Report On

FCC CFR 47 Parts 22 and 24 and Industry Canada Testing of the Modelabs Manufacture
CD1D

COMMERCIAL-IN-CONFIDENCE

FCC ID: WCKCD1D
IC ID: IC 7343B

Document 75903927 Report 03 Issue 3 June 2008

Product Service

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REPORT ON FCC CFR 47 Parts 22 and 24 and Industry Canada Testing of the Modelabs Manufacture CD1D

Document 75903927 Report 03 Issue 3

June 2008

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DATED 26 June 2008

This report has been up-issued to Issue 3 to amend the model name

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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 22 and Part 24 and Industry Canada RSS-132 and RSS-133. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineers;

G Lawler R Blagg S Bennett

UKAS TESTING 0141

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SECTION 1

REPORT SUMMARY

FCC CFR 47 Parts 22 and 24 and Industry Canada Testing of the
Modelabs Manufacture
CD1D

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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Modelabs Manufacture CD1D to the requirements of FCC CFR 47 Part 22: 2006 and FCC CFR 47 Part 24: 2006.

Objective	To perform FCC CFR 47 Parts 22 and 24 and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Modelabs Manufacture
Part Number(s)	CD1D
Serial Number (s)	031425000814000036 031425000815000074
IMEI Number(s)	004401750007144 004401750006880
Software Version	0259000505020000
Hardware Version	PrePilot
Number of Samples Tested	Two
Test Specification/Issue/Date	FCC CFR 47 Part 22: 2006 FCC CFR 47 Part 24: 2006 Industry Canada RSS-132: 2005 and RSS-133: 2005
Incoming Release Date	Declaration of Build Status 02 June 2008
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO 08_0000000152 21 May 2008
Start of Test	03 June 2008
Finish of Test	18 June 2008
Name of Engineer(s)	G Lawler R A Blagg S Bennett
Related Document(s)	FCC CFR 47 Part 2: 2006

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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results in accordance with FCC CFR 47 Part 22: 2006 and RSS-132: 2005, is shown below.

Configuration 1 – Mobile Handset							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	Part 22	Industry Canada					
2.1	2.1051, 22.905	RSS-132, 4.5	Spurious Emissions at Band Edge	1	0	Pass	-
				3	0	Pass	
2.2	22.913 (a)	RSS-312, 4.4	Maximum Peak Output Power - Conducted	1	0	Pass	-
				2	0	Pass	
				3	0	Pass	
2.3	22.913	RSS-132, 4.4	Effective Radiated Power	1	0	Pass	-
				2	0	Pass	
				3	0	Pass	
2.4	2.1047(d)	-	Modulation Characteristics	2	0	Pass	-
2.5	2.1049, 22.917 (b)	RSS-132, 4.2	Occupied Bandwidth	2	0	Pass	-
2.6	22.917	RSS-132, 4.2	Emission limitations for Cellular Equipment	1	0	Pass	-
				2	0	Pass	
				3	0	Pass	

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Configuration 1 - Mobile Handset							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	Part 22	Industry Canada					
2.7	2.1051, 22.917(a)	-	Conducted Spurious Emissions	1	0	Pass	-
				2	0	Pass	
				3	0	Pass	
2.8	2.1055, 22.355	RSS-132, 4.3	Frequency Stability Under Temperature Variations	2	0	Pass	-
2.9	2.1055, 22.355	-	Frequency Stability Under Voltage Variations	2	0	Pass	-

Product Service

A brief summary of results in accordance with FCC CFR 47 Part 24: 2006 and RSS-133: 2005, is shown below.

Configuration 1 - Mobile Handset							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	Part 24	Industry Canada					
2.10	2.1051, 24.229	RSS-133, 6.5	Spurious Emissions at Band Edge	4	0	Pass	-
				6	0	Pass	
2.11	2.1046, 24.232	-	Maximum Peak Output Power – Conducted	4	0	Pass	-
				5	0	Pass	
				6	0	Pass	
2.12	24.232(c)	RSS-133, 6.2	EIRP Peak Power	4	0	Pass	-
				5	0	Pass	
				6	0	Pass	
2.13	2.1047(d)	RSS-132, 4.4	Modulation Characteristics	5	0	Pass	-
2.14	2.1049, 24.238(b)	-	Occupied Bandwidth	5	0	Pass	-
2.15	2.1051, 24.238(a)	-	Conducted Spurious Emissions	4	0	Pass	-
				5	0	Pass	
				6	0	Pass	
2.16	2.1051, 24.238	RSS-133, 6.3	Emissions for broadband PCS Equipment	4	0	Pass	-
				5	0	Pass	
				6	0	Pass	

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Configuration 1 - Mobile Handset							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	Part 24	Industry Canada					
2.17	2.1055, 24.135(a)	RSS-133, 7	Frequency Stability Under Temperature Variations	5	0	Pass	-
2.18	2.1055, 24.135(a)	RSS-133, 7	Frequency Stability Under Voltage Variations	5	0	Pass	-

Product Service

1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Cellular mobile phone manufacturer
MANUFACTURER	Modelabs Manufacture
TYPE	Cellular mobile phone
PART NUMBER	CD1D
SERIAL NUMBER	031425000814000036
HARDWARE VERSION	PrePilot
SOFTWARE VERSION	0259000505020000
TRANSMITTER OPERATING RANGE	Part22(824.2-848.8 MHz) Part24(1850.2-1909.8 MHz)
RECEIVER OPERATING RANGE	Part22(869.2-893.8 MHz) Part24(1930.2-1989.8 MHz)
COUNTRY OF ORIGIN	France
INTERMEDIATE FREQUENCIES	Direct conversion
ITU DESIGNATION OF EMISSION	300KGXW
HIGHEST INTERNALLY GENERATED FREQUENCY	2480MHz
OUTPUT POWER (W or dBm)	32 dBm
FCC ID	WCKCD1D
INDUSTRY CANADA ID	IC 7343B
BATTERY/POWER SUPPLY	
MANUFACTURING DESCRIPTION	Batterie'e Manufacturer
MANUFACTURER	XWODA
TYPE	Lithium Ion
PART NUMBER	XWD00016063
VOLTAGE	3.7 V
COUNTRY OF ORIGIN	China

Signature 

Date: 02 June 2008
Declaration of Build Status Serial Number: 75903927-01

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Modelabs Manufacture CD1D as shown in the photograph below. A full technical description can be found in the Manufacturers documentation.

Equipment Under Test

Product Service

1.4.2 Test Configuration

Configuration 1: Mobile Handset

The EUT was configured in accordance with FCC CFR 47 Part 22: 2006 and FCC CFR 47 Part 24: 2006 and Industry Canada RSS-132: 2005 and RSS-133: 2005.

1.4.3 Modes of Operation

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

Mode 1 - 824.2 MHz Transmit

Mode 2 - 836.4 MHz Transmit

Mode 3 - 848.8 MHz Transmit

Mode 4 - 1850.2 MHz Transmit

Mode 5 - 1880.0 MHz Transmit

Mode 6 - 1909.8 MHz Transmit

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

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 battery or battery eliminator supply of 3.7V nominal.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC4270 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.

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SECTION 2

TEST DETAILS

FCC CFR 47 Parts 22 and 24 and Industry Canada Testing of the
Modelabs Manufacture
CD1D

Product Service

2.1 SPURIOUS EMISSIONS AT BAND EDGE

2.1.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.905, 2.1051
Industry Canada RSS-132: 2005, Clause 4.5

2.1.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.1.3 Date of Test and Modification State

16 June 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 22: 2006 and RSS-132: 2005.

In accordance with 22.917(e), any emissions outside of the block edges shall be attenuated by at leaset 43 + 10 log (P). The measurements are shown to ±1 MHz from the block edges. The plots shown under the Spurious Emissions sections covers the required range of 9 kHz to 9 GHz.

The reference power and path losses of all channels used for testing in each frequency block were measured. It was found that there was < 0.2 dB variation in all channels, thus the worst case reference level offset was used throughout. Having entered the reference level offset , the limit line was displayed, showing the -13 dBm, (43 + 10 log (P)), limit.

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

Configuration 1 - Mode 1
- Mode 3

2.1.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	38%

Product Service

2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132: 2005 for Spurious Emissions at Band Edge.

The test results are shown below.

Below are the Frequency Blocks the EUT was tested against along with the tested channels.

Communication Channel Pair Blocks

Frequency Block (MHz)	Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
A (824.0 – 835.0)	Channel : 129 Frequency : 824.4MHz	-
B (846.5 – 849.0)	-	Channel : 250 Frequency : 847.6MHz

Limit	≤-13dBm at Block Edge

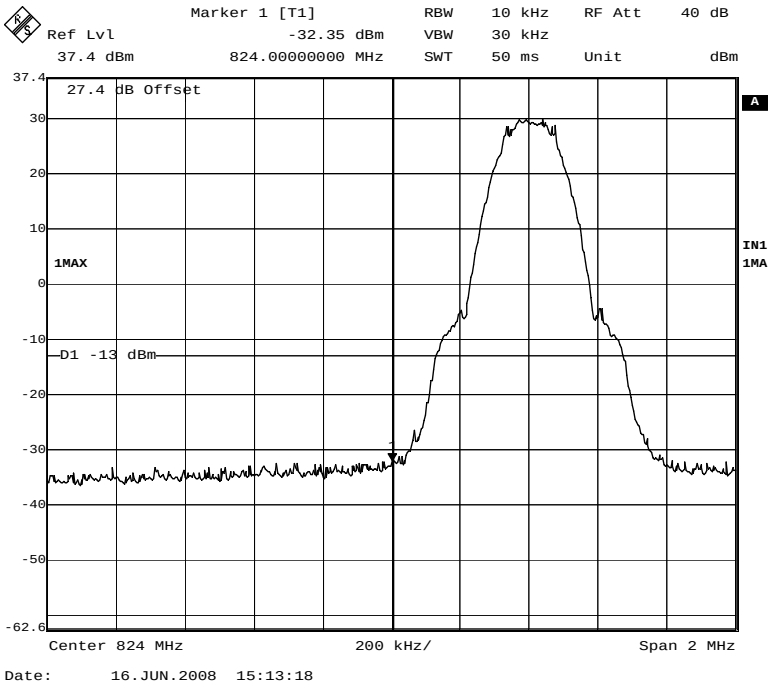
The channels shown in the table above are the minimum and maximum channels that can be used in each block to maintain compliance. Channels used outside of those stated in the table exceed the specification limits, thus they cannot be used.

The channels outside of those shown in the table were not tested at lower power levels to determine a level at which compliance would be achieved. Therefore, to maintain compliance, only the channel shown in the table above shall be used.

The measurement plots are shown on the following pages.

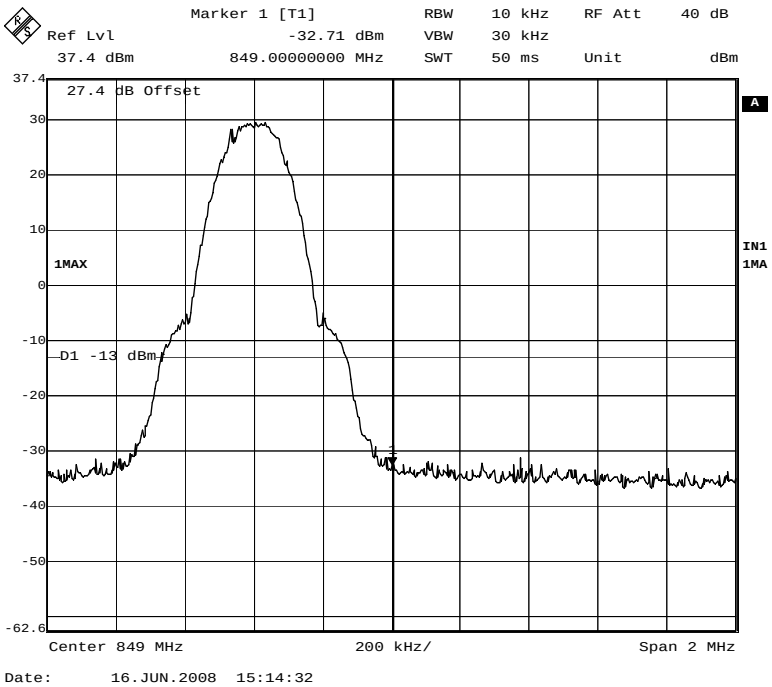
Maximum Power – GPRS with timeslots 3, 4, 5 and 6 active

Frequency Block A



Date: 16.JUN.2008 15:13:18

Frequency Block B



Date: 16.JUN.2008 15:14:32

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2.2 MAXIMUM PEAK OUTPUT POWER - CONDUCTED

2.2.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.913 (a)
Industry Canada RSS-132, 4.4

2.2.2 Equipment Under Test

CD1D, S/N: 031425000815000074 and IMEI: 004401750006880

2.2.3 Date of Test and Modification State

16 June 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 22: 2006 and RSS-132: 2005.

Using a spectrum analyser and attenuator(s), the output power of the EUT was measured at the antenna terminals.

The EUT supports GSM and GPRS. The EUT was tested in GPRS mode of operation. Testing was performed with GMSK modulation, with four timeslots active, (3 and 4) and (5 and 6). The mobile device is a class 12 device.

The spectrum analyser RBW and VBW were set to 1MHz and the pass loss measured and entered as a reference level offset.

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

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.2.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	41%

Product Service

2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132: 2005 for Maximum Peak Output Power - Conducted.

The test results are shown below.

Configuration 1 - Mode 1

3.7V DC Supply

Maximum Power – GMSK

Frequency (MHz)	Result (dBm)	Result (W)
824.2	32.34	1.71
836.4	32.42	1.75
848.8	32.43	1.75

Limit	7W

Product Service

2.3 EFFECTIVE RADIATED POWER

2.3.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.913
Industry Canada RSS-132: 2005, 4.4

2.3.2 Equipment Under Test

CD1D, S/N: 031425000814000036 and IMEI: 004401750007144

2.3.3 Date of Test and Modification State

03 June 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 CFR 47 Part 22: 2006 and RSS-132: 2005.

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

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.3.6 Environmental Conditions

	03 June 2008
Ambient Temperature	17.3°C
Relative Humidity	46%
Atmospheric Pressure	1011mbar

Product Service

2.3.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132: 2005 for Effective Radiated Power.

The test results are shown below.

Configuration 1 - Mode 1, 2 and 3

Frequency GHz	ERP (dBm)	Limit (dBm)	ERP (W)	Limit (W)
824.20	29.40	38.00	0.871	7.00
836.40	27.40	38.00	0.550	7.00
848.80	28.00	38.00	0.631	7.00

Product Service

2.4 MODULATION CHARACTERISTICS

2.4.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.1047(d)

2.4.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.4.3 Date of Test and Modification State

16 June 2008 - Modification State 0

2.4.4 Test Equipment Used

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

2.4.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 22: 2006.

Two plots are shown on the following pages showing the EUT transmitting with the display in the time domain.

Plot 1: EUT transmitting with GMSK modulation showing timeslots 3, 4, 5 and 6.
Plot 2: EUT transmitting with GMSK modulation showing one frame with four timeslots active.

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

Configuration 1 - Mode 2

2.4.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	31%

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2.4.7 Modulation Description

Description Of Modulation Technique

The modulation scheme used in GSM is called Gaussian Minimum Shift Keying (GMSK). GMSK facilitates the use of narrow bandwidth and allows for both coherent and non coherent detection capabilities. It is a scheme in which the transitions from One to Zero or Zero to One do not occur quickly, but over a period of time. If pulses are transmitted quickly harmonics are transmitted. The power spectrum for a square wave is rich in harmonics, and the power within the side lobes is wasted, and can be a cause of potential interference.

A method to reduce the harmonics is to round off the edges of the pulses thus lowering the spectral components of the signal. In GSM this is done by using a Gaussian pre-filter which typically has a bandwidth of 81.25kHz. The output from the Gaussian filter then phase modulates the carrier. As there are no dramatic phase transitions of the carrier this gives a constant envelope and low spectral component output from the transmitter.

The spectral efficiency is calculated by

bit rate / Channel bandwidth = 270.83333 kbit/s / 200 kHz = 1.354 bit/s/Hz.

The bandwidth product BT = Bandwidth x bit duration = 81.25 kHz x 3.6923 micros = 0.3

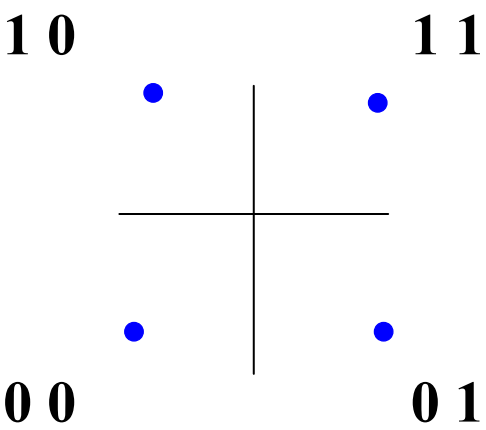
GMSK OVERVIEW

The modulation scheme used for the EUT is GMSK.

A brief overview of how GMSK works is shown below.

GMSK (Gaussian Minimum Shift Keying)

The fundamental principal behind GMSK is Phase shift keying. This splits a data stream into a series of 2-digit phase shifts, using the following phase shifts to represent data pairs.



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Therefore for the BIT sequence 0 0 1 1 1 0 0 1 The corresponding phase shift will be used

BIT SEQUENCE	0 0	1 1	1 0	01
PHASE	225º	45º	135º	315º

This is called QPSK (Quadratic Phase Shift Keying)

However

There is a problem with QPSK: transition from e.g. 00 to 11 gives phase shift of 180° (π radians). This has the effect of inverting the carrier waveform and this can lead to detection errors at the receiver.

Solution: restrict phase changes to ± 90°

1. Split bitstream into 2 streams e.g.

	0 0		1 1		0 1		1 0	
I Stream	0		1		0		1	
Q stream		0		1		1		0

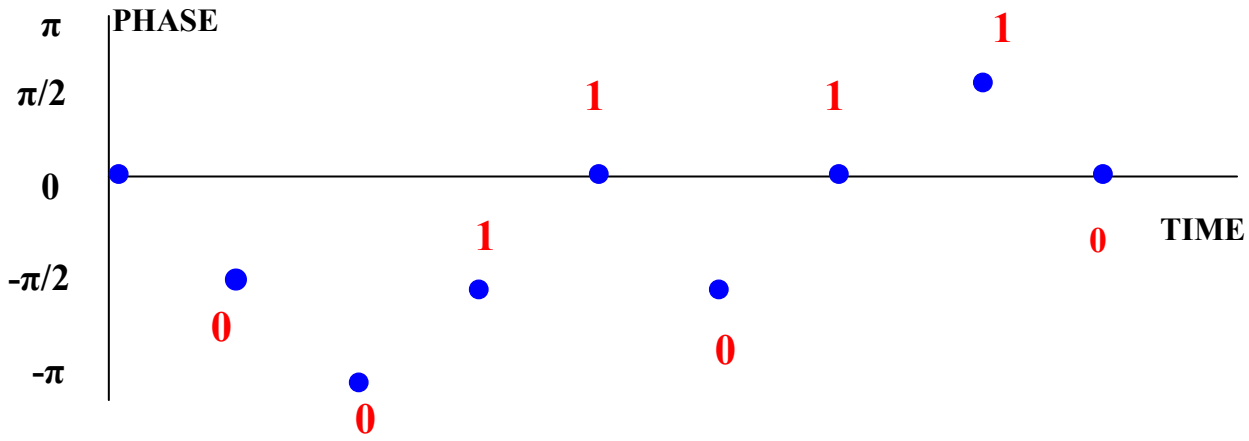
2. Modulate each stream with PSK (1 = 90° or π/2, 0 = -90° or - π/2 phase shift)

I Stream	0		1		0		1	
	-π/2		-π/2		-π/2		π/2	
Q stream		0		1		1		0
		-π/2		π/2		π/2		-π/2

3. Combine (add) the two PSK signals:

Combined Phase	-π/2	-π	-π/2	0	-π/2	0	π/2	0

Result: offset - QPSK, phase change is restricted to ± π/2 radians:



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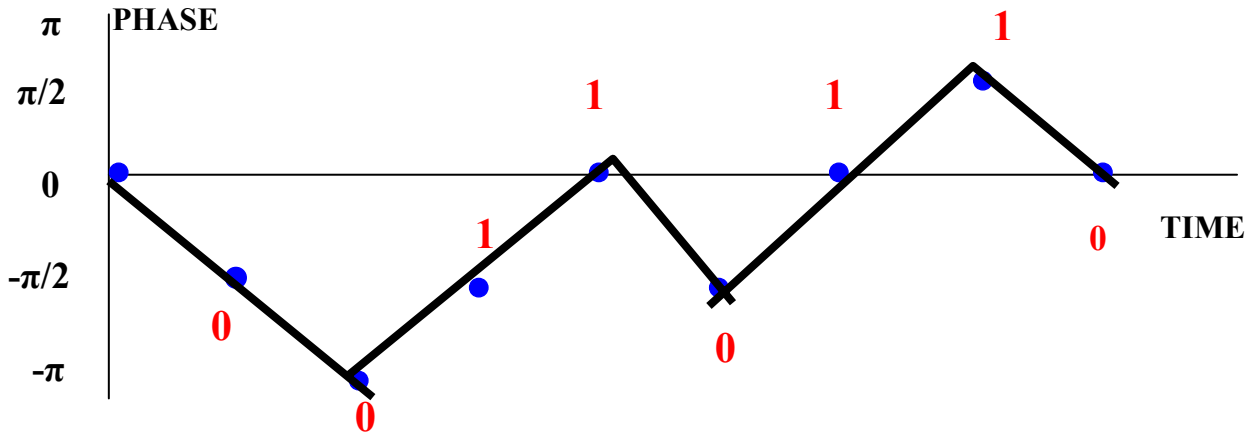
It would be preferable to have "gradual" changes in place between each pair of bits (Continuous-phase modulation). Replacing each “rectangular” shaped pulse (for 1 or 0) with a sinusoidal pulse can do this:

Result: Minimum Shift Keying (MSK):



Gaussian Minimum Shift Keying

MSK has high sidebands relative to the main lobes in the frequency domain - this can lead to interference with adjacent signals.

If the rectangular pulses corresponding to the bitstream are filtering using a Gaussian-shaped impulse response filter, we get Gaussian MSK (GMSK) - this has low sidelobes compared to MSK.

Product Service

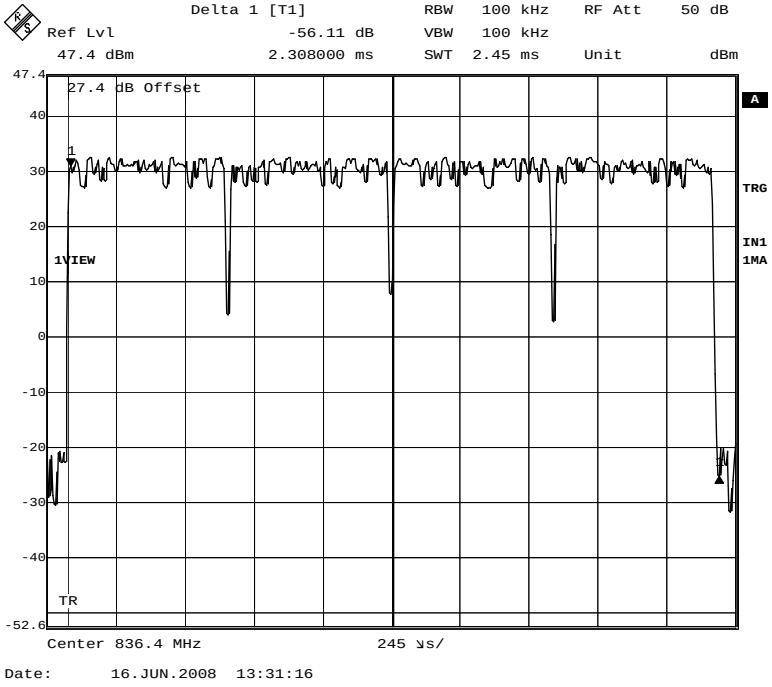
2.4.8 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 for Modulation Characteristics.

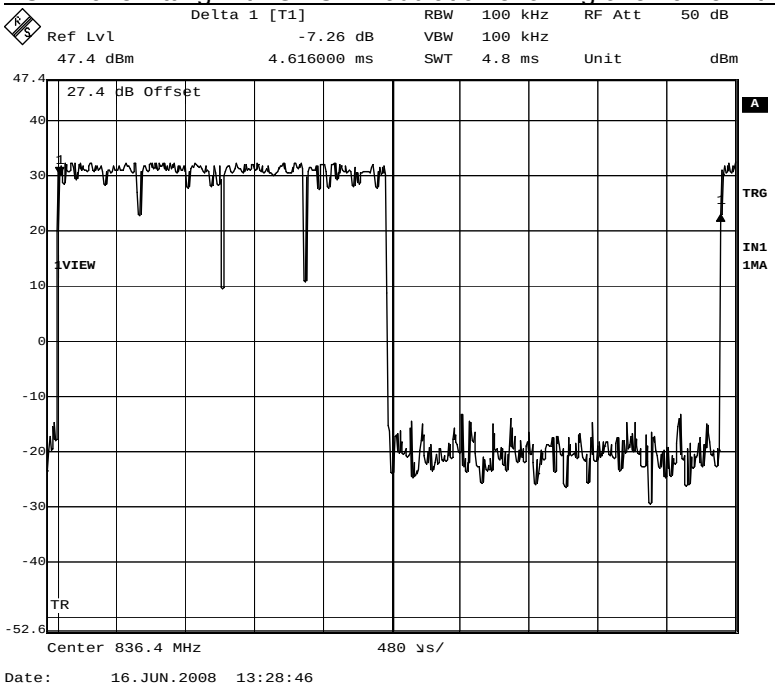
The test results are shown below.

Configuration 1 - Mode 1

EUT Transmitting with GMSK modulation showing timeslots 3, 4, 5 and 6



EUT Transmitting with GMSK modulation showing one frame with four timeslots active



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2.5 OCCUPIED BANDWIDTH

2.5.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.917(b), 2.1049(h)
Industry Canada RSS-132, Clause 4.2

2.5.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.5.3 Date of Test and Modification State

16 June 2008 - Modification State 0

2.5.4 Test Equipment Used

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

2.5.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 22: 2006 and RSS-132, 4.2.

The EUT was transmitting at maximum power, modulated with timeslots 3, 4, 5 and 6 active. Using a resolution bandwidth of 10 kHz and a video bandwidth of 30 kHs, the -26 dBc points were established and the emission bandwidth determined.

The plot of the following pages shows the resultant display from the Spectrum Analyser.

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

Configuration 1 - Mode 2

2.5.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	37%

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2.5.7 Test Results

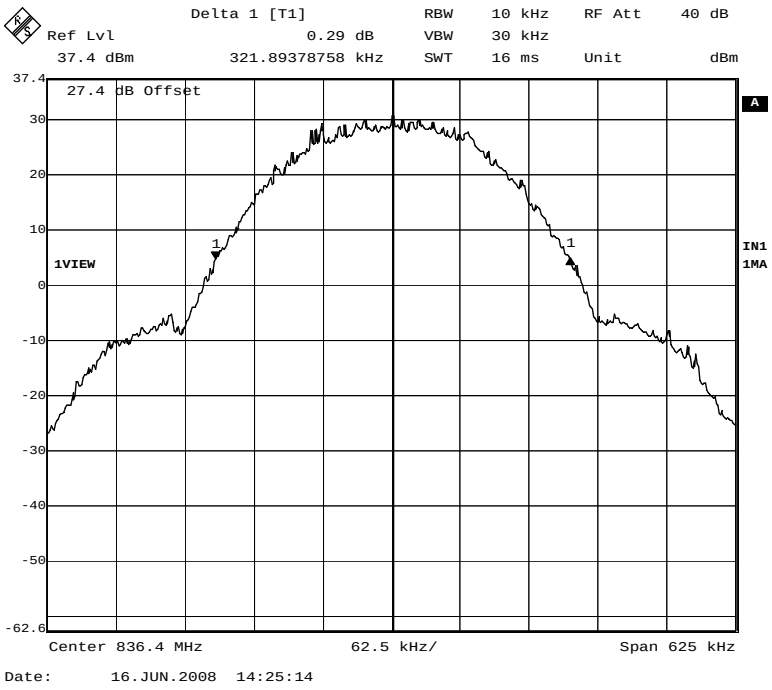
For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132 for Occupied Bandwidth.

The test results are shown below.

Configuration 1 - Mode 2

Occupied Bandwidth As Defined By The -26dBc Points

Maximum Power – GPRS



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2.6 EMISSION LIMITATIONS FOR CELLULAR EQUIPMENT

2.6.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.917
Industry Canada RSS-132: 2005, Clause 4.2

2.6.2 Equipment Under Test

CD1D, S/N: 031425000814000036 and IMEI: 004401750007144

2.6.3 Date of Test and Modification State

04 June 2008 - 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 FCC CFR 47 Part 22: 2006 and RSS-132: 2005.

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

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.6.6 Environmental Conditions

	04 June 2008
Ambient Temperature	17.3°C
Relative Humidity	46%
Atmospheric Pressure	1011mbar

Product Service

2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132: 2005 for Emission limitations for Cellular Equipment.

The test results are shown below.

No emissions other than the carrier were detected on the Top, Middle or Bottom channels.

The test results are shown below.

Configuration 1 - Mode 1

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degrees	Result Peak dBm	ERP Limit dBm	Margin dB	Result
2.4728	Horizontal	100	030	-41.6	-13.0	-28.6	Pass

Configuration 1 - Mode 2

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degrees	Result Peak dBm	ERP Limit dBm	Margin dB	Result
2.5091	Horizontal	100	030	-40.3	-13.0	-27.0	Pass

Configuration 1 - Mode 3

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degrees	Result Peak dBm	ERP Limit dBm	Margin dB	Result
2.5466	Horizontal	100	28	-45.1	-13.0	-32.1	Pass

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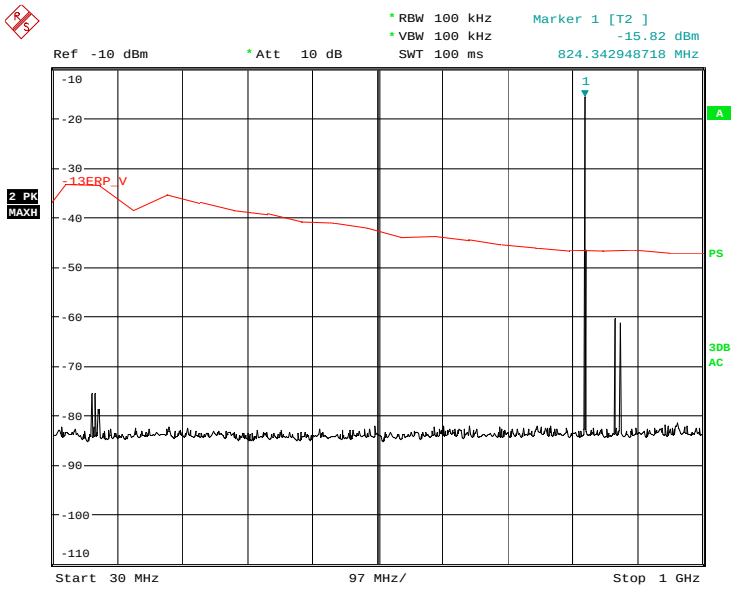
Configuration 1 - Mode 1

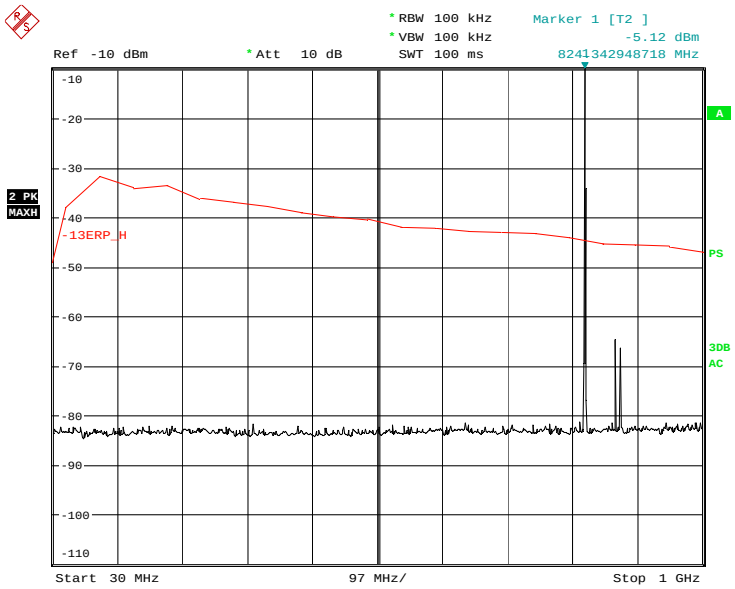
30MHz – 1GHz

Vertical Polarisation



Date: 4.JUN.2008 00:23:33

Horizontal Polarisation

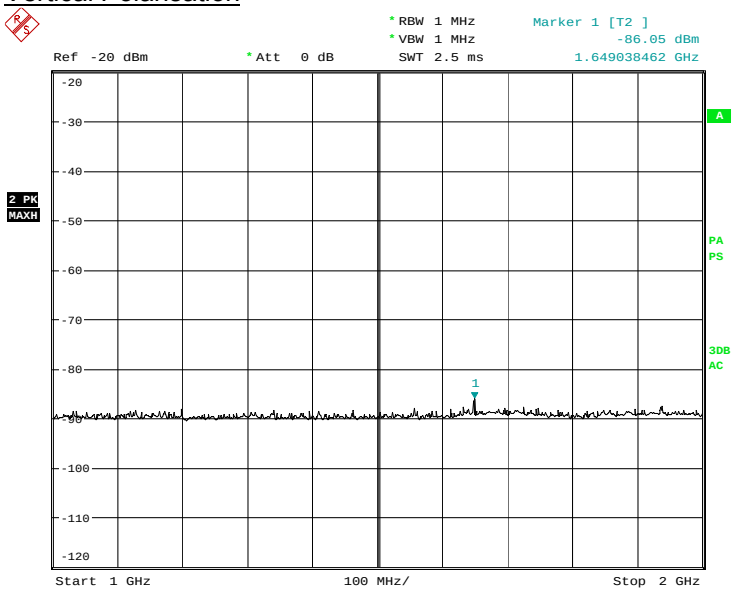


Date: 4.JUN.2008 00:27:41

Product Service

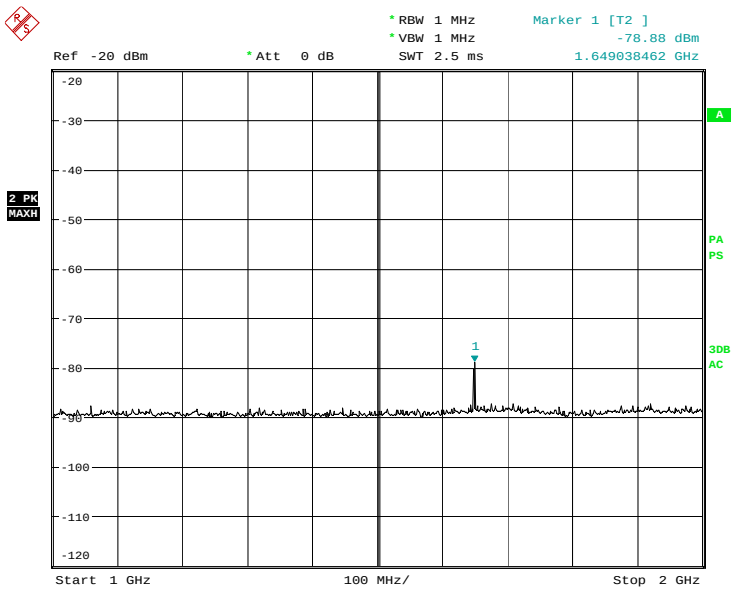
1GHz – 2GHz

Vertical Polarisation



Date: 4.JUN.2008 00:53:54

Horizontal Polarisation

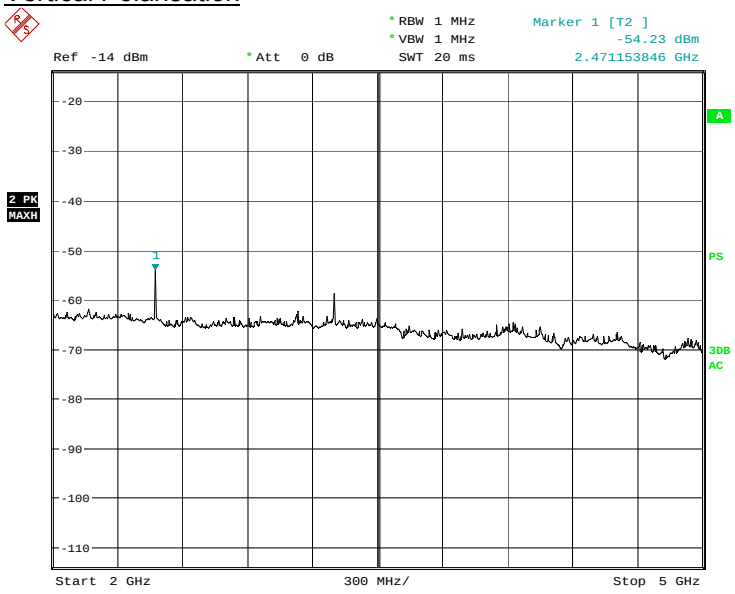


Date: 4.JUN.2008 01:06:31

Product Service

2GHz – 5GHz

Vertical Polarisation



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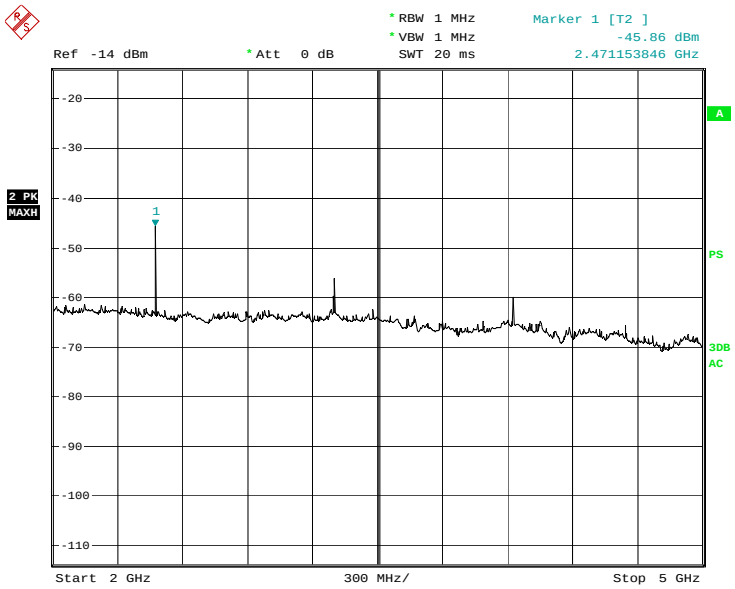
Horizontal Polarisation



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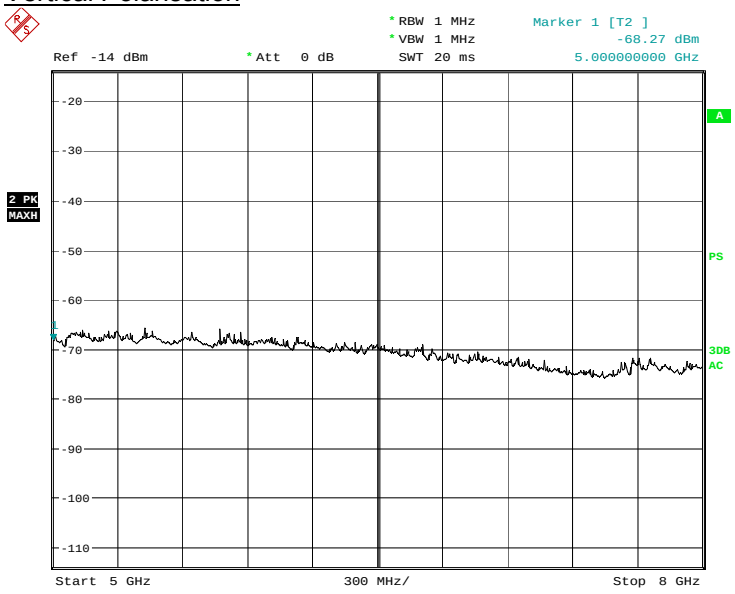
Product Service

5GHz – 8GHz

Vertical Polarisation



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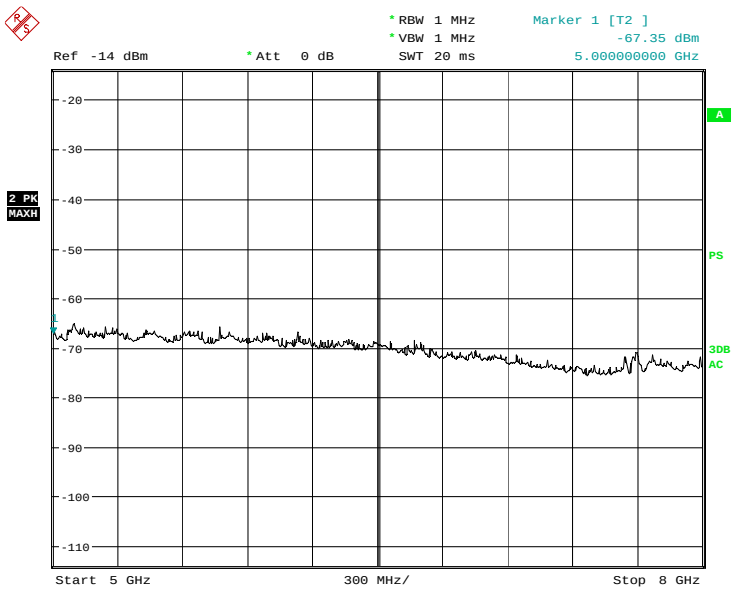
Horizontal Polarisation

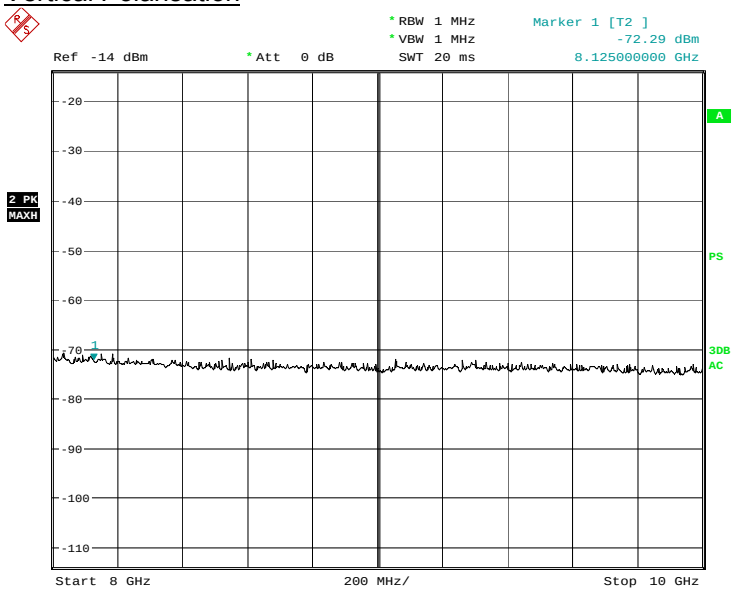


Date: 4.JUN.2008 01:46:09

Product Service

8GHz – 10GHz

Vertical Polarisation



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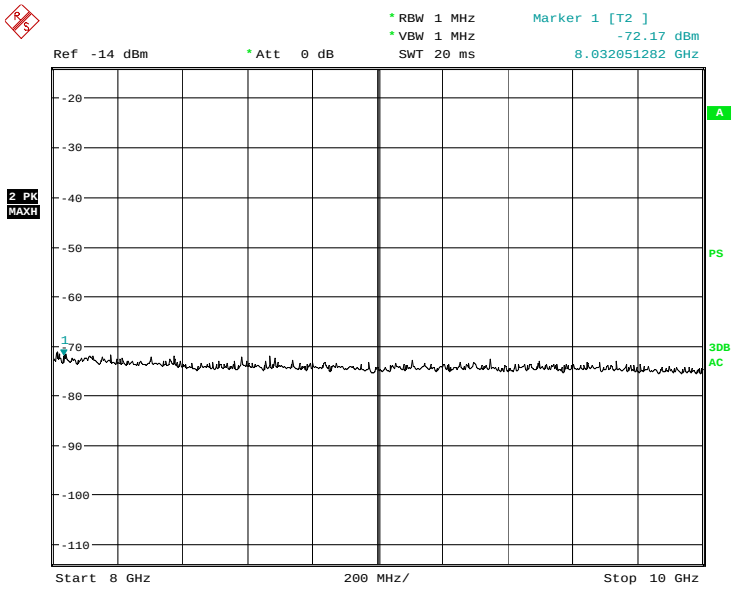
Horizontal Polarisation



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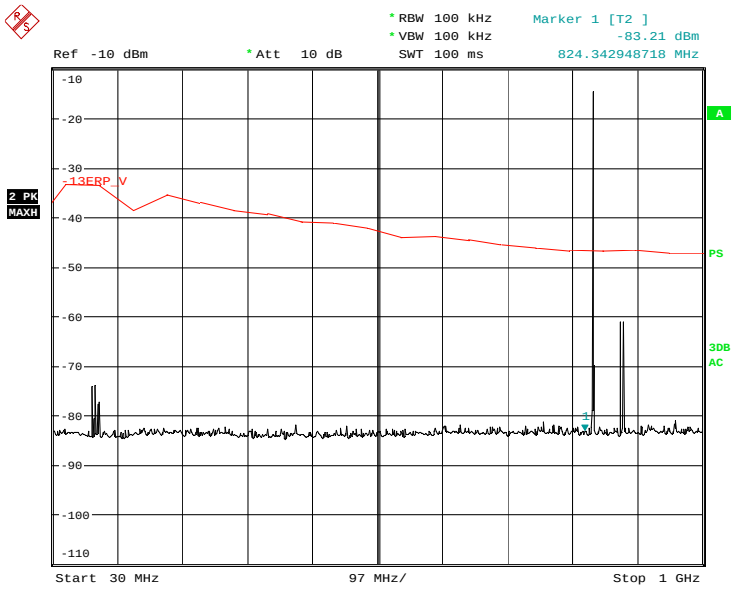
Product Service

Configuration 1 - Mode 2

30MHz – 1GHz

Vertical Polarisation



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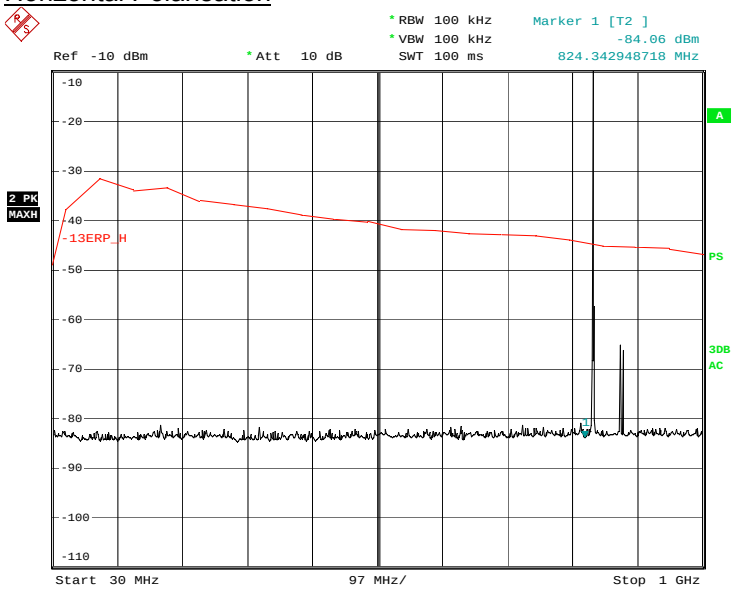
Horizontal Polarisation

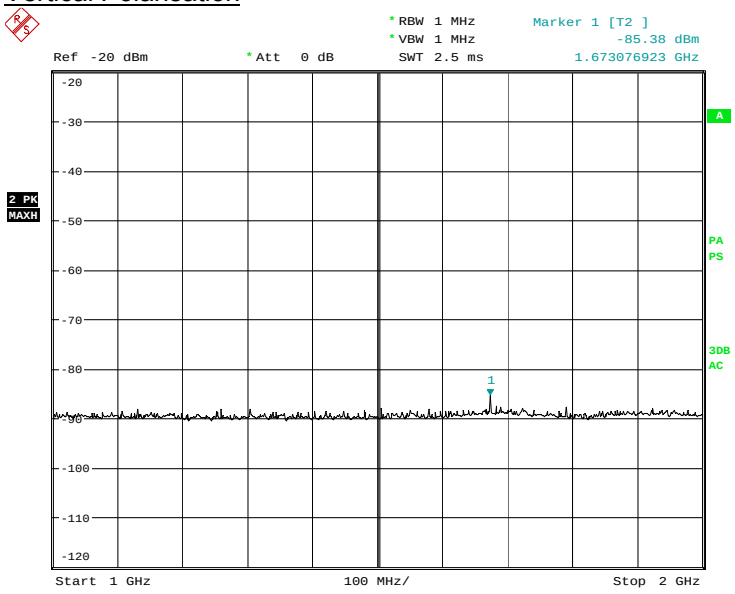


Date: 4.JUN.2008 00:31:05

Product Service

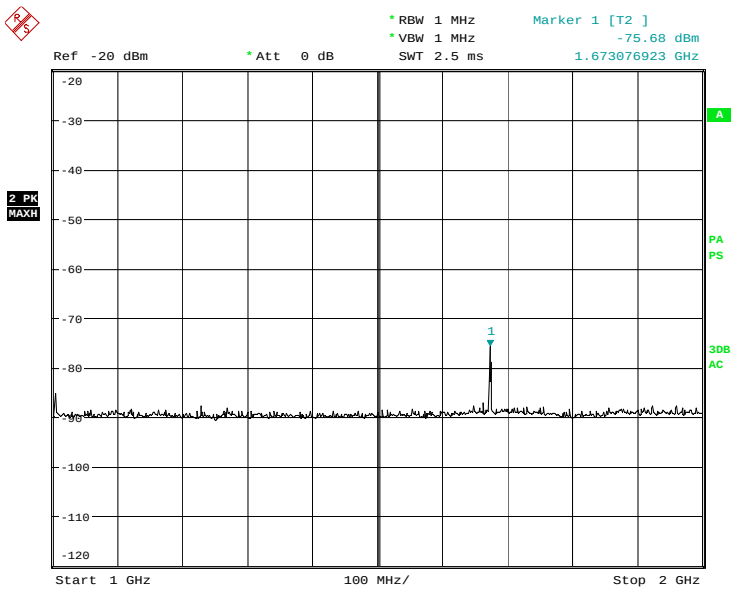
1GHz – 2GHz

Vertical Polarisation



Date: 4.JUN.2008 00:56:02

Horizontal Polarisation

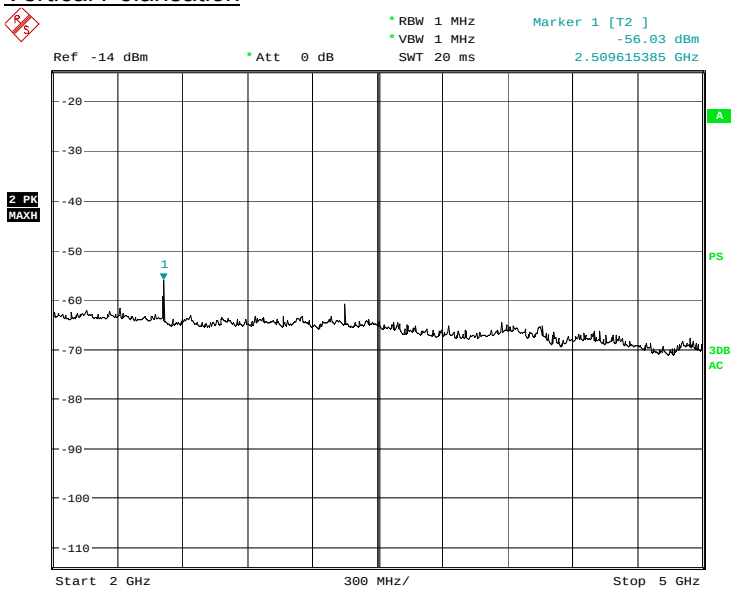


Date: 4.JUN.2008 01:01:53

Product Service

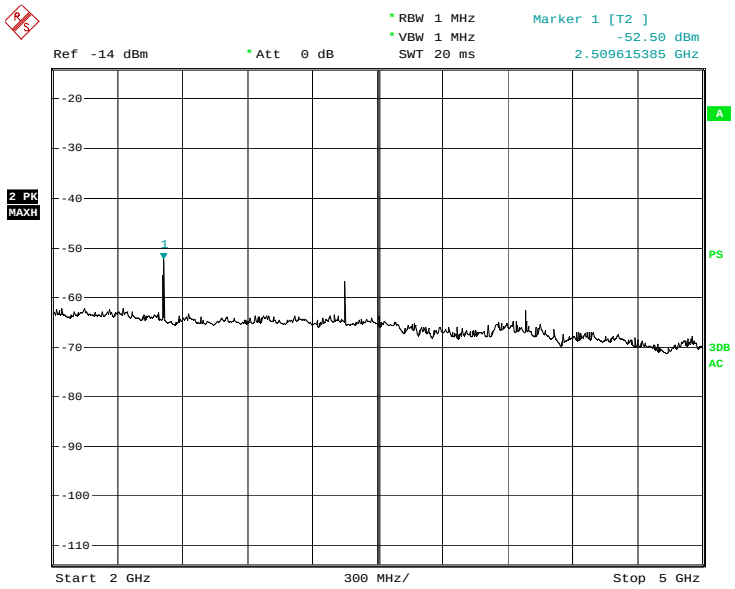
2GHz – 5GHz

Vertical Polarisation



Date: 4.JUN.2008 02:09:10

Horizontal Polarisation

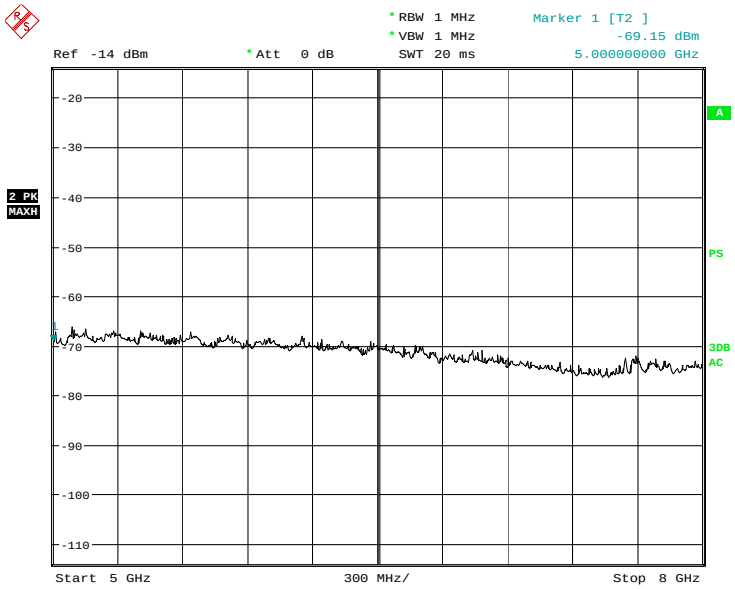


Date: 4.JUN.2008 01:55:33

Product Service

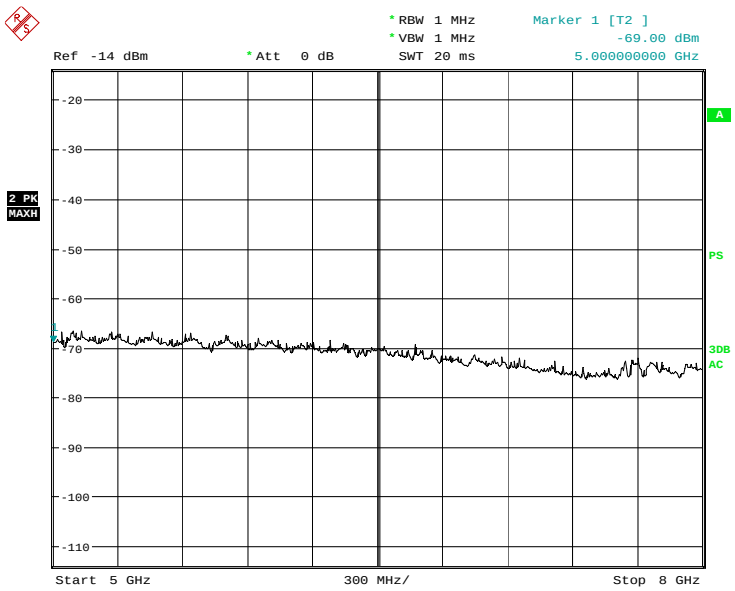
5GHz – 8GHz

Vertical Polarisation



Date: 4.JUN.2008 02:05:59

Horizontal Polarisation



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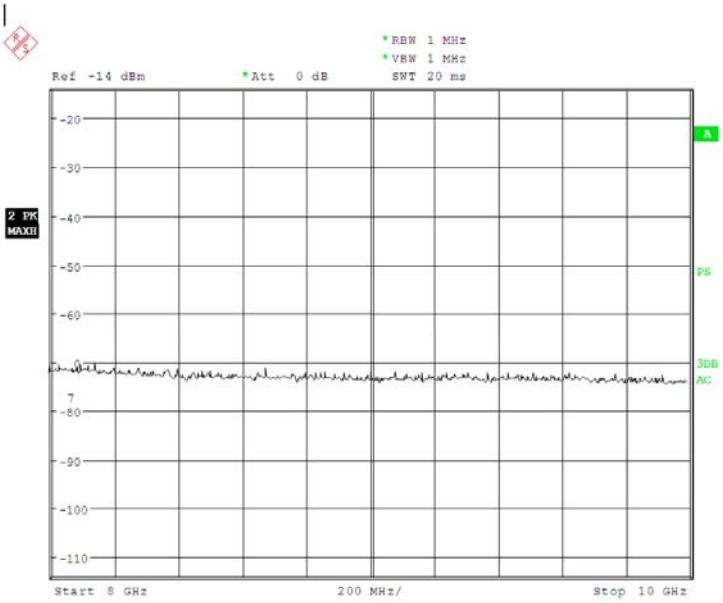
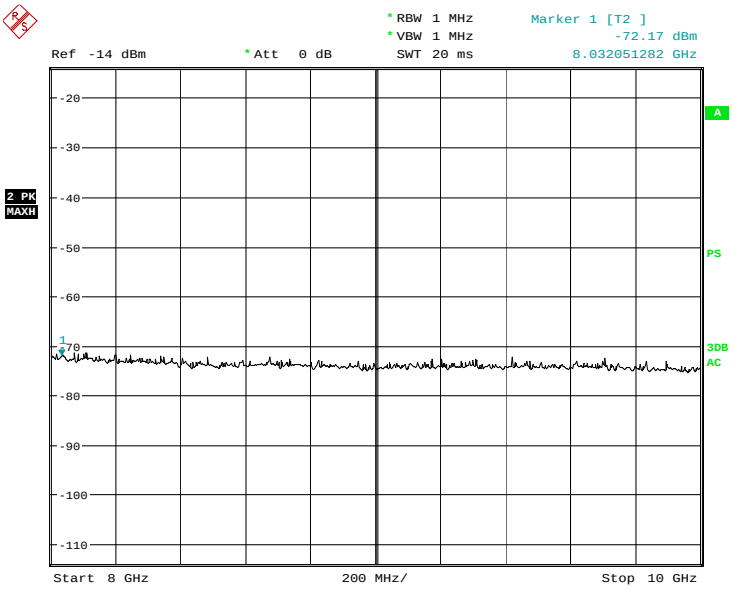
Product Service

8GHz – 10GHz

Vertical Polarisation



Horizontal Polarisation



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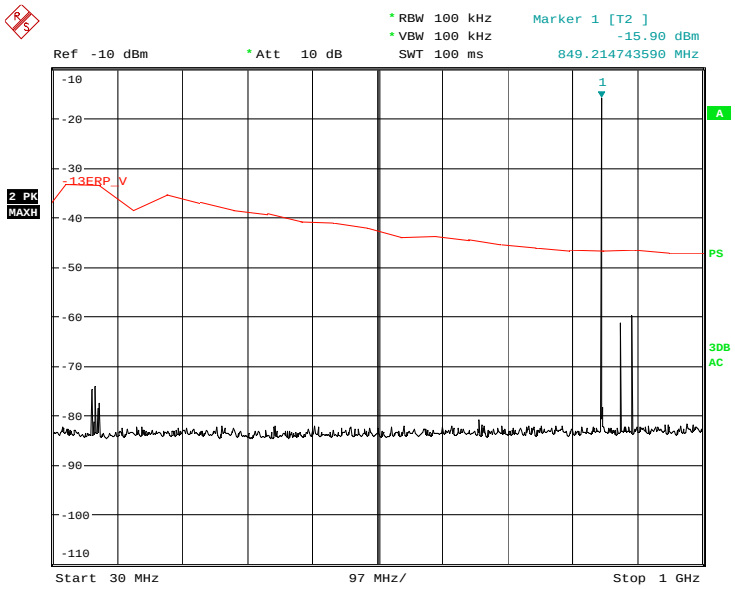
Product Service

Configuration 1 - Mode 3

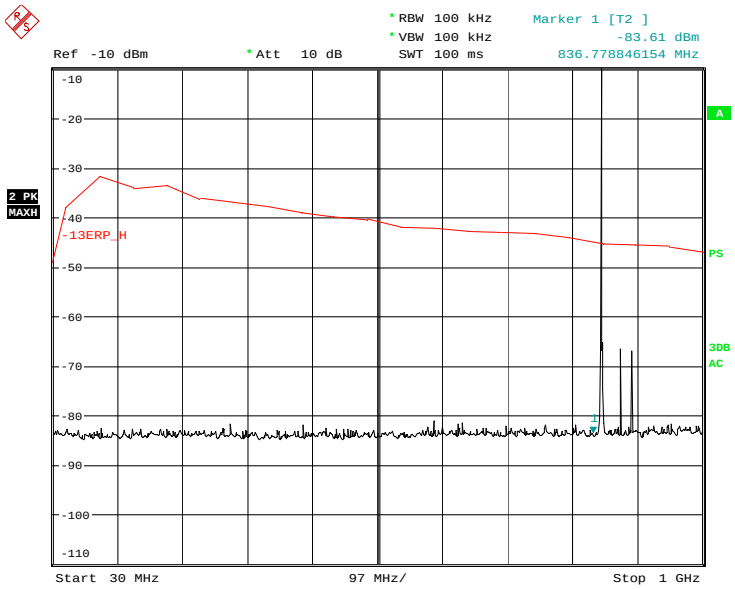
30MHz – 1GHz

Vertical Polarisation



Date: 4.JUN.2008 00:41:10

Horizontal Polarisation

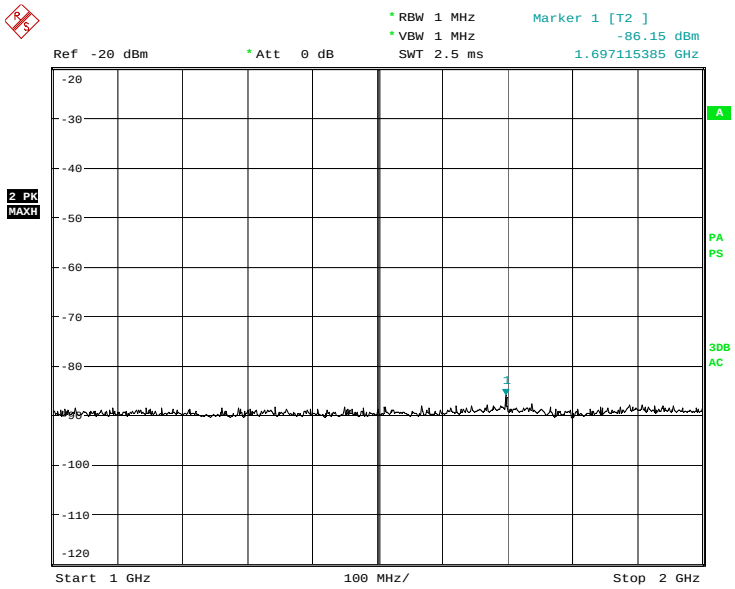


Date: 4.JUN.2008 00:39:16

Product Service

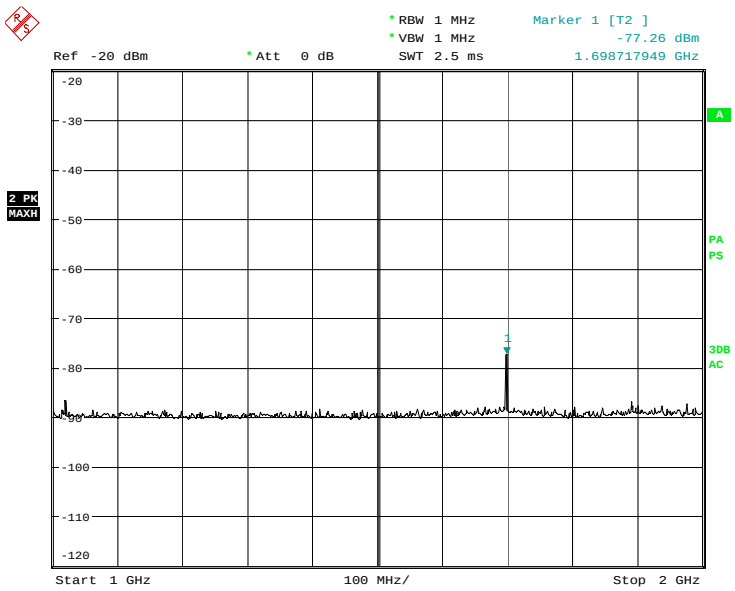
1GHz – 2GHz

Vertical Polarisation



Date: 4.JUN.2008 00:57:39

Horizontal Polarisation

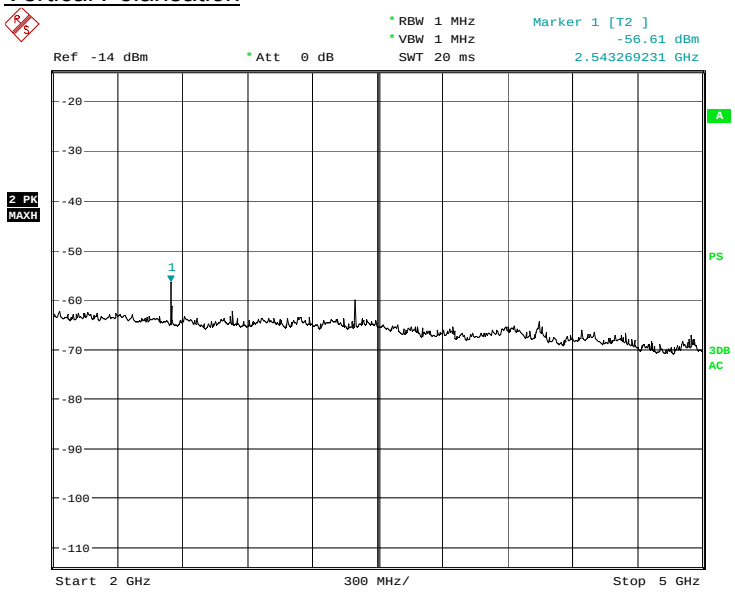


Date: 4.JUN.2008 00:59:46

Product Service

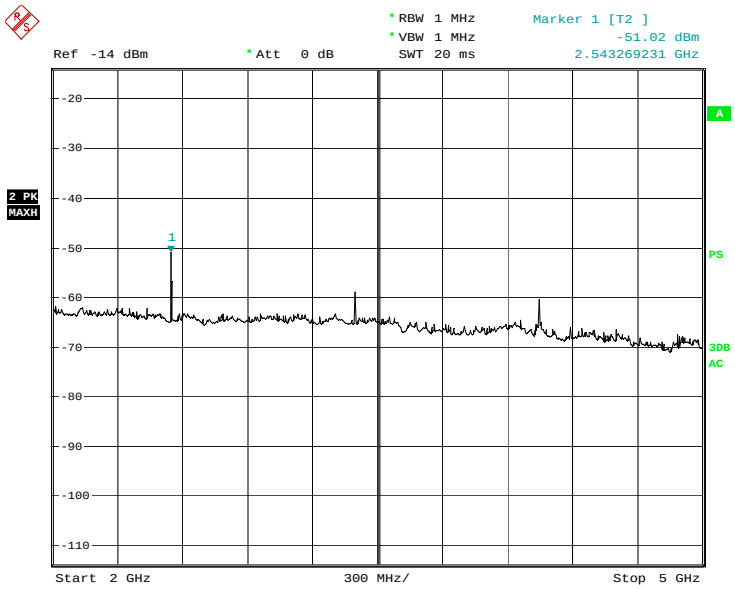
2GHz – 5GHz

Vertical Polarisation



Date: 4.JUN.2008 02:13:31

Horizontal Polarisation

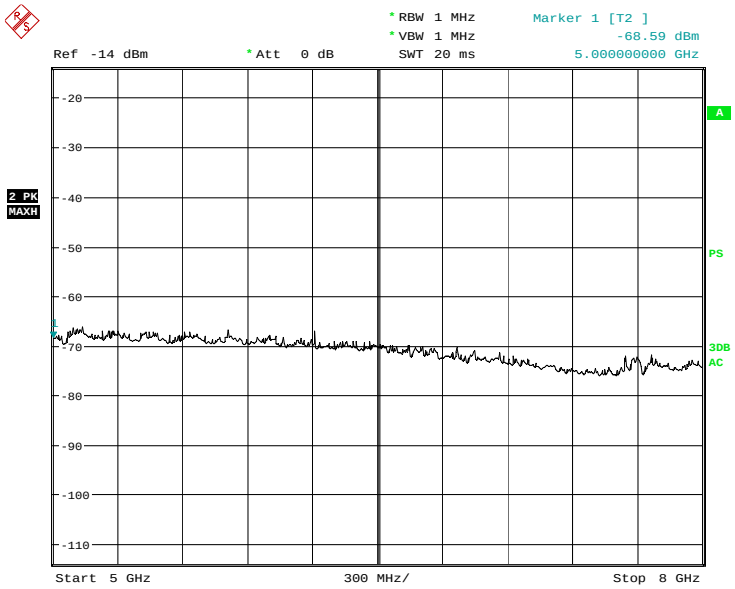


Date: 4.JUN.2008 02:19:41

Product Service

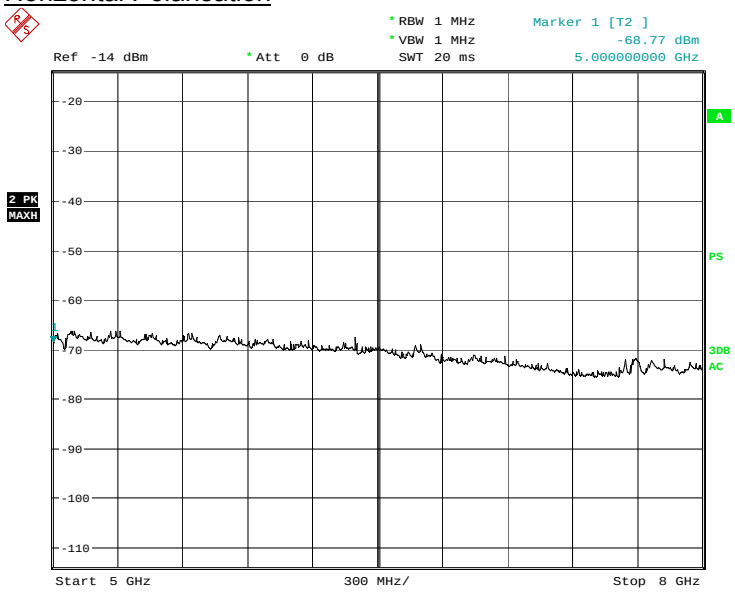
5GHz – 8GHz

Vertical Polarisation



Date: 4.JUN.2008 02:15:14

Horizontal Polarisation

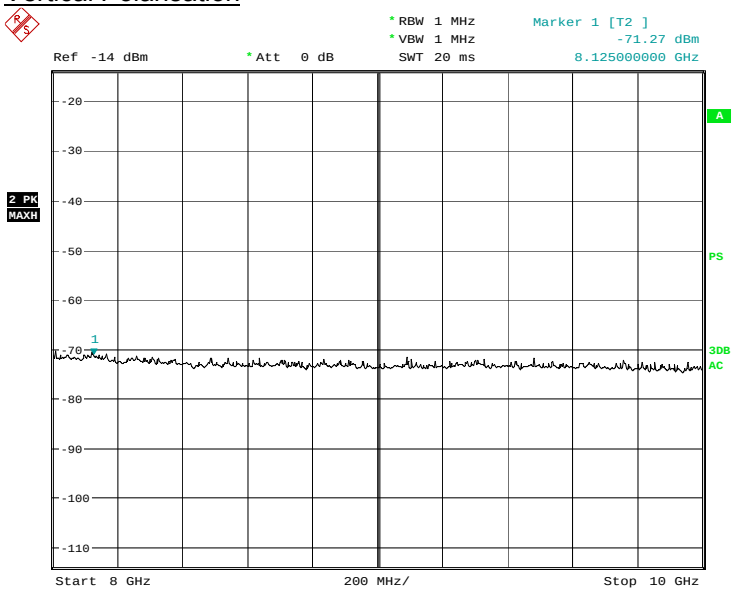


Date: 4.JUN.2008 02:17:38

Product Service

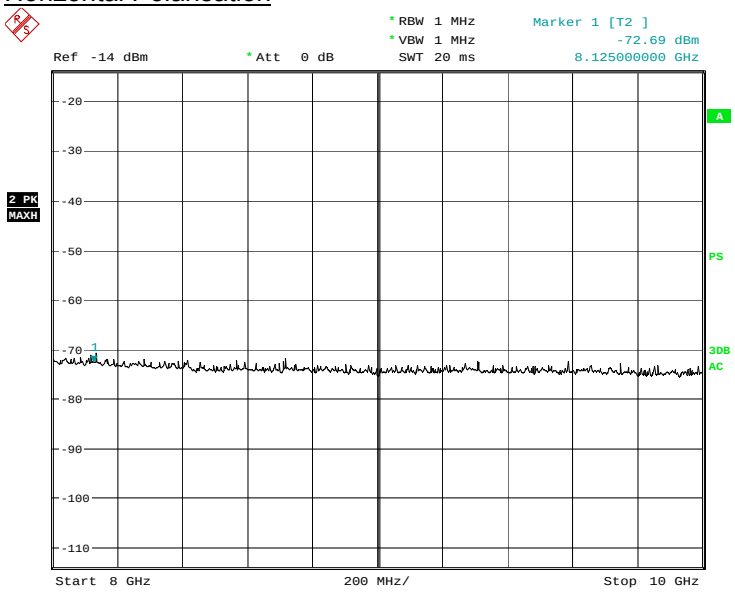
8GHz – 10GHz

Vertical Polarisation



Date: 4.JUN.2008 01:26:59

Horizontal Polarisation



Date: 4.JUN.2008 01:17:57

Product Service

2.7 CONDUCTED SPURIOUS EMISSIONS

2.7.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.917(a), 2.1051

2.7.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.7.3 Date of Test and Modification State

16 June 2008 - Modification State 0

2.7.4 Test Equipment Used

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

2.7.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 22: 2006.

In accrodance with Part 2.1051, the spurious 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 9 GHz. The EUT was set to transmit on full power on timeslots 3, 4, 5 and 6. The EUT was tested on Bottom, Middle and Top channels for maximum power. The resolution and video bandwidths were set to 1 MHz and 3 MHz thus meeting the requirements of Part 22.917(b). The spectrum analyser detector was set to max hold.

From 9 kHz to 4 GHz, an attenuator was used. For measuring the range 4 GHz to 9 GHz an attneuator and high pass filter were used. This was to reduce saturation effects in the spectrum analyser.

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

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

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.7.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	36%

Product Service

2.7.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 for Emission limitations for Cellular Equipment.

The test results are shown below.

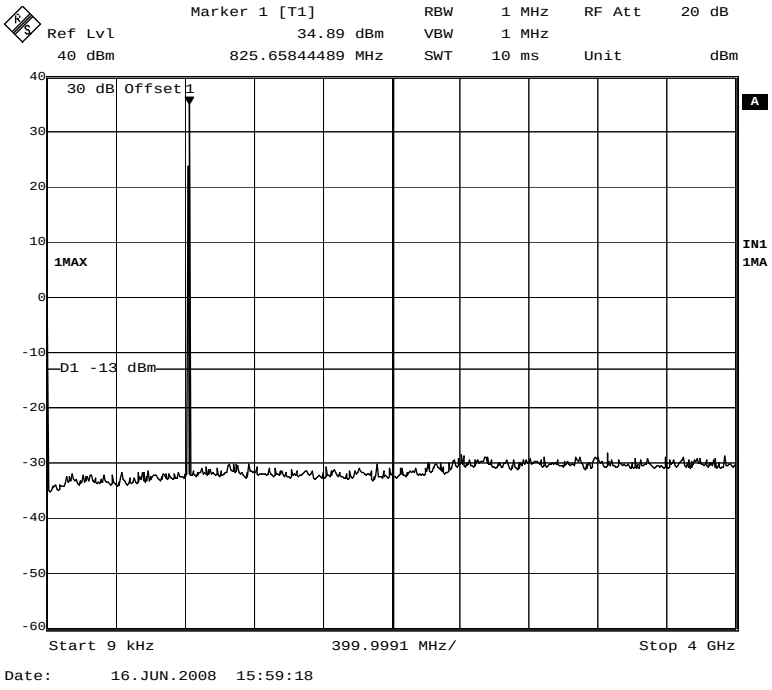
Configuration 1 - Mode 1

3.7V Supply

Mode 1 – Maximum Power

Spurious Emissions (9kHz – 4GHz)

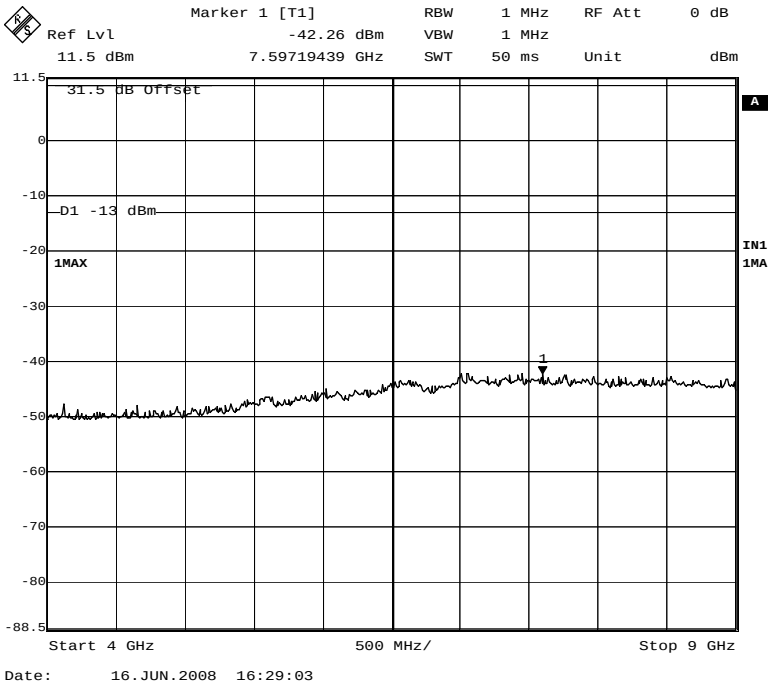
GPRS, Timeslots 3, 4, 5 and 6 active



Product Service

Spurious Emissions (4GHz – 9GHz)

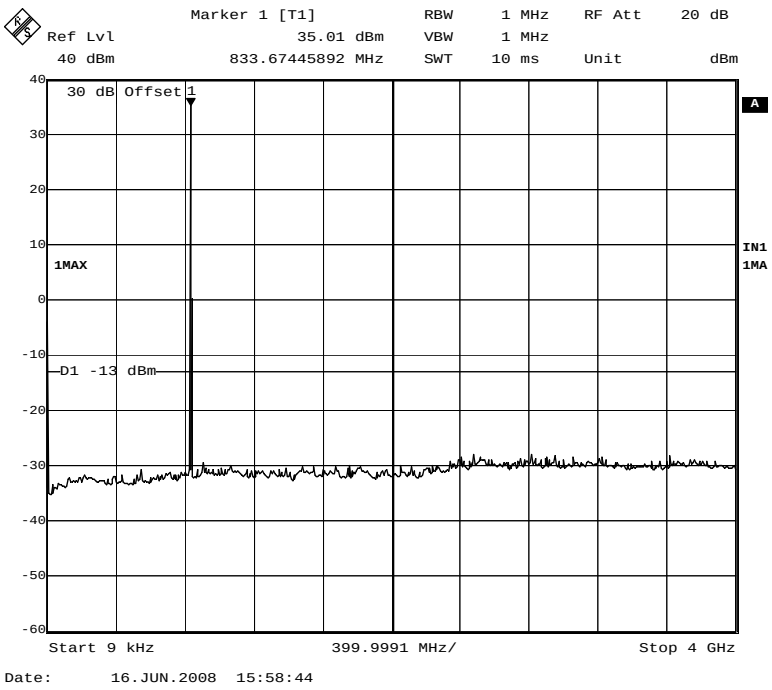
GPRS, Timeslots 3, 4, 5 and 6 active



Mode 2 – Maximum Power

Spurious Emissions (9 kHz – 4 GHz)

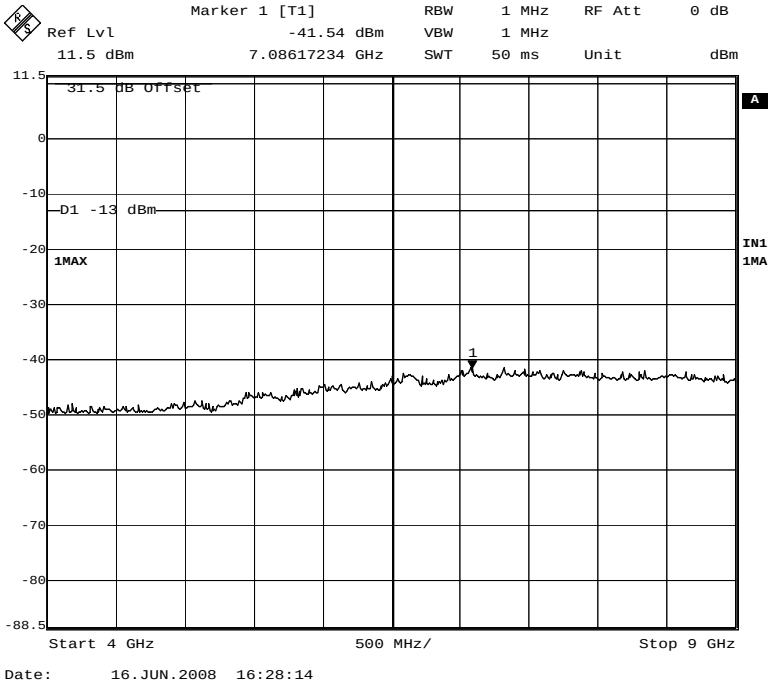
GPRS, Timeslots 3, 4, 5 and 6 active



Mode 2 – Maximum Power

Spurious Emissions (4GHz – 9GHz)

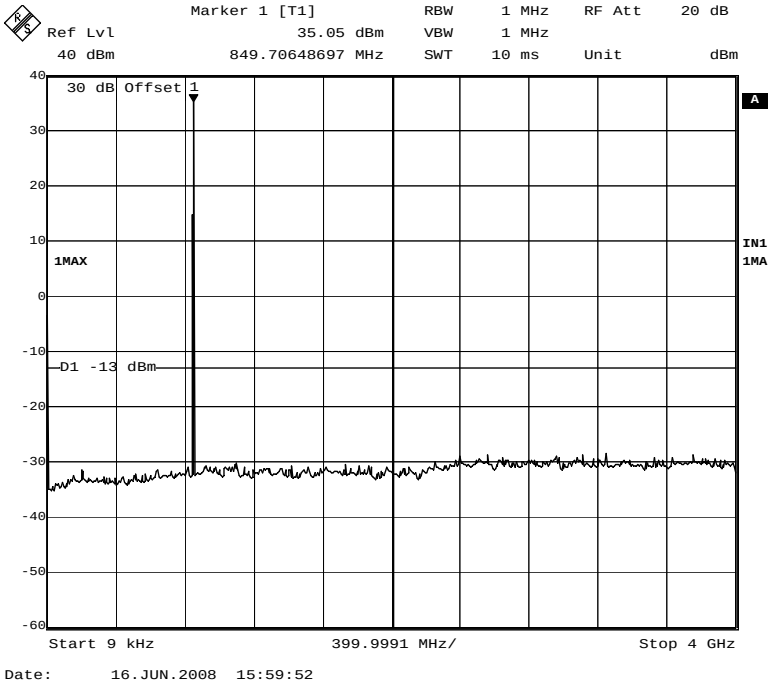
GPRS, Timeslots 3, 4, 5 and 6 active



Mode 3 – Maximum Power

Spurious Emissions (9kHz – 4GHz)

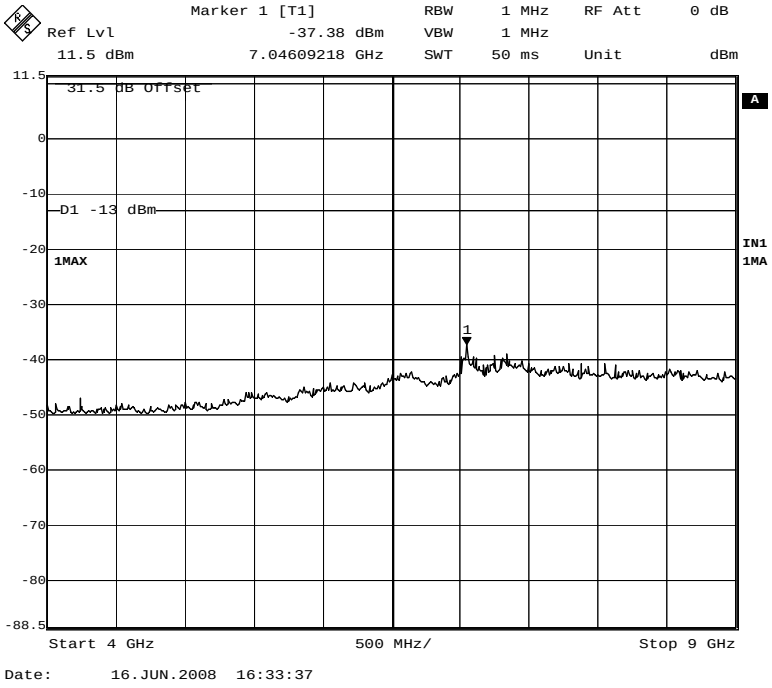
GPRS, Timeslots 3, 4, 5 and 6 active



Mode 3 – Maximum Power

Spurious Emissions (4GHz – 9GHz)

GPRS, Timeslots 3, 4, 5 and 6 active



Product Service

2.8 FREQUENCY STABILITY UNDER TEMPERATURE VARIATIONS

2.8.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.355, 2.1055
Industry Canada RSS-132: 2005, Clause 4.2

2.8.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.8.3 Date of Test and Modification State

17 June 2008 - Modification State 0

2.8.4 Test Equipment Used

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

2.8.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 22: 2006 and RSS-132: 2005.

The EUT was set to transmit on maximum power with timeslots 3, 4, 5 and 6 active. A digital communication analyser (CMU 200), was used to measure the frequency error. The maximum result was taken over 200 bursts. The temperature was adjusted between -30°C and +50°C in 10° steps as per 2.1055. Measurements were performed on timeslot 3.

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

Configuration 1 - Mode 2

2.8.6 Environmental Conditions

	17 June 2008
Ambient Temperature	23.3°C
Relative Humidity	40.5%

Product Service

2.8.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132: 2005 for Frequency Stability Under Temperature Variations.

The test results are shown below.

Configuration 1 - Mode 2

3.7V Supply

GMSK – Circuit Switched

Temperature Interval (ºC)	Test Frequency (MHz)	Deviation (Hz)	Limit (kHz)
-30	836.400	-14	±2.092
-20	836.400	-12	±2.092
-10	836.400	-11	±2.092
0	836.400	-11	±2.092
+10	836.400	-10	±2.092
+20	836.400	-10	±2.092
+30	836.400	-11	±2.092
+40	836.400	-12	±2.092
+50	836.400	-13	±2.092

Product Service

2.9 FREQUENCY STABILITY UNDER VOLTAGE VARIATIONS

2.9.1 Specification Reference

FCC CFR 47 Part 22: 2006, Clause 22.355, 2.1055

2.9.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.9.3 Date of Test and Modification State

17 June 2008 - Modification State 0

2.9.4 Test Equipment Used

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

2.9.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 22: 2006.

The EUT was set to transmit on maximum power on timeslots 3, 4, 5 and 6. Measurements were made on timeslot 3. A digital communciation anlayser (CMU200), was used to measure the frequency error. The maximum result was taken over 200 bursts.

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

Configuration 1 - Mode 2

2.9.6 Environmental Conditions

	17 June 2008
Ambient Temperature	23.3°C
Relative Humidity	40.5%

Product Service

2.9.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 for Frequency Stability Under Voltage Variations.

The test results are shown below.

Configuration 1 - Mode 2

GPRS – Circuit Switched

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Deviation Limit (kHz)
3.35	836.400	-10	±2.092

Product Service

2.10 SPURIOUS EMISSIONS AT BAND EDGE

2.10.1 Specification Reference

FCC Part 24: 2006, Part 24.229(a)(b), 24.238(a)(b)
Industry Canada RSS-133, Clause 6.5

2.10.2 Equipment Under Test

CD1D, S/N: 031425000815000074 and IMEI: 004401750006880

2.10.3 Date of Test and Modification State

16 June 2008 - 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 CFR 47 Part 24: 2006 and RSS-133: 2005.

In accordance with 24.238, at least 1% of the 26dB bandwith was used for the resolution and video bandwidths up to 1 MHz away from the block edge. At greater than 1MHz the resolution and video bandwidths were increased to 1 MHz.

The reference power and path losses of all channels used for testing in each frequency block were measured. It was found that there was < 0.6 dB variation in all channels, thus the worst case reference level offset was used throughout. Having entered the reference level offset , the limit line was displayed, showing the -13 dBm, (43 + 10 log (P)), limit.

The EUT was tested at it's maximum power level with timeslots 3, 4, 5 and 6 active.

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

Configuration 1 - Mode 4
- Mode 6

2.10.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	38%

Product Service

2.10.7 Test Results

For the period of test the EUT met the requirements of FCC Part 24: 2006 and RSS-133: 2005 for Band Edge Measurements.

The test results are shown below.

3.7V Supply

Configuration 1 - Mode 2

Maximum Power – GPRS, Timeslots 3, 4, 5 and 6

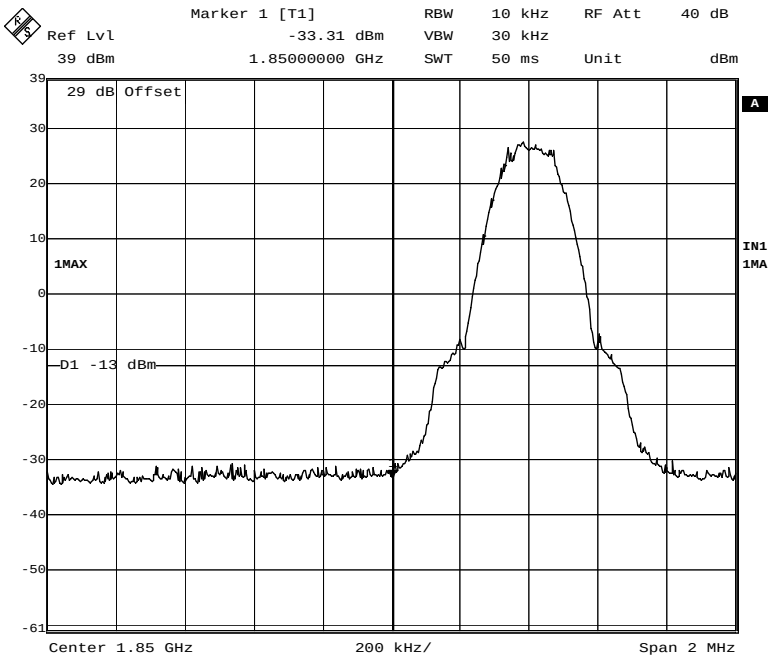
Frequency Block	Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
A	Channel : 513 Frequency : 1850.4 MHz	-
C	-	Channel : 809 Frequency : 1909.6 MHz

Limit	≤-13dBm at Block Edge

Product Service

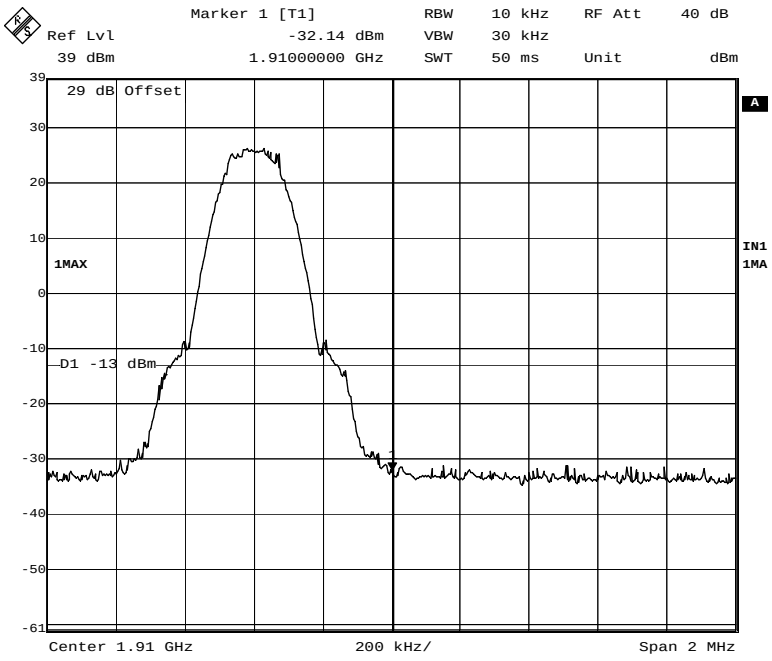
Maximum Power - GPRS

Frequency Block A



Date: 16.JUN.2008 14:52:31

Frequency Block C



Date: 16.JUN.2008 14:57:31

Product Service

2.11 MAXIMUM PEAK OUTPUT POWER - CONDUCTED

2.11.1 Specification Reference

FCC Part 24: 2006, Part 24.232(b), 2.1046
Industry Canada RSS-133, 6.2

2.11.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.11.3 Date of Test and Modification State

16 June 2008 - Modification State 0

2.11.4 Test Equipment Used

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

2.11.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of CFR 47 Part 24: 2006 and RSS-133: 2005.

Using a spectrum analyser and attenuator(s), the output power of the EUT was measured at the antenna terminals.

The EUT supports GSM and GPRS. The EUT was tested in GPRS mode of operation. Testing was performed with GMSK modulation, with four timeslots active, (3 and 4) and (5 and 6). The mobile device is a class 12 device.

The spectrum analyser RBW and VBW were set to 1MHz and the pass loss measured and entered as a reference level offset.

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

Configuration 1 - Mode 4
- Mode 5
- Mode 6

2.11.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	41%

Product Service

2.11.7 Test Results

For the period of test the EUT met the requirements of FCC Part 24: 2006 and RSS-133: 2005 for Maximum Peak Output Power - Conducted.

The test results are shown below.

3.7V Supply

Configuration 1 – Modes 4, 5 and 6

Maximum Power – GSM

Frequency (MHz)	Result (dBm)	Result (mW)
1850.2	29.60	0.912
1880.0	29.13	0.818
1909.8	28.83	0.764

Limit	<2W or <+33dBm

Product Service

2.12 EIRP PEAK POWER

2.12.1 Specification Reference

FCC CFR 47 Part 24: 2006, Clause 24.232(c) and RSS-133, 6.2

2.12.2 Equipment Under Test

CD1D, S/N: 031425000814000036 and IMEI: 004401750007144

2.12.3 Date of Test and Modification State

03 June 2008 - Modification State 0

2.12.4 Test Equipment Used

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

2.12.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 24: 2006 and RSS-133: 2005.

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

Configuration 1 - Mode 4
- Mode 5
- Mode 6

2.12.6 Environmental Conditions

	03 June 2008
Ambient Temperature	17.3°C
Relative Humidity	46%
Atmospheric Pressure	1011mbar

Product Service

2.12.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 and RSS-133: 2005 for EIRP Peak Power.

The test results are shown below.

Configuration 1 - Modes 4, 5 and 6

Frequency GHz	EIRP (dBm)	Limit (dBm)	EIRP (W)	Limit (W)
1.8502	25.70	33.00	0.372	2.00
1.8800	26.20	33.00	0.417	2.00
1.9098	27.10	33.00	0.513	2.00

Product Service

2.13 MODULATION CHARACTERISTICS

2.13.1 Specification Reference

FCC CFR 47 Part 24: 2006, Clause 2.1047(d)

2.13.2 Equipment Under Test

CD1D, S/N: 031425000815000074 and IMEI: 004401750006880

2.13.3 Date of Test and Modification State

16 June 2008 - Modification State 0

2.13.4 Test Equipment Used

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

2.13.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of CFR 47 Part 24: 2006.

Two plots are shown on the following pages showing the EUT transmitting with the display in the time domain.

Plot 1: EUT transmitting with GPRS modulation showing timeslots 3, 4, 5 and 6.
Plot 2: EUT transmitting with GPRS modulation showing one frame with four timeslots active.

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

Configuration 1 - Mode 5

2.13.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	37%

Product Service

2.13.7 Modulation Characteristics

For a description of the modulation techniques see section 2.4.7.

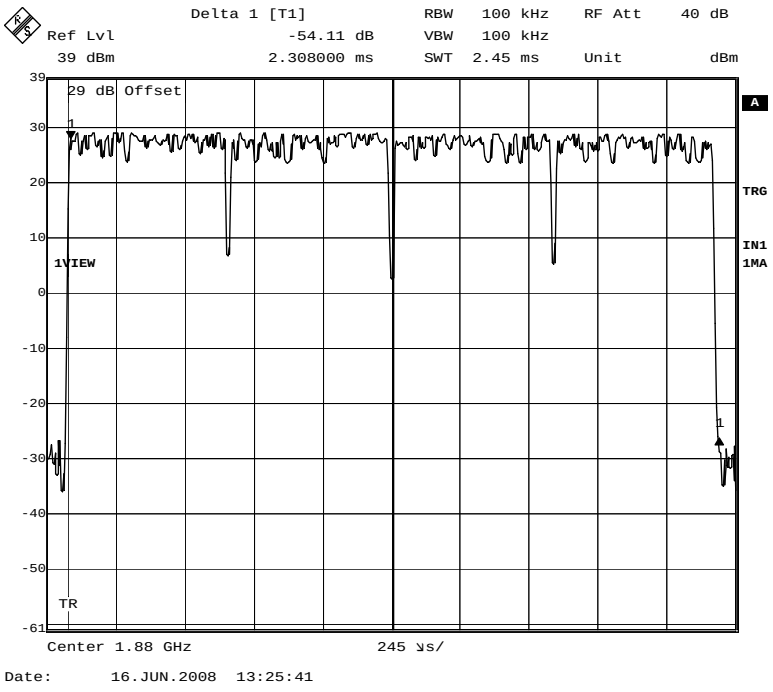
2.13.8 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 for Modulation Characteristics.

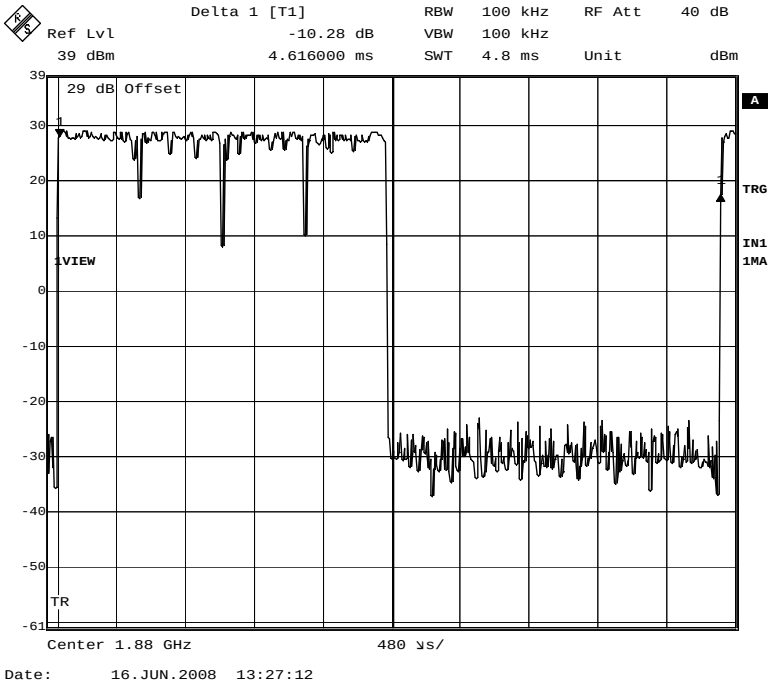
The test results are shown below.

Configuration 1 - Mode 5

EUT Transmitting with GPRS modulation showing timeslots 3, 4, 5 and 6 active



EUT Transmitting with GPRS modulation showing one frame with timeslots 3, 4, 5 and 6 active



Product Service

2.14 OCCUPIED BANDWIDTH

2.14.1 Specification Reference

FCC CFR 47 Part 24: 2006, Clause 24.238(b), 2.1049

2.14.2 Equipment Under Test

CD1D, S/N: 031425000815000074 and IMEI: 004401750006880

2.14.3 Date of Test and Modification State

16 June 2008 - Modification State 0

2.14.4 Test Equipment Used

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

2.14.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 24: 2006.

The EUT was transmitting at maximum power, modulated with timeslots 3, 4, 5 and 6 active. Using a resolution bandwidth of 10 kHz and a video bandwidth of 30 kHz, the -26 dBc points were established and the emission bandwidth determined.

The plot of the following page shows the resultant display from the Spectrum Analyser.

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

Configuration 1 - Mode 5

2.14.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	37%

Product Service

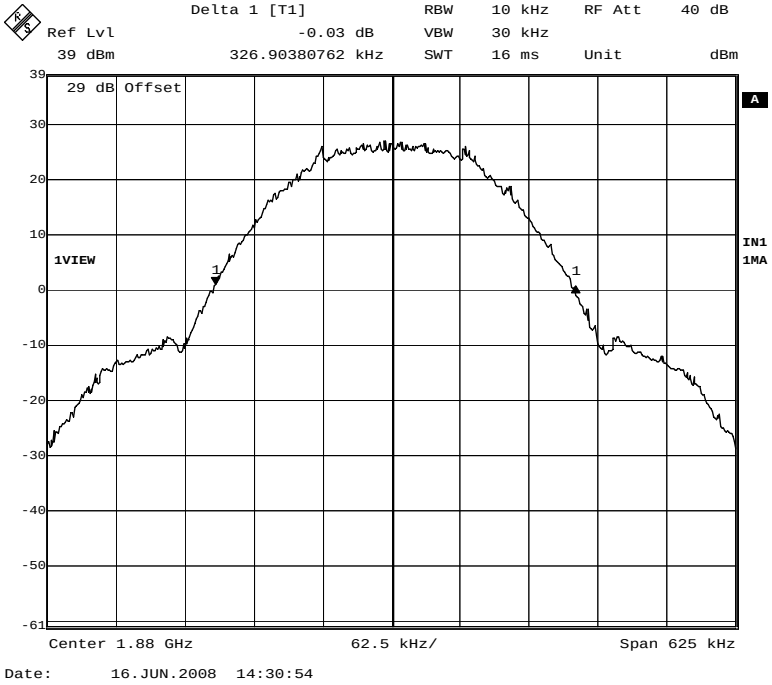
2.14.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 for Occupied Bandwidth.

The test results are shown below.

Configuration 1 - Mode 5

Occupied Bandwidth As Defined By The -26dBc Points



Product Service

2.15 CONDUCTED SPURIOUS EMISSIONS

2.15.1 Specification Reference

FCC CFR 47 Part 24: 2006, Part 24.238(a), 2.1051

2.15.2 Equipment Under Test

CD1D, S/N: 031425000815000074 and IMEI: 004401750006880

2.15.3 Date of Test and Modification State

16 June 2008 - Modification State 0

2.15.4 Test Equipment Used

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

2.15.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 24: 2006.

In accrodance with Part 2.1051, the spurious 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 20 GHz. The EUT was set to transmit on full power on timeslots 3, 4, 5 and 6. The EUT was tested on Bottom, Middle and Top channels for maximum power. The resolution and video bandwidths were set to 1 MHz in accordance with Part 24.238. The spectrum analyser detector was set to max hold.

For meauring the range 9 kHz to 4 GHz, on maximum power, a 20dB attenuator was used. From 4 GHz to 20GHz, attenuators and a high pass filter were used.

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

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

Configuration 1 - Mode 4
- Mode 5
- Mode 6

2.15.6 Environmental Conditions

	16 June 2008
Ambient Temperature	23°C
Relative Humidity	33%

Product Service

2.15.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 for Conducted Spurious Emissions.

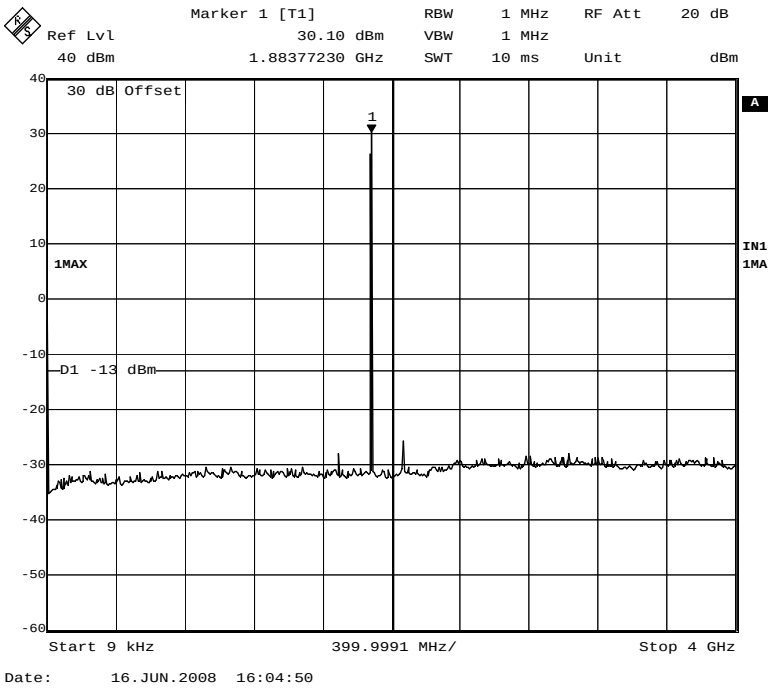
The test results are shown below.

3.7V Supply

Mode 4 – Maximum Power

Spurious Emissions (9kHz – 4GHz)

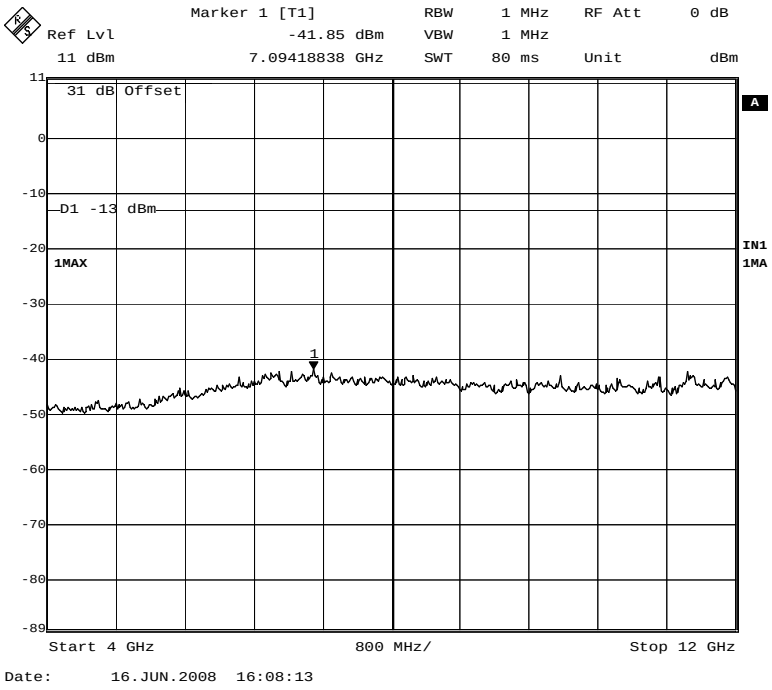
GPRS, Timeslots 3, 4, 5 and 6



Spurious Emissions (4GHz – 12GHz)

Mode 4 – Maximum Power

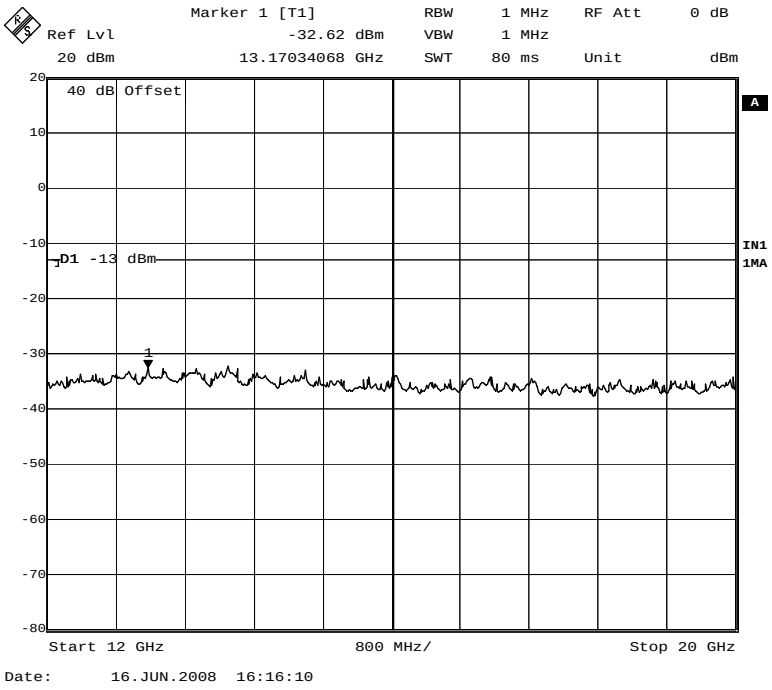
GPRS . Timeslots 3, 4, 5 and 6



Spurious Emissions (12GHz – 20GHz)

Mode 4 – Maximum Power

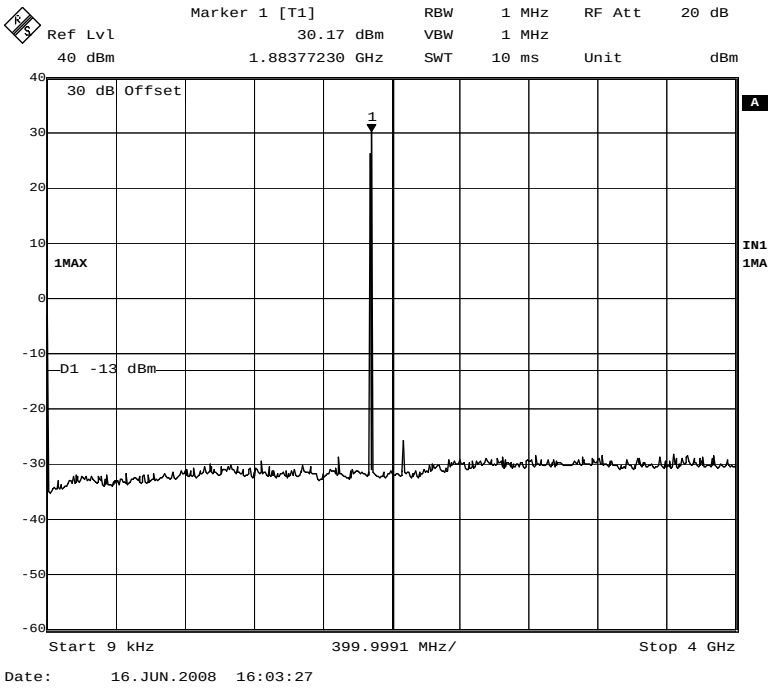
GPRS, Timeslots 3, 4, 5 and 6



Mode 5 – Maximum Power

Spurious Emissions (9kHz – 4GHz)

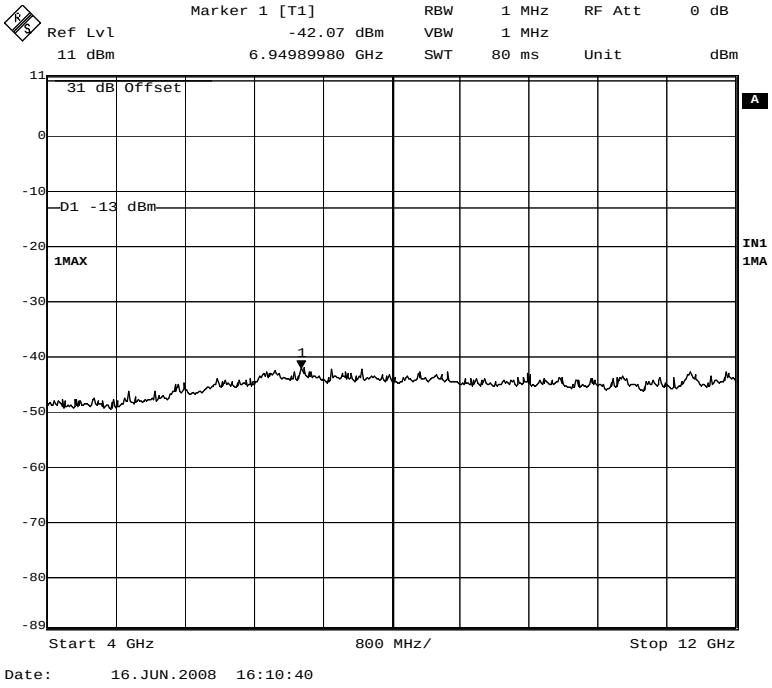
GPRS, Timeslots 3, 4, 5 and 6



Spurious Emissions (4GHz – 12GHz)

Mode 5– Maximum Power

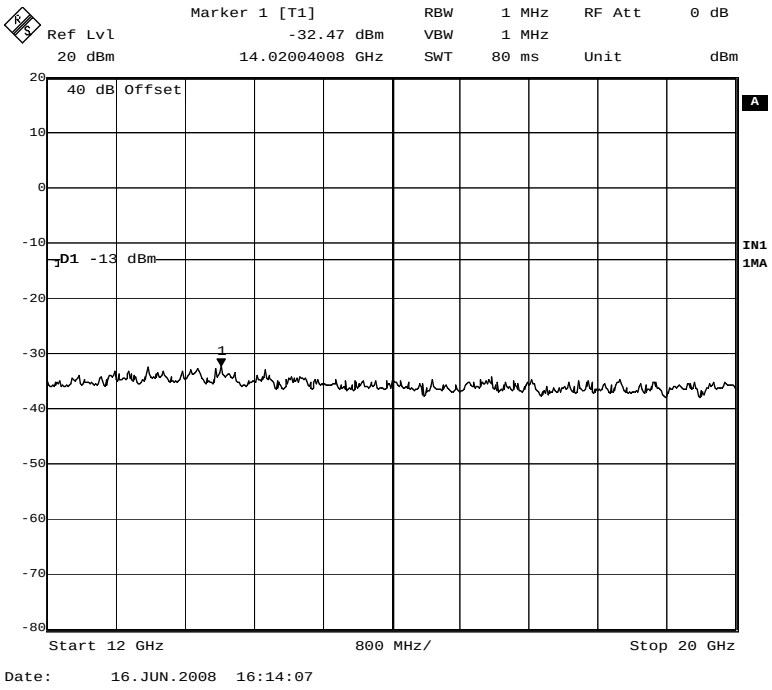
GPRS, Timeslots 3, 4, 5 and 6



Spurious Emissions (12GHz – 20GHz)

Mode 5– Maximum Power

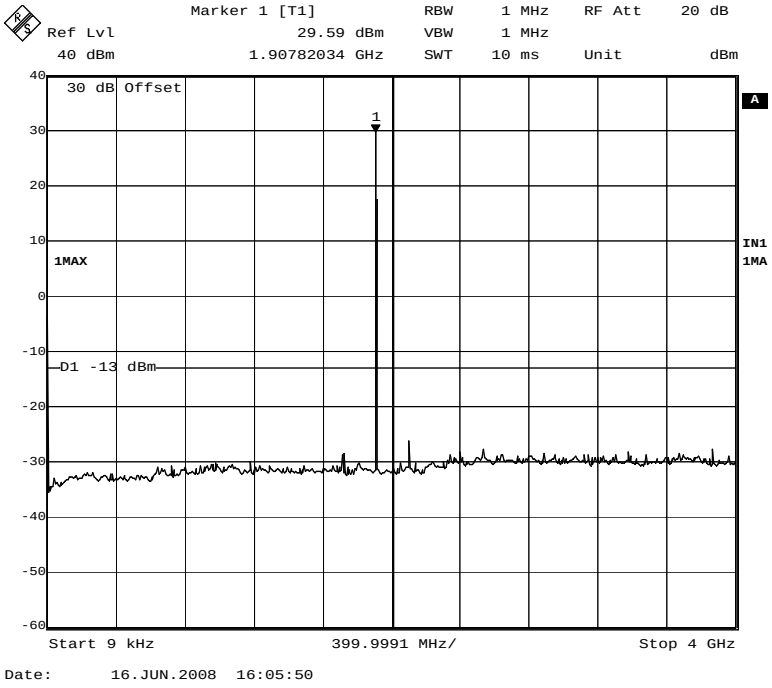
GPRS, Timeslots 3, 4, 5 and 6



Spurious Emissions (9kHz – 4GHz)

Mode 6 – Maximum Power

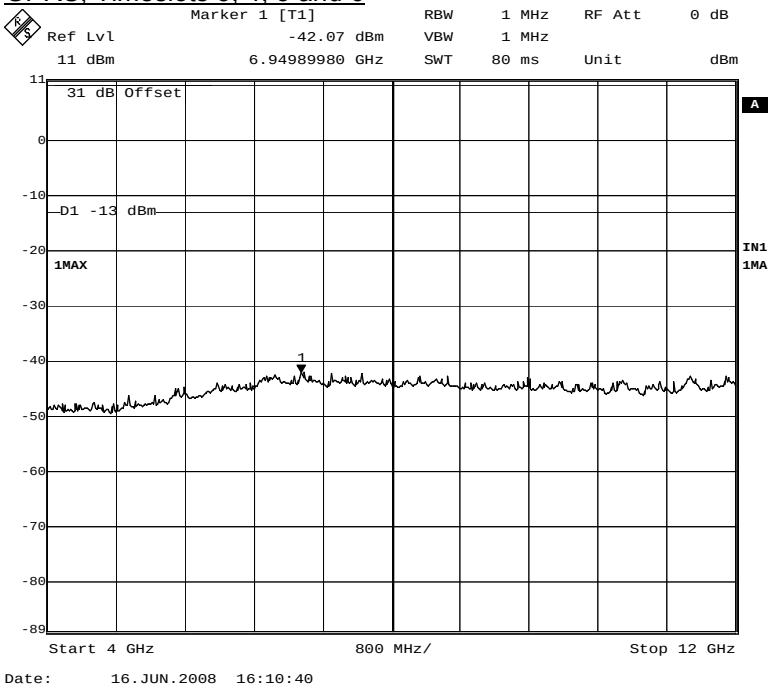
GPRS , Timeslots, 3, 4, 5 and 6



Spurious Emissions (4GHz – 12GHz)

Mode 6 – Maximum Power

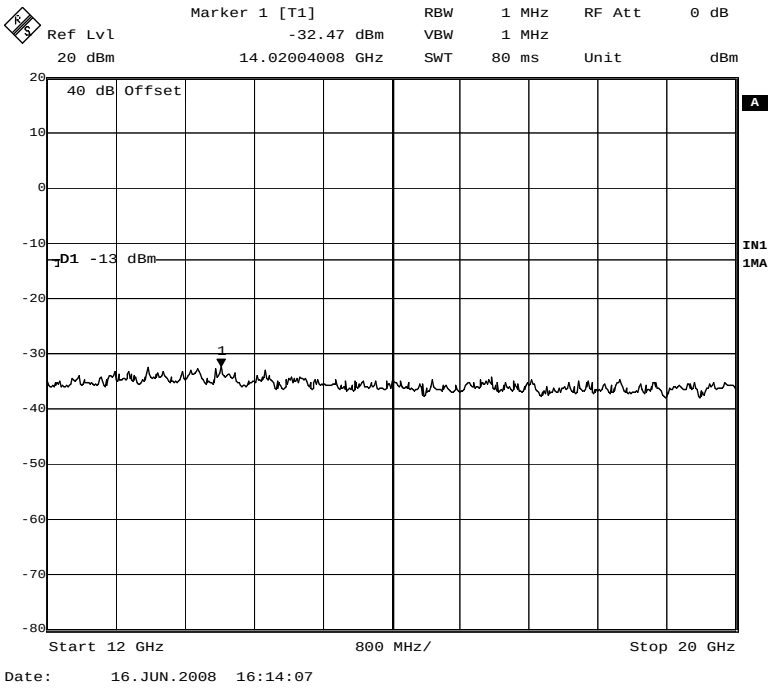
GPRS, Timeslots 3, 4, 5 and 6



Spurious Emissions (12GHz – 20GHz)

Mode 6 – Maximum Power

GPRS, Timeslots 3, 4, 5 and 6



Product Service

2.16 EMISSIONS FOR BROADBAND PCS EQUIPMENT

2.16.1 Specification Reference

FCC CFR 47 Part 24: 2006, Part 24.238 and RSS-133, Clause 6.3

2.16.2 Equipment Under Test

CD1D, S/N: 031425000814000036 and IMEI: 004401750007144

2.16.3 Date of Test and Modification State

03 June 2008 - Modification State 0

2.16.4 Test Equipment Used

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

2.16.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 24: 2006 and RSS-133: 2005.

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

Configuration 1 - Mode 4
- Mode 5
- Mode 6

2.16.6 Environmental Conditions

	03 June 2008
Ambient Temperature	17.3°C
Relative Humidity	46%
Atmospheric Pressure	1011mbar

Product Service

2.16.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 and RSS-133: 2005 for Emissions for Broadband PCS Equipment.

The test results are shown below.

Configuration 1 - Mode 4

Frequency GHz	Antenna Polarisation	Ant Hgt cm	EUT Arc deg	Result EIRP dBm	Limit EIRP dBm	Margin dB	Result
1.665	Horizontal	100	160	-32.8	-13.0	-19.8	Pass
3.700	Horizontal	100	003	-35.3	-13.0	-22.3	Pass

Configuration 1 - Mode 5

Frequency GHz	Antenna Polarisation	Ant Hgt cm	EUT Arc deg	Result EIRP dBm	Limit EIRP dBm	Margin dB	Result
1.692	Horizontal	100	143	-33.1	-13.0	-20.1	Pass
3.759	Horizontal	100	360	-35.4	-13.0	-22.4	Pass

Configuration 1 - Mode 6

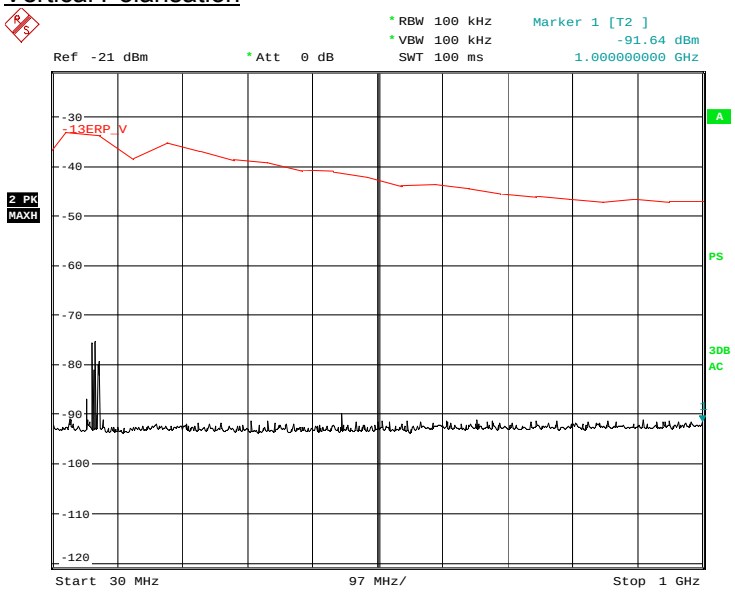
Frequency GHz	Antenna Polarisation	Ant Hgt cm	EUT Arc deg	Result EIRP dBm	Limit EIRP dBm	Margin dB	Result
1.719	Horizontal	100	149	-32.8	-13.0	-19.8	Pass
3.820	Horizontal	100	360	-36.7	-13.0	-23.7	Pass

Product Service

Configuration 1 - Mode 4

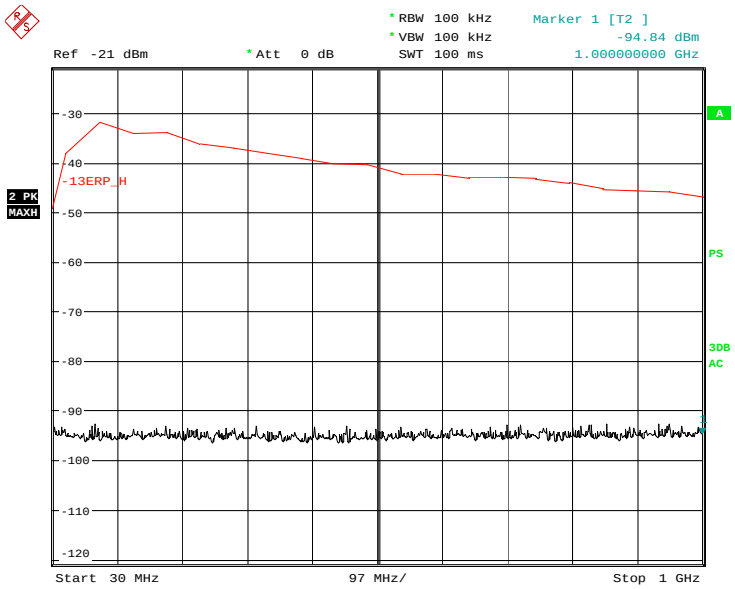
30MHz – 1GHz

Vertical Polarisation



Date: 4.JUN.2008 00:09:54

Horizontal Polarisation

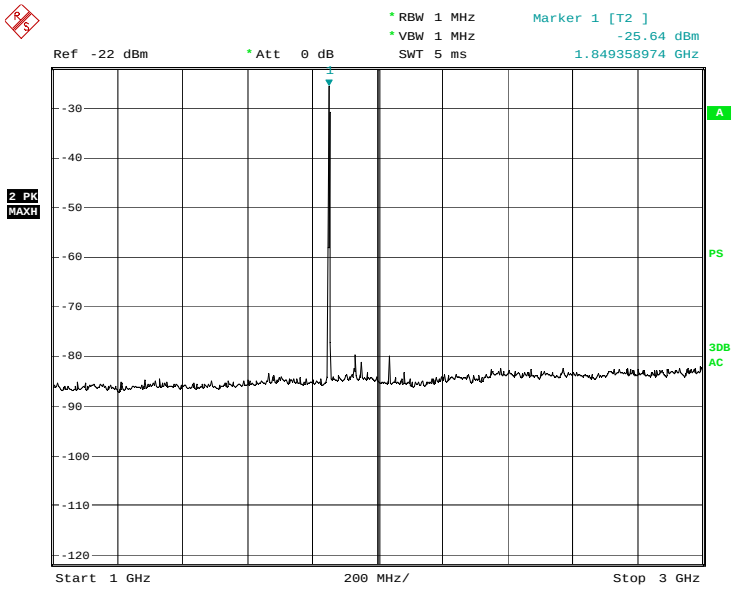


Date: 3.JUN.2008 23:56:09

Product Service

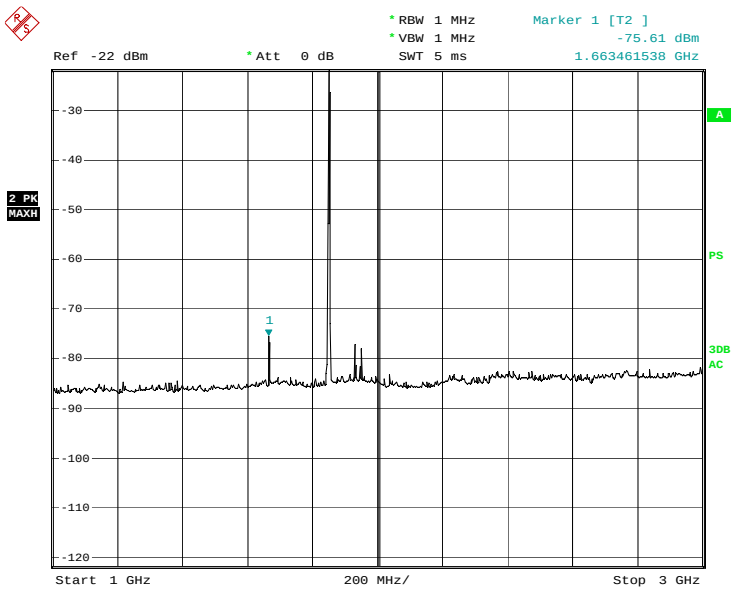
1GHz – 3GHz

Vertical Polarisation



Date: 3.JUN.2008 20:53:39

Horizontal Polarisation

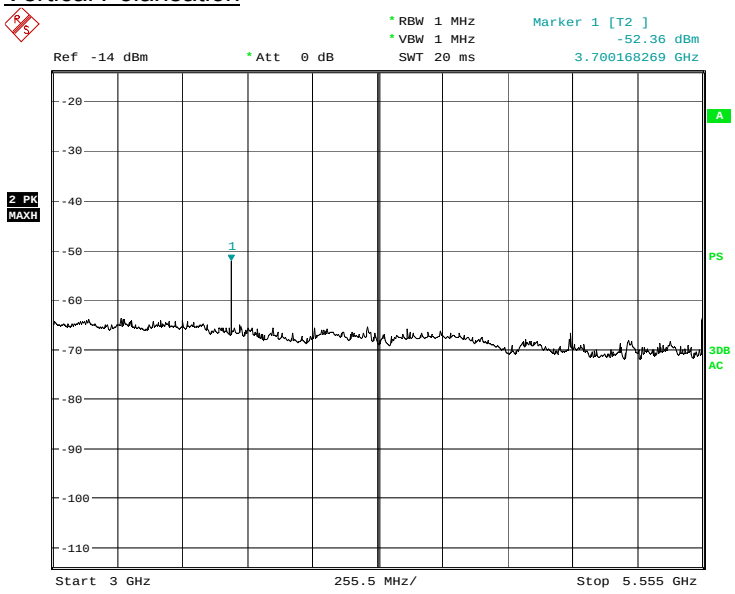


Date: 3.JUN.2008 21:12:48

Product Service

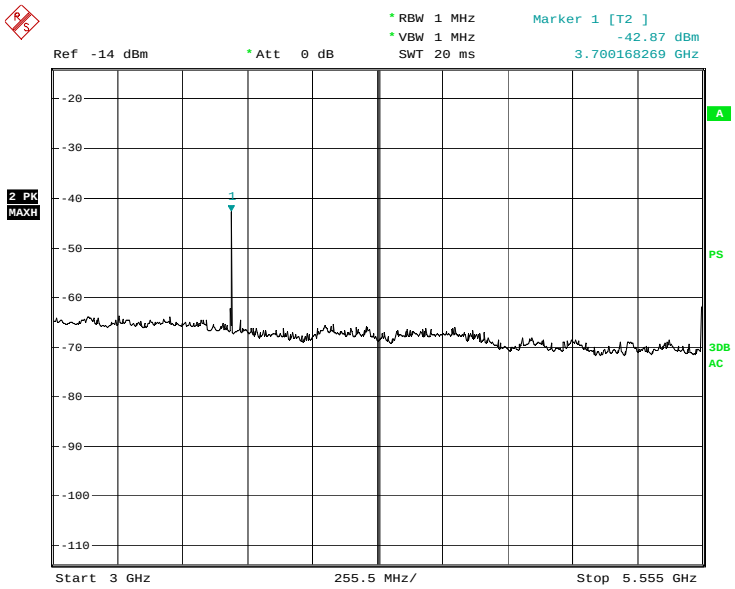
3GHz – 5.5GHz

Vertical Polarisation



Date: 3.JUN.2008 22:05:22

Horizontal Polarisation

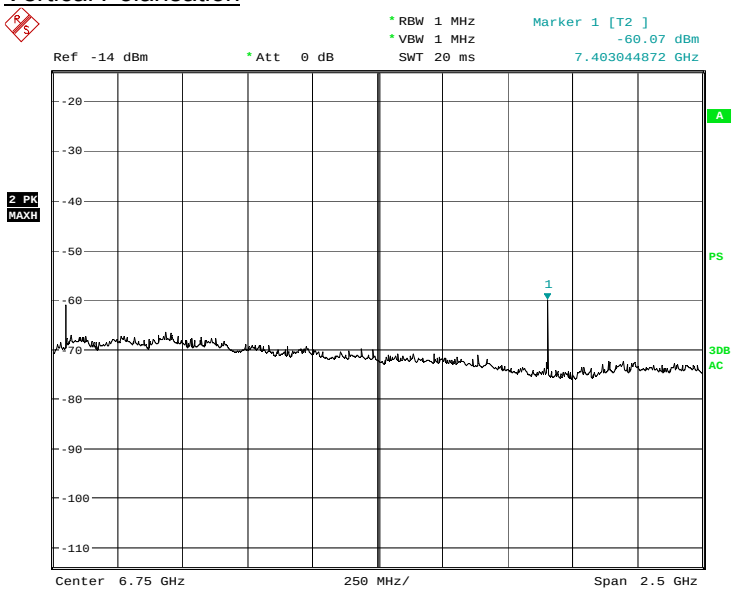


Date: 3.JUN.2008 22:07:40

Product Service

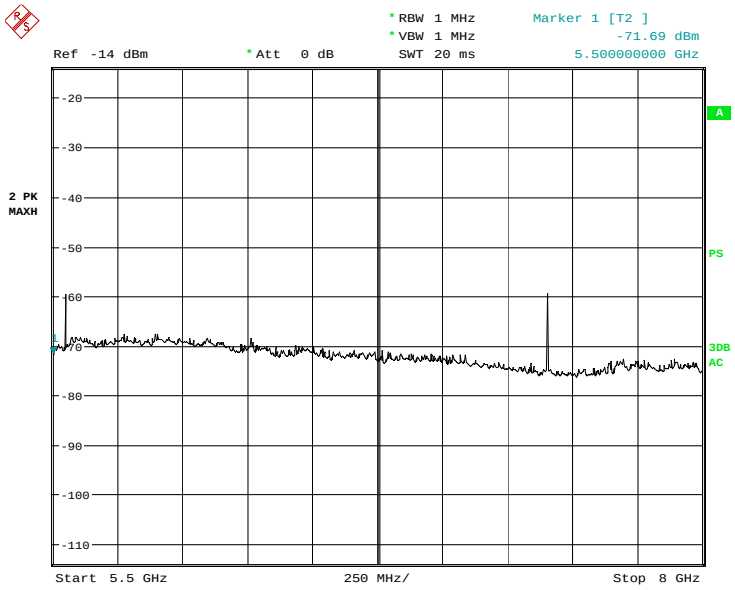
5.5GHz – 8GHz

Vertical Polarisation



Date: 3.JUN.2008 22:02:52

Horizontal Polarisation

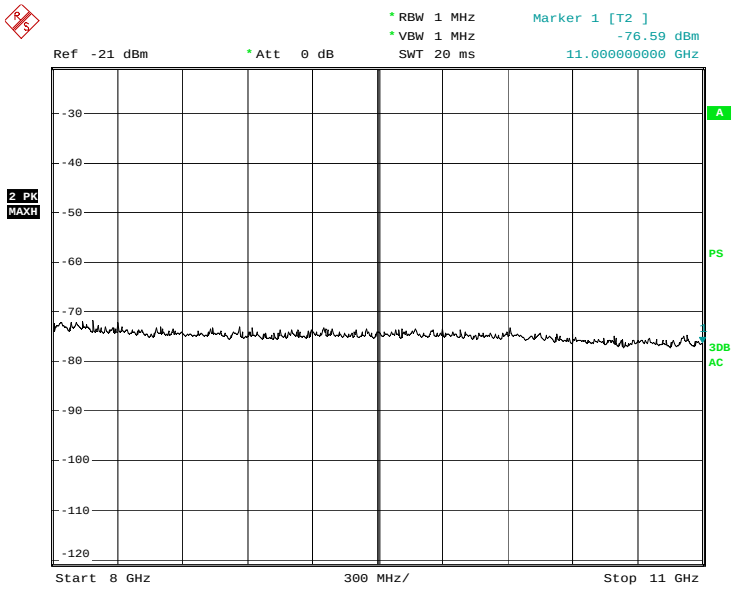


Date: 3.JUN.2008 22:19:19

Product Service

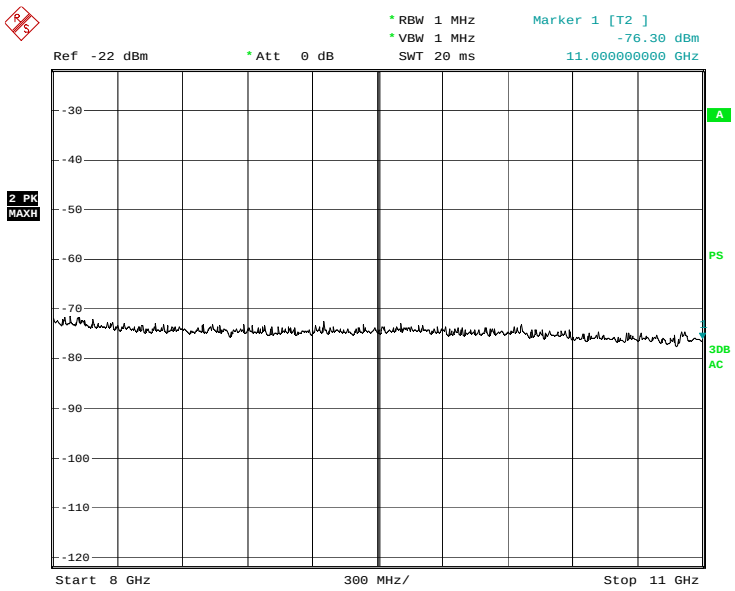
8GHz – 11GHz

Vertical Polarisation



Date: 3.JUN.2008 23:10:28

Horizontal Polarisation

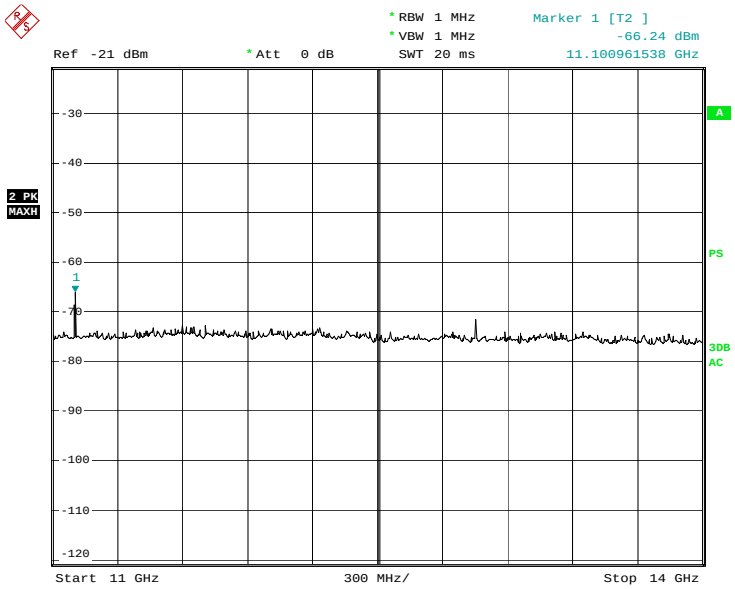


Date: 3.JUN.2008 22:55:36

Product Service

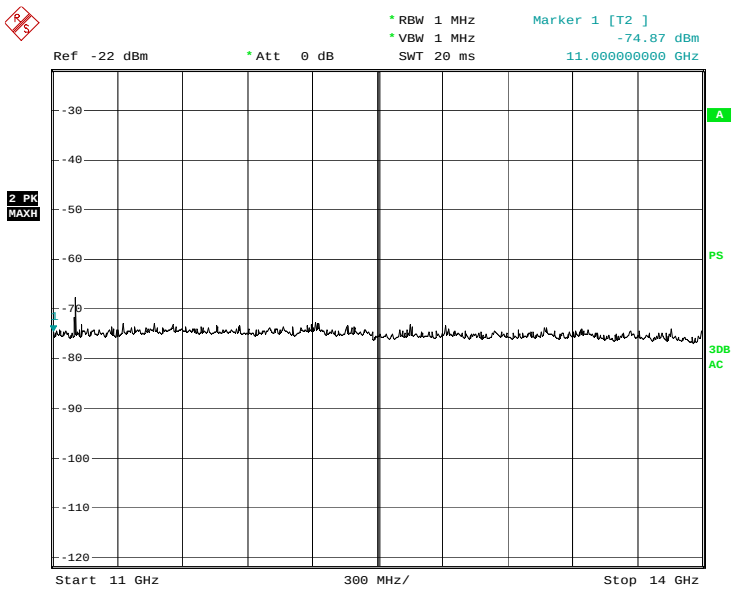
11GHz – 14GHz

Vertical Polarisation



Date: 3.JUN.2008 23:08:18

Horizontal Polarisation

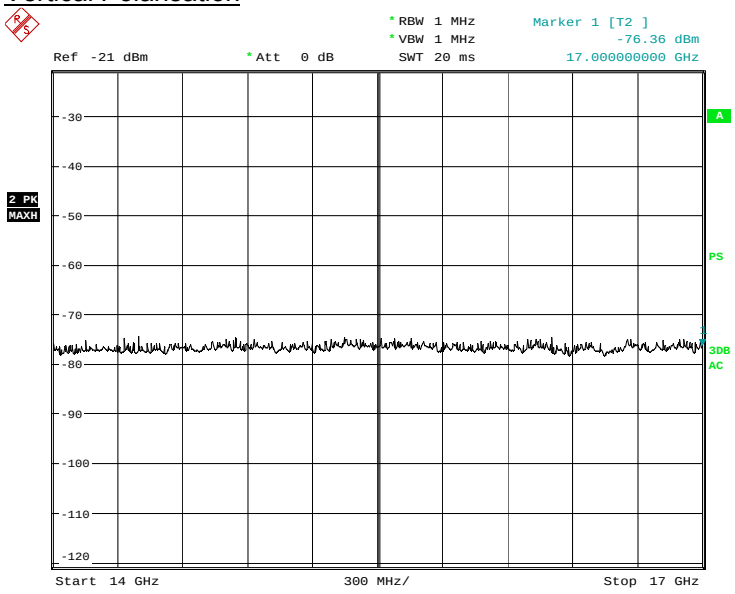


Date: 3.JUN.2008 22:57:44

Product Service

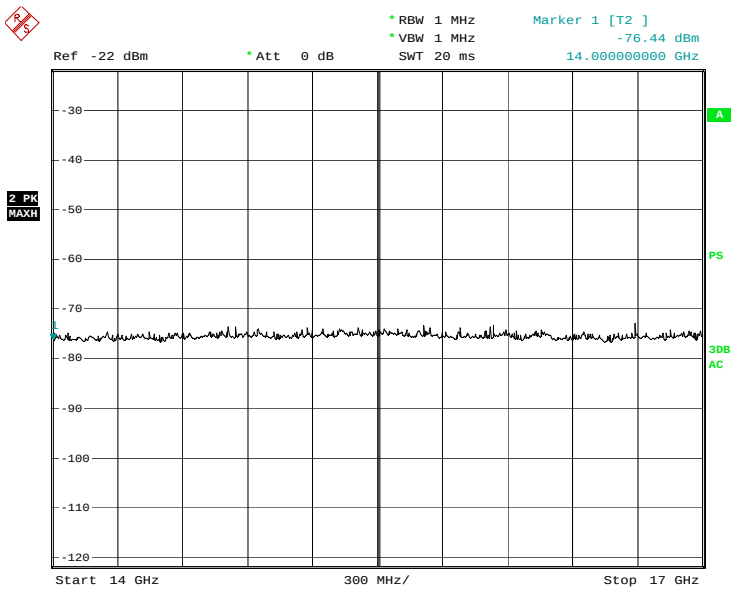
14GHz – 18GHz

Vertical Polarisation



Date: 3.JUN.2008 23:05:56

Horizontal Polarisation

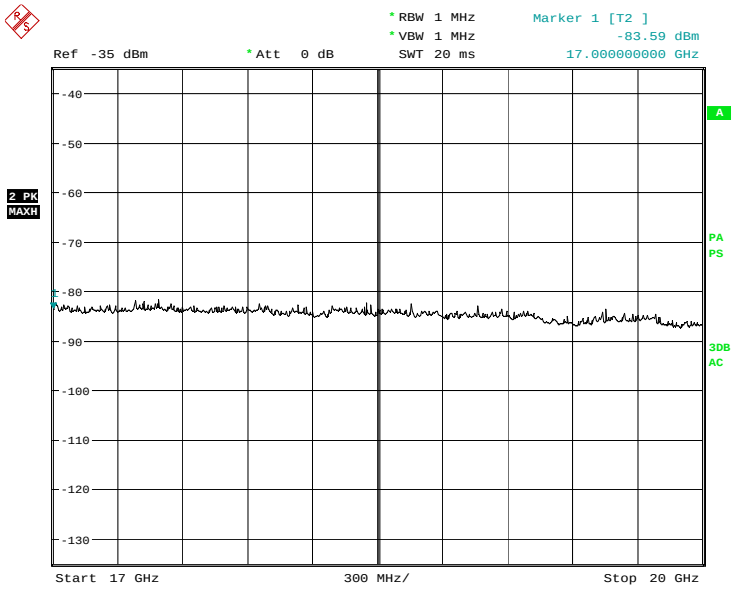


Date: 3.JUN.2008 22:59:29

Product Service

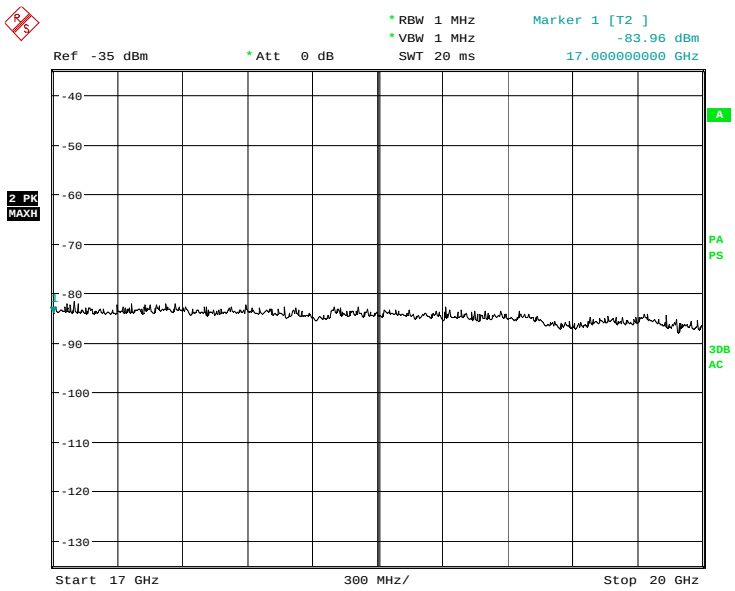
18GHz – 20GHz

Vertical Polarisation



Date: 3.JUN.2008 23:03:25

Horizontal Polarisation



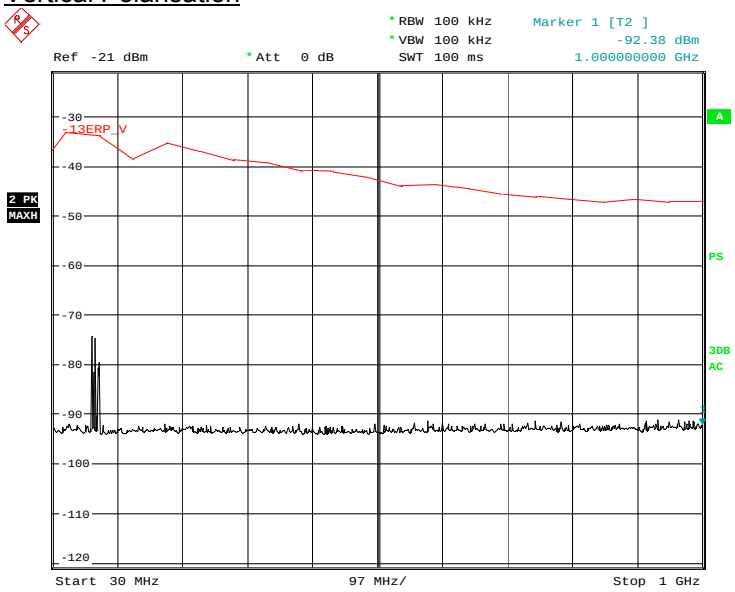
Date: 3.JUN.2008 23:01:03

Product Service

Configuration 1 - Mode 5

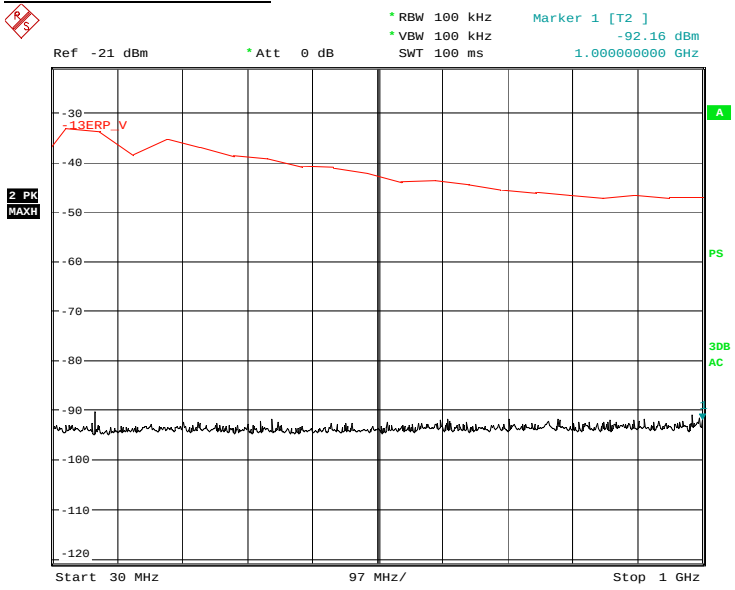
30MHz – 1GHz

Vertical Polarisation



Date: 3.JUN.2008 23:49:26

Horizontal Polarisation

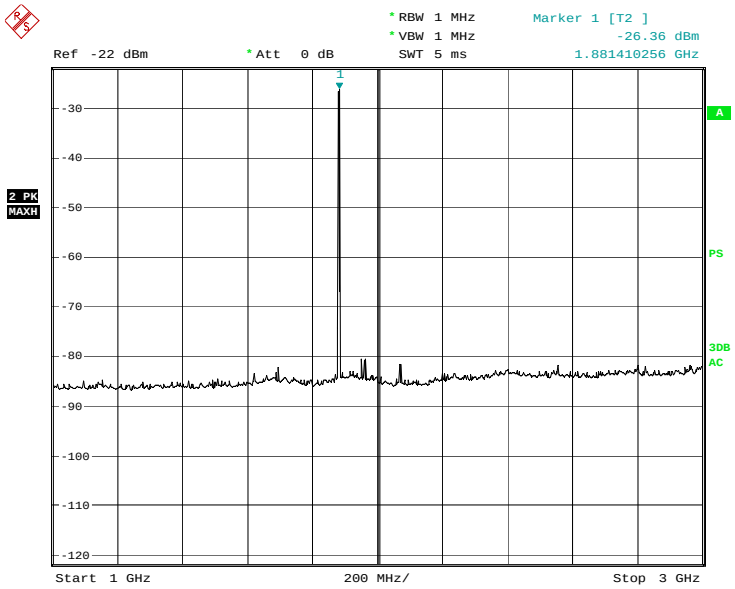


Date: 3.JUN.2008 23:51:15

Product Service

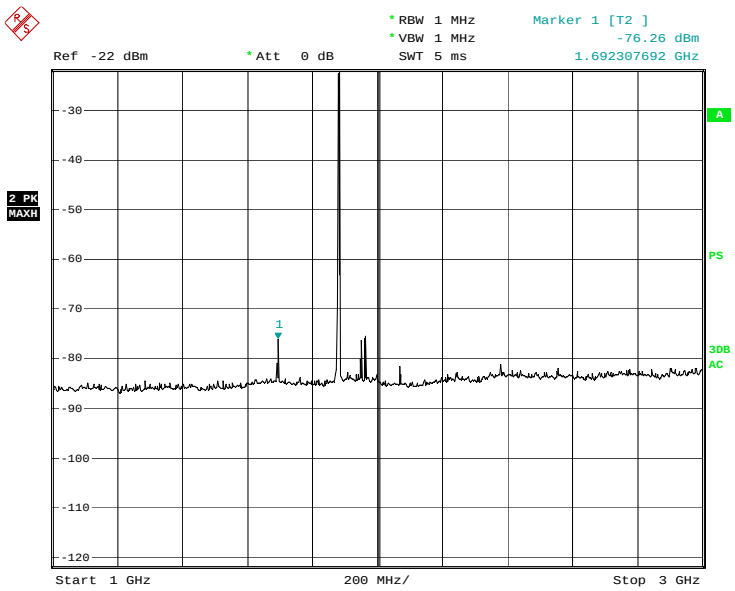
1GHz – 3GHz

Vertical Polarisation



Date: 3.JUN.2008 20:55:15

Horizontal Polarisation

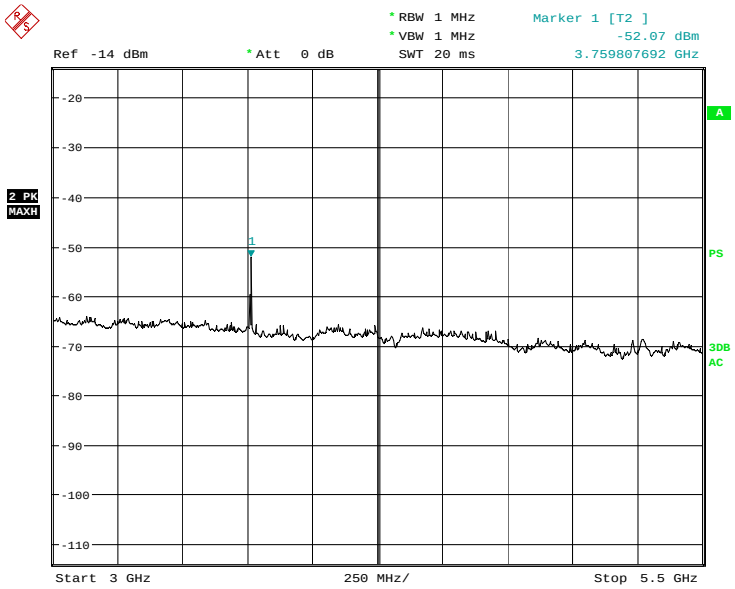


Date: 3.JUN.2008 21:06:38

Product Service

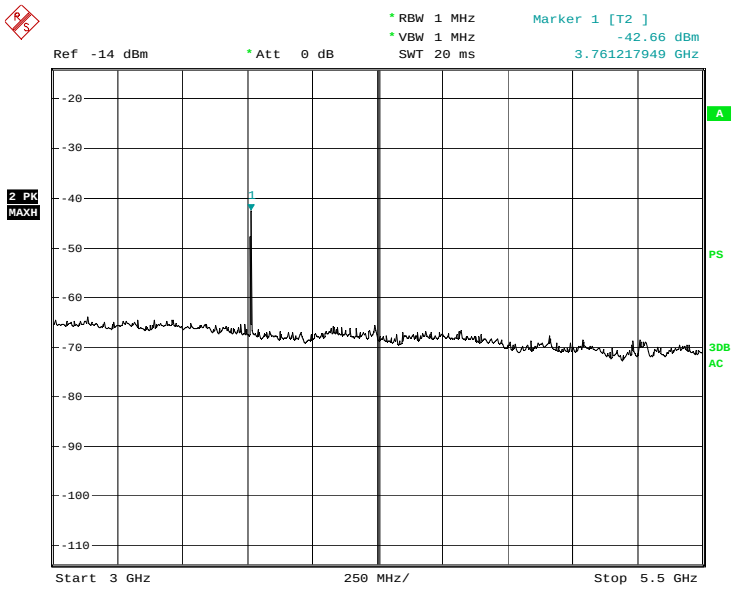
3GHz – 5.5GHz

Vertical Polarisation



Date: 3.JUN.2008 22:28:09

Horizontal Polarisation

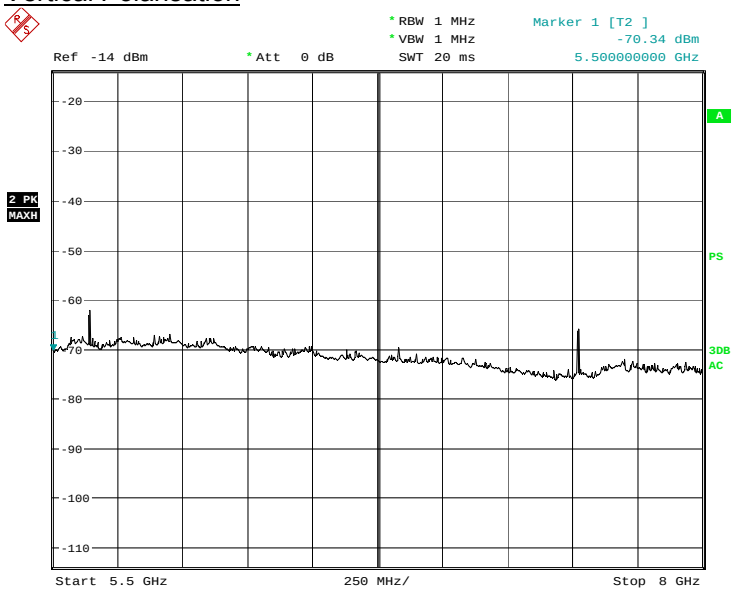


Date: 3.JUN.2008 22:22:38

Product Service

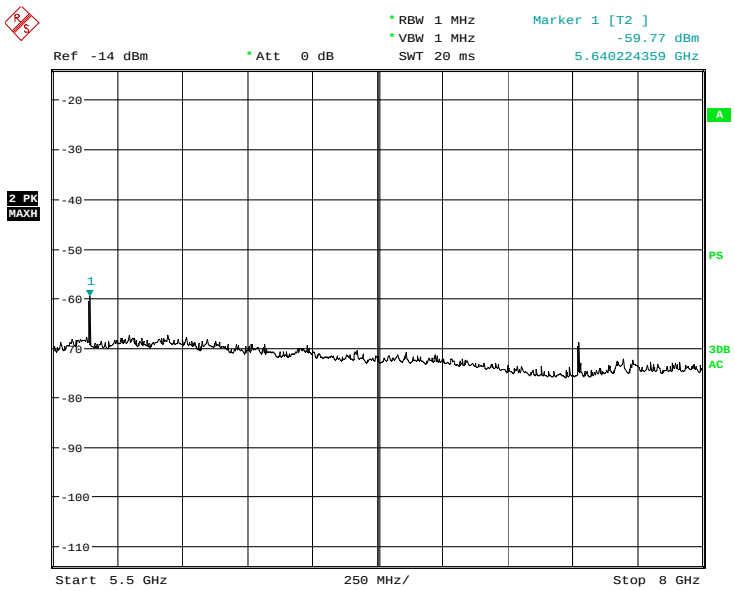
5.5GHz – 8GHz

Vertical Polarisation



Date: 3.JUN.2008 22:30:10

Horizontal Polarisation

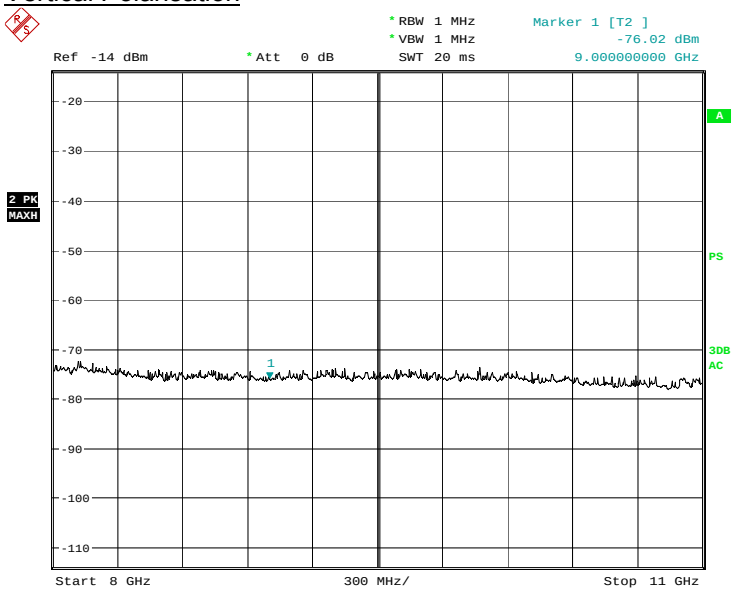


Date: 3.JUN.2008 22:24:25

Product Service

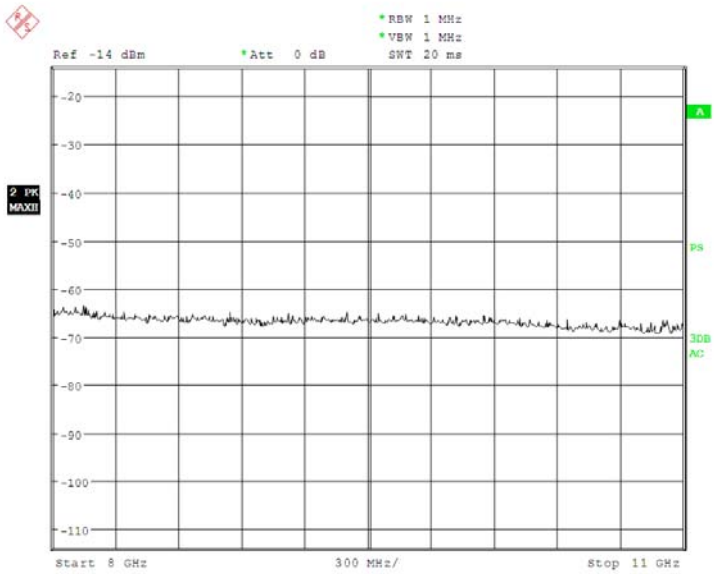
8GHz – 11GHz

Vertical Polarisation



Date: 3.JUN.2008 22:38:28

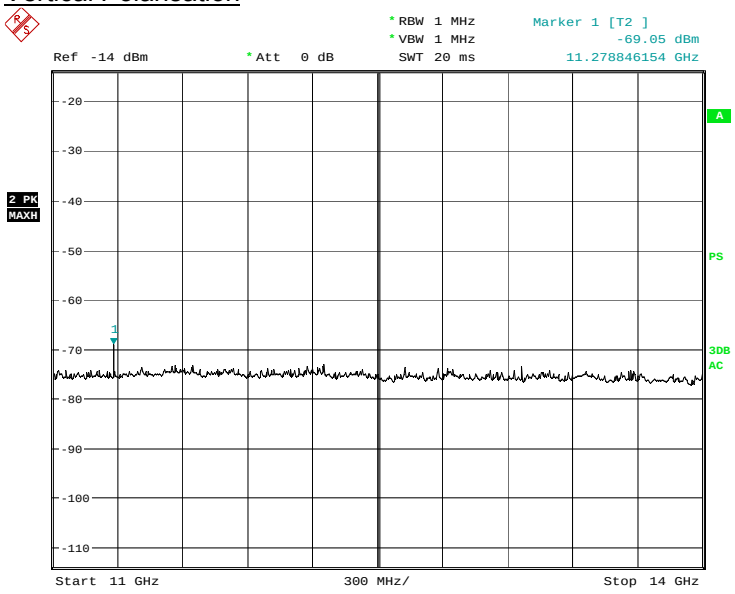
Horizontal Polarisation



Product Service

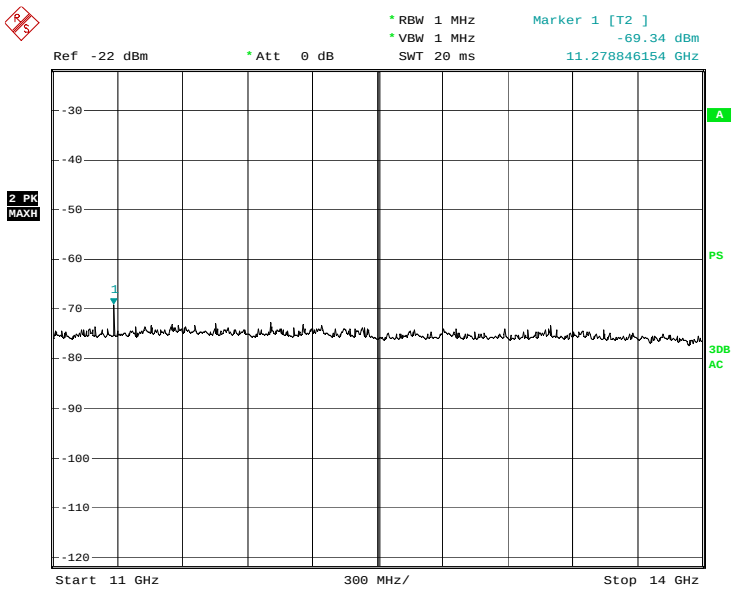
11GHz – 14GHz

Vertical Polarisation



Date: 3.JUN.2008 22:40:21

Horizontal Polarisation

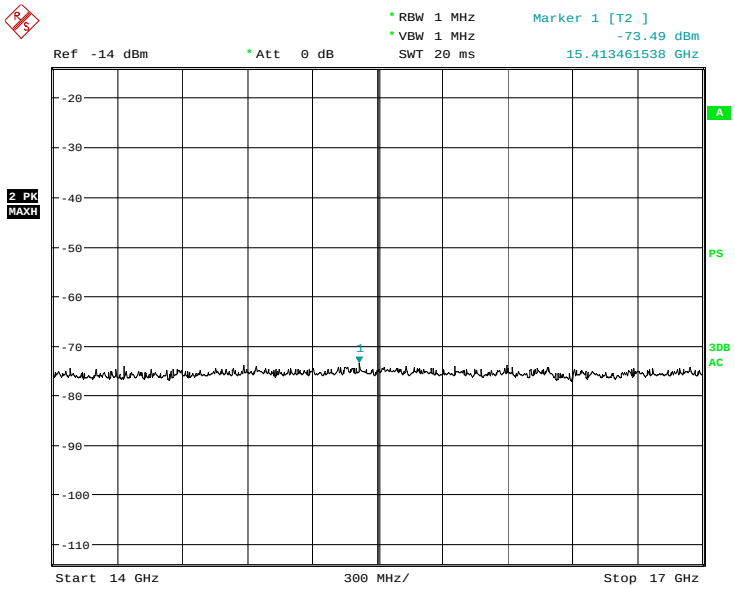


Date: 3.JUN.2008 22:50:47

Product Service

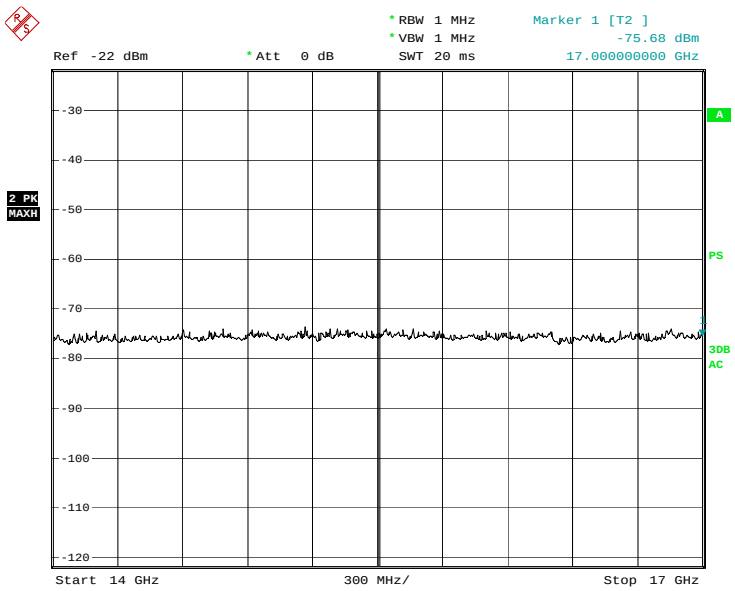
14GHz – 18GHz

Vertical Polarisation



Date: 3.JUN.2008 22:42:10

Horizontal Polarisation

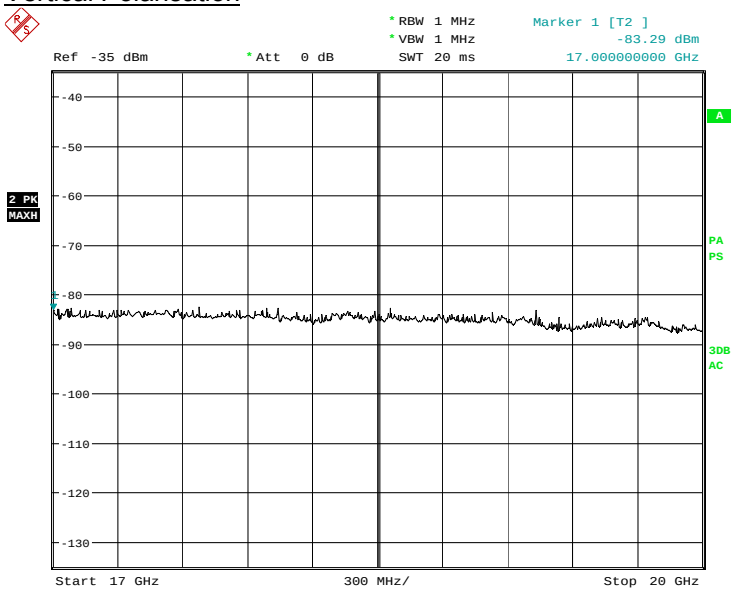


Date: 3.JUN.2008 22:49:20

Product Service

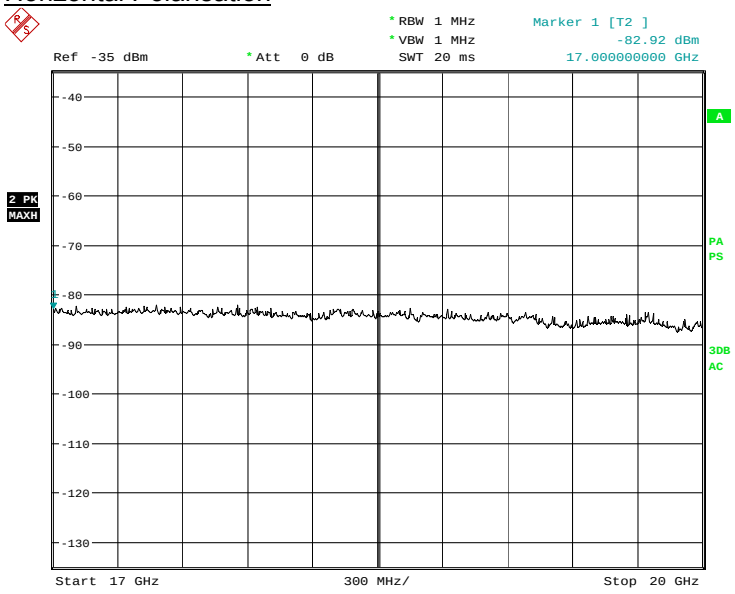
18GHz – 20GHz

Vertical Polarisation



Date: 3.JUN.2008 22:44:18

Horizontal Polarisation



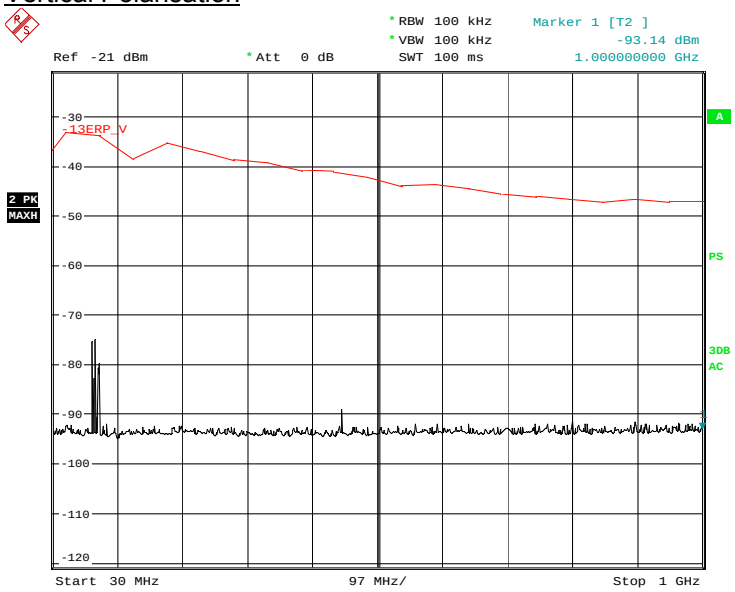
Date: 3.JUN.2008 22:47:41

Product Service

Configuration 1 - Mode 6

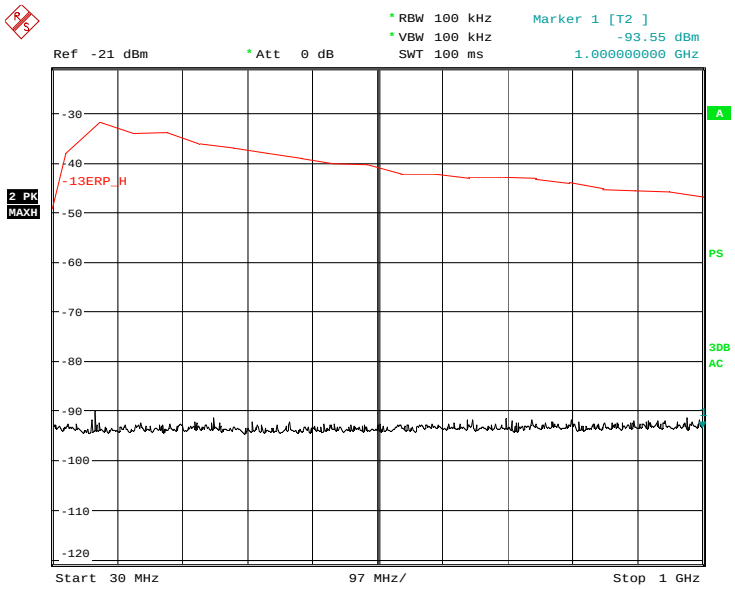
30MHz – 1GHz

Vertical Polarisation



Date: 3.JUN.2008 23:43:48

Horizontal Polarisation

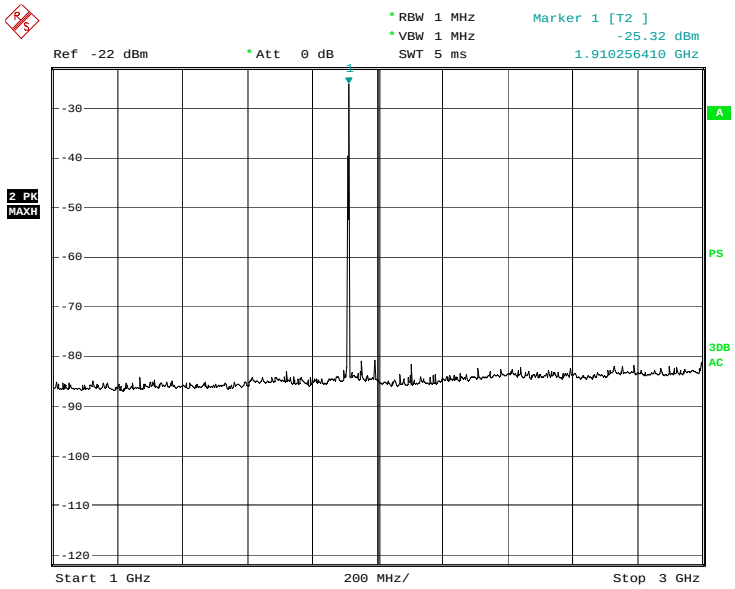


Date: 3.JUN.2008 23:41:42

Product Service

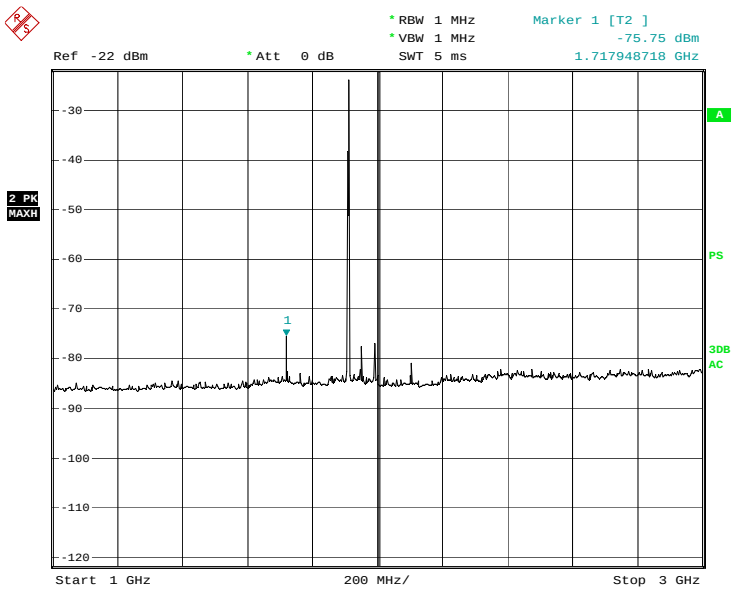
1GHz – 3GHz

Vertical Polarisation



Date: 3.JUN.2008 20:56:27

Horizontal Polarisation

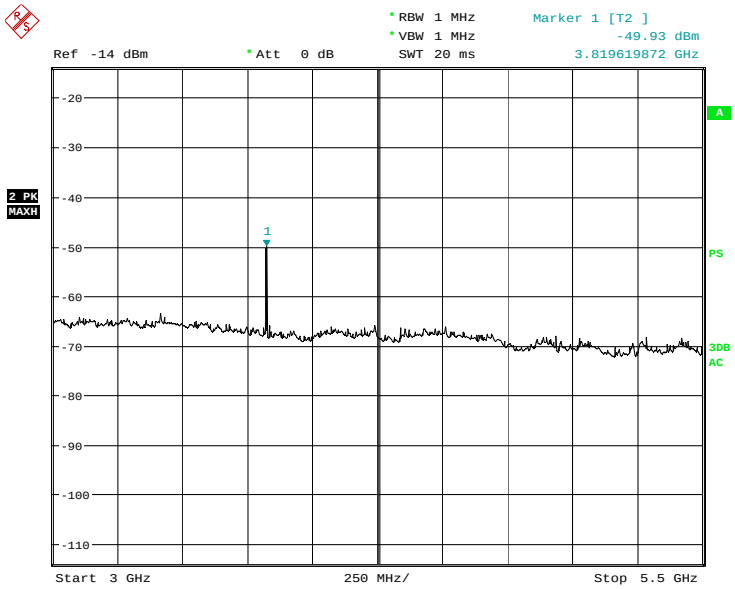


Date: 3.JUN.2008 20:58:46

Product Service

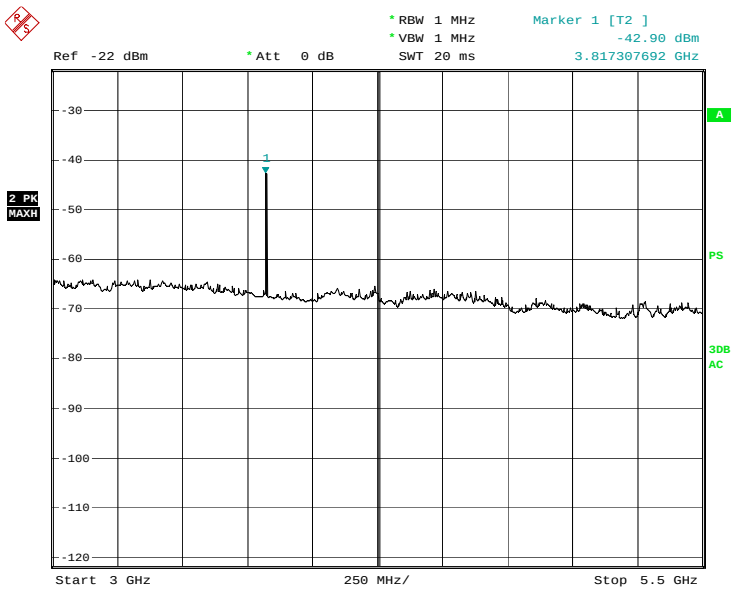
3GHz – 5.5GHz

Vertical Polarisation



Date: 3.JUN.2008 21:56:17

Horizontal Polarisation

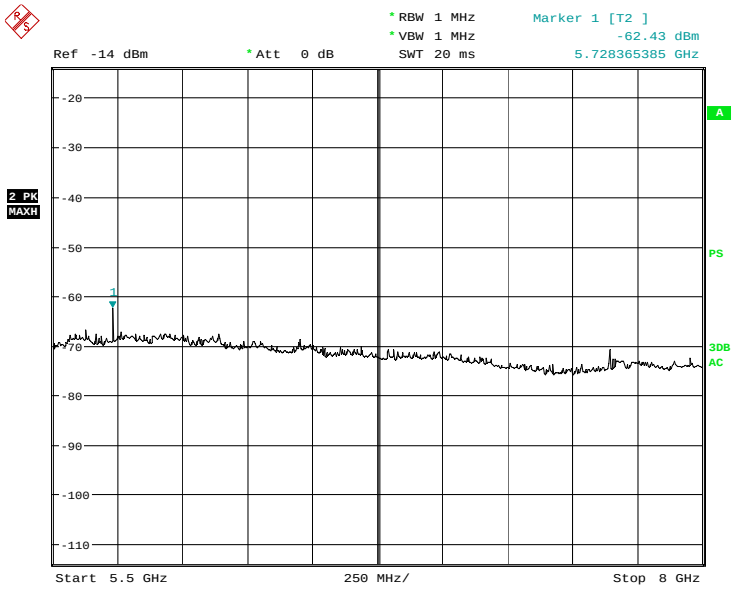


Date: 3.JUN.2008 21:49:27

Product Service

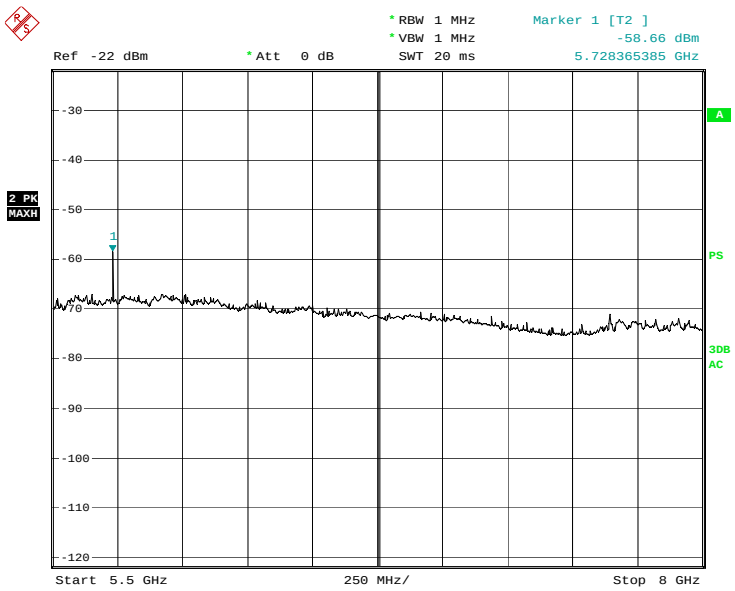
5.5GHz – 8GHz

Vertical Polarisation



Date: 3.JUN.2008 21:58:42

Horizontal Polarisation

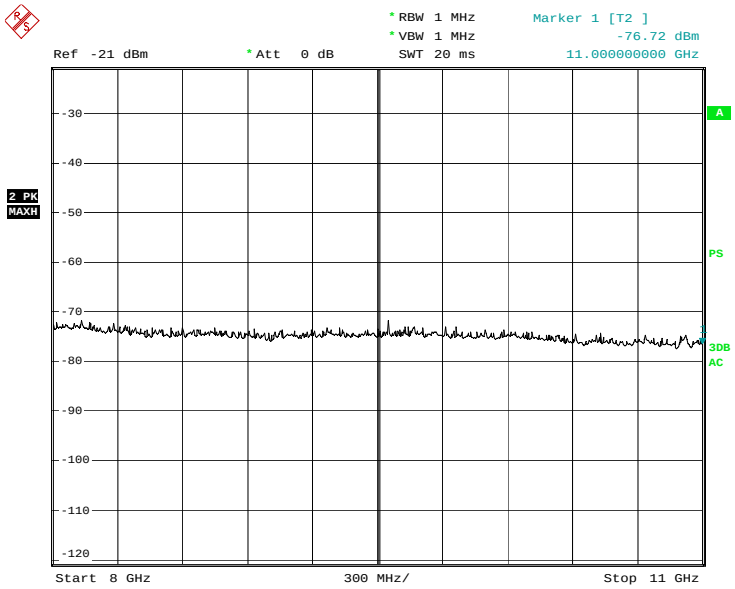


Date: 3.JUN.2008 21:47:16

Product Service

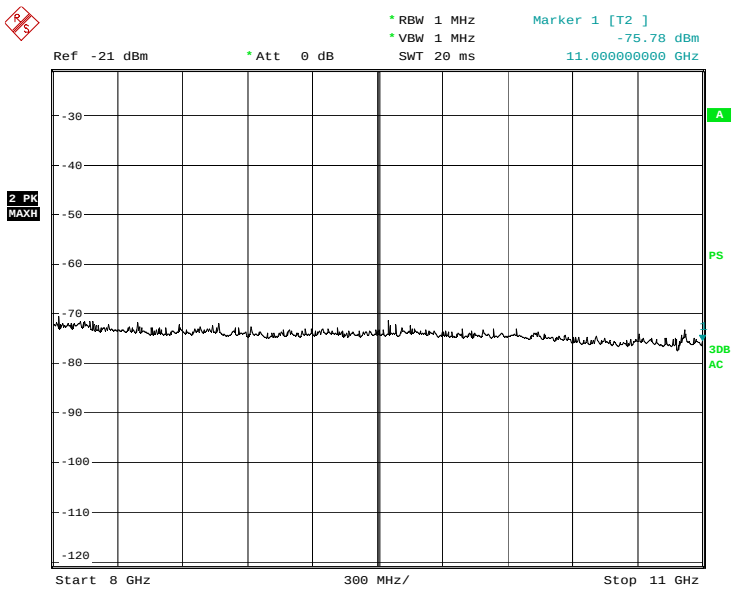
8GHz – 11GHz

Vertical Polarisation



Date: 3.JUN.2008 23:16:45

Horizontal Polarisation

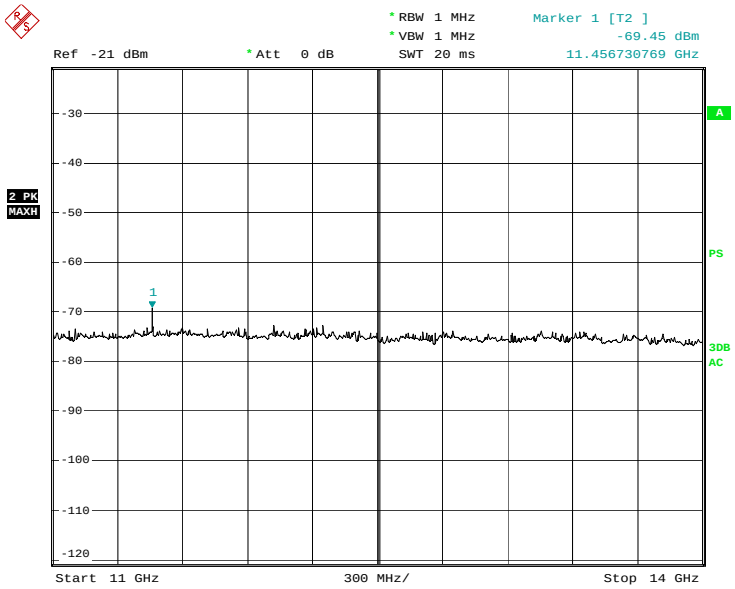


Date: 3.JUN.2008 23:34:27

Product Service

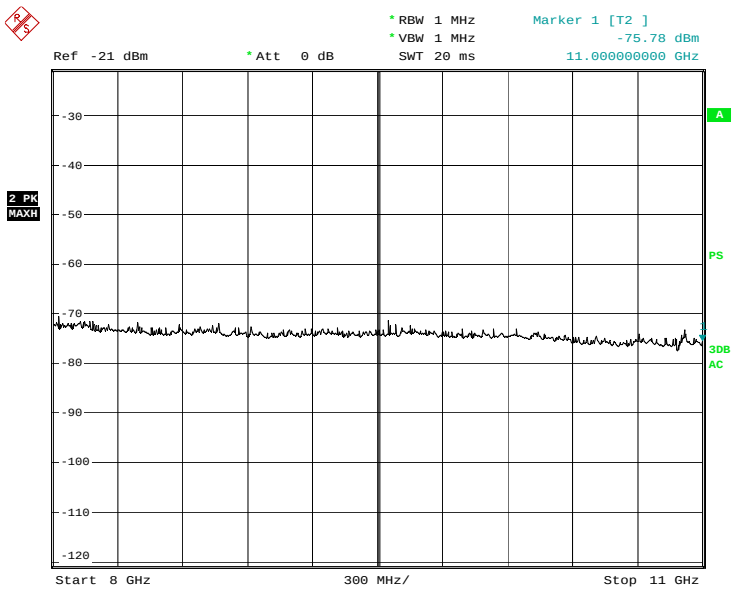
11GHz – 14GHz

Vertical Polarisation



Date: 3.JUN.2008 23:18:40

Horizontal Polarisation

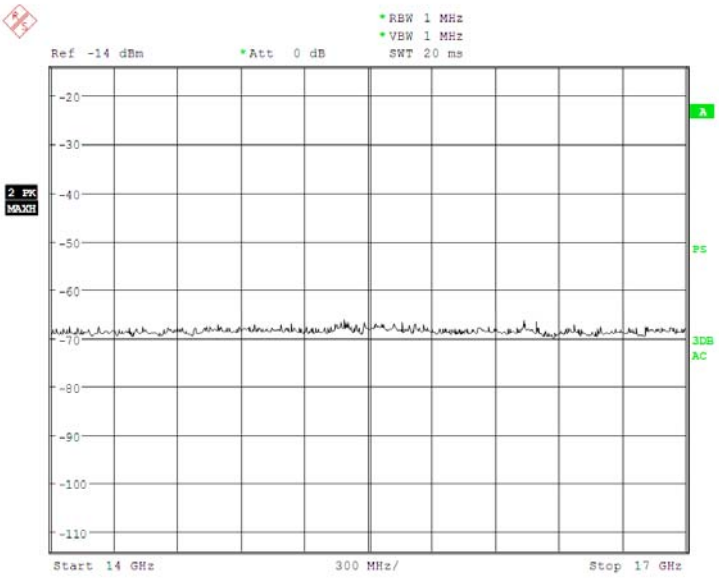


Date: 3.JUN.2008 23:34:27

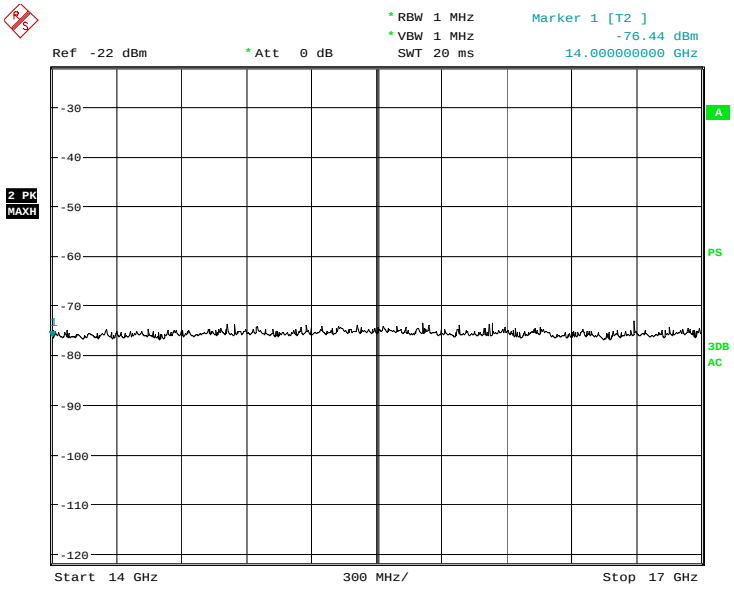
Product Service

14GHz – 18GHz

Vertical Polarisation



Horizontal Polarisation

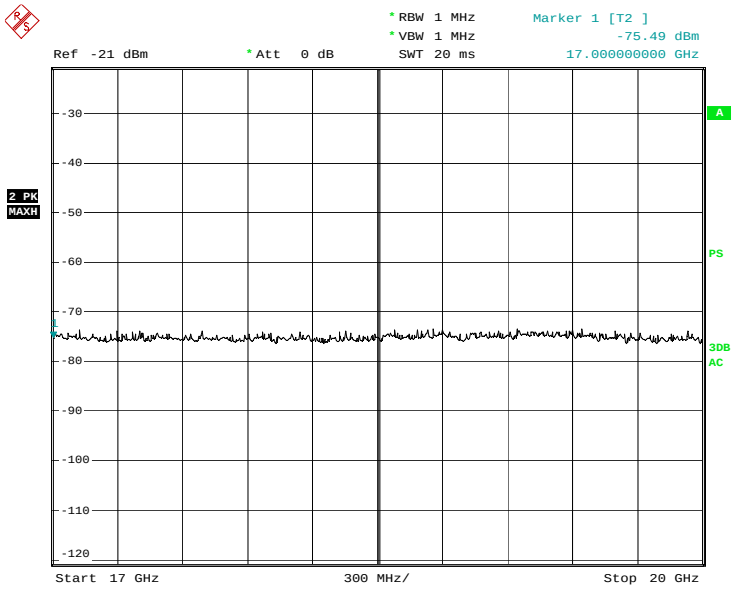


Date: 3.JUN.2008 22:59:29

Product Service

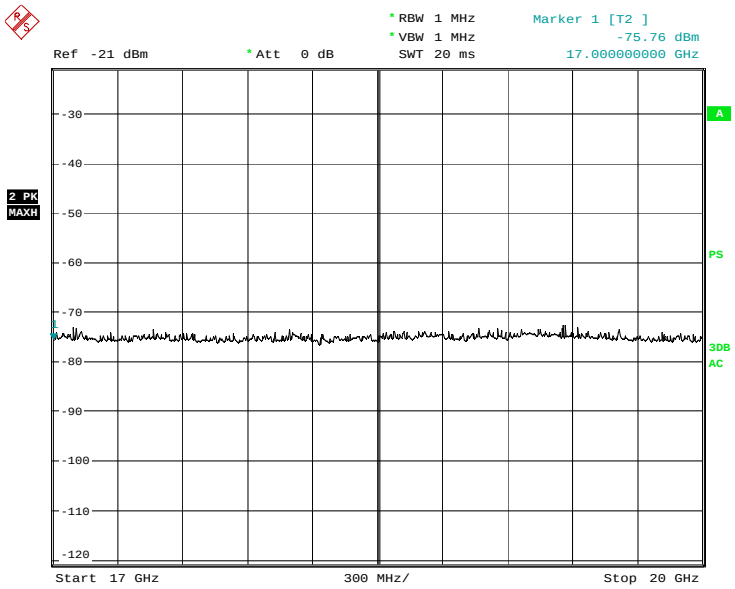
18GHz – 20GHz

Vertical Polarisation



Date: 3.JUN.2008 23:21:57

Horizontal Polarisation



Date: 3.JUN.2008 23:24:18

Product Service

2.17 FREQUENCY STABILITY UNDER TEMPERATURE VARIATIONS

2.17.1 Specification Reference

FCC CFR 47 Part 24: 2006, Clause 24.235, 2.1055
Industry Canada RSS-133, Clause 7

2.17.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.17.3 Date of Test and Modification State

17 June 2008 - Modification State 0

2.17.4 Test Equipment Used

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

2.17.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 24: 2006 and RSS-133: 2005.

The EUT was set to transmit on maximum power on timeslots 3, 4, 5 and 6. Measurements were made on timeslot 3. A digital communication anlayser (CMU200), was used to measure the frequency error. The maximum result was taken over 200 bursts. The temperature was varied over the range -30°C to +50°C..

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

Configuration 1 - Mode 5

2.17.6 Environmental Conditions

	17 June 2008
Ambient Temperature	25°C
Relative Humidity	42%

Product Service

2.17.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 and RSS-133: 2005 for Frequency Stability Under Temperature Variations.

The test results are shown below.

Configuration 1 - Mode 5

3.7V Supply

GSM – Circuit Switched

Temperature Interval (ºC)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
-30	1.88	+12	±1.88
-20	1.88	+11	±1.88
-10	1.88	+10	±1.88
0	1.88	+10	±1.88
+10	1.88	+11	±1.88
+20	1.88	+8	±1.88
+30	1.88	+7	±1.88
+40	1.88	+10	±1.88
+50	1.88	+9	±1.88

Limit	±0.0001% or 1ppm

Product Service

2.18 FREQUENCY STABILITY UNDER VOLTAGE VARIATIONS

2.18.1 Specification Reference

FCC CFR 47 Part 24: 2006, Clause 24.135(a), 2.1055
Industry Canada RSS-133, Clause 7

2.18.2 Equipment Under Test

CD1D, , S/N: 031425000815000074 and IMEI: 004401750006880

2.18.3 Date of Test and Modification State

18 June 2008 - Modification State 0

2.18.4 Test Equipment Used

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

2.18.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 24: 2006.

The EUT was set to transmit on maximum power on timeslots 3, 4, 5 and 6. A digital communication anlayser (CMU200), was used to measure the frequency error. The maximum result was taken over 200 bursts. The voltage was varied to the end point voltage as declared by the manufacturer.

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

Configuration 1 - Mode 5

2.18.6 Environmental Conditions

	18 June 2008
Ambient Temperature	18°C
Relative Humidity	37%

Product Service

2.18.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 and Industry Canada RSS-133 for Frequency Stability Under Voltage Variations.

The test results are shown below.

Configuration 1 - Mode 5

3.7V Supply

GPRS– Circuit Switched

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Deviation Limit (kHz)
3.35	1.88	+9	±1.88

Limit	±0.0001% or 1ppm

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
Sections 2.3, 2.6, 2.12 and 2.16 – Effective Radiated Power, Emission Limitations for Cellular Equipment, EIRP Peak Power and Emissions for Broadband PCS Equipment					
Spectrum Analyser	Hewlett Packard	8562A	14	12	9-Jun-2008
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	27-Oct-2008
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	22-Jun-2008
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Jun-2008
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	29-Jun-2008
Pre-Amplifier	Phase One	PS04-0085	1532	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	-	TU
Pre-Amplifier	Phase One	PSO4-0087	1534	0	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
Filter (High Pass)	RLC Electronics	RLC-F100-1500-S-R	2843	12	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	28-Nov-2009
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	11-Jul-2008
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	23-May-2009
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	27-Nov-2008
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	15-Mar-2009
Sections 2.2 and 2.11 Radio (Tx) - Maximum Peak Output Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	24-Jan-2009
Power Sensor	Hewlett Packard	84812A	2743	12	24-Jan-2009
Power Supply Unit	Various	SC1398	2754	0	Class 1 (Int)
Multimeter	Fluke	77 Series II	3067	12	15-May-2009
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	16-Apr-2009

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Sections 2.7 and 2.15 Radio (Tx) - Conducted Spurious Emissions					
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	TU
Power Splitter	Weinschel	1506A	607	12	18-Sep-2008
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
Power Supply Unit	Various	SC1398	2754	0	Class 1 (Int)
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	21-Apr-2009
Attenuator (3dB)	Suhner	6803.17.B	3026	12	20-Mar-2009
Multimeter	Fluke	77 Series II	3067	12	15-May-2009
Attenuator (20dB, 50W)	Aeroflex / Weinschel	47-20-34	3165	12	30-May-2009
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	30-May-2009
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3355	12	22-Apr-2009
1m RF Cable sma(m)-sma(m)	Reynolds	262-0248-1000	3453	12	17-Sep-2008
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	16-Apr-2009
Sections 2.8, 2.9, 2.17 and 2.18 Radio (Tx) - Frequency Characteristics					
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Attenuator (10dB)	Weinschel	47-10-34	481	12	20-Mar-2009
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	21-Apr-2009
Multimeter	Fluke	77 Series II	3067	12	15-May-2009
Thermocouple Thermometer	Fluke	51	3173	12	18-Jun-2008
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Sections 2.4 and 2.13 Radio (Tx) - Modulation Characteristics					
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	21-Apr-2009
Attenuator (20dB, 50W)	Aeroflex / Weinschel	47-20-34	3165	12	30-May-2009
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	30-May-2009
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3355	12	22-Apr-2009
1m RF Cable sma(m)-sma(m)	Reynolds	262-0248-1000	3453	12	17-Sep-2008
Section 2.1 and 2.10 Radio (Tx) - Power Characteristics					
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	21-Apr-2009
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	30-May-2009
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3355	12	22-Apr-2009
1m RF Cable sma(m)-sma(m)	Reynolds	262-0248-1000	3453	12	17-Sep-2008

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Sections 2.5 and 2.14 Radio (Tx) - Occupied Bandwidth					
Power Splitter	Weinschel	1506A	607	12	18-Sep-2008
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
Power Supply Unit	Various	SC1398	2754	0	TU
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	21-Apr-2009
Attenuator (3dB)	Suhner	6803.17.B	3026	12	20-Mar-2009
Multimeter	Fluke	77 Series II	3067	12	15-May-2009
Attenuator (20dB, 50W)	Aeroflex / Weinschel	47-20-34	3165	12	30-May-2009
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	30-May-2009
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3355	12	22-Apr-2009
1m RF Cable sma(m)-sma(m)	Reynolds	262-0248-1000	3453	12	17-Sep-2008

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	5.1dB*
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

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).