



TEST REPORT

Test Report No. : UL-RPT-RP93037JD09A

Manufacturer : Cambium Networks Ltd

Model No. : PTP 50650 Integrated ODU
PTP 50650 Connectorized ODU

FCC ID : QWP-50650

Test Standard(s) : FCC Parts 15.207, 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: 12 SEPTEMBER 2013

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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:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 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:	14 June 2013 to 13 August 2013

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.207	Transmitter AC Conducted Emissions	
Part 15.403(i)	Transmitter 26 dB Emission Bandwidth	
Part 15.407(a)(2)	Transmitter Maximum Conducted Output Power	
Part 15.407(a)(2)	Transmitter Peak Power Spectral Density	
Part 15.407(a)(6)	Transmitter Peak Excursion	
Part 15.407(b)/ 15.209(a)	Transmitter Out of Band Radiated Emissions	
Part 15.407(b)/ 15.209(a)	Transmitter Band Edge Radiated Emissions	
Part 15.407(g)	Transmitter Frequency Stability (Temperature & Voltage Variation)	Note 1
Part 15.407(h)(1)	Transmitter Power Control	
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. Dynamic Frequency Selection results are contained in a separate report UL-RPT-RP93037JD09B V2.0.

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 D01 v01r03 April 8, 2013
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:	PTP 50650
Hardware Version:	Production Revision 4
Software Version:	50650-G7-B941
Serial Number:	0004565000B3
FCC ID:	QWP-50650

Brand Name:	Cambium Networks Ltd
Model Name or Number:	PTP 50650
Hardware Version:	Production Revision 4
Software Version:	50650-G7-B983
Serial Number:	0004565000A3
FCC ID:	QWP-50650

Brand Name:	Cambium Networks Ltd
Model Name or Number:	PTP 50650
Hardware Version:	Production Revision 4
Software Version:	50650-G7-B983
Serial Number:	0004565000D0
FCC ID:	QWP-50650

Description:	PoE Power supply
Brand Name:	LEADER ELECTRONICS INC.
Model Name or Number:	NU60-R550111-I3
Serial Number:	Not marked or stated

Description:	PoE Power supply
Brand Name:	Cambium Networks
Model Name or Number:	E100109B G
Serial Number:	1321000023

3.2. Description of EUT

The Equipment Under Test was a fixed radio transceiver operating in the 5250-5350 MHz and 5470-5725 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.

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:		14.0 dBm (when used in conjunction with omnidirectional antenna)				
Frequency Range:		5250 MHz to 5350 MHz / Parabolic Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5255	5255	5298	5345	5345
	10	5257	5257	5301	5342	5342
	15	5260	5260	5299	5340	5340
	20	5262	5262	5301	5338	5338
	30	5267	5267	5297	5333	5333
	40	5272	5272	5302	5328	5328
	45	5275	5275	5295	5325	5325
Frequency Range:		5470 MHz to 5725 MHz / Parabolic Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5475	5475	5593	5720	5720
	10	5477	5477	5591	5718	5718
	15	5480	5480	5589	5715	5715
	20	5482	5482	5586	5713	5713
	30	5487	5487	5577	5708	5708
	40	5492	5492	5572	5703	5703
	45	5495	5495	5575	5700	5700

Additional Information Related to Testing (continued)

Frequency Range:		5250 MHz to 5350 MHz / Flat Plate Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5256	5256	5298	5344	5344
	10	5258	5260	5301	5337	5342
	15	5261	5267	5299	5330	5340
	20	5265	5271	5301	5325	5338
	30	5268	5280	5297	5308	5333
	40	5275	5290	5302	5299	5328
	45	5279	5298	5295	5295	5325
Frequency Range:		5470 MHz to 5725 MHz / Flat Plate Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5476	5476	5593	5720	5720
	10	5478	5478	5591	5715	5718
	15	5480	5480	5589	5709	5715
	20	5482	5482	5586	5704	5713
	30	5487	5492	5577	5694	5708
	40	5493	5500	5572	5691	5703
	45	5495	5508	5575	5686	5700

Additional Information Related to Testing (continued)

Frequency Range:		5250 MHz to 5350 MHz / Sectorised Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5256	5256	5298	5344	5344
	10	5258	5258	5301	5342	5342
	15	5261	5261	5299	5340	5340
	20	5265	5265	5301	5338	5338
	30	5268	5268	5297	5333	5333
	40	5275	5275	5302	5328	5328
	45	5279	5279	5295	5325	5325
Frequency Range:		5470 MHz to 5725 MHz / Sectorised Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5476	5476	5593	5720	5720
	10	5478	5478	5591	5718	5718
	15	5480	5480	5589	5715	5715
	20	5482	5482	5586	5713	5713
	30	5487	5487	5577	5708	5708
	40	5493	5493	5572	5703	5703
	45	5495	5508	5575	5700	5700

Additional Information Related to Testing (continued)

Frequency Range:		5250 MHz to 5350 MHz / Omnidirectional Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5256	5256	5298	5344	5344
	10	5258	5258	5301	5342	5342
	15	5261	5261	5299	5340	5340
	20	5265	5265	5301	5338	5338
	30	5268	5268	5297	5333	5333
	40	5275	5275	5302	5328	5328
	45	5279	5279	5295	5325	5325
Frequency Range:		5470 MHz to 5725 MHz / Omnidirectional Antenna				
Channels Tested:	Channel Bandwidth (MHz)	Bottom Channel Frequency (MHz)	Lowest Full Pwr. Channel (MHz)	Middle Channel Frequency (MHz)	Highest Full Pwr. Channel (MHz)	Top Channel Frequency (MHz)
	5	5476	5476	5593	5720	5720
	10	5478	5478	5591	5718	5718
	15	5480	5480	5589	5715	5715
	20	5482	5482	5586	5713	5713
	30	5487	5487	5577	5708	5708
	40	5493	5493	5572	5703	5703
	45	5495	5495	5575	5700	5700

Note(s):

The EUT is unable to operate at full power and remain compliant on some lower and higher channels. Power has been reduced on some lower and higher channels. 'Lowest Full Pwr. Channel' and 'Highest Full Pwr. Channel' in the table above show the lowest and highest channel frequencies that the EUT can operate at full power and remain compliant. All channel frequencies between the 'Lowest Full Pwr. Channel' and 'Highest Full Pwr. Channel' can operate at full power. 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

3.6. Antenna

The table below lists the antennas that the manufacturer intends to use with this product when operating in the 5250-5350 & 5470-5725 MHz bands:

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	34.9	Andrews	PX4F-52-N7A/A	X	2
65° 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. The EUT is configured to produce the highest conducted output power when this antenna is used.

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 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 supplies and Ethernet cables.
- Radiated spurious emissions tests. The antenna and ODU under test were mounted on a metal 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.
- AC conducted emissions tests and radiated spurious emissions tests below 1 GHz were performed using sample with serial number 0004565000B3. This contained software version 50650-G7-B941. All other tests were performed with serial numbers 0004565000A3 and 0004565000D0 containing later software 50650-G7-B983. The manufacturer declared no changes in the later software will affect the AC conducted emission and radiated spurious emissions test results using the earlier software.

Power settings used during testing

'LCF' in the tables below indicates the power setting on the lower channels. 'HCF' indicates the power setting on the higher channels. Where the tables are marked as 'Mid Ch' the maximum power setting was used for all channels from the Lowest Full Power Channel to the Highest Full Power Channel including the centre channel. Where LCF, Mid Ch and HCF have the same values, then maximum power was used across the band from the bottom channel to the top channel. Corresponding channel frequencies are shown in Section 3.4 of this report.

Power Settings Used For Testing / 4' Parabolic Antenna / Lower Band

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.

	BPSK			QPSK			16QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	-9	-9	-9	-9	-9	-9	-9	-9	-9
10	-6	-6	-6	-6	-6	-6	-6	-6	-6
15	-4	-4	-4	-4	-4	-4	-4	-4	-4
20	-3	-3	-3	-3	-3	-3	-3	-3	-3
30	-3	-3	-3	-3	-3	-3	-3	-3	-3
40	-3	-3	-3	-3	-3	-3	-3	-3	-3
45	-3	-3	-3	-3	-3	-3	-3	-3	-3

	64QAM			256QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	-9	-9	-9	-9	-9	-9
10	-6	-6	-6	-6	-6	-6
15	-4	-4	-4	-4	-4	-4
20	-3	-3	-3	-3	-3	-3
30	-3	-3	-3	-3	-3	-3
40	-3	-3	-3	-3	-3	-3
45	-3	-3	-3	-3	-3	-3

Power Settings Used For Testing / 4' Parabolic Antenna / Upper Band

	BPSK			QPSK			16QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	-9	-9	-9	-9	-9	-9	-9	-9	-9
10	-6	-6	-6	-6	-6	-6	-6	-6	-6
15	-4	-4	-4	-4	-4	-4	-4	-4	-4
20	-3	-3	-3	-3	-3	-3	-3	-3	-3
30	-3	-3	-3	-3	-3	-3	-3	-3	-3
40	-3	-3	-3	-3	-3	-3	-3	-3	-3
45	-3	-3	-3	-3	-3	-3	-3	-3	-3

	64QAM			256QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	-9	-9	-9	-9	-9	-9
10	-6	-6	-6	-6	-6	-6
15	-4	-4	-4	-4	-4	-4
20	-3	-3	-3	-3	-3	-3
30	-3	-3	-3	-3	-3	-3
40	-3	-3	-3	-3	-3	-3
45	-3	-3	-3	-3	-3	-3

Power Settings Used For Testing / Plate Antenna / Lower Band

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.

	BPSK			QPSK			16QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	1	1	1	1	1	1	1	1	1
10	0	4	0	0	4	0	0	4	0
15	-1	6	-1	-1	6	-1	-1	6	-1
20	2	7	-2	2	7	-2	2	7	-2
30	2	7	0	2	7	0	2	7	0
40	1	7	-3	1	7	-3	1	7	-3
45	1	7	-3	1	7	-3	1	7	-3

	64QAM			256QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	1	1	1	1	1	1
10	0	4	0	0	4	0
15	-1	6	-1	-1	6	-1
20	2	7	-2	2	7	-2
30	2	7	0	2	7	0
40	1	7	-3	1	7	-3
45	1	7	-3	1	7	-3

Power Settings Used For Testing / Plate Antenna / Upper Band

	BPSK			QPSK			16QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	1	1	1	1	1	1	1	1	1
10	4	4	2	4	4	2	4	4	2
15	6	6	3	6	6	3	6	6	3
20	7	7	0	7	7	0	7	7	0
30	4	7	2	4	7	2	4	7	2
40	5	7	1	5	7	1	5	7	1
45	1	7	-1	1	7	-1	1	7	-1

	64QAM			256QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	1	1	1	1	1	1
10	4	4	2	4	4	2
15	6	6	3	6	6	3
20	7	7	0	7	7	0
30	4	7	2	4	7	2
40	5	7	1	5	7	1
45	1	7	-1	1	7	-1

Power Settings Used For Testing / Sectorised Antenna / Lower Band

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.

	BPSK			QPSK			16QAM		
Ch. BW	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

	64QAM			256QAM		
Ch. BW	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 / Sectorised Antenna / Upper Band

	BPSK			QPSK			16QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	4	4	4	4	4	4	4	4	4
10	4	4	4	4	4	4	4	4	4
15	7	7	7	7	7	7	7	7	7
20	8	8	8	8	8	8	8	8	8
30	9	9	9	9	9	9	9	9	9
40	9	9	9	9	9	9	9	9	9
45	9	9	9	9	9	9	9	9	9

	64QAM			256QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	4	4	4	4	4	4
10	4	4	4	4	4	4
15	7	7	7	7	7	7
20	8	8	8	8	8	8
30	9	9	9	9	9	9
40	9	9	9	9	9	9
45	9	9	9	9	9	9

Power Settings Used For Testing / Omnidirectional Antenna / Lower Band

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.

	BPSK			QPSK			16QAM		
Ch. BW	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

	64QAM			256QAM		
Ch. BW	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

Power Settings Used For Testing / Omnidirectional Antenna / Upper Band

	BPSK			QPSK			16QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	9	9	9	9	9	9	9	9	9
10	9	9	9	9	9	9	9	9	9
15	11	11	11	11	11	11	11	11	11
20	11	11	11	11	11	11	11	11	11
30	13	13	13	13	13	13	13	13	13
40	13	13	13	13	13	13	13	13	13
45	13	13	13	13	13	13	13	13	13

	64QAM			256QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	9	9	9	9	9	9
10	9	9	9	9	9	9
15	11	11	11	11	11	11
20	11	11	11	11	11	11
30	13	13	13	13	13	13
40	13	13	13	13	13	13
45	13	13	13	13	13	13

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 AC Conducted Spurious Emissions****Test Summary:**

Test Engineer:	David Doyle	Test Date:	14 June 2013
Test Sample Serial Number:	0004565000B3		

FCC Reference:	Part 15.207
Test Method Used:	ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	46

Note(s):

1. The manufacturer stated that two different power supplies can be used with this product. AC conducted spurious emissions tests were performed on each power supply.
2. The EUT was transmitting at maximum power during the test. RF ports were terminated using 50 Ohm loads.
3. The earth bonding point on the EUT was connected to the metal structure of the test chamber during testing.
4. All emissions >20 dB below the applicable limits were not recorded.

Transmitter AC Conducted Spurious Emissions (continued)**Results: Live / Quasi Peak / LEADER Power Supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150	Live	45.6	66.0	20.4	Complied
0.289	Live	46.2	60.5	14.3	Complied
0.618	Live	34.7	56.0	21.3	Complied
0.798	Live	35.4	56.0	20.6	Complied
1.054	Live	34.9	56.0	21.1	Complied
1.279	Live	35.1	56.0	20.9	Complied

Results: Live / Average / LEADER Power Supply

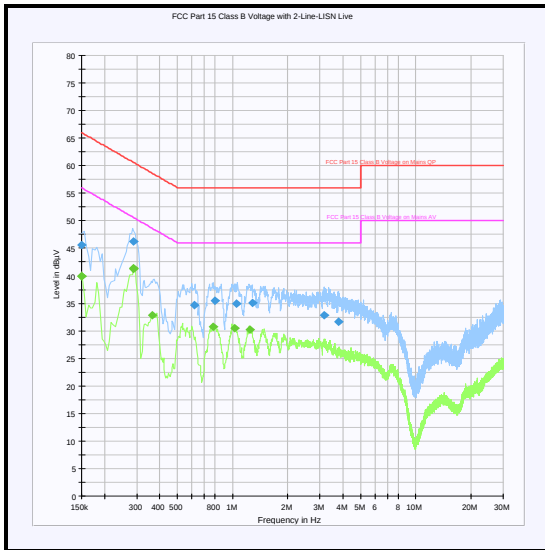
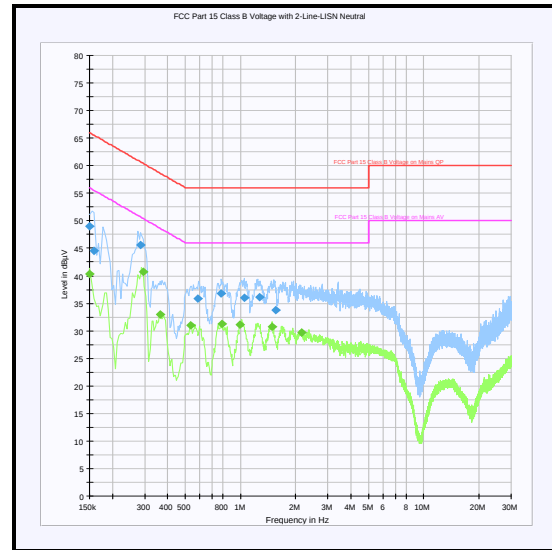
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150	Live	39.9	56.0	16.1	Complied
0.289	Live	41.4	50.5	9.1	Complied
0.366	Live	32.9	48.6	15.7	Complied
0.784	Live	30.7	46.0	15.3	Complied
1.027	Live	30.5	46.0	15.5	Complied
1.243	Live	30.3	46.0	15.7	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: Neutral / Quasi Peak / LEADER Power Supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150	Neutral	49.0	66.0	17.0	Complied
0.159	Neutral	44.5	65.5	21.0	Complied
0.285	Neutral	45.6	60.7	15.1	Complied
0.586	Neutral	35.8	56.0	20.2	Complied
0.780	Neutral	36.8	56.0	19.2	Complied
1.045	Neutral	36.0	56.0	20.0	Complied
1.275	Neutral	36.1	56.0	19.9	Complied
1.563	Neutral	33.8	56.0	22.2	Complied

Results: Neutral / Average / LEADER Power Supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150	Neutral	40.4	56.0	15.6	Complied
0.294	Neutral	40.7	50.4	9.7	Complied
0.366	Neutral	33.0	48.6	15.6	Complied
0.532	Neutral	31.0	46.0	15.0	Complied
0.789	Neutral	31.2	46.0	14.8	Complied
0.996	Neutral	31.1	46.0	14.9	Complied
1.486	Neutral	30.8	46.0	15.2	Complied
2.157	Neutral	29.7	46.0	16.3	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: LEADER Power Supply****Live****Neutral**

Transmitter AC Conducted Spurious Emissions (continued)**Results: Live / Quasi Peak / Cambium Networks Power Supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.267	Live	46.0	61.2	15.2	Complied
0.622	Live	46.2	56.0	9.8	Complied
0.627	Live	46.8	56.0	9.2	Complied
0.757	Live	36.0	56.0	20.0	Complied
1.563	Live	40.2	56.0	15.8	Complied
22.816	Live	28.1	60.0	31.9	Complied

Results: Neutral / Average / Cambium Networks Power Supply

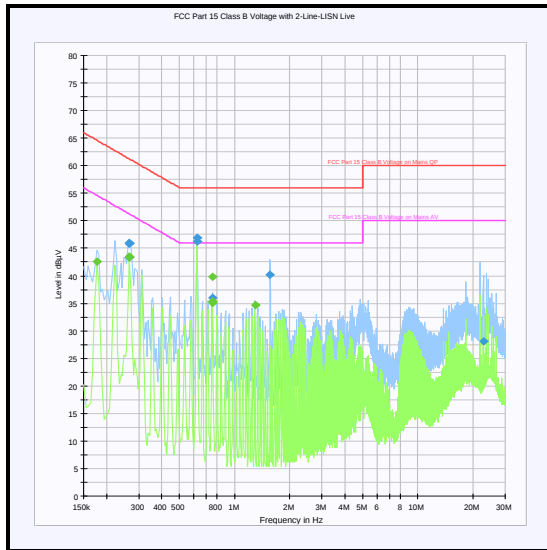
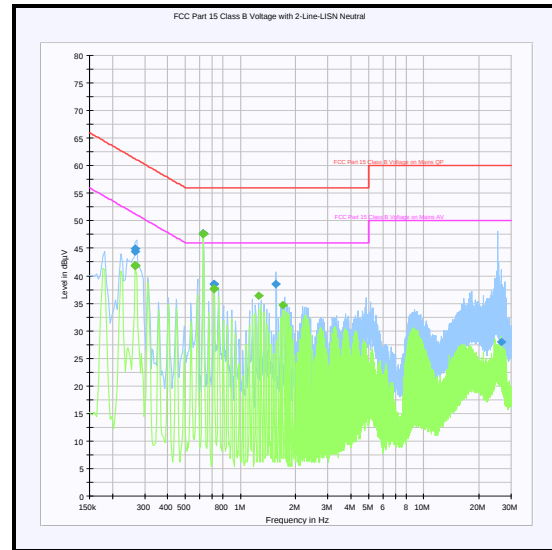
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.177	Live	42.5	54.6	12.1	Complied
0.267	Live	43.3	51.2	7.9	Complied
0.757	Live	39.8	46.0	6.2	Complied
1.297	Live	34.6	46.0	11.4	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: Neutral / Quasi Peak / Cambium Networks Power Supply**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.267	Neutral	44.4	61.2	16.8	Complied
0.627	Neutral	47.7	56.0	8.3	Complied
0.717	Neutral	38.6	56.0	17.4	Complied
1.563	Neutral	38.4	56.0	17.6	Complied
26.466	Neutral	28.0	60.0	32.0	Complied

Results: Neutral / Average / Cambium Networks Power Supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.267	Neutral	42.0	51.2	9.2	Complied
0.627	Neutral	45.7	46.0	0.3	Complied
0.717	Neutral	37.6	46.0	8.4	Complied
1.257	Neutral	36.3	46.0	9.7	Complied
1.707	Neutral	34.7	46.0	11.3	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: Cambium Networks Power Supply****Live****Neutral****Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A004	LISN	Rohde & Schwarz	ESH3-Z5	890604/027	10 Oct 2013	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	19 Feb 2014	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	09 Aug 2013	12
M1625	Thermohygrometer	JM Handelspunkt	30.5015.06	N/A	09 Jan 2014	12

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

Test Engineers:	Ian Watch & Sandeep Bharat	Test Dates:	17 June 2013 to 02 August 2013
Test Sample Serial Number:	0004565000D0		

FCC Reference:	Part 15.403(i)
Test Method Used:	FCC KDB 789033 Section C

Environmental Conditions:

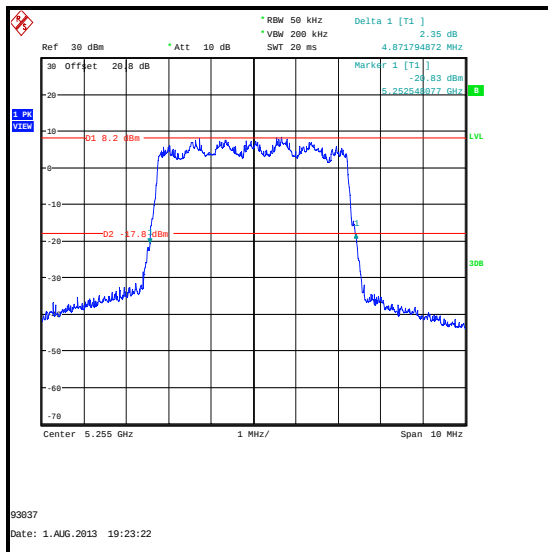
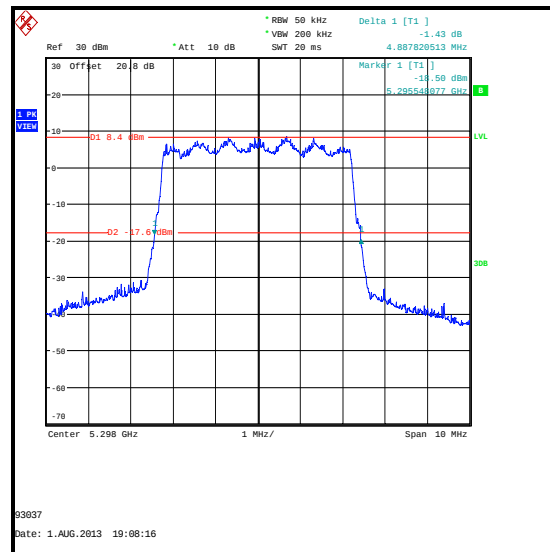
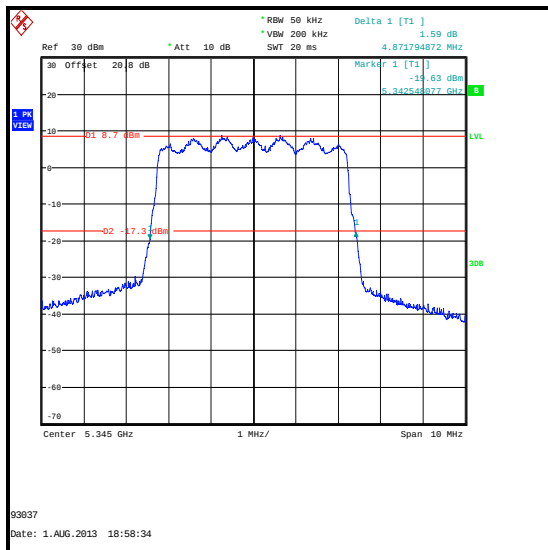
Temperatures (°C):	22 to 24
Relative Humidity (%):	45 to 48

Note(s):

1. All configurations supported by the EUT were investigated on the one channel in accordance with KDB 789033 Section C Emission bandwidth test procedure. The modes that produced the widest bandwidth and therefore deemed worst case were:
 - o 5 MHz channel bandwidth – BPSK
 - o 10 MHz channel bandwidth – QPSK
 - o 15 MHz channel bandwidth – BPSK
 - o 20 MHz channel bandwidth – QPSK
 - o 30 MHz channel bandwidth – QPSK
 - o 40 MHz channel bandwidth – QPSK
 - o 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.

Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.25-5.35 GHz band / 5 MHz Channel / BPSK / H Port**

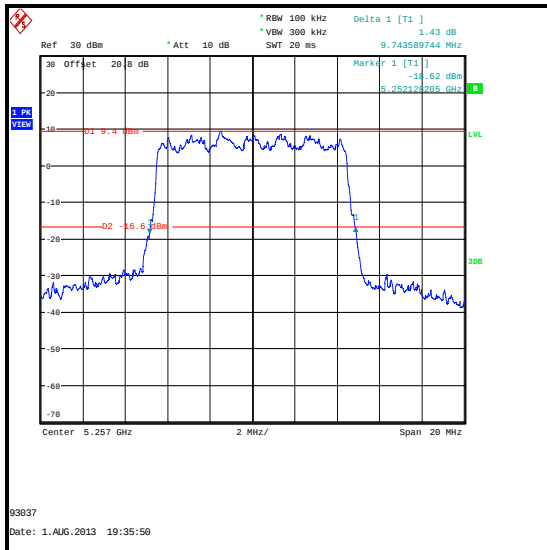
Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5255	BPSK	50	200	4.872
Middle	5298	BPSK	50	200	4.888
Top	5345	BPSK	50	200	4.872

**Bottom Channel****Middle Channel****Top Channel**

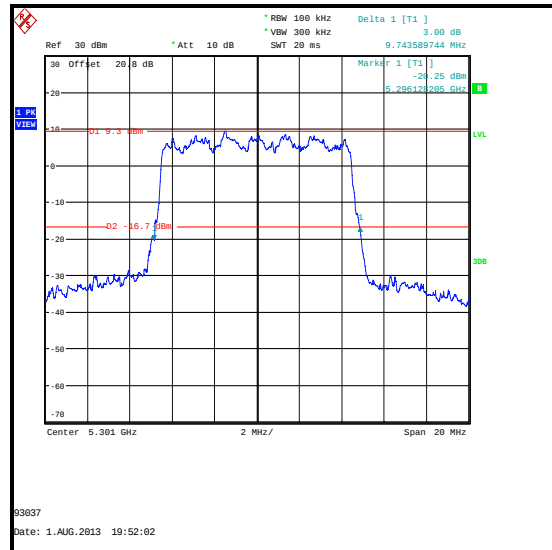
Transmitter 26 dB Emission Bandwidth (continued)

Results: 5.25-5.35 GHz band / 10 MHz Channel / QPSK / H Port

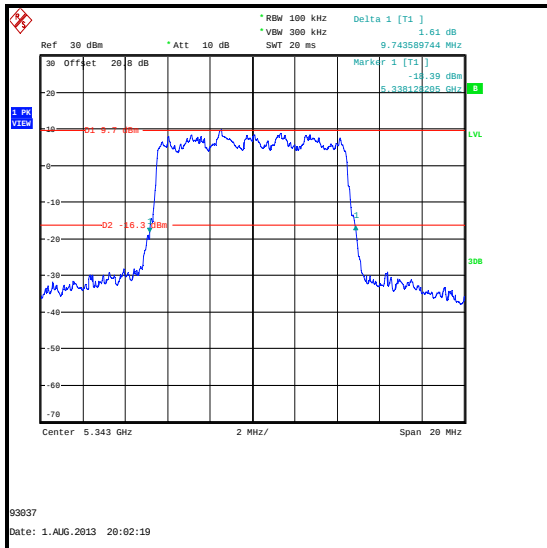
Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5257	QPSK	100	300	9.744
Middle	5301	QPSK	100	300	9.744
Top	5343	QPSK	100	300	9.744



Bottom Channel



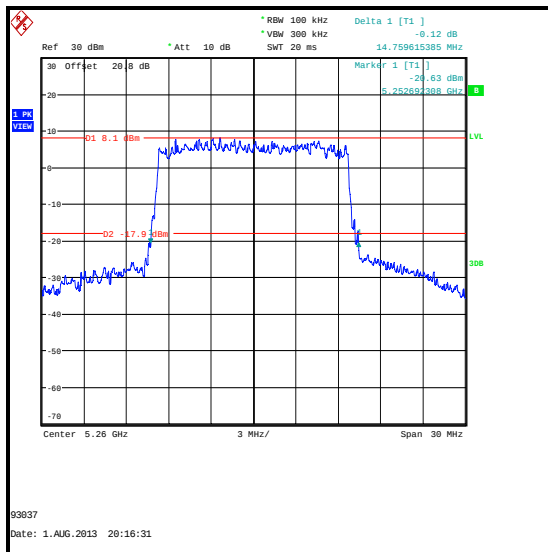
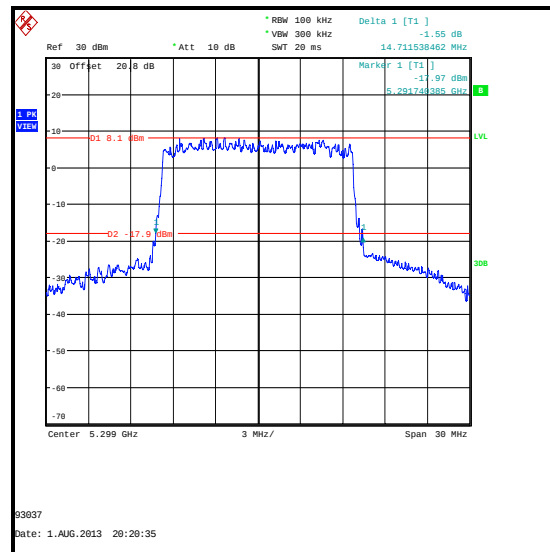
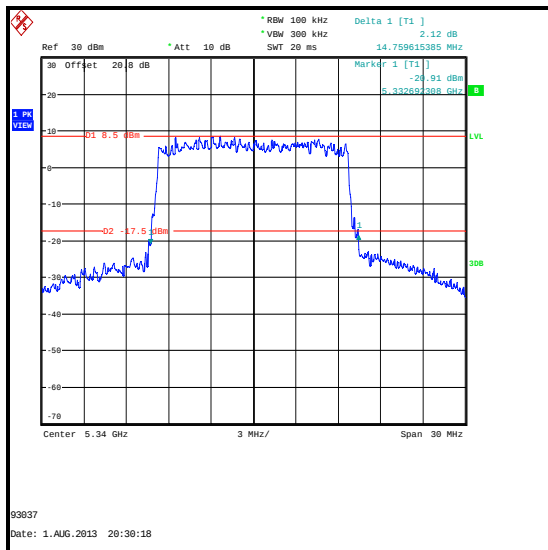
Middle Channel



Top Channel

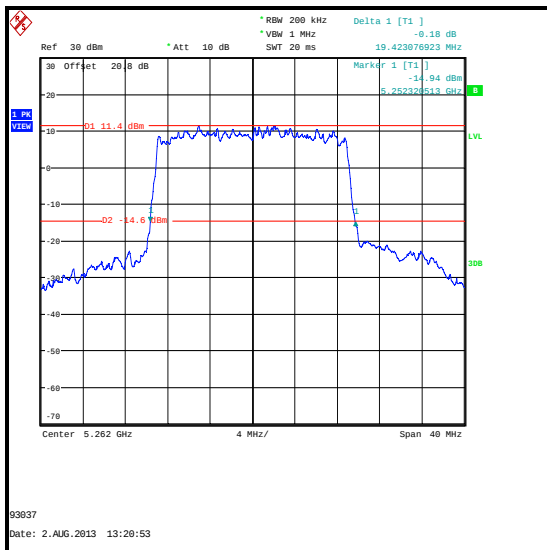
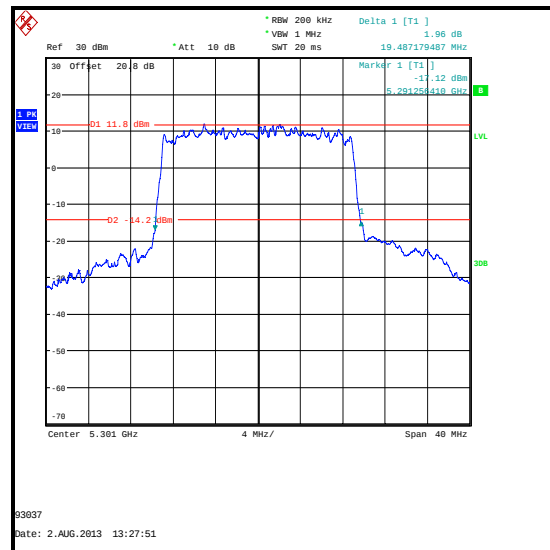
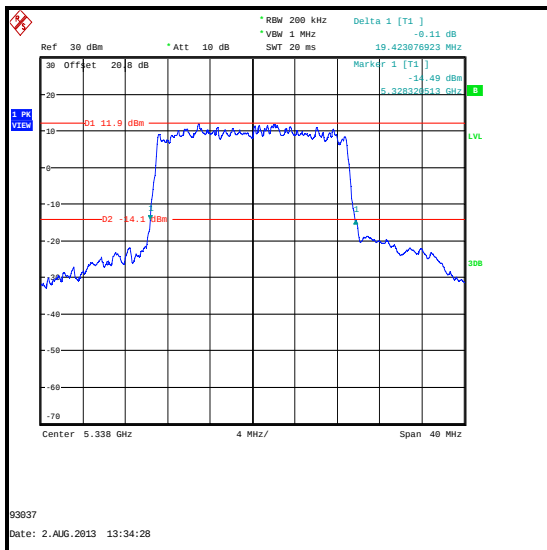
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.25-5.35 GHz band / 15 MHz Channel / BPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5260	BPSK	100	300	14.760
Middle	5299	BPSK	100	300	14.712
Top	5340	BPSK	100	300	14.760

**Bottom Channel****Middle Channel****Top Channel**

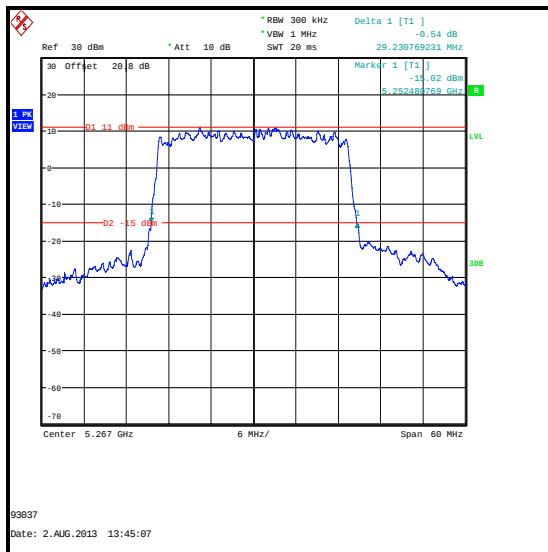
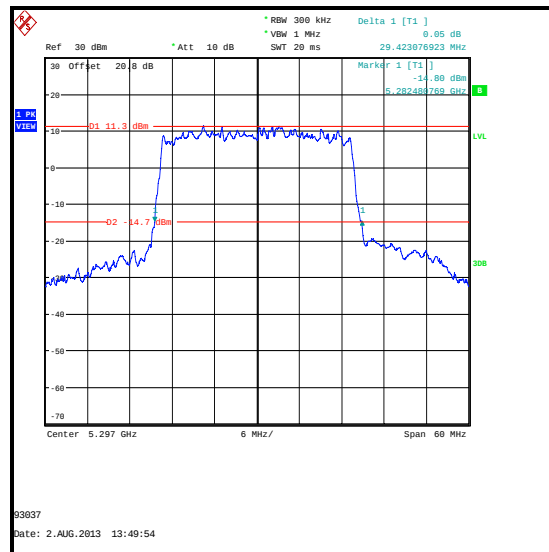
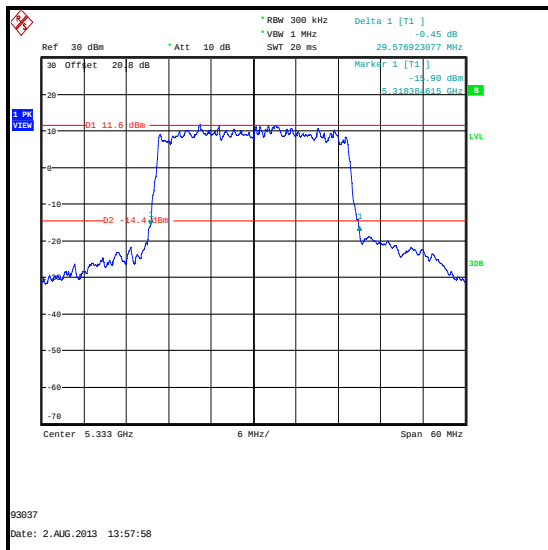
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.25-5.35 GHz band / 20 MHz Channel / QPSK/ H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5262	QPSK	200	1000	19.423
Middle	5301	QPSK	200	1000	19.487
Top	5338	QPSK	200	1000	19.423

**Bottom Channel****Middle Channel****Top Channel**

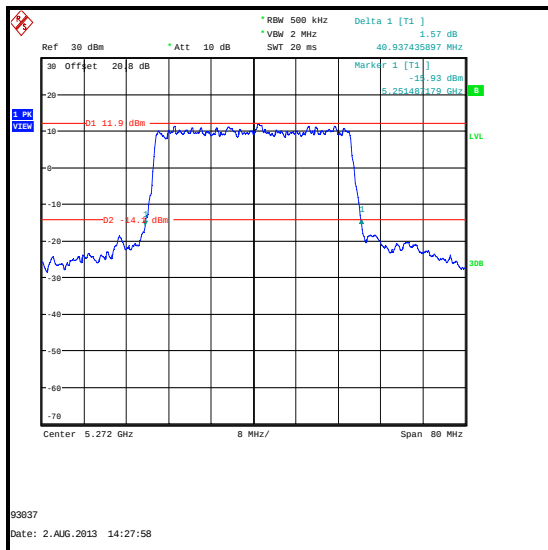
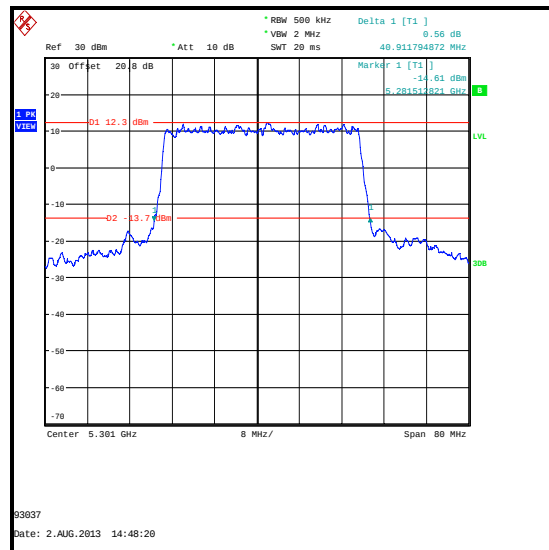
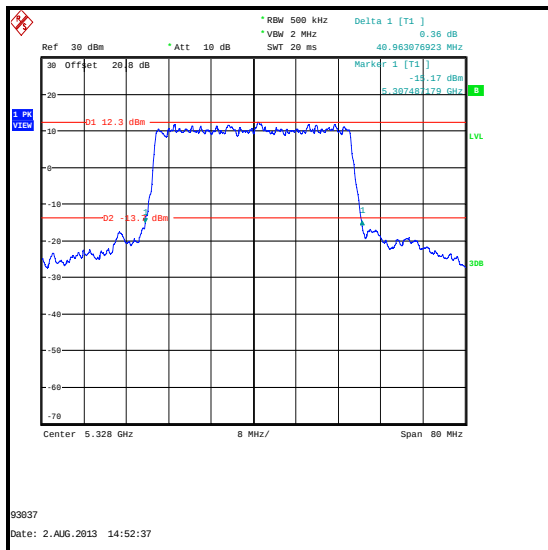
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.25-5.35 GHz band / 30 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5267	QPSK	300	1000	29.231
Middle	5297	QPSK	300	1000	29.423
Top	5333	QPSK	300	1000	29.577

**Bottom Channel****Middle Channel****Top Channel**

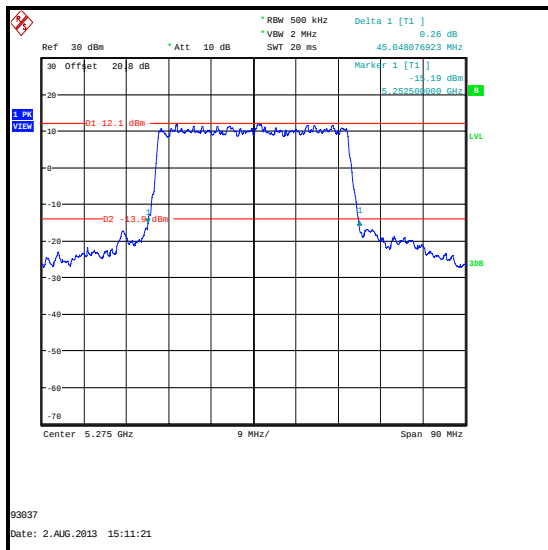
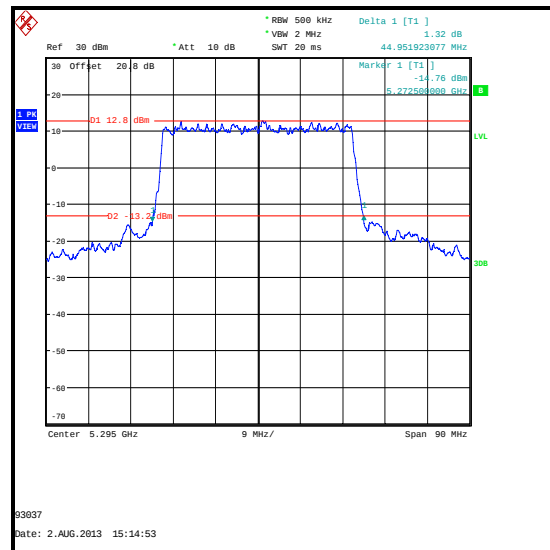
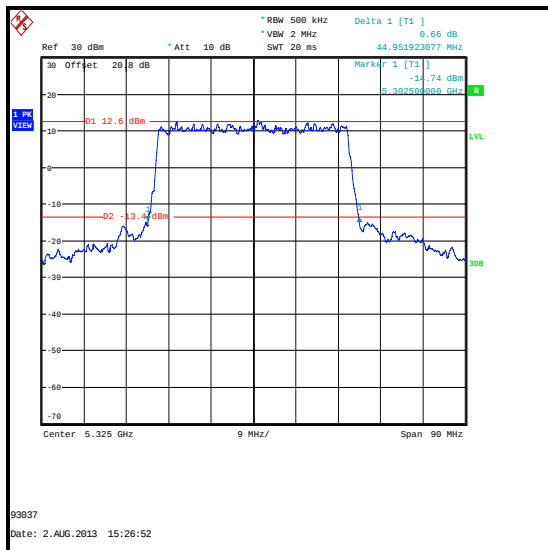
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.25-5.35 GHz band / 40 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5272	QPSK	500	2000	40.937
Middle	5301	QPSK	500	2000	40.912
Top	5328	QPSK	500	2000	40.963

**Bottom Channel****Middle Channel****Top Channel**

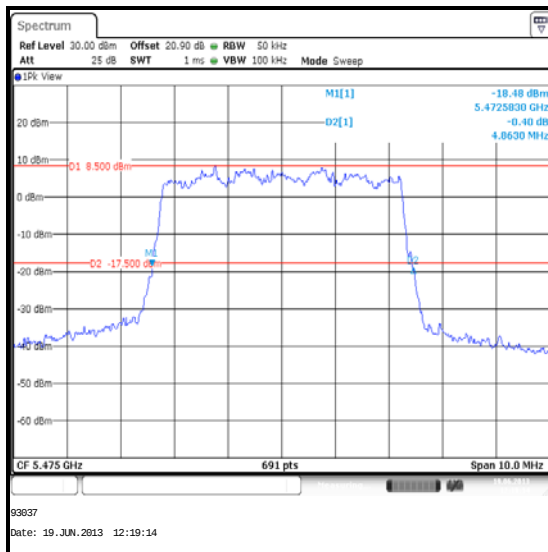
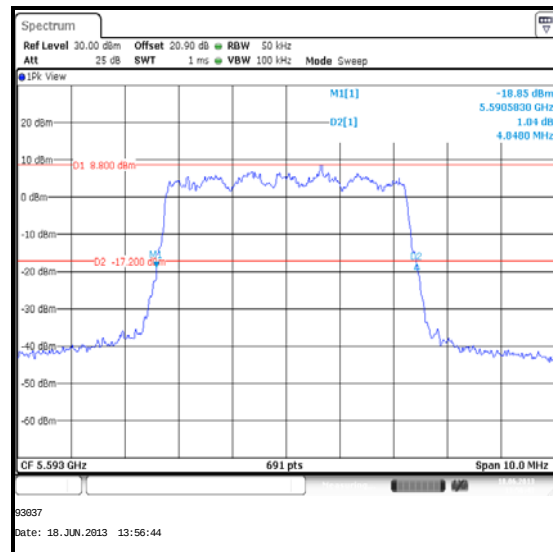
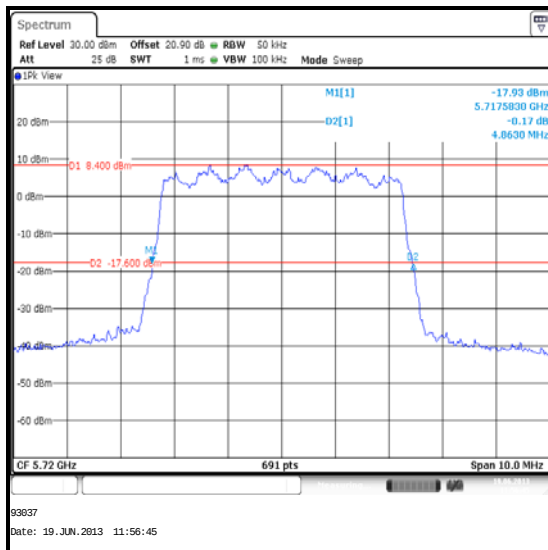
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.25-5.35 GHz band / 45 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5275	QPSK	500	2000	45.048
Middle	5295	QPSK	500	2000	44.952
Top	5325	QPSK	500	2000	44.952

**Bottom Channel****Middle Channel****Top Channel**

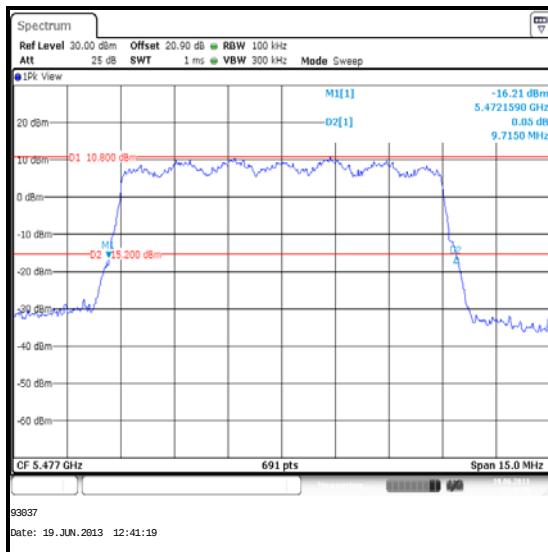
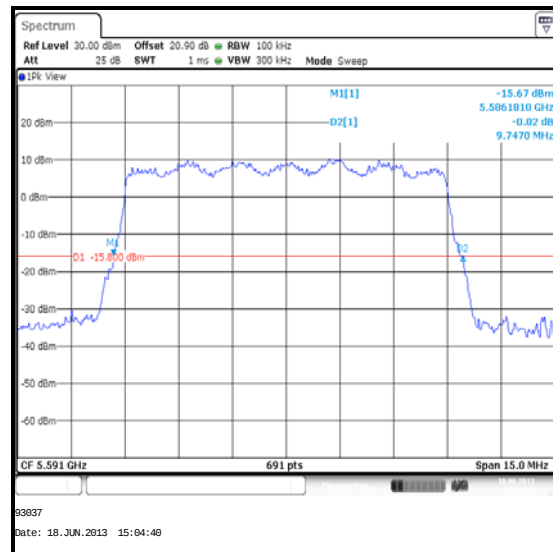
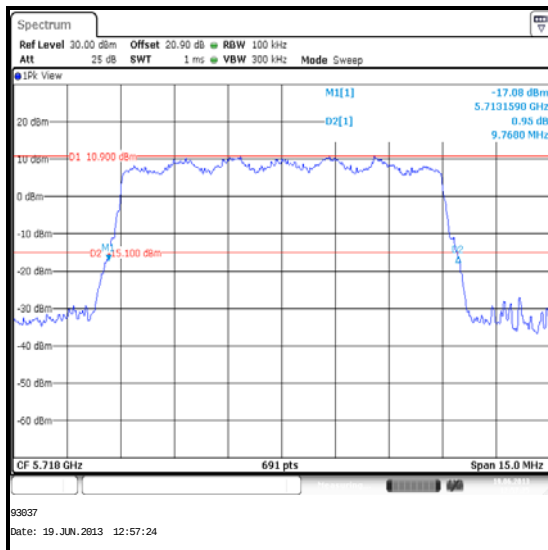
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.47-5.725 GHz band / 5 MHz Channel / BPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5475	BPSK	50	100	4.863
Middle	5593	BPSK	50	100	4.848
Top	5720	BPSK	50	100	4.863

**Bottom Channel****Middle Channel****Top Channel**

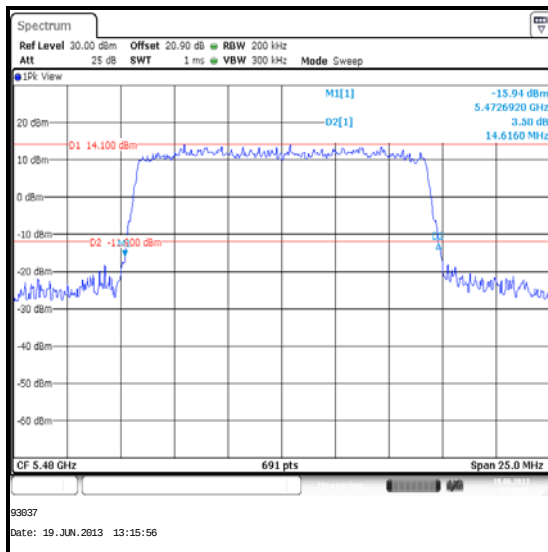
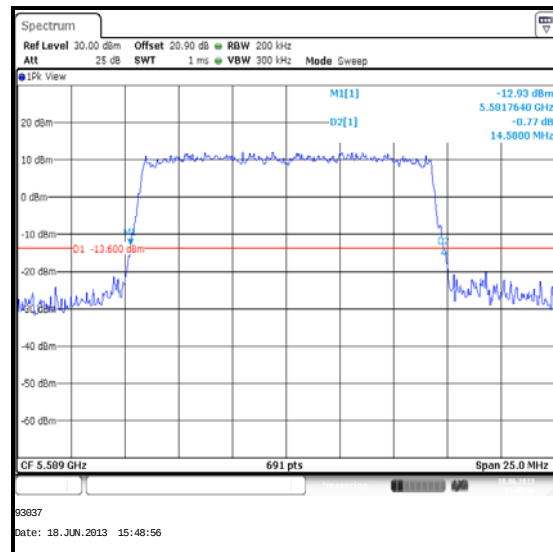
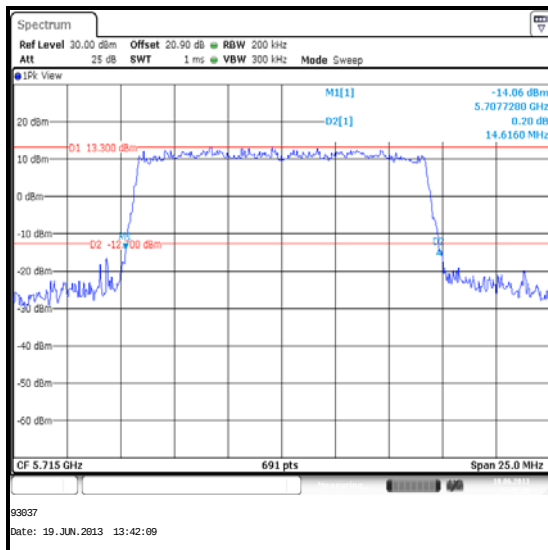
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.47-5.725 GHz band / 10 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5477	QPSK	100	300	9.715
Middle	5591	QPSK	100	300	9.747
Top	5718	QPSK	100	300	9.768

**Bottom Channel****Middle Channel****Top Channel**

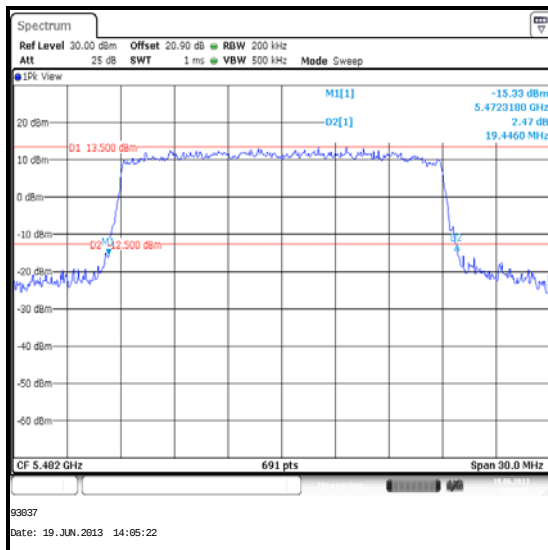
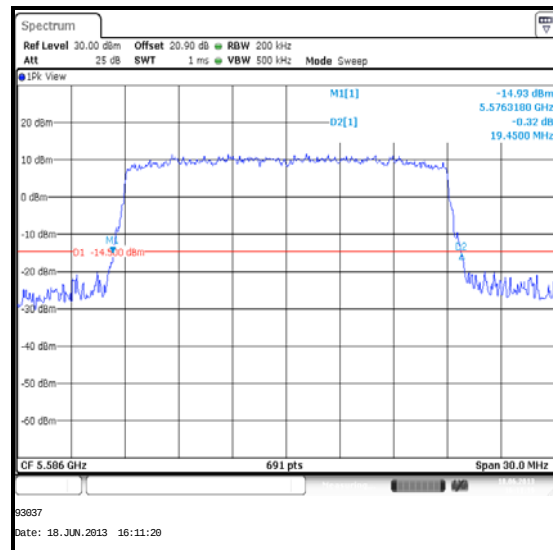
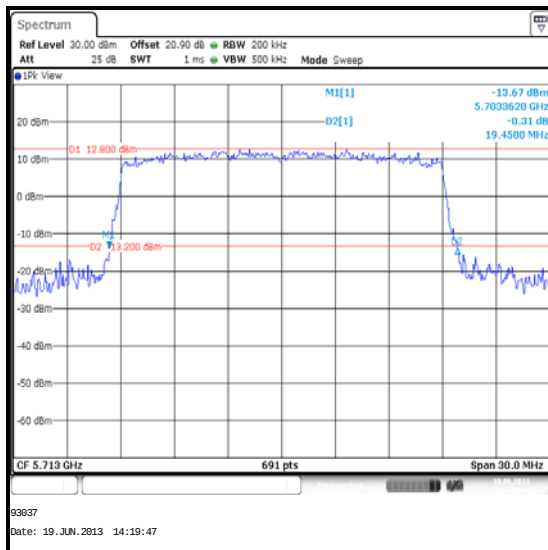
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.47-5.725 GHz band / 15 MHz Channel / BPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5480	BPSK	200	300	14.616
Middle	5589	BPSK	200	300	14.580
Top	5715	BPSK	200	300	14.616

**Bottom Channel****Middle Channel****Top Channel**

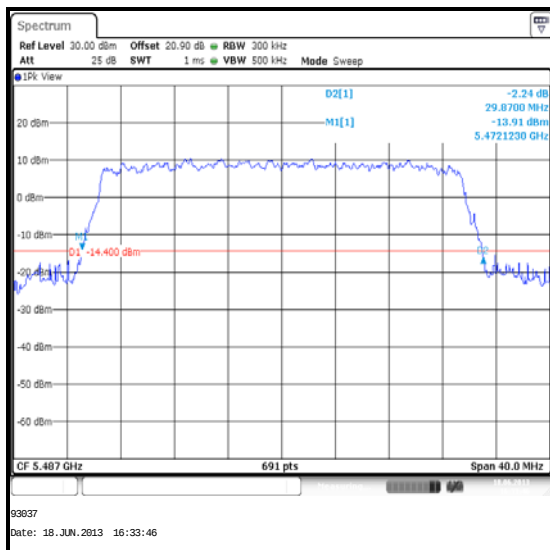
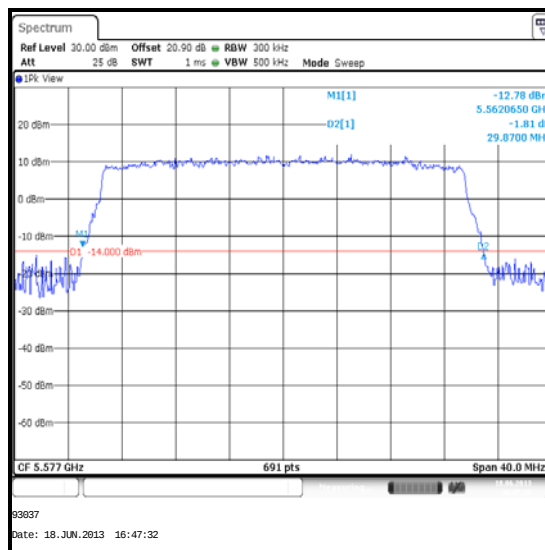
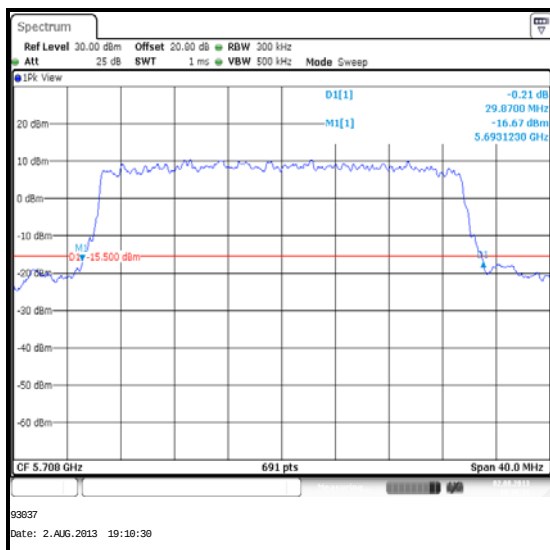
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.47-5.725 GHz band / 20 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5482	QPSK	200	500	19.446
Middle	5586	QPSK	200	500	19.450
Top	5713	QPSK	200	500	19.450

**Bottom Channel****Middle Channel****Top Channel**

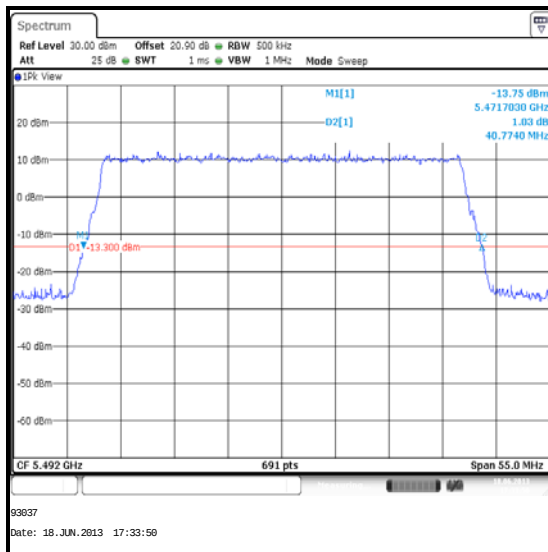
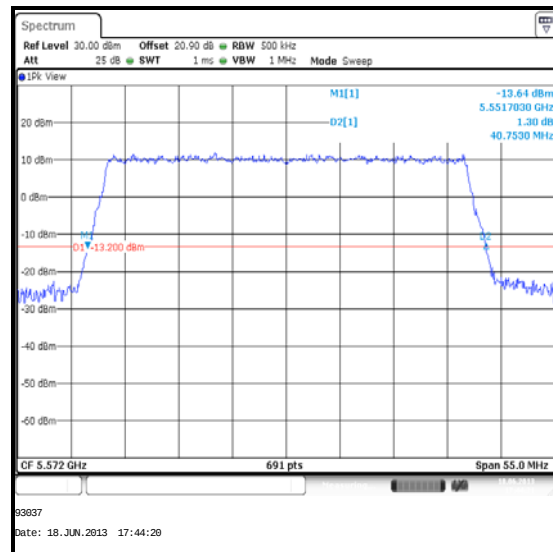
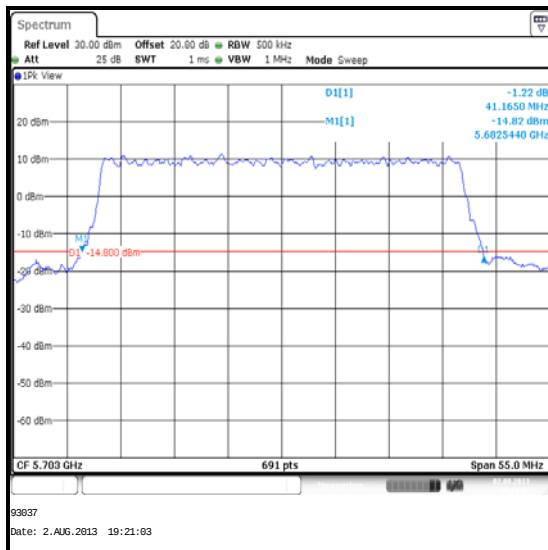
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.47-5.725 GHz band / 30 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5487	QPSK	300	500	29.870
Middle	5577	QPSK	300	500	29.870
Top	5708	QPSK	300	500	29.870

**Bottom Channel****Middle Channel****Top Channel**

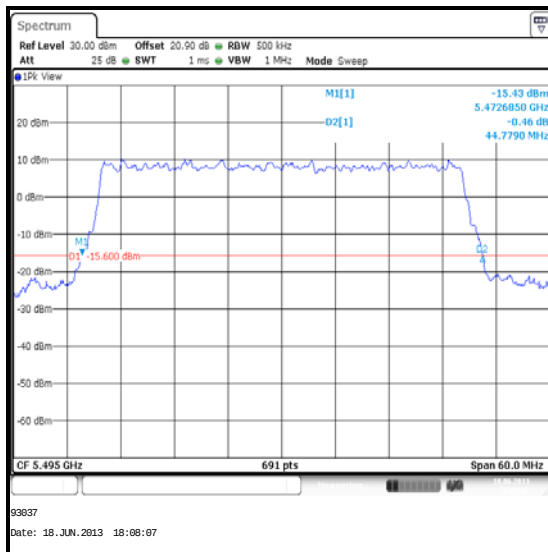
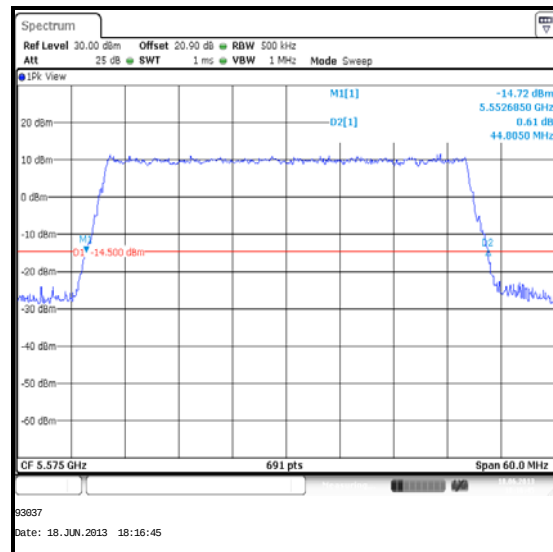
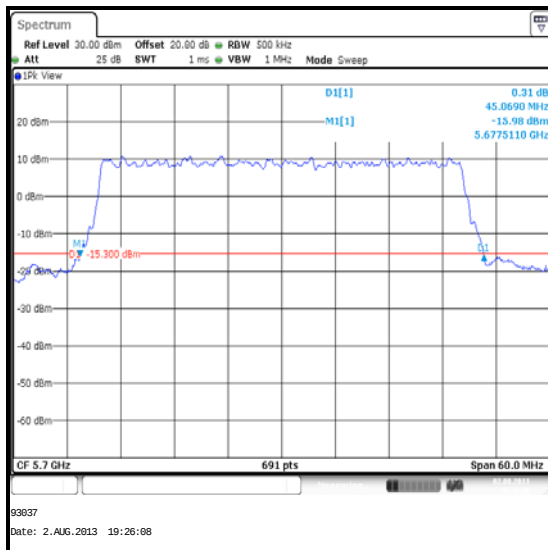
Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.47-5.725 GHz band / 40 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5492	QPSK	500	1000	40.774
Middle	5572	QPSK	500	1000	40.753
Top	5703	QPSK	500	1000	41.165

**Bottom Channel****Middle Channel****Top Channel**

Transmitter 26 dB Emission Bandwidth (continued)**Results: 5.47-5.725 GHz band / 45 MHz Channel / QPSK / H Port**

Channel	Frequency	Modulation	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	26 dB Bandwidth (MHz)
Bottom	5495	QPSK	500	1000	44.779
Middle	5575	QPSK	500	1000	44.805
Top	5700	QPSK	500	1000	45.069

**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)
A2142	Attenuator	Atlan TecRF	AN18-20	081120-23	10 May 2014	12
L1076	Spectrum Analyser	Rohde & Schwarz	FSU 8	101349	29 May 2014	12
L1028	Signal Analyser	Rohde & Schwarz	FSV 30	100854	23 May 2014	12
M1657	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12

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

Test Engineer:	Ian Watch	Test Dates:	06 August 2013 to 08 August 2013
Test Sample Serial Number:	0004565000A3		

FCC Reference:	Part 15.407(a)(2)
Test Method Used:	FCC KDB 789033 D01 Section E)3)a) Method PM

Environmental Conditions:

Temperature (°C):	24 to 26
Relative Humidity (%):	37 to 39

Transmitter Maximum Output Power (continued)**Note(s):**

1. Tests were performed with the EUT transmitting at its' lowest and highest configurable output power and >99% duty cycle. Minimum output power is used when the EUT is connected to the highest gain antenna (4' parabolic). Maximum output power is used when the EUT is used in conjunction with the lowest gain antenna (omnidirectional).
2. All conducted power measurements were made using an RF average power meter in accordance with FCC KDB 789033 E)3)a) Method PM.
3. All supported modes and channel widths were initially investigated on one channel. The mode that produced the highest power and therefore deemed worst case is recorded in the result tables shown in this section of the test report.
4. Results for all supported modes and channel bandwidths are archived on the test laboratory IT server and available for inspection upon request.
5. Measurements were performed in each supported operating band on the bottom, middle and top channels.
6. The FCC Part 15.407(a)(2) limit is the lesser of 250 mW (24.0 dBm) or $11 \text{ dBm} + 10 \log_{10} B$, where B is the previously measured 26 dB emission bandwidth in MHz. The limit for each channel was calculated as below:

Conducted Power Limit Calculations 5.25-5.35 GHz band

5 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 4.888 = 17.9 \text{ dBm}$
10 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 9.744 = 20.9 \text{ dBm}$
15 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 14.760 = 22.7 \text{ dBm}$
20 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 19.487 = 23.9 \text{ dBm}$
30 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 29.577 = 25.7 \text{ dBm}$
40 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 40.963 = 27.1 \text{ dBm}$
45 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 45.048 = 27.5 \text{ dBm}$

Conducted Power Limit Calculations 5.47-5.725 GHz band

5 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 4.863 = 17.9 \text{ dBm}$
10 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 9.768 = 20.9 \text{ dBm}$
15 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 14.616 = 22.6 \text{ dBm}$
20 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 19.450 = 23.9 \text{ dBm}$
30 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 29.870 = 25.7 \text{ dBm}$
40 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 41.165 = 27.1 \text{ dBm}$
45 MHz channel width = $11 \text{ dBm} + 10 \log_{10} 45.069 = 27.5 \text{ dBm}$

The lesser of the calculated and fixed limits was applied to the test results. The limits were further reduced by the amount that the stated antenna gain including RF cable loss exceeds 6 dBi. Limits for the omnidirectional antenna were reduced by 5.5 dB (13 dBi gain – 1.5 dB cable loss – 6 dB). Limits for the parabolic antenna were reduced by 27.4 dB (34.9 dBi gain – 1.5 dB cable loss – 6 dB).

Transmitter Maximum Output Power (5.25-5.35 GHz band) (continued)**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	7.9	8.0	11.0	12.4	1.4	Complied
Middle	8.1	8.0	11.1	12.4	1.3	Complied
Top	8.2	8.2	11.2	12.4	1.2	Complied

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	-13.8	-14.3	-11.0	-9.5	1.5	Complied
Middle	-13.7	-14.0	-10.8	-9.5	1.3	Complied
Top	-13.3	-13.8	-10.5	-9.5	1.0	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	8.7	9.1	11.9	15.4	3.5	Complied
Middle	9.1	9.4	12.3	15.4	3.1	Complied
Top	9.2	9.8	12.3	15.4	3.1	Complied

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	-11.2	-11.3	-8.2	-6.5	1.7	Complied
Middle	-10.8	-10.9	-7.8	-6.5	1.3	Complied
Top	-12.6	-12.5	-9.5	-6.5	3.0	Complied

Transmitter Maximum Output Power (5.25-5.35 GHz band) (continued)**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	8.9	9.3	12.1	17.2	5.1	Complied
Middle	9.1	9.4	12.3	17.2	4.9	Complied
Top	9.1	9.6	12.4	17.2	4.8	Complied

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	-9.3	-9.5	-6.4	-4.7	1.7	Complied
Middle	-9.2	-9.5	-6.3	-4.7	1.6	Complied
Top	-8.9	-9.3	-6.1	-4.7	1.4	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	9.5	12.3	18.4	6.1	Complied
Middle	9.0	9.3	12.2	18.4	6.2	Complied
Top	9.1	9.5	12.3	18.4	6.1	Complied

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	-7.9	-8.1	-5.0	-3.5	1.5	Complied
Middle	-8.0	-8.2	-5.1	-3.5	1.6	Complied
Top	-8.1	-8.2	-5.1	-3.5	1.6	Complied

Transmitter Maximum Output Power (5.25-5.35 GHz band) (continued)**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	10.9	11.0	14.0	18.5	4.5	Complied
Middle	10.7	10.9	13.8	18.5	4.7	Complied
Top	10.8	11.1	14.0	18.5	4.5	Complied

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	-8.7	-8.9	-5.8	-3.4	2.4	Complied
Middle	-8.1	-8.2	-5.1	-3.4	1.7	Complied
Top	-7.9	-7.9	-4.9	-3.4	1.5	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	8.8	9.2	12.0	18.5	6.5	Complied
Middle	9.1	9.4	12.3	18.5	6.2	Complied
Top	9.0	9.5	12.3	18.5	6.2	Complied

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	-9.5	-10.0	-6.7	-3.4	3.3	Complied
Middle	-8.7	-8.7	-5.7	-3.4	2.3	Complied
Top	-8.7	-8.6	-5.6	-3.4	2.2	Complied

Transmitter Maximum Output Power (5.25-5.35 GHz band) (continued)**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	10.1	10.2	13.2	18.5	5.3	Complied
Middle	10.0	10.2	13.1	18.5	5.4	Complied
Top	10.1	10.5	13.3	18.5	5.2	Complied

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	-9.2	-9.6	-6.4	-3.4	3.0	Complied
Middle	-8.7	-8.8	-5.7	-3.4	2.3	Complied
Top	-8.5	-8.5	-5.5	-3.4	2.1	Complied

Transmitter Maximum Output Power (5.47-5.725 GHz band) (continued)**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	7.9	8.0	11.0	12.4	1.4	Complied
Middle	8.1	8.0	11.1	12.4	1.3	Complied
Top	8.2	8.2	11.2	12.4	1.2	Complied

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	-13.8	-14.3	-11.0	-9.5	1.5	Complied
Middle	-13.7	-14.0	-10.8	-9.5	1.3	Complied
Top	-13.3	-13.8	-10.5	-9.5	1.0	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	8.7	9.1	11.9	15.4	3.5	Complied
Middle	9.1	9.4	12.3	15.4	3.1	Complied
Top	9.2	9.8	12.3	15.4	3.1	Complied

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	-11.2	-11.3	-8.2	-6.5	1.7	Complied
Middle	-10.8	-10.9	-7.8	-6.5	1.3	Complied
Top	-12.6	-12.5	-9.5	-6.5	3.0	Complied

Transmitter Maximum Output Power (5.47-5.725 GHz band) (continued)**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	8.9	9.3	12.1	17.2	5.1	Complied
Middle	9.1	9.4	12.3	17.2	4.9	Complied
Top	9.1	9.6	12.4	17.2	4.8	Complied

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	-9.3	-9.5	-6.4	-4.7	1.7	Complied
Middle	-9.2	-9.5	-6.3	-4.7	1.6	Complied
Top	-8.9	-9.3	-6.1	-4.7	1.4	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	9.5	12.3	18.4	6.1	Complied
Middle	9.0	9.3	12.2	18.4	6.2	Complied
Top	9.1	9.5	12.3	18.4	6.1	Complied

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	-7.9	-8.1	-5.0	-3.5	1.5	Complied
Middle	-8.0	-8.2	-5.1	-3.5	1.6	Complied
Top	-8.1	-8.2	-5.1	-3.5	1.6	Complied

Transmitter Maximum Output Power (5.47-5.725 GHz band) (continued)**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	10.9	11.0	14.0	18.5	4.5	Complied
Middle	10.7	10.9	13.8	18.5	4.7	Complied
Top	10.8	11.1	14.0	18.5	4.5	Complied

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	-8.7	-8.9	-5.8	-3.4	2.4	Complied
Middle	-8.1	-8.2	-5.1	-3.4	1.7	Complied
Top	-7.9	-7.9	-4.9	-3.4	1.5	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	8.8	9.2	12.0	18.5	6.5	Complied
Middle	9.1	9.4	12.3	18.5	6.2	Complied
Top	9.0	9.5	12.3	18.5	6.2	Complied

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	-9.5	-10.0	-6.7	-3.4	3.3	Complied
Middle	-8.7	-8.7	-5.7	-3.4	2.3	Complied
Top	-8.7	-8.6	-5.6	-3.4	2.2	Complied

Transmitter Maximum Output Power (5.47-5.725 GHz band) (continued)**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	10.1	10.2	13.2	18.5	5.3	Complied
Middle	10.0	10.2	13.1	18.5	5.4	Complied
Top	10.1	10.5	13.3	18.5	5.2	Complied

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	-9.2	-9.6	-6.4	-3.4	3.0	Complied
Middle	-8.7	-8.8	-5.7	-3.4	2.3	Complied
Top	-8.5	-8.5	-5.5	-3.4	2.1	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	25 Jun 2014	12
A2139	Attenuator	AtlanTec RF	AN18-10	090918-04	10 May 2014	12
A2140	Attenuator	AtlanTec RF	AN18-10	090918-14	10 May 2014	12
A2144	Attenuator	AtlanTec RF	AN18-20	081120-23	10 May 2014	12
M283	Power Sensor	HP	8487A	3318A03241	03 May 2014	12
M1009	Power Meter	HP	437B	3215U13706	25 Jan 2014	12
M1435	Power Meter	HP	437B	3215U14631	26 Apr 2014	12
M1175	Power Sensor	HP	8487A	2942A10299	19 Sep 2013	12
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12