



TEST REPORT

Test Report No. : UL-RPT-RP93037JD08A V2.0

Manufacturer : Cambium Networks Ltd
Model No. : PTP 50650
FCC ID : QWP-50650
Test Standard(s) : FCC Parts 15.207, 15.209 & 15.247

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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: 04 September 2013

Checked by:

Sarah Williams
WiSE Engineer

Issued by :

pp

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UL VS LTD



This laboratory is accredited by UKAS.
The tests reported herein have been
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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:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.247
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:	209735
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	01 May 2013 to 13 June 2013

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.207	Transmitter AC Conducted Emissions	
Part 15.247(a)(2)	Transmitter Minimum 6 dB Bandwidth	
Part 15.247(e)	Transmitter Power Spectral Density	
15.247(b)(3), 15.247(b)(4) & Part 15.247(c)(1)(ii)	Transmitter Conducted Output Power	
Part 15.247(d)/ 15.209(a)	Transmitter Band Edge Conducted Emissions	
Part 15.247(d)/ 15.209(a)	Transmitter Radiated Emissions	
Key to Results  = Complied  = Did not comply		

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 558074 D01 v03r01 April 9, 2013
Title:	Guidance for Performing Compliance Measurements on Digital Transmission System (DTS) devices operating Under §15.247
Reference:	FCC KDB 662911 D01 Multiple Transmitter Output v01r02 9/26/2012
Title:	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
Reference:	FCC KDB 662911 D02 v01, October 25 2011
Title:	MIMO with Cross-Polarized Antennas

2.4. Deviations from the Test Specification

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

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Cambium Networks Ltd
Model Name or Number:	PTP 50650
Hardware Version:	Production Rev 4
Software Version:	B880
Serial Number:	00045650004E
FCC ID:	QWP-50650

Brand Name:	Cambium Networks Ltd
Model Name or Number:	PTP 50650
Hardware Version:	Production Rev 4
Software Version:	B880
Serial Number:	0004565000BD
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
Part Number:	C000065L002A
Serial Number:	1321000023

3.2. Description of EUT

The Equipment Under Test was a point to point transceiver operating in the 5725 MHz to 5850 MHz band. The EUT is available in two configurations:

1. Connectorised with two external antenna ports. Model No. C050065B002A
2. Integrated flat plate antenna. Model 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:		Digital Transmission System				
Type of Unit:		Microwave fixed radio link transceiver				
Modes/Modulation:		ACQ, BPSK, QPSK, 16QAM, 64QAM, 256QAM				
Intended Operating Environment:		Residential, Commercial and Light Industry				
Data rates:		21.76, 60.54, 242.19, 380.9 & 452.16 Mbp/s				
Power Supply Requirement(s):		Nominal		PoE supply input 120 VAC 60 Hz. PoE output 48 VDC.		
Maximum Conducted Output Power:		28.1 dBm				
Frequency Range:		5725 MHz to 5850 MHz				
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	5728	5733	5788	5838	5847
	10	5732	5737	5787	5837	5842
	15	5735	5740	5785	5835	5840
	20	5737	5742	5787	5832	5837
	30	5742	5752	5782	5822	5832
	40	5746	5765	5786	5810	5826
	45	5748	5778	5778	5795	5827

Note(s):

The EUT is unable to operate at full power and remain compliant on the lower and higher channels. Power has been reduced on 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:	Laptop PC
Brand Name:	Dell
Model Name or Number:	Latitude D610
Serial Number:	UL Asset No. PC471NT

Description:	Ethernet Hub
Brand Name:	Netgear
Model Name or Number:	GS605 v2
Serial Number:	1FE17C5D01178

3.6. Antenna

The table below lists the antennas that the Customer intends to use with this product when operating in the 5725-5850 MHz band:

Type	Stated Gain (dBi)	Manufacturer	Antenna Name	Used for Testing	Note
Dual polarised plate	19.0	MARS	MA-EM56-DP-19CM	-	1,3
Dual polarised plate	23.0	MARS	MA-WS54-50R	X	-
4 ft Parabolic Dual Polarised	35.3	Andrews	PX4F-52-N7A/A	X	-
6 ft Parabolic Dual Polarised	38.1	Andrews	PX6F-52/A	X	-
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

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 length RF cables having an individual insertion loss of 1.8 dB across the EUT operating band.
3. Integral antenna. No external RF cables.

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- The unit operates in transceiver mode only as a TDD device in its' normal mode of operation. There is no dedicated receive only mode.
- For test purposes only, the EUT was 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 with graphical user interface was used to configure the EUT via the PoE power supply and Ethernet cables.
- The EUT was powered throughout testing via the PoE power supply.
- The EUT was operating at maximum allowable output power unless stated.
- 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.
- 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.

Power settings used during testing

'LCF' in the tables below indicates the power setting on the lower channels where the power has been reduced. 'HCF' indicates the power setting on the higher channels where the power has been reduced. 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. Channel frequencies are shown in Section 3.4 of this report.

Point-to-Point Antennas

The tables below show the EUT power settings that were used during testing for each channel bandwidth and modulation type when the EUT was operated as a point-to-point device.

	BPSK			QPSK			16QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	24	28	24	24	28	24	24	27	24
10	26	28	26	26	28	26	26	27	26
15	26	28	26	26	28	26	26	27	26
20	25	28	26	26	28	26	26	27	26
30	26	28	26	26	28	26	26	27	26
40	25	28	25	25	28	25	25	27	25
45	23	28	22	23	28	24	24	27	23

	64QAM			256QAM		
Ch. BW	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	24	26	24	24	25	24
10	26	26	26	25	25	25
15	26	26	26	25	25	25
20	26	26	26	25	25	25
30	26	26	26	25	25	25
40	25	26	25	25	25	25
45	24	26	24	24	25	24

Power settings used during testing (continued)

The tables below show the EUT power settings that were used during testing when the EUT was operated with the sectorised and omnidirectional antennas.

Sectorised Antenna

Ch. BW	BPSK			QPSK			16QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	20	20	20	20	20	20	20	20	20
10	20	20	20	20	20	20	20	20	20
15	20	20	20	20	20	20	20	20	20
20	20	20	20	20	20	20	20	20	20
30	20	20	20	20	20	20	20	20	20
40	20	20	20	20	20	20	20	20	20
45	19	19	19	19	19	19	19	19	19

Ch. BW	64QAM			256QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	20	20	20	20	20	20
10	20	20	20	20	20	20
15	20	20	20	20	20	20
20	20	20	20	20	20	20
30	20	20	20	20	20	20
40	20	20	20	20	20	20
45	19	19	19	19	19	19

Omnidirectional Antenna

Ch. BW	BPSK			QPSK			16QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	24	24	24	24	24	24	24	24	24
10	24	24	24	24	24	24	24	24	24
15	24	24	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24	24	24
40	24	24	24	24	24	24	24	24	24
45	22	22	22	22	22	22	22	22	22

Ch. BW	64QAM			256QAM		
	LCF	Mid Ch	HCF	LCF	Mid Ch	HCF
5	24	24	24	24	24	24
10	24	24	24	24	24	24
15	24	24	24	24	24	24
20	24	24	24	24	24	24
30	24	24	24	24	24	24
40	24	24	24	24	24	24
45	22	22	22	22	22	22

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 Engineers:	Ian Watch & David Doyle	Test Dates:	07 June 2013 & 11 June 2013
Test Sample Serial Number:	00045650004E		

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

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	39 to 42

Note(s):

1. The Customer 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 input to the power supply was connected to a 120 VAC 60 Hz single phase supply via a LISN during the testing.
3. The EUT was transmitting at maximum power during the test. RF ports were terminated using 50 Ohm loads.
4. The earth bonding point on the EUT was connected to the metal structure of the test chamber during testing.
5. 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
0.154500	Live	48.4	65.8	17.4	Complied
0.294000	Live	45.2	60.4	15.2	Complied
0.501000	Live	41.8	56.0	14.2	Complied
0.838500	Live	41.9	56.0	14.1	Complied
1.176000	Live	41.6	56.0	14.4	Complied
1.563000	Live	51.4	56.0	4.6	Complied

Results: Live / Average / LEADER Power Supply

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.154500	Average	41.7	55.8	14.1	Complied
0.294000	Average	41.1	50.4	9.3	Complied
0.568500	Average	38.4	46.0	7.6	Complied
0.892500	Average	36.0	46.0	10.0	Complied
1.257000	Average	35.4	46.0	10.6	Complied
1.563000	Average	38.1	46.0	7.9	Complied
2.274000	Average	32.2	46.0	13.8	Complied
3.700500	Average	29.0	46.0	17.0	Complied

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

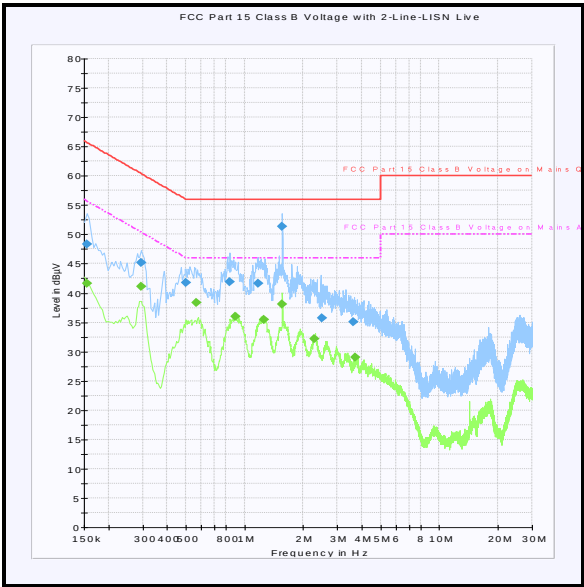
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.154500	Neutral	51.1	65.8	14.7	Complied
0.240000	Neutral	44.8	62.1	17.3	Complied
0.492000	Neutral	42.0	56.1	14.1	Complied
0.838500	Neutral	42.5	56.0	13.5	Complied
1.194000	Neutral	42.4	56.0	13.6	Complied
1.563000	Neutral	51.3	56.0	4.7	Complied
2.247000	Neutral	39.7	56.0	16.3	Complied
3.898500	Neutral	35.3	56.0	20.8	Complied

Results: Neutral / Average / LEADER Power Supply

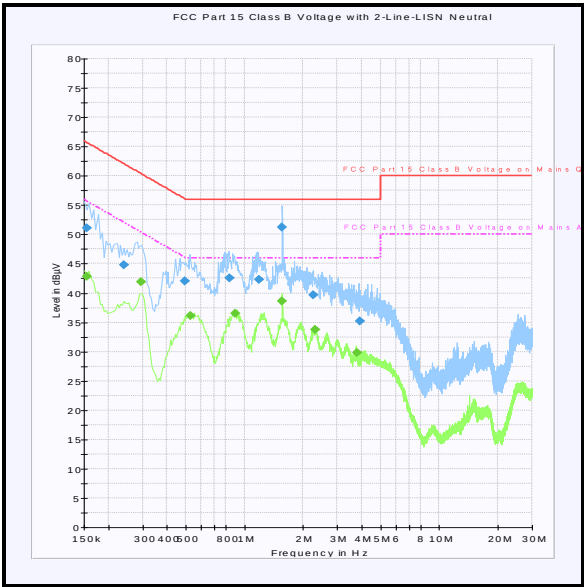
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.154500	Neutral	42.9	55.8	12.9	Complied
0.294000	Neutral	41.9	50.4	8.5	Complied
0.528000	Neutral	36.1	46.0	9.9	Complied
0.901500	Neutral	36.5	46.0	9.5	Complied
1.563000	Neutral	38.6	46.0	7.4	Complied
2.314500	Neutral	33.7	46.0	12.3	Complied
3.768000	Neutral	29.8	46.0	16.2	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 (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.222000	Live	47.1	62.7	15.6	Complied
0.622500	Live	45.3	56.0	10.7	Complied
1.563000	Live	40.9	56.0	15.1	Complied

Results: Live / Average / Cambium Networks Power Supply

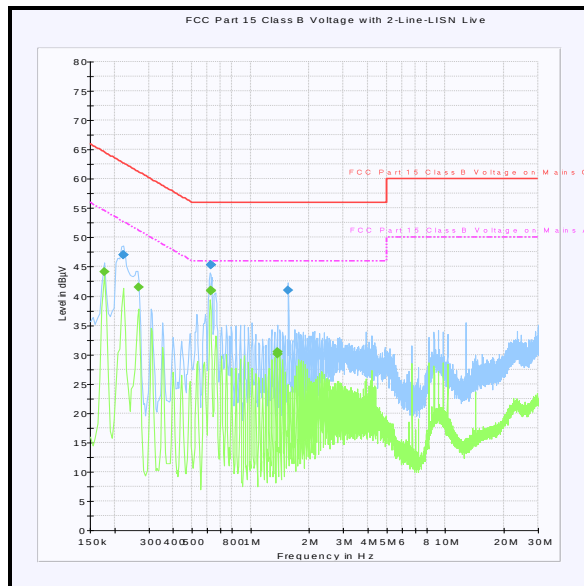
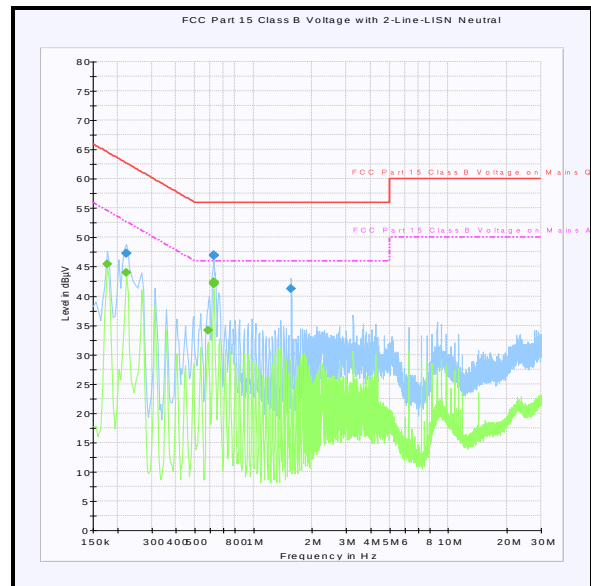
Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.177000	Live	44.1	54.6	10.5	Complied
0.267000	Live	41.5	51.2	9.7	Complied
0.622500	Live	40.9	46.0	5.1	Complied
1.378500	Live	30.1	46.0	15.9	Complied

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

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.222000	Neutral	47.3	62.7	15.4	Complied
0.627000	Neutral	47.0	56.0	9.0	Complied

Results: Neutral / Average / Cambium Networks Power Supply

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.177000	Neutral	45.4	54.6	9.2	Complied
0.222000	Neutral	43.9	52.7	8.8	Complied
0.582000	Neutral	34.2	46.0	11.8	Complied
0.627000	Neutral	42.0	46.0	4.0	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. Minimum 6 dB Bandwidth**Test Summary:**

Test Engineer:	David Doyle	Test Dates:	07 May 2013 to 09 May 2013
Test Sample Serial Number:	00045650004E		

FCC Reference:	Part 15.247(a)(2)
Test Method Used:	FCC KDB 558074 Section 8 Option 1

Environmental Conditions:

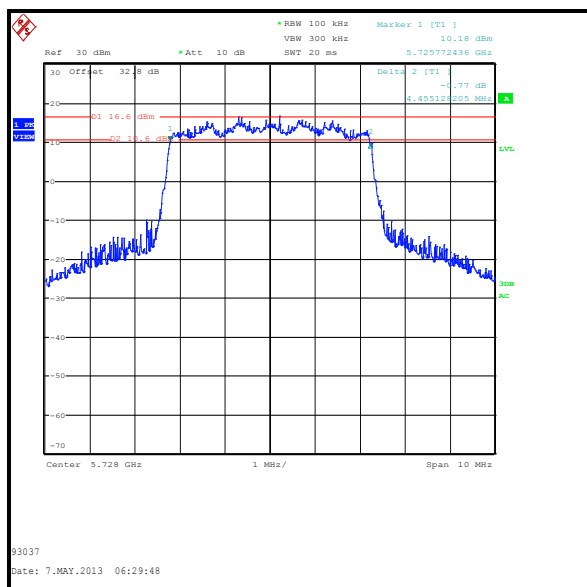
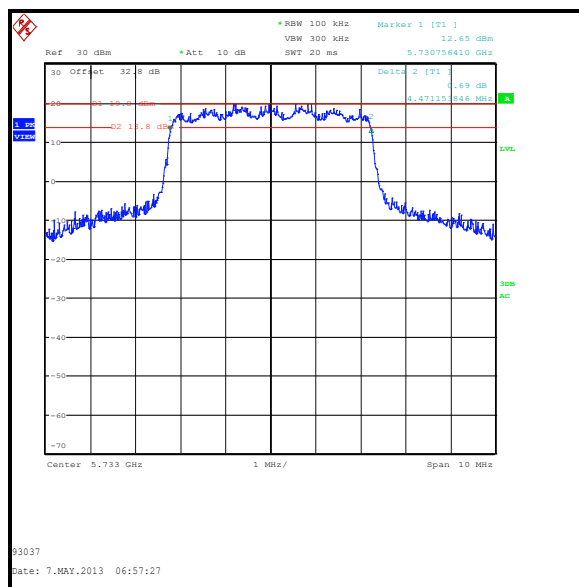
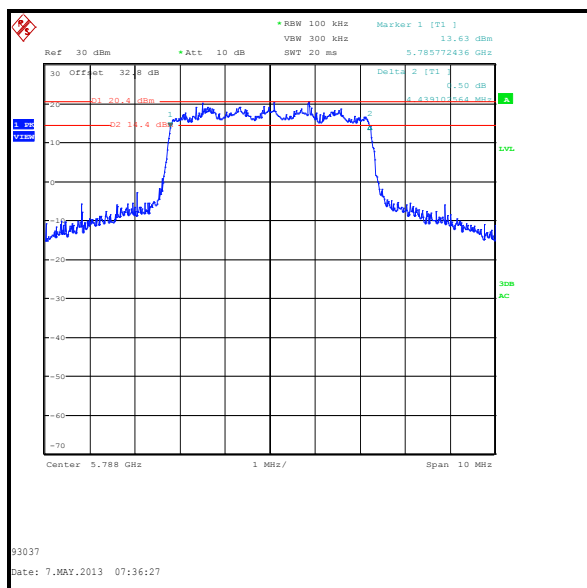
Temperature (°C):	23 to 26
Relative Humidity (%):	32 to 39

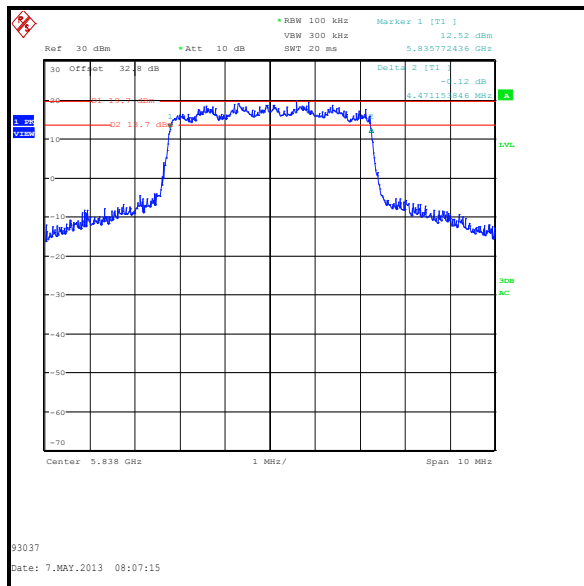
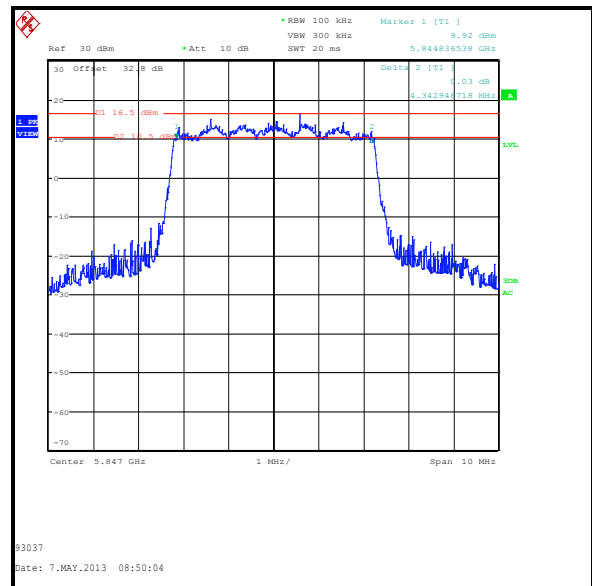
Note(s):

1. Minimum 6 dB bandwidth measurements were performed on the H port with the EUT transmitting with all modulation types and all channel bandwidths. Bottom, middle and top channels were tested. The EUT has reduced power on the bottom and top channels in order to comply with band edge emission limits, therefore minimum 6 dB bandwidth tests were also performed on the lowest and highest channels that support maximum power. Spot checks were performed on the V port.
2. All modulation types and channel widths were compared and BPSK on a 5 MHz channel was found to have the narrowest bandwidth and is therefore closest to the limit. Results for the H Port are reported in this section, spot checks were performed on the V port in the mode that produced the narrowest bandwidth. In addition, the EUT operates in ACQ (Acquisition) mode at full power on all channel and all supported channel widths. ACQ results are also reported on the bottom middle and top channels at maximum power. Results for all other configurations are archived on the test laboratory IT server and are available for inspection if required.

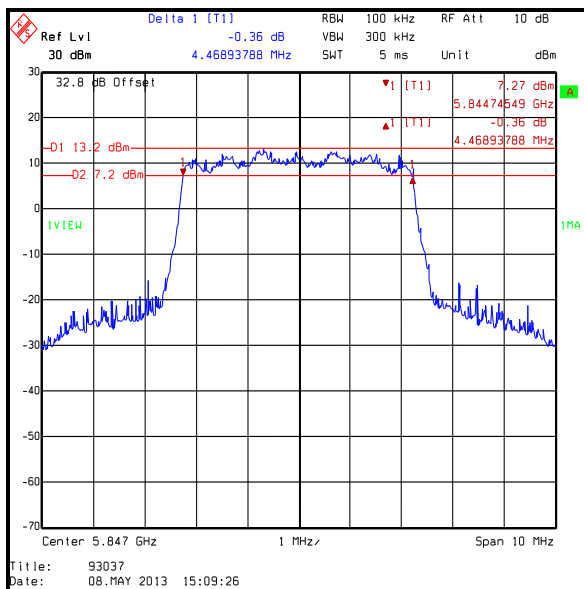
Minimum 6 dB Bandwidth (continued)**Results: 5 MHz Channel / BPSK / H Port**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	4.455128	≥ 0.5	3.955128	Complied
Lowest Full Power	4.471154	≥ 0.5	3.971154	Complied
Middle	4.439103	≥ 0.5	3.939103	Complied
Highest Full Power	4.471154	≥ 0.5	3.971154	Complied
Top	4.342949	≥ 0.5	3.842949	Complied

**Bottom Channel****Lowest Full Power Channel****Middle Channel**

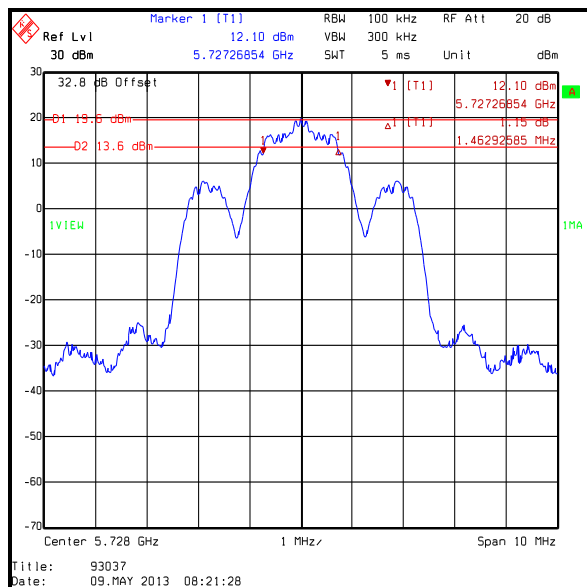
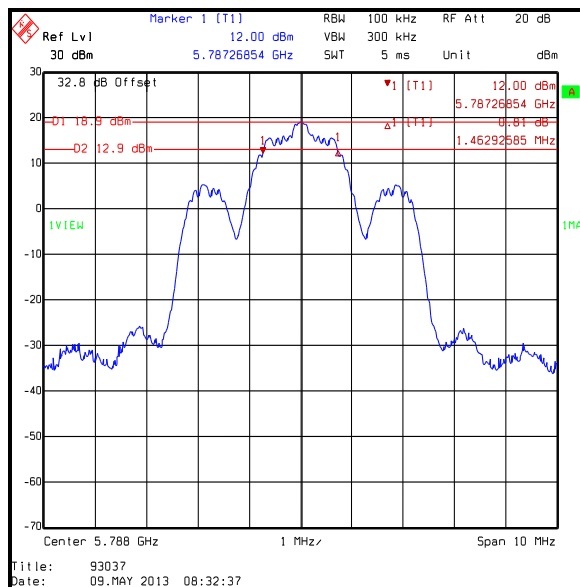
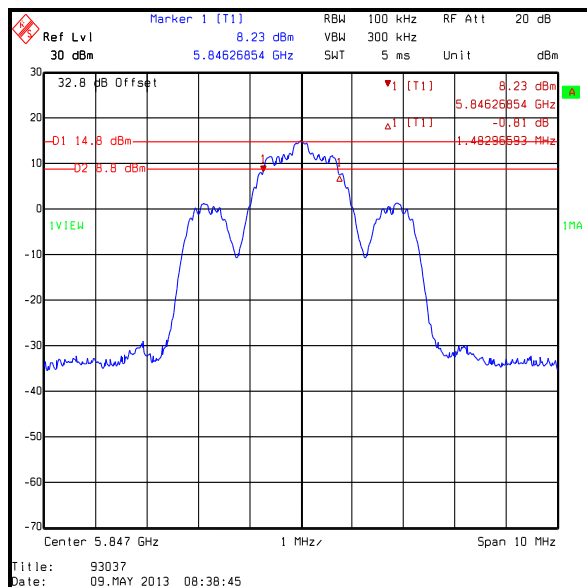
Minimum 6 dB Bandwidth (continued)**Highest Full Power Channel****Top Channel****Results: 5 MHz Channel / BPSK / V Port**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Top	4.468938	≥0.5	3.968938	Complied

**Top Channel**

Minimum 6 dB Bandwidth (continued)**Results: 5 MHz Channel / ACQ / H Port**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	1.462926	≥0.5	0.962926	Complied
Middle	1.462926	≥0.5	0.962926	Complied
Top	1.482966	≥0.5	0.982966	Complied

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

Minimum 6 dB Bandwidth (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A2007	Attenuator	Narda	769-20	001	Calibrated Before Use	N/A
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	19 Dec 2013	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	07 Feb 2014	12
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	N/A	10 Jun 2013	12

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

Test Engineer:	David Doyle	Test Dates:	10 May 2013 to 13 June 2013
Test Sample Serial Number:	00045650004E		

FCC Reference:	Part 15.247(e)
Test Method Used:	KDB 558074 v03r01 Section 10.3 Method AVGPSD-1 & KDB 662911 D02

Environmental Conditions:

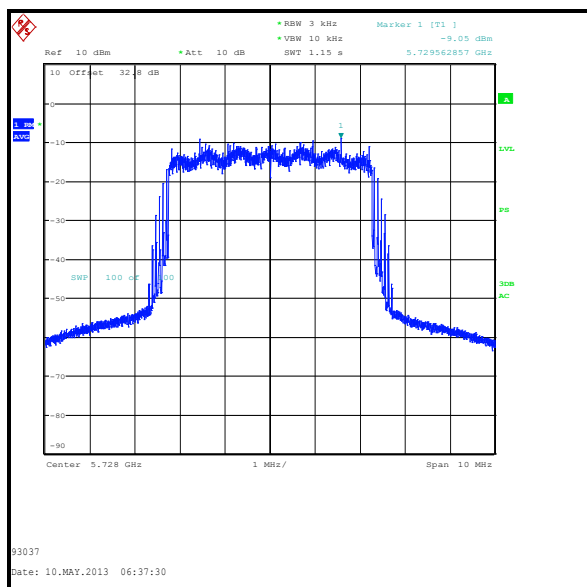
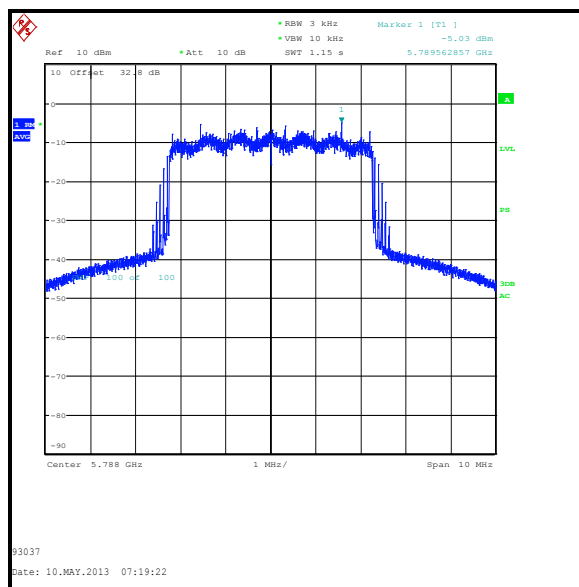
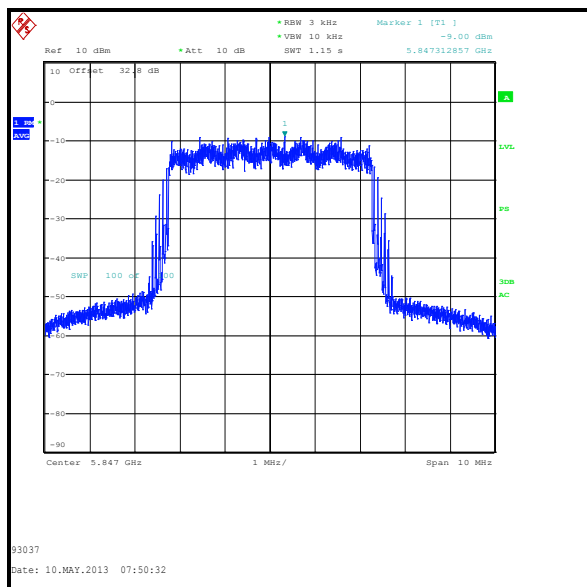
Temperature (°C):	22 to 26
Relative Humidity (%):	37 to 40

Note(s):

1. Transmitter Power Spectral Density tests were performed using a spectrum analyser in accordance with FCC KDB 558074 v03r01 Section 10.3 Method AVGPSD-1.
2. Preliminary tests were performed on all modulation types to determine the configurations that showed the highest PSD levels. Final measurements were performed on the worst case modulation type and also Acquisition mode (ACQ) for all channel bandwidths.
3. The EUT was transmitting at 100% duty cycle at the highest power setting for each mode.
4. Power has been reduced on the bottom and top channels in order to comply with band edge requirements. Result plots and numerical results are shown for bottom middle and top channels. Additional tests were performed on the lowest channel that operates on full power and the highest channel that operates at full power. Numerical results are shown for these channels. Plots are archived on the test laboratory IT server and available for inspection if required.
5. Measurements were performed on the Horizontal and Vertical RF ports. The PSD from both ports were linearly combined and then subtracted from the limit to obtain the margin.
6. Trace averaging was performed over at least 100 traces which was confirmed by viewing the spectrum analyser screen at the end of each test. However, a bug in the spectrum analyser caused some plots to show different random trace count values less than 100 when the screen trace was captured.
7. For 30 MHz bandwidth and above, the number of sweep points was set to 32,001 which was the maximum for the spectrum analyser.

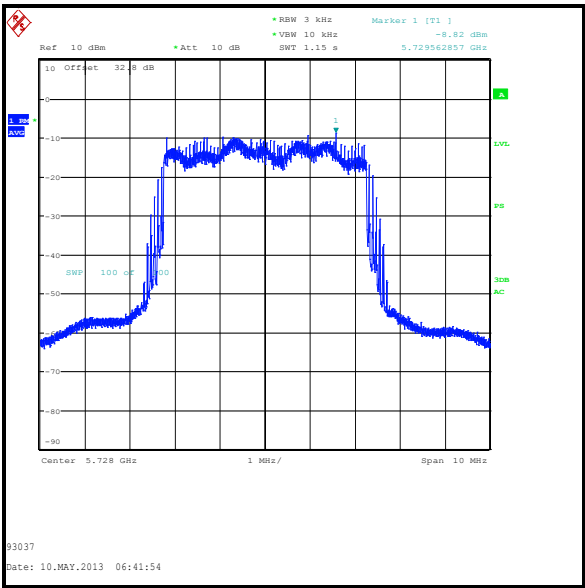
Power Spectral Density (continued)**Results: 5 MHz Channel / BPSK**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-9.1	-8.8	-5.9	8.0	13.9	Complied
Lowest Full Power	-5.0	-3.9	-1.4	8.0	9.4	Complied
Middle	-5.0	-5.3	-2.1	8.0	10.1	Complied
Highest Full Power	-4.6	-4.8	-1.7	8.0	9.7	Complied
Top	-9.0	-9.0	-6.0	8.0	14.0	Complied

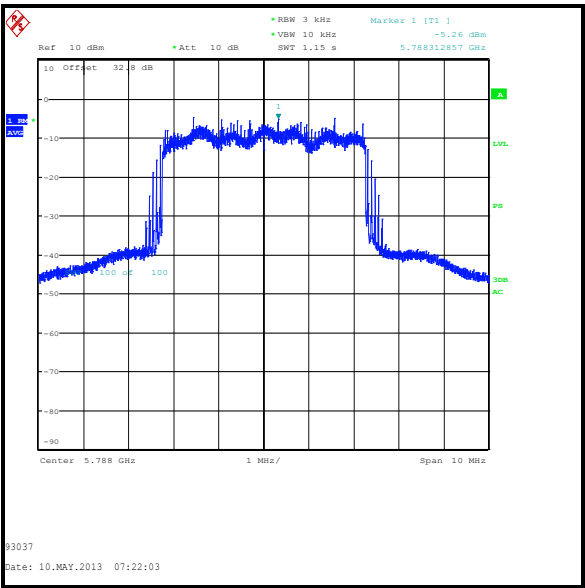
Results: 5 MHz Channel / BPSK / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

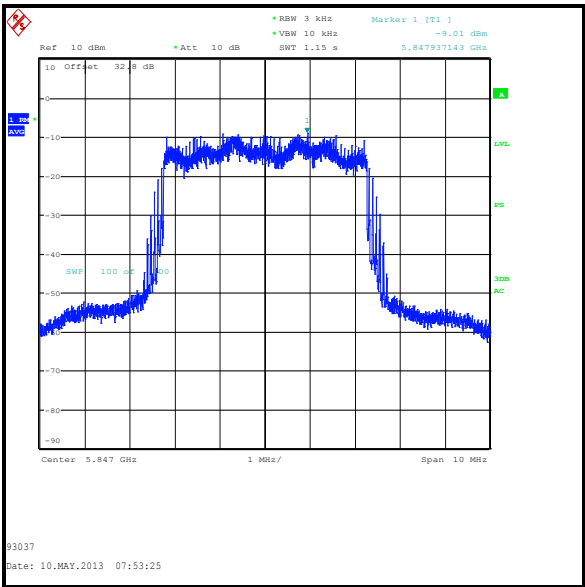
Results: 5 MHz Channel / BPSK / V Port



Bottom Channel



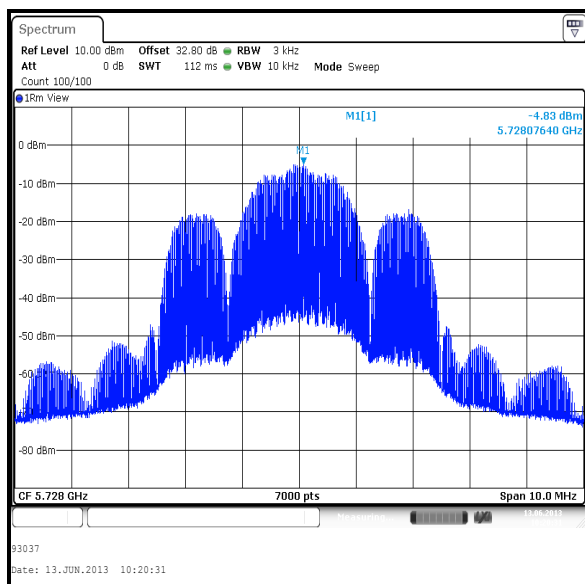
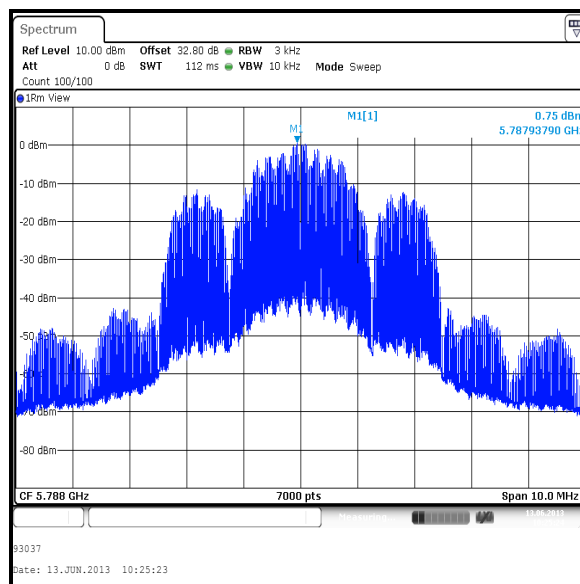
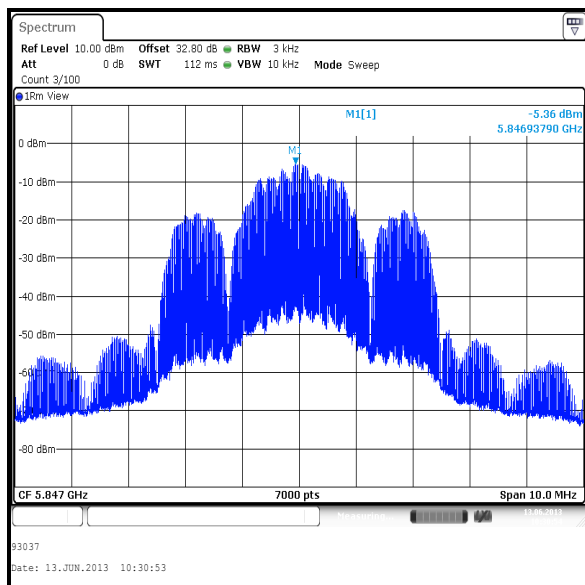
Middle Channel



Top Channel

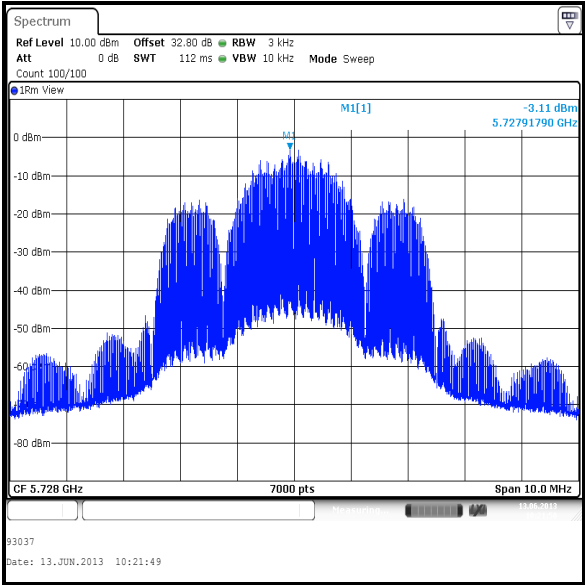
Power Spectral Density (continued)**Results: 5 MHz Channel / ACQ**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-4.8	-3.1	-0.9	8.0	8.9	Complied
Lowest Full Power	-0.7	-1.4	2.0	8.0	6.0	Complied
Middle	0.8	-0.7	3.1	8.0	4.9	Complied
Highest Full Power	-0.3	1.7	3.8	8.0	4.2	Complied
Top	-5.4	-6.1	-2.7	8.0	10.7	Complied

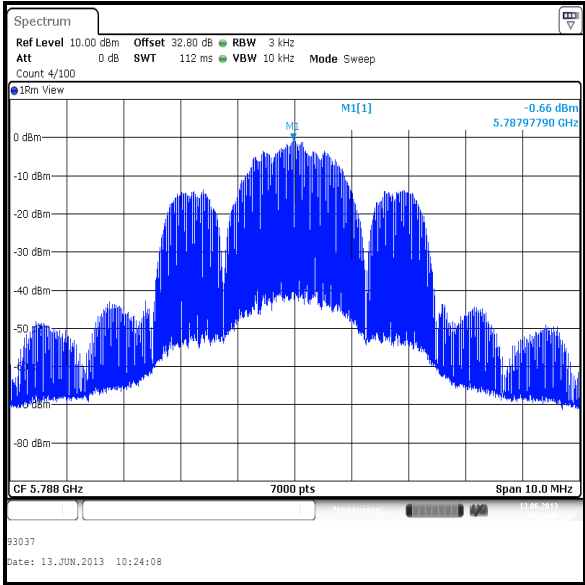
Results: 5 MHz Channel / ACQ / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

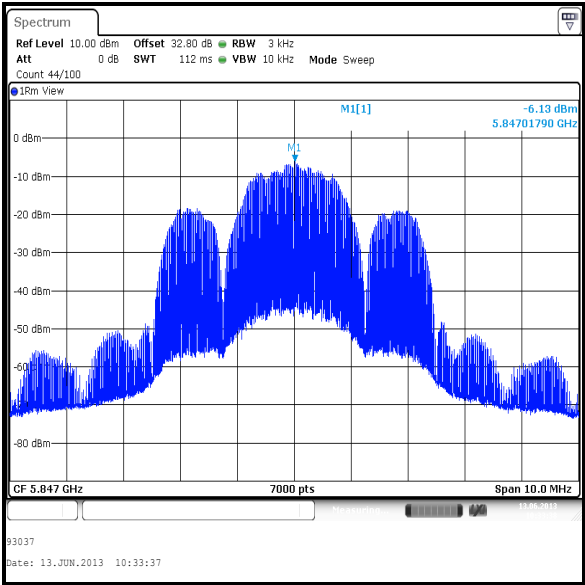
Results: 5 MHz Channel / ACQ / V Port



Bottom Channel



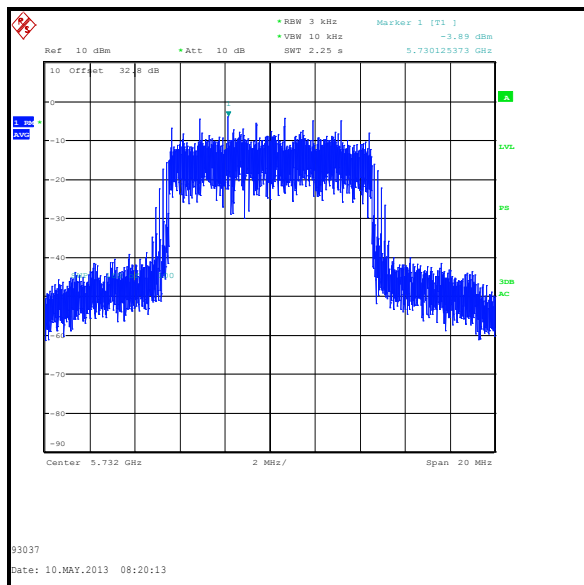
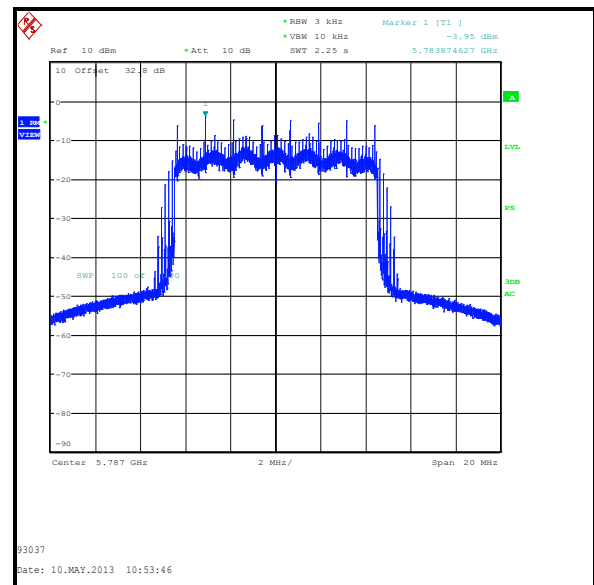
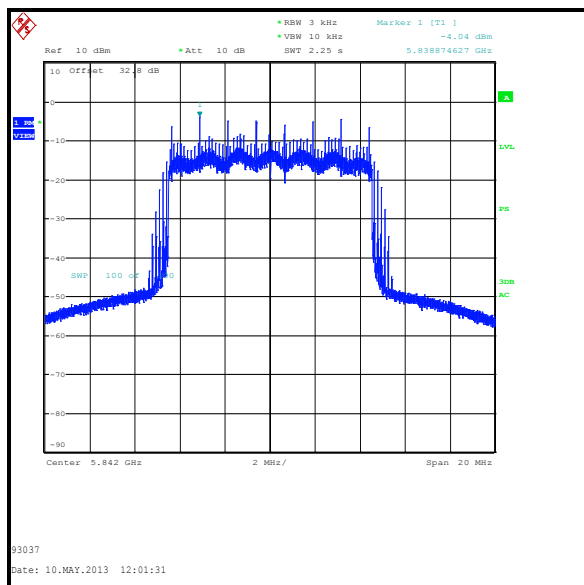
Middle Channel



Top Channel

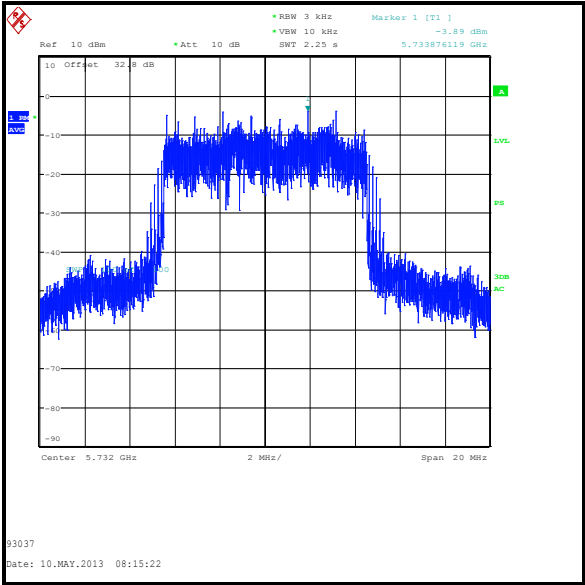
Power Spectral Density (continued)**Results: 10 MHz Channel / BPSK**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-3.9	-3.9	-0.9	8.0	8.9	Complied
Lowest Full Power	-4.2	-3.2	-0.7	8.0	8.7	Complied
Middle	-4.0	-3.3	-0.6	8.0	8.6	Complied
Highest Full Power	-4.4	-4.0	-1.2	8.0	9.2	Complied
Top	-4.0	-3.9	-0.9	8.0	8.9	Complied

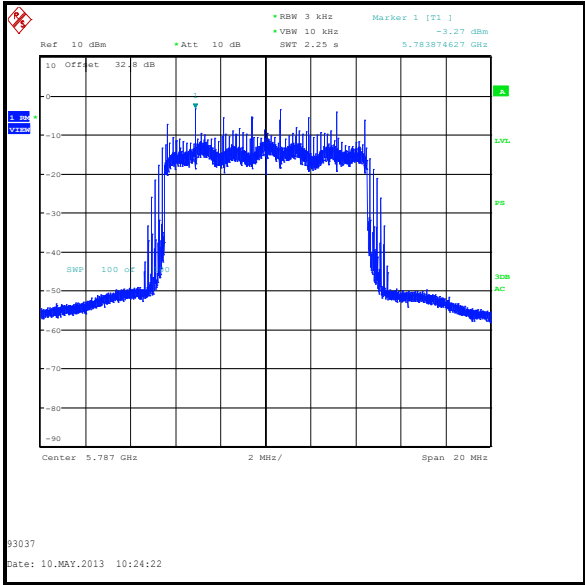
Results: 10 MHz Channel / BPSK / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

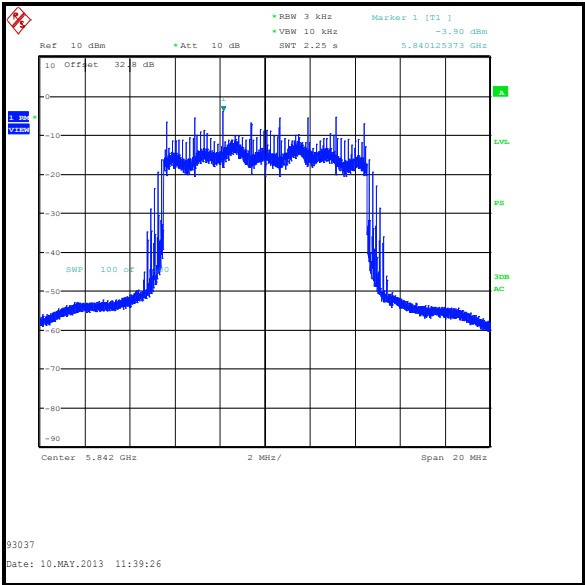
Results: 10 MHz Channel / BPSK / V Port



Bottom Channel



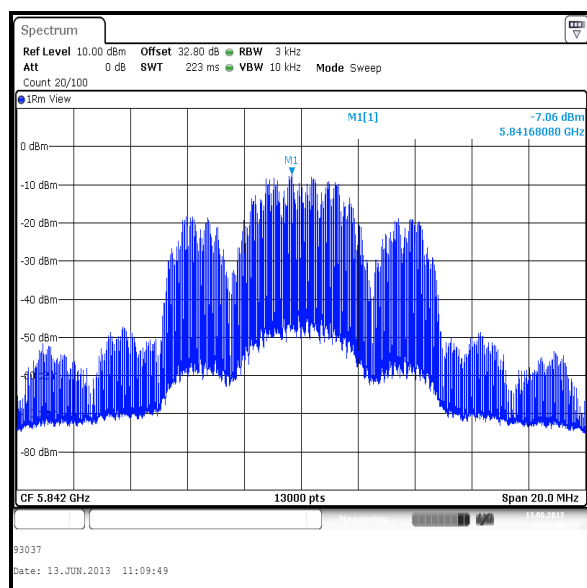
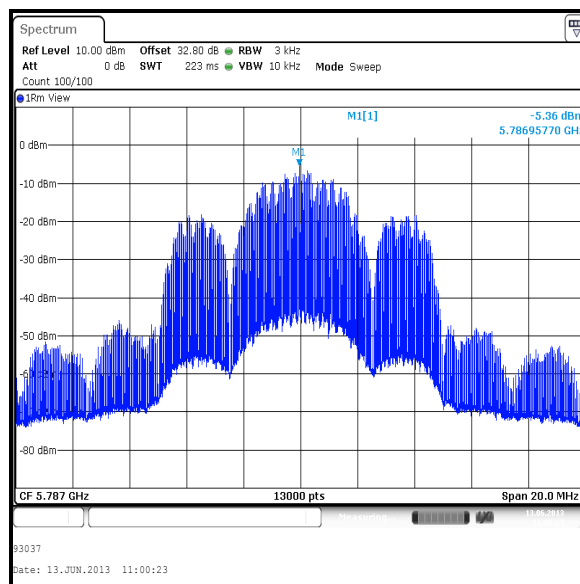
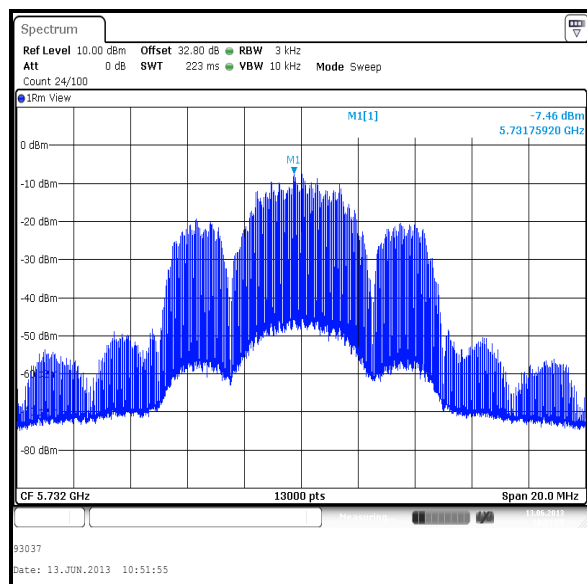
Middle Channel



Top Channel

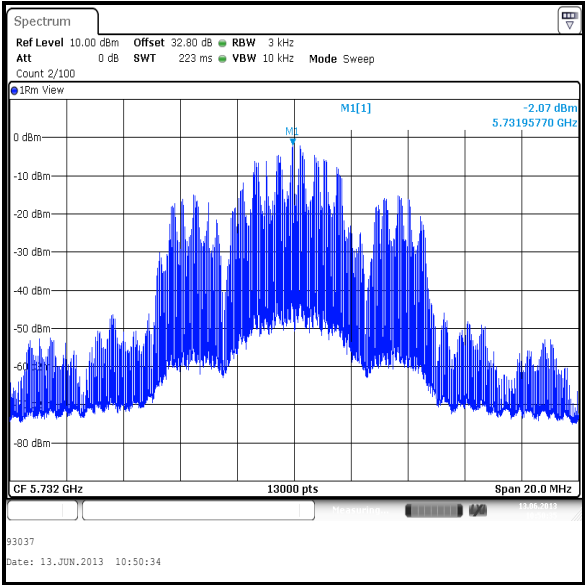
Power Spectral Density (continued)**Results: 10 MHz Channel / ACQ**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-7.5	-2.1	-1.0	8.0	9.0	Complied
Lowest Full Power	-1.0	-1.7	1.7	8.0	6.3	Complied
Middle	-5.4	-3.3	-1.2	8.0	9.2	Complied
Highest Full Power	-0.7	-1.1	2.1	8.0	5.9	Complied
Top	-7.1	-3.9	-2.2	8.0	10.2	Complied

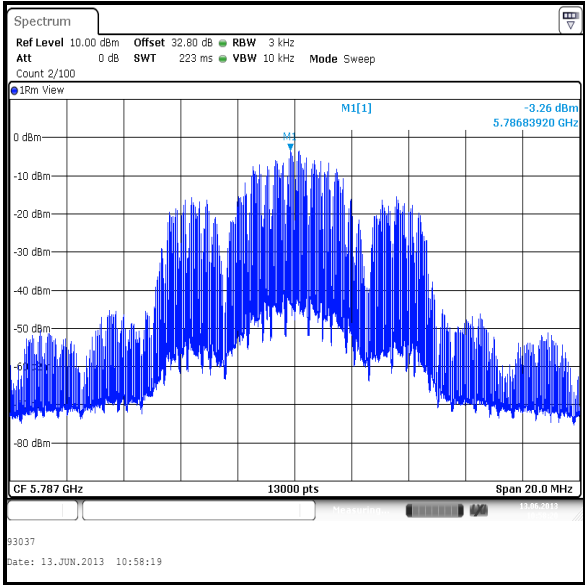
Results: 10 MHz Channel / ACQ / H Port

Power Spectral Density (continued)

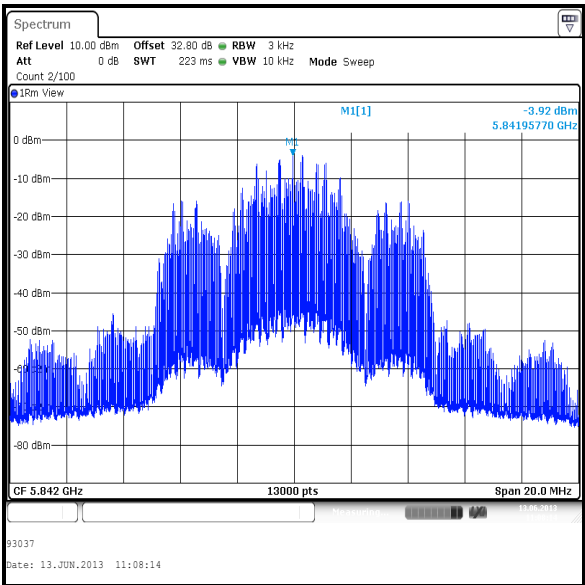
Results: 10 MHz Channel / ACQ / V Port



Bottom Channel



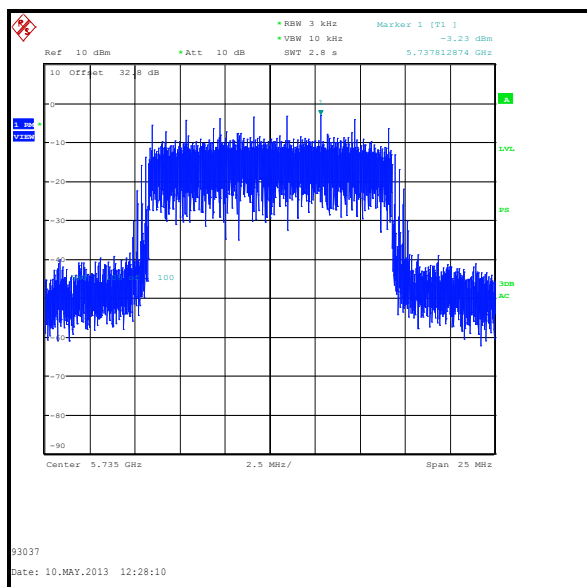
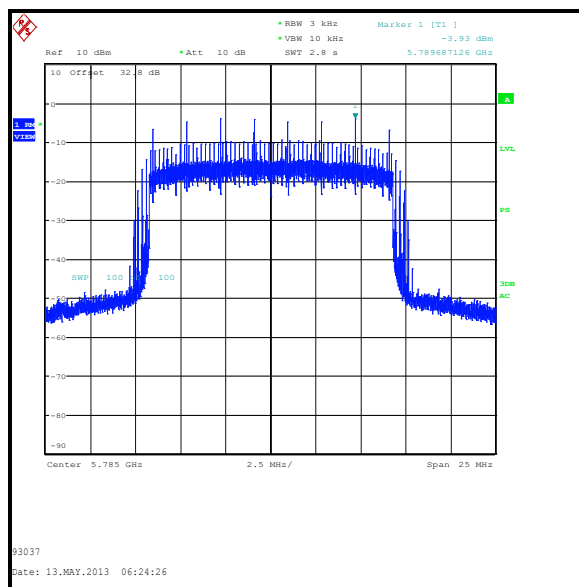
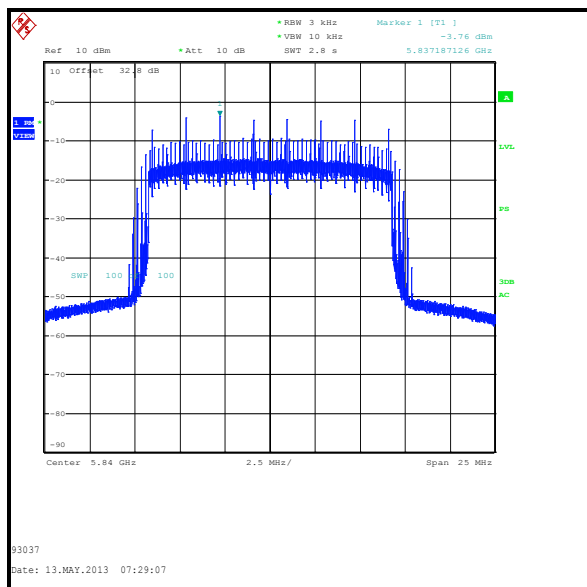
Middle Channel



Top Channel

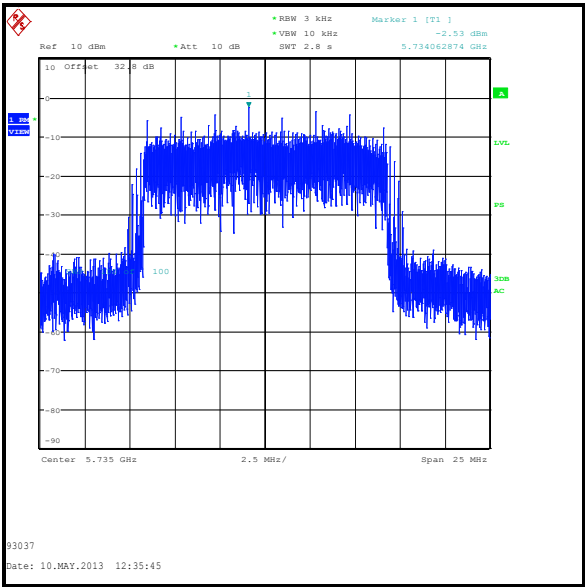
Power Spectral Density (continued)**Results: 15 MHz Channel / BPSK**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-3.2	-2.5	0.2	8.0	7.8	Complied
Lowest Full Power	-3.8	-3.6	-0.7	8.0	8.7	Complied
Middle	-3.9	-1.9	0.2	8.0	7.8	Complied
Highest Full Power	-4.4	-3.2	-0.7	8.0	8.7	Complied
Top	-3.8	-3.1	-0.4	8.0	8.4	Complied

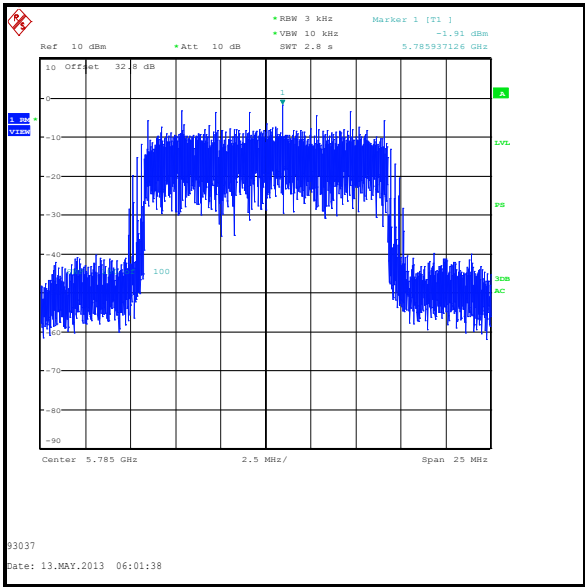
Results: 15 MHz Channel / BPSK / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

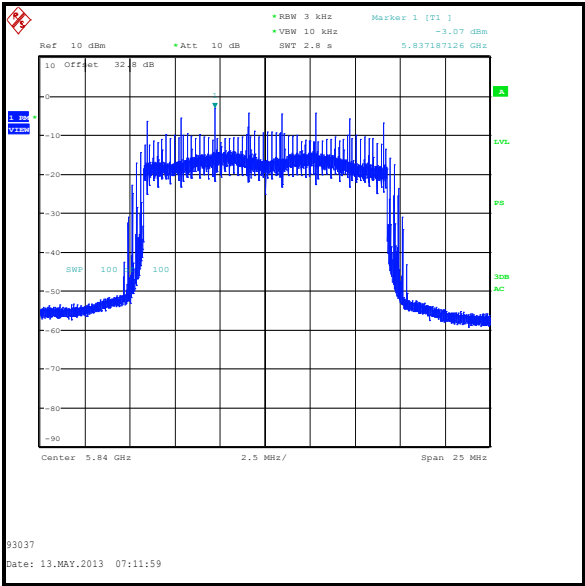
Results: 15 MHz Channel / BPSK / V Port



Bottom Channel



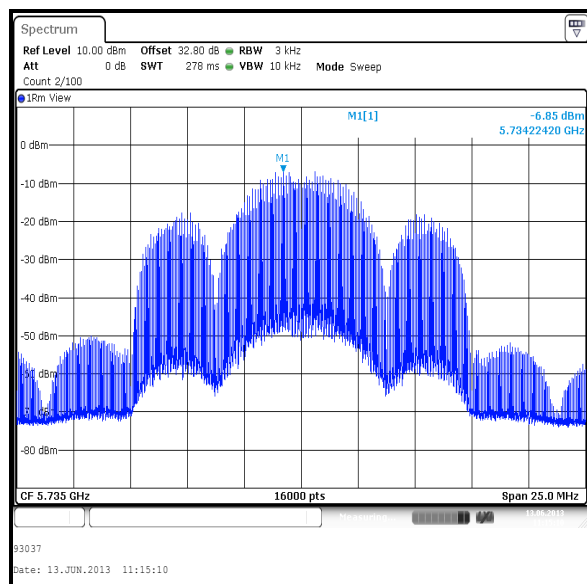
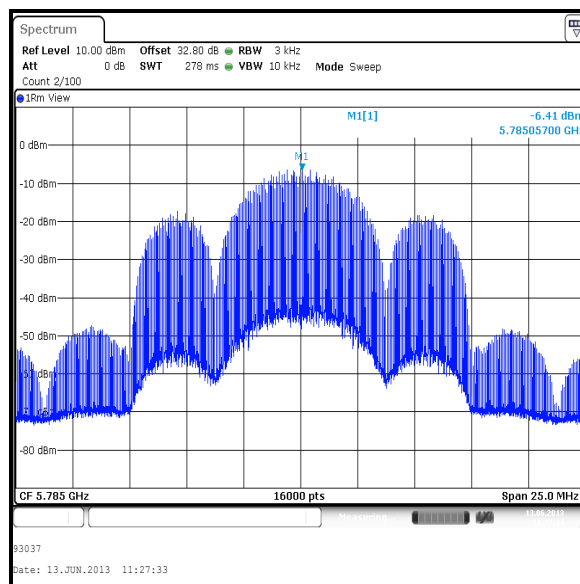
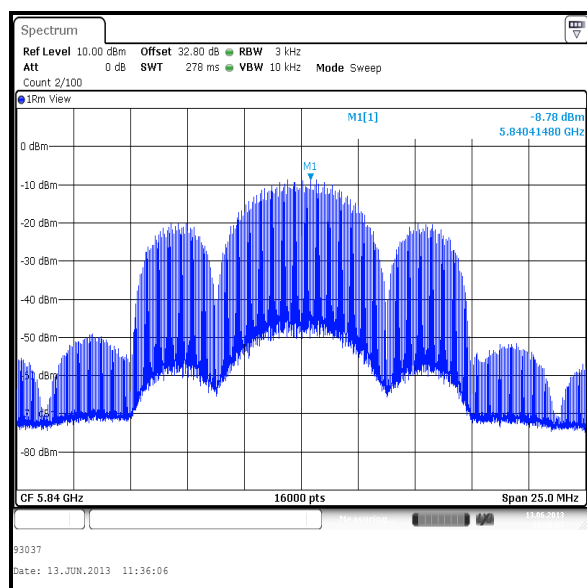
Middle Channel



Top Channel

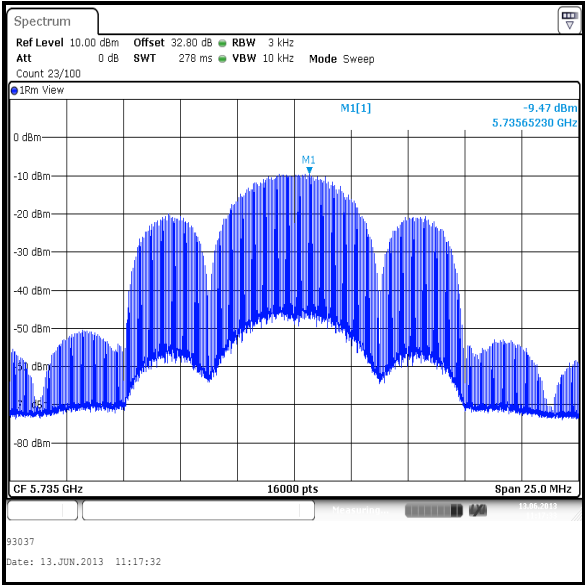
Power Spectral Density (continued)**Results: 15 MHz Channel / ACQ**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-6.9	-9.5	-5.0	8.0	13.0	Complied
Lowest Full Power	-7.0	-6.7	-3.8	8.0	11.8	Complied
Middle	-6.4	-5.2	-2.7	8.0	10.7	Complied
Highest Full Power	-5.2	-6.2	-2.7	8.0	10.7	Complied
Top	-8.8	-9.1	-5.9	8.0	13.9	Complied

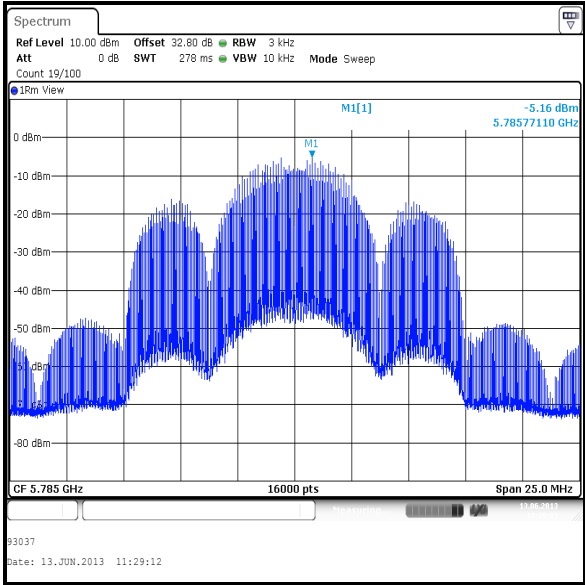
Results: 15 MHz Channel / ACQ / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

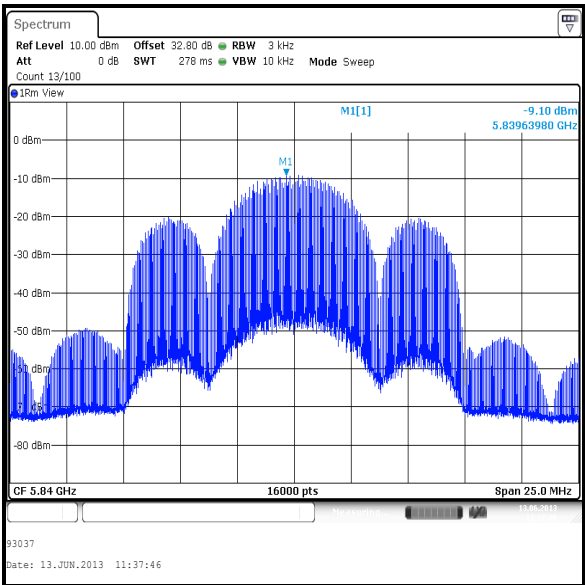
Results: 15 MHz Channel / ACQ / V Port



Bottom Channel



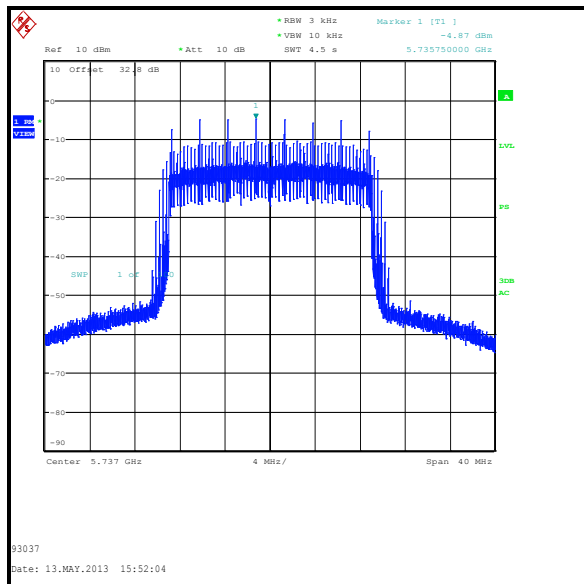
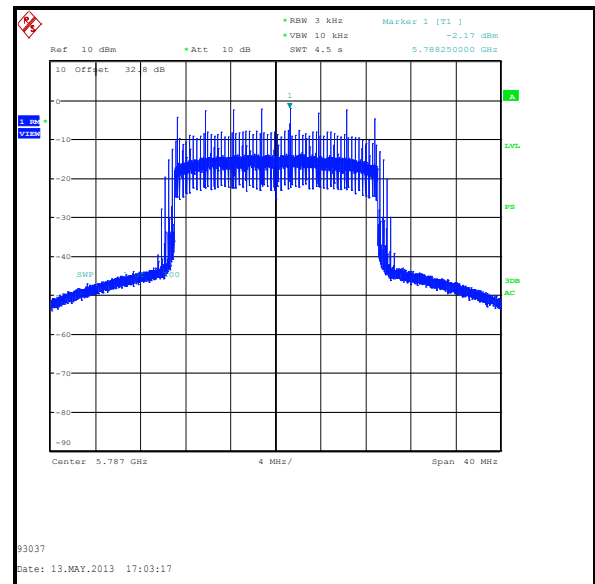
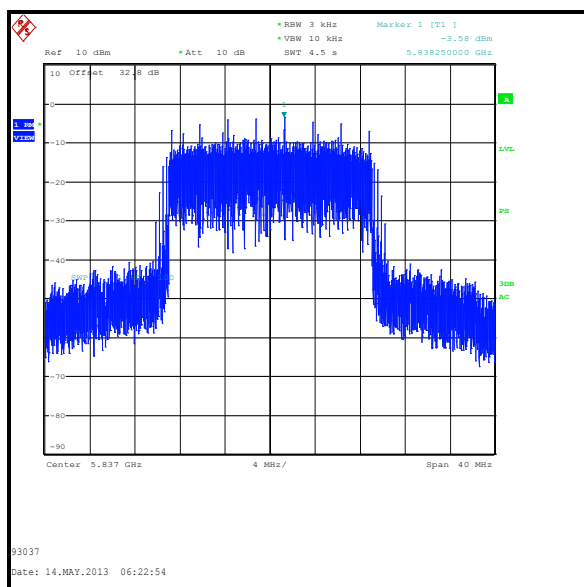
Middle Channel



Top Channel

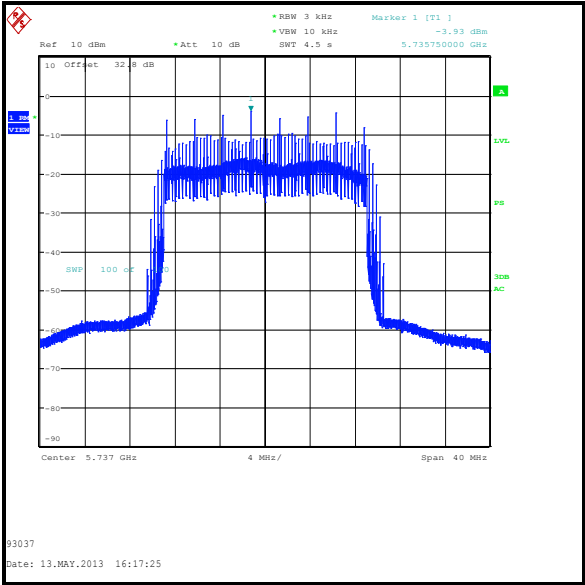
Power Spectral Density (continued)**Results: 20 MHz Channel / BPSK**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-4.9	-3.9	-1.4	8.0	9.4	Complied
Lowest Full Power	-1.9	-1.1	1.5	8.0	6.5	Complied
Middle	-2.2	-1.6	1.1	8.0	6.9	Complied
Highest Full Power	-2.1	-0.7	1.7	8.0	6.3	Complied
Top	-3.6	-4.3	-0.9	8.0	8.9	Complied

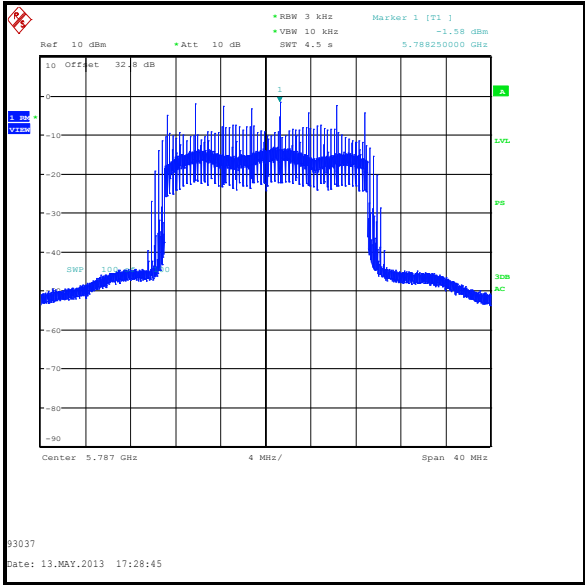
Results: 20 MHz Channel / BPSK / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

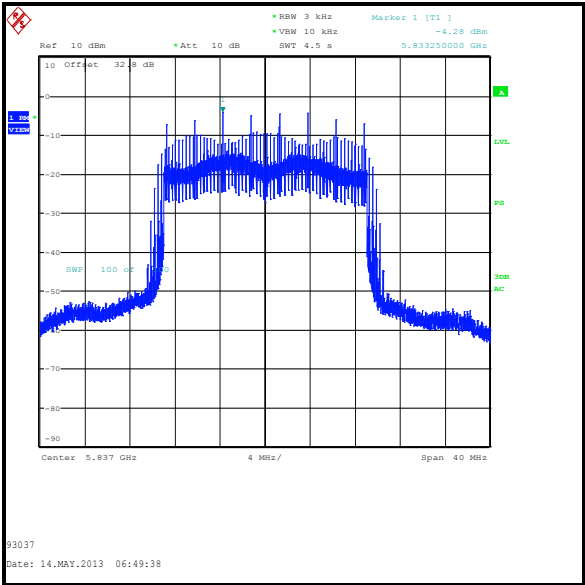
Results: 20 MHz Channel / BPSK / V Port



Bottom Channel



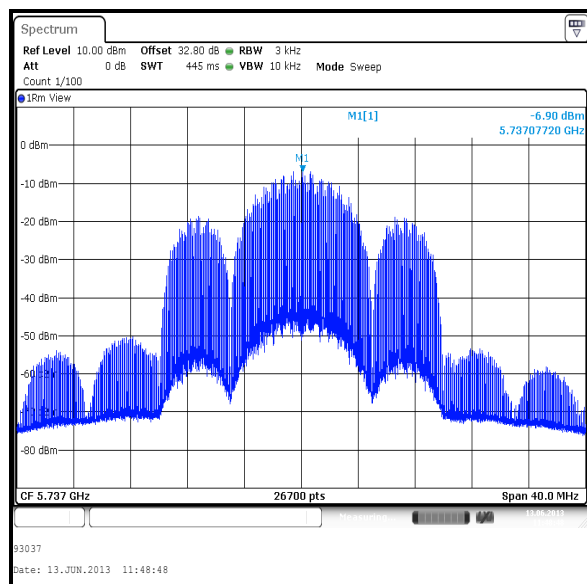
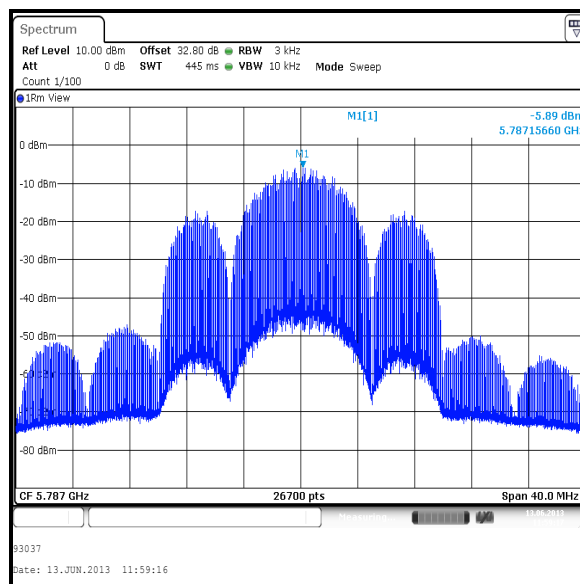
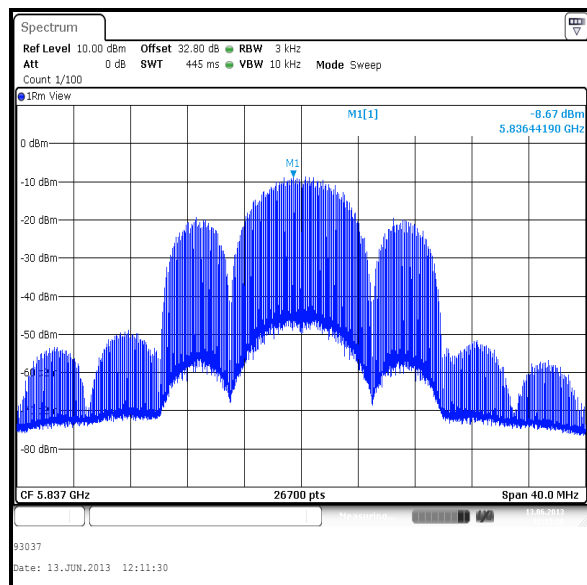
Middle Channel



Top Channel

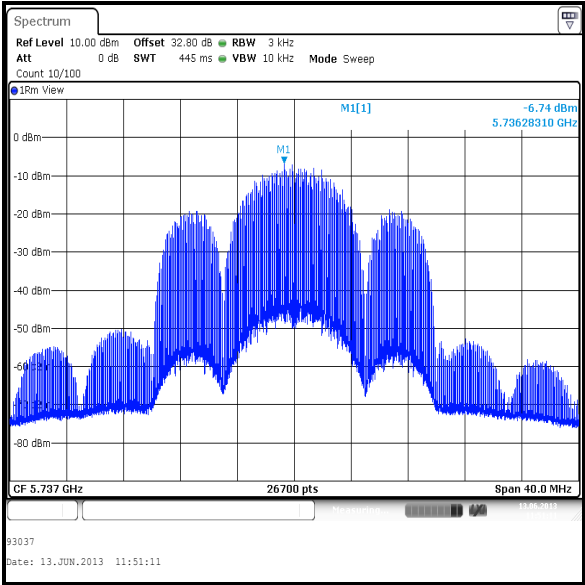
Power Spectral Density (continued)**Results: 20 MHz Channel / ACQ**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-6.9	-6.7	-3.8	8.0	11.8	Complied
Lowest Full Power	-5.7	-3.3	-1.3	8.0	9.3	Complied
Middle	-5.9	-5.7	-2.8	8.0	10.8	Complied
Highest Full Power	-5.6	-6.7	-3.1	8.0	11.1	Complied
Top	-8.7	-8.4	-5.5	8.0	13.5	Complied

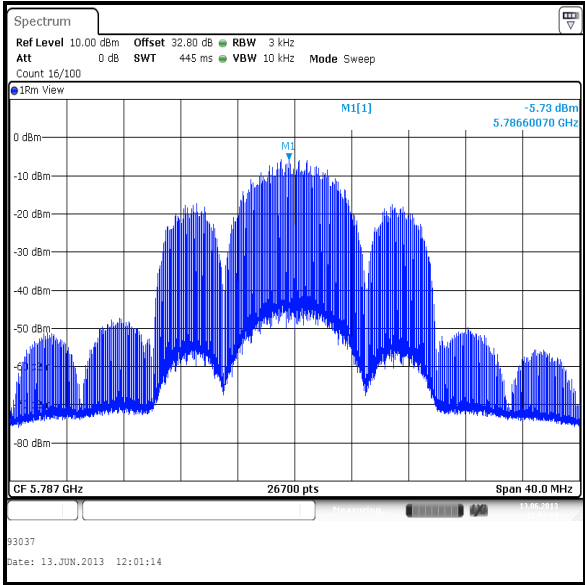
Results: 20 MHz Channel / ACQ / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

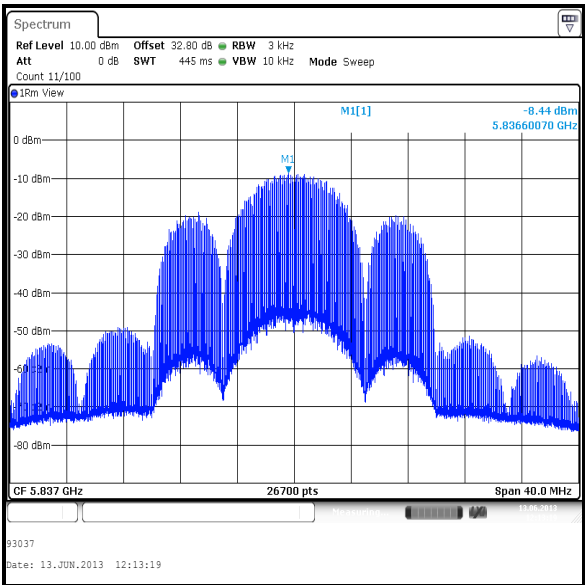
Results: 20 MHz Channel / ACQ / V Port



Bottom Channel



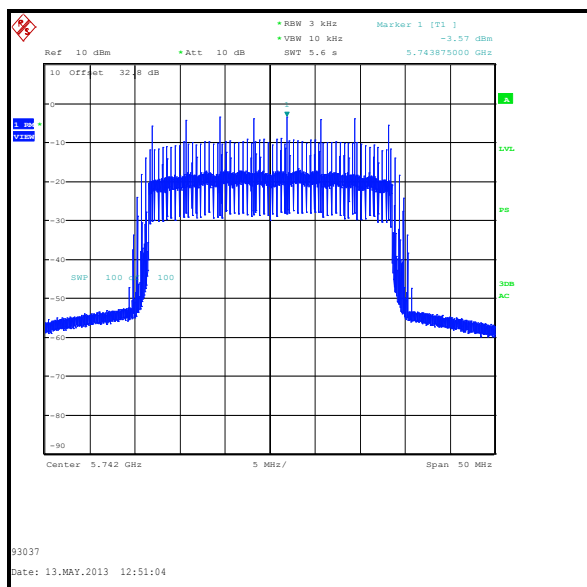
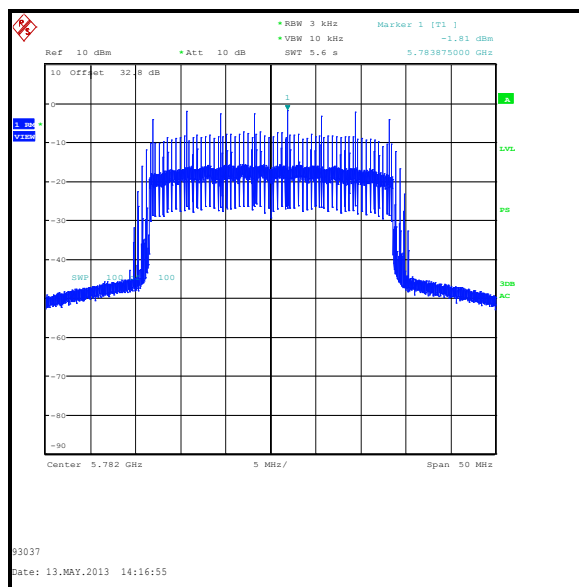
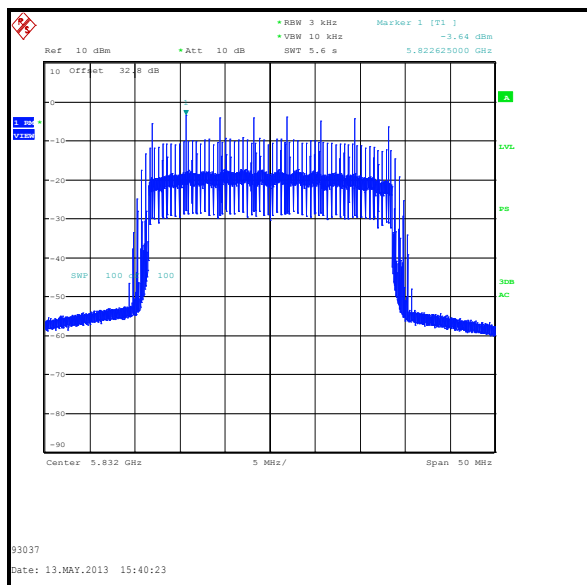
Middle Channel



Top Channel

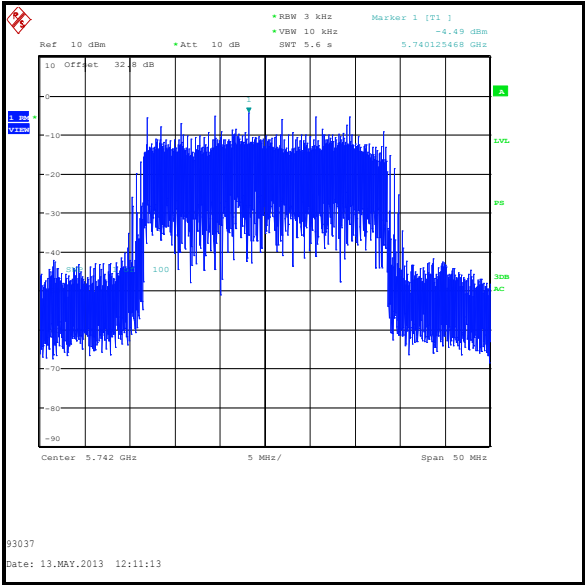
Power Spectral Density (continued)**Results: 30 MHz Channel / BPSK**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-3.6	-4.5	-1.0	8.0	9.0	Complied
Lowest Full Power	-1.9	-1.1	1.5	8.0	6.5	Complied
Middle	-1.8	-1.3	1.5	8.0	6.5	Complied
Highest Full Power	-2.0	-1.0	1.5	8.0	6.5	Complied
Top	-3.6	-3.0	-0.3	8.0	8.3	Complied

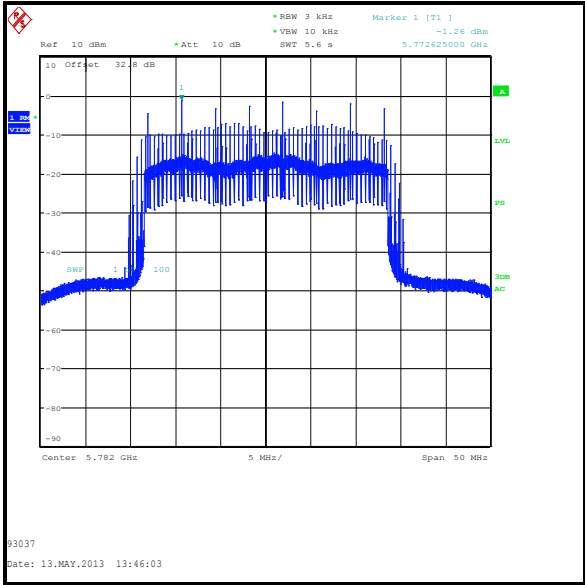
Results: 30 MHz Channel / BPSK / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

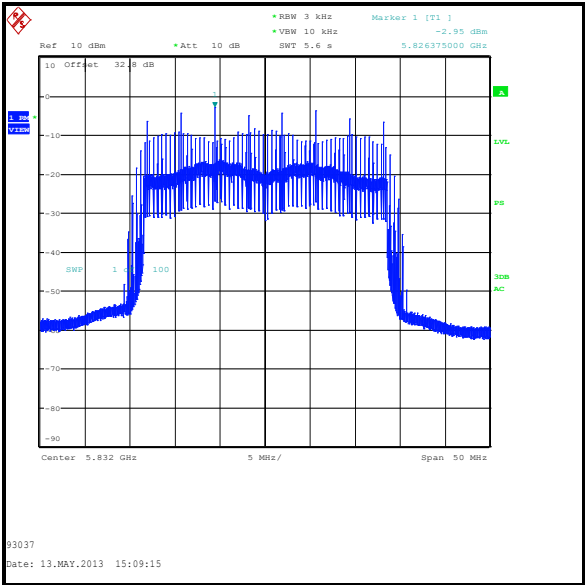
Results: 30 MHz Channel / BPSK / V Port



Bottom Channel



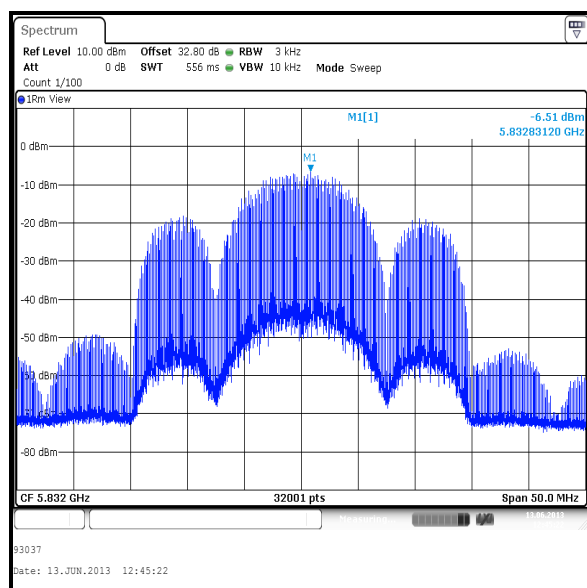
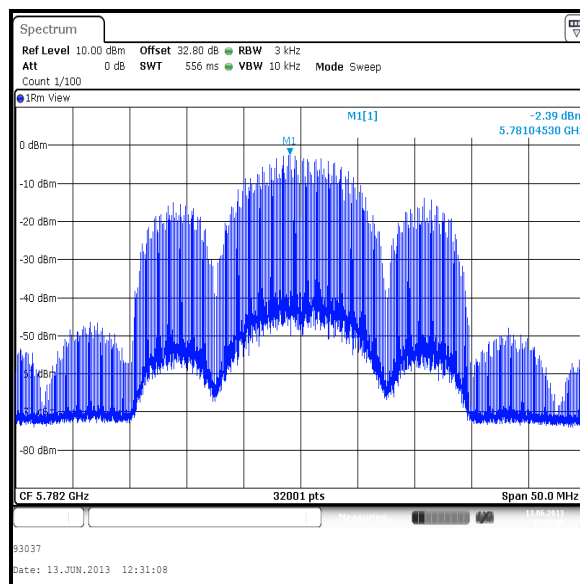
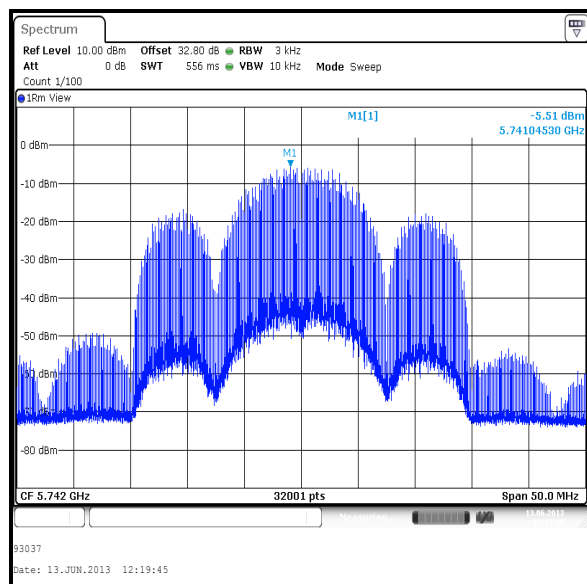
Middle Channel



Top Channel

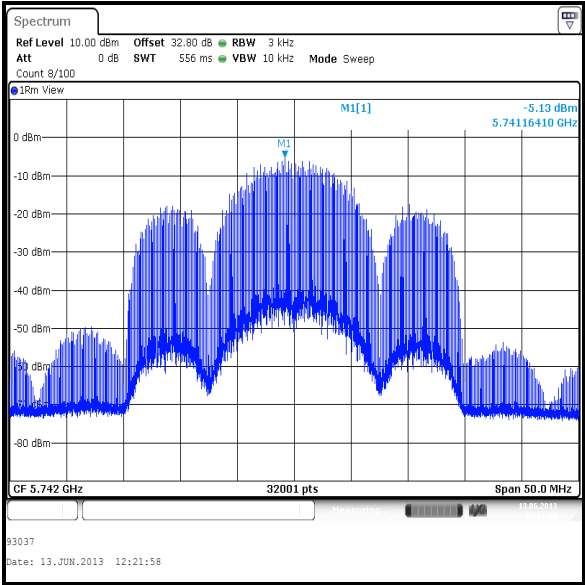
Power Spectral Density (continued)**Results: 30 MHz Channel / ACQ**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-5.5	-5.1	-2.3	8.0	10.3	Complied
Lowest Full Power	-2.9	-4.1	-0.4	8.0	8.4	Complied
Middle	-2.4	-4.3	-0.2	8.0	8.2	Complied
Highest Full Power	-4.3	-3.2	-0.7	8.0	8.7	Complied
Top	-6.5	-6.1	-3.3	8.0	11.3	Complied

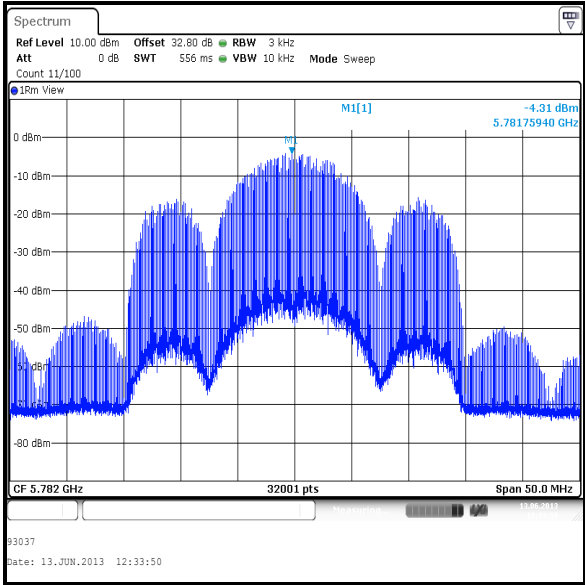
Results: 30 MHz Channel / ACQ / H Port

Power Spectral Density (continued)

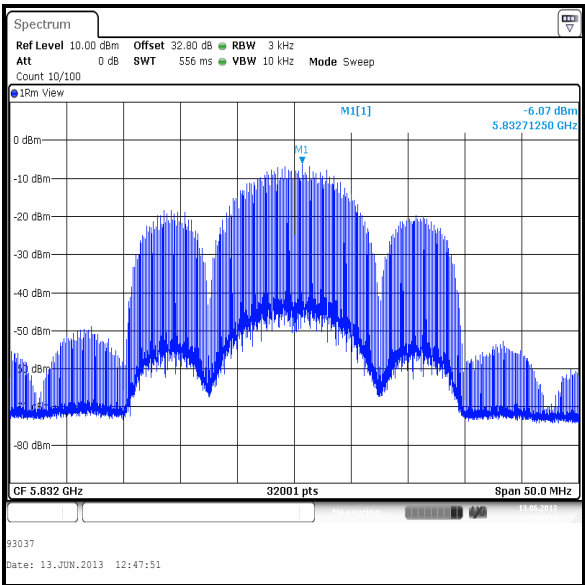
Results: 30 MHz Channel / ACQ / V Port



Bottom Channel



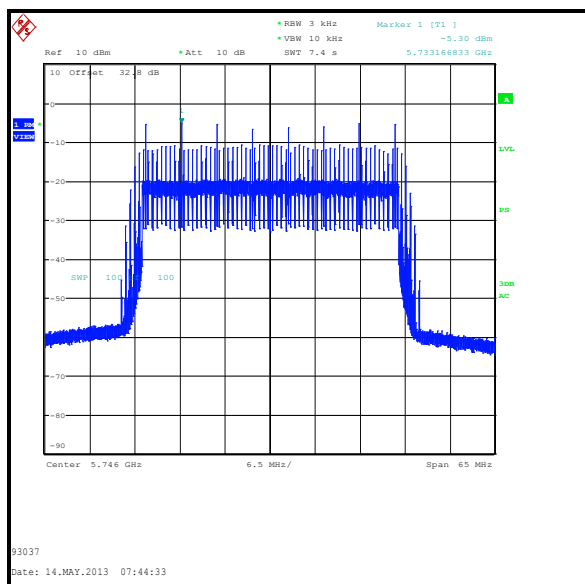
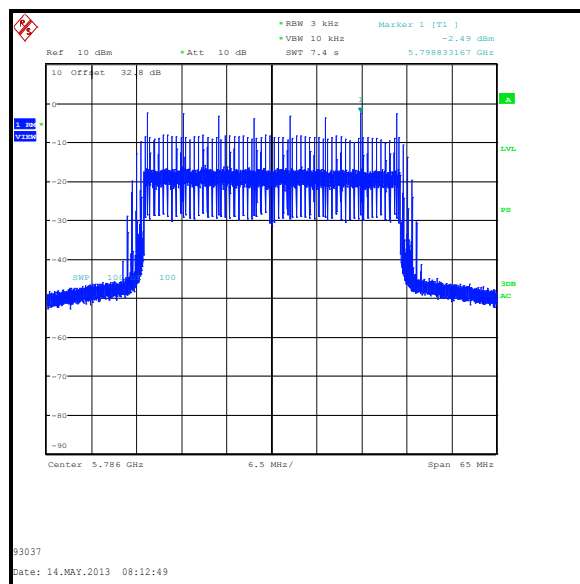
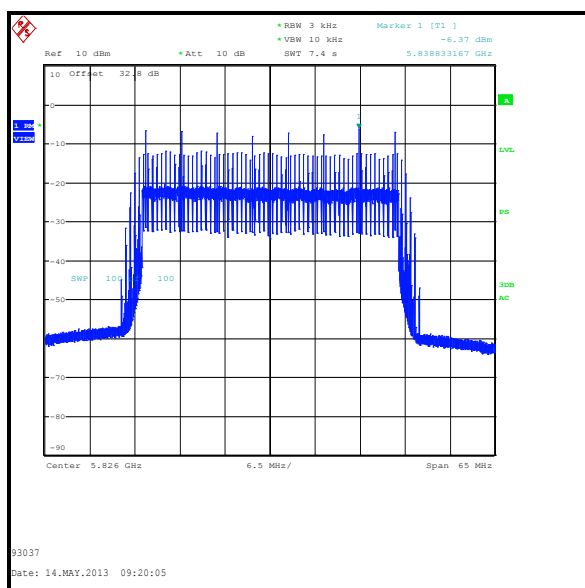
Middle Channel



Top Channel

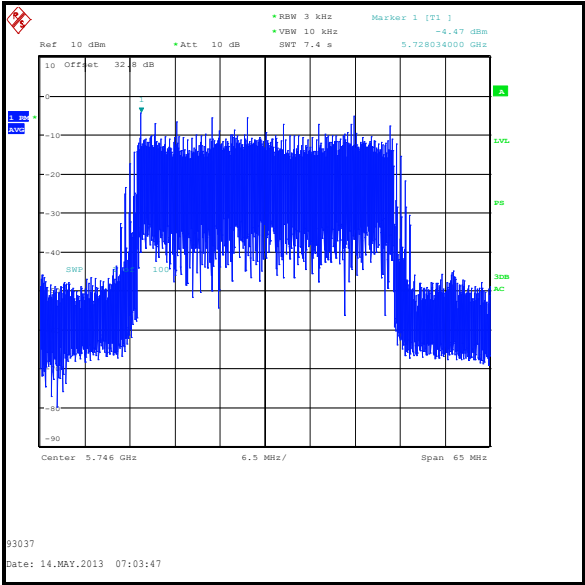
Power Spectral Density (continued)**Results: 40 MHz Channel / BPSK**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-5.3	-4.5	-1.9	8.0	9.9	Complied
Lowest Full Power	-2.5	-3.3	0.1	8.0	7.9	Complied
Middle	-2.5	-2.0	0.8	8.0	7.2	Complied
Highest Full Power	-2.5	-2.0	0.8	8.0	7.2	Complied
Top	-6.4	-4.6	-2.4	8.0	10.4	Complied

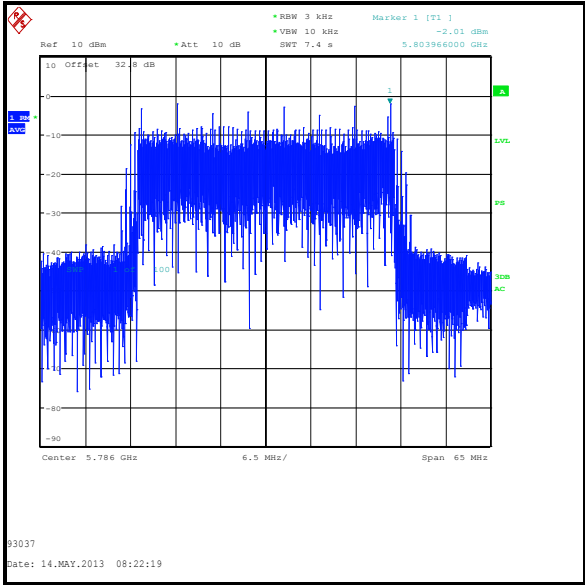
Results: 40 MHz Channel / BPSK / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

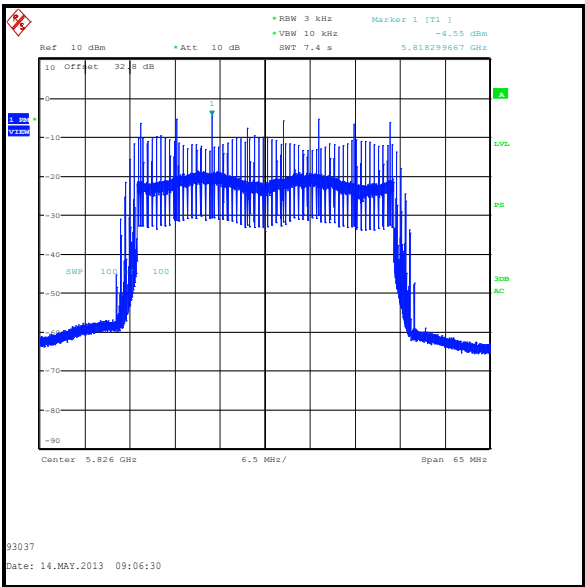
Results: 40 MHz Channel / BPSK / V Port



Bottom Channel



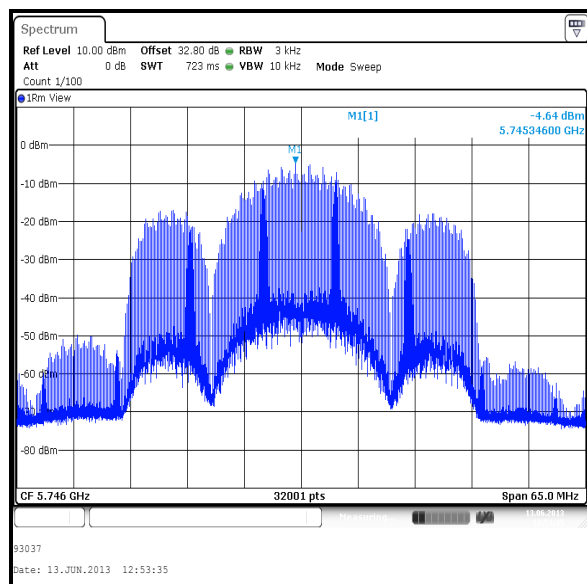
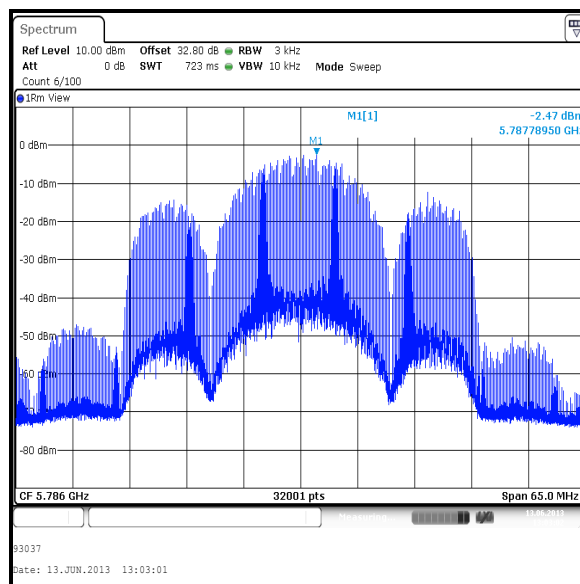
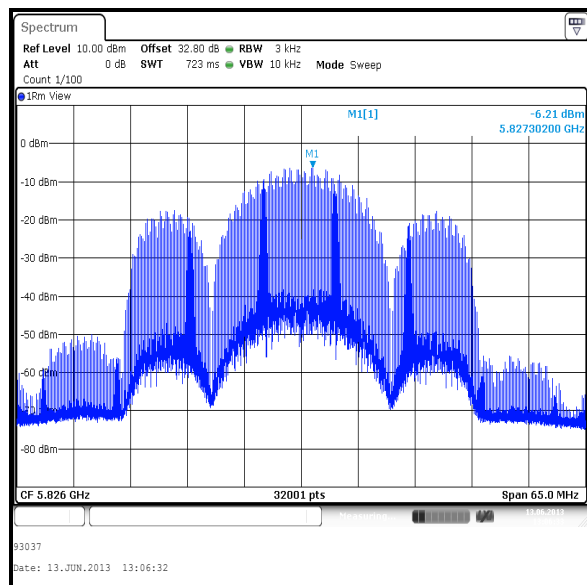
Middle Channel



Top Channel

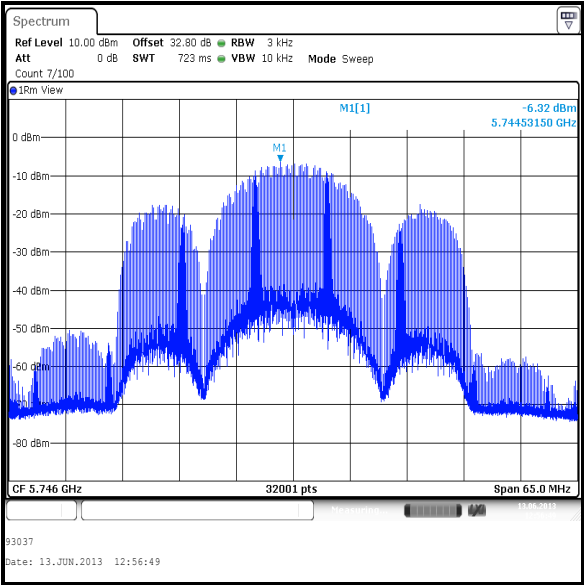
Power Spectral Density (continued)**Results: 40 MHz Channel / ACQ**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-4.6	-6.3	-2.4	8.0	10.4	Complied
Lowest Full Power	-3.3	-2.1	0.4	8.0	7.6	Complied
Middle	-2.5	-3.3	0.1	8.0	7.9	Complied
Highest Full Power	-3.6	-3.8	-0.7	8.0	8.7	Complied
Top	-6.2	-3.7	-1.8	8.0	9.8	Complied

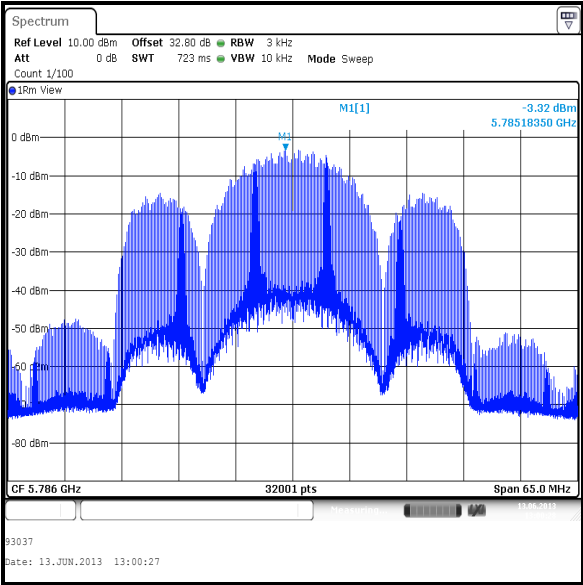
Results: 40 MHz Channel / ACQ / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

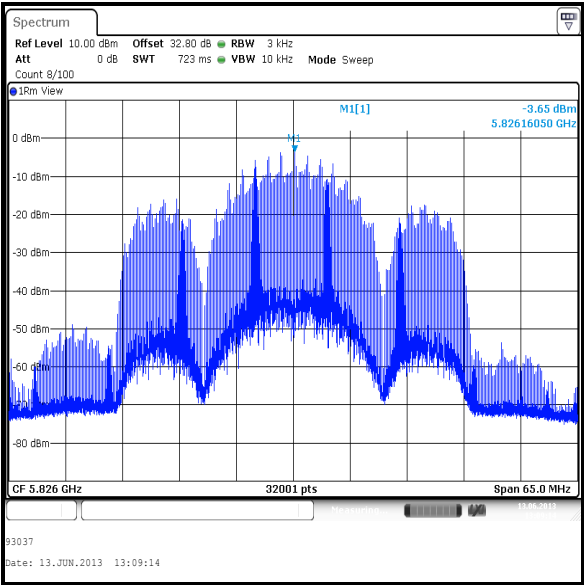
Results: 40 MHz Channel / ACQ / V Port



Bottom Channel



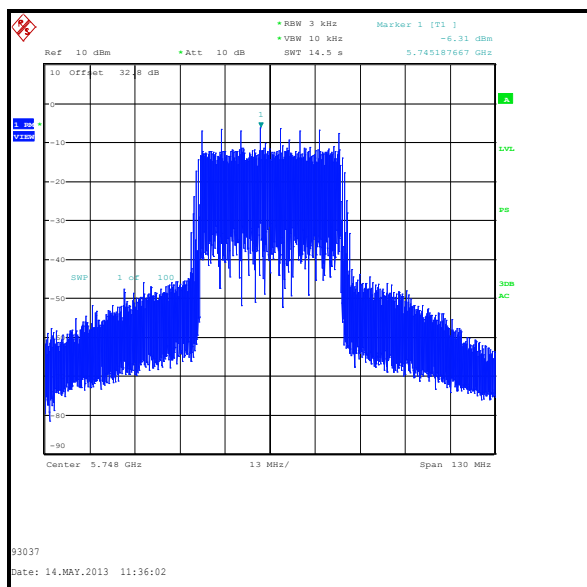
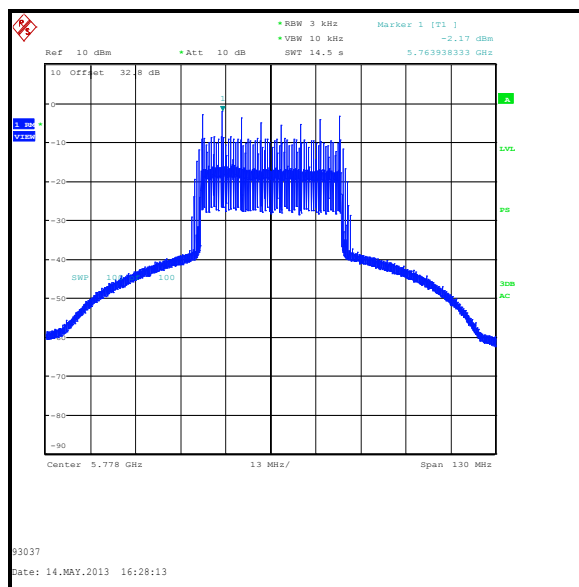
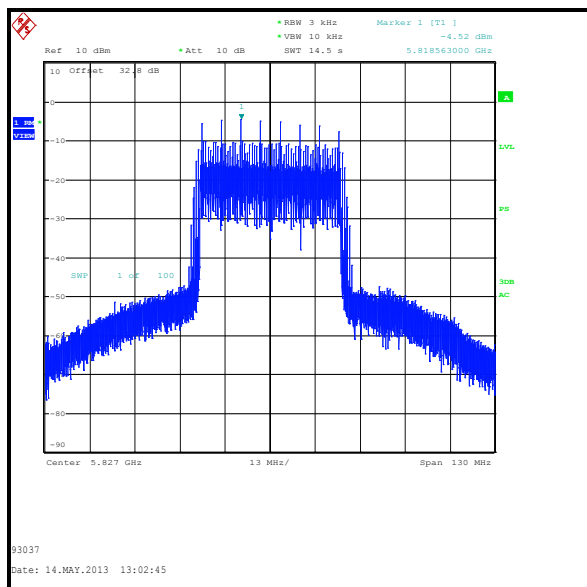
Middle Channel



Top Channel

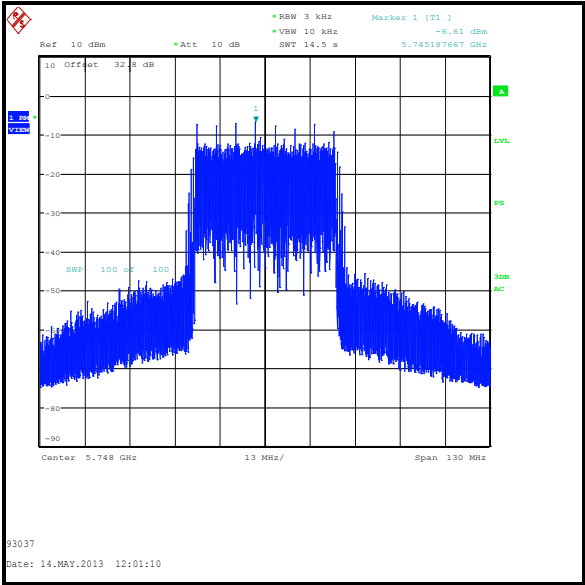
Power Spectral Density (continued)**Results: 45 MHz Channel / QPSK**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-6.3	-6.6	-3.4	8.0	11.4	Complied
Lowest Full Power	-2.6	-1.4	1.1	8.0	6.9	Complied
Middle	-2.2	-1.6	1.1	8.0	6.9	Complied
Highest Full Power	-2.5	-1.6	1.0	8.0	7.0	Complied
Top	-4.5	-4.2	-1.3	8.0	9.3	Complied

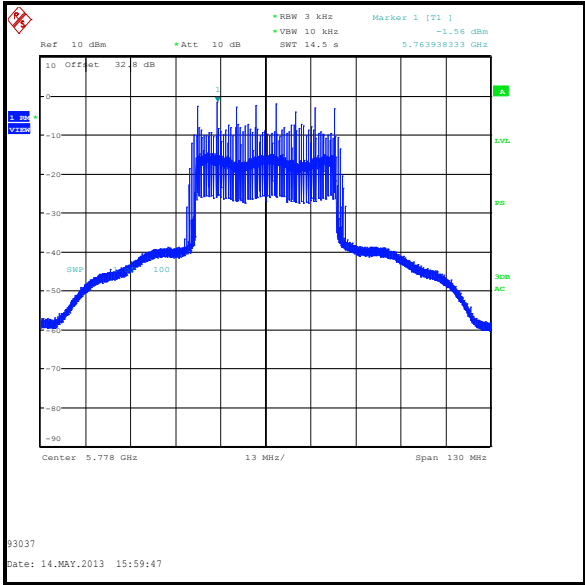
Results: 45 MHz Channel / QPSK / H Port**Bottom Channel****Middle Channel****Top Channel**

Power Spectral Density (continued)

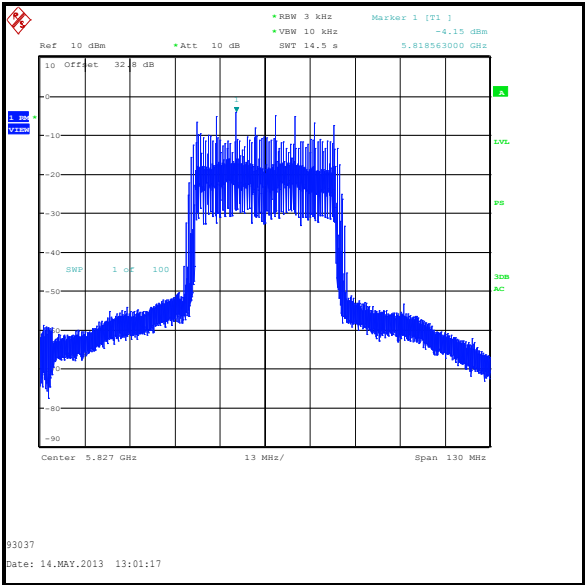
Results: 45 MHz Channel / QPSK / V Port



Bottom Channel



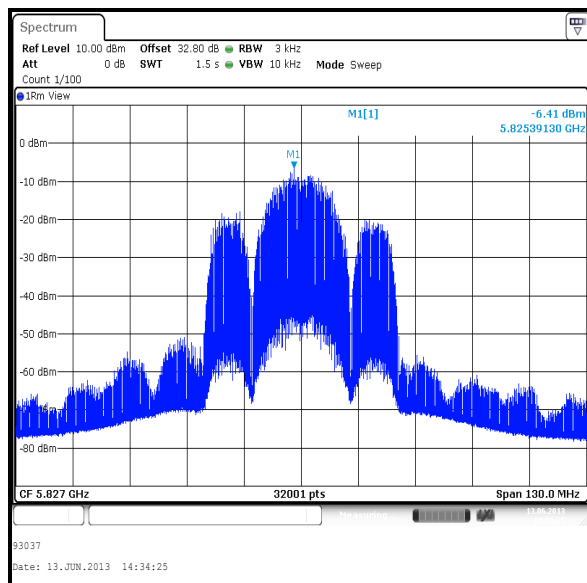
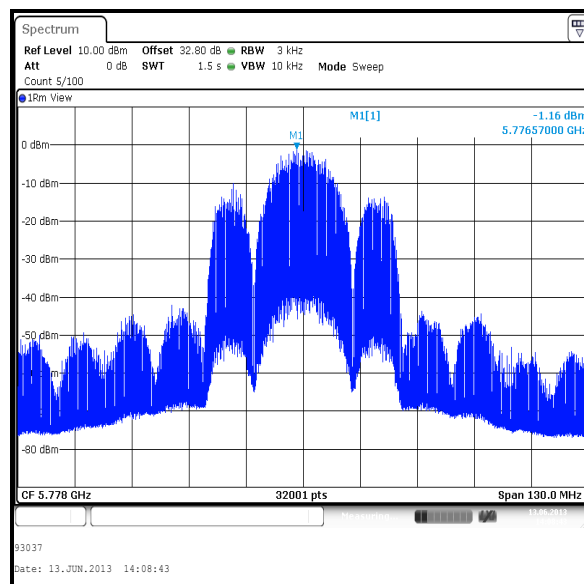
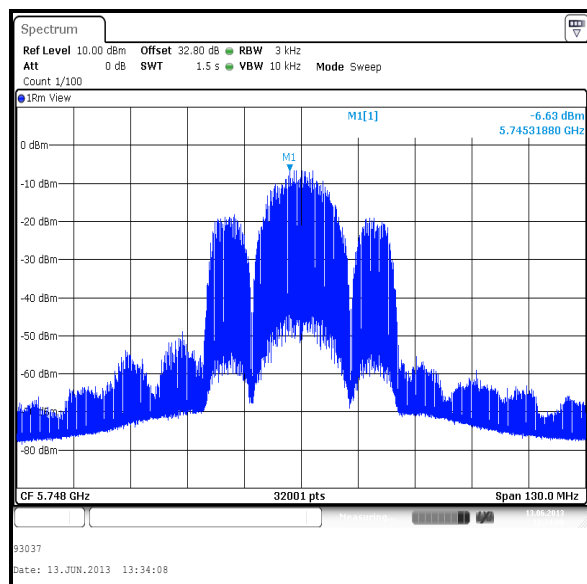
Middle Channel



Top Channel

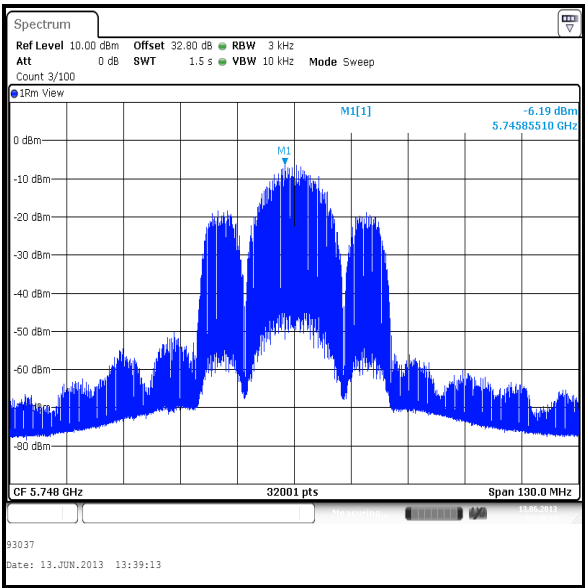
Power Spectral Density (continued)**Results: 45 MHz Channel / ACQ**

Channel	PSD at Port H (dBm / 3 kHz)	PSD at Port V (dBm / 3 kHz)	Combined PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-6.6	-6.2	-3.4	8.0	11.4	Complied
Lowest Full Power	-2.4	-0.6	1.6	8.0	6.4	Complied
Middle	-1.2	-1.0	1.9	8.0	6.1	Complied
Highest Full Power	-0.8	-0.9	2.2	8.0	5.8	Complied
Top	-6.4	-6.9	-3.6	8.0	11.6	Complied

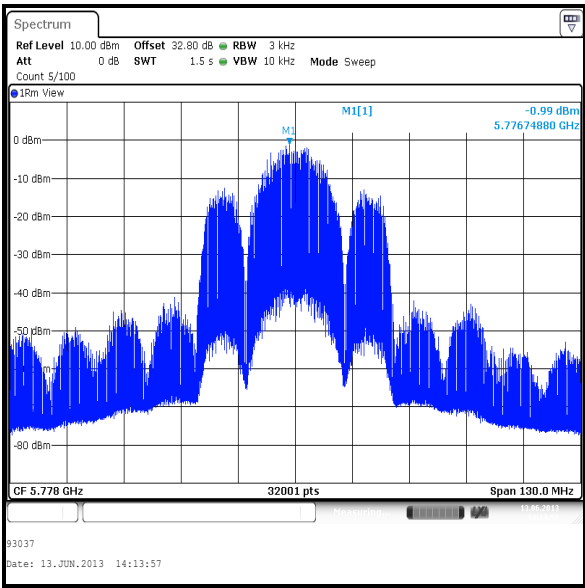
Results: 45 MHz Channel / ACQ / H Port

Power Spectral Density (continued)

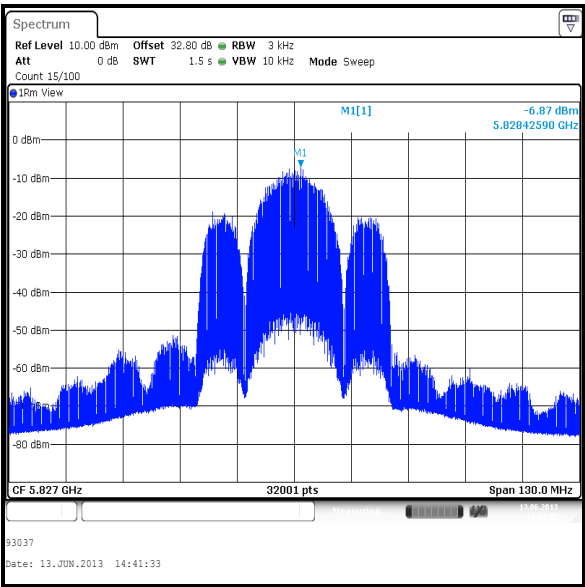
Results: 45 MHz Channel / ACQ / V Port



Bottom Channel



Middle Channel



Top Channel

Power Spectral Density (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A2007	Attenuator	Narda	769-20	001	Calibrated Before Use	N/A
M1590	Test Receiver	Rohde & Schwarz	ESU26	100239	15 Jun 2013	12
L1028	Signal Analyser	Rohde & Schwarz	FSV 30	100854	23 May 2014	12
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	N/A	24 May 2014	12

5.2.4. Maximum Conducted Output Power**Test Summary:**

Test Engineer:	David Doyle	Test Dates:	09 May 2013 & 05 June 2013
Test Sample Serial Number:	00045650004E		

FCC Reference:	Part 15.247(b)(3), 15.247(b)(4) & Part 15.247(c)(1)(ii)
Test Method Used:	KDB 558074 Section 9.2.3.1 & KDB 662911 D02

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	38 to 40

Note(s):

1. Conducted power tests in all bands were performed using a wideband average power meter and associated power sensor in accordance with FCC KDB 558074 Section 9.2.3.1 Measurement Procedure AVGPM. RF attenuators were fitted between the EUT and power sensors. The attenuator loss was measured prior to performing the measurements and the loss compensation incorporated into the measurement results.
2. Tests in point-point mode. Preliminary tests were made on all supported modulation types to determine worst case (highest power) operation. Highest power was observed in BPSK mode on all channel widths. BPSK operates with reduced power settings compared with other modes on the bottom and top 45 MHz channels. 16QAM, 64QAM and 256QAM operate with a higher power setting and additional tests were performed in these modes with a 45 MHz channel width.
3. Tests in sectorised (point-to-multipoint) and omnidirectional modes. Preliminary tests were made on all supported modulation types to determine worst case (highest power) operation. Highest power was observed in BPSK mode on all channel widths apart from 45 MHz channel bandwidth where 256QAM exhibited the highest power. Conducted power limits were reduced by 1 dB for each dB that the stated gain of the antenna exceeded 6 dB in accordance with 15.247(b)(4), the power settings of the the EUT were reduced accordingly.
4. The transmitter was continuously transmitting at maximum configurable power with 100% duty cycle on the required channels during the tests.
5. Power from both ports was measured and combined using the measure-and-sum method stated in FCC KDB 662911 D02.
6. No E.I.R.P. limit is specified for point-to point operation as the system can be configured as a fixed link using directional antennas with gains greater than 6 dBi. According to FCC Part 15.247(c)(1)(ii), systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

Maximum Conducted Output Power (continued)**Results: 5 MHz Channel / BPSK / Directional Antennas**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	20.2	20.5	23.4	30.0	6.6	Complied
Middle	24.0	24.0	27.0	30.0	3.0	Complied
Top	19.0	18.4	21.7	30.0	8.3	Complied

Results: 10 MHz Channel / BPSK / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	21.8	21.5	24.7	30.0	5.3	Complied
Middle	24.1	24.0	27.1	30.0	2.9	Complied
Top	21.0	21.0	24.0	30.0	6.0	Complied

Results: 15 MHz Channel / BPSK / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	22.4	22.4	25.4	30.0	4.6	Complied
Middle	23.8	23.8	26.8	30.0	3.2	Complied
Top	22.0	21.6	24.8	30.0	5.2	Complied

Results: 20 MHz Channel / BPSK / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	21.4	21.7	24.6	30.0	5.4	Complied
Middle	23.9	24.0	27.0	30.0	3.0	Complied
Top	22.0	21.6	24.8	30.0	5.2	Complied

Results: 30 MHz Channel / BPSK / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	22.3	22.1	25.2	30.0	4.8	Complied
Middle	23.9	23.9	26.9	30.0	3.1	Complied
Top	22.0	21.5	24.8	30.0	5.2	Complied

Maximum Conducted Output Power (continued)**Results: 40 MHz Channel / BPSK / Directional Antennas**

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	21.2	21.2	24.2	30.0	5.8	Complied
Middle	23.9	24.0	27.0	30.0	3.0	Complied
Top	21.2	20.8	24.0	30.0	6.0	Complied

Results: 45 MHz Channel / BPSK / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	20.9	20.9	23.9	30.0	6.1	Complied
Middle	25.1	25.6	28.1	30.0	1.9	Complied
Top	19.7	19.7	22.7	30.0	7.3	Complied

Results: 45 MHz Channel / 16QAM / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	22.4	23.0	25.7	30.0	4.3	Complied
Top	22.6	22.5	25.6	30.0	4.4	Complied

Results: 45 MHz Channel / 64QAM / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	22.2	22.1	25.2	30.0	4.8	Complied
Top	22.4	22.4	25.4	30.0	4.6	Complied

Results: 45 MHz Channel / 256QAM / Directional Antennas

Channel	Conducted Power H Port (dBm)	Conducted Power V Port (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	22.0	22.5	25.3	30.0	4.7	Complied
Top	22.7	23.0	25.9	30.0	4.1	Complied

Maximum Conducted Output Power (continued)**Results: 5 MHz Channel / BPSK / 17 dBi 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	14.8	15.0	17.9	19.0	1.1	Complied
Middle	14.8	14.8	17.8	19.0	1.2	Complied
Top	14.9	14.9	17.9	19.0	1.1	Complied

Results: 5 MHz Channel / BPSK / 17 dBi Sectorised Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	17.9	15.2	33.1	36.0	2.9	Complied
Middle	17.8	15.2	33.0	36.0	3.0	Complied
Top	17.9	15.2	33.1	36.0	2.9	Complied

Results: 10 MHz Channel / BPSK / 17 dBi 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	15.0	15.4	18.2	19.0	0.8	Complied
Middle	14.5	14.9	17.7	19.0	1.3	Complied
Top	14.8	15.2	18.0	19.0	1.0	Complied

Results: 10 MHz Channel / BPSK / 17 dBi Sectorised Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	18.2	15.2	33.4	36.0	2.6	Complied
Middle	17.7	15.2	32.9	36.0	3.1	Complied
Top	18.0	15.2	33.2	36.0	2.8	Complied

Maximum Conducted Output Power (continued)**Results: 15 MHz Channel / BPSK / 17 dBi 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	15.1	15.3	18.2	19.0	0.8	Complied
Middle	15.0	15.3	18.2	19.0	0.8	Complied
Top	14.8	14.8	17.8	19.0	1.2	Complied

Results: 15 MHz Channel / BPSK / 17 dBi Sectorised Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	18.2	15.2	33.4	36.0	2.6	Complied
Middle	18.2	15.2	33.4	36.0	2.6	Complied
Top	17.8	15.2	33.0	36.0	3.0	Complied

Results: 20 MHz Channel / BPSK / 17 dBi 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	15.0	15.2	18.1	19.0	0.9	Complied
Middle	14.5	14.9	17.7	19.0	1.3	Complied
Top	15.0	15.2	18.1	19.0	0.9	Complied

Results: 20 MHz Channel / BPSK / 17 dBi Sectorised Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	18.1	15.2	33.3	36.0	2.7	Complied
Middle	17.7	15.2	32.9	36.0	3.1	Complied
Top	18.1	15.2	33.3	36.0	2.7	Complied

Maximum Conducted Output Power (continued)**Results: 30 MHz Channel / BPSK / 17 dBi 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	14.9	15.1	18.0	19.0	1.0	Complied
Middle	14.7	15.1	17.9	19.0	1.1	Complied
Top	15.0	15.0	18.0	19.0	1.0	Complied

Results: 30 MHz Channel / BPSK / 17 dBi Sectorised Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	18.0	15.2	33.2	36.0	2.8	Complied
Middle	17.9	15.2	33.1	36.0	2.9	Complied
Top	18.0	15.2	33.2	36.0	2.8	Complied

Results: 40 MHz Channel / BPSK / 17 dBi 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	15.1	15.4	18.3	19.0	0.7	Complied
Middle	14.9	15.2	18.1	19.0	0.9	Complied
Top	15.1	15.4	18.3	19.0	0.7	Complied

Results: 40 MHz Channel / BPSK / 17 dBi Sectorised Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	18.3	15.2	33.5	36.0	2.5	Complied
Middle	18.1	15.2	33.3	36.0	2.7	Complied
Top	18.3	15.2	33.5	36.0	2.5	Complied

Maximum Conducted Output Power (continued)**Results: 45 MHz Channel / 256QAM / 17 dBi 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	15.7	15.8	18.8	19.0	0.2	Complied
Middle	15.2	15.8	18.5	19.0	0.5	Complied
Top	15.6	15.9	18.8	19.0	0.2	Complied

Results: 45 MHz Channel / 256QAM / 17 dBi Sectorised Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	18.8	15.2	34.0	36.0	2.0	Complied
Middle	18.5	15.2	33.7	36.0	2.3	Complied
Top	18.8	15.2	34.0	36.0	2.0	Complied

Maximum Conducted Output Power (continued)**Results: 5 MHz Channel / BPSK / 13 dBi 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	18.8	19.2	22.0	23.0	1.0	Complied
Middle	18.8	19.2	22.0	23.0	1.0	Complied
Top	18.9	19.1	22.0	23.0	1.0	Complied

Results: 5 MHz Channel / BPSK / 13 dBi Omnidirectional Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	22.0	11.2	33.2	36.0	2.8	Complied
Middle	22.0	11.2	33.2	36.0	2.8	Complied
Top	22.0	11.2	33.2	36.0	2.8	Complied

Results: 10 MHz Channel / BPSK / 13 dBi 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	19.0	19.2	22.1	23.0	0.9	Complied
Middle	18.8	19.2	22.0	23.0	1.0	Complied
Top	19.0	19.1	22.1	23.0	0.9	Complied

Results: 10 MHz Channel / BPSK / 13 dBi Omnidirectional Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	22.1	11.2	33.3	36.0	2.7	Complied
Middle	22.0	11.2	33.2	36.0	2.8	Complied
Top	22.1	11.2	33.3	36.0	2.7	Complied

Maximum Conducted Output Power (continued)**Results: 15 MHz Channel / BPSK / 13 dBi 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	18.9	19.3	22.1	23.0	0.9	Complied
Middle	19.0	19.4	22.2	23.0	0.8	Complied
Top	18.7	18.9	21.8	23.0	1.2	Complied

Results: 15 MHz Channel / BPSK / 13 dBi Omnidirectional Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	22.1	11.2	33.3	36.0	2.7	Complied
Middle	22.2	11.2	33.4	36.0	2.6	Complied
Top	21.8	11.2	33.0	36.0	3.0	Complied

Results: 20 MHz Channel / BPSK / 13 dBi 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	18.9	19.3	22.1	23.0	0.9	Complied
Middle	18.7	19.2	22.0	23.0	1.0	Complied
Top	18.8	19.2	22.0	23.0	1.0	Complied

Results: 20 MHz Channel / BPSK / 13 dBi Omnidirectional Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	22.1	11.2	33.3	36.0	2.7	Complied
Middle	22.0	11.2	33.2	36.0	2.8	Complied
Top	22.0	11.2	33.2	36.0	2.8	Complied

Maximum Conducted Output Power (continued)**Results: 30 MHz Channel / BPSK / 13 dBi 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	19.0	19.4	22.2	23.0	0.8	Complied
Middle	18.9	19.2	22.1	23.0	0.9	Complied
Top	18.9	19.2	22.1	23.0	0.9	Complied

Results: 30 MHz Channel / BPSK / 13 dBi Omnidirectional Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	22.2	11.2	33.4	36.0	2.6	Complied
Middle	22.1	11.2	33.3	36.0	2.7	Complied
Top	22.1	11.2	33.3	36.0	2.7	Complied

Results: 40 MHz Channel / 256QAM / 13 dBi 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	18.9	19.4	22.2	23.0	0.8	Complied
Middle	18.8	19.3	22.1	23.0	0.9	Complied
Top	18.9	19.3	22.1	23.0	0.9	Complied

Results: 40 MHz Channel / 256QAM / 13 dBi Omnidirectional Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	22.2	11.2	33.4	36.0	2.6	Complied
Middle	22.1	11.2	33.3	36.0	2.7	Complied
Top	22.1	11.2	33.3	36.0	2.7	Complied

Maximum Conducted Output Power (continued)**Results: 45 MHz Channel / 256QAM / 13 dBi 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	19.1	18.5	21.8	23.0	1.2	Complied
Middle	18.8	18.9	21.9	23.0	1.1	Complied
Top	19.1	18.6	21.9	23.0	1.1	Complied

Results: 45 MHz Channel / 256QAM / 13 dBi Omnidirectional Antenna

Channel	Combined Conducted Peak Power (dBm)	Declared Antenna Gain + cable loss (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	21.8	11.2	33.0	36.0	3.0	Complied
Middle	21.9	11.2	33.1	36.0	2.9	Complied
Top	21.9	11.2	33.1	36.0	2.9	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M281	Power Meter	HP	E4418A	GB37170210-01	25 Jan 2014	12
M283	Power Sensor	HP	8487A	3318A03241	30 Apr 2014	12
M1009	Power Meter	HP	437B	3125U13706	25 Jan 2014	12
M1021	Signal Generator	Rohde & Schwarz	SMIQ	833286/004	05 Feb 2014	12
M1592	Power Sensor	HP	8487A	3318A02094	02 Aug 2013	12
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	N/A	24 May 2014	12
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	N/A	24 May 2014	12

5.2.5. Band Edge Conducted Emissions**Test Summary:**

Test Engineer:	David Doyle	Test Dates:	02 May 2013 & 03 May 2013
Test Sample Serial Number:	00045650004E		

FCC Reference:	Part 15.247(d)
Test Method Used:	FCC KDB 558074 Sections 11, 13 & ANSI C63.10 Section 6.9.3

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	33

Note(s):

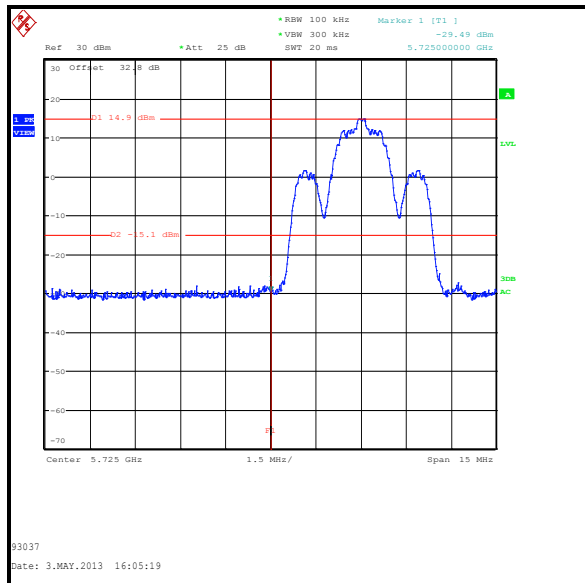
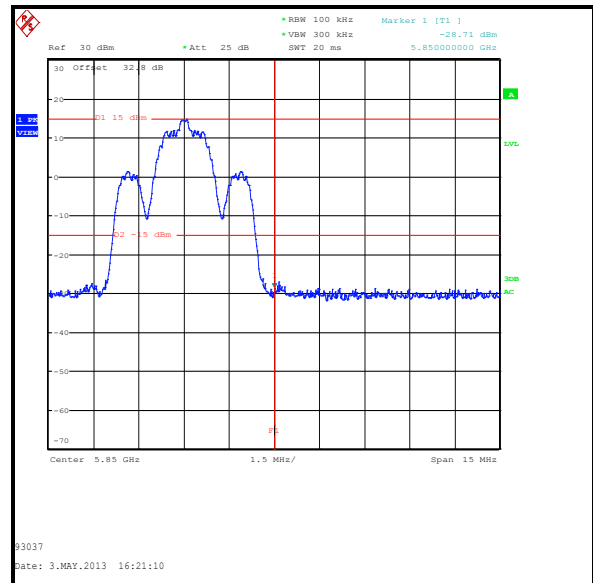
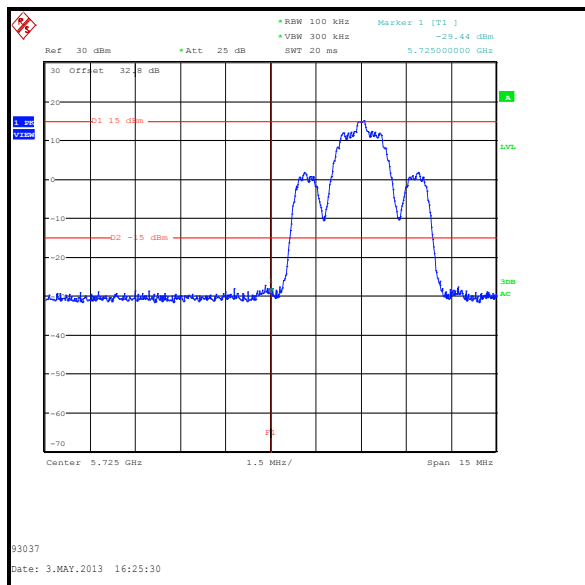
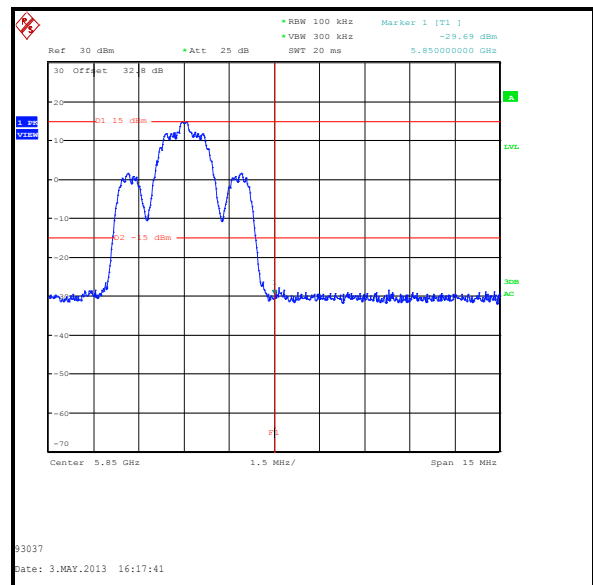
1. Conducted measurements at band edges were used in conjunction with radiated limits. The EUT was set to transmit on the bottom channel when performing measurements at the lower band edge and the top channel when performing measurements at the upper band edge.
2. Non-restricted bands of operation are adjacent to lower and upper band edges therefore a relative limit applies. The antenna gain and RF cable losses were not included in the band edge measurements as the relative limit to peak emission level ratio remains constant with respect to the peak amplitude of the carrier.
3. RF cables and attenuators connecting the EUT to the spectrum analyser were calibrated before testing commenced. A reference level offset of 32.8 db was used on the spectrum analyser to compensate for the attenuator and cable losses at both band edges. The spectrum analyser centre frequencies were set to the upper and lower band edges. Span was adjusted so that it encompassed the DTS bandwidth in order to determine the reference levels for each mode of operation. The spectrum analyser resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The EUT was set to transmit at the maximum power with 100% duty cycle in the worst case modes for all supported channel bandwidths. The spectrum analyser was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker and corresponding reference level line were placed on the peak of the carrier. Non-restricted bands are adjacent to the lower and upper band edges and the -30 dBc limit applies as maximum average conducted output power measurements are used to demonstrate compliance with the power limits. As the maximum conducted output power was measured using an average power meter in accordance with FCC KDB 558074 Section 9.2.3.1 an out-of-band limit line was placed 30 dB (FCC KDB 558074 Section 11.1(b)) below the peak level. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent non-restricted band of operation (where a higher level emission was present). Marker frequencies and levels were recorded.
4. The Customer has reduced power on the highest and lowest channels for all operating modes and channel bandwidths in order to comply with band edge limits. Band edge measurements were also performed on the band edges with the EUT transmitting at nominal (full) power on the lowest channel and highest channels that operate at full power. The worst case modes are recorded in this section. Full results are held on the test laboratory IT server and available for inspection if required.

Band Edge Conducted Emissions (continued)**Results: 5 MHz Channel / ACQ / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-29.5	-15.1	14.4	Complied
5850	-28.7	-15.0	13.7	Complied

Results: 5 MHz Channel / ACQ / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-29.5	-15.0	14.5	Complied
5850	-29.7	-15.0	14.7	Complied

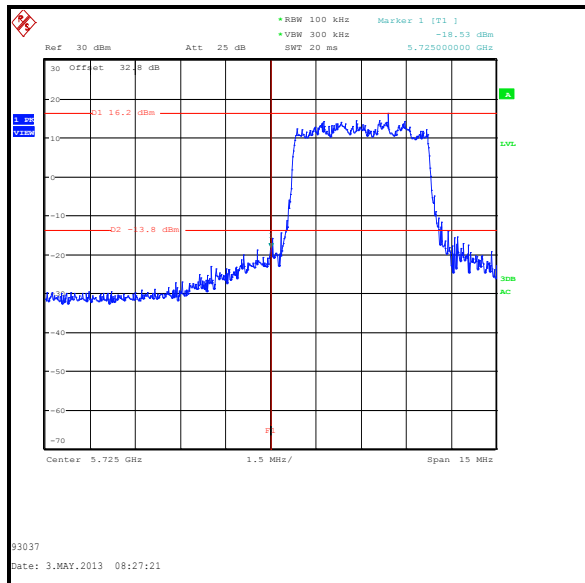
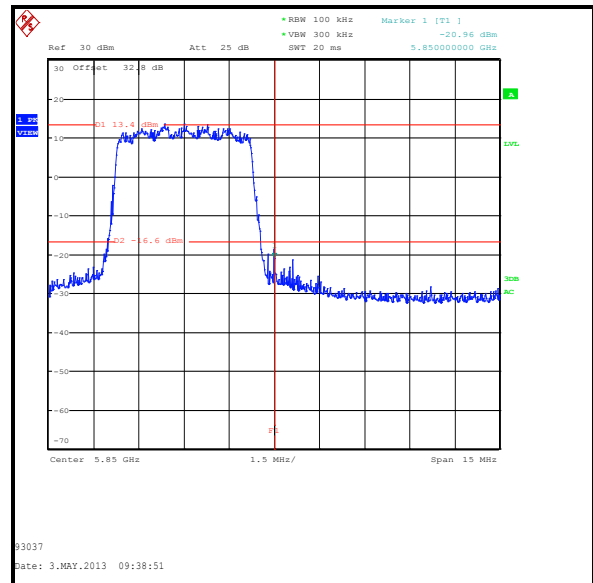
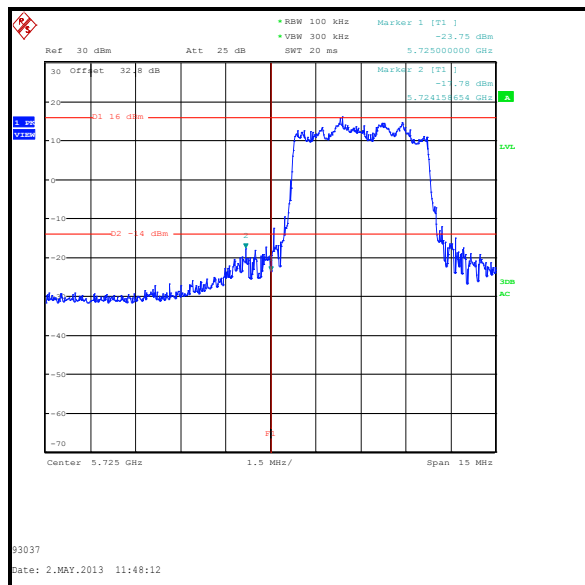
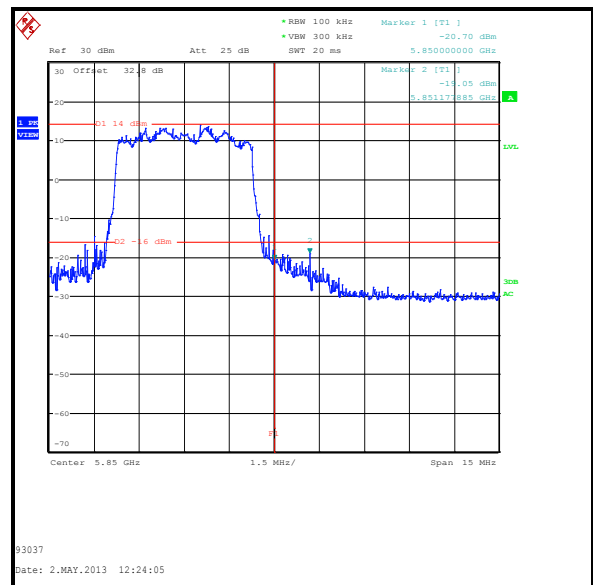
Band Edge Conducted Emissions (continued)**Results: 5 MHz Channel / ACQ / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 5 MHz Channel / ACQ / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 5 MHz Channel / BPSK / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-18.5	-13.8	4.7	Complied
5850	-21.0	-16.6	4.4	Complied

Results: 5 MHz Channel / BPSK / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5724.158	-17.8	-14.0	3.8	Complied
5725	-23.8	-14.0	9.8	Complied
5850	-20.7	-16.0	4.7	Complied
5851.178	-19.1	-16.0	3.1	Complied

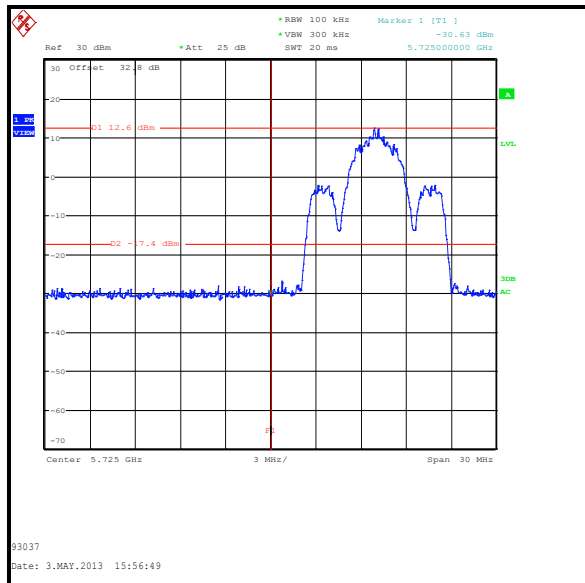
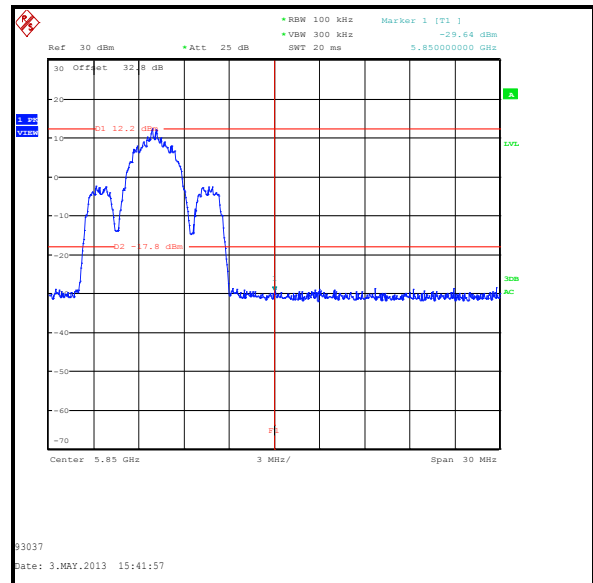
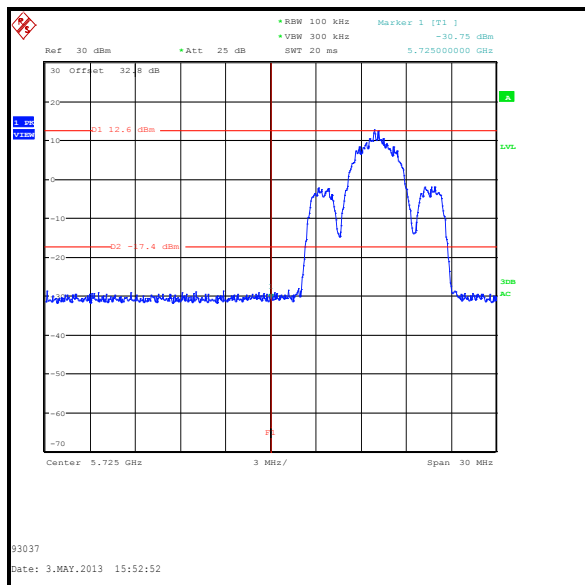
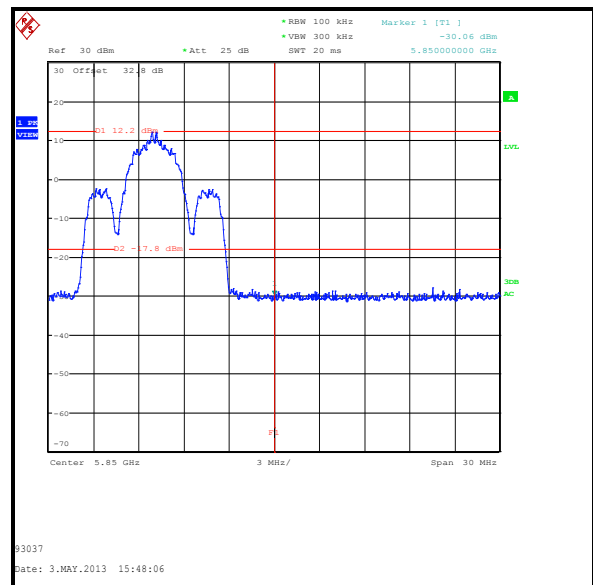
Band Edge Conducted Emissions (continued)**Results: 5 MHz Channel / BPSK / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 5 MHz Channel / BPSK / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 10 MHz Channel / ACQ / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-30.6	-17.4	13.2	Complied
5850	-29.6	-17.8	11.8	Complied

Results: 10 MHz Channel / ACQ / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-30.8	-17.4	13.4	Complied
5850	-30.6	-17.8	12.8	Complied

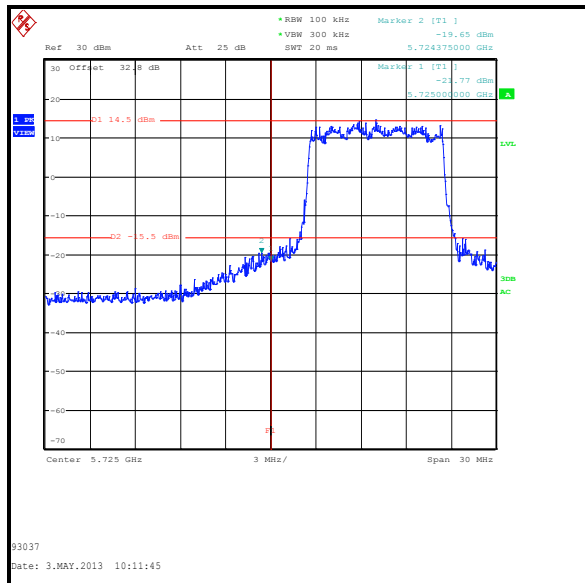
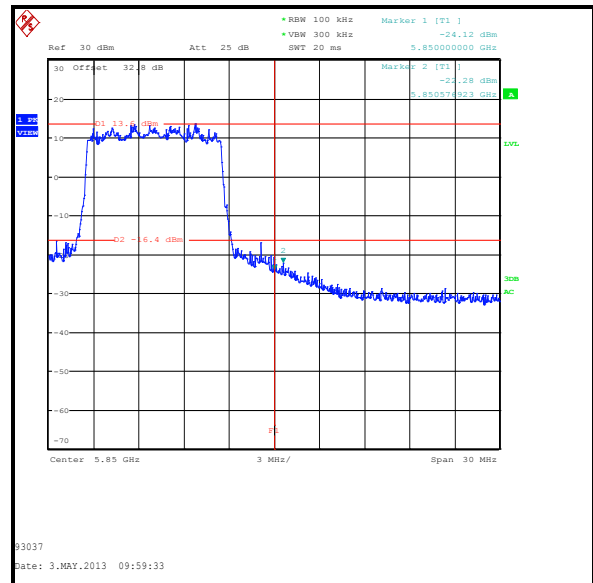
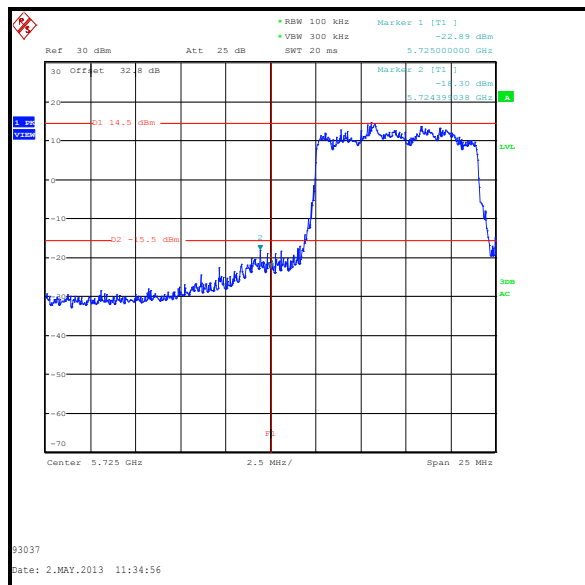
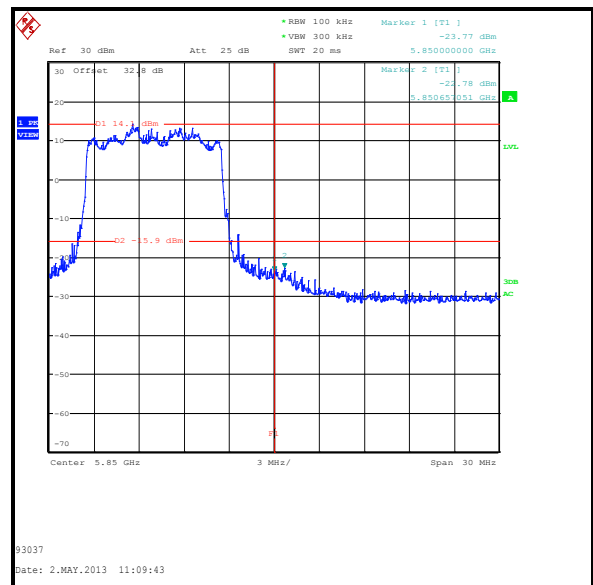
Band Edge Conducted Emissions (continued)**Results: 10 MHz Channel / ACQ / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 10 MHz Channel / ACQ / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 10 MHz Channel / BPSK / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5724.375	-19.7	-15.5	4.2	Complied
5725	-21.8	-15.5	6.3	Complied
5850	-24.1	-16.4	7.7	Complied
5850.577	-22.3	-16.4	5.9	Complied

Results: 10 MHz Channel / BPSK / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5724.399	-18.3	-15.5	2.8	Complied
5725	-22.9	-15.5	7.4	Complied
5850	-23.8	-15.9	7.9	Complied
5850.657	-22.8	-15.9	6.9	Complied

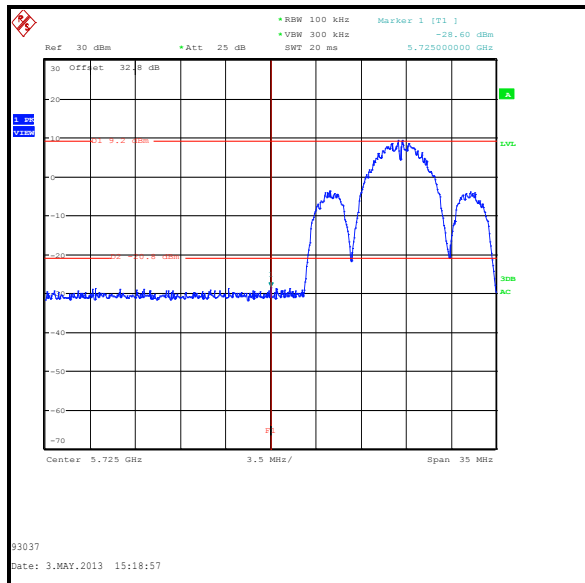
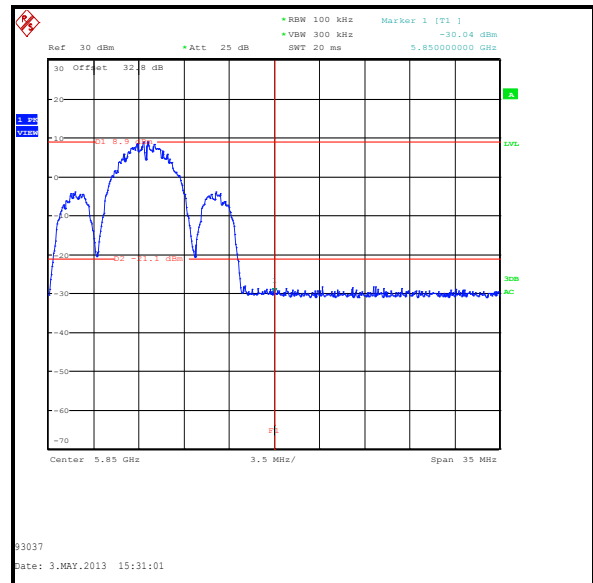
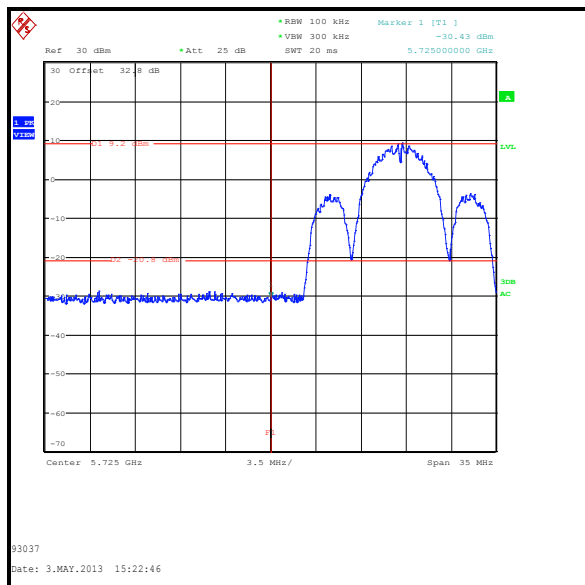
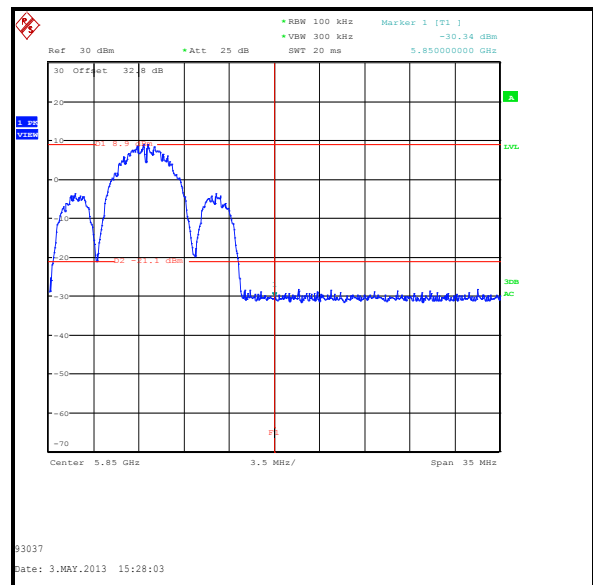
Band Edge Conducted Emissions (continued)**Results: 10 MHz Channel / BPSK / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 10 MHz Channel / BPSK / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 15 MHz Channel / ACQ / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-28.6	-20.8	7.8	Complied
5850	-30.4	-21.2	9.2	Complied

Results: 15 MHz Channel / ACQ / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-30.4	-20.8	9.6	Complied
5850	-30.3	-21.1	9.2	Complied

Band Edge Conducted Emissions (continued)**Results: 15 MHz Channel / ACQ / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 15 MHz Channel / ACQ / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

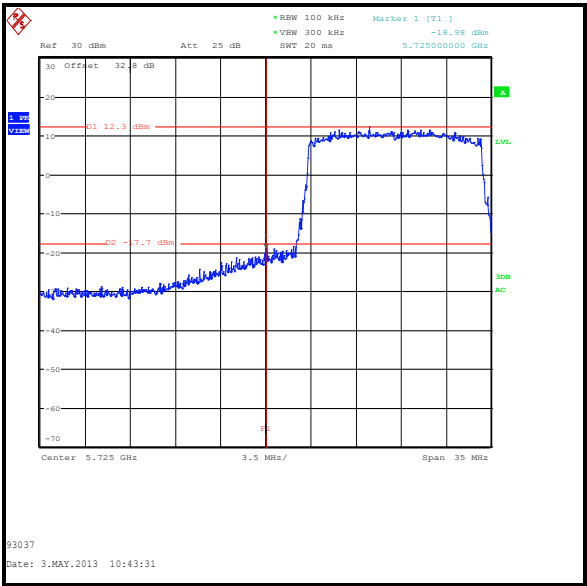
Band Edge Conducted Emissions (continued)**Results: 15 MHz Channel / QPSK / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-19.0	-17.7	1.3	Complied
5850	-23.0	-18.3	4.7	Complied
5850.561	-22.1	-18.3	3.8	Complied

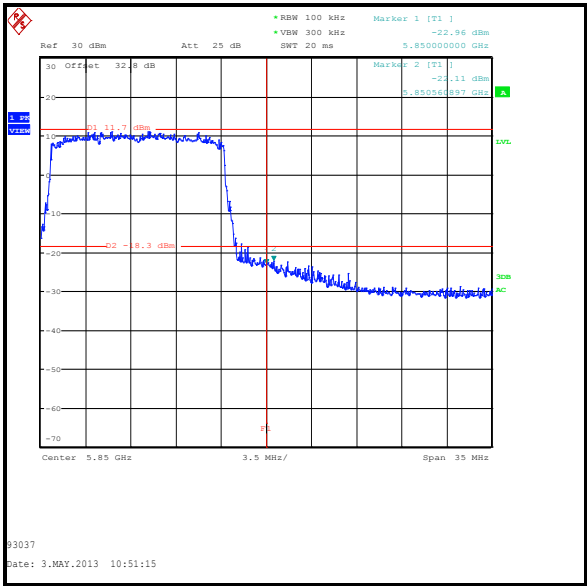
Results: 15 MHz Channel / QPSK / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5723.149	-19.7	-17.8	1.9	Complied
5725	-23.0	-17.8	5.2	Complied
5850	-25.2	-18.3	6.9	Complied
5852.524	-23.2	-18.3	4.9	Complied

Band Edge Conducted Emissions (continued)
Results: 15 MHz Channel / QPSK / H Port

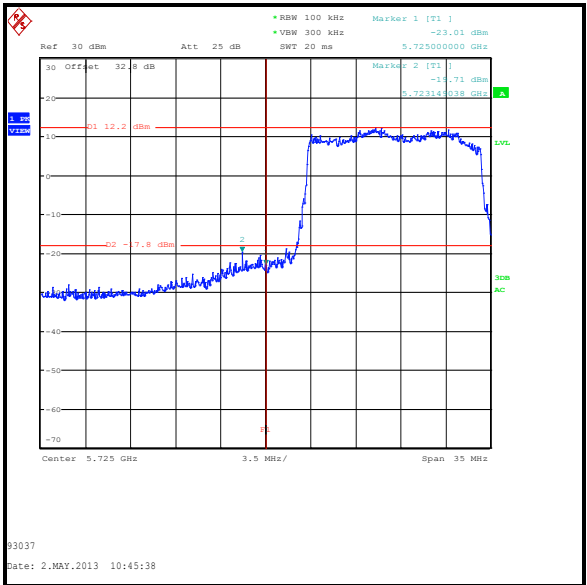


Lower Band Edge Peak Measurement

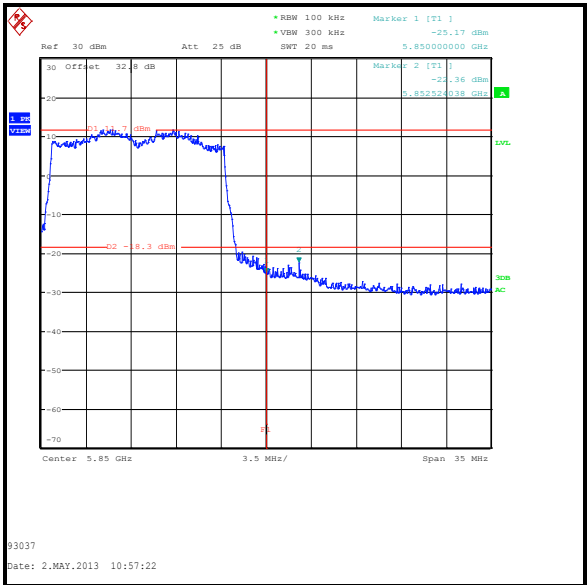


Upper Band Edge Peak Measurement

Results: 15 MHz Channel / QPSK / V Port



Lower Band Edge Peak Measurement



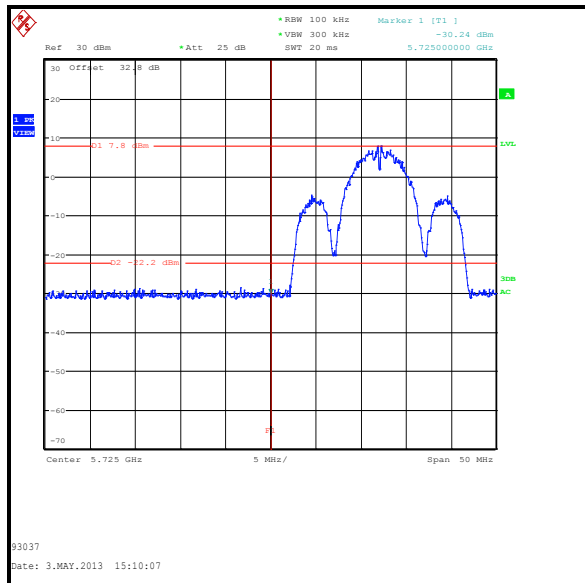
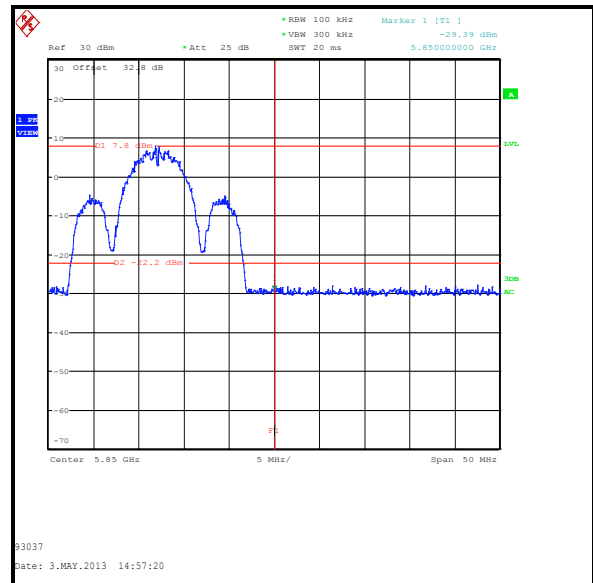
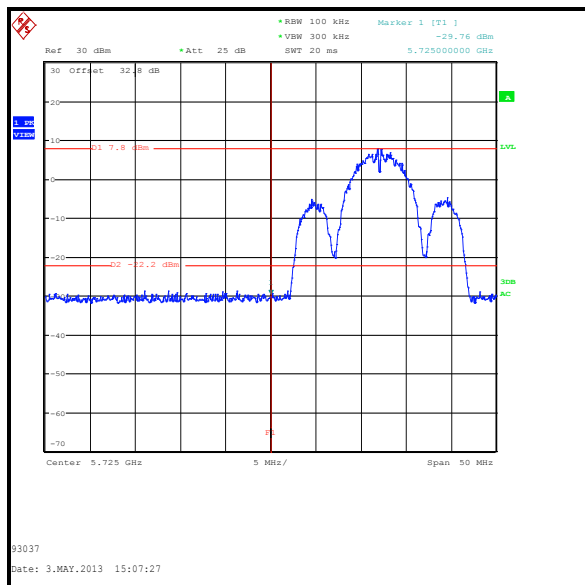
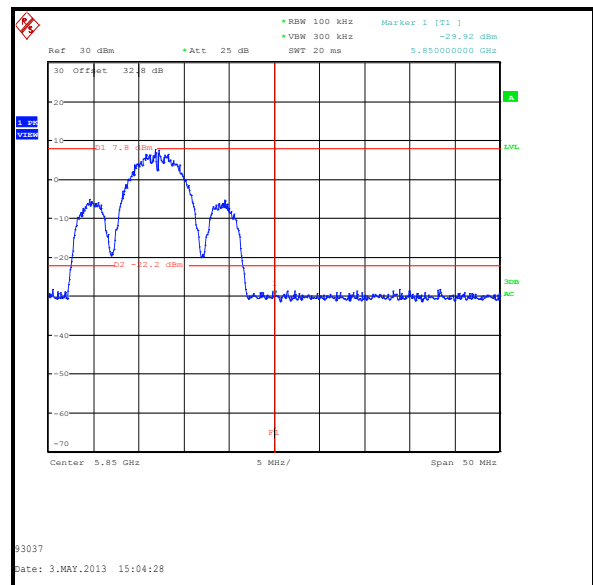
Upper Band Edge Peak Measurement

Band Edge Conducted Emissions (continued)**Results: 20 MHz Channel / ACQ / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-30.2	-22.2	8.0	Complied
5850	-29.4	-22.2	7.2	Complied

Results: 20 MHz Channel / ACQ / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-29.8	-22.2	7.6	Complied
5850	-29.9	-22.2	7.7	Complied

Band Edge Conducted Emissions (continued)**Results: 20 MHz Channel / ACQ / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 20 MHz Channel / ACQ / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 20 MHz Channel / BPSK / H Port**

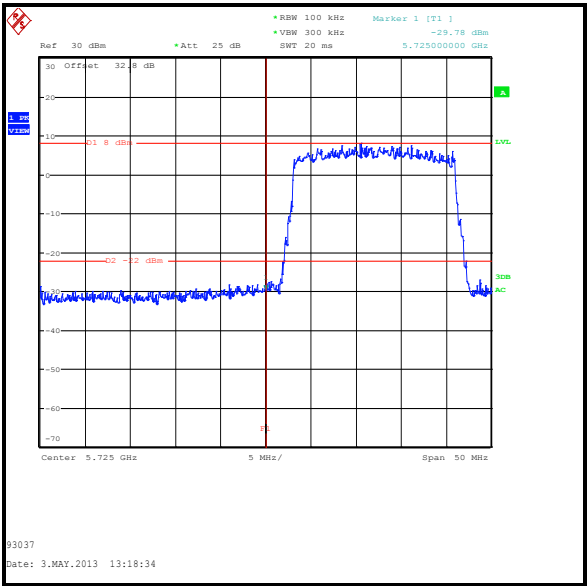
Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-29.8	-22.0	7.8	Complied
5850	-23.0	-19.6	3.4	Complied

Results: 20 MHz Channel / BPSK / V Port

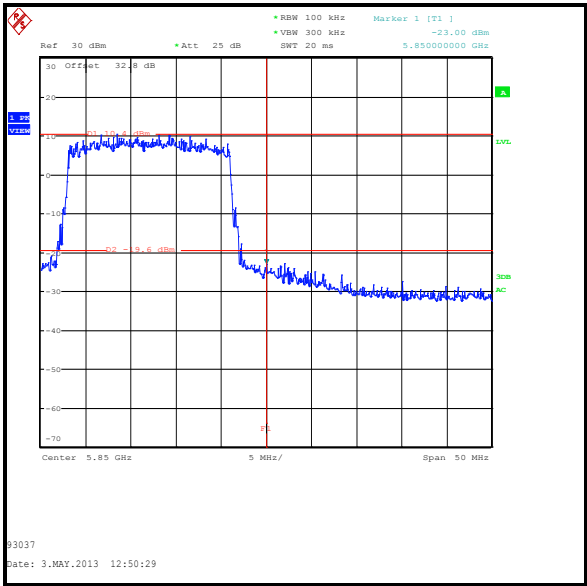
Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5724.760	-26.4	-22.1	4.3	Complied
5725	-27.8	-22.1	5.7	Complied
5850	-26.3	-19.2	7.1	Complied
5850.801	-24.5	-19.2	5.3	Complied

Band Edge Conducted Emissions (continued)

Results: 20 MHz Channel / BPSK / H Port

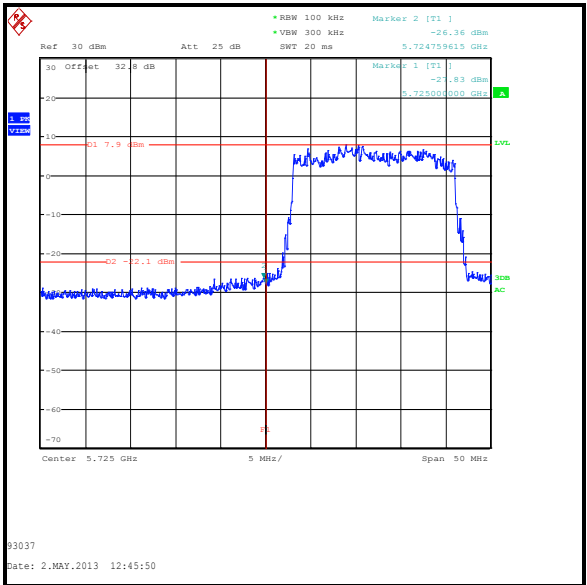


Lower Band Edge Peak Measurement

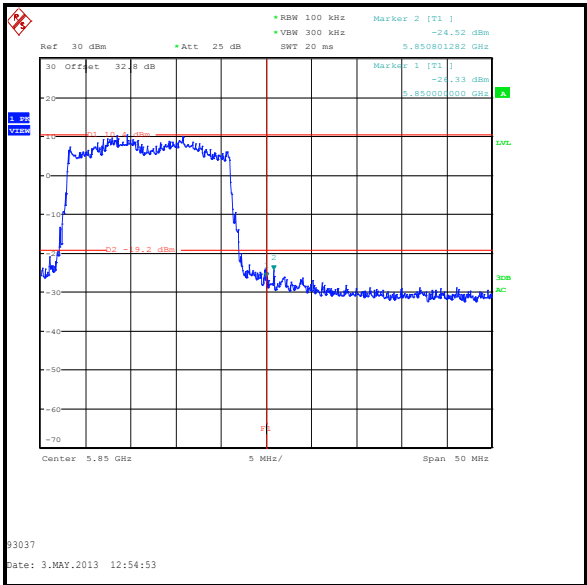


Upper Band Edge Peak Measurement

Results: 20 MHz Channel / BPSK / V Port



Lower Band Edge Peak Measurement



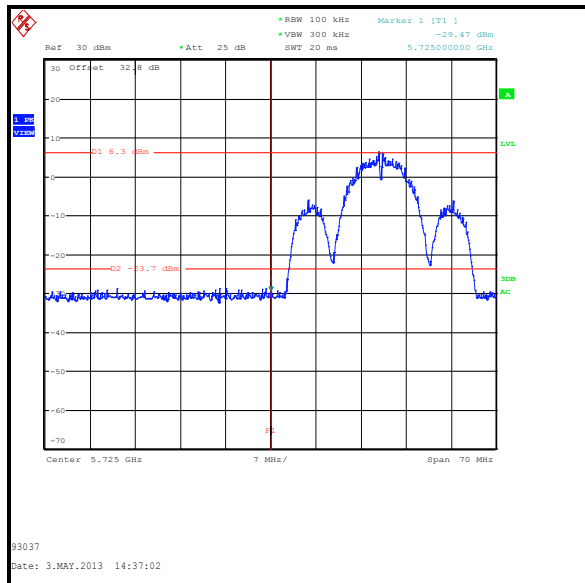
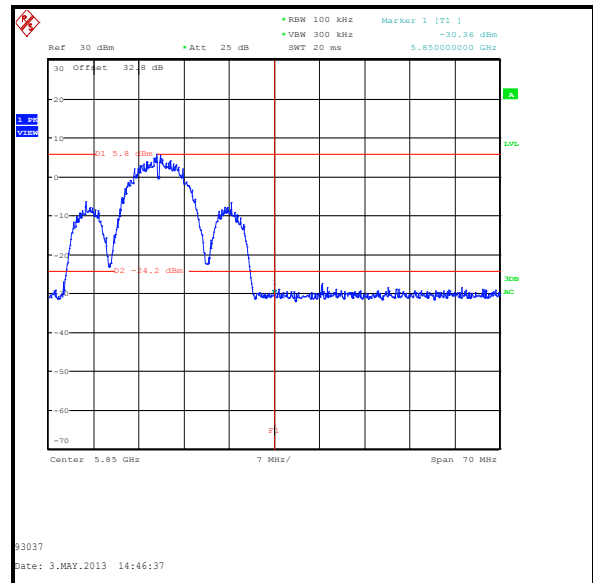
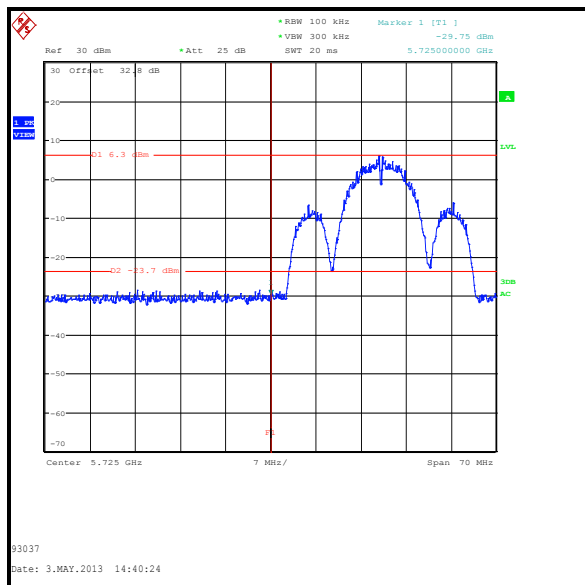
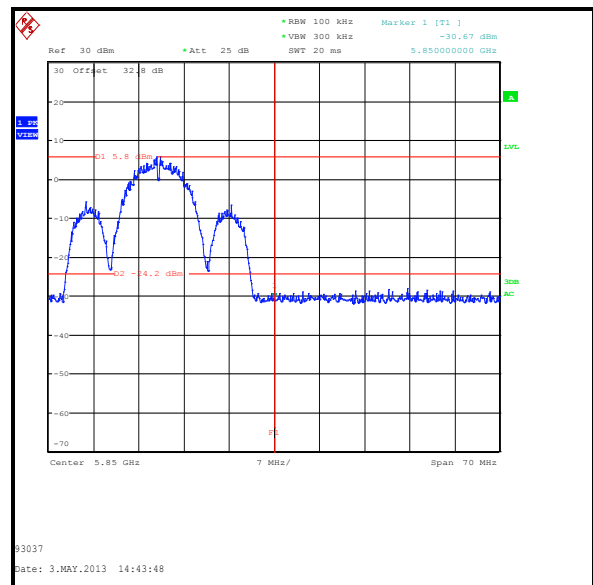
Upper Band Edge Peak Measurement

Band Edge Conducted Emissions (continued)**Results: 30 MHz Channel / ACQ / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-29.5	-23.7	5.8	Complied
5850	-30.4	-24.2	6.2	Complied

Results: 30 MHz Channel / ACQ / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-29.8	-23.7	6.1	Complied
5850	-30.7	-24.2	6.5	Complied

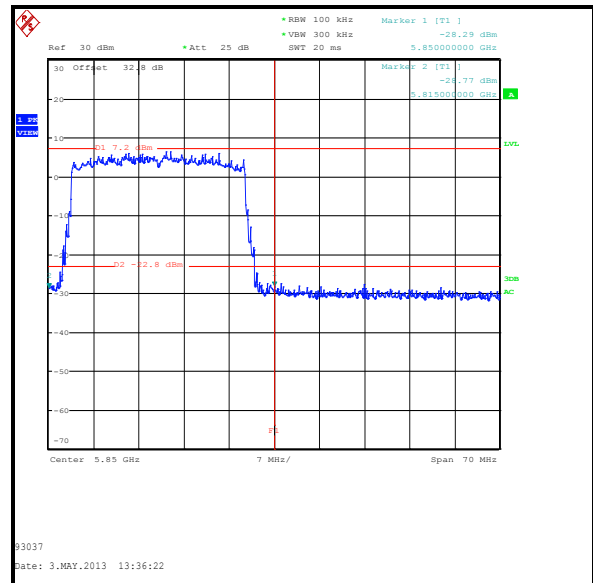
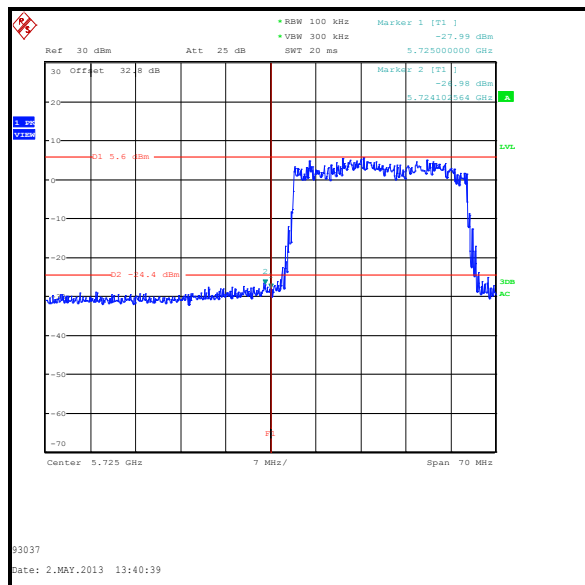
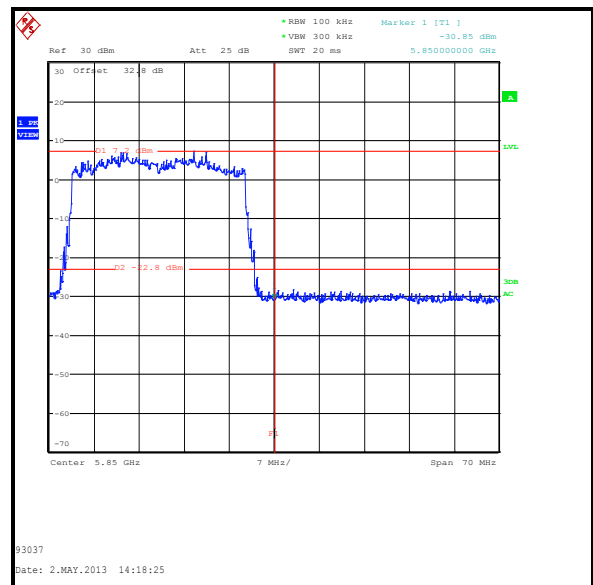
Band Edge Conducted Emissions (continued)**Results: 30 MHz Channel / ACQ / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 30 MHz Channel / ACQ / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 30 MHz Channel / BPSK / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5722.308	-26.4	-25.4	1.0	Complied
5725	-27.7	-25.4	2.3	Complied
5850	-28.3	-22.8	5.5	Complied

Results: 30 MHz Channel / BPSK / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5724.103	-26.7	-24.4	2.3	Complied
5725	-28.0	-24.4	3.6	Complied
5850	-30.9	-22.8	8.1	Complied

Band Edge Conducted Emissions (continued)**Results: 30 MHz Channel / BPSK / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 30 MHz Channel / BPSK / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 40 MHz Channel / ACQ / H Port**

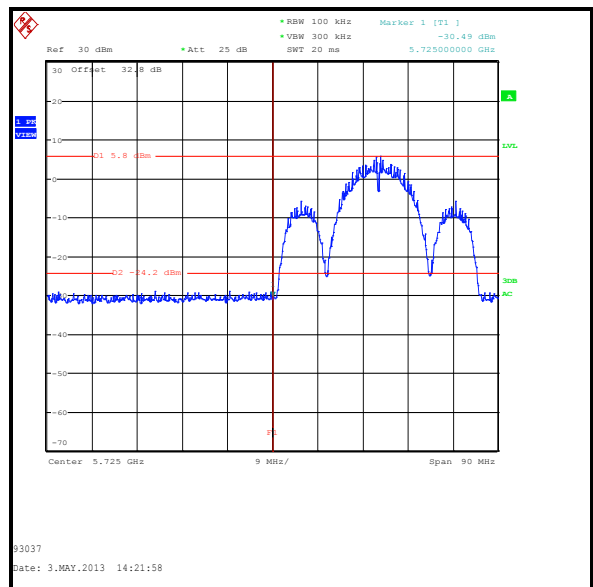
Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-30.5	-24.2	6.3	Complied
5850	-31.3	-24.5	6.8	Complied

Results: 40 MHz Channel / ACQ / V Port

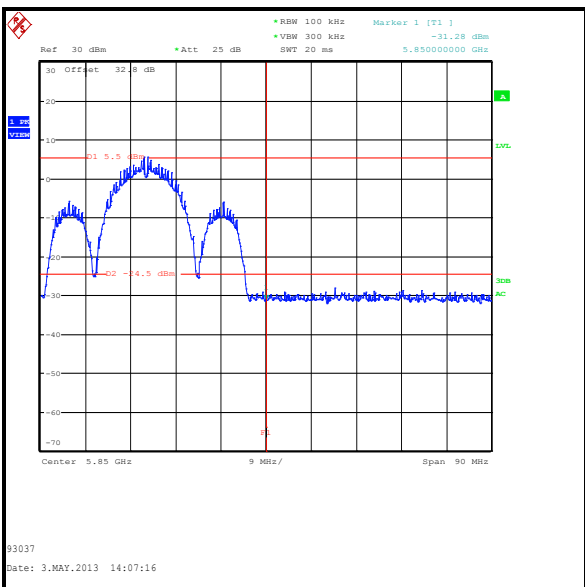
Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5722.837	-27.8	-24.2	3.6	Complied
5725	-31.1	-24.2	6.9	Complied
5850	-30.4	-24.5	5.9	Complied

Band Edge Conducted Emissions (continued)

Results: 40 MHz Channel / ACQ / H Port

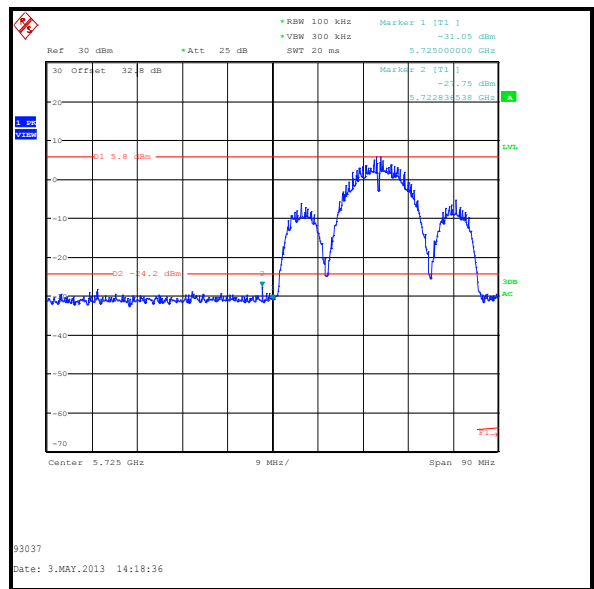


Lower Band Edge Peak Measurement

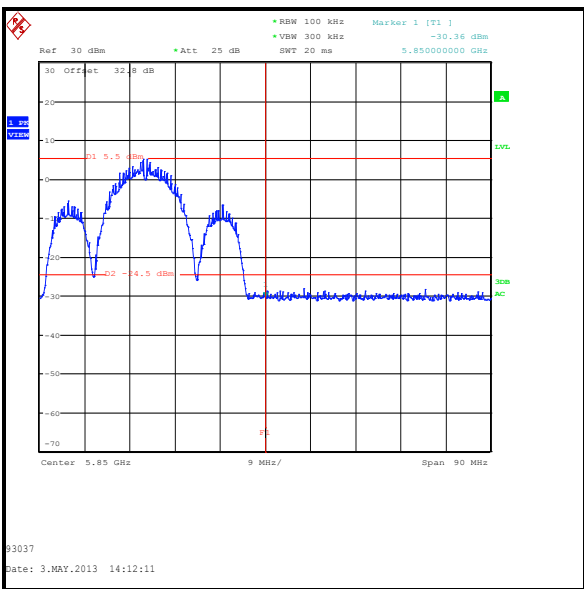


Upper Band Edge Peak Measurement

Results: 40 MHz Channel / ACQ / V Port



Lower Band Edge Peak Measurement



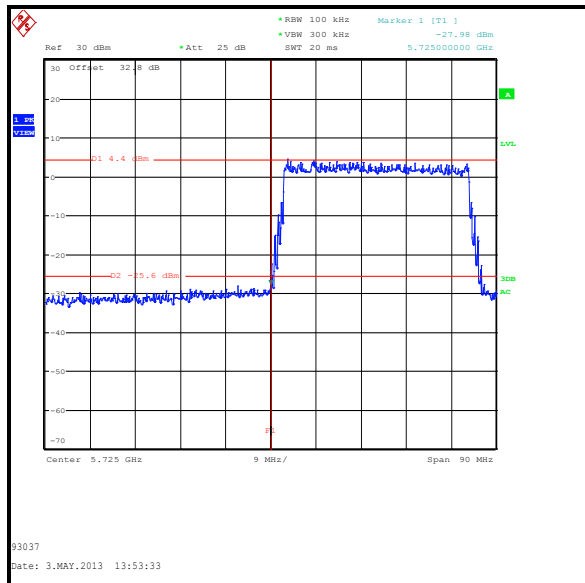
Upper Band Edge Peak Measurement

Band Edge Conducted Emissions (continued)**Results: 40 MHz Channel / BPSK / H Port**

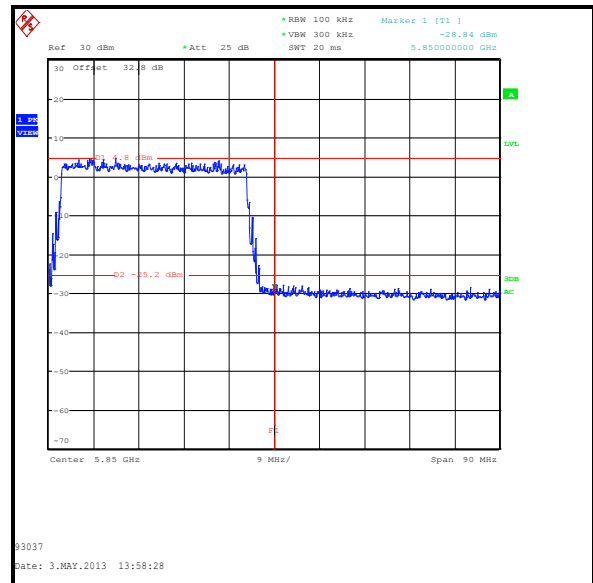
Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-28.0	-25.6	2.4	Complied
5850	-28.8	-25.2	3.6	Complied

Results: 40 MHz Channel / BPSK / V Port

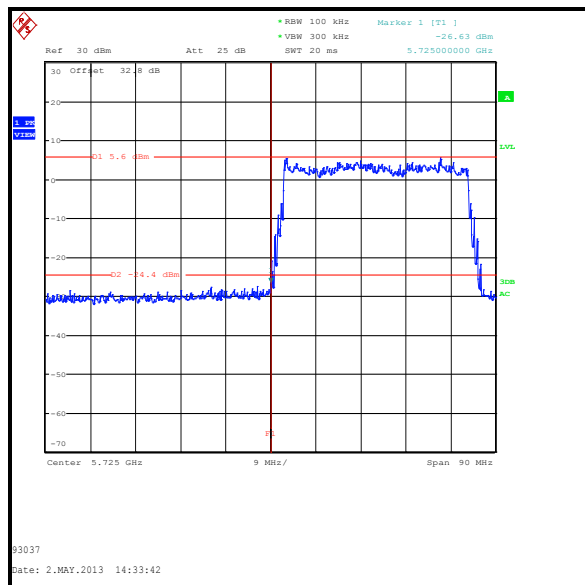
Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-26.6	-24.4	2.2	Complied
5850	-28.8	-24.7	4.1	Complied

Band Edge Conducted Emissions (continued)**Results: 40 MHz Channel / BPSK / H Port**

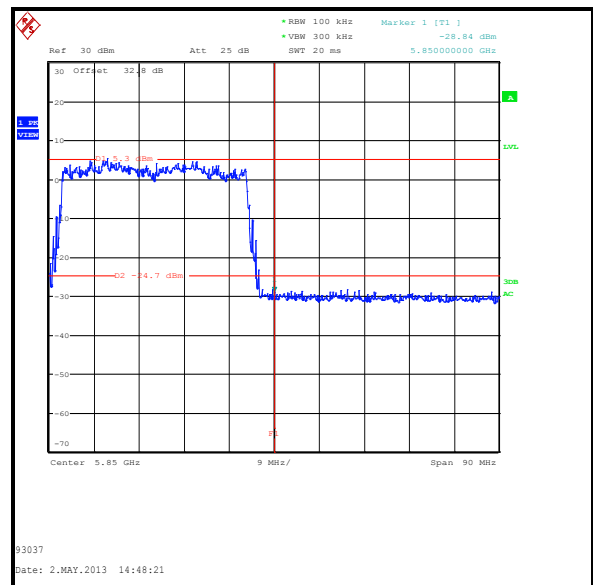
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement

Results: 40 MHz Channel / BPSK / V Port

Lower Band Edge Peak Measurement



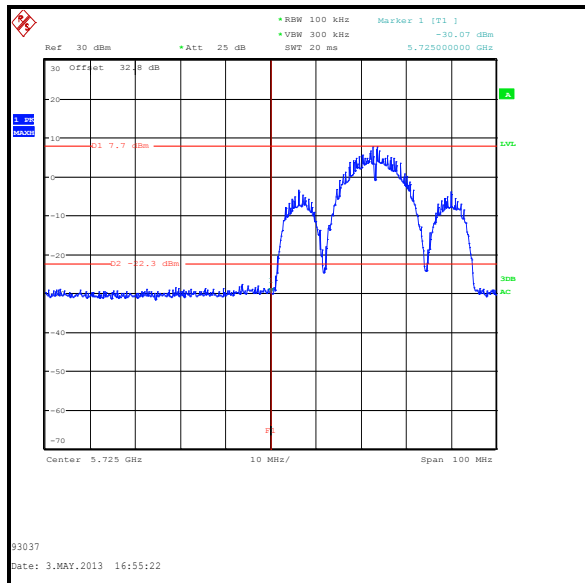
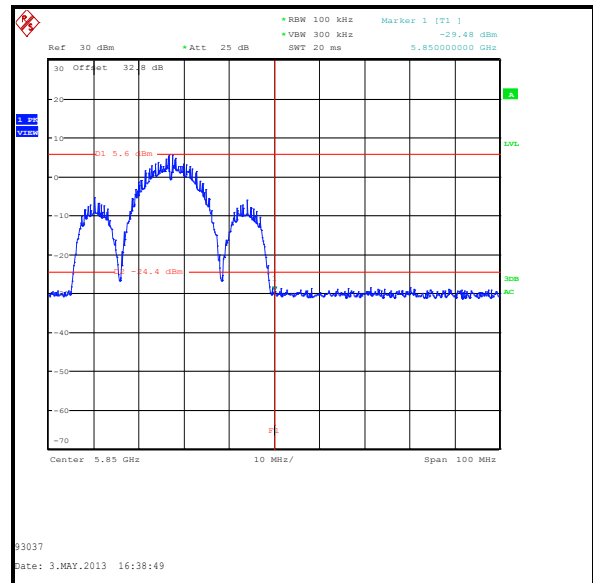
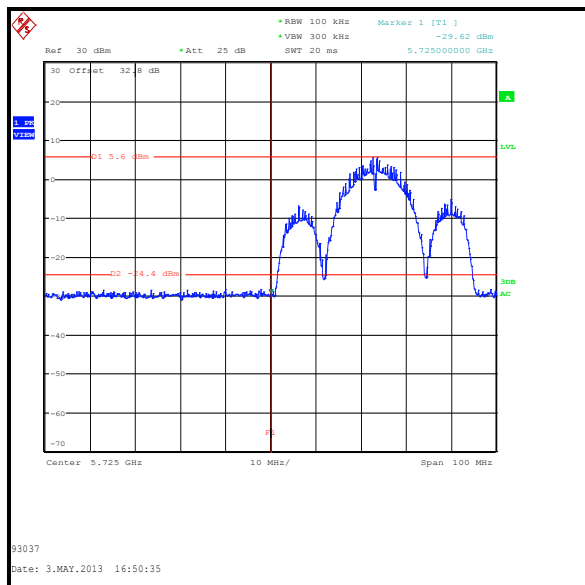
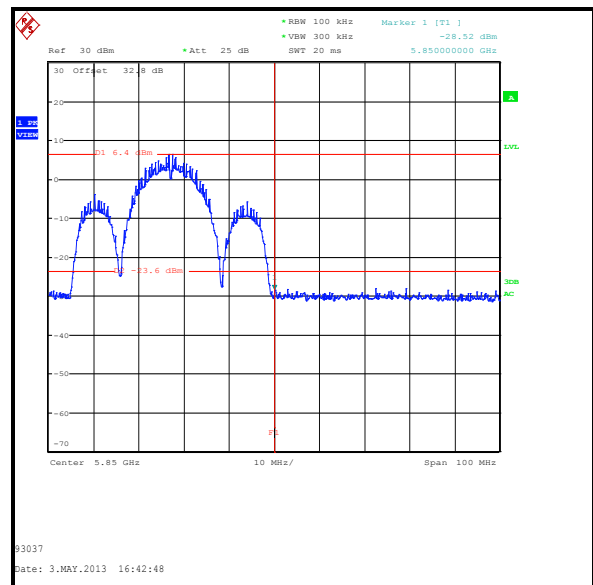
Upper Band Edge Peak Measurement

Band Edge Conducted Emissions (continued)**Results: 45 MHz Channel / ACQ / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-30.1	-22.3	7.8	Complied
5850	-29.5	-24.4	5.1	Complied

Results: 45 MHz Channel / ACQ / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-29.6	-24.4	5.2	Complied
5850	-28.5	-23.6	4.9	Complied

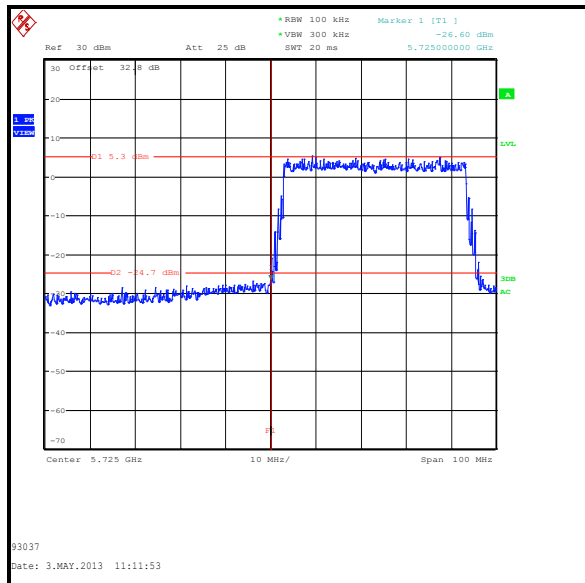
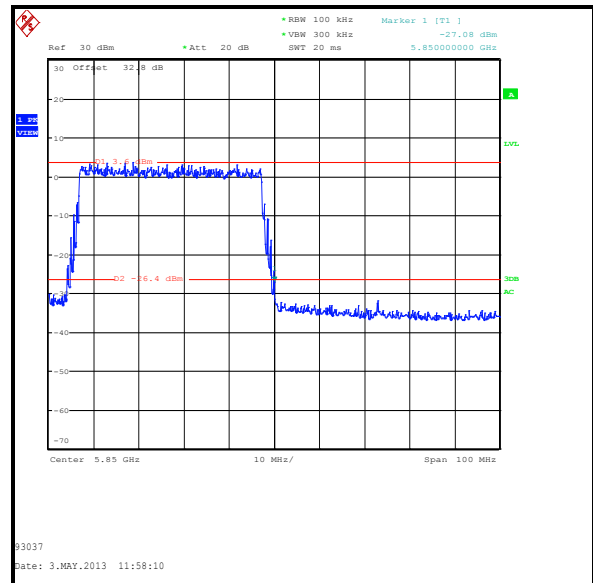
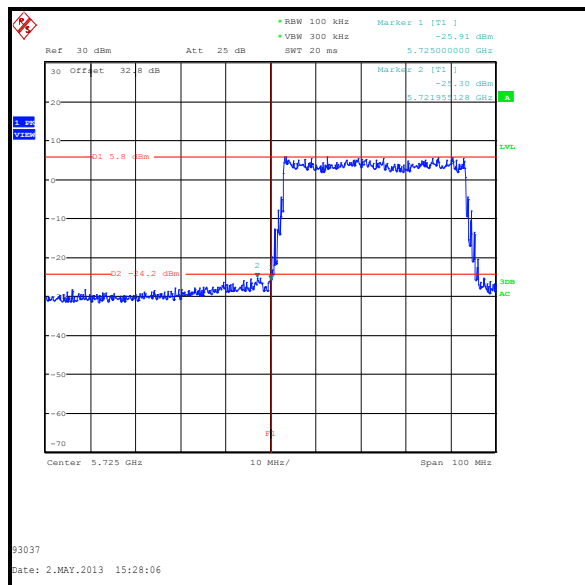
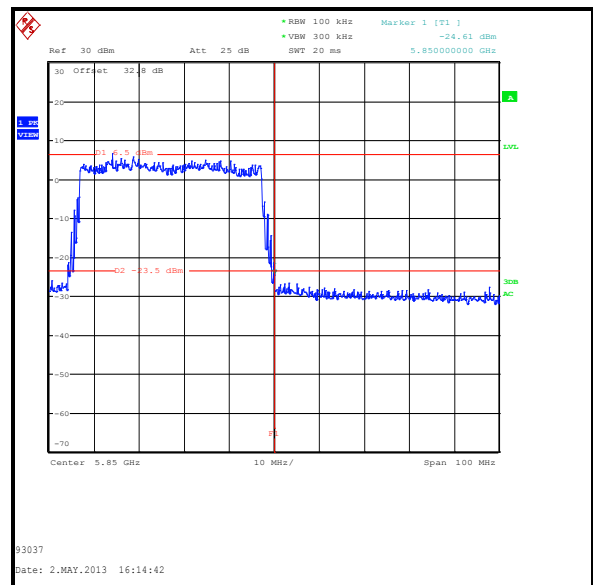
Band Edge Conducted Emissions (continued)**Results: 45 MHz Channel / ACQ / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 45 MHz Channel / ACQ / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 45 MHz Channel / BPSK / H Port**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-26.6	-24.7	1.9	Complied
5850	-27.1	-26.4	0.7	Complied

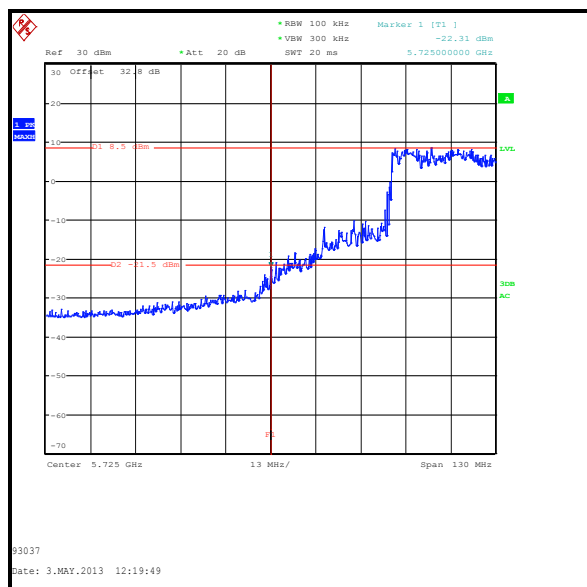
Results: 45 MHz Channel / BPSK / V Port

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5721.955	-25.3	-24.2	1.1	Complied
5725	-25.9	-24.2	1.7	Complied
5850	-24.6	-23.5	1.1	Complied

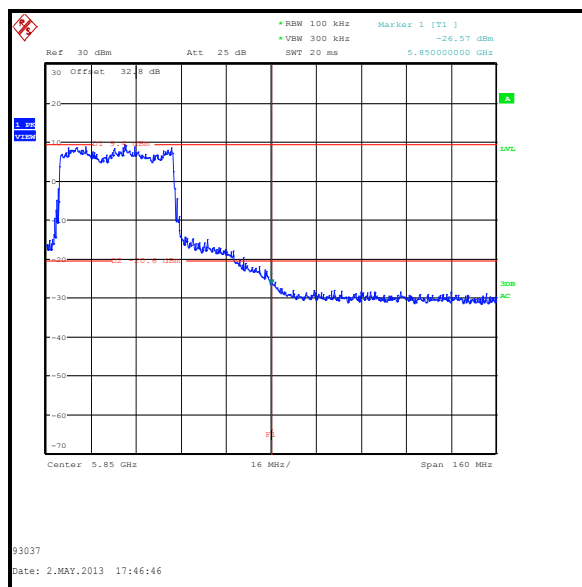
Band Edge Conducted Emissions (continued)**Results: 45 MHz Channel / BPSK / H Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Results: 45 MHz Channel / BPSK / V Port****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement**

Band Edge Conducted Emissions (continued)**Results: 45 MHz Channel / BPSK / V Port / Maximum Power**

Frequency (MHz)	Peak Level (dBm)	-30 dBc Limit (dBm)	Margin (dB)	Result
5725	-22.3	-21.5	0.8	Complied
5850	-26.6	-20.6	6.0	Complied

Results: 45 MHz Channel / BPSK / V Port / Maximum Power

**Lower Band Edge Peak Measurement
TX Frequency 5780 MHz**



**Upper Band Edge Peak Measurement
TX Frequency 5795 MHz**

Band Edge Conducted Emissions (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A2007	Attenuator	Narda	769-20	001	Calibrated Before Use	N/A
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	07 Feb 2014	12
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	N/A	10 Jun 2013	12

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

Test Engineer:	Andrew Edwards	Test Date:	06 June 2013
Test Sample Serial Number:	00045650004E		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	FCC KDB 558074 Section 11 and 12 / ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

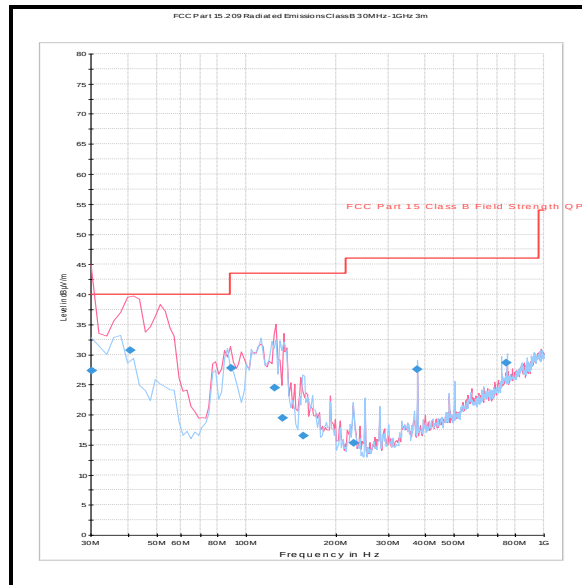
Temperature (°C):	23 to 27
Relative Humidity (%):	38 to 41

Note(s):

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

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / Plate Antenna**

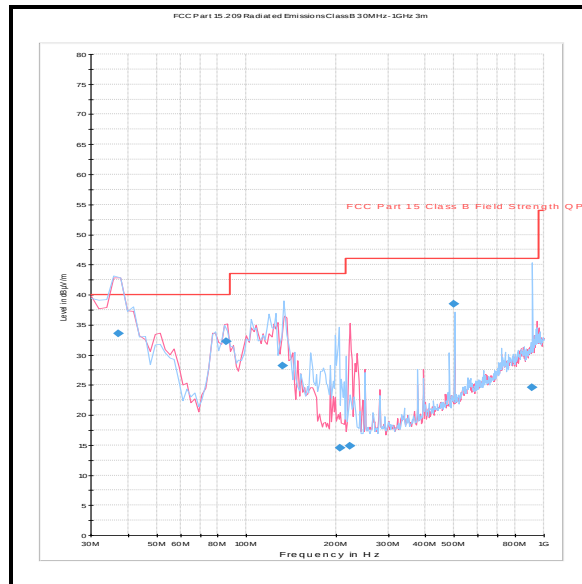
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
124.611	Vertical	24.5	43.5	19.0	Complied
132.511	Vertical	19.4	43.5	24.1	Complied



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

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / 4' Parabolic Antenna**

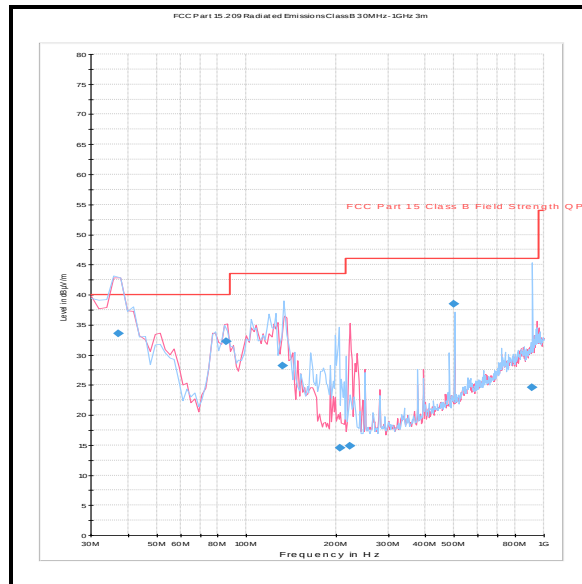
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
132.348	Horizontal	25.4	43.5	18.1	Complied



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

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / 6' Parabolic Antenna**

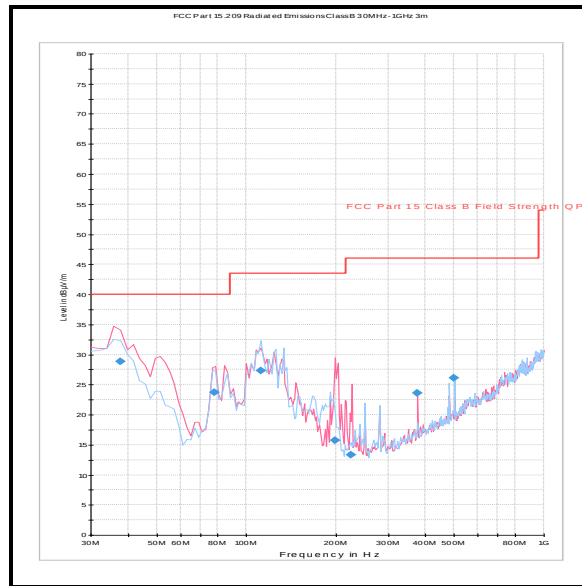
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
132.348	Horizontal	28.2	43.5	15.3	Complied



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

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / 60° Sectorised Antenna**

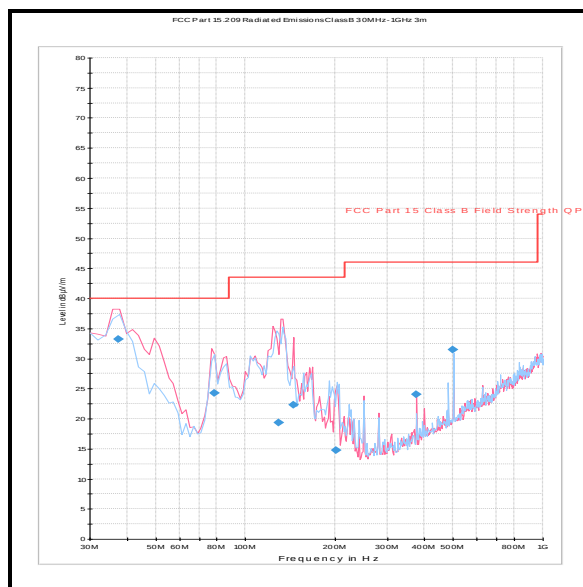
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
37.789	Vertical	28.8	40.0	11.2	Complied
112.206	Horizontal	27.3	43.5	16.2	Complied



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

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / Omnidirectional Antenna**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
37.501	Vertical	33.2	40.0	6.8	Complied
129.096	Vertical	19.4	43.5	24.1	Complied



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

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A490	Antenna	Chase	CBL6111A	1590	18 Apr 2014	12
A1834	Attenuator	Hewlett Packard	8491B	10444	27 Jan 2014	12
G0543	Pre Amplifier	Sonoma	310N	230801	04 Jul 2013	3
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	24 Oct 2013	12
L1097	Low Pass Filter	AtlanTec RF	AS6573	13022102350	Calibrated before use	N/A
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	07 Feb 2014	12
M1622	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	24 May 2014	12

Transmitter Radiated Emissions (continued)**Test Summary:**

Test Engineers:	David Doyle & Andrew Edwards	Test Dates:	17 May 2013 to 01 July 2013
Test Sample Serial Numbers:	00045650004E & 0004565000BD		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	FCC KDB 558074 Section 11 and 12 / ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	21 to 28
Relative Humidity (%):	28 to 40

Note(s):

1. Radiated spurious emissions testing was performed with the EUT transmitting at maximum power on a 45 MHz channel with 256QAM modulation. This configuration produced the highest emission levels and was therefore deemed to be worst case. The EUT was transmitting at 100% duty cycle.
2. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
3. The reference levels for emissions in non-restricted bands was established by following KDB 558074 D01 Section 11.2 procedure.
4. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
5. Measurements for the 6' parabolic antenna were performed using a 4' parabolic antenna and the difference in gain was incorporated into the measurement as an RF level offset.
6. *-30 dBc limit applies in non-restricted bands as the conducted output power and spectral density test were performed using an average detector.
7. Emissions in restricted bands; Where peak-detected amplitude was shown to comply with average limits, an average measurement was not performed.
8. Pre-scans above 1 GHz were performed in a fully anechoic chamber (UL Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (UL Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Radiated Emissions (continued)**Results: Bottom Channel / 256QAM / Peak / Plate Antenna**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5719.188	Horizontal	92.7	93.4*	0.7	Complied

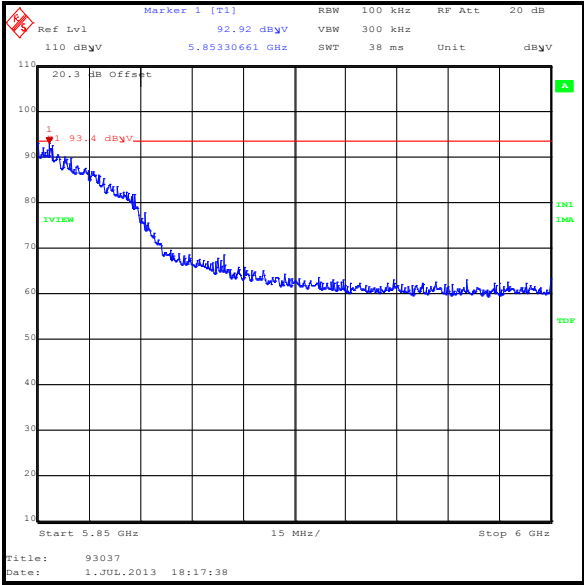
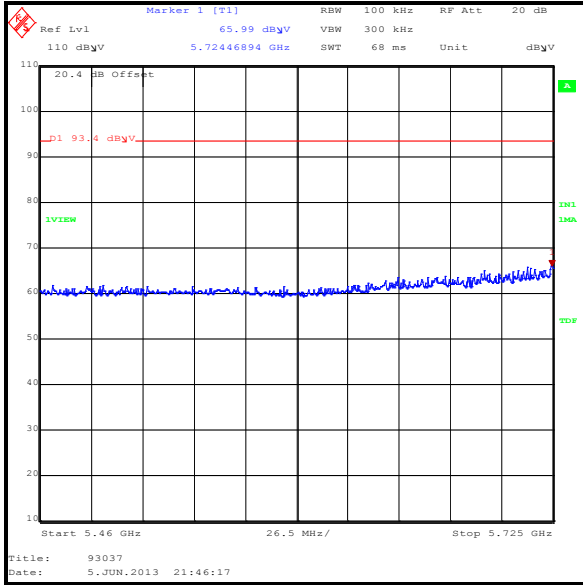
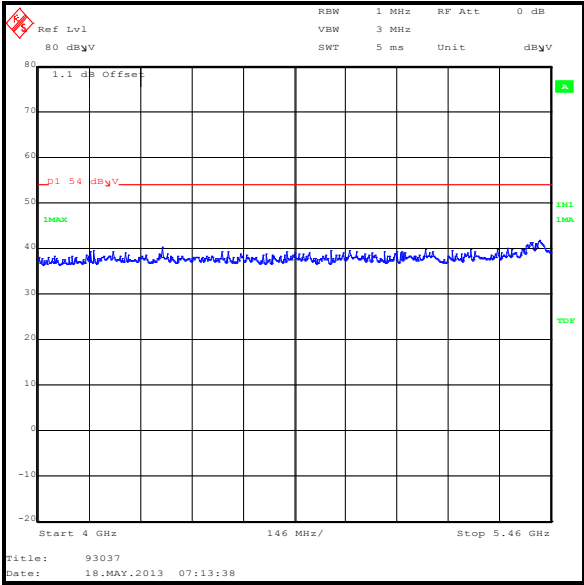
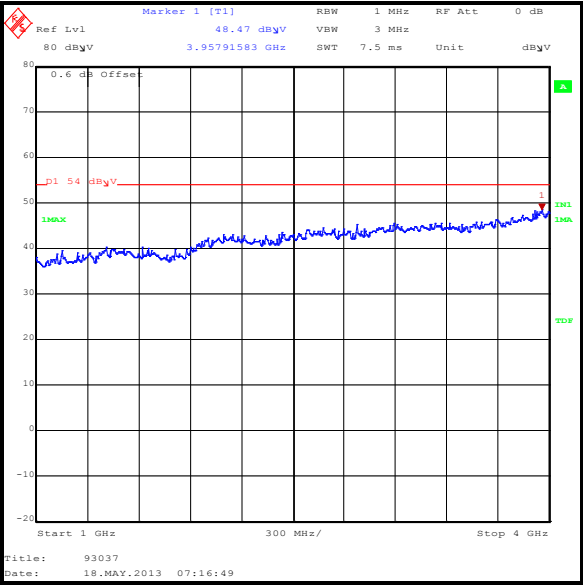
Results: Middle Channel / 256QAM / Peak / Plate Antenna

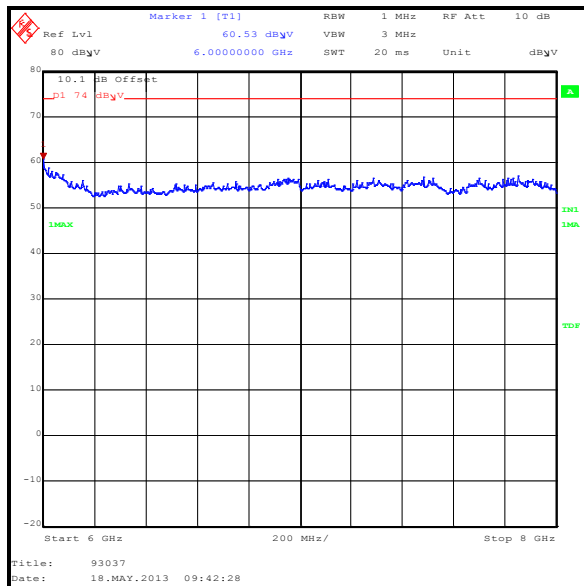
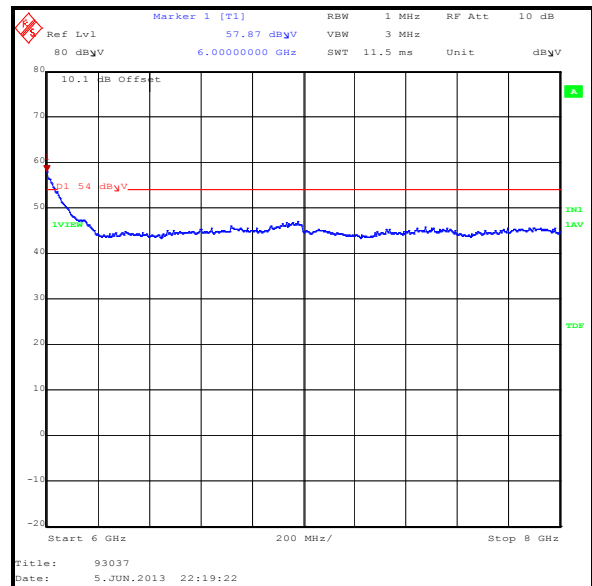
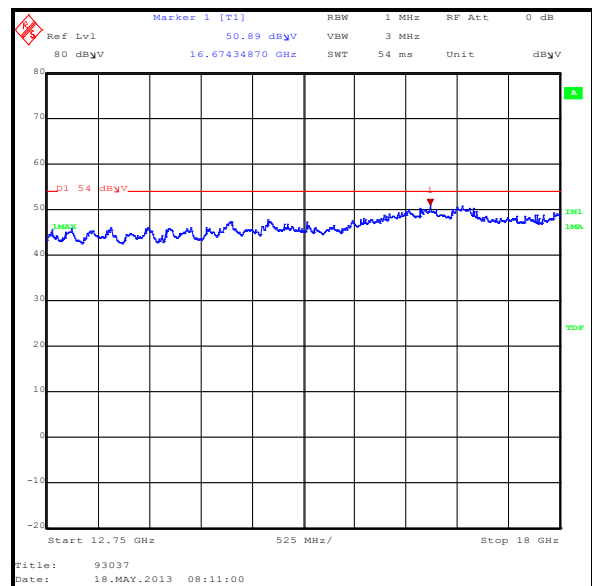
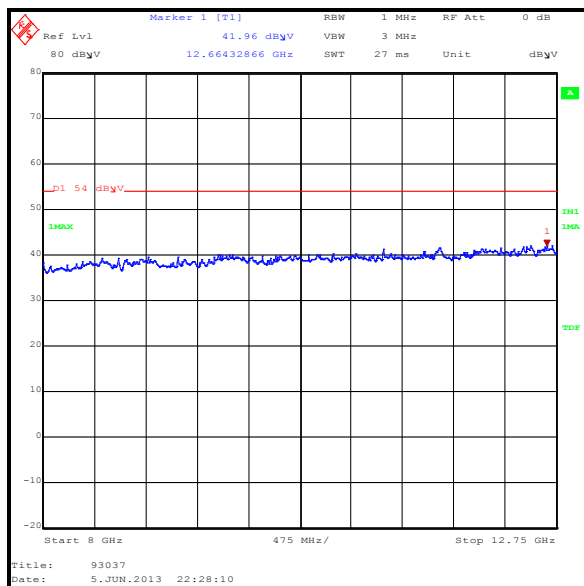
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5721.042	Horizontal	73.7	93.4*	19.7	Complied

Results: Top Channel / 256QAM / Peak / Plate Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5853.307	Horizontal	92.9	93.4*	0.5	Complied

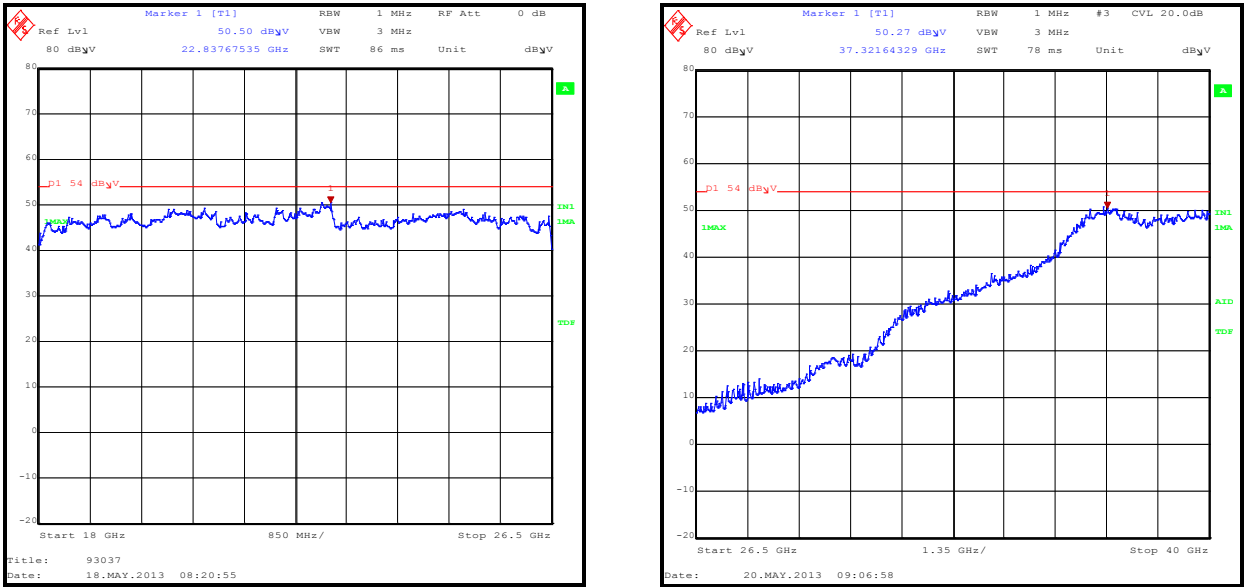
Transmitter Radiated Emissions (continued)
Results: Top Channel / 256QAM / Peak / Plate Antenna



Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / Plate Antenna****Peak Detector****Average Detector**

Transmitter Radiated Emissions (continued)

Results: Top Channel / 256QAM / Peak / Plate Antenna



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

Transmitter Radiated Emissions (continued)**Results: Bottom Channel / 256QAM / Peak / 4' Parabolic Antenna**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11497.339	Vertical	58.4	74.0	15.6	Complied

Results: Bottom Channel / 256QAM / Average / 4' Parabolic Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11495.773	Vertical	45.4	54.0	8.6	Complied

Results: Middle Channel / 256QAM / Peak / 4' Parabolic Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11557.631	Vertical	57.7	74.0	16.3	Complied

Results: Middle Channel / 256QAM / Average / 4' Parabolic Antenna

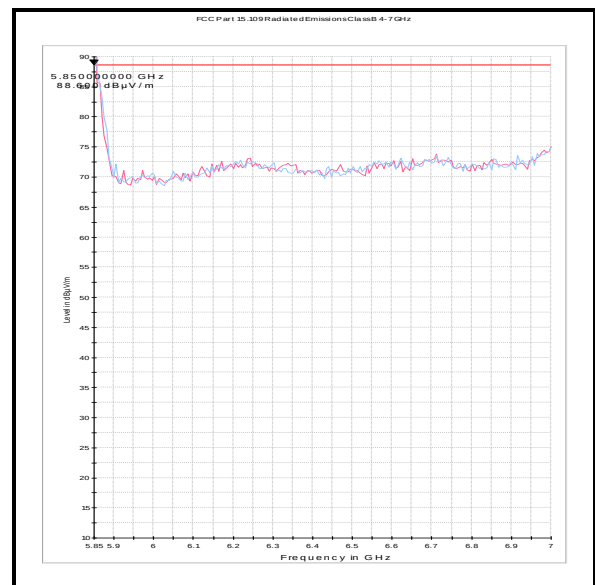
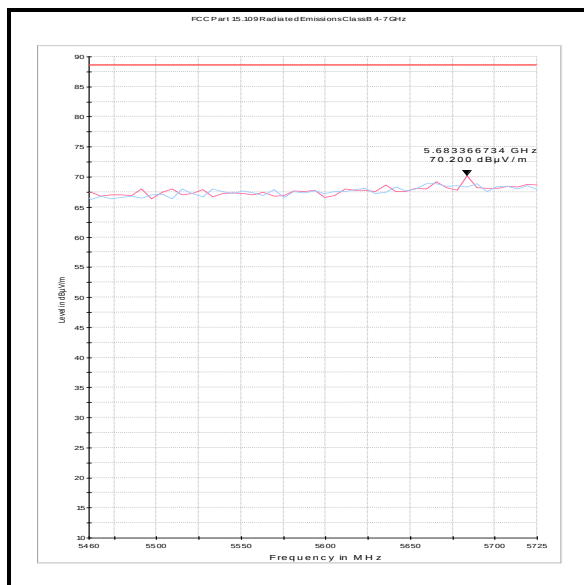
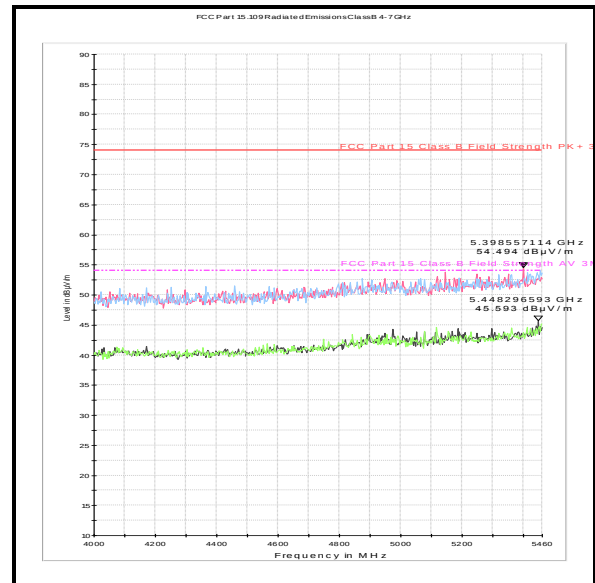
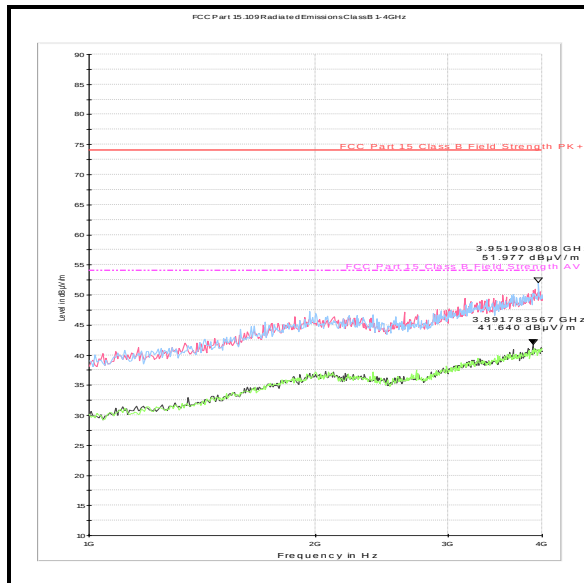
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11555.475	Vertical	44.4	54.0	9.6	Complied

Results: Top Channel / 256QAM / Peak / 4' Parabolic Antenna

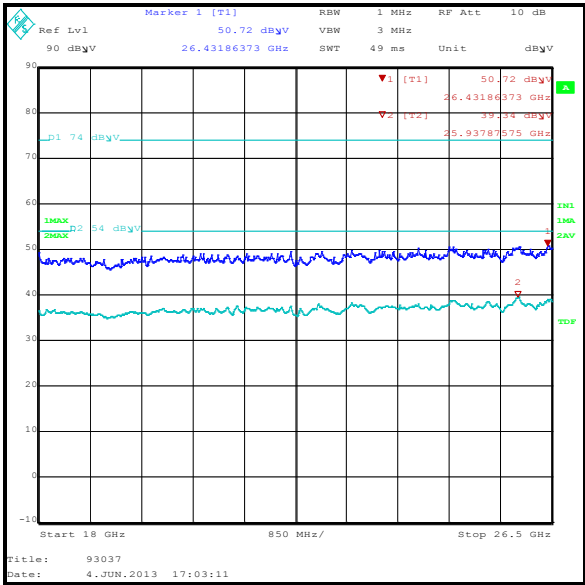
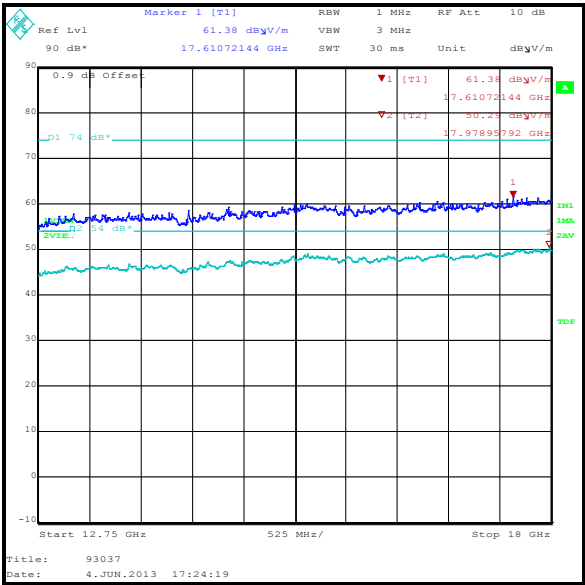
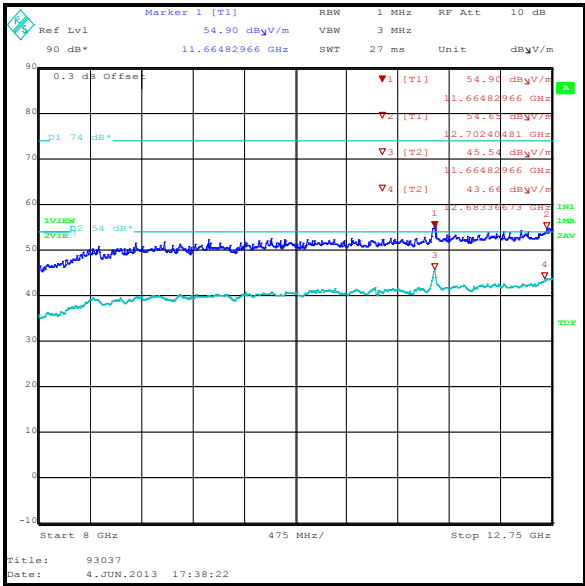
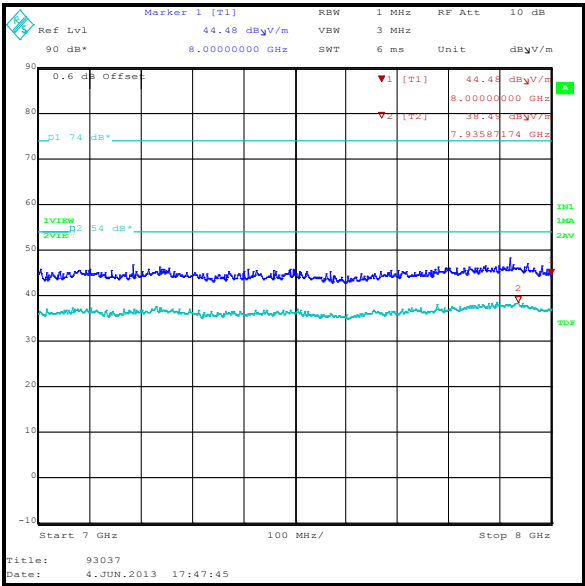
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11660.991	Vertical	58.4	74.0	15.6	Complied

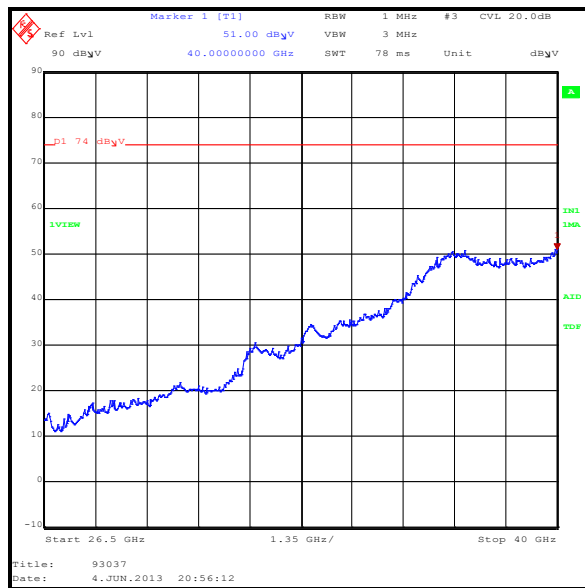
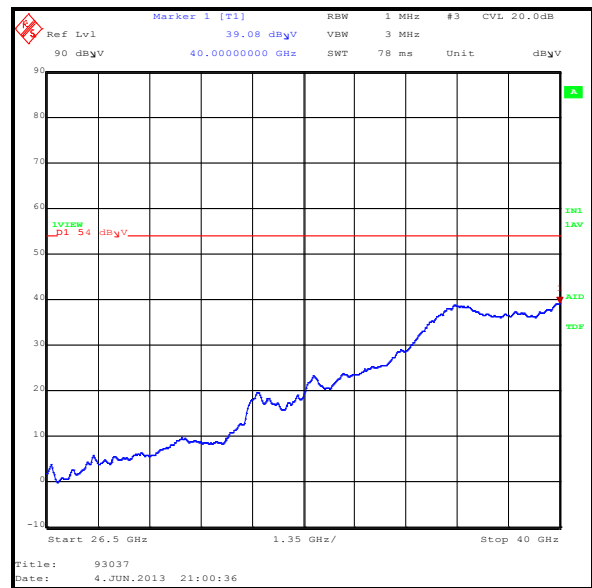
Results: Top Channel / 256QAM / Average / 4' Parabolic Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11657.644	Vertical	45.1	54.0	8.9	Complied

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / 4' Parabolic Antenna**

Transmitter Radiated Emissions (continued)
Results: Top Channel / 256QAM / Peak / 4' Parabolic Antenna



Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / 4' Parabolic Antenna****Peak Detector****Average Detector**

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

Transmitter Radiated Emissions (continued)**Results: Bottom Channel / 256QAM / Peak / 6' Parabolic Antenna**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11497.339	Vertical	61.2	74.0	12.8	Complied

Results: Bottom Channel / 256QAM / Average / 6' Parabolic Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11495.773	Vertical	48.2	54.0	5.8	Complied

Results: Middle Channel / 256QAM / Peak / 6' Parabolic Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11557.631	Vertical	60.5	74.0	13.5	Complied

Results: Middle Channel / 256QAM / Average / 6' Parabolic Antenna

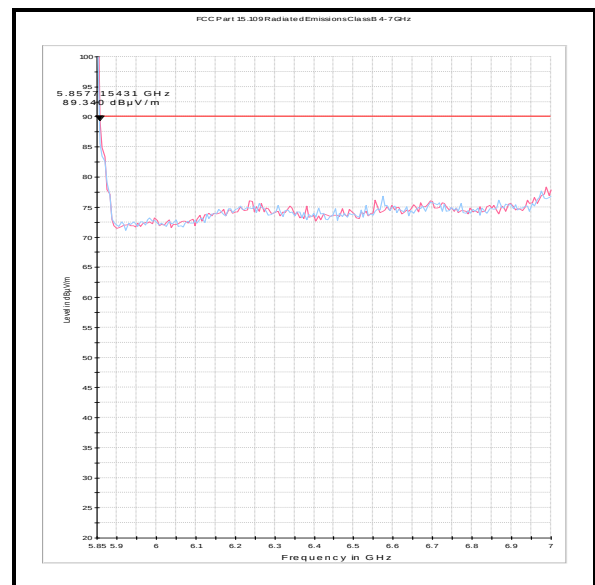
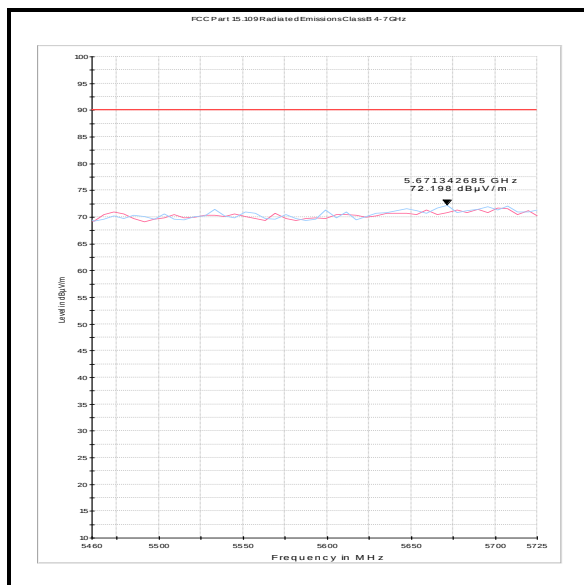
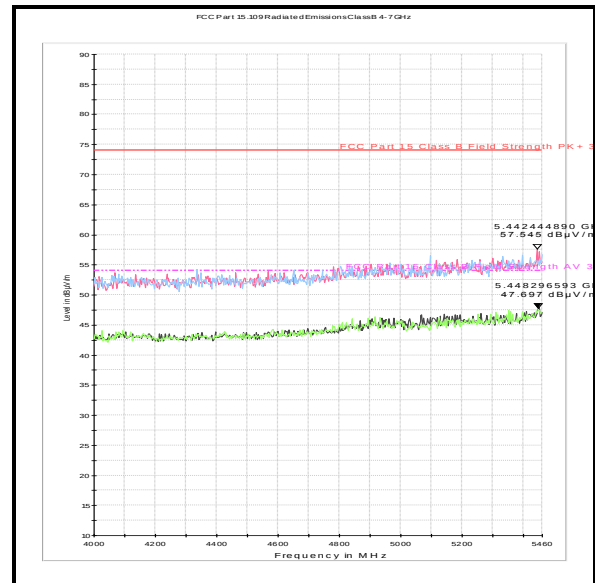
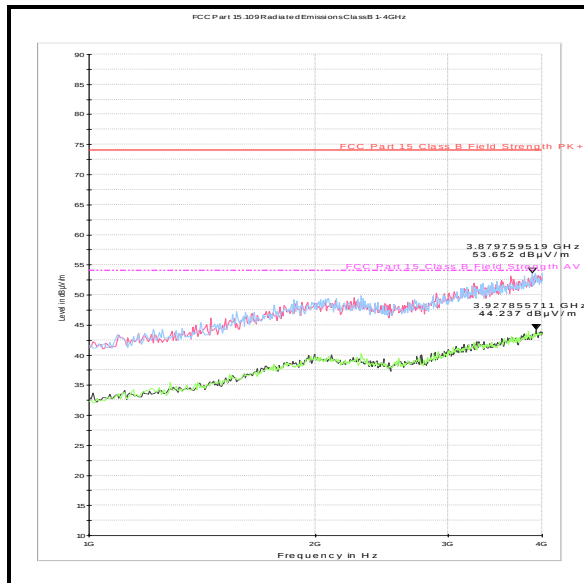
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11555.475	Vertical	47.2	54.0	6.8	Complied

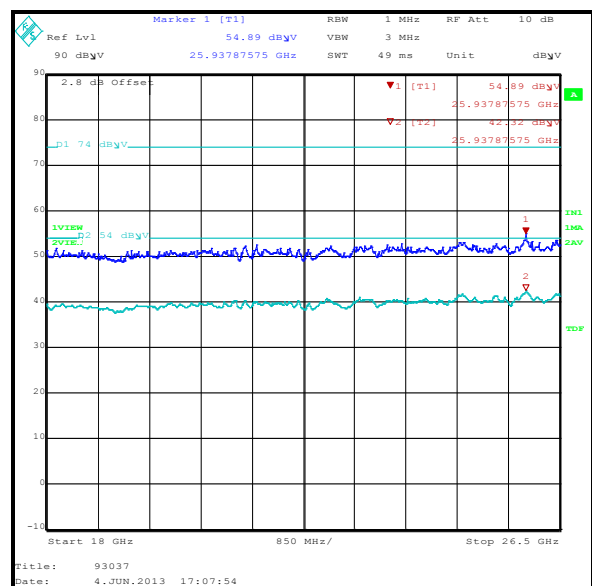
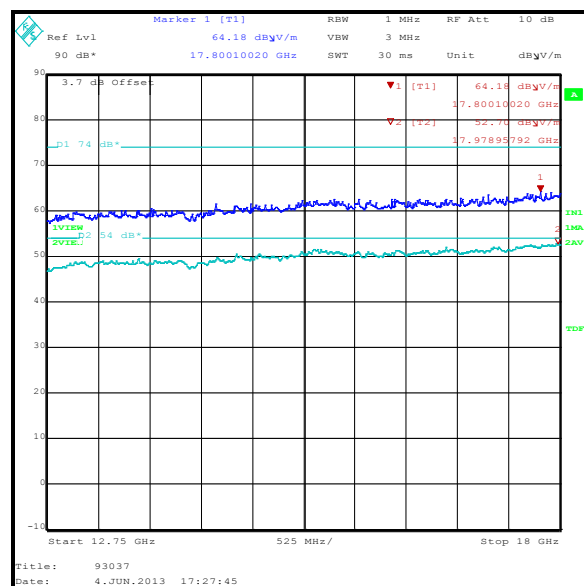
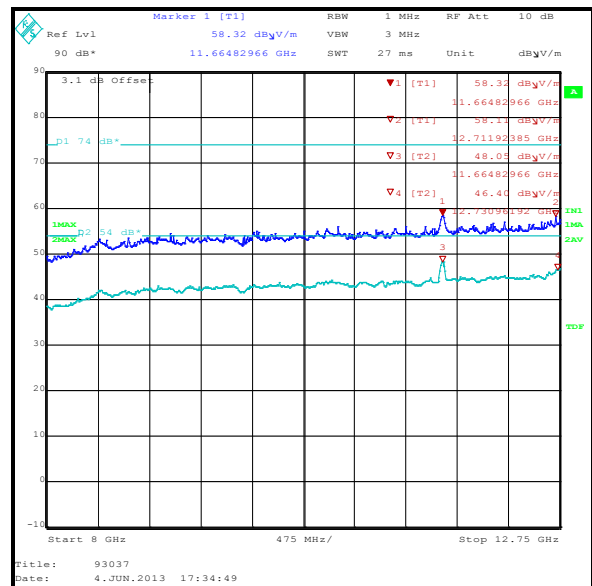
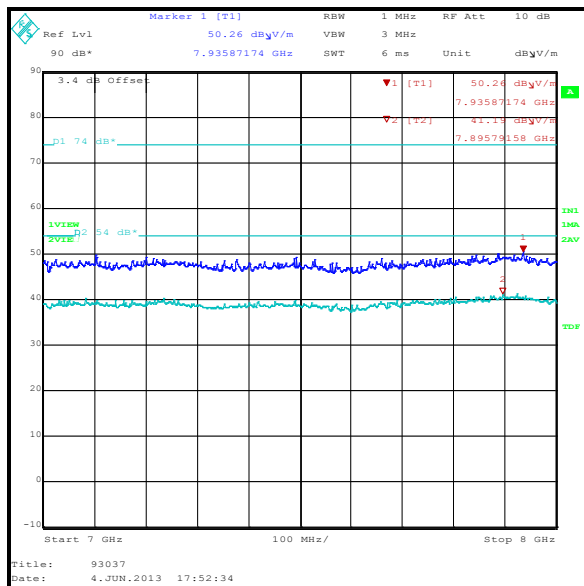
Results: Top Channel / 256QAM / Peak / 6' Parabolic Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11660.991	Vertical	61.2	74.0	12.8	Complied

Results: Top Channel / 256QAM / Average / 6' Parabolic Antenna

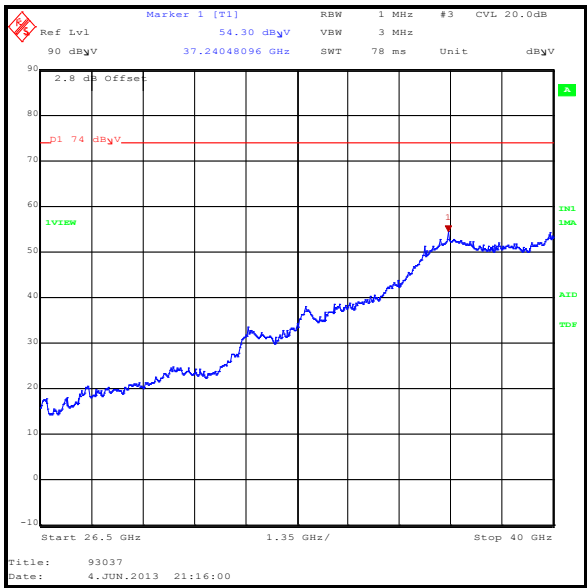
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11657.644	Vertical	47.9	54.0	6.1	Complied

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / 6' Parabolic Antenna**

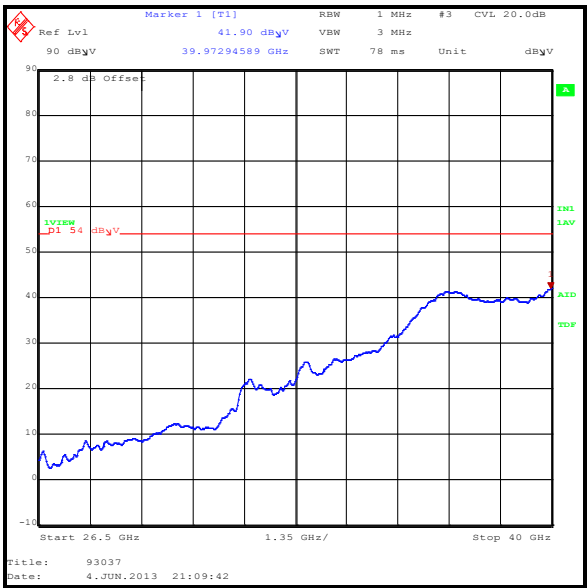
Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / 6' Parabolic Antenna**

Transmitter Radiated Emissions (continued)

Results: Top Channel / 256QAM / Peak / 6' Parabolic Antenna



Peak Detector



Average Detector

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

Transmitter Radiated Emissions (continued)**Results: Bottom Channel / 256QAM / Peak / 60° Sectorised Antenna**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5718.537	Horizontal	81.0	83.3*	2.3	Complied

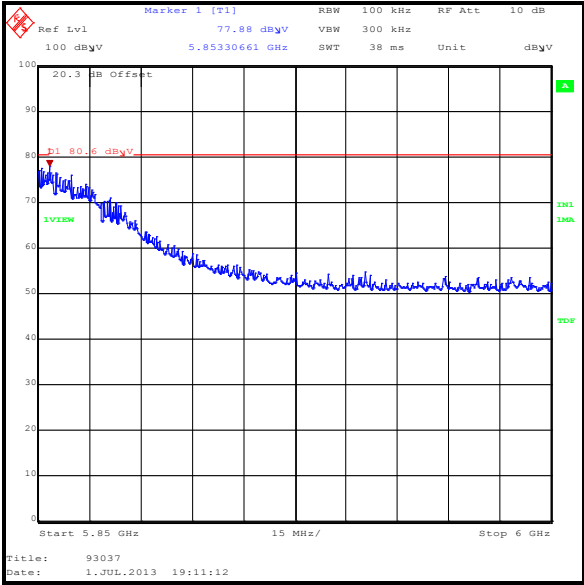
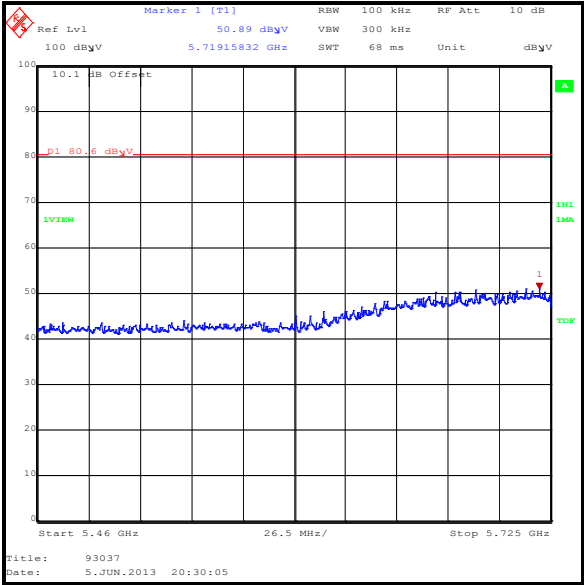
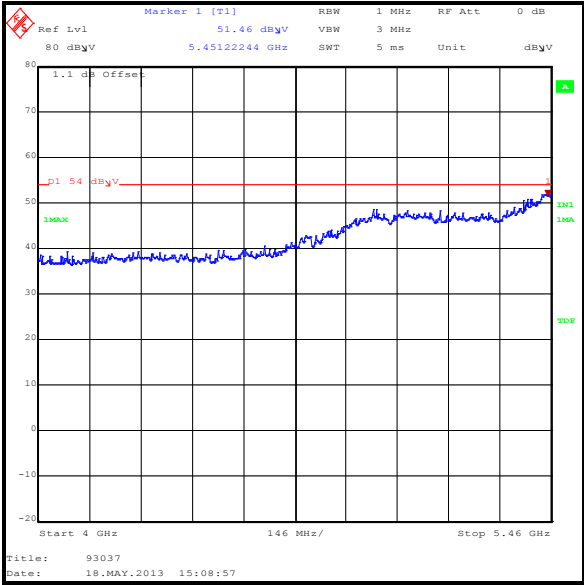
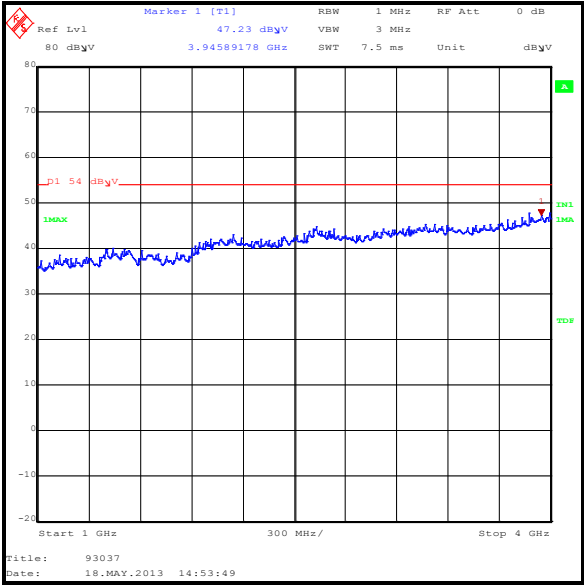
Results: Middle Channel / 256QAM / Peak / 60° Sectorised Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5721.643	Horizontal	70.6	84.3*	13.7	Complied

Results: Top Channel / 256QAM / Peak / 60° Sectorised Antenna

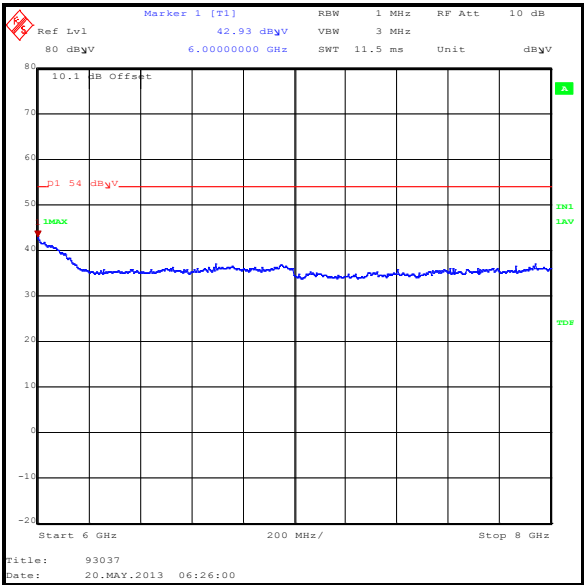
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5850.000	Horizontal	77.9	83.6*	5.7	Complied

Transmitter Radiated Emissions (continued)
Top Channel / 256QAM / Peak / 60° Sectorised Antenna

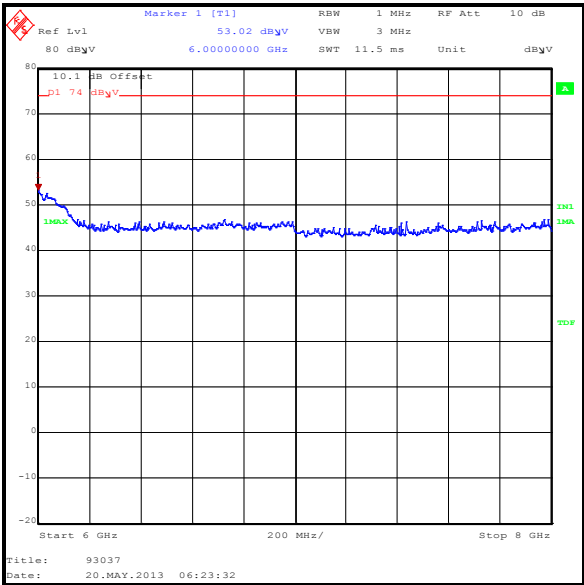


Transmitter Radiated Emissions (continued)

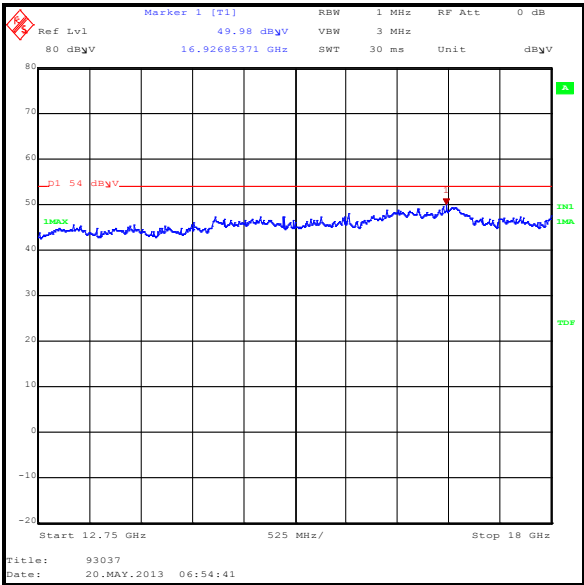
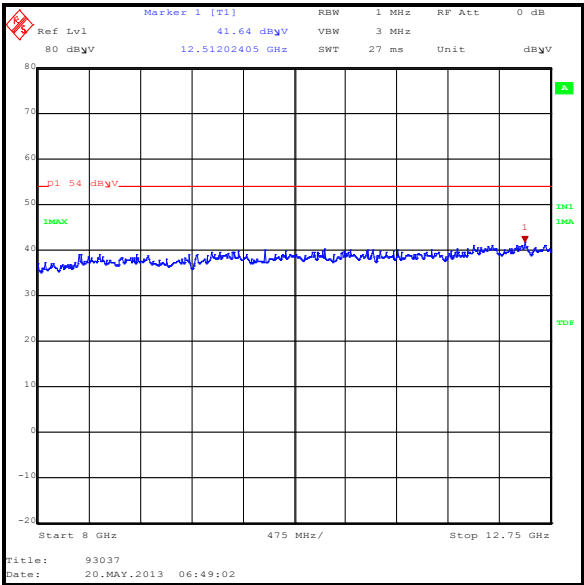
Top Channel / 256QAM / Peak / 60° Sectorised Antenna



Average Detector

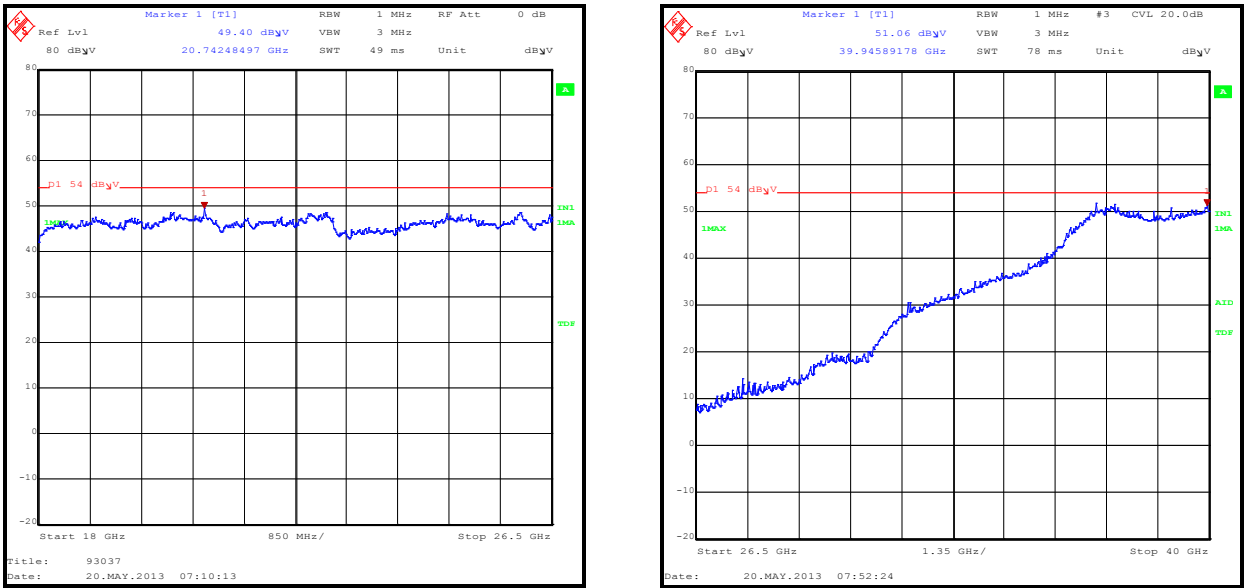


Peak Detector



Transmitter Radiated Emissions (continued)

Top Channel / 256QAM / Peak / 60° Sectorised Antenna



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

Transmitter Radiated Emissions (continued)**Results: Bottom Channel / BPSK / Peak / Omnidirectional Antenna**

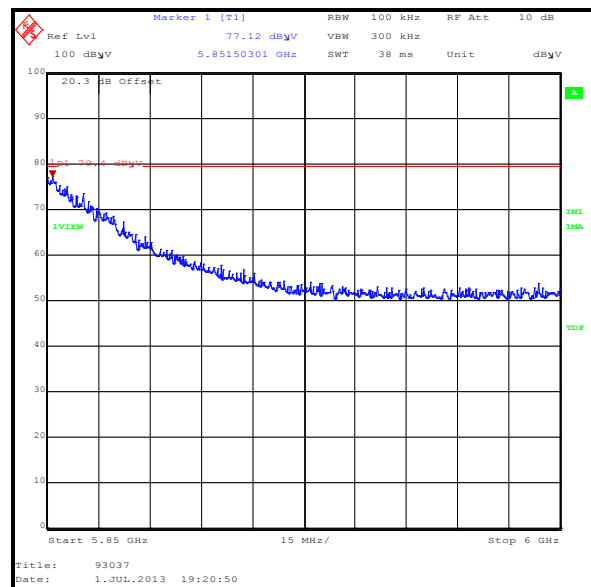
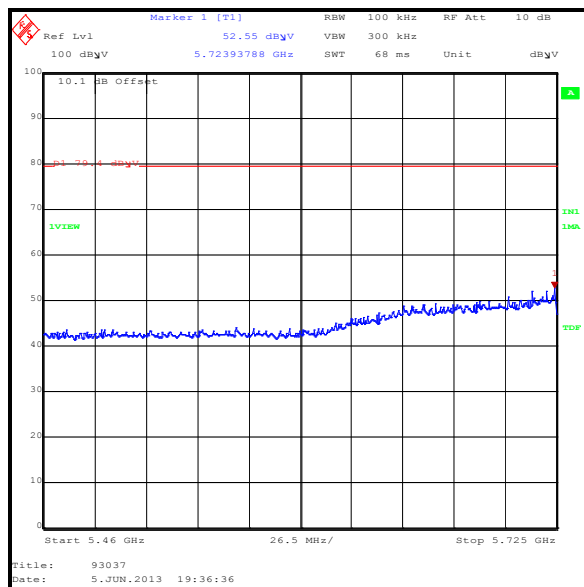
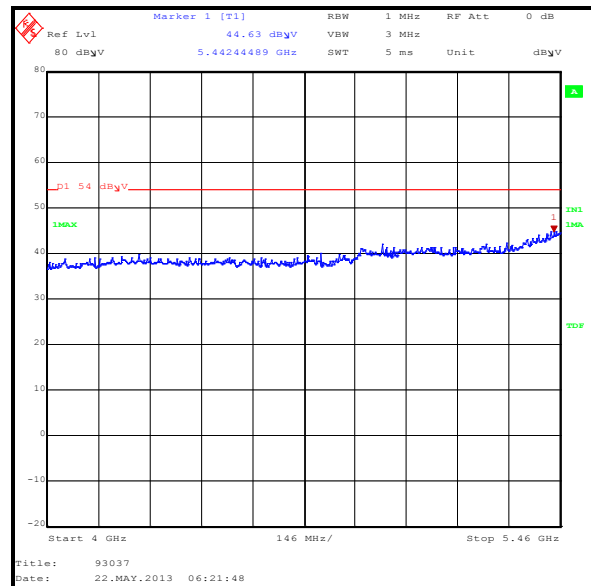
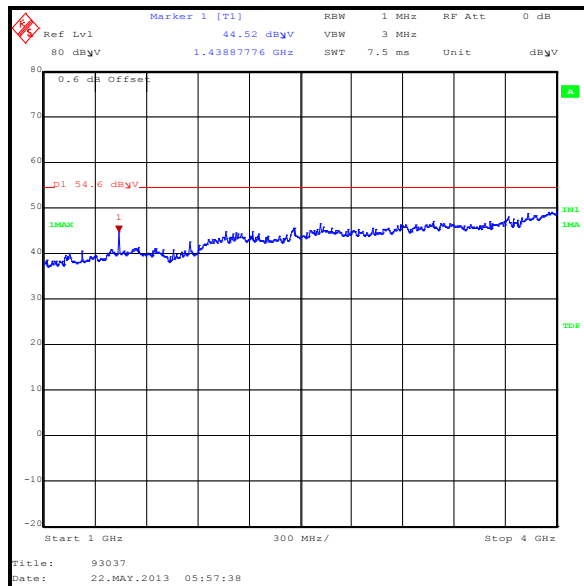
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5723.166	Horizontal	73.7	79.4*	5.7	Complied

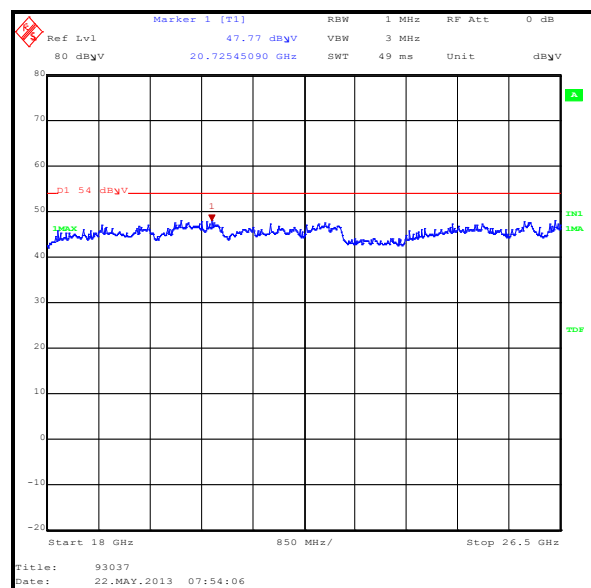
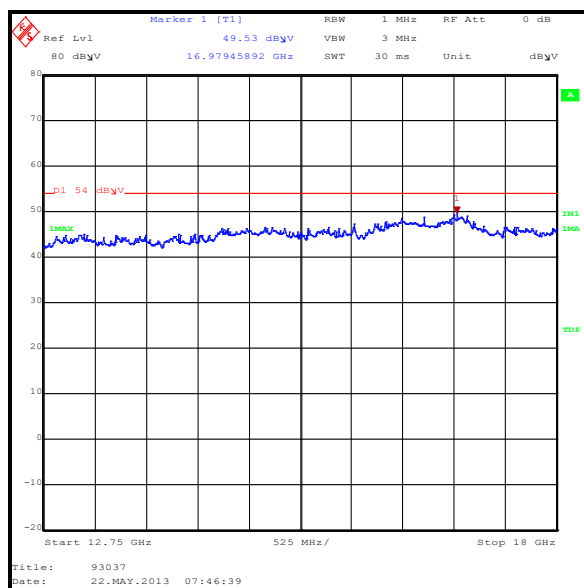
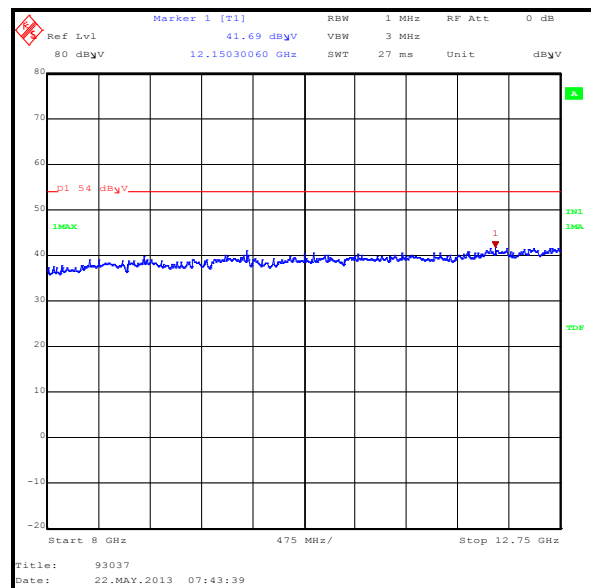
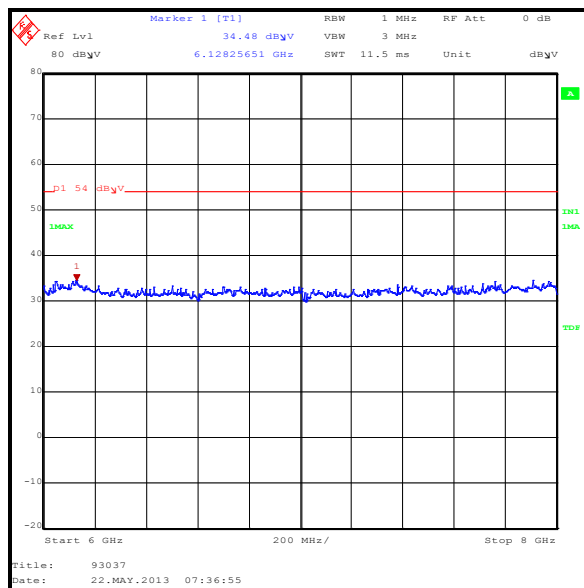
Results: Middle Channel / BPSK / Peak / Omnidirectional Antenna

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5723.968	Horizontal	65.2	79.4*	14.2	Complied

Results: Top Channel / BPSK / Peak / Omnidirectional Antenna

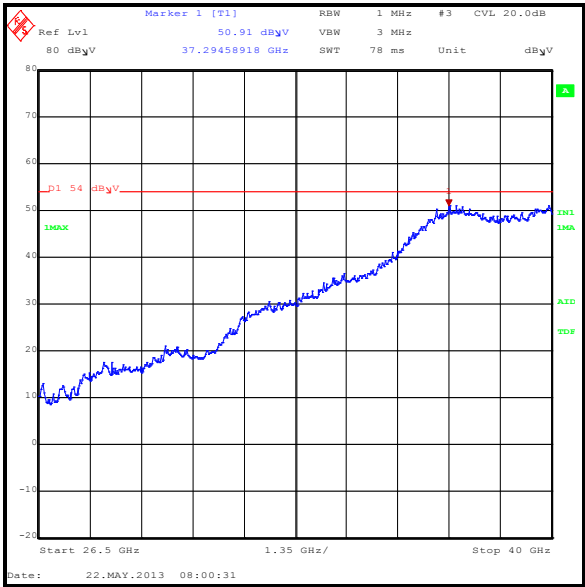
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5851.503	Horizontal	77.1	79.4*	2.3	Complied

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / Omnidirectional Antenna**

Transmitter Radiated Emissions (continued)**Results: Top Channel / 256QAM / Peak / Omnidirectional Antenna**

Transmitter Radiated Emissions (continued)

Results: Top Channel / 256QAM / Peak / Omnidirectional Antenna



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

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

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	24 Oct 2013	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	04 Nov 2013	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	04 Nov 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
A2000	Attenuator	Huber & Suhner	6830.17.B	301623	05 Apr 2014	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	10 May 2014	12
L1097	Low Pass Filter	AtlanTec RF	AS6573	13022102350	Calibrated before use	12
A2176	High Pass Filter	AtlanTec RF	AFH-07000	800980	10 May 2014	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
A253	Antenna	Flann Microwave	12240-20	128	04 Nov 2013	12
A254	Antenna	Flann Microwave	14240-20	139	04 Nov 2013	12
A255	Antenna	Flann Microwave	16240-20	519	04 Nov 2013	12
A256	Antenna	Flann Microwave	18240-20	400	04 Nov 2013	12
A436	Antenna	Flann Microwave	20249-20	330	04 Nov 2013	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	07 Feb 2014	12
G0543	Pre Amplifier	Sonoma	310N	230801	04 Jul 2013	3
A1227	Pre Amplifier	Agilent	8449B	3008A01566	05 Jul 2013	3
A1817	Antenna	EMCO	3115	00075694	22 Feb 2014	12
A1231	Attenuator	Narda	769-10	04845	Calibrated before use	N/A
A2141	Attenuator	Atlan TecRF	AN18-10	090918-04	10 May 2014	12
A1834	Attenuator	Hewlett Packard	8491B	10444	27 Jan 2014	12
A203	WG 22 Microwave Horn	Flann Microwave	22240-20	343	19 May 2016	36
M1390	26.5 GHz to 40 GHz Harmonic Mixer	Farran Technology	WHMP 28	FTL1677B	Calibrated before use	N/A
A1785	26.5 GHz to 40 GHz Pre-amplifier	Farran Technology	FLNA-28-30	FTL 6483	Calibrated before use	N/A
A366	Isolator	MRI	FRR-400	169	Calibrated before use	N/A
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	10 Jun 2013	12

6. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±4.69 dB
Conducted Maximum Peak Output Power	5725 MHz to 5850 MHz	95%	±0.27 dB
Power Spectral Density	5725 MHz to 5850 MHz	95%	±2.94 dB
6 dB Bandwidth	5725 MHz to 5850 MHz	95%	±0.92 ppm
Occupied Bandwidth	5725 MHz to 5850 MHz	95%	±0.92 ppm
Conducted Spurious Emissions	9 kHz to 40 GHz	95%	±2.62 dB
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 40 GHz	95%	±2.94 dB

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

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	-	-	Minor admin updates