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Report On

FCC and Industry Canada Testing of the
Ericsson RRUS 11 B5 / KRC 161 285/2

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FCC ID: TA8AKRC161285-2
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REPORT ON FCC and Industry Canada Testing of the Ericsson RRUS 11 B5 / KRC 161 285/2

Document 75915950 Report 01 Issue 1

Janurary 2012

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DATED 16 January 2012

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

Product Service

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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Ericsson RRUS 11 B5 / KRC 161 285/2

Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Ericsson RRUS 11 B5 / KRC 161 285/2 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 Authorisation in the name of RRUS 11 B5 / KRC 161 285/2.

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	RRUS 11 B5
Product Number	KRC 161 285/2
IC Model Number	AS1612852
Serial Number(s)	CB4L317567
Software Version	CXP9017316%1_R39UH
Hardware Version	R1C
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 22: 2010 Industry Canada RSS-132 Issue 2: 2005
Incoming Release Date	Declaration of Build Status 17 November 2011
Order Number Date	9201317753 10 November 2011
Start of Test	29 November 2011
Finish of Test	21 December 2011
Name of Engineer(s)	X Zhang C Zhang
Related Document(s)	ANSI C63.4: 2009 FCC CFR 47 Part 2: 2010 Industry Canada RSS-GEN Issue 3: 2010

Product Service

1.2 BRIEF SUMMARY OF RESULTS

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

Configuration 1 – Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2, 22 and 15	RSS-132 and RSS-GEN					
	22.913 (a)	4.4	Effective Radiated Power	871.4MHz		N/A	No integral antenna.
				881.4MHz		N/A	
				891.6MHz		N/A	
				871.4MHz + 886.4MHz		N/A	
				876.6MHz + 891.6MHz		N/A	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	
2.1	2.1046, 22.913 (a)	4.4	Maximum Peak Output Power - Conducted	871.4MHz	0	Pass	-
				881.4MHz	0	Pass	
				891.6MHz	0	Pass	
				871.4MHz + 886.4MHz	0	Pass	
				876.6MHz + 891.6MHz	0	Pass	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz	0	Pass	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz	0	Pass	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz	0	Pass	
2.2	22.913 (a)	-	Peak – Average Ratio	871.4MHz	0	Pass	-
				881.4MHz	0	Pass	
				891.6MHz	0	Pass	
				871.4MHz + 886.4MHz	0	Pass	
				876.6MHz + 891.6MHz	0	Pass	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz	0	Pass	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz	0	Pass	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz	0	Pass	
2.3	2.1047 (d)	4.2	Modulation Characteristics	871.4MHz		N/A	-
				881.4MHz	0	Pass	
				891.6MHz		N/A	
				871.4MHz + 886.4MHz		N/A	
				876.6MHz + 891.6MHz		N/A	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	

Product Service

Configuration 1 – Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2, 22 and 15	RSS-132 and RSS-GEN					
2.4	2.1049, 22.917 (b)	RSS-Gen 4.6.1	Occupied Bandwidth	871.4MHz	0	Pass	-
				881.4MHz	0	Pass	
				891.6MHz	0	Pass	
				871.4MHz + 886.4MHz		N/A	
				876.6MHz + 891.6MHz		N/A	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	
2.5	2.1051, 22.917 (b)	4.5	Spurious Emissions at Antenna Terminals (±1MHz)	871.4MHz	0	Pass	-
				881.4MHz		N/A	
				891.6MHz	0	Pass	
				871.4MHz + 876.4MHz	0	Pass	
				886.6MHz + 891.6MHz	0	Pass	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	
2.6	2.1053, 22.917 (a)	4.5	Radiated Spurious Emissions	871.4MHz	0	Pass	-
				881.4MHz	0	Pass	
				891.6MHz	0	Pass	
				871.4MHz + 886.4MHz		N/A	
				876.6MHz + 891.6MHz	0	Pass	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz	0	Pass	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	
2.7	2.1051, 22.917 (a)	4.5	Conducted Spurious Emissions	871.4MHz	0	Pass	-
				881.4MHz	0	Pass	
				891.6MHz	0	Pass	
				871.4MHz + 886.4MHz	0	Pass	
				876.6MHz + 891.6MHz	0	Pass	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	

Product Service

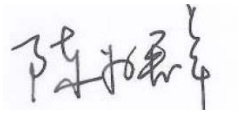
Configuration 1 – Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2, 22 and 15	RSS-132 and RSS-GEN					
2.8	2.1055, 22.355	4.3	Frequency Stability Under Temperature Variations	871.4MHz		N/A	-
				881.4MHz	0	Pass	
				891.6MHz		N/A	
				871.4MHz + 886.4MHz		N/A	
				876.6MHz + 891.6MHz		N/A	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	
2.9	2.1055, 22.355	4.3	Frequency Stability Under Voltage Variations	871.4MHz		N/A	-
				881.4MHz	0	Pass	
				891.6MHz		N/A	
				871.4MHz + 886.4MHz		N/A	
				876.6MHz + 891.6MHz		N/A	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	
2.10	15.111	4.6	Receiver Spurious Emissions	871.4MHz		N/A	-
				881.4MHz	0	Pass	
				891.6MHz		N/A	
				871.4MHz + 886.4MHz		N/A	
				876.6MHz + 891.6MHz		N/A	
				871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz		N/A	
				876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz		N/A	
				876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz		N/A	

N/A – Not Applicable

Product Service

1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Equipment
MANUFACTURER	Ericsson AB
PRODUCT NUMBER	RRUS 11 B5
PART NUMBER	KRC 161 285/2
IC Model NUMBER	AS1612852
SERIAL NUMBER	CB4L317567
HARDWARE VERSION	R1C
SOFTWARE VERSION	CXP9017316%1_R39UH
TRANSMITTER OPERATING RANGE	TX: 871.4MHz - 891.6MHz RX: 826.4MHz - 846.6MHz
MODULATIONS	QPSK, 16QAM, 64QAM
INTERMEDIATE FREQUENCIES	--
ITU DESIGNATION OF EMISSION	5M00F9W
CHANNEL BANDWIDTH	4.2 to 5MHz (configurable in steps of 100/200kHz)
OUTPUT POWER (RMS) (W or dBm)	Single Carrier: 1 x 46dBm (1 x 40W) Multi Carrier (x 2): 2 x 43dBm (2 x 20W) Multi Carrier (x 4): 4 x 40dBm (4 x 10W)
OUTPTU POWER TOLERANCE	± 0.6dB
NUMBER OF ANTENNA PORTS	2 TX/ RX ports
SUPPORTED CONFIGUATION	Dual Single Carrier or Multi Carrier. TX Diversity. Both RF chains are identical.
FCC ID	TA8AKRC161285-2
IC ID	287AB-AS1612852
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is the Radio Part of WCDMA Base Station.

Signature 

Date 14 December 2011

D of B S Serial No 75915950 /01

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

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) RRUS 11 B5 / KRC 161 285/2 is an Ericsson Radio Equipment working in the public mobile service 850MHz band which provides communication connections to WCDMA850 network. The RRUS 11 B5 / KRC 161 285/2 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 Manufacturers documentation.

Equipment Under Test

Product Service

1.4.2 Test Configuration

Configuration 1: Radio Equipment

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

The RRUS 11 B5 / KRC 161 285/2 supports both dual single mode and Tx Diversity mode. Both modes have been included when several settings were tested to find worst case setting, and Tx Diversity was used for the TX measurements.

The RRUS 11 B5 / KRC 161 285/2 supports Test Models TM1, TM5 and TM6 at 850MHz defined in 3GPP TS 25.141. Test Model 1 (TM1) uses the QPSK modulation, Test Model 5 (TM5) includes the 16QAM modulation and Test Model 6 (TM6) includes 64QAM modulation.

The settings below were found to be representative for all traffic scenarios when several settings with the different modulations, channel bandwidths and the number of carriers were tested to find the worst case setting. These settings were used for all measurements unless otherwise stated.

Single carrier:
Test Model1 (TM1): 64 DPCHs at 30 ksps (SF=128)

Multi carrier (1x2):
Test model 1 (TM1): 30 DPCHs at 30 ksps (SF=128) in each carrier

Channel bandwidth 5MHz.

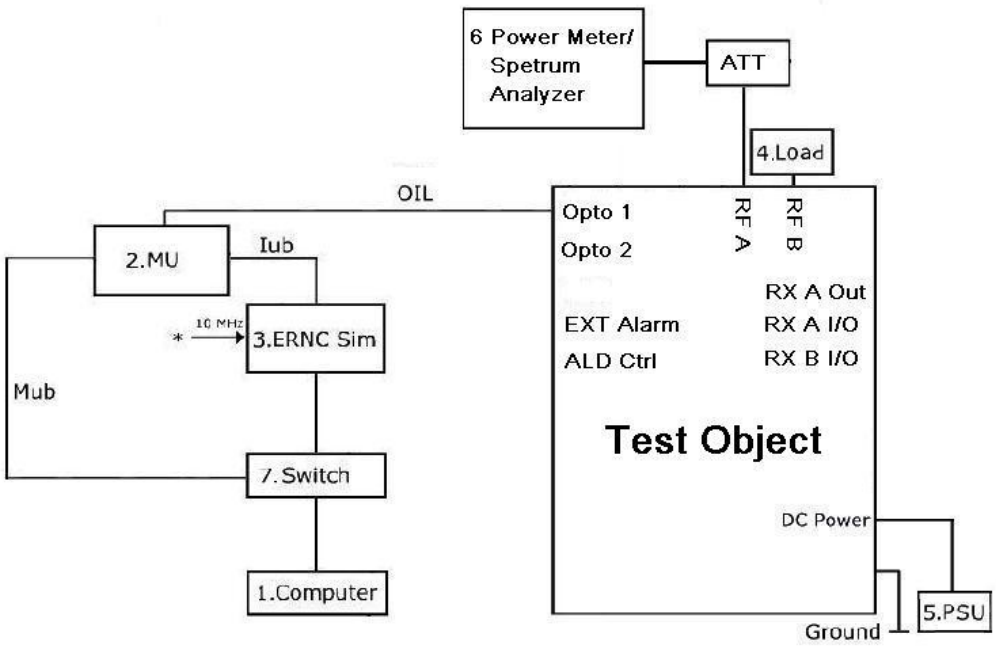
The EUT has two TX/RX ports and it can be configured to transmit with 850MHz single or multi carrier at both RF output connectors.

For TX test cases: Maximum Conducted Output Power, Peak – Average Ratio, Spurious Emissions at Antenna Terminals (±1MHz) and Conducted Spurious Emissions, measurements were performed on both combined TX/RX output connectors RF A and RF B of the EUT. For all other TX test cases, measurements were performed on the combined TX/RX output connector RF A. RX testing was performed on the RX connector RF B of the EUT when the ETU was set as single transmitter. The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

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

Product Service

Test Setup, Conducted Measurement:

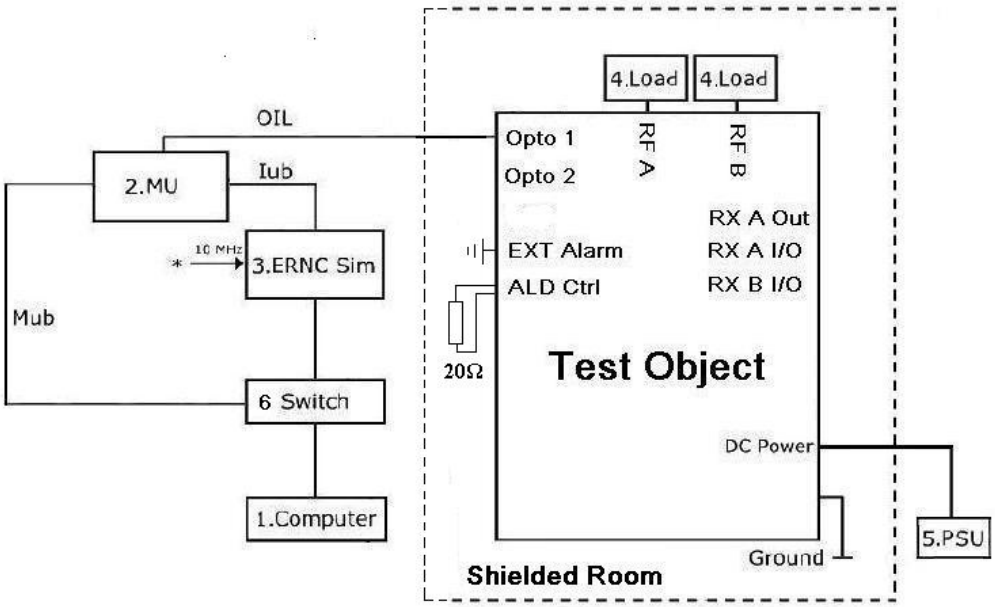


Product Name	Product Number	Version	Serial Number
RRUS 11 B5	KRC 161 285/2	R1C	CB4L317567

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	Sun Blade 500S	--	0826TFC1VD
2.1	RBS 6601 (Master)	BFL 901 009/1	--	--
	DUW 30 01	KDU 127 161/3	R3C	X174015704
	SUP 6601	1/BFL 901 009/1	R3B	BR80908054
2.2	RBS 6601 (Slave)	BFL 901 009/1	--	--
	DUW 30 01	KDU 127 161/3	R3C	X174015840
	SUP 6601	1/BFL 901 009/1	R3C	BR81350416
3	ERNC Sim	FAB 102 614	R30A	A535116344
4	Load	TFZ100-3NF	--	09121144
5	Power Supply	DH1716-5D	--	ETC/L090
	Power Supply	DH1716A-14	--	ETD/L042
6	Power Meter	Rohde & Schwarz NRP	--	102438
	Thermal Power Sensor	Rohde & Schwarz NRP-Z51	--	102431
	Spectrum Analyzer	FSQ26	--	100253
7	Switch	TL-SF1008+	2.1	09617800822

Product Service

Test Setup, Radiated Measurement:



Product Name	Product Number	Version	Serial Number
RRUS 11 B5	KRC 161 285/2	R1C	CB4L317567

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	Sun Blade 500S	--	0826TFC1VD
2.1	RBS 6601 (Master)	BFL 901 009/1	--	--
	DUW 30 01	KDU 127 161/3	R3C	X174015704
	SUP 6601	1/BFL 901 009/1	R3B	BR80908054
2.2	RBS 6601 (Slave)	BFL 901 009/1	--	--
	DUW 30 01	KDU 127 161/3	R3C	X174015840
	SUP 6601	1/BFL 901 009/1	R3C	BR81350416
3	ERNC Sim	FAB 102 614	R30A	A535116344
4	Load	TFZ100-3NF	--	09121144
	Load	TF100	--	09121602
5	Power Supply	DH1716-5D	--	ETC/L090
	Power Supply	DH1716A-14	--	ETD/L042
6	Switch	TL-SF1008+	2.1	09617800822

Product Service

1.4.3 Modes of Operation

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

Mode 1 – UARFCN 4357: 871.4MHz (Bottom Channel)

Mode 2 – UARFCN 4407: 881.4MHz (Middle Channel)

Mode 3 – UARFCN 4458: 891.6MHz (Top Channel)

Mode 4 – UARFCN 4357 + 4432: 871.4MHz + 886.4MHz (B and B+15MHz)

Mode 5 – UARFCN 4383 + 4458: 876.6MHz + 891.6MHz (T-15MHz and T)

Mode 6 – UARFCN 4357 + 4382: 871.4MHz + 876.4MHz (B and B+5MHz)

Mode 7 – UARFCN 4433 + 4458: 886.6MHz + 891.6MHz (T-5MHz and T)

Mode 8 – UARFCN 4357 + 4382 + 4407 + 4432:
871.4MHz + 876.4MHz + 881.4MHz + 886.4MHz (B, B+5MHz, B+10MHz and B+15MHz)

Mode 9 – UARFCN 4382 + 4407 + 4432 + 4457:
876.4MHz + 881.4MHz + 886.4MHz + 891.4MHz (M-5MHz, M, M+5MHz and M+10MHz)

Mode 10 – UARFCN 4383 + 4408 + 4433 + 4458:
876.6MHz + 881.6MHz + 886.6MHz + 891.6MHz (T-15MHz, T-10MHz, T-5MHz and T)

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 an open test area as appropriate.

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

1.6 DEVIATIONS FROM THE STANDARD

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

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.8 ALTERNATIVE TEST SITE

Testing has been performed under the following site registrations:

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

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

Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Ericsson RRUS 11 B5 / KRC 161 285/2

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

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.1.3 Date of Test and Modification State

29 November to 02 December 2011 – Modification State 0

2.1.4 Test Equipment Used

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

2.1.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132.

Using a power meter and attenuator(s), the output power of the EUT was measured at the antenna terminal. The carrier power was measured with QPSK, 16QAM, 64QAM using the test model described.

Since the EUT transmits on two antennas simultaneously in the same frequency range, i.e, TX Diversity Mode, using the Measure-and-Sum approach, the output power at both antennas were tested, and the total output power were then summed mathematically in linear power units.

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
- Mode 4
- Mode 5
- Mode 8
- Mode 9
- Mode 10

2.1.6 Environmental Conditions

	29 Nov. 2011	30 Nov. 2011	01 Dec. 2011	02 Dec. 2011
Ambient Temperature	22.7°C	22.4°C	23.5°C	22.5°C
Relative Humidity	22.0%	20.1%	20.5%	29.0%

Product Service

2.1.7 Test Results

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

The test results are shown below

Antenna A and B

Single Carrier

Configuration 1 - Mode 1, 2 and 3

TM1

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357	871.4	46.07	40.46	46.07	40.46	49.08	80.92
4407	881.4	46.00	39.81	45.98	39.63	49.00	79.44
4458	891.6	45.98	39.63	45.96	39.45	48.98	79.08

TM5

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357	871.4	46.07	40.46	46.06	40.36	49.07	80.82
4407	881.4	45.99	39.72	45.98	39.63	49.00	79.35
4458	891.6	45.97	39.54	45.94	39.26	48.97	78.80

TM6

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357	871.4	45.89	38.82	45.90	38.90	48.91	77.72
4407	881.4	45.82	38.19	45.80	38.02	48.82	76.21
4458	891.6	45.80	38.02	45.75	37.58	48.79	75.60

Multi Carrier (1x2)

Configuration 1 - Mode 4 and 5

TM1

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357 & 4432	871.4 & 886.4	45.99	39.72	45.97	39.54	48.99	79.26
4383 & 4458	876.6 & 891.6	45.94	39.26	45.95	39.36	48.96	78.62

TM5

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357 & 4432	871.4 & 886.4	45.97	39.54	45.97	39.54	48.98	79.08
4383 & 4458	876.6 & 891.6	45.92	39.08	45.95	39.36	48.95	78.44

TM6

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357 & 4432	871.4 & 886.4	45.79	37.93	45.76	37.67	48.79	75.60
4383 & 4458	876.6 & 891.6	45.73	37.41	45.76	37.67	48.76	75.08

Multi Carrier (1x4)

Configuration 1 - Mode 8, 9 and 10

TM1

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357 & 4382 & 4407& 4432	871.4 & 876.4 & 881.4 & 886.4	45.98	39.63	45.98	39.63	48.99	79.26
4382 & 4407 & 4432 & 4457	876.4& 881.4 & 886.4 & 891.4	45.94	39.26	45.93	39.17	48.94	78.43
4383 & 4408 & 4423 & 4458	876.6 & 881.6 & 886.6 & 891.6	46.03	40.09	46.02	39.99	49.04	80.08

TM5

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357 & 4382 & 4407& 4432	871.4 & 876.4 & 881.4 & 886.4	46.04	40.18	46.05	40.27	49.06	80.45
4382 & 4407 & 4432 & 4457	876.4& 881.4 & 886.4 & 891.4	46.00	39.81	45.98	39.63	49.00	79.44
4383 & 4408 & 4423 & 4458	876.6 & 881.6 & 886.6 & 891.6	46.01	39.90	45.97	39.54	49.00	79.44

TM6

UARFCN	Frequency (MHz)	Antenna A		Antenna B		Total (dBm) RMS	Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
4357 & 4382 & 4407& 4432	871.4 & 876.4 & 881.4 & 886.4	45.48	35.32	45.49	35.40	48.50	70.72
4382 & 4407 & 4432 & 4457	876.4& 881.4 & 886.4 & 891.4	45.44	34.99	45.43	34.91	48.44	69.90
4383 & 4408 & 4423 & 4458	876.6 & 881.6 & 886.6 & 891.6	45.44	34.99	45.42	34.83	48.44	69.82

Limit	≤500W or ≤+57dBm

Remarks

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

Product Service

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

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.2.3 Date of Test and Modification State

29 November to 02 December 2011 – Modification State 0

2.2.4 Test Equipment Used

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

2.2.5 Test Method and Operating Modes

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

A peak to average ratio measurment is performed at the conducted ports of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine 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 spectrum analyzer Measurment bandwidth was set to 10MHz for single carrier and 20MHz for multi carrier and the path loss measured and entered as a reference level offset.

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

Configuration 1
- Mode 1
- Mode 2
- Mode 3
- Mode 4
- Mode 5
- Mode 8
- Mode 9
- Mode 10

2.2.6 Environmental Conditions

	29 Nov. 2011	30 Nov. 2011	01 Dec. 2011	02 Dec. 2011
Ambient Temperature	22.7°C	22.4°C	23.5°C	22.5°C
Relative Humidity	22.0%	20.1%	20.5%	29.0%

Product Service

2.2.7 Test Results

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

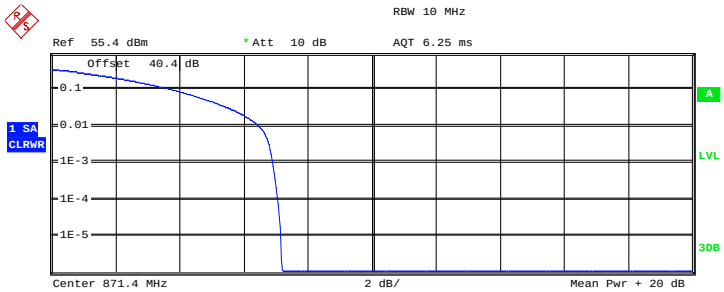
The test results are shown below.

Antenna A

Single Carrier

Configuration 1 - Mode 1

TM1



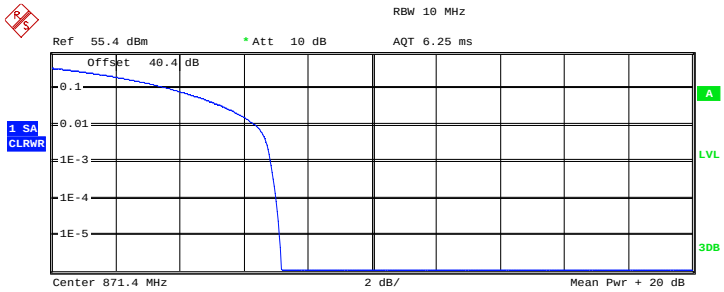
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.24 dBm
Peak	53.41 dBm
Crest	7.17 dB
10 %	3.78 dB
1 %	6.47 dB
.1 %	6.89 dB
.01 %	7.05 dB

Date: 1.DEC.2011 09:55:04

Product Service

TM5

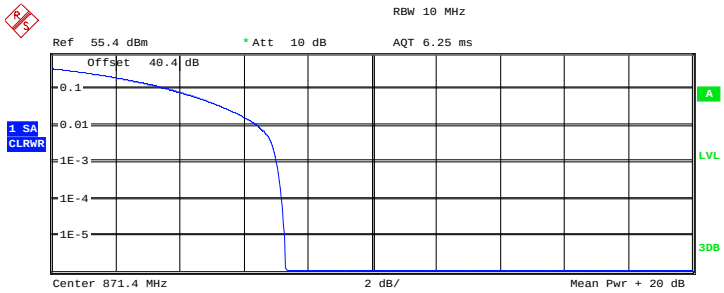


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.24 dBm
Peak	53.41 dBm
Crest	7.17 dB
10 %	3.72 dB
1 %	6.35 dB
.1 %	6.83 dB
.01 %	7.02 dB

Date: 1.DEC.2011 09:22:41

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

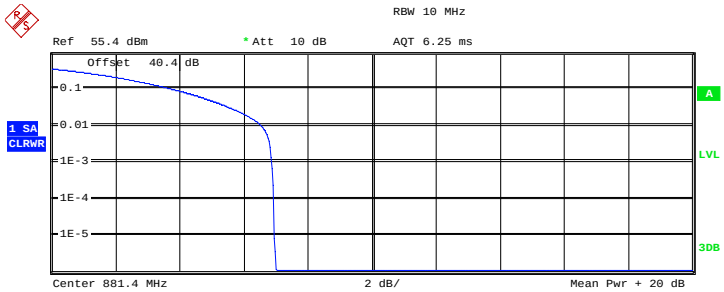
	Trace 1
Mean	46.04 dBm
Peak	53.34 dBm
Crest	7.30 dB
10 %	3.72 dB
1 %	6.41 dB
.1 %	7.02 dB
.01 %	7.18 dB

Date: 1.DEC.2011 08:43:03

Product Service

Configuration 1 – Mode 2

TM1

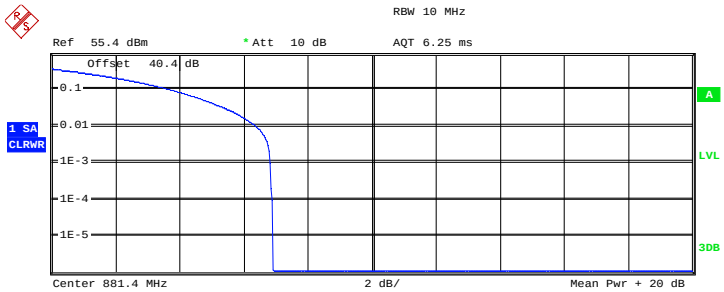


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.13 dBm
Peak	53.12 dBm
Crest	7.00 dB
10 %	3.78 dB
1 %	6.54 dB
.1 %	6.86 dB
.01 %	6.96 dB

Date: 2.DEC.2011 13:29:30

TM5

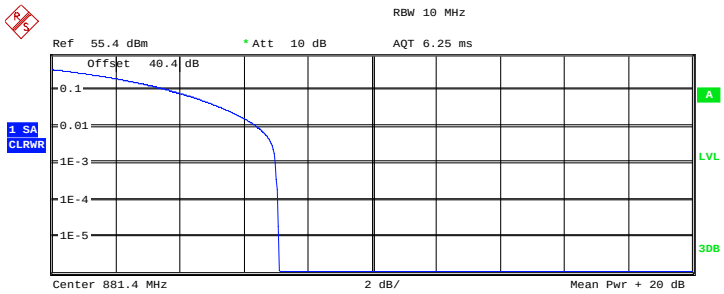


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.14 dBm
Peak	53.05 dBm
Crest	6.91 dB
10 %	3.75 dB
1 %	6.38 dB
.1 %	6.83 dB
.01 %	6.89 dB

Date: 2.DEC.2011 14:31:24

TM6



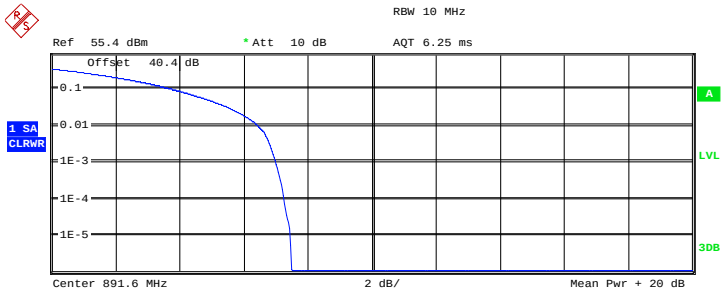
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	45.98 dBm
Peak	53.05 dBm
Crest	7.08 dB
10 %	3.69 dB
1 %	6.41 dB
.1 %	6.99 dB
.01 %	7.05 dB

Date: 2.DEC.2011 15:04:41

Configuration 1 – Mode 3

TM1



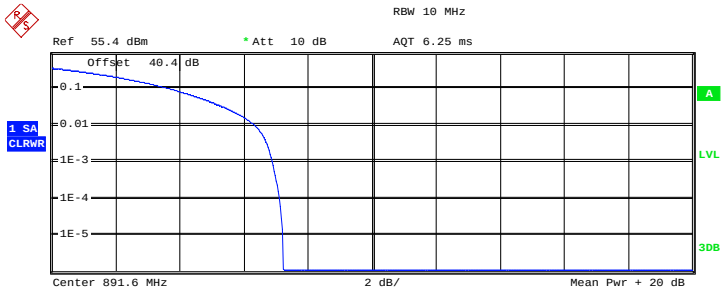
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.17 dBm
Peak	53.64 dBm
Crest	7.47 dB
10 %	3.78 dB
1 %	6.44 dB
.1 %	6.99 dB
.01 %	7.24 dB

Date: 1.DEC.2011 12:18:14

Product Service

TM5

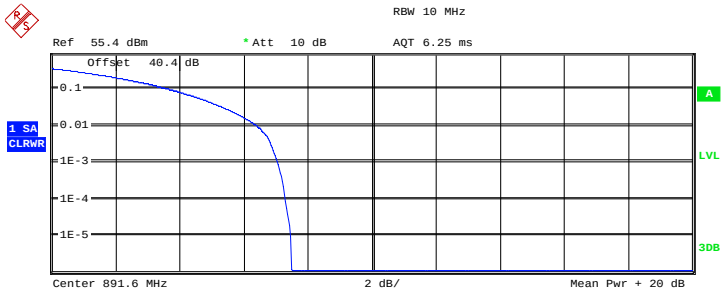


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.13 dBm
Peak	53.36 dBm
Crest	7.23 dB
10 %	3.72 dB
1 %	6.35 dB
.1 %	6.89 dB
.01 %	7.12 dB

Date: 1.DEC.2011 12:42:08

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	45.94 dBm
Peak	53.43 dBm
Crest	7.49 dB
10 %	3.69 dB
1 %	6.41 dB
.1 %	7.05 dB
.01 %	7.31 dB

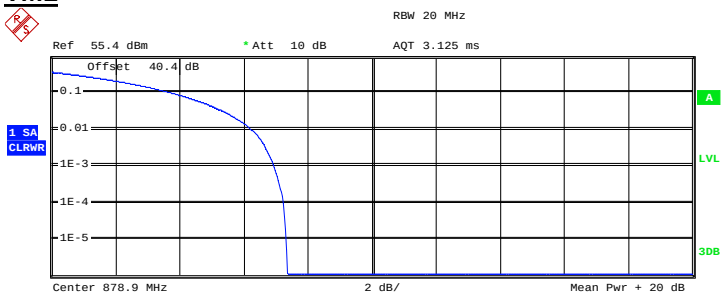
Date: 1.DEC.2011 13:19:37

Product Service

Multi Carrier (1x2)

Configuration 1 - Mode 4

TM1

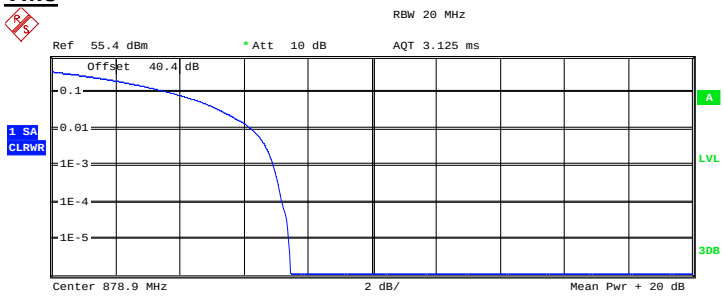


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.26 dBm
Peak	53.60 dBm
Crest	7.34 dB
10 %	3.75 dB
1 %	6.22 dB
.1 %	6.92 dB
.01 %	7.24 dB

Date: 30.NOV.2011 09:54:46

TM5



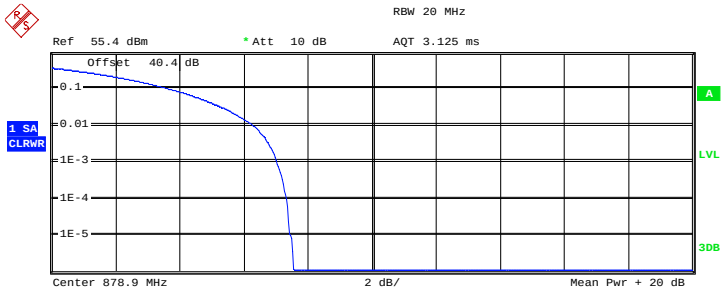
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.15 dBm
Peak	53.60 dBm
Crest	7.45 dB
10 %	3.72 dB
1 %	6.22 dB
.1 %	6.92 dB
.01 %	7.18 dB

Date: 30.NOV.2011 12:15:09

Product Service

TM6



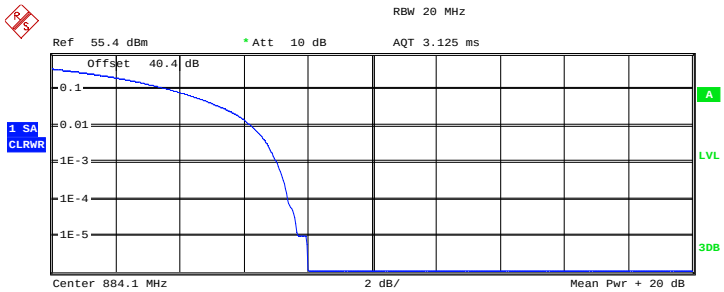
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.99 dBm
Peak	53.53 dBm
Crest	7.54 dB
10 %	3.69 dB
1 %	6.28 dB
.1 %	7.02 dB
.01 %	7.34 dB

Date: 30.NOV.2011 13:05:59

Configuration 1 – Mode 5

TM1

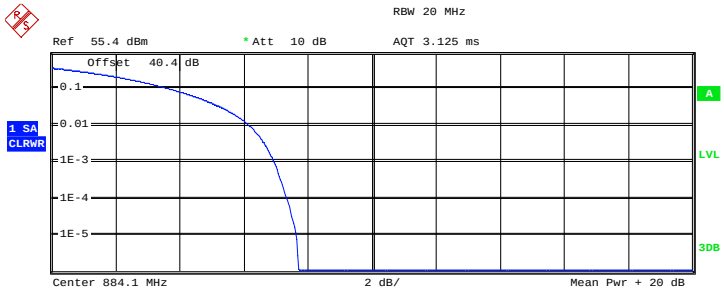


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.13 dBm
Peak	54.14 dBm
Crest	8.01 dB
10 %	3.72 dB
1 %	6.22 dB
.1 %	7.02 dB
.01 %	7.37 dB

Date: 29.NOV.2011 15:02:16

TM5

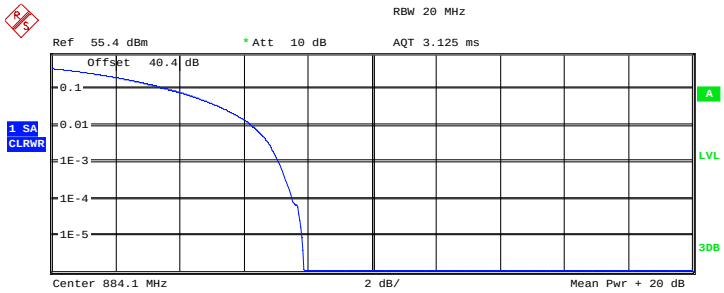


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.16 dBm
Peak	53.86 dBm
Crest	7.70 dB
10 %	3.69 dB
1 %	6.15 dB
.1 %	6.96 dB
.01 %	7.34 dB

Date: 29.NOV.2011 15:56:19

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.92 dBm
Peak	53.79 dBm
Crest	7.87 dB
10 %	3.69 dB
1 %	6.25 dB
.1 %	7.08 dB
.01 %	7.50 dB

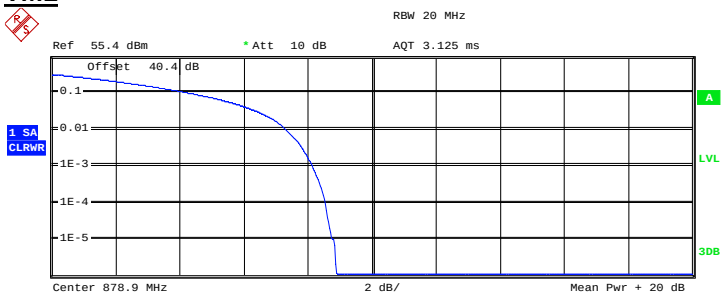
Date: 30.NOV.2011 08:50:00

Product Service

Multi Carrier (1x4)

Configuration 1 – Mode 8

TM1

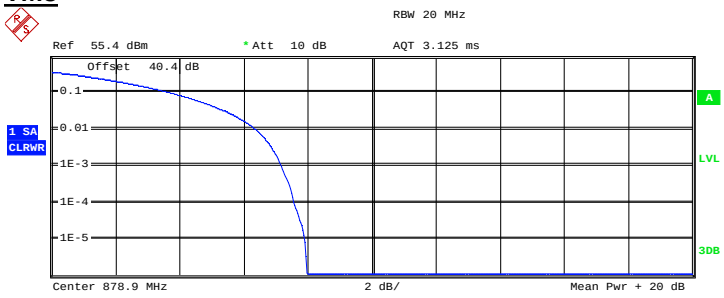


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.13 dBm
Peak	55.01 dBm
Crest	8.88 dB
10 %	4.29 dB
1 %	7.31 dB
.1 %	8.14 dB
.01 %	8.53 dB

Date: 29.NOV.2011 08:55:56

TM5



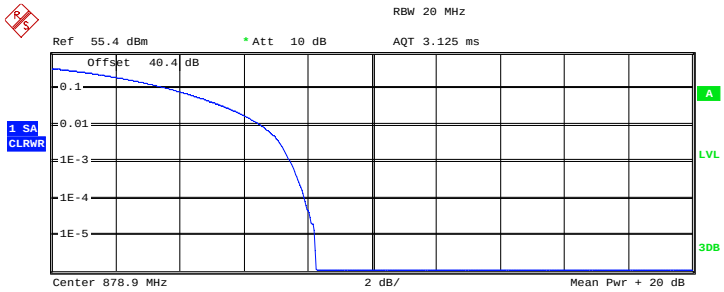
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.21 dBm
Peak	54.17 dBm
Crest	7.96 dB
10 %	3.72 dB
1 %	6.35 dB
.1 %	7.18 dB
.01 %	7.56 dB

Date: 29.NOV.2011 14:19:17

Product Service

TM6



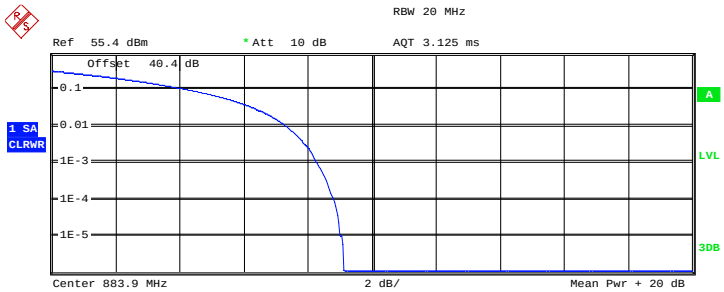
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.65 dBm
Peak	53.88 dBm
Crest	8.24 dB
10 %	3.69 dB
1 %	6.54 dB
.1 %	7.44 dB
.01 %	7.88 dB

Date: 29.NOV.2011 13:53:45

Configuration 1 – Mode 9

TM1



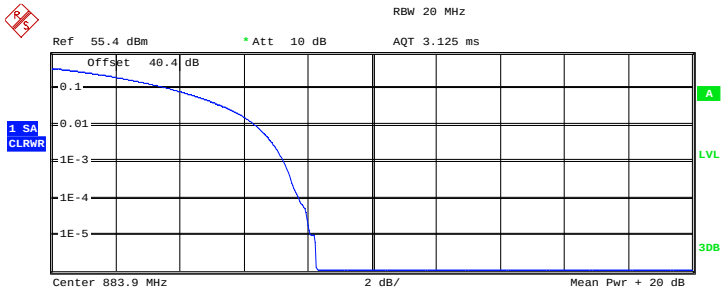
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.14 dBm
Peak	55.27 dBm
Crest	9.13 dB
10 %	4.29 dB
1 %	7.31 dB
.1 %	8.27 dB
.01 %	8.81 dB

Date: 29.NOV.2011 09:23:13

Product Service

TM5

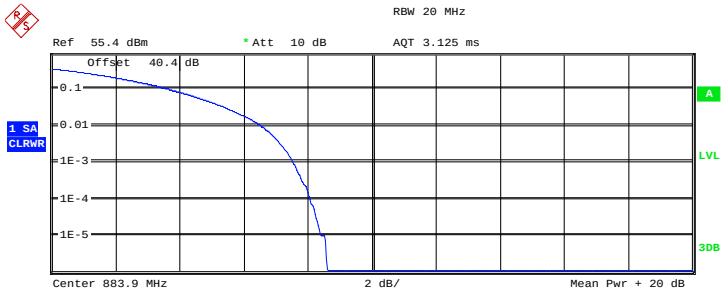


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.16 dBm
Peak	54.42 dBm
Crest	8.26 dB
10 %	3.72 dB
1 %	6.35 dB
.1 %	7.24 dB
.01 %	7.72 dB

Date: 29.NOV.2011 11:45:24

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

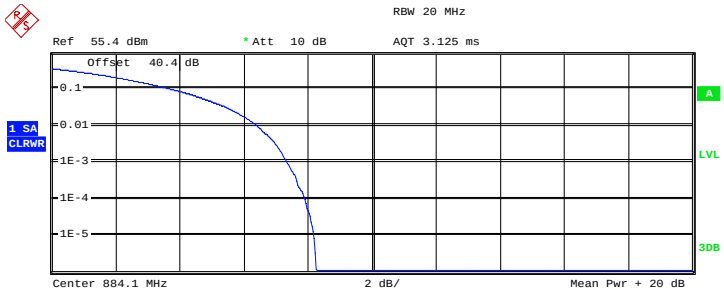
	Trace 1
Mean	45.62 dBm
Peak	54.21 dBm
Crest	8.59 dB
10 %	3.69 dB
1 %	6.54 dB
.1 %	7.53 dB
.01 %	8.04 dB

Date: 29.NOV.2011 12:16:28

Product Service

Configuration 1 – Mode 10

TM1

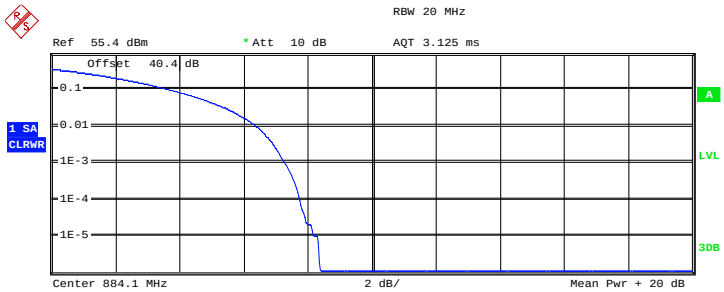


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.18 dBm
Peak	54.42 dBm
Crest	8.25 dB
10 %	3.72 dB
1 %	6.41 dB
.1 %	7.34 dB
.01 %	7.92 dB

Date: 29.NOV.2011 14:42:04

TM5



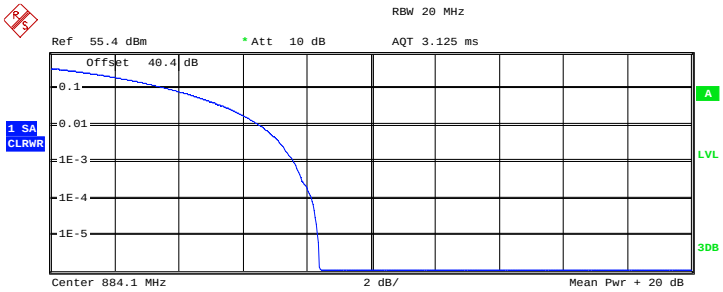
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.13 dBm
Peak	54.49 dBm
Crest	8.37 dB
10 %	3.72 dB
1 %	6.38 dB
.1 %	7.28 dB
.01 %	7.76 dB

Date: 29.NOV.2011 13:09:39

Product Service

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.61 dBm
Peak	54.00 dBm
Crest	8.39 dB
10 %	3.72 dB
1 %	6.54 dB
.1 %	7.60 dB
.01 %	8.14 dB

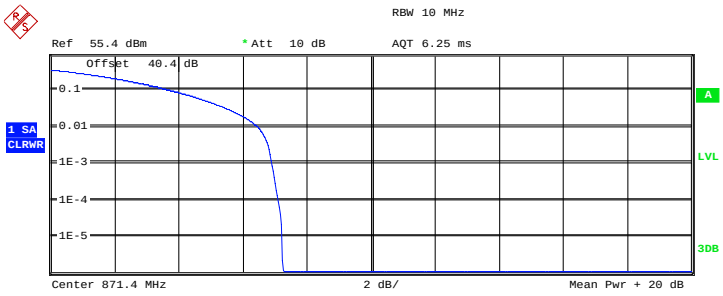
Date: 29.NOV.2011 12:55:22

Antenna B

Single Carrier

Configuration 1 - Mode 1

TM1



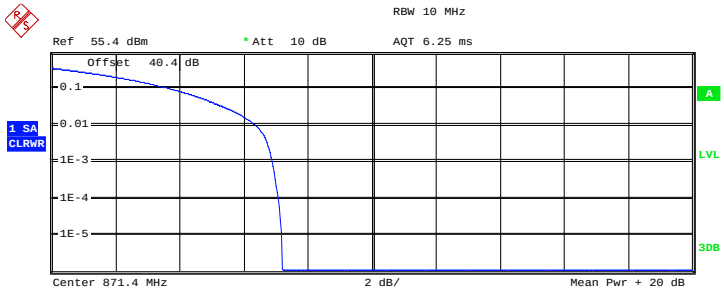
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.24 dBm
Peak	53.48 dBm
Crest	7.24 dB
10 %	3.75 dB
1 %	6.44 dB
.1 %	6.89 dB
.01 %	7.12 dB

Date: 1.DEC.2011 10:13:08

Product Service

TM5

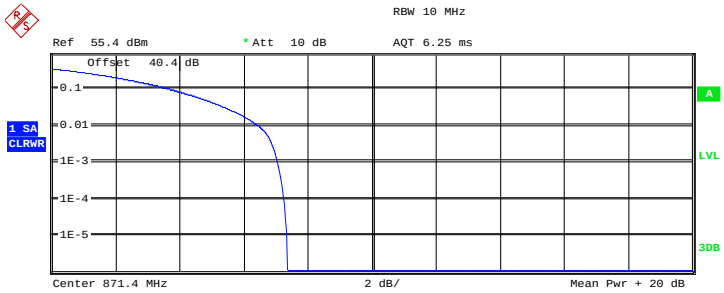


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.21 dBm
Peak	53.41 dBm
Crest	7.19 dB
10 %	3.75 dB
1 %	6.35 dB
.1 %	6.89 dB
.01 %	7.08 dB

Date: 1.DEC.2011 09:16:04

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

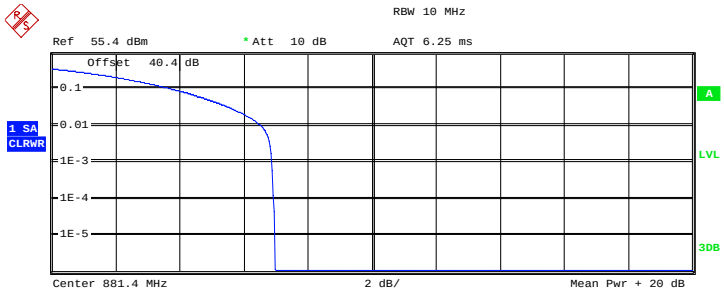
	Trace 1
Mean	46.05 dBm
Peak	53.41 dBm
Crest	7.36 dB
10 %	3.72 dB
1 %	6.44 dB
.1 %	7.05 dB
.01 %	7.24 dB

Date: 1.DEC.2011 08:50:07

Product Service

Configuration 1 – Mode 2

TM1

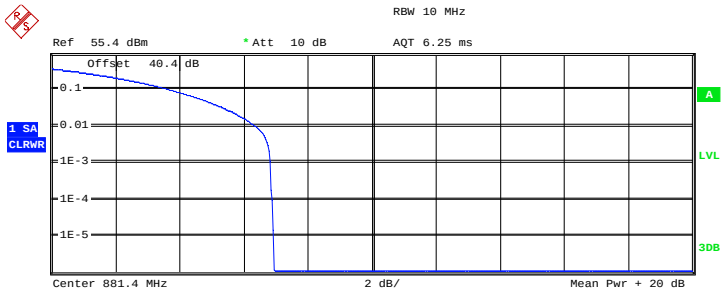


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.16 dBm
Peak	53.12 dBm
Crest	6.96 dB
10 %	3.78 dB
1 %	6.51 dB
.1 %	6.89 dB
.01 %	6.92 dB

Date: 2.DEC.2011 13:49:02

TM5

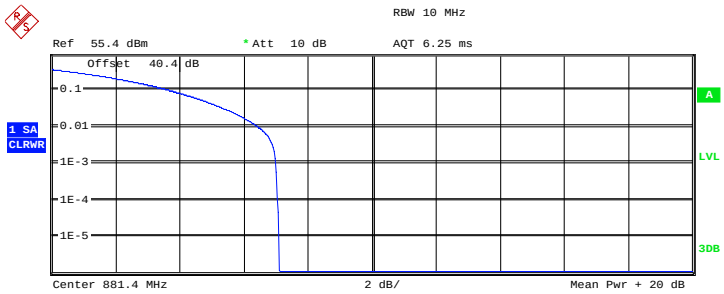


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.14 dBm
Peak	53.05 dBm
Crest	6.92 dB
10 %	3.72 dB
1 %	6.35 dB
.1 %	6.83 dB
.01 %	6.89 dB

Date: 2.DEC.2011 14:14:12

TM6



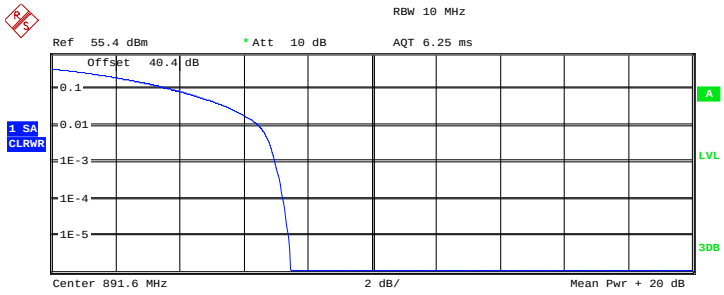
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	45.96 dBm
Peak	53.05 dBm
Crest	7.10 dB
10 %	3.69 dB
1 %	6.44 dB
.1 %	6.99 dB
.01 %	7.05 dB

Date: 2.DEC.2011 15:16:10

Configuration 1 – Mode 3

TM1



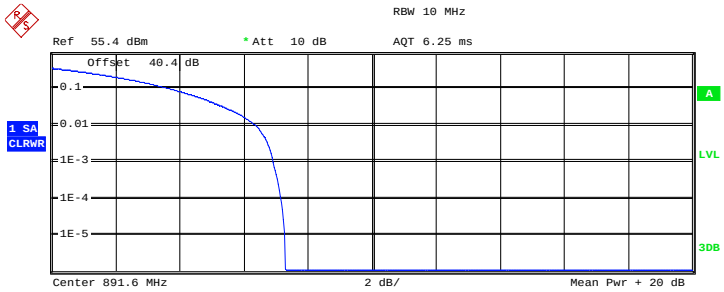
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.12 dBm
Peak	53.57 dBm
Crest	7.45 dB
10 %	3.75 dB
1 %	6.47 dB
.1 %	6.96 dB
.01 %	7.21 dB

Date: 1.DEC.2011 11:49:37

Product Service

TM5

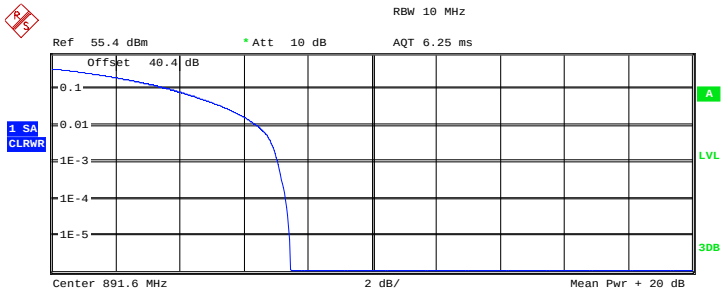


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	46.07 dBm
Peak	53.36 dBm
Crest	7.29 dB
10 %	3.72 dB
1 %	6.35 dB
.1 %	6.92 dB
.01 %	7.15 dB

Date: 1.DEC.2011 12:51:39

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	45.91 dBm
Peak	53.36 dBm
Crest	7.45 dB
10 %	3.72 dB
1 %	6.41 dB
.1 %	7.05 dB
.01 %	7.31 dB

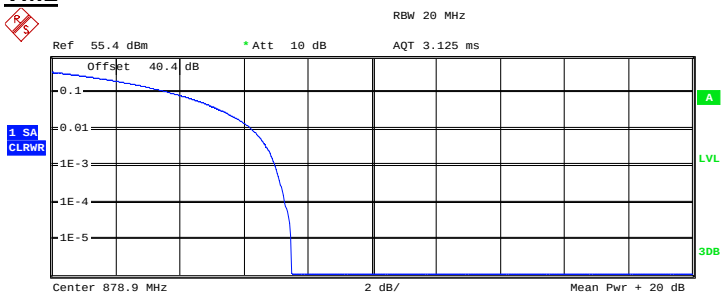
Date: 1.DEC.2011 13:09:45

Product Service

Multi Carrier (1x2)

Configuration 1 - Mode 4

TM1

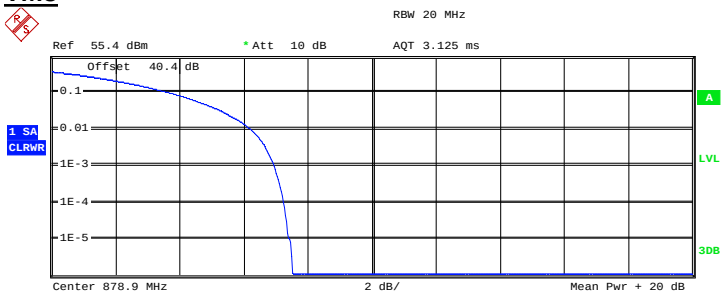


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.19 dBm
Peak	53.67 dBm
Crest	7.48 dB
10 %	3.75 dB
1 %	6.25 dB
.1 %	6.99 dB
.01 %	7.28 dB

Date: 30.NOV.2011 09:29:34

TM5



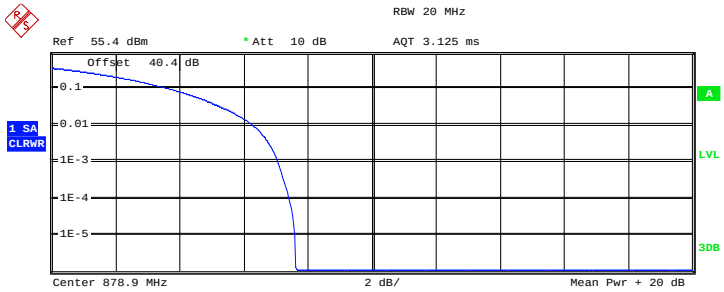
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.16 dBm
Peak	53.67 dBm
Crest	7.51 dB
10 %	3.69 dB
1 %	6.19 dB
.1 %	6.96 dB
.01 %	7.24 dB

Date: 30.NOV.2011 12:26:02

Product Service

TM6



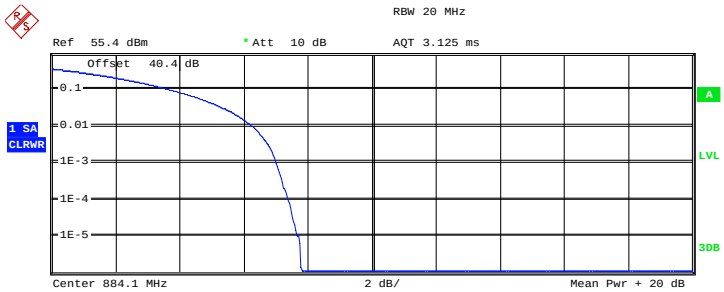
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.98 dBm
Peak	53.60 dBm
Crest	7.62 dB
10 %	3.72 dB
1 %	6.28 dB
.1 %	7.05 dB
.01 %	7.40 dB

Date: 30.NOV.2011 13:00:29

Configuration 1 – Mode 5

TM1



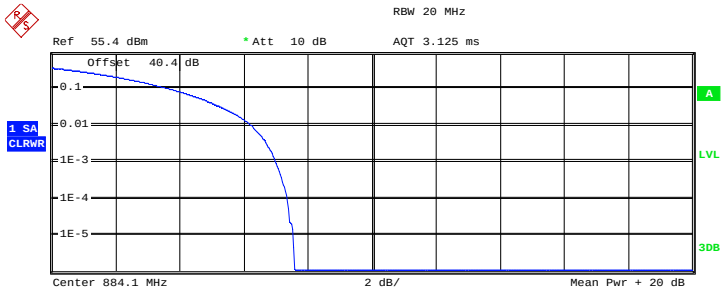
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.14 dBm
Peak	53.93 dBm
Crest	7.79 dB
10 %	3.72 dB
1 %	6.25 dB
.1 %	7.02 dB
.01 %	7.37 dB

Date: 30.NOV.2011 09:14:17

Product Service

TM5

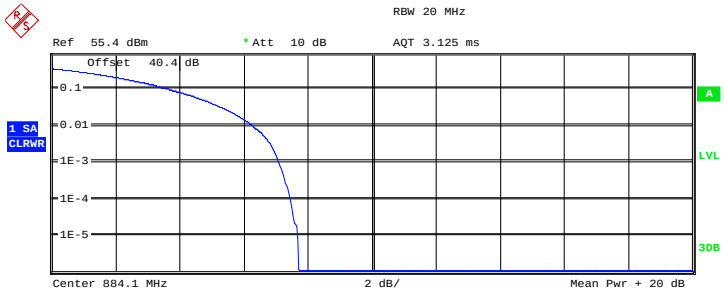


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.15 dBm
Peak	53.72 dBm
Crest	7.57 dB
10 %	3.69 dB
1 %	6.22 dB
.1 %	6.99 dB
.01 %	7.34 dB

Date: 29.NOV.2011 15:49:38

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.94 dBm
Peak	53.65 dBm
Crest	7.71 dB
10 %	3.69 dB
1 %	6.28 dB
.1 %	7.08 dB
.01 %	7.44 dB

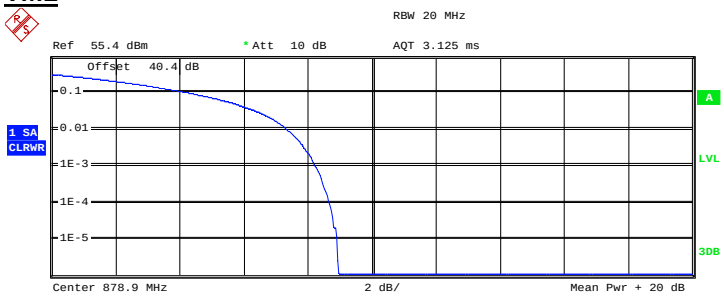
Date: 30.NOV.2011 08:53:16

Product Service

Multi Carrier (1x4)

Configuration 1 – Mode 8

TM1

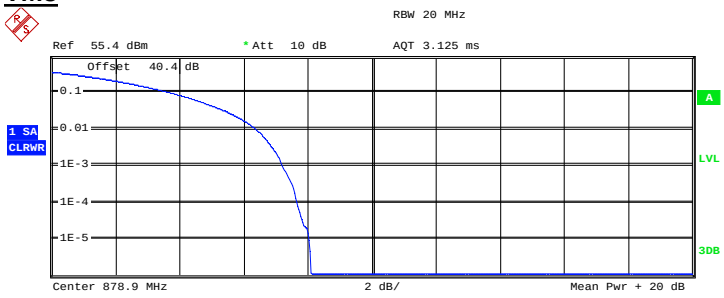


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.15 dBm
Peak	55.08 dBm
Crest	8.94 dB
10 %	4.33 dB
1 %	7.34 dB
.1 %	8.24 dB
.01 %	8.65 dB

Date: 29.NOV.2011 08:40:43

TM5



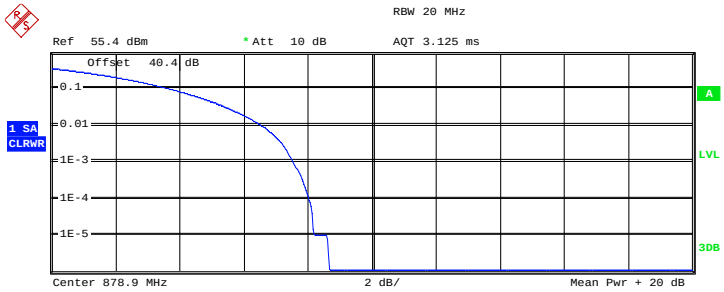
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.21 dBm
Peak	54.31 dBm
Crest	8.09 dB
10 %	3.72 dB
1 %	6.38 dB
.1 %	7.21 dB
.01 %	7.66 dB

Date: 29.NOV.2011 14:19:40

Product Service

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.65 dBm
Peak	54.31 dBm
Crest	8.66 dB
10 %	3.72 dB
1 %	6.54 dB
.1 %	7.53 dB
.01 %	8.01 dB

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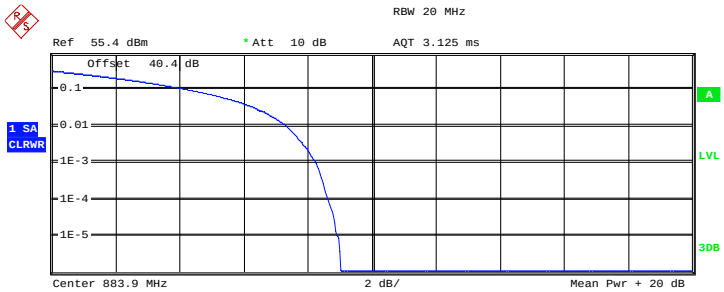
Configuration 1 – Mode 9

TM1



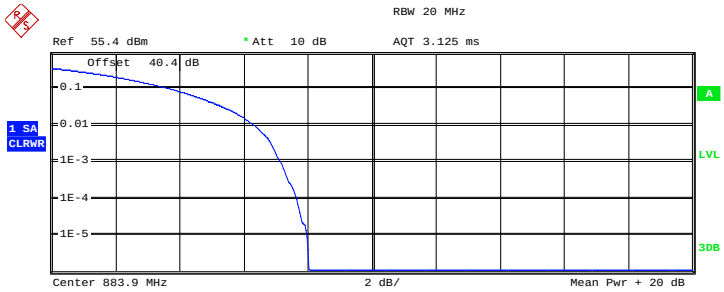
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.11 dBm
Peak	55.13 dBm
Crest	9.02 dB
10 %	4.29 dB
1 %	7.34 dB
.1 %	8.24 dB
.01 %	8.62 dB

Date: 29.NOV.2011 09:26:52

Product Service

TM5



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.18 dBm
Peak	54.21 dBm
Crest	8.03 dB
10 %	3.72 dB
1 %	6.31 dB
.1 %	7.15 dB
.01 %	7.63 dB

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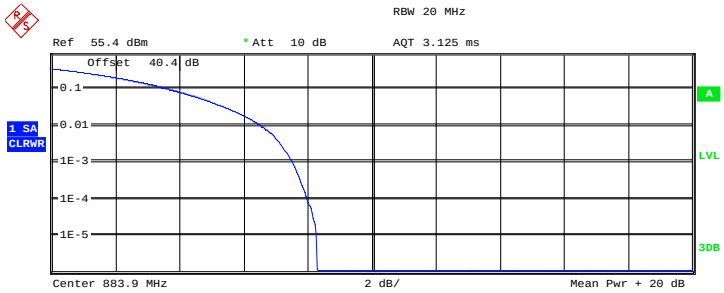
TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

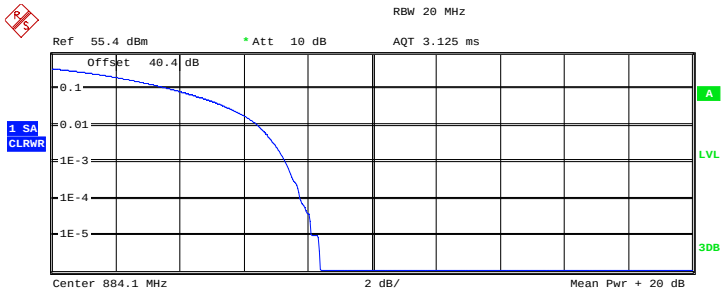
	Trace 1
Mean	45.64 dBm
Peak	53.93 dBm
Crest	8.29 dB
10 %	3.72 dB
1 %	6.54 dB
.1 %	7.50 dB
.01 %	7.98 dB

Date: 29.NOV.2011 12:23:40

Product Service

Configuration 1 – Mode 10

TM1

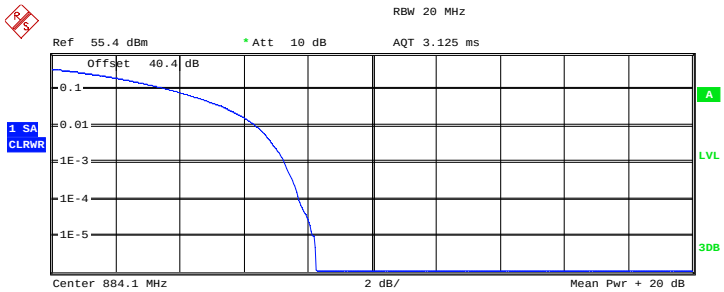


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.19 dBm
Peak	54.56 dBm
Crest	8.38 dB
10 %	3.72 dB
1 %	6.44 dB
.1 %	7.28 dB
.01 %	7.76 dB

Date: 29.NOV.2011 14:37:12

TM5



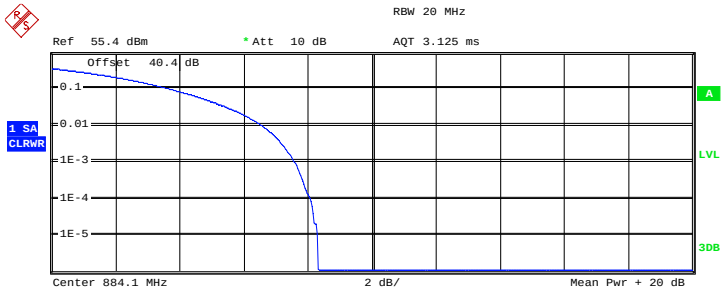
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	46.10 dBm
Peak	54.35 dBm
Crest	8.26 dB
10 %	3.72 dB
1 %	6.38 dB
.1 %	7.28 dB
.01 %	7.72 dB

Date: 29.NOV.2011 13:15:08

Product Service

TM6



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	45.61 dBm
Peak	53.93 dBm
Crest	8.32 dB
10 %	3.69 dB
1 %	6.54 dB
.1 %	7.56 dB
.01 %	8.08 dB

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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

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.3.3 Date of Test and Modification State

02 December 2011 – Modification State 0

2.3.4 Test Method and Operating Modes

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

Connect the TX output connector RF A to a spectrum analyzer with an attenuator. The other connector RF B was connected to match load. The EUT was controlled to transmit maximum power. Measure and record the constellation of the EUT by the spectrum analyzer.

The EUT supports QPSK, 16QAM and 64QAM 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

	02 December 2011
Ambient Temperature	22.5°C
Relative Humidity	29.0%

Product Service

2.3.6 Test Results

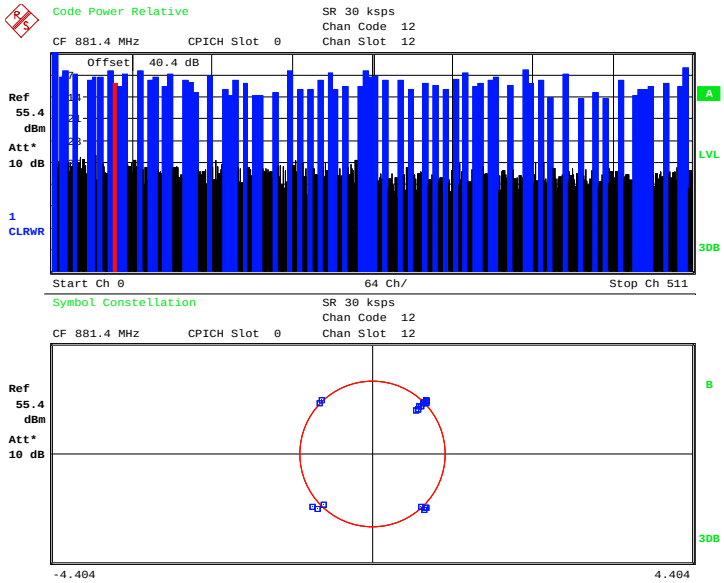
Plots are listed on the following showing the EUT transmitting with all of the modulations:

The test results are shown below

Single Carrier

Configuration 1 - Mode 2

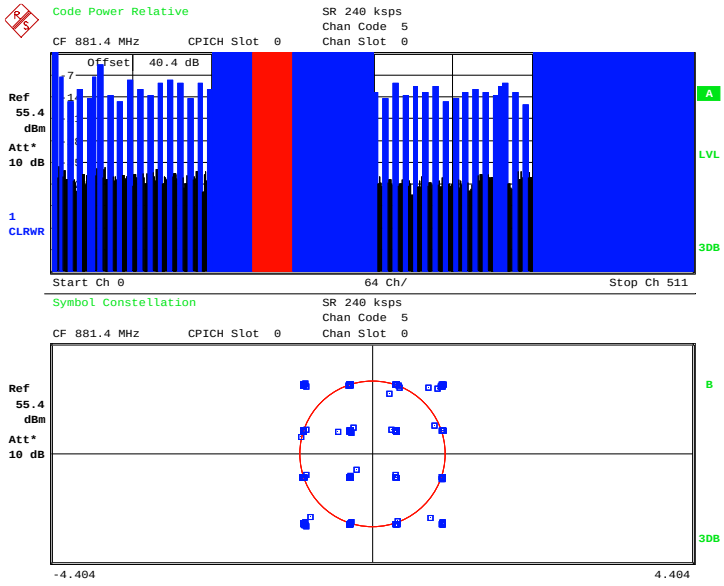
TM1: EUT transmitting with QPSK modulation:



Date: 2.DEC.2011 13:31:18

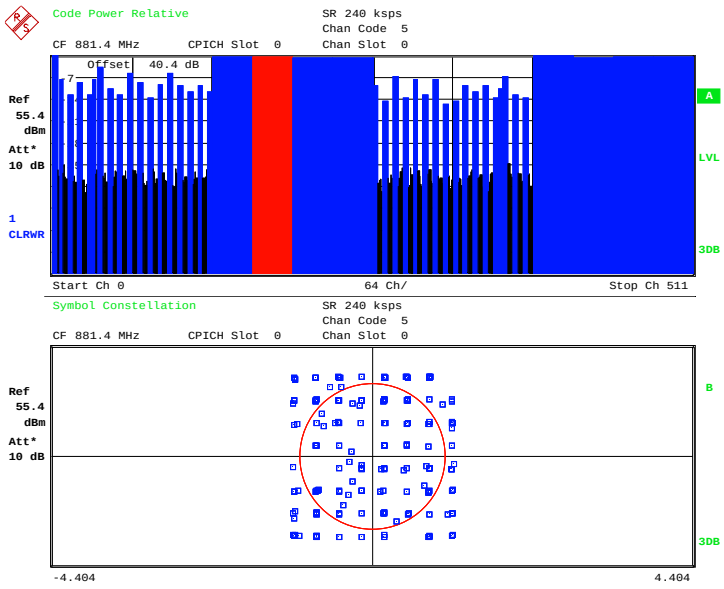
Product Service

TM5: EUT transmitting with 16QAM modulation:



Date: 2.DEC.2011 14:30:54

TM6: EUT transmitting with 64QAM modulation:



Date: 2.DEC.2011 15:04:11

Product Service

2.4 OCCUPIED BANDWIDTH

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.4.3 Date of Test and Modification State

01 and 02 December 2011 – Modification State 0

2.4.4 Test Equipment Used

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

2.4.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-GEN.

The EUT was transmitting at maximum power, modulated using TM1 as the representative test model. Using a resolution bandwidth of 50kHz and a video bandwidth of 500kHz, 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 configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.4.6 Environmental Conditions

	01 December 2011	02 December 2011
Ambient Temperature	23.5°C	22.5°C
Relative Humidity	20.5%	29.0%

Product Service

2.4.7 Test Results

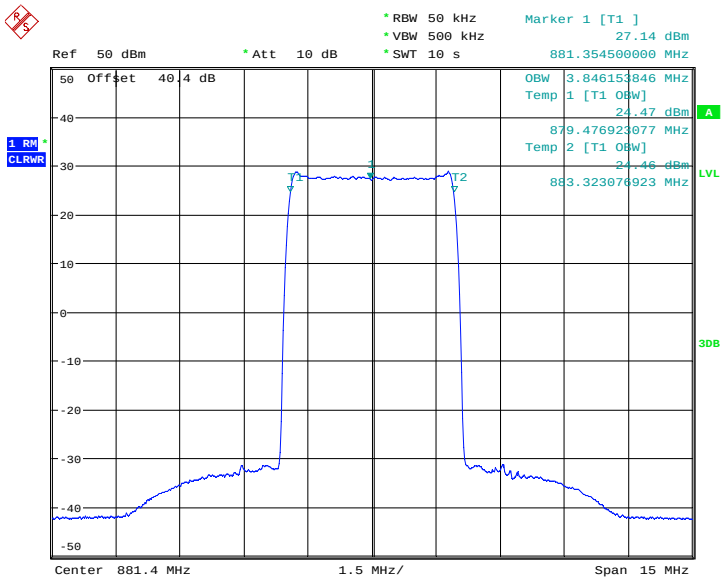
For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-GEN for Occupied Bandwidth.

The test results are shown below

Single Carrier: 4.2MHz Bandwidth

TM1

Configuration 1 – Mode 2



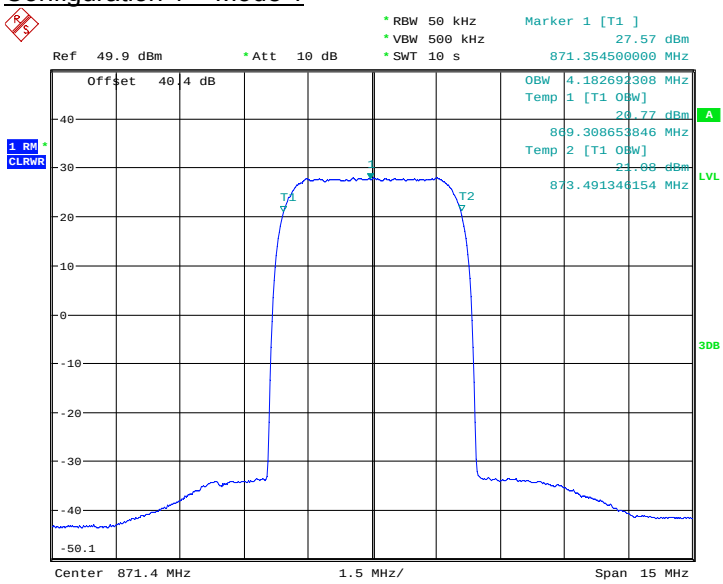
Date: 2.DEC.2011 16:01:26

Product Service

Single Carrier: 5MHz Bandwidth

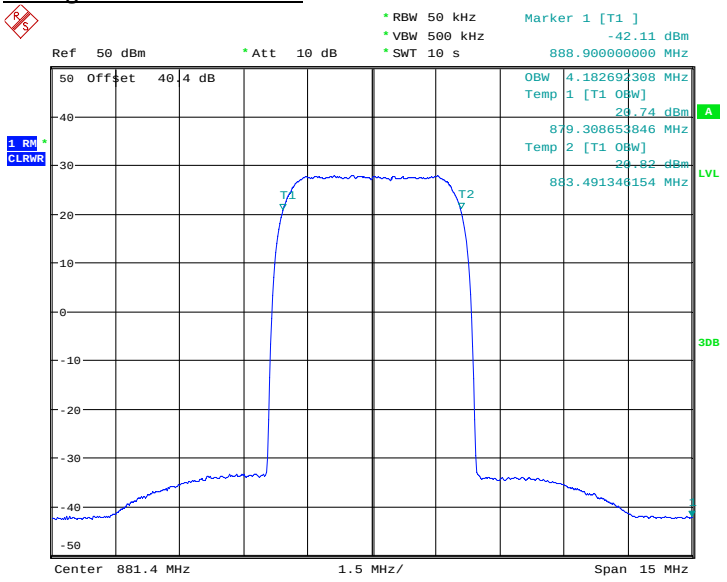
TM1

Configuration 1 – Mode 1



Date: 1.DEC.2011 09:54:08

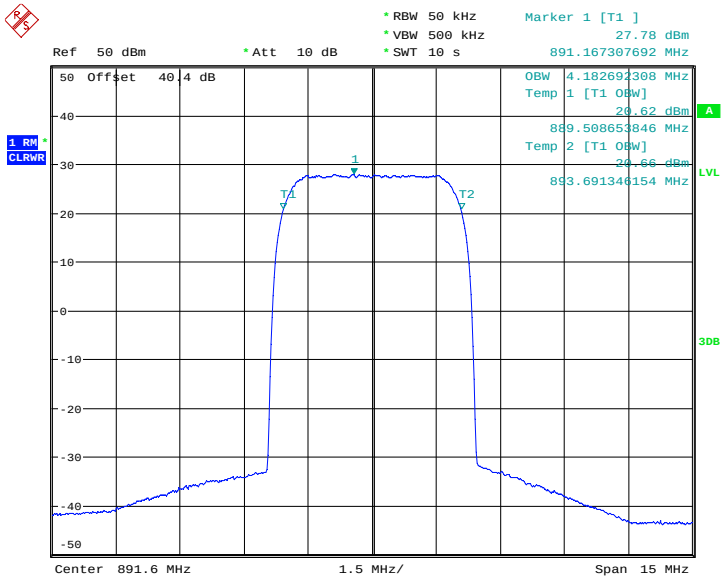
Configuration 1 – Mode 2



Date: 2.DEC.2011 13:28:57

Product Service

Configuration 1 – Mode 3



Date: 2.DEC.2011 13:09:51

2.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS (±1MHz)

2.5.1 Specification Reference

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

2.5.2 Equipment Under Test

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.5.3 Date of Test and Modification State

01 and 02 December 2011 – Modification State 0

2.5.4 Test Equipment Used

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

2.5.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132.

Since the EUT transmits on two antennas simultaneously in the same frequency range, i.e, TX Diversity Mode, using the Measure and Add 10log(N) dB technique, the limits for spurious emissions at antenna terminals (±1MHz) should be adjusted with a correction of 10log2.

In accordance with 22.917(b), at least 1% of the emission bandwith shall be used for the resolution bandwidth up to 1MHz away from the block edge. A resolution bandwidth of 30kHz was used up to 1MHz away from the band edges. 30kHz is <1% of the Emission Bandwidth (5MHz nominal BW setting). To compensate for the reduced measurement bandwidth, the limit -13dBm was adjusted to -18dBm (-15dBm – 10log2) up to 1MHz away from the band edges. A resolution bandwidth of 50kHz was used between 1MHz to 5MHz away from the band edges. As Industry Canada RSS-132 specify a RBW of 1MHz for measurements of emissions > 1MHz away from the band edges, the limit was adjusted with (-13dB – 10log2) to -29dBm to compensate for the reduce mesurement bandwidth. Spectrum analyzer detector was set as RMS.

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

The EUT was tested at it's maximum power level.

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

Configuration 1 - Mode 1
- Mode 3
- Mode 6
- Mode 7

Product Service

2.5.6 Environmental Conditions

	01 December 2011	02 December 2011
Ambient Temperature	23.5°C	22.5°C
Relative Humidity	20.5%	29.0%

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.

Antenna A and B

TM1

Single Carrier

Configuration 1 - Mode 1 and 3

Band Edge Frequency	Edge Test with QPSK modulation Channel No./Frequencies
Bottom 869 MHz	Channel: 4357 Frequency: 871.4 MHz
Top 894 MHz	Channel: 4458 Frequency: 891.6 MHz

Multi Carrier (1x2)

Configuration 1 - Mode 6 and 7

Band Edge Frequency	Edge Test with QPSK modulation Channel No./Frequencies
Bottom 869 MHz	Channel: 4357 & 4382 Frequency: 871.4 & 876.4 MHz
Top 894 MHz	Channel: 4433 & 4458 Frequency: 886.6 & 891.6 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.

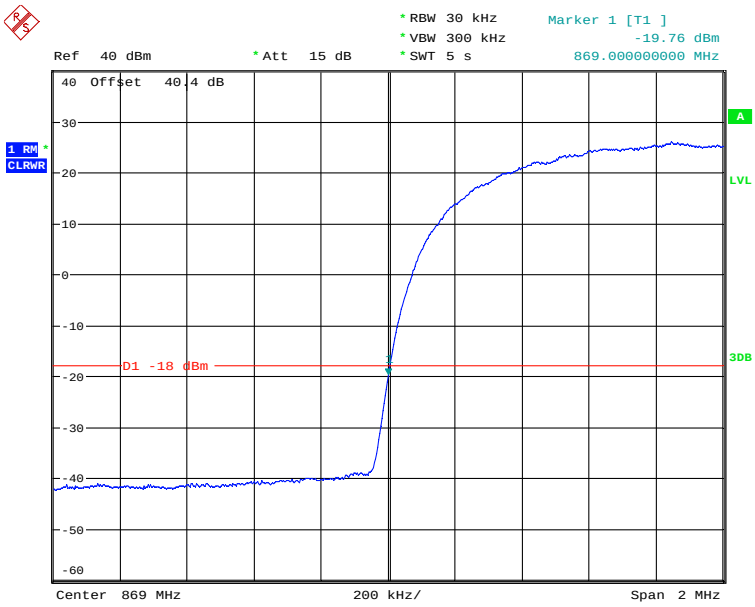
The test results are shown below

Antenna A

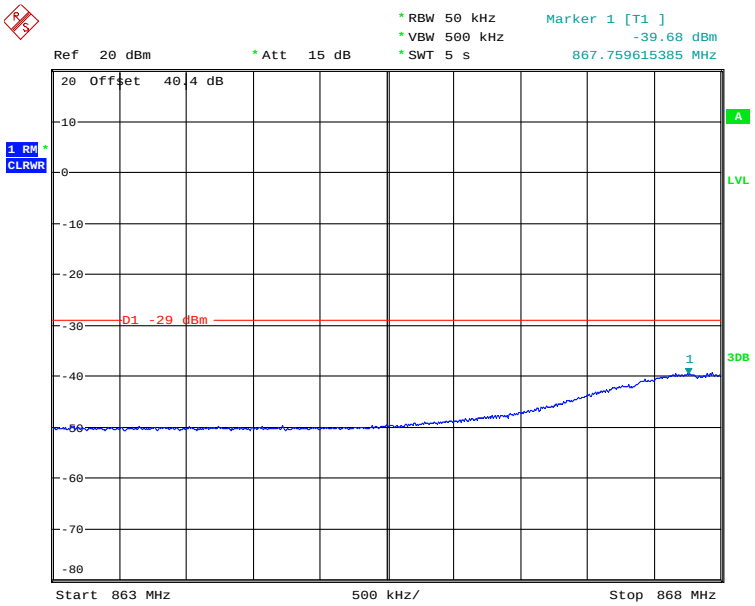
TM1

Single Carrier

Configuration 1 - Mode 1



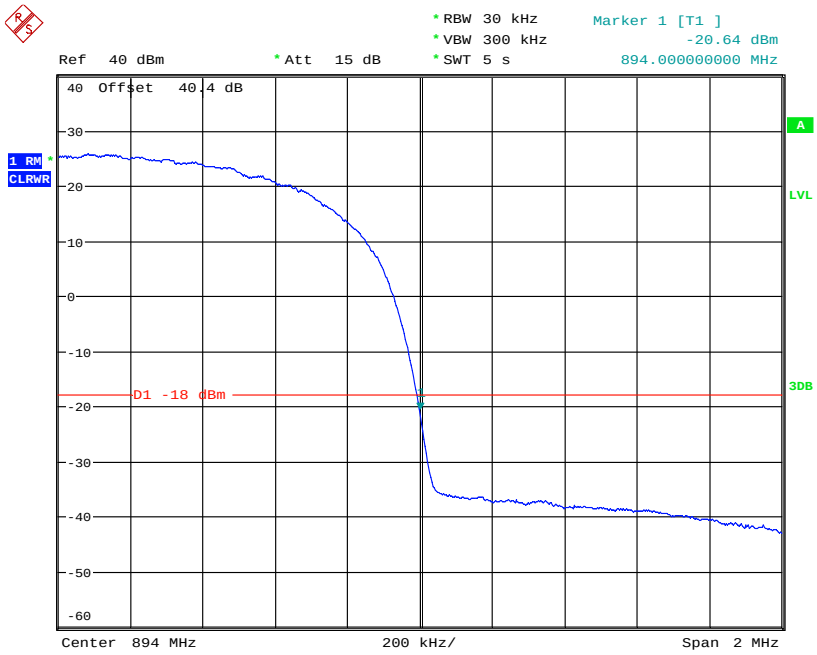
Date: 1.DEC.2011 09:46:29



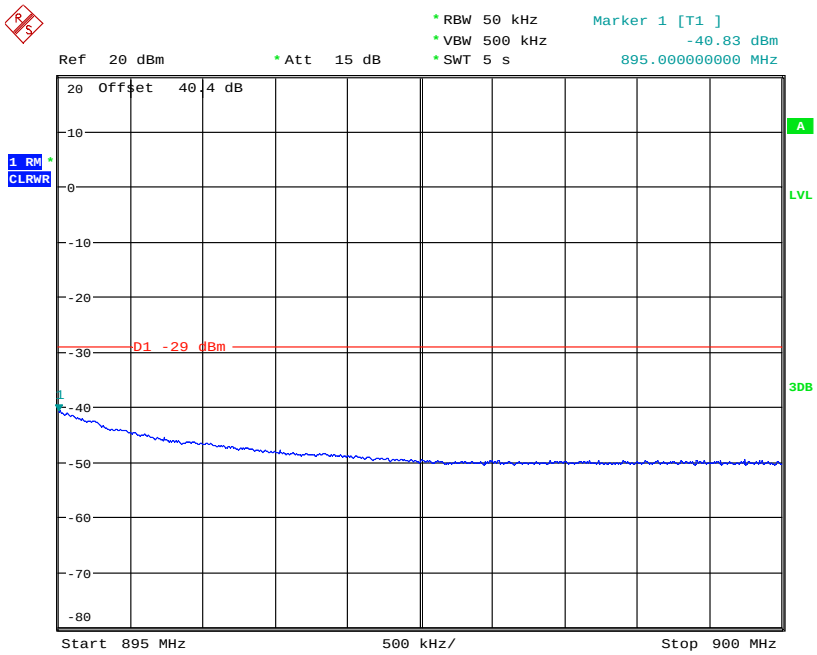
Date: 1.DEC.2011 09:45:17

Product Service

Configuration 1 – Mode 3



Date: 1.DEC.2011 12:17:12

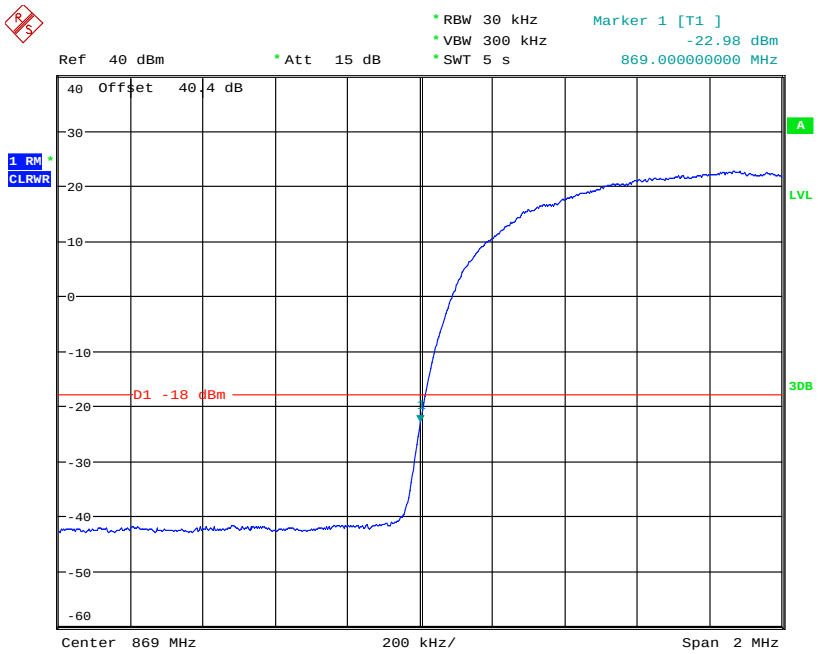


Date: 1.DEC.2011 12:16:04

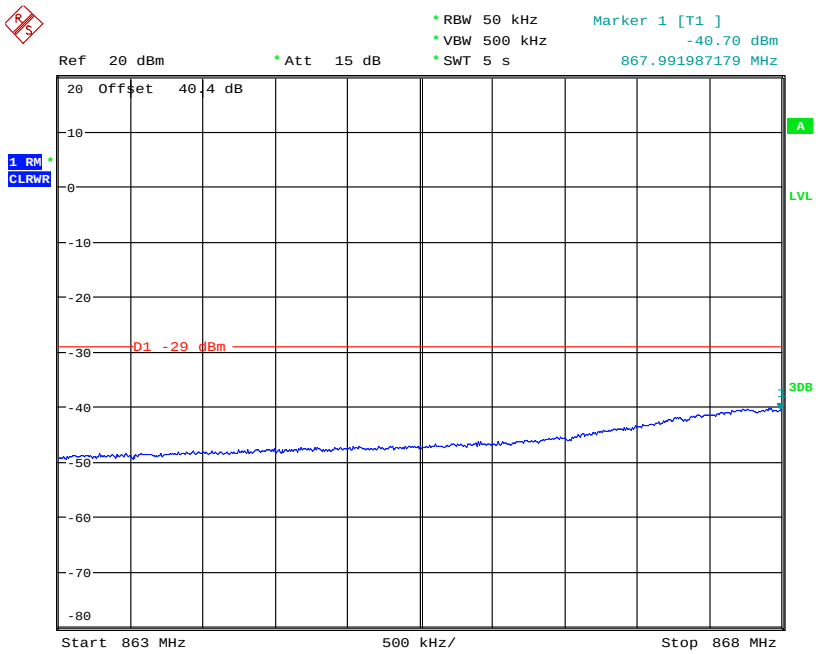
Product Service

Multi Carrier (1x2)

Configuration 1 - Mode 6



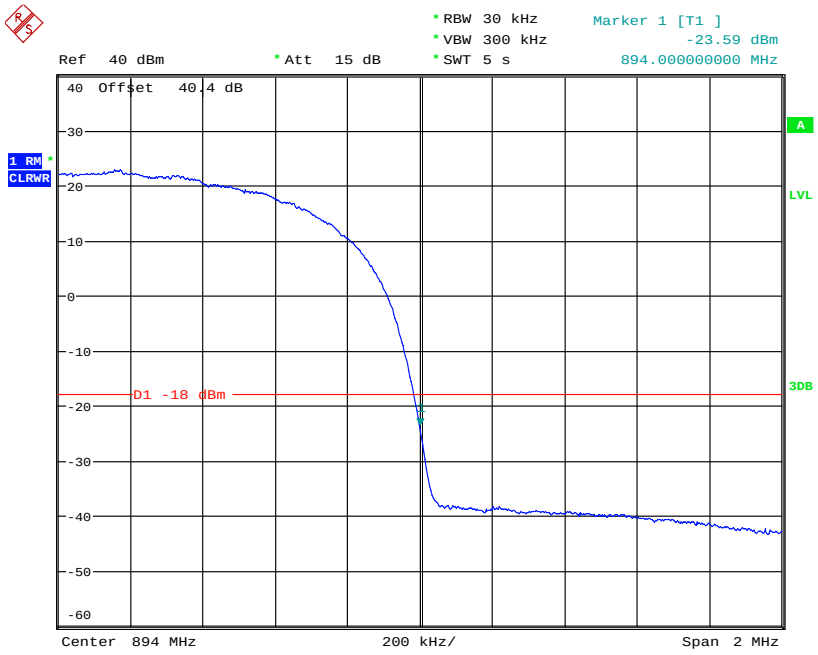
Date: 2.DEC.2011 11:43:30



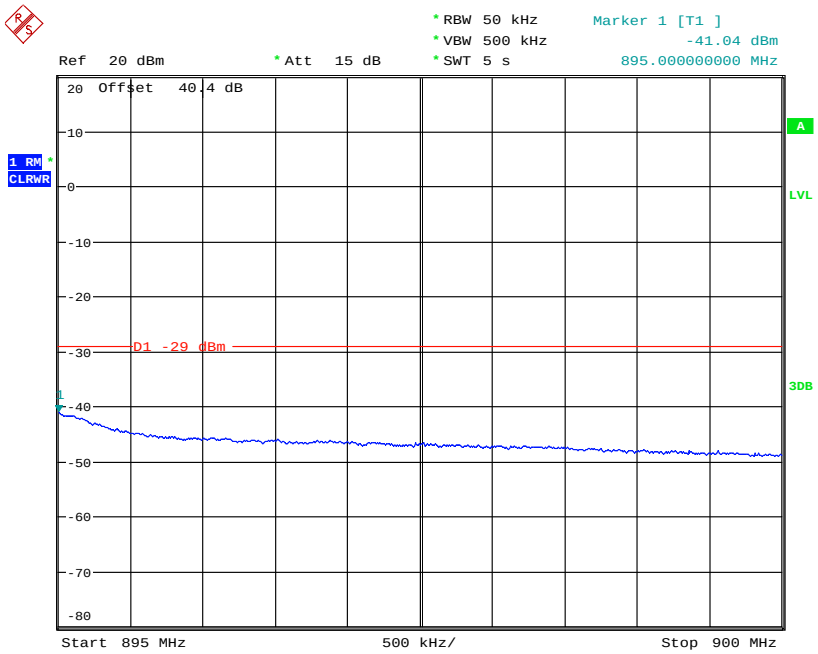
Date: 2.DEC.2011 11:45:32

Product Service

Configuration 1 - Mode 7



Date: 2.DEC.2011 09:57:36



Date: 2.DEC.2011 09:48:11

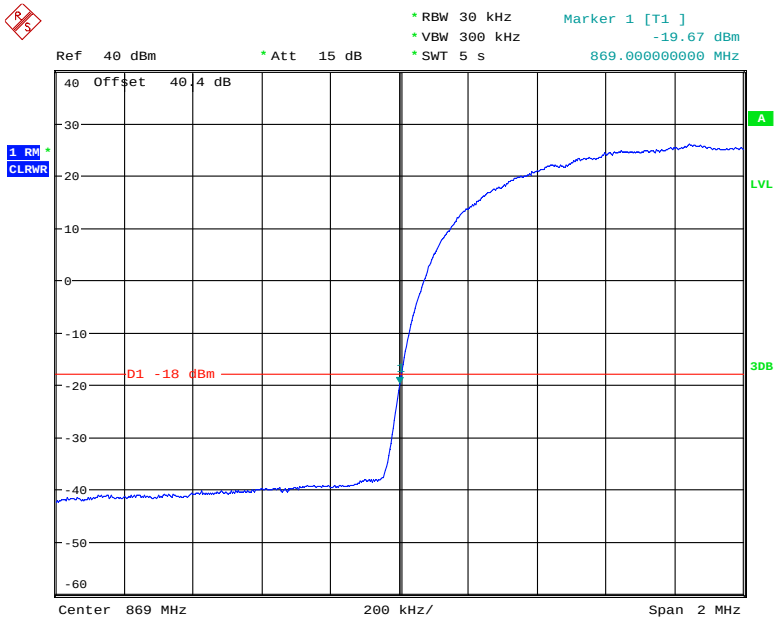
Product Service

Antenna B

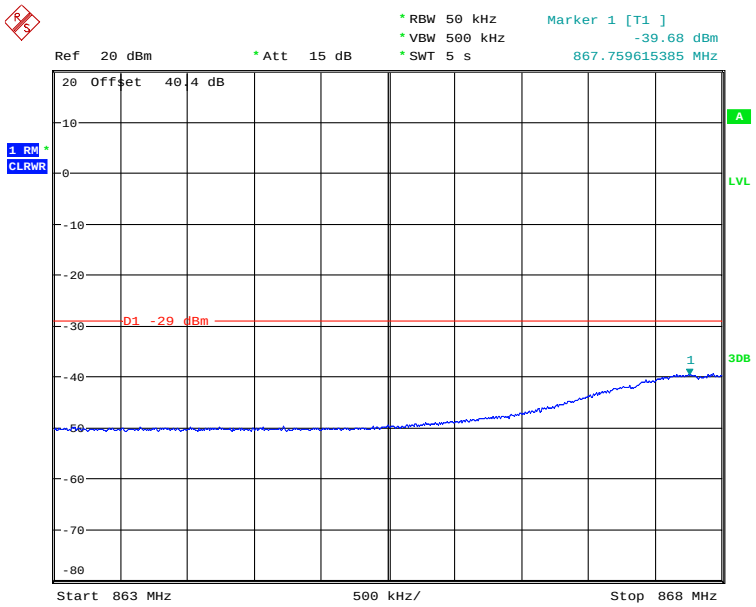
TM1

Single Carrier

Configuration 1 - Mode 1



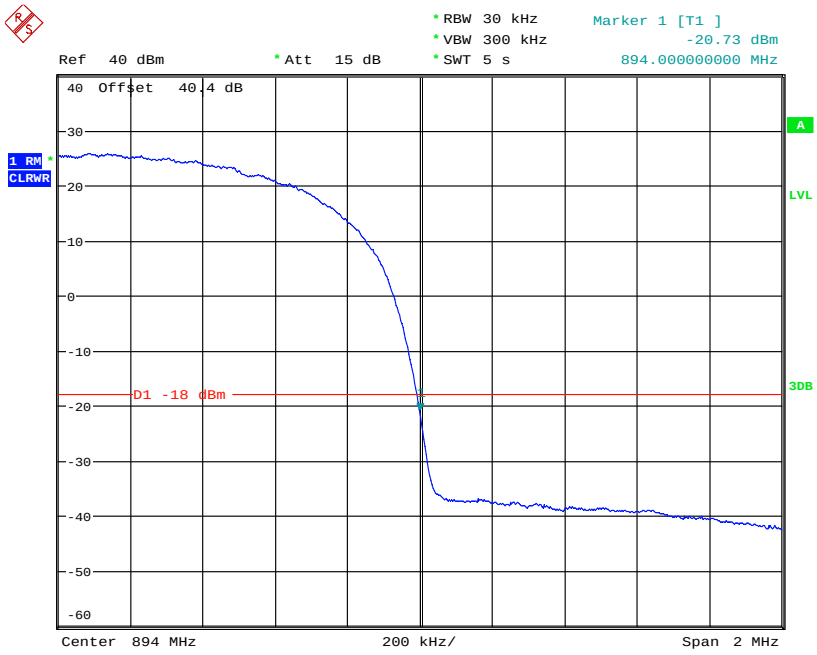
Date: 1.DEC.2011 10:12:34



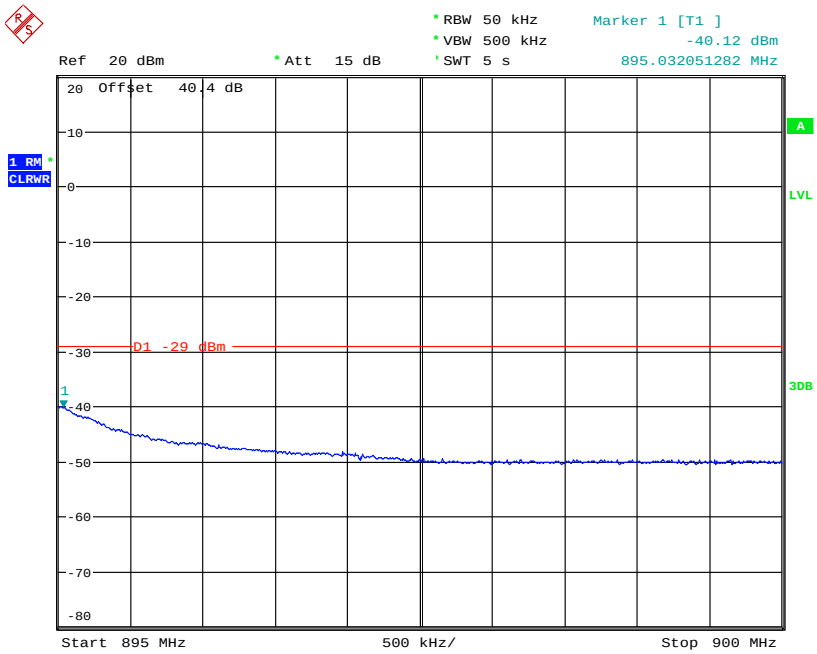
Date: 1.DEC.2011 09:45:17

Product Service

Configuration 1 – Mode 3



Date: 1.DEC.2011 11:54:14

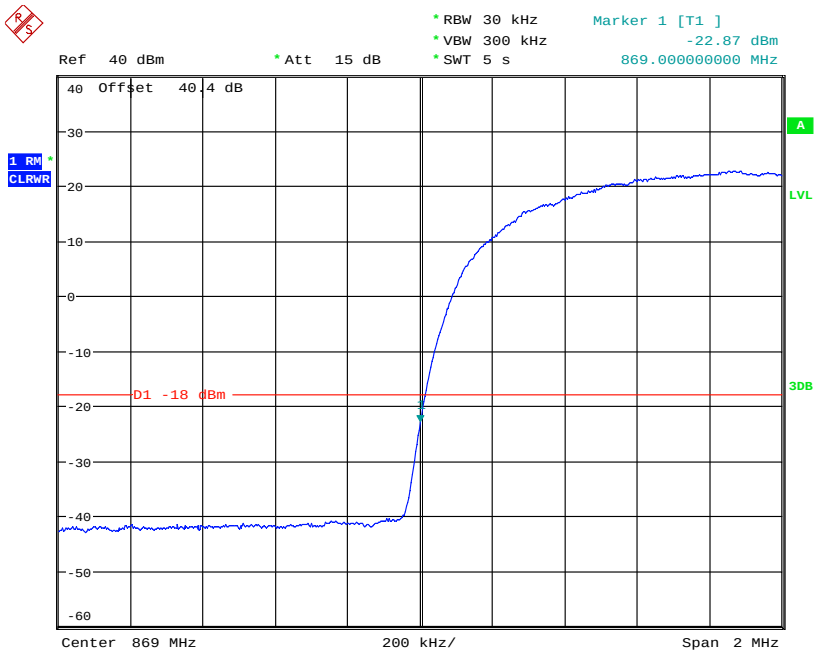


Date: 1.DEC.2011 11:52:59

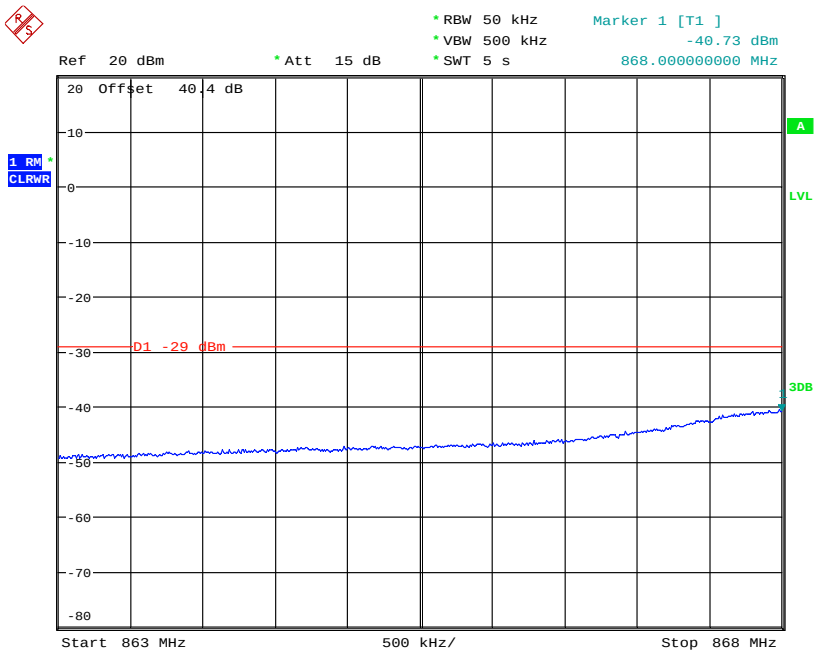
Product Service

Multi Carrier (1x2)

Configuration 1 - Mode 6



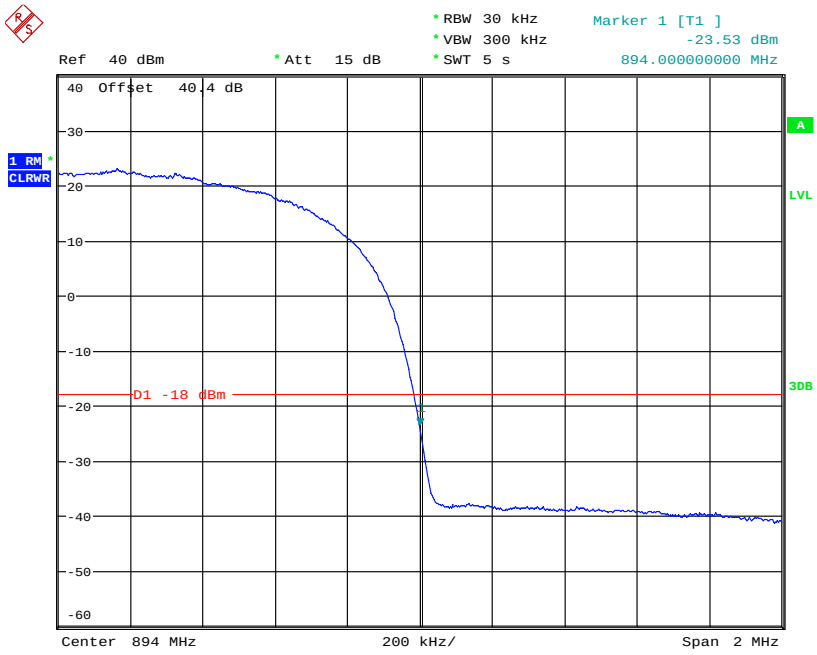
Date: 2.DEC.2011 11:40:40



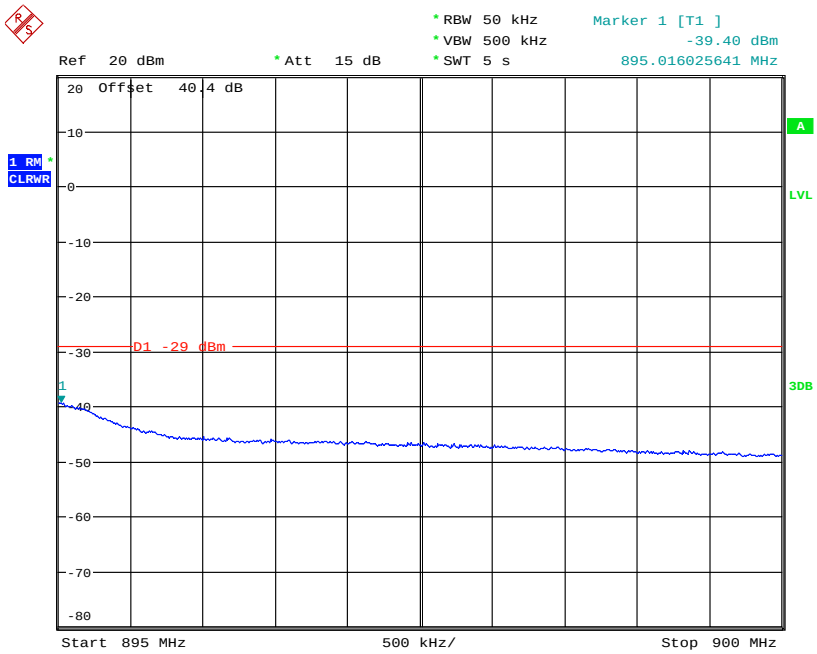
Date: 2.DEC.2011 11:38:41

Product Service

Configuration 1 - Mode 7



Date: 2.DEC.2011 10:00:11



Date: 2.DEC.2011 10:02:59

Limit

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

2.6 RADIATED SPURIOUS EMISSIONS

2.6.1 Specification Reference

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

2.6.2 Equipment Under Test

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.6.3 Date of Test and Modification State

08 and 09 December 2011 – Modification State 0

2.6.4 Test Equipment Used

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

2.6.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132.

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 – 25GHz were then formally measured using a Peak detector as the worst case.

In the frequency Range 30MHz – 25GHz, 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:

$E_{(v/m)}=(30 \times 1.64 \times 34.83)^{0.5} / 3 = 13.80V/m = 142.80dB\mu V/m$

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

43 + 10log(34.83) = 58.42dB

Therefore the limit at 3m measurement distance is:

142.80 – 58.42 = 84.4 dBµV/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 as the worst cases:

Configuration 1 - Mode 1
- Mode 2
- Mode 3
- Mode 5
- Mode 9

2.6.6 Environmental Conditions

	08 December 2011	09 December 2011
Ambient Temperature	22.5°C	20.3°C
Relative Humidity	28.5%	36.8%

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

Note: Only the worst case results plots have been included as all of the emissions are greater than 20dB below the limit. A set of plots have been included to show the measurement system noise floor.

Single Carrier

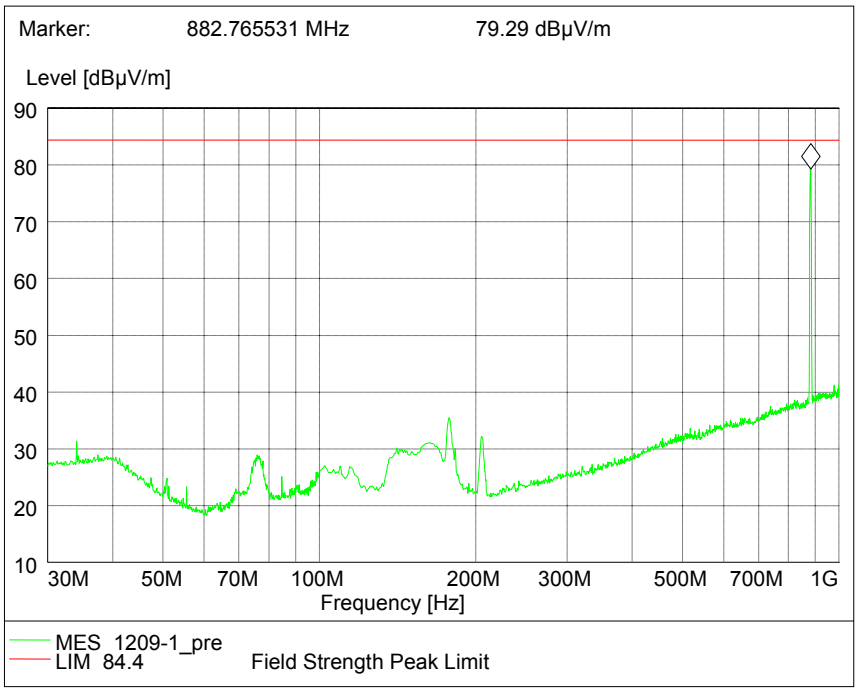
TM1

Configuration 1 - Mode 1

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2

30MHz – 1GHz

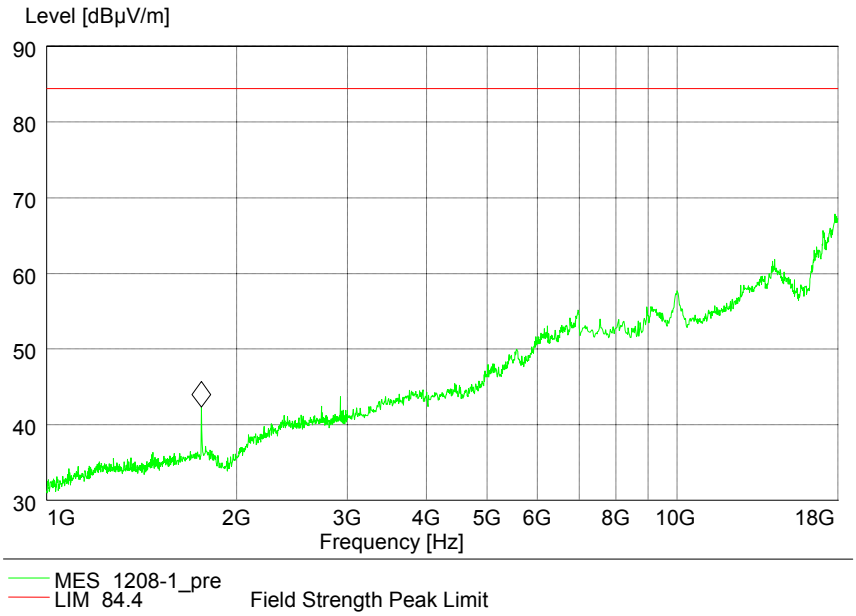


Note: The marked emission is the operating frequency.

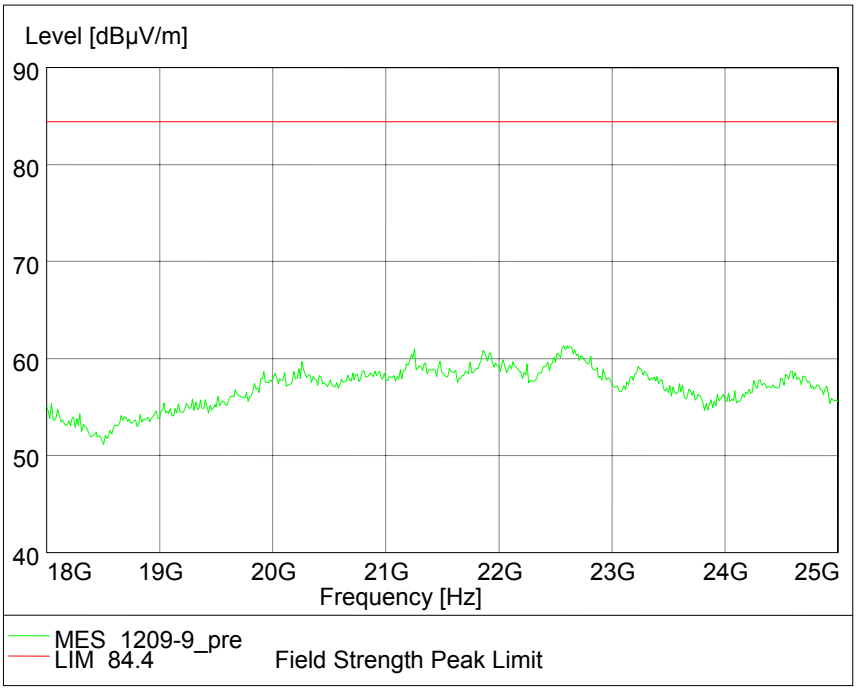
Product Service

1GHz – 18GHz

Marker: 1.75991984 GHz 42.32 dBµV/m



18GHz – 25GHz



Configuration 1 - Mode 3

No emissions were detected within 20dB of the limit.

TM5

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

TM6

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

Multi Carrier (1x2)

TM1

Configuration 1 - Mode 5

No emissions were detected within 20dB of the limit.

Multi Carrier (1x4)

TM1

Configuration 1 - Mode 9

No emissions were detected within 20dB of the limit.

Limit	-13dBm / 84.4 dBµV/m

Remarks

The EUT does not exceed -13dBm at the measured frequencies.

2.7 CONDUCTED SPURIOUS EMISSIONS

2.7.1 Specification Reference

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

2.7.2 Equipment Under Test

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.7.3 Date of Test and Modification State

29 November to 02 December and 07 December 2011 – Modification State 0

2.7.4 Test Equipment Used

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

2.7.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132.

In accordance with Part 2.1051, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using an attenuator and the frequency spectrum investigated from 9kHz to 25GHz. The EUT was set to transmit on maximum power. The resolution was set to 1MHz for 9kHz to 25GHz thus meeting the requirements of Industry Canada RSS-132 Clause 4.5.1.2. The spectrum analyzer detector was set to peak and trace was kept on Max Hold.

Since the EUT transmits on two antennas simultaneously in the same frequency range, i.e, TX Diversity Mode, using the Measure and Add 10log(N) dB technique, the limit for Conducted Spurious Emissions was adjusted with a correction of 10log2 to -16dBm.

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 highest internal frequency.

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

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

Product Service

2.7.6 Environmental Conditions

	29 Nov. 2011	30 Nov. 2011	01 Dec. 2011	02 Dec. 2011	07 Dec. 2011
Ambient Temperature	22.7°C	23.4°C	23.5°C	22.5°C	22.5°C
Relative Humidity	22.0%	20.1%	20.5%	29.0%	29.5%

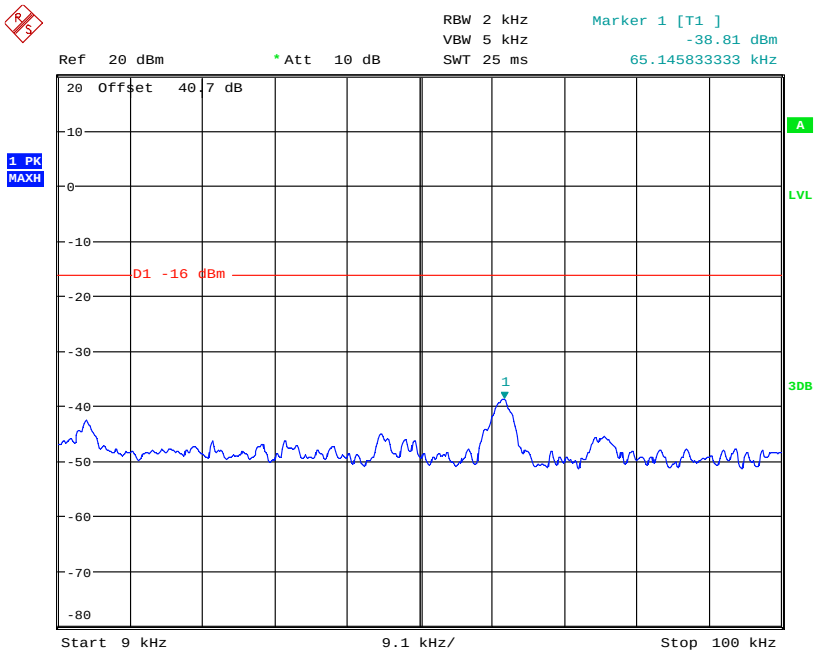
2.7.7 Test Results

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

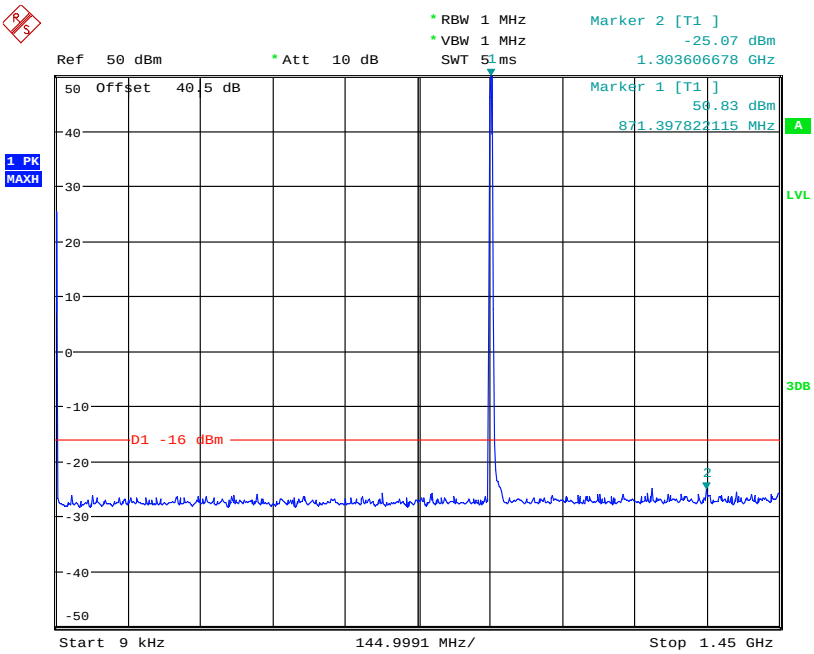
Antenna A

TM1

Single Carrier

Configuration 1 - Mode 1

9kHz to 1.45GHz

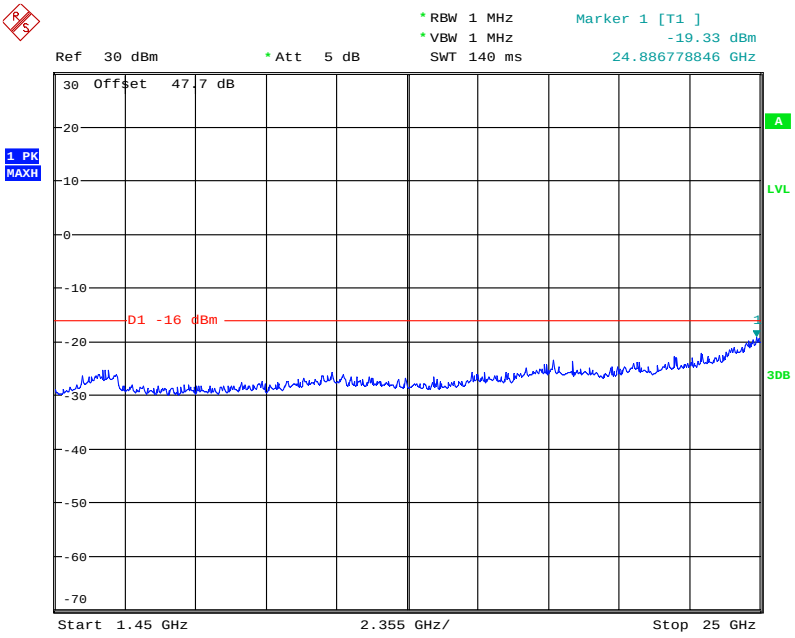


Date: 1.DEC.2011 09:50:39

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

Product Service

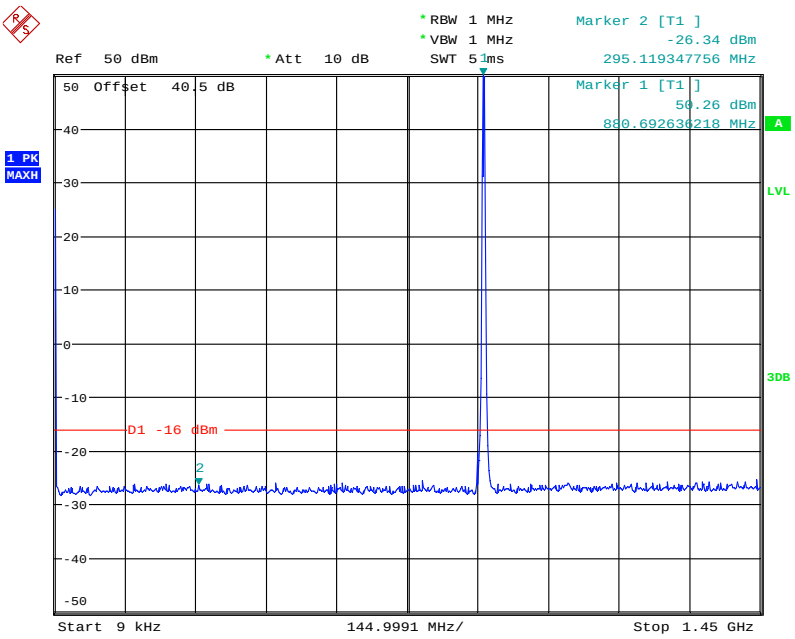
1.45GHz to 25GHz



Date: 1.DEC.2011 09:58:11

Configuration 1 - Mode 2

9kHz to 1.45GHz

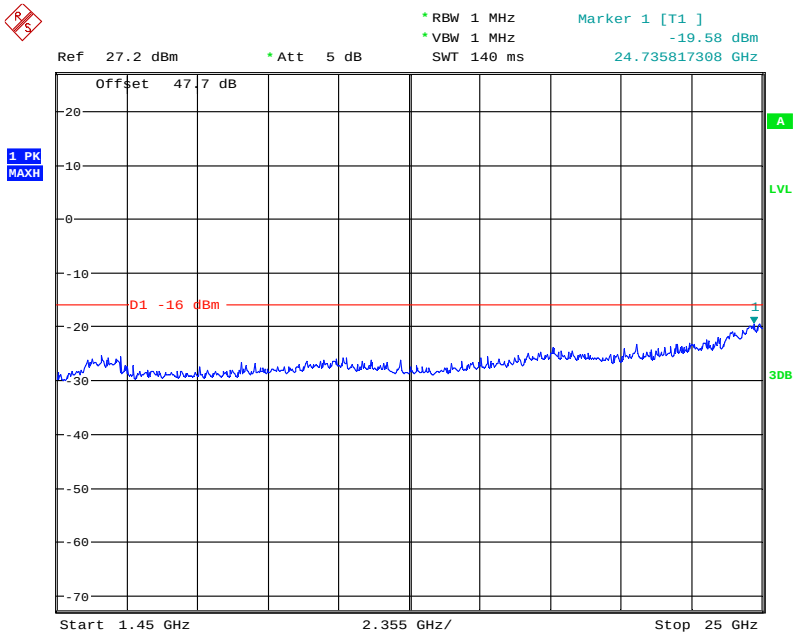


Date: 2.DEC.2011 13:33:34

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

Product Service

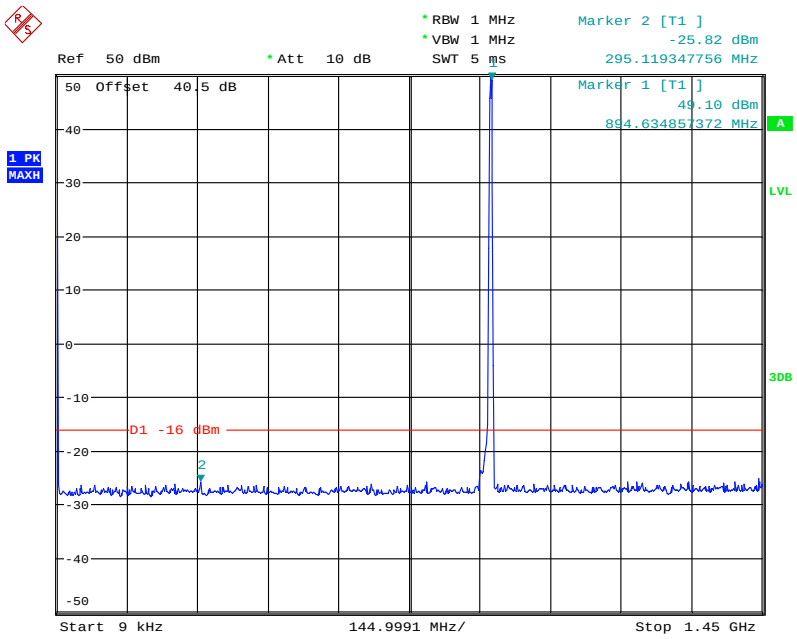
1.45GHz to 25GHz



Date: 2.DEC.2011 13:37:04

Configuration 1 – Mode 3

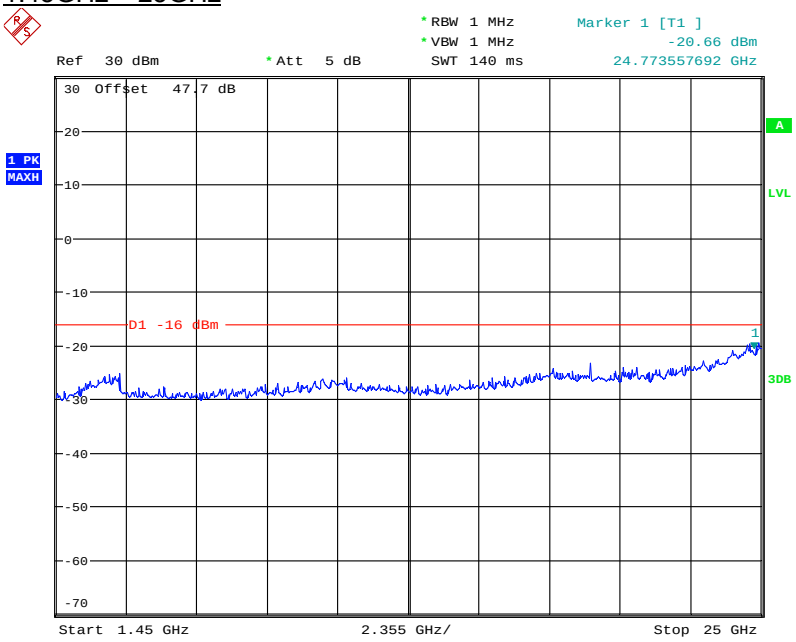
9kHz – 1.45GHz



Date: 1.DEC.2011 12:14:15

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

1.45GHz – 25GHz

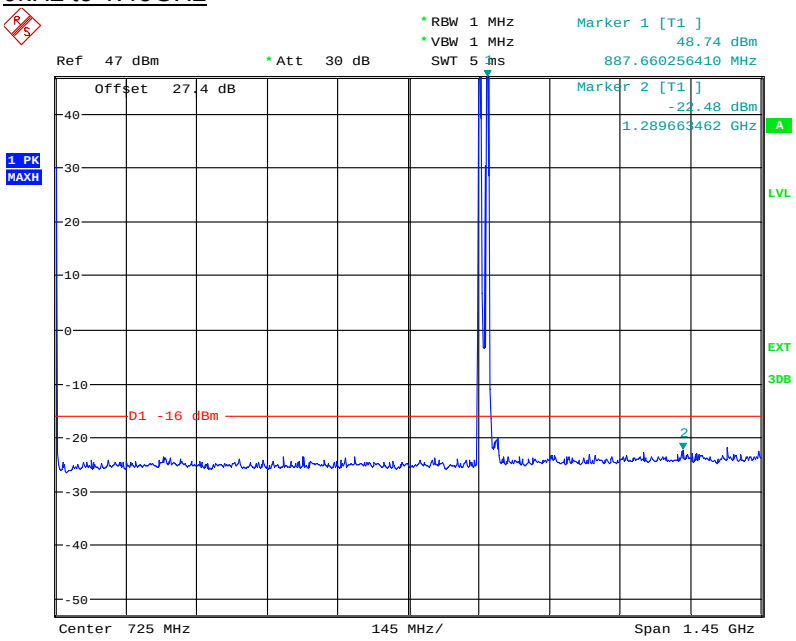


Date: 1.DEC.2011 12:11:25

Multi Carrier (1x2)

Configuration 1 - Mode 4

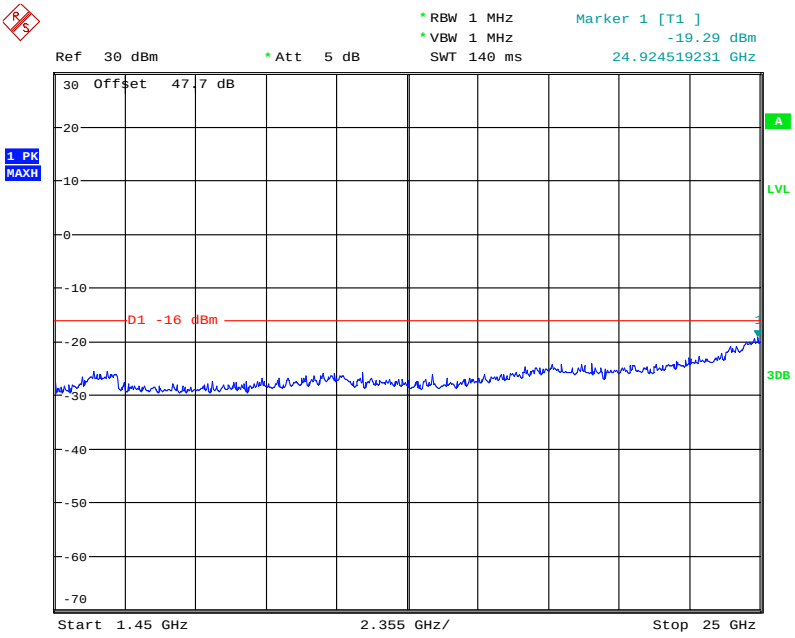
9kHz to 1.45GHz



Date: 7.DEC.2011 09:27:01

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

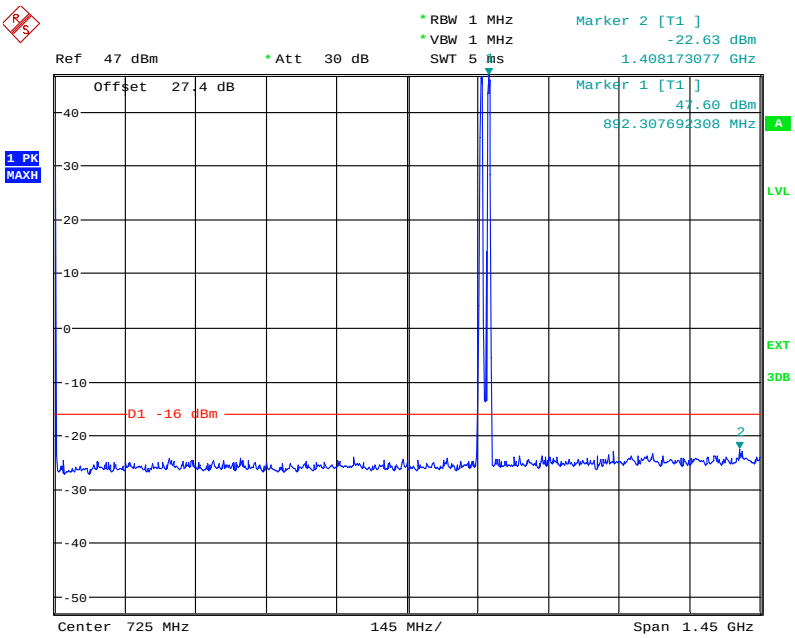
1.45GHz to 25GHz



Date: 30.NOV.2011 09:50:31

Configuration 1 - Mode 5

9kHz to 1.45GHz

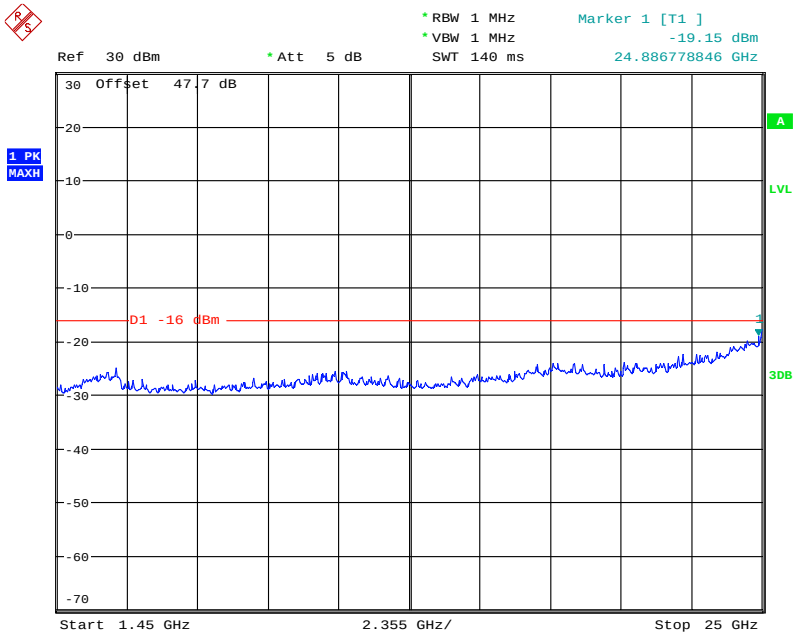


Date: 7.DEC.2011 09:44:23

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

Product Service

1.45GHz to 25GHz



Date: 29.NOV.2011 15:18:53

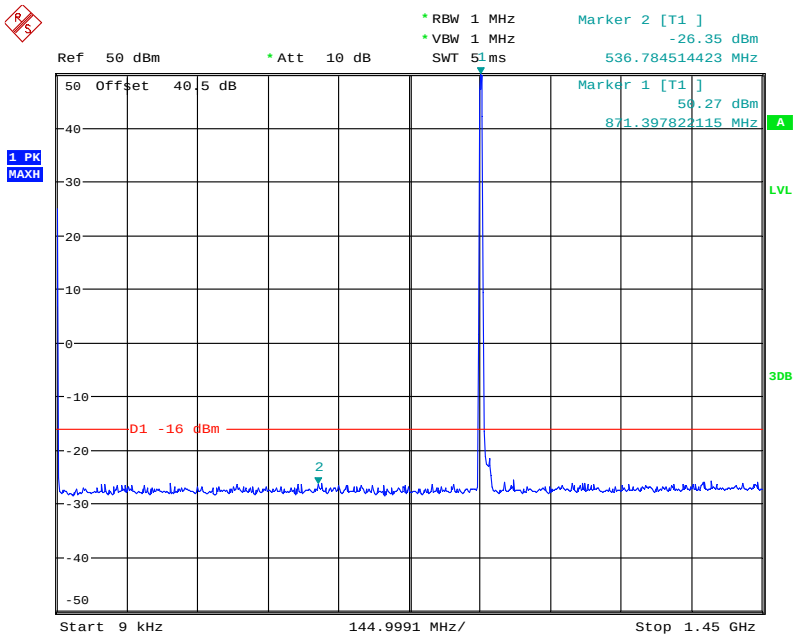
Antenna B

TM1

Single Carrier

Configuration 1 - Mode 1

9kHz to 1.45GHz

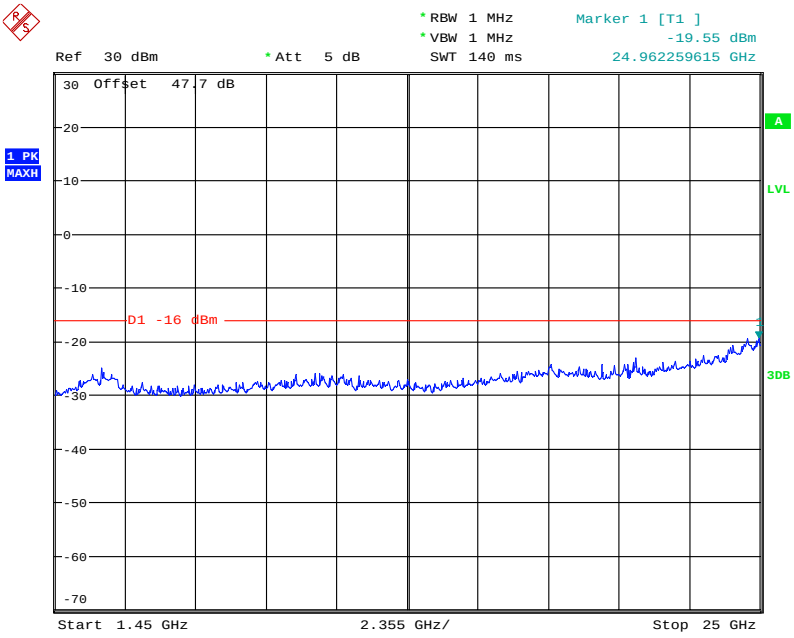


Date: 1.DEC.2011 10:09:07

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

Product Service

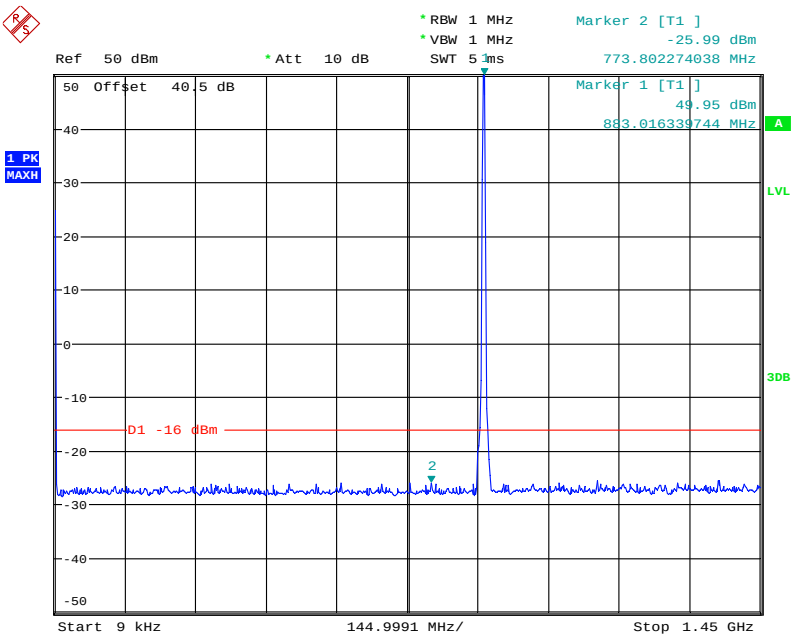
1.45GHz to 25GHz



Date: 1.DEC.2011 10:05:46

Configuration 1 - Mode 2

9kHz to 1.45GHz

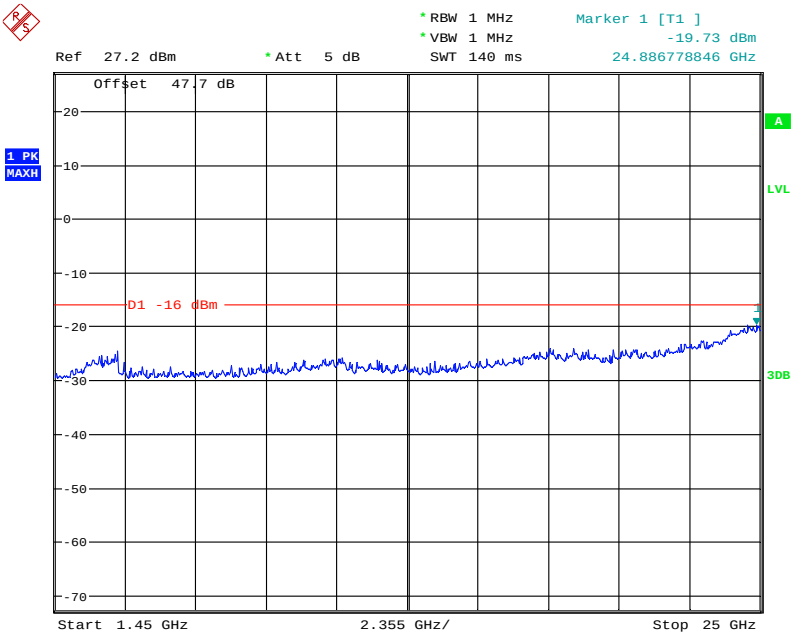


Date: 2.DEC.2011 13:47:14

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

Product Service

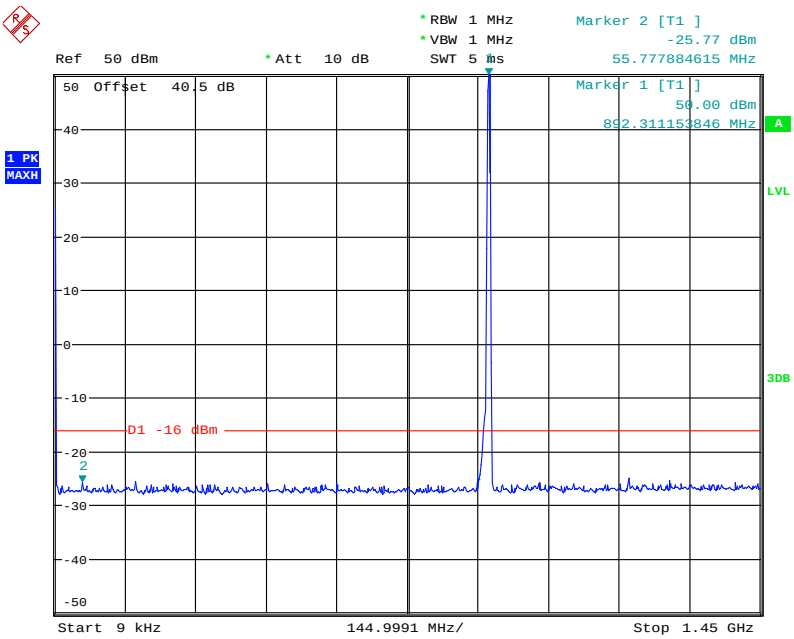
1.45GHz to 25GHz



Date: 2.DEC.2011 13:44:30

Configuration 1 - Mode 3

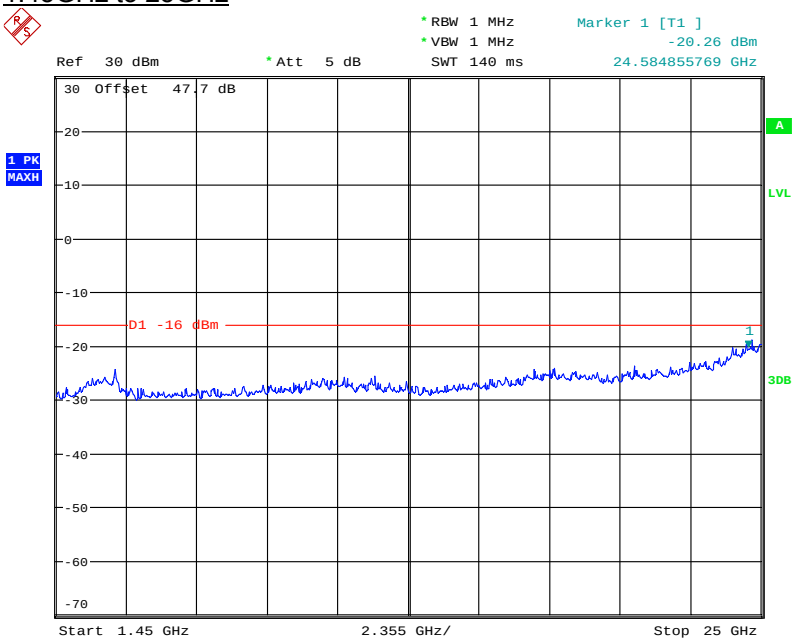
9kHz to 1.45GHz



Date: 1.DEC.2011 11:56:36

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

1.45GHz to 25GHz

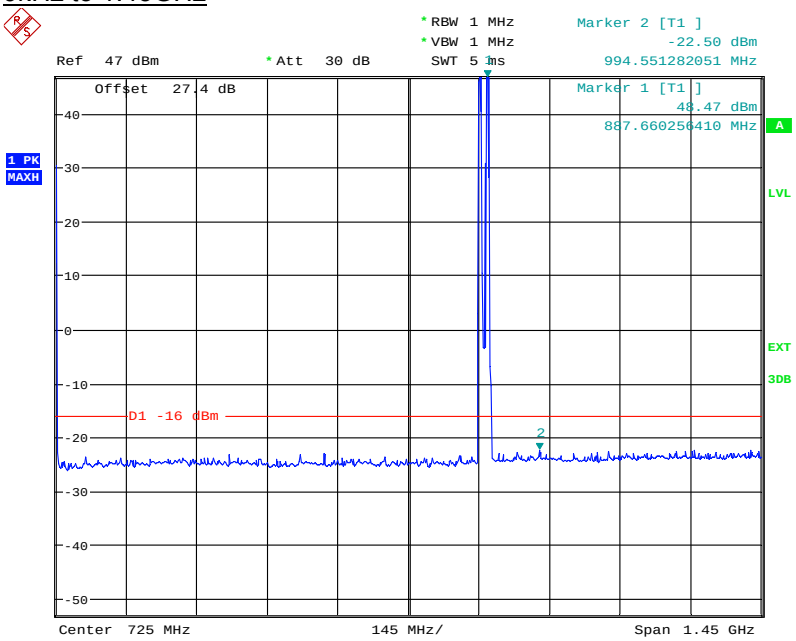


Date: 1.DEC.2011 12:00:07

Multi Carrier (1x2)

Configuration 1 - Mode 4

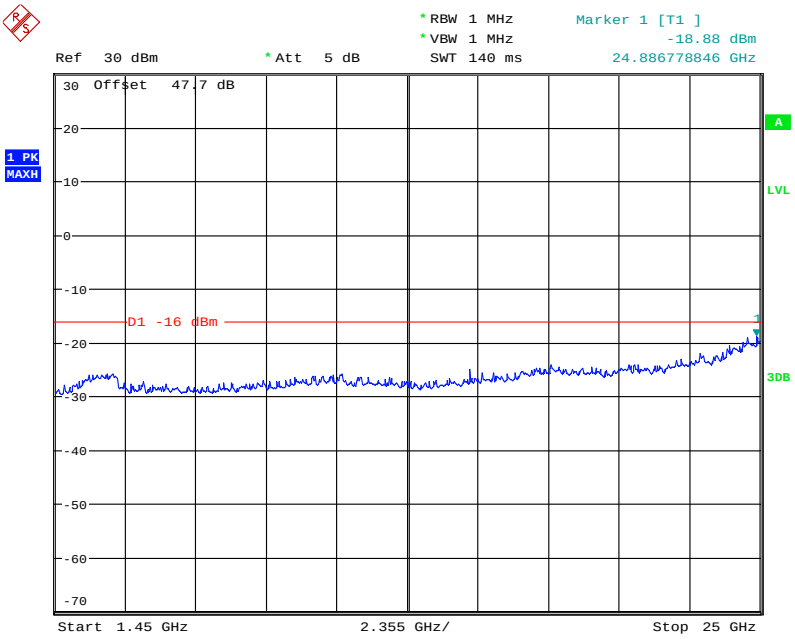
9kHz to 1.45GHz



Date: 7.DEC.2011 09:21:06

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

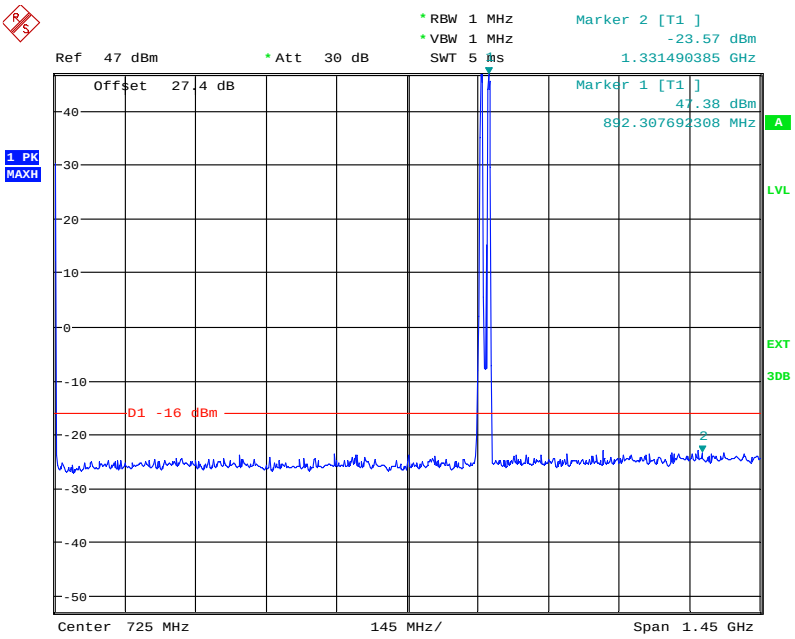
1.45GHz to 25GHz



Date: 29.NOV.2011 15:22:57

Configuration 1 - Mode 5

9kHz to 1.45GHz

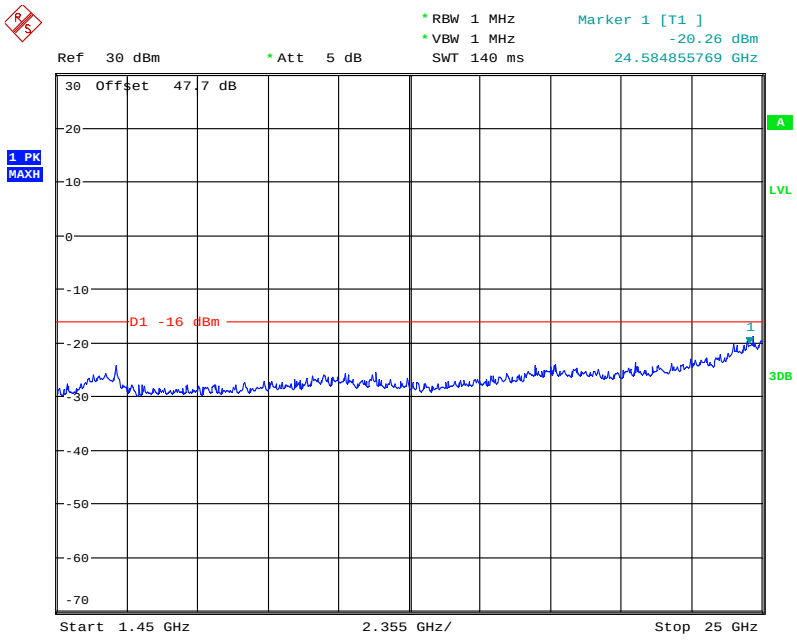


Date: 7.DEC.2011 09:47:04

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

Product Service

1.45GHz to 25GHz



Date: 1.DEC.2011 12:00:07

Limit	-16dBm (-13dBm – 10log2)

Remarks

The EUT does not exceed -16dBm (-13dBm – 10log2) at the frequency range of 9kHz to 25GHz.

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

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.8.3 Date of Test and Modification State

05 and 06 December 2011 – Modification State 0

2.8.4 Test Equipment Used

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

2.8.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132.

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

	05 December 2011	06 December 2011
Ambient Temperature	21.7°C	22.0°C
Relative Humidity	32.4%	38.2%

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

Single Carrier

TM1

Configuration 1 - Mode 2

Temperature Interval (ºC)	Deviation (Hz)
-30	-3.24
-20	-3.35
-10	3.14
0	-3.13
+10	-6.92
+20	**-4.81**
+30	4.29
+40	-5.88
+50	-4.18

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

2.9 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

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.9.3 Date of Test and Modification State

05 December 2011 – Modification State 0

2.9.4 Test Equipment Used

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

2.9.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132.

The EUT was set to transmit on maximum power. A Spectrum Analyzer 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

	05 December 2011
Ambient Temperature	21.7°C
Relative Humidity	32.4%

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

Single Carrier

TM1

Configuration 1 - Mode 2

DC Voltage (V)	Deviation (Hz)
-40.8	-4.53
-48.0	**-4.81**
-55.2	-4.69

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.

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

RRUS 11 B5 / KRC 161 285/2, S/N: CB4L317567

2.10.3 Date of Test and Modification State

21 December 2011 – Modification State 0

2.10.4 Test Equipment Used

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

2.10.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry 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 RF B. The EUT was set to transmitter mode on the TX connector RF A and during the measurement the RF A was terminated with match load, (50 Ohm).

The resolution was set to 1MHz in the frequency range 9kHz to 13GHz thus meeting the requirements of RSS-Gen Clause 4.10, the spectrum analyzer 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 13GHz.

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 higest internal frequency.

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

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.10.6 Environmental Conditions

	21 December 2011
Ambient Temperature	23.4°C
Relative Humidity	20.2%

Product Service

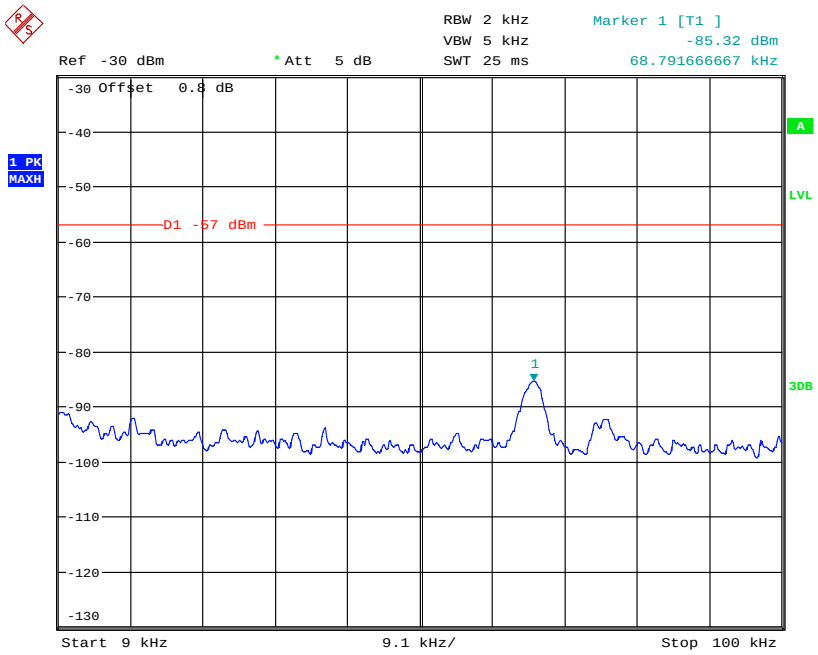
2.10.7 Test Results

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.



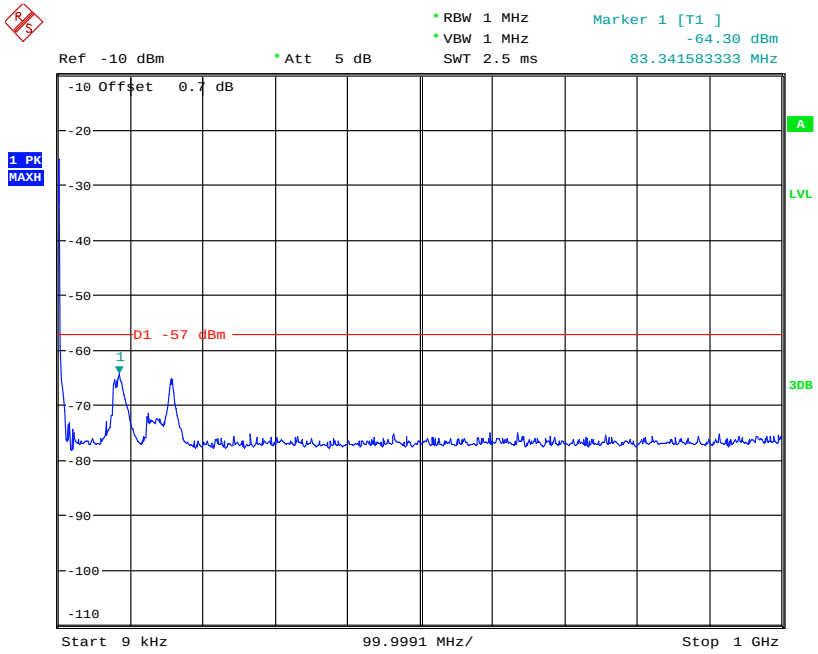
Date: 21.DEC.2011 14:41:11

Single Carrier

TM1

Configuration 1 - Mode 1

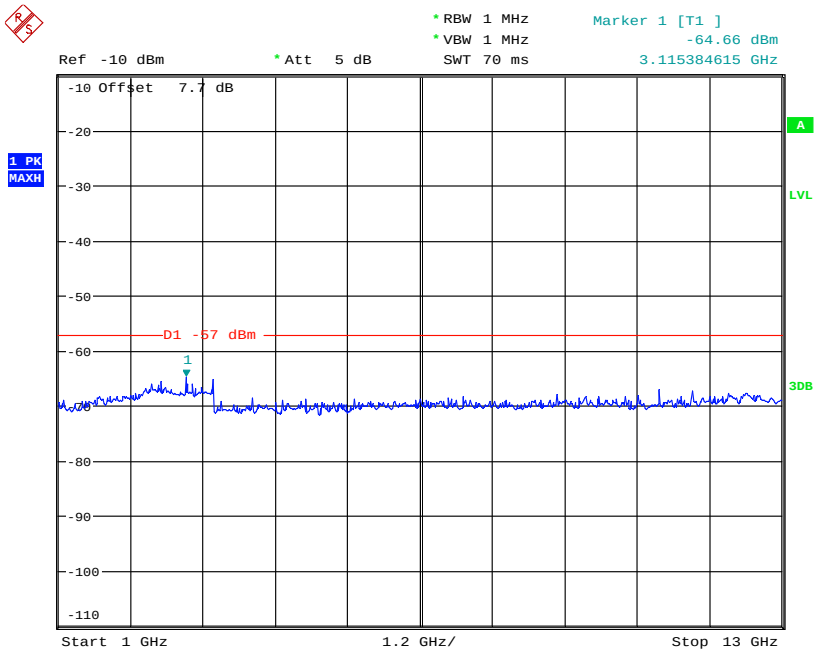
9kHz to 1GHz



Date: 21.DEC.2011 13:32:52

Product Service

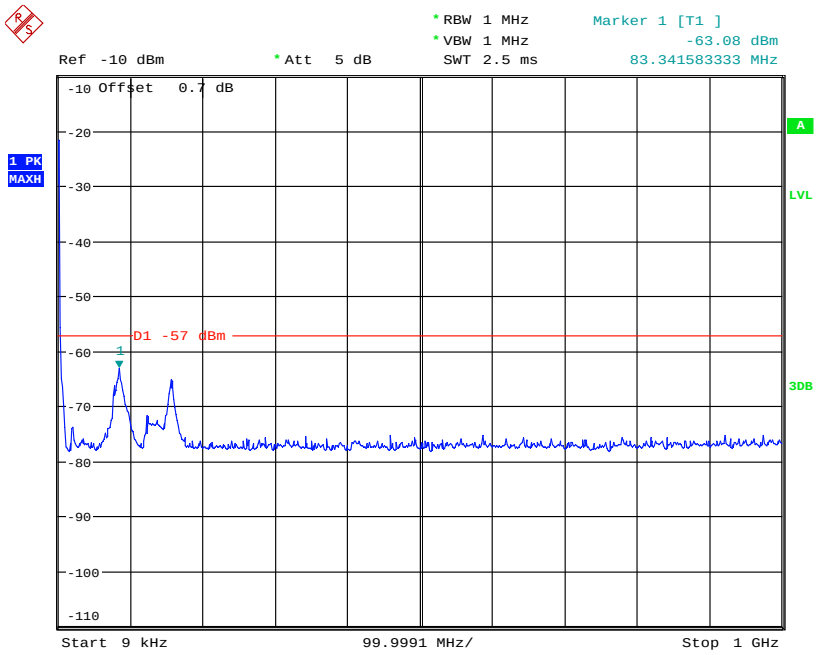
1GHz to 13GHz



Date: 21.DEC.2011 14:50:06

Configuration 1 - Mode 2

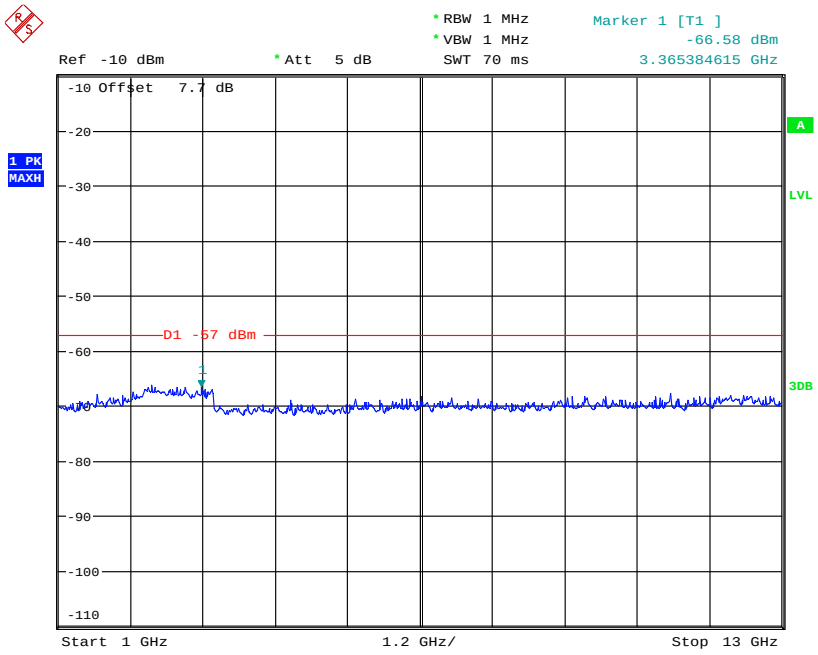
9kHz to 1GHz



Date: 21.DEC.2011 14:10:09

Product Service

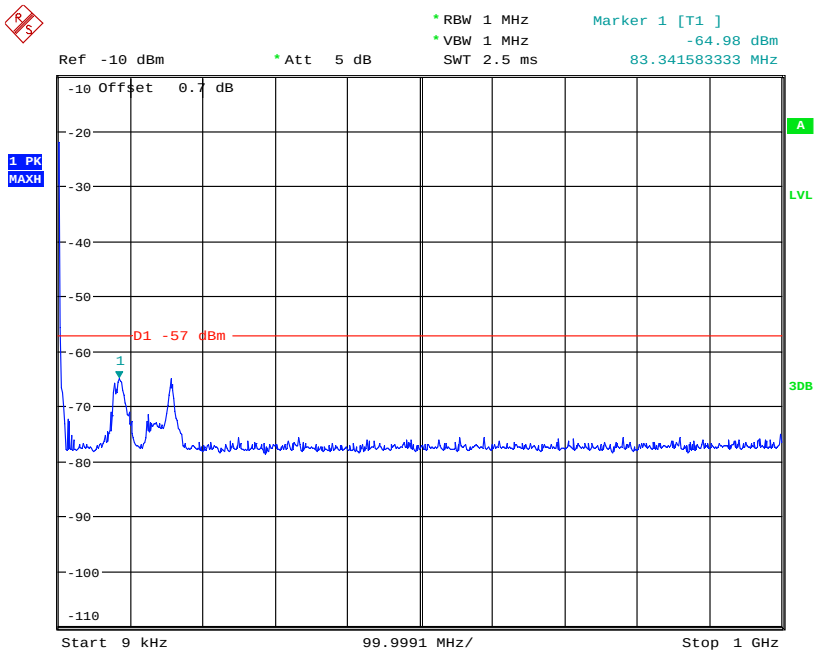
1GHz to 13GHz



Date: 21.DEC.2011 14:27:04

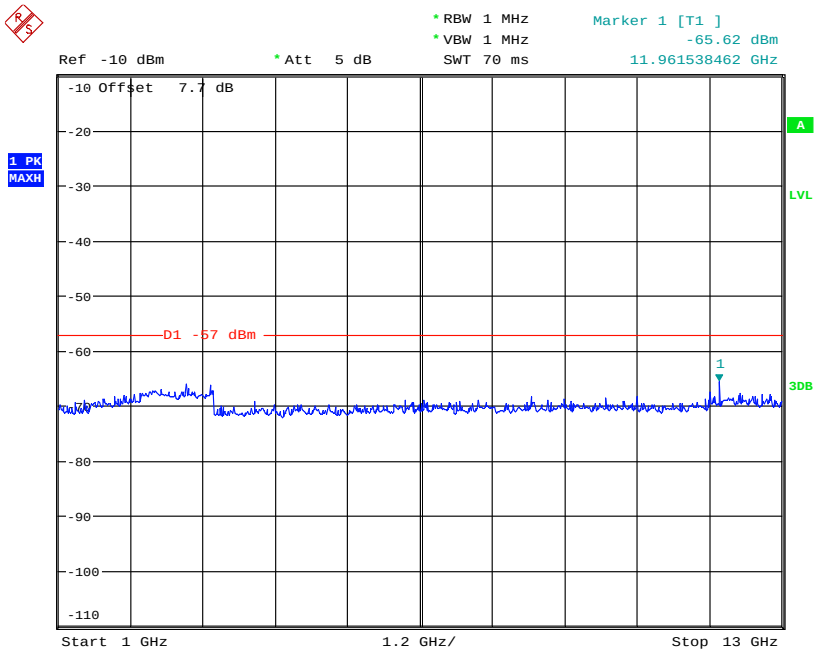
Configuration 1 - Mode 3

9kHz to 1GHz



Date: 21.DEC.2011 14:23:49

1GHz to 13GHz



Date: 21.DEC.2011 14:39:30

Limit

From 47 CFR Part 15.111:
The power at the antenna terminal at any frequency with the range of measurements shall not exceed -57dBm / 2 nanowatts.

From RSS GEN Section 6.2:
Receiver spurious emissions shall not exceed -57dBm / 2 nanowatts in the band 30MHz to 1000MHz, and -53dBm / 5 nanowatts above 1000MHz;

Remarks

The EUT does not exceed -57dBm at the frequency range of 9kHz to 13GHz.

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

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

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 Analyzer	Rohde & Schwarz	FSQ26	100253	12	27-Mar-2012
Power Meter	Rohde & Schwarz	NRP	102438	12	10-Aug-2012
Thermal Power Sensor	Rohde & Schwarz	NRP-Z51	102431	12	10-Aug-2012
Network Analyzer	Agilent	8720D	US36140166	12	09-Sep-2012
High Pass Filter	K&L	11SH10-1450	8	-	O/P MON
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
20dB Attenuator	Shanghai Huaxiang	DTS100	090722021	-	O/P MON
6dB Attennuator	Aeroflex / Weinschel	91-6-33-LIM	#A194	-	O/P MON
Load	Shanghai Huaxiang	TFZ100-3NF	09121144	-	O/P MON
Power Supply	Dahua	DH1716-5D	ETC/L090	-	08-Nov-2012
Power Supply	Dahua	DH1716A-14	ETD/L042	-	08-Nov-2012
Digital Multi-meter	FLUKE	179	91820401	12	03-Jan-2012
Thermo-hygrometer	AZ Instruments	8705	9151655	12	16-Dec-2012
Section 2.6 – Radiated Spurious Emissions					
Load	Shanghai Huaxiang	TFZ100-3NF	09121144	-	O/P MON
Load	Shanghai Huaxiang	TF100	09121602	-	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 Waveguide Horn Antenna	Rohde & Schwarz	HF 906	100029	12	19-Aug-2012
Pyramidal Horn Antenna	EMCO	3160-09	-	-	-
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	DH1716-5D	ETC/L090	-	08-Nov-2012
Power Supply	Dahua	DH1716A-14	ETD/L042	-	08-Nov-2012
Digital Multimeter	FLUKE	179	91820401	12	03-Jan-2012
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 Analyzer	Rohde & Schwarz	FSQ26	100253	12	27-Mar-2012
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	TFZ100-3NF	09121144	-	O/P MON
Temperature Chamber	Zenda	WGD/SJ7-10	200505100	-	O/P MON
Power Supply	Dahua	DH1716-5D	ETC/L090	-	08-Nov-2012
Power Supply	Dahua	DH1716A-14	ETD/L042	-	08-Nov-2012
Digital Multimeter	FLUKE	179	91820401	12	03-Jan-2012
Thermo-hygrometer	AZ Instruments	8705	9151655	12	16-Dec-2012

O/P MON Output monitored with calibration equipment
TU Traceability Unscheduled

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).