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Report On

FCC Testing of the
Pace Plc PX001ANM
In accordance with FCC CFR 47 Part 15C

COMMERCIAL-IN-CONFIDENCE

FCC ID: NQ8PX001ANM

Document 75916394 Report 02 Issue 1

January 2012



Product Service

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COMMERCIAL-IN-CONFIDENCE

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Pace Plc PX001ANM
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PREPARED FOR

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PREPARED BY

Natalie Bennett
Technical Administrator

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED

11 January 2012

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 15C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

R Henley

G Lawler



S Hartley



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SECTION 1

REPORT SUMMARY

FCC Testing of the
Pace Plc PX001ANM
In accordance with FCC CFR 47 Part 15C



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Pace Plc PX001ANM to the requirements of FCC CFR 47 Part 15C.

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	Pace Plc
Model Number(s)	xfinity
Serial Number(s)	PAPV00001023 PAPV00000983
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 15C (2010)
Incoming Release Date	Application Form 15 December 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	5141267 19 December 2011
Start of Test	19 December 2011
Finish of Test	4 January 2012
Name of Engineer(s)	R Henley G Lawler S Hartley
Related Document(s)	ANSI C63.10: 2009



1.2 BRIEF SUMMARY OF RESULTS

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

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Transmit				
2.1	15.207	AC Line Conducted Emissions	Pass	
2.2	15.247 (b)(3)	Maximum Peak Conducted Output Power	Pass	
2.3	15.247 (b)(4)	EIRP Peak Power	Pass	
2.4	15.247 (e)	Power Spectral Density	Pass	
2.5	15.247 (d)	Spurious and Band Edge Emissions	Pass	
2.6	15.247 (2)	6dB Bandwidth	Pass	
Transmit - Alternate Antenna				
2.2	15.247 (b)(3)	Maximum Peak Conducted Output Power	Pass	
2.4	15.247 (e)	Power Spectral Density	Pass	
2.5	15.247 (d)	Spurious and Band Edge Emissions	Pass	
2.6	15.247 (2)	6dB Bandwidth	Pass	



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1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	PX001ANM
Part Number	PX001ANM
FCC ID	NQ8PX001ANM
Industry Canada ID (if applicable)	
Technical Description (Please provide a brief description of the intended use of the equipment)	High Definition Cable Set top box with MOC

POWER SOURCE	
☐ AC mains	State voltage
AC supply frequency	50-60 (Hz)
VAC	
Max Current	
Hz	
☒ Single phase	☐ Three phase
And / Or	
☐ External DC supply	
Nominal voltage	15dc V Max Current 4.3 A
Extreme upper voltage	240 V
Extreme lower voltage	100 V
Battery	
☐ Nickel Cadmium	☐ Lead acid (Vehicle regulated)
☐ Alkaline	☐ Leclanche
☐ Lithium	☐ Other Details :
Volts nominal.	
End point voltage as quoted by equipment manufacturer	V

FREQUENCY INFORMATION	
Frequency Range	2.405 to 2.485 MHz
Channel Spacing (where applicable)	
Test Frequencies*	Bottom 2.425 MHz Channel Number (if applicable) 15
	Middle 2.45 MHz Channel Number (if applicable) 20
	Top 2.485 MHz Channel Number (if applicable) 25
If alternate test modes are available resulting in different test frequencies please specify which mode is applicable:	
POWER CHARACTERISTICS	
Maximum TX power	0.002 W
Minimum TX power	W (if variable)
Is transmitter intended for :	
Continuous duty	☐ Yes ☐ No
Intermittent duty	☒ Yes ☐ No
If intermittent state DUTY CYCLE	
Transmitter ON	0.01 seconds
Transmitter OFF	0.99 seconds



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ANTENNA CHARACTERISTICS			
☐	Antenna connector	State impedance	Ohm
☐	Temporary antenna connector	State impedance	Ohm
☐	Integral antenna	Gain	>1.3 dBi

MODULATION CHARACTERISTICS			
☐	Amplitude	☐	Frequency
☐	Phase	☐	Other (please provide details):
Can the transmitter operate un-modulated?			☐ Yes ☐ No

CLASS OF EMISSION USED
ITU designation or Class of Emission: 1 (if applicable) 2 (if applicable) 3
If more than three classes of emission, list separately:

EXTREME CONDITIONS			
Extreme test voltages (Max)	V	Extreme test voltages (Min)	V
Nominal DC Voltage	V	DC Maximum Current	A
Maximum temperature	°C	Minimum temperature	°C

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

Signature: *J. Ryan* Name: Joseph Ryan

Position held: Global Approvals Manager Date: 15/12/2011



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Pace Plc PX001ANM. 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 110 V AC 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.



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SECTION 2

TEST DETAILS

FCC Testing of the
Pace Plc PX001ANM
In accordance with FCC CFR 47 Part 15C



2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.207

2.1.2 Equipment Under Test and Modification State

xfinity S/N: PAPV00001023 - Modification State 0

2.1.3 Date of Test

4 January 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

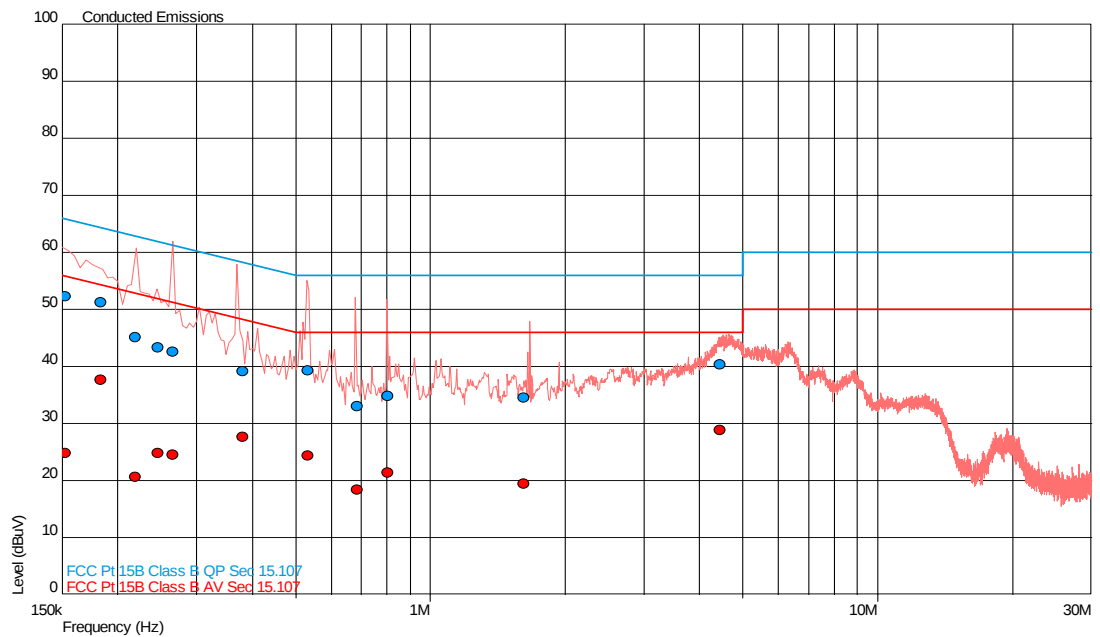
Ambient Temperature	19.0°C
Relative Humidity	42.0%



2.1.7 Test Results

Transmit

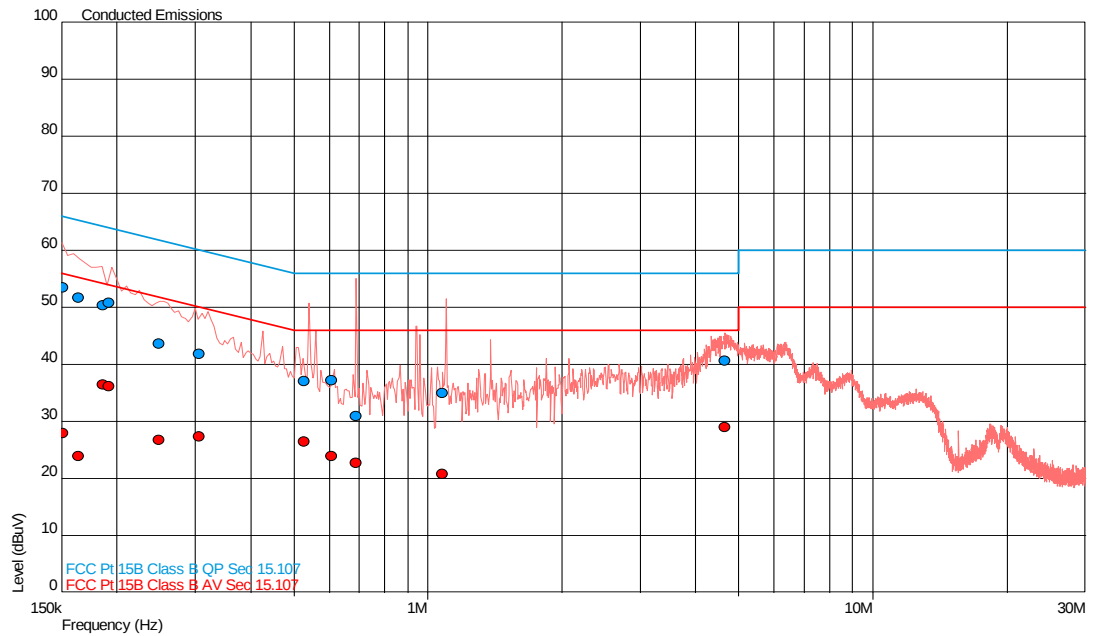
Live Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.153	52.4	65.8	-13.5	24.9	55.8	-31.0
0.183	51.3	64.4	-13.1	37.7	54.4	-16.6
0.219	45.1	62.9	-17.8	20.6	52.9	-32.2
0.247	43.4	61.9	-18.5	24.9	51.9	-27.0
0.265	42.7	61.3	-18.6	24.5	51.3	-26.8
0.380	39.1	58.3	-19.2	27.6	48.3	-20.7
0.531	39.4	56.0	-16.6	24.4	46.0	-21.6
0.685	33.0	56.0	-23.0	18.5	46.0	-27.5
0.804	34.8	56.0	-21.2	21.4	46.0	-24.6
1.617	34.5	56.0	-21.5	19.5	46.0	-26.5
4.445	40.3	56.0	-15.7	28.9	46.0	-17.1



Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)	
0.151	53.5	65.9	-12.4	28.0	55.9	-27.9	
0.164	51.7	65.3	-13.6	23.9	55.3	-31.4	
0.186	50.3	64.2	-13.9	36.5	54.2	-17.7	
0.192	50.9	64.0	-13.1	36.2	54.0	-17.8	
0.249	43.7	61.8	-18.1	26.9	51.8	-24.9	
0.306	41.9	60.1	-18.2	27.4	50.1	-22.7	
0.527	37.1	56.0	-18.9	26.5	46.0	-19.5	
0.607	37.3	56.0	-18.7	23.9	46.0	-22.1	
0.690	30.9	56.0	-25.1	22.8	46.0	-23.2	
1.077	35.1	56.0	-20.9	20.8	46.0	-25.2	
4.640	40.6	56.0	-15.4	29.0	46.0	-17.0	



Product Service

2.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(3)

2.2.2 Equipment Under Test and Modification State

xfinity S/N: PAPV00000983 - Modification State 0

2.2.3 Date of Test

21 December 2011

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

The EUT was transmitted at maximum power via a cable to the Peak Power Analyser. The Analyser settings were adjusted to display the resultant trace on screen and a reference level offset was entered to account for the measurement path loss. The measurement bandwidth was set according to the signal being measured and the peak and average levels were recorded.

2.2.6 Environmental Conditions

Ambient Temperature	26.7°C
Relative Humidity	35.5%



Product Service

2.2.7 Test Results

Transmit

110 V AC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2425 MHz	2450 MHz	2475 MHz	2425 MHz	2450 MHz	2475 MHz
1	2.810	2.320	1.930	1.910	1.706	1.560

Limit Clause

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

Transmit - Alternate Antenna

110 V AC Supply

Modulation Data Rate (Mbps)	Maximum Peak Conducted Output Power					
	dBm			mW		
	2425 MHz	2450 MHz	2475 MHz	2425 MHz	2450 MHz	2475 MHz
1	1.570	0.990	0.570	1.435	1.256	1.140

Limit Clause

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.



Product Service

2.3 EIRP PEAK POWER

2.3.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(4)

2.3.2 Equipment Under Test and Modification State

xfinity S/N: PAPV00001023 - Modification State 0

2.3.3 Date of Test

19 December 2011

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

The EUT was transmitted at maximum power via a cable 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. The level on the spectrum analyser 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. If applicable, a peak power analyser was also used to obtain a correction factor for wideband signals such as WLAN.

A calculation was then performed to obtain the final figure.

2.3.6 Environmental Conditions

Ambient Temperature	19.3°C
Relative Humidity	36.0%



Product Service

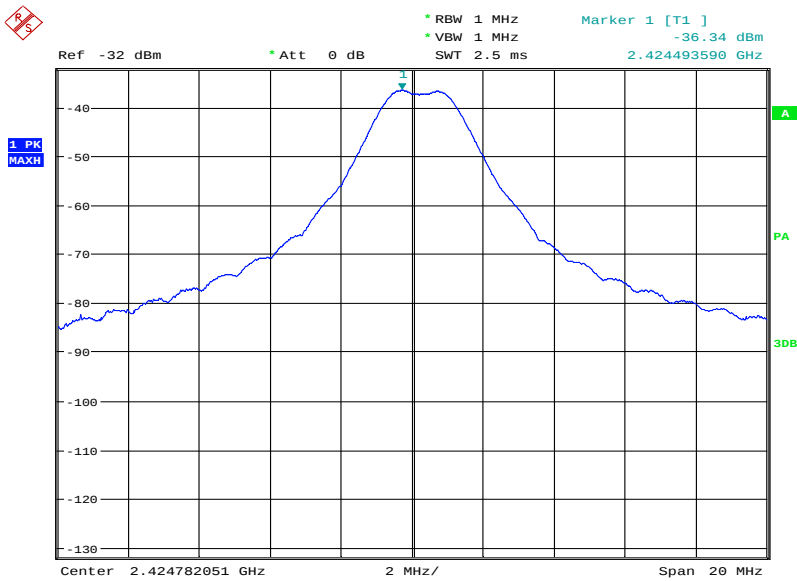
2.3.7 Test Results

Transmit

110 V AC Supply

2425 MHz

EIRP (dBm)	EIRP (mW)
+8.44	6.98



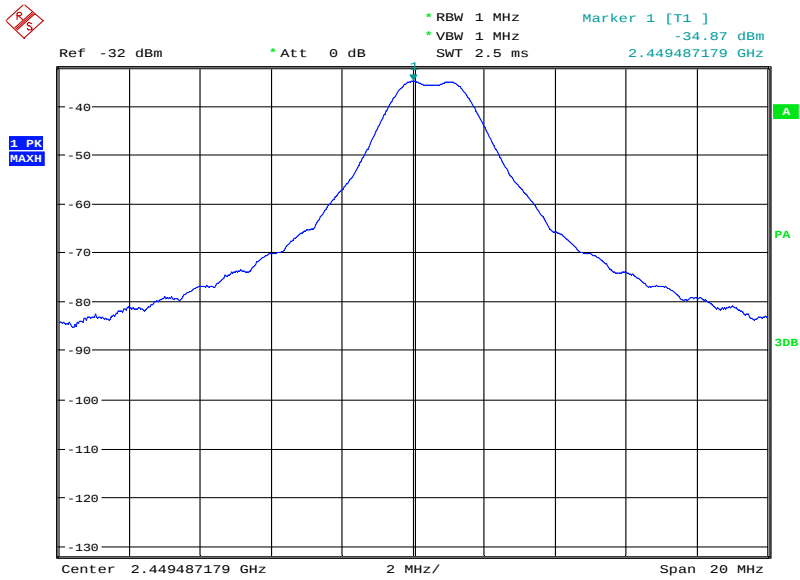
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2450 MHz

EIRP (dBm)	EIRP (mW)
+8.28	6.73



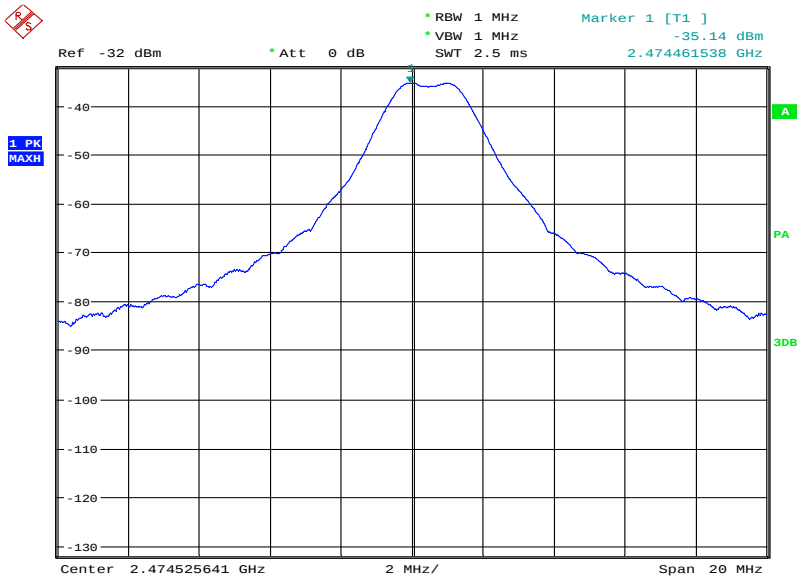
Date: 19.DEC.2011 20:39:49



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2475 MHz

EIRP (dBm)	EIRP (mW)
+7.69	5.87



Date: 19.DEC.2011 21:37:44

Limit

EIRP (dBm)	EIRP (mW)
36.0	4000



Product Service

2.4 POWER SPECTRAL DENSITY**2.4.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.247 (e)

2.4.2 Equipment Under Test and Modification State

xfinity S/N: PAPV00000983 - Modification State 0

2.4.3 Date of Test

21 December 2011

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 connected to a spectrum analyser via a 10 dB attenuator. The path loss was measured between the EUT and the spectrum analyser and entered as a reference level offset. The trace was set to max hold and using a peak detector the maximum response was established. With the spectrum analyser RBW at 3 kHz and VBW at 10 kHz, the power spectral density in a 3 kHz bandwidth was measured.

2.4.6 Environmental Conditions

Ambient Temperature	26.7°C
Relative Humidity	35.5%



Product Service

2.4.7 Test Results

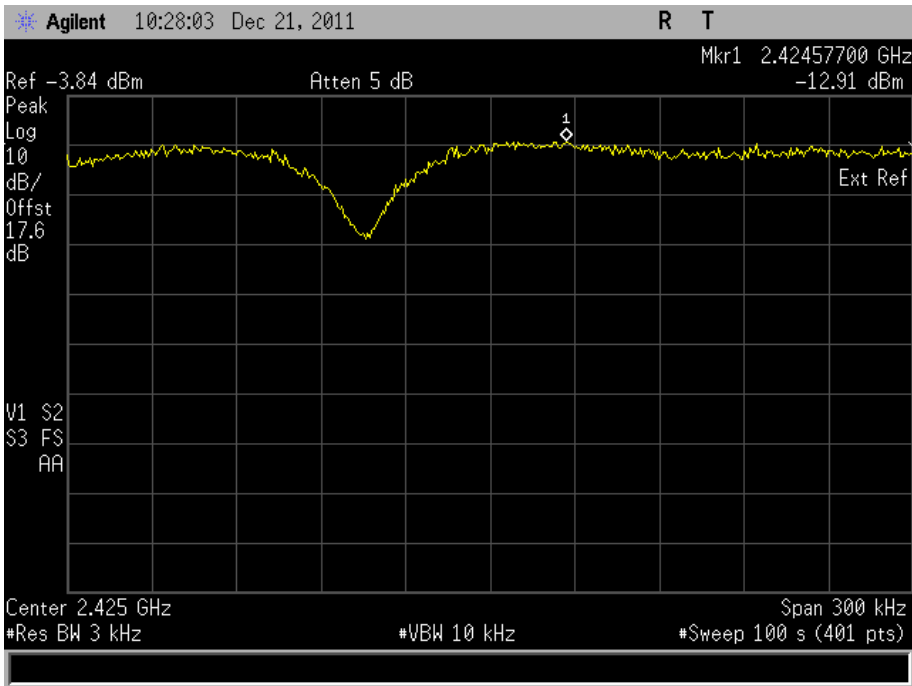
Transmit

110 V AC Supply

Frequency	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2425 MHz	1	-12.91
2450 MHz	1	-12.59
2475 MHz	1	-13.16

2425 MHz

1 Mbps

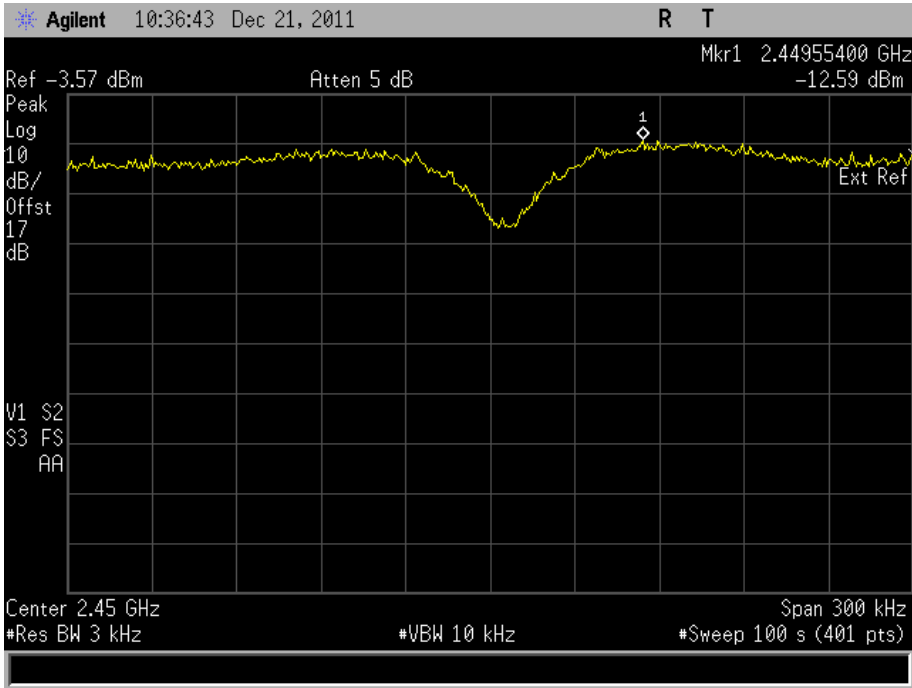




Product Service

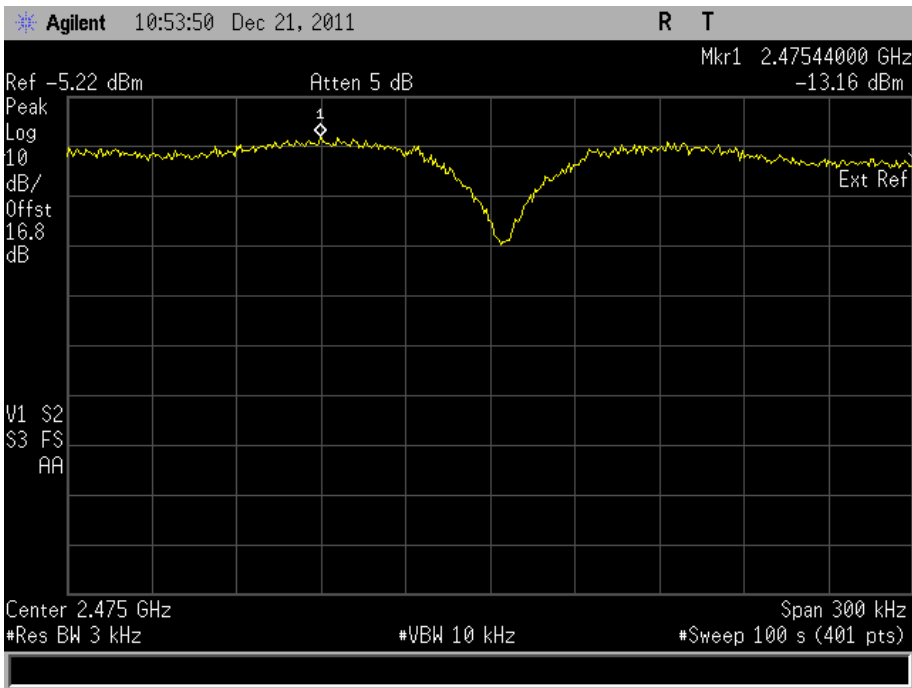
2450 MHz

1 Mbps



2475 MHz

1 Mbps





Product Service

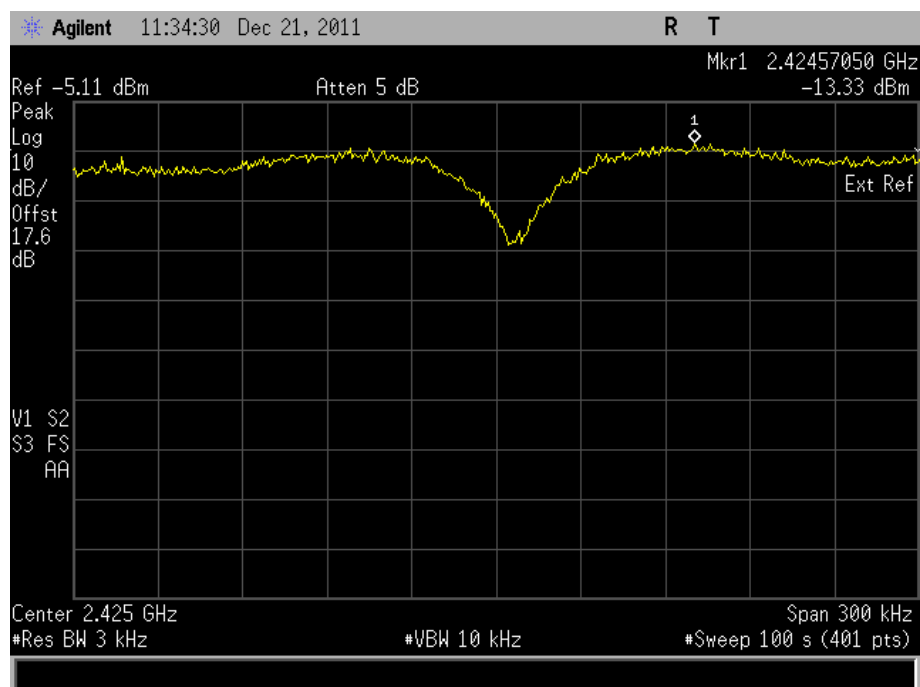
Limit Clause

The minimum 6 dB Bandwidth shall be at least 500 kHz.

Transmit - Alternate Antenna

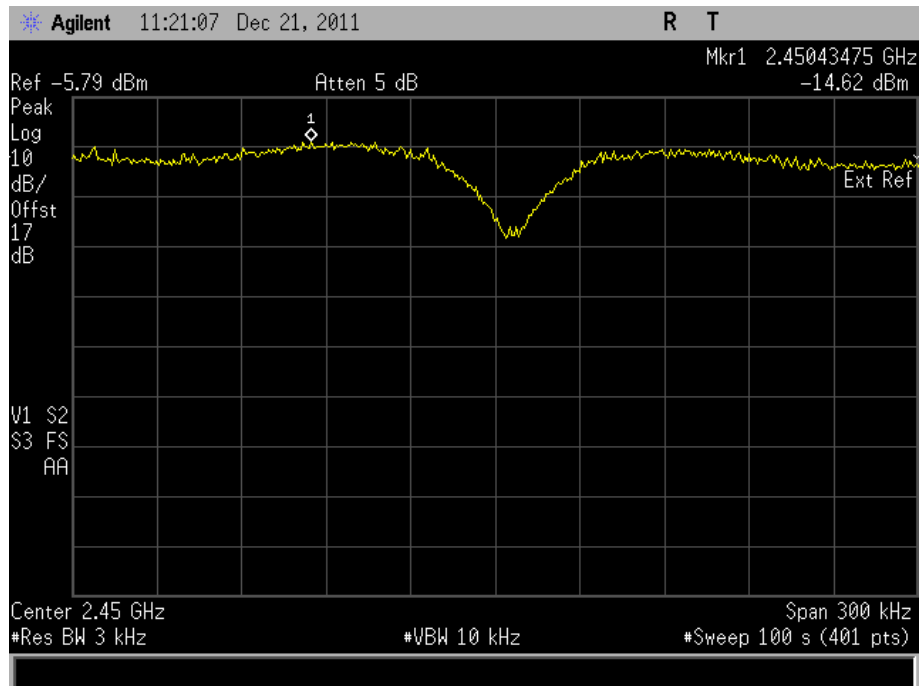
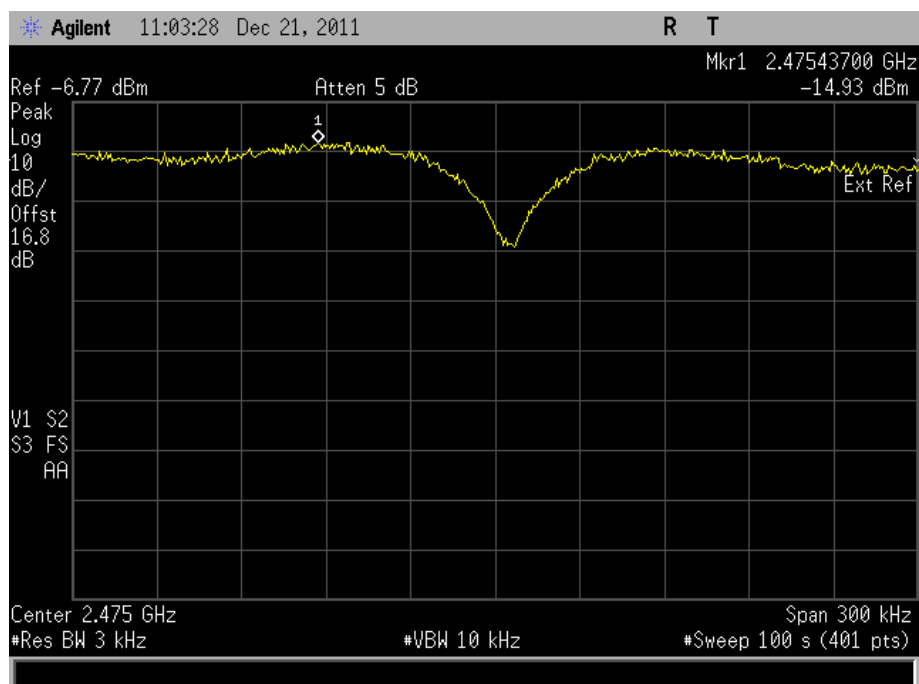
110 V AC Supply

Frequency (MHz)	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2425 MHz	1	-13.33
2450 MHz	1	-14.62
2475 MHz	1	-14.93

2425 MHz1 Mbps



Product Service

2450 MHz1 Mbps2475 MHz1 MbpsLimit Clause

The minimum 6 dB Bandwidth shall be at least 500 kHz.



2.5 SPURIOUS AND BAND EDGE EMISSIONS

2.5.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (d)

2.5.2 Equipment Under Test and Modification State

xfinity S/N: PAPV00001023 - Modification State 0

xfinity S/N: PAPV00000983 - Modification State 0

2.5.3 Date of Test

19 December 2011, 21 December 2011, 22 December 2011, 23 December 2011 & 4 January 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

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 25 GHz. Firstly, the power of each fundamental frequency was measured in 100 kHz bandwidth and this was used to shown a -20 dBc limit line on the trace. The measurement path loss in each relevant frequency band was measured and entered a s a reference level offset.

For radiated emissions, the test method described above was also used. However, the measurement was performed from 30 MHz to 25 GHz and the path loss is incorporated as a transducer factor and entered into the spectrum analyser.

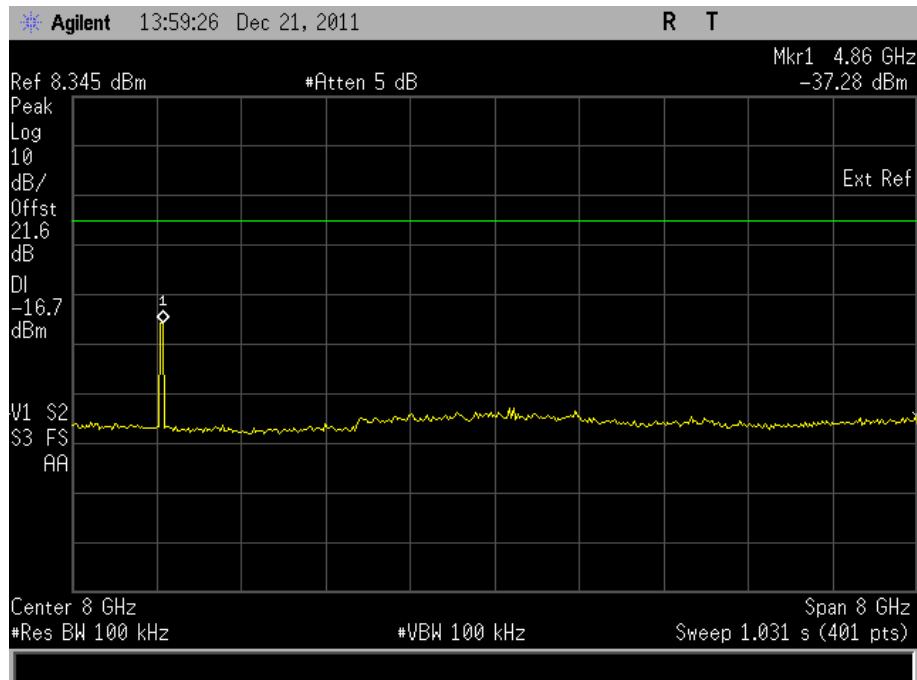
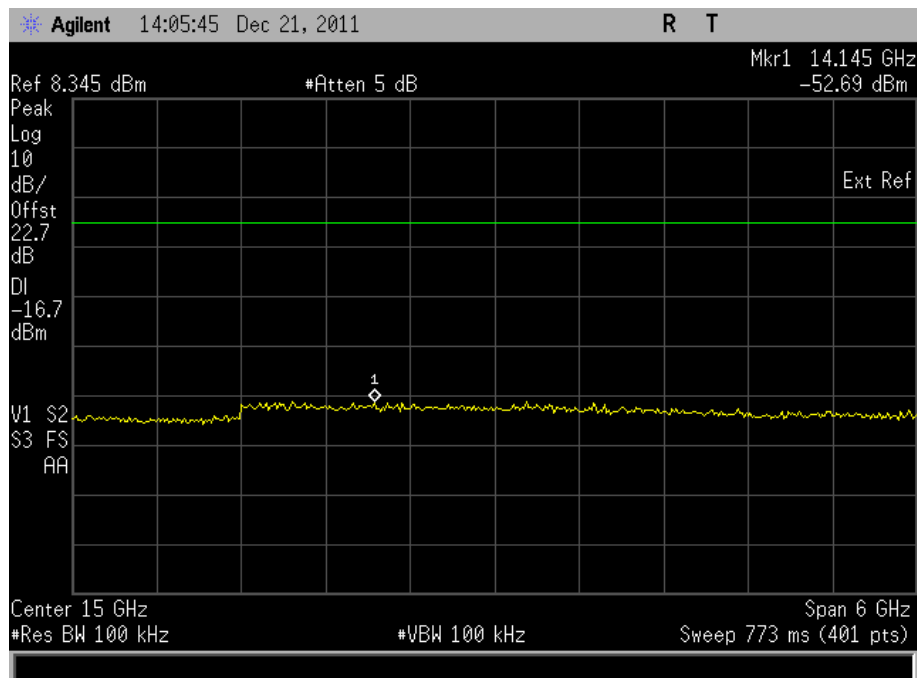
The band edge measurements were performed in accordance with ANSI C63.10, Clause 6.9.3. The results were analysed to ensure compliance with restricted bands. The EUT was set to the lowest and highest operating frequencies.

2.5.6 Environmental Conditions

Ambient Temperature	18.0 - 26.7°C
Relative Humidity	31.0 - 46.0%

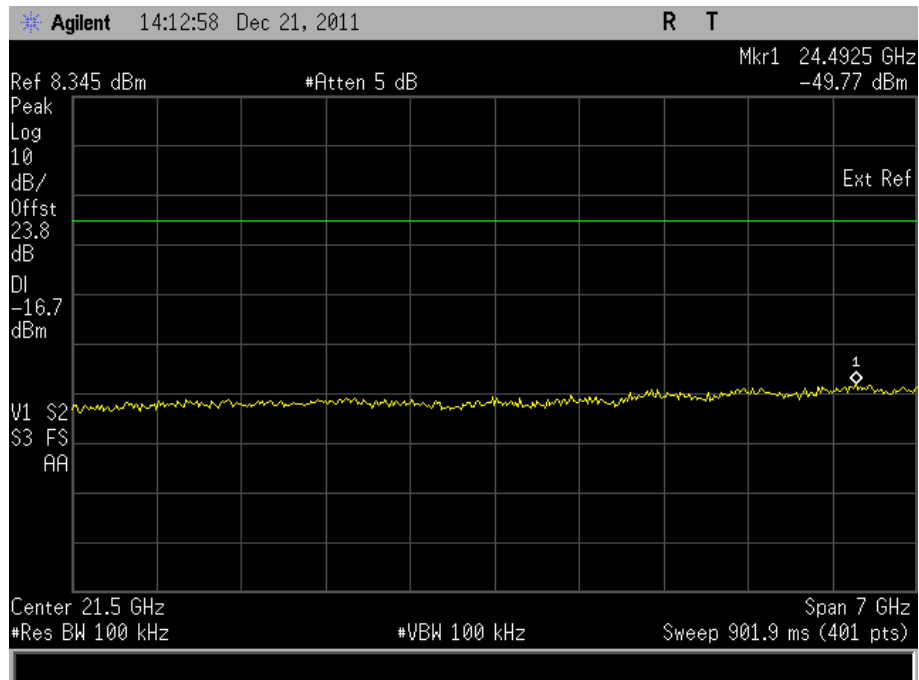
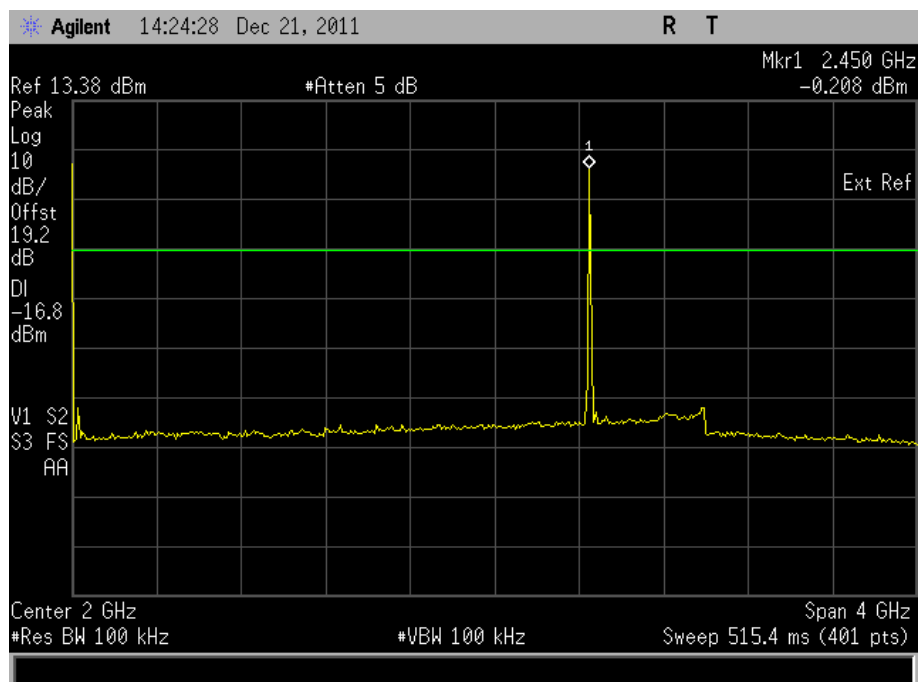


Product Service

4 GHz to 12 GHz12 GHz to 18 GHz

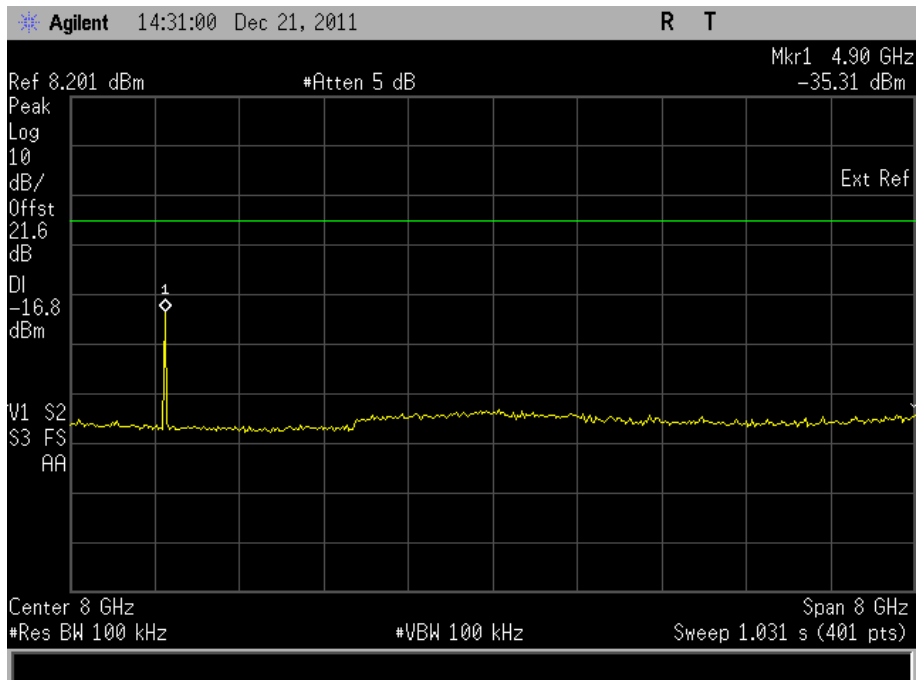
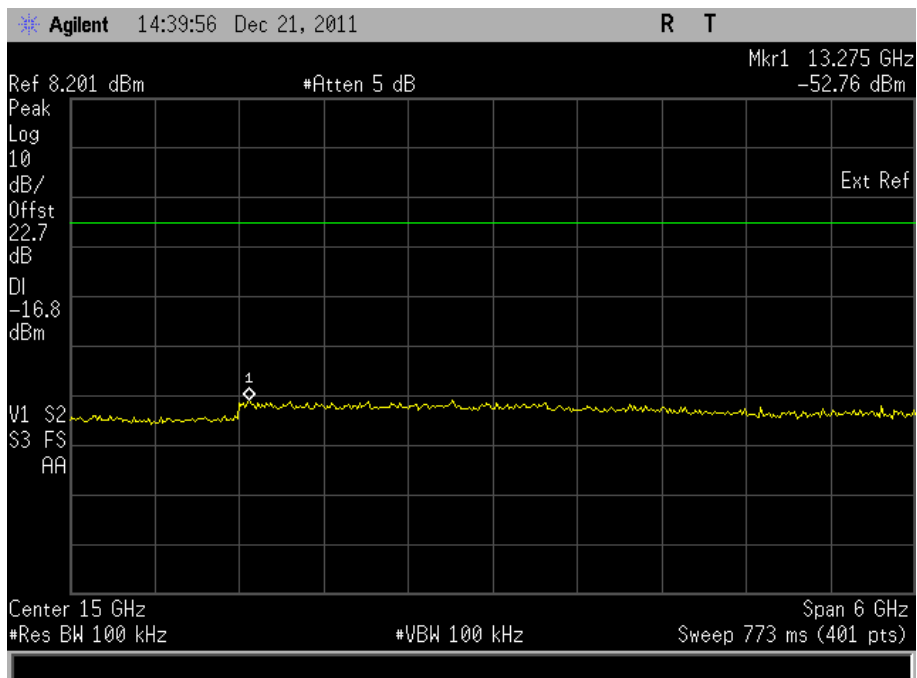


Product Service

18 GHz to 25 GHz2450 MHz9 kHz to 4 GHz



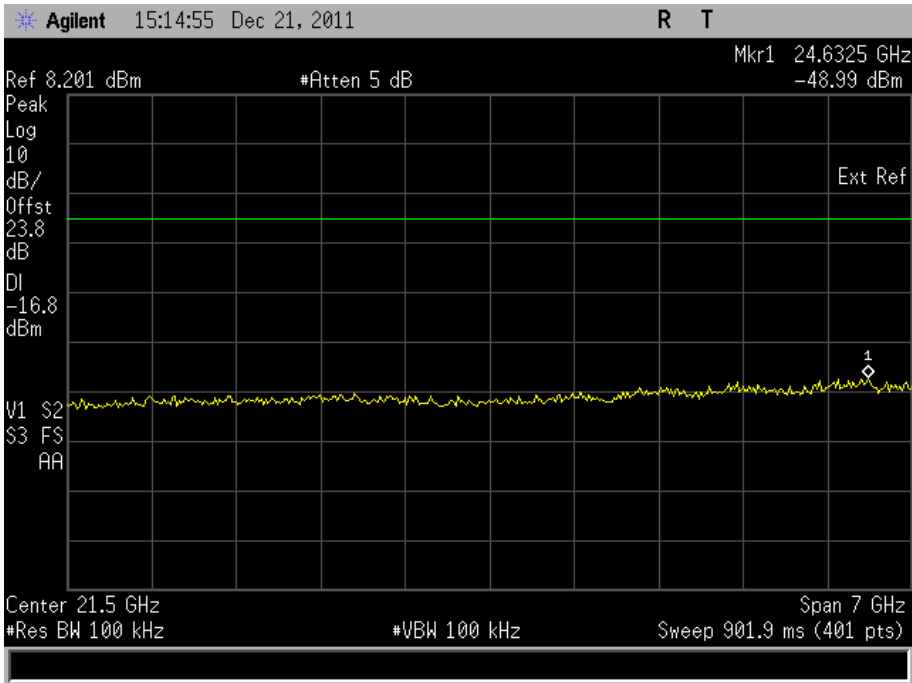
Product Service

4 GHz to 12 GHz12 GHz to 18 GHz



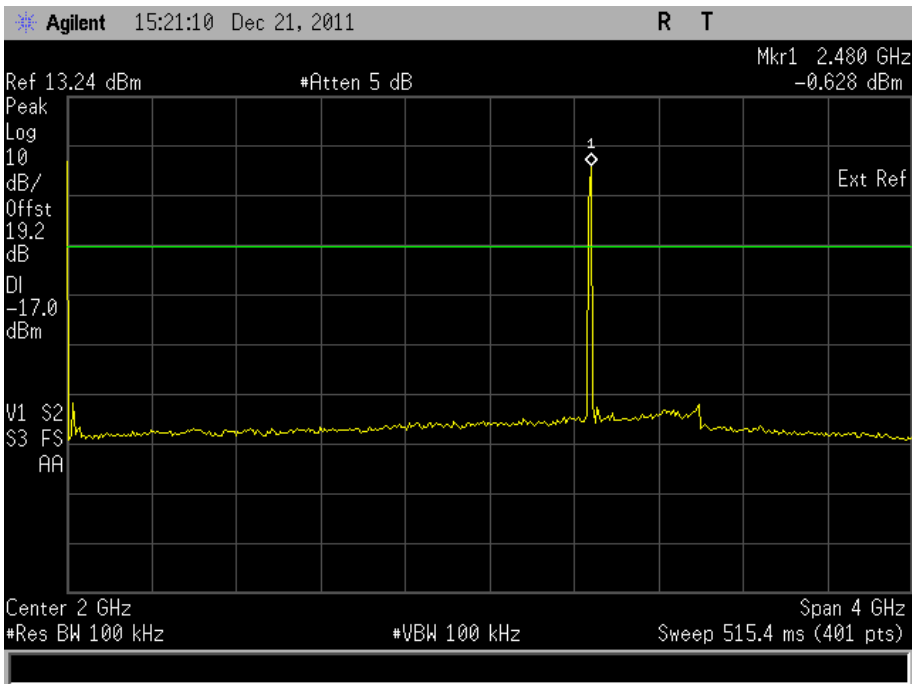
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18 GHz to 25 GHz



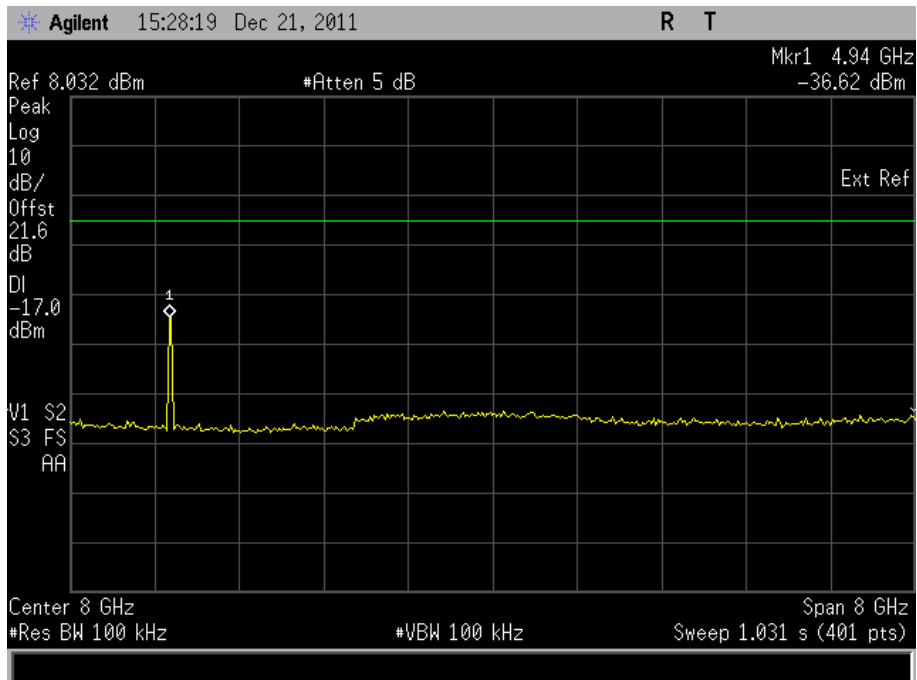
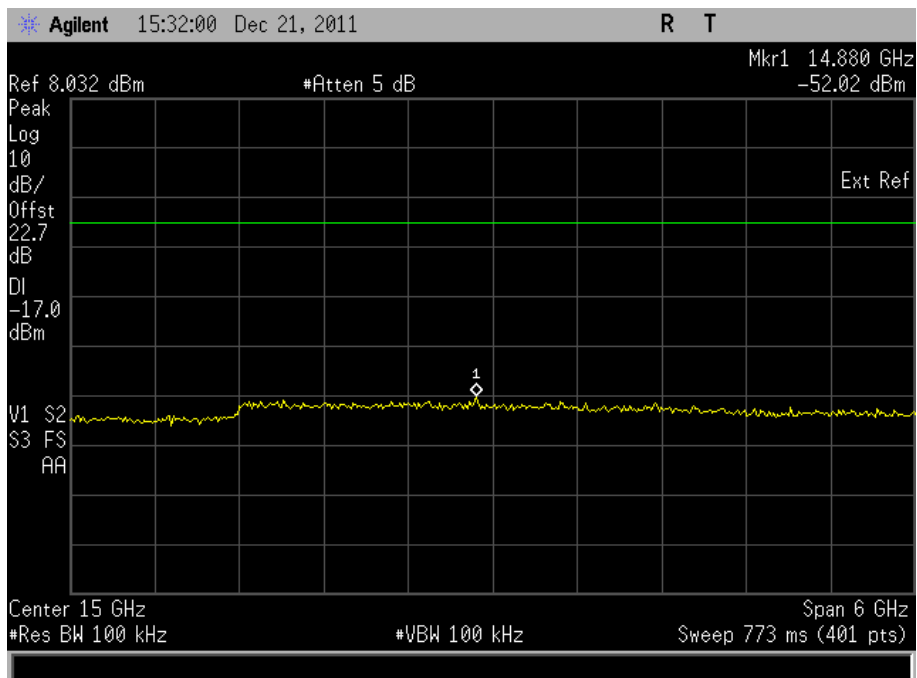
2475 MHz

9 kHz to 4 GHz





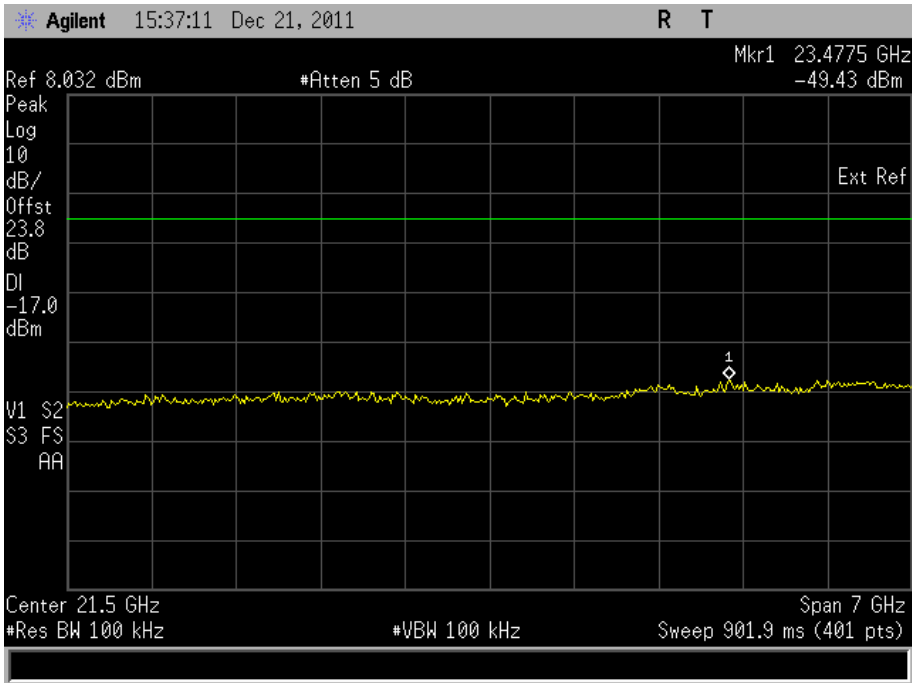
Product Service

4 GHz to 12 GHz12 GHz to 18 GHz



Product Service

18 GHz to 25 GHz



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.

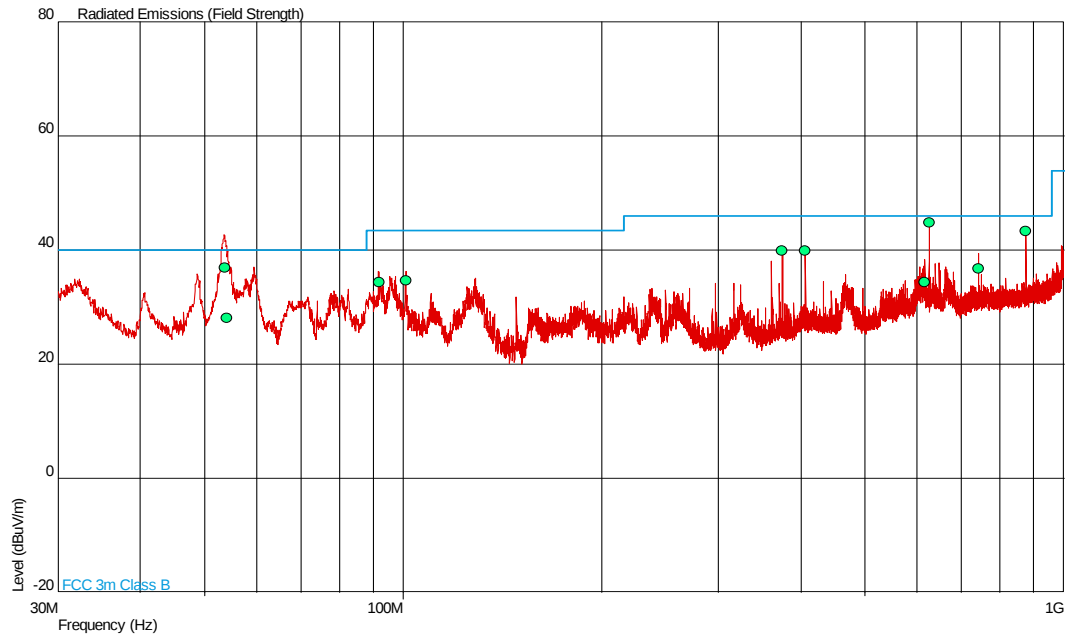
If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB.



Spurious Radiated Emissions

2425 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
53.665	37.0	70.8	40.0	100	-3.0	29.2	55	1.00	Vertical
54.004	28.2	25.7	40.0	100	-11.8	74.3	120	4.00	Horizontal
91.811	34.4	52.5	43.5	150	-9.1	97.5	111	1.00	Vertical
101.011	34.7	54.3	43.5	150	-8.8	95.7	118	1.00	Vertical
374.999	40.0	100.0	46.0	200	-6.0	100.0	198	1.19	Horizontal
406.441	39.9	98.9	46.0	200	-6.1	101.1	191	1.03	Horizontal
615.211	34.4	52.5	46.0	200	-11.6	147.5	180	1.03	Horizontal
624.998	44.8	173.8	46.0	200	-1.2	26.2	275	1.00	Horizontal
741.798	36.8	69.2	46.0	200	-9.2	130.8	138	1.25	Horizontal
875.001	43.4	147.9	46.0	200	-2.6	52.1	86	1.00	Horizontal

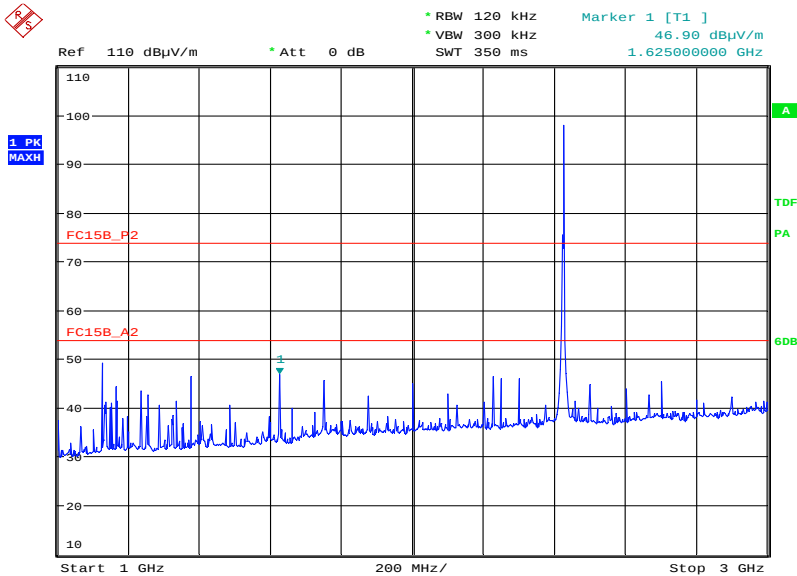


Product Service

1GHz to 25GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
1.1250	Vertical	120	035	54.22	49.79
1.6250	Vertical	120	101	53.74	46.49
2.2500	Vertical	110	093	52.77	46.06
3.333	Horizontal	100	329	55.60	50.50
4.600	Vertical	100	293	54.50	46.90
4.850	Vertical	100	66	57.80	49.40
7.275	Vertical	178	343	63.20	9.00 (55.0 before duty cycle correction)

1 GHz to 3 GHz

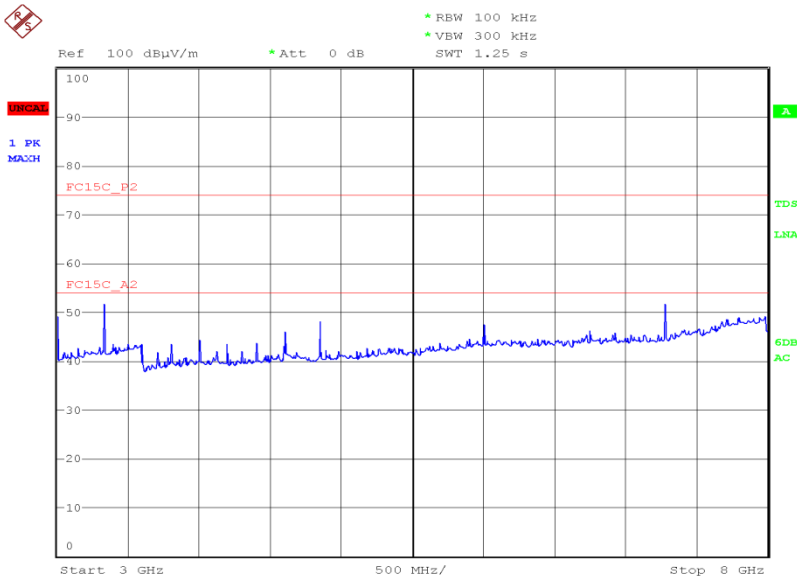


Date: 19.DEC.2011 20:07:29



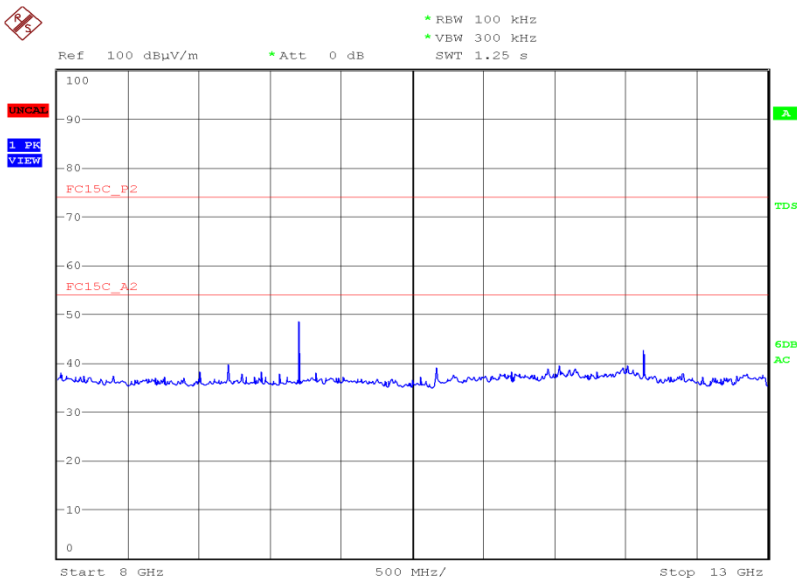
Product Service

3 GHz to 8 GHz



Date: 3.JAN.2012 10:30:35

8 GHz to 13 GHz

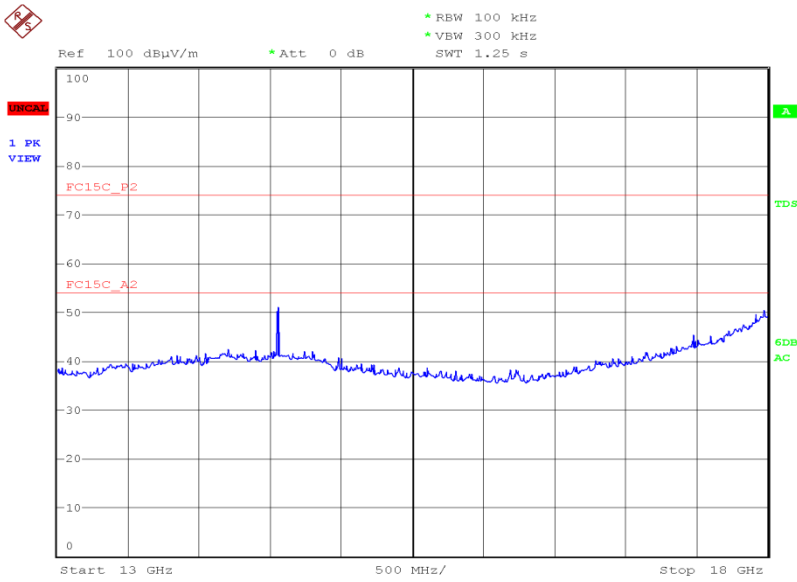


Date: 3.JAN.2012 14:29:38



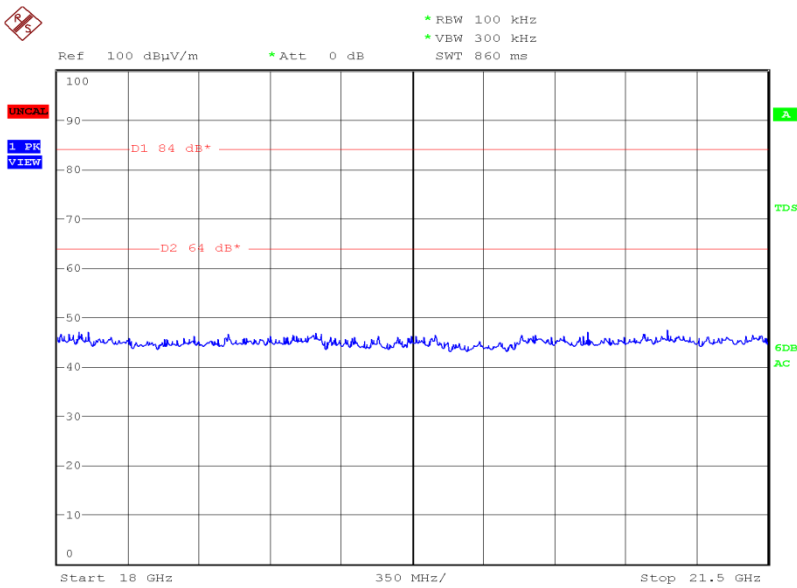
Product Service

13 GHz to 18 GHz



Date: 3.JAN.2012 14:48:06

18 GHz to 21.5 GHz

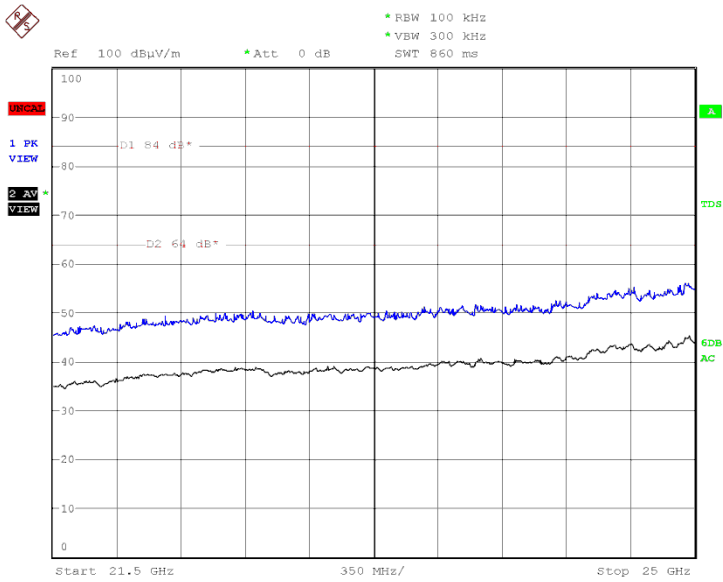


Date: 4.JAN.2012 13:59:01



Product Service

21.5 GHz to 25 GHz

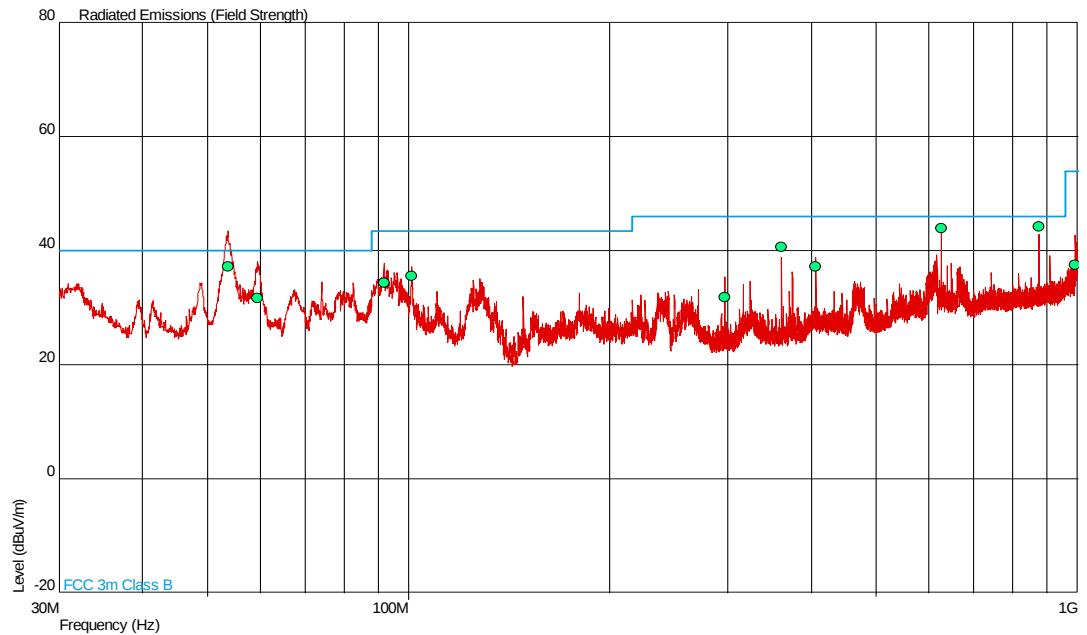


Date: 4.JAN.2012 14:04:07



2450 MHz

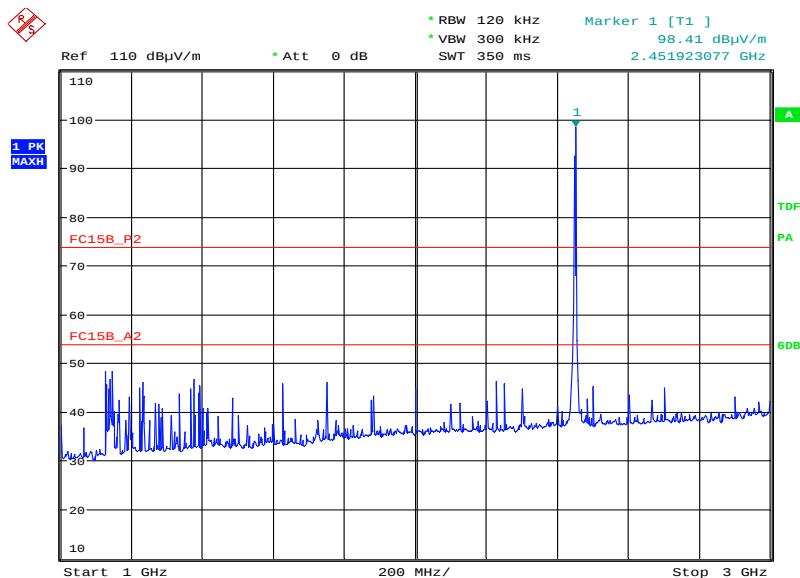
30 MHz to 1 GHz



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	
53.717	37.3	73.3	40.0	100	-2.7	26.7	24	1.00	Vertical	
59.485	31.7	38.5	40.0	100	-8.3	61.5	8	1.00	Vertical	
91.895	34.4	52.5	43.5	150	-9.1	97.5	117	1.00	Vertical	
101.082	35.6	60.3	43.5	150	-7.9	89.7	91	1.00	Vertical	
296.715	31.9	39.4	46.0	200	-14.1	160.6	23	1.00	Vertical	
361.284	40.7	108.4	46.0	200	-5.3	91.6	212	1.00	Horizontal	
406.441	37.2	72.4	46.0	200	-8.8	127.6	198	1.00	Horizontal	
624.994	44.0	158.5	46.0	200	-2.0	41.5	281	1.00	Horizontal	
875.004	44.3	164.1	46.0	200	-1.7	35.9	298	1.03	Horizontal	
992.304	37.6	75.9	54.0	500	-16.4	424.1	192	1.00	Vertical	

1GHz to 25GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBμV/m)	Final Average (dBμV/m)
1.1250	Vertical	120	035	54.24	49.83
1.6250	Vertical	118	105	52.52	46.04
2.2500	Vertical	110	096	52.99	46.20
3.333	Horizontal	100	329	55.60	50.90
4.900	Vertical	100	65	57.30	48.30
7.350	Vertical	187	349	64.30	9.20 (55.2 before duty cycle correction)

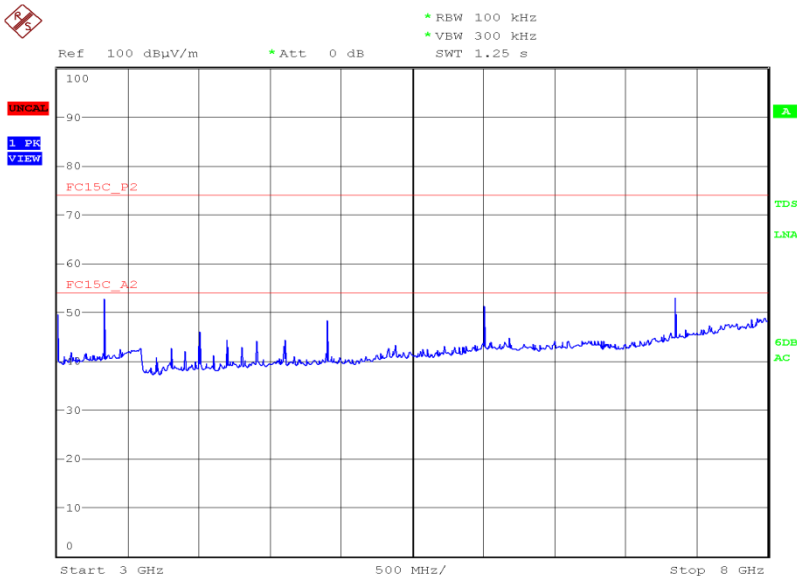
1 GHz to 3 GHz

Date: 19.DEC.2011 20:33:09



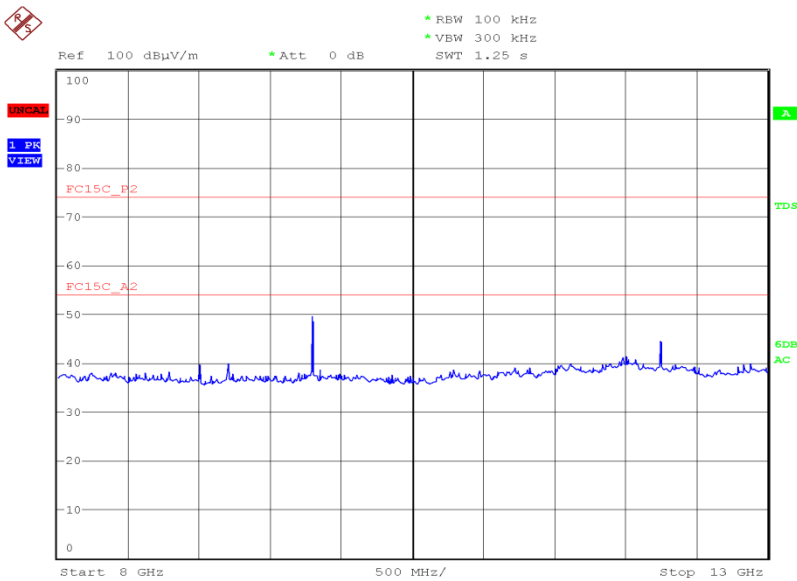
Product Service

3 GHz to 8 GHz



Date: 4.JAN.2012 09:40:14

8 GHz to 13 GHz

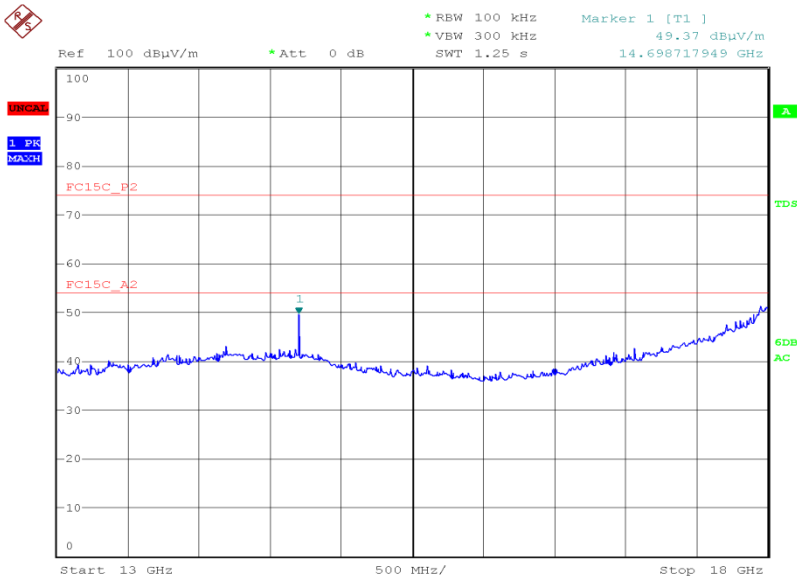


Date: 4.JAN.2012 10:27:35



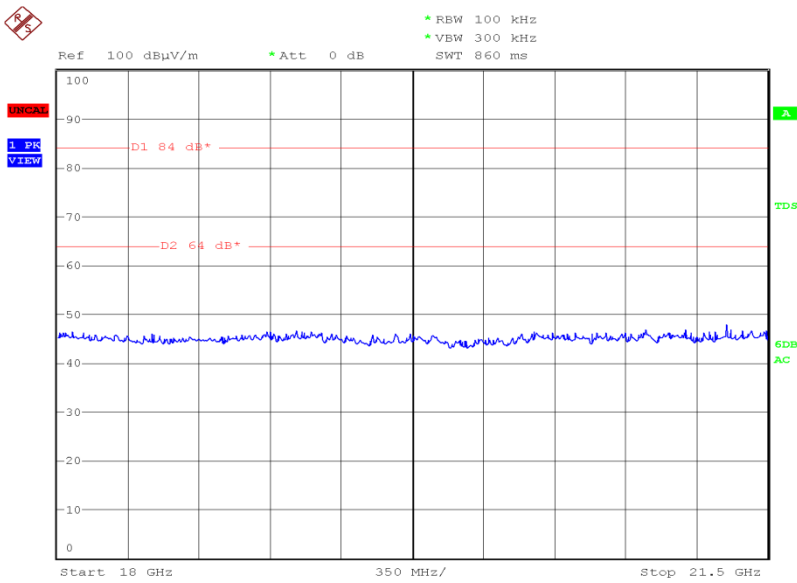
Product Service

13 GHz to 18 GHz



Date: 4.JAN.2012 10:33:12

18 GHz to 21.5 GHz

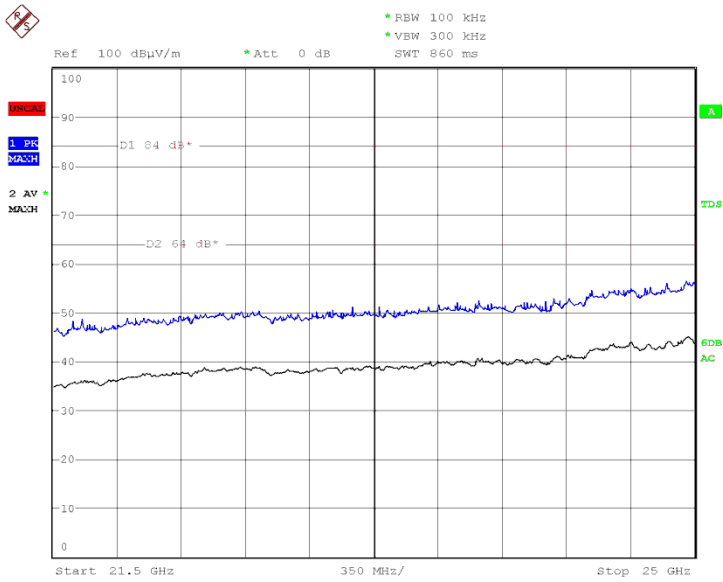


Date: 4.JAN.2012 13:47:10



Product Service

21.5 GHz to 25 GHz



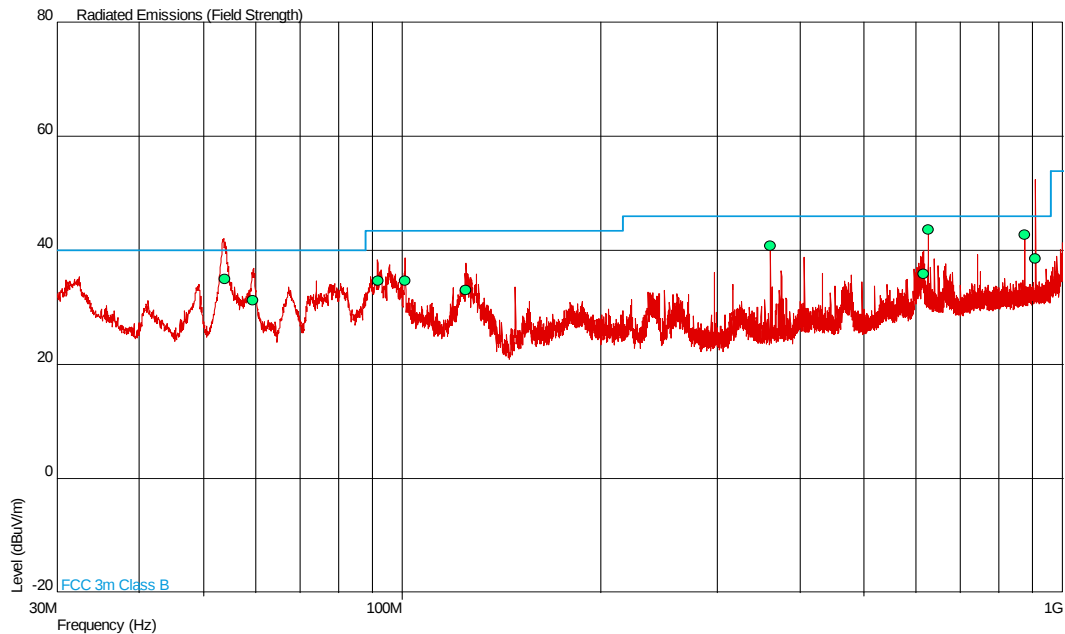
Date: 4.JAN.2012 13:42:29



Product Service

2475 MHz

30 MHz to 1 GHz



The frequency at 908MHz was at a different magnitude during finals. This is thought to be a GSM transmission caught during pre scan but as it passes no further action was taken.

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	
53.915	35.1	56.9	40.0	100	-4.9	43.1	84	1.00	Vertical	
59.395	31.3	36.7	40.0	100	-8.7	63.3	360	1.00	Vertical	
91.935	34.7	54.3	43.5	150	-8.8	95.7	80	1.00	Vertical	
101.124	34.7	54.3	43.5	150	-8.8	95.7	117	1.24	Vertical	
125.016	33.1	45.2	43.5	150	-10.4	104.8	295	1.00	Vertical	
361.284	40.8	109.6	46.0	200	-5.2	90.4	199	1.00	Horizontal	
615.560	36.0	63.1	46.0	200	-10.0	136.9	169	1.15	Horizontal	
625.001	43.6	151.4	46.0	200	-2.4	48.6	284	1.00	Horizontal	
874.999	42.8	138.0	46.0	200	-3.2	62.0	292	1.00	Horizontal	
908.757	38.5	84.1	46.0	200	-7.5	115.9	120	1.00	Horizontal	

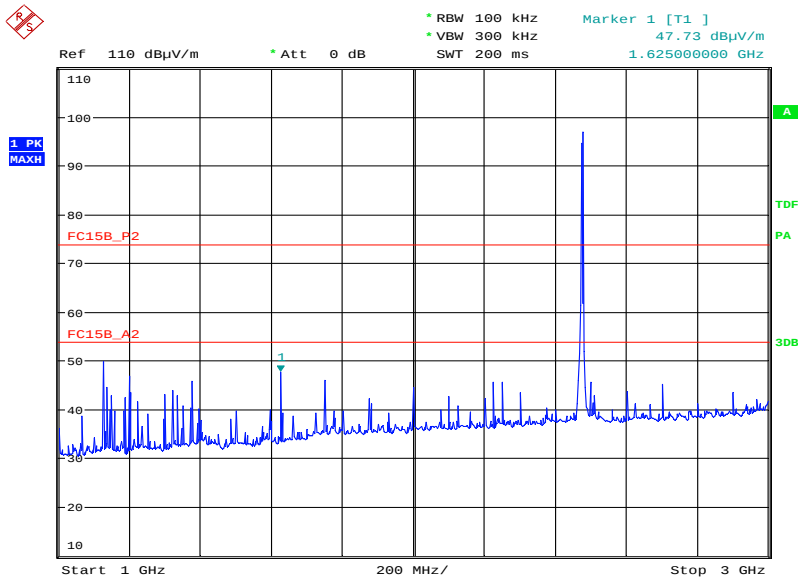


Product Service

1GHz to 25GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
1.1250	Vertical	120	035	55.35	50.69
1.6250	Vertical	117	097	53.45	47.64
2.2500	Vertical	110	094	52.31	45.67
3.333	Horizontal	103	327	56.90	51.80
4.950	Vertical	100	66	56.20	46.60
7.425	Vertical	199	350	62.70	53.50

1 GHz to 3 GHz

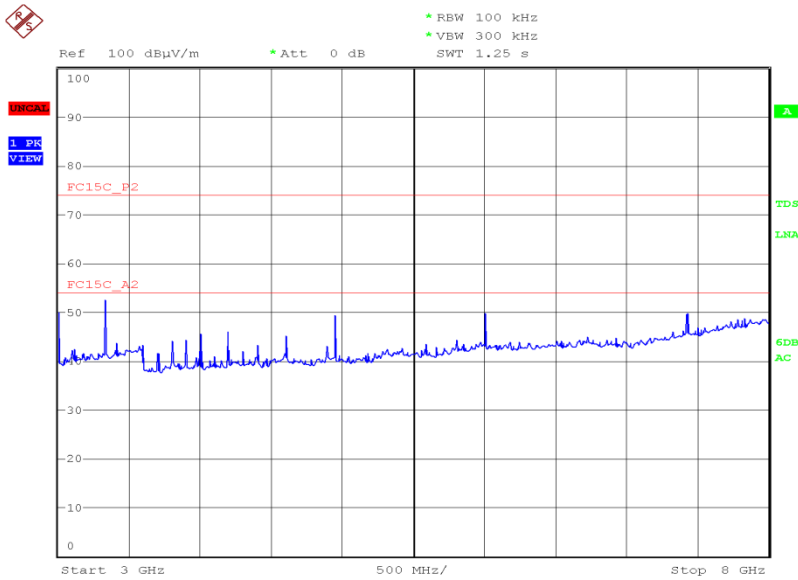


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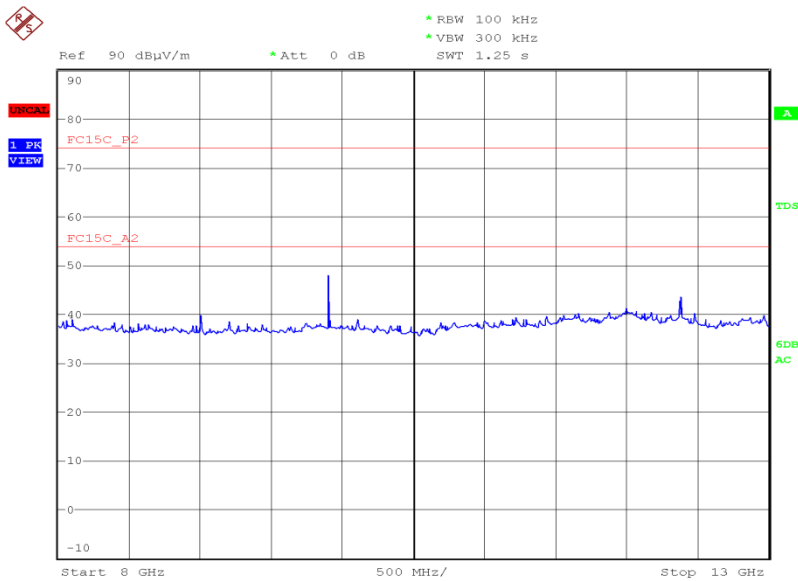
Product Service

3 GHz to 8 GHz



Date: 4.JAN.2012 11:01:12

8 GHz to 13 GHz

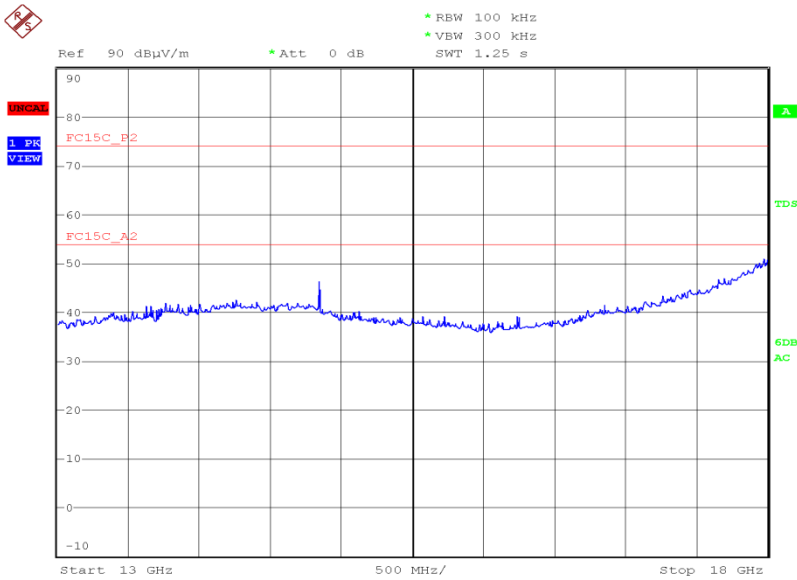


Date: 4.JAN.2012 11:43:04



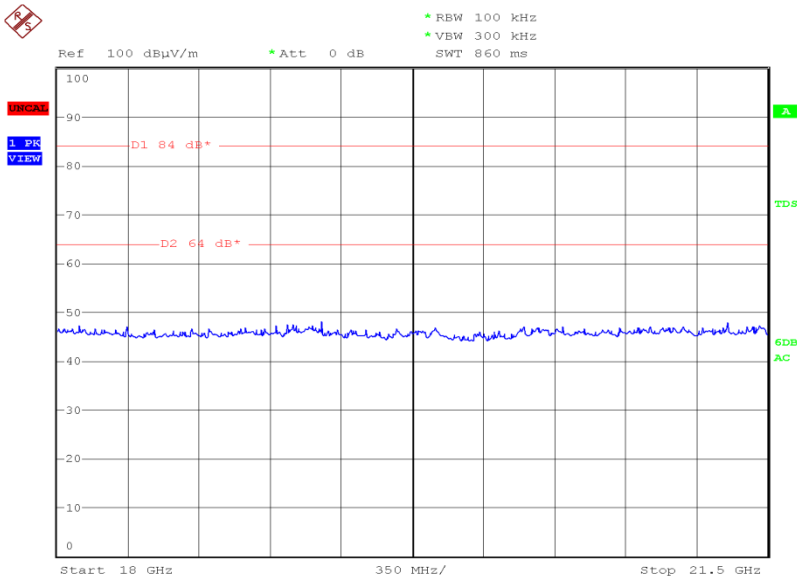
Product Service

13 GHz to 18 GHz



Date: 4.JAN.2012 11:48:35

18 GHz to 21.5 GHz

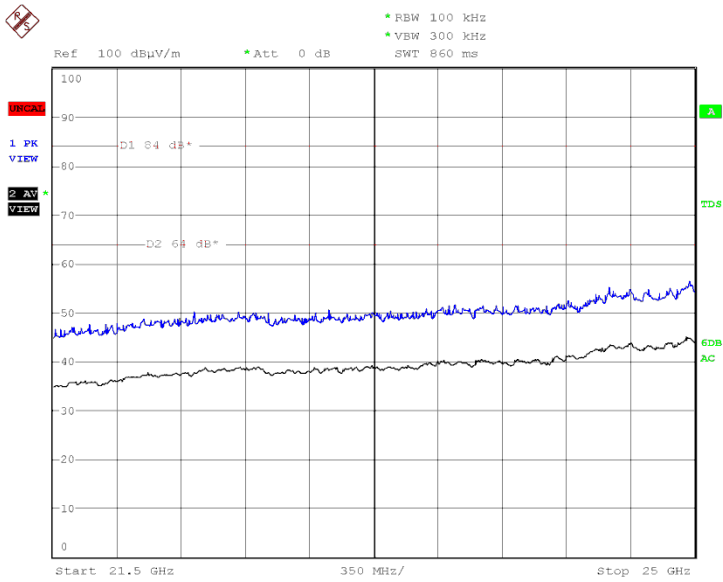


Date: 4.JAN.2012 12:25:03



Product Service

21.5 GHz to 25 GHz



Date: 4.JAN.2012 12:29:27

Limit

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

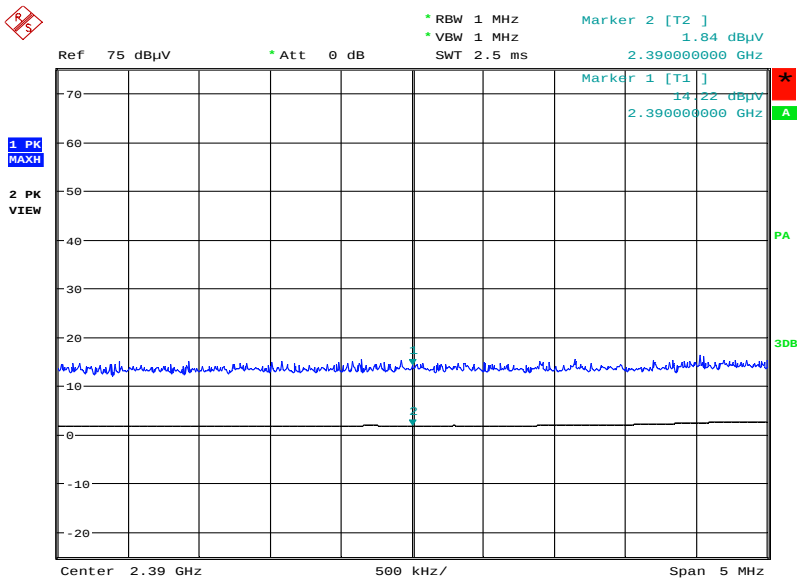


Product Service

Band Edge Emissions

2425 MHz

Polarisation	Final Peak (dBμV/m)	Final Average (dBμV/m)
Vertical	46.87	34.86



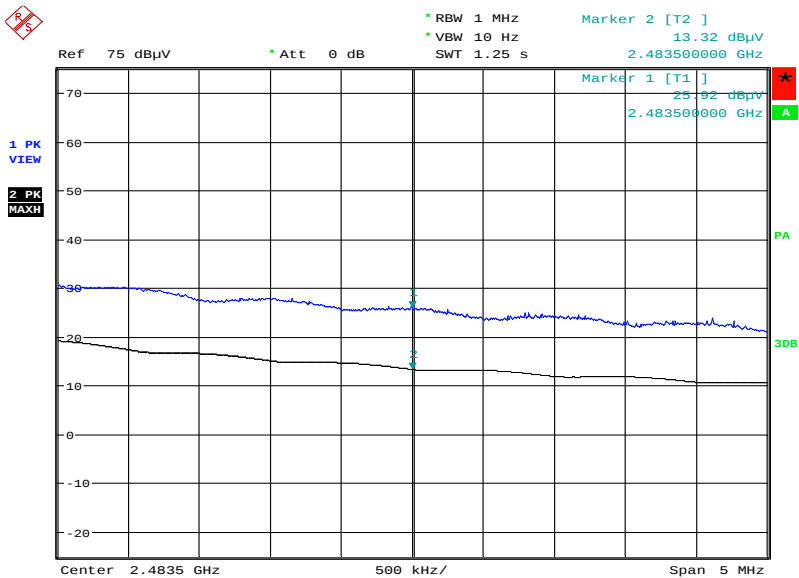
Date: 19.DEC.2011 19:14:39



Product Service

2475 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Vertical	58.83	46.23



Date: 19.DEC.2011 21:36:46

Limit

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

The emissions at 7.275 MHz and 7.350 MHz on the bottom and middle channels respectively, initially fail the average limit before a duty cycle corerrection factor is applied. The maximum duty cycle possible in normal operating mode is 0.5%.

The correction factor is $20 \log (0.5\text{ms} \times 100\text{ms}) = -46 \text{ dB}$

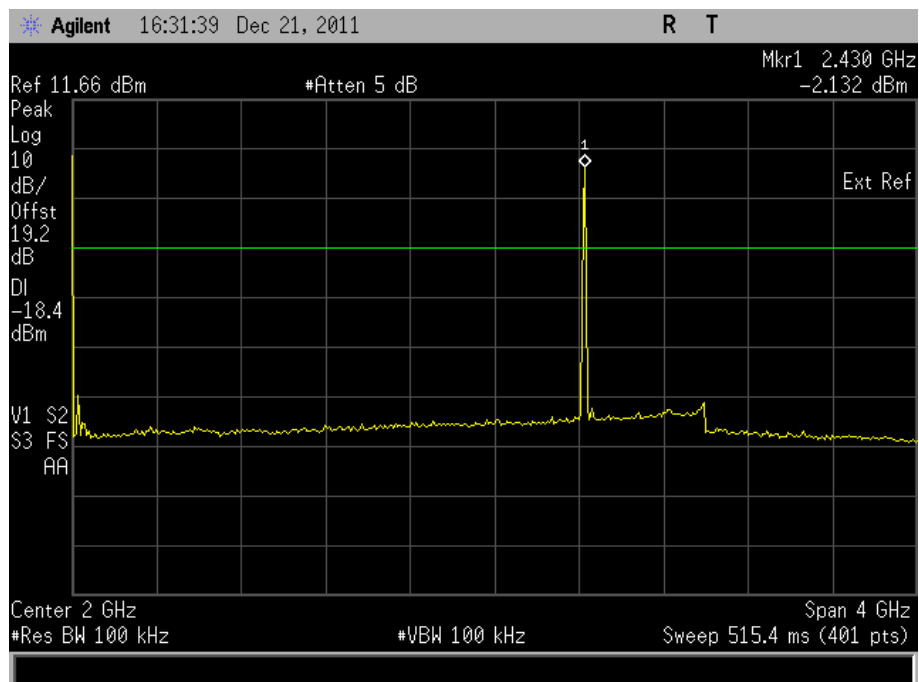
The average values for both these emissions have been corrected by the duty cycle correction factor of 46 dB.



Product Service

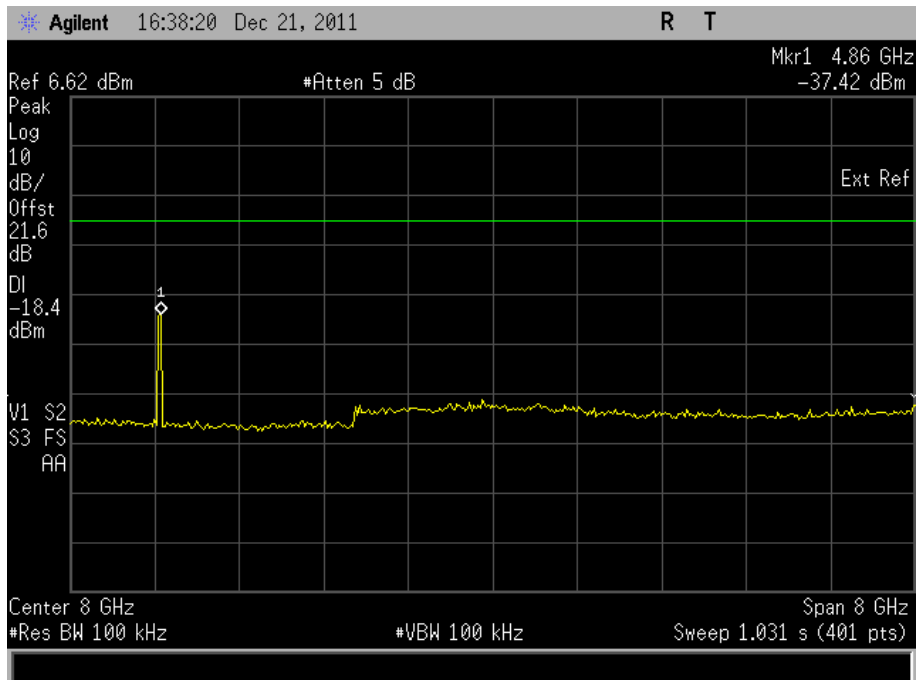
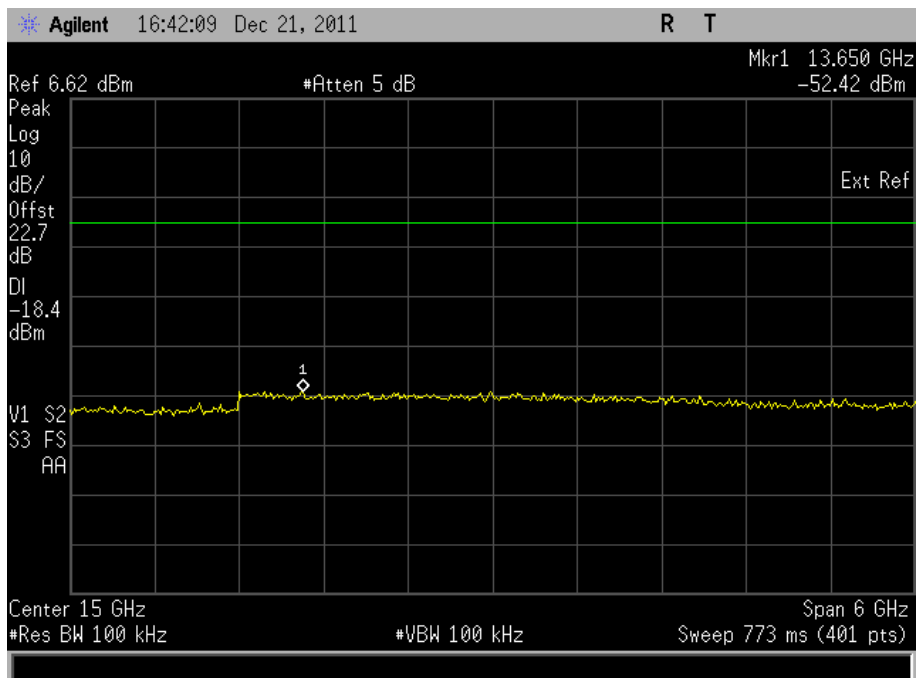
Transmit - Alternate Antenna

110 V AC Supply

Spurious Conducted EmissionsZigbee2425 MHz9 kHz to 4 GHz

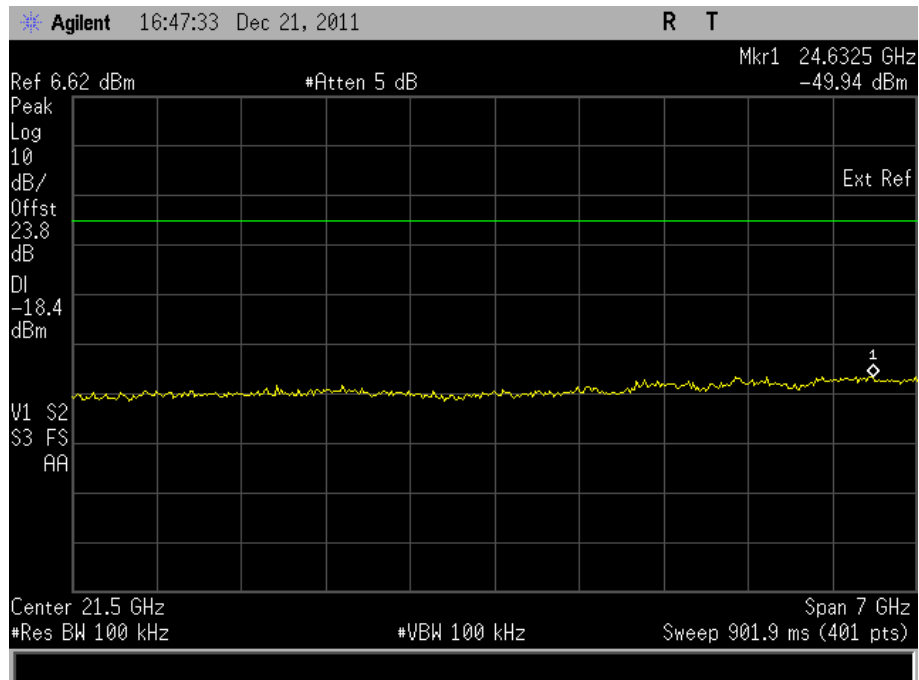
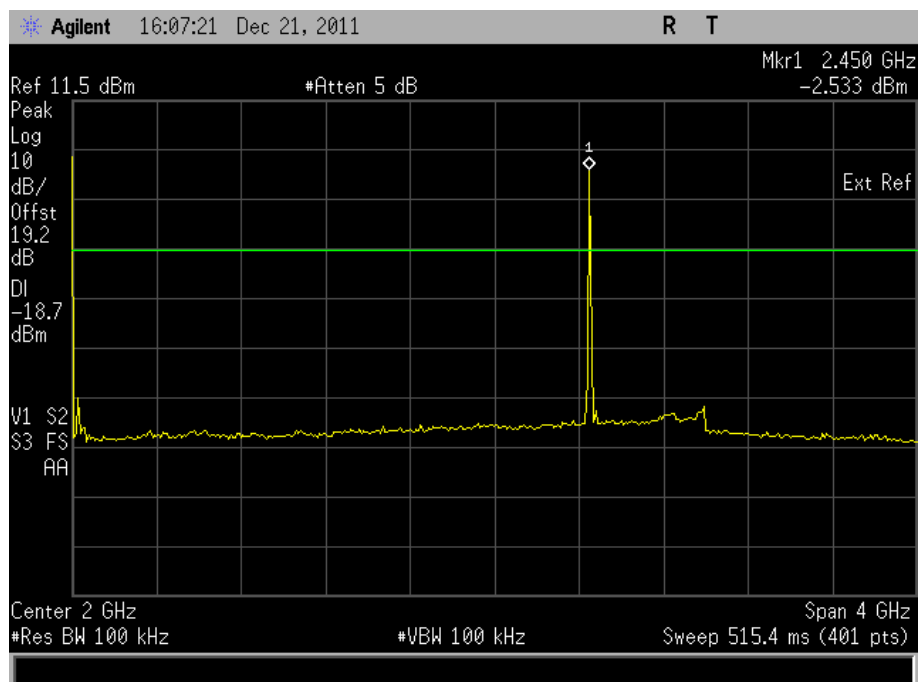


Product Service

4 GHz to 12 GHz12 GHz to 18 GHz

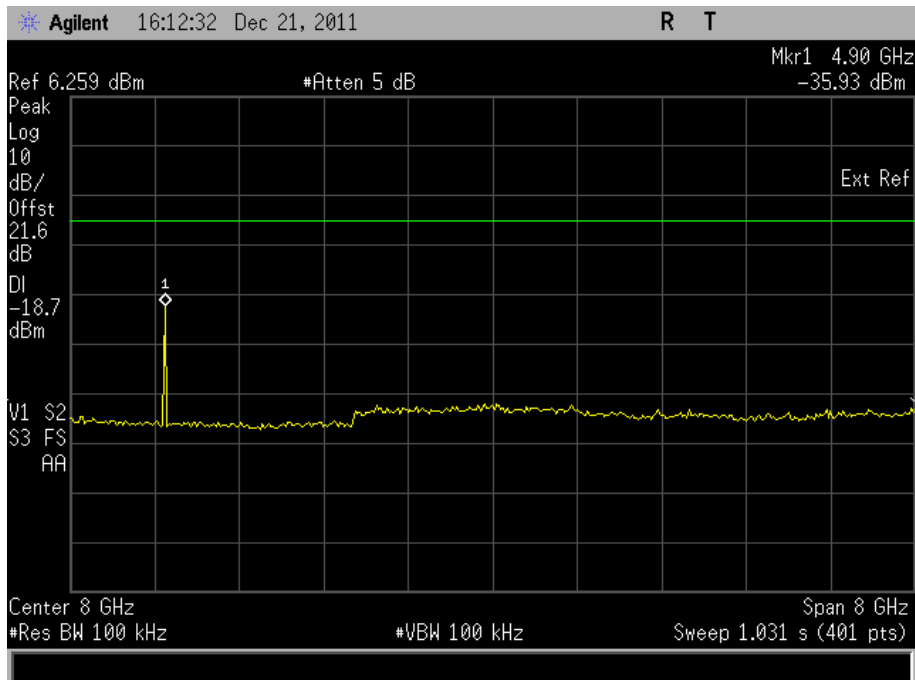
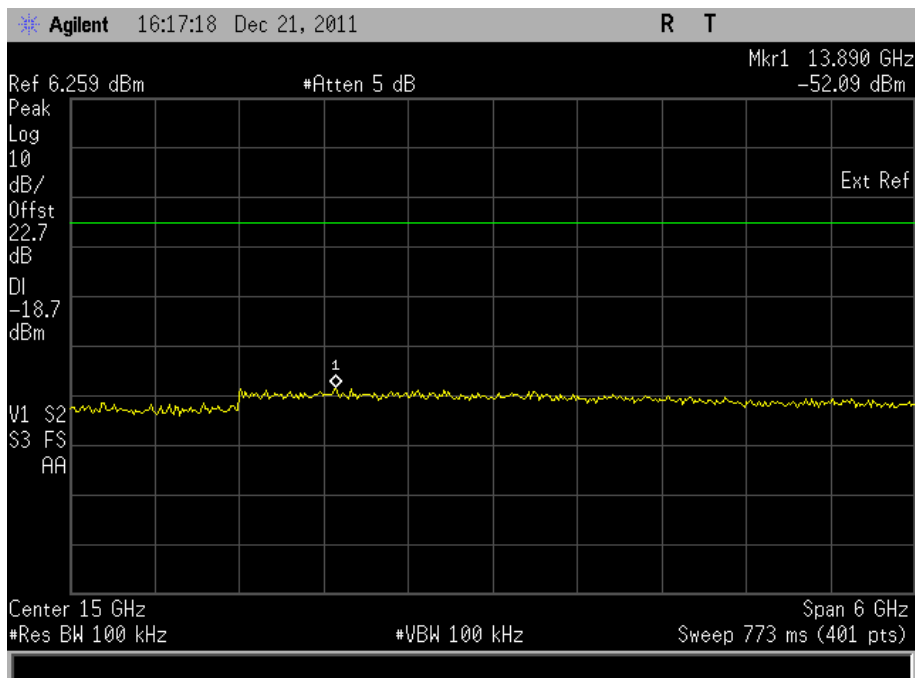


Product Service

18 GHz to 25 GHz2450 MHz9 kHz to 4 GHz



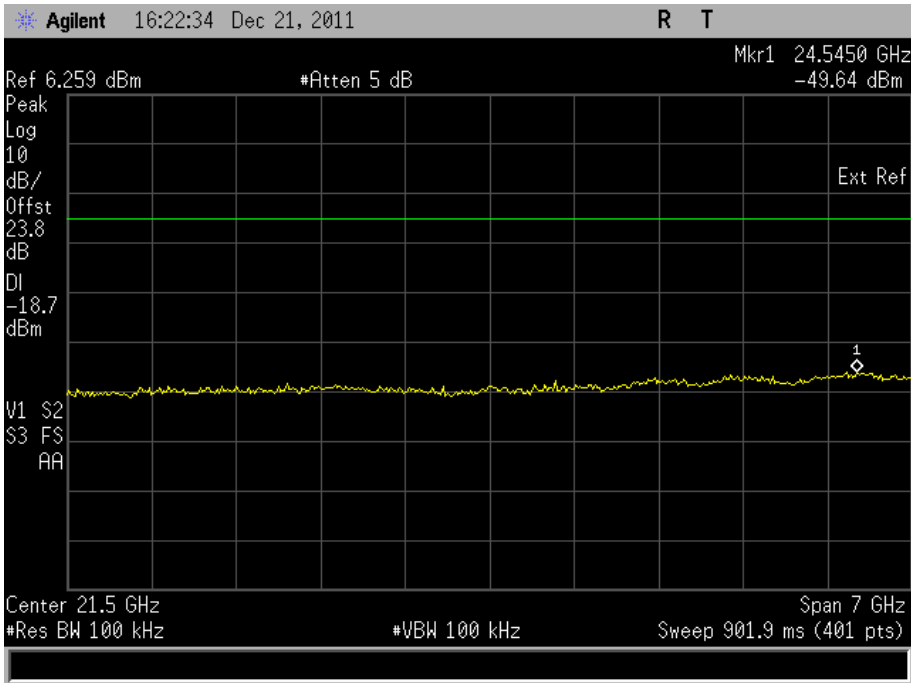
Product Service

4 GHz to 12 GHz12 GHz to 18 GHz



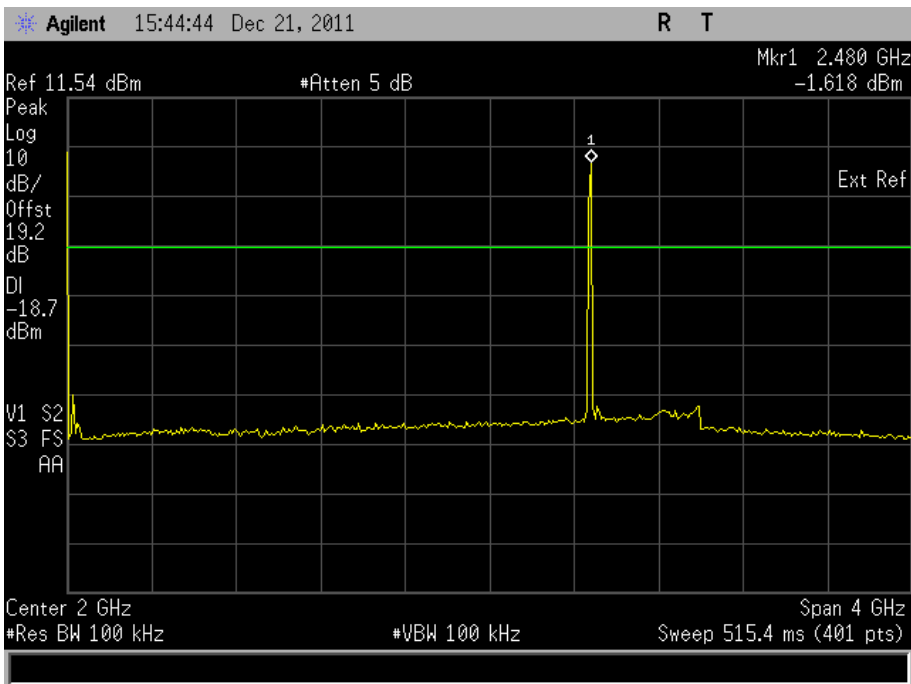
Product Service

18 GHz to 25 GHz



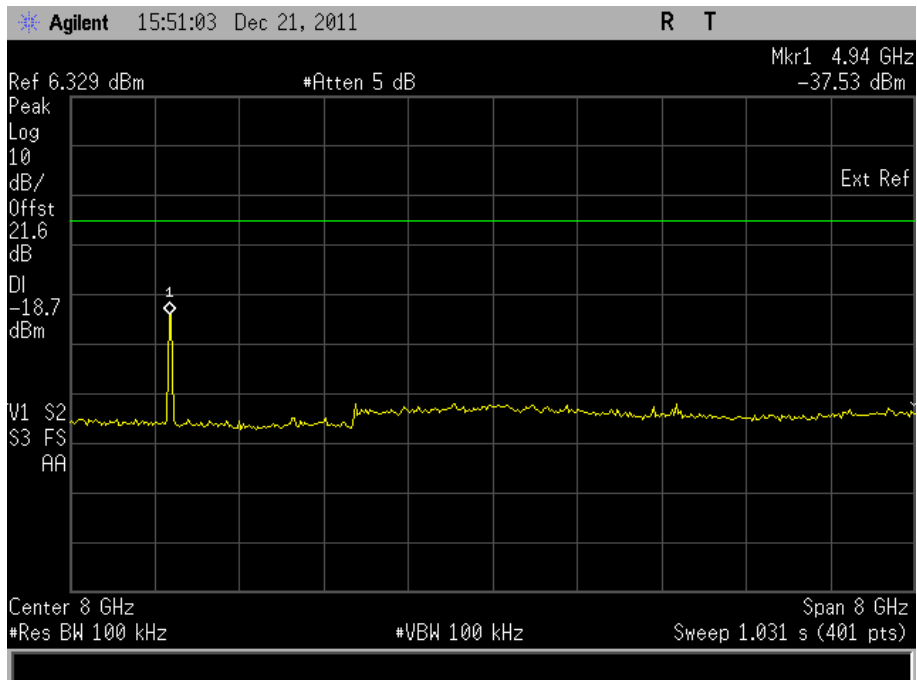
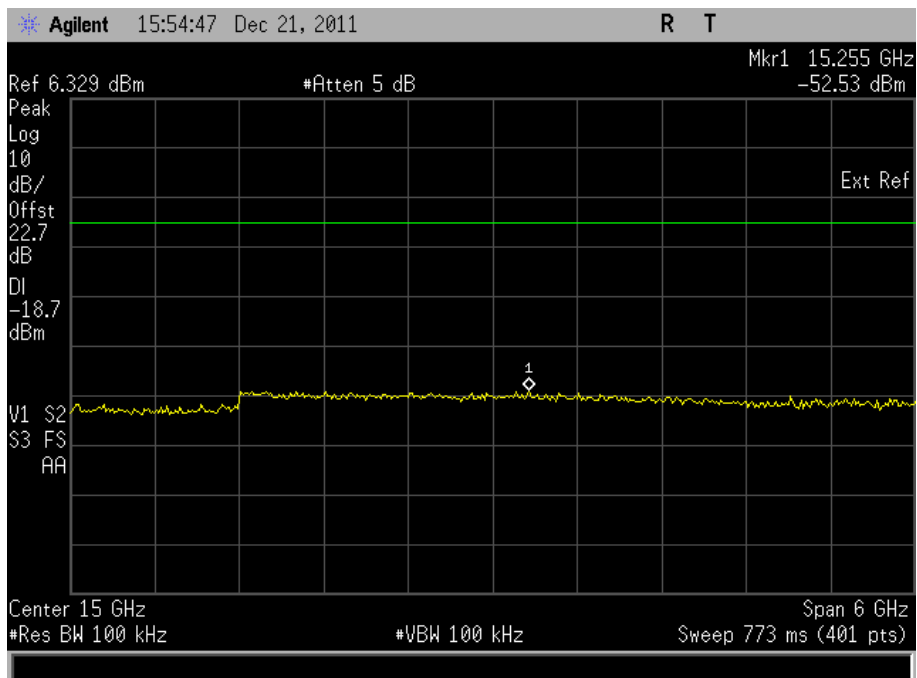
2475 MHz

9 kHz to 4 GHz





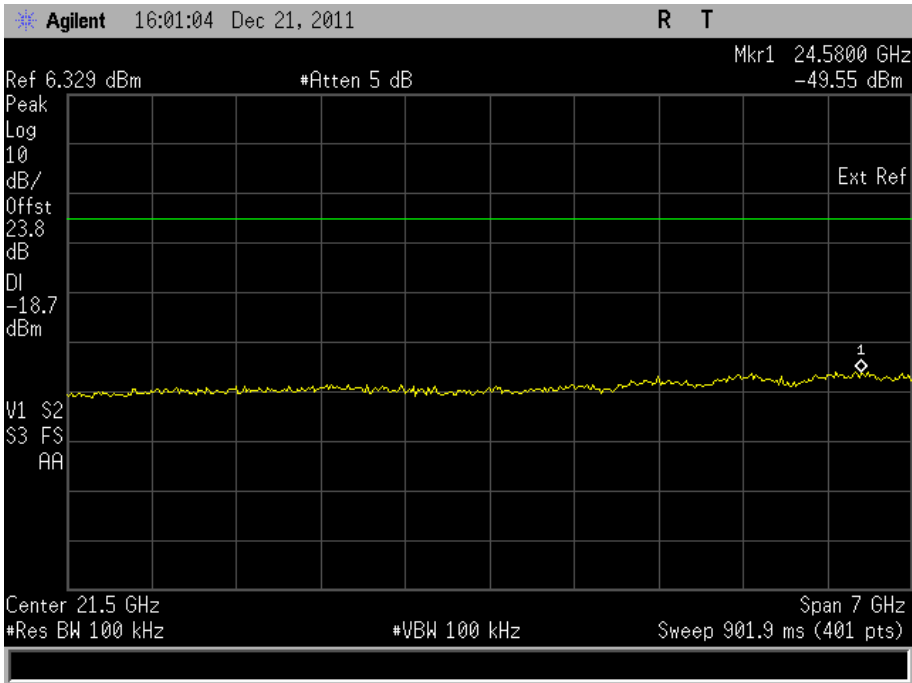
Product Service

4 GHz to 12 GHz12 GHz to 18 GHz



Product Service

18 GHz to 25 GHz



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

2.6 6dB BANDWIDTH**2.6.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.247 (2)

2.6.2 Equipment Under Test and Modification State

xfinity S/N: PAPV00000983 - Modification State 0

2.6.3 Date of Test

21 December 2011

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 a cable to the Spectrum Analyser. The Analyser settings were adjusted to display the resultant trace on screen. The peak point of the trace was measured and the markers positioned to give the -6dBc points of the displayed spectrum.

2.6.6 Environmental Conditions

Ambient Temperature	26.7°C
Relative Humidity	35.5%



Product Service

2.6.7 Test Results

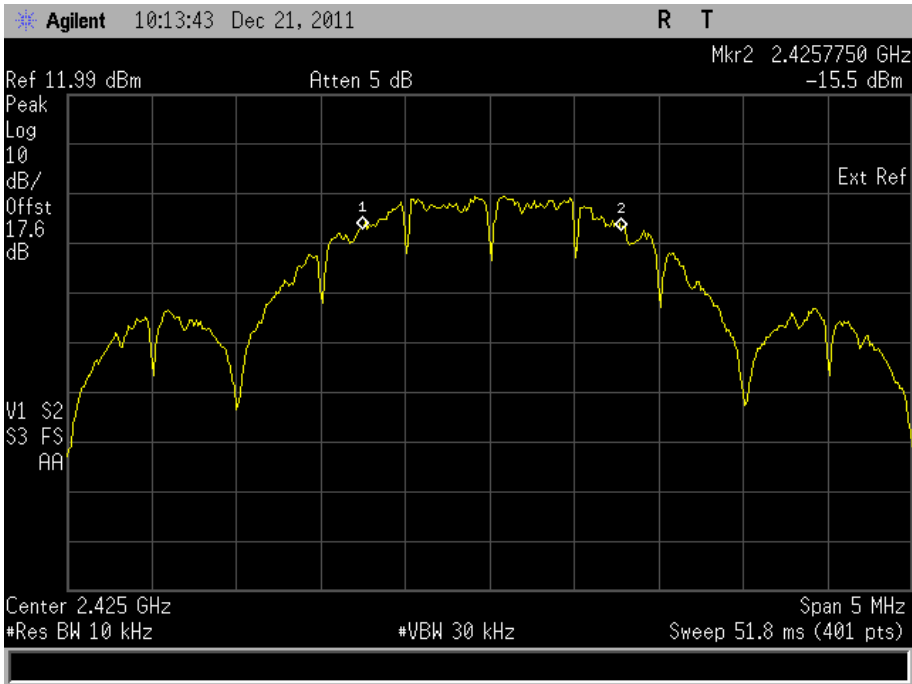
Transmit

110 V AC Supply

Frequency	Data Rate (Mbps)	6dB Bandwidth (kHz)
2425 MHz	1	1462.5
2450 MHz	1	1550.0
2475 MHz	1	1687.5

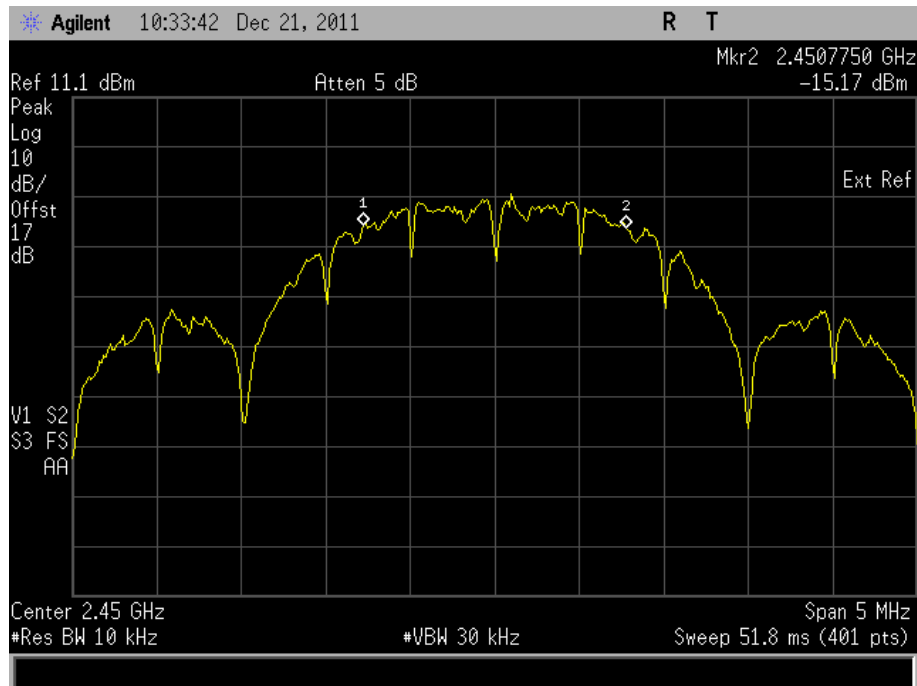
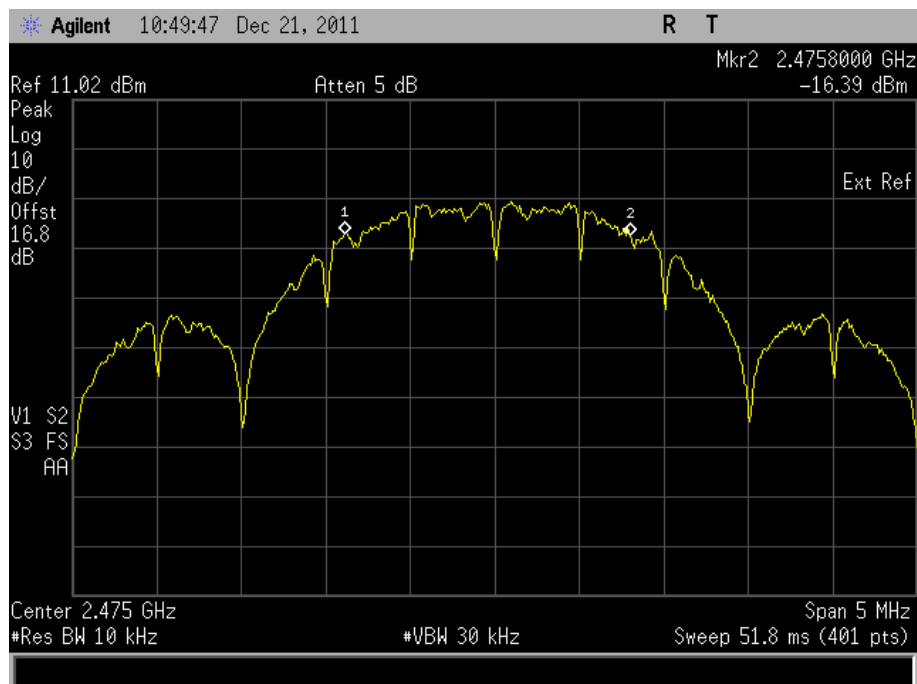
2425 MHz

1 Mbps





Product Service

2450 MHz1 Mbps2475 MHz1 MbpsLimit Clause

The minimum 6 dB Bandwidth shall be at least 500 kHz.



Product Service

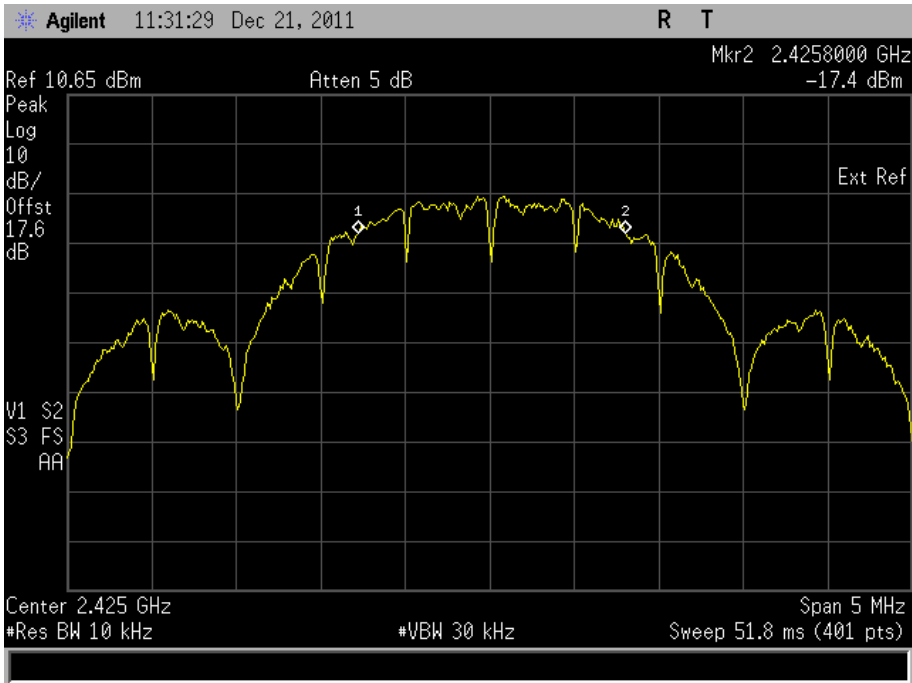
Transmit - Alternate Antenna

110 V AC Supply

Frequency	Data Rate (Mbps)	6dB Bandwidth (kHz)
2425 MHz	1	1575.0
2450 MHz	1	1575.0
2475 MHz	1	1362.5

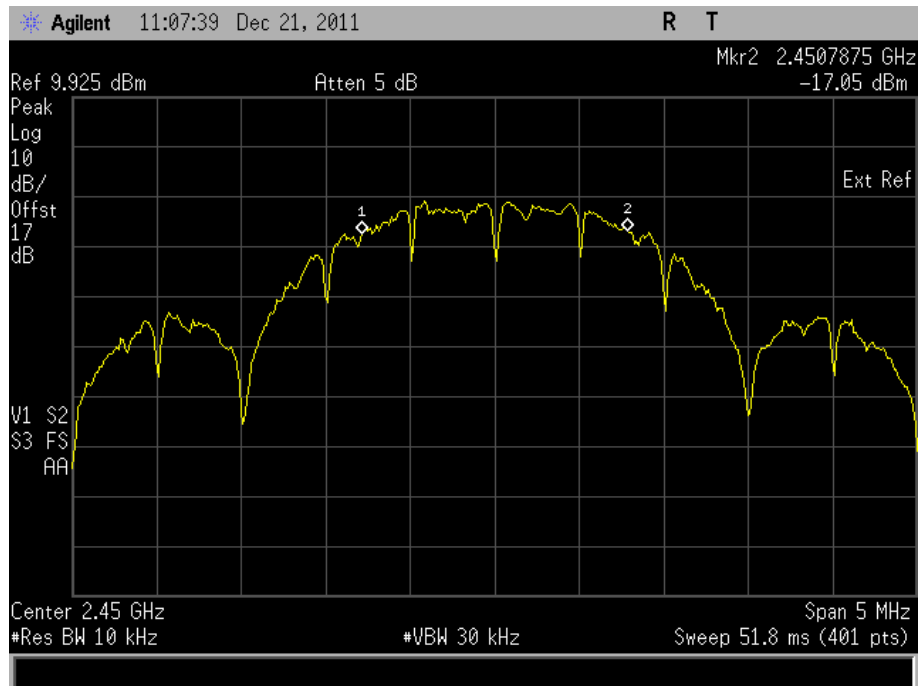
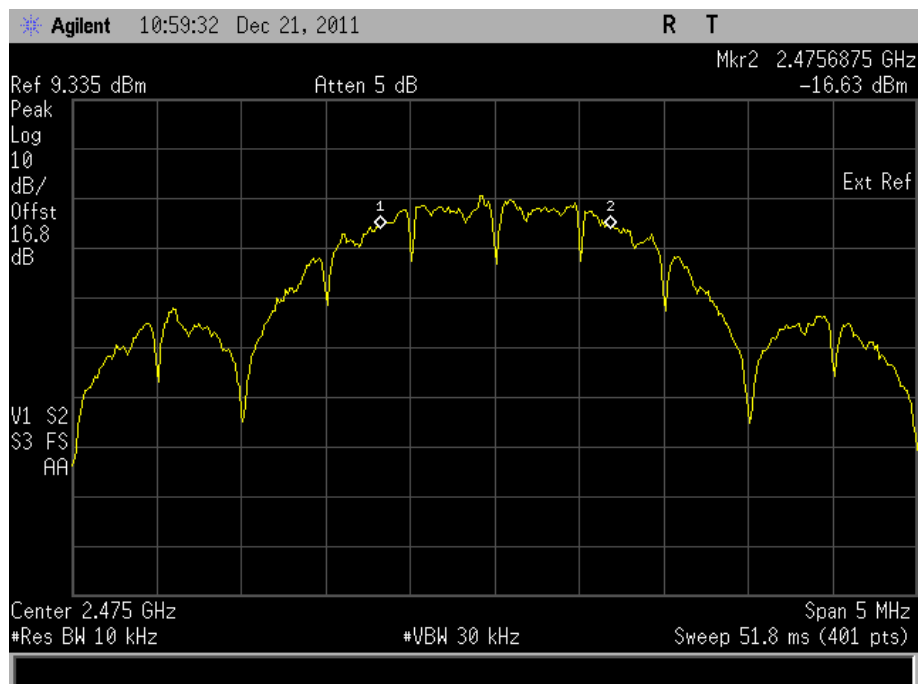
2425 MHz

1 Mbps





Product Service

2450 MHz1 Mbps2475 MHz1 MbpsLimit Clause

The minimum 6 dB Bandwidth shall be at least 500 kHz.



Product Service

SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

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

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - AC Line Conducted Emissions					
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	4-Oct-2012
Transient Limiter	Hewlett Packard	11947A	2378	12	22-Jun-2012
Section 2.2 - Maximum Peak Conducted Output Power					
Signal Generator	Hewlett Packard	ESG4000A	61	12	18-May-2012
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Variac Transformer	Zenith	Z-710-R	3169	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3879	12	22-Feb-2012
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
Section 2.3 - EIRP Peak Power					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	27-Apr-2012
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Section 2.4 - Power Spectral Density					
Signal Generator	Hewlett Packard	ESG4000A	61	12	18-May-2012
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Variac Transformer	Zenith	Z-710-R	3169	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3879	12	22-Feb-2012
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 2.5 - Spurious and Band Edge Emissions					
Signal Generator	Hewlett Packard	ESG4000A	61	12	18-May-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Pre-Amplifier	Phase One	PS04-0087	1534	12	26-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
4GHz HPF	Sematron	F-100-4000-5-R	2245	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Variac Transformer	Zenith	Z-710-R	3169	-	O/P Mon
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Combiner/Splitter	Weinschel	1506A	3879	12	22-Feb-2012
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo 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
Section 2.6 - 6dB Bandwidth					
Signal Generator	Hewlett Packard	ESG4000A	61	12	18-May-2012
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Variac Transformer	Zenith	Z-710-R	3169	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3879	12	22-Feb-2012
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
Maximum Peak Conducted Output Power	± 0.70 dB
EIRP Peak Power	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Power Spectral Density	± 3.0 dB
Spurious and Band Edge Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
6dB Bandwidth	± 212.114 kHz
AC Line Conducted Emissions	± 3.2 dB



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
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