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Report On

FCC and Industry Canada Testing of the
Inmarsat Global Ltd IsatPhone Pro GMR2+ Satellite Phone

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IC ID: 8944A-ISATPHONE

Document 75909459 Report 06 Issue 3

June 2010



Product Service

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Inmarsat Global Ltd IsatPhone Pro GMR2+ Satellite Phone

Document 75909459 Report 06 Issue 3

June 2010

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DATED

14 June 2010

This report has been up-issued to Issue 3 to correct typographical errors.

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, RSS-210 and RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

A R Hubbard

S Hartley

S Bennett





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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Inmarsat Global Ltd IsatPhone Pro GMR2+ Satellite Phone



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Inmarsat Global Ltd, IsatPhone Pro GMR2+ Satellite Phone to the requirements of FCC CFR 47 Part 15C and RSS-210.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Inmarsat Global Ltd
Model Number(s)	IsatPhone Pro GMR2+ Satellite Phone
Serial Number(s)	IMEI: 004401510018183 IMEI: 004401510021666
Software Version	V0.3.9_P6
Hardware Version	0321
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 15C: 2009 RSS-210: Issue 2: 2007 RSS-GEN: Issue 2: 2007
Incoming Release Date	Declaration of Build Status 02 June 2010
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	3100003117 29 March 2010
Start of Test	19 April 2010
Finish of Test	17 May 2010
Name of Engineer(s)	S C Hartley A R Hubbard S Bennett
Related Document(s)	ANSI C63.4: 2003



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 15C, RSS-210 and RSS-Gen is shown below.

Configuration 1 – Mobile Handset								
Section	Spec Clause			Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC						
		RSS-Gen	RSS-210					
	15.207	7.2.2	-	Conducted Emissions (AC Power Port)	Bluetooth		N/A	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
2.2	15.247(d)	-	A8.5	Radiated Emissions (Enclosure Port)	Bluetooth	0	Pass	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
2.3	15.247 (a)(1)	-	A8.1(a)	20dB Bandwidth	Bluetooth	0	Pass	
					GPS Receive		N/A	
					Carrier Off		N/A	
2.4	15.247 (b)(3)	-	A8.4(4)	Maximum Peak Conducted Output Power	Bluetooth	0	Pass	
					GPS Receive		N/A	
					Carrier Off		N/A	
	15.247 (b)(4)	-	A8.4(4)	EIRP Peak Power	Bluetooth		N/A	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
2.6	15.247 (d)	-	A8.5	Spurious Emissions	Bluetooth	0	Pass	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
	15.247 (d)	-	A8.5	Band Edge Measurements	Bluetooth		N/A	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
2.8	15.247 (a)(1)(iii)	-	A8.1(d)	Channel Dwell Time	Bluetooth	0	Pass	
					GPS Receive		N/A	
					Carrier Off		N/A	
2.9	15.247 (a)(1)	-	A8.1(b)	Channel Separation	Bluetooth	0	Pass	
					GPS Receive		N/A	
					Carrier Off		N/A	
2.10	15.247 (a)(1)(iii)	-	A8.1(d)	Number of Hopping Channels	Bluetooth	0	Pass	
					GPS Receive		N/A	
					Carrier Off		N/A	



Configuration 2 - Mobile Handset + AC Charger								
Section	Spec Clause			Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC						
		RSS-Gen	RSS-210					
2.1	15.207	7.2.2	-	Conducted Emissions (AC Power Port)	Bluetooth	0	Pass	ANSI C63.4
					GPS Receive		N/A	
					Carrier On	0	Pass	
2.2	15.247(d)	-	A8.5	Radiated Emissions (Enclosure Port)	Bluetooth	0	Pass	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
	15.247 (a)(1)	-	A8.1(a)	20dB Bandwidth	Bluetooth		N/A	
				GPS Receive		N/A		
				Carrier Off		N/A		
	15.247 (b)(3)	-	A8.4(4)	Maximum Peak Conducted Output Power	Bluetooth		N/A	
				GPS Receive		N/A		
				Carrier Off		N/A		
2.5	15.247 (b)(4)	-	A8.4(4)	EIRP Peak Power	Bluetooth	0	Pass	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
	15.247 (d)	-	A8.5	Spurious Emissions	Bluetooth		N/A	ANSI C63.4
				GPS Receive		N/A		
				Carrier Off		N/A		
2.7	15.247 (d)	-	A8.5	Band Edge Measurements	Bluetooth	0	Pass	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
	15.247 (a)(1)(iii)	-	A8.1(d)	Channel Dwell Time	Bluetooth		N/A	
				GPS Receive		N/A		
				Carrier Off		N/A		
	15.247 (a)(1)	-	A8.1(b)	Channel Separation	Bluetooth		N/A	
				GPS Receive		N/A		
				Carrier Off		N/A		
	15.247 (a)(1)(iii)	-	A8.1(d)	Number of Hopping Channels	Bluetooth		N/A	
				GPS Receive		N/A		
				Carrier Off		N/A		



Configuration 3 – Mobile Handset + USB								
Section	Spec Clause			Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC						
		RSS-Gen	RSS-210					
2.1	15.207	7.2.2	-	Conducted Emissions (AC Power Port)	Bluetooth		N/A	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
2.2	15.247(d)	-	A8.5	Radiated Emissions (Enclosure Port)	Bluetooth	0	Pass	ANSI C63.4
					GPS Receive		N/A	
					Carrier Off		N/A	
	15.247 (a)(1)	-	A8.1(a)	20dB Bandwidth	Bluetooth		N/A	
GPS Receive						N/A		
Carrier Off						N/A		
	15.247 (b)(3)	-	A8.4(4)	Maximum Peak Conducted Output Power	Bluetooth		N/A	
GPS Receive						N/A		
Carrier Off						N/A		
	15.247 (b)(4)	-	A8.4(4)	EIRP Peak Power	Bluetooth		N/A	ANSI C63.4
GPS Receive						N/A		
Carrier Off						N/A		
	15.247 (d)	-	A8.5	Spurious Emissions	Bluetooth		N/A	ANSI C63.4
GPS Receive						N/A		
Carrier Off						N/A		
	15.247 (d)	-	A8.5	Band Edge Measurements	Bluetooth		N/A	ANSI C63.4
GPS Receive						N/A		
Carrier Off						N/A		
	15.247 (a)(1)(iii)	-	A8.1(d)	Channel Dwell Time	Bluetooth		N/A	
GPS Receive						N/A		
Carrier Off						N/A		
	15.247 (a)(1)	-	A8.1(b)	Channel Separation	Bluetooth		N/A	
GPS Receive						N/A		
Carrier Off						N/A		
	15.247 (a)(1)(iii)	-	A8.1(d)	Number of Hopping Channels	Bluetooth		N/A	
GPS Receive						N/A		
Carrier Off						N/A		

N/A – Not Applicable



1.3 DECLARATION OF BUILD STATUS

MAIN EUT		
MANUFACTURING DESCRIPTION	IsatPhone Pro GMR2+ Satellite Phone	
MANUFACTURER	Inmarsat	
TYPE	IsatPhone Pro	
PART NUMBER	NA	
SERIAL NUMBER	004401510018092 004401510018183 004401510018167 004401510018258 – HWID: 0321 Rx Modification Fitted 004401510018217 – HWID: 0321 Rx Modification Fitted 004401510021666 004401510019736	
HARDWARE VERSION	0321	
SOFTWARE VERSION	V0.3.9 P6	
TRANSMITTER OPERATING RANGE	GMR 2+ 1626.5 – 1660.5 1668 - 1675MHz BT 2402 – 2480 MHz	
RECEIVER OPERATING RANGE	GMR2+ 1518 – 1559 MHz BT 2402 – 2480 MHz GPS 1575.42MHz	
INTERMEDIATE FREQUENCIES	110.592 MHz	
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	G1D	
MODULATION TYPES: (i.e. GMSK, QPSK)	GMR 2+ TX: GMSK RX:OQPSK	
HIGHEST INTERNALLY GENERATED FREQUENCY	3350MHz	
HIGHEST INTERNALLY GENERATED FREQUENCY IN RECEIVE IDLE MODE	3118MHz	
OUTPUT POWER (W or dBm)	GMR2+ +33.5dBm BT +3.8dBm	
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	GMR2+ Satellite Phone for Inmarsat satellite network system	
If unit is SRD being tested to ETS 301 489-3 please state Class of Equipment as defined in Section 6.1	3	
BATTERY/POWER SUPPLY		
MANUFACTURING DESCRIPTION	Li-Ion Battery	AC-Charger
MANUFACTURER	VARTA	Tenwei
TYPE	Li-Ion 2600mAh	TAV01-00501200
PART NUMBER	56626 701 099	
VOLTAGE	3.7V	5V
SERIAL NUMBER	NA	NA
ANCILLARIES (if applicable)		
MANUFACTURING DESCRIPTION	Headset	
MANUFACTURER	TopDen	
TYPE	Mono headset with 2.5mm plug	
PART NUMBER	TS628D-168-4	
SERIAL NUMBER	NA	

Signature

Date

D of B S Serial No

Held on File at TUV

02 June 2010

75909459/01

Note: This document has been prepared to enable manufacturers with no mechanism for producing their own Declaration of Build Status, to declare the build state of the equipment submitted for test.

No responsibility will be accepted by TÜV Product Service as to the accuracy of the information declared in this document by the manufacturer.



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Inmarsat Global Ltd, IsatPhone Pro GMR2+ Satellite Phone as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test



1.4.2 Test Configuration

Configuration 1: Mobile Handset

The EUT was configured in accordance with FCC CFR 47 Part 15C, RSS-210 and RSS-GEN.

Configuration 2: Mobile Handset + AC Charger

The EUT was configured in accordance with FCC CFR 47 Part 15C, RSS-210 and RSS-GEN.

Configuration 3: Mobile Handset + USB

The EUT was configured in accordance with FCC CFR 47 Part 15C, RSS-210 and RSS-GEN.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened
AC Power	1.5m	AC Power Lead	2 core	No
USB Data	1.5m	Data Transfer	Multicore	No

1.4.4 Modes of Operation

Modes of operation of each EUT during testing were as follows:

Mode 1 - Bluetooth

Mode 3 - Carrier On



Product Service

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 or test laboratories as appropriate.

The EUT was powered from a 3.7V internal battery or an AC power adaptor.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

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

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.



Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Inmarsat Global Ltd IsatPhone Pro GMR2+ Satellite Phone



Product Service

2.1 CONDUCTED EMISSIONS (AC POWER PORT)**2.1.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.207
RSS-GEN, Clause 7.2.2

2.1.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510018183 and IMEI 004401510018167

2.1.3 Date of Test and Modification State

23 April and 17 May 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 2 - Mode 1
- Mode 3 (Tested with the Simple Hands Free device).

2.1.6 Environmental Conditions

	23 April 2010	17 May 2010
Ambient Temperature	19°C	19°C
Relative Humidity	27%	42%
Atmospheric Pressure	1013mbar	1021mbar



Product Service

2.1.7 Test Results

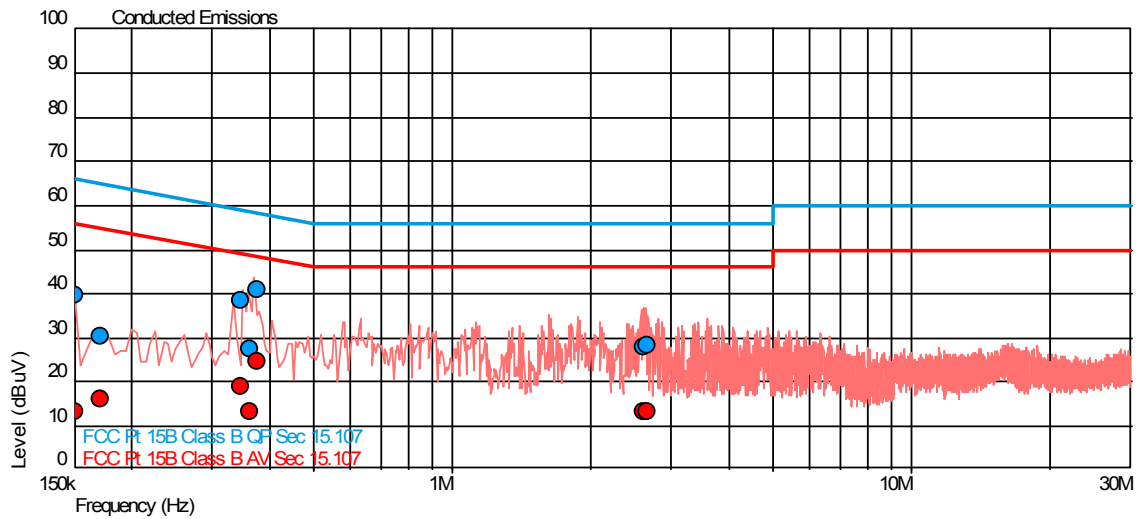
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Conducted Emission (AC Power Port).

The test results are shown below.

Configuration 2 - Mode 1

Top Channel

Live Line



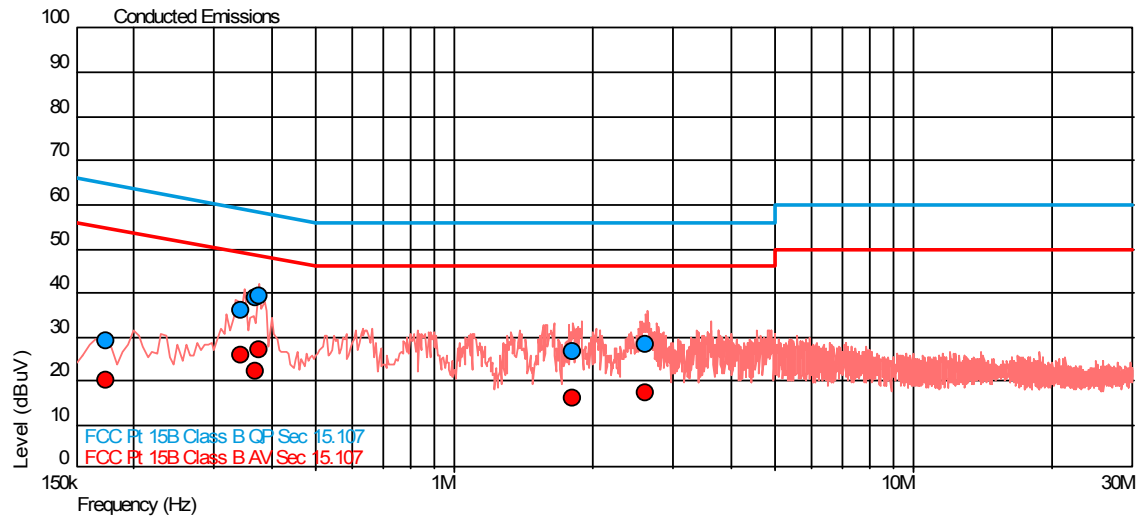
Final Result

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.151	39.5	66.0	-26.4	13.2	56.0	-42.7
0.172	30.1	64.9	-34.8	16.2	54.9	-38.7
0.345	38.4	59.1	-20.6	18.9	49.1	-30.1
0.361	27.5	58.7	-31.2	13.2	48.7	-35.5
0.376	41.1	58.4	-17.3	24.6	48.4	-23.8
2.610	27.8	56.0	-28.2	13.4	46.0	-32.6
2.645	28.4	56.0	-27.6	13.4	46.0	-32.6



Product Service

Neutral Line

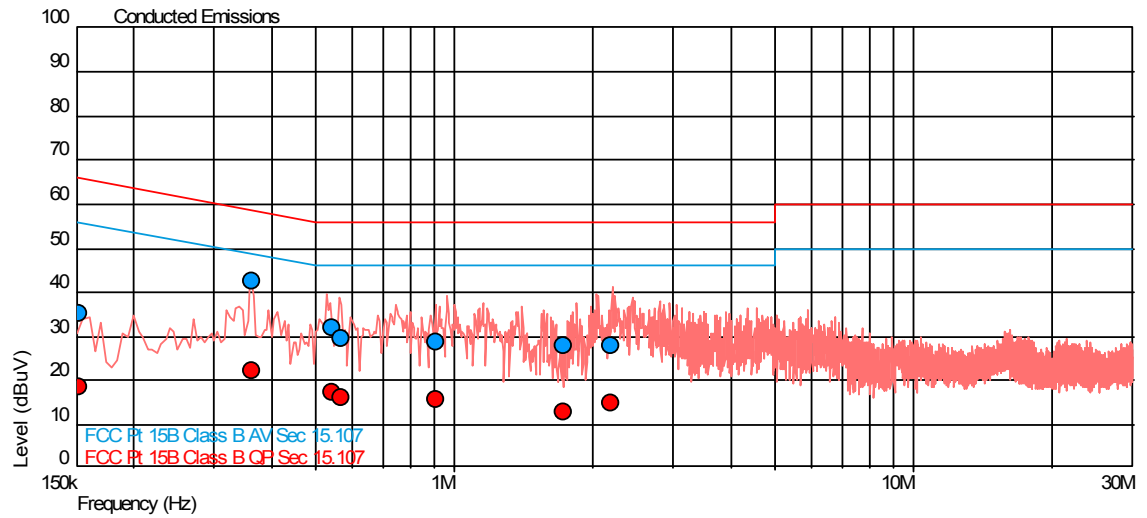


Final Result

Frequency (MHz)	QP Level (dBUV/m)	QP Limit (dBUV/m)	QP Margin (dBUV/m)	AV Level (dBUV)	AV Limit (dBUV)	AV Margin (dBUV)
0.175	29.0	64.7	-35.7	20.3	54.7	-34.4
0.344	36.0	59.1	-23.1	26.0	49.1	-23.1
0.369	38.8	58.5	-19.7	22.2	48.5	-26.3
0.374	39.3	58.4	-19.1	27.1	48.4	-21.3
1.815	26.5	56.0	-29.5	15.9	46.0	-30.1
2.611	28.1	56.0	-27.9	17.2	46.0	-28.8



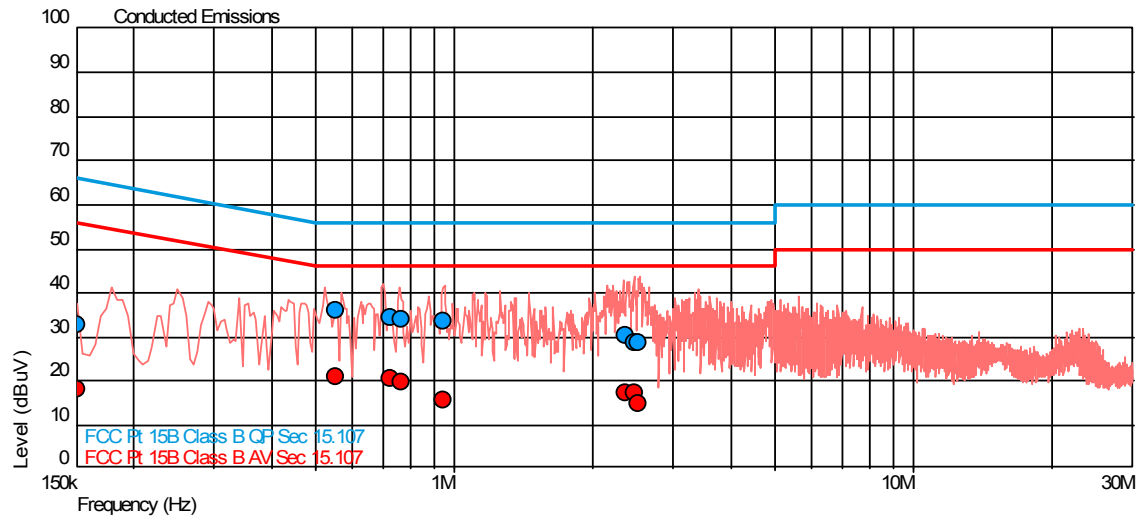
Product Service

Middle ChannelLive LineFinal Result

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.152	35.1	65.9	-30.8	18.4	55.9	-37.5
0.363	42.3	58.7	-16.4	22.3	48.7	-26.3
0.541	31.7	56.0	-24.3	17.3	46.0	-28.7
0.565	29.6	56.0	-26.4	16.2	46.0	-29.8
0.915	28.5	56.0	-27.5	15.8	46.0	-30.2
1.720	28.0	56.0	-28.0	12.7	46.0	-33.3
2.184	27.9	56.0	-28.1	14.8	46.0	-31.2



Neutral Line

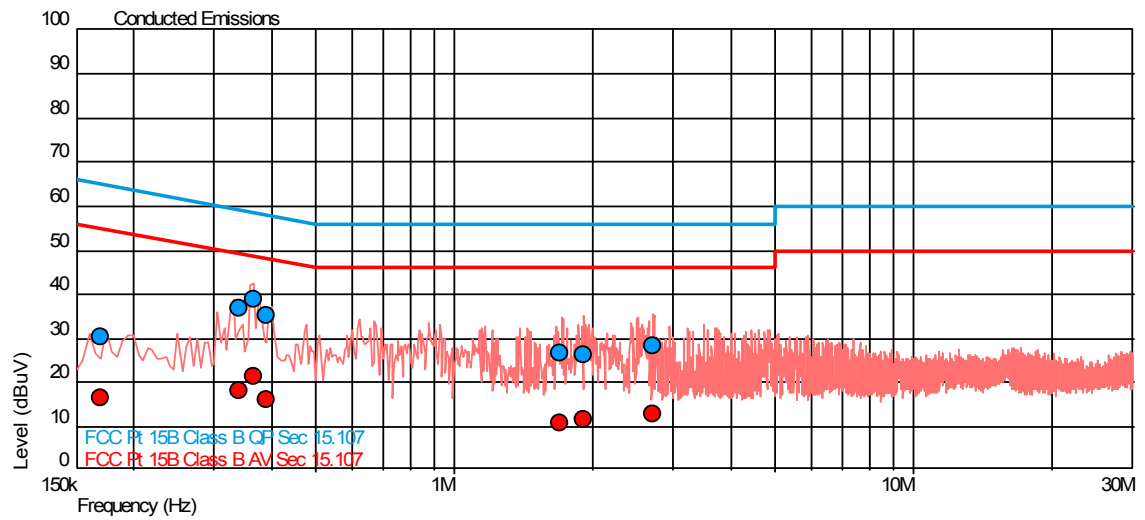


Final Result

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	32.6	66.0	-33.4	18.0	56.0	-38.0
0.550	35.9	56.0	-20.1	20.8	46.0	-25.2
0.725	34.5	56.0	-21.5	20.5	46.0	-25.5
0.769	33.9	56.0	-22.1	19.6	46.0	-26.4
0.946	33.7	56.0	-22.3	15.8	46.0	-30.2
2.346	30.1	56.0	-25.9	17.4	46.0	-28.6
2.467	28.7	56.0	-27.3	17.2	46.0	-28.8
2.522	28.8	56.0	-27.2	14.8	46.0	-31.2



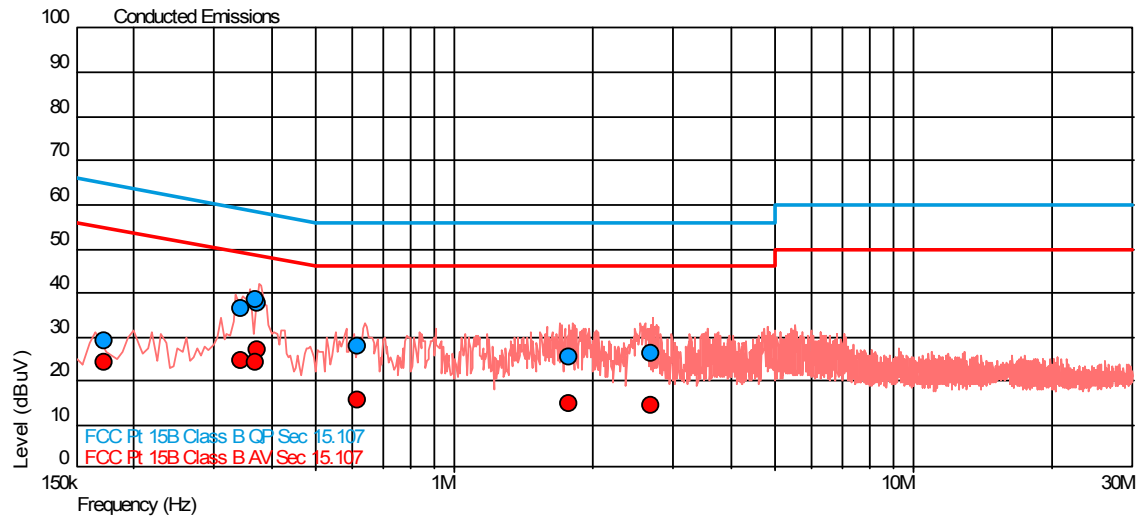
Product Service

Bottom ChannelLive LineFinal Result

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.170	30.3	65.0	-34.6	16.4	55.0	-38.6
0.339	36.9	59.2	-22.3	18.2	49.2	-31.0
0.367	38.6	58.6	-19.9	21.4	48.6	-27.2
0.391	35.3	58.1	-22.7	16.0	48.1	-32.1
1.696	26.5	56.0	-29.5	10.8	46.0	-35.2
1.907	26.0	56.0	-30.0	11.6	46.0	-34.4
2.697	28.1	56.0	-27.9	12.7	46.0	-33.3



Neutral Line

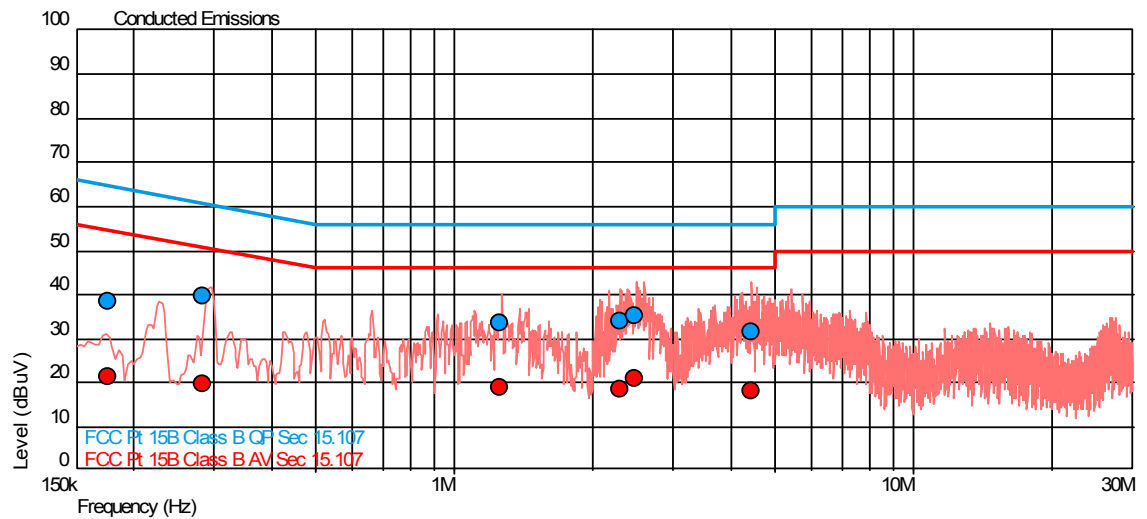


Final Result

Frequency (MHz)	QP Level (dBUV/m)	QP Limit (dBUV/m)	QP Margin (dBUV/m)	AV Level (dBUV)	AV Limit (dBUV)	AV Margin (dBUV)
0.172	28.9	64.9	-36.0	24.3	54.9	-30.5
0.343	36.2	59.1	-22.9	24.4	49.1	-24.7
0.369	38.3	58.5	-20.2	24.2	48.5	-24.4
0.372	37.7	58.5	-20.7	27.0	48.5	-21.5
0.614	27.8	56.0	-28.2	15.5	46.0	-30.5
1.781	25.2	56.0	-30.8	14.8	46.0	-31.2
2.670	26.1	56.0	-29.9	14.3	46.0	-31.7



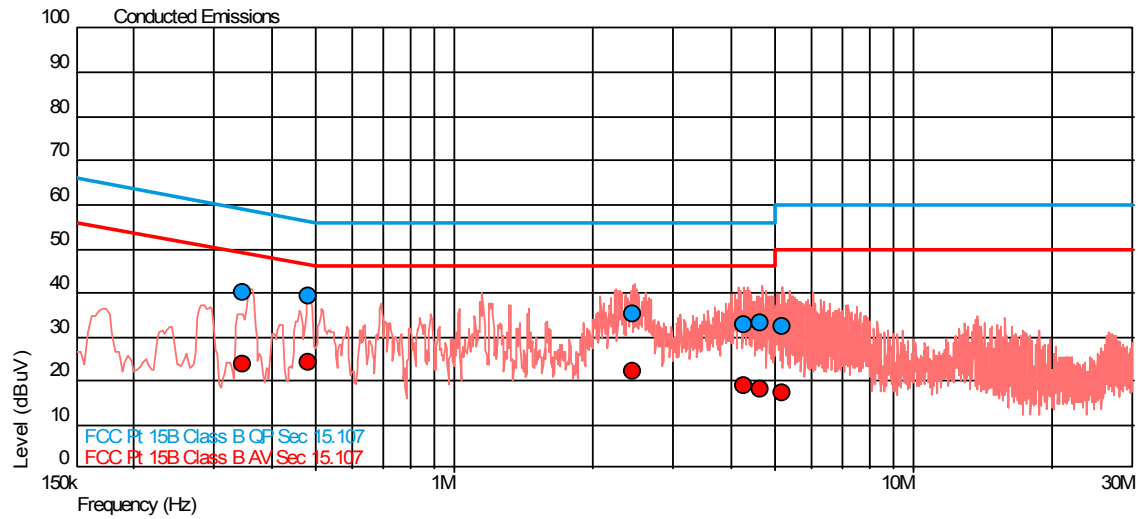
Product Service

Configuration 2 - Mode 3Top ChannelLive LineFinal Result

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.176	38.3	64.7	-26.4	21.3	54.7	-33.3
0.284	39.7	60.7	-21.0	19.6	50.7	-31.1
1.253	33.6	56.0	-22.4	19.0	46.0	-27.0
2.282	33.8	56.0	-22.2	18.6	46.0	-27.4
2.457	35.3	56.0	-20.7	20.7	46.0	-25.3
4.428	31.3	56.0	-24.7	17.9	46.0	-28.1



Neutral Line

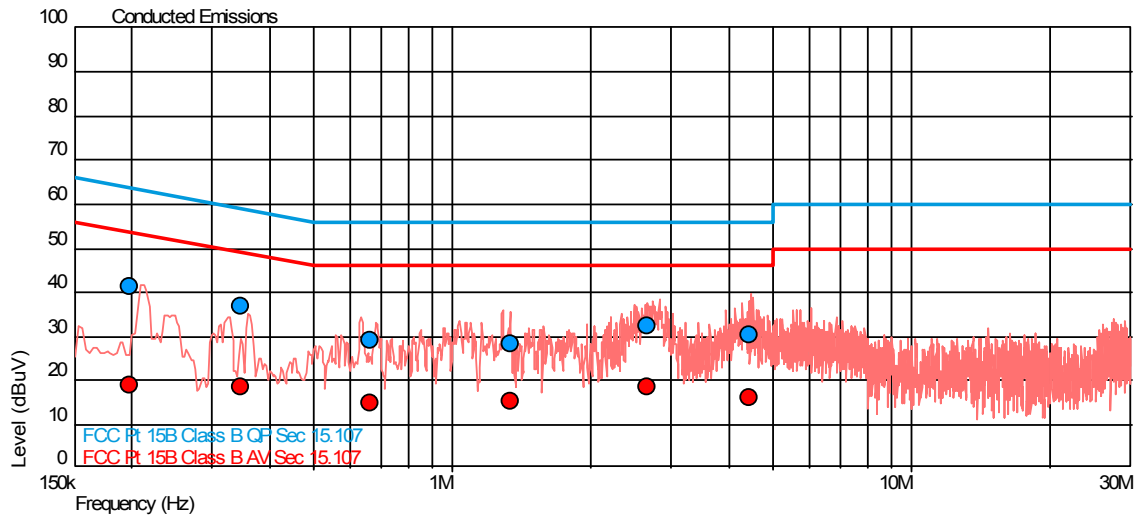


Final Result

Frequency (MHz)	QP Level (dBUV/m)	QP Limit (dBUV/m)	QP Margin (dBUV/m)	AV Level (dBUV)	AV Limit (dBUV)	AV Margin (dBUV)
0.345	40.1	59.1	-19.0	23.7	49.1	-25.4
0.482	39.1	56.3	-17.2	24.0	46.3	-22.3
2.438	35.0	56.0	-21.0	22.3	46.0	-23.7
4.264	32.9	56.0	-23.1	19.1	46.0	-26.9
4.634	33.1	56.0	-22.9	18.2	46.0	-27.8
5.188	32.5	60.0	-27.5	17.3	50.0	-32.7



Product Service

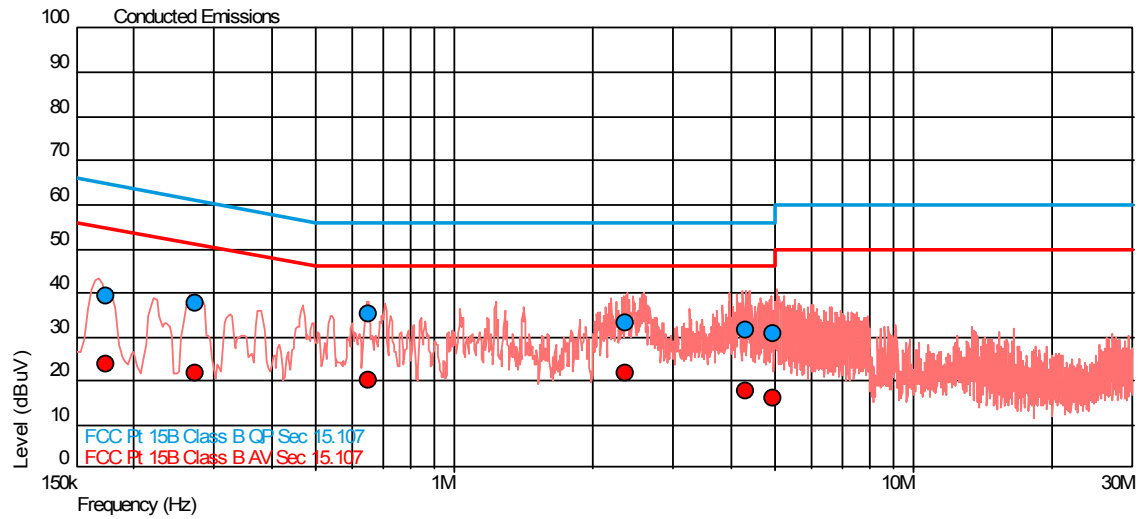
Middle ChannelLive LineFinal Result

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.199	41.1	63.7	-22.5	19.1	53.7	-34.6
0.346	36.8	59.0	-22.3	18.4	49.0	-30.6
0.661	29.0	56.0	-27.0	14.9	46.0	-31.1
1.334	28.1	56.0	-27.9	15.2	46.0	-30.8
2.660	32.3	56.0	-23.7	18.3	46.0	-27.7
4.441	30.2	56.0	-25.8	16.1	46.0	-29.9



Product Service

Neutral Line

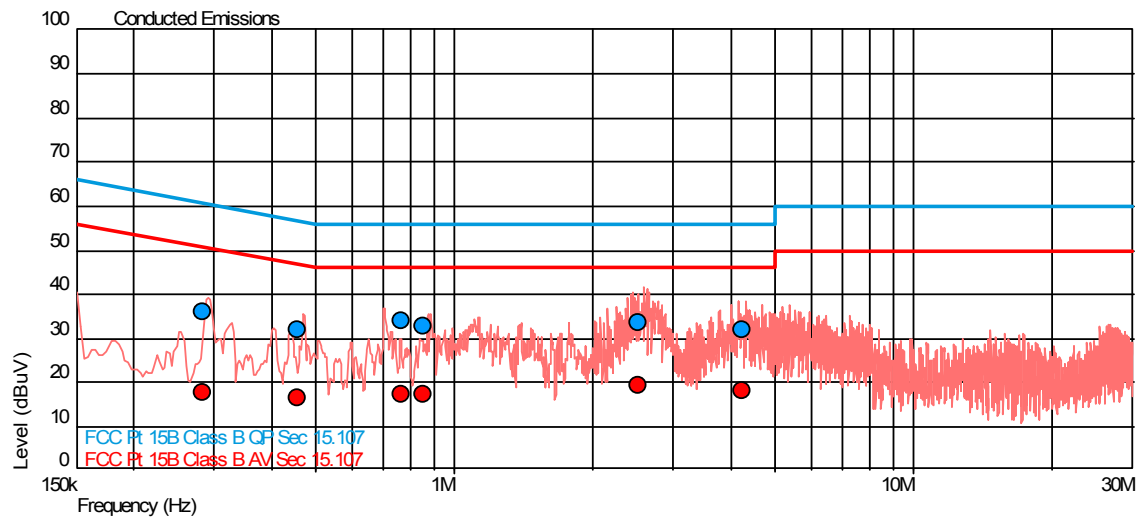


Final Result

Frequency (MHz)	QP Level (dBUV/m)	QP Limit (dBUV/m)	QP Margin (dBUV/m)	AV Level (dBUV)	AV Limit (dBUV)	AV Margin (dBUV)
0.175	39.4	64.7	-25.3	23.8	54.7	-30.9
0.274	37.6	61.0	-23.4	21.9	51.0	-29.2
0.650	35.0	56.0	-21.0	20.1	46.0	-25.9
2.365	33.2	56.0	-22.8	21.6	46.0	-24.4
4.304	31.5	56.0	-24.5	17.8	46.0	-28.2
4.917	30.7	56.0	-25.3	16.2	46.0	-29.8



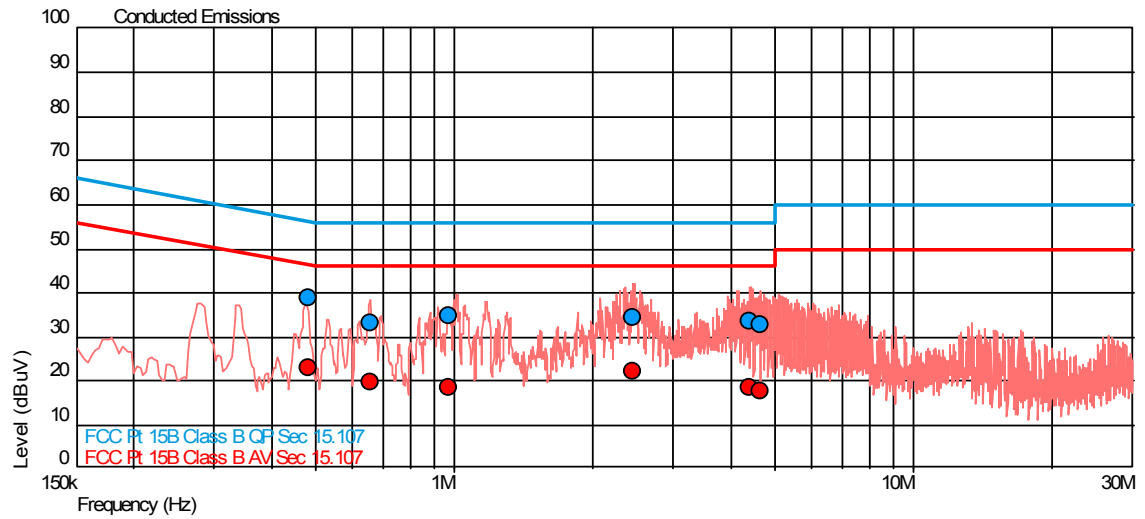
Product Service

Bottom ChannelLive LineFinal Result

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.282	35.8	60.8	-24.9	17.7	50.8	-33.1
0.457	31.8	56.8	-25.0	16.3	46.8	-30.4
0.768	34.0	56.0	-22.0	17.1	46.0	-28.9
0.852	32.7	56.0	-23.3	17.3	46.0	-28.7
2.521	33.6	56.0	-22.4	19.3	46.0	-26.7
4.244	32.0	56.0	-24.0	18.1	46.0	-27.9



Neutral Line



Final Result

Frequency (MHz)	QP Level (dBUV/m)	QP Limit (dBUV/m)	QP Margin (dBUV/m)	AV Level (dBUV)	AV Limit (dBUV)	AV Margin (dBUV)
0.479	38.9	56.3	-17.4	23.1	46.3	-23.2
0.656	33.1	56.0	-22.9	19.7	46.0	-26.3
0.972	34.8	56.0	-21.2	18.5	46.0	-27.5
2.443	34.5	56.0	-21.5	22.2	46.0	-23.8
4.398	33.4	56.0	-22.6	18.7	46.0	-27.3
4.630	32.8	56.0	-23.2	17.8	46.0	-28.2



Product Service

2.2 RADIATED EMISSIONS (ENCLOSURE PORT)

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (d)
RSS-210, Clause A8.5

2.2.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510018183 and IMEI 004401510018167

2.2.3 Date of Test and Modification State

19, 20 and 21 April 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Through this process of profiling the EUT, it was determined that the worst case was Configuration 2 (Mobile Handset + AC Charger), therefore a full sweep of plots for Top, Middle and Bottom Channels has been presented. For Configurations 1 and 3 a plot showing 30MHz to 1GHz for the Top and Bottom Channels plus a full sweep of plots for the Middle Channel have also been presented in this document to support this judgement.

Emissions within the restricted bands defined in 15.205 were measured in accordance with 15.209. Emissions measured below 1 GHz employed a peak detector unless the limit was exceeded in which case, a quasi peak detector was used, in accordance with 15.35(a). Emissions measured above 1 GHz employed an average detector as defined in 15.35(b). The peak level of the emission was also measured to ensure that a difference of 20 dB from the average level was not exceeded, as defined in 15.35(b). Emissions identified within the range 30MHz – 1GHz were then formally measured using a CISPR Quasi-Peak detector. Other emissions from 30 MHz to 25 GHz excluding the restricted bands were measured using a peak detector.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
Configuration 2 - Mode 1
Configuration 3 - Mode 1



Product Service

2.2.6 Environmental Conditions

	19 April 2010	20 April 2010	21 April 2010
Ambient Temperature	19°C	21.5°C	19°C
Relative Humidity	31%	25%	32%
Atmospheric Pressure	1013mbar	1015mbar	1018mbar

2.2.7 Test Results

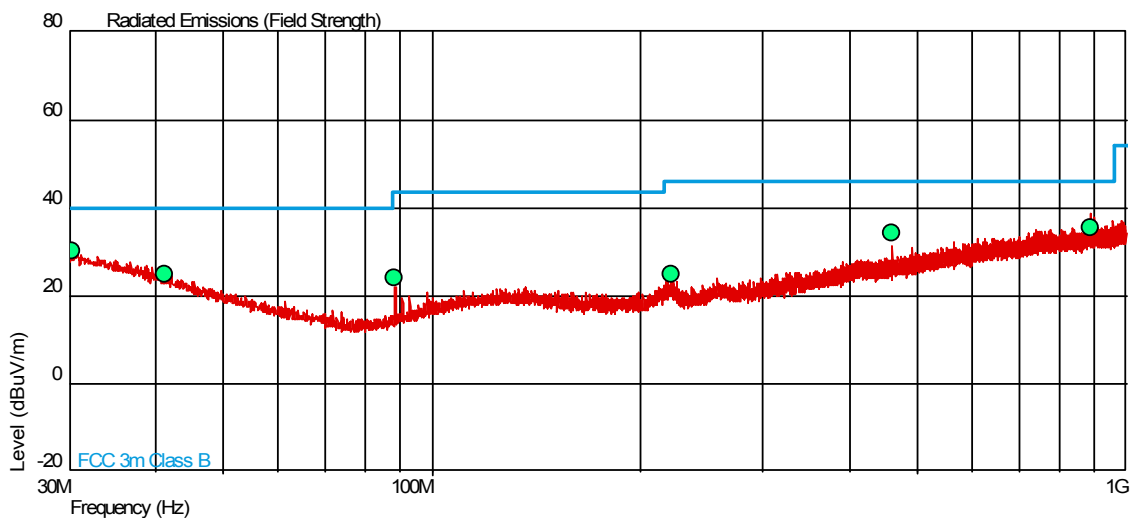
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Radiated Emissions (Enclosure Port).

The test results are shown below.

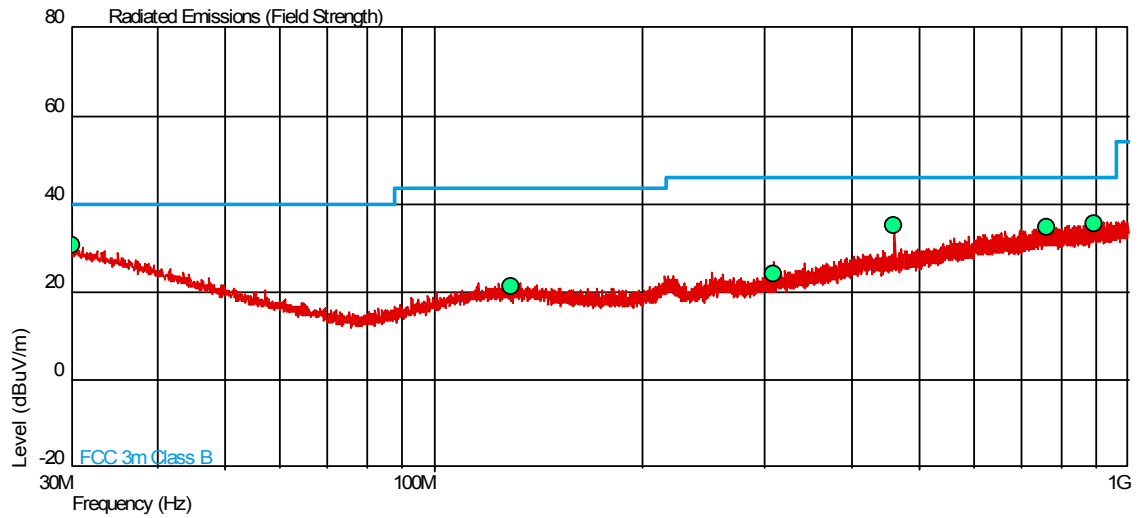
Configuration 1 - Mode 1

Top Channel

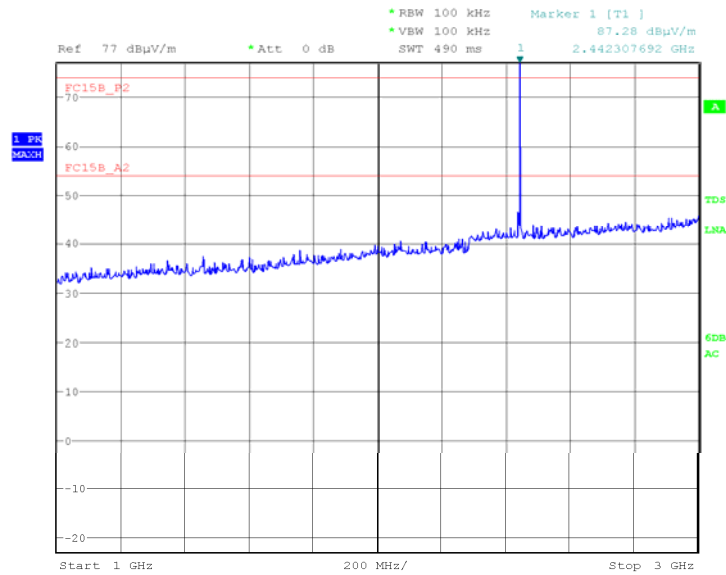
30 MHz to 1 GHz



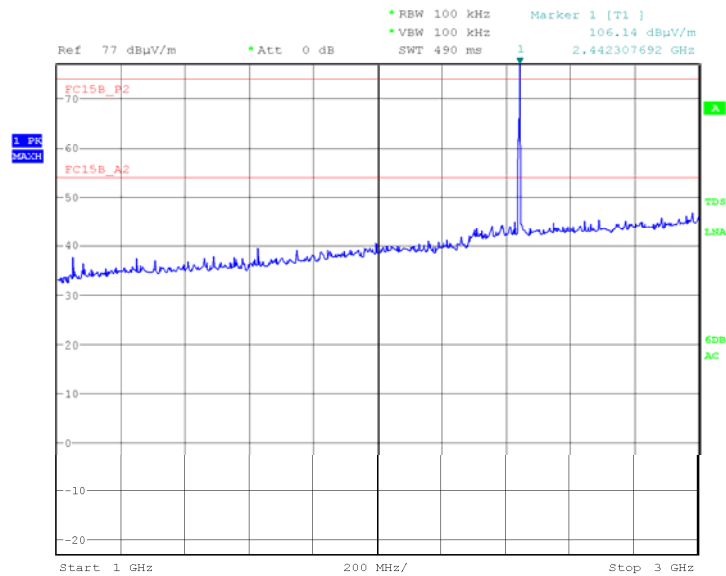
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.290	30.3	32.7	40.0	100	-9.7	-67.3	356	1.00	Vertical
41.202	24.9	17.6	40.0	100	-15.1	-82.4	82	1.00	Vertical
88.501	24.0	15.8	43.5	150	-19.5	-134.2	283	3.03	Horizontal
221.007	25.1	18.0	46.0	200	-20.9	-182.0	4	1.00	Vertical
460.627	34.1	50.7	46.0	200	-11.9	-149.3	46	3.27	Horizontal
887.266	35.4	58.9	46.0	200	-10.6	-141.1	9	1.00	Vertical

Middle Channel30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.097	30.5	33.5	40.0	100	-9.5	-66.5	47	1.00	Horizontal
129.379	21.2	11.5	43.5	150	-22.3	-138.5	358	1.00	Horizontal
309.360	24.2	16.2	46.0	200	-21.8	-183.8	128	1.78	Vertical
460.632	35.1	56.9	46.0	200	-10.9	-143.1	6	1.00	Vertical
762.580	34.7	54.3	46.0	200	-11.3	-145.7	223	1.78	Horizontal
892.989	35.4	58.9	46.0	200	-10.6	-141.1	273	1.00	Horizontal

1GHz to 3GHzVertical

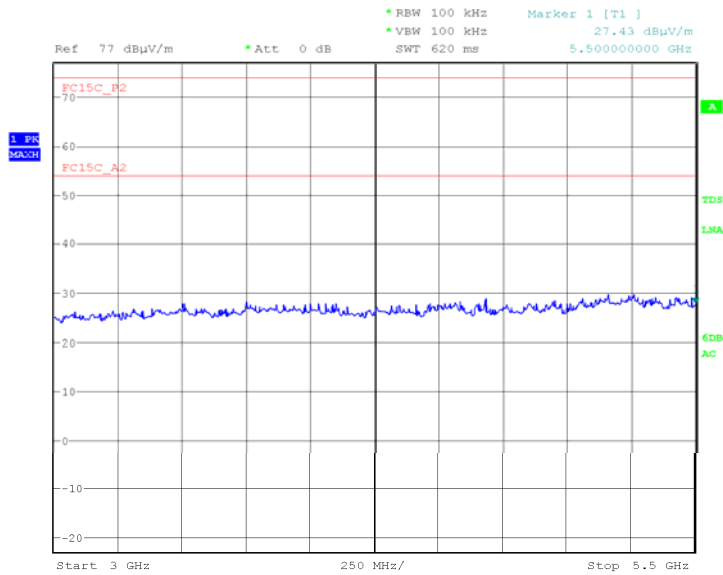
Date: 26.MAY.2010 00:23:43

Horizontal

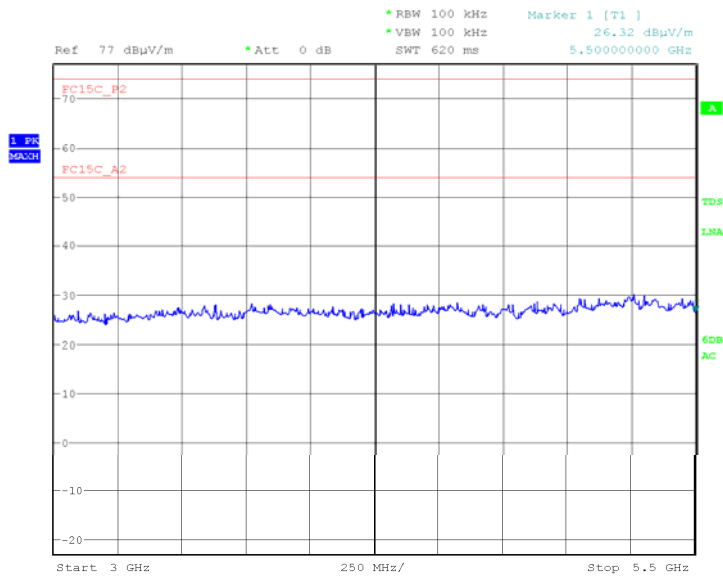
Date: 26.MAY.2010 00:25:08



Product Service

3GHz to 5.5GHzVertical

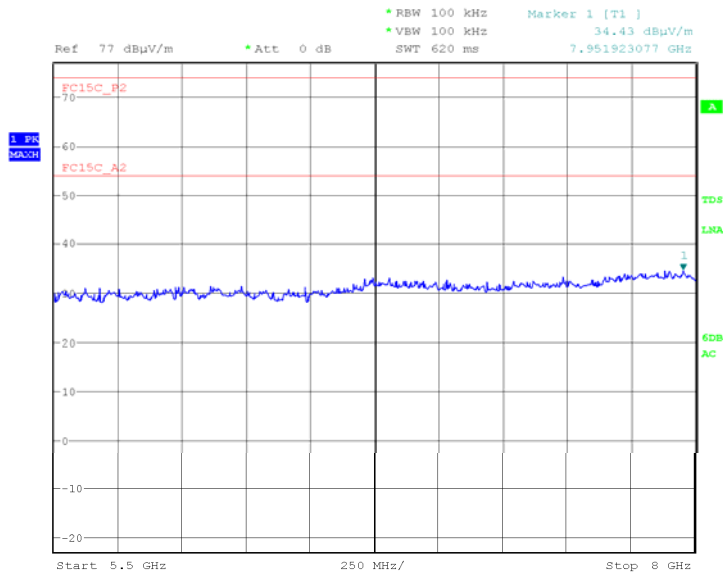
Date: 26.MAY.2010 01:33:35

Horizontal

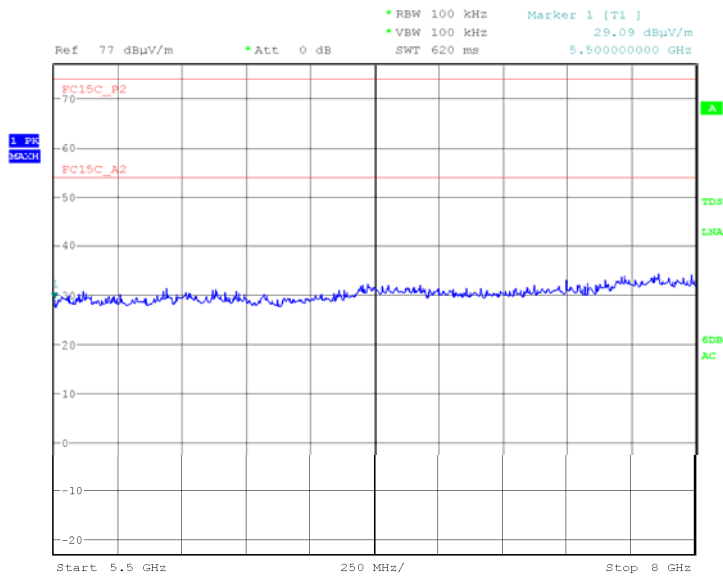
Date: 26.MAY.2010 01:24:12



Product Service

5.5GHz to 8GHzVertical

Date: 26.MAY.2010 01:32:22

Horizontal

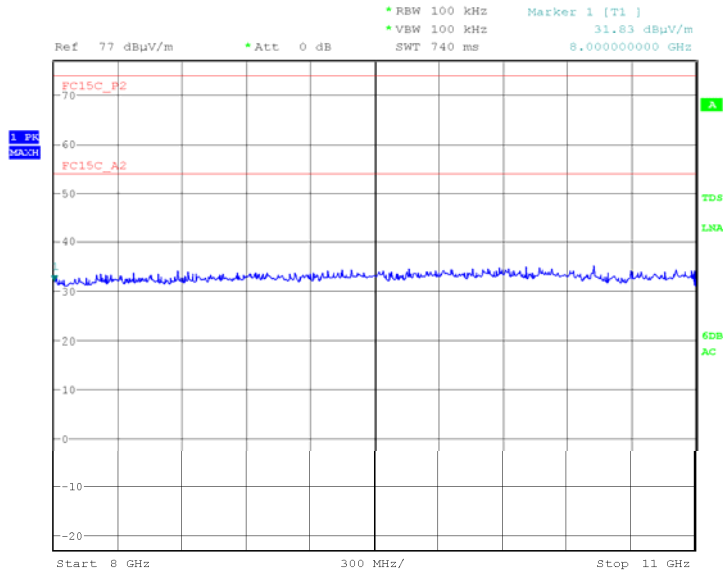
Date: 26.MAY.2010 01:25:16



Product Service

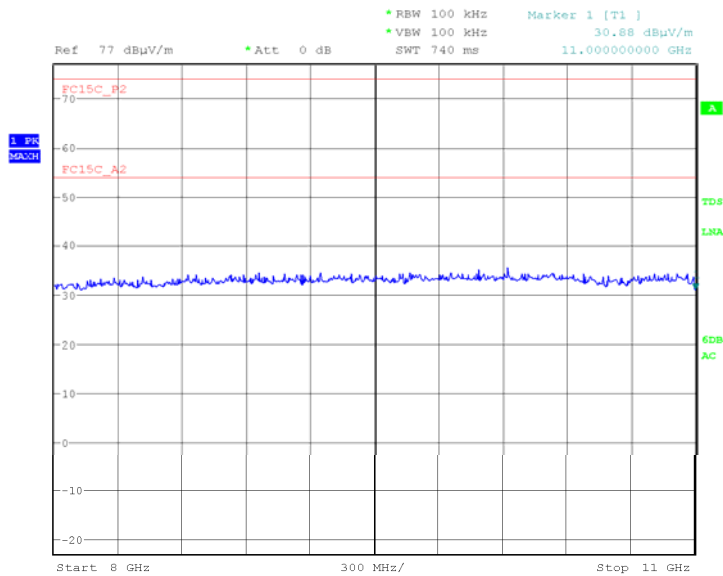
8GHz to 11GHz

Vertical



Date: 26.MAY.2010 01:54:11

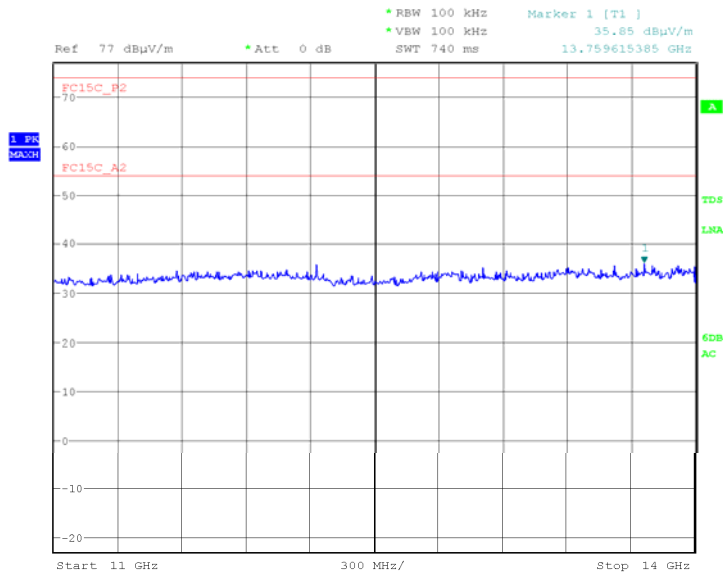
Horizontal



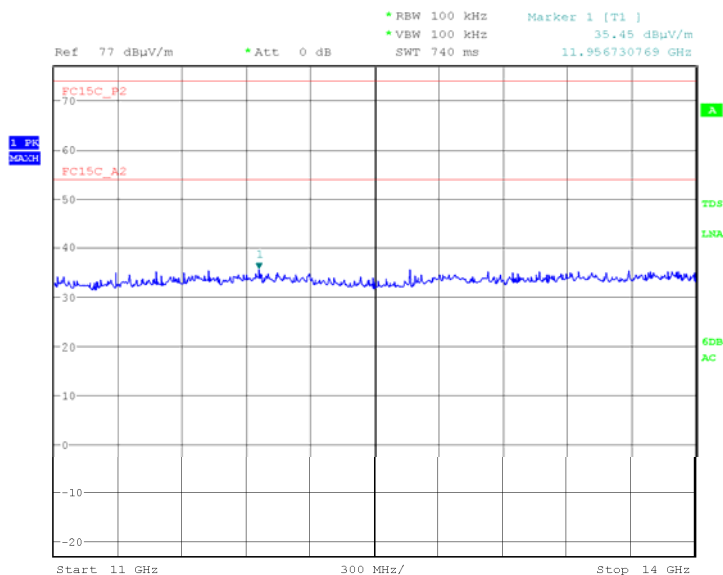
Date: 26.MAY.2010 01:59:28



Product Service

11GHz to 14GHzVertical

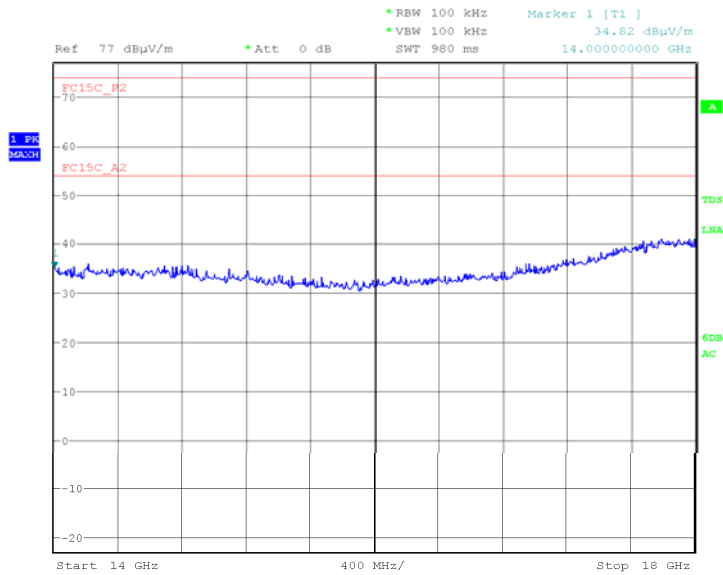
Date: 26.MAY.2010 01:55:27

Horizontal

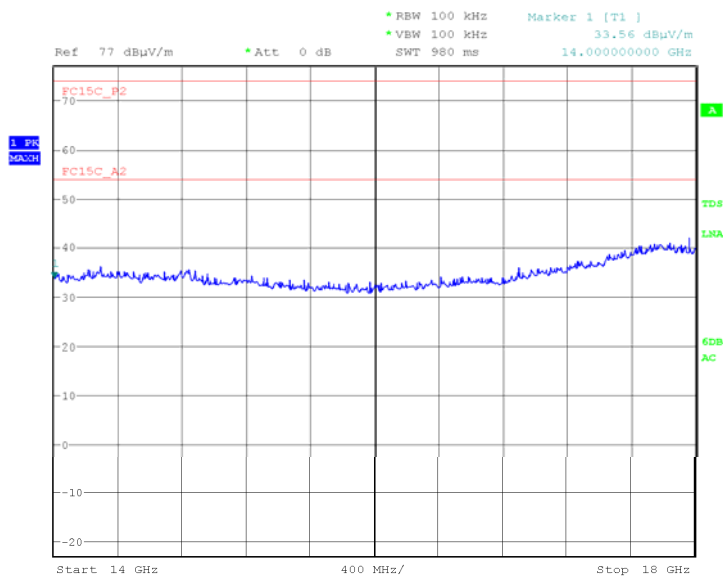
Date: 26.MAY.2010 02:01:17



Product Service

14GHz to 18GHzVertical

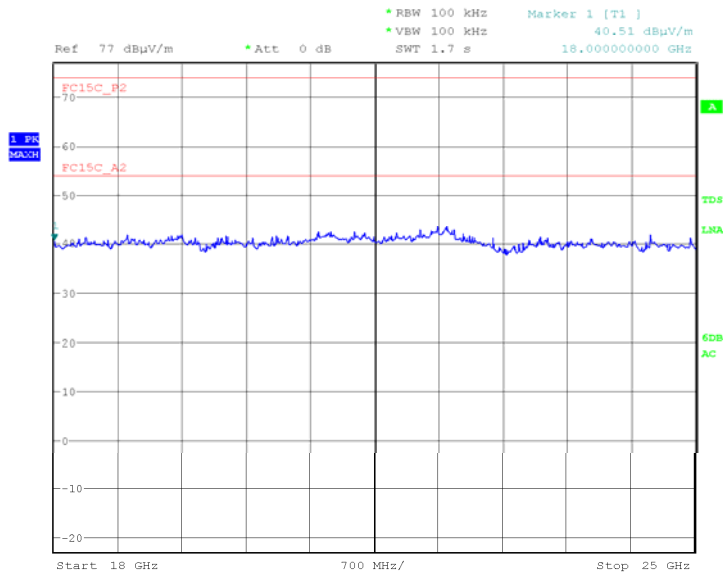
Date: 26.MAY.2010 01:56:34

Horizontal

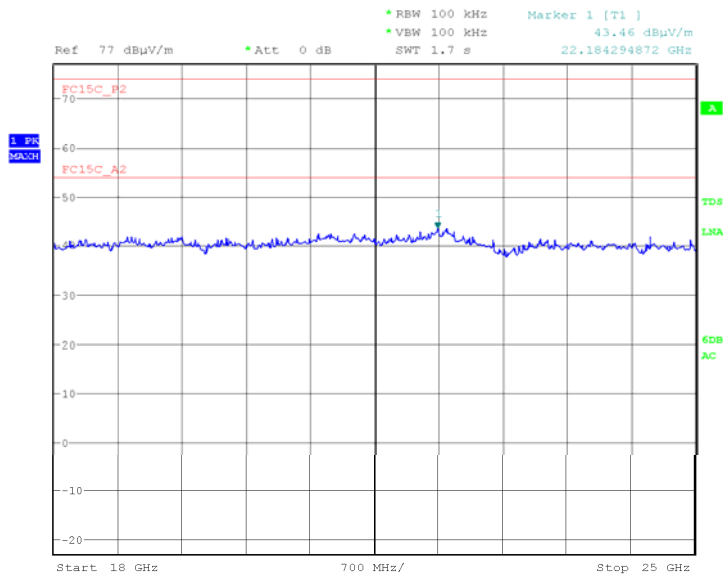
Date: 26.MAY.2010 02:02:22



Product Service

18GHz to 25GHzVertical

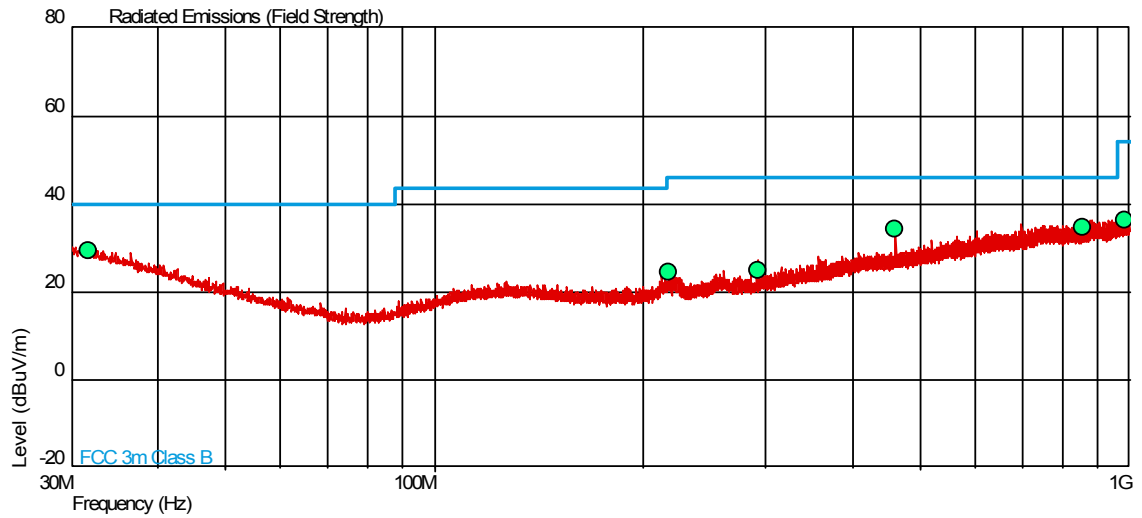
Date: 26.MAY.2010 02:18:17

Horizontal

Date: 26.MAY.2010 02:26:54



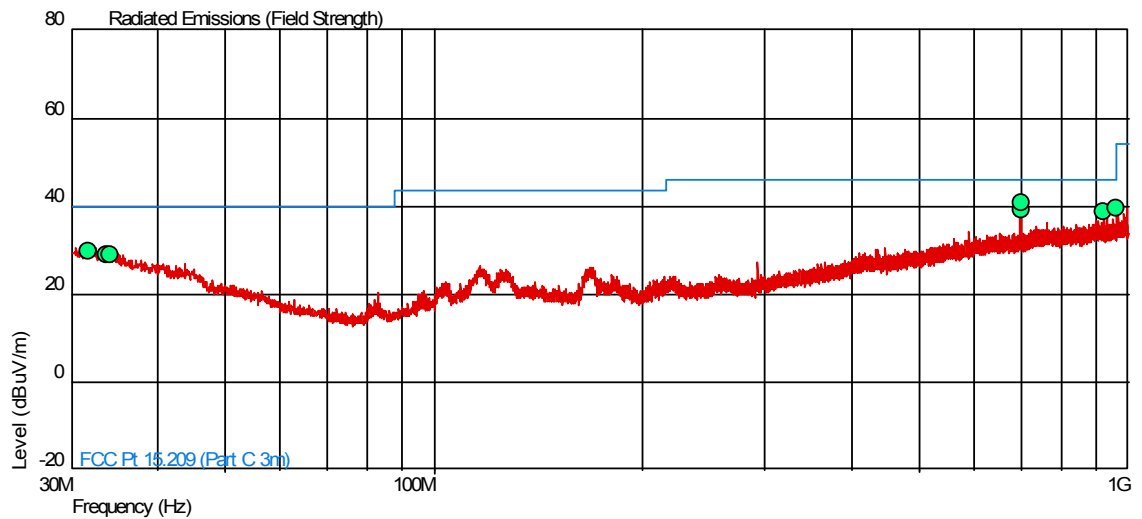
Product Service

Bottom Channel30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
31.844	29.5	29.9	40.0	100	-10.5	-70.1	293	1.40	Horizontal
217.006	24.6	17.0	46.0	200	-21.4	-183.0	189	1.02	Vertical
292.490	24.8	17.4	46.0	200	-21.2	-182.6	276	1.00	Horizontal
460.623	34.4	52.5	46.0	200	-11.6	-147.5	21	1.00	Vertical
857.168	34.7	54.3	46.0	200	-11.3	-145.7	250	1.21	Vertical
985.271	36.1	63.8	54.0	200	-17.9	-136.2	5	1.08	Horizontal



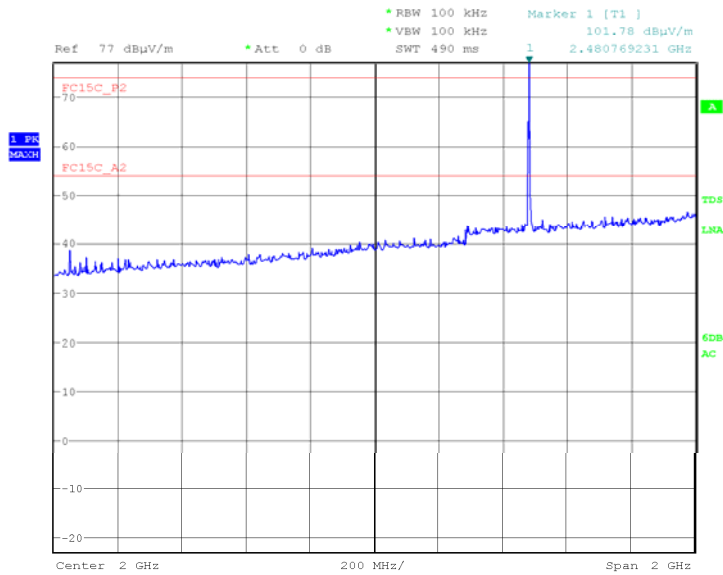
Product Service

Configuration 2 - Mode 1Top Channel30 MHz to 1 GHz

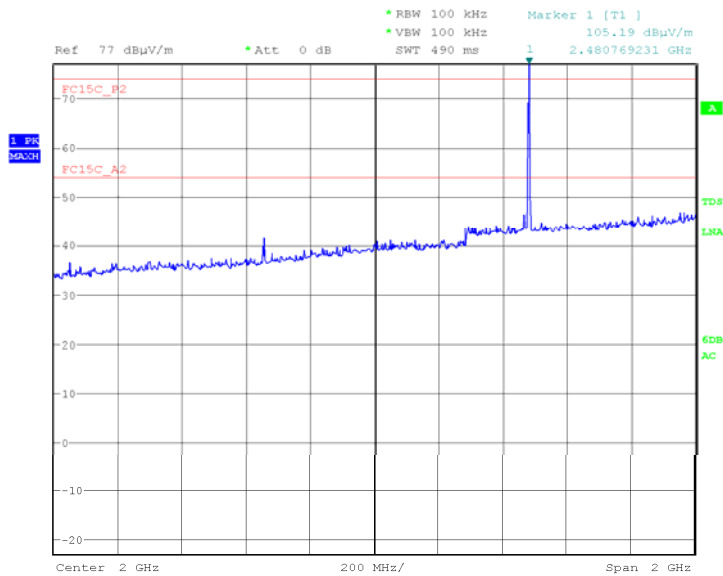
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
31.740	29.8	30.9	40.0	100	-10.2	-69.1	137	1.00	Vertical
33.768	29.1	28.5	40.0	100	-10.9	-71.5	100	1.00	Vertical
34.246	29.0	28.1	40.0	100	-11.0	-71.9	83	1.00	Vertical
699.998	39.3	92.2	46.0	200	-6.7	-107.8	60	1.00	Horizontal
699.998	40.8	109.6	46.0	200	-5.2	-90.4	197	1.37	Vertical
922.657	38.8	87.1	46.0	200	-7.2	-112.9	21	1.00	Vertical
960.005	39.5	94.4	54.0	500	-14.5	-405.6	357	1.49	Vertical



Product Service

1GHz to 3GHzVertical

Date: 19.APR.2010 18:37:49

Horizontal

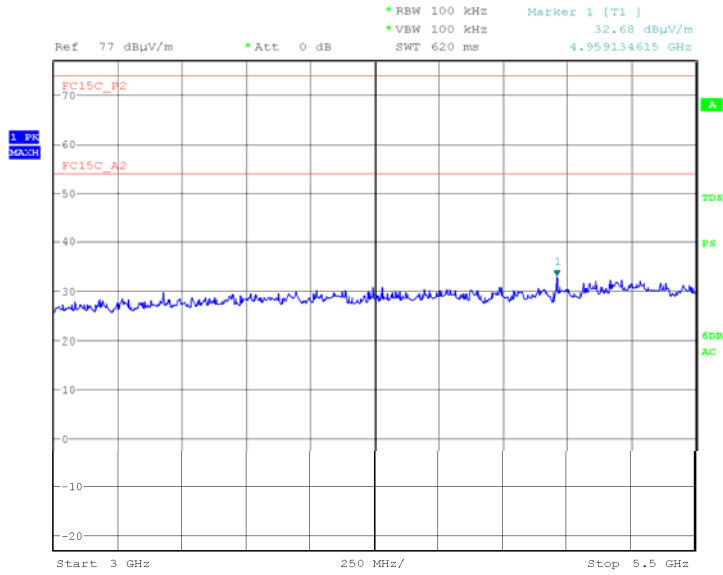
Date: 19.APR.2010 18:43:01



Product Service

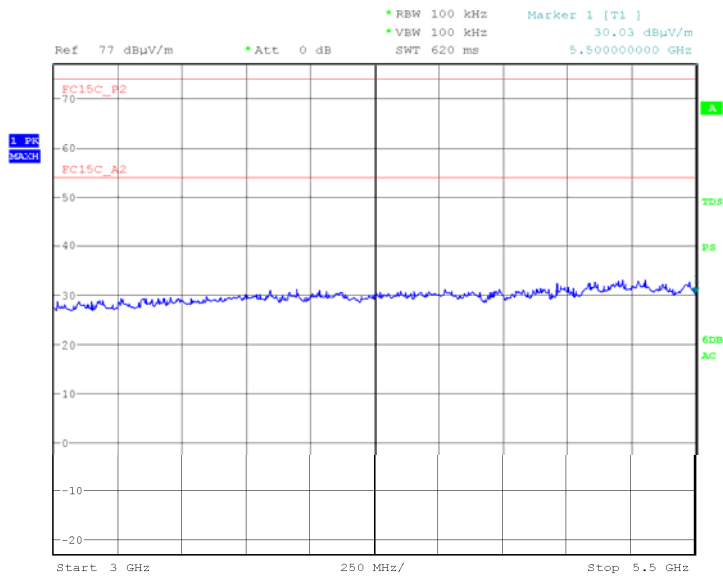
3GHz to 5.5GHz

Vertical



Date: 19.APR.2010 20:51:33

Horizontal



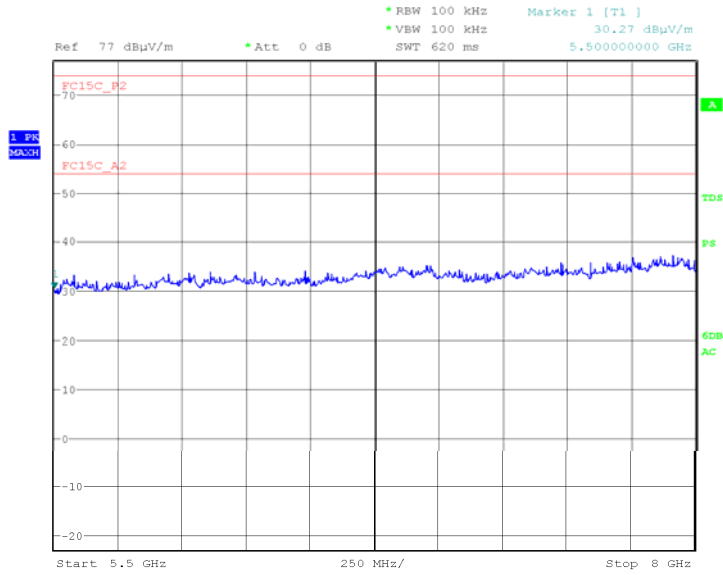
Date: 19.APR.2010 20:47:58



Product Service

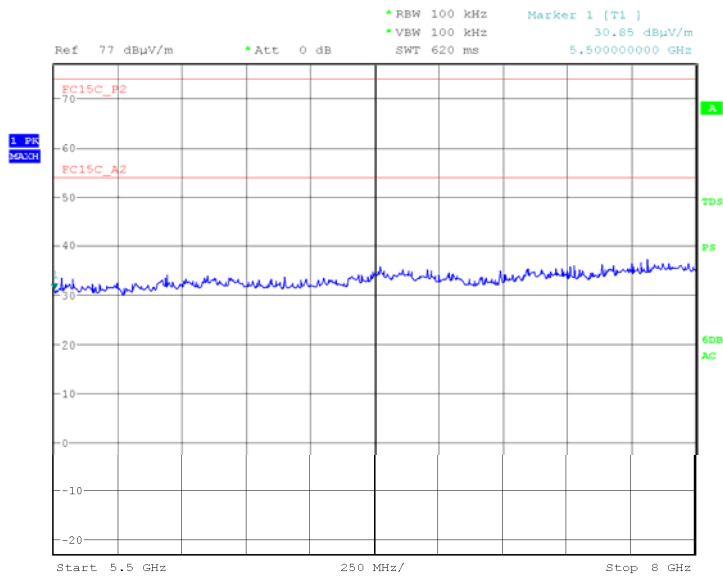
5.5GHz to 8GHz

Vertical



Date: 19.APR.2010 20:50:31

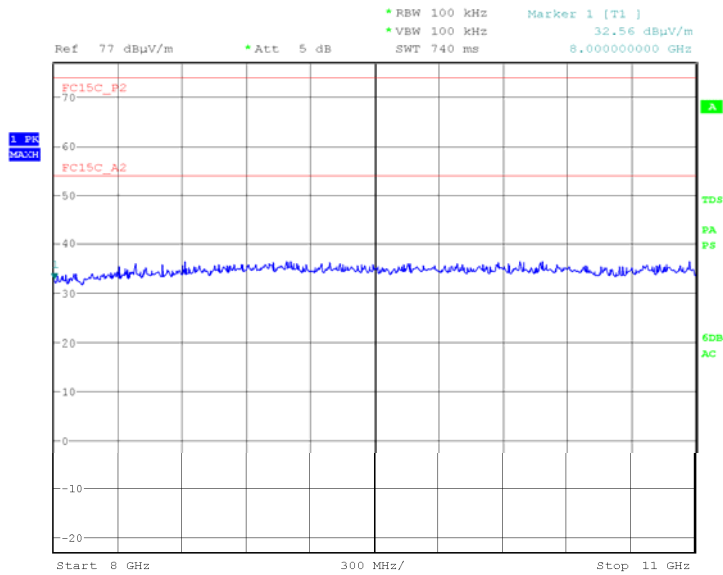
Horizontal



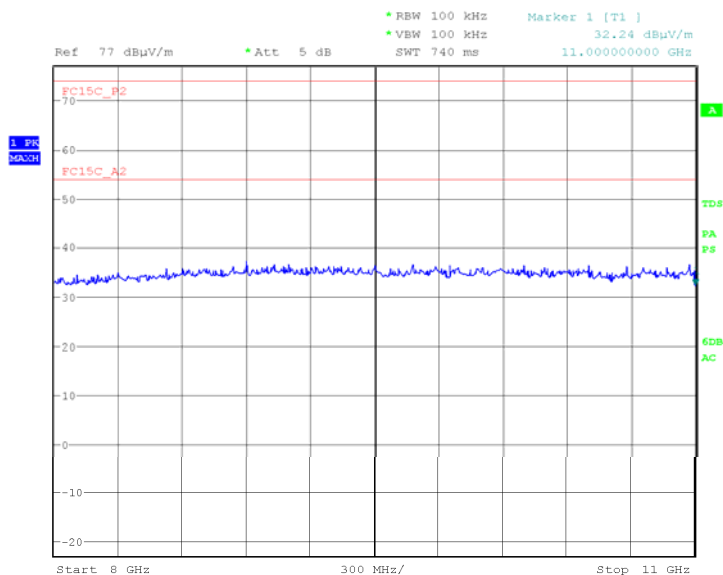
Date: 19.APR.2010 20:49:03



Product Service

8GHz to 11GHzVertical

Date: 19.APR.2010 21:48:18

Horizontal

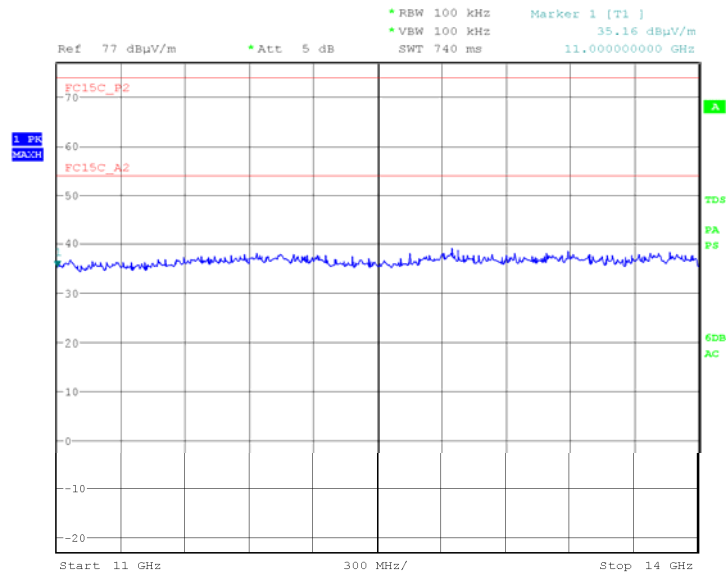
Date: 19.APR.2010 21:54:35



Product Service

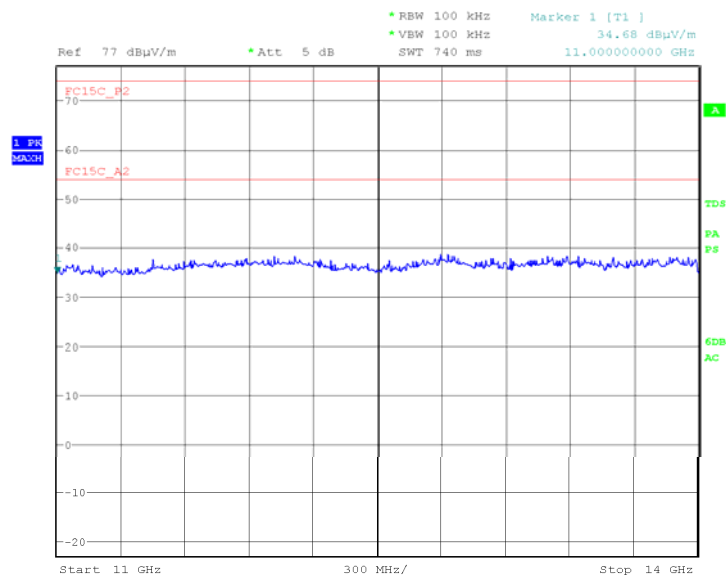
11GHz to 14GHz

Vertical



Date: 19.APR.2010 21:51:22

Horizontal



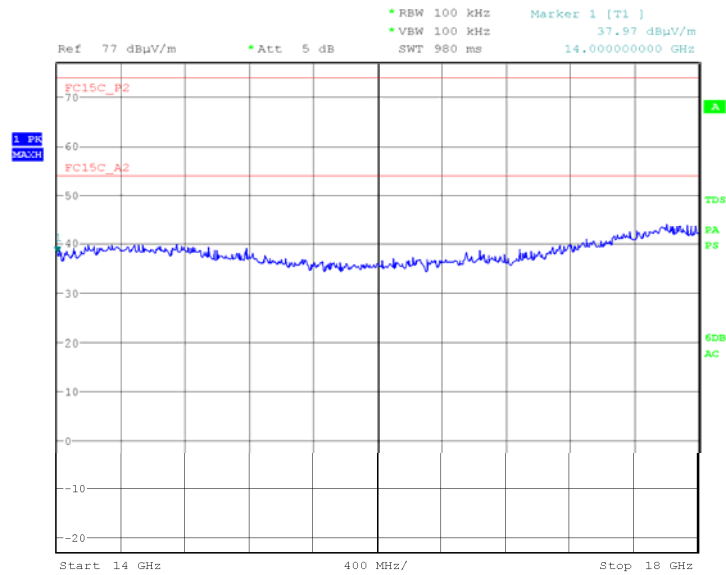
Date: 19.APR.2010 21:56:36



Product Service

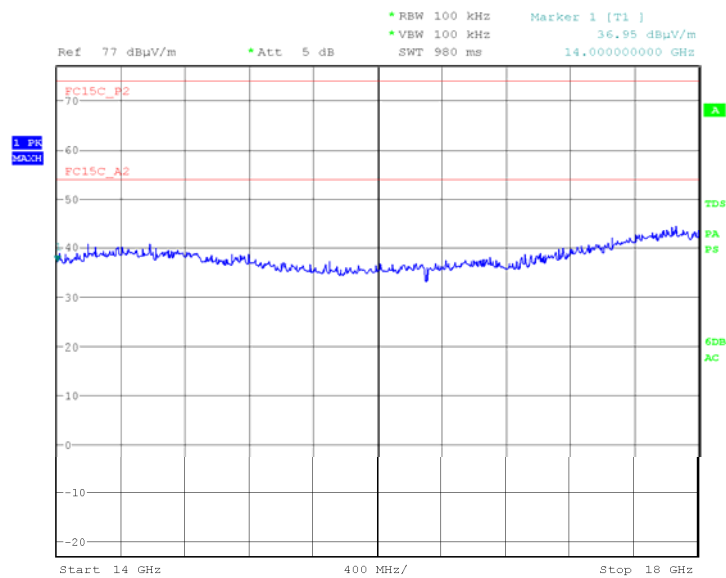
14GHz to 18GHz

Vertical



Date: 19.APR.2010 21:52:46

Horizontal



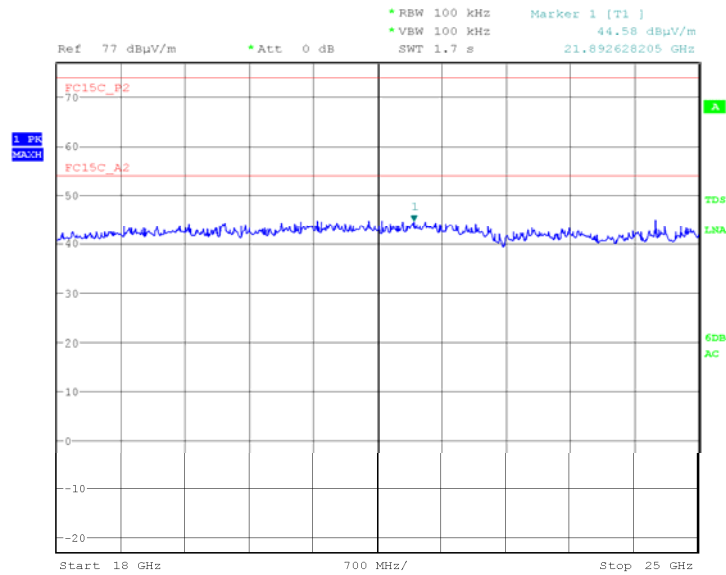
Date: 19.APR.2010 21:57:29



Product Service

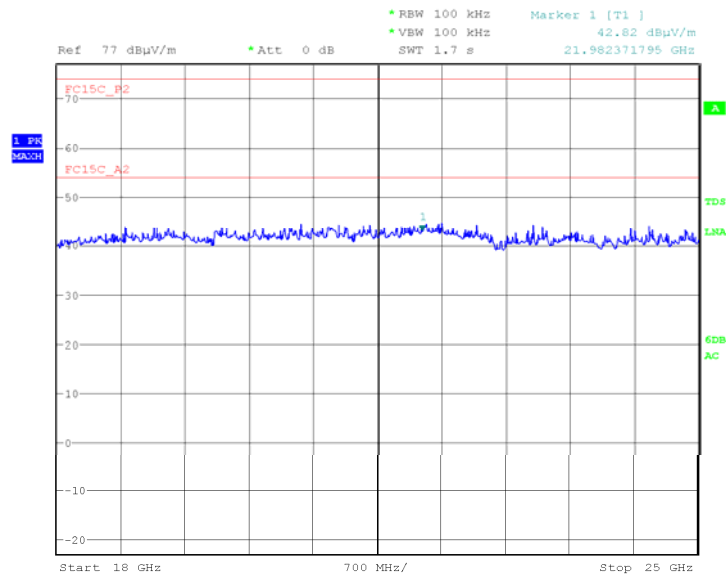
18GHz to 25GHz

Vertical

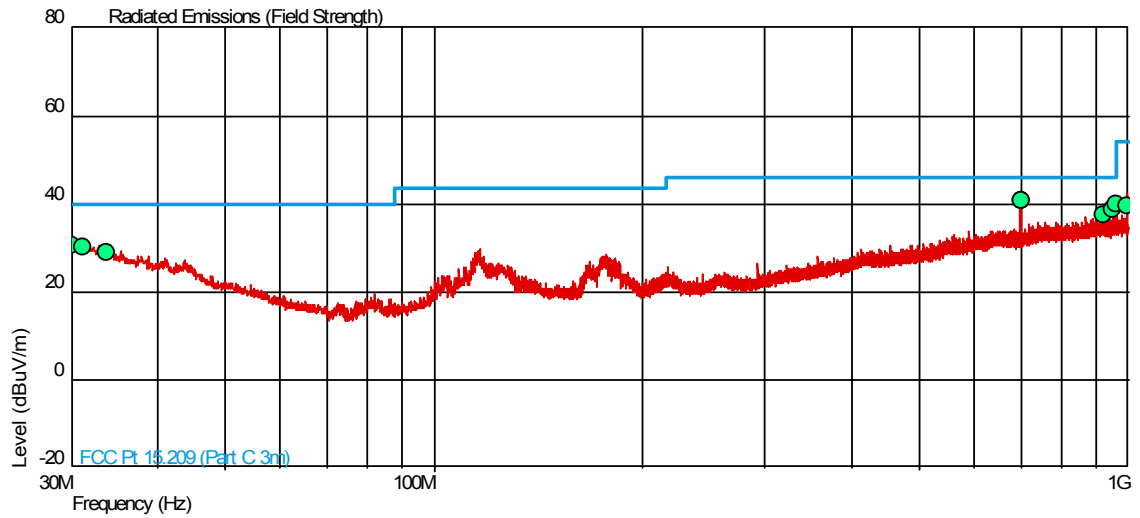


Date: 19.APR.2010 23:28:27

Horizontal



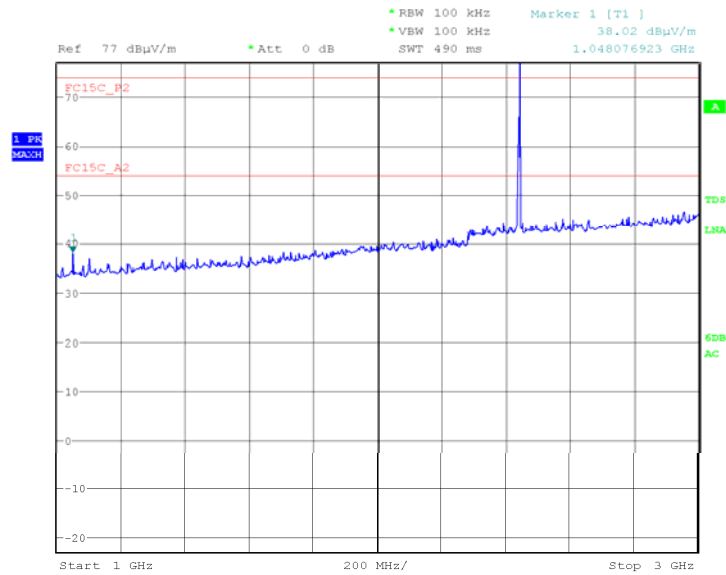
Date: 19.APR.2010 23:43:20

Middle Channel30 MHz to 1 GHz

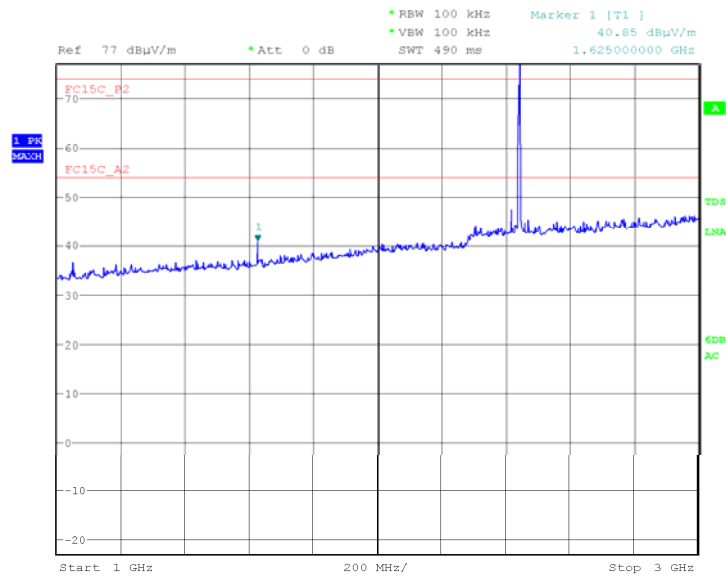
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.035	30.6	33.9	40.0	100	-9.4	-66.1	69	1.00	Vertical
31.120	30.1	32.0	40.0	100	-9.9	-68.0	66	1.00	Vertical
33.769	29.1	28.5	40.0	100	-10.9	-71.5	304	1.00	Vertical
700.000	40.6	107.2	46.0	200	-5.4	-92.8	250	1.00	Horizontal
700.000	40.6	107.2	46.0	200	-5.4	-92.8	179	1.71	Vertical
922.669	37.5	75.0	46.0	200	-8.5	-125.0	169	1.00	Vertical
950.000	38.6	85.1	46.0	200	-7.4	-114.9	360	1.00	Vertical
959.999	40.1	101.2	46.0	200	-5.9	-98.8	259	1.00	Horizontal
997.461	39.6	95.5	54.0	500	-14.4	-404.5	358	1.00	Vertical



Product Service

1GHz to 3GHzVertical

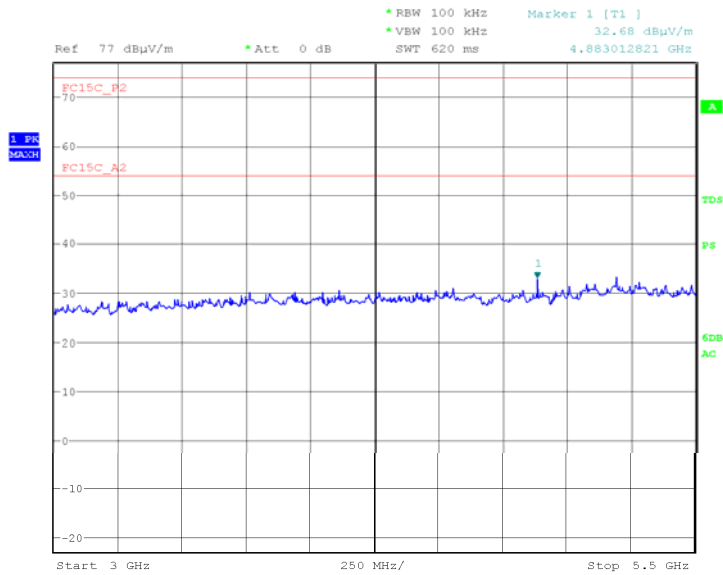
Date: 19.APR.2010 19:21:15

Horizontal

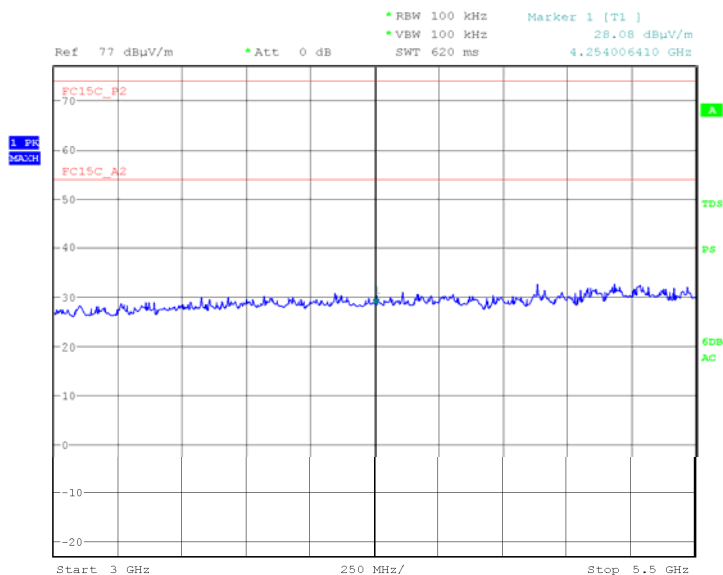
Date: 19.APR.2010 19:19:59



Product Service

3GHz to 5.5GHzVertical

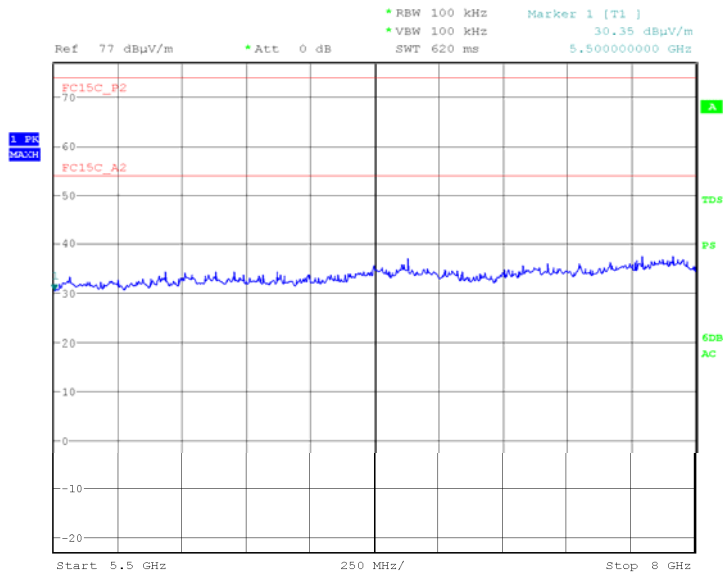
Date: 19.APR.2010 20:08:23

Horizontal

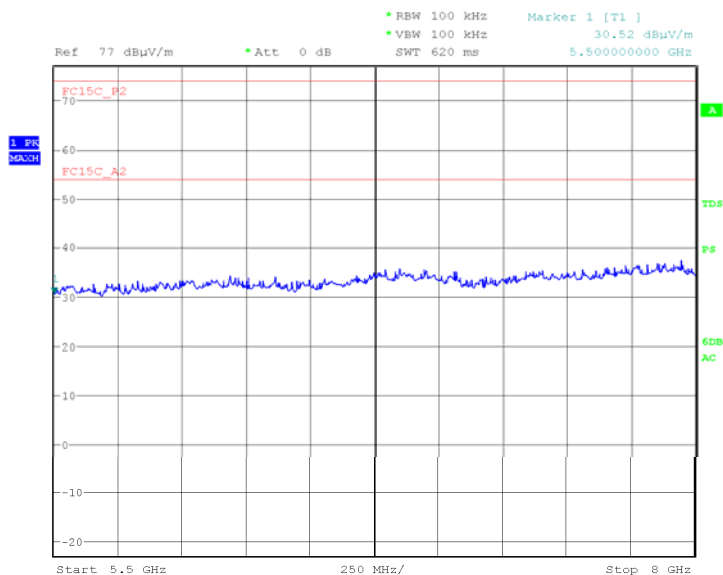
Date: 19.APR.2010 20:21:41



Product Service

5.5GHz to 8GHzVertical

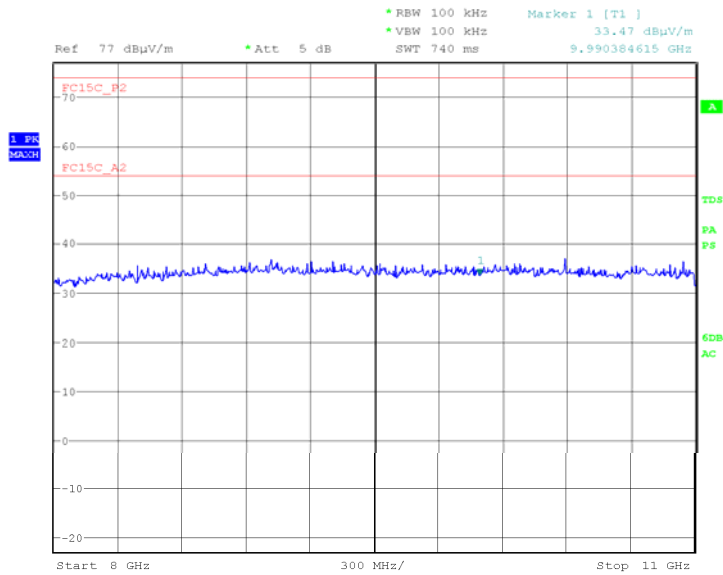
Date: 19.APR.2010 20:12:50

Horizontal

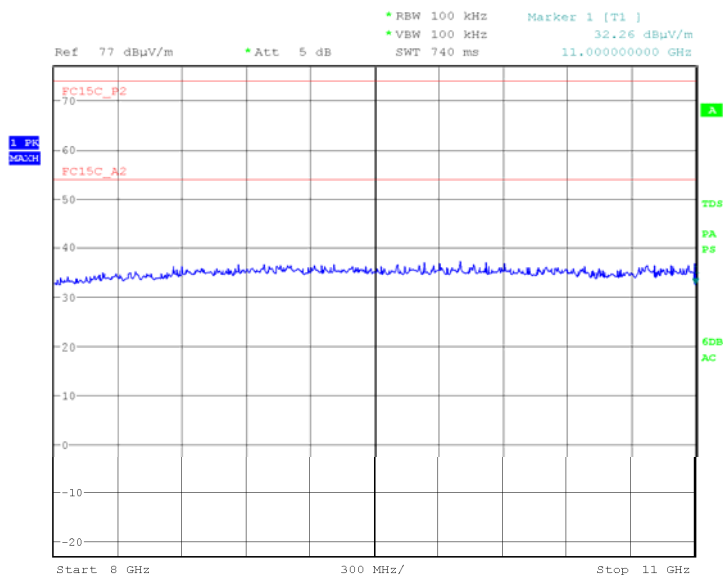
Date: 19.APR.2010 20:23:37



Product Service

8GHz to 11GHzVertical

Date: 19.APR.2010 22:07:52

Horizontal

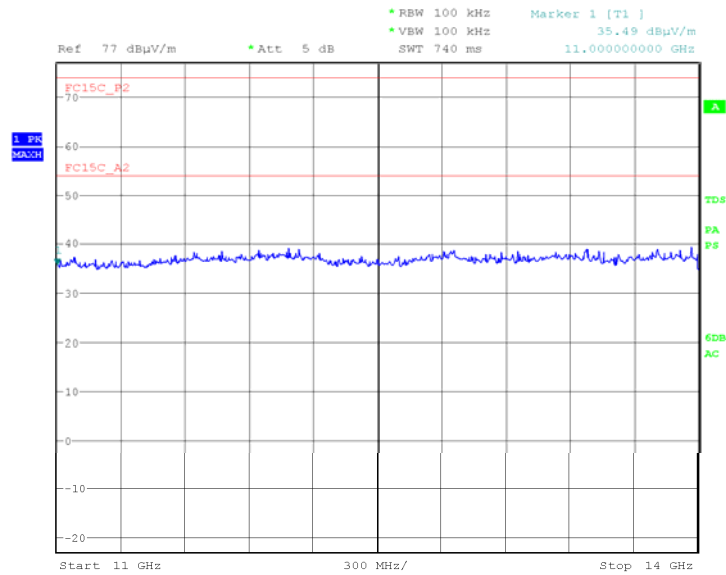
Date: 19.APR.2010 22:29:20



Product Service

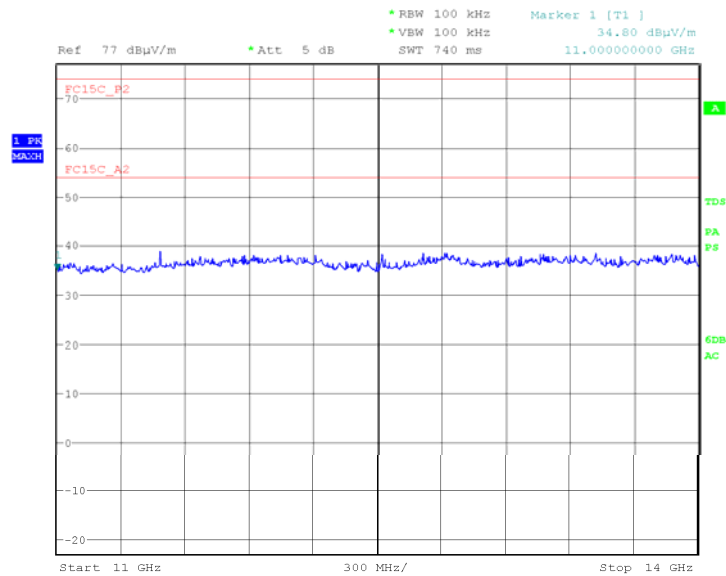
11GHz to 14GHz

Vertical



Date: 19.APR.2010 22:11:14

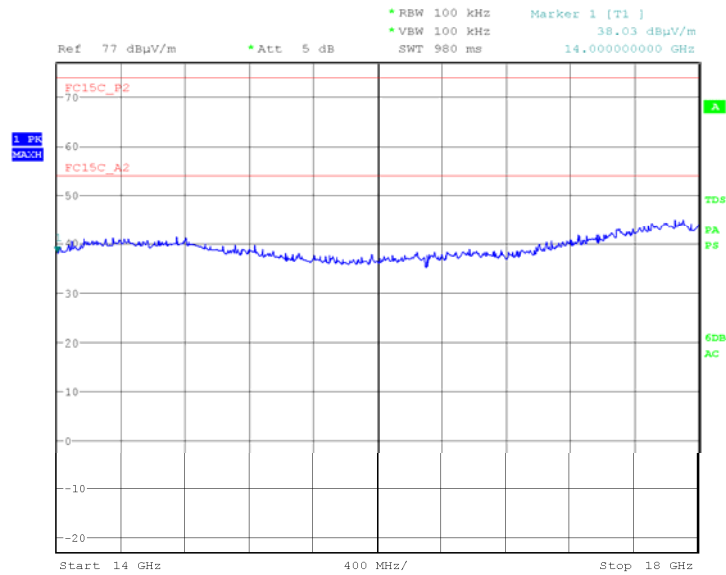
Horizontal



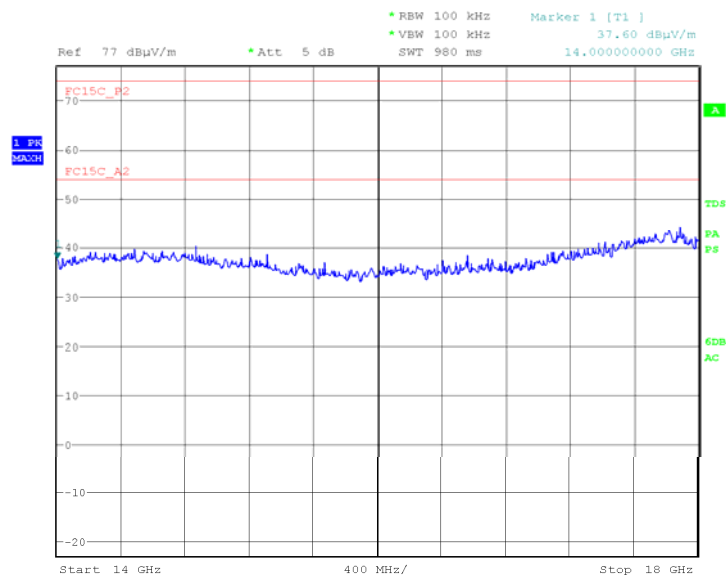
Date: 19.APR.2010 22:30:47



Product Service

14GHz to 18GHzVertical

Date: 19.APR.2010 22:27:18

Horizontal

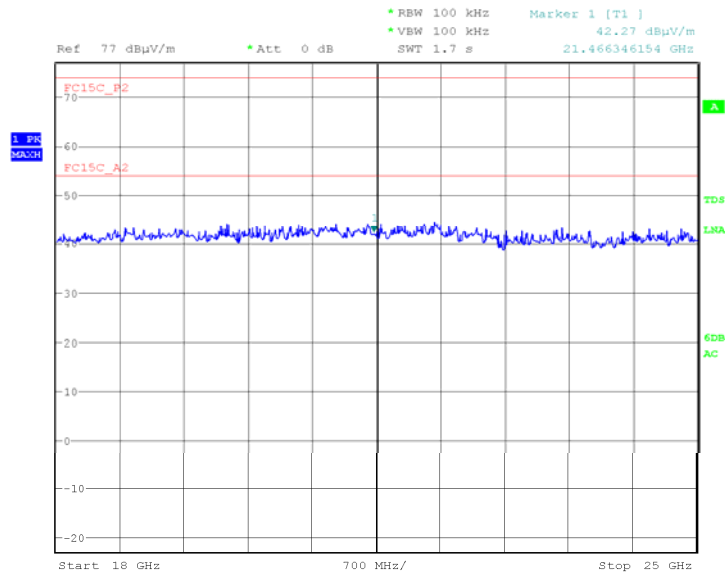
Date: 19.APR.2010 22:31:42



Product Service

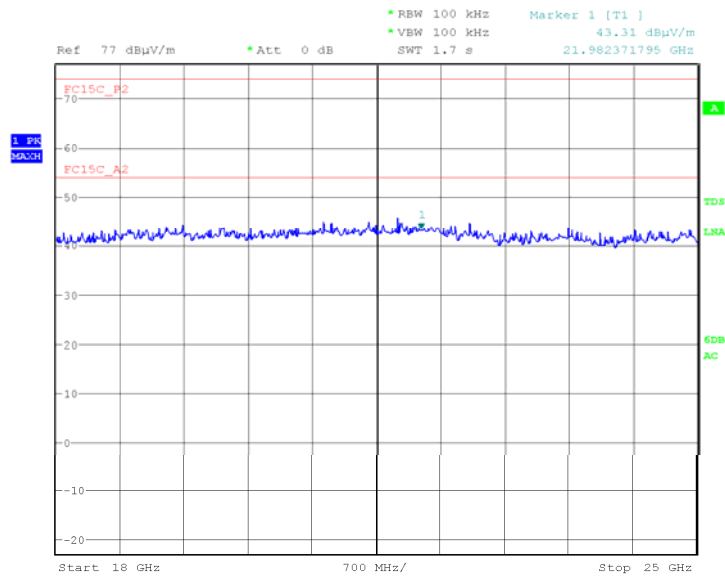
18GHz to 25GHz

Vertical



Date: 19.APR.2010 23:49:07

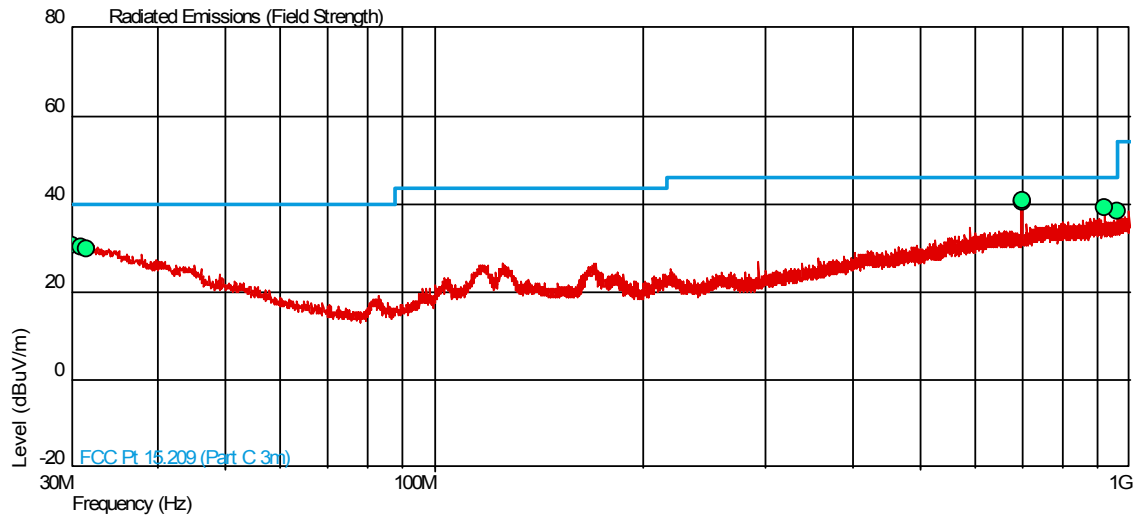
Horizontal



Date: 19.APR.2010 23:47:05



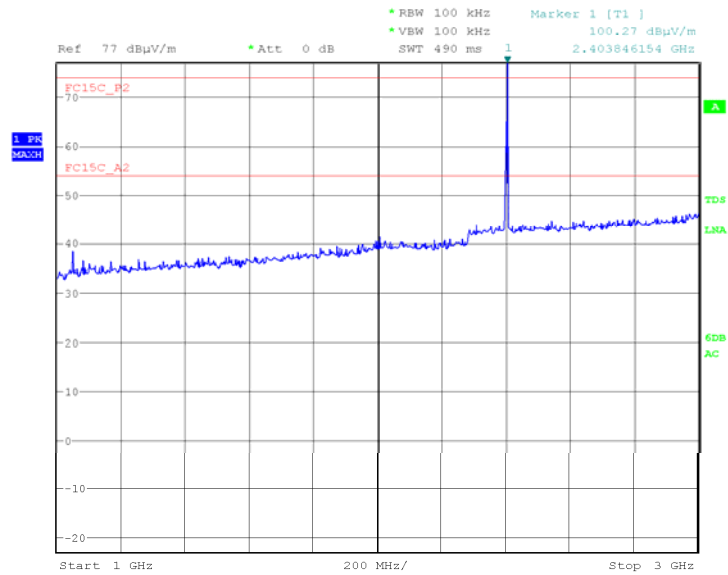
Product Service

Bottom Channel30 MHz to 1 GHz

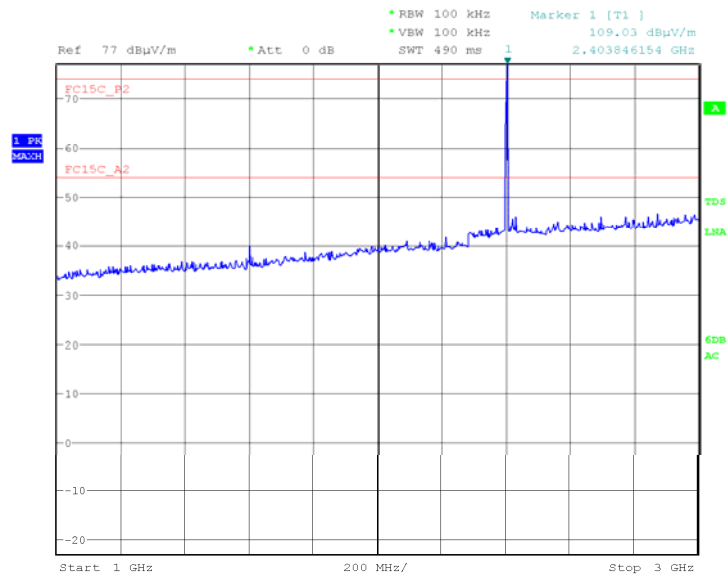
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.037	30.6	33.9	40.0	100	-9.4	-66.1	64	1.02	Vertical
31.074	30.0	31.6	40.0	100	-10.0	-68.4	96	1.15	Vertical
31.535	29.9	31.3	40.0	100	-10.1	-68.7	6	1.00	Vertical
700.000	40.5	105.9	46.0	200	-5.5	-94.1	306	1.44	Horizontal
700.000	40.7	108.4	46.0	200	-5.3	-91.6	174	1.18	Vertical
922.655	39.0	89.1	46.0	200	-7.0	-110.9	19	1.15	Vertical
959.996	38.3	82.2	46.0	200	-7.7	-117.8	277	1.00	Horizontal



Product Service

1GHz to 3GHzVertical

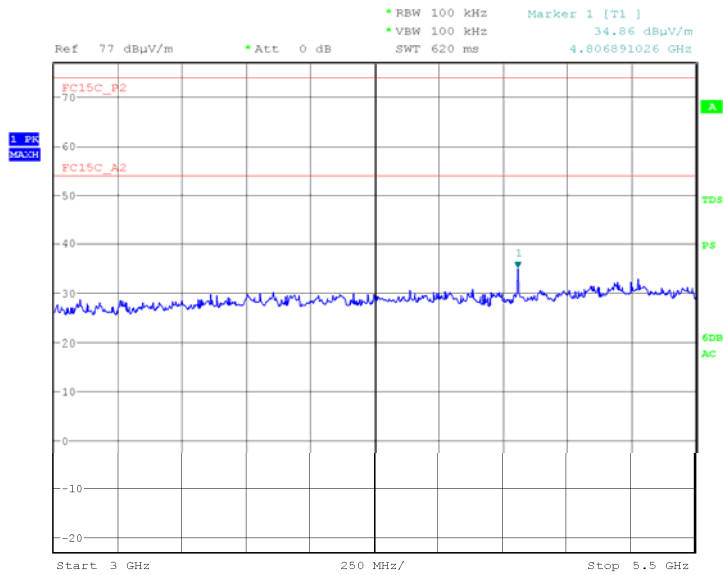
Date: 19.APR.2010 19:23:22

Horizontal

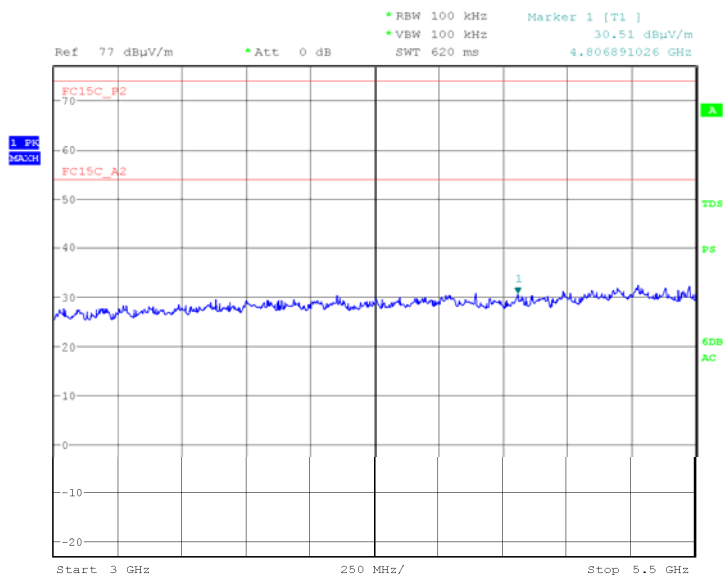
Date: 19.APR.2010 19:24:45



Product Service

3GHz to 5.5GHzVertical

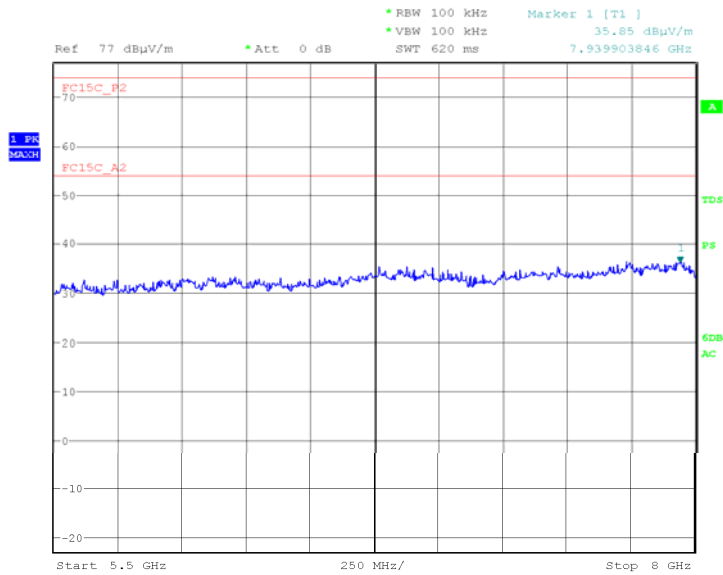
Date: 19.APR.2010 19:54:46

Horizontal

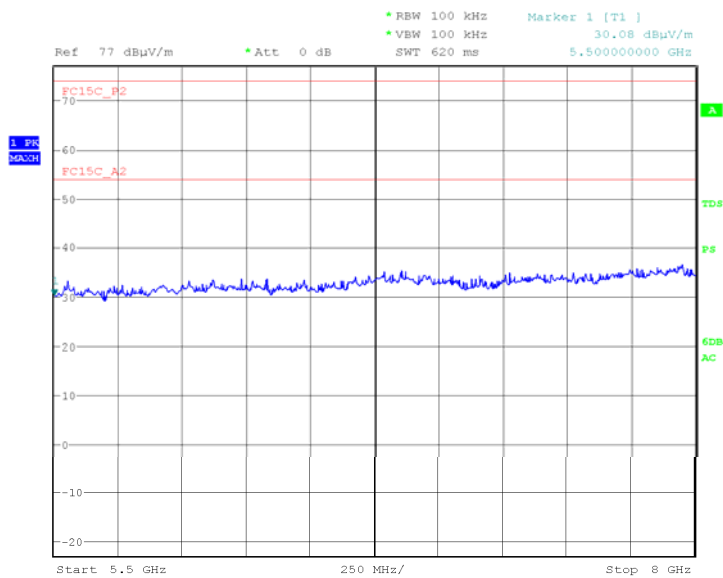
Date: 19.APR.2010 19:56:11



Product Service

5.5GHz to 8GHzVertical

Date: 19.APR.2010 19:58:37

Horizontal

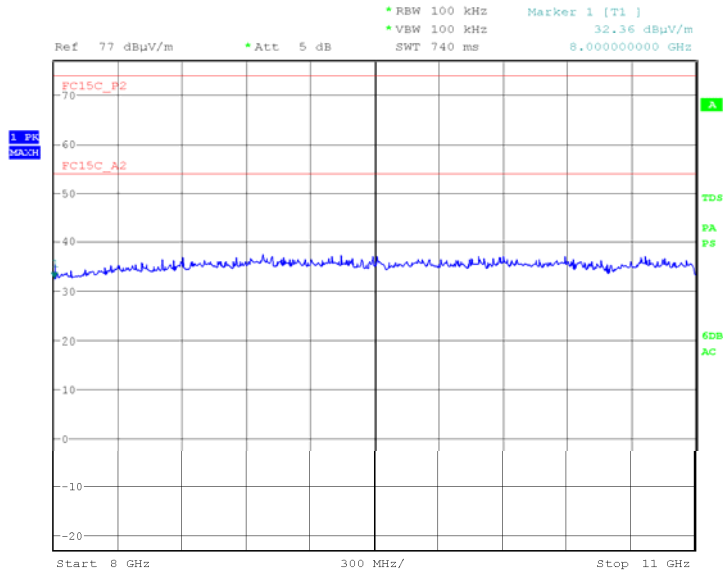
Date: 19.APR.2010 19:57:06



Product Service

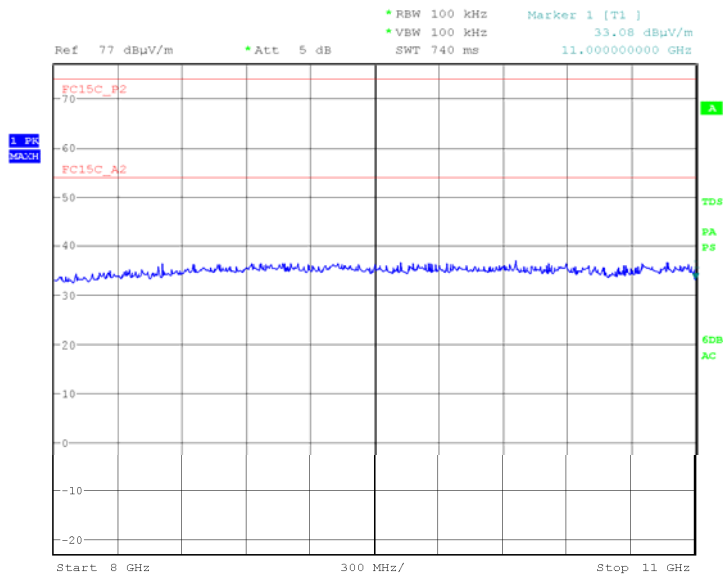
8GHz to 11GHz

Vertical



Date: 19.APR.2010 22:39:39

Horizontal



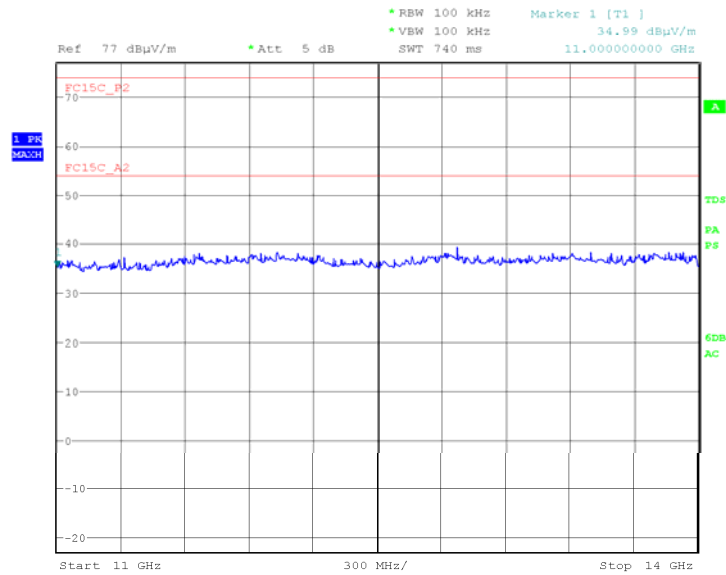
Date: 19.APR.2010 22:44:08



Product Service

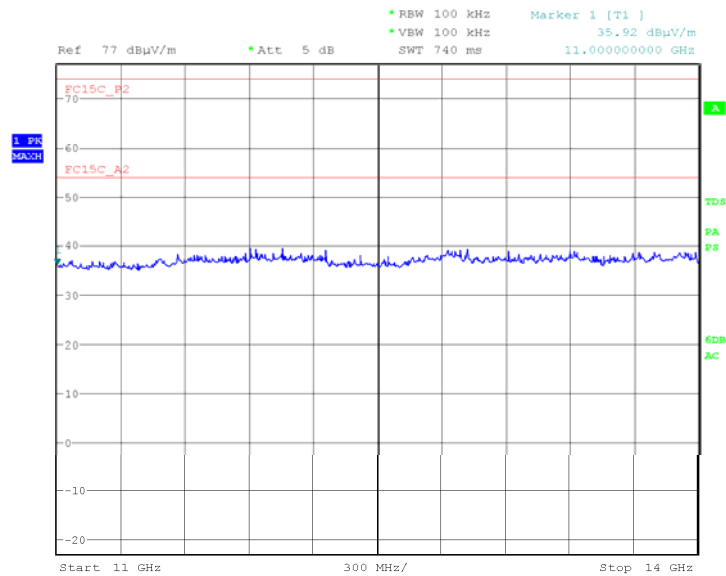
11GHz to 14GHz

Vertical



Date: 19.APR.2010 22:41:02

Horizontal



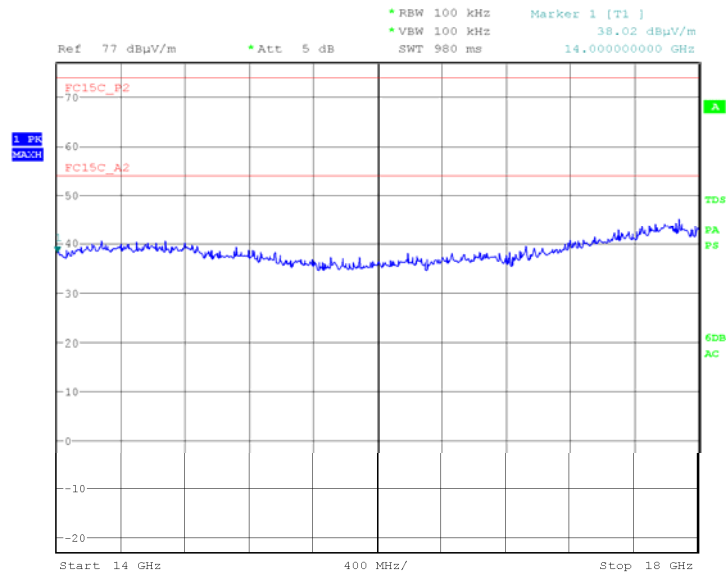
Date: 19.APR.2010 22:48:47



Product Service

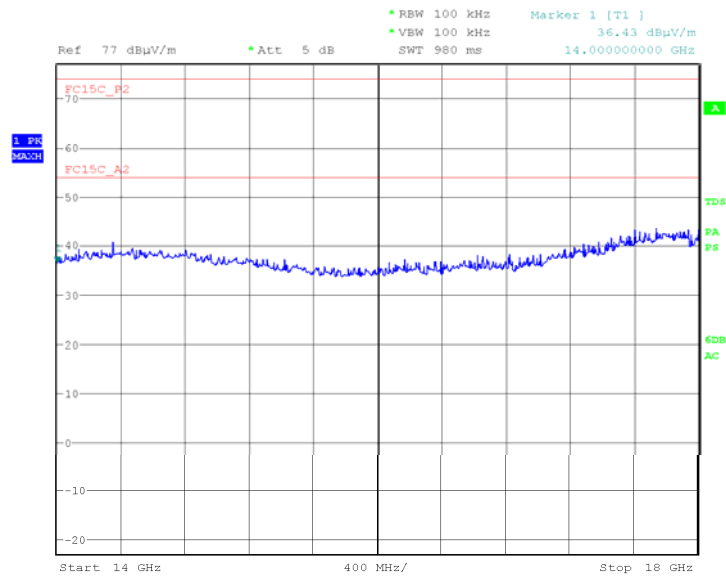
14GHz to 18GHz

Vertical

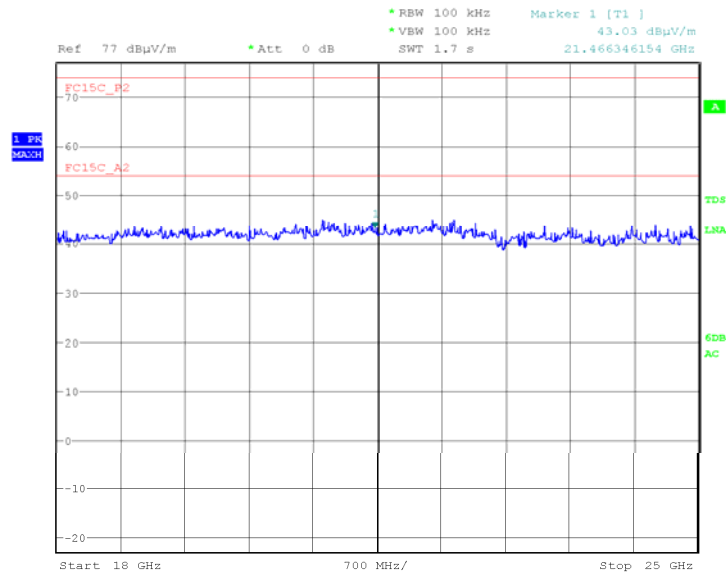


Date: 19.APR.2010 22:42:17

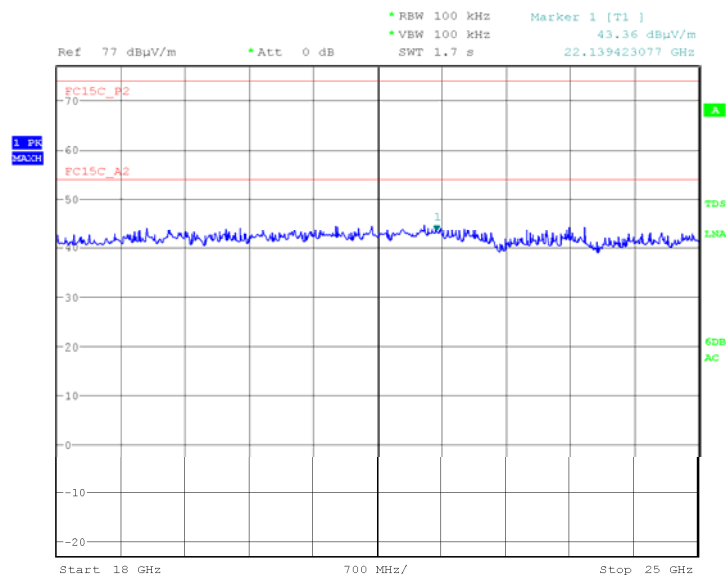
Horizontal



Date: 19.APR.2010 22:50:47

18GHz to 25GHzVertical

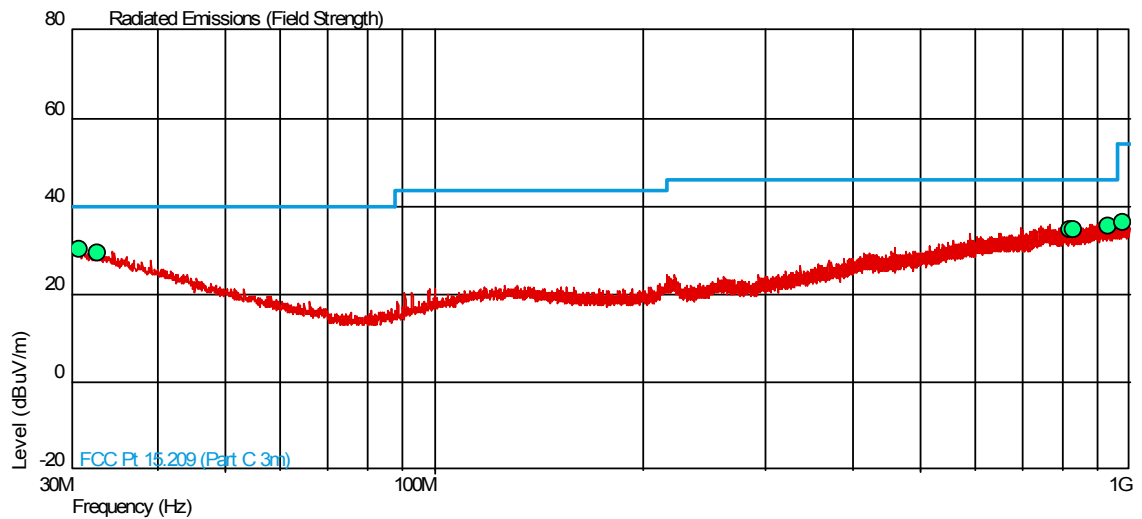
Date: 19.APR.2010 23:56:28

Horizontal

Date: 19.APR.2010 23:58:04



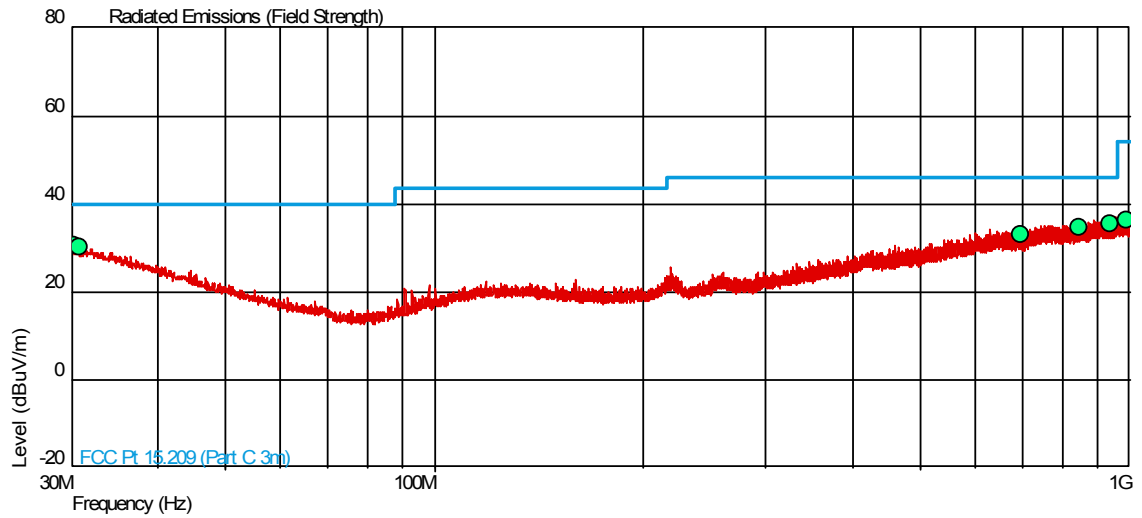
Product Service

Configuration 3 - Mode 1Top Channel30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.873	30.0	31.6	40.0	100	-10.0	-68.4	270	1.00	Vertical
32.716	29.2	28.8	40.0	100	-10.8	-71.2	90	1.00	Vertical
822.733	34.7	54.3	46.0	200	-11.3	-145.7	90	1.00	Horizontal
830.687	34.8	55.0	46.0	200	-11.2	-145.0	90	1.00	Vertical
930.063	35.4	58.9	46.0	200	-10.6	-141.1	90	1.00	Horizontal
981.570	36.2	64.6	54.0	501	-17.8	-436.4	90	1.00	Horizontal



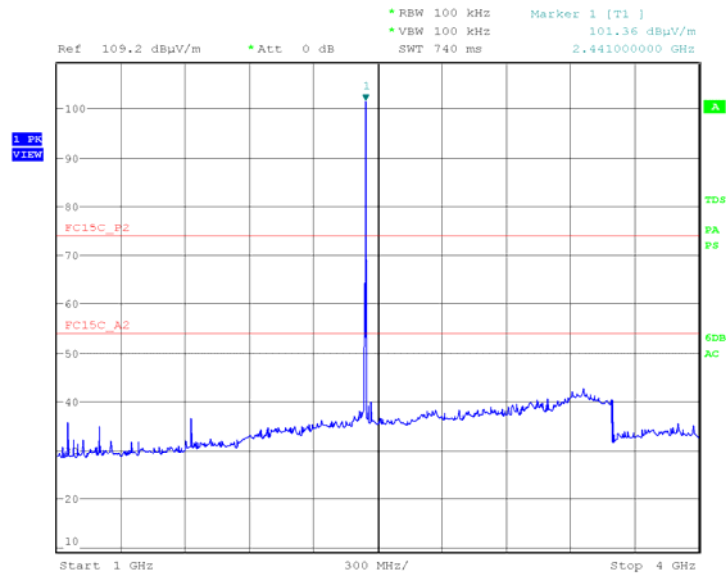
Product Service

Middle Channel30 MHz to 1 GHz

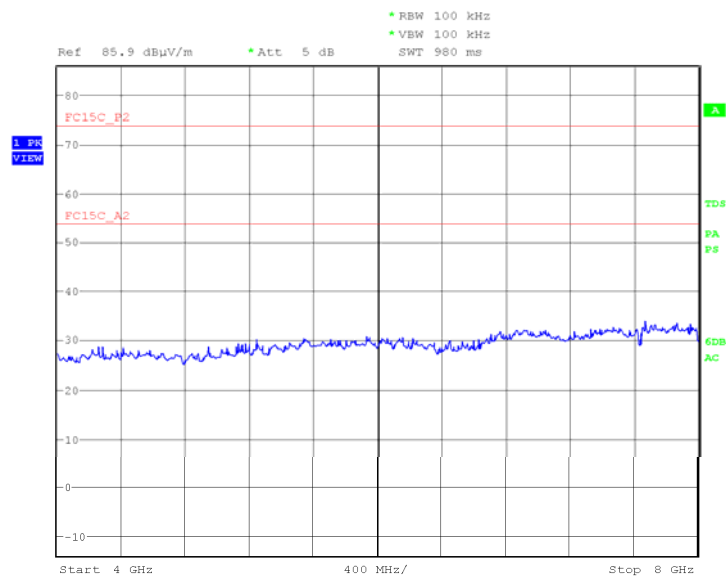
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.291	30.4	33.1	40.0	100	-9.6	-66.9	270	1.00	Vertical
30.873	30.1	32.0	40.0	100	-9.9	-68.0	180	1.00	Horizontal
699.979	33.2	45.7	46.0	200	-12.8	-154.3	270	1.00	Horizontal
845.334	34.8	55.0	46.0	200	-11.2	-145.0	180	1.00	Horizontal
941.121	35.5	59.6	46.0	200	-10.5	-140.4	90	1.00	Vertical
990.931	36.3	65.3	54.0	501	-17.7	-434.7	180	1.00	Vertical



Product Service

1GHz to 4GHzCombined Vertical and Horizontal Plot

Date: 26.MAY.2010 12:27:43

4GHz to 8GHzCombined Vertical and Horizontal Plot

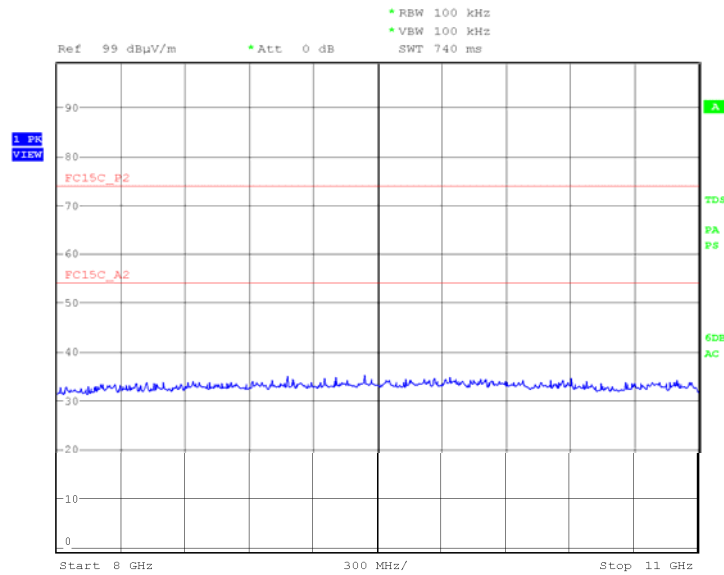
Date: 26.MAY.2010 12:14:53



Product Service

8GHz to 11GHz

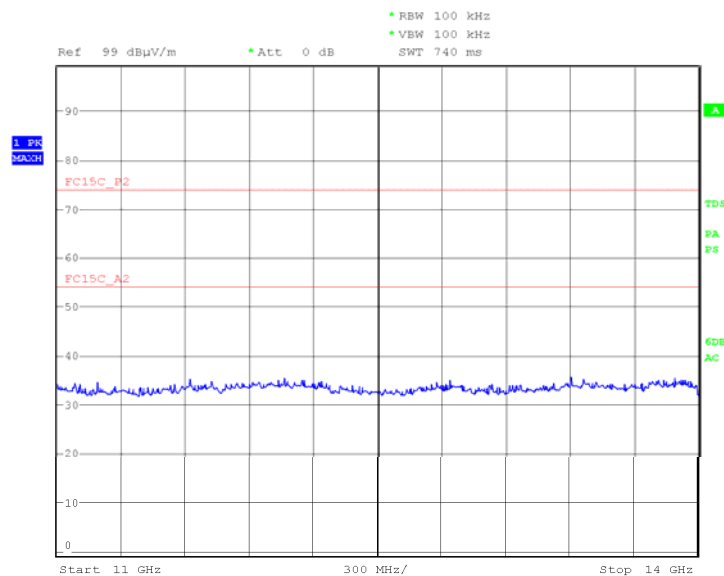
Combined Vertical and Horizontal Plot



Date: 26.MAY.2010 11:56:13

11GHz to 14GHz

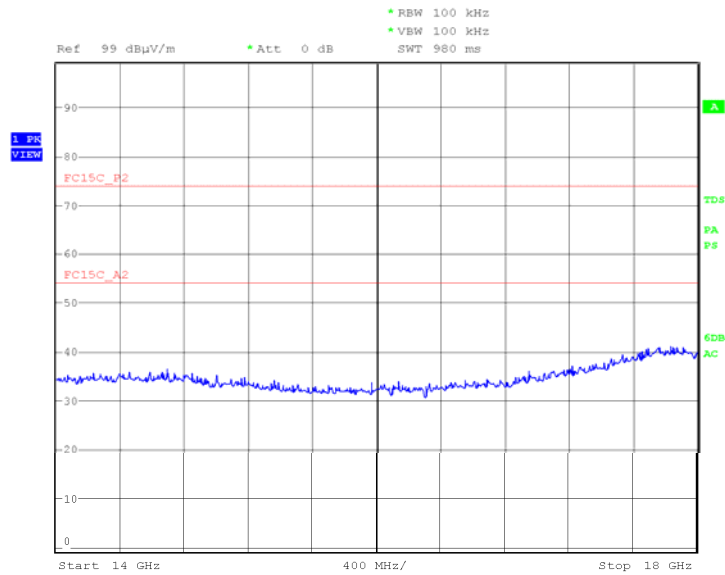
Combined Vertical and Horizontal Plot



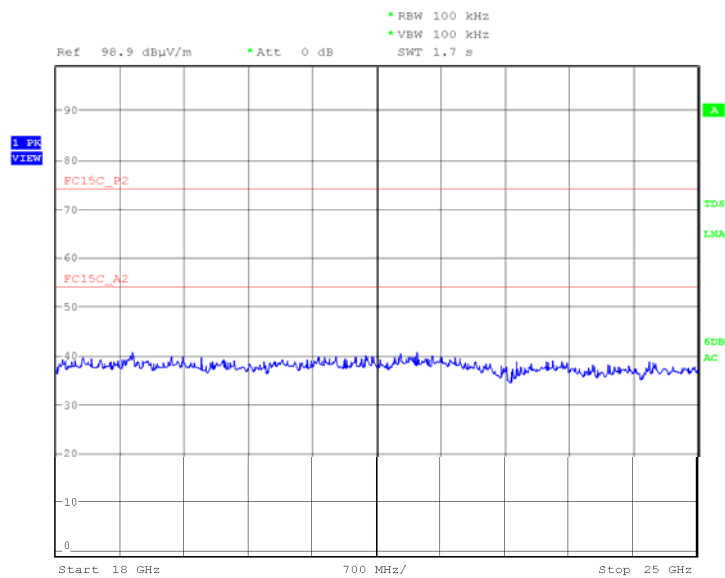
Date: 26.MAY.2010 11:38:55



Product Service

14GHz to 18GHzCombined Vertical and Horizontal Plot

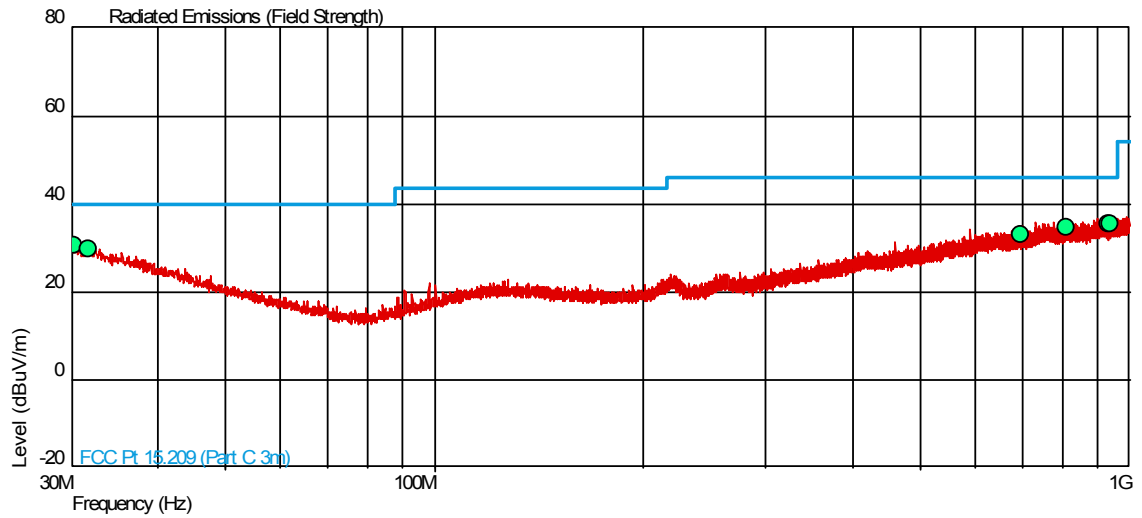
Date: 26.MAY.2010 11:32:09

18GHz to 25GHzCombined Vertical and Horizontal Plot

Date: 26.MAY.2010 11:00:12



Product Service

Bottom Channel30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.327	30.4	33.1	40.0	100	-9.6	-66.9	17	2.60	Horizontal
31.862	29.6	30.2	40.0	100	-10.4	-69.8	8	1.00	Horizontal
697.761	33.1	45.2	46.0	200	-12.9	-154.8	48	1.00	Horizontal
811.007	34.7	54.3	46.0	200	-11.3	-145.7	299	1.00	Horizontal
933.942	35.4	58.9	46.0	200	-10.6	-141.1	237	1.00	Horizontal
937.182	35.4	58.9	46.0	200	-10.6	-141.1	250	1.00	Horizontal



Product Service

2.3 20dB BANDWIDTH**2.3.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)
RSS-210, Clause A8.2 (1)

2.3.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510021666

2.3.3 Date of Test and Modification State

07 May 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and RSS-210.

The EUT was transmitted at maximum power at all data rates 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 -20dBc points of the displayed spectrum.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.3.6 Environmental Conditions

07 May 2010

Ambient Temperature 24°C

Relative Humidity 27%



2.3.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for 20dB Bandwidth.

The test results are shown below.

Configuration 1 - Mode 1

3.7 V DC Supply

Frequency (MHz)	Data Rate (Mbps)	20dB Bandwidth (kHz)
2402	DH1	1052.307
	DH3	1055.769
	DH5	1052.307
2441	DH1	1053.692
	DH3	1052.307
	DH5	1052.307
2480	DH1	1055.769
	DH3	1055.769
	DH5	1055.769

Limit Clause

15.247 (a)(1) for FCC and A8.1 (b) for RSS-210

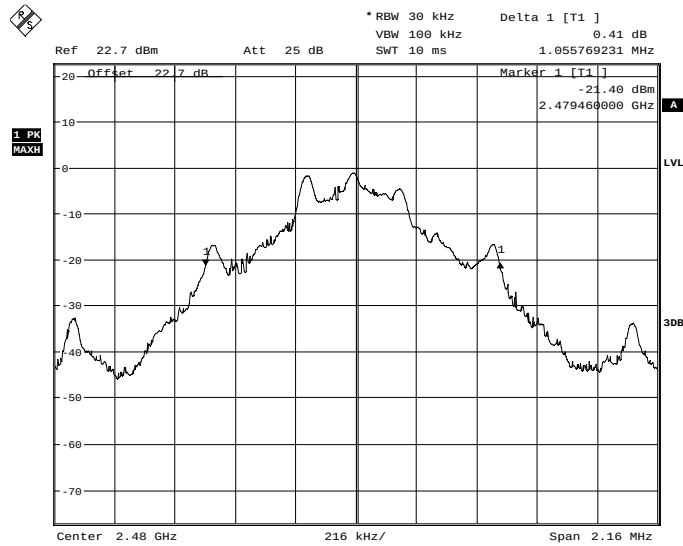
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The channel separation is 1 MHz, therefore the 20 dB bandwidth is greater than 1 MHz.



Product Service

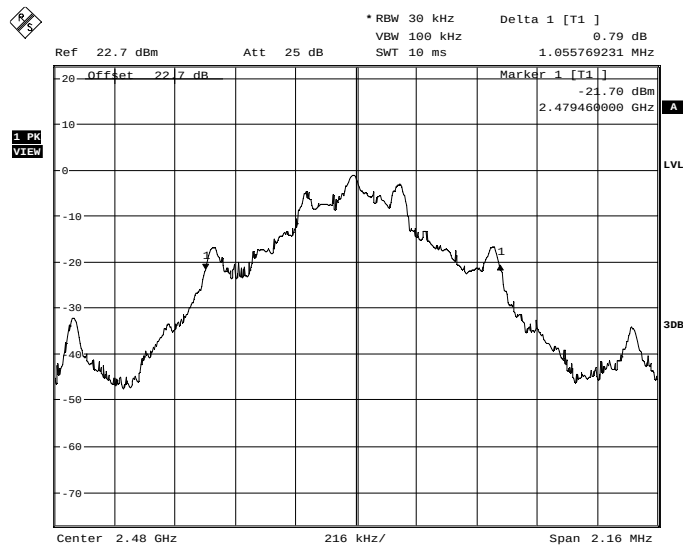
Top Channel

DH1



OBW1
Date: 7.MAY.2010 10:15:00

DH3

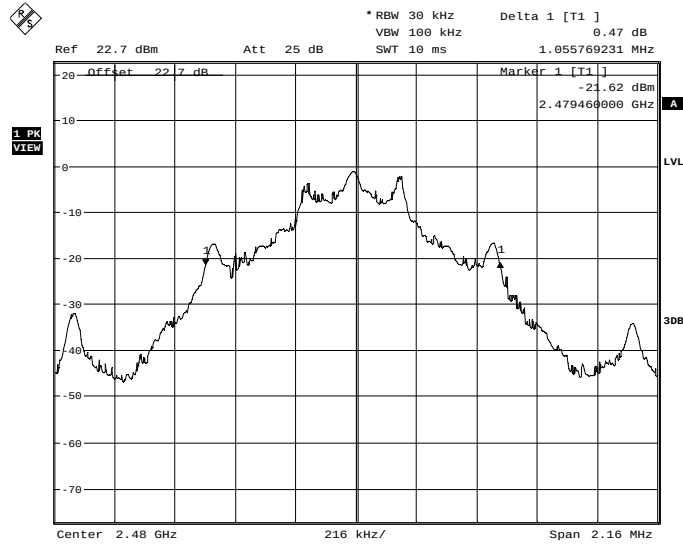


OBW1
Date: 7.MAY.2010 10:09:33



Product Service

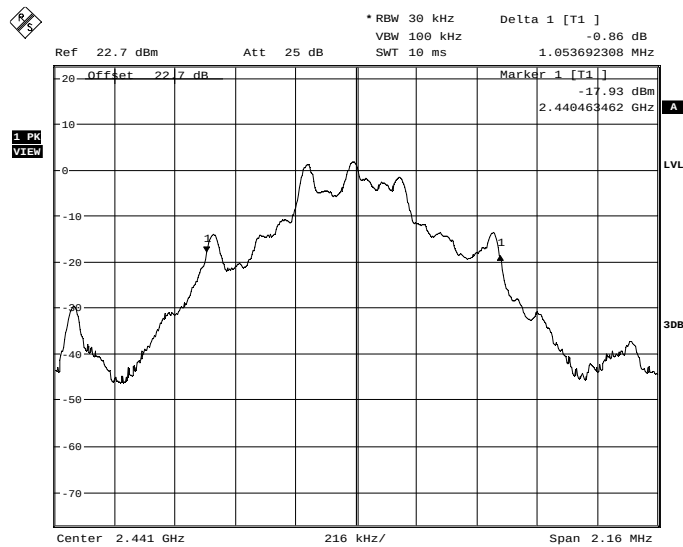
DH5



OBW1
Date: 7.MAY.2010 10:05:50

Middle Channel

DH1

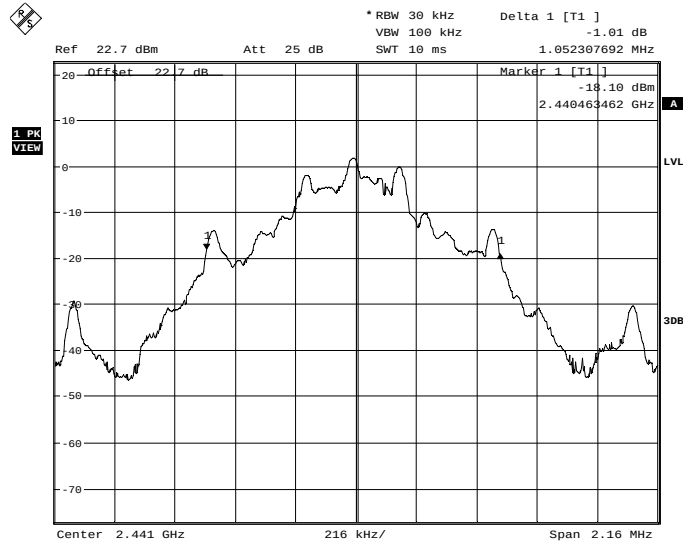


OBW1
Date: 7.MAY.2010 09:52:20



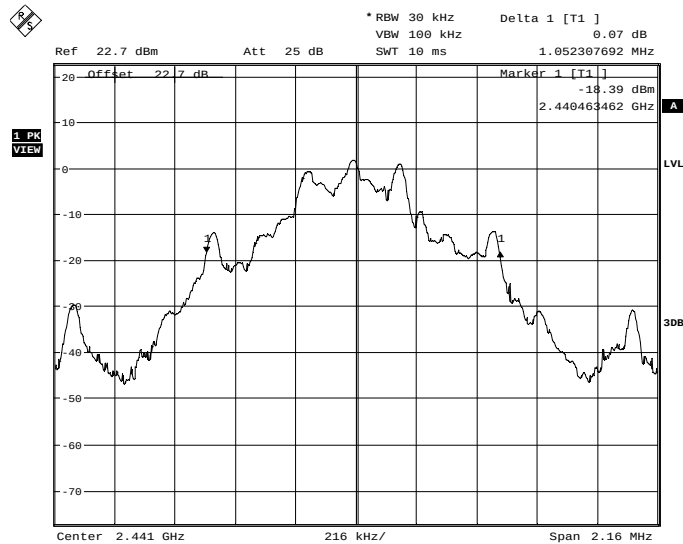
Product Service

DH3



OBW1
Date: 7.MAY.2010 09:56:29

DH5



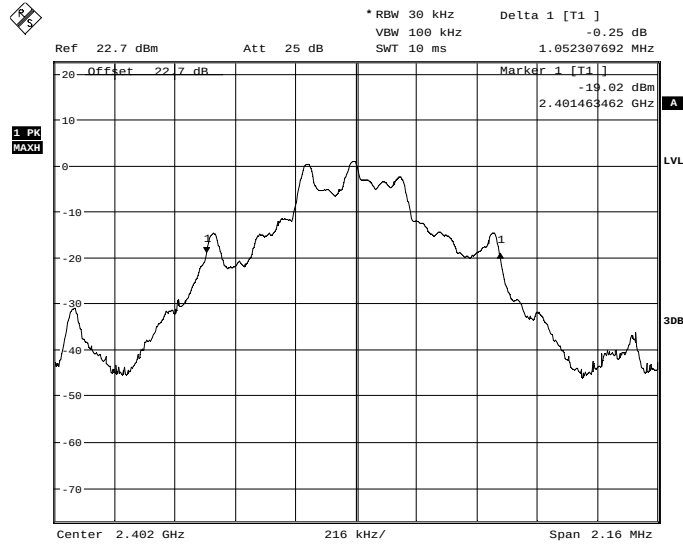
OBW1
Date: 7.MAY.2010 10:00:12



Product Service

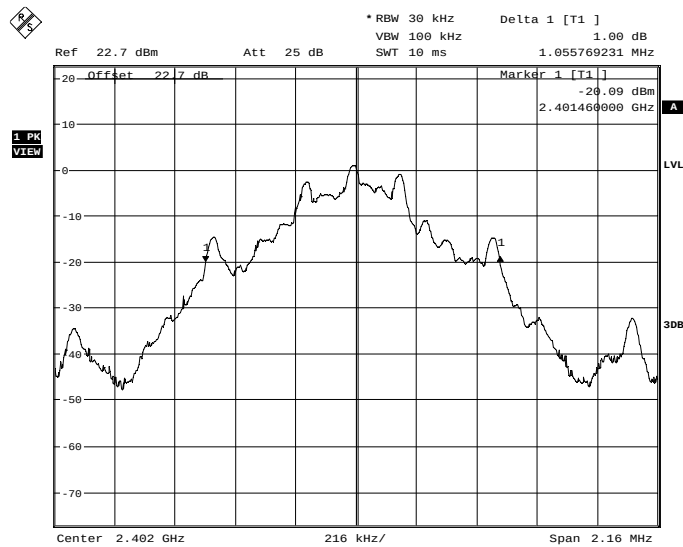
Bottom Channel

DH1



OBW1
Date: 7.MAY.2010 09:47:57

DH3

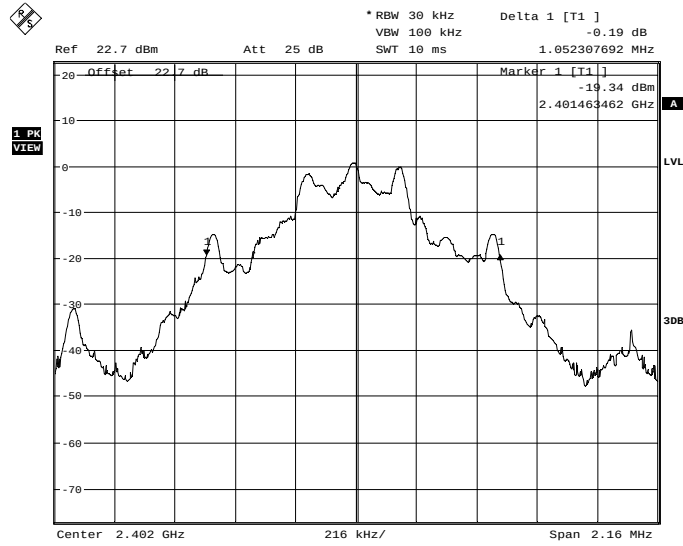


OBW1
Date: 7.MAY.2010 09:44:45



Product Service

DH5



OBW1
 Date: 7.MAY.2010 09:41:02



Product Service

2.4 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.4.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(3)
RSS-210, Clause A8.4 (4)

2.4.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510021666

2.4.3 Date of Test and Modification State

12 May 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and RSS-210.

The EUT was transmitted at maximum power at all data rates via a cable to the Peak Power Analyser. The auto scale function was used to display the resultant trace on the screen. The path loss was entered as a reference level offset and the peak measurement was recorded.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.4.6 Environmental Conditions

12 May 2010

Ambient Temperature 22°C

Relative Humidity 25%



2.4.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Maximum Peak Conducted Output Power.

The test results are shown below.

Configuration 1 - Mode 1

3.7 V DC Supply

Frequency (MHz)	Maximum Peak Conducted Output Power					
	dBm			mW		
	DH1	DH3	DH5	DH1	DH3	DH5
2402	1.85	1.82	1.77	1.53	1.52	1.50
2441	2.55	2.65	2.55	1.80	1.84	1.80
2480	-0.60	-0.76	-0.58	0.87	0.84	0.87

Limit Clause

15.247 (b)(1) for FCC

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 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

A8.4 (2) for RSS-210

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W. Except as provided in Section A8.4(5), the e.i.r.p shall not exceed 4W



Product Service

2.5 EIRP PEAK POWER**2.5.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.247 (b)(3)
RSS-210, Clause A8.4(4)

2.5.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone: IMEI 004401510018183

2.5.3 Date of Test and Modification State

20 April 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

Measurements of the fundamental from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The fundamental frequency was maximised by adjusting the antenna height, antenna polarisation and turntable azimuth. A peak detector was used with the trace set to max hold. The maximum result was recorded.

The EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss.

The measurements were performed at a 3m distance unless otherwise stated.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 2 - Mode 1

2.5.6 Environmental Conditions

20 April 2010

Ambient Temperature 21°C

Relative Humidity 32%



2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for EIRP Peak Power.

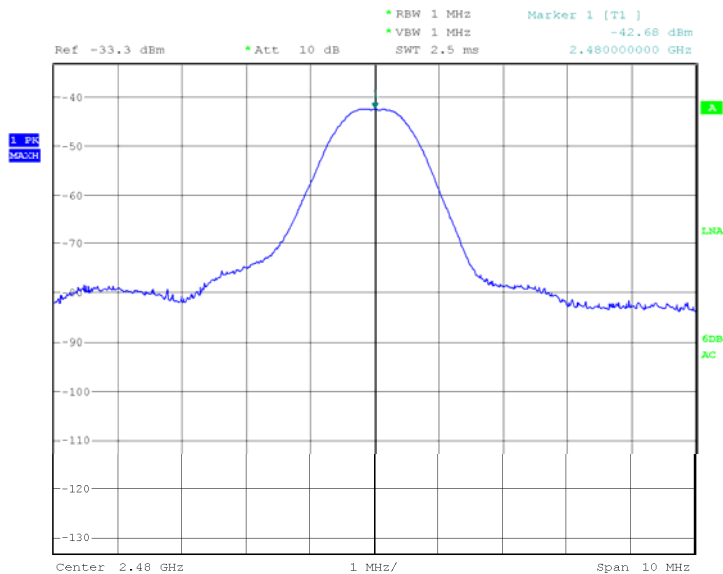
The test results are shown below.

Configuration 2 - Mode 1

Frequency (MHz)	Maximum Peak EIRP	
	DH5	
	dBm	mW
2480 (Top Channel)	8.4	6.91
2441 (Middle Channel)	9.1	8.12
2402 (Bottom Channel)	9.3	8.51

Top Channel

Vertical

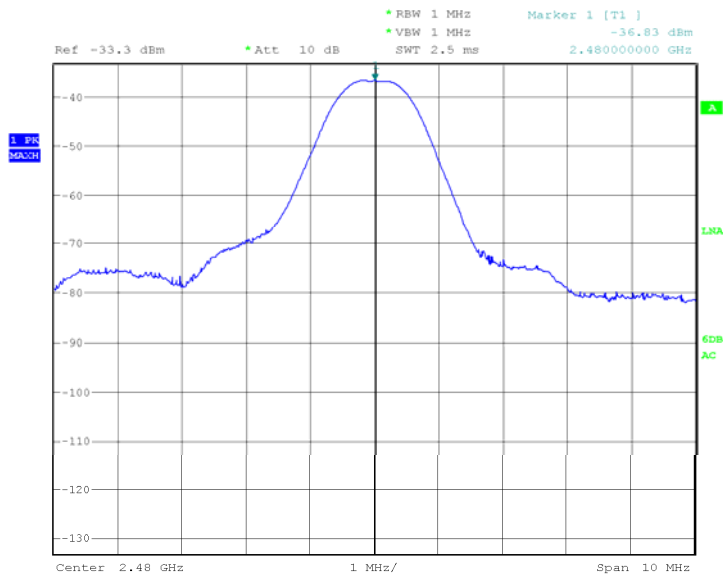


Date: 20.APR.2010 11:27:42



Product Service

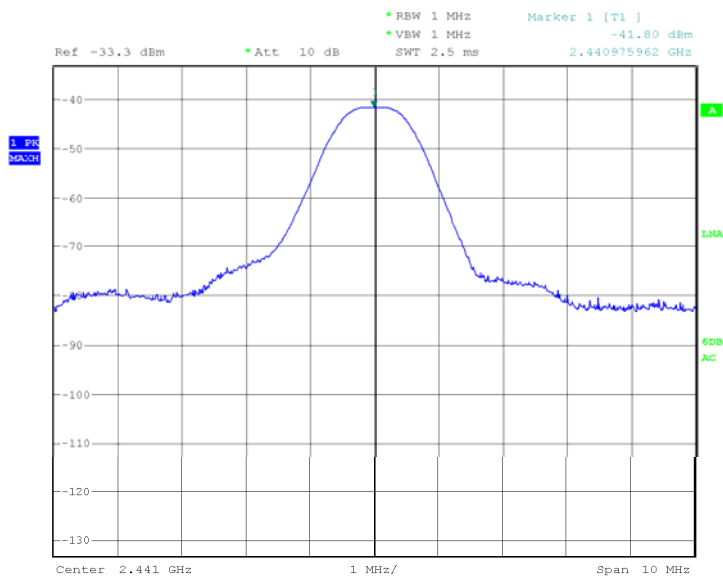
Horizontal



Date: 20.APR.2010 11:23:07

Middle Channel

Vertical

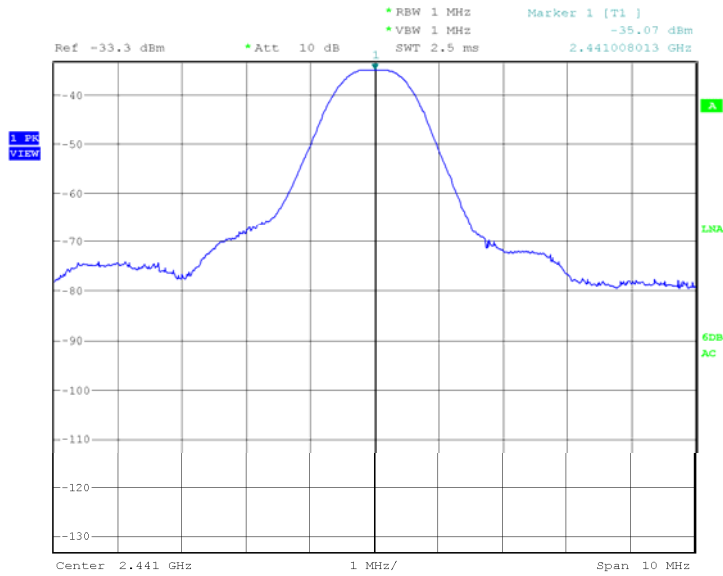


Date: 20.APR.2010 12:09:32



Product Service

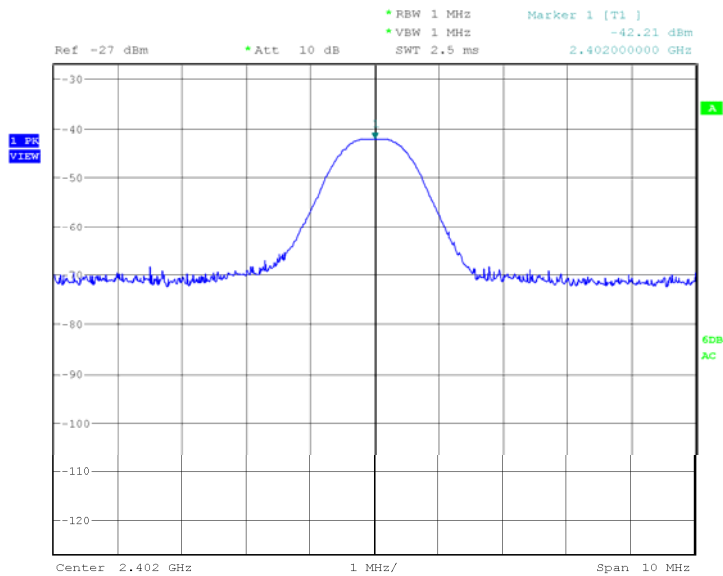
Horizontal



Date: 20.APR.2010 12:15:31

Bottom Channel

Vertical

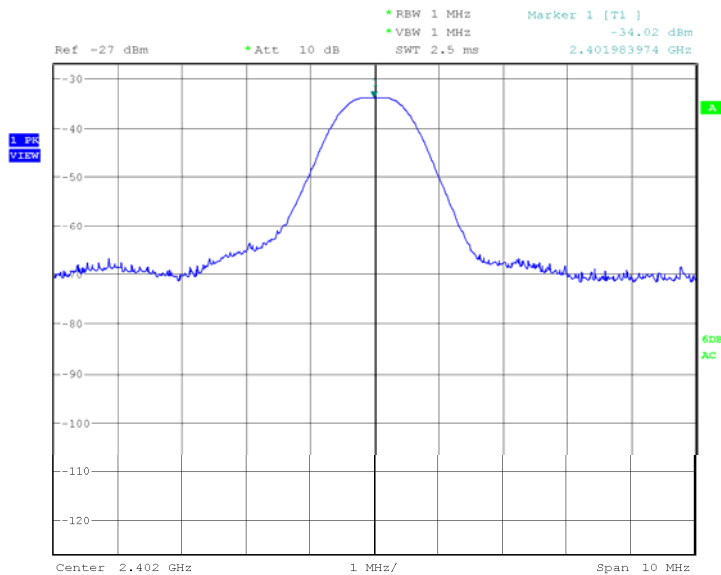


Date: 20.APR.2010 10:16:11



Product Service

Horizontal



Date: 20.APR.2010 10:25:59

Limit Clause

Clause 15.247 (b)(3) for FCC Part 15C

The EIRP peak power 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 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

A8.4(4) for RSS-210

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W. Except as provided in Section A8.4(5), the e.i.r.p shall not exceed 4W



Product Service

2.6 SPURIOUS EMISSIONS

2.6.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (d)
RSS-210, Clause A8.5

2.6.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510021666

2.6.3 Date of Test and Modification State

07 May 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

In accordance with Part 15.247(c), the Spurious Conducted Emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 9 kHz to 25 GHz. The EUT was set to transmit on full power and frequency hopping on all channels. The resolution and video bandwidths were set to 100 kHz and 300 kHz respectively, in accordance with Part 15.247. The spectrum analyser detector was set to Max Hold.

With the EUT transmitting at maximum power, the Spectrum Analyser was set to Max Hold and the fundamental peak measured in a RBW and VBW of 100 kHz. This level was used to determine the limit line as displayed on the plots of -20dBc.

The maximum path loss across each measurement band was used as the reference level offset to ensure worst case results.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.6.6 Environmental Conditions

07 May 2010

Ambient Temperature 25°C

Relative Humidity 23%



Product Service

2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Spurious Emissions.

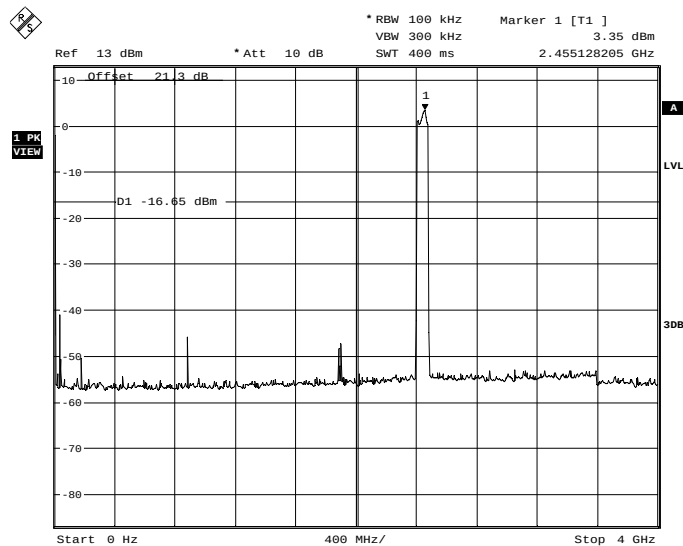
The test results are shown below.

Configuration 1 - Mode 1

3.7 V DC Supply

DH1

9kHz to 4GHz

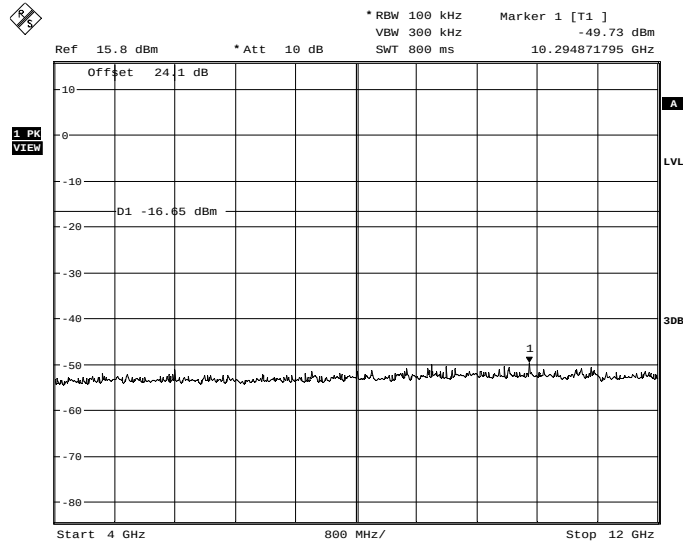


OBW1
Date: 7.MAY.2010 13:58:13



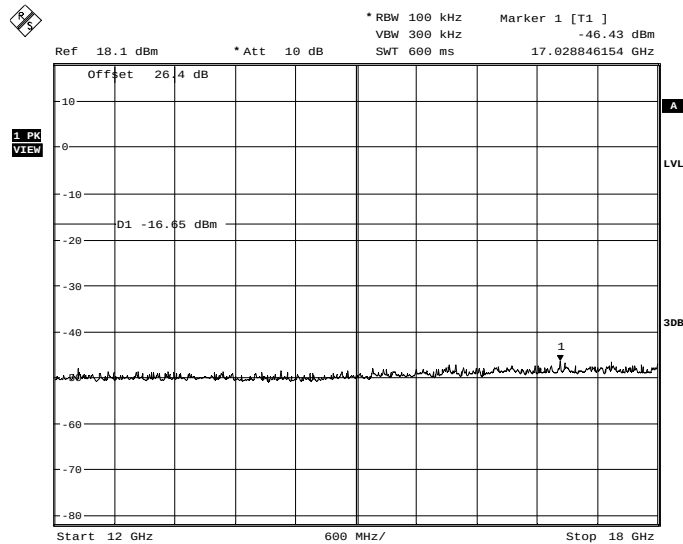
Product Service

4GHz to 12GHz



OBW1
Date: 7.MAY.2010 14:17:21

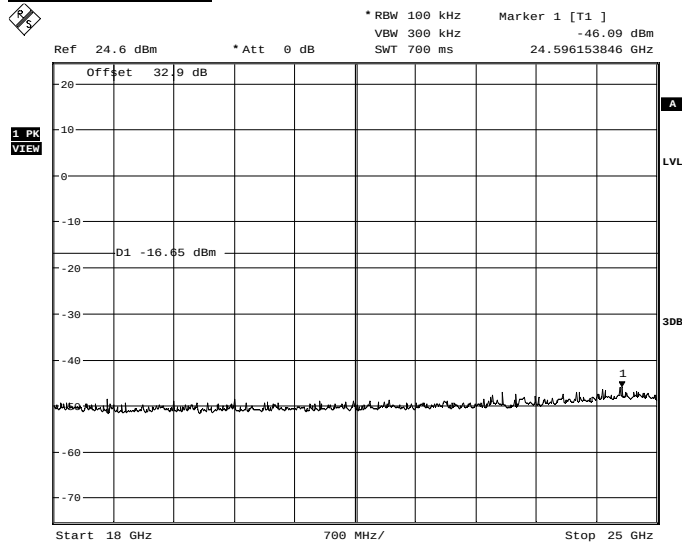
12GHz to 18GHz



OBW1
Date: 7.MAY.2010 14:28:17

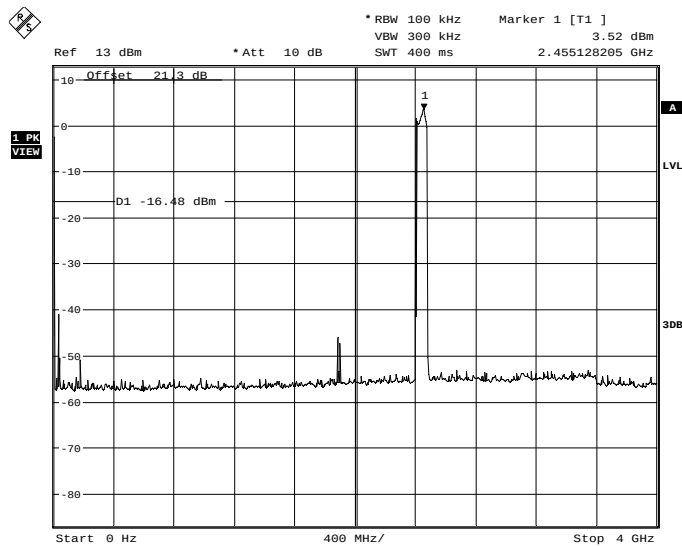


Product Service

18GHz to 25GHz

OBW1

Date: 7.MAY.2010 14:45:44

DH39kHz to 4GHz

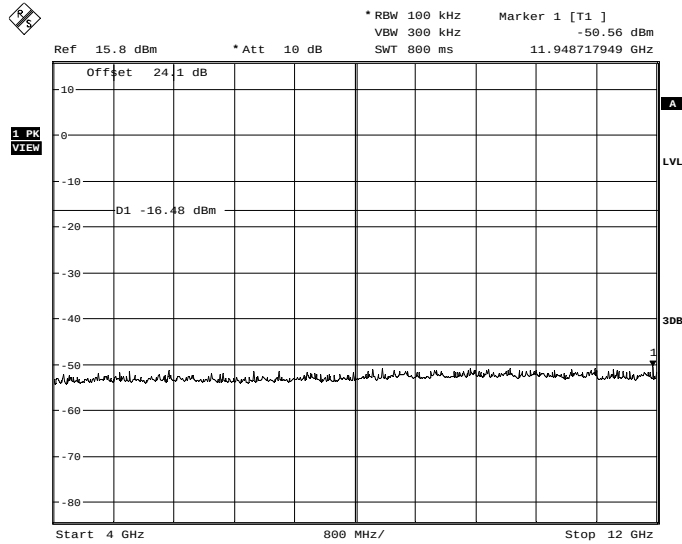
OBW1

Date: 7.MAY.2010 14:02:42



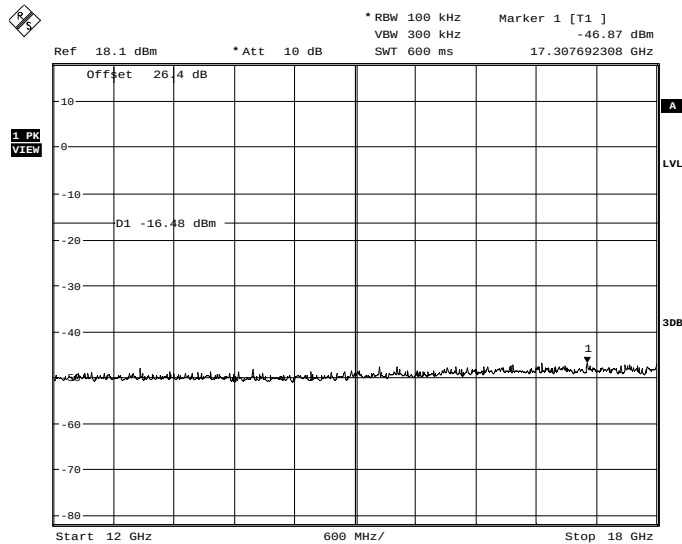
Product Service

4GHz to 12GHz



OBW1
Date: 7.MAY.2010 14:19:59

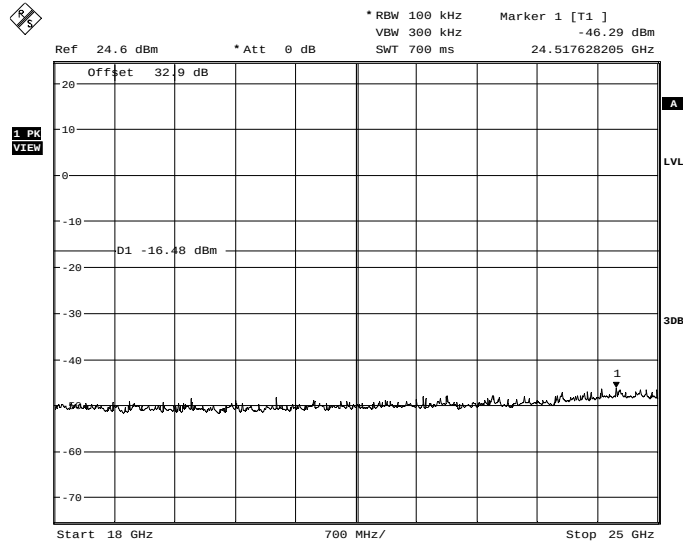
12GHz to 18GHz



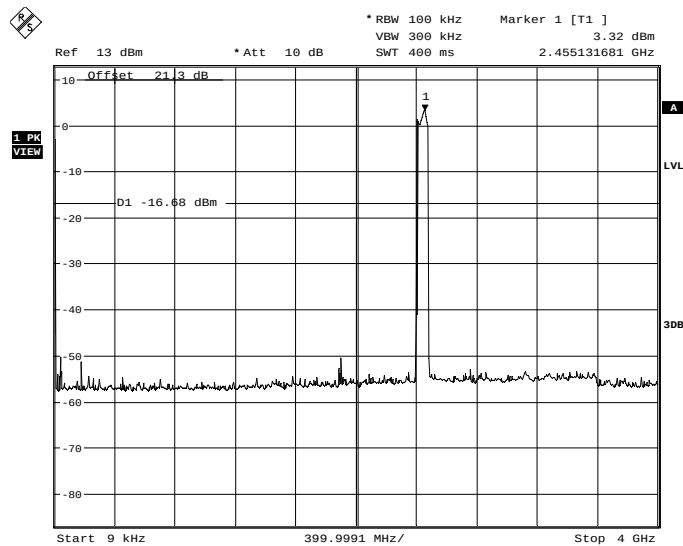
OBW1
Date: 7.MAY.2010 14:32:26



Product Service

18GHz to 25GHz

OBW1
Date: 7.MAY.2010 14:49:47

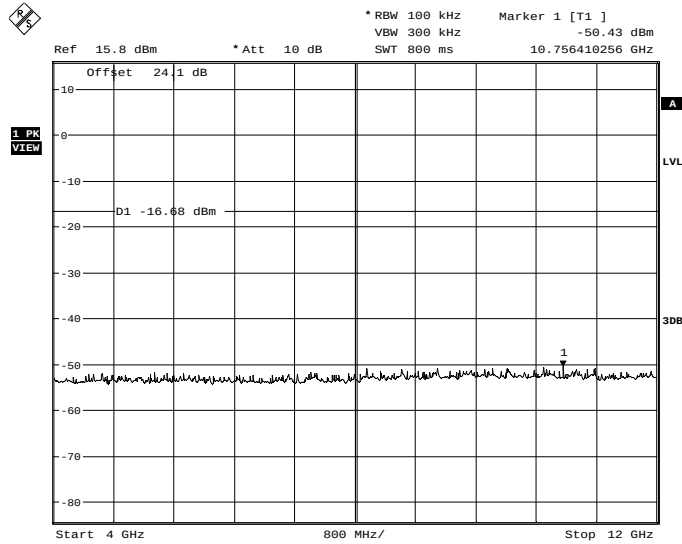
DH59kHz to 4GHz

OBW1
Date: 7.MAY.2010 14:08:54



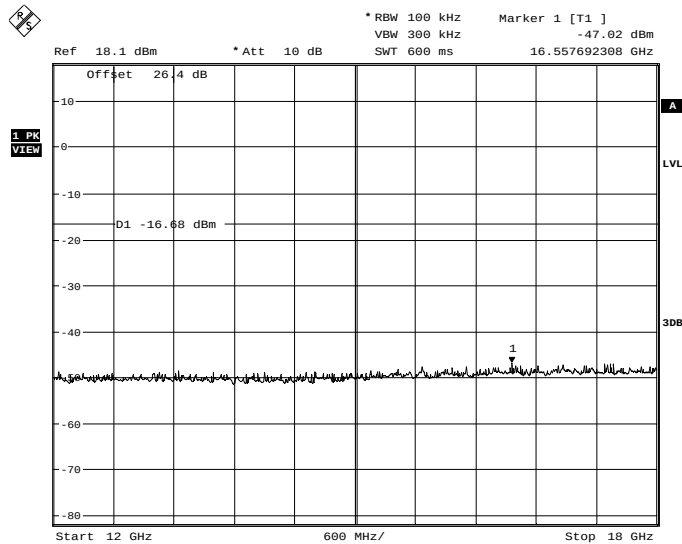
Product Service

4GHz to 12GHz



OBW1
Date: 7.MAY.2010 14:22:45

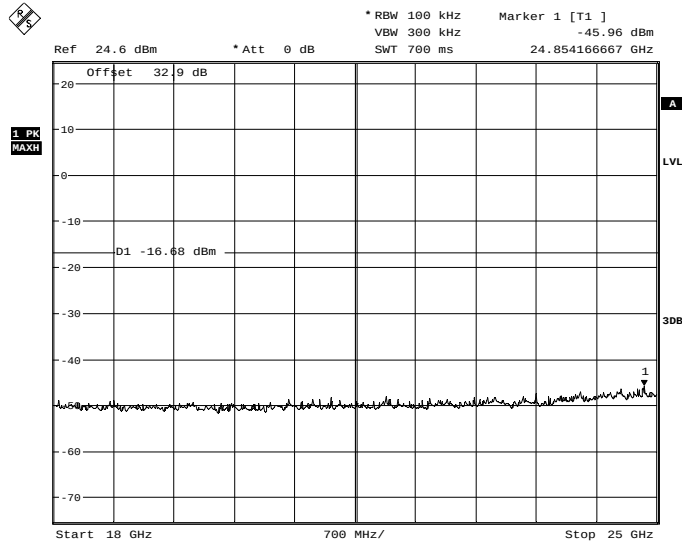
12GHz to 18GHz



OBW1
Date: 7.MAY.2010 14:35:08



Product Service

18GHz to 25GHz

OBW1
Date: 7.MAY.2010 14:53:47

Limit Clause

15.247 (d) for FCC and A8.5 for RSS-210

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

2.7 BAND EDGE MEASUREMENT**2.7.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.247 (d)
RSS-210, Clause A8.5

2.7.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone: IMEI 004401510018183

2.7.3 Date of Test and Modification State

20 April 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

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

The measurements were performed at a 3m distance unless otherwise stated.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 2 - Mode 1

2.7.6 Environmental Conditions

	20 April 2010
Ambient Temperature	21°C
Relative Humidity	32%

2.7.7 Test Results

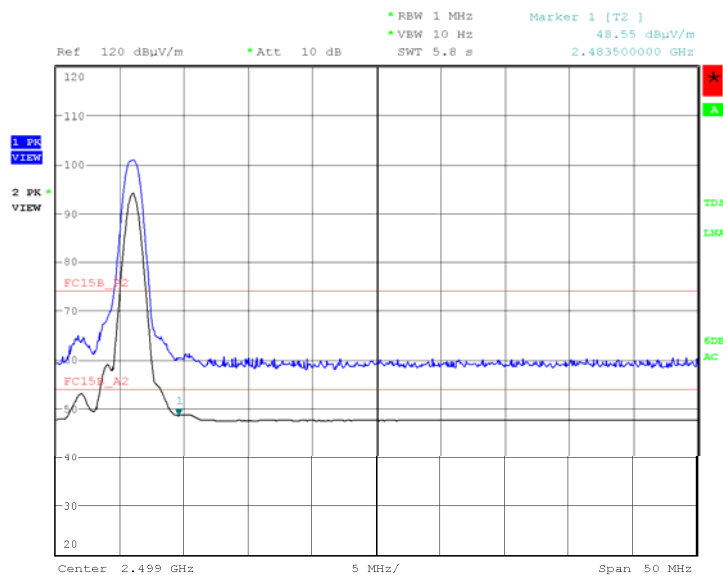
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Band Edge Measurement.

The test results are shown below.

Configuration 2 - Mode 1

Frequency (MHz)	Polarisation	Height (cm)	Azimuth (degree)	Field Strength			
				Average		Peak	
				dBµV/m	µV/m	dBµV/m	µV/m
2480.0 (Top Channel)	Vertical	100	215	48.6	269.2	60.4	1047.1
	Horizontal	100	330	50.6	338.8	62.2	1288.2
2390.0 (Bottom Channel)	Vertical	100	0	47.0	223.8	58.3	822.2
	Horizontal	100	331	47.3	231.7	58.0	794.3

Top Channel

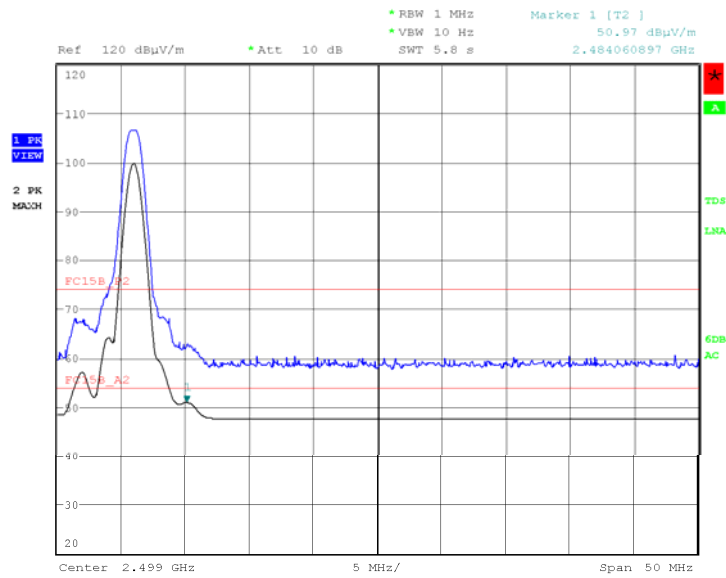
Vertical

Date: 20.APR.2010 11:36:17



Product Service

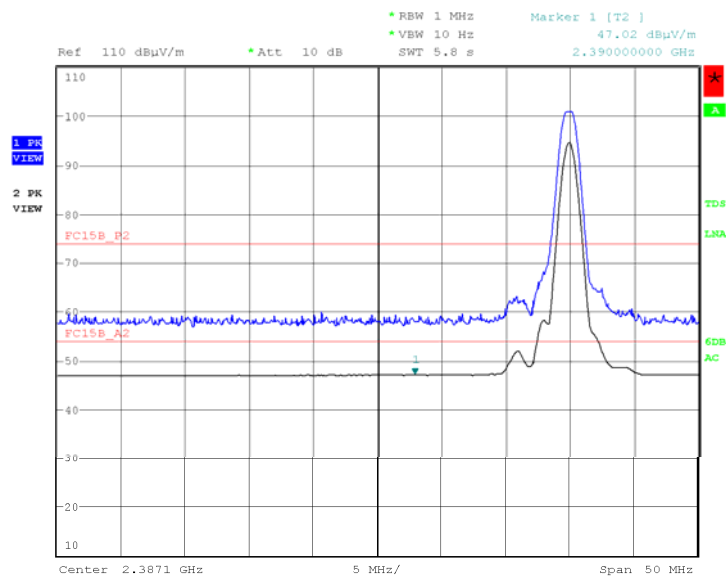
Horizontal



Date: 20.APR.2010 11:19:16

Bottom Channel

Vertical

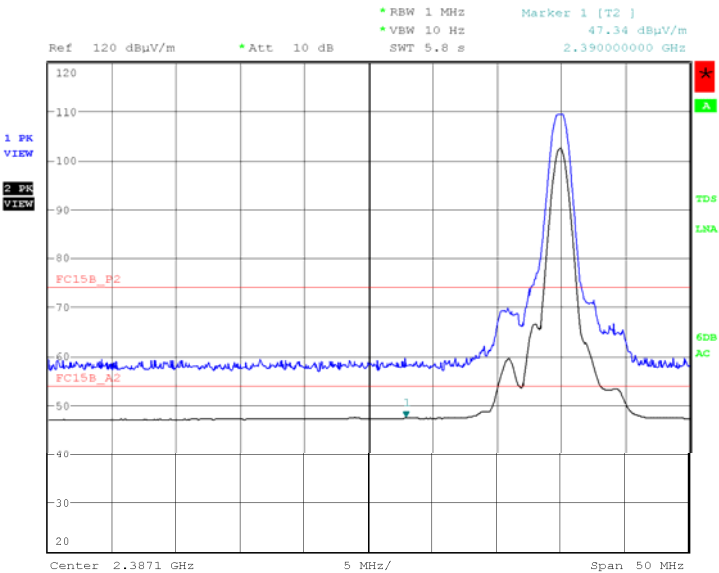


Date: 20.APR.2010 10:07:43



Product Service

Horizontal



Date: 20.APR.2010 10:35:00

Limit Clause

15.247 (d) for FCC and A8.5 for RSS-210

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.

Frequency	Limit
30 MHz to 25 GHz excluding restricted bands	-20 dBc



Product Service

2.8 CHANNEL DWELL TIME

2.8.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)(iii)
RSS-210, Clause A8.1 (d)

2.8.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510021666

2.8.3 Date of Test and Modification State

12 May 2010 - Modification State 0

2.8.4 Test Equipment Used

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

2.8.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and RSS-210.

DH1

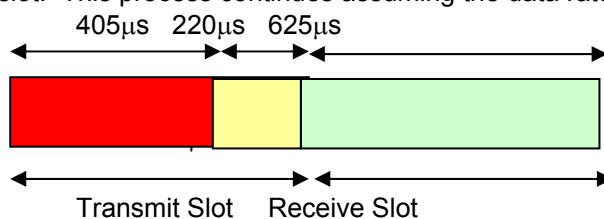
The Bluetooth system hops at a rate of 1600 times per second. Thus, this equates to 1600 timeslots in 1 second.

The DH1 data rate operates on a Transmit on 1 timeslot and Receive on 1 timeslot basis. Thus, in 1 second, there are 800 Transmit timeslots and 800 Receive timeslots.

Thus:

$$1 \text{ Timeslot} = \frac{1}{1600} = 625\mu\text{s}$$

In 1 transmit timeslot, the transmit on time is only 405 μs . 220 μs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.





DH1 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle

So, with 800 Tx and 800 Rx timeslots, the transmitter is on for $800 \times 405\mu\text{s} = 0.324$ seconds.

$$\therefore \frac{\text{Total Tx Time On}}{\text{No of Channels}} = \frac{0.324}{80} = 4.05\text{ms}$$

So, in 32 seconds, the transmitter dwell time per channel is:

$$32 \times 4.05\text{ms} = 0.1296 \text{ seconds}$$

DH3

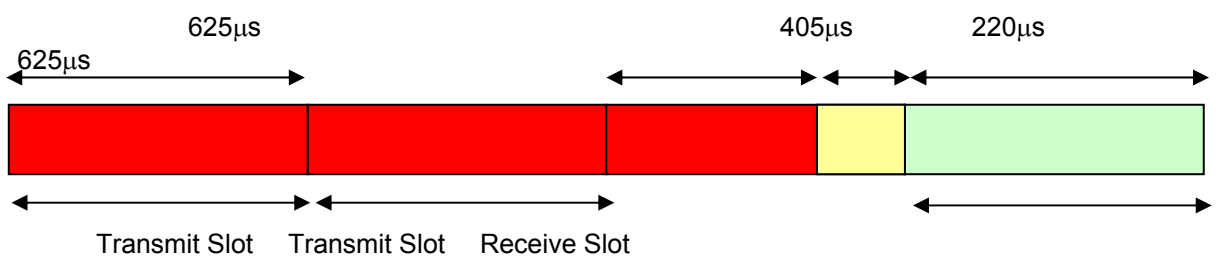
With data rate DH3, the data payload is higher and can use up to 3 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 3 slots, (ie. no receive slot in-between the 3 transmit slots). The $220\mu\text{s}$ off time for synthesizer re-tuning at the end of a slot is only used on the final slot. Thus, for one cycle, there are 3 transmit timeslots. 2 are $625\mu\text{s}$ long and the final slot is transmitting for $405\mu\text{s}$.

The DH3 data rate operates on a Transmit on 3 timeslots and Receives on 1 timeslot basis, (assuming maximum data payload). The frequency-hopping rate is the same. Thus, in 1 second, there are 1200 Transmit timeslots and 400 Receive timeslots.

Thus:

$$1 \text{ Timeslot} = \frac{1}{1600} = 625\mu\text{s}$$

The first 2 Transmit timeslots are transmitting for the complete $625\mu\text{s}$. In the third transmit slot, the transmit on time is only $405\mu\text{s}$. $220\mu\text{s}$ is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.





DH3 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle, (Maximum Payload)

Thus, the transmitter for one complete transmit and receive cycle would be on for:

$$\text{Tx} \quad (2 \times 625\mu\text{s}) + (1 \times 405\mu\text{s}) = 1.655\text{ms}$$

So:

$$\begin{aligned} 800 \times 625\mu\text{s} &= 0.5 \text{ seconds} \\ 400 \times 405\mu\text{s} &= 0.162 \text{ seconds} \end{aligned}$$

$$\text{Thus:} \quad 0.5 + 0.162 = 0.662 \text{ seconds}$$

$$\therefore \frac{\text{Total Tx Time On}}{\text{No Of Channels}} = \frac{0.662}{80} = 8.275\text{ms}$$

So, in 32 seconds, the transmitter dwell time per channel is:

$$32 \times 8.275\text{ms} = 0.2648 \text{ seconds}$$

DH5

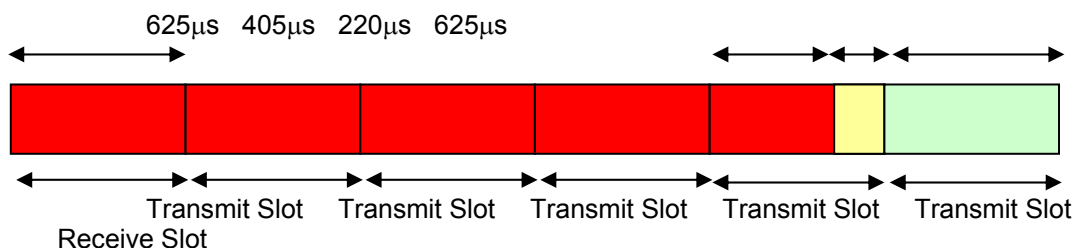
With data rate DH5, the data payload is higher and can use up to 5 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 5 slots, (ie. no receive slot in-between the 5 transmit slots). The 220μs off time for synthesizer re-tuning at the end of a slot is only used on the final slot. Thus, for one cycle, there are 5 transmit timeslots. 4 are 625μs long and the final slot is transmitting for 405μs.

The DH5 data rate operates on a Transmit on 5 timeslots and Receives on 1 timeslot basis, (assuming maximum data payload). The frequency-hopping rate is the same. Thus, in 1 second, there are 1333.3 Transmit timeslots and 266.7 Receive timeslots.

Thus:

$$1 \text{ Timeslot} = \frac{1}{1600} = 625\mu\text{s}$$

The first 4 Transmit timeslots are transmitting for the complete 625μs. In the fifth transmit slot, the transmit on time is only 405μs. 220μs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.





DH5 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle, (Maximum Payload)

Thus, the transmitter for one complete transmit and receive cycle would be on for:

$$\text{Tx} \quad (2 \times 625\mu\text{s}) + (1 \times 405\mu\text{s}) \quad = \quad 2.905\text{ms}$$

So:

$$1066.7 \times 625\mu\text{s} \quad = \quad 0.666 \text{ seconds}$$

$$266.7 \times 405\mu\text{s} \quad = \quad 0.108 \text{ seconds}$$

$$\text{Thus:} \quad 0.666 + 0.108 = 0.774 \text{ seconds}$$

$$\therefore \quad \frac{\text{Total Tx Time On}}{\text{No Of Channels}} \quad = \quad \frac{0.774}{80} \quad = \quad 9.675\text{ms}$$

So, in 32 seconds, the transmitter dwell time per channel is:

$$32 \times 9.675\text{ms} = \quad 0.31 \text{ seconds}$$

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.8.6 Environmental Conditions

12 May 2010

Ambient Temperature 22°C

Relative Humidity 25%



Product Service

2.8.7 Test Results

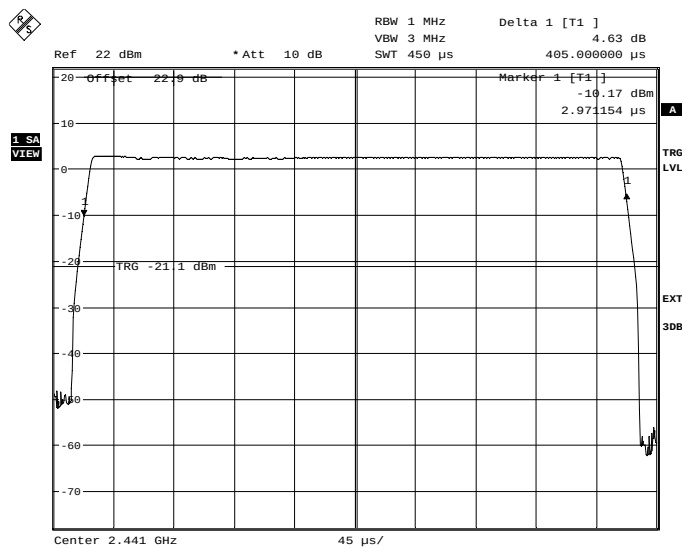
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Channel Dwell Time.

The test results are shown below.

Configuration 1 - Mode 1

3.7 V DC Supply

DH1



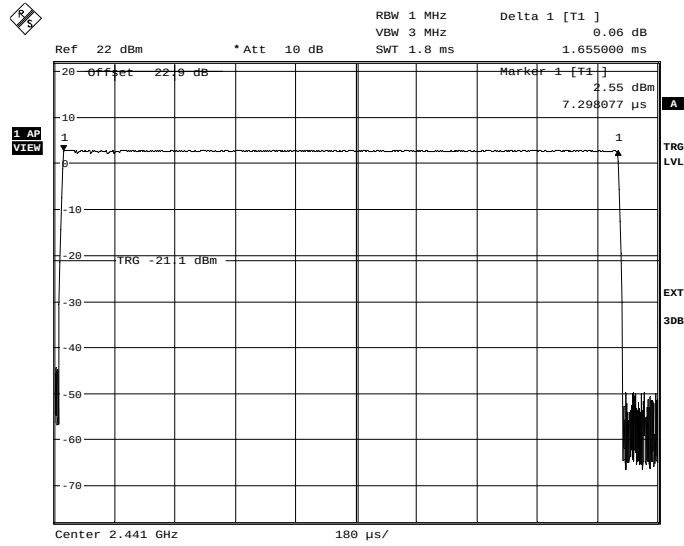
OBW1

Date: 12.MAY.2010 09:24:25



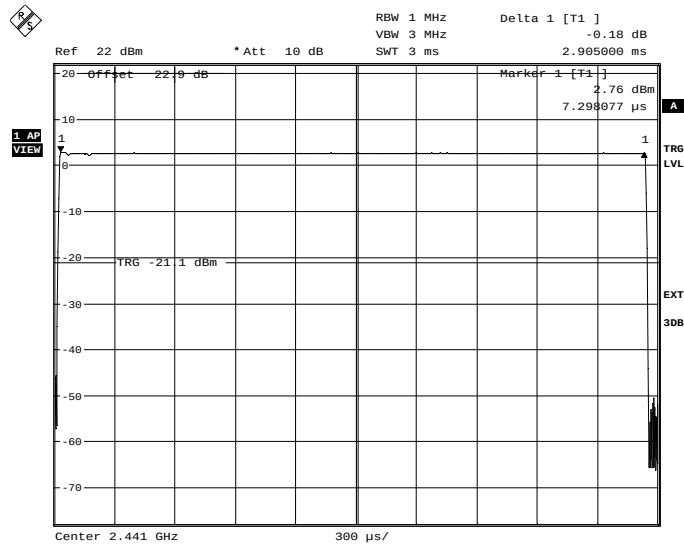
Product Service

DH3



OBW1
Date: 12.MAY.2010 09:19:24

DH5



OBW1
Date: 12.MAY.2010 09:20:56



Product Service

Limit Clause

15.247 (a)(1)(iii) for FCC and A8.1(d) for RSS-210

Frequency hopping systems operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that a minimum of 15 hopping channels are used.



Product Service

2.9 CHANNEL SEPARATION**2.9.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)
RSS-210, Clause A8.1 (b)

2.9.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510021666

2.9.3 Date of Test and Modification State

07 May 2010 - Modification State 0

2.9.4 Test Equipment Used

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

2.9.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and RSS-210.

The EUT was transmitted at maximum power into a Spectrum Analyser. The trace was set to Max Hold to store several adjacent channels on screen. Using the marker delta function, the markers were positioned to show the separation between adjacent channels.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.9.6 Environmental Conditions

07 May 2010

Ambient Temperature 24°C

Relative Humidity 26%



2.9.7 Test Results

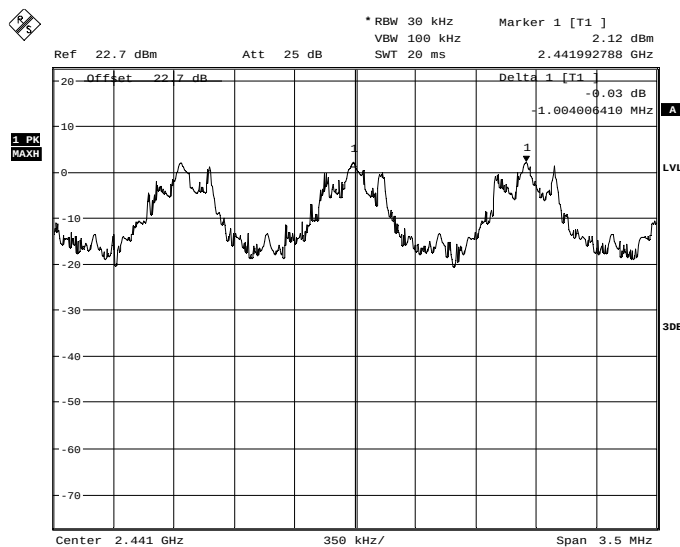
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Channel Separation.

The test results are shown below.

Configuration 1 - Mode 1

3.7 V DC Supply

1.004 MHz



OBW1
Date: 7.MAY.2010 11:42:50

Limit Clause

15.247 (a)(1) for FCC and A8.1(b) for RSS-210

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125 W.

The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.



Product Service

2.10 NUMBER OF HOPPING CHANNELS**2.10.1 Specification Reference**

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)(iii)
RSS-210, Clause A8.1 (d)

2.10.2 Equipment Under Test

IsatPhone Pro GMR2+ Satellite Phone, IMEI: 004401510021666

2.10.3 Date of Test and Modification State

07 May 2010 - Modification State 0

2.10.4 Test Equipment Used

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

2.10.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and RSS-210.

The EUT was connected to a Spectrum Analyser via a cable. The EUT was set to transmit on maximum power and hopping on all channels. The span was adjusted to show the individual channels. To reasonably display the number of channels, the occupied band was split into four traces. The display trace was set to Max Hold and the plots recorded.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.10.6 Environmental Conditions

07 May 2010

Ambient Temperature 24°C

Relative Humidity 26%



Product Service

2.10.7 Test Results

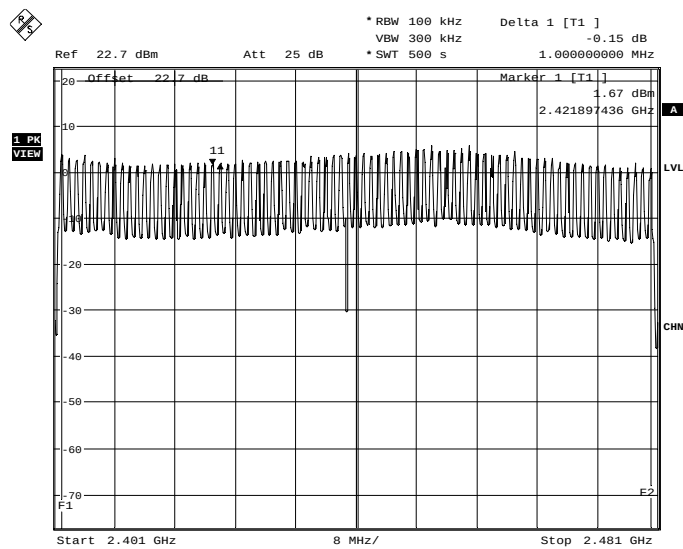
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-210 for Number of Hopping Channels.

The test results are shown below.

Configuration 1 - Mode 1

3.7 V DC Supply

0 to 79



OBW1
 Date: 7.MAY.2010 11:11:39

Limit

15.247 (a)(1)(iii) for FCC and A8.1(d) for RSS-210

≥ 15 channels



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 - Conducted Emissions					
3 Phase Artificial Mains Network (LISN)	Rohde & Schwarz	ESH2-Z5	16	12	11-Mar-2011
LISN	Rohde & Schwarz	ESH2-Z5	17	12	6-Jun-2010
LISN (1 Phase)	Chase	MN 2050	336	12	25-Mar-2011
Test Receiver	Rohde & Schwarz	ESIB40	1006	6	26-May-2010
Transient Limiter	Hewlett Packard	11947A	1032	12	22-Jun-2010
Screened Room (1)	Rainford	Rainford	1541	-	TU
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Test Receiver	Rohde & Schwarz	ESIB40	1934	12	28-Sep-2010
Transient Limiter	Hewlett Packard	11947A	2377	12	16-Dec-2010
Transient Limiter	Hewlett Packard	11947A	2378	12	22-Jun-2010
GPS/SBAS Simulator	Spirent	STR4500	3056	-	TU
Compliance 3 Emissions	Schaffner	C3e Software V.4.00.00	3274	-	N/A - Software
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010
Section 2.2, 2.5 & 2.7 - Radiated Emissions, EIRP Power and Band Edge					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	12-Oct-2010
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Oct-2010
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	17-Jul-2010
Pre-Amplifier	Phase One	PS04-0085	1532	12	16-Sep-2010
Pre-Amplifier	Phase One	PS04-0086	1533	12	17-Sep-2010
Pre-Amplifier	Phase One	PS04-0087	1534	12	22-Sep-2010
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Turntable/Mast Controller	EMCO	2090	1610	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	4-Dec-2011
Peak Power Analyser	Hewlett Packard	8990A	107	12	10-Feb-2011
Comb Generator	Schaffner	RSG1000	3034	-	TU
GPS/SBAS Simulator	Spirent	STR4500	3056	-	TU
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	1-May-2010
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	4-Aug-2010
Compliance 3 Emissions	Schaffner	C3e Software V.4.00.00	3274	-	N/A - Software
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	22-May-2010
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010
3 GHz High Pass Filter	K&L uwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2011
Bluetooth Tester	Tescom	TC30004	-	-	-



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 – 20dB Bandwidth					
Attenuator (10dB)	Weinschel	47-10-34	481	12	26-Mar-2011
Broadband Resistive Power Divider	Weinschel	1506A	605	12	8-Sep-2010
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	8-Sep-2010
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2010
Programmable Power Supply	Iso-tech	IPS 2010	2436	-	O/P Mon
Attenuator (3dB)	Suhner	6803.17.B	3026	12	26-Mar-2011
Attenuator (20dB, 20W)	Weinschel	1	3032	12	10-Jul-2010
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	3-Jun-2010
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	25-Feb-2011
Bluetooth Tester	Tescom	TC-3000A	-	-	-
Section 2.4 – Maximum Peak Conducted Output Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	10-Feb-2011
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Broadband Resistive Power Divider	Weinschel	1506A	605	12	8-Sep-2010
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	8-Sep-2010
Cable (1m, sma(m) - sma(m))	Reynolds	262-0248-1000	2406	12	15-Oct-2010
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2010
Programmable Power Supply	Iso-tech	IPS 2010	2436	-	O/P Mon
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Attenuator (20dB, 20W)	Weinschel	1	3032	12	10-Jul-2010
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	28-Nov-2010
Thermocouple Thermometer	Fluke	51	3172	12	3-Jul-2010
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
Power Meter	Rohde & Schwarz	NRP	3491	-	TU
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z51	3492	12	15-Apr-2011
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	25-Feb-2011
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	26-Jan-2011
Bluetooth Tester	Tescom	TC-3000A	-	-	-



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.6 - Spurious Emissions					
True RMS Multimeter	Fluke	79 Series III	411	12	24-Jul-2010
Tuneable Notch Filter	K&L uwave	5TNF-1500/3000-N/N	435	-	TU
Attenuator (10dB)	Weinschel	47-10-34	481	12	26-Mar-2011
Power Divider	Weinschel	1506A	603	12	18-Mar-2011
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	19-Jun-2010
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	8-Sep-2010
800MHz Low Pass Filter	Mini-Circuits	NLP-800	1638	12	TU
Cable (1m, sma(m) - sma(m))	Reynolds	262-0248-1000	2406	12	15-Oct-2010
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2010
Programmable Power Supply	Iso-tech	IPS 2010	2436	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	2-Nov-2010
Power Supply Unit	Weir	460	2754	-	TU
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	8-Sep-2010
Filter (Hi Pass)	Lorch	5HP7-2500-SR	2779	12	TU
Attenuator (3dB)	Suhner	6803.17.B	3026	12	26-Mar-2011
Attenuator (20dB, 20W)	Weinschel	1	3032	12	10-Jul-2010
Beacon RF Unit	TUV	N/A	3066	-	TU
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-03-34	3161	12	4-Jun-2010
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	28-Nov-2010
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
Attenuator (20dB, 150W)	Narda	769-20	3367	12	19-May-2010
Attenuator (30dB, 150W)	Narda	769-30	3369	12	19-May-2010
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	3-Jun-2010
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	25-Feb-2011
Logic Level Shifter	Andy Blagg	0V to 10V to TTL Interface	3584	-	O/P Mon
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3702	12	26-Jan-2011
Bluetooth Tester	Tescom	TC30004	-	-	-
Waveguide	Flann Microwave	18-26.5GHz	-	-	-
Bluetooth Tester	Tescom	TC-3000A	-	-	-
Section 2.8, 2.9 and 2.10 - Channel Dwell Time, Channel Separation and Number of Hopping Channels					
Broadband Resistive Power Divider	Weinschel	1506A	605	12	8-Sep-2010
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	8-Sep-2010
Cable (1m, sma(m) - sma(m))	Reynolds	262-0248-1000	2406	12	15-Oct-2010
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2010
Programmable Power Supply	Iso-tech	IPS 2010	2436	-	O/P Mon
Attenuator (3dB)	Suhner	6803.17.B	3026	12	26-Mar-2011
Attenuator (20dB, 20W)	Weinschel	1	3032	12	10-Jul-2010
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	4-Jun-2010
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	3-Jun-2010
Bluetooth Tester	Tescom	TC-3000A	-	-	-

TU – Traceability Unscheduled

O/P Mon – Output monitored using calibrated equipment.



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	10MHz to 6GHz Test Amplitude	2.0dB†
Conducted Susceptibility RF	50kHz to 1000MHz Amplitude	3.1dB•
	EM Clamp Method of Test	1.2dB•
	CDN Method of Test	1.1dB•
	BCI Clamp Method of Test	1.2dB•
Conducted Susceptibility LF	DC to 150kHz	1.0%†
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°
Channel Occupancy/Separation	19.1kHz	N/A
Maximum Output Power	Not Applicable	±0.5dB
Number of Channels	Not Applicable	N/A
20dB Bandwidth	19.1kHz	±0.5dB

Worst case error for both Time and Frequency measurement 12 parts in 10^6 .

- * In accordance with CISPR 16-4-2
- † In accordance with UKAS Lab 34
- In accordance with EN61000-4-6



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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