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Report On

FCC Testing of the
Sharp CDMA SHT21 Dual-band CDMA (BC0, BC6) & Dual-band LTE
(B11, B18). Dual mode Media Tablet with Bluetooth, WLAN,
NFC(Type-A/ B) and GPS
In accordance with FCC CFR 47 Part 15E (WLAN)

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00179

Document 75919259 Report 11 Issue 3

November 2012



Product Service

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COMMERCIAL-IN-CONFIDENCE

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NFC(Type-A/ B) and GPS
In accordance with FCC CFR 47 Part 15E (WLAN)

Document 75919259 Report 11 Issue 3

November 2012

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DATED

20 November 2012

This report has been up-issued to Issue 3 to amend conducted power measurements.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15E. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler
M Russell



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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHT21 Dual-band CDMA (BC0, BC6) & Dual-band LTE (B11, B18). Dual mode
Media Tablet with Bluetooth, WLAN, NFC(Type-A/ B) and GPS
In accordance with FCC CFR 47 Part 15E (WLAN)



Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Sharp CDMA SHT21 Dual-band CDMA (BC0, BC6) & Dual-band LTE (B11, B18). Dual mode Media Tablet with Bluetooth, WLAN, NFC(Type-A/ B) and GPS to the requirements of FCC CFR 47 Part 15E.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Sharp Corporation
Model Number(s)	CDMA SHT21
Serial Number(s)	IMEI 004401114403765 IMEI 004401114403773
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 15E (2011)
Incoming Release Date	Application Form 11 October 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	9385 24 October 2012
Start of Test	9 October 2012
Finish of Test	1 November 2012
Name of Engineer(s)	G Lawler M Russell
Related Document(s)	FCC 06-96: 2006; FCC Public Notice DA 02-2138: 2002; UKAS M3003: Edition 2: 2007; ETSI TR 100 028: 2001



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15E is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
802.11(a)				
2.1	15.207	AC Line Conducted Emissions	Pass	
2.2	15.407 (a)(1)(2)(3)	Power Limits	Pass	
2.3	15.407 (b)(1)(2)(3)(4)(6)(7)	Undesirable Emission Limits	Pass	
2.4	2.1055 and 15.407 (g)	Frequency Stability	Pass	
2.5	15.407 (a)	26 dB Bandwidth	Pass	
2.6	15.407 (a)(5)	Peak Power Spectral Density	Pass	
2.7	15.407 (a)(6)	Ratio of the Peak Excursion of the Modulation Envelope	Pass	
802.11(n) - 5 GHz 20 MHz BW				
2.2	15.407 (a)(1)(2)(3)	Power Limits	Pass	
2.3	15.407 (b)(1)(2)(3)(4)(6)(7)	Undesirable Emission Limits	Pass	
2.4	2.1055 and 15.407 (g)	Frequency Stability	Pass	
2.5	15.407 (a)	26 dB Bandwidth	Pass	
2.6	15.407 (a)(5)	Peak Power Spectral Density	Pass	
2.7	15.407 (a)(6)	Ratio of the Peak Excursion of the Modulation Envelope	Pass	



Product Service

Section	Spec Clause	Test Description	Result	Comments/Base Standard
802.11(n) - 5 GHz 40 MHz BW				
2.2	15.407 (a)(1)(2)(3)	Power Limits	Pass	
2.3	15.407 (b)(1)(2)(3)(4)(6)(7)	Undesirable Emission Limits	Pass	
2.4	2.1055 and 15.407 (g)	Frequency Stability	Pass	
2.5	15.407 (a)	26 dB Bandwidth	Pass	
2.6	15.407 (a)(5)	Peak Power Spectral Density	Pass	
2.7	15.407 (a)(6)	Ratio of the Peak Excursion of the Modulation Envelope	Pass	



Product Service

1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	CDMA SHT21
Part Number	DA198_A
Hardware Version	PP1
Software Version	A8310
FCC ID	APYHRO00179
Technical Description (Please provide a brief description of the intended use of the equipment)	Dual-Band CDMA(800MHz_BC0, 1900MHz_BC6) and Dual-band LTE(1.5GHz_B11, 800MHz_B18) Dual Mode Media Tablet with Bluetooth, W-LAN, NFC and GPS receiver enabled

TYPE OF EQUIPMENT	
<input type="checkbox"/>	Master
<input type="checkbox"/>	Client with Radar Detection
<input checked="" type="checkbox"/>	Client without Radar Detection

TRANSMITTER TECHNICAL CHARACTERISTICS	
FREQUENCY CHARACTERISTICS	
<input checked="" type="checkbox"/>	5.150 GHz to 5.250 GHz
<input checked="" type="checkbox"/>	5.250 GHz to 5.350 GHz
<input checked="" type="checkbox"/>	5.470 GHz to 5.725 GHz
<input type="checkbox"/>	5.725 GHz to 5.825 GHz
<input checked="" type="checkbox"/>	EUT operates in the frequency band 5600 – 5650 MHz?
<input type="checkbox"/>	Off Channel CAC Implemented
	Off Channel CAC within 5600 – 5650 MHz band hours, (1 – 24)
	Off Channel CAC outside 5600 – 5650 MHz band minutes, (6 – 240)
Note: DFS is not required in the ranges 5.15 – 5.25 GHz and 5.725 – 5.825 GHz	

TRANSMITTER RF POWER CHARACTERISTICS	
Maximum rated transmitter output power as stated by manufacturer (if applicable)	
Conducted Power	13 dBm
Maximum Antenna Gain	2 dBi
EIRP	15 dBm
Minimum rated transmitter output power as stated by manufacturer (if applicable)	
Conducted Power	10 dBm
Maximum Antenna Gain	2 dBi
EIRP	12 dBm
Is TPC supported?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, provide a description of operation.	
N/A - less than 500mW	



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POWER SOURCE	
<input type="checkbox"/> AC mains supply	State voltage
AC supply frequency (Hz)	VAC
<input checked="" type="checkbox"/> DC supply	
Nominal voltage	4

SYSTEM ARCHITECTURE			
<input checked="" type="checkbox"/>	Frame Based		
<input type="checkbox"/>	IP Based		
<input type="checkbox"/>	Other	If other please state	
<input checked="" type="checkbox"/>	802.11(a)	Receiver Bandwidth:	N/A MHz
<input checked="" type="checkbox"/>	802.11(n) – 20 MHz	Receiver Bandwidth:	N/A MHz
<input checked="" type="checkbox"/>	802.11(n) – 40 MHz	Receiver Bandwidth:	N/A MHz

DECLARATION	
No parameter or information relating to the detected radar waveforms is available or accessible to the end user.	
<input checked="" type="checkbox"/> True	<input type="checkbox"/> False

MISCELLANEOUS	
Power-on cycle time*	N/A
* Time from switching on the UUT to the point at which Channel Availability Check (CAC) commences	

UNIFORM SPREADING	
Describe how the meter provides, on aggregate, uniform channel loading of the spectrum across all channels.	
N/A	



Product Service

ANTENNA OPTIONS	
Antenna 1	
Antenna Description:	Integral BT / WLAN strip line antenna
Antenna Model:	GCABBA456AFS*
Antenna Maximum Gain:	2dBi
Antenna Frequency Range:	Dual band: 2400MHz -2500MHz, 5100MHz- 5750MHz
Antenna 2	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
Antenna 3	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
Antenna 4	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
Antenna 5	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature: *M. Moroi* Name: Mototsugu Moroi
 Position held: Manager Date: 11th October, 2012



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHT21 Dual-band CDMA (BC0, BC6) & Dual-band LTE (B11, B18). Dual mode Media Tablet with Bluetooth, WLAN, NFC(Type-A/ B) and GPS. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 4.0 V DC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard or test plan were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
Sharp CDMA SHT21 Dual-band CDMA (BC0, BC6) & Dual-band LTE (B11, B18). Dual mode
Media Tablet with Bluetooth, WLAN, NFC(Type-A/ B) and GPS
In accordance with FCC CFR 47 Part 15E (WLAN)



2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.207

2.1.2 Equipment Under Test and Modification State

CDMA SHT21 S/N: IMEI 004401114403765 - Modification State 0

2.1.3 Date of Test

31 October 2012

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The EUT is set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

2.1.6 Environmental Conditions

Ambient Temperature	21.5°C
Relative Humidity	36.0%

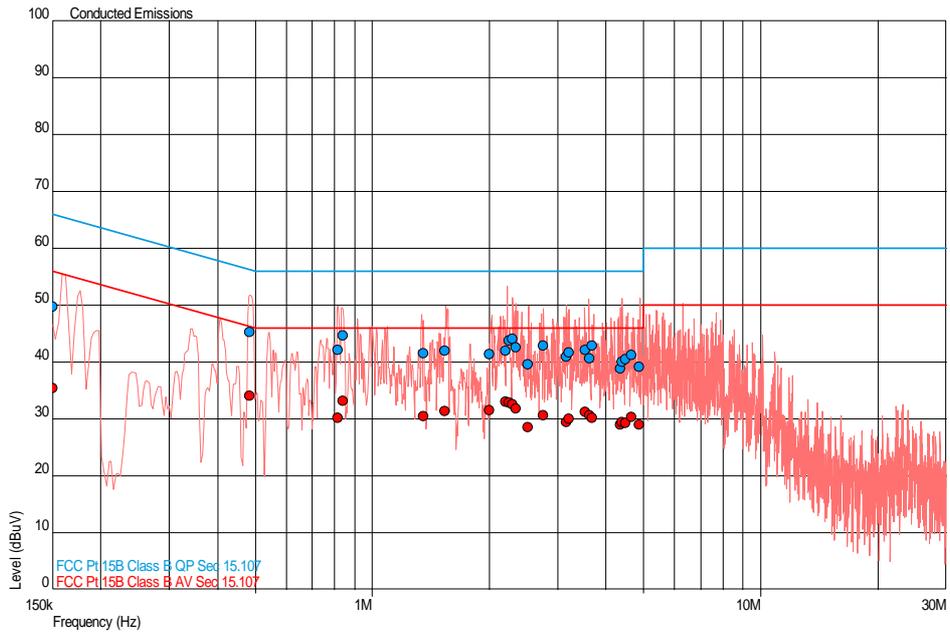


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2.1.7 Test Results

802.11(a)

Live Line



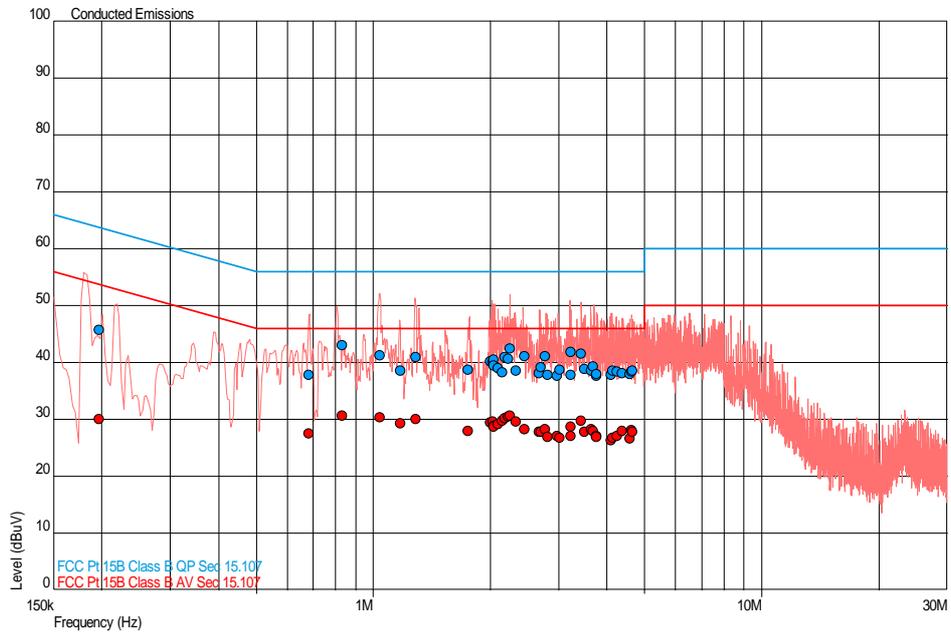


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	49.8	66.0	-16.1	35.4	56.0	-20.6
0.484	45.3	56.3	-11.0	34.1	46.3	-12.1
0.817	42.1	56.0	-13.9	30.2	46.0	-15.8
0.842	44.7	56.0	-11.3	33.2	46.0	-12.8
1.352	41.6	56.0	-14.4	30.5	46.0	-15.5
1.533	42.0	56.0	-14.0	31.4	46.0	-14.6
2.004	41.4	56.0	-14.6	31.6	46.0	-14.4
2.199	42.0	56.0	-14.0	33.0	46.0	-13.0
2.245	43.8	56.0	-12.2	32.9	46.0	-13.1
2.291	44.1	56.0	-11.9	32.6	46.0	-13.4
2.342	42.6	56.0	-13.4	31.8	46.0	-14.2
2.515	39.6	56.0	-16.4	28.6	46.0	-17.4
2.758	42.9	56.0	-13.1	30.7	46.0	-15.3
3.153	41.0	56.0	-15.0	29.4	46.0	-16.6
3.203	41.7	56.0	-14.3	30.1	46.0	-15.9
3.527	42.2	56.0	-13.8	31.3	46.0	-14.7
3.630	40.6	56.0	-15.4	30.7	46.0	-15.3
3.683	42.9	56.0	-13.1	30.3	46.0	-15.7
4.339	38.8	56.0	-17.2	29.1	46.0	-16.9
4.392	40.1	56.0	-15.9	29.4	46.0	-16.6
4.480	40.6	56.0	-15.4	29.3	46.0	-16.7
4.653	41.3	56.0	-14.7	30.4	46.0	-15.6
4.856	39.1	56.0	-16.9	29.1	46.0	-16.9



Product Service

Neutral Line





Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.197	45.8	63.7	-17.9	30.1	53.7	-23.7
0.684	37.8	56.0	-18.2	27.5	46.0	-18.5
0.830	43.1	56.0	-12.9	30.7	46.0	-15.3
1.041	41.3	56.0	-14.7	30.4	46.0	-15.6
1.176	38.6	56.0	-17.4	29.3	46.0	-16.7
1.288	41.0	56.0	-15.0	30.0	46.0	-16.0
1.756	38.8	56.0	-17.2	28.0	46.0	-18.0
2.000	40.2	56.0	-15.8	29.4	46.0	-16.6
2.030	40.1	56.0	-15.9	29.6	46.0	-16.4
2.039	40.6	56.0	-15.4	28.9	46.0	-17.1
2.044	39.4	56.0	-16.6	28.7	46.0	-17.3
2.094	39.0	56.0	-17.0	29.1	46.0	-16.9
2.150	38.3	56.0	-17.7	29.8	46.0	-16.2
2.185	41.0	56.0	-15.0	30.3	46.0	-15.7
2.221	40.7	56.0	-15.3	30.6	46.0	-15.4
2.247	42.4	56.0	-13.6	30.7	46.0	-15.3
2.331	38.5	56.0	-17.5	29.6	46.0	-16.4
2.455	41.1	56.0	-14.9	28.3	46.0	-17.7
2.677	38.1	56.0	-17.9	27.8	46.0	-18.2
2.701	39.2	56.0	-16.8	27.9	46.0	-18.1
2.767	41.1	56.0	-14.9	28.2	46.0	-17.8
2.805	37.8	56.0	-18.2	26.9	46.0	-19.1
2.967	37.7	56.0	-18.3	27.1	46.0	-18.9
3.024	38.8	56.0	-17.2	26.8	46.0	-19.2
3.219	37.9	56.0	-18.1	27.1	46.0	-18.9
3.227	41.9	56.0	-14.1	28.8	46.0	-17.2
3.432	41.5	56.0	-14.5	29.8	46.0	-16.2
3.503	38.9	56.0	-17.1	27.9	46.0	-18.1
3.634	38.6	56.0	-17.4	28.3	46.0	-17.7
3.686	39.3	56.0	-16.7	28.0	46.0	-18.0
3.758	38.0	56.0	-18.0	27.0	46.0	-19.0
3.761	37.6	56.0	-18.4	27.1	46.0	-18.9
4.097	37.8	56.0	-18.2	26.3	46.0	-19.7
4.143	38.6	56.0	-17.4	26.8	46.0	-19.2
4.243	38.5	56.0	-17.5	27.1	46.0	-18.9
4.366	38.2	56.0	-17.8	27.9	46.0	-18.1
4.586	38.0	56.0	-18.0	26.6	46.0	-19.4
4.616	38.5	56.0	-17.5	28.2	46.0	-17.8
4.657	38.6	56.0	-17.4	27.8	46.0	-18.2



2.2 POWER LIMITS

2.2.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(1)(2)(3)

2.2.2 Equipment Under Test and Modification State

CDMA SHT21 S/N: IMEI 004401114403765 - Modification State 0

2.2.3 Date of Test

9 October 2012, 16 October 2012, 17 October 2012, 20 October and 20 November 2012

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

For conducted power, the EUT was transmitted at maximum power via a cable and attenuator to the Spectrum Analyser. The Analyser settings were adjusted to display the resultant trace on screen and a resolution bandwidth and video bandwidth of 1 MHz were used to perform the measurement.

For radiated power, the EUT was transmitted at maximum power level. The signal was observed on the Spectrum Analyser using a Double Ridge Guide antenna at 3 metres from the EUT. The signal was maximised by rotating the EUT 360° and a height search of the measuring antenna. A substitution was then performed using a substitution antenna and signal generator.

This level was maximised by adjusting the height of the measuring antenna once more. The level from the signal generator was then adjusted to achieve the same raw result as with the EUT. This level was then corrected to account for cable loss and antenna factor. A calculation was then performed to obtain the final figure.

In both cases a Peak Power Analyser was then used to obtain a correction factor for the wideband signal and in terms of an rms-equivalent voltage.

2.2.6 Environmental Conditions

Ambient Temperature	19.2 - 21.9°C
Relative Humidity	38.7 - 55.0%



Product Service

2.2.7 Test Results

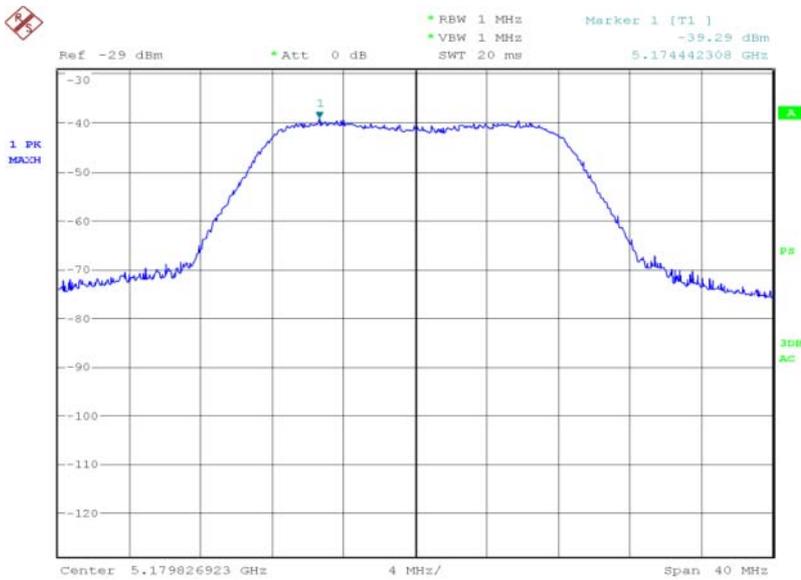
802.11(a)

Radiated

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
13.28	21.281



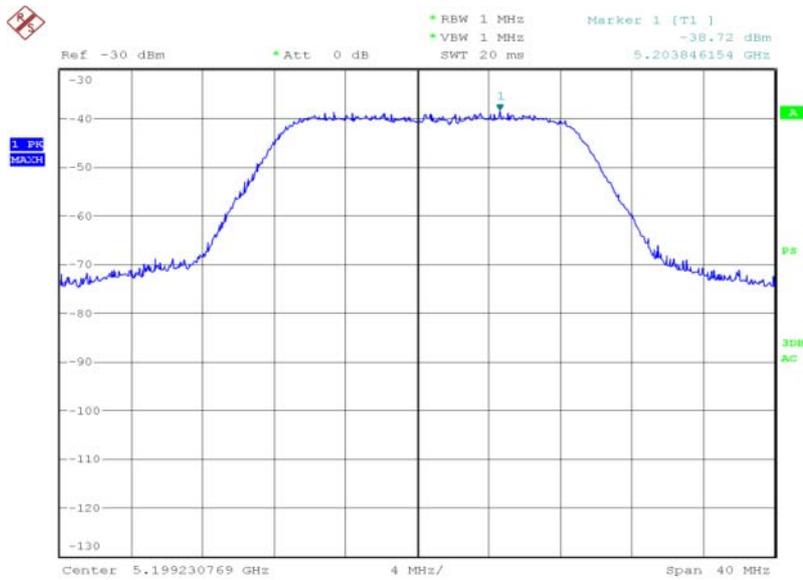
Date: 16.OCT.2012 18:20:13



Product Service

5200 MHz

EIRP (dBm)	EIRP (mW)
12.94	19.679



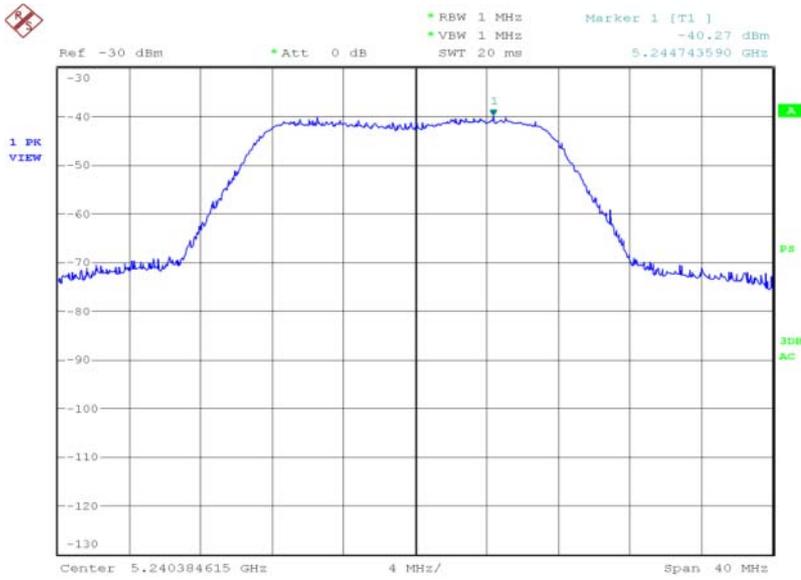
Date: 16.OCT.2012 19:40:09



Product Service

5240 MHz

EIRP (dBm)	EIRP (mW)
11.93	15.596



Date: 16.OCT.2012 20:12:33



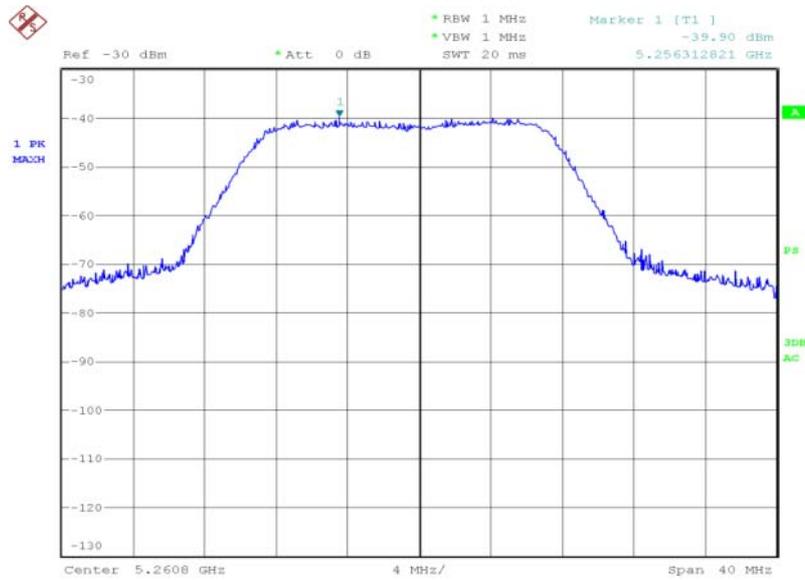
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Radiated

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
11.95	15.668



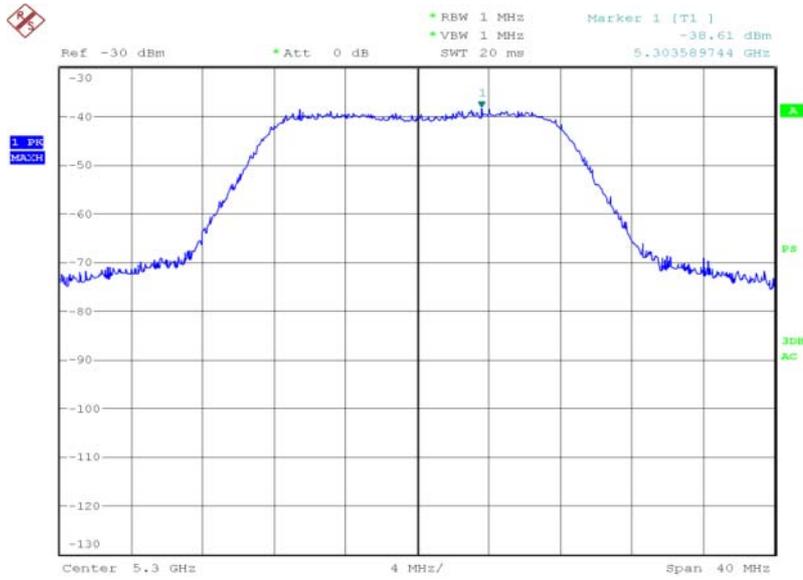
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Product Service

5300 MHz

EIRP (dBm)	EIRP (mW)
13.09	20.370



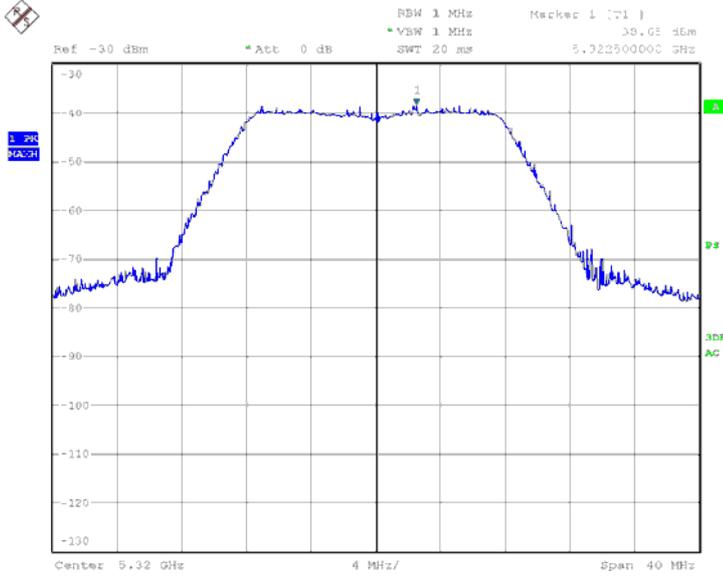
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Product Service

5320 MHz

EIRP (dBm)	EIRP (mW)
13.30	21.380



Date: 5.NOV.2012 19:28:42



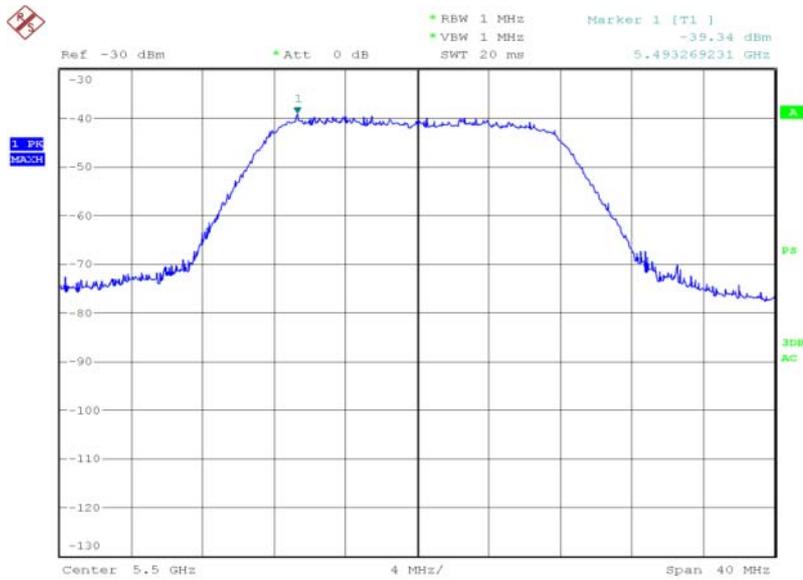
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Radiated

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
12.84	19.231



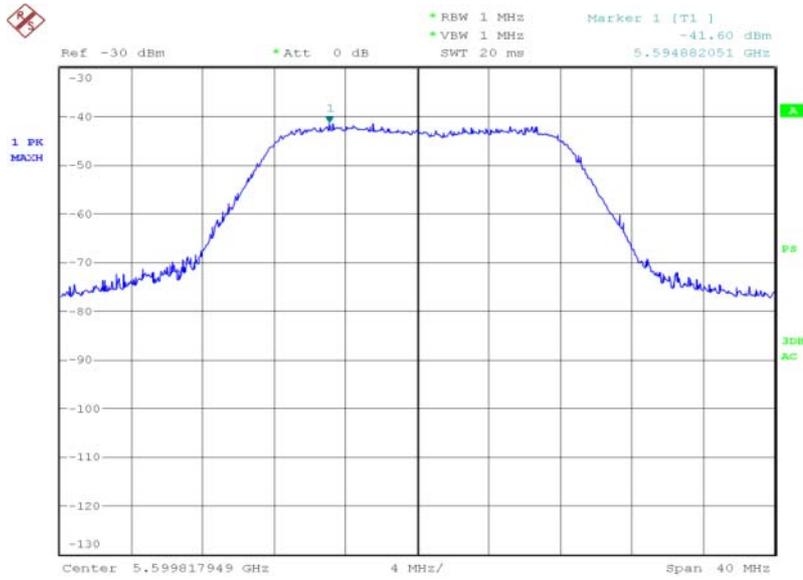
Date: 16.OCT.2012 22:24:47



Product Service

5600 MHz

EIRP (dBm)	EIRP (mW)
11.14	13.002



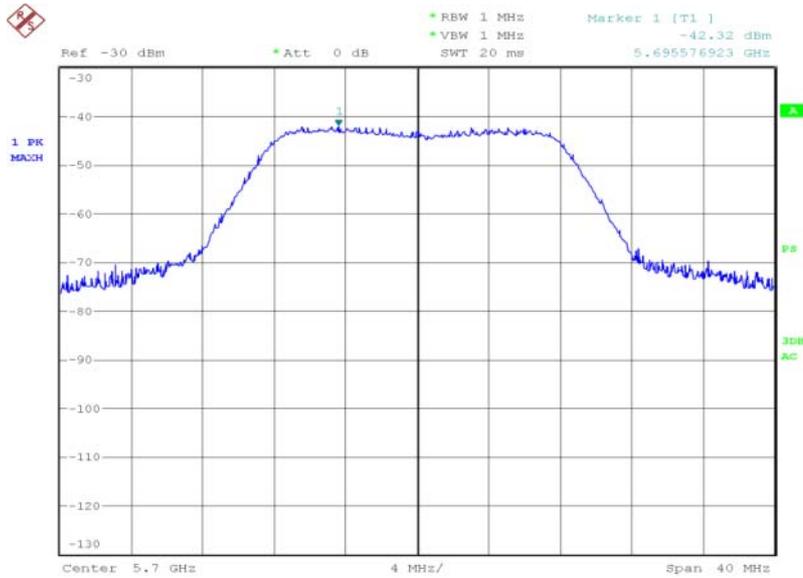
Date: 16.OCT.2012 22:43:21



Product Service

5700 MHz

EIRP (dBm)	EIRP (mW)
10.29	10.691



Date: 16.OCT.2012 22:53:50

Limit for Radiated

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B	Lesser of 4 W or 23 dBm + 10 log B

Note: For FCC limit, "B" = 26 dB Bandwidth. For IC limit "B" = 99% Occupied Bandwidth.
 For FCC only – It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.



Product Service

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
9.86	9.683

5200 MHz

EIRP (dBm)	EIRP (mW)
9.71	9.354

5240 MHz

EIRP (dBm)	EIRP (mW)
9.10	8.128

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
8.91	7.780

5300 MHz

EIRP (dBm)	EIRP (mW)
9.77	9.484

5320 MHz

EIRP (dBm)	EIRP (mW)
9.73	9.397

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.



Product Service

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
9.26	8.433

5600 MHz

EIRP (dBm)	EIRP (mW)
8.38	6.887

5700 MHz

EIRP (dBm)	EIRP (mW)
8.88	7.727

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

Limit for Conducted

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B	-
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B

Note: For FCC limit, "B" = 26 dB Bandwidth. For IC limit "B" = 99% Occupied Bandwidth.



Product Service

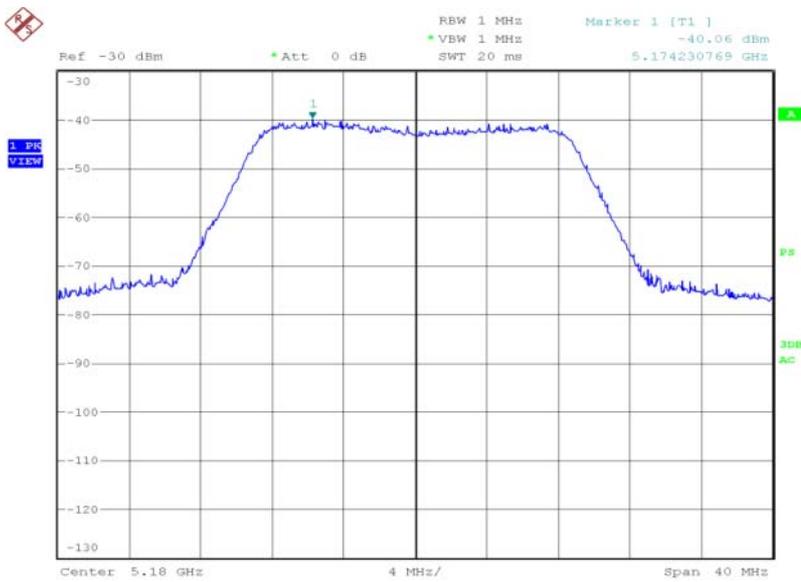
802.11(n) - 5 GHz 20 MHz BW

Radiated

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
14.28	26.792



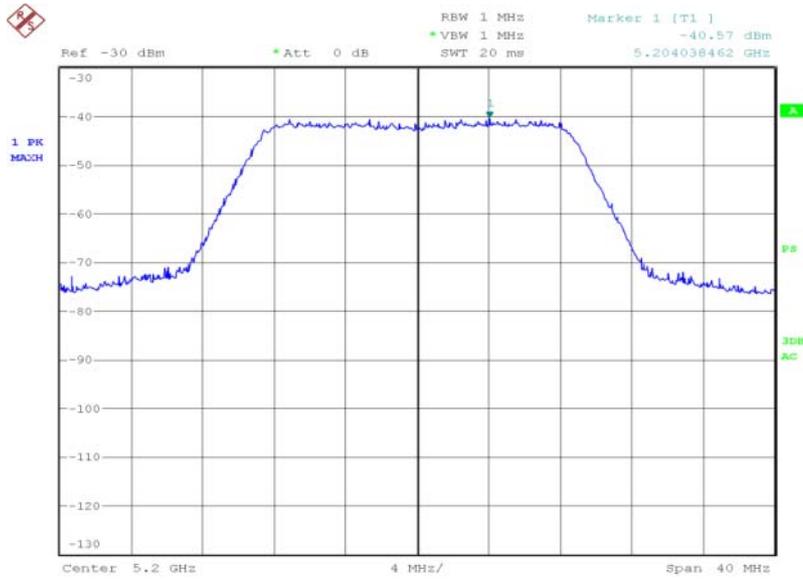
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Product Service

5200 MHz

EIRP (dBm)	EIRP (mW)
13.16	20.701



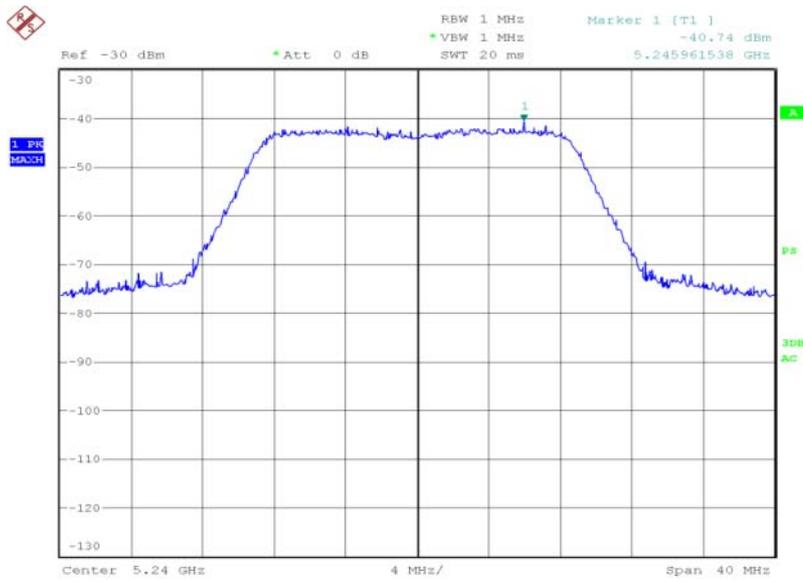
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Product Service

5240 MHz

EIRP (dBm)	EIRP (mW)
13.69	23.388



Date: 17.OCT.2012 20:25:44



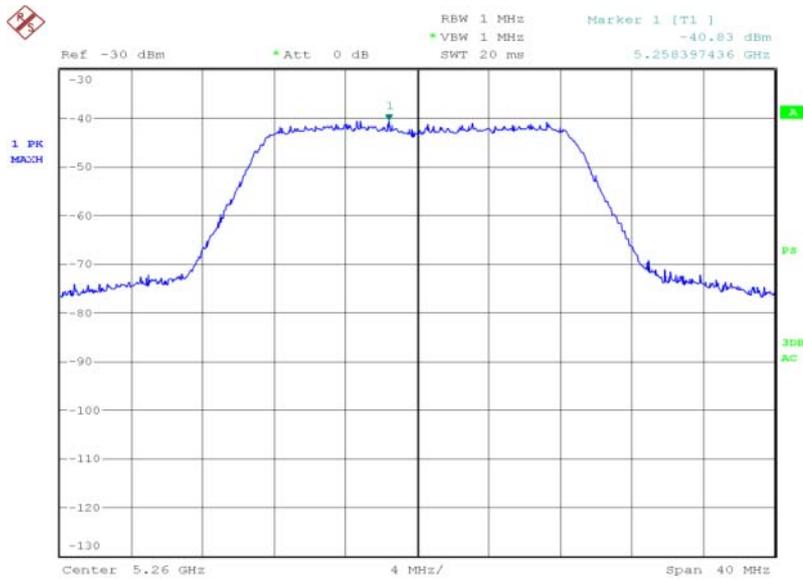
Product Service

Radiated

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
12.90	19.498



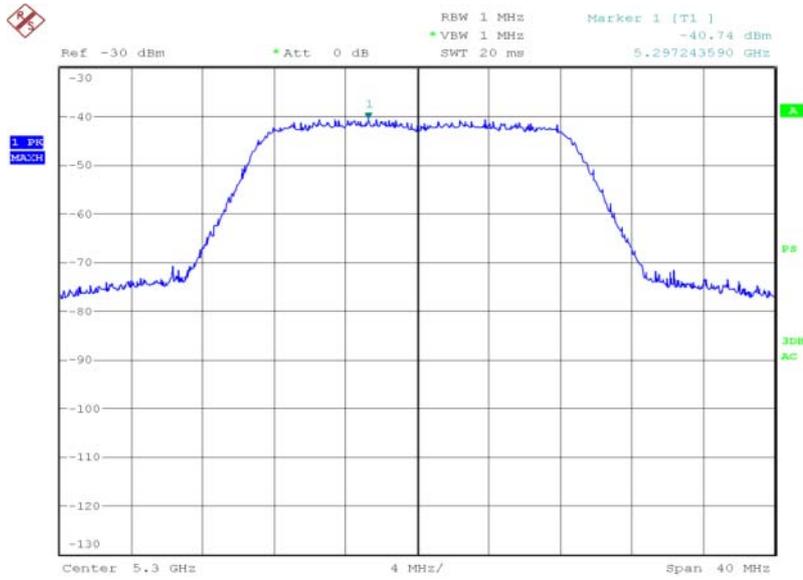
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Product Service

5300 MHz

EIRP (dBm)	EIRP (mW)
12.83	19.187



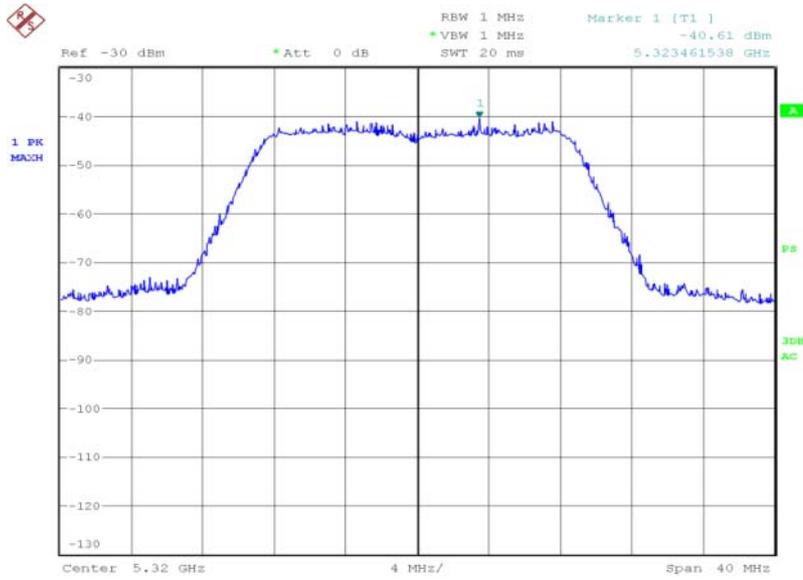
Date: 17.OCT.2012 20:47:47



Product Service

5320 MHz

EIRP (dBm)	EIRP (mW)
13.17	20.749



Date: 17.OCT.2012 20:53:44



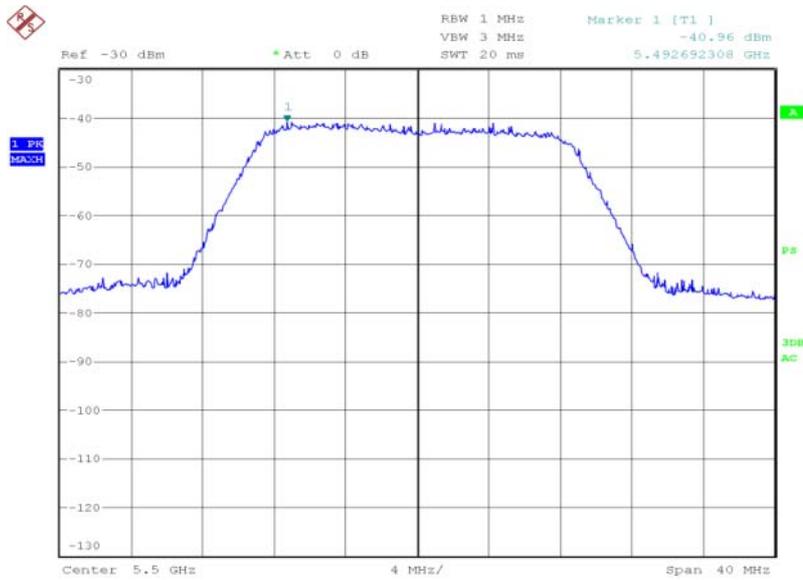
Product Service

Radiated

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
12.50	17.783



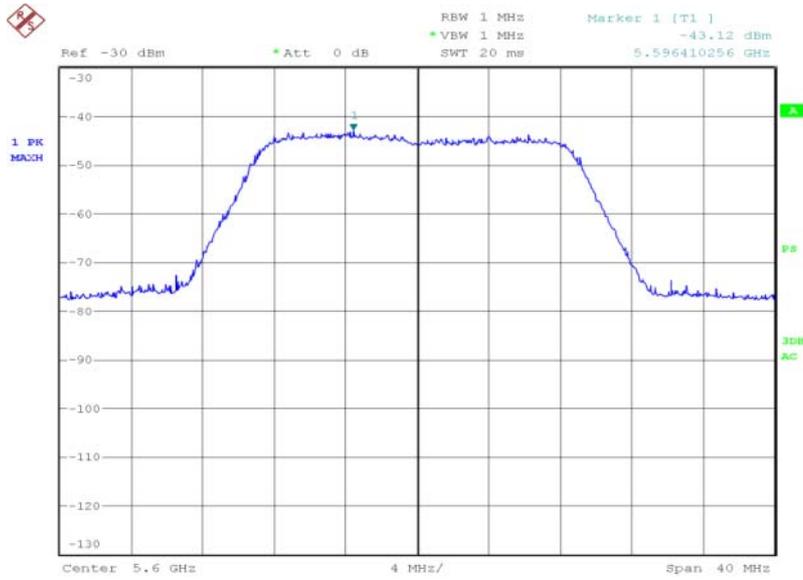
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Product Service

5600 MHz

EIRP (dBm)	EIRP (mW)
10.61	11.508

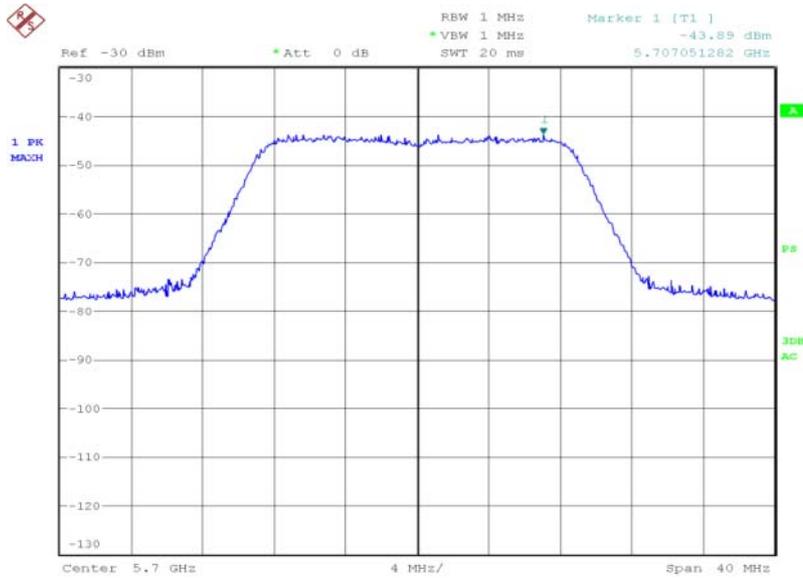


Date: 17.OCT.2012 21:39:37



5700 MHz

EIRP (dBm)	EIRP (mW)
9.36	8.630



Date: 17.OCT.2012 21:46:26

Limit for Radiated

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B	Lesser of 4 W or 23 dBm + 10 log B

Note: For FCC limit, "B" = 26 dB Bandwidth. For IC limit "B" = 99% Occupied Bandwidth.
 For FCC only – It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.



Product Service

Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
9.89	9.75

5200 MHz

EIRP (dBm)	EIRP (mW)
9.36	8.63

5240 MHz

EIRP (dBm)	EIRP (mW)
9.12	8.17

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
8.58	7.21

5300 MHz

EIRP (dBm)	EIRP (mW)
9.43	8.77

5320 MHz

EIRP (dBm)	EIRP (mW)
9.47	8.85

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.



Product Service

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
8.83	7.64

5600 MHz

EIRP (dBm)	EIRP (mW)
8.48	7.05

5700 MHz

EIRP (dBm)	EIRP (mW)
8.12	6.49

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

Limit for Conducted

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B	-
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B

Note: For FCC limit, "B" = 26 dB Bandwidth. For IC limit "B" = 99% Occupied Bandwidth.



Product Service

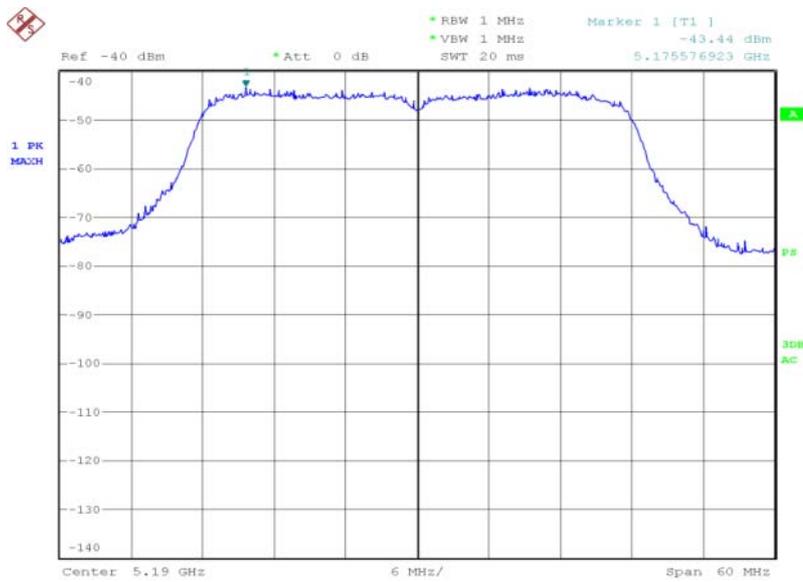
802.11(n) - 5 GHz 40 MHz BW

Radiated

Frequency Band 1

5190 MHz

EIRP (dBm)	EIRP (mW)
11.68	14.723

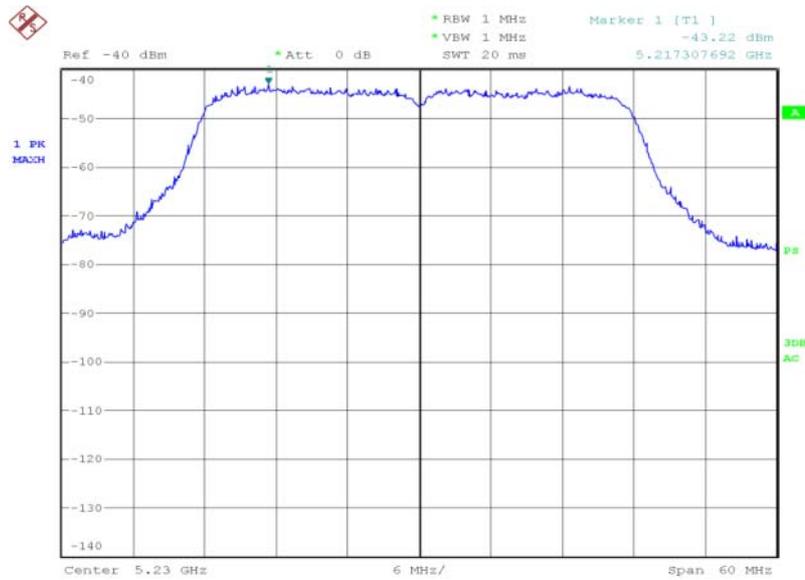


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5230 MHz

EIRP (dBm)	EIRP (mW)
11.62	14.521



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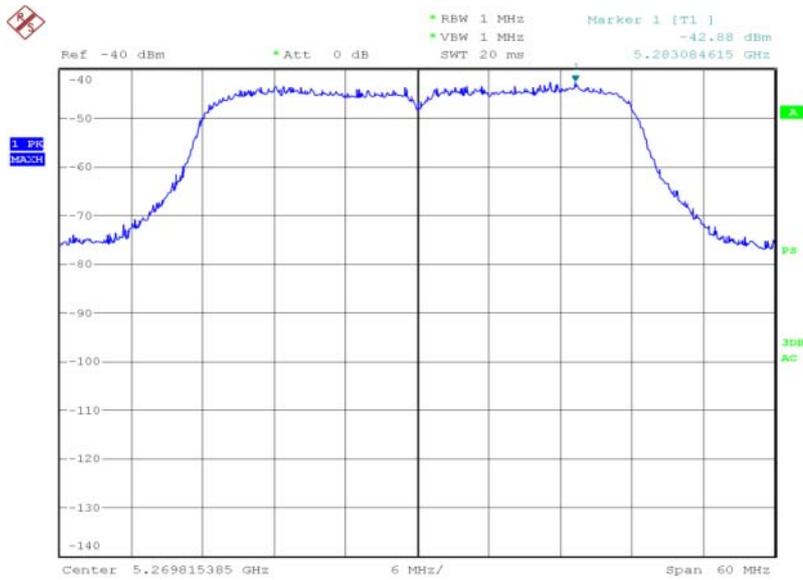
Product Service

Radiated

Frequency Band 2

5270 MHz

EIRP (dBm)	EIRP (mW)
11.73	14.894



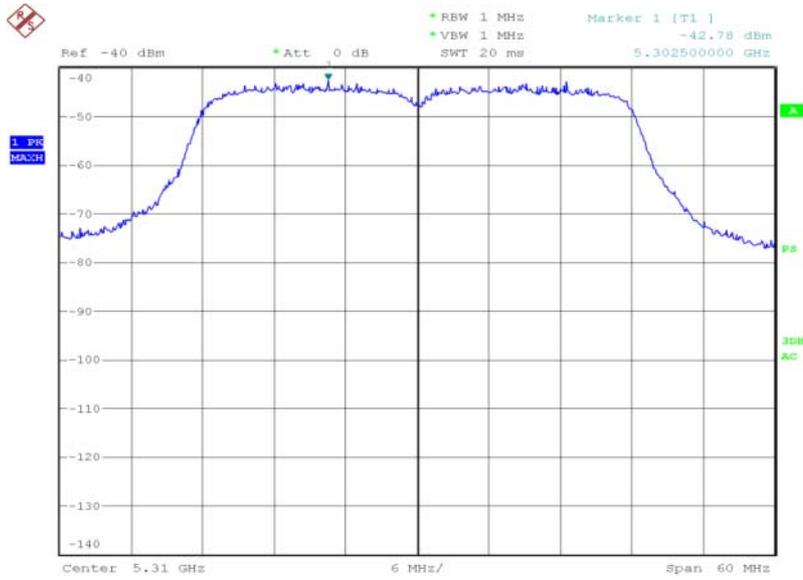
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Product Service

5310 MHz

EIRP (dBm)	EIRP (mW)
11.81	15.171



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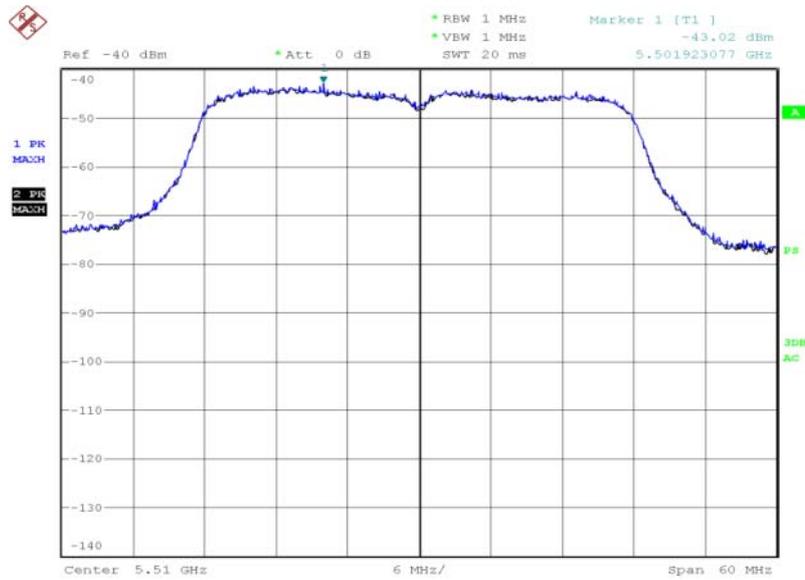
Product Service

Radiated

Frequency Band 3

5510 MHz

EIRP (dBm)	EIRP (mW)
12.09	16.181



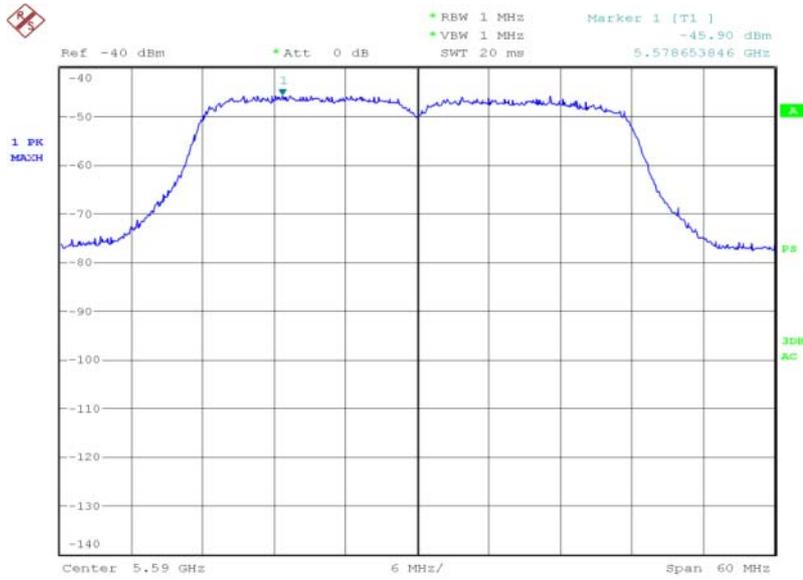
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Product Service

5590 MHz

EIRP (dBm)	EIRP (mW)
8.79	7.568



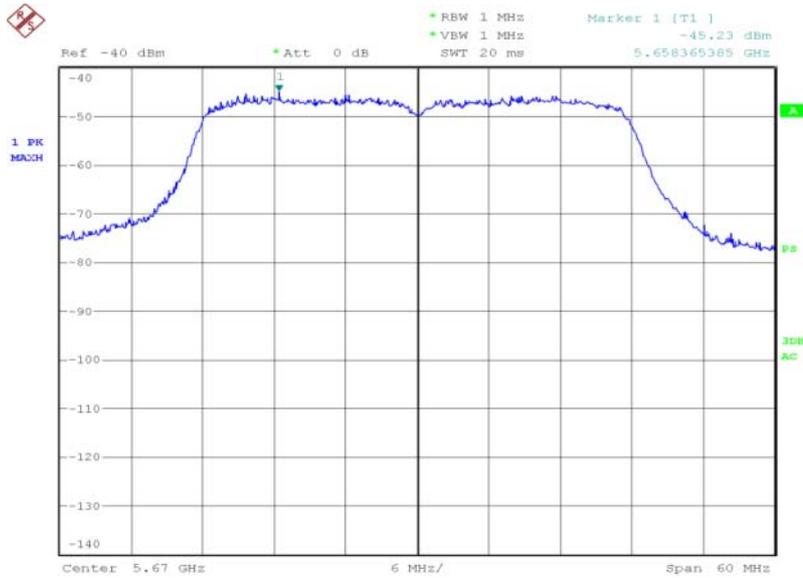
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Product Service

5670 MHz

EIRP (dBm)	EIRP (mW)
8.75	7.499



Date: 20.OCT.2012 14:06:17

Limit for Radiated

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B	Lesser of 4 W or 23 dBm + 10 log B

Note: For FCC limit, "B" = 26 dB Bandwidth. For IC limit "B" = 99% Occupied Bandwidth.
 For FCC only – It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.



Product Service

Conducted

Frequency Band 1

5190 MHz

EIRP (dBm)	EIRP (mW)
8.91	7.78

5230 MHz

EIRP (dBm)	EIRP (mW)
9.16	8.24

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27Mbps.

Conducted

Frequency Band 2

5270 MHz

EIRP (dBm)	EIRP (mW)
8.82	7.62

5310 MHz

EIRP (dBm)	EIRP (mW)
9.17	8.26

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27Mbps.



Product Service

Conducted

Frequency Band 3

5510 MHz

EIRP (dBm)	EIRP (mW)
8.11	6.47

5590 MHz

EIRP (dBm)	EIRP (mW)
8.01	6.32

5670 MHz

EIRP (dBm)	EIRP (mW)
7.63	5.79

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27Mbps.

Limit for Conducted

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B	-
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B	Lesser of 1 W or 17 dBm + 10 log B

Note: For FCC limit, "B" = 26 dB Bandwidth. For IC limit "B" = 99% Occupied Bandwidth.



Product Service

2.3 UNDESIRABLE EMISSION LIMITS

2.3.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (b)(1)(2)(3)(4)(6)(7)

2.3.2 Equipment Under Test and Modification State

CDMA SHT21 S/N: IMEI 004401114403773 - Modification State 0

CDMA SHT21 S/N: IMEI 004401114403765 - Modification State 0

2.3.3 Date of Test

17 October 2012, 20 October 2012, 21 October 2012, 22 October 2012, 29 October 2012, 30 October 2012 & 1 November 2012

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Procedure

For conducted emissions, the EUT was set to operate at maximum power on the worst case data rate. The test was performed on the bottom, middle and top channels. The test was performed from 9 kHz to 40 GHz.

The measurement path loss in each relevant frequency band was measured and entered as a reference level offset.

For radiated emissions, the test method described above was also used. However, the measurement was performed from 30 MHz to 40 GHz and the path loss is incorporated as a transducer factor and entered into the spectrum analyser. In each frequency span the level was maximised by rotating the EUT 360° and a height search of the measuring antenna.

The band edge measurements were performed in accordance with ANSI C63.10, Clause 6.9.3. The results were analysed to ensure compliance with restricted bands. The EUT was set to the lowest and highest operating frequencies.

2.3.6 Environmental Conditions

Ambient Temperature	16.6 - 21.9°C
Relative Humidity	33.0 - 58.0%



Product Service

2.3.7 Test Results

802.11(a)

4.0 V DC Supply

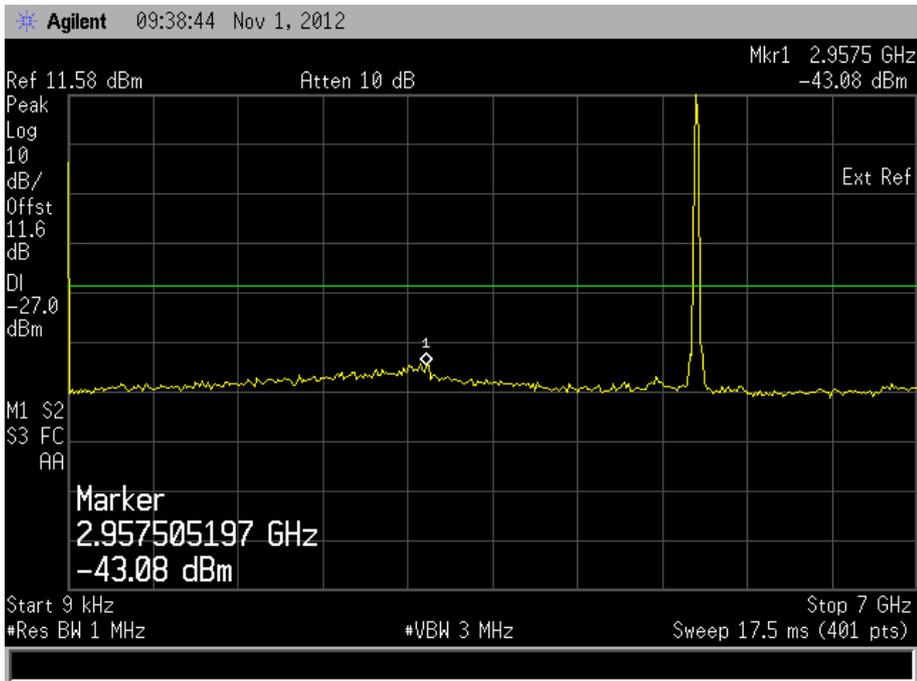
Spurious Conducted Emissions

9Mbps

Frequency Band 1

5180 MHz

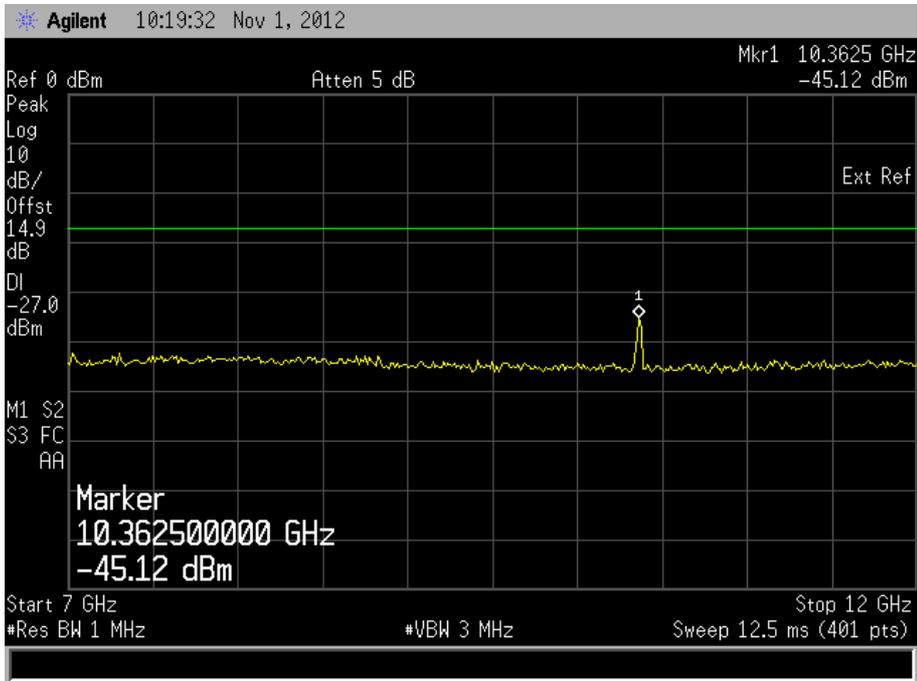
9 kHz to 7 GHz



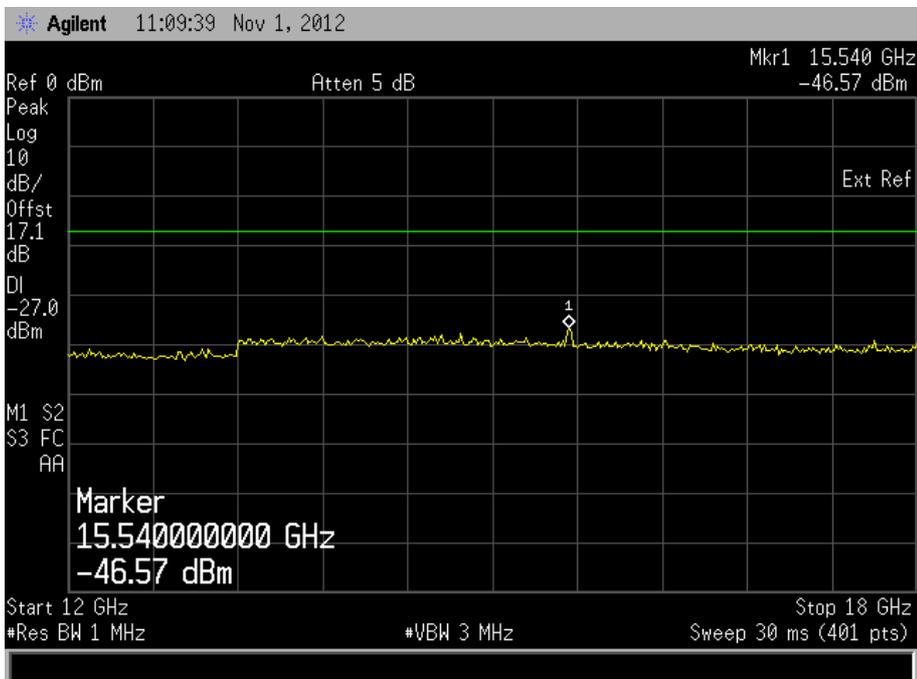


Product Service

7 GHz to 12 GHz



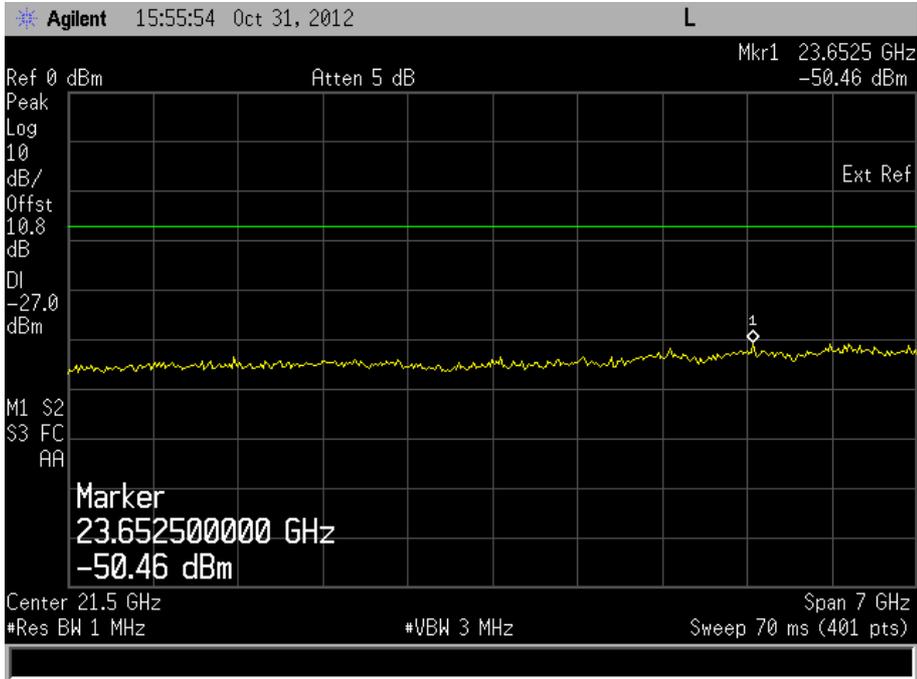
12 GHz to 18 GHz



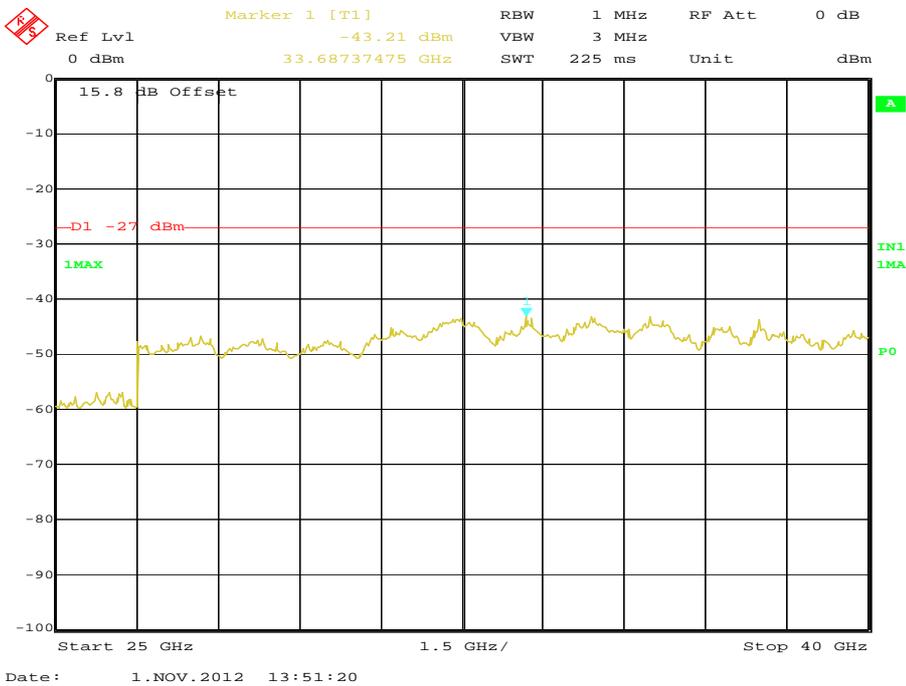


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz

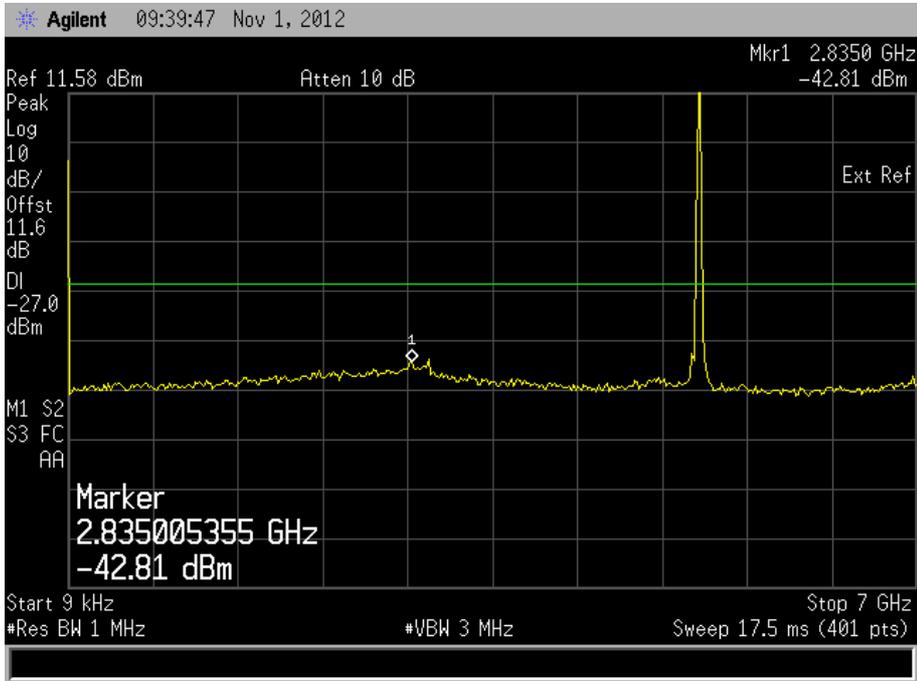




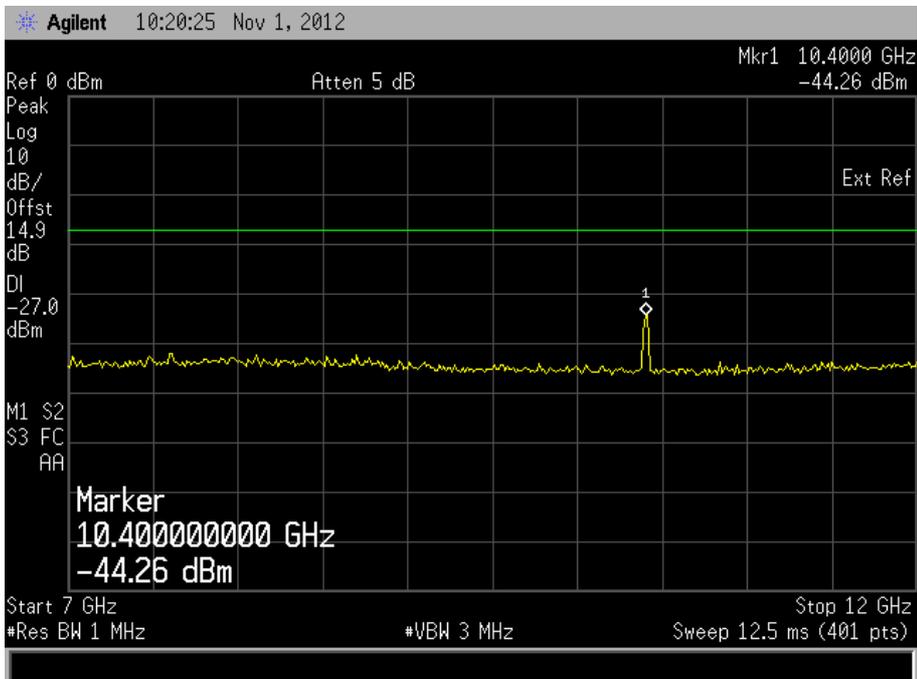
Product Service

5200 MHz

9 kHz to 7 GHz



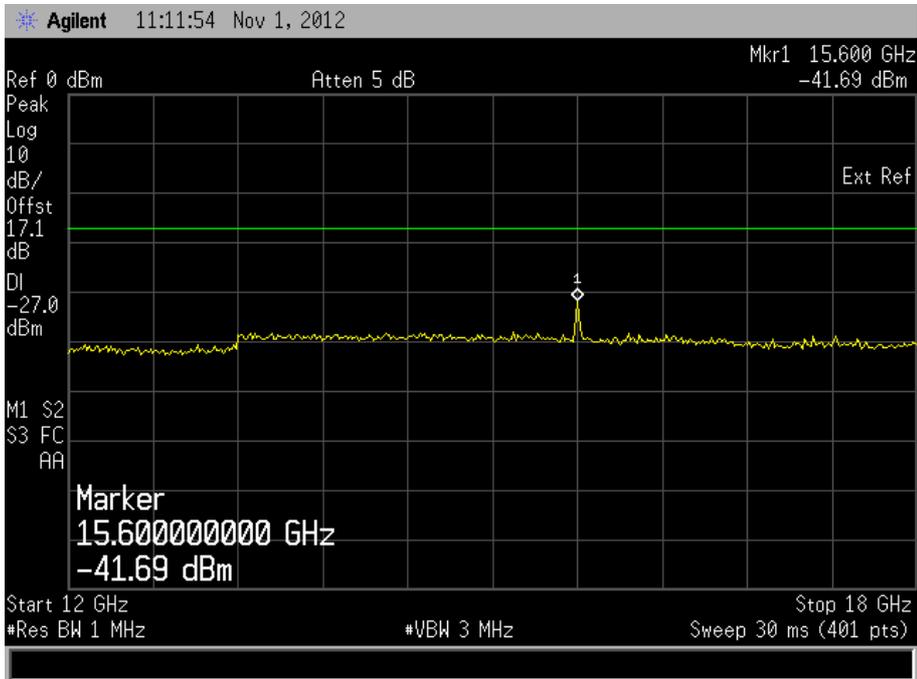
7 GHz to 12 GHz



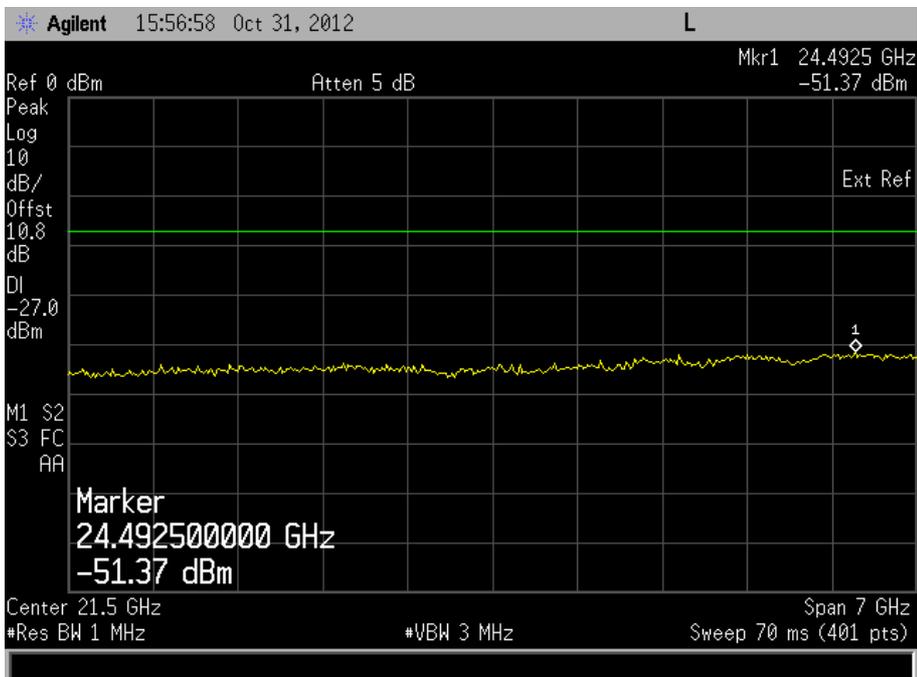


Product Service

12 GHz to 18 GHz



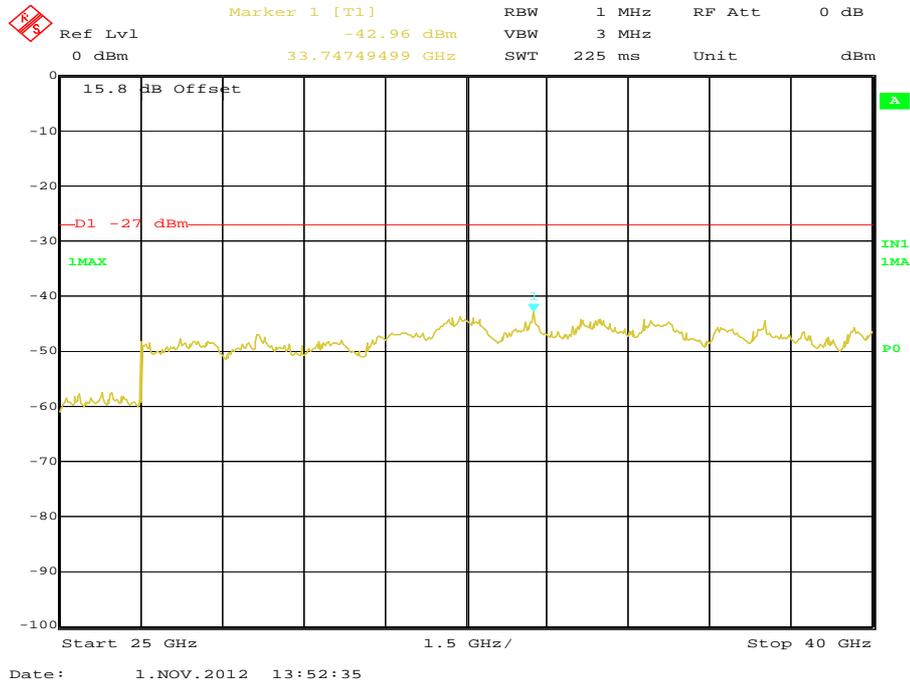
18 GHz to 25 GHz





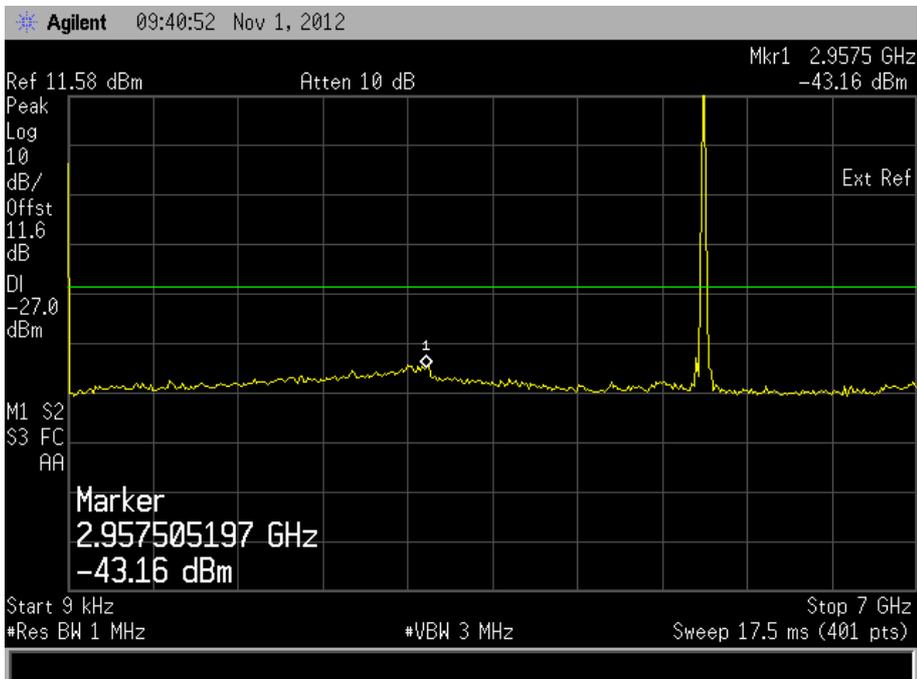
Product Service

25 GHz to 40 GHz



5240 MHz

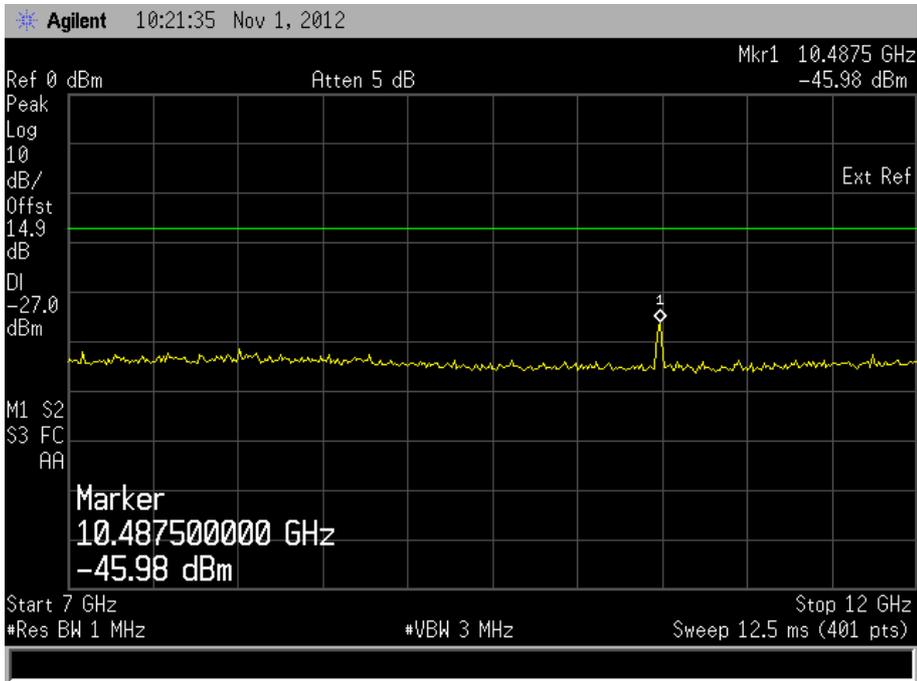
9 kHz to 7 GHz



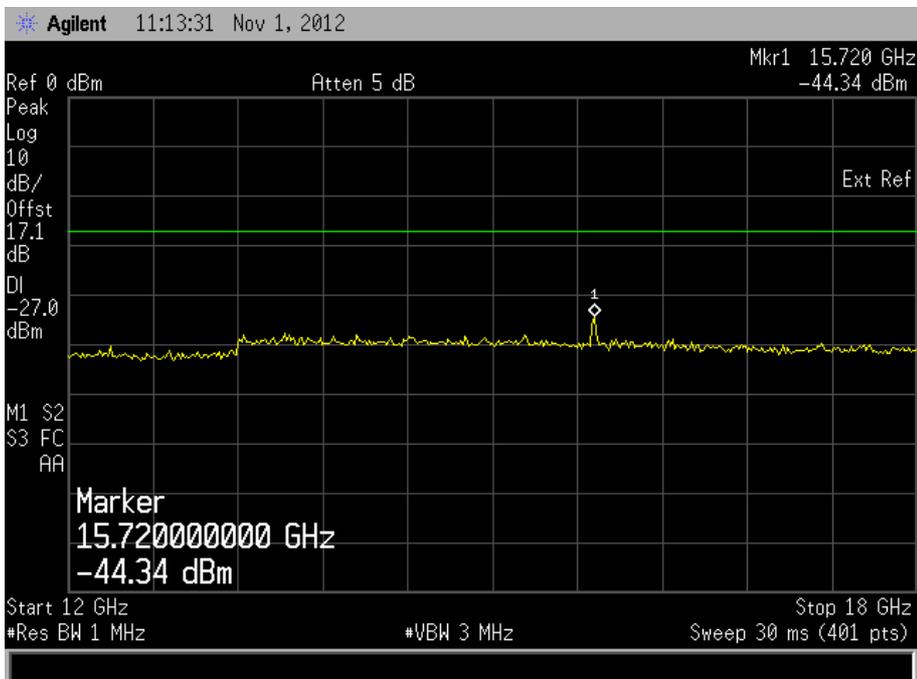


Product Service

7 GHz to 12 GHz



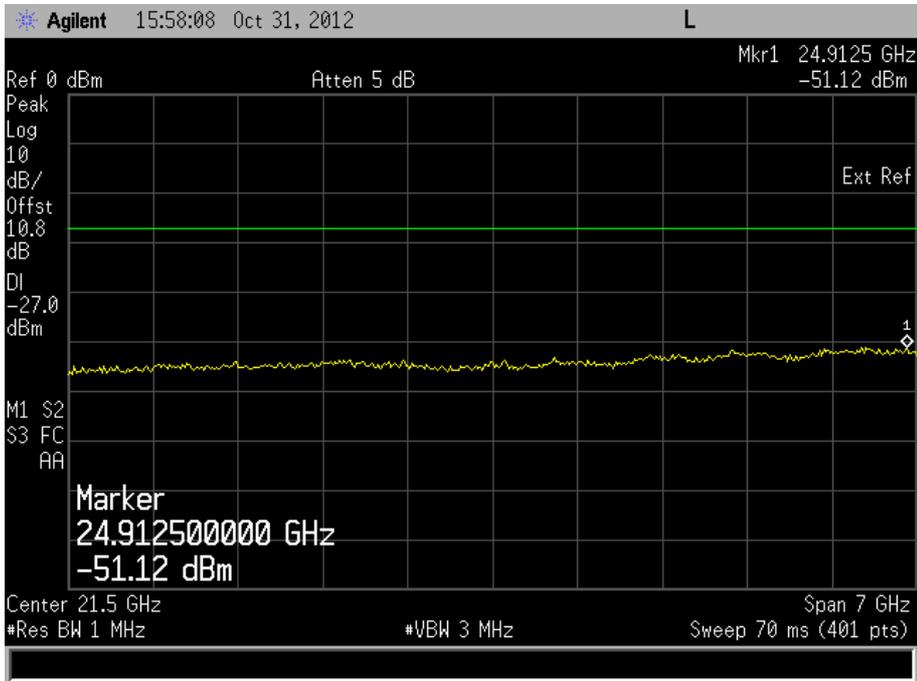
12 GHz to 18 GHz



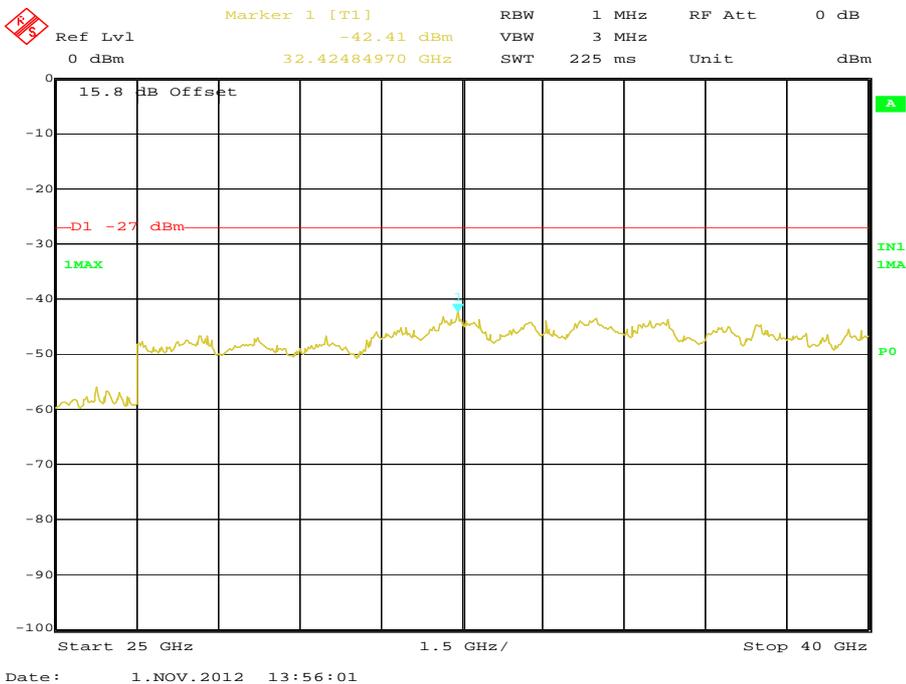


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz



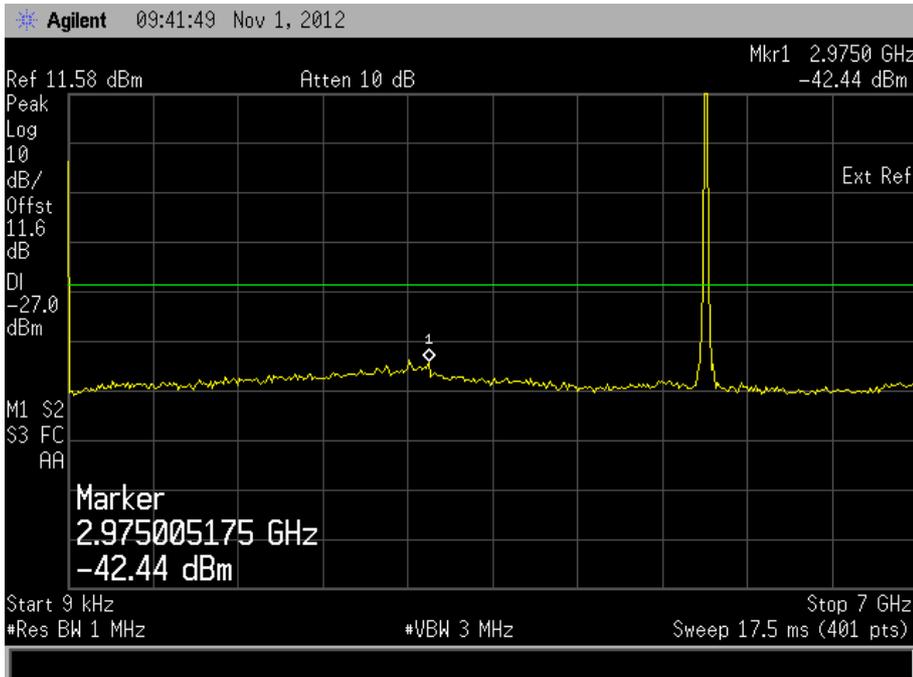


Product Service

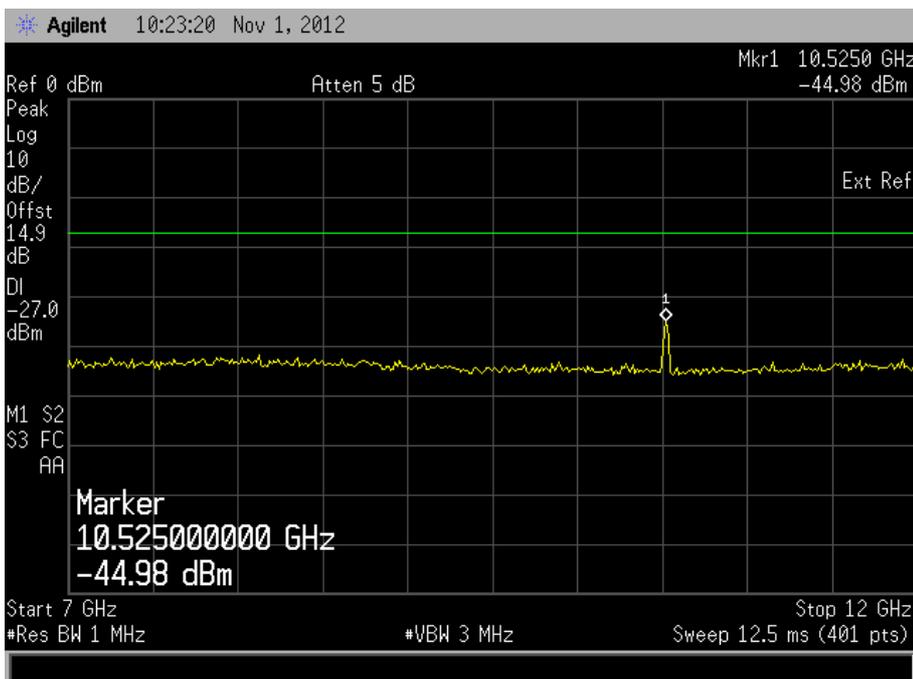
Frequency Band 2

5260 MHz

9 kHz to 7 GHz



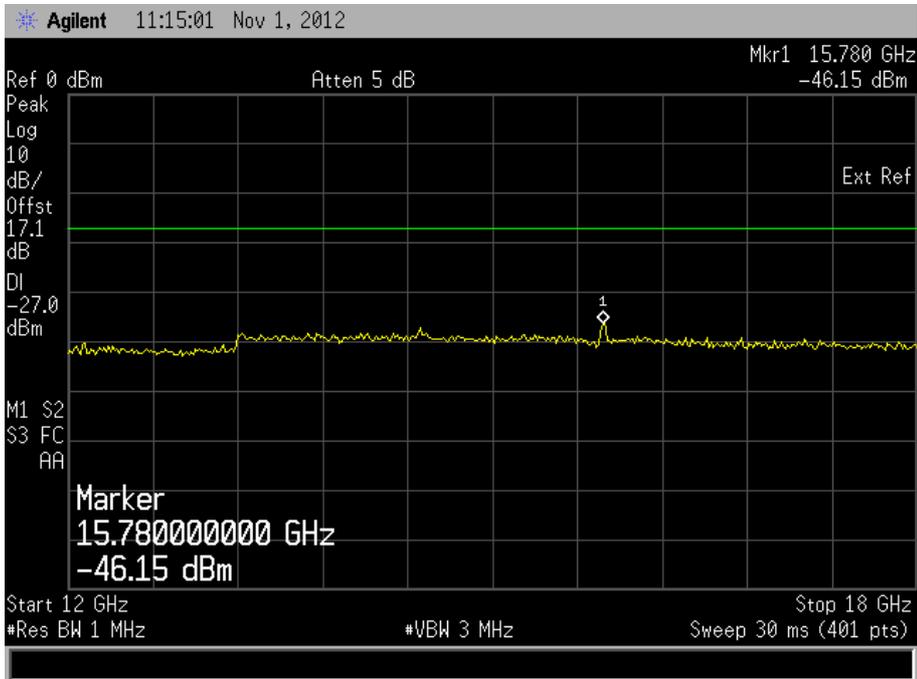
7 GHz to 12 GHz



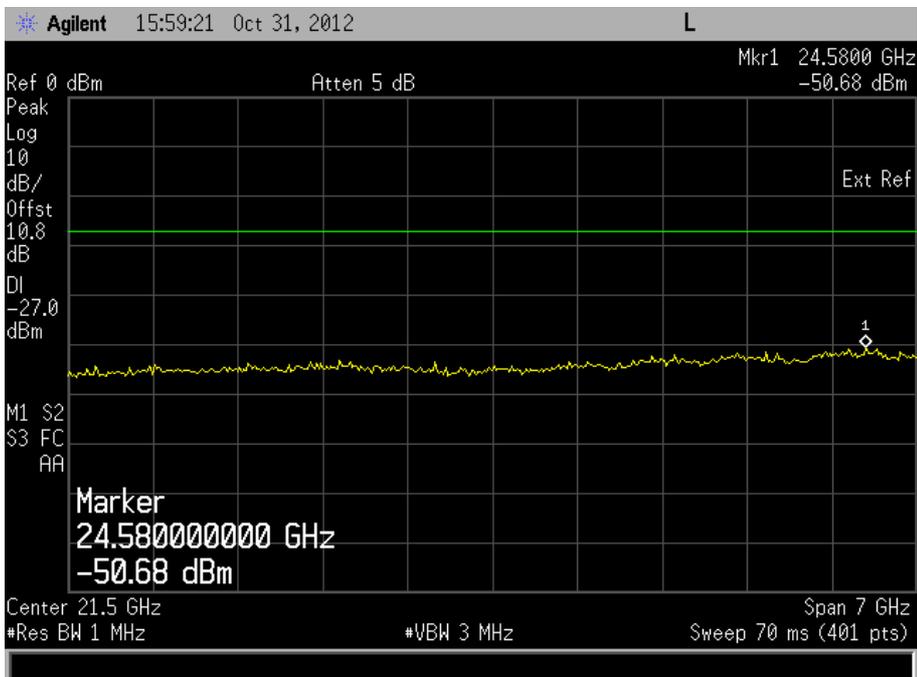


Product Service

12 GHz to 18 GHz



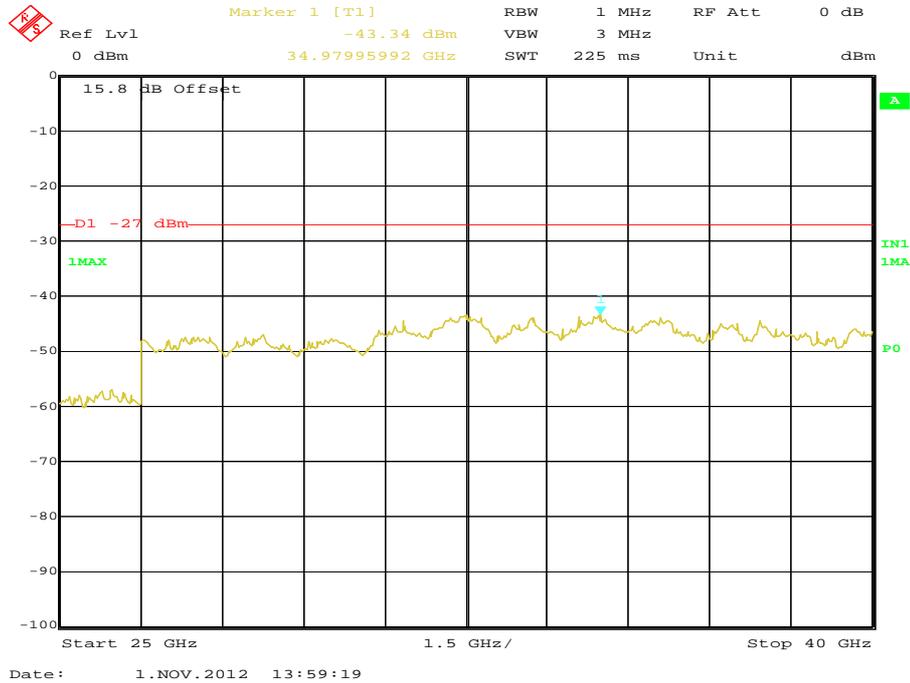
18 GHz to 25 GHz





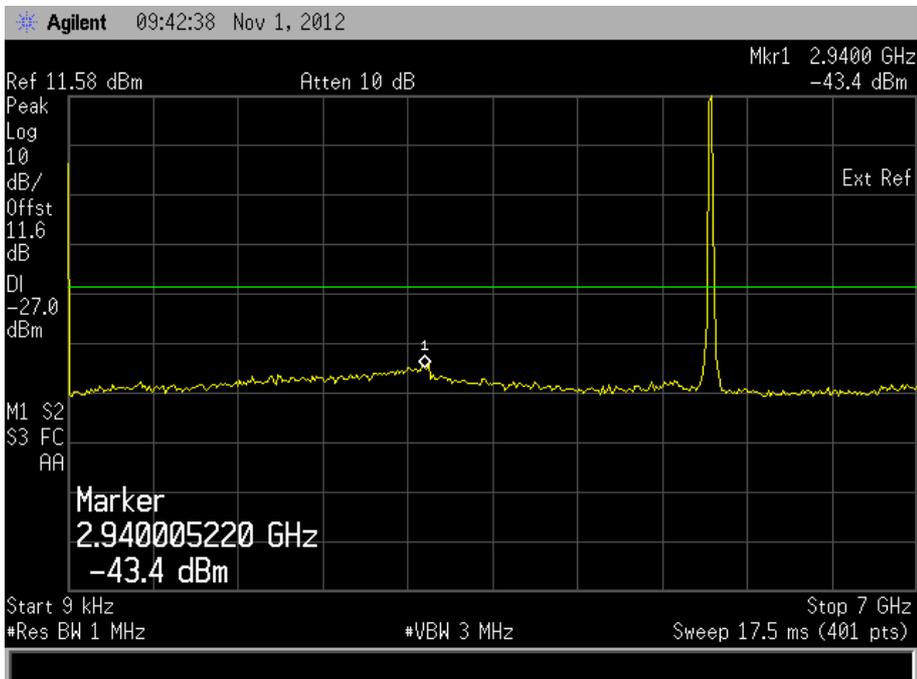
Product Service

25 GHz to 40 GHz



5300 MHz

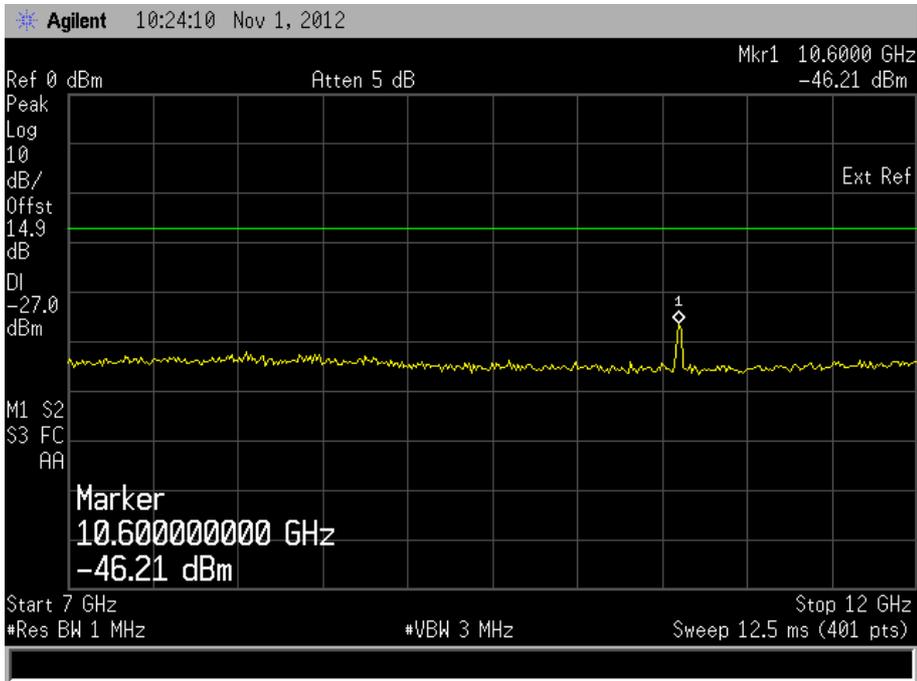
9 kHz to 7 GHz



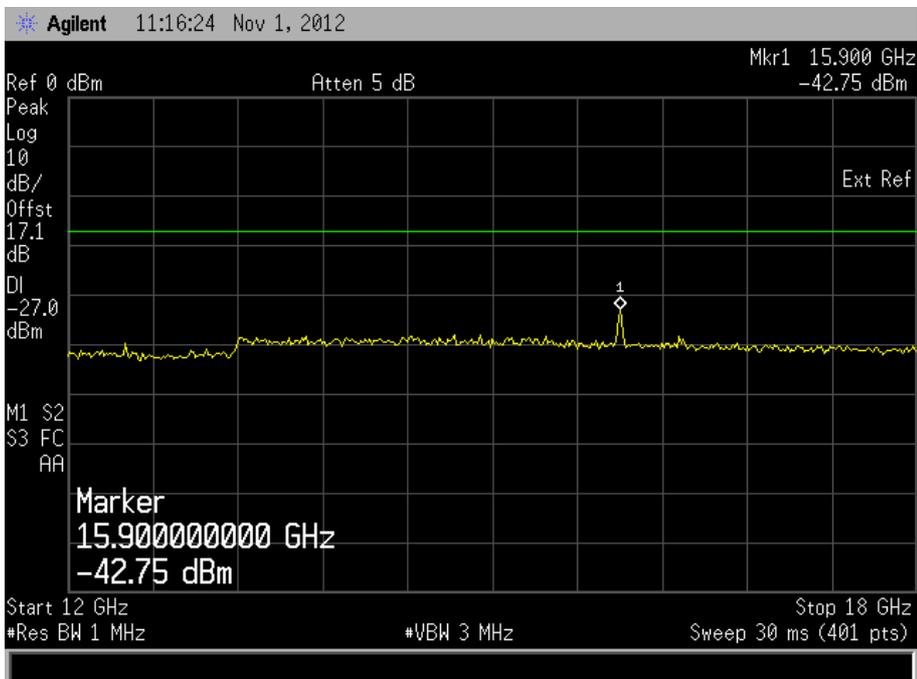


Product Service

7 GHz to 12 GHz



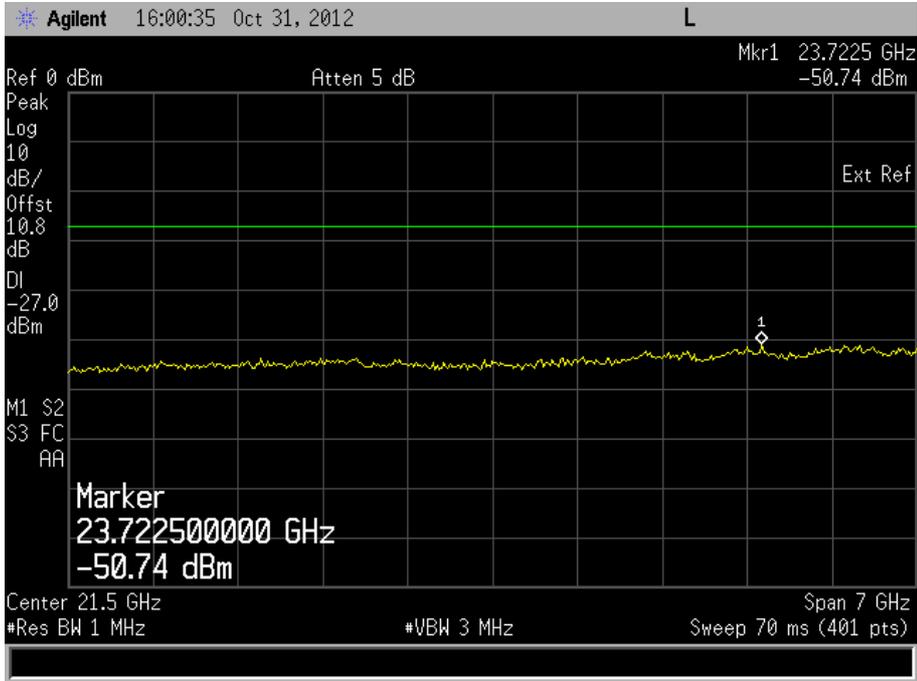
12 GHz to 18 GHz



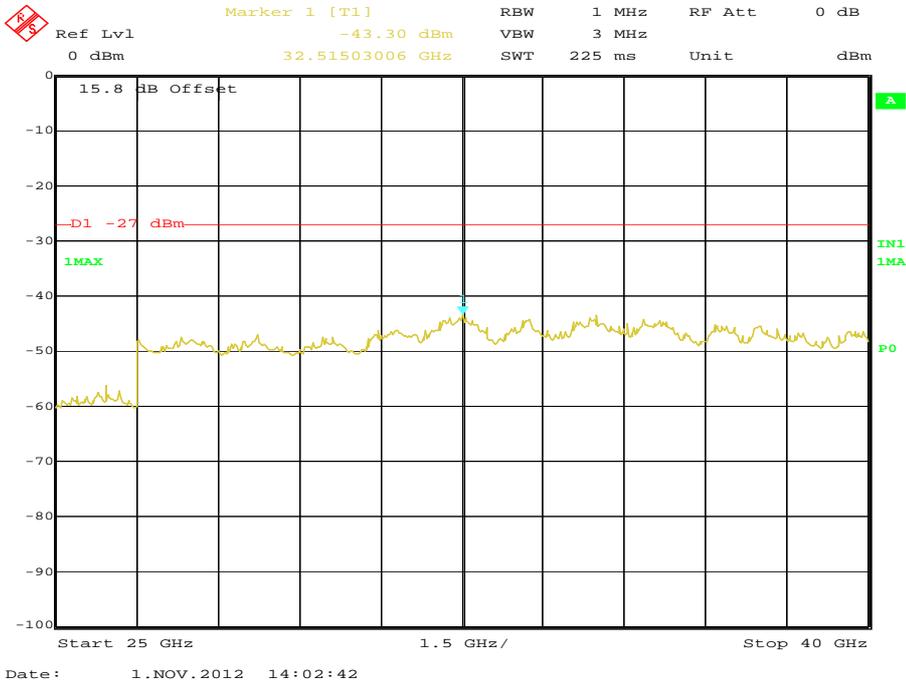


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz

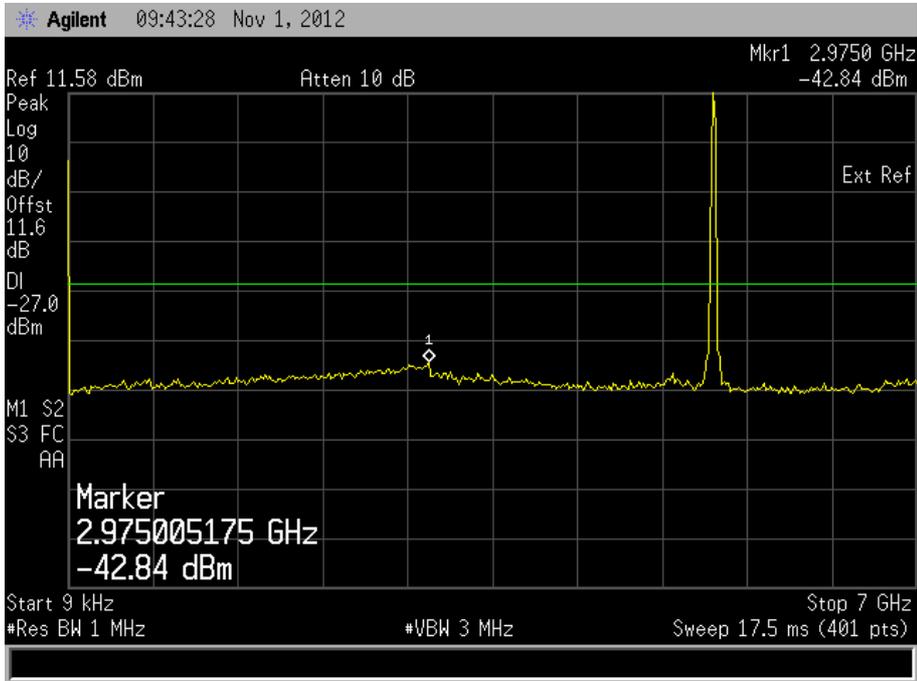




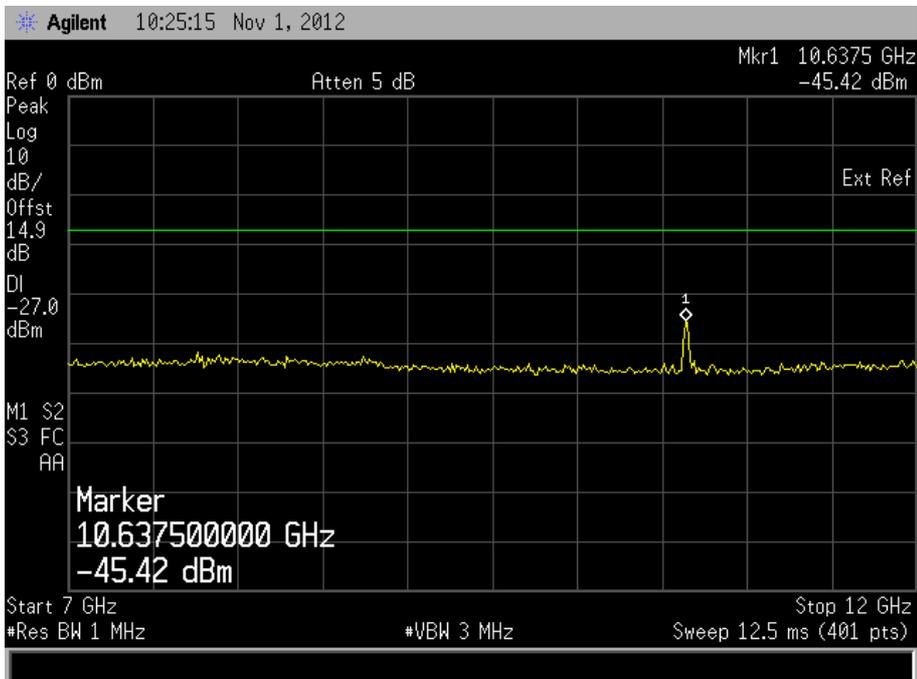
Product Service

5320 MHz

9 kHz to 7 GHz



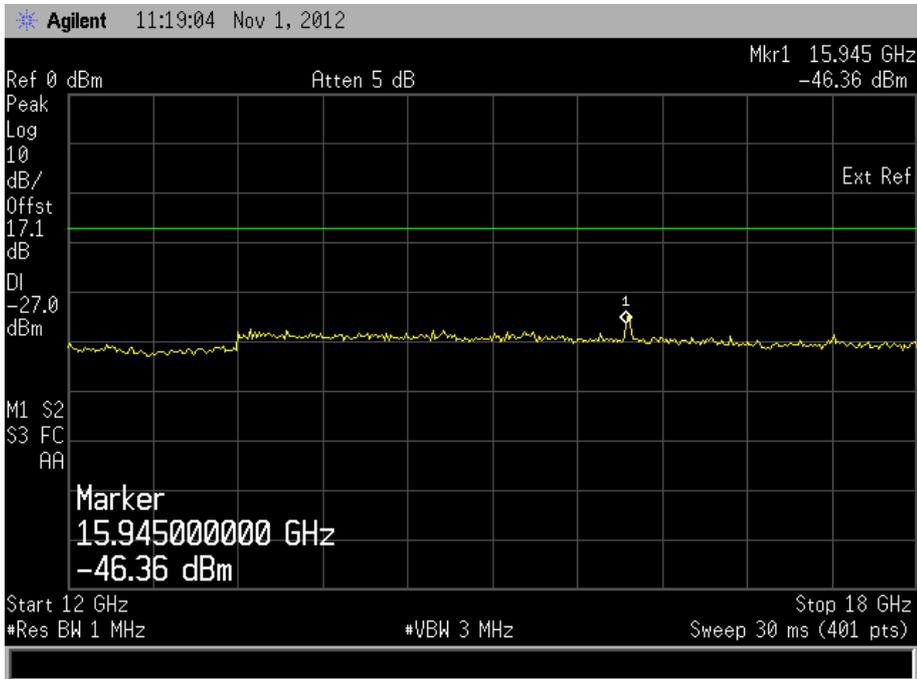
7 GHz to 12 GHz



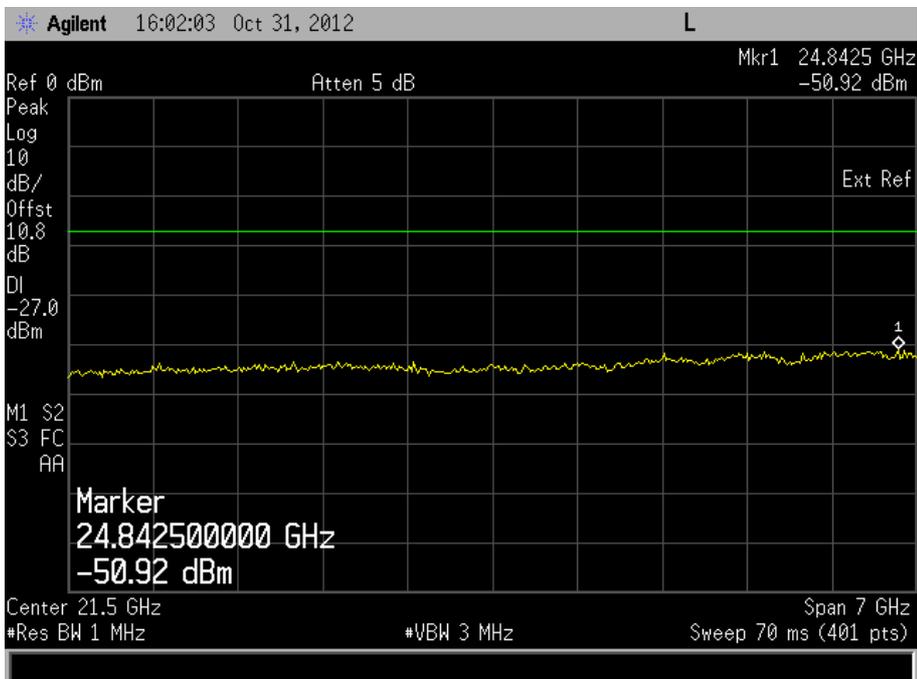


Product Service

12 GHz to 18 GHz



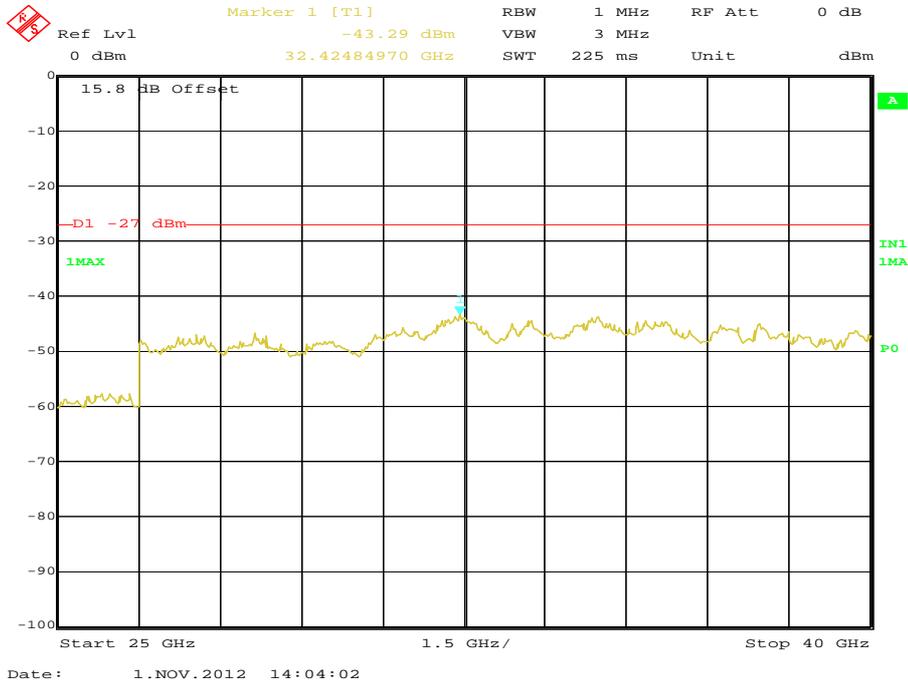
18 GHz to 25 GHz





Product Service

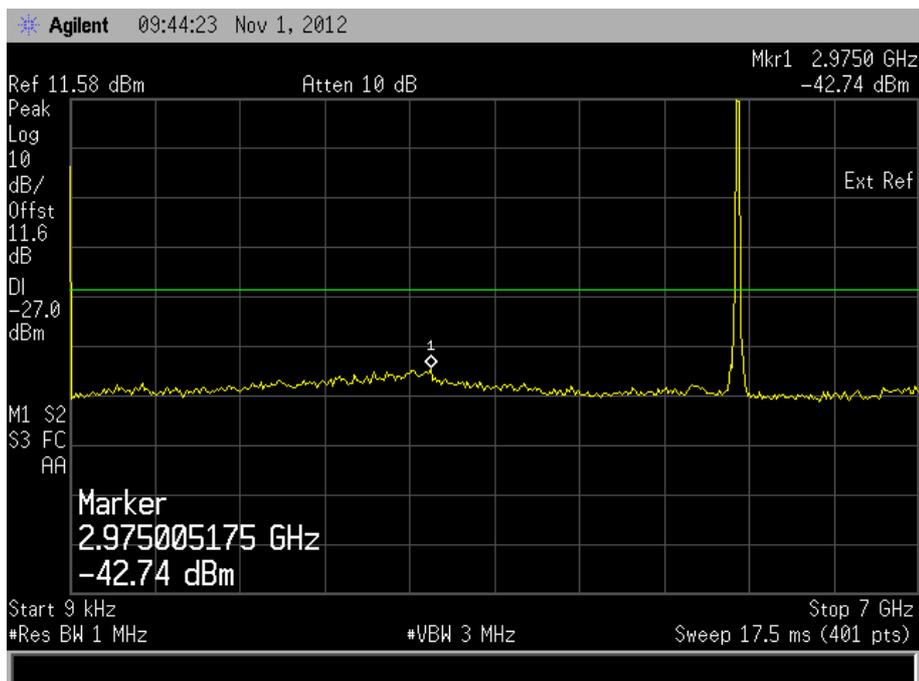
25 GHz to 40 GHz



Frequency Band 3

5500 MHz

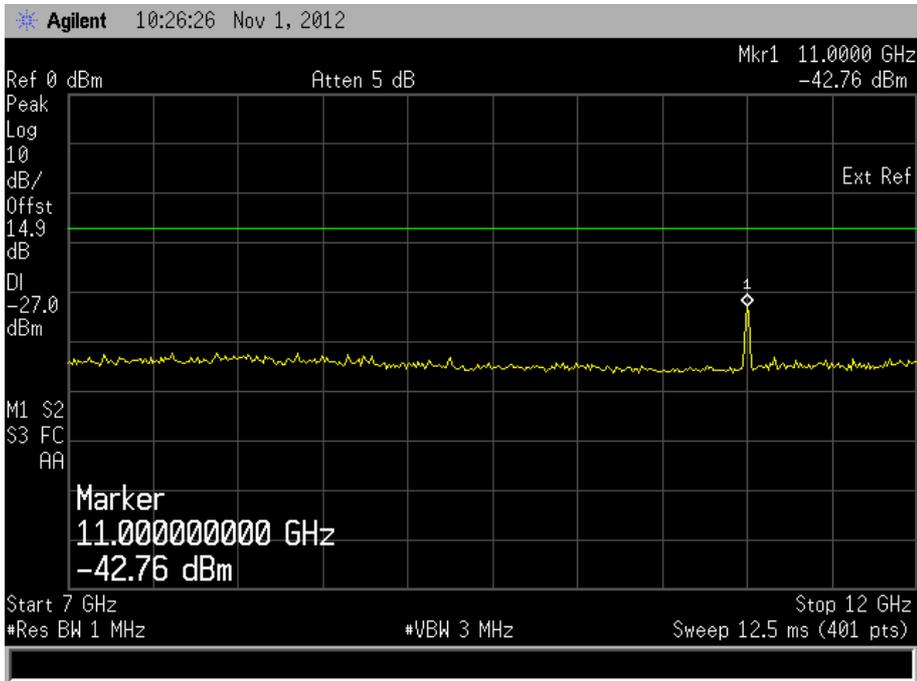
9 kHz to 7 GHz



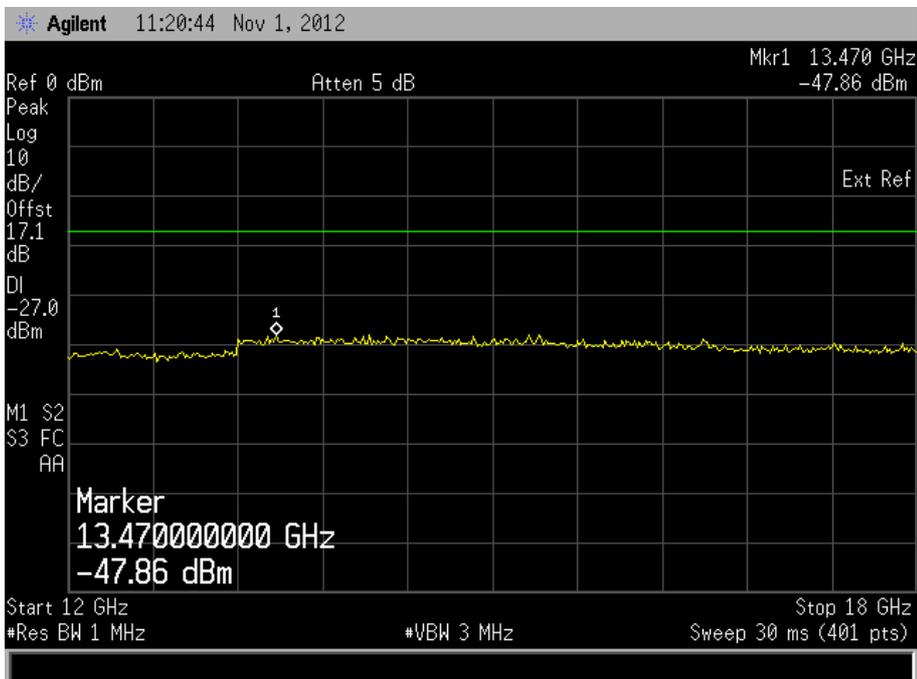


Product Service

7 GHz to 12 GHz



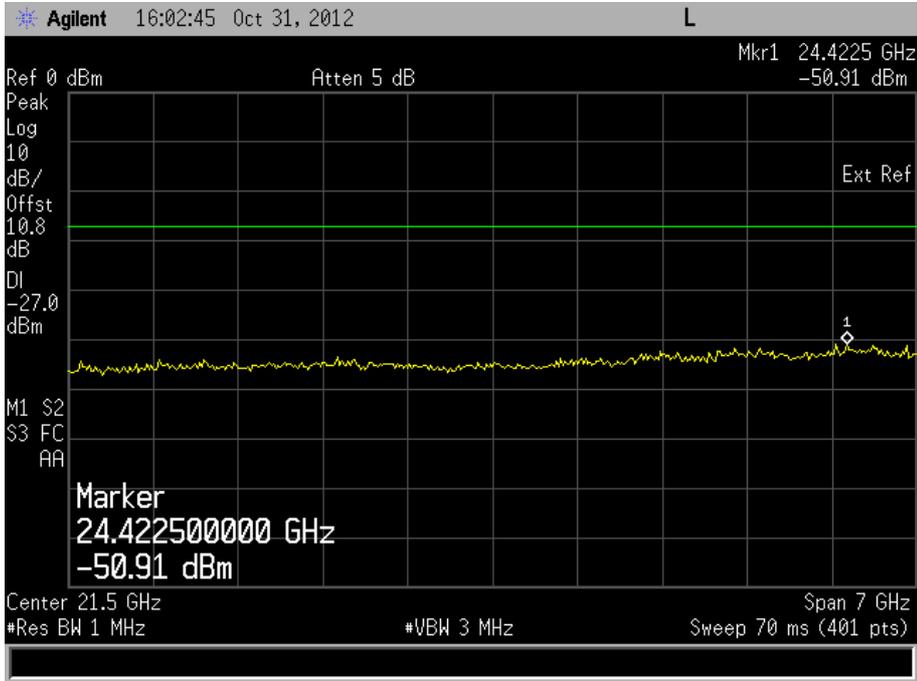
12 GHz to 18 GHz



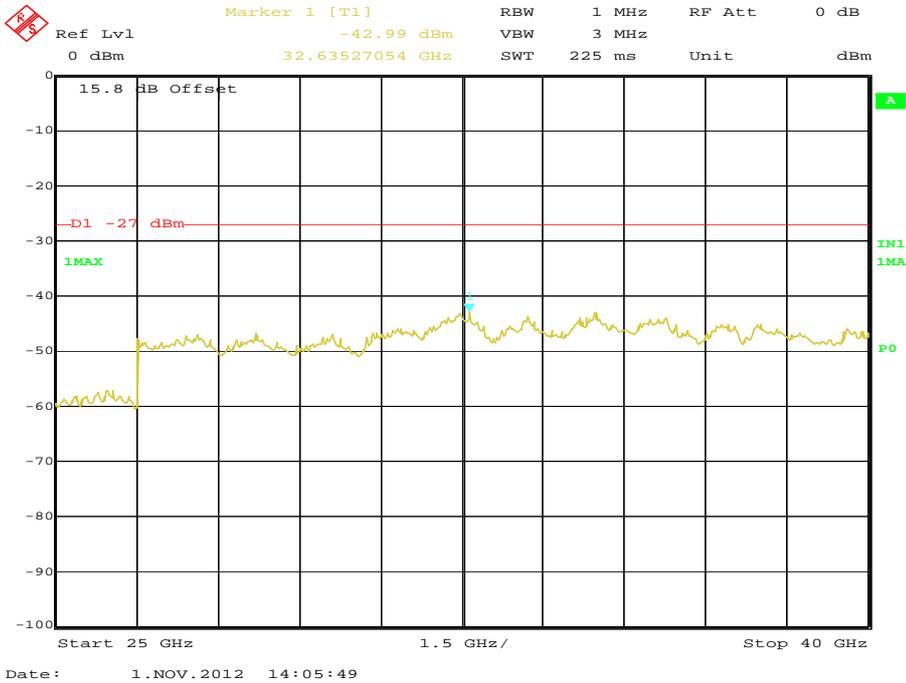


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz

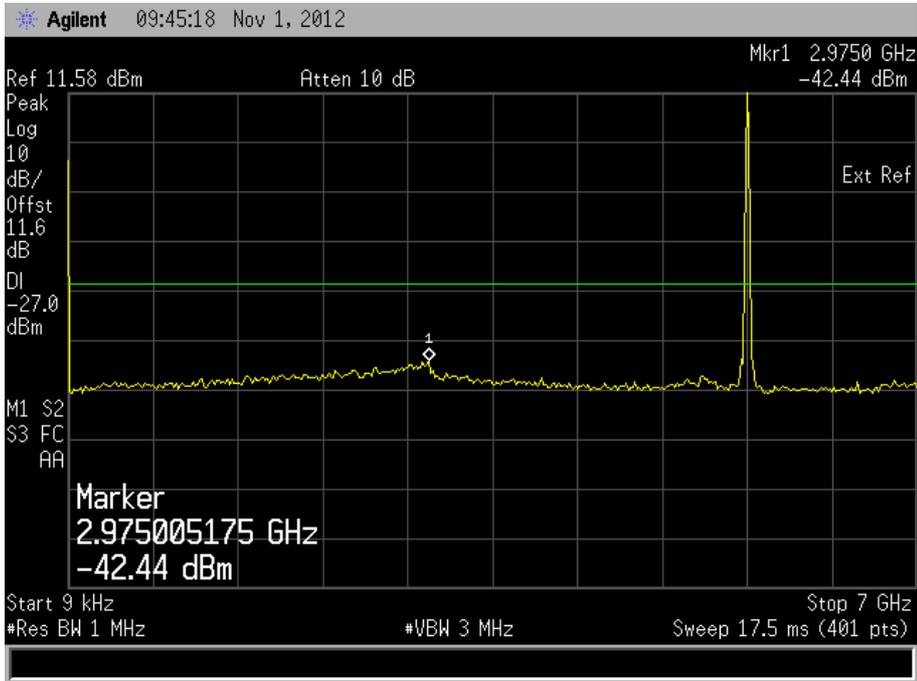




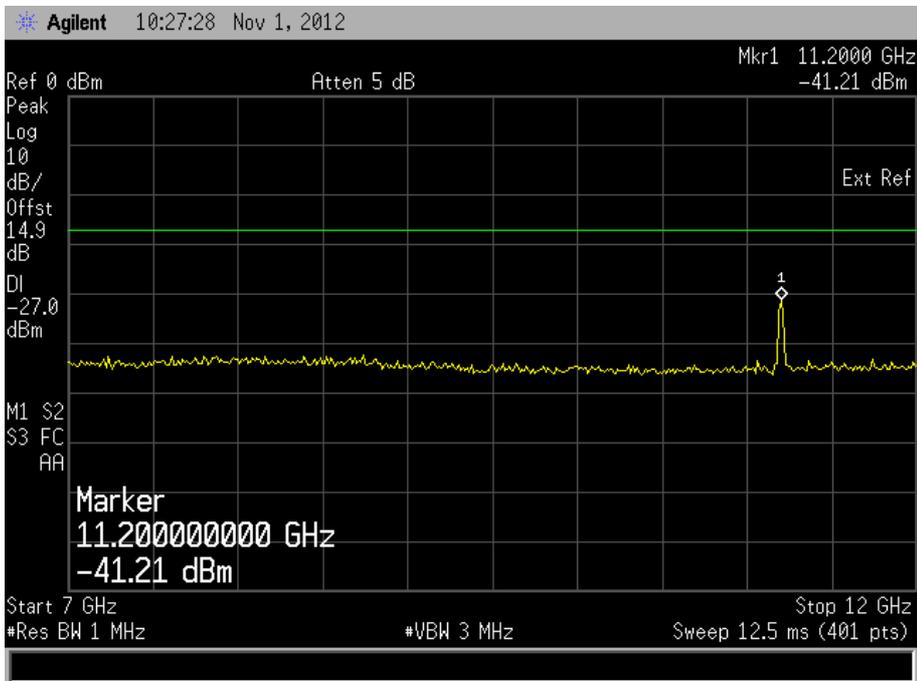
Product Service

5600 MHz

9 kHz to 7 GHz



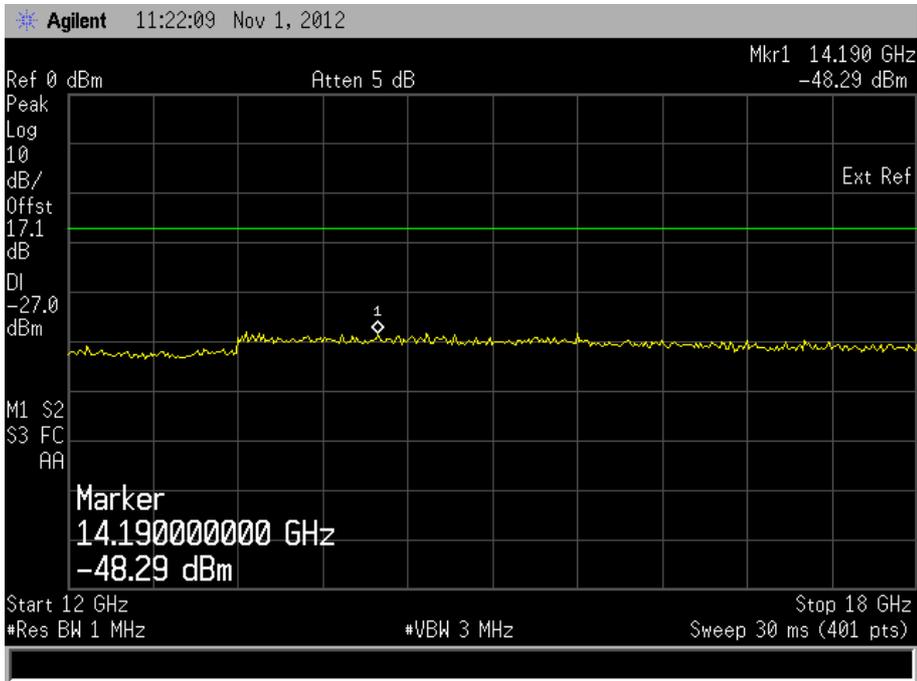
7 GHz to 12 GHz



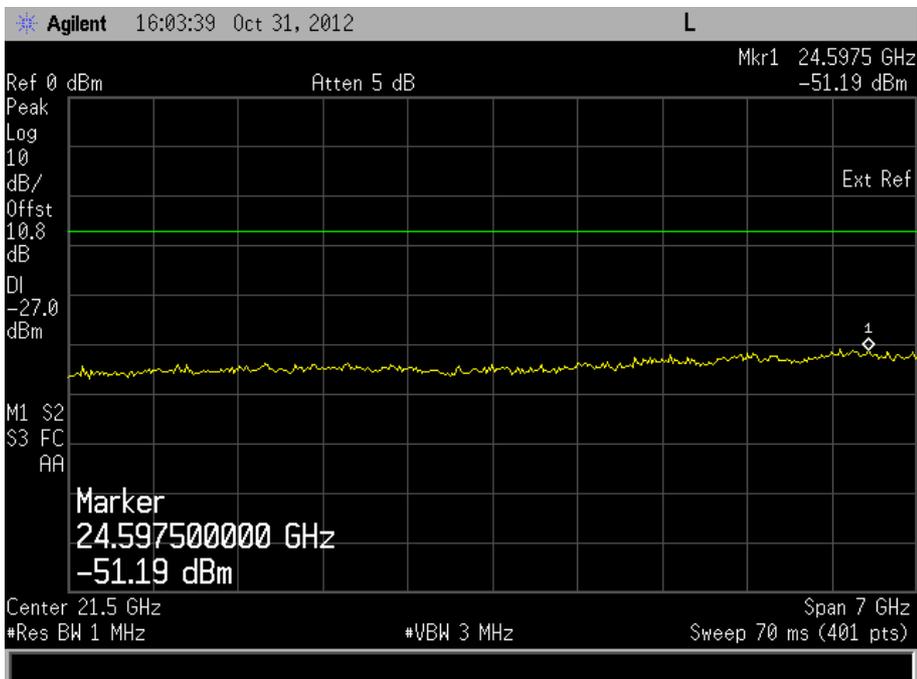


Product Service

12 GHz to 18 GHz



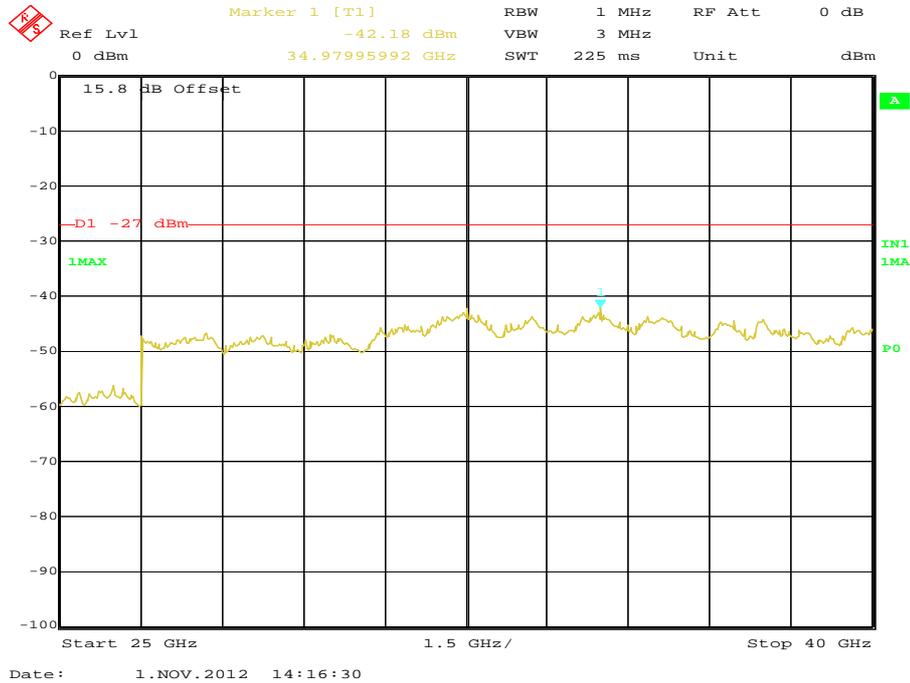
18 GHz to 25 GHz





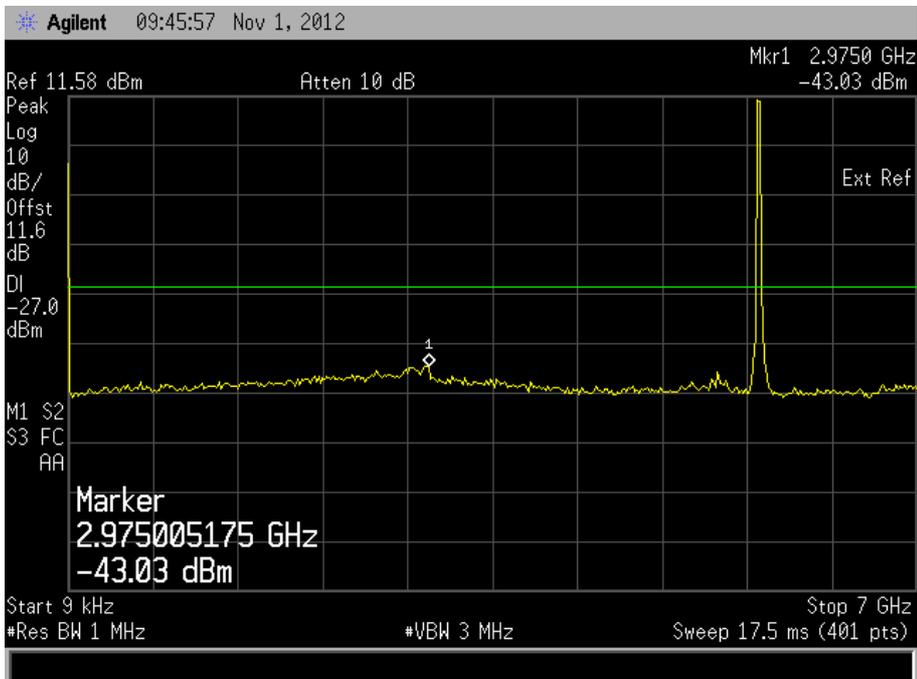
Product Service

25 GHz to 40 GHz



5700 MHz

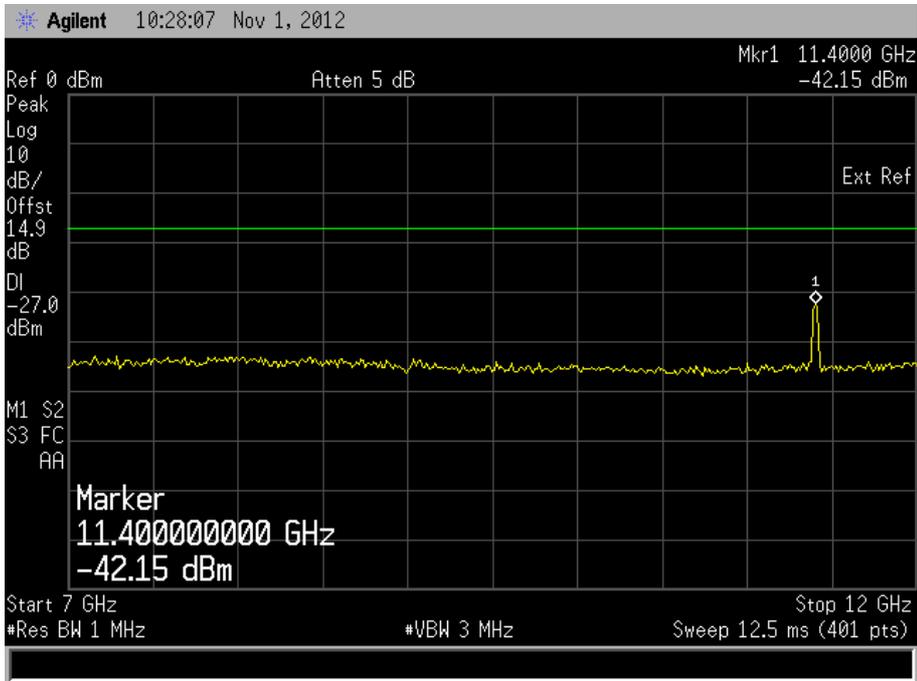
9 kHz to 7 GHz



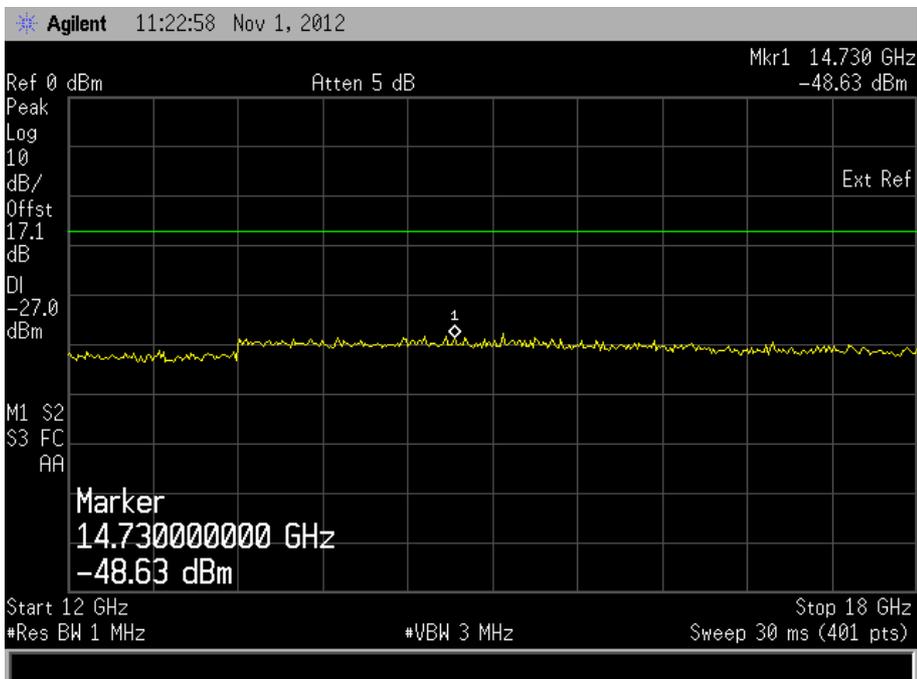


Product Service

7 GHz to 12 GHz



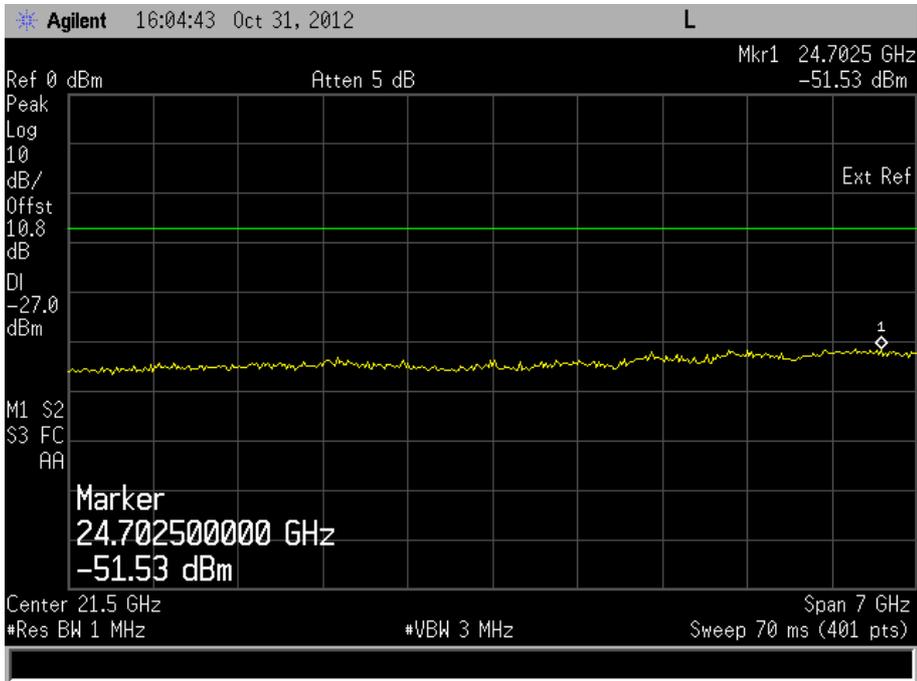
12 GHz to 18 GHz



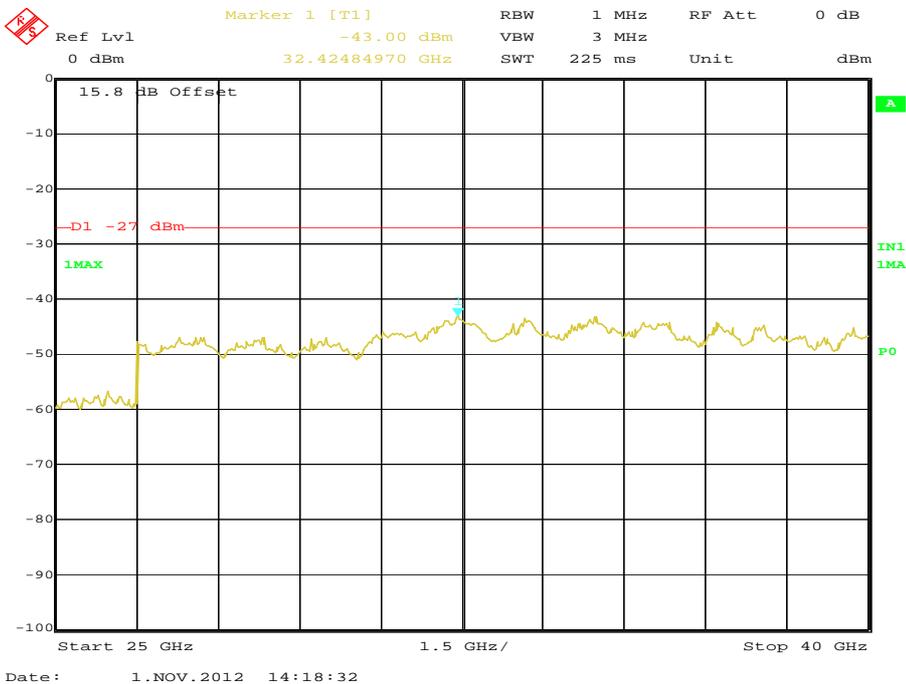


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz





Product Service

Limit Clause

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB.



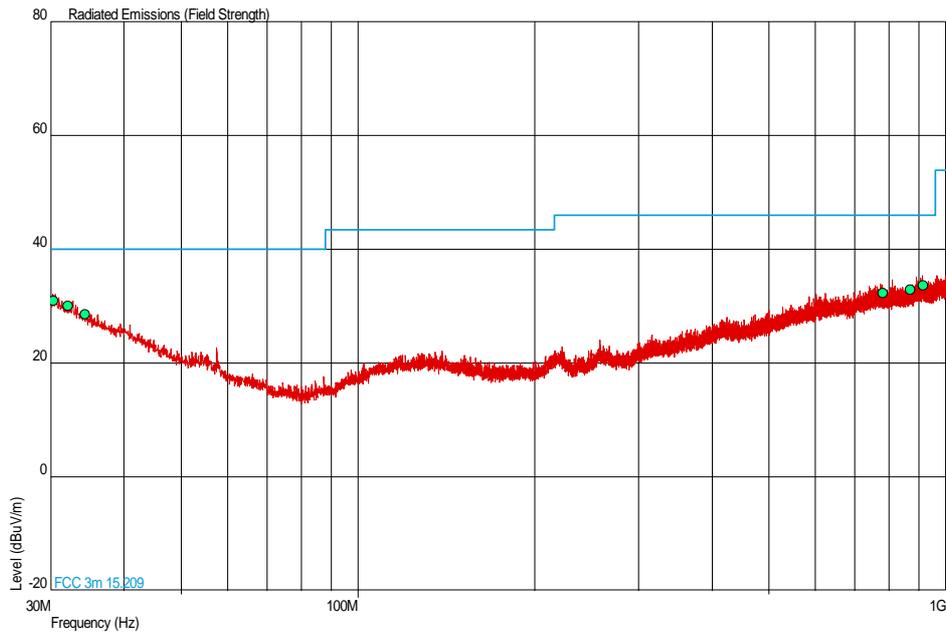
Product Service

Spurious Radiated Emissions

Frequency Band 1

5180 MHz

30 MHz to 1 GHz



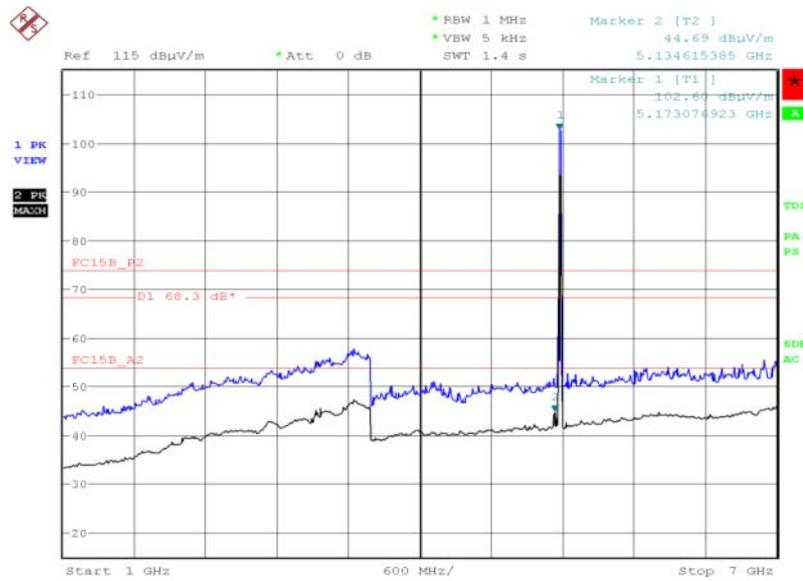
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.371	31.0	35.5	40.0	100	-9.0	64.5	106	1.66	Vertical
32.160	30.0	31.6	40.0	100	-10.0	68.4	181	1.00	Horizontal
34.385	28.5	26.6	40.0	100	-11.5	73.4	265	1.51	Horizontal
781.420	32.3	41.2	46.0	200	-13.7	158.8	299	1.00	Horizontal
871.333	32.9	44.2	46.0	200	-13.1	155.8	32	1.00	Horizontal
915.076	33.7	48.4	46.0	200	-12.3	151.6	204	1.00	Vertical



1GHz to 40GHz

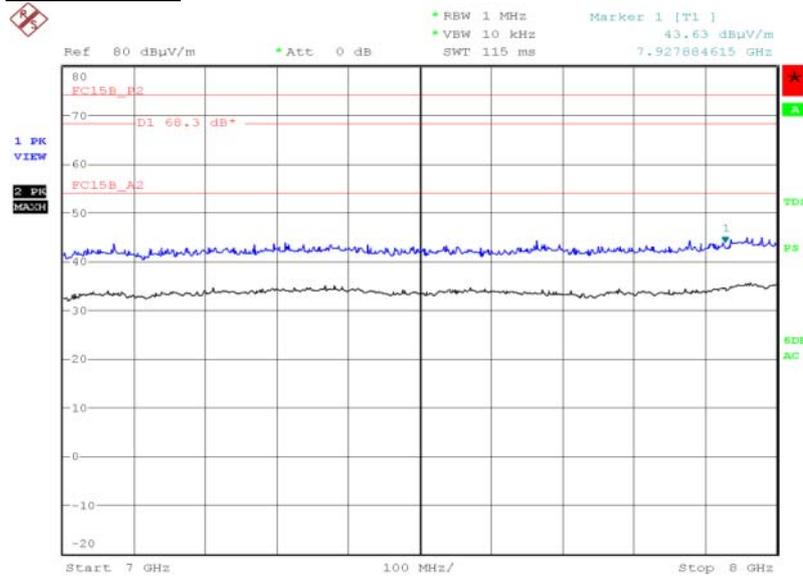
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.119	Horizontal	128	014	55.05	45.10
5.127	Horizontal	128	014	56.10	44.68

1GHz to 7GHz



Date: 16.OCT.2012 18:49:49

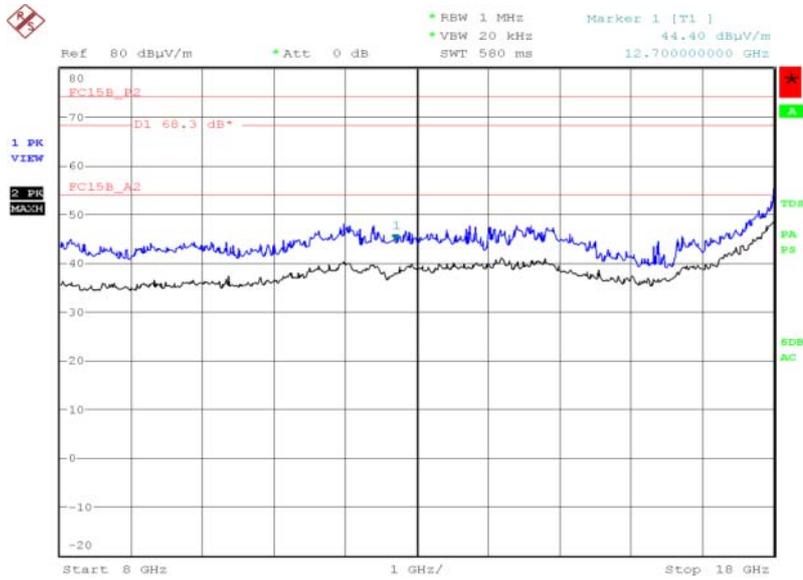
7GHz to 8GHz



Date: 21.OCT.2012 07:55:10

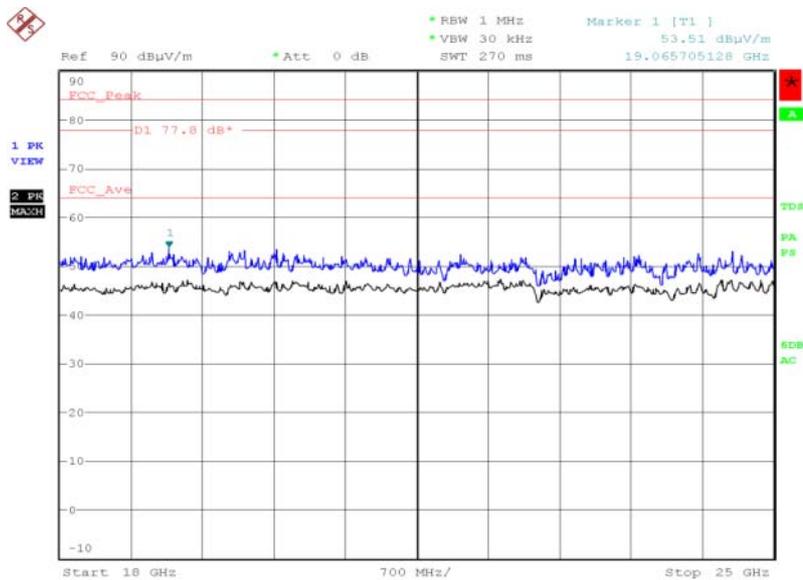


8GHz to 18GHz



Date: 21.OCT.2012 12:11:06

18GHz to 25GHz

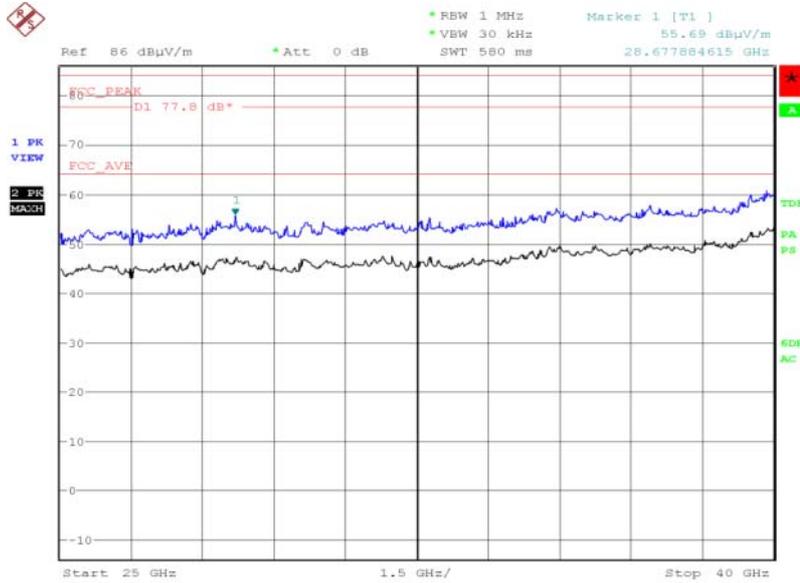


Date: 29.OCT.2012 23:13:38



Product Service

25GHz to 40GHz

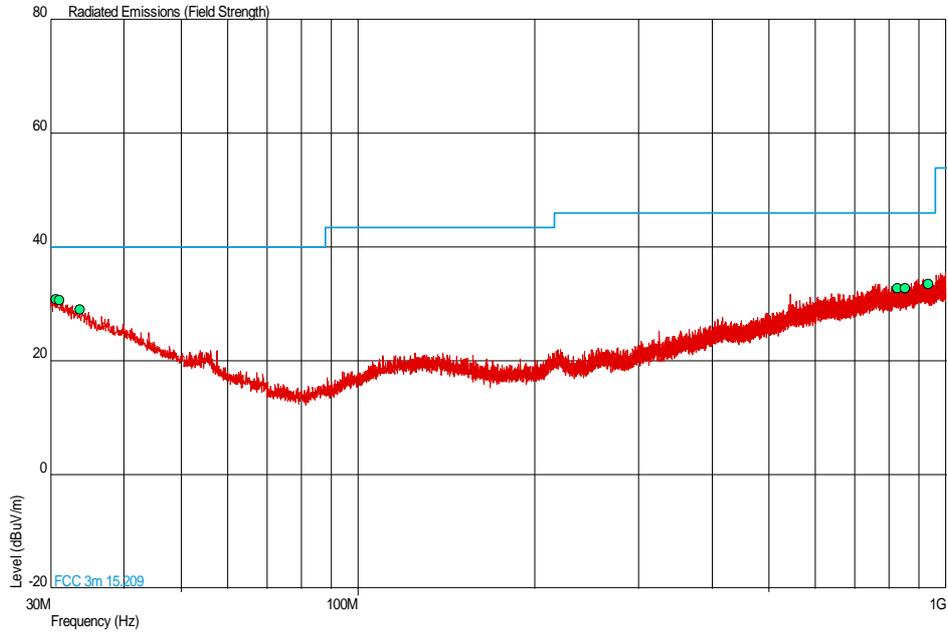


Date: 30.OCT.2012 17:31:49



5200 MHz

30 MHz to 1 GHz



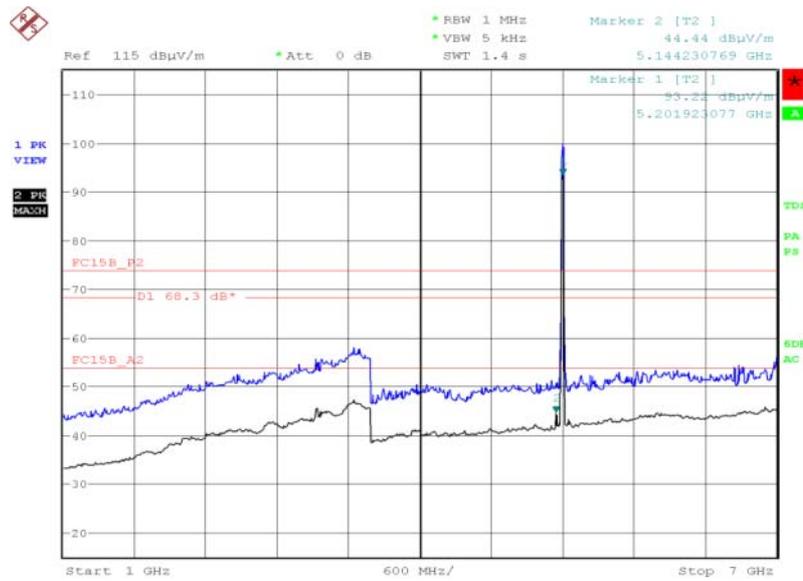
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.679	30.8	34.7	40.0	100	-9.2	65.3	0	1.00	Horizontal
31.116	30.7	34.3	40.0	100	-9.3	65.7	90	1.00	Vertical
33.735	29.0	28.2	40.0	100	-11.0	71.8	0	1.00	Horizontal
826.370	32.7	43.2	46.0	200	-13.3	156.8	90	1.00	Vertical
852.706	32.8	43.7	46.0	200	-13.2	156.3	0	1.00	Horizontal
932.343	33.4	46.8	46.0	200	-12.6	153.2	90	1.00	Horizontal



1GHz to 40GHz

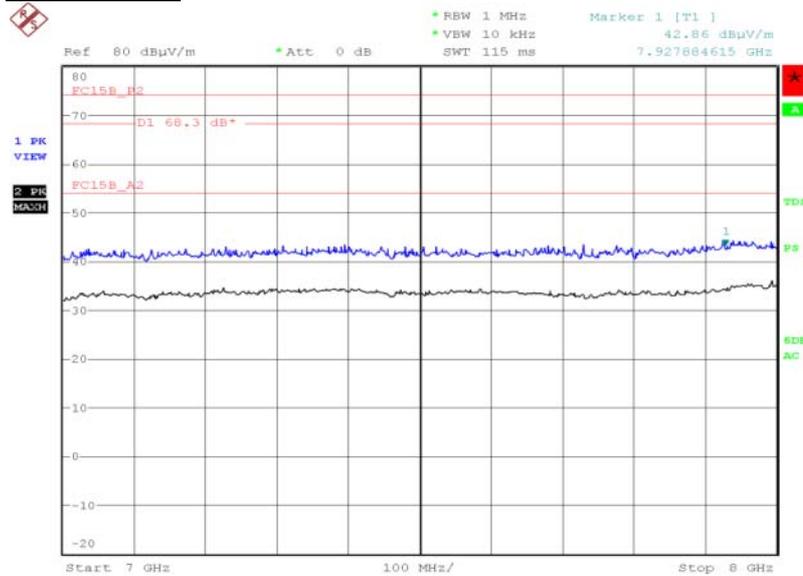
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.140	Horizontal	150	017	54.56	44.83
5.147	Horizontal	150	017	46.64	45.13

1GHz to 7GHz



Date: 16.OCT.2012 19:24:05

7GHz to 8GHz

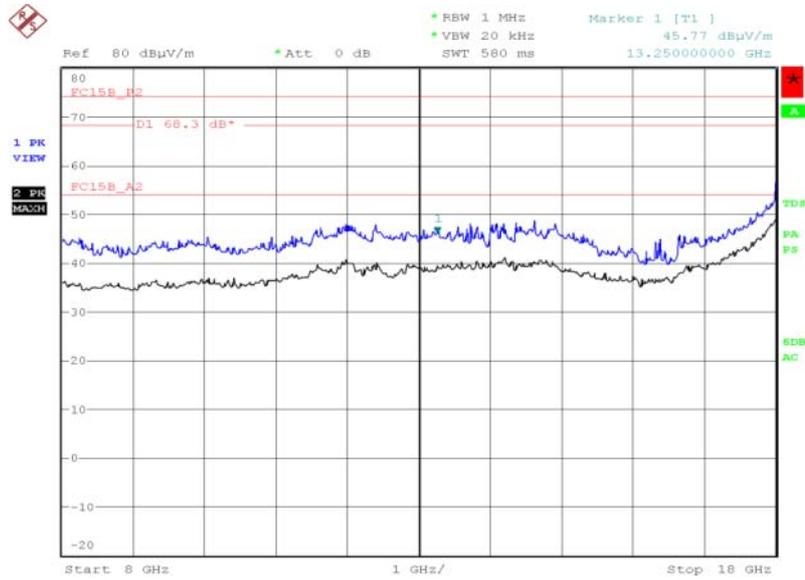


Date: 21.OCT.2012 07:59:01



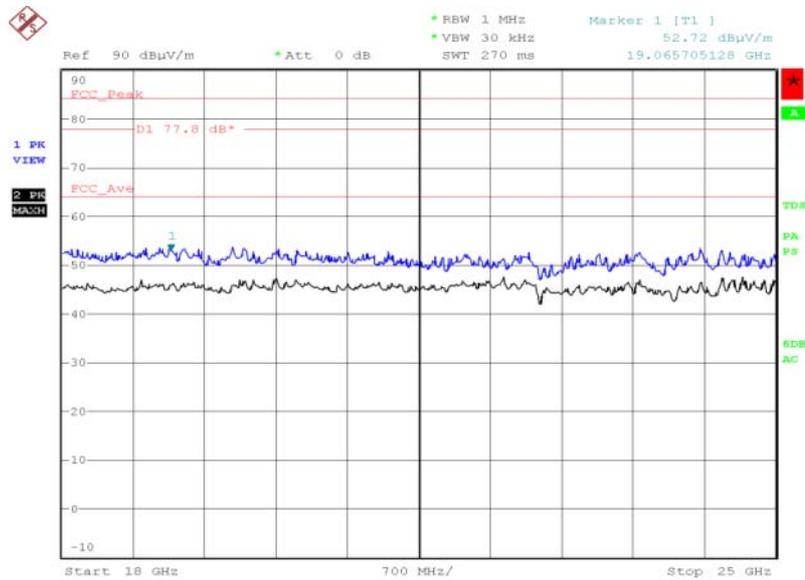
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 12:18:30

18GHz to 25GHz

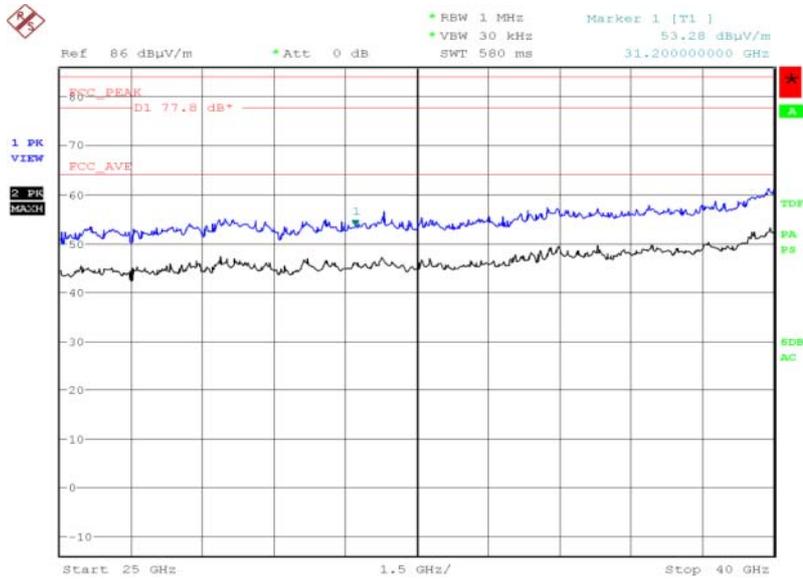


Date: 29.OCT.2012 23:16:49



Product Service

25GHz to 40GHz



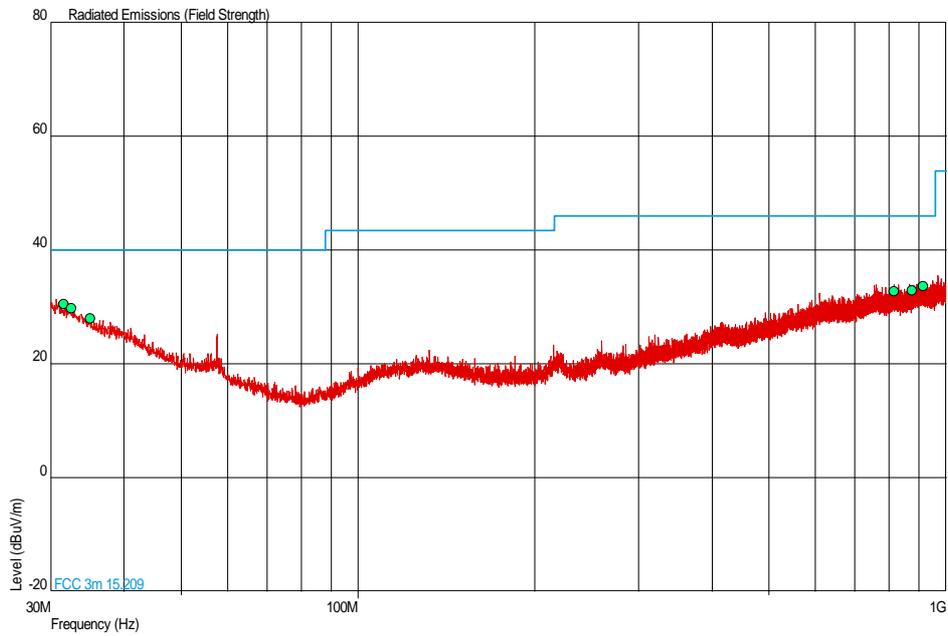
Date: 30.OCT.2012 17:45:21



Product Service

5240 MHz

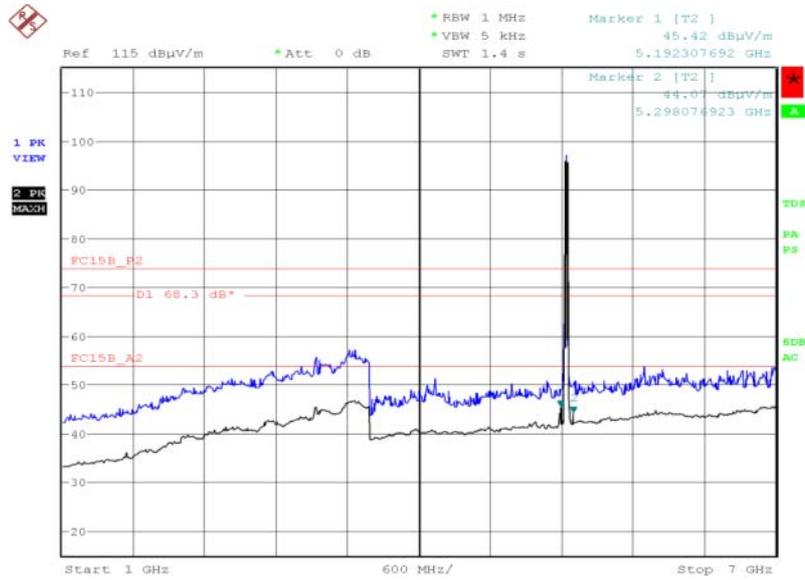
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
31.552	30.5	33.5	40.0	100	-9.5	66.5	90	1.00	Horizontal
32.619	29.8	30.9	40.0	100	-10.2	69.1	0	1.00	Vertical
35.093	28.0	25.1	40.0	100	-12.0	74.9	90	1.00	Vertical
816.913	32.7	43.2	46.0	200	-13.3	156.8	180	1.00	Horizontal
874.919	32.9	44.2	46.0	200	-13.1	155.8	0	1.00	Vertical
916.047	33.7	48.4	46.0	200	-12.3	151.6	0	1.00	Horizontal

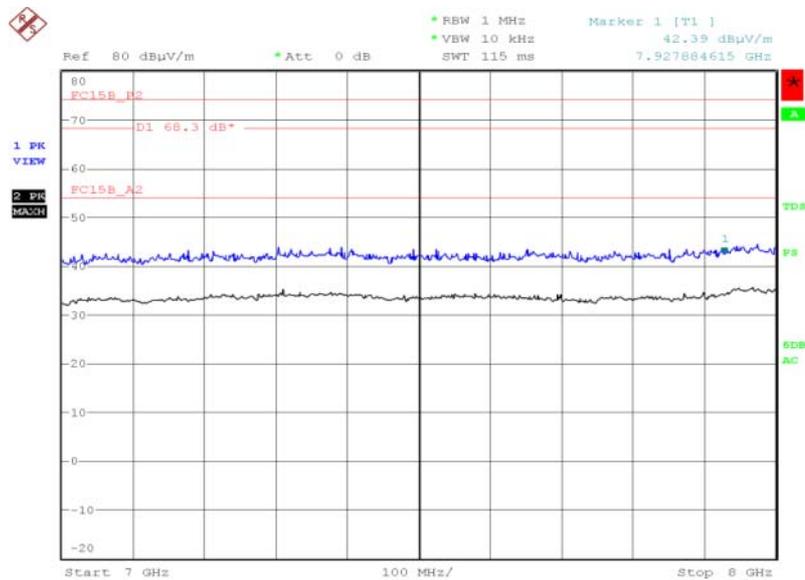


1GHz to 7GHz



Date: 16.OCT.2012 20:16:14

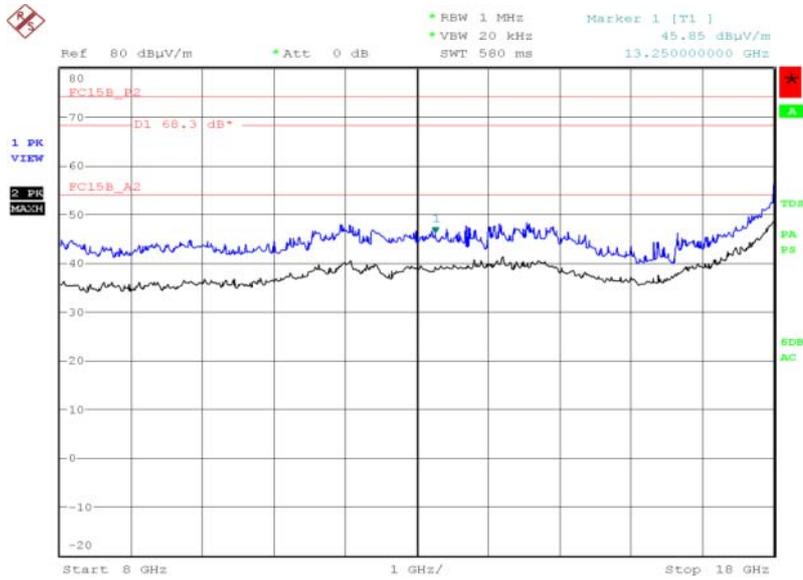
7GHz to 8GHz



Date: 21.OCT.2012 08:03:00

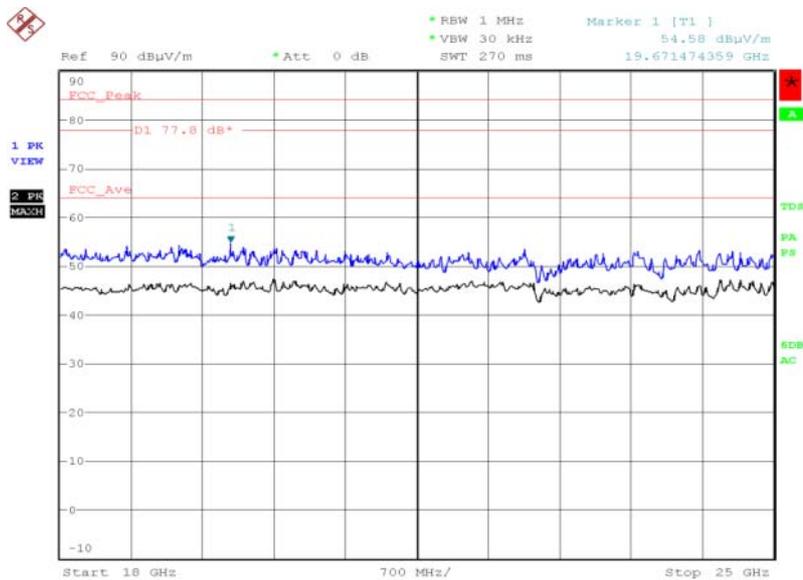


8GHz to 18GHz



Date: 21.OCT.2012 12:25:37

18GHz to 25GHz

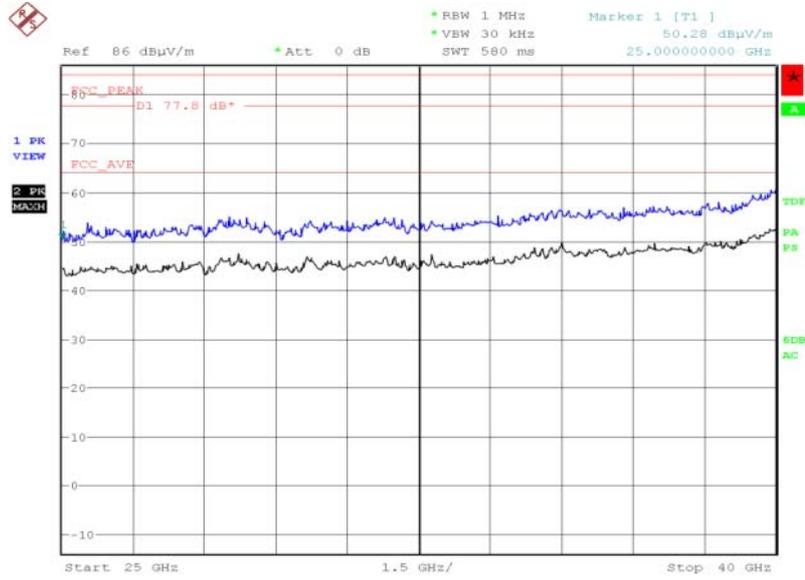


Date: 29.OCT.2012 23:18:47



Product Service

25GHz to 40GHz



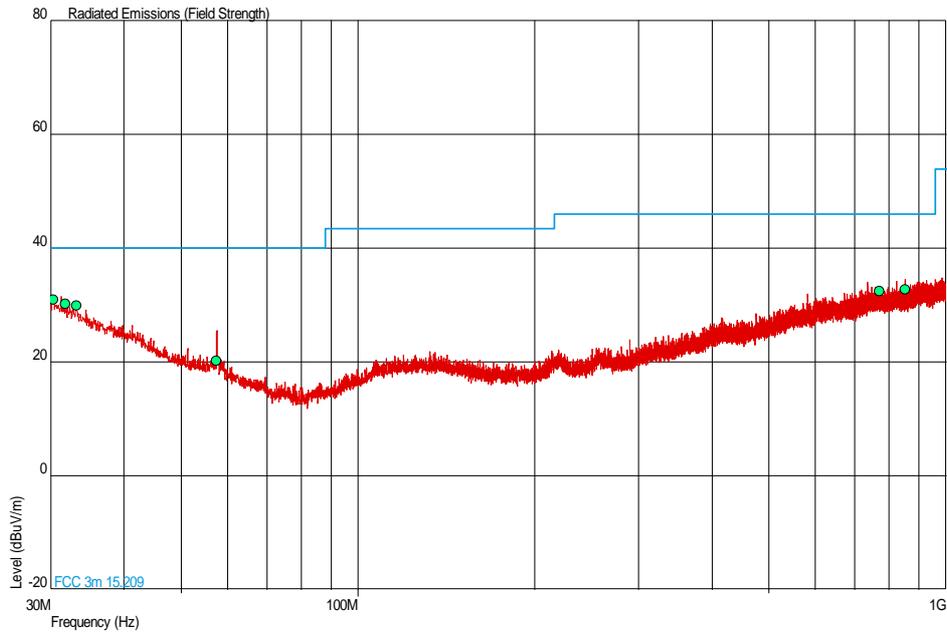
Date: 30.OCT.2012 17:51:04



Frequency Band 2

5260 MHz

30 MHz to 1 GHz

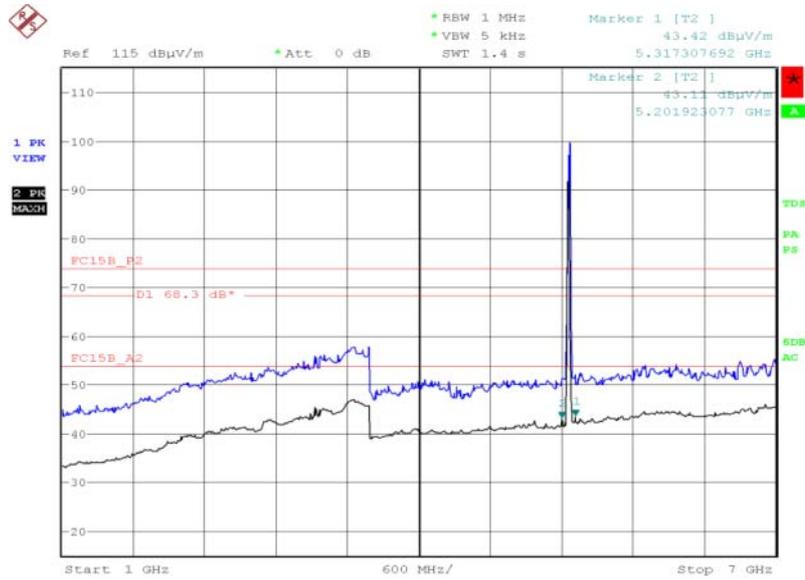


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.388	31.0	35.5	40.0	100	-9.0	64.5	180	1.00	Vertical
31.795	30.2	32.4	40.0	100	-9.8	67.6	180	1.00	Horizontal
33.250	29.9	31.3	40.0	100	-10.1	68.7	0	1.00	Vertical
57.500	20.2	10.2	40.0	100	-19.8	89.8	90	1.00	Vertical
770.207	32.4	41.7	46.0	200	-13.6	158.3	0	1.00	Horizontal
852.706	32.8	43.7	46.0	200	-13.2	156.3	0	1.00	Horizontal



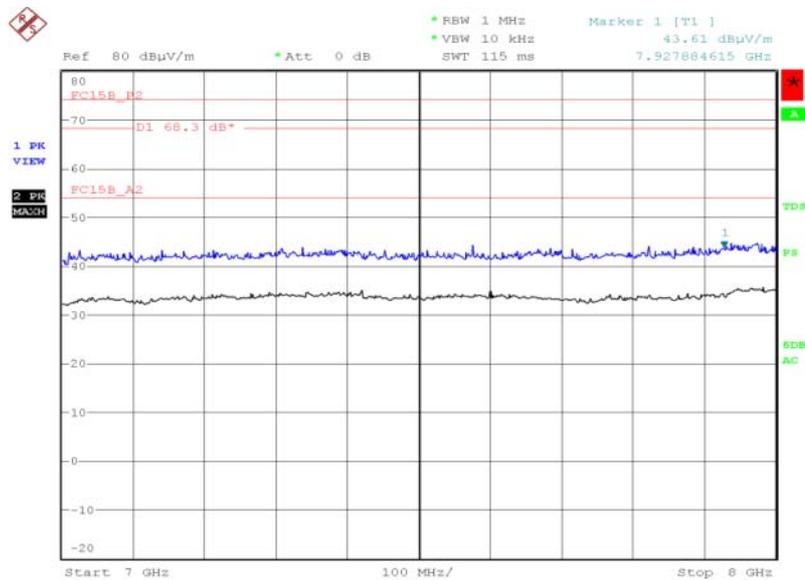
Product Service

1GHz to 7GHz



Date: 16.OCT.2012 20:47:38

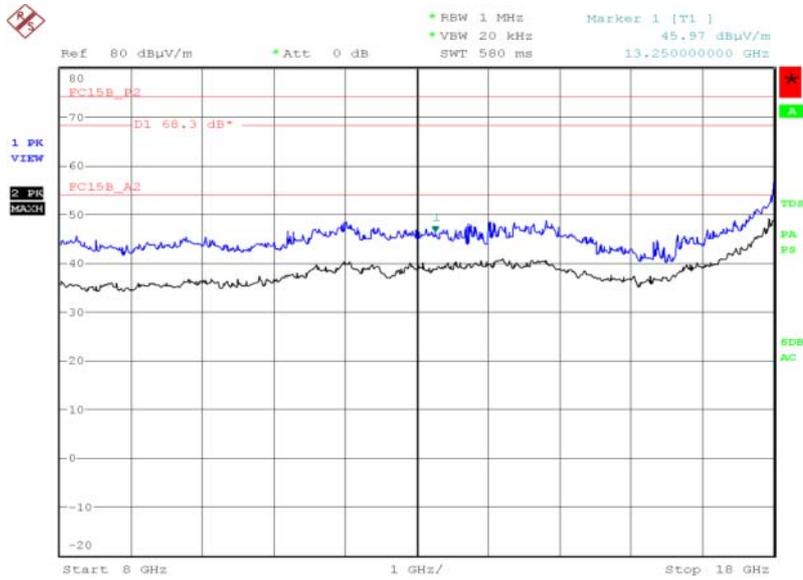
7GHz to 8GHz



Date: 21.OCT.2012 08:11:58

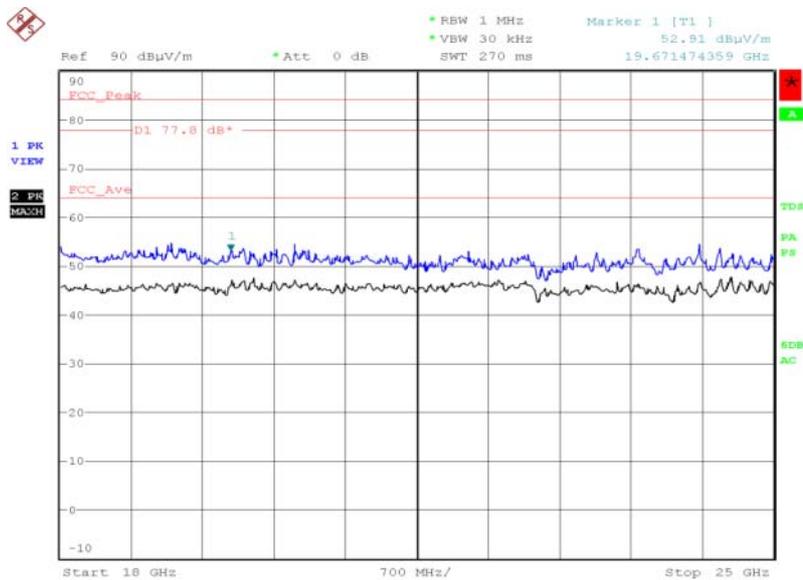


8GHz to 18GHz



Date: 21.OCT.2012 12:37:11

18GHz to 25GHz

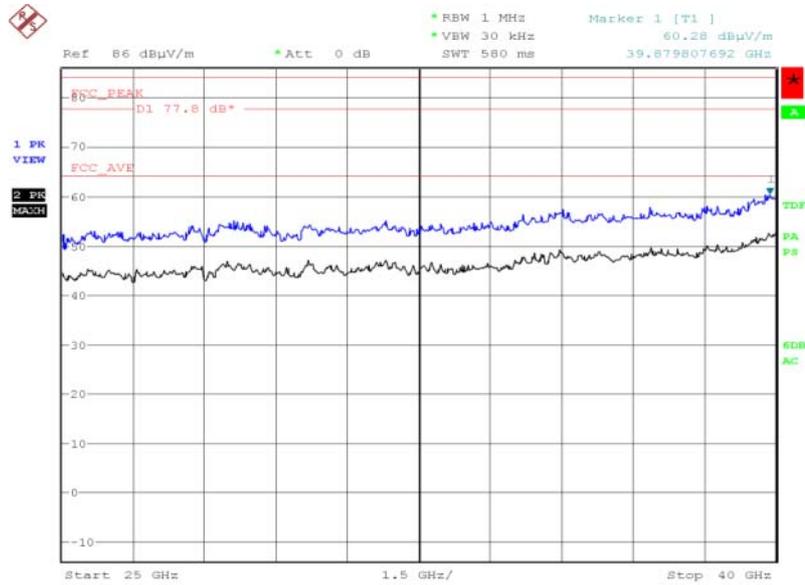


Date: 29.OCT.2012 23:21:26



Product Service

25GHz to 40GHz

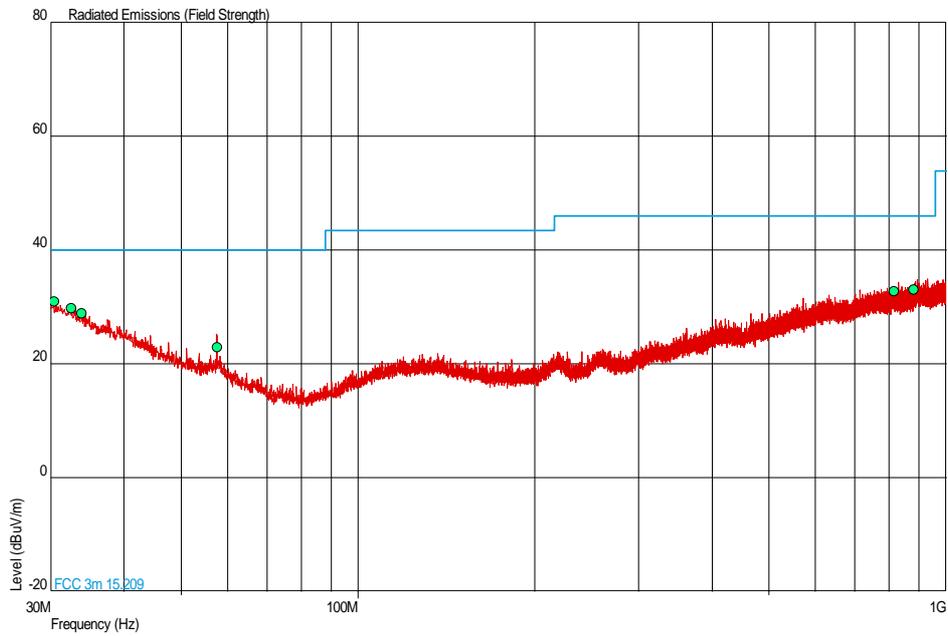


Date: 30.OCT.2012 17:58:33



5300 MHz

30 MHz to 1 GHz



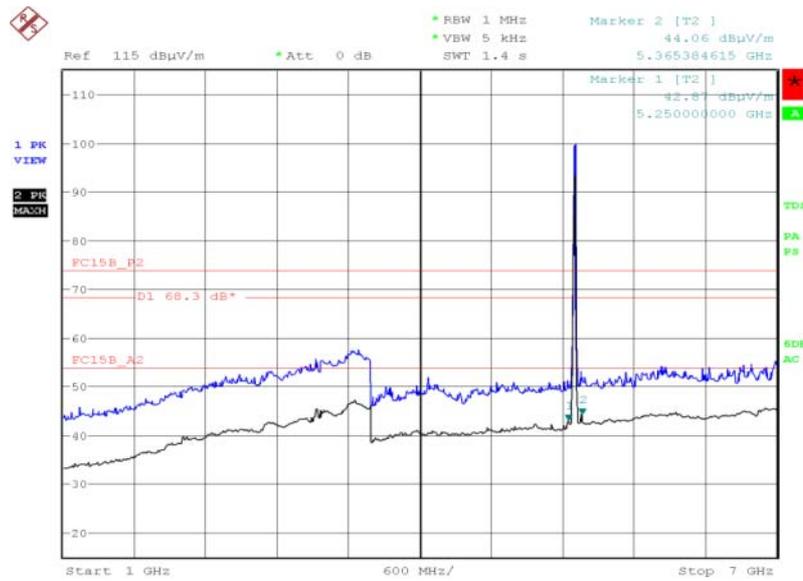
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.437	30.9	35.1	40.0	100	-9.1	64.9	90	1.00	Horizontal
32.522	29.8	30.9	40.0	100	-10.2	69.1	0	1.00	Horizontal
33.880	28.9	27.9	40.0	100	-11.1	72.1	0	1.00	Vertical
57.645	22.9	14.0	40.0	100	-17.1	86.0	90	1.00	Vertical
815.458	32.7	43.2	46.0	200	-13.3	156.8	180	1.00	Horizontal
880.351	33.0	44.7	46.0	200	-13.0	155.3	90	1.00	Horizontal



1GHz to 40GHz

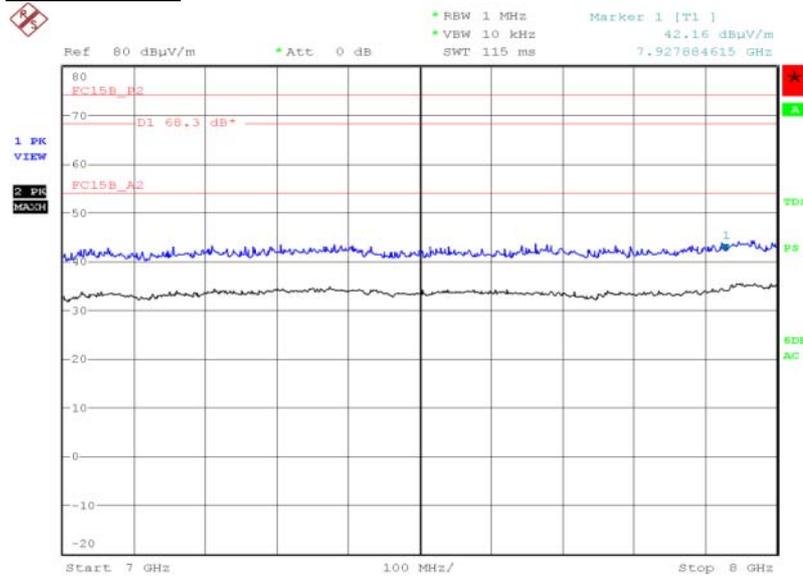
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.352	Horizontal	140	007	57.32	45.37
5.359	Horizontal	140	007	55.26	44.36

1GHz to 7GHz



Date: 16.OCT.2012 20:58:55

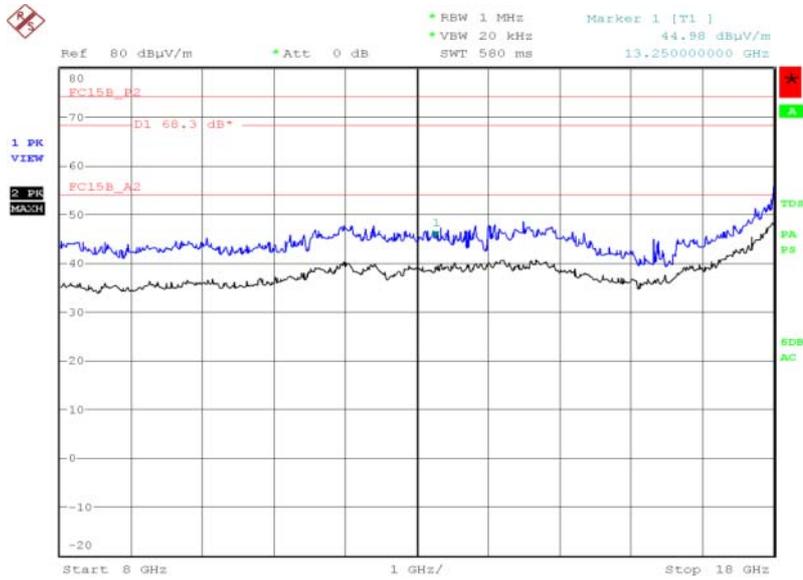
7GHz to 8GHz



Date: 21.OCT.2012 08:16:30

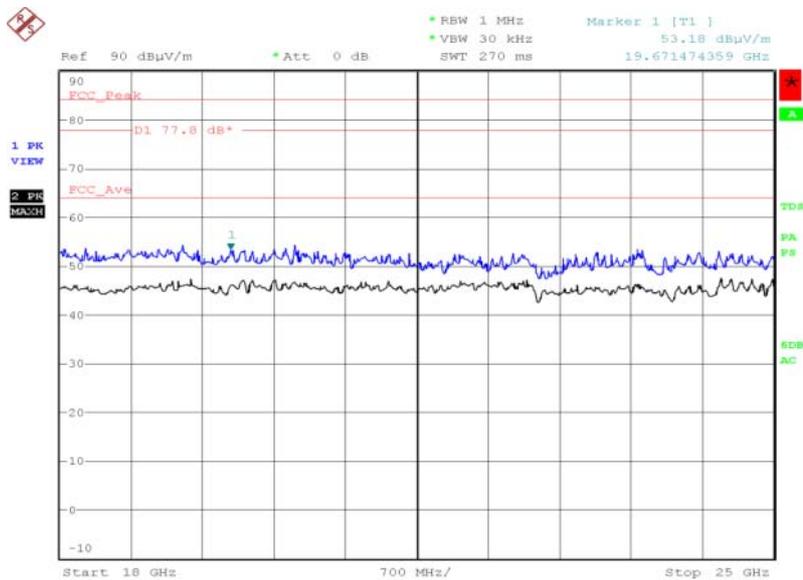


8GHz to 18GHz



Date: 21.OCT.2012 12:48:32

18GHz to 25GHz

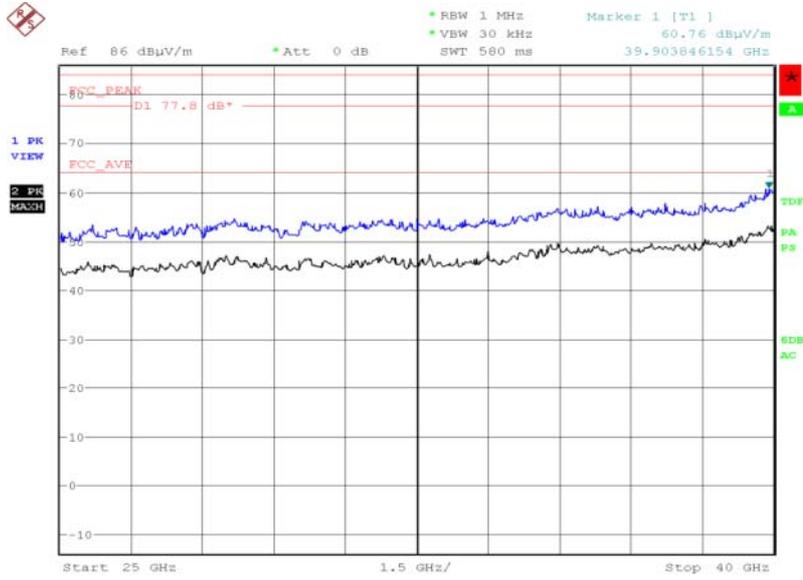


Date: 29.OCT.2012 23:23:49



Product Service

25GHz to 40GHz

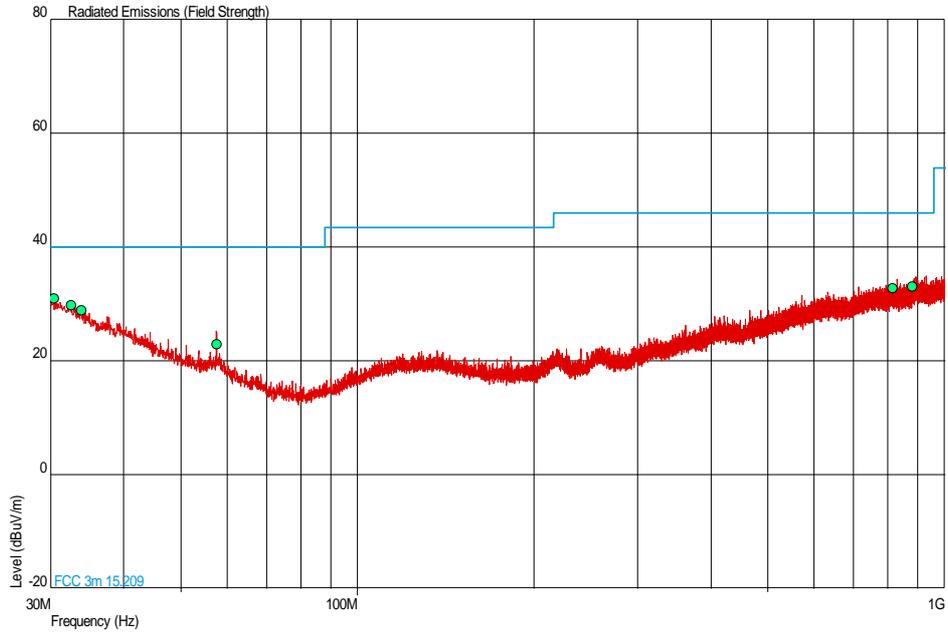


Date: 30.OCT.2012 18:10:26



5320 MHz

30 MHz to 1 GHz



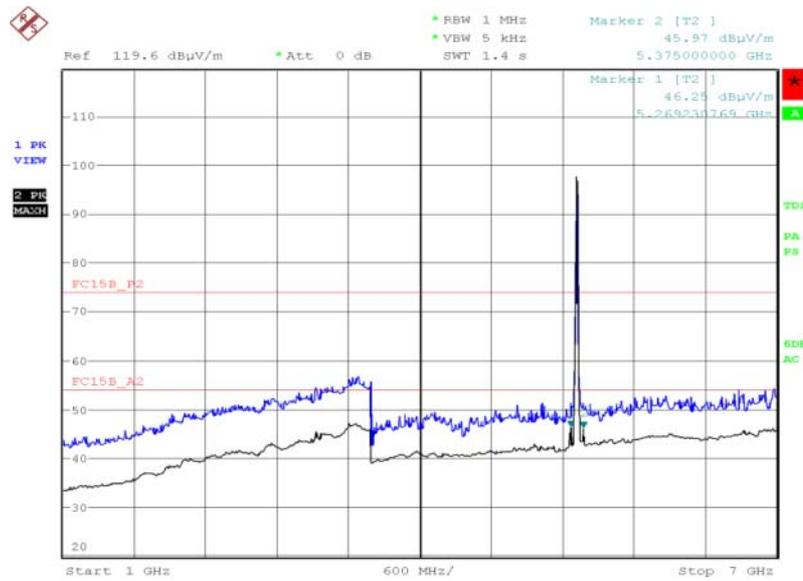
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.437	30.9	35.1	40.0	100	-9.1	64.9	90	1.00	Horizontal
32.522	29.8	30.9	40.0	100	-10.2	69.1	0	1.00	Horizontal
33.880	28.9	27.9	40.0	100	-11.1	72.1	0	1.00	Vertical
57.645	22.9	14.0	40.0	100	-17.1	86.0	90	1.00	Vertical
815.458	32.7	43.2	46.0	200	-13.3	156.8	180	1.00	Horizontal
880.351	33.0	44.7	46.0	200	-13.0	155.3	90	1.00	Horizontal



1GHz to 40GHz

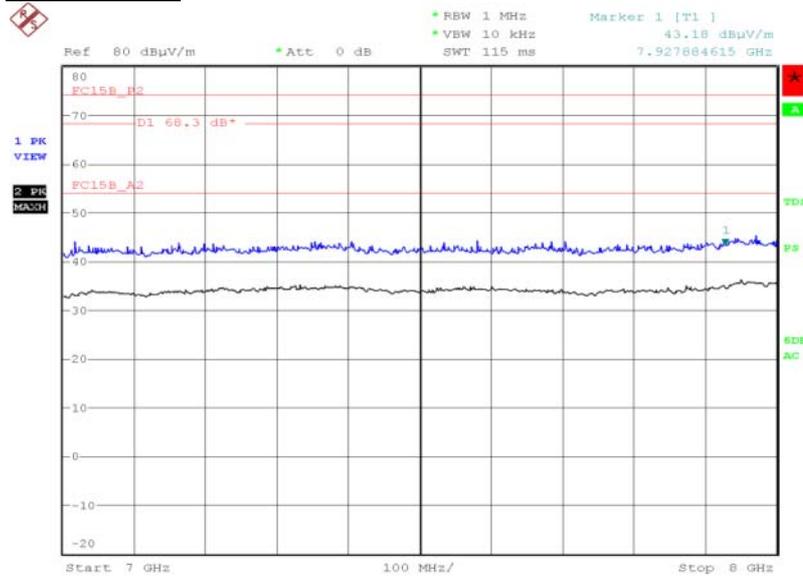
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.372	Horizontal	139	012	57.18	45.11
5.380	Horizontal	139	012	55.20	43.87

1GHz to 7GHz



Date: 16.OCT.2012 21:49:45

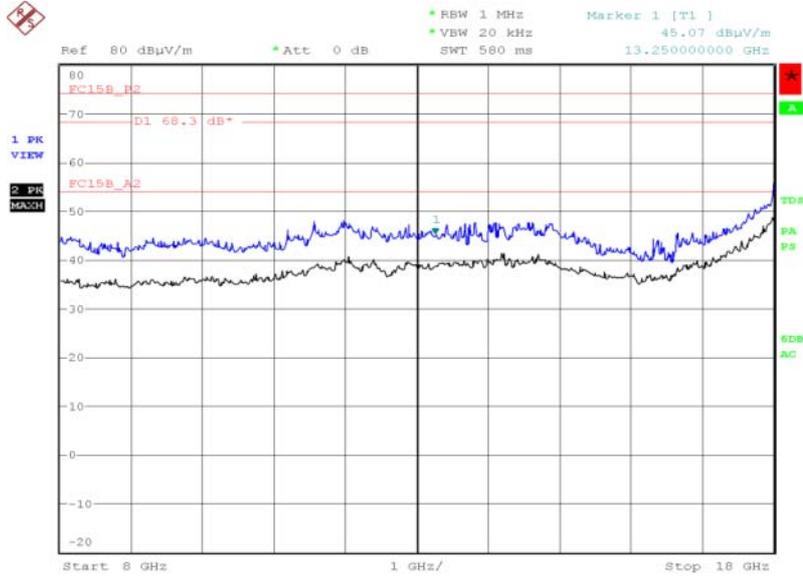
7GHz to 8GHz



Date: 21.OCT.2012 09:00:59

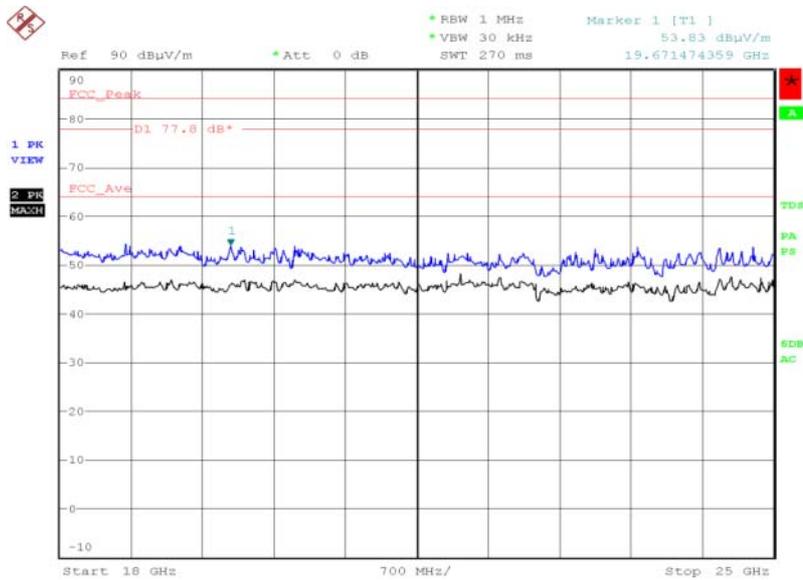


8GHz to 18GHz



Date: 21.OCT.2012 13:00:02

18GHz to 25GHz

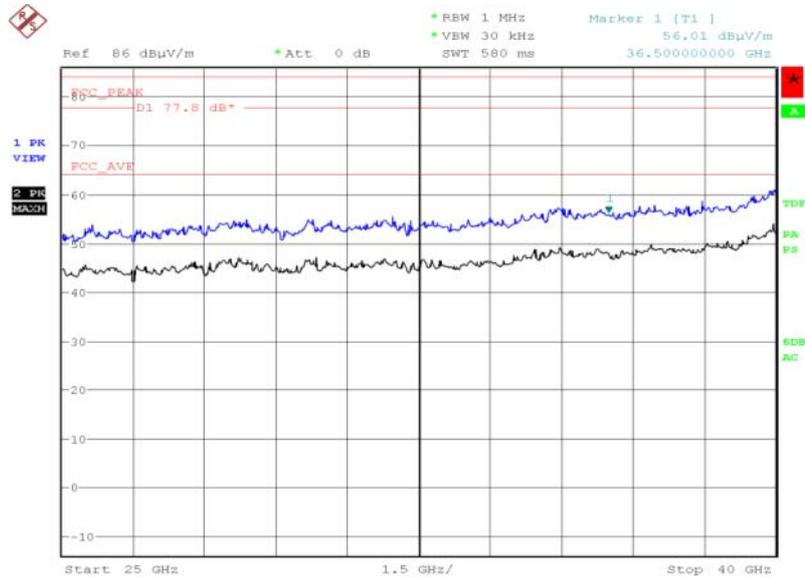


Date: 29.OCT.2012 23:26:09



Product Service

25GHz to 40GHz



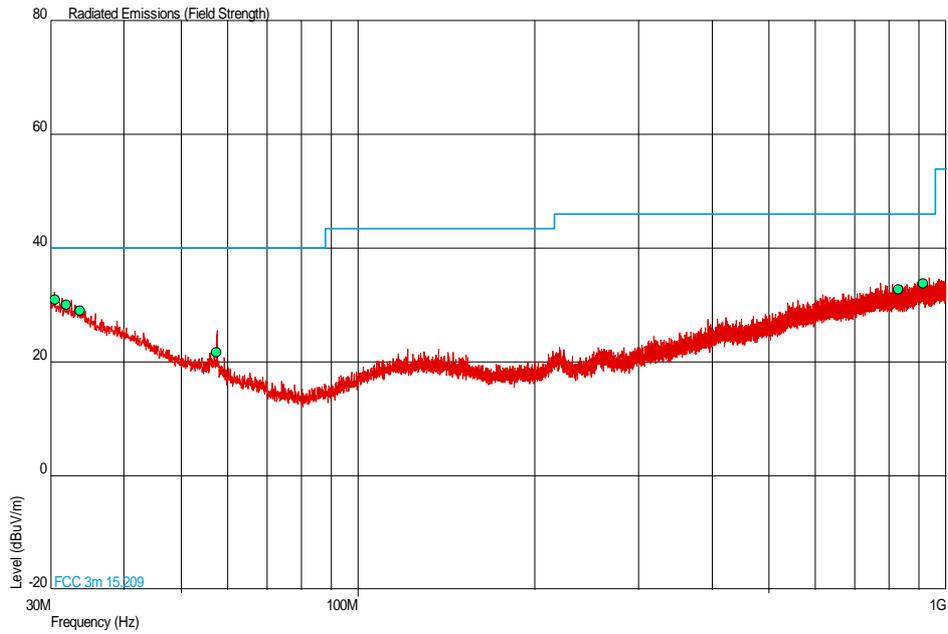
Date: 30.OCT.2012 18:22:24



Frequency Band 3

5500 MHz

30 MHz to 1 GHz



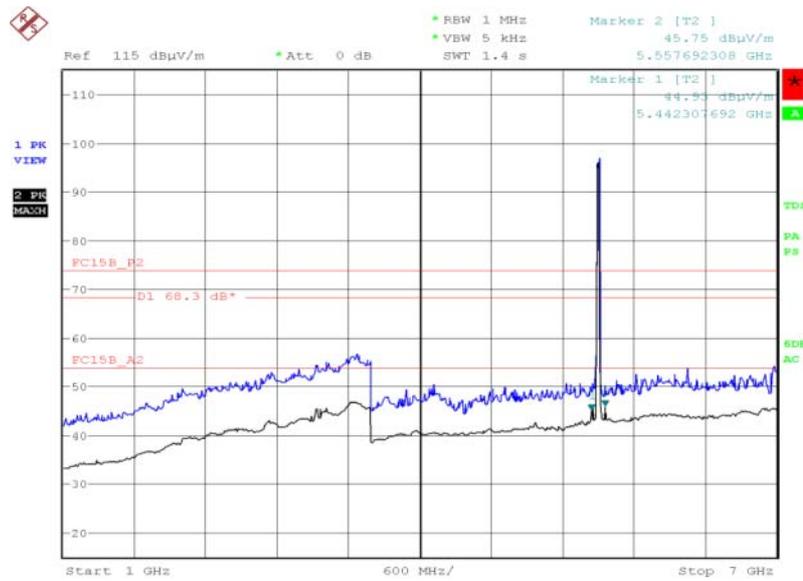
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.582	30.9	35.1	40.0	100	-9.1	64.9	180	1.00	Vertical
31.892	30.1	32.0	40.0	100	-9.9	68.0	0	1.00	Vertical
33.686	29.1	28.5	40.0	100	-10.9	71.5	90	1.00	Horizontal
57.548	21.7	12.2	40.0	100	-18.3	87.8	90	1.00	Vertical
831.269	32.8	43.7	46.0	200	-13.2	156.3	0	1.00	Horizontal
914.689	33.8	49.0	46.0	200	-12.2	151.0	180	1.00	Vertical



1GHz to 40GHz

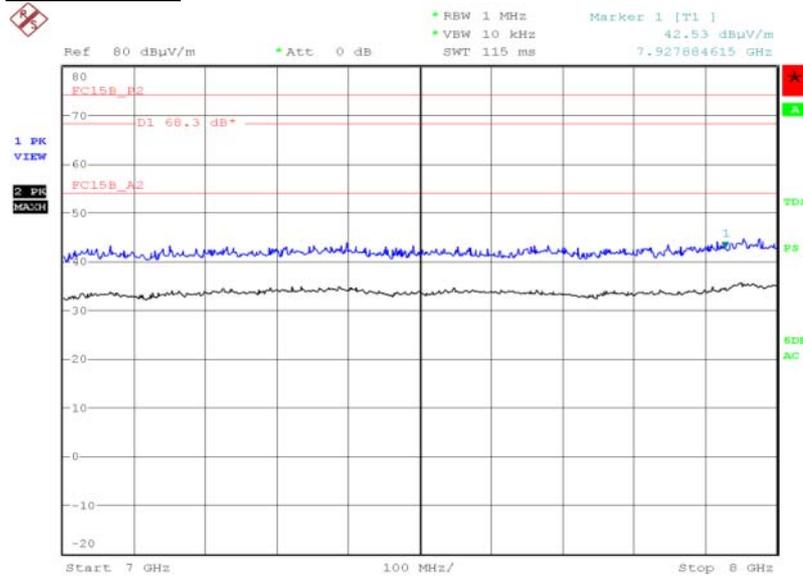
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.439	Horizontal	155	021	56.04	44.13
5.425	Horizontal	155	021	58.08	45.38

1GHz to 7GHz



Date: 16.OCT.2012 22:18:19

7GHz to 8GHz

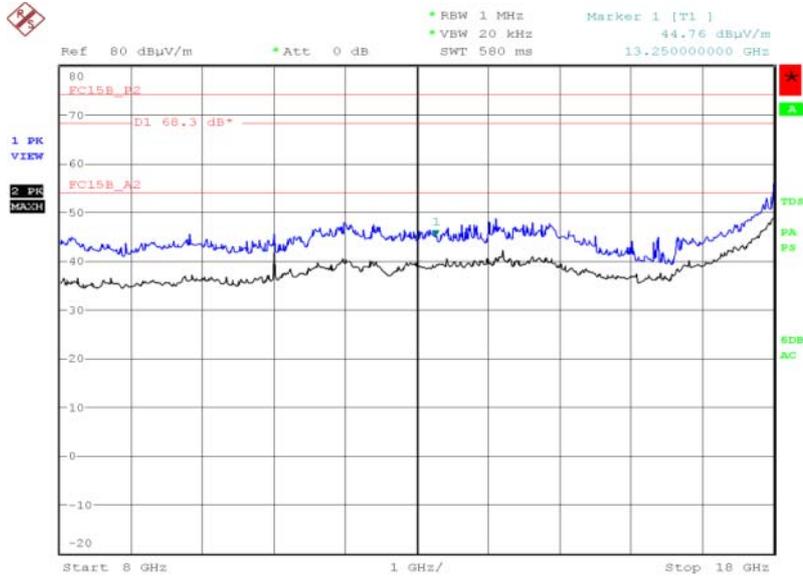


Date: 21.OCT.2012 09:05:21



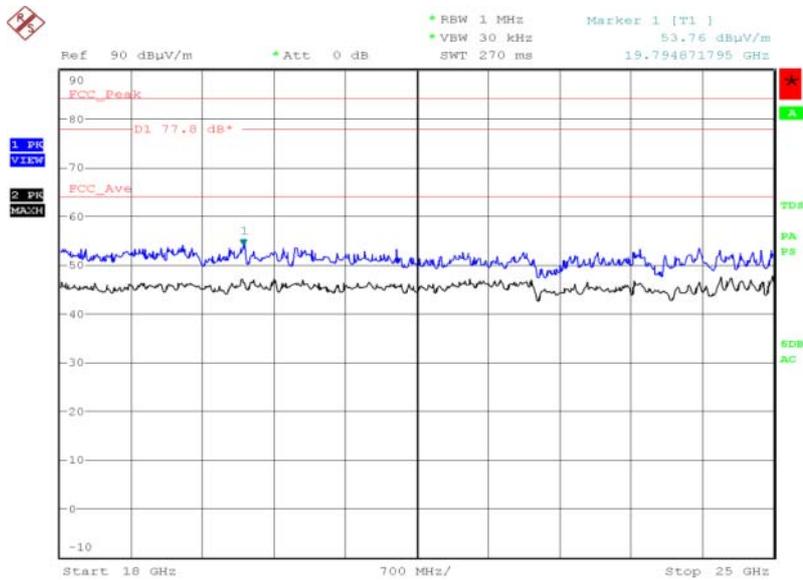
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 13:10:42

18GHz to 25GHz

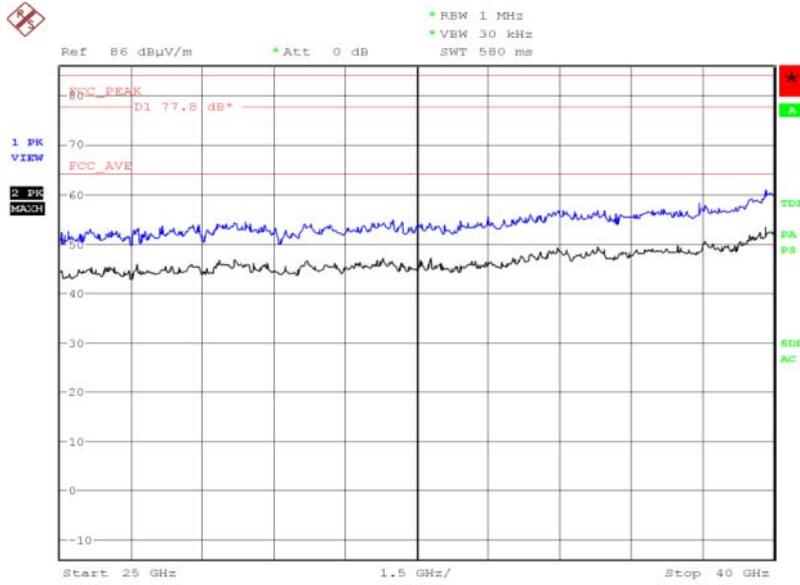


Date: 29.OCT.2012 23:28:14



Product Service

25GHz to 40GHz



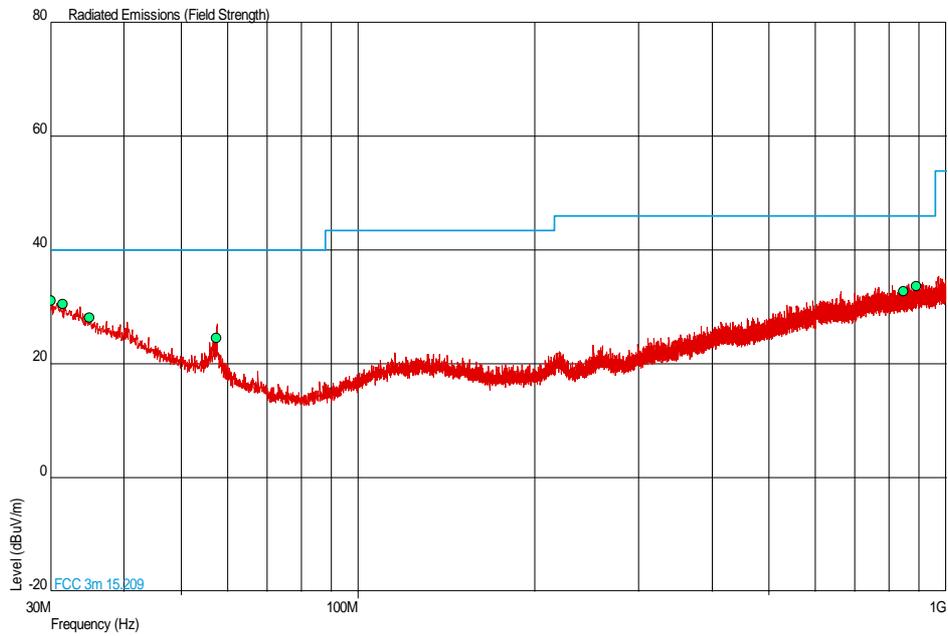
Date: 30.OCT.2012 18:27:49



Product Service

5600 MHz

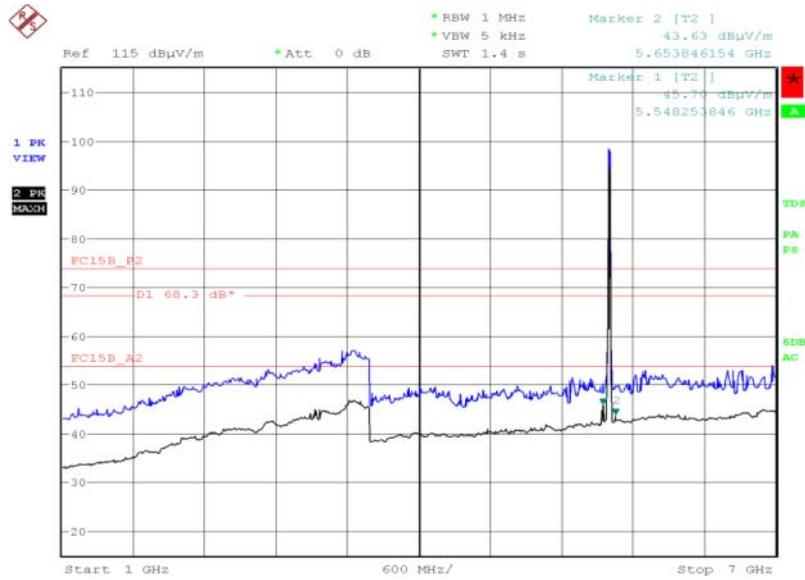
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.097	31.1	35.9	40.0	100	-8.9	64.1	180	1.00	Vertical
31.455	30.5	33.5	40.0	100	-9.5	66.5	180	1.00	Vertical
34.996	28.1	25.4	40.0	100	-11.9	74.6	0	1.00	Horizontal
57.548	24.5	16.8	40.0	100	-15.5	83.2	180	1.00	Vertical
847.371	32.7	43.2	46.0	200	-13.3	156.8	0	1.00	Vertical
891.603	33.6	47.9	46.0	200	-12.4	152.1	0	1.00	Horizontal

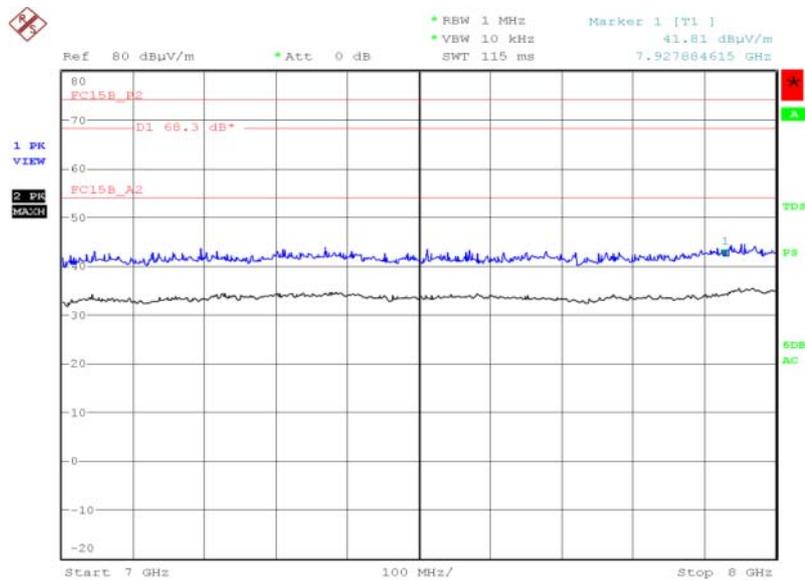


1GHz to 7GHz



Date: 17.OCT.2012 19:03:33

7GHz to 8GHz

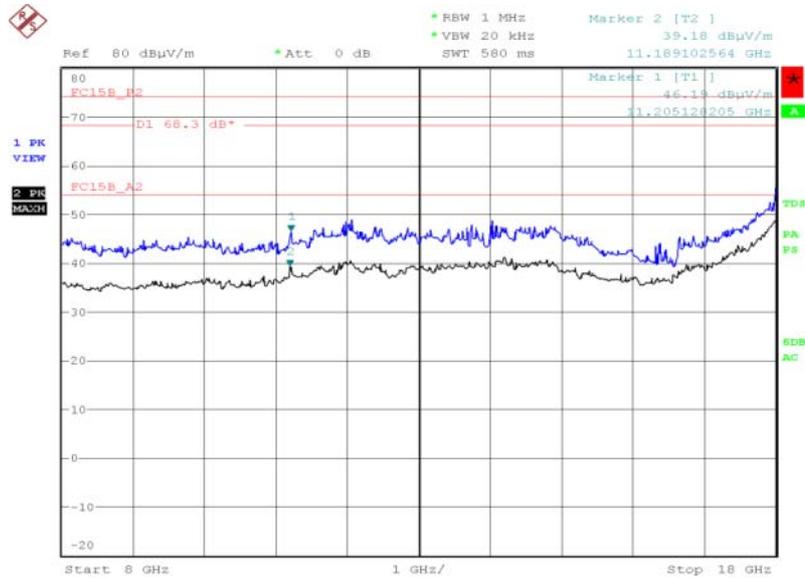


Date: 21.OCT.2012 09:08:37



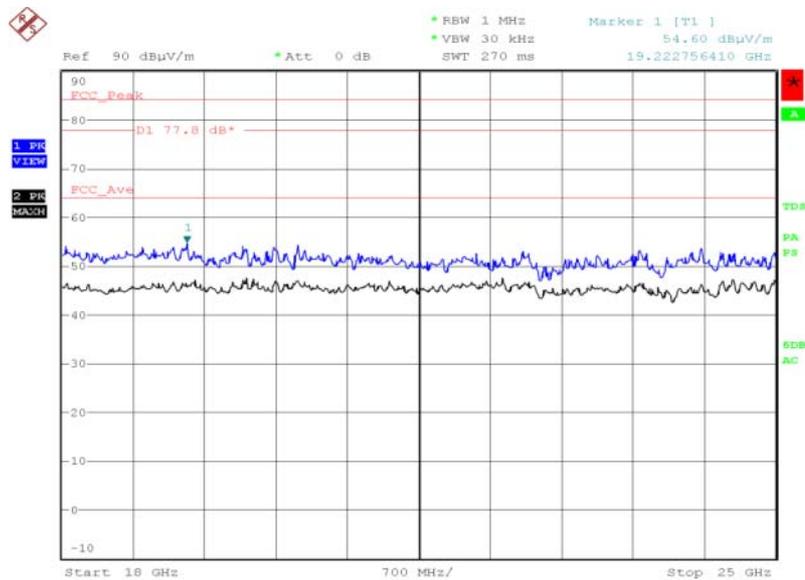
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 13:16:57

18GHz to 25GHz

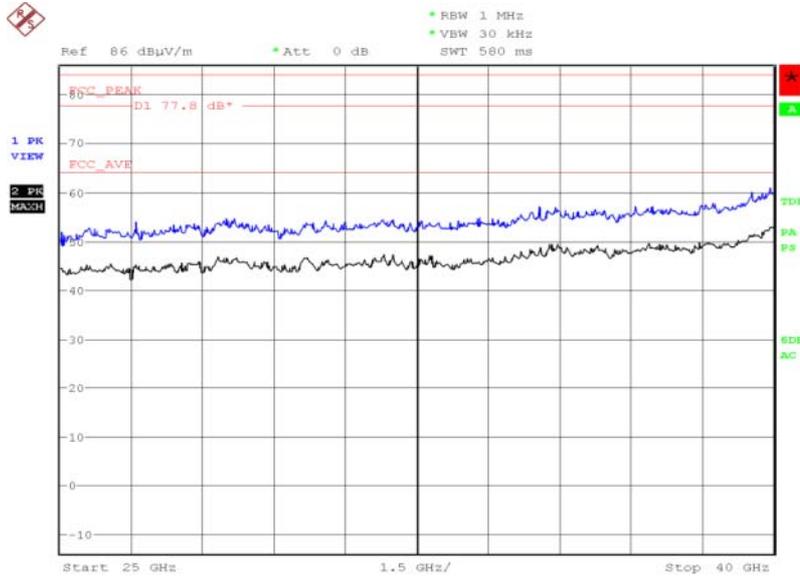


Date: 29.OCT.2012 23:30:09



Product Service

25GHz to 40GHz

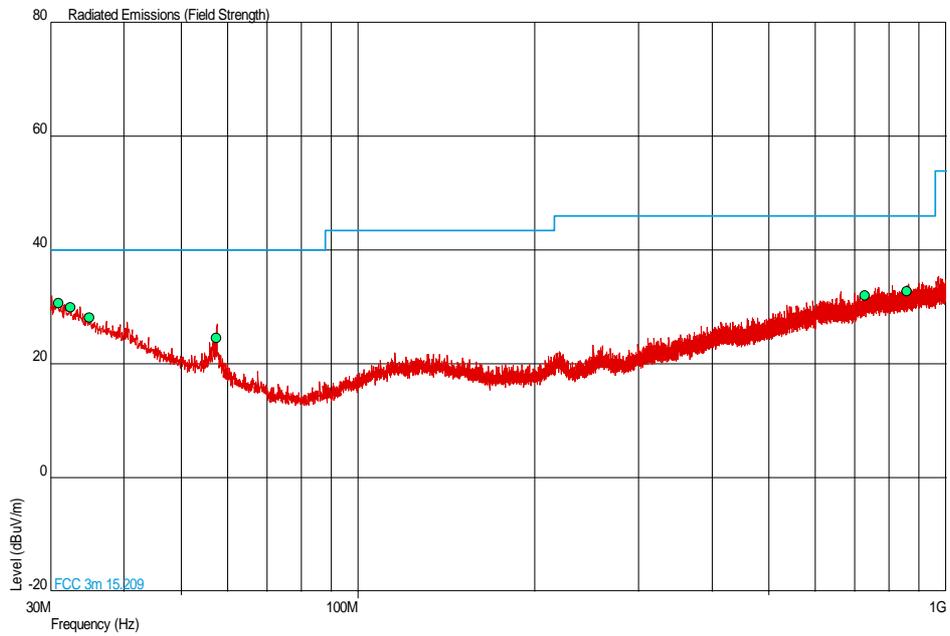


Date: 30.OCT.2012 18:35:06



5700 MHz

30 MHz to 1 GHz



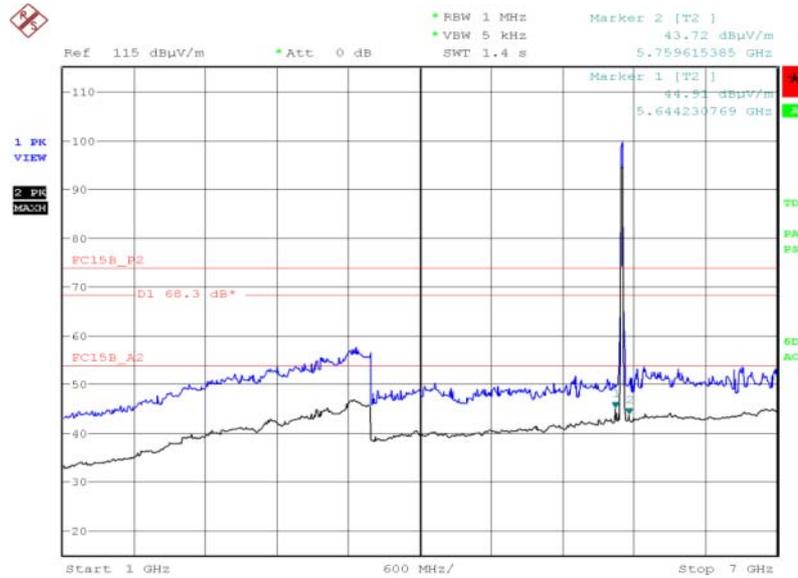
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
31.019	30.7	34.3	40.0	100	-9.3	65.7	0	1.00	Vertical
32.425	29.9	31.3	40.0	100	-10.1	68.7	0	1.00	Horizontal
34.899	28.1	25.4	40.0	100	-11.9	74.6	0	1.00	Horizontal
57.548	24.6	17.0	40.0	100	-15.4	83.0	180	1.00	Vertical
727.091	32.0	39.8	46.0	200	-14.0	160.2	0	1.00	Horizontal
858.138	32.7	43.2	46.0	200	-13.3	156.8	180	1.00	Vertical



1GHz to 40GHz

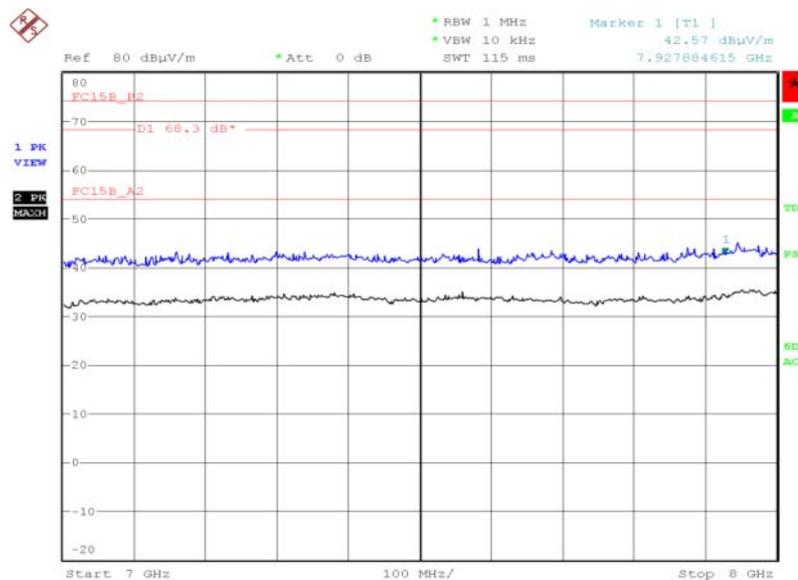
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.400	Vertical	139	152	53.00	47.62

1GHz to 7GHz



Date: 17.OCT.2012 19:23:14

7GHz to 8GHz

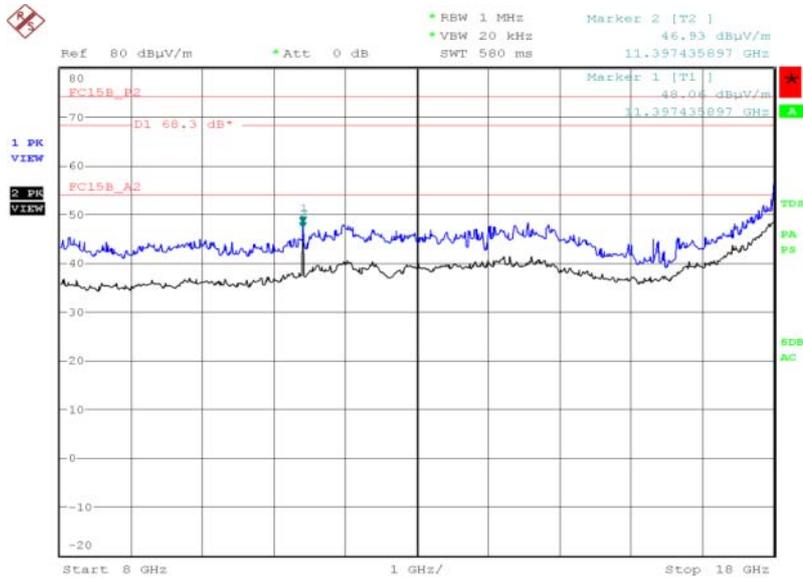


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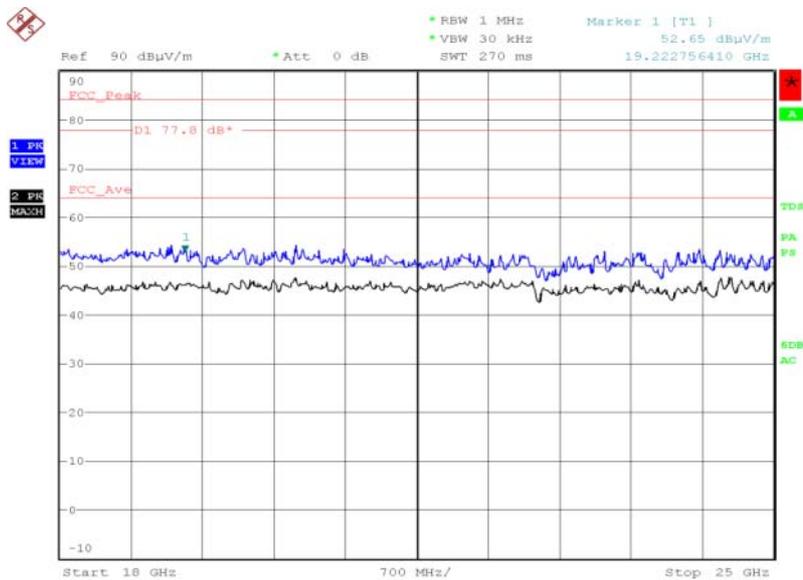
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 13:22:14

18GHz to 25GHz

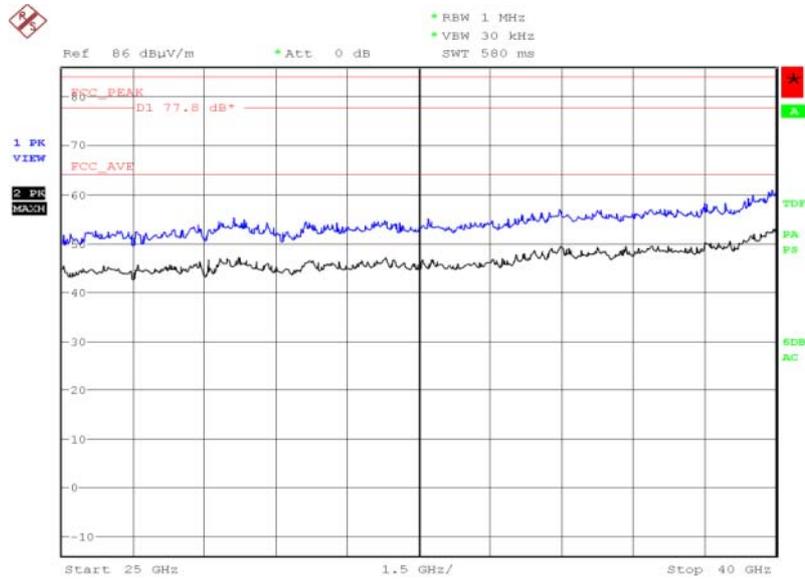


Date: 29.OCT.2012 23:32:45



Product Service

25GHz to 40GHz



Date: 30.OCT.2012 18:39:17

Limit

Peak (dB μ V/m)	Average (dB μ V/m)
74.0	54.0

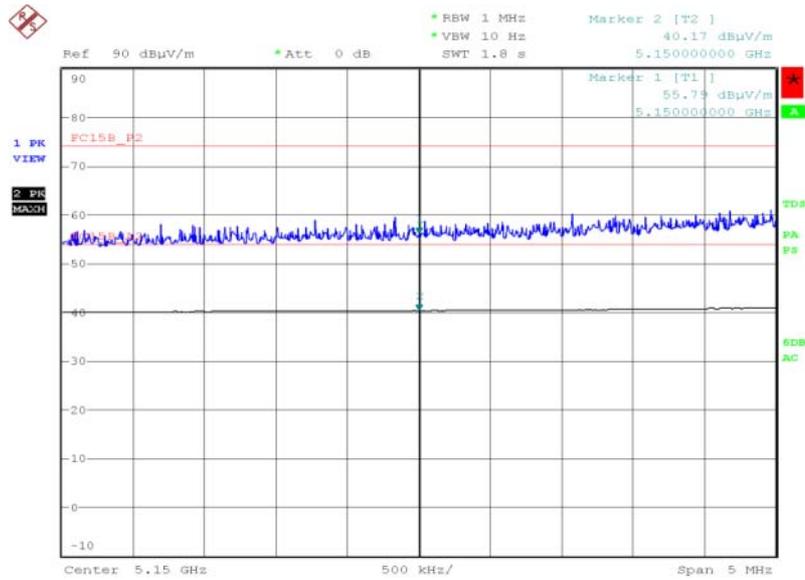


Product Service

Band Edge Emissions

5180 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	55.79	40.17

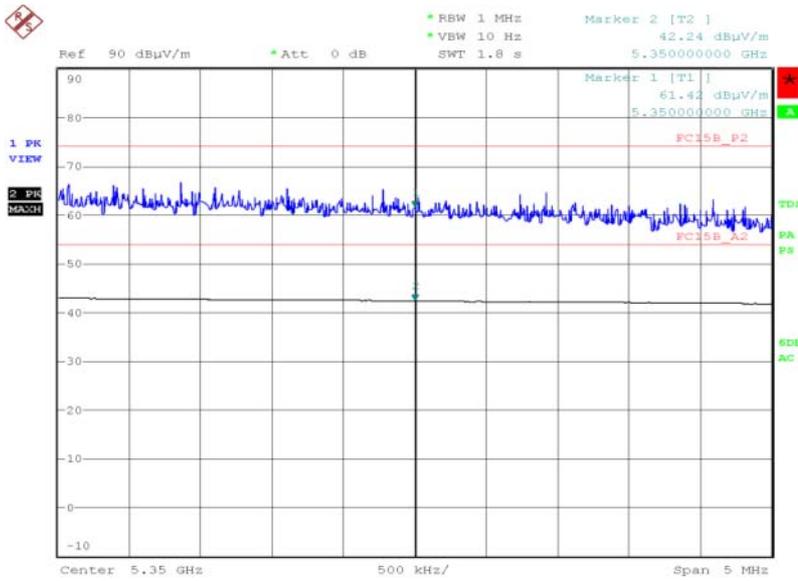


Date: 16.OCT.2012 18:33:13



5320 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	61.42	42.24

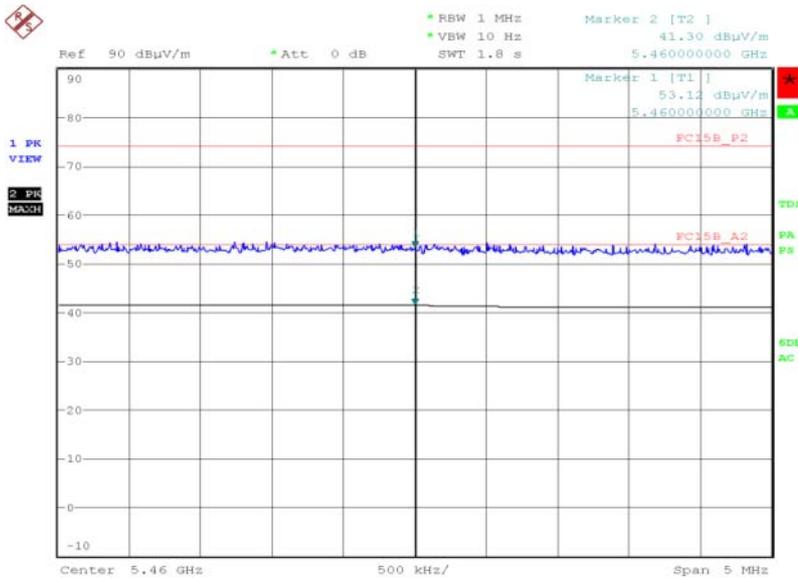


Date: 16.OCT.2012 21:29:27



5500 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	53.12	41.30



Date: 16.OCT.2012 22:27:51

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0



Product Service

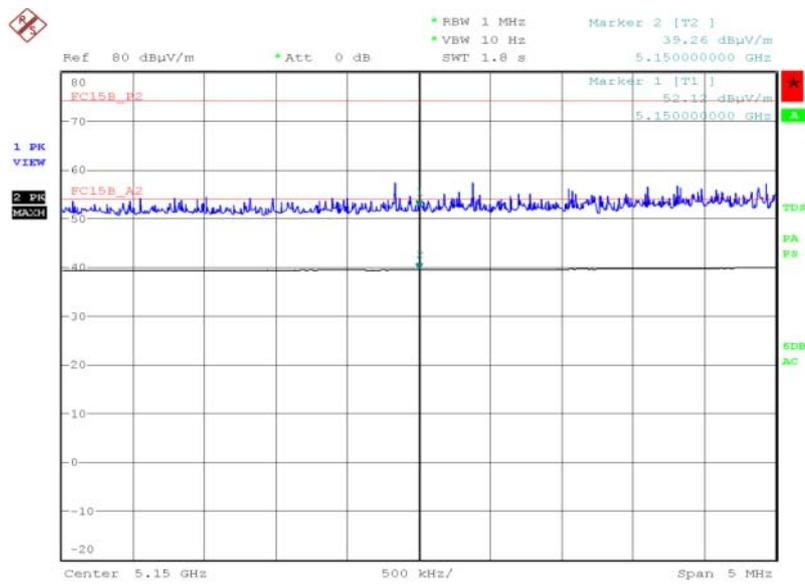
802.11(n) - 5 GHz 20 MHz BW

4.0 V DC Supply

Band Edge Emissions

5180 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	52.12	39.26



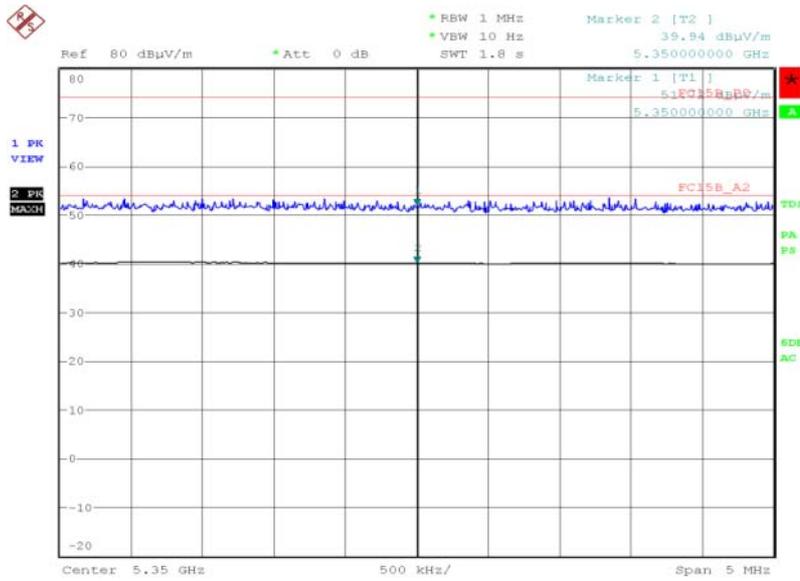
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Product Service

5320 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	51.72	39.94



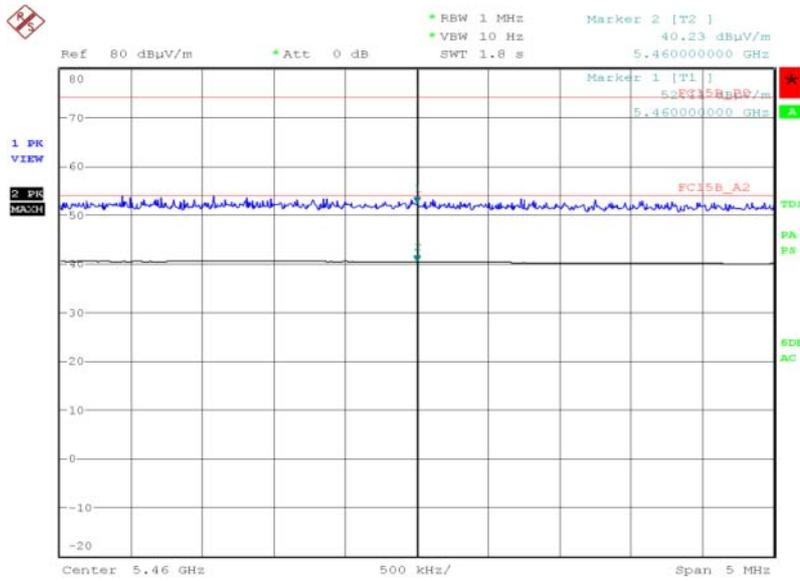
Date: 17.OCT.2012 20:58:19



Product Service

5500 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	52.11	40.23



Date: 17.OCT.2012 21:17:40

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0



Product Service

802.11(n) - 5 GHz 40 MHz BW

4.0 V DC Supply

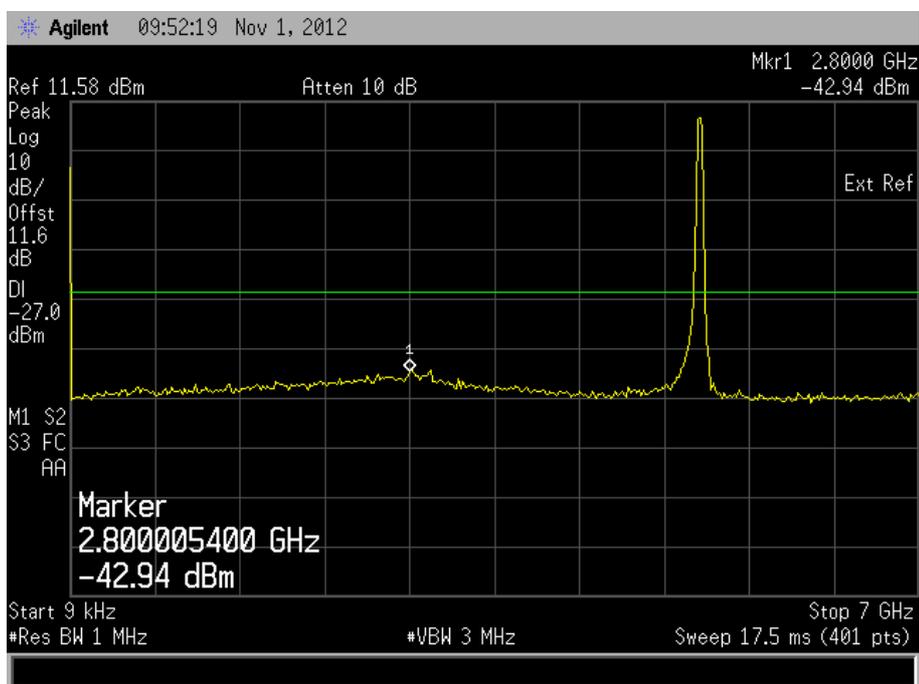
Spurious Conducted Emissions

27Mbps

Frequency Band 1

5190 MHz

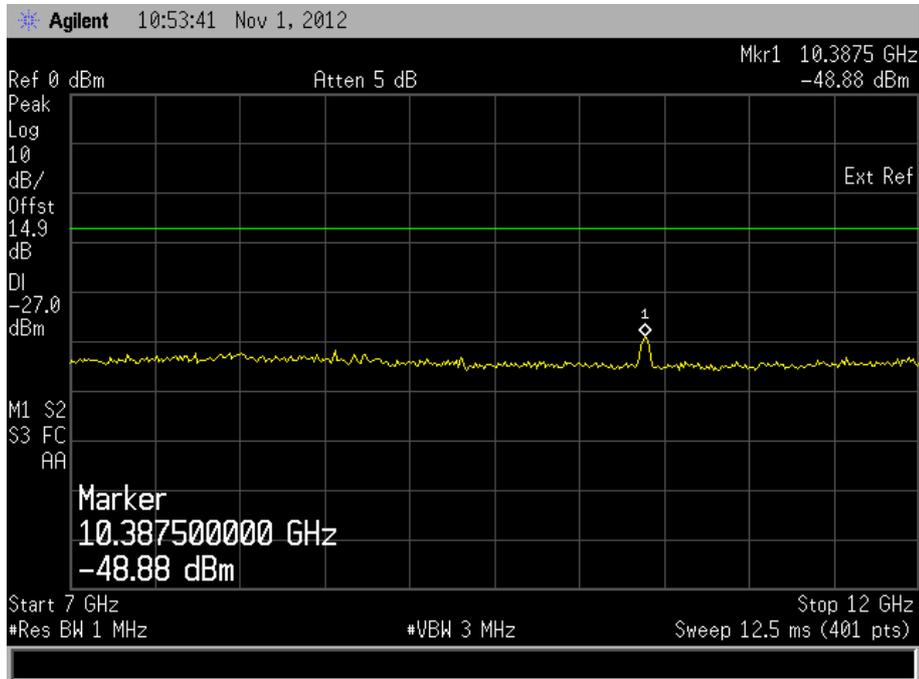
9 kHz to 7 GHz



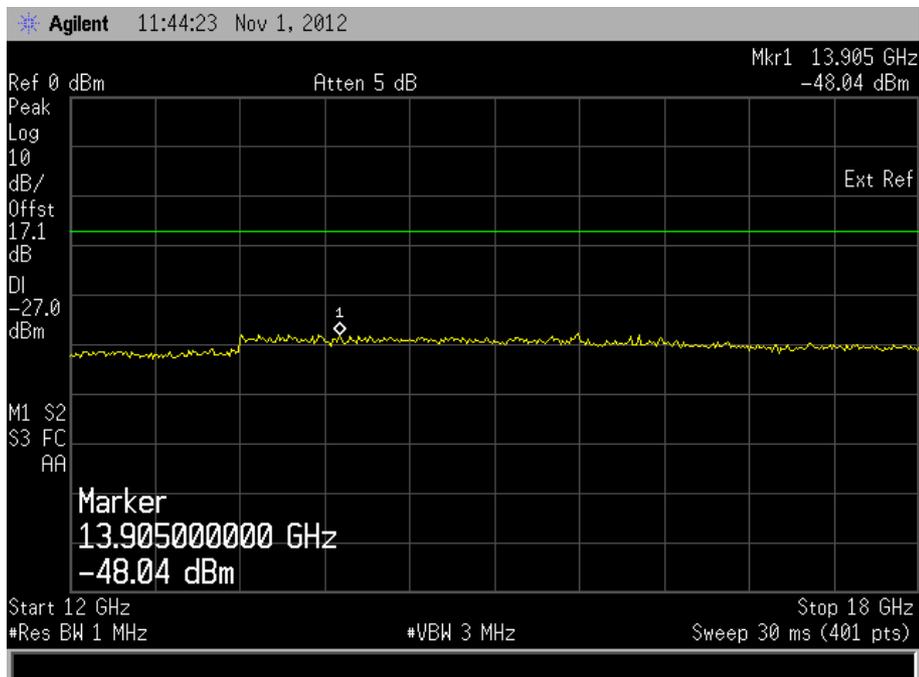


Product Service

7 GHz to 12 GHz

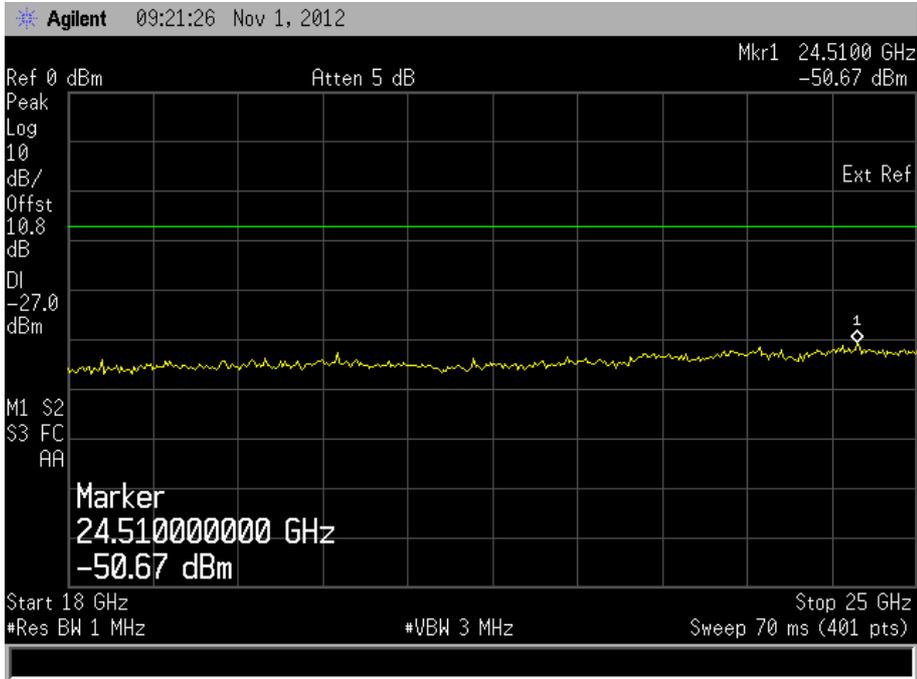


12 GHz to 18 GHz

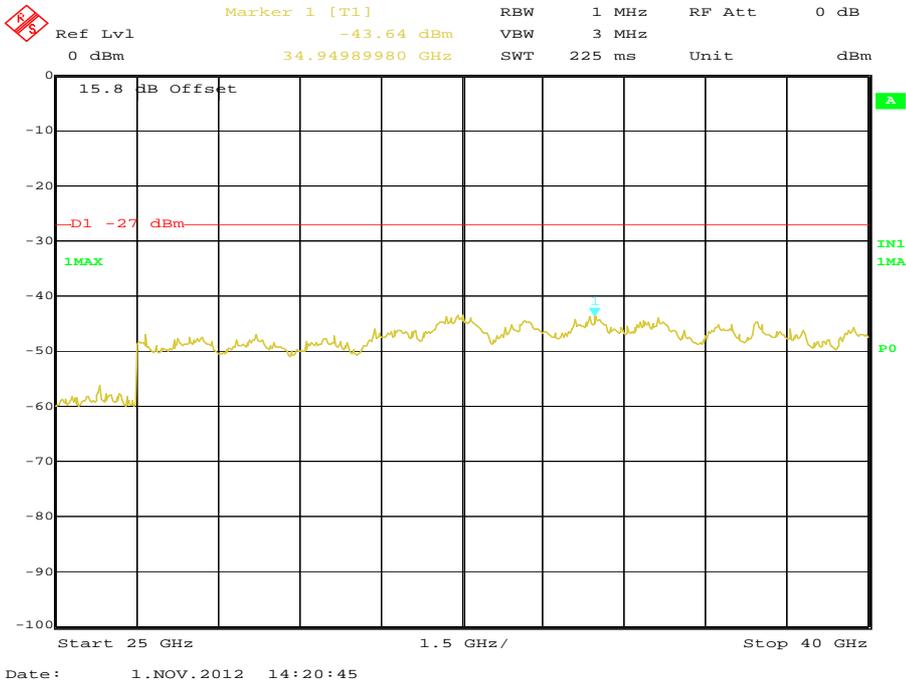




18 GHz to 25 GHz



25 GHz to 40 GHz

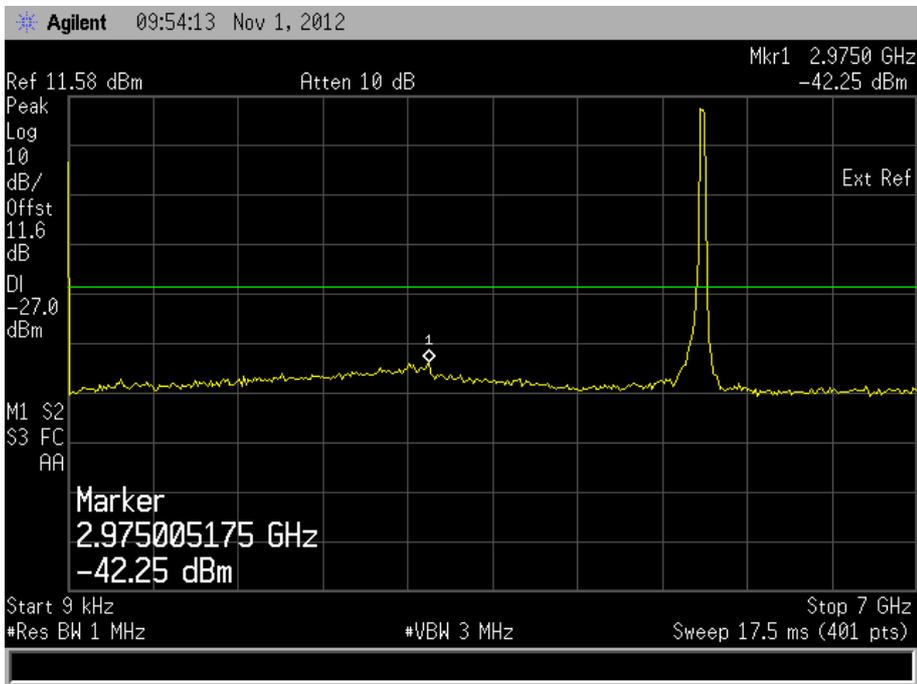




Product Service

5230 MHz

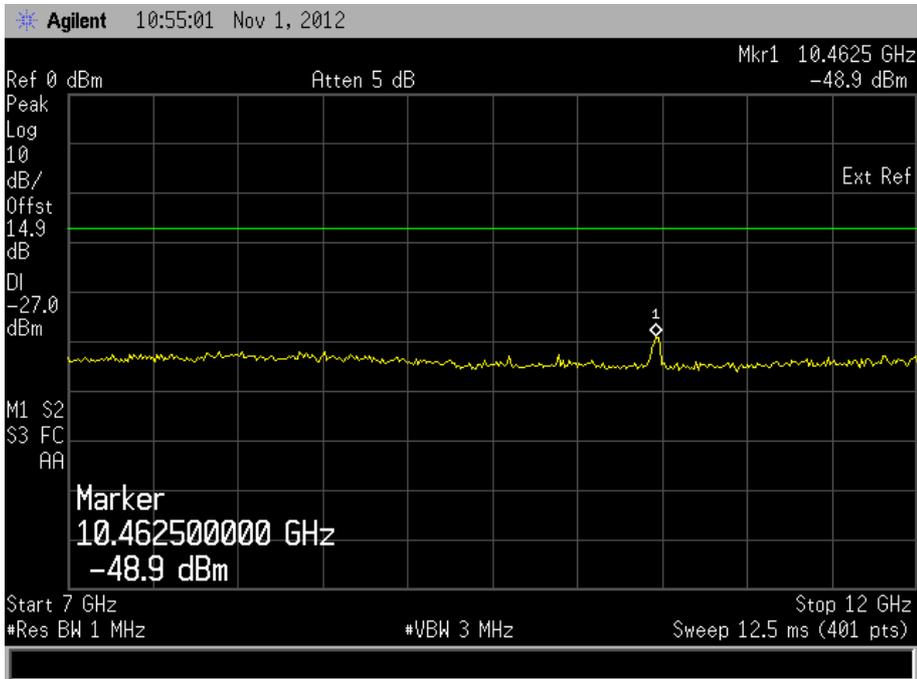
9 kHz to 7 GHz



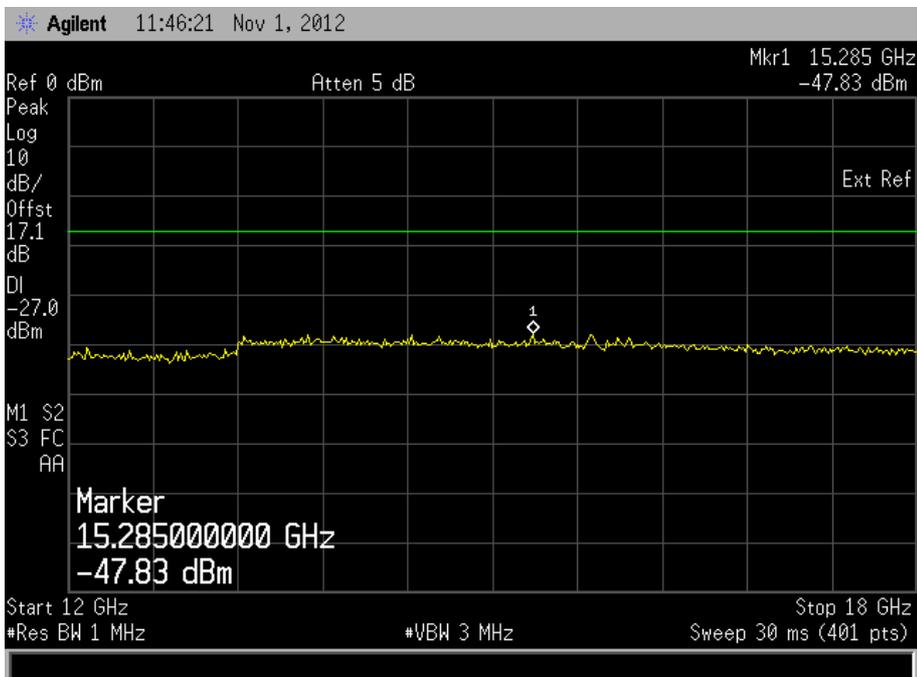


Product Service

7 GHz to 12 GHz



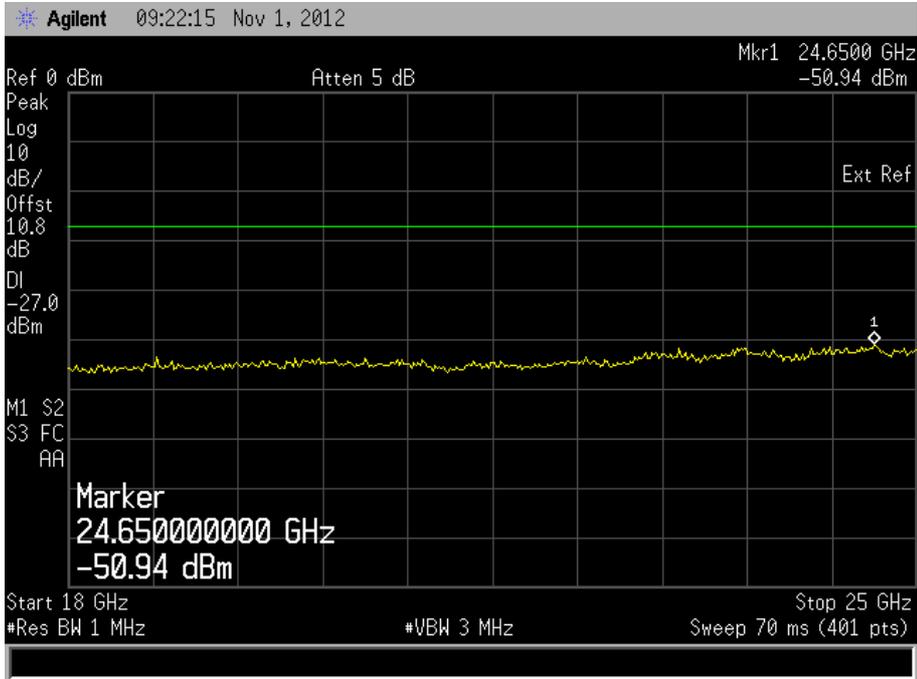
12 GHz to 18 GHz



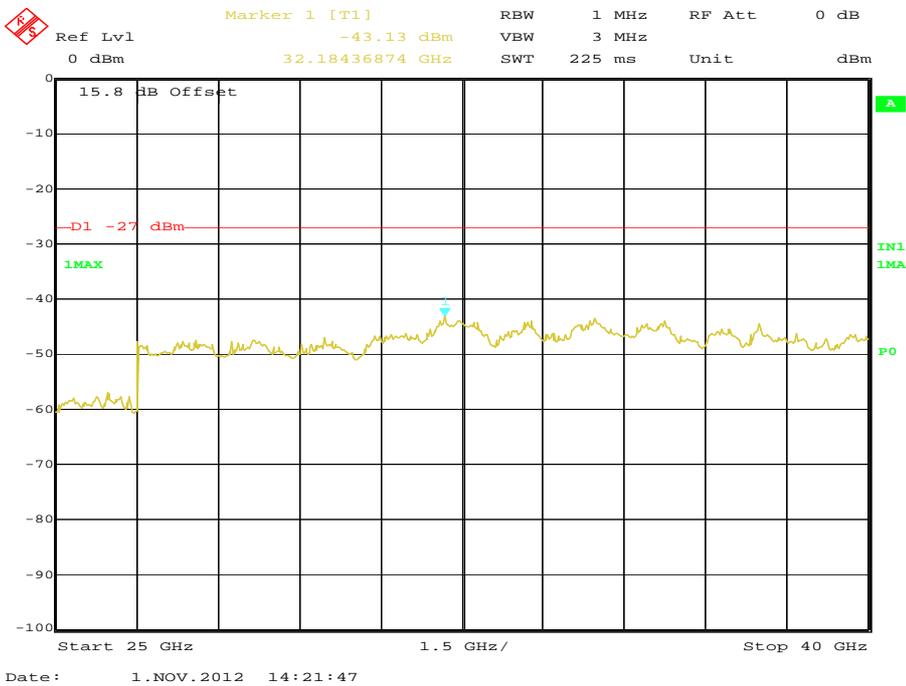


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz



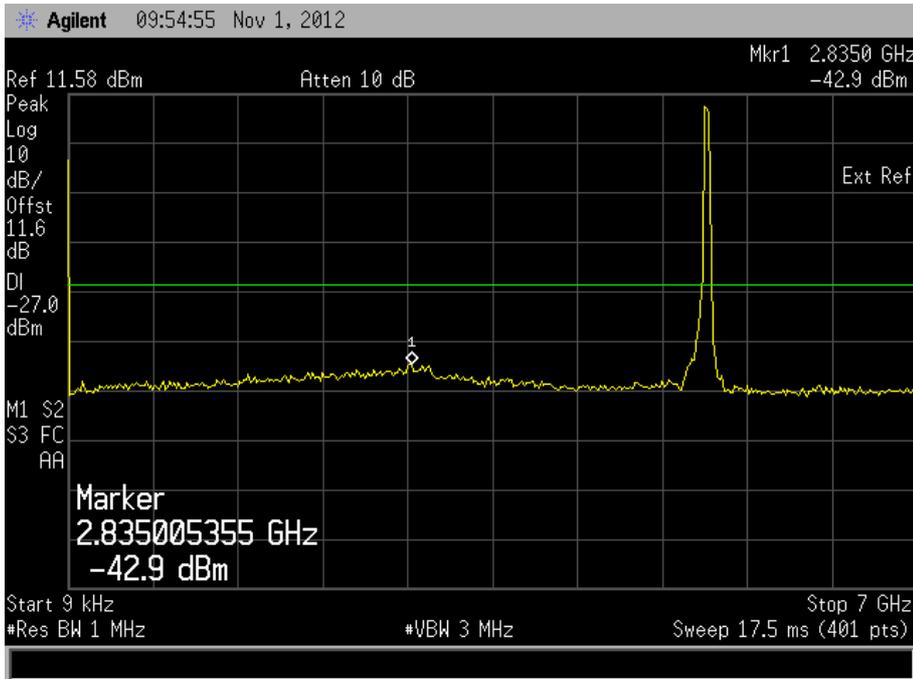


Product Service

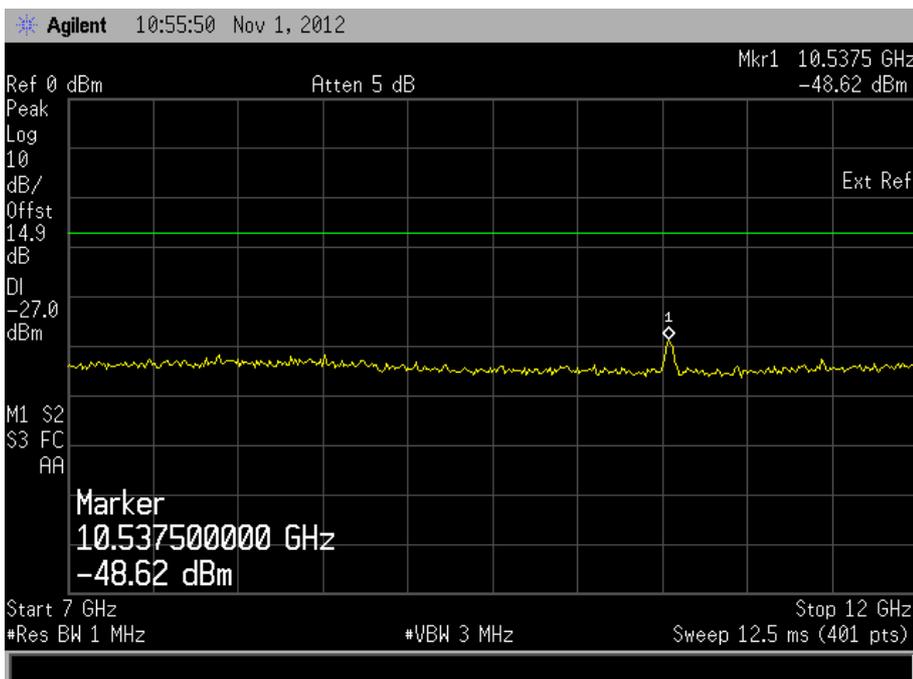
Frequency Band 2

5270 MHz

9 kHz to 7 GHz



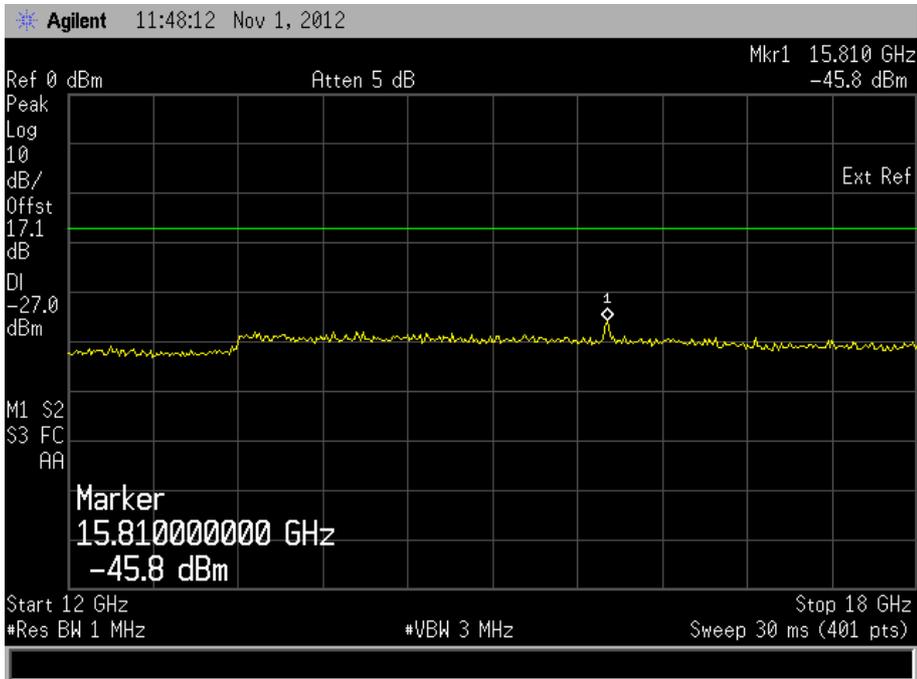
7 GHz to 12 GHz



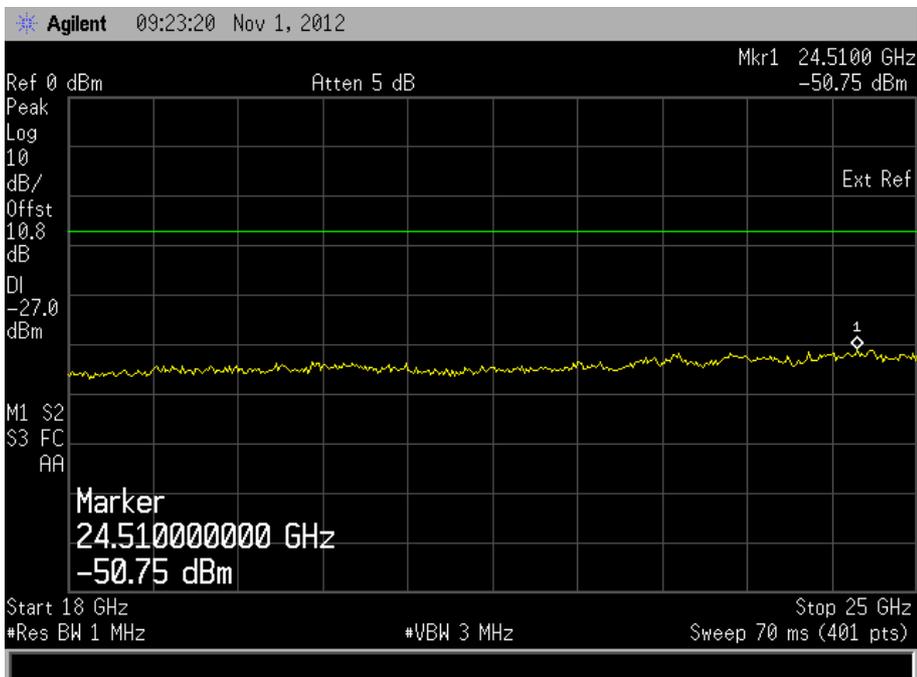


Product Service

12 GHz to 18 GHz



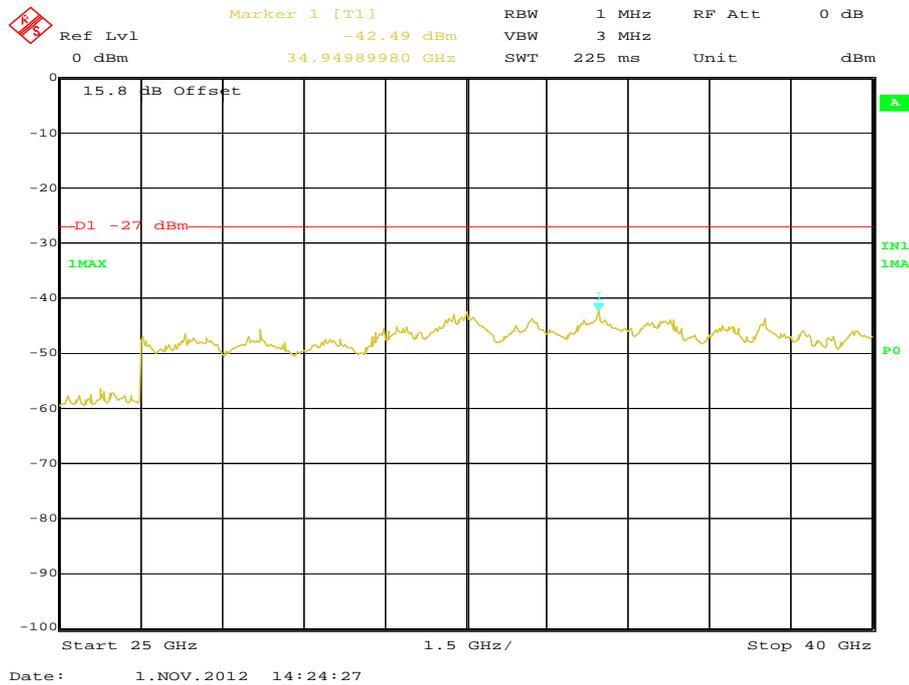
18 GHz to 25 GHz





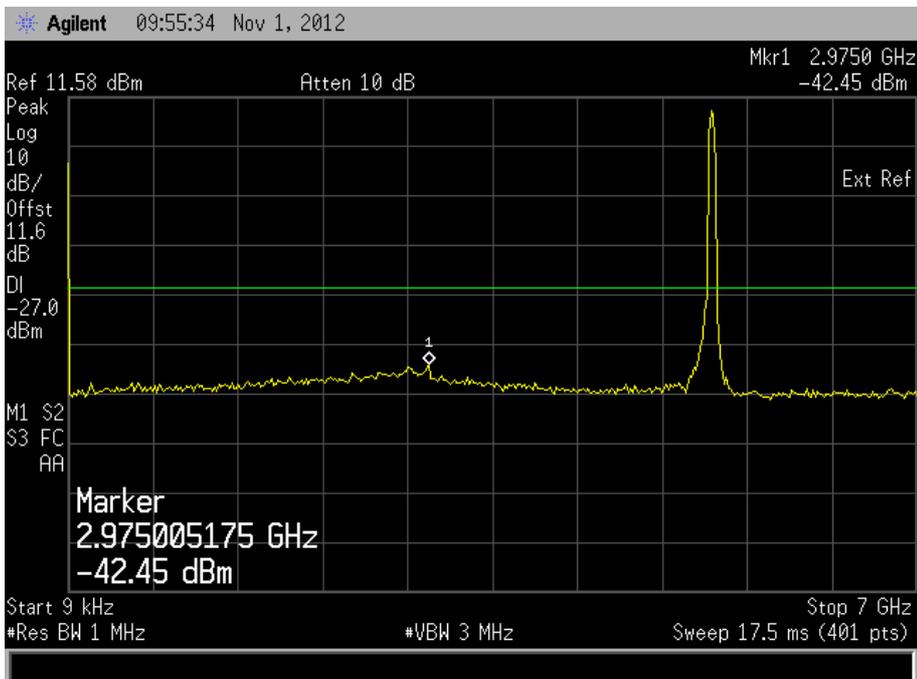
Product Service

25 GHz to 40 GHz



5310 MHz

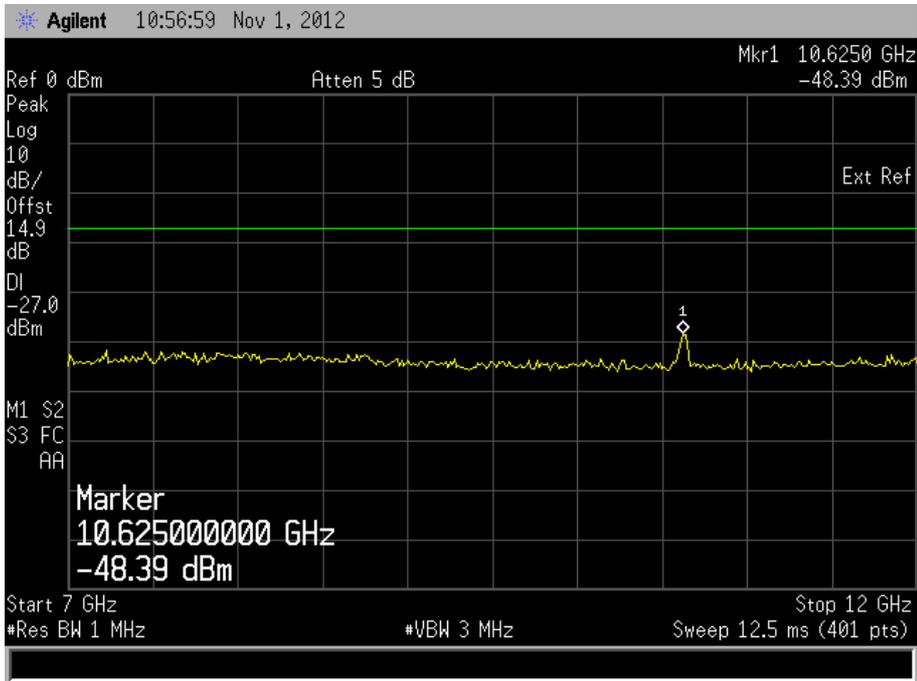
9 kHz to 7 GHz



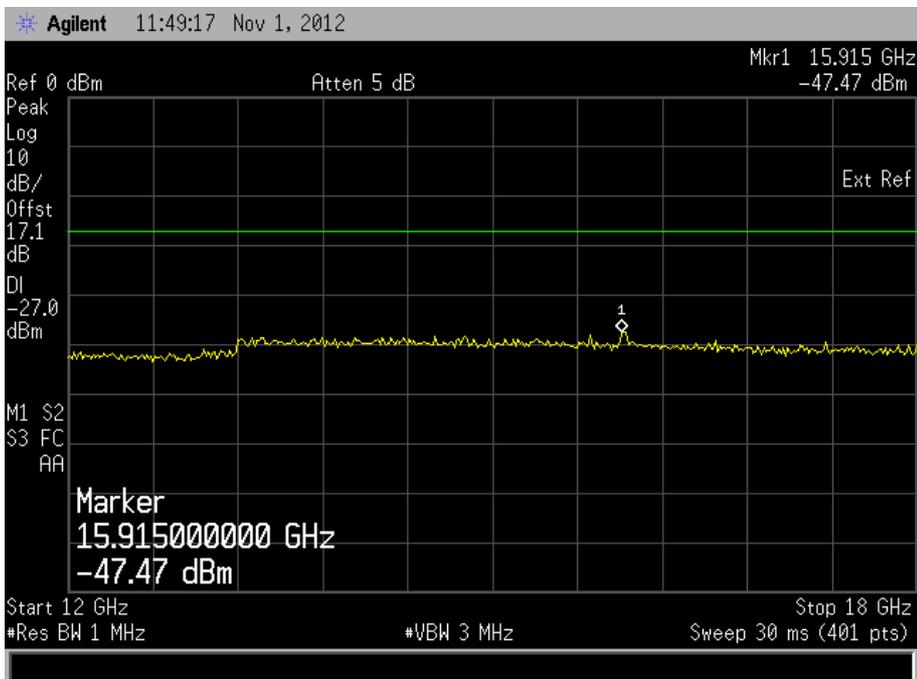


Product Service

7 GHz to 12 GHz



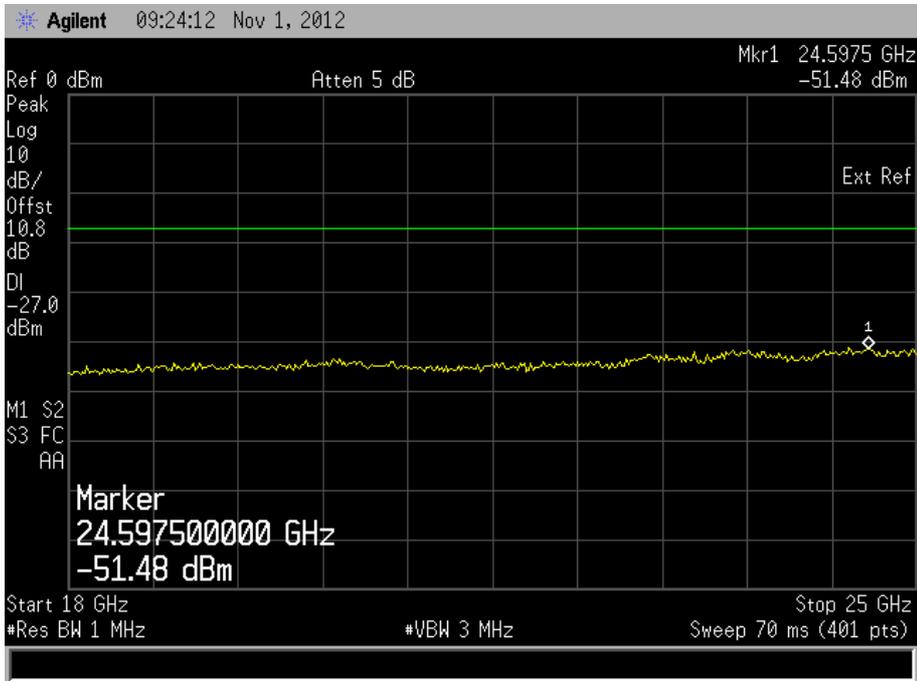
12 GHz to 18 GHz



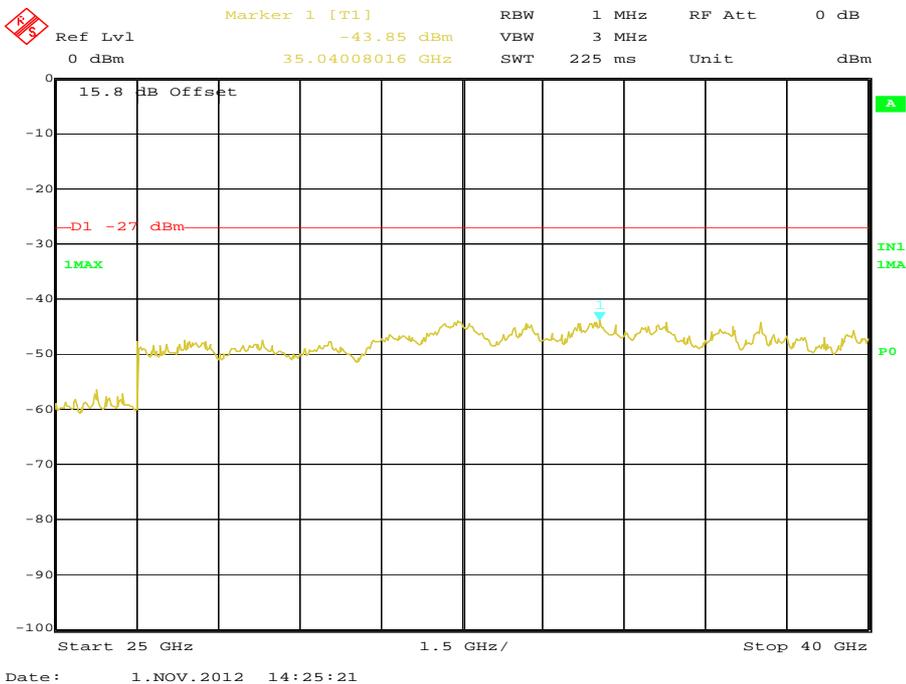


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz



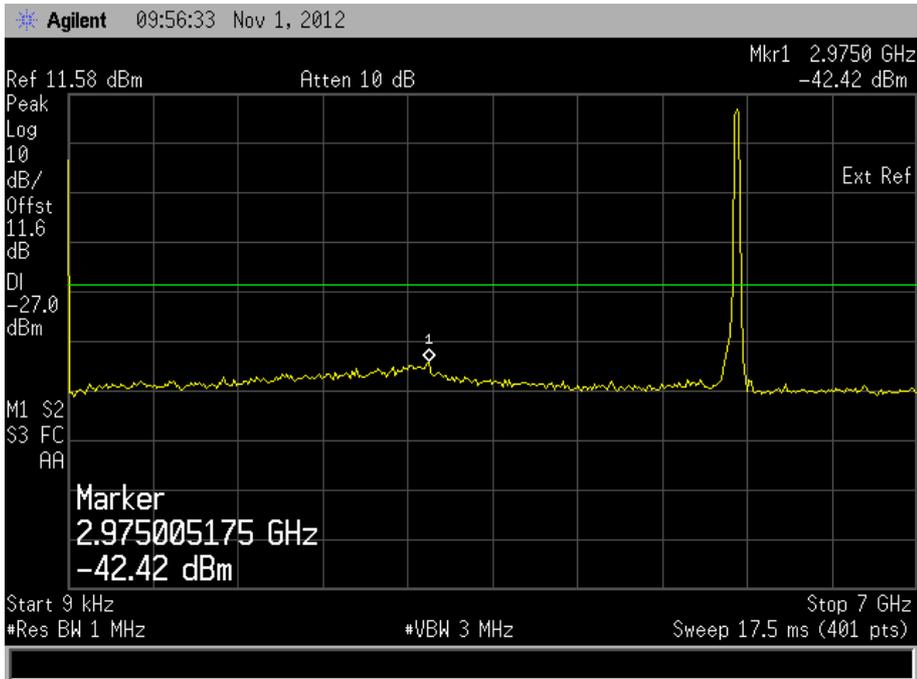


Product Service

Frequency Band 3

5510 MHz

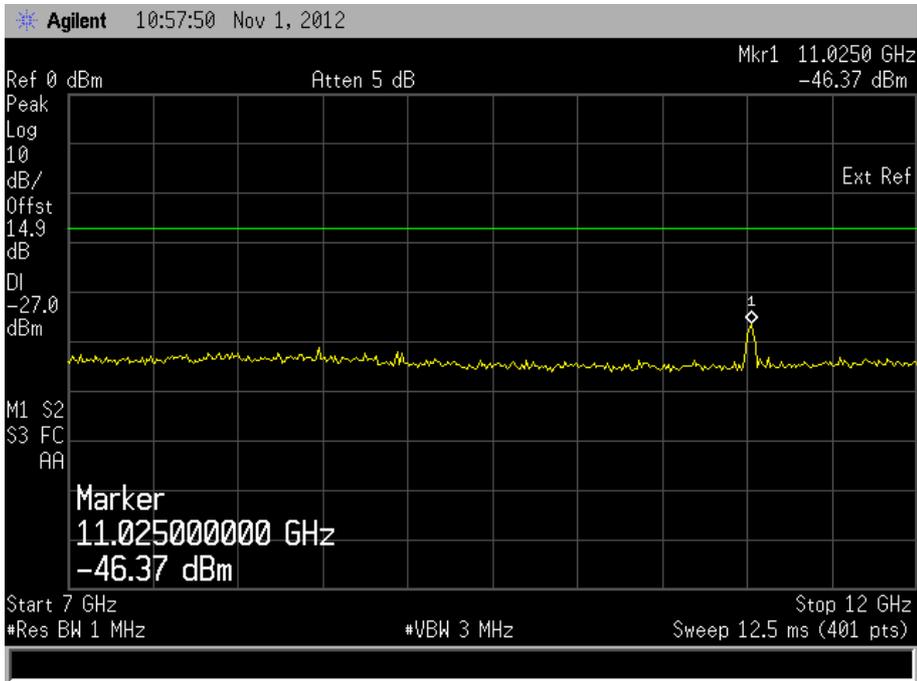
9 kHz to 7 GHz



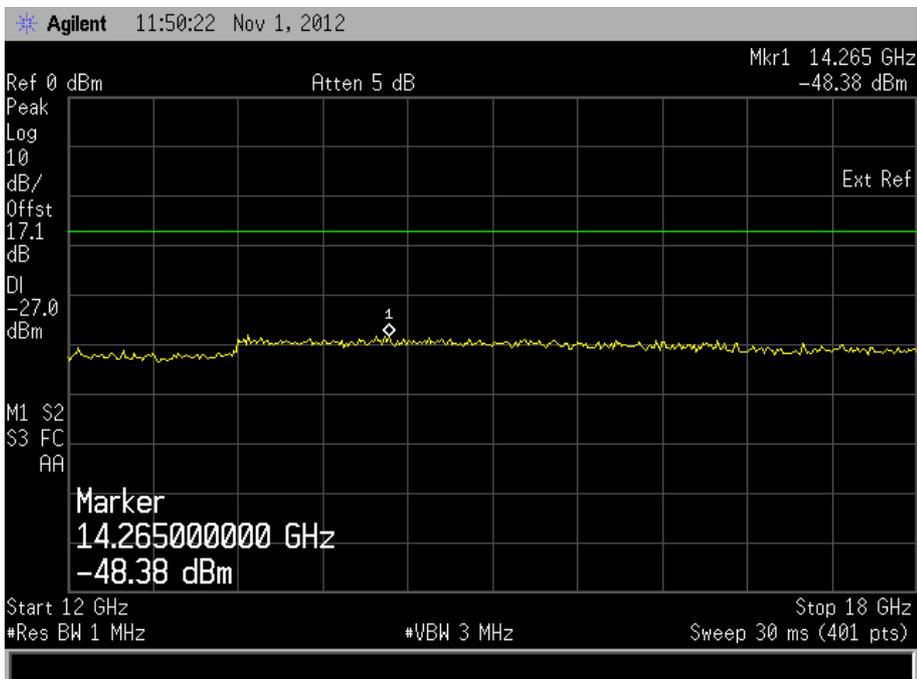


Product Service

7 GHz to 12 GHz

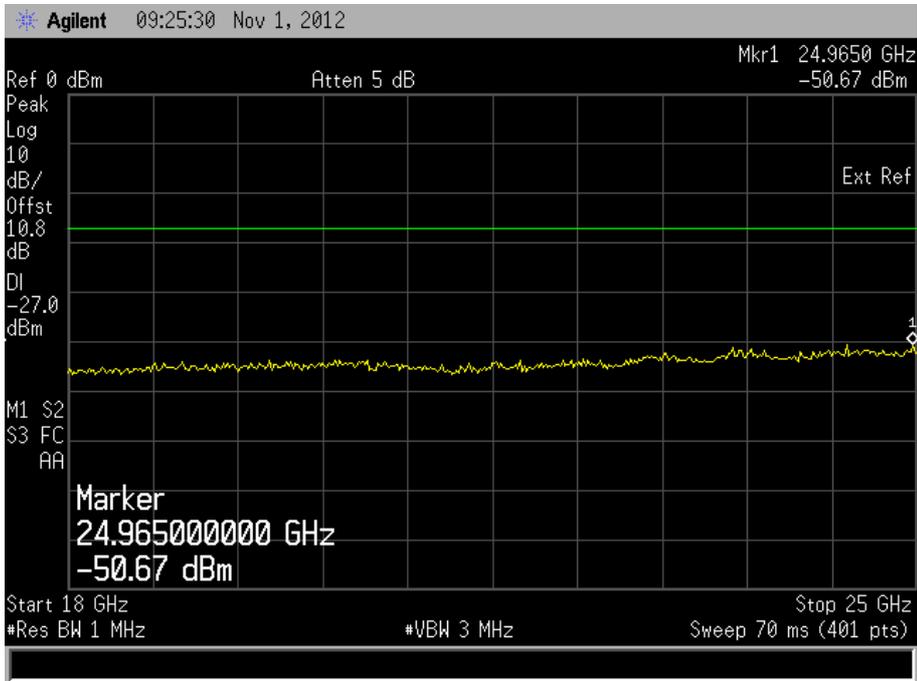


12 GHz to 18 GHz

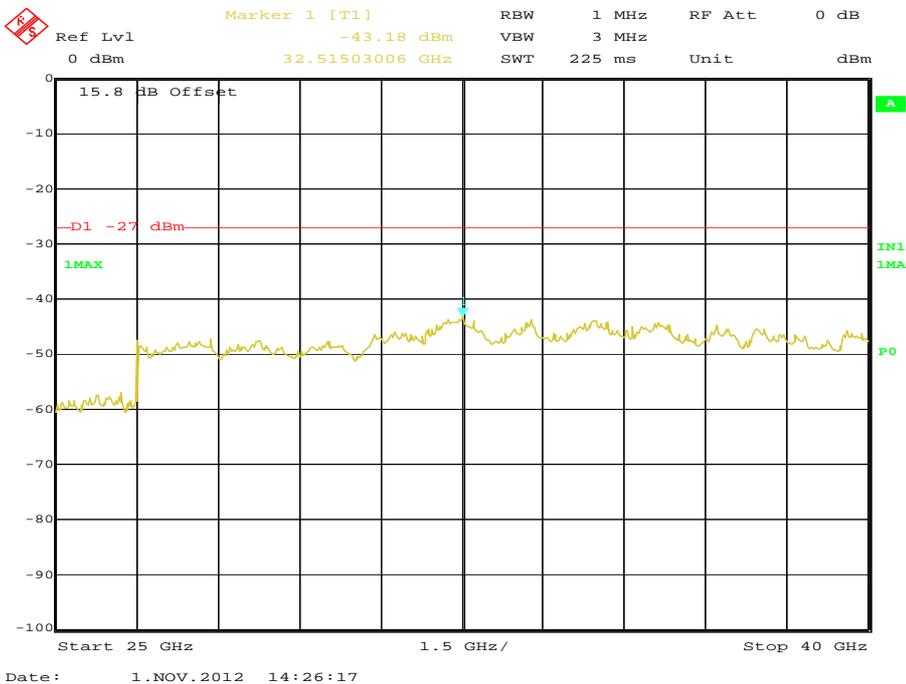




18 GHz to 25 GHz



25 GHz to 40 GHz

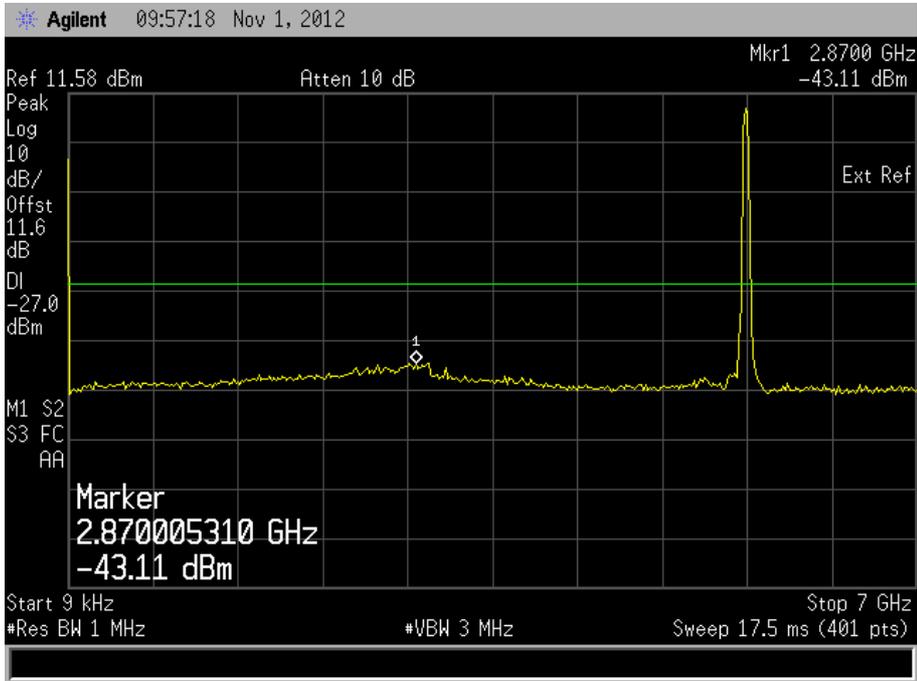




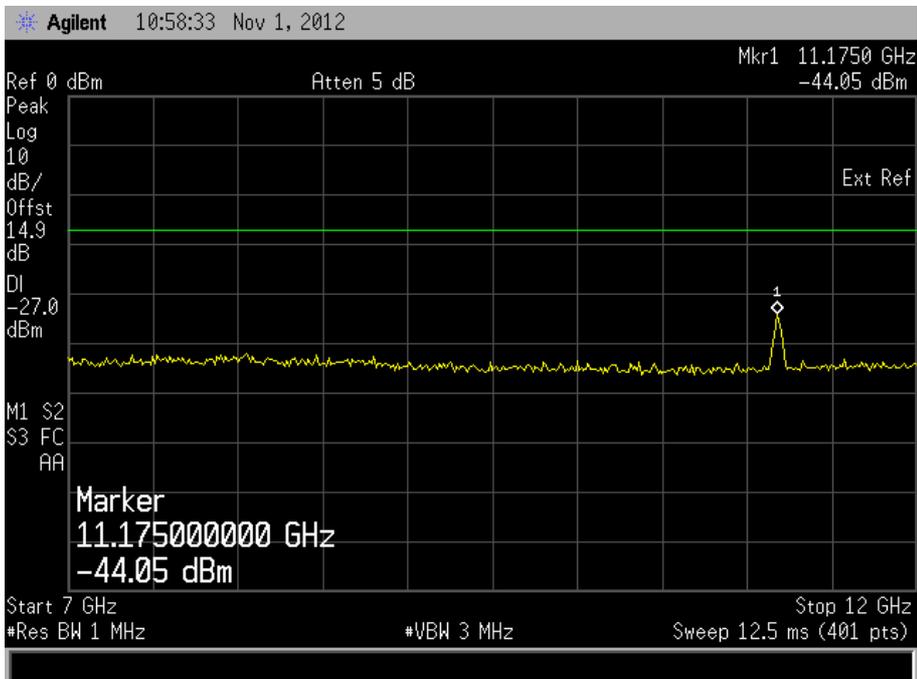
Product Service

5590 MHz

9 kHz to 7 GHz



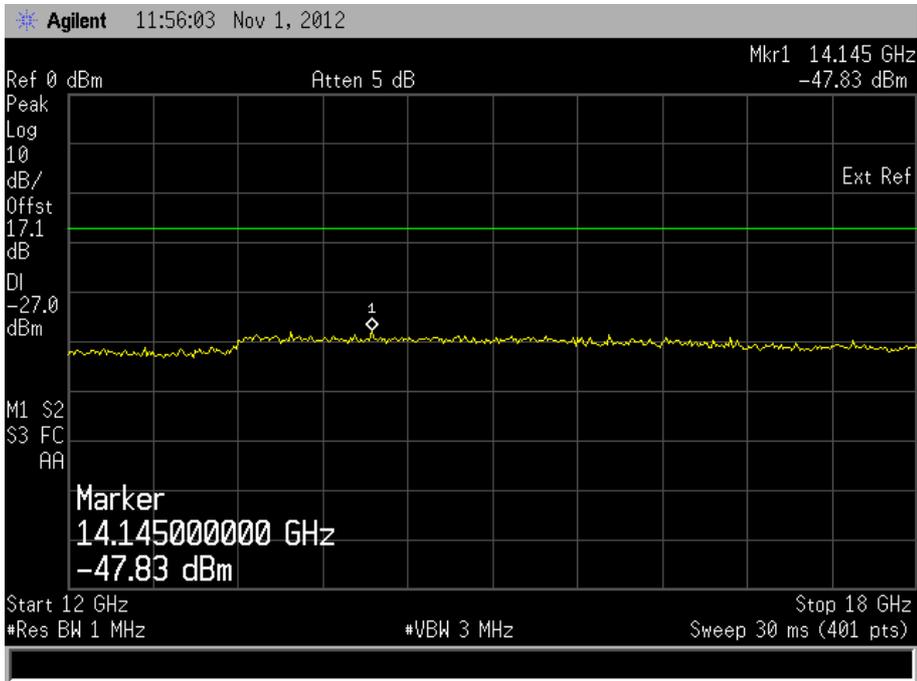
7 GHz to 12 GHz



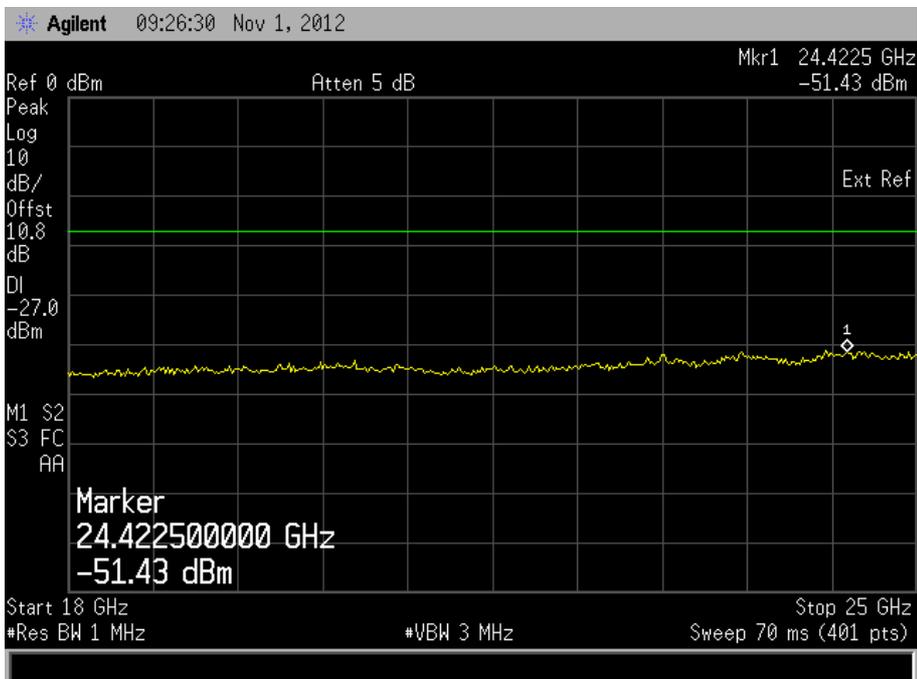


Product Service

12 GHz to 18 GHz



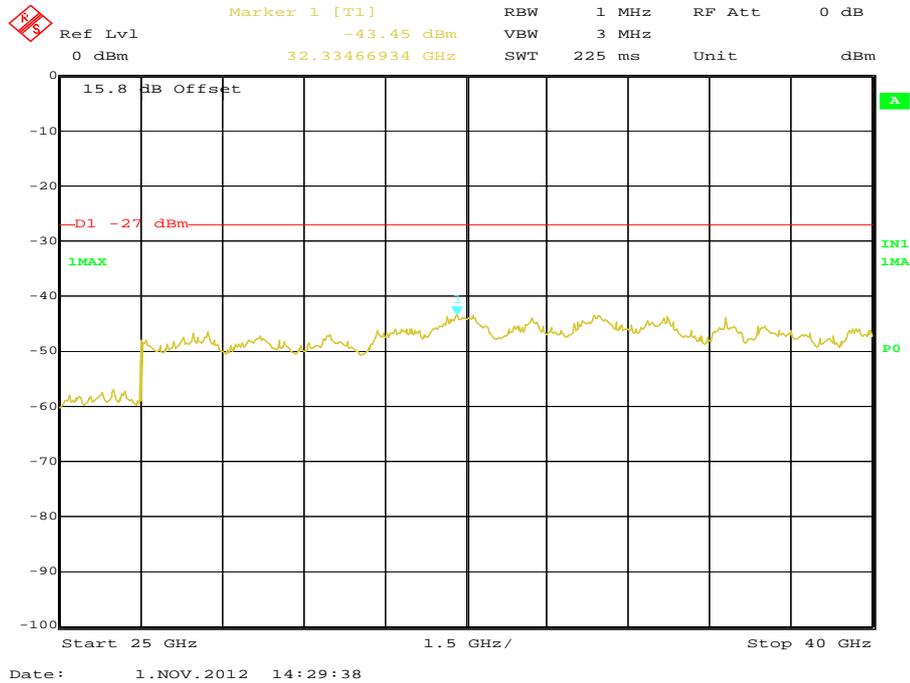
18 GHz to 25 GHz





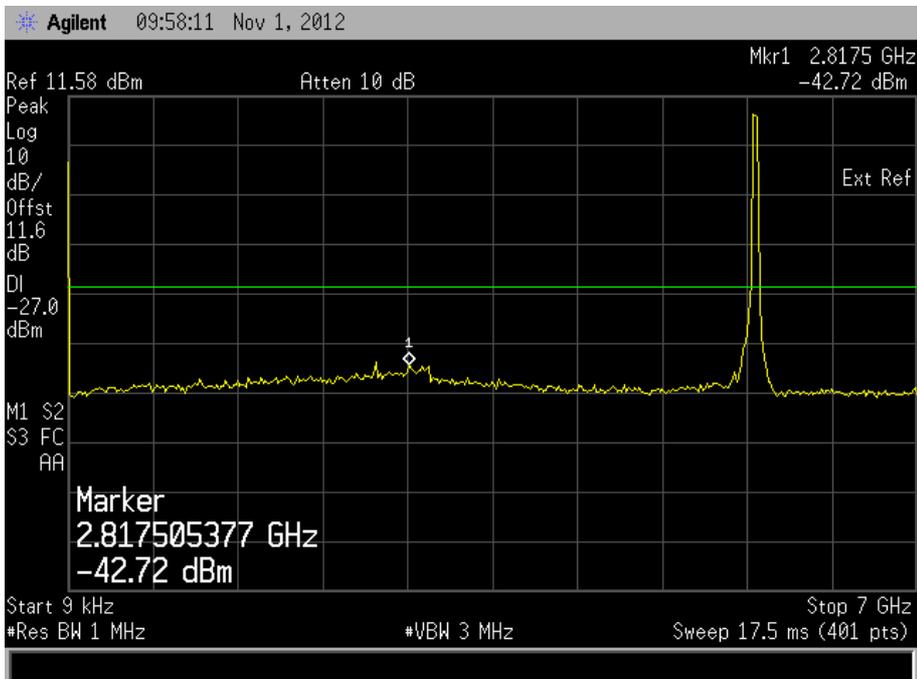
Product Service

25 GHz to 40 GHz



5670 MHz

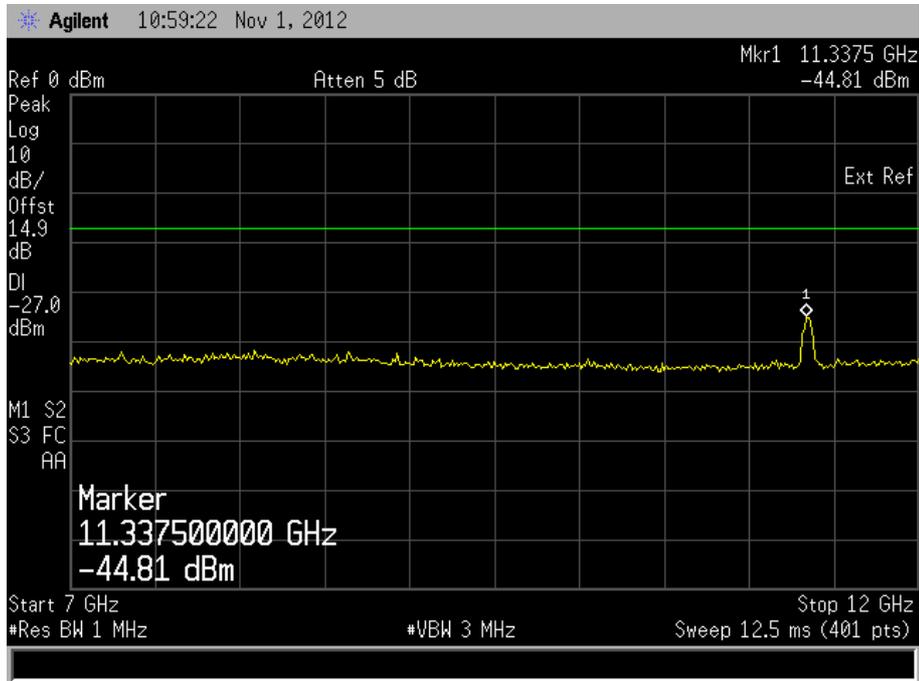
9 kHz to 7 GHz



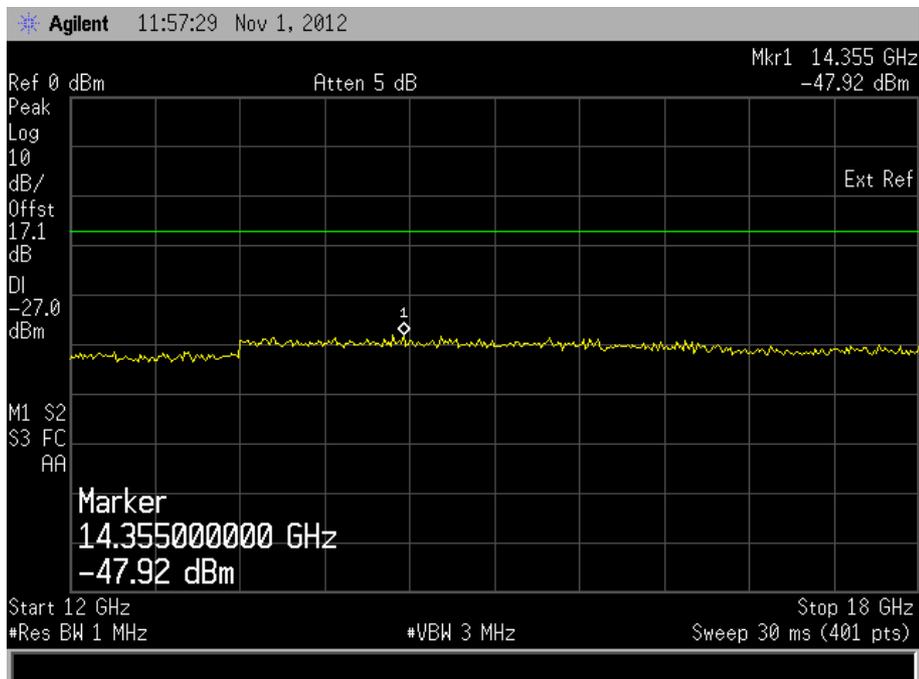


Product Service

7 GHz to 12 GHz



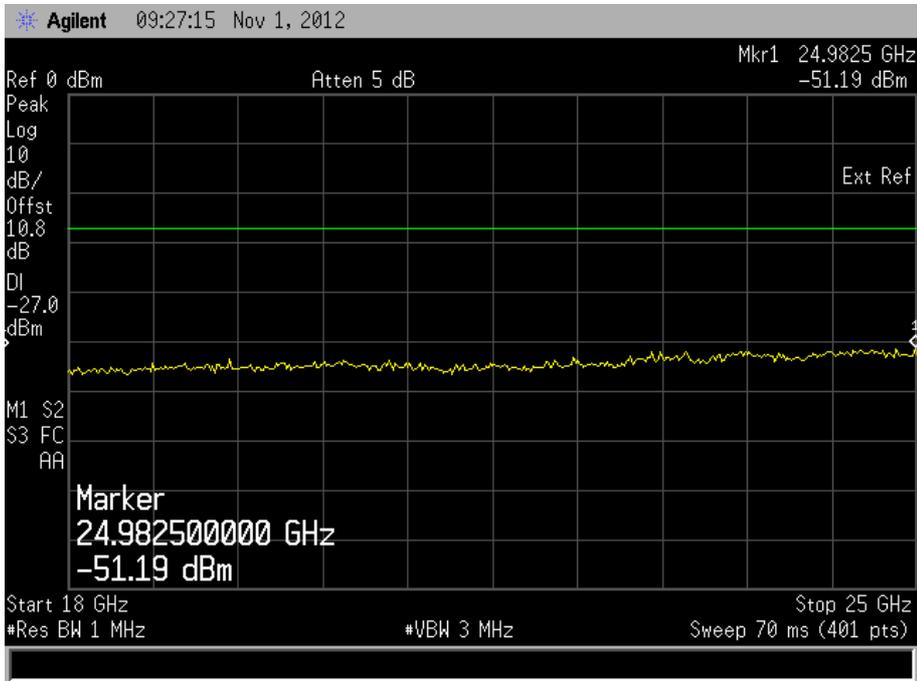
12 GHz to 18 GHz



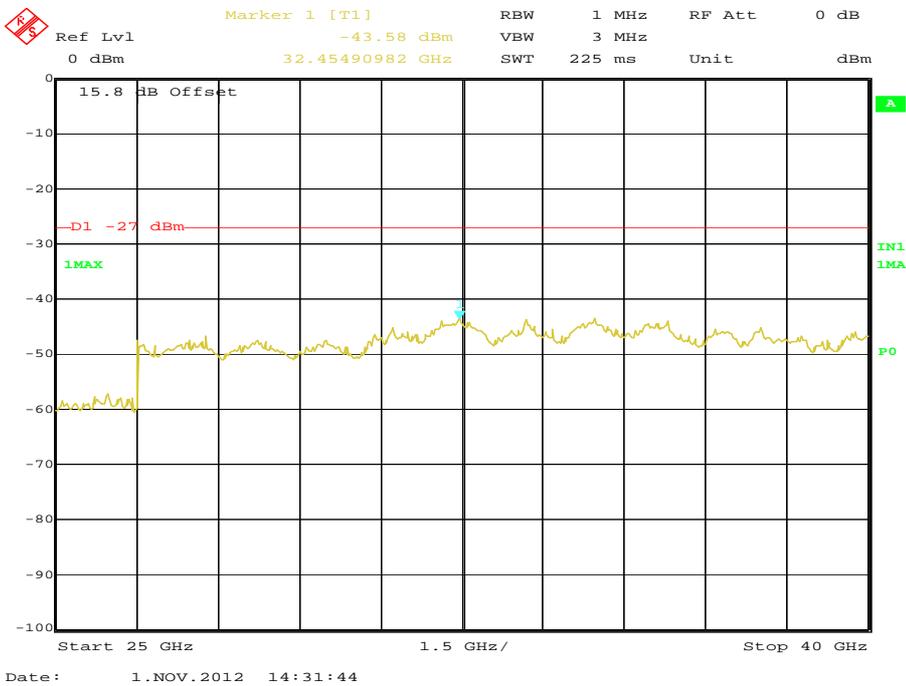


Product Service

18 GHz to 25 GHz



25 GHz to 40 GHz





Product Service

Limit Clause

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB.



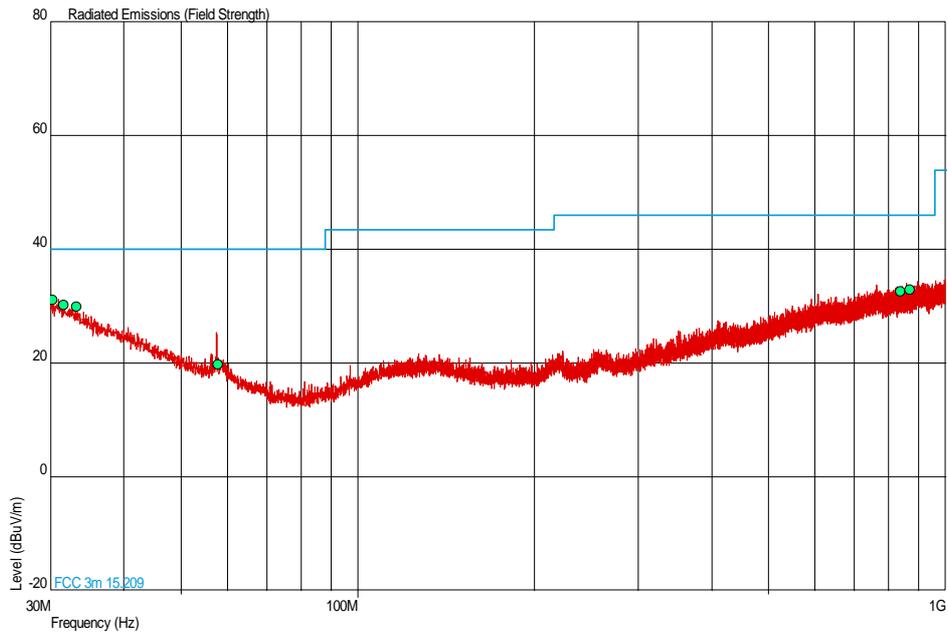
Product Service

Spurious Radiated Emissions

Frequency Band 1

5190 MHz

30 MHz to 1 GHz



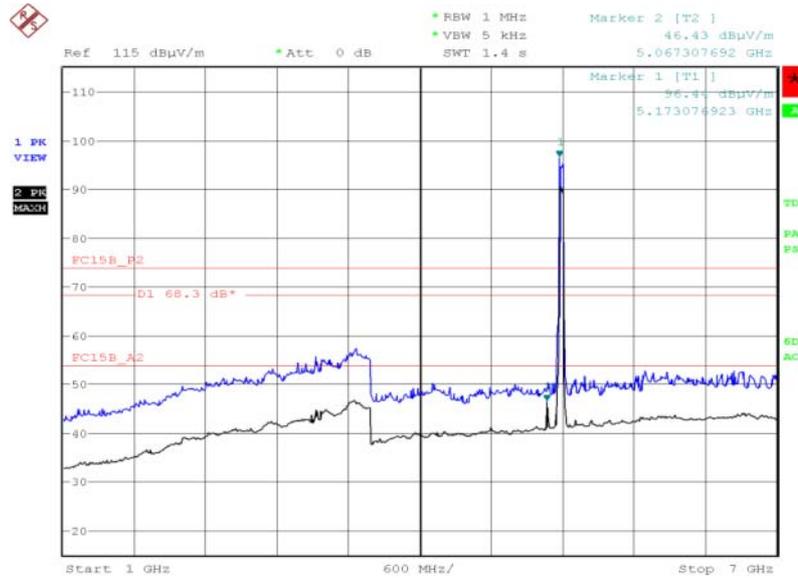
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.243	31.0	35.5	40.0	100	-9.0	64.5	0	1.00	Vertical
31.601	30.3	32.7	40.0	100	-9.7	67.3	180	1.00	Horizontal
33.250	30.0	31.6	40.0	100	-10.0	68.4	0	1.00	Horizontal
57.852	19.8	9.8	40.0	100	-20.2	90.2	0	1.00	Horizontal
837.089	32.7	43.2	46.0	200	-13.3	156.8	0	1.00	Vertical
869.535	32.9	44.2	46.0	200	-13.1	155.8	180	1.00	Vertical



1GHz to 40GHz

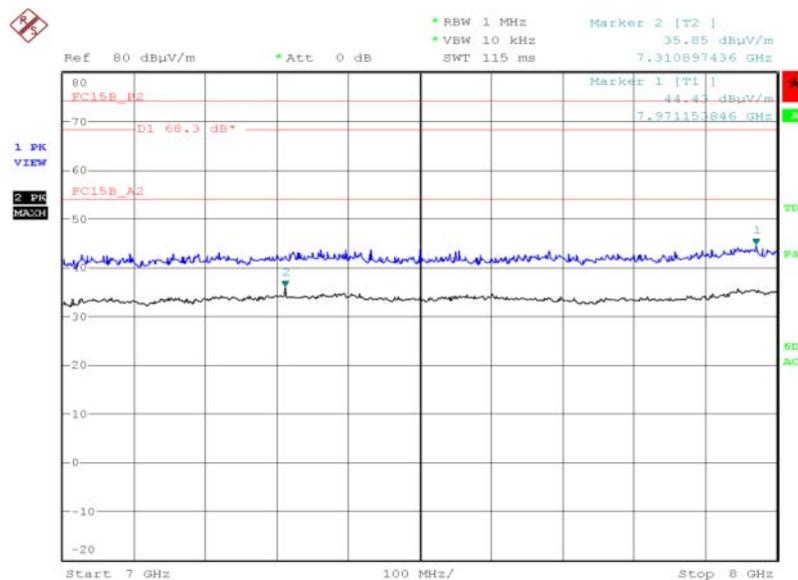
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.070	Horizontal	115	025	56.00	45.86

1GHz to 7GHz



Date: 20.OCT.2012 10:42:41

7GHz to 8GHz

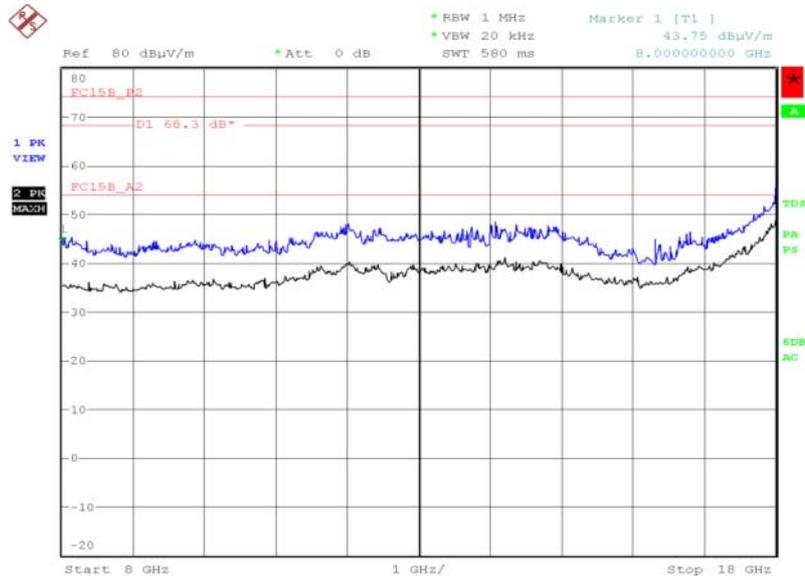


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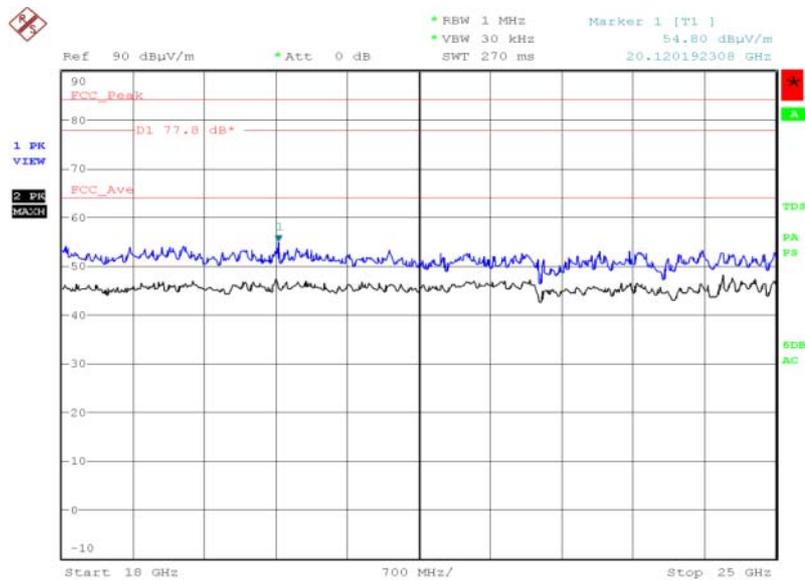
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 12:02:16

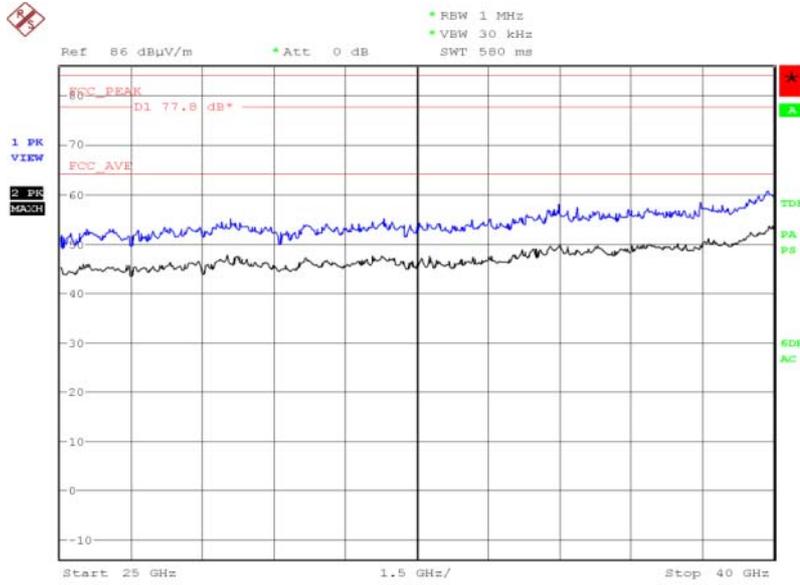
18GHz to 25GHz



Date: 29.OCT.2012 23:51:52



25GHz to 40GHz

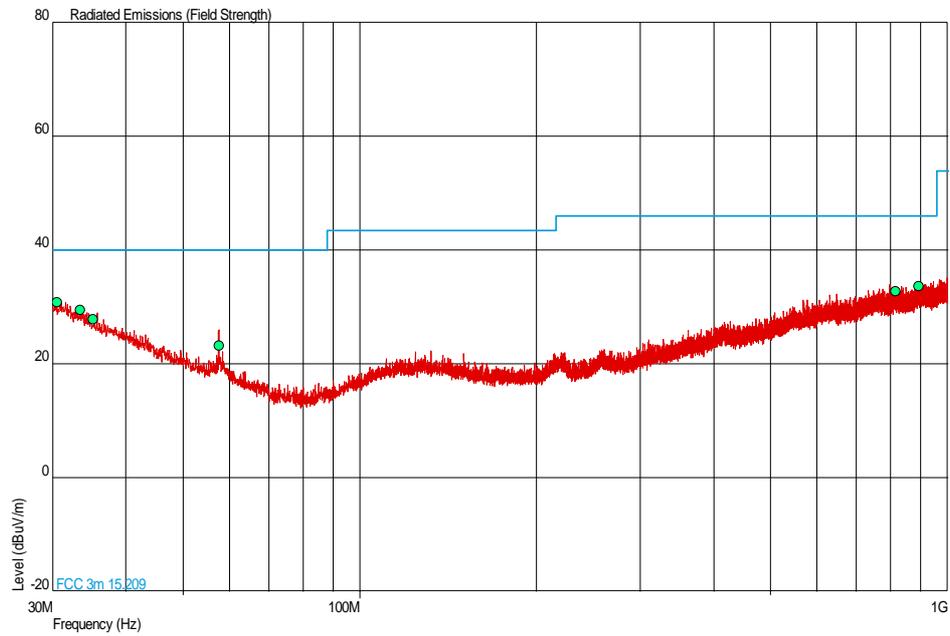


Date: 30.OCT.2012 18:50:50



5230 MHz

30 MHz to 1 GHz

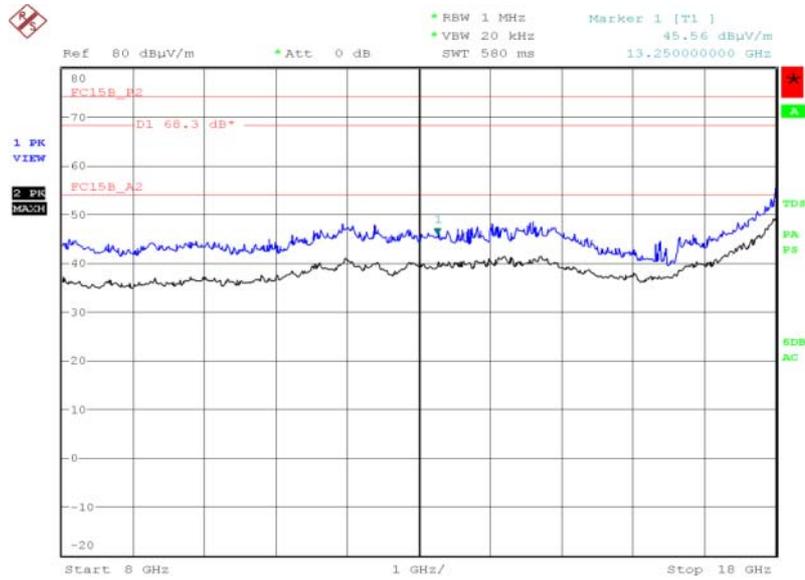


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.582	30.8	34.7	40.0	100	-9.2	65.3	90	1.00	Vertical
33.492	29.4	29.5	40.0	100	-10.6	70.5	90	1.00	Vertical
35.190	27.9	24.8	40.0	100	-12.1	75.2	90	1.00	Vertical
57.645	23.2	14.5	40.0	100	-16.8	85.5	90	1.00	Vertical
815.555	32.7	43.2	46.0	200	-13.3	156.8	90	1.00	Vertical
892.621	33.7	48.4	46.0	200	-12.3	151.6	0	1.00	Vertical



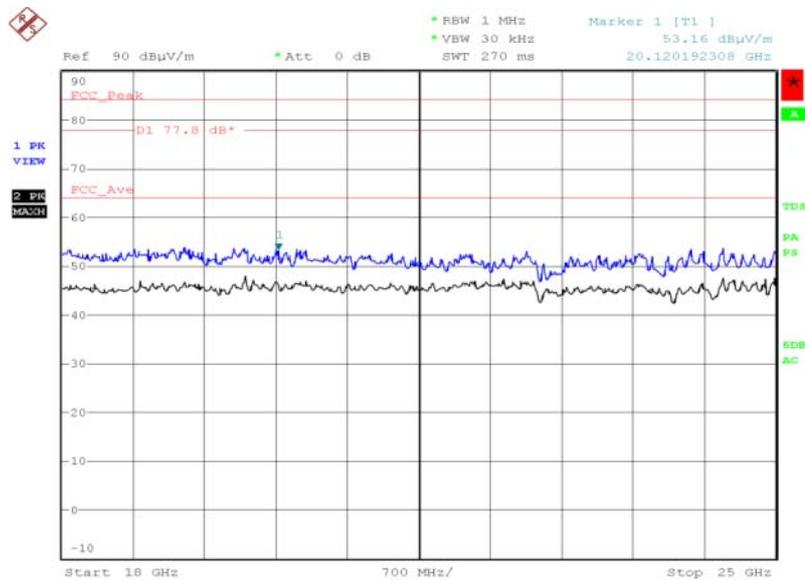
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 11:53:28

18GHz to 25GHz

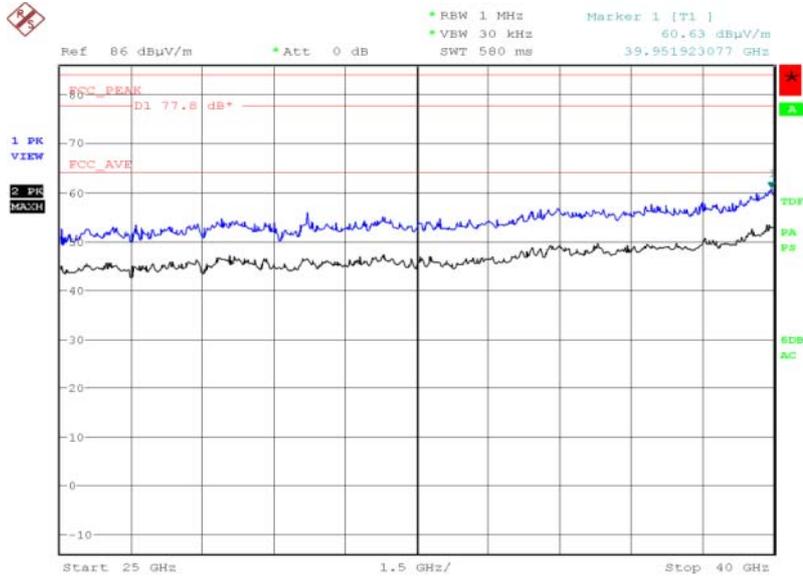


Date: 29.OCT.2012 23:54:19



Product Service

25GHz to 40GHz



Date: 30.OCT.2012 18:54:41

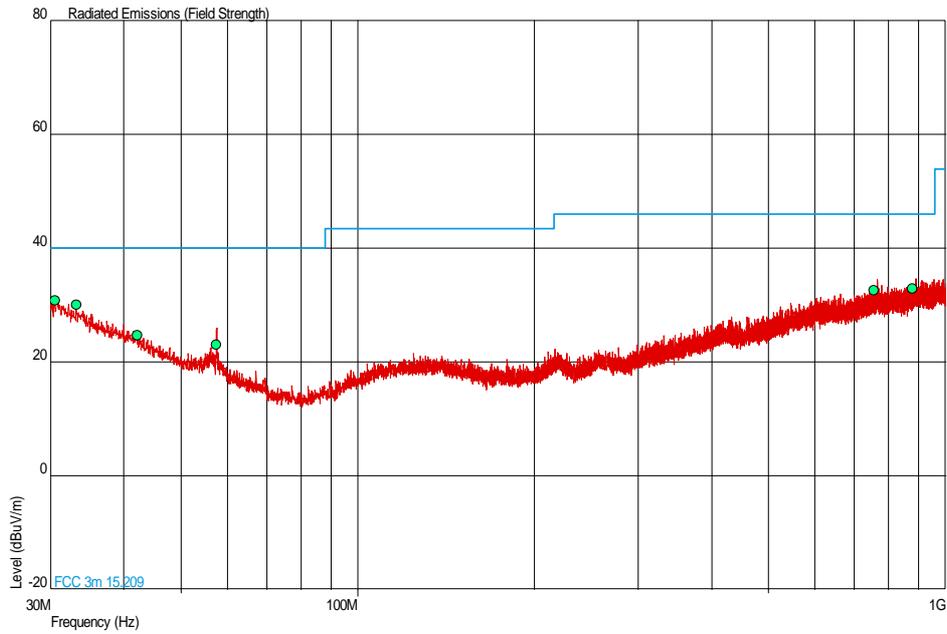


Product Service

Frequency Band 2

5270 MHz

30 MHz to 1 GHz



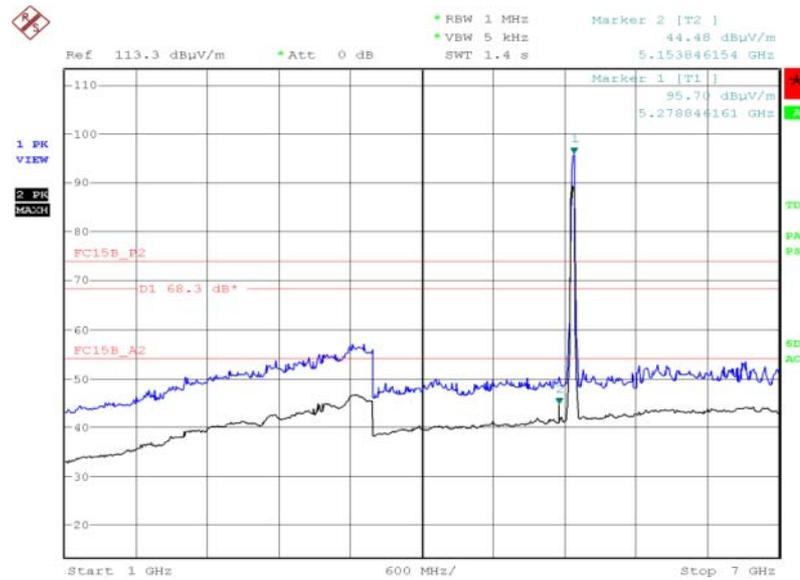
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.582	30.9	35.1	40.0	100	-9.1	64.9	180	1.00	Horizontal
33.250	30.1	32.0	40.0	100	-9.9	68.0	0	1.00	Horizontal
42.174	24.7	17.2	40.0	100	-15.3	82.8	180	1.00	Horizontal
57.548	23.1	14.3	40.0	100	-16.9	85.7	180	1.00	Vertical
755.415	32.6	42.7	46.0	200	-13.4	157.3	180	1.00	Vertical
878.605	32.9	44.2	46.0	200	-13.1	155.8	0	1.00	Vertical



1GHz to 40GHz

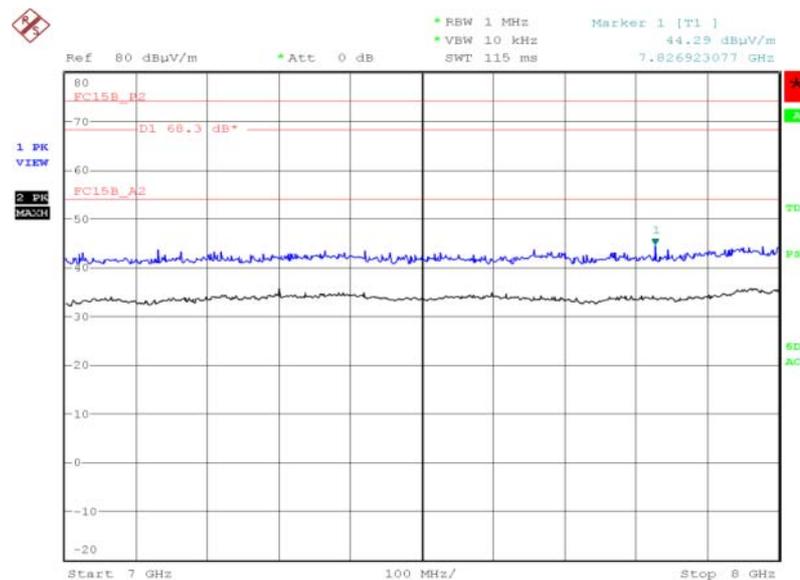
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.150	Horizontal	150	027	53.78	44.21

1GHz to 7GHz



Date: 20.OCT.2012 12:14:56

7GHz to 8GHz

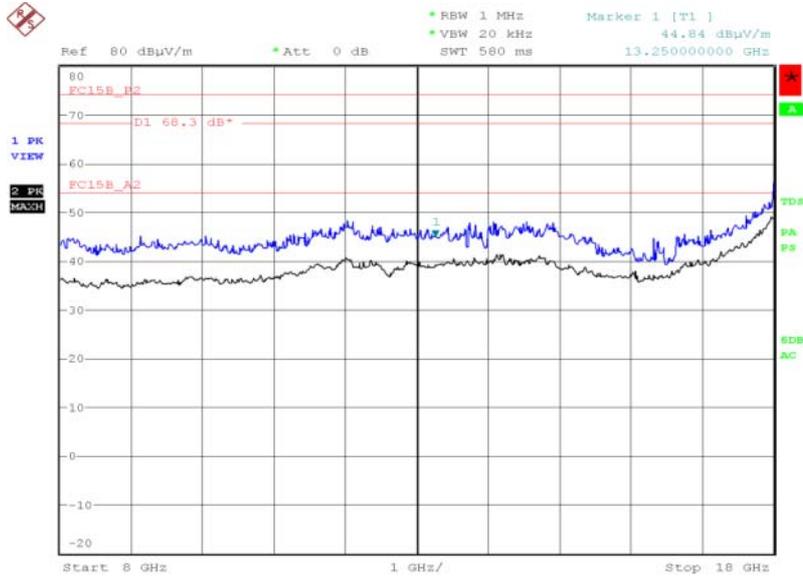


Date: 21.OCT.2012 09:33:36



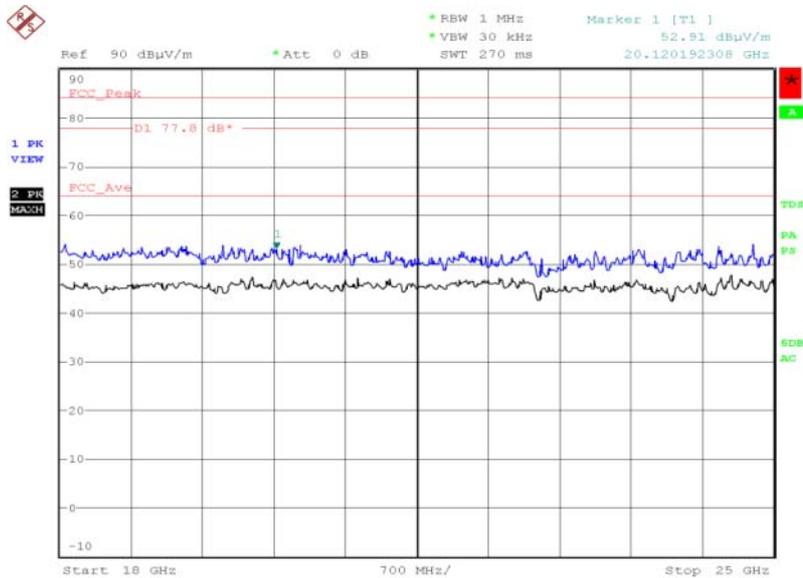
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 11:37:42

18GHz to 25GHz

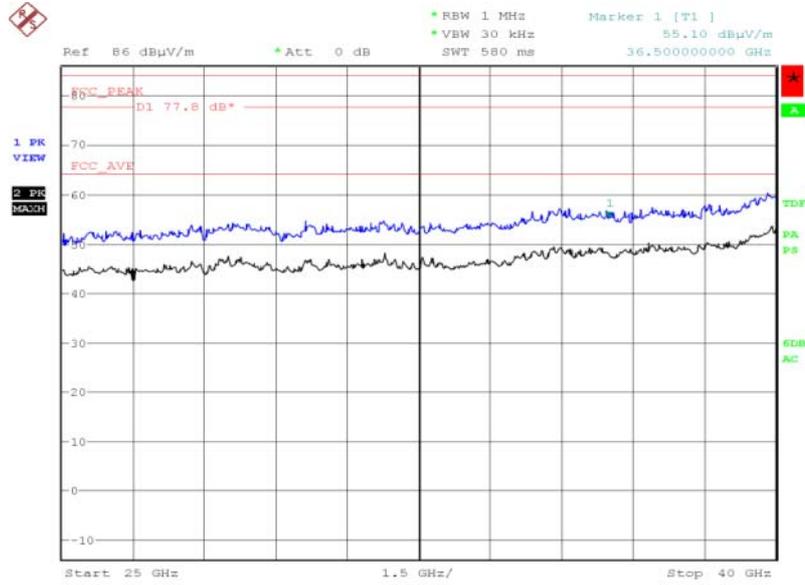


Date: 29.OCT.2012 23:57:36



Product Service

25GHz to 40GHz

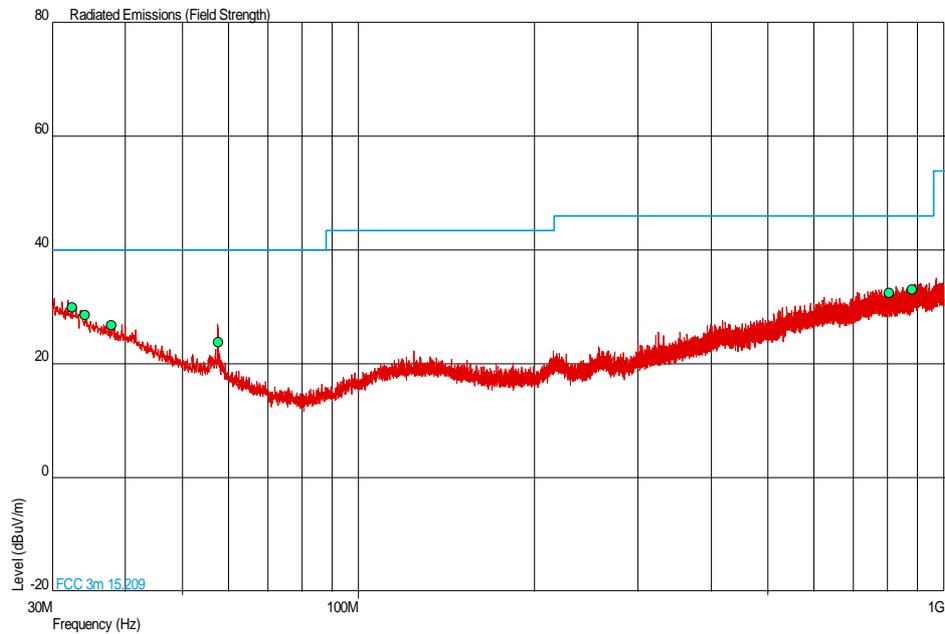


Date: 30.OCT.2012 19:03:49



5310 MHz

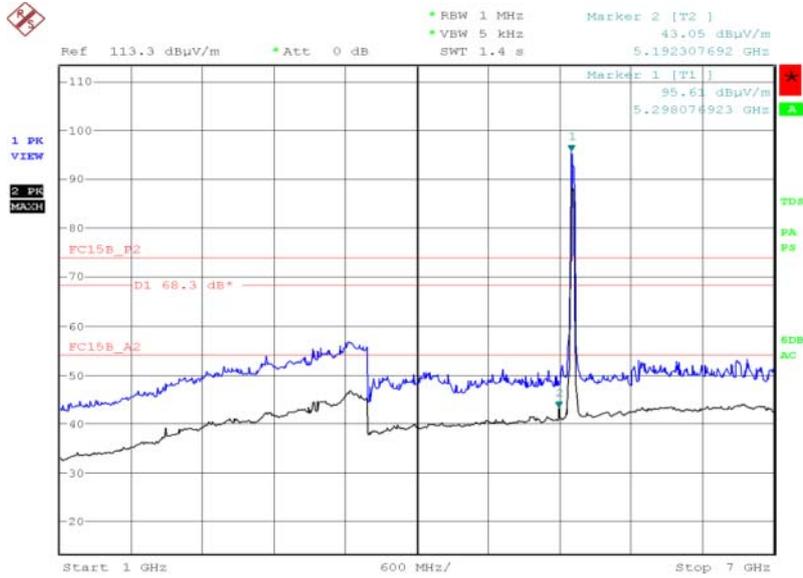
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
32.474	29.9	31.3	40.0	100	-10.1	68.7	180	1.00	Vertical
34.171	28.7	27.2	40.0	100	-11.3	72.8	0	1.00	Horizontal
37.857	26.7	21.6	40.0	100	-13.3	78.4	0	1.00	Vertical
57.645	23.8	15.5	40.0	100	-16.2	84.5	180	1.00	Vertical
805.467	32.5	42.2	46.0	200	-13.5	157.8	180	1.00	Horizontal
880.642	33.1	45.2	46.0	200	-12.9	154.8	0	1.00	Vertical

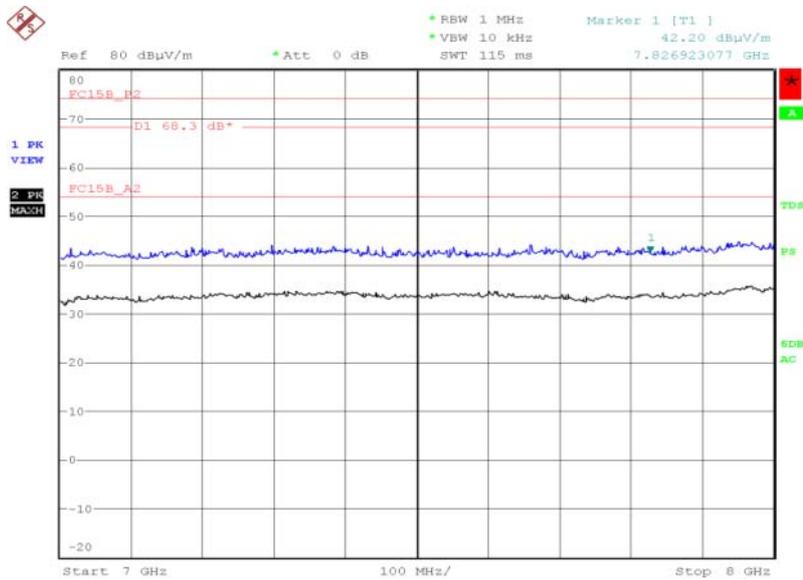


1GHz to 7GHz



Date: 20.OCT.2012 12:46:49

7GHz to 8GHz

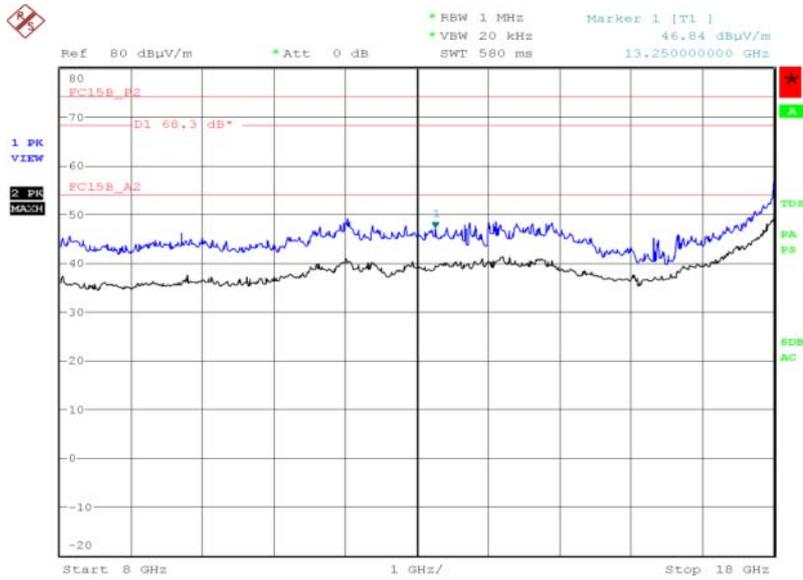


Date: 21.OCT.2012 09:44:34



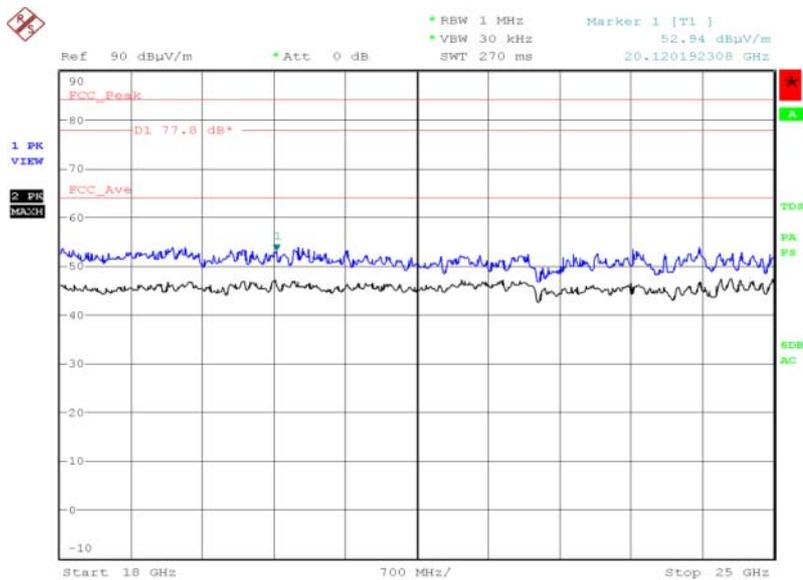
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 11:24:10

18GHz to 25GHz

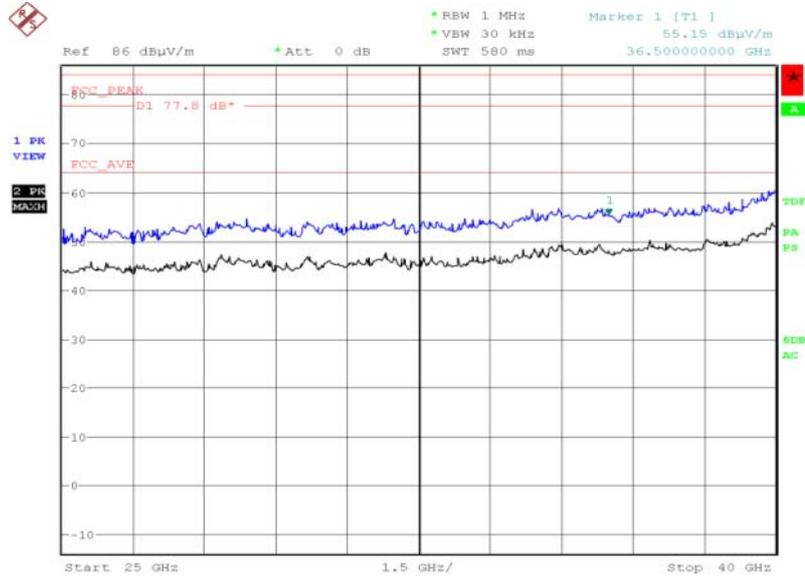


Date: 29.OCT.2012 23:59:54



Product Service

25GHz to 40GHz



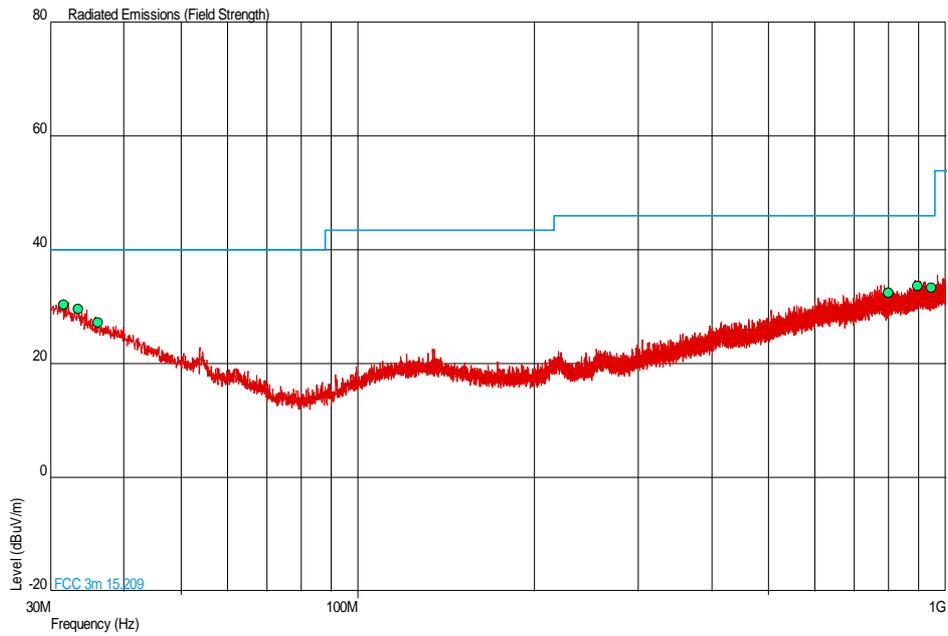
Date: 30.OCT.2012 19:08:22



Frequency Band 3

5510 MHz

30 MHz to 1 GHz



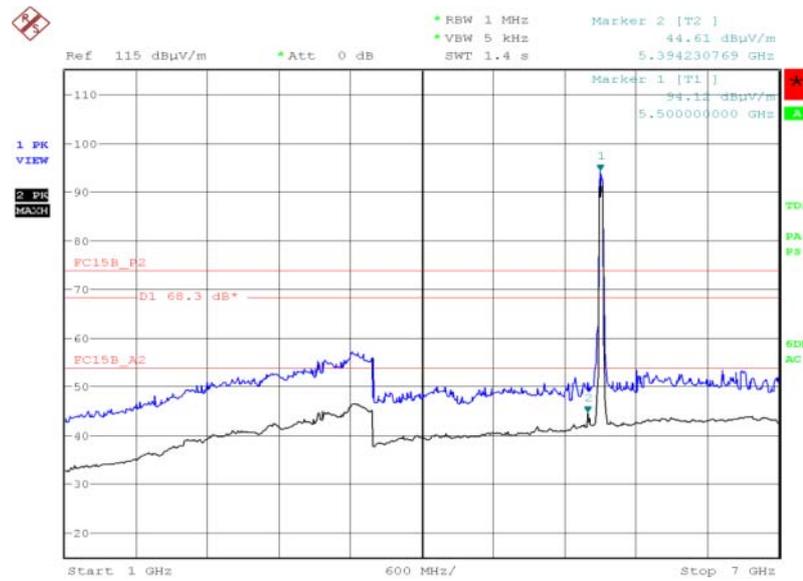
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
31.649	30.4	33.1	40.0	100	-9.6	66.9	180	1.00	Vertical
33.444	29.6	30.2	40.0	100	-10.4	69.8	0	1.00	Horizontal
36.208	27.3	23.2	40.0	100	-12.7	76.8	180	1.00	Vertical
800.035	32.4	41.7	46.0	200	-13.6	158.3	0	1.00	Vertical
897.326	33.7	48.4	46.0	200	-12.3	151.6	0	1.00	Horizontal
945.826	33.4	46.8	46.0	200	-12.6	153.2	180	1.00	Vertical



1GHz to 40GHz

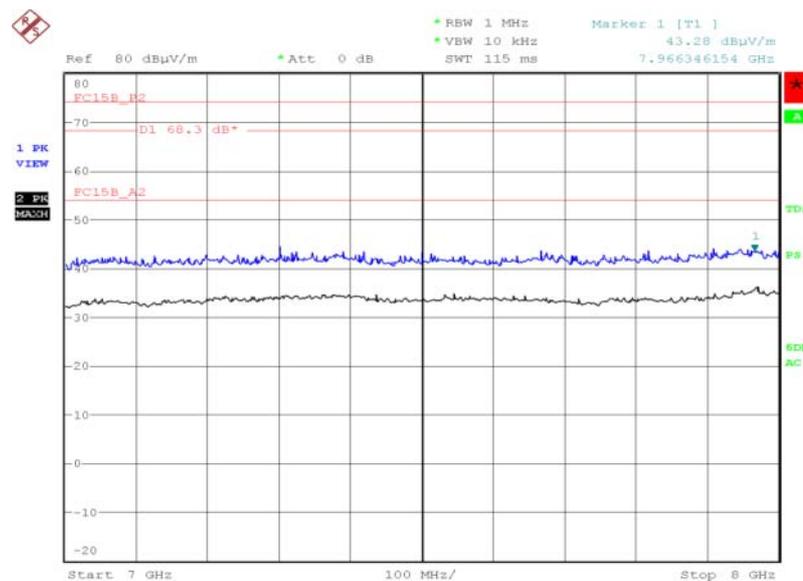
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.390	Horizontal	158	032	52.64	43.57
11.020	Vertical	106	147	50.10	43.26

1GHz to 7GHz



Date: 20.OCT.2012 13:26:28

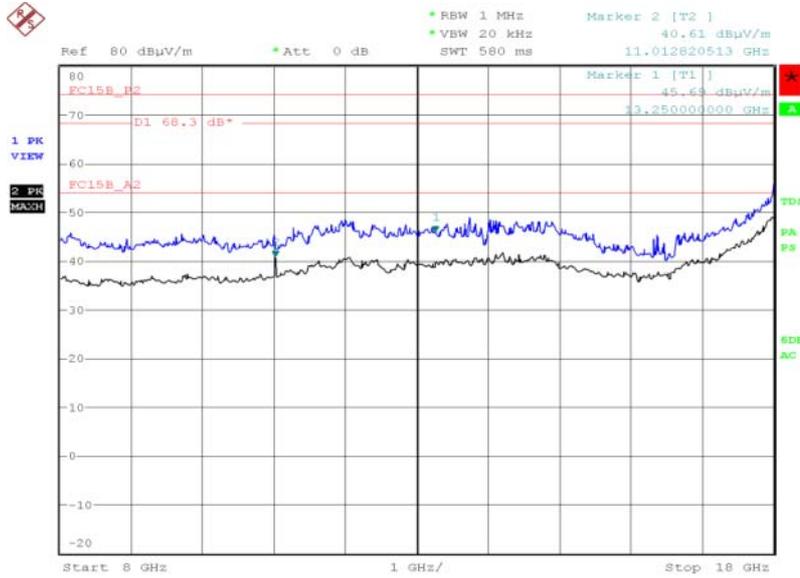
7GHz to 8GHz



Date: 21.OCT.2012 09:50:53

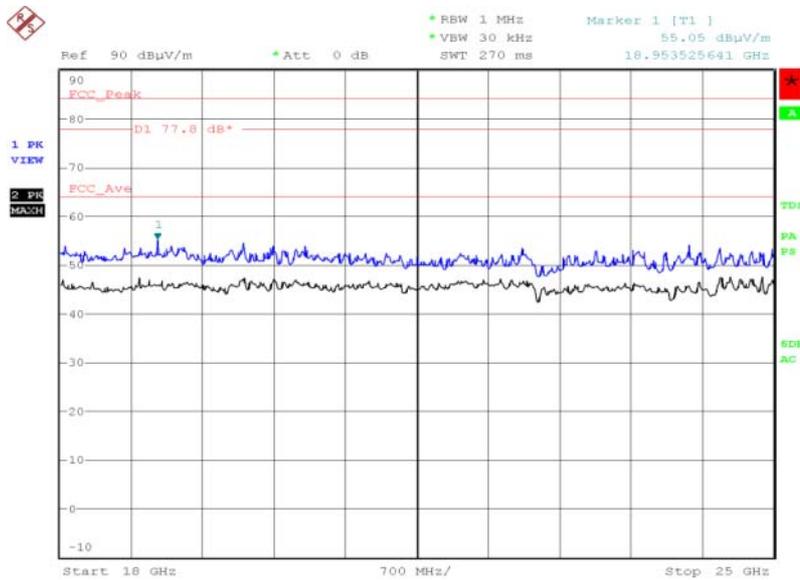


8GHz to 18GHz



Date: 21.OCT.2012 11:07:14

18GHz to 25GHz

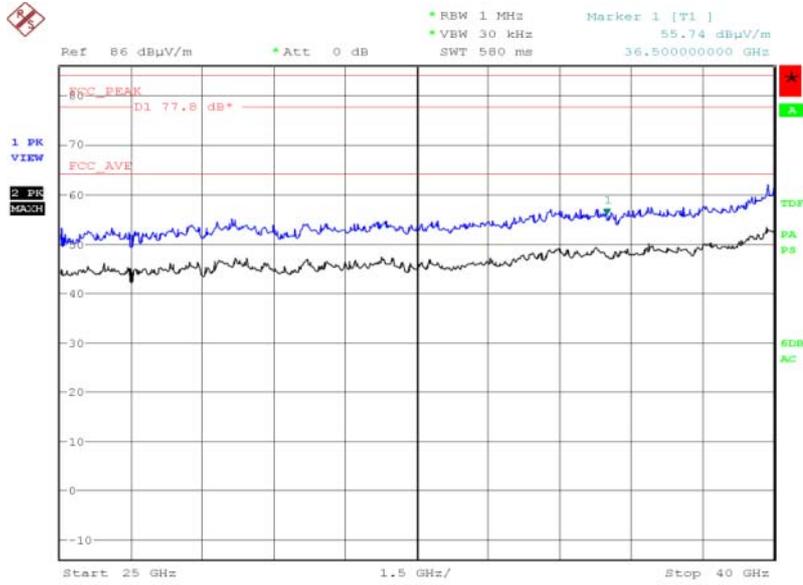


Date: 30.OCT.2012 00:02:26



Product Service

25GHz to 40GHz

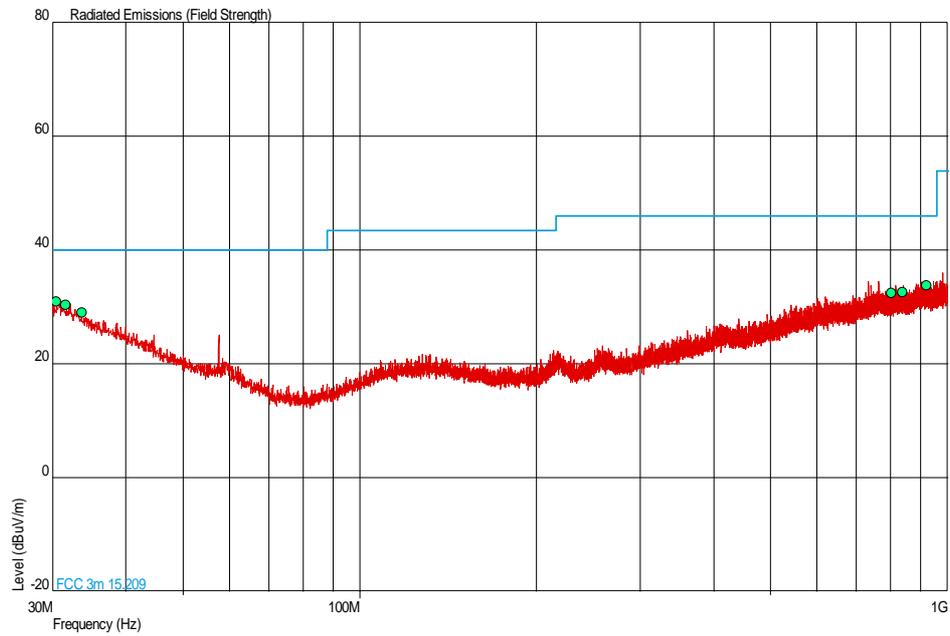


Date: 30.OCT.2012 19:15:03



5590 MHz

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.437	31.0	35.5	40.0	100	-9.0	64.5	0	1.00	Horizontal
31.649	30.4	33.1	40.0	100	-9.6	66.9	0	1.00	Horizontal
33.686	29.0	28.2	40.0	100	-11.0	71.8	180	1.00	Horizontal
802.702	32.5	42.2	46.0	200	-13.5	157.8	180	1.00	Vertical
838.204	32.7	43.2	46.0	200	-13.3	156.8	180	1.00	Horizontal
922.449	33.7	48.4	46.0	200	-12.3	151.6	180	1.00	Vertical

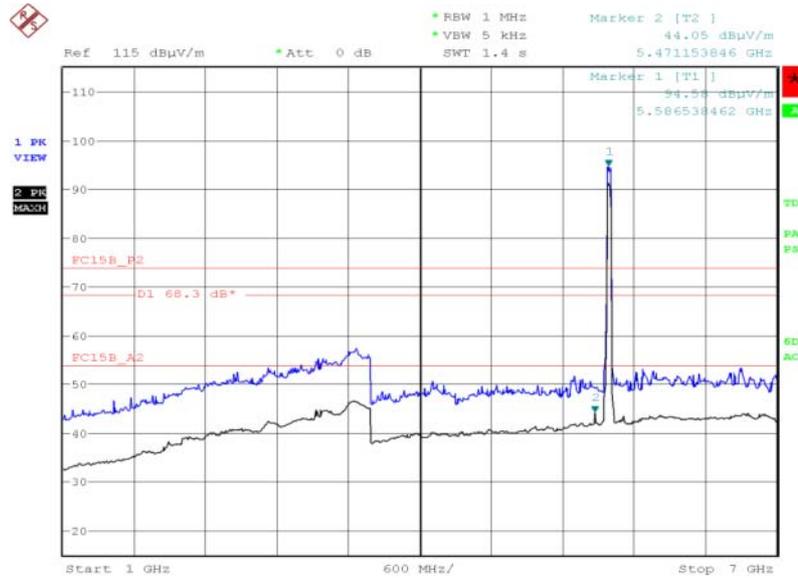


Product Service

1GHz to 40GHz

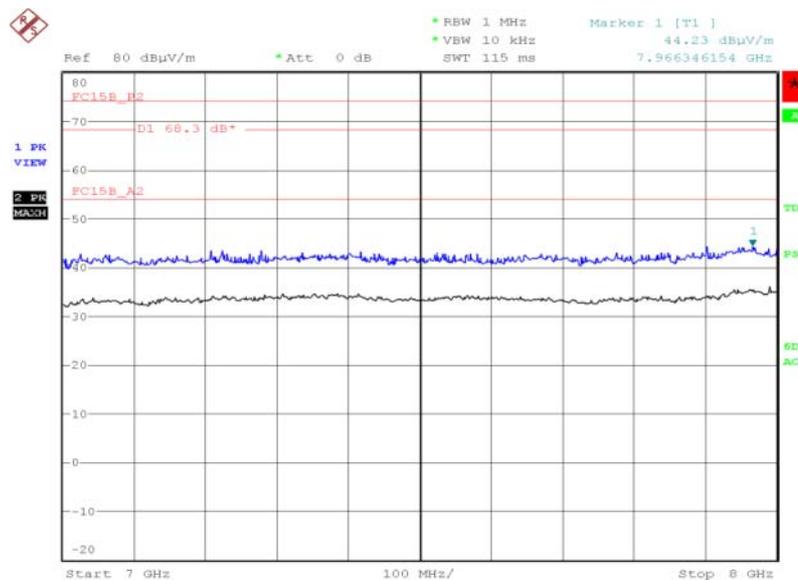
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.180	Vertical	127	155	50.97	42.43

1GHz to 7GHz



Date: 20.OCT.2012 13:44:50

7GHz to 8GHz

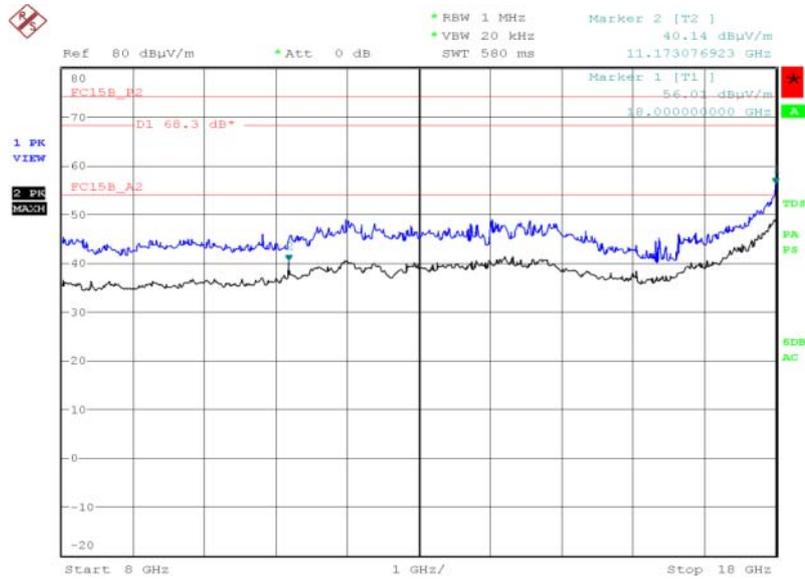


Date: 21.OCT.2012 09:54:29



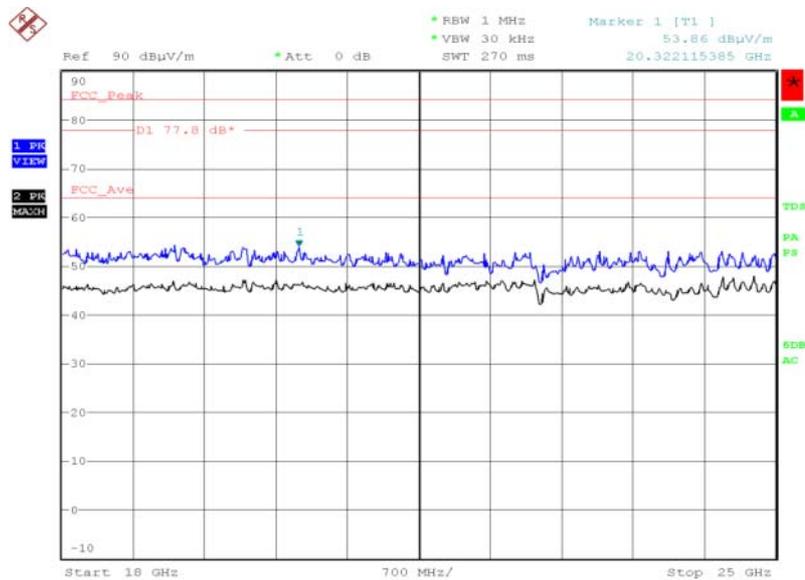
Product Service

8GHz to 18GHz



Date: 21.OCT.2012 10:40:38

18GHz to 25GHz

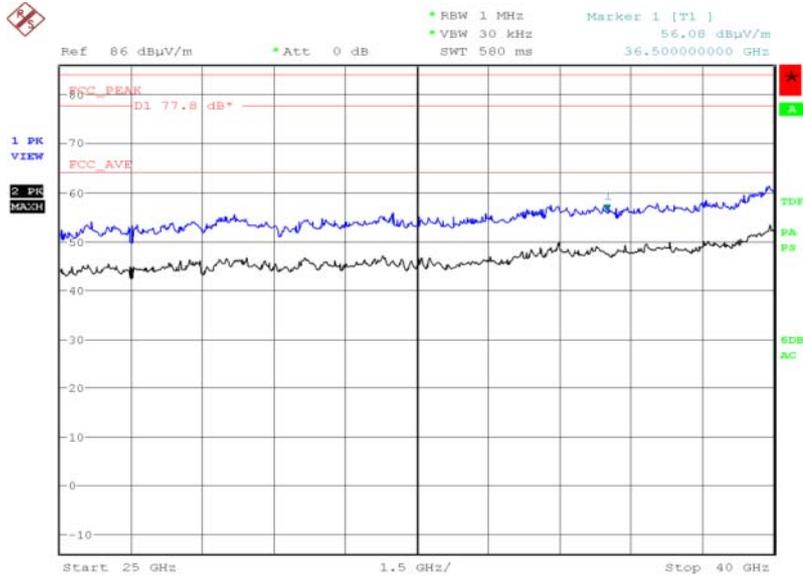


Date: 30.OCT.2012 00:04:34



Product Service

25GHz to 40GHz

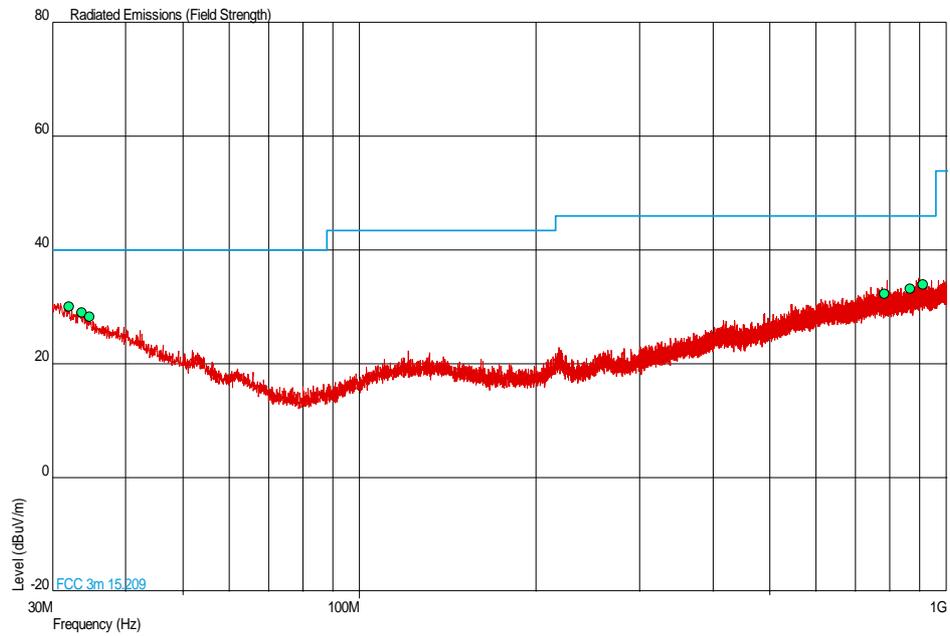


Date: 30.OCT.2012 19:31:12



5670 MHz

30 MHz to 1 GHz



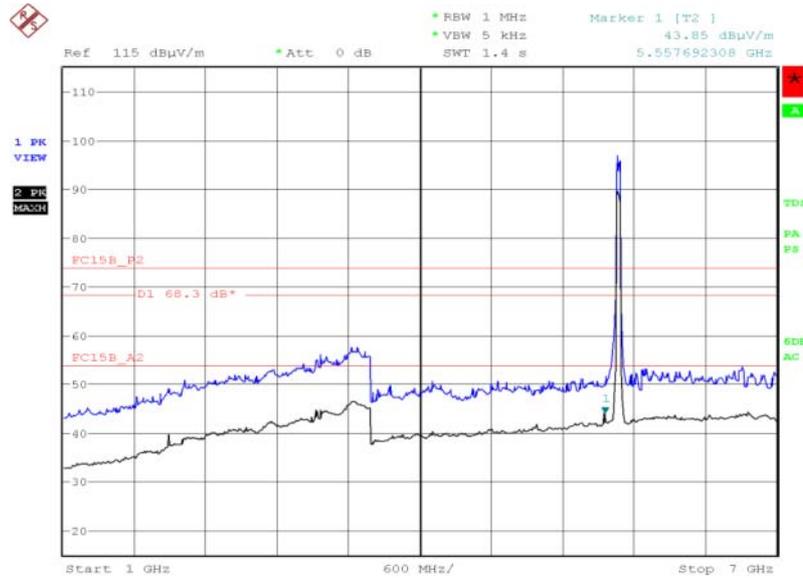
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
31.989	30.1	32.0	40.0	100	-9.9	68.0	0	1.00	Horizontal
33.686	29.0	28.2	40.0	100	-11.0	71.8	180	1.00	Horizontal
34.753	28.2	25.7	40.0	100	-11.8	74.3	180	1.00	Horizontal
785.145	32.3	41.2	46.0	200	-13.7	158.8	180	1.00	Vertical
865.704	33.1	45.2	46.0	200	-12.9	154.8	180	1.00	Horizontal
910.566	33.9	49.5	46.0	200	-12.1	150.5	0	1.00	Horizontal



1GHz to 40GHz

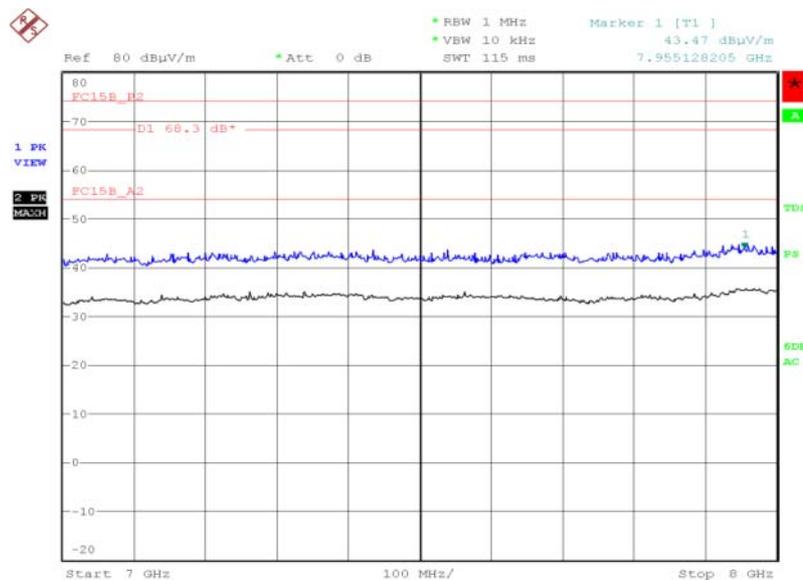
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.340	Vertical	140	154	51.91	46.56

1GHz to 7GHz



Date: 20.OCT.2012 14:15:59

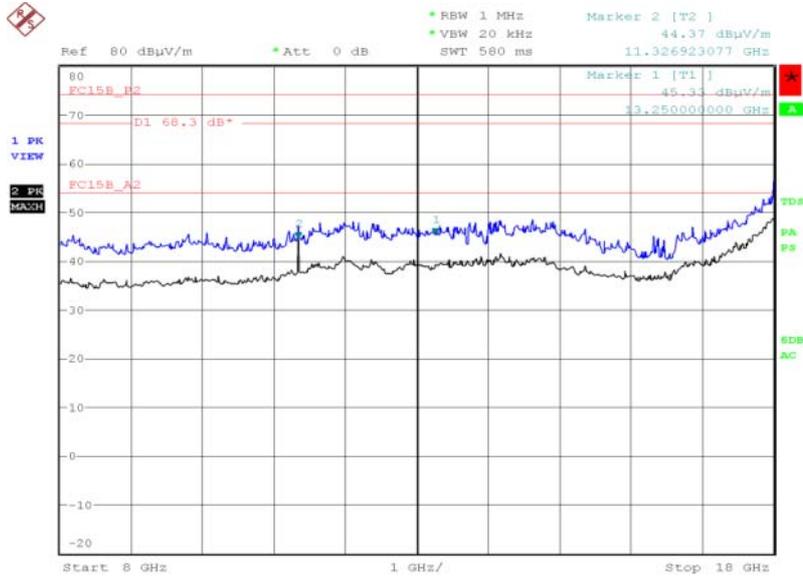
7GHz to 8GHz



Date: 21.OCT.2012 10:02:58

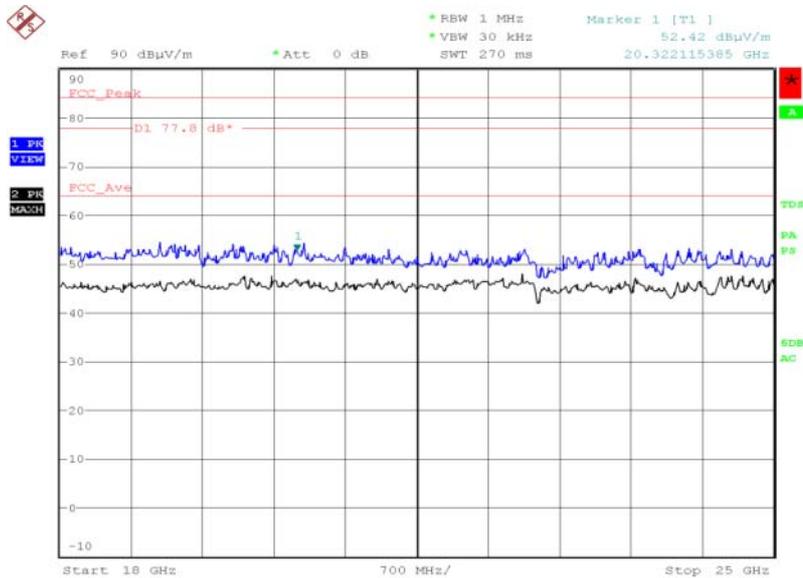


8GHz to 18GHz



Date: 21.OCT.2012 10:21:54

18GHz to 25GHz

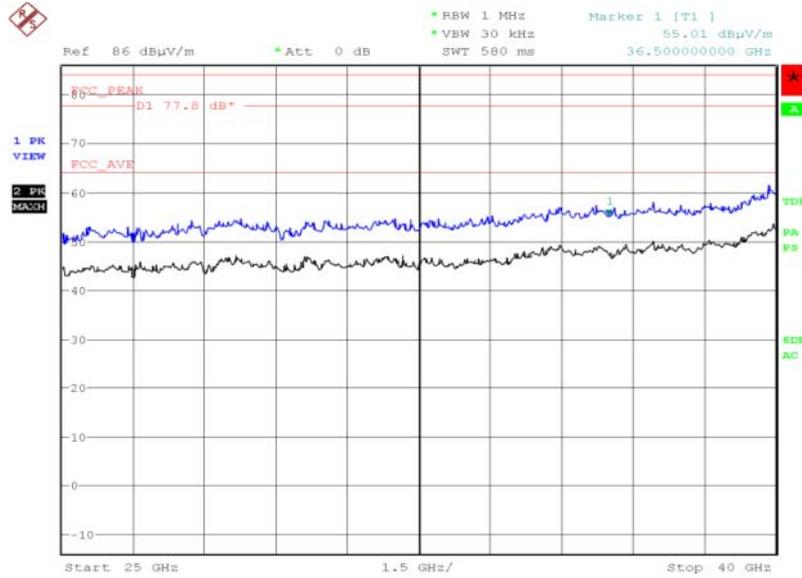


Date: 30.OCT.2012 00:06:42



Product Service

25GHz to 40GHz



Date: 30.OCT.2012 19:35:28

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0

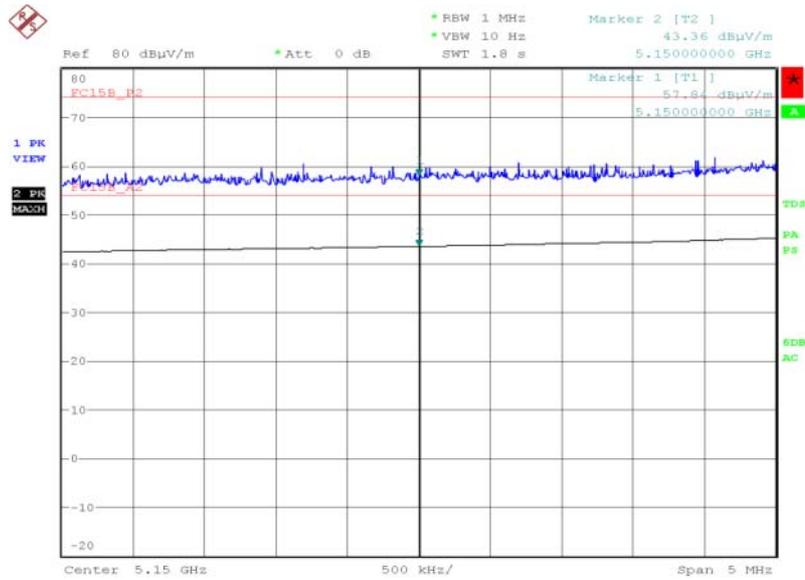


Product Service

Band Edge Emissions

5190 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	57.84	43.36

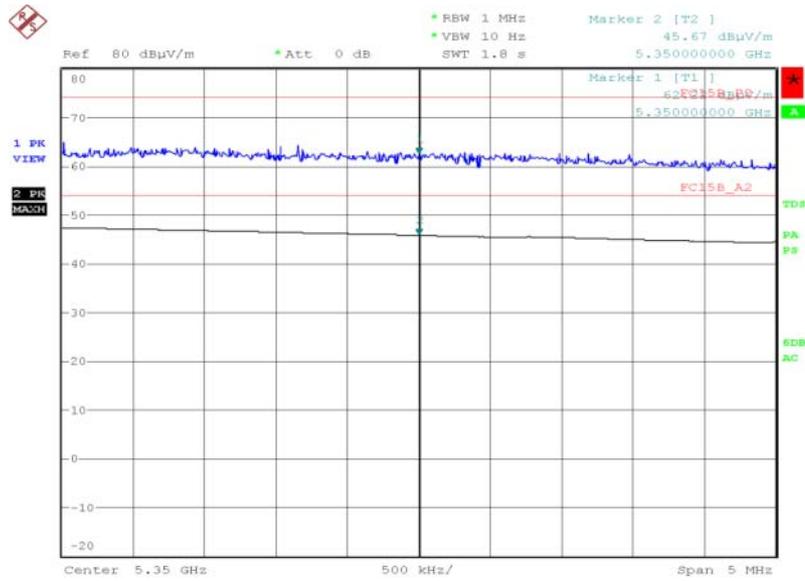


Date: 20.OCT.2012 10:28:28



5310 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	62.22	45.67



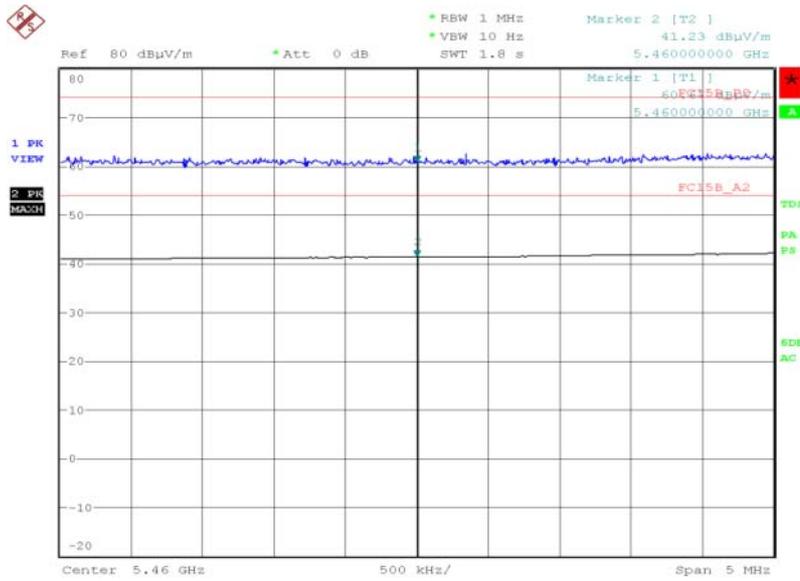
Date: 20.OCT.2012 12:54:12



Product Service

5510 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	60.67	41.23



Date: 20.OCT.2012 13:10:57

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0



Product Service

2.4 FREQUENCY STABILITY

2.4.1 Specification Reference

FCC CFR 47 Part 15E, Clause 2.1055 and 15.407 (g)

2.4.2 Equipment Under Test and Modification State

CDMA SHT21 S/N: IMEI 004401114403773 - Modification State 0

2.4.3 Date of Test

25 October 2012

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

The EUT was set to transmit on maximum power with test model 1. In accordance with 2.1055, the temperature was varied from -30°C to +50° in 10° steps. Testing was performed on the middle channel only 2132.4MHz, Channel 1637.

2.4.6 Environmental Conditions

Ambient Temperature	18.1 - 20.3°C
Relative Humidity	49.2 - 55.4%



Product Service

2.4.7 Test Results

802.11(a)

4.0 V DC Supply

Frequency Band 1

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5180 MHz	5240 MHz
-30°C	4.0 V DC	21.71	7.15
	3.7 V DC	-24.13	-42.93
-20°C	4.0 V DC	14.47	28.62
	3.7 V DC	28.95	-19.08
-10°C	4.0 V DC	36.19	28.62
	3.7 V DC	21.71	0,0
0°C	4.0 V DC	7.23	-7.15
	3.7 V DC	14.47	42.93
+10°C	4.0 V DC	21.71	14.31
	3.7 V DC	0.0	-7.15
+20°C	4.0 V DC	21.71	35.78
	3.7 V DC	7.23	7.15
	4.0 V DC	21.71	35.78
+30°C	4.0 V DC	-14.47	7.15
	3.7 V DC	-14.47	21.46
+40°C	4.0 V DC	-14.47	7.15
	3.7 V DC	7.23	-7.15
+50°C	4.0 V DC	24.13	7.15
	3.7 V DC	36.19	-7.15
Maximum Frequency Error (Hz)		36.19	42.93



Product Service

Frequency Band 2

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5260 MHz	5320 MHz
-30°C	4.0 V DC	28.51	21.14
	3.7 V DC	14.25	21.14
-20°C	4.0 V DC	23.76	49.34
	3.7 V DC	33.26	49.34
-10°C	4.0 V DC	33.26	14.09
	3.7 V DC	33.64	14.09
0°C	4.0 V DC	47.52	0.0
	3.7 V DC	14.25	28.19
+10°C	4.0 V DC	30.89	-28.19
	3.7 V DC	21.38	14.09
+20°C	4.0 V DC	45.15	-7.04
	3.7 V DC	-14.25	-42.29
	4.0 V DC	45.15	-7.04
+30°C	4.0 V DC	38.02	-14.09
	3.7 V DC	-7.12	-14.09
+40°C	4.0 V DC	16.63	-7.04
	3.7 V DC	0.0	-14.09
+50°C	4.0 V DC	23.76	-7.04
	3.7 V DC	7.12	2.34
Maximum Frequency Error (Hz)		47.52	49.34



Product Service

Frequency Band 3

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5500 MHz	5700 MHz
-30°C	4.0 V DC	40.90	41.66
	3.7 V DC	-10.45	26.31
-20°C	4.0 V DC	37.27	0.0
	3.7 V DC	47.72	21.92
-10°C	4.0 V DC	43.18	6.57
	3.7 V DC	-18.18	19.73
0°C	4.0 V DC	36.36	-26.31
	3.7 V DC	0.0	46.05
+10°C	4.0 V DC	29.54	0.0
	3.7 V DC	6.81	19.73
+20°C	4.0 V DC	36.36	-6.57
	3.7 V DC	-27.27	-6.57
	4.0 V DC	36.36	-6.57
+30°C	4.0 V DC	43.18	-26.31
	3.7 V DC	13.63	32.89
+40°C	4.0 V DC	29.54	-19.73
	3.7 V DC	6.81	-6.57
+50°C	4.0 V DC	-25	-19.73
	3.7 V DC	-13.63	-39.47
Maximum Frequency Error (Hz)		47.72	46.05

Limit

Maintained within the band of operation under all conditions of normal operations as specified in the user's manual.
--



Product Service

802.11(n) - 5 GHz 20 MHz BW

4.0 V DC Supply

Frequency Band 1

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5180 MHz	5240 MHz
-30°C	4.0 V DC	-2.41	7.15
	3.7 V DC	9.65	40.55
-20°C	4.0 V DC	14.47	14.31
	3.7 V DC	28.95	28.62
-10°C	4.0 V DC	7.23	35.78
	3.7 V DC	21.71	40.55
0°C	4.0 V DC	-28.95	14.31
	3.7 V DC	-7.23	21.46
+10°C	4.0 V DC	-14.47	14.31
	3.7 V DC	-14.47	14.31
+20°C	4.0 V DC	-14.47	14.31
	3.7 V DC	14.47	7.15
	4.0 V DC	-14.47	14.31
+30°C	4.0 V DC	0.0	-14.31
	3.7 V DC	14.47	28.62
+40°C	4.0 V DC	-7.23	-7.15
	3.7 V DC	14.47	0.0
+50°C	4.0 V DC	0.24	2.38
	3.7 V DC	-7.23	14.31
Maximum Frequency Error (Hz)		-28.95	40.55



Product Service

Frequency Band 2

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5260 MHz	5320 MHz
-30°C	4.0 V DC	21.38	49.34
	3.7 V DC	14.25	7.04
-20°C	4.0 V DC	28.51	7.04
	3.7 V DC	21.38	21.14
-10°C	4.0 V DC	23.76	42.29
	3.7 V DC	42.77	0.0
0°C	4.0 V DC	14.25	7.04
	3.7 V DC	14.25	-14.09
+10°C	4.0 V DC	7.12	14.09
	3.7 V DC	-14.25	-21.14
+20°C	4.0 V DC	-14.25	7.04
	3.7 V DC	0.0	-7.04
	4.0 V DC	-14.25	7.04
+30°C	4.0 V DC	-7.12	-7.04
	3.7 V DC	28.51	-7.04
+40°C	4.0 V DC	-7.12	-14.09
	3.7 V DC	0.0	-14.09
+50°C	4.0 V DC	0.95	-7.04
	3.7 V DC	14.25	2.34
Maximum Frequency Error (Hz)		42.77	49.34



Product Service

Frequency Band 3

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5500 MHz	5700 MHz
-30°C	4.0 V DC	13.63	26.31
	3.7 V DC	13.63	32.89
-20°C	4.0 V DC	-36.36	19.73
	3.7 V DC	13.63	48.24
-10°C	4.0 V DC	47.72	-13.15
	3.7 V DC	40.90	13.15
0°C	4.0 V DC	13.63	13.15
	3.7 V DC	6.81	-13.15
+10°C	4.0 V DC	20.45	-13.15
	3.7 V DC	13.63	-19.73
+20°C	4.0 V DC	-13.63	6.57
	3.7 V DC	6.81	6.57
	4.0 V DC	-13.63	6.57
+30°C	4.0 V DC	0.0	-13.15
	3.7 V DC	0.0	6.57
+40°C	4.0 V DC	6.81	6.57
	3.7 V DC	13.63	6.57
+50°C	4.0 V DC	13.63	4.38
	3.7 V DC	2.72	6.57
Maximum Frequency Error (Hz)		47.72	48.24

Limit

Maintained within the band of operation under all conditions of normal operations as specified in the user's manual.
--



Product Service

802.11(n) - 5 GHz 40 MHz BW

4.0 V DC Supply

Frequency Band 1

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5190 MHz	5230 MHz
-30°C	4.0 V DC	33.71	35.85
	3.7 V DC	14.45	35.85
-20°C	4.0 V DC	0.0	35.85
	3.7 V DC	24.08	11.95
-10°C	4.0 V DC	0.0	47.8
	3.7 V DC	-12.04	40.63
0°C	4.0 V DC	-12.04	23.90
	3.7 V DC	0.0	0.0
+10°C	4.0 V DC	-12.04	-11.95
	3.7 V DC	0.0	35.85
+20°C	4.0 V DC	0.0	19.12
	3.7 V DC	-12.04	19.12
	4.0 V DC	0.0	19.12
+30°C	4.0 V DC	0.0	11.95
	3.7 V DC	24.08	0.0
+40°C	4.0 V DC	0.0	-11.95
	3.7 V DC	7.22	-23.90
+50°C	4.0 V DC	12.04	-11.95
	3.7 V DC	12.04	-23.90
Maximum Frequency Error (Hz)		33.71	47.8



Product Service

Frequency Band 2

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5270 MHz	5310 MHz
-30°C	4.0 V DC	35.57	39.07
	3.7 V DC	13.75	48.96
-20°C	4.0 V DC	45.06	23.54
	3.7 V DC	11.85	11.77
-10°C	4.0 V DC	47.43	35.31
	3.7 V DC	40.32	23.54
0°C	4.0 V DC	11.85	-23.54
	3.7 V DC	0.0	-11.77
+10°C	4.0 V DC	-11.85	0.0
	3.7 V DC	11.85	-35.31
+20°C	4.0 V DC	23.71	0.0
	3.7 V DC	23.71	0.0
	4.0 V DC	23.71	0.0
+30°C	4.0 V DC	23.71	-11.77
	3.7 V DC	-11.85	11.77
+40°C	4.0 V DC	-4.74	0.0
	3.7 V DC	-11.85	-23.54
+50°C	4.0 V DC	-11.85	0.0
	3.7 V DC	-16.60	-4.7
Maximum Frequency Error (Hz)		47.43	48.96



Product Service

Frequency Band 3

Hand Carrier Battery Powered

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5510 MHz	5670 MHz
-30°C	4.0 V DC	45.37	33.06
	3.7 V DC	11.34	6.17
-20°C	4.0 V DC	11.34	2.20
	3.7 V DC	45.37	33.06
-10°C	4.0 V DC	49.90	8.81
	3.7 V DC	-11.34	11.02
0°C	4.0 V DC	22.68	22.04
	3.7 V DC	11.34	0.0
+10°C	4.0 V DC	0.0	0.0
	3.7 V DC	-11.34	22.04
+20°C	4.0 V DC	33.84	44.09
	3.7 V DC	11.34	44.09
	4.0 V DC	33.84	44.09
+30°C	4.0 V DC	11.34	22.04
	3.7 V DC	22.68	-11.02
+40°C	4.0 V DC	11.34	-22.04
	3.7 V DC	0.0	11.02
+50°C	4.0 V DC	-4.53	22.04
	3.7 V DC	-11.34	11.02
Maximum Frequency Error (Hz)		49.90	44.09

Limit

Maintained within the band of operation under all conditions of normal operations as specified in the user's manual.
--



Product Service

2.5 26 dB BANDWIDTH**2.5.1 Specification Reference**

FCC CFR 47 Part 15E, Clause 15.407 (a)

2.5.2 Equipment Under Test and Modification State

CDMA SHT21 S/N: IMEI 004401114403773 - Modification State 0

2.5.3 Date of Test

16 October 2012

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Procedure

The EUT was set to transmit on maximum power with test model 1. In accordance with 2.1055, the temperature was varied from -30°C to +50° in 10° steps. Testing was performed on the middle channel only 2132.4MHz, Channel 1637.

2.5.6 Environmental Conditions

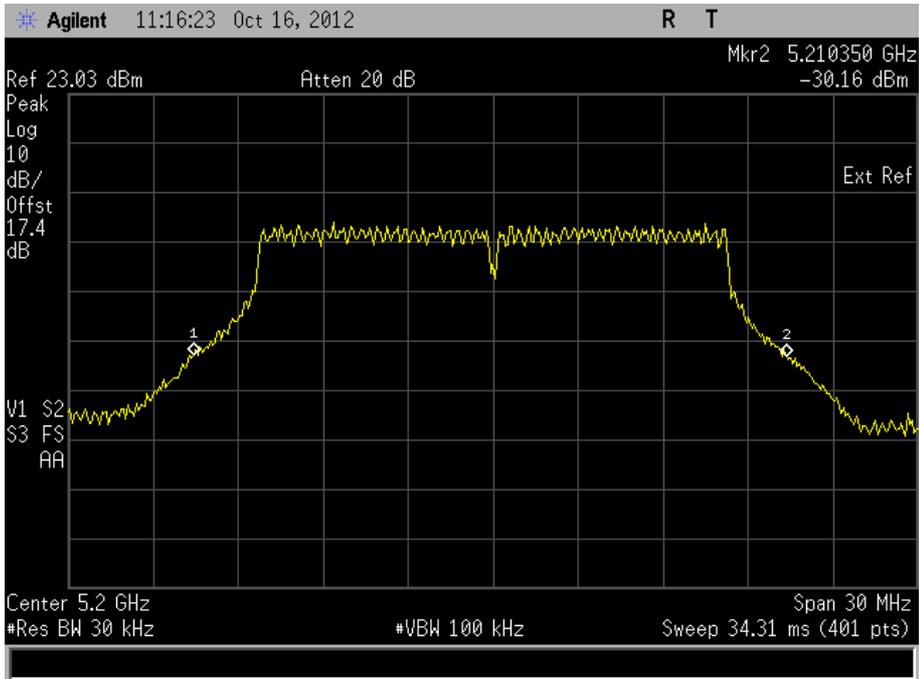
Ambient Temperature	19.8 - 20.0°C
Relative Humidity	37.9 - 48.7%



Product Service

5200 MHz

26 dB Bandwidth (MHz)	20.925
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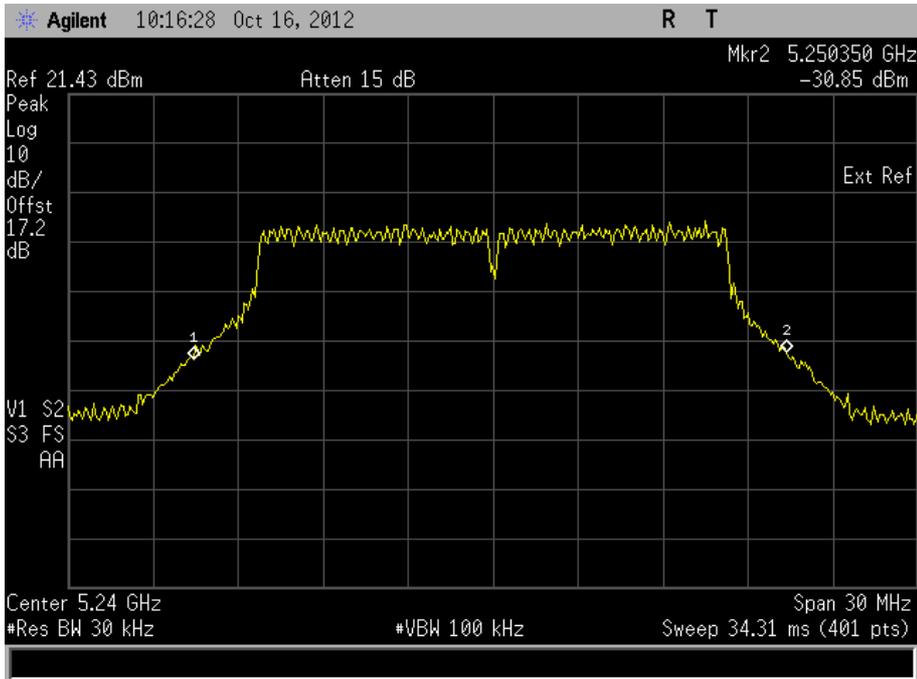




Product Service

5240 MHz

26 dB Bandwidth (MHz)	20.925
-----------------------	--------



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

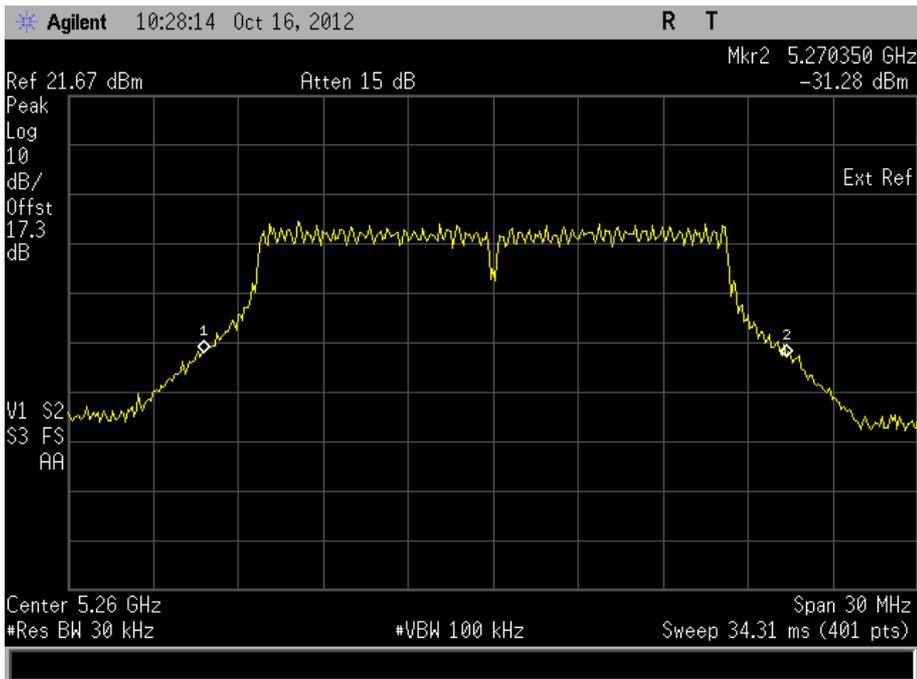


Product Service

Frequency Band 2

5260 MHz

26 dB Bandwidth (MHz)	20.550
-----------------------	--------

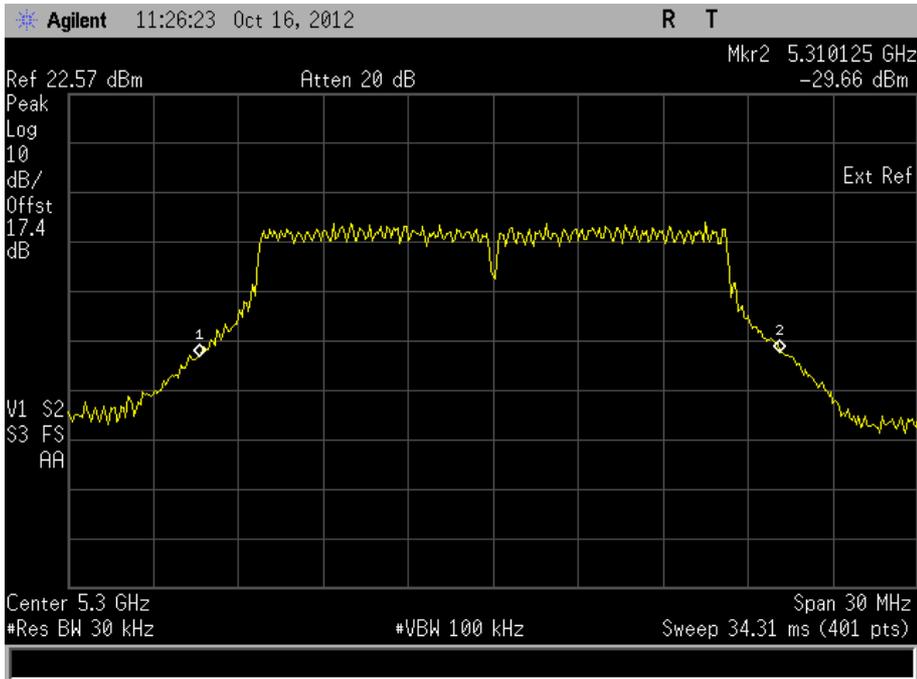




Product Service

5300 MHz

26 dB Bandwidth (MHz)	20.475
-----------------------	--------

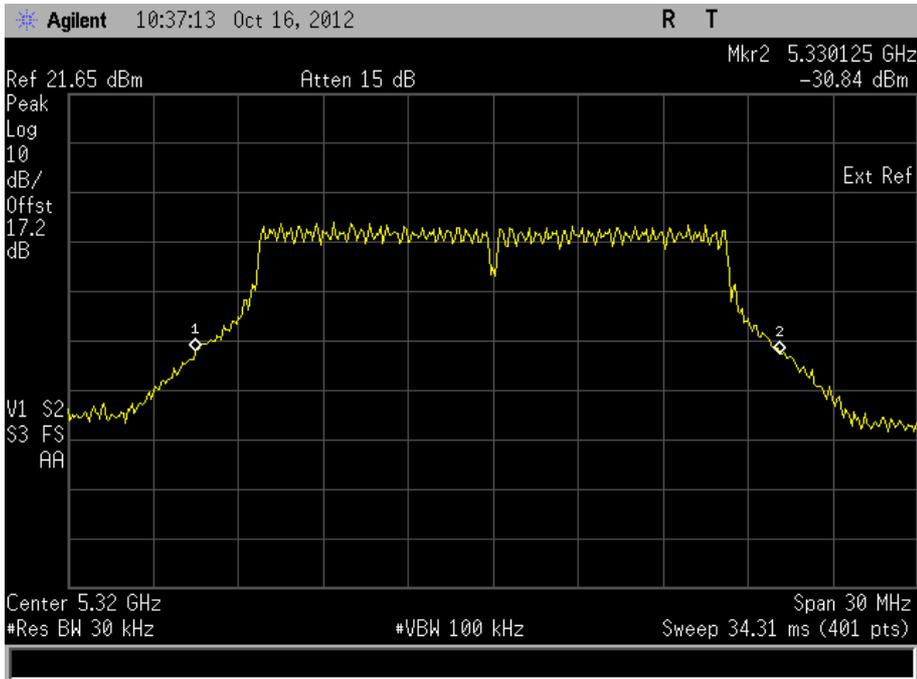




Product Service

5320 MHz

26 dB Bandwidth (MHz)	20.625
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The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

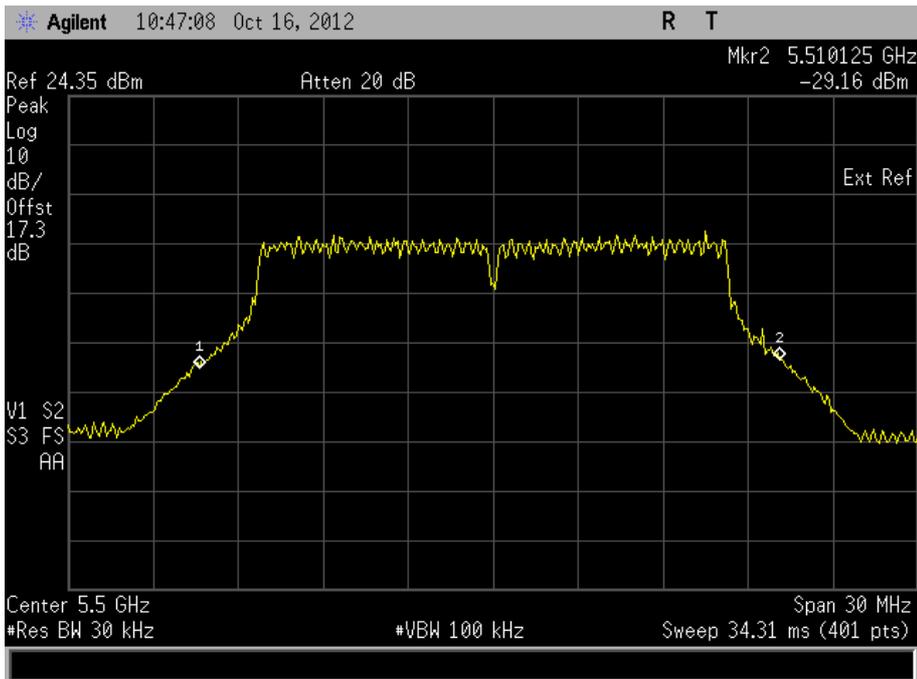


Product Service

Frequency Band 3

5500 MHz

26 dB Bandwidth (MHz)	20.475
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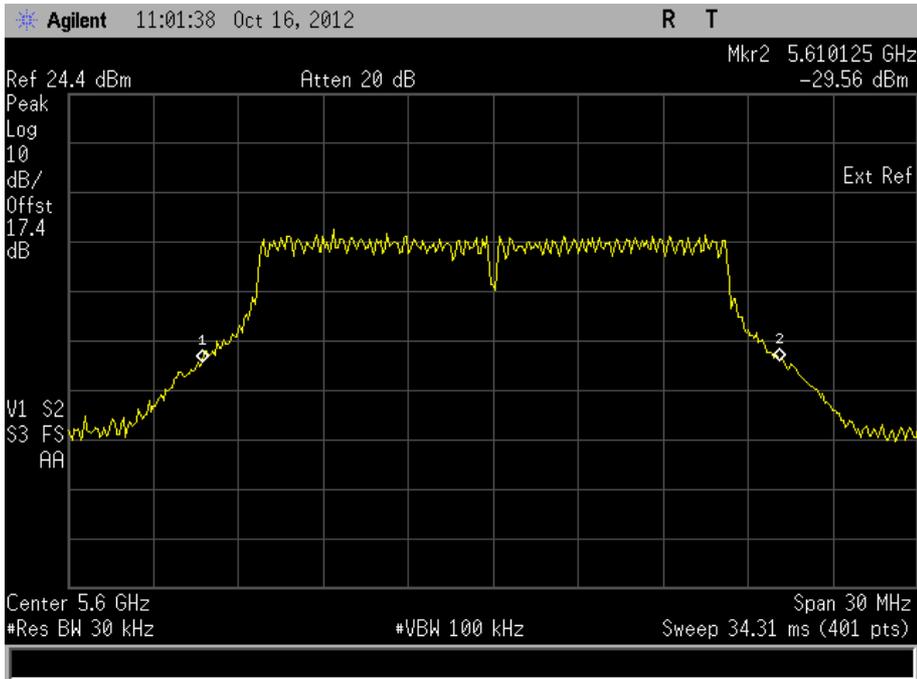




Product Service

5600 MHz

26 dB Bandwidth (MHz)	20.400
-----------------------	--------

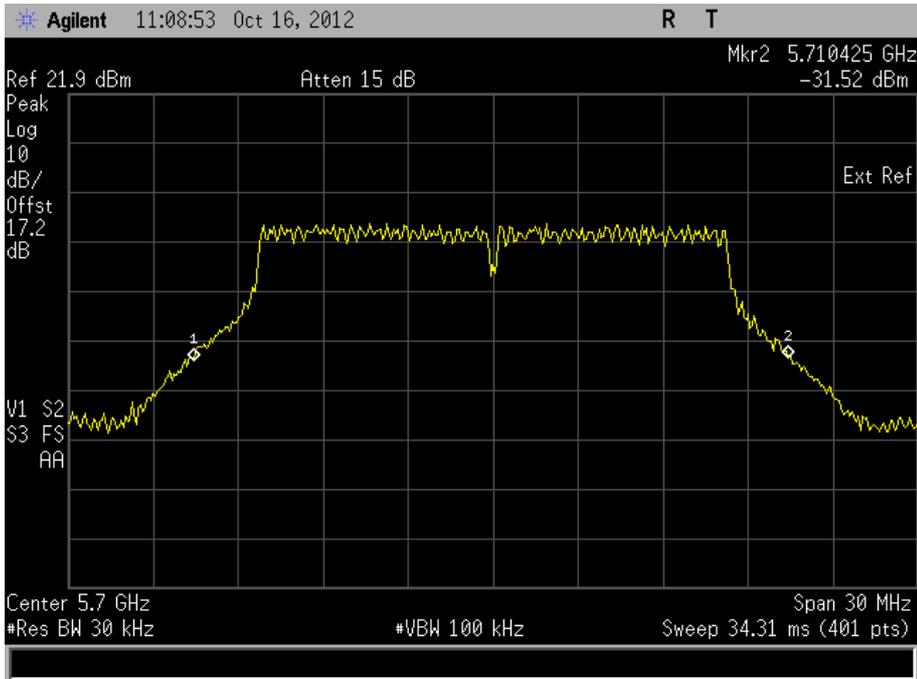




Product Service

5700 MHz

26 dB Bandwidth (MHz)	21.000
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The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

Limit

Not specified.



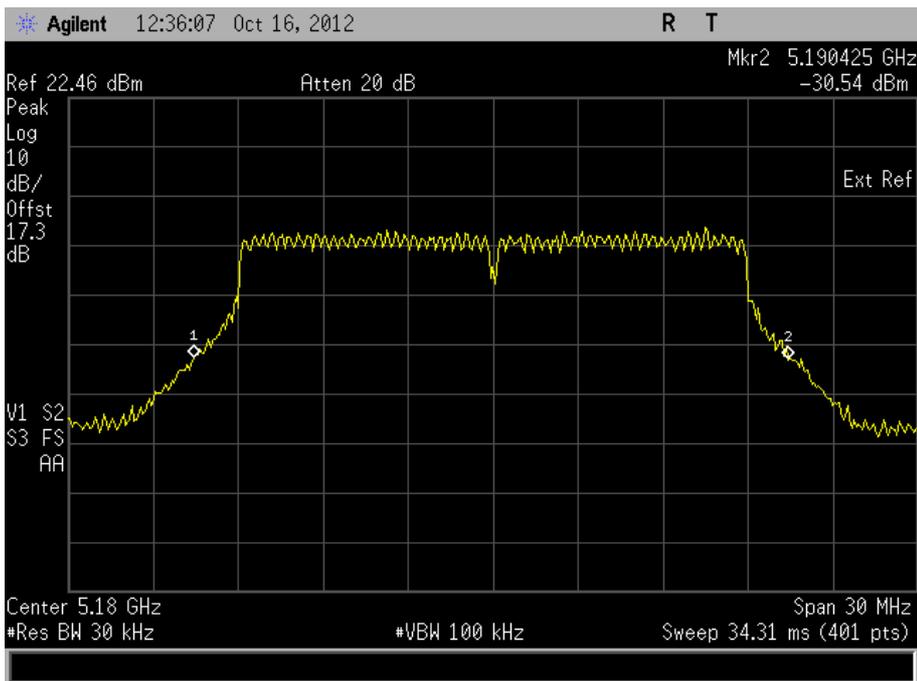
Product Service

802.11(n) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

26 dB Bandwidth (MHz)	21.000
-----------------------	--------

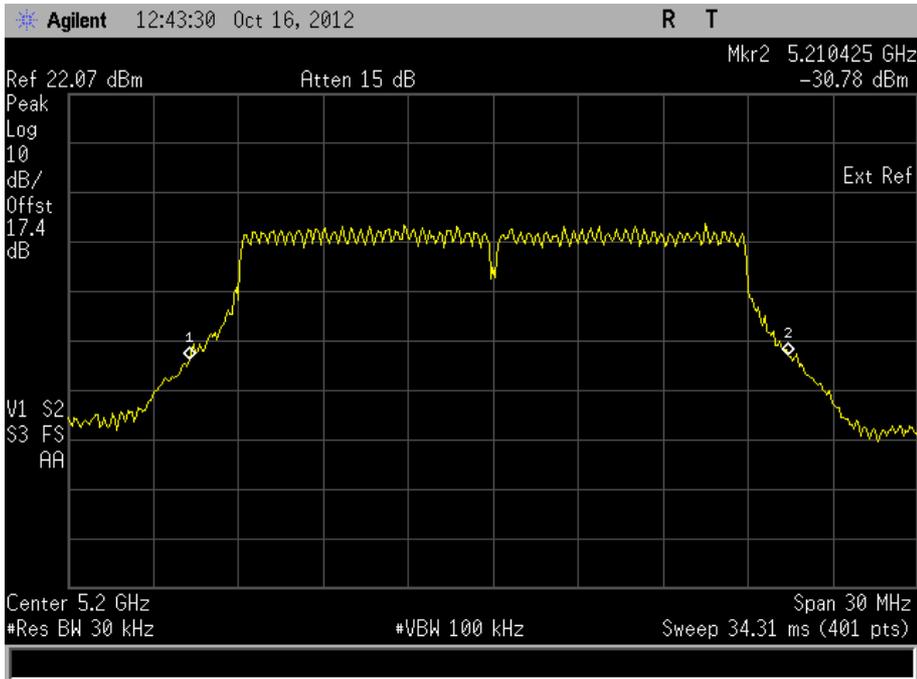




Product Service

5200 MHz

26 dB Bandwidth (MHz)	21.150
-----------------------	--------

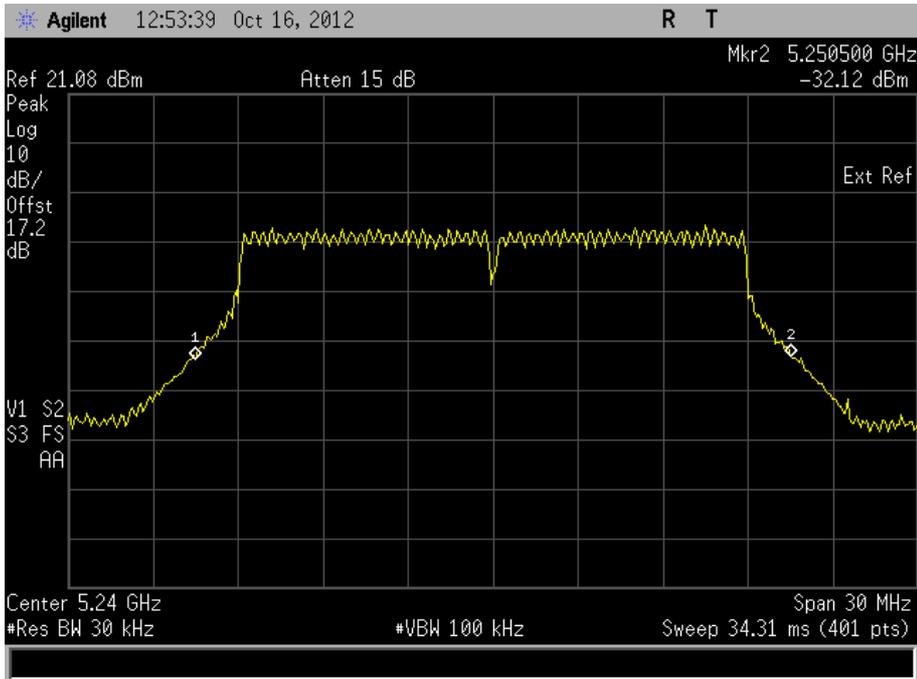




Product Service

5240 MHz

26 dB Bandwidth (MHz)	21.000
-----------------------	--------



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

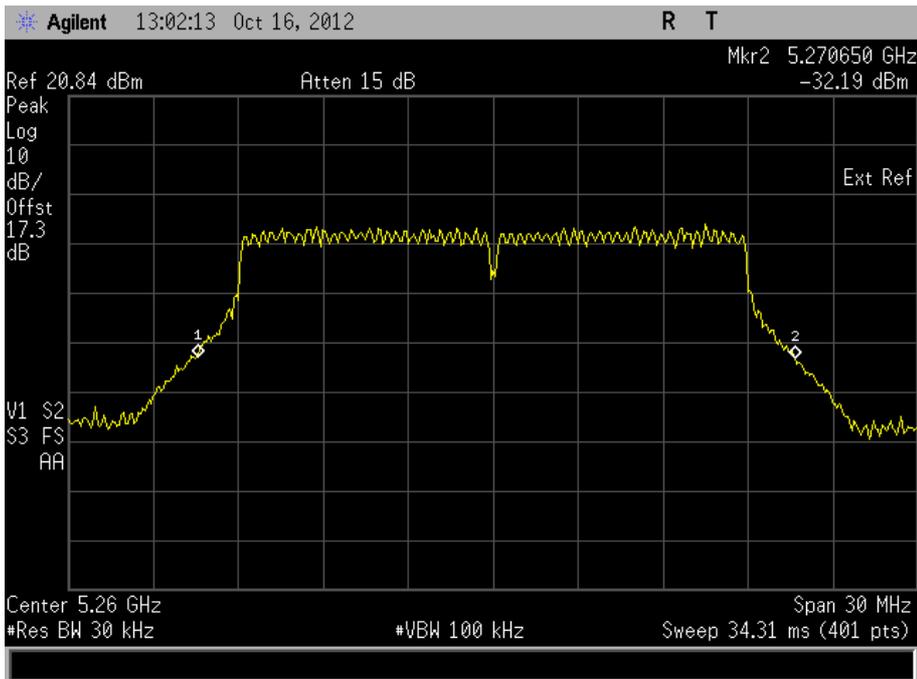


Product Service

Frequency Band 2

5260 MHz

26 dB Bandwidth (MHz)	21.075
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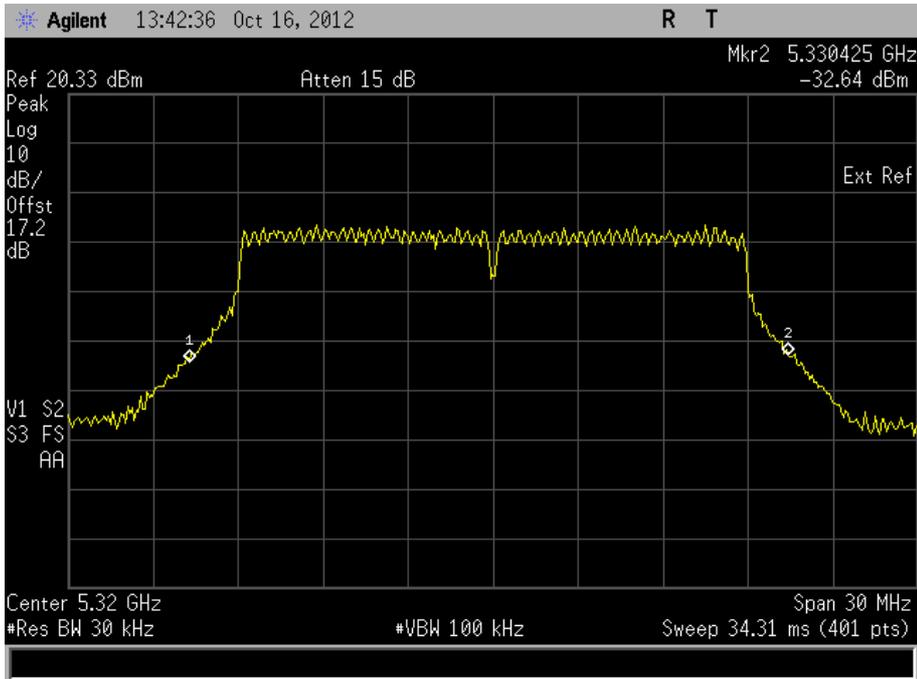




Product Service

5320 MHz

26 dB Bandwidth (MHz)	21.150
-----------------------	--------



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

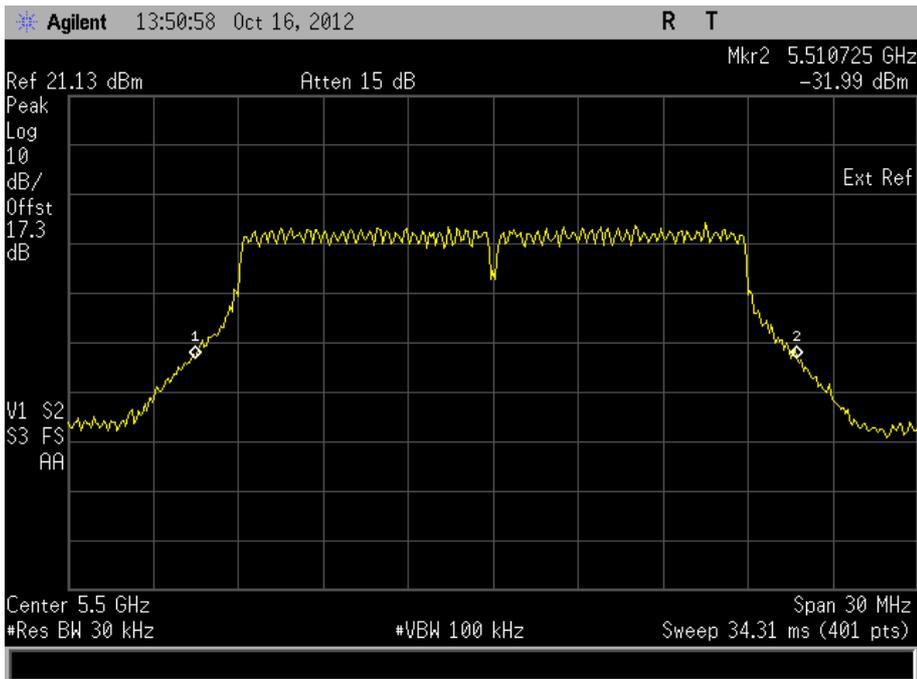


Product Service

Frequency Band 3

5500 MHz

26 dB Bandwidth (MHz)	21.225
-----------------------	--------

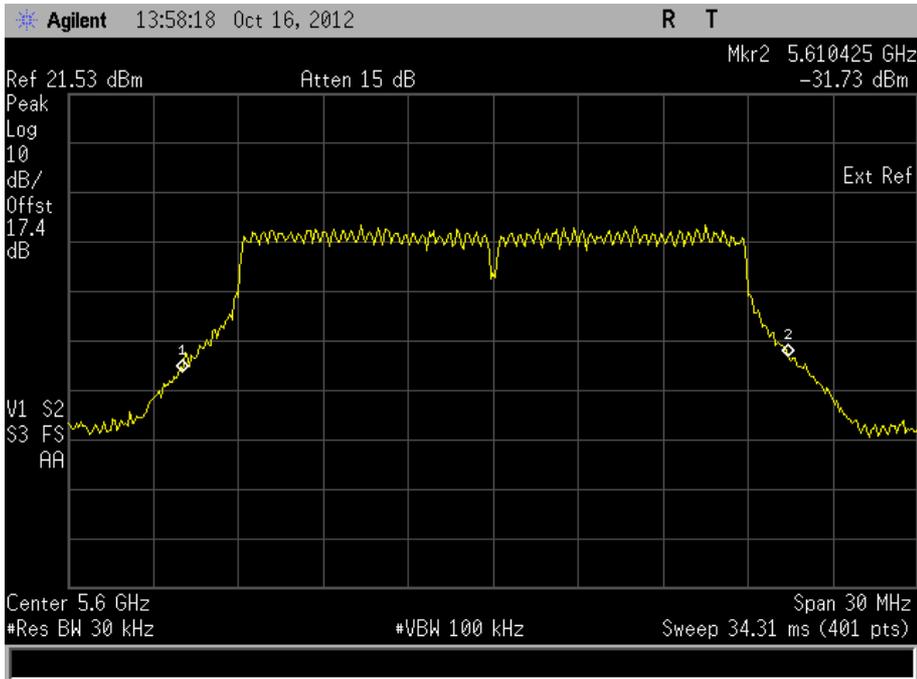




Product Service

5600 MHz

26 dB Bandwidth (MHz)	21.375
-----------------------	--------

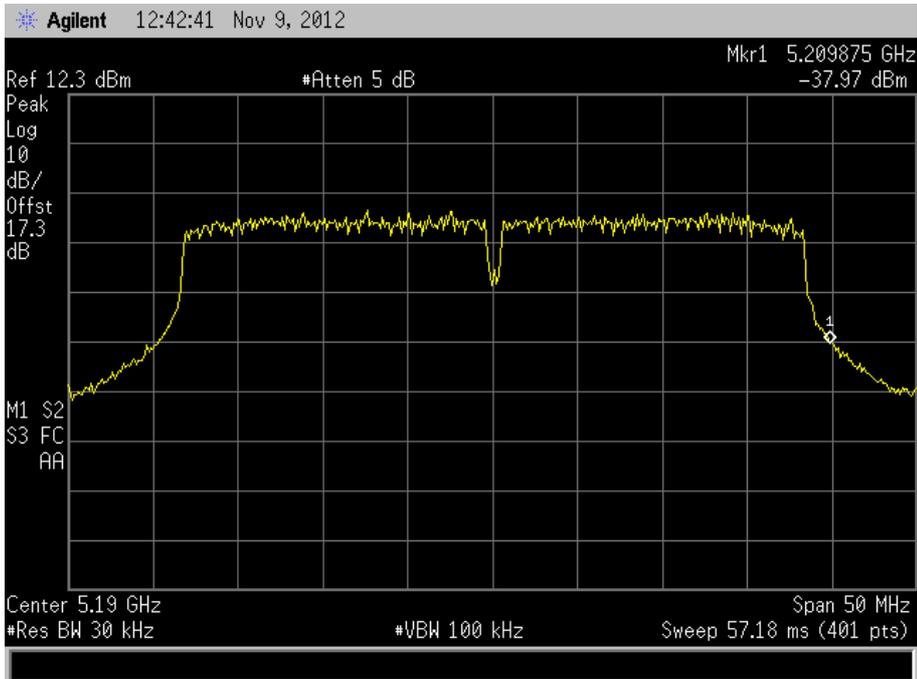




Product Service

5700 MHz

26 dB Bandwidth (MHz)	21.225
-----------------------	--------



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

Limit

Not specified.



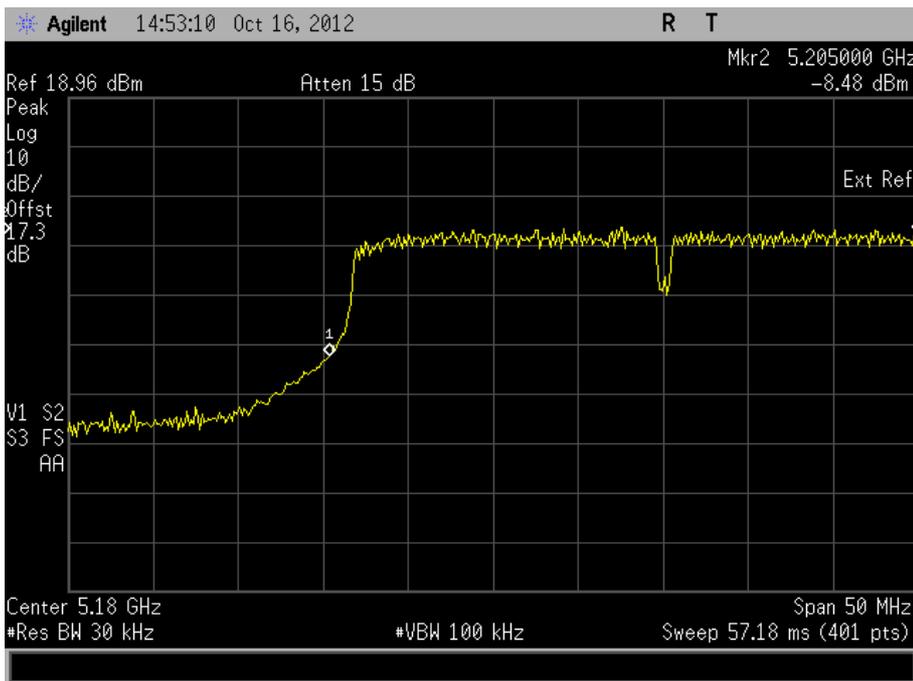
Product Service

802.11(n) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

26 dB Bandwidth (MHz)	34.625
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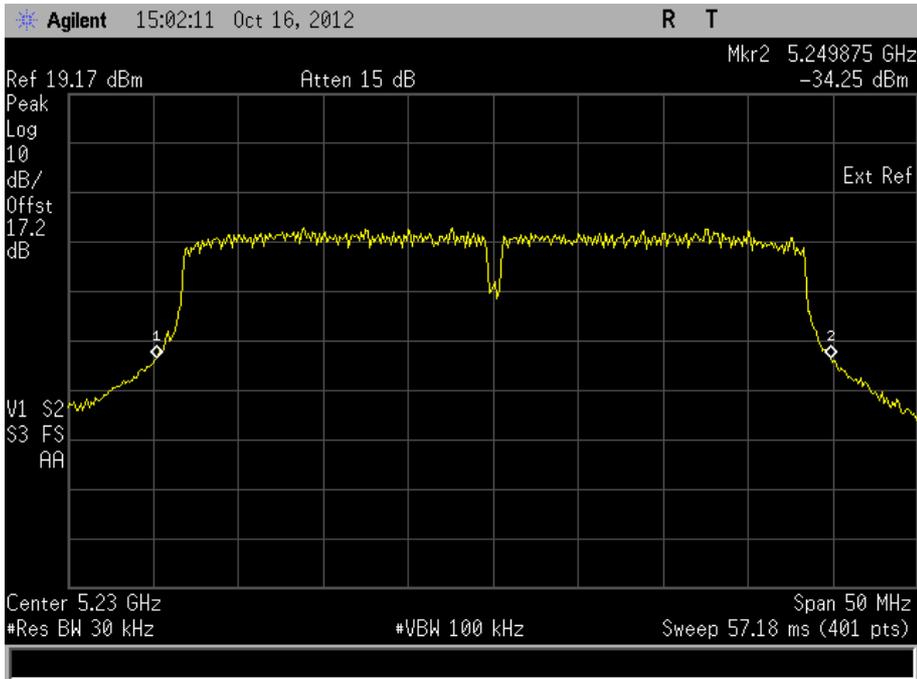




Product Service

5230 MHz

26 dB Bandwidth (MHz)	39.625
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The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

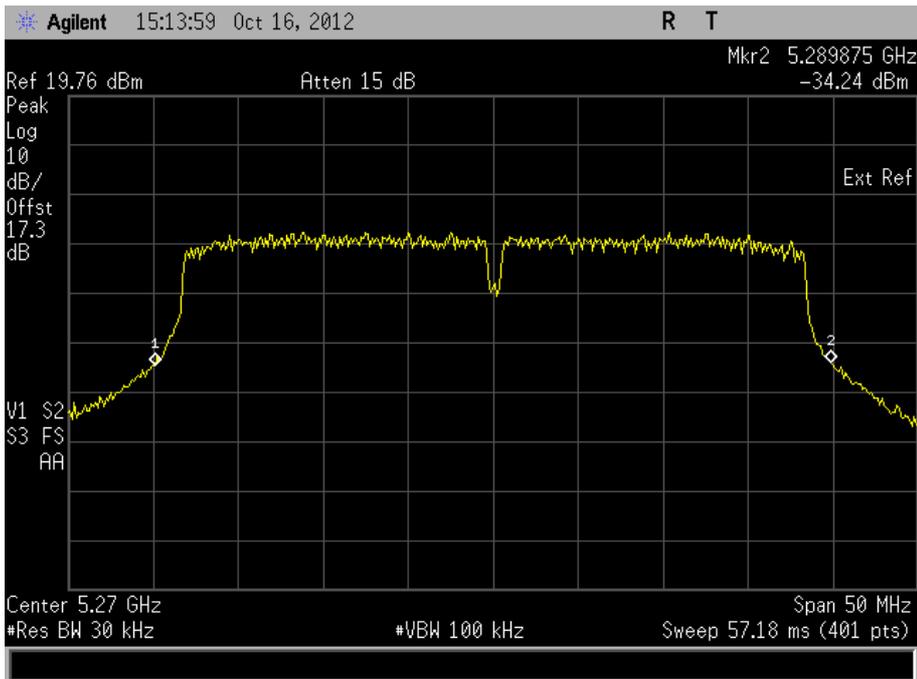


Product Service

Frequency Band 2

5270 MHz

26 dB Bandwidth (MHz)	39.75
-----------------------	-------

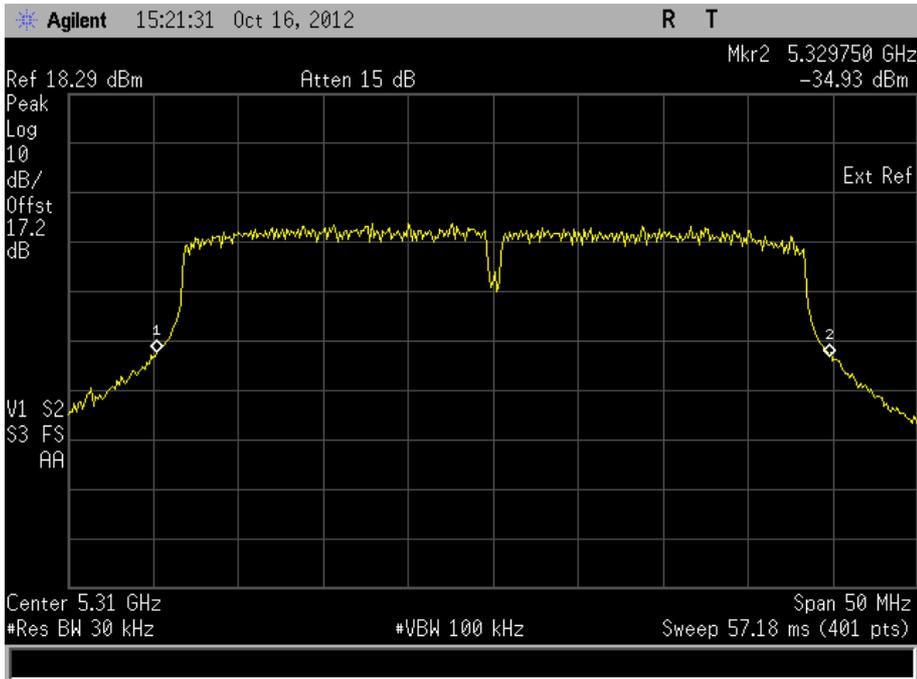




Product Service

5310 MHz

26 dB Bandwidth (MHz)	39.50
-----------------------	-------



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

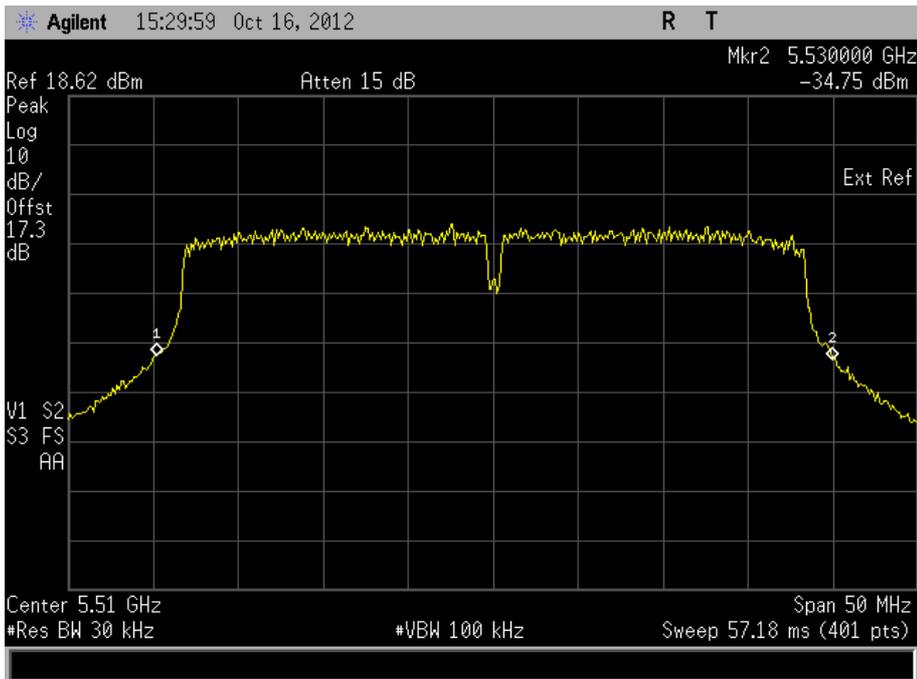


Product Service

Frequency Band 3

5510 MHz

26 dB Bandwidth (MHz)	39.750
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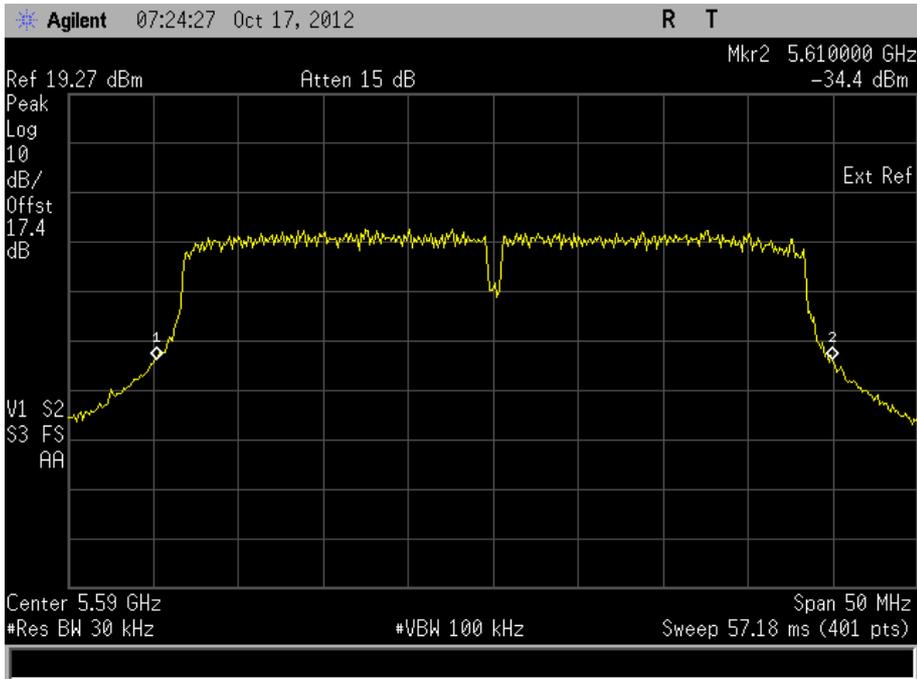




Product Service

5590 MHz

26 dB Bandwidth (MHz)	39.750
-----------------------	--------

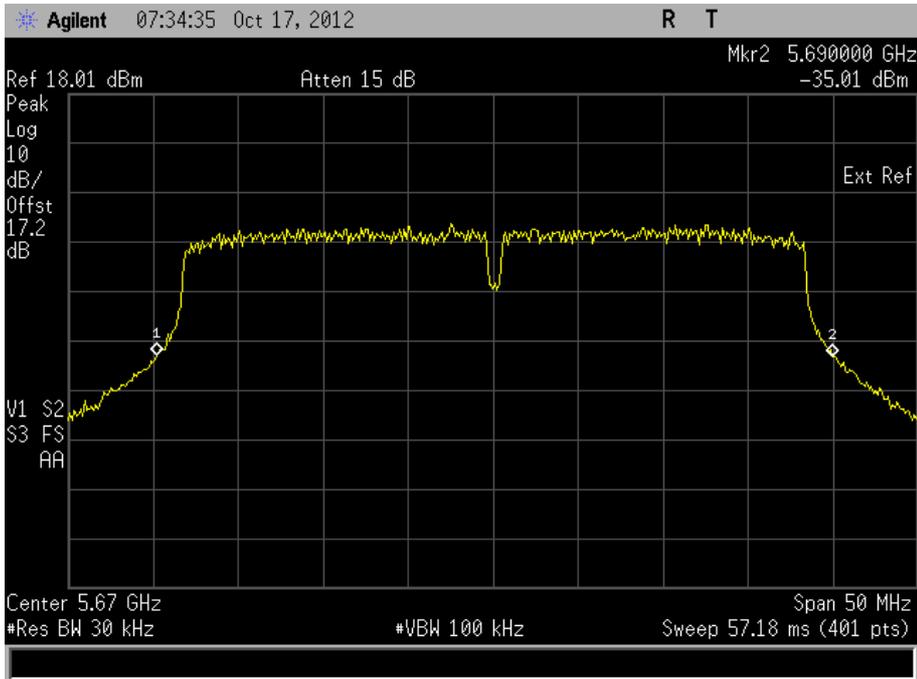




Product Service

5670 MHz

26 dB Bandwidth (MHz)	39.750
-----------------------	--------



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

Limit

Not specified.



Product Service

2.6 PEAK POWER SPECTRAL DENSITY

2.6.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(5)

2.6.2 Equipment Under Test and Modification State

CDMA SHT21 S/N: IMEI 004401114403773 - Modification State 0

2.6.3 Date of Test

16 October 2012 & 17 October 2012

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.5 Test Procedure

The EUT was transmitted at maximum power via an attenuator and cable to the Spectrum Analyser. The Analyser settings were adjusted to display the resultant trace on screen. The resolution bandwidth and video bandwidth were set to 3 kHz and 10 kHz respectively. The trace was set to Max Hold and the peak of the level was measured.

2.6.6 Environmental Conditions

Ambient Temperature	19.8 - 22.1°C
Relative Humidity	38.7 - 51.3%



Product Service

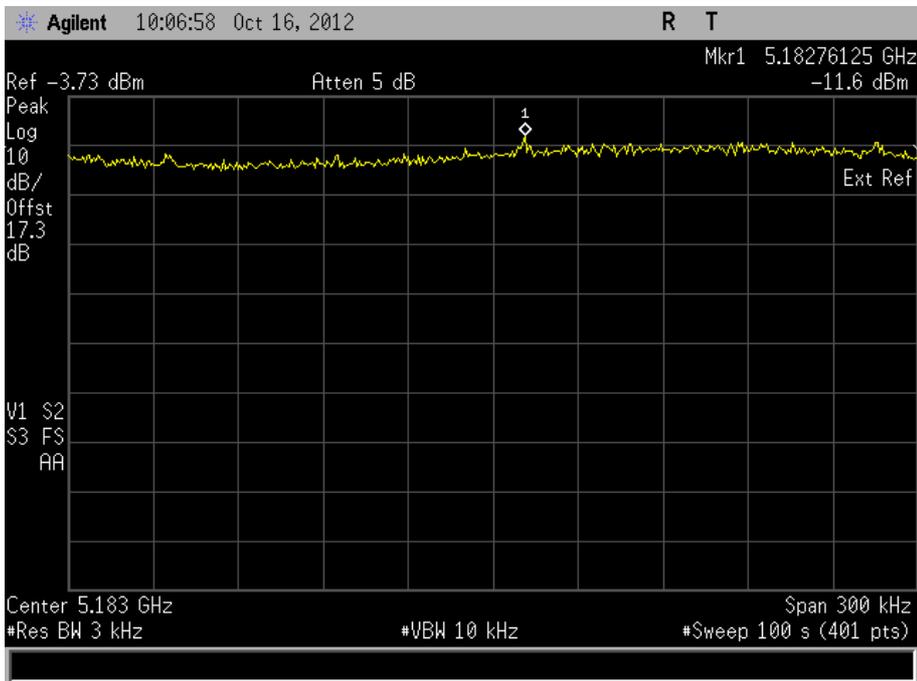
2.6.7 Test Results

802.11(a)

Frequency Band 1

5180 MHz

Peak Power Spectral Density (dBm)	-11.60
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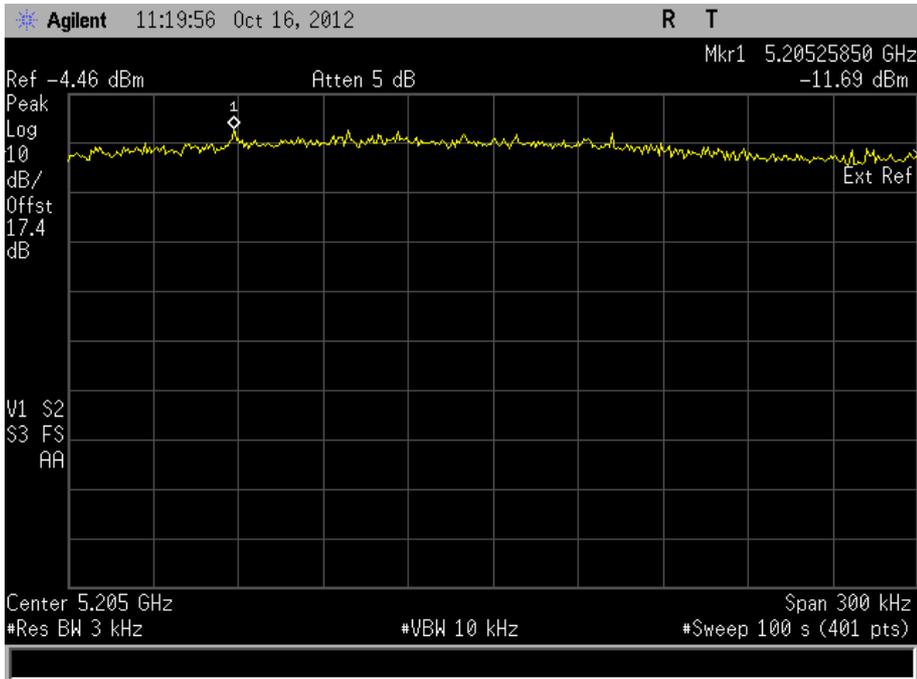




Product Service

5200 MHz

Peak Power Spectral Density (dBm)	-11.69
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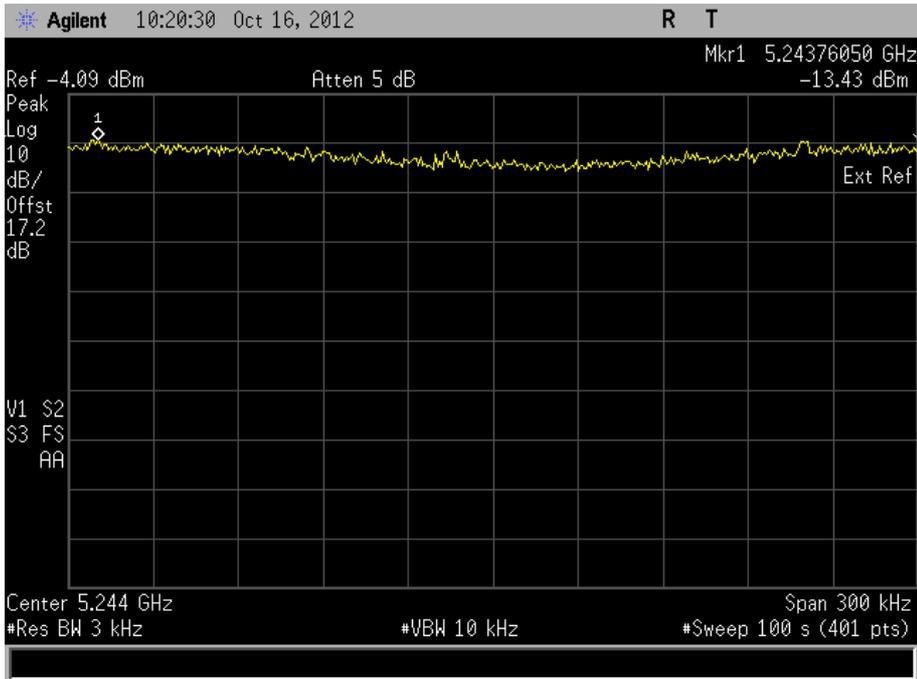




Product Service

5240 MHz

Peak Power Spectral Density (dBm)	-13.43
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The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

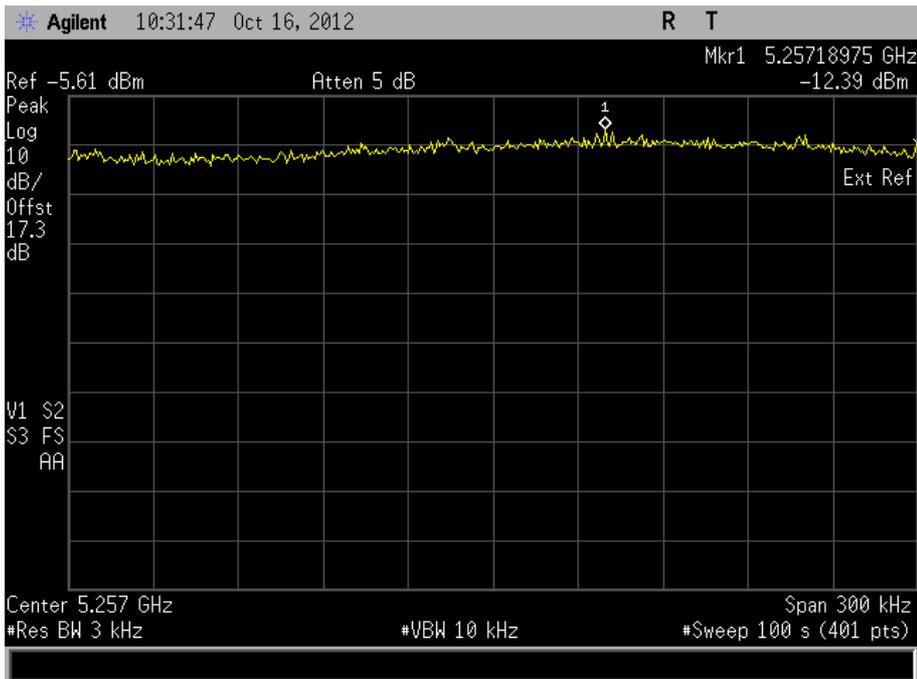


Product Service

Frequency Band 2

5260 MHz

Peak Power Spectral Density (dBm)	-12.39
-----------------------------------	--------

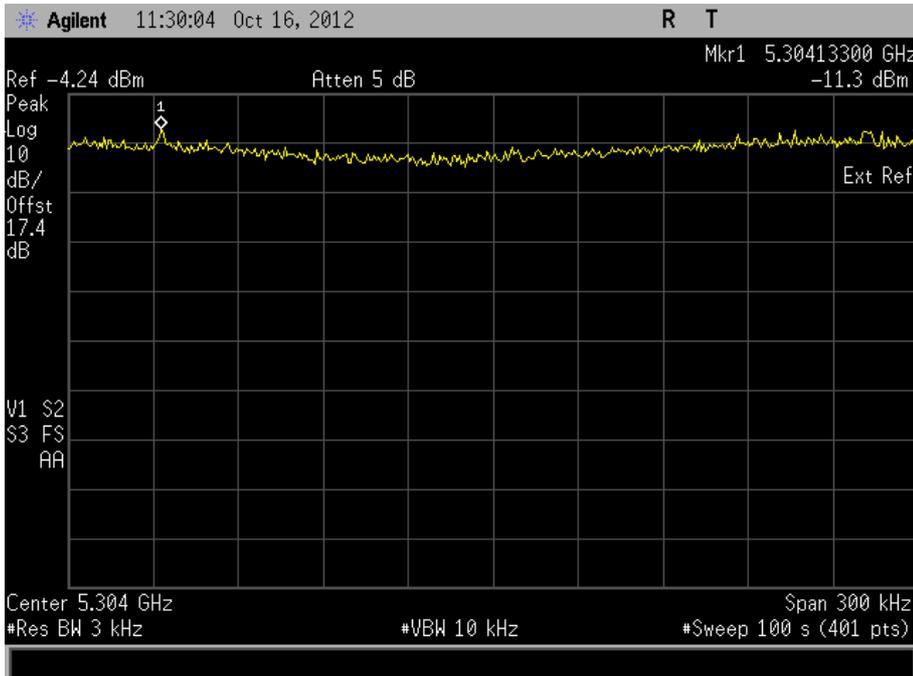




Product Service

5300 MHz

Peak Power Spectral Density (dBm)	-11.30
-----------------------------------	--------

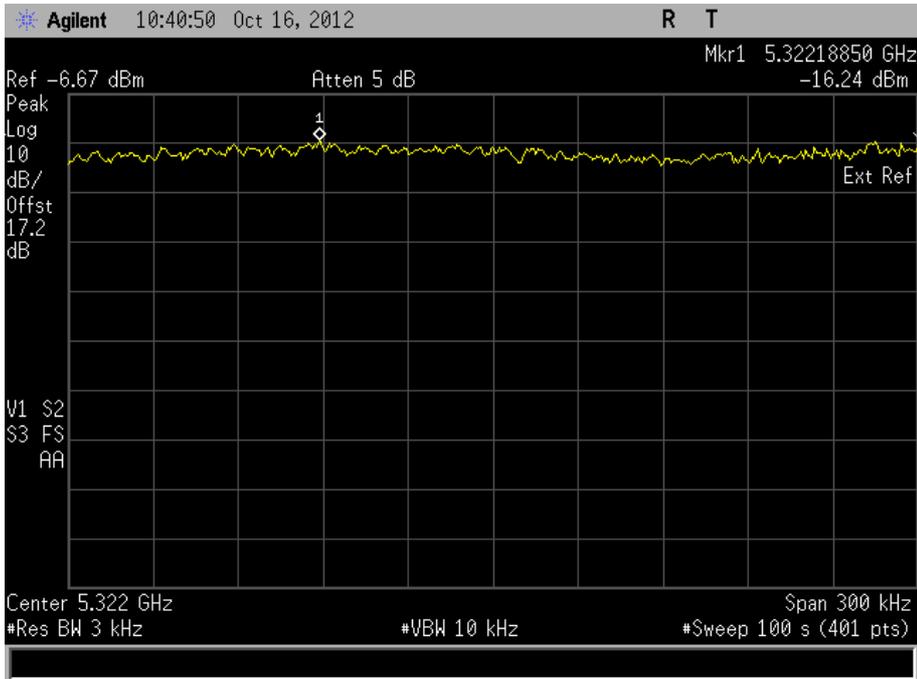




Product Service

5320 MHz

Peak Power Spectral Density (dBm)	-16.24
-----------------------------------	--------



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

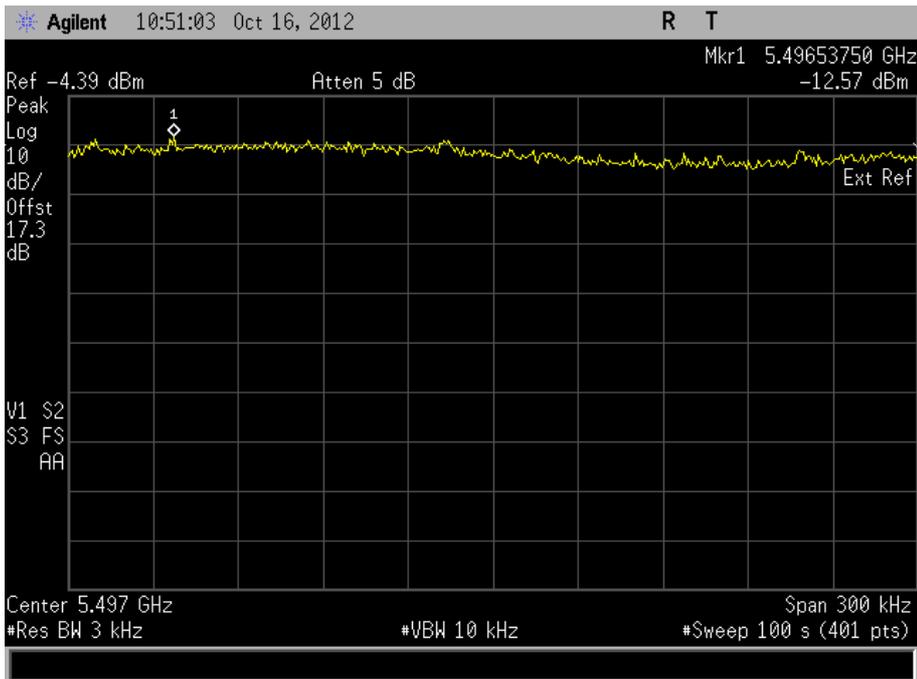


Product Service

Frequency Band 3

5500 MHz

Peak Power Spectral Density (dBm)	-12.57
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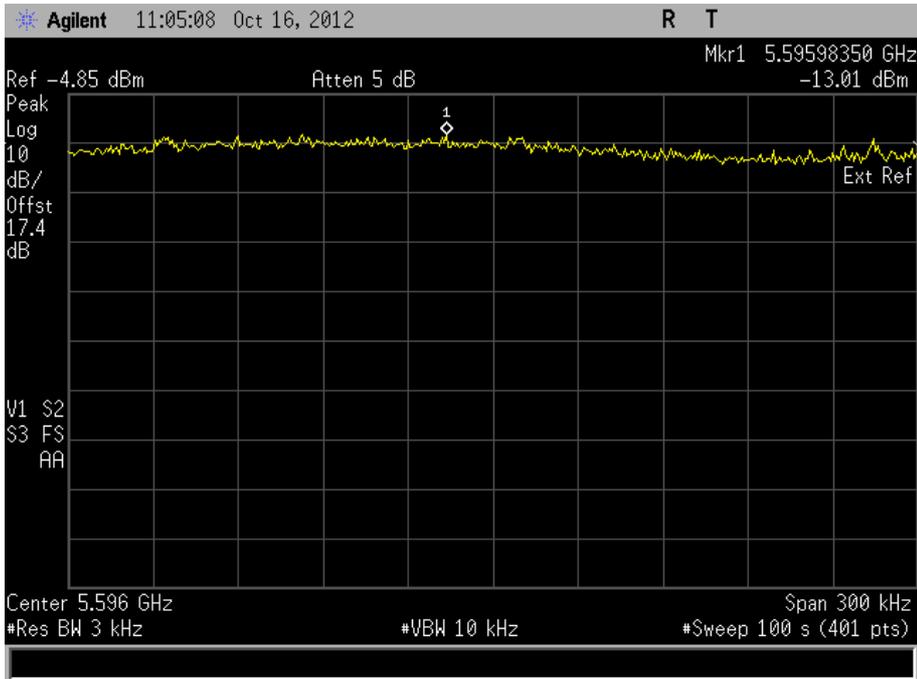




Product Service

5600 MHz

Peak Power Spectral Density (dBm)	-13.01
-----------------------------------	--------

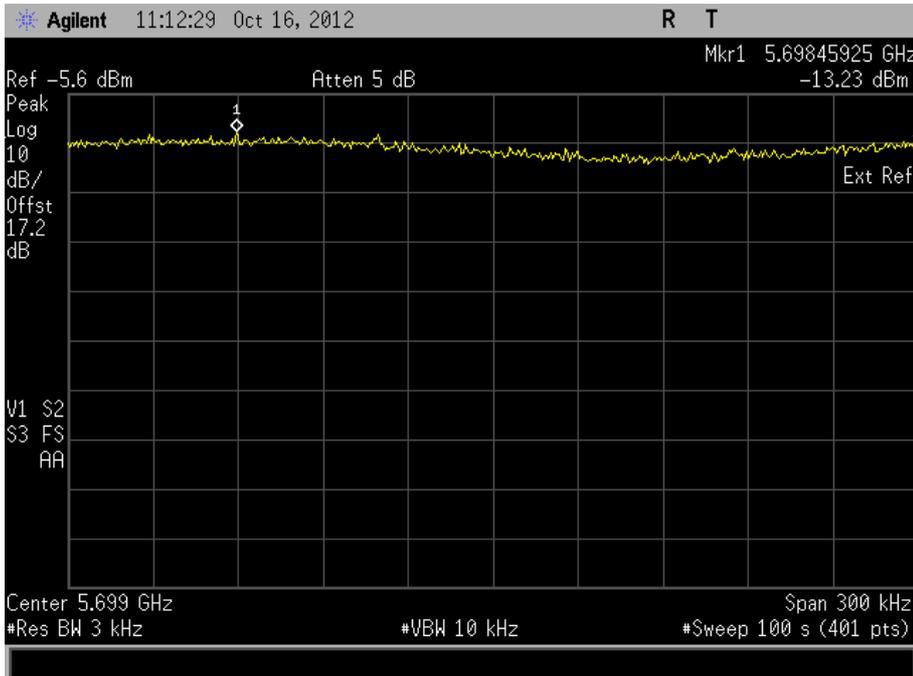




Product Service

5700 MHz

Peak Power Spectral Density (dBm)	-132.23
-----------------------------------	---------



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

Limit

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



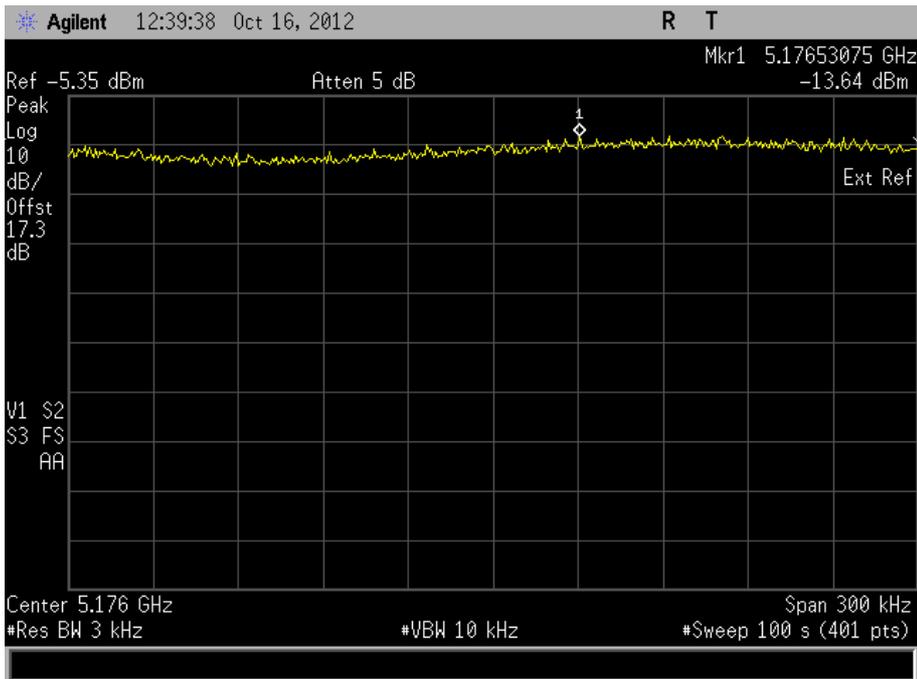
Product Service

802.11(n) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

Peak Power Spectral Density (dBm)	-13.64
-----------------------------------	--------

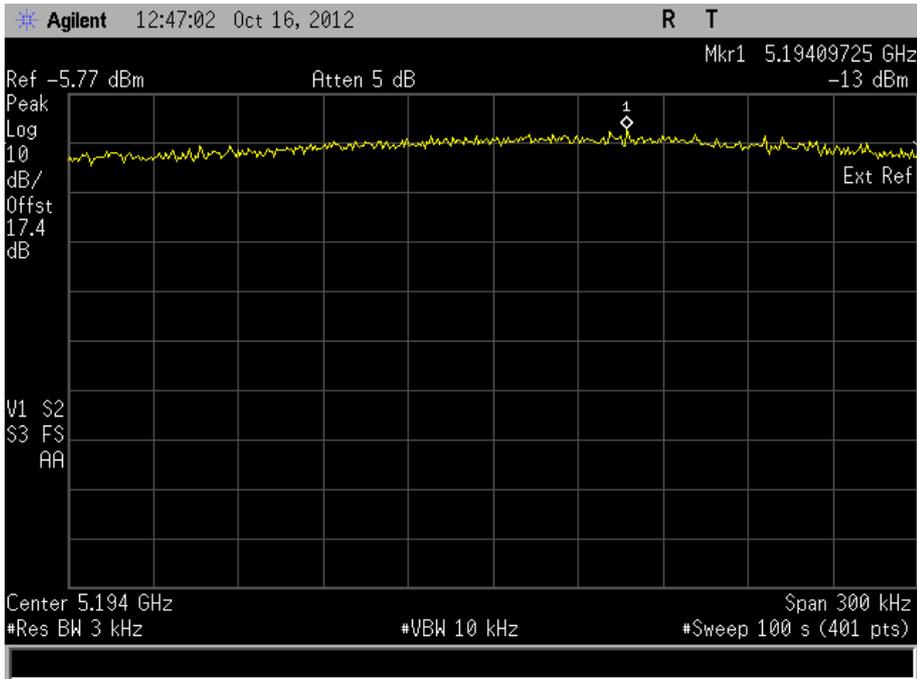




Product Service

5200 MHz

Peak Power Spectral Density (dBm)	-13.00
-----------------------------------	--------

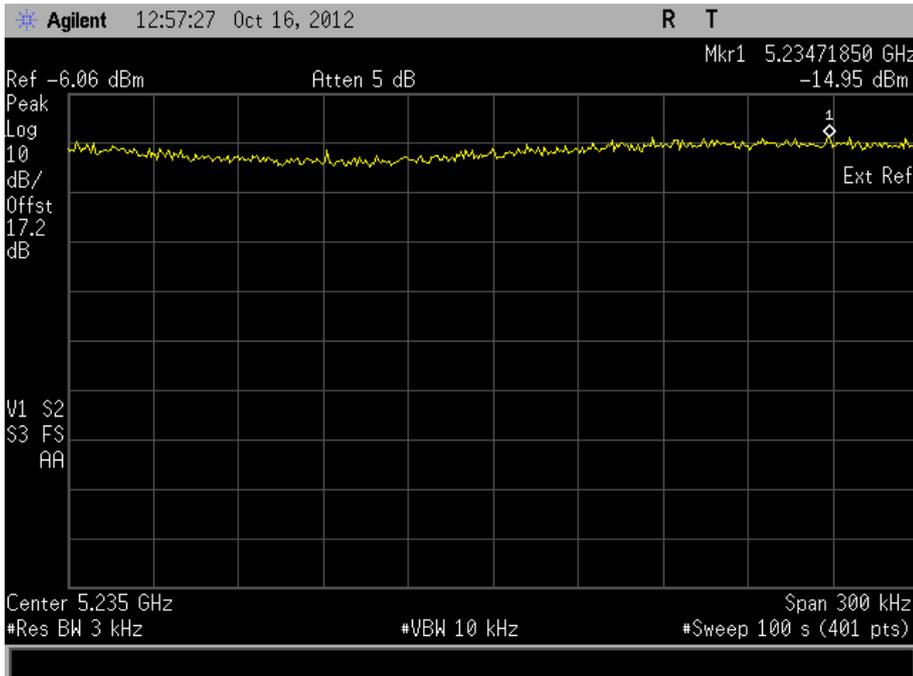




Product Service

5240 MHz

Peak Power Spectral Density (dBm)	-14.95
-----------------------------------	--------



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

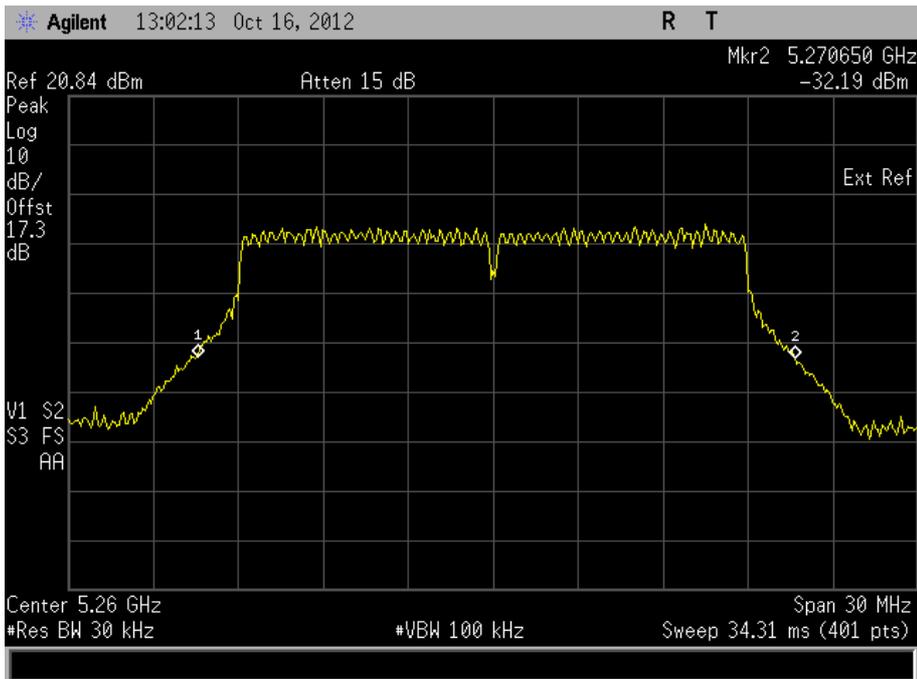


Product Service

Frequency Band 2

5260 MHz

Peak Power Spectral Density (dBm)	-14.18
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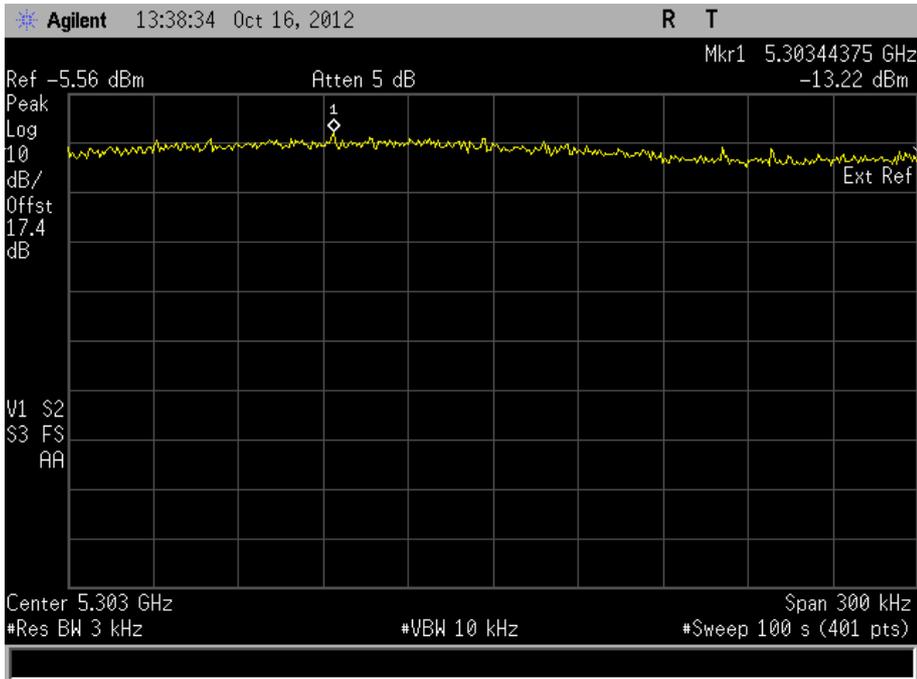




Product Service

5300 MHz

Peak Power Spectral Density (dBm)	-13.22
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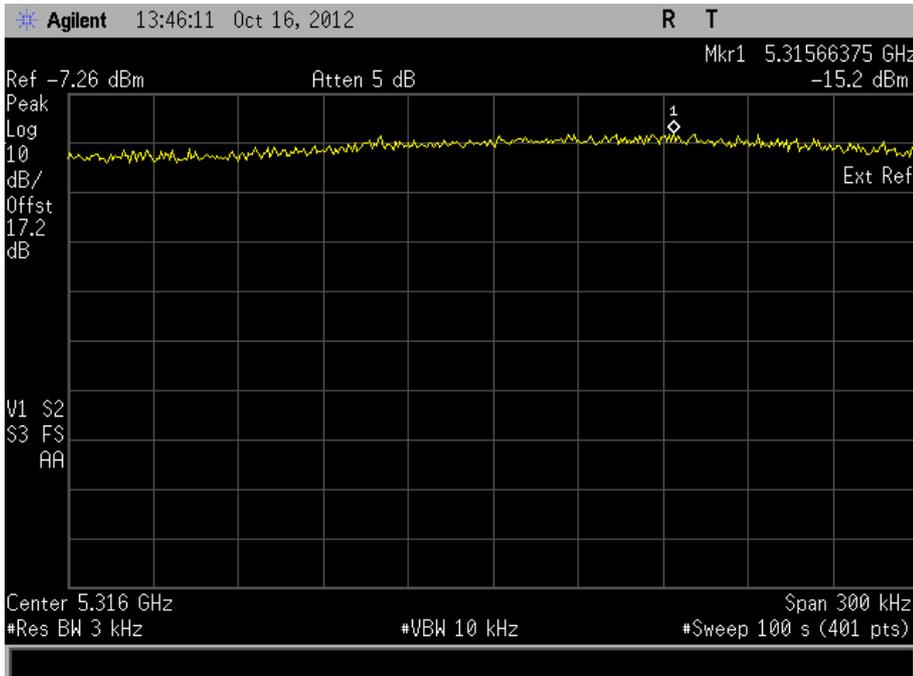




Product Service

5320 MHz

Peak Power Spectral Density (dBm)	-15.20
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The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

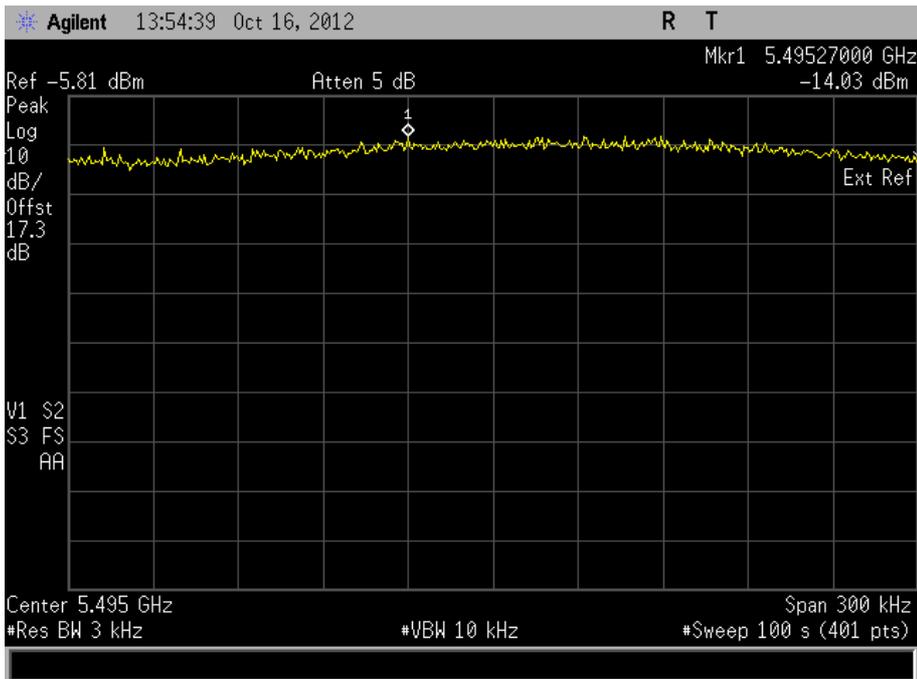


Product Service

Frequency Band 3

5500 MHz

Peak Power Spectral Density (dBm)	-14.03
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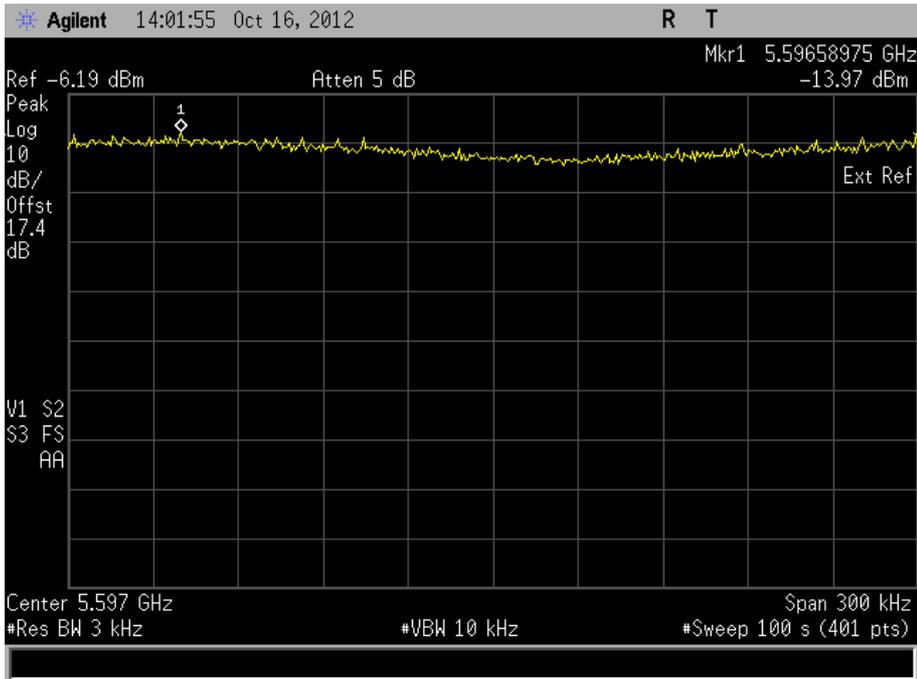




Product Service

5600 MHz

Peak Power Spectral Density (dBm)	-13.97
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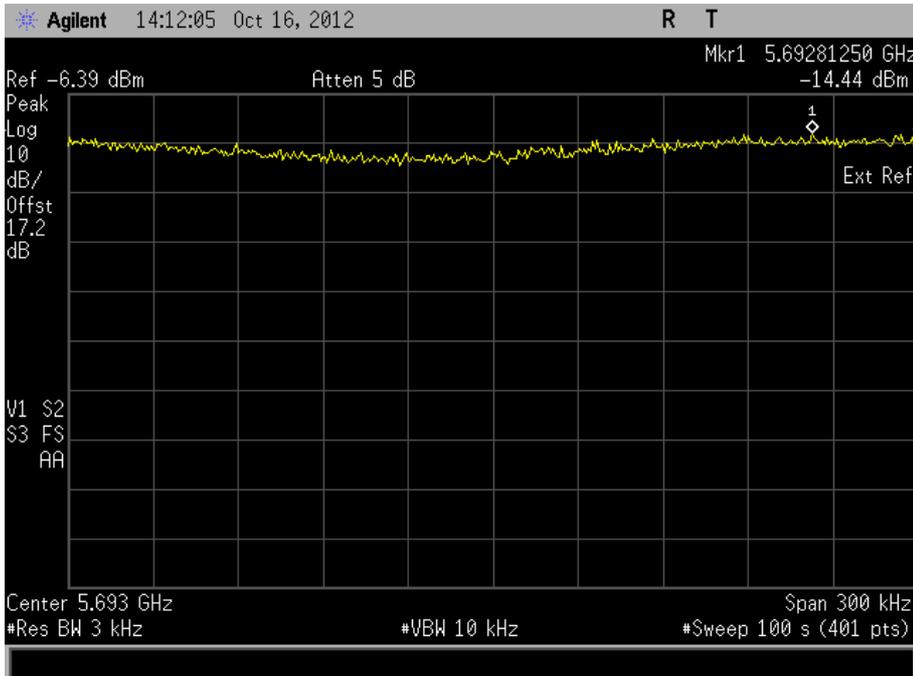




Product Service

5700 MHz

Peak Power Spectral Density (dBm)	-14.44
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The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

Limit

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



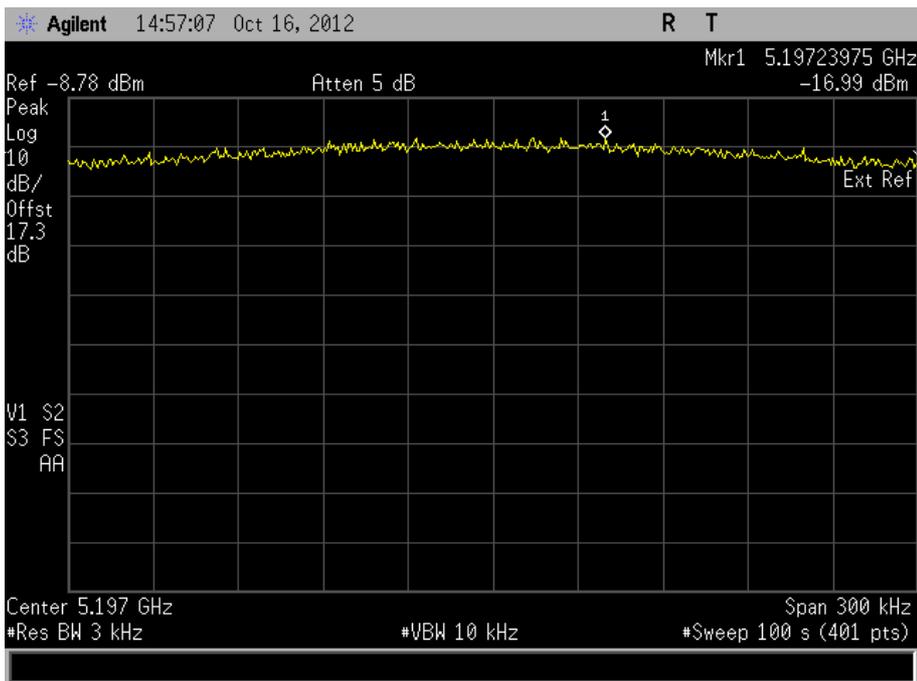
Product Service

802.11(n) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

Peak Power Spectral Density (dBm)	-16.99
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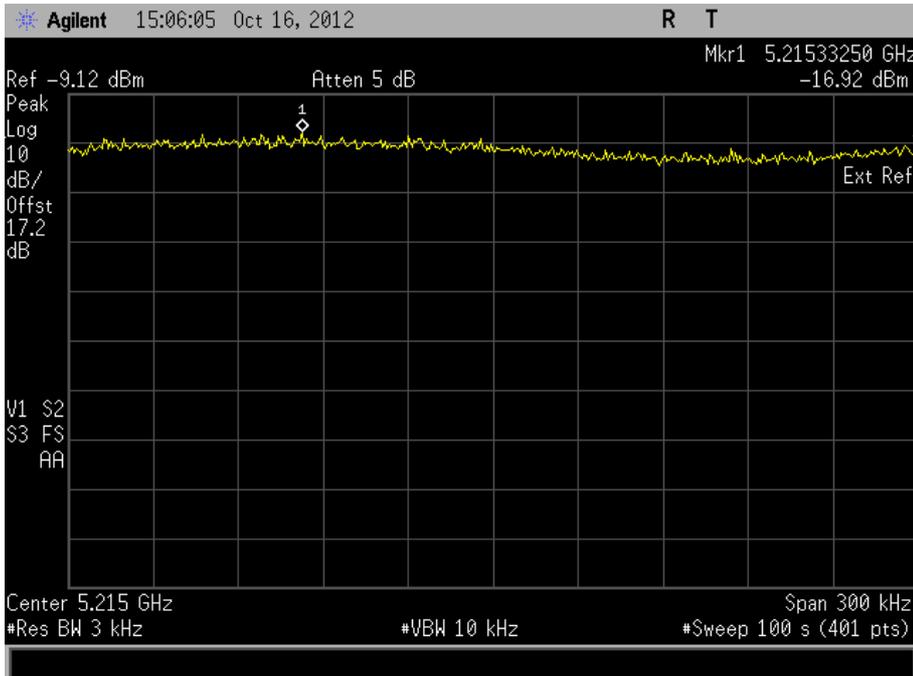




Product Service

5230 MHz

Peak Power Spectral Density (dBm)	-16.93
-----------------------------------	--------



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

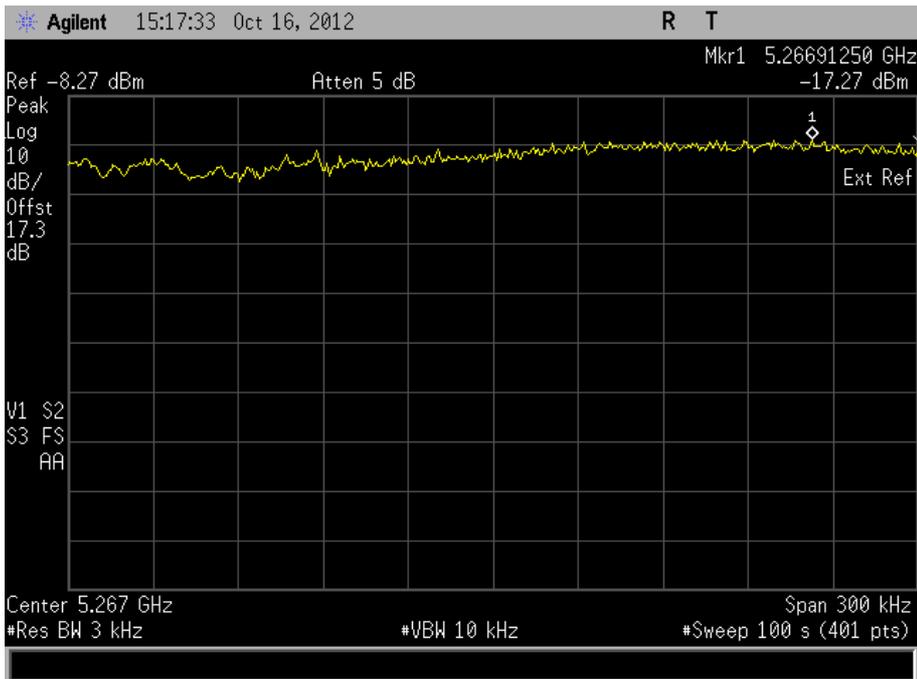


Product Service

Frequency Band 2

5270 MHz

Peak Power Spectral Density (dBm)	-17.27
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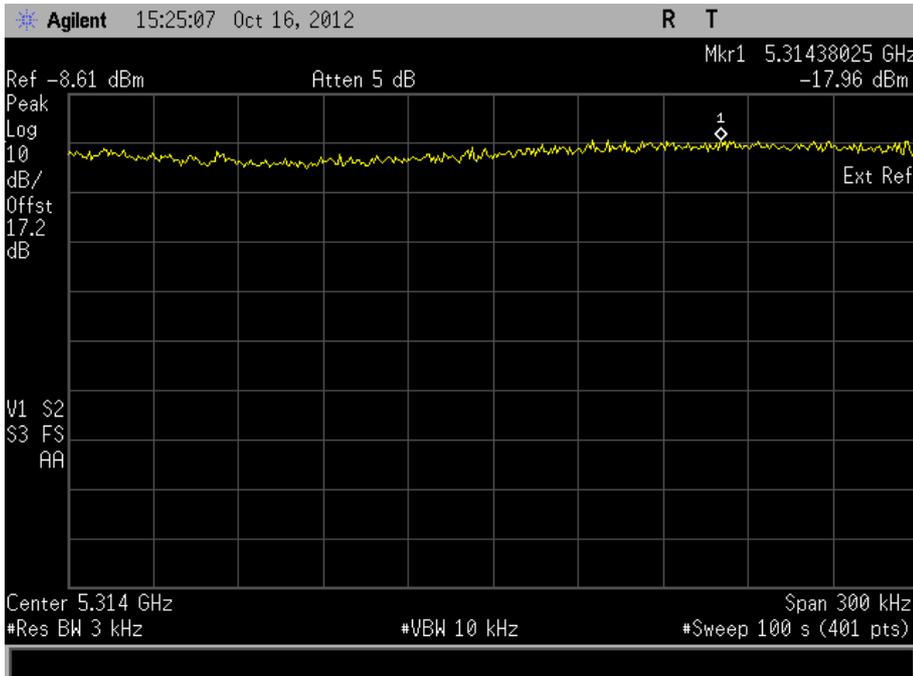




Product Service

5310 MHz

Peak Power Spectral Density (dBm)	-17.96
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The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

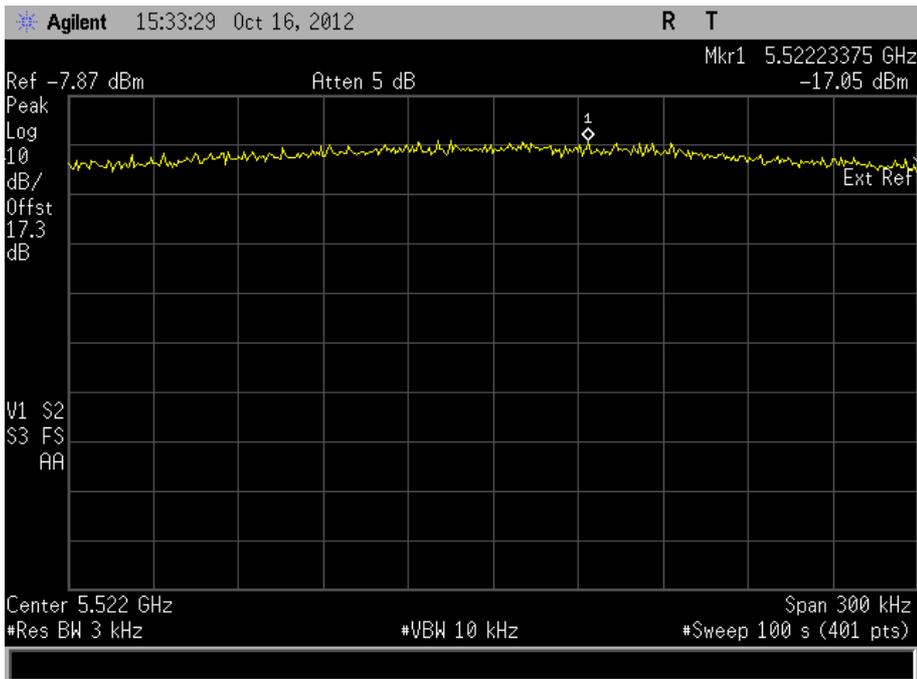


Product Service

Frequency Band 3

5510 MHz

Peak Power Spectral Density (dBm)	-17.05
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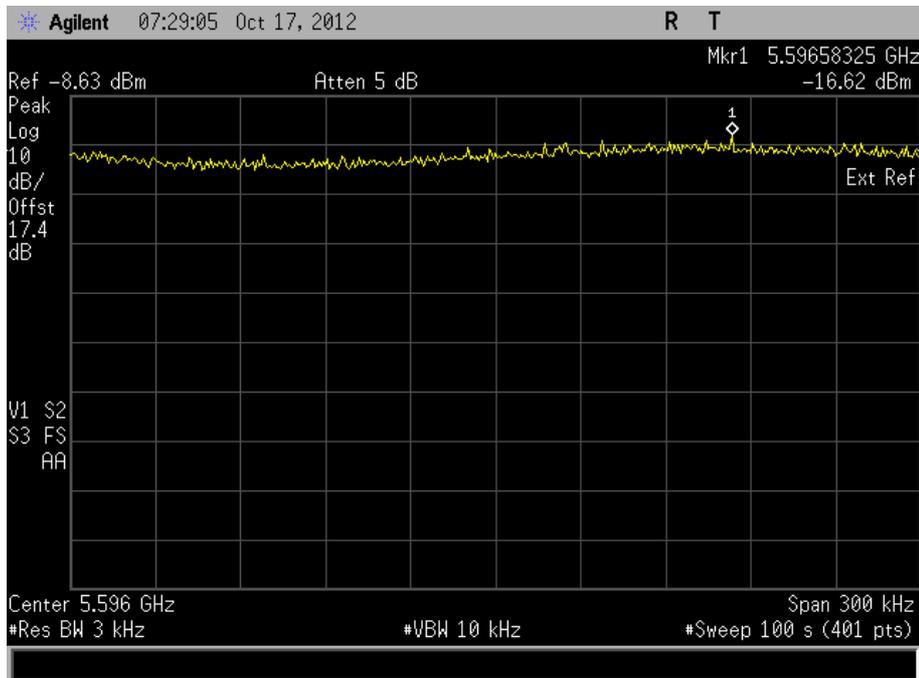




Product Service

5590 MHz

Peak Power Spectral Density (dBm)	-16.62
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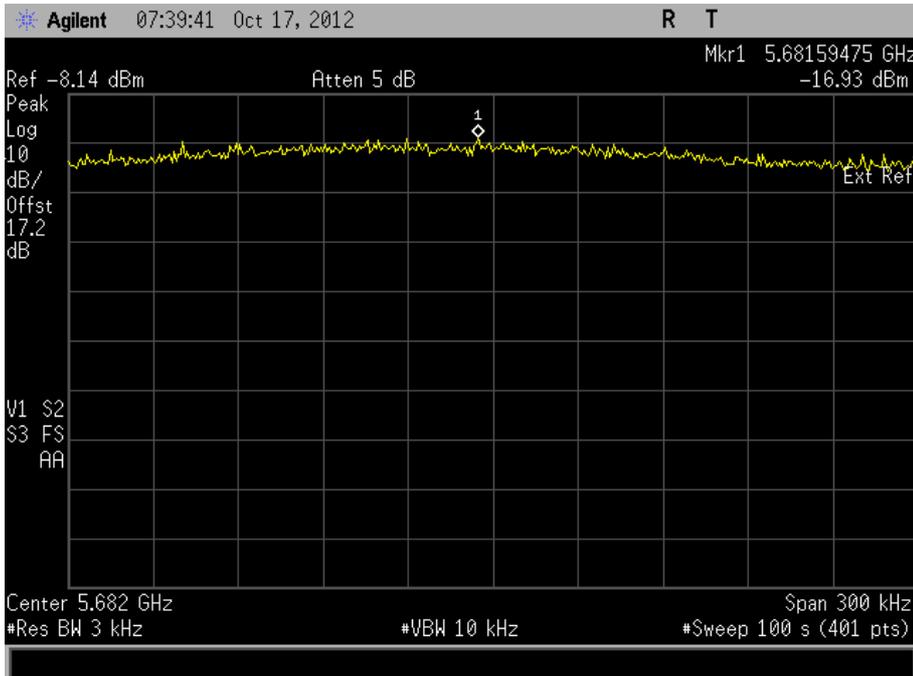




Product Service

5670 MHz

Peak Power Spectral Density (dBm)	-16.94
-----------------------------------	--------



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

Limit

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



Product Service

2.7 RATIO OF THE PEAK EXCURSION OF THE MODULATION ENVELOPE

2.7.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(6)

2.7.2 Equipment Under Test and Modification State

CDMA SHT21 S/N: IMEI 004401114403773 - Modification State 0

2.7.3 Date of Test

17 October 2012

2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.5 Test Procedure

The EUT was transmitted at maximum power via an attenuator and cable to the Spectrum Analyser. The Analyser settings were adjusted to display the resultant trace on screen. The resolution bandwidth and video bandwidth were set to 1 MHz and 1 MHz respectively. The trace was set to Max Hold and the peak excursion of the modulation envelope was measured. The ratio of this measurement to the maximum conducted output power was measured.

2.7.6 Environmental Conditions

Ambient Temperature	18.7 - 22.3°C
Relative Humidity	44.2 - 51.8%



Product Service

2.7.7 Test Results802.11(a)Frequency Band 15180 MHz

Ratio (dB)	-1.94
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5200 MHz

Ratio (dB)	-1.78
------------	-------

5240 MHz

Ratio (dB)	-1.75
------------	-------

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

Frequency Band 25260 MHz

Ratio (dB)	-1.17
------------	-------

5300 MHz

Ratio (dB)	-2.08
------------	-------

5320 MHz

Ratio (dB)	-1.58
------------	-------

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.



Product Service

Frequency Band 3

5500 MHz

Ratio (dB)	-1.21
------------	-------

5600 MHz

Ratio (dB)	-1.14
------------	-------

5700 MHz

Ratio (dB)	-1.64
------------	-------

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

Limit

Not specified.



Product Service

802.11(n) - 5 GHz 20 MHz BW

Frequency Band 1

5180 MHz

Ratio (dB)	-2.33
------------	-------

5200 MHz

Ratio (dB)	-1.68
------------	-------

5240 MHz

Ratio (dB)	-1.28
------------	-------

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

Frequency Band 2

5260 MHz

Ratio (dB)	-1.48
------------	-------

5300 MHz

Ratio (dB)	-1.83
------------	-------

5320 MHz

Ratio (dB)	0.12
------------	------

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.



Product Service

Frequency Band 3

5500 MHz

Ratio (dB)	-2.97
------------	-------

5600 MHz

Ratio (dB)	-2.01
------------	-------

5700 MHz

Ratio (dB)	-1.51
------------	-------

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 13 Mbps.

Limit

Not specified.



Product Service

802.11(n) - 5 GHz 40 MHz BW

Frequency Band 1

5190 MHz

Ratio (dB)	-5.03
------------	-------

5230 MHz

Ratio (dB)	-3.52
------------	-------

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

Frequency Band 2

5270 MHz

Ratio (dB)	-4.27
------------	-------

5310 MHz

Ratio (dB)	-4.08
------------	-------

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.



Product Service

Frequency Band 3

5510 MHz

Ratio (dB)	-4.07
------------	-------

5590 MHz

Ratio (dB)	-4.37
------------	-------

5670 MHz

Ratio (dB)	-3.43
------------	-------

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 27 Mbps.

Limit

Not specified.



Product Service

SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1– AC Line Conducted Emissions					
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2013
Transient Limiter	Hewlett Packard	11947A	1032	12	28-Jun-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
Section 2.2 - Power Limits					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Iso-tech	IDM101	2424	12	10-Sep-2013
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	24-May-2013
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	19-Nov-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000- NPS	3791	-	TU
Tilt Antenna Mast	mature GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	mature GmbH	NCD	3917	-	TU
P-Series Power Meter	Agilent	N1911A	3981	12	17-Sep-2013
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	17-Sep-2013



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 – Undesirable Emission Limits					
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	13-Sep-2013
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	20-Feb-2013
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Pre-Amplifier	Phase One	PS04-0086	1533	12	27-Sep-2013
Pre-Amplifier	Phase One	PS04-0087	1534	12	28-Sep-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Test Receiver	Rohde & Schwarz	ESIB40	1934	12	25-Oct-2012
Power Supply	Hewlett Packard	6104A	1948	-	TU
4GHz HPF	Sematron	F-100-4000-5-R	2245	-	TU
Multimeter	Iso-tech	IDM101	2424	12	10-Sep-2013
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Test Receiver	Rohde & Schwarz	ESIB40	2941	12	23-Oct-2013
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	27-Jun-2013
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	31-Aug-2013
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	16-Apr-2013
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3694	12	25-Oct-2013
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3695	12	15-Oct-2013
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	-	TU
Section 2.4 - Frequency Stability					
RF Coupler	TUV SUD Product Service	TUV	415	-	TU
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Multimeter	Iso-tech	IDM101	2424	12	10-Sep-2013
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Thermocouple Thermometer	Fluke	51	3173	12	23-Aug-2013
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	19-Nov-2012
Section 2.5 - Channel Bandwidth					
RF Coupler	TUV SUD Product Service	TUV	415	-	TU
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Multimeter	Iso-tech	IDM101	2424	12	10-Sep-2013
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	27-Jun-2013
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	19-Nov-2012



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.6 - Peak Power Spectral Density					
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Multimeter	Iso-tech	IDM101	2424	12	10-Sep-2013
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	19-Nov-2012
Section 2.7 - Ratio of the Peak Excursion of the Modulation Envelope					
Broadband Resistive Power Divider	Weinschel	1506A	601	12	2-Dec-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	17-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Multimeter	Iso-tech	IDM101	2424	12	10-Sep-2013
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	19-Nov-2012
P-Series Power Meter	Agilent	N1911A	3981	12	17-Sep-2013
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	17-Sep-2013

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Frequency Stability	± 90.32 Hz
Power Limits	Conducted: ± 0.70 dB Radiated: 30MHz to 1GHz: ± 5.1 dB Radiated: 1GHz to 40GHz: ± 6.3 dB
Undesirable Emission Limits	Conducted: ± 3.454 dB Radiated: ± 3.08 dB
AC Line Conducted Emissions	± 3.2 dB
26 dB Bandwidth	± 5.72 kHz
Peak Power Spectral Density	± 3.0 dB
Ratio of the Peak Excursion of the Modulation Envelope	± 0.70 dB



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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