Report On

FCC and IC Testing of the
Motorola Inc
CR0078 Cradle

COMMERCIAL-IN-CONFIDENCE

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REPORT ON

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Motorola Inc
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Document 75909238 Report 05 Issue 2

September 2010

PREPARED FOR

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DATED

02 September 2010

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

Test Engineer(s);

G Lawler A Guy S C Hartley N Forsyth M Russell R Henley S Bennett

UKAS TESTING 0141

Product Service

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Product Service

SECTION 1

REPORT SUMMARY

FCC and IC Testing of the
Motorola Inc
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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Motorola Inc, CR0078 Cradle to the requirements of FCC CFR 47 Part 15C and RSS-210.

Objective	To perform FCC and IC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Motorola Inc
Model Number(s)	CR0078 Cradle
Serial Number(s)	9YZTX 9YZTP
Software Version	Rev A
Hardware Version	Rev A
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 15C: 2009 RSS-210: 2007
Incoming Release Date	Declaration of Build Status 15 July 2010
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	NP5084073 09 March 2010
Start of Test	24 June 2010
Finish of Test	31 August 2010
Name of Engineer(s)	G Lawler A Guy S C Hartley N Forsyth M Russell R Henley S Bennett
Related Document(s)	ANSI C63.4: 2003

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1.2 BRIEF SUMMARY OF RESULTS

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

Configuration 1 - Stand Alone AC Charger & Scanner						
Section	Spec Clause		Test Description	Mode	Result	Comments
	FCC	IC				
2.1	15.207	-	Conducted Emissions (AC Power Port)	Transmit Bottom	Pass	
				Transmit Middle	Pass	
				Transmit Top	Pass	
2.2	15.247 (a)(1)	A8.1(a)	20dB Bandwidth	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.3	15.247 (b)(1)	A8.4(2)	Maximum Peak Conducted Output Power	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247	A8.4	EIRP Peak Power	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
2.5	15.247 (d)	A8.5	Spurious Emissions	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247	-	Band Edge Emissions	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
2.7	15.247 (a)(1)(iii)	A8.1(d)	Channel Dwell Time	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.8	15.247 (a)(1)	A8.1(b)	Channel Separation	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.9	15.247 (a)(1)(iii)	A8.1(d)	Number of Hopping Channels	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.10	15.205, 15.209, 15.247	2.2	Radiated Emissions (Enclosure Port) (Limited to 30MHz to 1GHz)	Transmit Bottom	N/T	
				Transmit Middle	Pass	
				Transmit Top	N/T	

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Configuration 2 - BT & RS232						
Section	Spec Clause		Test Description	Mode	Result	Comments
	FCC	IC				
2.1	15.207	-	Conducted Emissions (AC Power Port)	Transmit Bottom	Pass	
				Transmit Middle	Pass	
				Transmit Top	Pass	
	15.247 (a)(1)	A8.1(a)	20dB Bandwidth	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247 (b)(1)	A8.4(2)	Maximum Peak Conducted Output Power	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.4	15.247	A8.4	EIRP Peak Power	Transmit Bottom	Pass	
				Transmit Middle	Pass	
				Transmit Top	Pass	
	15.247 (d)	A8.5	Spurious Emissions	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.6	15.247	-	Band Edge Emissions	Transmit Bottom	Pass	
				Transmit Middle	N/A	
				Transmit Top	Pass	
	15.247 (a)(1)(iii)	A8.1(d)	Channel Dwell Time	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247 (a)(1)	A8.1(b)	Channel Separation	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247 (a)(1)(iii)	A8.1(d)	Number of Hopping Channels	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.10	15.205, 15.209, 15.247	2.2	Radiated Emissions (Enclosure Port) (Limited to 30MHz to 1GHz)	Transmit Bottom	Pass	
				Transmit Middle	Pass	
				Transmit Top	Pass	

Product Service

Configuration 3 -USB						
Section	Spec Clause		Test Description	Mode	Result	Comments
	FCC	IC				
	15.207	-	Conducted Emissions (AC Power Port)	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
	15.247 (a)(1)	A8.1(a)	20dB Bandwidth	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247 (b)(1)	A8.4(2)	Maximum Peak Conducted Output Power	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.4	15.247	A8.4	EIRP Peak Power	Transmit Bottom	N/T	
				Transmit Middle	Pass	
				Transmit Top	N?T	
	15.247 (d)	A8.5	Spurious Emissions	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247	-	Band Edge Emissions	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
	15.247 (a)(1)(iii)	A8.1(d)	Channel Dwell Time	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247 (a)(1)	A8.1(b)	Channel Separation	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
	15.247 (a)(1)(iii)	A8.1(d)	Number of Hopping Channels	Transmit Bottom	N/A	
				Transmit Middle	N/A	
				Transmit Top	N/A	
2.10	15.205, 15.209, 15.247	2.2	Radiated Emissions (Enclosure Port) (Limited to 30MHz to 1GHz)	Transmit Bottom	N/A	
				Transmit Middle	Pass	
				Transmit Top	N/A	

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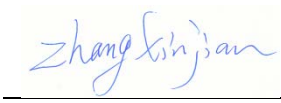
Configuration 4 – Stand Alone AC Charger						
Section	Spec Clause		Test Description	Mode	Result	Comments
	FCC	IC				
2.1	15.207	-	Conducted Emissions (AC Power Port)	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
2.2	15.247 (a)(1)	A8.1(a)	20dB Bandwidth	Transmit Bottom	Pass	
				Transmit Middle	Pass	
				Transmit Top	Pass	
2.3	15.247 (b)(1)	A8.4(2)	Maximum Peak Conducted Output Power	Transmit Bottom	Pass	
				Transmit Middle	Pass	
				Transmit Top	Pass	
	15.247	A8.4	EIRP Peak Power	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
2.5	15.247 (d)	A8.5	Spurious Emissions	Transmit Bottom	N/T	
				Transmit Middle	Pass	
				Transmit Top	N/T	
	15.247	-	Band Edge Emissions	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
2.7	15.247 (a)(1)(iii)	A8.1(d)	Channel Dwell Time	Transmit Bottom	Pass	
				Transmit Middle	Pass	
				Transmit Top	N/T	
2.8	15.247 (a)(1)	A8.1(b)	Channel Separation	Transmit Bottom	N/T	
				Transmit Middle	Pass	
				Transmit Top	N/T	
2.9	15.247 (a)(1)(iii)	A8.1(d)	Number of Hopping Channels	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	
				Transmit All	Pass	
2.10	15.205, 15.209, 15.247	2.2	Radiated Emissions (Enclosure Port) (Limited to 30MHz to 1GHz)	Transmit Bottom	N/T	
				Transmit Middle	N/T	
				Transmit Top	N/T	

N/A – Not Applicable; N/T – Not Tested

Product Service

1.3 DECLARATION OF BUILD STATUS

Manufacturer	Motorola Inc
Country of origin	Mexico
UK Agent	
Technical Description	Bluetooth 2.0 EDR cradle for DS6878
Model No	CR0078
Part No	See the following page for details
Serial No	9YZUF
Drawing Number	17-123572-01
Build Status	Rev A
Software Issue	Rev A
Hardware Issue	Rev A

Signature	
Date	15 July 2010
D of B S Serial No	75909238/01

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.

Part Number Format: CR00XX-XXXXXXXXX

Radio	CR00?X-XXXXXXXXX		
	0	=	No radio
	7	=	Bluetooth
Interface	CR00X?-XXXXXXXXX		
	8	=	Multi-Interface
Form Factor	CR00XX-?XXXXXXXX		
	S	=	Standard
	P	=	Hands-free Presentation
Charging	CR00XX-X?XXXXXXX		
	C	=	Charging
	Z	=	Non-charging
Number of Slots	CR00XX-XX?XXXXXX		
	0-9		Number of slots
Encryption	CR00XX-XXX?XXXXX		
	0	=	Standard
	F	=	FIPS
Standard/Custom	CR00XX-XXXX?XXXX		
	0	=	Standard
	1-9, A-Z	=	Custom
Material	CR00XX-XXXXX?XXX		
	0	=	Standard
	9	=	Disinfectant Ready
Colour	CR00XX-XXXXXX?XX		
	1	=	Cash Register White
	7	=	Twilight Black
	B	=	Healthcare White
Country	CR00XX-XXXXXXX??		
	WR	=	Worldwide RoHS

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Motorola Inc, CR0078 Cradle as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.

Equipment Under Test

Product Service

1.4.2 Test Configuration

The EUT was set to work with customer supplied software for each configuration.

Configuration 1: Stand Alone AC Charger/Scanner

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

The RS232 cable and the laptop which was used to set the EUT to work was removed from the test environment leaving the Scanner, EUT (power supply unit) for test.

Configuration 2: BT & RS232

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

For the test the EUT (power supply unit) and scanner was connected to a dormant laptop via a RS232 cable supplied with 5Vdc from a AC/DC power supply unit.

Configuration 3: USB

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

The EUT (power supply unit) and scanner was connected to a dormant laptop using a screened USB cable cable.

Configuration 4: Stand Alone AC Charger

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

The EUT (power supply unit) was connected to a DC power supply and operated via a laptop using customer supplied software.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened	Configuration and Mode
AC Power input (120V60Hz)	2.3m	Input to AC/DC power supply (12Vdc)	3 core	No	Configuration 1 Mode 1,2,3 Configuration 2 Mode 1,2,3 Configuration 3 Mode 1,2,3
DC Power input to Scanner cradle	1.8m	Output from AC/DC power supply (12Vdc)	2 core	No	Configuration 1 Mode 1,2,3 Configuration 2 Mode 1,2,3 Configuration 3 Mode 1,2,3
DC Power input to RS232 connector	1.8m	Output from AC/DC power supply (5Vdc)	2 core	No	Configuration 2 Mode 1,2,3
RS232	1.5	5Vdc power and Data	Multi-core	No	Configuration 2 Mode 1,2,3
USB	4.5m	5Vdc power and data	4Core	Yes	Configuration 3 Mode 1,2,3

Product Service

1.4.4 Modes of Operation

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

Mode 1 - 2402MHz Tx

Mode 2 - 2441MHz Tx

Mode 3 - 2480MHz Tx

Mode 4 – Hopping on all channels Tx

A pseudo random (PRBS9) modulated single channel output was selected by using the customer supplied software and selecting MOD TX mode.

Information on the specific test modes utilised are detailed in the test procedure for each individual test.

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, test laboratories or an open test area as appropriate.

The EUT was powered from a 120V 60Hz AC Power Supply, or via a DC bench power supply as described for each test.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

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

1.6 DEVIATIONS FROM THE STANDARD

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

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 (BT & RS232), 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.

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.

Product Service

SECTION 2

TEST DETAILS

FCC and IC Testing of the
Motorola Inc
CR0078 Cradle

Product Service

2.1 CONDUCTED EMISSIONS (AC POWER PORT)

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.207

2.1.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTX

2.1.3 Date of Test and Modification State

24 June 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 1 - Mode 1
- Mode 2
- Mode 3

Configuration 2 - Mode 1
- Mode 2
- Mode 3

2.1.6 Environmental Conditions

	24 June 2010
Ambient Temperature	21.3°C
Relative Humidity	36%
Atmospheric Pressure	1015mbar

Product Service

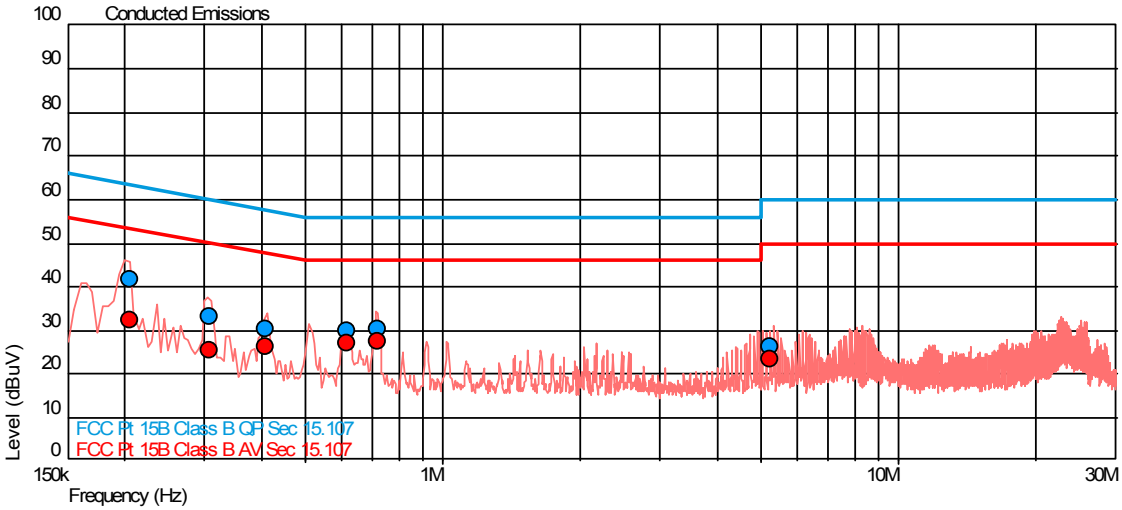
2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Conducted Emissions (AC Power Port).

The test results are shown below.

Configuration 1 - Mode 1

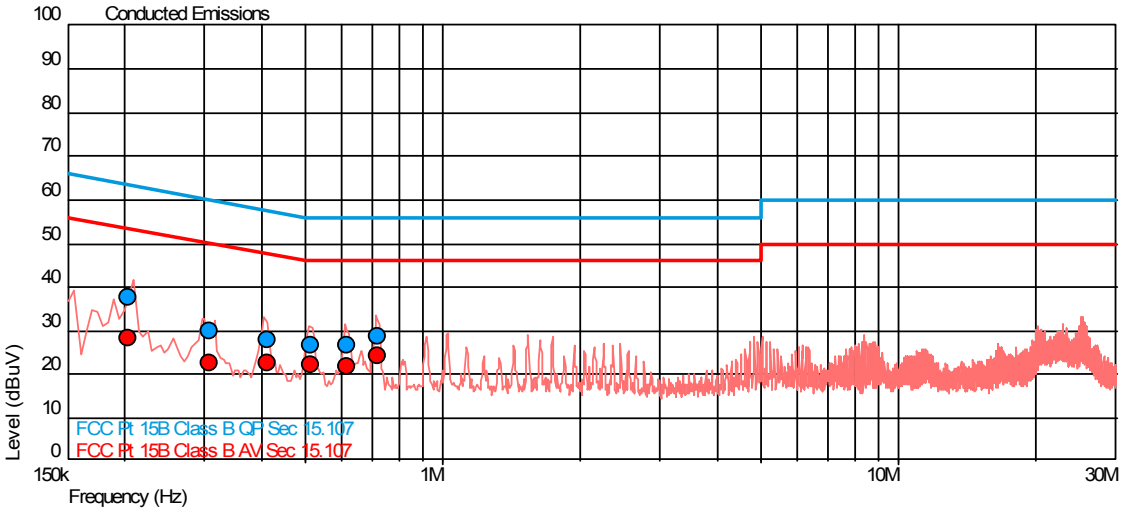
Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.205	41.6	63.4	-21.8	32.1	53.4	-21.3
0.306	33.3	60.1	-26.8	25.4	50.1	-24.7
0.408	30.1	57.7	-27.5	26.3	47.7	-21.4
0.616	29.8	56.0	-26.2	26.8	46.0	-19.2
0.717	30.2	56.0	-25.8	27.6	46.0	-18.4
5.224	26.3	60.0	-33.7	23.4	50.0	-26.6

Product Service

Live Line

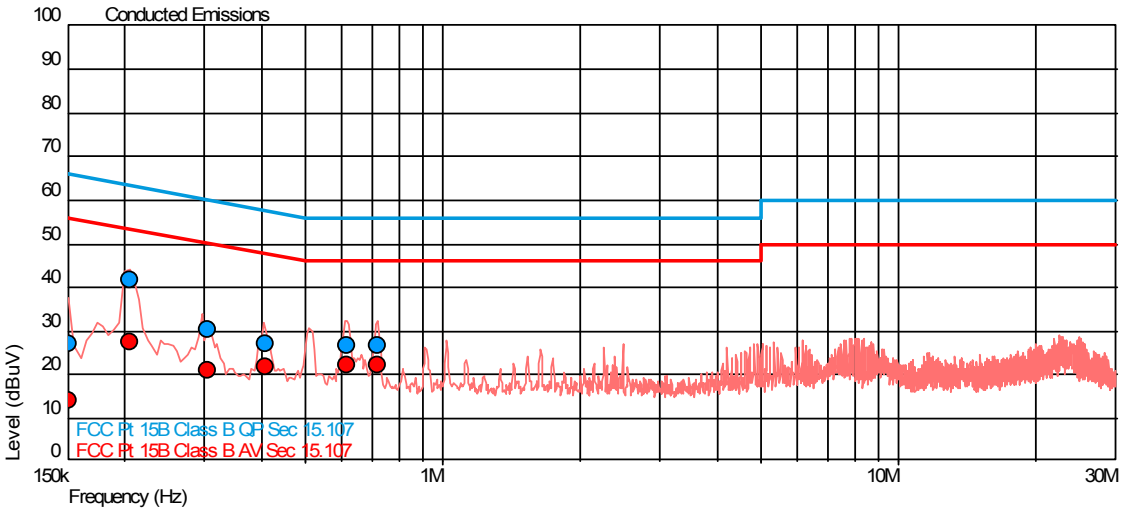


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.204	37.6	63.5	-25.8	28.4	53.5	-25.0
0.307	30.0	60.0	-30.1	22.6	50.0	-27.5
0.411	28.0	57.6	-29.7	22.6	47.6	-25.1
0.513	26.8	56.0	-29.2	22.1	46.0	-23.9
0.615	26.6	56.0	-29.4	21.7	46.0	-24.3
0.717	28.7	56.0	-27.3	24.2	46.0	-21.8

Product Service

Configuration 1 - Mode 2

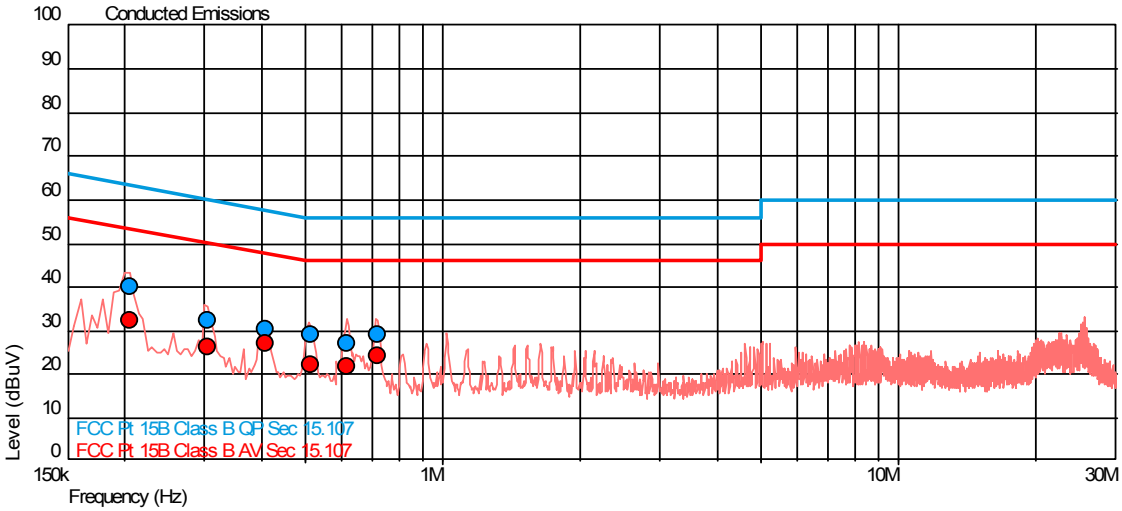
Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	27.1	66.0	-38.9	13.8	56.0	-42.2
0.205	41.6	63.4	-21.8	27.3	53.4	-26.1
0.305	30.5	60.1	-29.6	21.1	50.1	-29.0
0.408	26.9	57.7	-30.8	21.6	47.7	-26.0
0.615	26.6	56.0	-29.4	22.0	46.0	-24.0
0.719	26.4	56.0	-29.6	22.1	46.0	-23.9

Product Service

Live Line

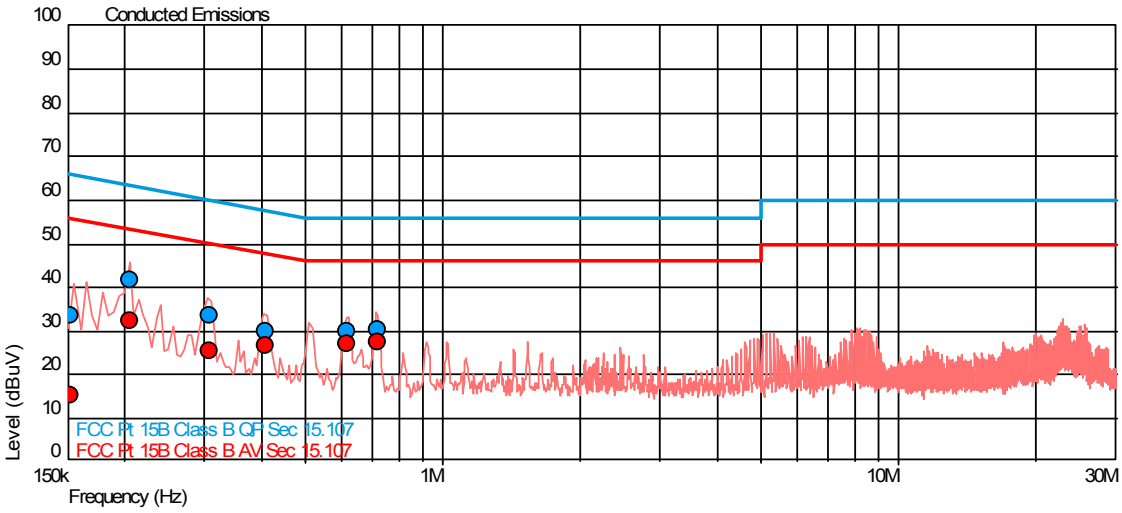


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.206	40.1	63.4	-23.3	32.1	53.4	-21.3
0.306	32.5	60.1	-27.6	26.1	50.1	-24.0
0.409	30.2	57.7	-27.4	27.0	47.7	-20.7
0.512	29.0	56.0	-27.0	22.1	46.0	-23.9
0.615	26.8	56.0	-29.2	21.7	46.0	-24.3
0.717	28.9	56.0	-27.1	24.1	46.0	-21.9

Product Service

Configuration 1 - Mode 3

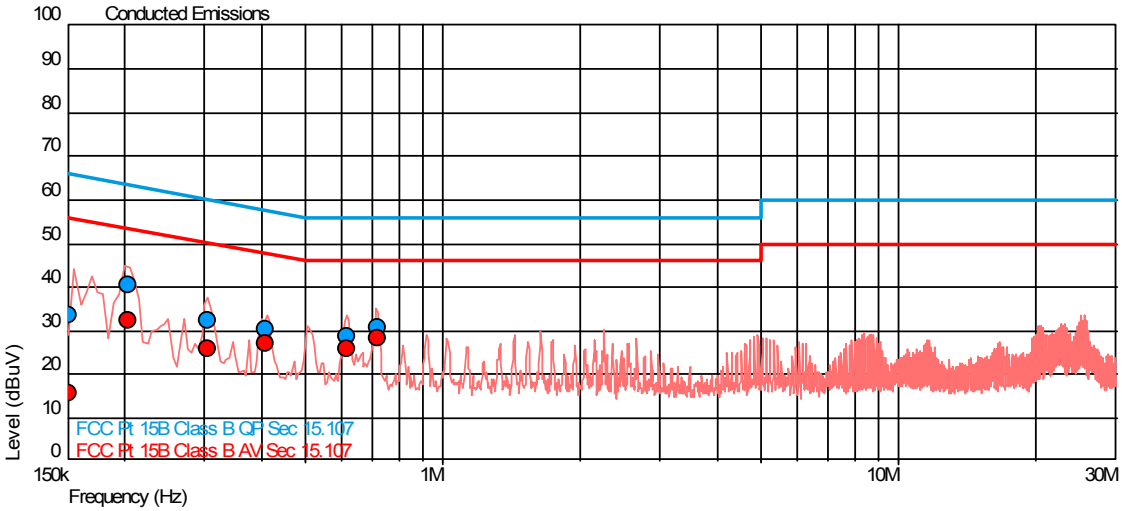
Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.151	33.4	65.9	-32.5	15.2	55.9	-40.7
0.205	41.7	63.4	-21.7	32.2	53.4	-21.2
0.307	33.4	60.0	-26.7	25.6	50.0	-24.5
0.409	30.0	57.7	-27.7	26.5	47.7	-21.1
0.616	29.7	56.0	-26.3	27.0	46.0	-19.0
0.717	30.1	56.0	-25.9	27.6	46.0	-18.4

Product Service

Live Line

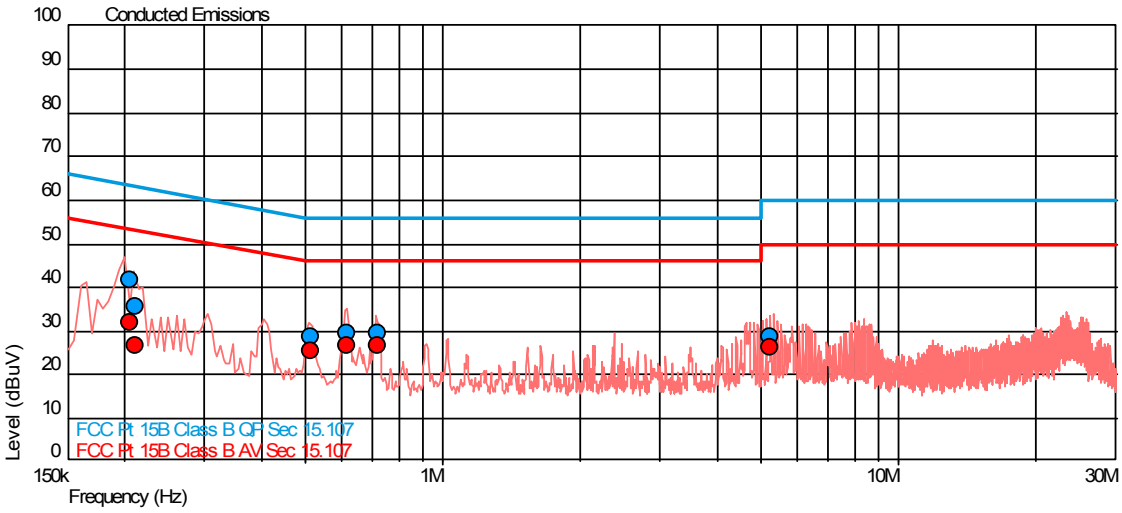


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.151	33.4	66.0	-32.6	15.7	56.0	-40.3
0.204	40.5	63.4	-22.9	32.5	53.4	-21.0
0.305	32.2	60.1	-27.9	25.9	50.1	-24.2
0.409	30.2	57.7	-27.4	27.0	47.7	-20.6
0.616	28.7	56.0	-27.3	25.6	46.0	-20.4
0.718	30.7	56.0	-25.3	28.2	46.0	-17.8

Product Service

Configuration 2 - Mode 1

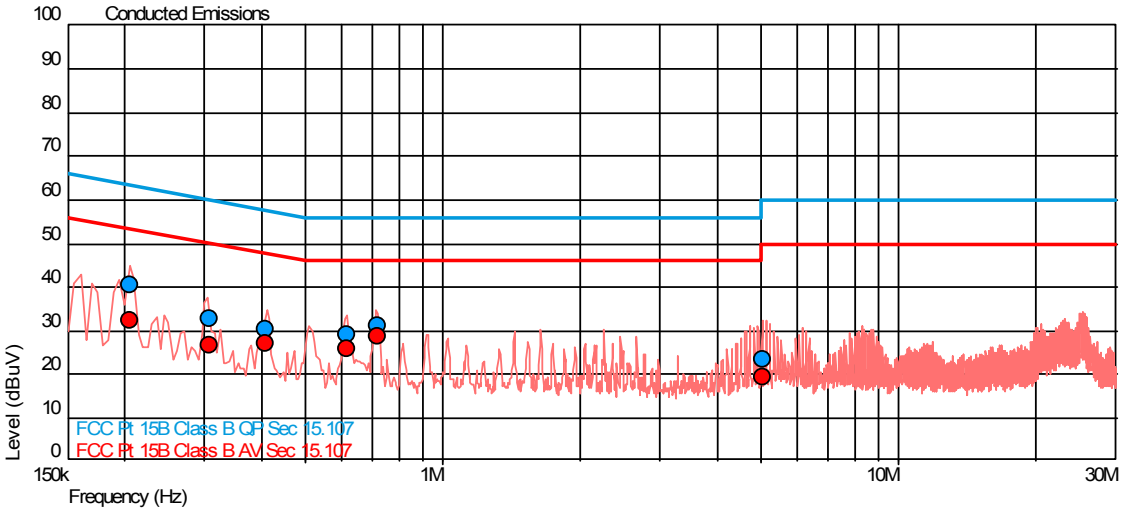
Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.206	41.8	63.4	-21.6	32.0	53.4	-21.4
0.212	35.8	63.1	-27.4	26.6	53.1	-26.6
0.512	28.5	56.0	-27.5	25.6	46.0	-20.4
0.616	29.6	56.0	-26.4	26.6	46.0	-19.4
0.719	29.5	56.0	-26.5	26.7	46.0	-19.3
5.223	28.8	60.0	-31.2	26.1	50.0	-23.9

Product Service

Live Line

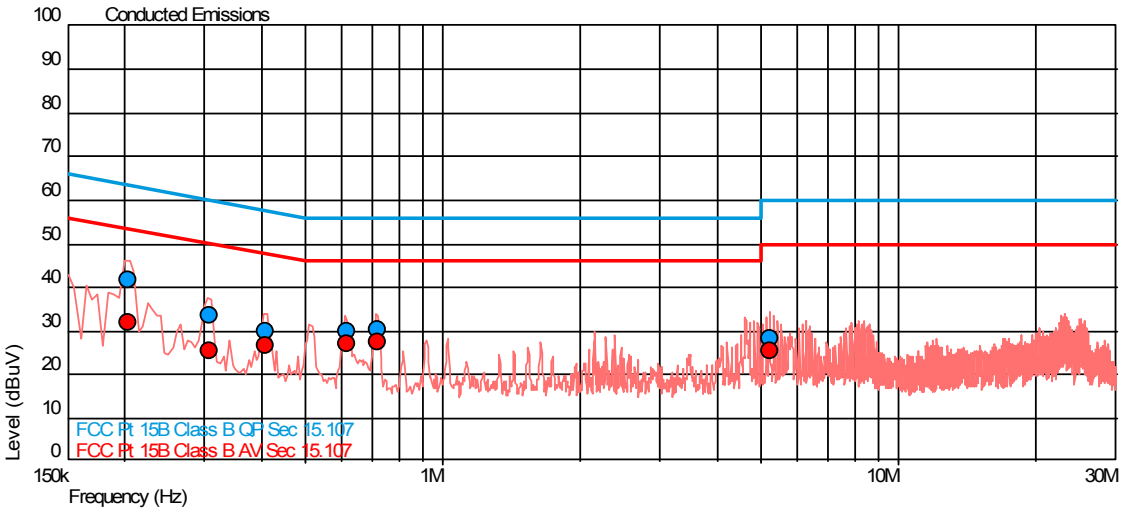


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.205	40.5	63.4	-22.9	32.5	53.4	-20.9
0.307	32.8	60.0	-27.2	26.5	50.0	-23.5
0.410	30.3	57.7	-27.3	27.1	47.7	-20.6
0.616	29.2	56.0	-26.8	25.8	46.0	-20.2
0.717	31.1	56.0	-24.9	28.7	46.0	-17.3
5.018	23.4	60.0	-36.6	19.4	50.0	-30.6

Product Service

Configuration 2 - Mode 2

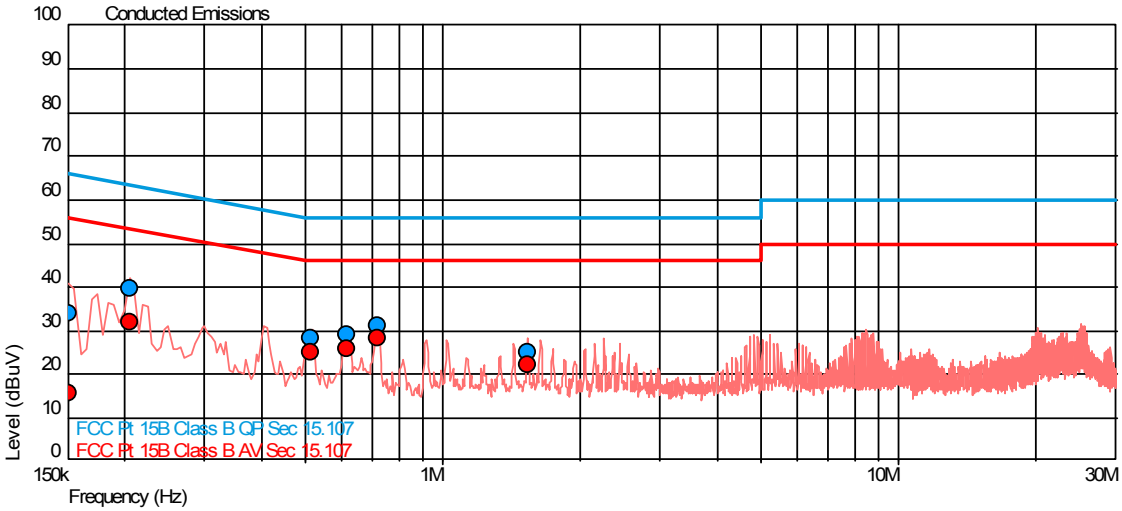
Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.204	41.6	63.4	-21.8	32.1	53.4	-21.4
0.307	33.4	60.1	-26.7	25.5	50.1	-24.6
0.410	30.0	57.7	-27.7	26.5	47.7	-21.2
0.615	30.1	56.0	-25.9	27.2	46.0	-18.8
0.717	30.1	56.0	-25.9	27.6	46.0	-18.4
5.223	28.3	60.0	-31.7	25.4	50.0	-24.6

Product Service

Live Line

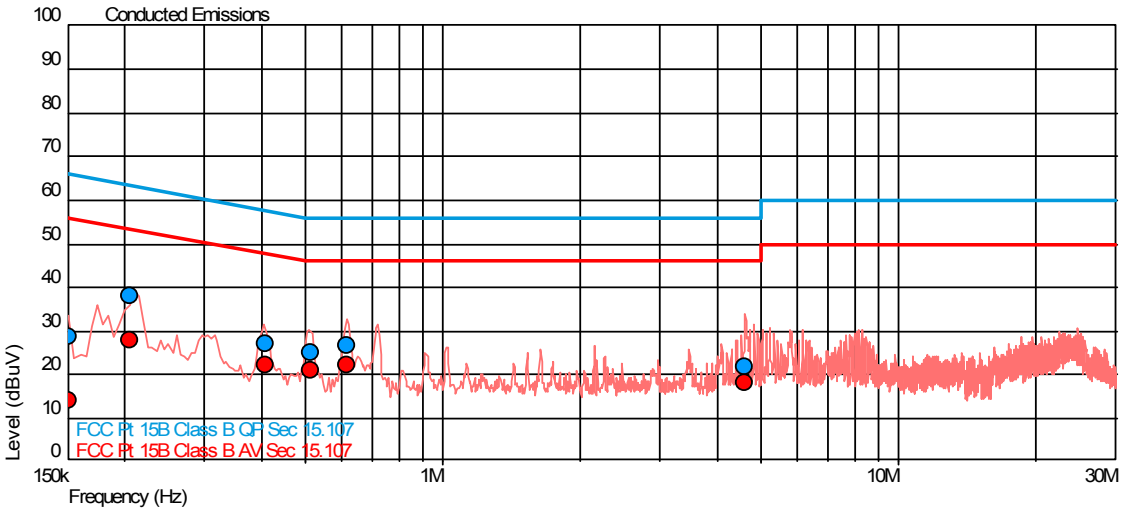


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.151	33.8	65.9	-32.1	15.5	55.9	-40.5
0.206	39.8	63.4	-23.6	31.8	53.4	-21.5
0.514	28.1	56.0	-27.9	25.1	46.0	-20.9
0.615	29.0	56.0	-27.0	25.6	46.0	-20.4
0.718	30.9	56.0	-25.1	28.4	46.0	-17.6
1.537	25.0	56.0	-31.0	22.3	46.0	-23.7

Product Service

Configuration 2 - Mode 3

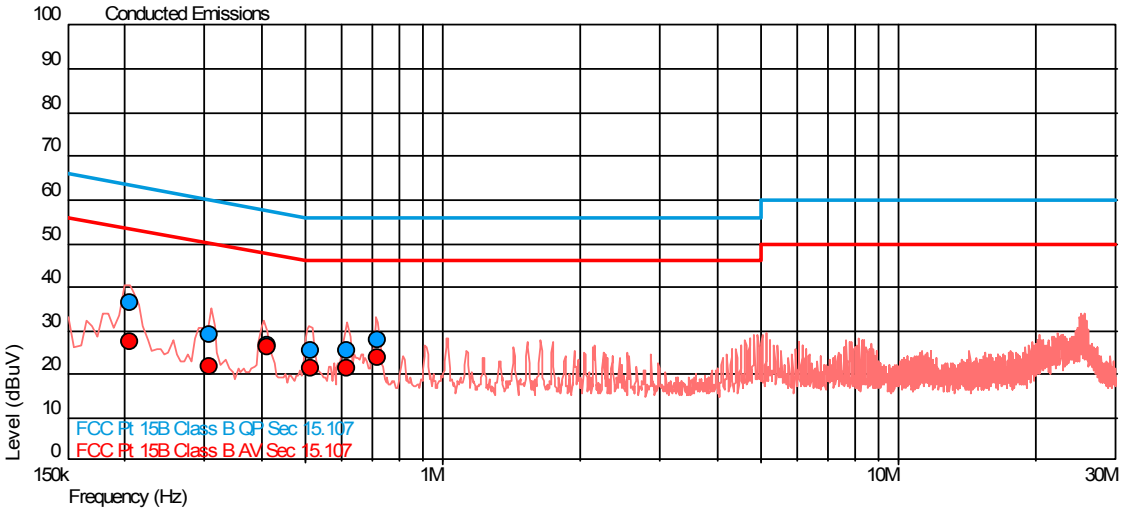
Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.151	28.6	65.9	-37.4	13.8	55.9	-42.1
0.205	38.1	63.4	-25.3	28.0	53.4	-25.4
0.409	27.0	57.7	-30.6	22.3	47.7	-25.3
0.512	25.1	56.0	-30.9	20.7	46.0	-25.3
0.616	26.5	56.0	-29.5	22.1	46.0	-23.9
4.608	21.9	56.0	-34.1	18.0	46.0	-28.0

Product Service

Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.205	36.6	63.4	-26.8	27.6	53.4	-25.8
0.307	29.3	60.0	-30.8	21.9	50.0	-28.2
0.411	26.7	57.6	-30.9	26.2	47.6	-21.4
0.510	25.4	56.0	-30.6	21.4	46.0	-24.6
0.616	25.5	56.0	-30.5	21.1	46.0	-24.9
0.716	27.7	56.0	-28.3	23.7	46.0	-22.3

Product Service

2.2 20dB BANDWIDTH

2.2.1 Specification Reference

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

2.2.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTP

2.2.3 Date of Test and Modification State

25 August 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

Test Performed in accordance with FCC CFR 47 Part 15C 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 4 - Mode 1
- Mode 2
- Mode 3

2.2.6 Environmental Conditions

	25 August 2010
Ambient Temperature	23.1°C
Relative Humidity	56.11%

Product Service

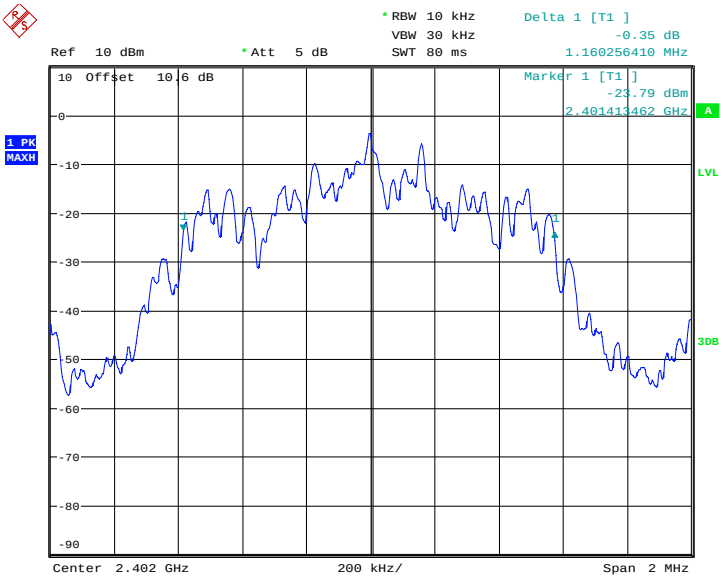
2.2.7 Test Results

12 V DC Supply

Frequency (MHz)	Data Rate (Mbps)	20dB Bandwidth (MHz)
2402	3DH1	1.160256410
	3DH3	1.256410256
	3DH5	1.250000000
2441	3DH1	1.163461538
	3DH3	1.253205128
	3DH5	1.259615385
2480	3DH1	1.160256410
	3DH3	1.256410256
	3DH5	1.256410256

Configuration 4 – Mode 1

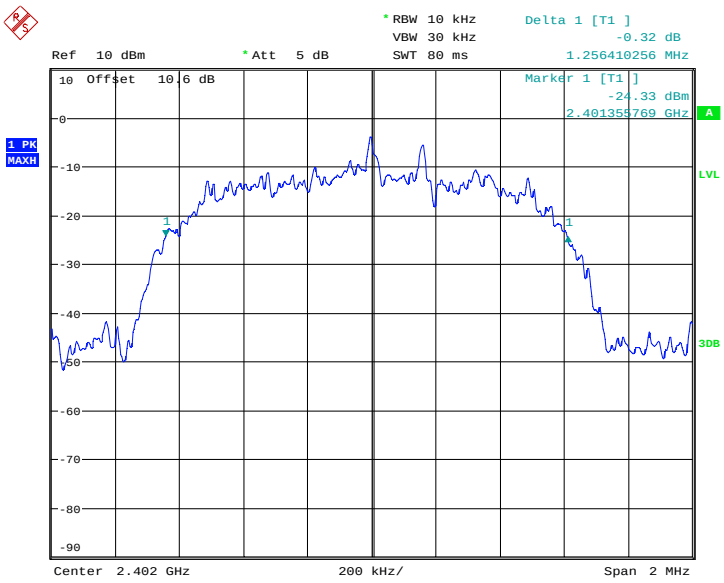
3DH1



Date: 25.AUG.2010 16:28:09

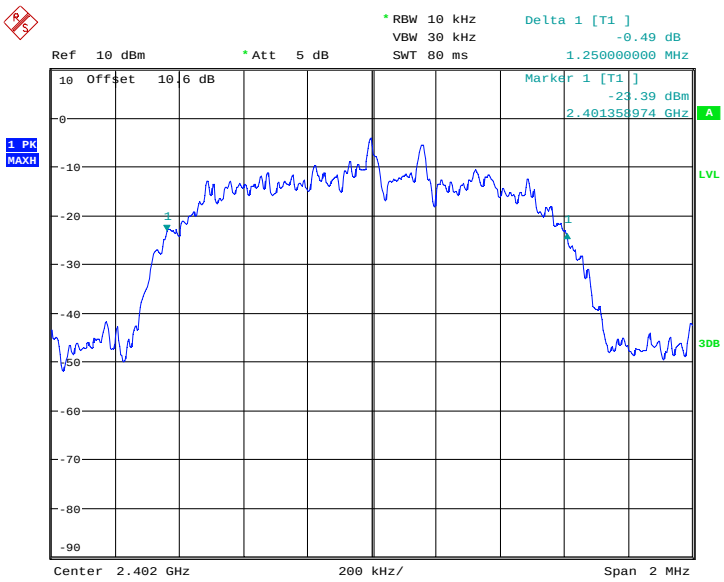
Product Service

3DH3



Date: 25.AUG.2010 16:29:35

3DH5

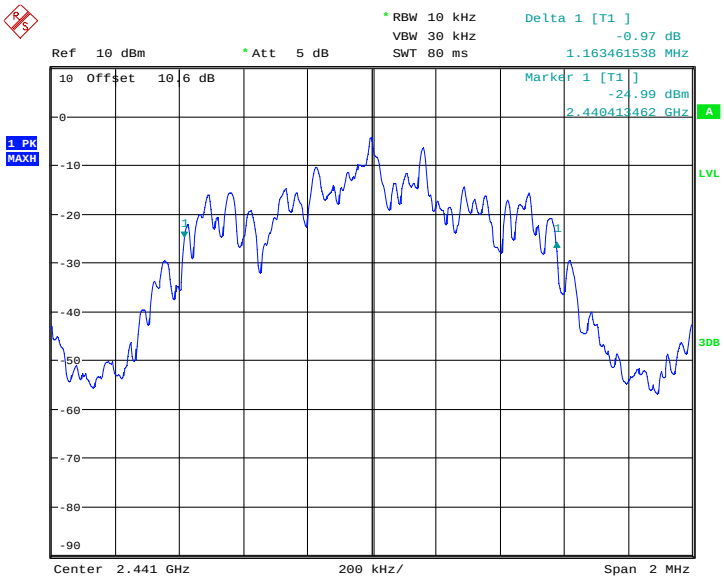


Date: 25.AUG.2010 16:30:50

Product Service

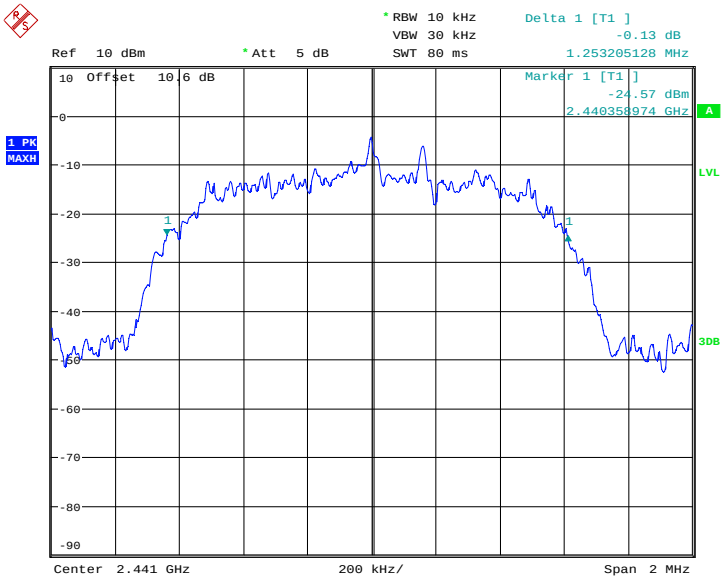
Configuration 4 – Mode 2

3DH1



Date: 25.AUG.2010 16:41:38

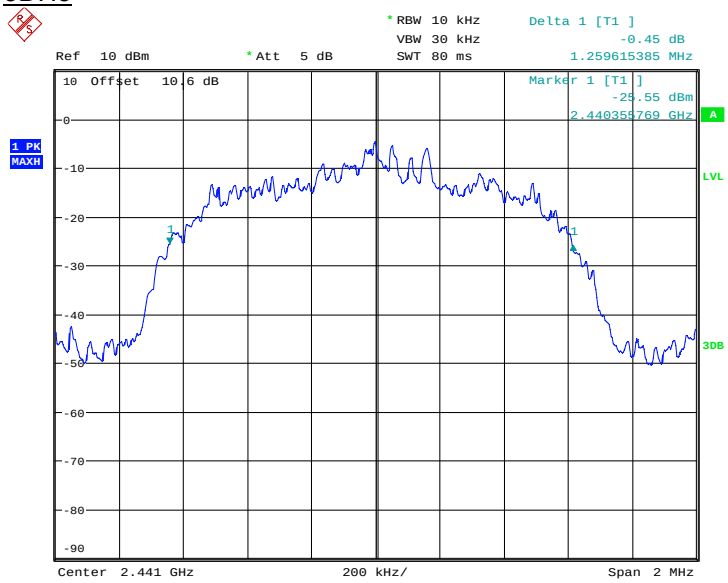
3DH3



Date: 25.AUG.2010 16:39:44

Product Service

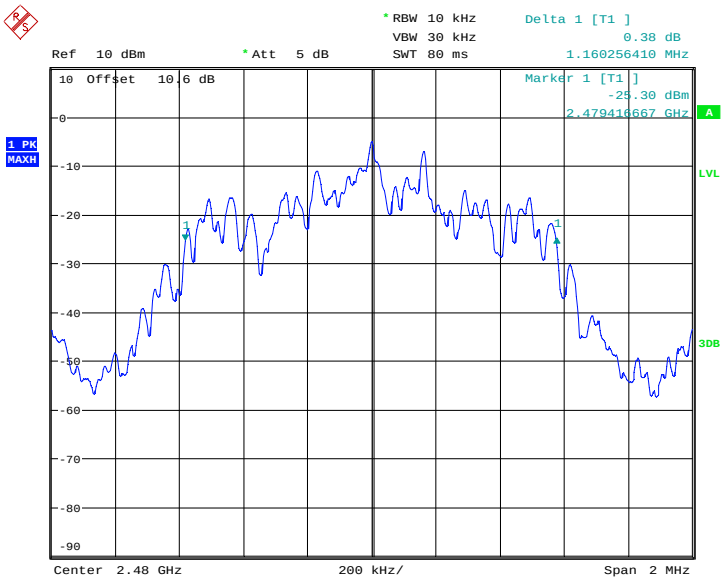
3DH5



Date: 25.AUG.2010 16:34:12

Configuration 4 – Mode 3

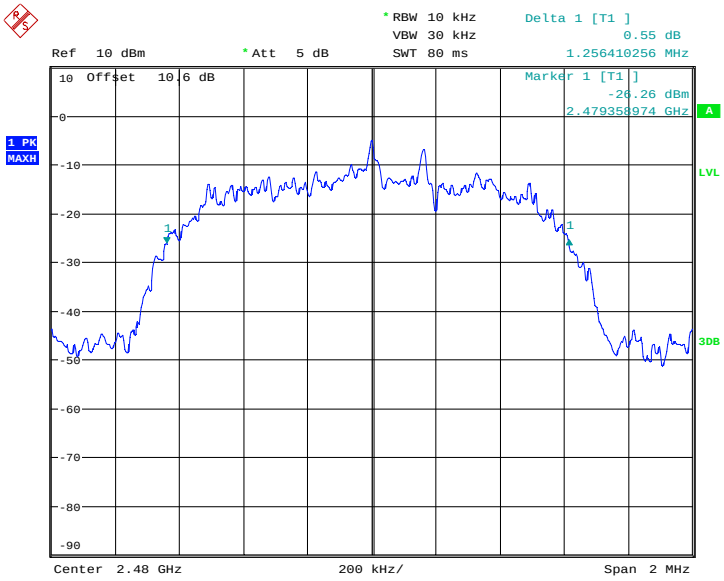
3DH1



Date: 25.AUG.2010 16:43:35

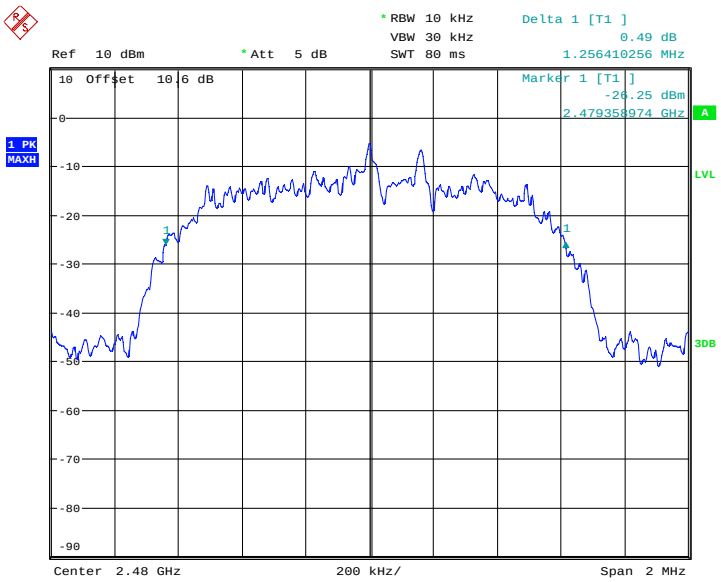
Product Service

3DH3



Date: 25.AUG.2010 16:45:05

3DH5



Date: 25.AUG.2010 16:46:25

Product Service

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

2.3 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.3.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(1)
RSS-210, Clause A8.4(2)

2.3.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTP

2.3.3 Date of Test and Modification State

25 August 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

Test Performed in accordance with FCC CFR 47 Part 15C and RSS-210.

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

Configuration 4 - Mode 1
- Mode 2
- Mode 3

2.3.6 Environmental Conditions

	25 August 2010
Ambient Temperature	21.8°C
Relative Humidity	53.9%

2.3.7 Test Results

12 V DC

Frequency (MHz)	Maximum Peak Conducted Output Power					
	dBm			mW		
	3DH1	3DH3	3DH5	3DH1	3DH3	3DH5
2402	3.83	4.28	4.29	2.42	2.68	2.69
2441	3.36	3.76	3.75	2.17	2.38	2.37
2480	3.10	3.12	3.09	2.04	2.05	2.04

Product Service

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 Watt.

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 watt; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 watt.

Except as provided in section A8.4(5), the e.i.r.p shall not exceed 4 watts.

Product Service

2.4 EIRP PEAK POWER

2.4.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247
RSS-210, Clause A8.4

2.4.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTX

2.4.3 Date of Test and Modification State

26 June to 02 July 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 ANSI C63.4.

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

Configuration 2 - Mode 1
- Mode 2
- Mode 3

Configuration 3 - Mode 2 (Limited testing Middle Channel only)

2.4.6 Environmental Conditions

	26 June 2010	02 July 2010
Ambient Temperature	25.1°C	24°C
Relative Humidity	32.0%	40%
Atmospheric Pressure	1013mbar	1012mbar

Product Service

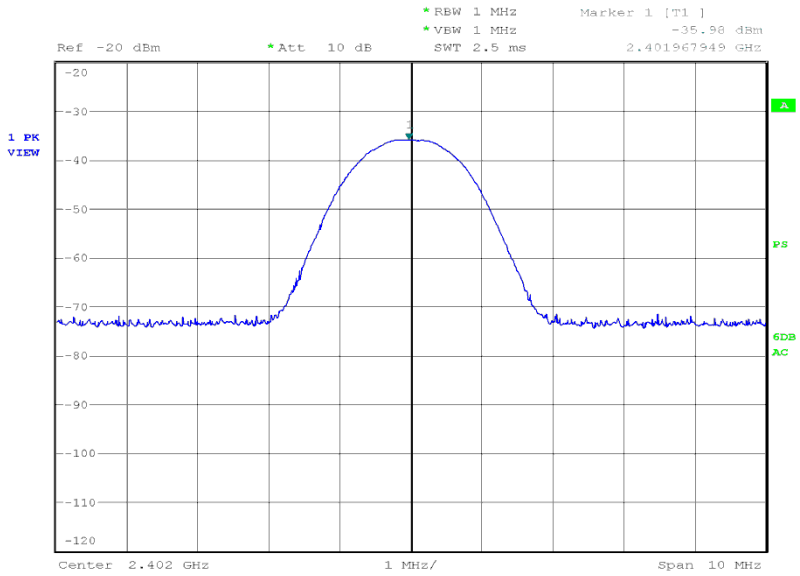
2.4.7 Test Results

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

The test results are shown below.

Configuration 2 - Mode 1

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.402	7.2	36.0	5.3	4000

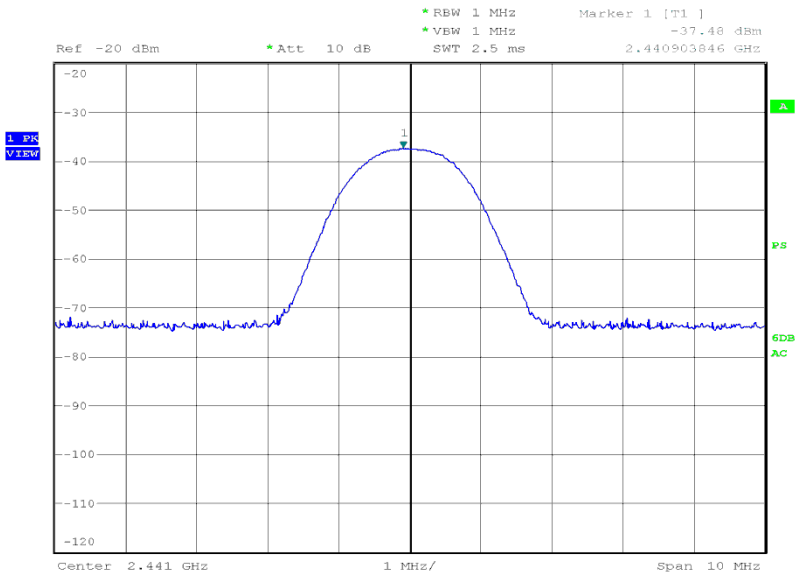


Date: 2.JUL.2010 22:42:31

Product Service

Configuration 2 - Mode 2

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.441	7.4	36.0	5.5	4000

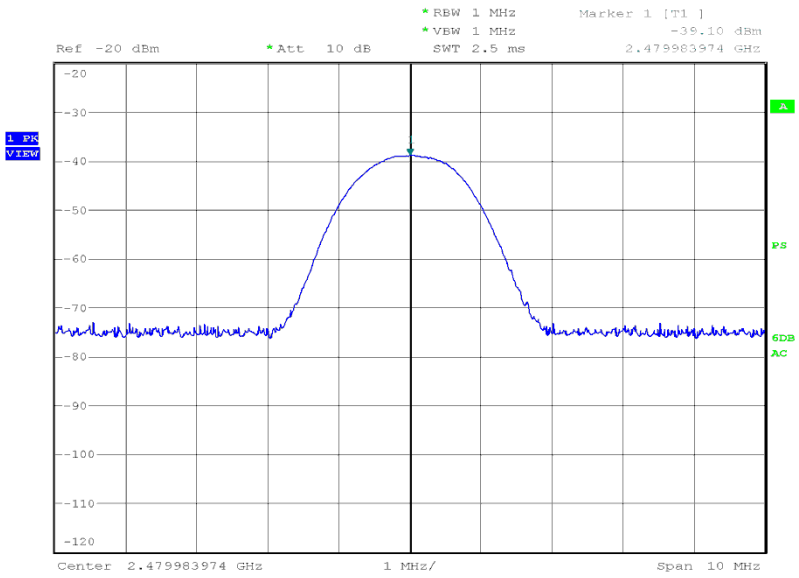


Date: 2.JUL.2010 22:15:02

Product Service

Configuration 2 - Mode 3

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.480	7.6	36.0	5.75	4000

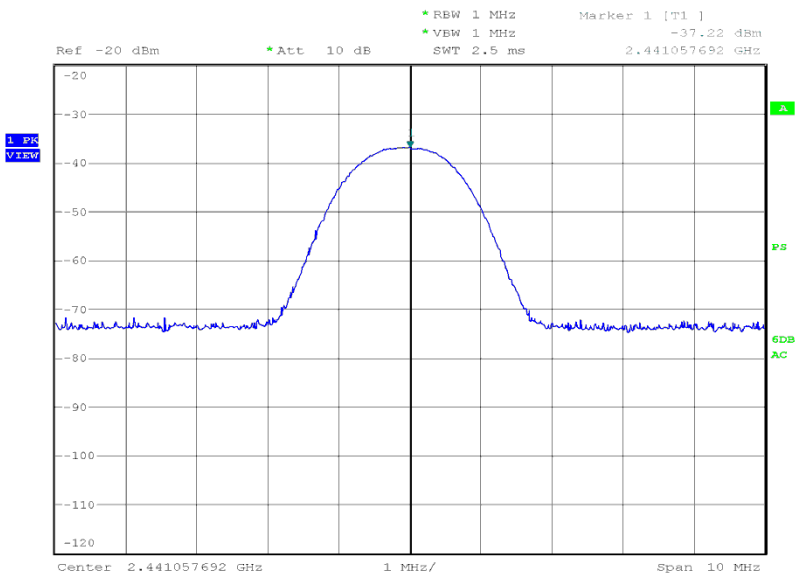


Date: 2.JUL.2010 21:47:57

Product Service

Configuration 3 - Mode 2

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.441	7.5	36.0	5.6	4000



Date: 27.JUN.2010 04:31:28

Product Service

2.5 SPURIOUS EMISSIONS

2.5.1 Specification Reference

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

2.5.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTP

2.5.3 Date of Test and Modification State

27 August 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

Test Performed in accordance with FCC CFR 47 Part 15C and RSS-210.

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 4 - Mode 2

2.5.6 Environmental Conditions

	27 August 2010
Ambient Temperature	23.2°C
Relative Humidity	49.0%

Product Service

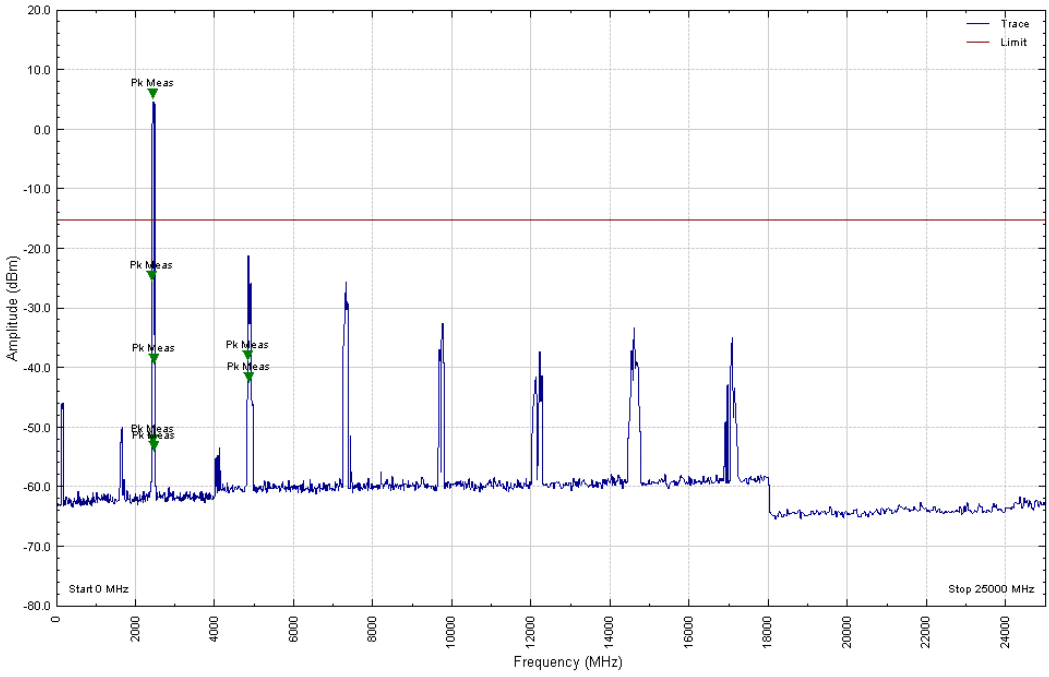
2.5.7 Test Results

12 V DC Supply

Configuration 4 – Mode 2

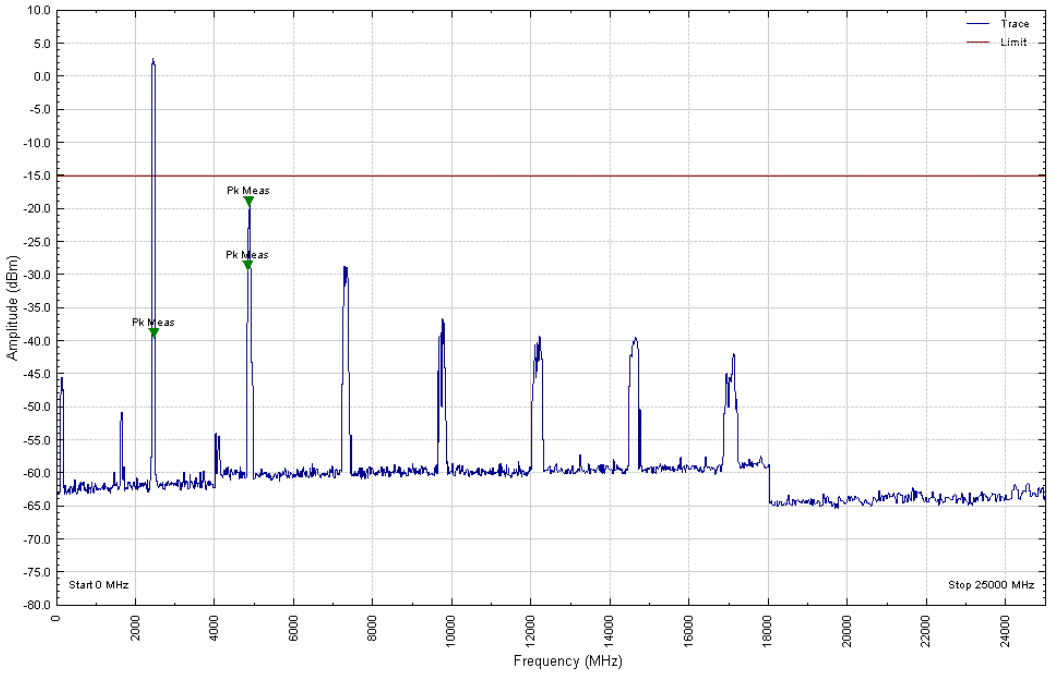
3DH1

9kHz to 25GHz



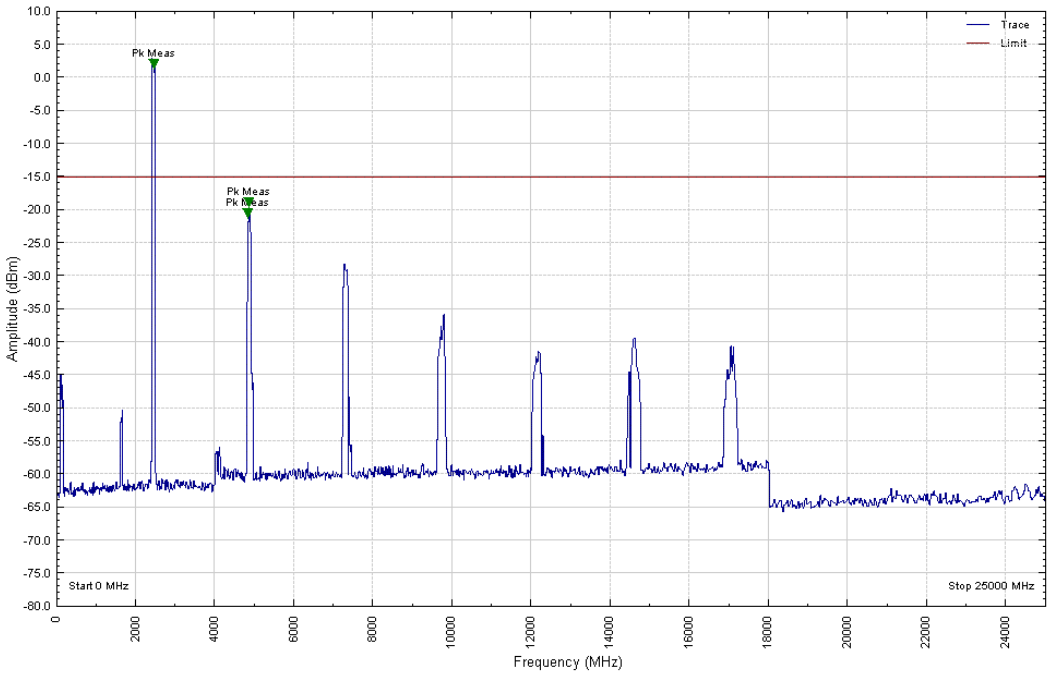
3DH3

9kHz to 25GHz



3DH5

9kHz to 25GHz



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 the RMS averaging over a time interval the attenuation required shall be 30 dB instead of 20 dB.

Product Service

2.6 BAND EDGE EMISSIONS

2.6.1 Specification Reference

FCC CFR 47 Part 15C. Clause 15.247

2.6.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTX

2.6.3 Date of Test and Modification State

02 July 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.

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

Configuration 2 - Mode 1
- Mode 3

2.6.6 Environmental Conditions

	02 July 2010
Ambient Temperature	24°C
Relative Humidity	40%
Atmospheric Pressure	1012mbar

Product Service

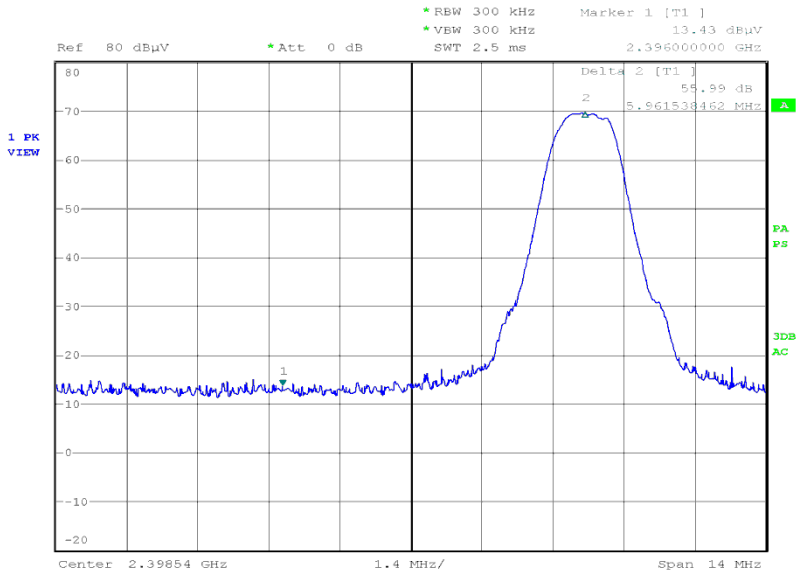
2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Band Edge Emissions.

The test results are shown below.

Configuration 2 - Mode 1

Freq in GHz	Pol	Peak dBuV/m	Average dBuV/m	Delta Difference	Final Peak dBuV/m	Final Peak Limit dBuV/m	Final Average dBuV/m	Final Average Limit dBuV/m
2.402	H	107.55	102.96	55.99	51.56	74.0	46.97	54.0

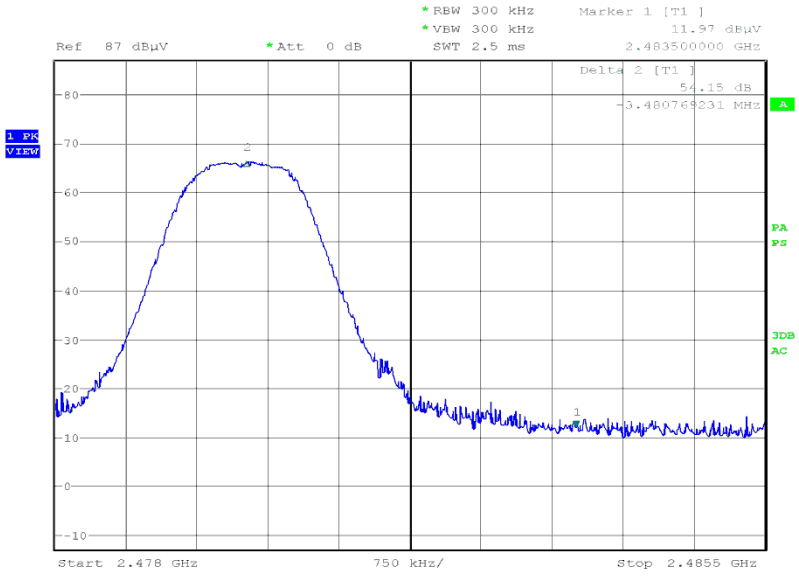


Date: 2.JUL.2010 22:59:40

Product Service

Configuration 2 - Mode 3

Freq in GHz	Pol	Peak dBuV/m	Average dBuV/m	Delta Difference	Final Peak dBuV/m	Final Peak Limit dBuV/m	Final Average dBuV/m	Final Average Limit dBuV/m
2.480	H	103.87	100.78	54.15	49.72	74.0	46.63	54.0



Product Service

2.7 CHANNEL DWELL TIME

2.7.1 Specification Reference

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

2.7.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTP

2.7.3 Date of Test and Modification State

25 August 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

Test Performed in accordance with FCC CFR 47 Part 15C and RSS-210.

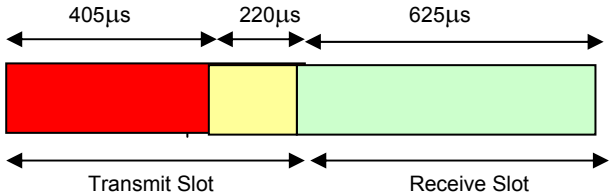
The Bluetooth system hops at a rate of 1600 times per second. Thus, this equates to 1600 timeslots in 1 second.

The 3DH1 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:

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

In 1 transmit timeslot, 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.



3DH1 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle

So, with 800 Tx and 800 Rx timelsots, the transmitter is on for 800 x 405μs = 0.324 seconds.

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

So, in 31.6 seconds, the transmitter dwell time per channel is:

31.6 x 4.05ms = 0.12798 seconds

Product Service

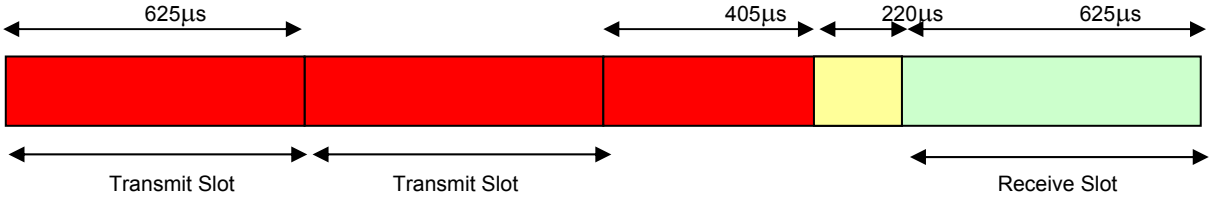
With data rate 3DH3, the data payload is higher and can use up to 3 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 3 slots, (ie. no receive slot in-between the 3 transmit slots). The 220μs off time for synthesizer re-tuning at the end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

The 3DH3 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:

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

The first 2 Transmit timeslots are transmitting for the complete 625μs. In the third 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.



3DH3 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:

Tx (2 x 625μs) + (1 x 405μs) = 1.655ms

So:

800 x 625μs = 0.5 seconds
400 x 405μs = 0.162 seconds

Thus: 0.5 + 0.162 = 0.662 seconds

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

So, in 31.6 seconds, the transmitter dwell time per channel is:

31.6 x 8.275ms = 0.26149 seconds

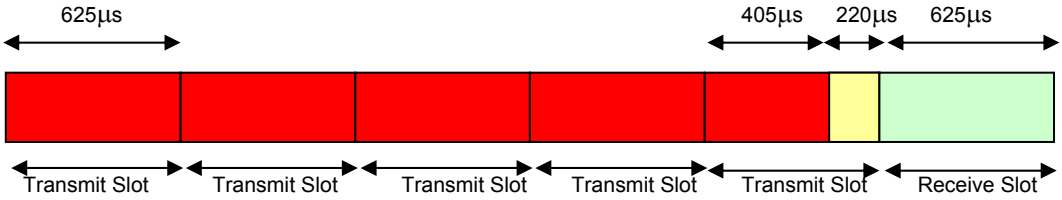
With data rate 3DH5, the data payload is higher and can use up to 5 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 5 slots, (ie. no receive slot in-between the 5 transmit slots). The 220μs off time for synthesizer re-tuning at the end 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 3DH5 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:

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

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:

Tx (2 x 625μs) + (1 x 405μs) = 2.905ms

So:

1066.7 x 625μs = 0.666 seconds
266.7 x 405μs = 0.108 seconds

Thus: 0.666 + 0.108 = 0.774 seconds

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

So, in 31.6 seconds, the transmitter dwell time per channel is:

32 x 9.675ms = 0.3096 seconds

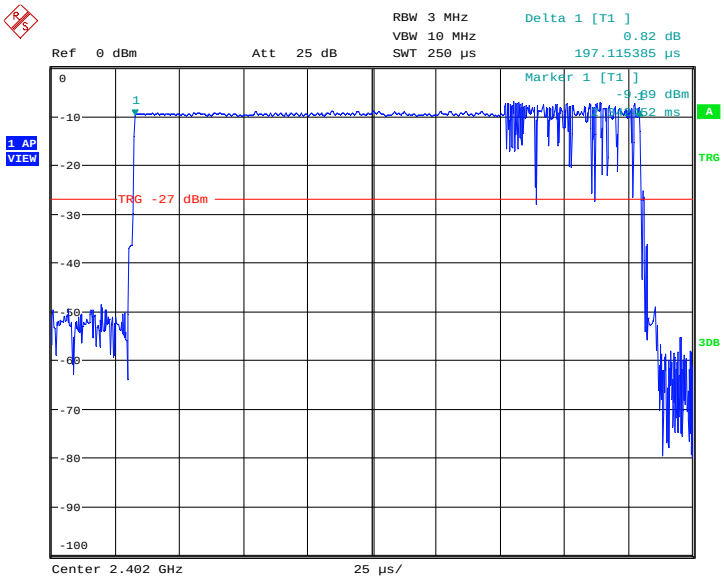
2.7.6 Environmental Conditions

	25 August 2010
Ambient Temperature	21.8°C
Relative Humidity	56.7%

Product Service

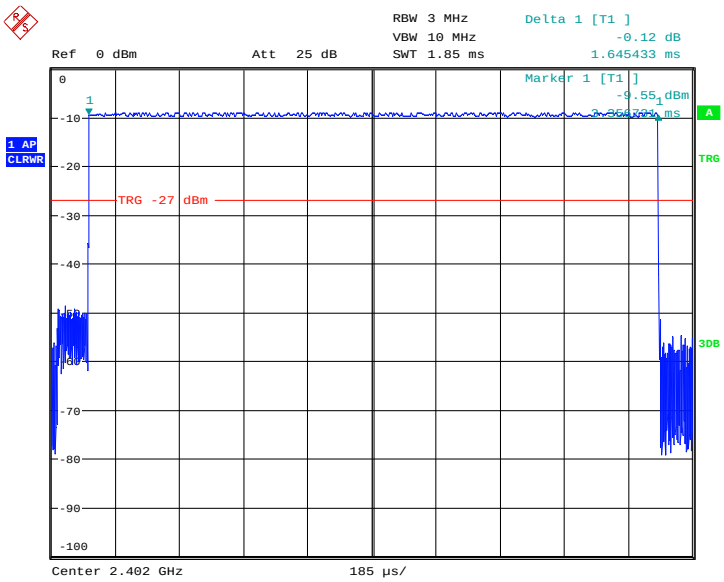
2.7.7 Test Results

3DH1



Date: 25.AUG.2010 12:37:14

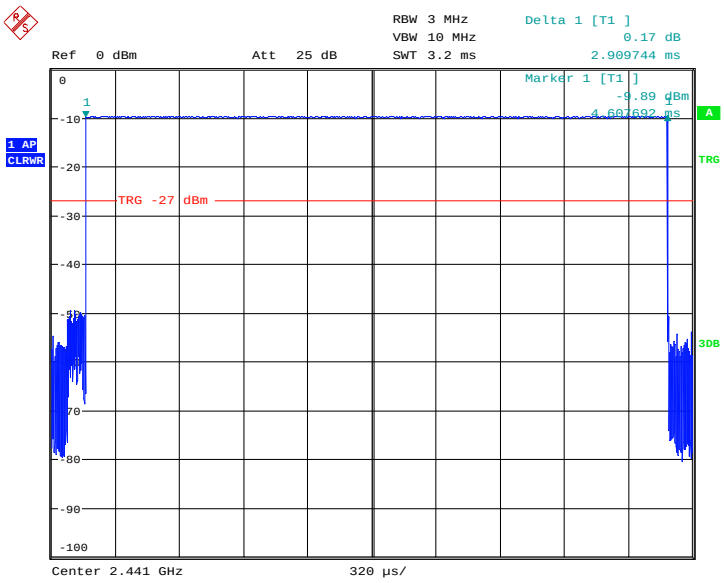
3DH3



Date: 25.AUG.2010 12:39:37

Product Service

3DH5



Date: 25.AUG.2010 14:36:12

Limit Clause

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

Frequency hopping systems operating in the band 240-2483.5 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 suppressed provided that a minimum of 15 hopping channels are used.

Product Service

2.8 CHANNEL SEPARATION

2.8.1 Specification Reference

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

2.8.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTP

2.8.3 Date of Test and Modification State

31 August 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

Test Performed in accordance with FCC CFR 47 Part 15C 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 4 - Mode 2

2.8.6 Environmental Conditions

	31 August 2010
Ambient Temperature	21.7°C
Relative Humidity	55.3%

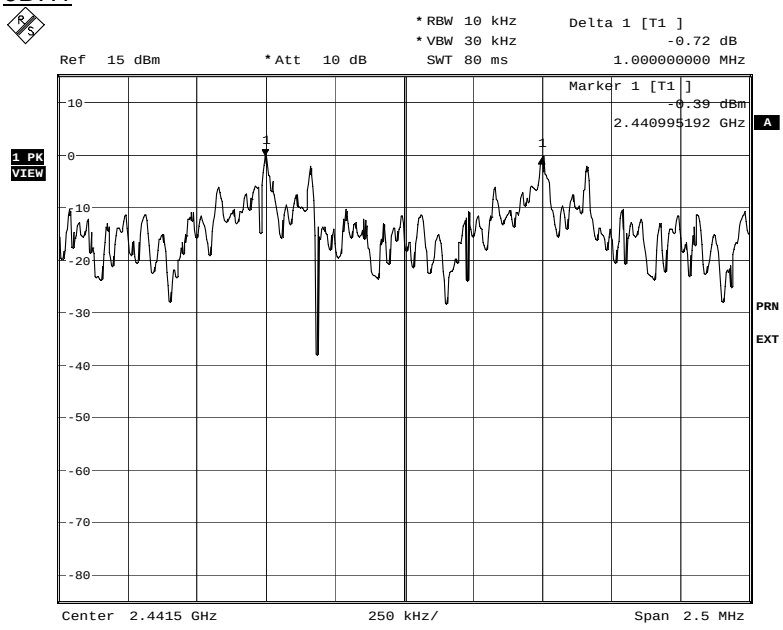
Product Service

2.8.7 Test Results

12 V DC Supply

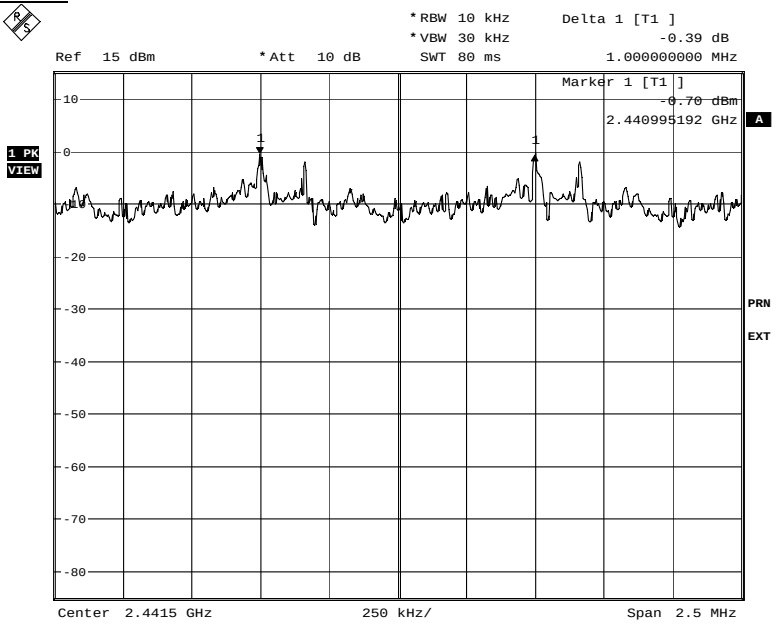
Configuration 4 – Mode 2

3DH1



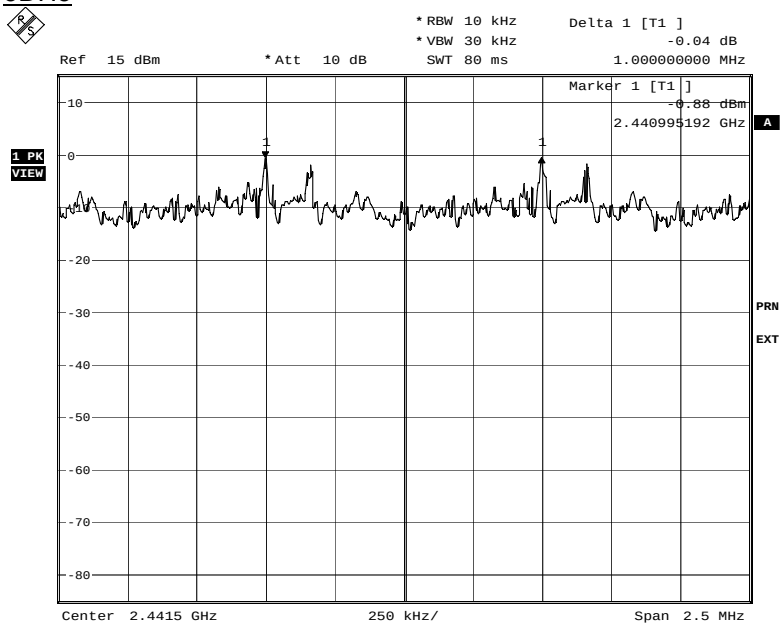
Date: 31.AUG.2010 12:11:22

3DH3



Date: 31.AUG.2010 12:06:09

3DH5



Date: 31.AUG.2010 11:59:26

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 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 synchronisation with the transmitted signals.

Product Service

2.9 NUMBER OF HOPPING CHANNELS

2.9.1 Specification Reference

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

2.9.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTP

2.9.3 Date of Test and Modification State

01 July 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

Test Performed in accordance with FCC CFR 47 Part 15C 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. 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 4 - Mode 4

2.9.6 Environmental Conditions

	01 July 2010
Ambient Temperature	20.1°C
Relative Humidity	56.8%

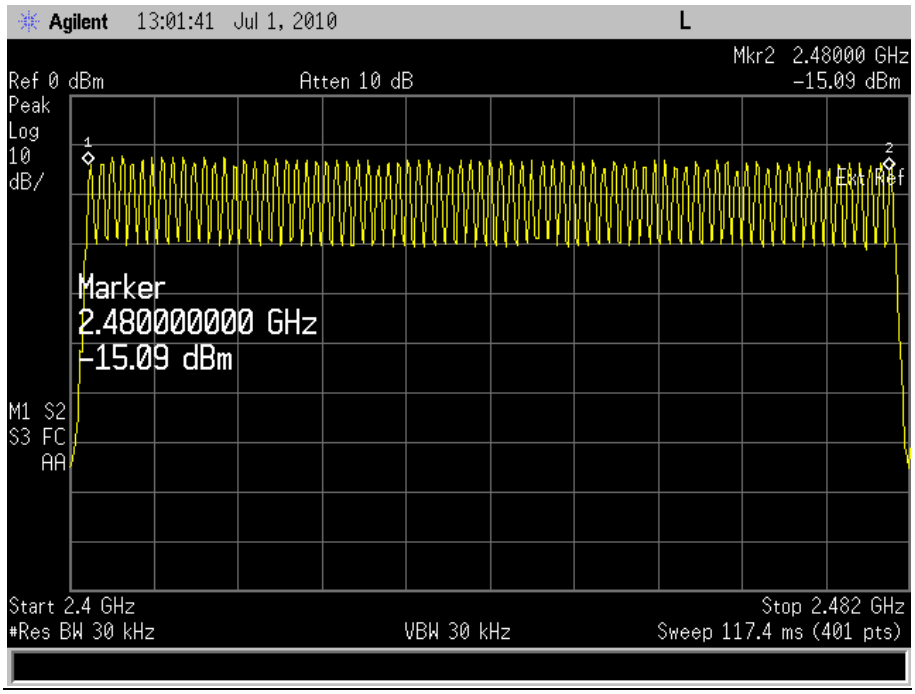
Product Service

2.9.7 Test Results

12 V DC Supply

Configuration 4 – Mode 4

0 to 79



Limit Clause

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

Limit	≥15 channels

2.10 RADIATED EMISSIONS (ENCLOSURE PORT)

2.10.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.205,15.209, 15.247
RSS-210, Clause 2.2

2.10.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTX

2.10.3 Date of Test and Modification State

24 June to 08 July 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 ANSI C63.4.

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

Configuration 1 - Mode 2 (Limited testing 30MHz to 1GHz)
Configuration 2 - Mode 1
- Mode 2
- Mode 3
Configuration 3 - Mode 2 (Limited testing 30MHz to 25GHz Middle Channel only)

2.10.6 Environmental Conditions

	24 June 2010	26 June 2010	02 July 2010
Ambient Temperature	21.3°C	20 - 26.0°C	22 - 24°C
Relative Humidity	36%	30.0 - 34%	40 - 48%
Atmospheric Pressure	1015mbar	1012 - 1023mbar	1009 - 1012mbar

	08 July 2010
Ambient Temperature	25.0°C
Relative Humidity	37.0%
Atmospheric Pressure	1014mbar

Product Service

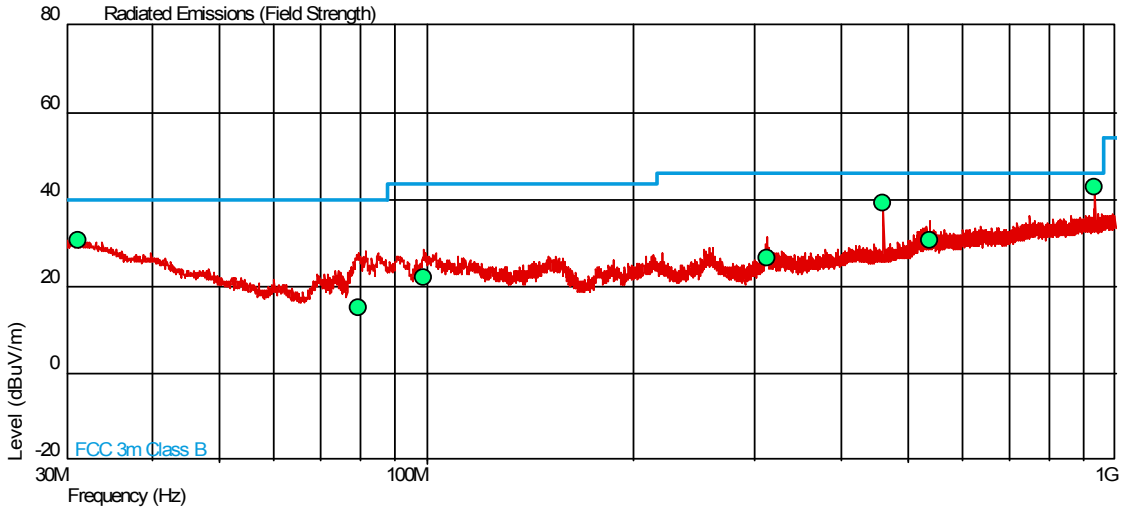
2.10.7 Test Results

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

The test results are shown below.

Configuration 1 - Mode 2

30MHz to 1GHz

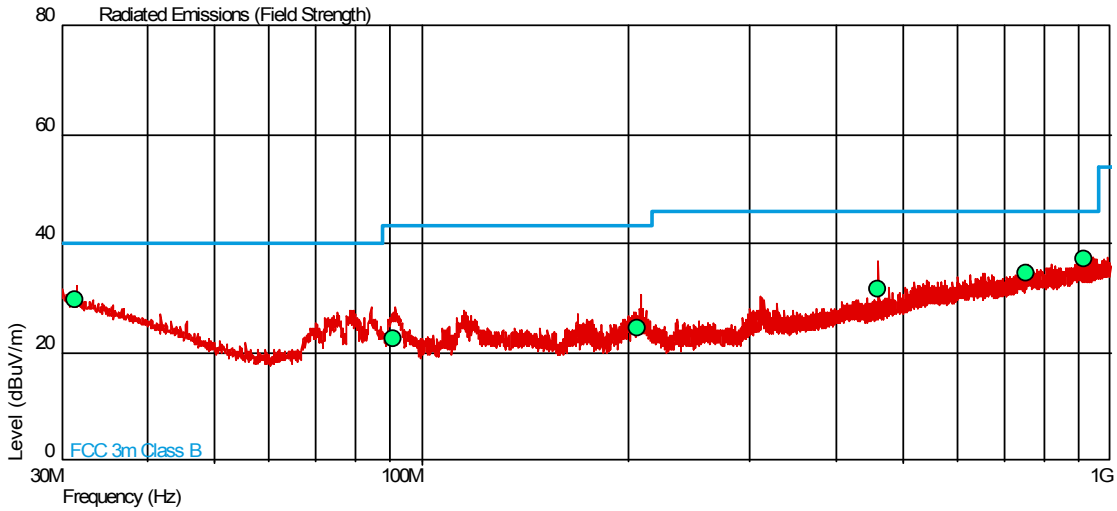


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
31.261	30.7	34.3	40.0	100	-9.3	-65.7	3	3.74	Horizontal
79.563	15.2	5.8	40.0	100	-24.8	-94.2	115	1.00	Vertical
99.203	22.0	12.6	43.5	150	-21.5	-137.4	4	1.00	Vertical
312.410	26.5	21.1	46.0	200	-19.5	-178.9	71	1.00	Vertical
460.632	39.1	90.2	46.0	200	-6.9	-109.8	275	1.00	Vertical
538.661	30.4	33.1	46.0	200	-15.6	-166.9	320	1.00	Vertical

Product Service

Configuration 2 - Mode 1

30MHz to 1GHz



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
31.363	29.9	31.3	40.0	100	-10.1	-68.7	78	1.00	Horizontal
90.954	22.7	13.7	43.5	150	-20.8	-136.3	292	1.00	Vertical
205.177	24.5	16.8	43.5	150	-19.0	-133.2	296	1.00	Vertical
460.642	31.7	38.5	46.0	200	-14.3	-161.5	343	1.86	Vertical
756.077	34.5	53.1	46.0	200	-11.5	-146.9	108	1.00	Vertical
913.782	37.1	71.6	46.0	200	-8.9	-128.4	98	1.00	Horizontal

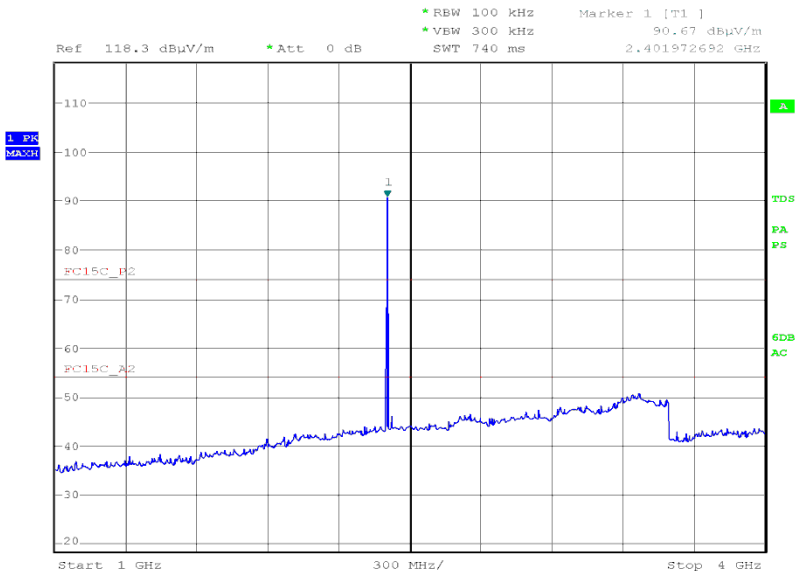
1GHz to 25GHz

Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Average dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m
4.804	H	119	343	55.0	46.98	74.0	54.0

Product Service

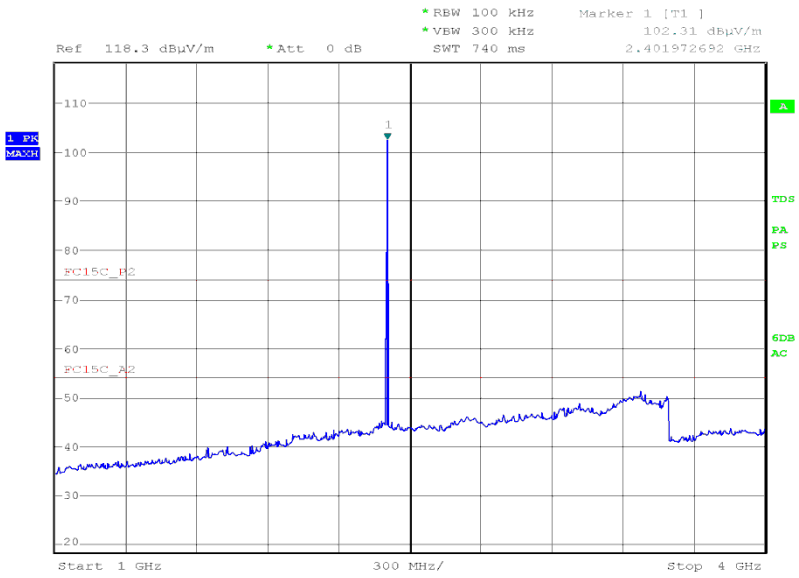
1GHz to 4GHz

Vertical Polarity



Date: 2.JUL.2010 23:37:29

Horizontal Polarity

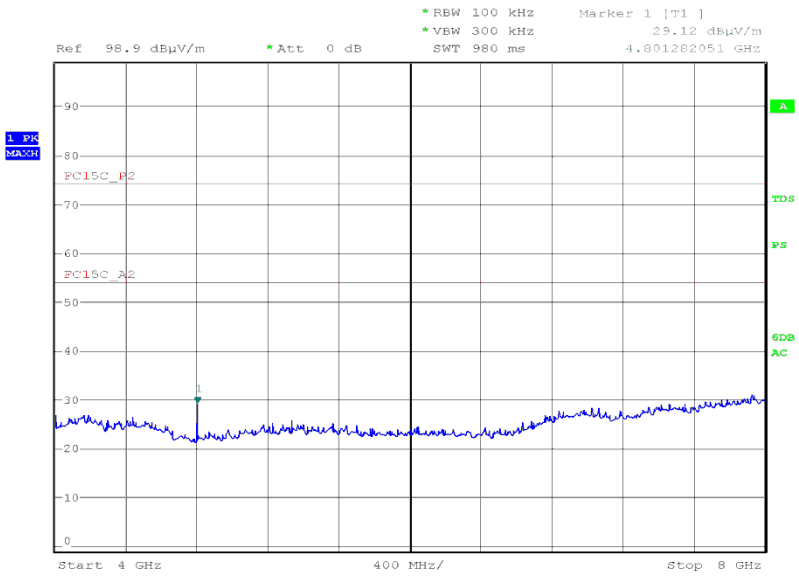


Date: 2.JUL.2010 23:28:49

Product Service

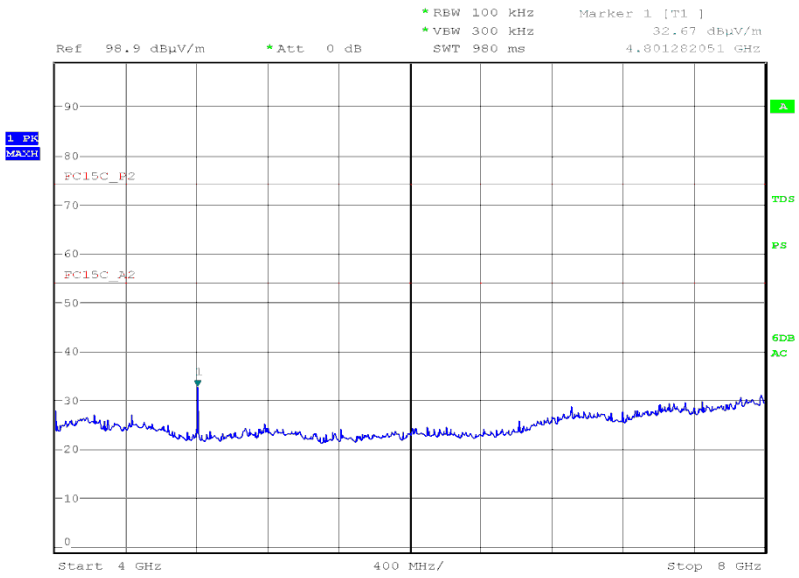
4GHz to 8GHz

Vertical Polarity



Date: 3.JUL.2010 01:11:11

Horizontal Polarity

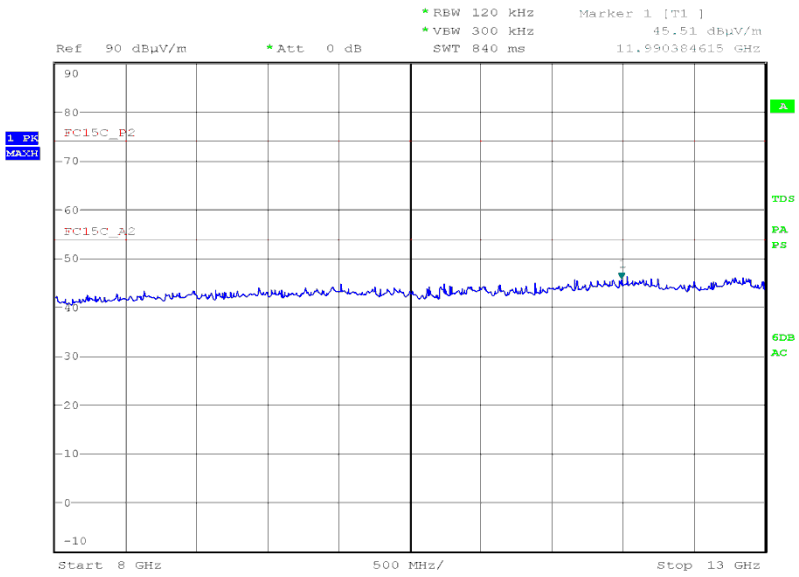


Date: 3.JUL.2010 01:13:22

Product Service

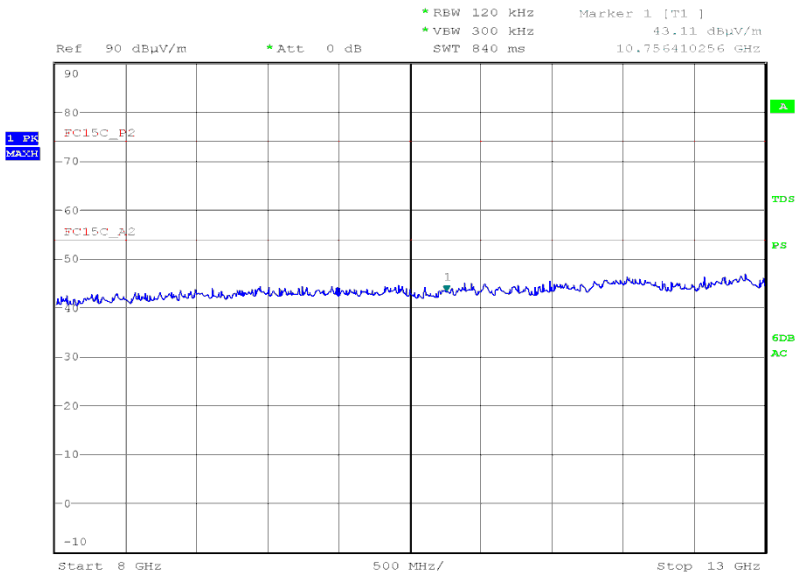
8GHz to 13GHz

Vertical Polarity



Date: 3.JUL.2010 04:21:58

Horizontal Polarity

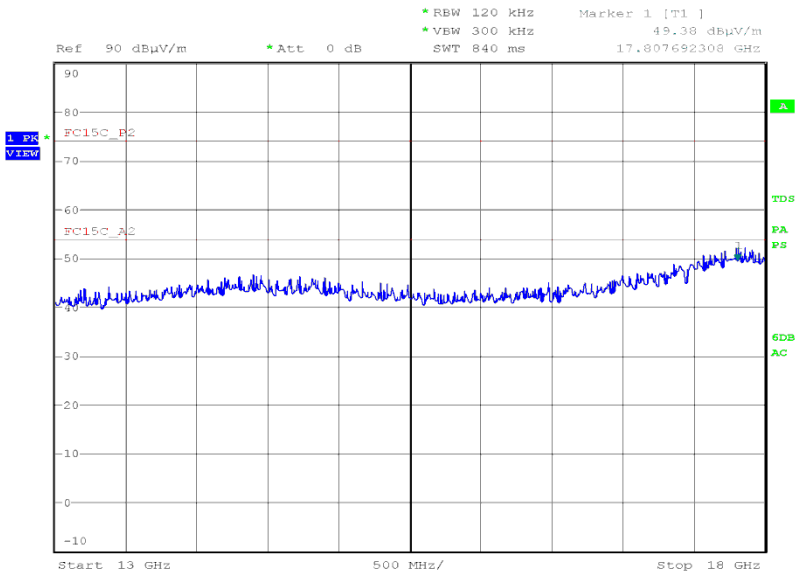


Date: 3.JUL.2010 04:03:43

Product Service

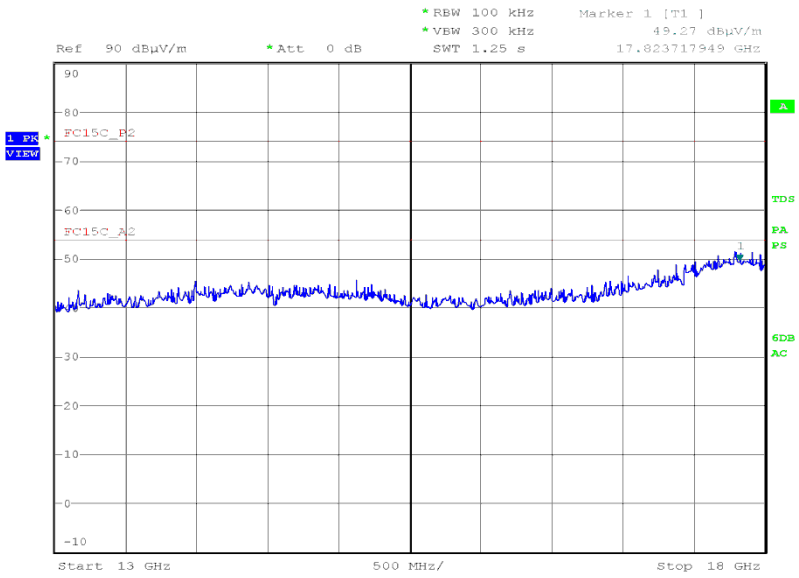
13GHz to 18GHz

Vertical Polarity



Date: 3.JUL.2010 04:17:50

Horizontal Polarity

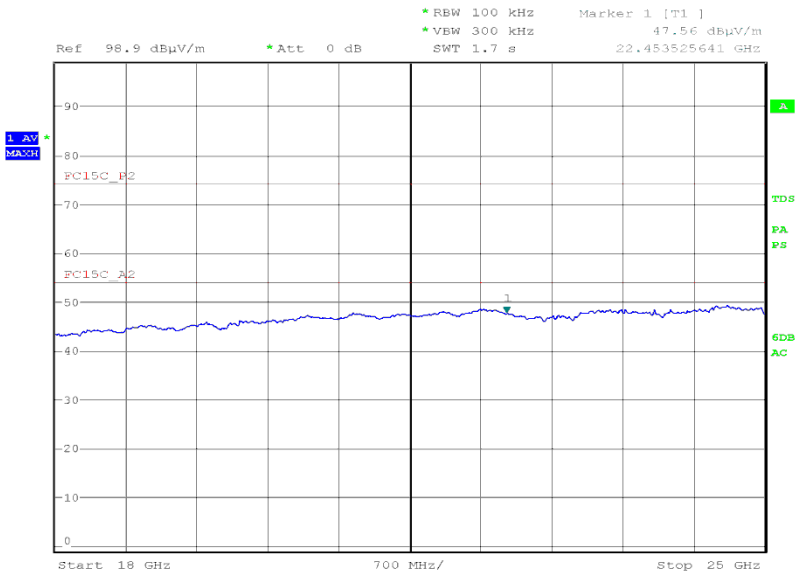


Date: 3.JUL.2010 04:08:48

Product Service

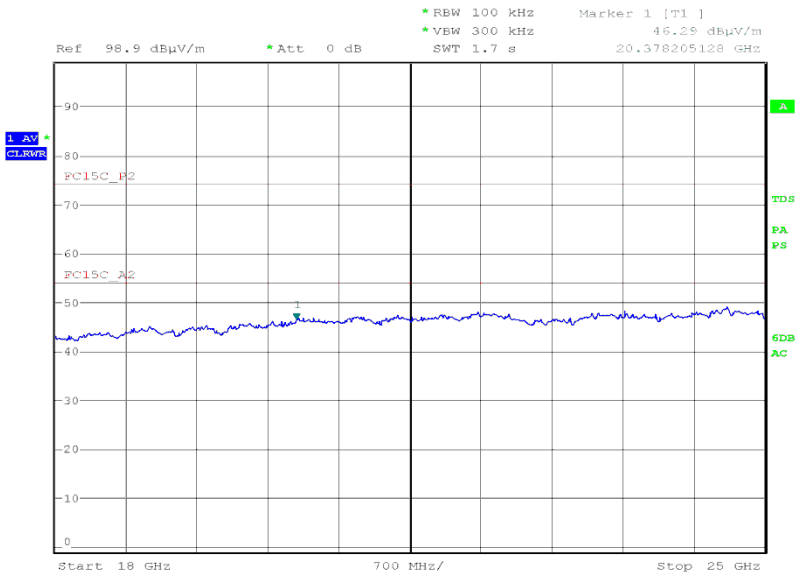
18GHz to 25GHz

Vertical Polarity



Date: 3.JUL.2010 05:46:23

Horizontal Polarity

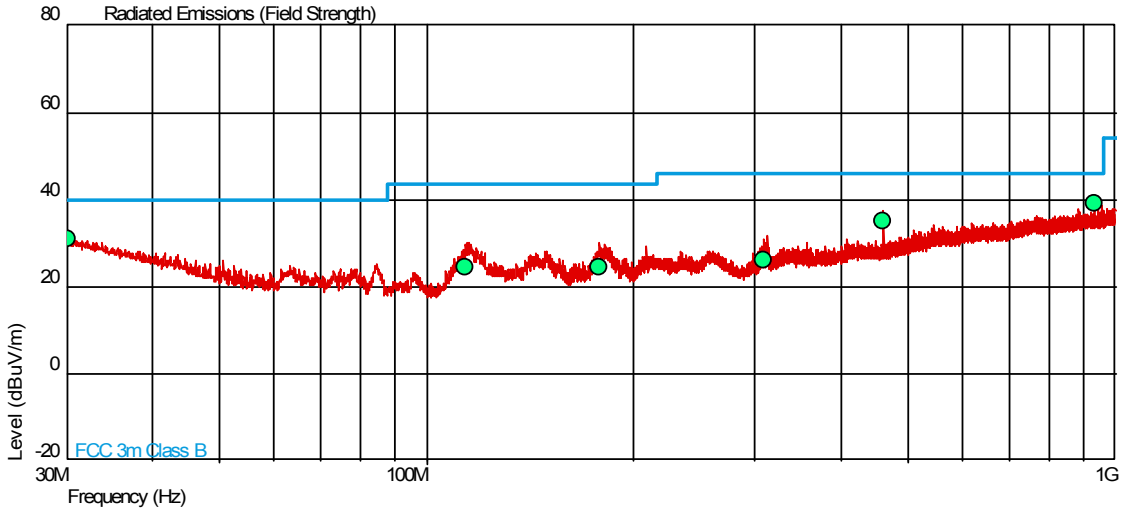


Date: 3.JUL.2010 05:42:31

Product Service

Configuration 2 - Mode 2

30MHz to 1GHz



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
30.050	31.2	36.3	40.0	100	-8.8	-63.7	45	1.00	Vertical
113.813	24.7	17.2	43.5	150	-18.8	-132.8	82	1.00	Vertical
177.942	24.4	16.6	43.5	150	-19.1	-133.4	104	1.00	Vertical
309.385	26.0	20.0	46.0	200	-20.0	-180.0	283	1.00	Horizontal
460.632	35.2	57.5	46.0	200	-10.8	-142.5	67	1.00	Vertical

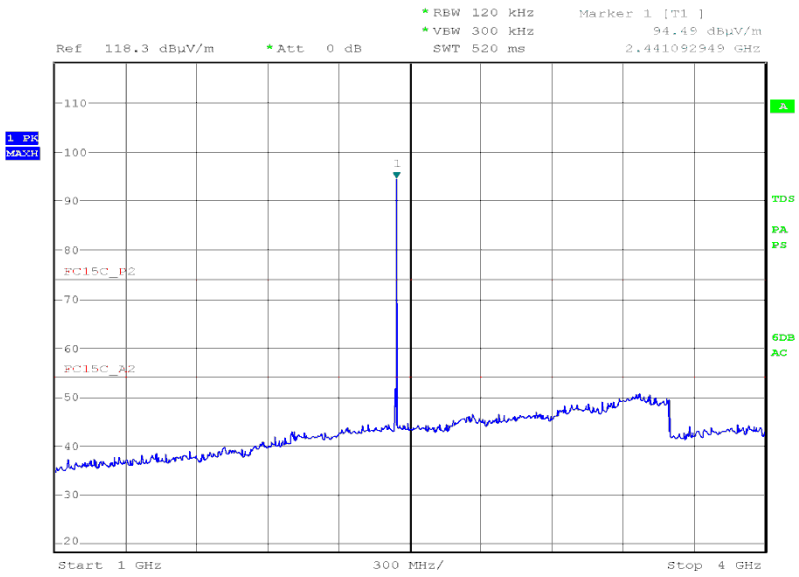
1GHz to 25GHz

Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Average dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m
4.882	V	142	39	52.54	44.39	74.0	54.0
4.882	H	110	232	54.02	46.78	74.0	54.0

Product Service

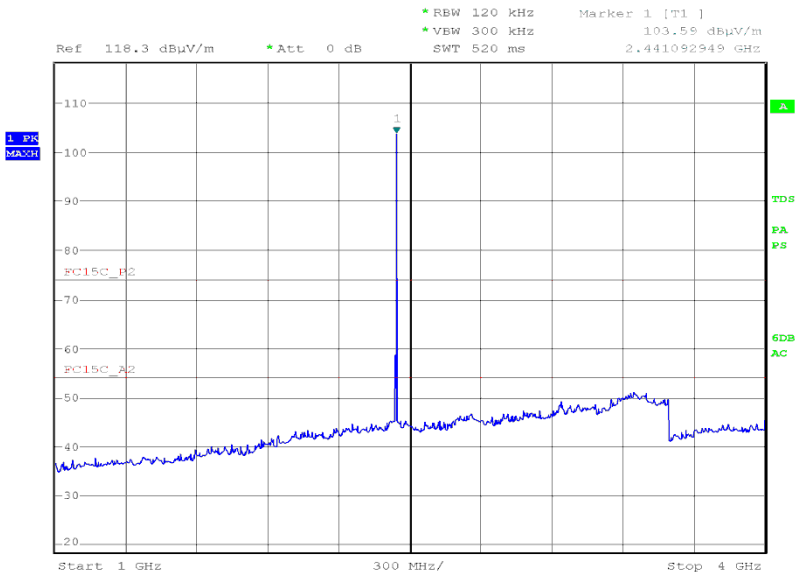
1GHz to 4GHz

Vertical Polarity



Date: 27.JUN.2010 00:24:11

Horizontal Polarity

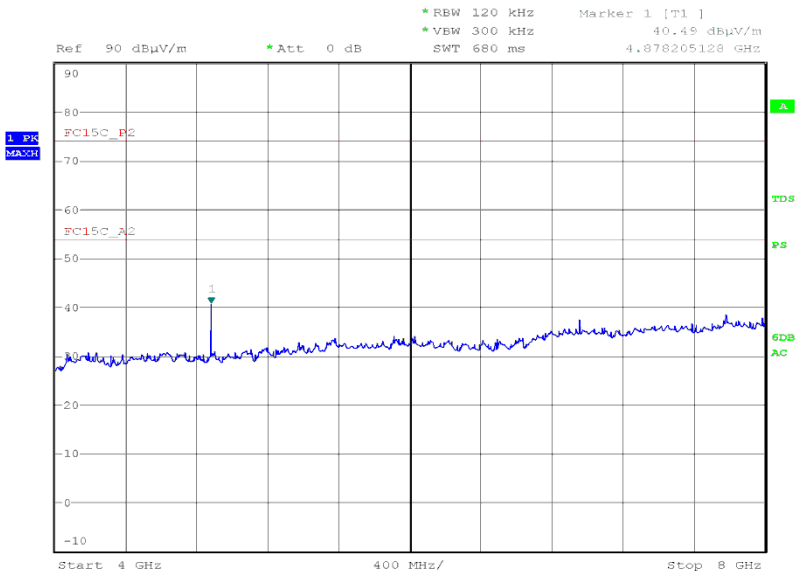


Date: 27.JUN.2010 00:22:28

Product Service

4GHz to 8GHz

Vertical Polarity



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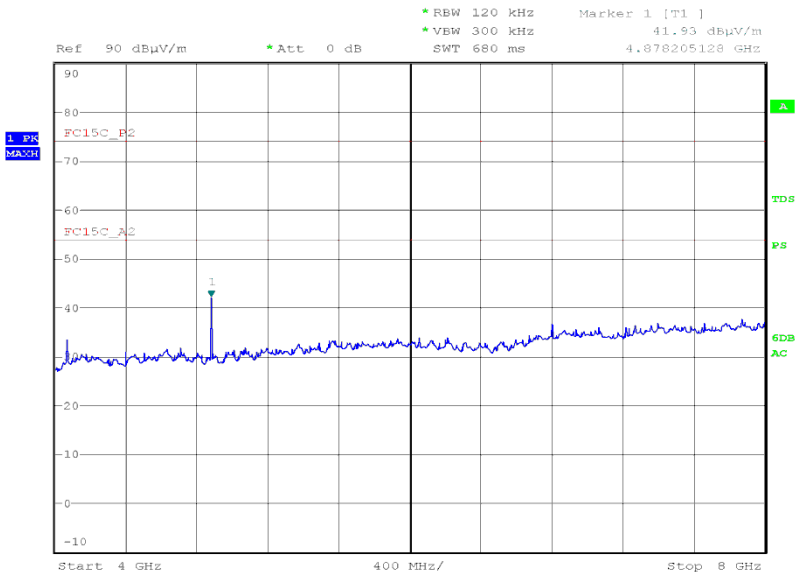
Horizontal Polarity

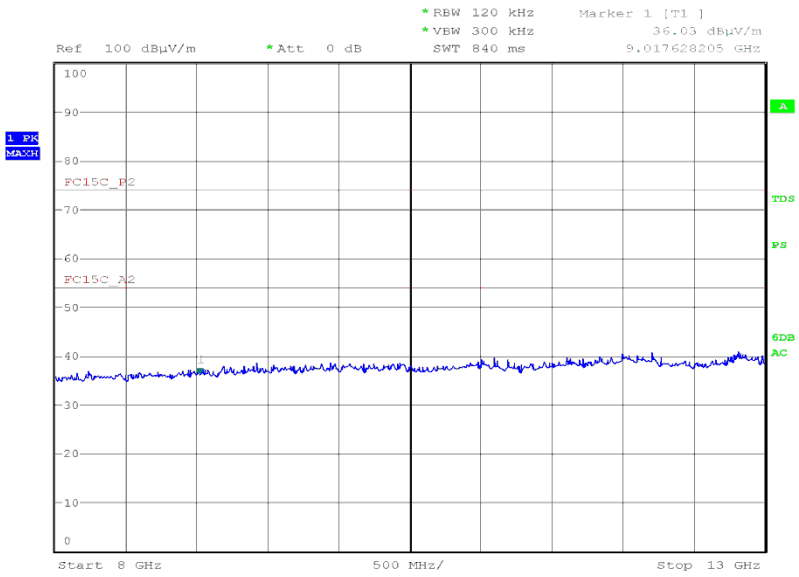


Date: 27.JUN.2010 00:33:39

Product Service

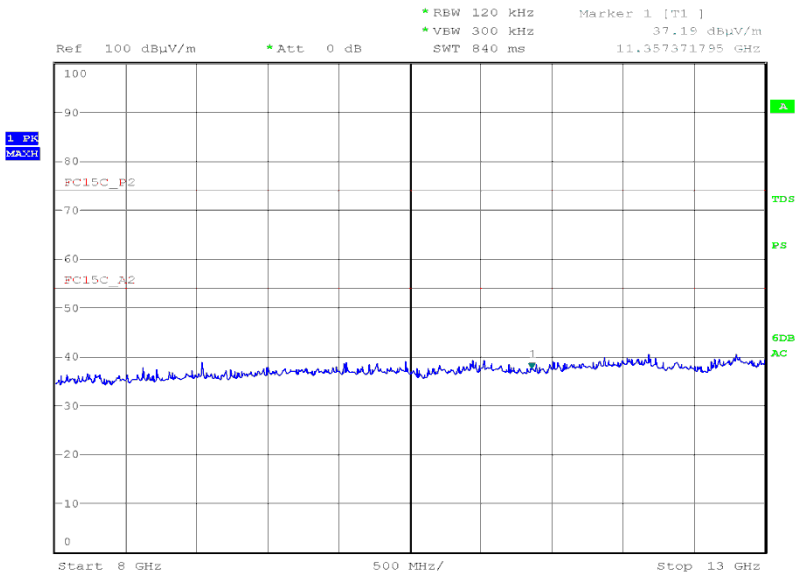
8GHz to 13GHz

Vertical Polarity



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

Horizontal Polarity

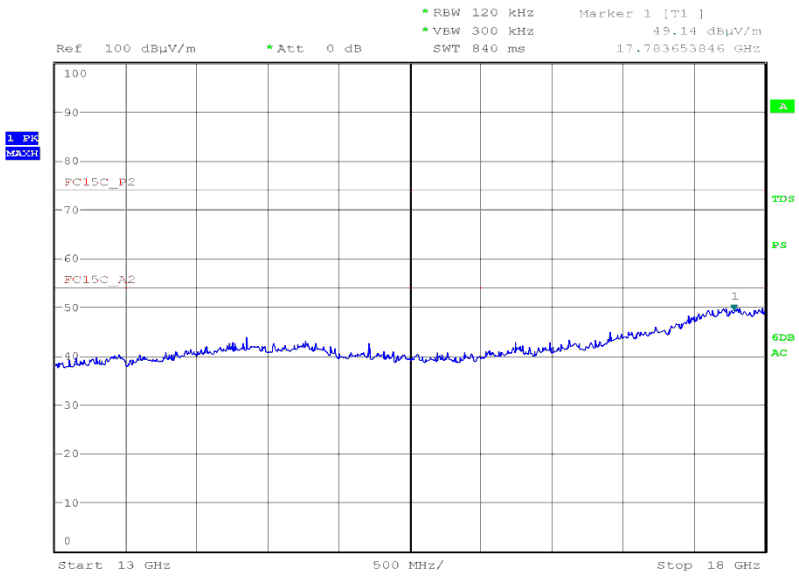


Date: 27.JUN.2010 01:33:19

Product Service

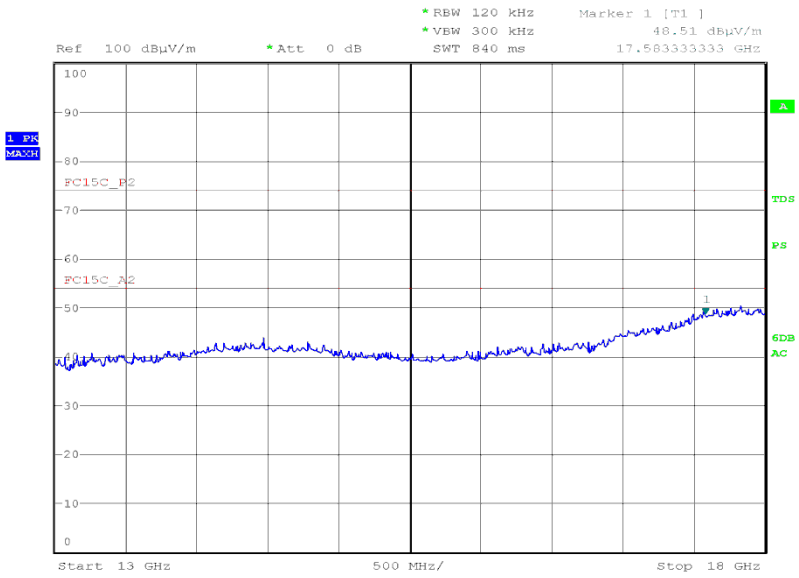
13GHz to 18GHz

Vertical Polarity



Date: 27.JUN.2010 01:30:11

Horizontal Polarity



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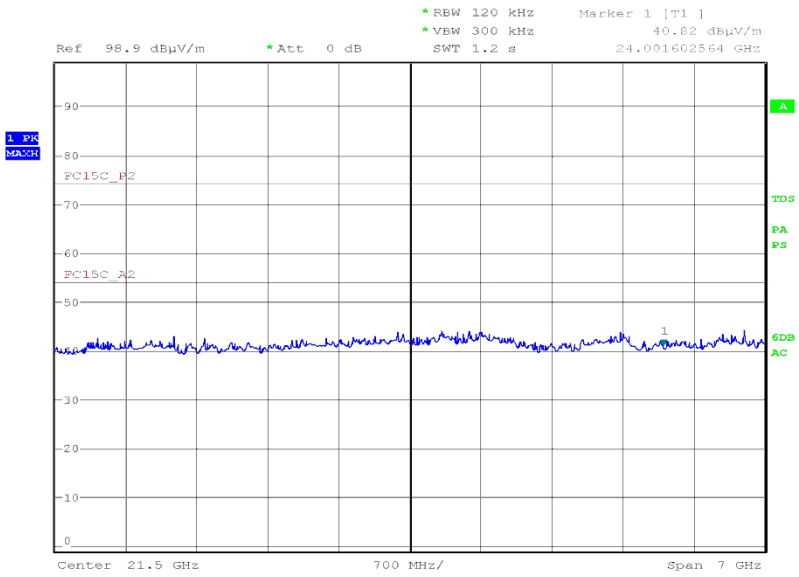
Product Service

18GHz to 25GHz

Vertical Polarity



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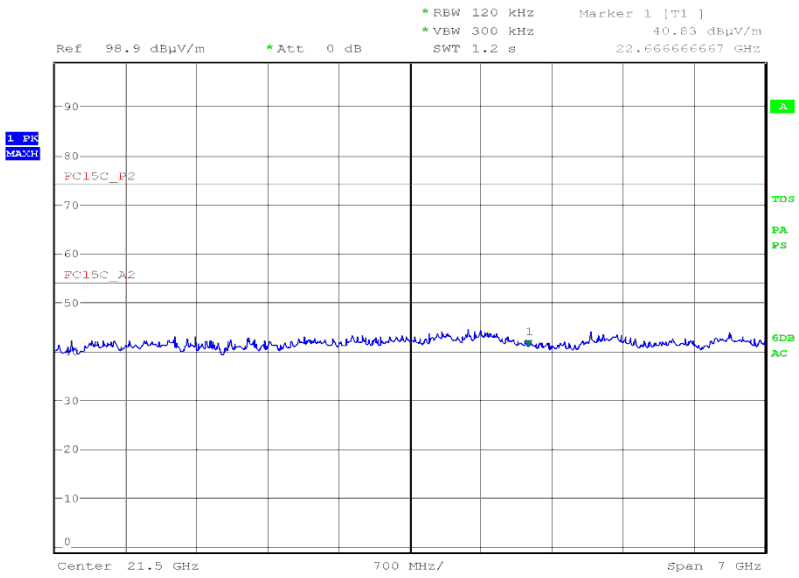
Horizontal Polarity

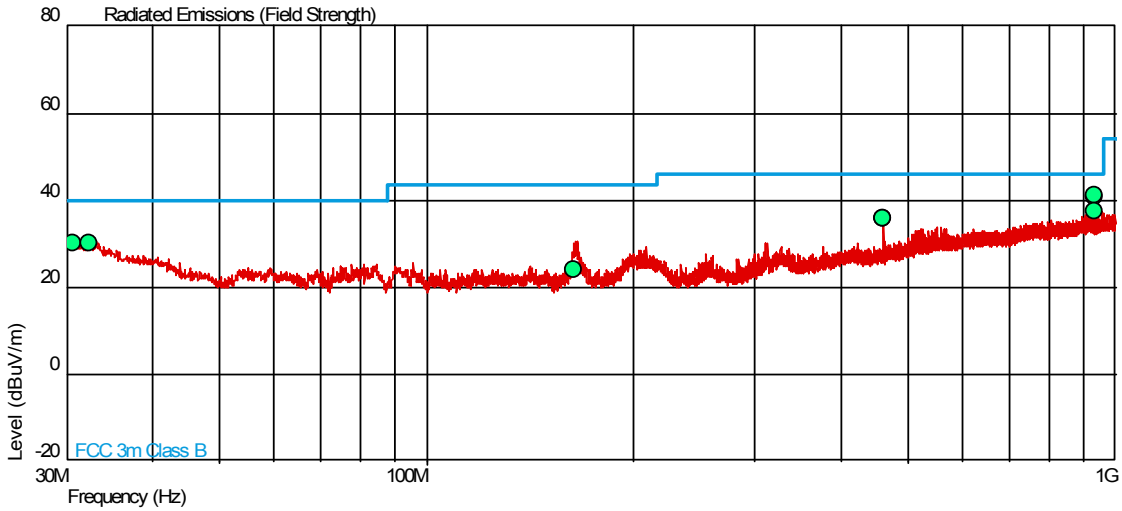


Date: 27.JUN.2010 01:54:09

Product Service

Configuration 2 - Mode 3

30MHz to 1GHz



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
30.729	30.2	32.4	40.0	100	-9.8	-67.6	358	1.00	Vertical
32.285	30.0	31.6	40.0	100	-10.0	-68.3	102	1.00	Vertical
163.834	24.1	16.0	43.5	150	-19.4	-134.0	90	1.00	Vertical
460.632	35.9	62.4	46.0	200	-10.1	-137.6	70	1.00	Horizontal
460.636	36.0	63.1	46.0	200	-10.0	-136.9	120	1.00	Vertical

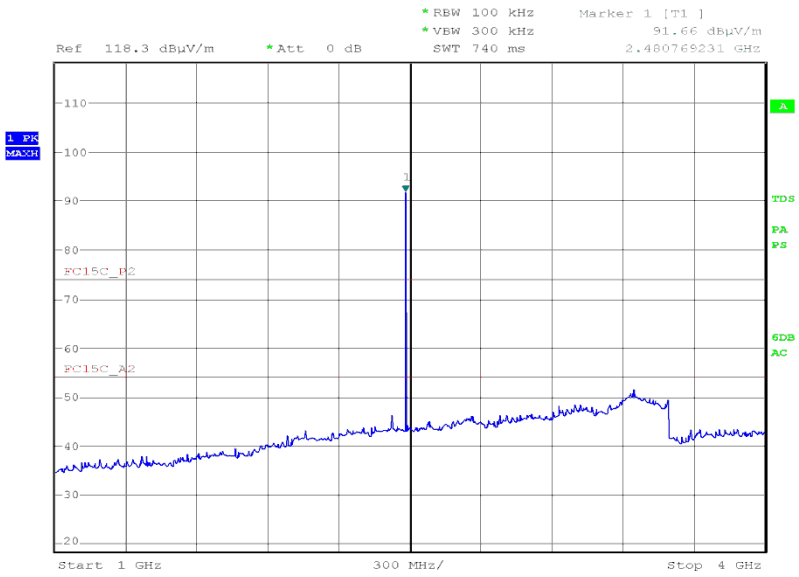
1GHz to 25GHz

Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Average dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m
4.960	H	117	343	52.86	44.49	74.0	54.0

Product Service

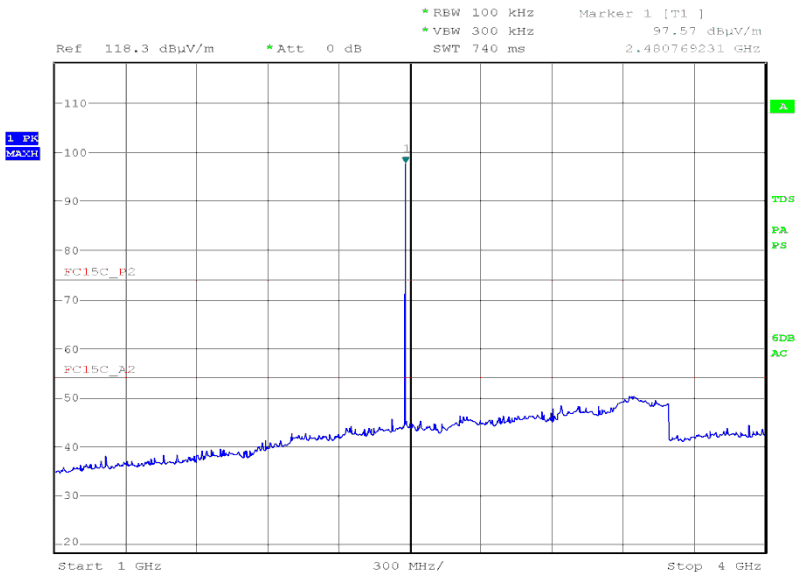
1GHz to 4GHz

Vertical Polarity



Date: 2.JUL.2010 23:48:27

Horizontal Polarity

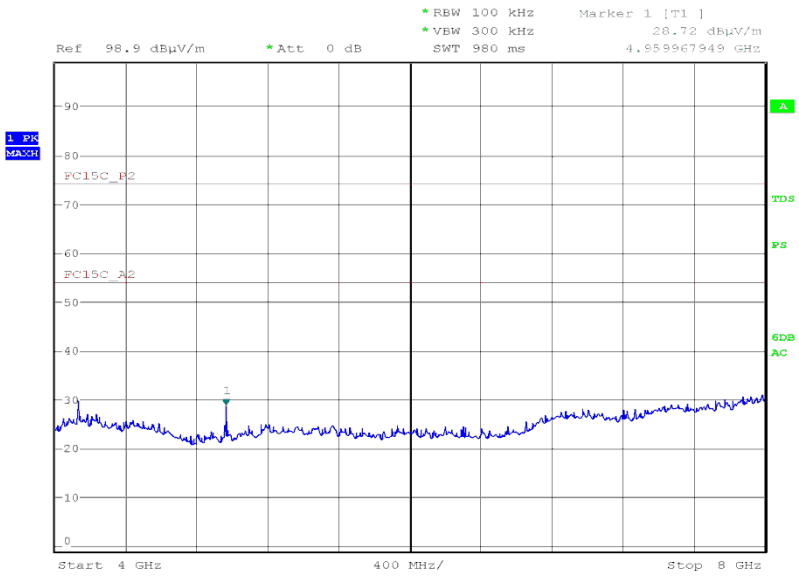


Date: 2.JUL.2010 23:58:06

Product Service

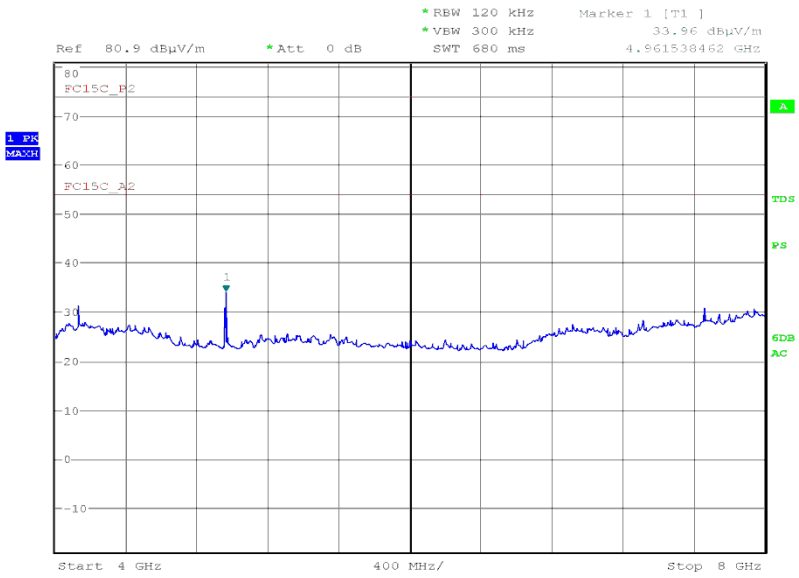
4GHz to 8GHz

Vertical Polarity



Date: 3.JUL.2010 00:45:00

Horizontal Polarity

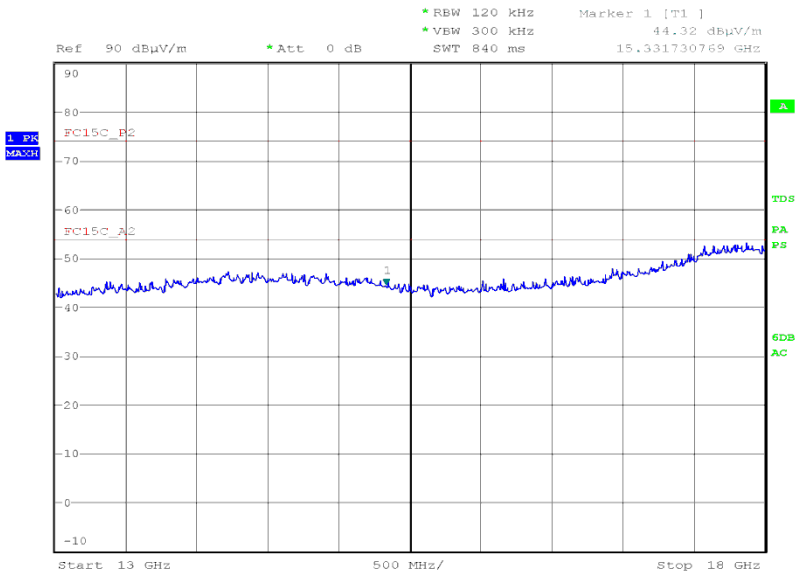


Date: 3.JUL.2010 00:24:44

Product Service

8GHz to 13GHz

Vertical Polarity



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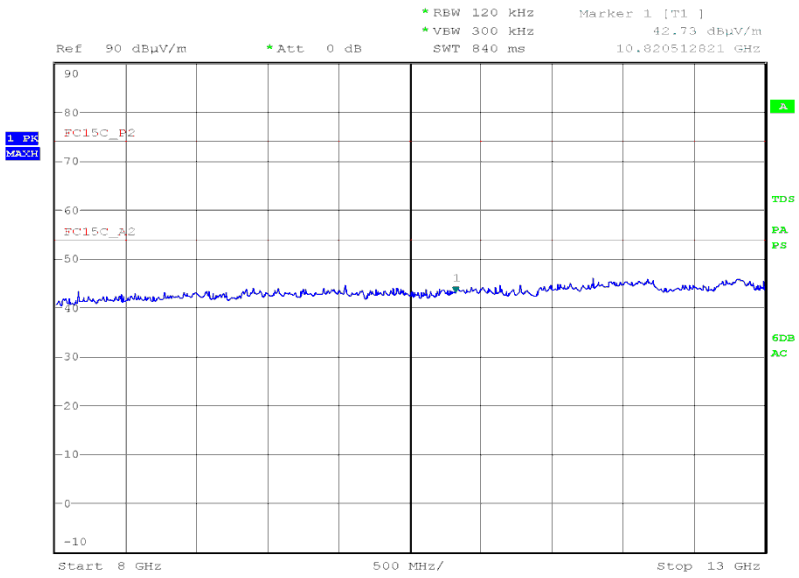
Horizontal Polarity

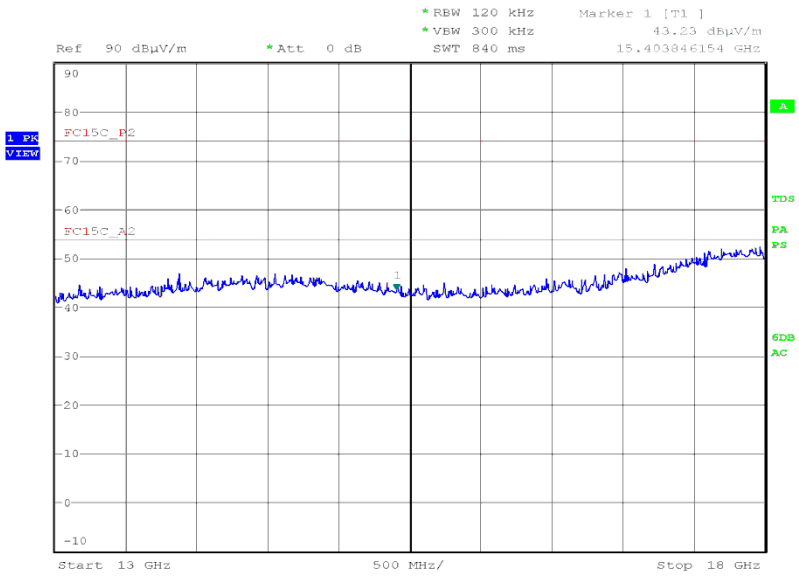


Date: 3.JUL.2010 04:31:17

Product Service

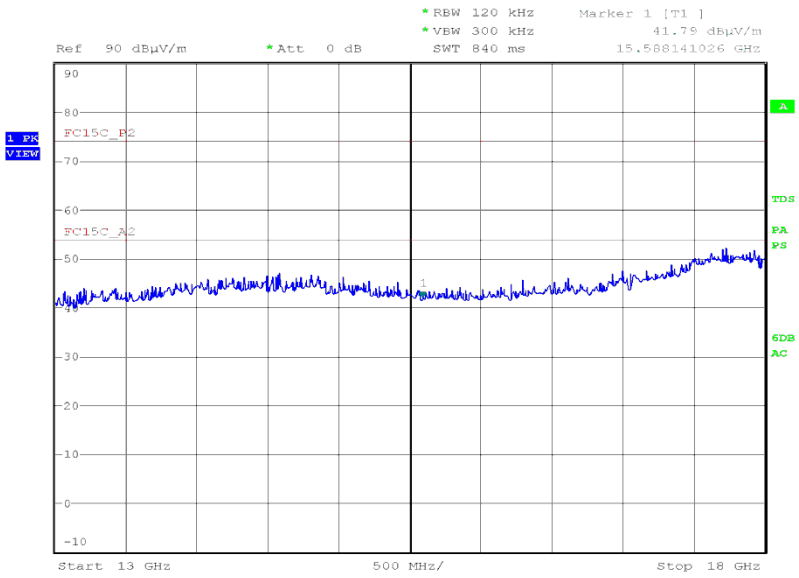
13GHz to 18GHz

Vertical Polarity



Date: 3.JUL.2010 04:55:21

Horizontal Polarity

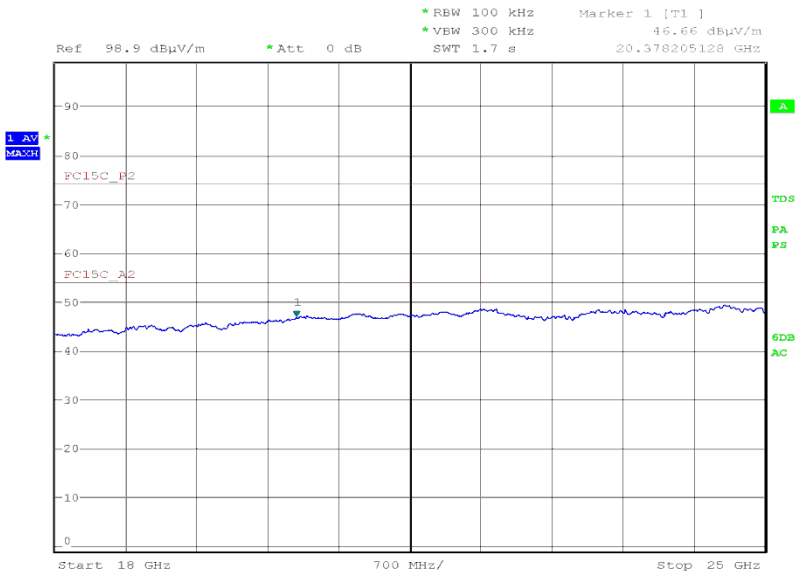


Date: 3.JUL.2010 04:37:46

Product Service

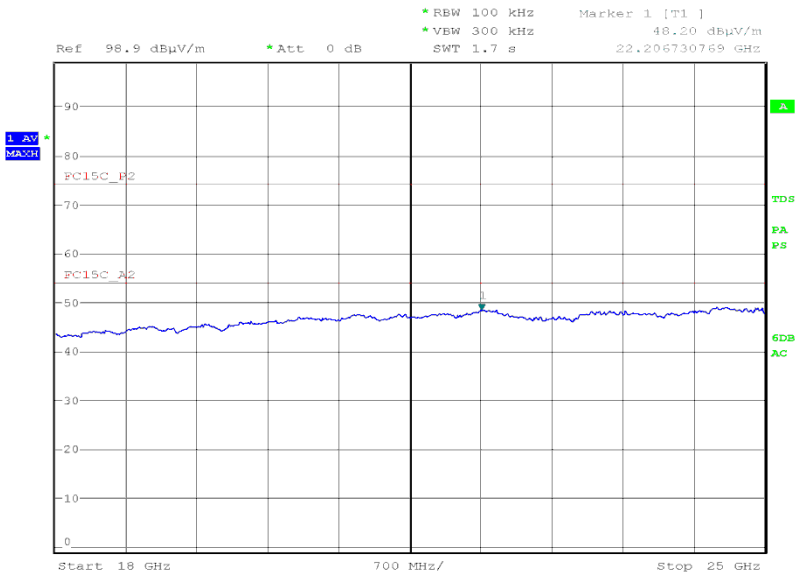
18GHz to 25GHz

Vertical Polarity



Date: 3.JUL.2010 05:39:26

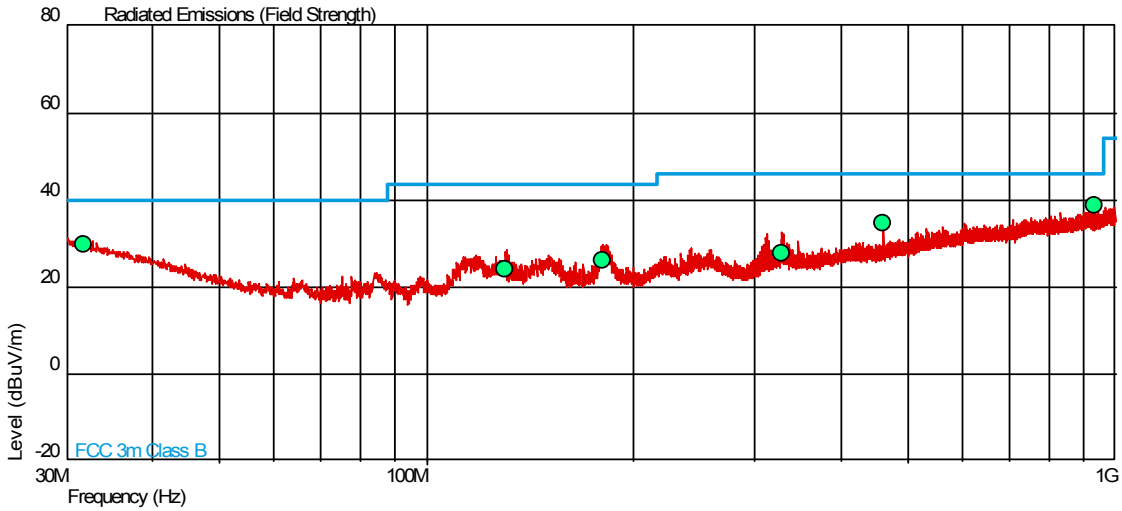
Horizontal Polarity



Date: 3.JUL.2010 05:37:36

Product Service

Configuration 3 - Mode 2



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
31.745	30.0	31.6	40.0	100	-10.0	-68.4	292	3.67	Vertical
130.058	23.9	15.7	43.5	150	-19.6	-134.3	58	1.00	Vertical
179.623	26.2	20.4	43.5	150	-17.3	-129.6	147	1.00	Vertical
328.250	27.7	24.3	46.0	200	-18.3	-175.7	169	1.03	Horizontal
460.635	34.5	53.1	46.0	200	-11.5	-146.9	31	1.72	Horizontal

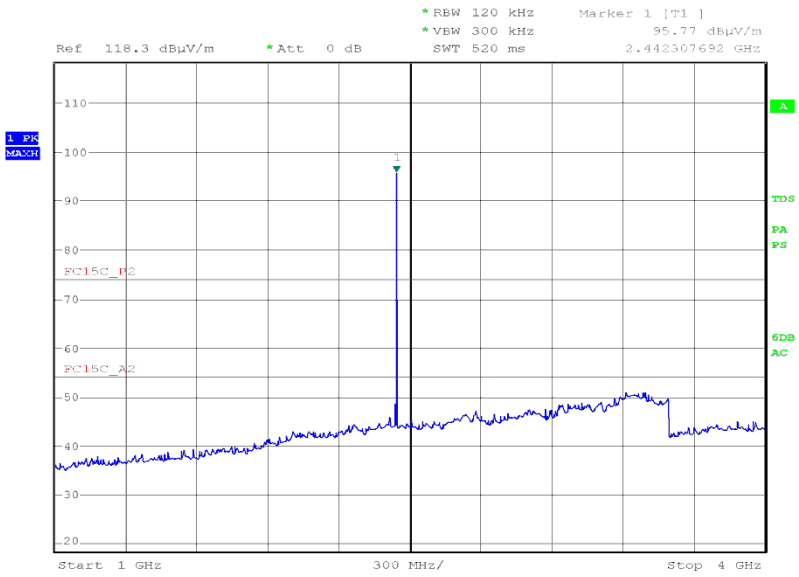
1GHz to 25GHz

Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Average dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m
4.882	H	109	323	54.94	47.47	74.0	54.0
4.882	V	125	238	52.12	44.79	74.0	54.0

Product Service

1GHz to 4GHz

Vertical Polarity



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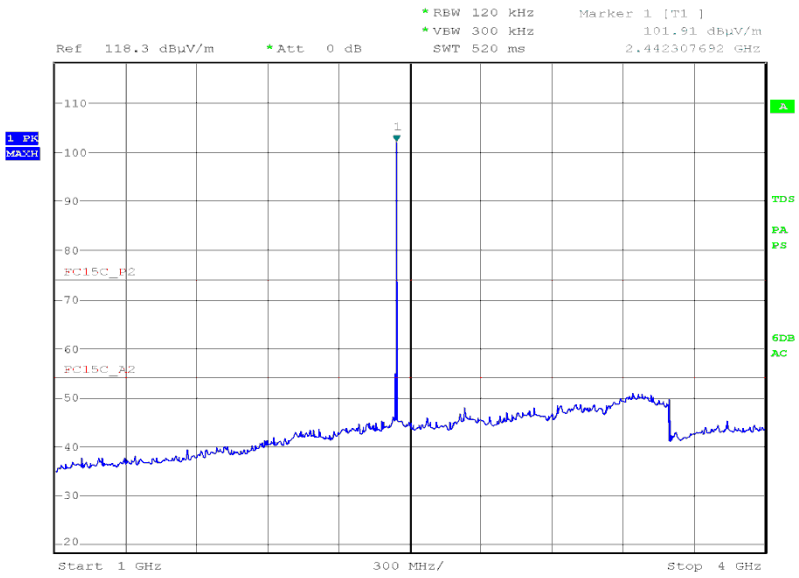
Horizontal Polarity



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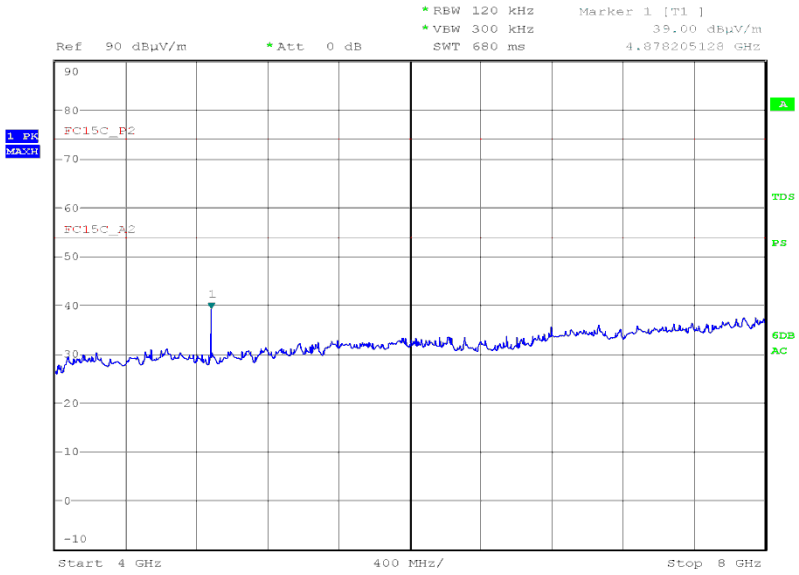
4GHz to 8GHz

Vertical Polarity



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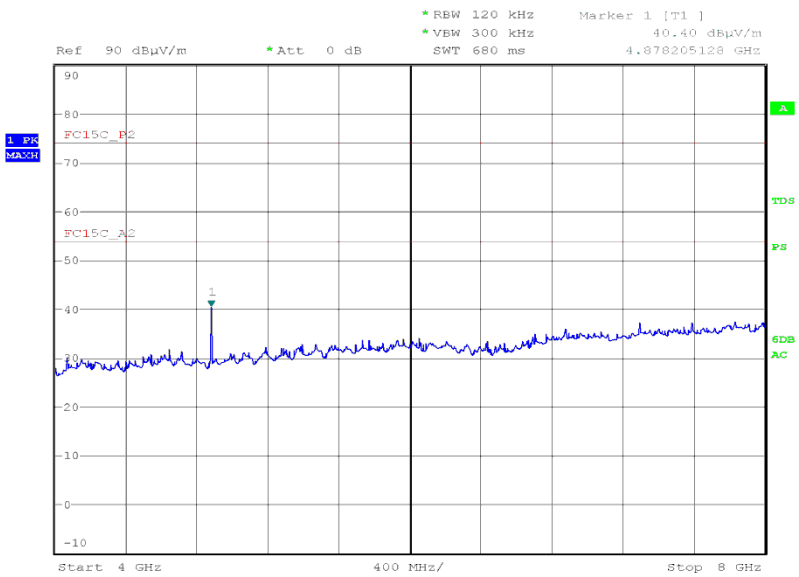
Horizontal Polarity

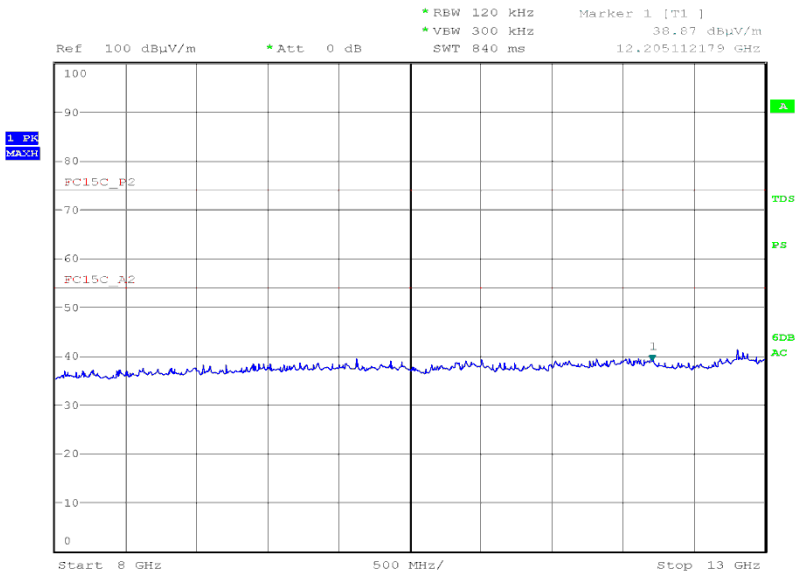


Date: 27.JUN.2010 03:17:12

Product Service

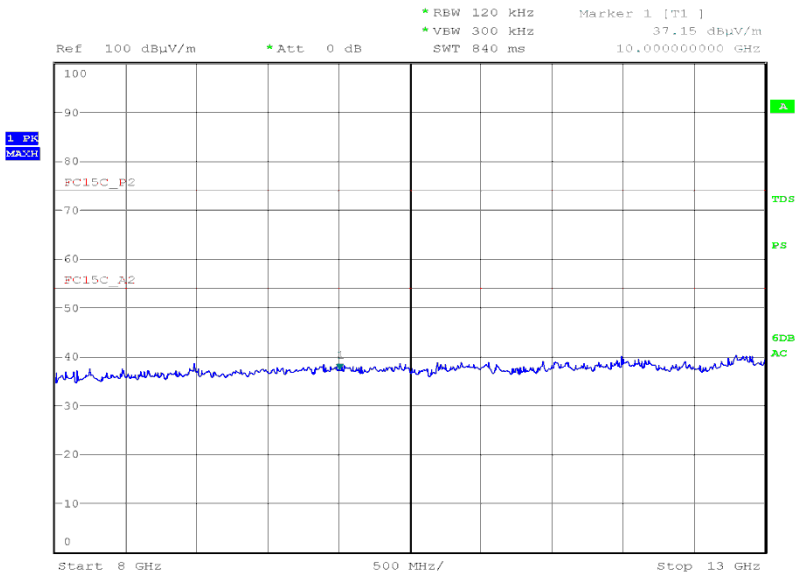
8GHz to 13GHz

Vertical Polarity



Date: 27.JUN.2010 03:01:41

Horizontal Polarity



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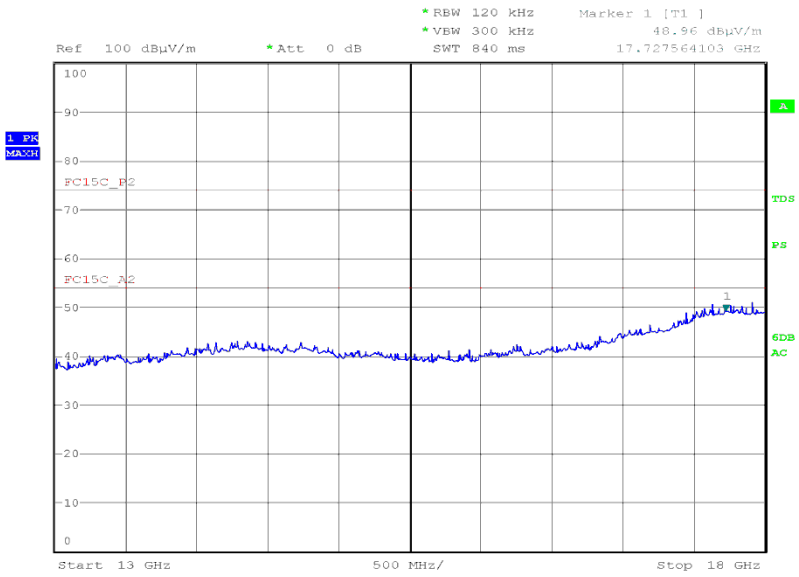
Product Service

13GHz to 18GHz

Vertical Polarity



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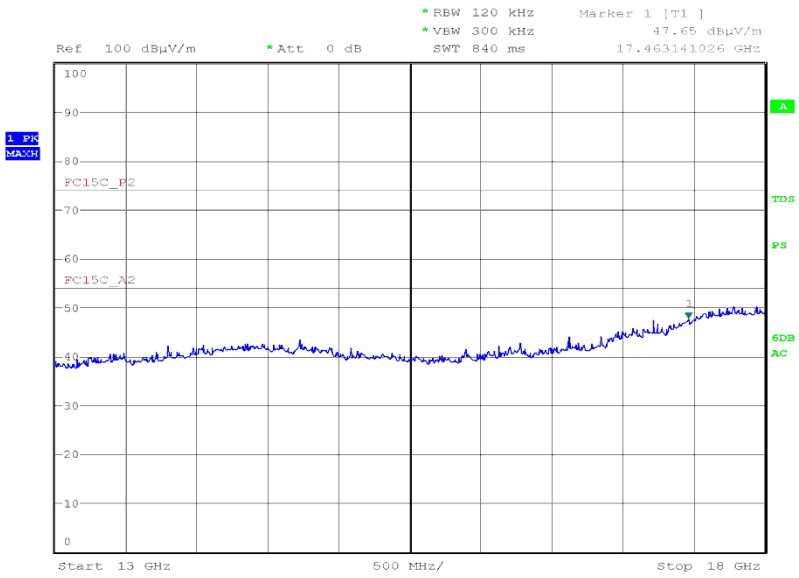
Horizontal Polarity



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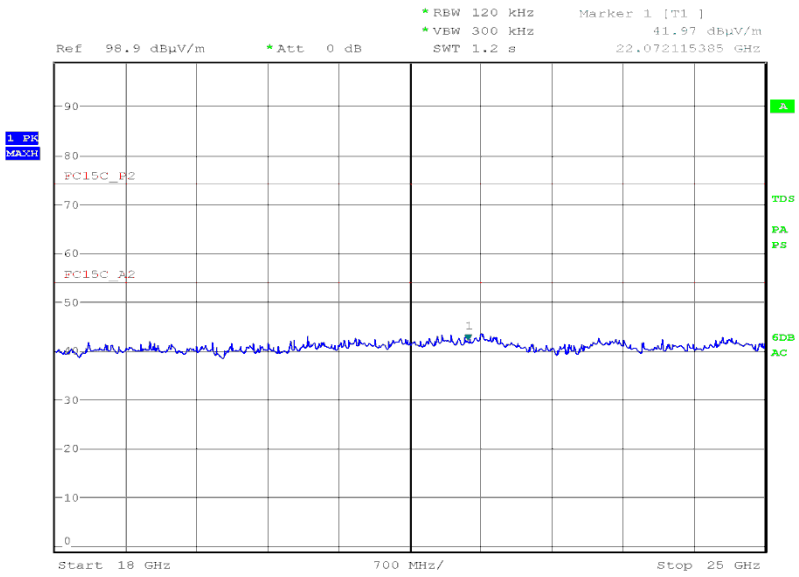
Product Service

18GHz to 25GHz

Vertical Polarity



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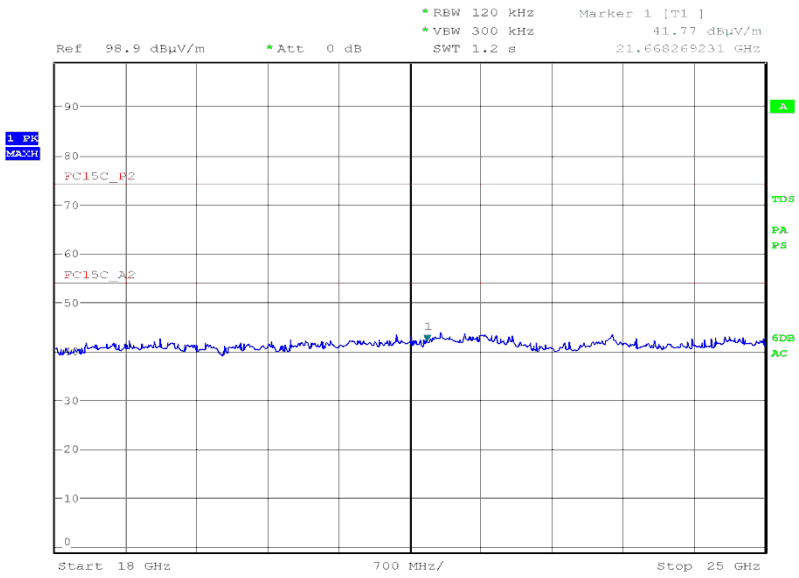
Horizontal Polarity



Date: 27.JUN.2010 02:44:23

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

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 (AC Power Port)					
3 phase LISN	Rohde & Schwarz	ESH2-Z5	323	12	7-Jan-2011
LISN (1 Phase)	Chase	MN 2050	336	12	25-Mar-2011
Load (50ohm, 15W)	Diamond Antenna	DL-30N	344	12	22-Jun-2011
Screened Room (1)	Rainford	Rainford	1541	-	TU
Transient Limiter	Hewlett Packard	11947A	2377	12	16-Dec-2010
Test Receiver	Rohde & Schwarz	ESIB40	2941	12	28-Apr-2011
Section 2.2, 2.3, 2.8 and 2.10 – 20dB Bandwidth, Maximum Peak Conducted Output Power, Channel Dwell Time and Number of Hopping Channels					
Attenuator (10dB, 10W)	Trilithic	HFP-50N	1377	12	15-Oct-2010
Cable (1m, sma(m) - sma(m)	Reynolds	262-0248-1000	2406	12	15-Oct-2010
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	3-Jun-2011
Section 2.4, 2.5 and 2.7 - Radiated Emissions (Enclosure Port					
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 18GHz to 40GHz)	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	PSO4-0087	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
4GHz HPF	Sematron	F-100-4000-5-R	2245	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	4-Dec-2011
Signal Generator	Rohde & Schwarz	SMR40	3171	12	4-Aug-2010
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010
Section 2.6- Conducted Spurious Emissions					
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
Hygrometer	Rotronic	I-1000	2891	12	27-Apr-2011
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	10-Jun-2011
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	25-Feb-2011
3 GHz High Pass Filter	K&L uwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2011
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3694	12	26-Jan-2011
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3695	12	26-Jan-2011
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3696	12	26-Jan-2011
Section 2.9 - Channel Bandwidth					
Multimeter	White Gold	WG022	190	12	26-Oct-2010
Programmable Power Supply	Iso-tech	IPS 2010	2437	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	2-Nov-2010
Hygrometer	Rotronic	I-1000	2891	12	27-Apr-2011
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3696	12	26-Jan-2011

TU – Traceability Unscheduled

Product Service

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	5.2dB*
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 EM Clamp Method of Test CDN Method of Test BCI Clamp Method of Test Direct Injection Method of Test	 3.1dB• 1.2dB• 1.1dB• 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 in accordance with 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°

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: 2009

Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

UKAS TESTING 0141

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 (Not UKAS Accredited).