Report On

FCC and Industry Canada Testing of the
Ericsson AB
RUG 11 B5 / KRC 161 194/1

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC161194-1
IC ID: 287AB-AG1611941

Document 75913280 Report 01 Issue 1 June 2011

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REPORT ON

FCC and Industry Canada Testing of the
Ericsson AB
RUG 11 B5 / KRC 161 194/1

Document 75913280 Report 01 Issue 1

June 2011

PREPARED FOR

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PREPARED BY

X Zhang
Test Engineer

APPROVED BY

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Authorised Signatory

DATED 02 June 2011

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 compliance with FCC CFR 47: Part 22 and Industry Canada RSS-132. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

X Zhang C Zhang

UKAS TESTING 0141

Product Service

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Product Service

SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Ericsson AB
RUG 11 B5 / KRC 161 194/1

Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Ericsson AB RUG 11 B5 / KRC 161 194/1 to the requirements of FCC CFR 47 Part 22 and Industry Canada RSS-132.

Testing was carried out in support of a C2PC application for Grant of RUG 11 B5 / KRC 161 194/1 for the hardware update.

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	Ericsson AB
Product Name	RUG 11 B5
Part Number	KRC 161 194/1
IC Model Name	AG1611941
Serial Number(s)	CB40584240
Software Version	CXP1040007_05P1BN
Hardware Version	R1C
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 22: 2010 FCC CFR 47 Part 2: 2010 Industry Canada RSS-132: 2005
Incoming Release Date	Declaration of Build Status 17 March 2011
Order Number Date	PTP 17 March 2011
Start of Test	18 March 2011
Finish of Test	18 April 2011
Name of Engineer(s)	X Zhang C Zhang
Related Document(s)	ANSI C63.4: 2009 Industry Canada RSS-GEN Issue 3: 2010

Product Service

1.2 BRIEF SUMMARY OF RESULTS

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

Configuration 1 – UC (Hybrid Uncombined): Output 1 without internal combiner							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 22	RSS-132 and RSS-GEN					
	22.913 (a)	4.4	Effective Radiated Power	869.2MHz		N/A	No integral antenna.
				881.6MHz		N/A	
				893.8MHz		N/A	
2.1	2.1046, 22.913 (a)	4.4	Maximum Peak Output Power - Conducted	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.2	22.913 (a)	-	Peak – Average Ratio	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.3	2.1047 (d)	4.2	Modulation Characteristics	869.2MHz		N/A	
				881.6MHz	0	Pass	
				893.8MHz		N/A	
2.4	2.1049, 22.917 (b)	RSS-Gen 4.6.1	Occupied Bandwidth	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.5	2.1051, 22.917 (b)	4.5	Spurious Emissions at Antenna Terminals (±1MHz)	869.4MHz	0	Pass	The channel adjacent to the lower and higher band-edge cannot be used. The lowest usable channel is 129 (869.4MHz), the highest usable channel is 250 (893.6MHz)
				881.6MHz		N/A	
				893.6MHz	0	Pass	
2.6	2.1053, 22.917 (a)	4.5	Radiated Spurious Emissions	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.7	2.1051, 22.917 (a)	4.5	Conducted Spurious Emissions	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.8	2.1055, 22.355	4.3	Frequency Stability Under Temperature Variations	869.2MHz		N/A	
				881.6MHz	0	Pass	
				893.8MHz		N/A	

Product Service

Configuration 1 – UC (Hybrid Uncombined): Output 1 without internal combiner							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 22	RSS-132 and RSS-GEN					
2.9	2.1055, 22.355	4.3	Frequency Stability Under Voltage Variations	869.2MHz		N/A	
				881.6MHz	0	Pass	
				893.8MHz		N/A	
2.10	-	4.6	Receiver Spurious Emissions	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	

Product Service

Configuration 2 – TCC (Transmitter Coherent Combining): Output 1 with internal combiner plus TCC							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 22	RSS-132 and RSS-GEN					
	22.913 (a)	4.4	Effective Radiated Power	869.2MHz		N/A	No integral antenna.
				881.6MHz		N/A	
				893.8MHz		N/A	
2.1	2.1046, 22.913 (a)	4.4	Maximum Peak Output Power - Conducted	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.2	22.913 (a)	-	Peak – Average Ratio	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.3	2.1047 (d)	4.2	Modulation Characteristics	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.4	2.1049, 22.917 (b)	RSS-Gen 4.6.1	Occupied Bandwidth	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.5	2.1051, 22.917 (b)	4.5	Spurious Emissions at Antenna Terminals (±1MHz)	869.4MHz	0	Pass	The channel adjacent to the lower and higher band-edge cannot be used. The lowest usable channel is 129 (869.4MHz), the highest usable channel is 250 (893.6MHz)
				881.6MHz		N/A	
				893.6MHz	0	Pass	
2.6	2.1053, 22.917 (a)	4.5	Radiated Spurious Emissions	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.7	2.1051, 22.917 (a)	4.5	Conducted Spurious Emissions	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.8	2.1055, 22.355	4.3	Frequency Stability Under Temperature Variations	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.9	2.1055, 22.355	4.3	Frequency Stability Under Voltage Variations	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.10	-	4.6	Receiver Spurious Emissions	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	

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Configuration 3 – HC (Hybrid combined): Output 1 with internal combiner							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 22	RSS-132 and RSS-GEN					
	22.913 (a)	4.4	Effective Radiated Power	869.2MHz		N/A	No integral antenna.
				881.6MHz		N/A	
				893.8MHz		N/A	
2.1	2.1046, 22.913 (a)	4.4	Maximum Peak Output Power - Conducted	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.2	22.913 (a)	-	Peak – Average Ratio	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.3	2.1047 (d)	4.2	Modulation Characteristics	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.4	2.1049, 22.917 (b)	RSS-Gen 4.6.1	Occupied Bandwidth	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.5	2.1051, 22.917 (b)	4.5	Spurious Emissions at Antenna Terminals (±1MHz)	869.4MHz	0	Pass	The channel adjacent to the lower and higher band-edge cannot be used. The lowest usable channel is 129 (869.4MHz), the highest usable channel is 250 (893.6MHz)
				881.6MHz		N/A	
				893.6MHz	0	Pass	
2.6	2.1053, 22.917 (a)	4.5	Radiated Spurious Emissions	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.7	2.1051, 22.917 (a)	4.5	Conducted Spurious Emissions	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.8	2.1055, 22.355	4.3	Frequency Stability Under Temperature Variations	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.9	2.1055, 22.355	4.3	Frequency Stability Under Voltage Variations	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
2.10	-	4.6	Receiver Spurious Emissions	869.2MHz		N/A	
				881.6MHz	0	Pass	
				893.8MHz		N/A	

N/A – Not Applicable

Product Service

1.3 DECLARATION OF BUILD STATUS

MAIN EUT				
MANUFACTURING DESCRIPTION	Radio Unit			
MANUFACTURER	Ericsson AB			
PRODUCT NAME	RUG 11 B5			
PART NUMBER	KRC 161 194/1			
IC Model Name	AG1611941			
SERIAL NUMBER	CB40584240			
HARDWARE VERSION	R1C			
SOFTWARE VERSION	CXP1040007_05P1BN			
TRANSMITTER OPERATING RANGE	TX: 869.4MHz - 893.6MHz RX: 824.4MHz - 848.6MHz			
MODULATIONS	GMSK, 8-PSK, 16QAM, 32QAM			
INTERMEDIATE FREQUENCIES	--			
ITU DESIGNATION OF EMISSION	250KGXW 250KG7W			
OUTPUT POWER (RMS) (W or dBm)	--	UC	TCC	HC
	GMSK	46.0dBm	48.5dBm	42.5dBm
	8PSK	42.7dBm	45.2dBm	39.2dBm
	16QAM	41.3dBm	43.8dBm	37.8dBm
	32QAM	40.9dBm	43.4dBm	37.4dBm
OUTPUT POWER TOLERANCE	±2dB			
FCC ID	TA8AKRC161194-1			
IC ID	287AB-AG1611941			
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is a Radio Unit of GSM Base Station.			

Signature E Cain Pan

Date 20 April 2011

D of B S Serial No 75913280/01

No responsibility will be accepted by TÜV SÜD Product Service Limited as to the accuracy of the information declared in this document by the manufacturer.

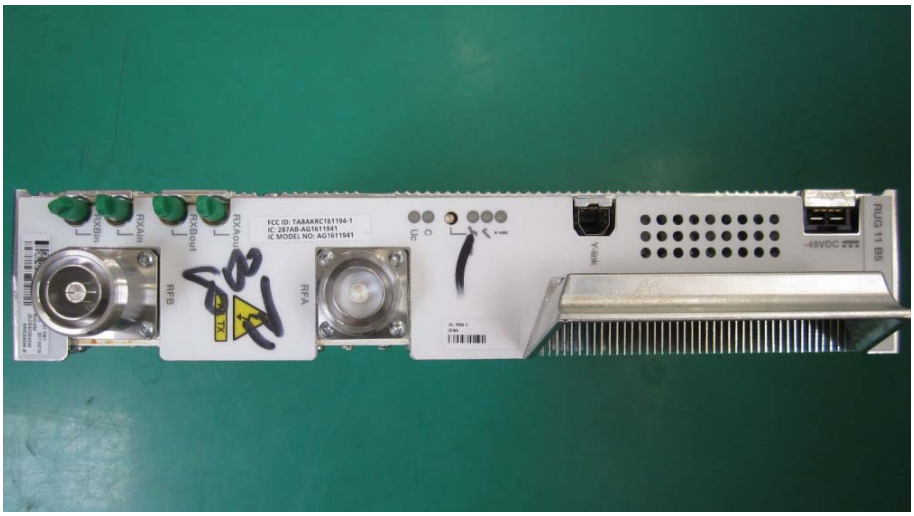
Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) RUG 11 B5 / KRC 161 194/1 is an Ericsson AB Radio Unit working in the public mobile service 850MHz band which provides communication connections to GSM850 network. The RUG 11 B5 / KRC 161 194/1 operates from a -48V DC volt supply.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



Equipment Under Test

Product Service

1.4.2 Test Configuration

Configuration 1 – UC (Hybrid Uncombined): Output 1 without internal combiner

The EUT was configured in accordance with FCC CFR 47 Part 22 and Industry Canada RSS-132.

Configuration 2 – TCC (Transmitter Coherent Combining): Output 1 with internal combiner plus TCC

The EUT was configured in accordance with FCC CFR 47 Part 22 and Industry Canada RSS-132.

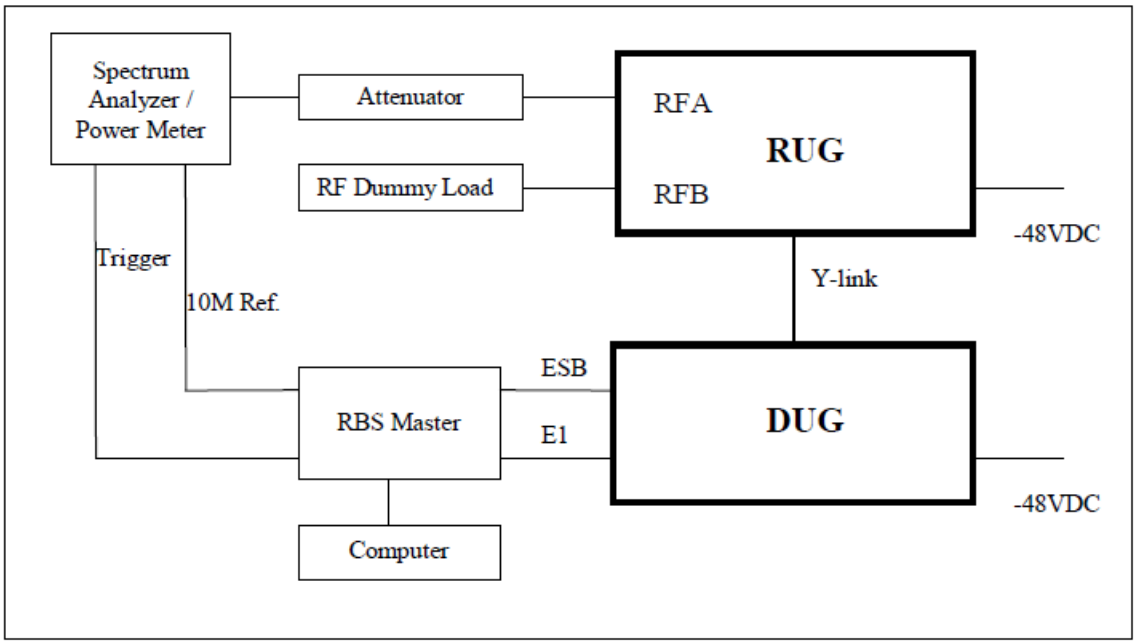
Configuration 3 – HC (Hybrid combined): Output 1 with internal combiner

The EUT was configured in accordance with FCC CFR 47 Part 22 and Industry Canada RSS-132.

The RUG 11 B5 / KRC 161 194/1 supports GMSK, 8-PSK, 16QAM and 32QAM modulations at 850MHz. the unit includes a maximum of two TRX's. All RF conducted TX tests were performed on one TRX RF output connector and the RX test was performed on the other TRX connector in HC configuration. The complete testing was performed with all modulation schemes at maximum RF power unless otherwise stated. The EUT was powered by a -48V DC Power supply.

Product Service

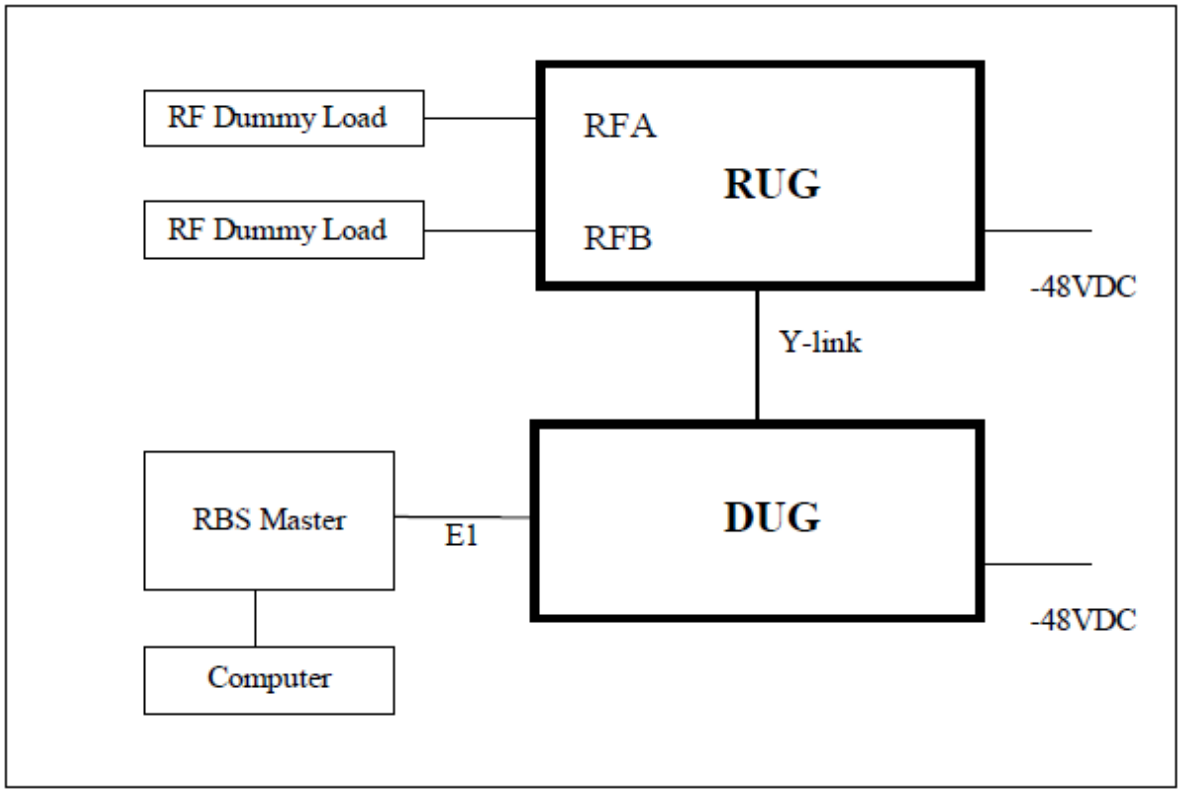
Test Setup, Conducted Measurement:



Test Object	Part Number	Version	Serial Number
Radio Part	RUG 11 B5 / KRC 161 194/1	R1C	CB40584240

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP Compaq	--	CNG8450JVD
2	Main Unit DUG 10 01	KDU 137 599/1	R1G	CB4C823748
3	RBS Master	LPC 102 462/1	R1C	T01E632659
4	Load	TF100	--	09121642
5	Power Supply	DH1716-5D	--	4001375
	Power Supply	DH1716A-14	--	--
6	Power Meter	NRP	--	102428
	Thermal Power Sensor	NRP-Z21	--	102106
	Spectrum Analyzer	FSQ26	--	100244

Test Setup, Radiated Measurement:



Test Object	Part Number	Version	Serial Number
Radio Part	RUG 11 B5 / KRC 161 194/1	R1C	CB40584240

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP Compaq	--	CNG8450JVD
2	Main Unit DUG 10 01	KDU 137 599/1	R1G	CB4C823748
3	RBS Master	LPC 102 462/1	R1C	T01E632659
4	Load	TF100	--	09121642
	Load	TF100	--	09121608
5	Power Supply	DH1716-5D	--	2008040003
	Power Supply	DH1716A-10	--	1000303181

Product Service

1.4.3 Modes of Operation

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

Mode 1 - ARFCN 128: 869.2 MHz (Bottom Channel)

Mode 2 - ARFCN 190: 881.6 MHz (Middle Channel)

Mode 3 - ARFCN 251: 893.8 MHz (Top Channel)

Mode 4 - ARFCN 129: 869.4 MHz

Mode 5 - ARFCN 250: 893.6 MHz

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

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or a chamber as appropriate.

The EUT was powered from a -48V DC supply.

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.

1.8 ALTERNATIVE TEST SITE

Testing has been performed under the following site registrations:

FCC Accreditation 910917:
The State Radio Monitoring Centre, No.80 Beilishi Road Xicheng District Beijing, China.

Industry Canada Accreditation 7308A:
The State Radio Monitoring Centre, No.80 Beilishi Road Xicheng District Beijing, China.

Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Ericsson AB
RUG 11 B5 / KRC 161 194/1

Product Service

2.1 MAXIMUM PEAK OUTPUT POWER - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 22, Clause 22.913 (a)
Industry Canada RSS-132, Clause 4.4

2.1.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.1.3 Date of Test and Modification State

18 March 2011 – 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 2 and Part 22 and Industry Canada RSS-132.

Using a power meter and attenuator(s), the output power of the EUT was measured at the antenna terminal. The carrier power was measured with GMSK, 8-PSK, 16QAM and 32QAM using the test model described.

The path loss was 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

Configuration 2 - Mode 1
- Mode 2
- Mode 3

Configuration 3 - Mode 1
- Mode 2
- Mode 3

2.1.6 Environmental Conditions

	18 March 2011
Ambient Temperature	25.0°C
Relative Humidity	34.0%

Product Service

2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 for Maximum Peak Output Power.

The test results are shown below

GMSK

Configuration 1 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	46.23	41.98
Middle	881.6	41.2	46.35	43.15
Top	893.8	41.2	46.19	41.59

Configuration 2 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	48.85	76.74
Middle	881.6	41.2	48.88	77.27
Top	893.8	41.2	48.82	76.21

Configuration 3 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	42.94	19.68
Middle	881.6	41.2	42.95	19.72
Top	893.8	41.2	42.94	19.68

8PSK

Configuration 1 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	42.95	19.72
Middle	881.6	41.2	43.08	20.32
Top	893.8	41.2	42.96	19.77

Configuration 2 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	45.56	35.97
Middle	881.6	41.2	45.57	36.06
Top	893.8	41.2	45.49	35.40

Configuration 3 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	39.67	9.27
Middle	881.6	41.2	39.73	9.40
Top	893.8	41.2	39.68	9.29

16QAM

Configuration 1 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	41.76	15.00
Middle	881.6	41.2	41.85	15.31
Top	893.8	41.2	41.72	14.86

Configuration 2 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	44.39	27.48
Middle	881.6	41.2	44.39	27.48
Top	893.8	41.2	44.27	26.73

Configuration 3 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	38.50	7.08
Middle	881.6	41.2	38.54	7.14
Top	893.8	41.2	38.49	7.06

32QAM

Configuration 1 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	40.84	12.13
Middle	881.6	41.2	40.86	12.19
Top	893.8	41.2	40.72	11.80

Configuration 2 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	43.43	22.03
Middle	881.6	41.2	43.44	22.08
Top	893.8	41.2	43.36	21.68

Configuration 3 - Mode 1, 2 and 3

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.2	37.50	5.62
Middle	881.6	41.2	37.57	5.71
Top	893.8	41.2	37.55	5.69

Limit	≤500W or ≤+57dBm

Remarks

The EUT does not exceed 500W or 57dBm at the measured frequencies.

2.2 PEAK – AVERAGE RATIO

2.2.1 Specification Reference

FCC CFR 47 Part 22, Clause 22.913 (a)

2.2.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.2.3 Date of Test and Modification State

22 and 23 March 2011 – 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.

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determined the largest deviation between the average and the peak power of the EUT in given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

The path loss is 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
Configuration 2	- Mode 1
	- Mode 2
	- Mode 3
Configuration 3	- Mode 1
	- Mode 2
	- Mode 3

2.2.6 Environmental Conditions

	22 March 2011	23 March 2011
Ambient Temperature	26.2°C	26.8°C
Relative Humidity	20.4%	20.0%

Product Service

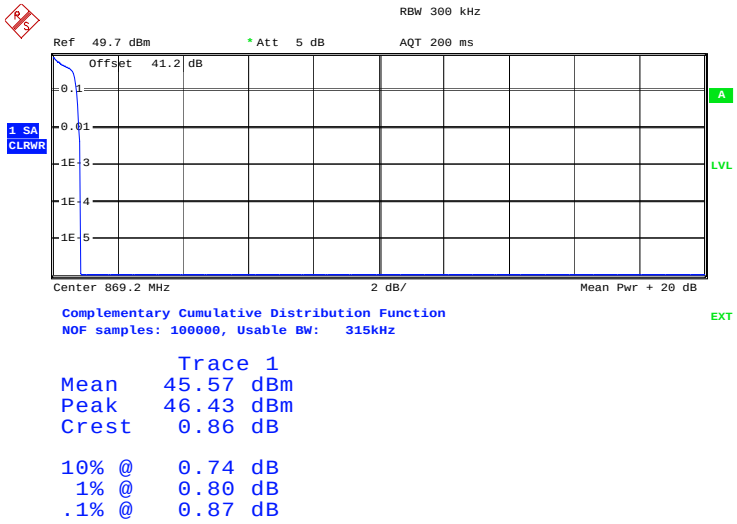
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 22 Peak – Average Ratio.

The test results are shown below.

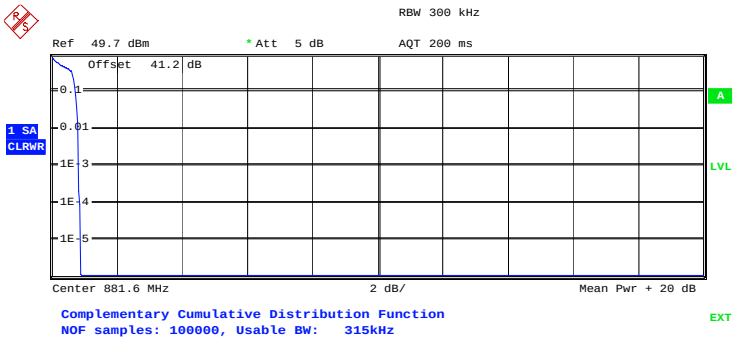
GMSK

Configuration 1 - Mode 1



Product Service

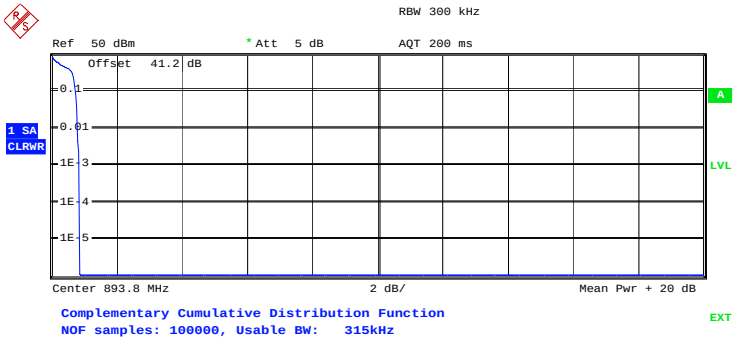
Configuration 1 - Mode 2



	Trace 1
Mean	45.68 dBm
Peak	46.57 dBm
Crest	0.89 dB
10% @	0.74 dB
1% @	0.80 dB
.1% @	0.83 dB

Date: 22.MAR.2011 15:34:33

Configuration 1 - Mode 3

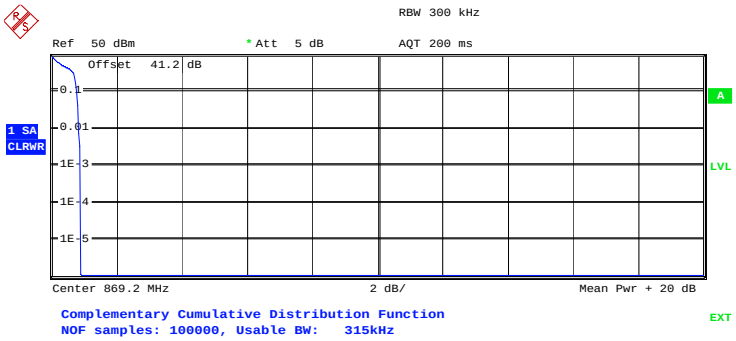


	Trace 1
Mean	45.58 dBm
Peak	46.45 dBm
Crest	0.86 dB
10% @	0.74 dB
1% @	0.80 dB
.1% @	0.87 dB

Date: 22.MAR.2011 15:29:38

Product Service

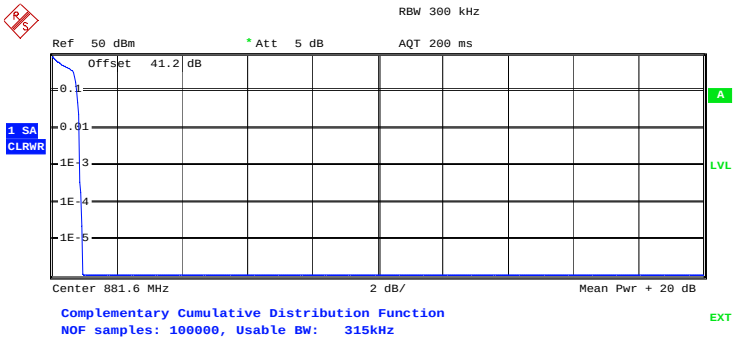
Configuration 2 - Mode 1



	Trace 1
Mean	48.24 dBm
Peak	49.13 dBm
Crest	0.89 dB
10% @	0.77 dB
1% @	0.83 dB
.1% @	0.90 dB

Date: 23.MAR.2011 08:21:45

Configuration 2 - Mode 2

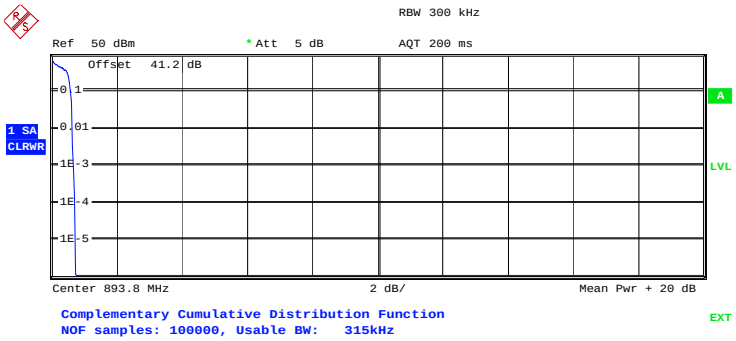


	Trace 1
Mean	48.27 dBm
Peak	49.20 dBm
Crest	0.93 dB
10% @	0.77 dB
1% @	0.87 dB
.1% @	0.87 dB

Date: 23.MAR.2011 08:20:58

Product Service

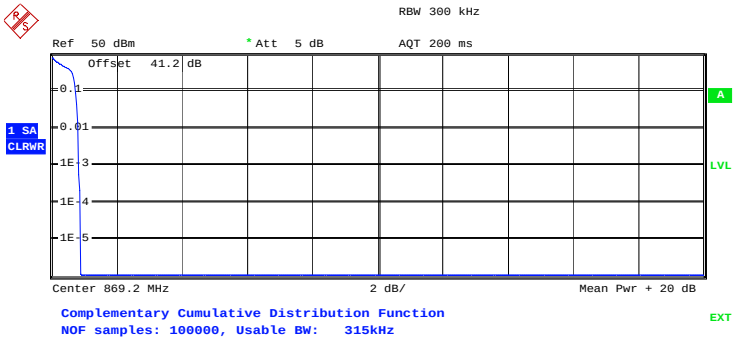
Configuration 2 - Mode 3



	Trace 1
Mean	48.42 dBm
Peak	49.13 dBm
Crest	0.71 dB
10% @	0.58 dB
1% @	0.64 dB
.1% @	0.67 dB

Date: 23.MAR.2011 08:15:28

Configuration 3 - Mode 1

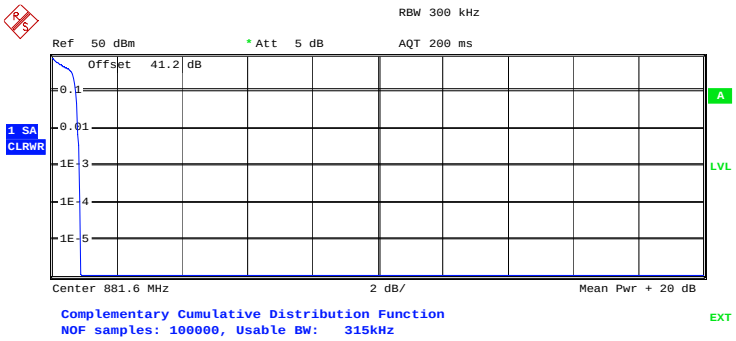


	Trace 1
Mean	42.46 dBm
Peak	43.34 dBm
Crest	0.88 dB
10% @	0.74 dB
1% @	0.80 dB
.1% @	0.83 dB

Date: 23.MAR.2011 09:17:19

Product Service

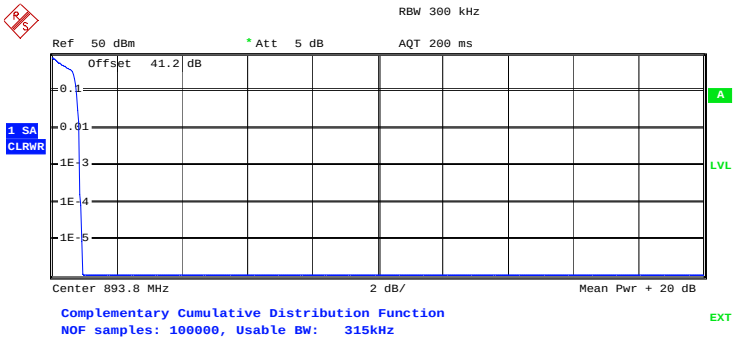
Configuration 3 - Mode 2



	Trace 1
Mean	42.48 dBm
Peak	43.34 dBm
Crest	0.87 dB
10% @	0.74 dB
1% @	0.80 dB
.1% @	0.87 dB

Date: 23.MAR.2011 09:08:45

Configuration 3 - Mode 3



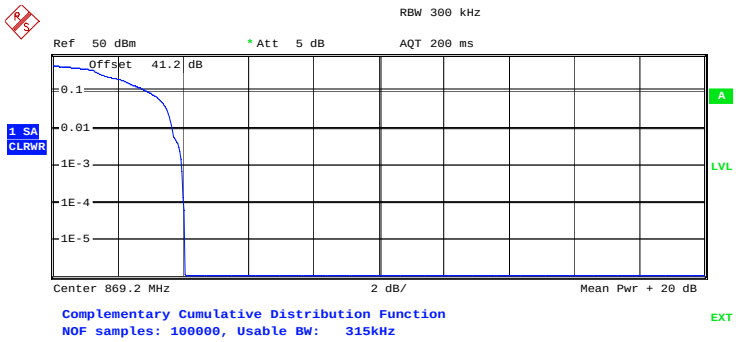
	Trace 1
Mean	42.48 dBm
Peak	43.41 dBm
Crest	0.93 dB
10% @	0.77 dB
1% @	0.83 dB
.1% @	0.87 dB

Date: 23.MAR.2011 09:07:41

Product Service

8-PSK

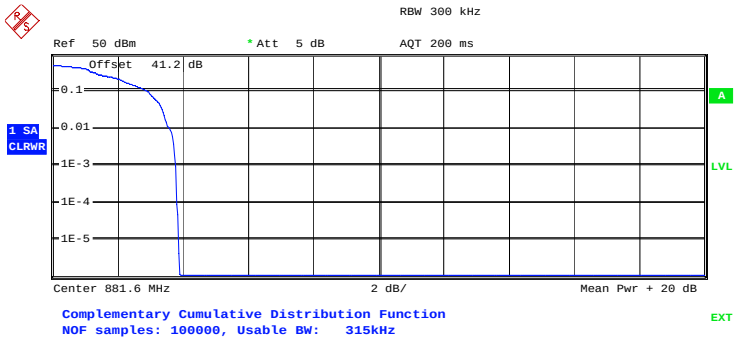
Configuration 1 - Mode 1



	Trace 1
Mean	42.46 dBm
Peak	46.52 dBm
Crest	4.06 dB
10% @	2.92 dB
1% @	3.65 dB
.1% @	3.97 dB

Date: 22.MAR.2011 15:48:36

Configuration 1 - Mode 2

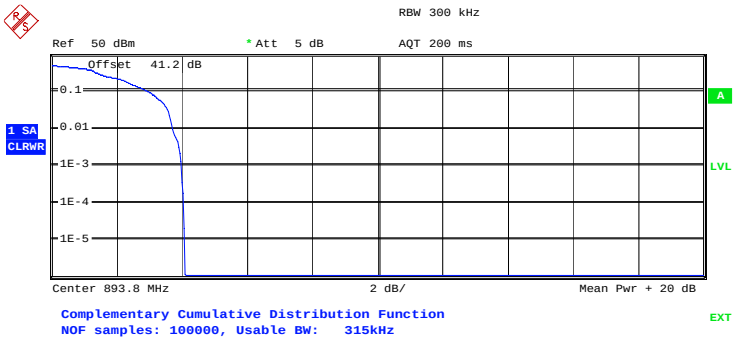


	Trace 1
Mean	42.78 dBm
Peak	46.66 dBm
Crest	3.88 dB
10% @	2.88 dB
1% @	3.56 dB
.1% @	3.78 dB

Date: 22.MAR.2011 15:49:14

Product Service

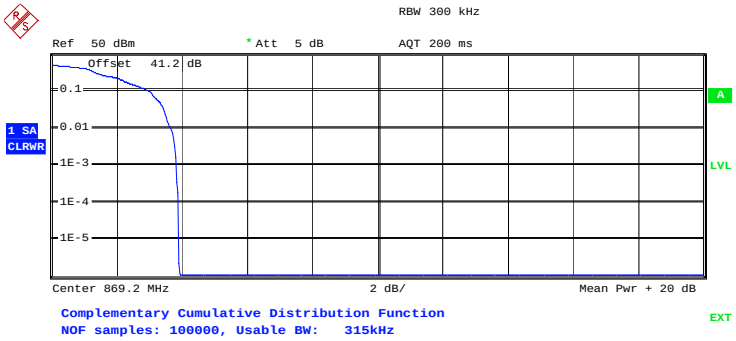
Configuration 1 - Mode 3



	Trace 1
Mean	42.45 dBm
Peak	46.52 dBm
Crest	4.07 dB
10% @	2.95 dB
1% @	3.72 dB
.1% @	3.97 dB

Date: 22.MAR.2011 15:51:37

Configuration 2 - Mode 1

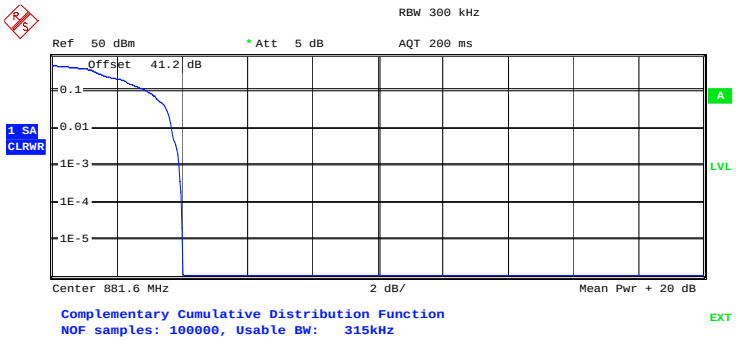


	Trace 1
Mean	45.22 dBm
Peak	49.13 dBm
Crest	3.90 dB
10% @	2.95 dB
1% @	3.62 dB
.1% @	3.81 dB

Date: 23.MAR.2011 08:22:18

Product Service

Configuration 2 - Mode 2

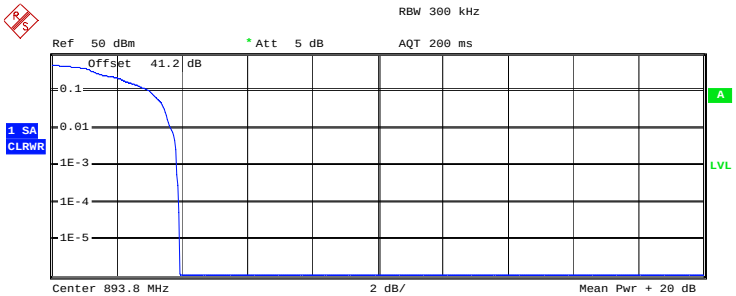


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	45.12 dBm
Peak	49.13 dBm
Crest	4.00 dB
10% @	2.92 dB
1% @	3.69 dB
.1% @	3.91 dB

Date: 23.MAR.2011 08:20:28

Configuration 2 - Mode 3



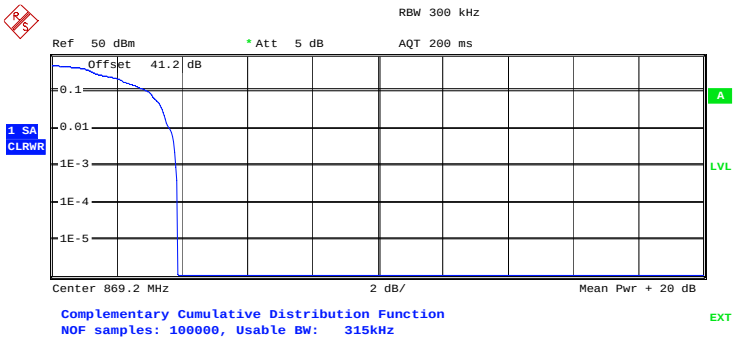
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	45.22 dBm
Peak	49.13 dBm
Crest	3.91 dB
10% @	2.98 dB
1% @	3.65 dB
.1% @	3.85 dB

Date: 23.MAR.2011 08:16:23

Product Service

Configuration 3 - Mode 1

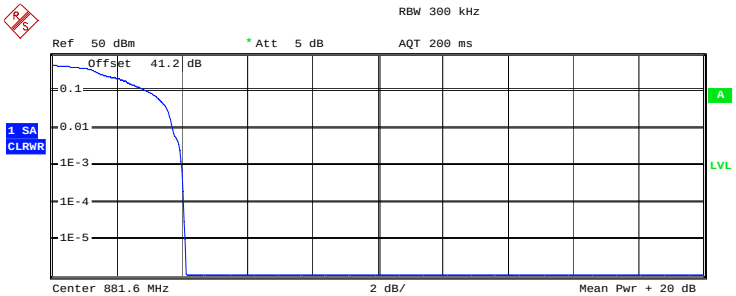


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	39.41 dBm
Peak	43.27 dBm
Crest	3.86 dB
10% @	2.92 dB
1% @	3.59 dB
.1% @	3.81 dB

Date: 23.MAR.2011 09:16:49

Configuration 3 - Mode 2



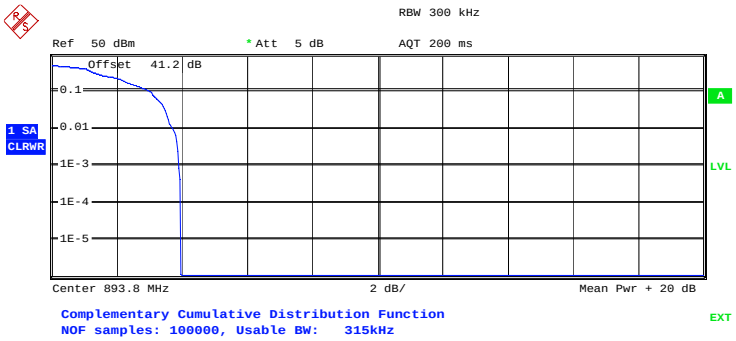
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	39.23 dBm
Peak	43.34 dBm
Crest	4.11 dB
10% @	2.92 dB
1% @	3.72 dB
.1% @	3.97 dB

Date: 23.MAR.2011 09:10:49

Product Service

Configuration 3 - Mode 3

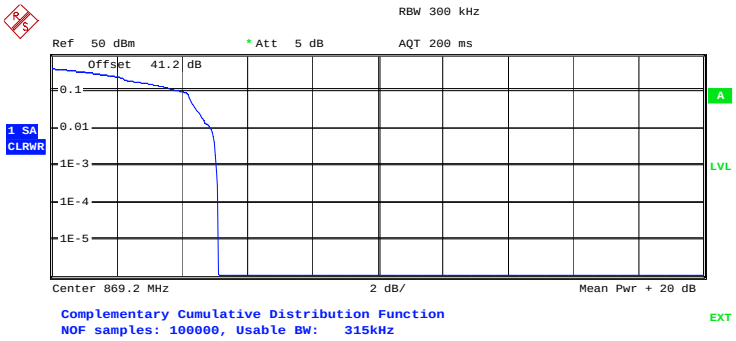


	Trace 1
Mean	39.38 dBm
Peak	43.34 dBm
Crest	3.97 dB
10% @	2.98 dB
1% @	3.69 dB
.1% @	3.91 dB

Date: 23.MAR.2011 09:06:48

16QAM

Configuration 1 - Mode 1

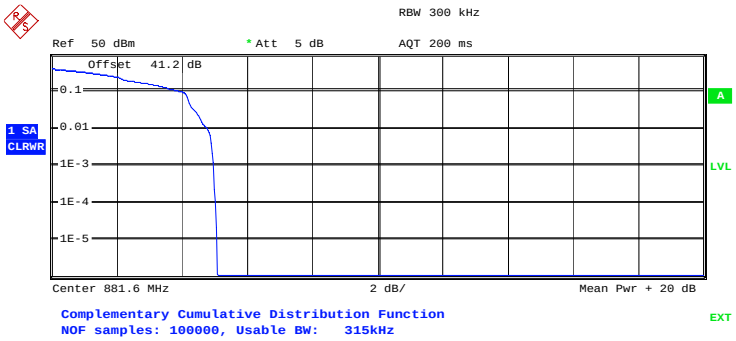


	Trace 1
Mean	41.41 dBm
Peak	46.52 dBm
Crest	5.11 dB
10% @	3.94 dB
1% @	4.87 dB
.1% @	5.06 dB

Date: 22.MAR.2011 15:48:07

Product Service

Configuration 1 - Mode 2

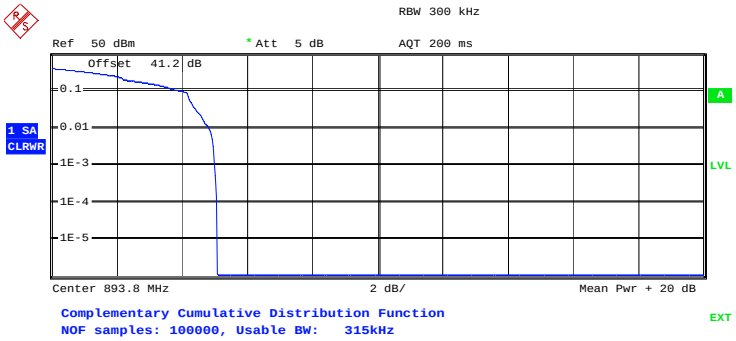


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	41.59 dBm
Peak	46.66 dBm
Crest	5.06 dB
10% @	3.94 dB
1% @	4.74 dB
.1% @	4.97 dB

Date: 22.MAR.2011 15:49:41

Configuration 1 - Mode 3



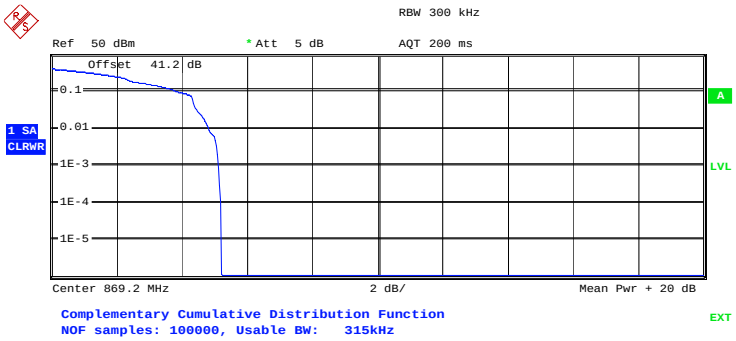
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	41.45 dBm
Peak	46.52 dBm
Crest	5.07 dB
10% @	3.94 dB
1% @	4.81 dB
.1% @	5.00 dB

Date: 22.MAR.2011 15:51:10

Product Service

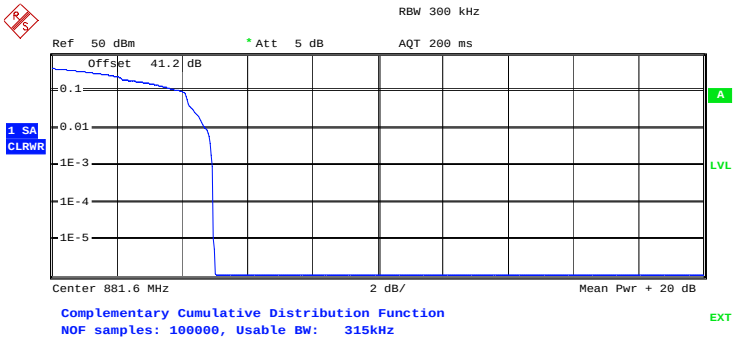
Configuration 2 - Mode 1



	Trace 1
Mean	43.92 dBm
Peak	49.13 dBm
Crest	5.20 dB
10% @	3.81 dB
1% @	4.81 dB
.1% @	5.13 dB

Date: 23.MAR.2011 08:23:25

Configuration 2 - Mode 2

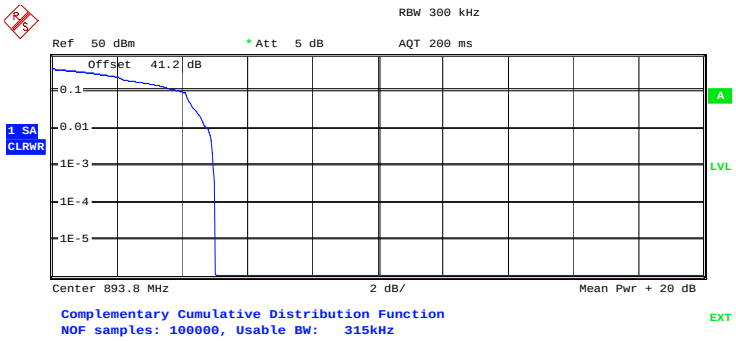


	Trace 1
Mean	44.17 dBm
Peak	49.20 dBm
Crest	5.03 dB
10% @	3.94 dB
1% @	4.71 dB
.1% @	4.94 dB

Date: 23.MAR.2011 08:19:50

Product Service

Configuration 2 - Mode 3

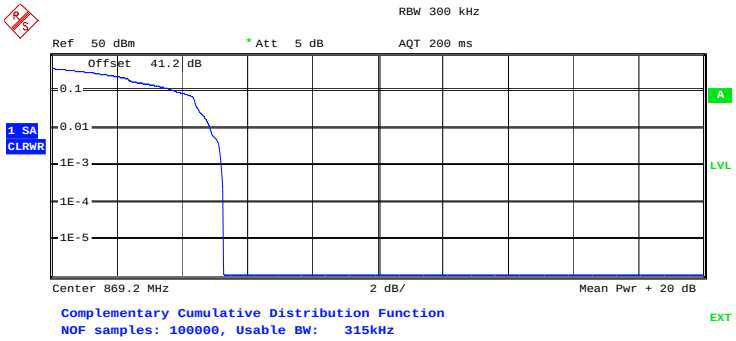


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.11 dBm
Peak	49.13 dBm
Crest	5.02 dB
10% @	3.94 dB
1% @	4.78 dB
.1% @	4.97 dB

Date: 23.MAR.2011 08:16:49

Configuration 3 - Mode 1



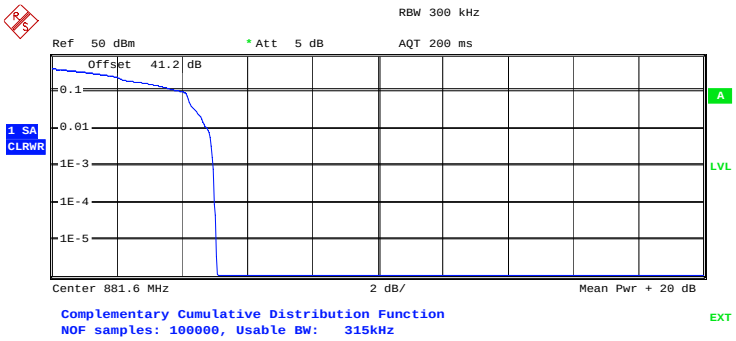
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	38.00 dBm
Peak	43.27 dBm
Crest	5.27 dB
10% @	3.78 dB
1% @	4.84 dB
.1% @	5.22 dB

Date: 23.MAR.2011 09:16:29

Product Service

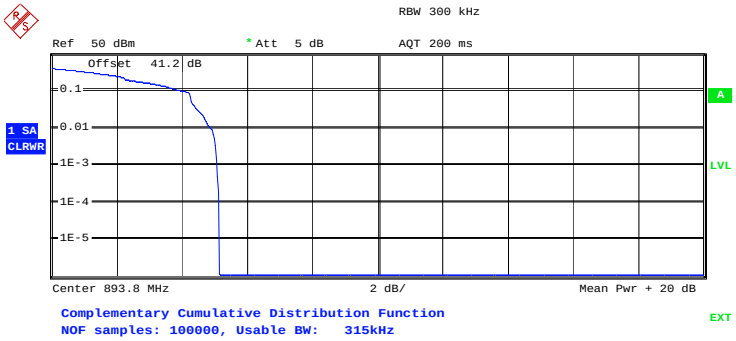
Configuration 3 - Mode 2



	Trace 1
Mean	38.28 dBm
Peak	43.34 dBm
Crest	5.06 dB
10% @	3.94 dB
1% @	4.74 dB
.1% @	4.97 dB

Date: 23.MAR.2011 09:11:10

Configuration 3 - Mode 3



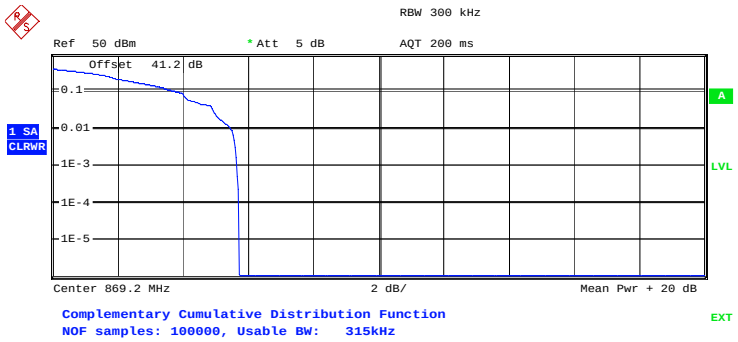
	Trace 1
Mean	38.20 dBm
Peak	43.34 dBm
Crest	5.14 dB
10% @	4.01 dB
1% @	4.84 dB
.1% @	5.06 dB

Date: 23.MAR.2011 09:05:08

Product Service

32QAM

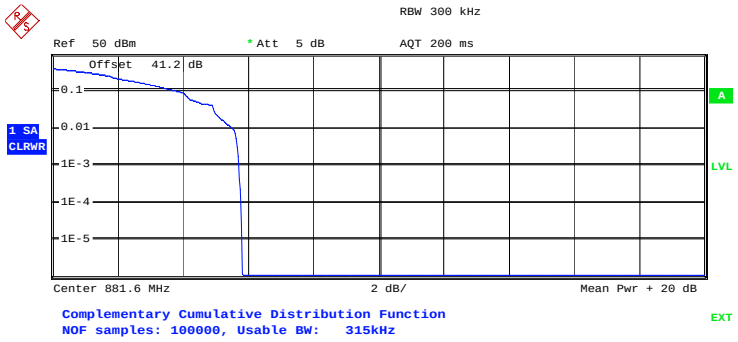
Configuration 1 - Mode 1



	Trace 1
Mean	40.79 dBm
Peak	46.52 dBm
Crest	5.72 dB
10% @	3.81 dB
1% @	5.45 dB
.1% @	5.67 dB

Date: 22.MAR.2011 15:47:24

Configuration 1 - Mode 2

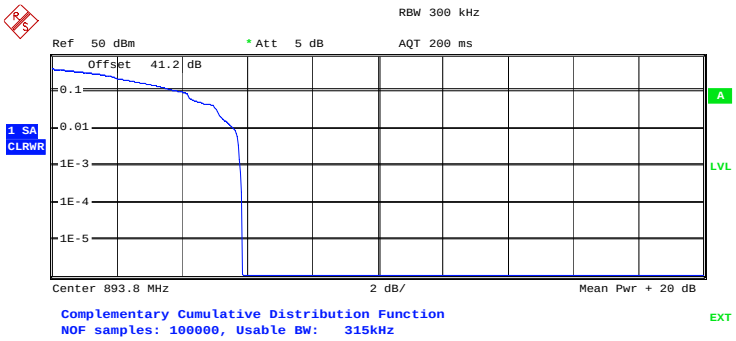


	Trace 1
Mean	40.86 dBm
Peak	46.66 dBm
Crest	5.80 dB
10% @	3.85 dB
1% @	5.51 dB
.1% @	5.74 dB

Date: 22.MAR.2011 15:50:05

Product Service

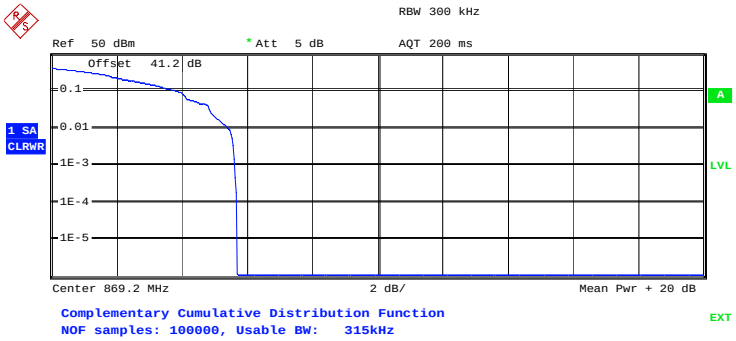
Configuration 1 - Mode 3



	Trace 1
Mean	40.68 dBm
Peak	46.52 dBm
Crest	5.84 dB
10% @	3.91 dB
1% @	5.58 dB
.1% @	5.80 dB

Date: 22.MAR.2011 15:50:41

Configuration 2 - Mode 1

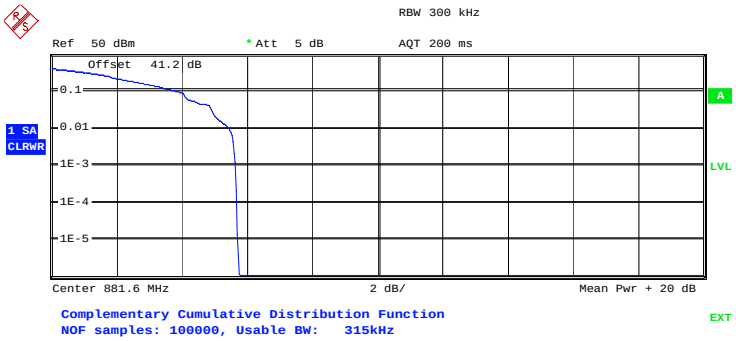


	Trace 1
Mean	43.44 dBm
Peak	49.13 dBm
Crest	5.68 dB
10% @	3.81 dB
1% @	5.42 dB
.1% @	5.61 dB

Date: 23.MAR.2011 08:23:46

Product Service

Configuration 2 - Mode 2

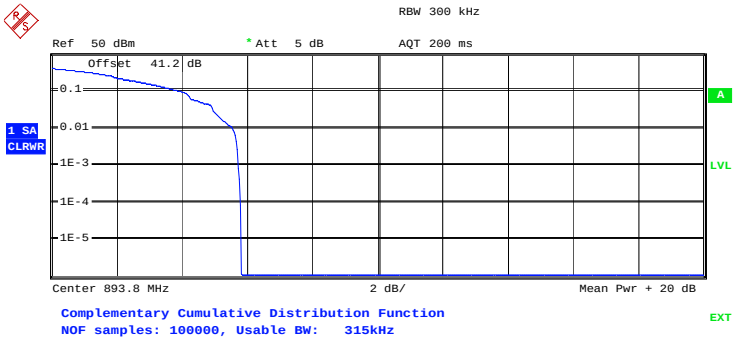


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	43.46 dBm
Peak	49.20 dBm
Crest	5.74 dB
10% @	3.81 dB
1% @	5.42 dB
.1% @	5.64 dB

Date: 23.MAR.2011 08:18:55

Configuration 2 - Mode 3



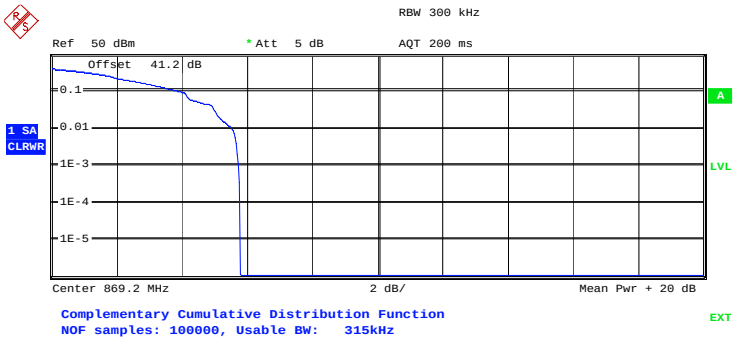
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	43.33 dBm
Peak	49.13 dBm
Crest	5.80 dB
10% @	3.91 dB
1% @	5.51 dB
.1% @	5.74 dB

Date: 23.MAR.2011 08:17:59

Product Service

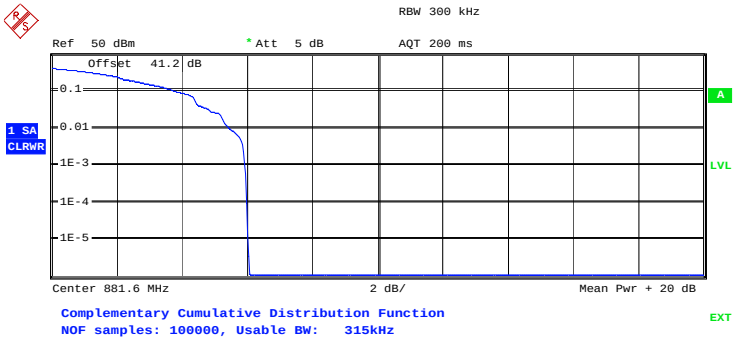
Configuration 3 - Mode 1



	Trace 1
Mean	37.49 dBm
Peak	43.27 dBm
Crest	5.78 dB
10% @	3.91 dB
1% @	5.51 dB
.1% @	5.74 dB

Date: 23.MAR.2011 09:13:59

Configuration 3 - Mode 2

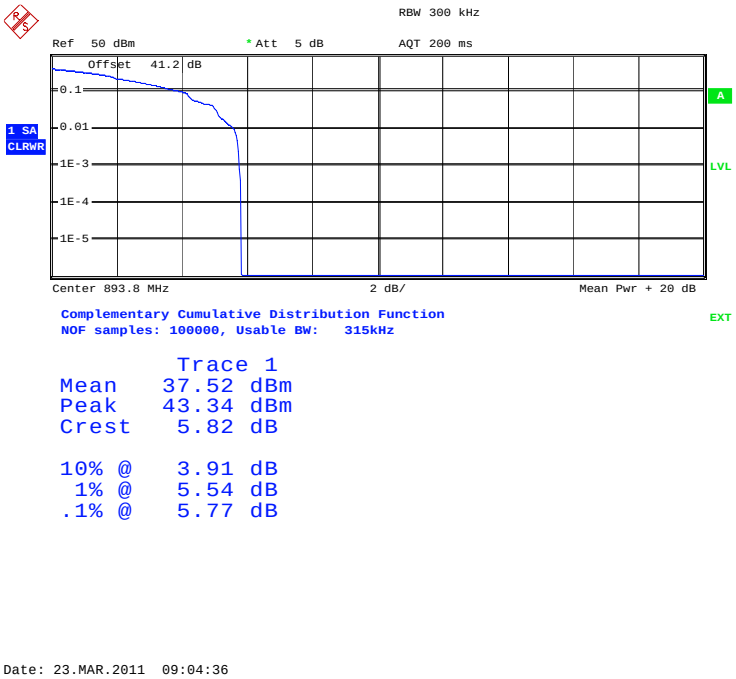


	Trace 1
Mean	37.28 dBm
Peak	43.34 dBm
Crest	6.06 dB
10% @	3.75 dB
1% @	5.45 dB
.1% @	5.93 dB

Date: 23.MAR.2011 09:12:55

Product Service

Configuration 3 - Mode 3



Limit	13dB

Remarks

The Peak – Average ratio does not exceed 13dB at the measured frequencies.

Product Service

2.3 MODULATION CHARACTERISTICS

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1047 (d)
Industry Canada RSS-132 Clause 4.2

2.3.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.3.3 Date of Test and Modification State

23 March 2011 – Modification State 0

2.3.4 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Industry Canada RSS-132.

The EUT supports GMSK, 8-PSK, 16QAM and 32QAM modulations.

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

Configuration 1 - Mode 2

2.3.5 Environmental Conditions

	23 March 2011
Ambient Temperature	26.8°C
Relative Humidity	20.0%

Product Service

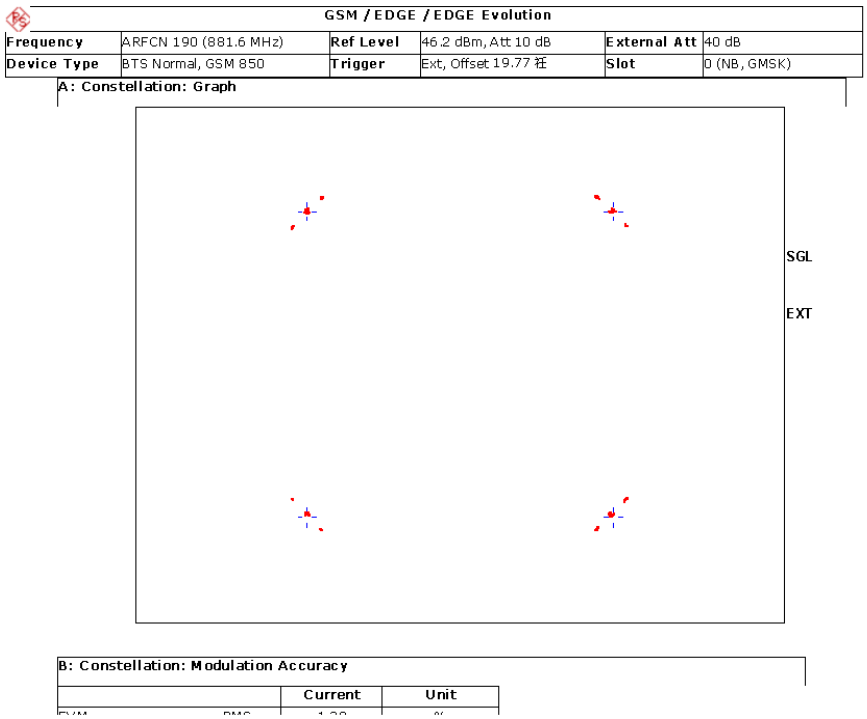
2.3.6 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Industry Canada RSS-132 for Modulation Characteristics.

The test results are shown below

Configuration 1 - Mode 2

GMSK

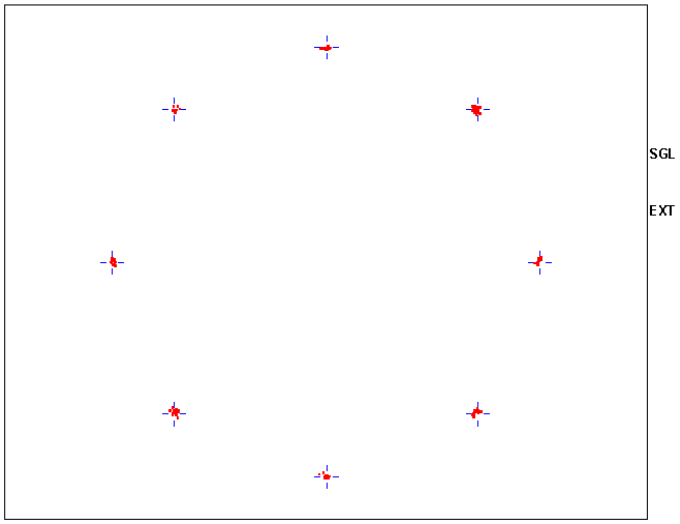


Product Service

8-PSK

GSM / EDGE / EDGE Evolution					
Frequency	ARFCN 190 (881.6 MHz)	**Ref Level**	46.2 dBm, Att 10 dB	**External Att**	40 dB
Device Type	BTS Normal, GSM 850	**Trigger**	Ext, Offset 19.77 µs	**Slot**	0 (NB, 8PSK)

A: Constellation: Graph



B: Constellation: Modulation Accuracy

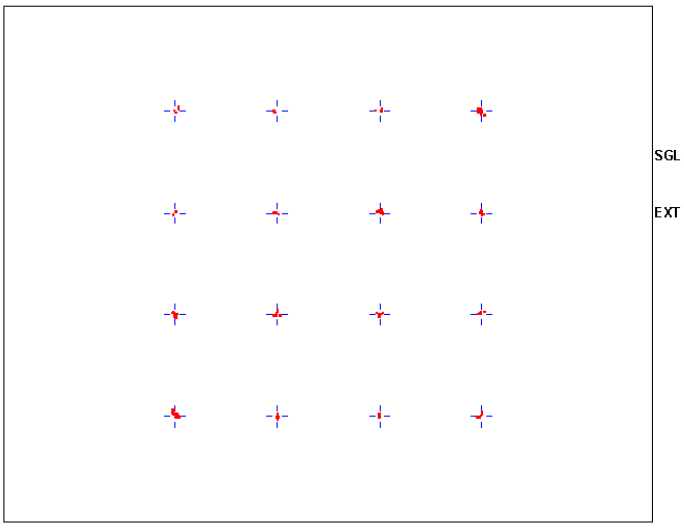
	Current	Unit
EVM	1.12	%

Date: 23.MAR.2011 10:34:44

16QAM

GSM / EDGE / EDGE Evolution					
Frequency	ARFCN 190 (881.6 MHz)	**Ref Level**	46.2 dBm, Att 10 dB	**External Att**	40 dB
Device Type	BTS Normal, GSM 850	**Trigger**	Ext, Offset 19.77 µs	**Slot**	0 (NB, 16QAM)

A: Constellation: Graph



B: Constellation: Modulation Accuracy

	Current	Unit
EVM	1.09	%

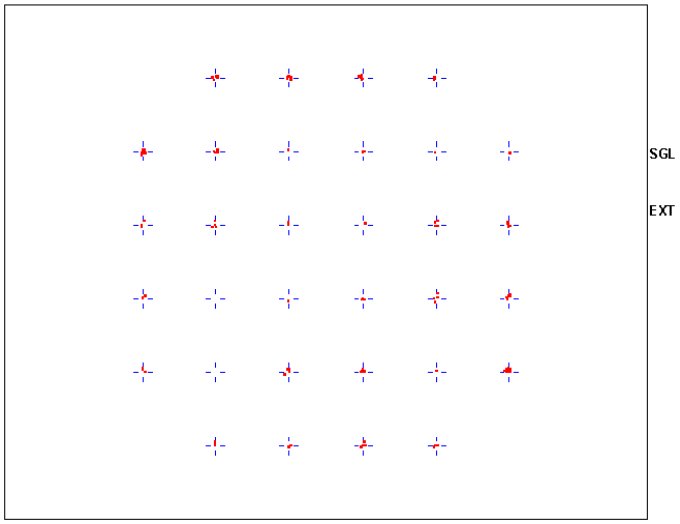
Date: 23.MAR.2011 10:36:01

Product Service

32QAM

GSM / EDGE / EDGE Evolution					
Frequency	ARFCN 190 (881.6 MHz)	**Ref Level**	46.2 dBm, Att 10 dB	**External Att**	40 dB
Device Type	BTS Normal, GSM 850	**Trigger**	Ext, Offset 19.77 µ	**Slot**	0 (NB, 32QAM)

A: Constellation: Graph



B: Constellation: Modulation Accuracy

	Current	Unit
EVM	1.13	%

Date: 23.MAR.2011 10:36:57

Product Service

2.4 OCCUPIED BANDWIDTH

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 22, Clause 22.917 (b)
Industry Canada RSS-GEN, Clause 4.6.1

2.4.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.4.3 Date of Test and Modification State

22 March 2011 – 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 2 and Part 22 and Industry Canada RSS-GEN.

The EUT was transmitting at maximum power, modulated with all timeslots active. Using a resolution bandwidth of 3kHz and a video bandwidth of 30kHz.The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.The -26dBc points were also established and the emission bandwidth determined.

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

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.4.6 Environmental Conditions

	22 March 2011
Ambient Temperature	26.2°C
Relative Humidity	20.4%

Product Service

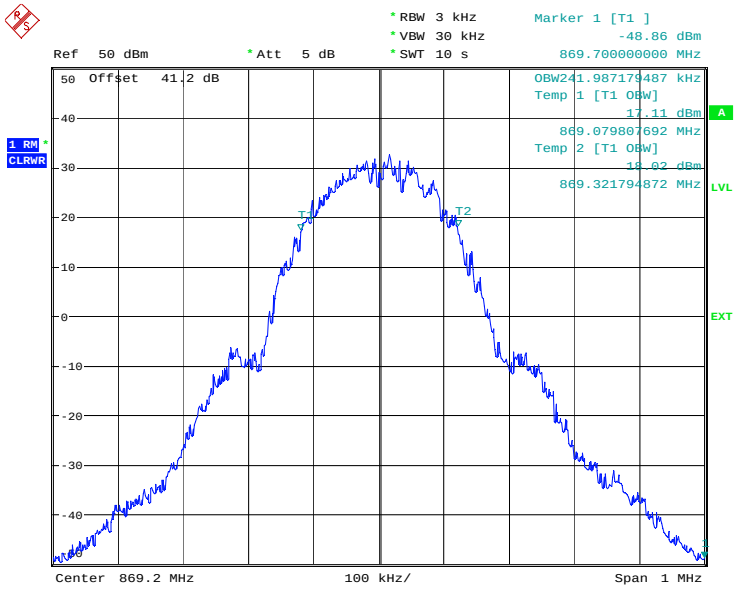
2.4.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-GEN for Occupied Bandwidth.

The test results are shown below

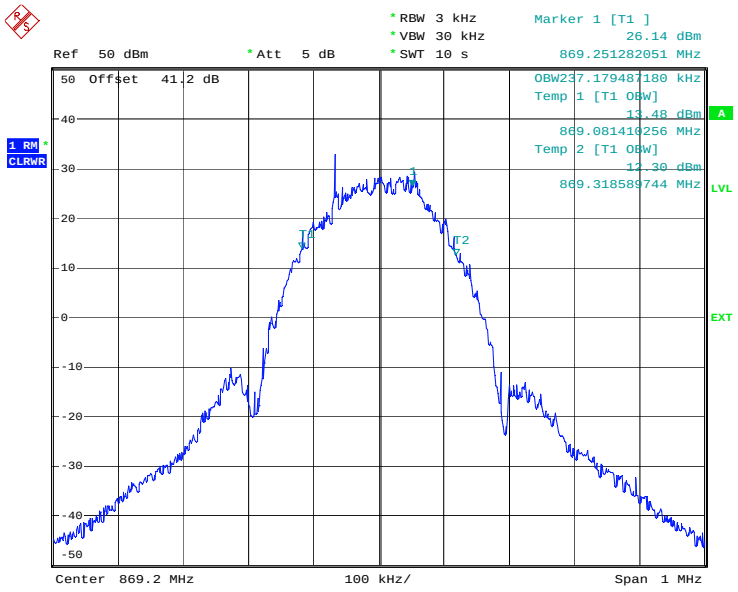
Configuration 1 - Mode 1

GMSK



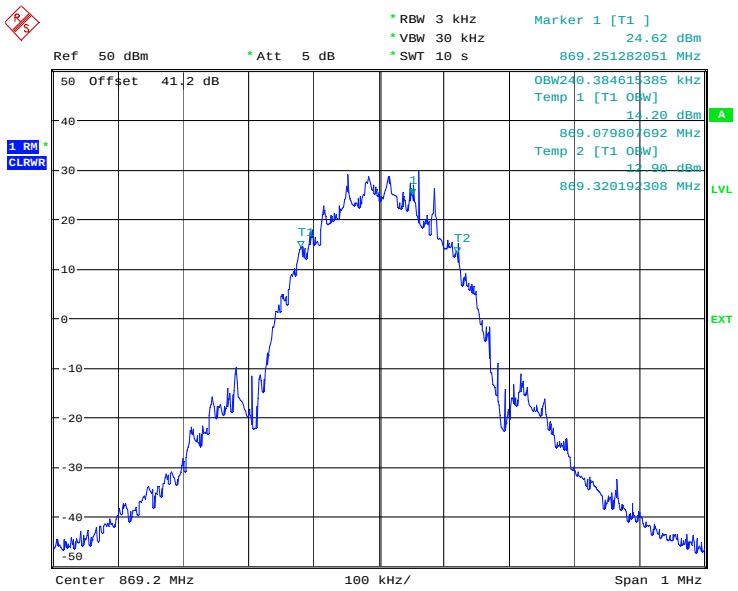
Date: 22.MAR.2011 14:18:24

8-PSK



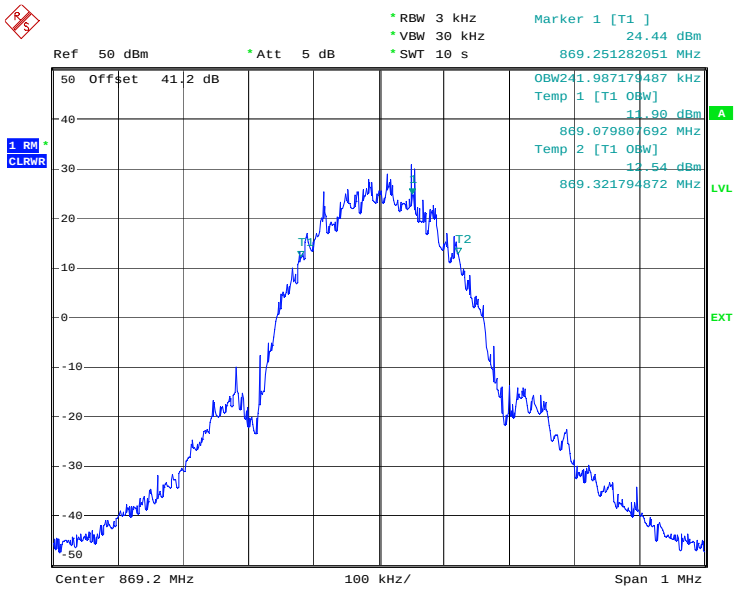
Date: 22.MAR.2011 14:23:47

16QAM



Date: 22.MAR.2011 14:21:16

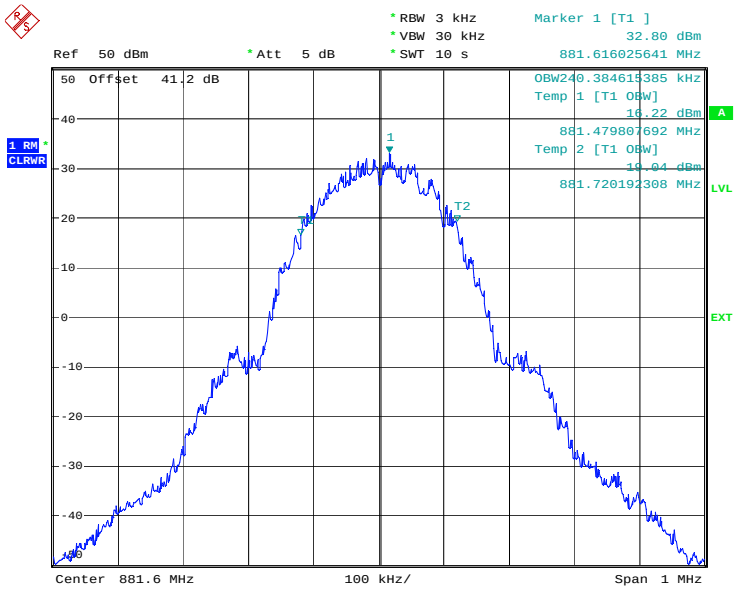
32QAM



Date: 22.MAR.2011 14:22:11

Configuration 1 - Mode 2

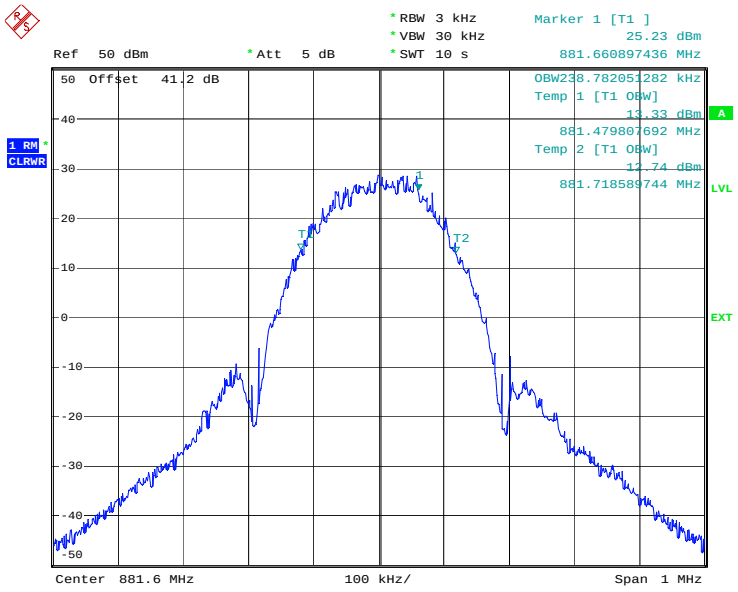
GMSK



Date: 22.MAR.2011 14:28:12

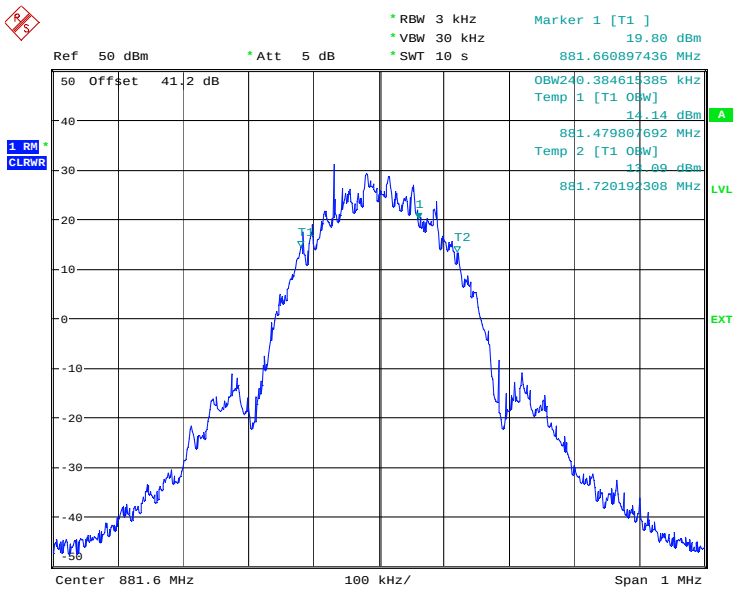
Product Service

8-PSK



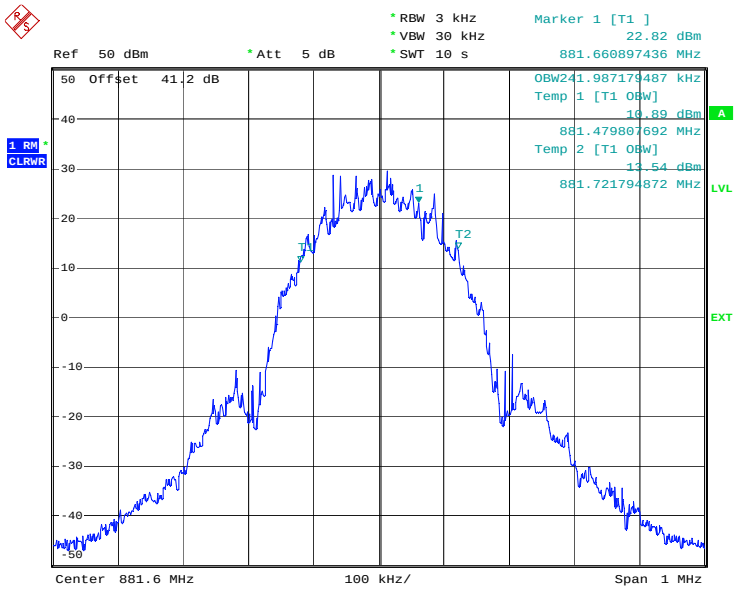
Date: 22.MAR.2011 14:29:21

16QAM



Date: 22.MAR.2011 14:30:20

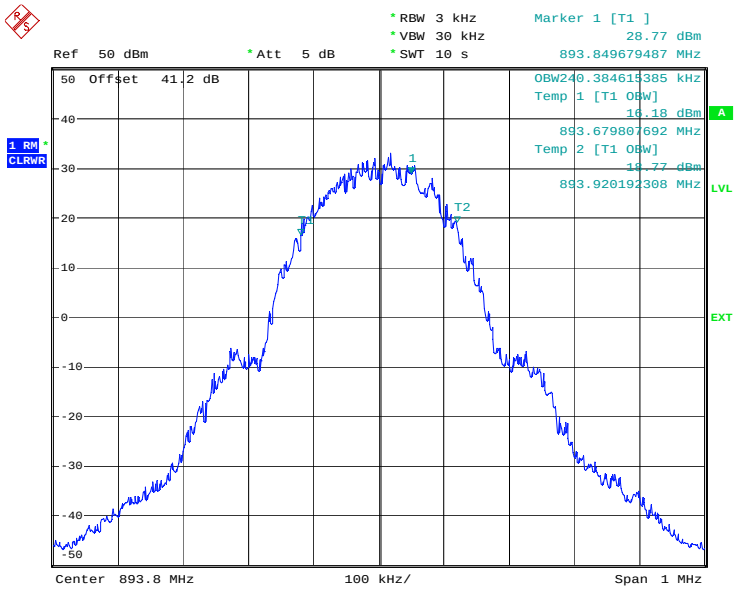
32QAM



Date: 22.MAR.2011 14:31:13

Configuration 1 - Mode 3

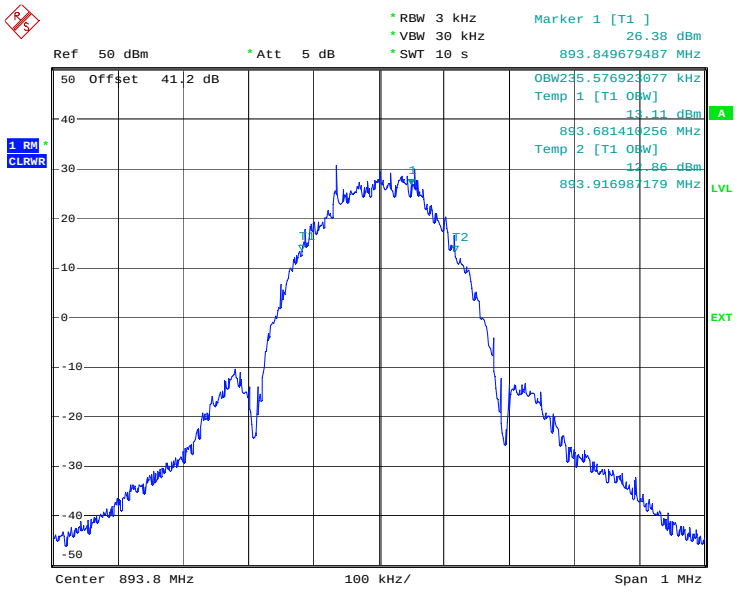
GMSK



Date: 22.MAR.2011 14:36:05

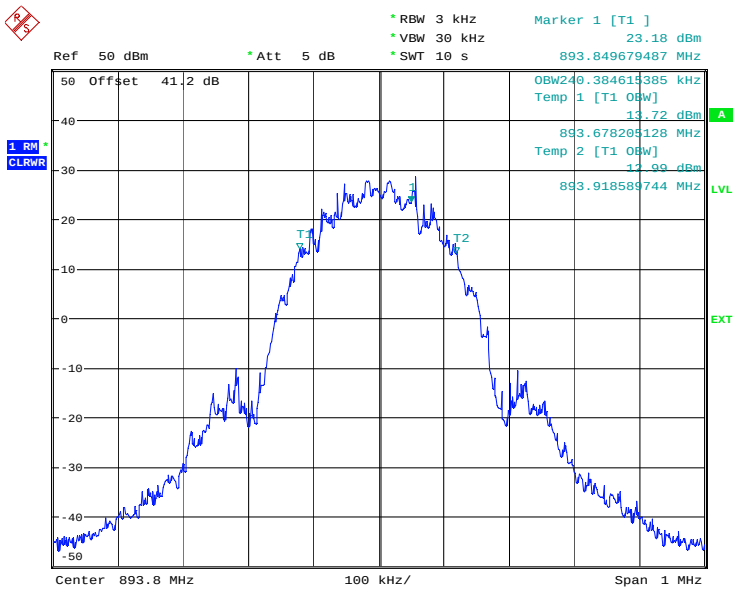
Product Service

8-PSK



Date: 22.MAR.2011 14:34:10

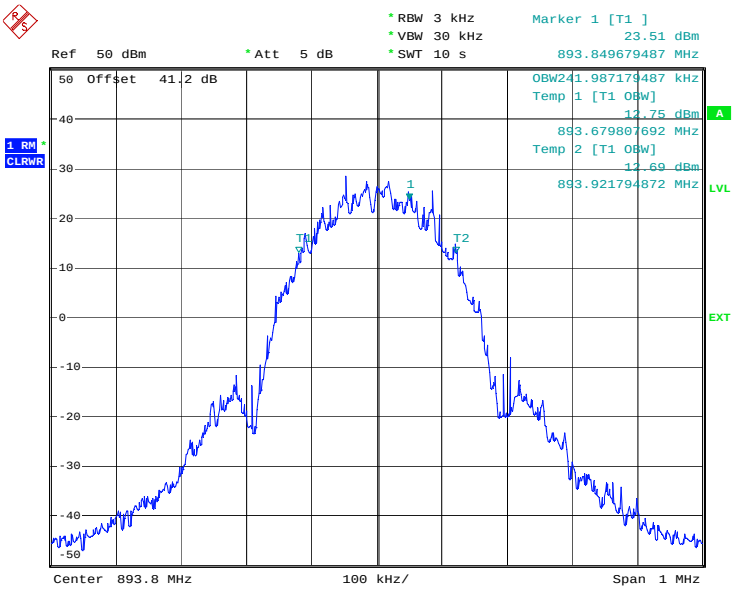
16QAM



Date: 22.MAR.2011 14:33:11

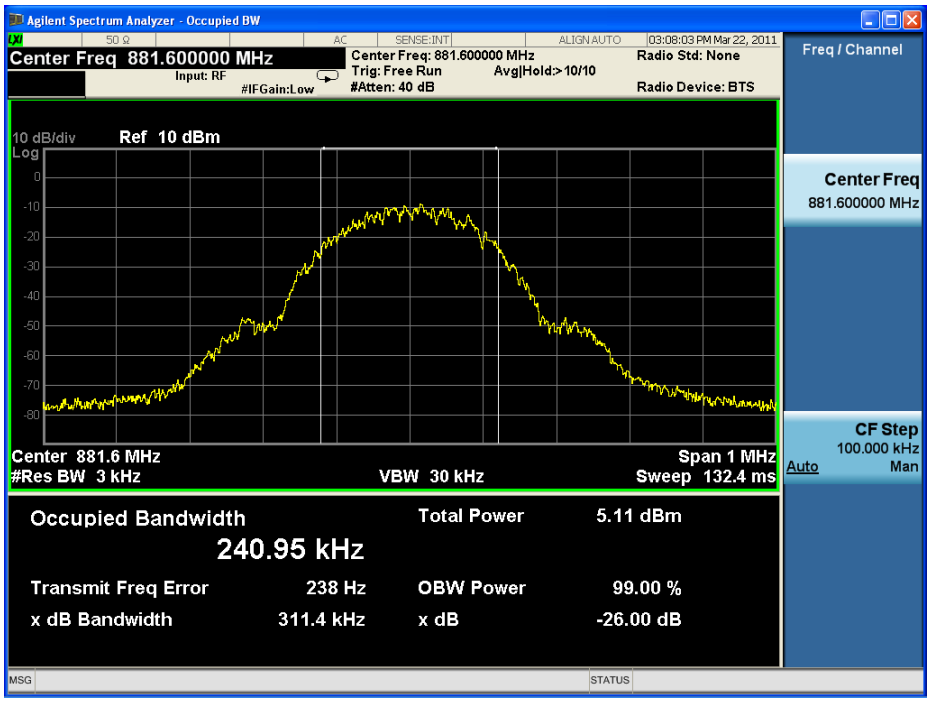
Product Service

32QAM



Date: 22.MAR.2011 14:32:23

-26dBc Bandwidth



2.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS (±1MHz)

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 22, Clause 22.917 (b)
Industry Canada RSS-132 Clause 4.5

2.5.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.5.3 Date of Test and Modification State

23 March 2011 – 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 2 and Part 22 and Industry Canada RSS-132.

In accordance with 22.917(b), at least 1% of the 26dB bandwith was used for the resolution bandwidth up to 1 MHz away from the block edge. A resolution bandwidth of 50kHz was used between1MHz to 5MHz away from the band edge. As the FCC rules specify a RBW of 1MHz for measurements of emissions > 1MHz away from the band edges, the limit was adjusted with -13dB to -26dBm to compensate for the reduced mesurement bandwidth. Spectrum analyser detector was set as RMS.

The path loss measured and entered as a reference level offset.

The EUT was tested at it's maximum power level with all timeslots active.

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

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

2.5.6 Environmental Conditions

	23 March 2011
Ambient Temperature	26.8°C
Relative Humidity	20.0%

Product Service

2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 for Spurious Emissions Antenna Terminals (±1MHz)

Below are the Frequencies the EUT was tested against along with the tested channels.

Remark:
The channel adjacent to the lower and higher band-edge cannot be used. The lowest usable channel is 129 (869.4MHz), the highest usable channel is 250 (893.6MHz)

Configuration 1 - Mode 4 and 5

Band Edge Frequency	Edge Test with GMSK modulation Channel No./Frequencies	Edge Test with 8-PSK modulation Channel No./Frequencies	Edge Test with 16QAM modulation Channel No./Frequencies	Edge Test with 32QAM modulation Channel No./Frequencies
Bottom 869 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz
Top 894 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz

Configuration 2 - Mode 4 and 5

Band Edge Frequency	Edge Test with GMSK modulation Channel No./Frequencies	Edge Test with 8-PSK modulation Channel No./Frequencies	Edge Test with 16QAM modulation Channel No./Frequencies	Edge Test with 32QAM modulation Channel No./Frequencies
Bottom 869 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz
Top 894 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz

Configuration 3 - Mode 4 and 5

Band Edge Frequency	Edge Test with GMSK modulation Channel No./Frequencies	Edge Test with 8-PSK modulation Channel No./Frequencies	Edge Test with 16QAM modulation Channel No./Frequencies	Edge Test with 32QAM modulation Channel No./Frequencies
Bottom 869 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz	Channel: 129 Frequency: 869.4 MHz
Top 894 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz	Channel: 250 Frequency: 893.6 MHz

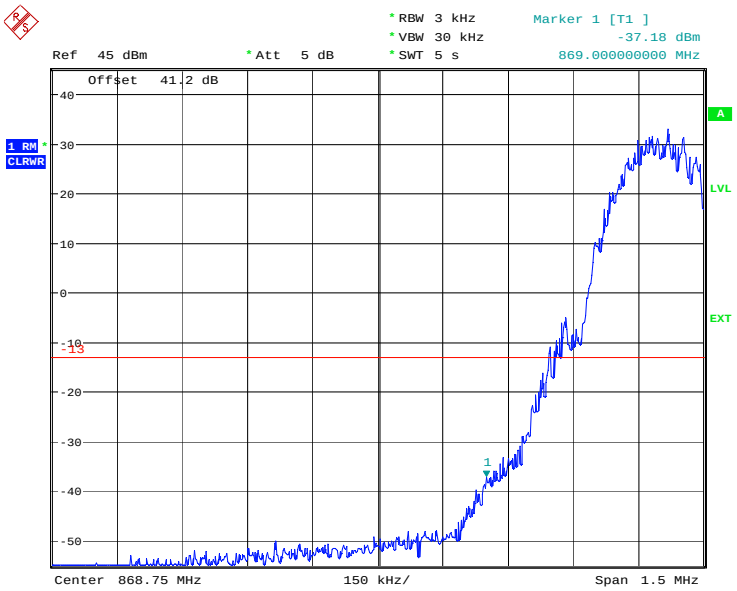
The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels used outside of those stated and power levels used beyond those stated in the table exceed the specification limits, thus they cannot be used.

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

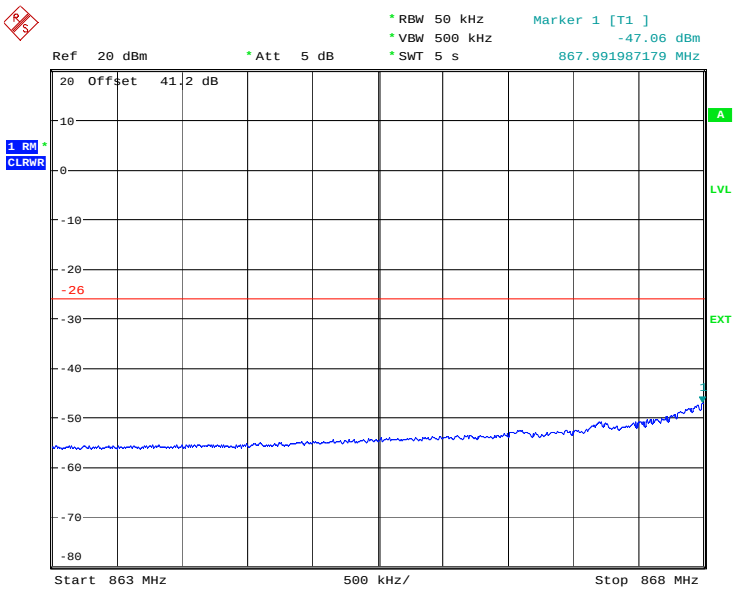
The test results are shown below

Configuration 1 - Mode 4

GMSK

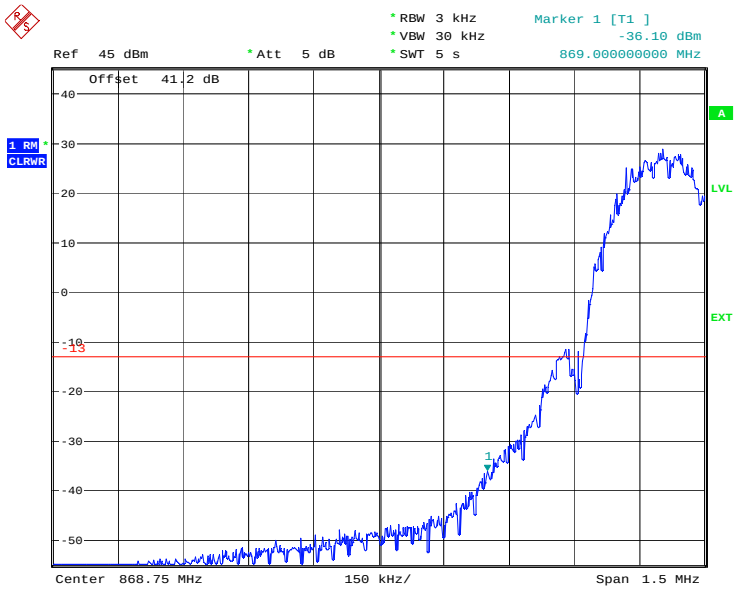


Date: 23.MAR.2011 13:45:50

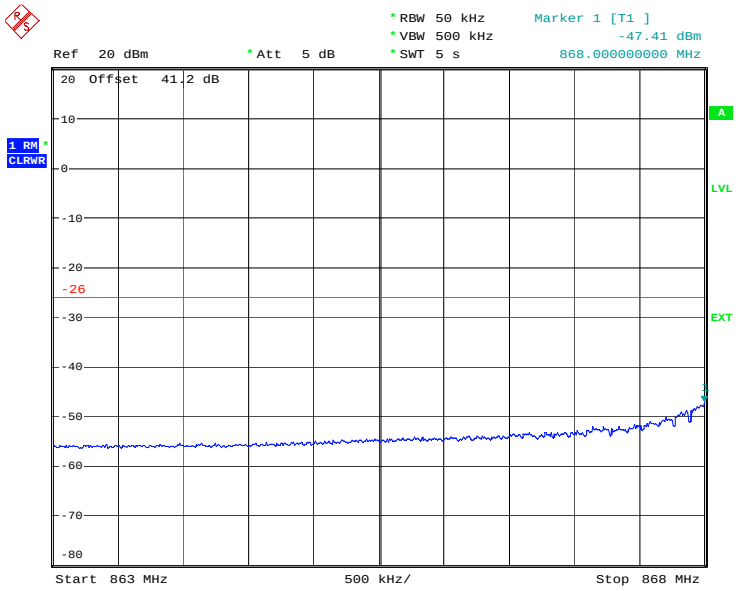


Date: 23.MAR.2011 13:58:01

8-PSK

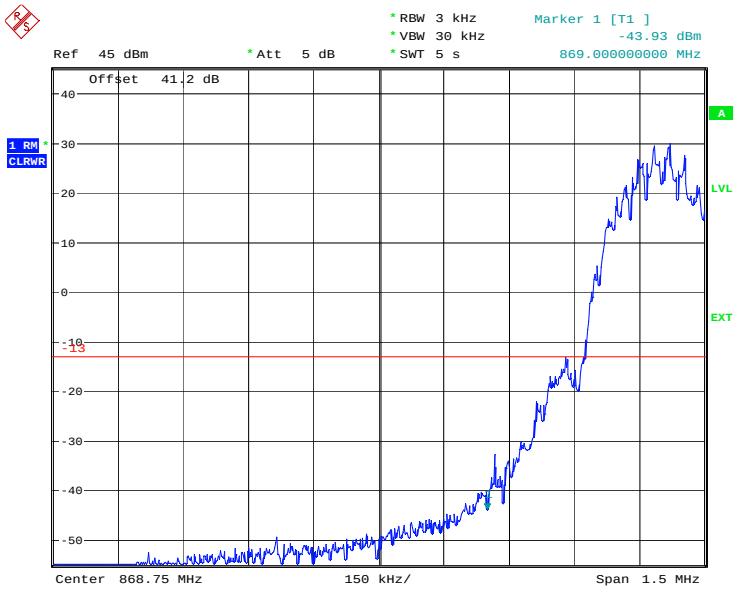


Date: 23.MAR.2011 13:46:27

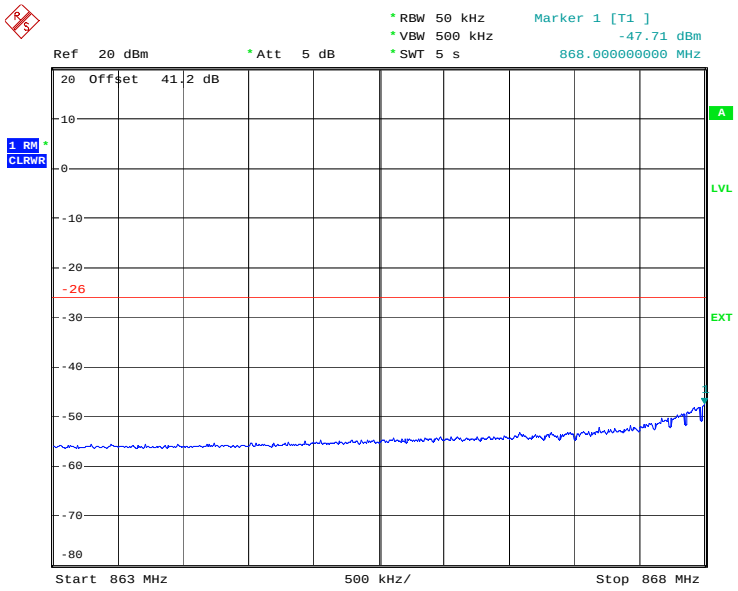


Date: 23.MAR.2011 13:57:15

16QAM



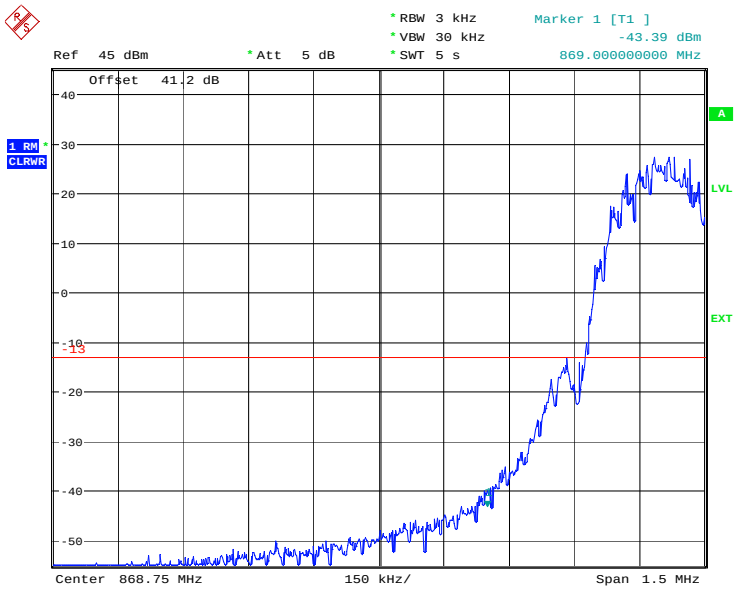
Date: 23.MAR.2011 13:47:09



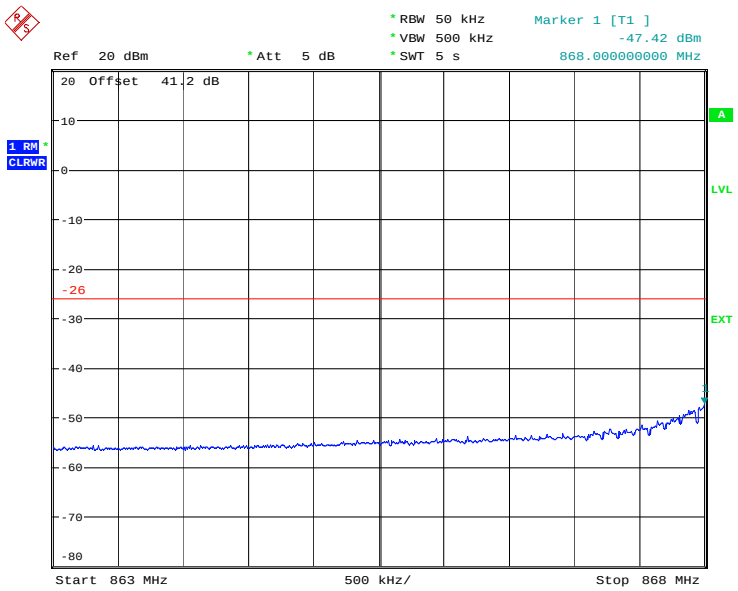
Date: 23.MAR.2011 13:55:19

Product Service

32QAM



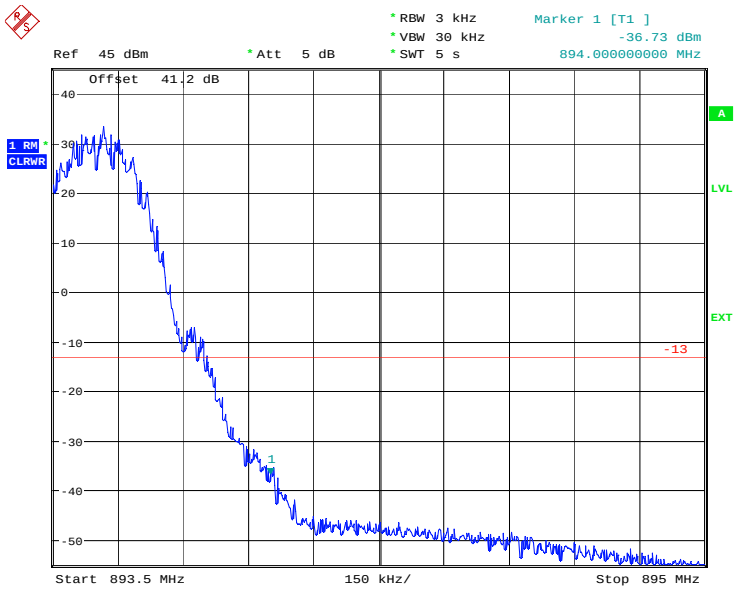
Date: 23.MAR.2011 13:47:45



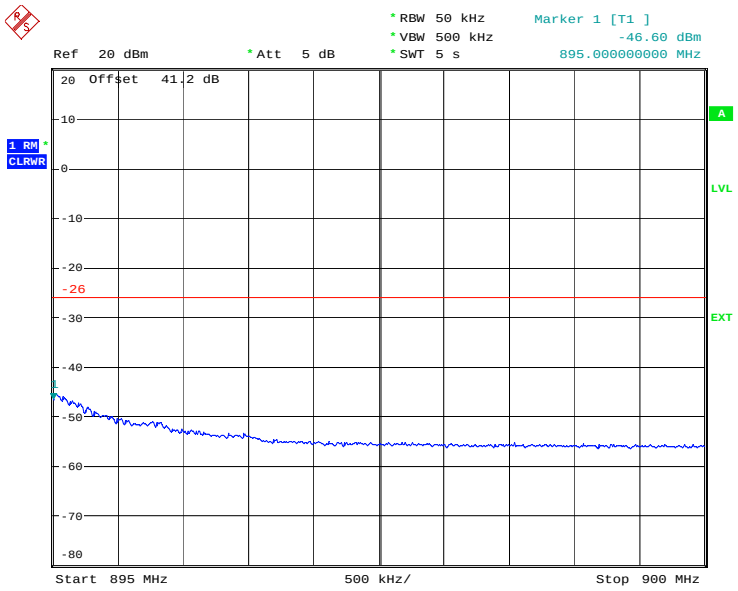
Date: 23.MAR.2011 13:54:43

Configuration 1 - Mode 5

GMSK

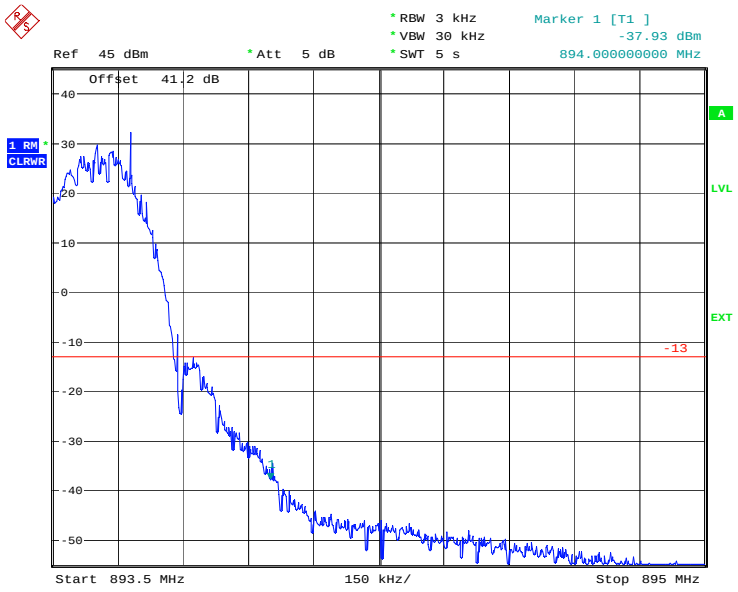


Date: 23.MAR.2011 13:50:23

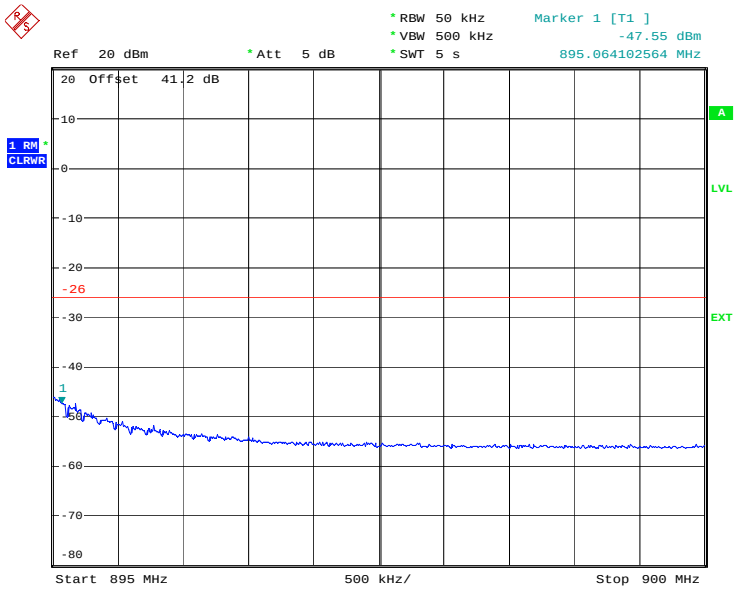


Date: 23.MAR.2011 13:52:00

8-PSK

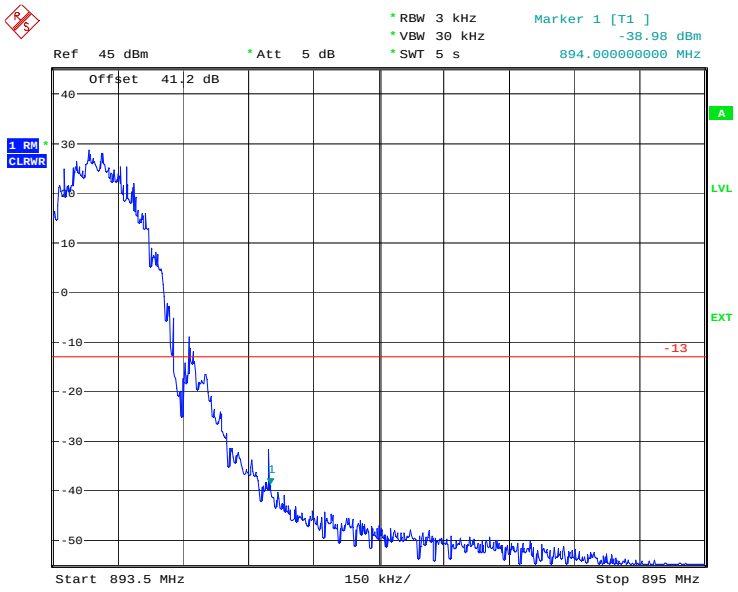


Date: 23.MAR.2011 13:49:49

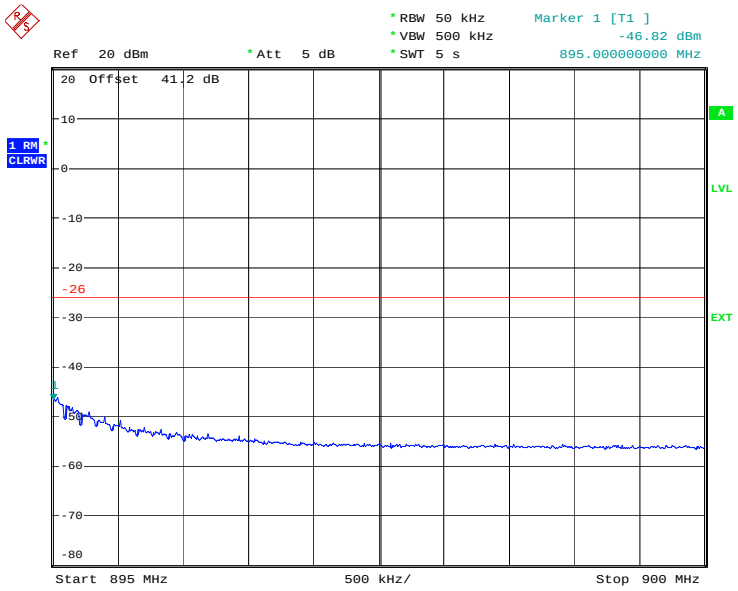


Date: 23.MAR.2011 13:52:37

16QAM



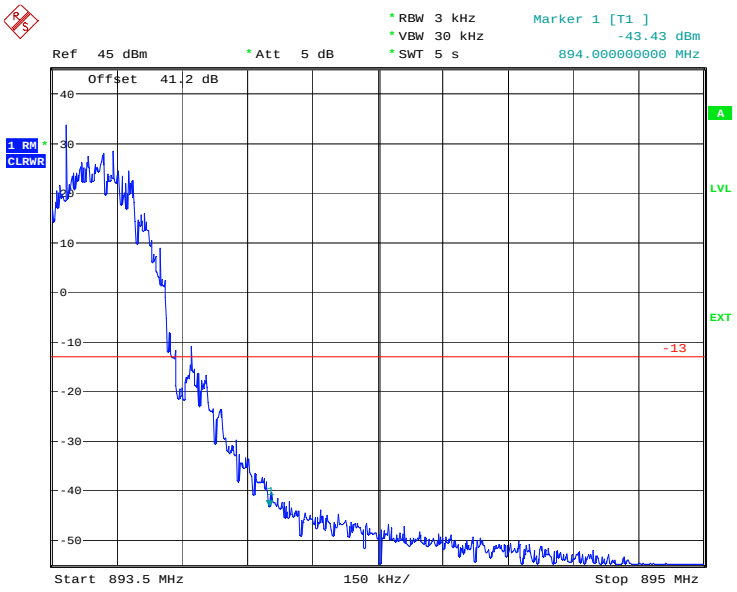
Date: 23.MAR.2011 13:49:21



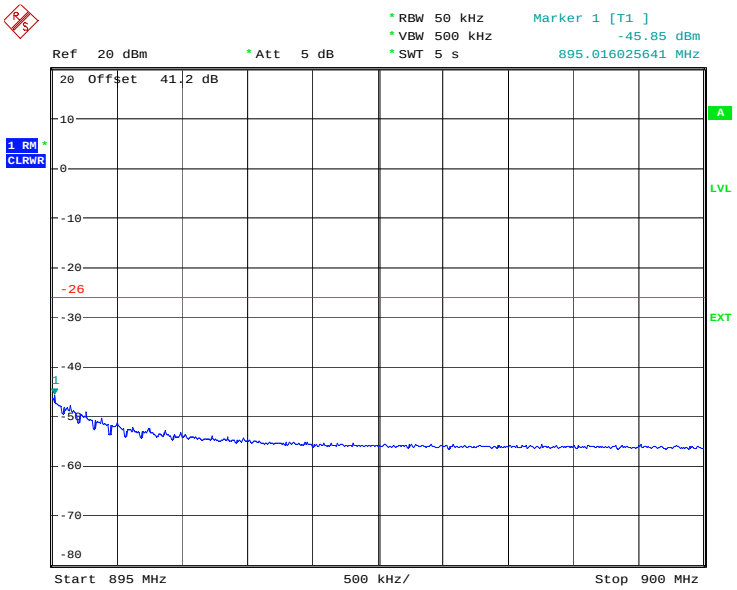
Date: 23.MAR.2011 13:53:21

Product Service

32QAM



Date: 23.MAR.2011 13:48:44

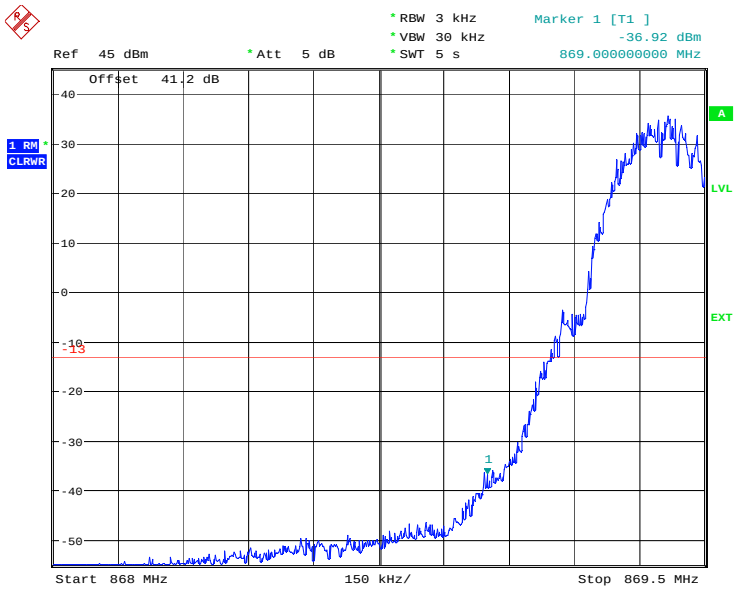


Date: 23.MAR.2011 13:53:59

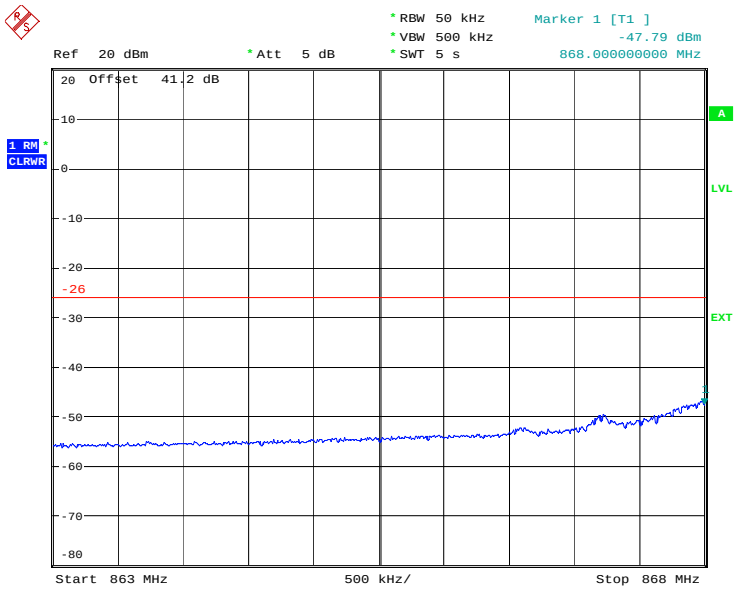
Product Service

Configuration 2 - Mode 4

GMSK



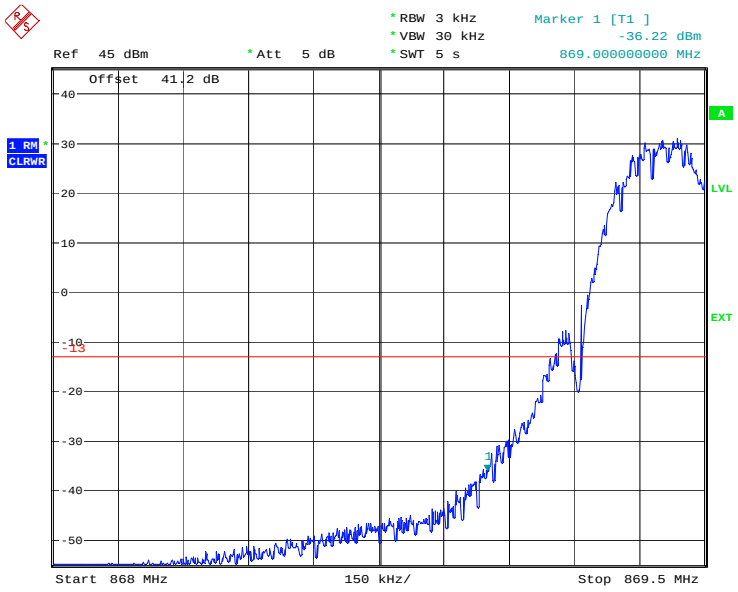
Date: 23.MAR.2011 12:00:55



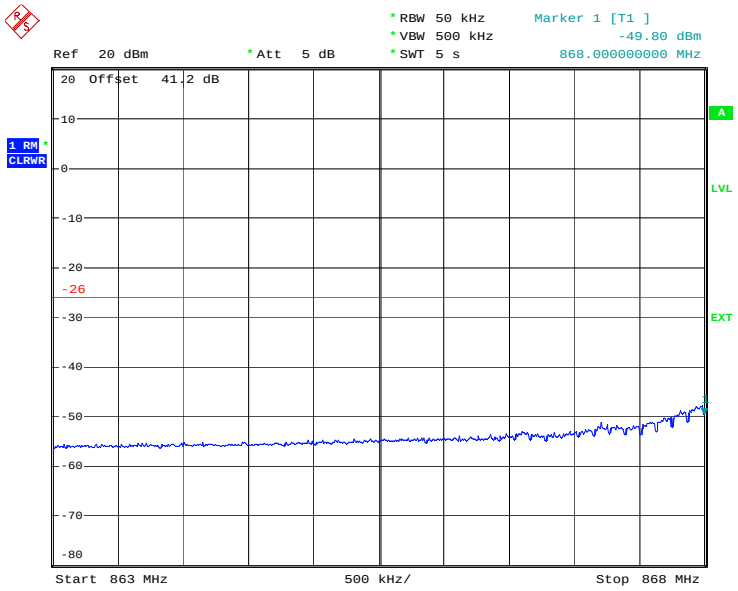
Date: 23.MAR.2011 12:03:46

Product Service

8-PSK



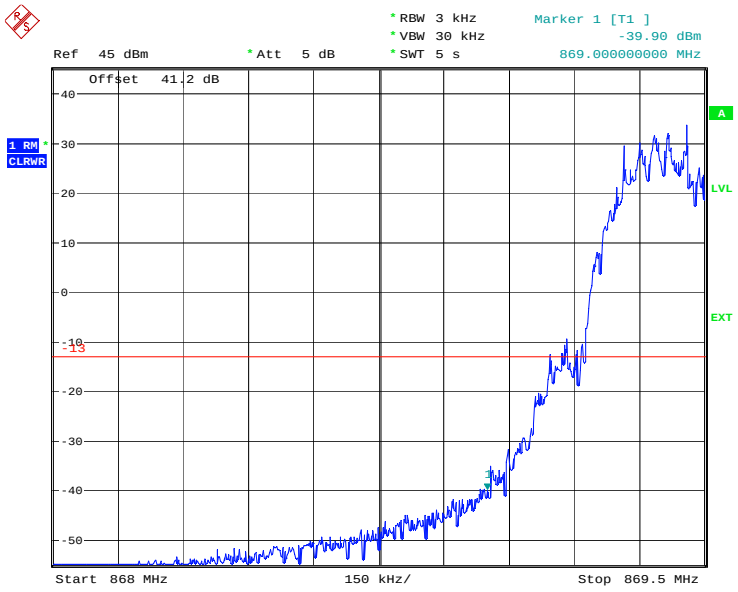
Date: 23.MAR.2011 12:00:26



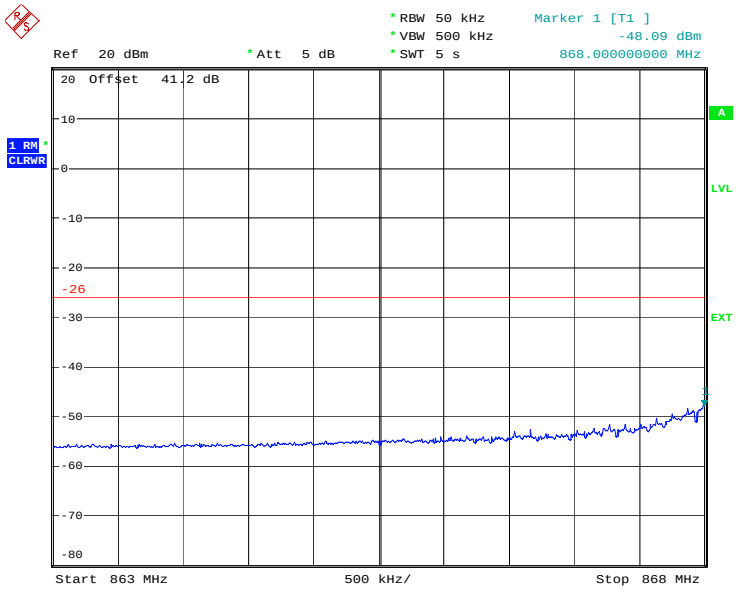
Date: 23.MAR.2011 12:04:21

Product Service

16QAM



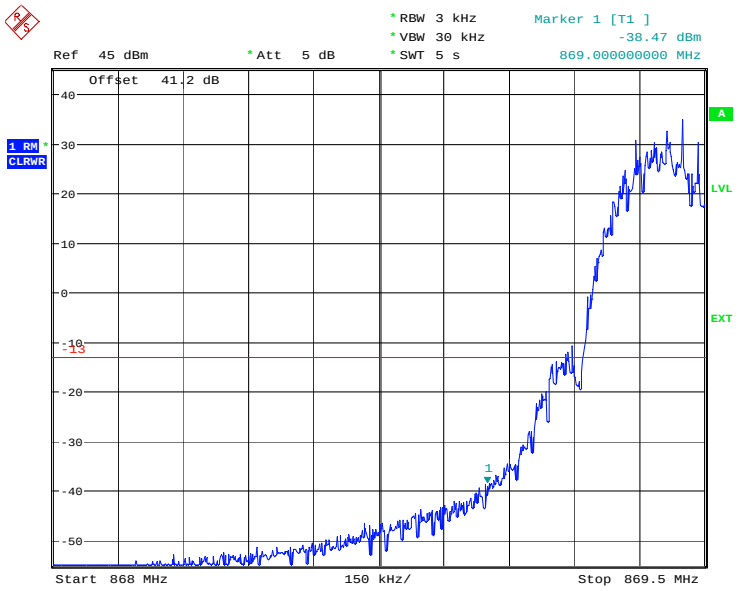
Date: 23.MAR.2011 11:59:50



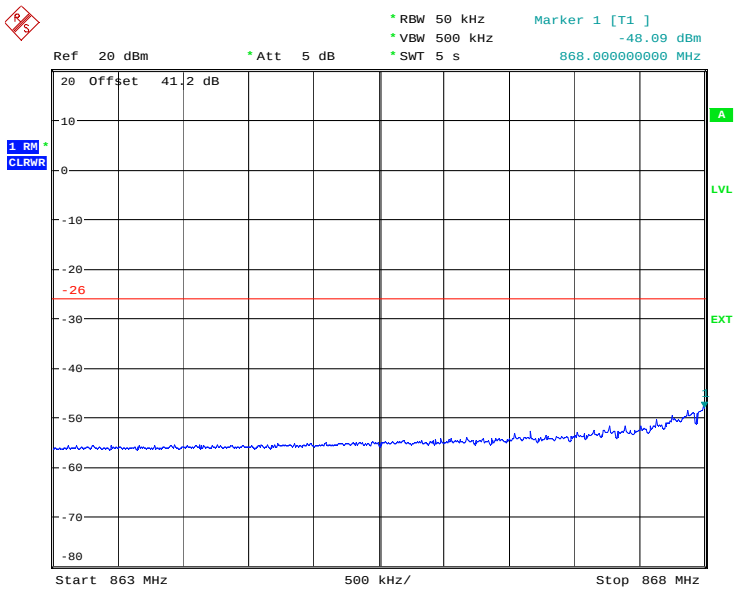
Date: 23.MAR.2011 12:04:54

Product Service

32QAM



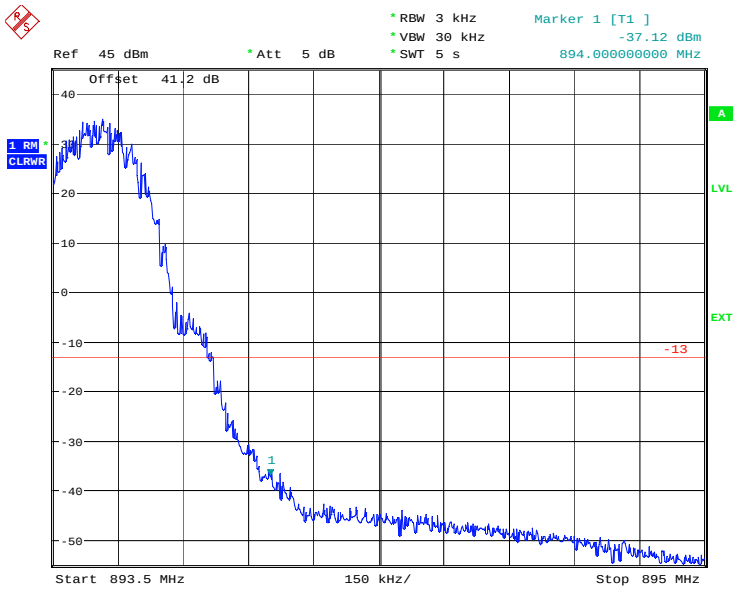
Date: 23.MAR.2011 11:59:17



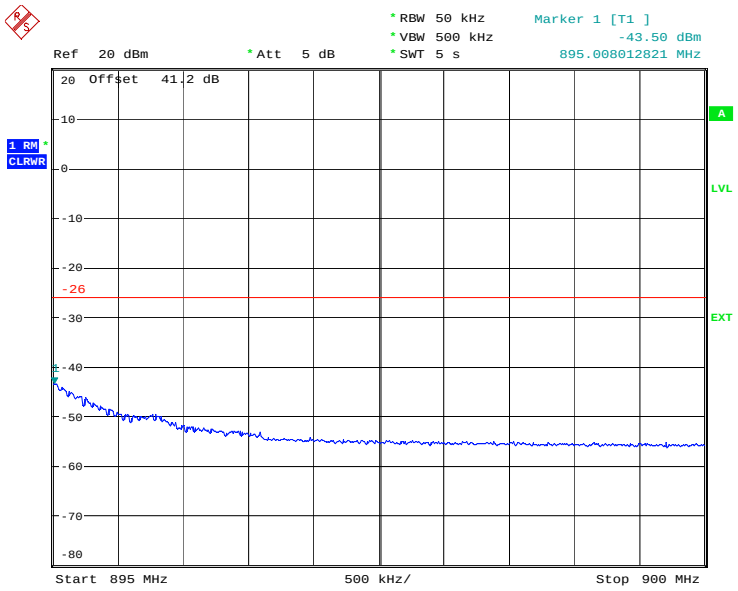
Date: 23.MAR.2011 12:04:54

Configuration 2 - Mode 5

GMSK

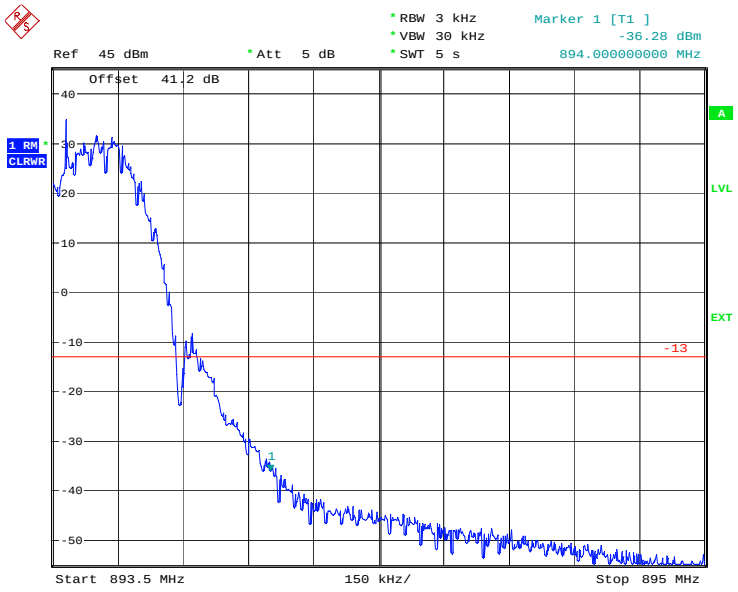


Date: 23.MAR.2011 11:56:35

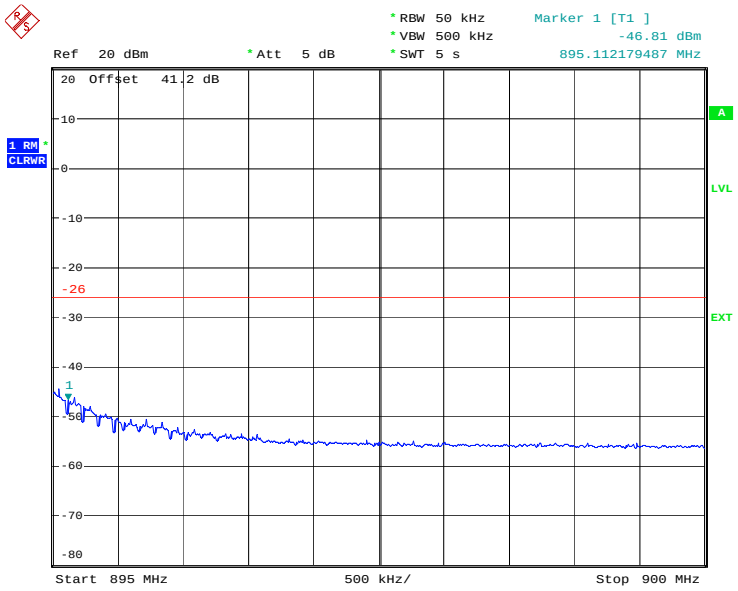


Date: 23.MAR.2011 12:10:51

8-PSK



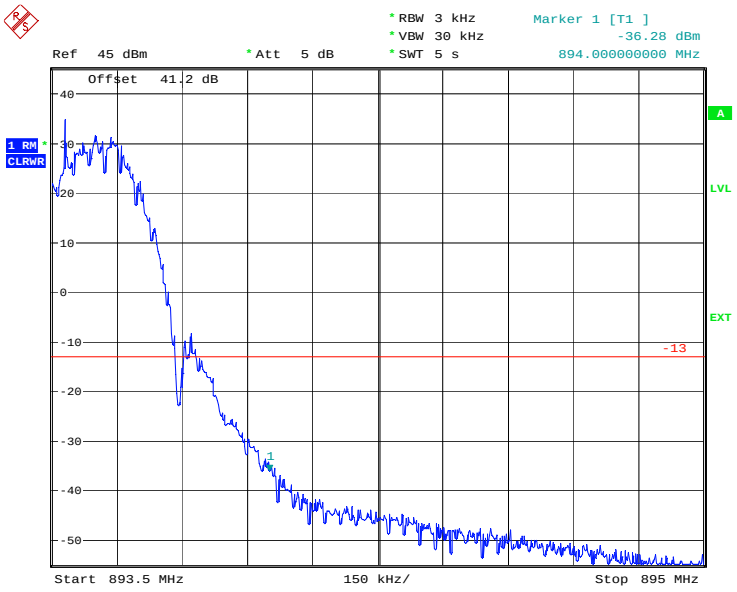
Date: 23.MAR.2011 11:57:14



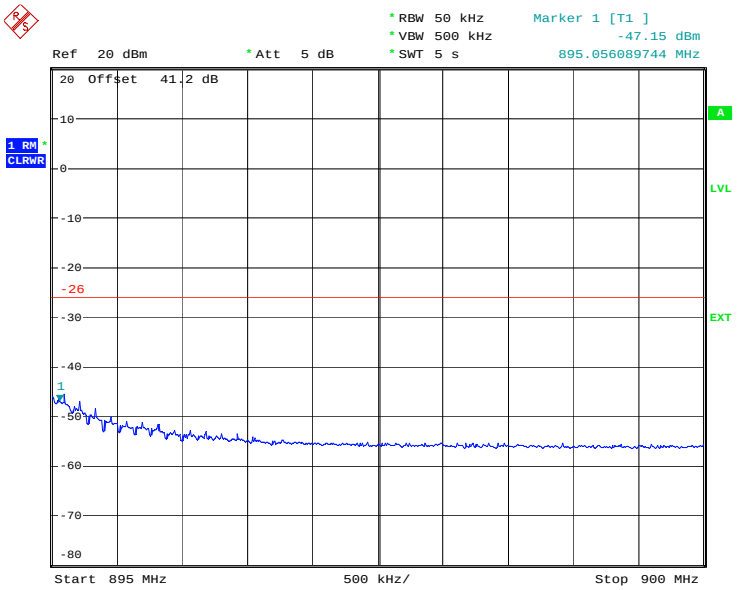
Date: 23.MAR.2011 12:10:18

Product Service

16QAM



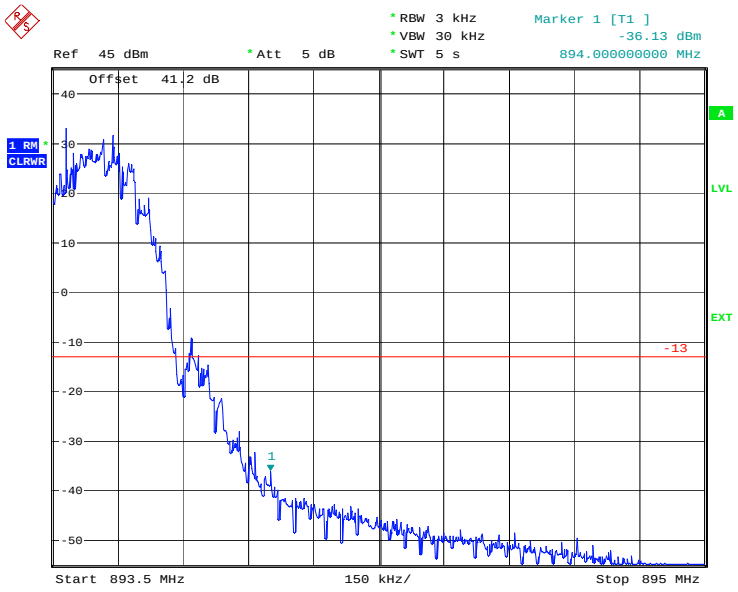
Date: 23.MAR.2011 11:57:14



Date: 23.MAR.2011 12:09:36

Product Service

32QAM



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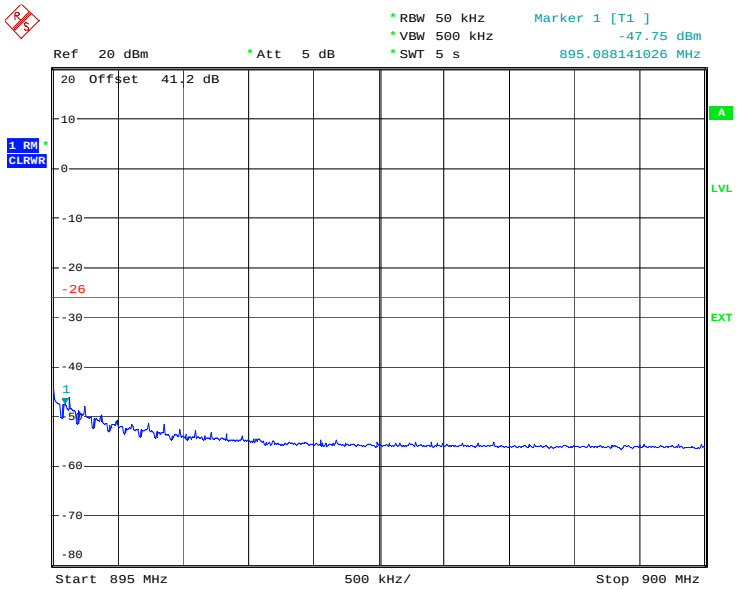
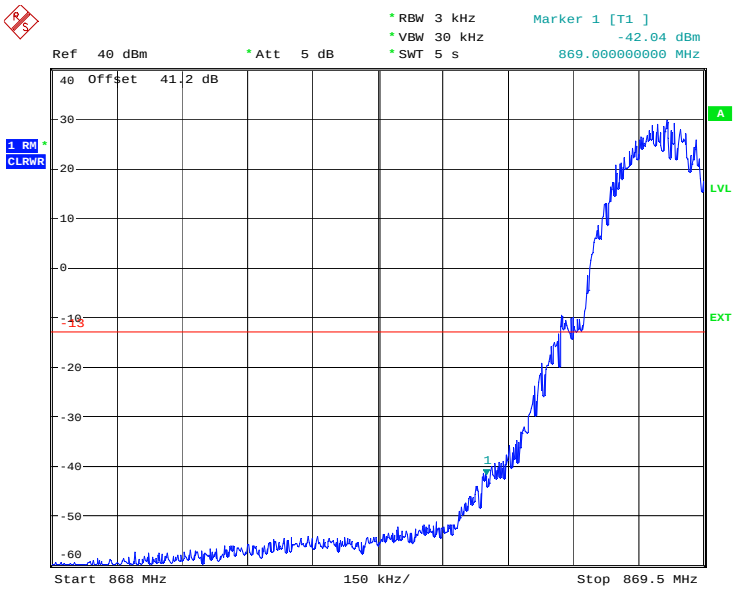


Date: 23.MAR.2011 12:08:51

Product Service

Configuration 3 - Mode 4

GMSK



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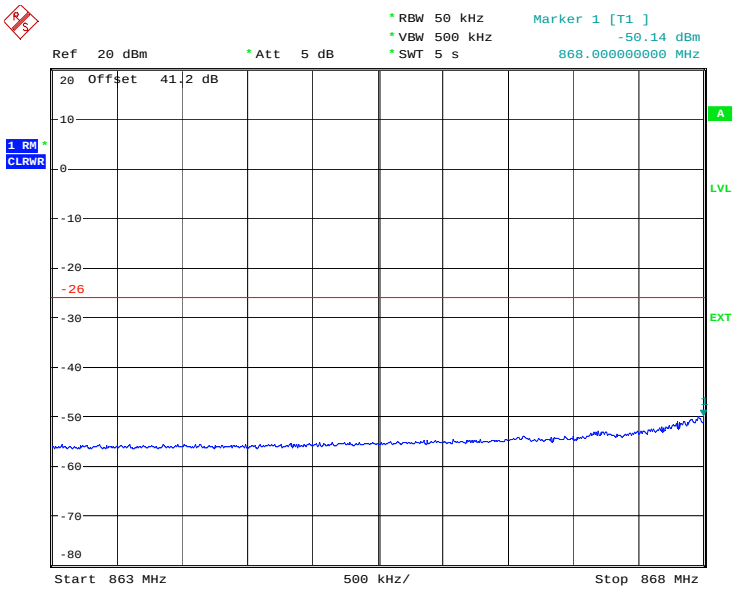
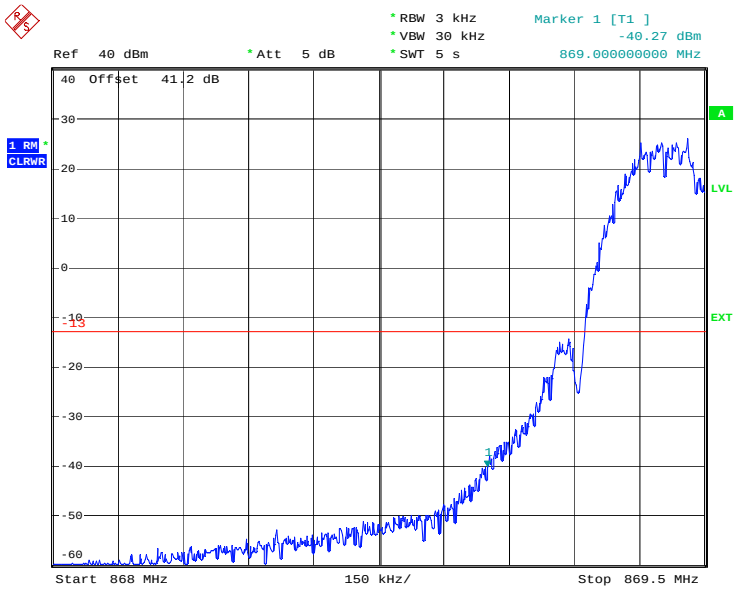


Date: 23.MAR.2011 12:26:46

Product Service

8-PSK



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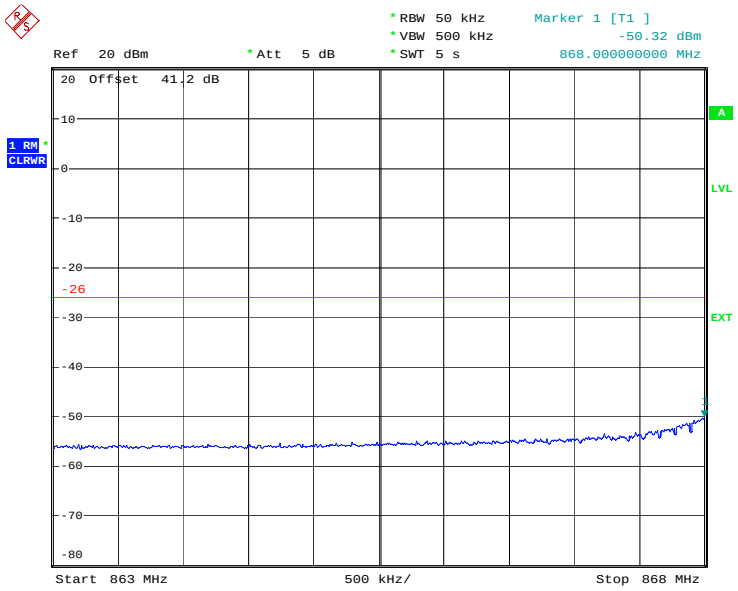
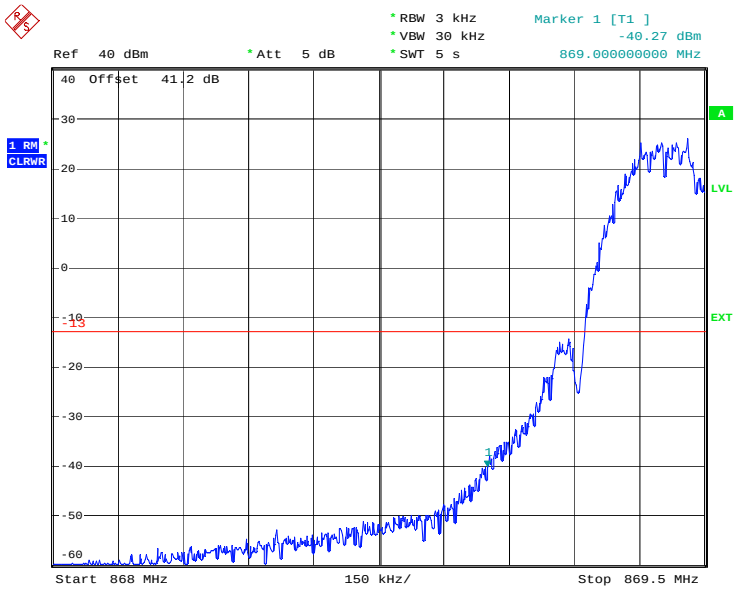


Date: 23.MAR.2011 12:26:11

Product Service

16QAM



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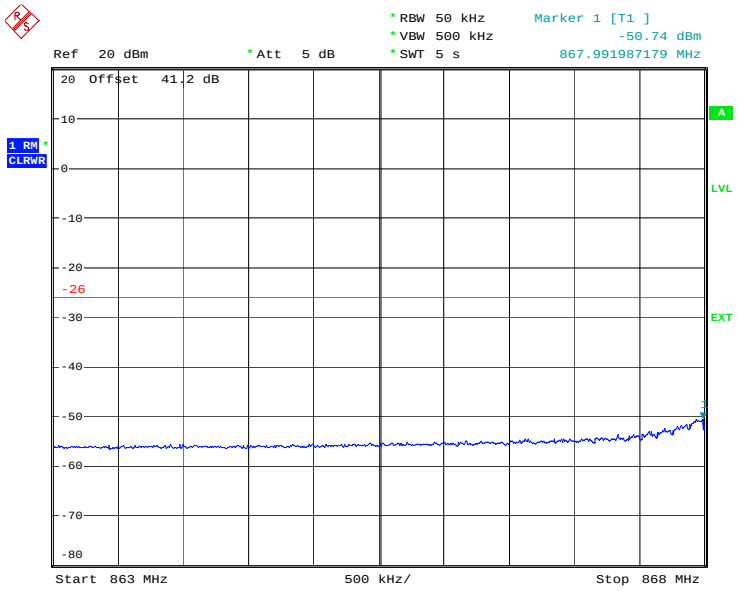
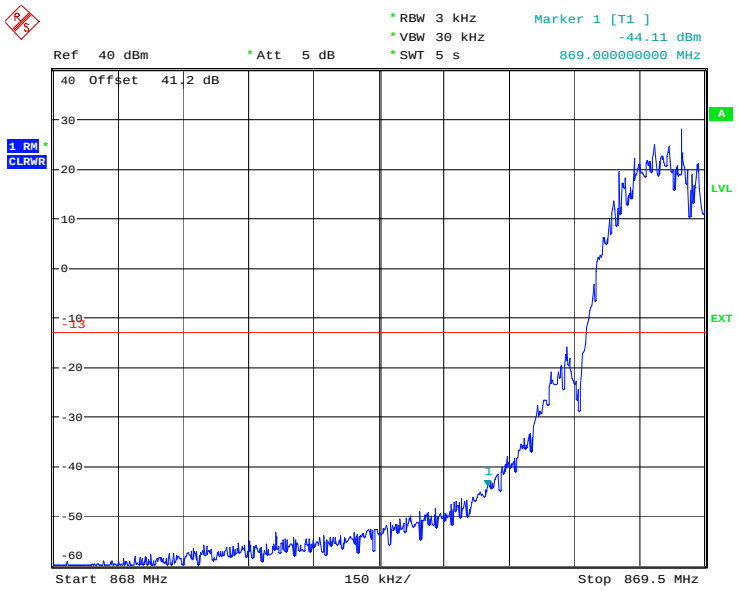


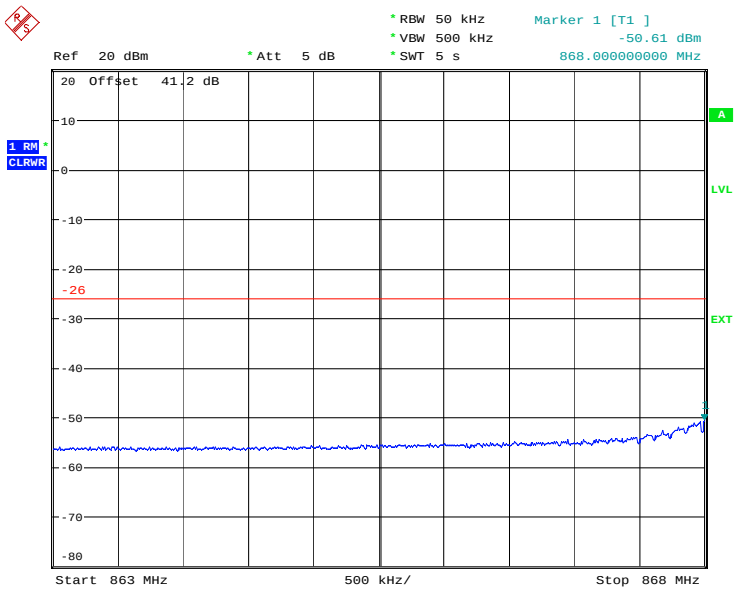
Date: 23.MAR.2011 12:25:43

Product Service

32QAM



Date: 23.MAR.2011 11:46:23

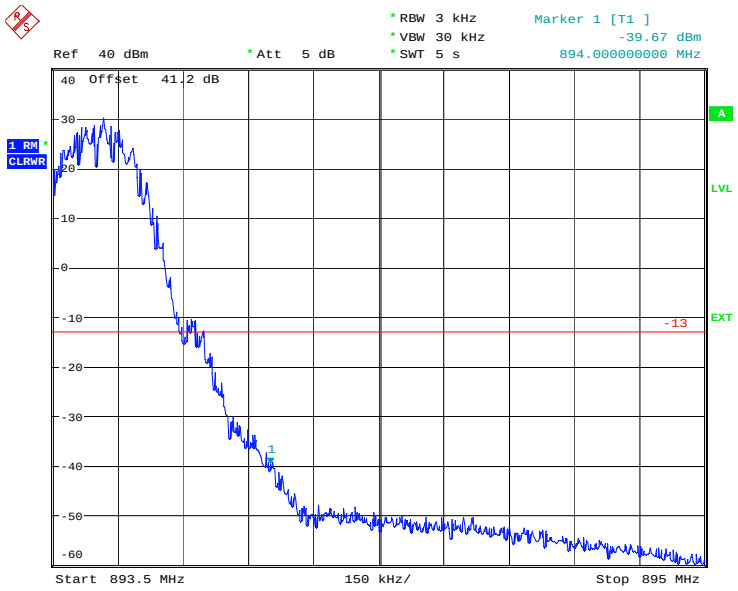


Date: 23.MAR.2011 12:24:58

Product Service

Configuration 3 - Mode 5

GMSK



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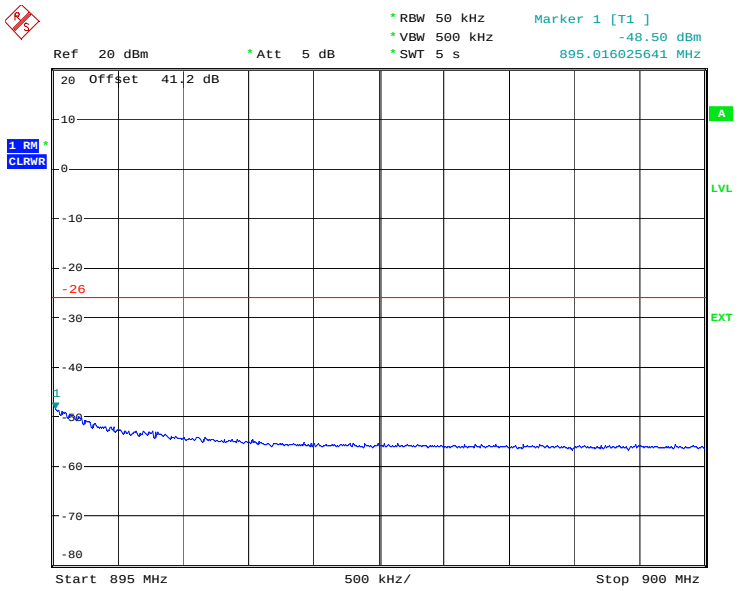
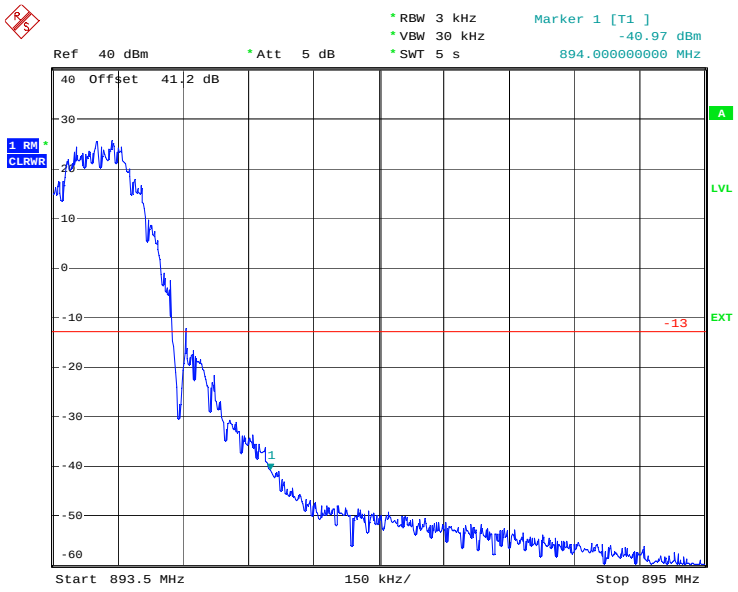


Date: 23.MAR.2011 12:21:48

8-PSK



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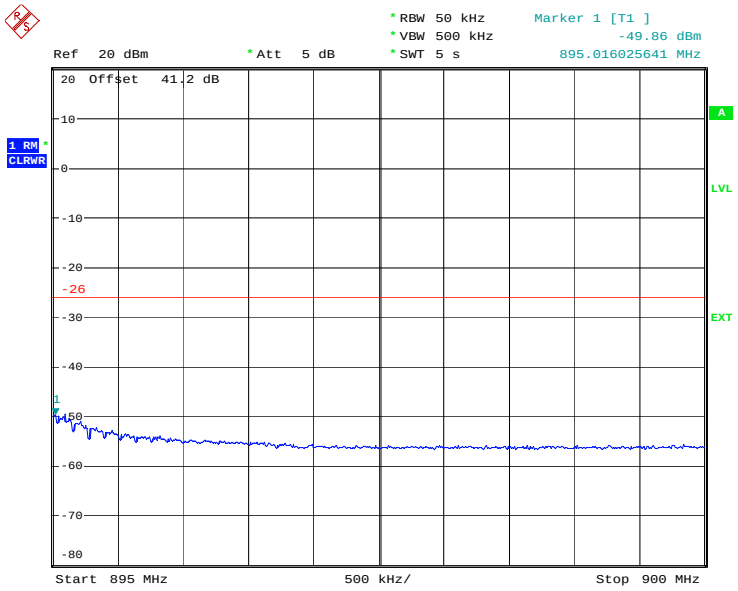

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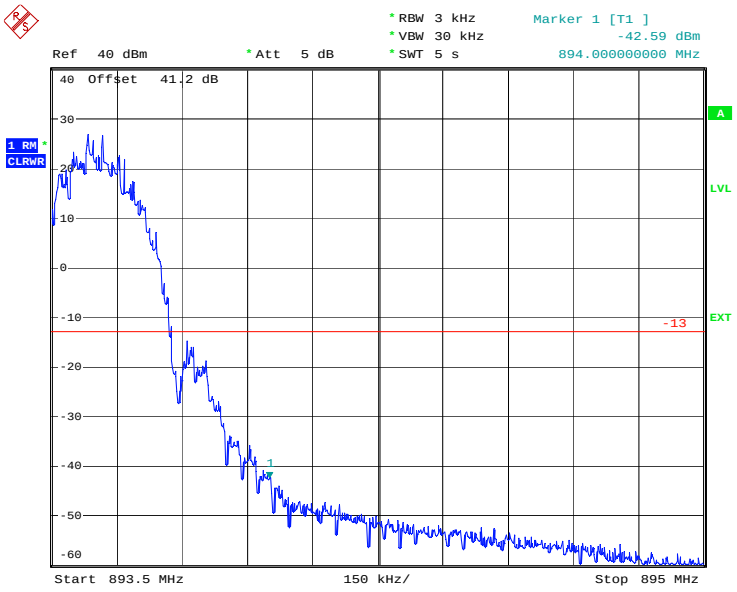
16QAM



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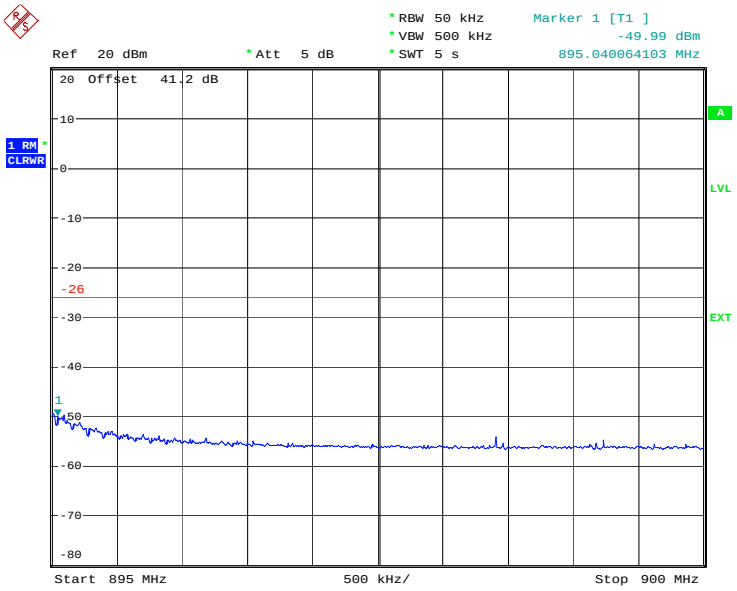
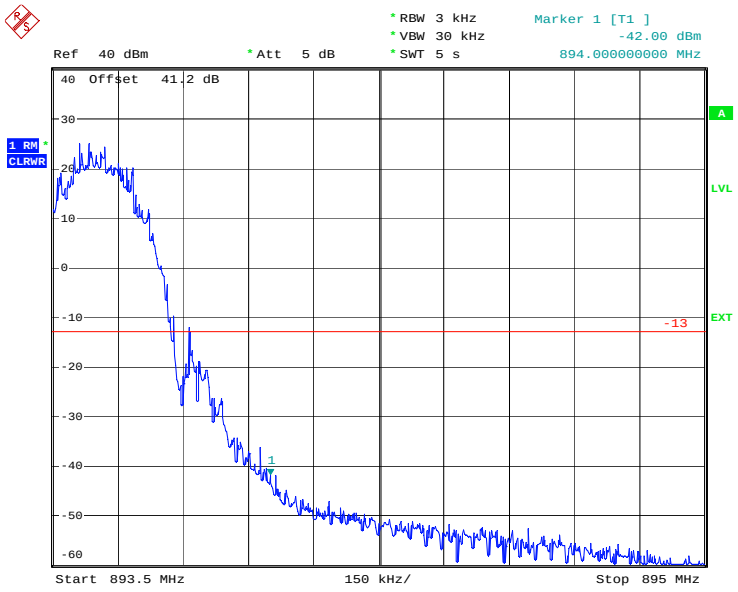


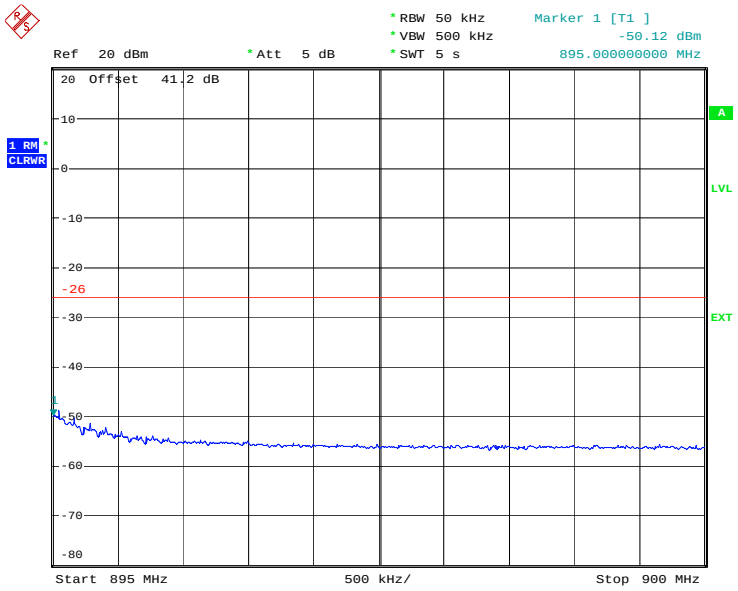
Date: 23.MAR.2011 12:23:12

Product Service

32QAM



Date: 23.MAR.2011 11:47:49



Date: 23.MAR.2011 12:23:44

Limit

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least 43 + 10logP dB.

Product Service

2.6 RADIATED SPURIOUS EMISSIONS

2.6.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1053
FCC CFR 47 Part 22, 22.917 (a)
Industry Canada RSS-132, Clause 4.5

2.6.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.6.3 Date of Test and Modification State

15 and 18 April 2011 – 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 2 and Part 22 and Industry Canada RSS-132.

The test obect was powered with -48V DC. All measurements were performed with the test object configured for maximum transmit power. The configuration represents worst case for radiated spurious emission measurements. The configuration TCC was found to be representative for worst cas for the measurements.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations.

Emissions identified within the range 30MHz - 10GHz were then formally measured using a Peak detector as the worst case.

In the frequency Range 30MHz - 10GHz, the measurement was performed with a resolution bandwidth of 1MHz.

The measurements were performed at a 3m distance unless otherwise stated.

The limits for Spurious Emissions have been calculated, as shown below using the following formula:

Field Strength of Carrier - (43 + 10Log (P)) dB

Where:
Field Strength is measured in dBµV/m
P is measured Transmitter Power in Watts

Product Service

Determination of Spurious Emission Limit

As the EUT does not have an integral antenna, the field strength of the carrier has been calculated assuming that the power is to be fed to a half-wave tuned dipoles as per 2.1053 (a).

$E_{(v/m)}=(30 \times G_i \times P_o)^{0.5} / d$

Where G_i is the antenna gain of ideal half-wave dipoles,
P_o is the power out of the transceiver in W,
d is the measurement distance in meter.

Therefore at 3m measurement distance the field strength using the lowest transceiver output power would be:

$E_{(v/m)}=(30 \times 1.64 \times 60.12)^{0.5} / 3 = 18.129V/m = 145.2dB\mu V/m$

As per 22.917(a) the spurious emission must be attenuated by 43 + 10log (P_o) dB this gives:

43 + 10log(60.12) = 60.8dB

Therefore the limit at 3m measurement distance is:

145.2 – 60.8 = 84.4dBµV/m

This limit has been used to determine Pass or Fail for the harmonics measured and detailed in the following results.

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

Configuration 2 - Mode 1
- Mode 2
- Mode 3

2.6.6 Environmental Conditions

	15 April 2011	18 April 2011
Ambient Temperature	22.5°C	23.6°C
Relative Humidity	21.5%	22.5%

Product Service

2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 & Part 22 and Industry Canada RSS-132 for Radiated Spurious Emissions.

The test results are shown below

Configuration 2 - Mode 1

GMSK and 8-PSK and 16QAM and 32QAM

No emissions were detected within 20dB of the limit.

Configuration 2 - Mode 2

GMSK and 8-PSK and 16QAM and 32QAM

No emissions were detected within 20dB of the limit.

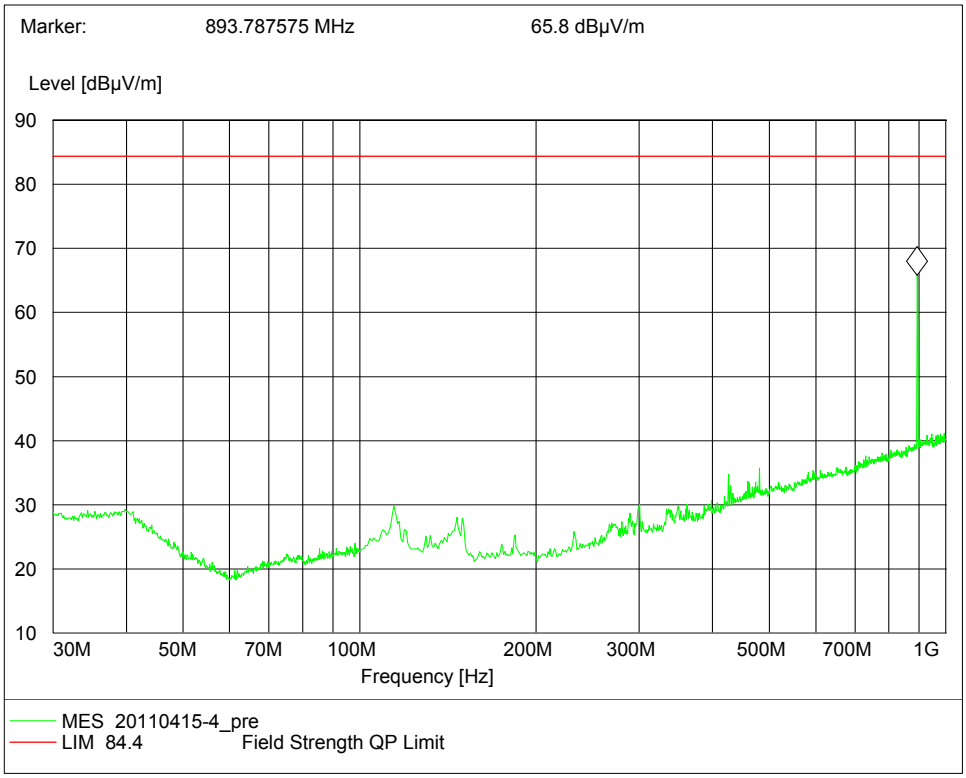
Configuration 2 - Mode 3

GMSK

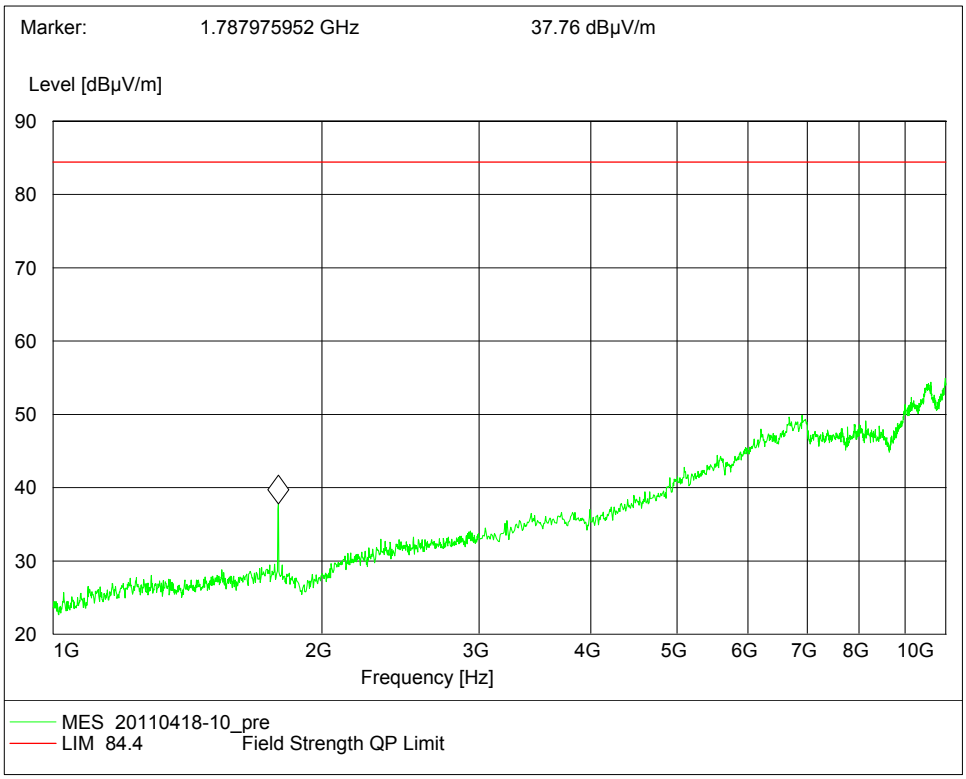
No emissions were detected within 20dB of the limit.

8PSK

30MHz – 1GHz



1GHz – 10GHz



16QAM and 32QAM

No emissions were detected within 20dB of the limit.

Limit	-13dBm / 84.4dBµV/m

Remarks

The EUT does not exceed -13dBm / 84.4dBµV/m at the measured frequencies.

2.7 CONDUCTED SPURIOUS EMISSIONS

2.7.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 22, Clause 22.917 (a)
Industry Canada RSS-132, Clause 4.5

2.7.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.7.3 Date of Test and Modification State

22 and 23 March 2011 – 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 2 and Part 22 and Industry Canada RSS-132.

In accordance with Part 2.1051, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using an attenuator and the frequency spectrum investigated from 9kHz to 10GHz. The EUT was set to transmit on maximum power. The EUT was tested on with GMSK, 8-PSK, 16QAM and 32QAM modulation types. The resolution was set to 1MHz for 9kHz to 10GHz as the worst case thus meeting the requirements of Part 22.917(b). The spectrum analyser detector was set to peak and trace was kept on Max Hold.

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

Configuration 2 - Mode 1
- Mode 2
- Mode 3

Configuration 3 - Mode 1
- Mode 2
- Mode 3

Product Service

2.7.6 Environmental Conditions

	22 March 2011	23 March 2011
Ambient Temperature	26.2°C	26.8°C
Relative Humidity	20.4%	20.0%

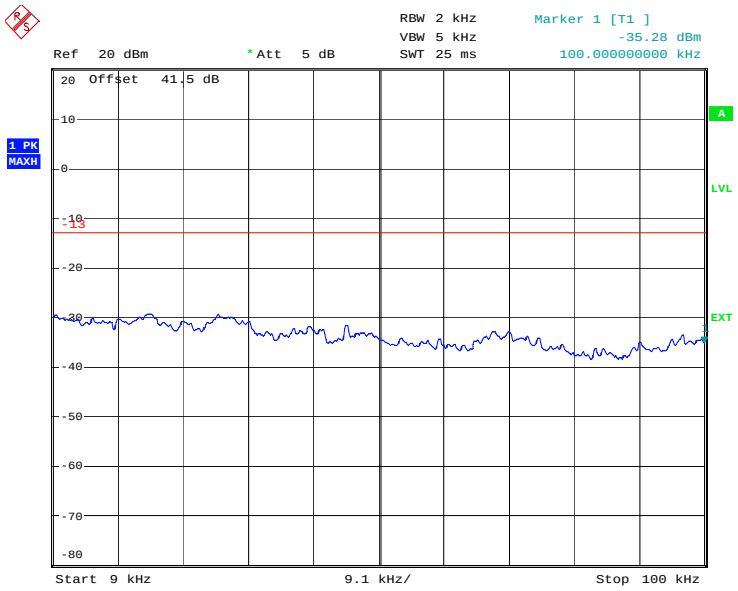
2.7.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 for Conducted Spurious Emissions.

The test results are shown below

Remark:

The emissions at 9kHz on the plots was not generated by the test object. A complementary measruement with a smaller Span showed that it was related to the LO feedthrough.

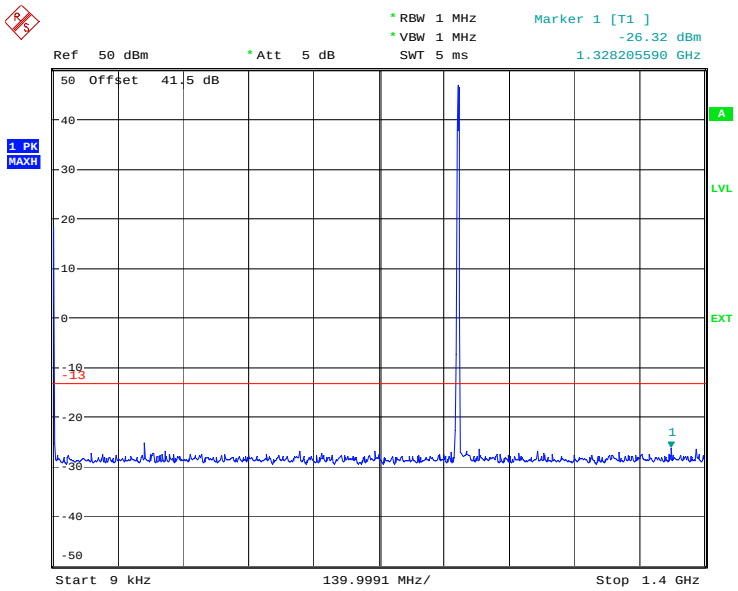


Product Service

GMSK

Configuration 1 - Mode 1

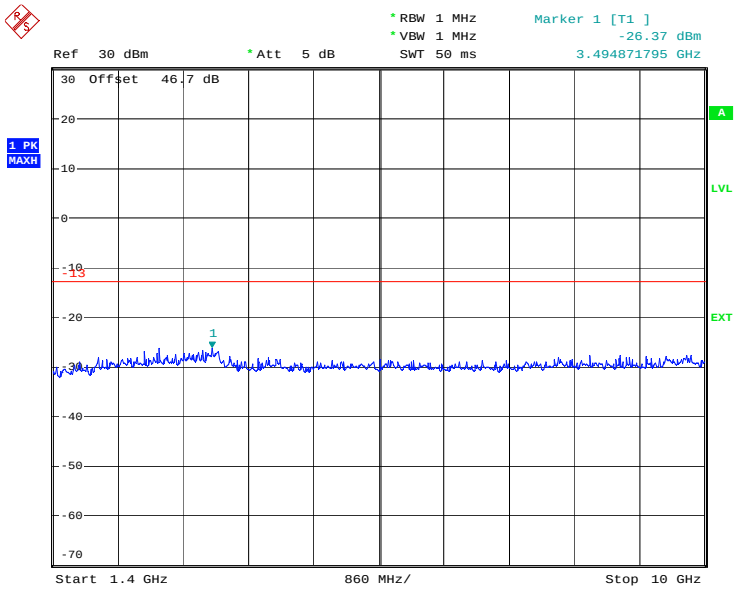
9kHz to 1.4GHz



Date: 22.MAR.2011 15:37:00

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

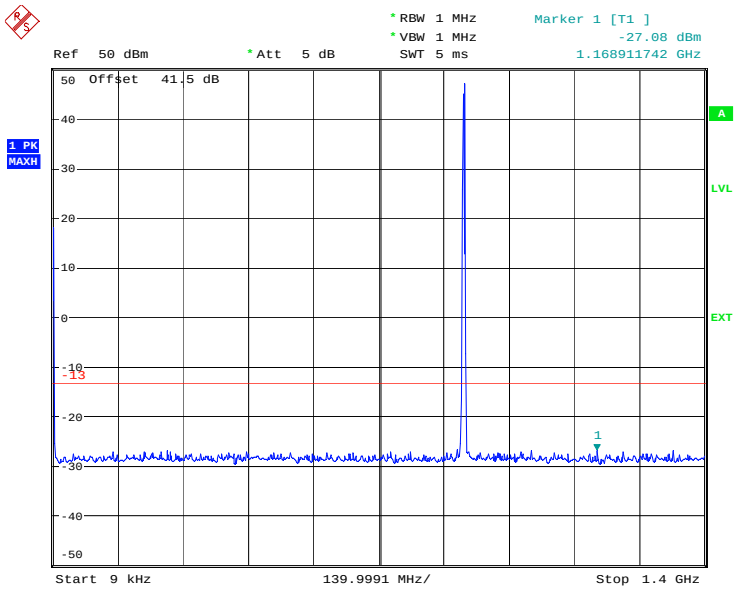


Date: 23.MAR.2011 13:33:27

Product Service

Configuration 1 - Mode 2

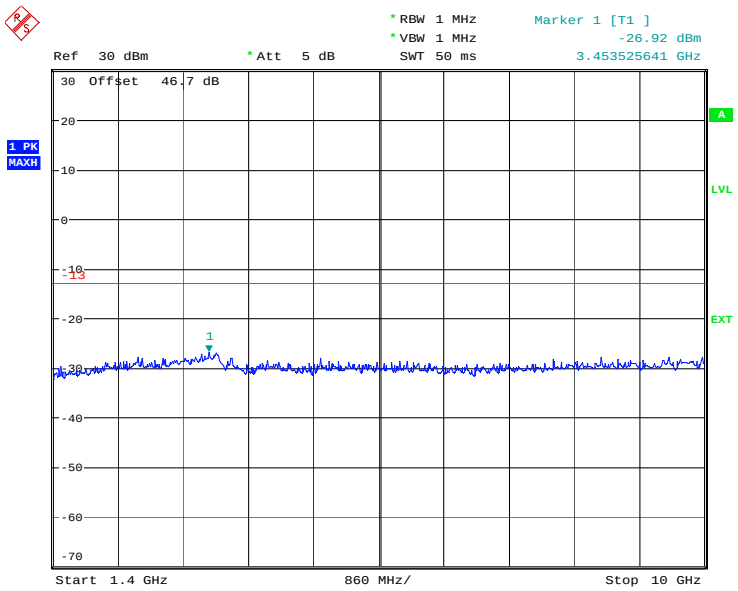
9kHz to 1.4GHz



Date: 22.MAR.2011 15:33:38

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

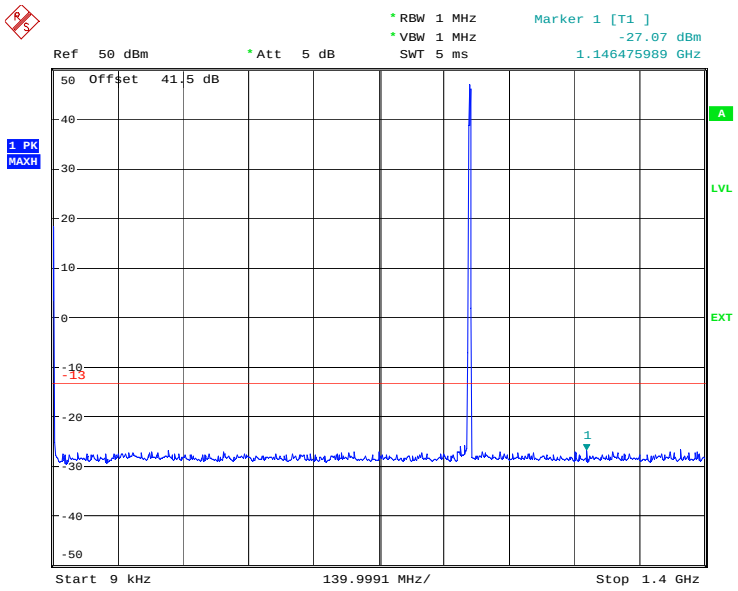


Date: 23.MAR.2011 13:37:59

Product Service

Configuration 1 - Mode 3

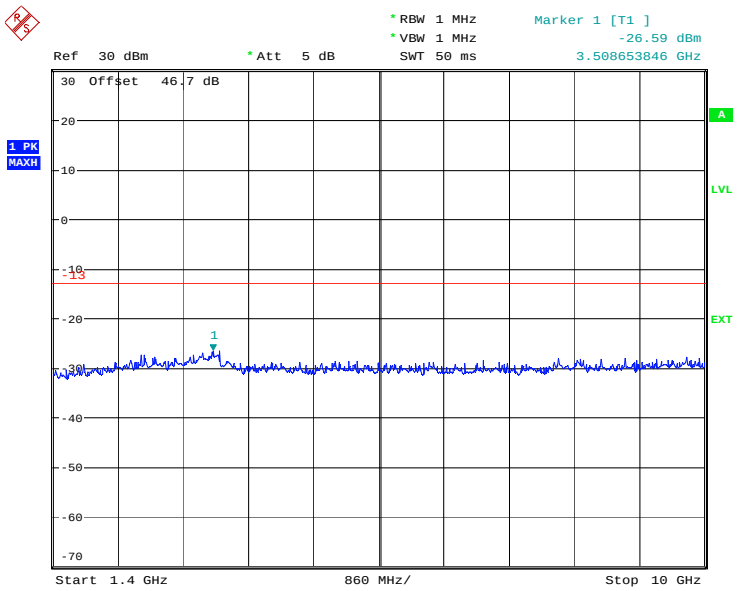
9kHz to 1.4GHz



Date: 22.MAR.2011 15:32:26

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

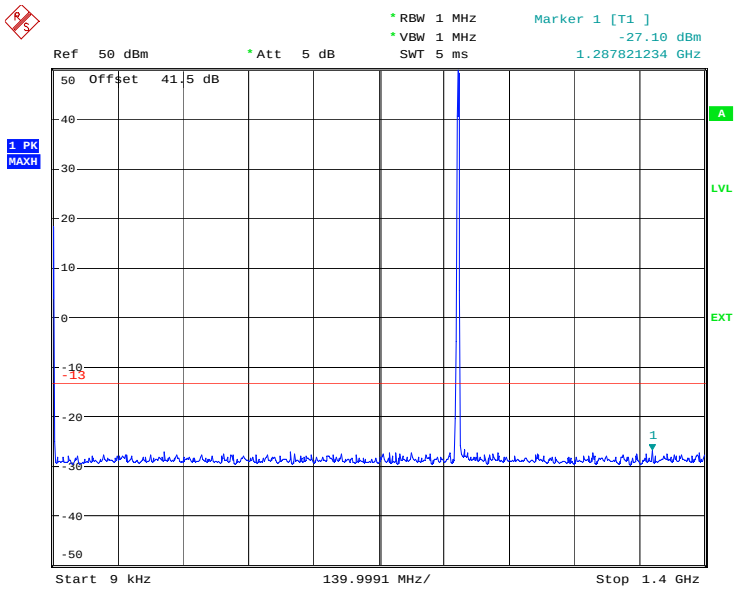


Date: 23.MAR.2011 13:38:33

Product Service

Configuration 2 - Mode 1

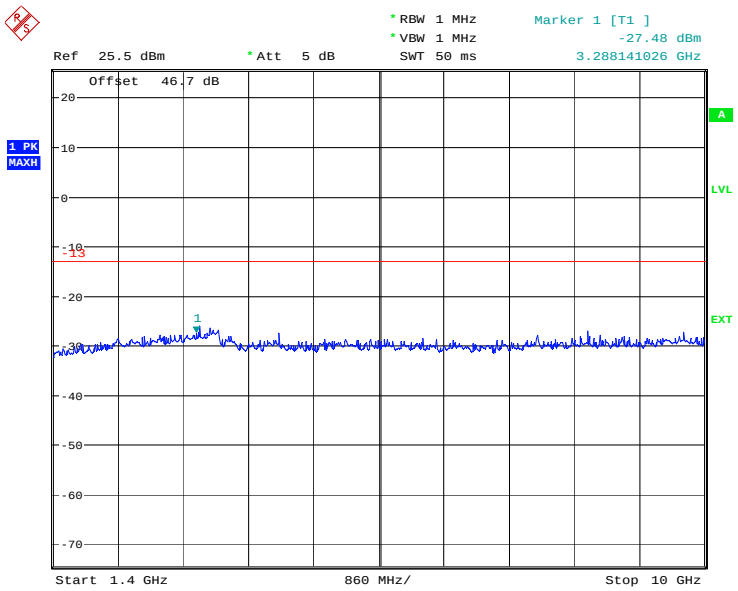
9kHz to 1.4GHz



Date: 23.MAR.2011 08:28:20

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

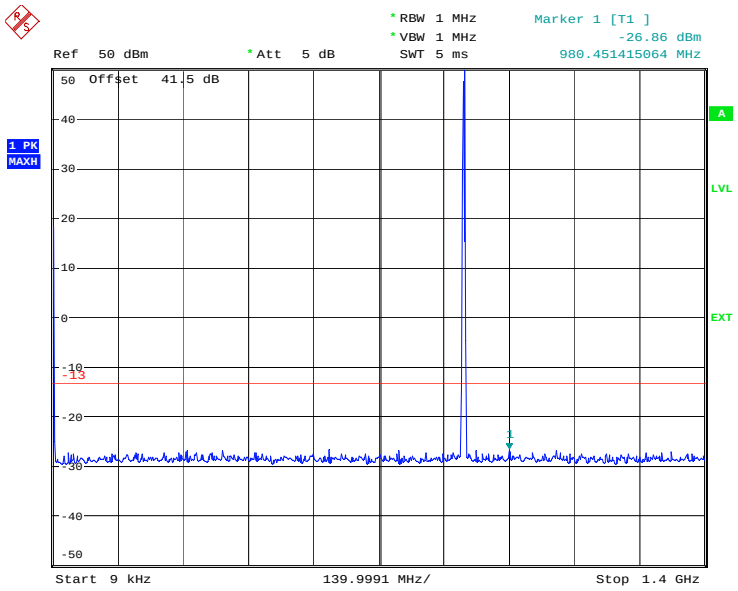


Date: 23.MAR.2011 12:43:35

Product Service

Configuration 2 - Mode 2

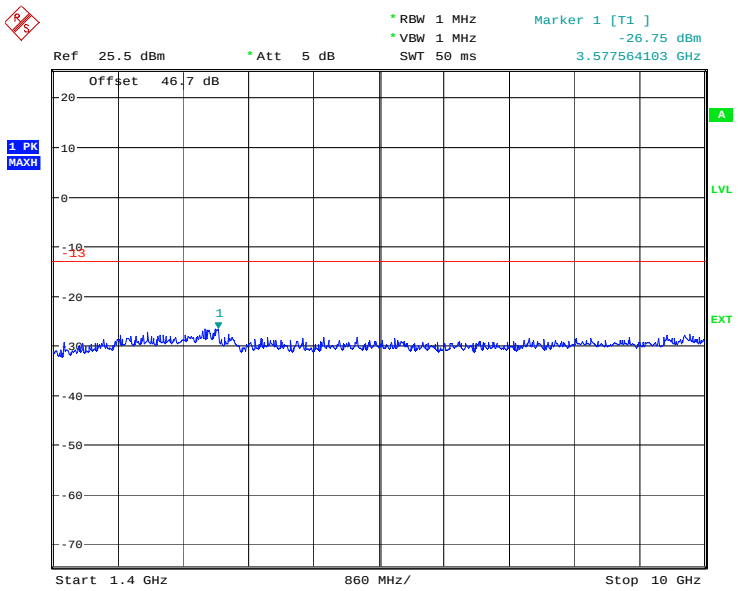
9kHz to 1.4GHz



Date: 23.MAR.2011 08:29:05

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

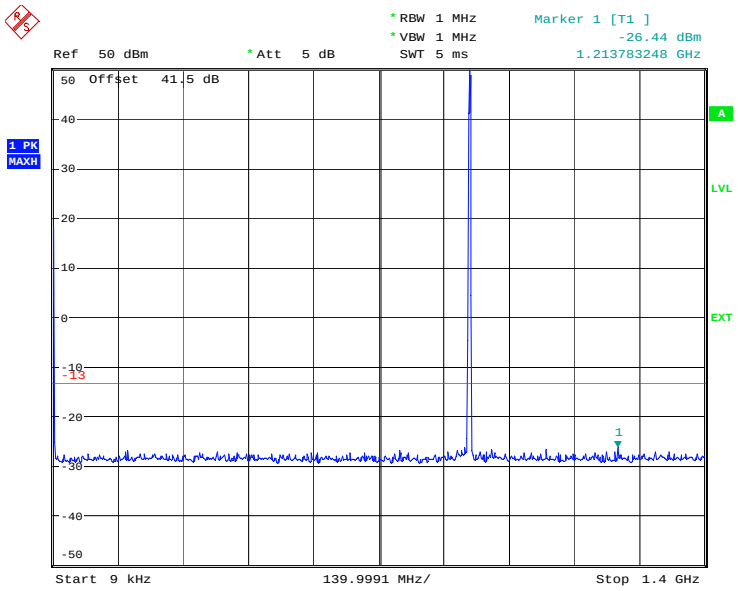


Date: 23.MAR.2011 12:40:18

Product Service

Configuration 2 - Mode 3

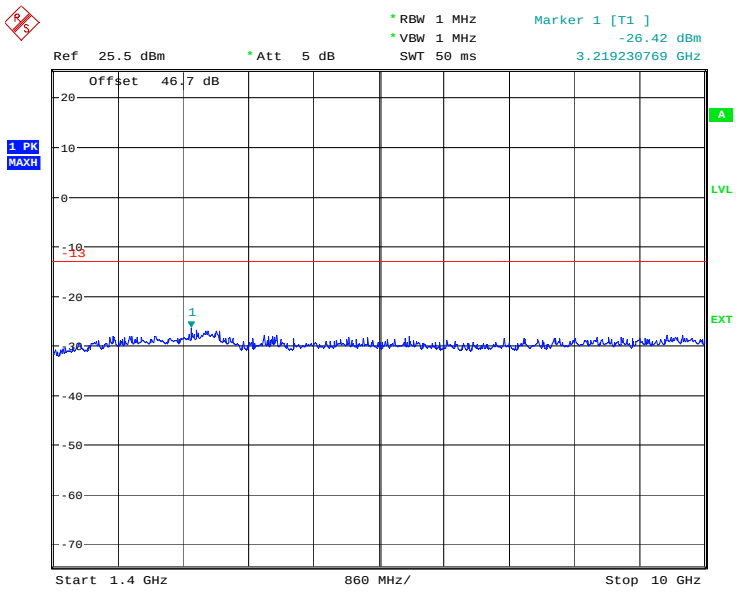
9kHz to 1.4GHz



Date: 23.MAR.2011 08:33:44

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

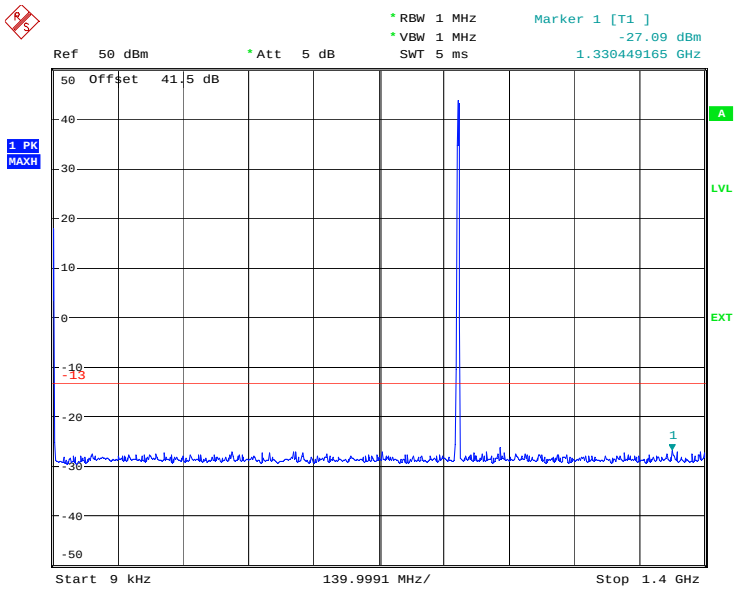


Date: 23.MAR.2011 12:39:44

Product Service

Configuration 3 - Mode 1

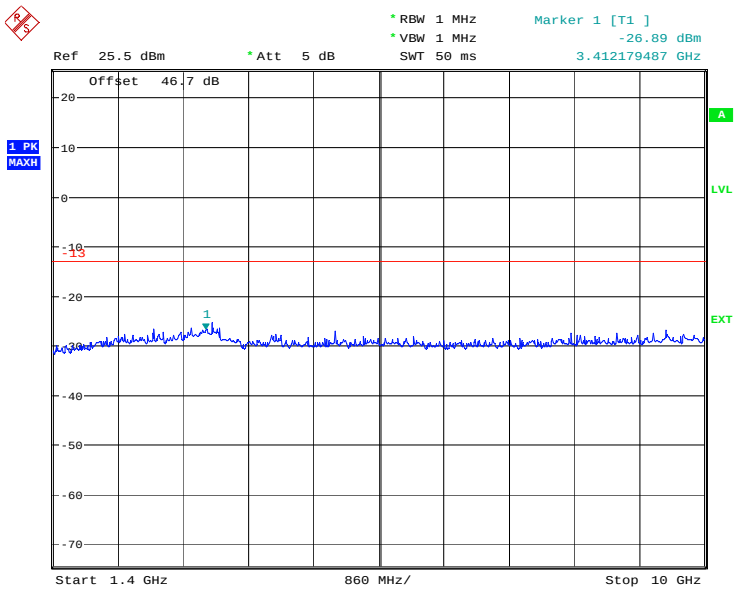
9kHz to 1.4GHz



Date: 23.MAR.2011 08:42:09

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

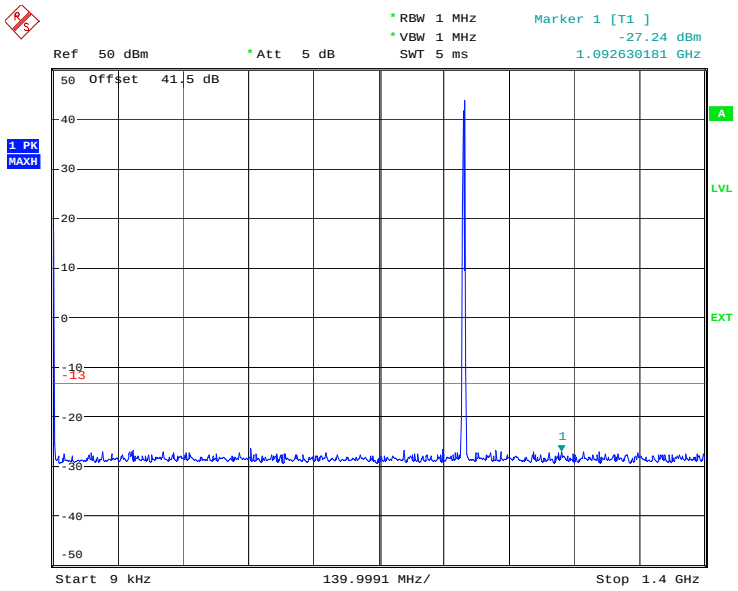


Date: 23.MAR.2011 12:29:57

Product Service

Configuration 3 - Mode 2

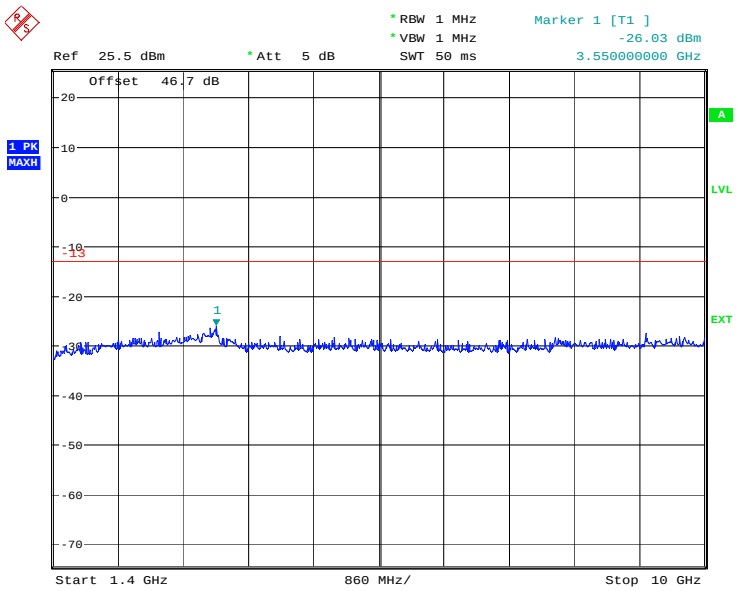
9kHz to 1.4GHz



Date: 23.MAR.2011 08:50:22

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

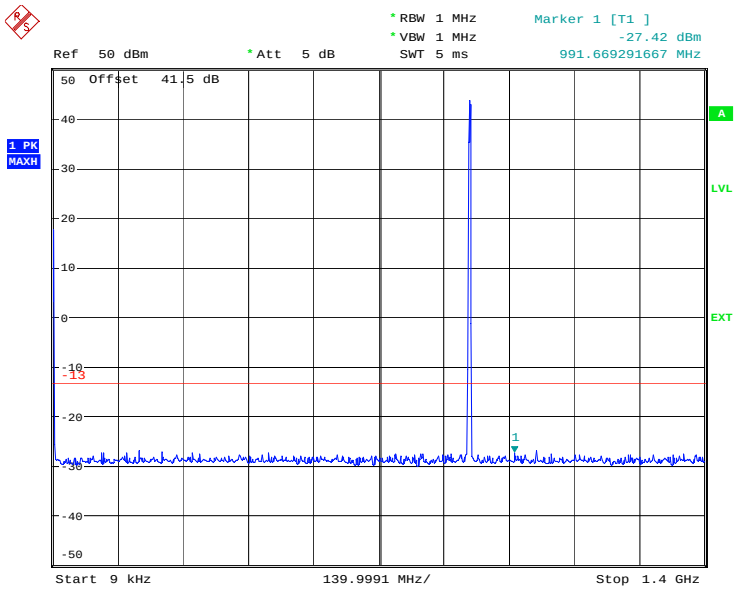


Date: 23.MAR.2011 12:35:06

Product Service

Configuration 3 - Mode 3

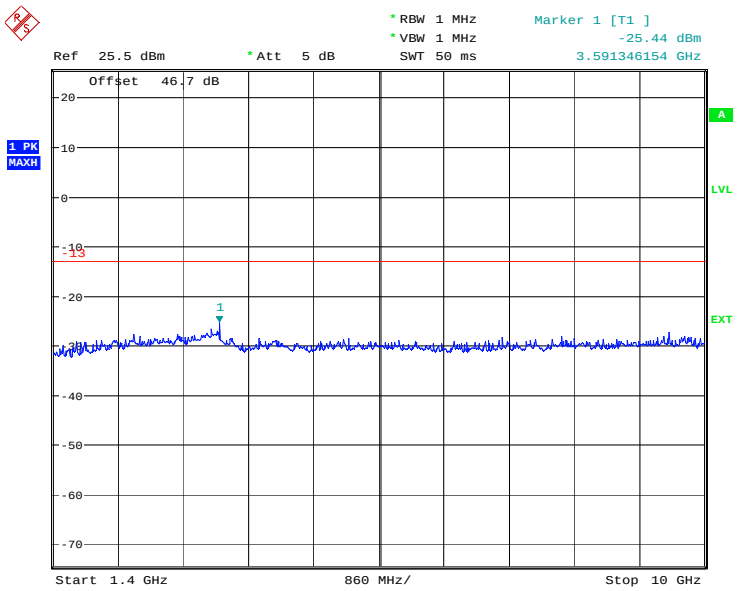
9kHz to 1.4GHz



Date: 23.MAR.2011 08:51:08

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz



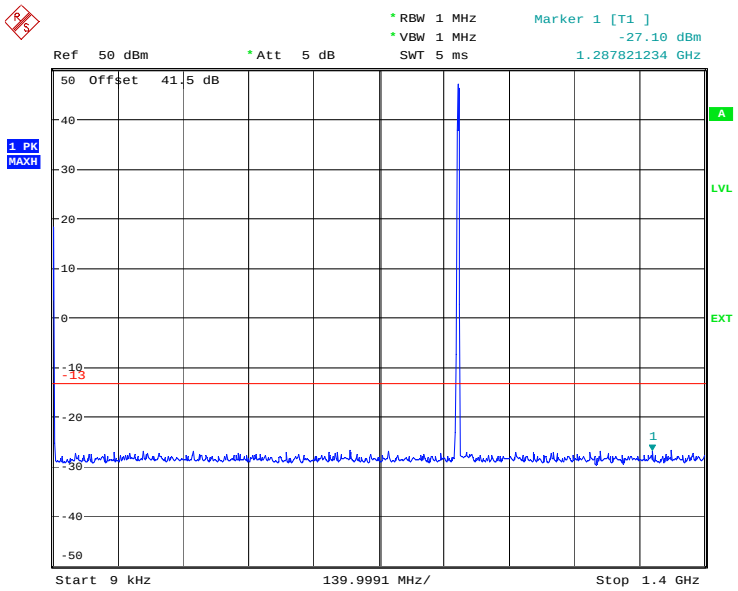
Date: 23.MAR.2011 12:35:33

Product Service

8-PSK

Configuration 1 - Mode 1

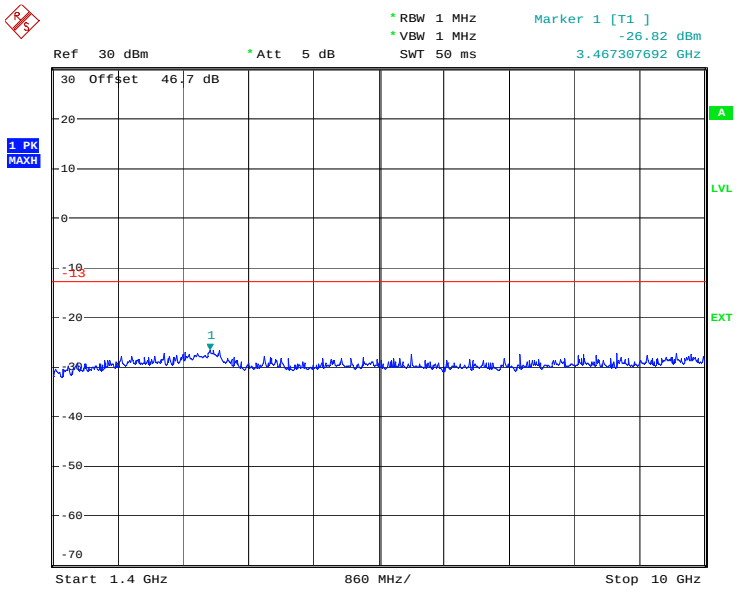
9kHz to 1.4GHz



Date: 22.MAR.2011 15:37:58

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

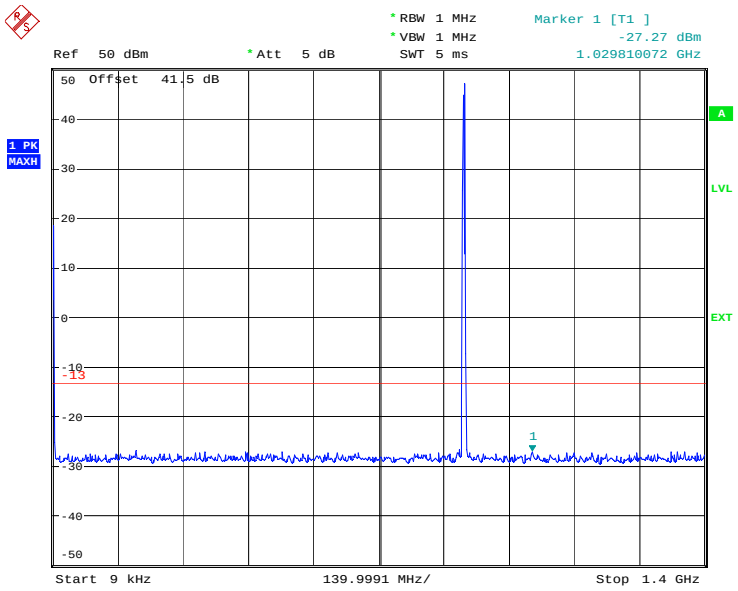


Date: 23.MAR.2011 13:34:06

Product Service

Configuration 1 - Mode 2

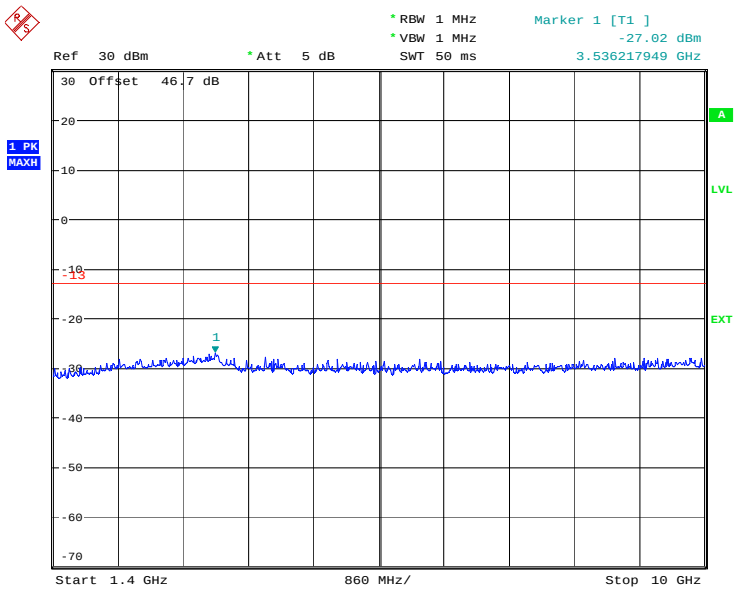
9kHz to 1.4GHz



Date: 22.MAR.2011 15:39:24

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

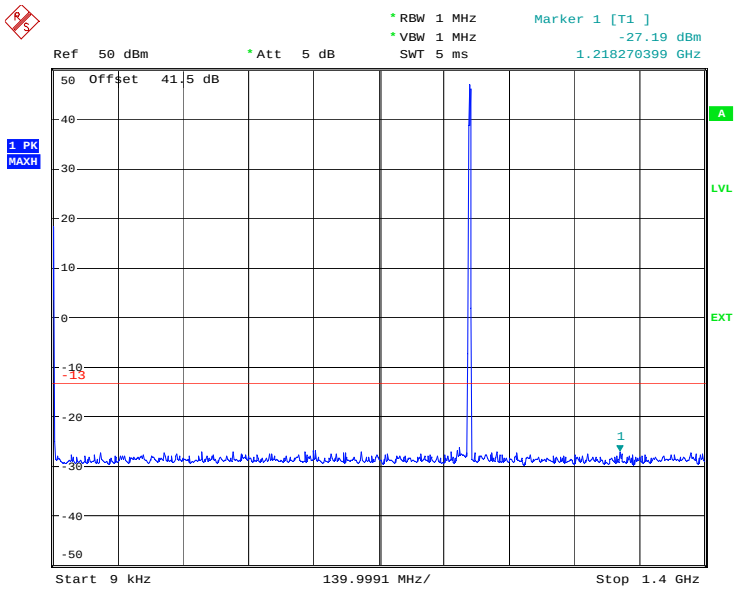


Date: 23.MAR.2011 13:37:08

Product Service

Configuration 1 - Mode 3

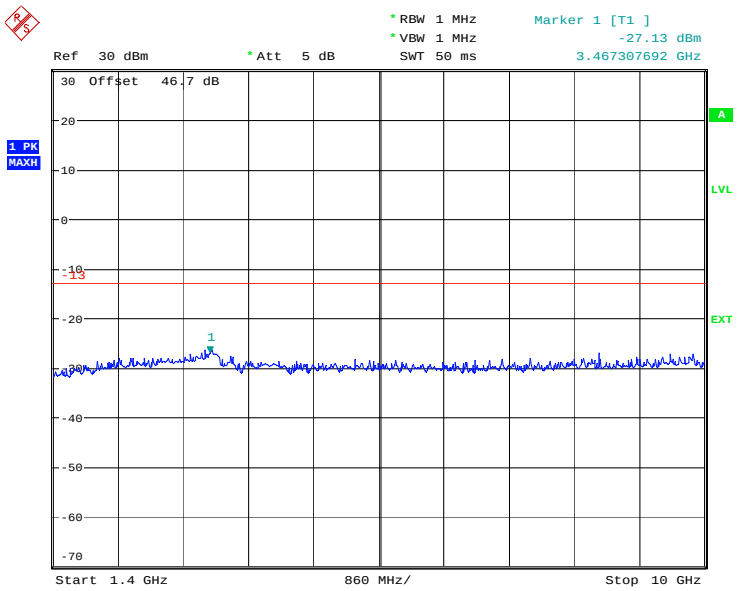
9kHz to 1.4GHz



Date: 22.MAR.2011 15:40:08

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

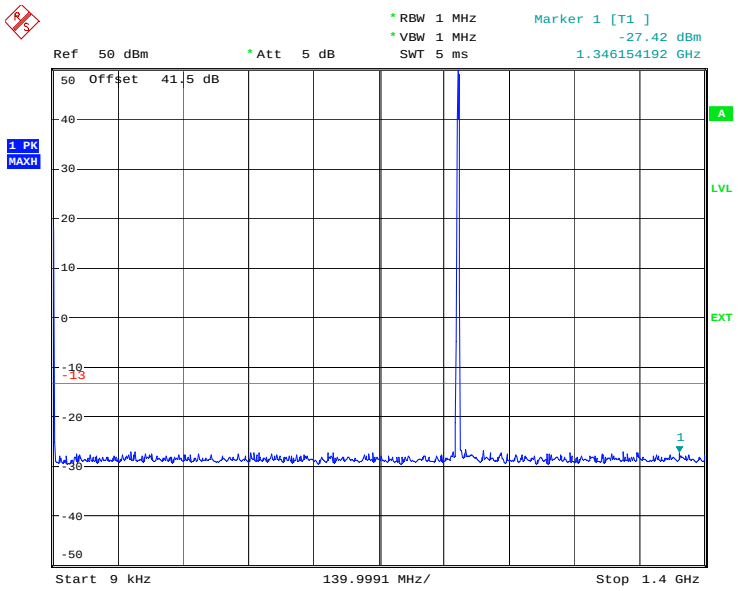


Date: 23.MAR.2011 13:39:14

Product Service

Configuration 2 - Mode 1

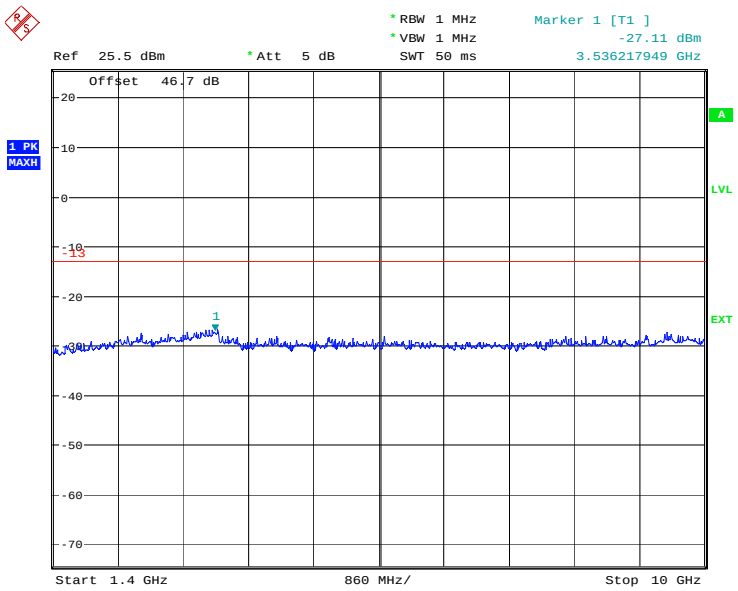
9kHz to 1.4GHz



Date: 23.MAR.2011 08:27:43

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

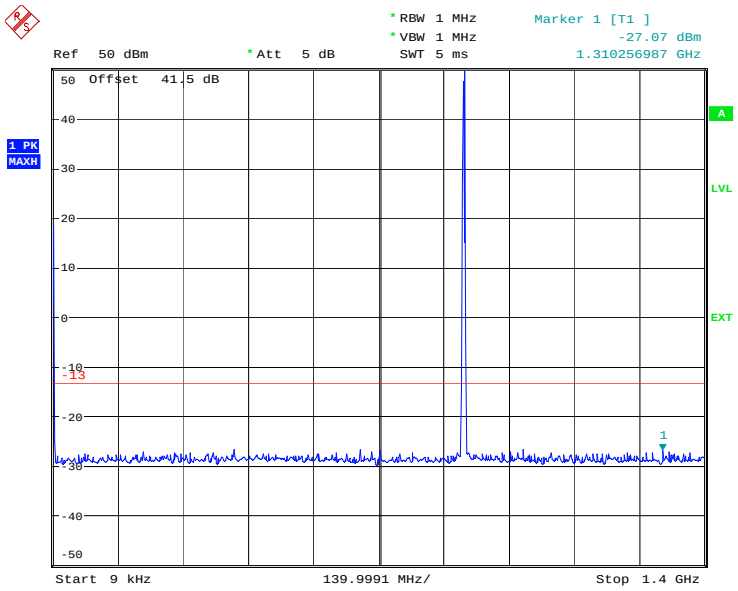


Date: 23.MAR.2011 12:43:09

Product Service

Configuration 2 - Mode 2

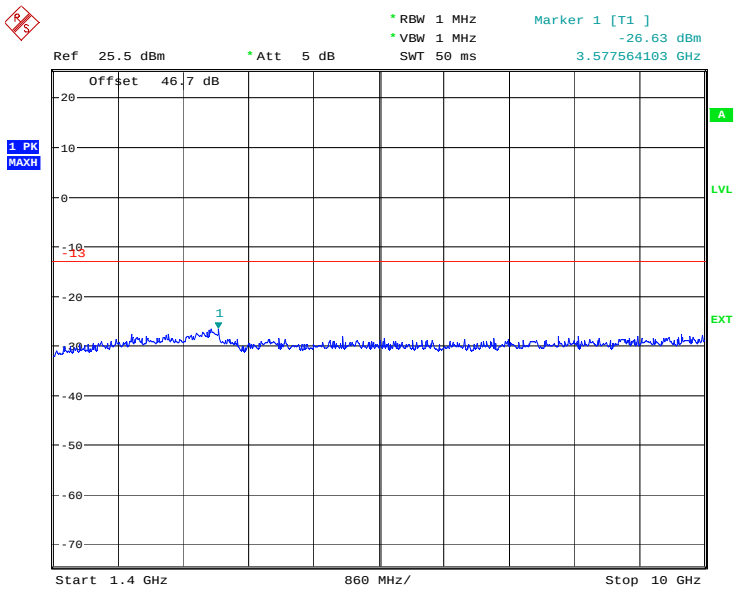
9kHz to 1.4GHz



Date: 23.MAR.2011 08:29:40

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

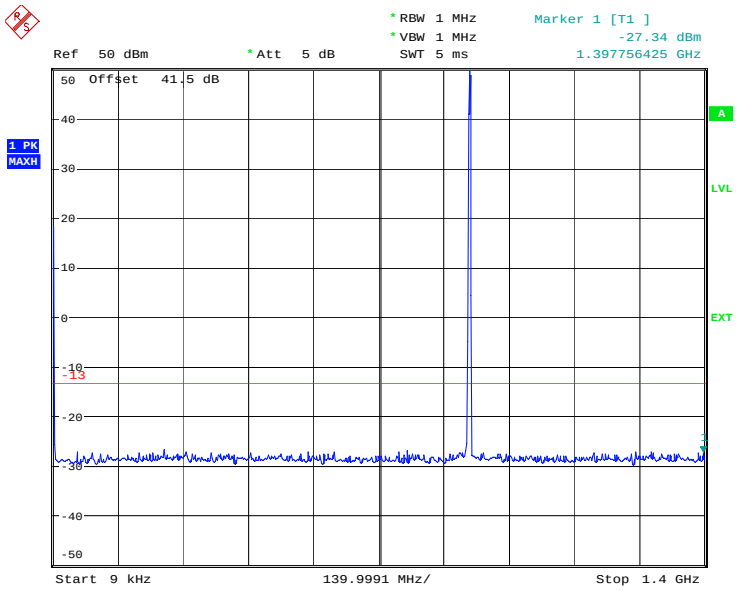


Date: 23.MAR.2011 12:40:42

Product Service

Configuration 2 - Mode 3

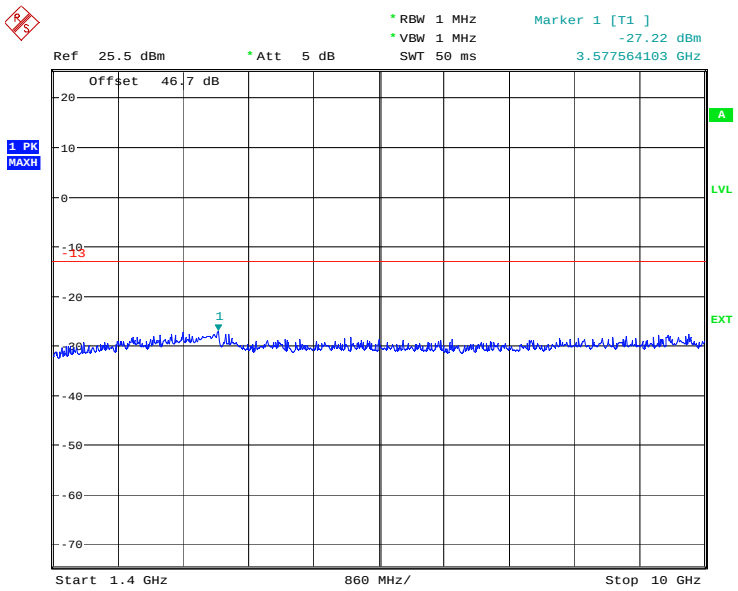
9kHz to 1.4GHz



Date: 23.MAR.2011 08:32:49

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

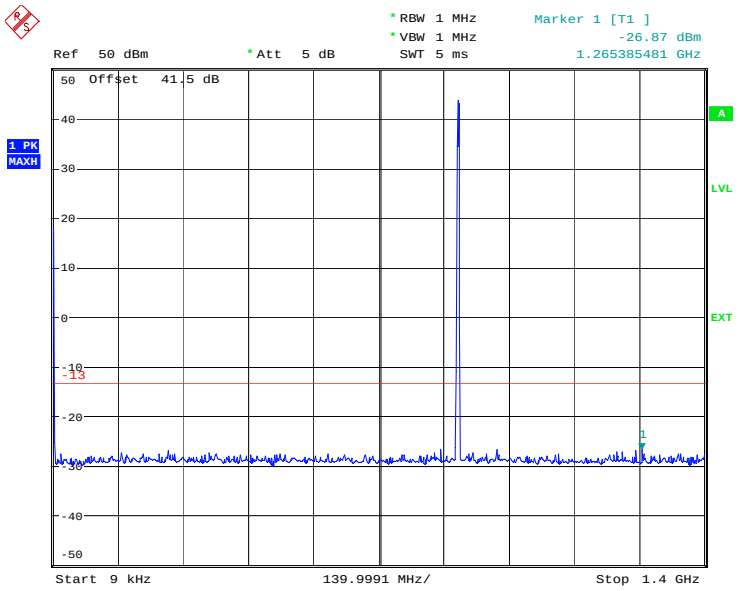


Date: 23.MAR.2011 12:39:24

Product Service

Configuration 3 - Mode 1

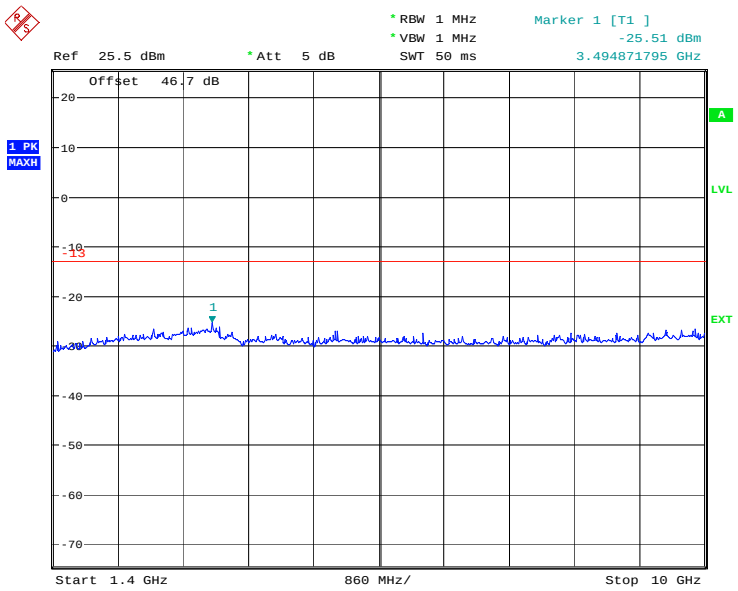
9kHz to 1.4GHz



Date: 23.MAR.2011 08:42:43

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

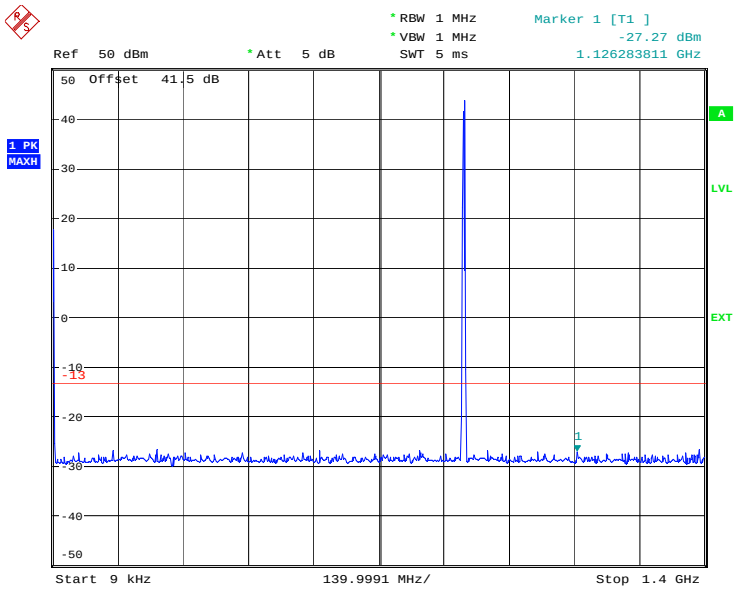


Date: 23.MAR.2011 12:30:55

Product Service

Configuration 3 - Mode 2

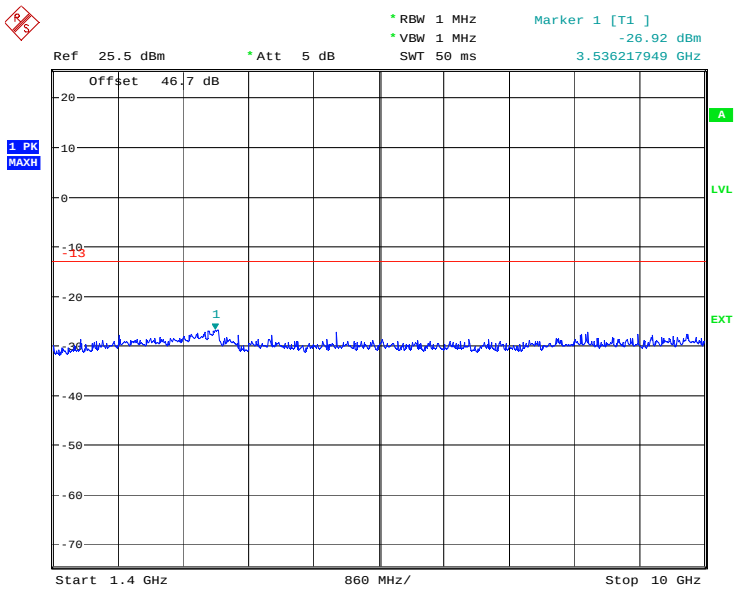
9kHz to 1.4GHz



Date: 23.MAR.2011 08:49:16

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

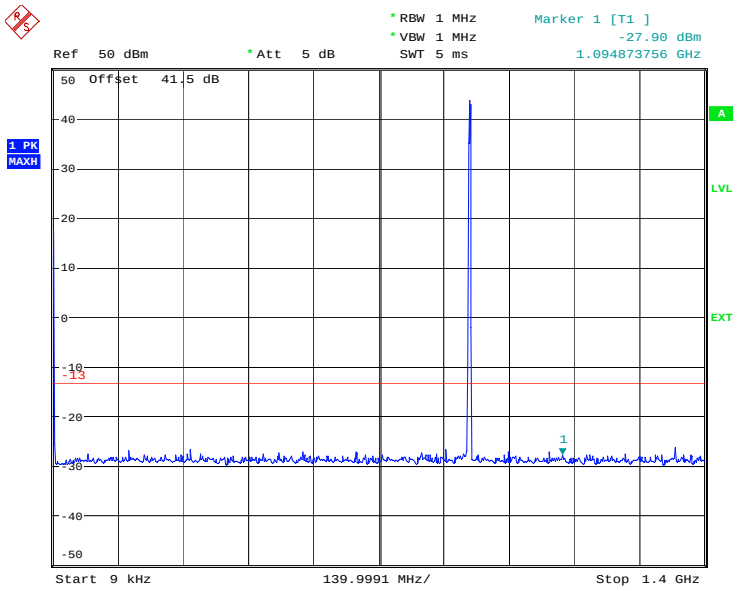


Date: 23.MAR.2011 12:33:45

Product Service

Configuration 3 - Mode 3

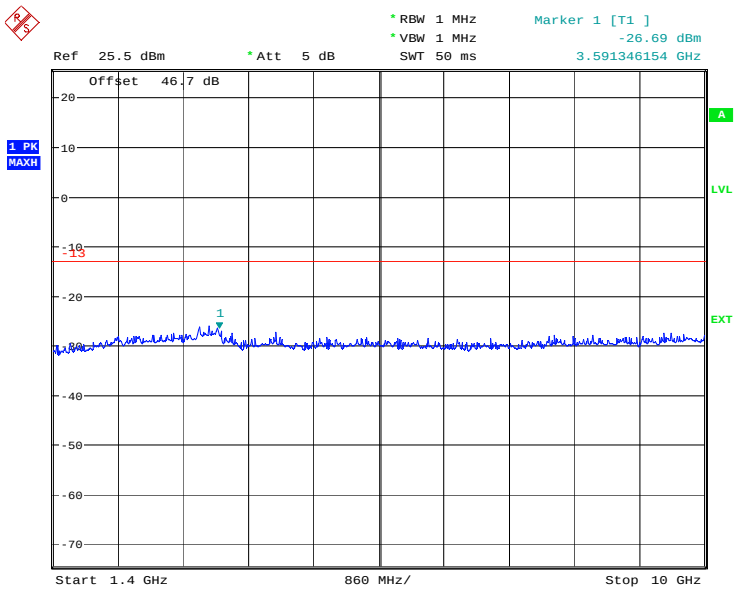
9kHz to 1.4GHz



Date: 23.MAR.2011 08:51:42

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz



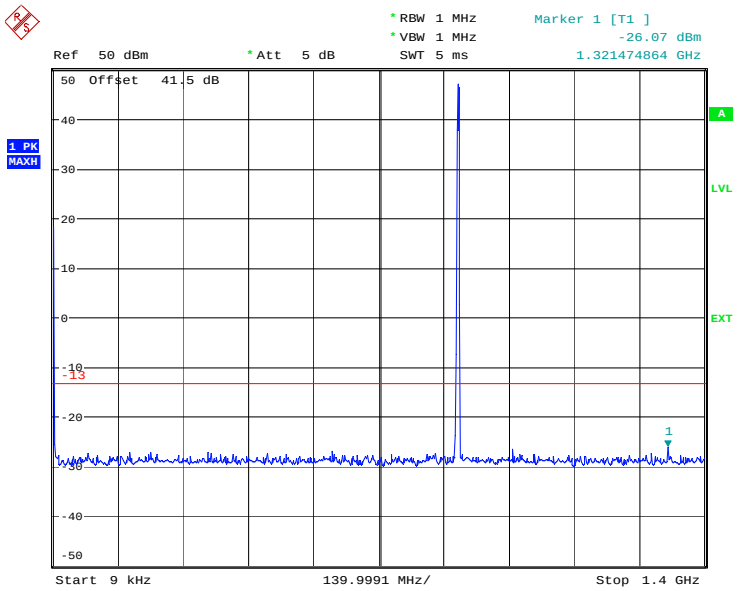
Date: 23.MAR.2011 12:36:02

Product Service

16QAM

Configuration 1 - Mode 1

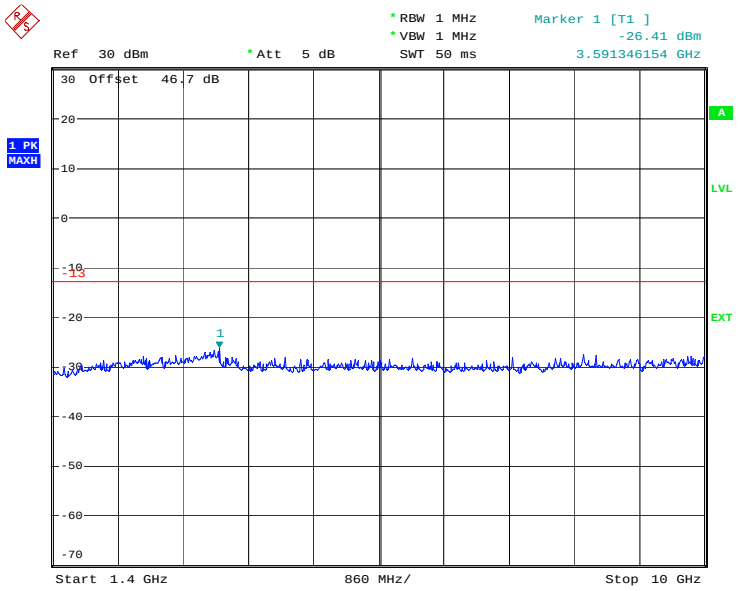
9kHz to 1.4GHz



Date: 22.MAR.2011 15:43:28

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

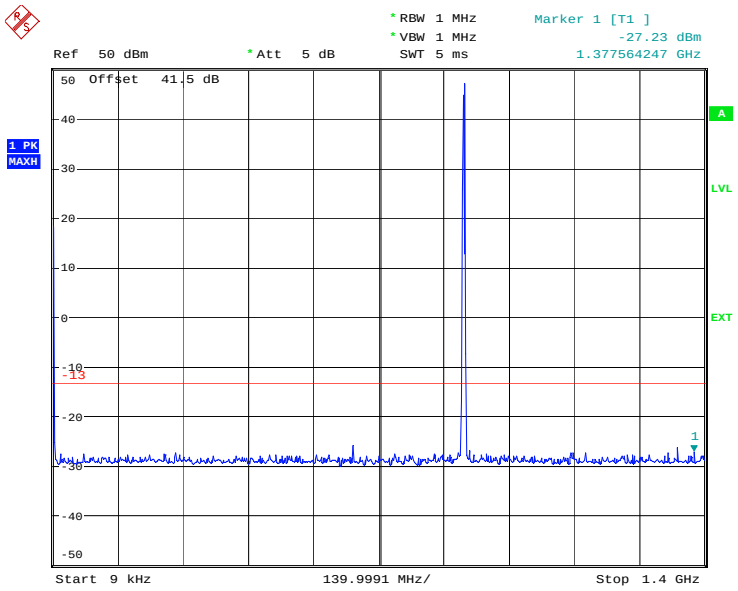


Date: 23.MAR.2011 13:35:18

Product Service

Configuration 1 - Mode 2

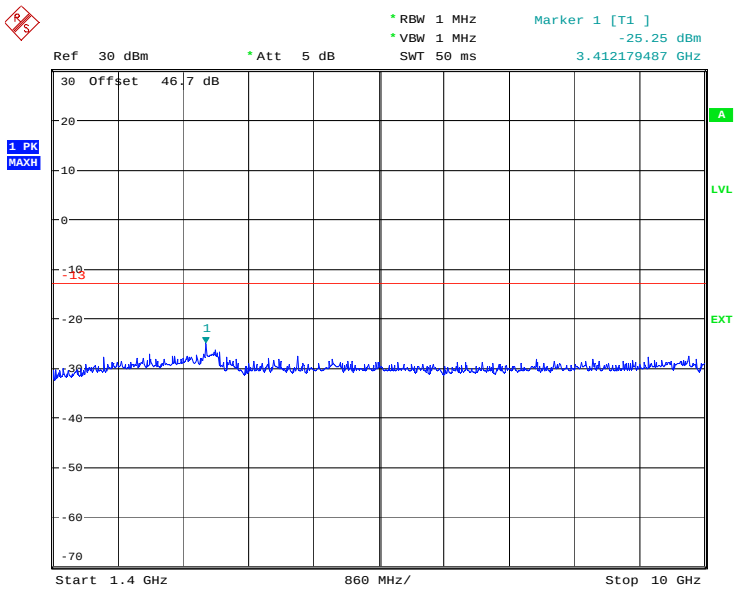
9kHz to 1.4GHz



Date: 22.MAR.2011 15:42:49

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

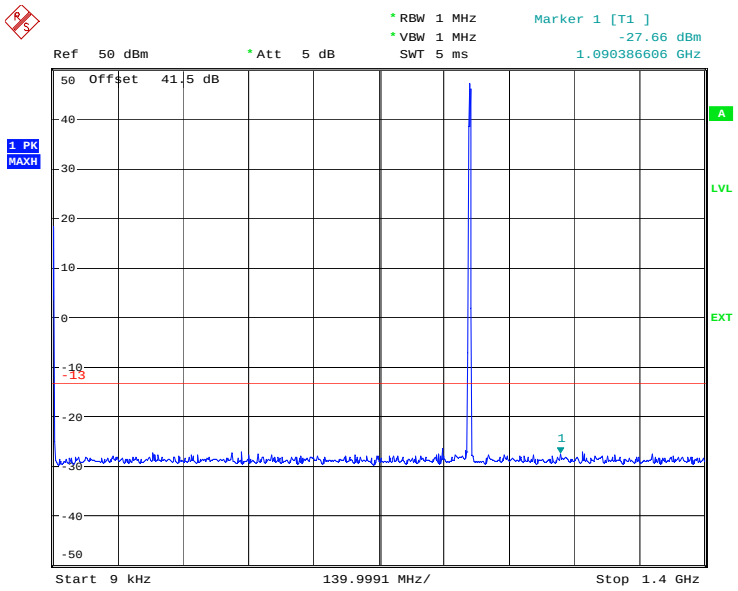


Date: 23.MAR.2011 13:36:38

Product Service

Configuration 1 - Mode 3

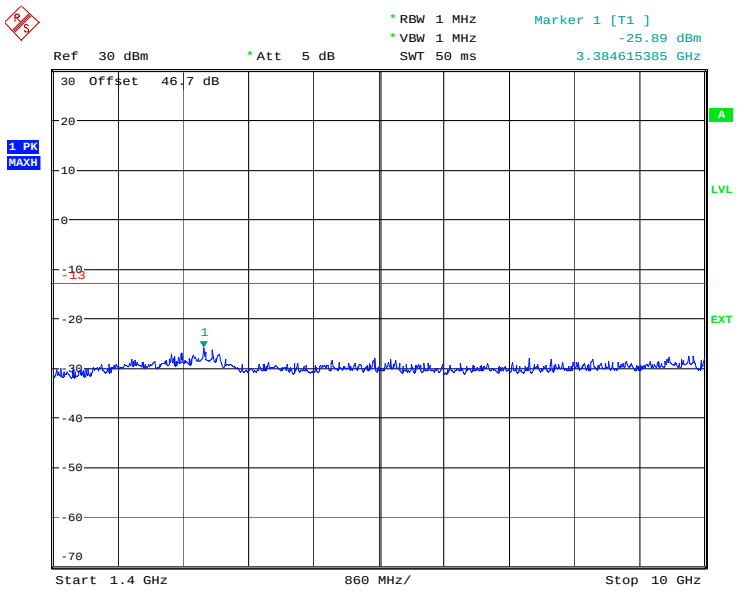
9kHz to 1.4GHz



Date: 22.MAR.2011 15:40:42

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

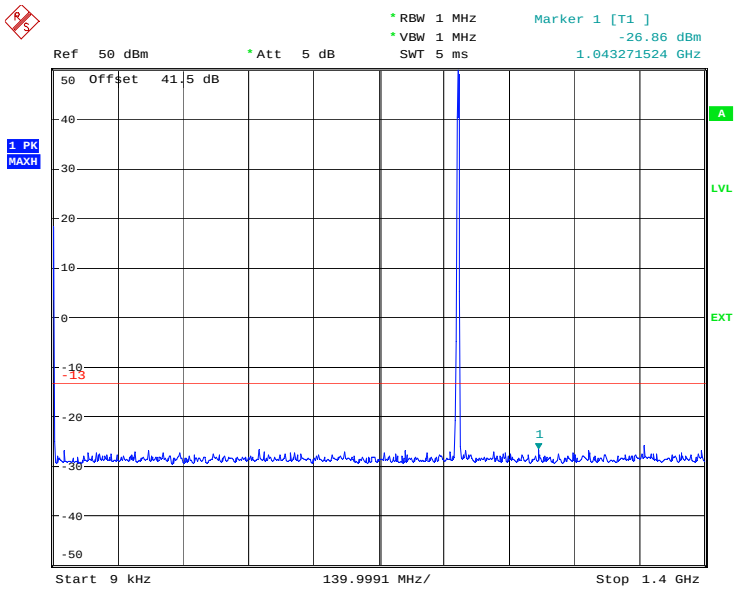


Date: 23.MAR.2011 13:39:44

Product Service

Configuration 2 - Mode 1

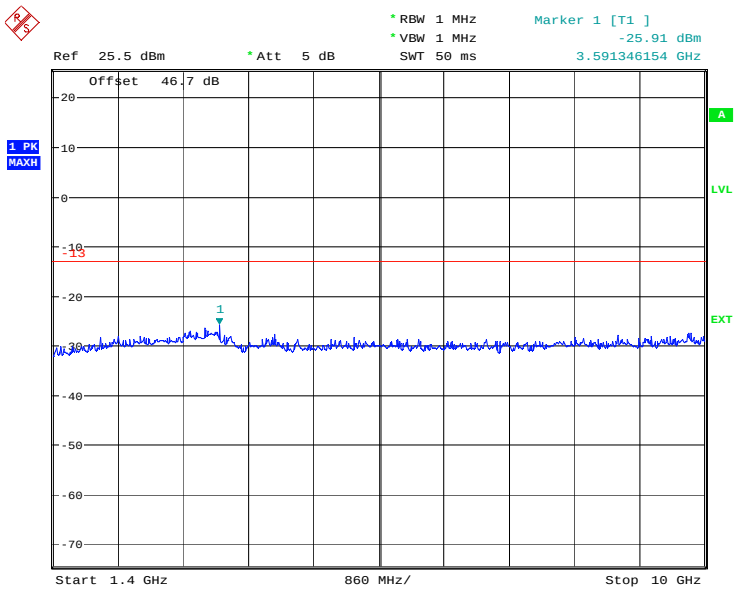
9kHz to 1.4GHz



Date: 23.MAR.2011 08:27:04

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

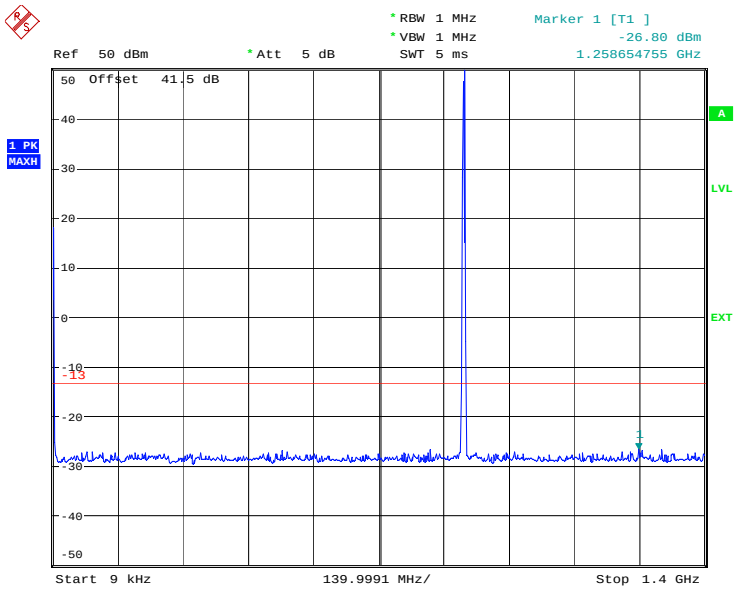


Date: 23.MAR.2011 12:42:24

Product Service

Configuration 2 - Mode 2

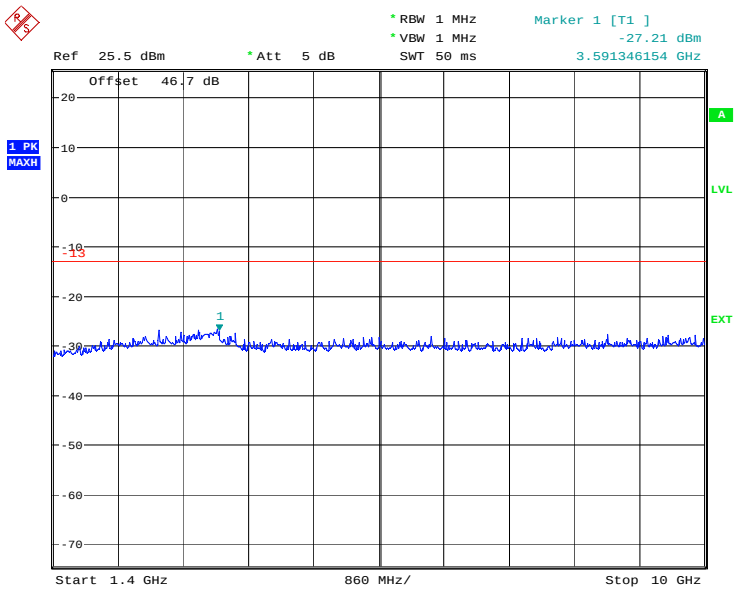
9kHz to 1.4GHz



Date: 23.MAR.2011 08:30:22

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

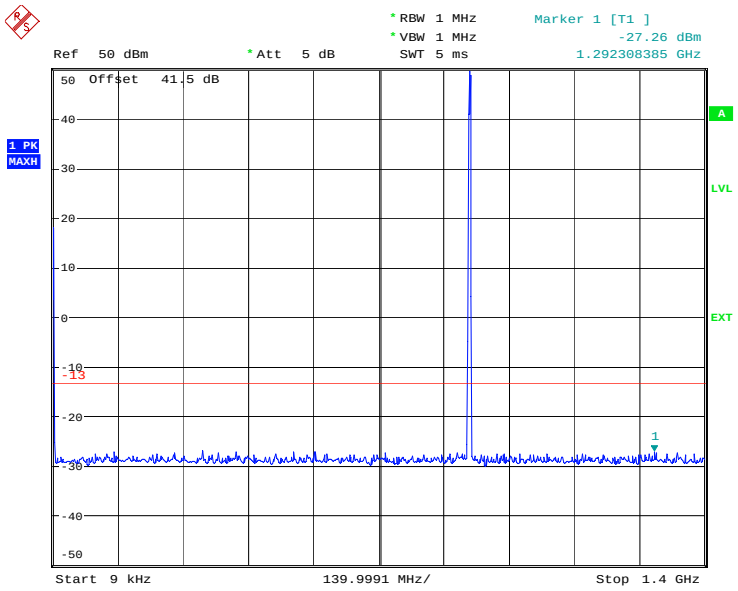


Date: 23.MAR.2011 12:41:04

Product Service

Configuration 2 - Mode 3

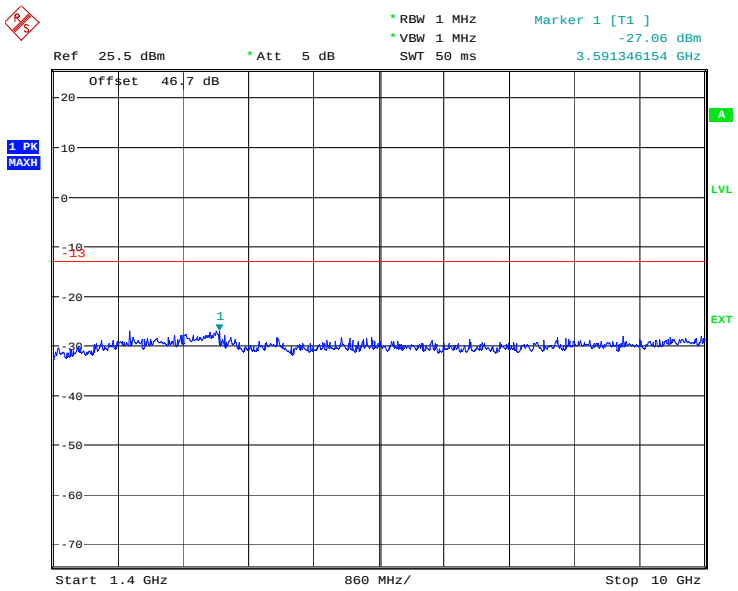
9kHz to 1.4GHz



Date: 23.MAR.2011 08:32:16

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

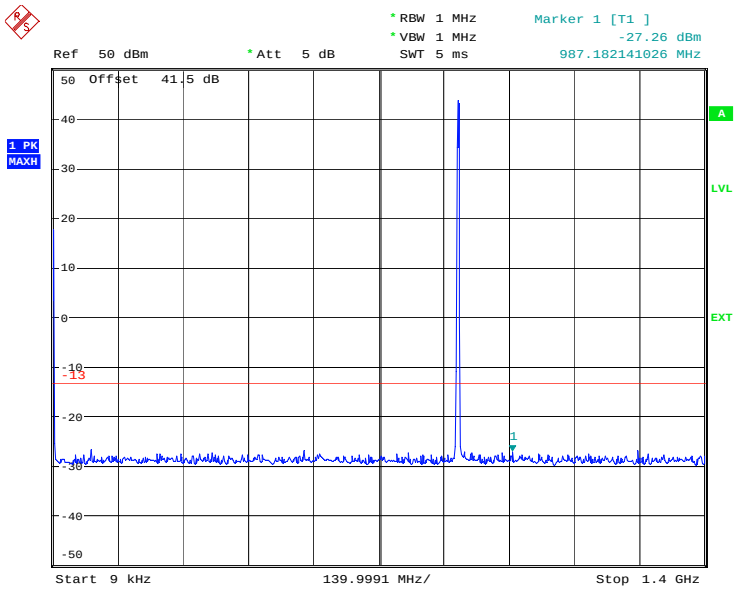


Date: 23.MAR.2011 12:39:04

Product Service

Configuration 3 - Mode 1

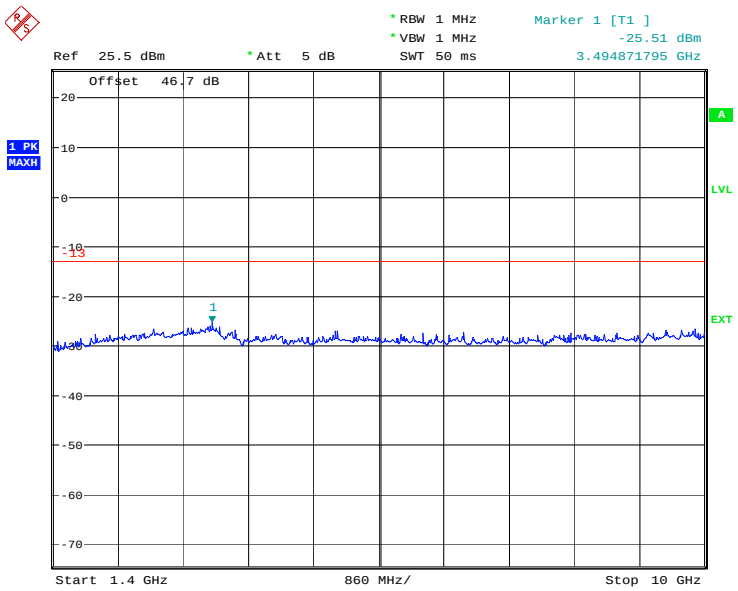
9kHz to 1.4GHz



Date: 23.MAR.2011 08:43:10

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

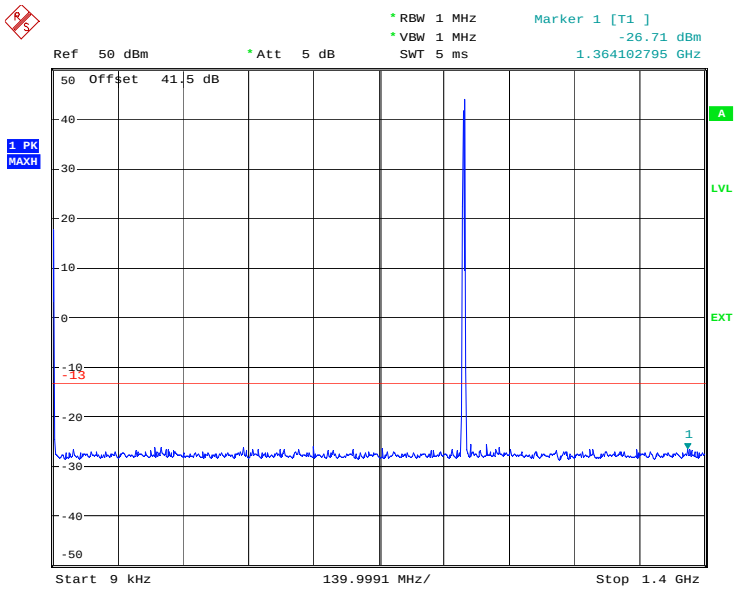


Date: 23.MAR.2011 12:31:41

Product Service

Configuration 3 - Mode 2

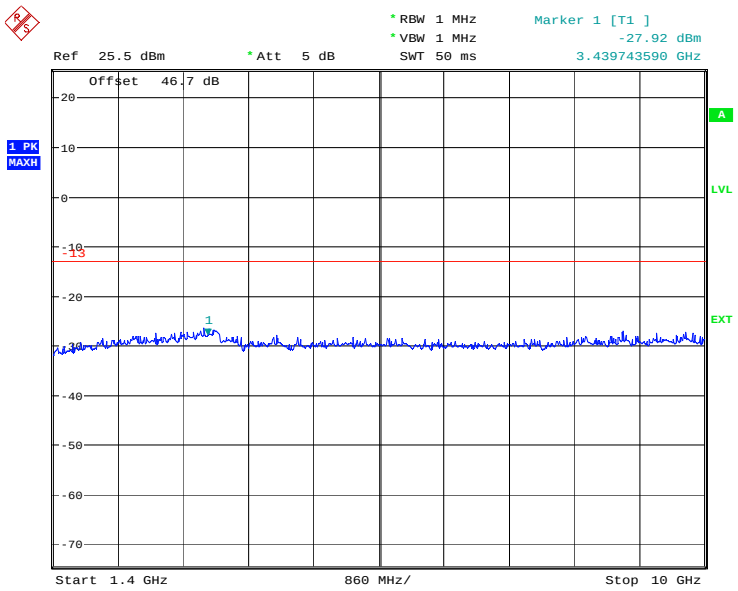
9kHz to 1.4GHz



Date: 23.MAR.2011 08:47:09

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

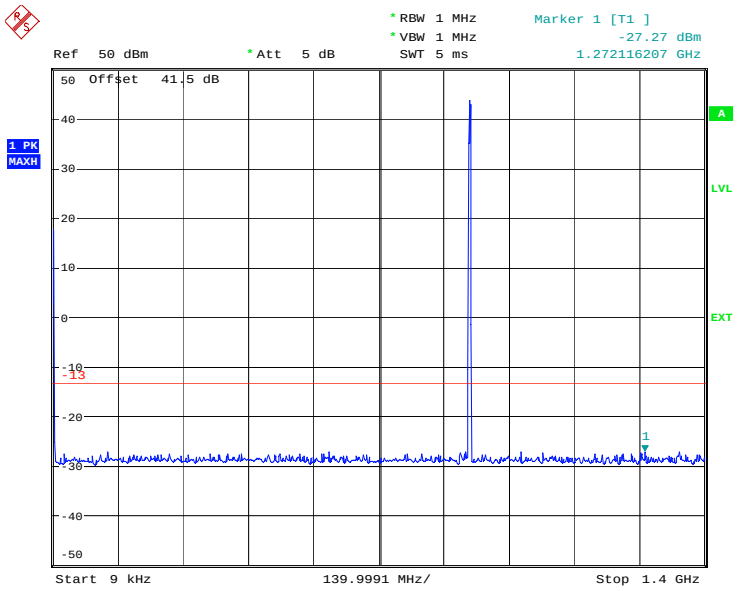


Date: 23.MAR.2011 12:33:11

Product Service

Configuration 3 - Mode 3

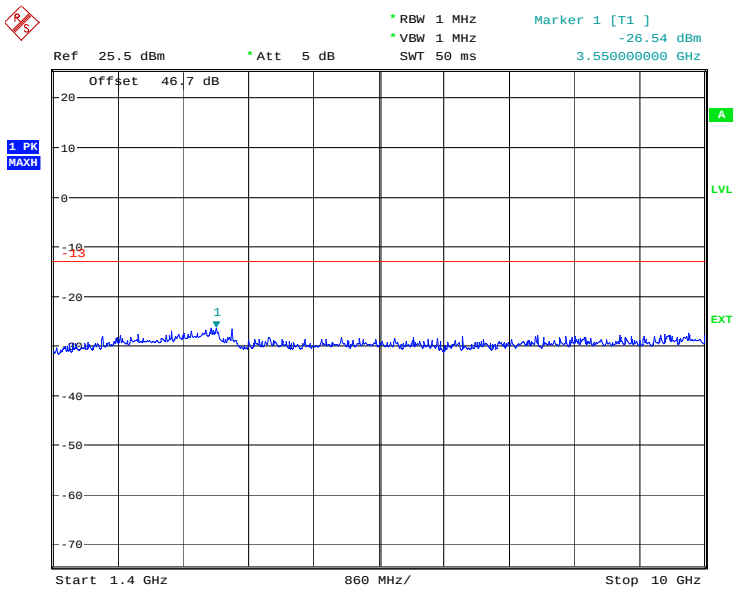
9kHz to 1.4GHz



Date: 23.MAR.2011 08:53:12

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz



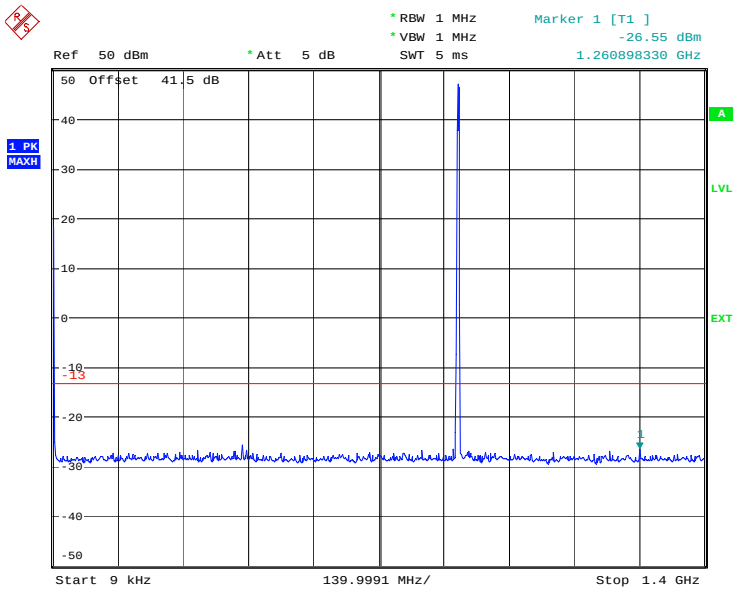
Date: 23.MAR.2011 12:36:28

Product Service

32QAM

Configuration 1 - Mode 1

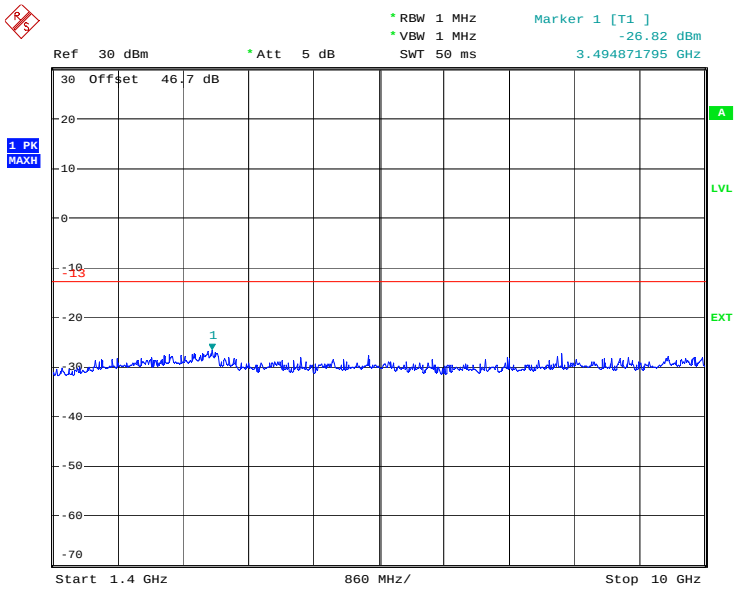
9kHz to 1.4GHz



Date: 22.MAR.2011 15:44:09

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

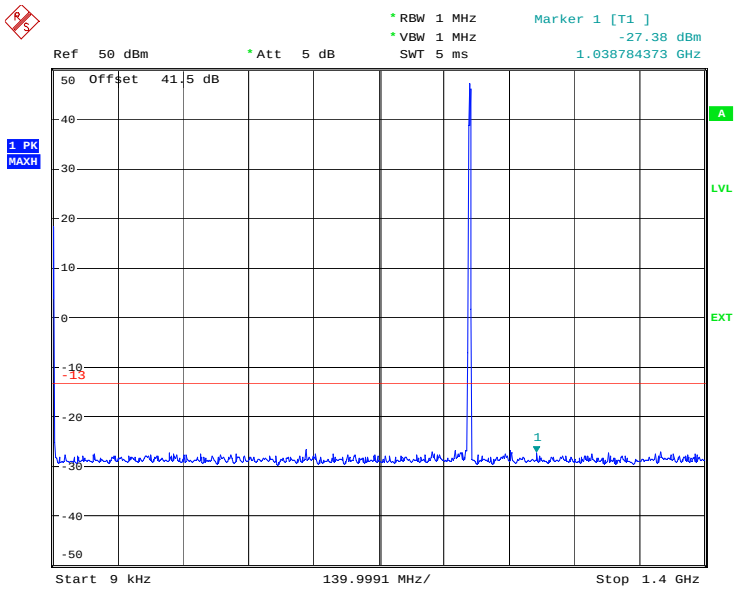


Date: 23.MAR.2011 13:35:43

Product Service

Configuration 1 - Mode 2

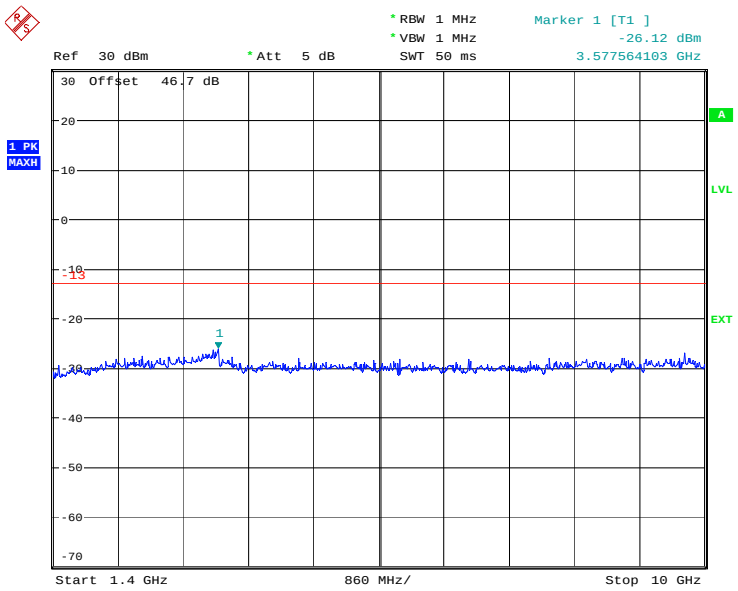
9kHz to 1.4GHz



Date: 22.MAR.2011 15:41:33

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

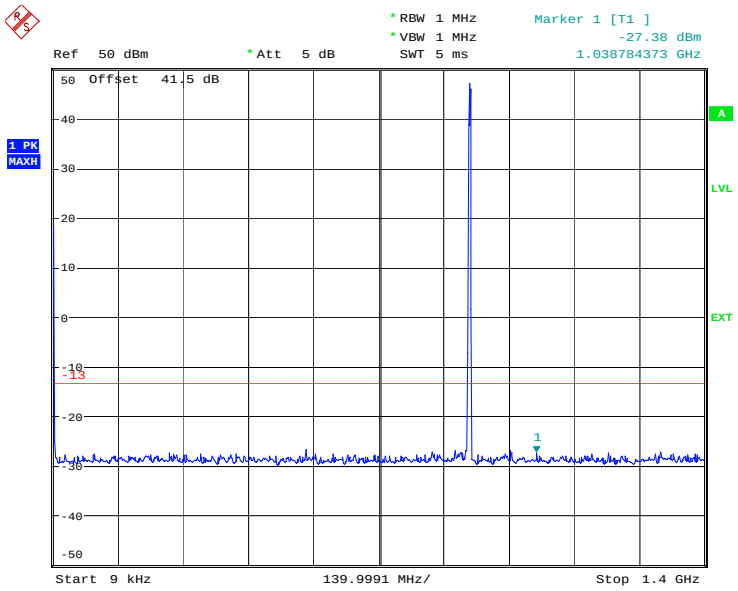


Date: 23.MAR.2011 13:36:15

Product Service

Configuration 1 - Mode 3

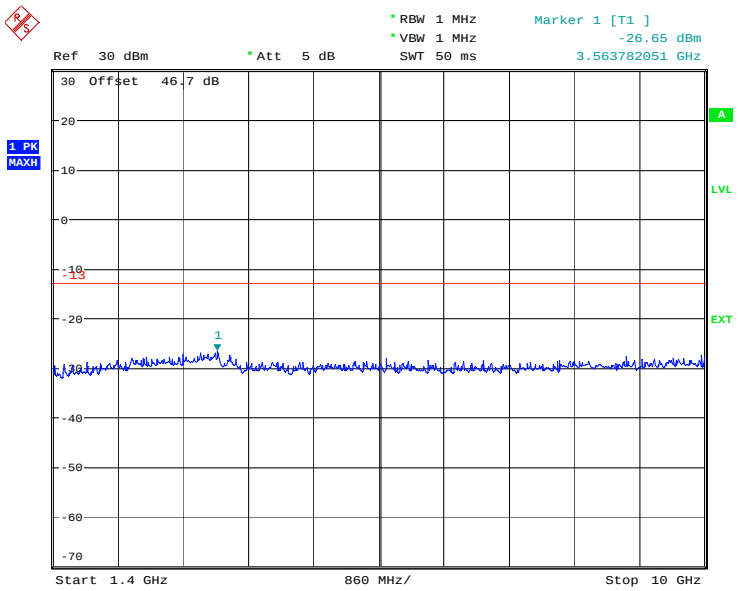
9kHz to 1.4GHz



Date: 22.MAR.2011 15:41:33

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

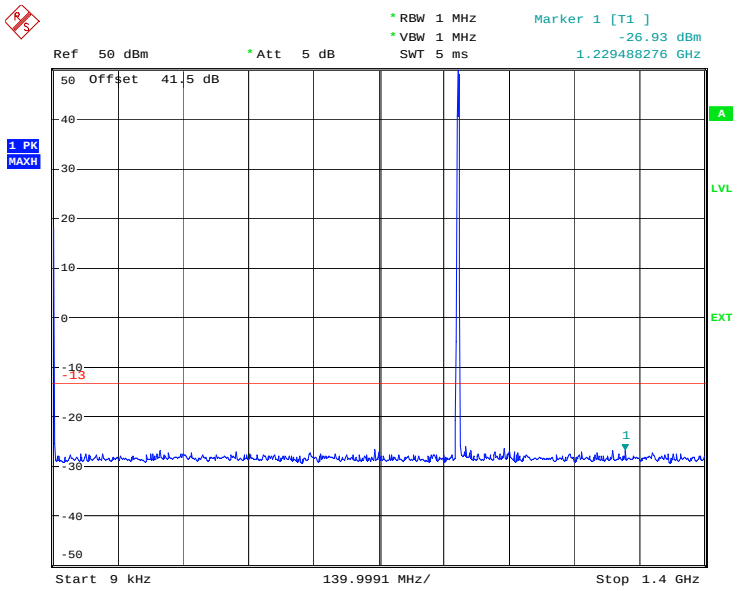


Date: 23.MAR.2011 13:40:14

Product Service

Configuration 2 - Mode 1

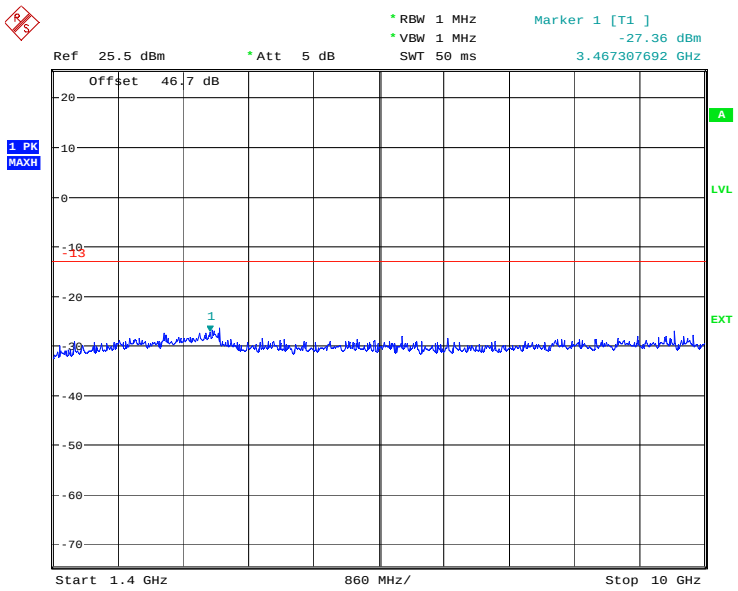
9kHz to 1.4GHz



Date: 23.MAR.2011 08:25:59

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

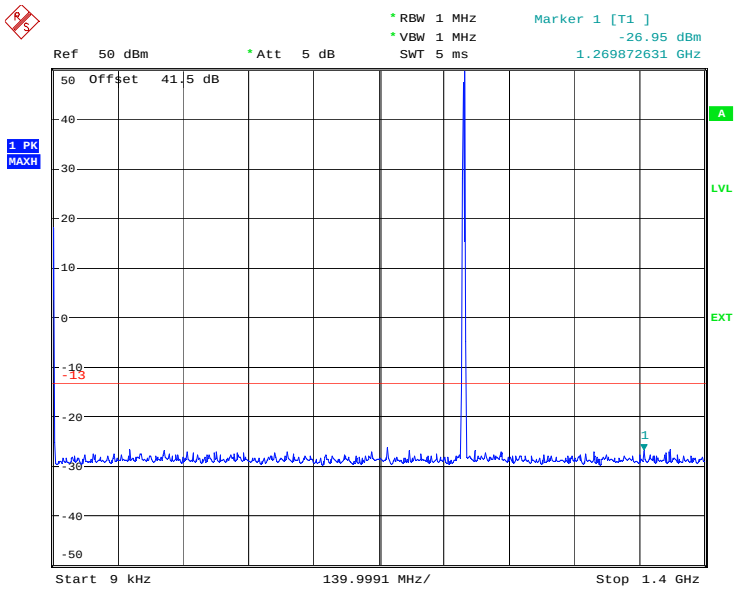


Date: 23.MAR.2011 12:42:06

Product Service

Configuration 2 - Mode 2

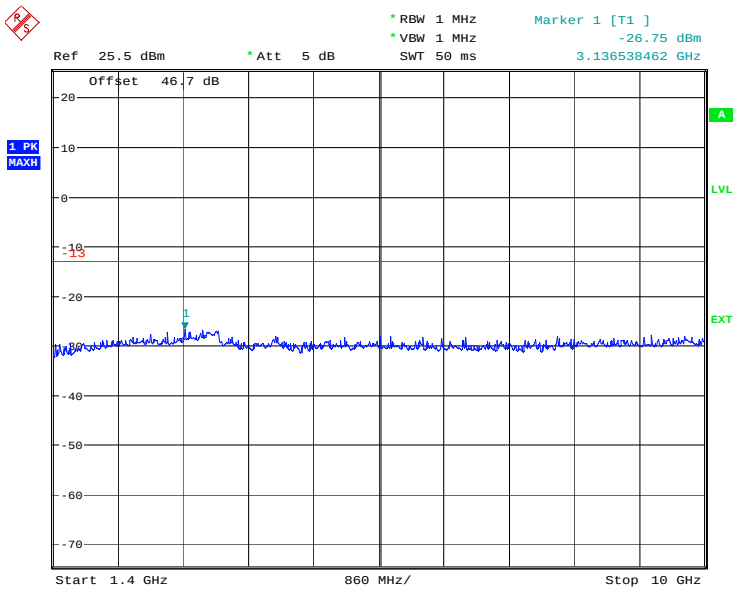
9kHz to 1.4GHz



Date: 23.MAR.2011 08:30:51

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

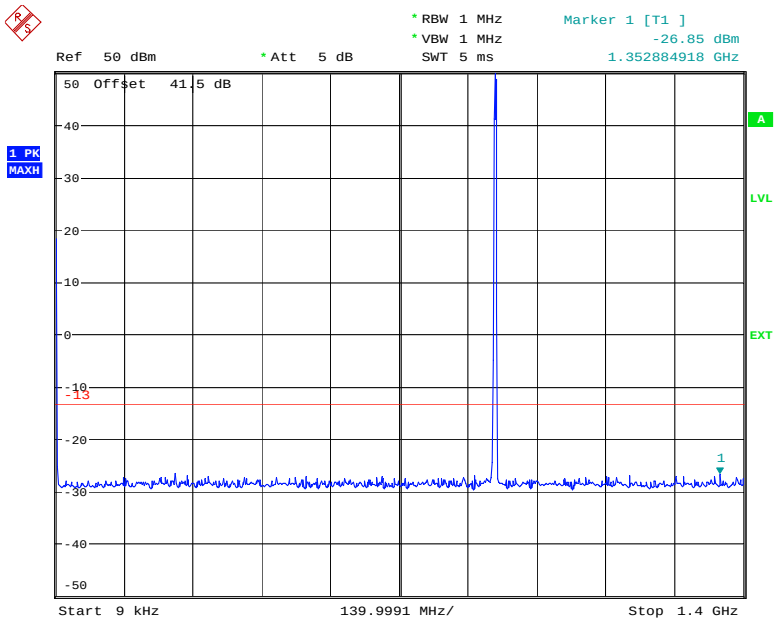


Date: 23.MAR.2011 12:41:30

Product Service

Configuration 2 - Mode 3

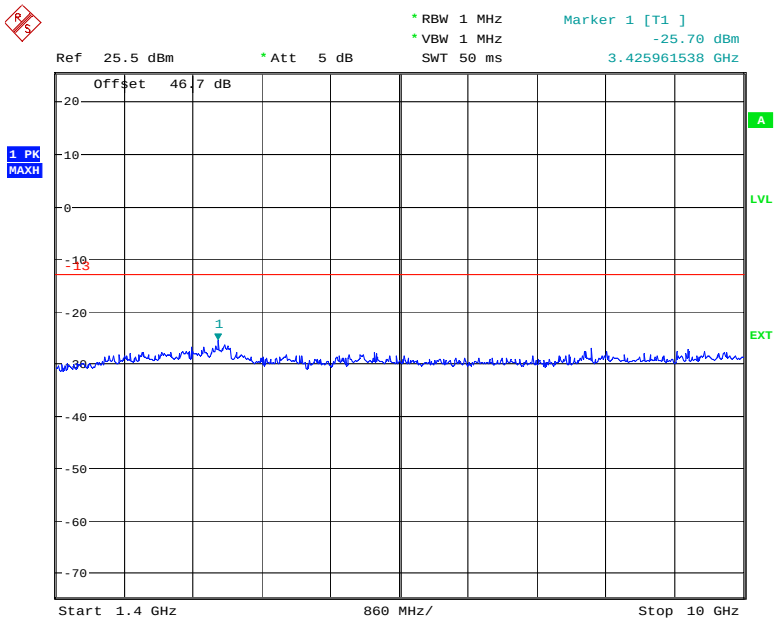
9kHz to 1.4GHz



Date: 23.MAR.2011 08:31:49

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

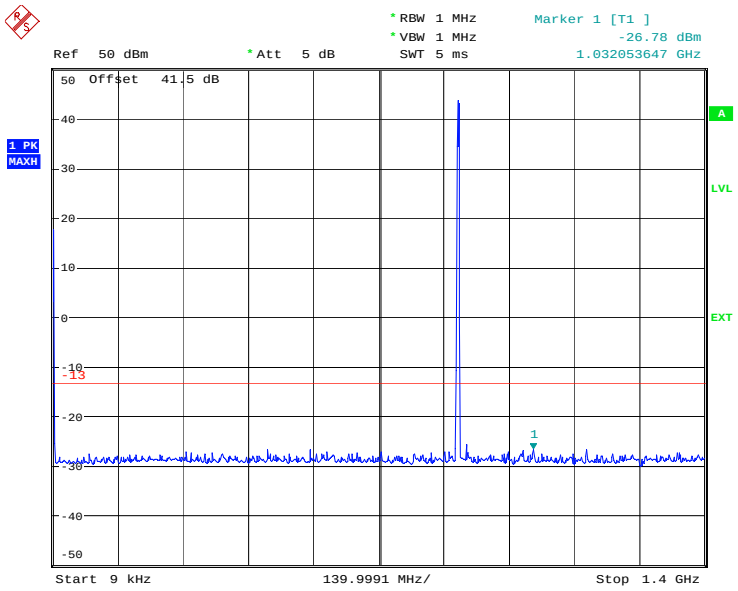


Date: 23.MAR.2011 12:38:40

Product Service

Configuration 3 - Mode 1

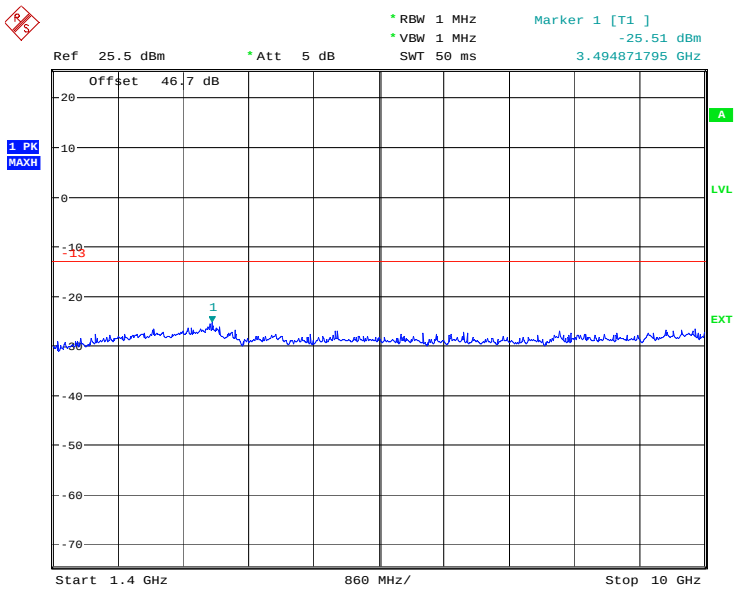
9kHz to 1.4GHz



Date: 23.MAR.2011 08:43:39

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

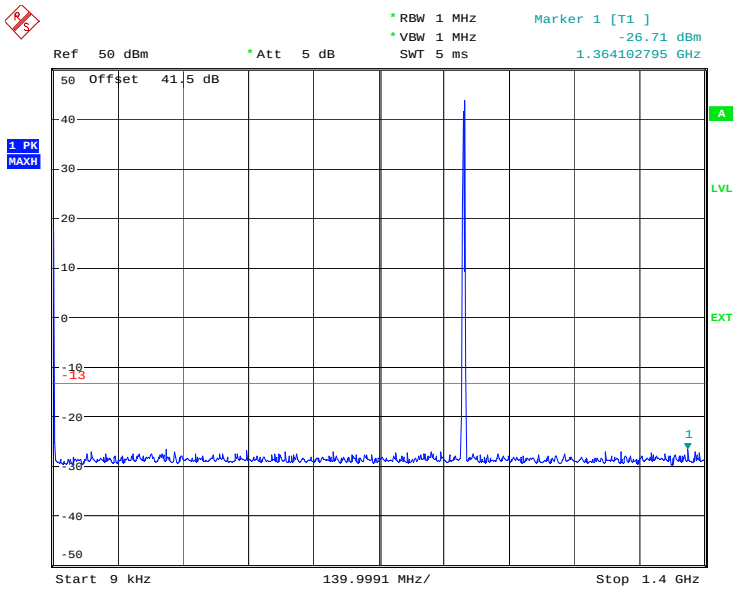


Date: 23.MAR.2011 12:31:58

Product Service

Configuration 3 - Mode 2

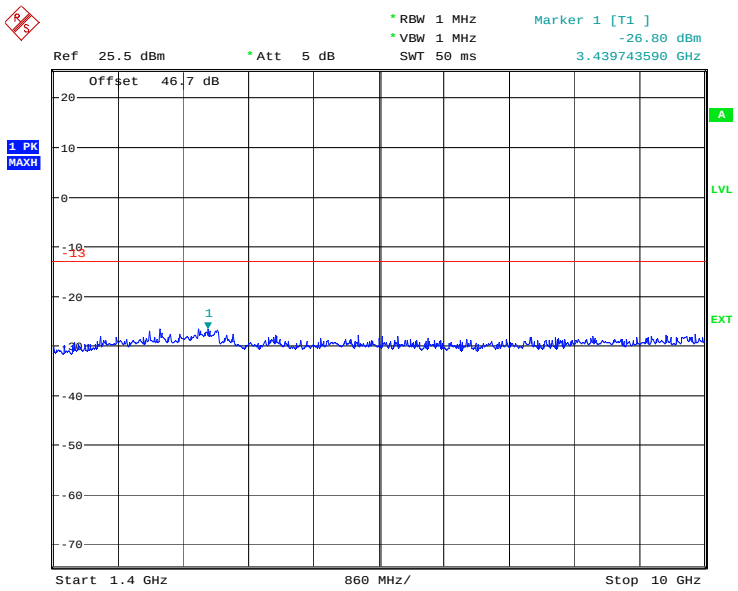
9kHz to 1.4GHz



Date: 23.MAR.2011 08:45:39

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz

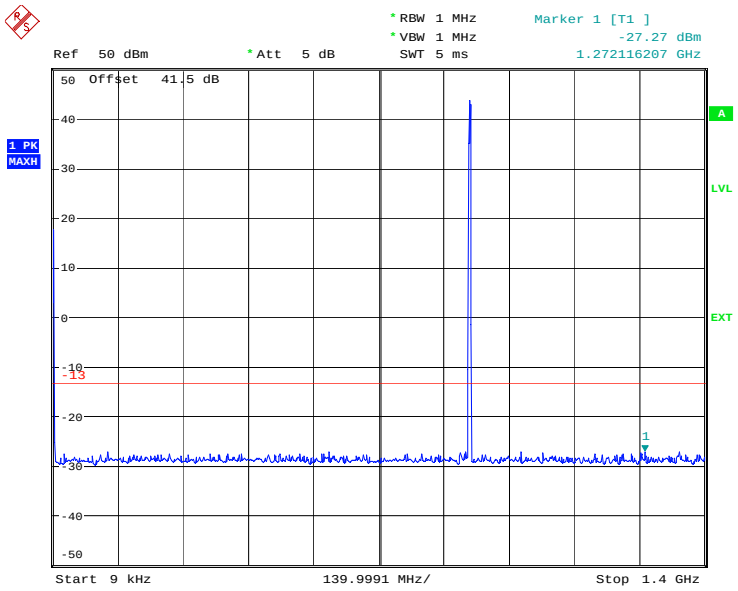


Date: 23.MAR.2011 12:32:42

Product Service

Configuration 3 - Mode 3

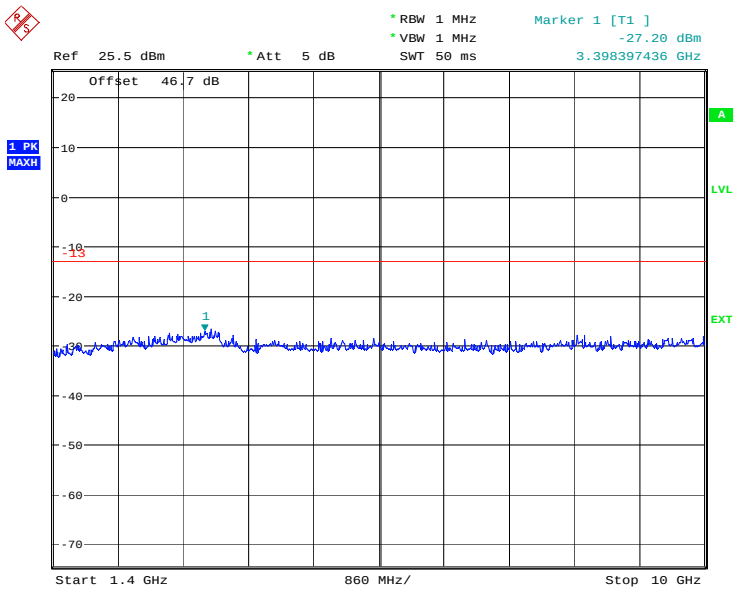
9kHz to 1.4GHz



Date: 23.MAR.2011 08:53:12

Note: The emission beyond the limit is the operating frequency.

1.4GHz to 10GHz



Date: 23.MAR.2011 12:36:53

Limit	-13dBm

Remarks

The EUT does not exceed -13dBm at the frequency range of 9kHz to 10GHz.

Product Service

2.8 FREQUENCY STABILITY UNDER TEMPERATURE VARIATIONS

2.8.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 22, Clause 22.355
Industry Canada RSS-132, Clause 4.3

2.8.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.8.3 Date of Test and Modification State

21 and 22 March 2011 – 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 2 and Part 22 and Industry Canada RSS-132.

The EUT was set to transmit on maximum power. A Spectrum Analyser was used to measure the frequency error. The temperature was adjusted between -30ºC and +50ºC in 10º steps as per 2.1055.

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

Configuration 1 - Mode 2

2.8.6 Environmental Conditions

	21 March 2011	22 March 2011
Ambient Temperature	24.3°C	26.2°C
Relative Humidity	24.5%	20.4%

Product Service

2.8.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 for Frequency Stability Under Temperature Variations.

The test results are shown below

Power Supply: -48V DC

Configuration 1 - Mode 2

GMSK

Temperature Interval (ºC)	Deviation (Hz)
-30	4.54
-20	-2.81
-10	-3.08
0	-7.59
+10	-5.78
+20	**4.15**
+30	-6.41
+40	-4.53
+50	-6.03

8-PSK

Temperature Interval (ºC)	Deviation (Hz)
-30	5.10
-20	-3.83
-10	-4.22
0	-8.10
+10	-7.23
+20	**7.25**
+30	-6.92
+40	-5.04
+50	-7.22

Product Service

16QAM

Temperature Interval (ºC)	Deviation (Hz)
-30	5.49
-20	-3.59
-10	-3.03
0	-6.82
+10	-6.89
+20	**6.02**
+30	-6.21
+40	-5.19
+50	-7.37

32QAM

Temperature Interval (ºC)	Deviation (Hz)
-30	4.7
-20	-2.79
-10	-3.17
0	-5.75
+10	-6.59
+20	**5.55**
+30	-7.12
+40	-6.44
+50	-7.51

Limit	±1.5 ppm or ±1.322kHz

Remarks

The frequency stability of the EUT is sufficient to keep it within the authorised frequency ranges at any temperature interval across the measured range.

Product Service

2.9 FREQUENCY STABILITY UNDER VOLTAGE VARIATIONS

2.9.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 22, Clause 22.355
Industry Canada RSS-132, Clause 4.3

2.9.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.9.3 Date of Test and Modification State

21 March 2011 – 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 2 and Part 22 and Industry Canada RSS-132.

The EUT was set to transmit on maximum power. A Spectrum Analyser was used to measure the frequency error. The supplied voltage was varied from 85 to 115 percent of the nominal value.

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

Configuration 1 - Mode 2

2.9.6 Environmental Conditions

	21 March 2011
Ambient Temperature	24.3°C
Relative Humidity	24.5%

Product Service

2.9.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 for Frequency Stability Under Voltage Variations.

The test results are shown below

Temperature: 20°C

Configuration 1 - Mode 2

GMSK

DC Voltage (V)	Deviation (Hz)
-40.8	4.22
-48.0	**4.15**
-55.2	4.56

8-PSK

DC Voltage (V)	Deviation (Hz)
-40.8	6.72
-48.0	**7.25**
-55.2	7.38

16QAM

DC Voltage (V)	Deviation (Hz)
-40.8	6.57
-48.0	**6.02**
-55.2	6.67

32QAM

DC Voltage (V)	Deviation (Hz)
-40.8	5.74
-48.0	**5.55**
-55.2	5.31

Limit	±1.5 ppm or ±1.322kHz

Remarks

The frequency stability of the EUT is sufficient to keep it within the authorised frequency ranges under voltage variations across the measured range.

Product Service

2.10 RECEIVER SPURIOUS EMISSIONS

2.10.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.111
Industry Canada RSS-132, Clause 4.6

2.10.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB40584240

2.10.3 Date of Test and Modification State

23 March 2011 – 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 FCC CFR 47 Part 15 and Canada RSS-132.

In accordance with RSS-Gen Clause 6.2, the receiver spurious emissions from the antenna terminal were measured. Measurments were performed on the receiver antenna connector Ant B. The EUT was set to transmitter mode on the TX connector Ant A and during the measurement the Ant A was terminated with match load, (50 Ohm).

The resolution was set to 1MHz in the frequency range 9kHz to 5GHz thus meeting the requirements of RSS-Gen Clause 4.10, the spectrum analyser detector was set to peak and trace was kept on Max Hold to give the worst case. The limit line was displayed, showing the -57dBm, 2 nanowatts in band 9kHz to 1GHz and above 1GHz, -53dBm, 5 nanowatts.

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

In addition, measurements were made from 9kHz up to the 5th harmonic of the fundamental.

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

Configuration 3 - Mode 2

2.10.6 Environmental Conditions

	23 March 2011
Ambient Temperature	26.8°C
Relative Humidity	20.0%

Product Service

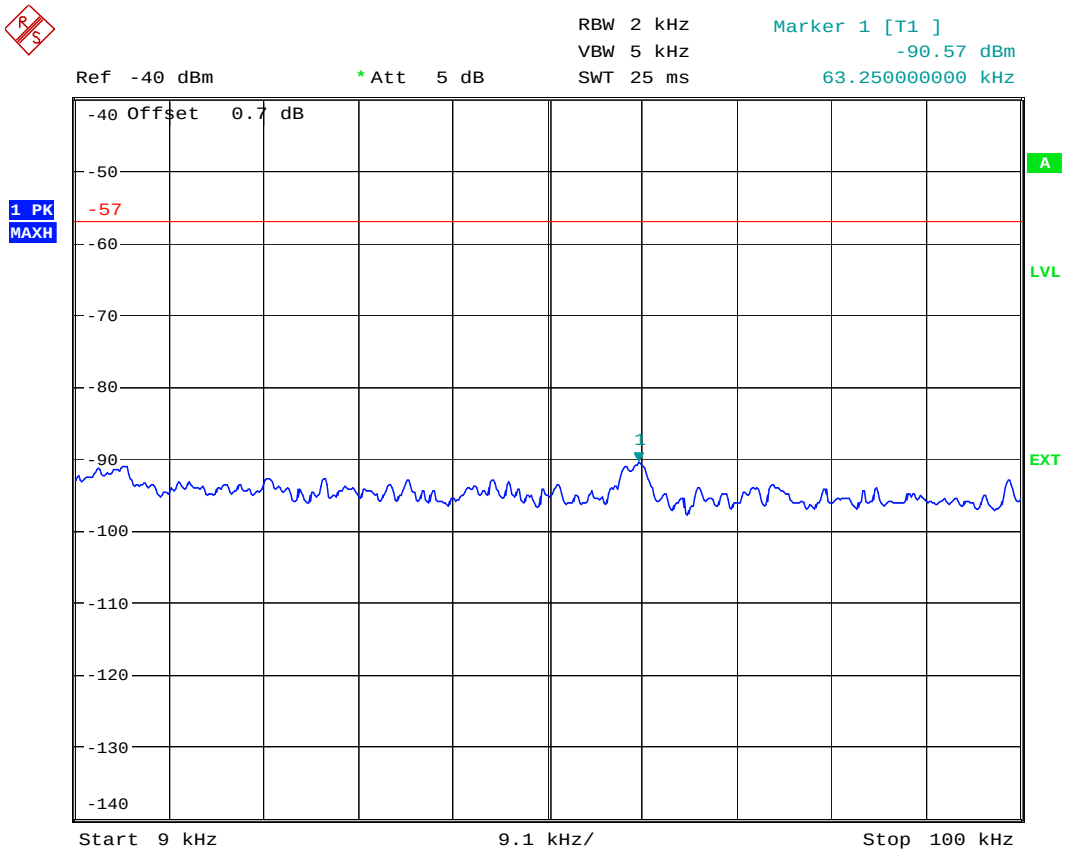
2.10.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-132 for Receiver Spurious Emissions.

The test results are shown below

Remark:

The emissions at 9kHz on the plots was not generated by the test object. A complementary measruement with a smaller Span showed that it was related to the LO feedthrough.



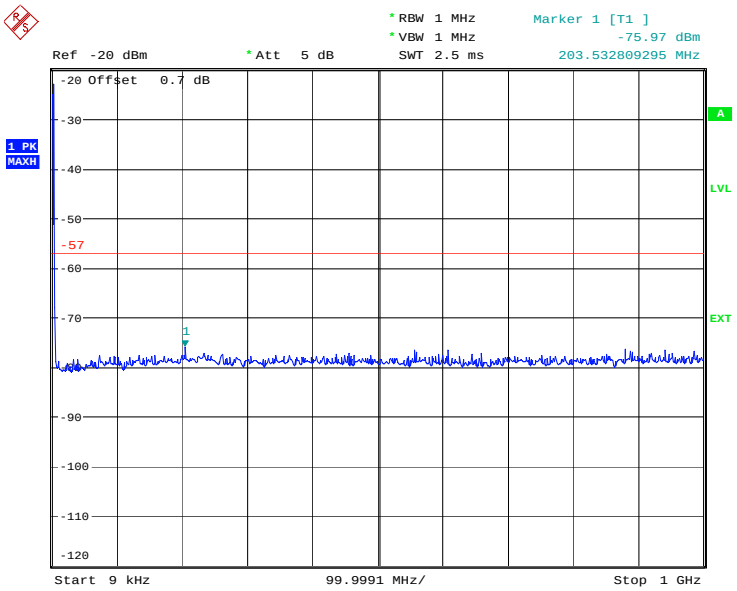
Date: 23.MAR.2011 13:21:31

Product Service

Configuration 3 - Mode 2

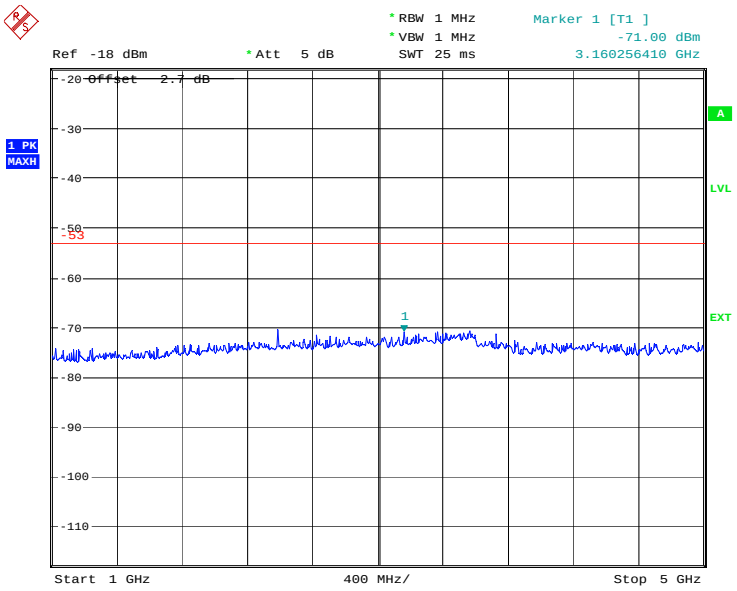
GMSK

9kHz to 1GHz



Date: 23.MAR.2011 13:16:45

1GHz to 5GHz

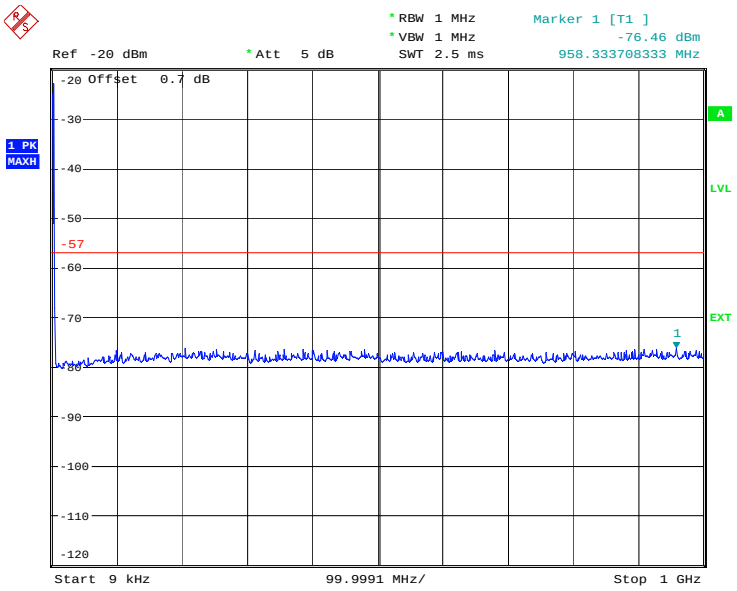


Date: 23.MAR.2011 13:18:21

Product Service

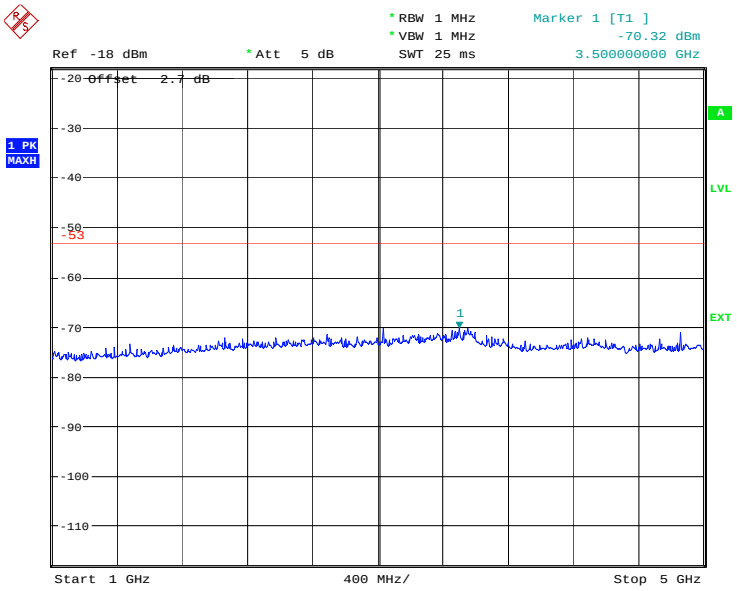
8-PSK

9kHz to 1GHz



Date: 23.MAR.2011 13:15:47

1GHz to 5GHz

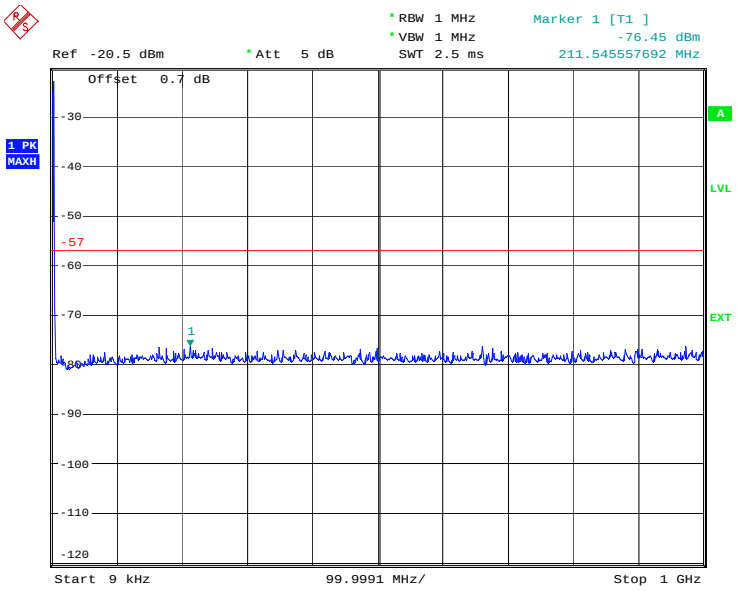


Date: 23.MAR.2011 13:19:09

Product Service

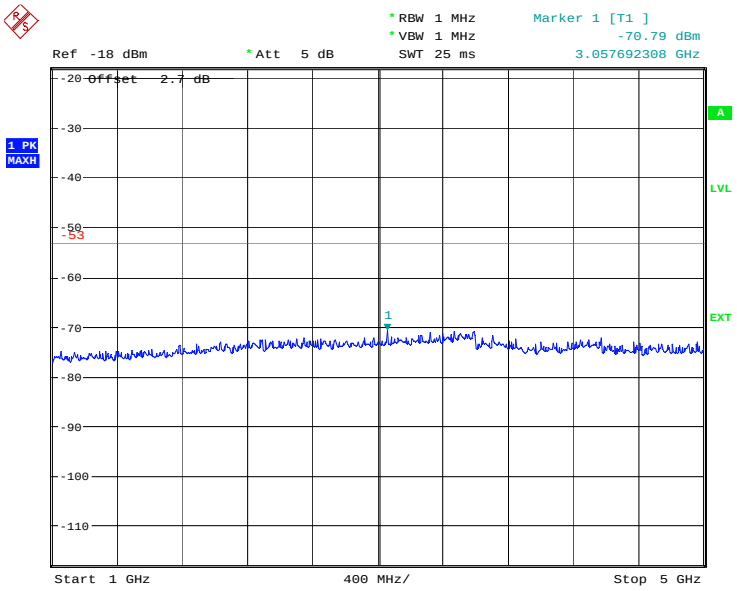
16QAM

9kHz to 1GHz



Date: 23.MAR.2011 12:51:02

1GHz to 5GHz

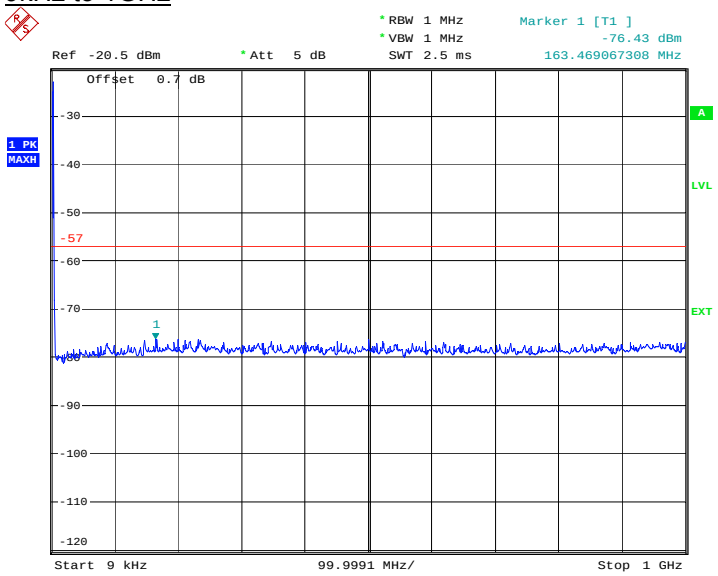


Date: 23.MAR.2011 13:19:37

Product Service

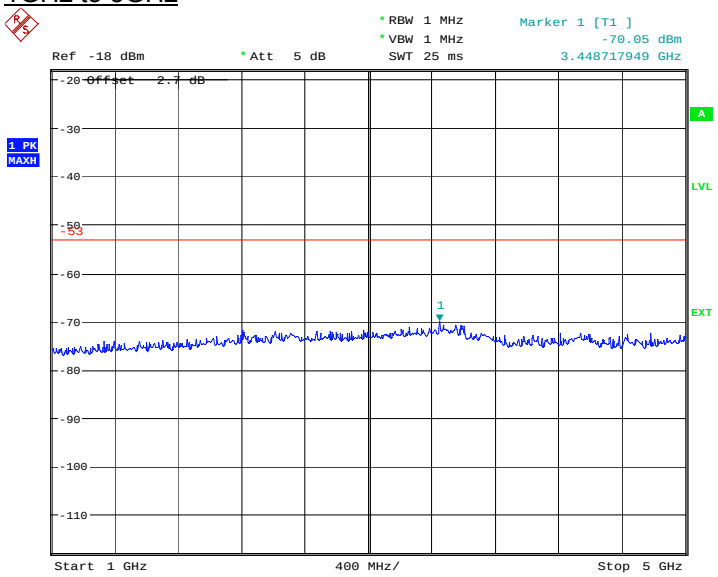
32QAM

9kHz to 1GHz



Date: 23.MAR.2011 12:50:01

1GHz to 5GHz



Date: 23.MAR.2011 13:20:07

Limit	-57dBm (30MHz-1GHz) and -53dBm (above 1GHz)

Remarks

The EUT does not exceed -57dBm at the frequency range of 9kHz to 1GHz and does not exceed -53dBm at the frequency range of 1GHz to 5GHz.

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.	Serial No.	Calibration Due
Section 2.1, 2.2, 2.3, 2.4, 2.5, 2.7 and 2.10 – Maximum Conducted Output Power, Peak – Average Ratio, Modulation Characteristics, Occupied Bandwidth, Spurious Emissions at Antenna Terminals (±1MHz), Conducted Spurious Emissions and Receiver Spurious Emissions.				
Spectrum Analyser	Rohde & Schwarz	FSQ26	100244	24-Aug-2011
Singnal Analyser	Agilent	MXA N9020A	MY49100419	11-Apr-2012
Spectrum Analyser	Rohde & Schwarz	FSQ26	200761	24-Aug-2011
Power Meter	Rohde & Schwarz	NRP	102428	24-Aug-2011
Thermal Power Sensor	Rohde & Schwarz	NRP-Z21	102106	16-Feb-2012
Network Analyzer	Agilent	8720D	US38431317	24-Aug-2011
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	O/P MON
Load	Shanghai Huaxiang	TF100	091216408	O/P MON
Power Supply	Dahua	DH1716-5D	4001375	O/P MON
Power Supply	Dahua	DH1716A-14	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	03-Jan-2012
Thermo-hygrometer	AZ Instruments	8705	9151655	24-Aug-2011
Section 2.6 – Radiated Spurious Emissions				
Load	Shanghai Huaxiang	TF100	09121642	O/P MON
Load	Shanghai Huaxiang	TF100	09121608	O/P MON
EMI Receiver	Rohde & Schwarz	ESI 40	100015	19-Aug-2011
Ultra log test antenna	Rohde & Schwarz	HL 562	100167	19-Aug-2011
Double-Ridged Waveguide Horn Antenna	Rohde & Schwarz	HF 906	100029	19-Aug-2011
Antenna master	Frankonia	MA 260	-	19-Aug-2011
Relay Switch Unit	Rohde & Schwarz	331.1601.31	338965002	N/A
Semi Anechoic Chamber	Frankonia	23.18m×16.88m×9.60m	-	19-Aug-2011
Power Supply	Dahua	DH1716-5D	2008040003	O/P MON
Power Supply	Dahua	DH1716A-10	1000303181	O/P MON
Digital Multimeter	FLUKE	179	91820401	03-Jan-2012
Thermo-hygrometer	AZ Instruments	8705	9151655	24-Aug-2011
Section 2.8 and 2.9 – Frequency Stability Under Temperature and Voltage Variations				
Spectrum Analyser	Rohde & Schwarz	FSQ26	200761	24-Aug-2011
20dB Attenuator	SHX	DTS100-20-3-A	090323444	O/P MON
20dB Attenuator	SHX	DTS80	090722015	O/P MON
Temperature Chamber	Zengda	ZTH030U	1009039	O/P MON
Power Supply	Dahua	DH1716-5D	4001375	O/P MON
Power Supply	Dahua	DH1716A-14	-	O/P MON
Digital Multimeter	FLUKE	179	91820401	03-Jan-2012

N/A – Not Applicable
O/P MON - Output monitored with calibration equipment

Product Service

3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Conducted Maximum Peak Output Power	30MHz to 10GHz Amplitude	0.5dB*
Conducted Emissions	30MHz to 40GHz Amplitude	3.0dB*
Frequency Stability	30MHz to 2GHz Amplitude	$<1x10^{-7}$
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Worst case error for both Time and Frequency measurement 12 parts in 10^6		

* In accordance with CISPR 16-4

Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

UKAS TESTING 0141

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).