Report On

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

COMMERCIAL-IN-CONFIDENCE

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IC ID: 287AB-BG1611941

Document 75917139 Report 01 Issue 2 May 2012

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REPORT ON

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

Document 75917139 Report 01 Issue 2

May 2012

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DATED 28 May 2012

This report has been up-issued to Issue 2 due to
add test plots for HC configuration in Conducted Spurious Emissions test case.

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

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SECTION 1

REPORT SUMMARY

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

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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 an application for Grant of Equipment Autorisation in the name of RUG 11 B5 / KRC 161 194/1.

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	BG1611941
Serial Number(s)	CB4L809633
Software Version	CXP1040007_07R35F
Hardware Version	R1E
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 22: 2011 Industry Canada RSS-132 Issue 2: 2005
Incoming Release Date	Declaration of Build Status 27 March 2012
Order Number Date	PTP 20 Feburary 2012
Start of Test	01 March 2012
Finish of Test	24 May 2012
Name of Engineer(s)	X Zhang C Zhang
Related Document(s)	ANSI C63.4: 2009 FCC CFR 47 Part 2: 2011 Industry Canada RSS-GEN Issue 3: 2010

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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)	4.5.1	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)	4.5.1	Radiated Spurious Emissions	869.2MHz		N/A	
				881.6MHz	0	Pass	
				893.8MHz		N/A	
2.7	2.1051, 22.917 (a)	4.5.1	Conducted Spurious Emissions	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	
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	
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	

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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					
2.10	-	4.6	Receiver Spurious Emissions	869.2MHz		N/A	
				881.6MHz		N/A	
				893.8MHz		N/A	

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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)	4.5.1	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)	4.5.1	Radiated Spurious Emissions	869.2MHz	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	
2.7	2.1051, 22.917 (a)	4.5.1	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)	4.5.1	Spurious Emissions at Antenna Terminals (±1MHz)	869.4 + 870.8 MHz	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)
				892.2 + 893.6MHz	0	Pass	
2.6	2.1053, 22.917 (a)	4.5.1	Radiated Spurious Emissions	869.2MHz		N/A	
				881.6MHz	0	Pass	
				893.8MHz		N/A	
2.7	2.1051, 22.917 (a)	4.5.1	Conducted Spurious Emissions	869.2 + 881.6MHz	0	Pass	
				881.6 + 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	0	Pass	
				881.6MHz	0	Pass	
				893.8MHz	0	Pass	

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	BG1611941			
SERIAL NUMBER	CB4L809633			
HARDWARE VERSION	R1E			
SOFTWARE VERSION	CXP1040007_07R35F			
TRANSMITTER OPERATING RANGE	TX: 869.4MHz - 893.6MHz RX: 824.4MHz - 848.6MHz			
MODULATIONS	GMSK, 8-PSK, 16QAM, 32QAM, AQPSK			
INTERMEDIATE FREQUENCIES	--			
ITU DESIGNATION OF EMISSION	242KGXW 242KG7W			
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
	AQPSK	42.6dBm	45.1dBm	39.1dBm
OUTPUT POWER TOLERANCE	±2dB			
FCC ID	TA8BKRC161194-1			
IC ID	287AB-BG1611941			
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is a Radio Unit of GSM Base Station.			

Signature

Date 14 March 2012

D of B S Serial No 75917139/01

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 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.

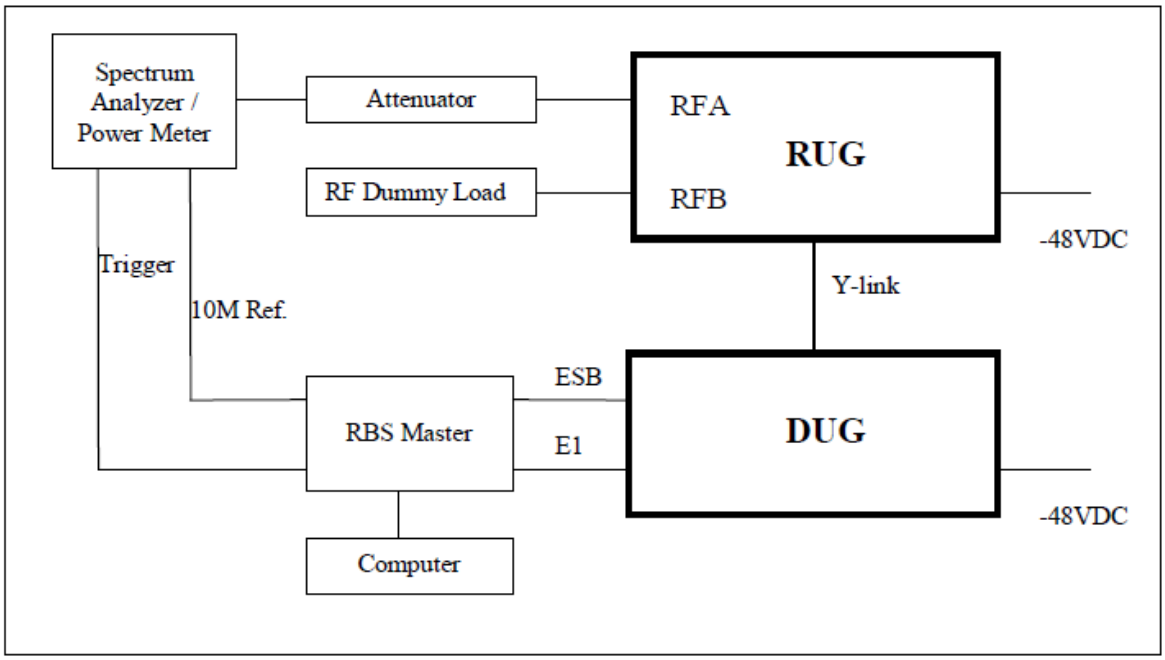
The RUG 11 B5 / KRC 161 194/1 supports GMSK, 8-PSK, 16QAM, 32QAM and AQPSK modulations at 850MHz. the unit includes a maximum of two TRX's. All RF conducted TX tests were performed on one TRX RF output connector RF A, with RF B terminated, and the RX test was performed on the other TRX connector RF B in HC configuration.

The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated. For AQPSK modulation, the SCPIR is 0dB.

The EUT was powered by a -48V DC Power supply.

Product Service

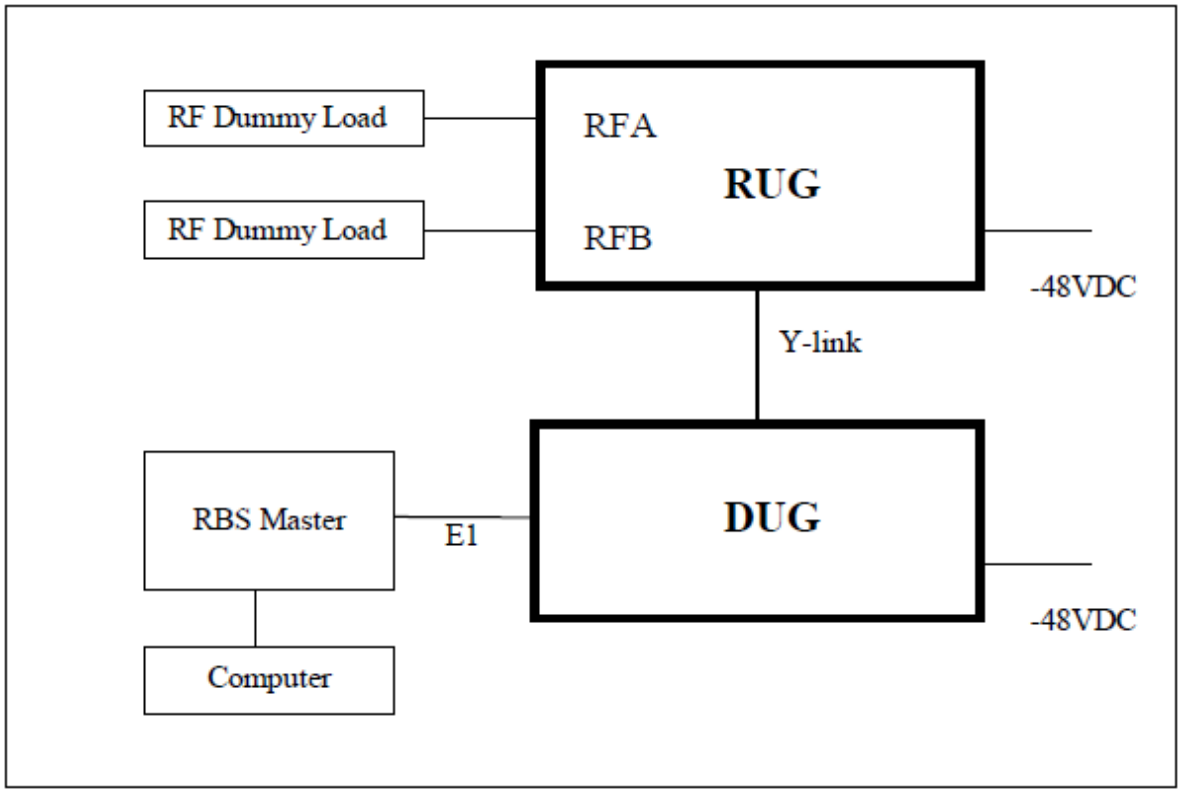
Test Setup, Conducted Measurement:



Test Object	Part Number	Version	Serial Number
Radio Part	RUG 11 B5 / KRC 161 194/1	R1E	CB4L809633

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP Compaq	--	CNG8450JVD
2	Main Unit DUG 10 01	KDU 137 597/1	R1G	CB4H725750
3	RBS Master	LPY 107 1007/3	R1C	T01E050965
4	Load	TF100	--	09121619
5	Power Supply	DH1716-5D	--	200360033
	Power Supply	DH1716A-14	--	1000718365
6	Power Meter	NRP	--	102428
	Thermal Power Sensor	NRP-Z21	--	102106
	Spectrum Analyzer	FSQ26	--	201122

Test Setup, Radiated Measurement:



Test Object	Part Number	Version	Serial Number
Radio Part	RUG 11 B5 / KRC 161 194/1	R1E	CB4L809633

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP Compaq	--	CNG8450JVD
2	Main Unit DUG 10 01	KDU 137 597/1	R1G	CB4H725750
3	RBS Master	LPY 107 1007/3	R1C	T01E050965
4	Load	TF100	--	09121619
	Load	TF150-3	--	090323433
5	Power Supply	DH1716-5D	--	200360033
	Power Supply	DH1716A-14	--	1000718365

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 (B + 1 Channel)

Mode 5 - ARFCN 250: 893.6 MHz (T - 1 Channel)

Mode 6 - ARFCN 129 + 136 : 869.2 MHz + 870.8 MHz (B + 1 Channel and B + 8 Channel)

Mode 7 - ARFCN 243 + 250: 892.2 MHz + 893.6 MHz (T - 8 Chanel and T - 1 Channel)

Mode 8 - ARFCN 128 + 190 : 869.2 MHz + 881.6 MHz (Bottom Channel + Middle Channel)

Mode 9 - ARFCN 190 + 251 : 881.6 MHz + 893.8 MHz (Middle Channel + Tope Channel)

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

Radiated Spurious Emission 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

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: CB4L809633

2.1.3 Date of Test and Modification State

01 March 2012 – 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, 32QAM and AQPSK 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

	01 March 2012
Ambient Temperature	24.5°C
Relative Humidity	34.0%

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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

Rated output power level at RF A connector: 46.0dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	45.97	39.54
Middle	881.6	41.4	46.02	39.99
Top	893.8	41.4	45.96	39.45

Configuration 2 - Mode 1, 2 and 3

Rated output power level at RF A connector: 48.5dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	48.68	73.79
Middle	881.6	41.4	48.80	75.86
Top	893.8	41.4	48.73	74.64

Configuration 3 - Mode 1, 2 and 3

Rated output power level at RF A connector: 42.5dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	42.76	18.88
Middle	881.6	41.4	42.93	19.63
Top	893.8	41.4	42.86	19.32

8PSK

Configuration 1 - Mode 1, 2 and 3

Rated output power level at RF A connector: 42.7dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	42.61	18.24
Middle	881.6	41.4	42.72	18.71
Top	893.8	41.4	42.60	18.20

Configuration 2 - Mode 1, 2 and 3

Rated output power level at RF A connector: 45.2dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	45.35	34.28
Middle	881.6	41.4	45.48	35.32
Top	893.8	41.4	45.40	34.67

Configuration 3 - Mode 1, 2 and 3

Rated output power level at RF A connector: 39.2dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	39.51	8.93
Middle	881.6	41.4	39.64	9.20
Top	893.8	41.4	39.56	9.04

16QAM

Configuration 1 - Mode 1, 2 and 3

Rated output power level at RF A connector: 41.3dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	40.83	12.11
Middle	881.6	41.4	40.90	12.30
Top	893.8	41.4	40.82	12.08

Configuration 2 - Mode 1, 2 and 3

Rated output power level at RF A connector: 43.8dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	43.50	22.39
Middle	881.6	41.4	43.63	23.07
Top	893.8	41.4	43.55	22.65

Configuration 3 - Mode 1, 2 and 3

Rated output power level at RF A connector: 37.8dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	37.66	5.83
Middle	881.6	41.4	37.74	5.94
Top	893.8	41.4	37.66	5.83

32QAM

Configuration 1 - Mode 1, 2 and 3

Rated output power level at RF A connector: 40.9dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	40.50	11.22
Middle	881.6	41.4	40.52	11.27
Top	893.8	41.4	40.46	11.12

Configuration 2 - Mode 1, 2 and 3

Rated output power level at RF A connector: 43.4dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	43.13	20.56
Middle	881.6	41.4	43.22	20.99
Top	893.8	41.4	43.17	20.75

Configuration 3 - Mode 1, 2 and 3

Rated output power level at RF A connector: 37.4dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	37.26	5.32
Middle	881.6	41.4	37.45	5.56
Top	893.8	41.4	37.32	5.40

AQPSK

Configuration 1 - Mode 1, 2 and 3

Rated output power level at RF A connector: 42.6dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	42.10	16.22
Middle	881.6	41.4	42.40	17.38
Top	893.8	41.4	42.33	17.10

Configuration 2 - Mode 1, 2 and 3

Rated output power level at RF A connector: 45.1dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	44.88	30.76
Middle	881.6	41.4	45.00	31.62
Top	893.8	41.4	45.09	32.28

Configuration 3 - Mode 1, 2 and 3

Rated output power level at RF A connector: 39.1dBm

Channel	Frequency (MHz)	Path Loss (dB)	Result (dBm) RMS	Result (W) RMS
Bottom	869.2	41.4	39.06	8.05
Middle	881.6	41.4	39.04	8.02
Top	893.8	41.4	38.96	7.87

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: CB4L809633

2.2.3 Date of Test and Modification State

01 and 02 March 2012 – 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

	01 March 2012	02 March 2012
Ambient Temperature	24.5°C	24.0°C
Relative Humidity	34.0%	36.0%

Product Service

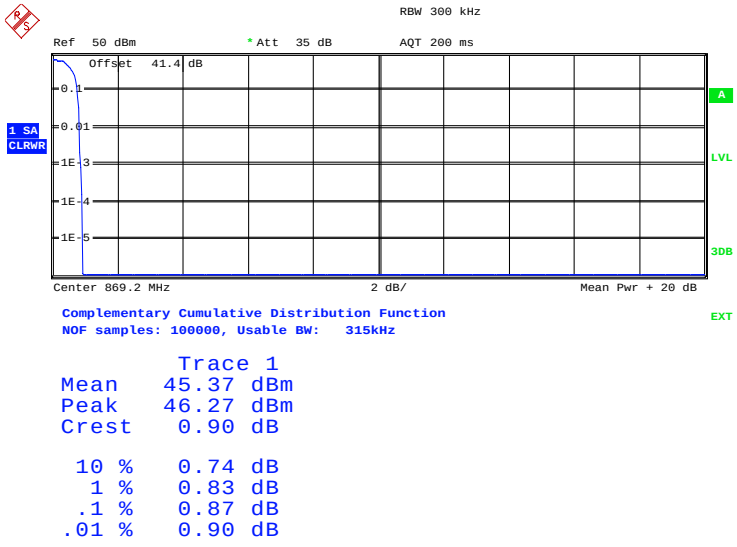
2.2.7 Test Results

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.

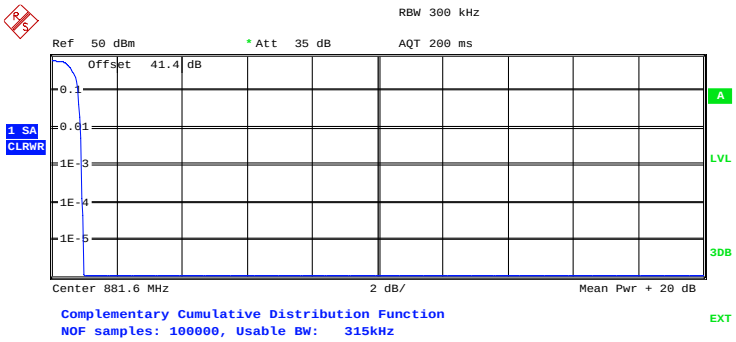
GMSK

Configuration 1 - Mode 1



Product Service

Configuration 1 - Mode 2

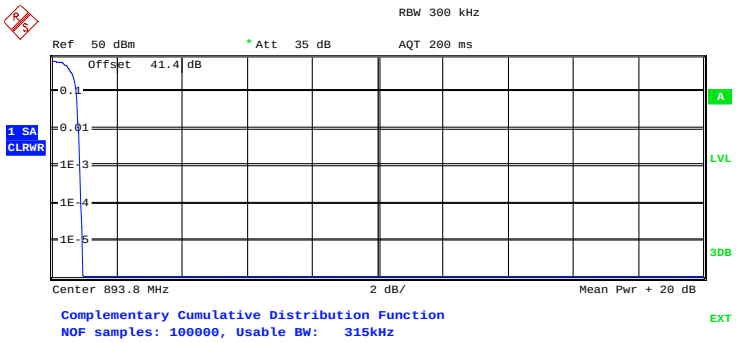


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	45.36 dBm
Peak	46.34 dBm
Crest	0.98 dB
10 %	0.80 dB
1 %	0.90 dB
.1 %	0.93 dB
.01 %	0.93 dB

Date: 1.MAR.2012 07:02:01

Configuration 1 - Mode 3



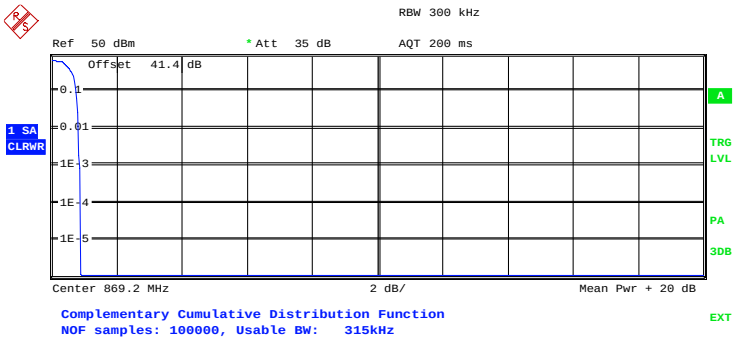
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	45.26 dBm
Peak	46.20 dBm
Crest	0.94 dB
10 %	0.77 dB
1 %	0.83 dB
.1 %	0.87 dB
.01 %	0.90 dB

Date: 1.MAR.2012 07:00:57

Product Service

Configuration 2 - Mode 1

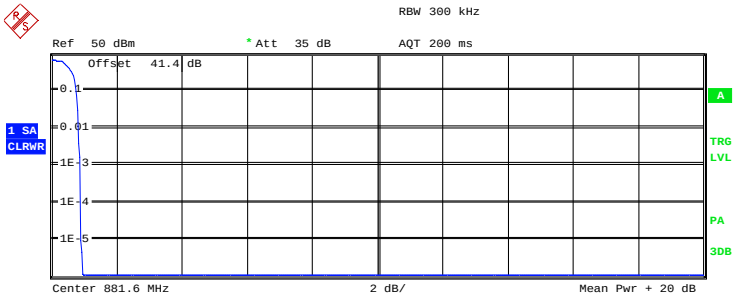


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	47.83 dBm
Peak	48.72 dBm
Crest	0.89 dB
10 %	0.74 dB
1 %	0.83 dB
.1 %	0.87 dB
.01 %	0.90 dB

Date: 2.MAR.2012 06:22:41

Configuration 2 - Mode 2



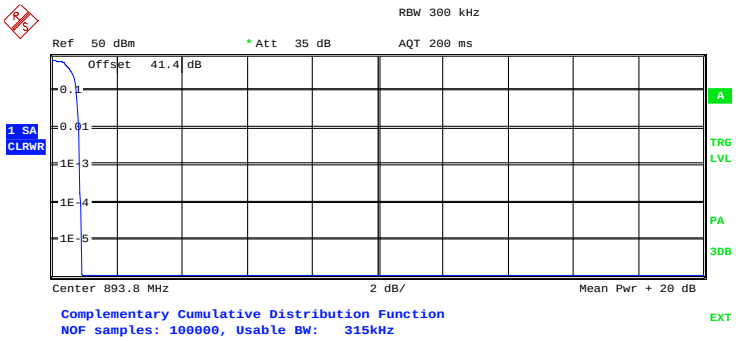
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	48.04 dBm
Peak	49.00 dBm
Crest	0.96 dB
10 %	0.74 dB
1 %	0.83 dB
.1 %	0.87 dB
.01 %	0.90 dB

Date: 2.MAR.2012 06:13:03

Product Service

Configuration 2 - Mode 3

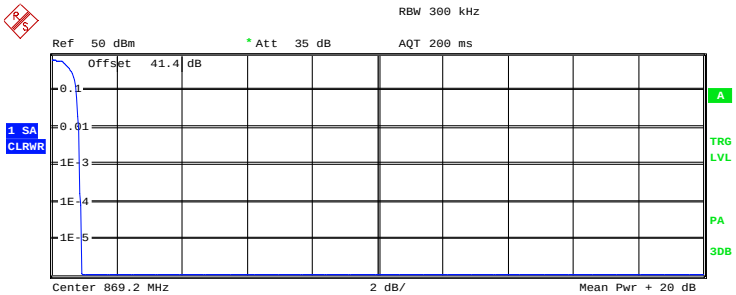


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	47.94 dBm
Peak	48.86 dBm
Crest	0.92 dB
10 %	0.77 dB
1 %	0.83 dB
.1 %	0.87 dB
.01 %	0.90 dB

Date: 2.MAR.2012 06:12:01

Configuration 3 - Mode 1



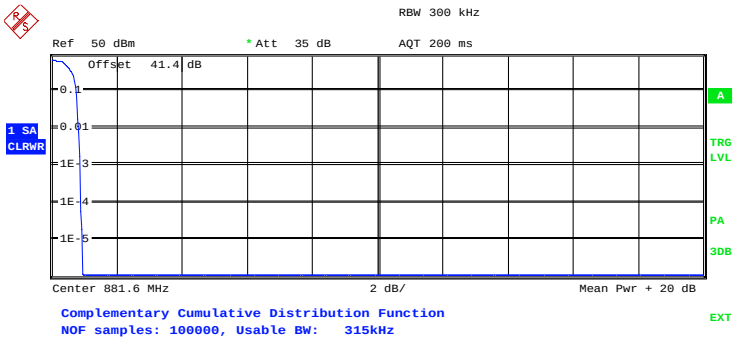
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	41.87 dBm
Peak	42.79 dBm
Crest	0.93 dB
10 %	0.74 dB
1 %	0.83 dB
.1 %	0.87 dB
.01 %	0.90 dB

Date: 2.MAR.2012 04:32:11

Product Service

Configuration 3 - Mode 2

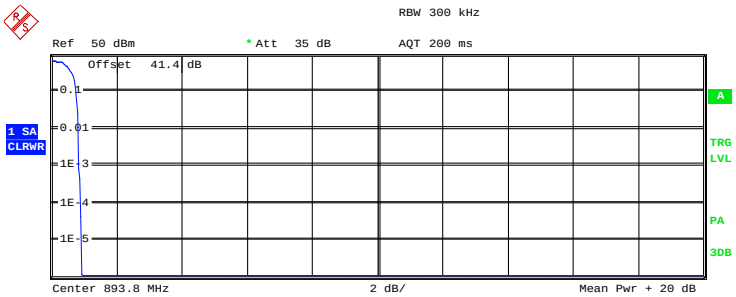


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	42.13 dBm
Peak	43.08 dBm
Crest	0.94 dB
10 %	0.77 dB
1 %	0.83 dB
.1 %	0.87 dB
.01 %	0.90 dB

Date: 2.MAR.2012 04:39:43

Configuration 3 - Mode 3



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

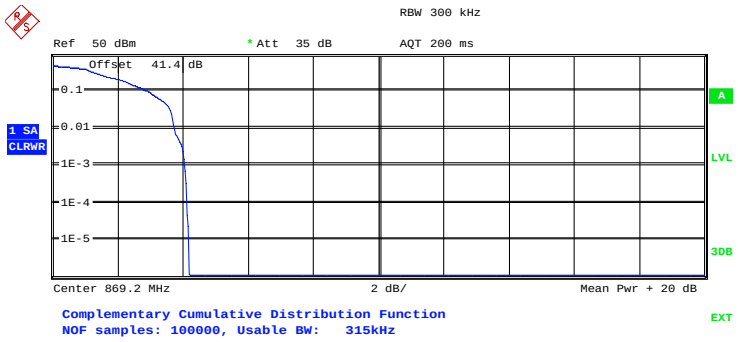
	Trace 1
Mean	41.96 dBm
Peak	42.86 dBm
Crest	0.90 dB
10 %	0.74 dB
1 %	0.83 dB
.1 %	0.83 dB
.01 %	0.90 dB

Date: 2.MAR.2012 04:40:59

Product Service

8-PSK

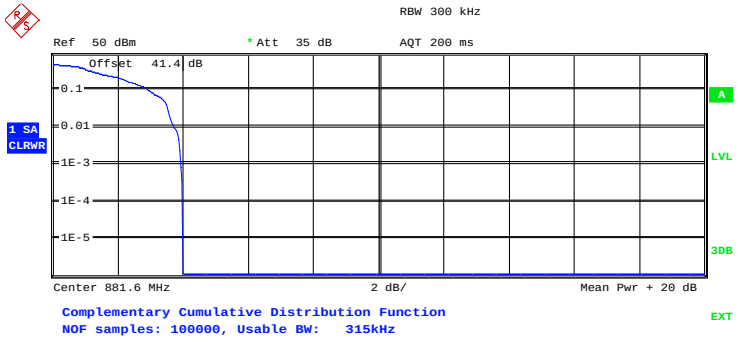
Configuration 1 - Mode 1



	Trace 1
Mean	42.08 dBm
Peak	46.27 dBm
Crest	4.19 dB
10 %	2.92 dB
1 %	3.75 dB
.1 %	4.07 dB
.01 %	4.13 dB

Date: 1.MAR.2012 07:06:31

Configuration 1 - Mode 2

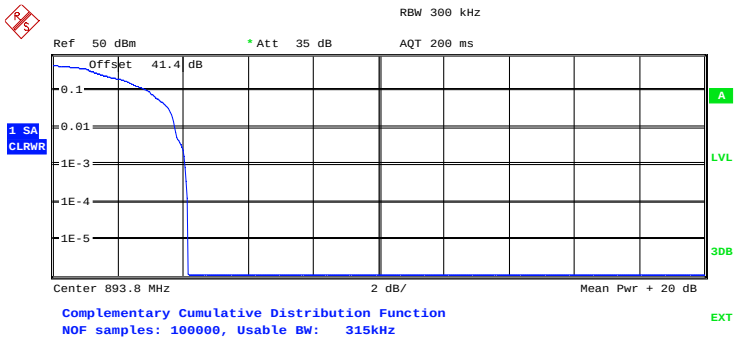


	Trace 1
Mean	42.27 dBm
Peak	46.27 dBm
Crest	4.00 dB
10 %	2.92 dB
1 %	3.72 dB
.1 %	3.94 dB
.01 %	4.01 dB

Date: 1.MAR.2012 07:02:38

Product Service

Configuration 1 - Mode 3

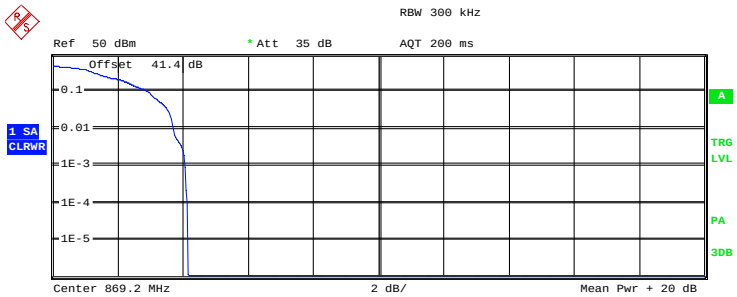


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	41.98 dBm
Peak	46.13 dBm
Crest	4.15 dB
10 %	2.95 dB
1 %	3.75 dB
.1 %	4.07 dB
.01 %	4.13 dB

Date: 1.MAR.2012 06:59:49

Configuration 2 - Mode 1



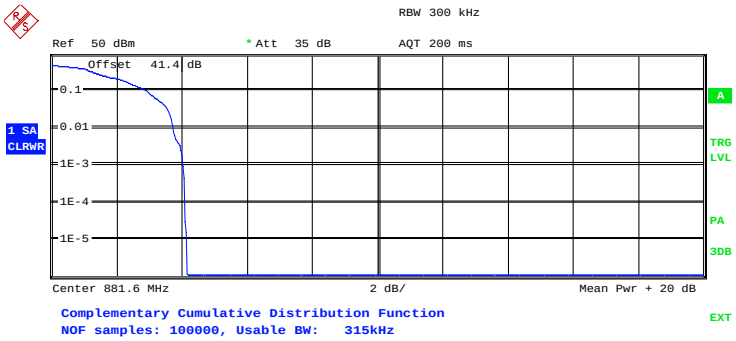
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.56 dBm
Peak	48.72 dBm
Crest	4.16 dB
10 %	2.92 dB
1 %	3.72 dB
.1 %	4.07 dB
.01 %	4.13 dB

Date: 2.MAR.2012 06:21:51

Product Service

Configuration 2 - Mode 2

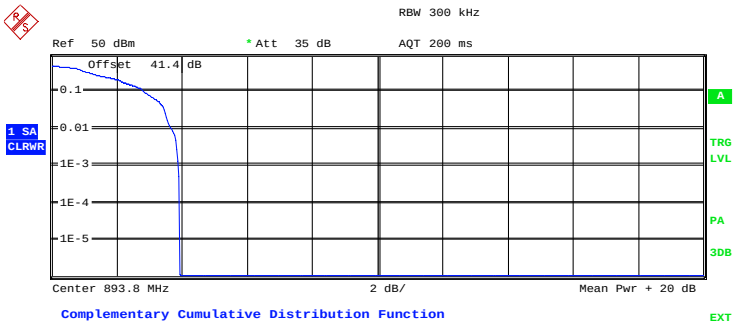


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.77 dBm
Peak	48.93 dBm
Crest	4.16 dB
10 %	2.92 dB
1 %	3.72 dB
.1 %	4.04 dB
.01 %	4.10 dB

Date: 2.MAR.2012 06:14:56

Configuration 2 - Mode 3



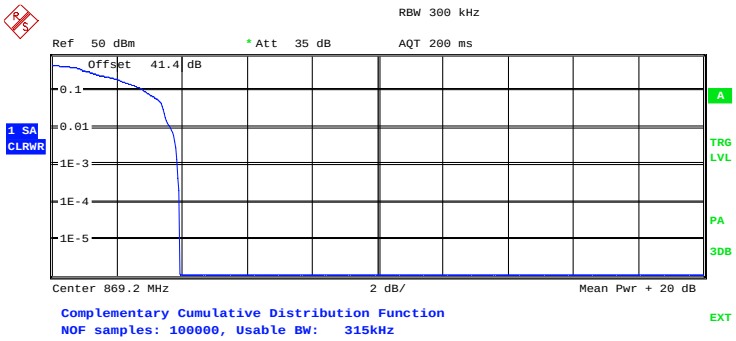
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.87 dBm
Peak	48.79 dBm
Crest	3.92 dB
10 %	2.82 dB
1 %	3.65 dB
.1 %	3.88 dB
.01 %	3.94 dB

Date: 2.MAR.2012 06:11:30

Product Service

Configuration 3 - Mode 1

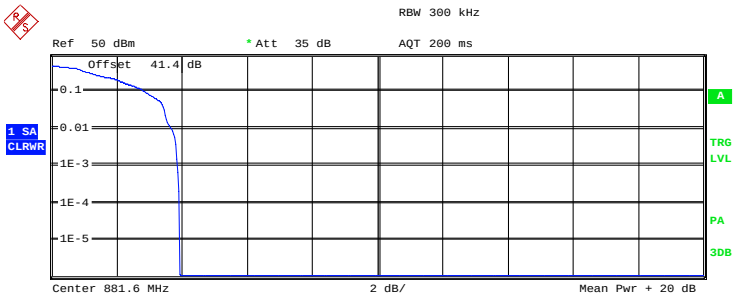


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	38.93 dBm
Peak	42.86 dBm
Crest	3.93 dB
10 %	2.82 dB
1 %	3.65 dB
.1 %	3.85 dB
.01 %	3.91 dB

Date: 2.MAR.2012 04:33:42

Configuration 3 - Mode 2



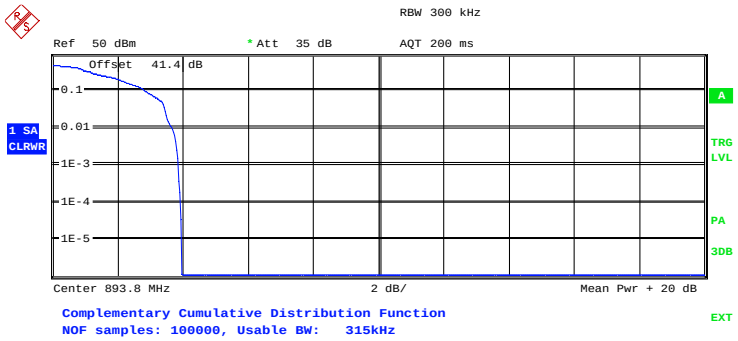
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	39.09 dBm
Peak	43.00 dBm
Crest	3.92 dB
10 %	2.85 dB
1 %	3.65 dB
.1 %	3.88 dB
.01 %	3.91 dB

Date: 2.MAR.2012 04:38:31

Product Service

Configuration 3 - Mode 3

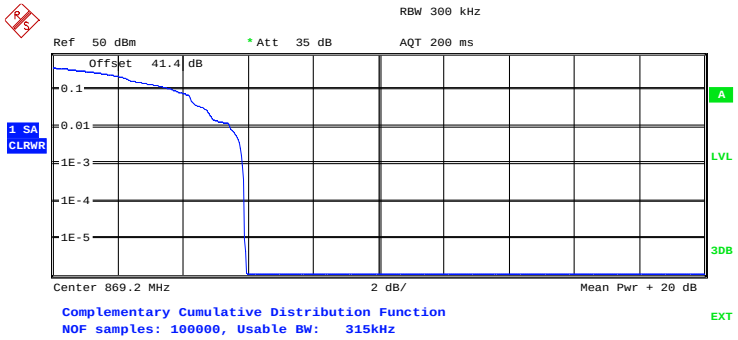


	Trace 1
Mean	38.92 dBm
Peak	42.86 dBm
Crest	3.94 dB
10 %	2.85 dB
1 %	3.65 dB
.1 %	3.85 dB
.01 %	3.94 dB

Date: 2.MAR.2012 04:41:54

16QAM

Configuration 1 - Mode 1

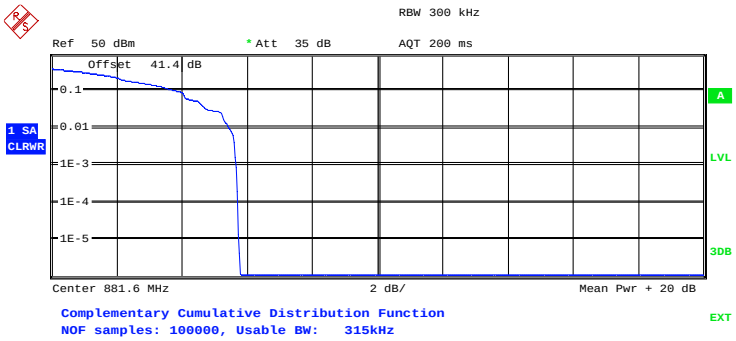


	Trace 1
Mean	40.32 dBm
Peak	46.27 dBm
Crest	5.95 dB
10 %	3.72 dB
1 %	5.45 dB
.1 %	5.83 dB
.01 %	5.90 dB

Date: 1.MAR.2012 07:05:55

Product Service

Configuration 1 - Mode 2

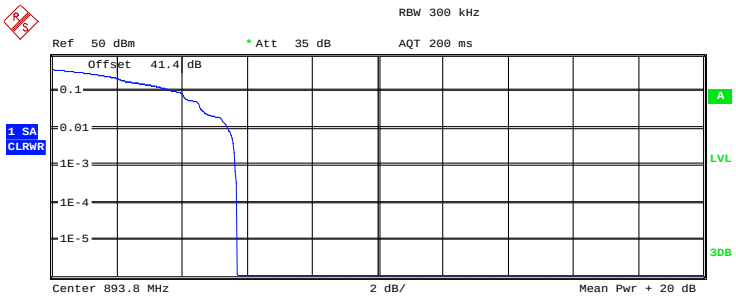


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	40.56 dBm
Peak	46.34 dBm
Crest	5.77 dB
10 %	3.85 dB
1 %	5.45 dB
.1 %	5.67 dB
.01 %	5.71 dB

Date: 1.MAR.2012 07:03:26

Configuration 1 - Mode 3



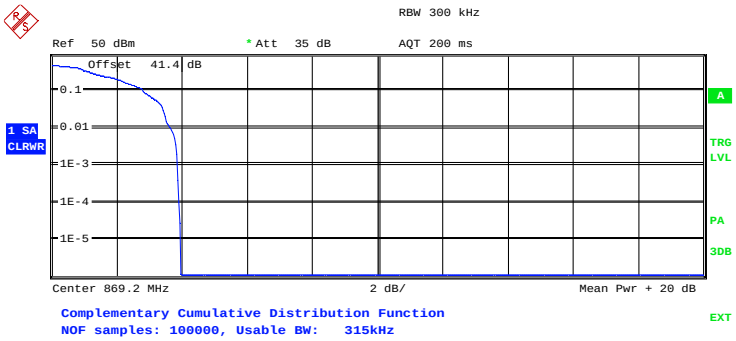
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	40.43 dBm
Peak	46.13 dBm
Crest	5.69 dB
10 %	3.85 dB
1 %	5.42 dB
.1 %	5.64 dB
.01 %	5.71 dB

Date: 1.MAR.2012 06:58:58

Product Service

Configuration 2 - Mode 1

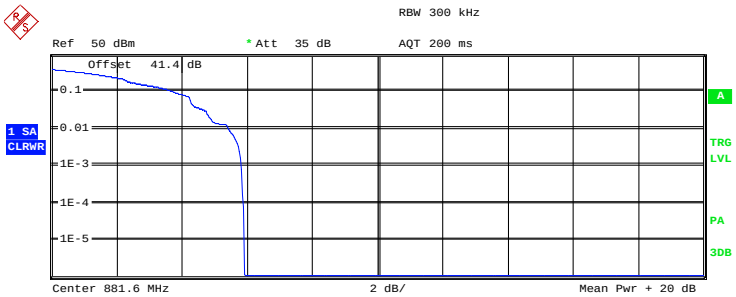


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.77 dBm
Peak	48.72 dBm
Crest	3.95 dB
10 %	2.79 dB
1 %	3.62 dB
.1 %	3.88 dB
.01 %	3.91 dB

Date: 2.MAR.2012 06:21:01

Configuration 2 - Mode 2



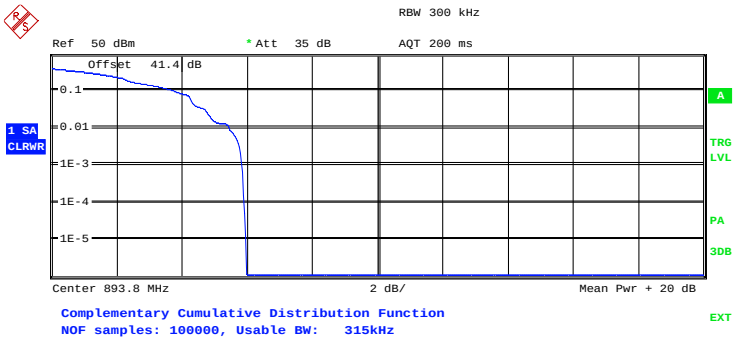
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	43.01 dBm
Peak	48.93 dBm
Crest	5.92 dB
10 %	3.75 dB
1 %	5.42 dB
.1 %	5.83 dB
.01 %	5.90 dB

Date: 2.MAR.2012 06:16:08

Product Service

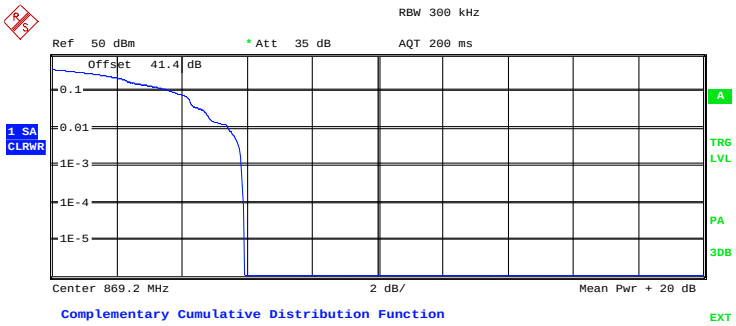
Configuration 2 - Mode 3



	Trace 1
Mean	42.90 dBm
Peak	48.86 dBm
Crest	5.96 dB
10 %	3.75 dB
1 %	5.45 dB
.1 %	5.83 dB
.01 %	5.90 dB

Date: 2.MAR.2012 06:10:29

Configuration 3 - Mode 1

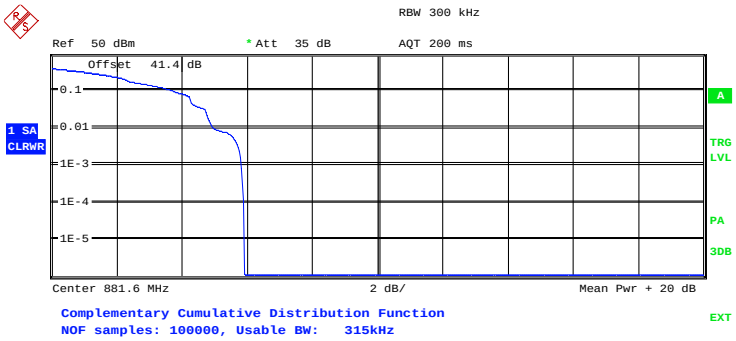


	Trace 1
Mean	36.96 dBm
Peak	42.86 dBm
Crest	5.91 dB
10 %	3.72 dB
1 %	5.42 dB
.1 %	5.83 dB
.01 %	5.90 dB

Date: 2.MAR.2012 04:34:53

Product Service

Configuration 3 - Mode 2

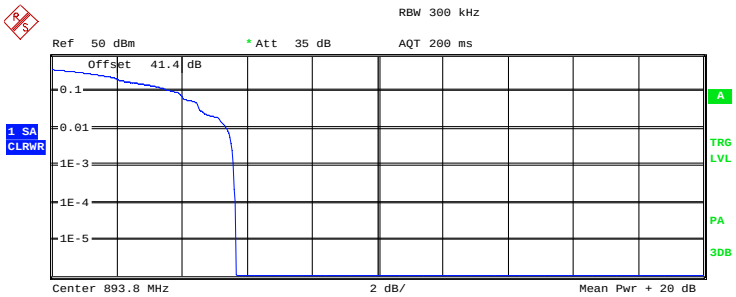


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	37.09 dBm
Peak	43.00 dBm
Crest	5.91 dB
10 %	3.75 dB
1 %	4.97 dB
.1 %	5.83 dB
.01 %	5.90 dB

Date: 2.MAR.2012 04:37:41

Configuration 3 - Mode 3



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

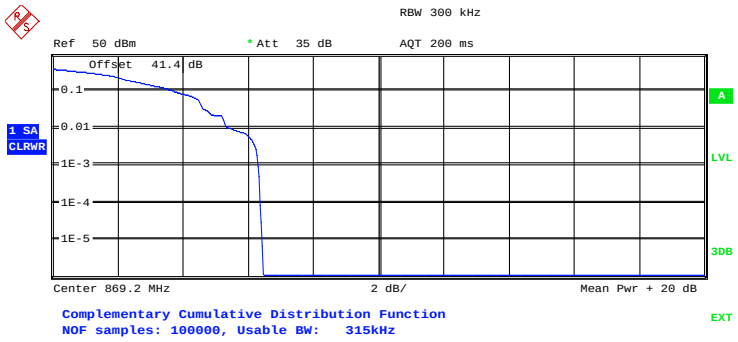
	Trace 1
Mean	37.20 dBm
Peak	42.86 dBm
Crest	5.66 dB
10 %	3.81 dB
1 %	5.38 dB
.1 %	5.58 dB
.01 %	5.64 dB

Date: 2.MAR.2012 04:42:46

Product Service

32QAM

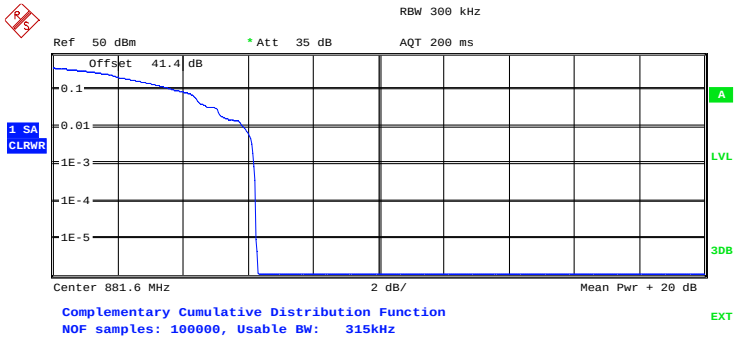
Configuration 1 - Mode 1



	Trace 1
Mean	39.83 dBm
Peak	46.27 dBm
Crest	6.44 dB
10 %	3.75 dB
1 %	5.45 dB
.1 %	6.31 dB
.01 %	6.38 dB

Date: 1.MAR.2012 07:05:28

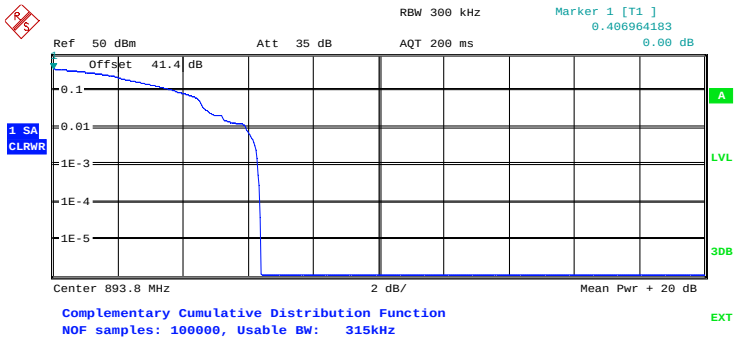
Configuration 1 - Mode 2



	Trace 1
Mean	40.04 dBm
Peak	46.34 dBm
Crest	6.30 dB
10 %	3.78 dB
1 %	5.83 dB
.1 %	6.19 dB
.01 %	6.25 dB

Date: 1.MAR.2012 07:04:17

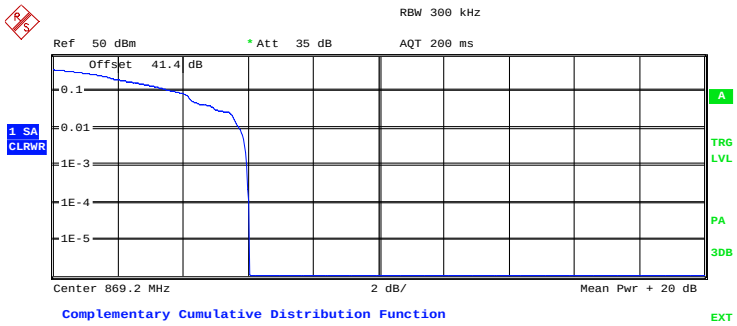
Configuration 1 - Mode 3



	Trace 1
Mean	39.75 dBm
Peak	46.13 dBm
Crest	6.37 dB
10 %	3.75 dB
1 %	5.93 dB
.1 %	6.28 dB
.01 %	6.38 dB

Date: 1.MAR.2012 06:56:51

Configuration 2 - Mode 1

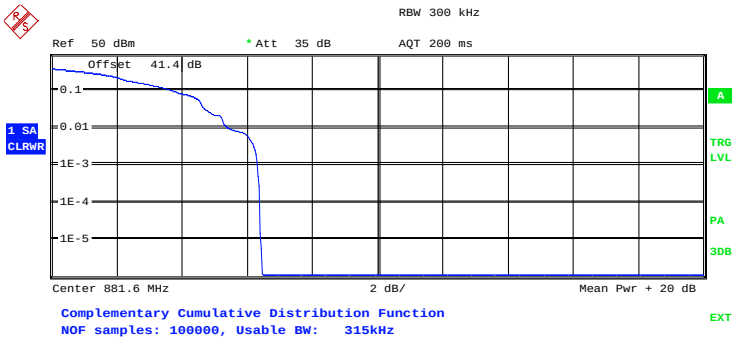


	Trace 1
Mean	42.67 dBm
Peak	48.72 dBm
Crest	6.05 dB
10 %	3.81 dB
1 %	5.74 dB
.1 %	5.96 dB
.01 %	6.03 dB

Date: 2.MAR.2012 06:19:26

Product Service

Configuration 2 - Mode 2

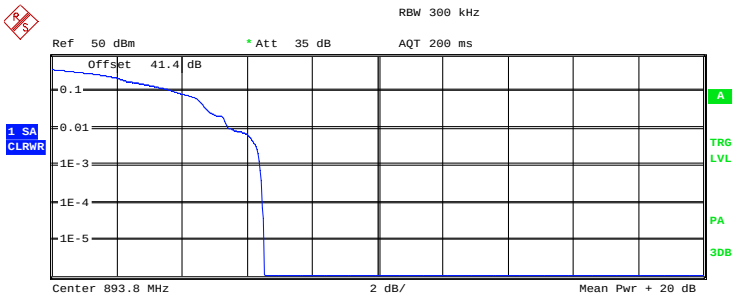


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	42.46 dBm
Peak	48.93 dBm
Crest	6.47 dB
10 %	3.75 dB
1 %	5.45 dB
.1 %	6.31 dB
.01 %	6.41 dB

Date: 2.MAR.2012 06:16:48

Configuration 2 - Mode 3



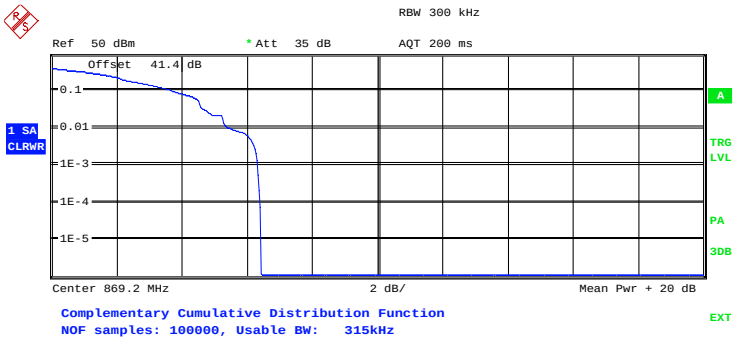
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	42.26 dBm
Peak	48.79 dBm
Crest	6.53 dB
10 %	3.78 dB
1 %	5.48 dB
.1 %	6.41 dB
.01 %	6.47 dB

Date: 2.MAR.2012 06:09:48

Product Service

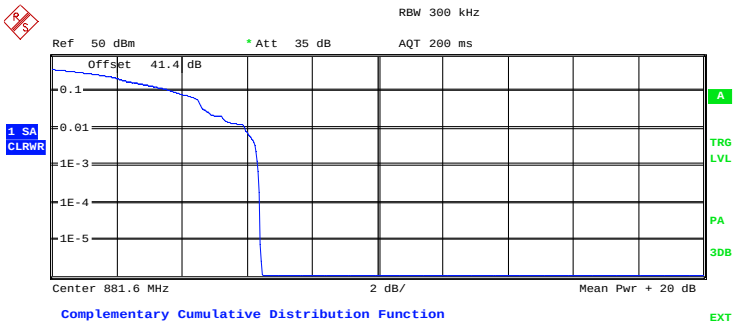
Configuration 3 - Mode 1



	Trace 1
Mean	36.45 dBm
Peak	42.86 dBm
Crest	6.42 dB
10 %	3.72 dB
1 %	5.48 dB
.1 %	6.31 dB
.01 %	6.41 dB

Date: 2.MAR.2012 04:35:35

Configuration 3 - Mode 2

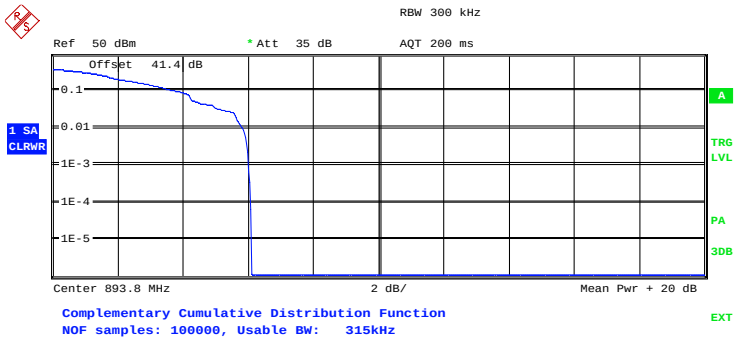


	Trace 1
Mean	36.55 dBm
Peak	43.00 dBm
Crest	6.45 dB
10 %	3.75 dB
1 %	5.93 dB
.1 %	6.31 dB
.01 %	6.38 dB

Date: 2.MAR.2012 04:37:07

Product Service

Configuration 3 - Mode 3

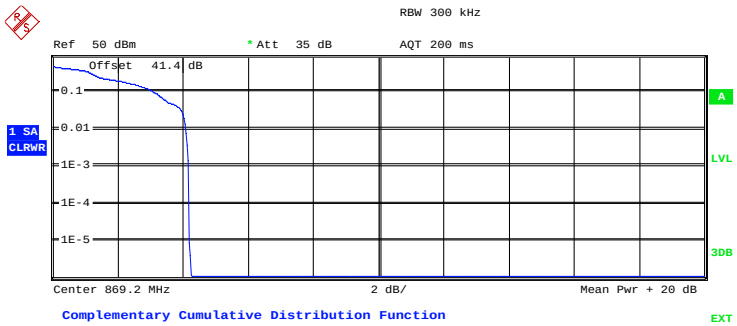


	Trace 1
Mean	36.64 dBm
Peak	42.72 dBm
Crest	6.09 dB
10 %	3.81 dB
1 %	5.83 dB
.1 %	6.03 dB
.01 %	6.09 dB

Date: 2.MAR.2012 04:43:34

AQPSK

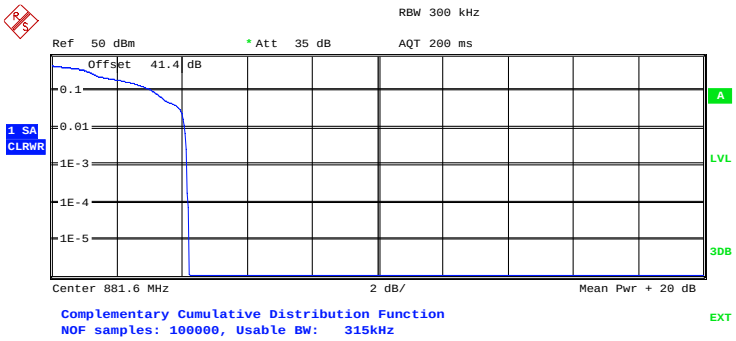
Configuration 1 - Mode 1



	Trace 1
Mean	41.52 dBm
Peak	45.77 dBm
Crest	4.25 dB
10 %	3.11 dB
1 %	4.10 dB
.1 %	4.17 dB
.01 %	4.20 dB

Date: 1.MAR.2012 07:19:00

Configuration 1 - Mode 2

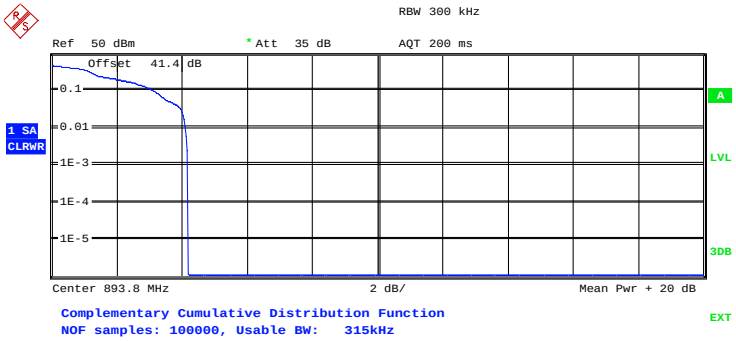


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	41.63 dBm
Peak	45.84 dBm
Crest	4.22 dB
10 %	3.08 dB
1 %	4.07 dB
.1 %	4.17 dB
.01 %	4.20 dB

Date: 1.MAR.2012 07:20:55

Configuration 1 - Mode 3



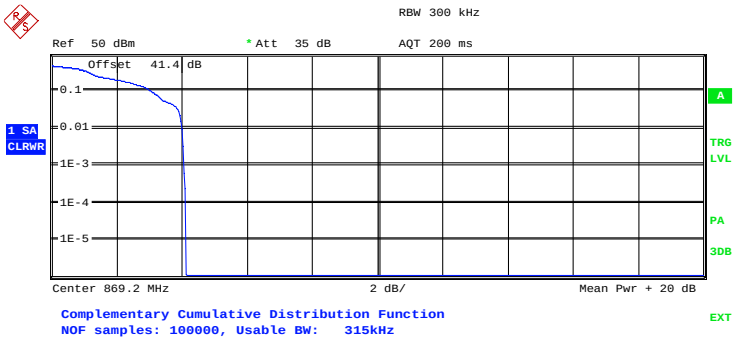
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	41.45 dBm
Peak	45.63 dBm
Crest	4.18 dB
10 %	3.11 dB
1 %	4.10 dB
.1 %	4.20 dB
.01 %	4.20 dB

Date: 1.MAR.2012 07:22:08

Product Service

Configuration 2 - Mode 1

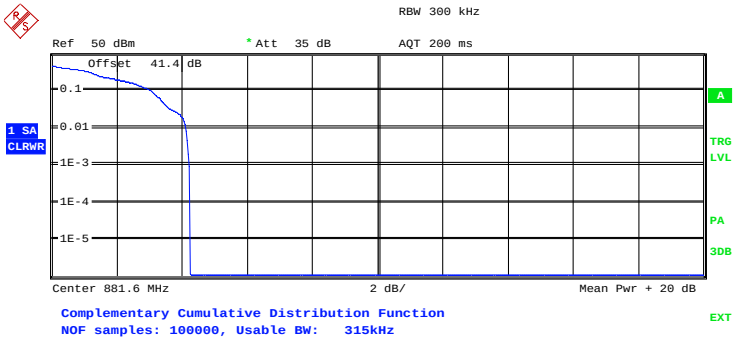


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.11 dBm
Peak	48.23 dBm
Crest	4.12 dB
10 %	3.04 dB
1 %	4.01 dB
.1 %	4.07 dB
.01 %	4.13 dB

Date: 2.MAR.2012 06:25:57

Configuration 2 - Mode 2



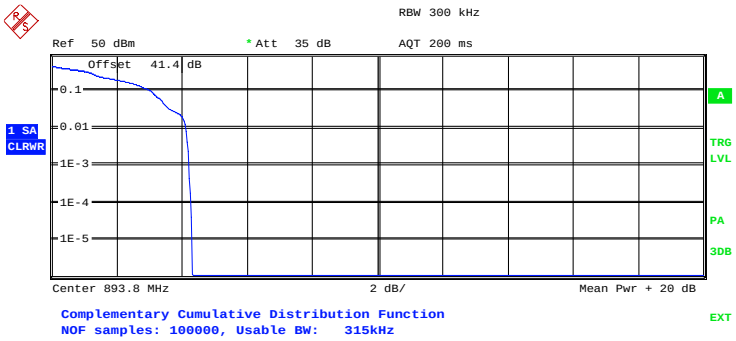
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.12 dBm
Peak	48.37 dBm
Crest	4.25 dB
10 %	3.04 dB
1 %	4.10 dB
.1 %	4.23 dB
.01 %	4.26 dB

Date: 2.MAR.2012 06:27:21

Product Service

Configuration 2 - Mode 3

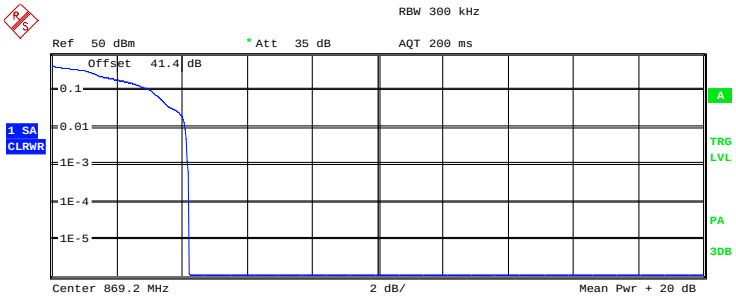


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	44.00 dBm
Peak	48.30 dBm
Crest	4.30 dB
10 %	3.04 dB
1 %	4.13 dB
.1 %	4.23 dB
.01 %	4.29 dB

Date: 2.MAR.2012 06:28:49

Configuration 3 - Mode 1



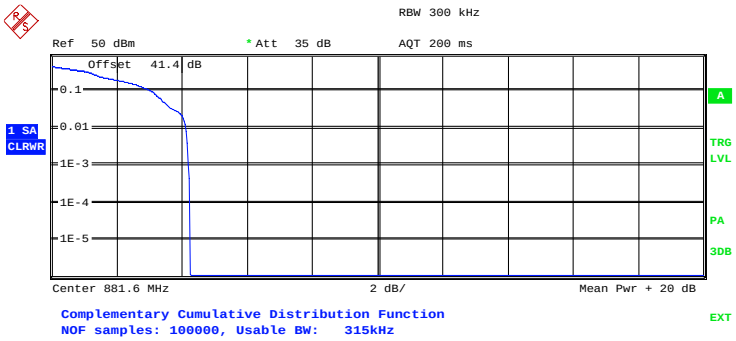
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 315kHz

	Trace 1
Mean	38.01 dBm
Peak	42.23 dBm
Crest	4.22 dB
10 %	3.04 dB
1 %	4.10 dB
.1 %	4.17 dB
.01 %	4.23 dB

Date: 2.MAR.2012 06:45:43

Product Service

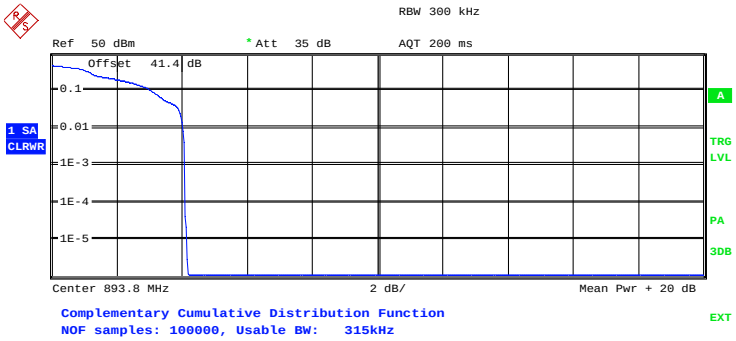
Configuration 3 - Mode 2



	Trace 1
Mean	38.26 dBm
Peak	42.51 dBm
Crest	4.25 dB
10 %	3.04 dB
1 %	4.13 dB
.1 %	4.20 dB
.01 %	4.26 dB

Date: 2.MAR.2012 06:44:22

Configuration 3 - Mode 3



	Trace 1
Mean	38.13 dBm
Peak	42.30 dBm
Crest	4.16 dB
10 %	3.04 dB
1 %	4.04 dB
.1 %	4.10 dB
.01 %	4.10 dB

Date: 2.MAR.2012 06:31:45

Limit	13dB

Remarks

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

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: CB4L809633

2.3.3 Date of Test and Modification State

01 and 06 March 2012 – 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, 32QAM and AQPSK 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

	01 March 2012	06 March 2012
Ambient Temperature	24.5°C	23.7°C
Relative Humidity	34.0%	22.0%

Product Service

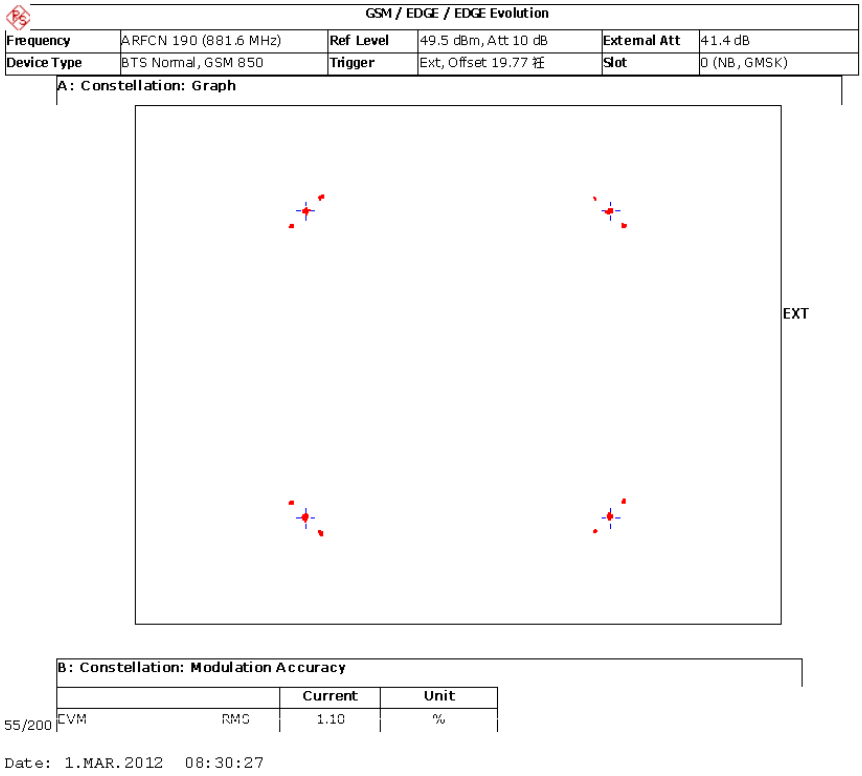
2.3.6 Test Results

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

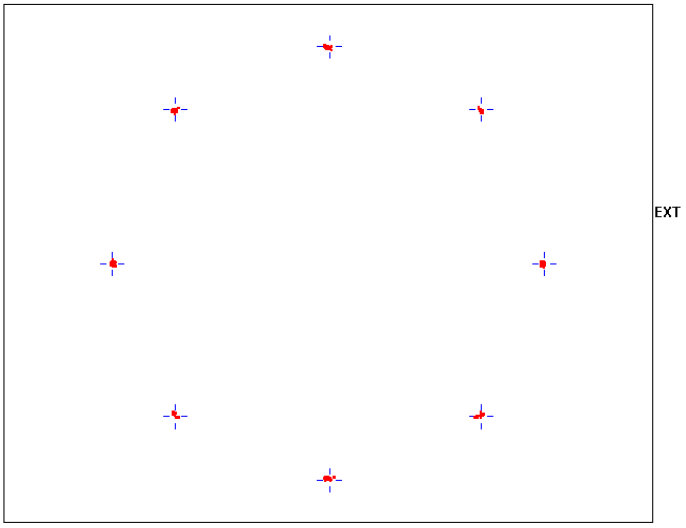


Product Service

8-PSK

GSM / EDGE / EDGE Evolution					
Frequency	ARFCN 190 (881.6 MHz)	Ref Level	49.1 dBm, Att 10 dB	External Att	41.4 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	RMS	0.00	%

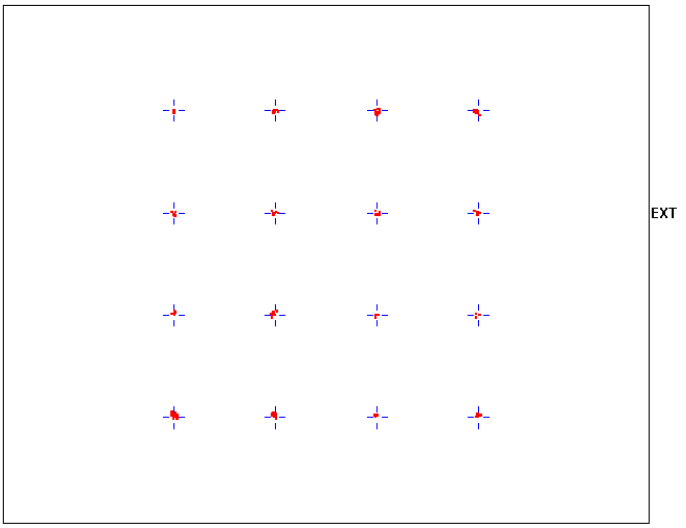
45/200

Date: 1.MAR.2012 08:31:47

16QAM

GSM / EDGE / EDGE Evolution					
Frequency	ARFCN 190 (881.6 MHz)	Ref Level	48.5 dBm, Att 10 dB	External Att	41.4 dB
Device Type	BTS Normal, GSM 850	Trigger	Ext, Offset 1.18 ms	Slot	0 (NB, 16QAM)

A: Constellation: Graph



B: Constellation: Modulation Accuracy

		Current	Unit
EVM	RMS	0.99	%

43/200

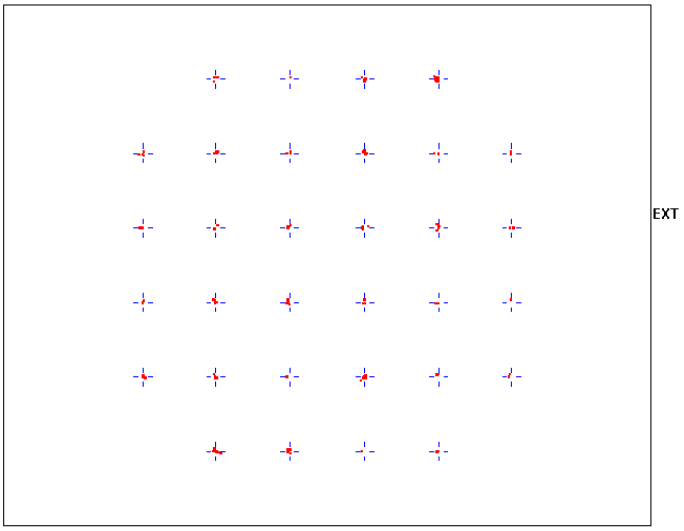
Date: 1.MAR.2012 08:33:05

Product Service

32QAM

GSM / EDGE / EDGE Evolution					
Frequency	ARFCN 190 (881.6 MHz)	Ref Level	48.5 dBm, Att 10 dB	External Att	41.4 dB
Device Type	BTS Normal, GSM 850	Trigger	Ext, Offset 2.33 ms	Slot	0 (NB, 32QAM)

A: Constellation: Graph



B: Constellation: Modulation Accuracy

		Current	Unit
EVM	RMS	1.03	%

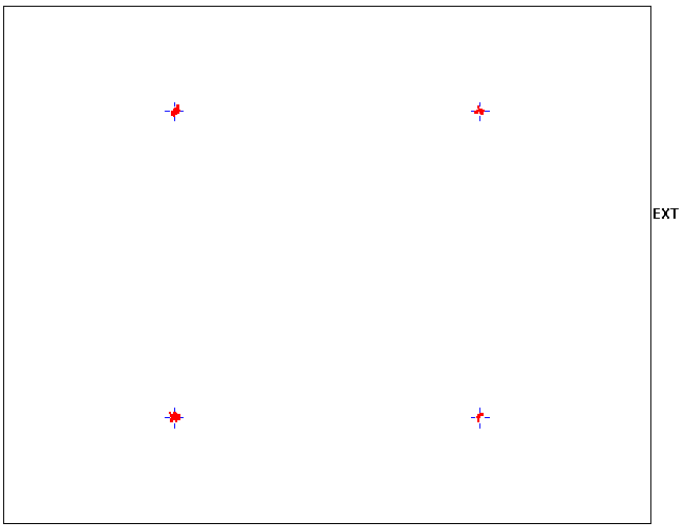
155/205

Date: 1.MAR.2012 08:34:30

AQPSK

GSM / EDGE / EDGE Evolution					
Frequency	ARFCN 190 (881.6 MHz)	Ref Level	46 dBm, Att 5 dB	External Att	41.4 dB
Device Type	BTS Normal, GSM 850	Trigger	Ext, Offset 1.18 ms	Slot	0 (NB, AQPSK)

A: Constellation: Graph



B: Constellation: Modulation Accuracy

		Current	Unit
EVM	RMS	0.04	%

269(/205)

Date: 6.MAR.2012 04:12:21

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: CB4L809633

2.4.3 Date of Test and Modification State

01 March 2012 – 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 test was performed with the EUT in the following configuration and mode of operation:

Configuration 1 - Mode 2

2.4.6 Environmental Conditions

	01 March 2012
Ambient Temperature	24.5°C
Relative Humidity	34.0%

Product Service

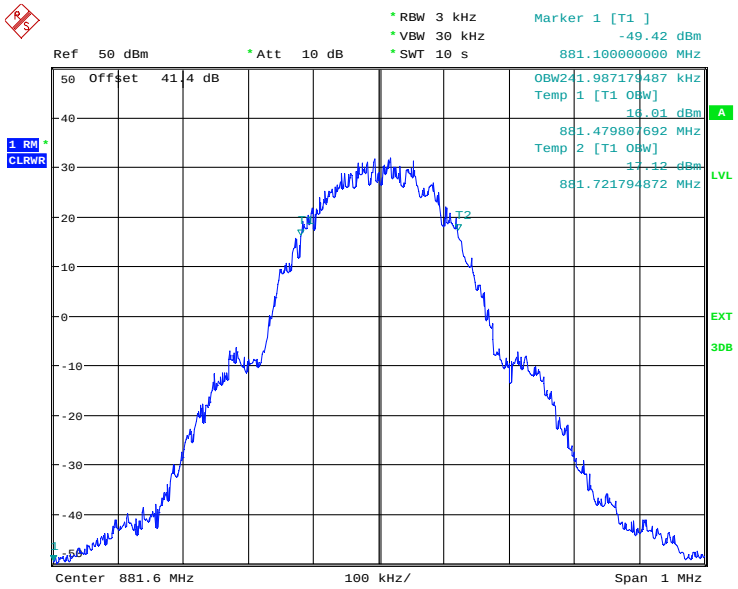
2.4.7 Test Results

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 2

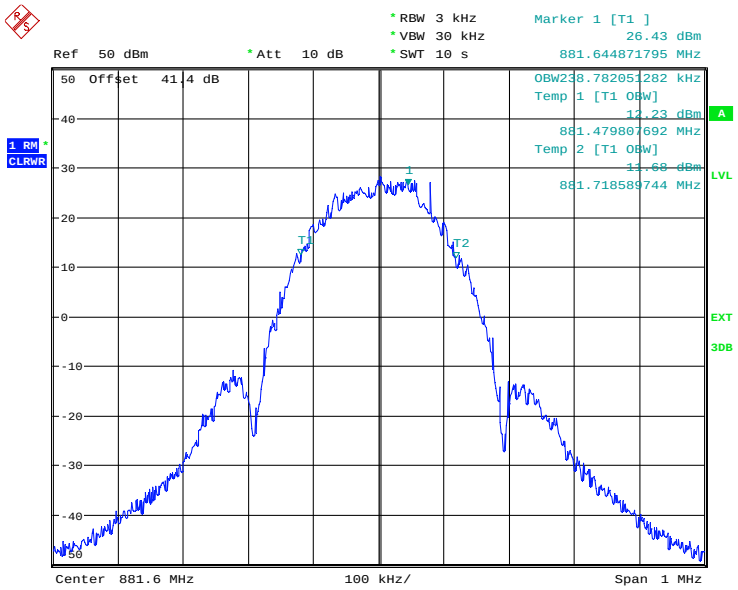
GMSK



Date: 1.MAR.2012 07:55:50

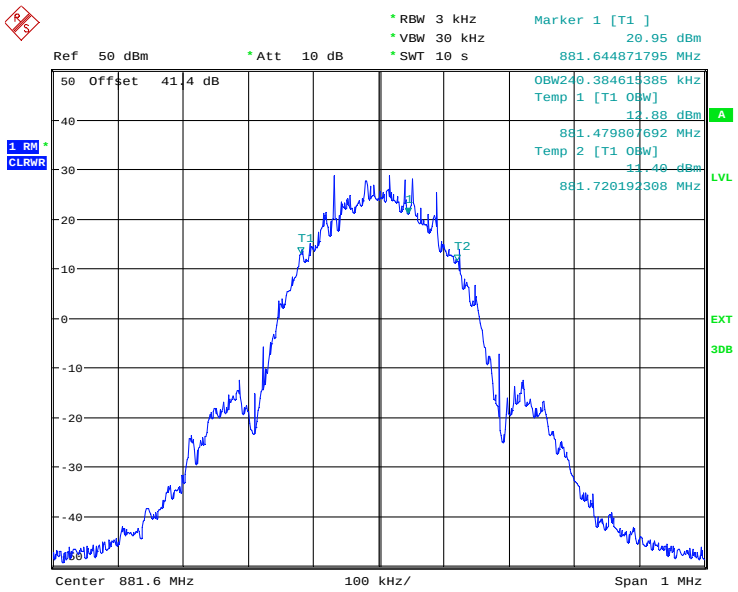
Product Service

8-PSK



Date: 1.MAR.2012 07:58:43

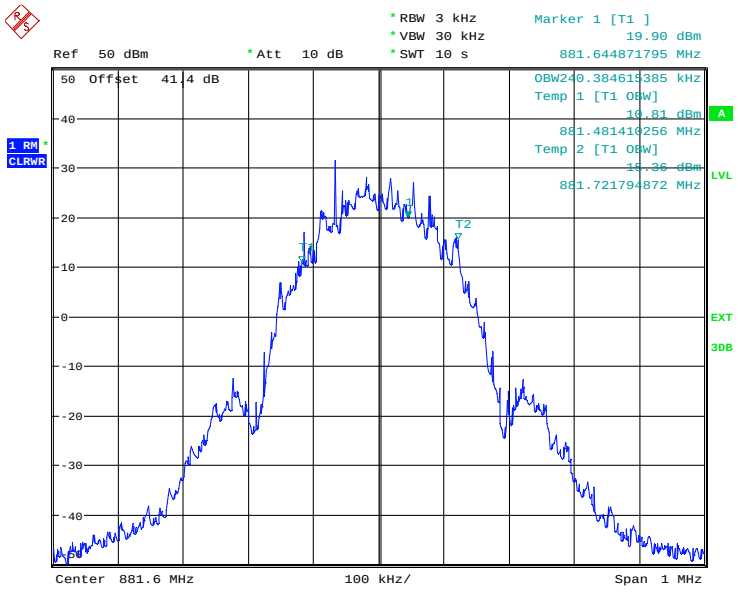
16QAM



Date: 1.MAR.2012 08:03:05

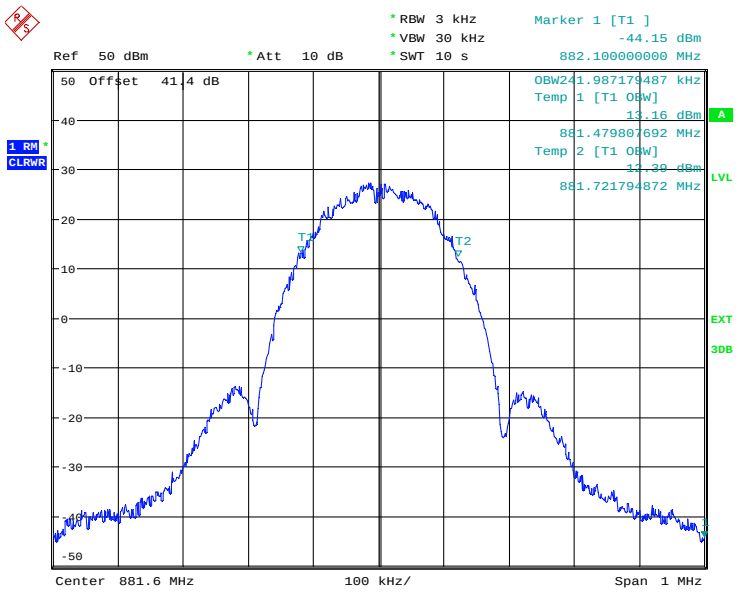
Product Service

32QAM



Date: 1.MAR.2012 08:06:24

AQPSK



Date: 1.MAR.2012 07:27:03

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 4.5.1.1

2.5.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB4L809633

2.5.3 Date of Test and Modification State

02 and 05 March and 10 and 24 May 2012 – 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 FCC Part 22 clause 22.917(b) and RSS-132 Clause 4.5.1.1, at least 1% of the emission bandwith was used for the resolution bandwidth up to 1 MHz away from the block edge. A resolution bandwidth of 100kHz was used between1MHz to 5MHz or 15MHz away from the band edge. Spectrum analyser detector was set as RMS.

For HC configuration, several modes were tested and B + 1 channel and B + 8 channel, T - 8 channel and T - 1 channel were found to be the worst cases.

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 6
- Mode 7

2.5.6 Environmental Conditions

	02 March 2012	05 March 2012	10 May 2012	24 May 2012
Ambient Temperature	24.0°C	24.0°C	26.8°C	25.2°C
Relative Humidity	36.0%	28.4%	37.2%	48.0%

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, 8-PSK, 16QAM, 32QAM and AQPSK modulations Channel No./Frequencies
Bottom 869 MHz	Channel: 129 Frequency: 869.4 MHz
Top 894 MHz	Channel: 250 Frequency: 893.6 MHz

Configuration 2 - Mode 4 and 5

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

Configuration 3 - Mode 6 and 7

Band Edge Frequency	Edge Test with GMSK, 8-PSK, 16QAM, 32QAM and AQPSK modulations Channel No./Frequencies
Bottom 869 MHz	Channel: 129 and 136 Frequency: 869.4 MHz and 870.8 MHz
Top 894 MHz	Channel: 243 and 250 Frequency: 892.2MHz and 893.6 MHz

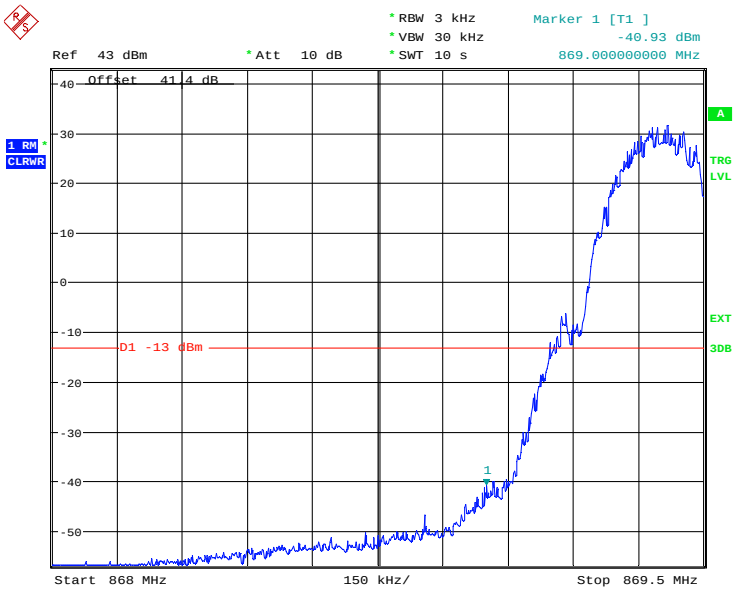
The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels used outside of those stated and power levels used beyond those stated in the table exceed the specification limits, thus they cannot be used.

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.

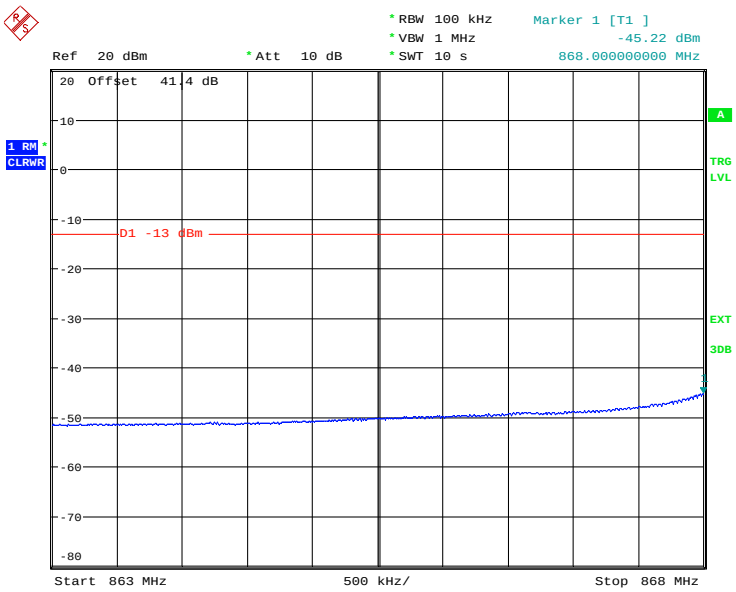
The test results are shown below

Configuration 1 - Mode 4

GMSK



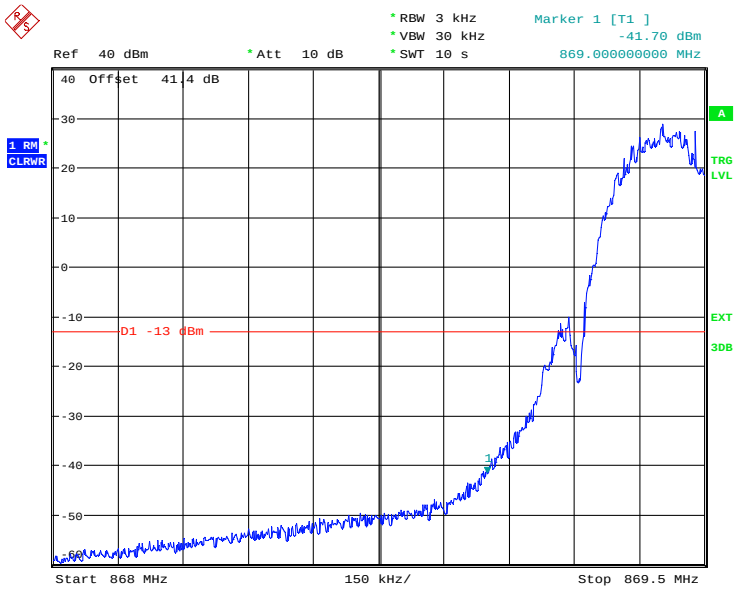
Date: 2.MAR.2012 03:35:48



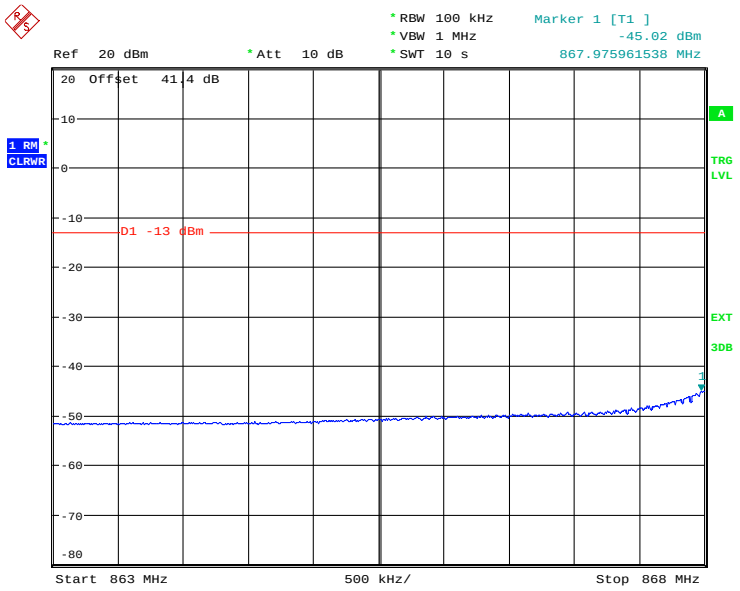
Date: 2.MAR.2012 03:40:36

Product Service

8-PSK



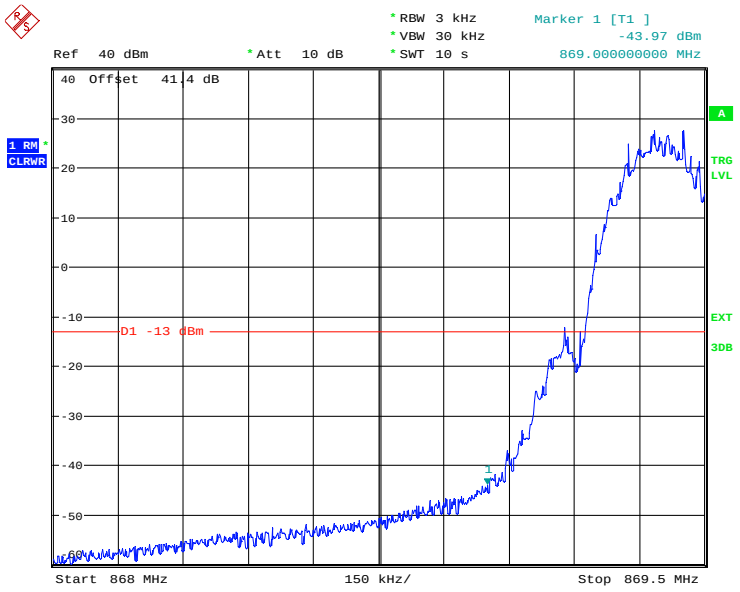
Date: 2.MAR.2012 03:07:47



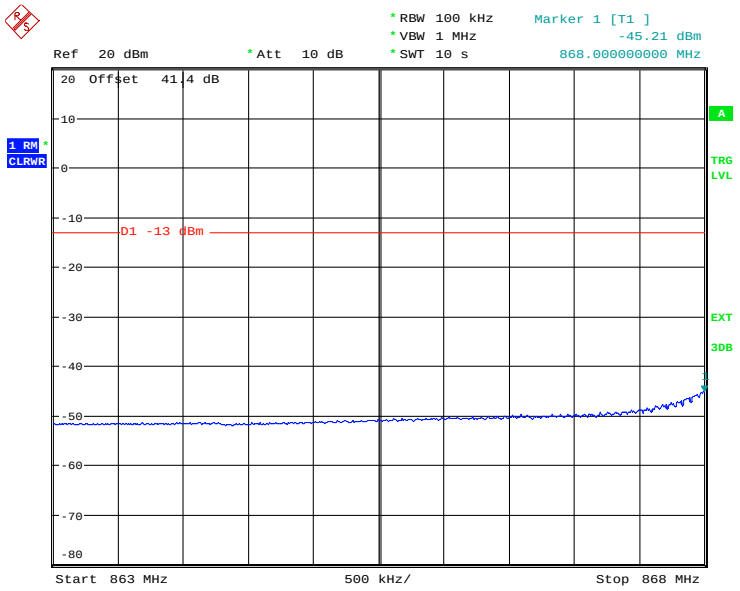
Date: 2.MAR.2012 03:05:29

Product Service

16QAM



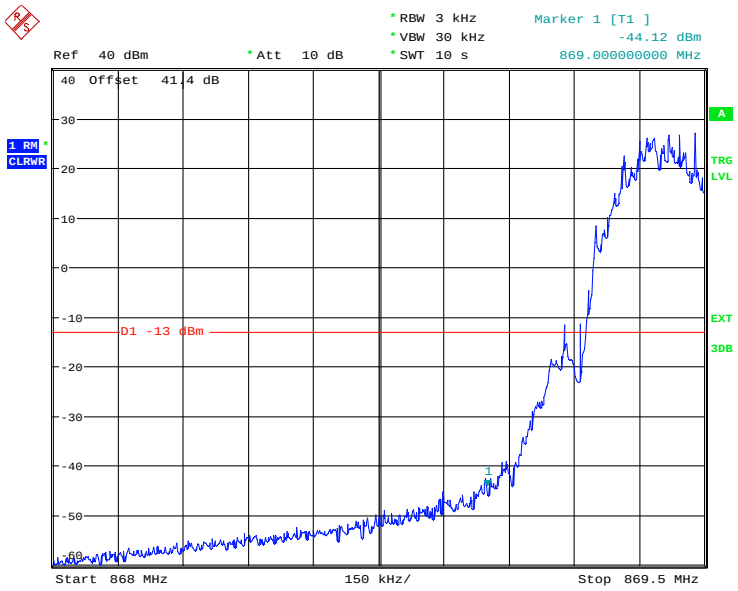
Date: 2.MAR.2012 02:59:02



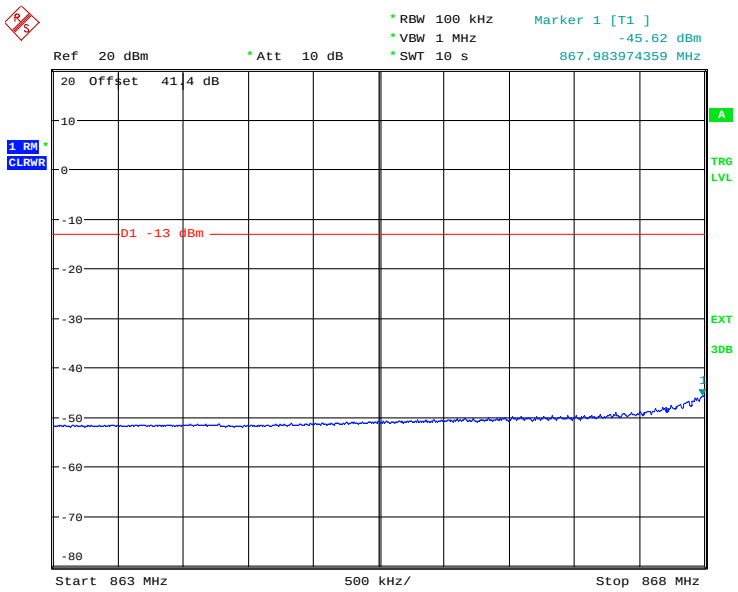
Date: 2.MAR.2012 03:01:01

Product Service

32QAM



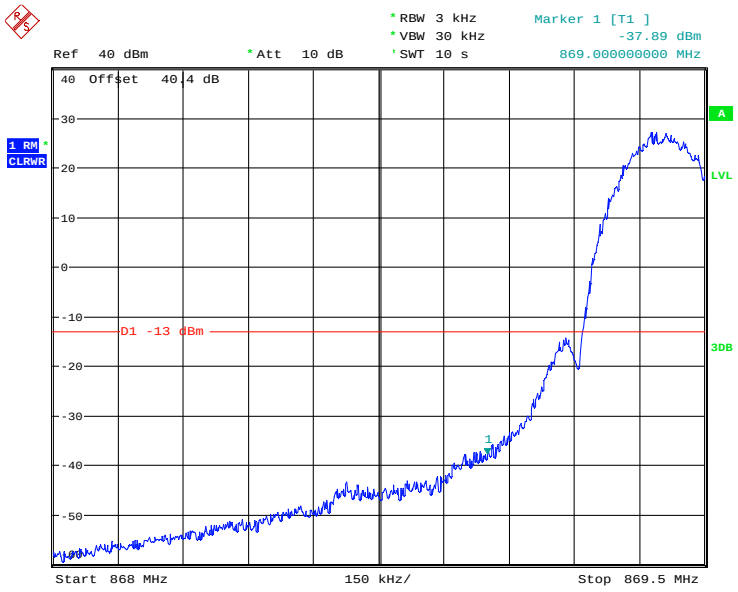
Date: 2.MAR.2012 02:56:57



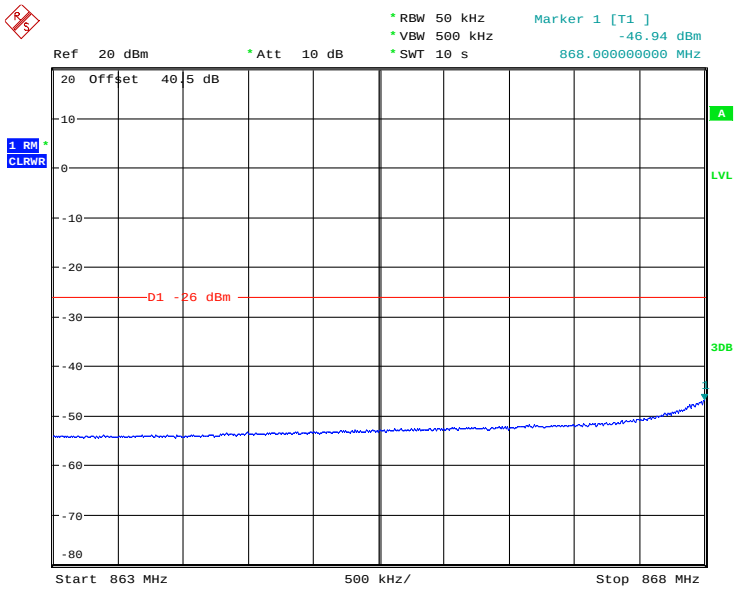
Date: 2.MAR.2012 02:55:35

Product Service

AQPSK



Date: 20.MAR.2012 18:52:51

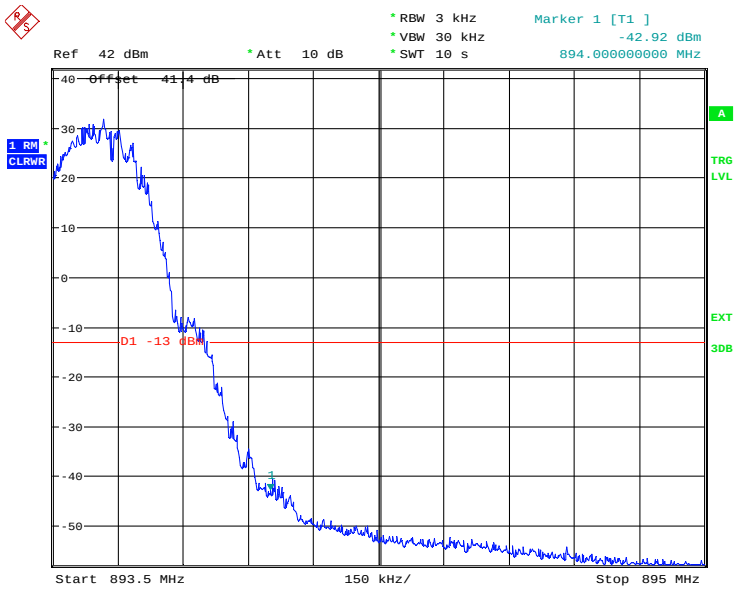


Date: 20.MAR.2012 18:48:14

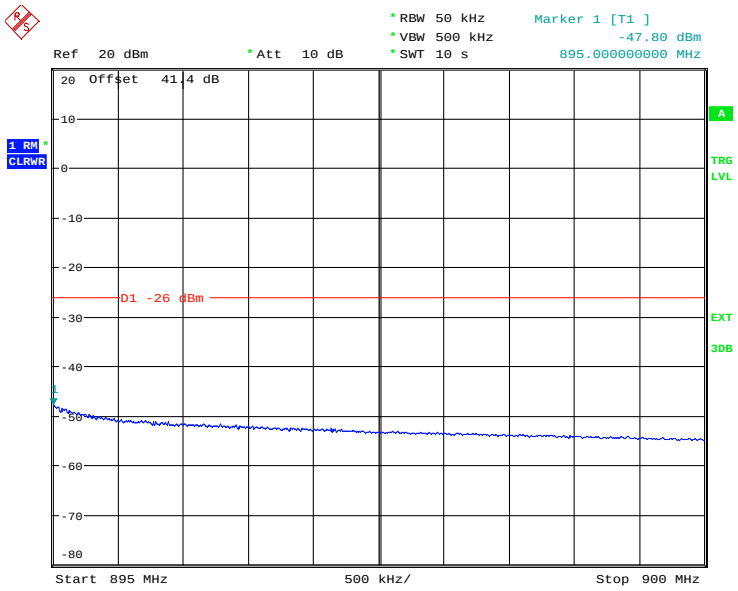
Product Service

Configuration 1 - Mode 5

GMSK



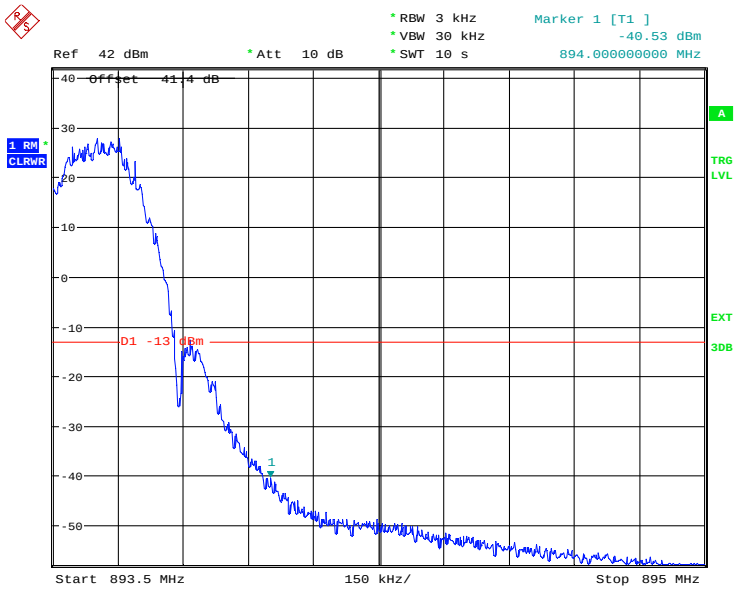
Date: 2.MAR.2012 03:46:56



Date: 2.MAR.2012 03:42:40

Product Service

8-PSK



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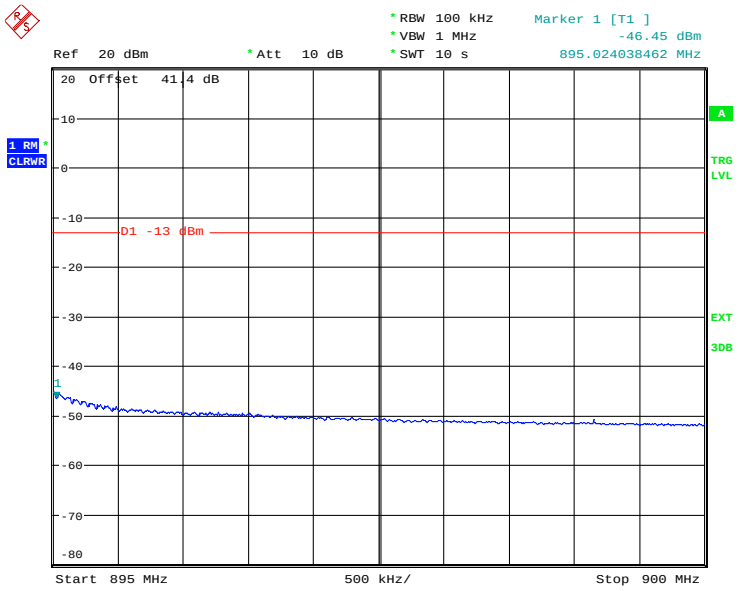

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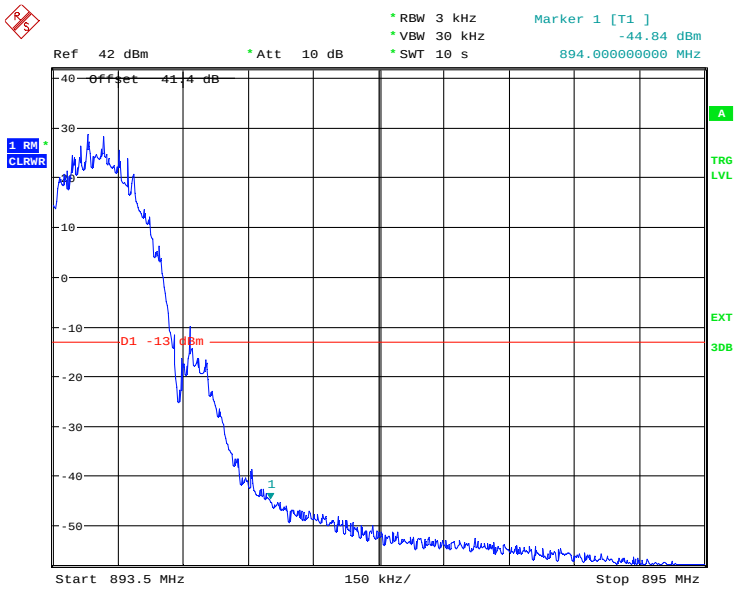
16QAM



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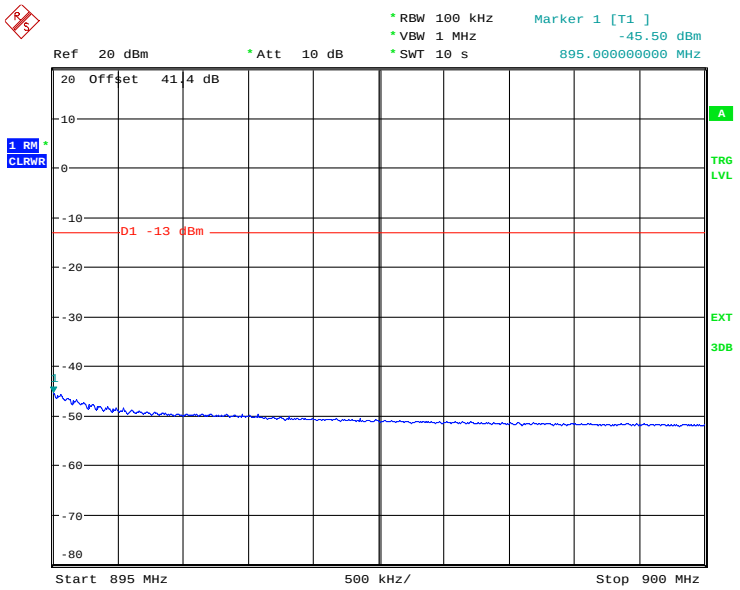

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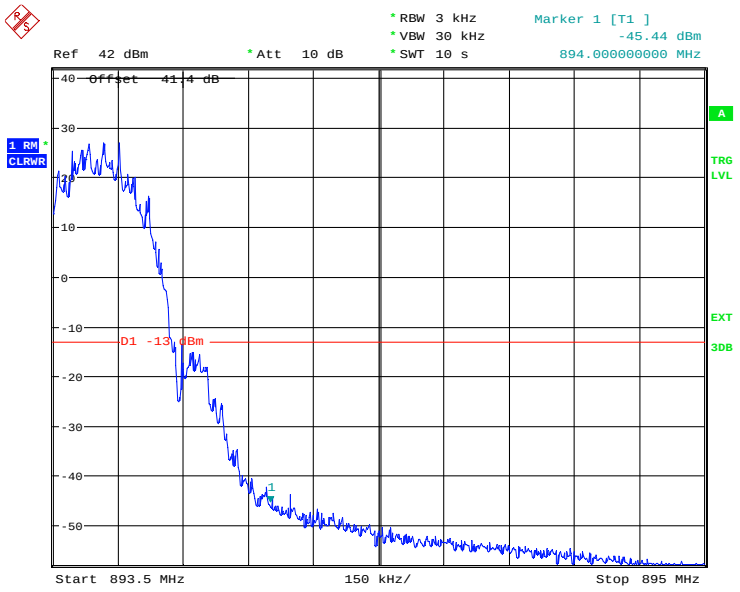
Product Service

32QAM



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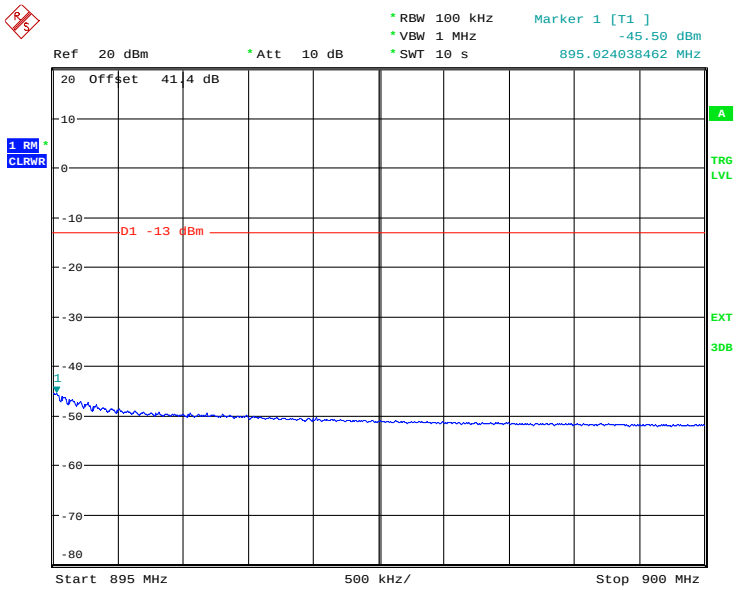

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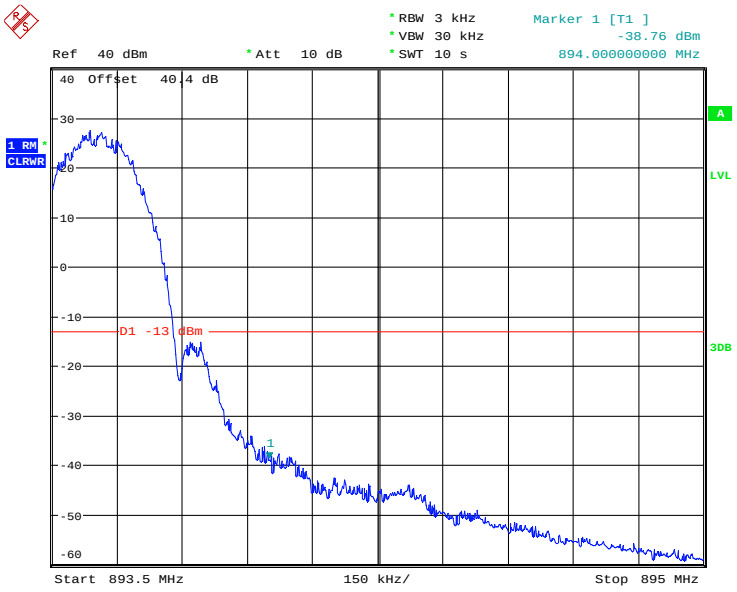

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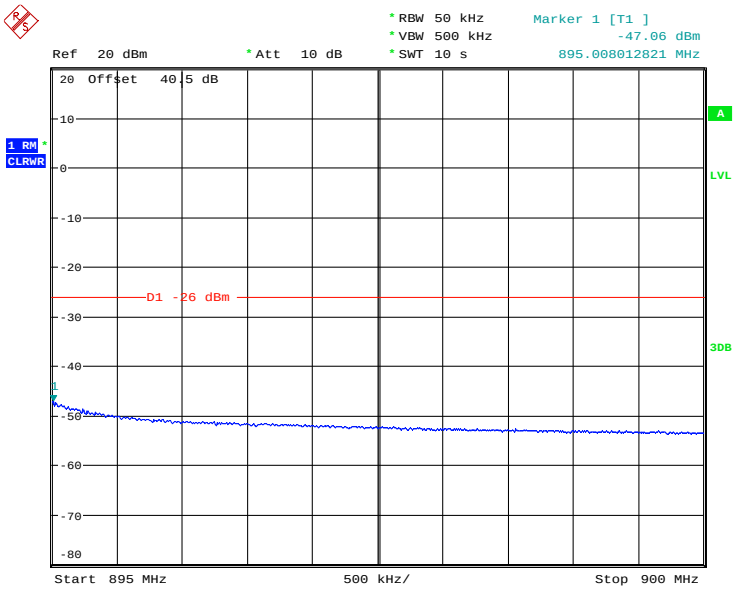

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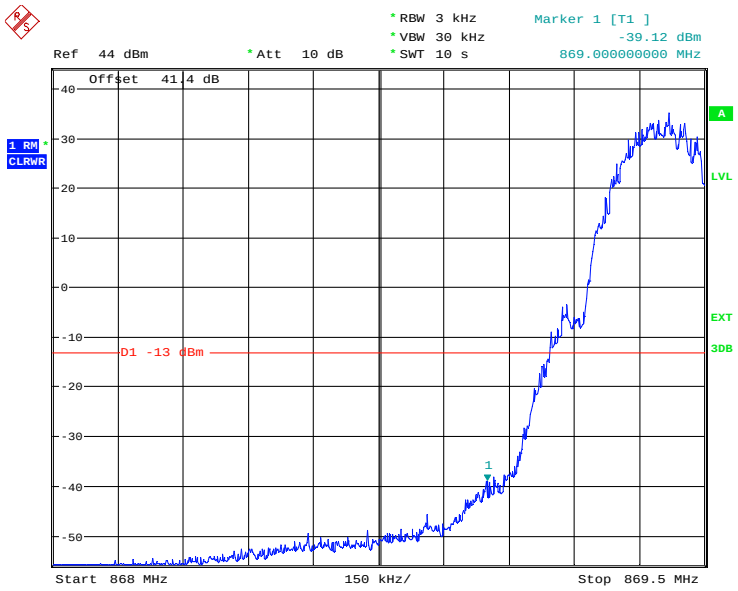
Product Service

Configuration 2 - Mode 4

GMSK



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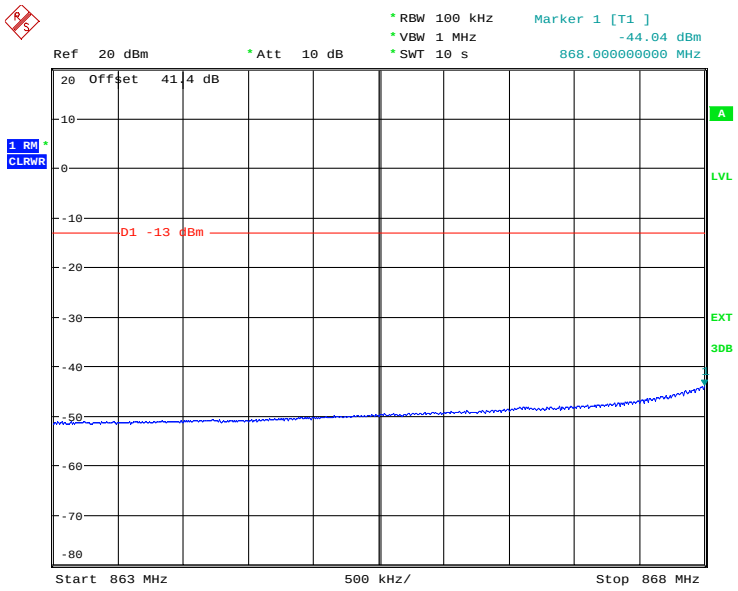

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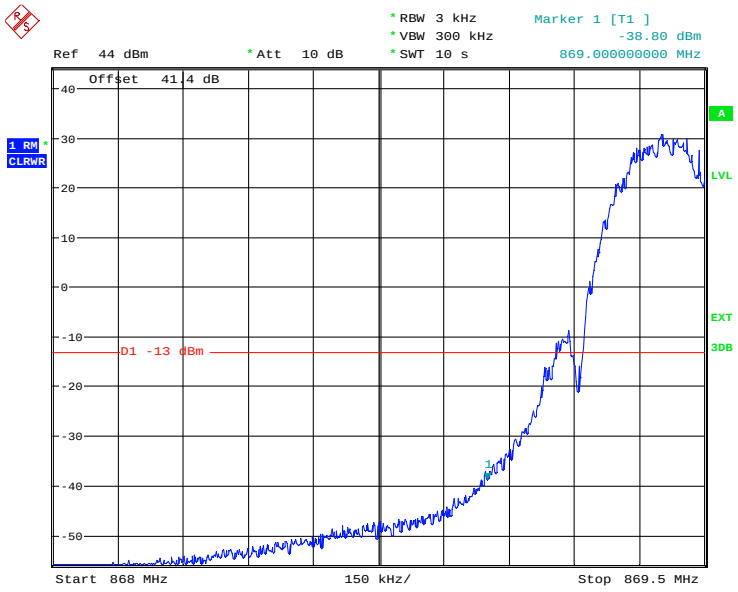
Product Service

8-PSK



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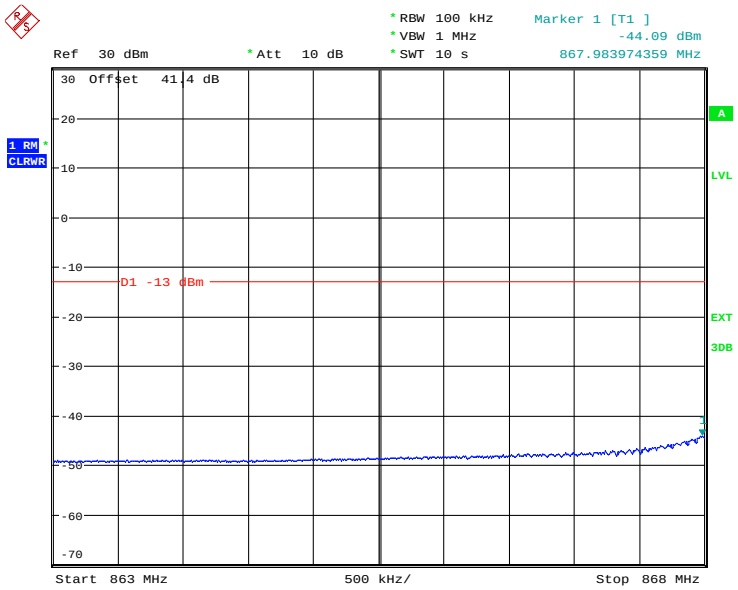

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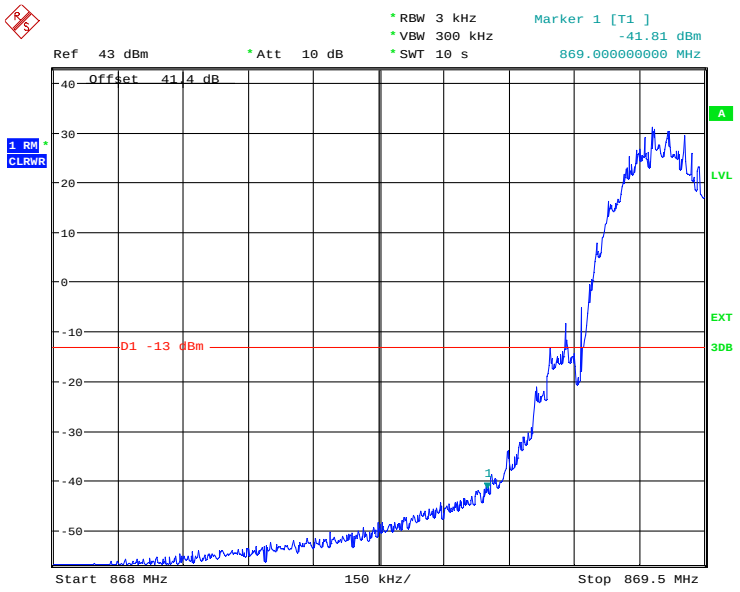
Product Service

16QAM



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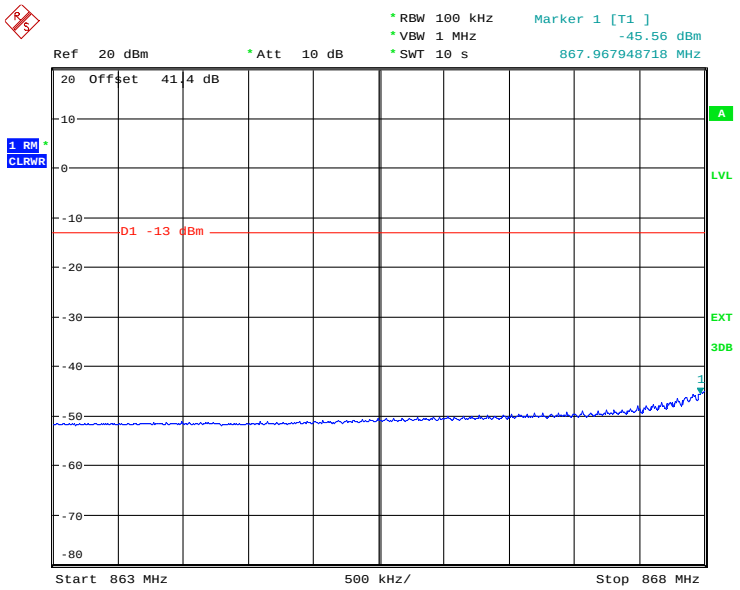

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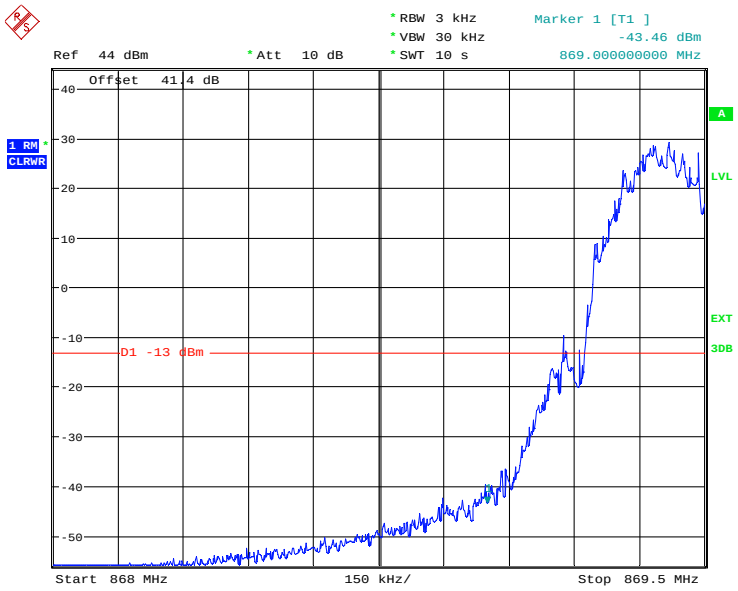
Product Service

32QAM



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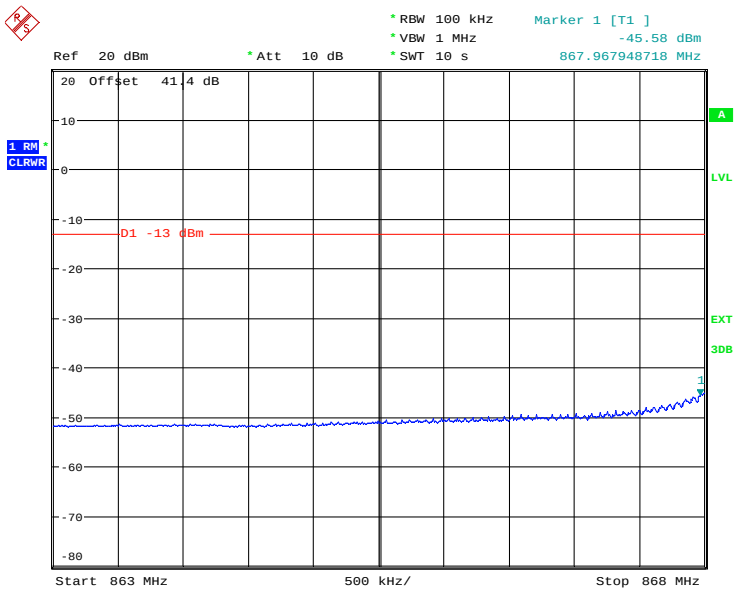

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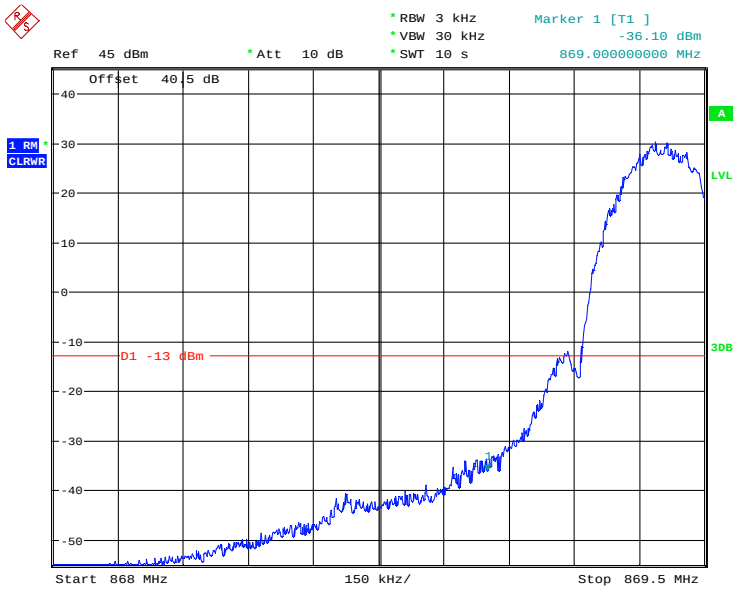
AQPSK



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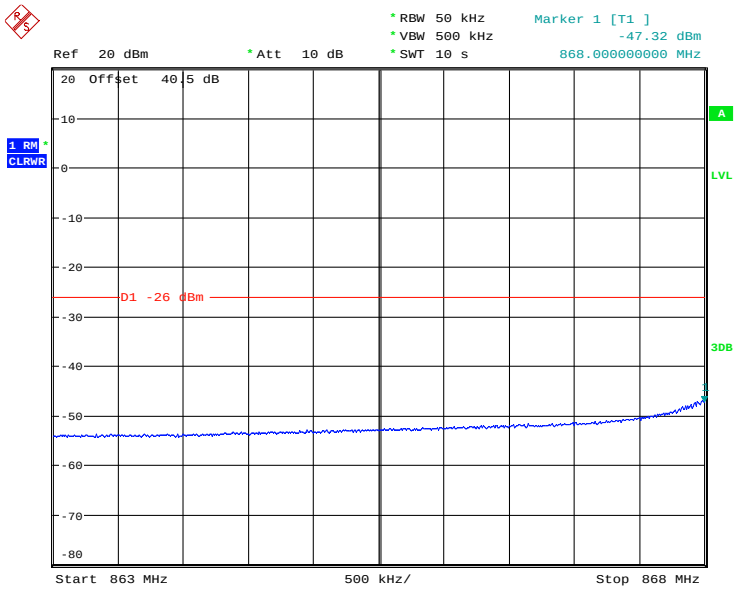

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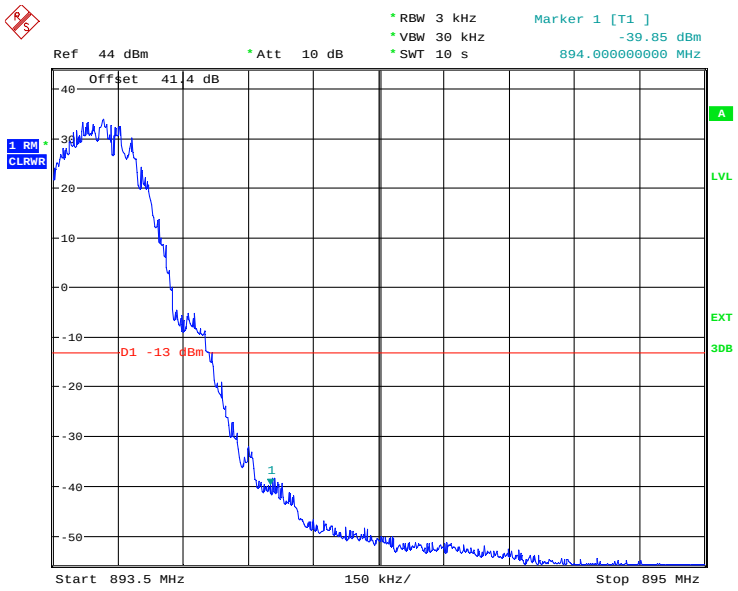
Configuration 2 - Mode 5

GMSK



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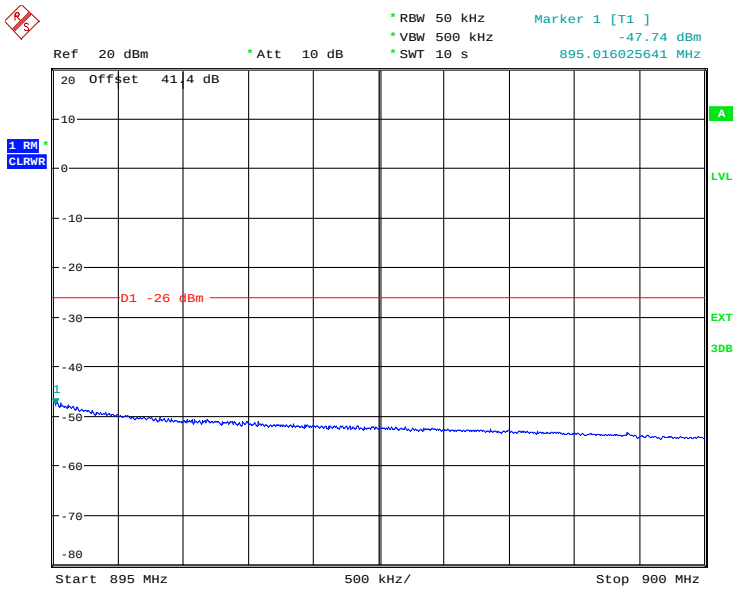

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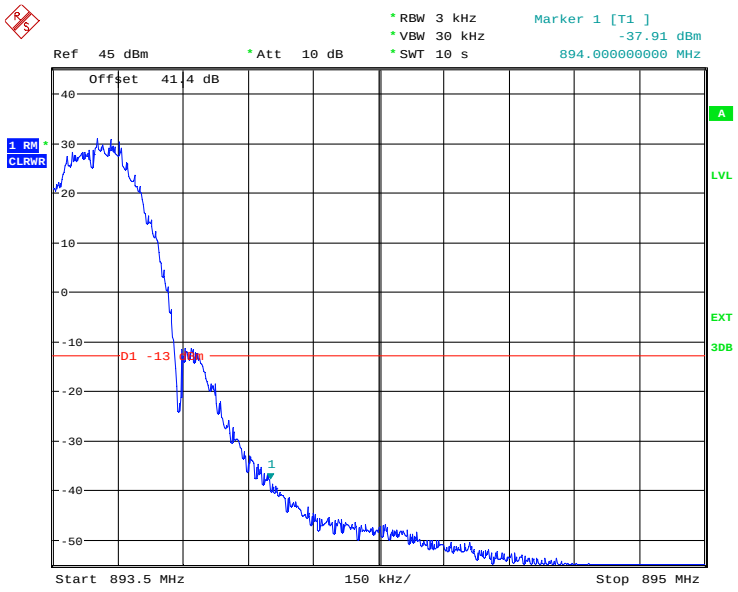
8-PSK



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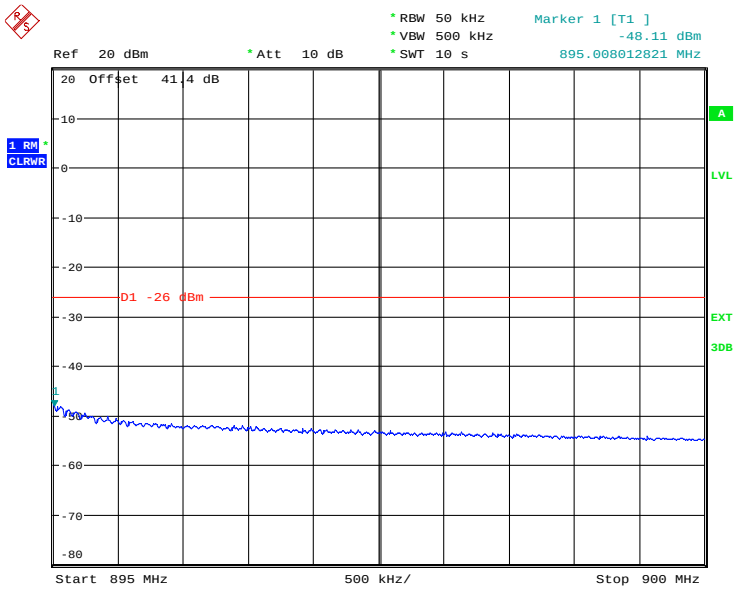

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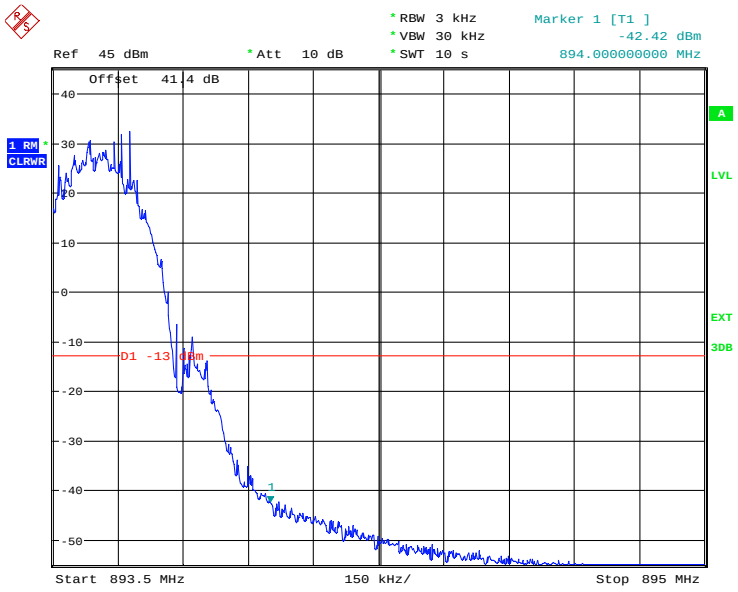
16QAM



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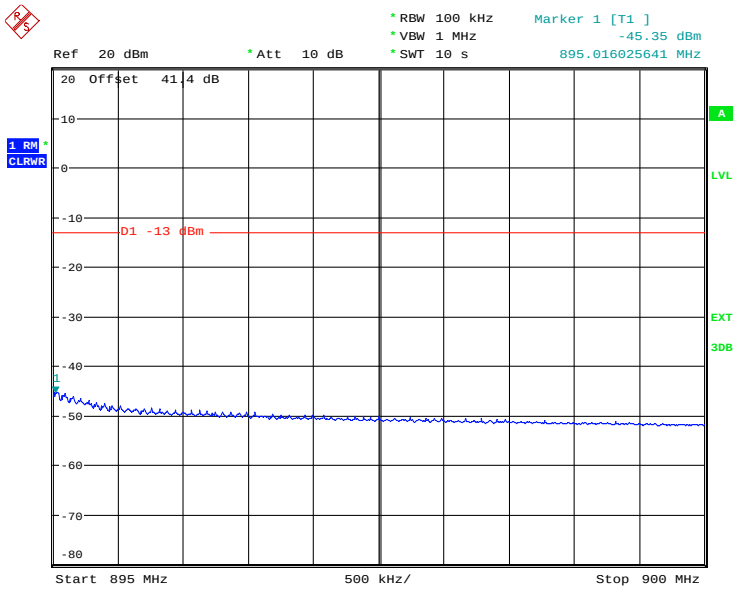
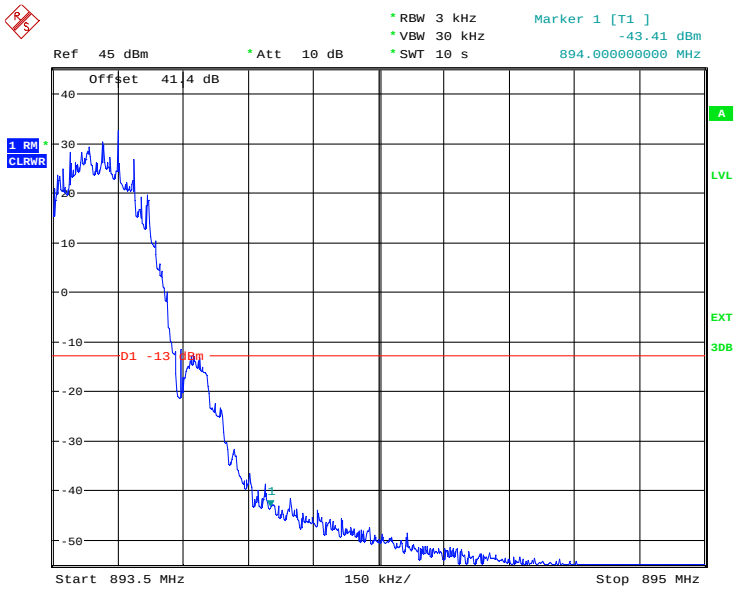


Date: 2.MAR.2012 09:24:11

Product Service

32QAM



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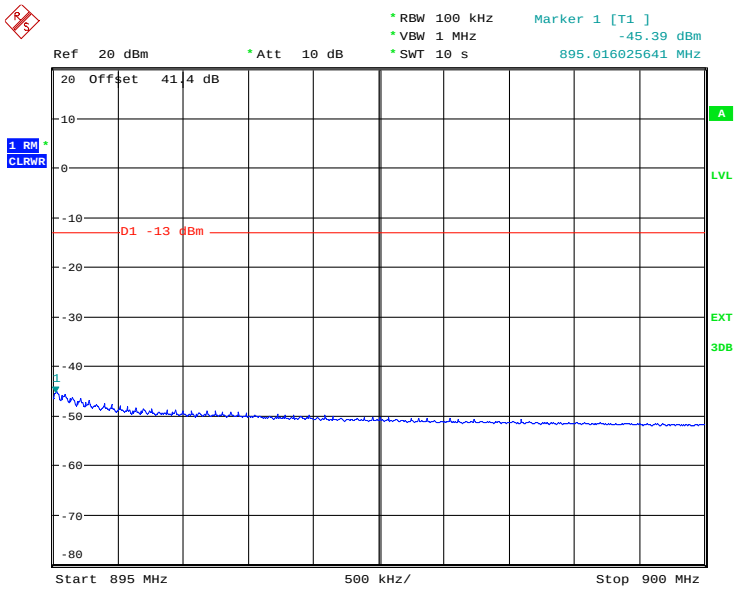

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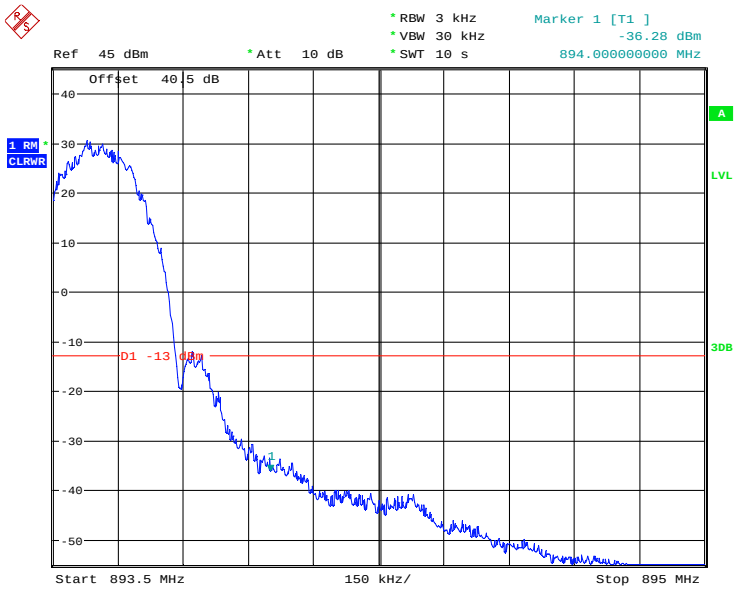
AQPSK



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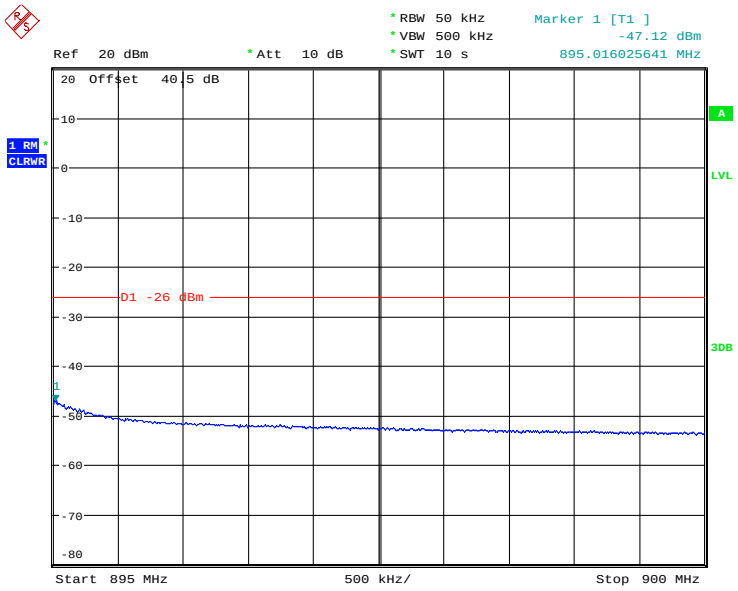

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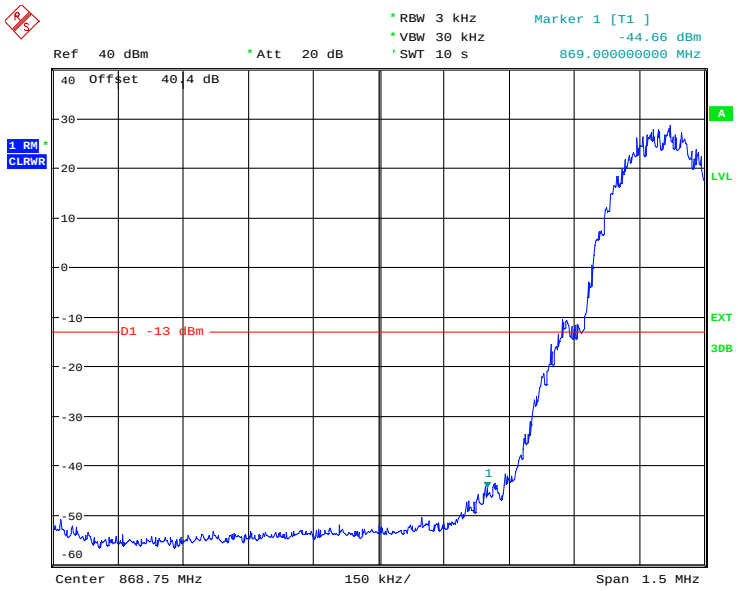
Configuration 3 - Mode 6

GMSK



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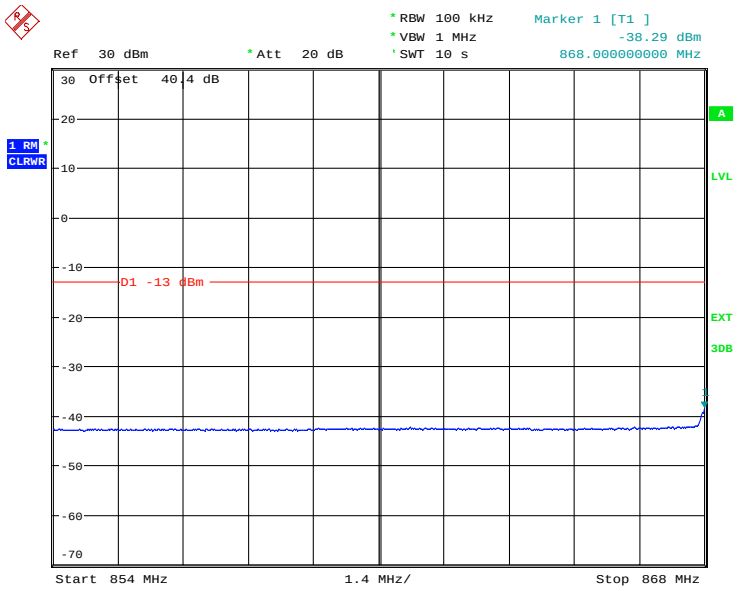

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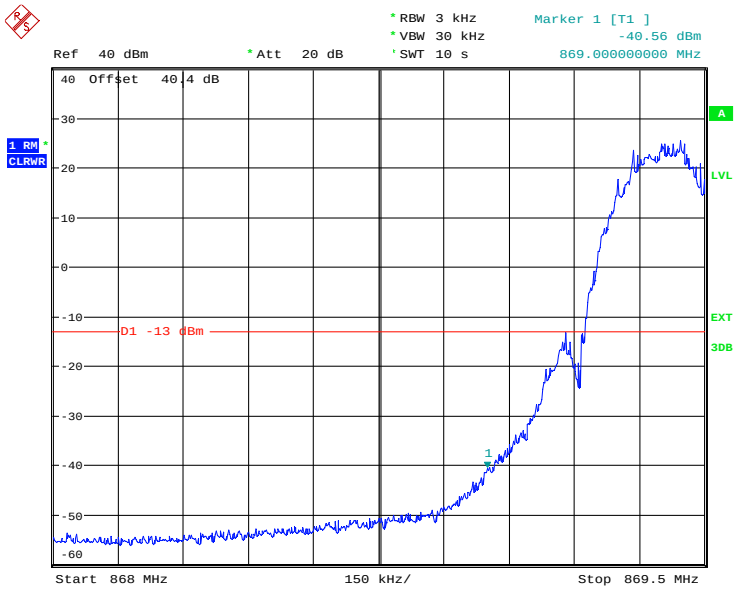
8-PSK



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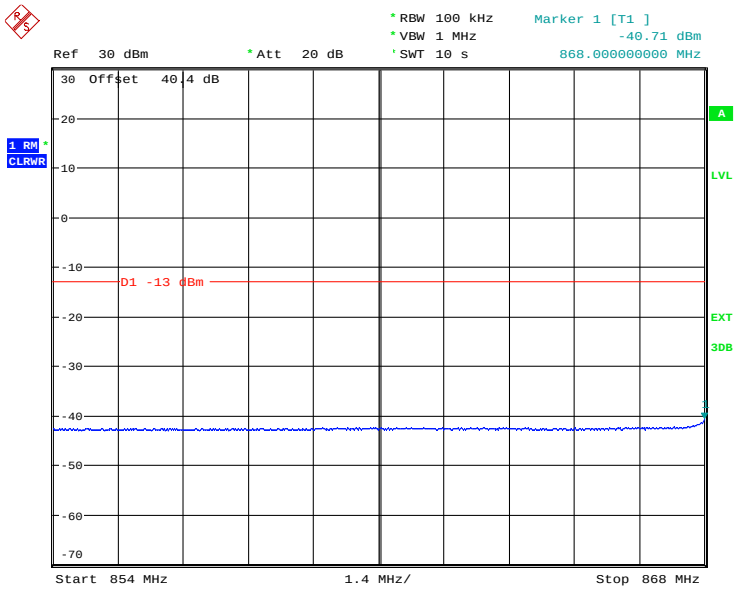

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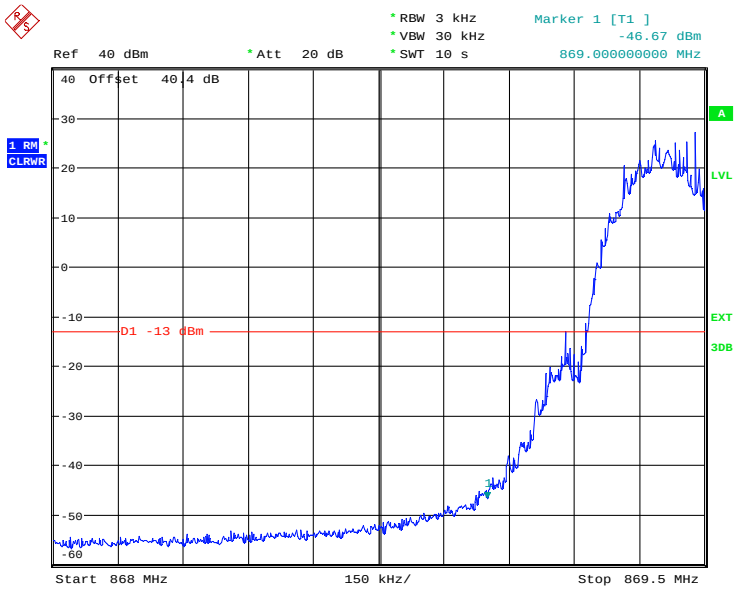
Product Service

16QAM



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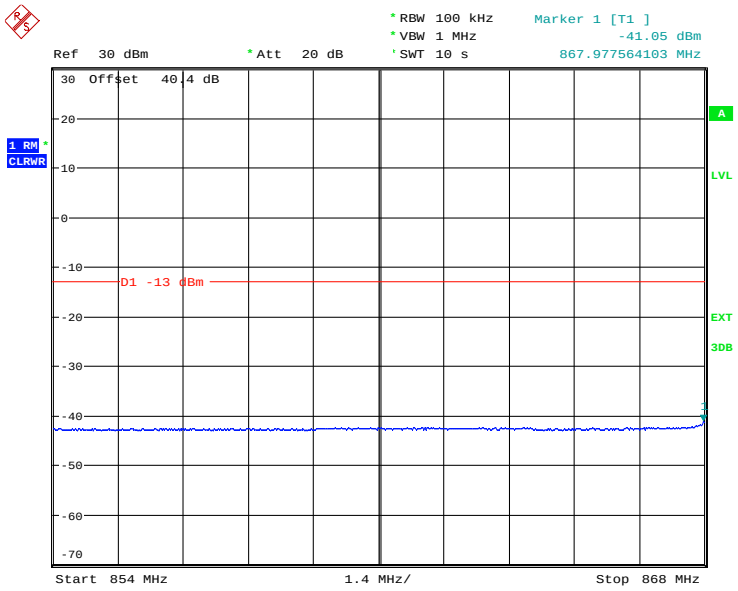

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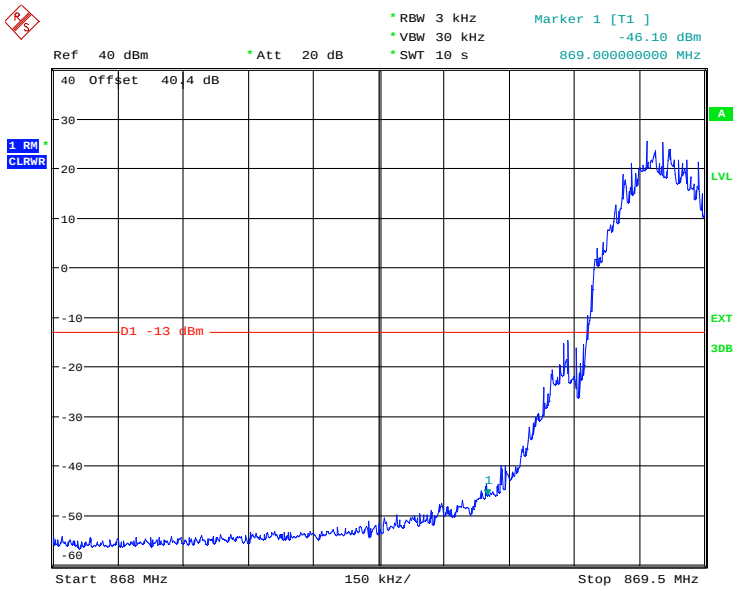
Product Service

32QAM



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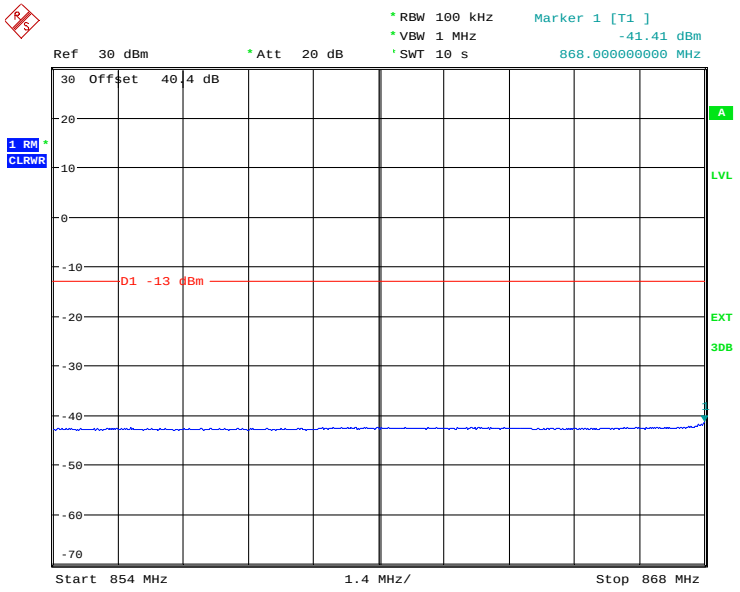

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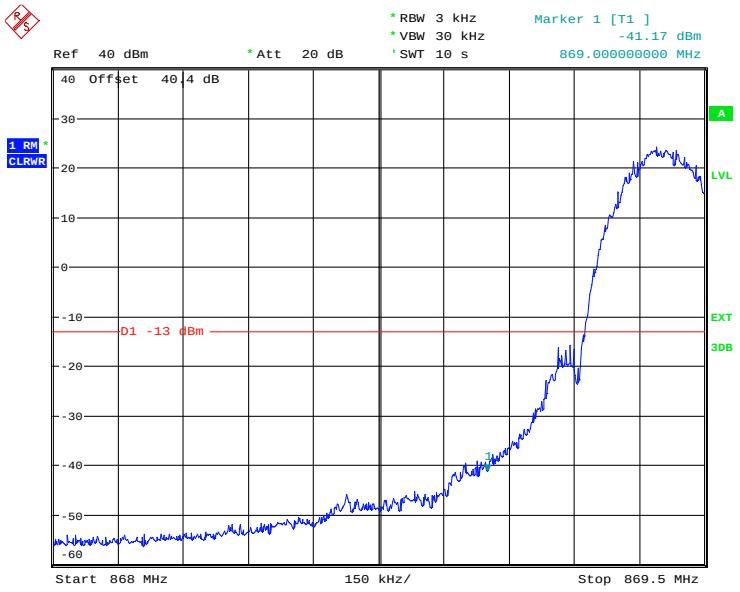
Product Service

AQPSK



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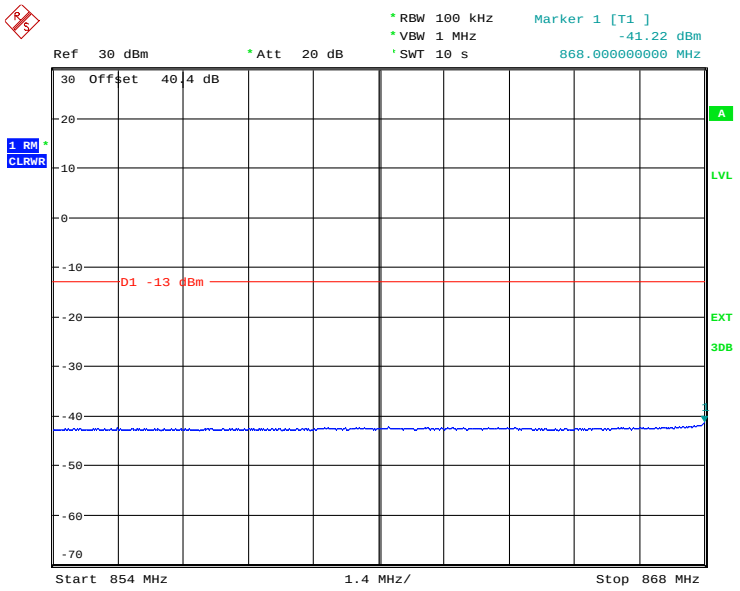

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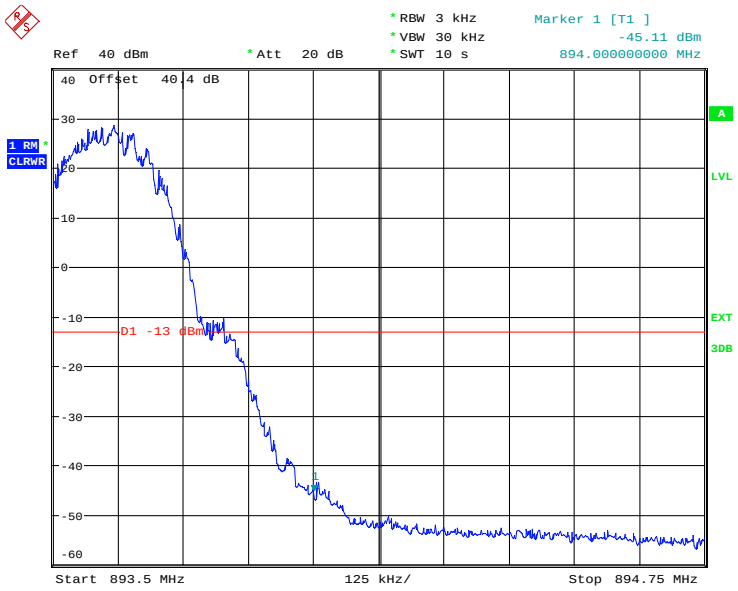
Configuration 3 - Mode 7

GMSK



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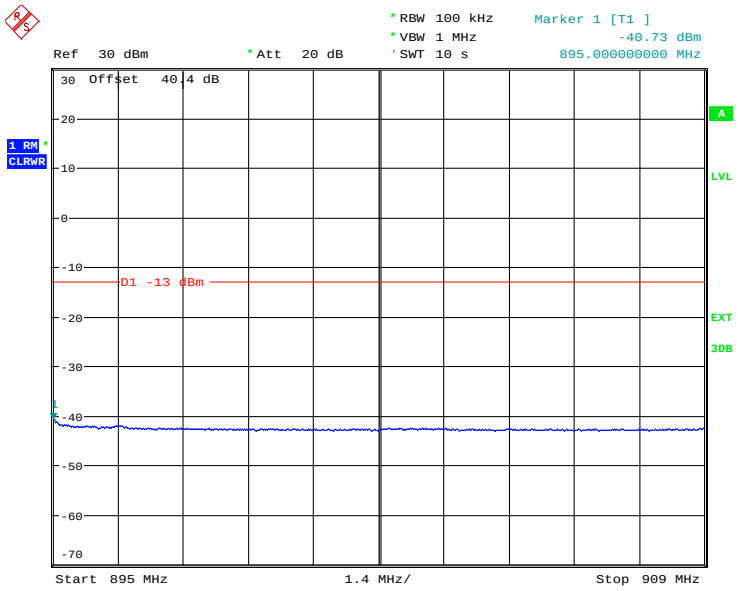

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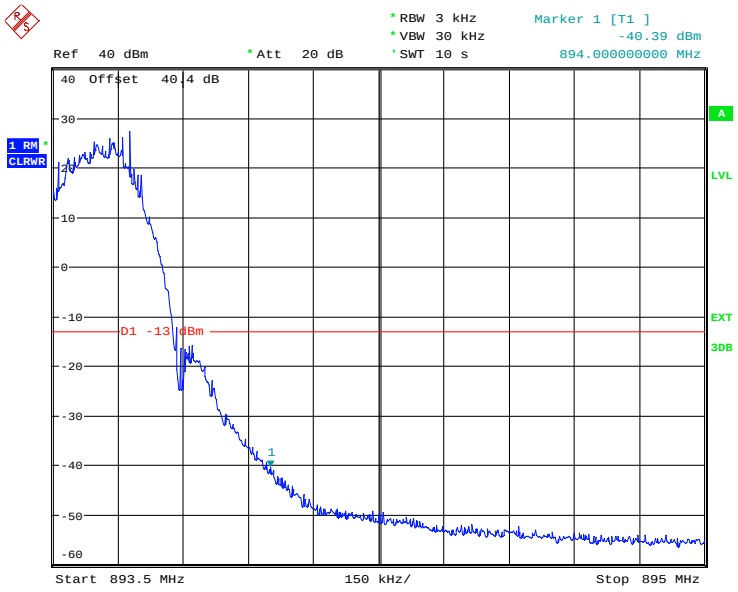
Product Service

8-PSK



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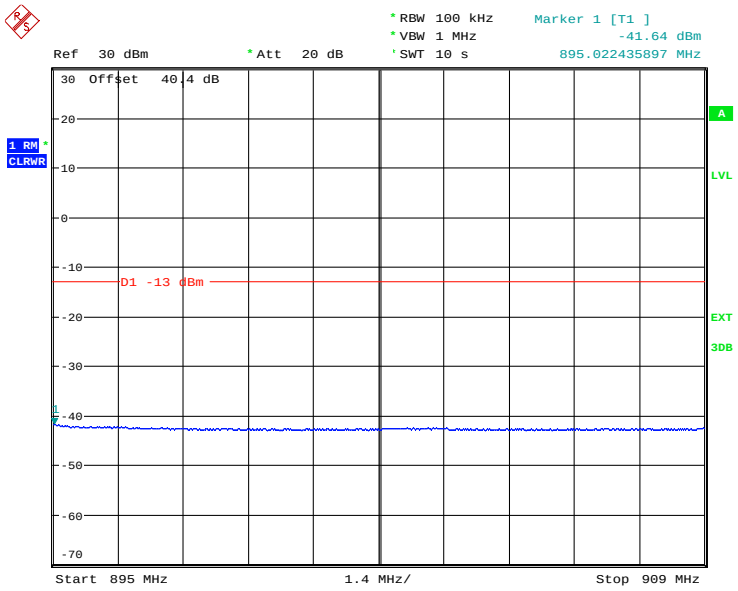

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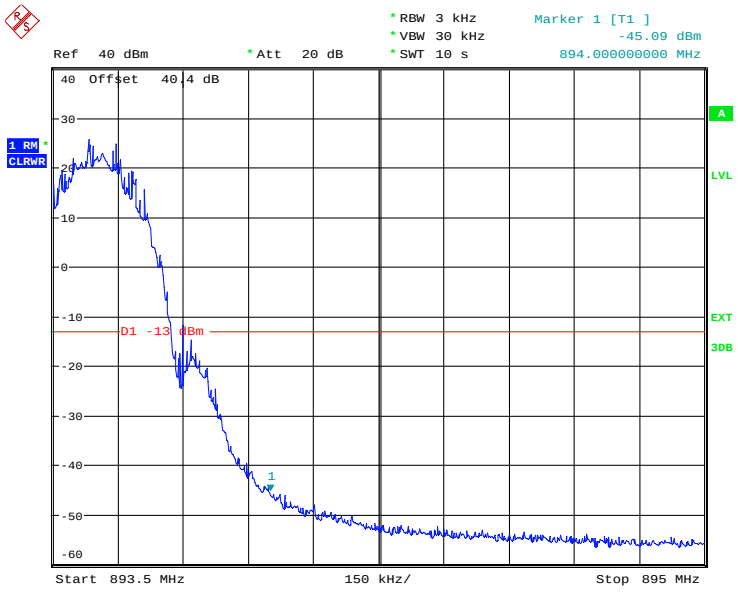
Product Service

16QAM



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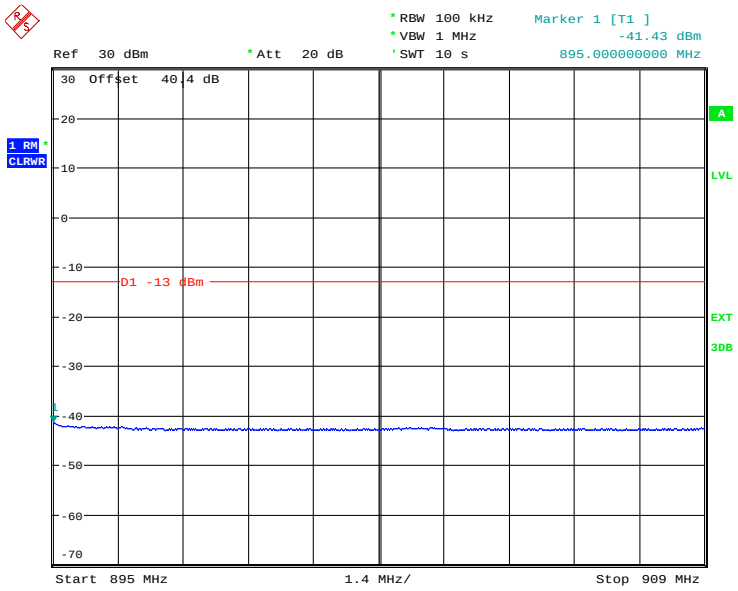

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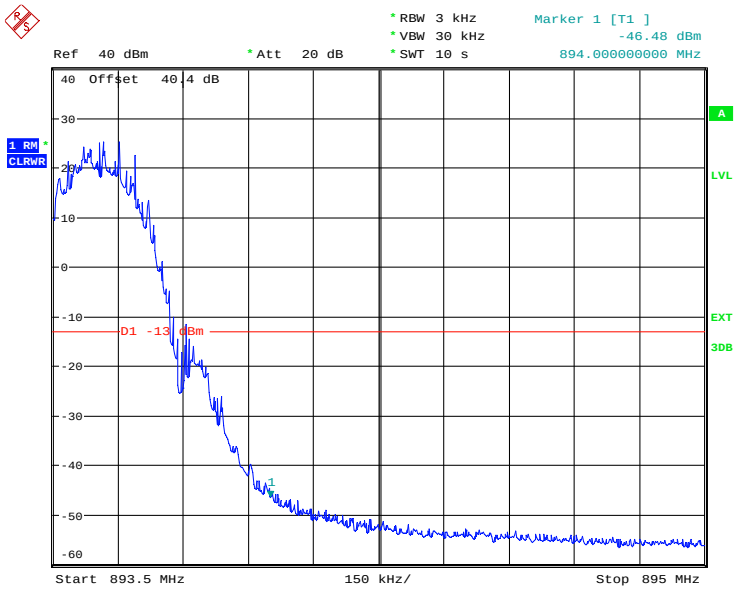
Product Service

32QAM



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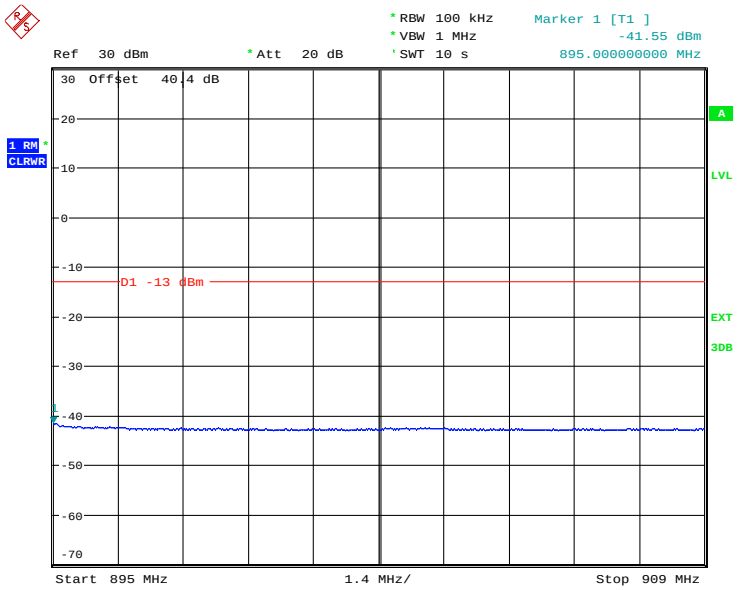

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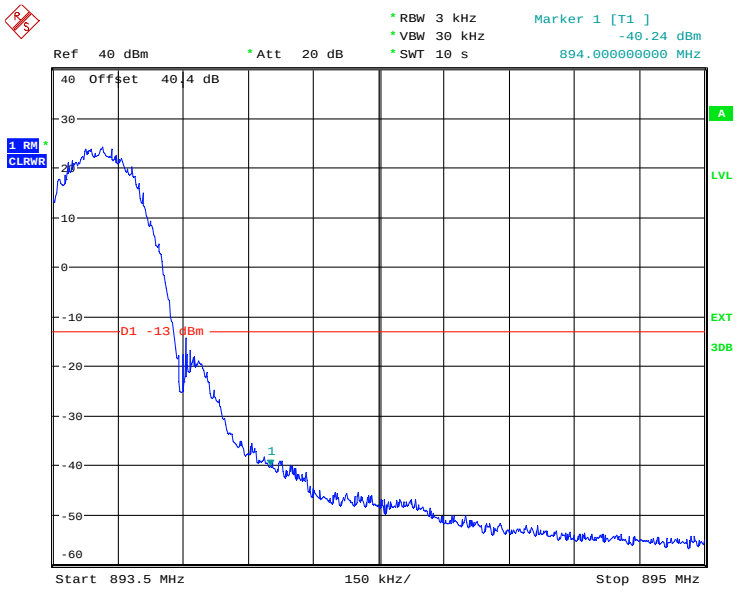
AQPSK



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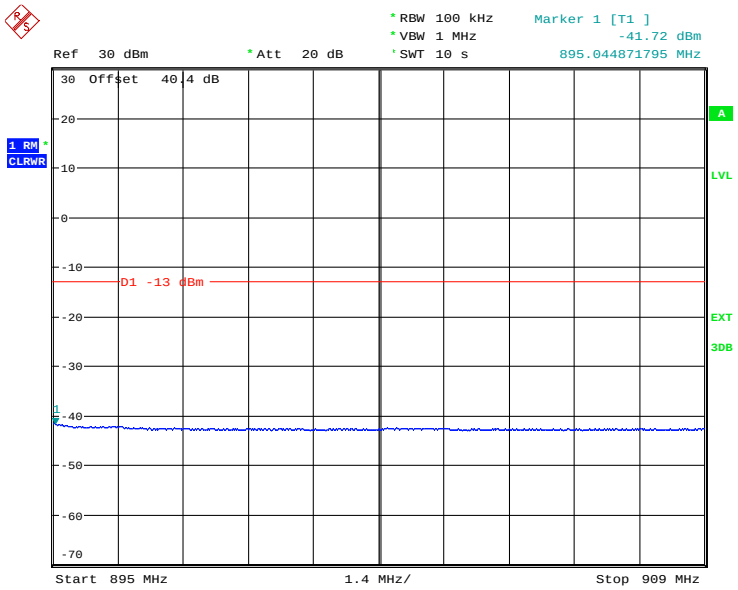


Date: 24.MAY.2012 10:29:21

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 4.5.1

2.6.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB4L809633

2.6.3 Date of Test and Modification State

08 and 09 March 2012 – 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:

$E_{(v/m)}=(30 \times 1.64 \times 5.32)^{0.5} / 3 = 5.393V/m = 134.6dB\mu V/m$

As per FCC Part 22 clause 22.917(a) and RSS-132 Clause 4.5.1 the spurious emission must be attenuated by 43 + 10log (P_o) dB this gives:

43 + 10log(5.32) = 50.2dB

Therefore the limit at 3m measurement distance is:

134.6 – 50.2 = 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 1 - Mode 2
Configuration 2 - Mode 1
- Mode 2
- Mode 3
Configuration 3 - Mode 2

2.6.6 Environmental Conditions

	07 March 2012	08 March 2012
Ambient Temperature	22.3°C	20.5°C
Relative Humidity	20.2%	28.3%

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 1 - Mode 1

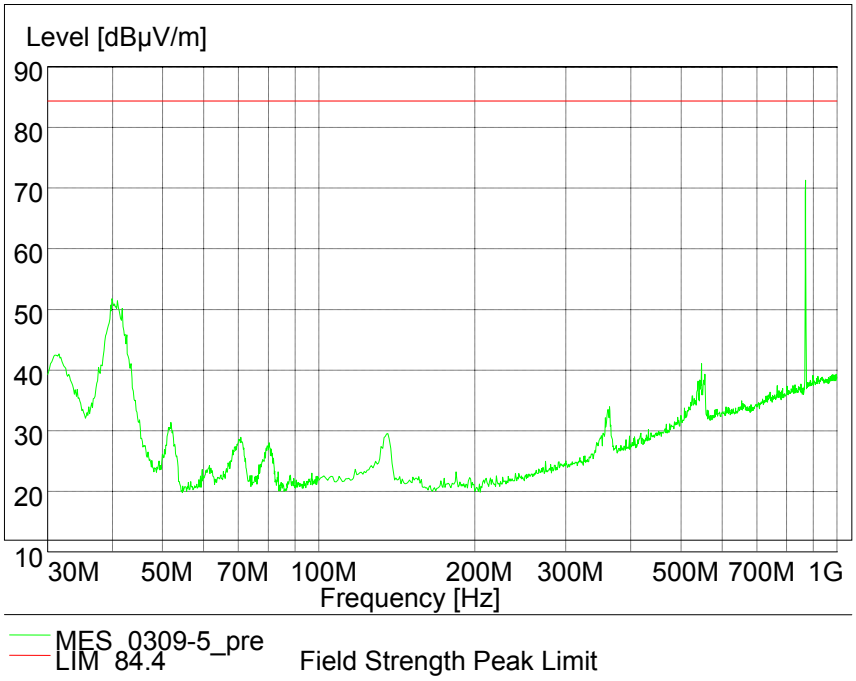
32QAM

No emissions were detected within 20dB of the limit.

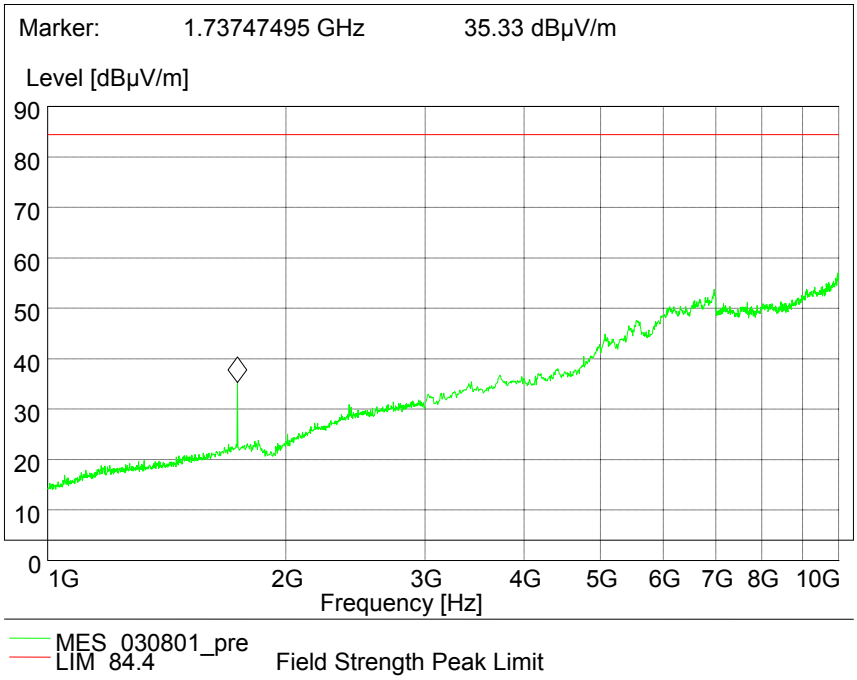
Configuration 2 - Mode 1

32QAM

30MHz – 1GHz



1GHz – 10GHz



Configuration 2 - Mode 2

GMSK and 8-PSK and 16QAM and 32QAM and AQPSK

No emissions were detected within 20dB of the limit.

Configuration 2 - Mode 3

32QAM

No emissions were detected within 20dB of the limit.

Configuration 3 - Mode 1

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 4.5.1

2.7.2 Equipment Under Test

RUG 11 B5 / KRC 161 194/1, S/N: CB4L809633

2.7.3 Date of Test and Modification State

01, 02 March and 10, 24 May 2012 – 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, 32QAM and AQPSK modulation types. TCC was found to be representative for all configurations when several configurations were tested to found the worst case configuration. The resolution was set to 1MHz for 9kHz to 10GHz as the worst case thus meeting the requirements of FCC Part 22 clause 22.917(b) and RSS-132 clause 4.5.1. The spectrum analyser detector was set to peak and trace was kept on Max Hold.

The testing was performed on UC, TCC and HC configurations, and only test plots for TCC and HC configurations were shown as the worst case.

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 2 - Mode 1
- Mode 2
- Mode 3

Configuration 3 - Mode 8
- Mode 9

Product Service

2.7.6 Environmental Conditions

	01 March 2012	02 March 2012	10 May 2012	24 May 2012
Ambient Temperature	24.5°C	24.0°C	26.8°C	25.2°C
Relative Humidity	34.0%	36.0%	37.2%	48.0%

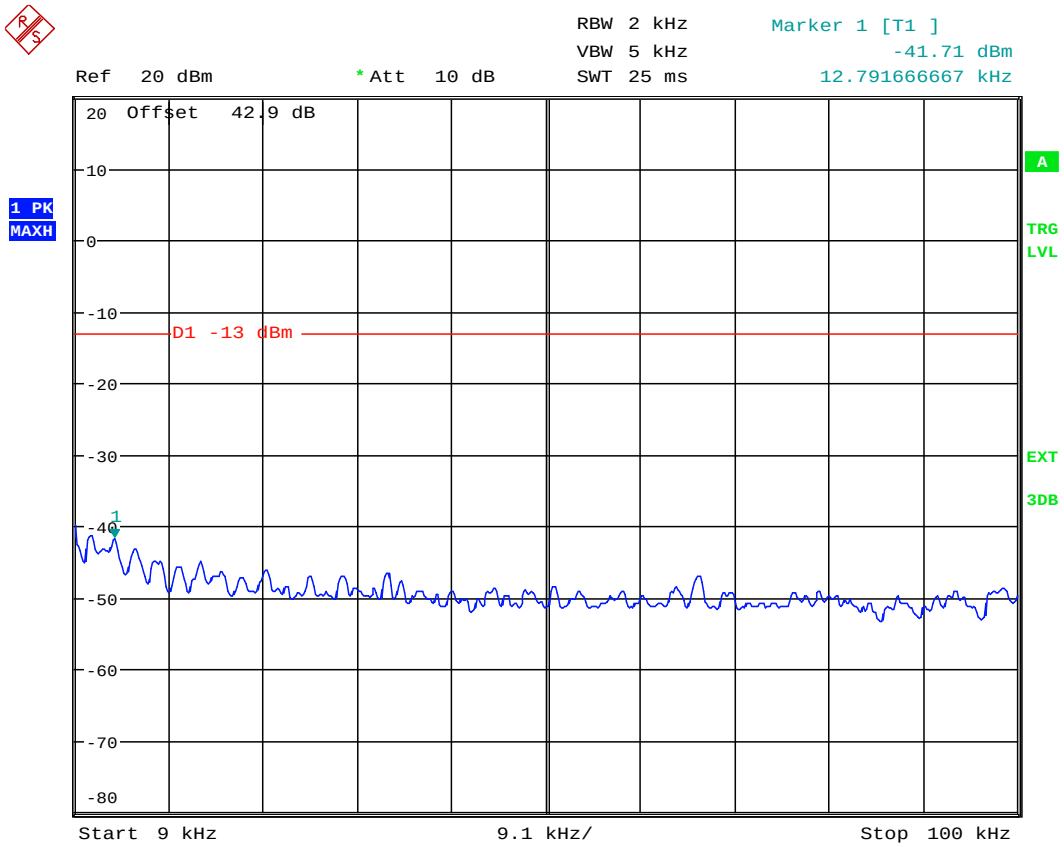
2.7.7 Test Results

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.

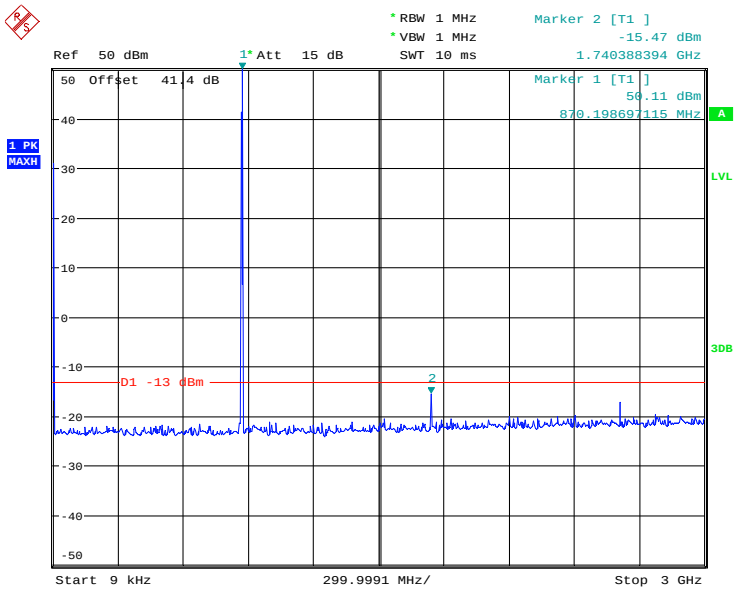


Product Service

GMSK

Configuration 2 - Mode 1

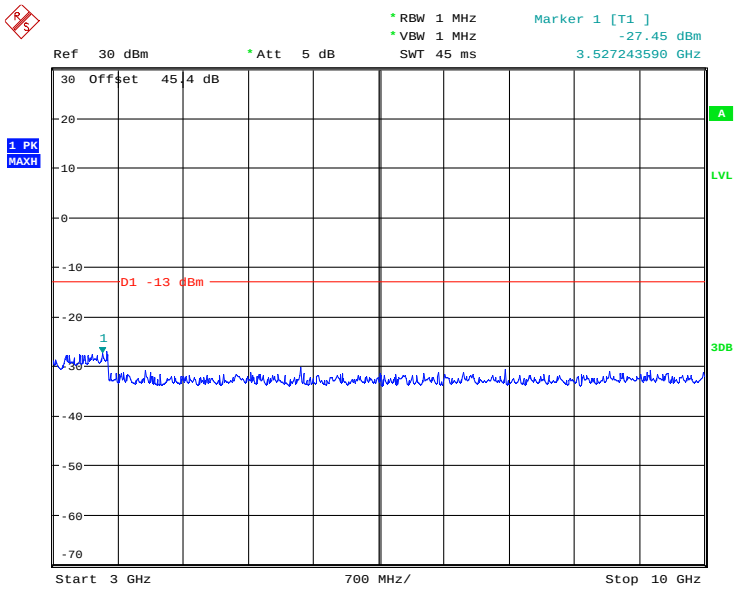
9kHz to 3GHz



Date: 20.MAR.2012 16:19:44

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

3GHz to 10GHz

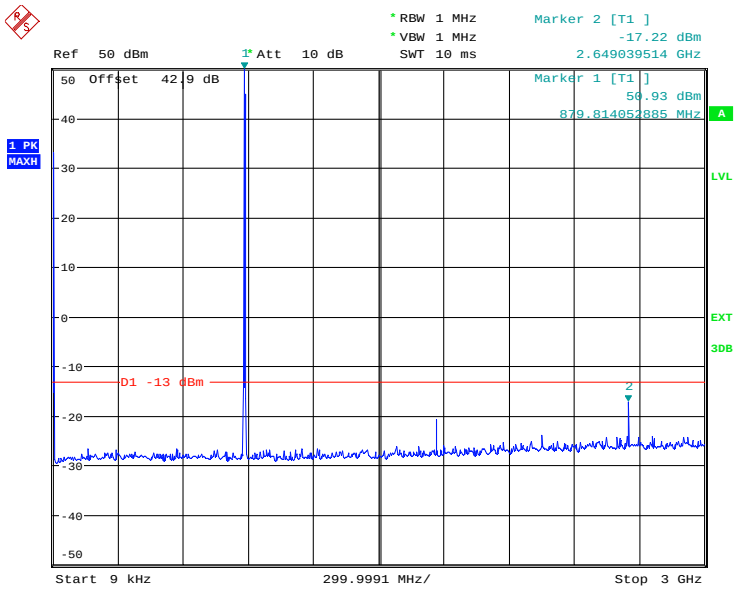


Date: 20.MAR.2012 16:31:35

Product Service

Configuration 2 - Mode 2

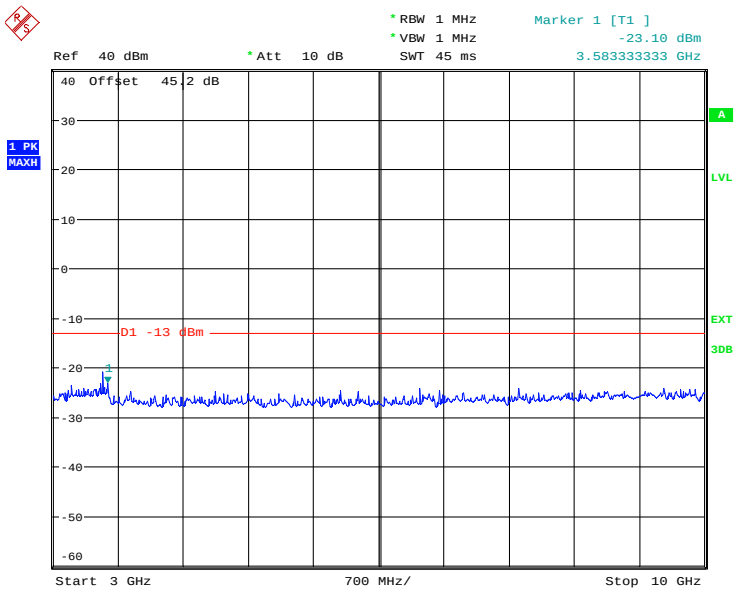
9kHz to 3GHz



Date: 2.MAR.2012 08:36:24

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

3GHz to 10GHz

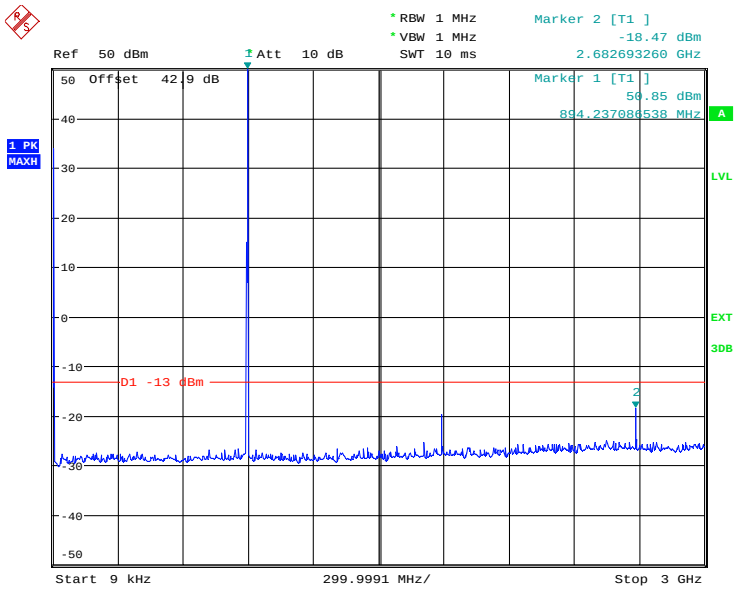


Date: 2.MAR.2012 08:37:10

Product Service

Configuration 2 - Mode 3

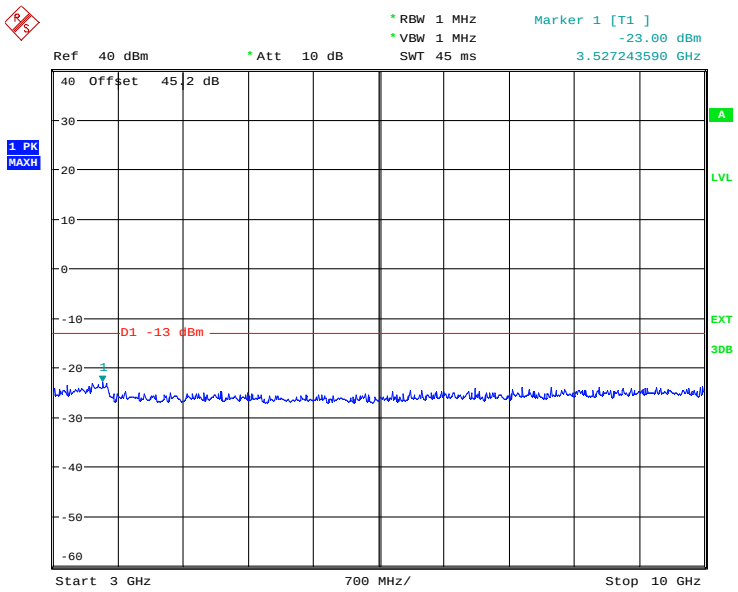
9kHz to 3GHz



Date: 2.MAR.2012 09:01:49

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

3GHz to 10GHz



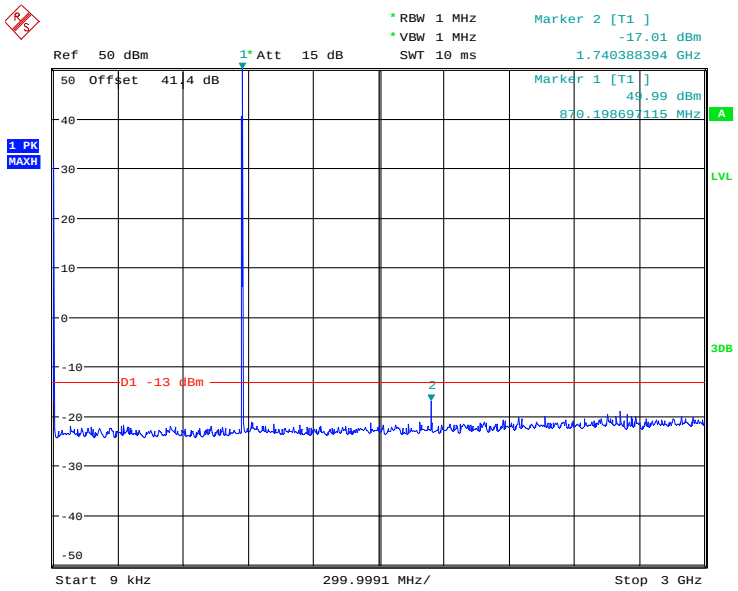
Date: 2.MAR.2012 08:58:58

Product Service

8-PSK

Configuration 2 - Mode 1

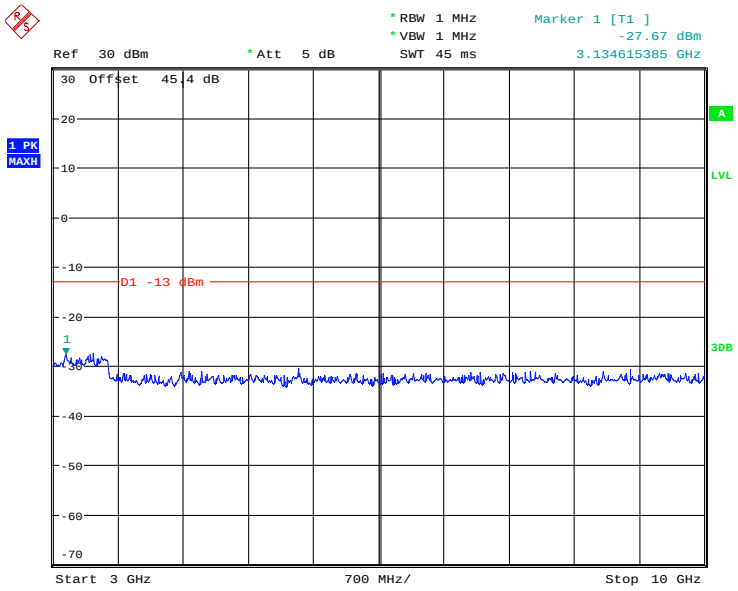
9kHz to 3GHz



Date: 20.MAR.2012 16:21:24

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

3GHz to 10GHz

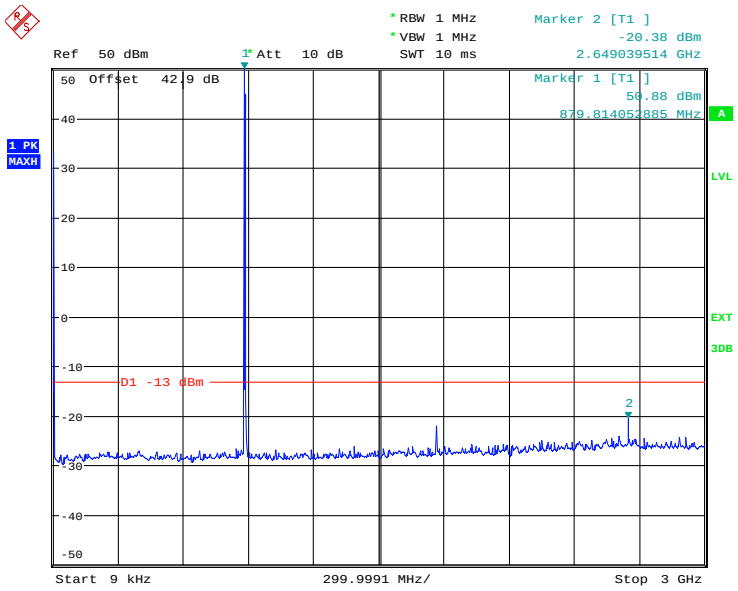


Date: 20.MAR.2012 16:30:35

Product Service

Configuration 2 - Mode 2

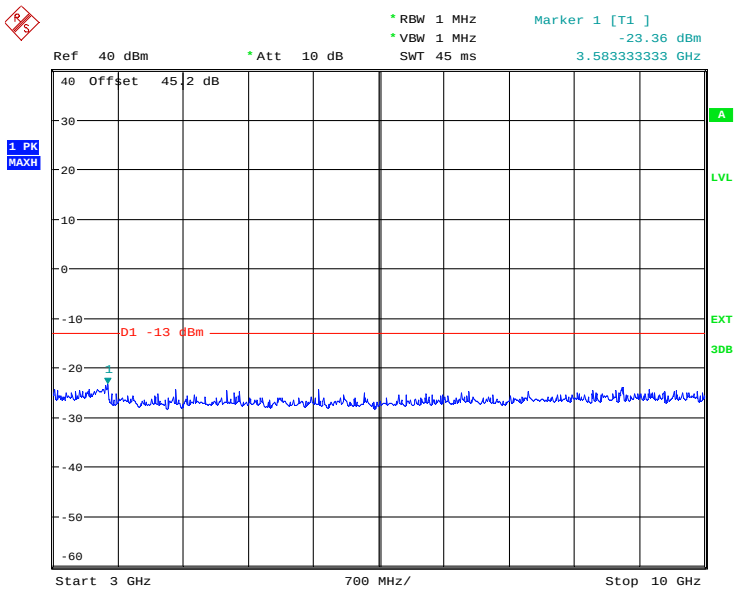
9kHz to 3GHz



Date: 2.MAR.2012 08:39:31

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

3GHz to 10GHz

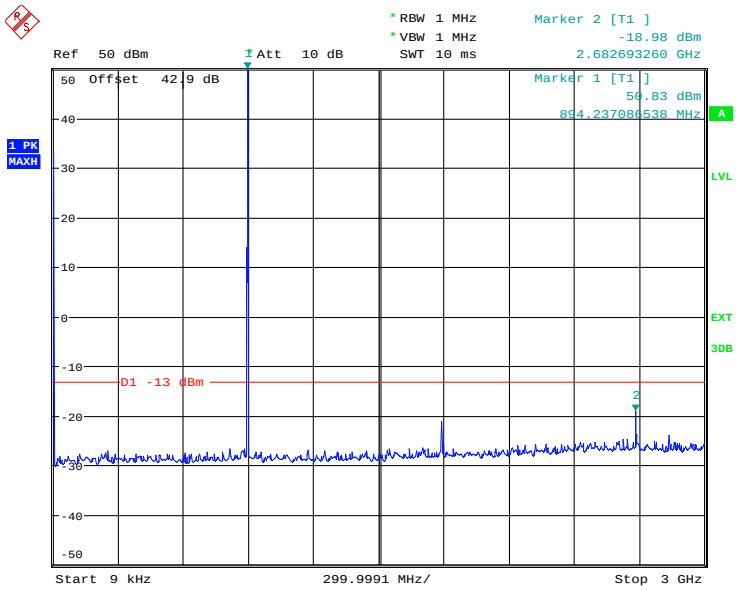


Date: 2.MAR.2012 08:38:32

Product Service

Configuration 2 - Mode 3

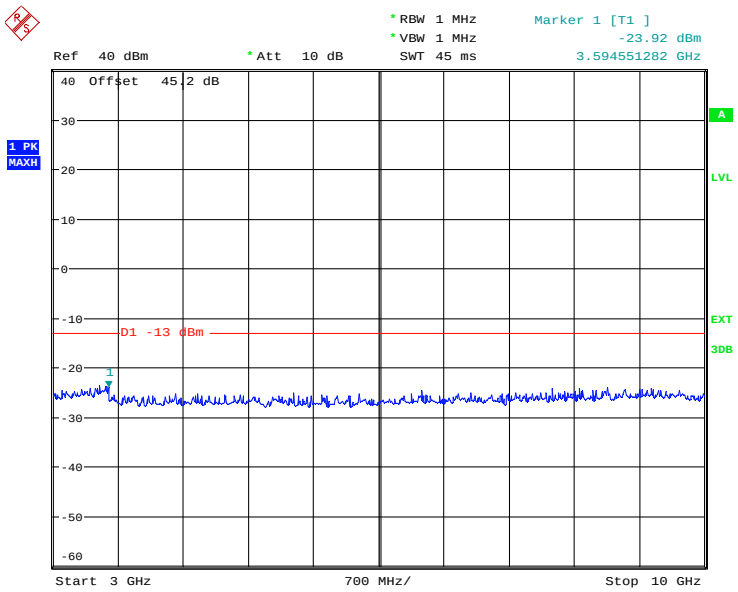
9kHz to 3GHz



Date: 2.MAR.2012 08:56:21

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

3GHz to 10GHz



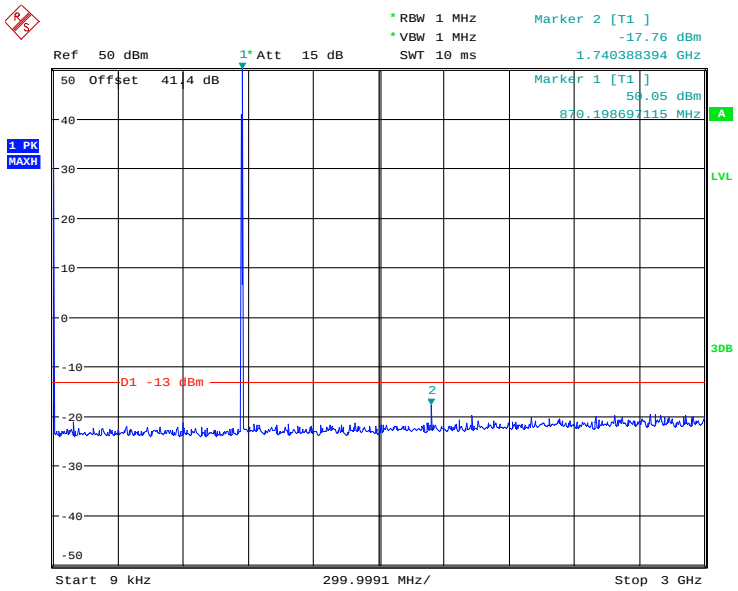
Date: 2.MAR.2012 08:57:33

Product Service

16QAM

Configuration 2 - Mode 1

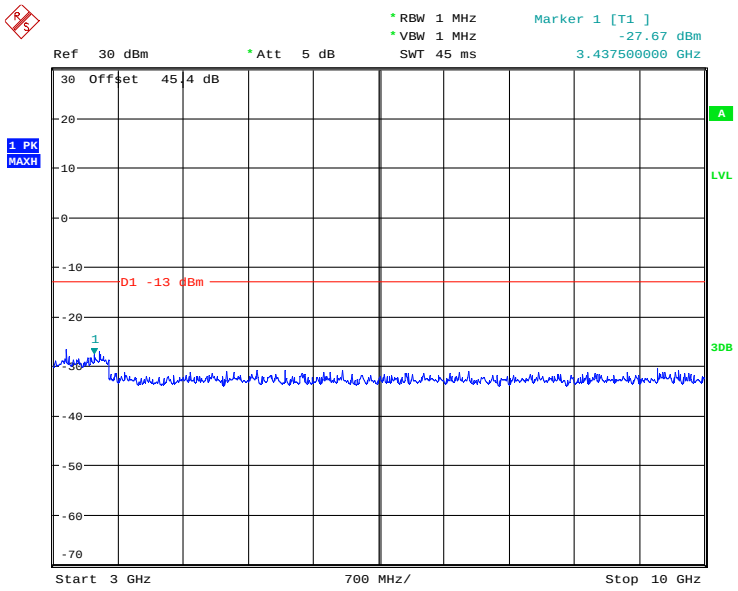
9kHz to 3GHz



Date: 20.MAR.2012 16:23:01

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

3GHz to 10GHz

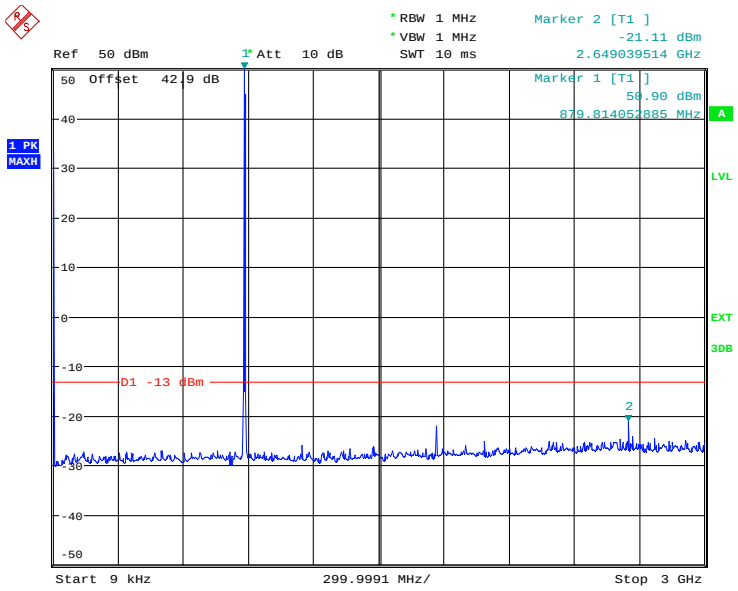


Date: 20.MAR.2012 16:29:14

Product Service

Configuration 2 - Mode 2

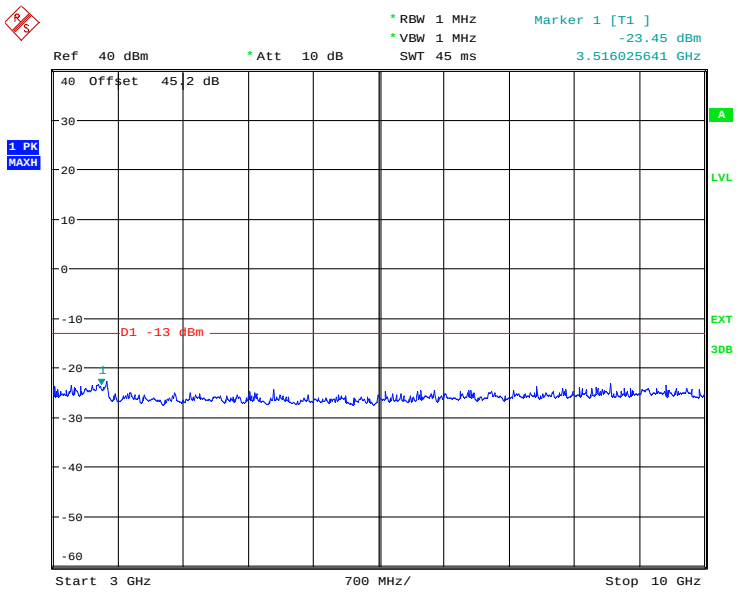
9kHz to 3GHz



Date: 2.MAR.2012 08:41:15

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

3GHz to 10GHz

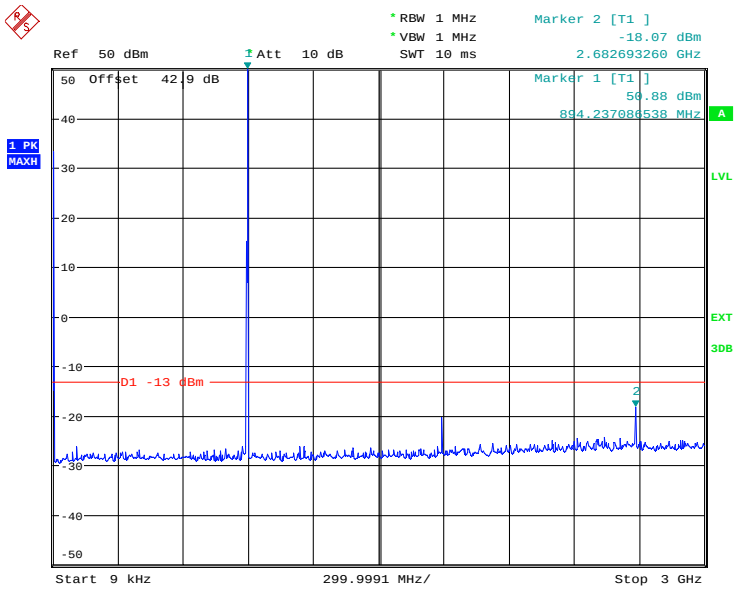


Date: 2.MAR.2012 08:42:45

Product Service

Configuration 2 - Mode 3

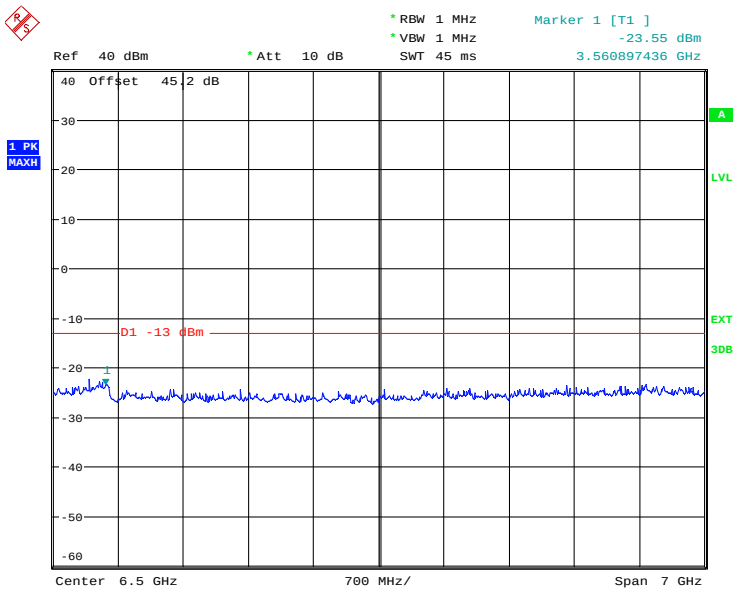
9kHz to 3GHz



Date: 2.MAR.2012 08:55:02

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

3GHz to 10GHz



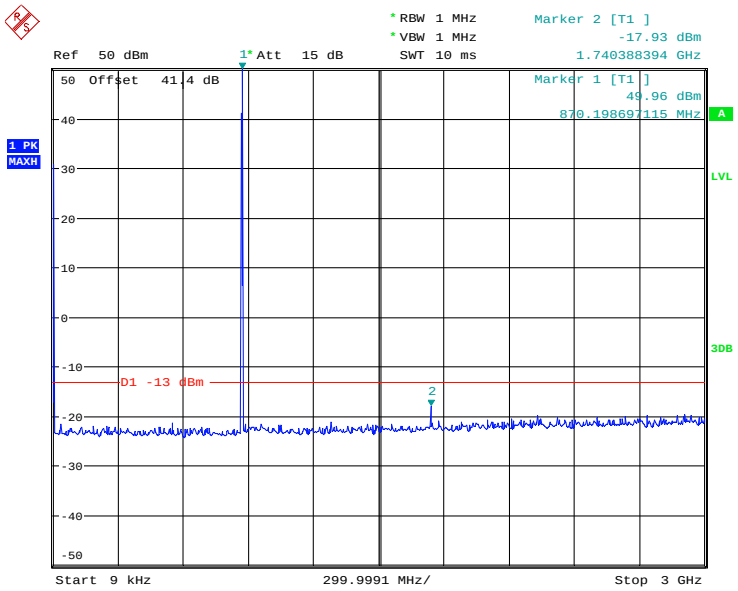
Date: 2.MAR.2012 08:54:07

Product Service

32QAM

Configuration 2 - Mode 1

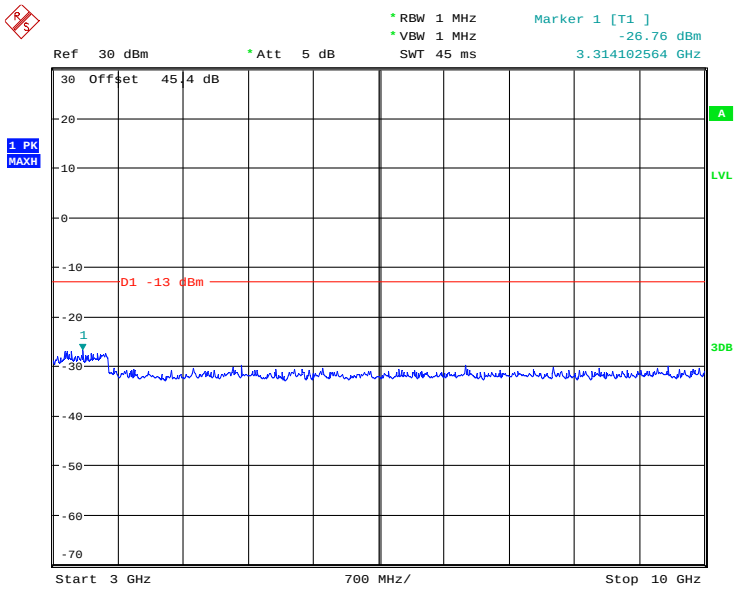
9kHz to 3GHz



Date: 20.MAR.2012 16:25:16

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

3GHz to 10GHz

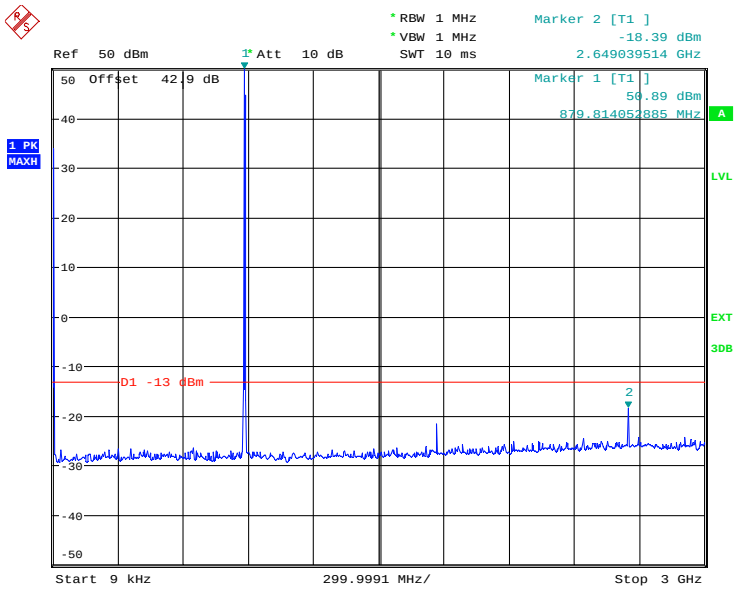


Date: 20.MAR.2012 16:28:00

Product Service

Configuration 2 - Mode 2

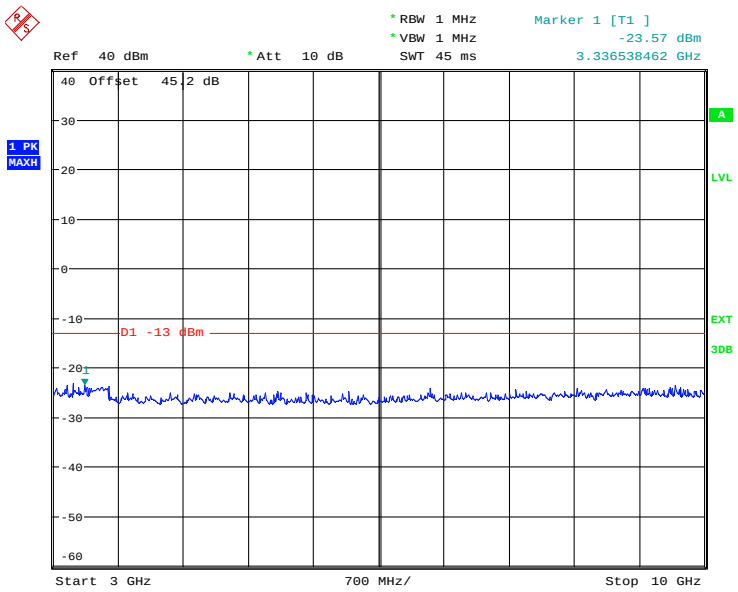
9kHz to 3GHz



Date: 2.MAR.2012 08:46:26

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

3GHz to 10GHz

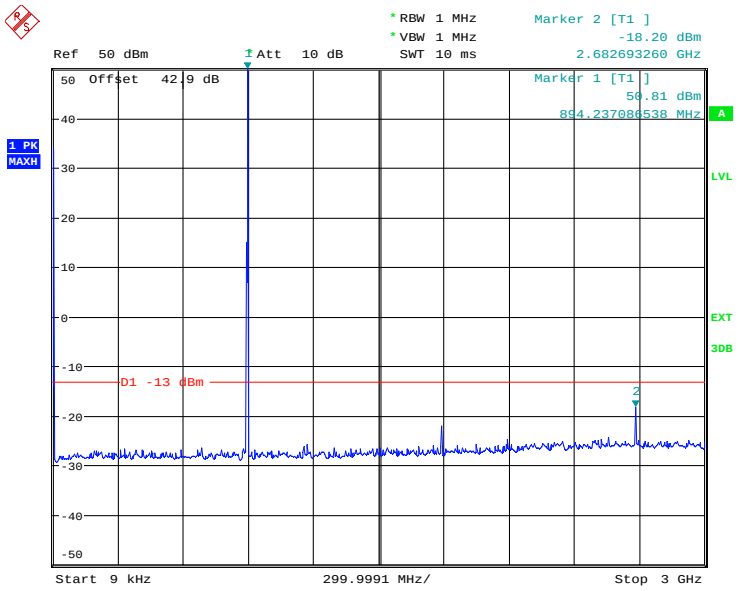


Date: 2.MAR.2012 08:44:41

Product Service

Configuration 2 - Mode 3

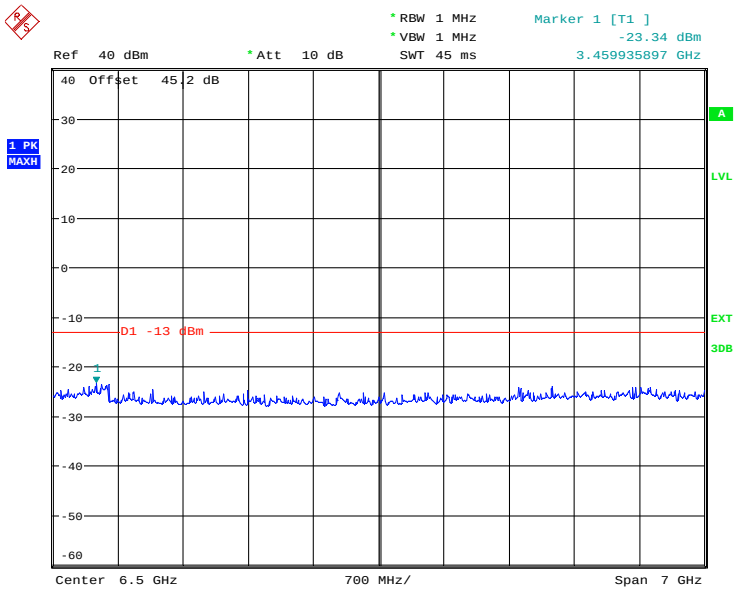
9kHz to 3GHz



Date: 2.MAR.2012 08:47:53

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

3GHz to 10GHz



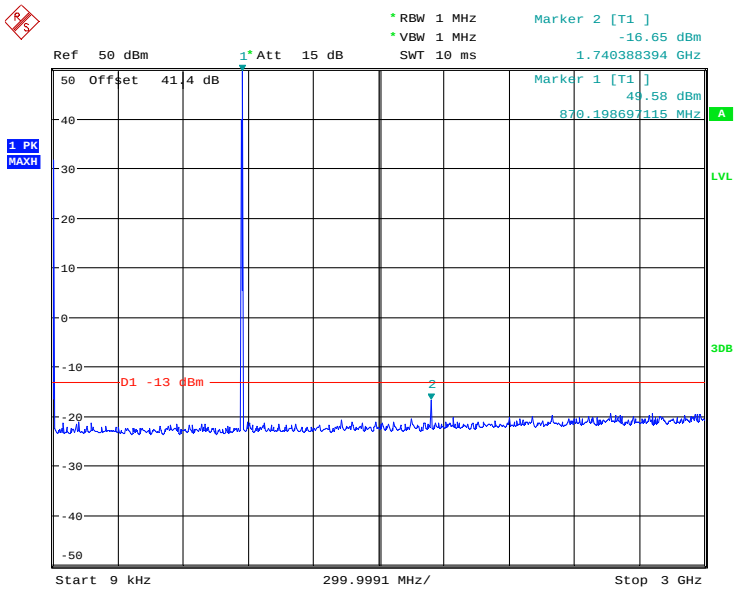
Date: 2.MAR.2012 08:52:26

Product Service

AQPSK

Configuration 2 - Mode 1

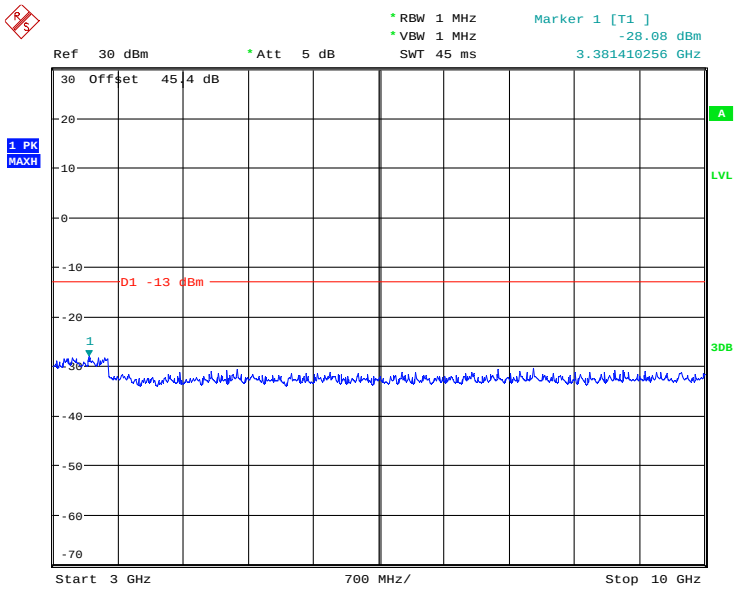
9kHz to 3GHz



Date: 20.MAR.2012 15:22:47

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

3GHz to 10GHz

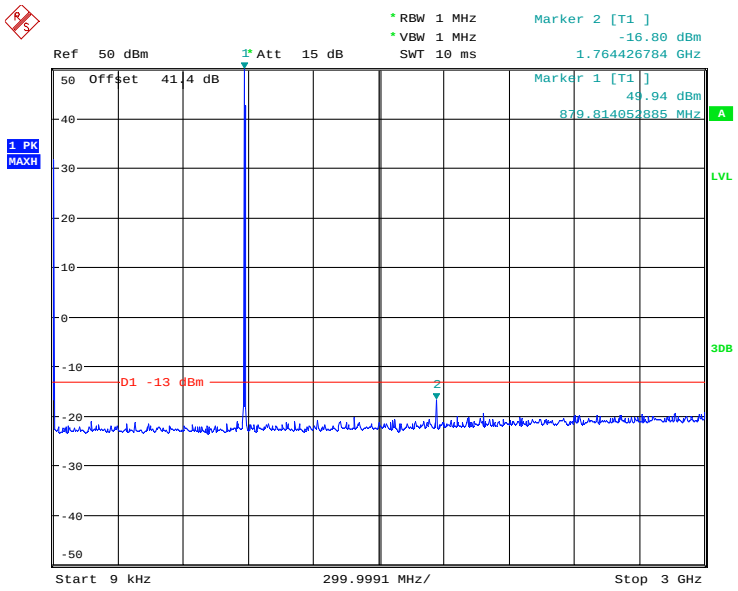


Date: 20.MAR.2012 15:34:36

Product Service

Configuration 2 - Mode 2

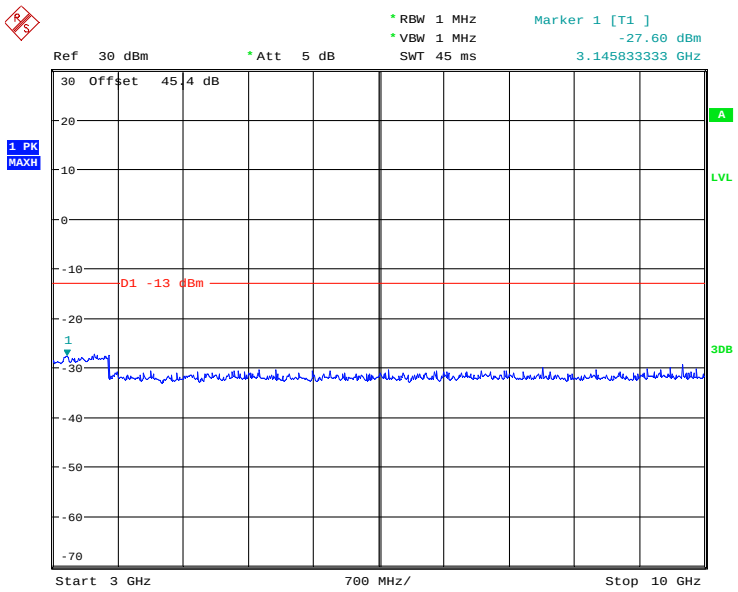
9kHz to 3GHz



Date: 20.MAR.2012 15:26:22

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

3GHz to 10GHz

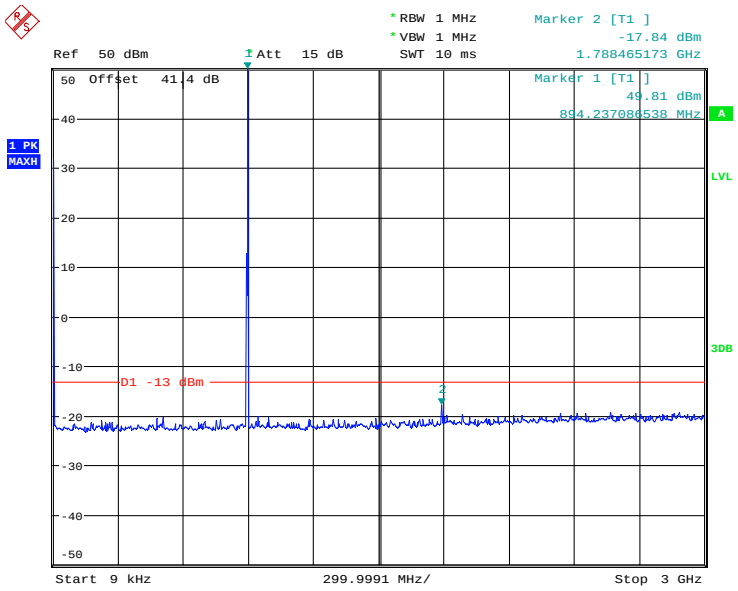


Date: 20.MAR.2012 15:33:20

Product Service

Configuration 2 - Mode 3

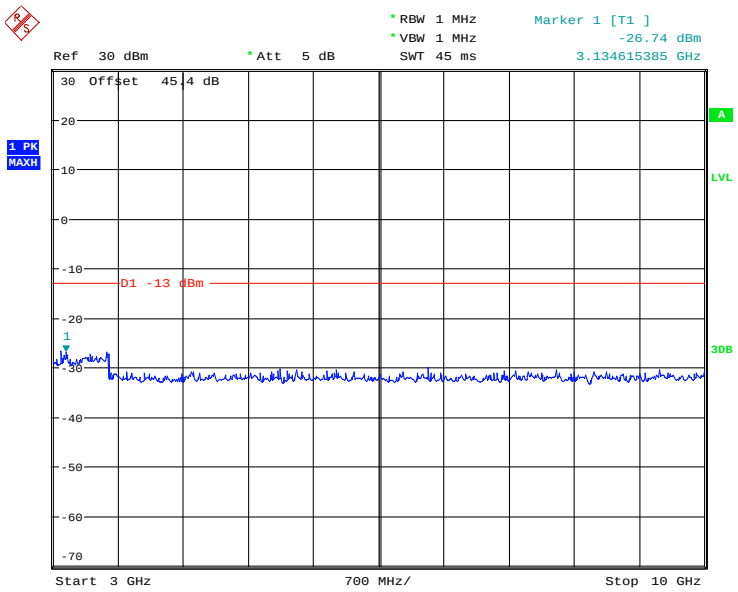
9kHz to 3GHz



Date: 20.MAR.2012 15:29:34

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

3GHz to 10GHz



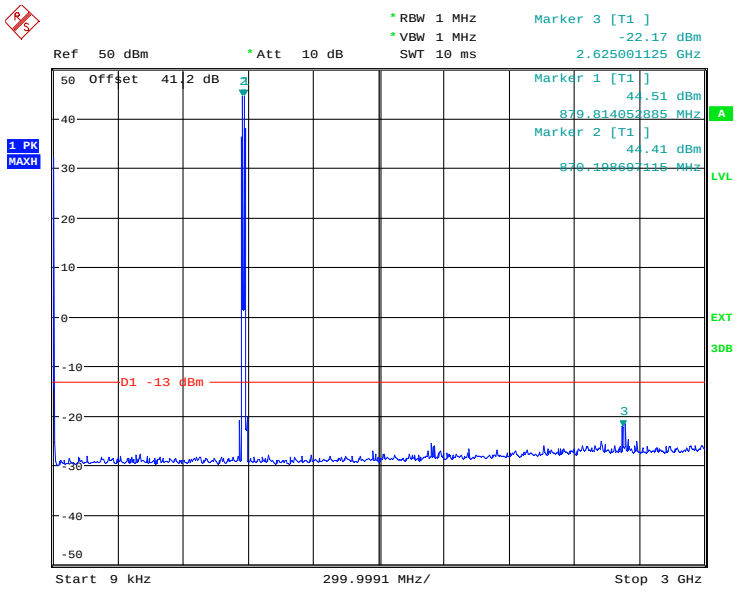
Date: 20.MAR.2012 15:31:49

Product Service

GMSK

Configuration 3 - Mode 8

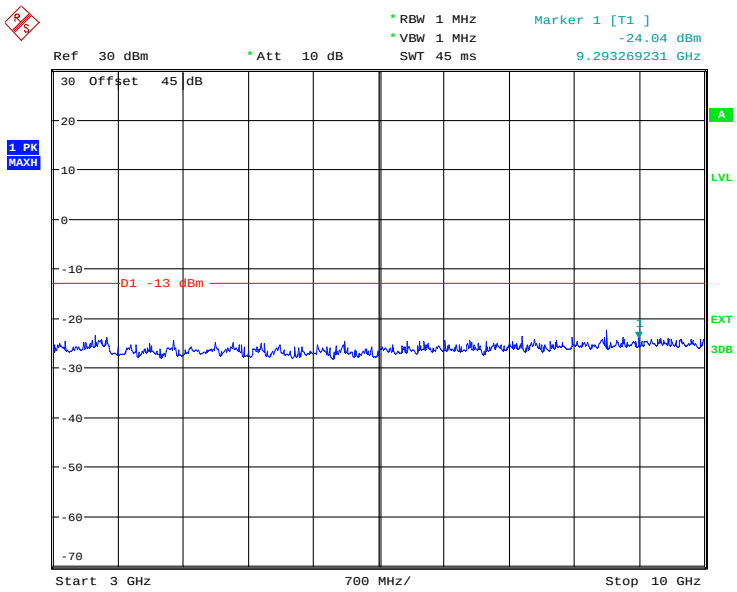
9kHz to 3GHz



Date: 24.MAY.2012 08:52:09

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz

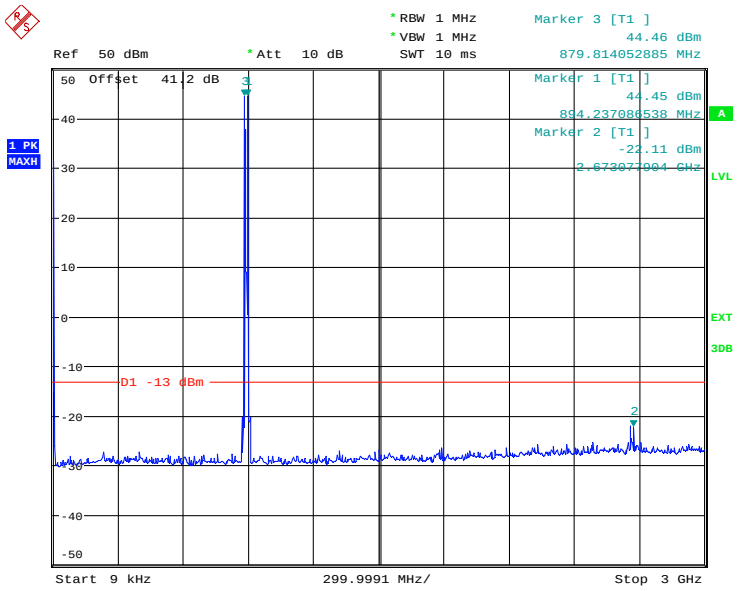


Date: 24.MAY.2012 08:49:48

Product Service

Configuration 3 - Mode 9

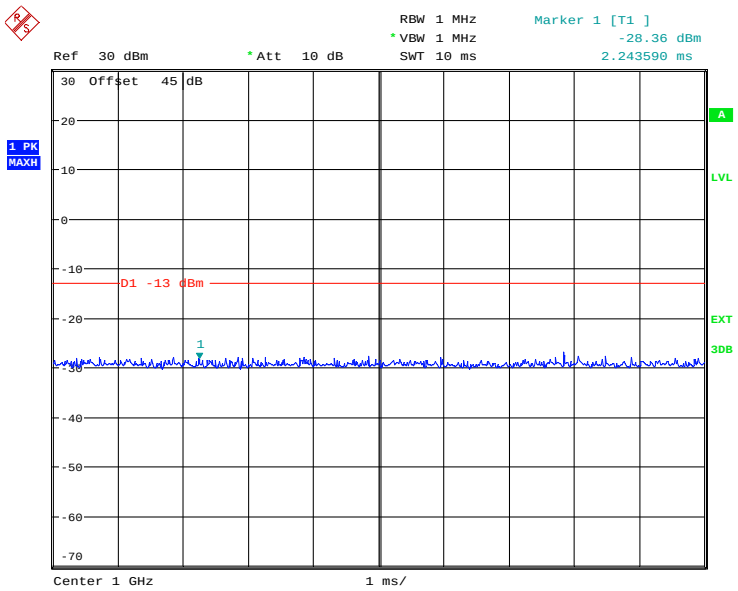
9kHz to 3GHz



Date: 24.MAY.2012 08:15:30

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz



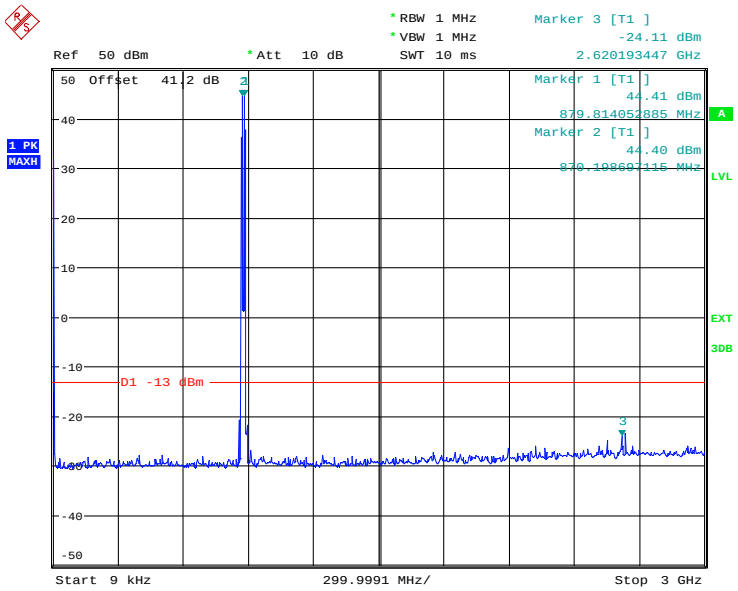
Date: 24.MAY.2012 08:17:31

Product Service

8-PSK

Configuration 3 - Mode 8

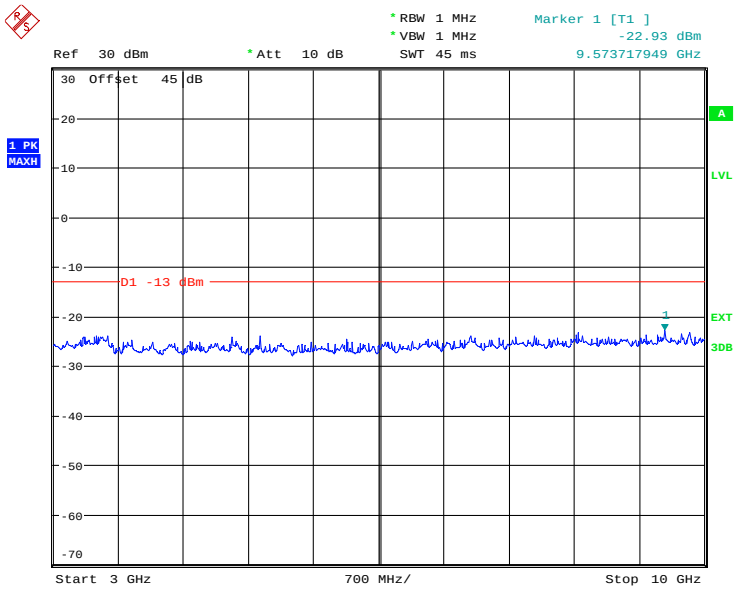
9kHz to 3GHz



Date: 24.MAY.2012 08:45:16

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz

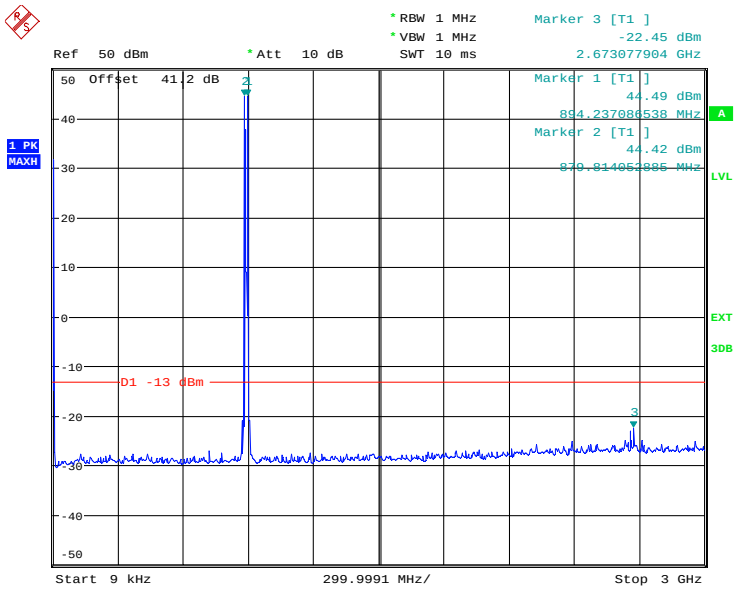


Date: 24.MAY.2012 08:46:47

Product Service

Configuration 3 - Mode 9

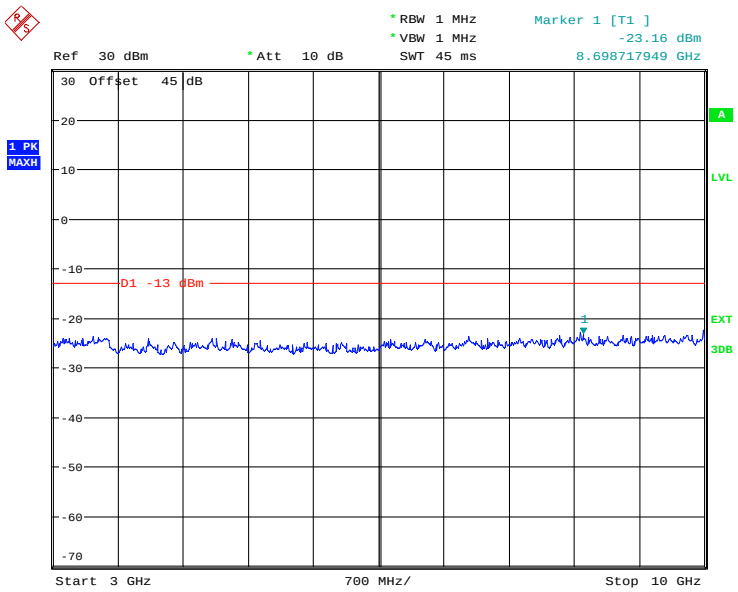
9kHz to 3GHz



Date: 24.MAY.2012 08:30:37

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz

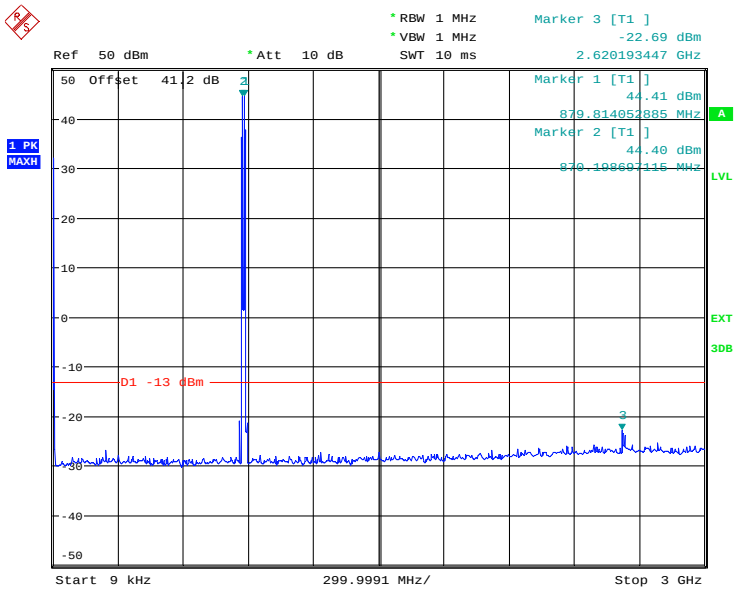


Date: 24.MAY.2012 08:28:53

16QAM

Configuration 3 - Mode 8

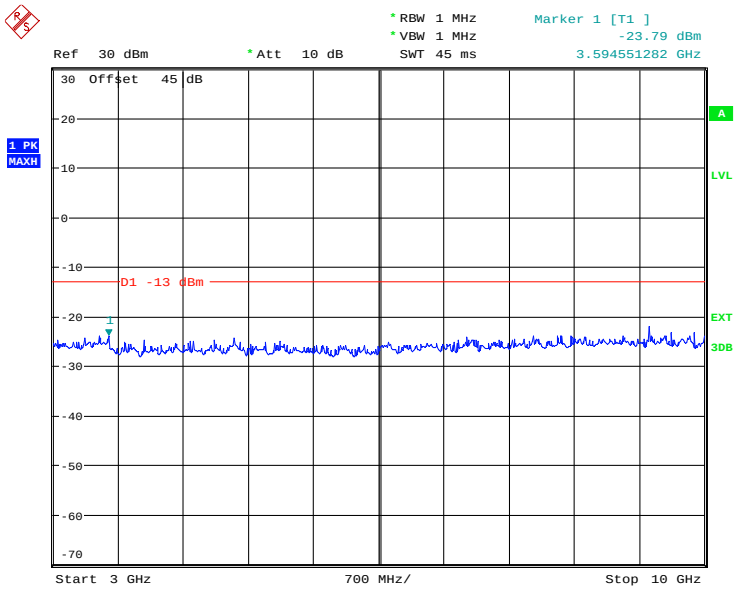
9kHz to 3GHz



Date: 24.MAY.2012 08:43:31

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz

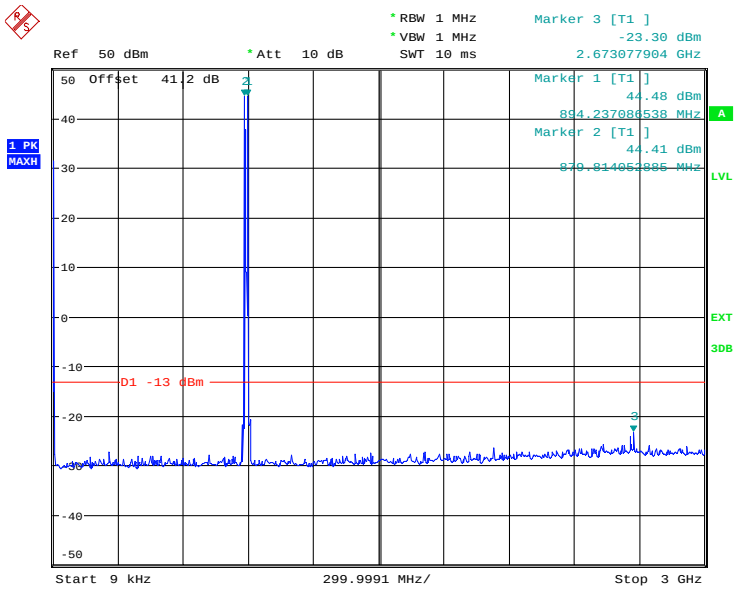


Date: 24.MAY.2012 08:41:41

Product Service

Configuration 3 - Mode 9

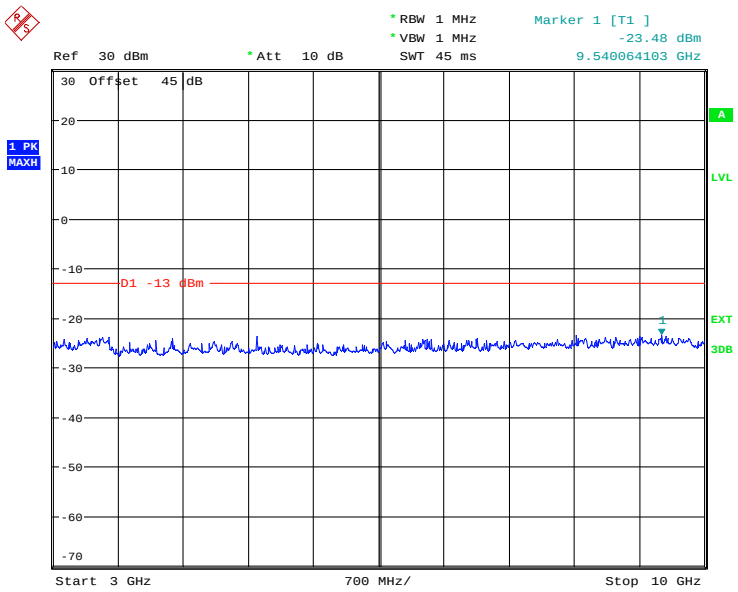
9kHz to 3GHz



Date: 24.MAY.2012 08:31:58

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz



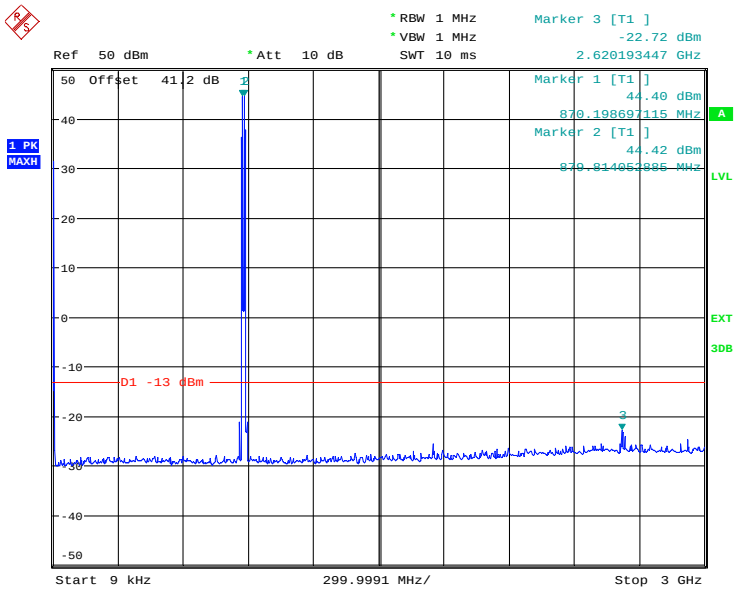
Date: 24.MAY.2012 08:33:17

Product Service

32QAM

Configuration 3 - Mode 8

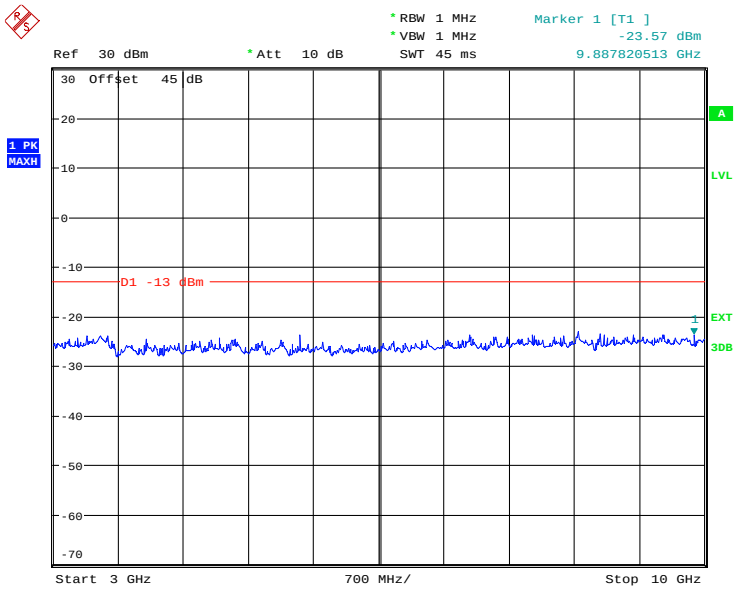
9kHz to 3GHz



Date: 24.MAY.2012 08:38:19

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz

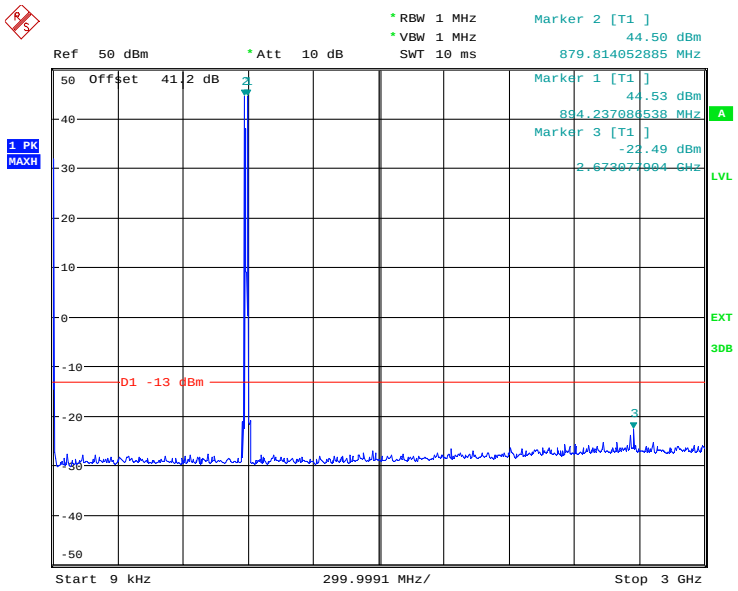


Date: 24.MAY.2012 08:40:19

Product Service

Configuration 3 - Mode 9

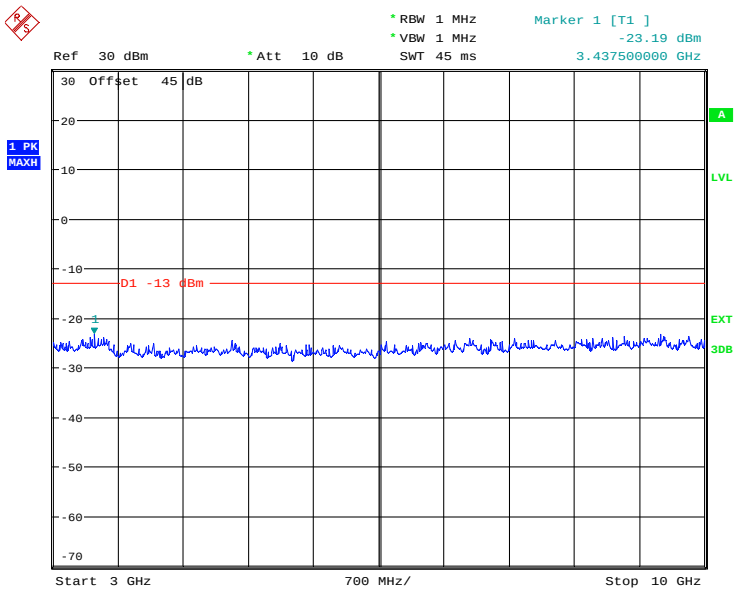
9kHz to 3GHz



Date: 24.MAY.2012 08:36:22

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz



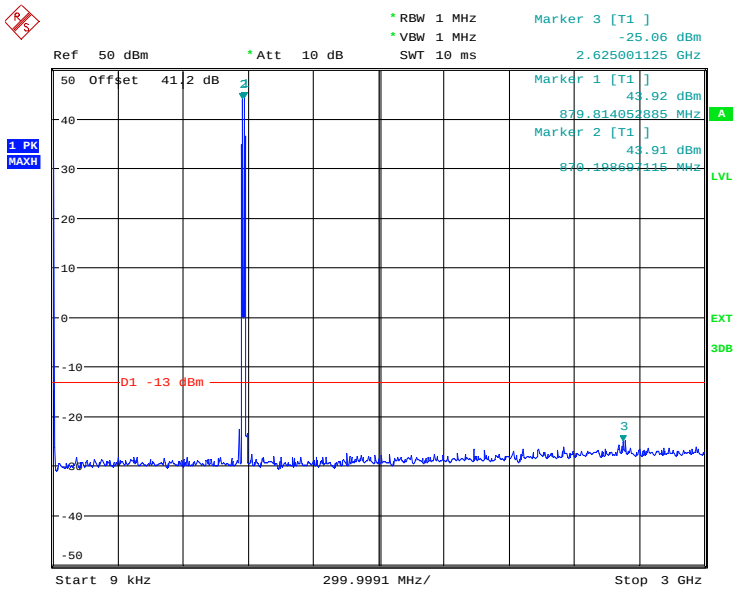
Date: 24.MAY.2012 08:35:07

Product Service

AQPSK

Configuration 3 - Mode 8

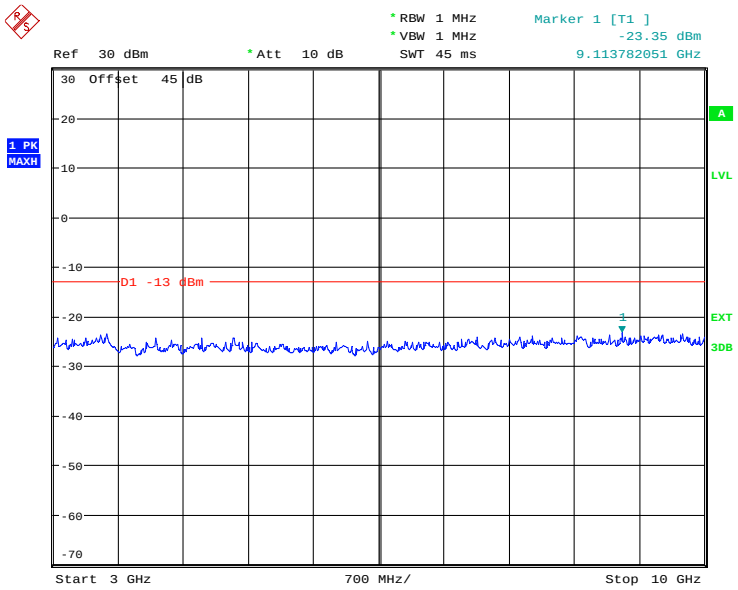
9kHz to 3GHz



Date: 24.MAY.2012 08:56:38

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz

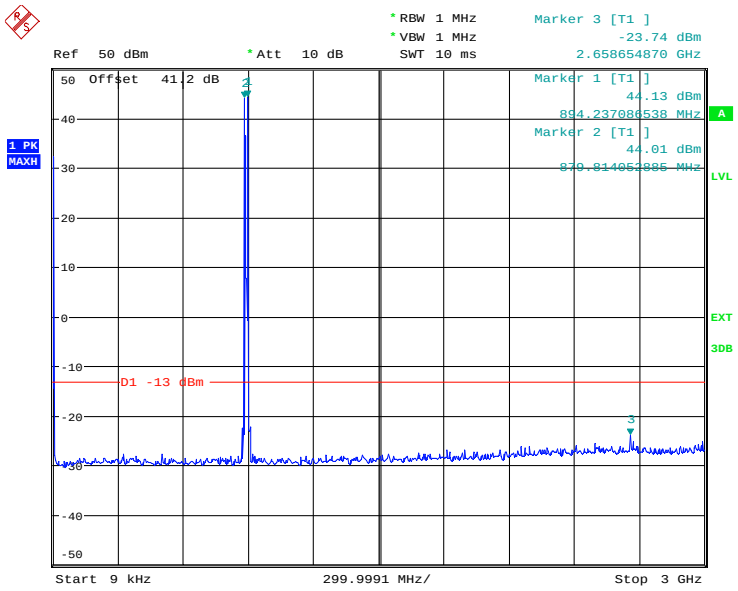


Date: 24.MAY.2012 08:59:50

Product Service

Configuration 3 - Mode 9

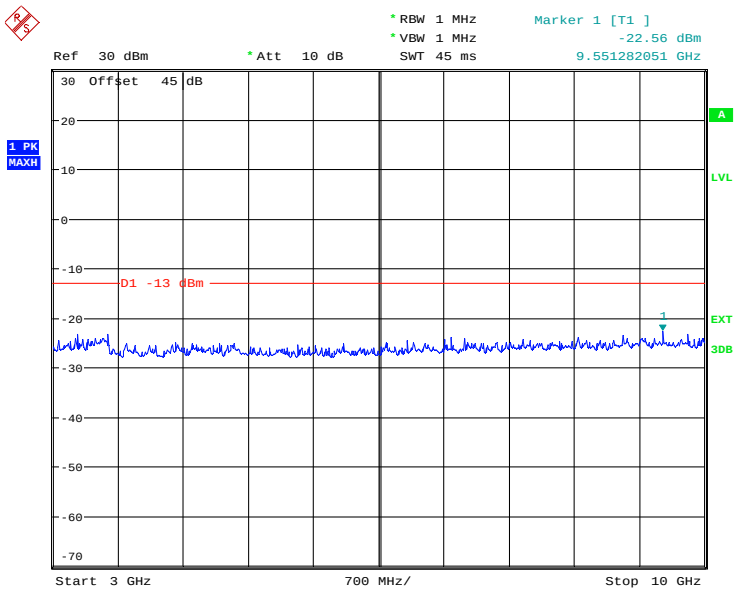
9kHz to 3GHz



Date: 24.MAY.2012 09:03:05

Note: The emissions beyond the limit are the operating frequencies.

3GHz to 10GHz



Date: 24.MAY.2012 09:01:49

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: CB4L809633

2.8.3 Date of Test and Modification State

06 and 07 March 2012 – 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

	06 March 2012	07 March 2012
Ambient Temperature	23.7°C	24.2°C
Relative Humidity	22.0%	20.8%

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	3.37
-20	3.08
-10	2.18
0	-2.25
+10	2.34
+20	**4.02**
+30	-2.98
+40	-3.22
+50	-2.58

8-PSK

Temperature Interval (ºC)	Deviation (Hz)
-30	2.69
-20	2.74
-10	-2.21
0	-2.69
+10	-3.06
+20	**4.82**
+30	-2.57
+40	-3.07
+50	-2.97

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: CB4L809633

2.9.3 Date of Test and Modification State

07 March 2012 – 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

	07 March 2012
Ambient Temperature	24.2°C
Relative Humidity	20.8%

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	5.14
-48.0	**4.02**
-55.2	4.85

8-PSK

DC Voltage (V)	Deviation (Hz)
-40.8	5.08
-48.0	**4.82**
-55.2	5.52

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: CB4L809633

2.10.3 Date of Test and Modification State

10 May 2012 – 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. GMSK was tested as the representative modulation. 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.

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 1
- Mode 2
- Mode 3

2.10.6 Environmental Conditions

	10 May 2012
Ambient Temperature	26.8°C
Relative Humidity	37.2%

Product Service

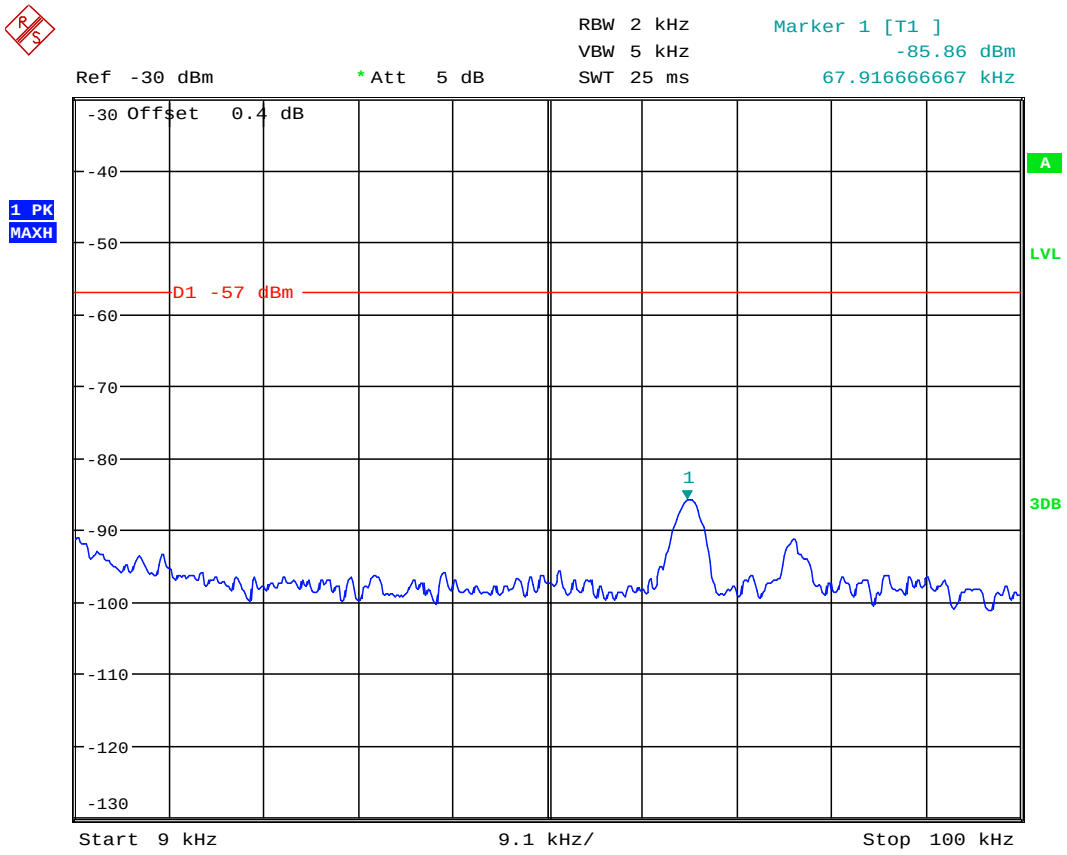
2.10.7 Test Results

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.



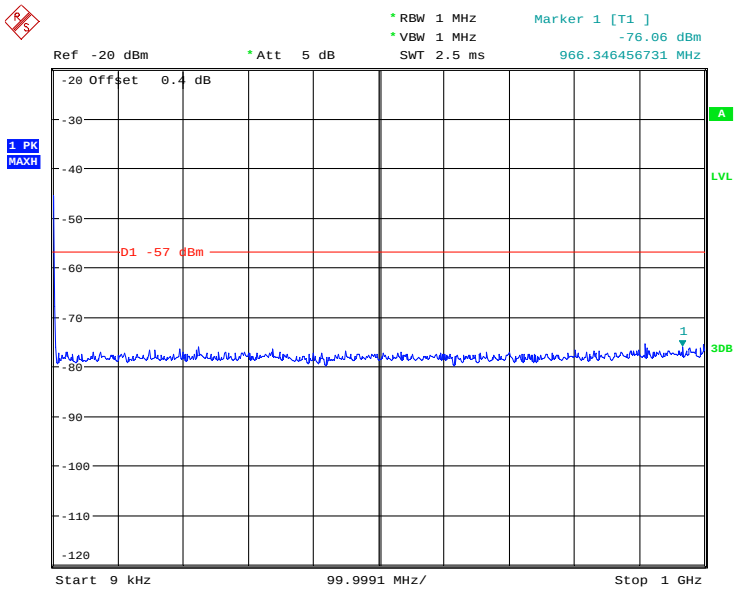
Date: 20.MAR.2012 18:24:27

Product Service

Configuration 3 - Mode 1

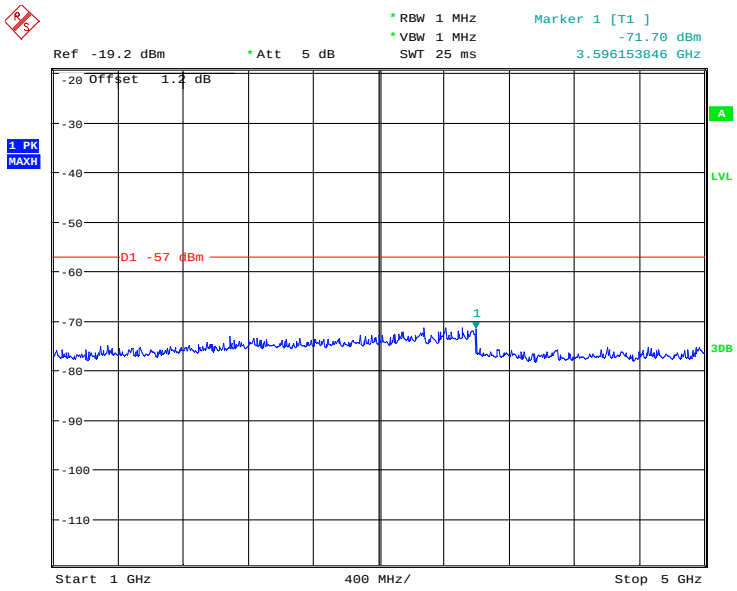
GMSK

9kHz to 1GHz



Date: 20.MAR.2012 17:51:23

1GHz to 5GHz



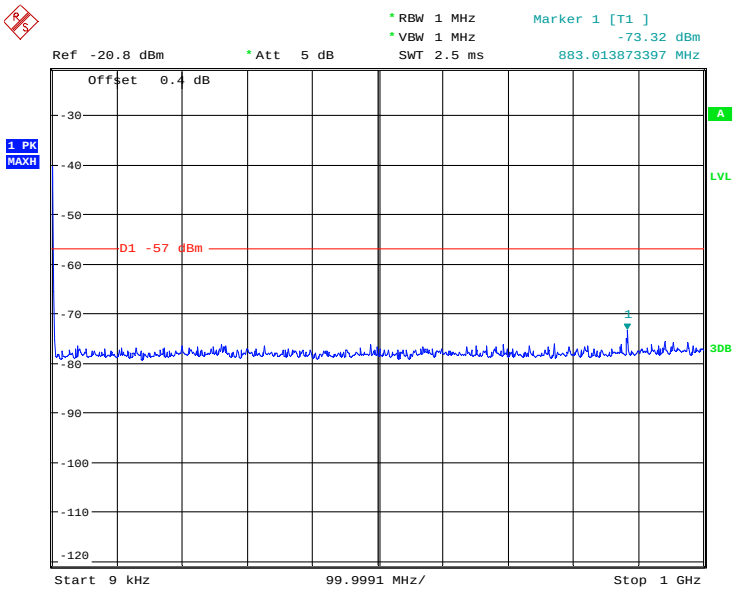
Date: 20.MAR.2012 17:52:54

Product Service

Configuration 3 - Mode 2

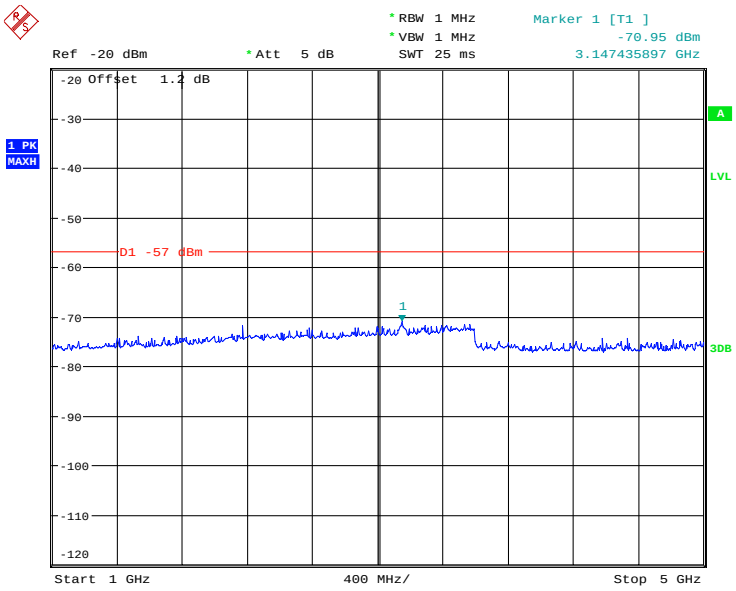
GMSK

9kHz to 1GHz



Date: 20.MAR.2012 17:59:29

1GHz to 5GHz



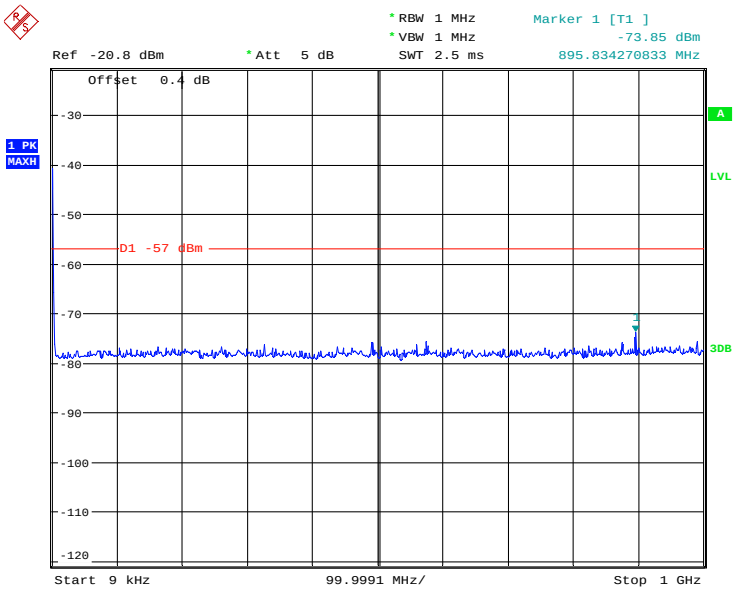
Date: 20.MAR.2012 17:58:20

Product Service

Configuration 3 - Mode 3

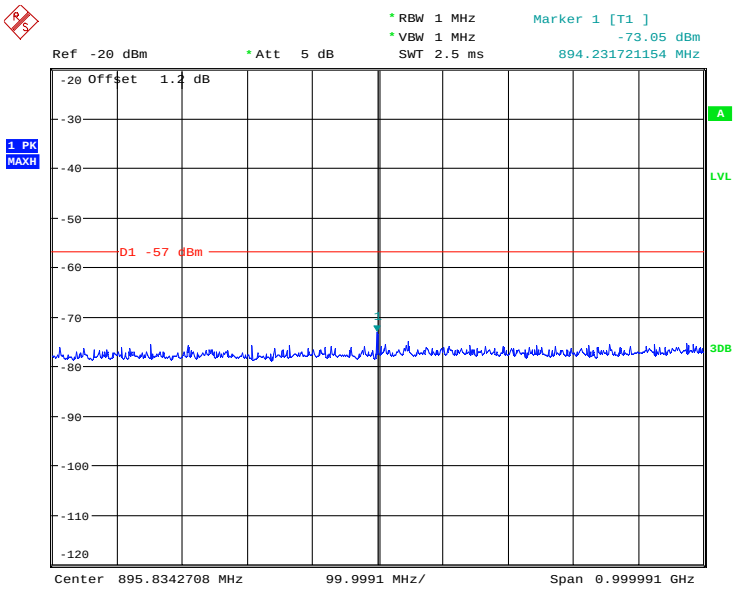
GMSK

9kHz to 1GHz



Date: 20.MAR.2012 18:05:14

1GHz to 5GHz



Date: 20.MAR.2012 18:06:07

Limit	-57dBm (30MHz-5GHz)

Remarks

The EUT does not exceed -57dBm at the frequency range of 9kHz 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 Period (months)	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	201122	12	09-Jun-2012
Power Metre	Rohde & Schwarz	NRP	102428	12	24-Aug-2012
Thermal Power Sensor	Rohde & Schwarz	NRP-Z21	102106	12	16-Feb-2013
Network Analyzer	Hewlett Packard	8720D	US36140166	12	09-Sep-2012
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TF100	09121619	-	O/P MON
Power Supply	Dahua	DH1716A-14	1000718365	-	O/P MON
Power Supply	Dahua	DH1716-5D	200360033	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	03-Jan-2013
Thermo-hygrometer	AZ Instruments	8705	9151655	12	16-Dec-2012
Section 2.5 – Radiated Spurious Emissions					
Load	Shanghai Huaxiang	TF100	09121619	-	O/P MON
Load	Shanghai Huaxiang	TF100	090323433	-	O/P MON
EMI Receiver	Rohde & Schwarz	ESI 40	100015	12	19-Aug-2012
Ultra log test antenna	Rohde & Schwarz	HL562	100167	12	19-Aug-2012
Double-Ridged Wave-guide Horn Antenna	Rohde & Schwarz	HF 906	100029	12	19-Aug-2012
Antenna master	Frankonia	MA 260	-	12	19-Aug-2012
Relay Switch Unit	Rohde & Schwarz	331.1601.31	338965002	-	TU
Semi Anechoic Chamber	Frankonia	23.18m×16.88m×9.60m	-	12	19-Aug-2012
Power Supply	Dahua	DH1716A-14	20080401	-	O/P MON
Digital Multimeter	FLUKE	179	91820401	12	03-Jan-2013
Thermo-hygrometer	AZ Instruments	8705	9151655	12	16-Dec-2012

Instrument	Manufacturer	Type No.	Serial No.	Calibration Period (months)	Calibration Due
Section 2.8 and 2.9 – Frequency Stability Under Temperature and Voltage Variations					
Spectrum Analyser	Rohde & Schwarz	FSQ26	201122	12	09-Jun-2012
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Temperature Chamber	Zengda	WD700-1.0	200407167	-	O/P MON
Power Supply	Dahua	DH1716A-14	1000718365	-	O/P MON
Power Supply	Dahua	DH1716-5D	200360033	-	O/P MON
Digital Multimeter	FLUKE	179	91820401	12	03-Jan-2013
Thermo-hygrometer	AZ Instruments	8705	9151655	12	16-Dec-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

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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

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

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