



Product Service

**Choose certainty.
Add value.**

Report On

FCC CFR 47 Part 15C and Industry Canada RSS-210 and
RSS-Gen Testing of the RDT Limited
Patient Monitoring System

COMMERCIAL-IN-CONFIDENCE

FCC ID: ROSTEMPUSIC

IC ID: TBC

Document 75904058 Report 02 Issue 1

July 2008



Product Service

TUV Product Service Ltd, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuvps.co.uk

COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC CFR 47 Part 15C and Industry Canada RSS-210 and
RSS-Gen Testing of the
RDT Limited
Patient Monitoring System

Document 75904058 Report 02 Issue 1

July 2008

PREPARED FOR

RDT Limited
The Old Coach House
Farleigh Wallop
Basingstoke
Hampshire
RG25 2HT

PREPARED BY

N Bennett
Senior Administrator

APPROVED BY

K Adsetts
Authorised Signatory

DATED

23 July 2008

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

Test Engineers;

A Guy

G Lawler



P Harrison



CONTENTS

Section	Page No
1	REPORT SUMMARY 3
1.1	Introduction 4
1.2	Brief Summary of Results 5
1.3	Declaration of Build Status 6
1.4	Product Information 7
1.5	Test Conditions 9
1.6	Deviations From the Standard 9
1.7	Modification Record 9
2	TEST DETAILS 10
2.1	Radiated Emissions (Enclosure Port) 11
2.2	Maximum Peak Output Power (Radiated) 64
2.3	Measurement at the Band Edge (Marker Delta Method) 69
3	TEST EQUIPMENT USED 72
3.1	Test Equipment Used 73
3.2	Measurement Uncertainty 74
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 75
4.1	Accreditation, Disclaimers and Copyright 76



SECTION 1

REPORT SUMMARY

FCC CFR 47 Part 15C and Industry Canada RSS-210 and RSS-Gen
Testing of the RDT Limited
Patient Monitoring System



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the RDT Limited Patient Monitoring System to the requirements of FCC CFR 47 Part 15C: 2006 and Industry Canada RSS-210 Issue 7: 2007 and RSS-Gen: 2007

Objective	To perform FCC CFR 47 Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specifications, for the series of tests carried out.
Manufacturer	RDT Limited
Part Number(s)	00-1001
Model/Type Number(s)	Tempus IC
Serial Number(s)	000008
Software Version	V1.00
Hardware Version	Not Applicable
Number of Samples Tested	One
Test Specification/Issue/Date	FCC CFR 47 Part 15C: 2006 Industry Canada RSS-210 Issue 7: 2007 and RSS-Gen: 2007
Incoming Release Date	Declaration of Build Status 26 June 2008
Disposal	Held Pending Disposal Not Applicable Not applicable
Order Number	7824
Date	26 June 2008
Start of Test	11 July 2008
Finish of Test	18 July 2008
Name of Engineer(s)	A Guy G Lawler P J Harrison
Related Documents	ANSI C63.4: 2003 FCC Public Notice DA 00-705: 2000



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 15C: 2006 and Industry Canada RSS-210 Issue 7: 2007 and RSS-Gen: 2007, is shown below.

Configuration 1 – EUT with ancillaries connected							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	Industry Canada					
2.1	15.209, 15.247(d), 15.205	RSS-Gen, 7.2.3	Radiated Emissions (Enclosure Port) (30MHz to 26GHz)	2412MHz Transmit	0	Pass	ANSI C63.4: 2003
				2437MHz Transmit	0	Pass	
				2462MHz Transmit	0	Pass	
				2402MHz Transmit	0	Pass	
				2441MHz Transmit	0	Pass	
				2480MHz Transmit	0	Pass	
2.2	15.247(b)(3)	RSS-210, A8.4 RSS-Gen, 4.8	Maximum Peak Output Power (Radiated)	2412MHz Transmit	0	Pass	ANSI C63.4: 2003
				2437MHz Transmit	0	Pass	
				2462MHz Transmit	0	Pass	
				2402MHz Transmit	0	Pass	
				2441MHz Transmit	0	Pass	
				2480MHz Transmit	0	Pass	
2.3	15.247(d)	RSS-210, A8.5	Measurement at the Band Edge (Marker Delta Method)	2412MHz Transmit	0	Pass	ANSI C63.4: 2003
				2437MHz Transmit		N/A	
				2462MHz Transmit	0	Pass	
				2402MHz Transmit	0	Pass	
				2441MHz Transmit		N/A	
				2480MHz Transmit	0	Pass	



1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	The Tempus IC is a patient monitor which comprises off-the-shelf modules for wireless communications, these include a WiFi SD card (Socket Communications GoWiFi P300i) and a Bluetooth module (Bluegiga WT11).
MANUFACTURER	RDT Ltd
TYPE	Tempus IC
PART NUMBER	00-1001
SERIAL NUMBER	000008
HARDWARE VERSION	N/A
SOFTWARE VERSION	V1.00
TRANSMITTER OPERATING RANGE	WiFi – 100m open field Bluetooth – 100m open field
RECEIVER OPERATING RANGE	WiFi – 100m open field Bluetooth – 100m open field
COUNTRY OF ORIGIN	UK
INTERMEDIATE FREQUENCIES	<u>WiFi</u> - 2.412-2.484 GHz (channels 1 - 14) <u>Bluetooth</u> - 2.4 – 2.4835 GHz
ITU DESIGNATION OF EMISSION	<u>WiFi</u> – 11MSF9W <u>Bluetooth</u> – 1M21G2D
HIGHEST INTERNALLY GENERATED FREQUENCY	2.4GHz
OUTPUT POWER (W or dBm)	<u>WiFi</u> - 12dBm CCK 9dBm OFDM (63mW designation RSS210) <u>Bluetooth</u> - -9dBm - +18dBm (22mW designation RSS210)
FCC ID	<u>TEMPUS IC</u> - ROSTEMPUSIC <u>WiFi Module</u> - FCC ID LUBP300SD-1 <u>Bluetooth Module</u> - FCC: Part 15, FCC ID QOQWT11
INDUSTRY CANADA ID	<u>TEMPUS IC</u> - TBC <u>WiFi Module</u> - Industry Canada license 2529A-WLANSADIO <u>Bluetooth Module</u> - Industry Canada license 5123A-BGTWT11E
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The Tempus IC is a portable patient monitor. It is intended to be run off a proprietary battery or from a COTS external dc supply. The device measures a variety of medical parameters e.g. blood pressure and pulse rate, and transmits the data in real time over a wired or wireless link. The device can currently communicate over WiFi for WAN communications. It uses Bluetooth for LAN communications with local peripherals such as with a Bluetooth-enabled glucometer or thermometer. Wireless peripherals supplied for use with the device are not part of this test or FCC application.
BATTERY/POWER SUPPLY	
MANUFACTURING DESCRIPTION	2S 3P proprietary lithium-ion cell pack using Varta 2.6Ah 18650 cells and a Varta protection circuit
MANUFACTURER	Varta
TYPE	Tempus IC Lithium-ion Battery
PART NUMBER	01-1001
VOLTAGE	7.4V nominal 6.5V min - 8.4V max
COUNTRY OF ORIGIN	Indonesia

Signature N/A Electronically supplied

Date: 26 June 2008

Declaration of Build Status Serial Number: 75904058/01



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a RDT Limited Patient Monitoring System as shown in the photograph below. A full technical description can be found in the Manufacturers documentation.



Equipment Under Test



1.4.2 Test Configuration

Configuration 1: EUT with ancillaries connected

The EUT was configured in accordance with FCC CFR 47 Part 15C: 2006 and Industry Canada RSS-210 Issue 7: 2007 and RSS-Gen: 2007.

1.4.3 Modes of Operation

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

Mode 1 - 2412MHz Transmit (WiFi, 5.5Mbps/s)

Mode 2 - 2437MHz Transmit (WiFi, 5.5Mbps/s)

Mode 3 - 2462MHz Transmit (WiFi, 5.5Mbps/s)

Mode 4 - 2402MHz Transmit (Bluetooth, 3DH5)

Mode 5 - 2441MHz Transmit (Bluetooth, 3DH5)

Mode 6 - 2480MHz Transmit (Bluetooth, 3DH5)

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

Note 1 : WiFi A data rate of 5.5Mbps/s was found to give the worse case emissions so was the data rate tested throughout this report.

Note 2 : Bluetooth The modulation scheme for Enhanced Data Rate 3DH5 was found to give the worse case emissions so was the modulation scheme tested throughout this report.



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, test laboratories or an open test area as appropriate.

The EUT was powered from a 7.4V nominal internal battery.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
2932B-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 CFR 47 Part 15C and Industry Canada RSS-210 and
RSS-Gen Testing of the RDT Limited
Patient Monitoring System



Product Service

2.1 RADIATED EMISSIONS (ENCLOSURE PORT)

2.1.1 Specification Reference

FCC CFR 47 Part 15C: 2006. Clause 15.209, 15.247(d), 15.205
Industry Canada RSS-Gen: 2007, Clause 7.2.3

2.1.2 Equipment Under Test

Patient Monitoring System, S/N: 000008

2.1.3 Date of Test and Modification State

11, 13 and 18 July 2008 - 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 FCC CFR 47 Part 15: 2006.

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

Configuration 1 - Mode 1
- Mode 2
- Mode 3
- Mode 4
- Mode 5
- Mode 6

2.1.6 Environmental Conditions

	11 July 2008	13 July 2008	18 July 2008
Ambient Temperature	20.8 - 21.4°C	20.4°C	21.1°C
Relative Humidity	45 - 47%	45%	54%
Atmospheric Pressure	1009 - 1011mbar	1009mbar	1009mbar



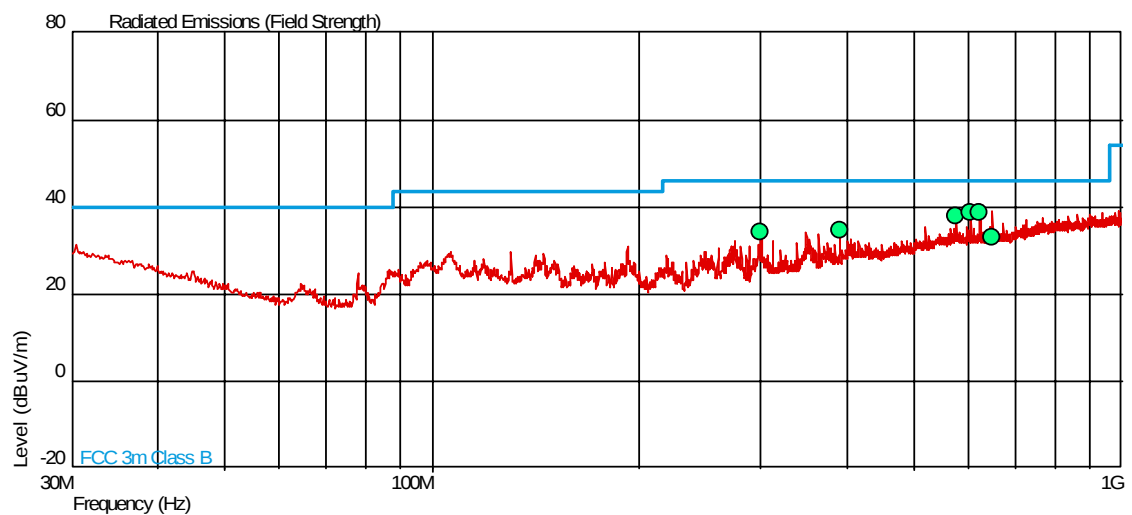
2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C: 2006 and Industry Canada RSS-Gen: 2007 for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1

30MHz to 1GHz (Combined Polarity)



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
300.015	34.1	46.0	-11.9	262	1.00	Vertical
389.971	34.7	46.0	-11.3	27	1.00	Horizontal
576.063	38.0	46.0	-8.0	359	1.00	Horizontal
604.494	38.6	46.0	-7.4	209	1.00	Vertical
624.006	38.9	46.0	-7.1	200	1.00	Vertical
650.211	33.0	46.0	-13.0	235	1.05	Vertical



1GHz to 26GHz

A Peak Field Strength Measurement, was performed on the carrier (5.5Mb/sec Data Rate) of the Bottom Channel to determine the specification limit for any Non-Restricted Band measurements (20dB down on carrier). The bandwidths used were 100kHz RBW & 300kHz VBW.

Frequency: 2.412GHz Peak Measurement: 95.7dB μ V/m
Non-Restricted Band Limit = 75.7dB μ V/m

All other spurious emissions are detailed below.

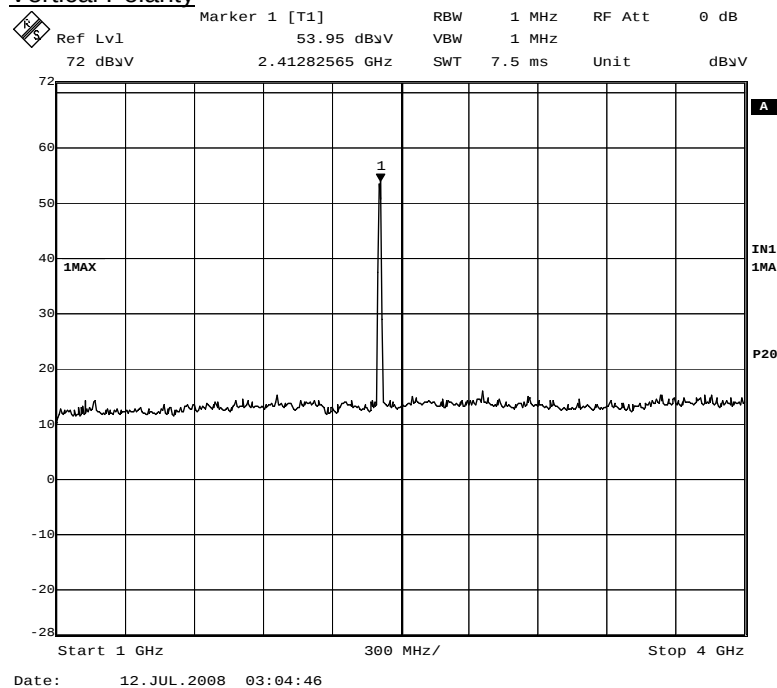
Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degree	Result Peak dB μ V/m	Result Average dB μ V/m	Peak Limit dB μ V/m	Average Limit dB μ V/m	Result
4.824 ⁽¹⁾	Horizontal	100	210	59.9	52.6	74.0	54.0	Pass
4.824 ⁽²⁾	Horizontal	100	164	56.4	52.3	74.0	54.0	Pass

(1) 5.5Mb/sec Data rate

(2) 6.0Mb/sec Data rate

1GHz to 4GHz

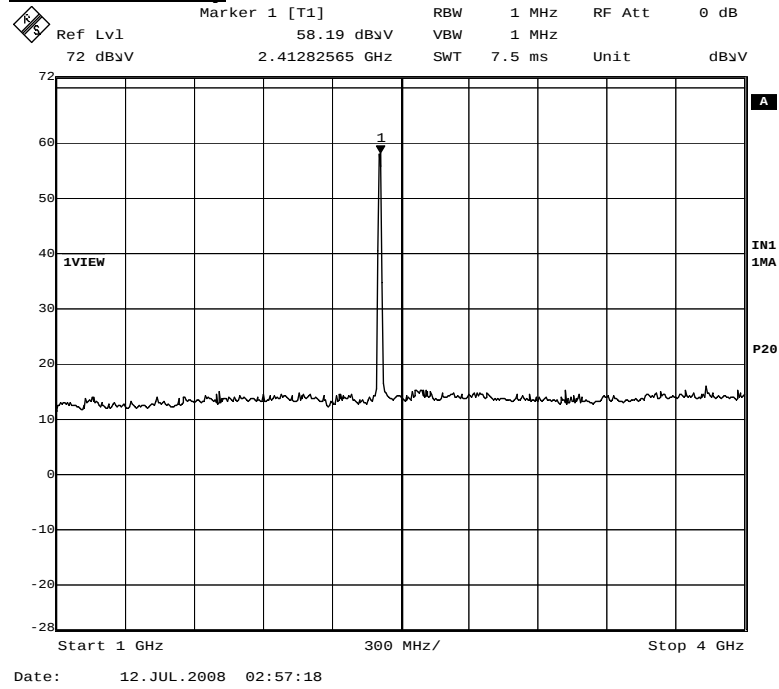
Vertical Polarity





Product Service

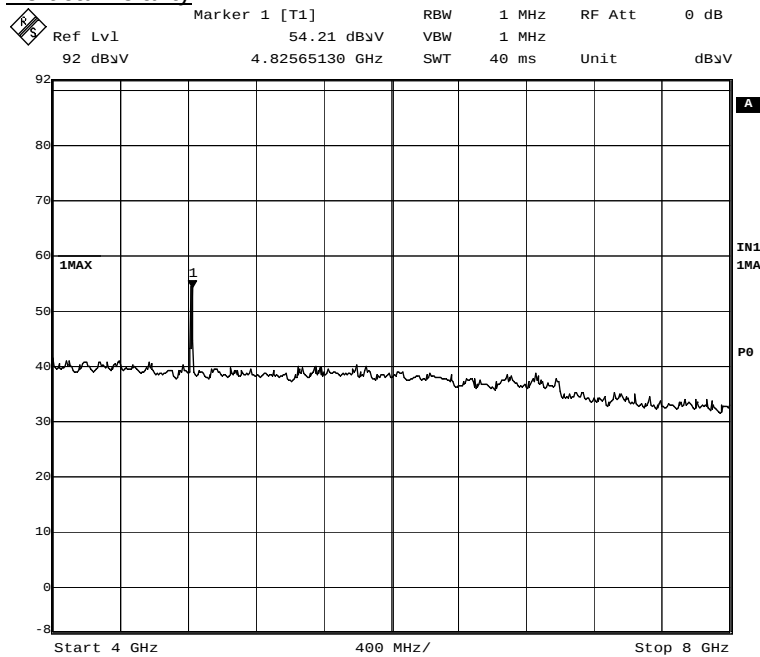
Horizontal Polarity





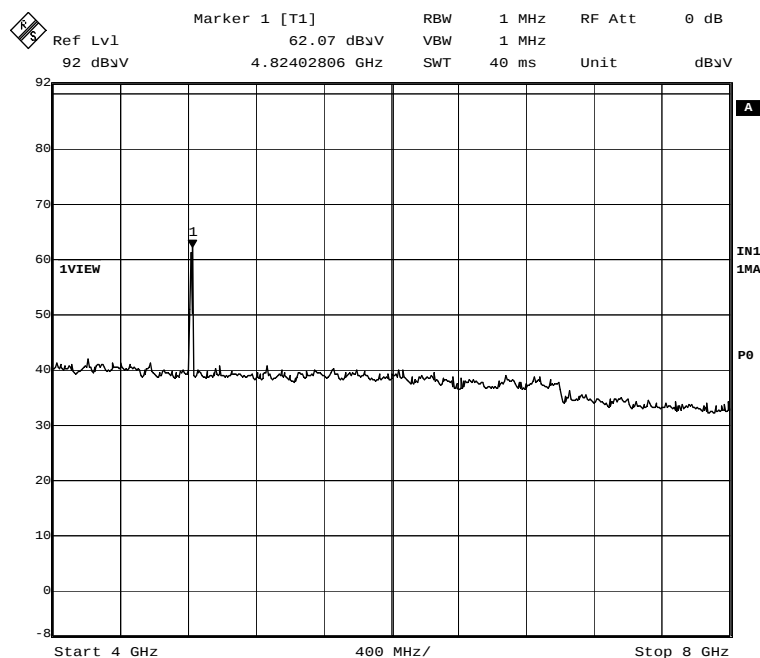
4GHz to 8GHz

Vertical Polarity

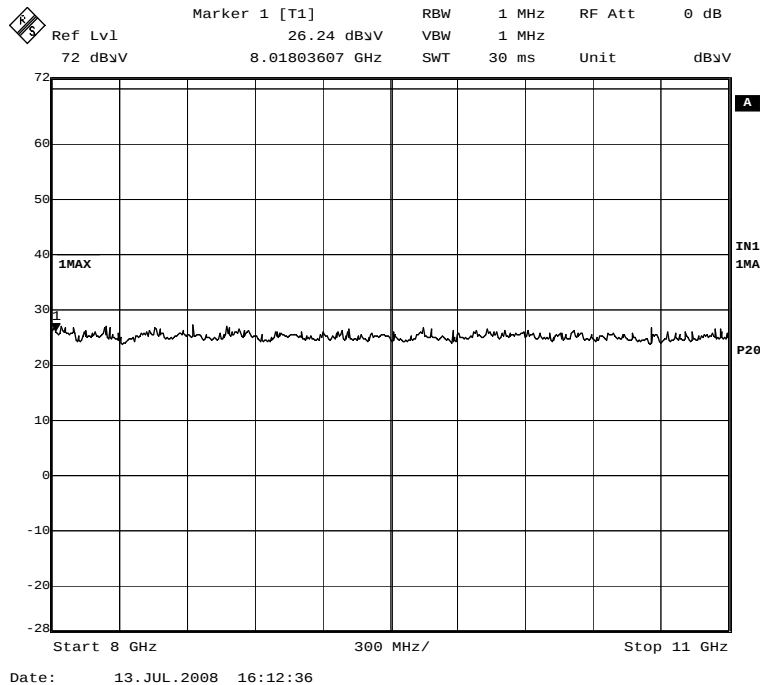
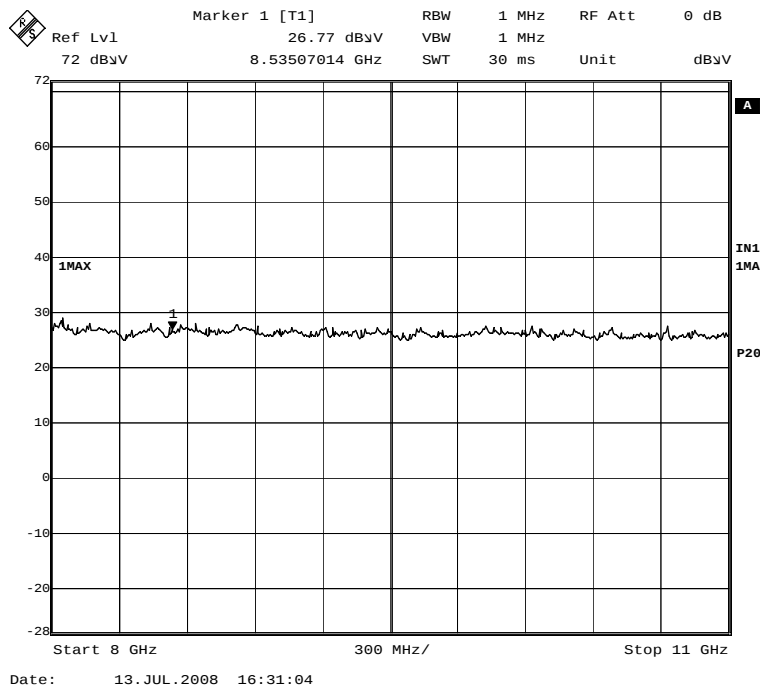


Date: 12.JUL.2008 20:42:35

Horizontal Polarity

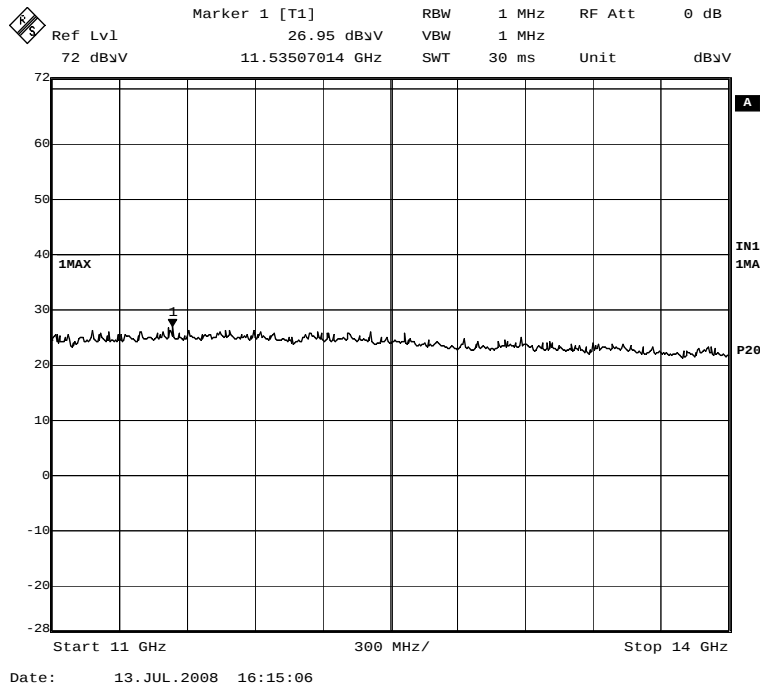
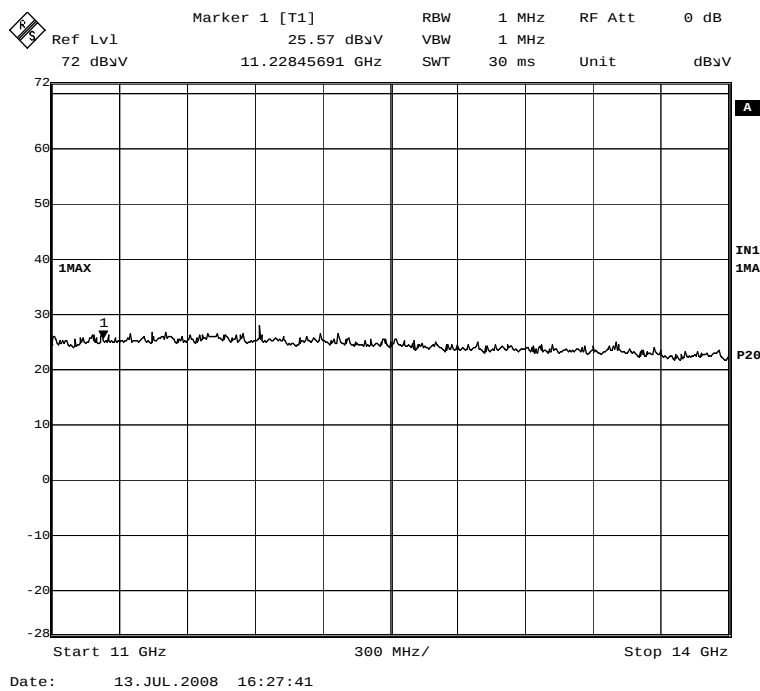


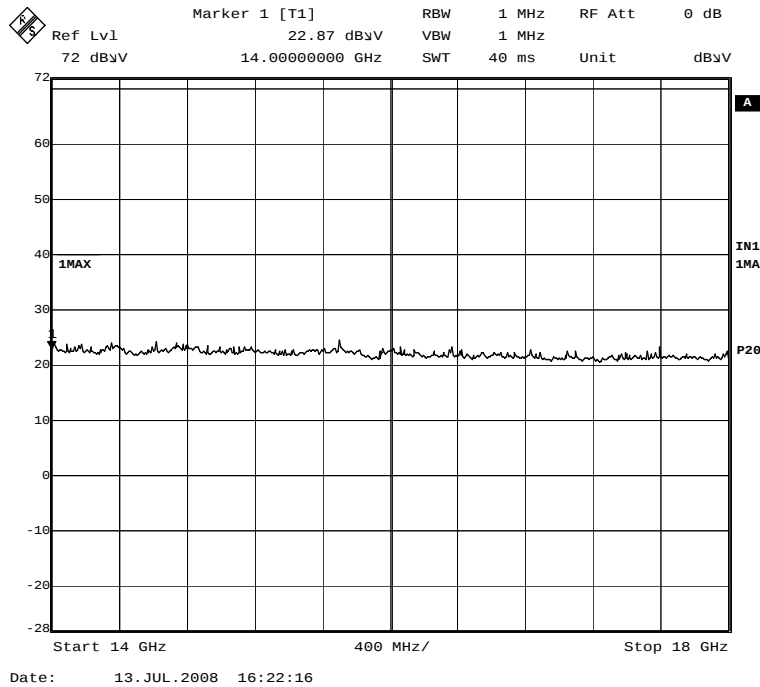
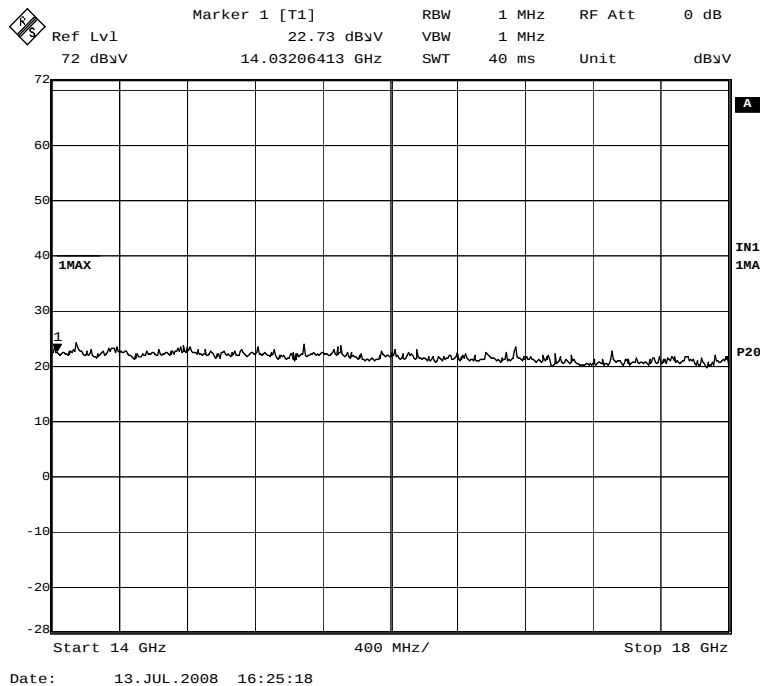
Date: 12.JUL.2008 20:13:40

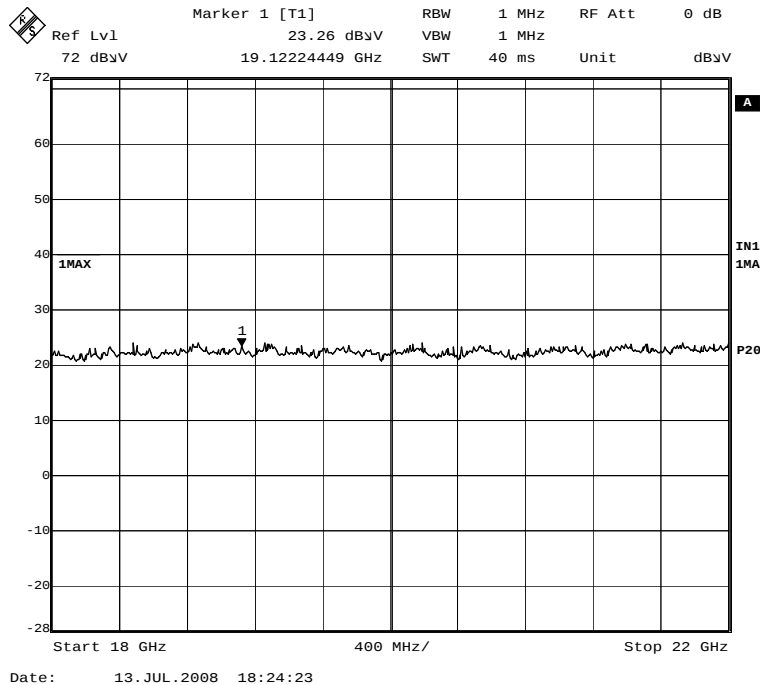
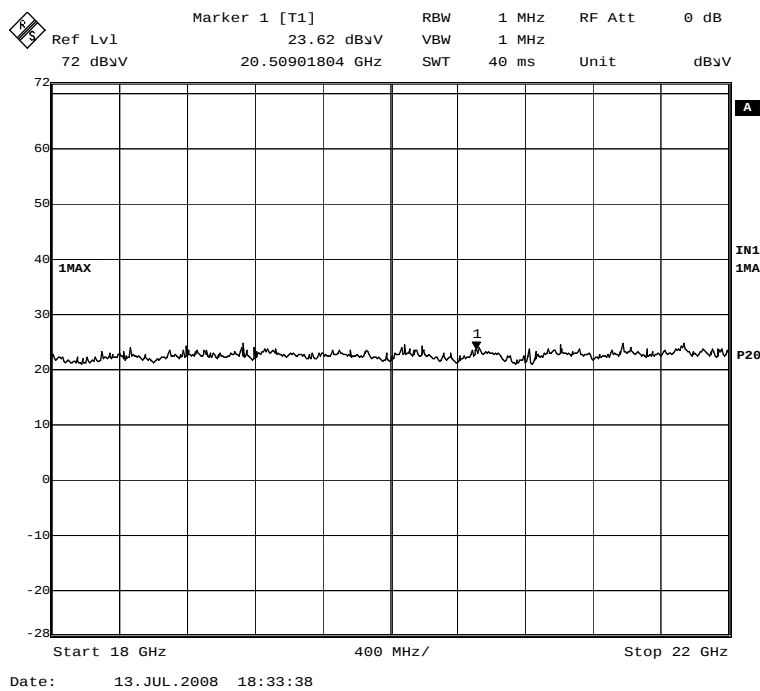
8GHz to 11GHzVertical PolarityHorizontal Polarity



Product Service

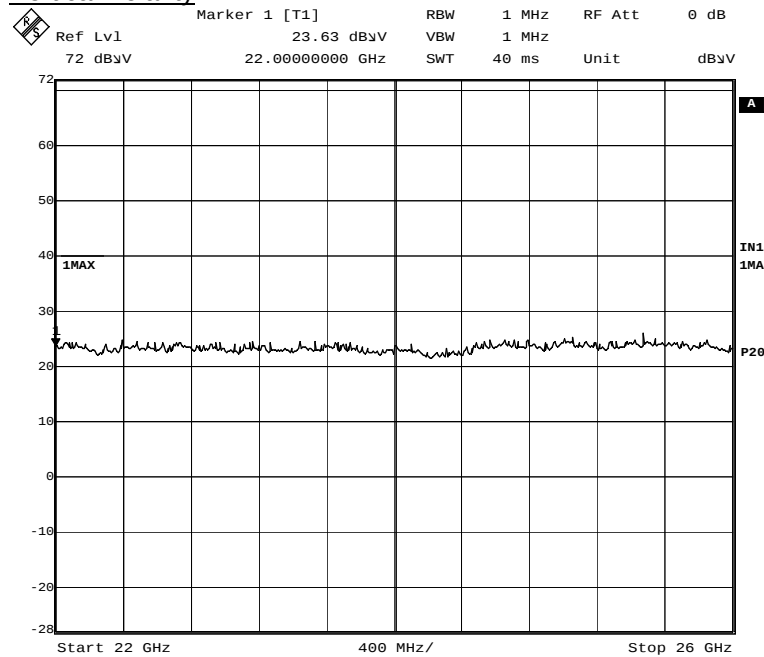
11GHz to 14GHzVertical PolarityHorizontal Polarity

14GHz to 18GHzVertical PolarityHorizontal Polarity

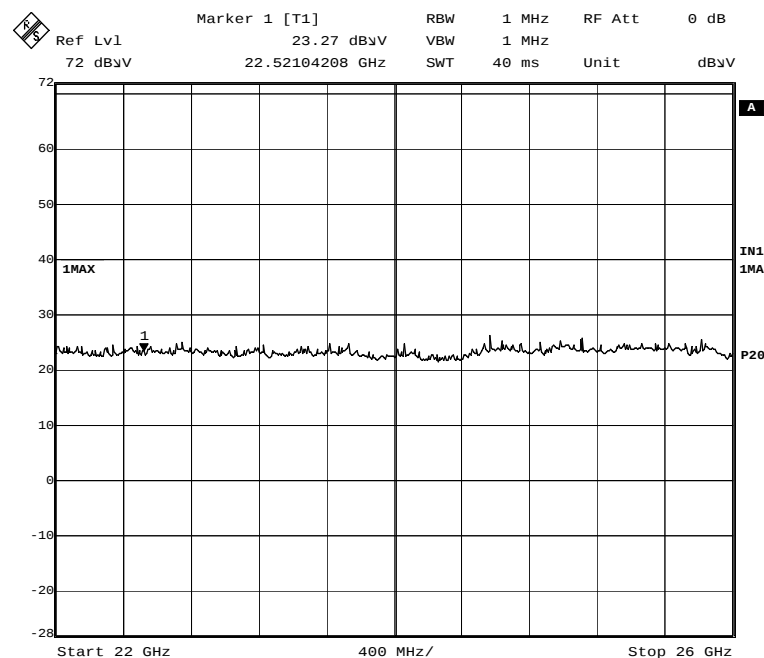
18GHz to 22GHzVertical PolarityHorizontal Polarity



Product Service

22GHz to 26GHzVertical Polarity

Date: 13.JUL.2008 18:27:54

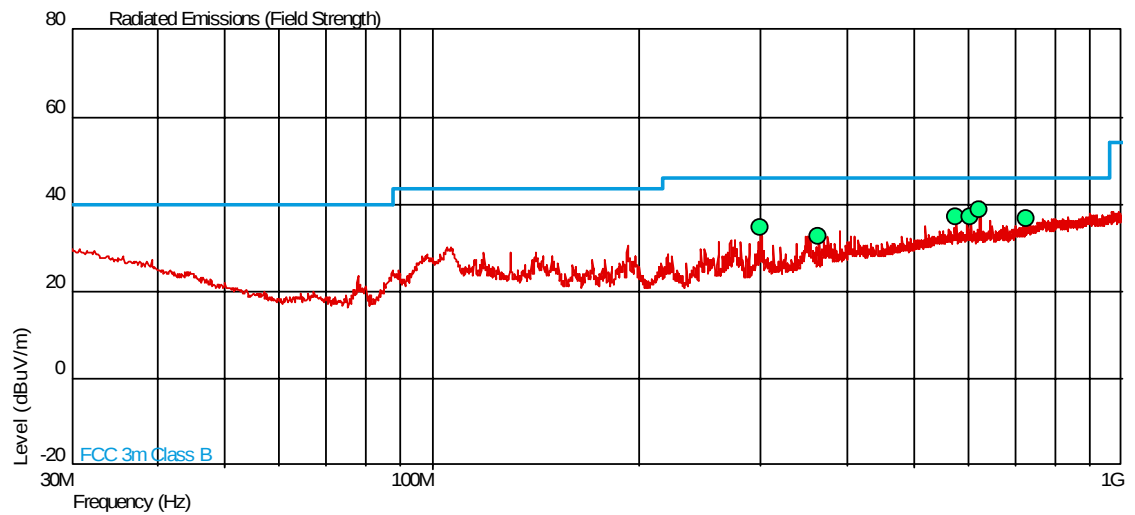
Horizontal Polarity

Date: 13.JUL.2008 18:30:35



Configuration 1 - Mode 2

30MHz to 1GHz (Combined Polarity)



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
300.033	34.5	46.0	-11.5	273	1.00	Vertical
363.973	32.7	46.0	-13.3	59	1.00	Horizontal
576.040	37.1	46.0	-8.9	360	1.00	Horizontal
604.518	37.2	46.0	-8.8	233	1.00	Vertical
624.006	38.8	46.0	-7.2	190	1.00	Vertical
727.957	36.6	46.0	-9.4	0	1.00	Vertical



1GHz to 26GHz

A Peak Field Strength Measurement, was performed on the carrier (5.5Mb/sec Data Rate) of the Middle Channel to determine the specification limit for any Non-Restricted Band measurements (20dB down on carrier). The bandwidths used were 100kHz RBW & 300kHz VBW.

Frequency: 2.437GHz Peak Measurement: 95.6dB μ V/m
Non-Restricted Band Limit = 75.6dB μ V/m

All other spurious emissions are detailed below.

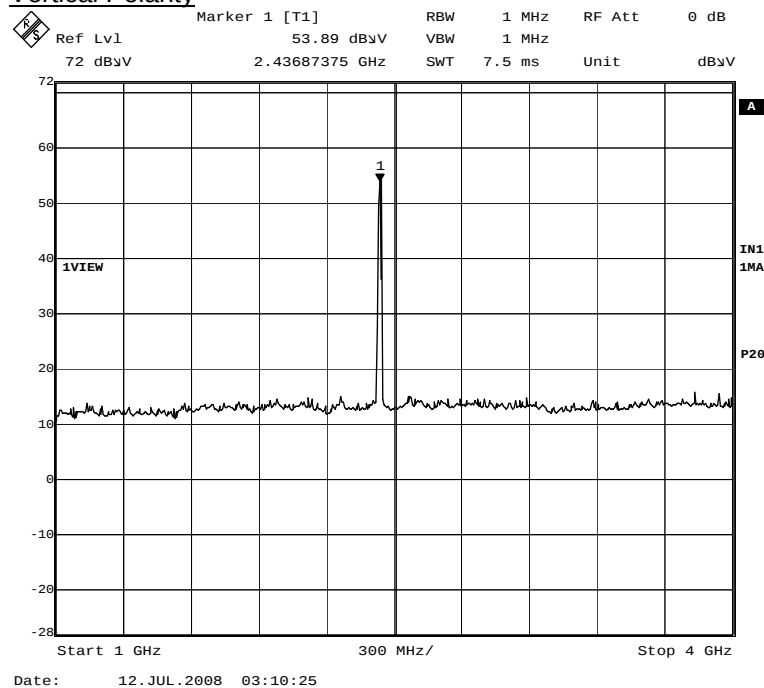
Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degree	Result Peak dB μ V/m	Result Average dB μ V/m	Peak Limit dB μ V/m	Average Limit dB μ V/m	Result
4.874 ⁽¹⁾	Horizontal	100	209	61.0	52.4	74.0	54.0	Pass
4.874 ⁽²⁾	Horizontal	100	214	56.6	51.2	74.0	54.0	Pass

(1) 5.5Mb/sec Data rate

(2) 6.0Mb/sec Data rate

1GHz to 4GHz

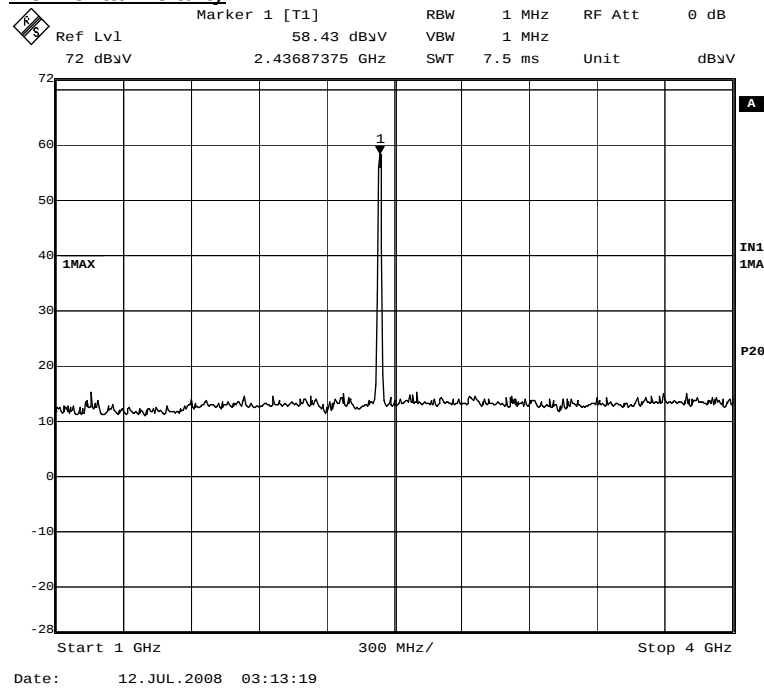
Vertical Polarity





Product Service

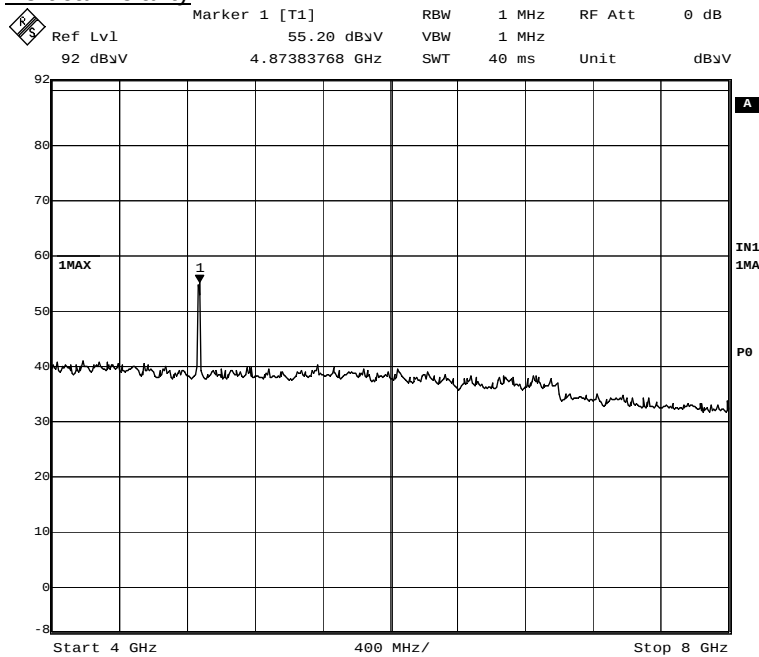
Horizontal Polarity





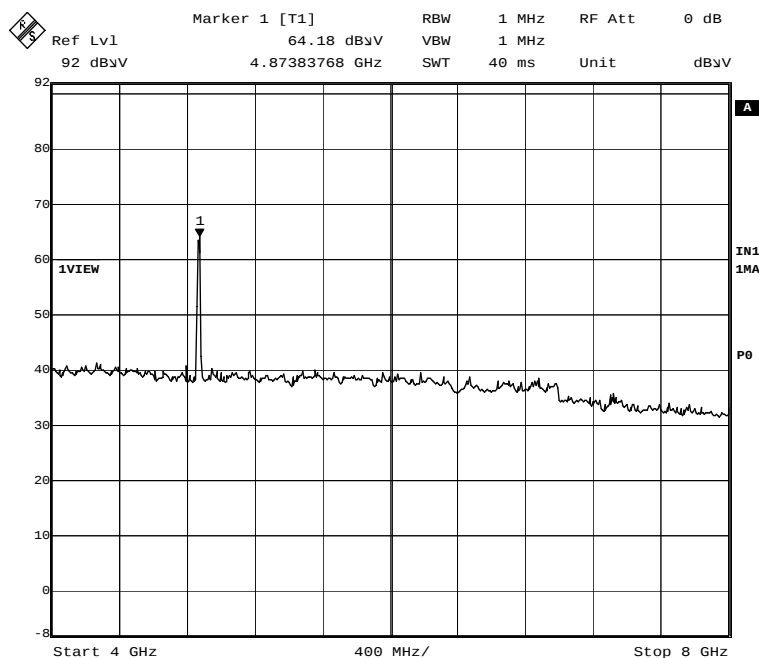
4GHz to 8GHz

Vertical Polarity

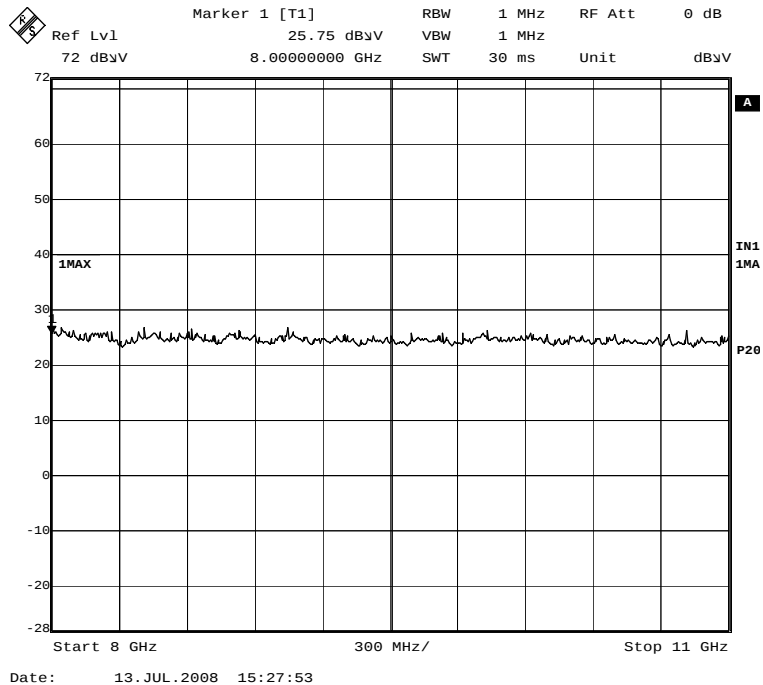
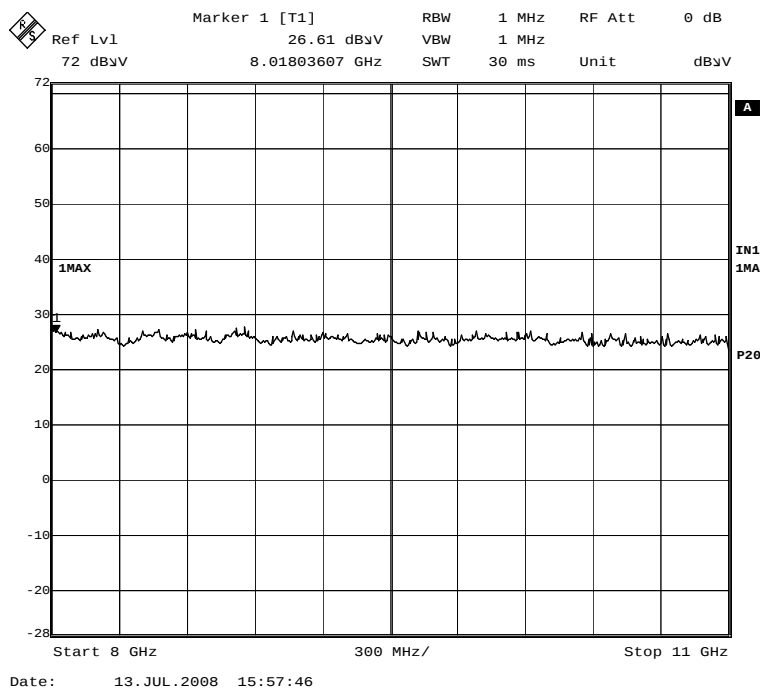


Date: 12.JUL.2008 21:06:54

Horizontal Polarity

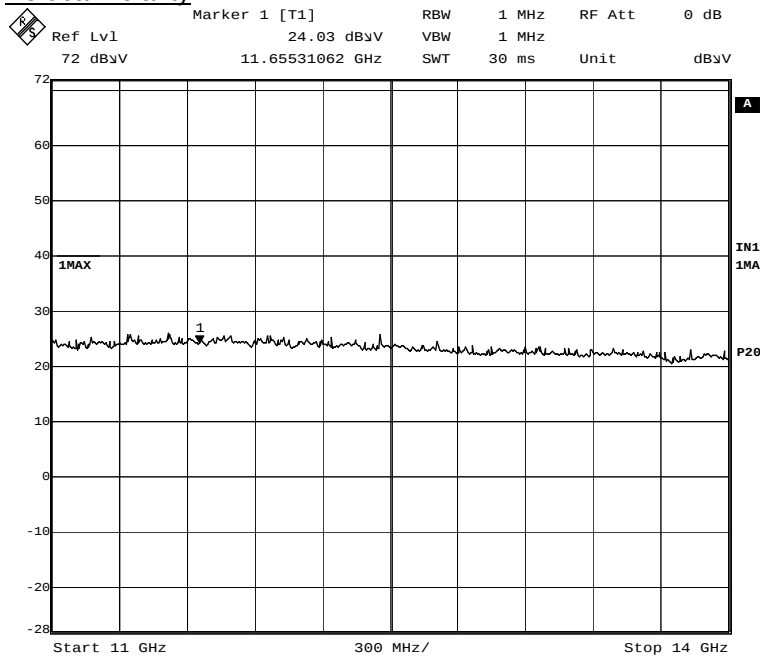


Date: 12.JUL.2008 21:11:39

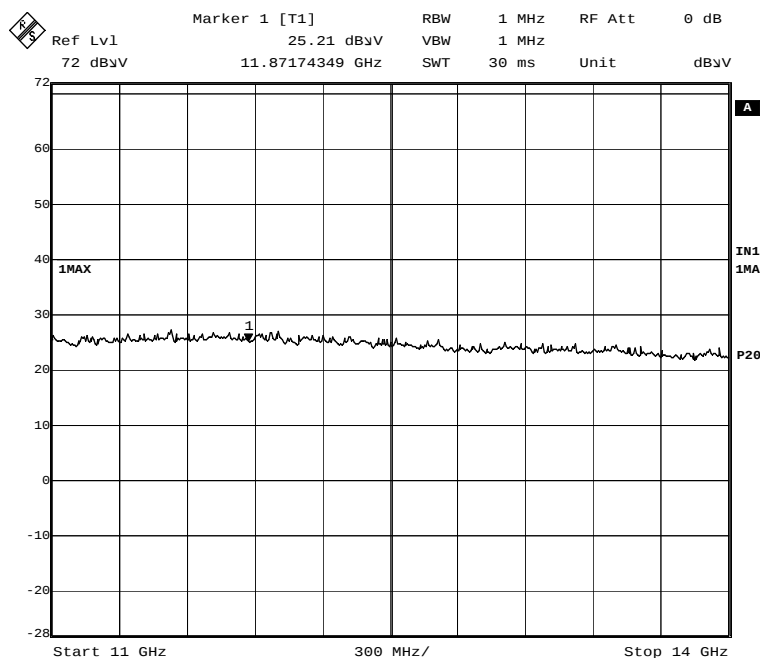
8GHz to 11GHzVertical PolarityHorizontal Polarity



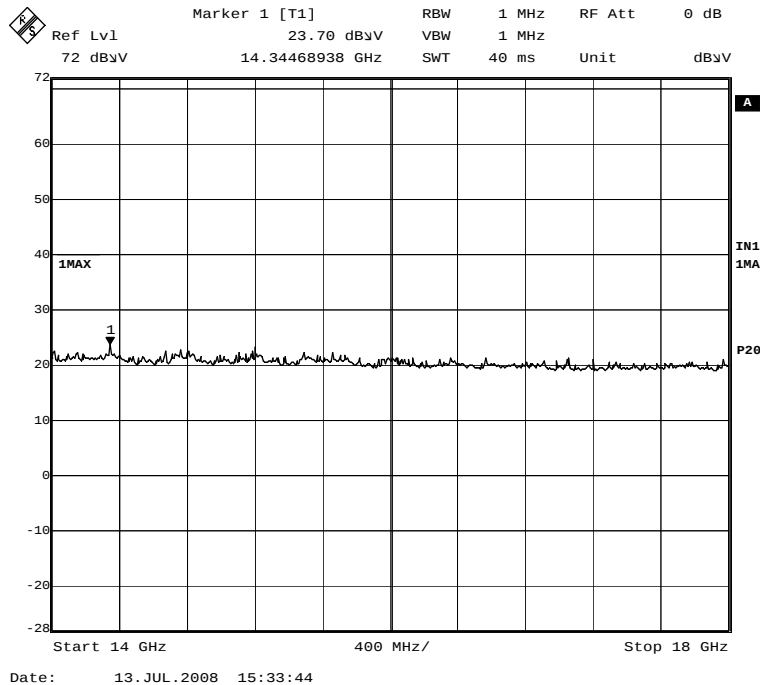
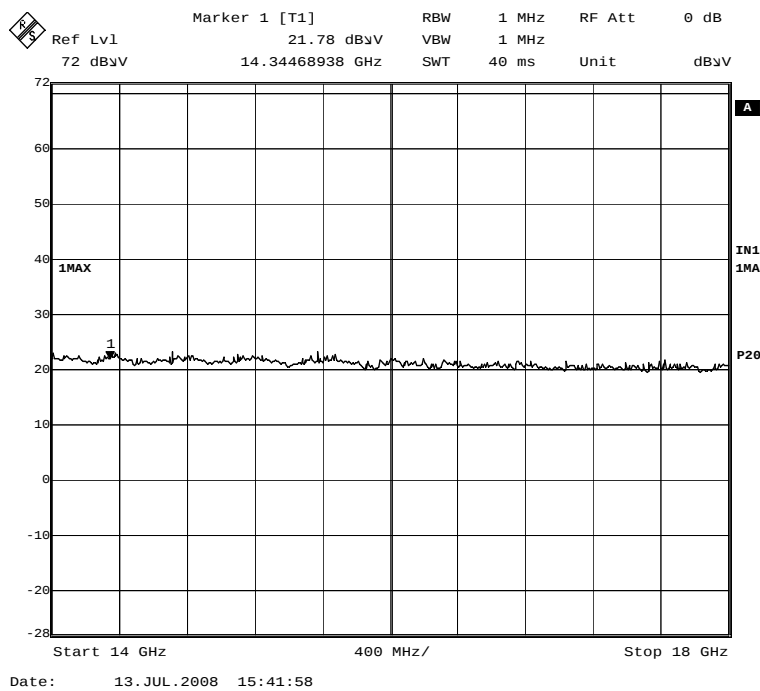
Product Service

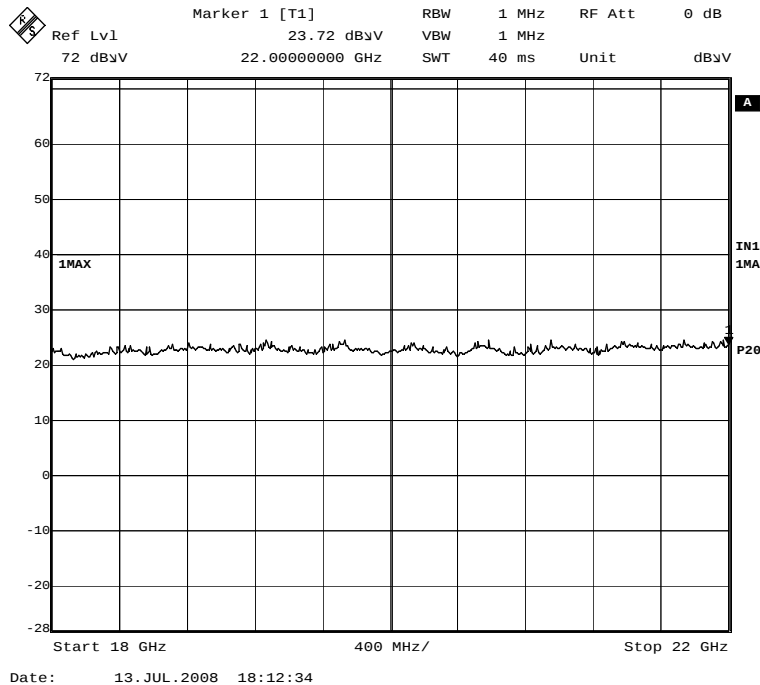
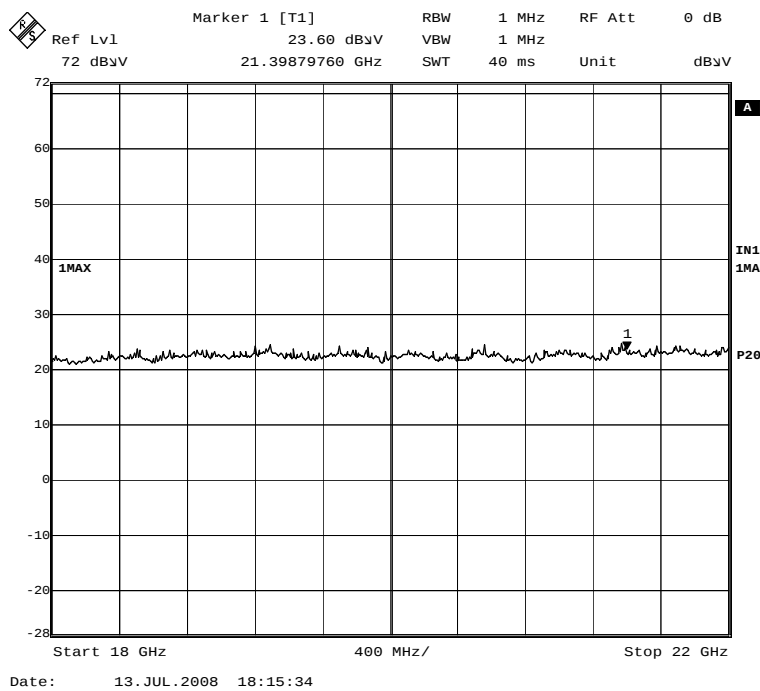
11GHz to 14GHzVertical Polarity

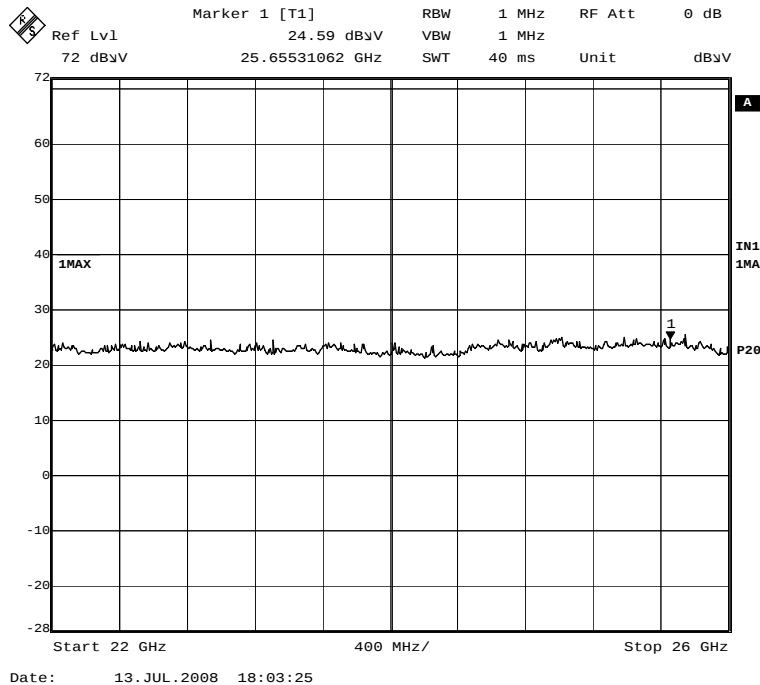
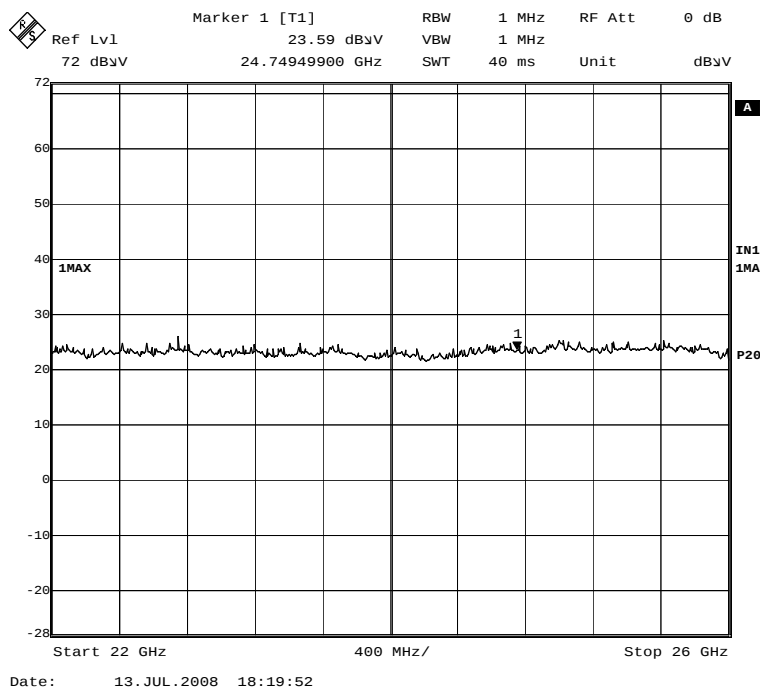
Date: 13.JUL.2008 15:31:13

Horizontal Polarity

Date: 13.JUL.2008 15:55:45

14GHz to 18GHzVertical PolarityHorizontal Polarity

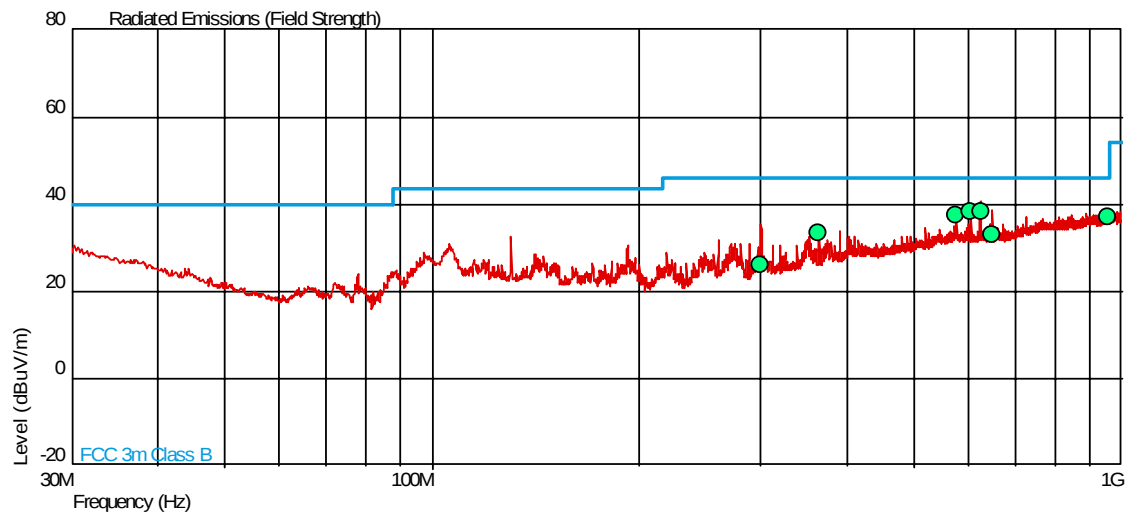
18GHz to 22GHzVertical PolarityHorizontal Polarity

22GHz to 26GHzVertical PolarityHorizontal Polarity



Configuration 1 - Mode 3

30MHz to 1GHz (Combined Polarity)



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
299.943	26.1	46.0	-19.9	246	1.00	Vertical
363.981	33.6	46.0	-12.4	99	1.00	Horizontal
576.086	37.4	46.0	-8.6	232	1.02	Horizontal
604.482	38.4	46.0	-7.6	218	1.00	Vertical
624.044	38.4	46.0	-7.6	188	1.00	Vertical
649.911	33.1	46.0	-12.9	232	1.00	Vertical
955.545	37.0	46.0	-9.0	160	1.00	Horizontal



1GHz to 26GHz

A Peak Field Strength Measurement, was performed on the carrier (5.5Mb/sec Data Rate) of the Top Channel to determine the specification limit for any Non-Restricted Band measurements (20dB down on carrier). The bandwidths used were 100kHz RBW & 300kHz VBW.

Frequency: 2.462GHz Peak Measurement: 97.4dBμV/m
Non-Restricted Band Limit = 77.4dBμV/m

All other spurious emissions are detailed below

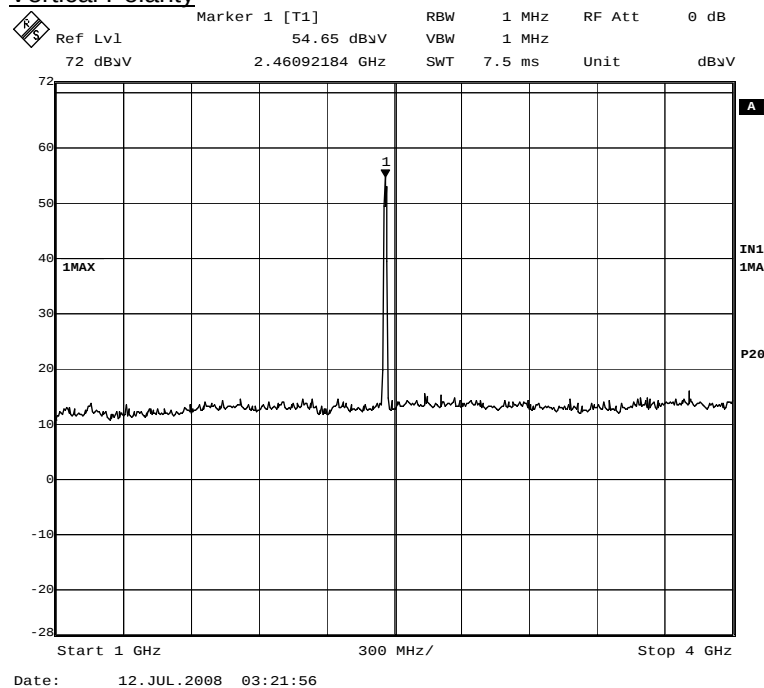
Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degree	Result Peak dBμV/m	Result Average dBμV/m	Peak Limit dBμV/m	Average Limit dBμV/m	Result
4.924 ⁽¹⁾	Horizontal	100	219	61.6	52.2	74.0	54.0	Pass
4.924 ⁽²⁾	Horizontal	100	210	56.6	51.5	74.0	54.0	Pass

(1) 5.5Mb/sec Data rate

(2) 6.0Mb/sec Data rate

1GHz to 4GHz

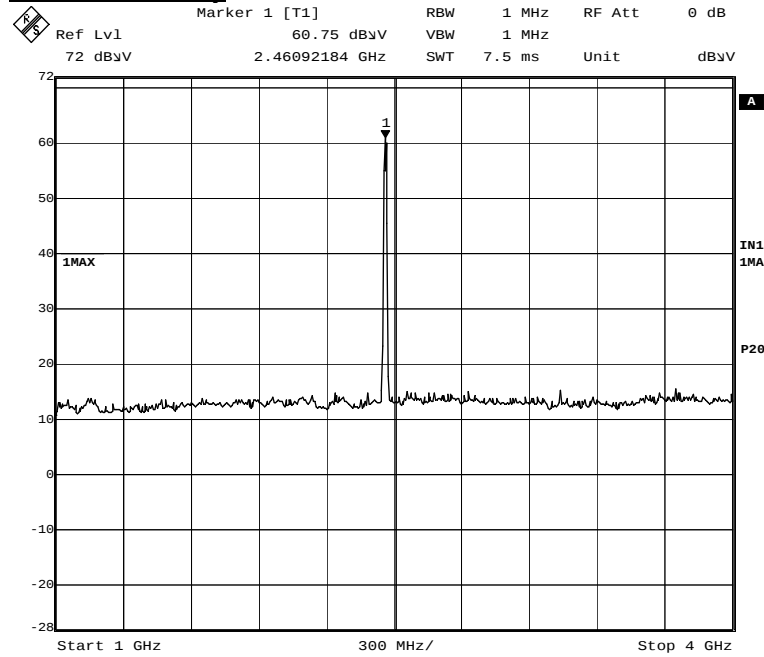
Vertical Polarity





Product Service

Horizontal Polarity

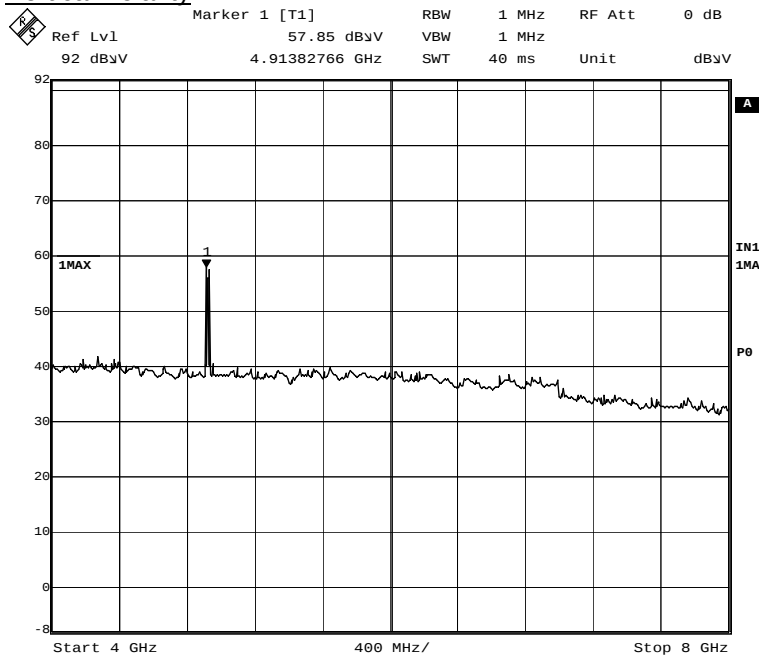


Date: 12.JUL.2008 03:18:45



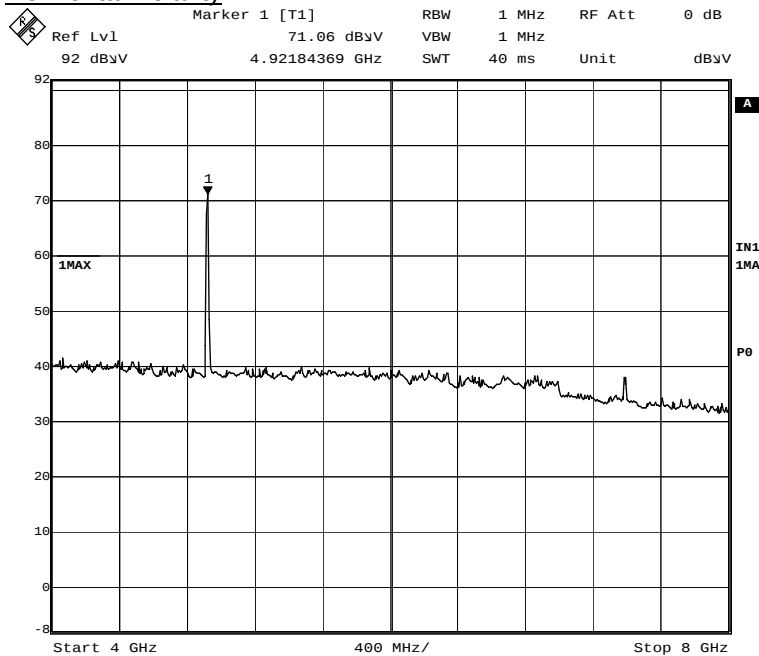
4GHz to 8GHz

Vertical Polarity



Date: 12.JUL.2008 21:51:50

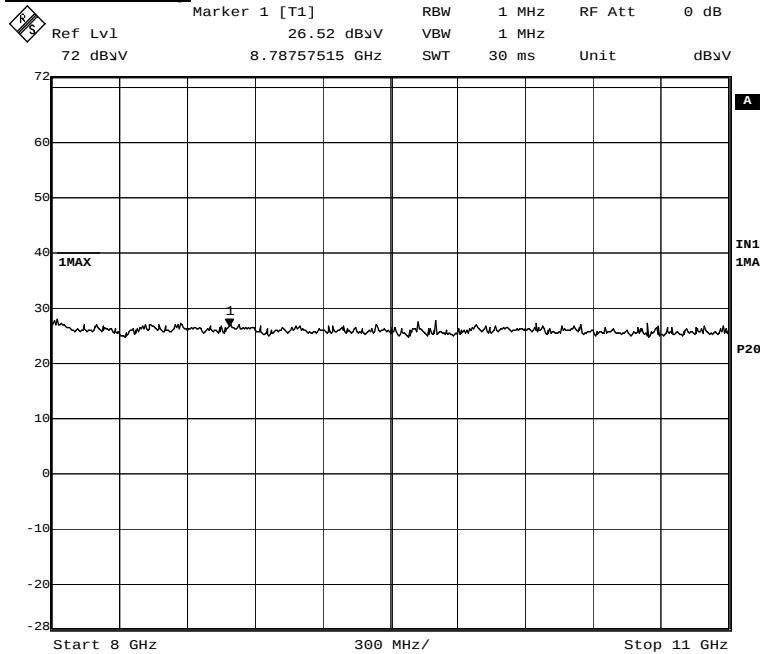
Horizontal Polarity



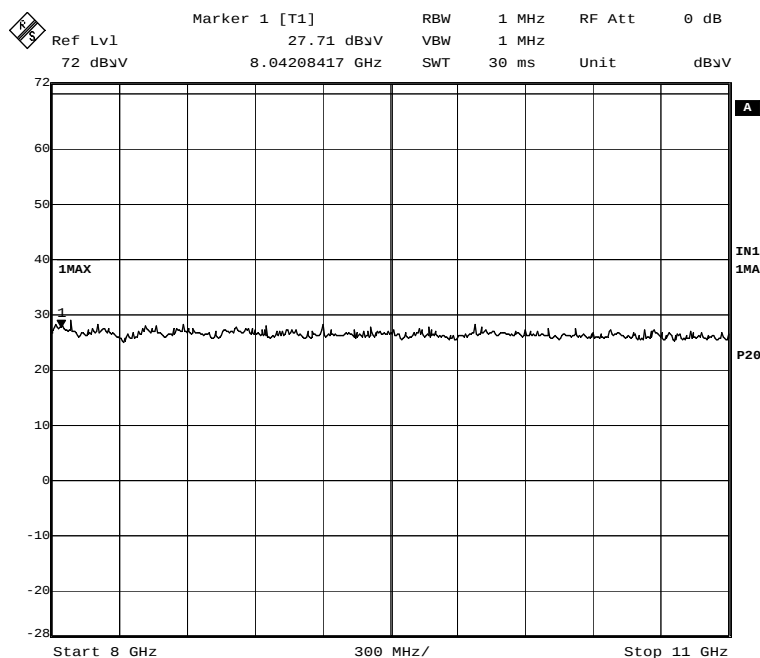
Date: 12.JUL.2008 21:55:15



Product Service

8GHz to 11GHzVertical Polarity

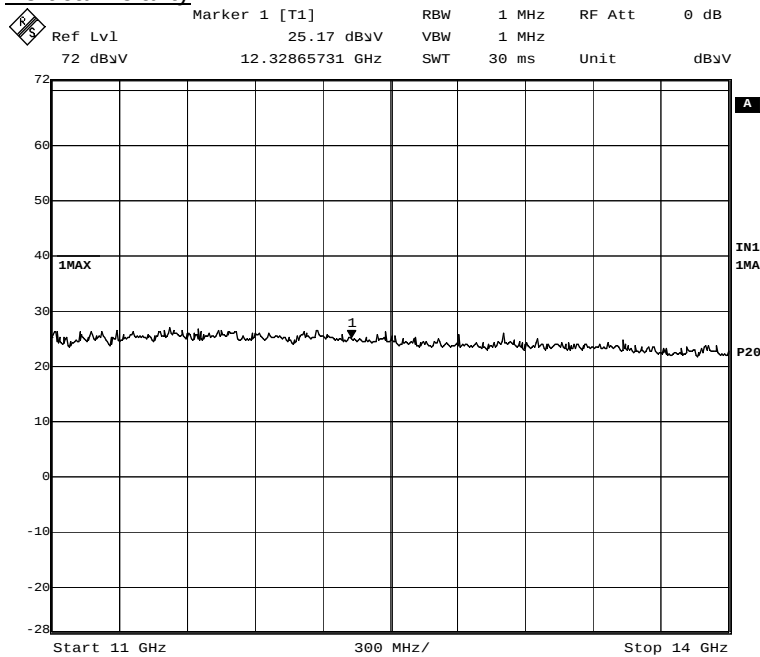
Date: 13.JUL.2008 16:39:50

Horizontal Polarity

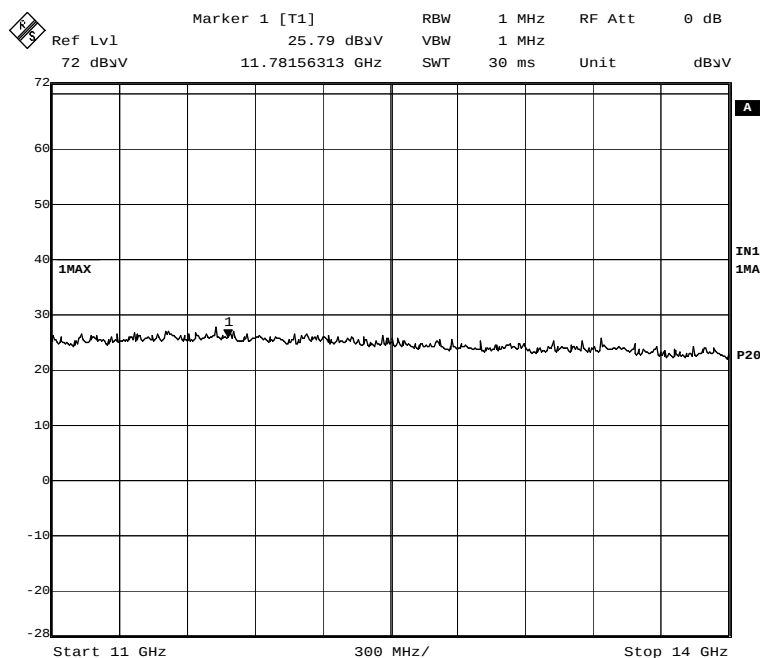
Date: 13.JUL.2008 17:01:44



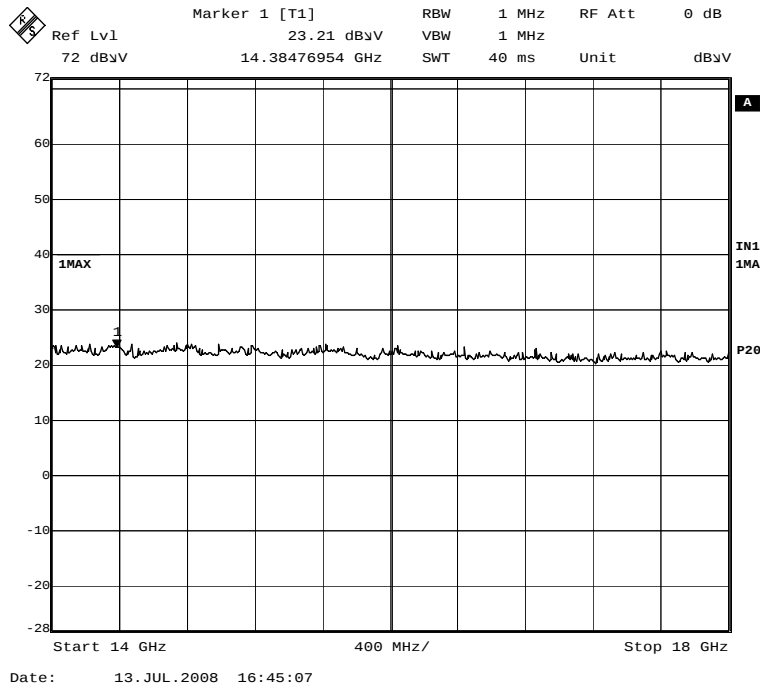
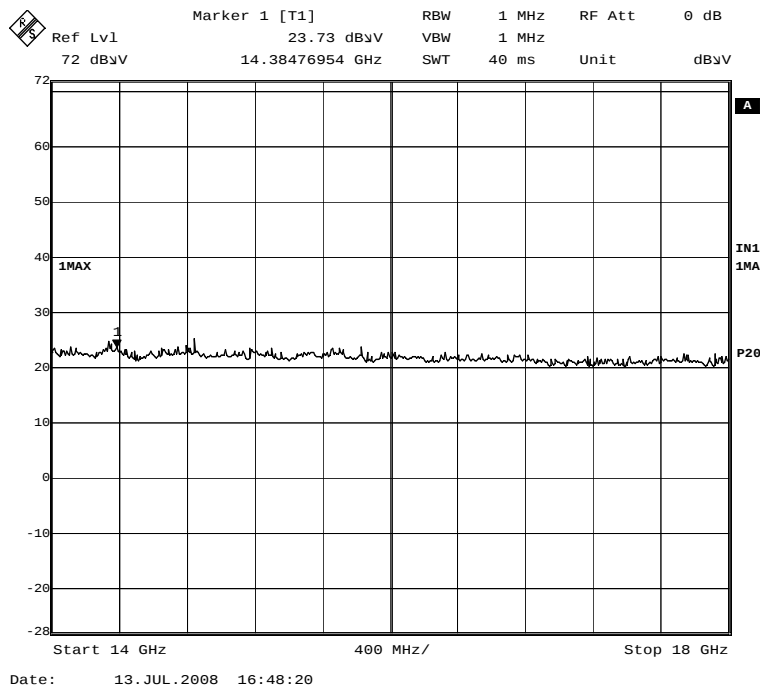
Product Service

11GHz to 14GHzVertical Polarity

Date: 13.JUL.2008 16:42:38

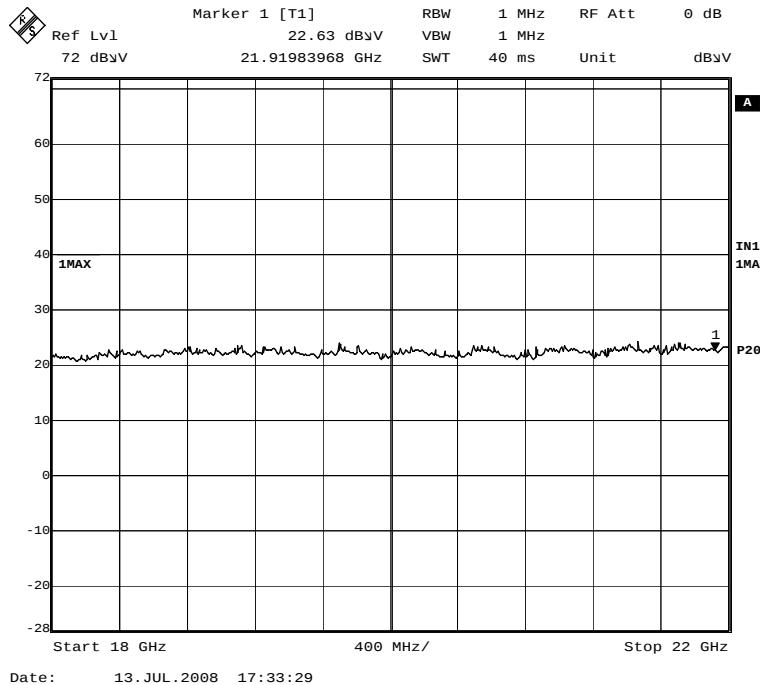
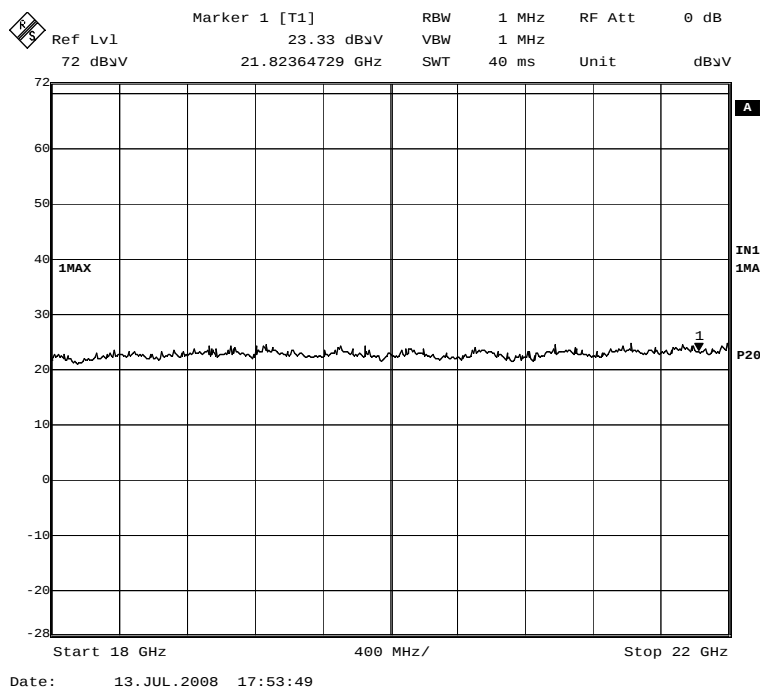
Horizontal Polarity

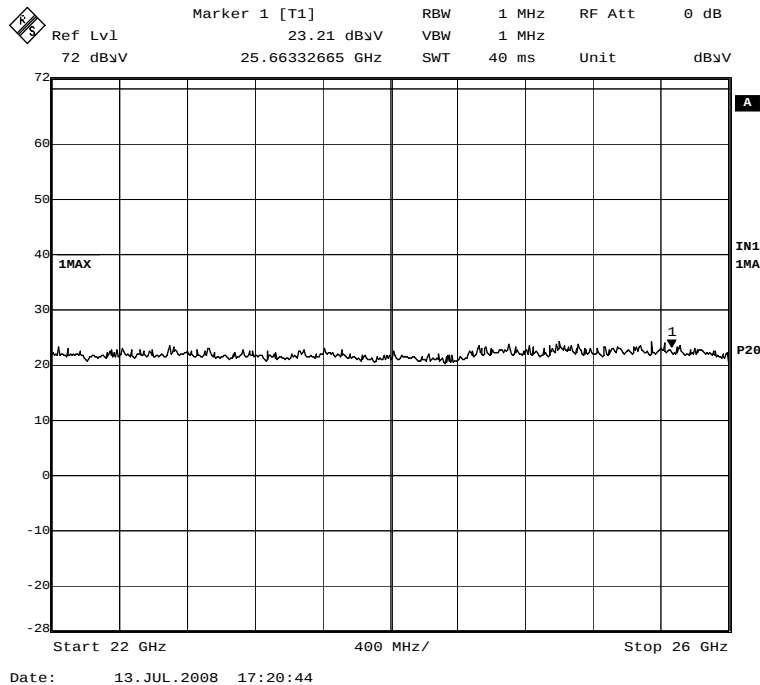
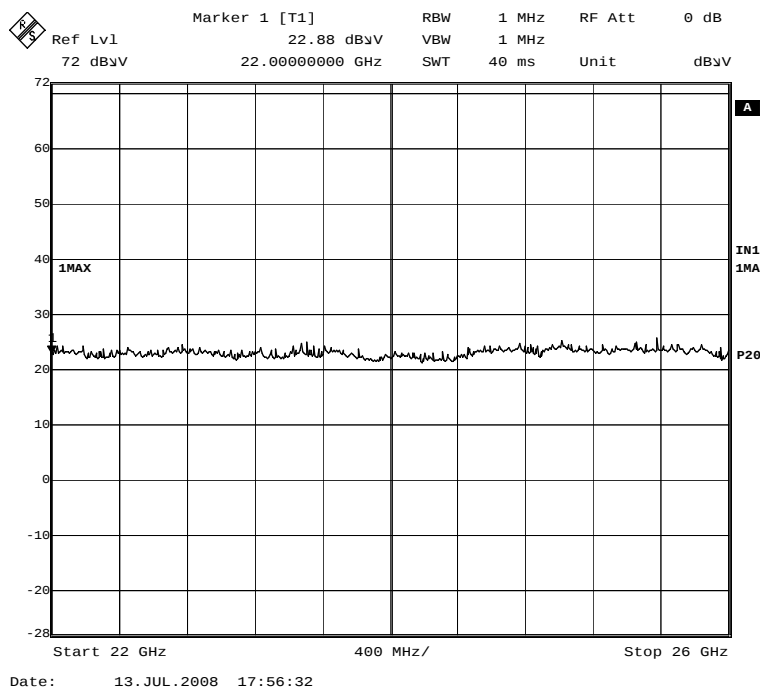
Date: 13.JUL.2008 16:54:06

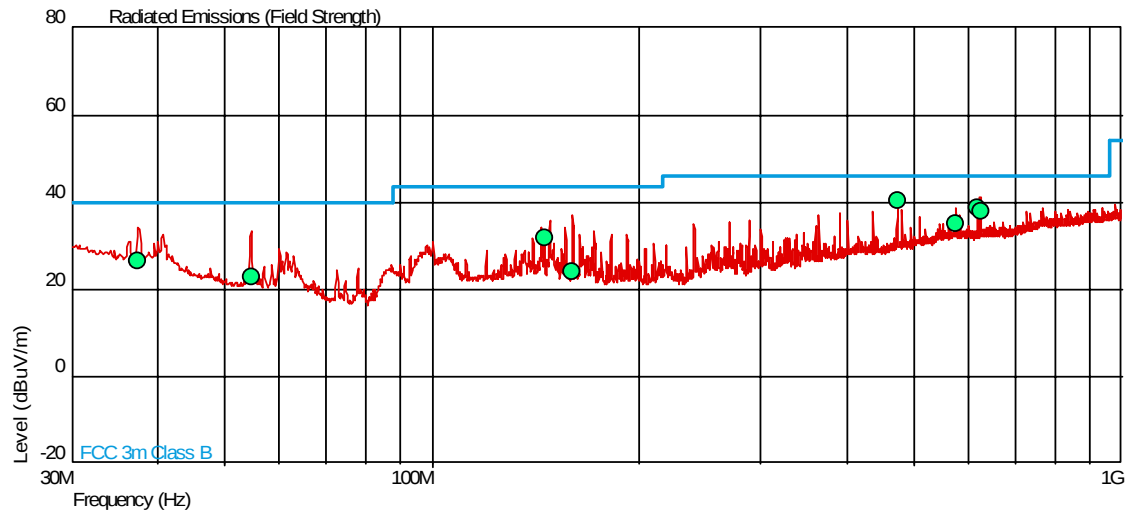
14GHz to 18GHzVertical PolarityHorizontal Polarity



Product Service

18GHz to 22GHzVertical PolarityHorizontal Polarity

22GHz to 26GHzVertical PolarityHorizontal Polarity

Configuration 1 - Mode 430MHz to 1GHz (Combined Polarity)

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
37.505	26.4	40.0	-13.6	27	1.00	Vertical
54.606	22.8	40.0	-17.2	252	1.19	Vertical
145.505	32.0	43.5	-11.5	189	1.59	Horizontal
160.014	24.1	43.5	-19.4	266	1.00	Vertical
472.834	40.5	46.0	-5.5	294	2.23	Horizontal
576.121	34.9	46.0	-11.1	35	1.00	Horizontal
618.320	38.9	46.0	-7.1	256	1.00	Vertical
624.031	38.1	46.0	-7.9	172	1.00	Vertical



1GHz to 26GHz

A Peak Field Strength Measurement, was performed on the carrier (3DH5 Modulation Scheme) of the Bottom Channel to determine the specification limit for any Non-Restricted Band measurements (20dB down on carrier). The bandwidths used were 100kHz RBW & 300kHz VBW.

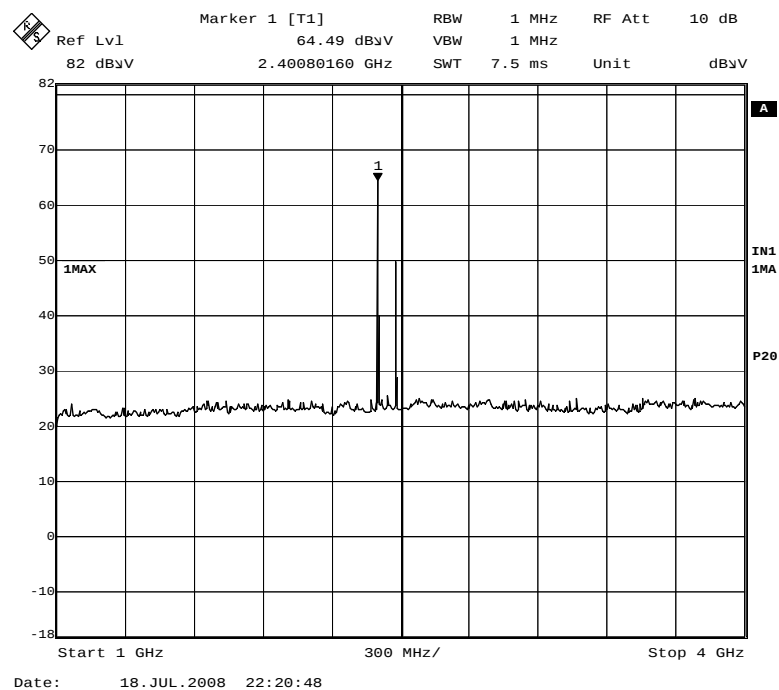
Frequency: 2.402GHz Peak Measurement: 102.5dB μ V/m
Non-Restricted Band Limit = 82.5dB μ V/m

All other spurious emissions are detailed below.

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degree	Result Peak dB μ V/m	Result Average dB μ V/m	Peak Limit dB μ V/m	Average Limit dB μ V/m	Result
4.804	Vertical	100	40	57.5	33.6	74.0	54.0	Pass
9.607	Vertical	100	137	47.2	N/A	82.5	N/A	Pass

1GHz to 4GHz

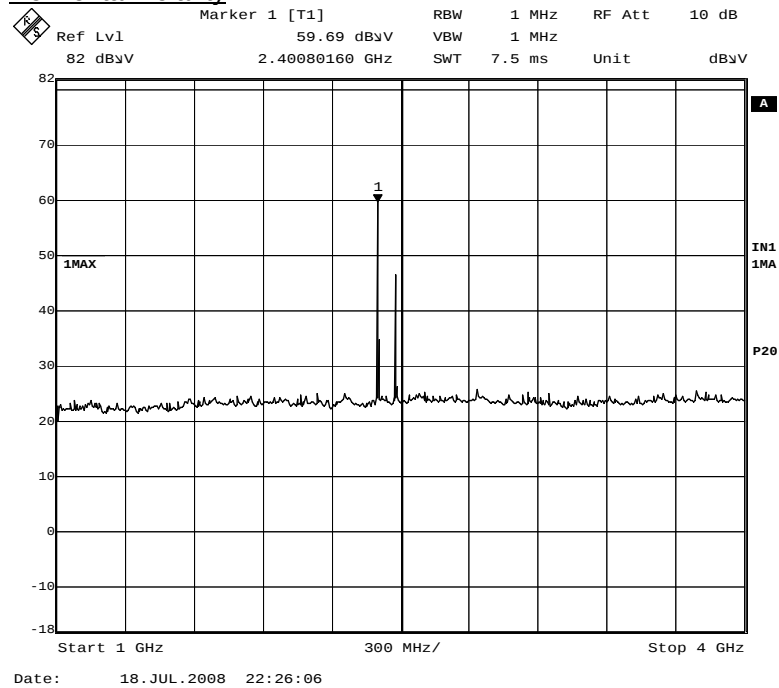
Vertical Polarity





Product Service

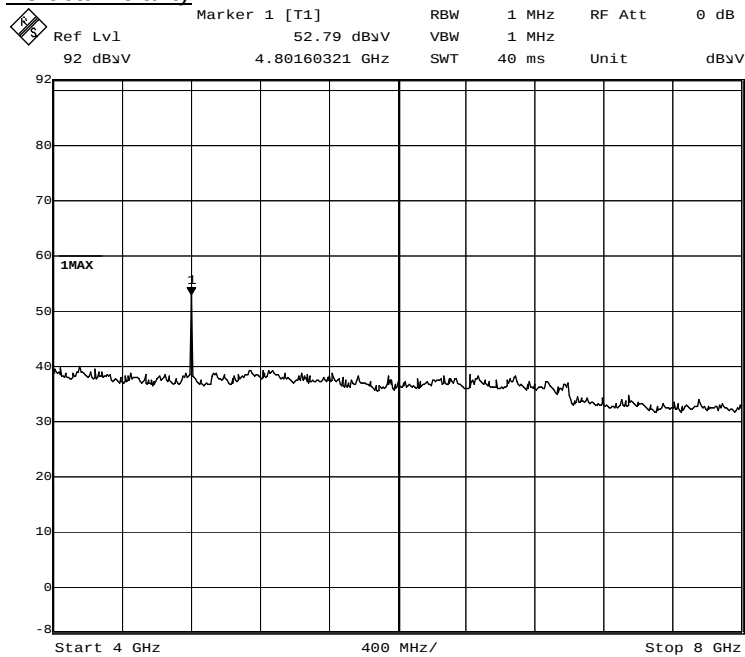
Horizontal Polarity





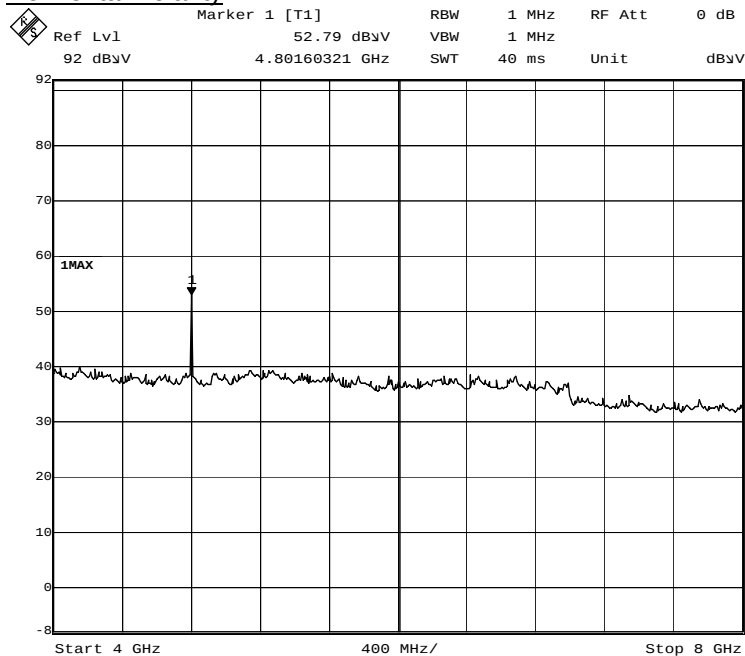
4GHz to 8GHz

Vertical Polarity



Date: 18.JUL.2008 23:33:15

Horizontal Polarity



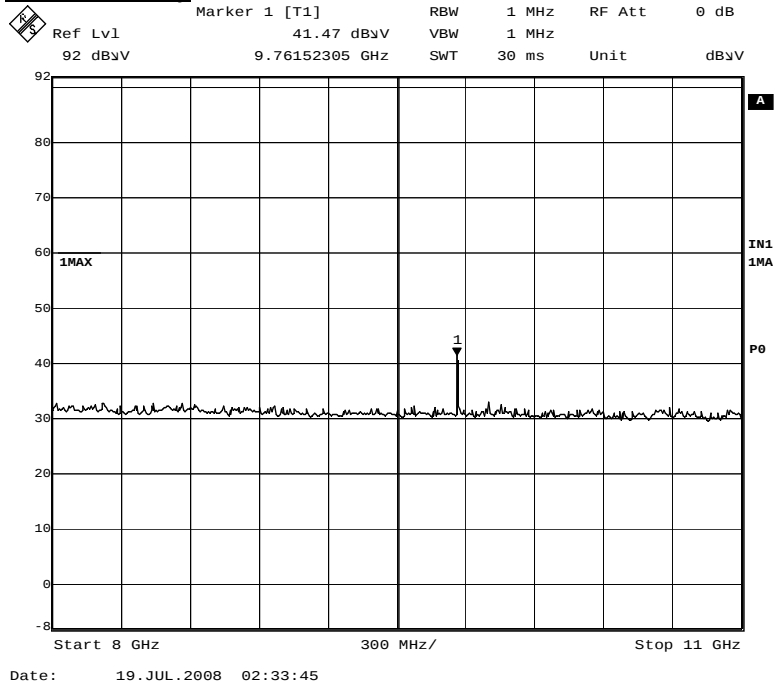
Date: 18.JUL.2008 23:33:15



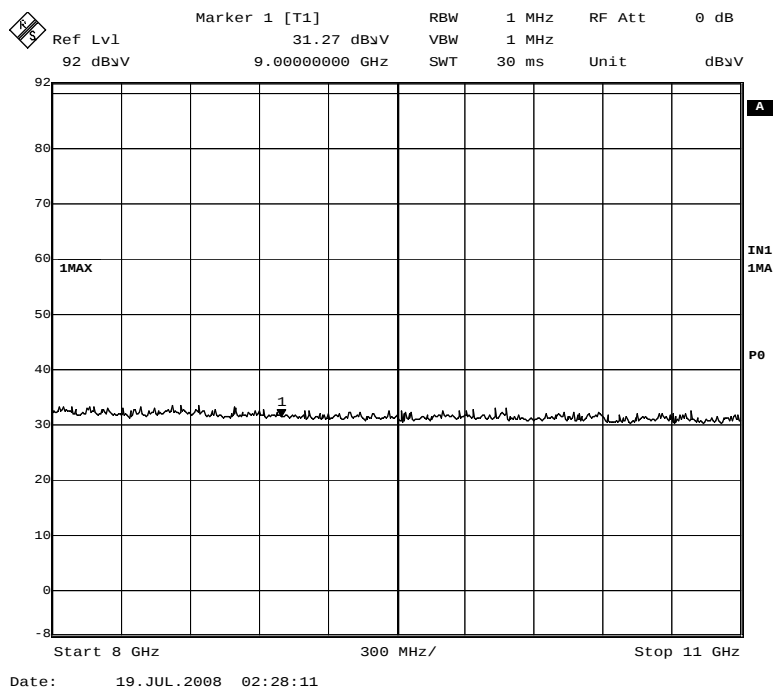
Product Service

8GHz to 11GHz

Vertical Polarity

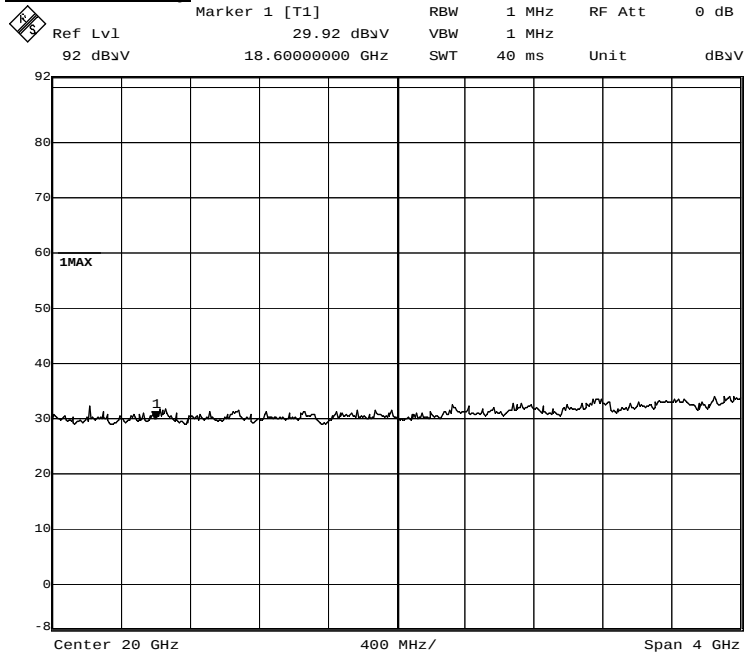


Horizontal Polarity

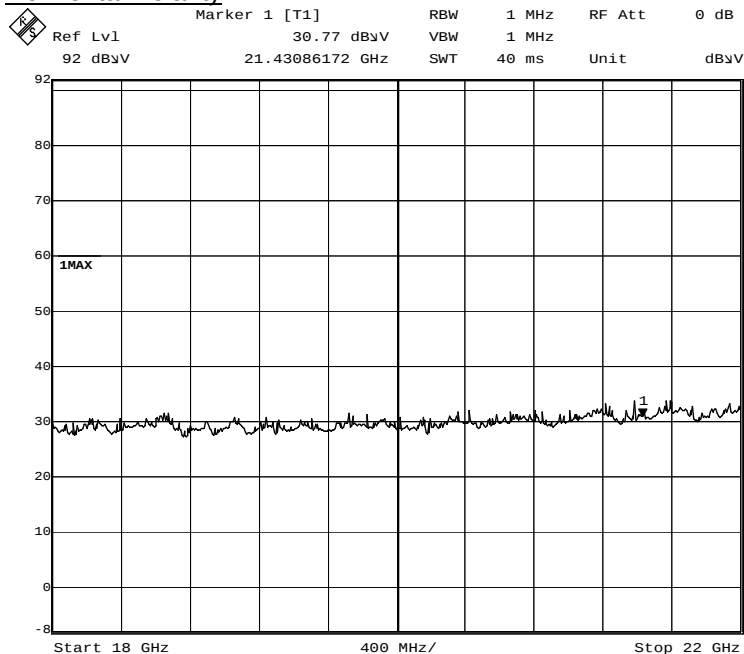




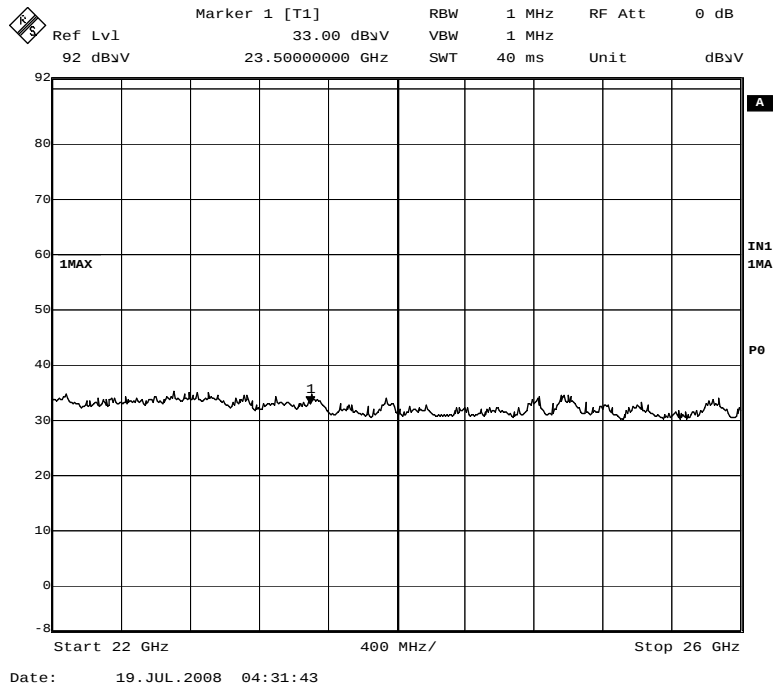
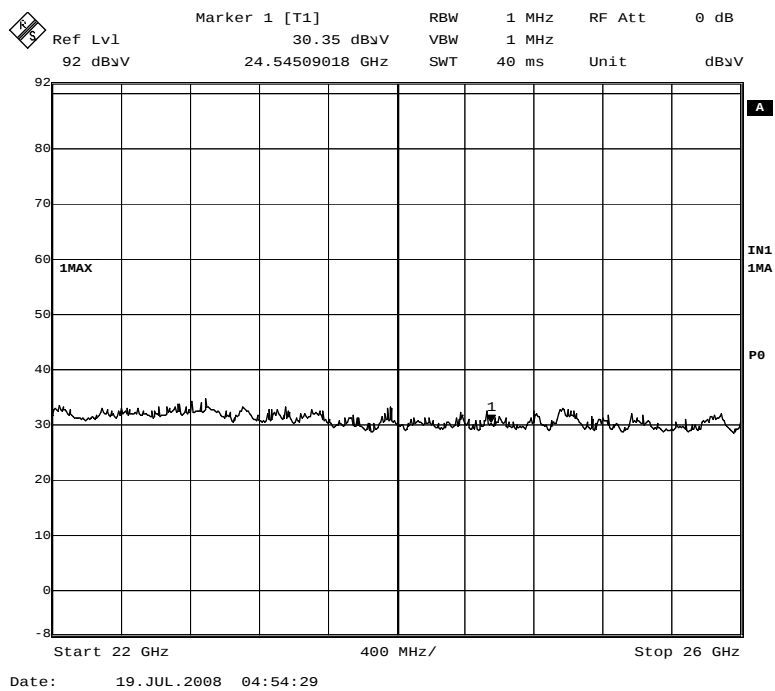
Product Service

18GHz to 22GHzVertical Polarity

Date: 19.JUL.2008 04:34:44

Horizontal Polarity

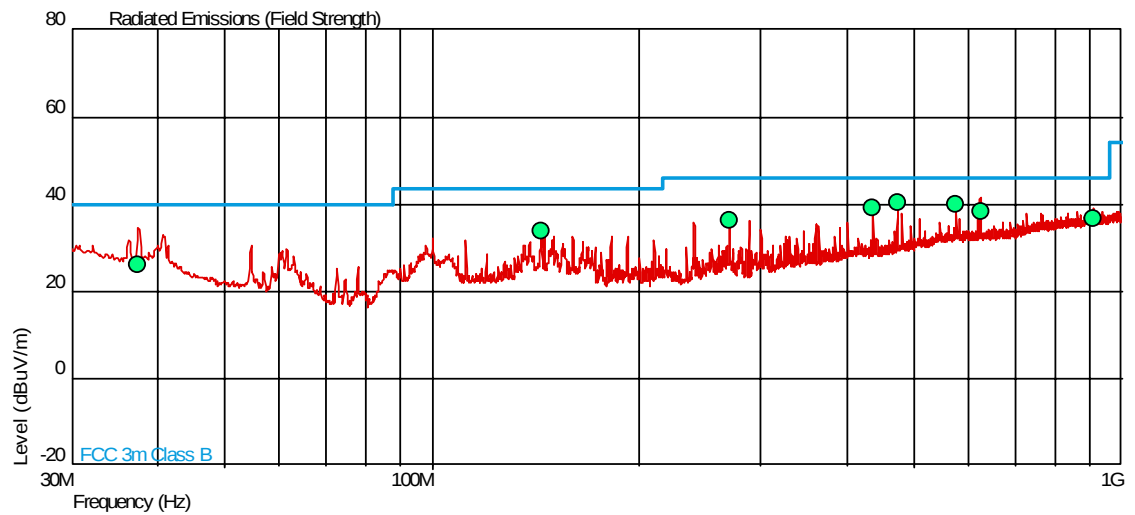
Date: 19.JUL.2008 04:55:05

22GHz to 26GHzVertical PolarityHorizontal Polarity



Configuration 1 - Mode 5

30MHz to 1GHz (Combined Polarity)



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
37.506	26.3	40.0	-13.7	251	1.00	Vertical
144.013	33.9	43.5	-9.6	136	2.90	Horizontal
270.035	36.4	46.0	-9.6	25	1.00	Horizontal
436.469	39.0	46.0	-7.0	274	2.36	Horizontal
472.824	40.5	46.0	-5.5	289	2.24	Horizontal
576.052	40.0	46.0	-6.0	247	1.60	Vertical
624.044	38.2	46.0	-7.8	182	1.00	Vertical
909.582	36.7	46.0	-9.3	185	1.00	Horizontal



1GHz to 26GHz

A Peak Field Strength Measurement, was performed on the carrier (3DH5 Modulation Scheme) of the Middle Channel to determine the specification limit for any Non-Restricted Band measurements (20dB down on carrier). The bandwidths used were 100kHz RBW & 300kHz VBW.

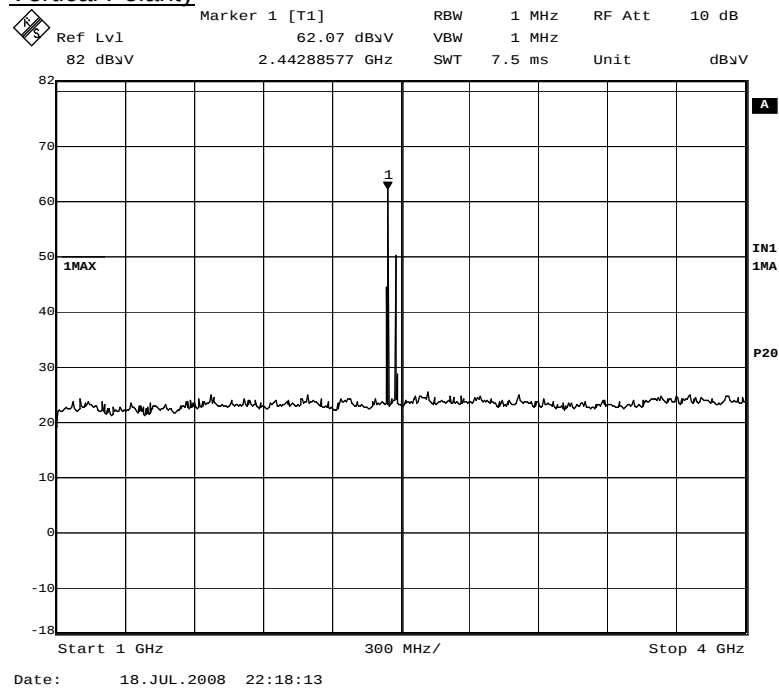
Frequency: 2.441GHz Peak Measurement: 102.8dB μ V/m
Non-Restricted Band Limit = 82.8dB μ V/m

All other spurious emissions are detailed below.

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degree	Result Peak dB μ V/m	Result Average dB μ V/m	Peak Limit dB μ V/m	Average Limit dB μ V/m	Result
4.882	Vertical	114	37	57.1	33.6	74.0	54.0	Pass
9.764	Vertical	100	136	40.4	N/A	82.8	N/A	Pass

1GHz to 4GHz

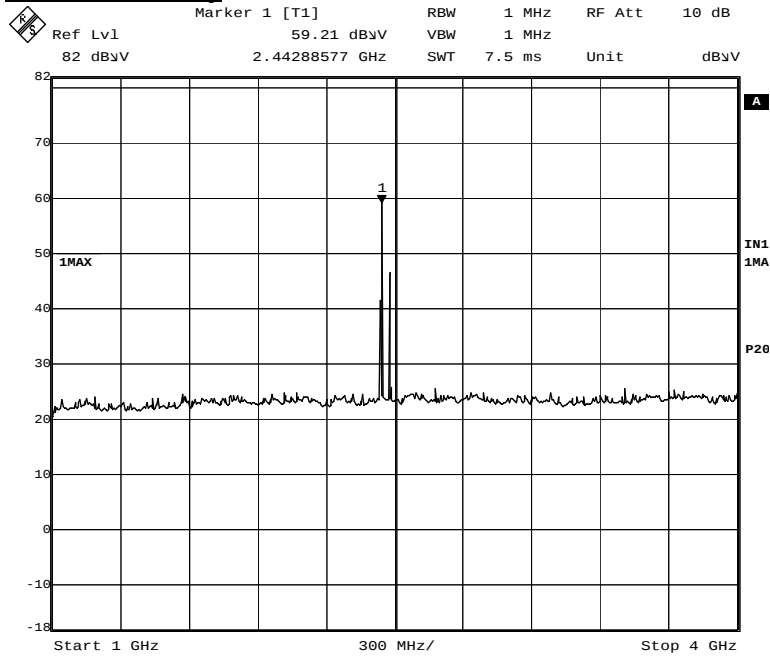
Vertical Polarity





Product Service

Horizontal Polarity

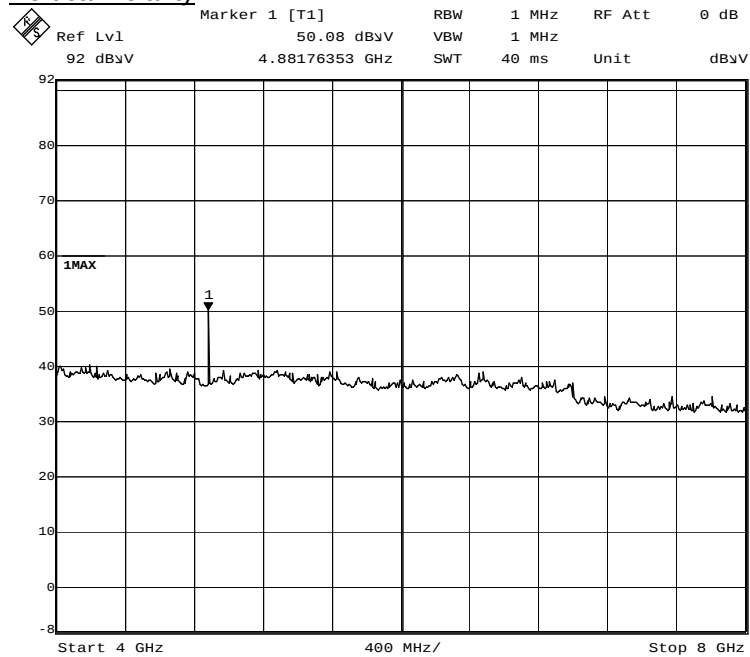


Date: 18.JUL.2008 22:28:51



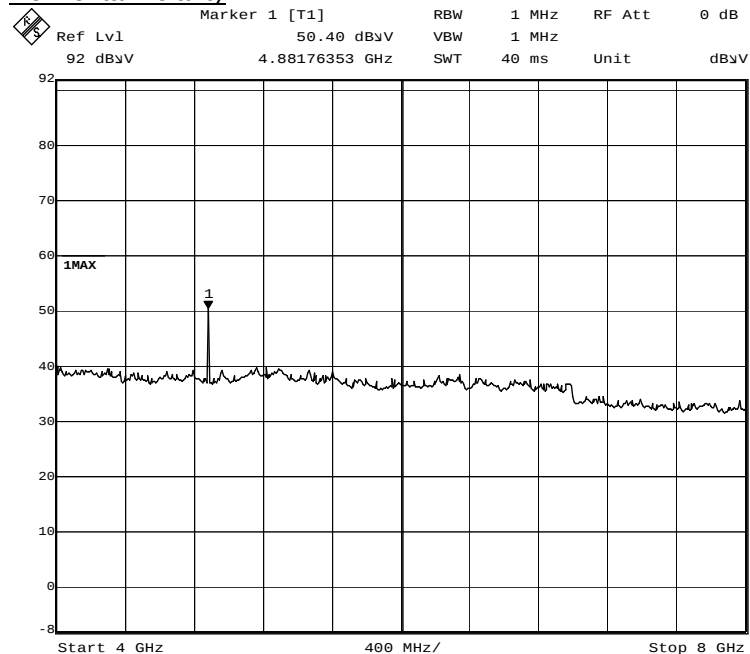
4GHz to 8GHz

Vertical Polarity

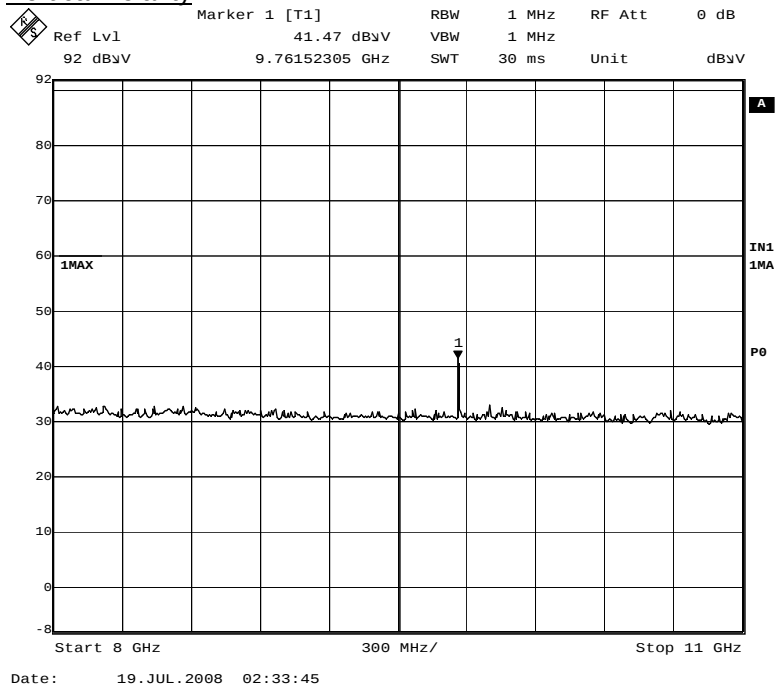
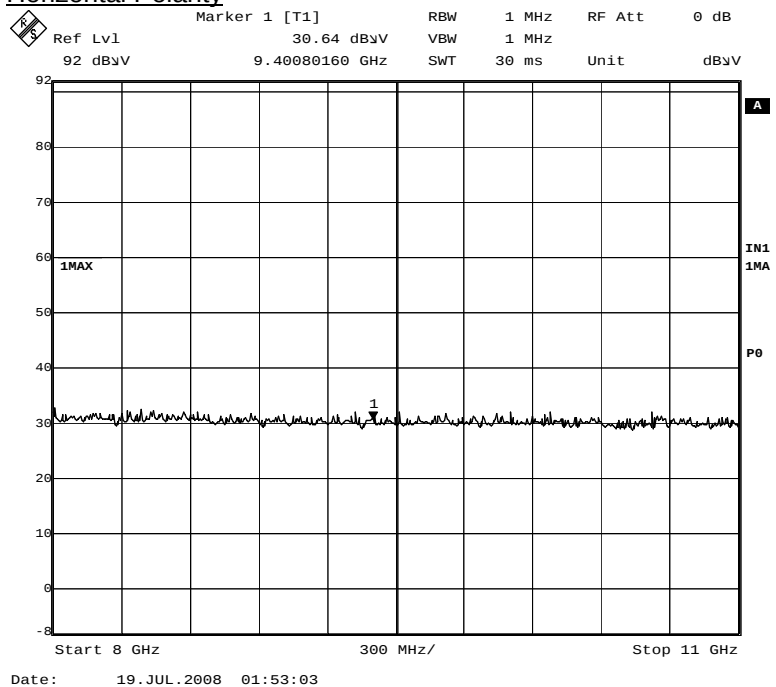


Date: 18.JUL.2008 23:36:23

Horizontal Polarity



Date: 18.JUL.2008 23:27:00

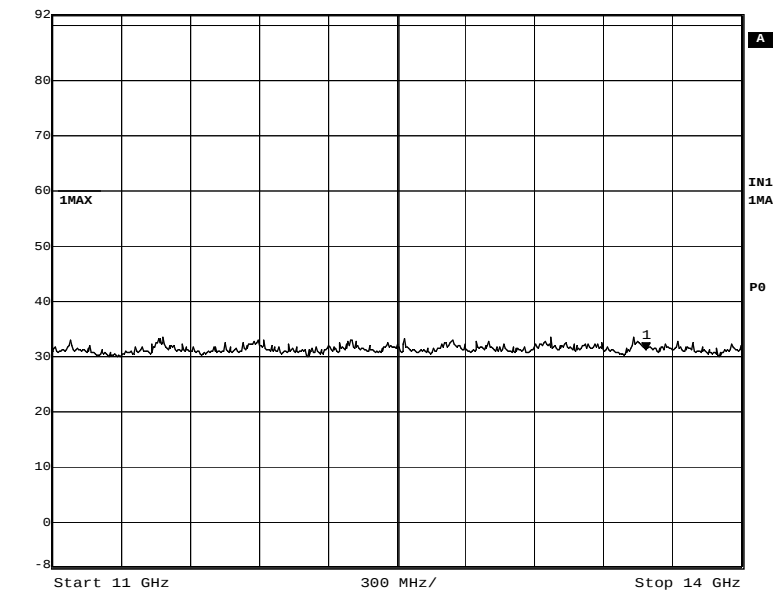
8GHz to 11GHzVertical PolarityHorizontal Polarity



Product Service

11GHz to 14GHzVertical Polarity

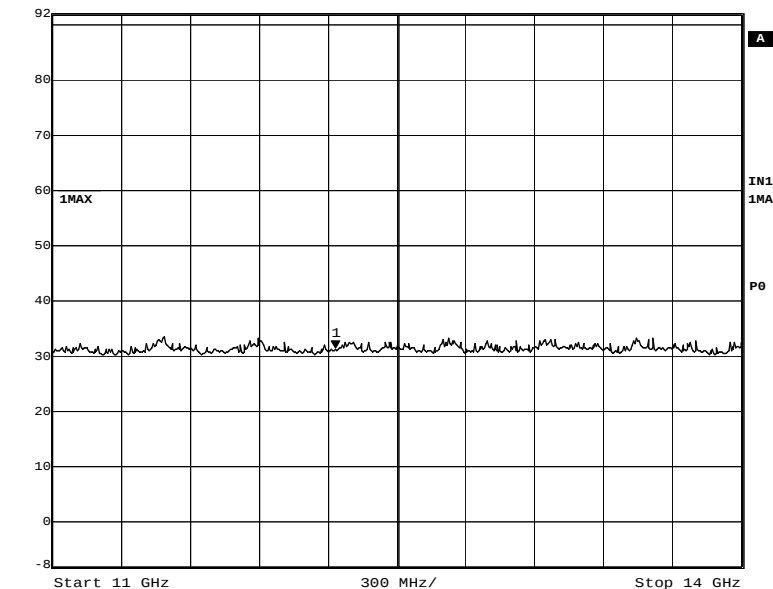
Marker 1 [T1]
Ref Lvl 31.20 dB μ V RBW 1 MHz RF Att 0 dB
92 dB μ V 13.58517034 GHz VBW 1 MHz
SWT 30 ms Unit dB μ V



Date: 19.JUL.2008 02:02:51

Horizontal Polarity

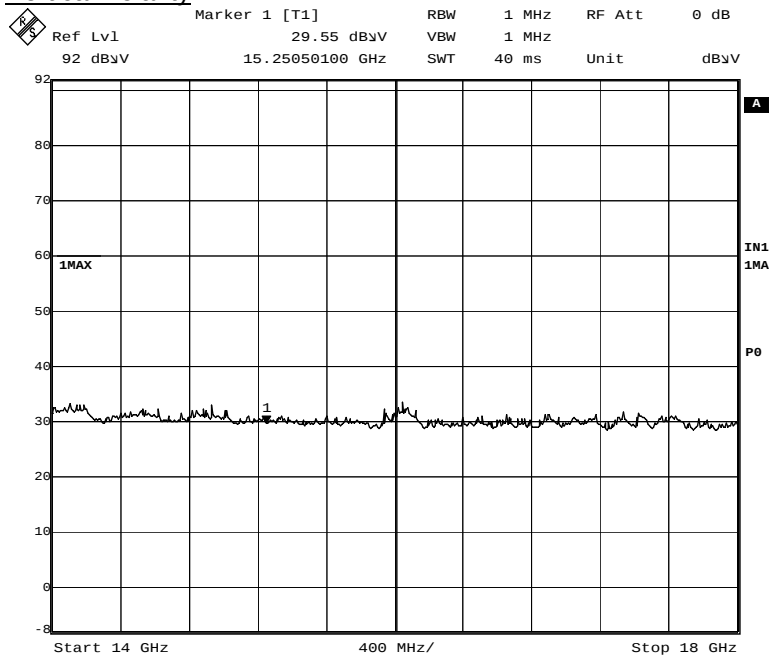
Marker 1 [T1]
Ref Lvl 31.35 dB μ V RBW 1 MHz RF Att 0 dB
92 dB μ V 12.23246493 GHz VBW 1 MHz
SWT 30 ms Unit dB μ V



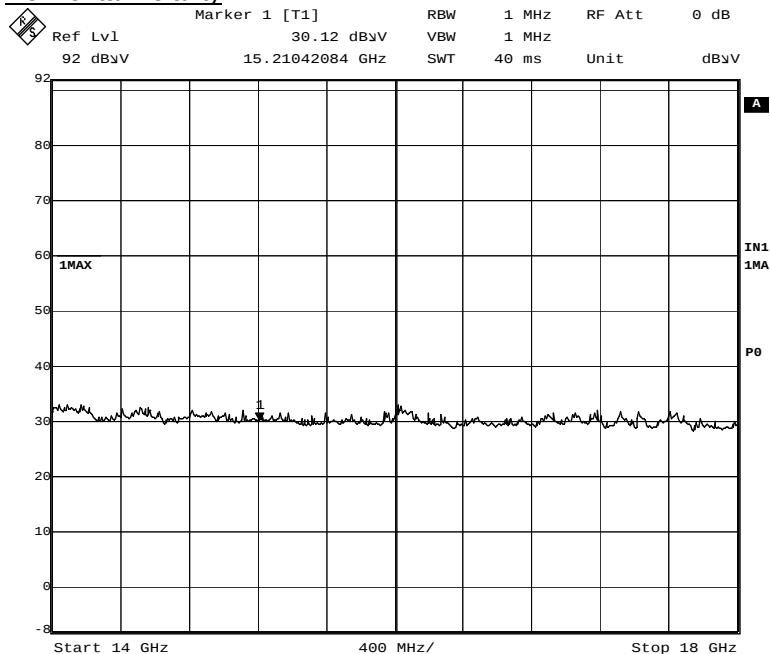
Date: 19.JUL.2008 01:55:13



Product Service

14GHz to 18GHzVertical Polarity

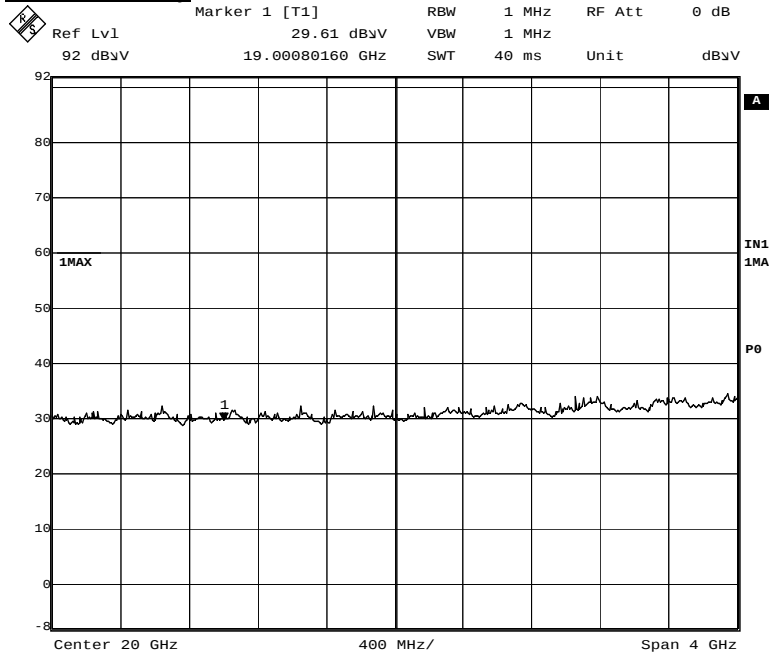
Date: 19.JUL.2008 02:00:43

Horizontal Polarity

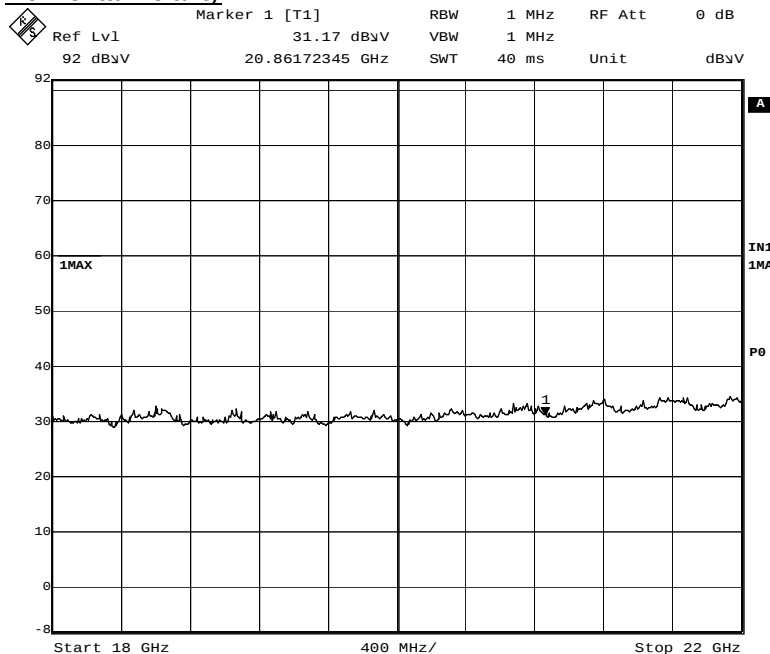
Date: 19.JUL.2008 01:57:52



Product Service

18GHz to 22GHzVertical Polarity

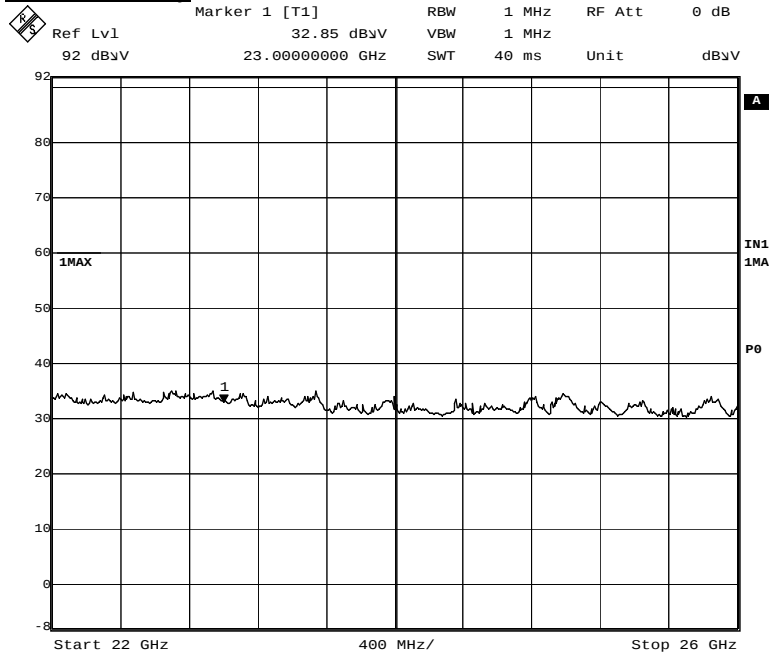
Date: 19.JUL.2008 04:38:03

Horizontal Polarity

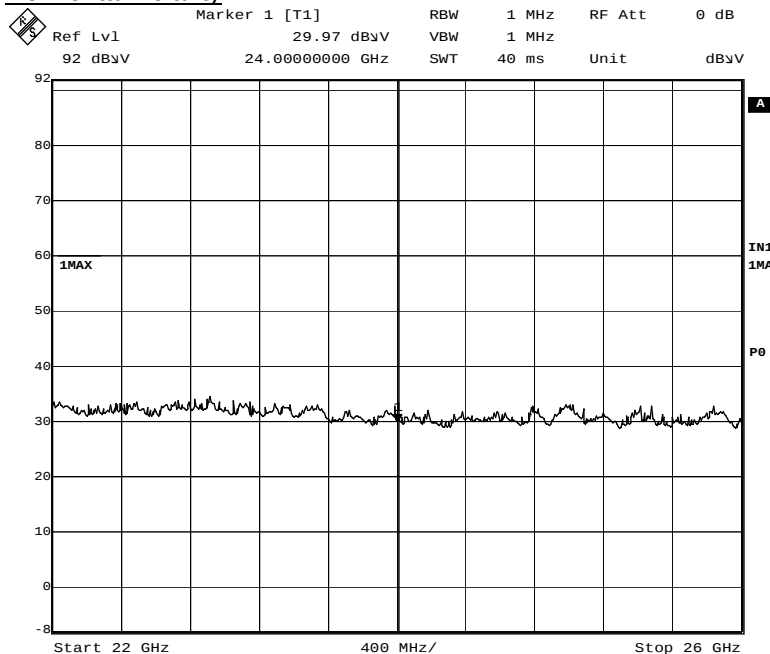
Date: 19.JUL.2008 04:53:19



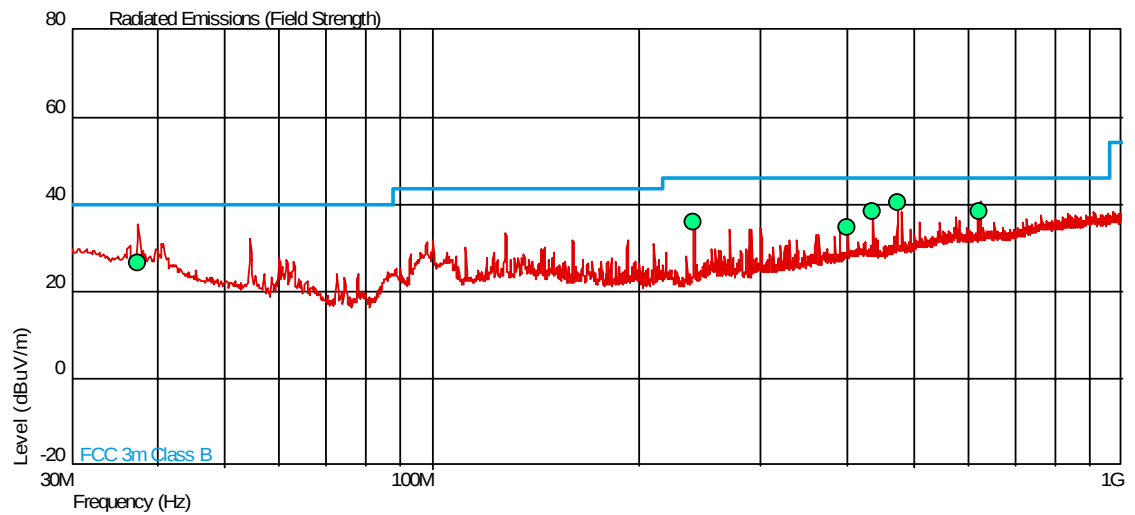
Product Service

22GHz to 26GHzVertical Polarity

Date: 19.JUL.2008 04:27:37

Horizontal Polarity

Date: 19.JUL.2008 04:54:00

Configuration 1 - Mode 630MHz to 1GHz (Combined Polarity)

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
37.498	26.4	40.0	-13.6	246	1.00	Vertical
240.022	35.7	46.0	-10.3	199	1.23	Horizontal
400.078	34.5	46.0	-11.5	260	1.00	Horizontal
436.459	38.2	46.0	-7.8	288	2.27	Horizontal
472.806	40.3	46.0	-5.7	289	2.14	Horizontal
624.006	38.4	46.0	-7.6	189	1.00	Vertical



1GHz to 26GHz

A Peak Field Strength Measurement, was performed on the carrier (3DH5 Modulation Scheme) of the Top Channel to determine the specification limit for any Non-Restricted Band measurements (20dB down on carrier). The bandwidths used were 100kHz RBW & 300kHz VBW.

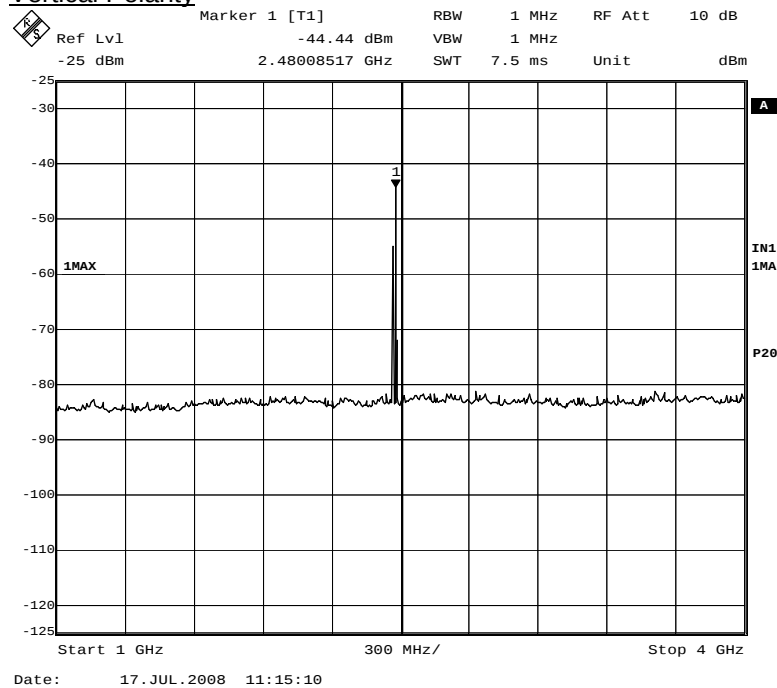
Frequency: 2.441GHz Peak Measurement: 101.1dBμV/m
Non-Restricted Band Limit = 81.1dBμV/m

All other spurious emissions are detailed below.

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degree	Result Peak dBμV/m	Result Average dBμV/m	Peak Limit dBμV/m	Average Limit dBμV/m	Result
4.960	Vertical	100	35	60.6	34.8	74.0	54.0	Pass

1GHz to 4GHz

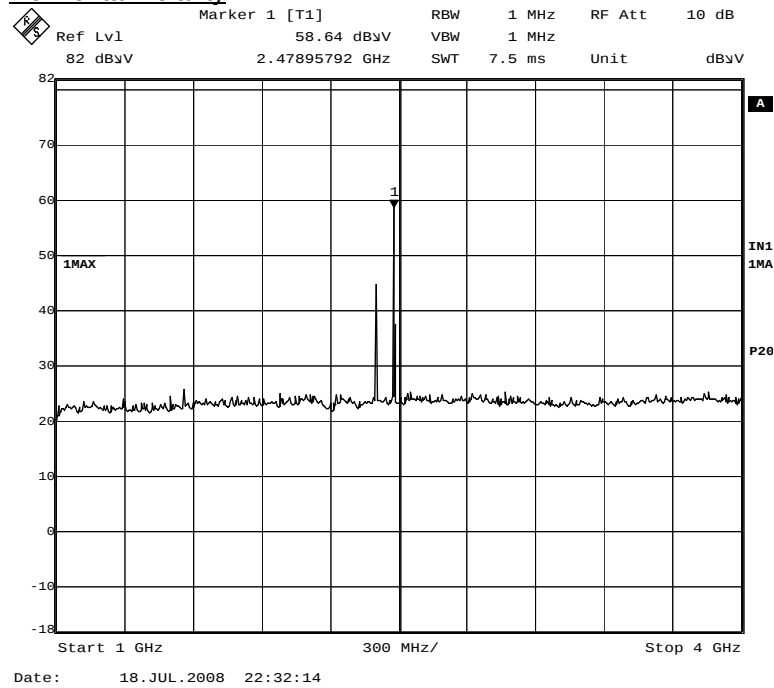
Vertical Polarity

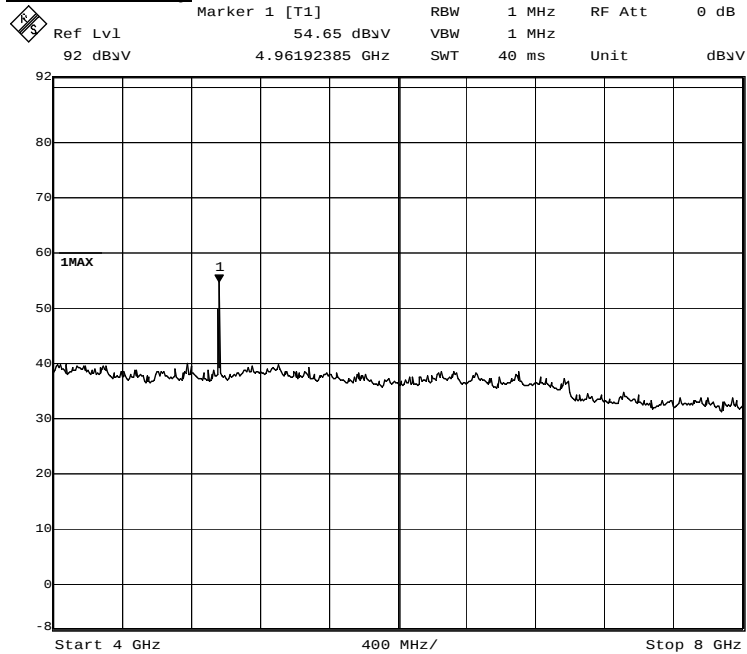




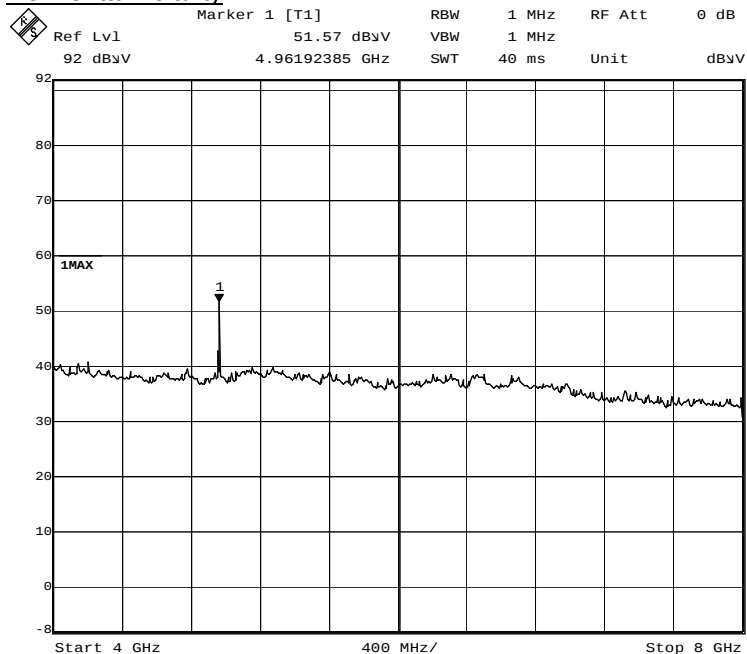
Product Service

Horizontal Polarity

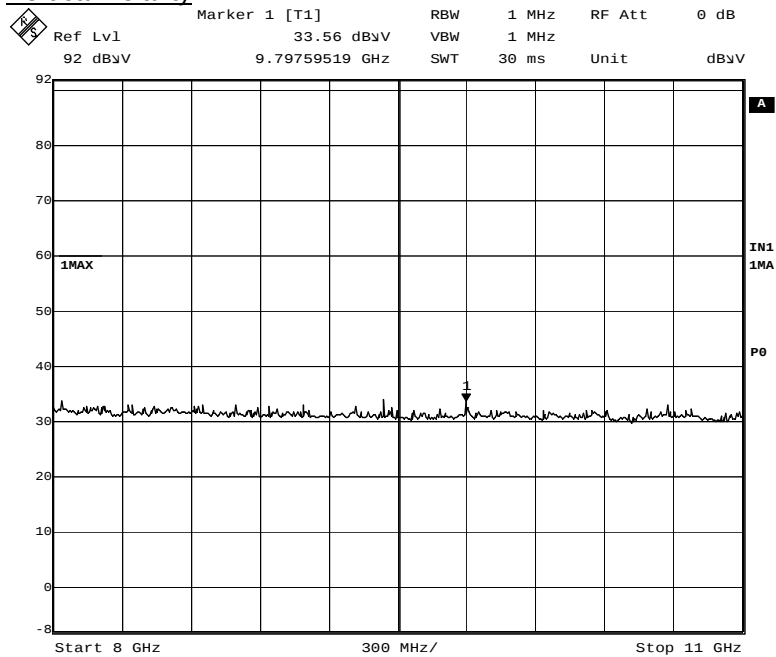


4GHz to 8GHzVertical Polarity

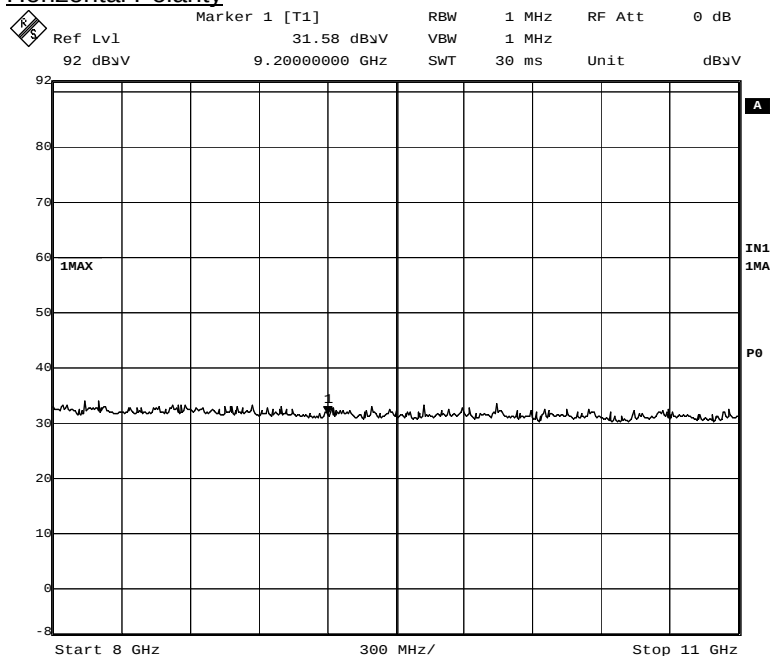
Date: 18.JUL.2008 23:40:13

Horizontal Polarity

Date: 18.JUL.2008 23:24:28

8GHz to 11GHzVertical Polarity

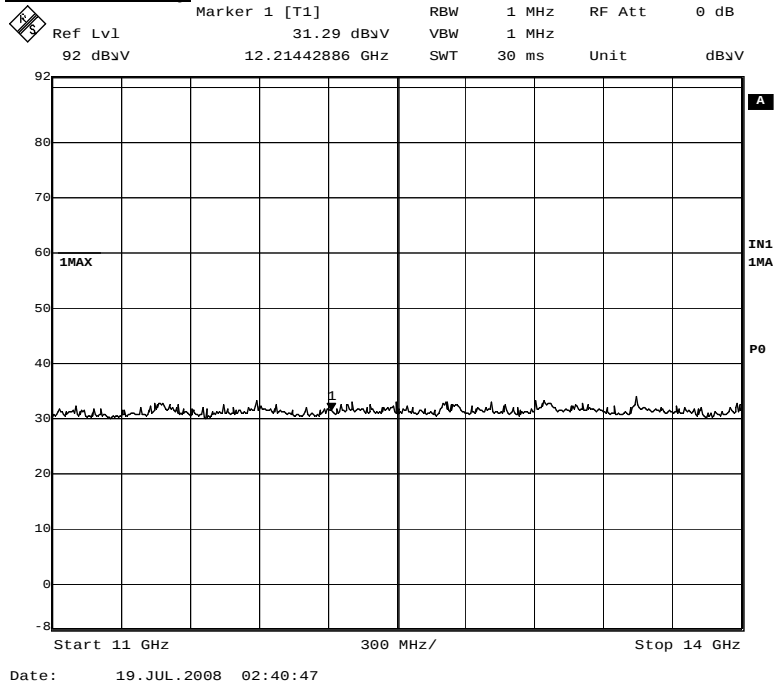
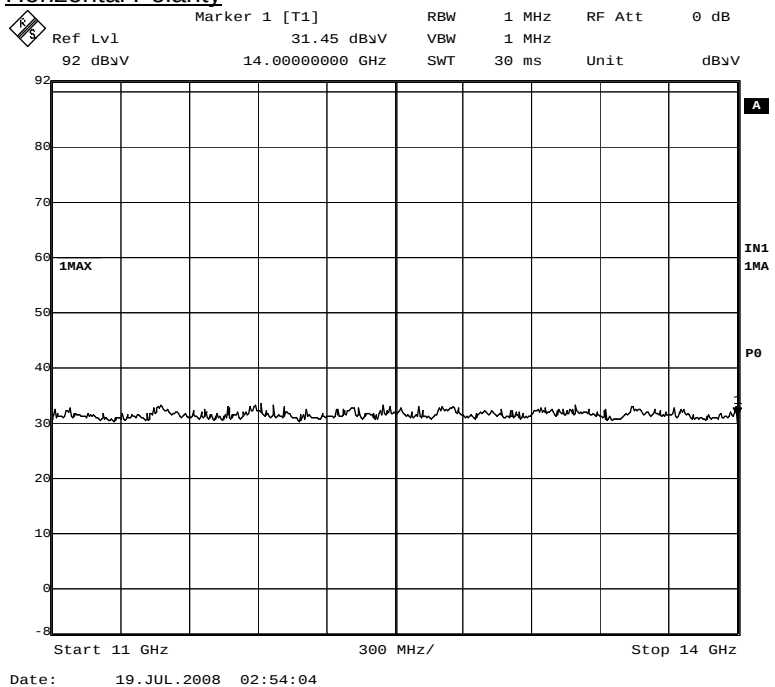
Date: 19.JUL.2008 02:38:05

Horizontal Polarity

Date: 19.JUL.2008 02:56:45



Product Service

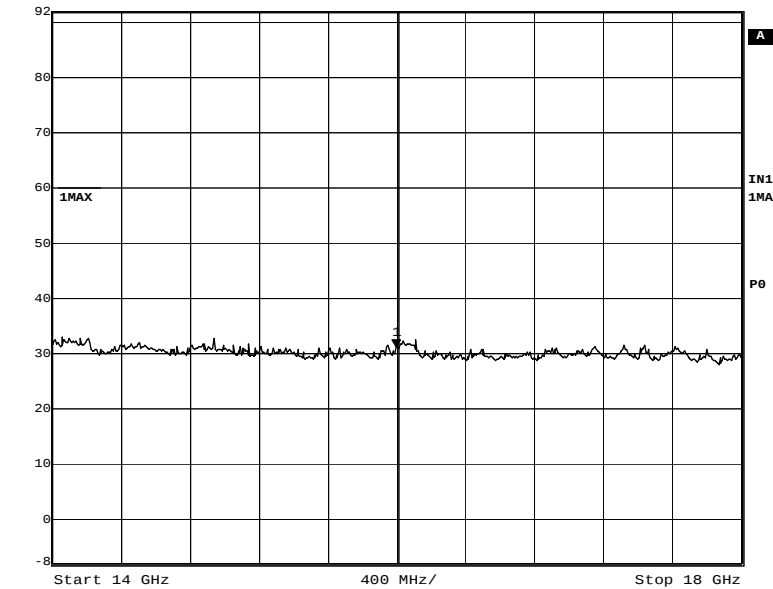
11GHz to 14GHzVertical PolarityHorizontal Polarity



Product Service

14GHz to 18GHzVertical Polarity

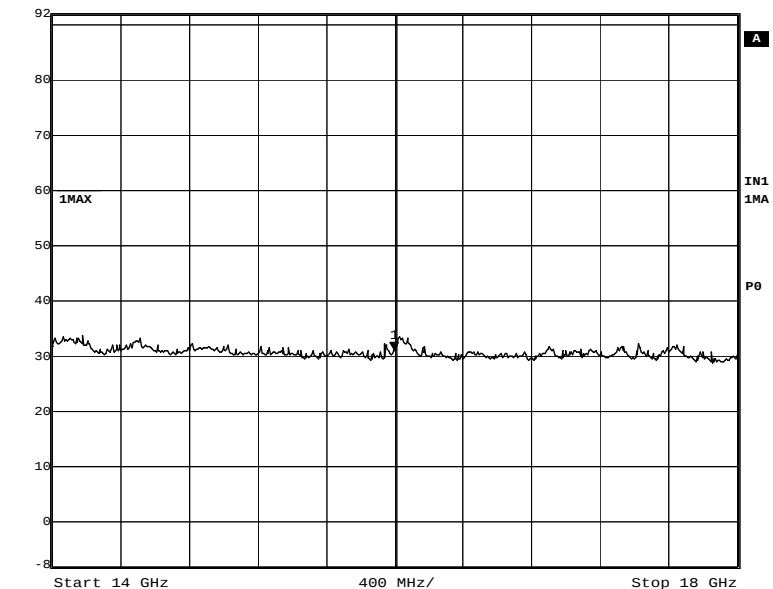
Marker 1 [T1]
Ref Lvl 31.03 dB μ V
92 dB μ V 15.99599198 GHz
RBW 1 MHz RF Att 0 dB
VBW 1 MHz
SWT 40 ms Unit dB μ V



Date: 19.JUL.2008 02:43:10

Horizontal Polarity

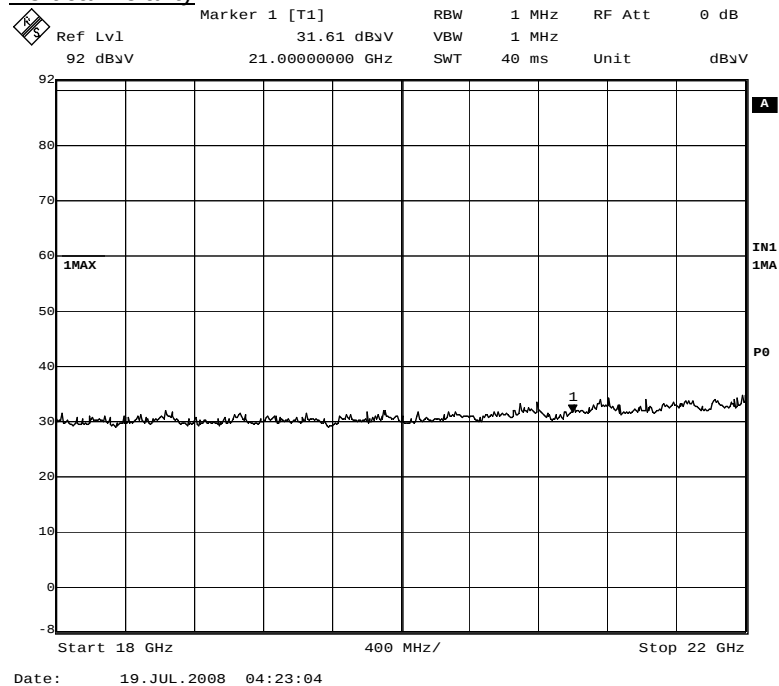
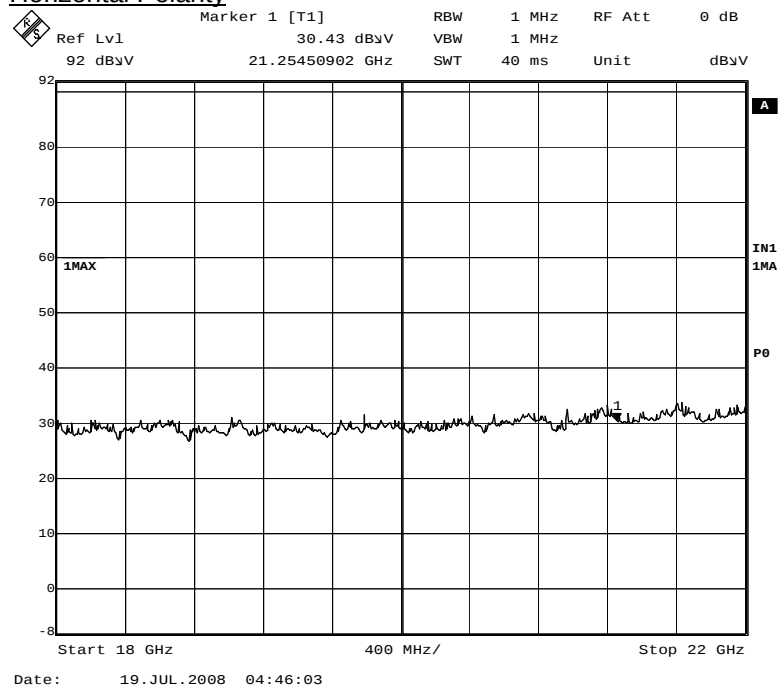
Marker 1 [T1]
Ref Lvl 31.05 dB μ V
92 dB μ V 15.99599198 GHz
RBW 1 MHz RF Att 0 dB
VBW 1 MHz
SWT 40 ms Unit dB μ V



Date: 19.JUL.2008 02:51:34

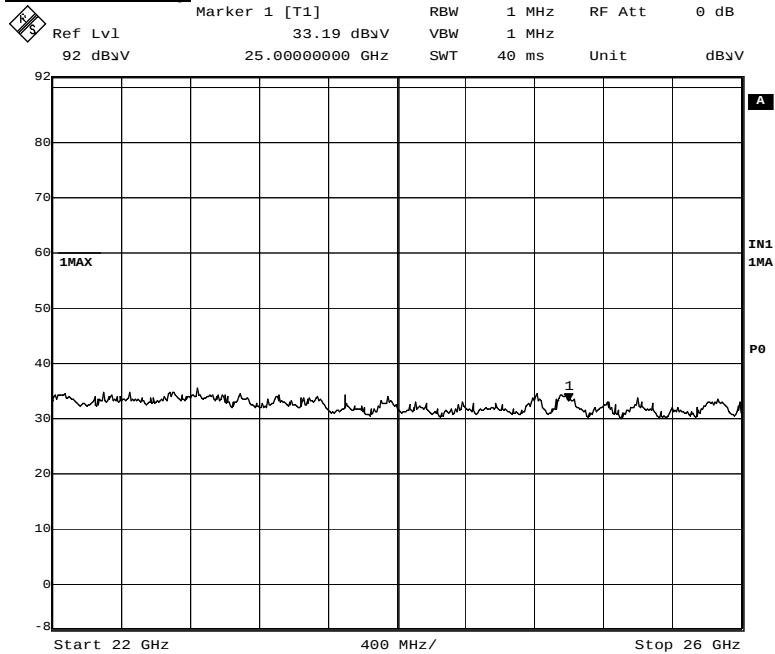


Product Service

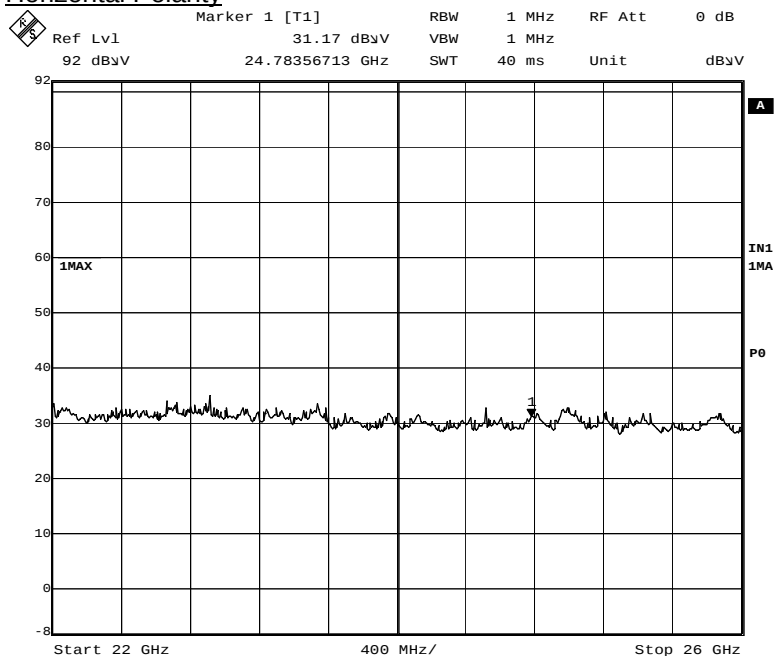
18GHz to 22GHzVertical PolarityHorizontal Polarity



Product Service

22GHz to 26GHzVertical Polarity

Date: 19.JUL.2008 04:42:21

Horizontal Polarity

Date: 19.JUL.2008 04:45:22



2.2 MAXIMUM PEAK OUTPUT POWER (RADIATED)

2.2.1 Specification Reference

FCC CFR 47 Part 15C: 2006, Clause 15.209, 15.247(d), 15.205
 Industry Canada Testing RSS-Gen: 2007, Clause 4.8 and RSS-210: 2007, Clause 8.4

2.2.2 Equipment Under Test

Patient Monitoring System, S/N: 000008

2.2.3 Date of Test and Modification State

11 and 17 July 2008 - 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 FCC CFR 47 Part 15: 2006 and Industry Canada.

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

Configuration 1 - Mode 1
 - Mode 2
 - Mode 3
 - Mode 4
 - Mode 5
 - Mode 6

2.2.6 Environmental Conditions

	11 July 2008	17 July 2008
Ambient Temperature	21.5°C	15.2°C
Relative Humidity	45%	44%
Atmospheric Pressure	1009 mbar	1011 mbar

2.2.7 Test Procedure

Test Performed in accordance with FCC CFR 47 Part 15.247: 2006



2.2.8 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C: 2006 and Industry Canada RSS-Gen: 2007 and RSS-210: 2007 for Maximum Peak Output Power.

The test results are shown below.

Configuration 1 – Modes 1, 2, 3, 4, 5 and 6

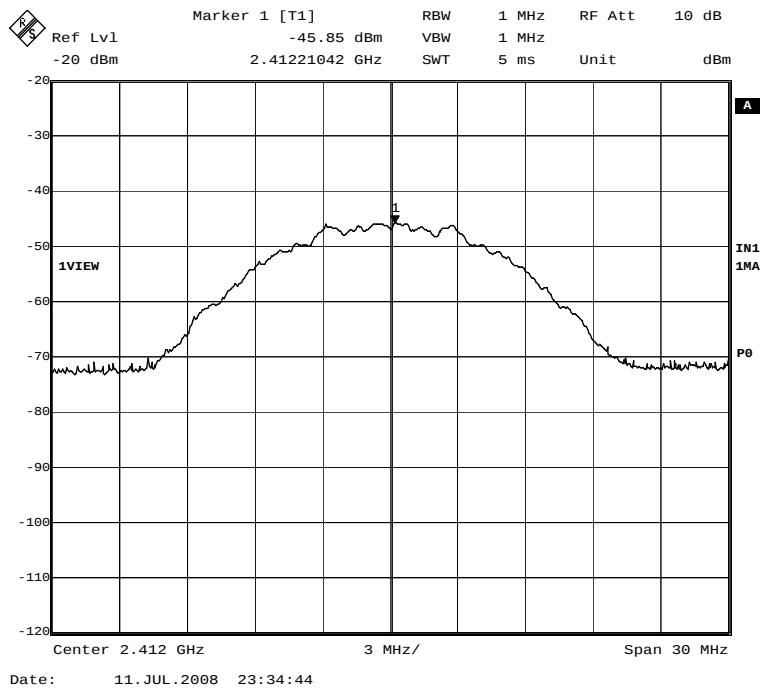
Mode	Frequency (MHz)	EIRP Result (dBm)	Limit (dBm)	EIRP Result (mW)	Limit (mW)
1	2.412	12.3	36.0	17.0	4000.0
2	2.437	12.0	36.0	15.8	4000.0
3	2.462	11.4	36.0	13.8	4000.0
4	2.402	6.43	36.0	4.39	4000.0
5	2.441	4.83	36.0	3.04	4000.0
6	2.480	3.19	36.0	2.08	4000.0

Limit	<4W or <+36dBm
-------	----------------

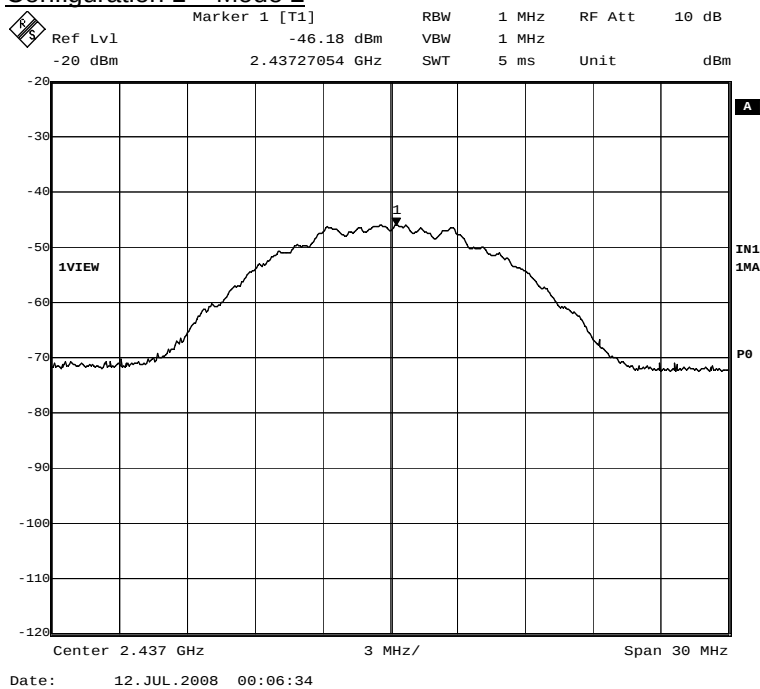


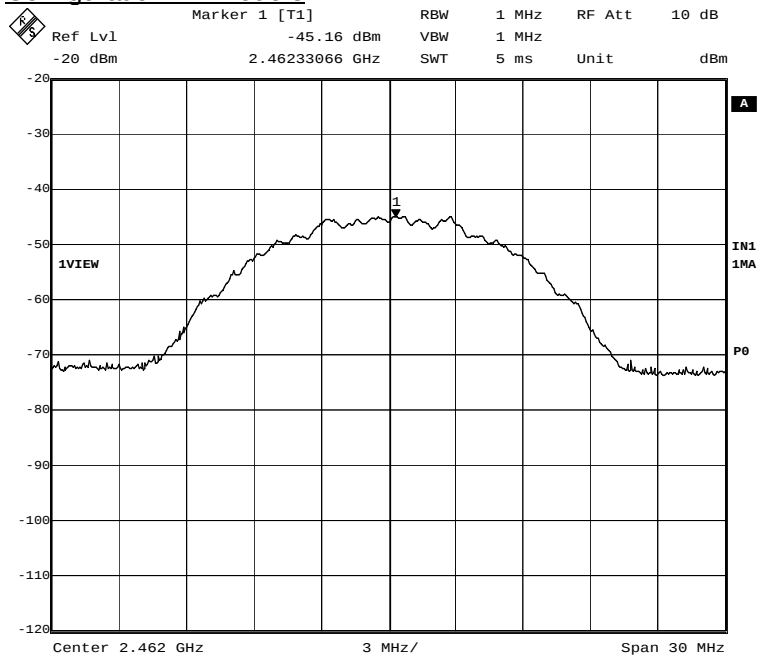
Product Service

Configuration 1 – Mode 1

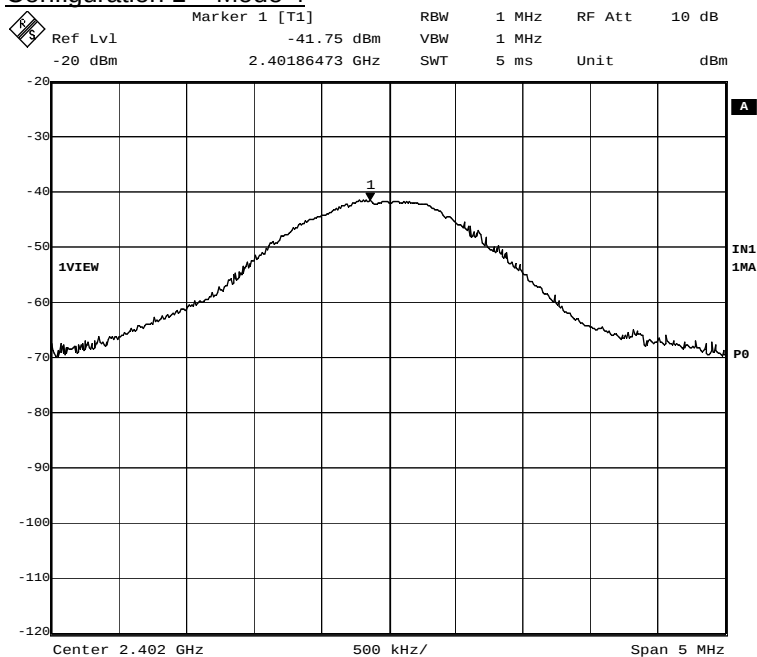


Configuration 1 – Mode 2



**Configuration 1 – Mode 3**

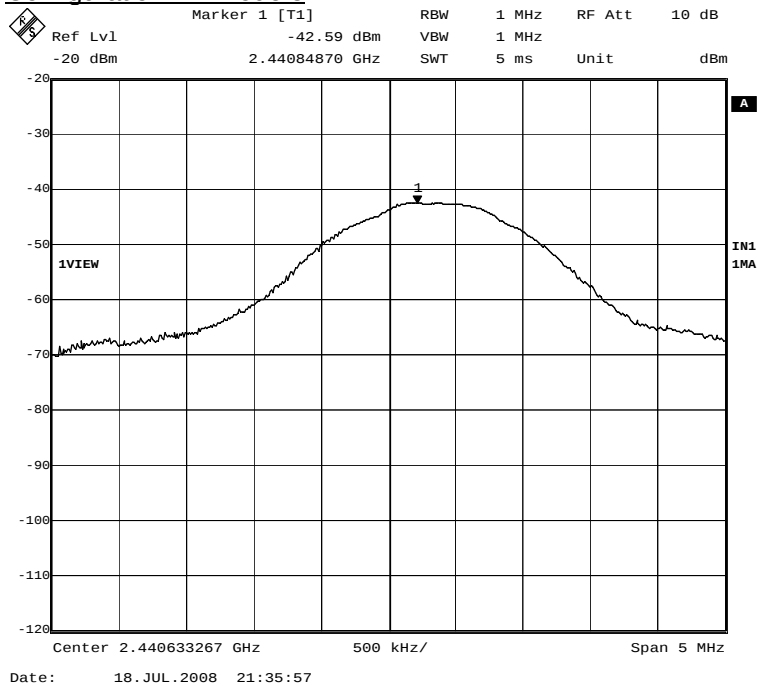
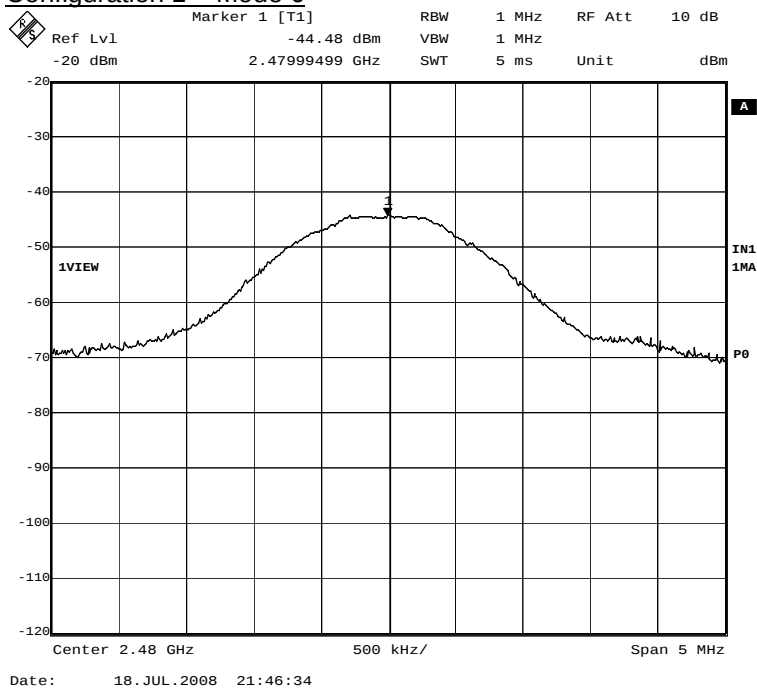
Date: 12.JUL.2008 00:52:52

Configuration 1 – Mode 4

Date: 18.JUL.2008 21:40:37



Product Service

Configuration 1 – Mode 5**Configuration 1 – Mode 6**



Product Service

2.3 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD)

2.3.1 Specification Reference

FCC CFR 47 Part 15C: 2006, Clause 15.247(d)
Industry Canada RSS-210: 2007. Clause A8.5

2.3.2 Equipment Under Test

Patient Monitoring System, S/N: 000008

2.3.3 Date of Test and Modification State

11 and 12 July 2008 - 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 Public Notice Document (DA 00-705: 2000) utilising the Marker Delta Method.

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

Configuration 1 - Mode 1
 - Mode 3

2.3.6 Environmental Conditions

	11 July 2008	12 July 2008
Ambient Temperature	21.4°C	21.4°C
Relative Humidity	45%	45%
Atmospheric Pressure	1009mbar	1009mbar



2.3.7 Test Results

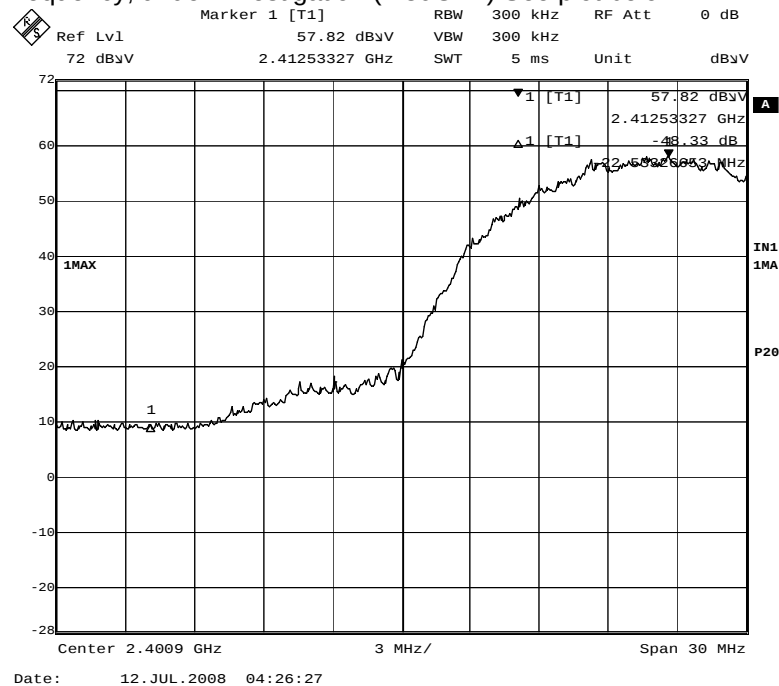
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C: 2006 for Band Edge Measurements.

The test results are shown below.

Configuration 1 - Mode 1

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degrees	Final Peak dBμV/m	Final Average dBμV/m
2.412	Horizontal	135	153	98.8	89.7

A delta measurement was taken between the peak carrier (2.412GHz) and the Band Edge frequency, under investigation (2.39GHz) See plot below



Delta = 48.3dB

Final Band Edge Result see below (Peak & Average Measurements above, minus Delta)

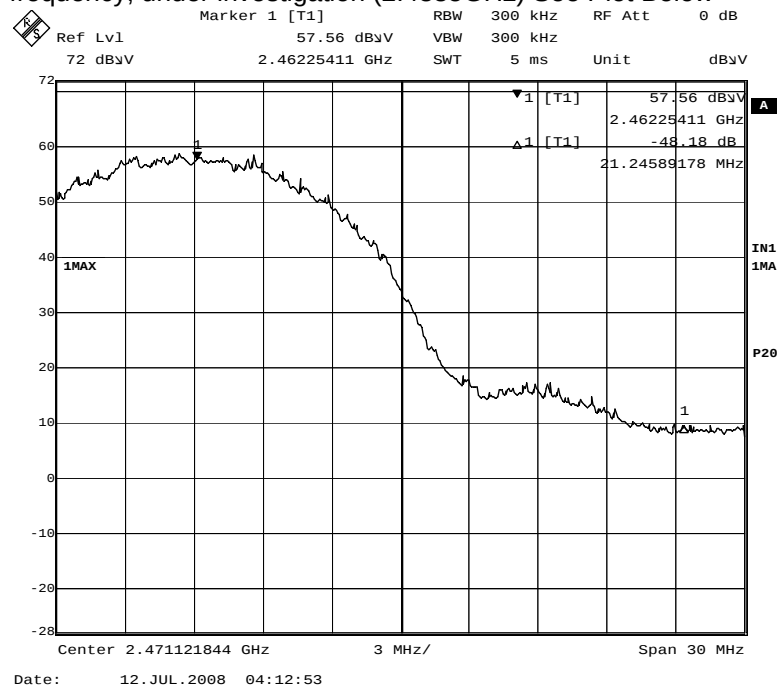
Frequency GHz	Antenna Polarisation	Final Peak dBμV/m	Final Average dBμV/m	Peak Limit dBμV/m	Average Limit dBμV/m
2.390	Horizontal	50.5	40.4	74.0	54.0



Configuration 1 - Mode 3

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degrees	Final Peak dBμV/m	Final Average dBμV/m
2.462	Horizontal	107	123	99.3	90.2

A Delta measurement was taken between the Peak Carrier (2.462GHz) and the Band Edge frequency, under investigation (2.4835GHz) See Plot Below



Delta = 48.2dB

Final Band Edge Result see below (Peak & Average Measurements above, minus Delta)

Frequency GHz	Antenna Polarisation	Final Peak dBμV/m	Final Average dBμV/m	Peak Limit dBμV/m	Average Limit dBμV/m
2.4835	Horizontal	51.1	42.0	74.0	54.0



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 2.2 EMC - Maximum Output Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	24-Jan-2009
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-Sep-2008
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Power Sensor	Hewlett Packard	84812A	2743	12	24-Jan-2009
Section 2.2 and 2.3 EMC - Radiated Emissions					
Signal Generator 10kHz to 2.7GHz	Marconi	2031	19	12	17-Jan-2009
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	35	12	9-Feb-2009
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	24-Aug-2008
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-Sep-2008
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	2-Sep-2008
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Pre-Amplifier	Phase One	PS04-0085	1532	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	-	TU
Pre-Amplifier	Phase One	PS04-0087	1534	-	TU
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
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	3-Jun-2009
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	28-Nov-2009

TU – Traceability Unscheduled



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

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

* In accordance with CISPR 16-4

† In accordance with UKAS Lab 34



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
(Not UKAS Accredited).

This report must not be reproduced, except in its entirety, without the written permission of
TÜV Product Service Limited

© 2008 TÜV Product Service Limited