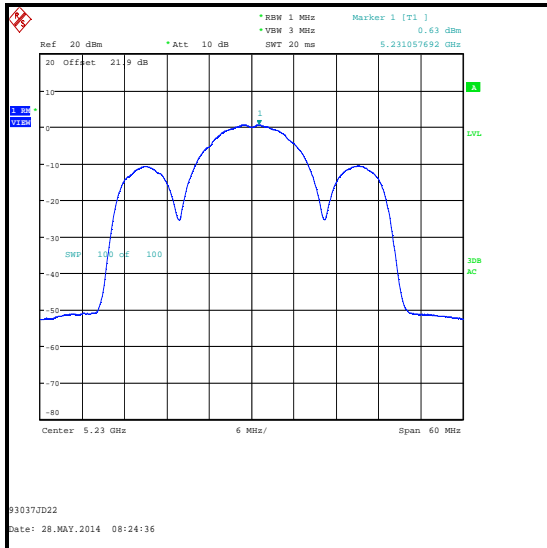
H Port



Bottom Channel



Middle Channel

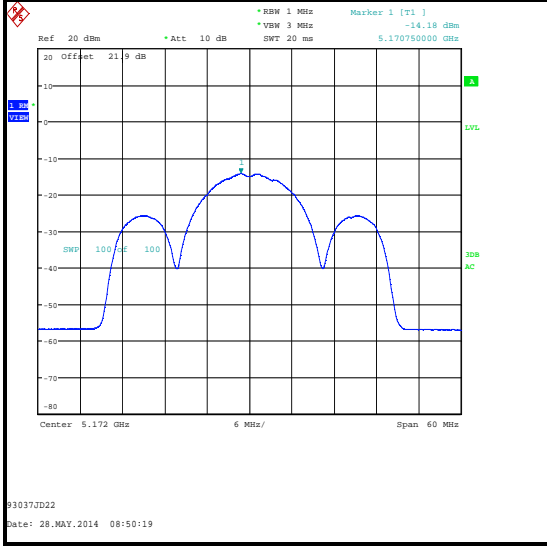


Top Channel

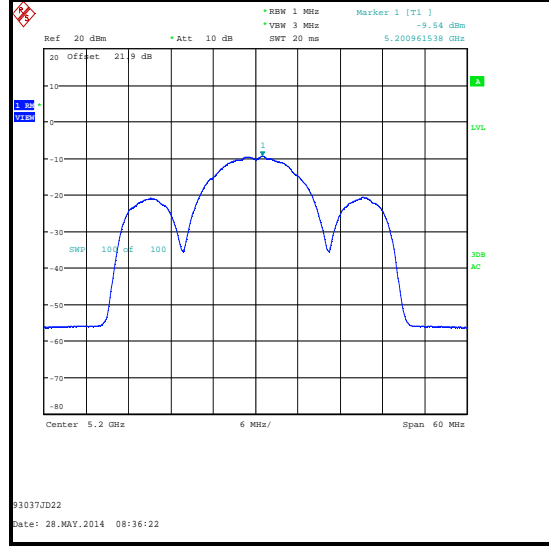
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 40 MHz Channel / ACQ

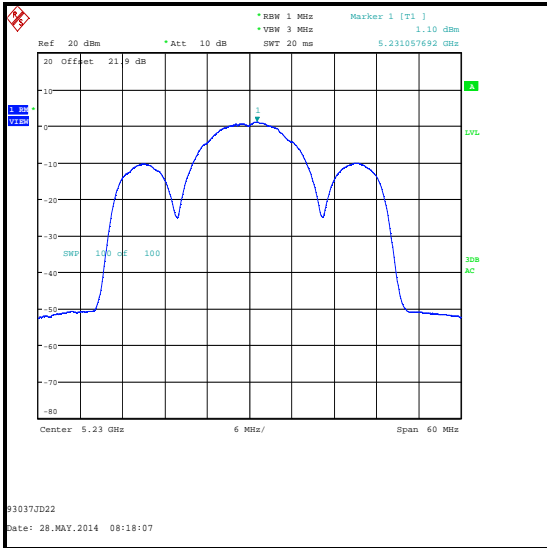
V Port



Bottom Channel



Middle Channel



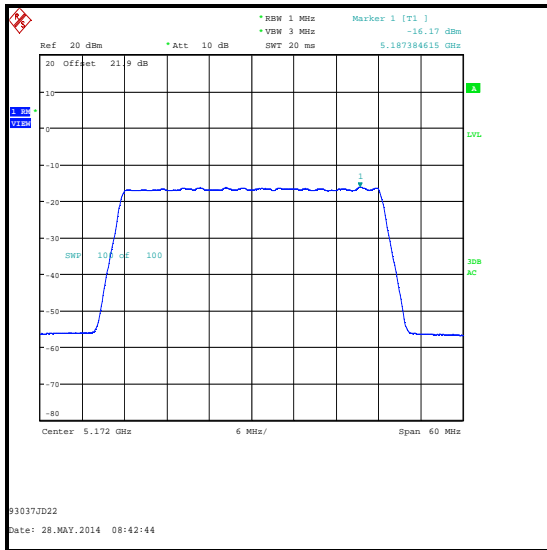
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

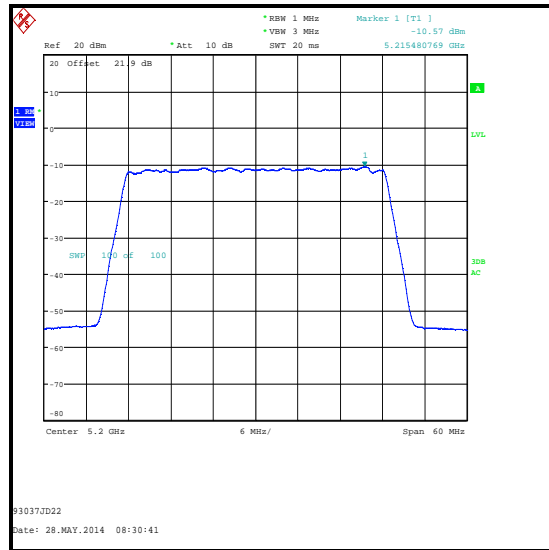
Results: Parabolic Antenna / 40 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-16.1	-15.5	-12.8	7.0	19.8	Complied
Middle	-10.5	-10.9	-7.7	7.0	14.7	Complied
Top	0.6	-0.1	3.3	7.0	3.7	Complied

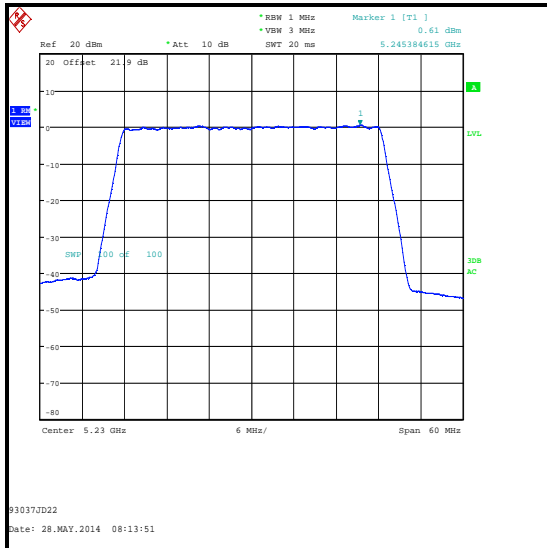
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 40 MHz Channel / 256QAM

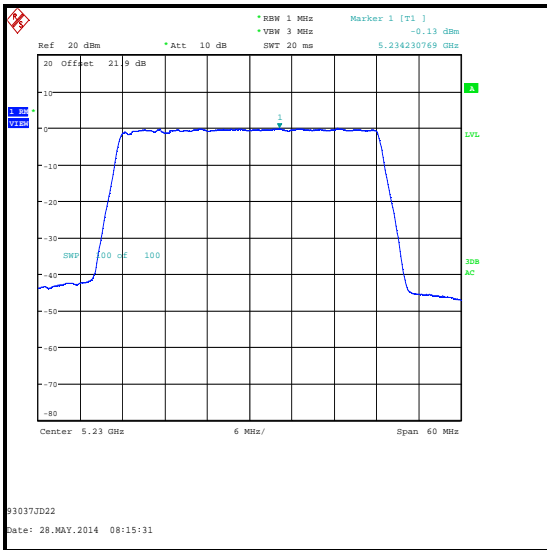
V Port



Bottom Channel



Middle Channel



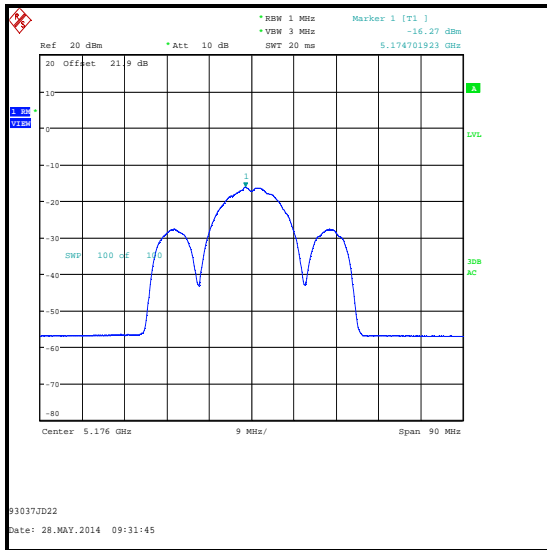
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

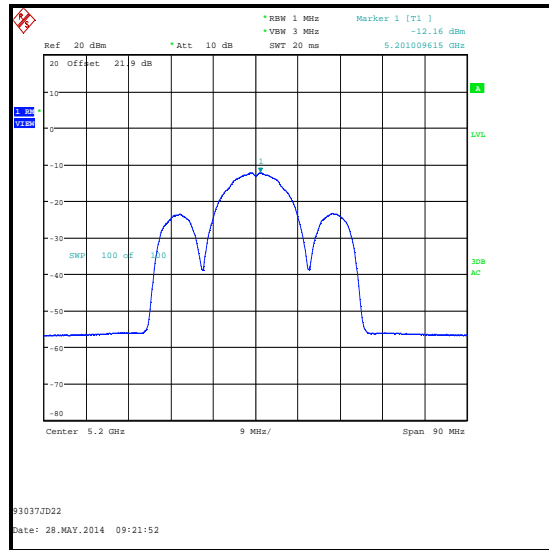
Results: Parabolic Antenna / 45 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-16.2	-15.3	-12.7	7.0	19.7	Complied
Middle	-12.1	-11.4	-8.7	7.0	15.7	Complied
Top	0.0	0.4	3.2	7.0	3.8	Complied

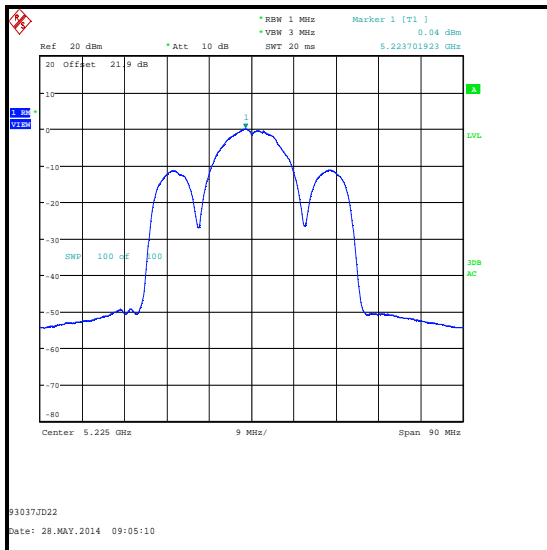
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 45 MHz Channel / ACQ

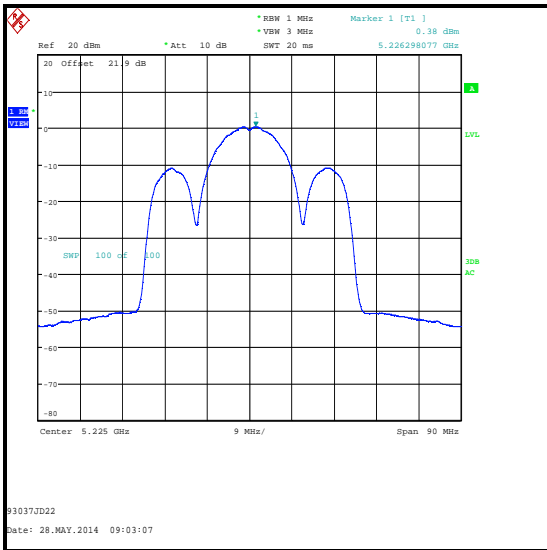
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

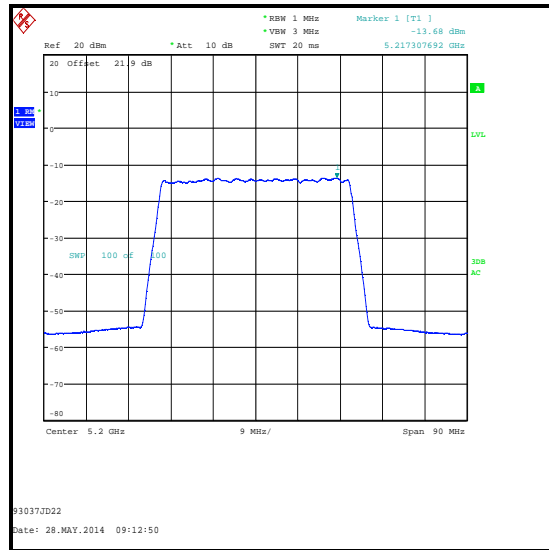
Results: Parabolic Antenna / 45 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-16.7	-16.8	-13.7	7.0	20.7	Complied
Middle	-13.6	-13.2	-10.4	7.0	17.4	Complied
Top	-0.4	-0.7	2.5	7.0	4.5	Complied

H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Parabolic Antenna / 45 MHz Channel / 256QAM

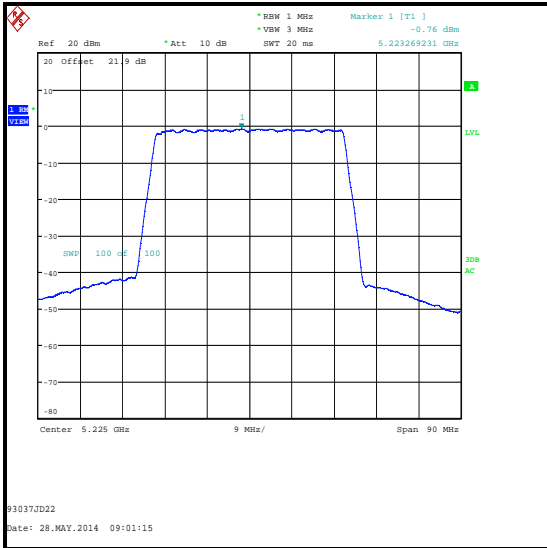
V Port



Bottom Channel



Middle Channel



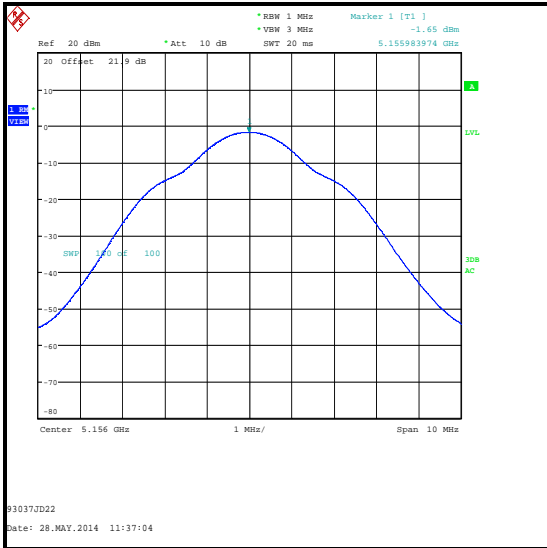
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

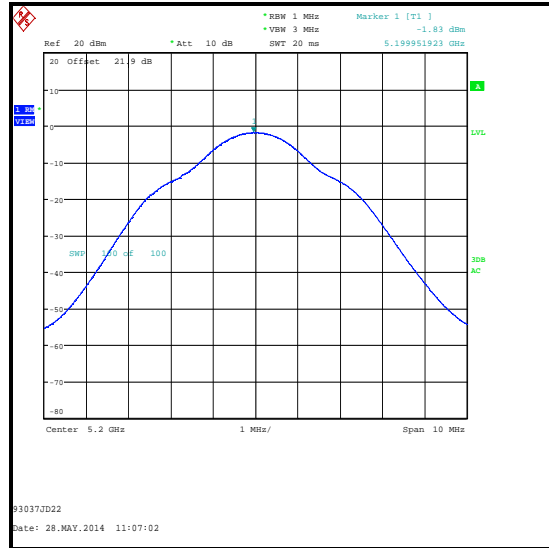
Results: Sectorised Antenna / 5 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-1.6	-1.4	1.5	7.5	6.0	Complied
Middle	-1.8	-1.7	1.3	7.5	6.2	Complied
Top	-1.1	-1.5	1.7	7.5	5.8	Complied

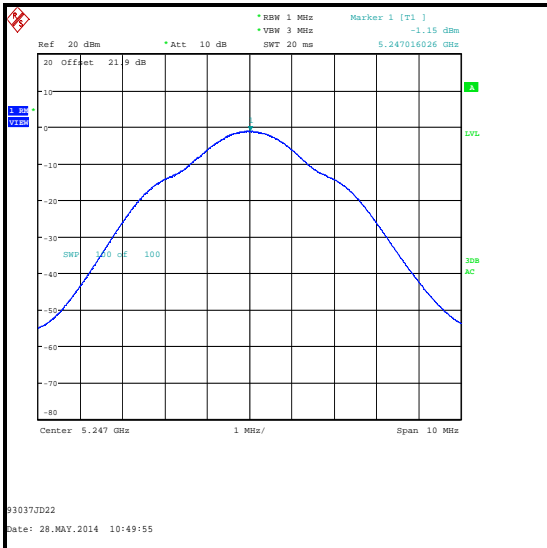
H Port



Bottom Channel



Middle Channel

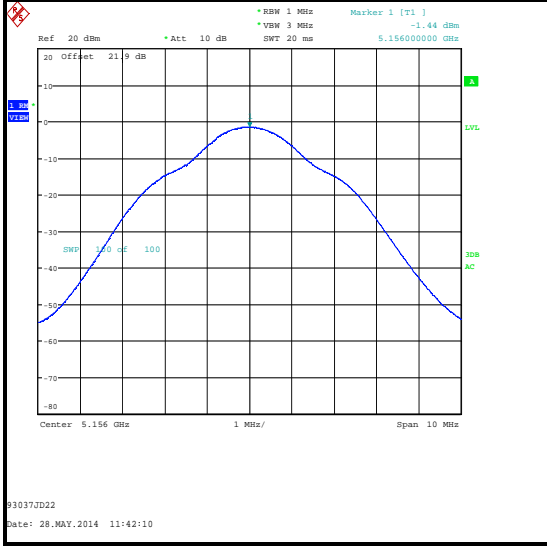


Top Channel

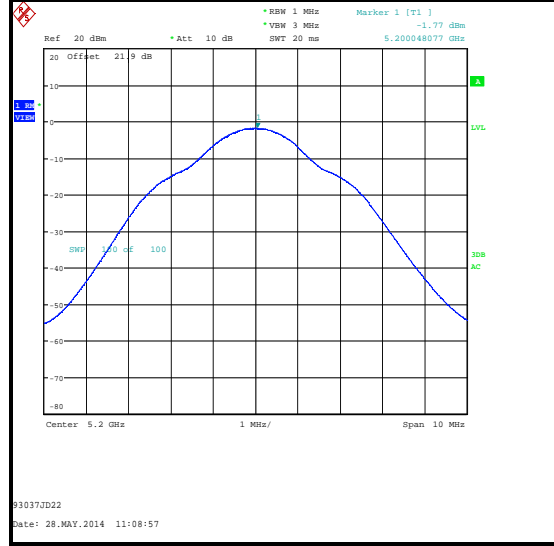
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 5 MHz Channel / ACQ

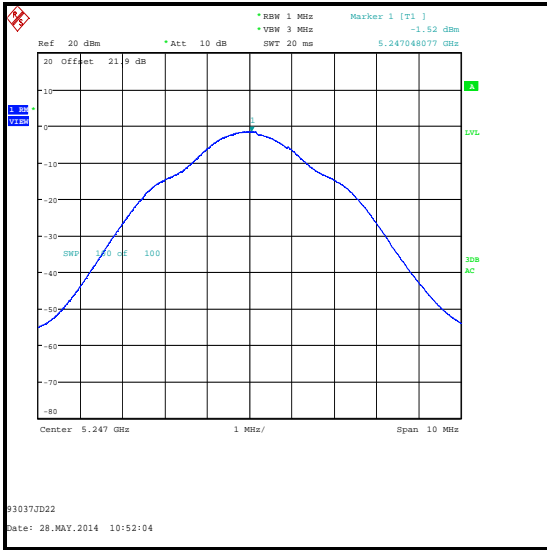
V Port



Bottom Channel



Middle Channel



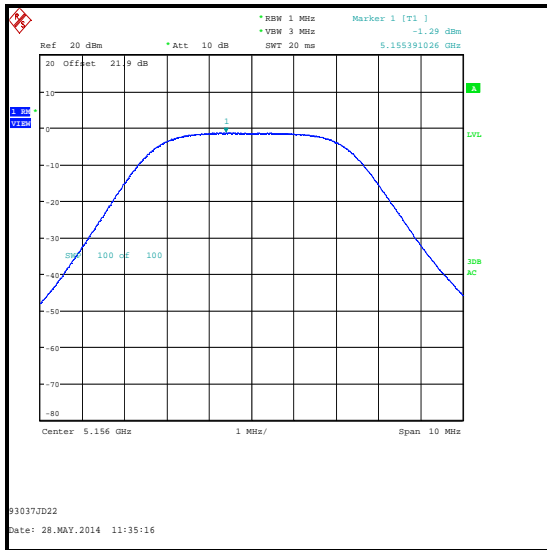
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

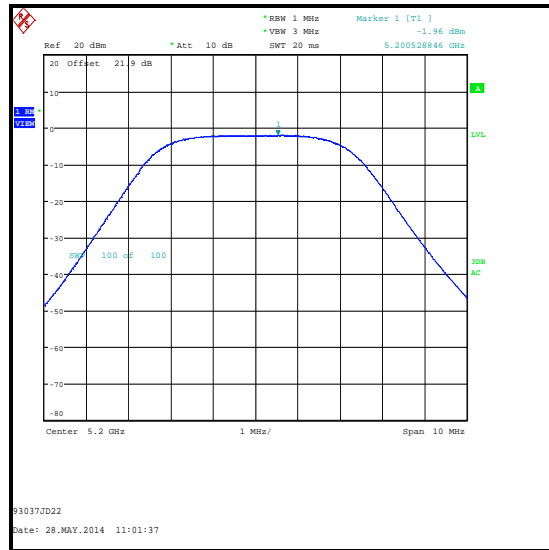
Results: Sectorised Antenna / 5 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-1.2	-0.9	2.0	7.5	5.5	Complied
Middle	-1.9	-1.4	1.4	7.5	6.1	Complied
Top	-1.0	-1.0	2.0	7.5	5.5	Complied

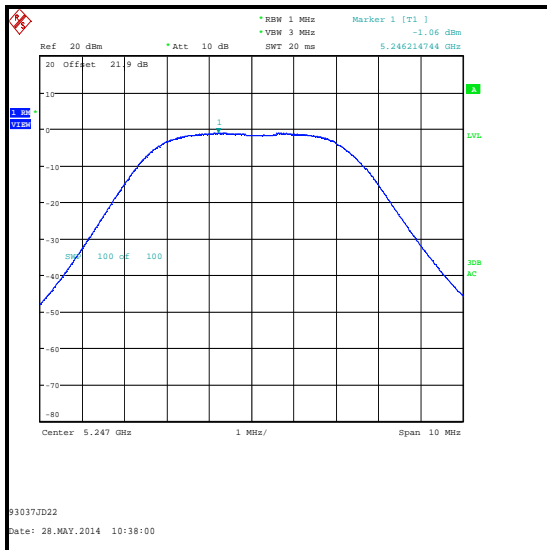
H Port



Bottom Channel



Middle Channel

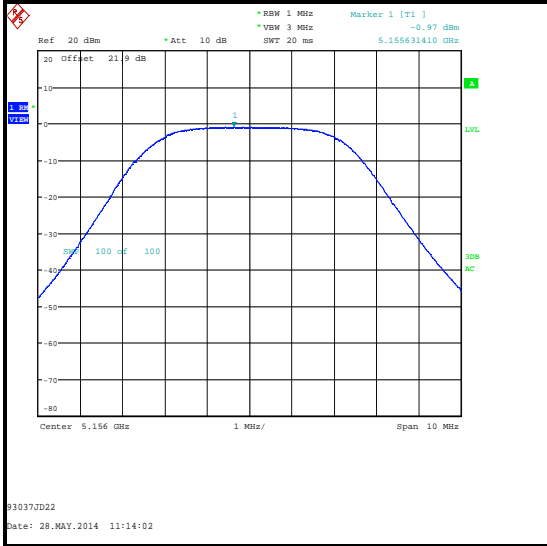


Top Channel

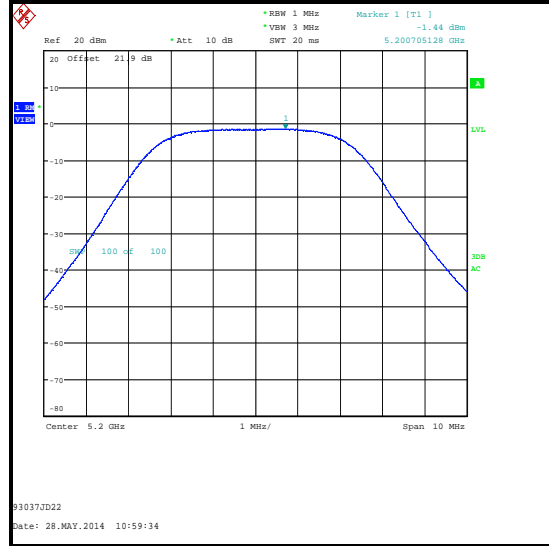
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 5 MHz Channel / 256QAM

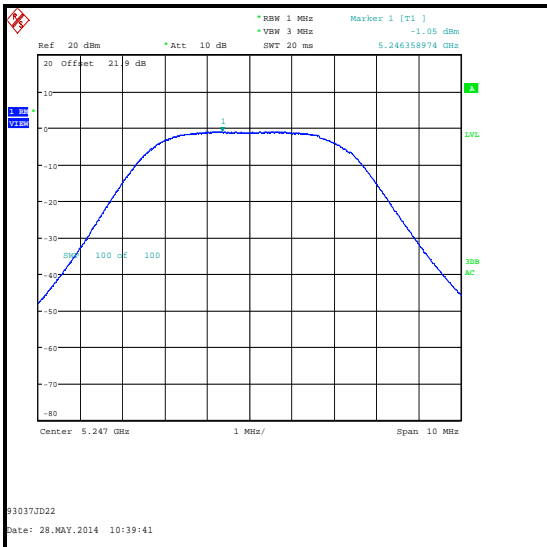
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

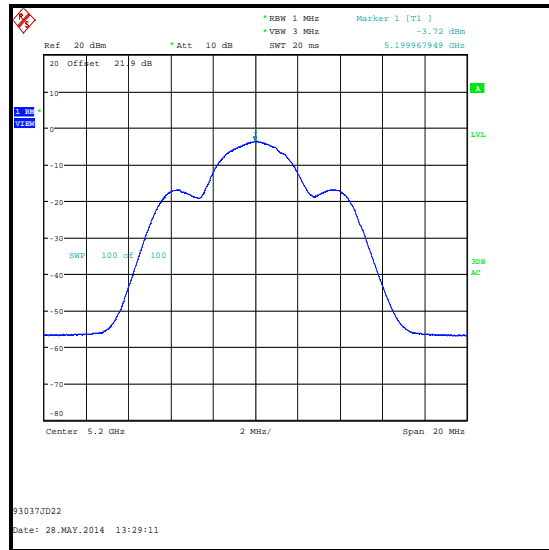
Results: Sectorised Antenna / 10 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-4.0	-4.0	-1.0	7.5	8.5	Complied
Middle	-3.7	-3.8	-0.7	7.5	8.2	Complied
Top	-3.9	-2.9	-0.4	7.5	7.9	Complied

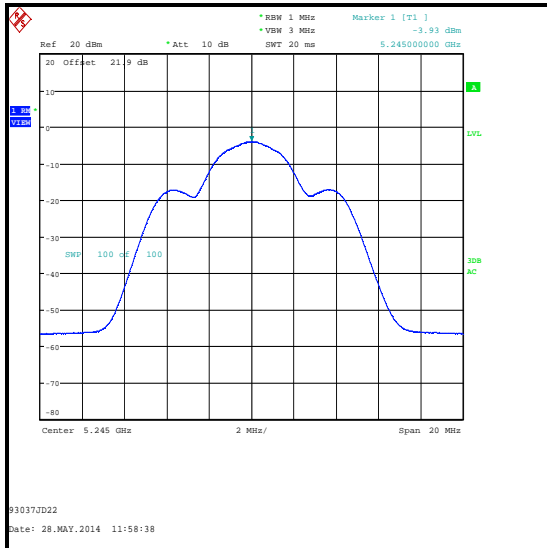
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 10 MHz Channel / ACQ

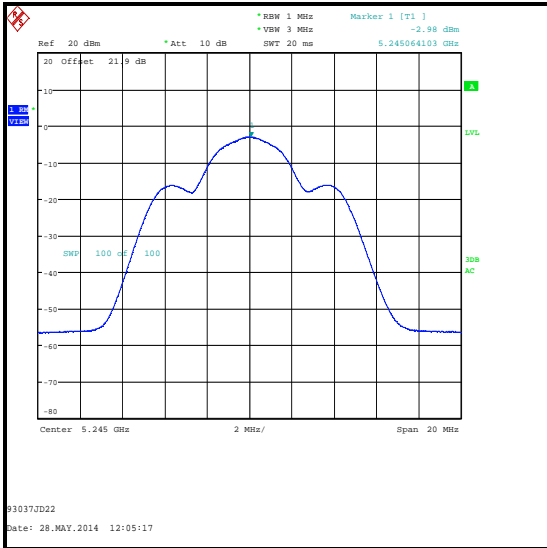
V Port



Bottom Channel



Middle Channel



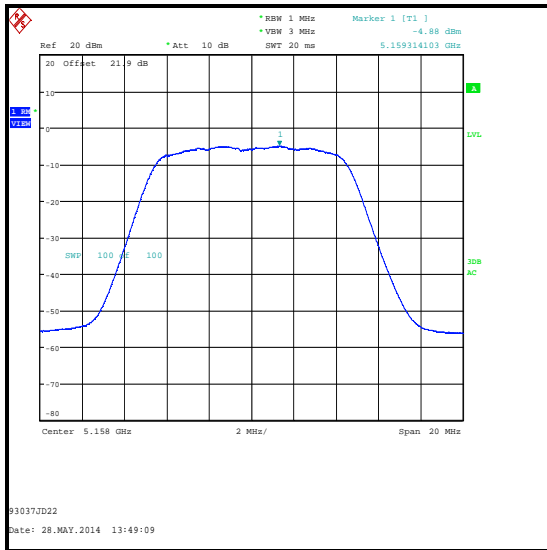
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

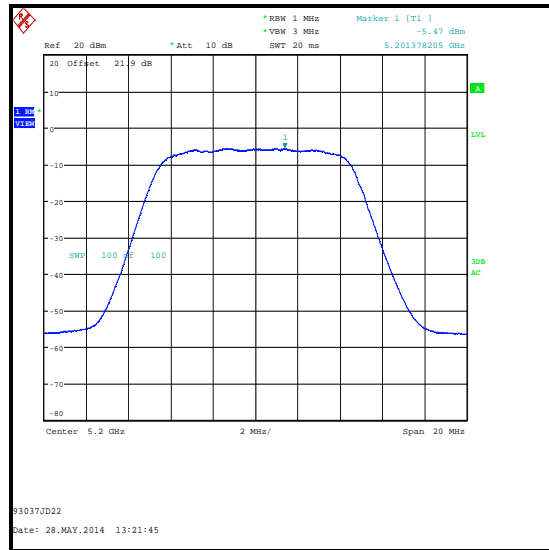
Results: Sectorised Antenna / 10 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-4.8	-4.5	-1.6	7.5	9.1	Complied
Middle	-5.4	-4.4	-1.9	7.5	9.4	Complied
Top	-4.0	-3.9	-0.9	7.5	8.4	Complied

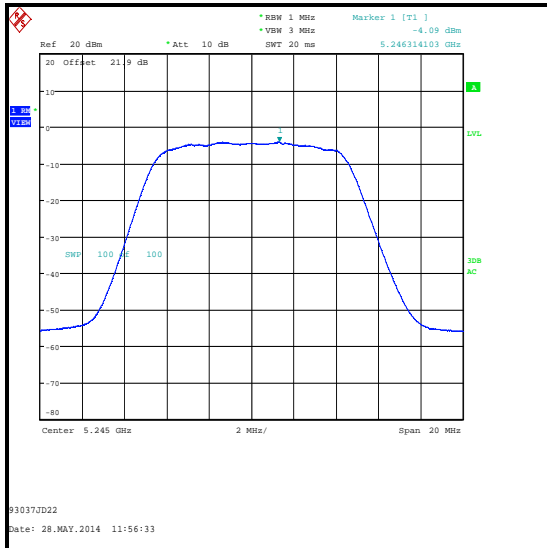
H Port



Bottom Channel



Middle Channel

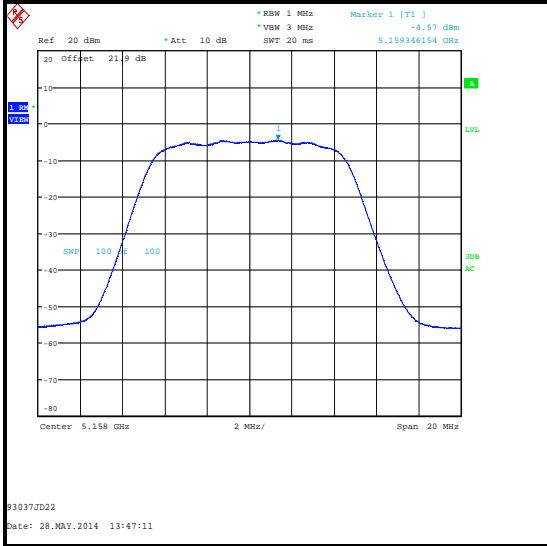


Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 10 MHz Channel / 256QAM

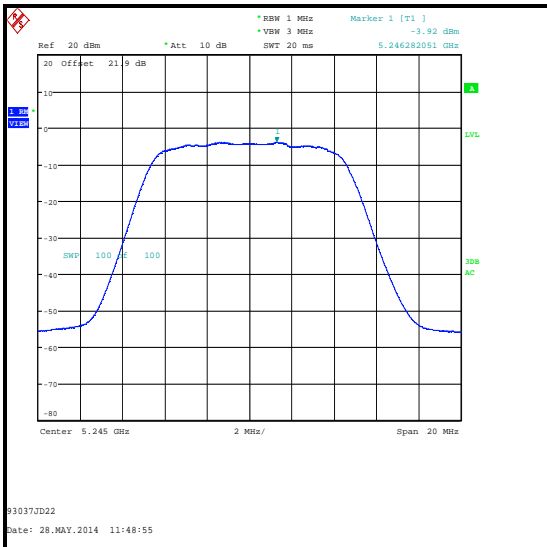
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

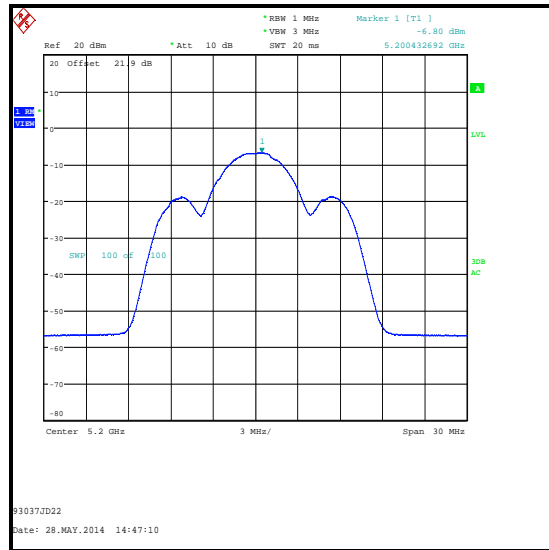
Results: Sectorised Antenna / 15 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-6.9	-6.7	-3.8	7.5	11.3	Complied
Middle	-6.8	-6.4	-3.6	7.5	11.1	Complied
Top	-5.8	-6.5	-3.1	7.5	10.6	Complied

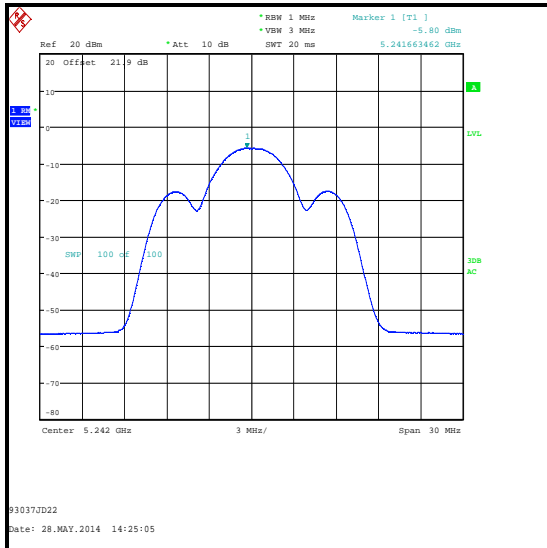
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 15 MHz Channel / ACQ

V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

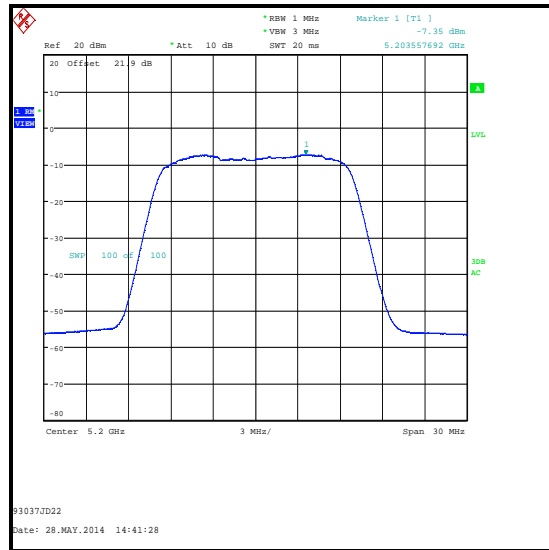
Results: Sectorised Antenna / 15 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-7.1	-7.1	-4.1	7.5	11.6	Complied
Middle	-7.3	-7.1	-4.2	7.5	11.7	Complied
Top	-7.0	-6.6	-3.8	7.5	11.3	Complied

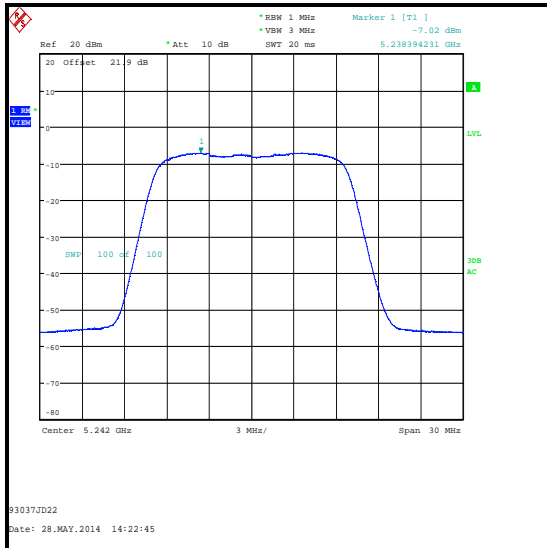
H Port



Bottom Channel



Middle Channel

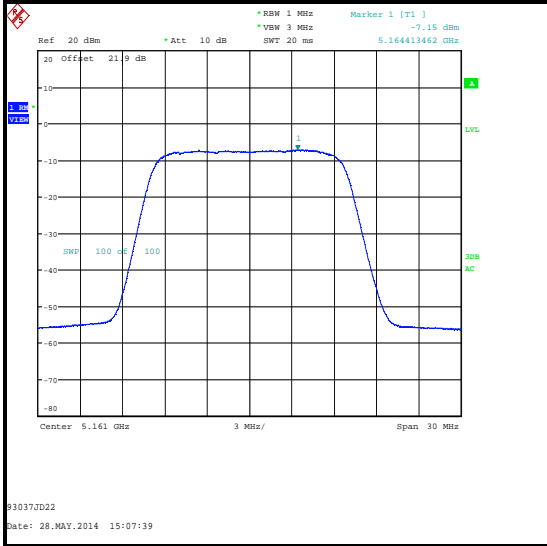


Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 15 MHz Channel / 256QAM

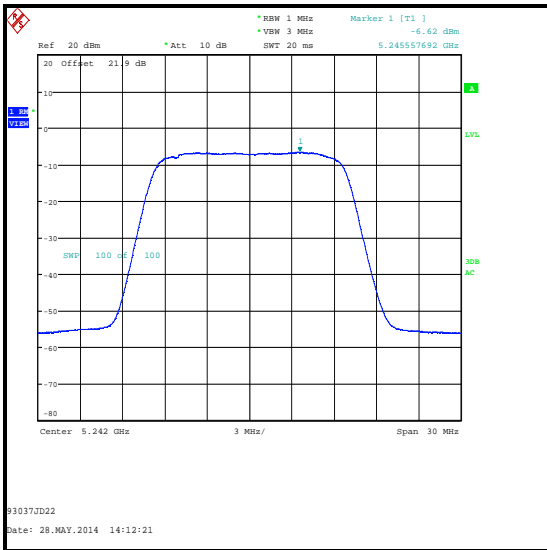
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

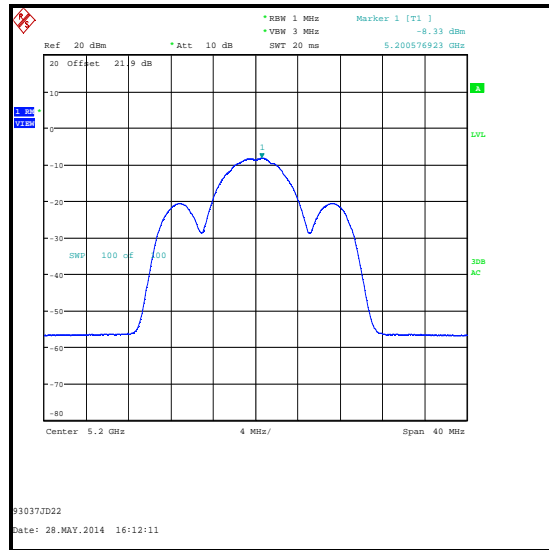
Results: Sectorised Antenna / 20 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-7.4	-7.5	-4.4	7.5	11.9	Complied
Middle	-8.3	-7.5	-4.9	7.5	12.4	Complied
Top	-7.5	-7.0	-4.2	7.5	11.7	Complied

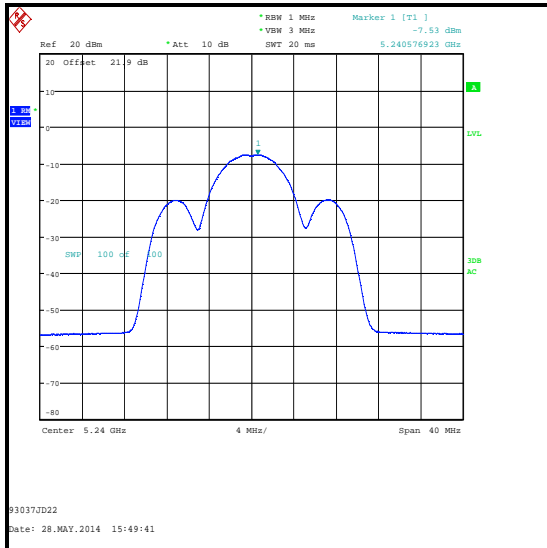
H Port



Bottom Channel



Middle Channel

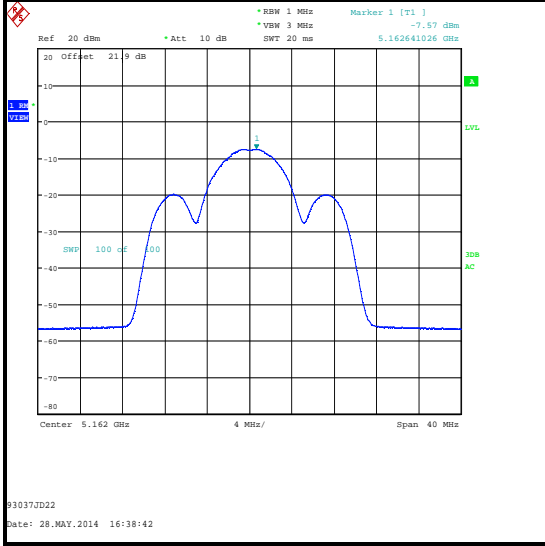


Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 20 MHz Channel / ACQ

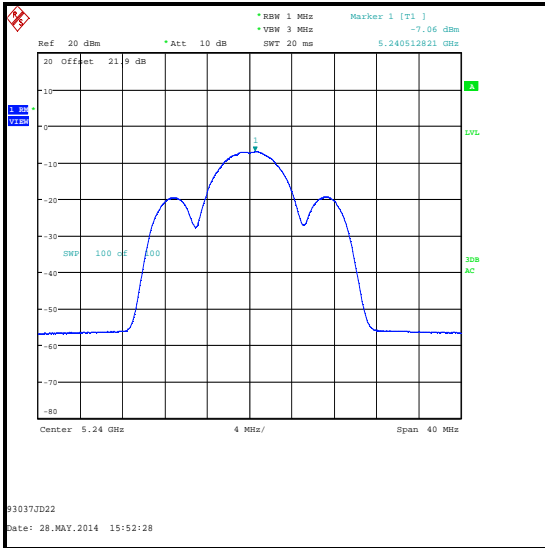
V Port



Bottom Channel



Middle Channel



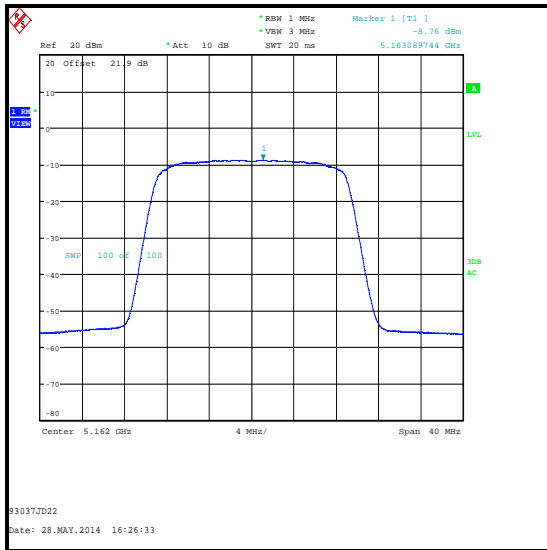
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

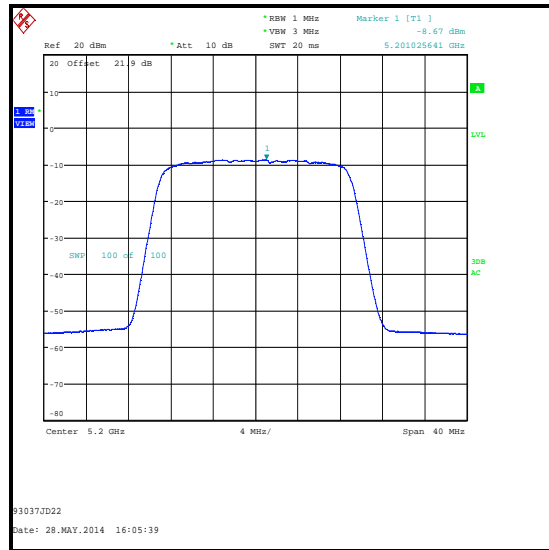
Results: Sectorised Antenna / 20 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-8.7	-8.4	-5.5	7.5	13.0	Complied
Middle	-8.6	-8.7	-5.6	7.5	13.1	Complied
Top	-8.1	-8.4	-5.2	7.5	12.7	Complied

H Port



Bottom Channel



Middle Channel

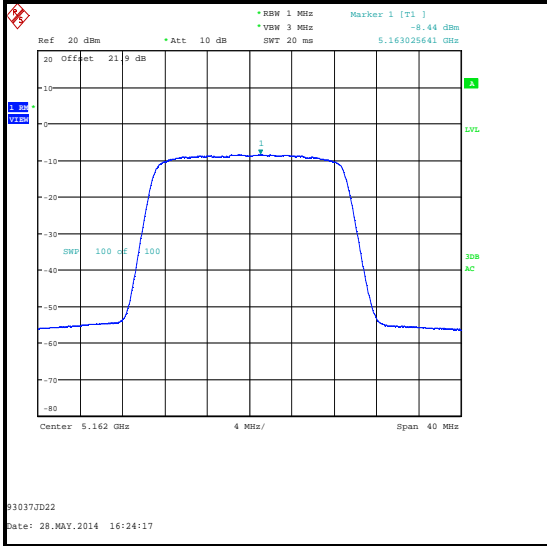


Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 20 MHz Channel / 256QAM

V Port



Bottom Channel



Middle Channel



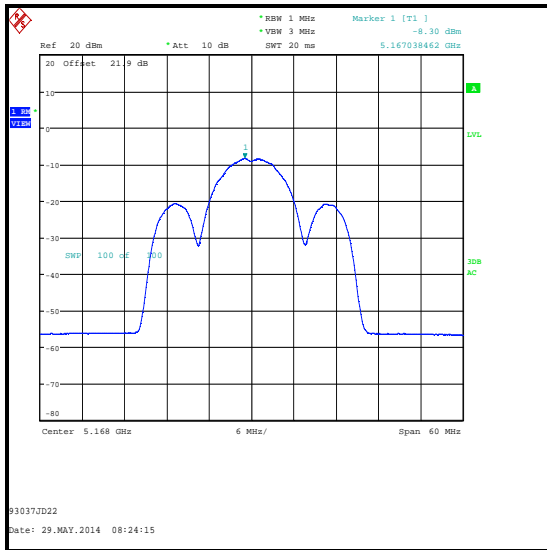
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

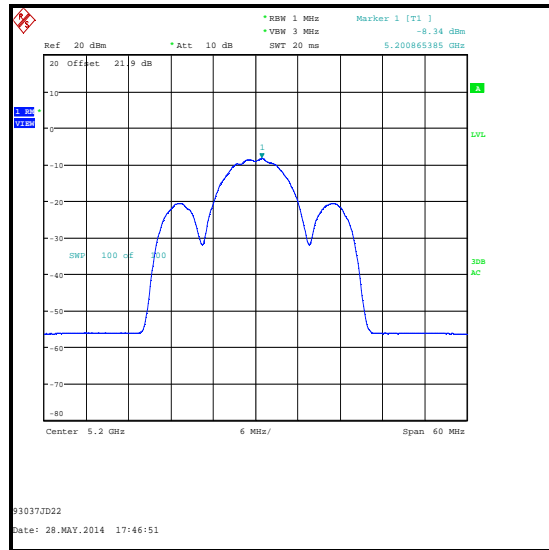
Results: Sectorised Antenna / 30 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-8.3	-8.3	-5.3	7.5	12.8	Complied
Middle	-8.3	-8.0	-5.1	7.5	12.6	Complied
Top	-8.3	-8.3	-5.3	7.5	12.8	Complied

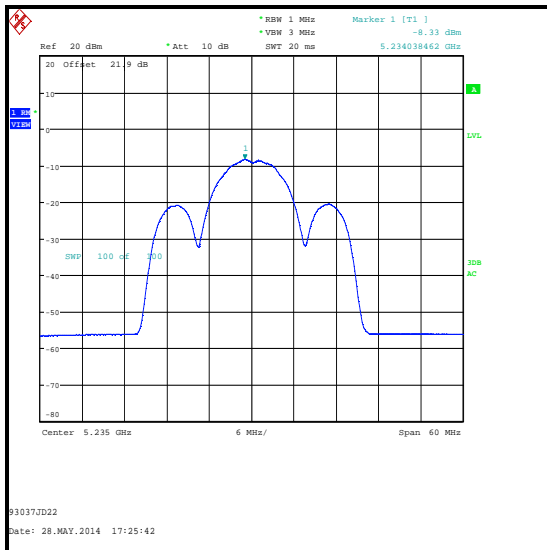
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 30 MHz Channel / ACQ

V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

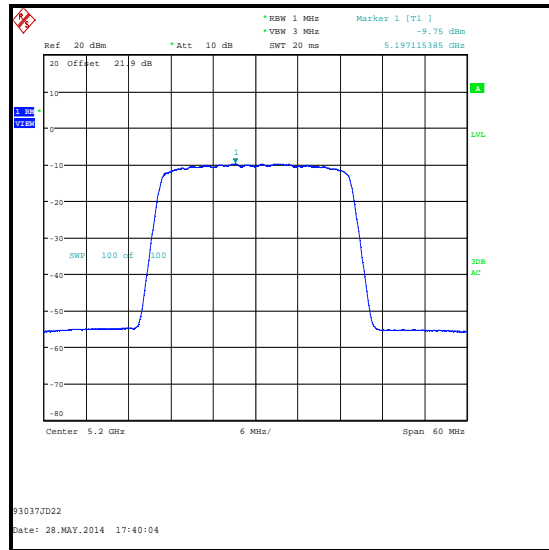
Results: Sectorised Antenna / 30 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-9.6	-8.9	-6.2	7.5	13.7	Complied
Middle	-9.7	-9.3	-6.6	7.5	14.1	Complied
Top	-9.3	-9.0	-6.1	7.5	13.6	Complied

H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 30 MHz Channel / 256QAM

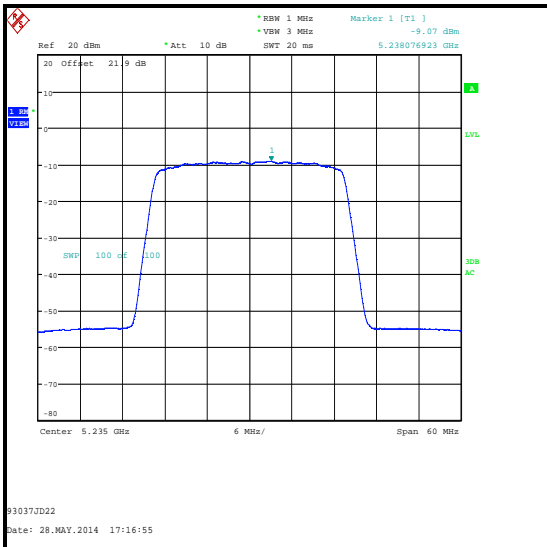
V Port



Bottom Channel



Middle Channel



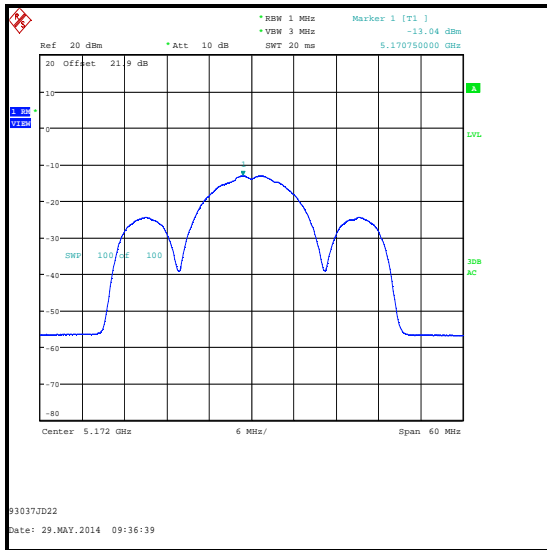
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

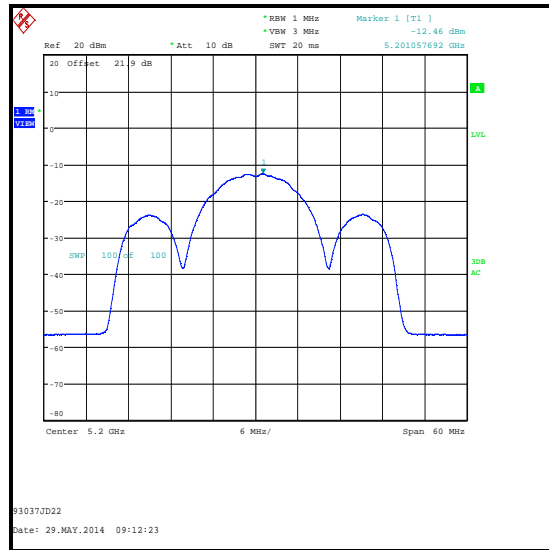
Results: Sectorised Antenna / 40 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-13.0	-12.5	-9.7	7.5	17.2	Complied
Middle	-12.4	-12.6	-9.5	7.5	17.0	Complied
Top	-13.0	-12.3	-9.6	7.5	17.1	Complied

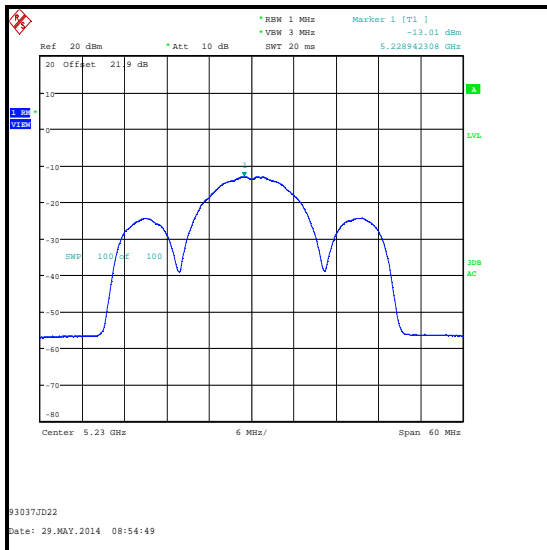
H Port



Bottom Channel



Middle Channel

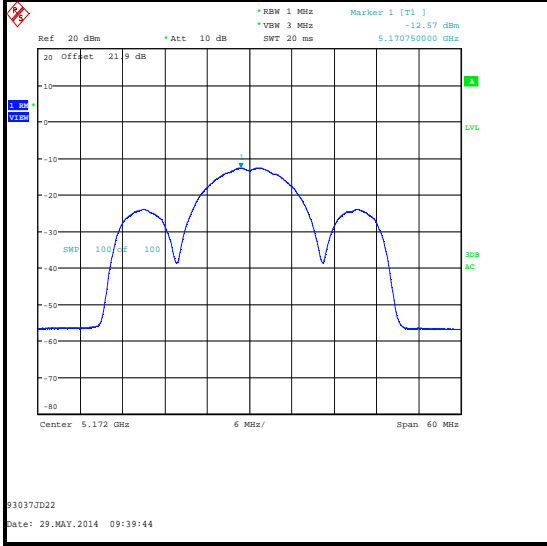


Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 40 MHz Channel / ACQ

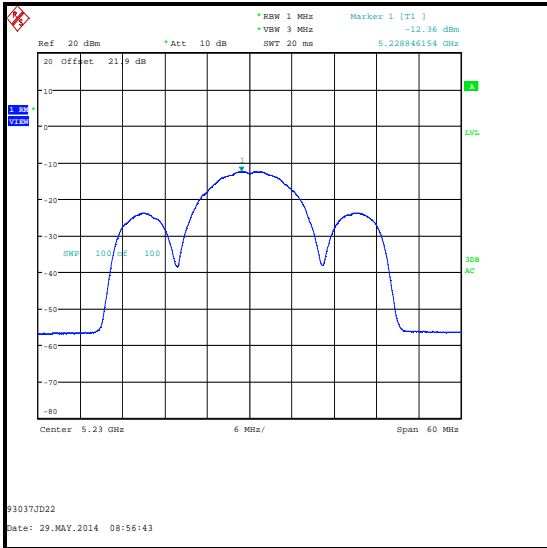
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

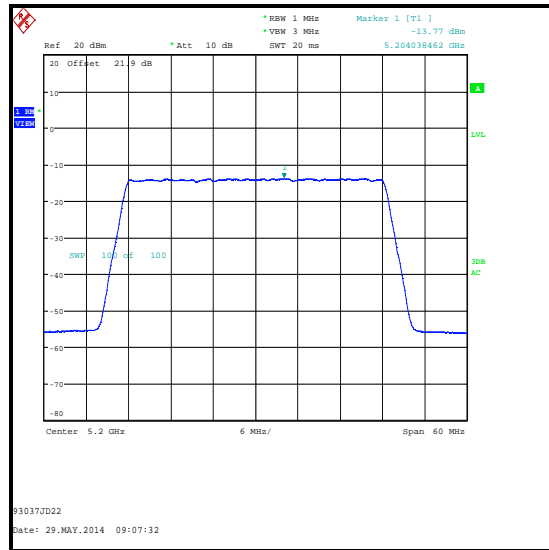
Results: Sectorised Antenna / 40 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-14.3	-13.7	-11.0	7.5	18.5	Complied
Middle	-13.7	-13.3	-10.5	7.5	18.0	Complied
Top	-13.6	-13.3	-10.4	7.5	17.9	Complied

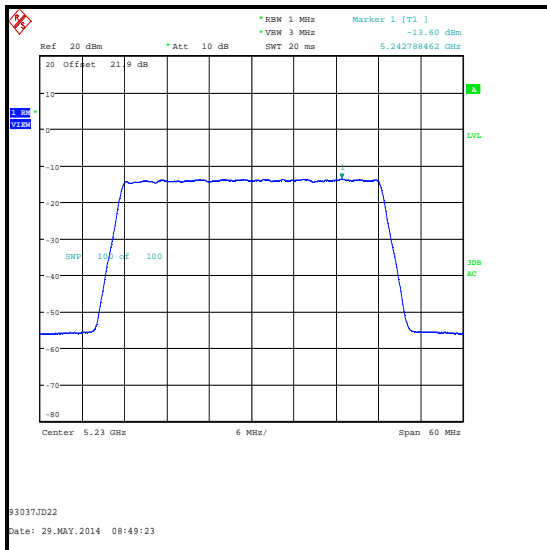
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 40 MHz Channel / 256QAM

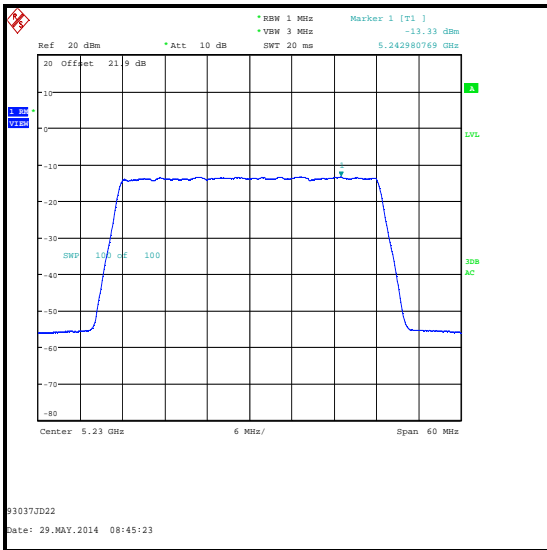
V Port



Bottom Channel



Middle Channel



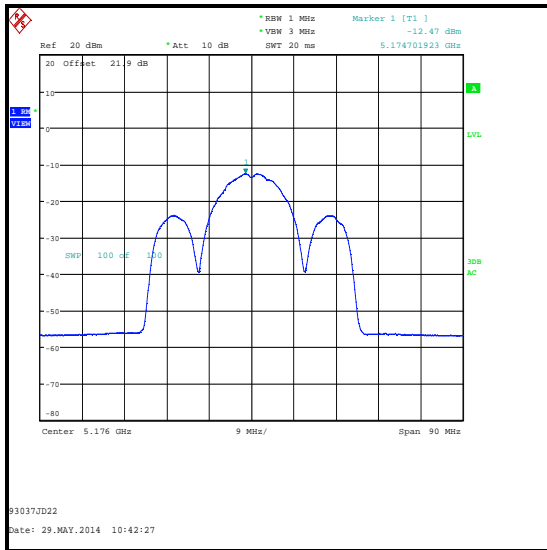
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

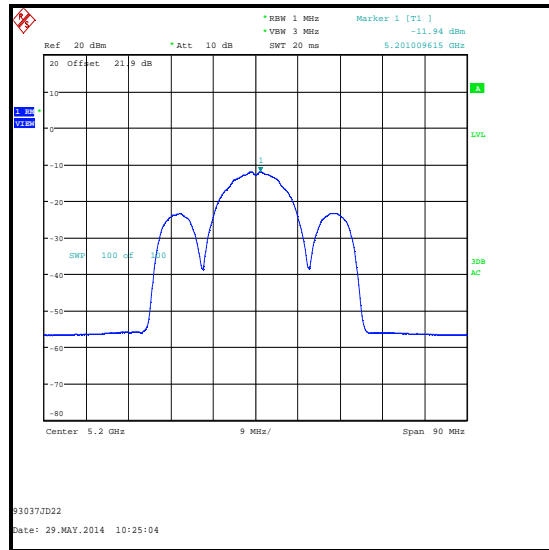
Results: Sectorised Antenna / 45 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-12.4	-11.5	-8.9	7.5	16.4	Complied
Middle	-11.9	-11.6	-8.7	7.5	16.2	Complied
Top	-12.5	-11.6	-9.0	7.5	16.5	Complied

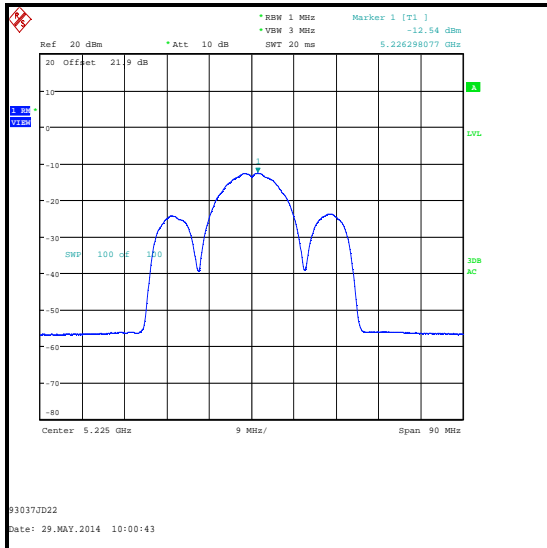
H Port



Bottom Channel



Middle Channel

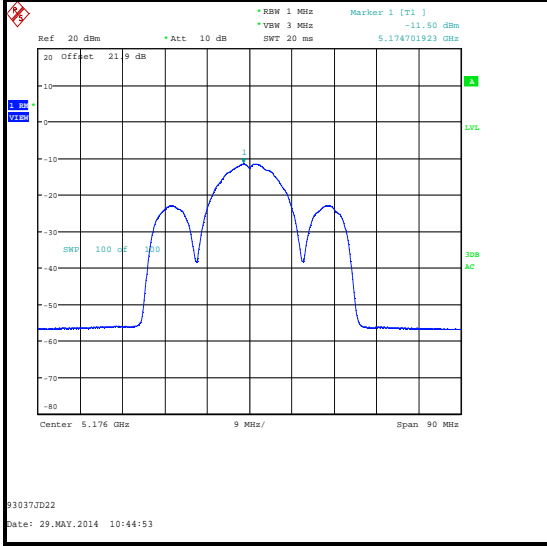


Top Channel

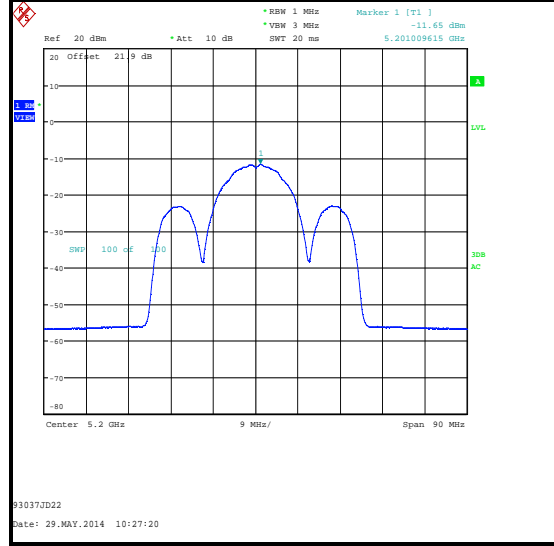
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 45 MHz Channel / ACQ

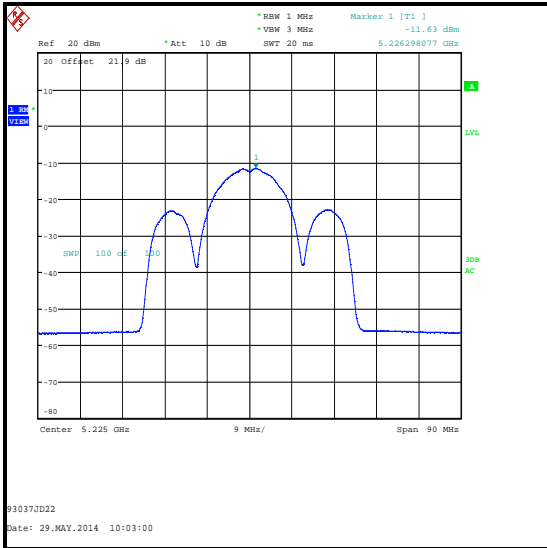
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

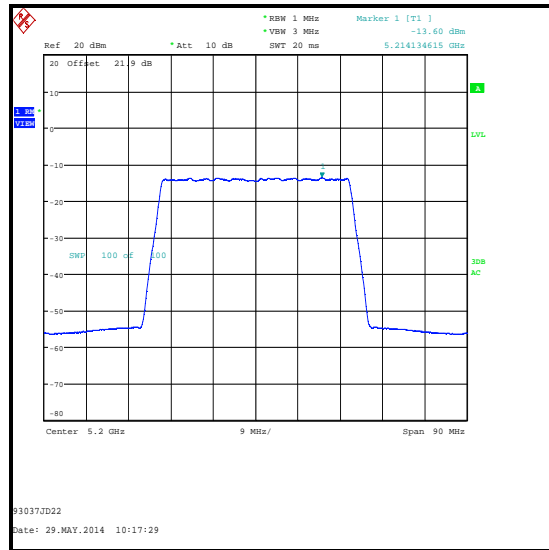
Results: Sectorised Antenna / 45 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-13.5	-12.5	-10.0	7.5	17.5	Complied
Middle	-13.6	-12.8	-10.2	7.5	17.7	Complied
Top	-13.7	-12.9	-10.3	7.5	17.8	Complied

H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Sectorised Antenna / 45 MHz Channel / 256QAM

V Port



Bottom Channel



Middle Channel



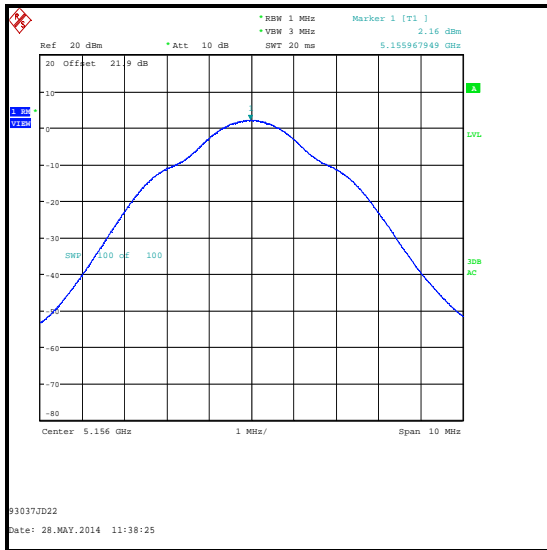
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

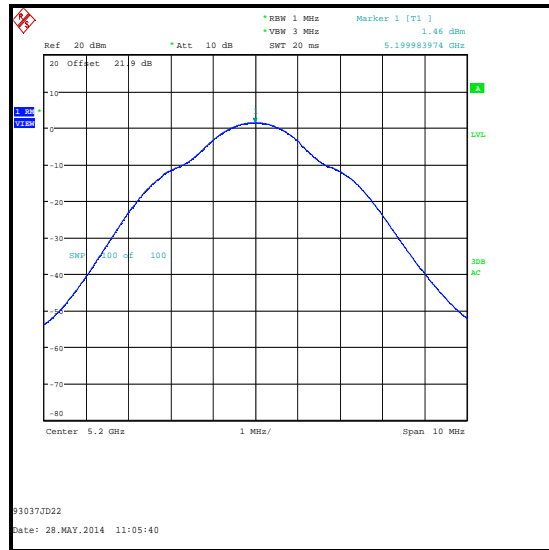
Results: Omnidirectional Antenna / 5 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	2.2	2.3	5.3	11.5	6.2	Complied
Middle	1.5	1.7	4.6	11.5	6.9	Complied
Top	2.2	2.9	5.6	11.5	5.9	Complied

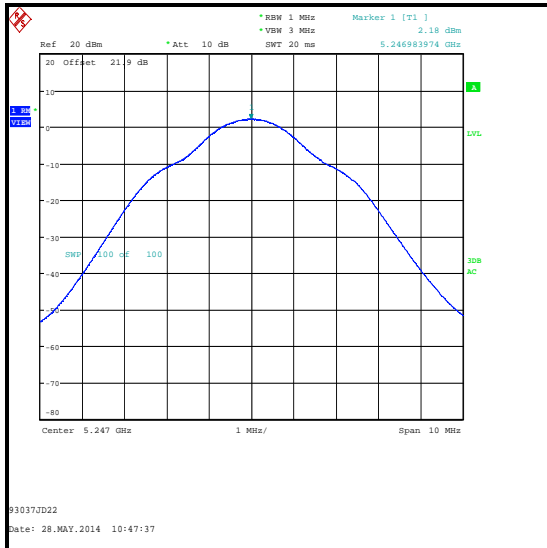
H Port



Bottom Channel



Middle Channel

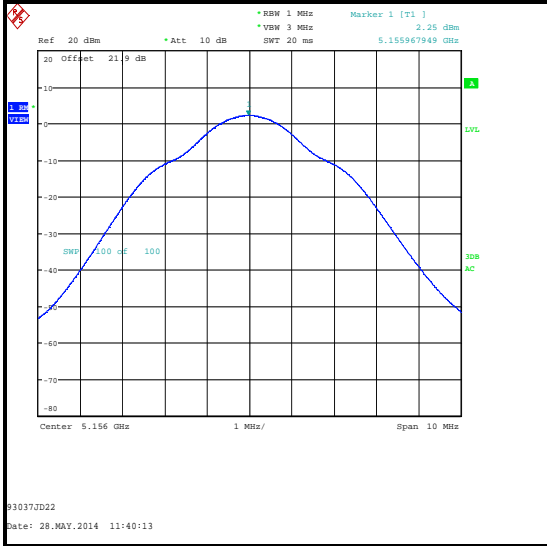


Top Channel

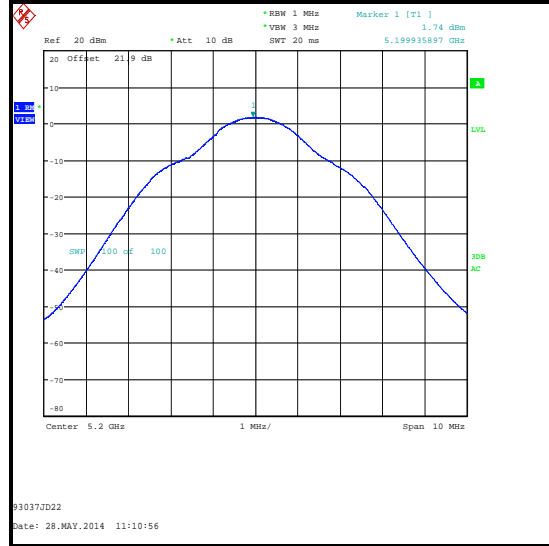
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Omnidirectional Antenna / 5 MHz Channel / ACQ

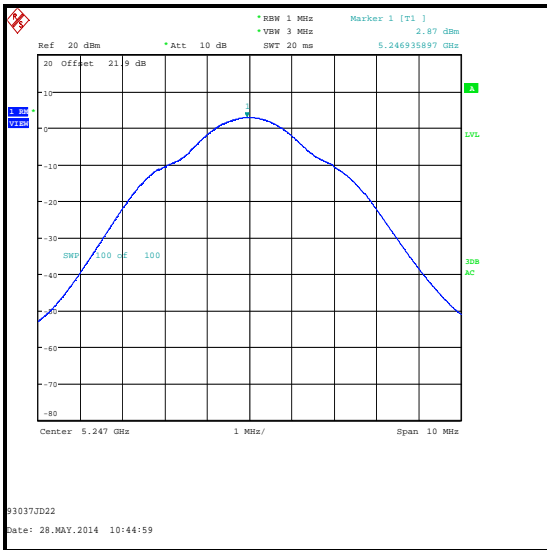
V Port



Bottom Channel



Middle Channel



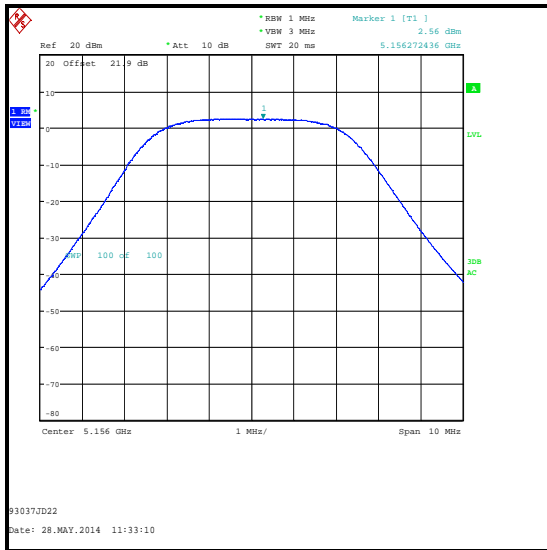
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

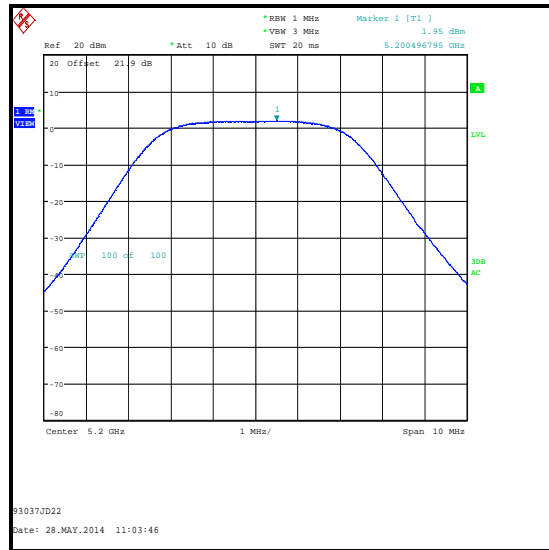
Results: Omnidirectional Antenna / 5 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	2.6	3.2	5.9	11.5	5.6	Complied
Middle	2.0	2.8	5.4	11.5	6.1	Complied
Top	3.5	3.7	6.6	11.5	4.9	Complied

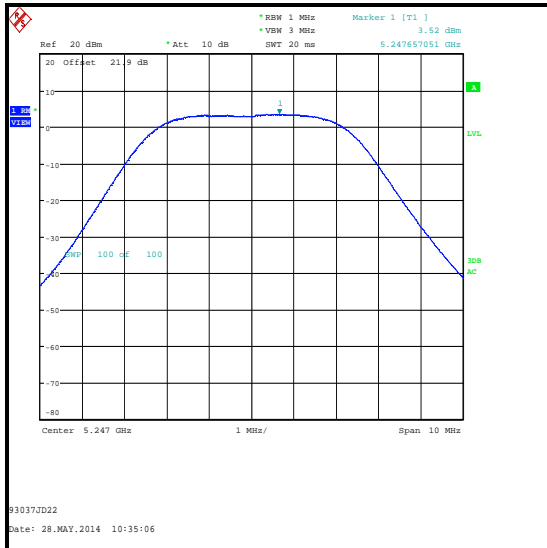
H Port



Bottom Channel



Middle Channel

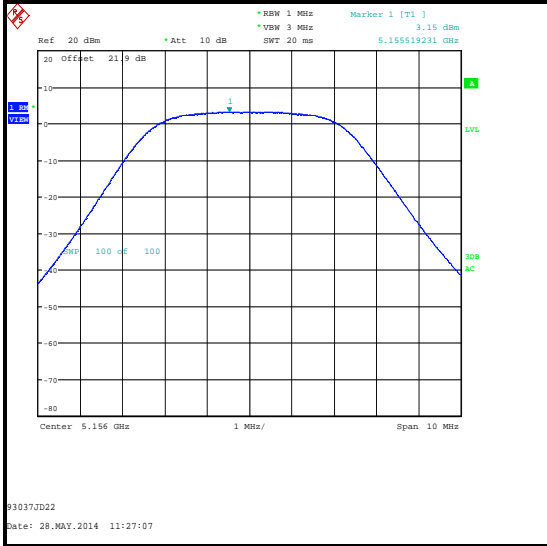


Top Channel

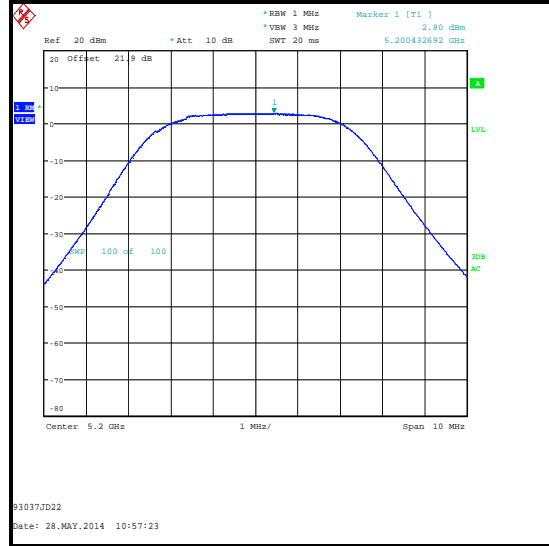
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Omnidirectional Antenna / 5 MHz Channel / 256QAM

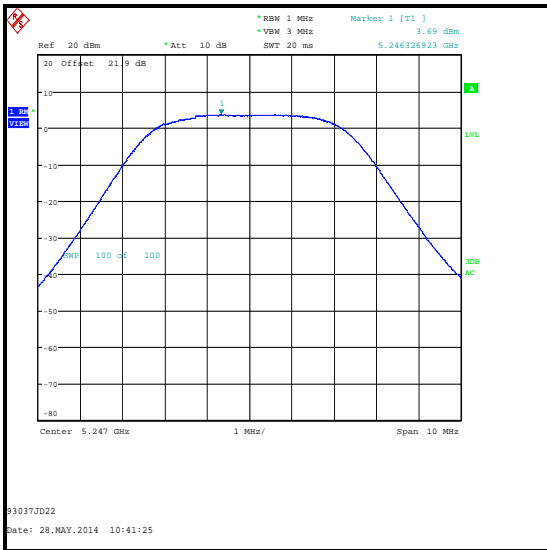
V Port



Bottom Channel



Middle Channel



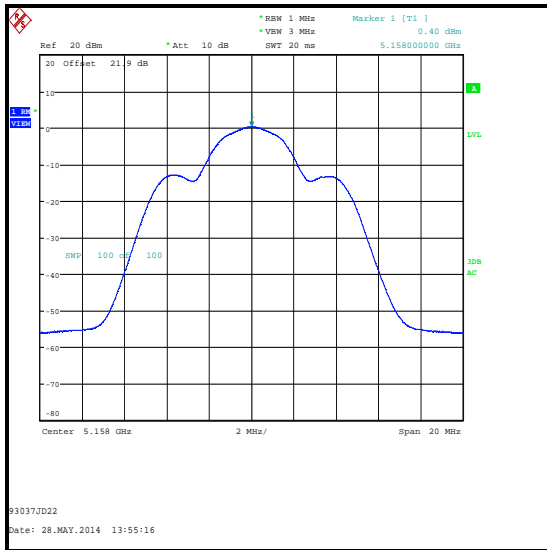
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

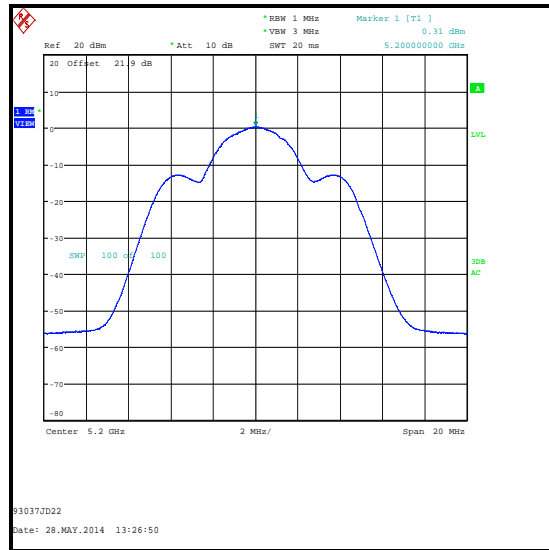
Results: Omnidirectional Antenna / 10 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	0.4	0.7	3.6	11.5	7.9	Complied
Middle	0.3	0.4	3.4	11.5	8.1	Complied
Top	0.8	0.7	3.8	11.5	7.7	Complied

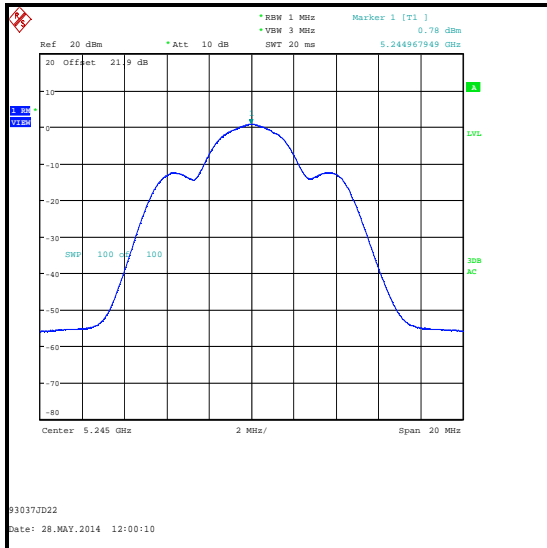
H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Omnidirectional Antenna / 10 MHz Channel / ACQ

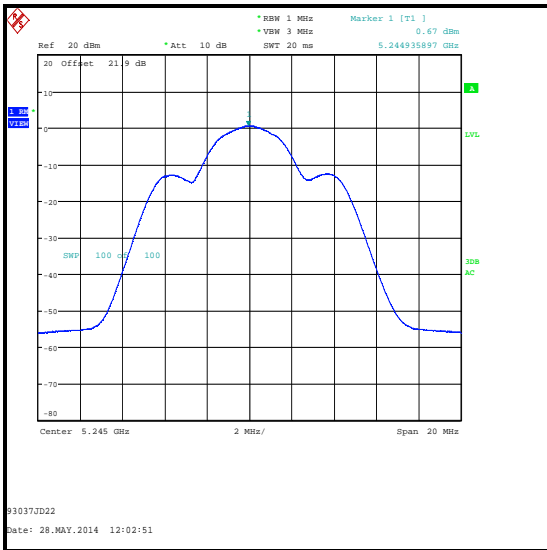
V Port



Bottom Channel



Middle Channel



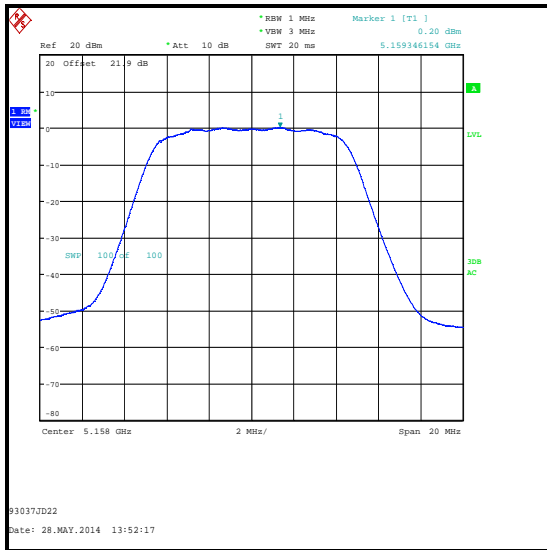
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

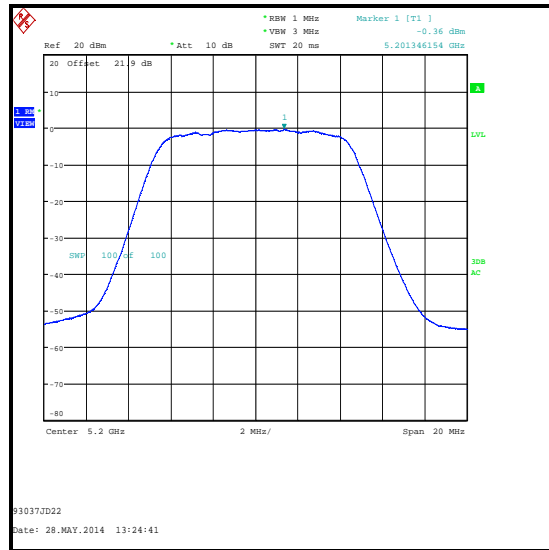
Results: Omnidirectional Antenna / 10 MHz Channel / 256QAM

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	0.2	1.0	3.6	11.5	7.9	Complied
Middle	-0.3	0.6	3.2	11.5	8.3	Complied
Top	0.4	0.5	3.5	11.5	8.0	Complied

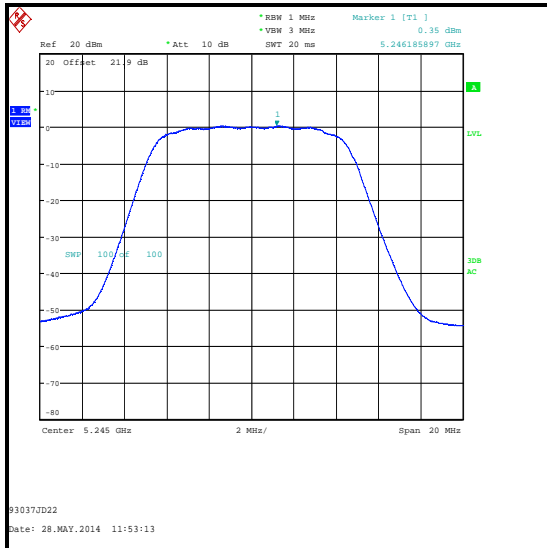
H Port



Bottom Channel



Middle Channel



Top Channel

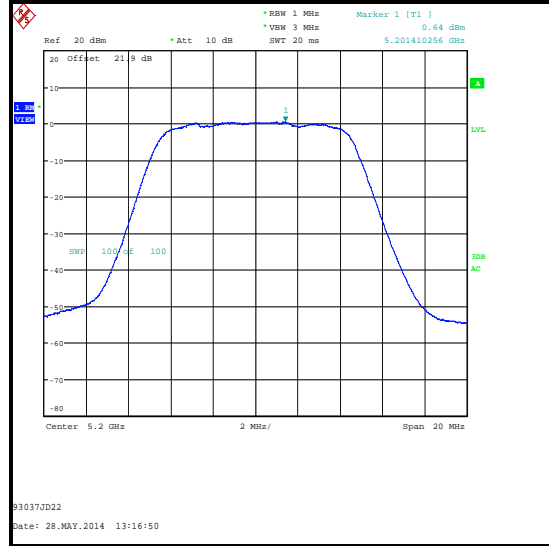
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Omnidirectional Antenna / 10 MHz Channel / 256QAM

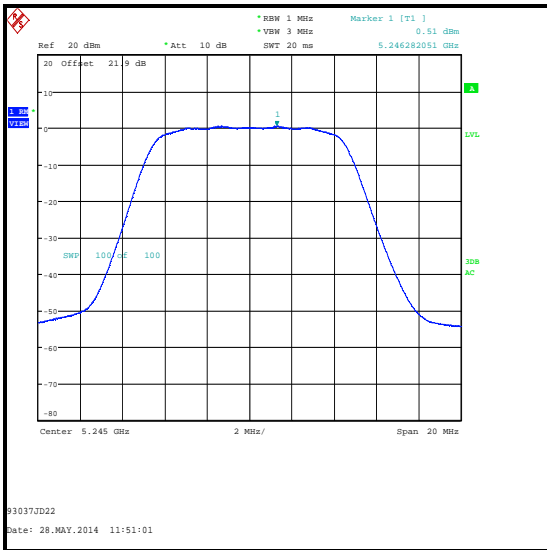
V Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

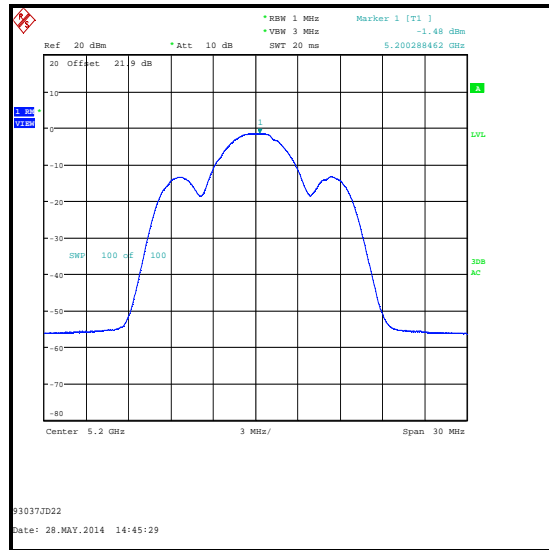
Results: Omnidirectional Antenna / 15 MHz Channel / ACQ

Channel	PPSD H Port (dBm/MHz)	PPSD V Port (dBm/MHz)	PPSD Power (dBm/MHz)	PPSD Power Limit (dBm/MHz)	Margin (dB)	Result
Bottom	-0.8	-1.1	2.1	11.5	9.4	Complied
Middle	-1.4	-1.3	1.6	11.5	9.9	Complied
Top	-1.1	-0.8	2.1	11.5	9.4	Complied

H Port



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: Omnidirectional Antenna / 15 MHz Channel / ACQ

V Port



Bottom Channel



Middle Channel



Top Channel