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Report On

FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 15E

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FCC ID: APYHRO00178

Document 75918726 Report 14 Issue 2

October 2012



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COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 15E

Document 75918726 Report 14 Issue 2

October 2012

PREPARED FOR

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PREPARED BY

Natalie Bennett
Senior Administrator (Technical)

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED

08 October 2012

This report has been up-issued to include the correct application form and to explain the reason for there being no plots for the 40MHz BW results in section 2.6

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

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B Airs



S Bennett

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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900
MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode
Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 15E



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) 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 SHL21
Serial Number(s)	IMEI 004401114094770 IMEI 004401114094523 IMEI 004401114094804
Number of Samples Tested	3
Test Specification/Issue/Date	FCC CFR 47 Part 15E (2011)
Incoming Release Date	Application Form 30 July 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	9290 03 August 2012
Start of Test	27 August 2012
Finish of Test	18 September 2012
Name of Engineer(s)	G Lawler B Airs S Bennett
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	



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1.3 APPLICATION FORM



Product Service

EQUIPMENT DESCRIPTION	
Model Name/Number	CDMA_SHL21
Part Number	CA226_B
Hardware Version	PP2
Software Version	F7096
FCC ID	APYHRO00176
Technical Description (Please provide a brief description of the intended use of the equipment)	Dual-band CDMA (BC0, BC6) & Tri-band GSM (GSM900/DCS1800/PCS1900) & Dual-band UMTS (FDD, FDDV) & Dual-band LTE (B11, B15) multi mode cellular phone with Bluetooth, WLAN, NFC (FeiCa) and GPS

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, (5 – 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 300mW	



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

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	



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Product Service

ANTENNA OPTIONS	
Antenna 1	
Antenna Description:	Integral BT / WLAN strip line antenna
Antenna Model:	GCABBA452AFS*
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. Kishino* Name: Masahiko Kishino
 Position held: Manager Date: 25th September, 2012



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) and Dual Band LTE (B11 and B18) Multi Mode Cellular Phone with Bluetooth, WLAN, NFC (FeliCa) 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 Communication Compliance Ltd CDMA SHL21
In accordance with FCC CFR 47 Part 15E



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 SHL21 S/N: IMEI 004401114094770 – Modification State 0

2.1.3 Date of Test

18 September 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	19.3°C
Relative Humidity	40.0%

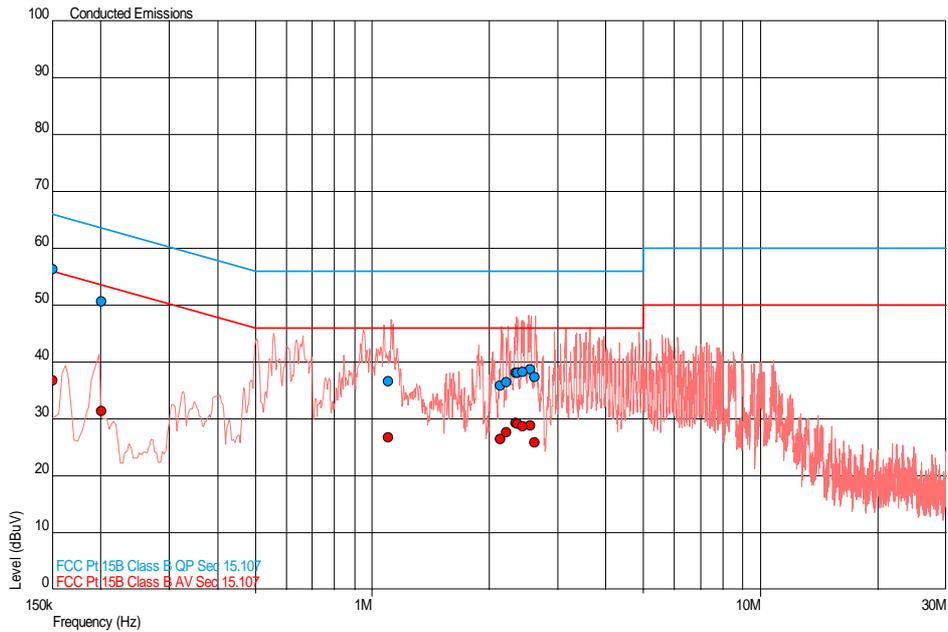


Product Service

2.1.7 Test Results

802.11(a)

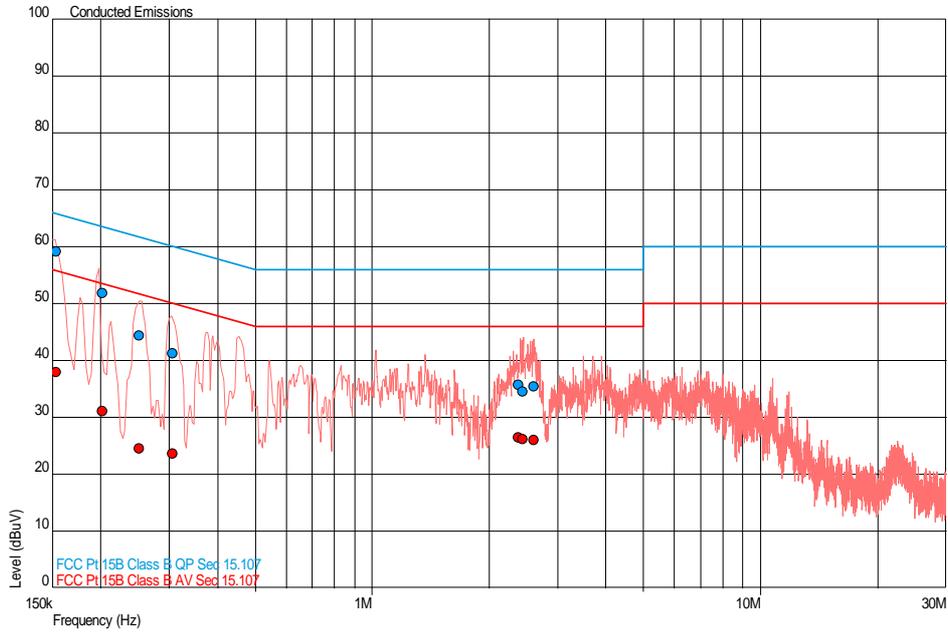
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.150	56.3	66.0	-9.7	36.8	56.0	-19.2
0.201	50.6	63.6	-12.9	31.4	53.6	-22.2
1.102	36.7	56.0	-19.3	26.8	46.0	-19.2
2.134	35.9	56.0	-20.1	26.6	46.0	-19.4
2.219	36.5	56.0	-19.5	27.6	46.0	-18.4
2.346	38.2	56.0	-17.8	29.4	46.0	-16.6
2.368	38.2	56.0	-17.8	29.2	46.0	-16.8
2.440	38.3	56.0	-17.7	28.7	46.0	-17.3
2.558	38.8	56.0	-17.2	28.9	46.0	-17.1
2.615	37.4	56.0	-18.6	25.9	46.0	-20.1



Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.153	59.2	65.8	-6.7	38.0	55.8	-17.8
0.202	51.9	63.5	-11.7	31.1	53.5	-22.5
0.251	44.3	61.7	-17.4	24.5	51.7	-27.2
0.307	41.2	60.1	-18.8	23.7	50.1	-26.4
2.382	35.7	56.0	-20.3	26.4	46.0	-19.6
2.440	34.5	56.0	-21.5	26.2	46.0	-19.8
2.606	35.5	56.0	-20.5	26.0	46.0	-20.0



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 SHL21 S/N: IMEI 004401114094523 – Modification State 0

CDMA SHL21 S/N: IMEI 004401114094770 – Modification State 0

2.2.3 Date of Test

27 August 2012, 30 August 2012, 31 August 2012 & 5 September 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 – 25.8°C
Relative Humidity	26.9 – 57.0%



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2.2.7 Test Results

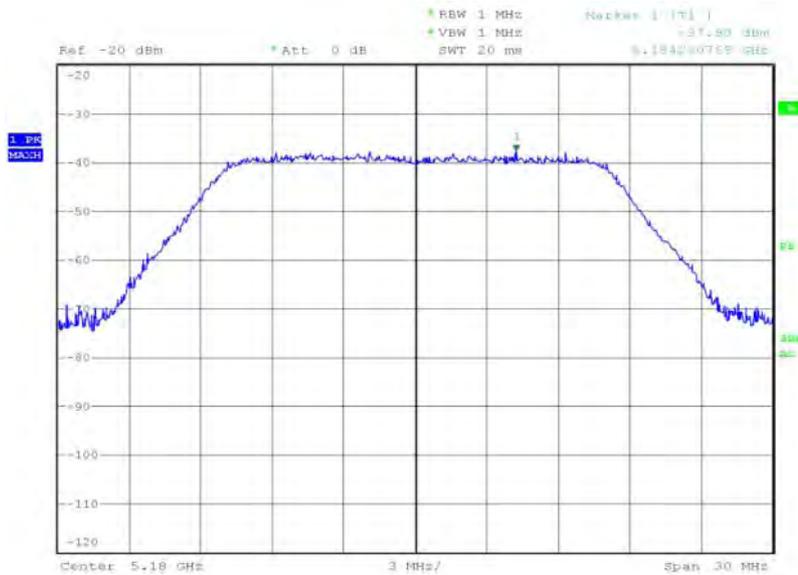
802.11(a)

Radiated

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
18.03	63.53



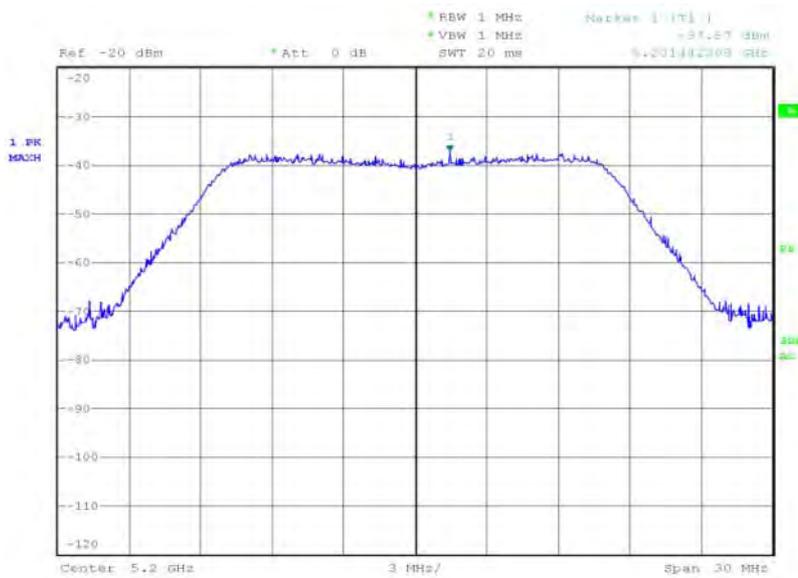
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Product Service

5200 MHz

EIRP (dBm)	EIRP (mW)
17.38	54.70



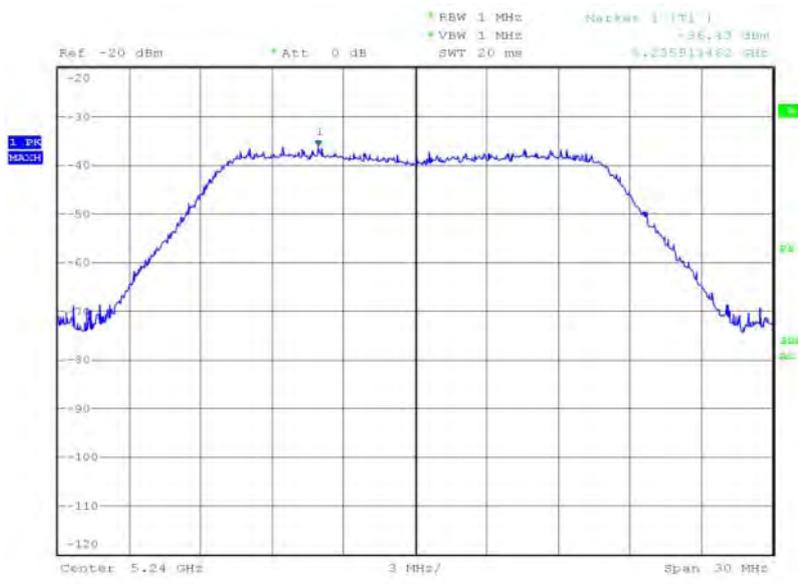
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Product Service

5240 MHz

EIRP (dBm)	EIRP (mW)
17.78	59.98



Date: 26.AUG.2012 08:57:09



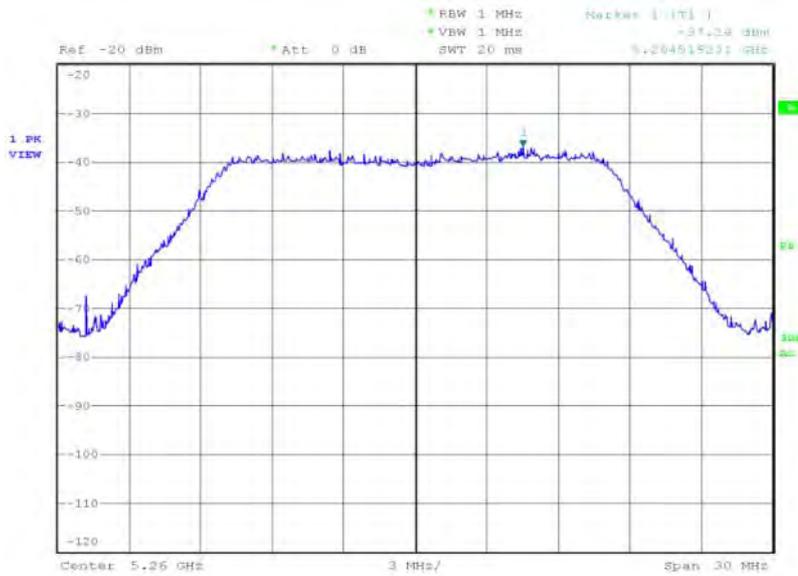
Product Service

Radiated

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
16.87	48.64



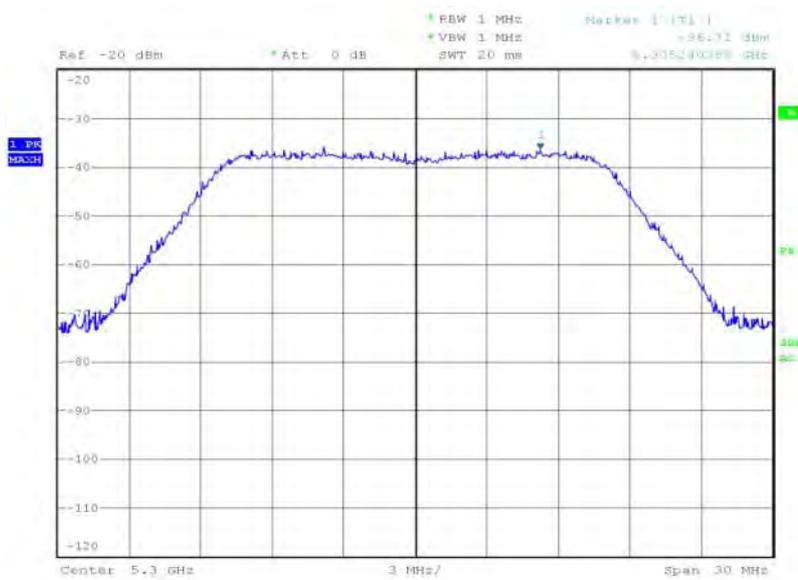
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Product Service

5300 MHz

EIRP (dBm)	EIRP (mW)
17.41	55.08



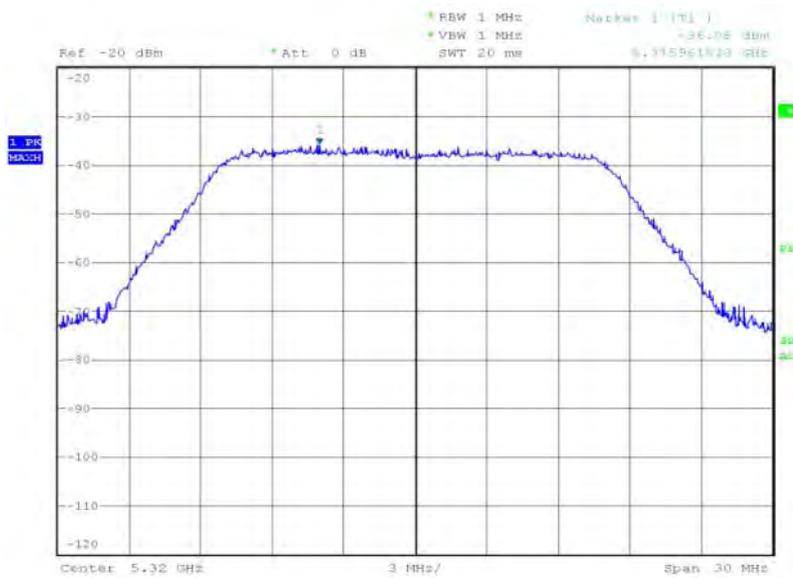
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Product Service

5320 MHz

EIRP (dBm)	EIRP (mW)
18.26	66.99



Date: 26.AUG.2012 09:32:31



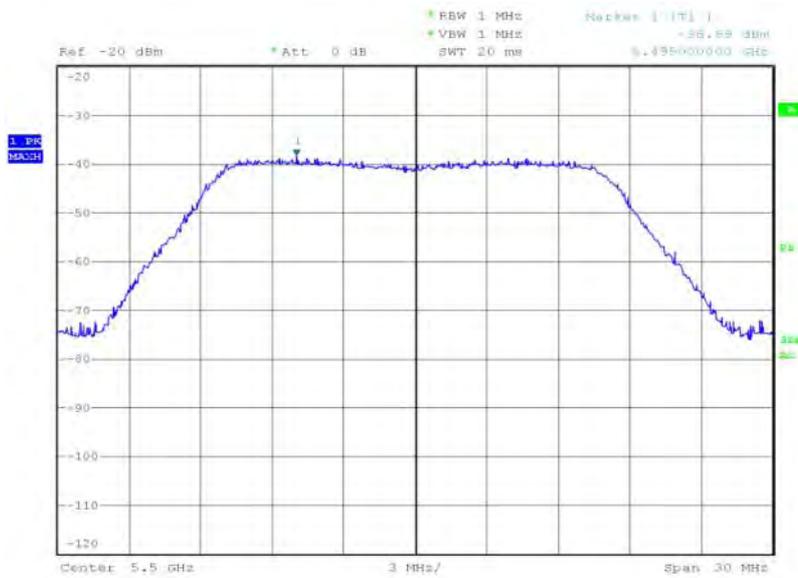
Product Service

Radiated

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
15.63	35.56



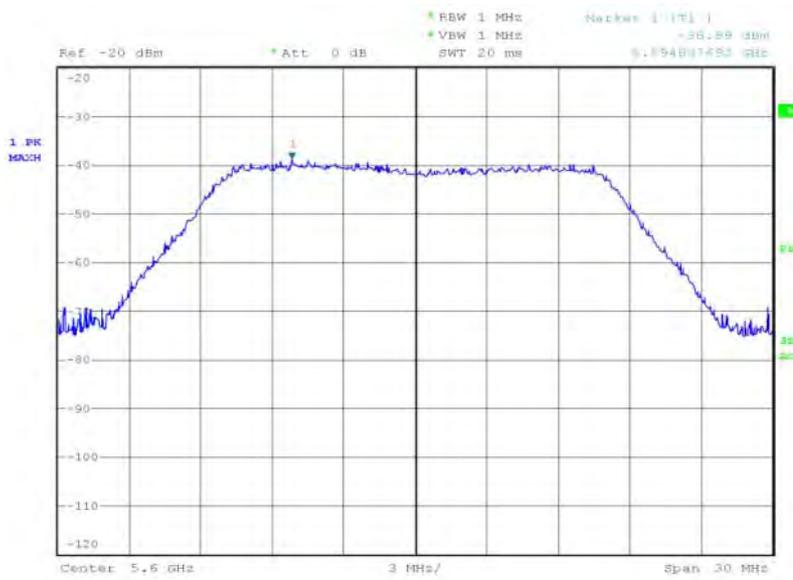
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Product Service

5600 MHz

EIRP (dBm)	EIRP (mW)
15.72	37.33



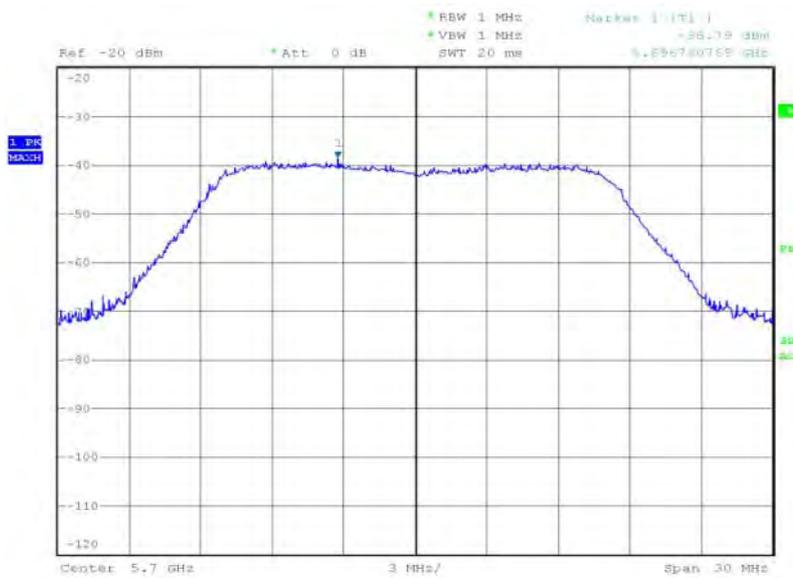
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5700 MHz

EIRP (dBm)	EIRP (mW)
15.43	34.91



Date: 26.AUG.2012 10:17:06

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.



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Conducted

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
12.19	16.557

5200 MHz

EIRP (dBm)	EIRP (mW)
12.22	16.672

5240 MHz

EIRP (dBm)	EIRP (mW)
12.18	16.519

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 12 Mbps.

Conducted

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
12.12	16.293

5300 MHz

EIRP (dBm)	EIRP (mW)
11.27	13.396

5320 MHz

EIRP (dBm)	EIRP (mW)
10.72	11.802

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 12 Mbps.



Product Service

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
11.92	15.559

5600 MHz

EIRP (dBm)	EIRP (mW)
11.80	15.135

5700 MHz

EIRP (dBm)	EIRP (mW)
11.57	14.355

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 12 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

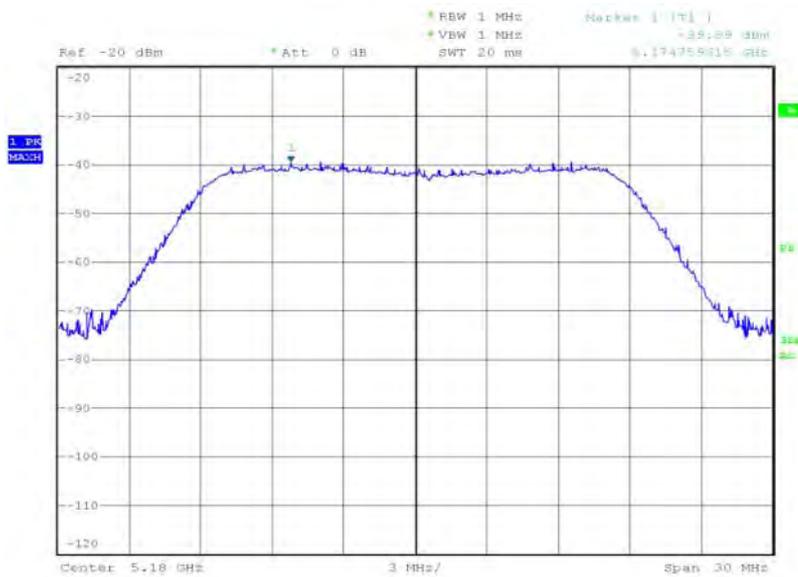
802.11(n) - 5 GHz, 20 MHz BW

Radiated

Frequency Band 1

5180 MHz

EIRP (dBm)	EIRP (mW)
17.23	52.84



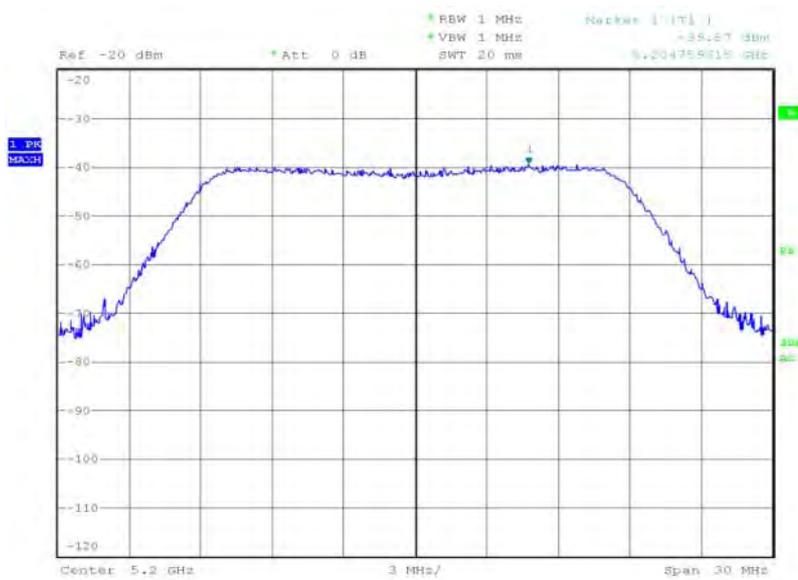
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Product Service

5200 MHz

EIRP (dBm)	EIRP (mW)
16.57	45.39



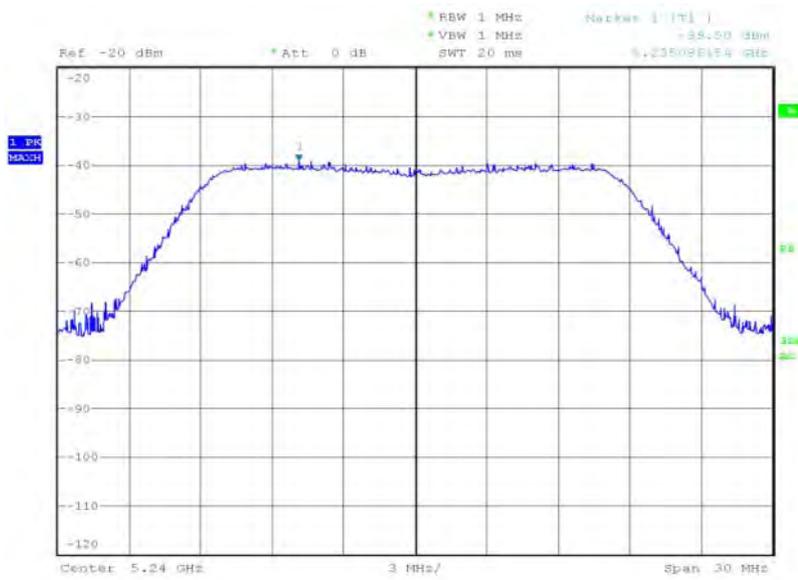
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Product Service

5240 MHz

EIRP (dBm)	EIRP (mW)
16.61	45.81



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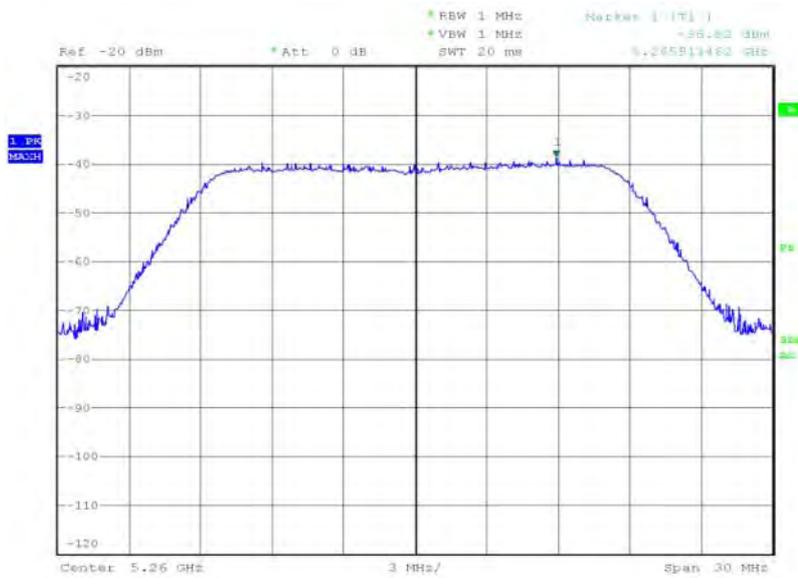
Product Service

Radiated

Frequency Band 2

5260 MHz

EIRP (dBm)	EIRP (mW)
16.38	43.45



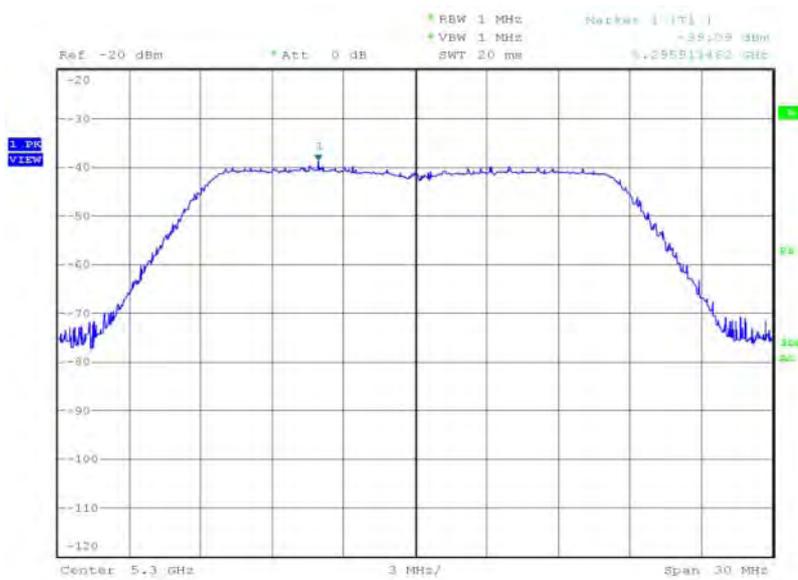
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Product Service

5300 MHz

EIRP (dBm)	EIRP (mW)
16.22	41.88



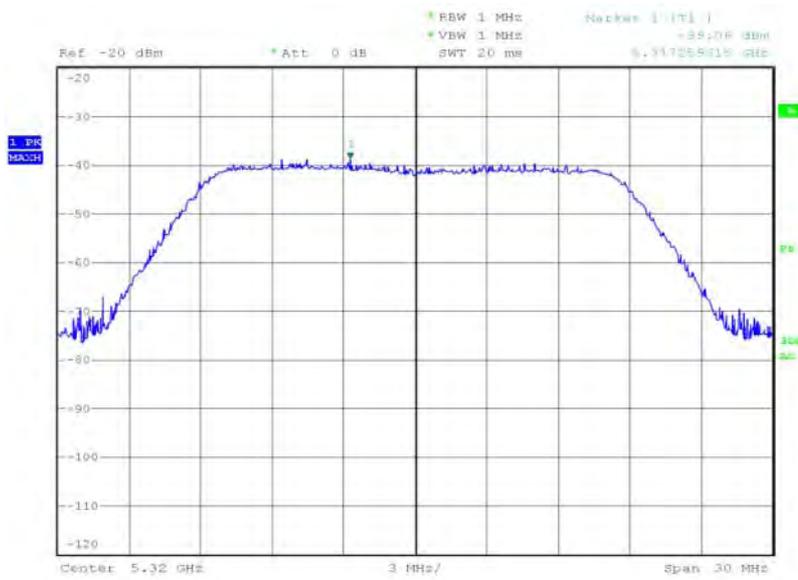
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Product Service

5320 MHz

EIRP (dBm)	EIRP (mW)
16.44	44.06



Date: 26.AUG.2012 11:27:43



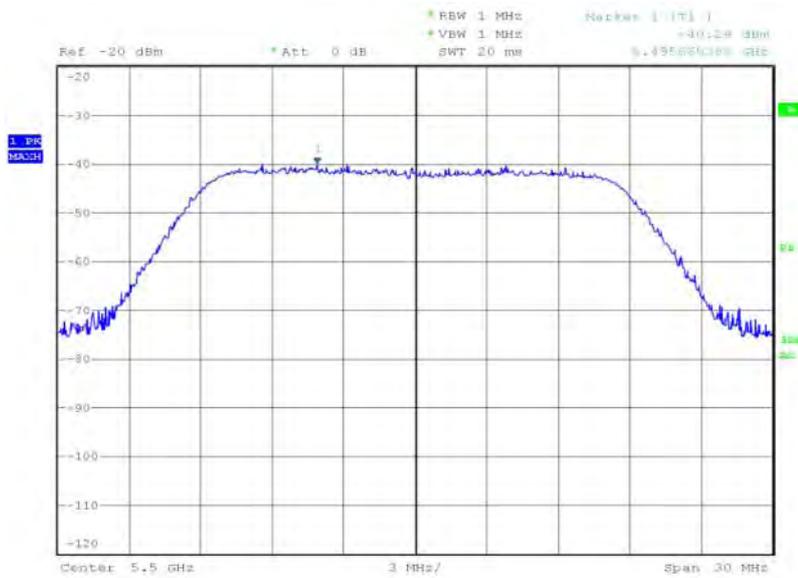
Product Service

Radiated

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
15.27	33.65



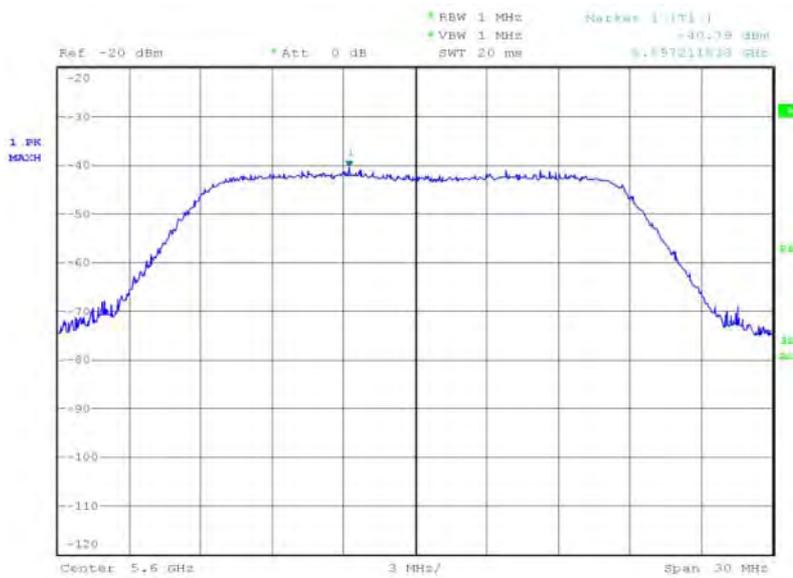
Date: 26.AUG.2012 11:51:40



Product Service

5600 MHz

EIRP (dBm)	EIRP (mW)
15.11	32.43



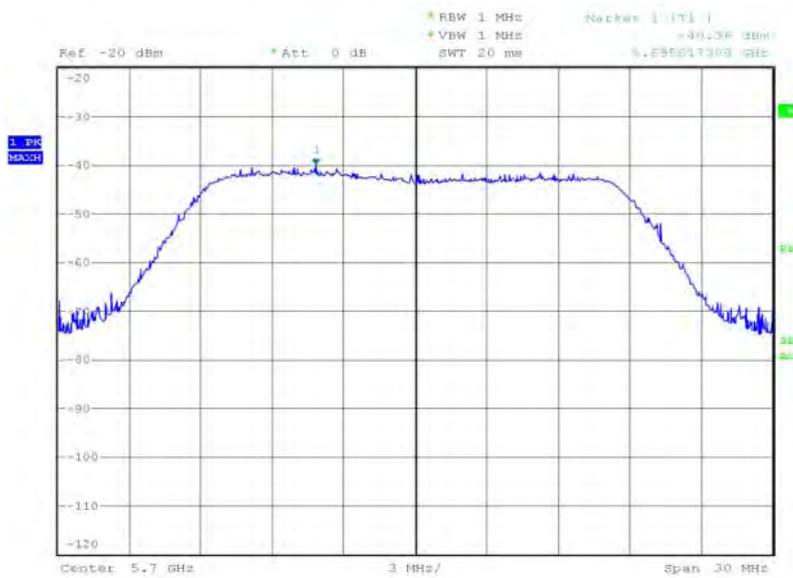
Date: 26.AUG.2012 12:14:49



Product Service

5700 MHz

EIRP (dBm)	EIRP (mW)
15.49	35.40



Date: 26.AUG.2012 12:20:46

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

ConductedFrequency Band 15180 MHz

EIRP (dBm)	EIRP (mW)
12.79	19.010

5200 MHz

EIRP (dBm)	EIRP (mW)
13.08	20.323

5240 MHz

EIRP (dBm)	EIRP (mW)
13.22	20.989

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 6.5 Mbps.

ConductedFrequency Band 25260 MHz

EIRP (dBm)	EIRP (mW)
13.24	21.086

5300 MHz

EIRP (dBm)	EIRP (mW)
12.19	16.557

5320 MHz

EIRP (dBm)	EIRP (mW)
12.06	16.094

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 6.5 Mbps.



Product Service

Conducted

Frequency Band 3

5500 MHz

EIRP (dBm)	EIRP (mW)
13.37	21.727

5600 MHz

EIRP (dBm)	EIRP (mW)
13.31	21.429

5700 MHz

EIRP (dBm)	EIRP (mW)
12.51	17.823

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 6.5 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

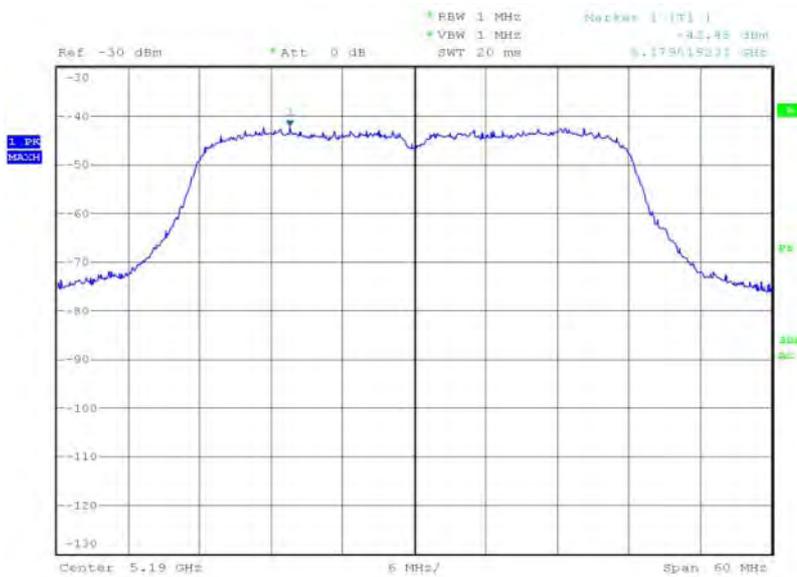
802.11(n) - 5 GHz, 40 MHz BW

Radiated

Frequency Band 1

5190 MHz

EIRP (dBm)	EIRP (mW)
13.46	22.182



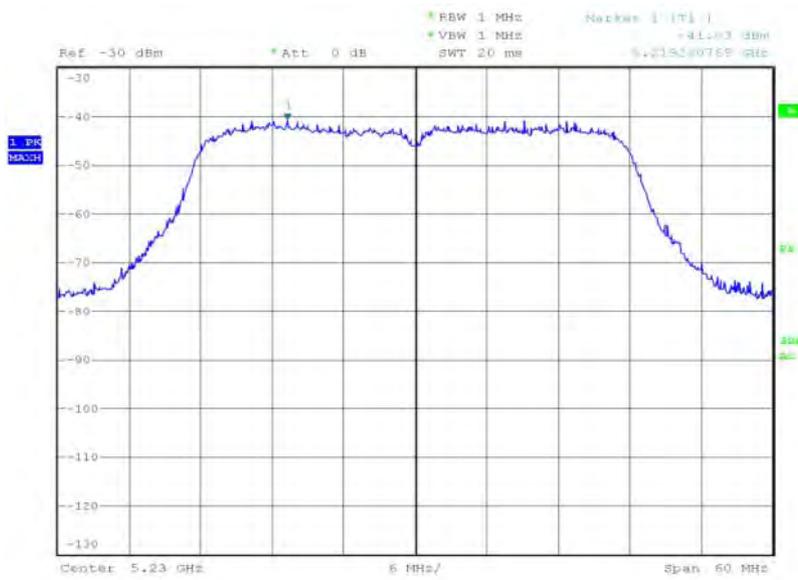
Date: 5.SEP.2012 18:33:49



Product Service

5230 MHz

EIRP (dBm)	EIRP (mW)
14.56	28.576



Date: 5.SEP.2012 19:17:37



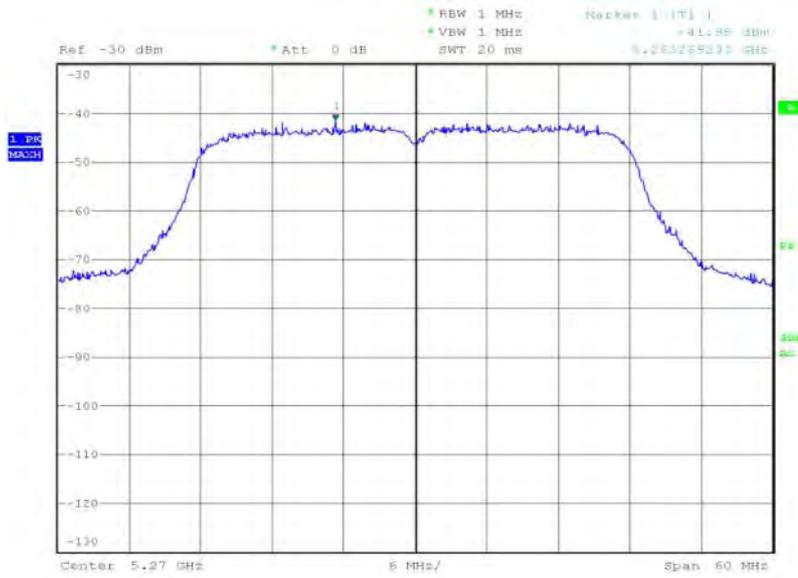
Product Service

Radiated

Frequency Band 2

5270 MHz

EIRP (dBm)	EIRP (mW)
13.12	20.512



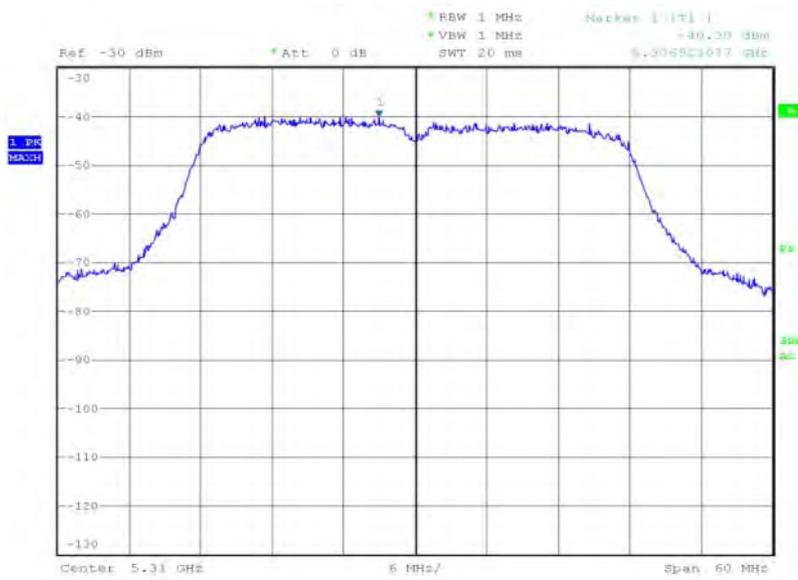
Date: 5.SEP.2012 19:29:45



Product Service

5310 MHz

EIRP (dBm)	EIRP (mW)
14.81	30.269



Date: 5.SEP.2012 19:52:42



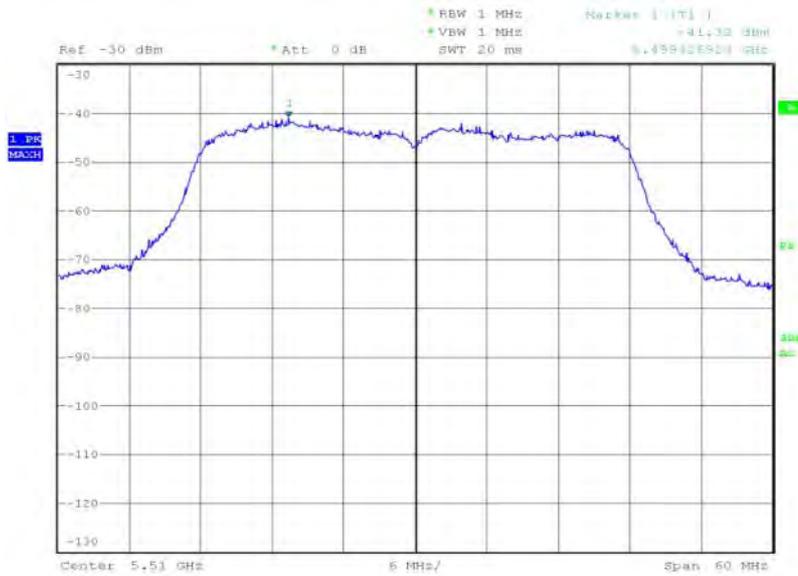
Product Service

Radiated

Frequency Band 3

5510 MHz

EIRP (dBm)	EIRP (mW)
14.09	25.645



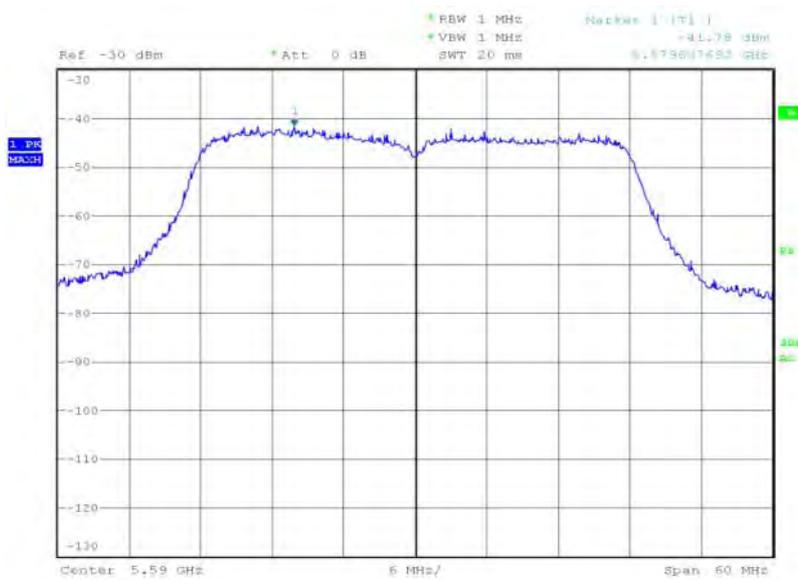
Date: 5.SEP.2012 20:06:09



Product Service

5590 MHz

EIRP (dBm)	EIRP (mW)
14.15	26.002



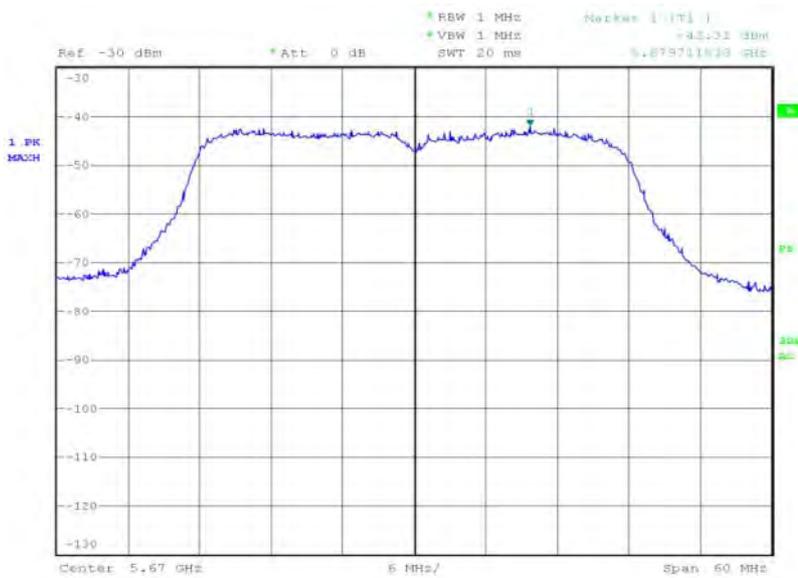
Date: 5.SEP.2012 20:19:37



Product Service

5670 MHz

EIRP (dBm)	EIRP (mW)
12.91	19.543



Date: 5.SEP.2012 20:32:20

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)
12.49	17.742

5230 MHz

EIRP (dBm)	EIRP (mW)
12.25	16.788

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.

Conducted

Frequency Band 2

5270 MHz

EIRP (dBm)	EIRP (mW)
11.35	16.646

5310 MHz

EIRP (dBm)	EIRP (mW)
11.68	14.723

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

Conducted

Frequency Band 3

5510 MHz

EIRP (dBm)	EIRP (mW)
11.46	13.996

5590 MHz

EIRP (dBm)	EIRP (mW)
12.42	17.458

5670 MHz

EIRP (dBm)	EIRP (mW)
11.45	13.963

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 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.



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 SHL21 S/N: IMEI 004401114094770 - Modification State 0

2.3.3 Date of Test

30 August 2012, 5 September 2012, 9 September 2012, 10 September 2012, 11 September 2012, 12 September 2012, 16 September 2012 & 17 September 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	18.1 - 23.8°C
Relative Humidity	43.0 - 70.0%



Product Service

2.3.7 Test Results

802.11(a)

4.0 V DC Supply

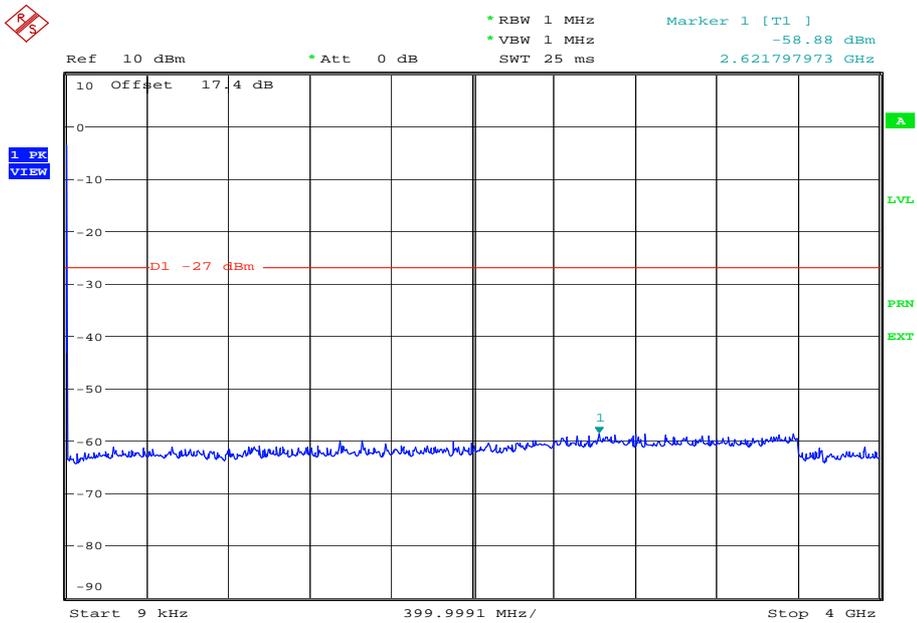
Spurious Conducted Emissions

12 Mbps

Frequency Band 1

5180 MHz

9 kHz to 7 GHz

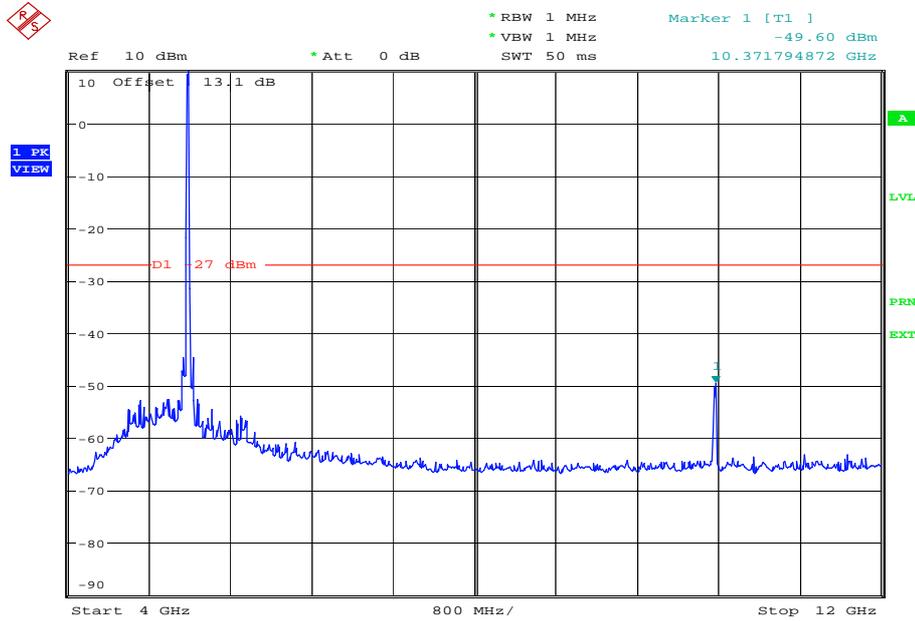


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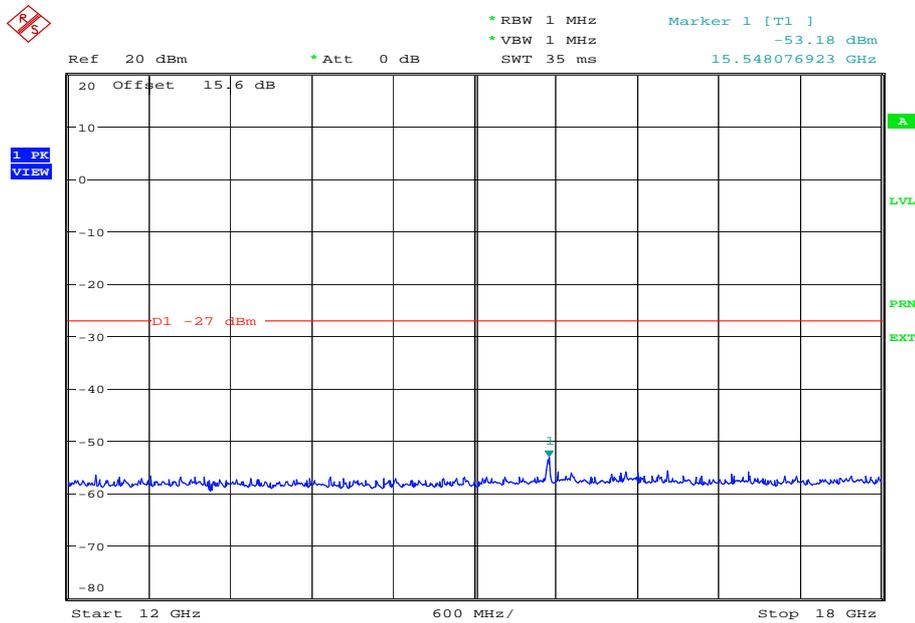
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 13:07:25

12 GHz to 18 GHz

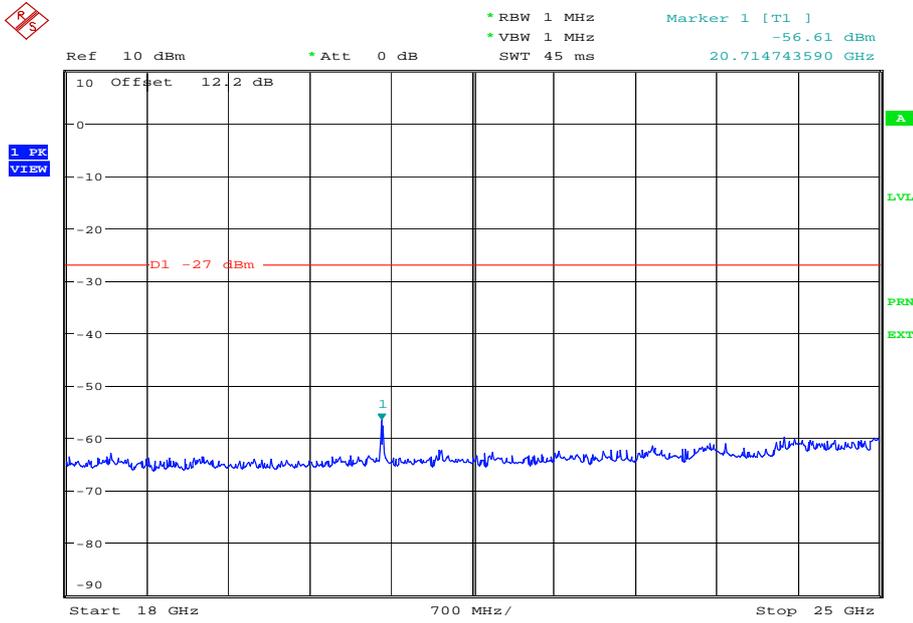


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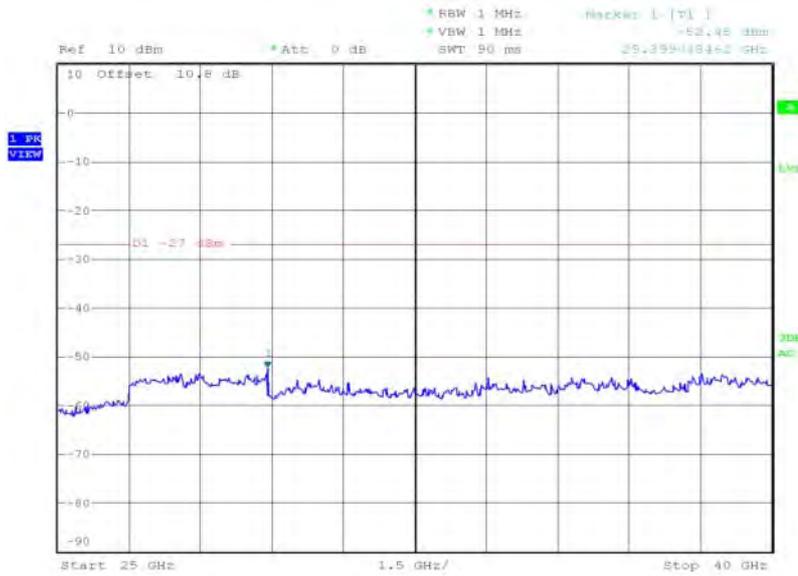
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 14:54:25

25 GHz to 40 GHz



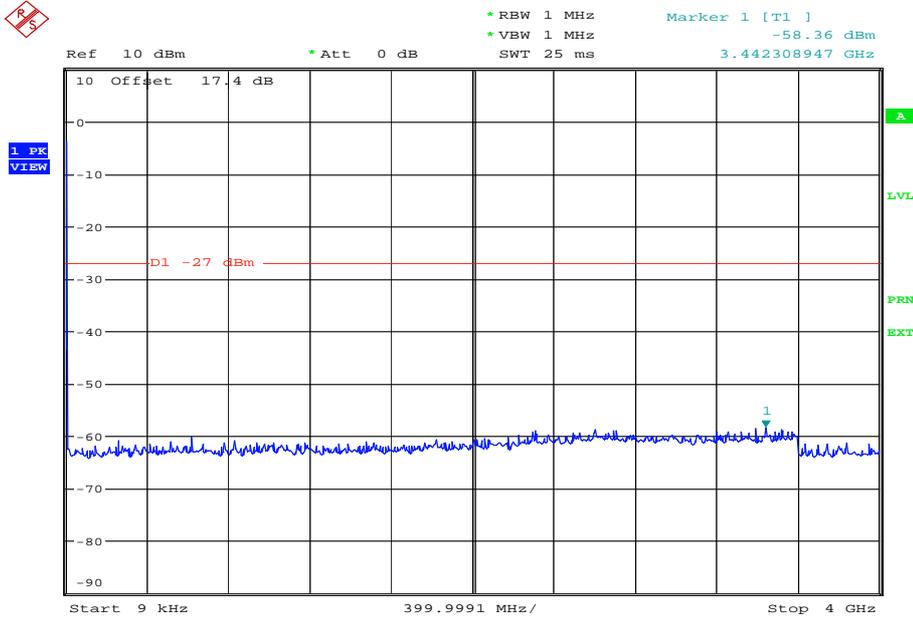
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Product Service

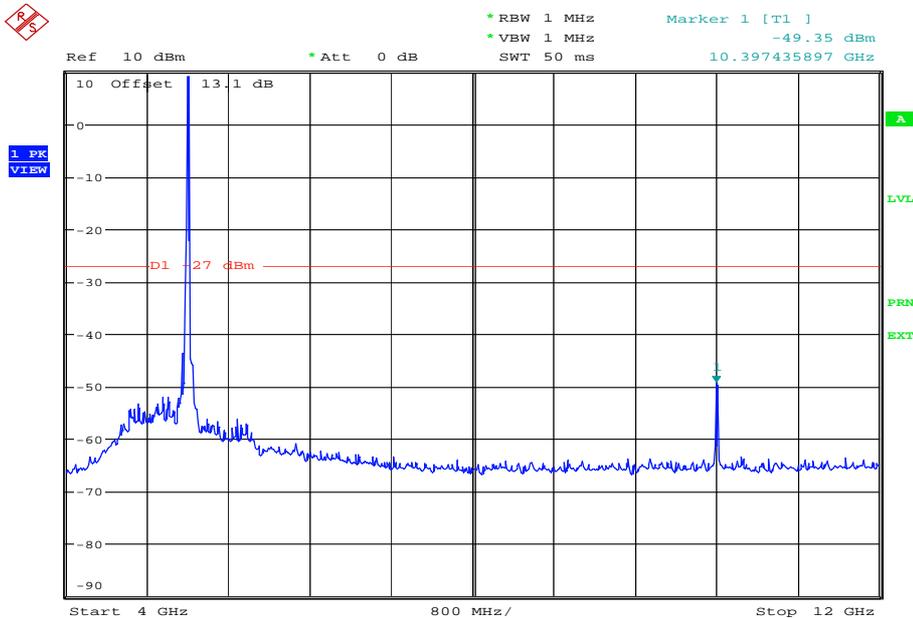
5200 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 11:57:48

7 GHz to 12 GHz

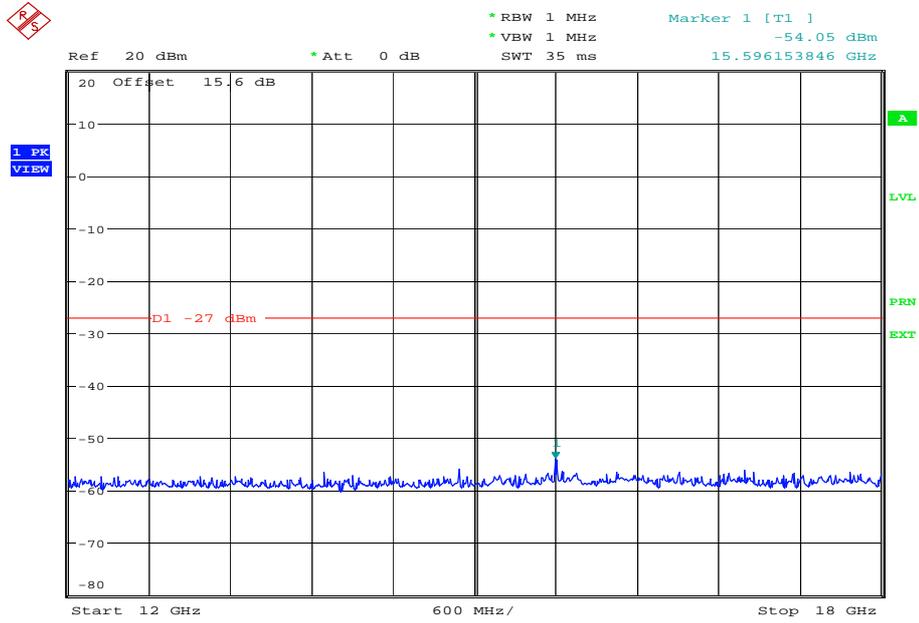


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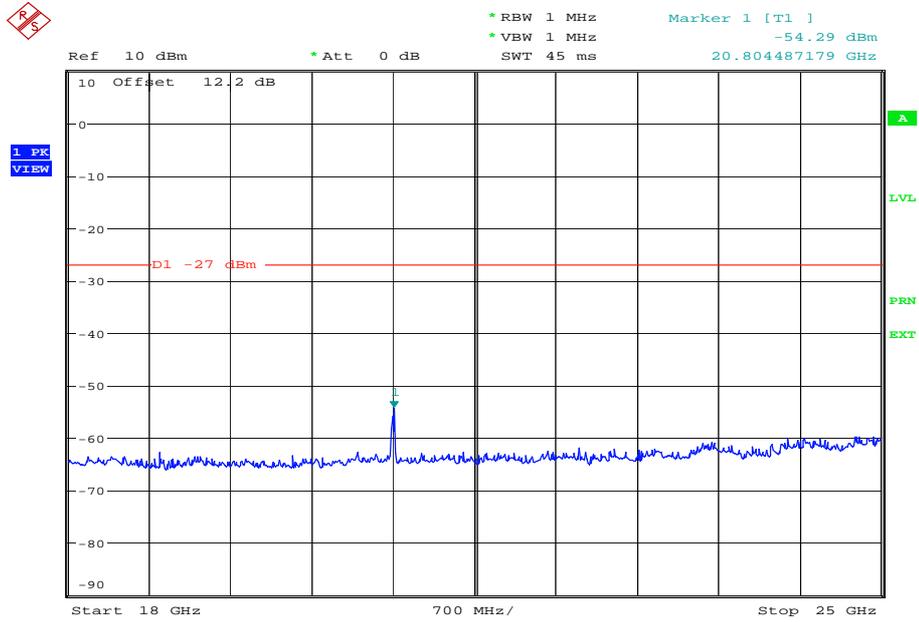
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:01:30

18 GHz to 25 GHz

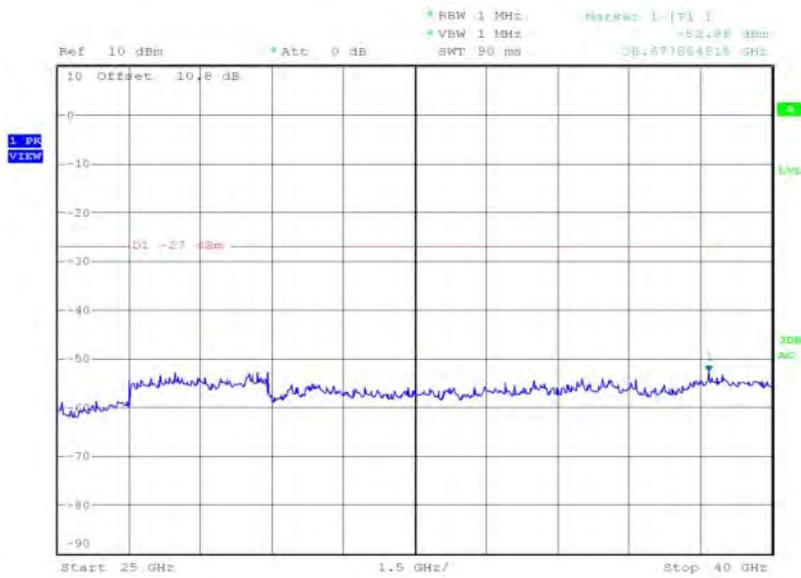


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Product Service

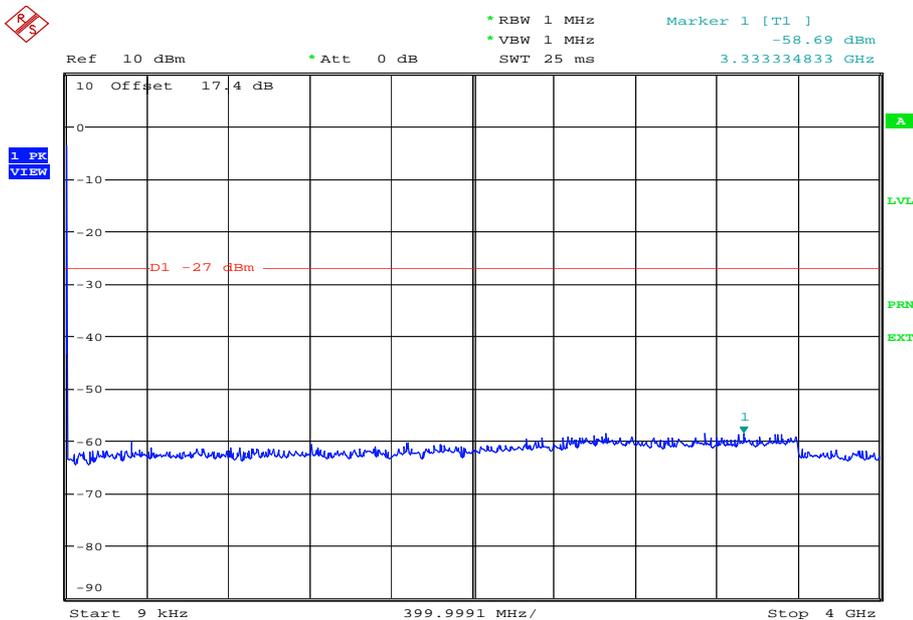
25 GHz to 40 GHz



Date: 30.AUG.2012 16:11:23

5240 MHz

9 kHz to 7 GHz

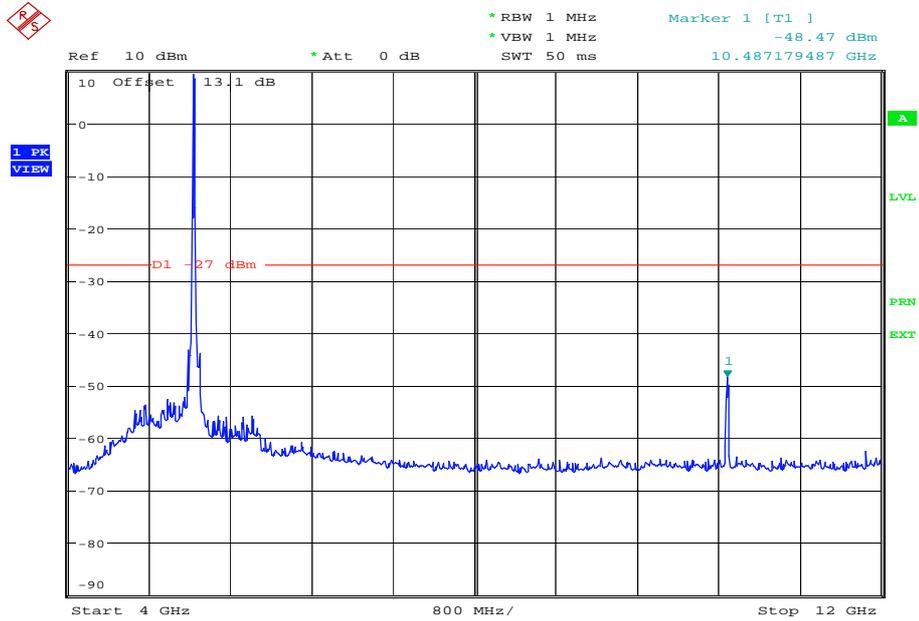


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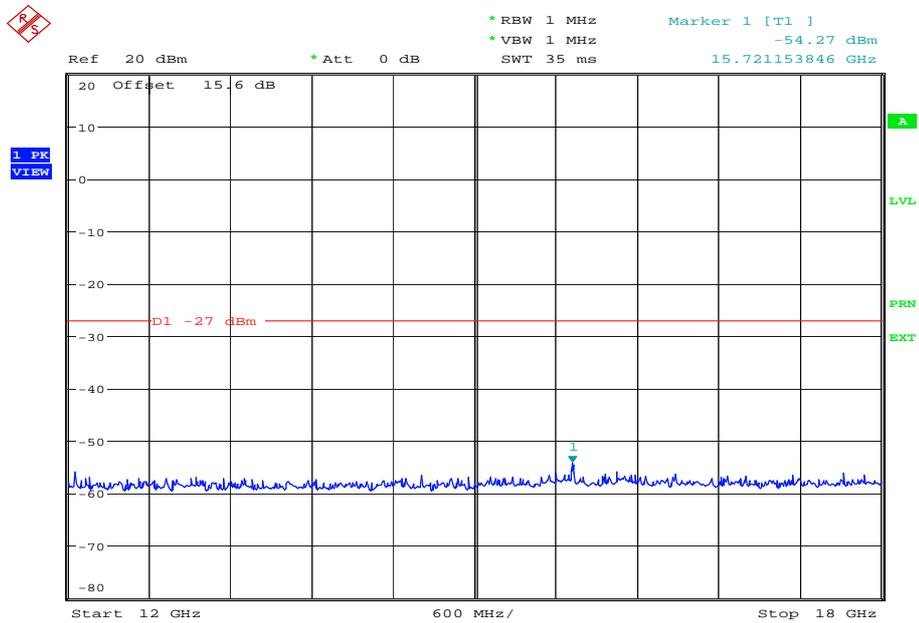
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 13:09:28

12 GHz to 18 GHz

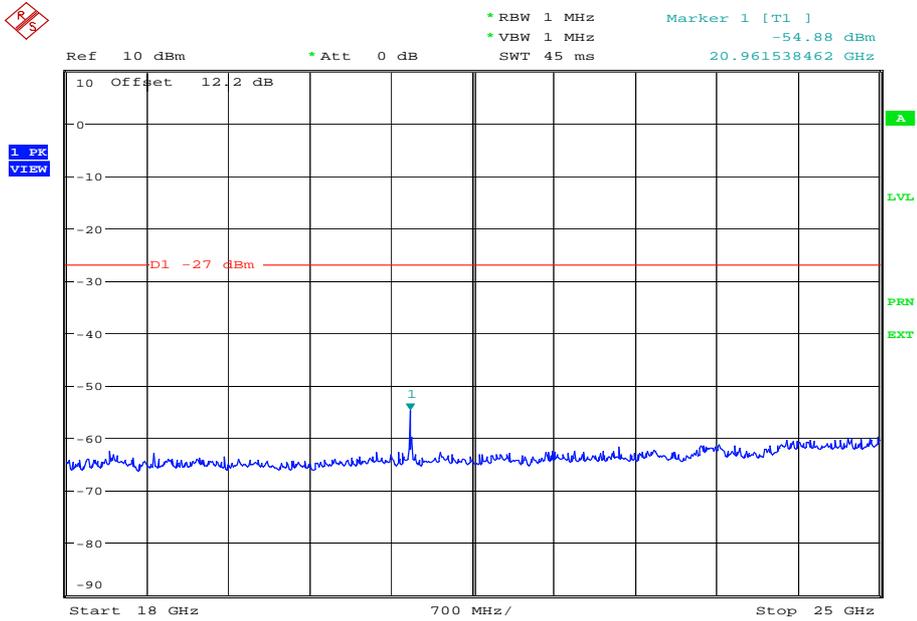


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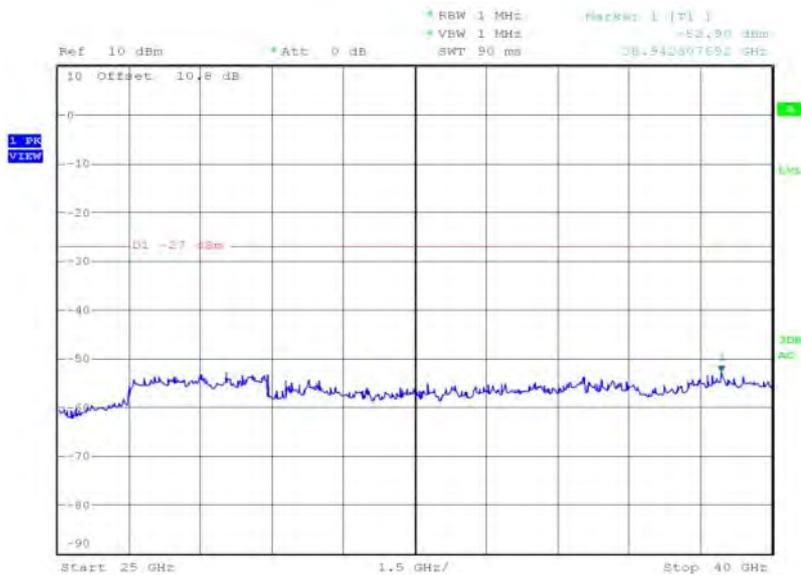
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 14:56:46

25 GHz to 40 GHz



Date: 30.AUG.2012 16:12:17

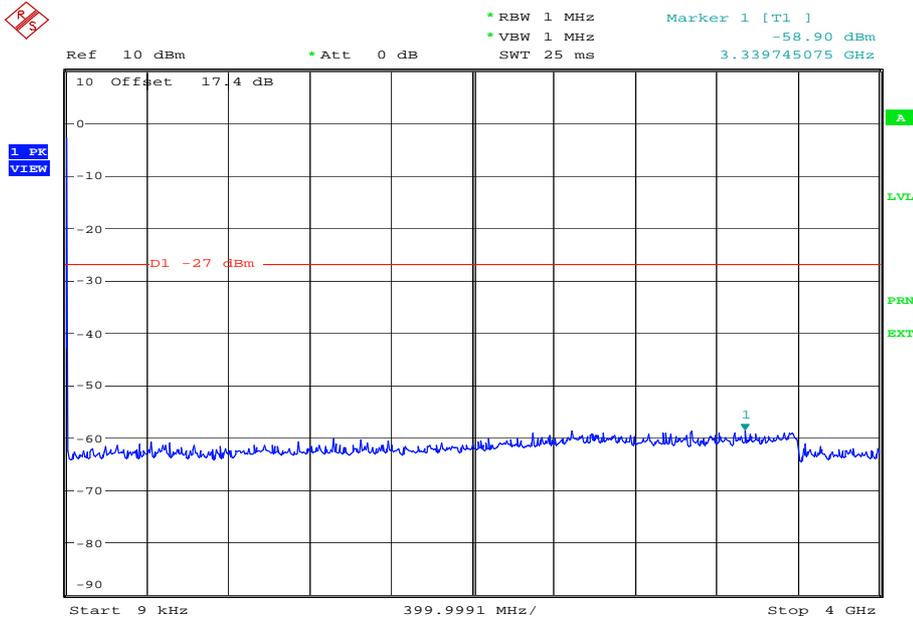


Product Service

Frequency Band 2

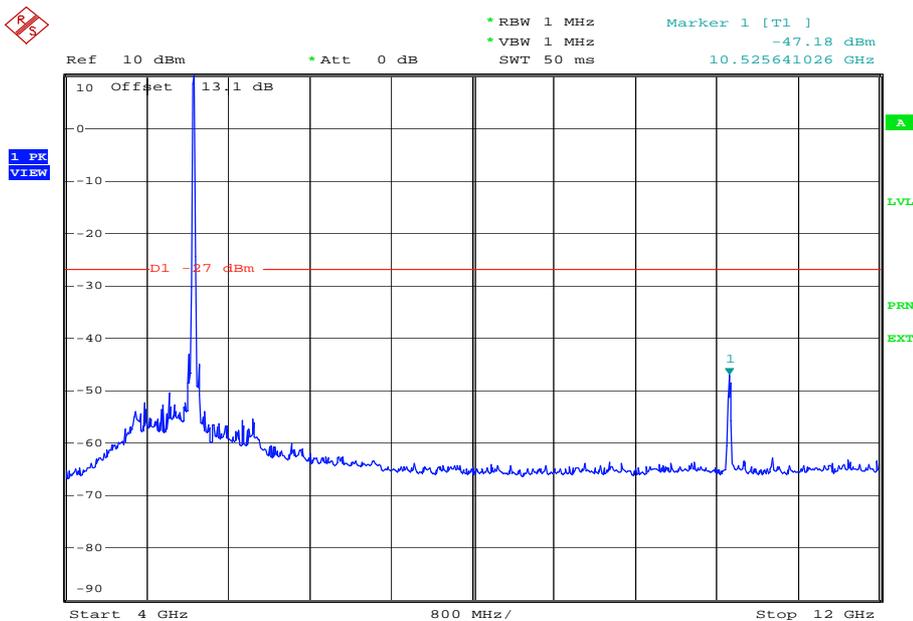
5260 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 12:00:31

7 GHz to 12 GHz

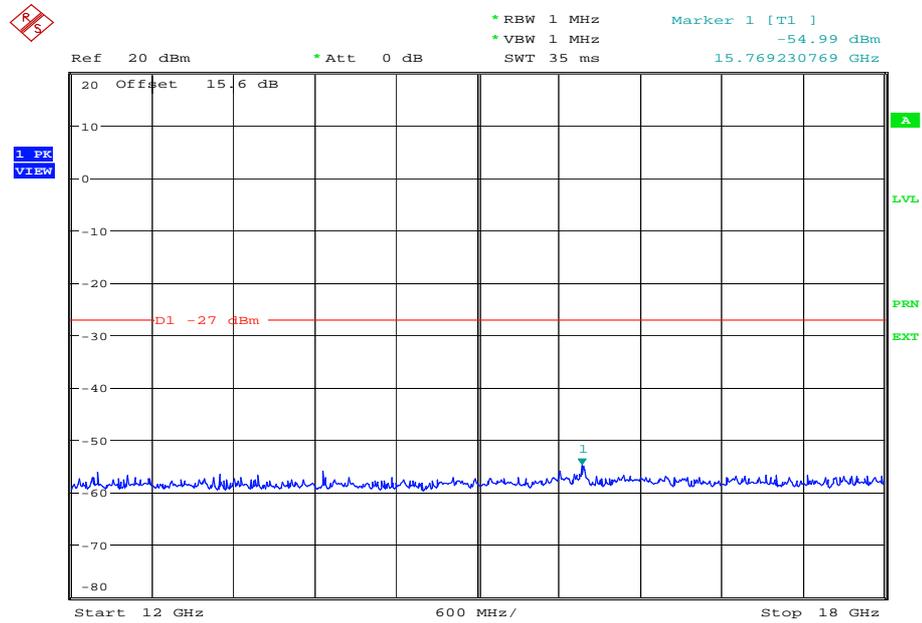


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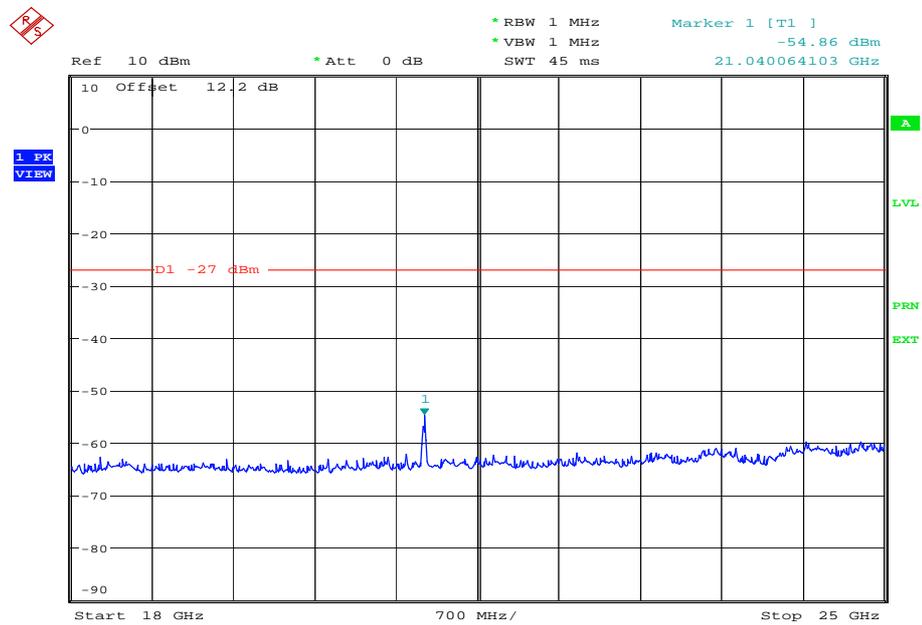
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:04:21

18 GHz to 25 GHz

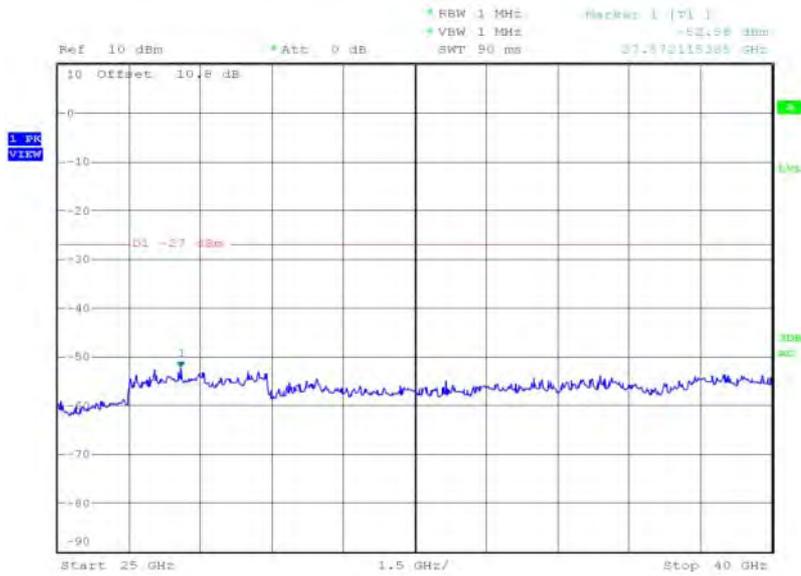


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Product Service

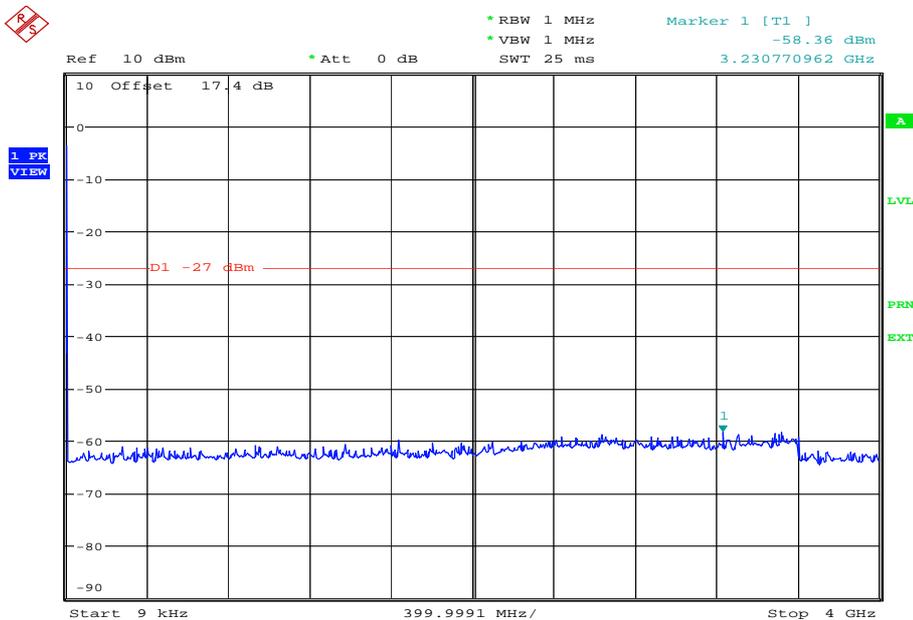
25 GHz to 40 GHz



Date: 30.AUG.2012 16:13:13

5300 MHz

9 kHz to 7 GHz

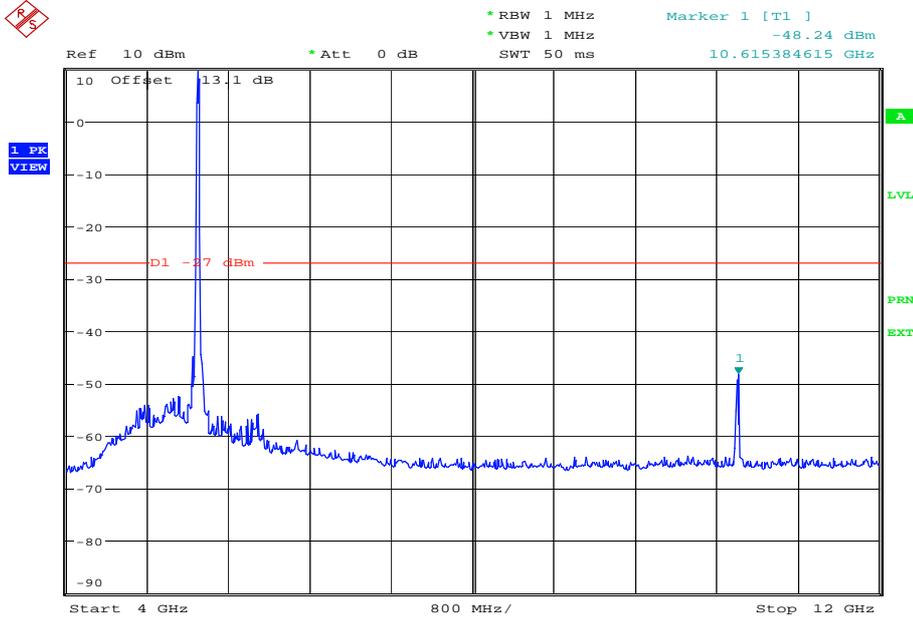


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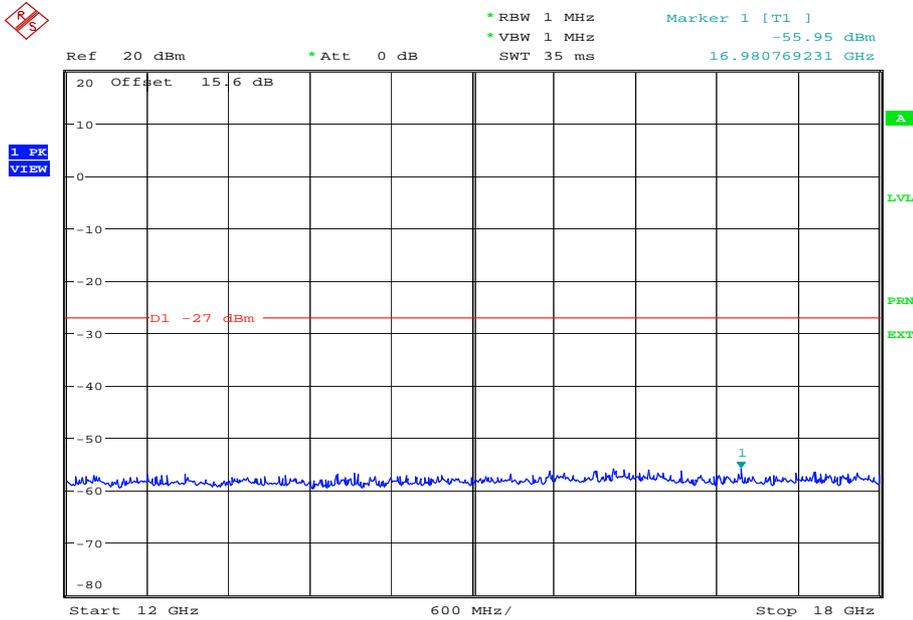
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 13:11:27

12 GHz to 18 GHz

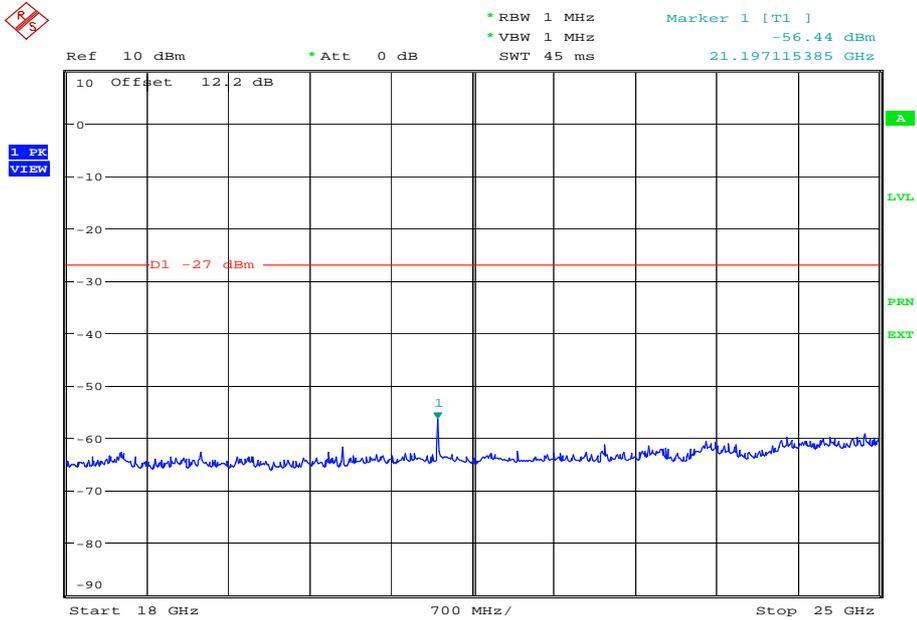


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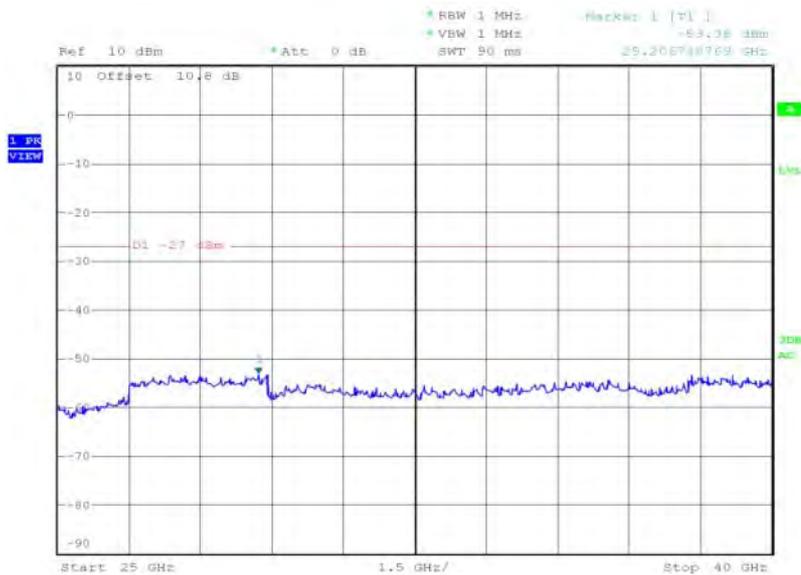
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 14:58:31

25 GHz to 40 GHz



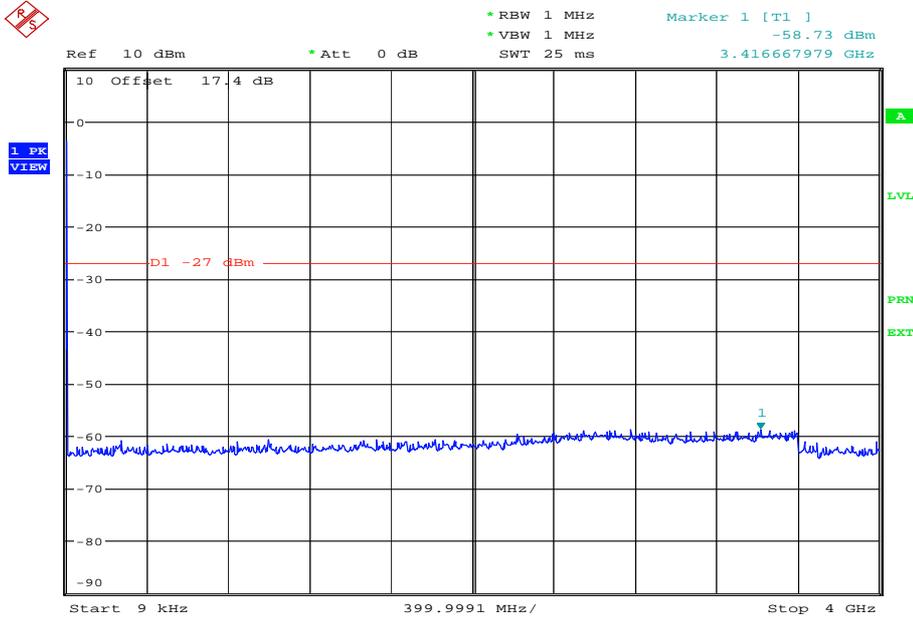
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Product Service

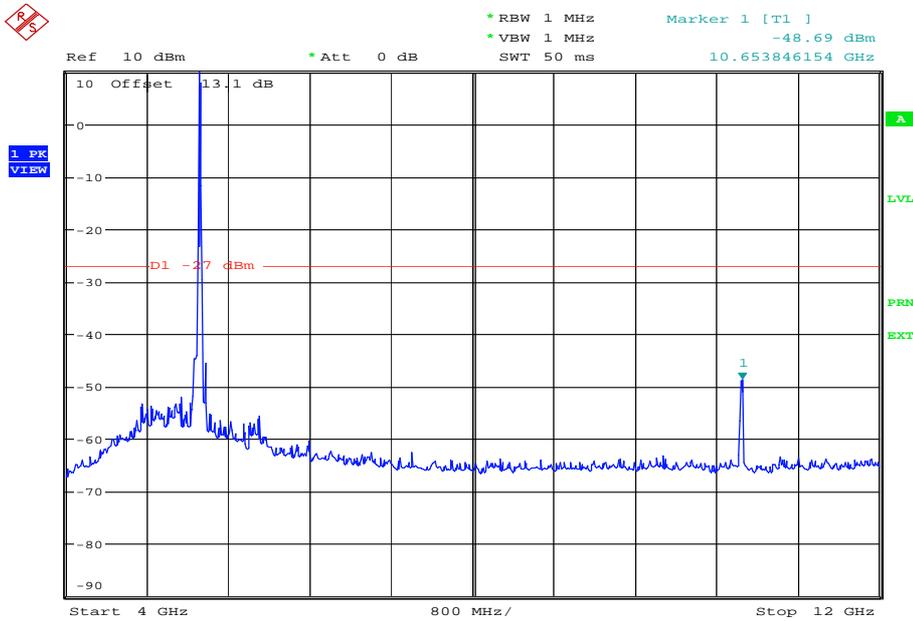
5320 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 12:02:32

7 GHz to 12 GHz

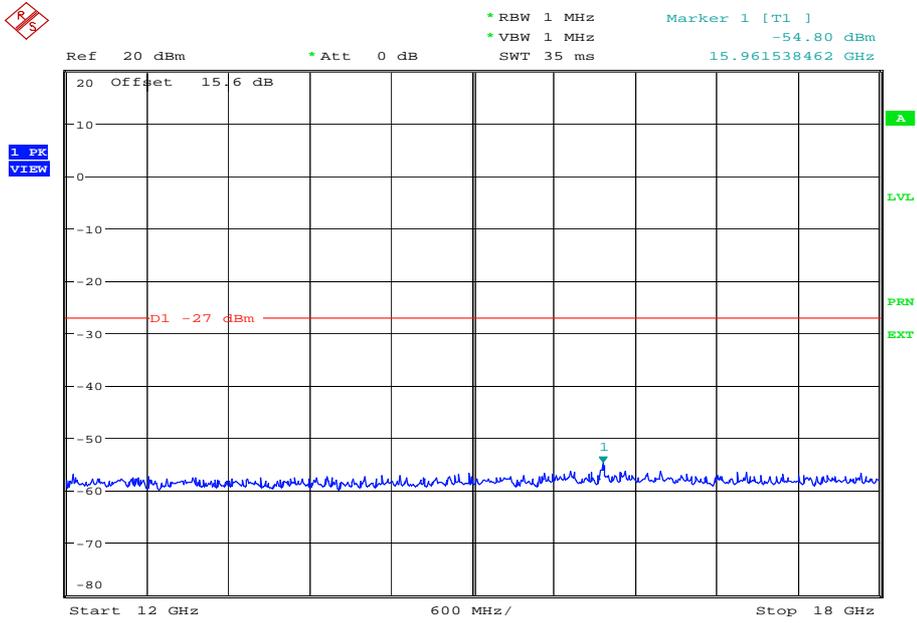


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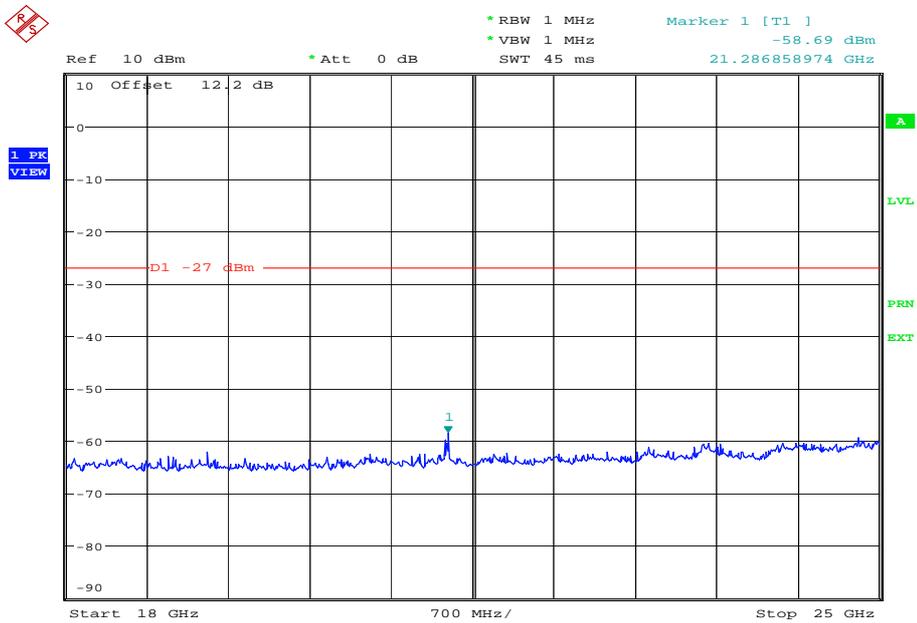
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:05:48

18 GHz to 25 GHz

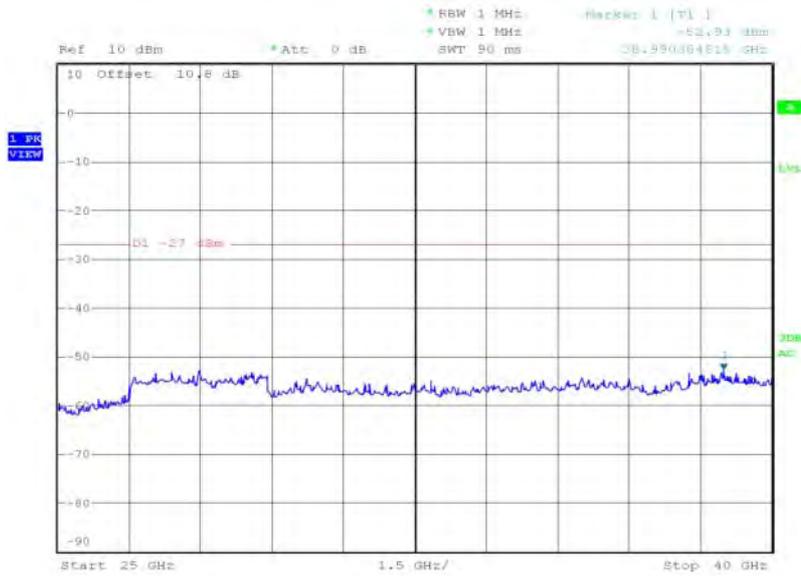


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Product Service

25 GHz to 40 GHz

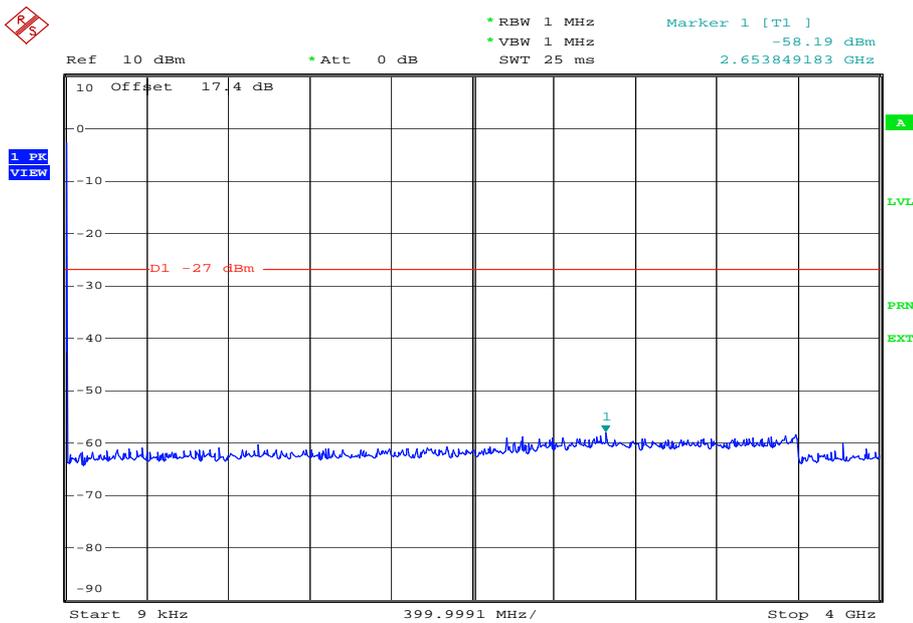


Date: 30.AUG.2012 16:15:05

Frequency Band 3

5500 MHz

9 kHz to 7 GHz

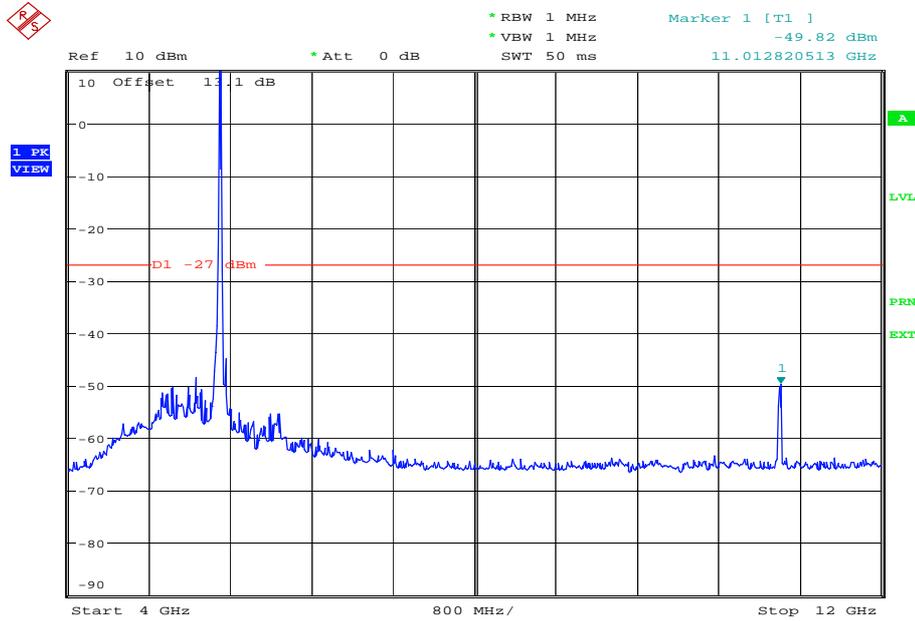


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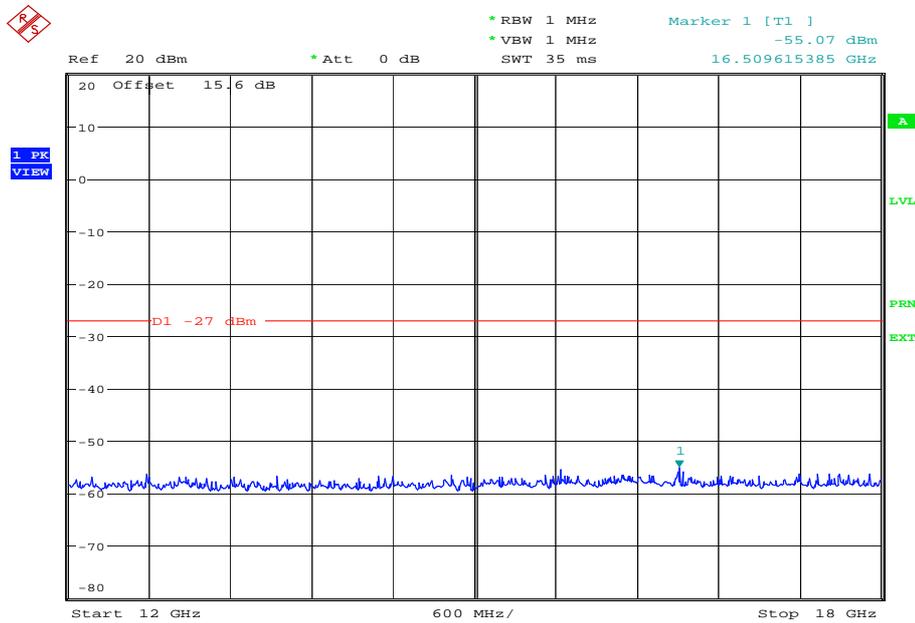
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 13:12:54

12 GHz to 18 GHz

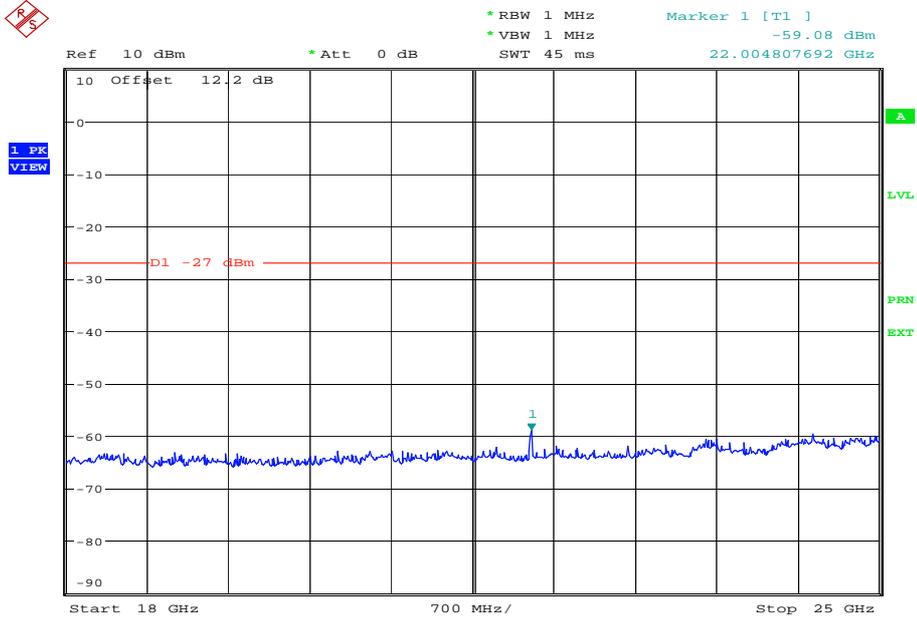


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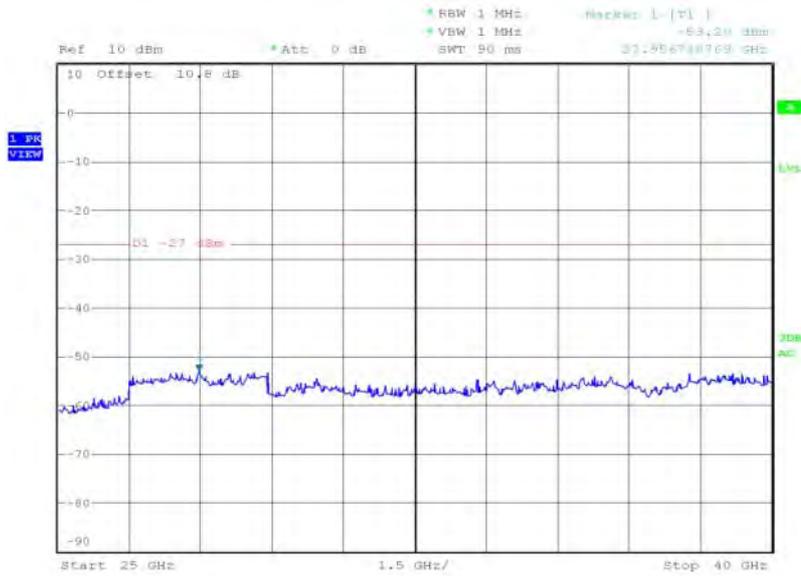
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 15:00:08

25 GHz to 40 GHz



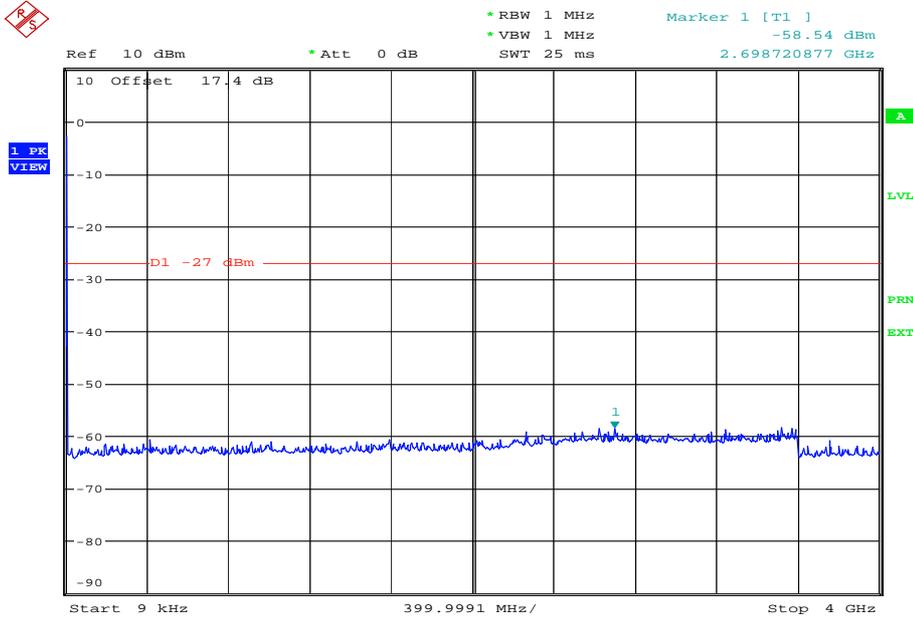
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Product Service

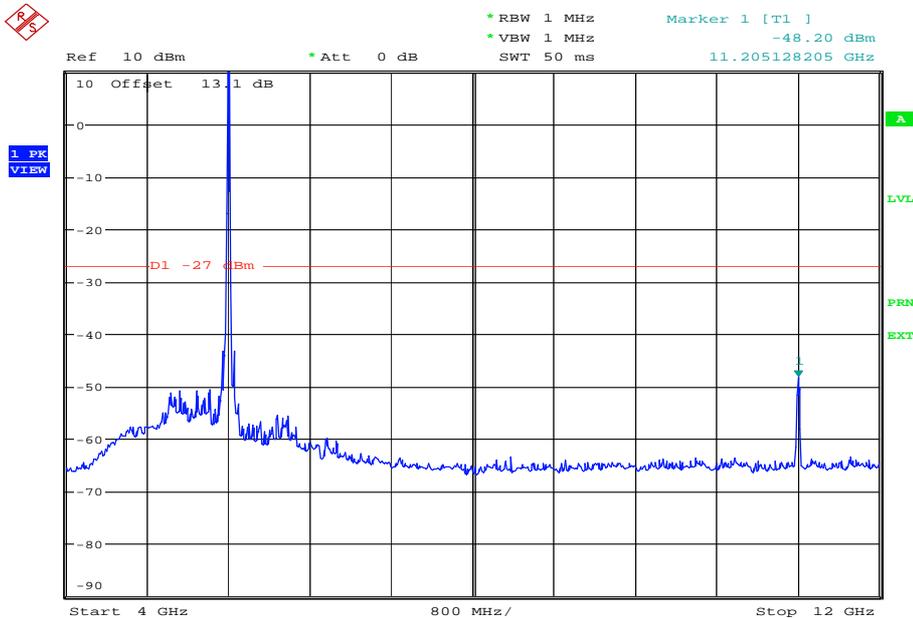
5600 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 12:04:28

7 GHz to 12 GHz

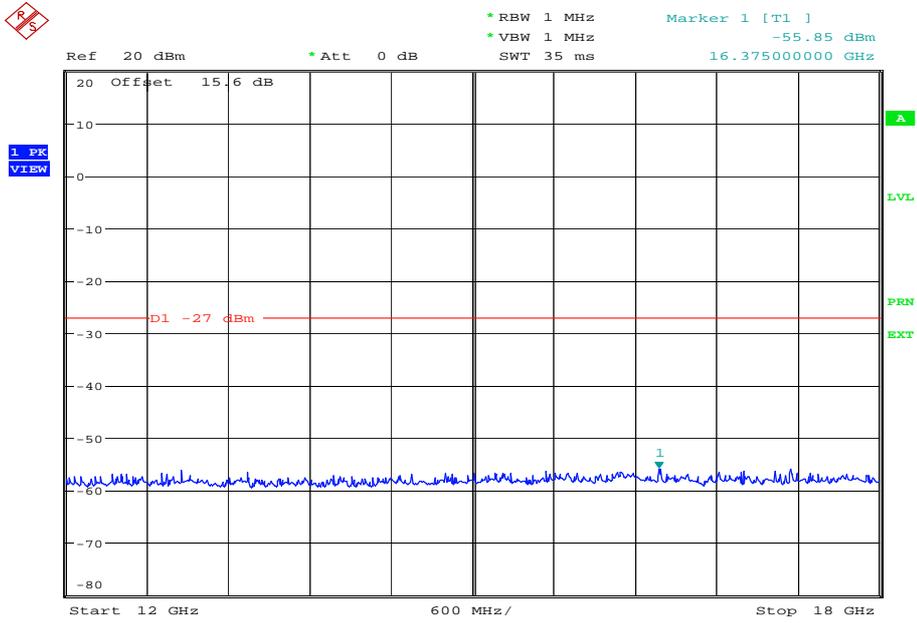


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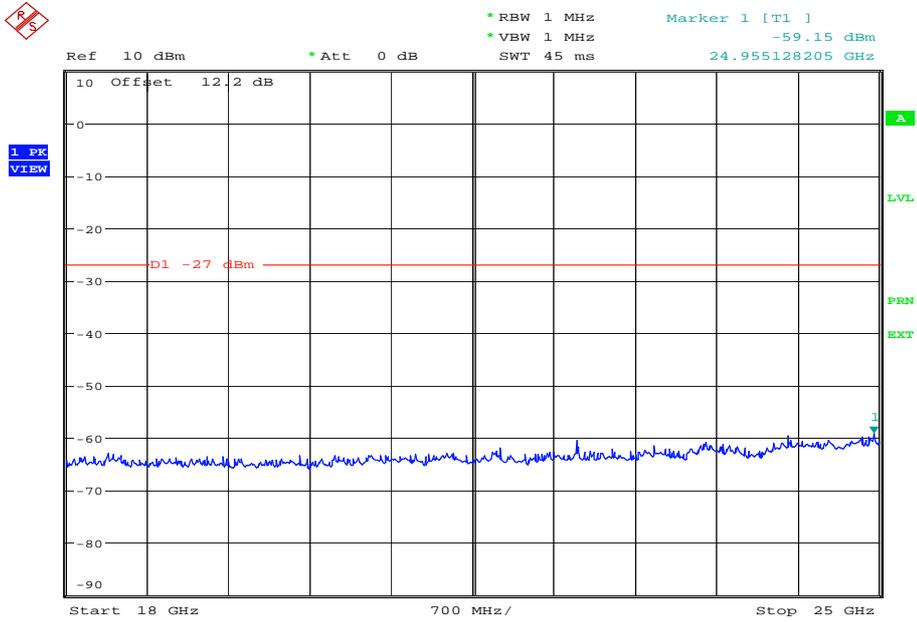
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:07:48

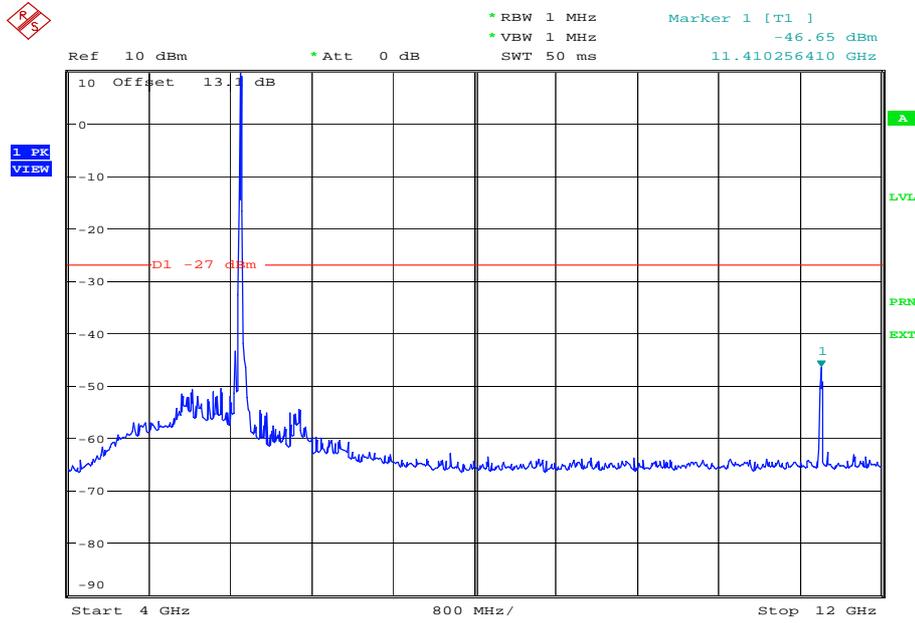
18 GHz to 25 GHz



Date: 30.AUG.2012 15:01:00

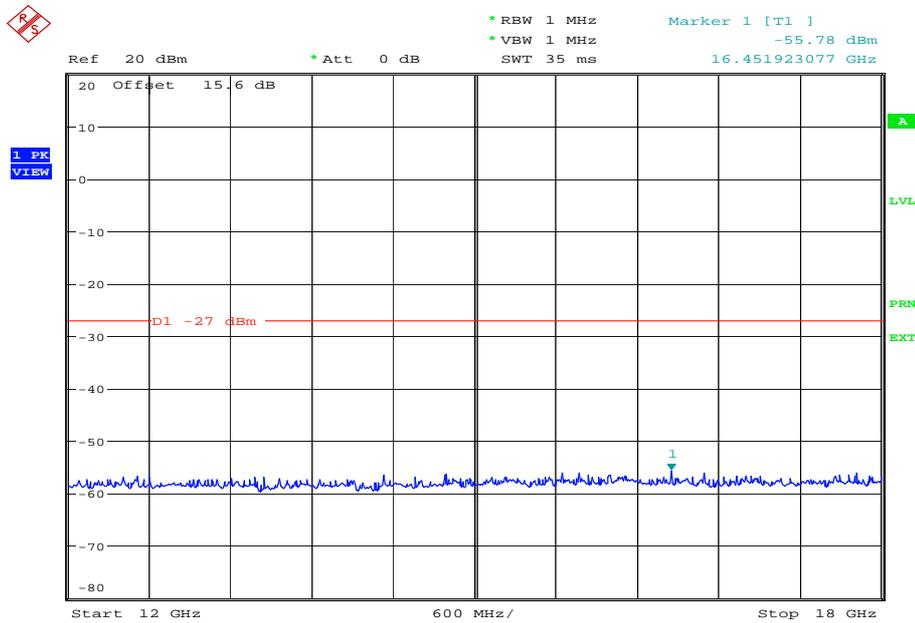


7 GHz to 12 GHz



Date: 30.AUG.2012 13:14:27

12 GHz to 18 GHz

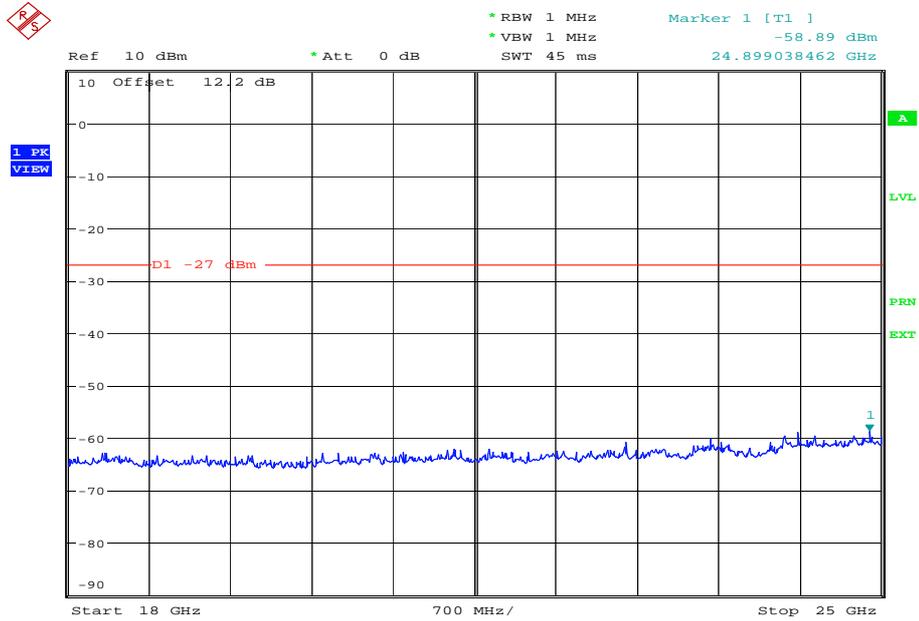


Date: 30.AUG.2012 14:08:46



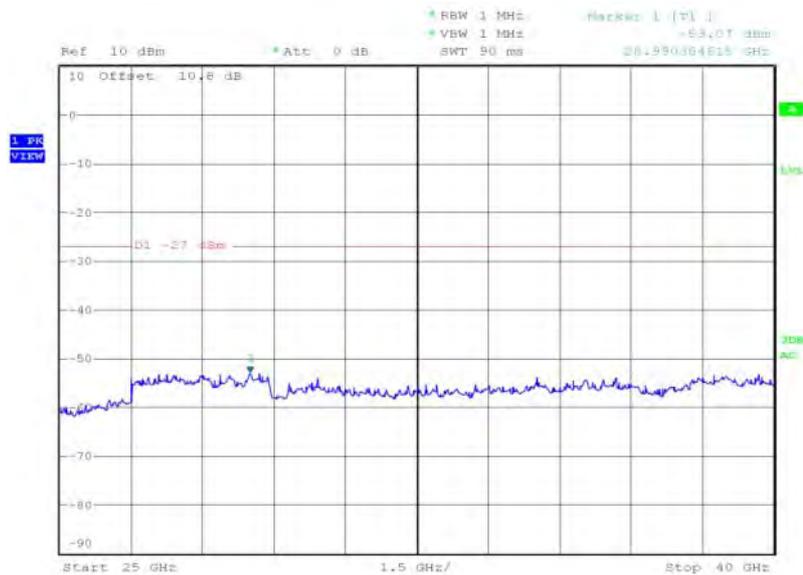
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 15:02:02

25 GHz to 40 GHz



Date: 30.AUG.2012 16:17:46



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.



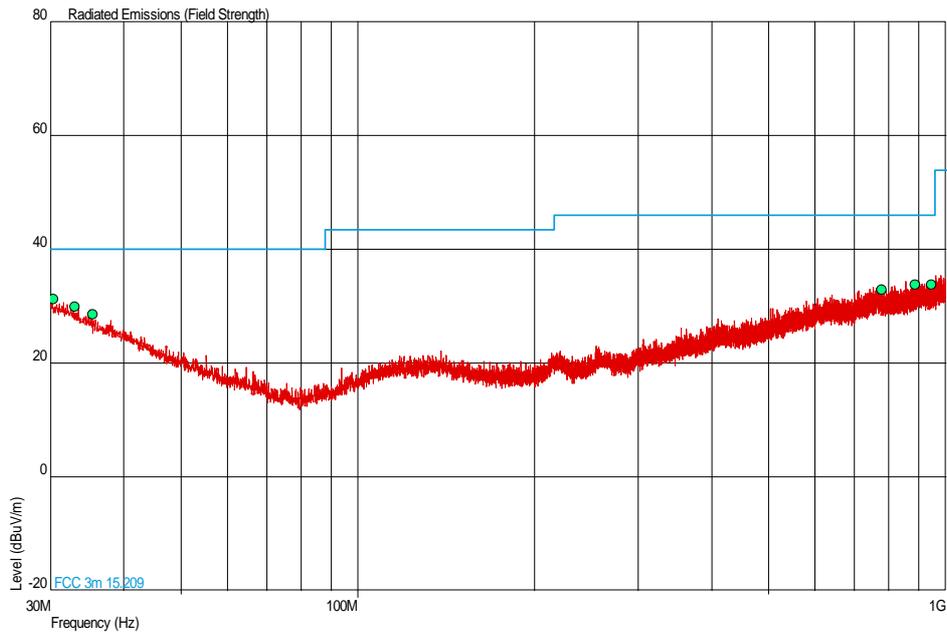
Product Service

Spurious Radiated Emissions

Frequency Band 1

5180 MHz

30 MHz to 1 GHz



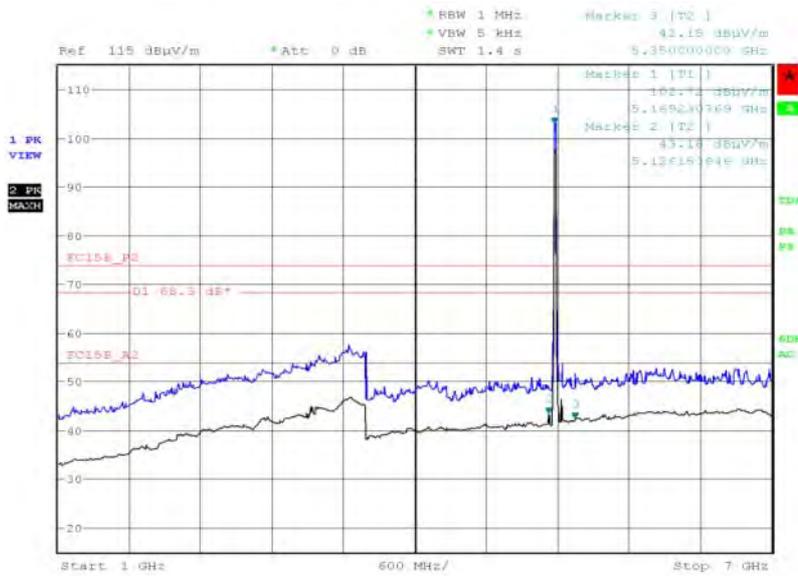
Frequency (MHz)	QP Level (dB μ V/m)	QP Level (μ V/m)	QP Limit (dB μ V/m)	QP Limit (μ V/m)	QP Margin (dB μ V/m)	QP Margin (μ V/m)	Angle (Deg)	Height (m)	Polarity
30.388	31.3	36.7	40.0	100	-8.7	63.3	90	1.00	Vertical
33.056	29.9	31.3	40.0	100	-10.1	68.7	180	1.00	Vertical
35.481	28.6	26.9	40.0	100	-11.4	73.1	0	1.00	Vertical
778.889	32.9	44.2	46.0	200	-13.1	155.8	0	1.00	Vertical
887.335	33.8	49.0	46.0	200	-12.2	151.0	0	1.00	Vertical
946.699	33.8	49.0	46.0	200	-12.2	151.0	0	1.00	Vertical



1 GHz to 40 GHz

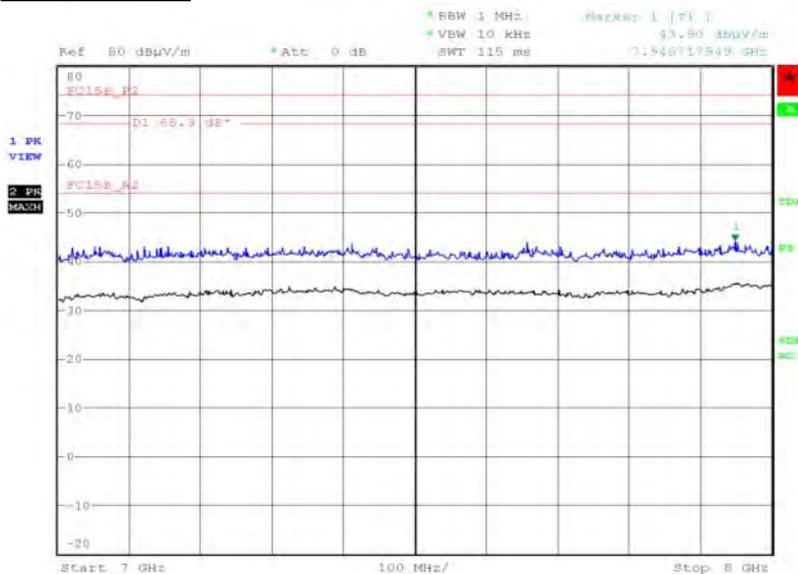
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.127	Vertical	118	246	55.86	44.20
15.539	Horizontal	115	177	53.89	39.25

1 GHz to 7 GHz



Date: 9.SEP.2012 17:42:20

7 GHz to 8 GHz

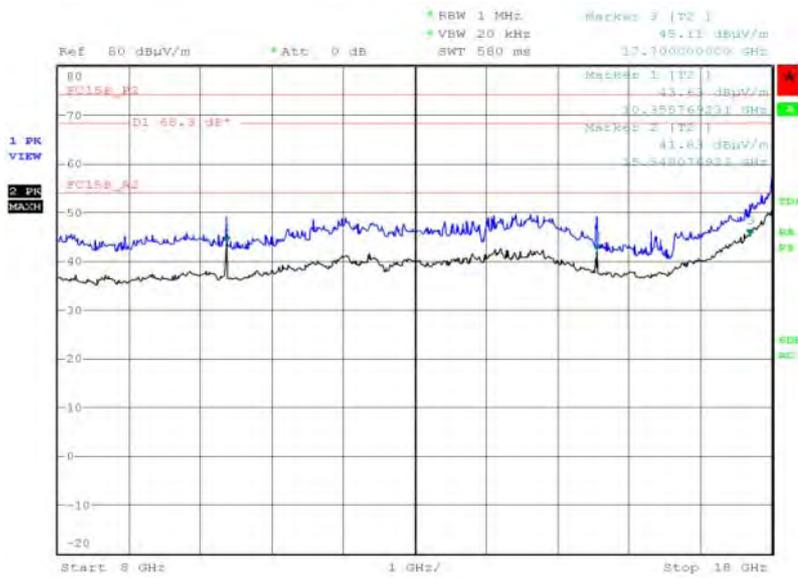


Date: 10.SEP.2012 23:45:24



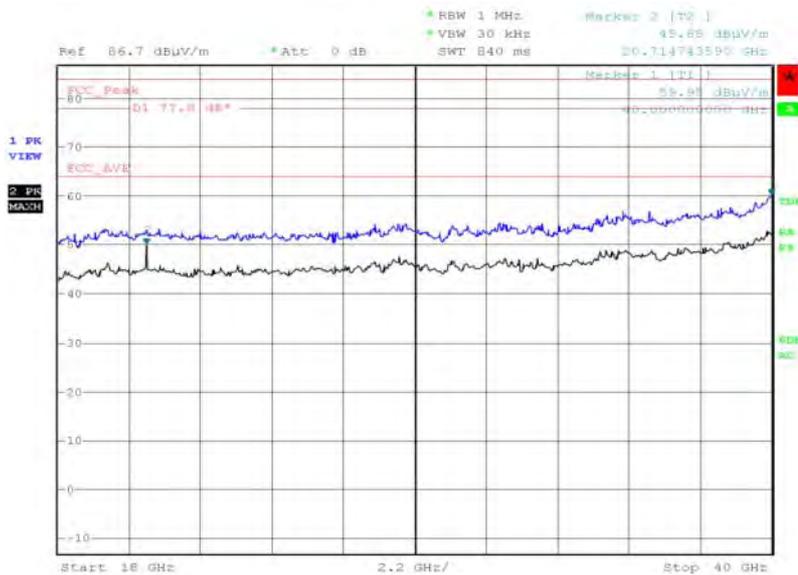
Product Service

8 GHz to 18 GHz



Date: 12.SEP.2012 20:31:00

18 GHz to 40 GHz

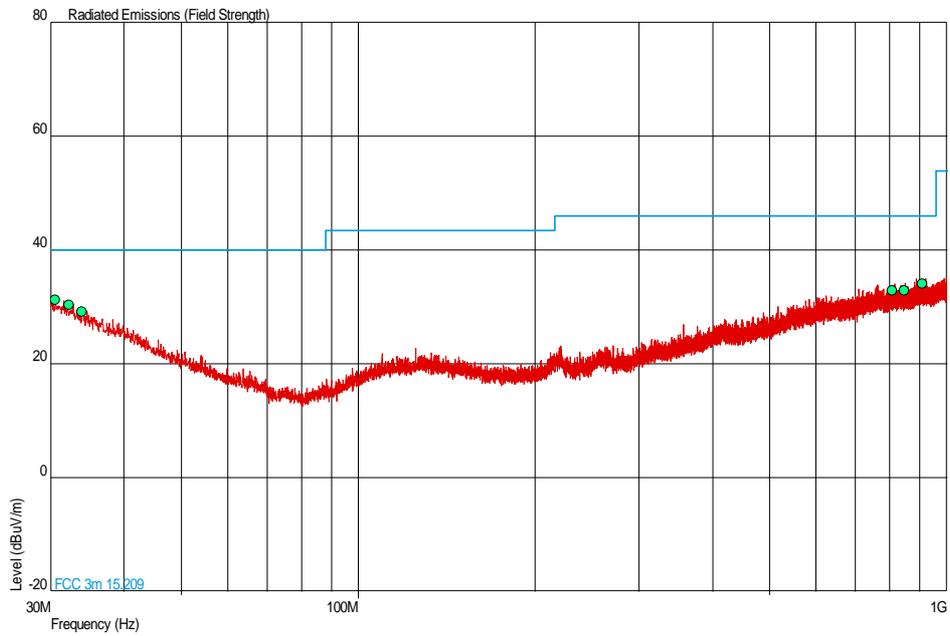


Date: 17.SEP.2012 17:35:55



5200 MHz

30 MHz to 1 GHz



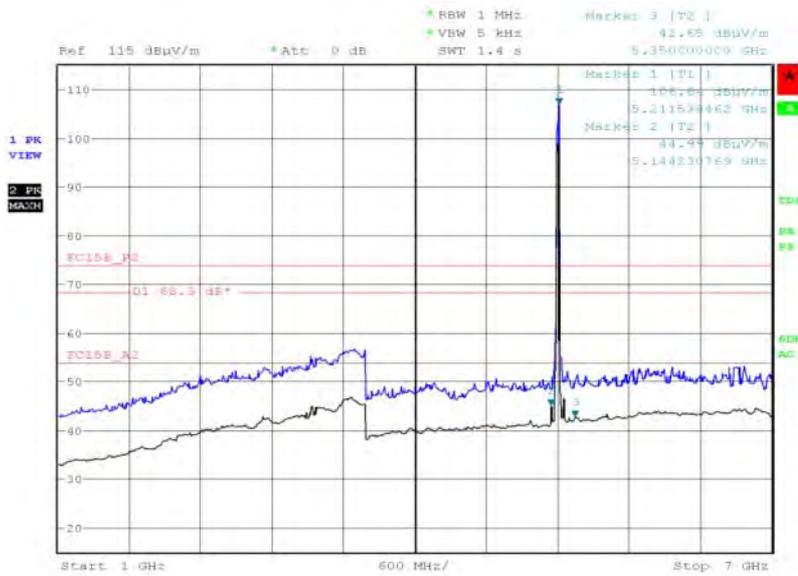
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.582	31.2	36.3	40.0	100	-8.8	63.7	0	1.00	Vertical
32.231	30.4	33.1	40.0	100	-9.6	66.9	0	1.00	Horizontal
33.880	29.2	28.8	40.0	100	-10.8	71.2	0	1.00	Vertical
807.261	32.9	44.2	46.0	200	-13.1	155.8	90	1.00	Horizontal
847.565	33.0	44.7	46.0	200	-13.0	155.3	90	1.00	Horizontal
909.305	34.1	50.7	46.0	200	-11.9	149.3	0	1.00	Vertical



1 GHz to 40 GHz

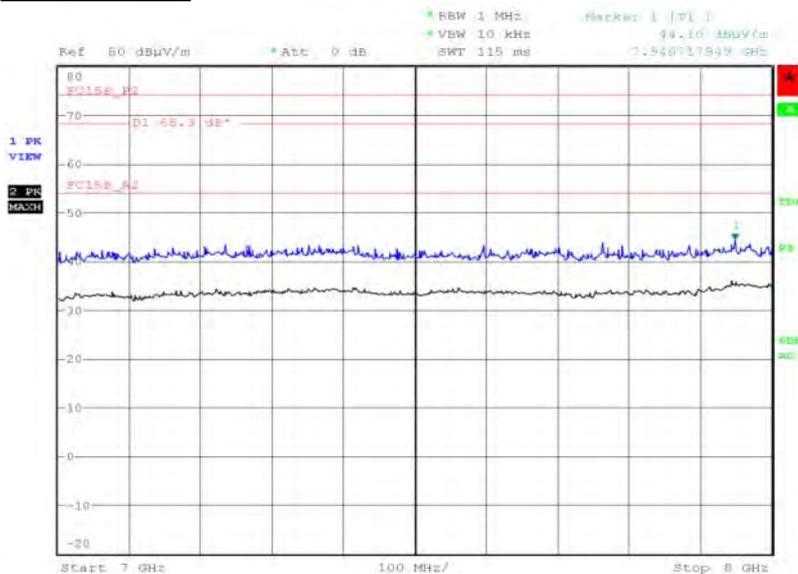
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.147	Vertical	118	243	56.87	44.86
15.599	Horizontal	136	236	57.92	40.92

1 GHz to 7 GHz



Date: 9.SEP.2012 16:20:30

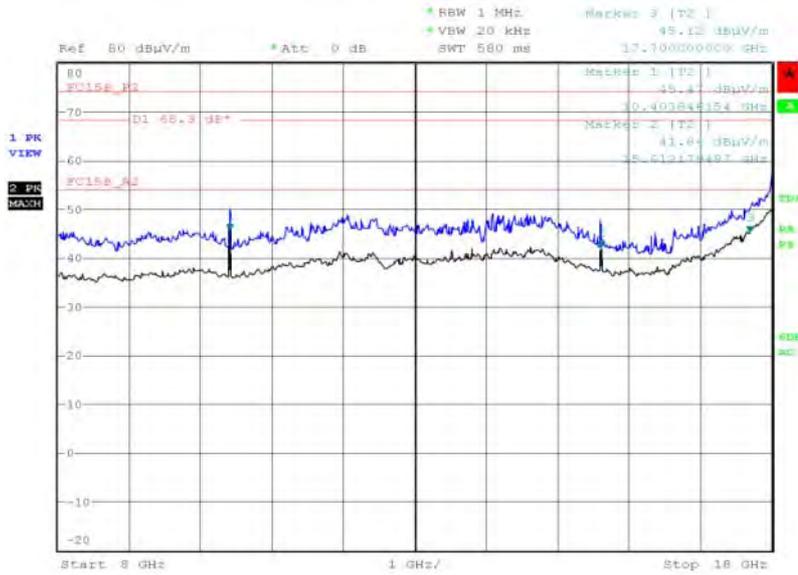
7 GHz to 8 GHz



Date: 10.SEP.2012 22:48:22

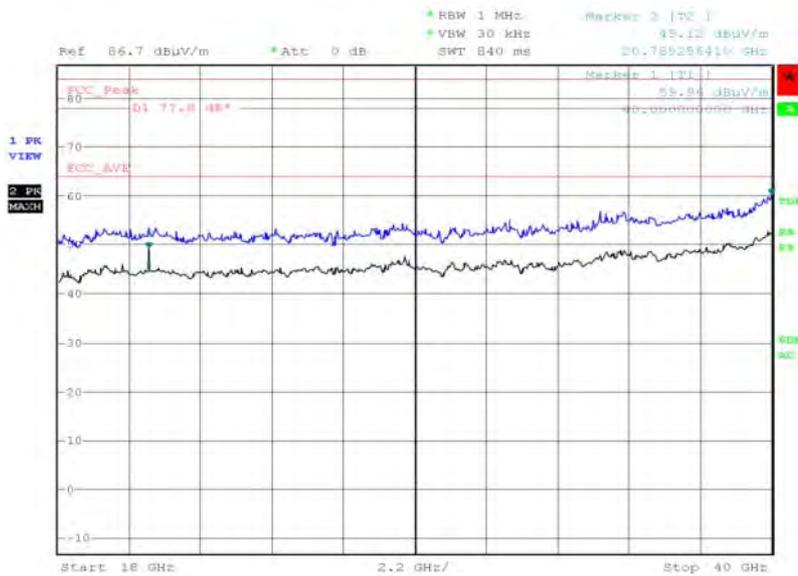


8 GHz to 18 GHz



Date: 12.SEP.2012 20:52:50

18 GHz to 40 GHz

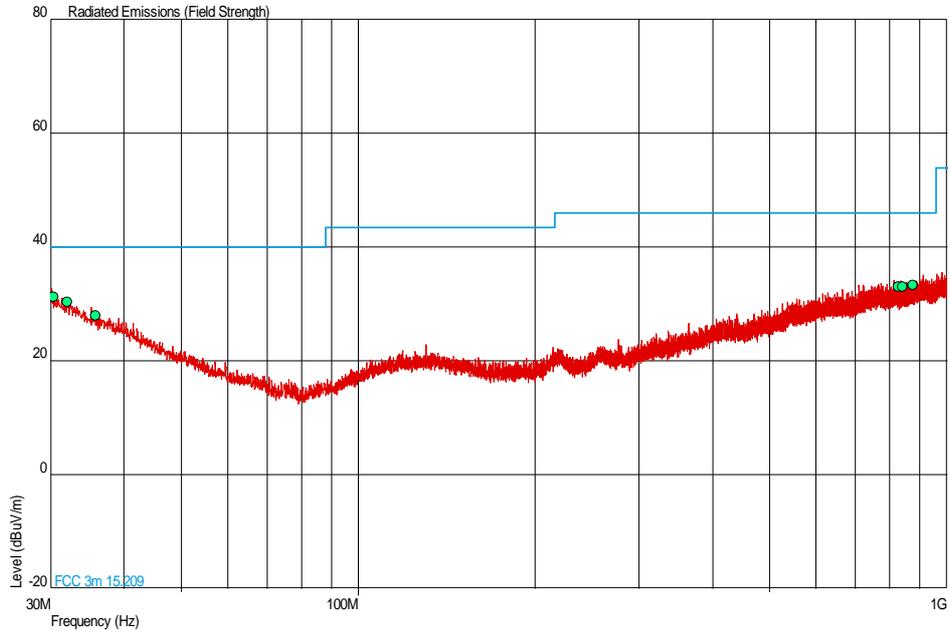


Date: 17.SEP.2012 18:07:59



5240 MHz

30 MHz to 1 GHz



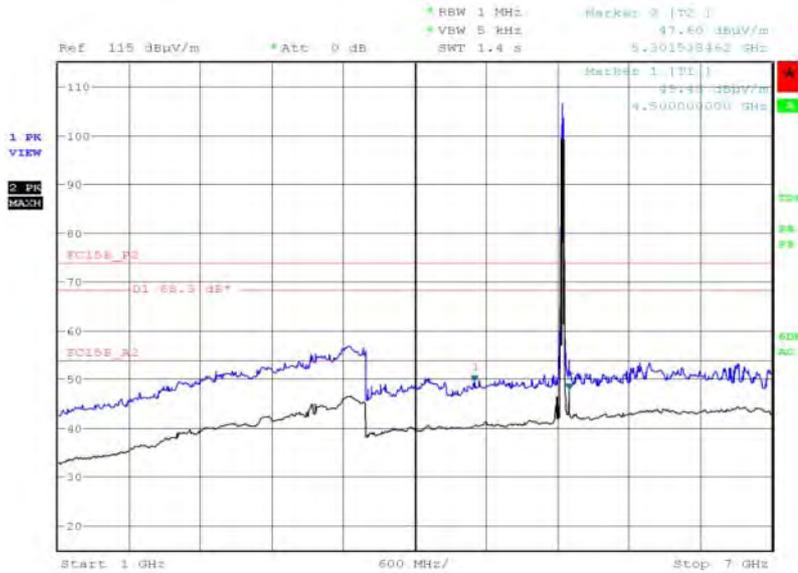
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.388	31.3	36.7	40.0	100	-8.7	63.3	180	1.00	Horizontal
31.989	30.4	33.1	40.0	100	-9.6	66.9	0	1.00	Vertical
35.772	27.9	24.8	40.0	100	-12.1	75.2	0	1.00	Vertical
825.934	33.0	44.7	46.0	200	-13.0	155.3	180	1.00	Horizontal
841.939	33.1	45.2	46.0	200	-12.9	154.8	180	1.00	Vertical
874.773	33.3	46.2	46.0	200	-12.7	153.8	90	1.00	Vertical



1 GHz to 40 GHz

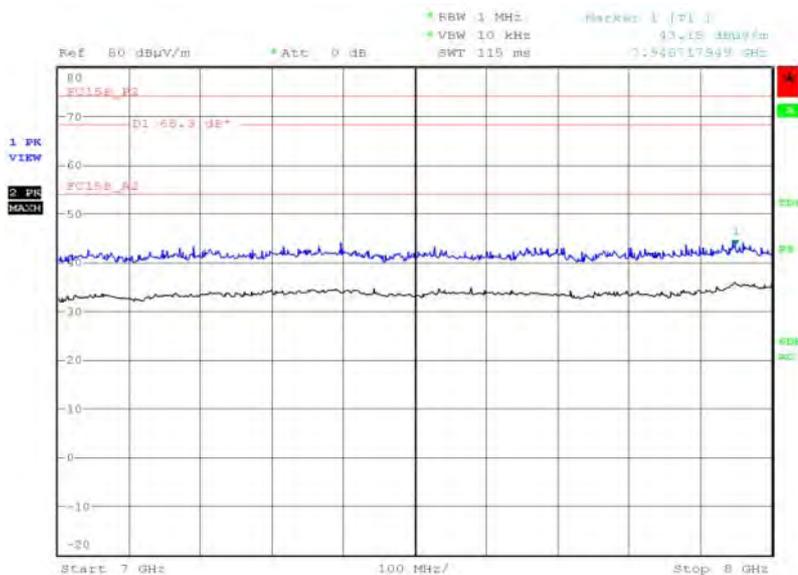
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
15.722	Horizontal	125	230	55.27	39.54

1 GHz to 7 GHz



Date: 9.SEP.2012 19:02:31

7 GHz to 8 GHz

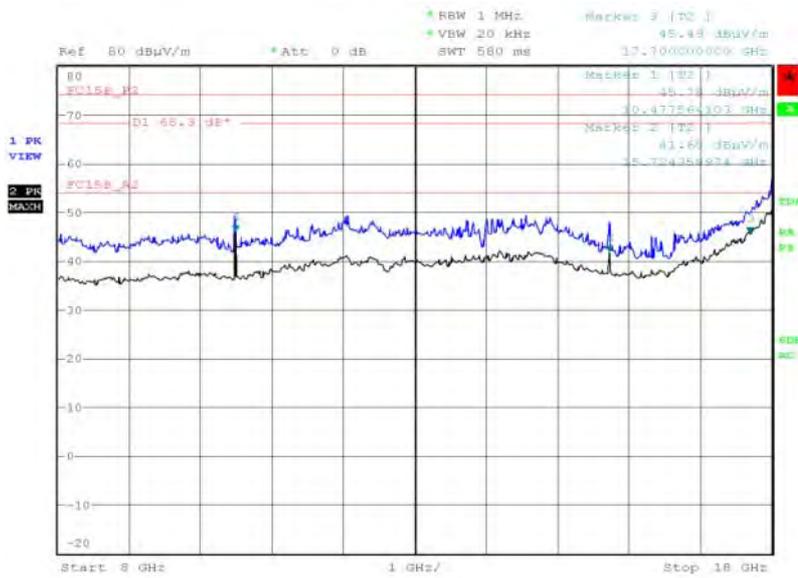


Date: 10.SEP.2012 22:51:33



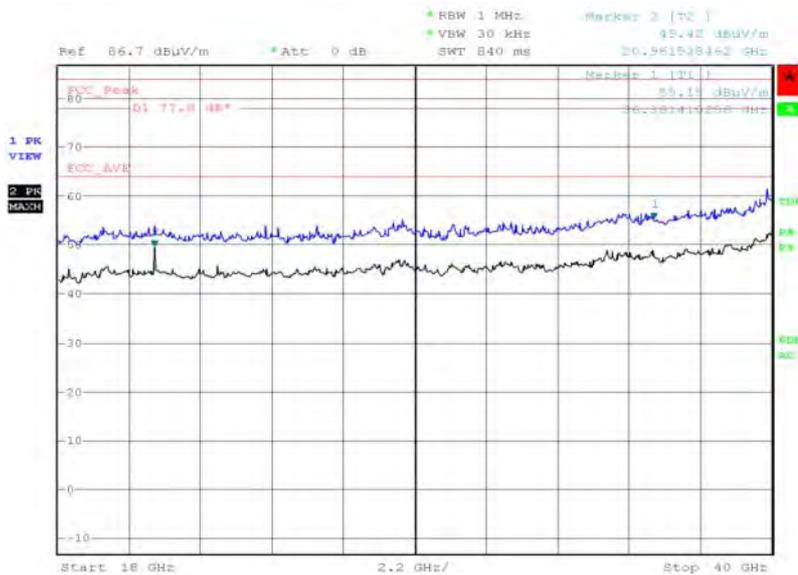
Product Service

8 GHz to 18 GHz



Date: 12-SEP-2012 21:11:30

18 GHz to 40 GHz



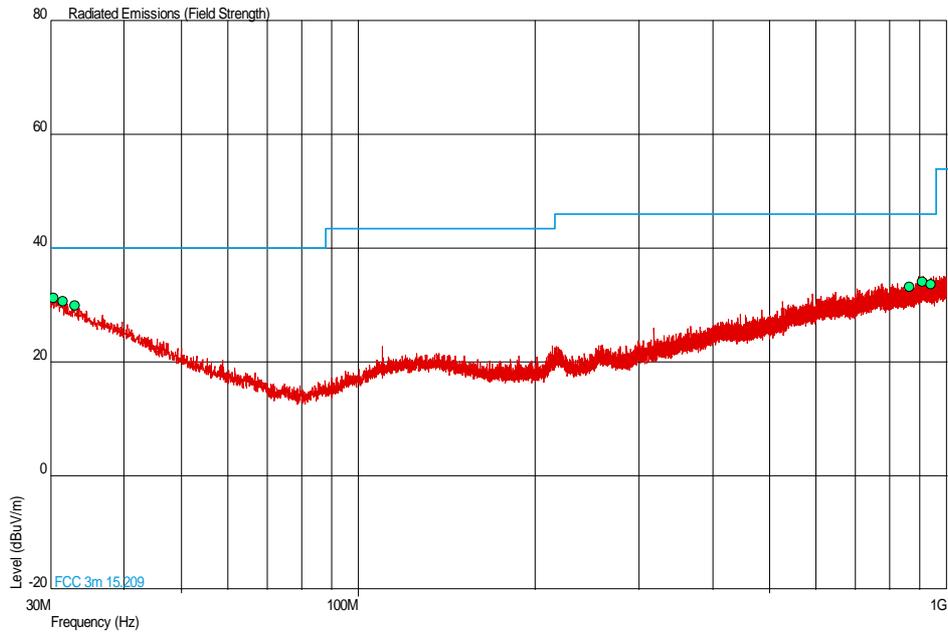
Date: 17-SEP-2012 18:19:05



Frequency Band 2

5260 MHz

30 MHz to 1 GHz



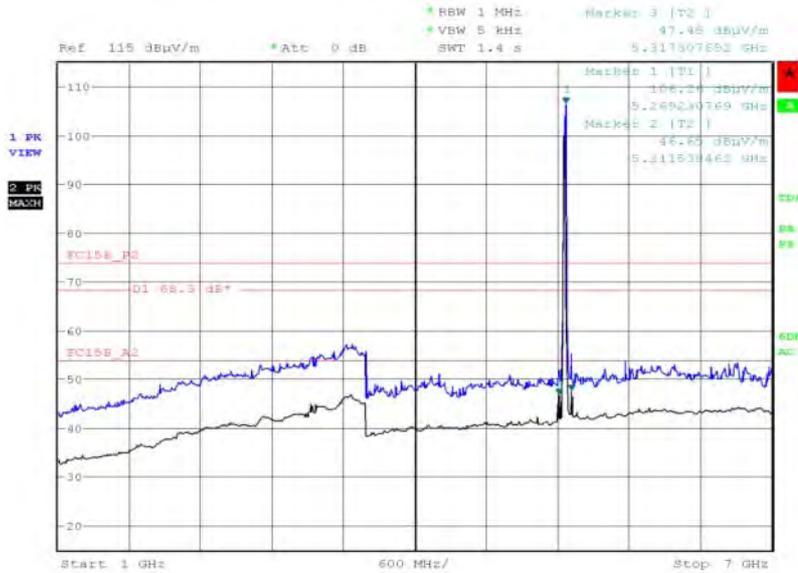
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.388	31.3	36.7	40.0	100	-8.7	63.3	0	1.00	Vertical
31.455	30.7	34.3	40.0	100	-9.3	65.7	90	1.00	Horizontal
33.056	29.9	31.3	40.0	100	-10.1	68.7	90	1.00	Horizontal
863.182	33.3	46.2	46.0	200	-12.7	153.8	0	1.00	Vertical
908.820	34.1	50.7	46.0	200	-11.9	149.3	180	1.00	Vertical
940.491	33.7	48.4	46.0	200	-12.3	151.6	90	1.00	Vertical



1 GHz to 40 GHz

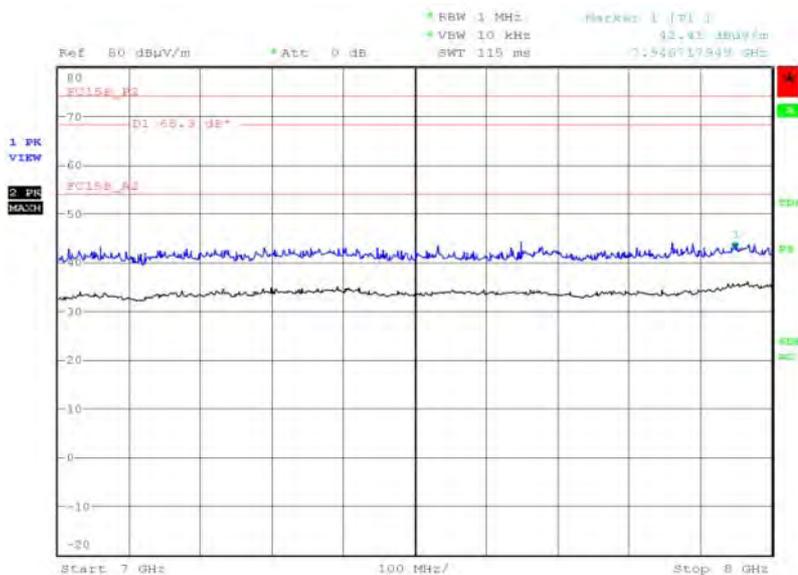
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
15.780	Horizontal	124	232	56.89	40.59

1 GHz to 7 GHz



Date: 9.SEP.2012 19:49:14

7 GHz to 8 GHz

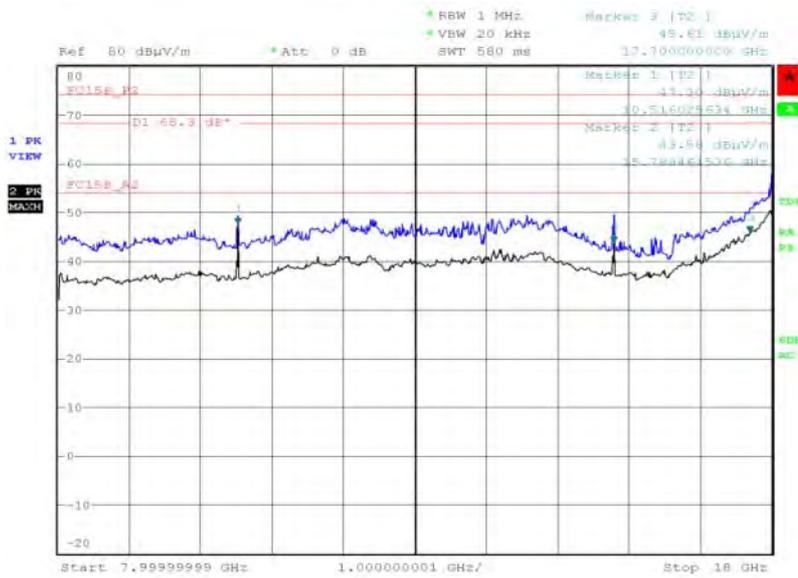


Date: 10.SEP.2012 22:55:26



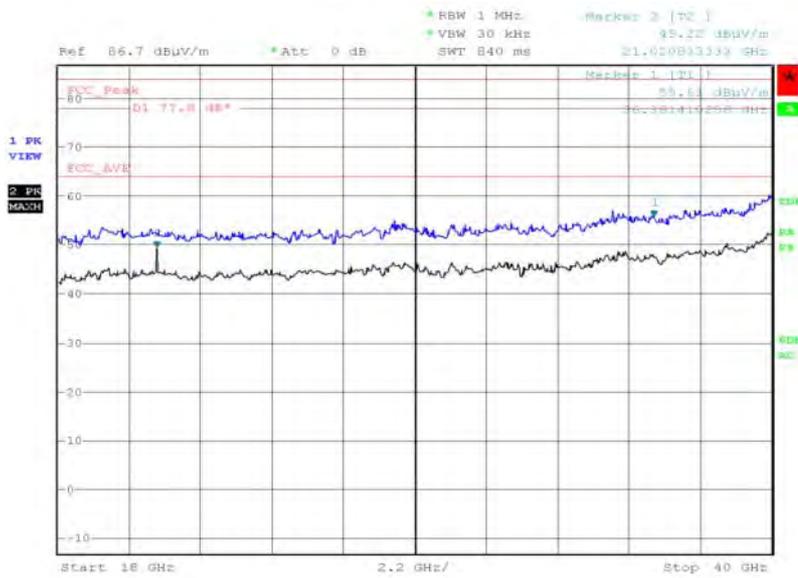
Product Service

8 GHz to 18 GHz



Date: 12.SEP.2012 21:42:12

18 GHz to 40 GHz

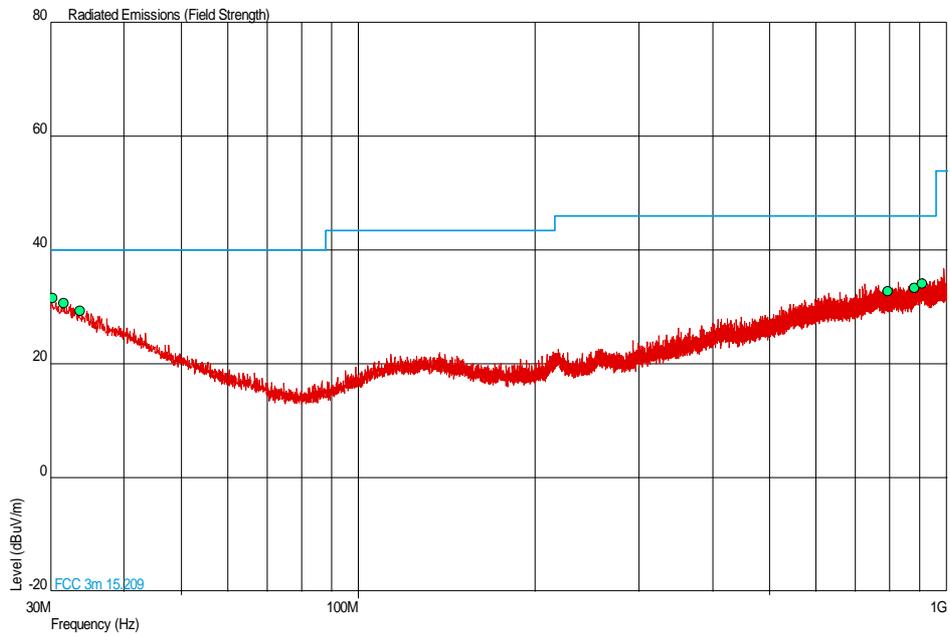


Date: 17.SEP.2012 18:31:27



5300 MHz

30 MHz to 1 GHz



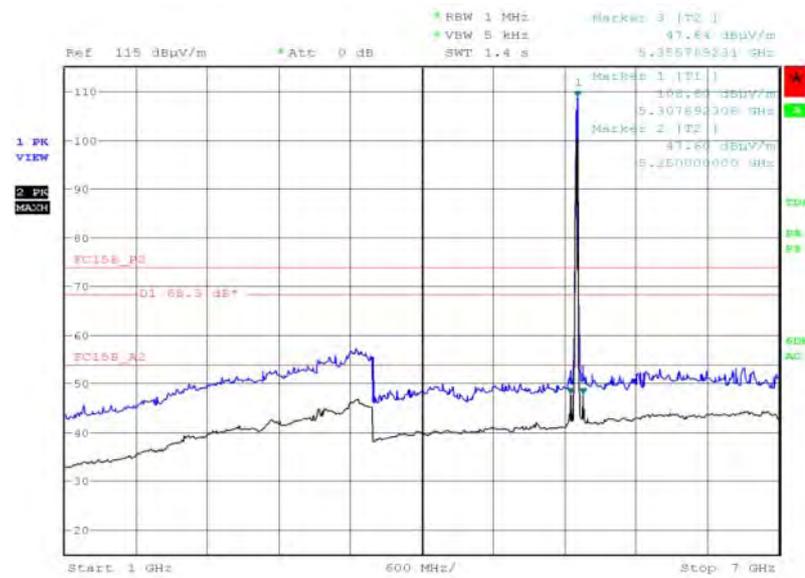
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.243	31.5	37.6	40.0	100	-8.5	62.4	180	1.00	Horizontal
31.601	30.7	34.3	40.0	100	-9.3	65.7	0	1.00	Vertical
33.735	29.3	29.2	40.0	100	-10.7	70.8	0	1.00	Vertical
795.573	32.7	43.2	46.0	200	-13.3	156.8	90	1.00	Horizontal
880.448	33.4	46.8	46.0	200	-12.6	153.2	0	1.00	Horizontal
909.305	34.2	51.3	46.0	200	-11.8	148.7	90	1.00	Horizontal



1 GHz to 40GHz

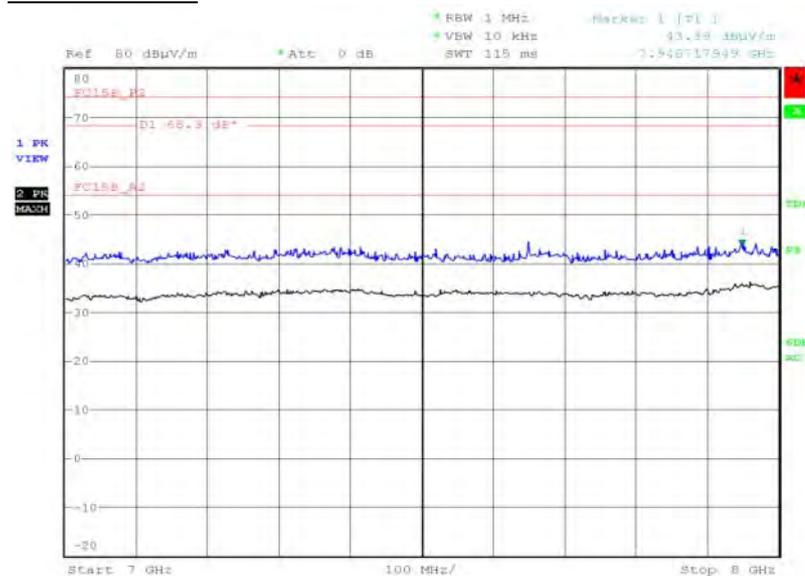
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.352	Vertical	100	205	57.65	47.11
10.600	Horizontal	130	166	56.96	50.61

1 GHz to 7 GHz



Date: 9.SEP.2012 20:08:49

7 GHz to 8 GHz

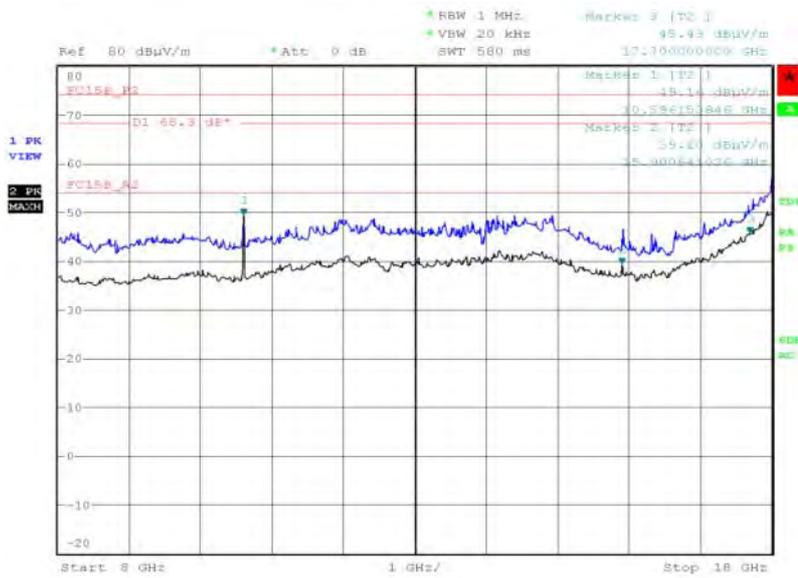


Date: 10.SEP.2012 23:01:15



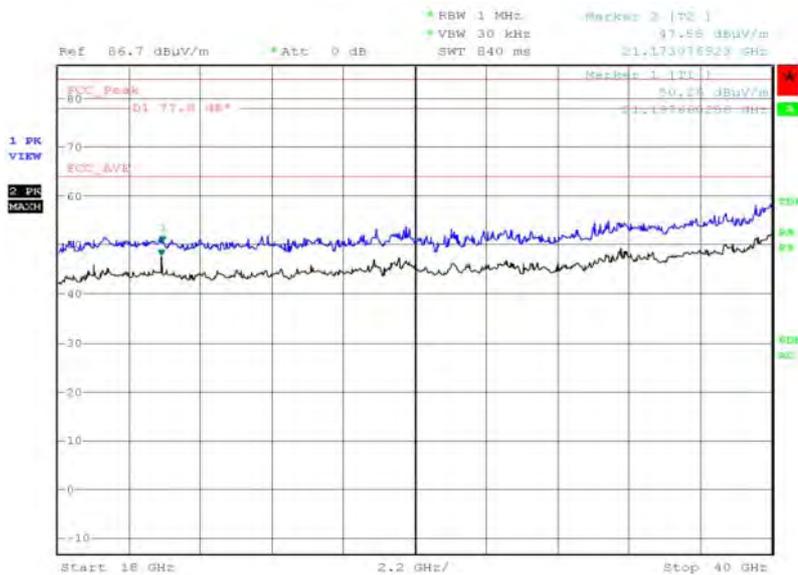
Product Service

8 GHz to 18 GHz



Date: 12-SEP-2012 21:58:35

18 GHz to 40 GHz

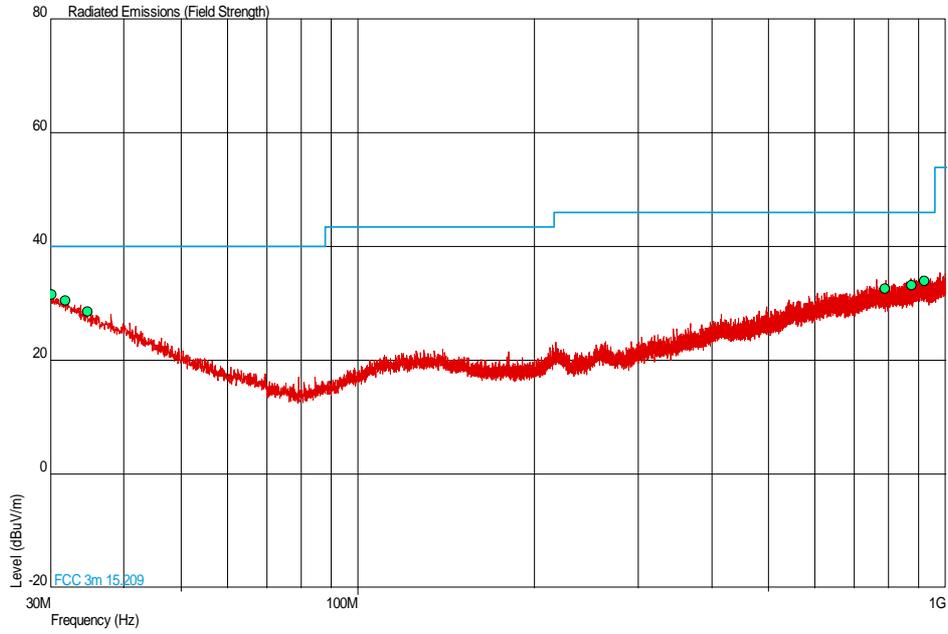


Date: 17-SEP-2012 18:53:06



5320 MHz

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
30.146	31.6	38.0	40.0	100	-8.4	62.0	0	1.00	Vertical
31.795	30.6	33.9	40.0	100	-9.4	66.1	180	1.00	Horizontal
34.753	28.5	26.6	40.0	100	-11.5	73.4	90	1.00	Horizontal
789.898	32.6	42.7	46.0	200	-13.4	157.3	0	1.00	Vertical
874.822	33.3	46.2	46.0	200	-12.7	153.8	90	1.00	Horizontal
920.557	34.0	50.1	46.0	200	-12.0	149.9	180	1.00	Horizontal

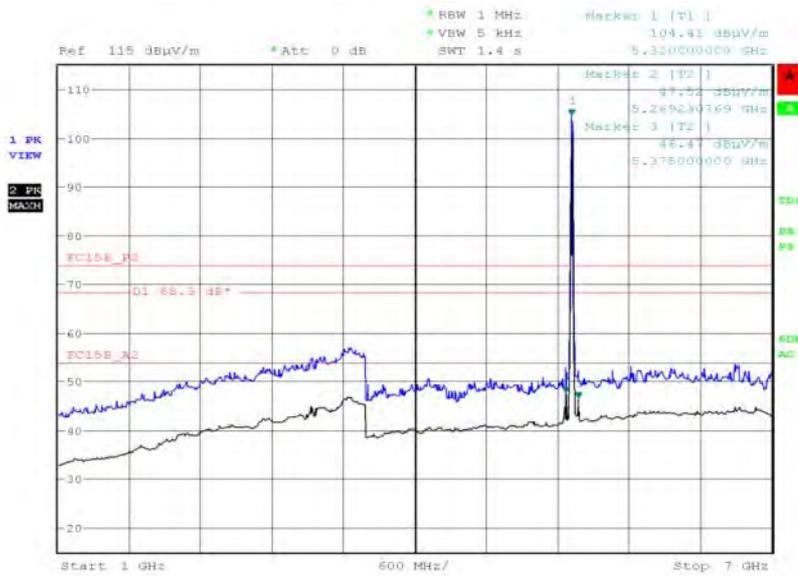


Product Service

1 GHz to 40 GHz

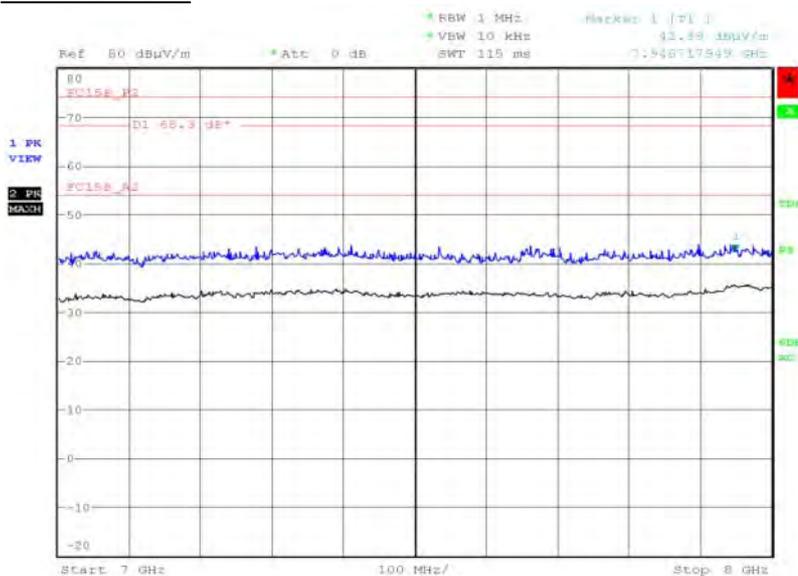
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.372	Vertical	125	211	58.02	46.45
10.640	Horizontal	100	139	56.21	50.51

1 GHz to 7 GHz



Date: 9.SEP.2012 20:36:14

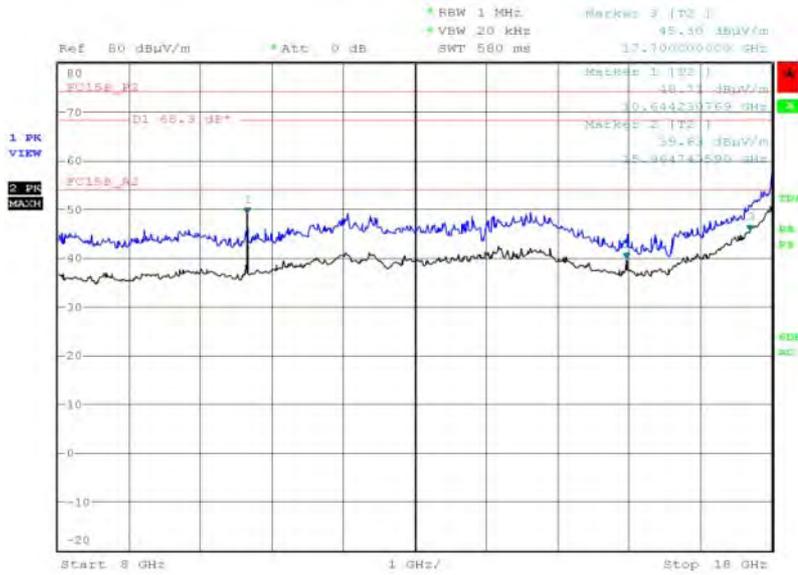
7 GHz to 8 GHz



Date: 10.SEP.2012 23:05:24

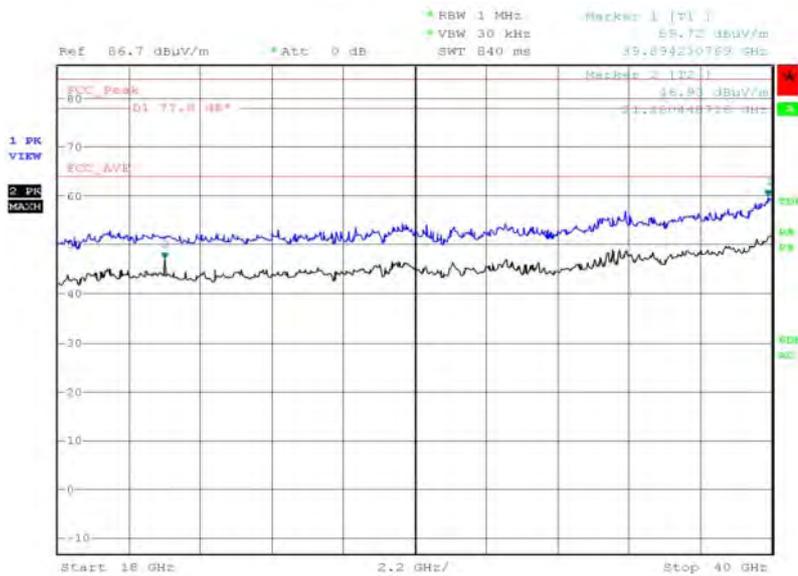


8 GHz to 18 GHz



Date: 12.SEP.2012 23:11:25

18 GHz to 40 GHz



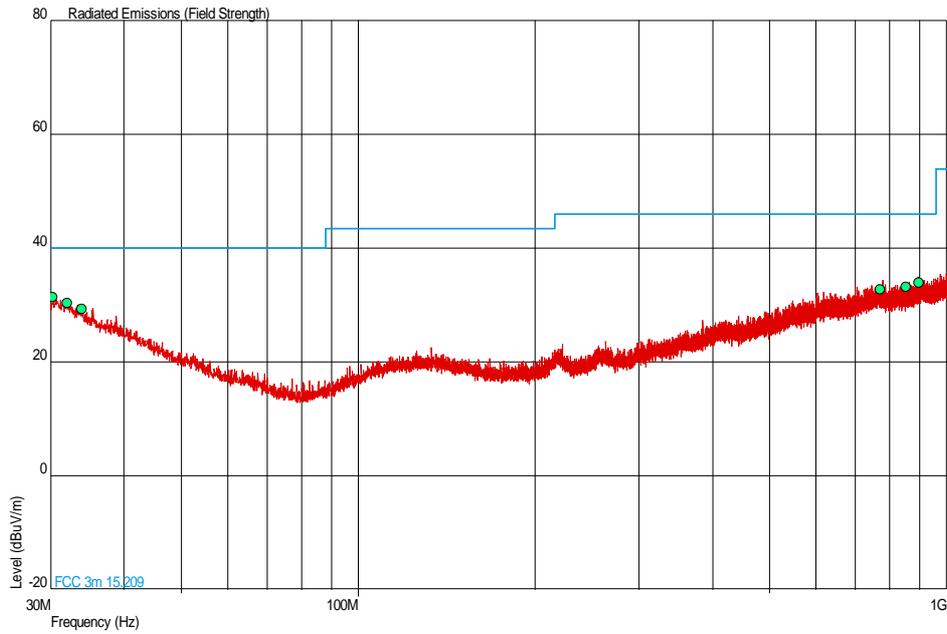
Date: 17.SEP.2012 19:12:06



Frequency Band 3

5500 MHz

30 MHz to 1 GHz



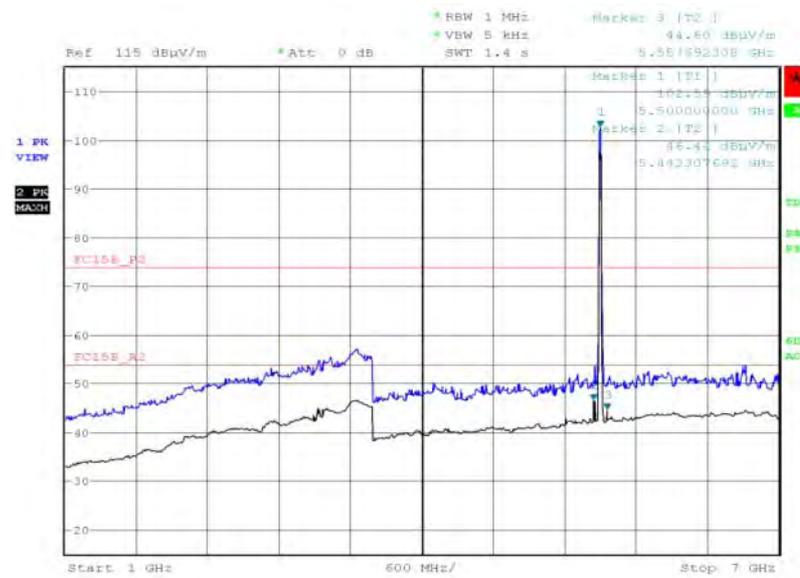
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.243	31.4	37.2	40.0	100	-8.6	62.8	0	1.00	Horizontal
32.037	30.3	32.7	40.0	100	-9.7	67.3	180	1.00	Horizontal
33.880	29.3	29.2	40.0	100	-10.7	70.8	0	1.00	Horizontal
770.207	32.7	43.2	46.0	200	-13.3	156.8	0	1.00	Horizontal
852.948	33.2	45.7	46.0	200	-12.8	154.3	180	1.00	Horizontal
897.423	33.9	49.5	46.0	200	-12.1	150.5	0	1.00	Vertical



1 GHz to 40 GHz

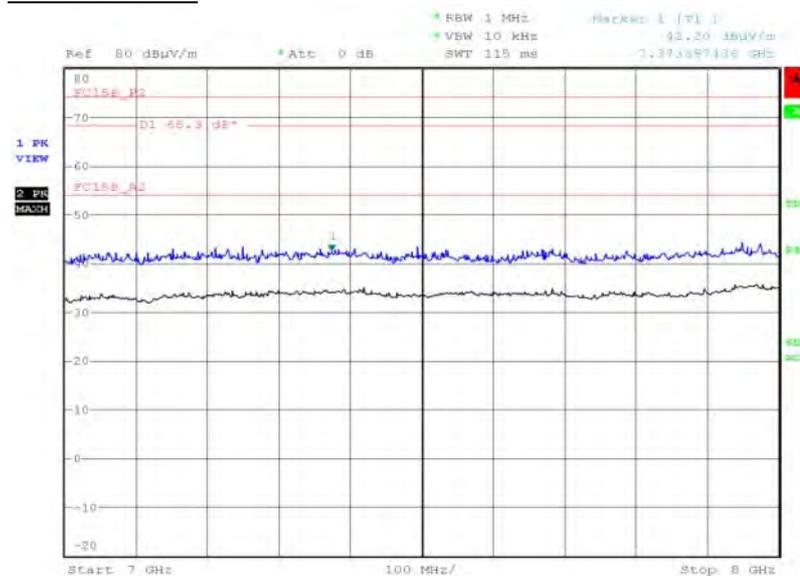
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.447	Vertical	100	161	57.62	46.54
10.999	Horizontal	116	166	55.73	48.93

1 GHz to 7 GHz



Date: 9.SEP.2012 21:14:09

7 GHz to 8 GHz

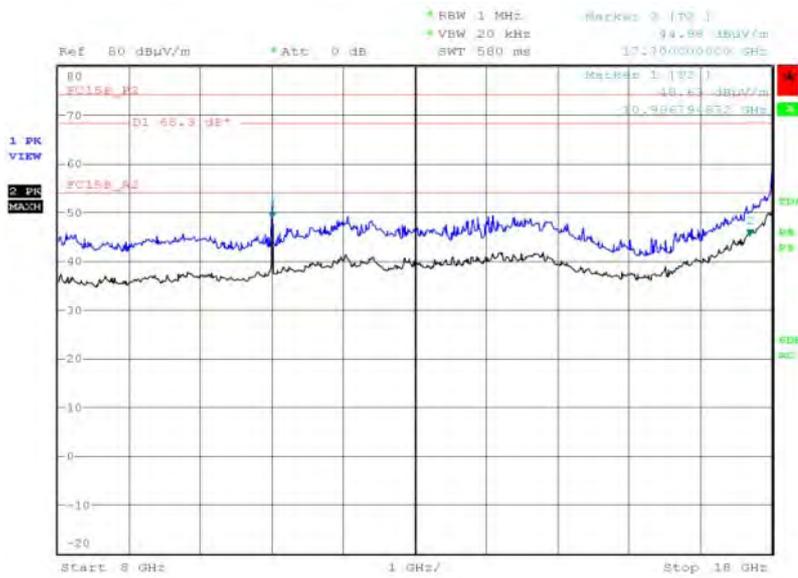


Date: 10.SEP.2012 23:08:56



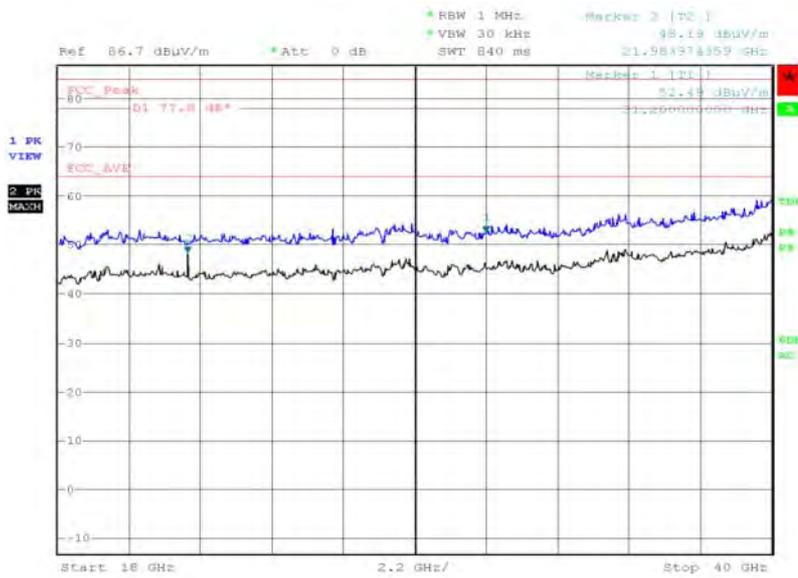
Product Service

8 GHz to 18 GHz



Date: 12.SEP.2012 22:19:10

18 GHz to 40 GHz

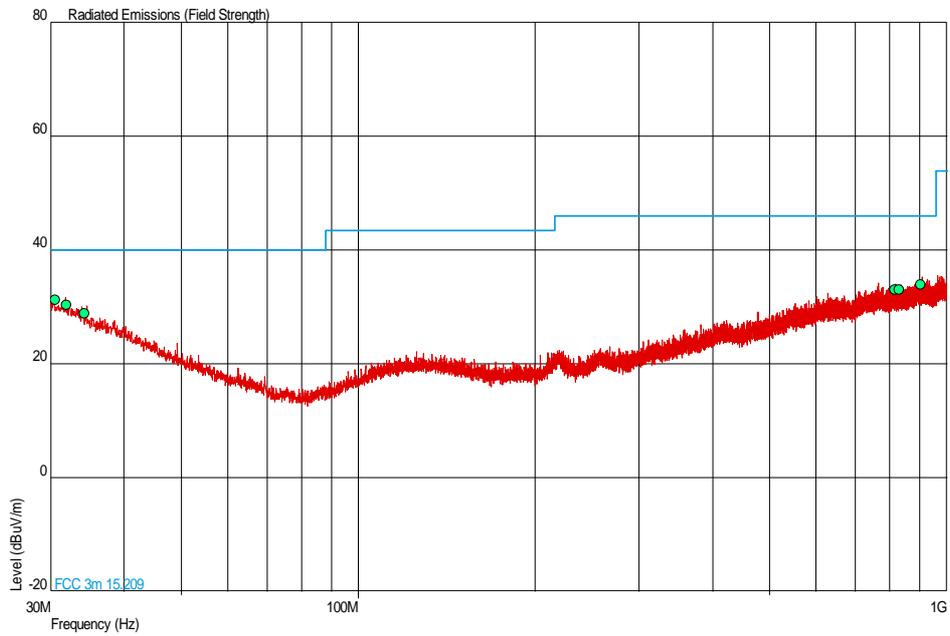


Date: 17.SEP.2012 19:20:34



5600 MHz

30 MHz to 1 GHz



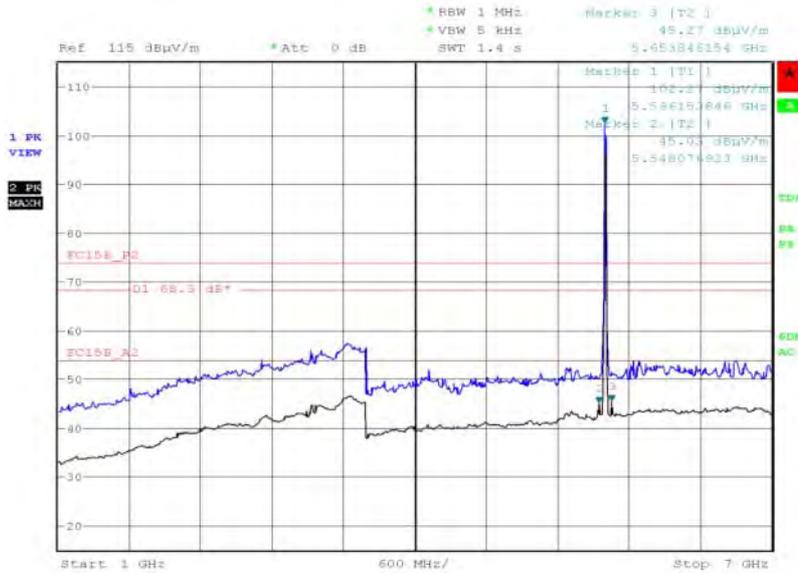
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.579	31.2	36.3	40.0	100	-8.8	63.7	0	0.00	Horizontal
31.940	30.4	33.1	40.0	100	-9.6	66.9	90	1.00	Vertical
34.220	29.0	28.2	40.0	100	-11.0	71.8	90	1.00	Horizontal
815.749	33.0	44.7	46.0	200	-13.0	155.3	90	1.00	Vertical
829.717	33.0	44.7	46.0	200	-13.0	155.3	0	1.00	Horizontal
903.340	34.0	50.1	46.0	200	-12.0	149.9	180	1.00	Vertical



1 GHz to 40 GHz

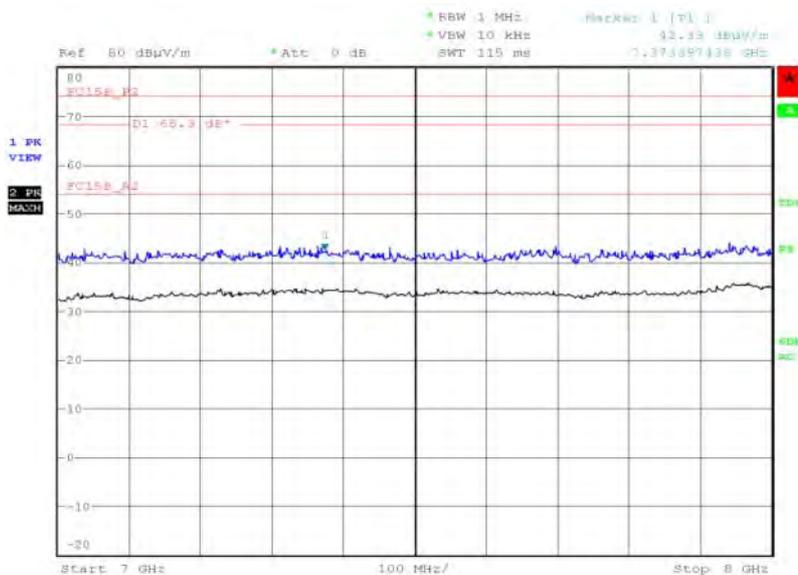
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.200	Horizontal	100	176	55.75	48.37

1 GHz to 7 GHz



Date: 9.SEP.2012 22:10:48

7 GHz to 8 GHz

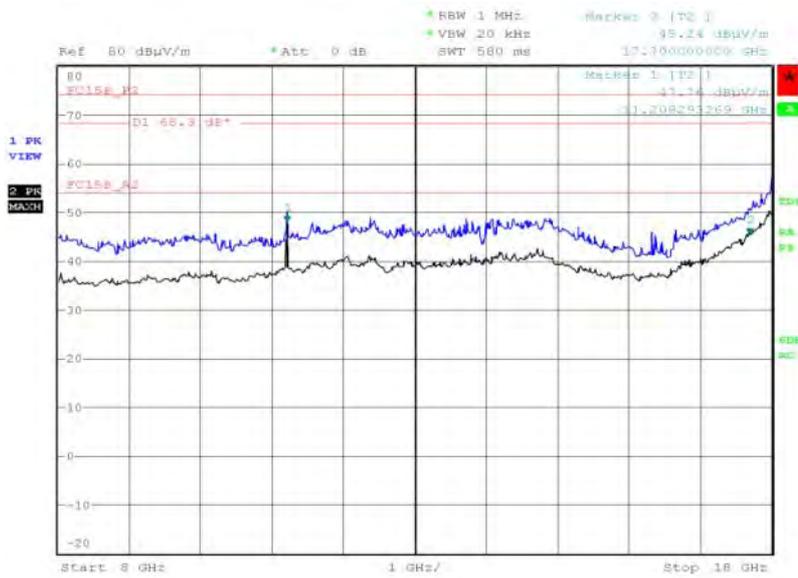


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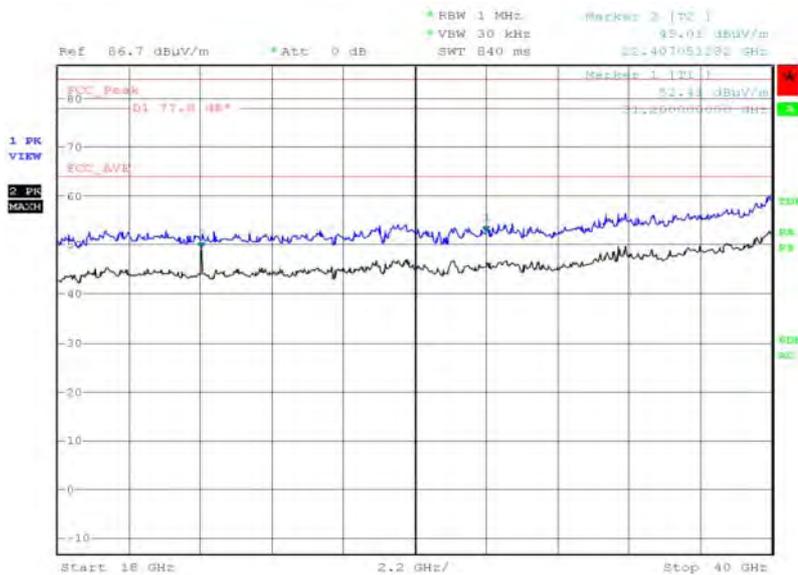
Product Service

8 GHz to 18 GHz



Date: 12.SEP.2012 22:28:15

18 GHz to 40 GHz

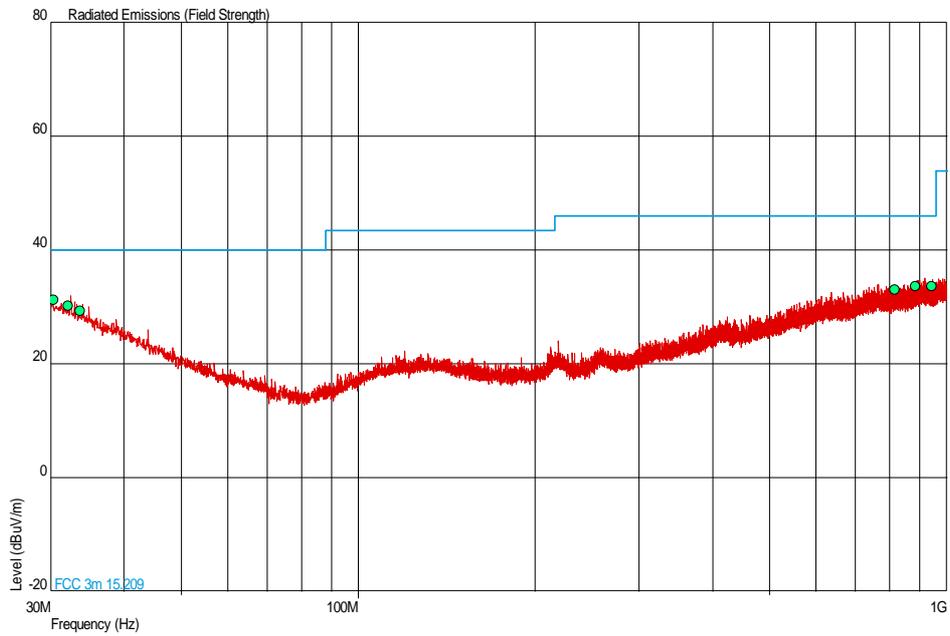


Date: 17.SEP.2012 19:35:39



5700 MHz

30 MHz to 1 GHz



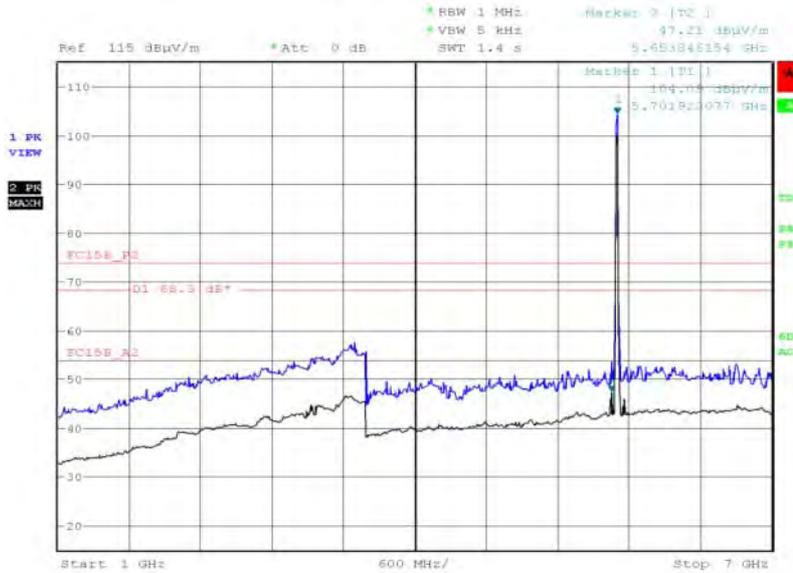
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.340	31.3	36.7	40.0	100	-8.7	63.3	0	1.00	Vertical
32.183	30.3	32.7	40.0	100	-9.7	67.3	0	1.00	Vertical
33.686	29.3	29.2	40.0	100	-10.7	70.8	90	1.00	Vertical
815.458	33.0	44.7	46.0	200	-13.0	155.3	0	1.00	Horizontal
885.928	33.7	48.4	46.0	200	-12.3	151.6	0	1.00	Horizontal
944.274	33.7	48.4	46.0	200	-12.3	151.6	90	1.00	Vertical



1 GHz to 40 GHz

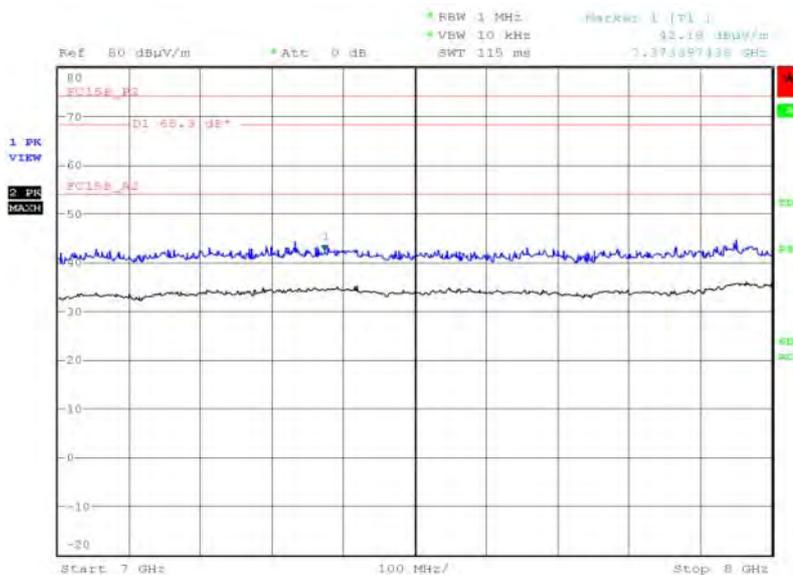
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.400	Horizontal	100	228	54.08	48.96

1 GHz to 7 GHz



Date: 9.SEP.2012 22:28:14

7 GHz to 8 GHz

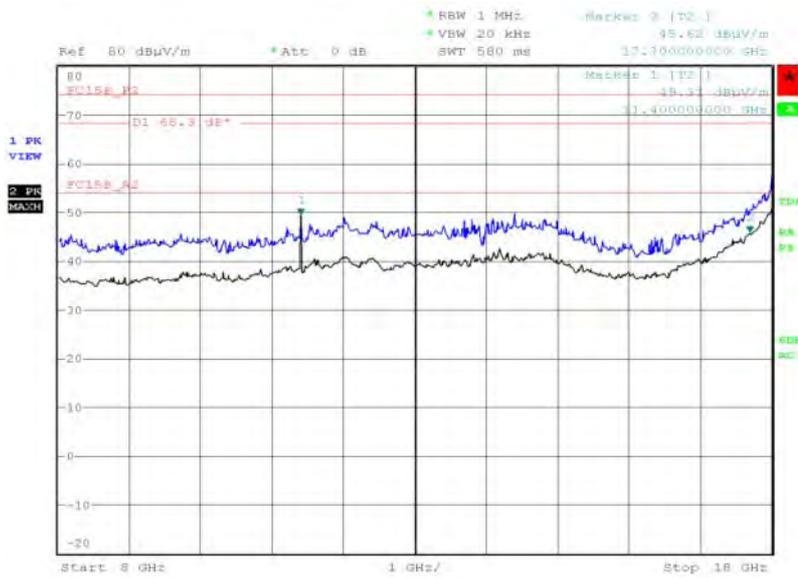


Date: 10.SEP.2012 23:18:47



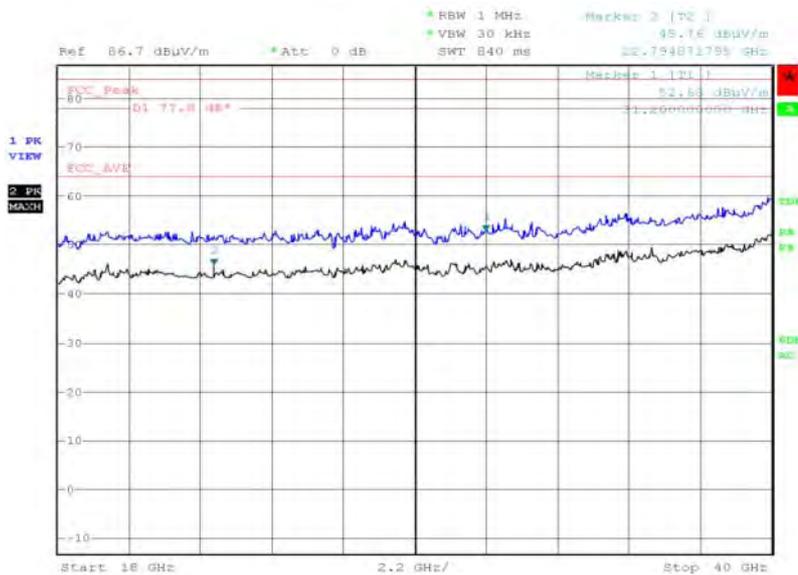
Product Service

8 GHz to 18 GHz



Date: 12.SEP.2012 22:42:07

18 GHz to 40 GHz



Date: 17.SEP.2012 19:43:58

Limit

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

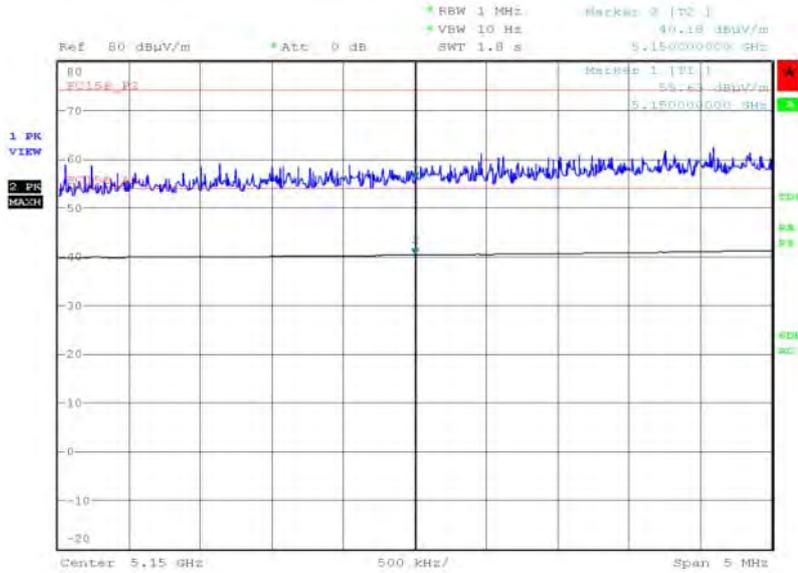


Product Service

Band Edge Emissions

5180 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	55.63	40.18

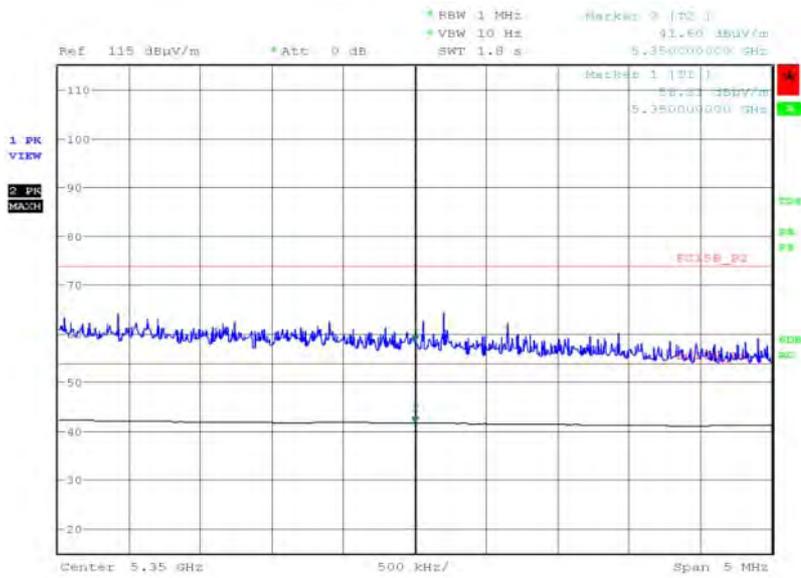


Date: 9.SEP.2012 16:02:06



5320 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	58.21	41.60



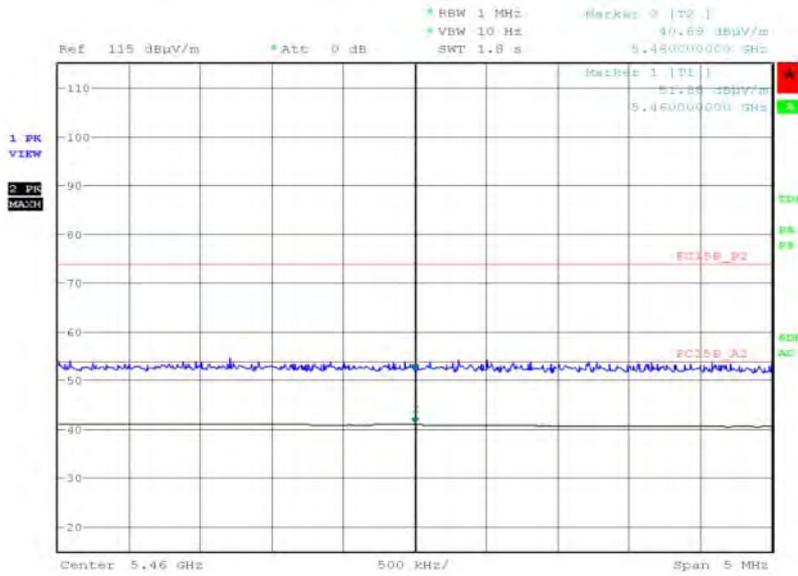
Date: 9.SEP.2012 20:49:44



Product Service

5500 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	51.88	40.89



Date: 9.SEP.2012 21:27:23

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

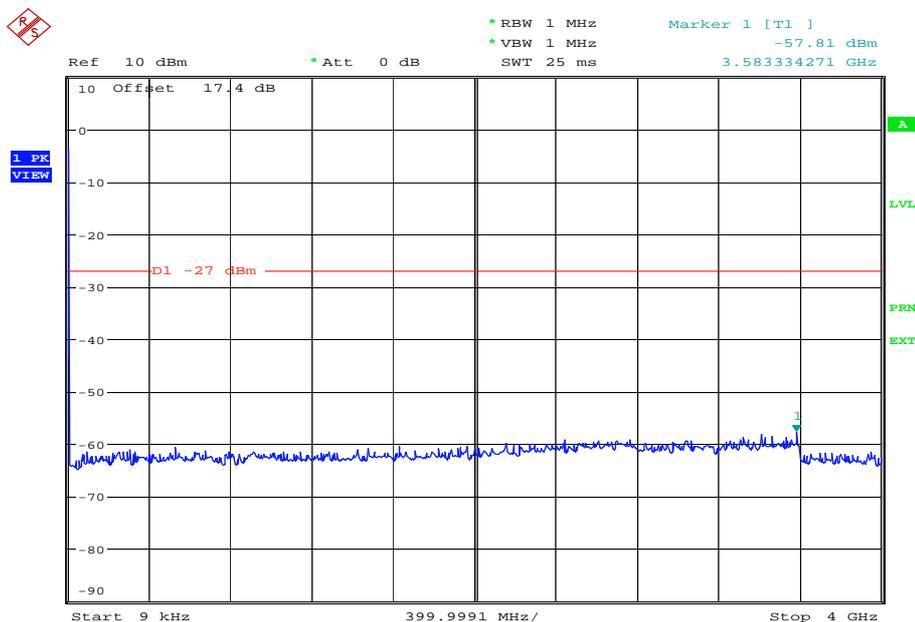
Spurious Conducted Emissions

6.5 Mbps

Frequency Band 1

5180 MHz

9 kHz to 7 GHz

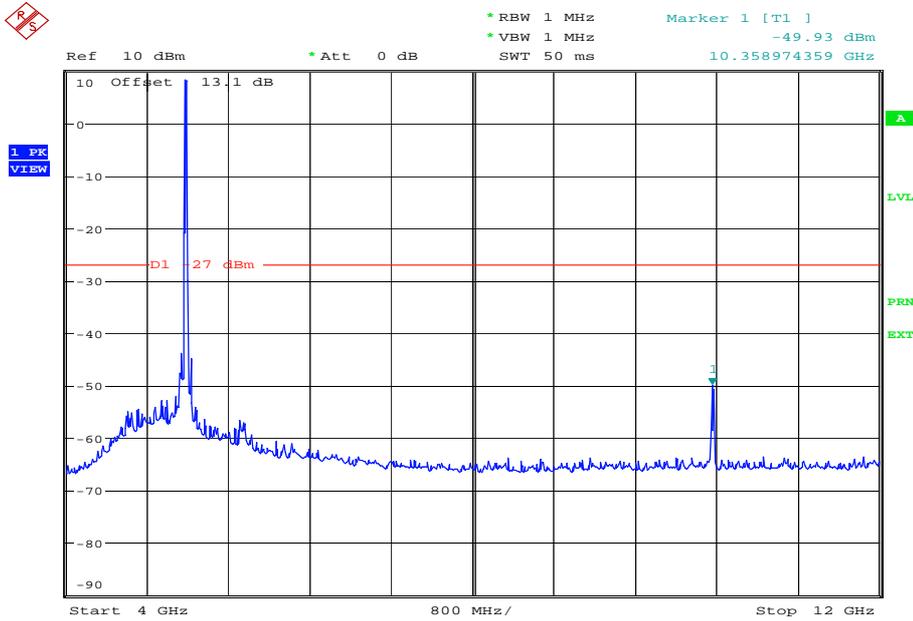


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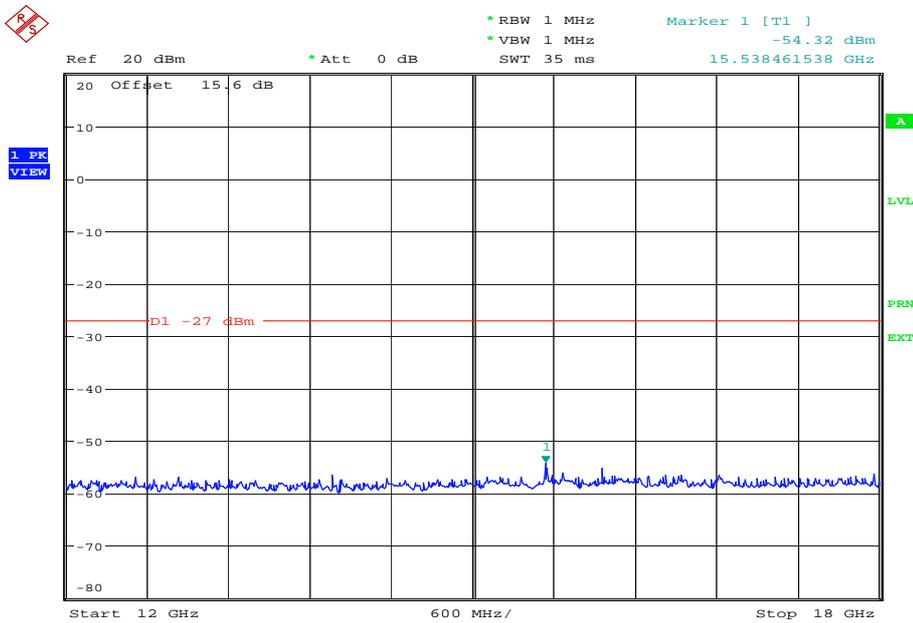
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 12:40:44

12 GHz to 18 GHz

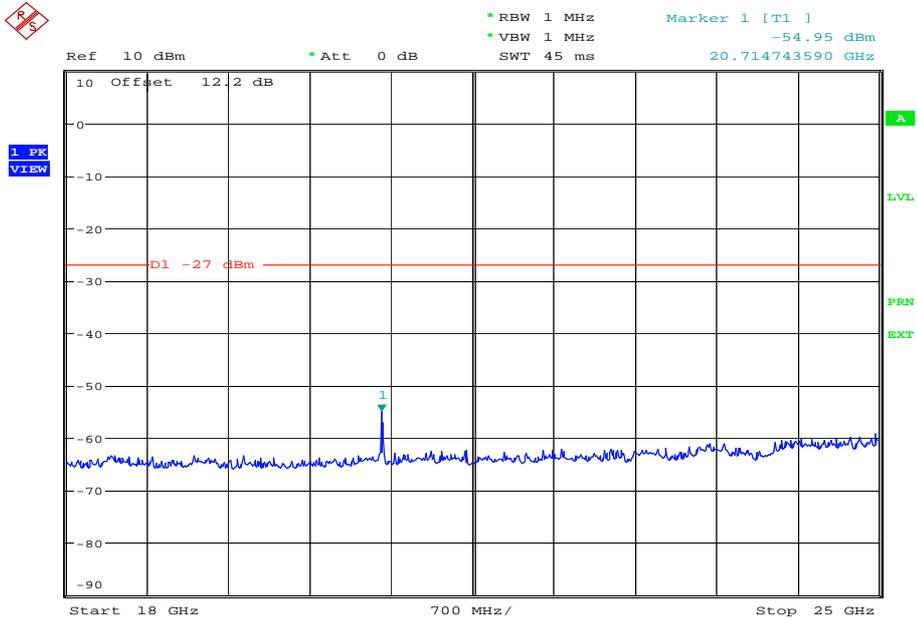


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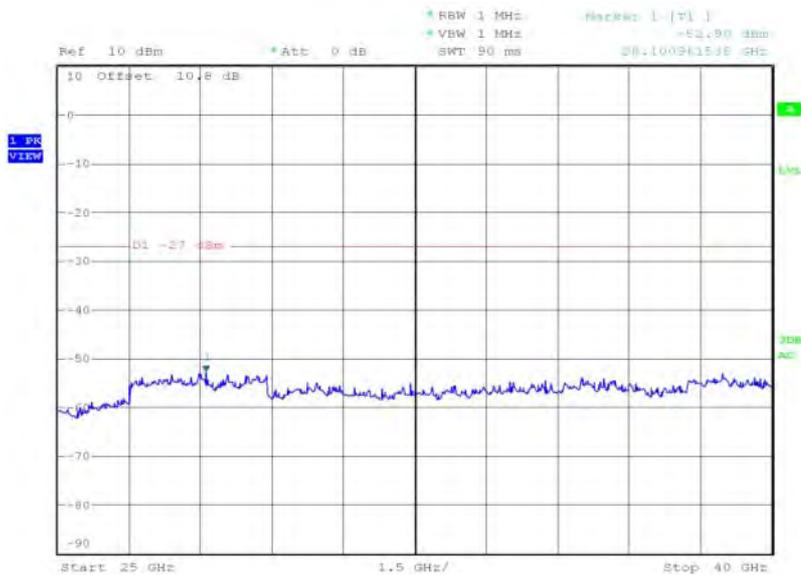
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 15:10:03

25 GHz to 40 GHz



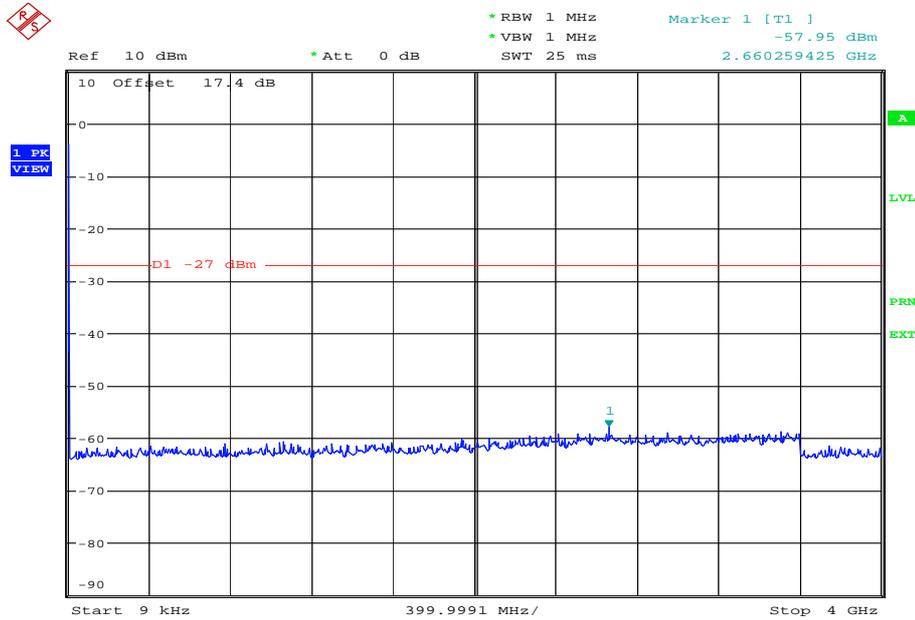
Date: 30.AUG.2012 16:35:22



Product Service

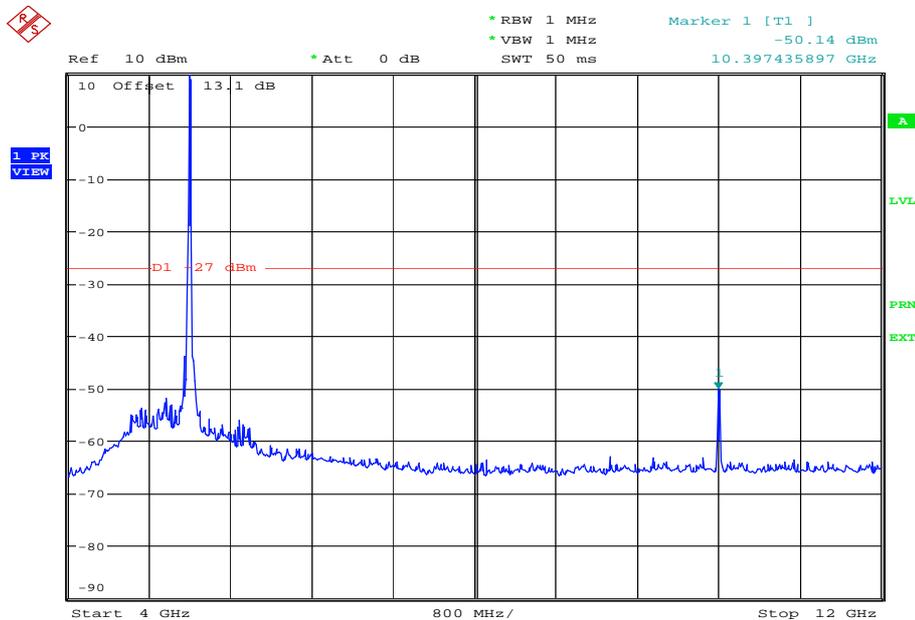
5200 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 12:20:26

7 GHz to 12 GHz

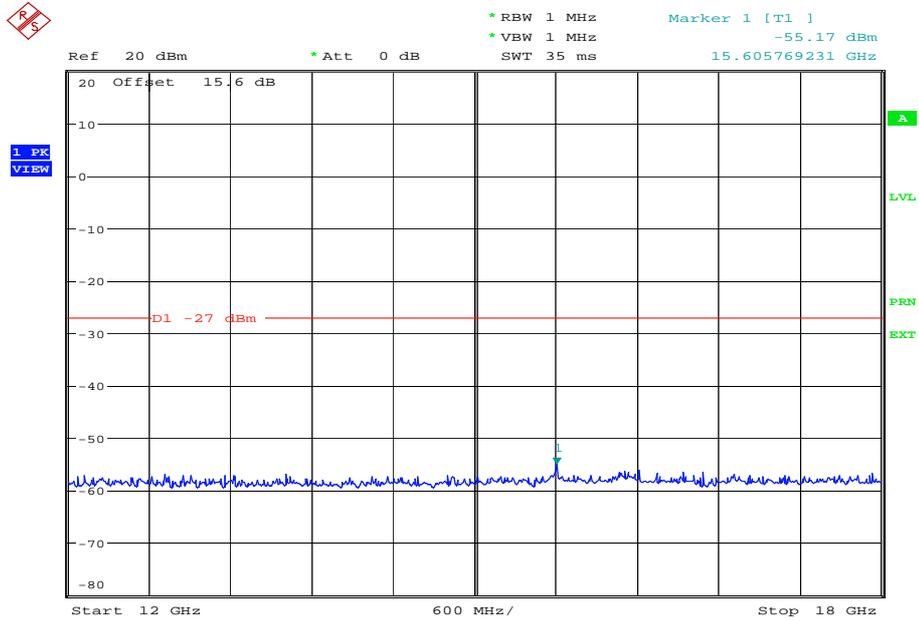


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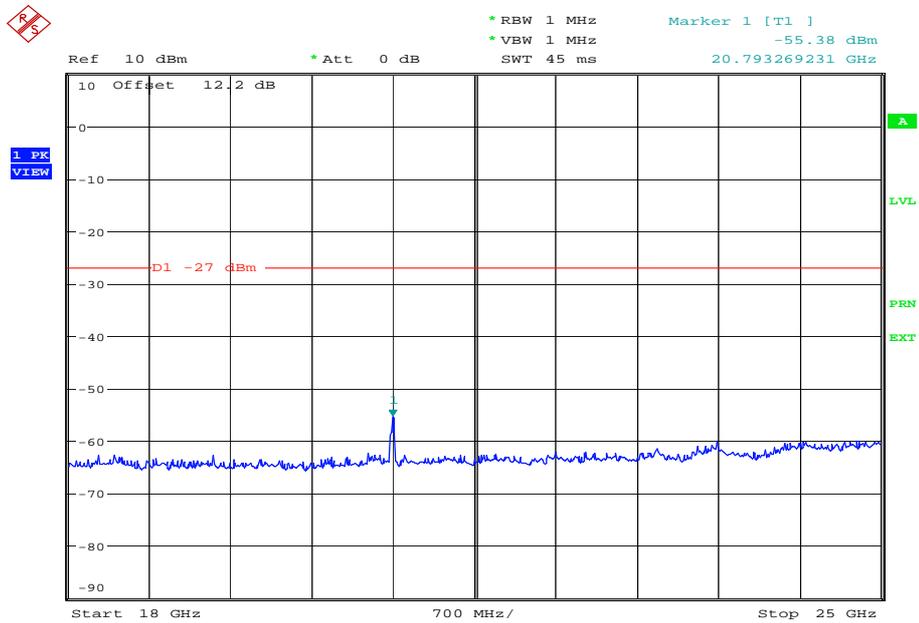
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:33:40

18 GHz to 25 GHz

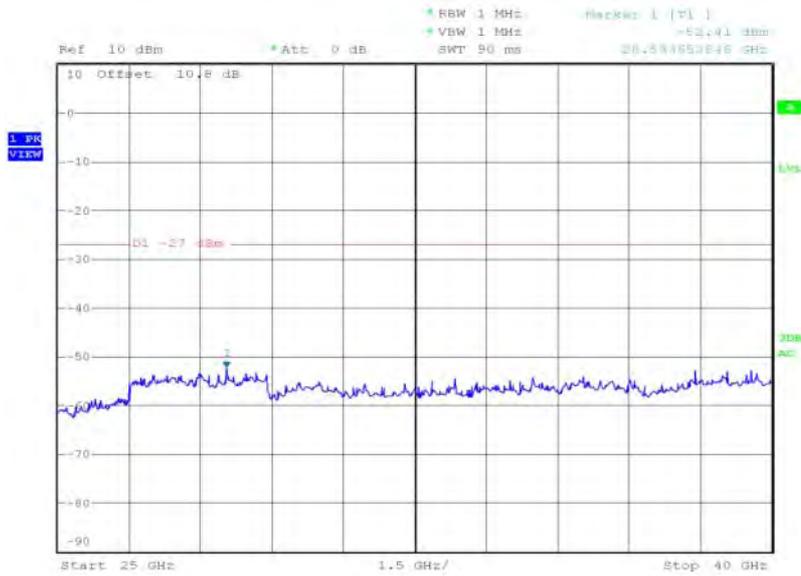


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Product Service

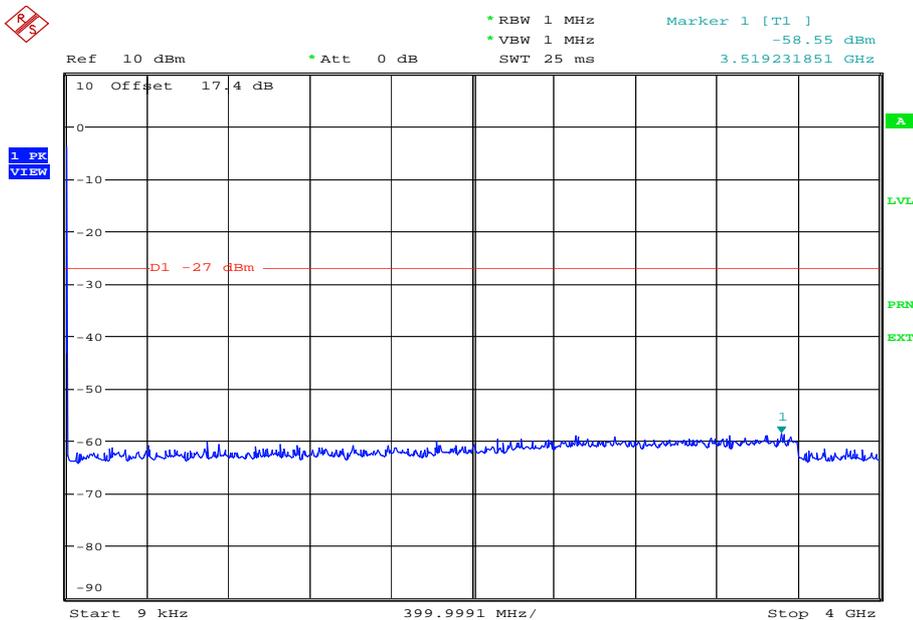
25 GHz to 40 GHz



Date: 30.AUG.2012 16:34:20

5240 MHz

9 kHz to 7 GHz

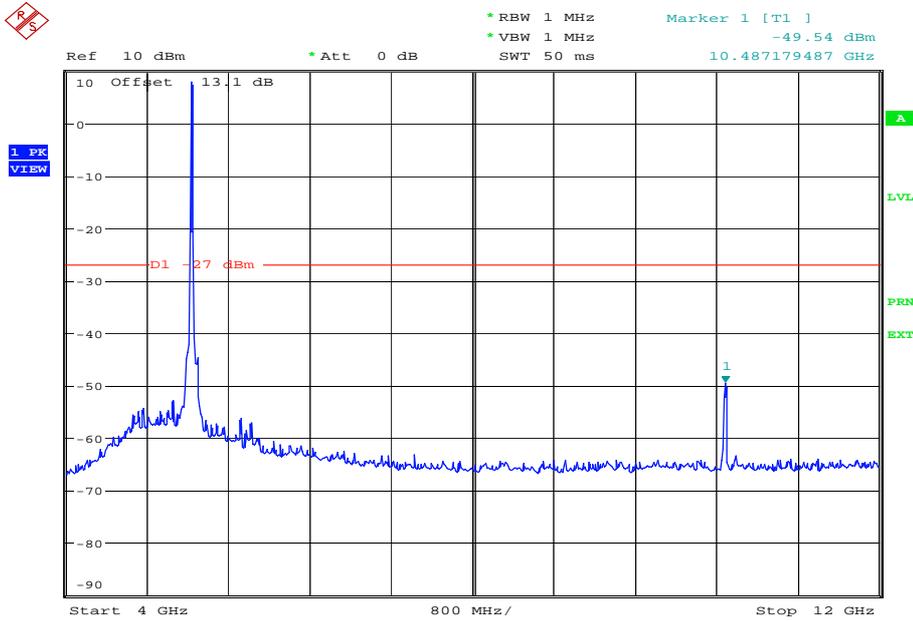


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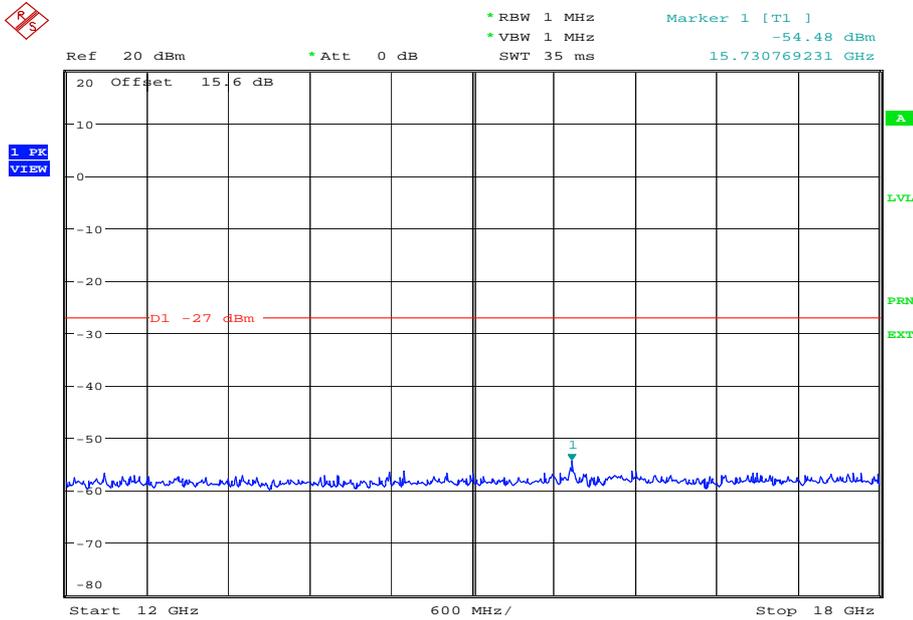
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 12:43:57

12 GHz to 18 GHz

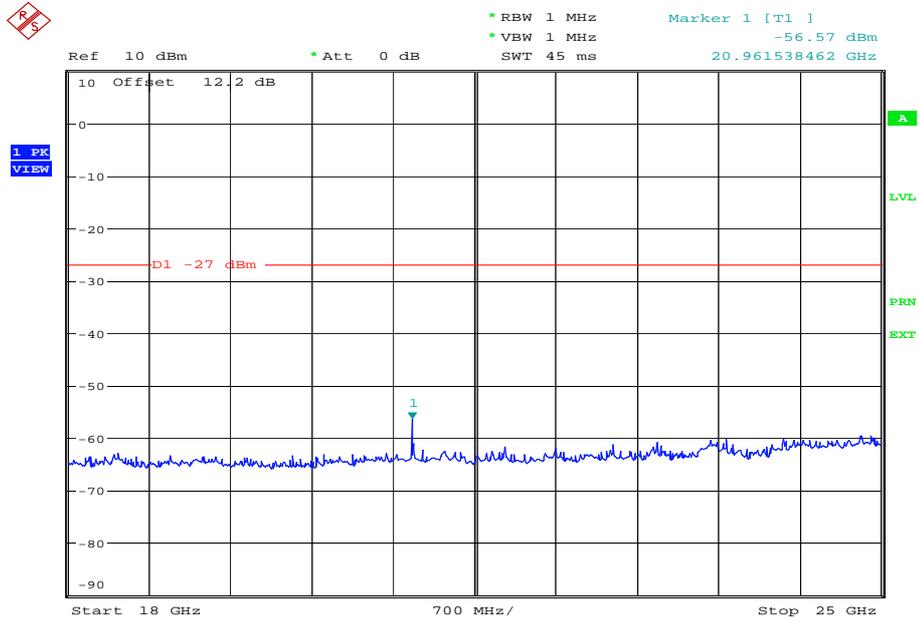


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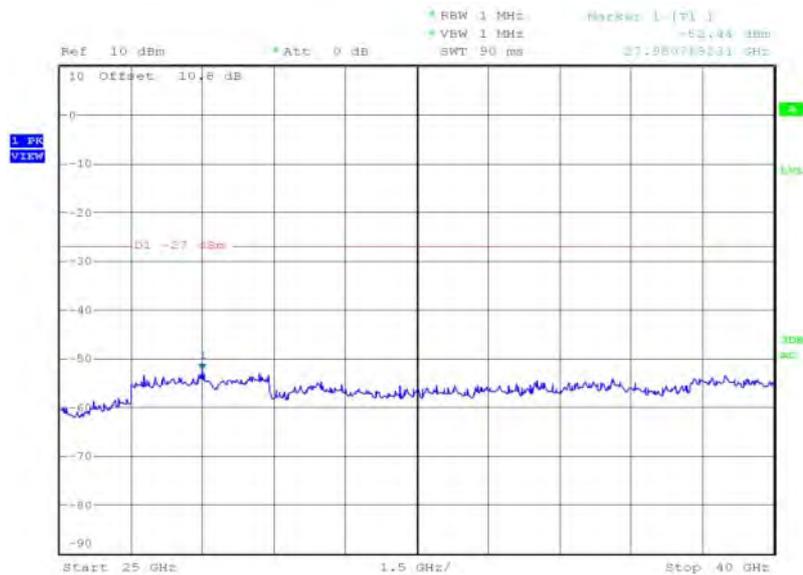
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 15:11:58

25 GHz to 40 GHz



Date: 30.AUG.2012 16:35:11

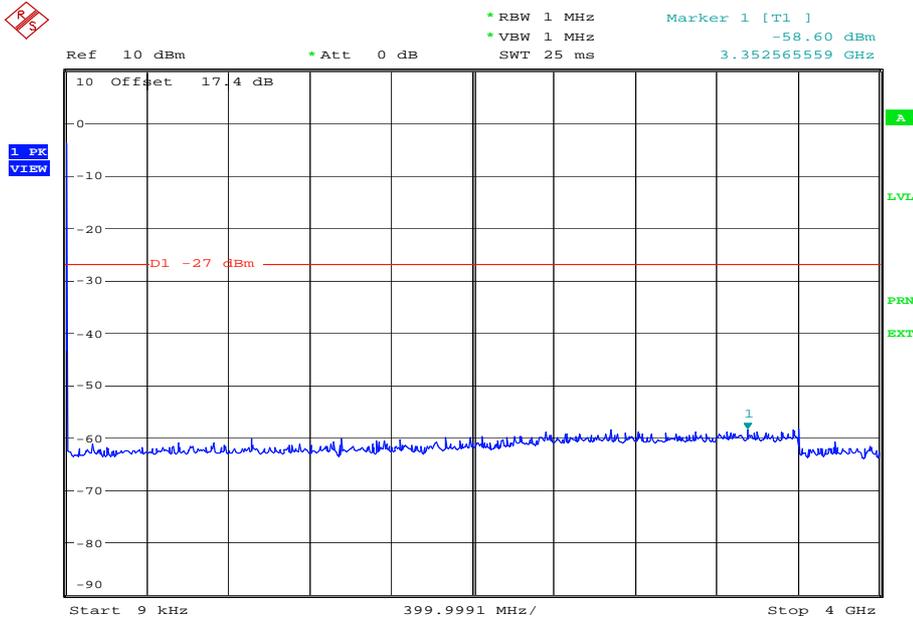


Product Service

Frequency Band 2

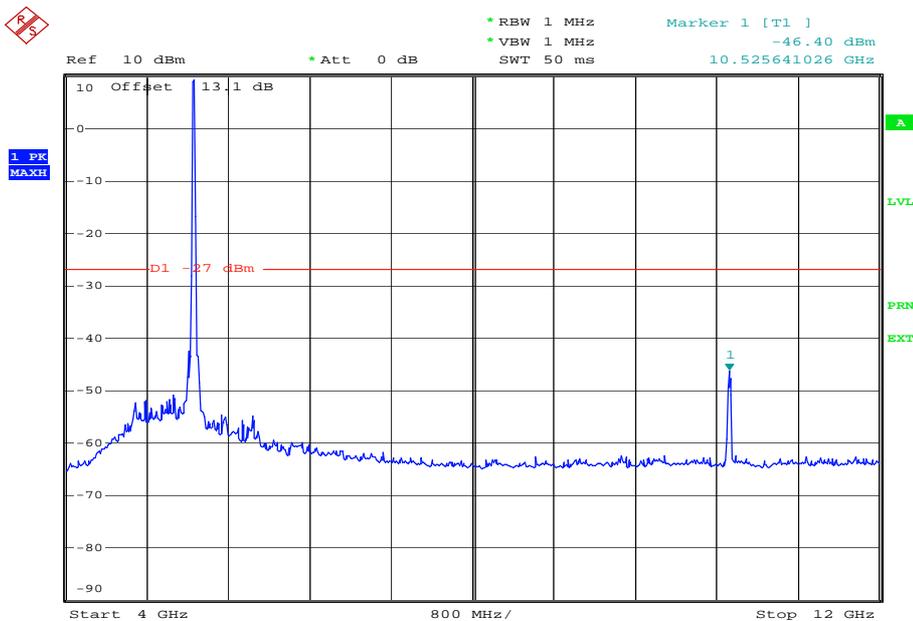
5260 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 12:22:51

7 GHz to 12 GHz

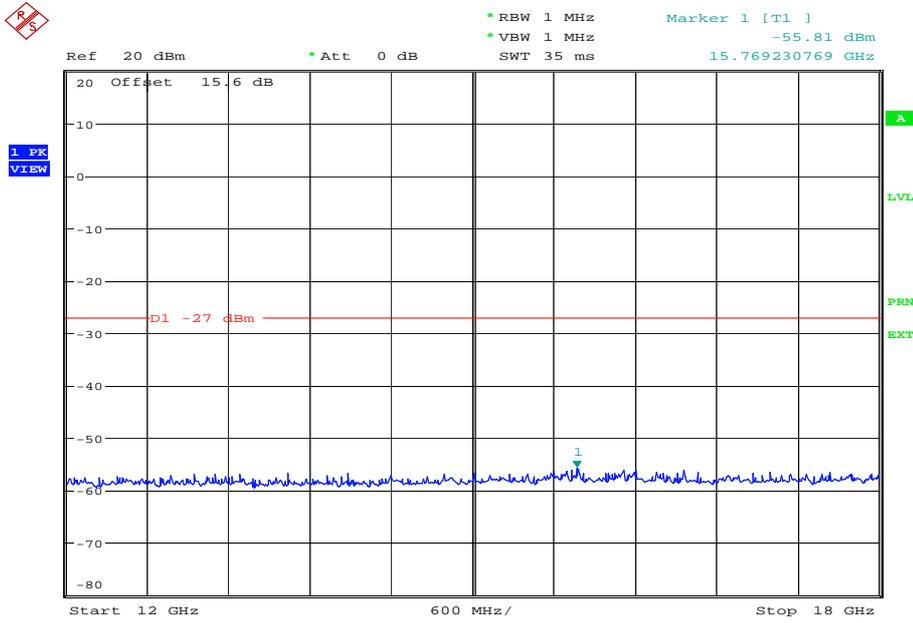


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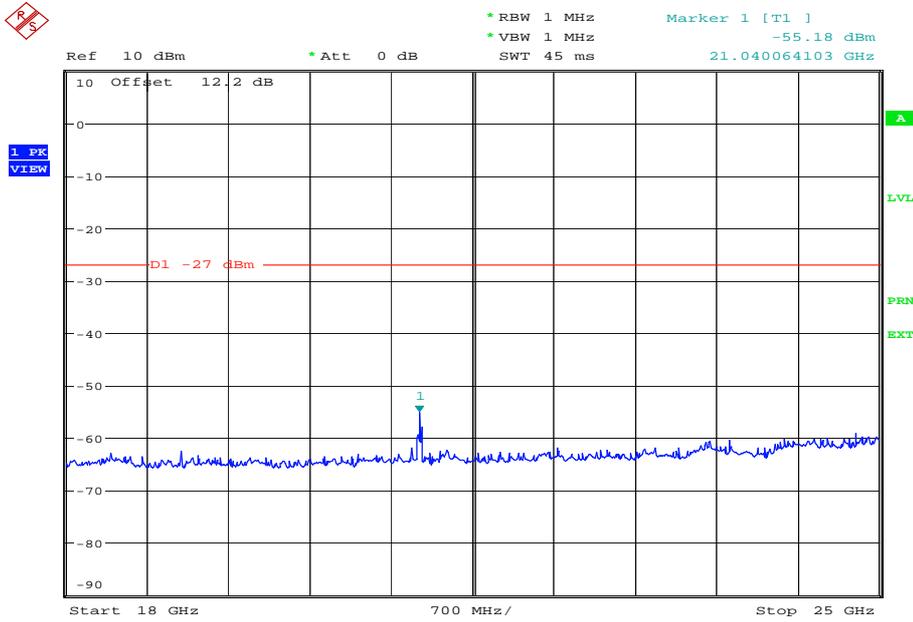
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:35:11

18 GHz to 25 GHz

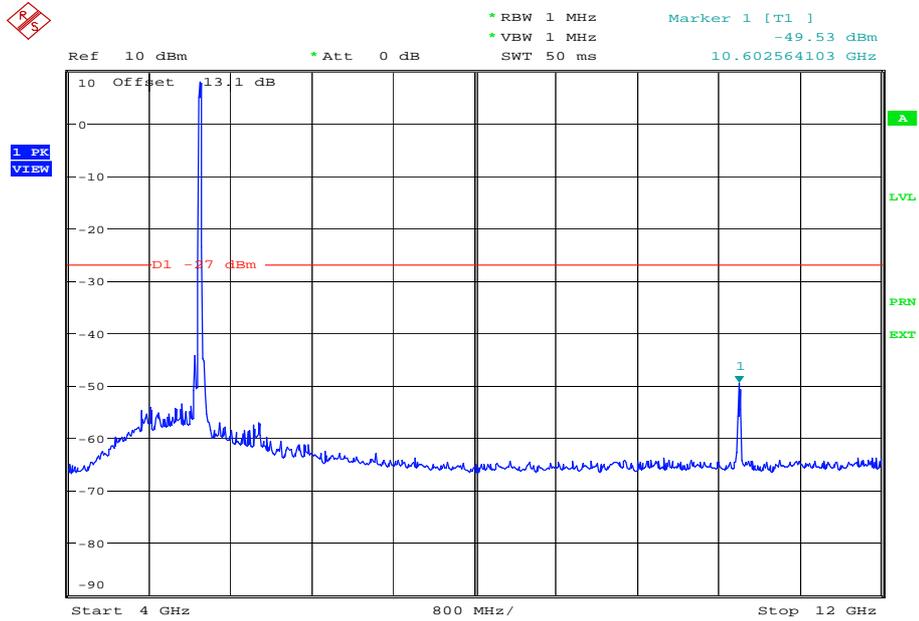


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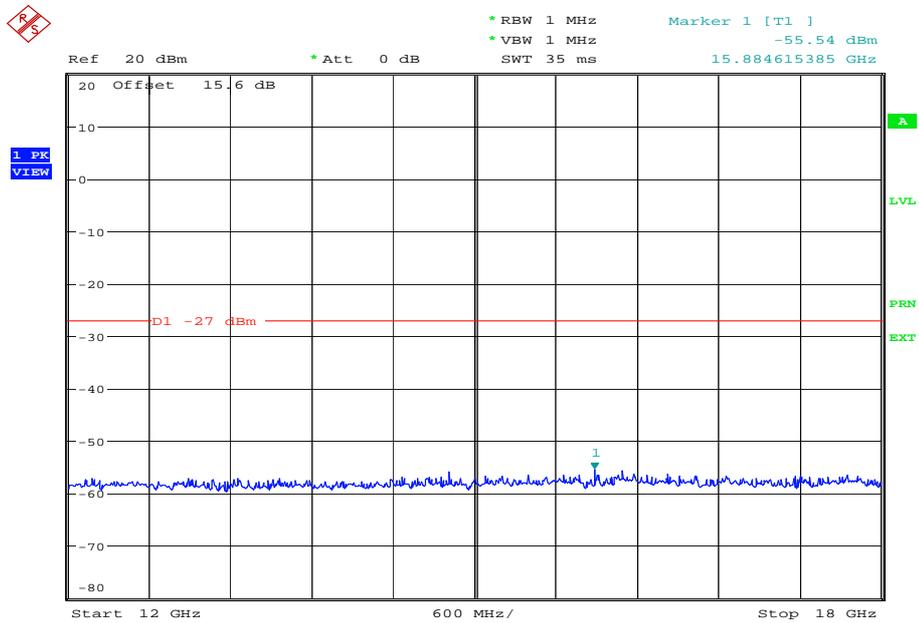
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 12:50:29

12 GHz to 18 GHz

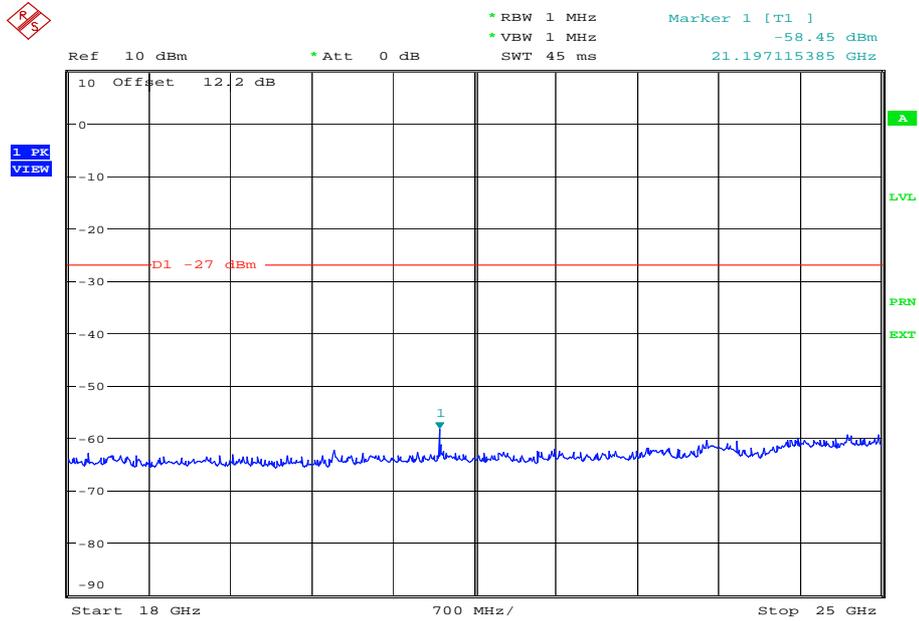


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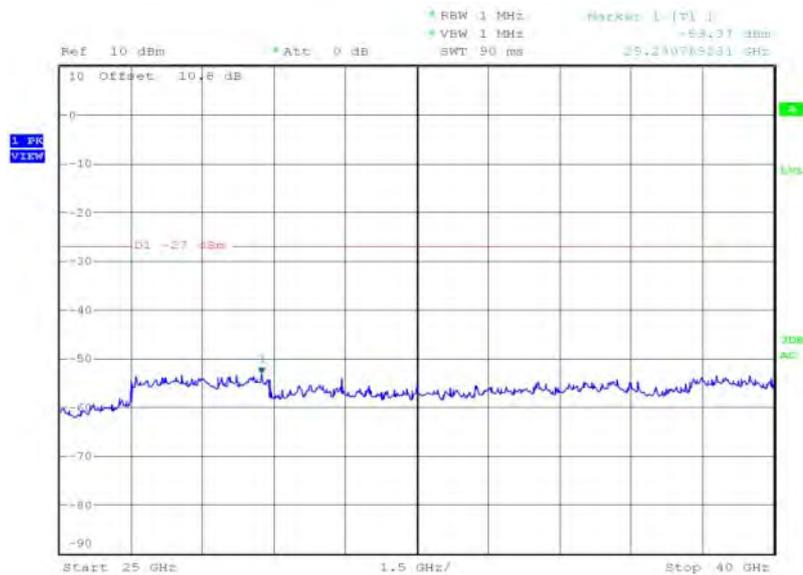
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 15:13:49

25 GHz to 40 GHz



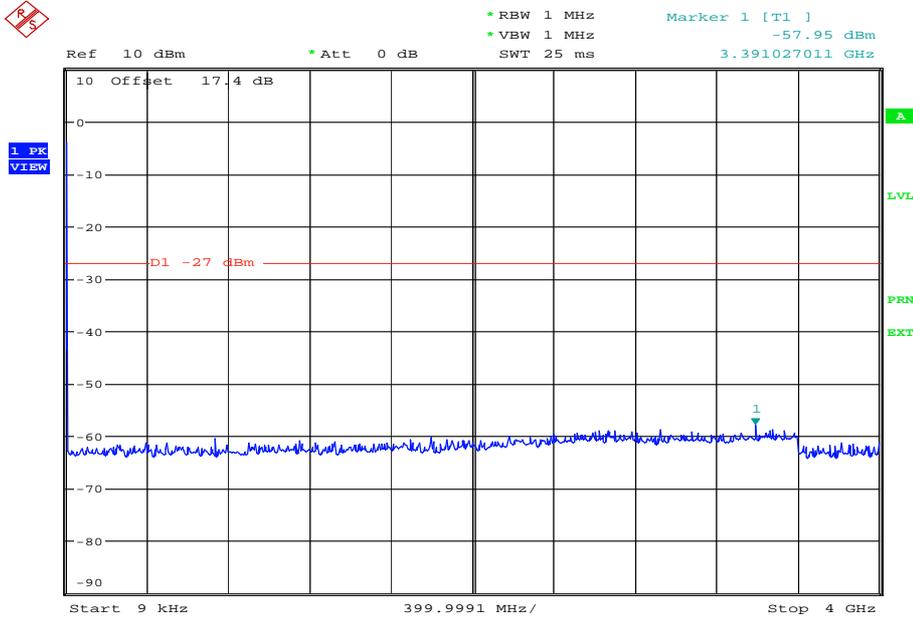
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Product Service

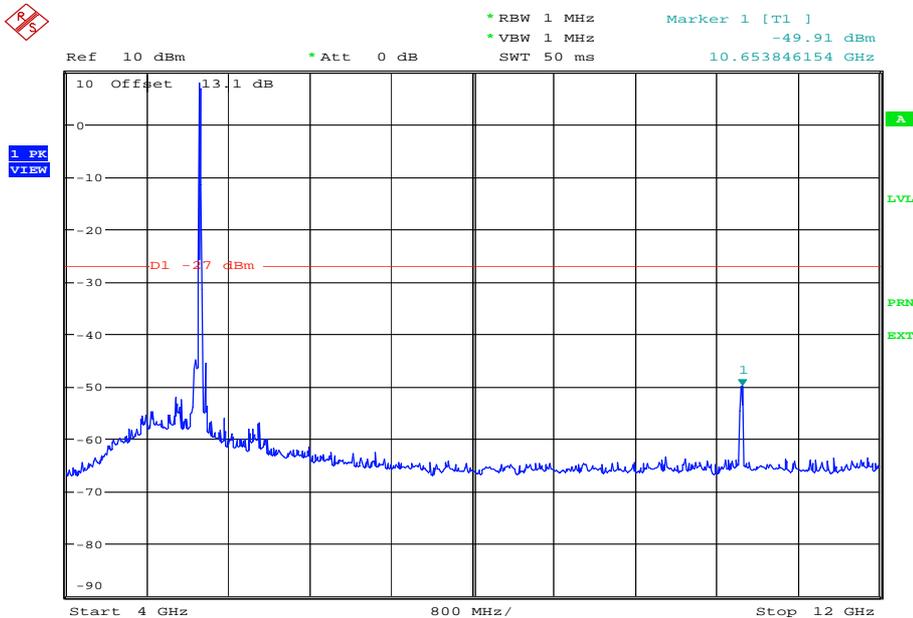
5320 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 12:24:45

7 GHz to 12 GHz

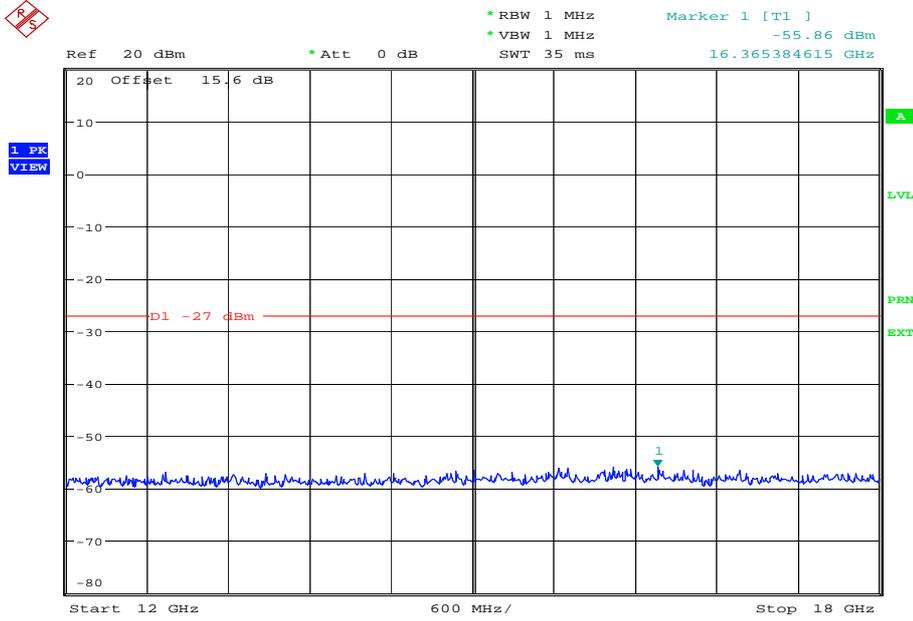


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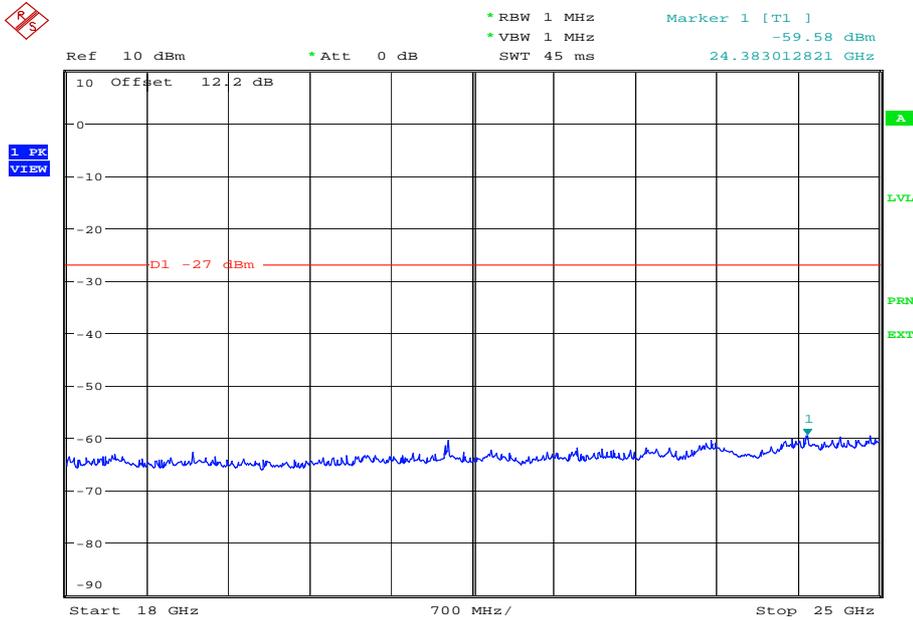
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:36:41

18 GHz to 25 GHz

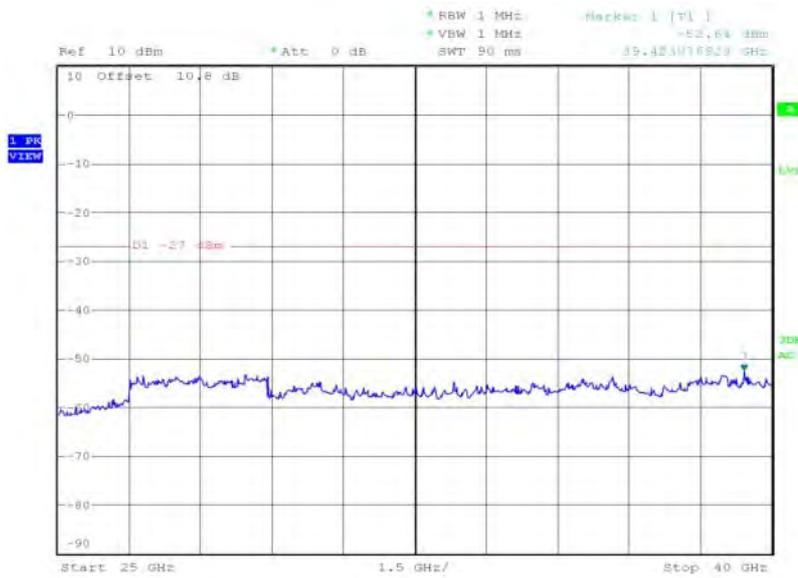


Date: 30.AUG.2012 15:14:33



Product Service

25 GHz to 40 GHz

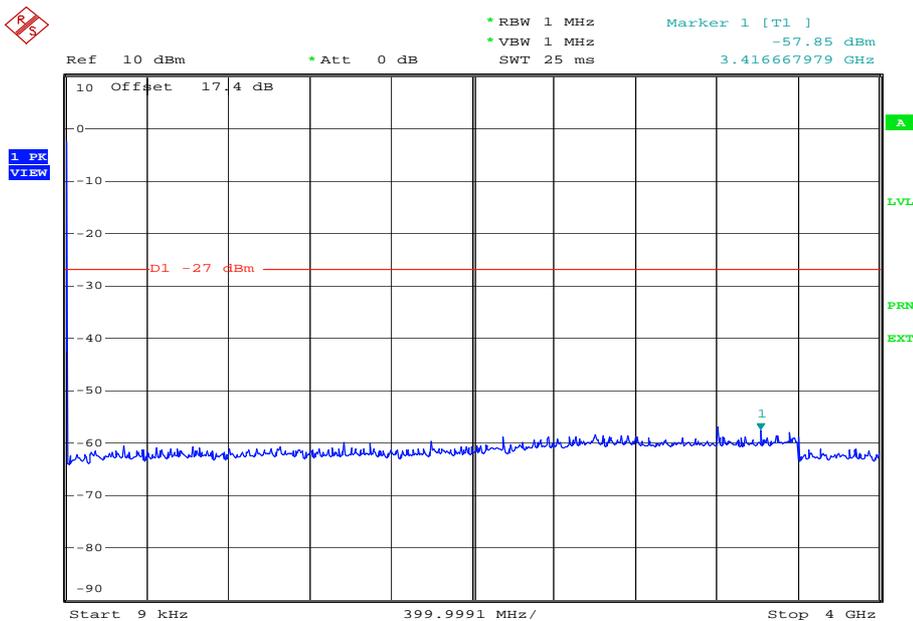


Date: 30.AUG.2012 16:38:17

Frequency Band 3

5500 MHz

9 kHz to 7 GHz

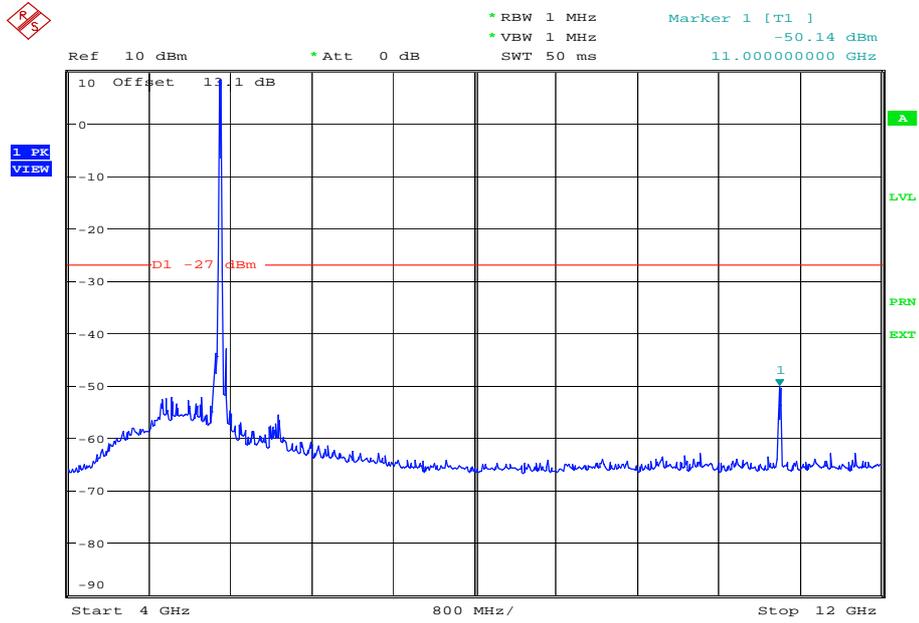


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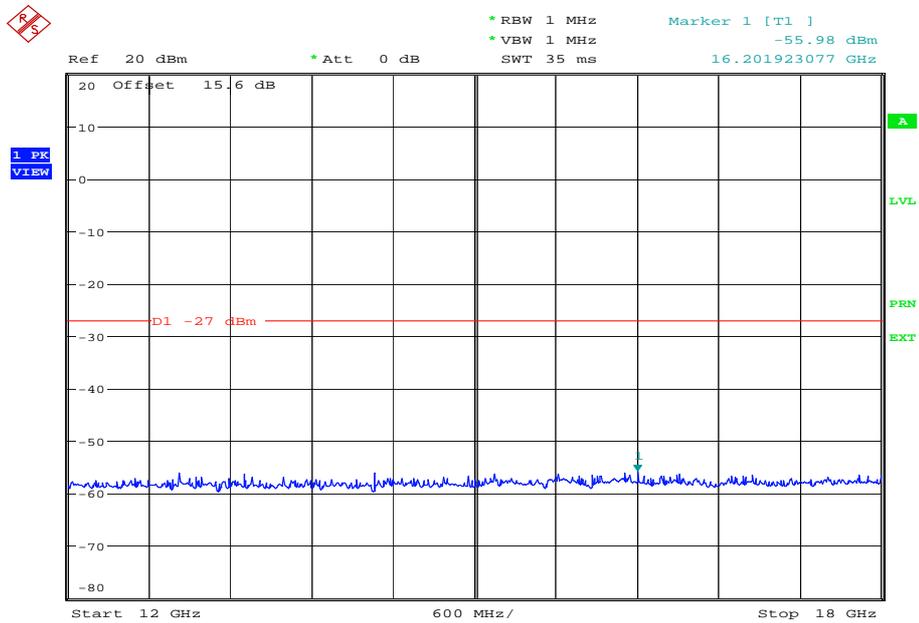
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 12:52:42

12 GHz to 18 GHz

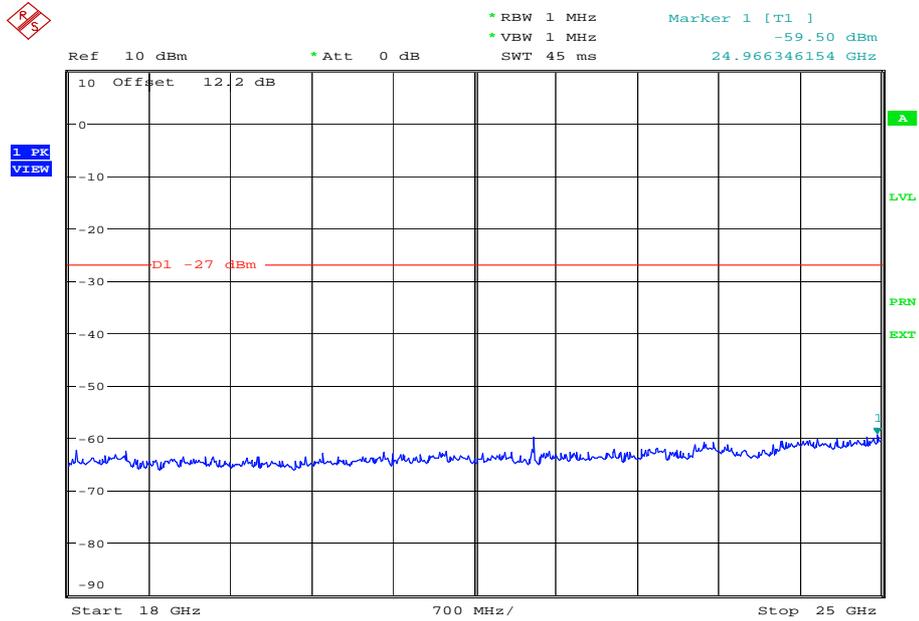


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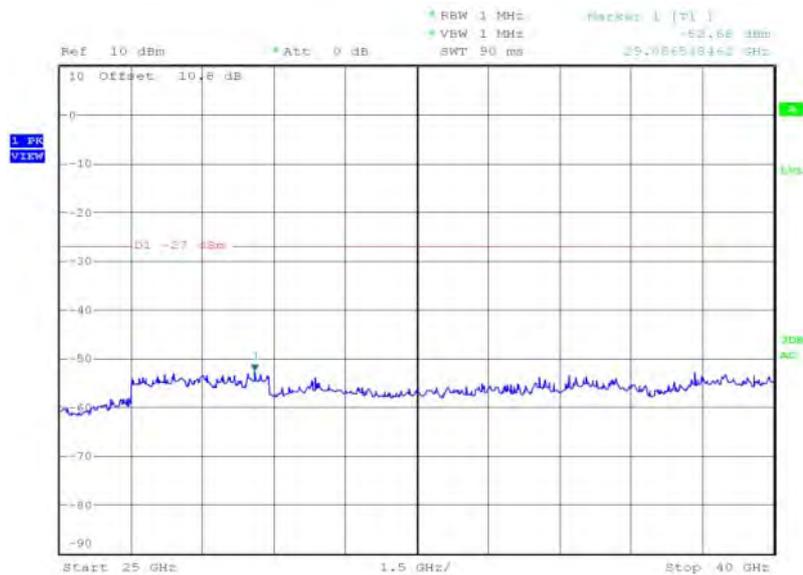
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 15:15:24

25 GHz to 40 GHz



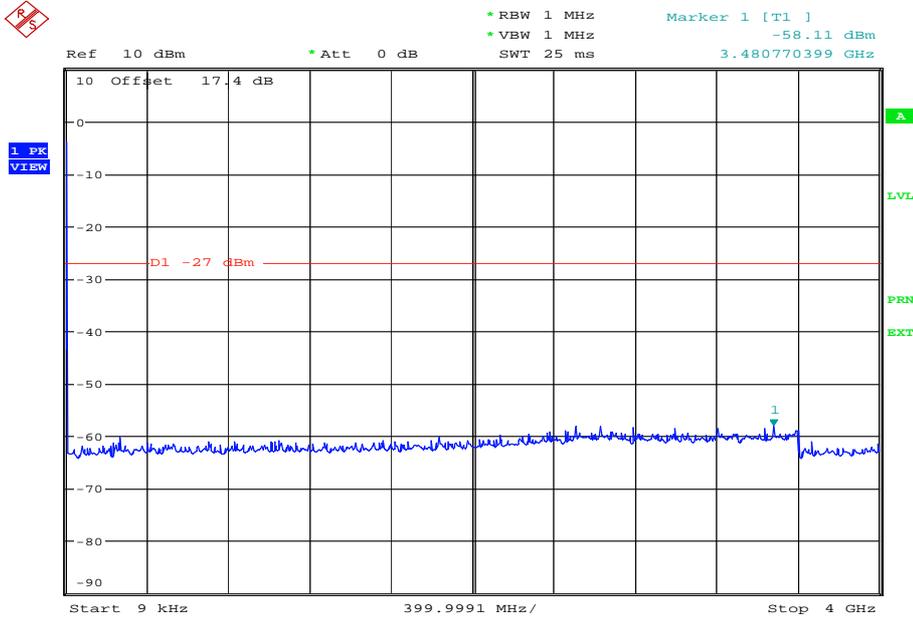
Date: 30.AUG.2012 16:39:38



Product Service

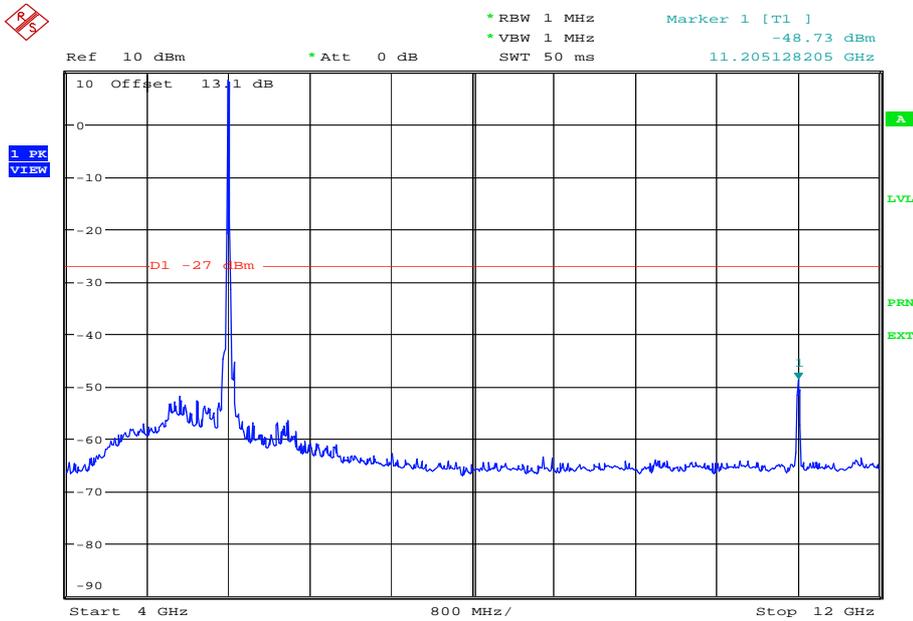
5600 MHz

9 kHz to 7 GHz



Date: 30.AUG.2012 12:26:38

7 GHz to 12 GHz

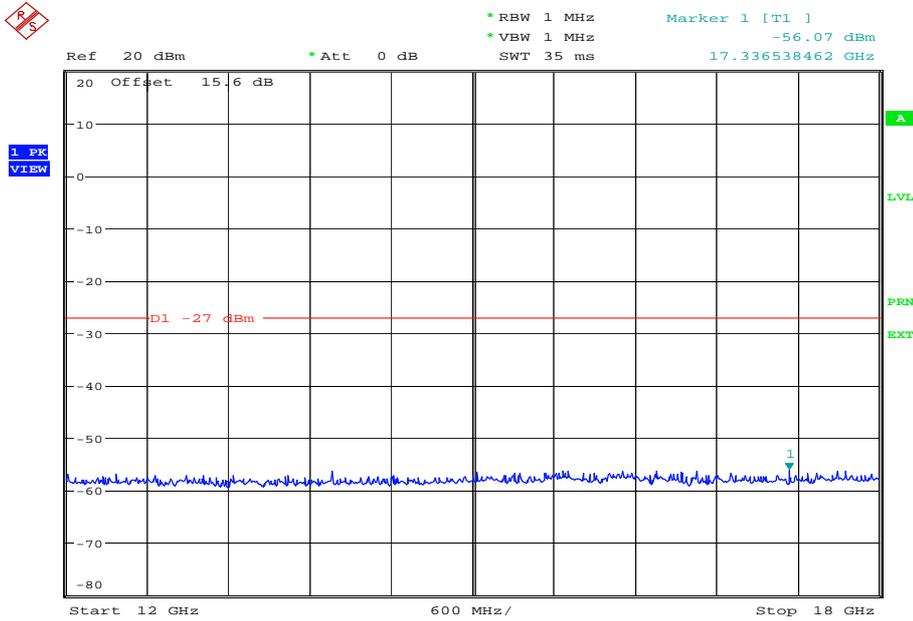


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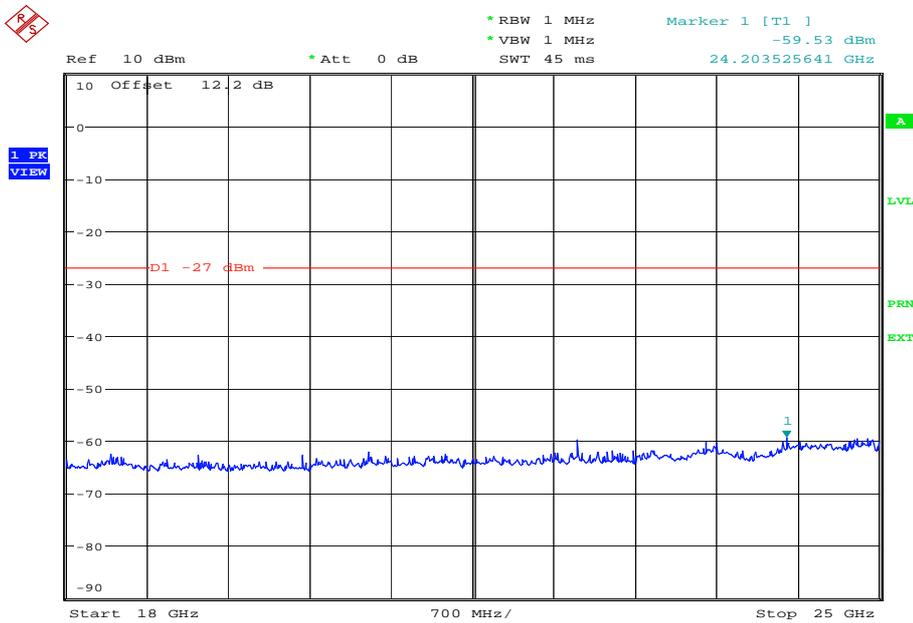
Product Service

12 GHz to 18 GHz



Date: 30.AUG.2012 14:38:11

18 GHz to 25 GHz

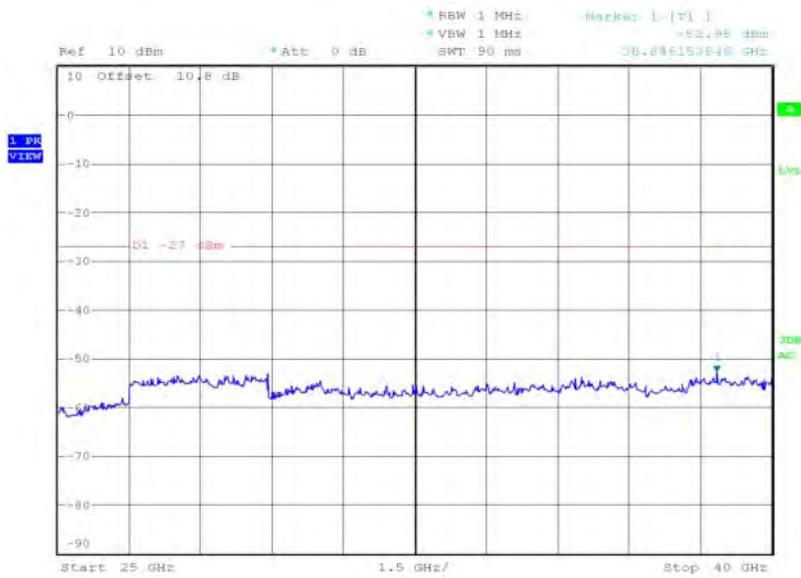


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Product Service

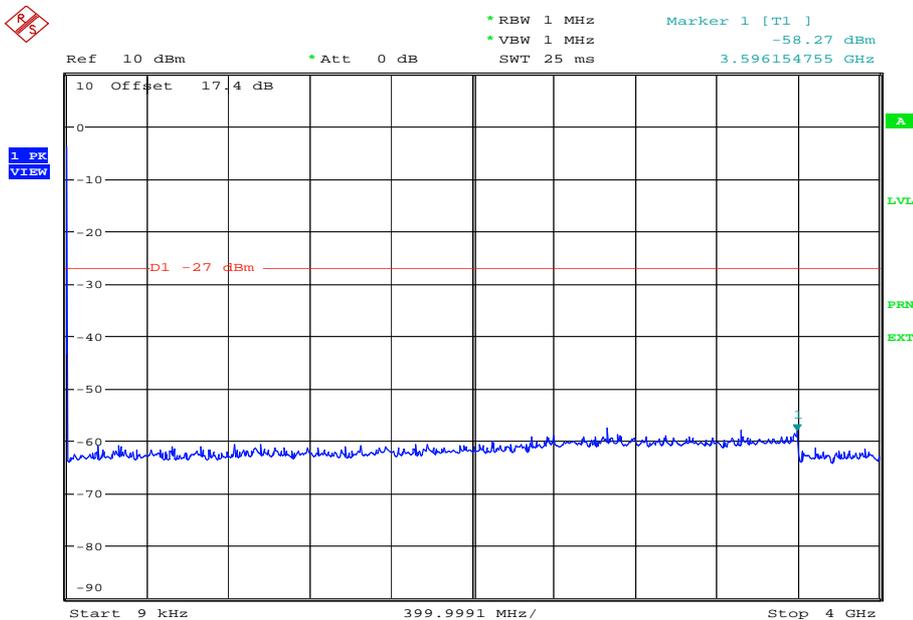
25 GHz to 40 GHz



Date: 30.AUG.2012 16:40:40

5700 MHz

9 kHz to 7 GHz

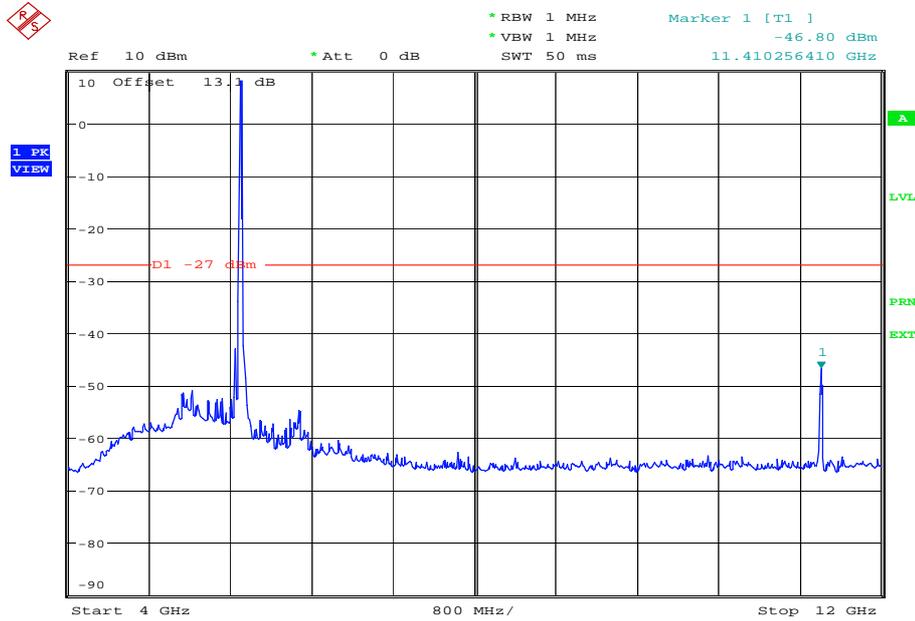


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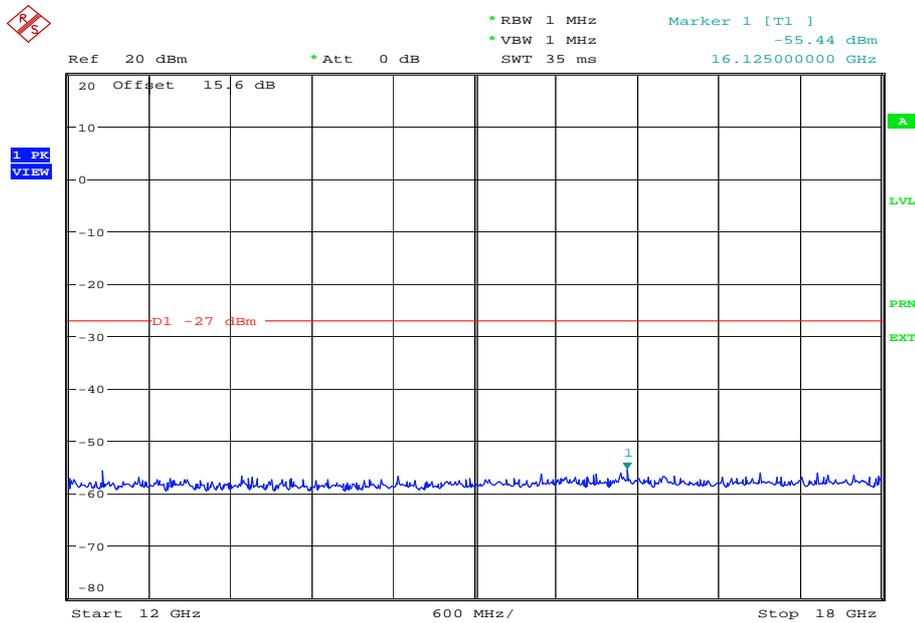
Product Service

7 GHz to 12 GHz



Date: 30.AUG.2012 12:54:02

12 GHz to 18 GHz

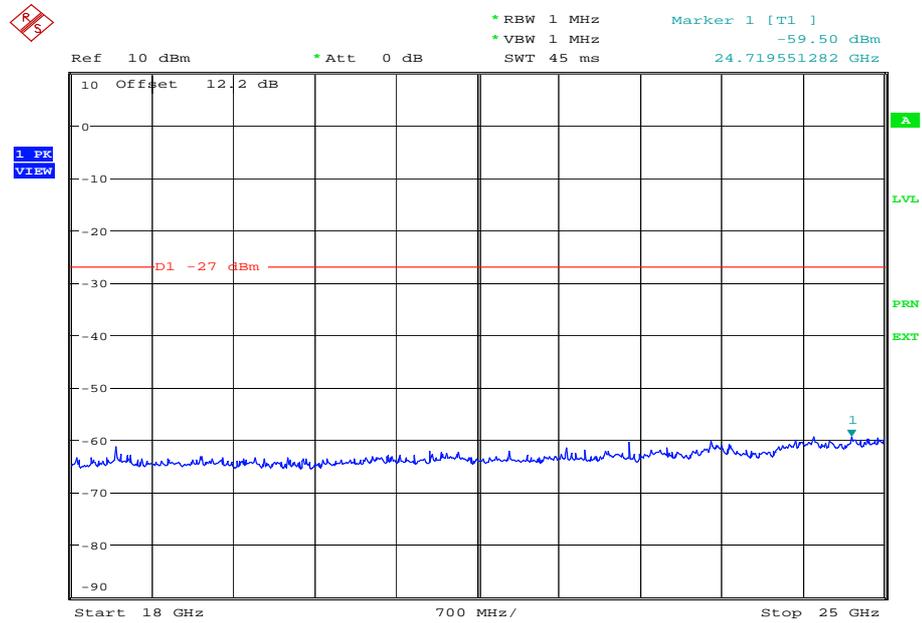


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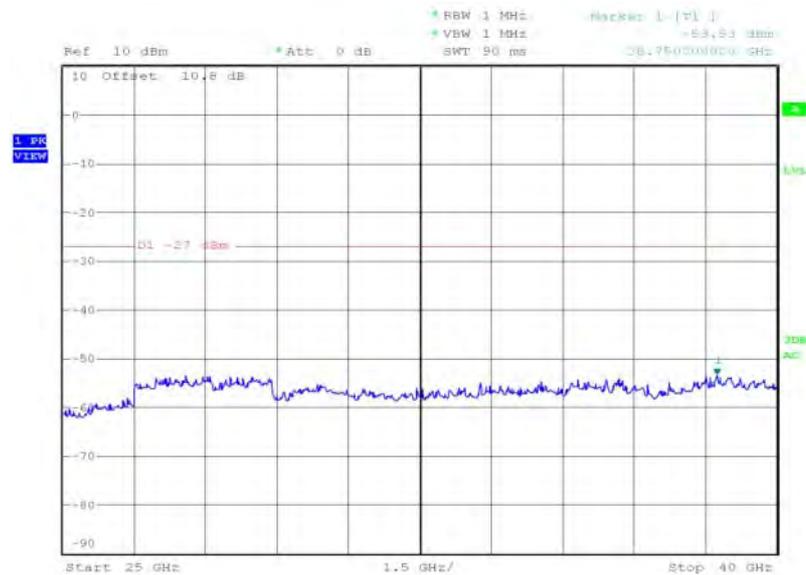
Product Service

18 GHz to 25 GHz



Date: 30.AUG.2012 15:17:23

25 GHz to 40 GHz



Date: 30.AUG.2012 16:41:34



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.



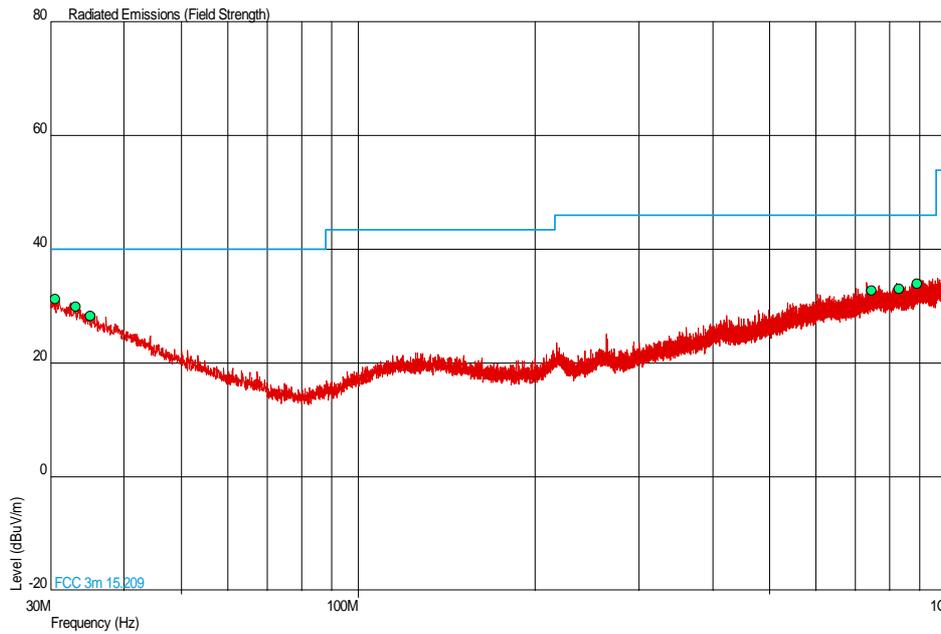
Product Service

Spurious Radiated Emissions

Frequency Band 1

5180 MHz

30 MHz to 1 GHz



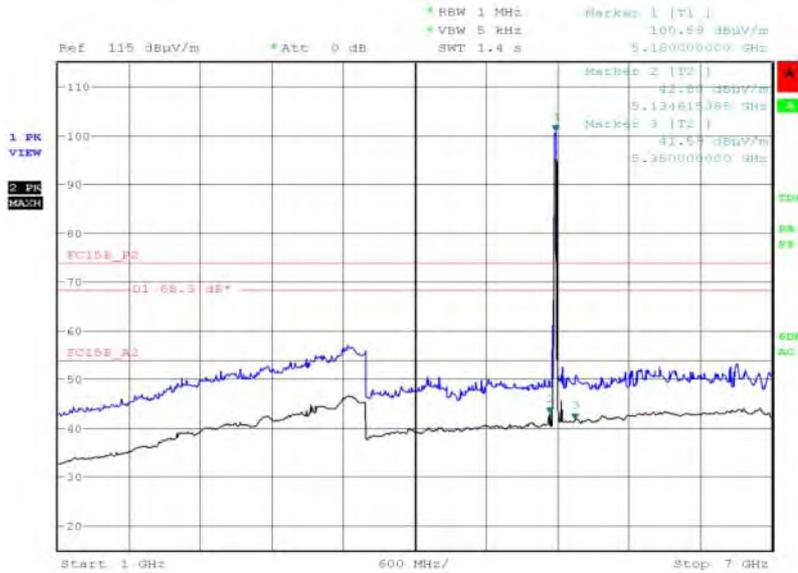
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.582	31.2	36.3	40.0	100	-8.8	63.7	90	1.00	Horizontal
33.153	29.9	31.3	40.0	100	-10.1	68.7	180	1.00	Horizontal
35.044	28.3	26.0	40.0	100	-11.7	74.0	90	1.00	Horizontal
745.860	32.7	43.2	46.0	200	-13.3	156.8	0	1.00	Vertical
831.269	33.1	45.2	46.0	200	-12.9	154.8	180	1.00	Horizontal
891.603	33.9	49.5	46.0	200	-12.1	150.5	180	1.00	Vertical



1 GHz to 40 GHz

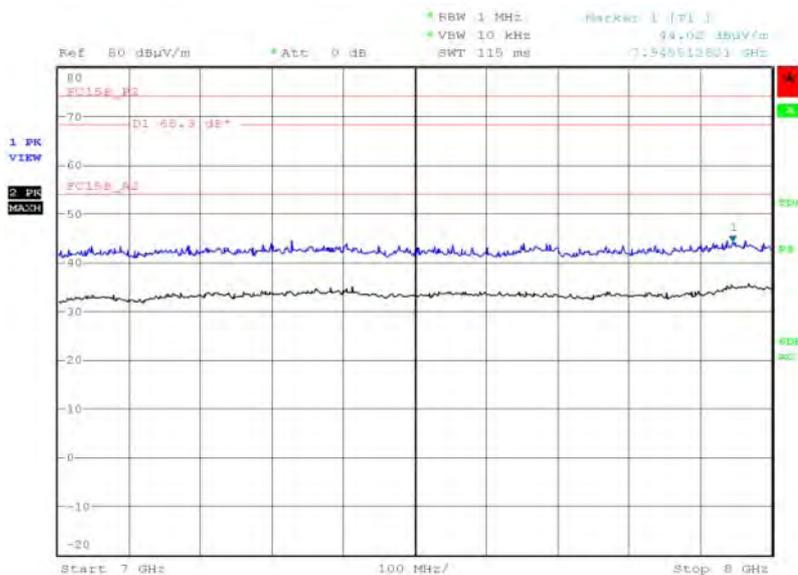
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.128	Vertical	150	228	55.41	44.10

1 GHz to 7 GHz



Date: 10.SEP.2012 17:23:34

7GHz to 8 GHz

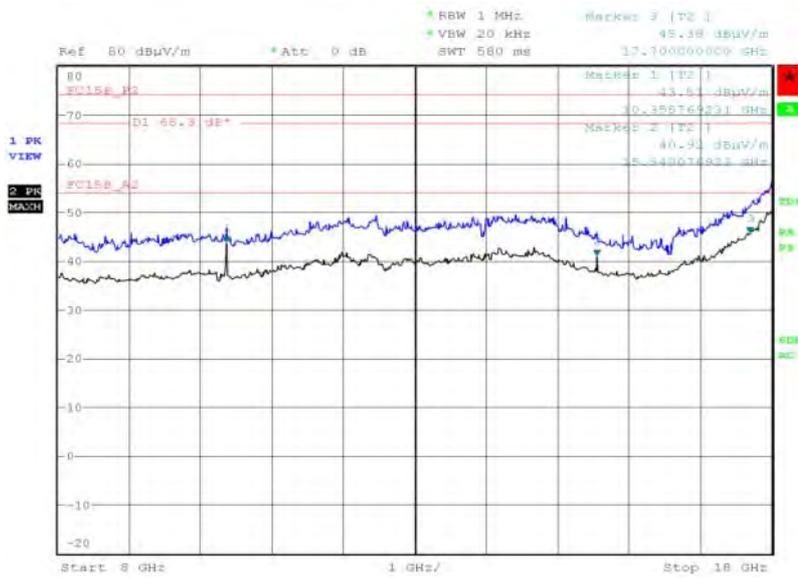


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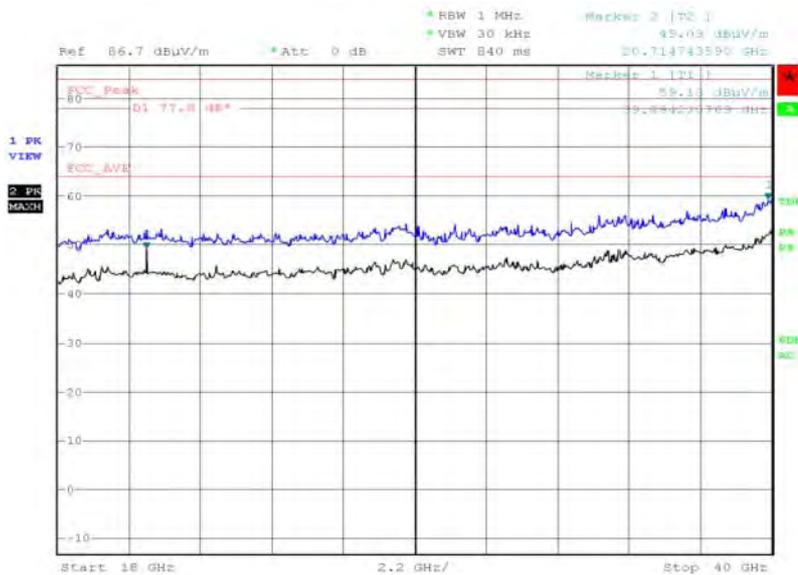
Product Service

8 GHz to 18 GHz



Date: 16.SEP.2012 08:40:14

18 GHz to 40 GHz

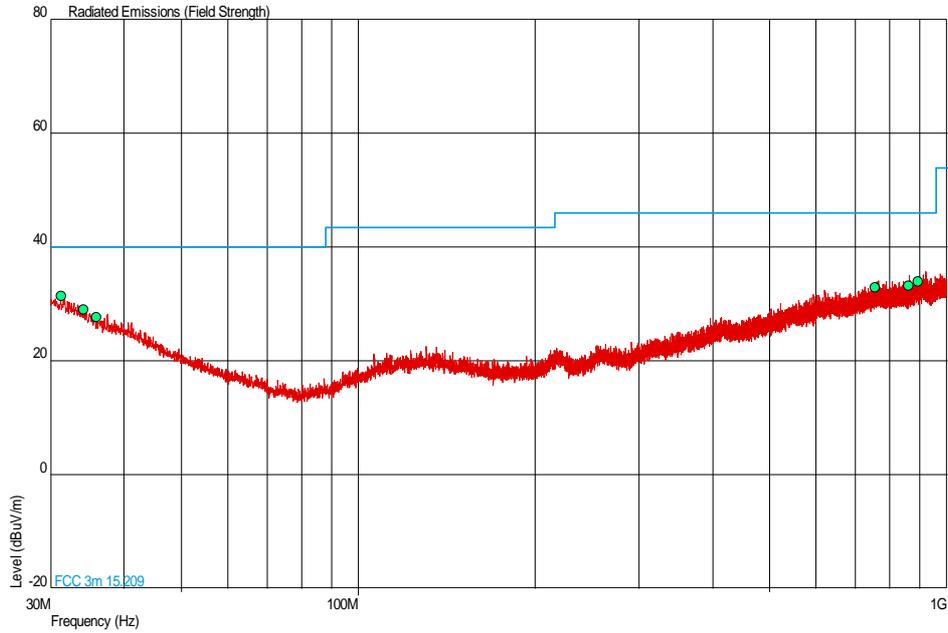


Date: 17.SEP.2012 19:51:23



5200 MHz

30 MHz to 1 GHz



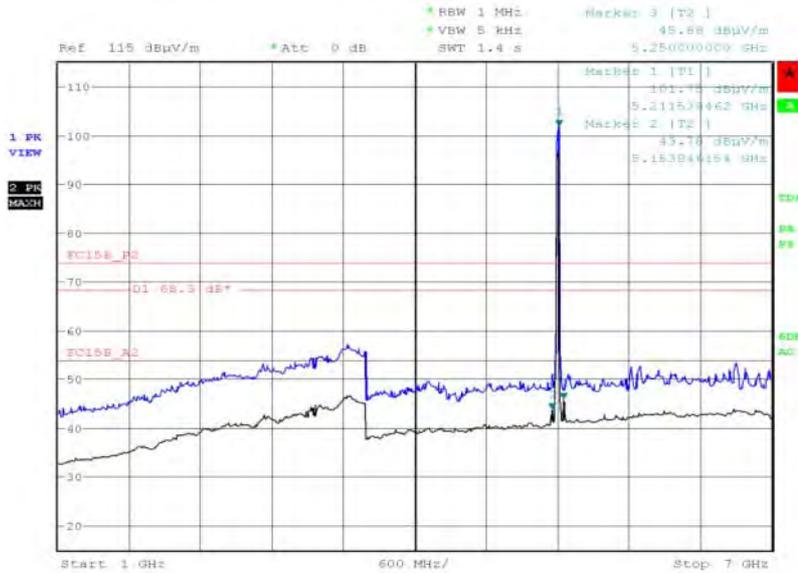
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
31.310	31.4	37.2	40.0	100	-8.6	62.8	90	1.00	Vertical
34.171	29.0	28.2	40.0	100	-11.0	71.8	180	1.00	Vertical
35.966	27.7	24.3	40.0	100	-12.3	75.7	0	1.00	Vertical
756.191	32.9	44.2	46.0	200	-13.1	155.8	180	1.00	Vertical
862.406	33.2	45.7	46.0	200	-12.8	154.3	90	1.00	Horizontal
893.979	34.0	50.1	46.0	200	-12.0	149.9	180	1.00	Horizontal



1 GHz to 40 GHz

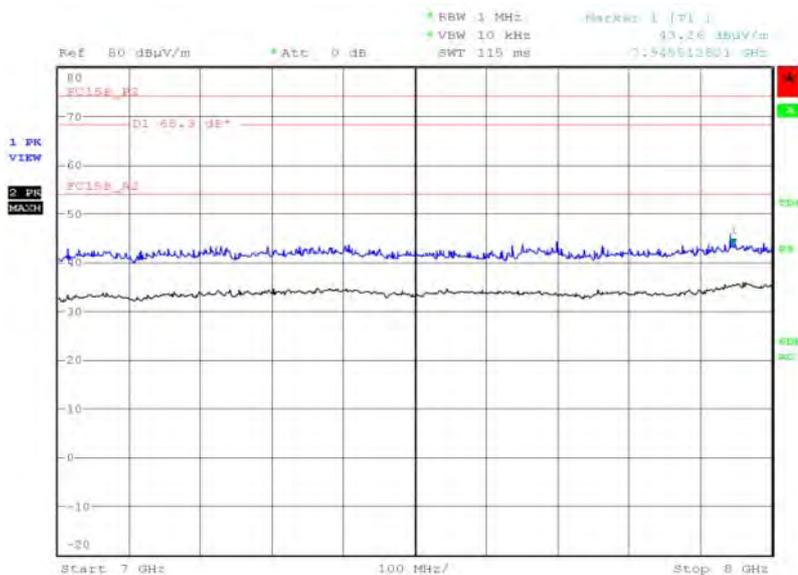
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.147	Vertical	162	248	55.57	44.04

1 GHz to 7 GHz



Date: 10.SEP.2012 17:54:52

7GHz to 8 GHz

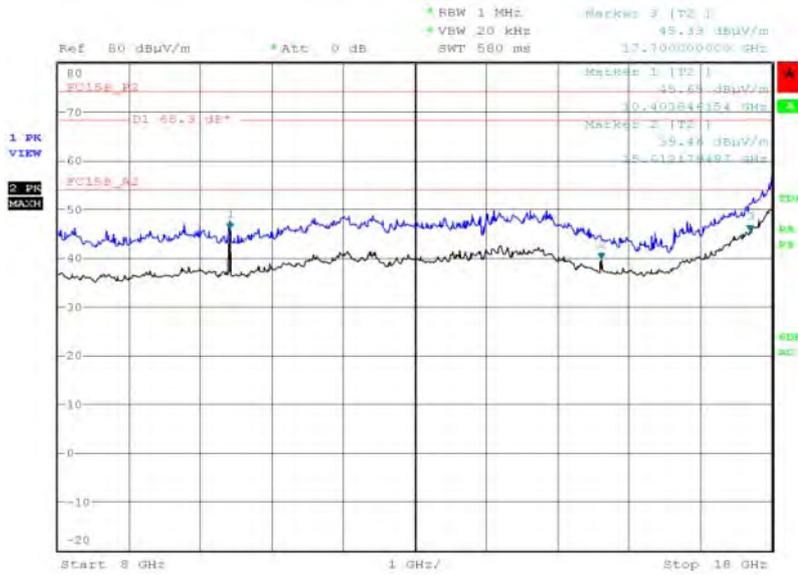


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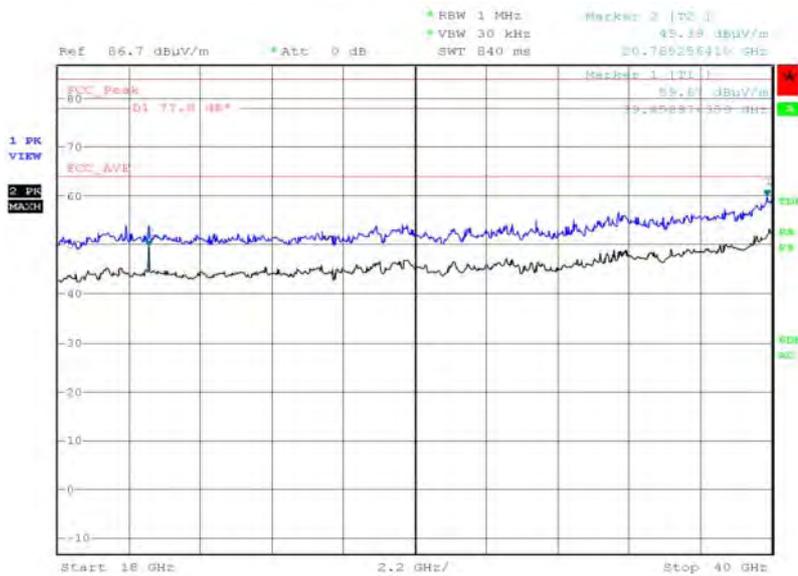
Product Service

8 GHz to 18 GHz



Date: 16.SEP.2012 08:49:49

18 GHz to 40 GHz

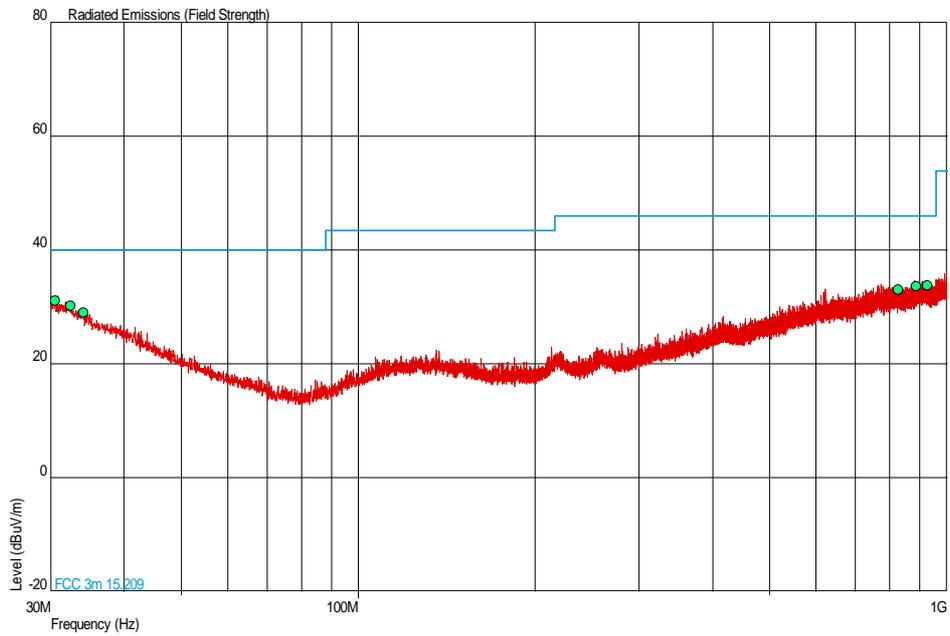


Date: 17.SEP.2012 19:54:48



5240 MHz

30 MHz to 1 GHz

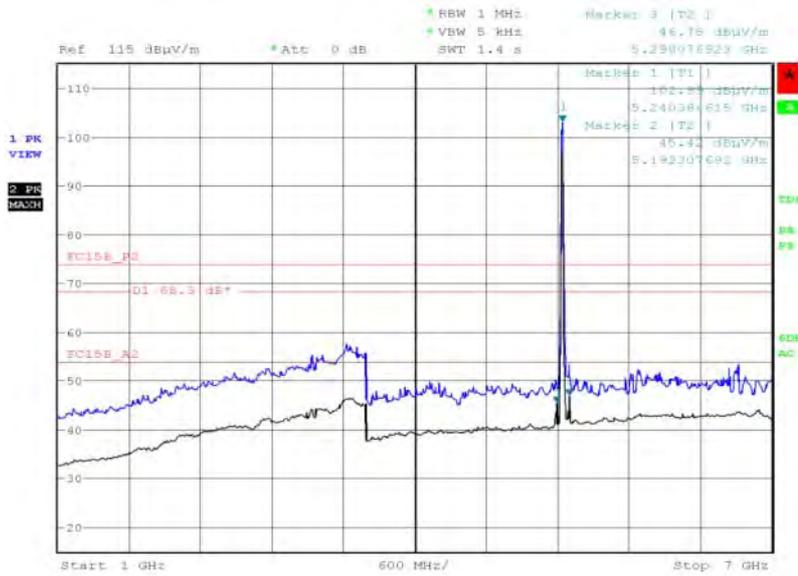


Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.582	31.2	36.3	40.0	100	-8.8	63.7	90	1.00	Horizontal
32.425	30.2	32.4	40.0	100	-9.8	67.6	0	1.00	Horizontal
34.123	29.1	28.5	40.0	100	-10.9	71.5	90	1.00	Vertical
826.467	33.0	44.7	46.0	200	-13.0	155.3	90	1.00	Vertical
886.413	33.7	48.4	46.0	200	-12.3	151.6	90	1.00	Vertical
926.377	33.8	49.0	46.0	200	-12.2	151.0	180	1.00	Vertical



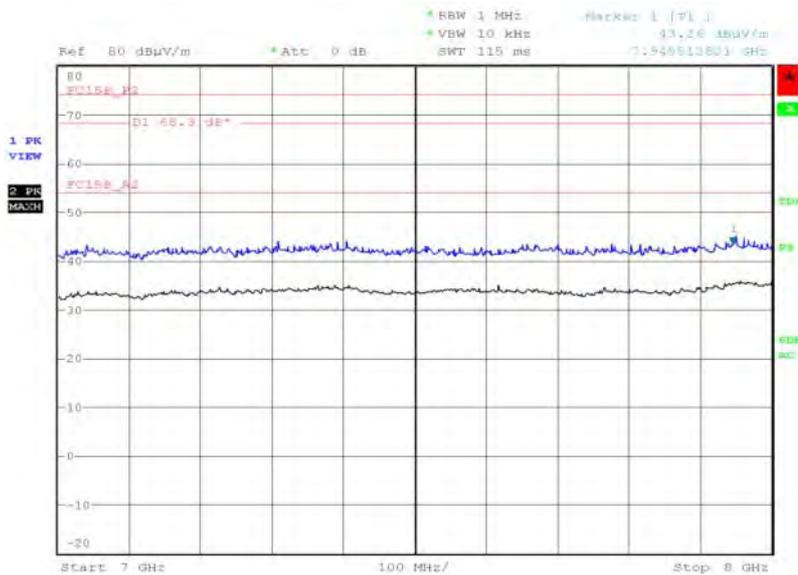
Product Service

1 GHz to 7 GHz



Date: 10.SEP.2012 18:14:57

7GHz to 8 GHz

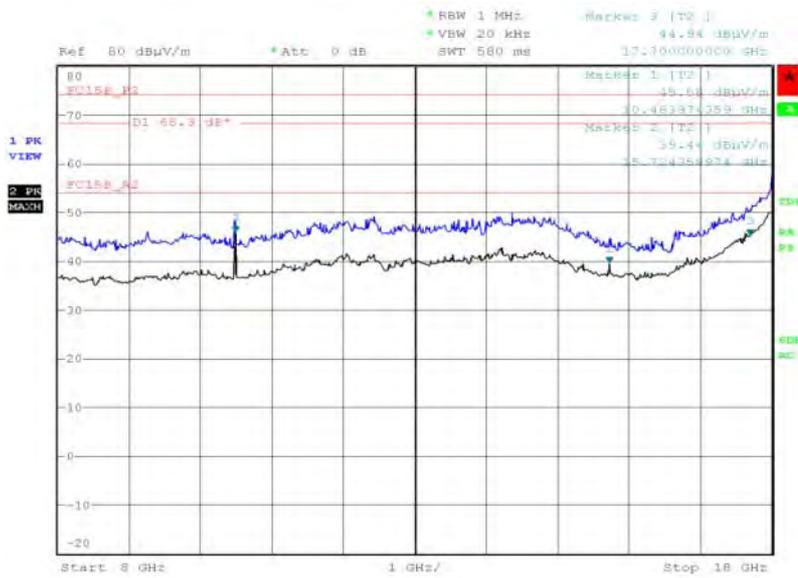


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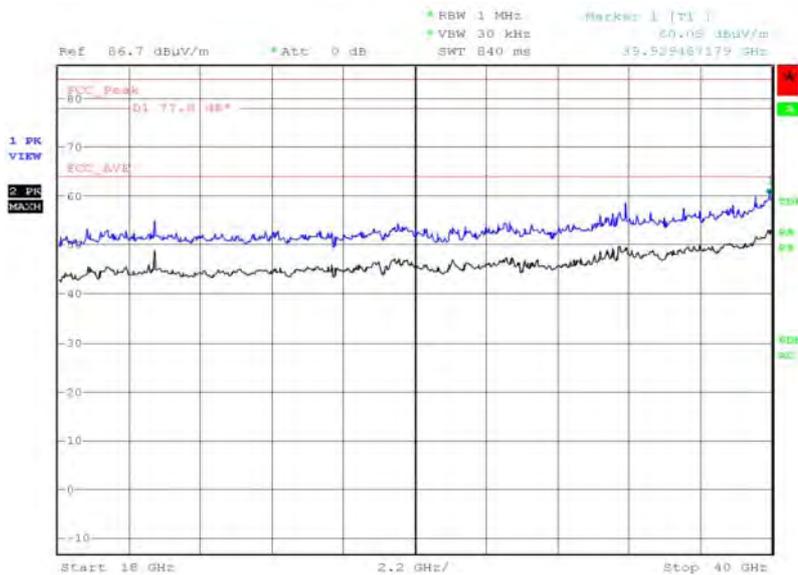
Product Service

8 GHz to 18 GHz



Date: 16.SEP.2012 08:58:34

18 GHz to 40 GHz



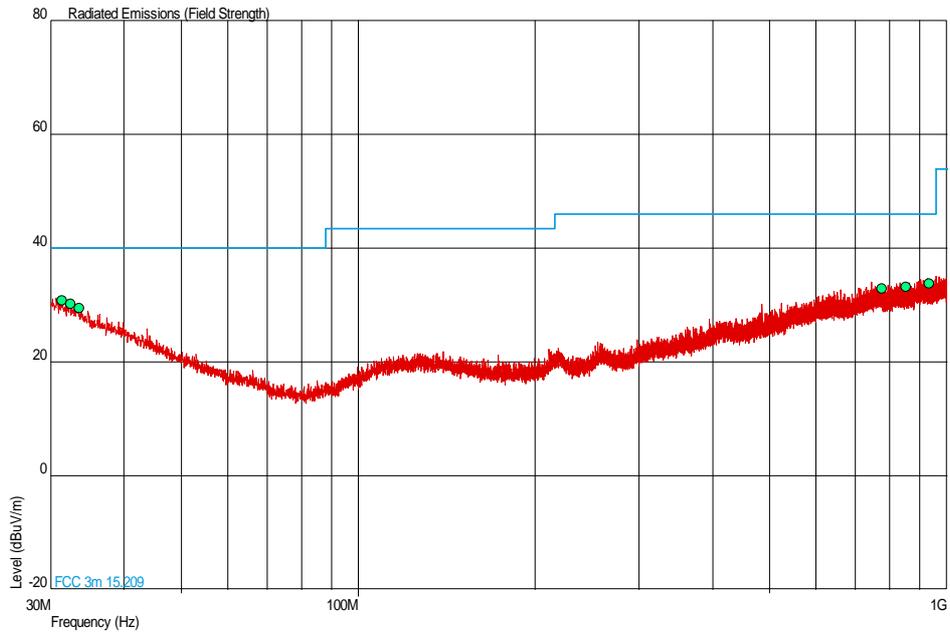
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Frequency Band 2

5260 MHz

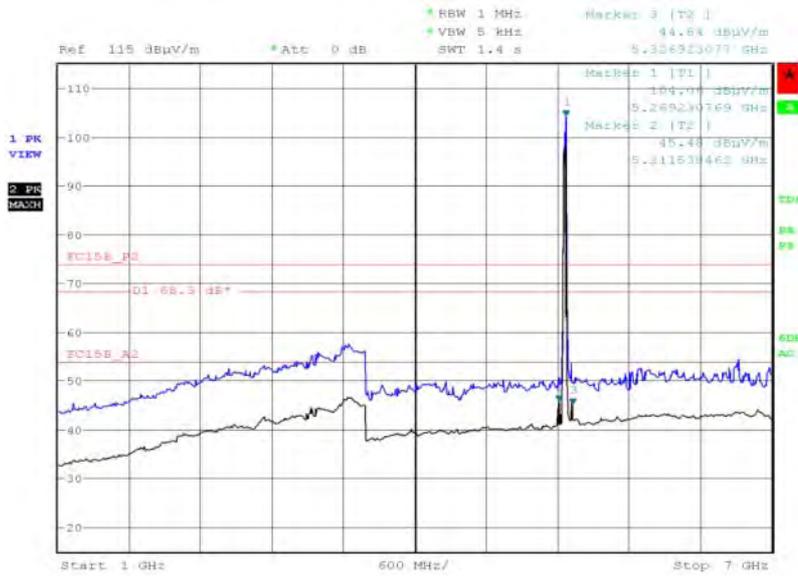
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
31.407	30.7	36.3	40.0	100	-9.3	63.7	0	1.00	Vertical
32.474	30.2	32.4	40.0	100	-9.8	67.6	0	1.00	Vertical
33.541	29.5	28.5	40.0	100	-10.5	71.5	0	1.00	Vertical
774.912	33.0	44.7	46.0	200	-13.0	155.3	180	1.00	Horizontal
852.851	33.1	48.4	46.0	200	-12.9	151.6	180	1.00	Vertical
932.488	33.8	49.0	46.0	200	-12.2	151.0	0	1.00	Horizontal

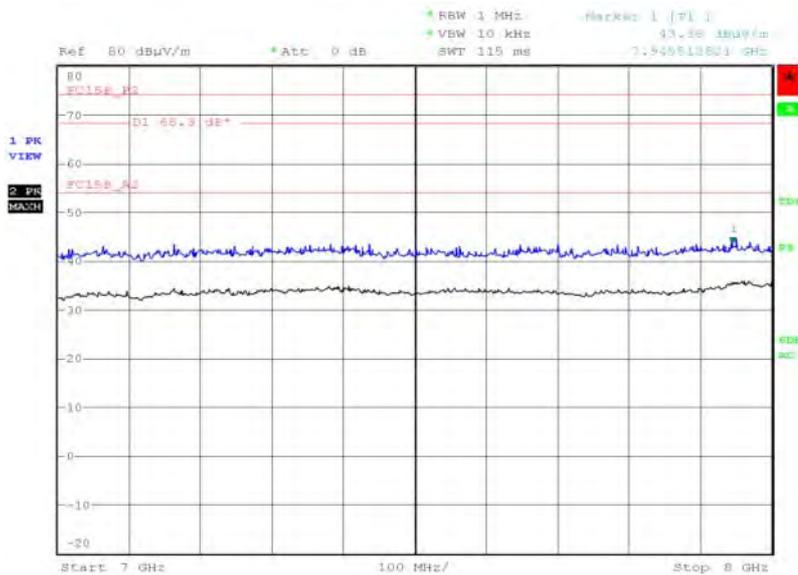


1 GHz to 7 GHz



Date: 10.SEP.2012 18:37:43

7GHz to 8 GHz

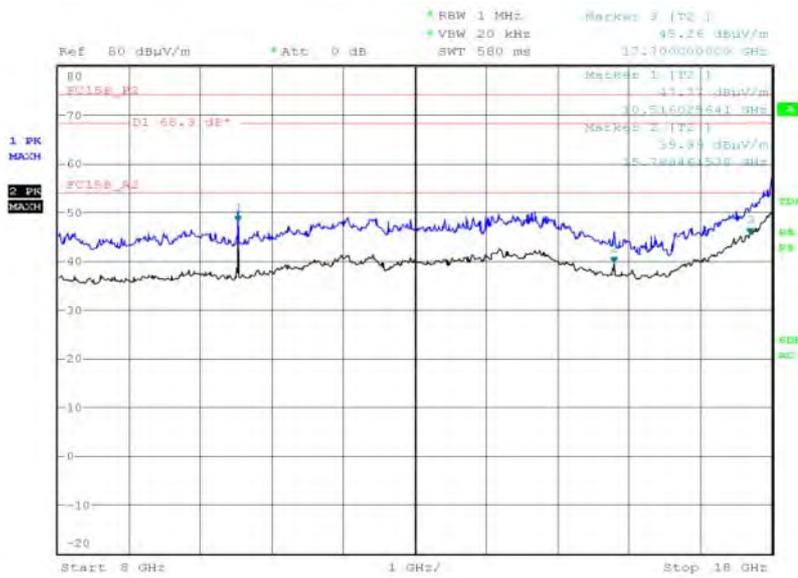


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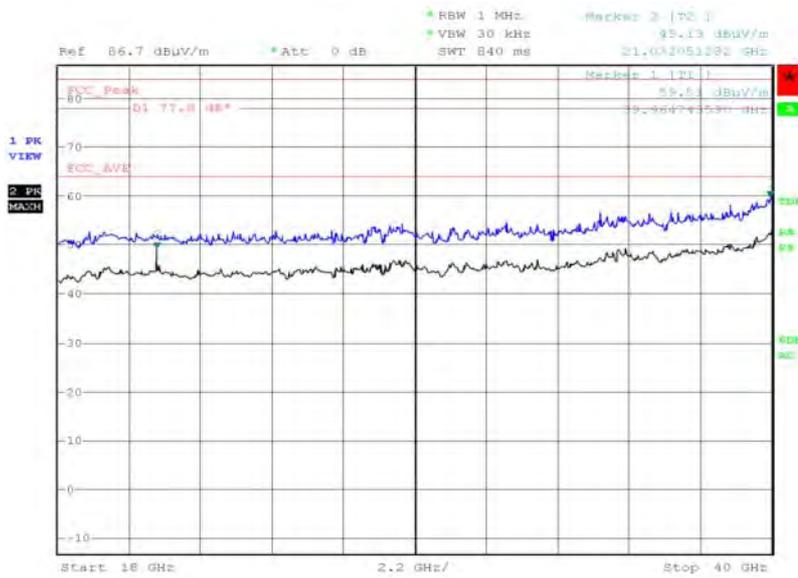
Product Service

8 GHz to 18 GHz



Date: 16.SEP.2012 09:06:05

18 GHz to 40 GHz

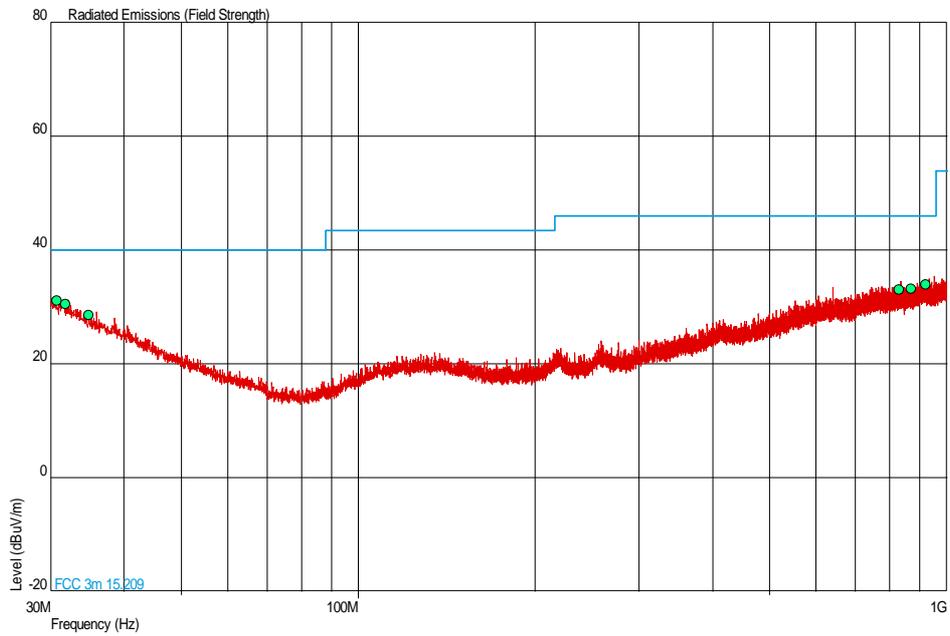


Date: 17.SEP.2012 20:06:51



5300 MHz

30 MHz to 1 GHz



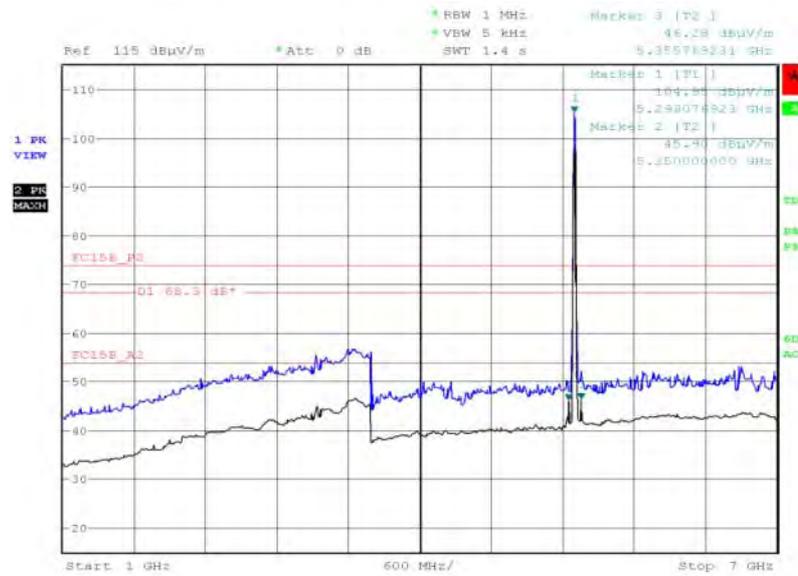
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.776	31.1	35.9	40.0	100	-8.9	64.1	90	1.00	Horizontal
31.843	30.5	33.5	40.0	100	-9.5	66.5	180	1.00	Horizontal
34.802	28.5	26.6	40.0	100	-11.5	73.4	180	1.00	Vertical
831.220	33.0	44.7	46.0	200	-13.0	155.3	0	1.00	Horizontal
869.584	33.2	45.7	46.0	200	-12.8	154.3	180	1.00	Horizontal
920.509	34.0	50.1	46.0	200	-12.0	149.9	90	1.00	Vertical



1 GHz to 40 GHz

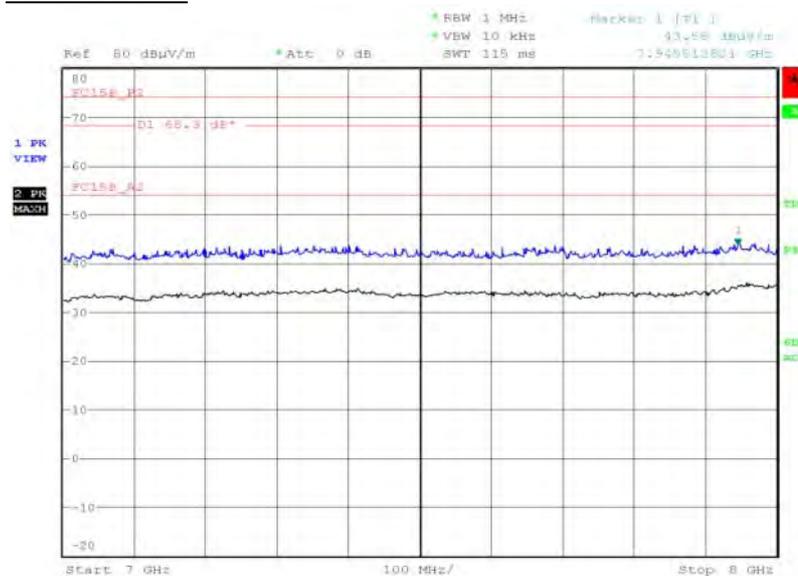
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.352	Vertical	112	209	57.12	46.09
10.600	Horizontal	120	164	55.93	50.98

1 GHz to 7 GHz



Date: 10.SEP.2012 19:31:35

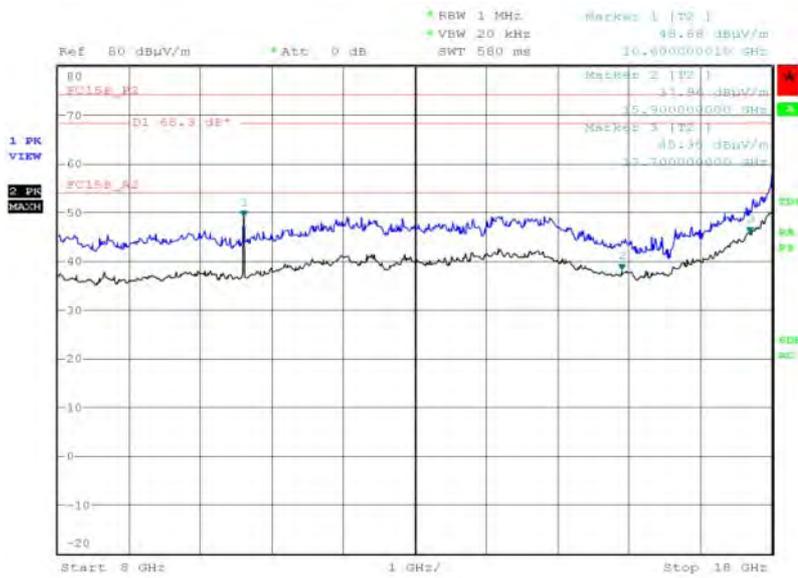
7GHz to 8 GHz



Date: 10.SEP.2012 22:07:35

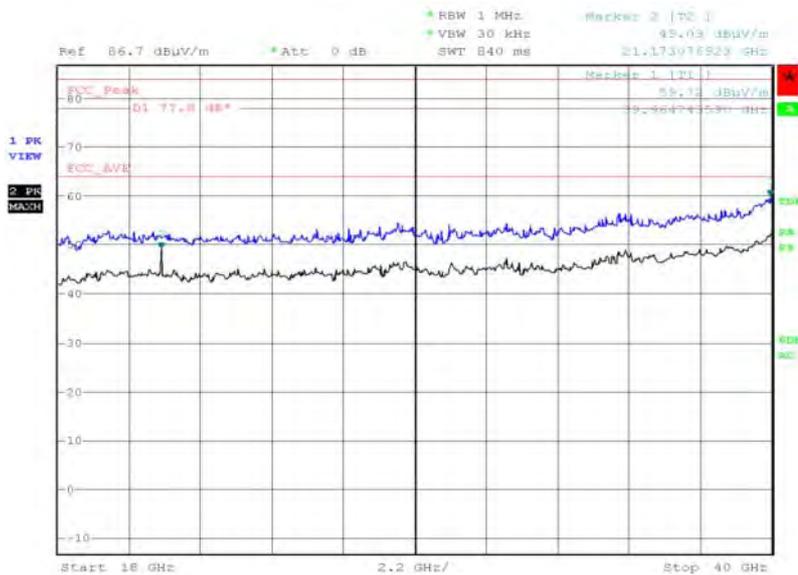


8 GHz to 18 GHz



Date: 16.SEP.2012 09:15:35

18 GHz to 40 GHz

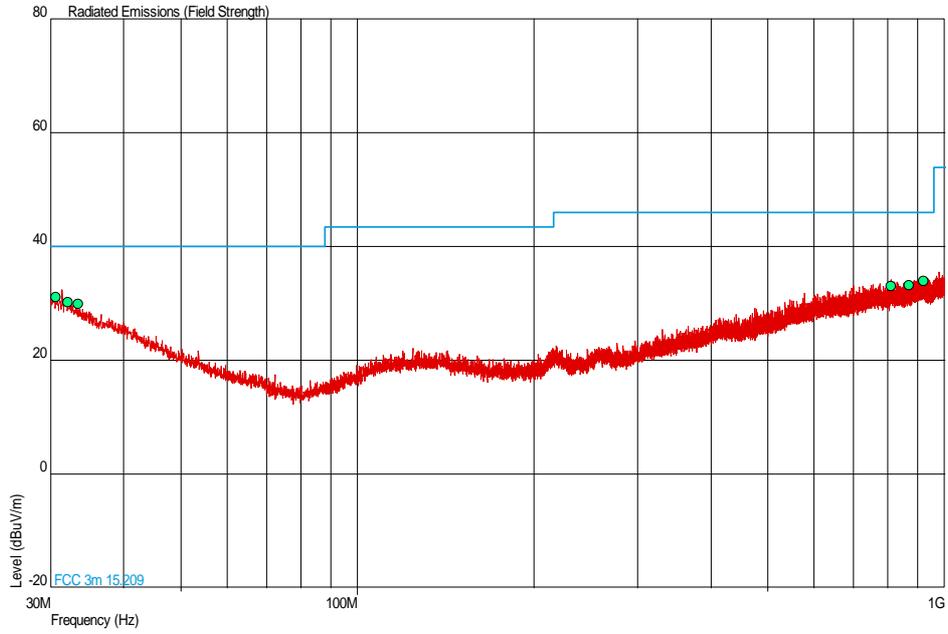


Date: 17.SEP.2012 20:10:36



5320 MHz

30 MHz to 1 GHz



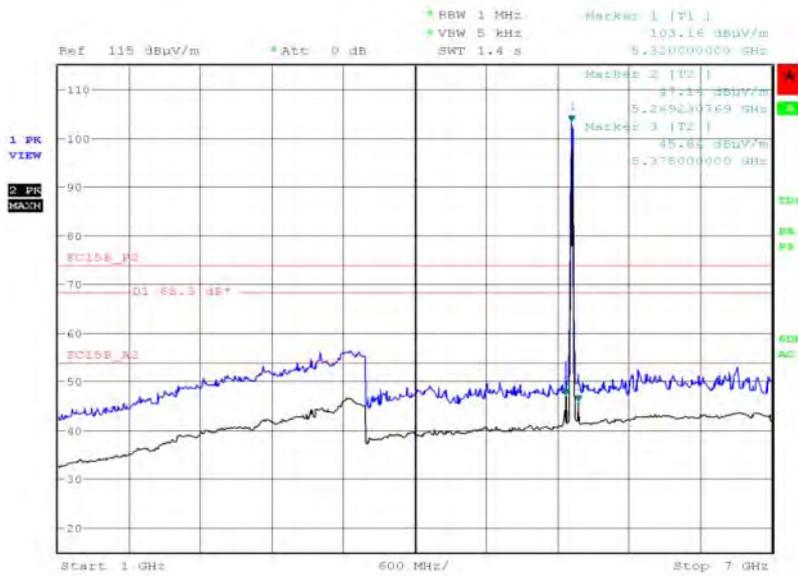
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.631	31.2	36.3	40.0	100	-8.8	63.7	0	1.00	Horizontal
32.183	30.3	32.7	40.0	100	-9.7	67.3	0	1.00	Horizontal
33.444	30.0	31.6	40.0	100	-10.0	68.4	0	1.00	Horizontal
810.705	33.0	44.7	46.0	200	-13.0	155.3	0	1.00	Vertical
869.487	33.3	46.2	46.0	200	-12.7	153.8	0	1.00	Vertical
920.460	34.0	50.1	46.0	200	-12.0	149.9	0	1.00	Vertical



1 GHz to 40 GHz

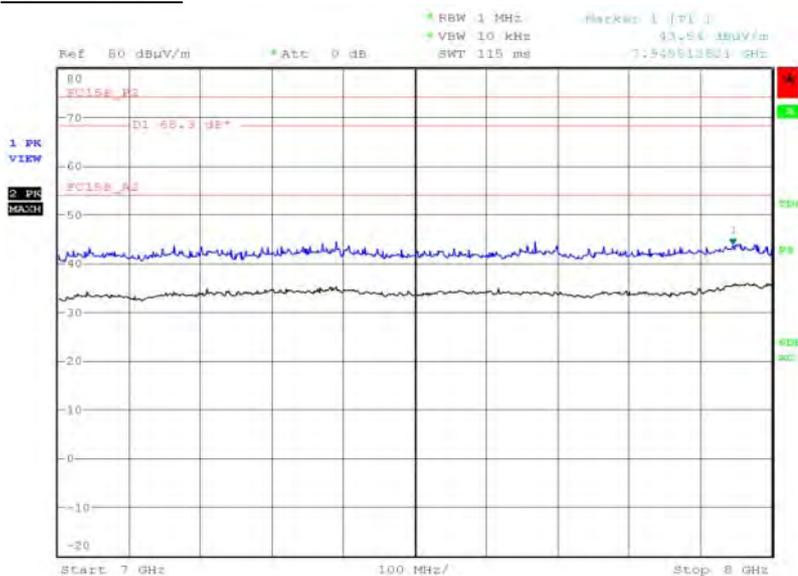
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.372	Vertical	155	203	57.37	46.13
10.640	Horizontal	112	166	55.83	50.78

1 GHz to 7 GHz



Date: 10.SEP.2012 19:51:35

7GHz to 8 GHz

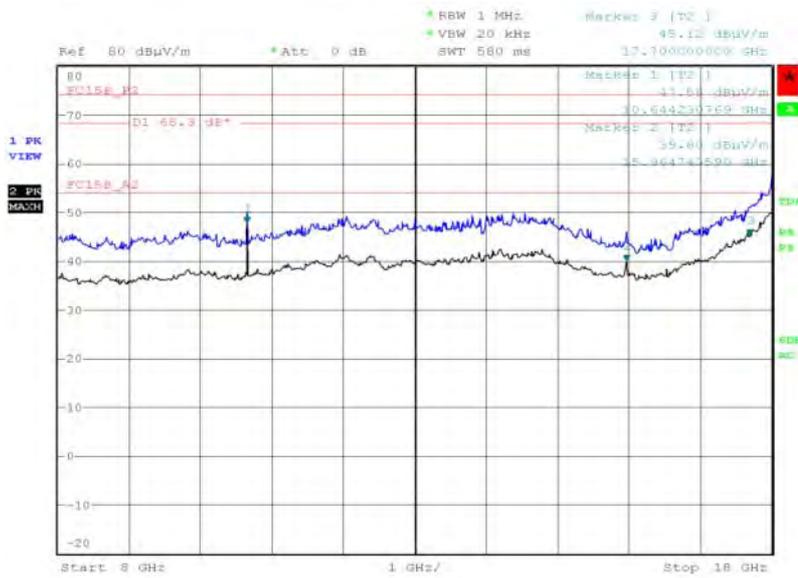


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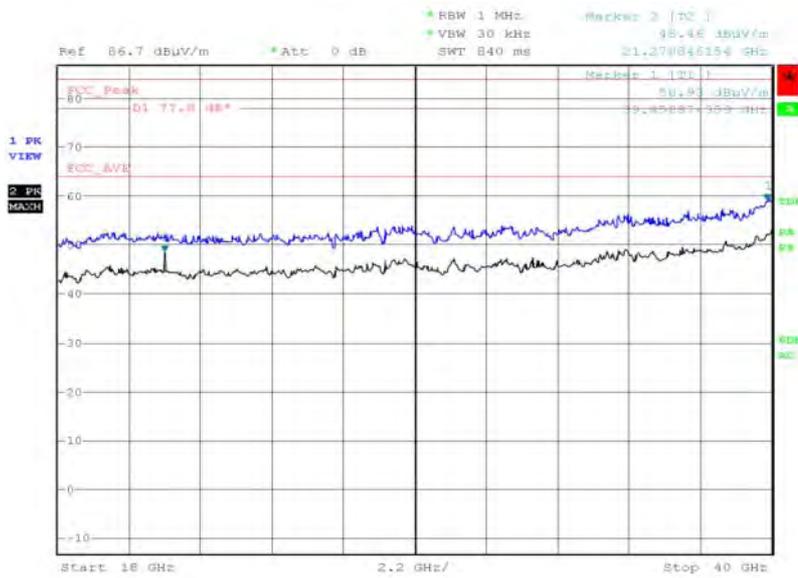
Product Service

8 GHz to 18 GHz



Date: 16.SEP.2012 09:38:05

18 GHz to 40 GHz



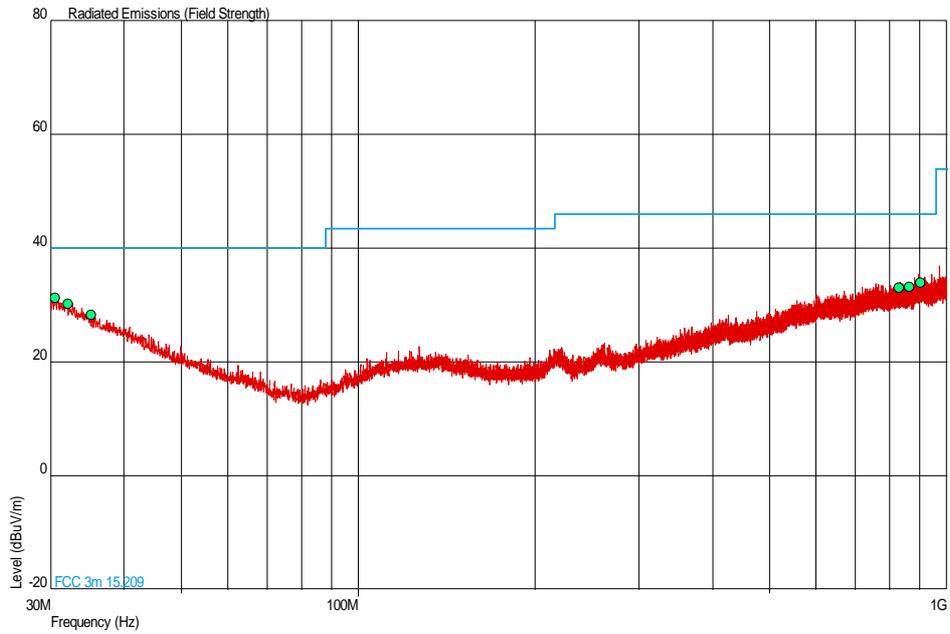
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Frequency Band 3

5500 MHz

30 MHz to 1 GHz



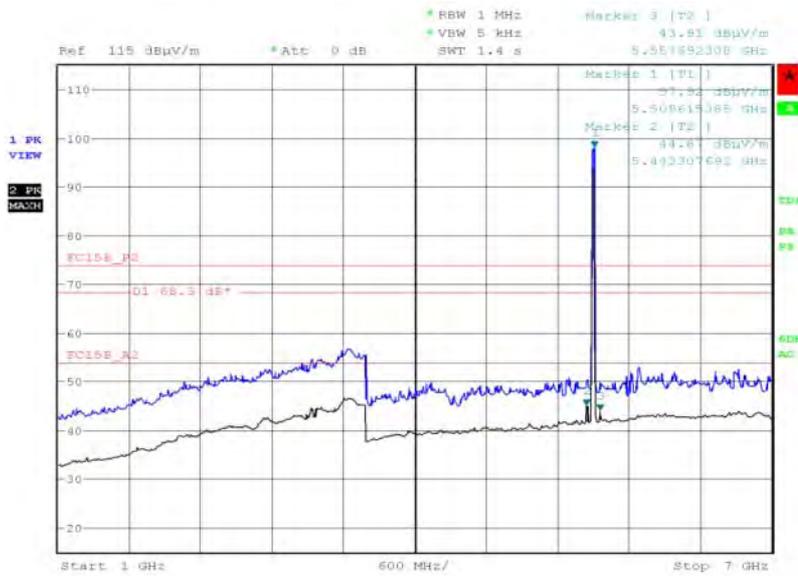
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.579	31.2	36.3	40.0	100	-8.8	63.7	0	0.00	Horizontal
32.183	30.3	32.7	40.0	100	-9.7	67.3	90	1.00	Horizontal
35.141	28.3	26.0	40.0	100	-11.7	74.0	90	1.00	Horizontal
829.135	33.0	44.7	46.0	200	-13.0	155.3	180	1.00	Vertical
862.842	33.2	45.7	46.0	200	-12.8	154.3	180	1.00	Vertical
903.437	34.0	50.1	46.0	200	-12.0	149.9	180	1.00	Vertical



1 GHz to 40 GHz

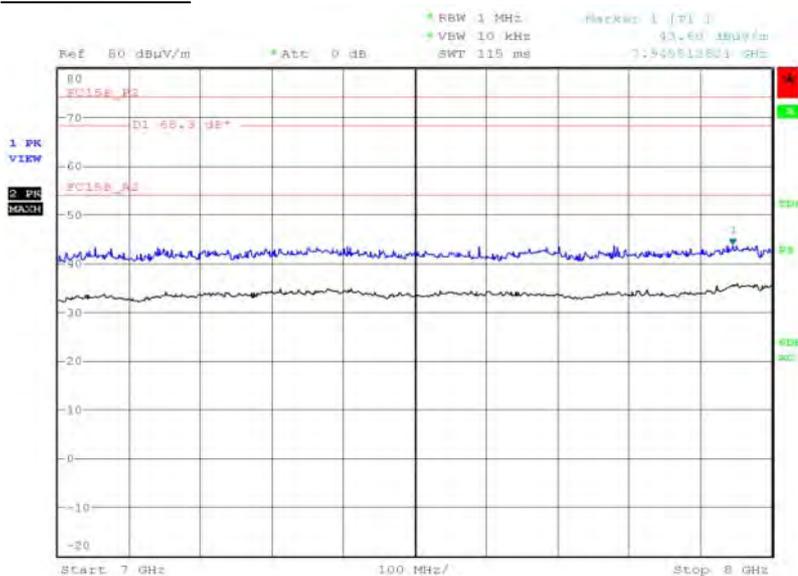
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.448	Vertical	125	152	56.83	45.44
11.000	Horizontal	100	166	53.54	47.60

1 GHz to 7 GHz



Date: 10.SEP.2012 20:22:17

7 GHz to 8 GHz

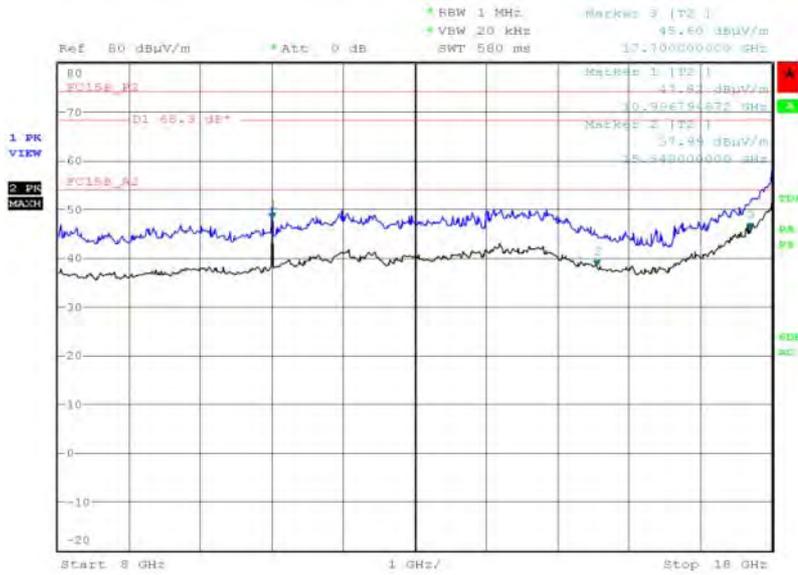


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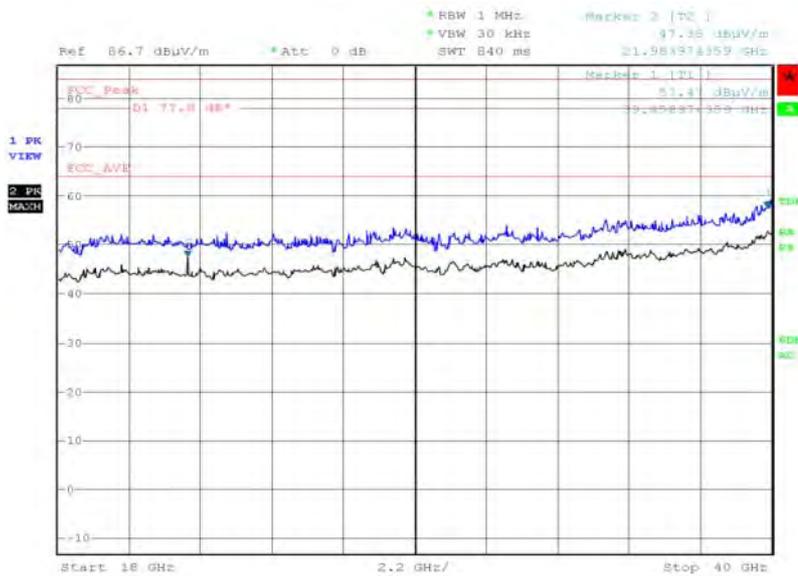


Product Service

8 GHz to 18 GHz



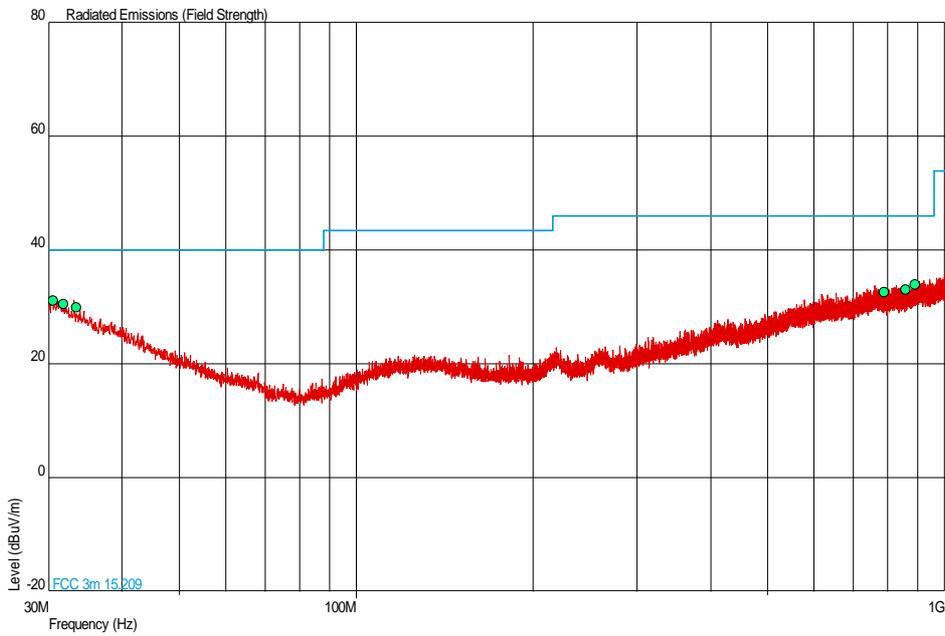
18 GHz to 40 GHz





5600 MHz

30 MHz to 1 GHz



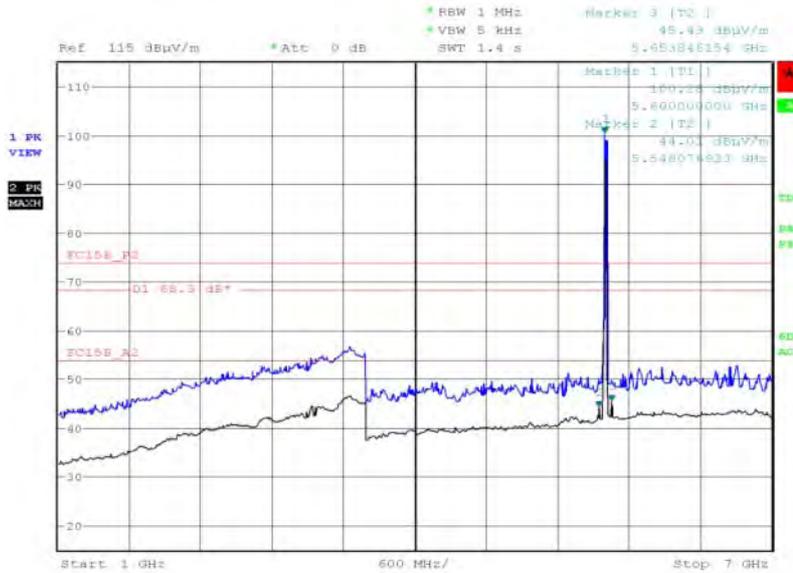
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.582	31.2	36.3	40.0	100	-8.8	63.7	0	1.00	Horizontal
31.795	30.5	33.5	40.0	100	-9.5	66.5	0	1.00	Horizontal
33.444	30.0	31.6	40.0	100	-10.0	68.4	0	1.00	Horizontal
789.898	32.6	42.7	46.0	200	-13.4	157.3	180	1.00	Vertical
858.671	33.0	44.7	46.0	200	-13.0	155.3	90	1.00	Horizontal
891.991	33.9	49.5	46.0	200	-12.1	150.5	180	1.00	Vertical



1GHz to 40 GHz

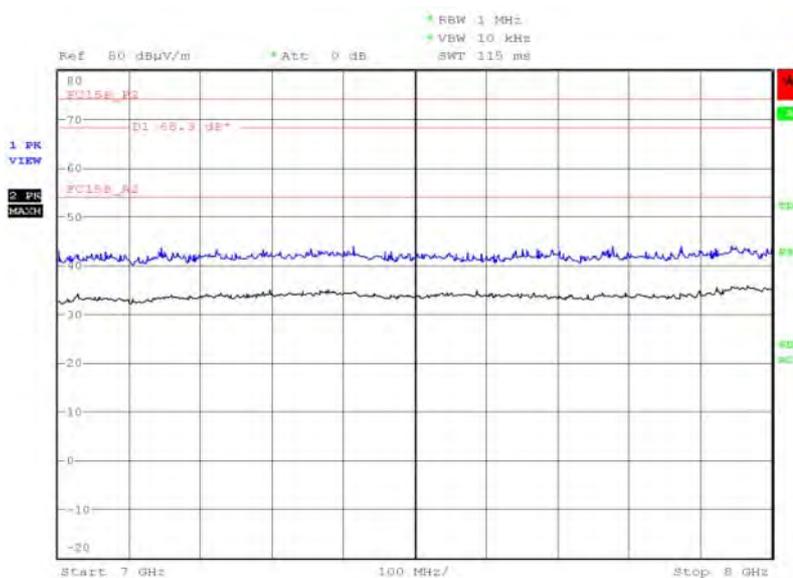
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.200	Horizontal	100	170	54.35	47.88

1 GHz to 7 GHz



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

7GHz to 8 GHz

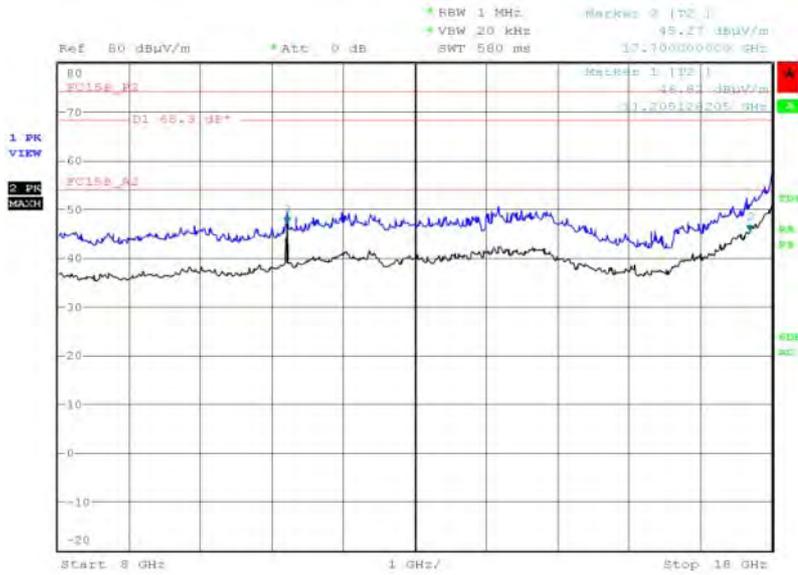


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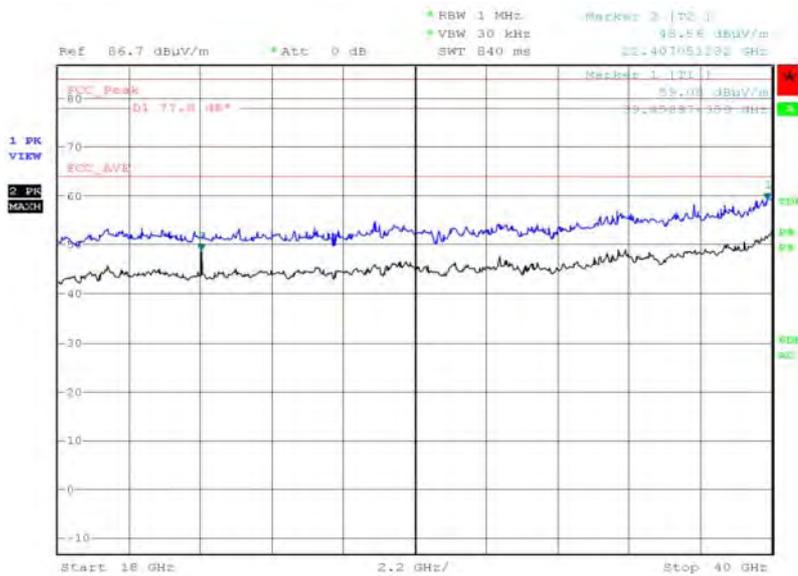
Product Service

8 GHz to 18 GHz



Date: 16.SEP.2012 10:33:09

18 GHz to 40 GHz

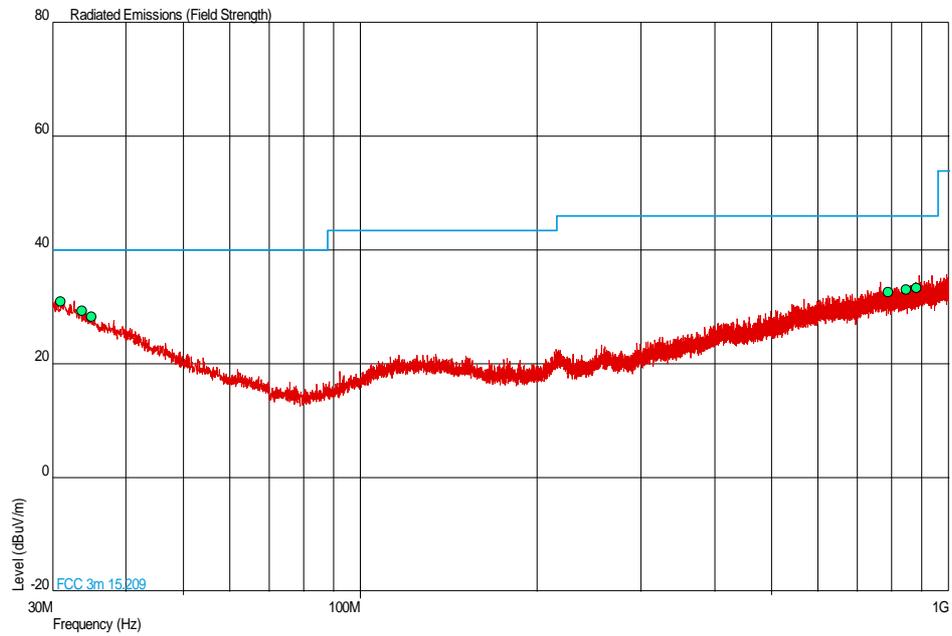


Date: 17.SEP.2012 20:25:34



5700 MHz

30 MHz to 1 GHz



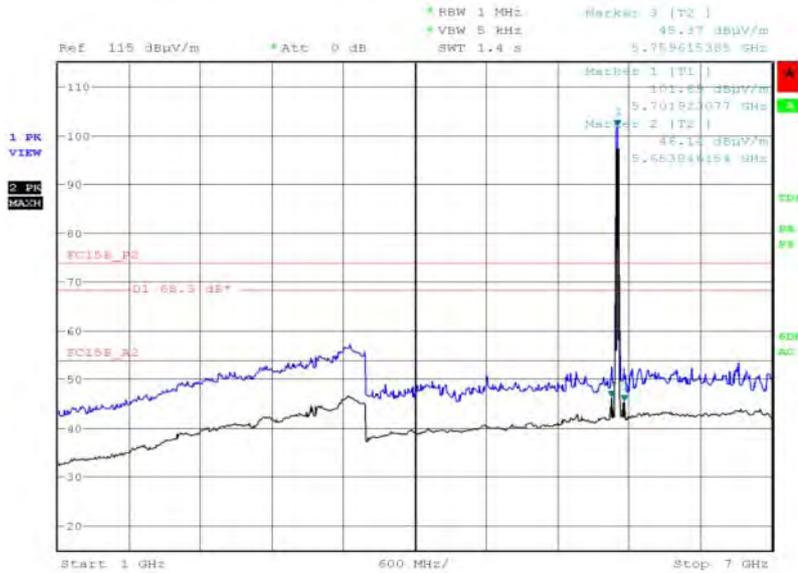
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
31.019	31.0	35.5	40.0	100	-9.0	64.5	180	1.00	Horizontal
33.638	29.4	29.5	40.0	100	-10.6	70.5	180	1.00	Horizontal
34.996	28.4	26.3	40.0	100	-11.6	73.7	180	1.00	Horizontal
789.898	32.6	42.7	46.0	200	-13.4	157.3	0	1.00	Vertical
847.662	33.0	44.7	46.0	200	-13.0	155.3	180	1.00	Vertical
880.351	33.4	46.8	46.0	200	-12.6	153.2	90	1.00	Vertical



1 GHz to 40 GHz

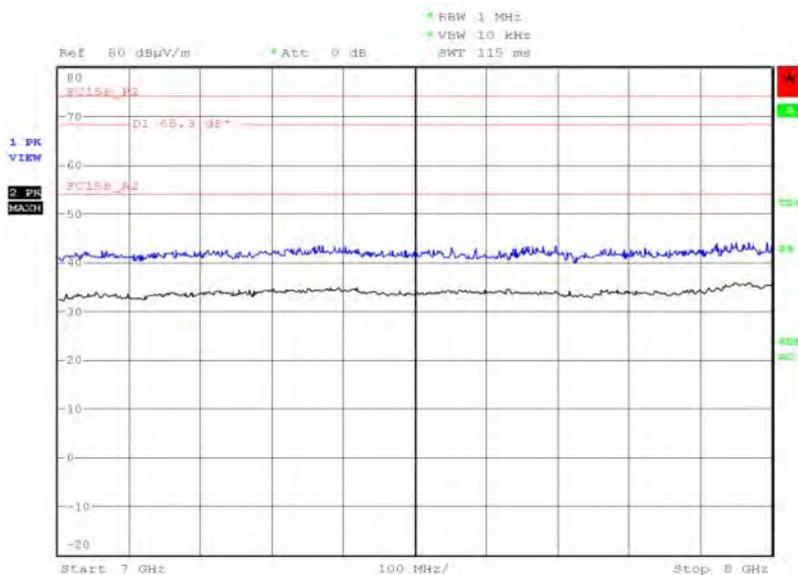
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
11.400	Horizontal	102	223	54.74	49.92

1 GHz to 7 GHz



Date: 10.SEP.2012 21:04:02

7GHz to 8 GHz

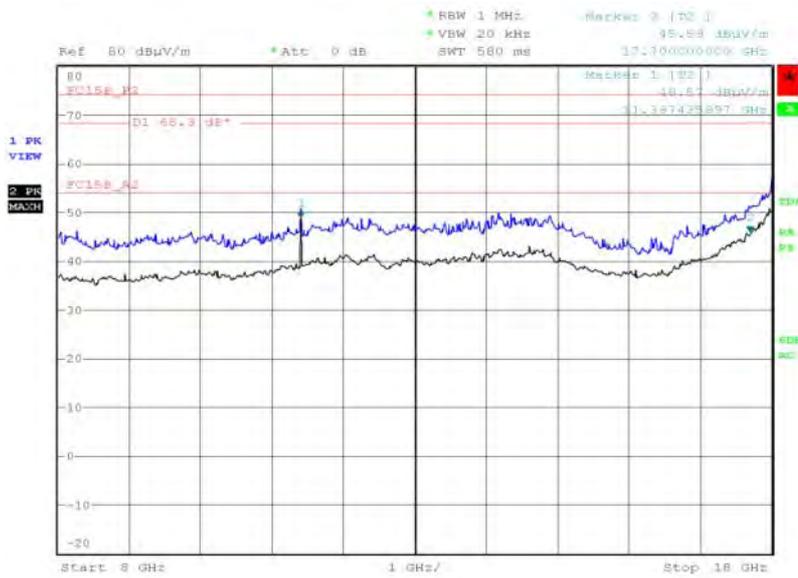


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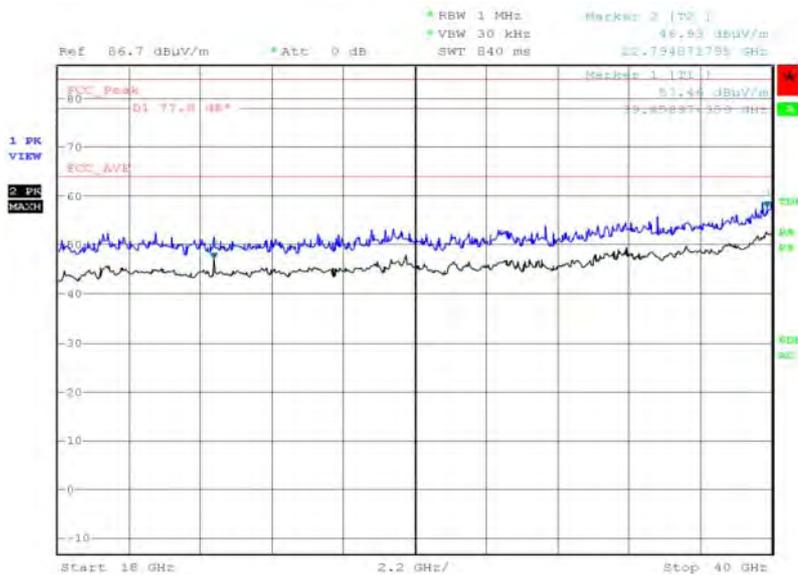
Product Service

8 GHz to 18 GHz



Date: 16.SEP.2012 10:51:44

18 GHz to 40 GHz



Date: 17.SEP.2012 20:32:18

Limit

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

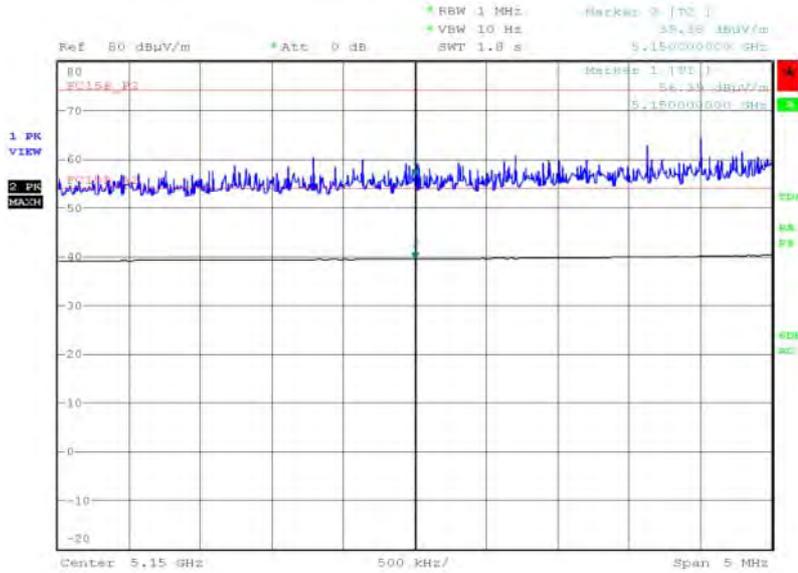


Product Service

Band Edge Emissions

5180 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	56.39	39.35



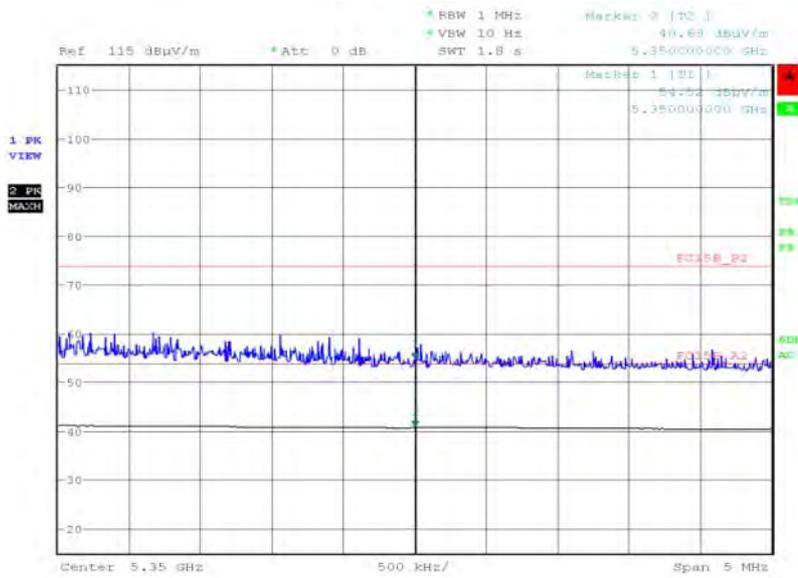
Date: 10.SEP.2012 17:37:25



Product Service

5320 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	54.52	40.69

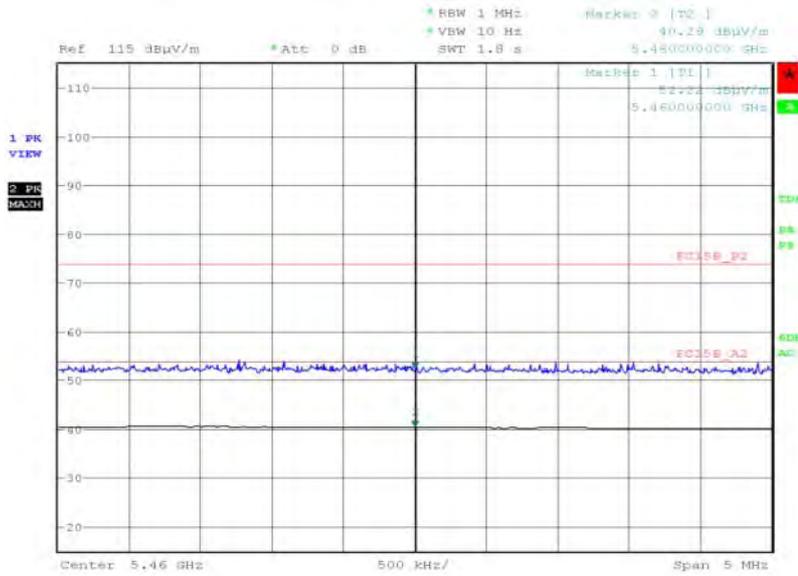


Date: 10.SEP.2012 20:05:09



5500 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	52.22	40.29



Date: 10.SEP.2012 20:36:31

Limit

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



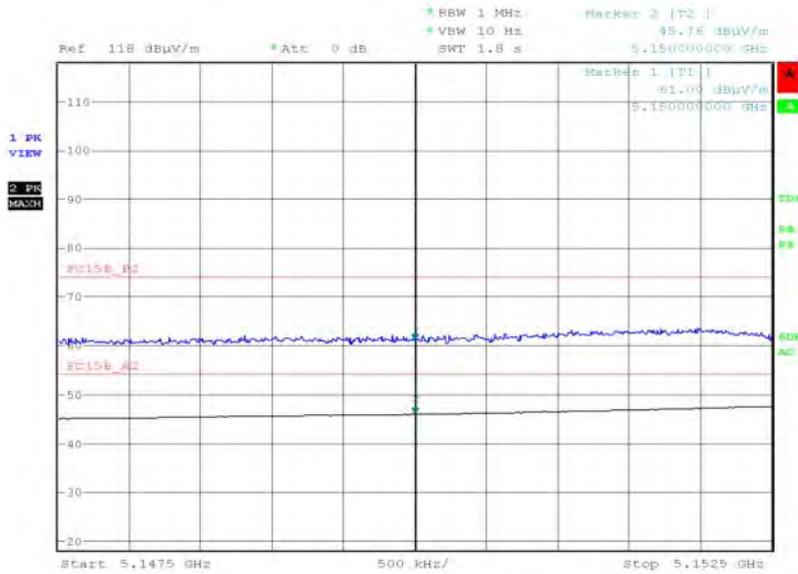
Product Service

802.11(n) - 5 GHz, 40 MHz BW

Band Edge Emissions

5190 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	61.00	45.76



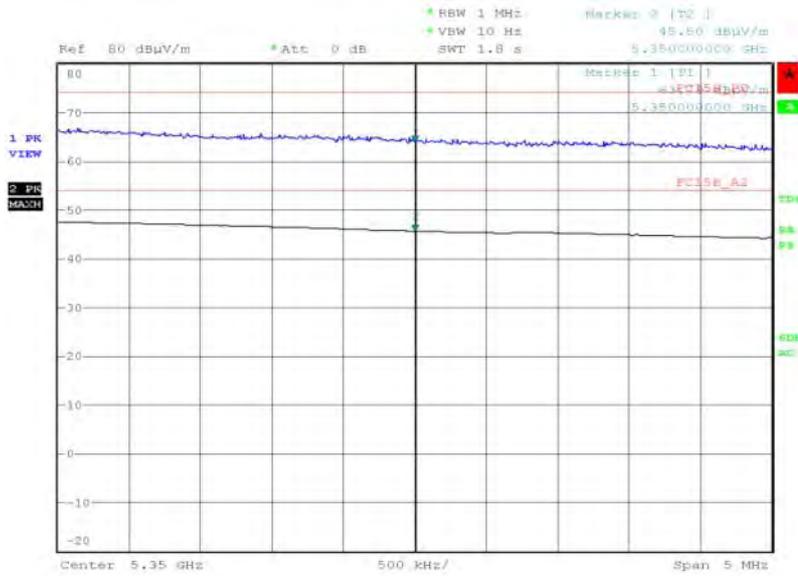
Date: 5.SEP.2012 19:02:45



Product Service

5310 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	63.79	45.50



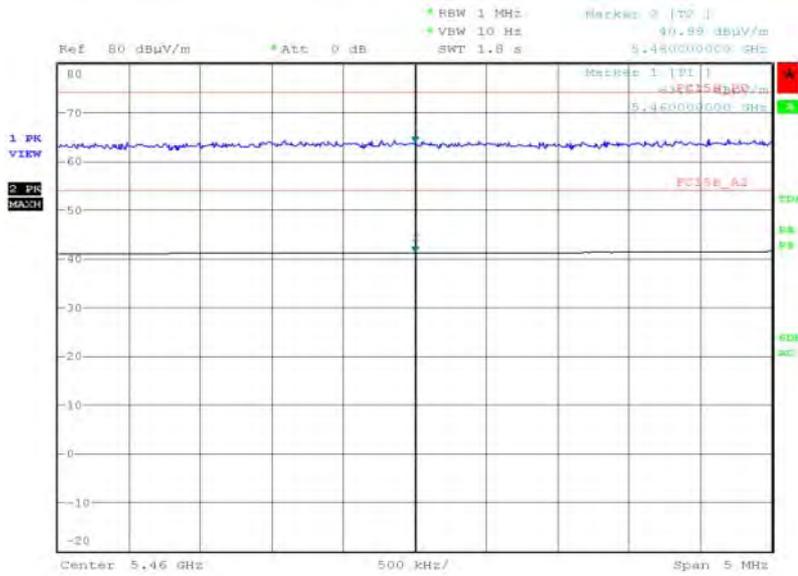
Date: 5.SEP.2012 19:55:40



Product Service

5510 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	63.57	40.99



Date: 5.SEP.2012 20:09:49

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 SHL21 S/N: IMEI 004401114094804 - Modification State 0

2.4.3 Date of Test

6 September 2012, 7 September 2012 & 12 September 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	20.6 - 25.6°C
Relative Humidity	33.6 - 57.2%



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	18.53	-4.58
	3.7 V DC	13.90	18.25
-20°C	4.0 V DC	12.12	12.20
	3.7 V DC	12.14	12.15
-10°C	4.0 V DC	11.60	11.40
	3.7 V DC	11.63	11.31
0°C	4.0 V DC	9.49	9.16
	3.7 V DC	9.67	9.15
+10°C	4.0 V DC	6.17	6.06
	3.7 V DC	6.26	6.22
+20°C	4.0 V DC	9.27	-4.58
	3.7 V DC	-18.53	0
	4.0 V DC	9.27	-4.58
-30°C	4.0 V DC	2.09	1.85
	3.7 V DC	2.10	1.71
+40°C	4.0 V DC	0.43	0.45
	3.7 V DC	0.41	0.44
+50°C	4.0 V DC	3.38	3.39
	3.7 V DC	3.23	3.25
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		96000	72000



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	-9.13	-18.05
	3.7 V DC	18.25	18.05
-20°C	4.0 V DC	12.16	12.14
	3.7 V DC	12.15	12.15
-10°C	4.0 V DC	11.32	11.28
	3.7 V DC	11.31	11.28
0°C	4.0 V DC	9.04	8.76
	3.7 V DC	9.15	8.91
+10°C	4.0 V DC	6.10	6
	3.7 V DC	6.22	6.08
+20°C	4.0 V DC	-18.25	-13.53
	3.7 V DC	0	-4.51
	4.0 V DC	-18.25	-13.53
-30°C	4.0 V DC	1.67	1.65
	3.7 V DC	1.71	1.73
+40°C	4.0 V DC	0.42	0.41
	3.7 V DC	0.41	0.41
+50°C	4.0 V DC	3.35	3.35
	3.7 V DC	3.17	3.22
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		96000	96000



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	4.36	4.21
	3.7 V DC	-8.73	8.42
-20°C	4.0 V DC	12.12	12.12
	3.7 V DC	12.12	12.11
-10°C	4.0 V DC	11.24	11.22
	3.7 V DC	11.24	11.24
0°C	4.0 V DC	8.74	8.82
	3.7 V DC	8.83	8.92
+10°C	4.0 V DC	6.15	6.11
	3.7 V DC	6.26	6.19
+20°C	4.0 V DC	-13.09	-4.21
	3.7 V DC	8.73	16.84
	4.0 V DC	8.73	-4.21
-30°C	4.0 V DC	1.58	1.58
	3.7 V DC	1.62	1.65
+40°C	4.0 V DC	0.41	0.40
	3.7 V DC	0.42	0.40
+50°C	4.0 V DC	3.30	3.32
	3.7 V DC	3.13	3.20
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		-72000	96000

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	18.53	4.58
	3.7 V DC	18.53	13.74
-20°C	4.0 V DC	12.12	12.20
	3.7 V DC	12.12	12.15
-10°C	4.0 V DC	11.63	11.40
	3.7 V DC	11.63	11.47
0°C	4.0 V DC	9.67	9.16
	3.7 V DC	9.97	9.20
+10°C	4.0 V DC	6.26	6.06
	3.7 V DC	6.26	6.15
+20°C	4.0 V DC	-4.63	-4.58
	3.7 V DC	-4.63	4.58
	4.0 V DC	-4.63	-4.58
-30°C	4.0 V DC	2.10	1.85
	3.7 V DC	2.10	1.94
+40°C	4.0 V DC	0.41	0.45
	3.7 V DC	0.43	0.44
+50°C	4.0 V DC	3.38	3.39
	3.7 V DC	3.23	3.25
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		96000	72000



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	13.69	9.02
	3.7 V DC	-9.13	4.51
-20°C	4.0 V DC	12.16	12.14
	3.7 V DC	12.15	12.15
-10°C	4.0 V DC	11.32	11.28
	3.7 V DC	11.31	11.28
0°C	4.0 V DC	9.04	8.76
	3.7 V DC	9.15	8.91
+10°C	4.0 V DC	6.10	6
	3.7 V DC	6.22	6.08
+20°C	4.0 V DC	4.56	-9.02
	3.7 V DC	0	0
	4.0 V DC	4.56	-9.02
-30°C	4.0 V DC	1.67	1.65
	3.7 V DC	1.71	1.73
+40°C	4.0 V DC	0.42	0.41
	3.7 V DC	0.41	0.41
+50°C	4.0 V DC	3.35	3.35
	3.7 V DC	3.17	3.22
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		72000	64615



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	8.73	-8.42
	3.7 V DC	8.73	12.63
-20°C	4.0 V DC	12.12	12.12
	3.7 V DC	12.12	12.11
-10°C	4.0 V DC	11.24	11.22
	3.7 V DC	11.24	11.24
0°C	4.0 V DC	8.74	8.82
	3.7 V DC	8.83	8.92
+10°C	4.0 V DC	6.15	6.11
	3.7 V DC	6.26	6.19
+20°C	4.0 V DC	-13.09	4.21
	3.7 V DC	4.36	-8.42
	4.0 V DC	-13.09	4.21
-30°C	4.0 V DC	1.58	1.58
	3.7 V DC	1.62	1.65
+40°C	4.0 V DC	0.41	0.40
	3.7 V DC	0.42	0.40
+50°C	4.0 V DC	3.30	3.32
	3.7 V DC	3.13	3.20
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		-72000	72000

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	7.71	7.65
	3.7 V DC	7.71	7.65
-20°C	4.0 V DC	15.41	15.30
	3.7 V DC	15.41	15.30
-10°C	4.0 V DC	15.41	15.3
	3.7 V DC	15.41	15.30
0°C	4.0 V DC	15.41	9.65
	3.7 V DC	15.41	7.65
+10°C	4.0 V DC	7.71	7.65
	3.7 V DC	7.71	7.65
+20°C	4.0 V DC	7.71	7.65
	3.7 V DC	7.71	7.65
	4.0 V DC	7.71	7.65
-30°C	4.0 V DC	7.71	7.65
	3.7 V DC	7.71	7.65
+40°C	4.0 V DC	7.71	7.65
	3.7 V DC	7.71	7.65
+50°C	4.0 V DC	-1.54	7.65
	3.7 V DC	-3.08	7.65
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		80000	80000



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	7.59	15.07
	3.7 V DC	7.59	15.07
-20°C	4.0 V DC	15.18	15.07
	3.7 V DC	15.18	15.07
-10°C	4.0 V DC	15.18	15.07
	3.7 V DC	15.18	15.07
0°C	4.0 V DC	15.18	15.07
	3.7 V DC	15.18	15.07
+10°C	4.0 V DC	7.59	7.53
	3.7 V DC	7.59	7.53
+20°C	4.0 V DC	7.59	7.53
	3.7 V DC	7.59	7.53
	4.0 V DC	7.59	7.53
-30°C	4.0 V DC	7.59	7.53
	3.7 V DC	7.59	7.53
+40°C	4.0 V DC	7.59	7.53
	3.7 V DC	7.59	7.53
+50°C	4.0 V DC	15.18	7.53
	3.7 V DC	15.18	7.53
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		80000	80000



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	14.52	14.11
	3.7 V DC	14.52	14.11
-20°C	4.0 V DC	21.78	14.11
	3.7 V DC	21.78	14.11
-10°C	4.0 V DC	21.78	7.05
	3.7 V DC	21.78	7.05
0°C	4.0 V DC	14.52	7.05
	3.7 V DC	14.52	7.05
+10°C	4.0 V DC	7.26	7.05
	3.7 V DC	7.26	7.05
+20°C	4.0 V DC	7.26	7.05
	3.7 V DC	7.26	7.05
	4.0 V DC	7.26	7.05
-30°C	4.0 V DC	7.26	7.05
	3.7 V DC	7.26	7.05
+40°C	4.0 V DC	7.26	7.05
	3.7 V DC	7.26	7.05
+50°C	4.0 V DC	7.26	-14.11
	3.7 V DC	-7.26	14.11
+60°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
+70°C	4.0 V DC	N/A	N/A
	3.7 V DC	N/A	N/A
Maximum Frequency Error (Hz)		120000	80000

Limit

Maintained within the band of operation under all conditions of normal operations as specified in the user's manual.
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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 SHL21 S/N: IMEI 004401114094523 - Modification State 0

2.5.3 Date of Test

29 August 2012 & 31 August 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 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 and a resolution bandwidth and video bandwidth were set appropriately to perform the measurement correctly.

2.5.6 Environmental Conditions

Ambient Temperature	25.0 - 25.8°C
Relative Humidity	26.9 - 44.2%



Product Service

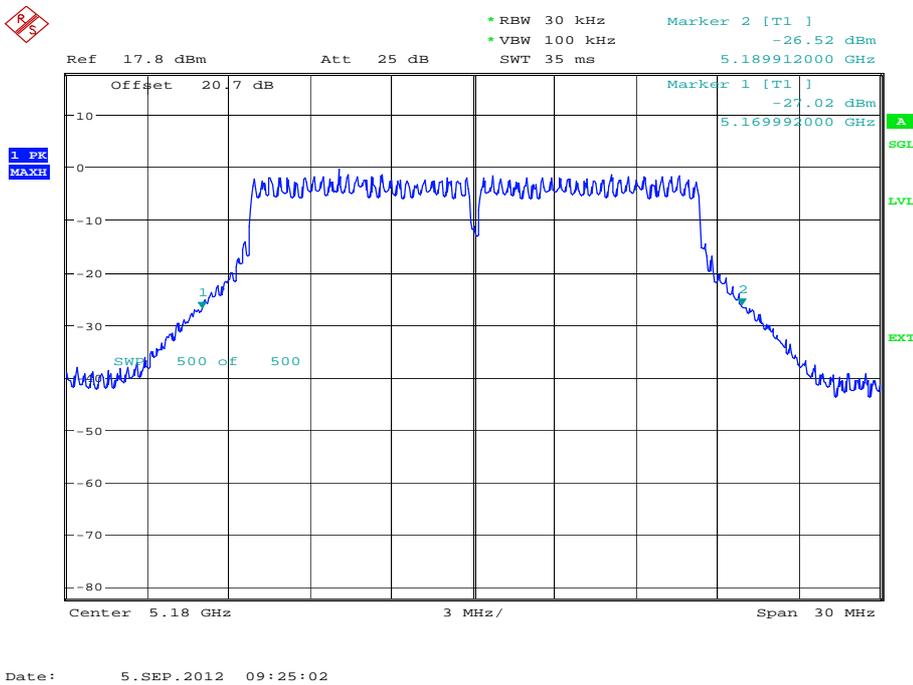
2.5.7 Test Results

802.11(a)

Frequency Band 1

5180 MHz

26 dB Bandwidth (MHz)	20.304
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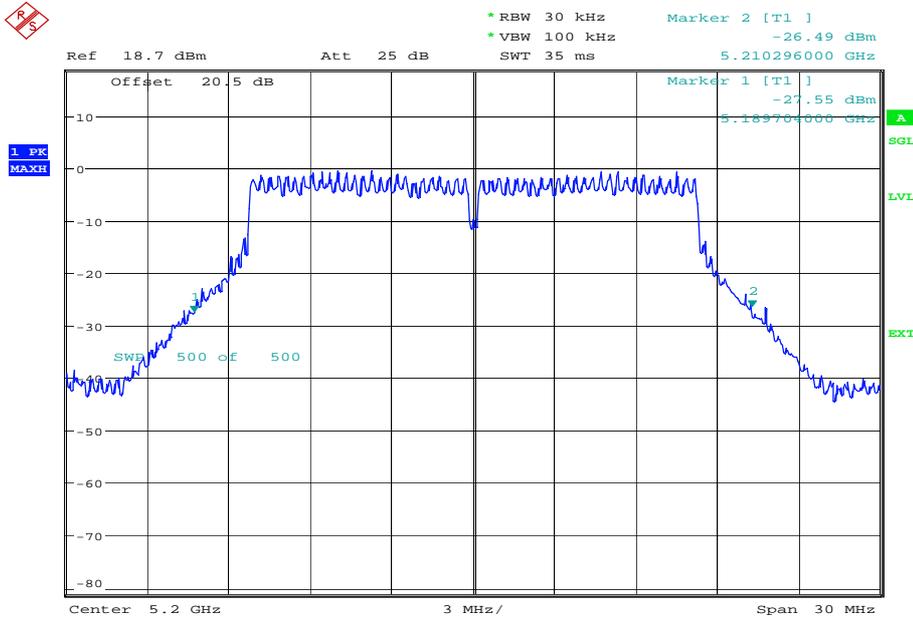




Product Service

5200 MHz

26 dB Bandwidth (MHz)	20.592
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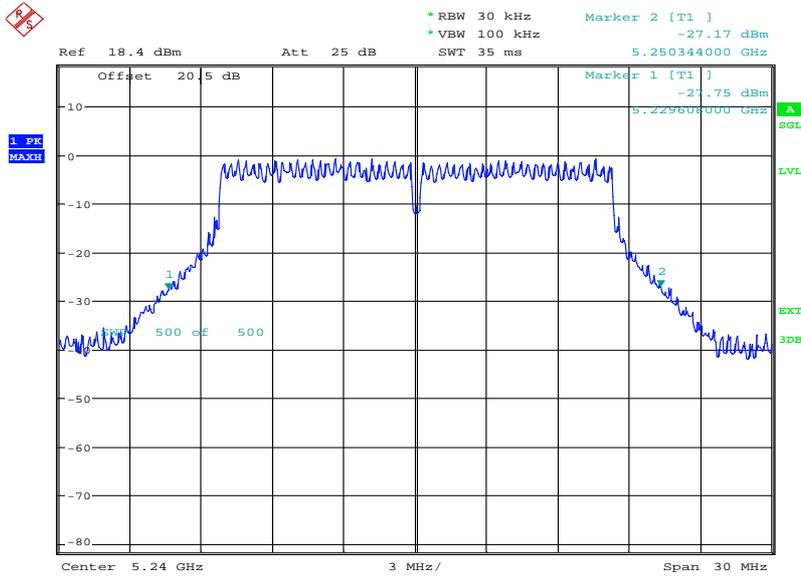
Date: 29.AUG.2012 11:00:08



Product Service

5240 MHz

26 dB Bandwidth (MHz)	20.592
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Date: 4.SEP.2012 13:44:49

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 12 Mbps.

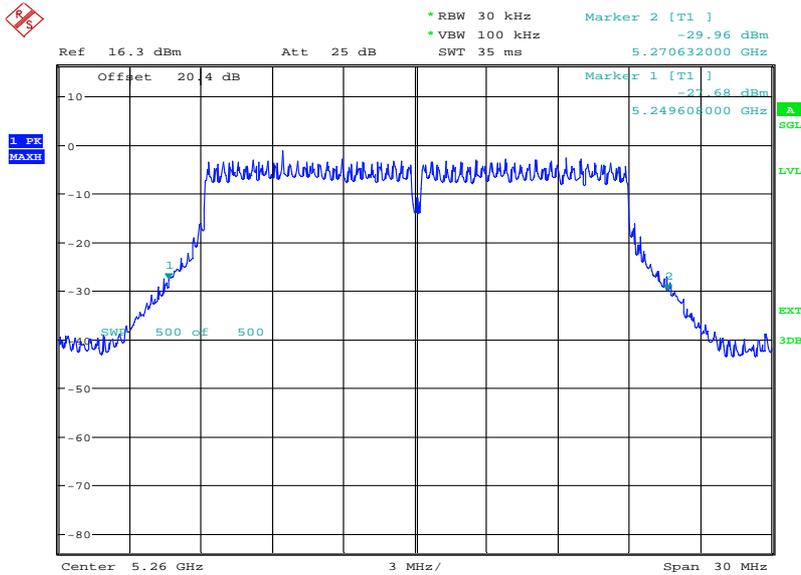


Product Service

Frequency Band 2

5260 MHz

26 dB Bandwidth (MHz)	20.832
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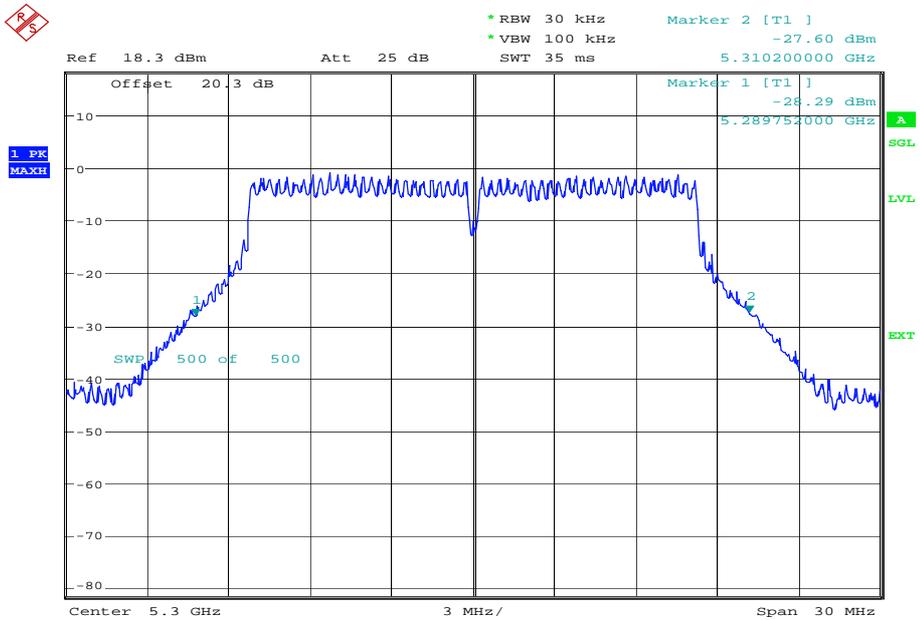
Date: 4.SEP.2012 15:08:28



Product Service

5300 MHz

26 dB Bandwidth (MHz)	20.448
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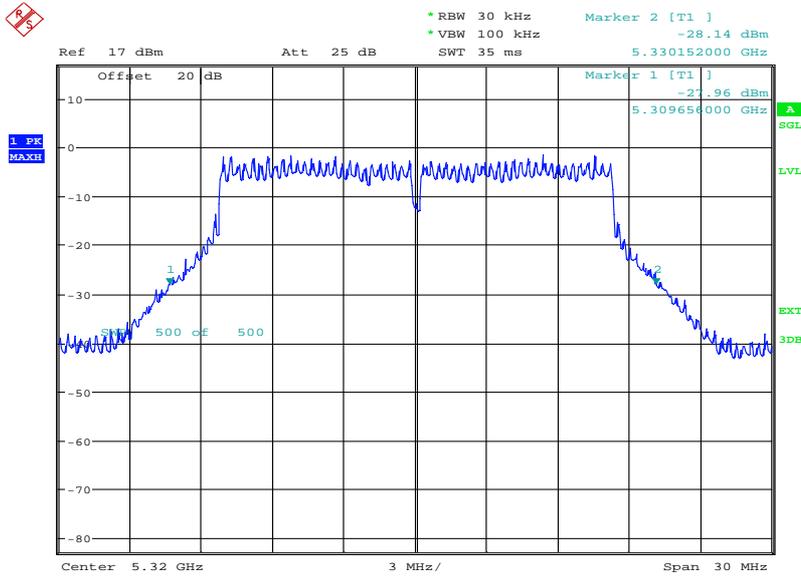




Product Service

5320 MHz

26 dB Bandwidth (MHz)	20.736
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Date: 4.SEP.2012 14:21:40

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 12 Mbps.

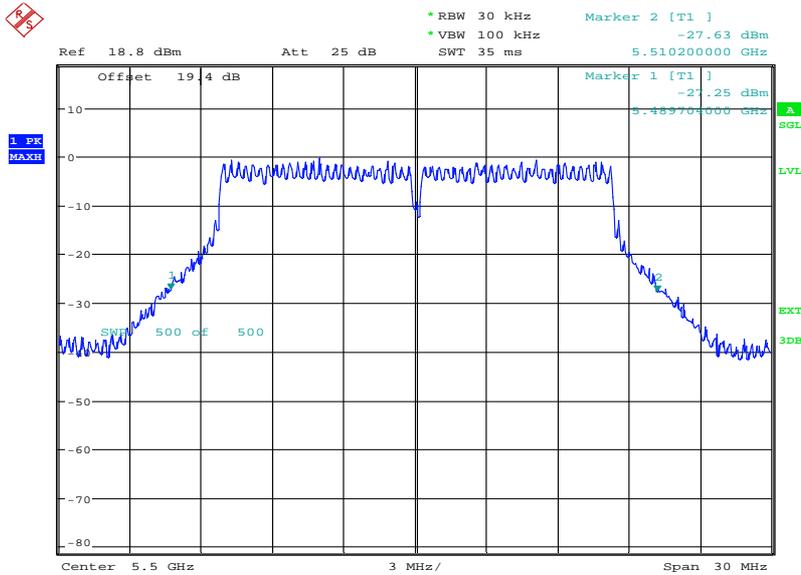


Product Service

Frequency Band 3

5500 MHz

26 dB Bandwidth (MHz)	20.448
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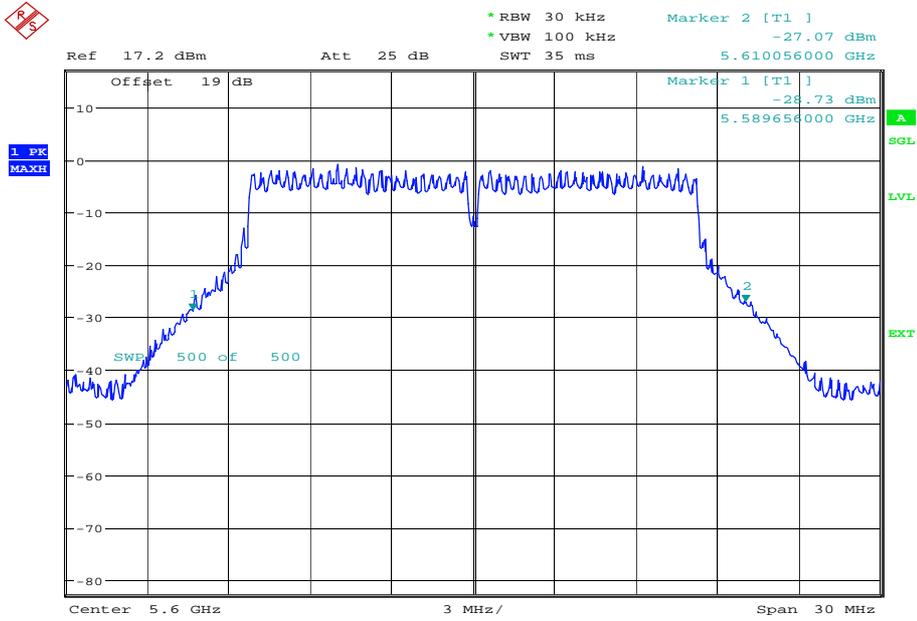
Date: 4.SEP.2012 14:38:28



Product Service

5600 MHz

26 dB Bandwidth (MHz)	20.400
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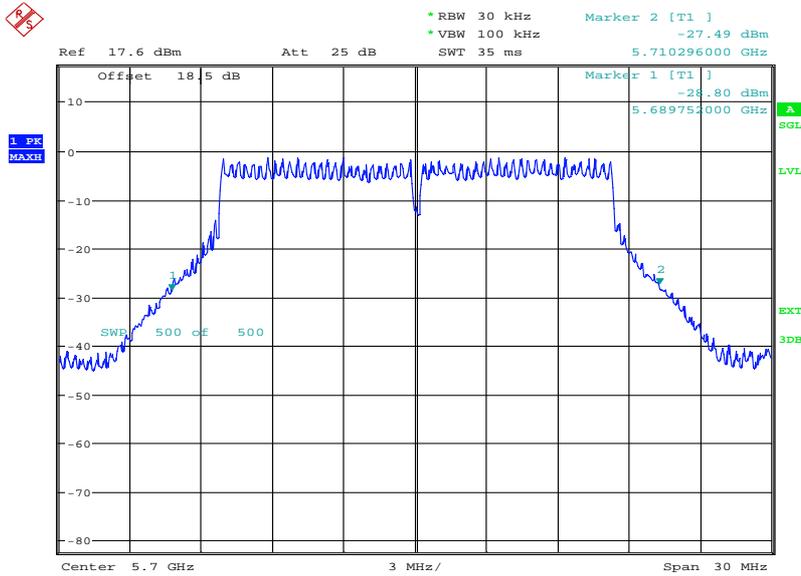
Date: 28.AUG.2012 14:51:35



Product Service

5700 MHz

26 dB Bandwidth (MHz)	20.592
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Date: 4.SEP.2012 14:46:05

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 12 Mbps.

Limit

Not specified.



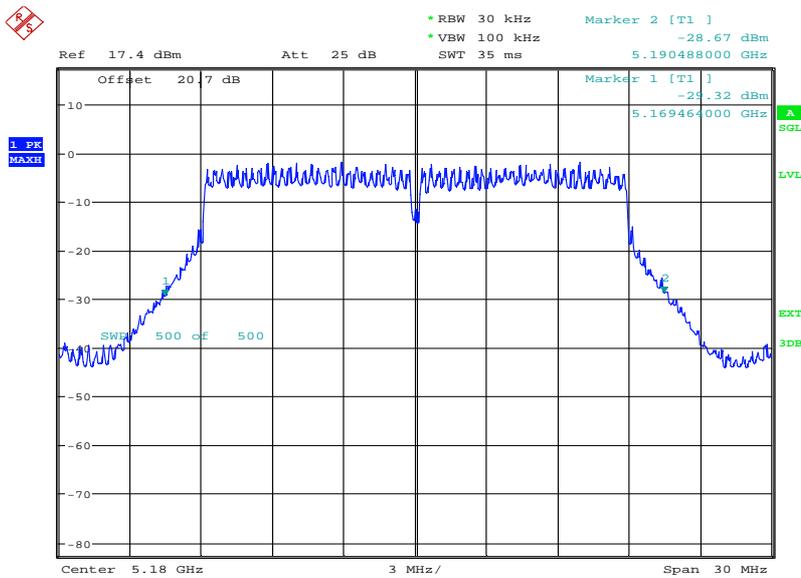
Product Service

802.11(n) - 5 GHz, 20 MHz BW

Frequency Band 1

5180 MHz

26 dB Bandwidth (MHz)	20.928
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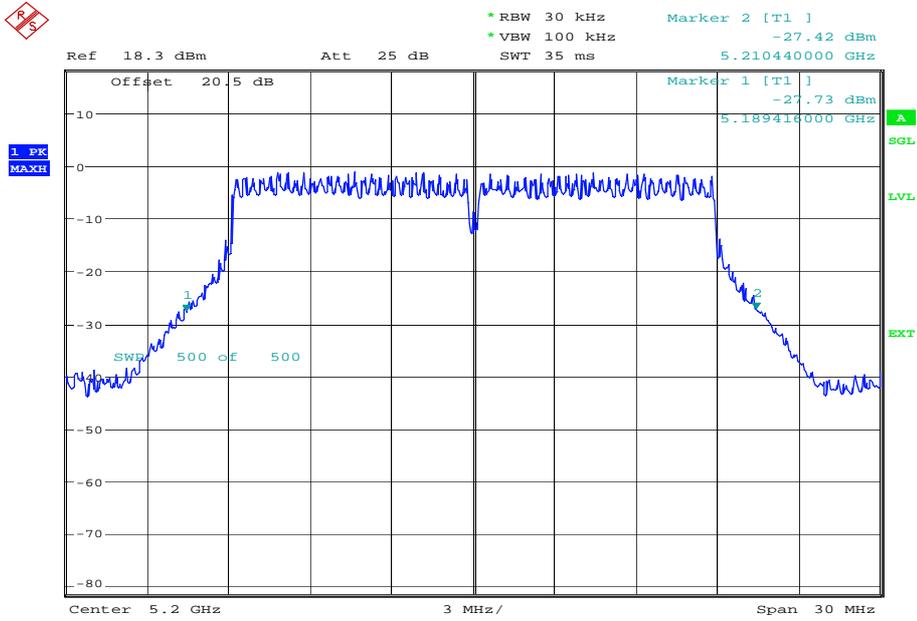
Date: 4.SEP.2012 09:16:04



Product Service

5200 MHz

26 dB Bandwidth (MHz)	21.024
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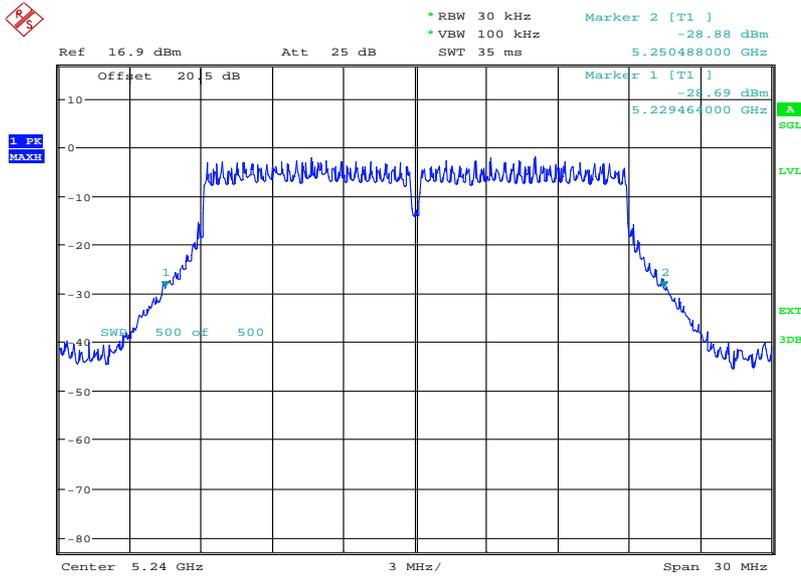
Date: 29.AUG.2012 12:16:43



Product Service

5240 MHz

26 dB Bandwidth (MHz)	21.168
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Date: 4.SEP.2012 09:10:43

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 6.5Mbps.

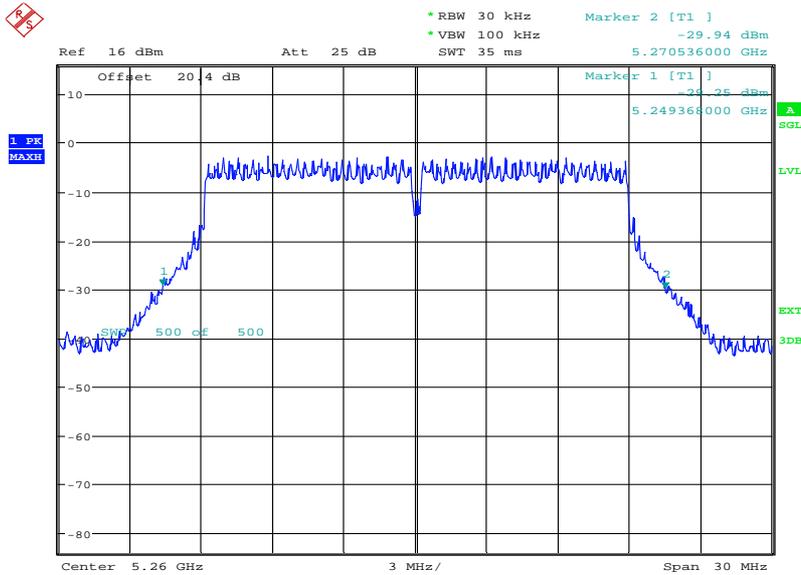


Product Service

Frequency Band 2

5260 MHz

26 dB Bandwidth (MHz)	20.780
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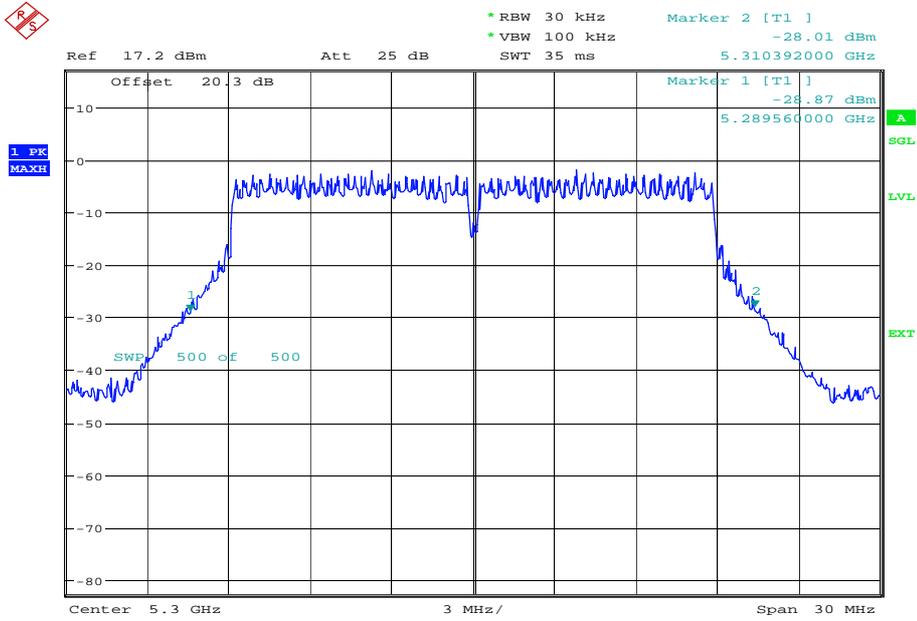
Date: 4.SEP.2012 15:14:31



Product Service

5300 MHz

26 dB Bandwidth (MHz)	20.832
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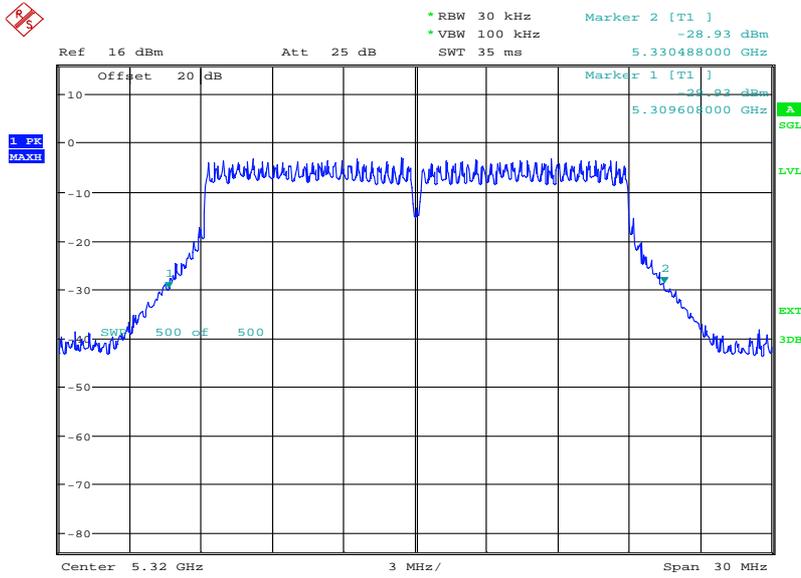
Date: 29.AUG.2012 12:38:15



Product Service

5320 MHz

26 dB Bandwidth (MHz)	20.928
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Date: 4.SEP.2012 15:26:05

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 6.5 Mbps.

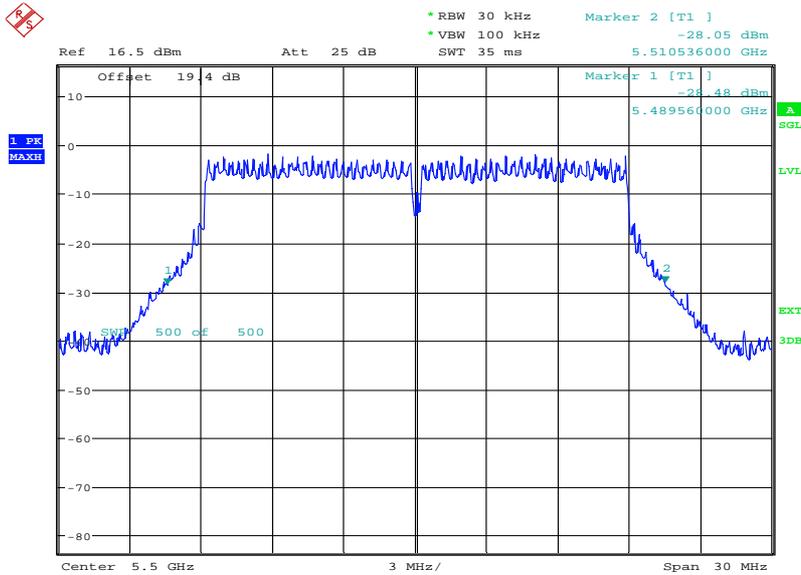


Product Service

Frequency Band 3

5500 MHz

26 dB Bandwidth (MHz)	21.168
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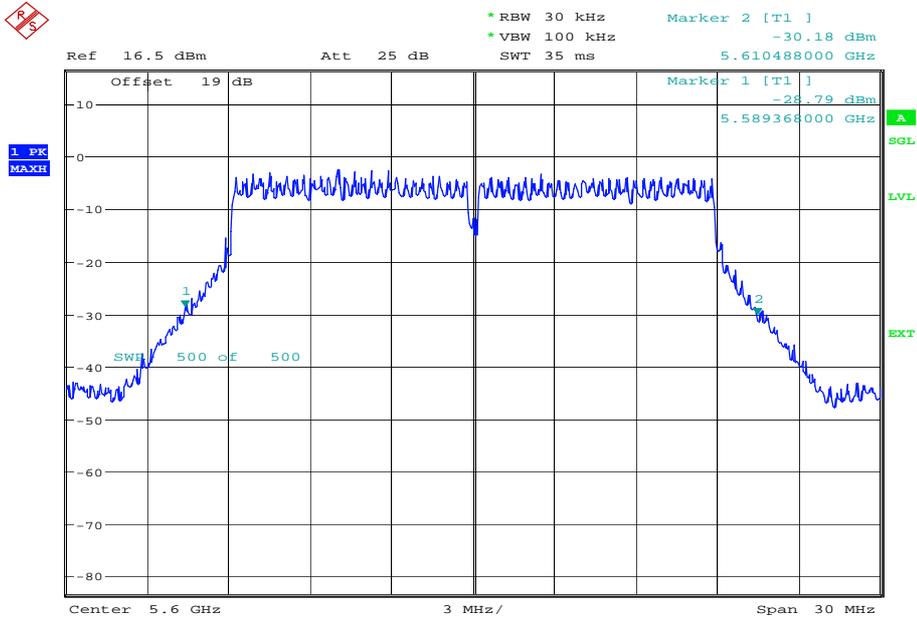
Date: 4.SEP.2012 15:43:13



Product Service

5600 MHz

26 dB Bandwidth (MHz)	21.120
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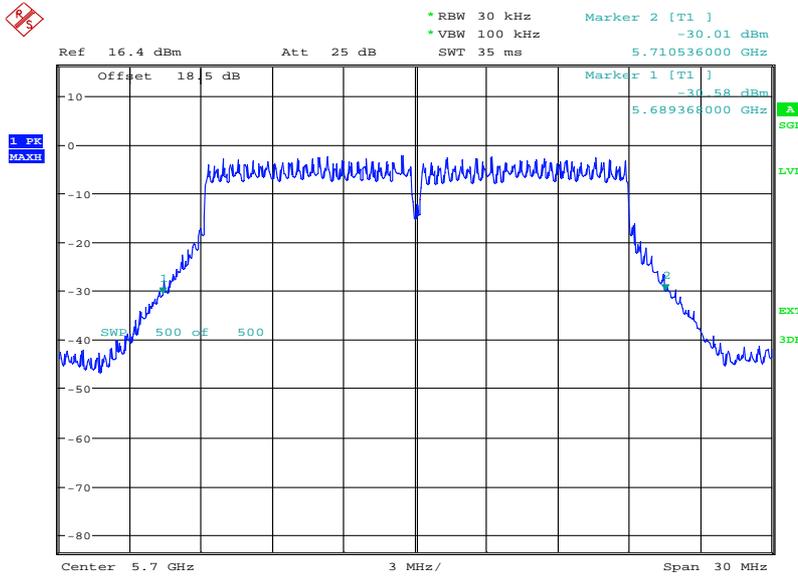
Date: 28.AUG.2012 17:00:39



Product Service

5700 MHz

26 dB Bandwidth (MHz)	21.168
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Date: 4.SEP.2012 15:48:49

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 6.5 Mbps.

Limit

Not specified.



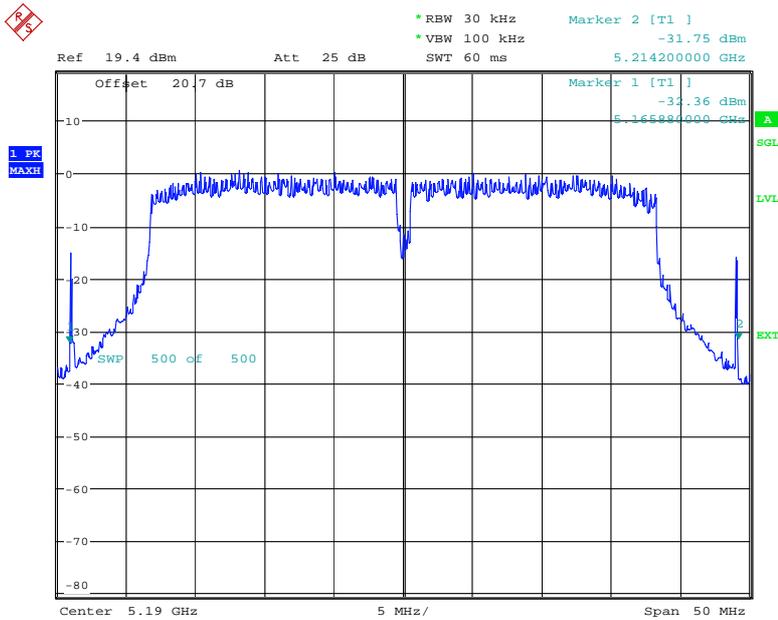
Product Service

802.11(n) - 5 GHz, 40 MHz BW

Frequency Band 1

5190 MHz

26 dB Bandwidth (MHz)	48320
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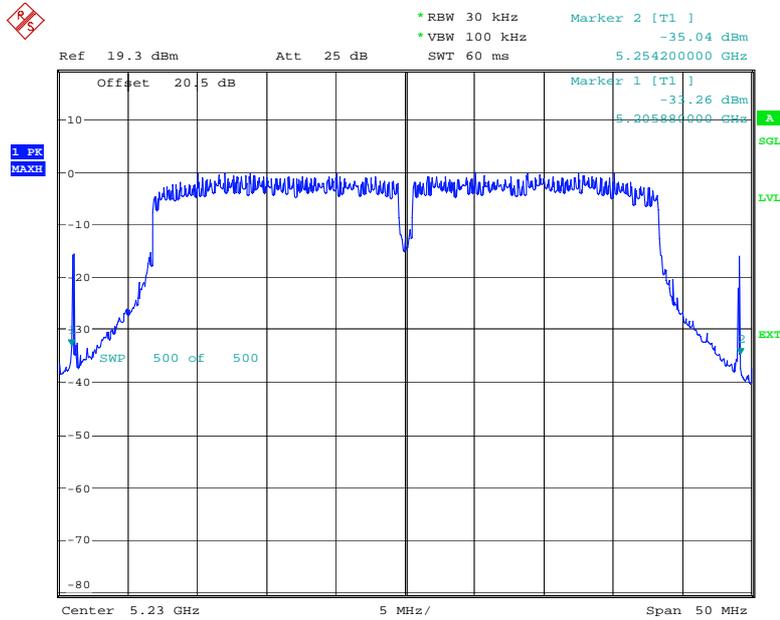
Date: 6.SEP.2012 16:34:50



Product Service

5230 MHz

26 dB Bandwidth (MHz)	48320
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Date: 6.SEP.2012 16:39:20

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.

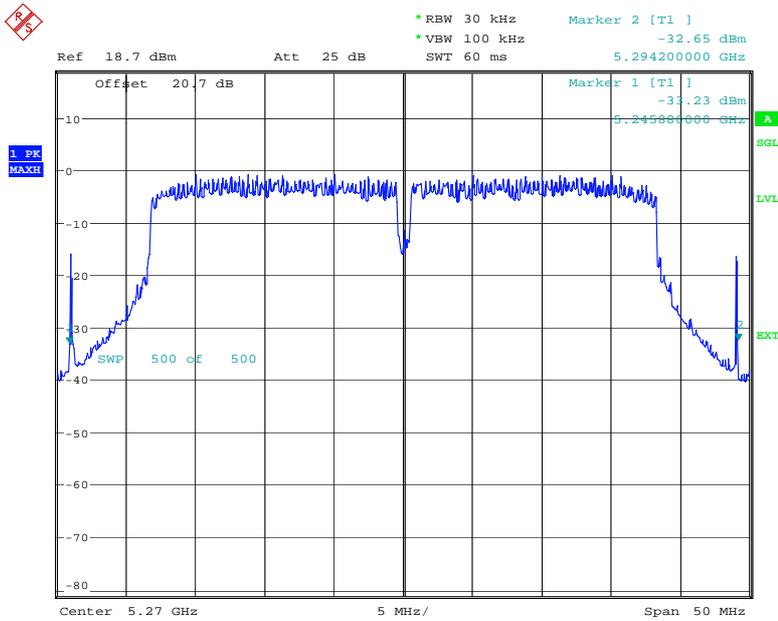


Product Service

Frequency Band 2

5270 MHz

26 dB Bandwidth (MHz)	48320
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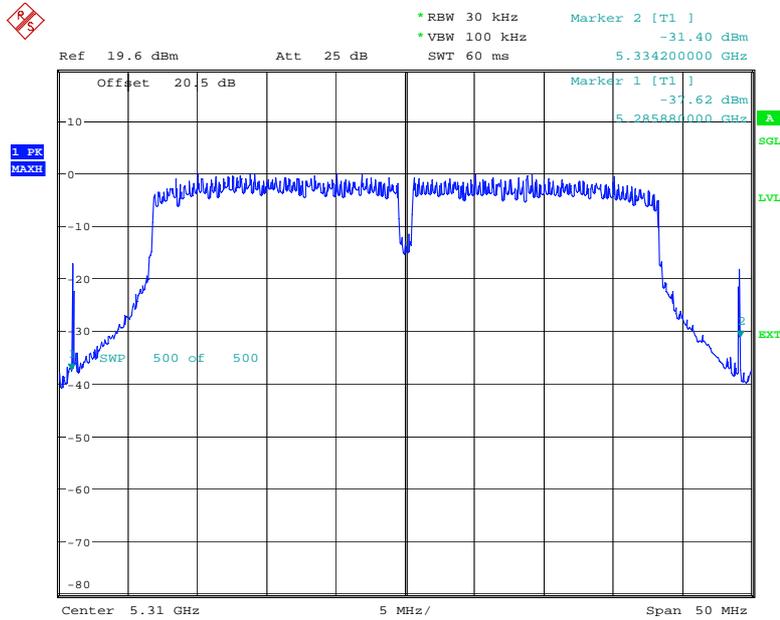
Date: 6.SEP.2012 16:43:54



Product Service

5310 MHz

26 dB Bandwidth (MHz)	48320
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Date: 6.SEP.2012 16:51:03

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.

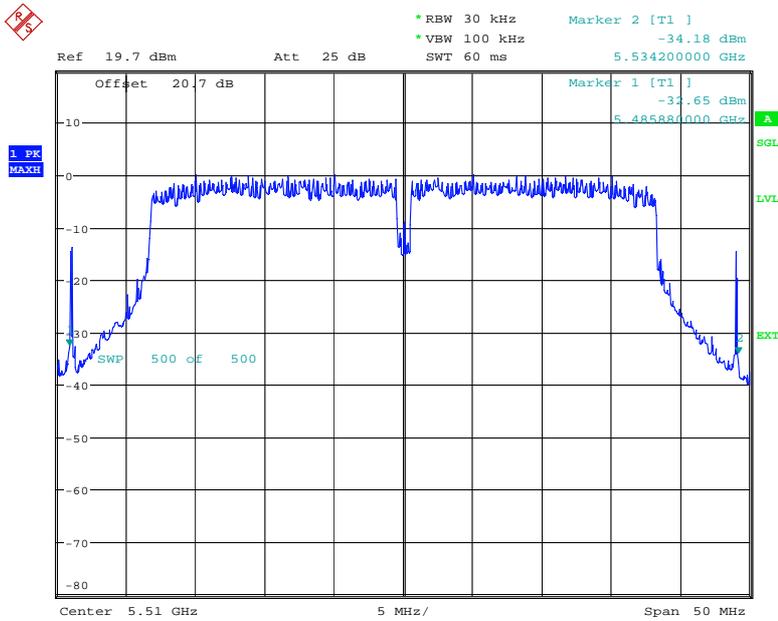


Product Service

Frequency Band 3

5510 MHz

26 dB Bandwidth (MHz)	48320
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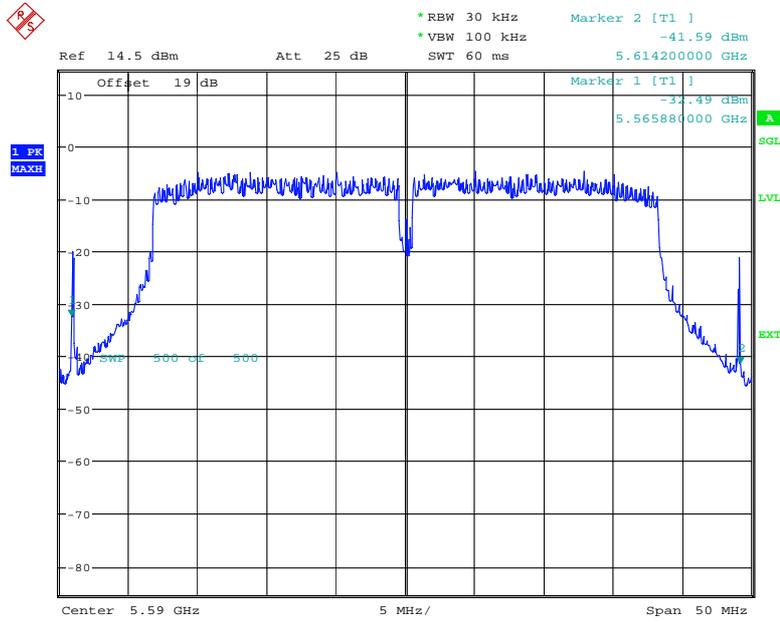
Date: 6.SEP.2012 16:56:16



Product Service

5590 MHz

26 dB Bandwidth (MHz)	48320
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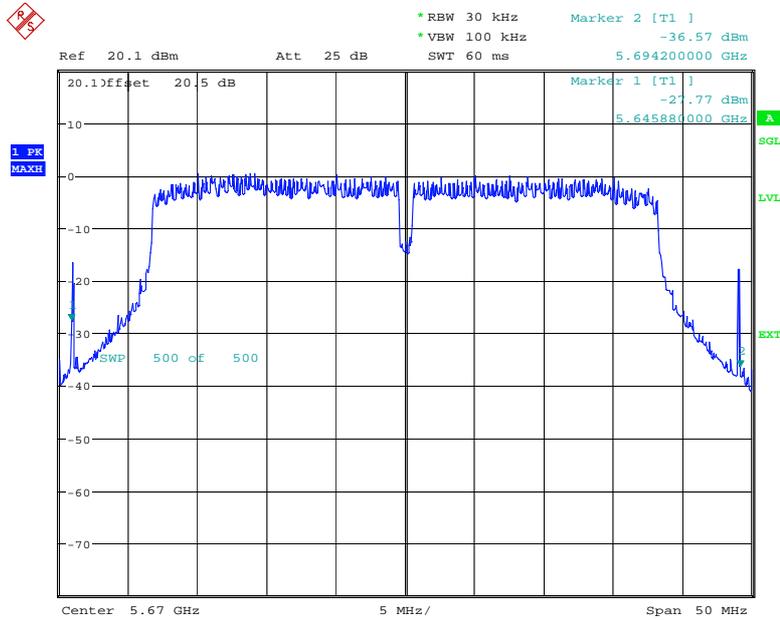
Date: 31.AUG.2012 15:02:32



Product Service

5670 MHz

26 dB Bandwidth (MHz)	48320
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Date: 6.SEP.2012 17:04:07

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.



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 SHL21 S/N: IMEI 004401114094523 - Modification State 0

2.6.3 Date of Test

29 August 2012 & 31 August 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	23.8 - 25.8°C
Relative Humidity	26.9 - 45.7%



Product Service

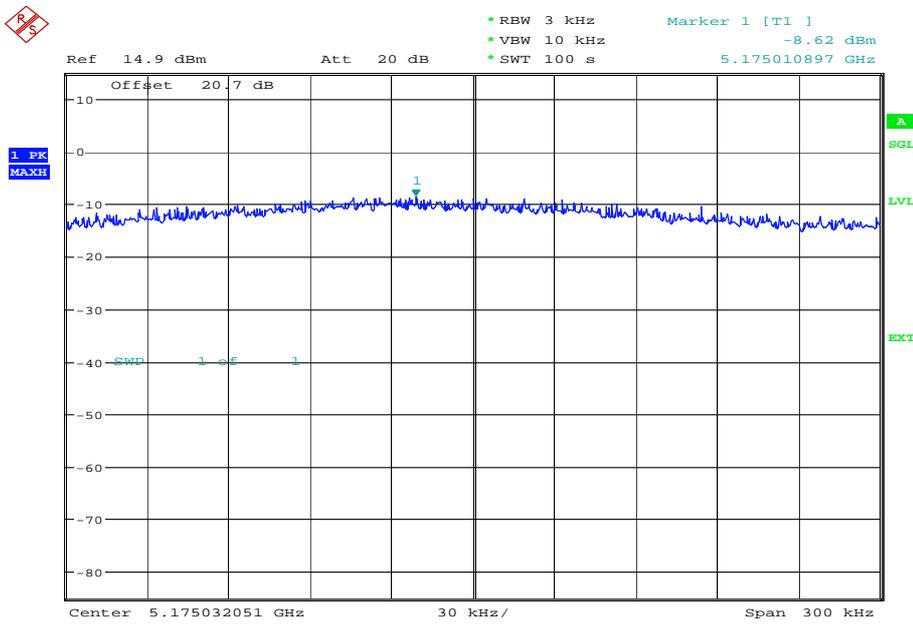
2.6.7 Test Results

802.11(a)

Frequency Band 1

5180 MHz

Peak Power Spectral Density (dBm)	-8.62
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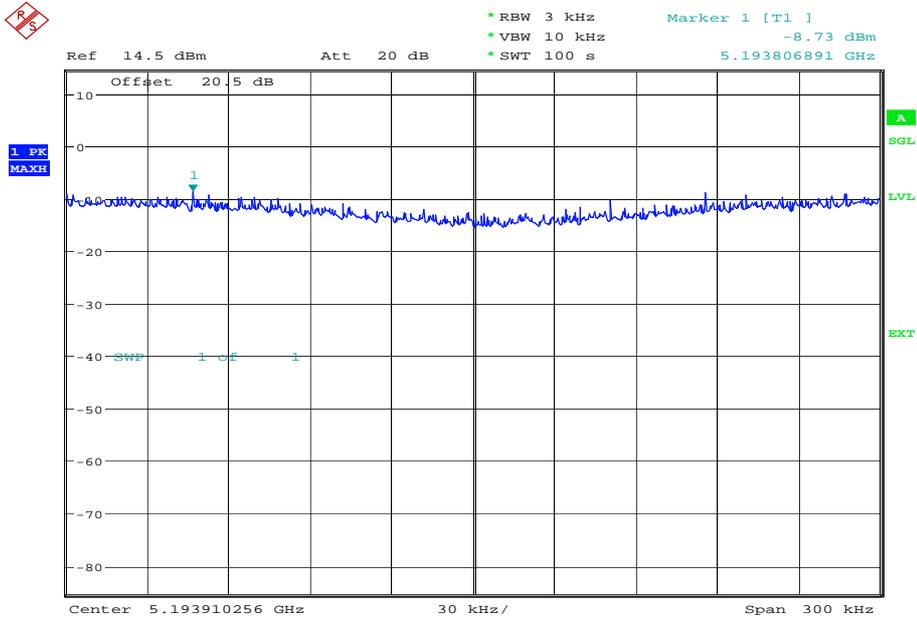
Date: 29.AUG.2012 10:55:24



Product Service

5200 MHz

Peak Power Spectral Density (dBm)	-8.73
-----------------------------------	-------



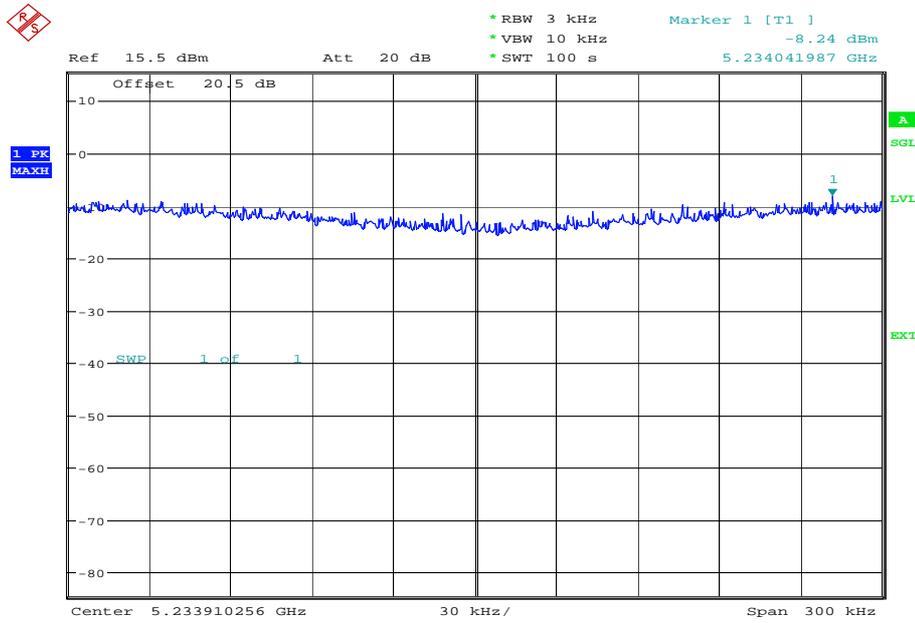
Date: 29.AUG.2012 11:14:28



Product Service

5240 MHz

Peak Power Spectral Density (dBm)	-8.24
-----------------------------------	-------



Date: 29.AUG.2012 11:31:13

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 12 Mbps.

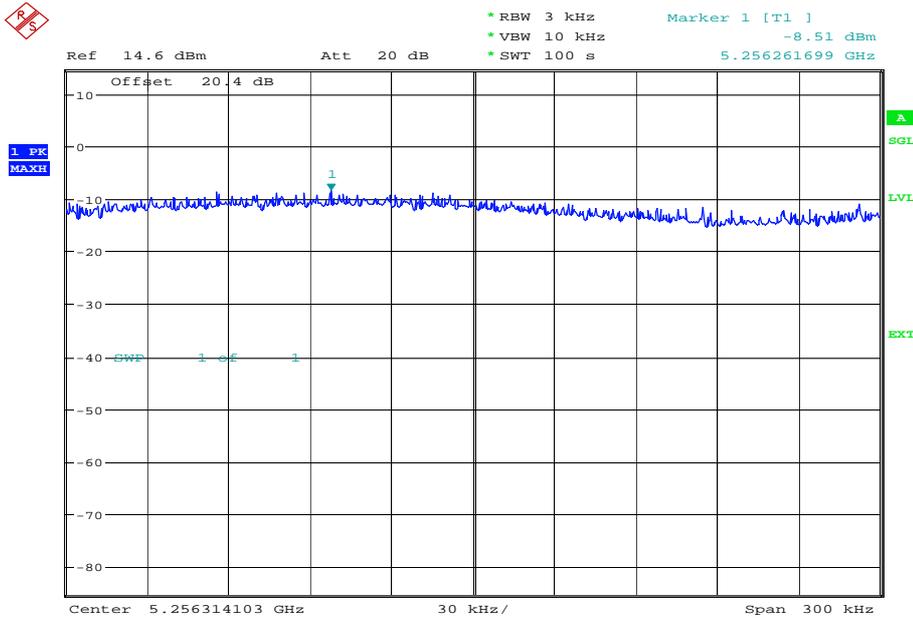


Product Service

Frequency Band 2

5260 MHz

Peak Power Spectral Density (dBm)	-8.51
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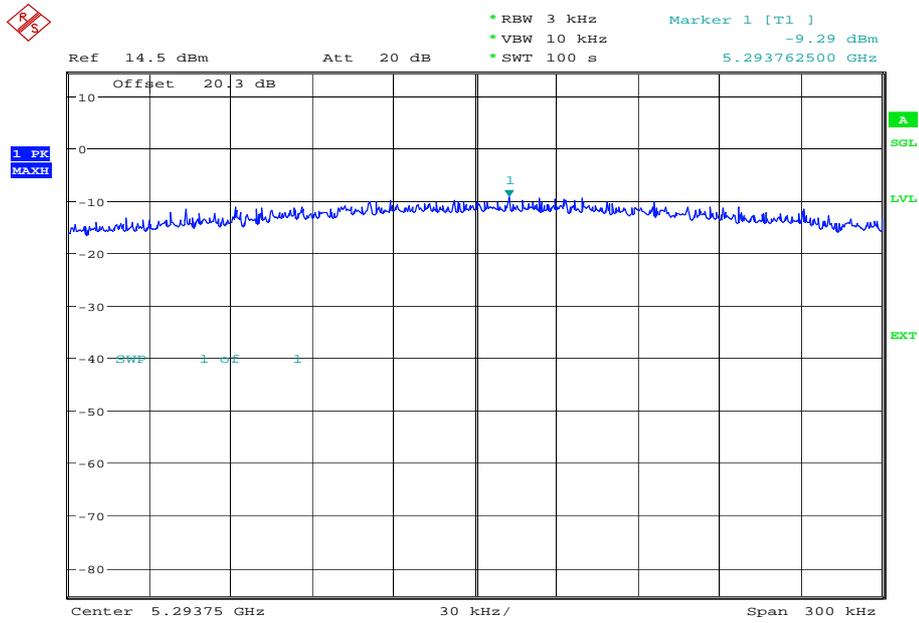
Date: 29.AUG.2012 11:41:15



Product Service

5300 MHz

Peak Power Spectral Density (dBm)	-9.29
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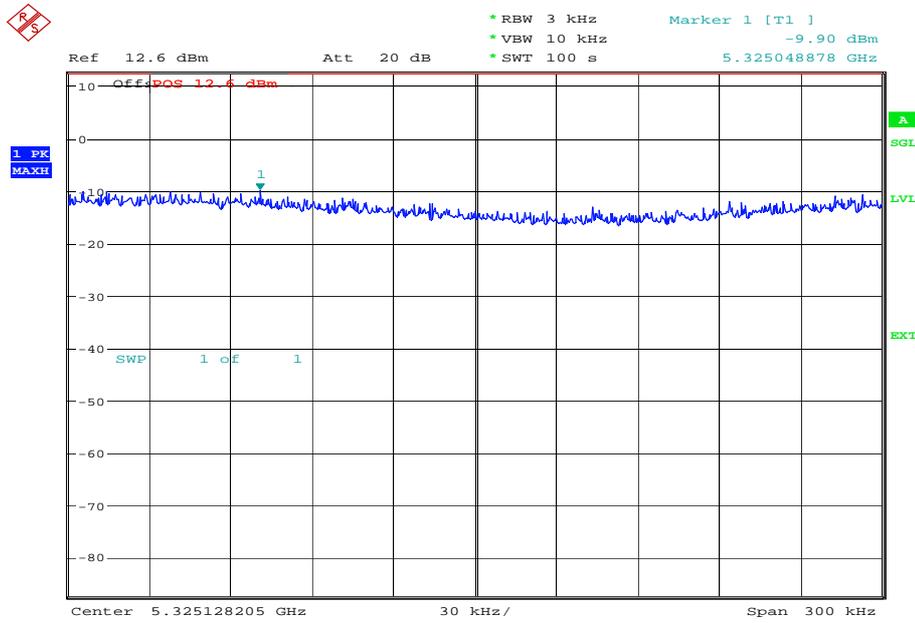
Date: 29.AUG.2012 11:54:18



Product Service

5320 MHz

Peak Power Spectral Density (dBm)	-9.9
-----------------------------------	------



Date: 29.AUG.2012 12:04:34

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 12 Mbps.

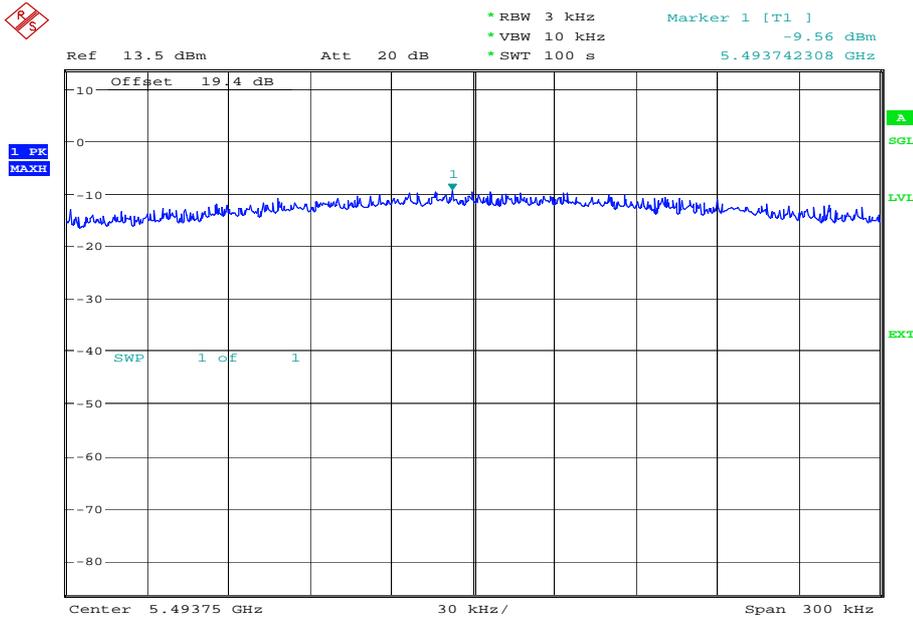


Product Service

Frequency Band 3

5500 MHz

Peak Power Spectral Density (dBm)	-10.84
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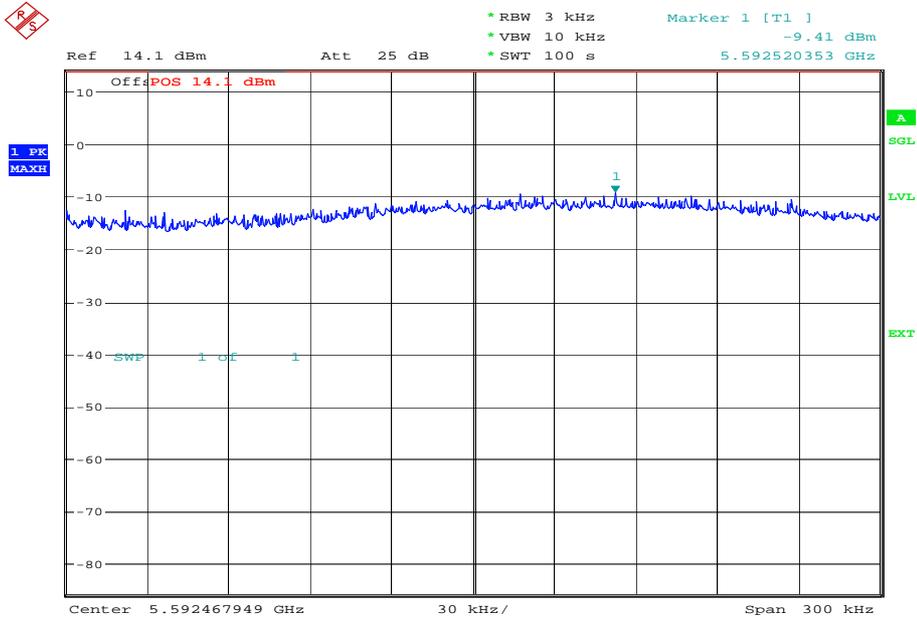
Date: 28.AUG.2012 14:46:16



Product Service

5600 MHz

Peak Power Spectral Density (dBm)	-10.73
-----------------------------------	--------



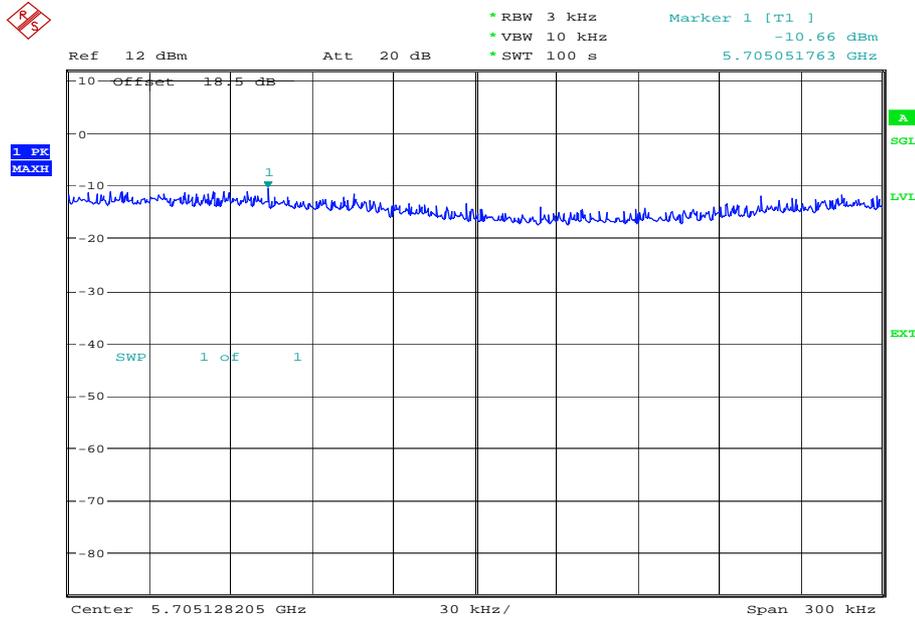
Date: 28.AUG.2012 14:55:18



Product Service

5700 MHz

Peak Power Spectral Density (dBm)	-10.33
-----------------------------------	--------



Date: 28.AUG.2012 15:12:04

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 12 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



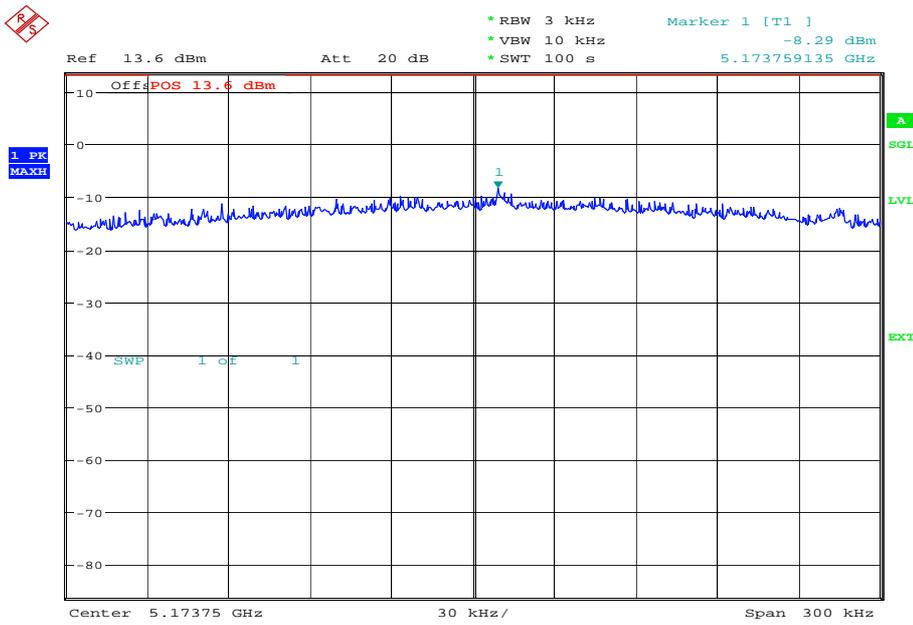
Product Service

802.11(n) - 5 GHz, 20 MHz BW

Frequency Band 1

5180 MHz

Peak Power Spectral Density (dBm)	-8.29
-----------------------------------	-------



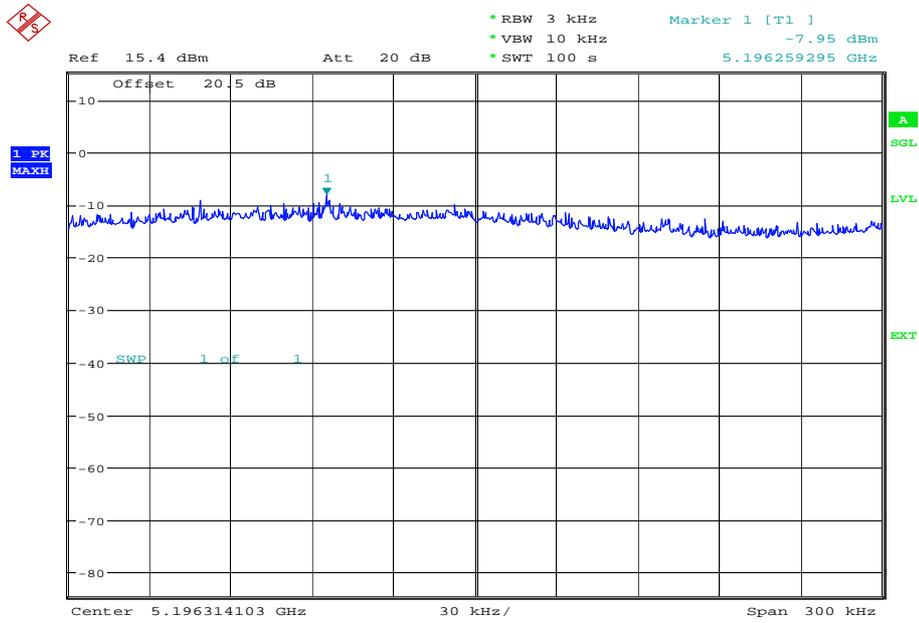
Date: 29.AUG.2012 12:13:33



Product Service

5200 MHz

Peak Power Spectral Density (dBm)	-7.95
-----------------------------------	-------



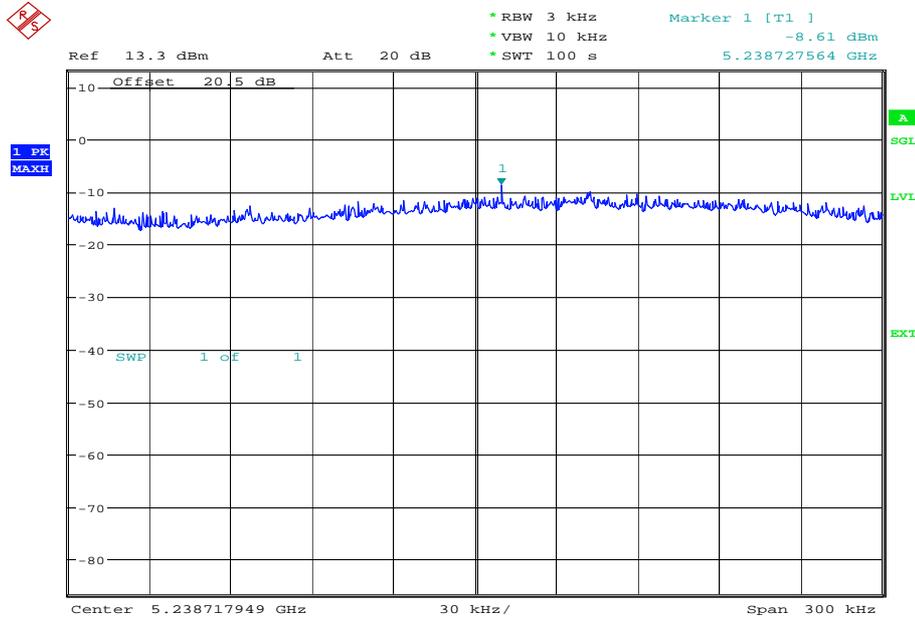
Date: 29.AUG.2012 12:20:01



Product Service

5240 MHz

Peak Power Spectral Density (dBm)	-8.61
-----------------------------------	-------



Date: 29.AUG.2012 12:26:44

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 6.5 Mbps.

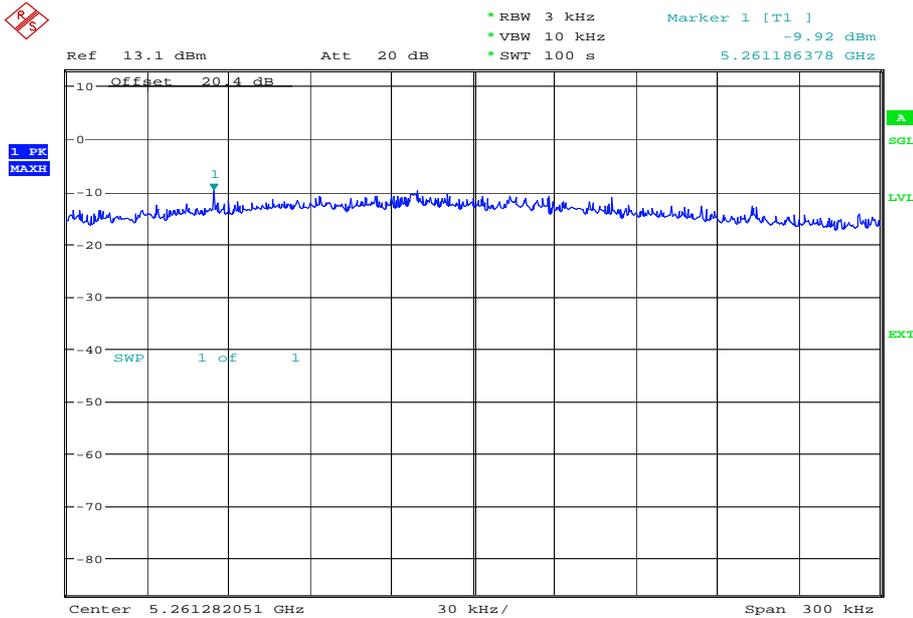


Product Service

Frequency Band 2

5260 MHz

Peak Power Spectral Density (dBm)	-9.92
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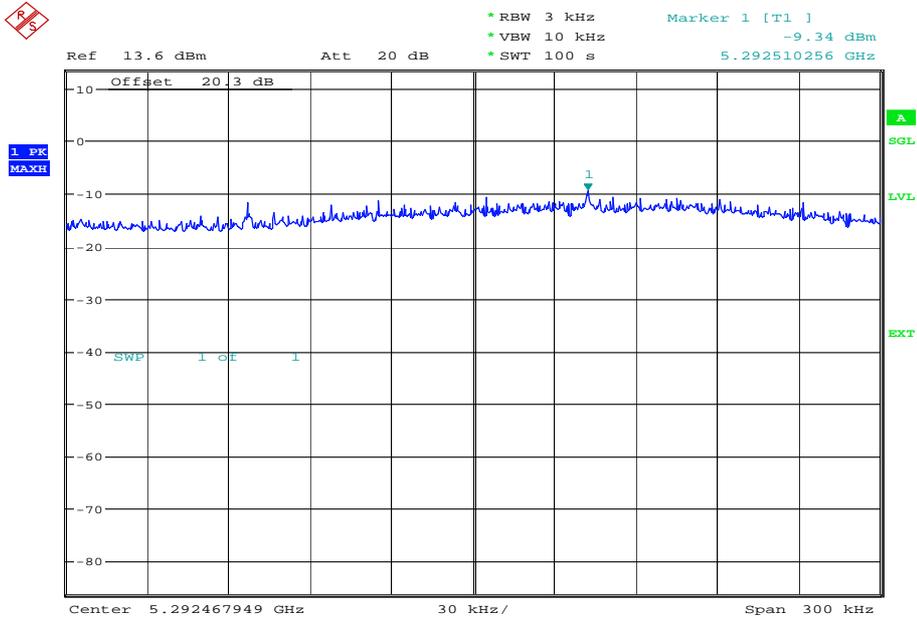
Date: 29.AUG.2012 12:33:11



Product Service

5300 MHz

Peak Power Spectral Density (dBm)	-9.34
-----------------------------------	-------



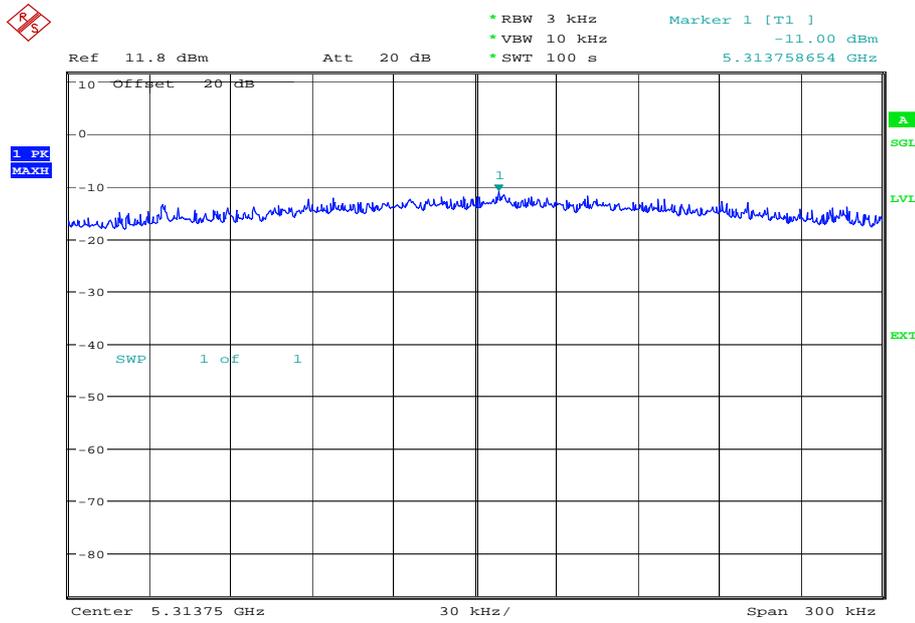
Date: 29.AUG.2012 12:41:42



Product Service

5320 MHz

Peak Power Spectral Density (dBm)	-11.00
-----------------------------------	--------



Date: 29.AUG.2012 12:47:22

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 6.5 Mbps.

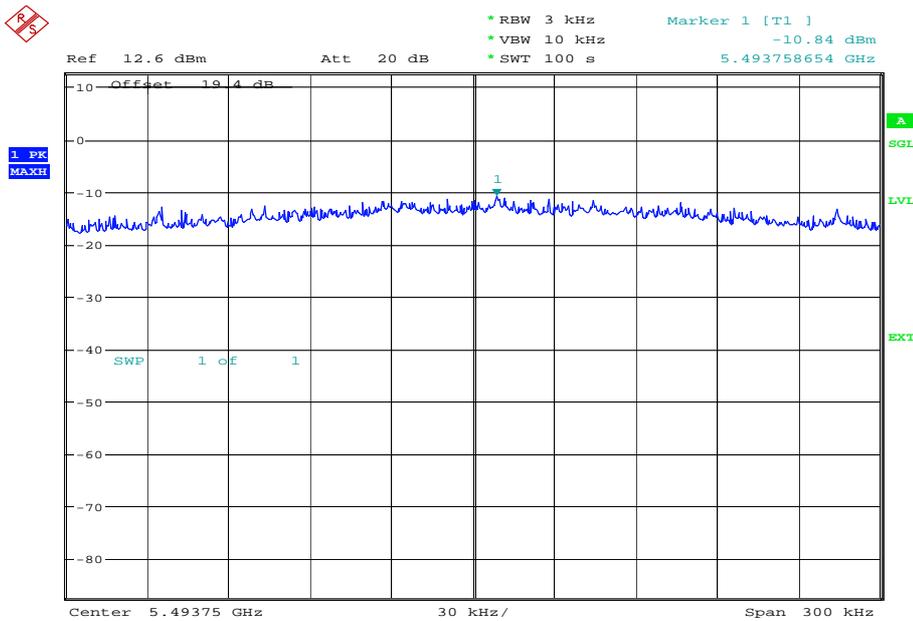


Product Service

Frequency Band 3

5500 MHz

Peak Power Spectral Density (dBm)	-10.84
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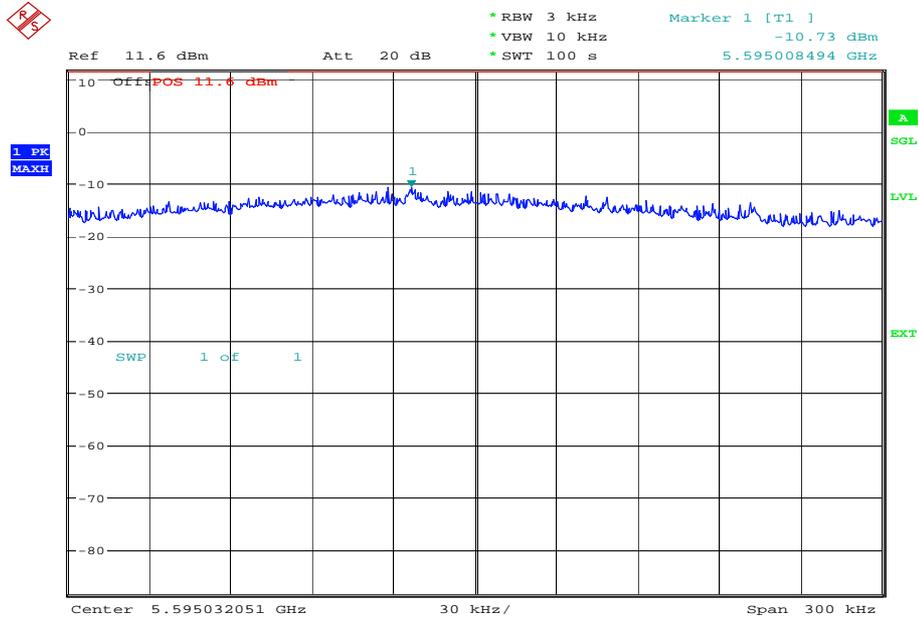
Date: 28.AUG.2012 16:49:27



Product Service

5600 MHz

Peak Power Spectral Density (dBm)	-10.73
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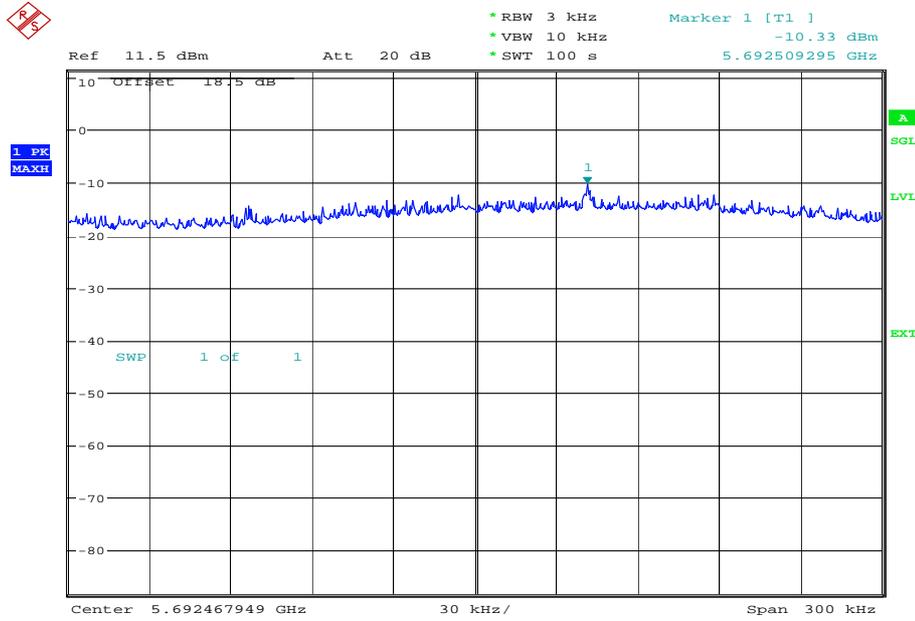
Date: 28.AUG.2012 17:04:10



Product Service

5700 MHz

Peak Power Spectral Density (dBm)	-10.33
-----------------------------------	--------



Date: 28.AUG.2012 17:12:08

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 6.5 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



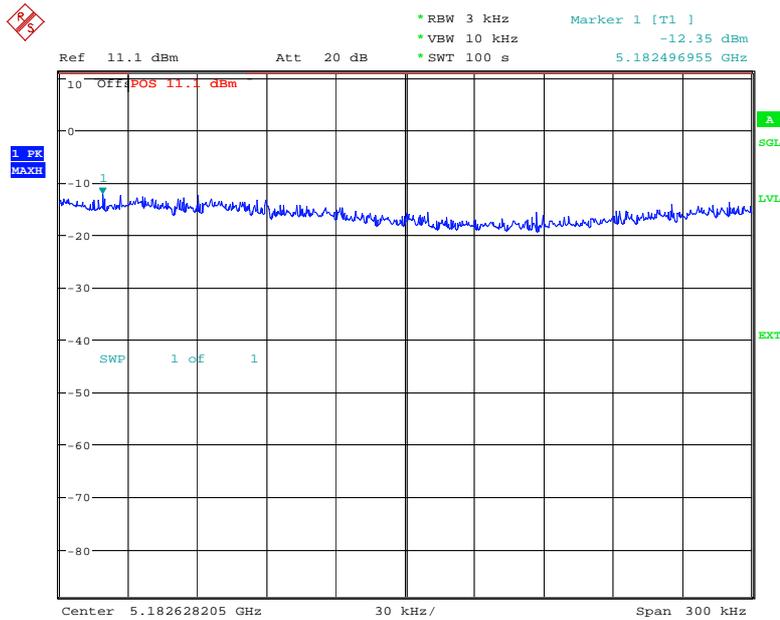
Product Service

802.11(n) - 5 GHz, 40 MHz BW

Frequency Band 1

5190 MHz

Peak Power Spectral Density (dBm)	-12.35
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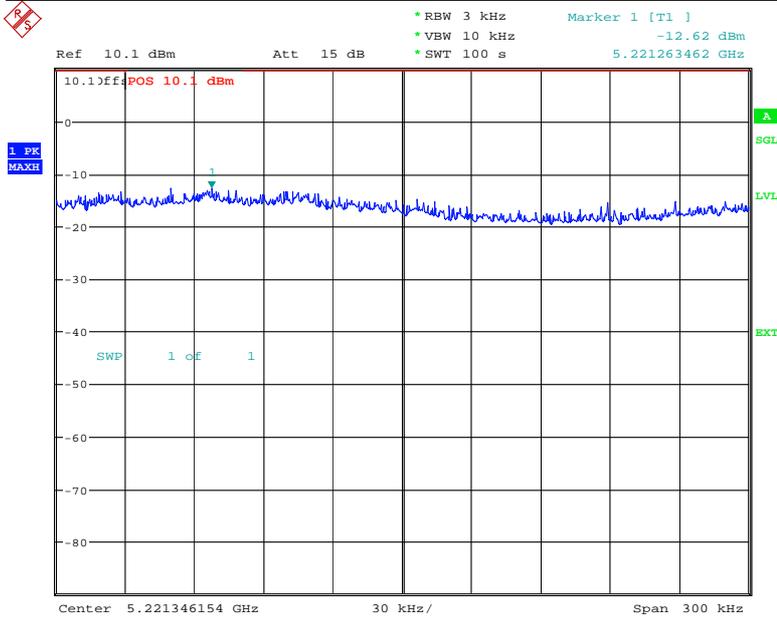
Date: 31.AUG.2012 12:38:29



Product Service

5230 MHz

Peak Power Spectral Density (dBm)	-12.62
-----------------------------------	--------



Date: 31.AUG.2012 13:43:49

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.

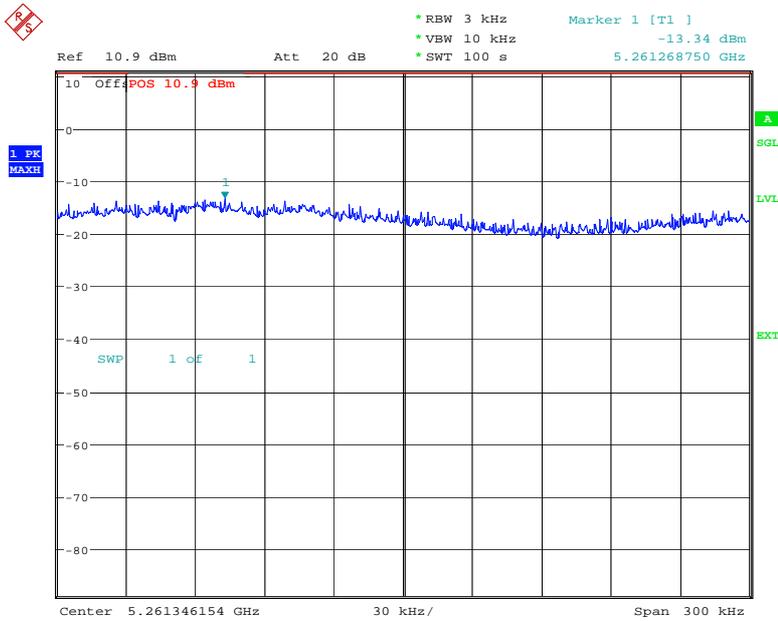


Product Service

Frequency Band 2

5270 MHz

Peak Power Spectral Density (dBm)	-13.34
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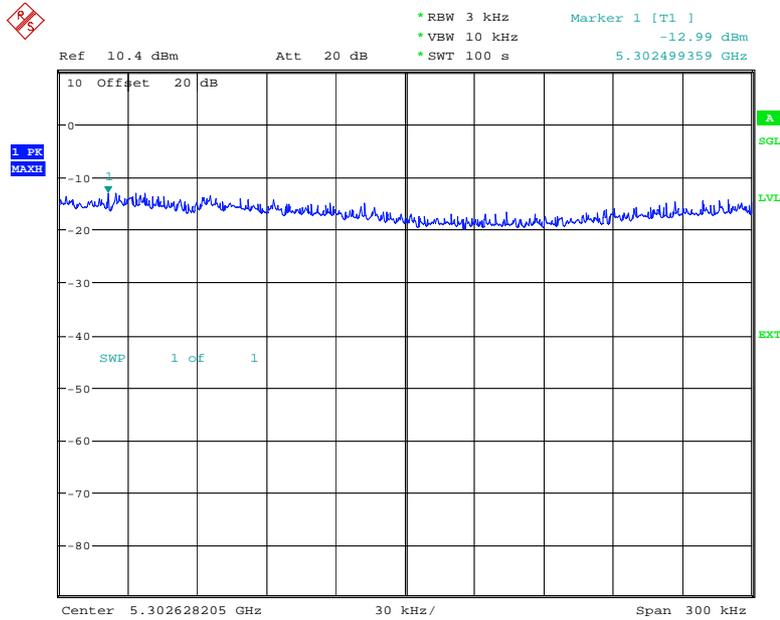
Date: 31.AUG.2012 13:57:13



Product Service

5310 MHz

Peak Power Spectral Density (dBm)	-12.99
-----------------------------------	--------



Date: 31.AUG.2012 14:34:18

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.

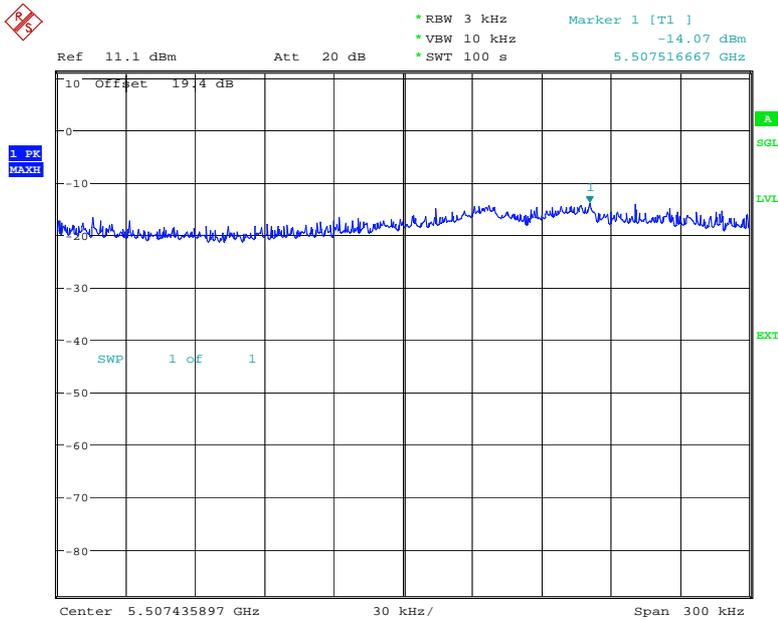


Product Service

Frequency Band 3

5510 MHz

Peak Power Spectral Density (dBm)	-14.07
-----------------------------------	--------



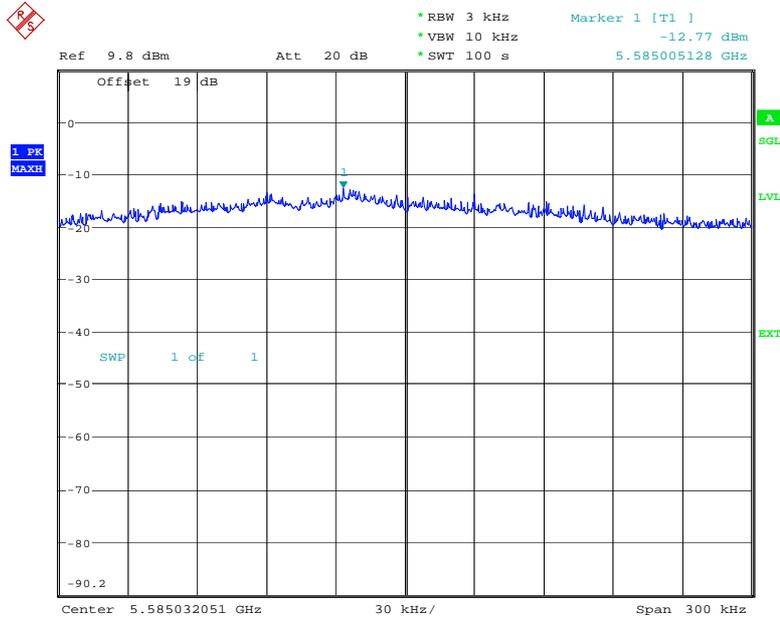
Date: 31.AUG.2012 14:50:57



Product Service

5590 MHz

Peak Power Spectral Density (dBm)	-12.77
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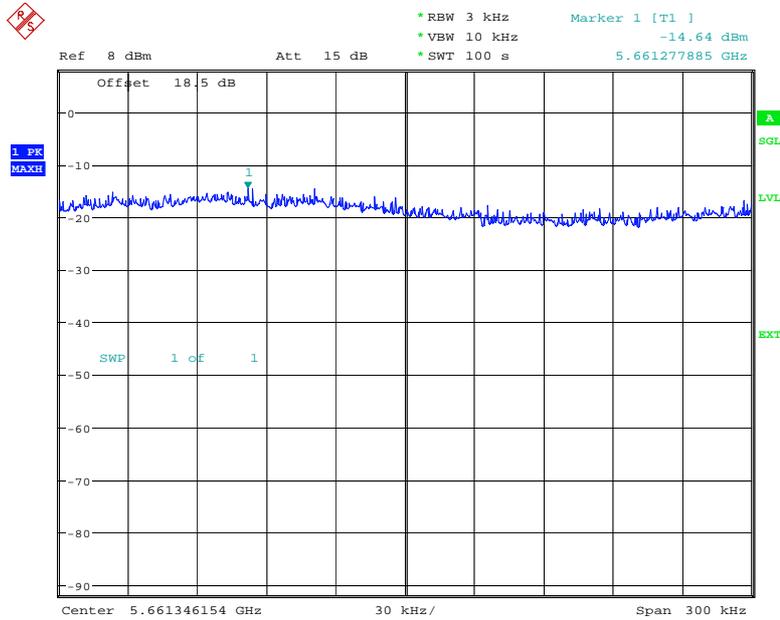
Date: 31.AUG.2012 15:05:08



Product Service

5670 MHz

Peak Power Spectral Density (dBm)	-14.64
-----------------------------------	--------



Date: 31.AUG.2012 15:15:16

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



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 SHL21 S/N: IMEI 004401114094523 - Modification State 0

2.7.3 Date of Test

29 August 2012 & 31 August 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 exclusion 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	23.8 - 25.8°C
Relative Humidity	26.9 - 45.7%



Product Service

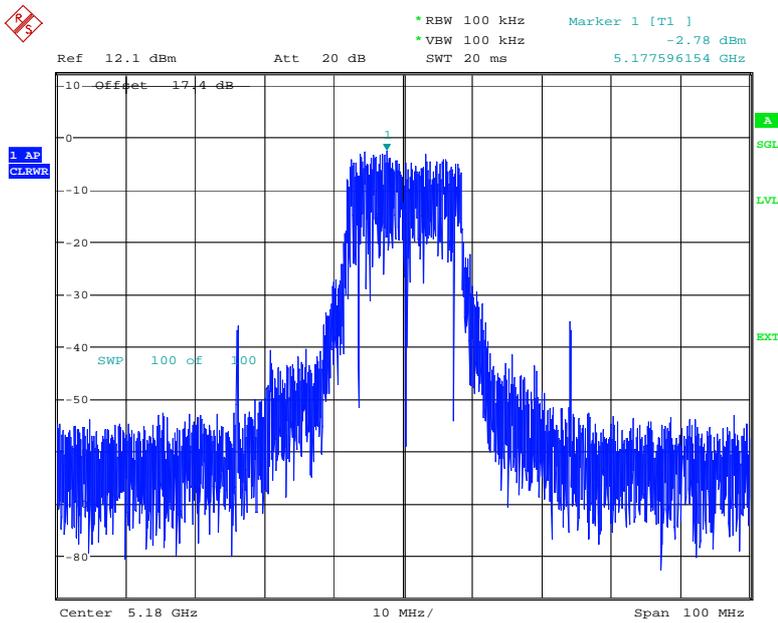
2.7.7 Test Results

802.11(a)

Frequency Band 1

5180 MHz

Ratio (dB)	12.03
------------	-------



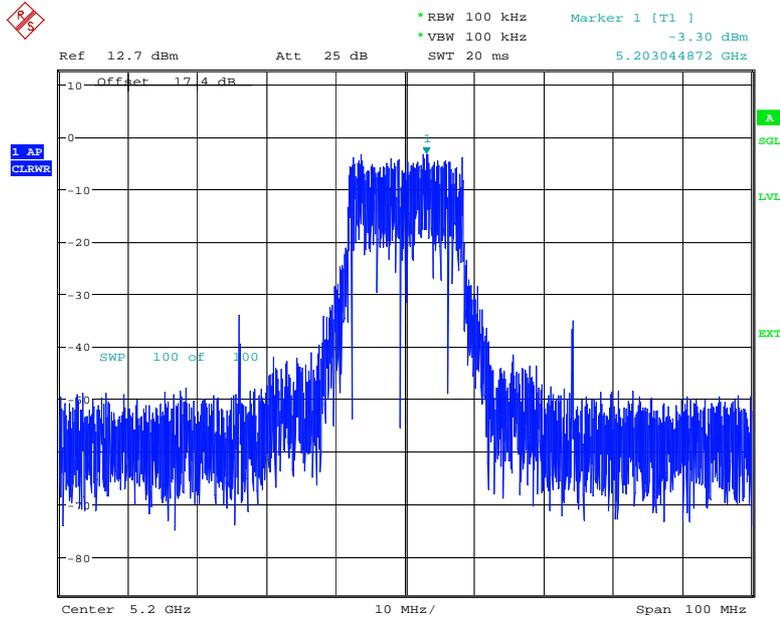
Date: 29.AUG.2012 13:21:07



Product Service

5200 MHz

Ratio (dB)	13.13
------------	-------



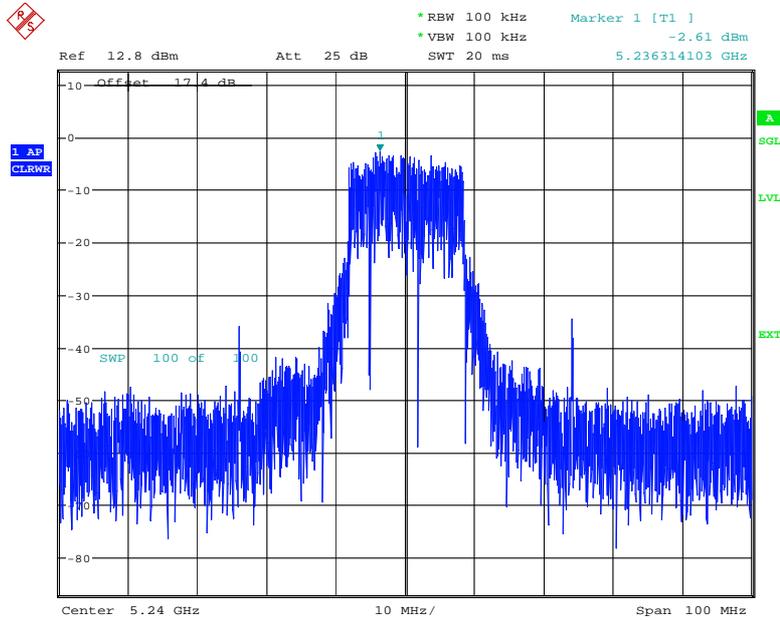
Date: 29.AUG.2012 13:26:38



Product Service

5240 MHz

Ratio (dB)	11.84
------------	-------



Date: 29.AUG.2012 13:29:51

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 12 Mbps.

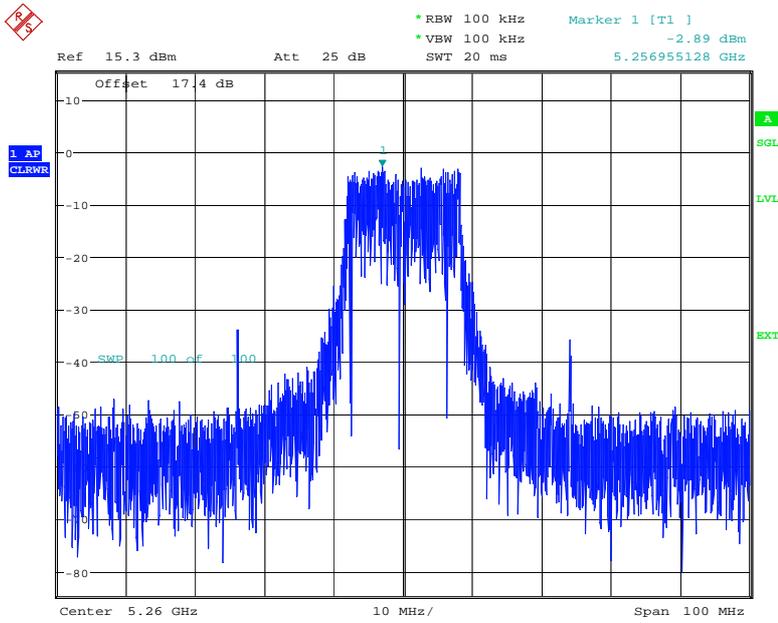


Product Service

Frequency Band 2

5260 MHz

Ratio (dB)	11.64
------------	-------



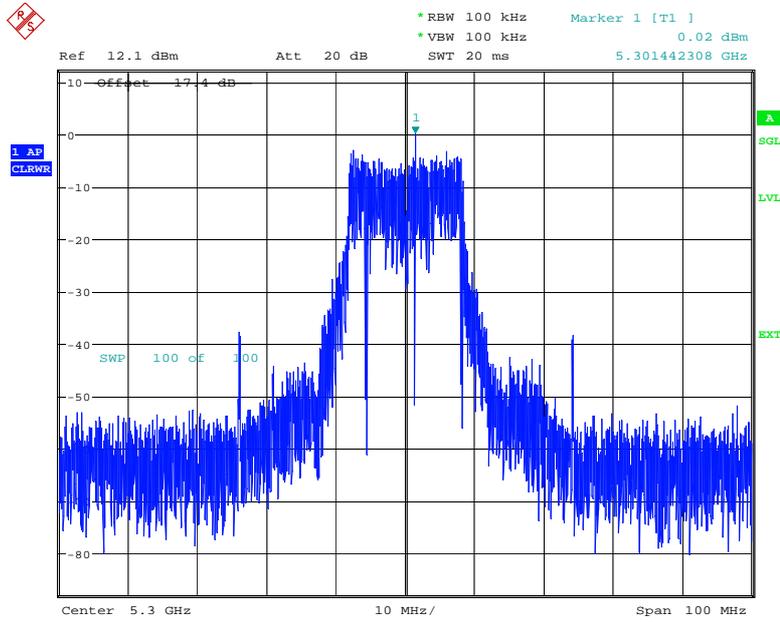
Date: 29.AUG.2012 13:34:50



Product Service

5300 MHz

Ratio (dB)	12.08
------------	-------



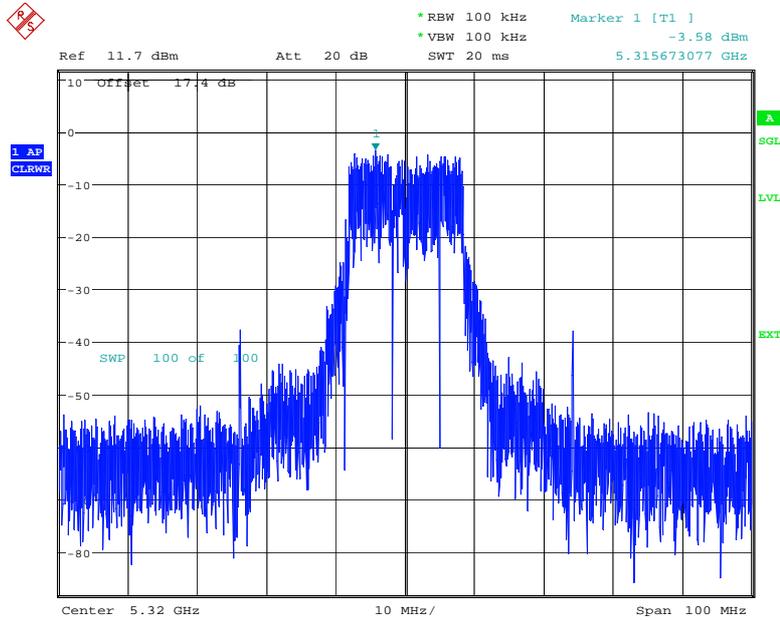
Date: 29.AUG.2012 13:38:45



Product Service

5320 MHz

Ratio (dB)	11.52
------------	-------



Date: 29.AUG.2012 13:41:36

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 12 Mbps.

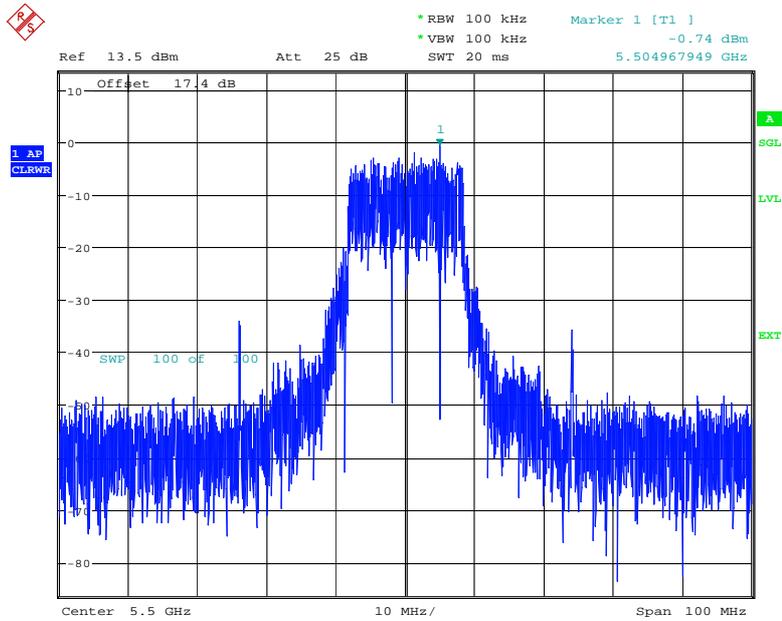


Product Service

Frequency Band 3

5500 MHz

Ratio (dB)	11.19
------------	-------



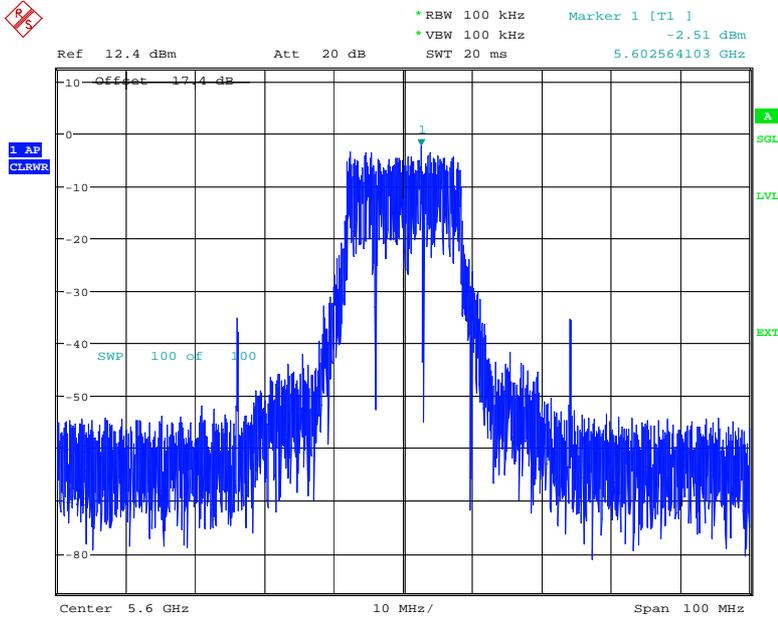
Date: 29.AUG.2012 13:47:28



Product Service

5600 MHz

Ratio (dB)	11.54
------------	-------



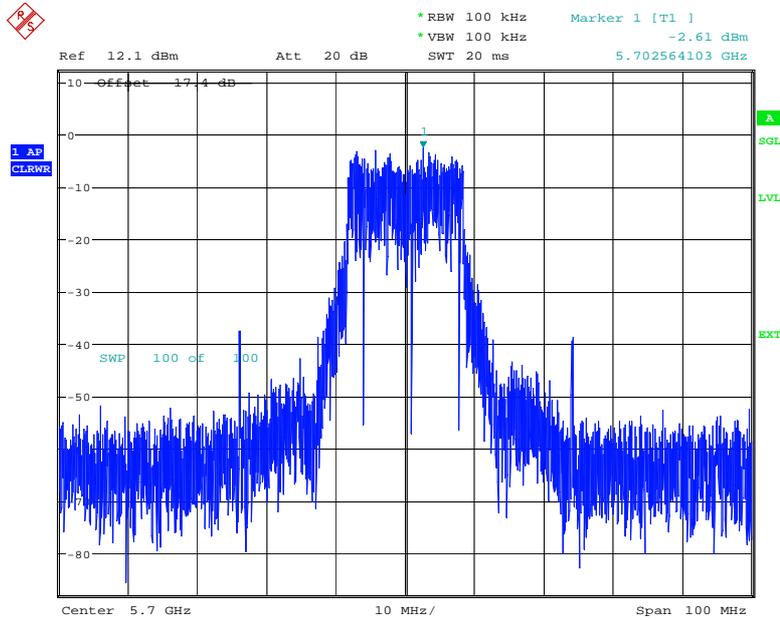
Date: 29.AUG.2012 13:52:13



Product Service

5700 MHz

Ratio (dB)	11.51
------------	-------



Date: 29.AUG.2012 13:58:24

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 12 Mbps.

Limit

Not specified.



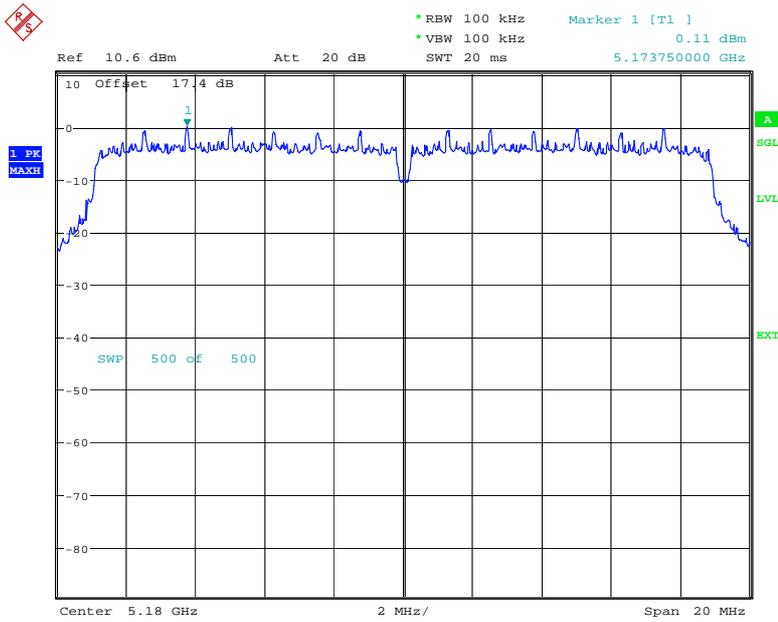
Product Service

802.11(n) - 5 GHz, 20 MHz BW

Frequency Band 1

5180 MHz

Ratio (dB)	12.03
------------	-------



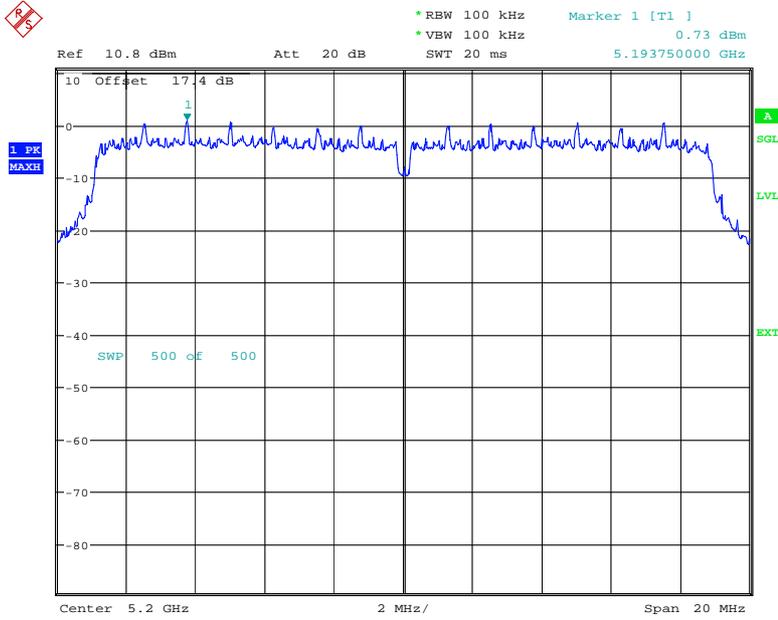
Date: 29.AUG.2012 14:03:48



Product Service

5200 MHz

Ratio (dB)	12.13
------------	-------



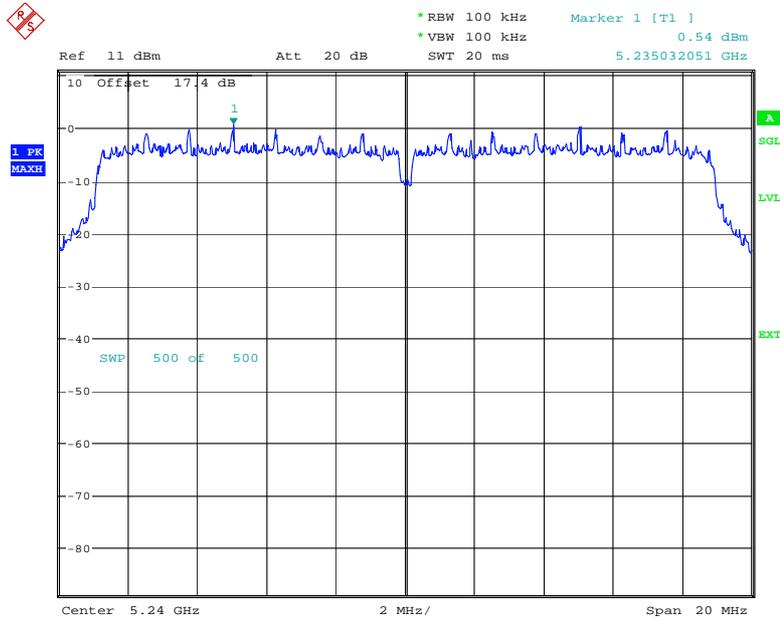
Date: 29.AUG.2012 14:07:05



Product Service

5240 MHz

Ratio (dB)	11.84
------------	-------



Date: 29.AUG.2012 14:14:05

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 6.5 Mbps.

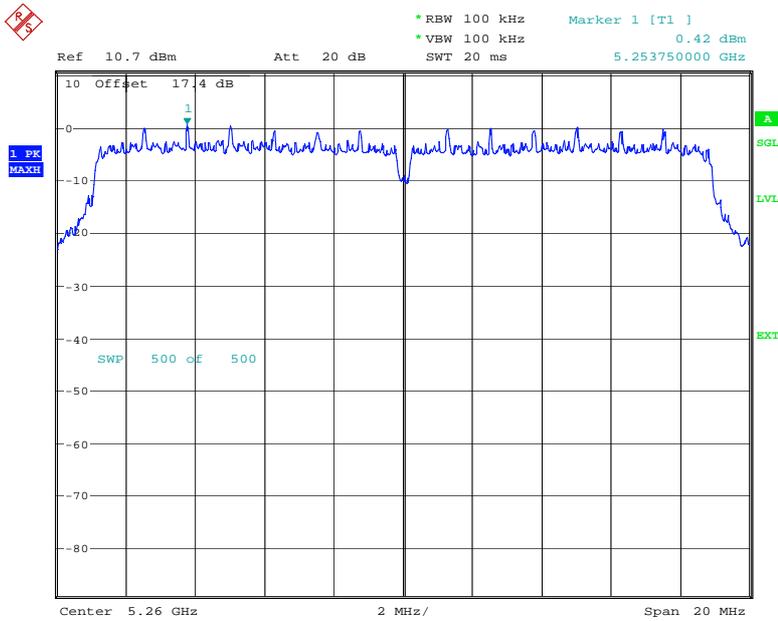


Product Service

Frequency Band 2

5260 MHz

Ratio (dB)	11.64
------------	-------



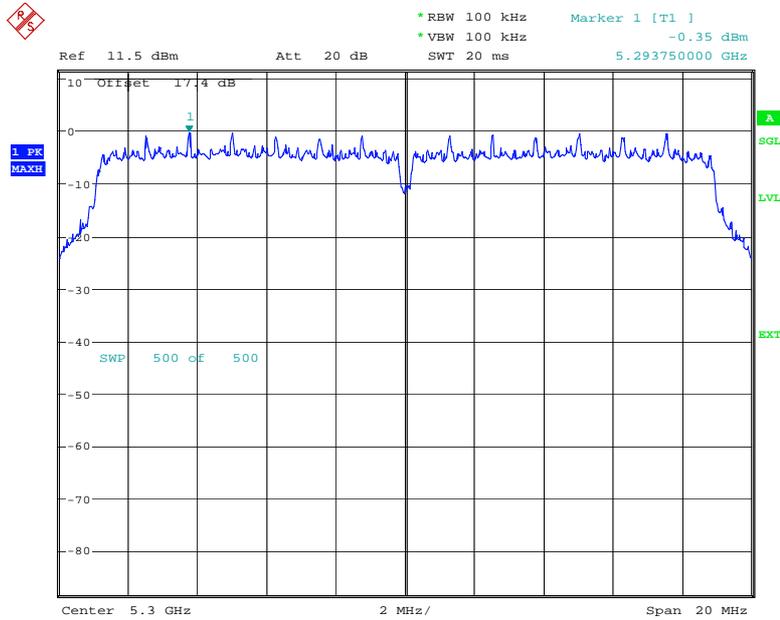
Date: 29.AUG.2012 14:19:59



Product Service

5300 MHz

Ratio (dB)	12.08
------------	-------



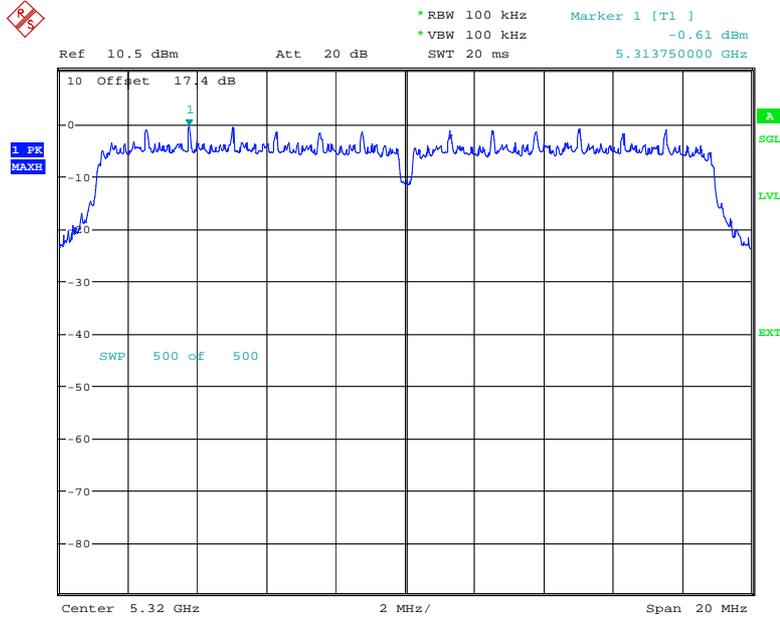
Date: 29.AUG.2012 14:23:18



Product Service

5320 MHz

Ratio (dB)	11.52
------------	-------



Date: 29.AUG.2012 14:26:42

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 6.5 Mbps.

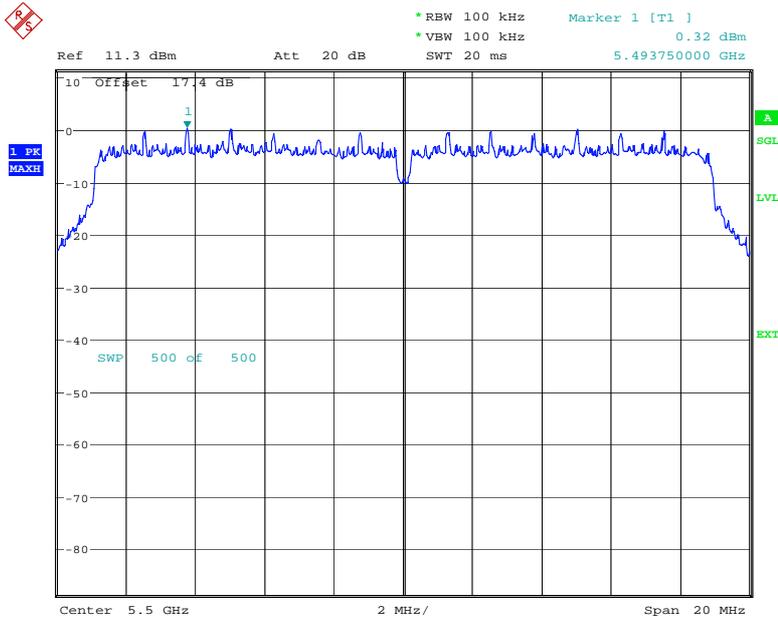


Product Service

Frequency Band 3

5500 MHz

Ratio (dB)	11.19
------------	-------



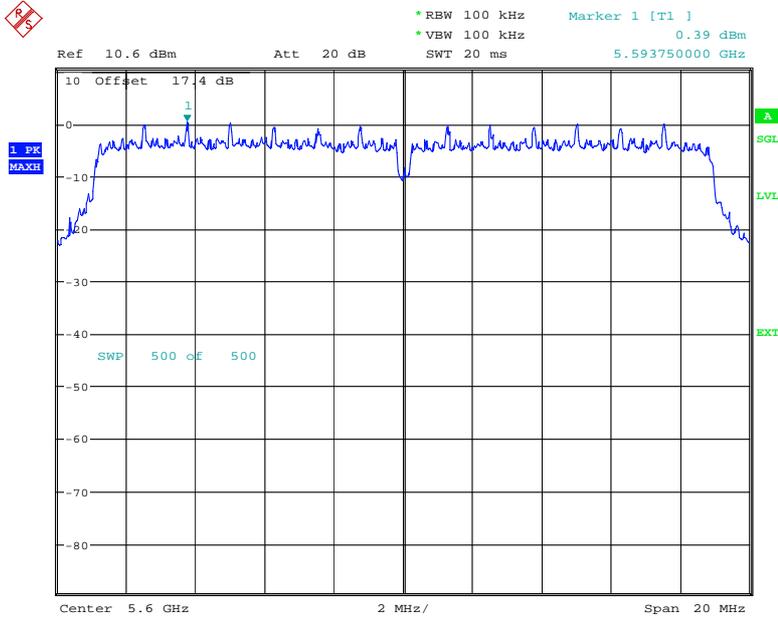
Date: 29.AUG.2012 14:32:24



Product Service

5600 MHz

Ratio (dB)	11.54
------------	-------



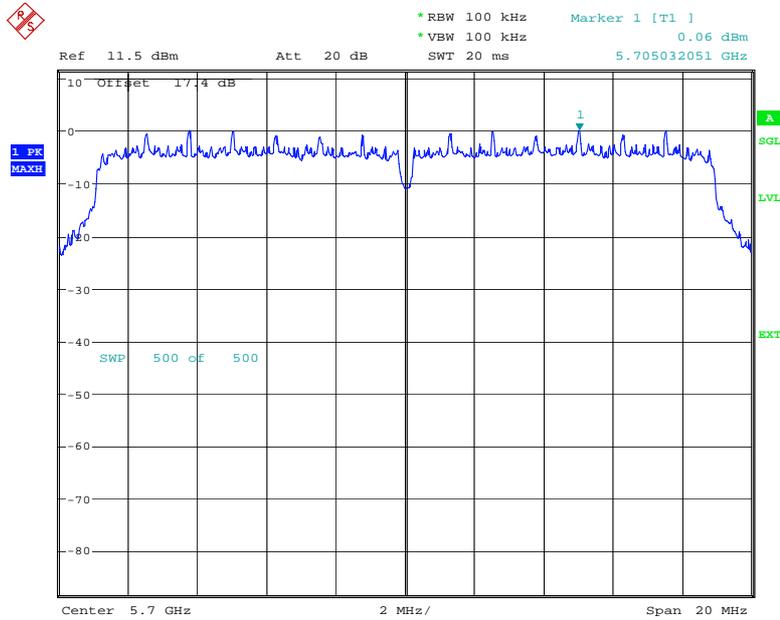
Date: 29.AUG.2012 14:35:42



Product Service

5700 MHz

Ratio (dB)	11.51
------------	-------



Date: 29.AUG.2012 14:39:21

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 6.5 Mbps.

Limit

Not specified.



Product Service

802.11(n) - 5 GHz, 40 MHz BW

Frequency Band 1

5190 MHz

Ratio (dB)	12.02
------------	-------

5230 MHz

Ratio (dB)	11.84
------------	-------

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.

Plots are not included for this test as it was evident that the worst case result was with the 20 MHz BW Modulation scheme.

Frequency Band 2

5270 MHz

Ratio (dB)	12.24
------------	-------

5310 MHz

Ratio (dB)	11.83
------------	-------

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.

Plots are not included for this test as it was evident that the worst case result was with the 20 MHz BW Modulation scheme.

Frequency Band 3

5510 MHz

Ratio (dB)	12.36
------------	-------

5590 MHz

Ratio (dB)	11.57
------------	-------

5670 MHz

Ratio (dB)	11.62
------------	-------



Product Service

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.

Plots are not included for this test as it was evident that the worst case result was with the 20 MHz BW Modulation scheme.

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					
Transient Limiter	Hewlett Packard	11947A	15	12	1-Dec-2012
3 phase LISN	Rohde & Schwarz	ESH2-Z5	323	12	13-Jan-2013
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	29-Sep-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
Section 2.2 – Power Limits					
Peak Power Analyser	Hewlett Packard	8990A	107	12	10-Feb-2013
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	8-Dec-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3159	12	13-Jun-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
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	3980	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	-	01-May-2013



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.2 – Power Limits					
Signal Generator	Rohde & Schwarz	SMX	185	-	O/P Mon
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
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	20-Feb-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Pre-Amplifier	Phase One	PSO4-0087	1534	12	26-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Programmable Power Supply	Iso-tech	IPS 2010	2438	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	20-Sep-2012
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	21-Dec-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	27-Jun-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	14-Jun-2013
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	29-May-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	16-Apr-2013
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3694	-	TU
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3695	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 - Undesirable Emission Limits					
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Combiner/Splitter	Weinschel	1506A	3879	12	19-Mar-2013
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
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
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144	-	01-May-2013
Section 2.4 - Frequency Stability					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	8-Jun-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3159	12	13-Jun-2013
Attenuator (20dB, 50W)	Aeroflex / Weinschel	47-20-34	3165	12	13-Jun-2013
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013
Hygrometer	Rotronic	I-1000	3220	12	13-Jun-2013
Termination	Diamond Antenna	DL-30N	3400	-	O/P Mon
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
True RMS Multimeter	Fluke	179	4007	12	16-Feb-2013
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	4144		Class 1 (Int)



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - 26 dB Bandwidth					
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	27-Jun-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	14-Jun-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	19-Aug-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
Section 2.6 - Peak Power Spectral Density					
Signal Generator	Marconi	2031	53	-	O/P Mon
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	21-Sep-2012
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Programmable Power Supply	Iso-tech	IPS 2010	2438	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
Combiner/Splitter	Weinschel	1506A	3879	12	19-Mar-2013
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.7 - Ratio of the Peak Excursion of the Modulation Envelope					
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	18-Nov-2012
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (10dB, 2W)	Weinschel	1	3030	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	27-Jan-2013
P-Series Power Meter	Agilent	N1911A	3980	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3982	12	12-Sep-2012

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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