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Report On

FCC Testing of the
Continental Automotive Systems
Quad Band Module

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FCC ID: LHJGNAD1A
IC ID: 2807E- GNAD1A

Document 75903749 Report 02 Issue 2

July 2008



Product Service

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

COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC Testing of the
Continental Automotive Systems
Quad Band Module

Document 75903749 Report 02 Issue 2

July 2008


PREPARED FOR

Temic Automotive of North America, Inc.
Continental Corporation
21440 West Lake Cook Road
Deer Park
IL 60010
United States

PREPARED BY


J Plummer
Technical Author

APPROVED BY


J Adams
Authorised Signatory


M Jenkins
Authorised Signatory

DATED

08 July 2008


This report has been up issued to correct references to GSM 1800 on page 6 to GSM 1900

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. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineers;


P Harrison


B Airs




M P Hardy



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SECTION 1

REPORT SUMMARY

FCC Testing of the
Continental Automotive Systems
Quad Band Module



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Continental Automotive Systems Quad Band Module to the requirements of FCC CFR 47 Part 22: 2006 and FCC CFR 47 Part 24: 2006.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Continental Automotive Nogales S.A. de C.V. Cortinez Lot 6 Parque Industrial 84000 San Carlos Nogales Mexico
Model Number(s)	GNAD1A
Serial Number(s)	N1A006L4WP N1A006L4VC
Software Version	16R
Hardware Version	P6
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 2 May 2008
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PMDE084151 29 April 2008
Start of Test	16 May 2008
Finish of Test	27 May 2008
Name of Engineer(s)	P Harrison B Airs M P Hardy
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 with 5V DC Supply							
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	GSM 850 Link	0	Pass	-
2.2	22.913 (a)	-	Maximum Peak Output Power - Conducted	GSM 850 Link	0	Pass	-
2.3	22.913	RSS-132: 2005, 4.4	Effective Radiated Power	GSM 850 Link	0	Pass	-
2.4	2.1047(d)	-	Modulation Characteristics	GSM 850 Link	0	Pass	-
2.5	2.1049, 22.917 (b)	RSS-132, 4.2	Occupied Bandwidth	GSM 850 Link	0	Pass	-
2.6	22.917	RSS-132, 4.2	Emission limitations for Cellular Equipment	GSM 850 Link	0	Pass	-
2.7	2.1051, 22.917(a)	-	Conducted Spurious Emissions	GSM 850 Link	0	Pass	-
2.8	2.1055, 22.355	RSS-132, 4.3	Frequency Stability Under Temperature Variations	GSM 850 Link	0	Pass	-
2.9	2.1055, 22.355	-	Frequency Stability Under Voltage Variations	GSM 850 Link	0	Pass	-



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

Configuration 1 - EUT with 5V DC Supply							
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	GSM 1900 Link	0	Pass	-
2.11	2.1046, 24.232	-	Maximum Peak Output Power – Conducted	GSM 1900 Link	0	Pass	-
2.12	24.232(c)	RSS-133, 6.2	EIRP Peak Power	GSM 1900 Link	0	Pass	-
2.13	2.1047(d)	RSS-132: 2005, 4.4	Modulation Characteristics	GSM 1900 Link	0	Pass	-
2.14	2.1049, 24.238(b)	-	Occupied Bandwidth	GSM 1900 Link	0	Pass	-
2.15	2.1051, 24.238(a)	-	Conducted Spurious Emissions	GSM 1900 Link	0	Pass	-
2.16	2.1051, 24.238	RSS-133, 6.3	Emissions for broadband PCS Equipment	GSM 1900 Link	0	Pass	-
2.17	2.1055, 24.135(a)	RSS-133, 7	Frequency Stability Under Temperature Variations	GSM 1900 Link	0	Pass	-
2.18	2.1055, 24.135(a)	RSS-133, 7	Frequency Stability Under Voltage Variations	GSM 1900 Link	0	Pass	-



1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	
MANUFACTURER	Temic Automotive of North America, Inc.
TYPE	Quad band GSM module
PART NUMBER	GNAD1A
SERIAL NUMBER	N1A006L4VC, N1A006L4WP, N1A006L4WN
HARDWARE VERSION	P6
SOFTWARE VERSION	16R
TRANSMITTER OPERATING RANGE	GSM 850/900/1800/1900
RECEIVER OPERATING RANGE	GSM 850/900/1800/1900
COUNTRY OF ORIGIN	Mexico
INTERMEDIATE FREQUENCIES	Not relevant
ITU DESIGNATION OF EMISSION	Not relevant
HIGHEST INTERNALLY GENERATED FREQUENCY	3980 MHz
OUTPUT POWER (W or dBm)	850/900 MHz - class 4 (2 Watt) 1800/1900 MHz - Class 1 (1 Watt)
FCC ID	LHJGNAD1A
INDUSTRY CANADA ID	2807E- GNAD1A
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The intended use is in automotive applications, e.g. telematic control units, emergency call functionality
BATTERY/POWER SUPPLY	
MANUFACTURING DESCRIPTION	Not Applicable
MANUFACTURER	Not Applicable
TYPE	Powered by device which integrates the module. The device itself will be powered by 12 VDC car battery.
PART NUMBER	Not Applicable
VOLTAGE	Minimum 4,5 VDC, nominal 5,0 VDC, maximum 5,5 VDC
COUNTRY OF ORIGIN	Not Applicable
MODULES (Not Applicable)	
ANCILLARIES (Not Applicable)	

Signature : Completed Electronically

Date: 16 May 2008

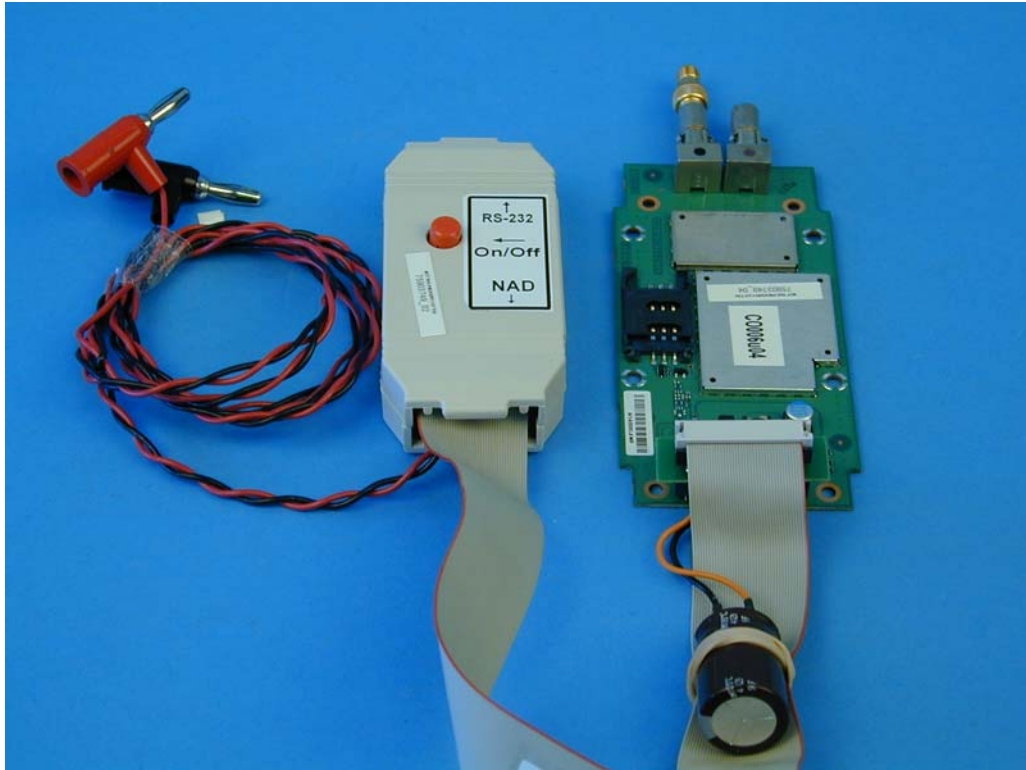
Declaration of Build Status Serial Number: 75903749



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Continental Automotive Systems Quad Band Module 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 5V 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 - GSM 850 Link

Mode 2 - GSM 1900 Link

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 5V DC (Vehicular) supply.

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.



Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
Continental Automotive Systems
Quad Band Module



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, 4.5

2.1.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.1.3 Date of Test and Modification State

23 May 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.

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

Configuration 1 - Mode 1

2.1.6 Environmental Conditions

23 May 2008

Ambient Temperature 23°C

Relative Humidity 46%



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 : 824MHz	-
A (845.0 – 846.5)	-	Channel : 238 Frequency : 846MHz
B (846.5 – 849.0)	-	Channel : 250 Frequency : 848MHz

5V Supply



Configuration 1 - Mode 1

Maximum Power – GMSK, Time slot 3

Frequency Block MHz	Lower Block Edge Test Channels/Frequencies
824.0 – 849.0 Lower	Channel : 128 Frequency : 824.2 MHz
824.0 – 849.0 Upper	Channel : 251 Frequency : 848.6 MHz

Maximum Power – GPRS, Time slot 3

Frequency Block MHz	Lower Block Edge Test Channels/Frequencies
824.0 – 849.0 Lower	Channel : 128 Frequency : 824.2 MHz
824.0 – 849.0 Upper	Channel : 251 Frequency : 848.6 MHz

Maximum Power – EDGE, Time slot 3

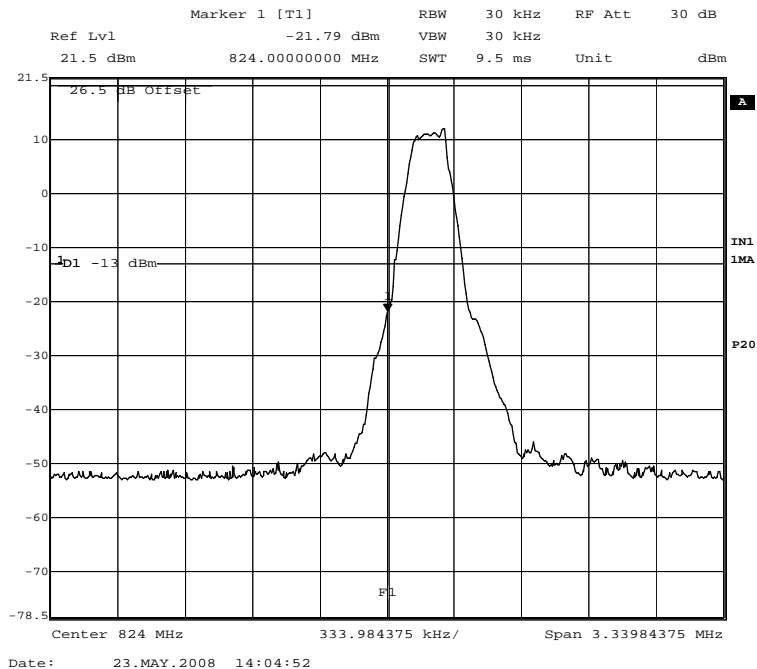
Frequency Block MHz	Lower Block Edge Test Channels/Frequencies
824.0 – 849.0 Lower	Channel : 128 Frequency : 824.2 MHz
824.0 – 849.0 Upper	Channel : 251 Frequency : 848.6 MHz

Limit	≤-13dBm at Block Edge
-------	-----------------------

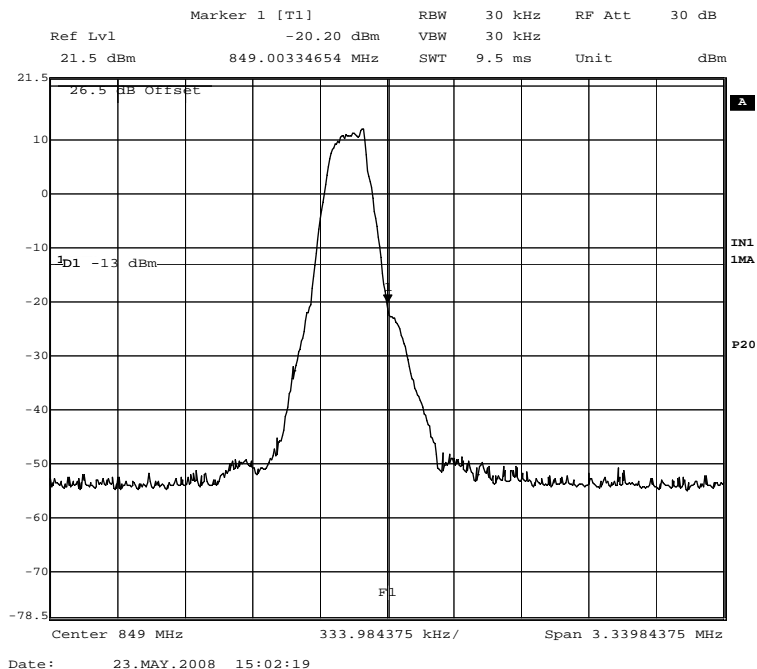


Maximum Power - GMSK

Frequency Block A



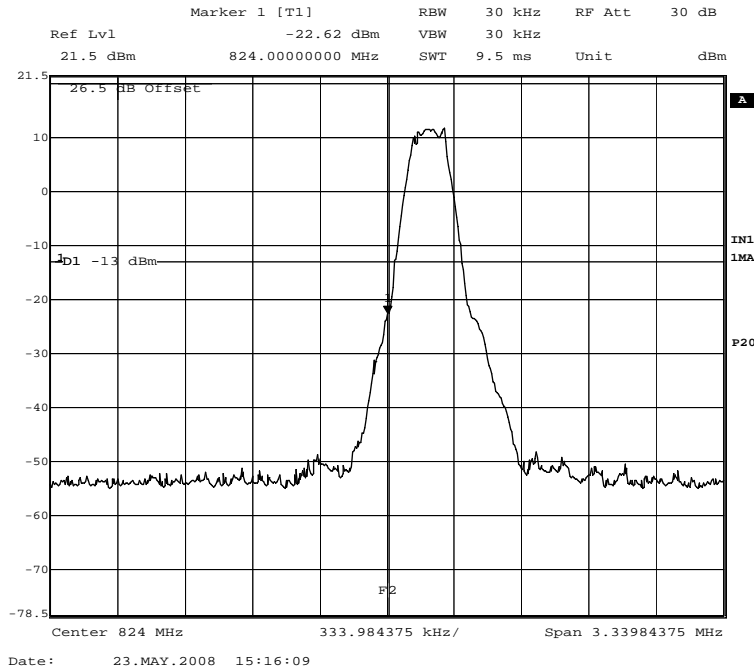
Frequency Block B



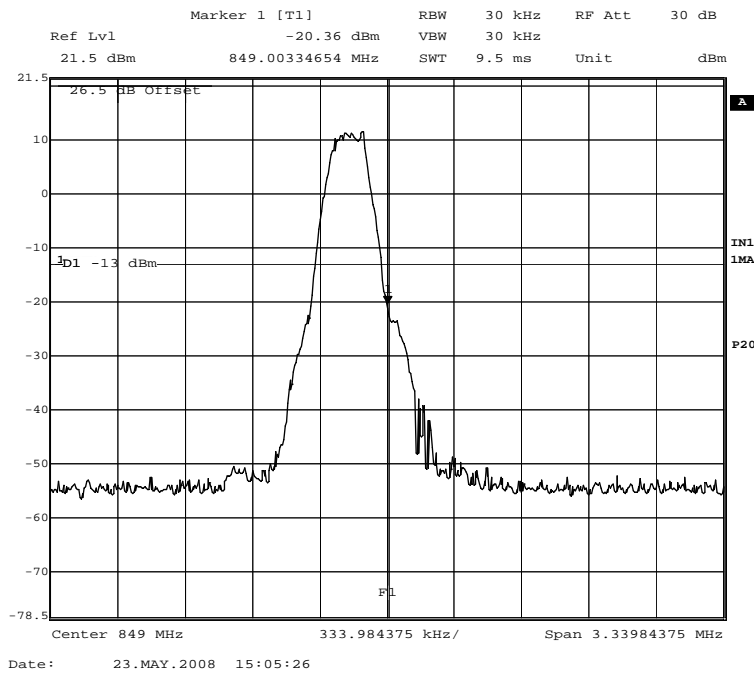


Maximum Power - GPRS

Frequency Block A



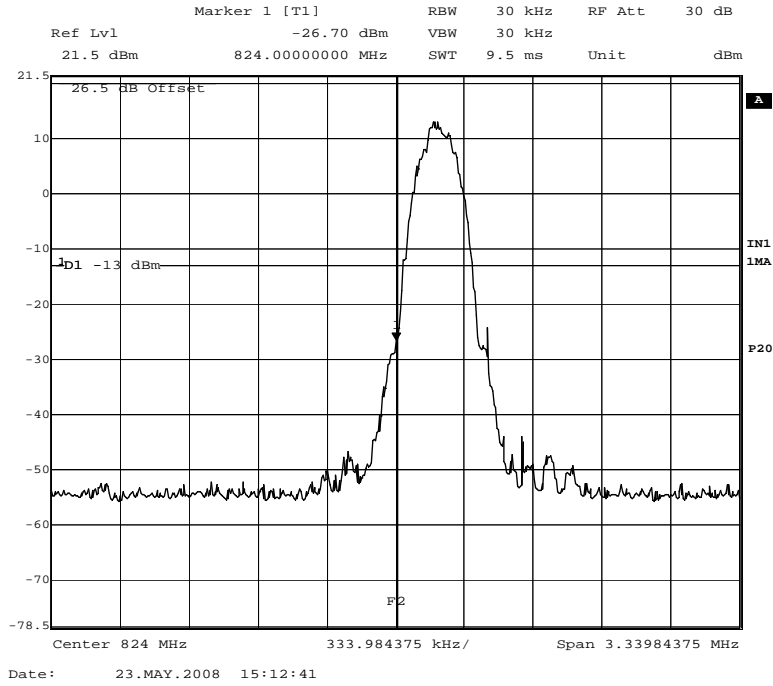
Frequency Block B



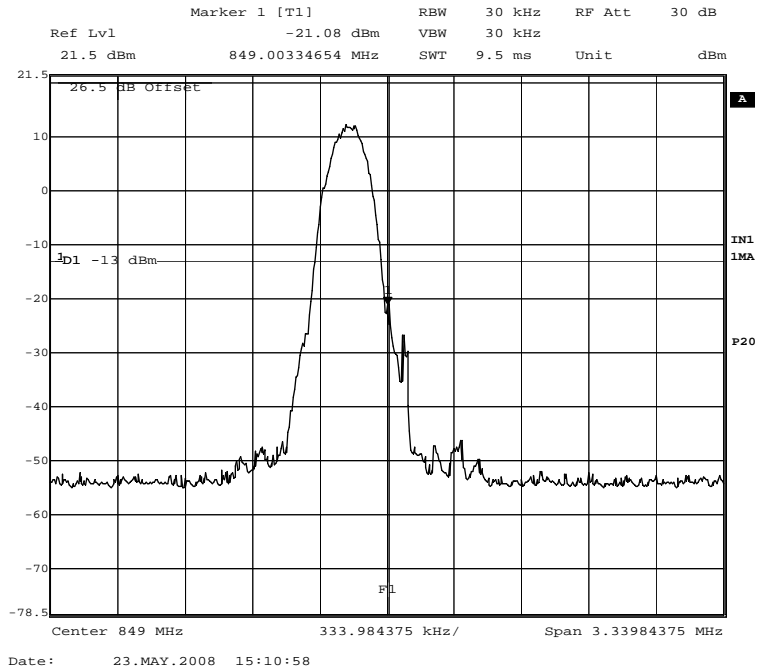


Maximum Power - EDGE

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, 4.4

2.2.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.2.3 Date of Test and Modification State

16 May 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.

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

Configuration 1 - Mode 1

2.2.6 Environmental Conditions

	16 May 2008
Ambient Temperature	21.7°C
Relative Humidity	45.2%



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

5V Supply

Maximum Power – GMSK

Frequency (MHz)	Result (dBm)	Result (W)
848.8	32.12	1.629
836.4	31.99	1.51
824.2	32.00	1.584

Maximum Power – GPRS

Frequency (MHz)	Result (dBm)	Result (W)
848.8	32.14	1.636
836.4	32.06	1.606
824.2	31.97	1.573

Maximum Power – EGPRS

Frequency (MHz)	Result (dBm)	Result (W)
848.8	32.08	1.614
836.4	31.95	1.566
824.2	31.92	1.555

Limit	7W
-------	----



Product Service

2.3 EFFECTIVE RADIATED POWER

2.3.1 Specification Reference

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

2.3.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4VC

2.3.3 Date of Test and Modification State

27 May 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

2.3.6 Environmental Conditions

27 May 2008

Ambient Temperature 18.2°C

Relative Humidity 52%

Atmospheric Pressure 1003mbar



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

Frequency GHz	ERP (dBm)	Limit (dBm)	ERP (W)	Limit (W)
824.19	32.10	38.00	1.62	7.00
836.37	32.83	38.00	1.92	7.00
848.74	33.00	38.00	2.00	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

Quad Band Module, S/N: N1A006L4WP

2.4.3 Date of Test and Modification State

16 May 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.

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

Configuration 1 - Mode 1

2.4.6 Environmental Conditions

	16 May 2008
Ambient Temperature	21.7°C
Relative Humidity	45.2%



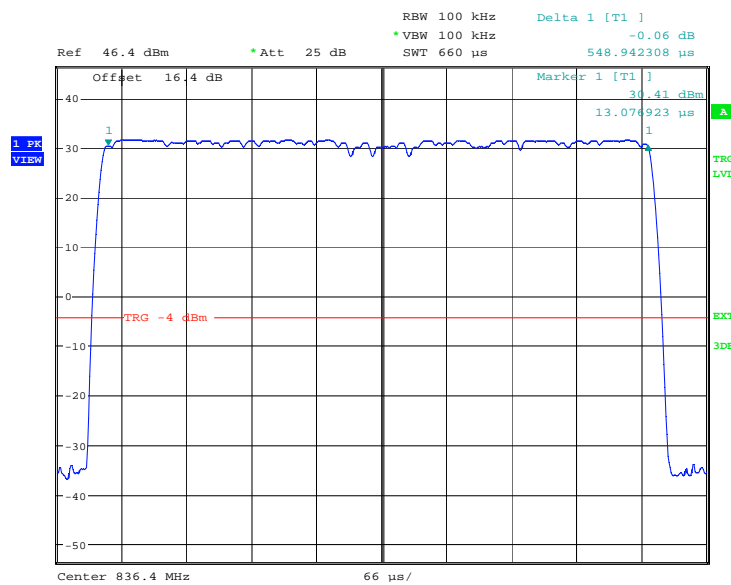
2.4.7 Test Results

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 one timeslot (GSM)

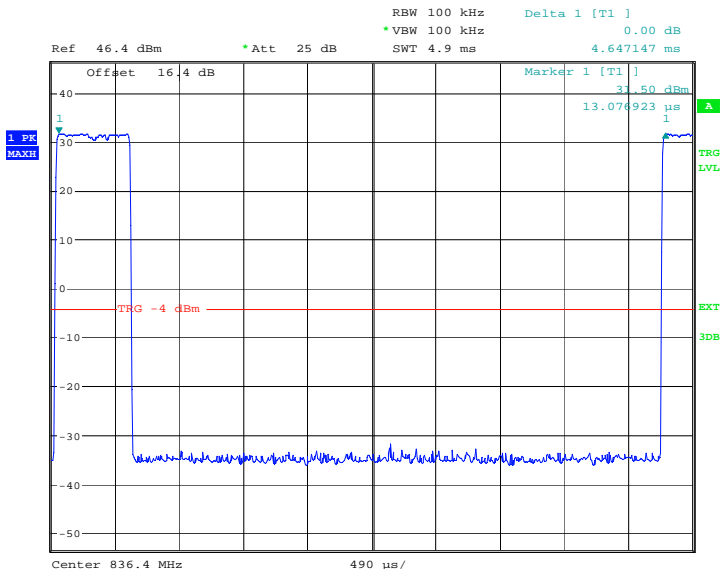


Date: 16.MAY.2008 13:40:37



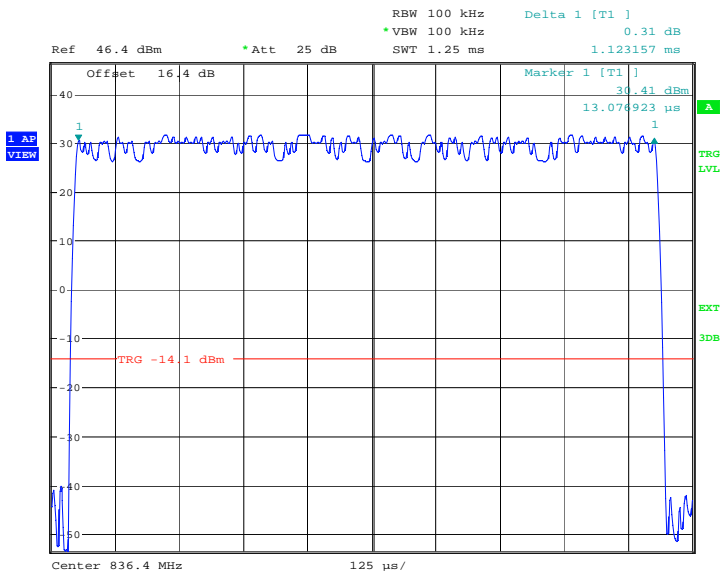
Product Service

EUT Transmitting with GMSK modulation showing one frame with one timeslot active (GSM)



Date: 16.MAY.2008 13:41:55

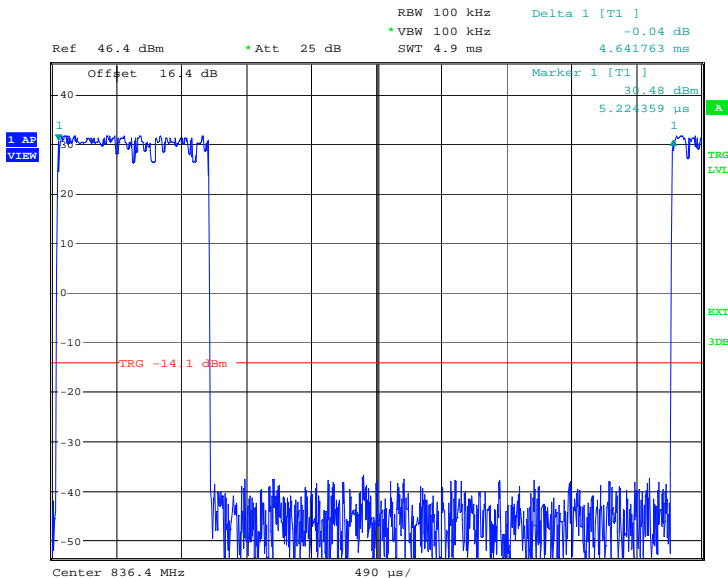
EUT Transmitting with GMSK modulation showing two timeslot (GPRS)



Date: 16.MAY.2008 13:52:29

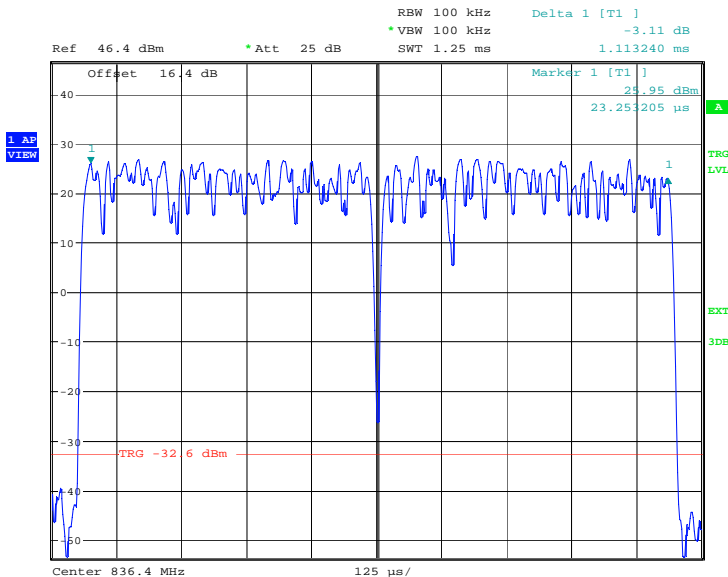


EUT Transmitting with GMSK modulation showing one frame with two timeslot active (GPRS)



Date: 16.MAY.2008 14:01:55

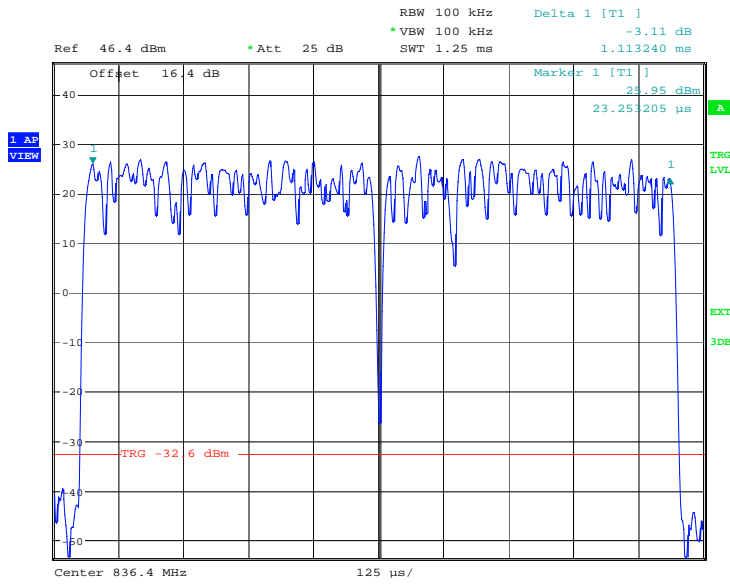
EUT Transmitting with 8PSK modulation showing two timeslot (EGPRS)



Date: 16.MAY.2008 14:10:24



EUT Transmitting with 8PSK modulation showing one frame with two timeslot active (EGPRS)



Date: 16.MAY.2008 14:10:24



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, 4.2

2.5.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.5.3 Date of Test and Modification State

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

Configuration 1 - Mode 1

2.5.6 Environmental Conditions

	16 May 2008
Ambient Temperature	20.7°C
Relative Humidity	49.5%



Product Service

2.5.7 Test Results

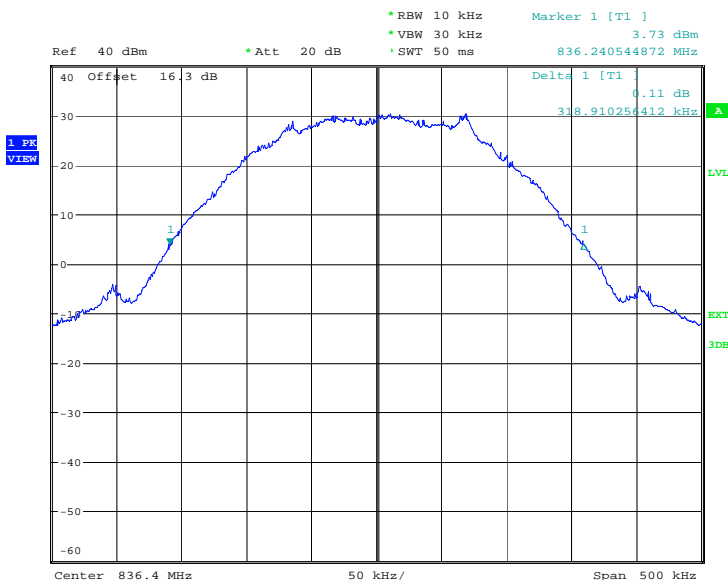
For the period of test the EUT met the requirements of FCC CFR 47 Part 22: 2006 and RSS-132 for Occupied Bandwidth.

The test results are shown below.

Configuration 1 - Mode 1

Occupied Bandwidth As Defined By The -26dBc Points

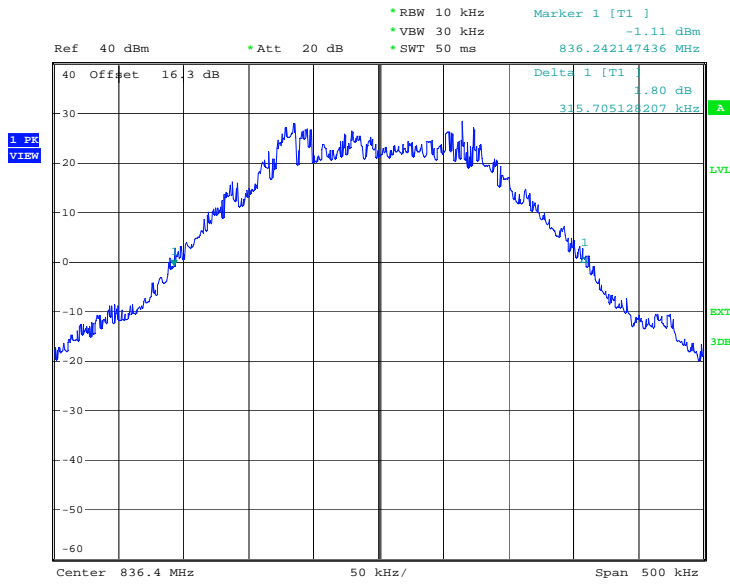
Maximum Power – GPRS



Date: 16.MAY.2008 11:14:41



Maximum Power – EGPRS



Date: 16.MAY.2008 11:19:03



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, 4.2

2.6.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4VC

2.6.3 Date of Test and Modification State

27 May 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

2.6.6 Environmental Conditions

	27 May 2008
Ambient Temperature	18.2°C
Relative Humidity	52%
Atmospheric Pressure	1003mbar



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.

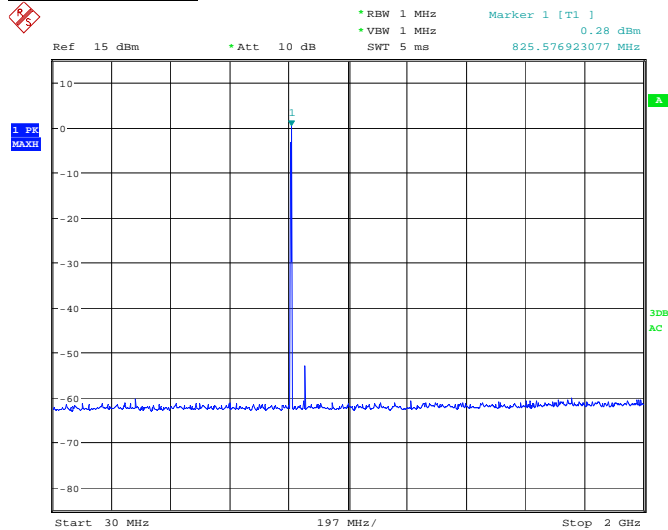
The test results are shown below.

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

Configuration 1 - Mode 1

Bottom Channel

30MHz to 2GHz

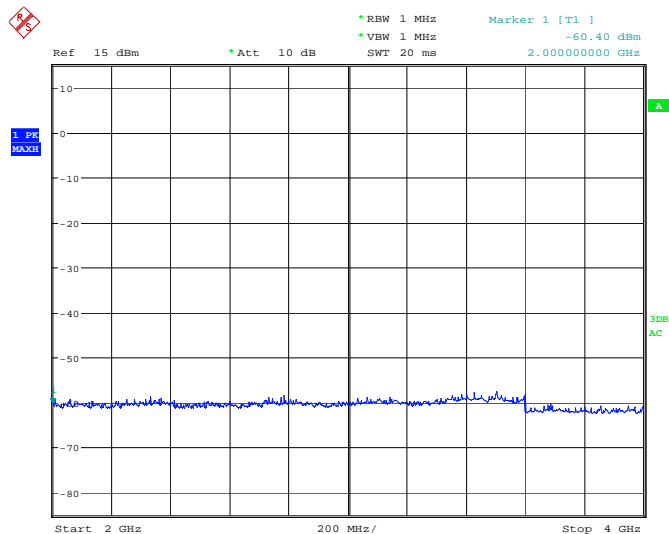


Date: 27.MAY.2008 20:41:50



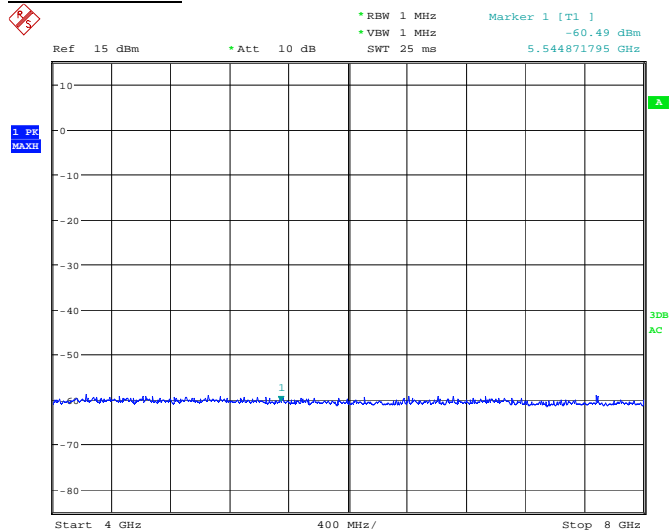
Product Service

2GHz to 4GHz



Date: 27.MAY.2008 21:27:21

4GHz to 8GHz

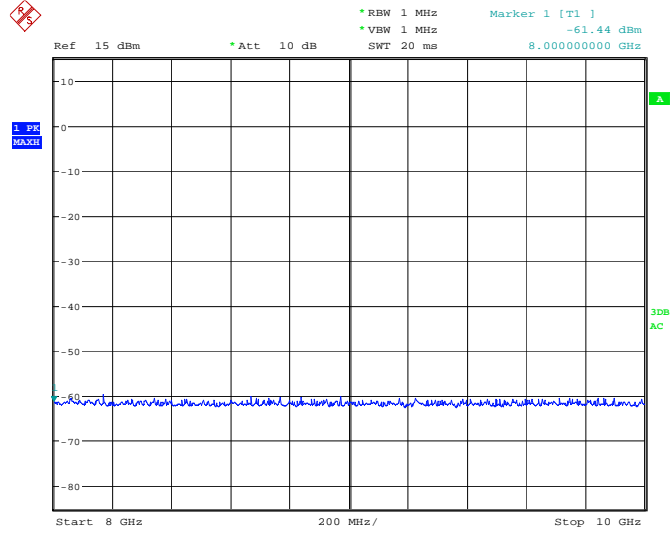


Date: 27.MAY.2008 21:54:06



Product Service

8GHz to 10GHz

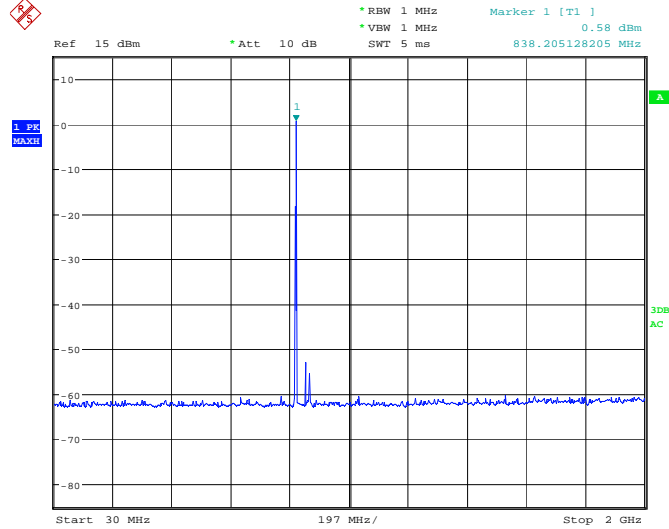


Date: 27.MAY.2008 22:11:43



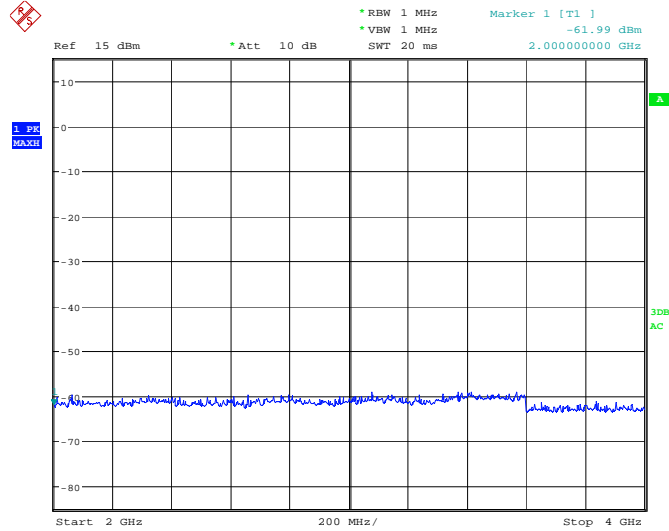
Middle Channel

30MHz to 2GHz



Date: 27.MAY.2008 20:32:03

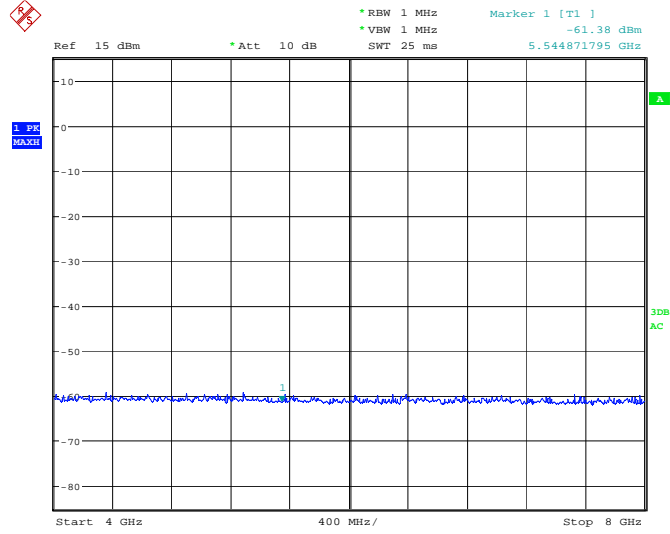
2GHz to 4GHz



Date: 27.MAY.2008 21:27:50

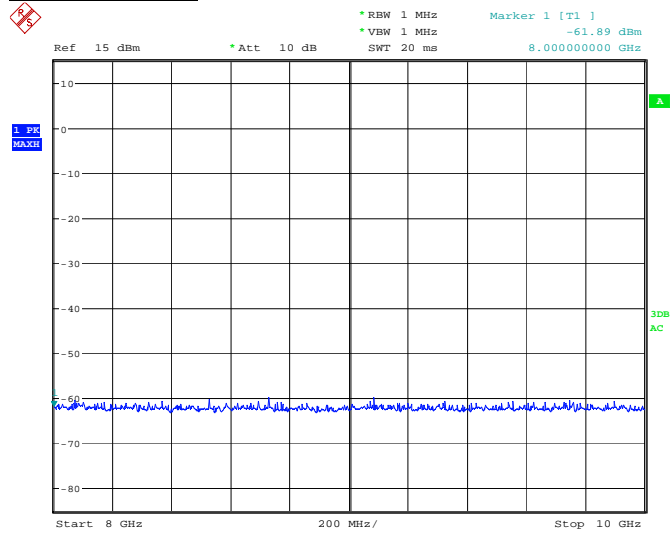


4GHz to 8GHz



Date: 27.MAY.2008 21:56:33

8GHz to 10GHz



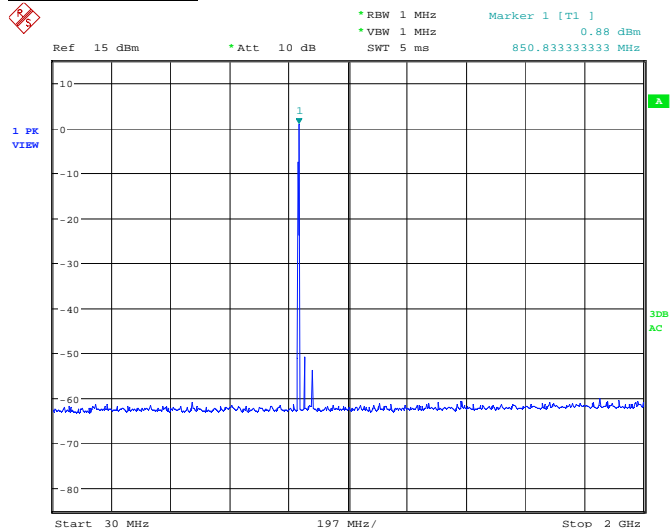
Date: 27.MAY.2008 22:12:05



Product Service

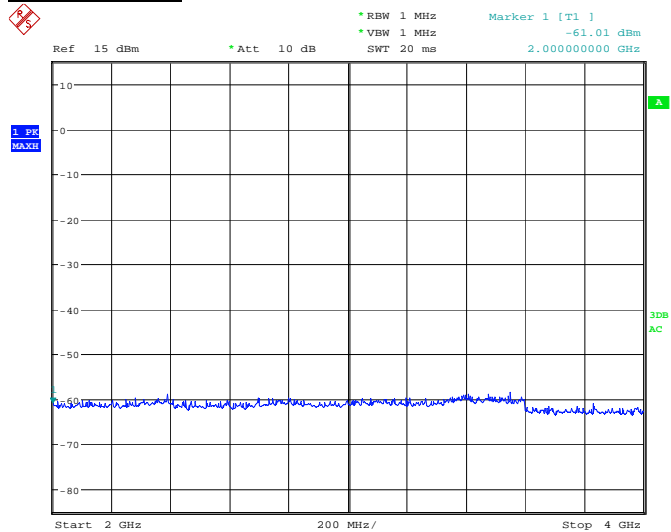
Top Channel

30MHz to 2GHz



Date: 27.MAY.2008 20:22:02

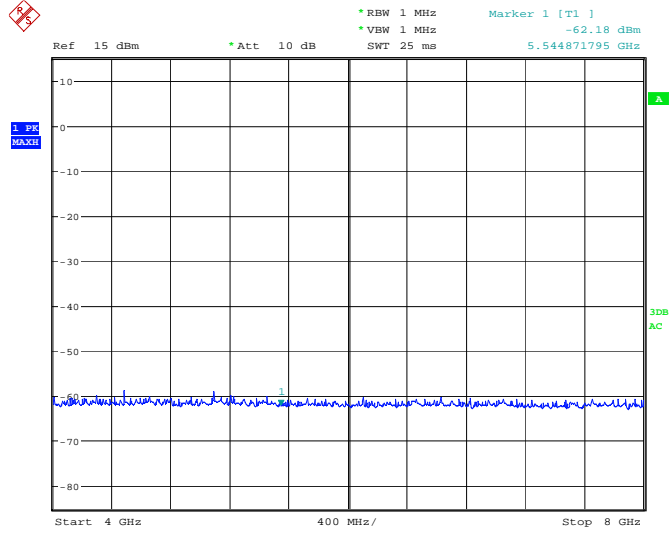
2GHz to 4GHz



Date: 27.MAY.2008 21:28:20

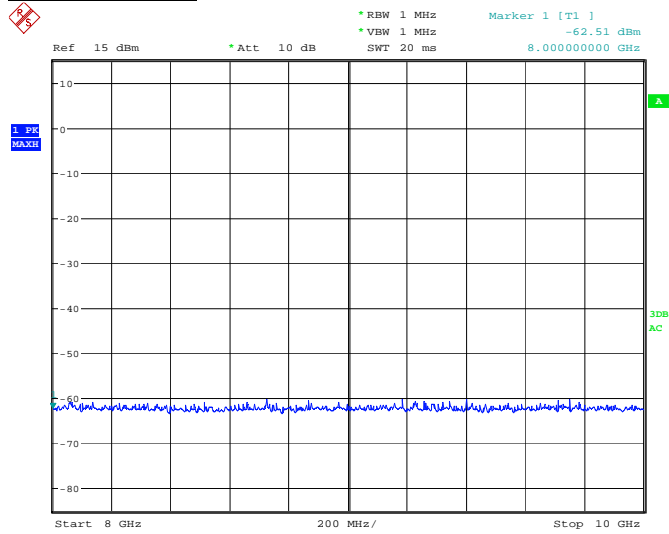


4GHz to 8GHz



Date: 27.MAY.2008 21:56:54

8GHz to 10GHz



Date: 27.MAY.2008 22:12:18



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

Quad Band Module, S/N: N1A006L4WP

2.7.3 Date of Test and Modification State

20 May 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 and RSS-132: 2005.

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

Configuration 1 - Mode 1

2.7.6 Environmental Conditions

	20 May 2008
Ambient Temperature	18.2°C
Relative Humidity	52%
Atmospheric Pressure	1003mbar



Product Service

2.7.7 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.

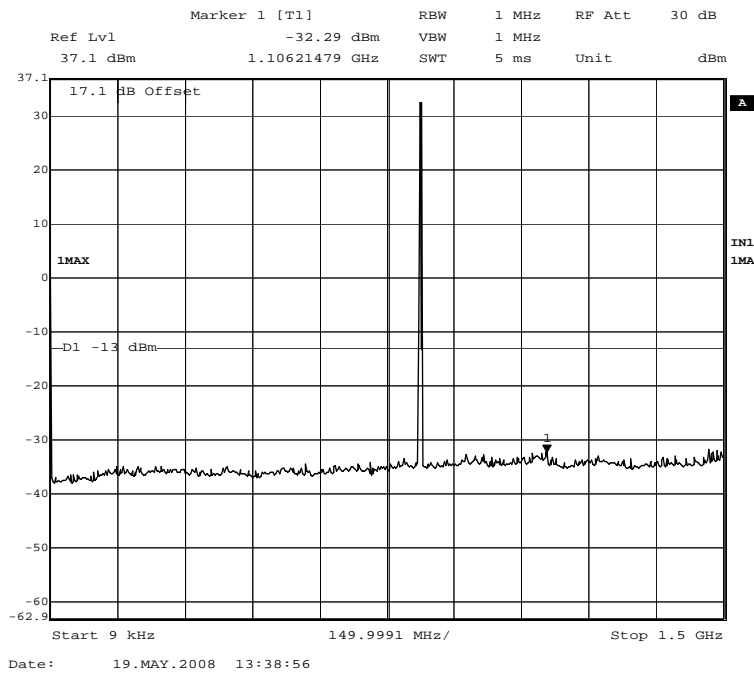
Configuration 1 - Mode 1

5V Supply

Channel 128, (824.2MHz) – Maximum Power

Spurious Emissions (9kHz – 1.5GHz)

GMSK



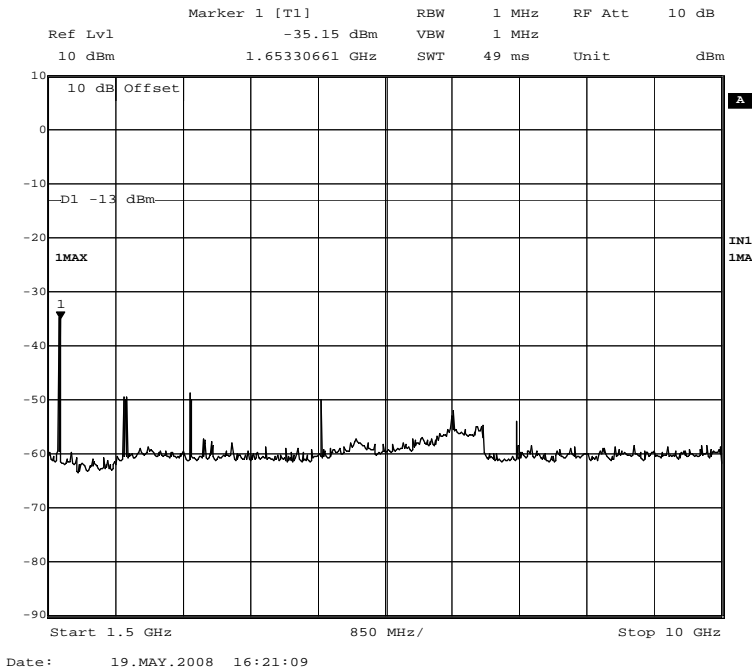


Product Service

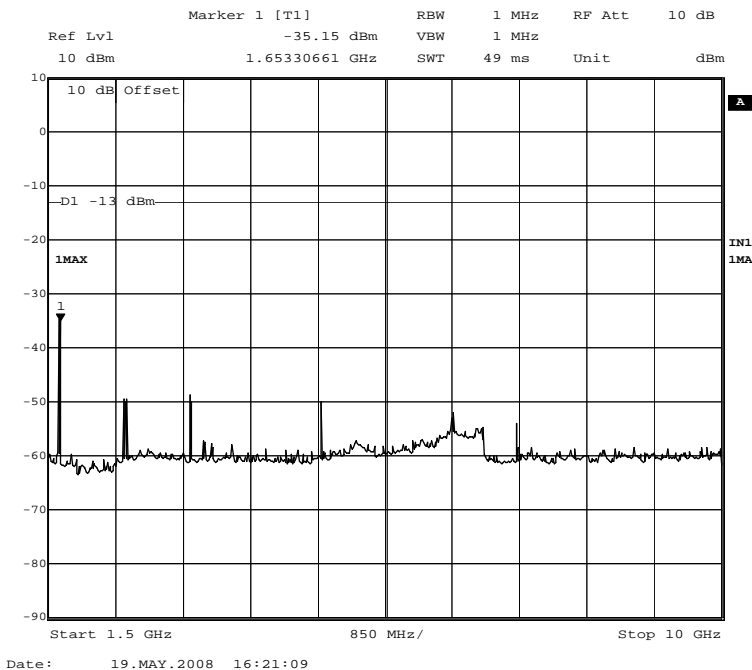
Spurious Emissions (1.5GHz – 10.0GHz)

Channel 128, (824.2MHz) – Maximum Power

GMSK



GPRS (GMSK)



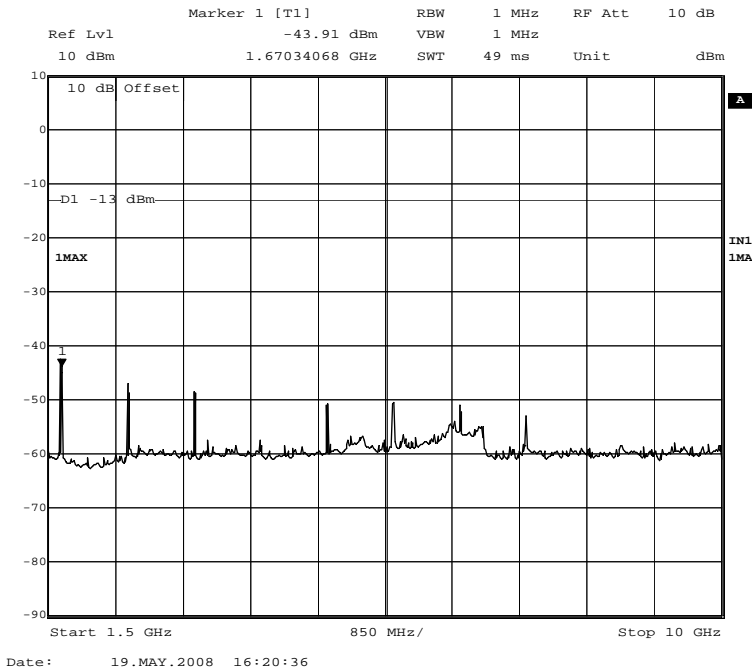


Product Service

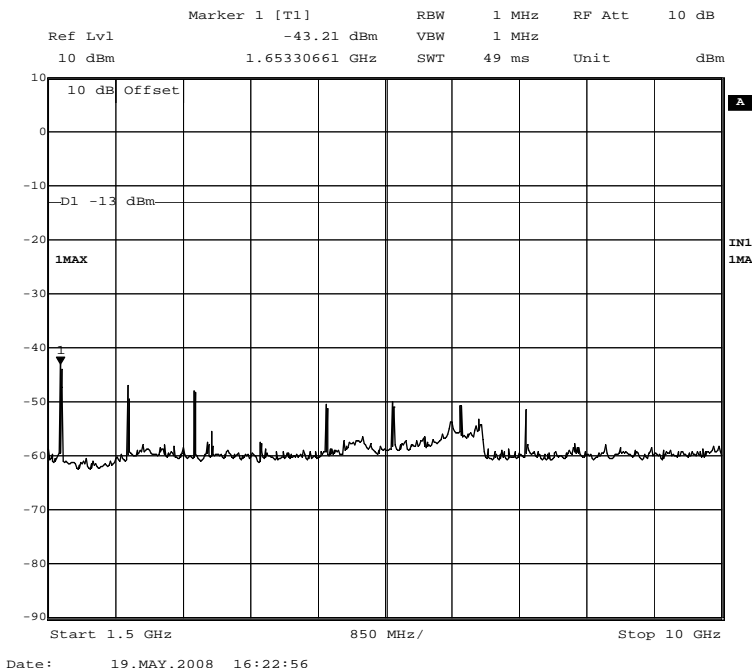
Spurious Emissions (1.5GHz – 10.0GHz)

Channel 189, (836.4MHz) – Maximum Power

GMSK

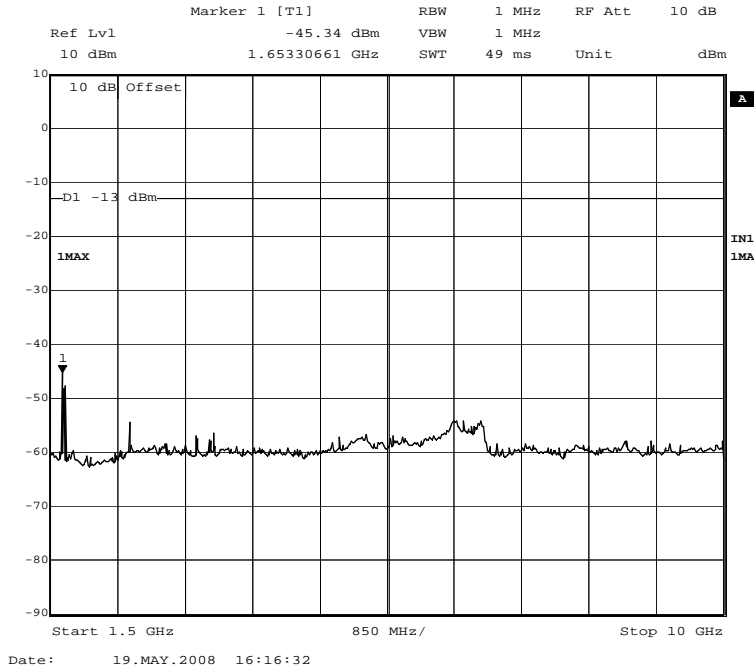


GPRS (GMSK)





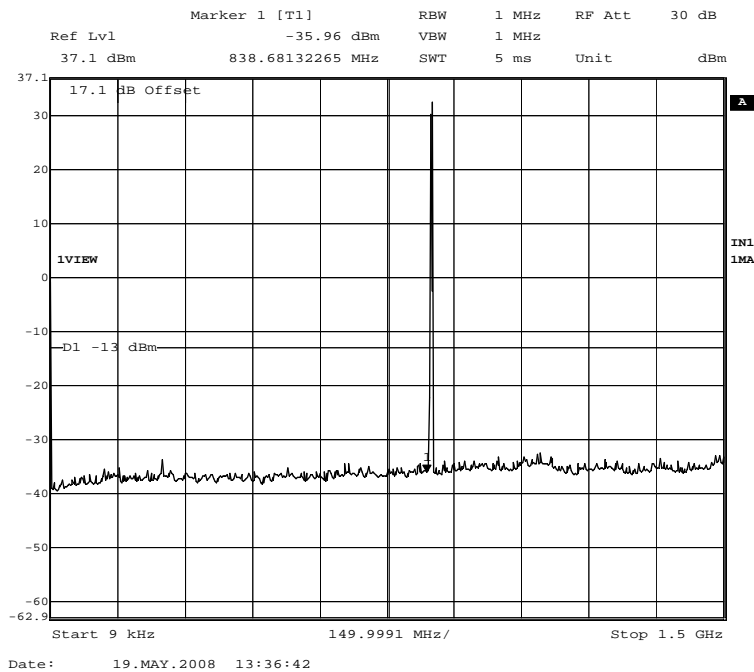
EGPRS (8PSK)



Channel 251, (848.8MHz) – Maximum Power

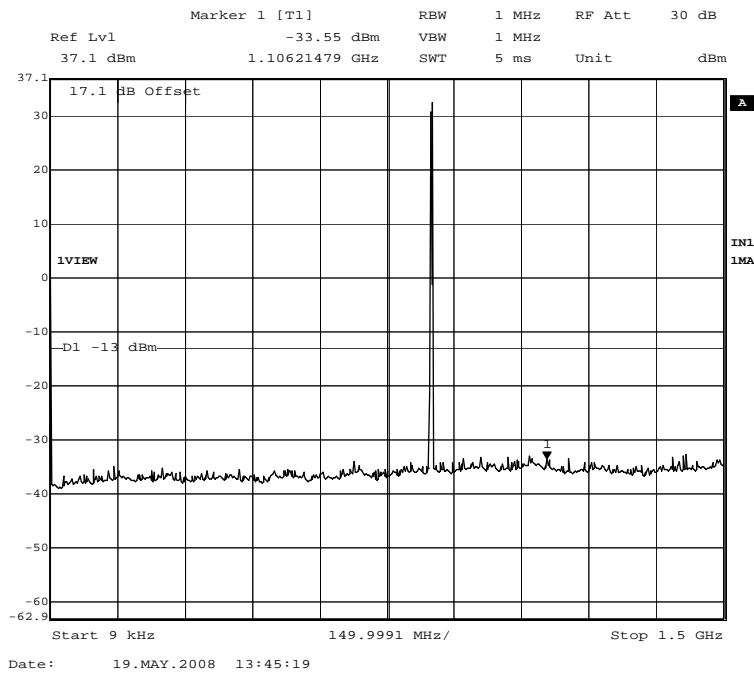
Spurious Emissions (9kHz – 1.5GHz)

GMSK

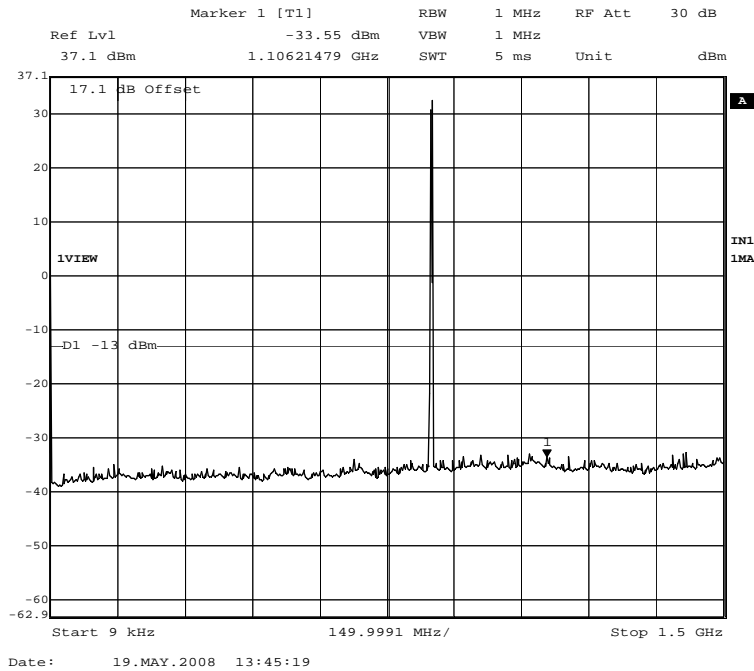




GPRS (GMSK)



EGPRS (8PSK)

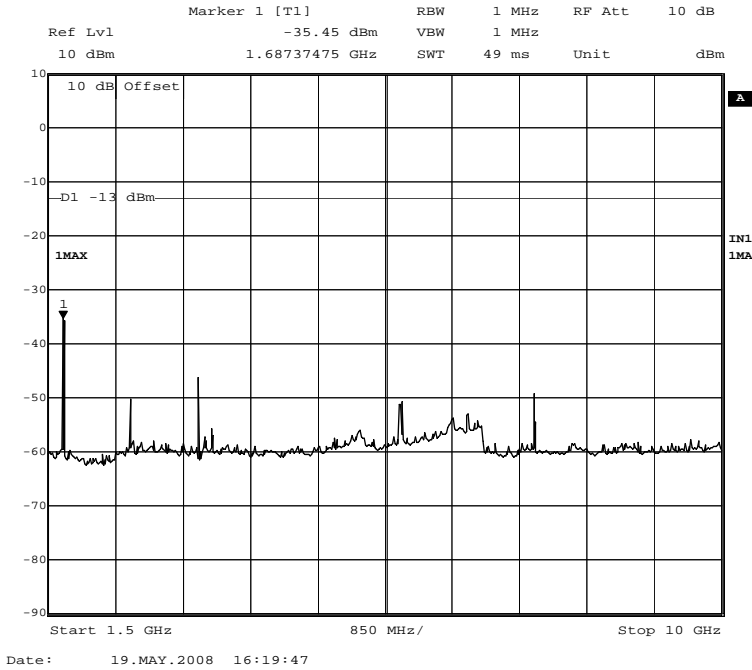




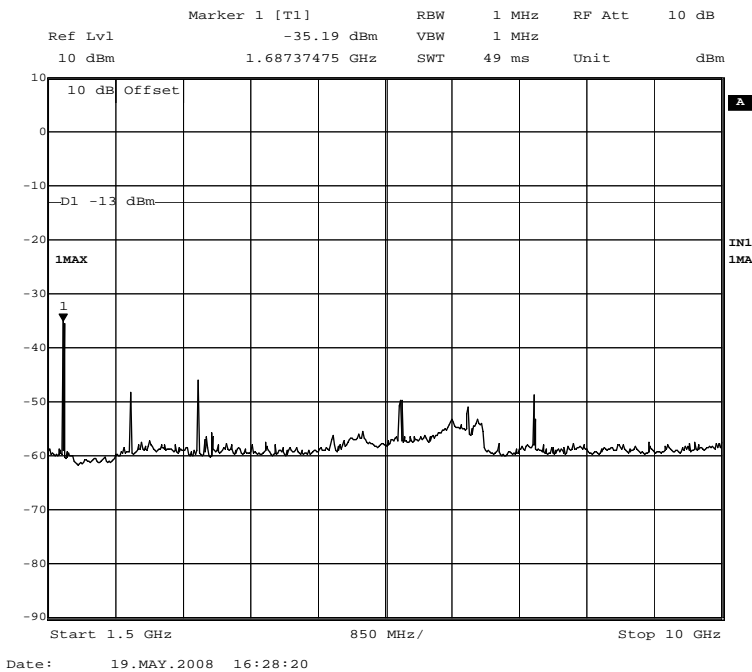
Spurious Emissions (1.5GHz – 10.0GHz)

Channel 189, (836.4MHz) – Maximum Power

GMSK

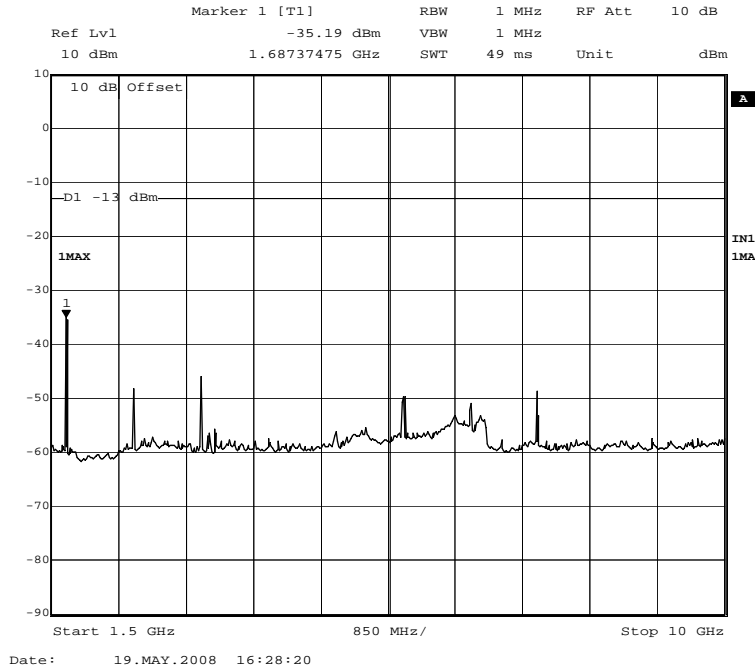


GPRS (GMSK)





EGPRS (8PSK)





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, 4.2

2.8.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.8.3 Date of Test and Modification State

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

Configuration 1 - Mode 1

2.8.6 Environmental Conditions

	21 May 2008
Ambient Temperature	20.0°C
Relative Humidity	48%



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 1

5V Supply

GMSK – Circuit Switched

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (kHz)
-30	836.400	48	±2.092
-20	836.400	45	±2.092
-10	836.400	35	±2.092
0	836.400	39	±2.092
+10	836.400	42	±2.092
+20	836.400	34	±2.092
+30	836.400	37	±2.092
+40	836.400	50	±2.092
+50	836.400	51	±2.092

GMSK – Packet Switched

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (kHz)
-30	836.400	33	±2.092
-20	836.400	-39	±2.092
-10	836.400	-48	±2.092
0	836.400	-61	±2.092
+10	836.400	-34	±2.092
+20	836.400	-38	±2.092
+30	836.400	-48	±2.092
+40	836.400	36	±2.092
+50	836.400	37	±2.092

8PSK – Packet Switched

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (kHz)
-30	836.400	39	±2.092
-20	836.400	-50	±2.092
-10	836.400	-46	±2.092
0	836.400	36	±2.092
+10	836.400	31	±2.092
+20	836.400	-44	±2.092
+30	836.400	-34	±2.092
+40	836.400	38	±2.092
+50	836.400	37	±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

Quad Band Module, S/N: N1A006L4WP

2.9.3 Date of Test and Modification State

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

Configuration 1 - Mode 1

2.9.6 Environmental Conditions

22 May 2008

Ambient Temperature 20.0°C

Relative Humidity 48%



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 1

5V Supply

GMSK – Circuit Switched

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Deviation Limit (kHz)
4.25	836.400	35	±2.092
5.75	836.400	37	±2.092

GMSK – Packet Switched

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Deviation Limit (kHz)
4.25	836.400	-47	±2.092
5.75	836.400	-49	±2.092

8PSK – Packet Switched

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Deviation Limit (kHz)
4.25	836.400	-48	±2.092
5.75	836.400	-51	±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, 6.5

2.10.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.10.3 Date of Test and Modification State

23 May 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.

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

Configuration 1 - Mode 2

2.10.6 Environmental Conditions

23 May 2008

Ambient Temperature 23°C

Relative Humidity 46%



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.

5V Supply

Configuration 1 - Mode 2

Maximum Power – GMSK, Time slot 3

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

Maximum Power – GPRS, Time slot 3

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

Maximum Power – EDGE, Time slot 3

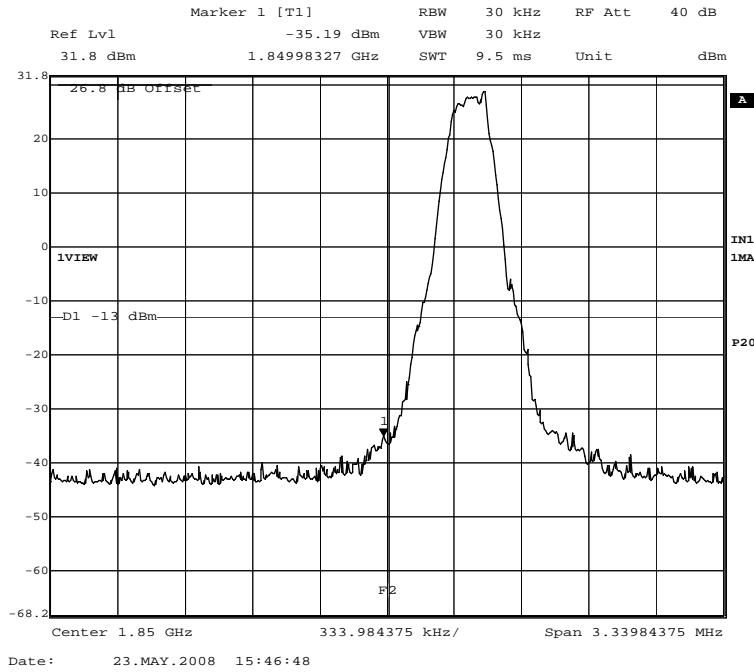
Frequency Block	Lower Block Edge Test Channels/Frequencies
A	Channel : 513 Frequency : 1850.4 MHz
C	Channel : 809 Frequency : 1909.6 MHz

Limit	≤-13dBm at Block Edge
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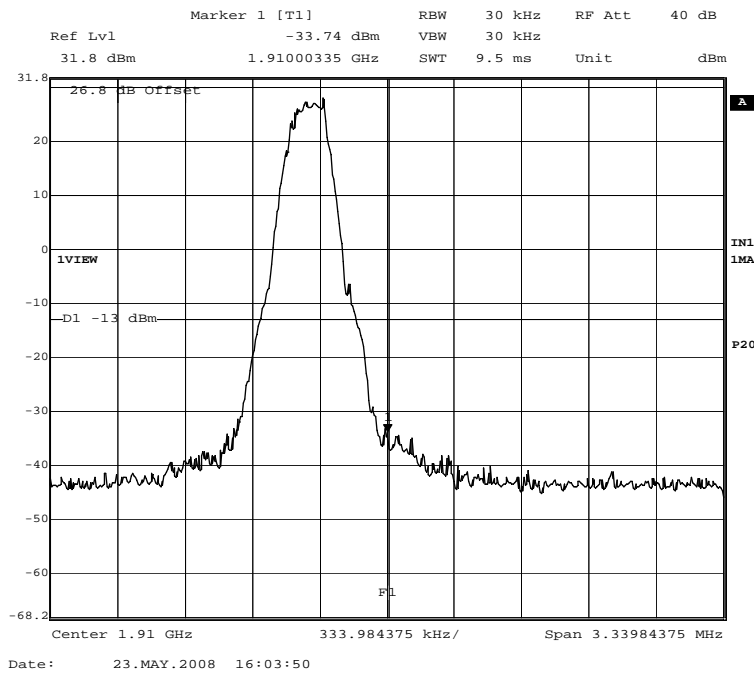


Maximum Power - GMSK

Frequency Block A



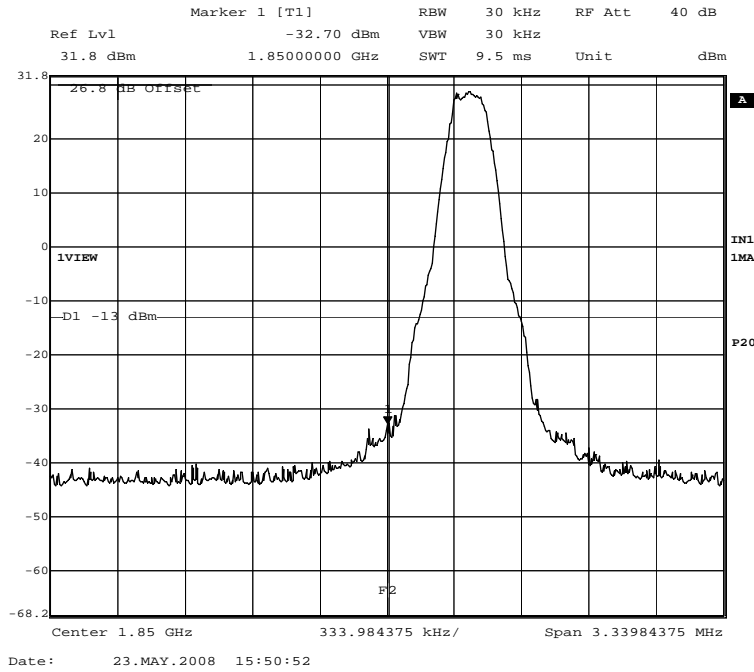
Frequency Block C



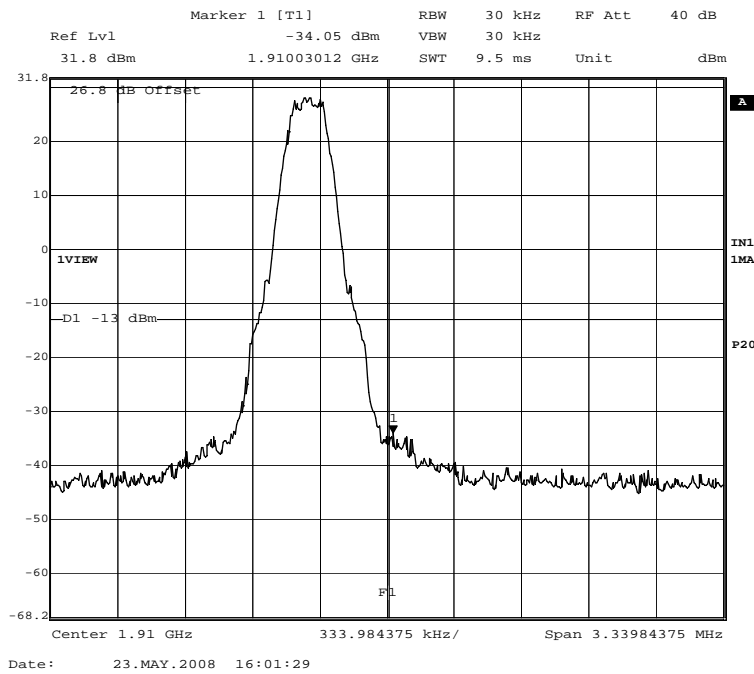


Maximum Power - GPSK

Frequency Block A



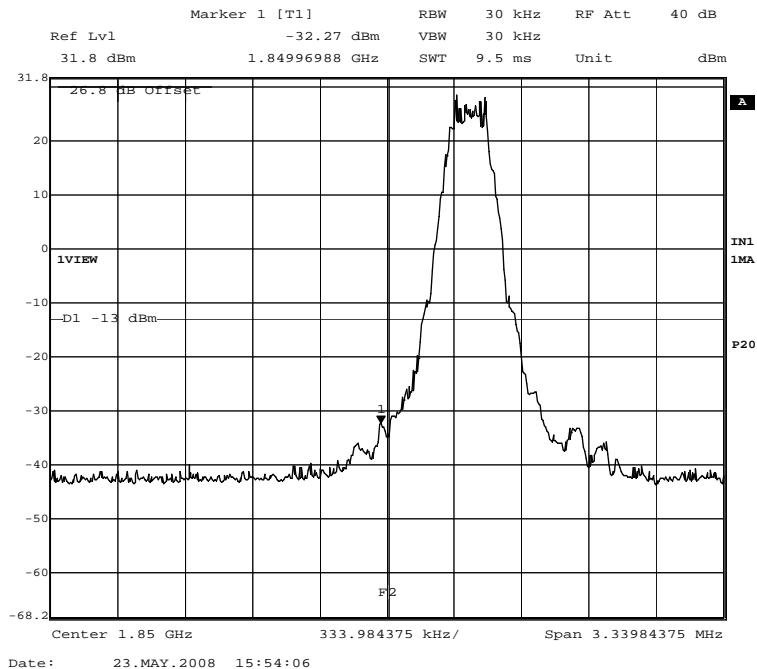
Frequency Block C



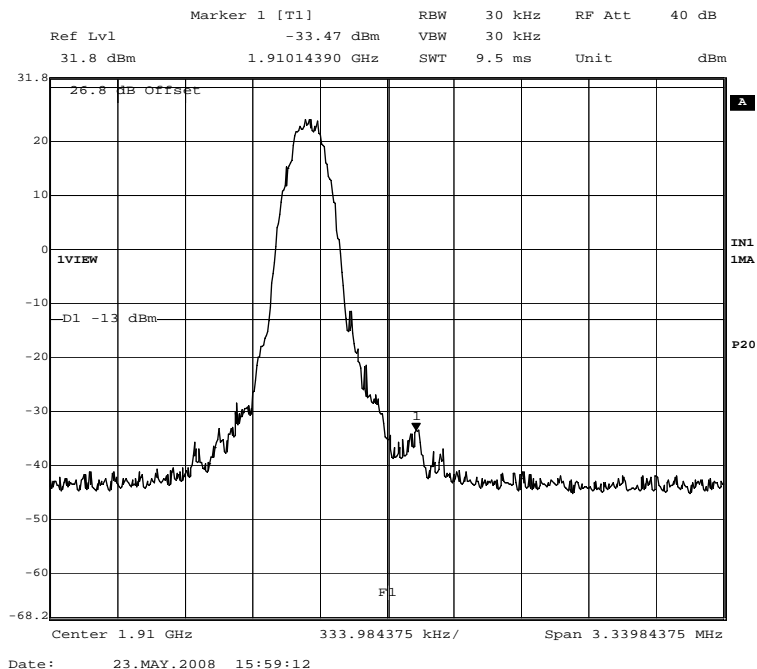


Maximum Power - EDGE

Frequency Block A



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, 6.2

2.11.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.11.3 Date of Test and Modification State

16 May 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.

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

Configuration 1 - Mode 2

2.11.6 Environmental Conditions

	16 May 2008
Ambient Temperature	20.3°C
Relative Humidity	49.6%



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.

5V Supply

Configuration 1 - Mode 2

5V Supply

Maximum Power – GMSK

Frequency (MHz)	Result (dBm)	Result (mW)
1850.2	29.67	926.8
1880.0	29.25	841.3
1909.8	29.28	847.2

Maximum Power – GPRS

Frequency (MHz)	Result (dBm)	Result (mW)
1850.2	29.92	981.7
1880.0	29.51	893.3
1909.8	29.54	899.4

Maximum Power – EGPRS

Frequency (MHz)	Result (dBm)	Result (mW)
1850.2	29.91	979.4
1880.0	29.52	895.3
1909.8	29.52	895.3

Limit	<2W or <+33dBm
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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

Quad Band Module, S/N: N1A006L4VC

2.12.3 Date of Test and Modification State

27 May 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 2

2.12.6 Environmental Conditions

	27 May 2008
Ambient Temperature	18.2°C
Relative Humidity	52%
Atmospheric Pressure	1003mbar



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 2

Frequency GHz	EIRP (dBm)	Limit (dBm)	EIRP (W)	Limit (W)
1.8502	25.21	33.00	0.332	2.00
1.8800	23.96	33.00	0.249	2.00
1.9098	24.90	33.00	0.309	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

Quad Band Module, S/N: N1A006L4WP

2.13.3 Date of Test and Modification State

16 May 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.

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

Configuration 1 - Mode 2

2.13.6 Environmental Conditions

16 May 2008

Ambient Temperature 21.7°C

Relative Humidity 45.2%



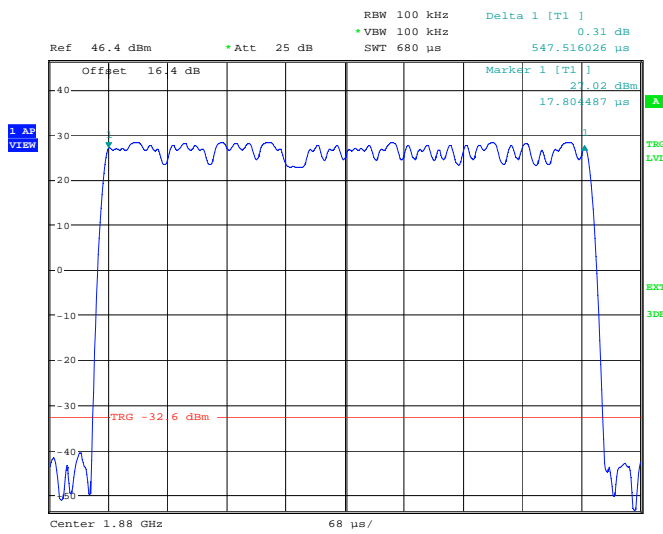
2.13.7 Test Results

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 2

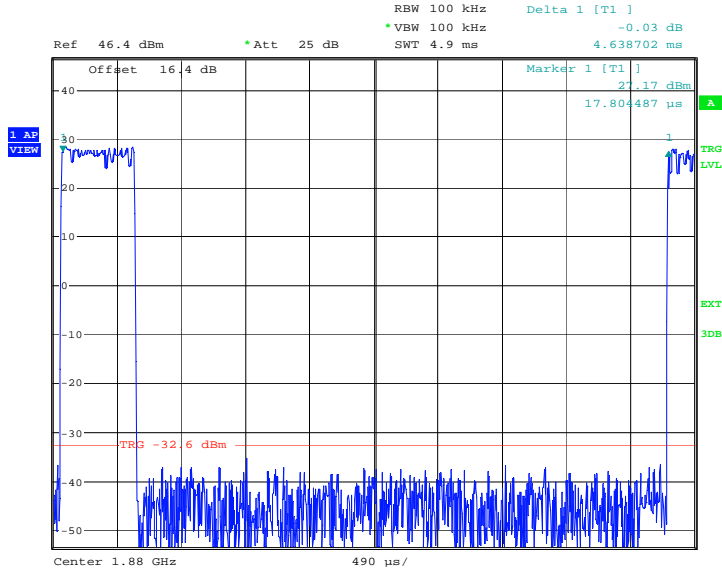
EUT Transmitting with GMSK modulation showing one timeslot (GSM)



Date: 16.MAY.2008 14:49:37

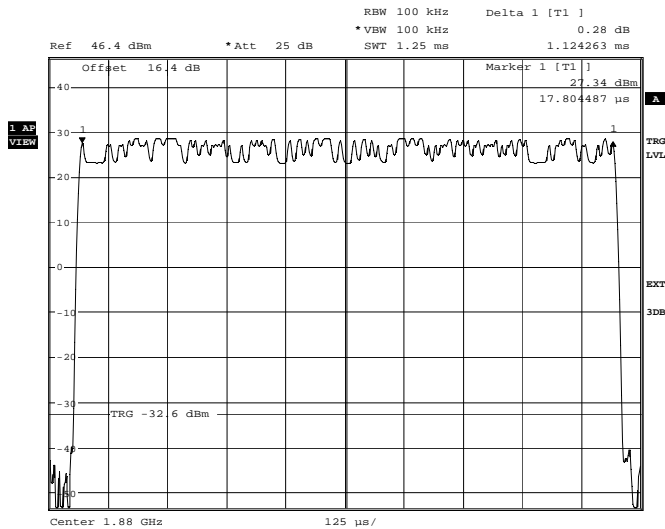


EUT Transmitting with GMSK modulation showing one timeslot active (GSM)



Date: 16.MAY.2008 14:50:58

EUT Transmitting with GMSK modulation showing two timeslot (GPRS)

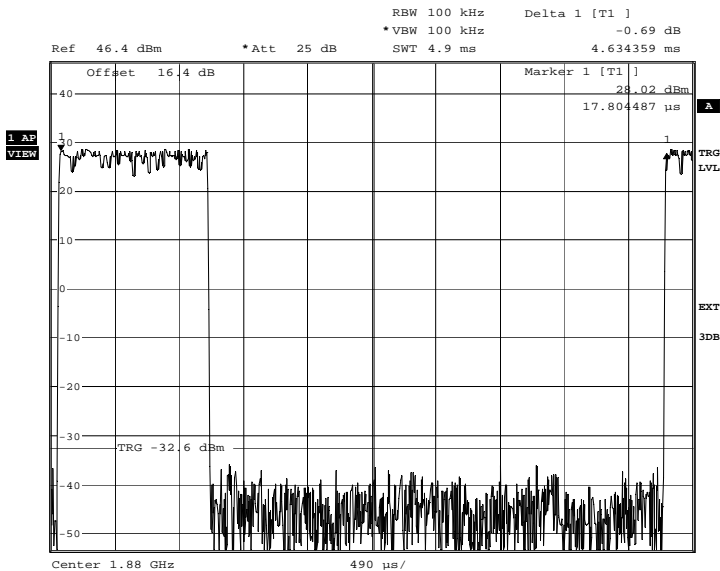


Date: 16.MAY.2008 15:01:14



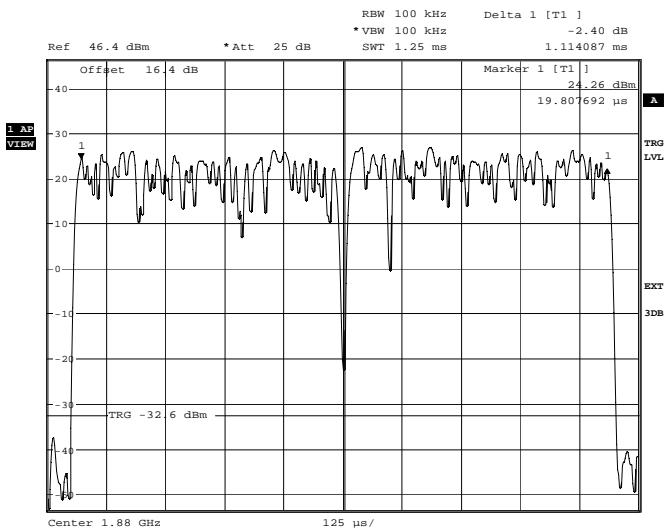
Product Service

EUT Transmitting with GMSK modulation showing one frame with two timeslot active (GPRS)



Date: 16.MAY.2008 15:02:24

EUT Transmitting with 8PSK modulation showing two timeslot (EGPRS)

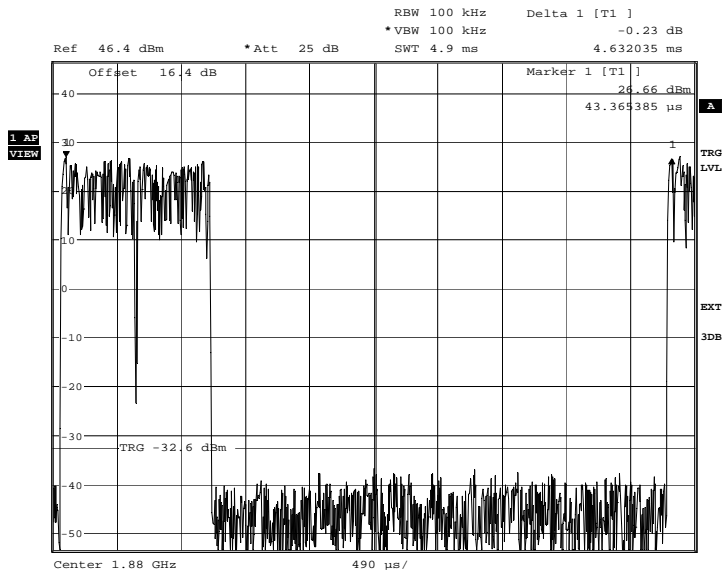


Date: 16.MAY.2008 15:07:56



Product Service

EUT Transmitting with 8PSK modulation showing one frame with two timeslot active (EGPRS)



Date: 16.MAY.2008 15:09:17



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

Quad Band Module, S/N: N1A006L4WP

2.14.3 Date of Test and Modification State

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

Configuration 1 - Mode 2

2.14.6 Environmental Conditions

	16 May 2008
Ambient Temperature	20.7°C
Relative Humidity	49.5%



Product Service

2.14.7 Test Results

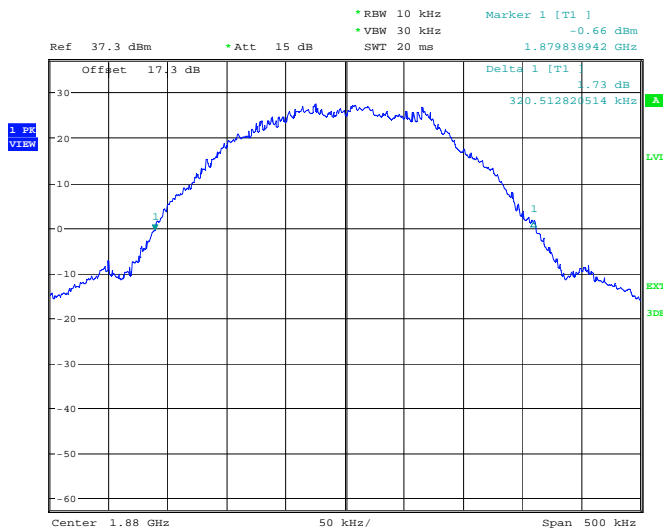
For the period of test the EUT met the requirements of FCC CFR 47 Part 24: 2006 for Occupied Bandwidth.

The test results are shown below.

Configuration 1 - Mode 2

Occupied Bandwidth As Defined By The -26dBc Points

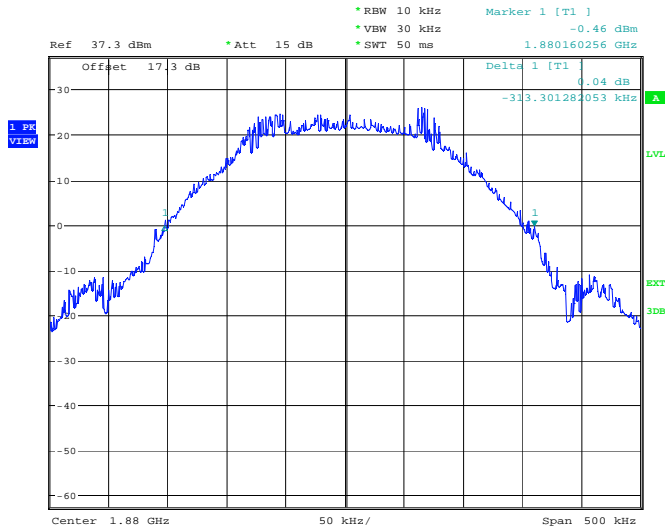
Maximum Power – GPRS – Packet Switched



Date: 16.MAY.2008 10:51:57



Maximum Power – EGPRS – Packet Switched



Date: 16.MAY.2008 11:00:25



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

Quad Band Module, S/N: N1A006L4WP

2.15.3 Date of Test and Modification State

20 May 2008 - Modification State

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

Configuration 1 - Mode 2

2.15.6 Environmental Conditions

20 May 2008

Ambient Temperature 20°C

Relative Humidity 48%

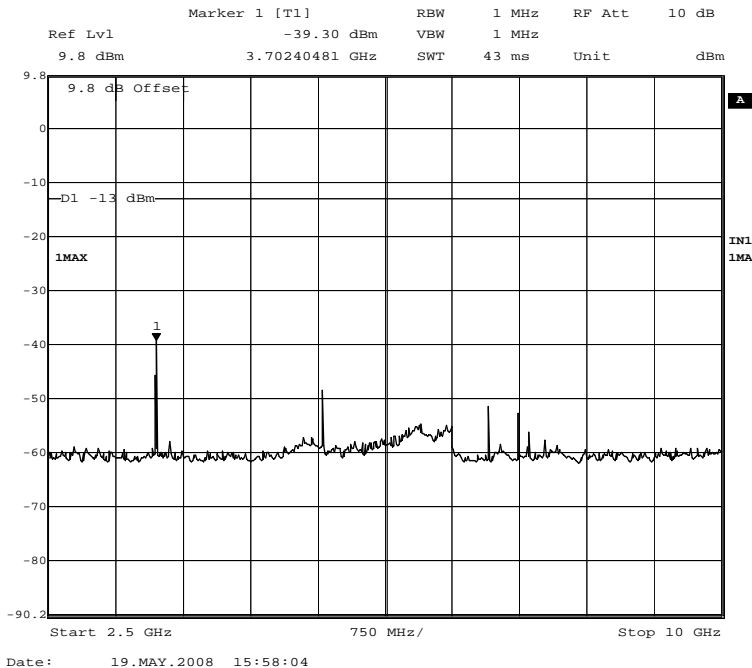


Product Service

Spurious Emissions (2.5GHz – 10.0GHz)

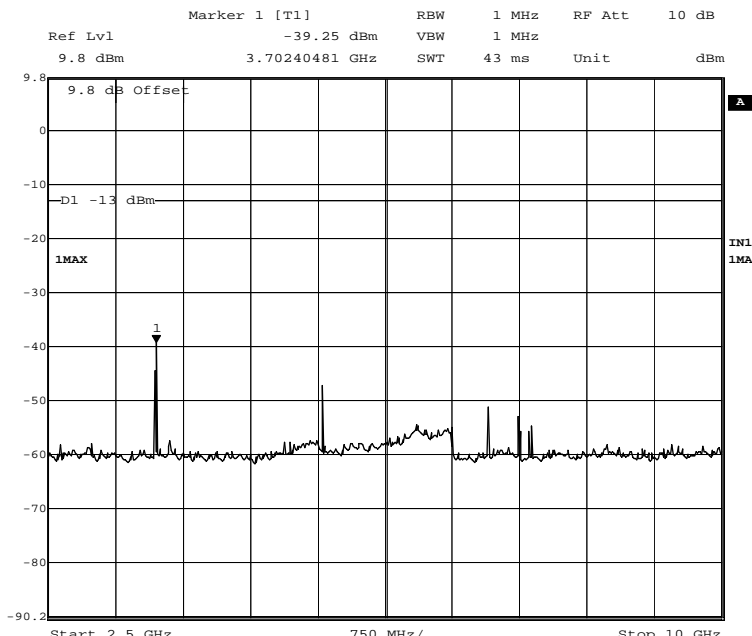
Channel 512, (1850.2MHz) – Maximum Power

GMSK



Date: 19.MAY.2008 15:58:04

GPRS (GMSK)

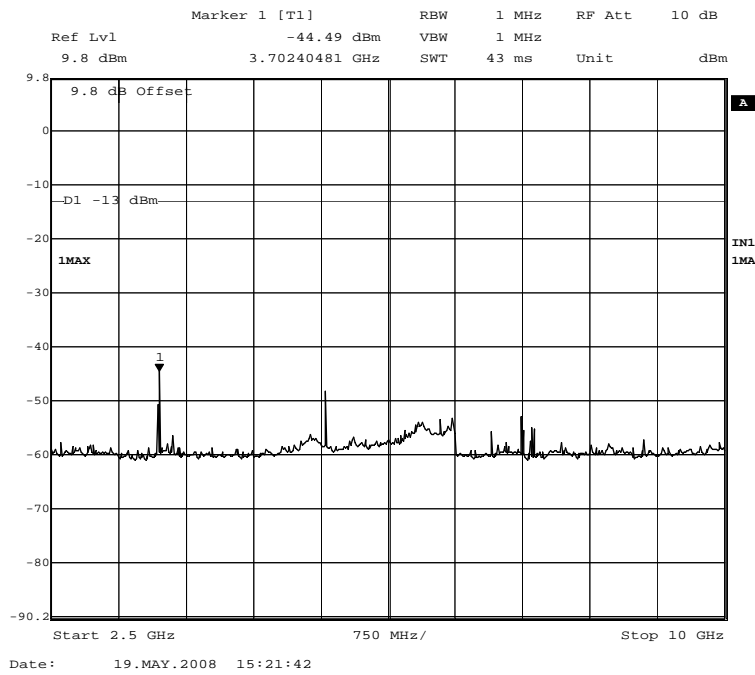


Date: 19.MAY.2008 15:30:58



Product Service

EGPRS (8PSK)

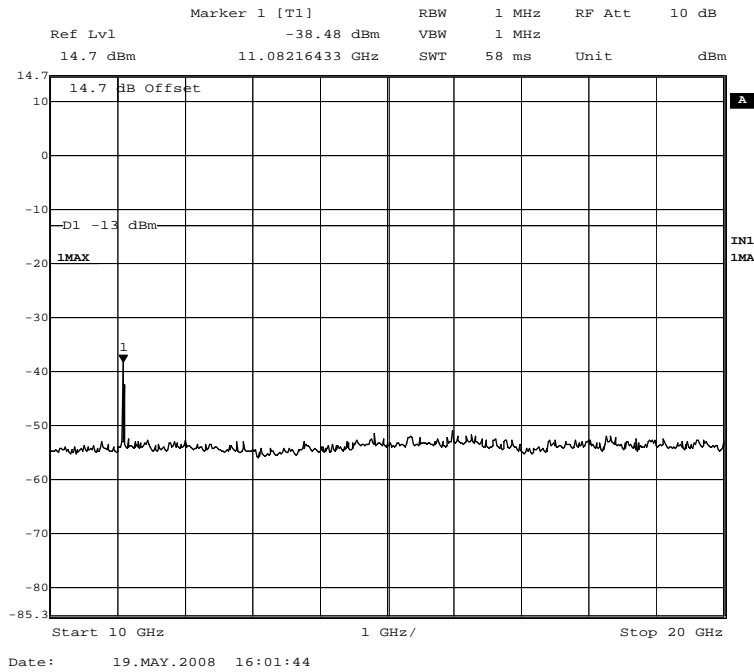




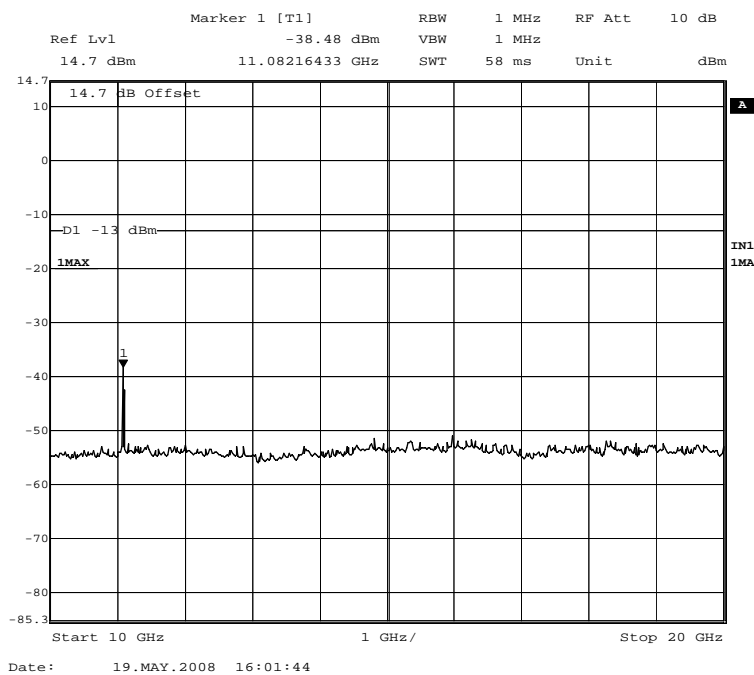
Spurious Emissions (10GHz – 20.0GHz)

Channel 512, (1850.2MHz) – Maximum Power

GMSK

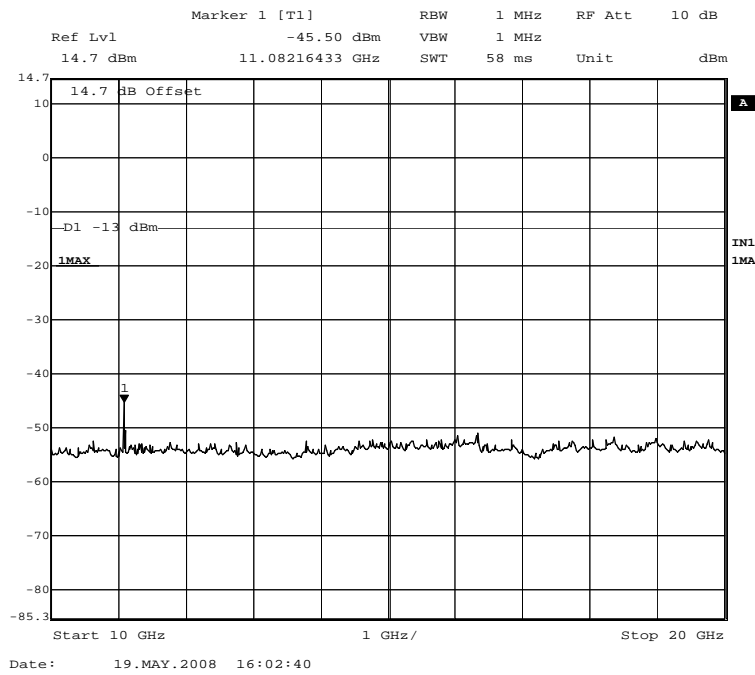


GPRS (GMSK)





EGPRS (8PSK)



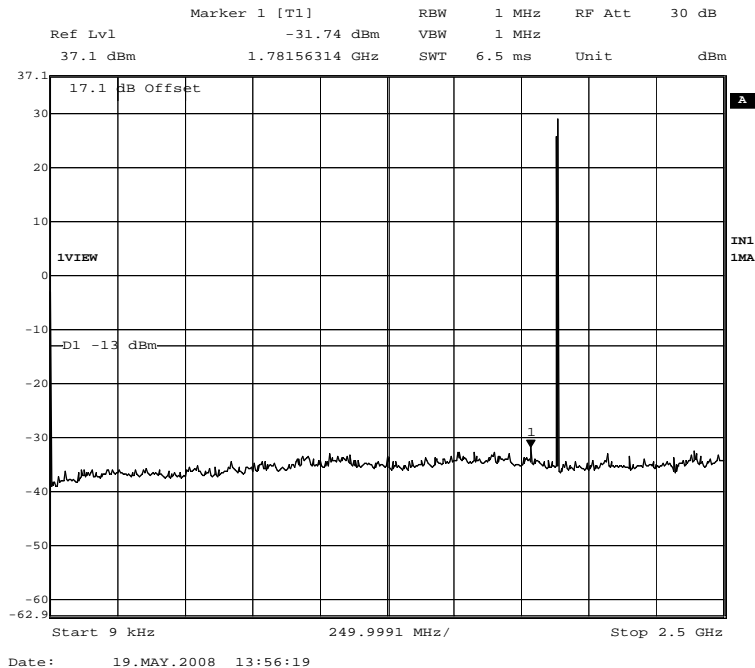


Product Service

Channel 661, (1880.0MHz) – Maximum Power

Spurious Emissions (9kHz – 2.5GHz)

GMSK

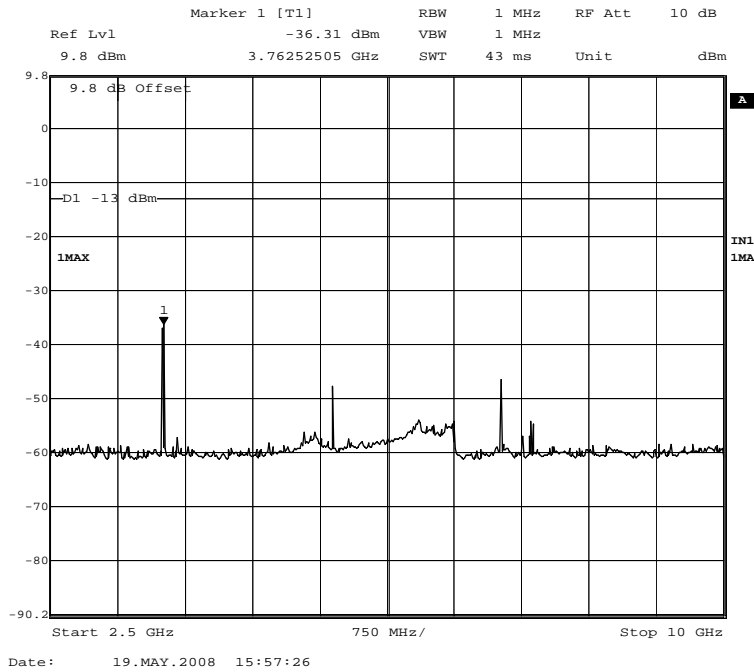




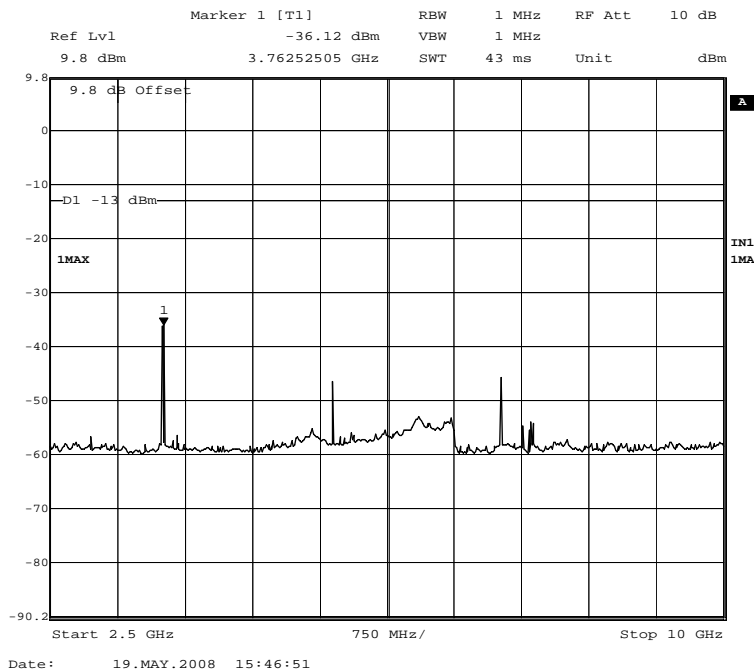
Spurious Emissions (2.5GHz – 10.0GHz)

Channel 661, (1800.0MHz) – Maximum Power

GMSK



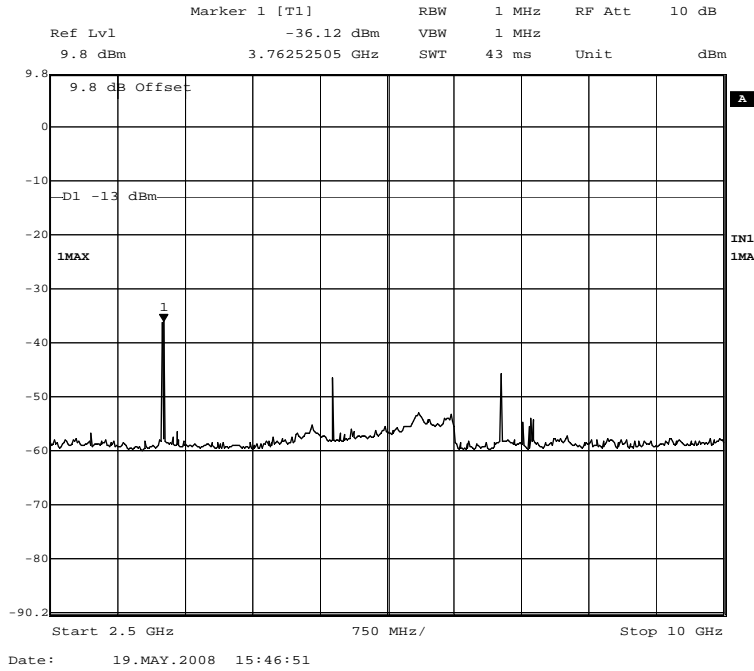
GPRS (GMSK)





Product Service

EGPRS (8PSK)

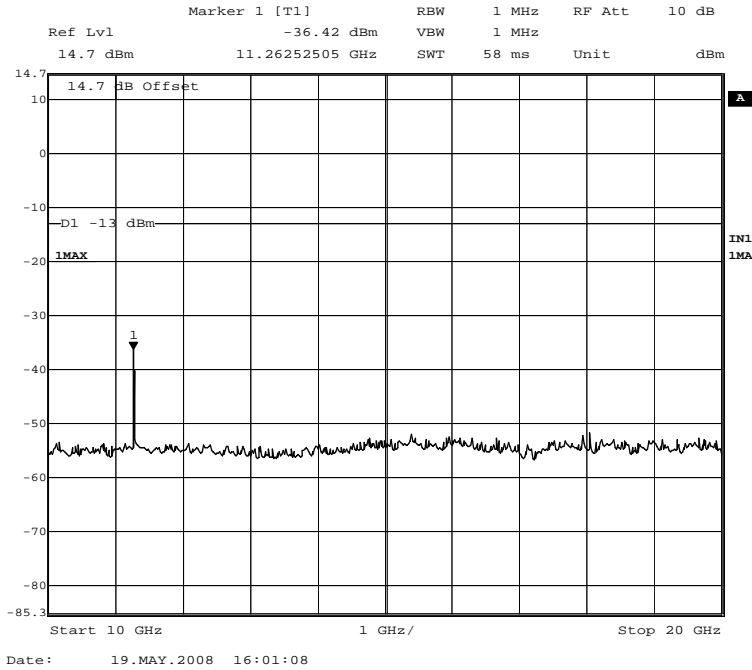




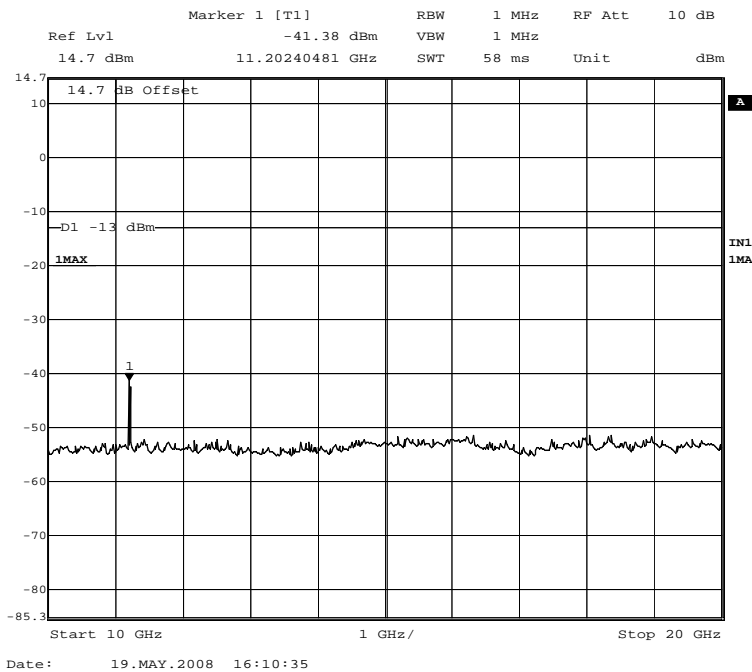
Spurious Emissions (10GHz – 20.0GHz)

Channel 661, (1800.0MHz) – Maximum Power

GMSK

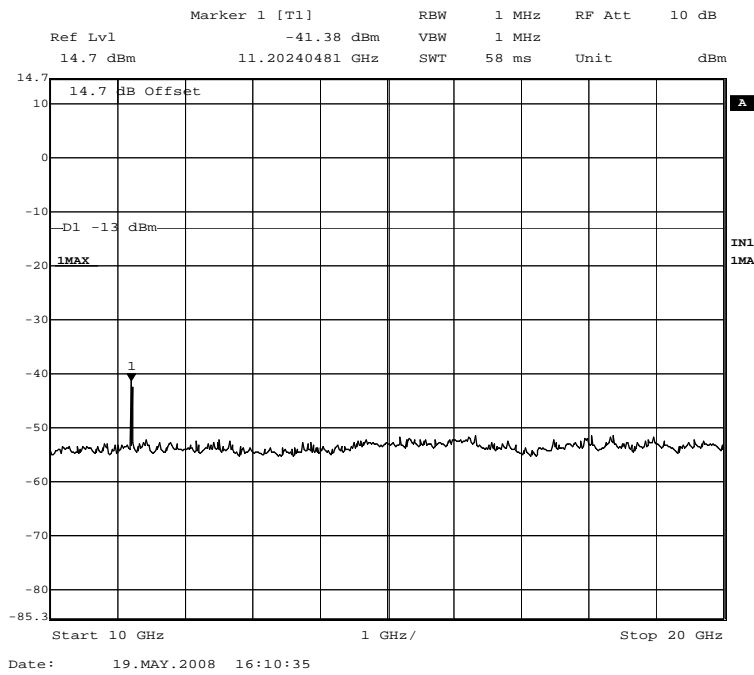


GPRS (GMSK)





EGPRS (8PSK)

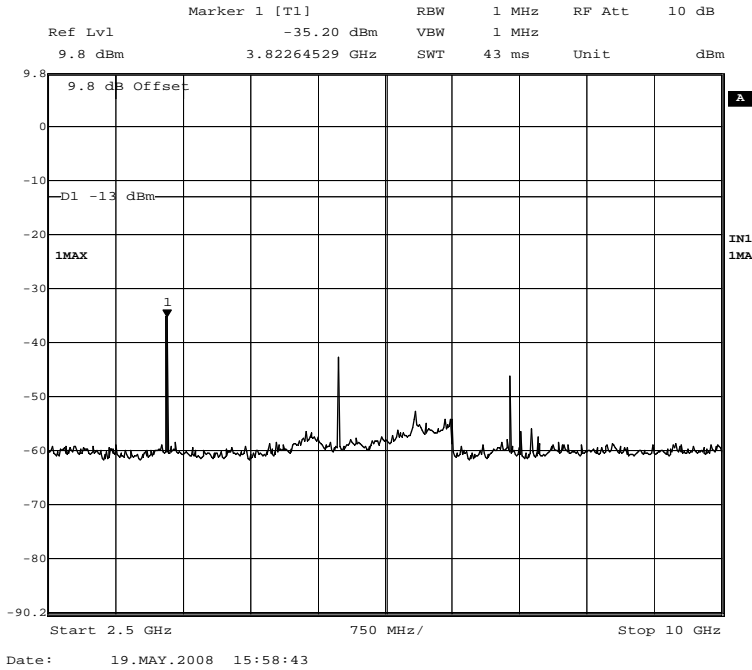




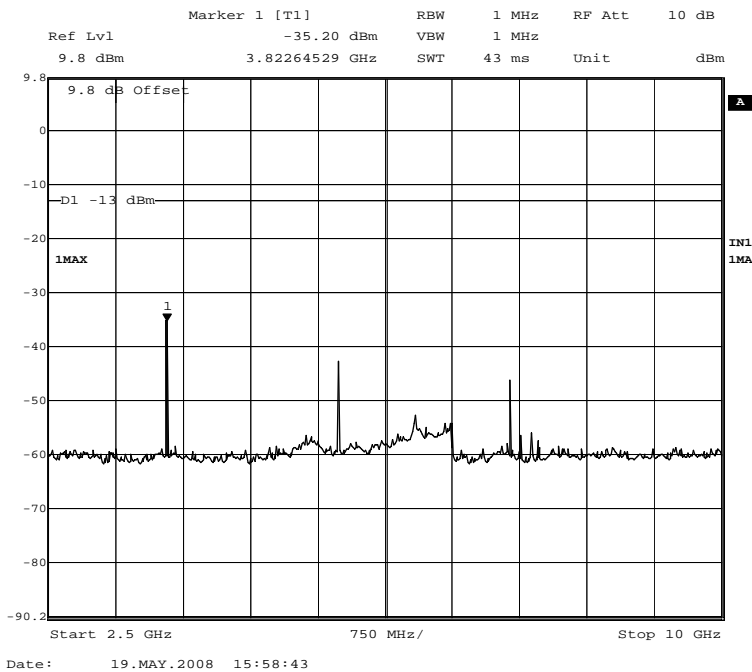
Spurious Emissions (2.5GHz – 10.0GHz)

Channel 810, (1909.8MHz) – Maximum Power

GMSK

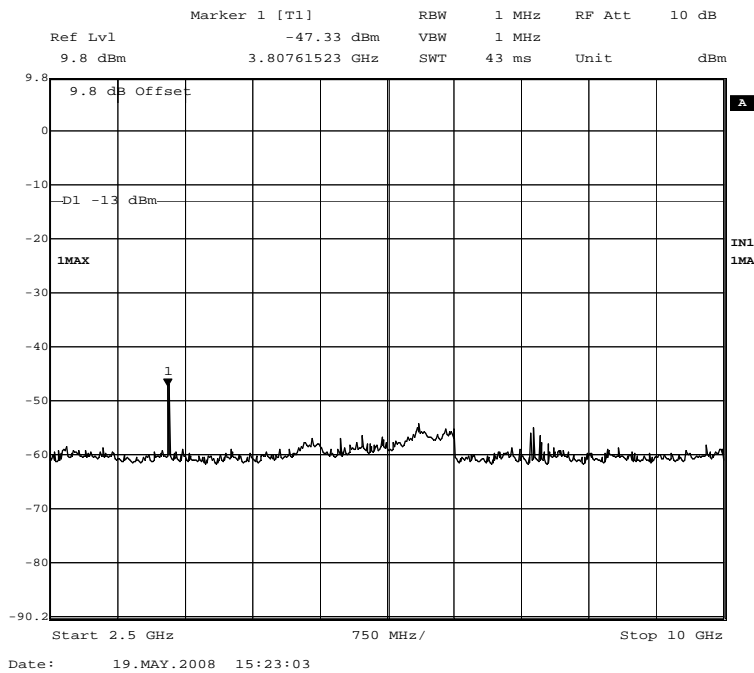


GPRS (GMSK)





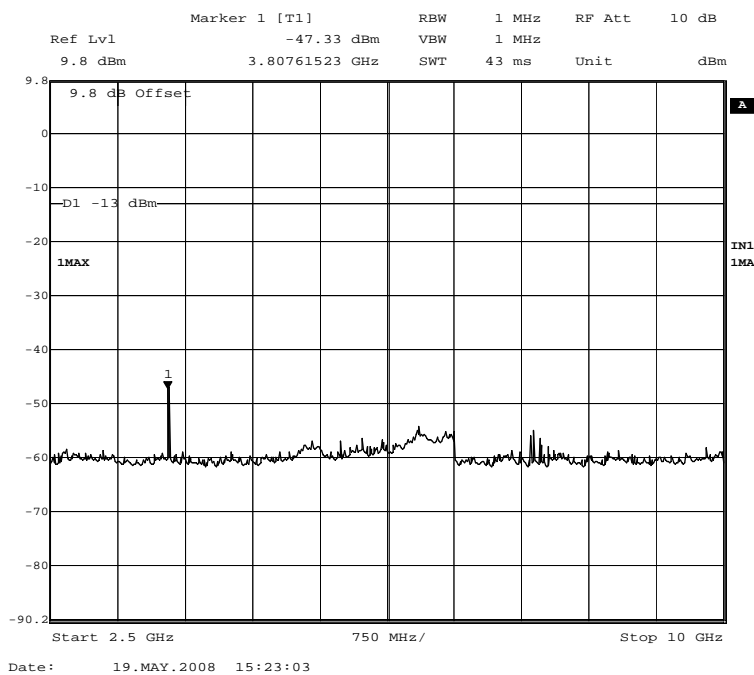
EGPRS (8PSK)



Channel 810, (1909.8MHz) – Maximum Power

Spurious Emissions (10GHz – 20GHz)

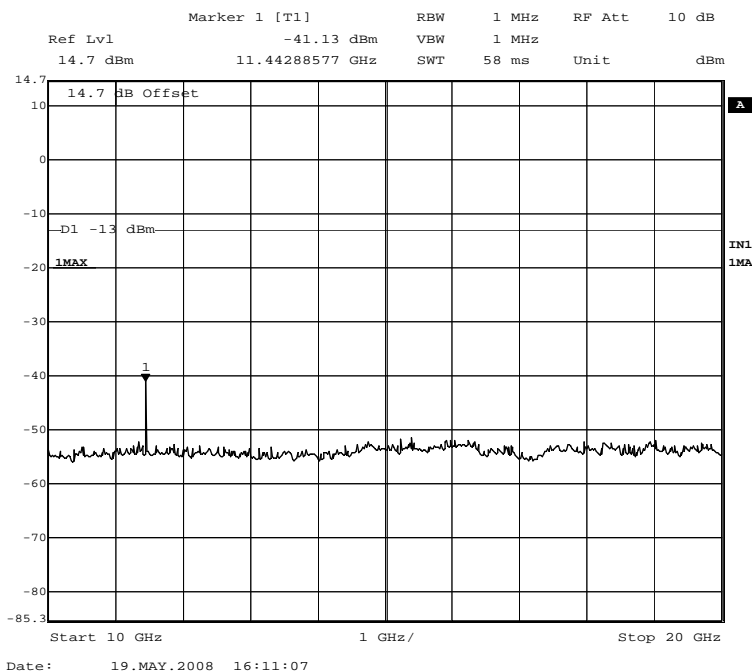
GMSK



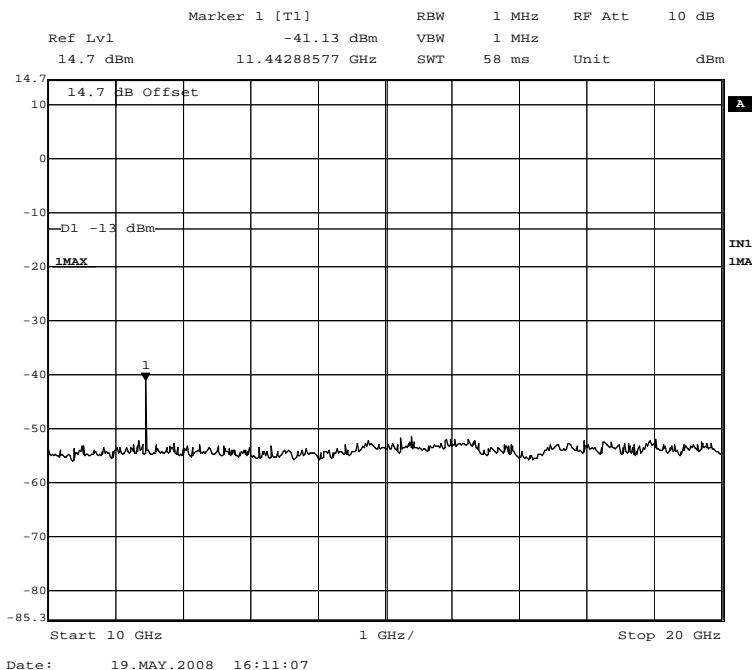


Product Service

GPRS (GMSK)



EGPRS (8PSK)





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, 6.3

2.16.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4VC

2.16.3 Date of Test and Modification State

27 May 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 2

2.16.6 Environmental Conditions

27 May 2008

Ambient Temperature 18.2°C

Relative Humidity 52%

Atmospheric Pressure 1003mbar



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.

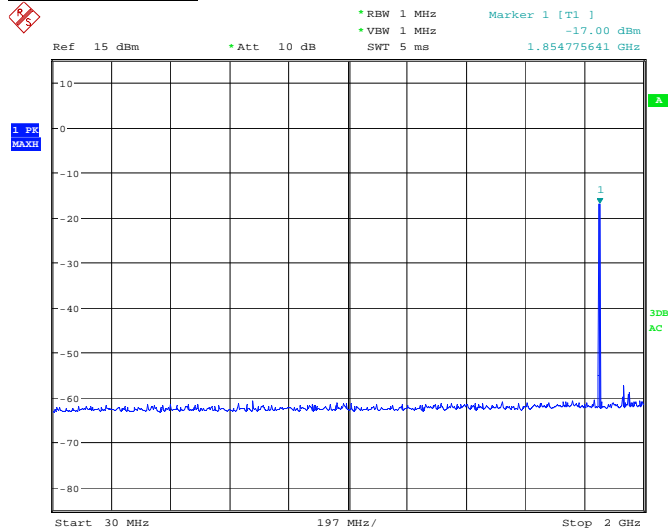
The test results are shown below.

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

Configuration 1 - Mode 2

Bottom Channel

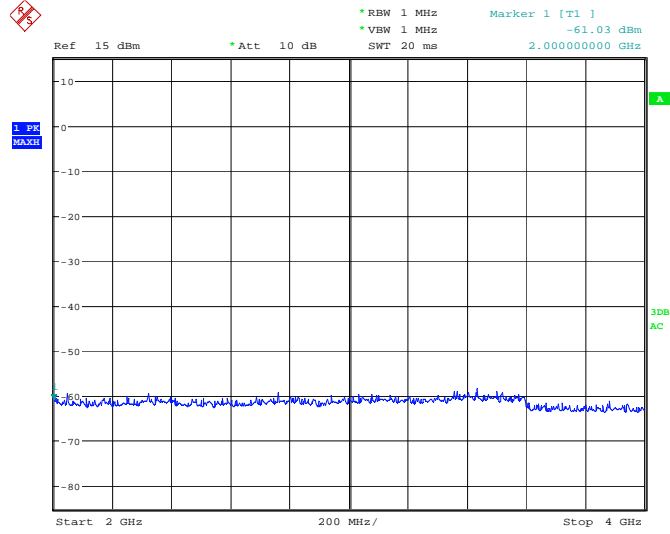
30MHz to 2GHz



Date: 27.MAY.2008 21:17:08

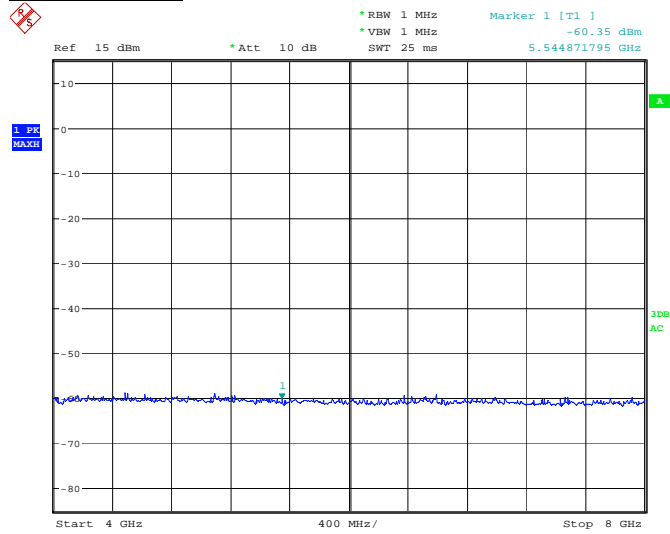


2GHz to 4GHz



Date: 27.MAY.2008 21:29:04

4GHz to 8GHz

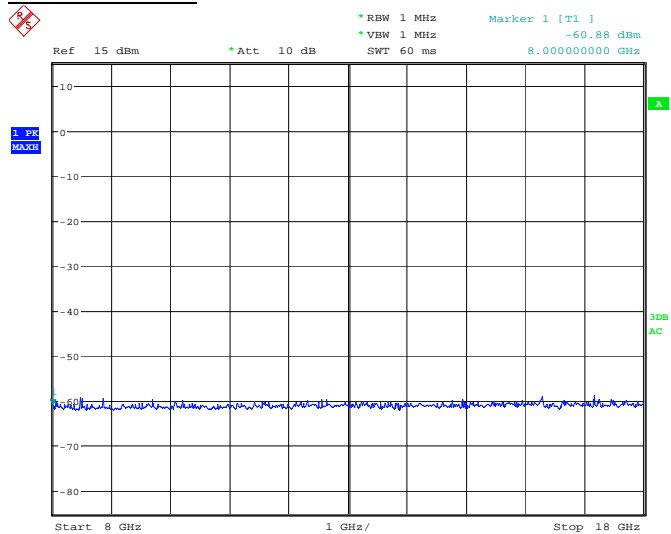


Date: 27.MAY.2008 22:01:16



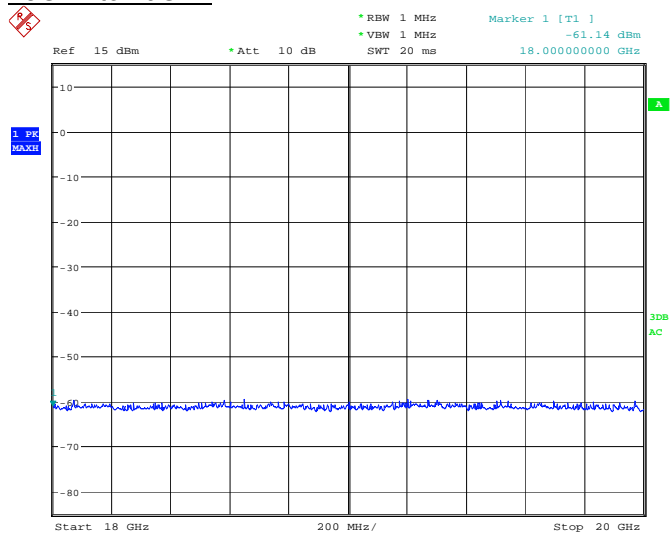
Product Service

8GHz to 18GHz



Date: 27.MAY.2008 22:06:23

18GHz to 20GHz



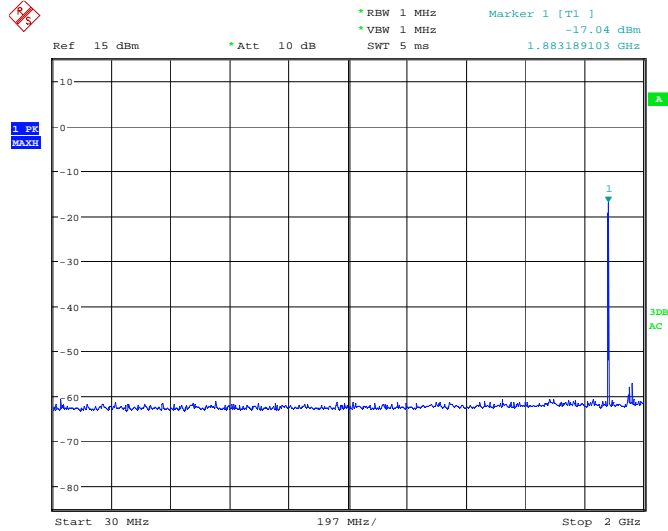
Date: 27.MAY.2008 22:21:47



Product Service

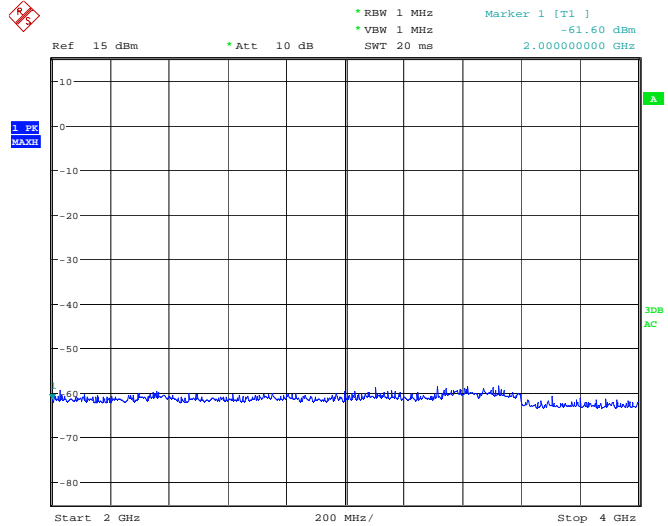
Middle Channel

30MHz to 2GHz



Date: 27.MAY.2008 21:10:06

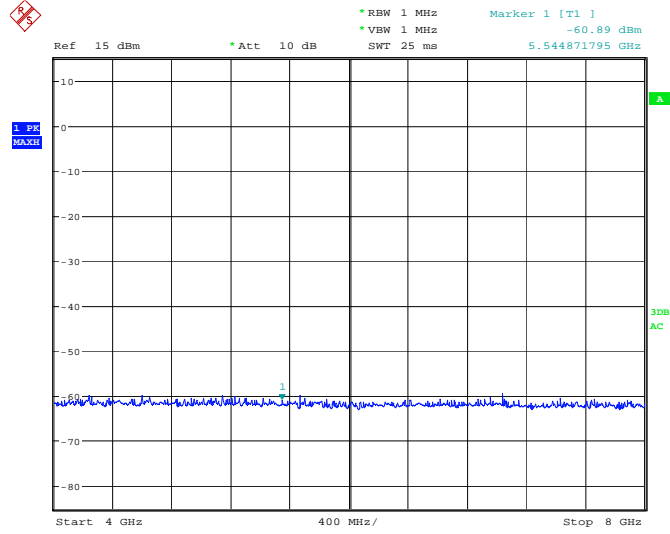
2GHz to 4GHz



Date: 27.MAY.2008 21:28:43

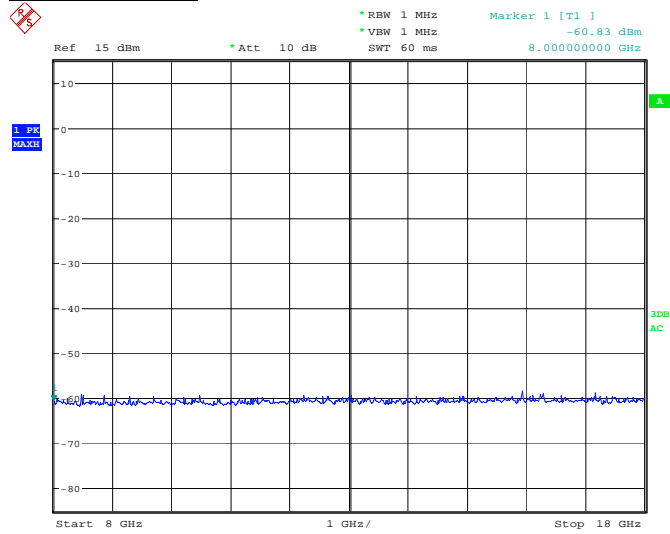


4GHz to 8GHz



Date: 27.MAY.2008 22:01:36

8GHz to 18GHz

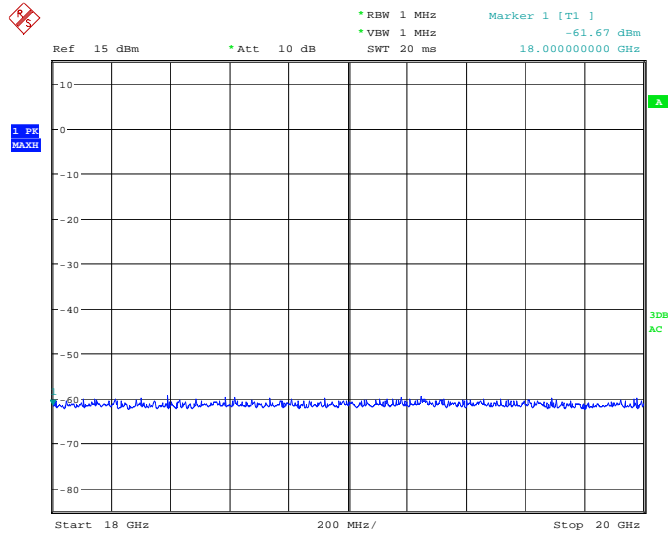


Date: 27.MAY.2008 22:08:03



Product Service

18GHz to 20GHz



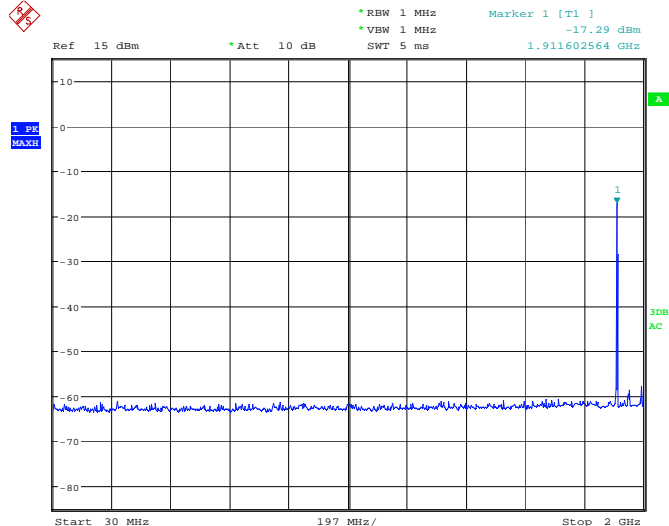
Date: 27.MAY.2008 22:22:11



Product Service

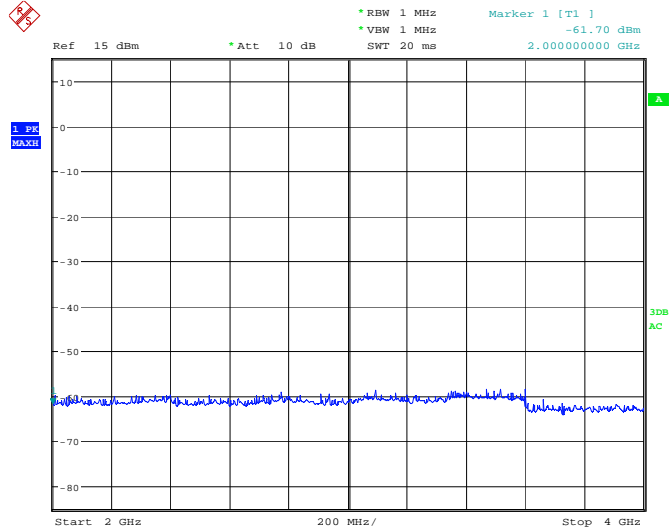
Top Channel

30MHz to 2GHz



Date: 27.MAY.2008 21:12:25

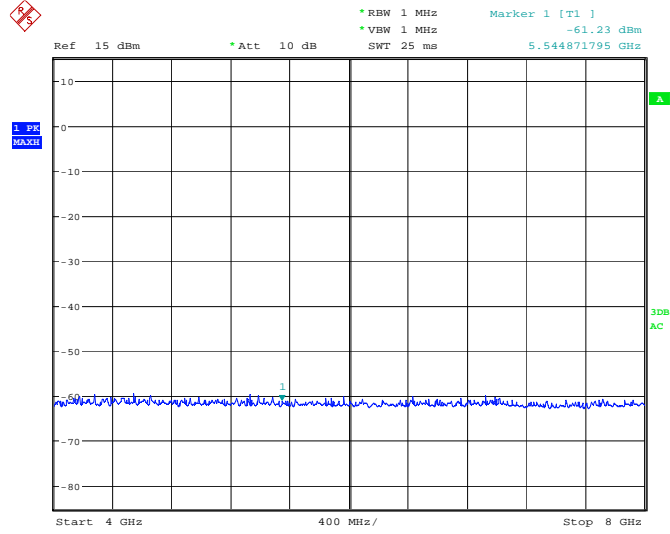
2GHz to 4GHz



Date: 27.MAY.2008 21:29:41

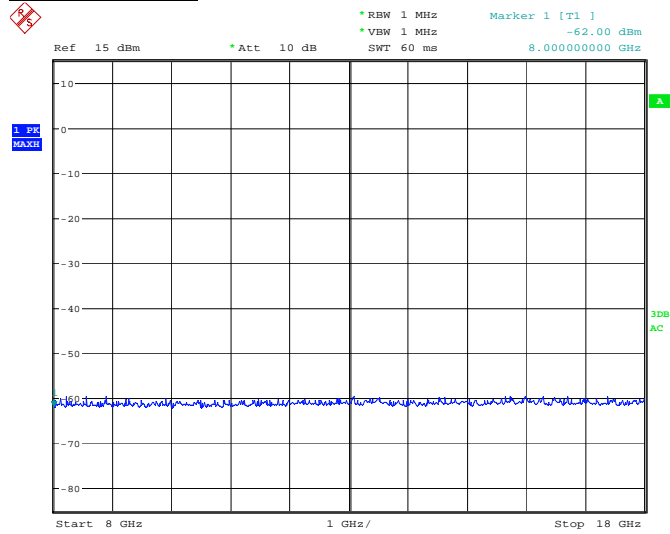


4GHz to 8GHz



Date: 27.MAY.2008 22:02:10

8GHz to 18GHz

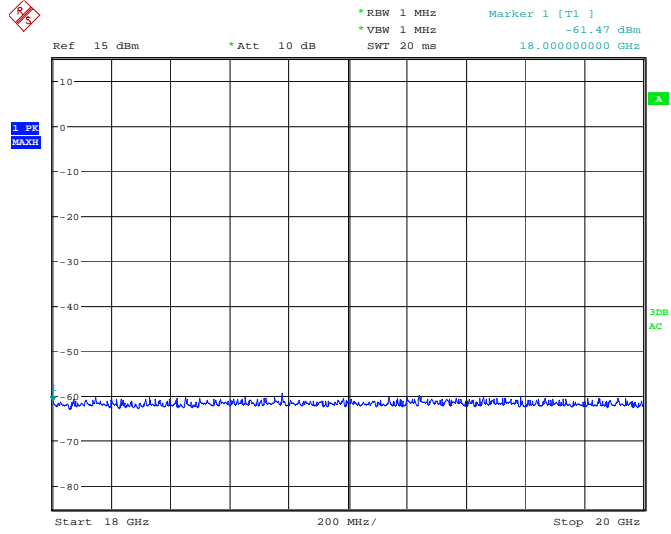


Date: 27.MAY.2008 22:09:03



Product Service

18GHz to 20GHz



Date: 27.MAY.2008 22:22:25



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, 7

2.17.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.17.3 Date of Test and Modification State

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

Configuration 1 - Mode 1

2.17.6 Environmental Conditions

	21 May 2008
Ambient Temperature	20.0°C
Relative Humidity	48%



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 1

5V Supply

GSM – Circuit Switched

Temperature Interval (°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
-30	1.88	85	±1.88
-20	1.88	85	±1.88
-10	1.88	88	±1.88
0	1.88	72	±1.88
+10	1.88	55	±1.88
+20	1.88	86	±1.88
+30	1.88	88	±1.88
+40	1.88	89	±1.88
+50	1.88	85	±1.88

GSM – Packet Switched

Temperature Interval (°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
-30	1.88	-56	±1.88
-20	1.88	-45	±1.88
-10	1.88	-57	±1.88
0	1.88	-49	±1.88
+10	1.88	-78	±1.88
+20	1.88	-56	±1.88
+30	1.88	-55	±1.88
+40	1.88	-56	±1.88
+50	1.88	-62	±1.88



Product Service

EGSM – Packet Switched

Temperature Interval (°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
-30	1.88	-52	±1.88
-20	1.88	-44	±1.88
-10	1.88	-60	±1.88
0	1.88	-52	±1.88
+10	1.88	-70	±1.88
+20	1.88	-56	±1.88
+30	1.88	-57	±1.88
+40	1.88	-58	±1.88
+50	1.88	-62	±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, 7

2.18.2 Equipment Under Test

Quad Band Module, S/N: N1A006L4WP

2.18.3 Date of Test and Modification State

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

Configuration 1 - Mode 2

2.18.6 Environmental Conditions

	22 May 2008
Ambient Temperature	20.0°C
Relative Humidity	48%



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 1

5V Supply

GSM – Circuit Switched

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Deviation Limit (kHz)
4.25	1.88	85	±1.88
5.75	1.88	89	±1.88

GMSK – Packet Switched

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Deviation Limit (kHz)
4.25	1.88	-54	±1.88
5.75	1.88	-60	±1.88

8PSK – Packet Switched

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Deviation Limit (kHz)
4.25	1.88	-64	±1.88
5.75	1.88	-53	±1.88

Limit	±0.0001% or 1ppm
-------	------------------



Product Service

SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Sections 2.3 and 2.12 EMC - Maximum Output Power					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	27-Oct-2008
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
Antenna (Bilog)	Chase	CBL6143	2904	24	28-Nov-2009
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	11-Jul-2008
Sections 2.6 and 2.16 EMC - Radiated Emissions					
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
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Attenuator (10dB, 10W)	Marconi	6534/3	1048	-	TU
Pre-Amplifier	Phase One	PS04-0085	1532	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	-	TU
Pre-Amplifier	Phase One	PS04-0087	1534	-	TU
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	28-Nov-2009
Antenna (Log Periodic)	Schaffner	UPA6108	3108	12	27-Mar-2009
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	11-Jul-2008
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	15-Mar-2009



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Sections 2.1 and 2.10 Radio (Tx) - Block Edge					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	27-Oct-2008
20dB/2W Attenuator	Narda	4772-20	462	-	TU
Multimeter	Iso-tech	1DM-101	466	12	15-Jan-2009
Power Supply Unit	Farnell	D302T	609	-	TU
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	25-Jun-2008
Hygromer	Rotronic	Hygropalm	2404	12	5-Dec-2008
Cable (1m, sma(m) - sma(m))	Reynolds	262-0248-1000	2408	12	17-Sep-2008
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
Sections 2.7 and 2.15 Radio (Tx) - Conducted Spurious Emissions					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	27-Oct-2008
Multimeter	Iso-tech	1DM-101	466	12	15-Jan-2009
Power Supply Unit	Farnell	D302T	609	-	TU
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	25-Jun-2008
Hygromer	Rotronic	Hygropalm	2404	12	5-Dec-2008
Daden Anthony Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	31-Oct-2008
Filter (Hi Pass)	Lorch	5HP7-2500-SR	2779	12	31-Oct-2008
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	29-May-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					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	27-Oct-2008
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Multimeter	Iso-tech	1DM-101	466	12	15-Jan-2009
Power Supply Unit	Farnell	D302T	609	-	TU
Digital Temperature Indicator	Fluke	51	2267	12	1-Jun-2008
Hygromer	Rotronic	Hygropalm	2404	12	5-Dec-2008
Cable (1m, sma(m) - sma(m))	Reynolds	262-0248-1000	2408	12	17-Sep-2008
Power Divider (N), 1W	Weinschel	1506A	3345	12	6-May-2009



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Sections Radio (Tx) - Maximum Peak Output Power					
Power Meter	Hewlett Packard	436A	47	12	9-Jul-2008
Multimeter	Iso-tech	1DM-101	466	12	15-Jan-2009
Power Splitter	Weinschel	1506A	607	12	18-Sep-2008
Power Sensor	Hewlett Packard	8482A	1341	12	15-Oct-2008
Cable (1m, SMA-SMA)	Reynolds	262-0248-1000	2407	12	17-Sep-2008
Programmable Power Supply	Iso-tech	IPS 2010	2435	-	TU
Radio Communications Test Set	Rohde & Schwarz	CMU 200	3035	12	5-Jun-2008
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	29-May-2008
Hygrometer	Rotronic	I-1000	3220	12	9-Apr-2009
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	27-Nov-2008
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	21-May-2009
Sections 2.2, 2.4, 2.6, 2.11, 2.13 and 2.14 Radio (Tx) - Power Characteristics					
Radiocommunications Tester	Rohde & Schwarz	CMU 200	39	12	27-Oct-2008
Multimeter	Iso-tech	1DM-101	466	12	15-Jan-2009
Power Divider	Weinschel	1506A	603	12	19-Mar-2009
Power Supply Unit	Farnell	D302T	609	-	TU
Hygromer	Rotronic	Hygropalm	2404	12	5-Dec-2008
Cable (1m, sma(m) - sma(m))	Reynolds	262-0248-1000	2408	12	17-Sep-2008
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	29-May-2008
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	20-Mar-2009

TU – Traceability Unscheduled



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
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 10⁶.

* In accordance with CISPR 16-4

† In accordance with UKAS Lab 34



Product Service

SECTION 4

PHOTOGRAPHS

4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)

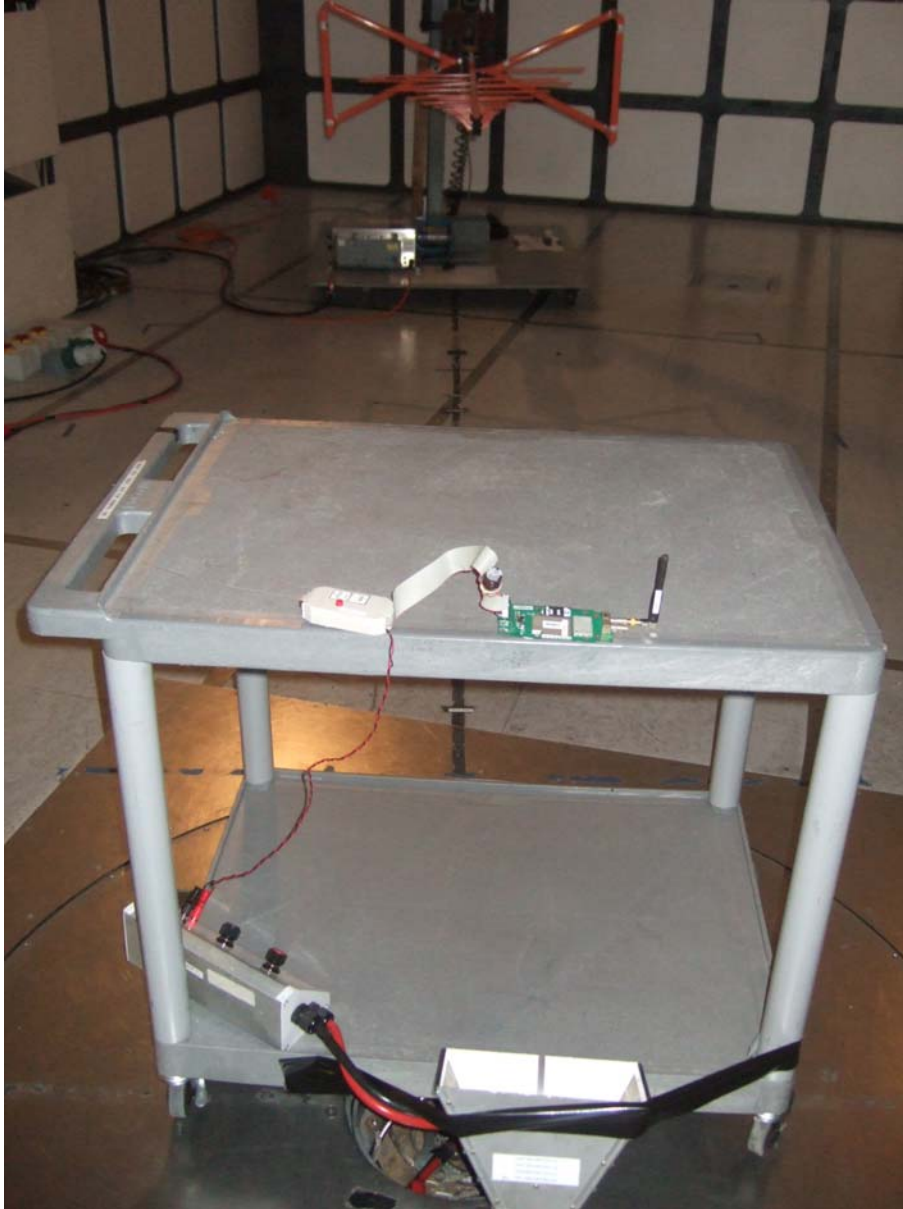


EUT Front View



EUT Rear View

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



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