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Report On

FCC and Industry Canada Testing of the
Modelabs Manufacture
TH01M Mobile Handset

COMMERCIAL-IN-CONFIDENCE

FCC ID: WCKTH01M
IC ID: IC 7712A TH01-M

Document 75903671 Report 03 Issue 3 July 2008

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REPORT ON

FCC and Industry Canada Testing of the
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Document 75903671 Report 03 Issue 3

July 2008

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DATED 16 July 2008

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

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Part 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;

S Bennett G Lawler S Hartley

Product Service

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Product Service

SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Modelabs Manufacture
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Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Modelabs Manufacture TH01M Mobile Handset to the requirements of FCC CFR 47 Part 22: 2006 and FCC CFR 47 Part 24: 2006.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Modelabs Manufacture
Part Number(s)	091358009804000
IMEI Number(s)	004401750001147 004401750000677
Software Version	0259000505020000
Hardware Version	PIR
Number of Samples Tested	2
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
Start of Test	01 June 2008
Finish of Test	06 June 2008
Name of Engineer(s)	S Bennett G Lawler S Hartley
Related Document(s)	FCC CFR 47 Part 2: 2006

Product Service

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 - EUT							
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	-
				2	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	1	0	Pass	-
2.5	2.1049, 22.917 (b)	RSS-132, 4.2	Occupied Bandwidth	1	0	Pass	-
2.6	22.917	RSS-132, 4.2	Emission limitations for Cellular Equipment	1	0	Pass	-
				2	0	Pass	
				3	0	Pass	

Product Service

Configuration 1 - EUT							
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 - EUT							
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	

Product Service

Configuration 1 - EUT							
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	091358009804000		
SERIAL NUMBER			
HARDWARE VERSION	PIR		
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			
OUTPUT POWER (W or dBm)	32 dBm		
FCC ID	WCKTH01M		
INDUSTRY CANADA ID	IC 7712A TH01-M		
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	This product is the cellular mobile phone in 850/900/1800/1900 bands		
BATTERY/POWER SUPPLY			
MANUFACTURING DESCRIPTION	Batterie's Manufacturer		
MANUFACTURER	Xwoda		
TYPE	Lithium Ion		
PART NUMBER	TH01M-BAT		
VOLTAGE	3.7 V		
COUNTRY OF ORIGIN	China		
MODULES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
POWER			
FCC ID			
COUNTRY OF ORIGIN			
INDUSTRY CANADA ID			
EMISSION DESIGNATOR			
DHSS/FHSS/COMBINED OR OTHER			
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
PART NUMBER			
SERIAL NUMBER			
COUNTRY OF ORIGIN			

Signature

Date 2 June 2008

Declaration of Build Status Serial Number

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Modelabs Manufacture TH01M Mobile Handset 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: EUT with 3.7V DC Supply

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.

For sections 2.1, 2.2, 2.4, 2.5, 2.7, 2.8, 2.9, 2.11, 2.13, 2.15, 2.17 and 2.18 the EUT was powered by a battery eliminator.

For sections 2.3, 2.6, 2.12 and 2.16 the EUT was powered by 120V, 60Hz AC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC 2392B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

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

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.

Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Modelabs Manufacture
TH01M Mobile Handset

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

TH01M Mobile Handset, IMEI: 004401750001147

2.1.3 Date of Test and Modification State

05 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

	05 June 2008
Ambient Temperature	23°C
Relative Humidity	44%

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.

Configuration 1 - Mode 1 and 3

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

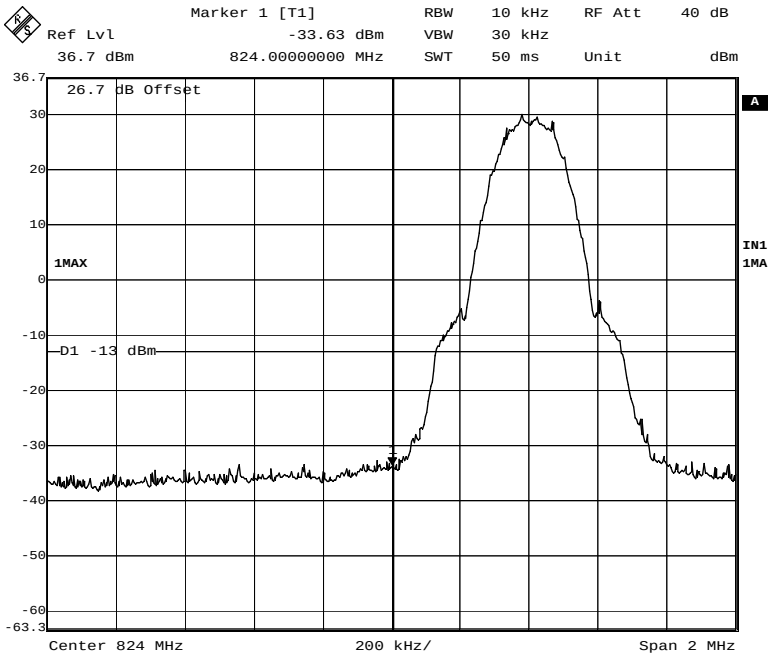
The channels shown in the table above are the minimum and maximum channels that can be used in each block to maintain compliance. Channels used outside of those stated in the table exceed the specification limits, thus they cannot be used.

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.

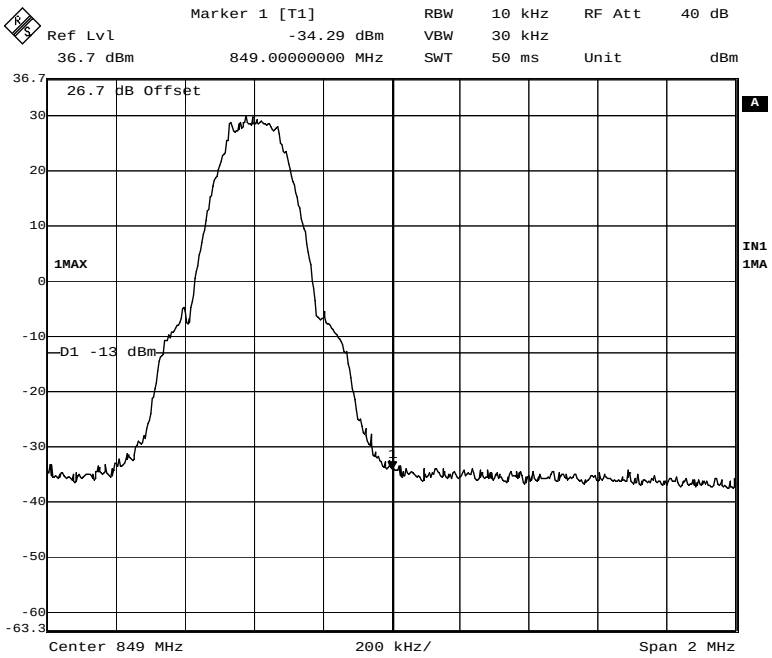
The measurement plots are shown on the following pages.

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

Frequency Block A



Frequency Block B



Product Service

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, Clause 4.4

2.2.2 Equipment Under Test

TH01M Mobile Handset, IMEI: 004401750001147

2.2.3 Date of Test and Modification State

05 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

	05 June 2008
Ambient Temperature	21°C
Relative Humidity	47%

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, 2 and 3

3.7V Supply

Maximum Power – GMSK

Frequency (MHz)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	26.7	31.80	1.514
836.4	26.7	31.78	1.507
848.8	26.7	31.70	1.479

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, Clause 4.4

2.3.2 Equipment Under Test

TH01M Mobile Handset, IMEI: 004401750001147

2.3.3 Date of Test and Modification State

01 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

	01 June 2008
Ambient Temperature	19°C
Relative Humidity	52%
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	30.20	38.45	1.05	7.00
836.40	30.10	38.45	1.02	7.00
848.80	28.30	38.45	0.68	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

TH01M Mobile Handset, IMEI: 004401750001147

2.4.3 Date of Test and Modification State

05 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

	05 June 2008
Ambient Temperature	22°C
Relative Humidity	46%

Product Service

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

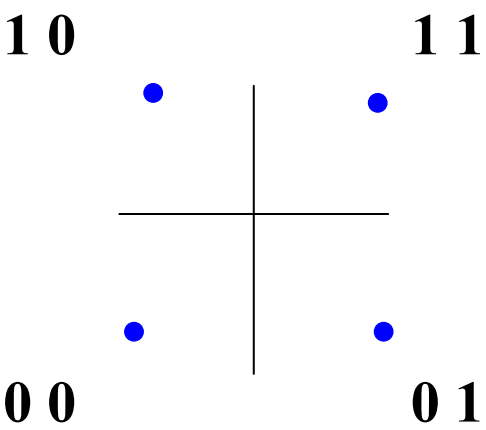
GMSK OVERVIEW

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.



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

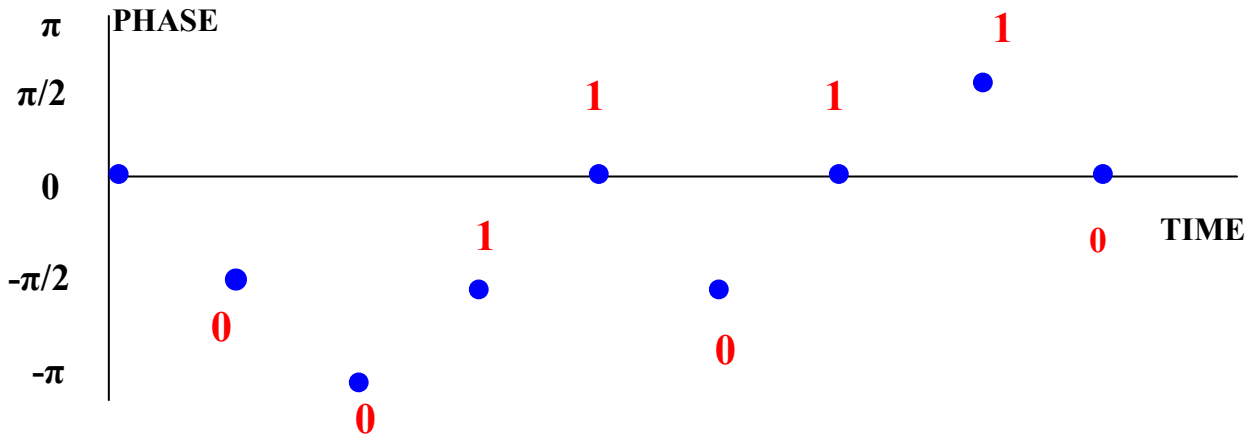
2. Modulate each stream with PSK (1 = 90° or π/2, 0 = -90° or - π/2 phase shift)

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

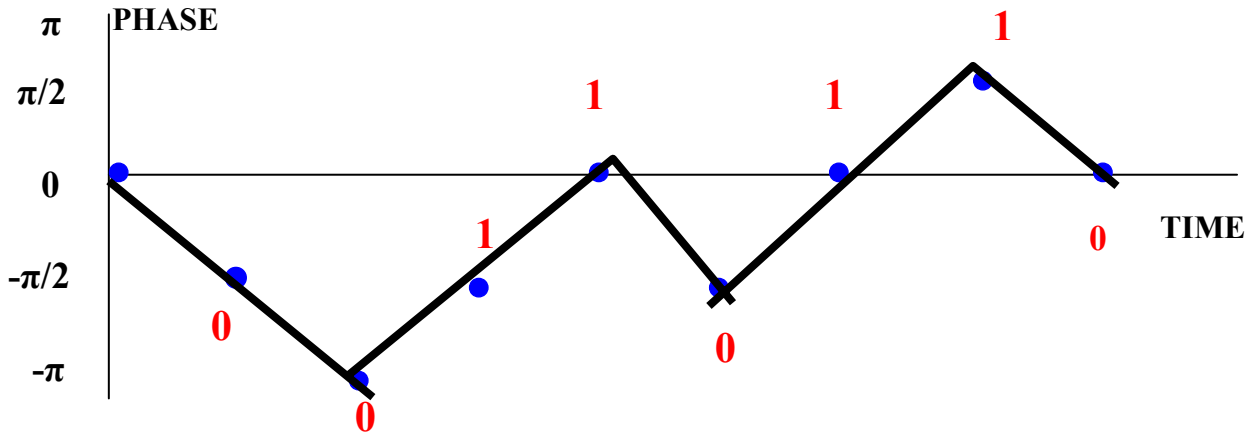
Result: offset - QPSK, phase change is restricted to ± π/2 radians:



Product Service

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

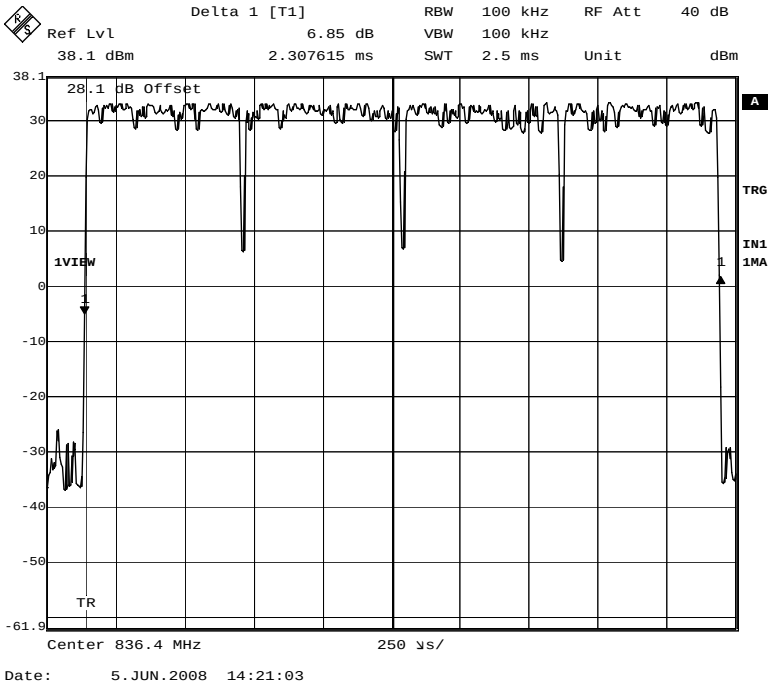
2.4.8 Test Results

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

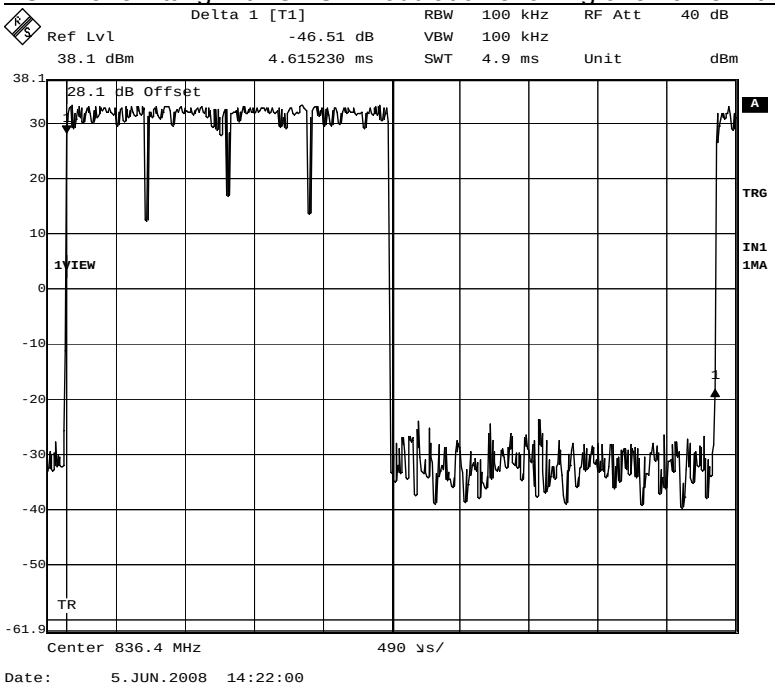
The test results are shown below.

Configuration 1 - Mode 2

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



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



Product Service

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

TH01M Mobile Handset, IMEI: 004401750001147

2.5.3 Date of Test and Modification State

05 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. 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

	05 June 2008
Ambient Temperature	23°C
Relative Humidity	44%

Product Service

2.5.7 Test Results

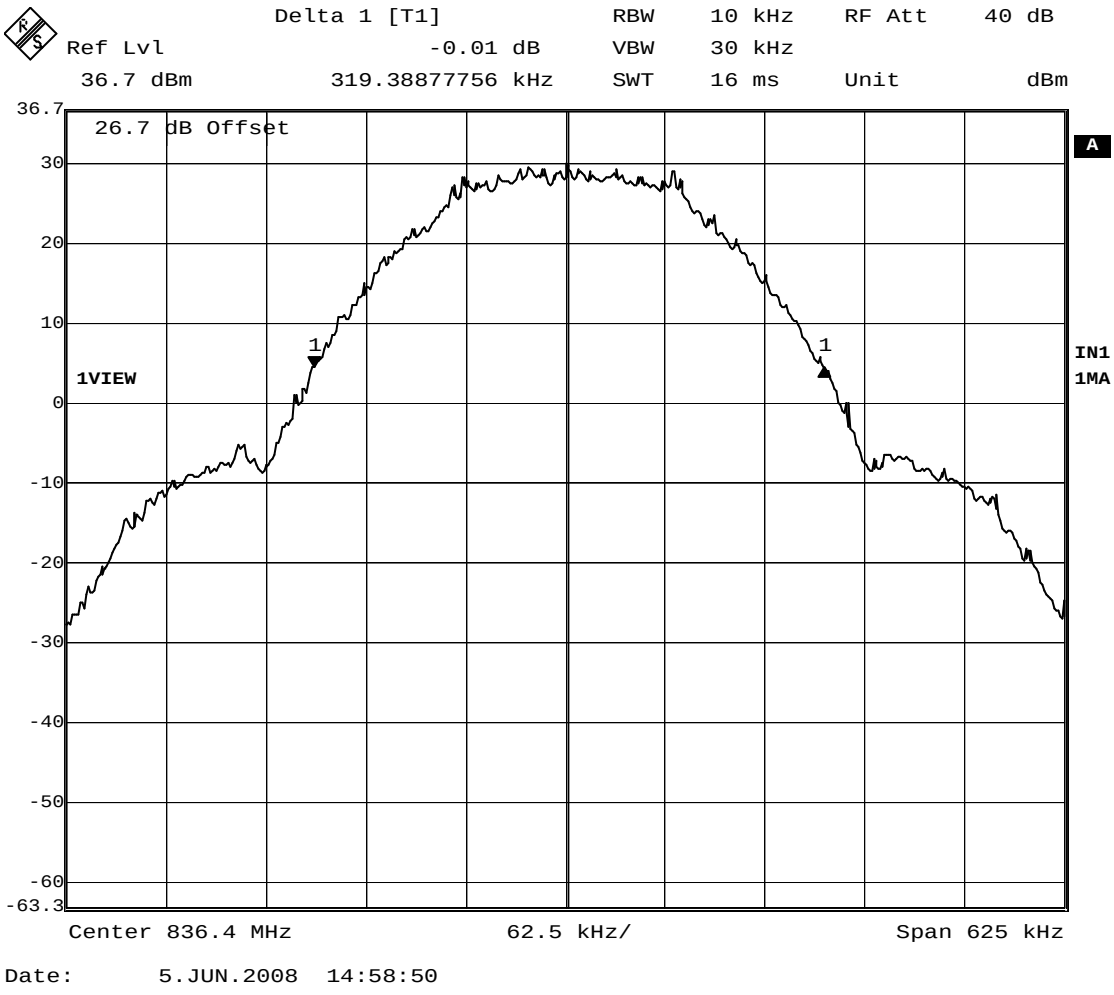
For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132 for Occupied Bandwidth.

The test results are shown below.

Configuration 1 - Mode 2

Occupied Bandwidth As Defined By The -26dBc Points

Maximum Power – GPRS



Product Service

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

TH01M Mobile Handset, IMEI: 004401750000677

2.6.3 Date of Test and Modification State

01 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

	01 June 2008
Ambient Temperature	19°C
Relative Humidity	52%
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	Pass / Fail
2.4728	Horizontal	100	320	-19.3	-13.0	-6.3	Pass

Configuration 1 - Mode 2

Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degrees	Result Peak dBm	ERP Limit dBm	Margin dB	Pass / Fail
2.5091	Horizontal	100	331	-20.9	-13.0	-7.0	Pass

Configuration 1 - Mode 3

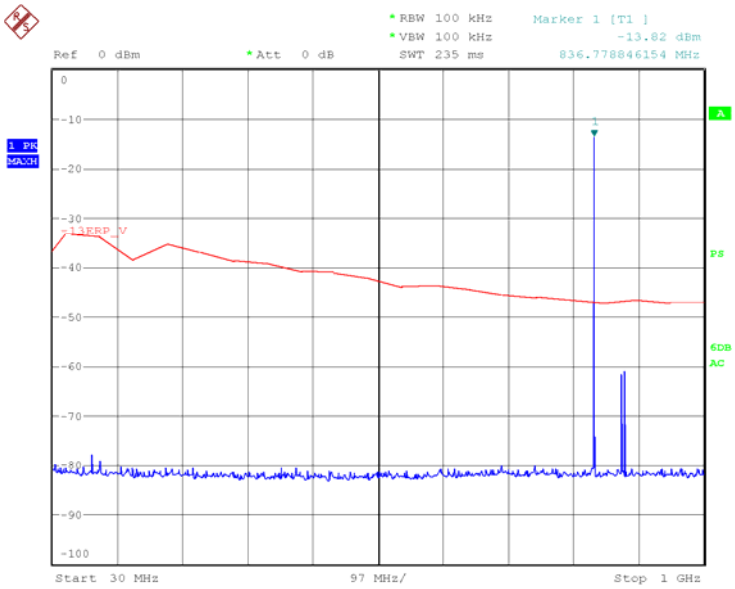
Frequency GHz	Antenna Polarisation	Antenna Height cm	EUT Arc degrees	Result Peak dBm	ERP Limit dBm	Margin dB	Pass / Fail
2.5466	Horizontal	100	320	-20.7	-13.0	-7.7	Pass

Product Service

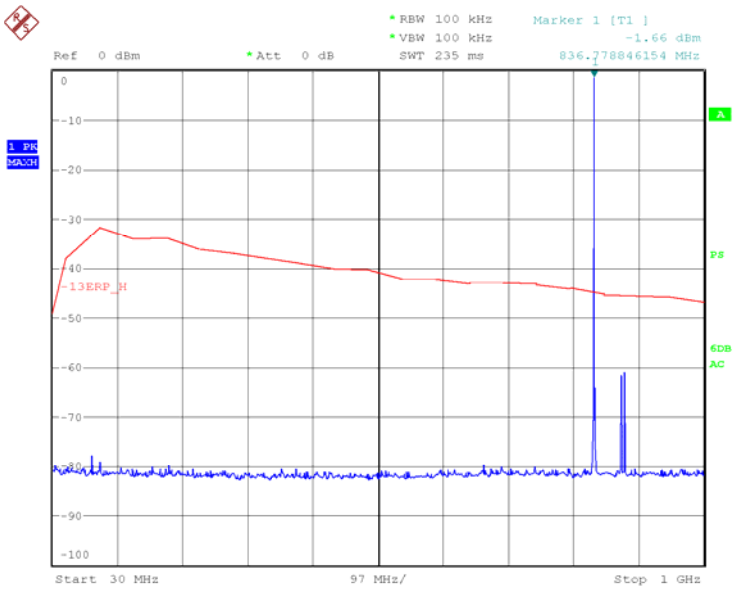
Configuration 1 - Mode 1

30MHz – 1GHz

Vertical Polarisation



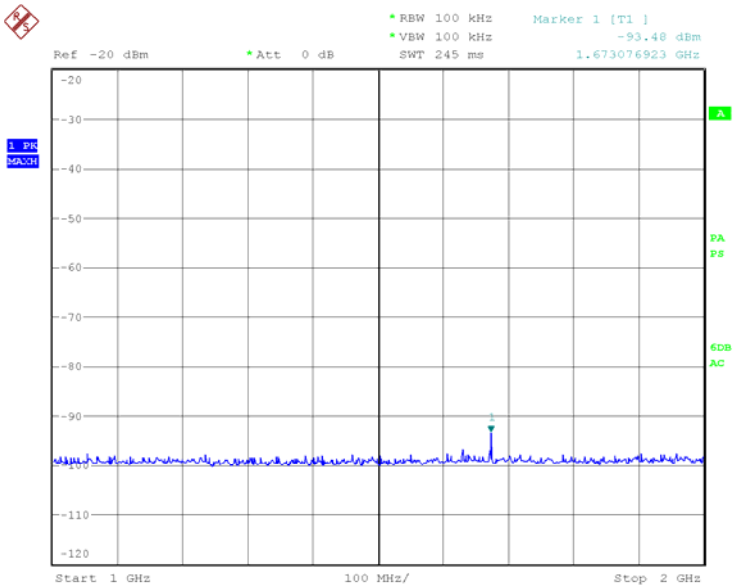
Horizontal Polarisation



Product Service

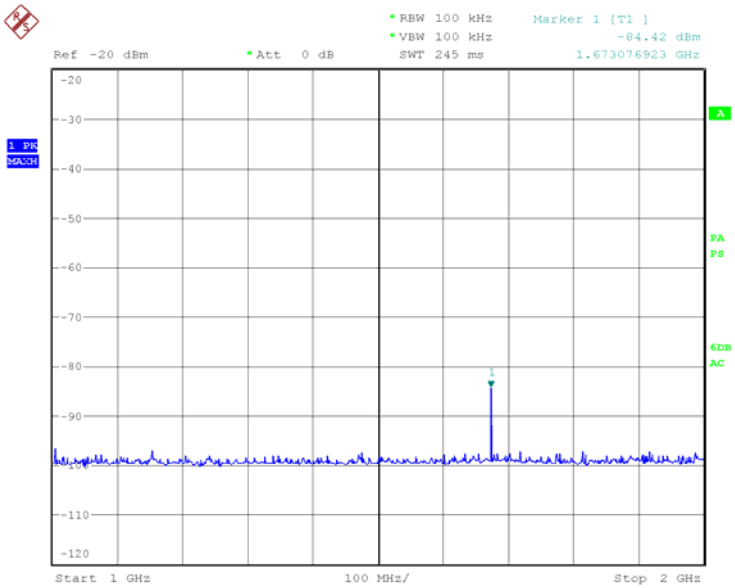
1GHz – 2GHz

Vertical Polarisation



Date: 1.JUN.2008 18:15:32

Horizontal Polarisation

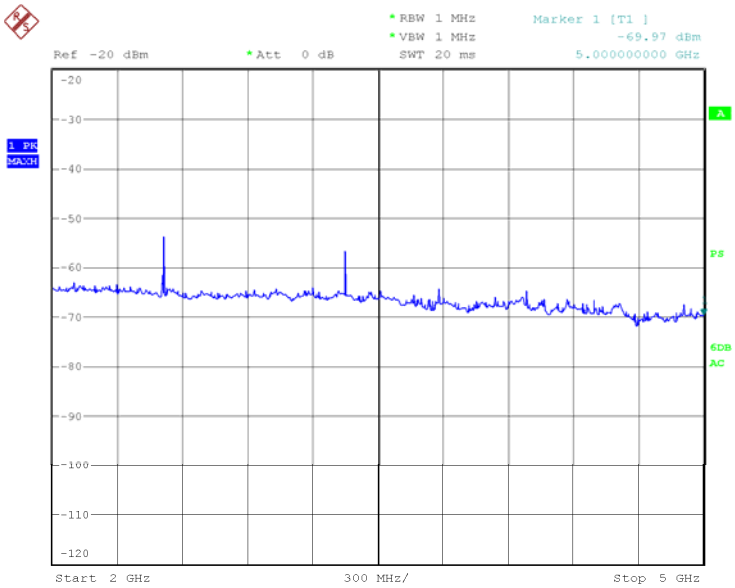


Date: 1.JUN.2008 18:12:51

Product Service

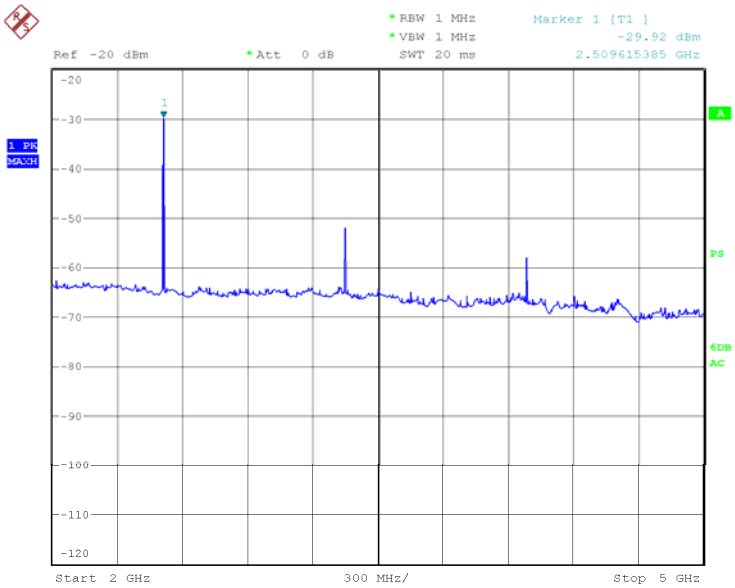
2GHz – 5GHz

Vertical Polarisation



Date: 1.JUN.2008 18:45:25

Horizontal Polarisation

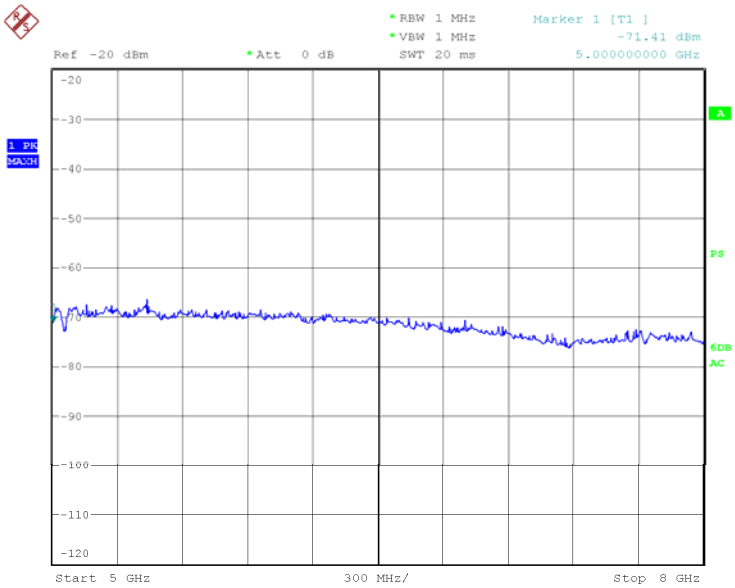


Date: 1.JUN.2008 18:54:57

Product Service

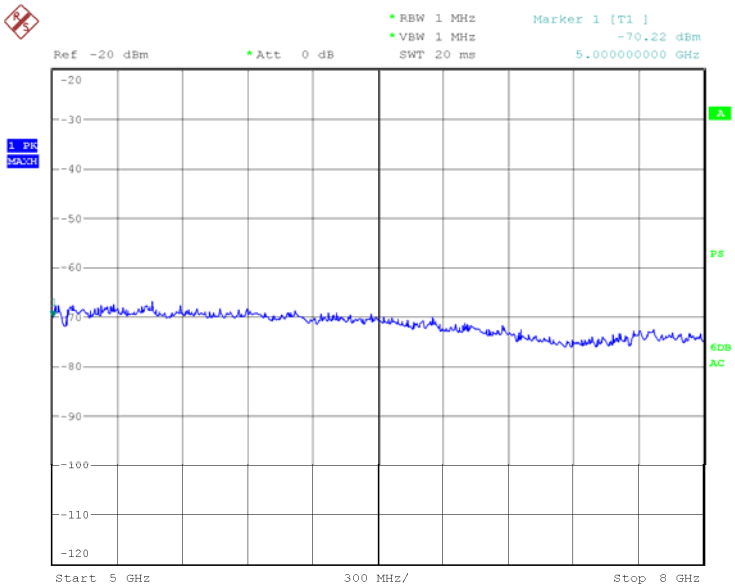
5GHz – 8GHz

Vertical Polarisation



Date: 1.JUN.2008 18:47:28

Horizontal Polarisation

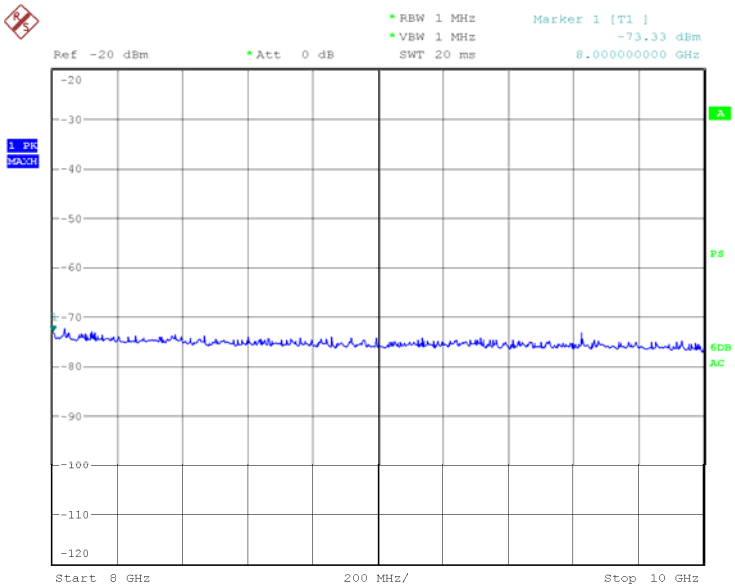


Date: 1.JUN.2008 18:49:53

Product Service

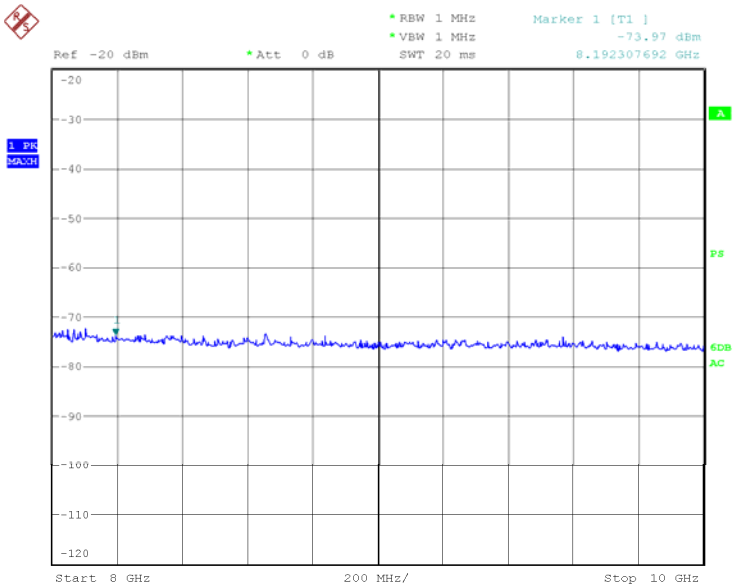
8GHz – 10GHz

Vertical Polarisation



Date: 1.JUN.2008 19:41:20

Horizontal Polarisation



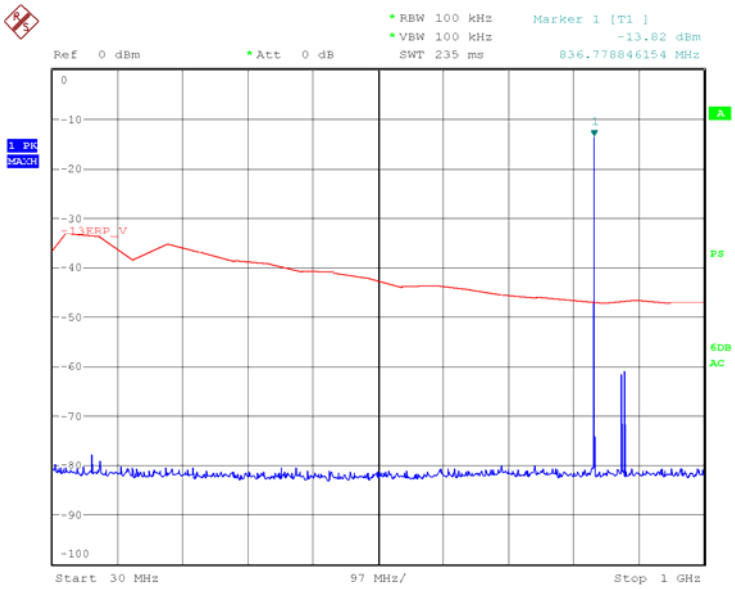
Date: 1.JUN.2008 19:43:22

Product Service

Configuration 1 - Mode 2

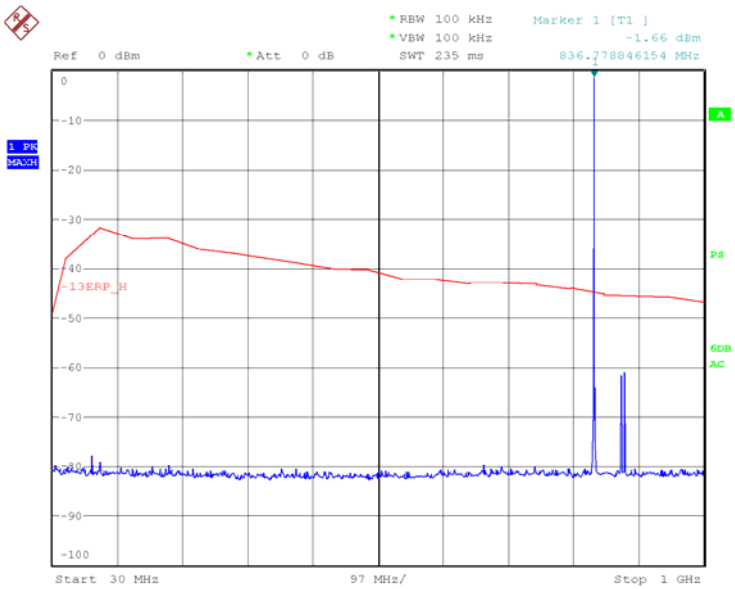
30MHz – 1GHz

Vertical Polarisation



Date: 1.JUN.2008 17:40:05

Horizontal Polarisation

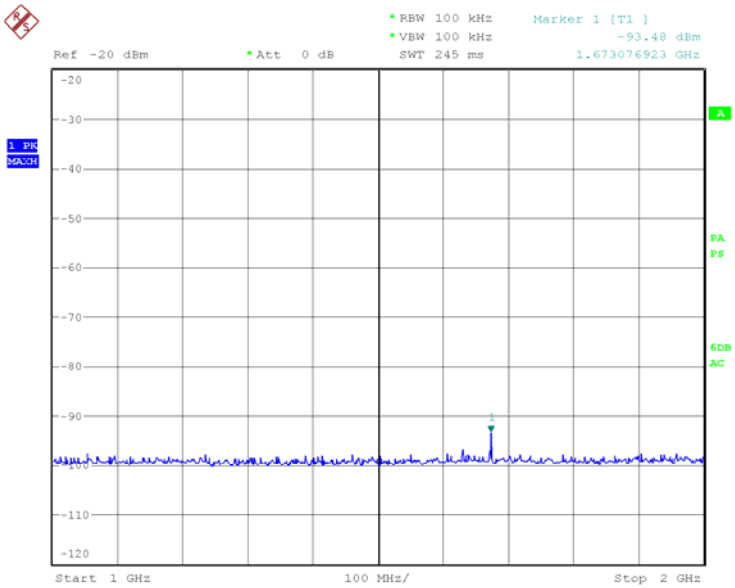


Date: 1.JUN.2008 17:42:05

Product Service

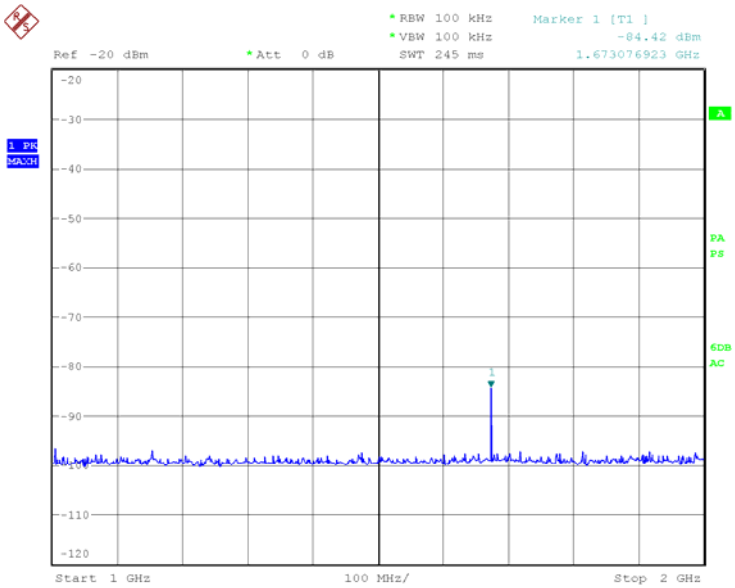
1GHz – 2GHz

Vertical Polarisation



Date: 1.JUN.2008 18:15:32

Horizontal Polarisation

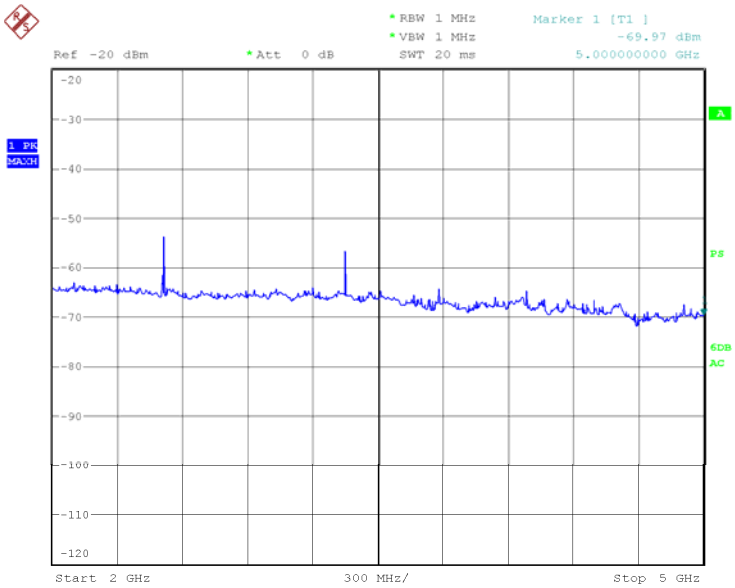


Date: 1.JUN.2008 18:12:51

Product Service

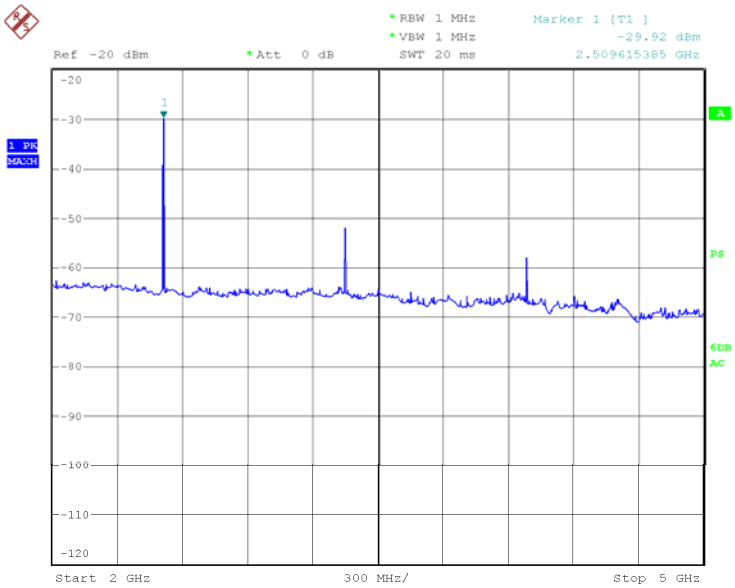
2GHz – 5GHz

Vertical Polarisation



Date: 1.JUN.2008 18:45:25

Horizontal Polarisation

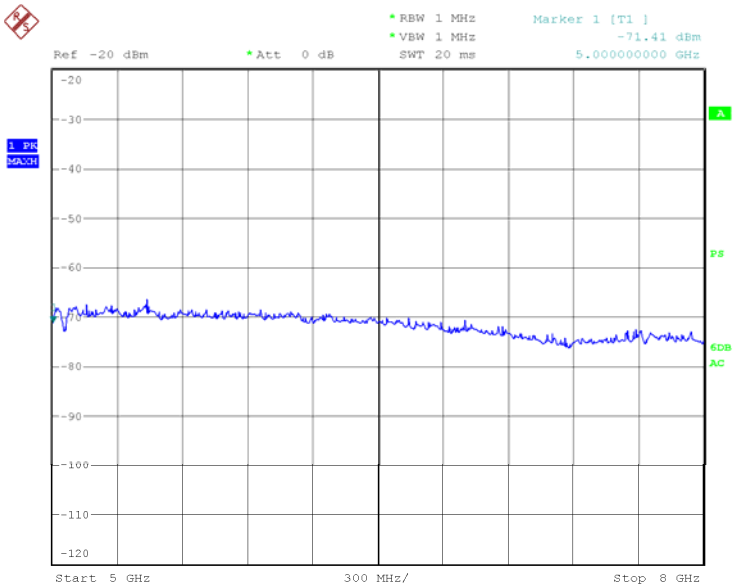


Date: 1.JUN.2008 18:54:57

Product Service

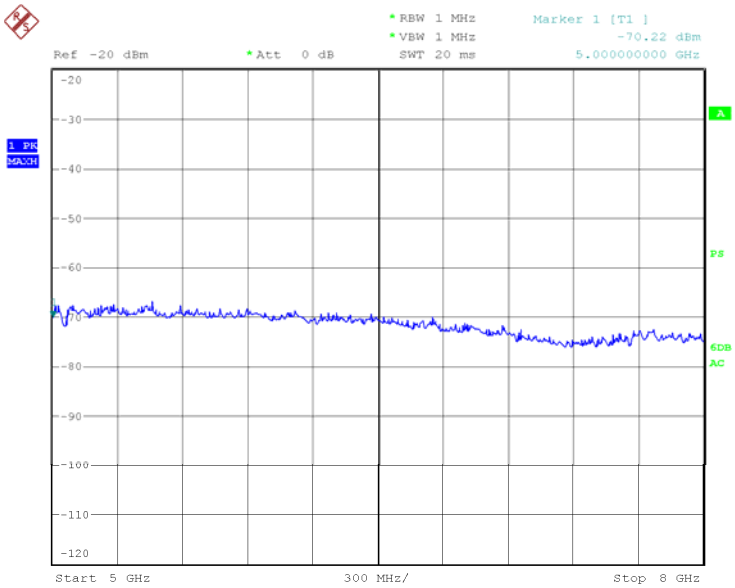
5GHz – 8GHz

Vertical Polarisation



Date: 1.JUN.2008 18:47:28

Horizontal Polarisation

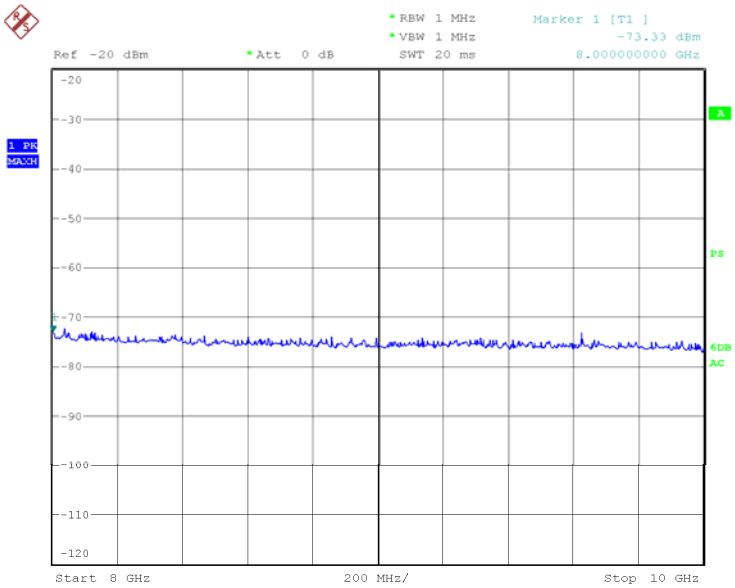


Date: 1.JUN.2008 18:49:53

Product Service

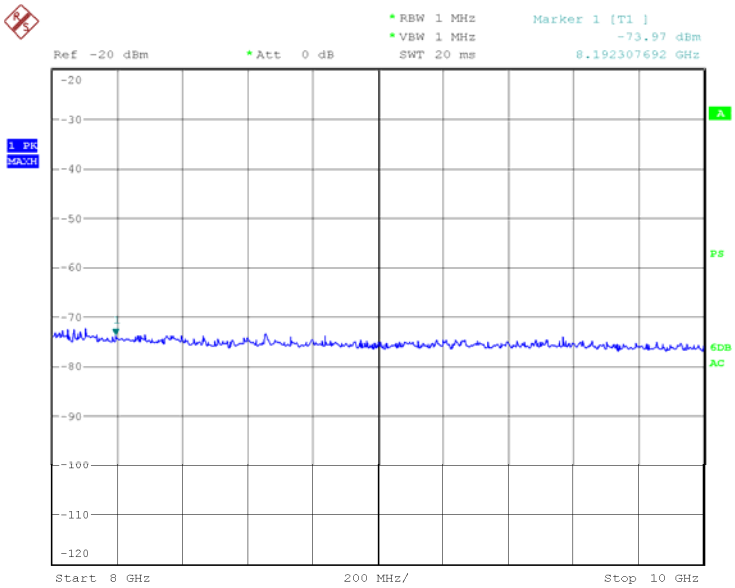
8GHz – 10GHz

Vertical Polarisation



Date: 1.JUN.2008 19:41:20

Horizontal Polarisation



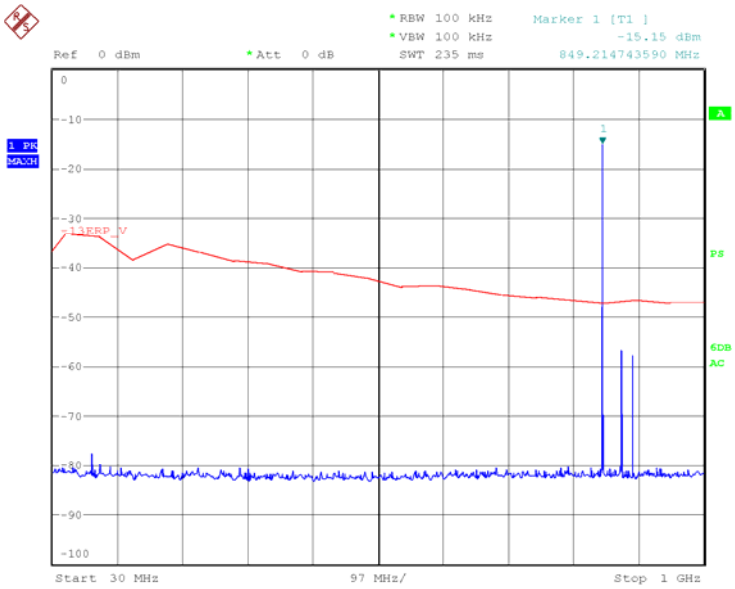
Date: 1.JUN.2008 19:43:22

Product Service

Configuration 1 - Mode 3

30MHz – 1GHz

Vertical Polarisation



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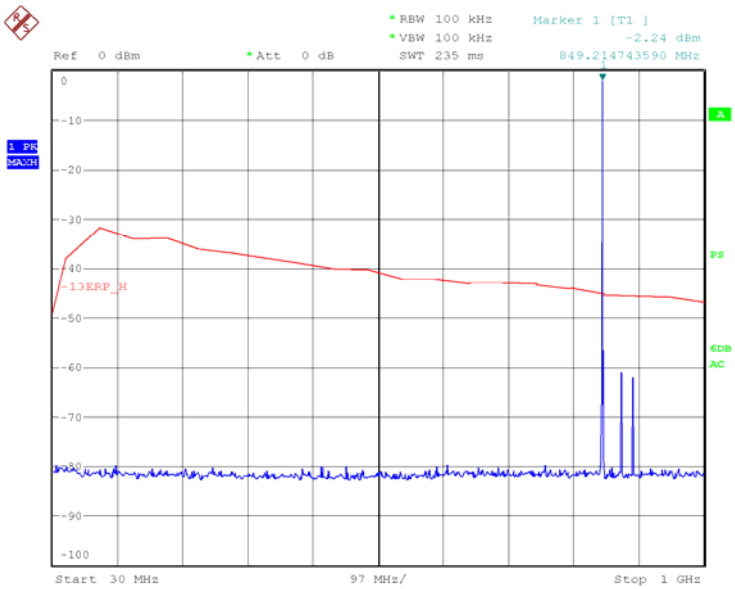
Horizontal Polarisation

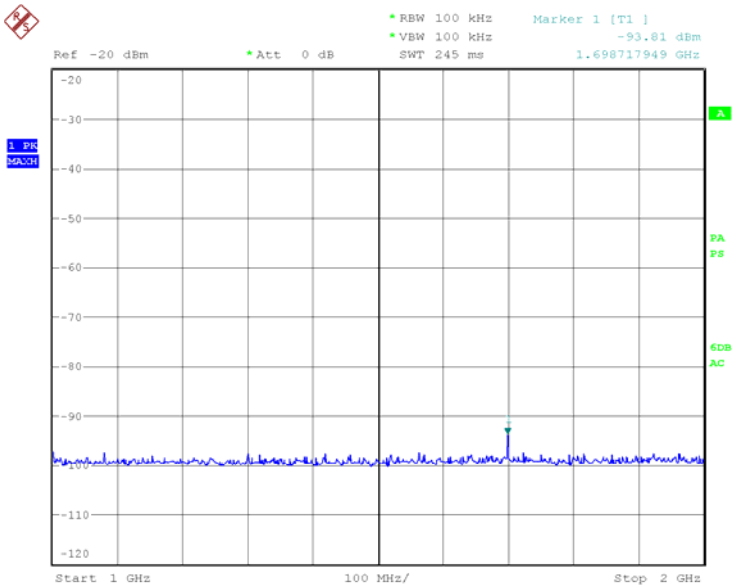


Date: 1.JUN.2008 17:24:47

Product Service

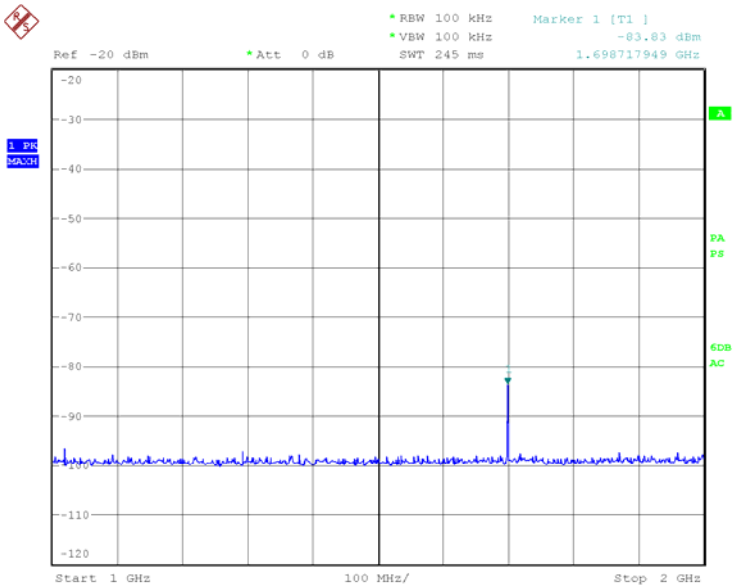
1GHz – 2GHz

Vertical Polarisation



Date: 1.JUN.2008 18:17:39

Horizontal Polarisation

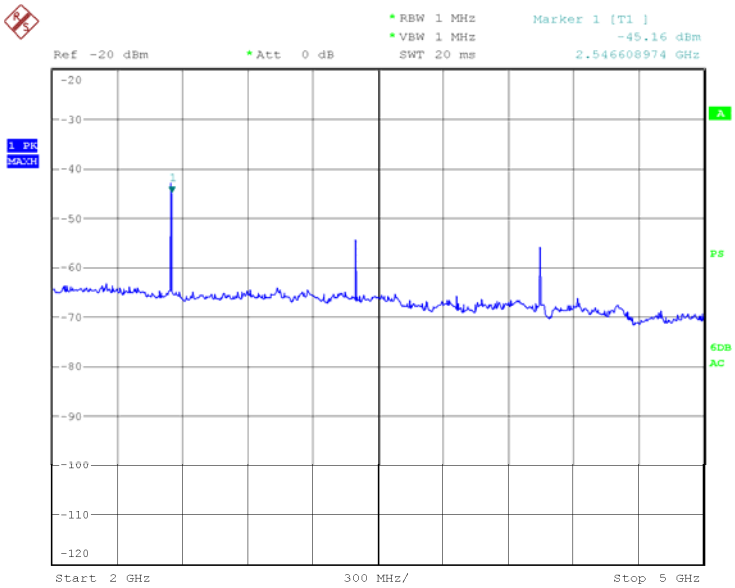


Date: 1.JUN.2008 18:20:10

Product Service

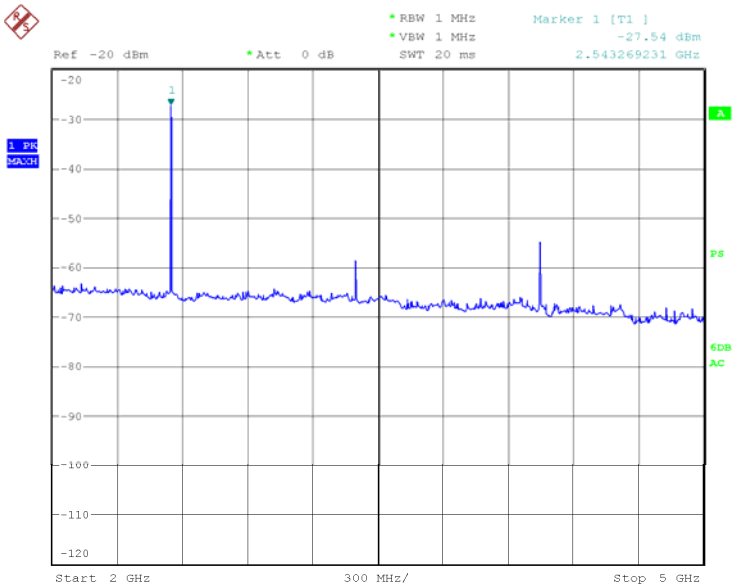
2GHz – 5GHz

Vertical Polarisation



Date: 1.JUN.2008 18:41:07

Horizontal Polarisation

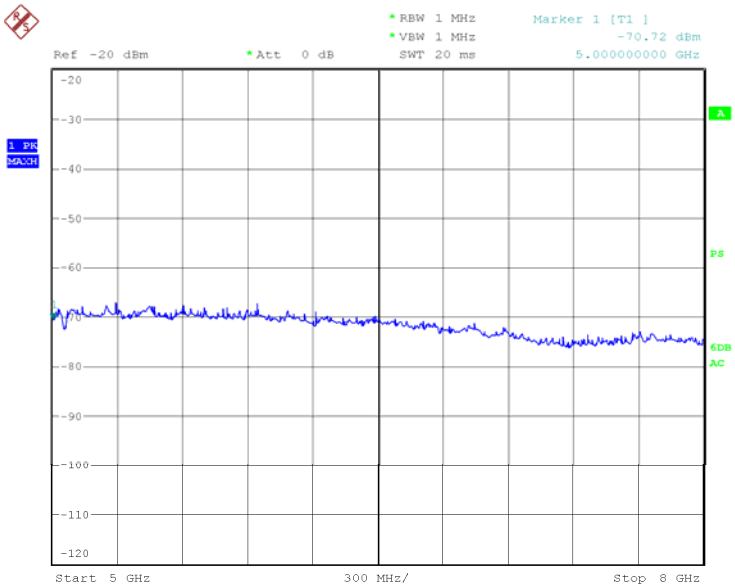


Date: 1.JUN.2008 18:29:58

Product Service

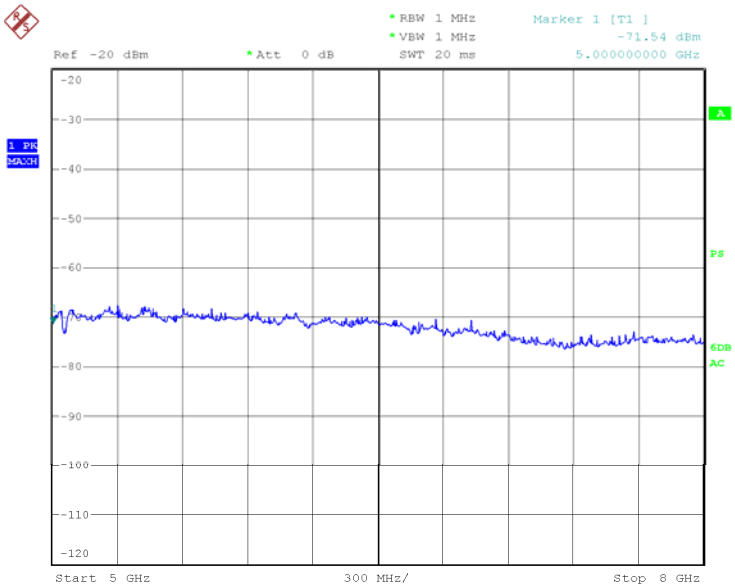
5GHz – 8GHz

Vertical Polarisation



Date: 1.JUN.2008 18:43:02

Horizontal Polarisation

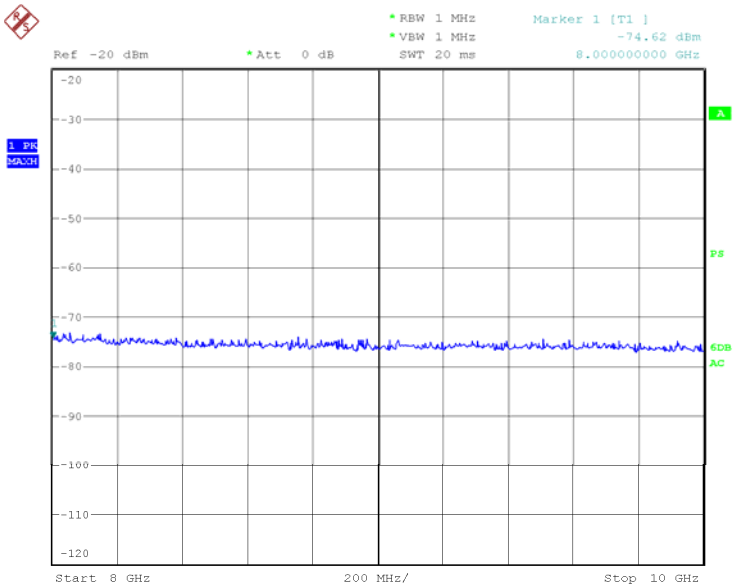


Date: 1.JUN.2008 18:31:46

Product Service

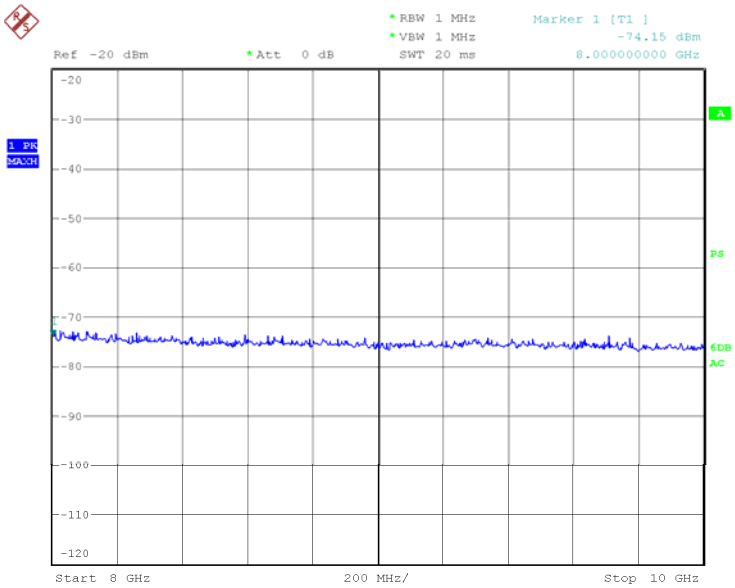
8GHz – 10GHz

Vertical Polarisation



Date: 1.JUN.2008 19:36:00

Horizontal Polarisation



Date: 1.JUN.2008 19:38:57

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

TH01M Mobile Handset, IMEI: 004401750001147

2.7.3 Date of Test and Modification State

05 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.

The spurious emissions from the antenna terminal were measured in accordance with Part 2.1051. 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.

To reduce saturation effects in the spectrum analyser over the frequency range 9 kHz to 4 GHz an attenuator was used and over the frequency range 4 GHz to 9GHz an attenuator 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.

In addition, measurements were made up to the 10^{th} harmonic of the fundamental.

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

	05 June 2008
Ambient Temperature	24°C
Relative Humidity	44%

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.

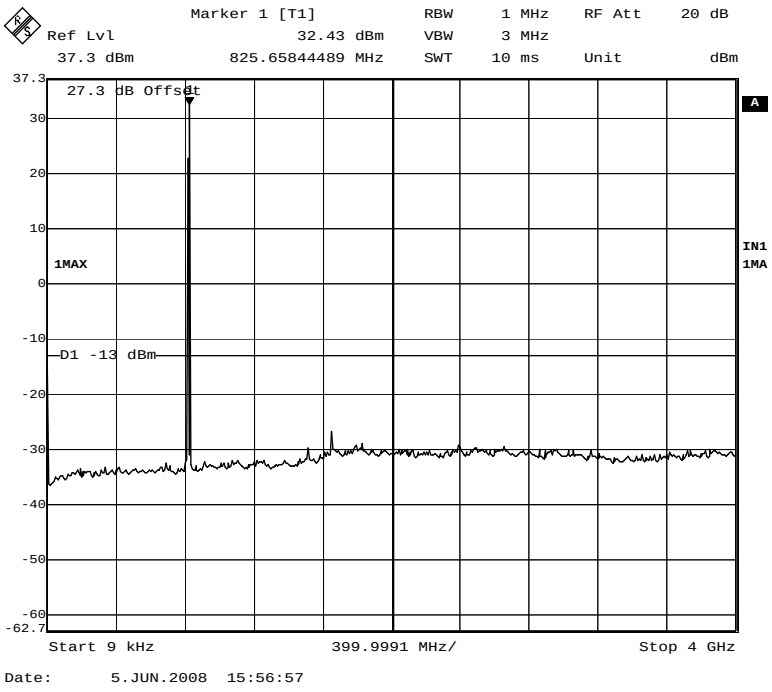
The test results are shown below.

3.7V Supply

Configuration 1 - Mode 1 – Maximum Power

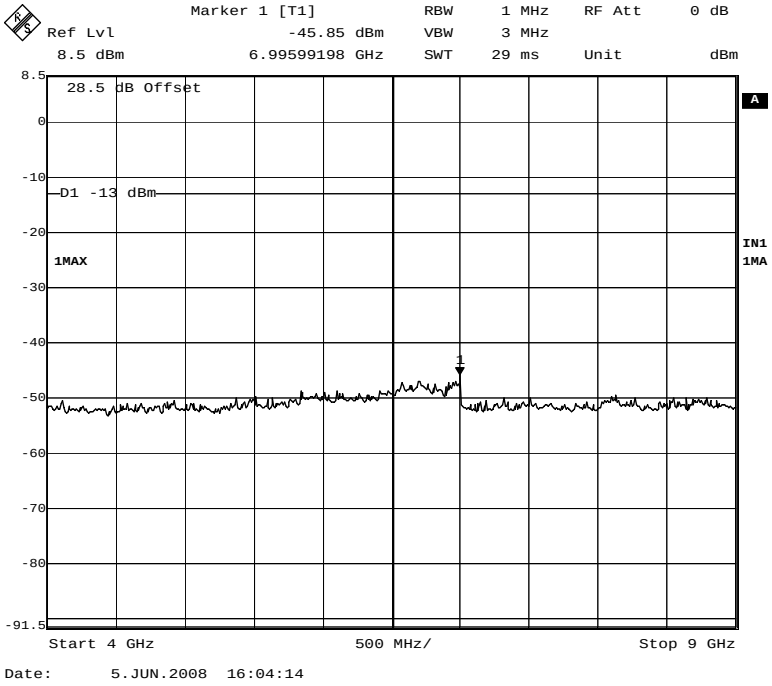
Spurious Emissions (9kHz – 4GHz)

GPRS, Timeslots 3, 4, 5 and 6 active



Spurious Emissions (4GHz – 9GHz)

GPRS, Timeslots 3, 4, 5 and 6 active

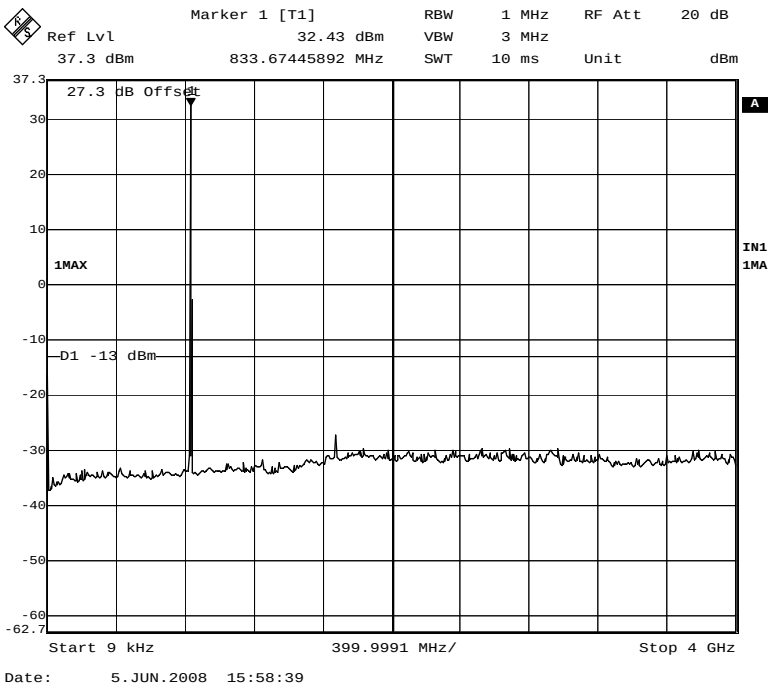


Product Service

Configuration 1 - Mode 2 – Maximum Power

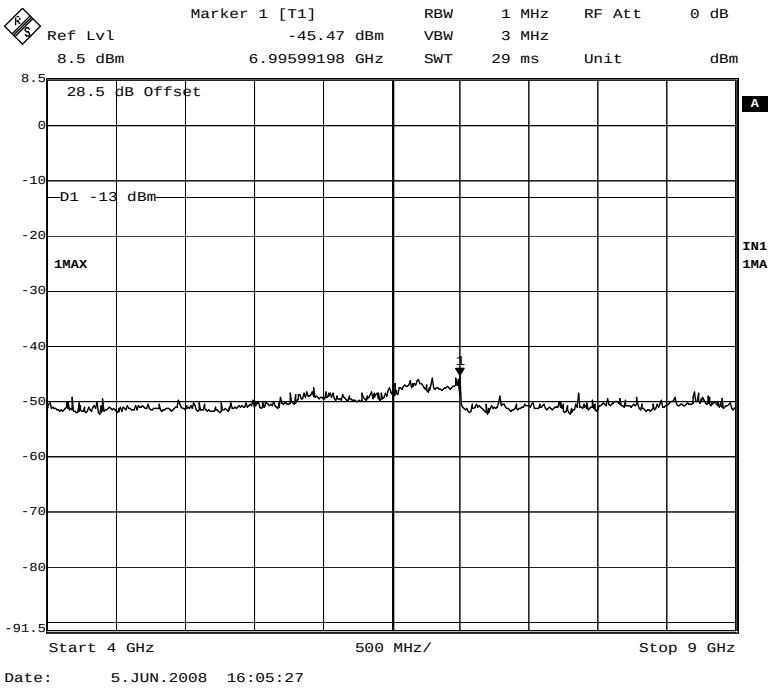
Spurious Emissions (9 kHz – 4 GHz)

GPRS, Timeslots 3, 4, 5 and 6 active



Spurious Emissions (4GHz – 9GHz)

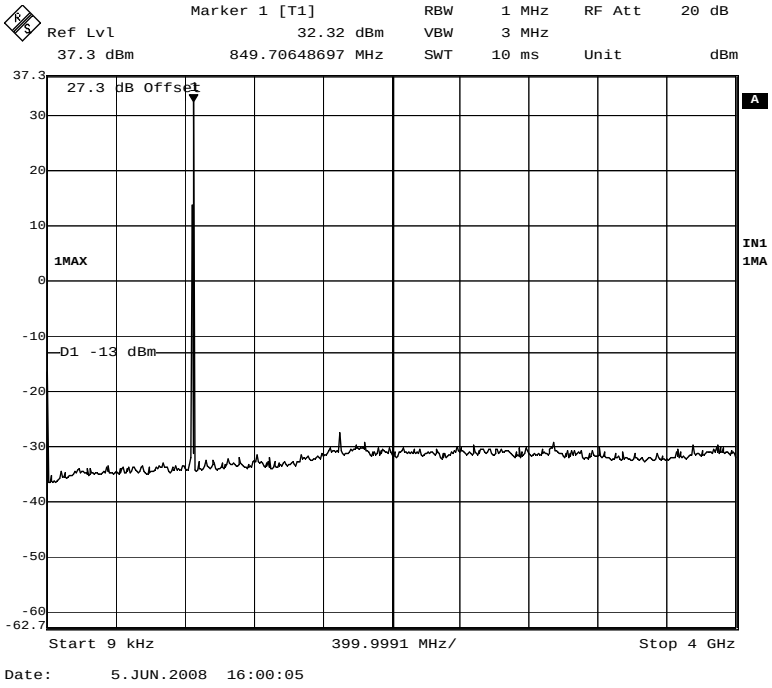
GPRS, Timeslots 3, 4, 5 and 6 active



Configuration 1 - Mode 3 – Maximum Power

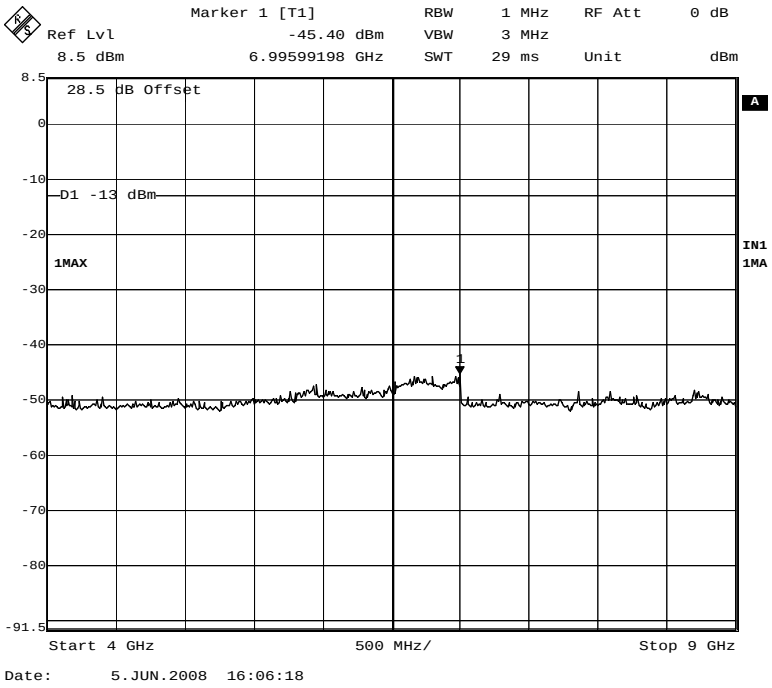
Spurious Emissions (9kHz – 4GHz)

GPRS, Timeslots 3, 4, 5 and 6 active



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

TH01M Mobile Handset, IMEI: 004401750001147

2.8.3 Date of Test and Modification State

06 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 clause 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

	06 June 2008
Ambient Temperature	23°C
Relative Humidity	44%

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	-11	±2.092
-20	836.400	-16	±2.092
-10	836.400	-11	±2.092
0	836.400	-15	±2.092
+10	836.400	-16	±2.092
+20	836.400	-10	±2.092
+30	836.400	-10	±2.092
+40	836.400	-12	±2.092
+50	836.400	-9	±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

TH01M Mobile Handset, IMEI: 004401750001147

2.9.3 Date of Test and Modification State

06 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

	06 June 2008
Ambient Temperature	23°C
Relative Humidity	44%

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

3.7V Supply

GPRS – Circuit Switched

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Deviation Limit (kHz)
3.70	836.400	-10	±2.092
3.35	836.400	-11	±2.092
4.20	836.400	-11	±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: 2005, Clause 6.5

2.10.2 Equipment Under Test

TH01M Mobile Handset, IMEI: 004401750001147

2.10.3 Date of Test and Modification State

05 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 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

	05 June 2008
Ambient Temperature	23°C
Relative Humidity	44%

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 – Modes 4 and 6

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

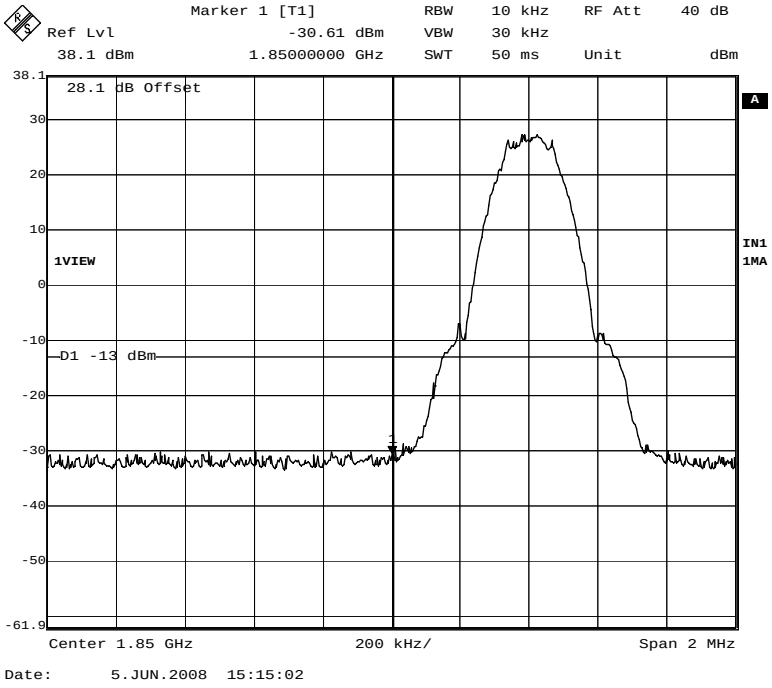
Frequency Block	Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
A	Channel : 513 Frequency : 1850.4 MHz	-
C	-	Channel : 809 Frequency : 1909.6 MHz

Limit	≤-13dBm at Block Edge

Maximum Power - GPRS

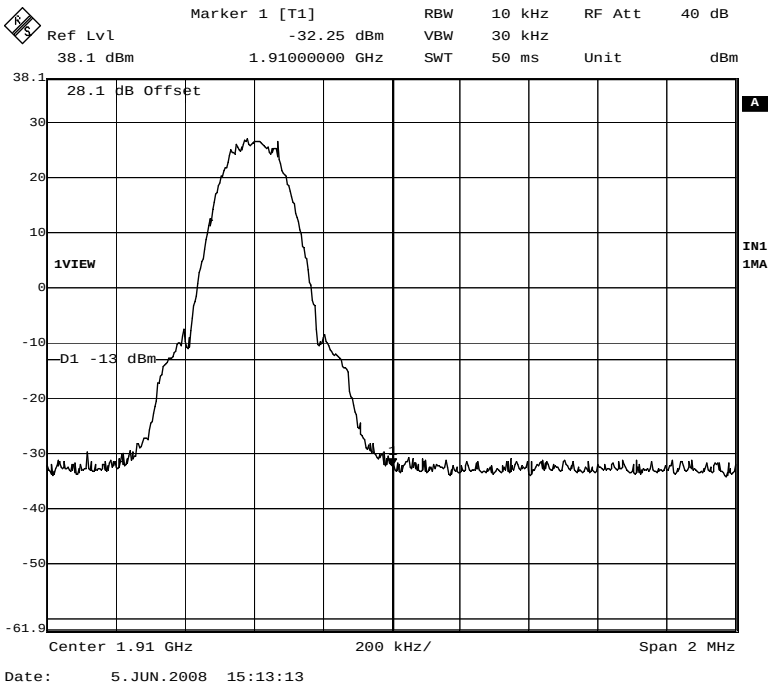
Configuration 1 – Mode 4

Frequency Block A



Configuration 1 – Mode 6

Frequency Block C



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: 2005, Clause 6.2

2.11.2 Equipment Under Test

TH01M Mobile Handset, IMEI: 004401750001147

2.11.3 Date of Test and Modification State

05 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 and 8PSK modulations, 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

	05 June 2008
Ambient Temperature	21°C
Relative Humidity	47%

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 - Mode 4, 5 and 6

Maximum Power – GSM

Frequency (MHz)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	27.9	29.60	0.912
1880.0	28.1	29.97	0.993
1909.8	28.1	29.94	0.993

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)
Industry Canada RSS-133: 2005, Clause 6.2

2.12.2 Equipment Under Test

TH01M Mobile Handset, IMEI: 004401750000677

2.12.3 Date of Test and Modification State

01 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 Industry Canada 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

	01 June 2008
Ambient Temperature	19°C
Relative Humidity	53%
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 - Mode 4, 5 and 6

Frequency GHz	EIRP (dBm)	Limit (dBm)	EIRP (W)	Limit (W)
1.8502	25.20	33.00	0.331	2.00
1.8800	27.90	33.00	0.331	2.00
1.9098	27.90	33.00	0.331	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

TH01M Mobile Handset, IMEI: 004401750001147

2.13.3 Date of Test and Modification State

05 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 four timeslots (GPRS).
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

	05 June 2008
Ambient Temperature	22°C
Relative Humidity	46%

Product Service

2.13.7 Test Results

For a description of the modulation techniques see section 2.4.7.

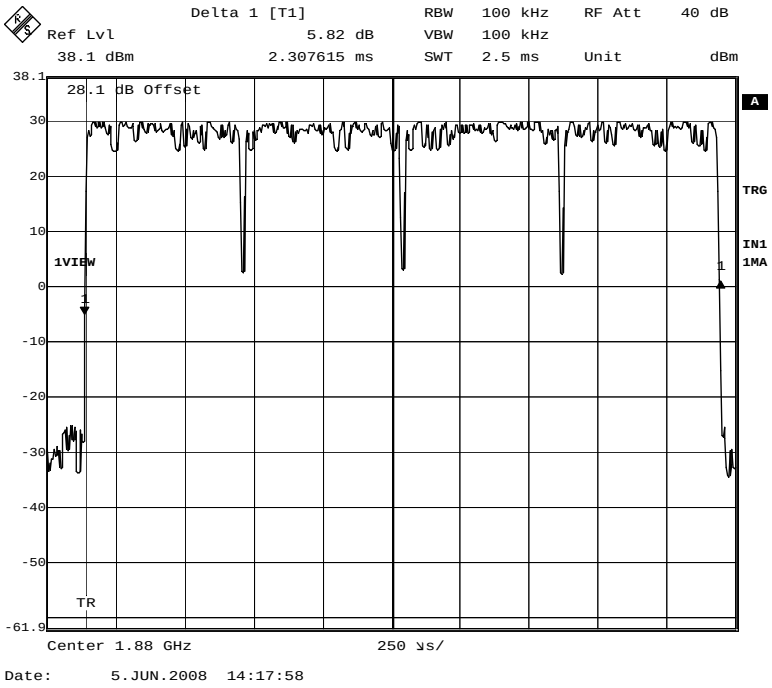
2.13.8 Test Results

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

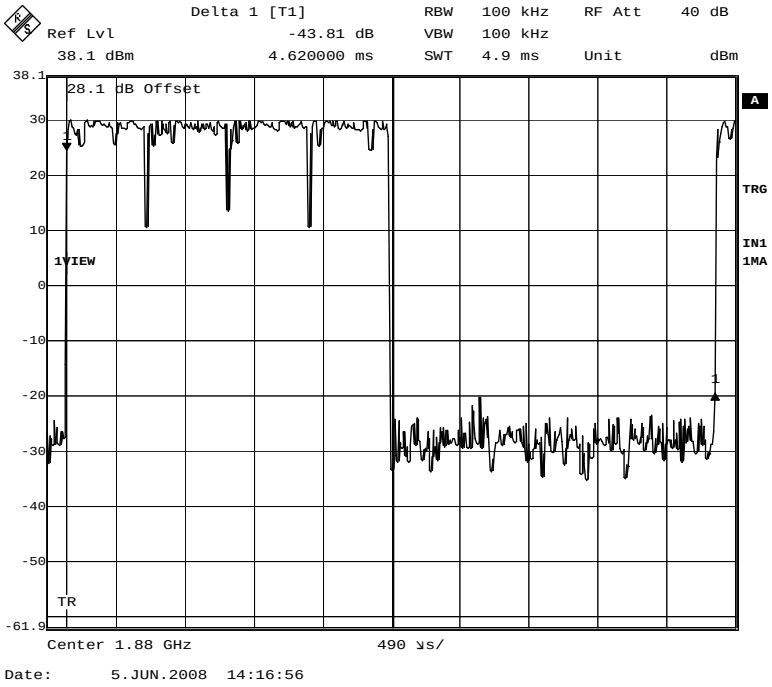
The test results are shown below.

Configuration 1 - Mode 5

EUT Transmitting with GPRS modulation showing four timeslots (GPRS)



EUT Transmitting with GPRS modulation showing one frame with four timeslots 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

TH01M Mobile Handset, IMEI: 004401750001147

2.14.3 Date of Test and Modification State

05 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. 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 5

2.14.6 Environmental Conditions

	05 June 2008
Ambient Temperature	23°C
Relative Humidity	44%

Product Service

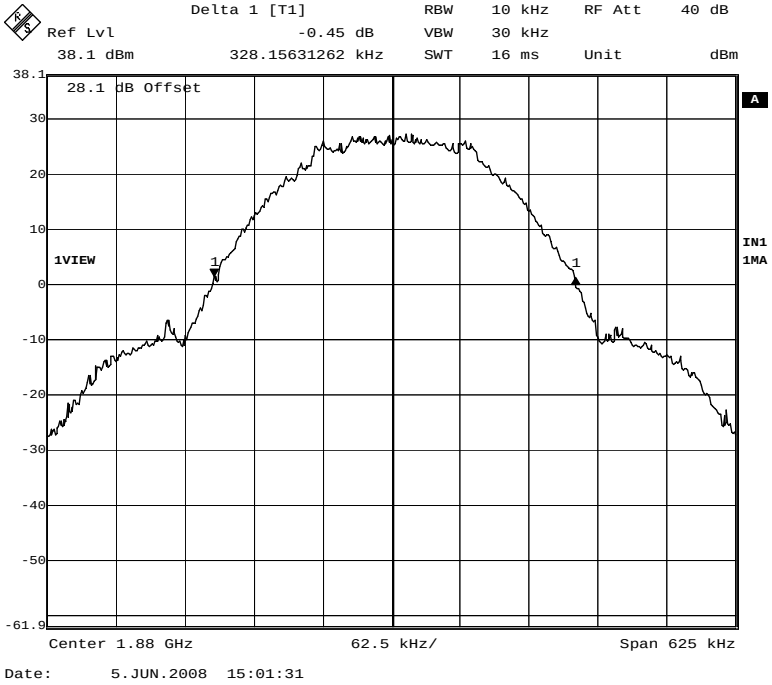
2.14.7 Test Results

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

TH01M Mobile Handset, IMEI: 004401750001147

2.15.3 Date of Test and Modification State

05 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.

The spurious emissions from the antenna terminal were measured in accordance with Part 2.1051. 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 and 3 MHz thus meeting the requirements of 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

	05 June 2008
Ambient Temperature	24°C
Relative Humidity	42%

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.

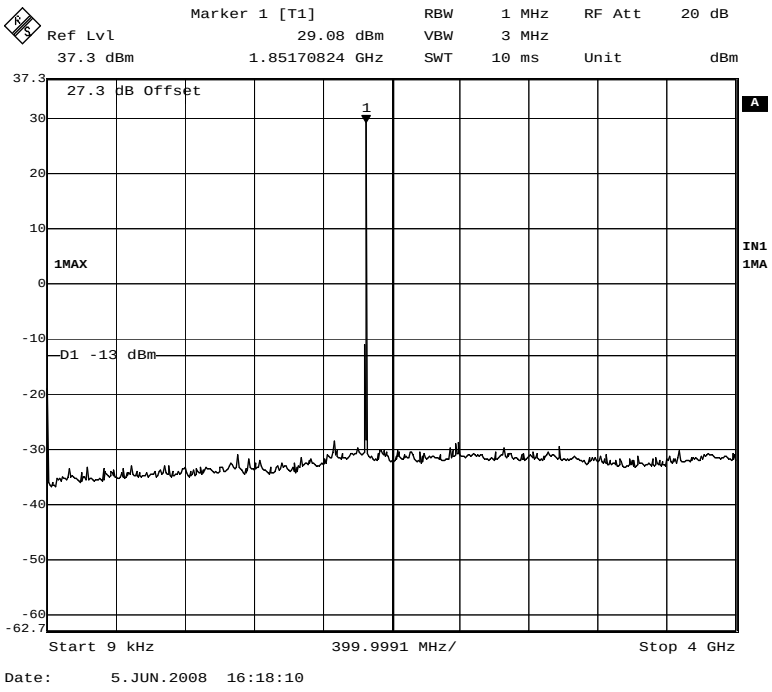
The test results are shown below.

3.7V Supply

Configuration 1 - Mode 4 – Maximum Power

Spurious Emissions (9kHz – 4GHz)

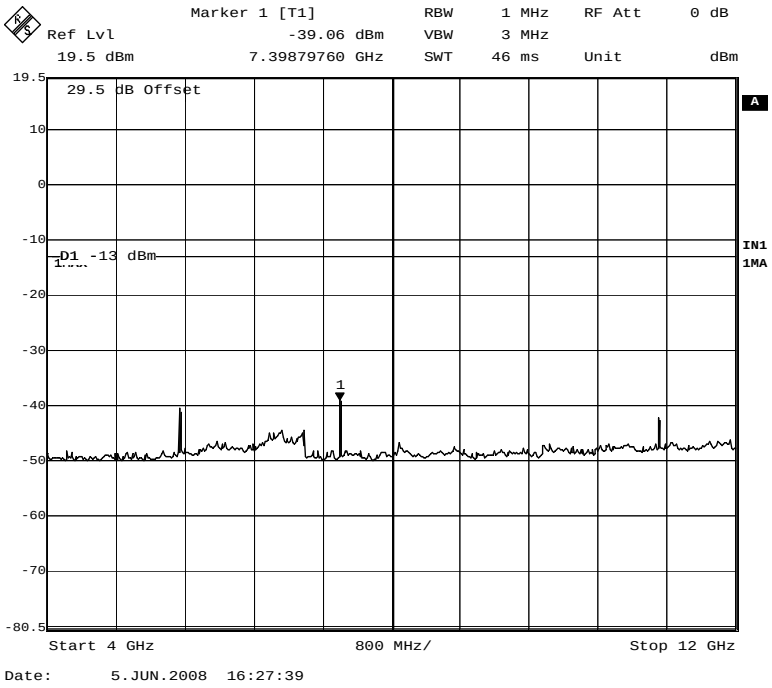
GPRS, Timeslots 3, 4, 5 and 6



Product Service

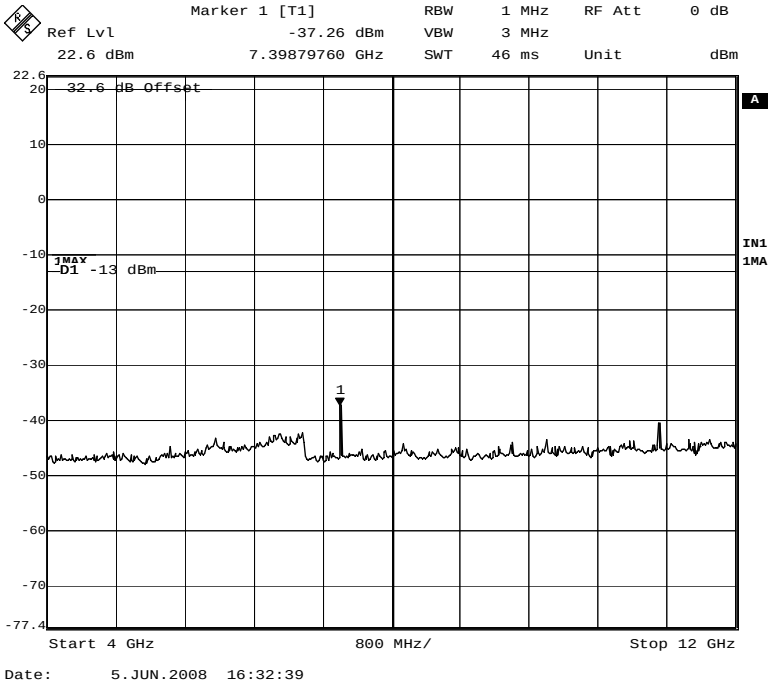
Spurious Emissions (4GHz – 12GHz)

GPRS . Timeslots 3, 4, 5 and 6



Spurious Emissions (12GHz – 20GHz)

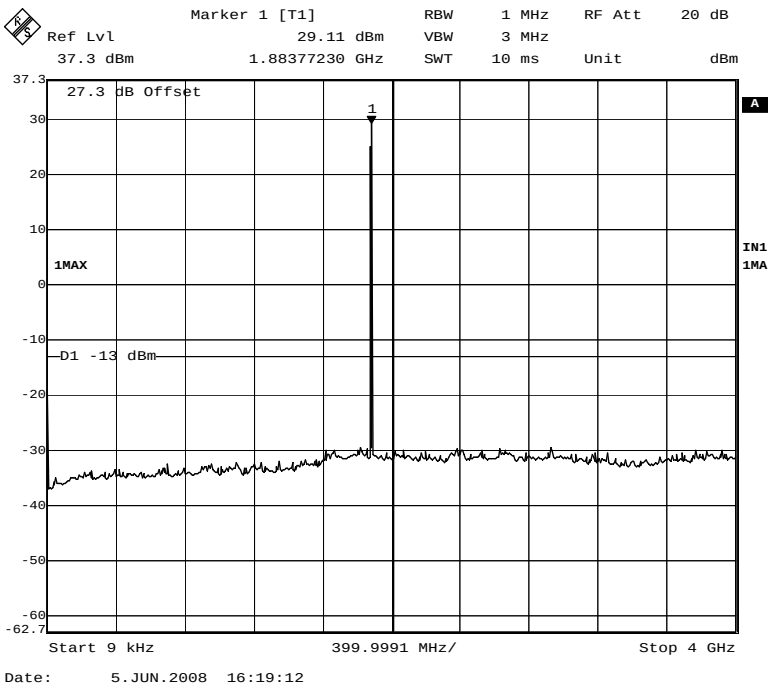
GPRS, Timeslots 3, 4, 5 and 6



Configuration 1 – Mode 5 – Maximum Power

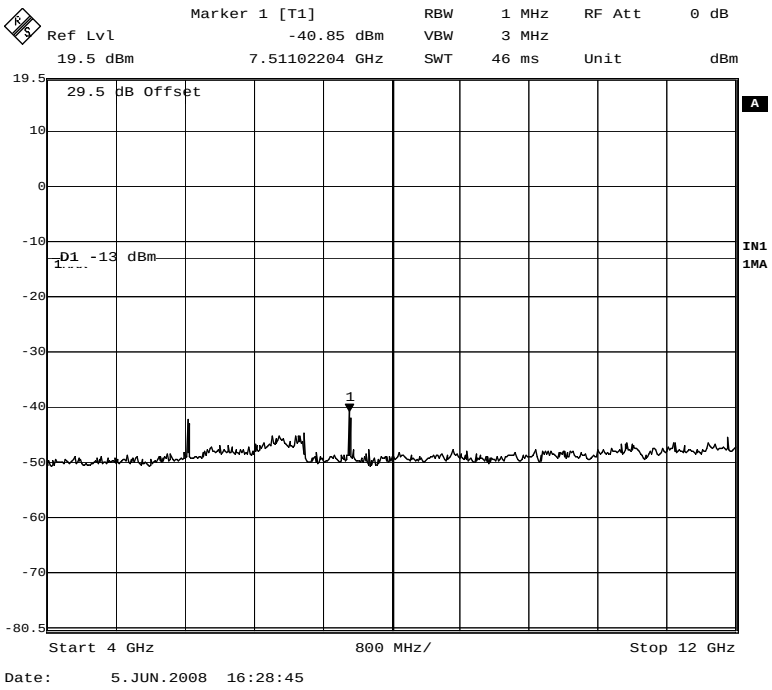
Spurious Emissions (9kHz – 4GHz)

GPRS, Timeslots 3, 4, 5 and 6



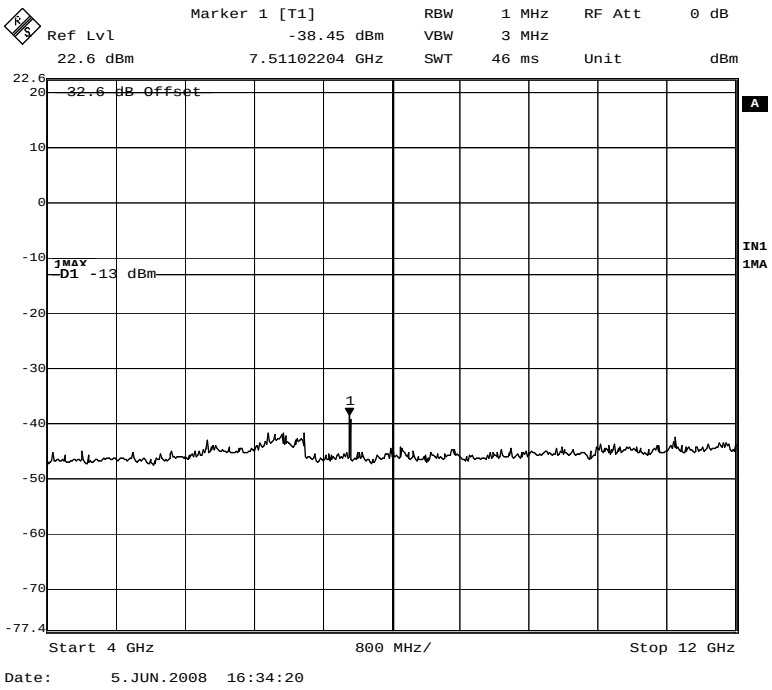
Spurious Emissions (4GHz – 12GHz)

GPRS, Timeslots 3, 4, 5 and 6



Spurious Emissions (12GHz – 20GHz)

GPRS, Timeslots 3, 4, 5 and 6

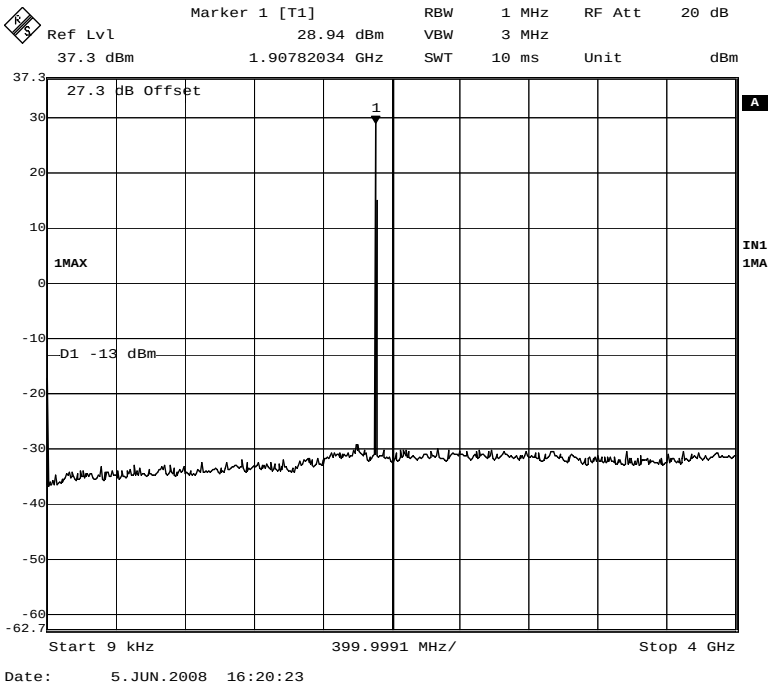


Product Service

Configuration 1 – Mode 6 – Maximum Power

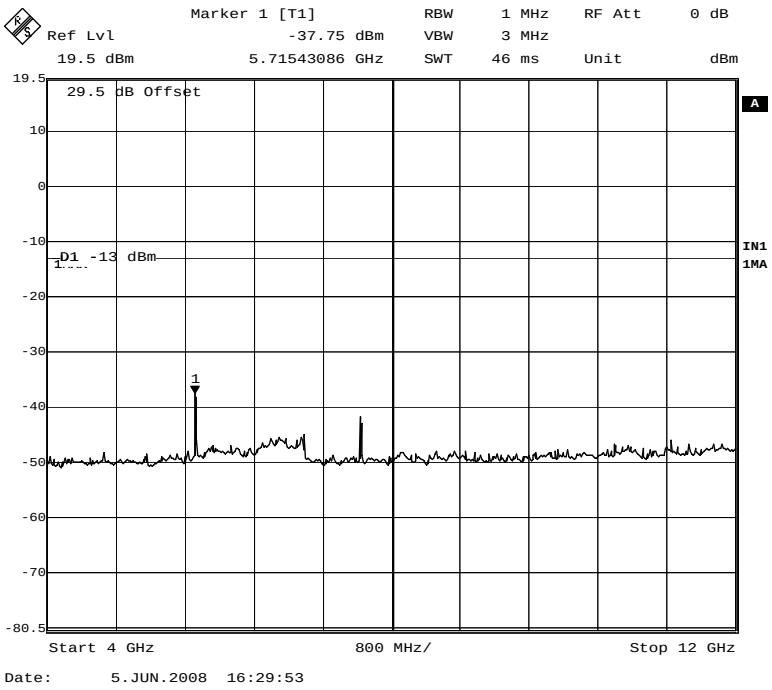
Spurious Emissions (9kHz – 4GHz)

GPRS , Timeslots, 4, 5 and 6



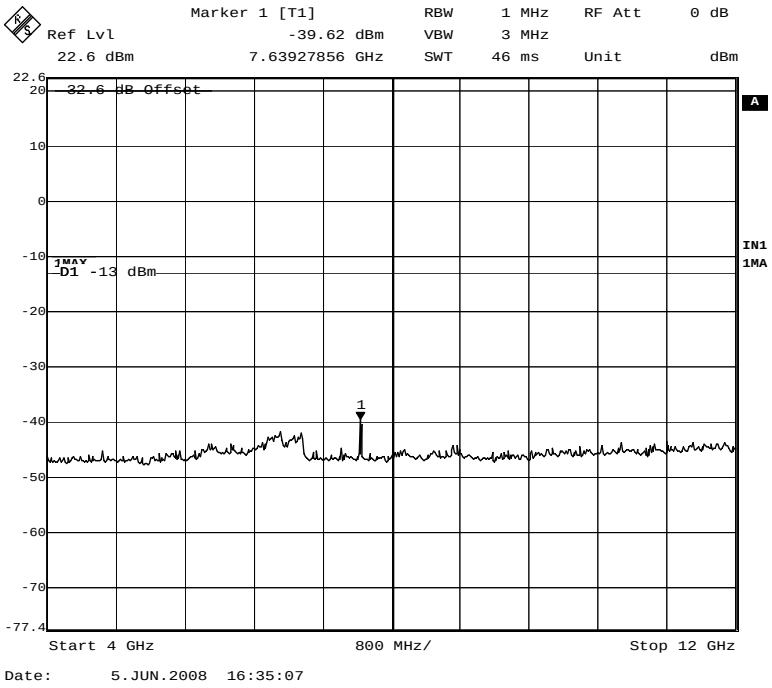
Spurious Emissions (4GHz – 12GHz)

GPRS, Timeslots 3, 4, 5 and 6



Spurious Emissions (12GHz – 20GHz)

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: 2005, Clause 6.3

2.16.2 Equipment Under Test

TH01M Mobile Handset, IMEI 004401750000677

2.16.3 Date of Test and Modification State

01 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

	01 June 2008
Ambient Temperature	19°C
Relative Humidity	52%
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	Pass / Fail
3.7011	Horizontal	100	351	-35.2	-13.0	-22.2	Pass
11.1010	Vertical	100	132	-34.5	-13.0	-21.5	Pass

Configuration 1 - Mode 5

Frequency GHz	Antenna Polarisation	Ant Hgt cm	EUT Arc deg	Result EIRP dBm	Limit EIRP dBm	Margin dB	Pass / Fail
3.7600	Horizontal	100	357	-33.4	-13.0	-20.4	Pass

Configuration 1 - Mode 6

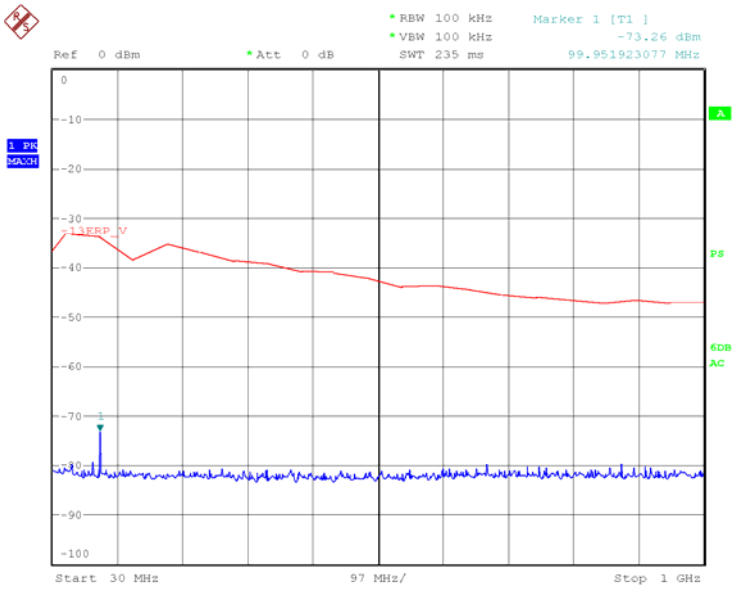
Frequency GHz	Antenna Polarisation	Ant Hgt cm	EUT Arc deg	Result EIRP dBm	Limit EIRP dBm	Margin dB	Pass / Fail
3.819	Horizontal	100	300	-36.5	-13.0	-23.5	Pass

Product Service

Configuration 1 - Mode 4

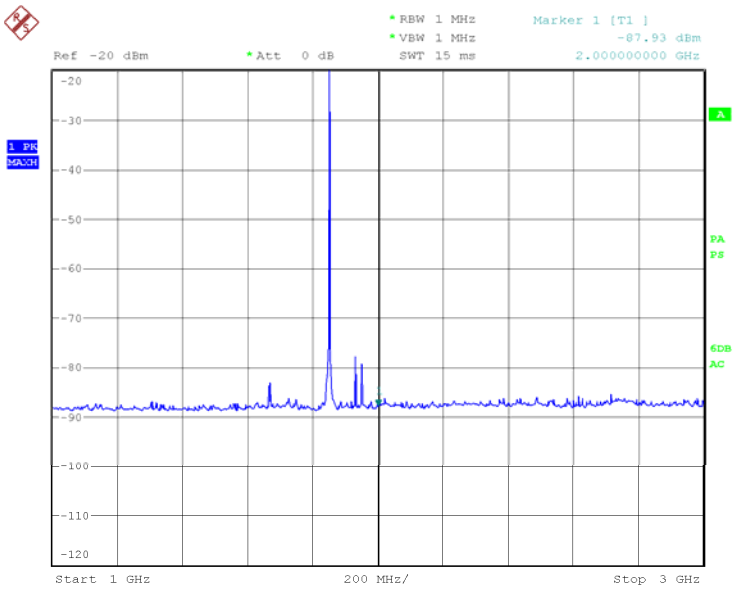
30MHz – 1GHz

Vertical Polarisation



Date: 1.JUN.2008 20:19:37

Horizontal Polarisation

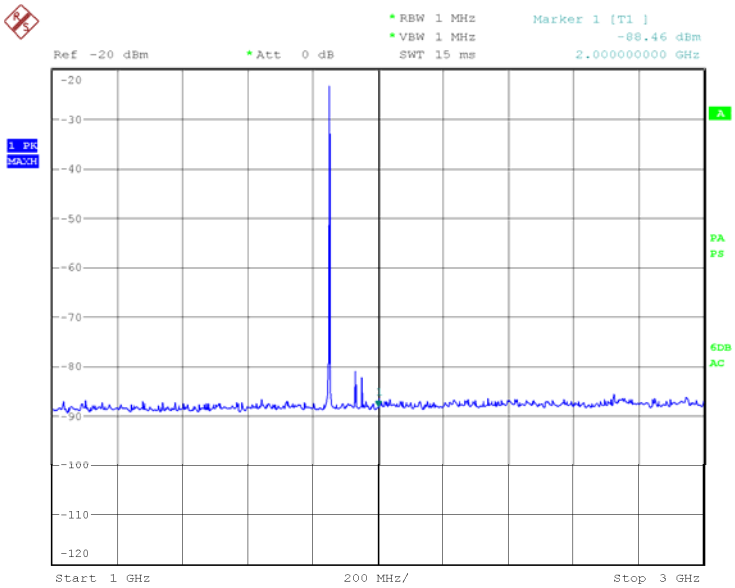


Date: 1.JUN.2008 20:38:55

Product Service

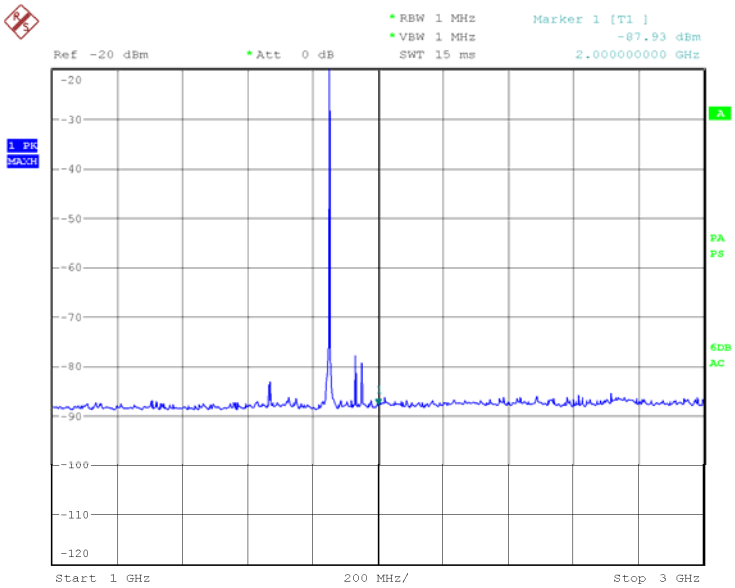
1GHz – 3GHz

Vertical Polarisation



Date: 1.JUN.2008 20:40:52

Horizontal Polarisation

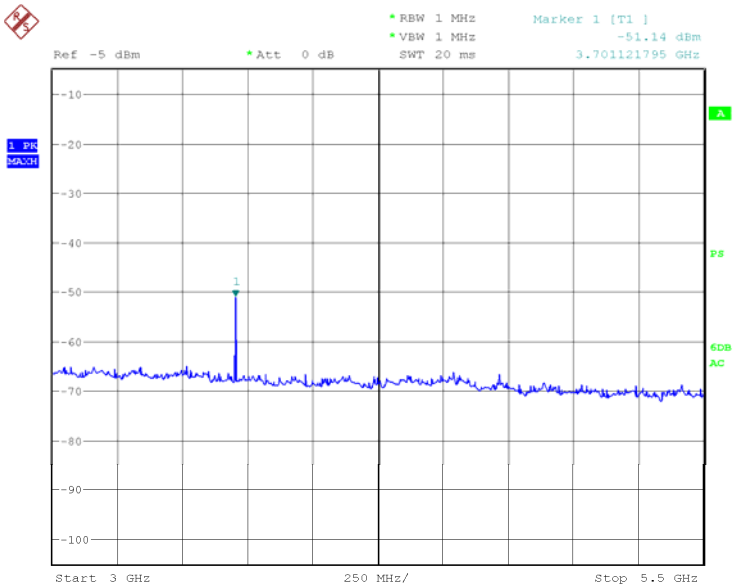


Date: 1.JUN.2008 20:38:55

Product Service

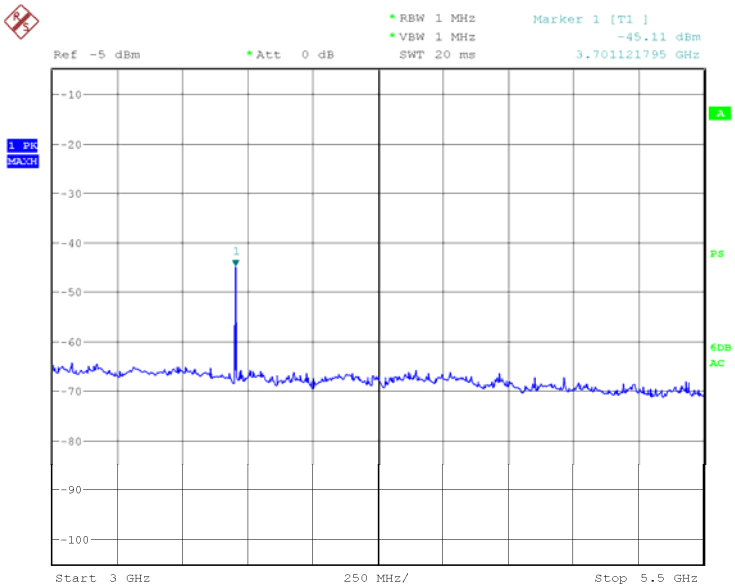
3GHz – 5.5GHz

Vertical Polarisation



Date: 1.JUN.2008 21:49:00

Horizontal Polarisation

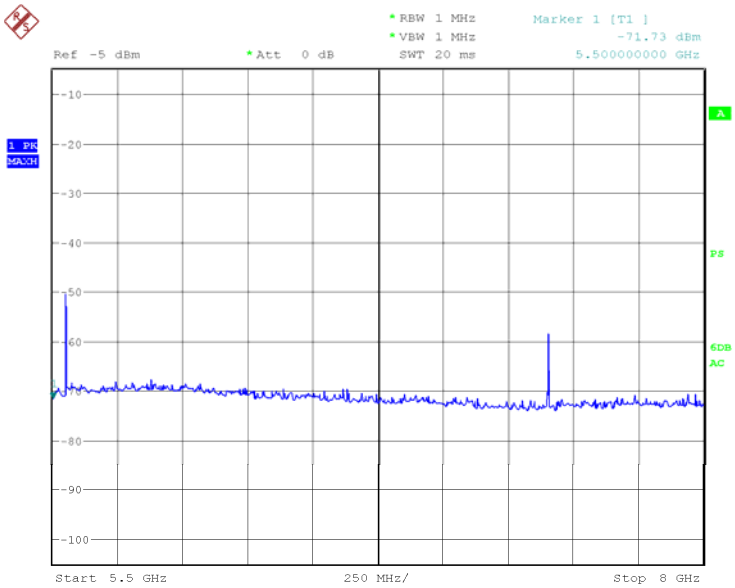


Date: 1.JUN.2008 21:55:44

Product Service

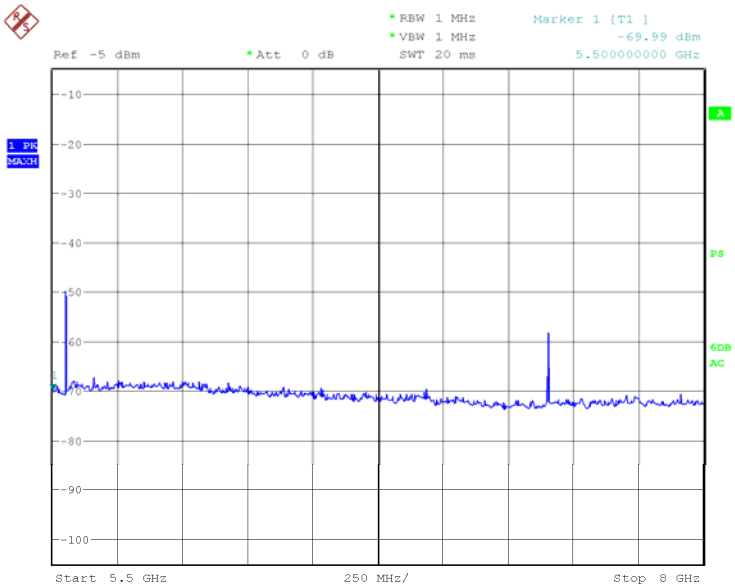
5.5GHz – 8GHz

Vertical Polarisation



Date: 1.JUN.2008 21:50:57

Horizontal Polarisation

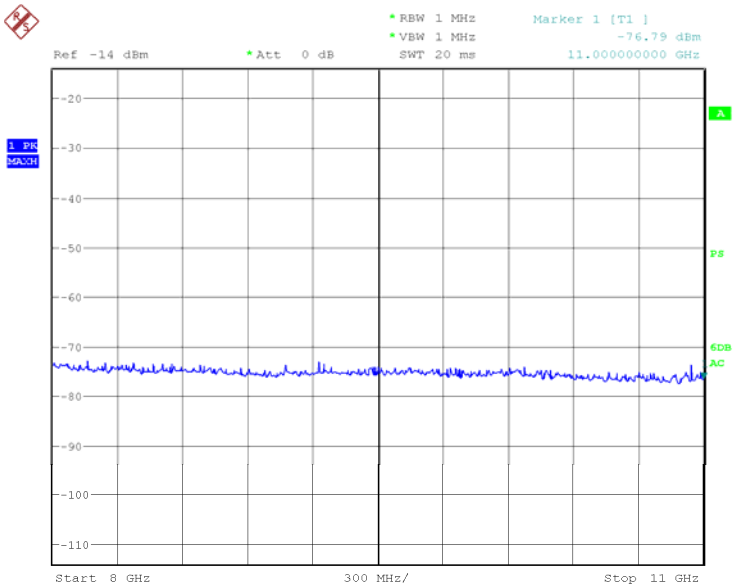


Date: 1.JUN.2008 21:53:38

Product Service

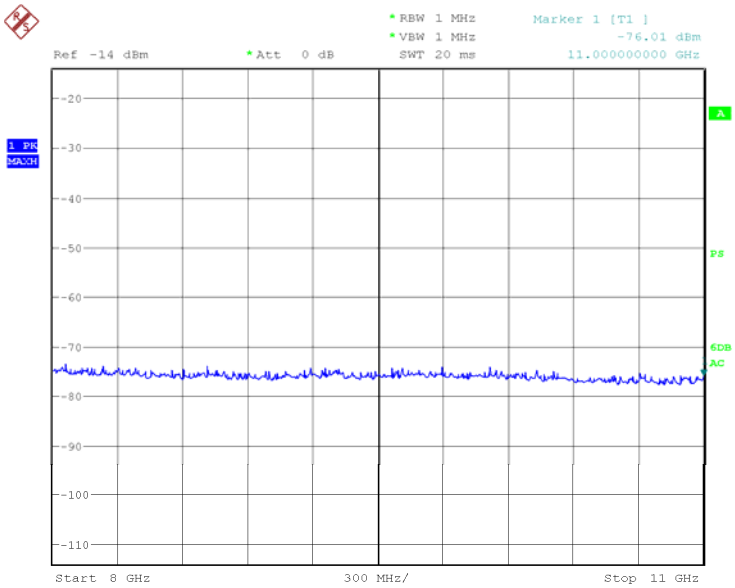
8GHz – 11GHz

Vertical Polarisation



Date: 1.JUN.2008 23:01:33

Horizontal Polarisation

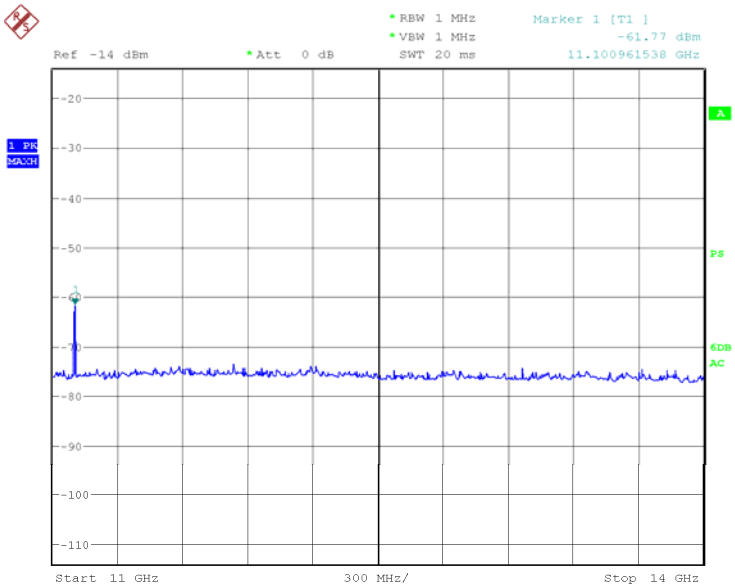


Date: 1.JUN.2008 23:10:16

Product Service

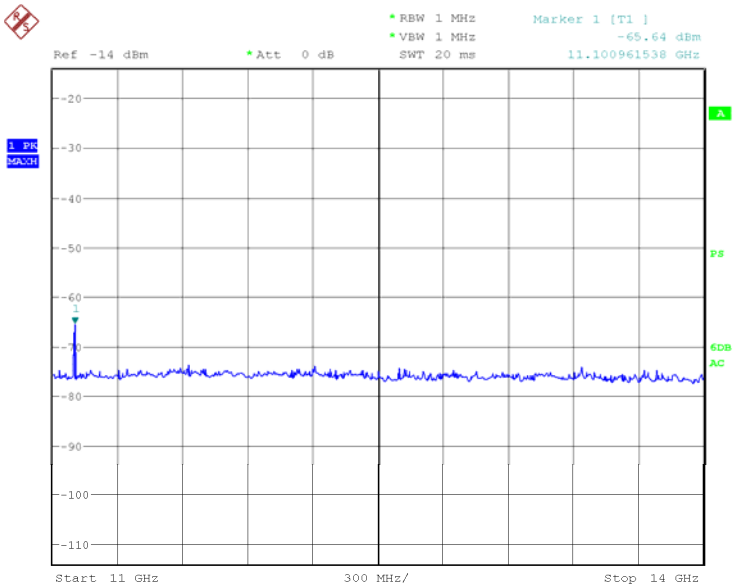
11GHz – 14GHz

Vertical Polarisation



Date: 1.JUN.2008 23:03:52

Horizontal Polarisation

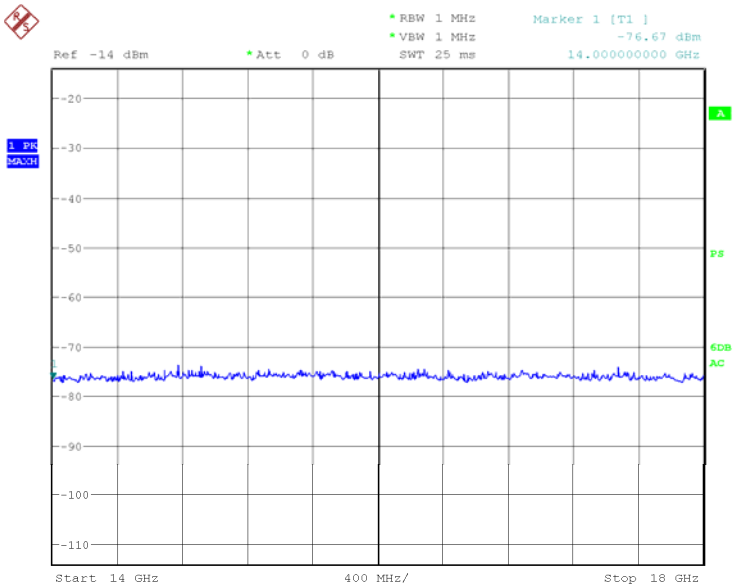


Date: 1.JUN.2008 23:12:32

Product Service

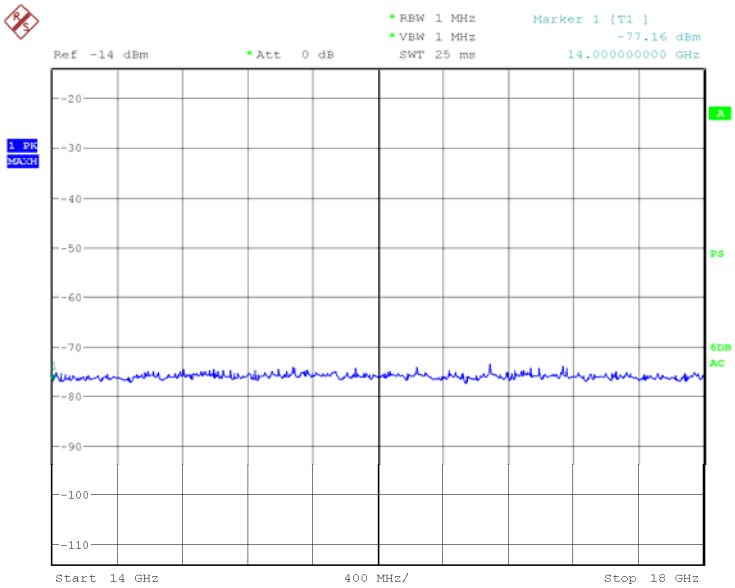
14GHz – 18GHz

Vertical Polarisation



Date: 1.JUN.2008 23:05:41

Horizontal Polarisation

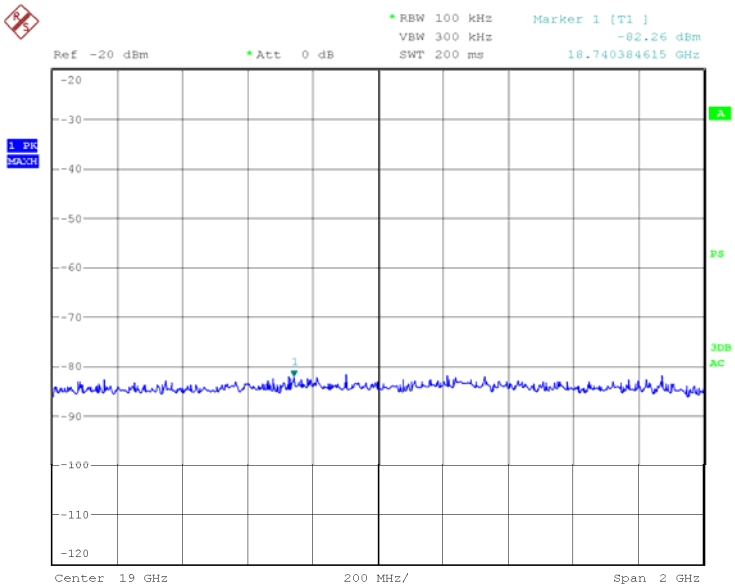


Date: 1.JUN.2008 23:08:25

Product Service

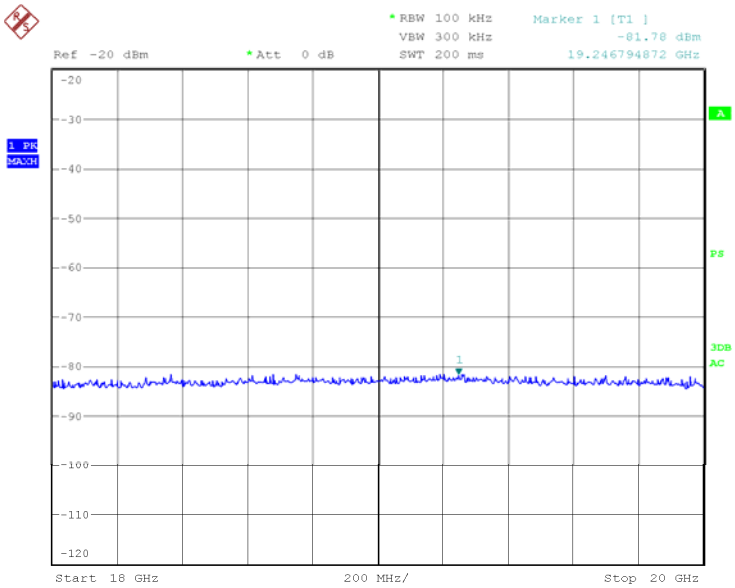
18GHz – 20GHz

Vertical Polarisation



Date: 14.JUN.2008 05:22:46

Horizontal Polarisation



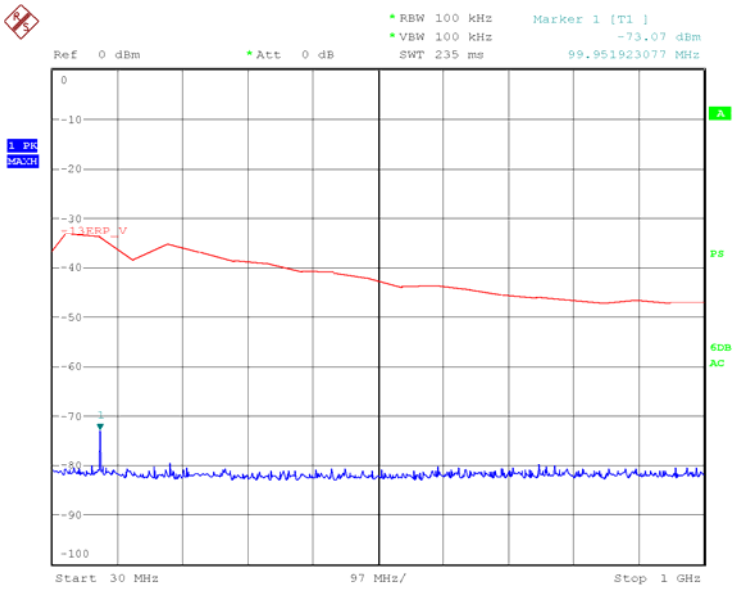
Date: 14.JUN.2008 05:04:05

Product Service

Configuration 1 - Mode 5

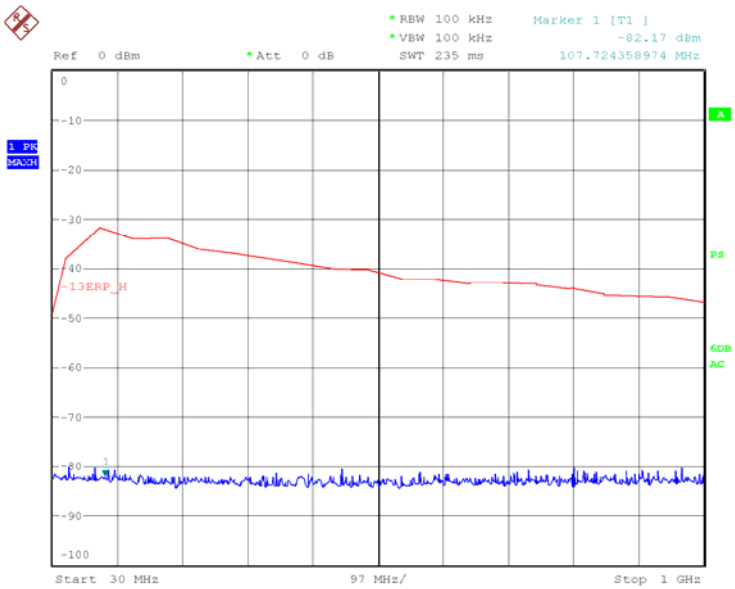
30MHz – 1GHz

Vertical Polarisation



Date: 1.JUN.2008 20:18:03

Horizontal Polarisation

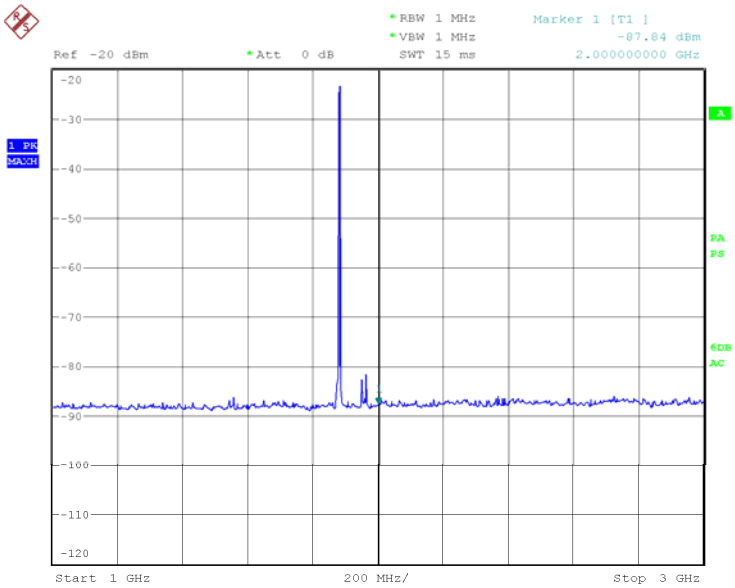


Date: 1.JUN.2008 20:24:24

Product Service

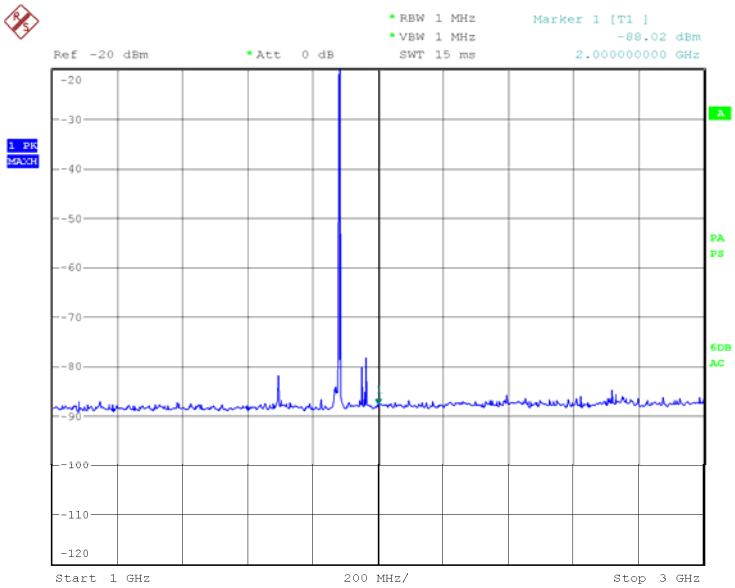
1GHz – 3GHz

Vertical Polarisation



Date: 1.JUN.2008 20:33:05

Horizontal Polarisation

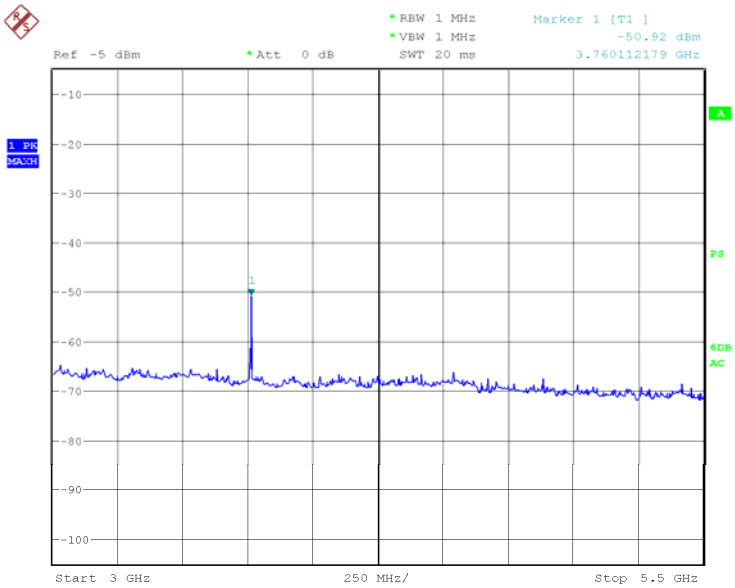


Date: 1.JUN.2008 20:35:19

Product Service

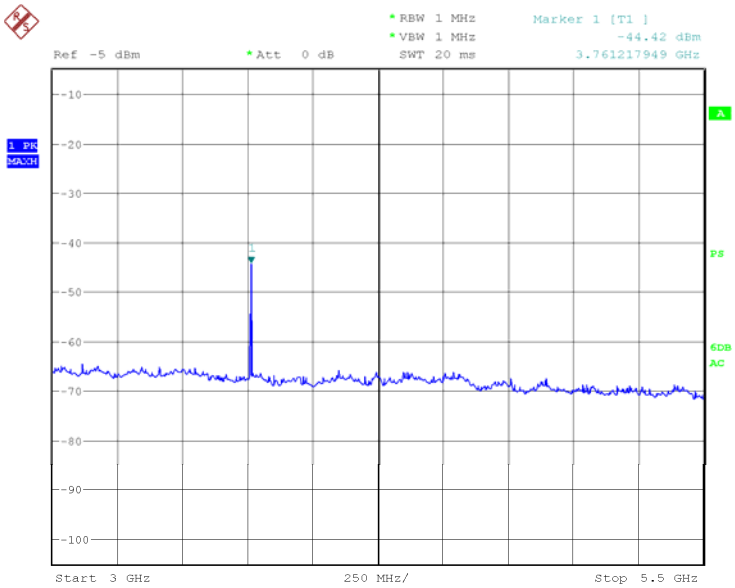
3GHz – 5.5GHz

Vertical Polarisation



Date: 1.JUN.2008 21:43:55

Horizontal Polarisation

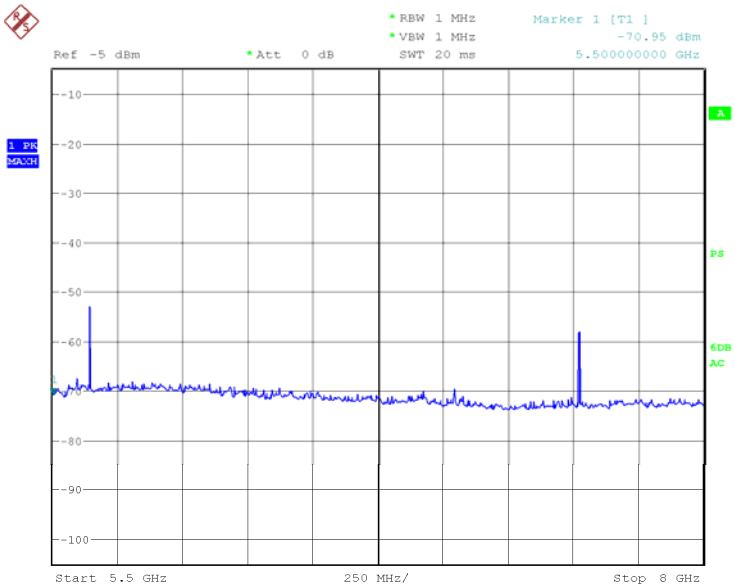


Date: 1.JUN.2008 21:21:56

Product Service

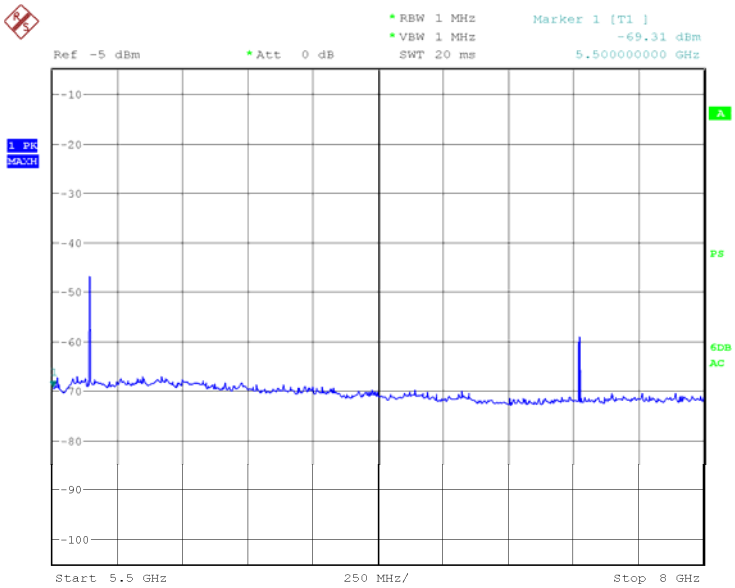
5.5GHz – 8GHz

Vertical Polarisation



Date: 1.JUN.2008 21:46:30

Horizontal Polarisation

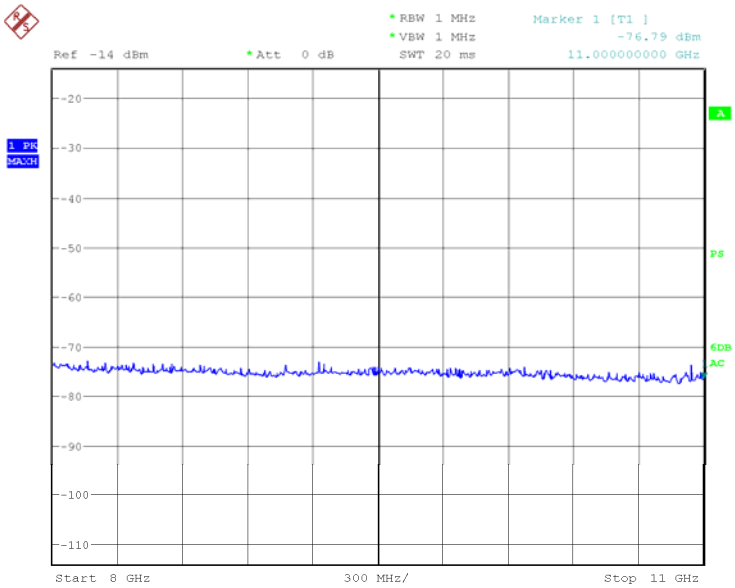


Date: 1.JUN.2008 21:36:55

Product Service

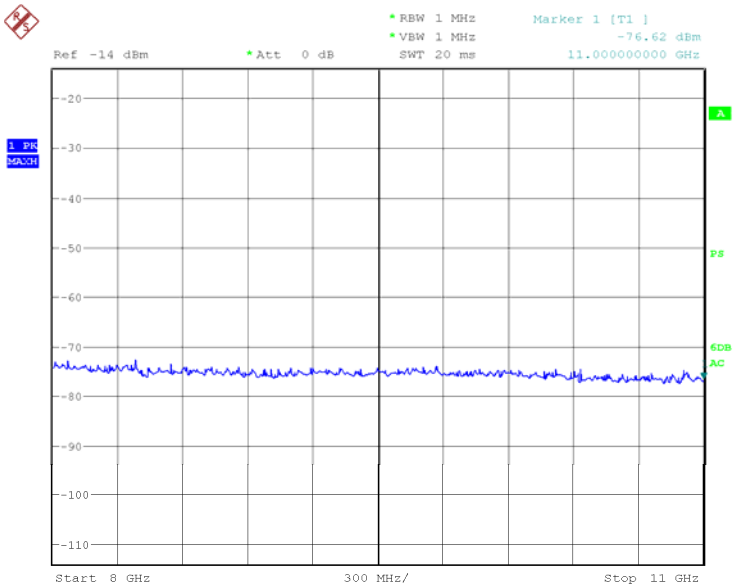
8GHz – 11GHz

Vertical Polarisation



Date: 1.JUN.2008 23:01:33

Horizontal Polarisation

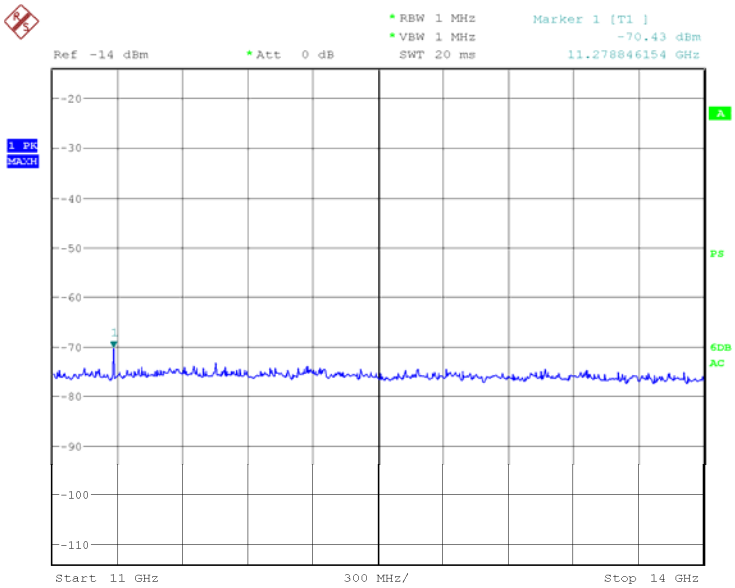


Date: 1.JUN.2008 23:40:30

Product Service

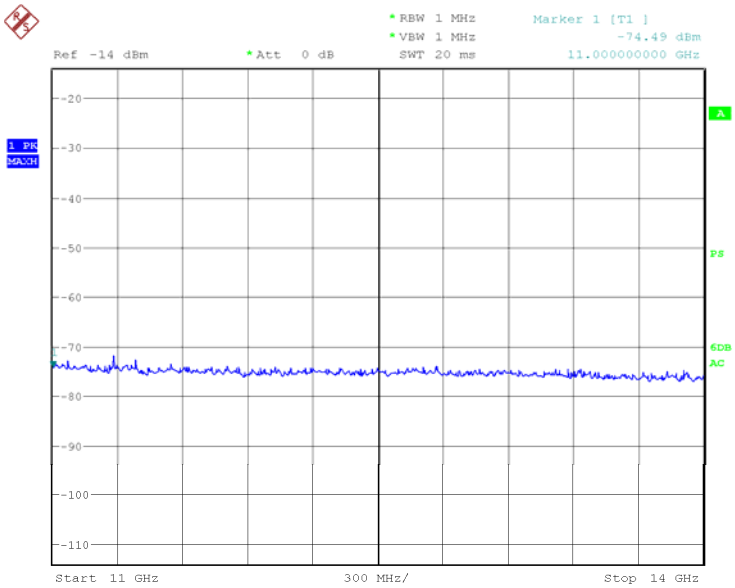
11GHz – 14GHz

Vertical Polarisation



Date: 1.JUN.2008 23:25:56

Horizontal Polarisation

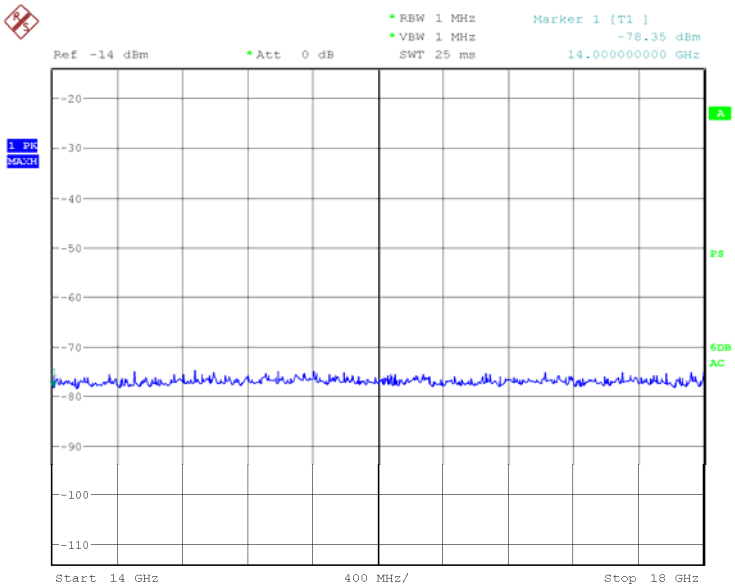


Date: 1.JUN.2008 23:42:52

Product Service

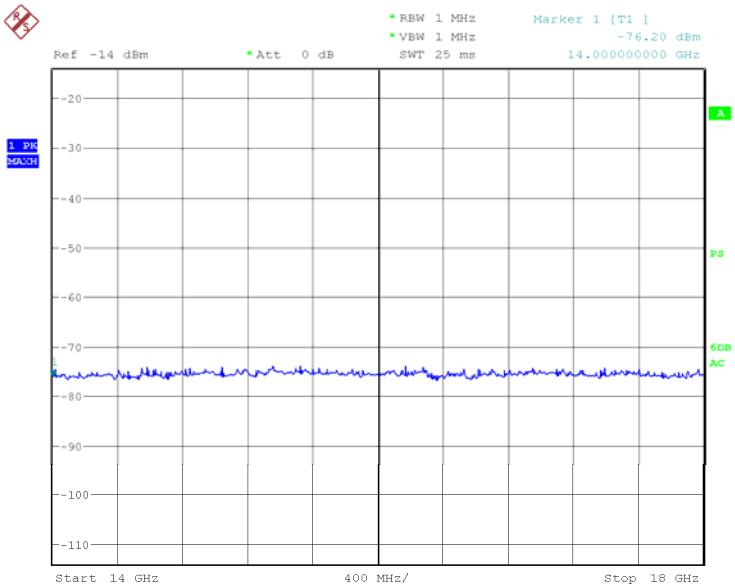
14GHz – 18GHz

Vertical Polarisation



Date: 1.JUN.2008 23:29:58

Horizontal Polarisation

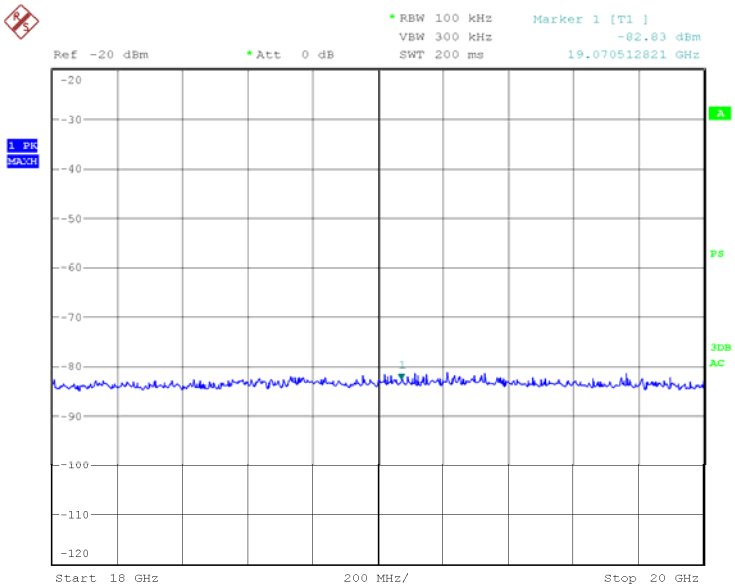


Date: 1.JUN.2008 23:37:31

Product Service

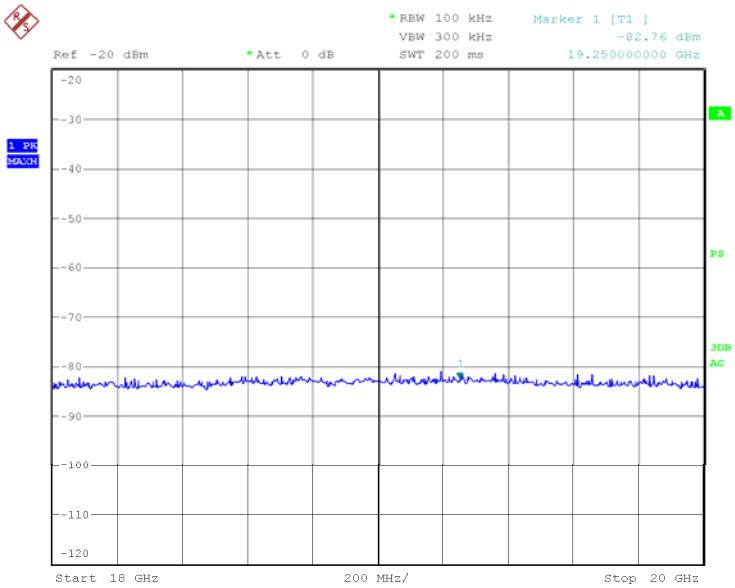
18GHz – 20GHz

Vertical Polarisation



Date: 14.JUN.2008 05:06:29

Horizontal Polarisation



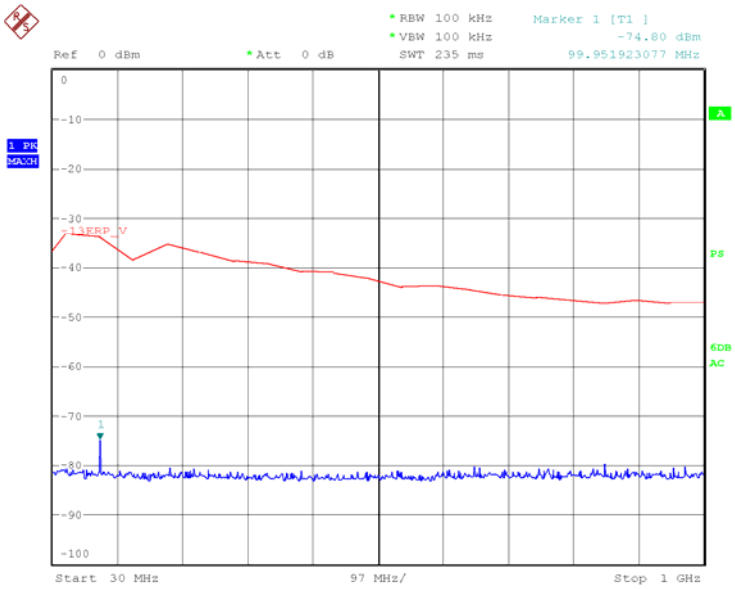
Date: 14.JUN.2008 05:18:19

Product Service

Configuration 1 - Mode 6

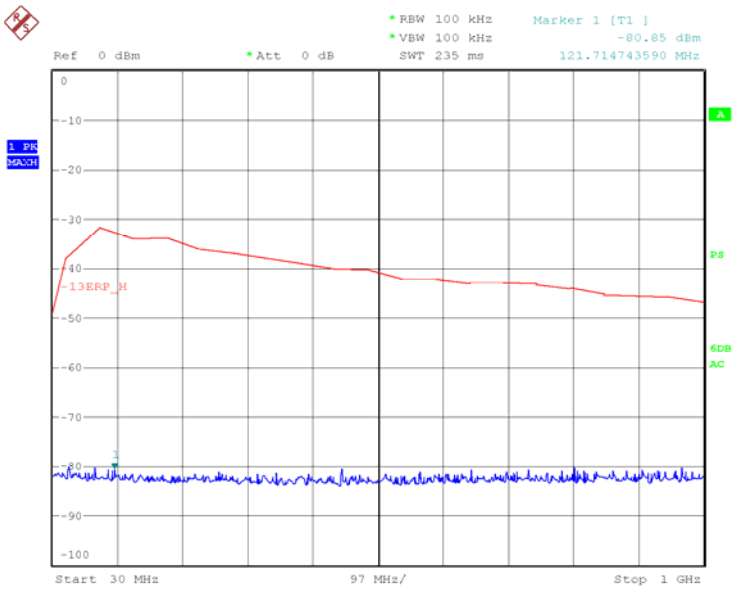
30MHz – 1GHz

Vertical Polarisation



Date: 1.JUN.2008 20:21:06

Horizontal Polarisation

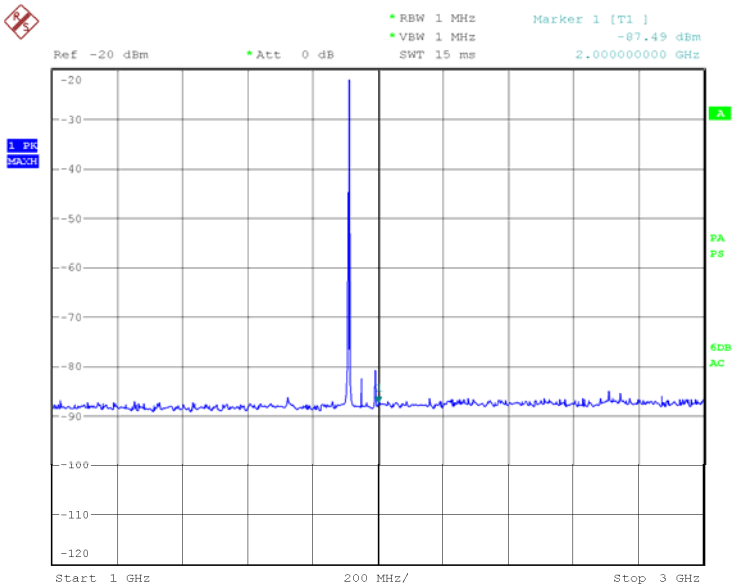


Date: 1.JUN.2008 20:24:41

Product Service

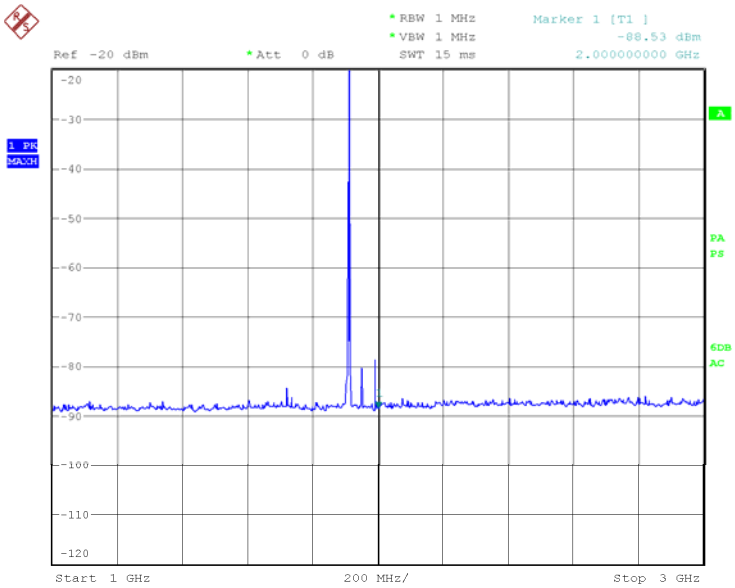
1GHz – 3GHz

Vertical Polarisation



Date: 1.JUN.2008 20:43:29

Horizontal Polarisation

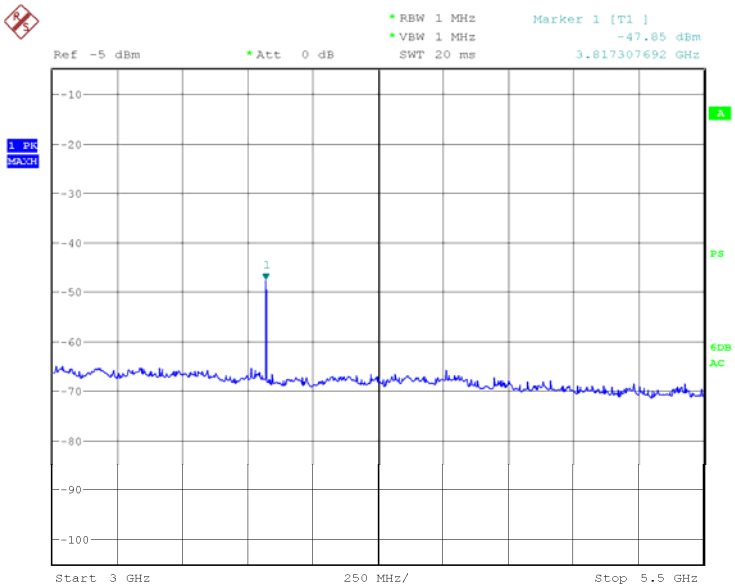


Date: 1.JUN.2008 20:46:06

Product Service

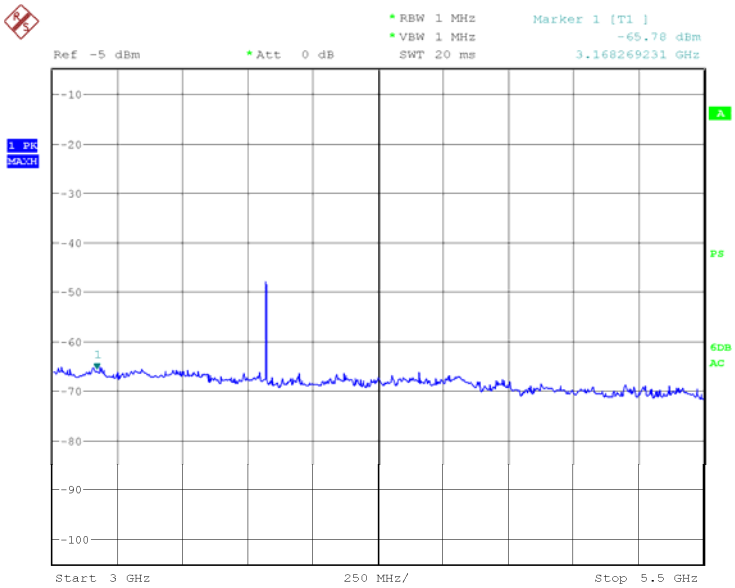
3GHz – 5.5GHz

Vertical Polarisation



Date: 1.JUN.2008 20:57:50

Horizontal Polarisation

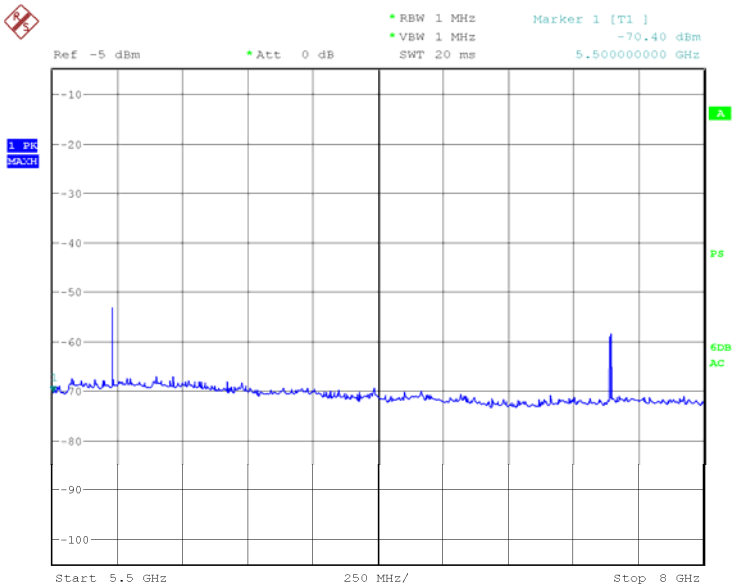


Date: 1.JUN.2008 21:07:11

Product Service

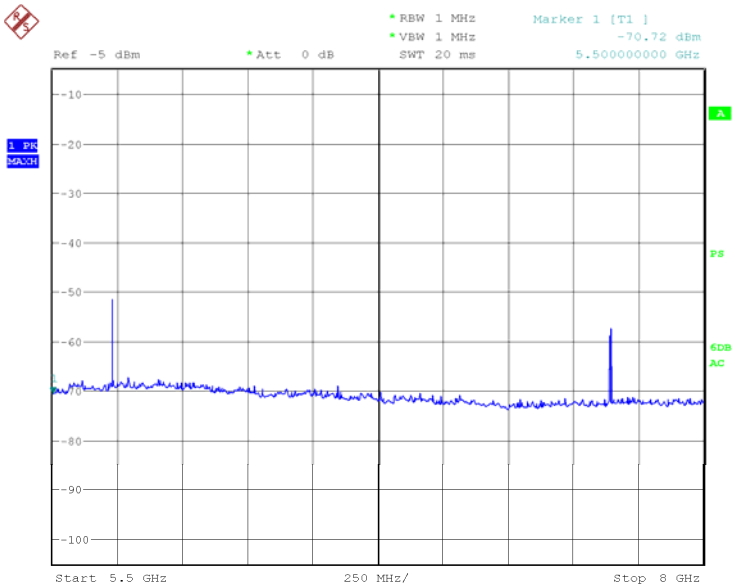
5.5GHz – 8GHz

Vertical Polarisation



Date: 1.JUN.2008 21:04:16

Horizontal Polarisation

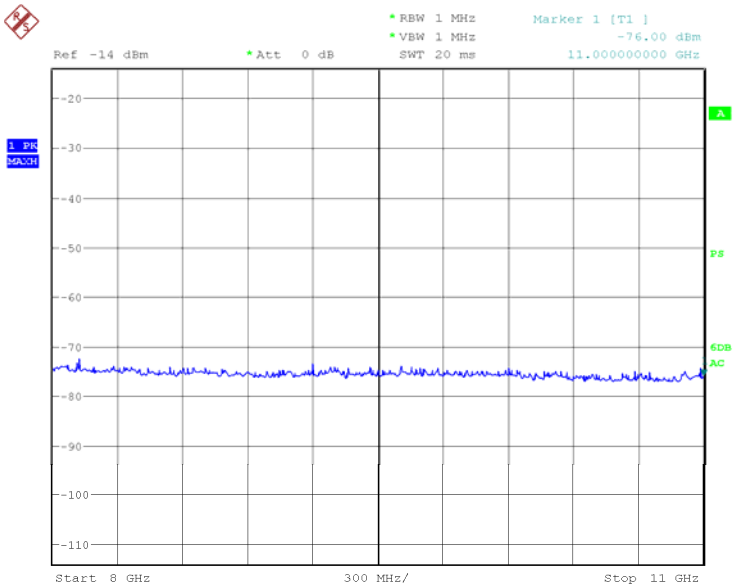


Date: 1.JUN.2008 21:10:38

Product Service

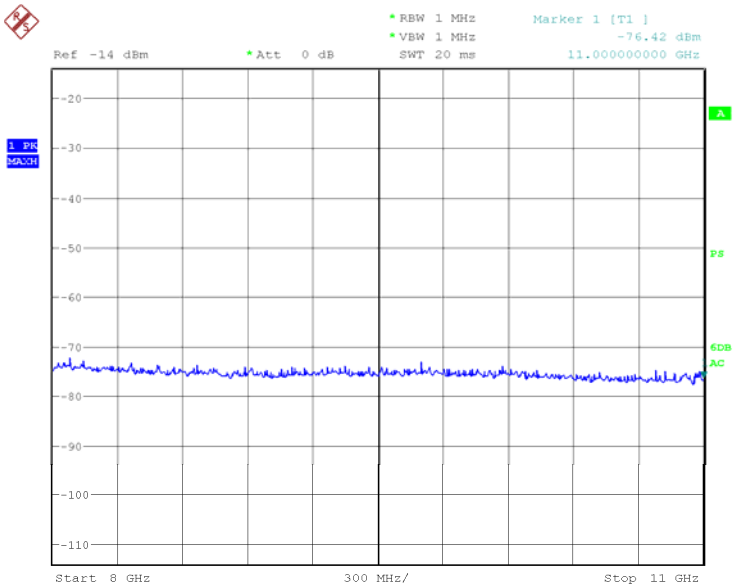
8GHz – 11GHz

Vertical Polarisation



Date: 2.JUN.2008 00:00:29

Horizontal Polarisation

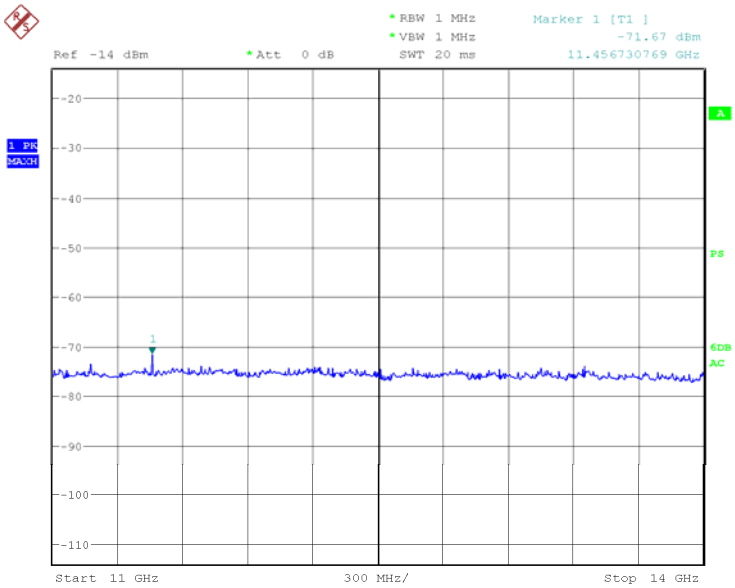


Date: 1.JUN.2008 23:48:09

Product Service

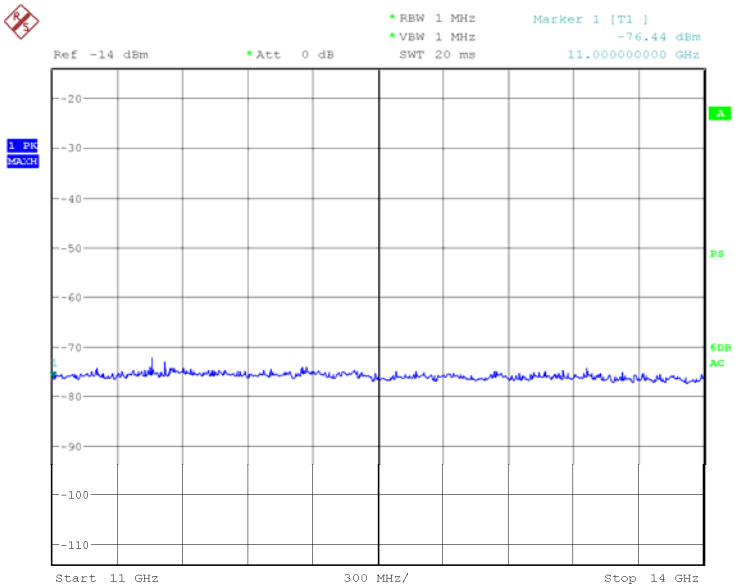
11GHz – 14GHz

Vertical Polarisation



Date: 2.JUN.2008 00:05:02

Horizontal Polarisation

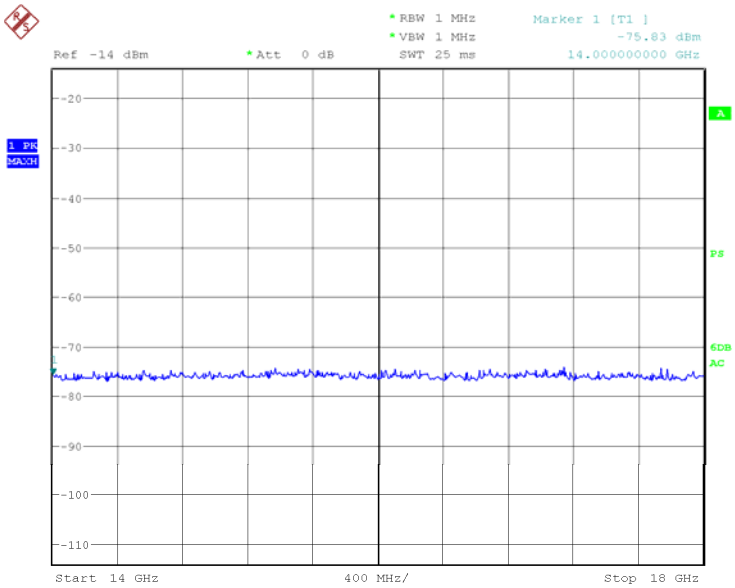


Date: 1.JUN.2008 23:49:58

Product Service

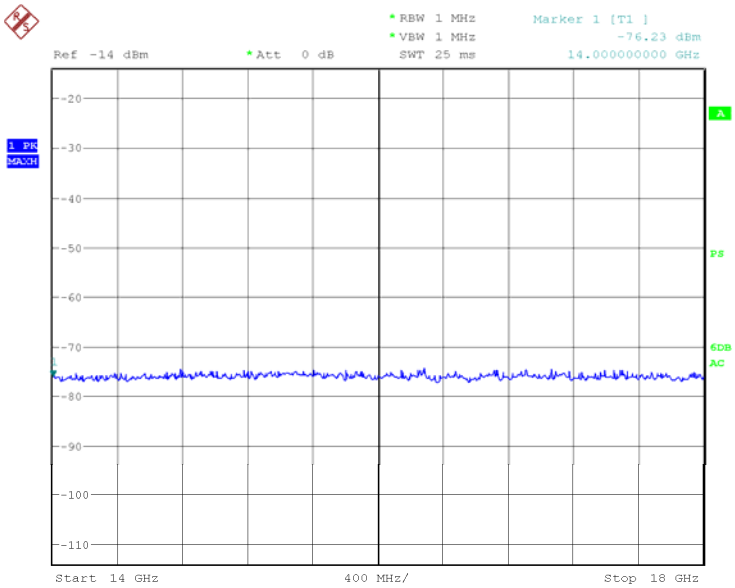
14GHz – 18GHz

Vertical Polarisation



Date: 1.JUN.2008 23:55:53

Horizontal Polarisation

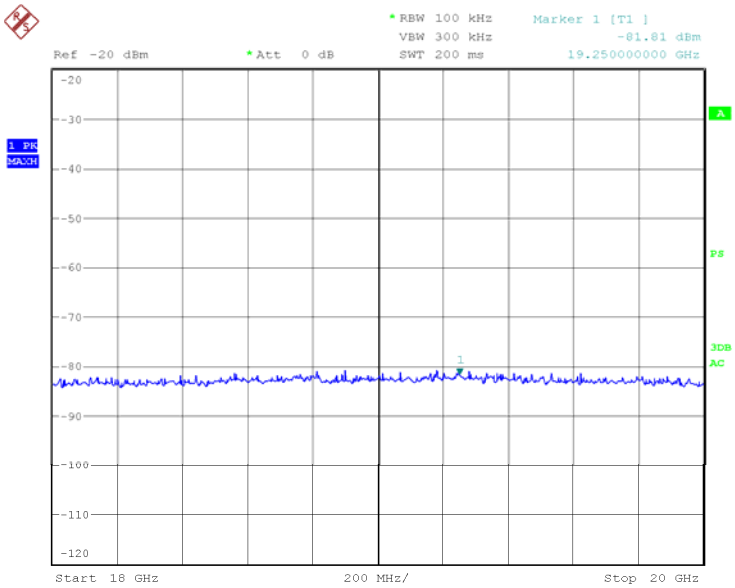


Date: 1.JUN.2008 23:51:57

Product Service

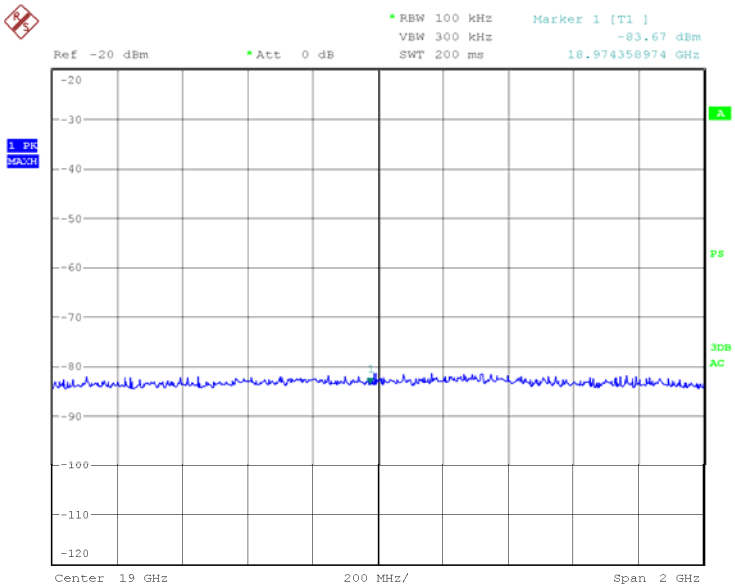
18GHz – 20GHz

Vertical Polarisation



Date: 14.JUN.2008 05:15:03

Horizontal Polarisation



Date: 14.JUN.2008 05:22:19

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: 2005, Clause 7

2.17.2 Equipment Under Test

TH01M Mobile Handset, IMEI: 004401750001147

2.17.3 Date of Test and Modification State

06 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 with no modulation. A Spectrum Analyser was used to measure the frequency error.

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

Configuration 1 - Mode 5

2.17.6 Environmental Conditions

	06 June 2008
Ambient Temperature	20.0°C
Relative Humidity	48%

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	-26	±1.88
-20	1.88	+12	±1.88
-10	1.88	+15	±1.88
0	1.88	+10	±1.88
+10	1.88	+15	±1.88
+20	1.88	+12	±1.88
+30	1.88	-8	±1.88
+40	1.88	-16	±1.88
+50	1.88	-13	±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: 2005, Clause 7

2.18.2 Equipment Under Test

TH01M Mobile Handset, IMEI: 004401750001147

2.18.3 Date of Test and Modification State

06 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. 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 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

	06 June 2008
Ambient Temperature	20.0°C
Relative Humidity	48%

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: 2005 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)
3.70	1.88	-7	±1.88
3.35	1.88	+12	±1.88
4.20	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 and 2.12 EMC - Maximum Output Power					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	27-Oct-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
Antenna, Dipole	Schwarzbeck	UHAP	447	24	7-Sep-2009
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
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	11-Jul-2008
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	15-Mar-2009
Sections 2.1, 2.6, 2.10 and 2.16 EMC - Radiated Emissions					
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	-	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	-	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
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	15-Mar-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					
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	19-Jun-2008
Filter (High Pass)	Lorch	SHP7-7000-SR	566	-	TU
Power Splitter	Weinschel	1506A	607	12	18-Sep-2008
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Test Receiver	Rohde & Schwarz	ESIB26	2085	12	3-Dec-2008
Cable (1m, sma(m) - sma(m)	Reynolds	262-0248-1000	2406	-	TU
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
Power Supply Unit	Various	SC1398	2754	-	TU
Attenuator (3dB)	Suhner	6803.17.B	3026	12	20-Mar-2009
Multimeter	Fluke	77 Series II	3067	12	15-May-2009
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	-	TU
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-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
3 GHz High Pass Filter	K&L 5wave	11SH10-3000/X18000-O/O	3552	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
Cable (1m, sma(m) - sma(m)	Reynolds	262-0248-1000	2406	-	TU
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, 10W)	Aeroflex / Weinschel	23-20-34	3158	-	TU
Thermocouple Thermometer	Fluke	51	3173	12	18-Jun-2008
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-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 Splitter	Weinschel	1506A	607	12	18-Sep-2008
Power Sensor	Hewlett Packard	84812A	2743	12	24-Jan-2009
Power Supply Unit	Various	SC1398	2754	-	TU
Attenuator (3dB)	Suhner	6803.17.B	3026	12	20-Mar-2009
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 2.4 and 2.13 Radio (Tx) - Modulation Characteristics					
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	19-Jun-2008
Test Receiver	Rohde & Schwarz	ESIB26	2085	12	3-Dec-2008
Cable (1m, sma(m) - sma(m)	Reynolds	262-0248-1000	2406	-	TU
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	-	TU
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-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 2.5 and 2.14 Radio (Tx) - Occupied Bandwidth					
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	19-Jun-2008
Power Splitter	Weinschel	1506A	607	12	18-Sep-2008
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	14-May-2009
Test Receiver	Rohde & Schwarz	ESIB26	2085	12	3-Dec-2008
Cable (1m, sma(m) - sma(m)	Reynolds	262-0248-1000	2406	-	TU
Programmable Power Supply	Iso-tech	IPS 2010	2436	12	21-Sep-2008
Power Supply Unit	Various	SC1398	2754	-	TU
Attenuator (3dB)	Suhner	6803.17.B	3026	12	20-Mar-2009
Multimeter	Fluke	77 Series II	3067	12	15-May-2009
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	-	TU
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-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

TU – Traceability Unscheduled
O/P Mon – Output monitored with calibrated equipment

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
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	26MHz to 2.5GHz Test Amplitude	1.4dB†
Conducted Susceptibility	100kHz to 250MHz Amplitude	1.8dB†
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°

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

PHOTOGRAPHS

Product Service

4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)

EUT Front View

EUT Rear View

EUT Rear View with Battery cover removed

Product Service

4.2 PHOTOGRAPHS OF TEST SETUP

Radiated Emissions (Enclosure Port) Test Setup

Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Product Service

5.1 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).