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Report On

FCC and Industry Canada Testing of the
Ericsson AB RUS 01 B2 / KRC 118 66/2

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC11866-2
IC ID: 287AB-AS118662

Document 75921580 Report 03 Issue 1 April 2013

TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuv-sud.co.uk

REPORT ON FCC and Industry Canada Testing of the Ericsson RUS 01 B2 / KRC 118 66/2

Document 75921580 Report 03 Issue 1

April 2013

PREPARED FOR

Ericsson AB
Isafjordsgatan 10
SE-164 80
Stockholm
Sweden

PREPARED BY

X Zhang
Test Engineer

APPROVED BY

M Jenkins
Authorised Signatory

DATED 22 April 2013

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 24 and Industry Canada RSS-133. 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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Product Service

SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Ericsson RUS 01 B2 / KRC 118 66/2

Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Ericsson RUS 01 B2 / KRC 118 66/2 to the requirements of FCC CFR 47 Part 24 and Industry Canada RSS-133.

Testing was carried out in support of a C2PC application for Grant of RUS 01 B2 / KRC 118 66/2 for hardware update and to add MIMO support in LTE mode.

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	RUS 01 B2
Part Number	KRC 118 66/2
IC Model Number	AS118662
Serial Number(s)	D164655168 D164655167
Software Version	CXP9013268/6 Rev R44GX
PIS Software Version	CXP 901 7316/1 Rev R39UL
Hardware Version	R1G
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 24: 2012 Industry Canada RSS-133 issue 6: 2013
Incoming Release Date	Declaration of Build Status 30 January 2013
Order Number Date	PTP 24 January 2013
Start of Test	06 February 2013
Finish of Test	29 March 2013
Name of Engineer(s)	X Zhang C Zhang
Related Document(s)	ANSI C63.4: 2009 FCC CFR 47 Part 2: 2012 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 24 and Industry Canada RSS-133, is shown below.

Configuration 1 – Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 24	RSS-133 and RSS-GEN					
	24.232 (a)	6.4	Effective Radiated Power	1930.7MHz (1.4MHz OBW) / 1940.0MHz (20.0MHz OBW)		N/A	No integral antenna.
				1960.0MHz (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20.0MHz OBW)		N/A	
				1989.3MHz (1.4MHz OBW) / 1980.0MHz (20.0MHz OBW)		N/A	
2.1	2.1046, 24.232 (a)	6.4	Maximum Peak Output Power - Conducted	1930.7MHz (1.4MHz OBW) / 1940.0MHz (20.0MHz OBW)	0	Pass	-
				1960.0MHz (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20.0MHz OBW)	0	Pass	
				1989.3MHz (1.4MHz OBW) / 1980.0MHz (20.0MHz OBW)	0	Pass	
2.2	24.232 (d)	6.4	Peak – Average Ratio	1930.7MHz (1.4MHz OBW) / 1940.0MHz (20.0MHz OBW)	0	Pass	-
				1960.0MHz (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20.0MHz OBW)	0	Pass	
				1989.3MHz (1.4MHz OBW) / 1980.0MHz (20.0MHz OBW)	0	Pass	
2.3	2.1047 (d)	6.2	Modulation Characteristics	1932.5MHz (5.0MHz OBW)		N/A	-
				1960.0MHz (5.0MHz OBW)	0	Pass	
				1987.5MHz (5.0MHz OBW)		N/A	
2.4	2.1049, 24.238 (b)	RSS-Gen 4.6.1	Occupied Bandwidth	1930.7MHz (1.4MHz OBW) / 1940.0MHz (20.0MHz OBW)	0	Pass	-
				1960.0MHz (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20.0MHz OBW)	0	Pass	
				1989.3MHz (1.4MHz OBW) / 1980.0MHz (20.0MHz OBW)	0	Pass	

Configuration 1 – Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 24	RSS-133 and RSS-GEN					
2.5	2.1051, 24.238 (b)	6.5	Spurious Emissions at Antenna Terminals (±1MHz)	1930.7MHz (1.4MHz OBW) / 1931.5MHz (3.0MHz OBW) 1932.5MHz (5.0MHz OBW) / 1935.0MHz (10.0MHz OBW) 1937.5MHz (15.0MHz OBW) / 1940.0MHz (20.0MHz OBW)	0	Pass	
				1960.0MHz		N/A	-
				1989.3MHz (1.4MHz OBW) / 1988.5MHz (3.0MHz OBW) 1987.5MHz (5.0MHz OBW) / 1985.0MHz (10.0MHz OBW) 1982.5MHz (15.0MHz OBW) / 1980.0MHz (20.0MHz OBW)	0	Pass	
2.6	2.1053, 24.238 (a)	6.5	Radiated Spurious Emissions	1935.0MHz (10MHz OBW)	0	Pass	
				1960.0MHz (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15MHz, 20.0MHz OBW)	0	Pass	-
				1985.0MHz (10MHz OBW)	0	Pass	
2.7	2.1051, 24.238 (a)	6.5	Conducted Spurious Emissions	1930.7MHz (1.4MHz OBW) / 1940.0MHz (20.0MHz OBW)	0	Pass	
				1960.0MHz (1.4MHz, 20.0MHz OBW)	0	Pass	-
				1989.3MHz (1.4MHz OBW) / 1980.0MHz (20.0MHz OBW)	0	Pass	
	2.1055, 24.235	6.3	Frequency Stability Under Temperature Variations	1932.5MHz (5.0MHz OBW)		N/A	
				1960.0MHz (5.0MHz OBW)		N/A	-
				1987.5MHz (5.0MHz OBW)		N/A	
	2.1055, 24.235	6.3	Frequency Stability Under Voltage Variations	1932.5MHz (5.0MHz OBW)		N/A	
				1960.0MHz (5.0MHz OBW)		N/A	-
				1987.5MHz (5.0MHz OBW)		N/A	

N/A – Not Applicable

Product Service

1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Equipment
MANUFACTURER	Ericsson AB
PRODUCT NAME	RUS 01 B2
PART NUMBER	KRC 118 66/2
IC Model Number	AS118662
SERIAL NUMBER	D164655168 D164655167
HARDWARE VERSION	R1G
SOFTWARE VERSION	CXP 901 3268/6 R44GX
PIS SOFTWARE VERSION	CXP 901 7316/1 R39UL
TRANSMITTER OPERATING RANGE	TX: 1930MHz - 1990MHz RX: 1850MHz - 1910MHz
DUPLEXER MODE	FDD
MODULATIONS	QPSK, 16QAM, 64QAM
INTERMEDIATE FREQUENCIES	--
ITU DESIGNATION OF EMISSION	1M40F9W 3M00F9W 5M00F9W 10M0F9W 15M0F9W 20M0F9W
SUPPORTED CHANNEL BANDWIDTH CONFIGURATION	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz according to 3GPP TS 36.141
OUTPUT POWER (RMS) (W or dBm)	49dBm per port (80W per port)
OUTPUT POWER TOLERANCE	± 2dB
NUMBER OF ANTENNA PORTS	1 TX/RX port, 1 RX port
FCC ID	TA8AKRC11866-2
IC ID	287AB-AS118662
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is the Radio Part of LTE Base Station.

Signature

Date 07 April 2013

D of B S Serial No 75921580/02

No responsibility will be accepted by TÜV SÜD Product Service 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) RUS 01 B2 / KRC 118 66/2 is an Ericsson Radio Equipment working in the public mobile service 1900MHz band which operates in LTE mode. The RUS 01 B2 / KRC 118 66/2 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 24 and Industry Canada RSS-133.

The RUS 01 B2 / KRC 118 66/2 supports Test Models E-TM1.1, E-TM3.2 and E-TM3.1 at 1900MHz defined in 3GPP TS 36.141. Test Model E-TM1.1 is used to represent QPSK modulation only, Test Model E-TM3.2 is used to represent 16QAM modulation, and Test Model E-TM3.1 is used to represent 64QAM modulation.

By combining two EUTs together, the EUTs were configured to transmit in 1900MHz MIMO mode with two TX/RX Ports (RF A1, RF A2) and two RX Ports (RF B1, RF B2). MIMO mode was selected as the worst configuration.

The settings below were found to be representative for all traffic scenarios when several settings with the different modulations, channel bandwidths were tested to find the worst case setting. These settings were used for all measurements if not otherwise noted:

- Test Model E-TM1.1 in channel bandwidth 1.4MHz and 20MHz.

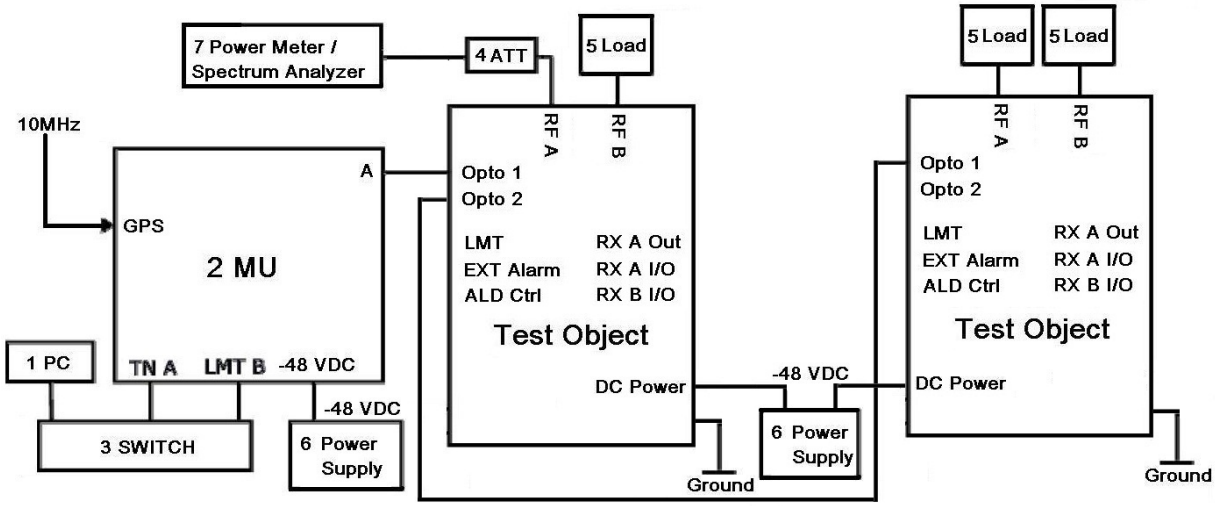
The Output Power was tested on the TX/RX output connectors RF A1 and RF A2, all other cases were tested on the TX/RX output connector RF A1 as the representative port. RX antenna ports were terminated.

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:

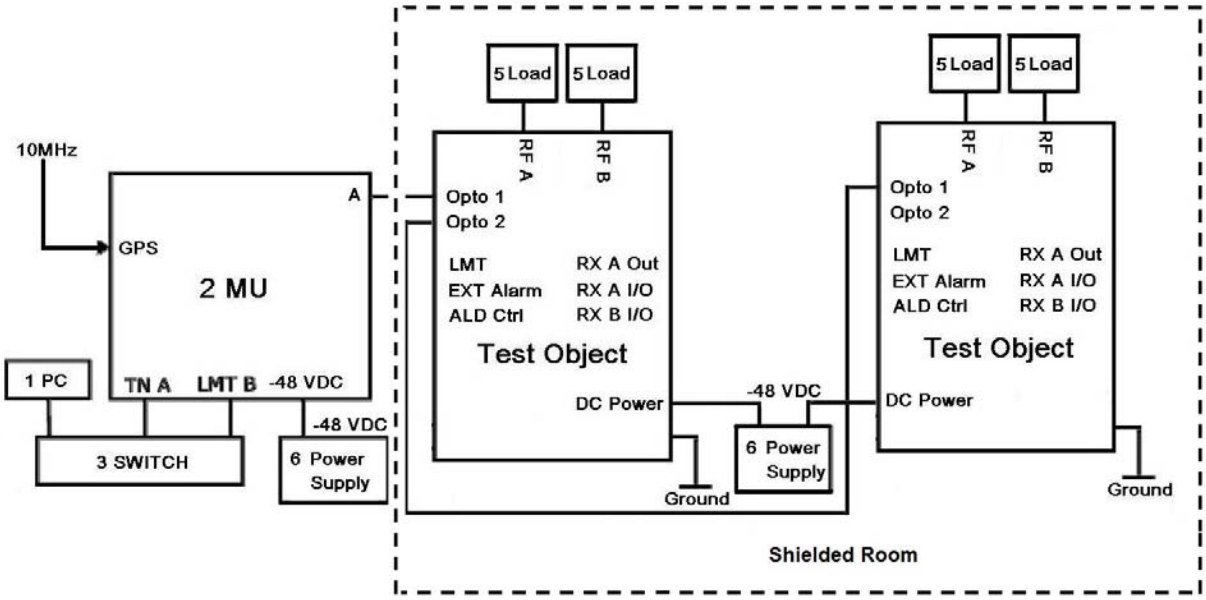


Test Object	Part Number	Version	Serial Number
Radio Part	RUS 01 B2 / KRC 118 66/2	R1G	D164655168 D164655167

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook	--	CND1234642
2	RBS 6601	BFL 901 009/1	--	--
	DUL 20 01	KDU 137 533/4	R1C	CB4H439682
	SUP 6601	1/BFL 901 009/1	R3B	BR81262555
3	Switch	TESF1008+	V4.2	11328413308
4	Attenuator	48-40-43-LIM	--	BR5020
5	Load	DTS100-40-3	--	090323457
	Load	TF100	--	09121602
	Load	TFZ10-3R	--	20100908079
6	Power Supply	DH1716-5D	--	2008040003
	Power Supply	DH1716A-14	--	200380401
7	Power Meter	Rohde & Schwarz NRP	--	102438
	Power Sensor	Rohde & Schwarz NRP-Z51	--	102434
	Spectrum Analyzer	FSQ26	--	200014

Product Service

Test Setup, Radiated Measurement:



Test Object	Part Number	Version	Serial Number
Radio Part	RUS 01 B2 / KRC 118 66/2	R1G	D164655168 D164655167

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook	--	CND1234642
2	RBS 6601	BFL 901 009/1	--	--
	DUL 20 01	KDU 137 533/4	R1C	CB4H439682
	SUP 6601	1/BFL 901 009/1	R3B	BR81262555
3	Switch	TESF1008+	V4.2	11328413308
4	Power Supply	DH1716-5D	--	2008040003
5	Load	DTS100-40-3	--	090323457
	Load	TF100	--	09121602
	Load	TFZ10-3R	--	20100908079
	Load	TFE	--	090323010

Product Service

1.4.3 Modes of Operation

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

Bottom Channel :

Mode 1 - 1.4 : EARFCN 607: 1930.7MHz (1.4MHz Bandwidth)

Mode 1 - 3 : EARFCN 615: 1931.5MHz (3.0MHz Bandwidth)

Mode 1 - 5 : EARFCN 625: 1932.5MHz (5.0MHz Bandwidth)

Mode 1 - 10 : EARFCN 650: 1935.0MHz (10.0MHz Bandwidth)

Mode 1 - 15 : EARFCN 675: 1937.5MHz (15.0MHz Bandwidth)

Mode 1 - 20 : EARFCN 700: 1940.0MHz (20.0MHz Bandwidth)

Middle Channel :

Mode 2 : EARFCN 900: 1960.0MHz

Top Channel :

Mode 3 - 1.4 : EARFCN 1193: 1989.3MHz (1.4MHz Bandwidth)

Mode 3 - 3 : EARFCN 1185: 1988.5MHz (3.0MHz Bandwidth)

Mode 3 - 5 : EARFCN 1175: 1987.5MHz (5.0MHz Bandwidth)

Mode 3 - 10 : EARFCN 1150: 1985.0MHz (10.0MHz Bandwidth)

Mode 3 - 15 : EARFCN 1125: 1982.5MHz (15.0MHz Bandwidth)

Mode 3 - 20 : EARFCN 1100: 1980.0MHz (20.0MHz Bandwidth)

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

Only Radiated Spurious Emissions 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-1:
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 RUS 01 B2 / KRC 118 66/2

2.1 MAXIMUM PEAK OUTPUT POWER - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2.1046
FCC CFR 47 Part 24, Clause 24.232 (a)
Industry Canada RSS-133, Clause 6.4

2.1.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655168, D164655167

2.1.3 Date of Test and Modification State

06 February 2013 – 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 24 and Industry Canada RSS-133.

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 E-TM1.1, E-TM3.2 and E-TM3.1 test models.

Since when working in MIMO mode, the EUT transmits on two antennas simutaneoulsy in the same frequency range, the output power at both antennas were tested and the total power were then summed mathematically in linear power units by using the Measure and Sum approach.

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 - 1.4, Mode 1 - 20
- Mode 2 (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20MHz OBW)
- Mode 3 - 1.4, Mode 3 - 20

2.1.6 Environmental Conditions

	06 February 2013
Ambient Temperature	23.0°C
Relative Humidity	31.0%

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 24 and Industry Canada RSS-133 for Maximum Peak Output Power.

The test results are shown below

E-TM1.1: 1.4MHz Bandwidth

Configuration 1 - Mode 1 - 1.4, Mode 2 and Mode 3 - 1.4

EARFCN	Frequency (MHz)	RF A1		RF A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
607 (Bottom)	1930.7	48.29	67.45	48.17	65.61	51.24	133.06
900 (Middle)	1960.0	48.67	73.62	48.65	73.28	51.67	146.90
1193 (Top)	1989.3	48.27	67.14	48.20	66.07	51.25	133.21

E-TM1.1: 20.0MHz Bandwidth

Configuration 1 - Mode 1 - 20, Mode 2 and Mode 3 - 20

EARFCN	Frequency (MHz)	RF A1		RF A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
700 (Bottom)	1940.0	48.74	74.82	48.71	74.30	51.74	149.12
900 (Middle)	1960.0	48.70	74.13	48.68	73.79	51.70	147.92
1100 (Top)	1980.0	48.75	74.99	48.63	72.95	51.70	147.94

E-TM1.1: 3.0MHz, 5.0MHz, 10.0MHz and 15.0MHz Bandwidth

Configuration 1 - Mode 2

EARFCN / Frequency (MHz)	BW Config (MHz)	RF A1		RF A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
900 (Middle) / 1960.0	3.0	48.77	75.34	48.78	75.51	51.79	150.85
	5.0	48.77	75.34	48.74	74.82	51.77	150.16
	10.0	48.76	75.16	48.75	74.99	51.77	150.15
	15.0	48.73	74.64	48.71	74.30	51.73	148.94

E-TM3.2 and E-TM3.1: 1.4MHz Bandwidth

Configuration 1 - Mode 2

EARFCN / Frequency (MHz)	Test Model	RF A1		RF A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
900 (Middle) / 1960.0	E-TM3.2	48.69	73.96	48.68	73.79	51.69	147.72
	E-TM3.1	48.64	73.11	48.67	73.62	51.67	146.73

E-TM3.2 and E-TM3.1: 20.0MHz Bandwidth

Configuration 1 - Mode 2

EARFCN / Frequency (MHz)	Test Model	RF A1		RF A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
900 (Middle) / 1960.0	E-TM3.2	48.67	73.62	48.67	73.62	51.68	147.24
	E-TM3.1	48.71	74.30	48.71	74.30	51.72	148.60

Note *:

Two transmitters output power were summed up according to FCC KDB662911 D01 for MIMO mode.

Limit	FCC: ≤1640W or ≤+62.15dBm IC: ≤100W or ≤+50dBm

Remarks

The total output power of the EUT does not exceed 1640W or 62.15dBm, and the output power per transmitter does not exceed 100W or 50dBm at the measured frequencies.

2.2 PEAK – AVERAGE RATIO

2.2.1 Specification Reference

FCC CFR 47 Part 24, Clause 24.232 (d)
Industry Canada RSS-133, Clause 6.4

2.2.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655168, D164655167

2.2.3 Date of Test and Modification State

06 February 2013 – 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 24 and Industry Canada RSS-133.

A peak to average ratio measurment 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 measurements were performed on the combined output connector RF A1. Limited complementary measurement were done at the output connector RF A2 to verify identical performance for both transmitter chains.

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 - 1.4, Mode 1 - 20
- Mode 2 (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20MHz OBW)
- Mode 3 - 1.4, Mode 3 - 20

2.2.6 Environmental Conditions

	06 February 2013
Ambient Temperature	23.0°C
Relative Humidity	31.0%

Product Service

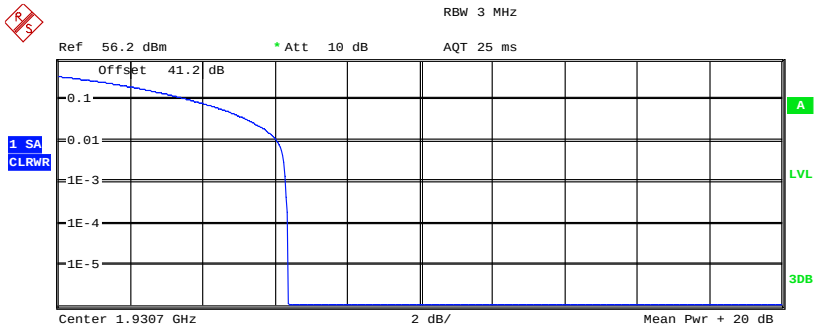
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 24 and Industry Canada RSS-133 for Peak – Average Ratio.

The test results are shown below.

Configuration 1 - Mode 1 - 1.4

E-TM1.1: 1.4MHz Bandwidth



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	48.29 dBm
Peak	54.65 dBm
Crest	6.36 dB
10 %	3.69 dB
1 %	6.06 dB
.1 %	6.28 dB
.01 %	6.35 dB

Date: 6.FEB.2013 05:40:44

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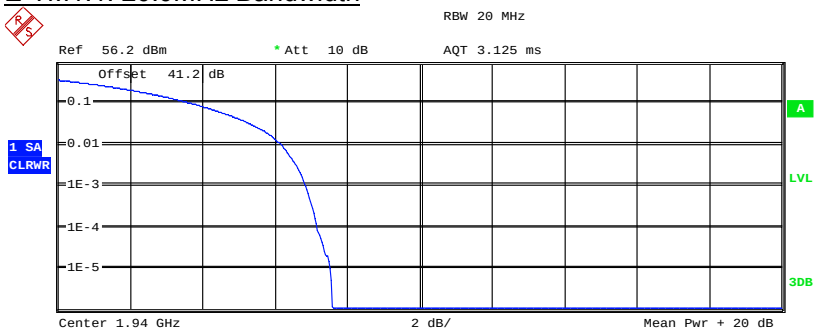
Configuration 1 - Mode 1 – 20

E-TM1.1: 20.0MHz Bandwidth



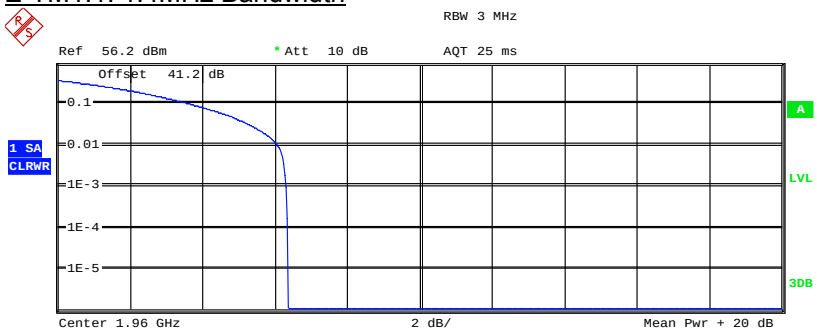
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	48.92 dBm
Peak	56.51 dBm
Crest	7.59 dB
10 %	3.72 dB
1 %	6.15 dB
.1 %	6.83 dB
.01 %	7.15 dB

Date: 6.FEB.2013 05:48:15

Configuration 1 - Mode 2

E-TM1.1: 1.4MHz Bandwidth



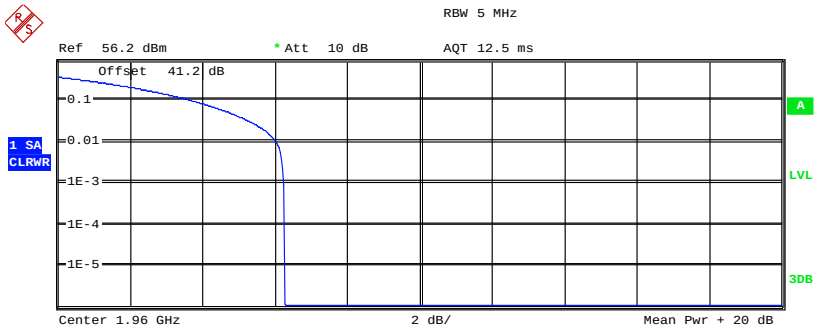
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	48.66 dBm
Peak	55.00 dBm
Crest	6.34 dB
10 %	3.69 dB
1 %	6.06 dB
.1 %	6.31 dB
.01 %	6.35 dB

Date: 6.FEB.2013 03:40:22

Product Service

E-TM1.1; 3.0MHz Bandwidth

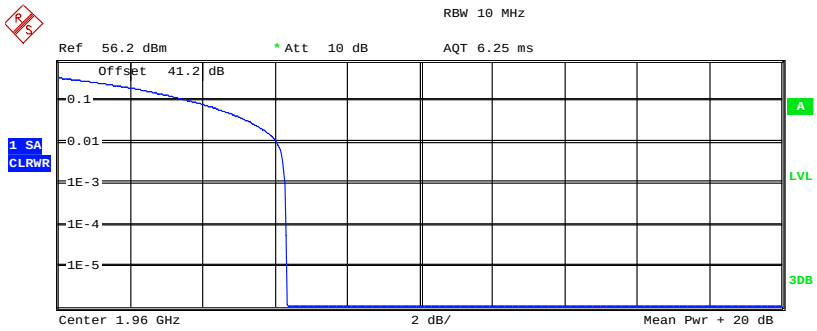


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	48.74 dBm
Peak	55.00 dBm
Crest	6.26 dB
10 %	3.75 dB
1 %	6.03 dB
.1 %	6.25 dB
.01 %	6.28 dB

Date: 6.FEB.2013 05:58:20

E-TM1.1; 5.0MHz Bandwidth



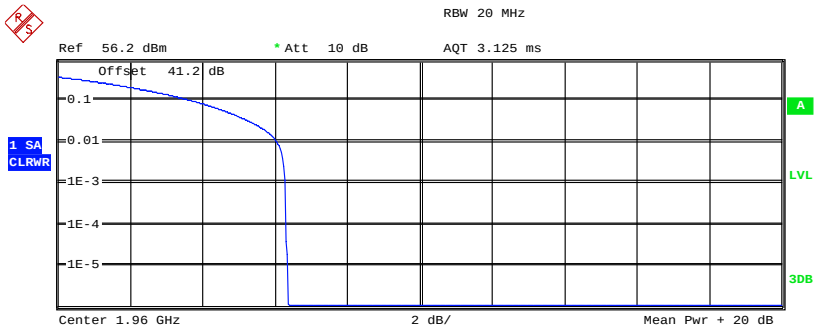
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	49.02 dBm
Peak	55.33 dBm
Crest	6.31 dB
10 %	3.75 dB
1 %	6.06 dB
.1 %	6.28 dB
.01 %	6.31 dB

Date: 6.FEB.2013 06:00:03

Product Service

E-TM1.1; 10.0MHz Bandwidth

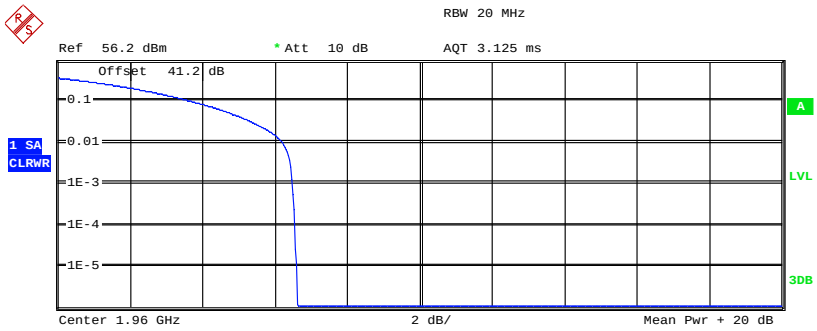


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	49.01 dBm
Peak	55.38 dBm
Crest	6.37 dB
10 %	3.72 dB
1 %	6.06 dB
.1 %	6.28 dB
.01 %	6.31 dB

Date: 6.FEB.2013 06:01:56

E-TM1.1; 15.0MHz Bandwidth



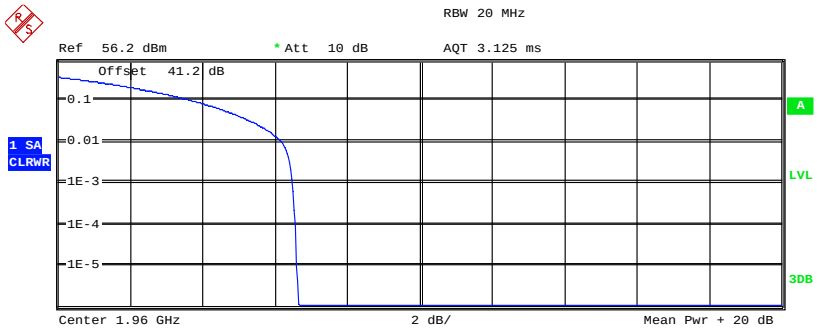
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	48.97 dBm
Peak	55.59 dBm
Crest	6.62 dB
10 %	3.72 dB
1 %	6.19 dB
.1 %	6.47 dB
.01 %	6.57 dB

Date: 6.FEB.2013 06:03:09

Product Service

E-TM1.1; 20.0MHz Bandwidth



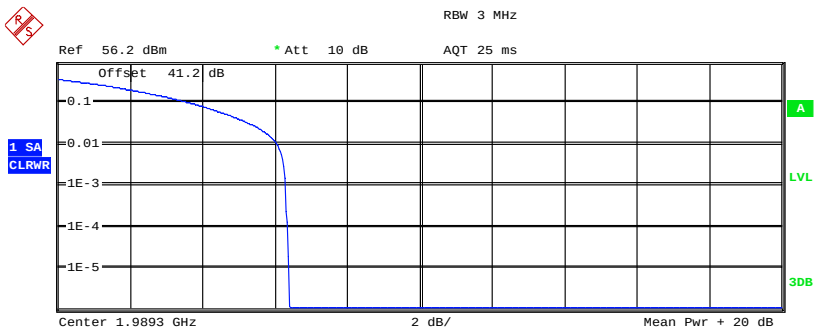
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	48.94 dBm
Peak	55.59 dBm
Crest	6.65 dB
10 %	3.72 dB
1 %	6.19 dB
.1 %	6.47 dB
.01 %	6.57 dB

Date: 6.FEB.2013 05:56:33

Configuration 1 - Mode 3 - 1.4

E-TM1.1: 1.4MHz Bandwidth



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

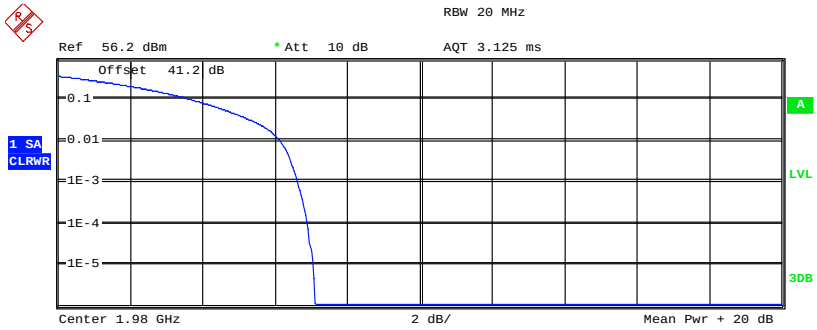
	Trace 1
Mean	48.20 dBm
Peak	54.58 dBm
Crest	6.37 dB
10 %	3.69 dB
1 %	6.06 dB
.1 %	6.28 dB
.01 %	6.35 dB

Date: 6.FEB.2013 05:44:10

Product Service

Configuration 1 - Mode 3 - 20

E-TM1.1: 20.0MHz Bandwidth



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

	Trace 1
Mean	48.93 dBm
Peak	56.01 dBm
Crest	7.09 dB
10 %	3.72 dB
1 %	6.12 dB
.1 %	6.63 dB
.01 %	6.89 dB

Date: 6.FEB.2013 05:55:28

Limit	13dB

Remarks

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

Product Service

2.3 MODULATION CHARACTERISTICS

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1047 (d)
Industry Canada RSS-133 Clause 6.2

2.3.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655168, D164655167

2.3.3 Date of Test and Modification State

07 February 2013 – 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-133.

Connect the RF output connector RF A1 to a spectrum analyzer with an attenuator. The other connectors were connected to match loads. 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 and was tested in 5MHz Bandwith.

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

Configuration 1 - Mode 2 (5.0MHz OBW)

2.3.5 Environmental Conditions

	07 February 2013
Ambient Temperature	20.3°C
Relative Humidity	20.7%

Product Service

2.3.6 Test Result

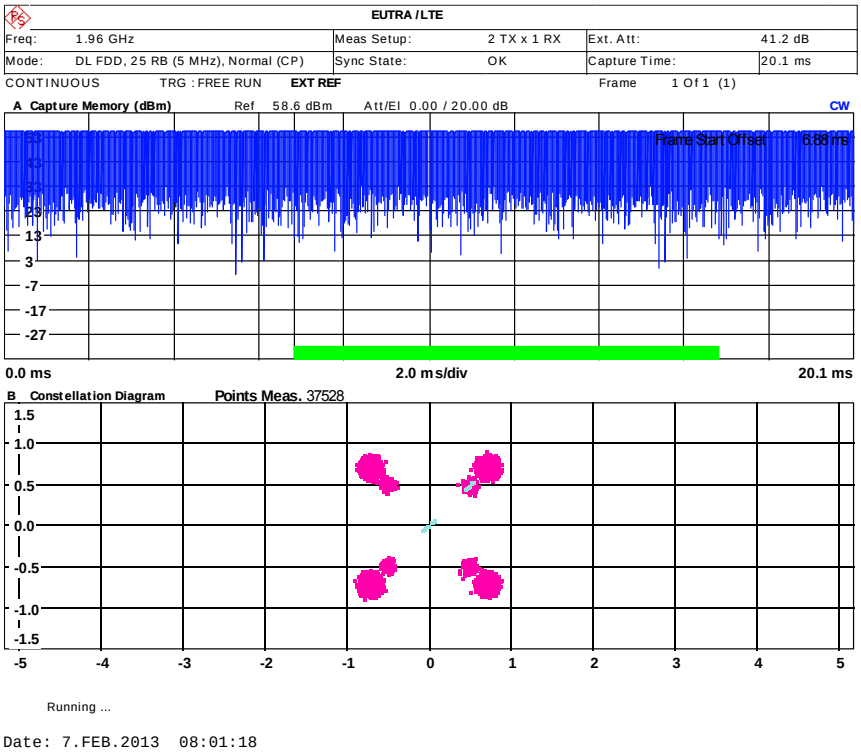
Plots are shown on the following page showing the EUT transmitting with all of the modulations:

The test results are shown below

Configuration 1 - Mode 2

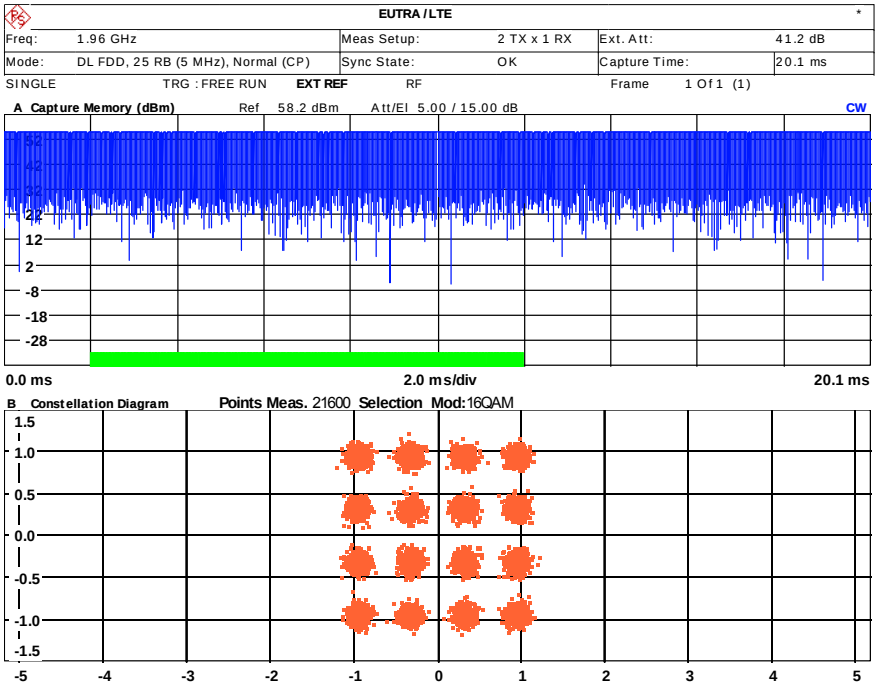
5.0MHz Bandwidth

E-TM1.1: EUT transmitting with QPSK modulation in:



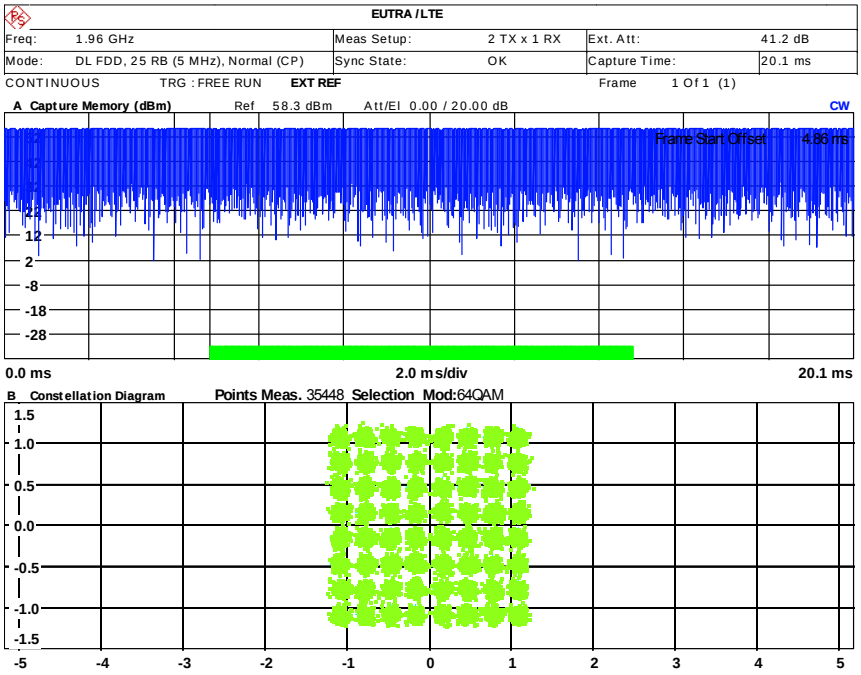
Product Service

E-TM3.2: EUTRA / LTE with 16QAM modulation:



Date: 7.FEB.2013 08:46:57

E-TM3.1: EUTRA / LTE with 64QAM modulation:



Running ...

Date: 7.FEB.2013 08:12:28

Product Service

2.4 OCCUPIED BANDWIDTH

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049 (h)
FCC CFR 47 Part 24, Clause 24.238 (b)
Industry Canada RSS-GEN, Clause 4.6.1

2.4.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655168, D164655167

2.4.3 Date of Test and Modification State

06 February 2013 – 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 24 and Industry Canada RSS-GEN.

The EUT was transmitting at maximum power, modulated using the test model E-TM1.1 as representative test model. The EUT was tested in the 6 supported bandwidths. At least 1% of the emission bandwiths were used for the resolution bandwidth.

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 - 1.4, Mode 1 - 20
- Mode 2 (1.4MHz, 3.0MHz, 5.0MHz, 10.0MHz, 15.0MHz, 20MHz OBW)
- Mode 3 - 1.4, Mode 3 - 20

2.4.6 Environmental Conditions

	06 February 2013
Ambient Temperature	23.0°C
Relative Humidity	31.0%

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 24 and Industry Canada RSS-GEN for Occupied Bandwidth.

The test results are shown below

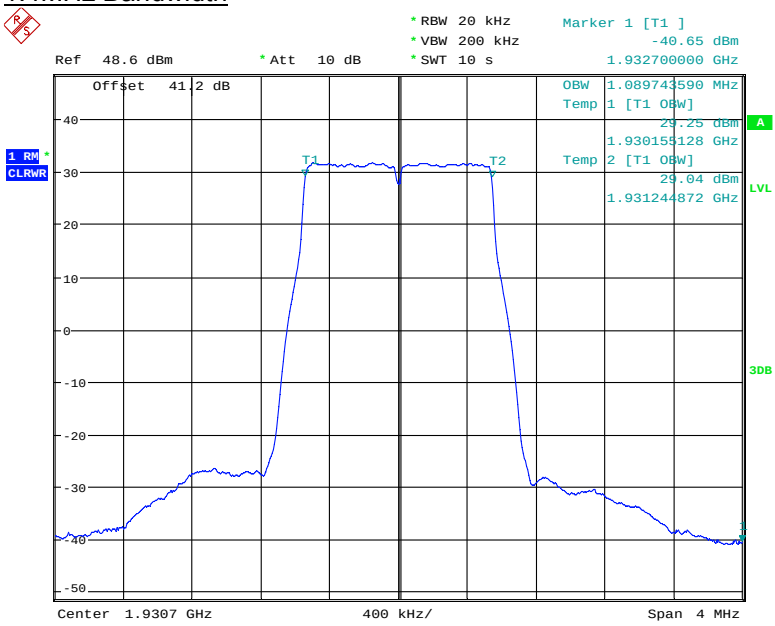
Test Model	BW configuration (MHz)	Frequency (MHz) / Channel	Occupied Bandwidth (MHz)
E-TM1.1	1.4	1930.7 (Bottom)	1.09
	20.0	1940.0 (Bottom)	17.87
	1.4	1960.0 (Middle)	1.09
	3.0	1960.0 (Middle)	2.68
	5.0	1960.0 (Middle)	4.47
	10.0	1960.0 (Middle)	8.97
	15.0	1960.0 (Middle)	13.46
	20.0	1960.0 (Middle)	17.95
	1.4	1989.3 (Top)	1.09
	20.0	1980.0 (Top)	17.87

Product Service

E-TM1.1

Configuration 1 - Mode 1 - 1.4

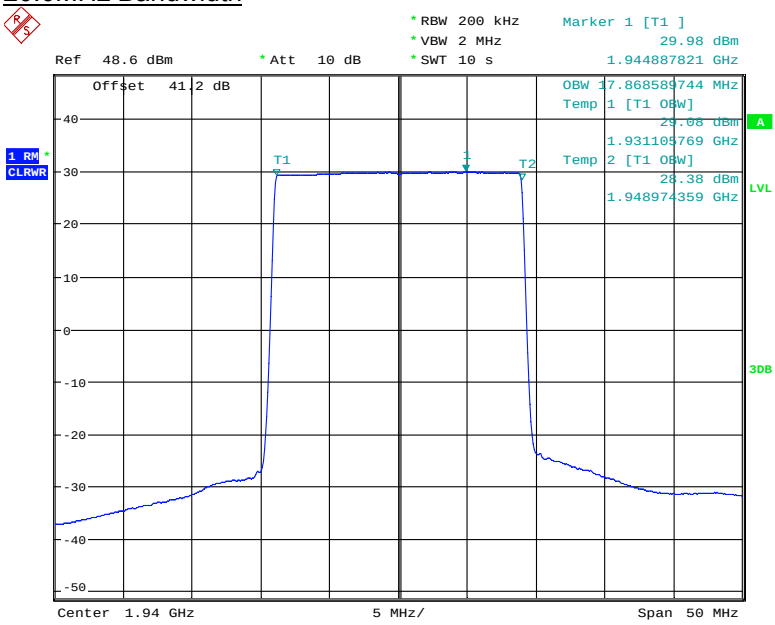
1.4MHz Bandwidth



Date: 6.FEB.2013 23:43:53

Configuration 1 - Mode 1 - 20

20.0MHz Bandwidth

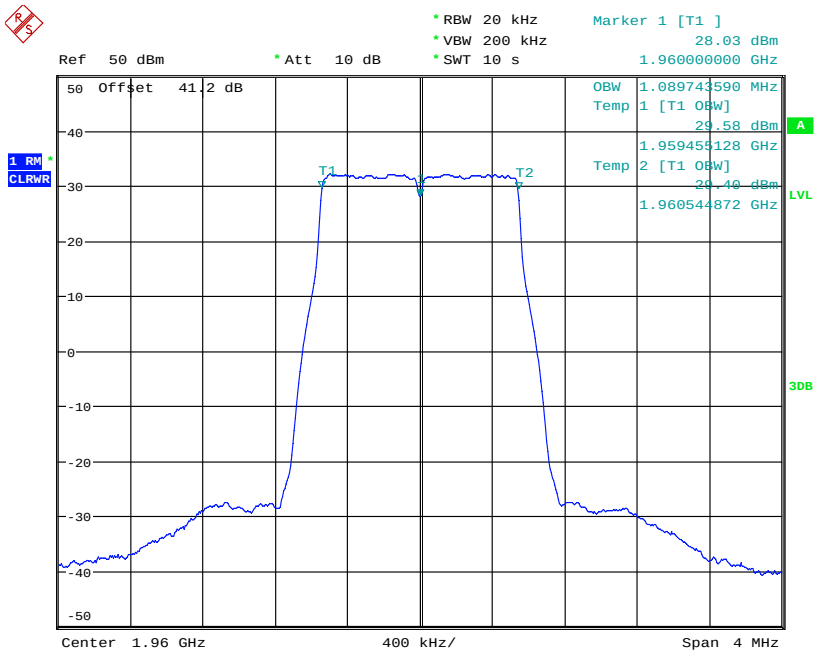


Date: 6.FEB.2013 23:41:29

Product Service

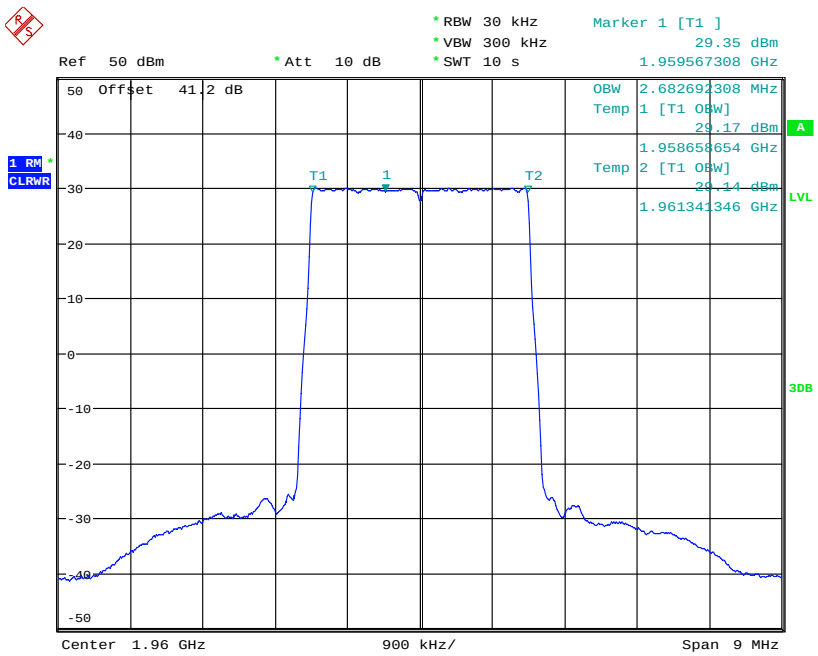
Configuration 1 - Mode 2

1.4MHz Bandwidth



Date: 6.FEB.2013 03:42:02

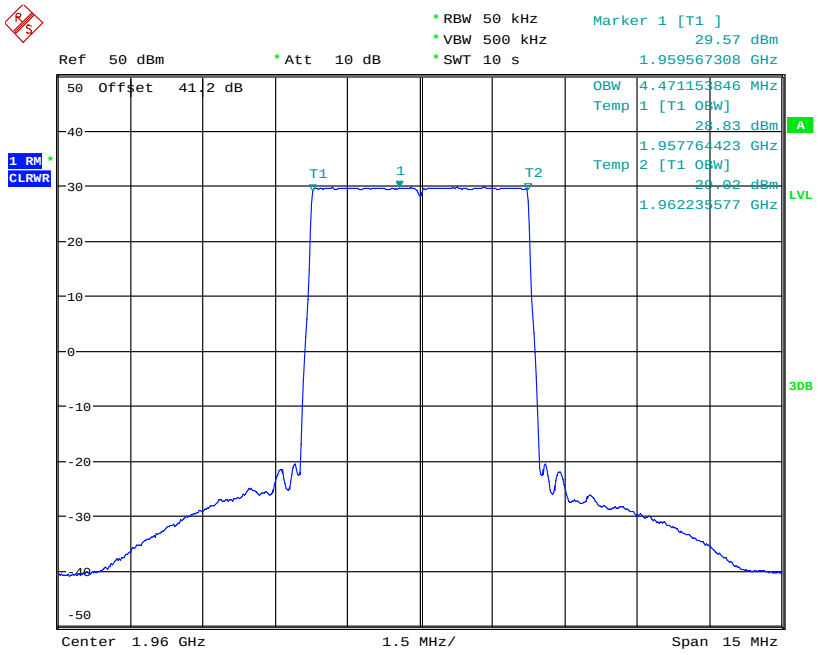
3.0MHz Bandwidth



Date: 6.FEB.2013 06:14:30

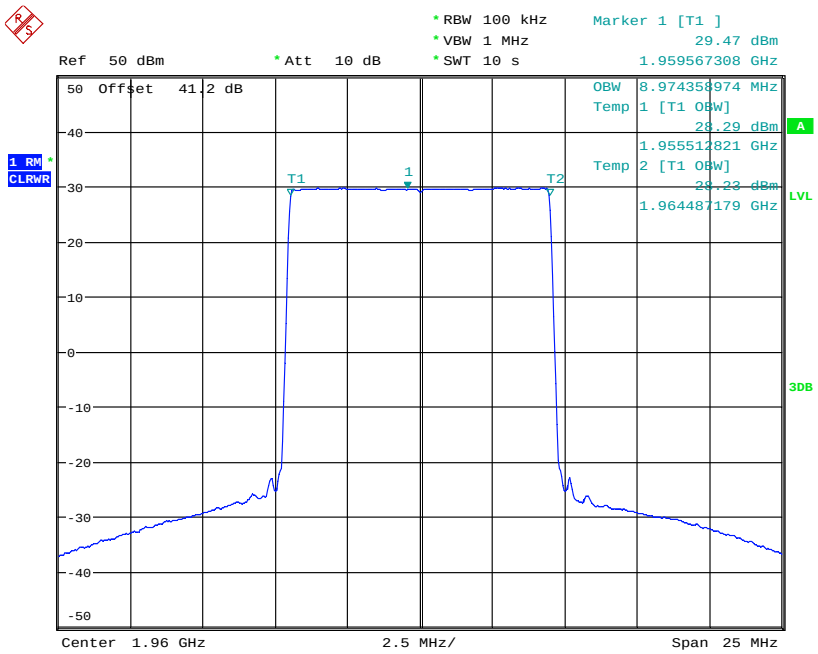
Product Service

5.0MHz Bandwidth



Date: 6.FEB.2013 06:17:08

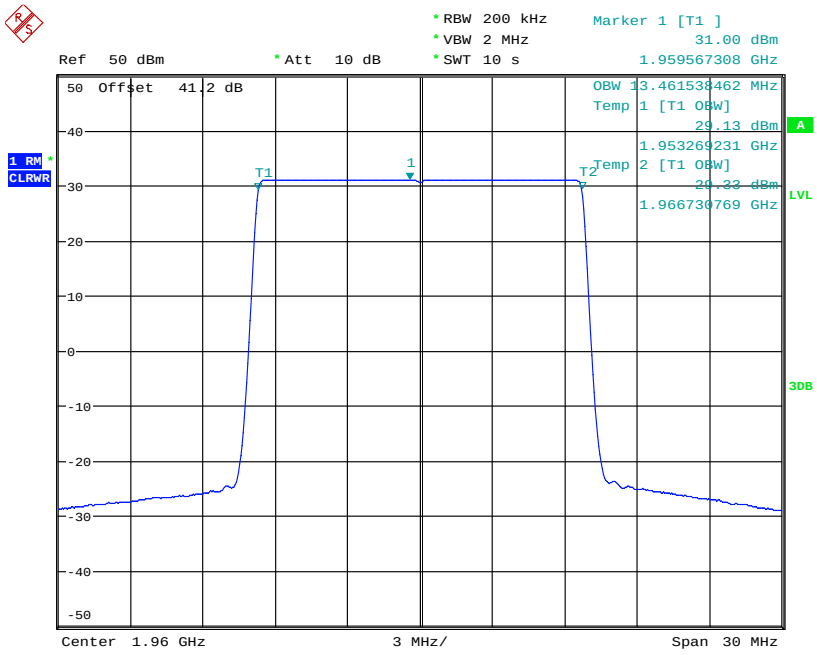
10.0MHz Bandwidth



Date: 6.FEB.2013 06:20:19

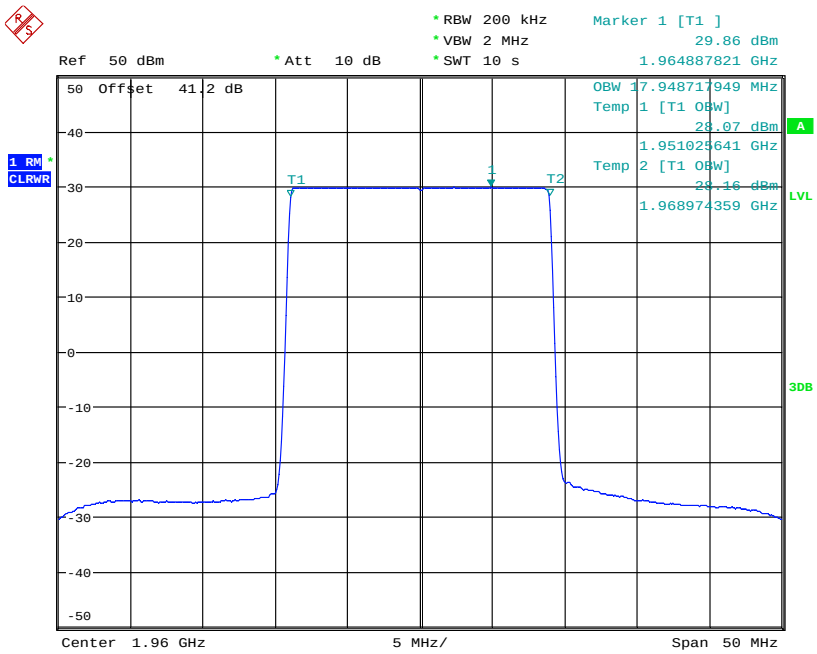
Product Service

15.0MHz Bandwidth



Date: 6.FEB.2013 06:22:33

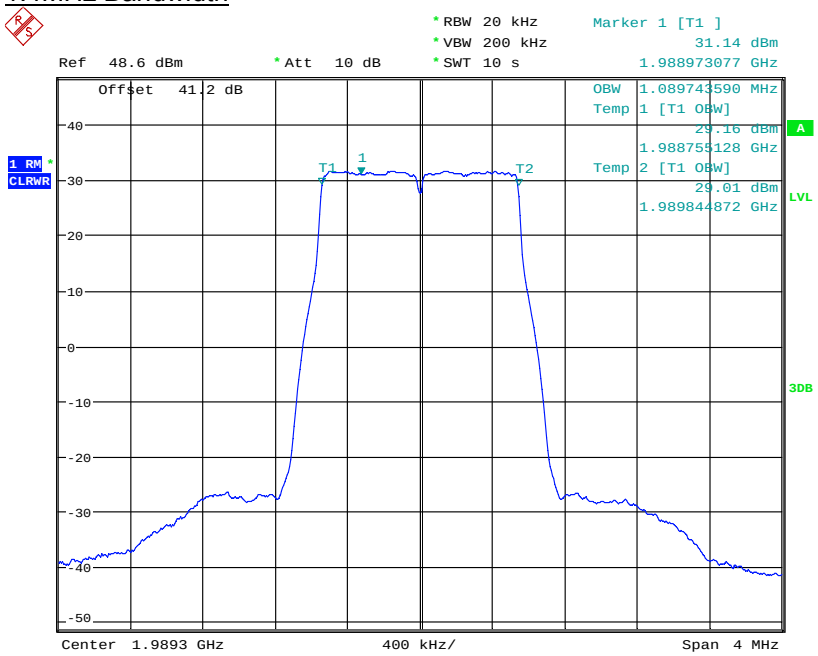
20.0MHz Bandwidth



Date: 6.FEB.2013 06:11:58

Configuration 1 - Mode 3 - 1.4

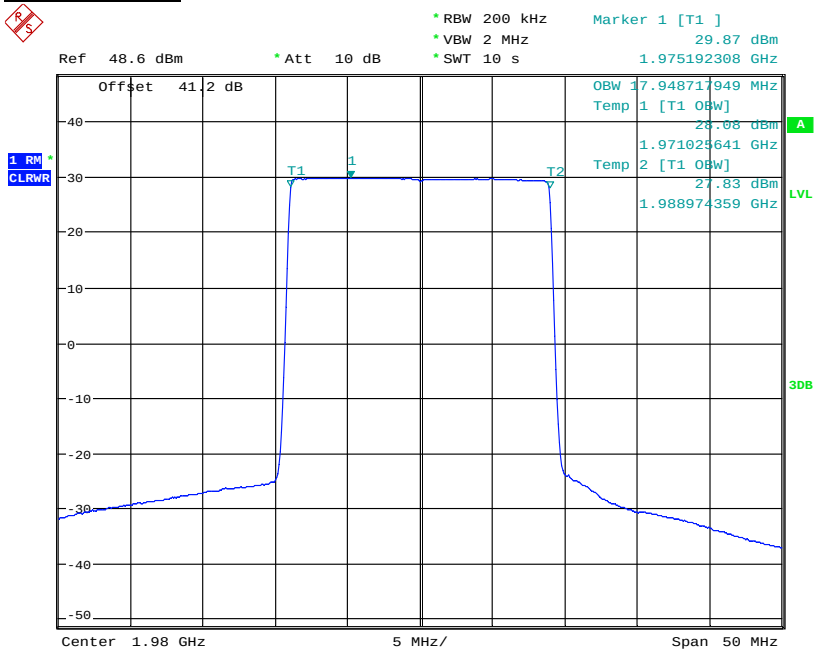
1.4MHz Bandwidth



Date: 6.FEB.2013 23:45:52

Configuration 1 - Mode 3 - 20

20.0MHz Band



Date: 6.FEB.2013 23:39:35

Product Service

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 24, Clause 24.238 (a)
Industry Canada RSS-133 Clause 6.5

2.5.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655168, D164655167

2.5.3 Date of Test and Modification State

07 Feburay 2013 – 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 24 and Industry Canada RSS-133.

In accordance with 24.238(b), at least 1% of the emission bandwith should be used for the resolution bandwidth up to 1MHz away from the block edge. For 1.4MHz OBW, a resolution bandwidth of 10kHz was used up to 1MHz away from the band edge. 10kHz is <1% of the Emission Bandwidth (1.12MHz), to compensate for the reduced measurement bandwidth, at the frequency range up to 1MHz away from the band edges, the limit was adjusted from -13dBm to -13.5dBm. For 3MHz OBW, a resolution bandwidth of 10kHz was used up to 1MHz away from the band edge. 10kHz is <1% of the Emission Bandwidth (2.74MHz), to compensate for the reduced measurement bandwidth, at the frequency range up to 1MHz away from the band edges, the limit was adjusted from -13dBm to -17.37dBm. A resolution bandwidth of 50kHz was used between 1MHz to 5MHz away from the band edge. As the FCC rules specify a RBW of 1MHz for measurements of emissions > 1MHz away from the band edges, the limit was adjusted from -13dB to -26dBm to compensate for the reduce mesurement bandwidth.

The limit was adjusted with a correction of -3dB [10Log(2)] by using the Measure and Add 10Log(N) dB technique according to FCC KDB662911 D01 accounting for simultaneous transmission from antenna ports RF A1 and RF A2.

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 - 1.4, Mode 1 - 3, Mode 1 - 5,
Mode 1 - 10, Mode 1 - 15, Mode 1 - 20

- Mode 3 - 1.4, Mode 3 - 3, Mode 3 - 5,
Mode 3 - 10, Mode 3 - 15, Mode 3 - 20

Product Service

2.5.6 Environmental Conditions

	07 February 2013
Ambient Temperature	20.3°C
Relative Humidity	20.7%

2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133 for Spurious Emissions Antenna Terminals (±1MHz)

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

ETM1.1

Bandwidth: 1.4MHz

Configuration 1 - Mode 1 -1.4 and Mode 3 - 1.4

Band Edge Frequency	Bottom 1930 MHz	Top 1990 MHz	RBW / VBW (Hz)	Limit (dBm)
Edge Test with 1.4MHz Bandwidth Channel No./Frequencies	Channel: 607 Frequency: 1930.7 MHz	Channel: 1193 Frequency: 1989.3 MHz	10k / 100k	-16.5

Bandwidth: 3.0MHz

Configuration 1 - Mode 1 - 3 and Mode 3 - 3

Band Edge Frequency	Bottom 1930 MHz	Top 1990 MHz	RBW / VBW (Hz)	Limit (dBm)
Edge Test with 3.0MHz Bandwidth Channel No./Frequencies	Channel: 615 Frequency: 1931.5 MHz	Channel: 1185 Frequency: 1988.5MHz	10k / 100k	-20.37

Bandwidth: 5.0MHz

Configuration 1 - Mode 1 - 5 and Mode 3 - 5

Band Edge Frequency	Bottom 1930 MHz	Top 1990 MHz	RBW / VBW (Hz)	Limit (dBm)
Edge Test with 5.0MHz Bandwidth Channel No./Frequencies	Channel: 625 Frequency: 1932.5 MHz	Channel: 1175 Frequency: 1987.5 MHz	50k / 500k	-16.0

Bandwidth: 10.0MHz

Configuration 1 - Mode 1 - 10 and Mode 3 - 10

Band Edge Frequency	Bottom 1930 MHz	Top 1990 MHz	RBW / VBW (Hz)	Limit (dBm)
Edge Test with 10.0MHz Bandwidth Channel No./Frequencies	Channel: 650 Frequency: 1935.0 MHz	Channel: 1150 Frequency: 1985.0 MHz	100k / 1M	-16.0

Bandwidth: 15.0MHz

Configuration 1 - Mode 1 - 15 and Mode 3 - 15

Band Edge Frequency	Bottom 1930 MHz	Top 1990 MHz	RBW / VBW (Hz)	Limit (dBm)
Edge Test with 15.0MHz Bandwidth Channel No./Frequencies	Channel: 675 Frequency: 1937.5 MHz	Channel: 1125 Frequency: 1982.5 MHz	200k / 2M	-16.0

Bandwidth: 20.0MHz

Configuration 1 - Mode 1 - 20 and Mode 3 - 20

Band Edge Frequency	Bottom 1930 MHz	Top 1990 MHz	RBW / VBW (Hz)	Limit (dBm)
Edge Test with 20.0MHz Bandwidth Channel No./Frequencies	Channel: 700 Frequency: 1940.0 MHz	Channel: 1100 Frequency: 1980.0 MHz	200k / 2M	-16.0

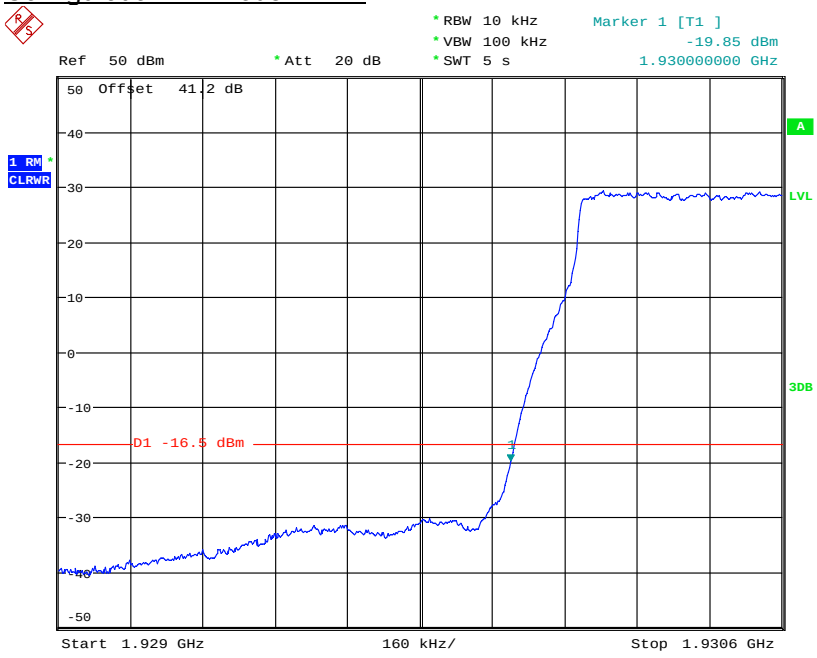
The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance.

The test results are shown below

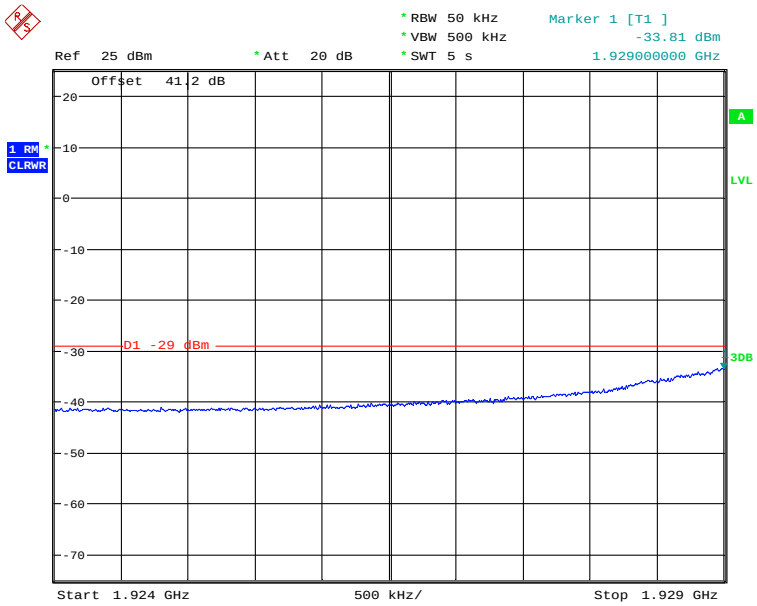
E-TM1.1

1.4MHz Bandwidth

Configuration 1 - Mode 1 - 1.4



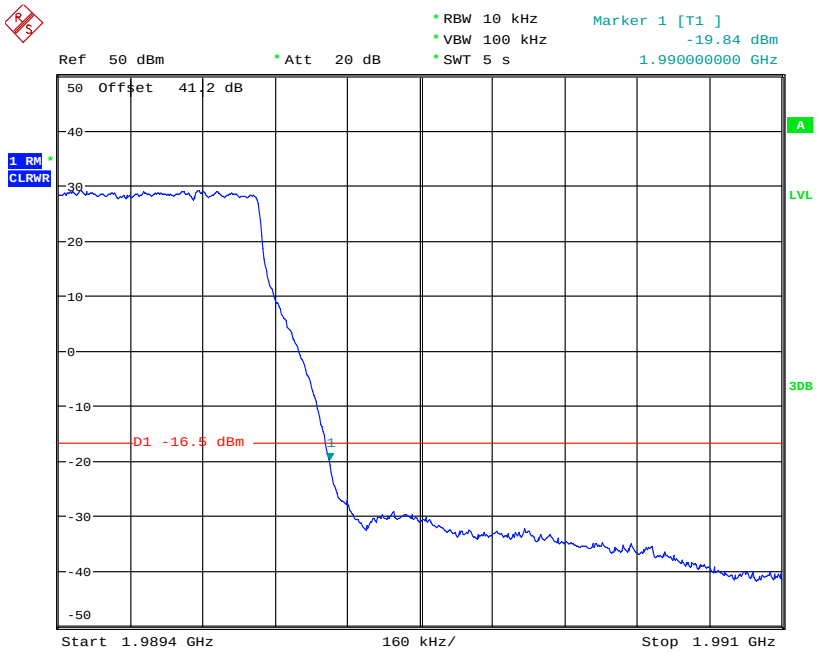
Date: 7.FEB.2013 03:30:05



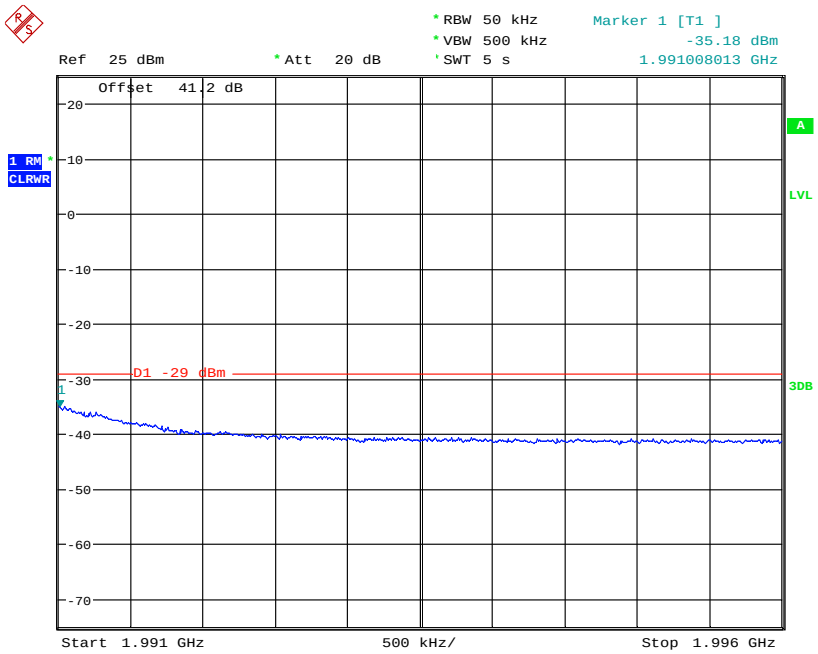
Date: 7.FEB.2013 03:27:48

Product Service

Configuration 1 - Mode 3 - 1.4



Date: 7.FEB.2013 03:21:43

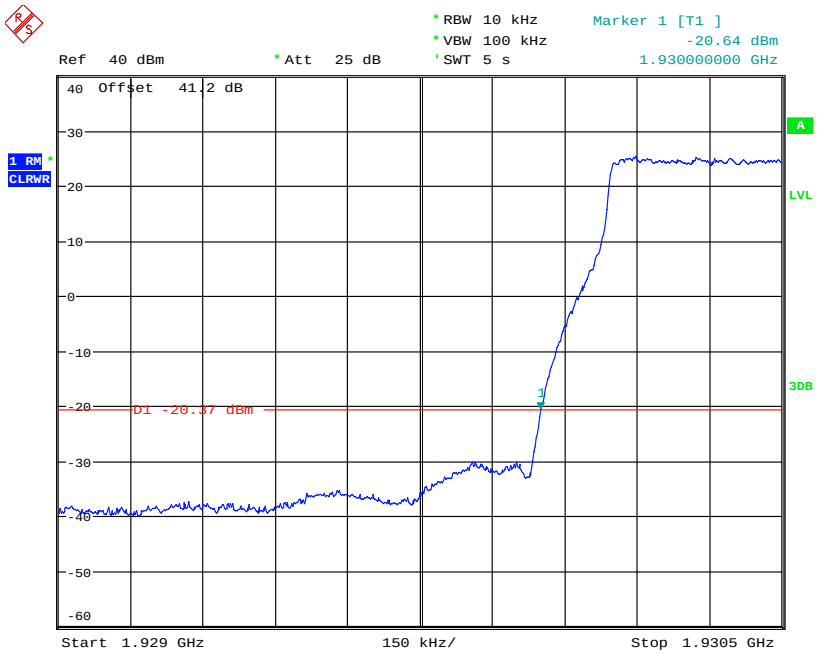


Date: 7.FEB.2013 03:26:04

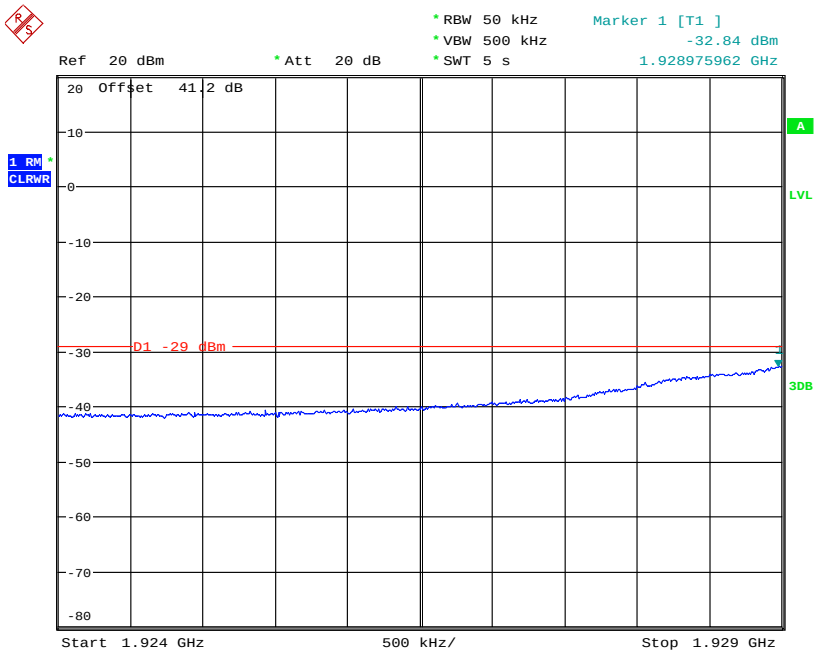
Product Service

3.0MHz Bandwidth

Configuration 1 - Mode 1 - 3



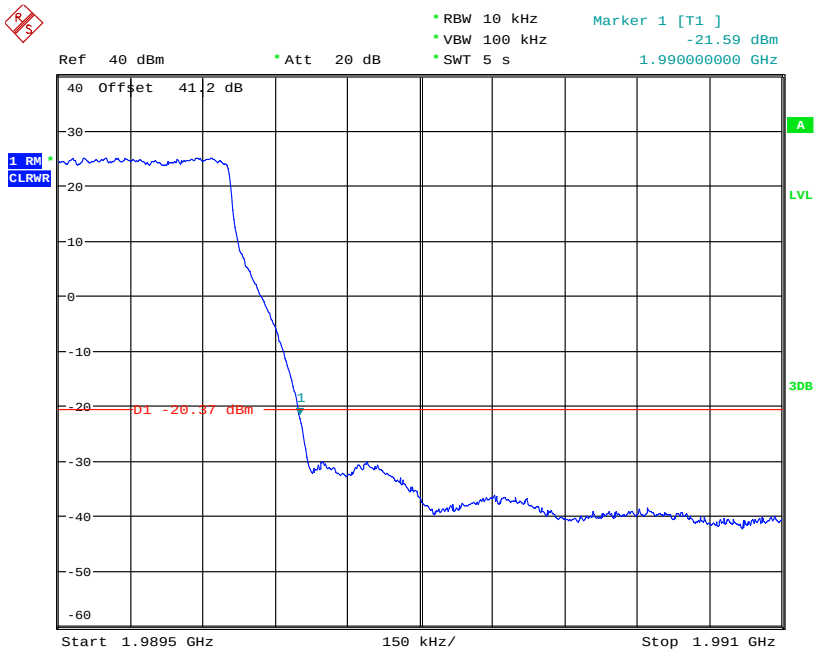
Date: 7.FEB.2013 03:01:43



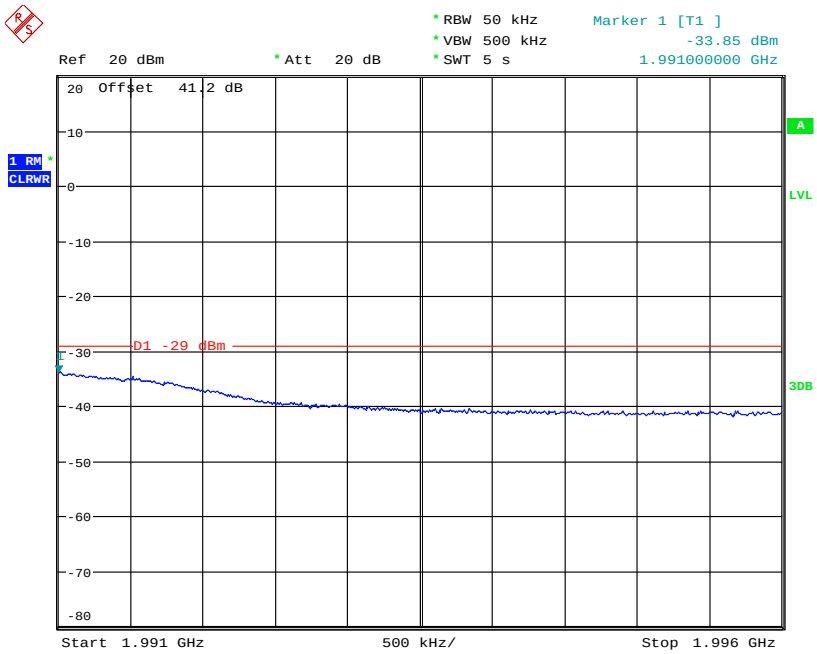
Date: 7.FEB.2013 03:07:44

Product Service

Configuration 1 - Mode 3 - 3



Date: 7.FEB.2013 03:11:31

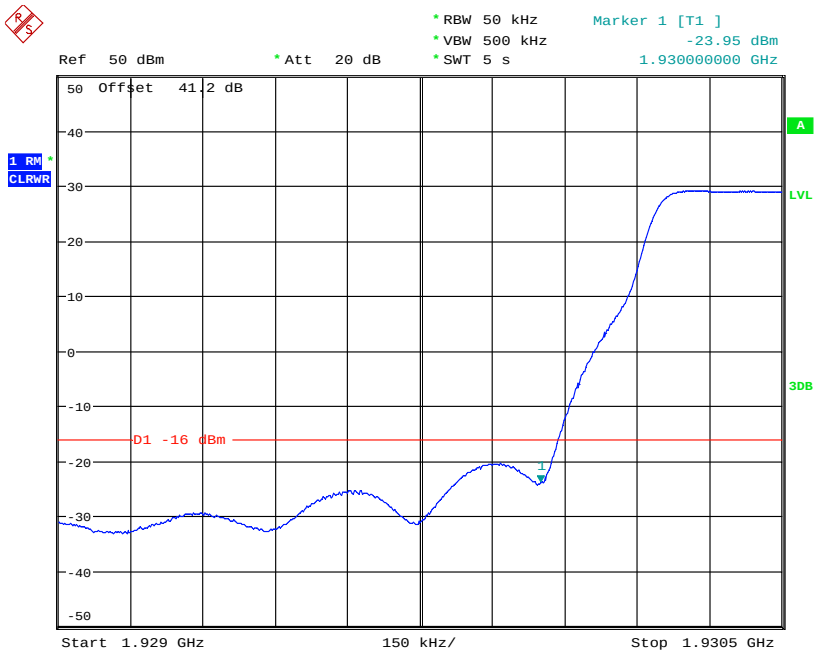


Date: 7.FEB.2013 03:08:48

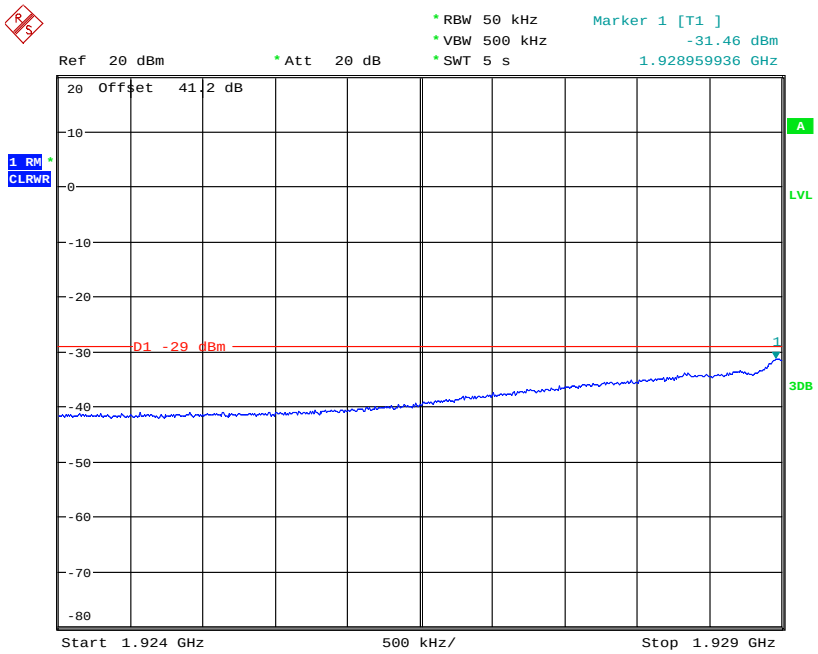
Product Service

5.0MHz Bandwidth

Configuration 1 - Mode 1 - 5



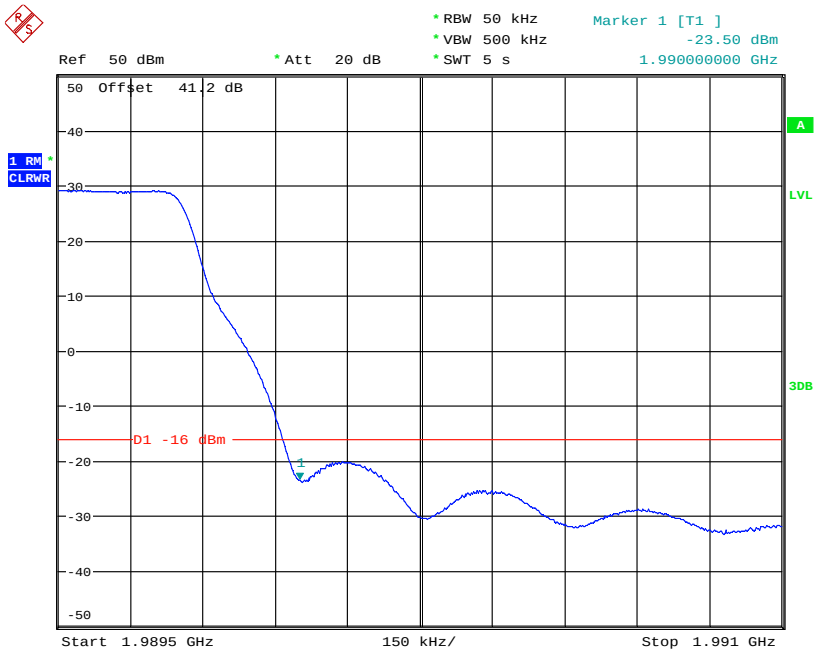
Date: 7.FEB.2013 03:53:27



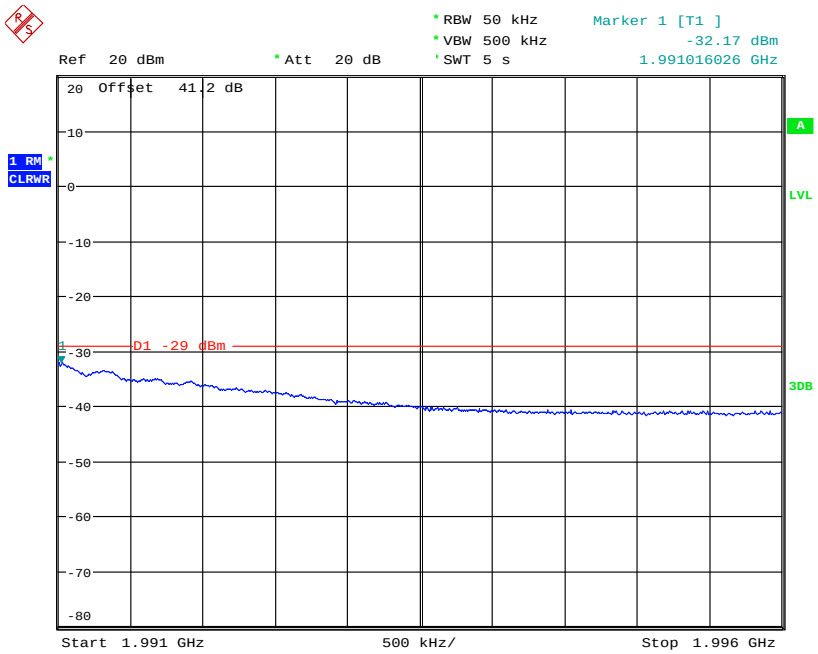
Date: 7.FEB.2013 03:54:56

Product Service

Configuration 1 - Mode 3 - 5



Date: 7.FEB.2013 03:52:24

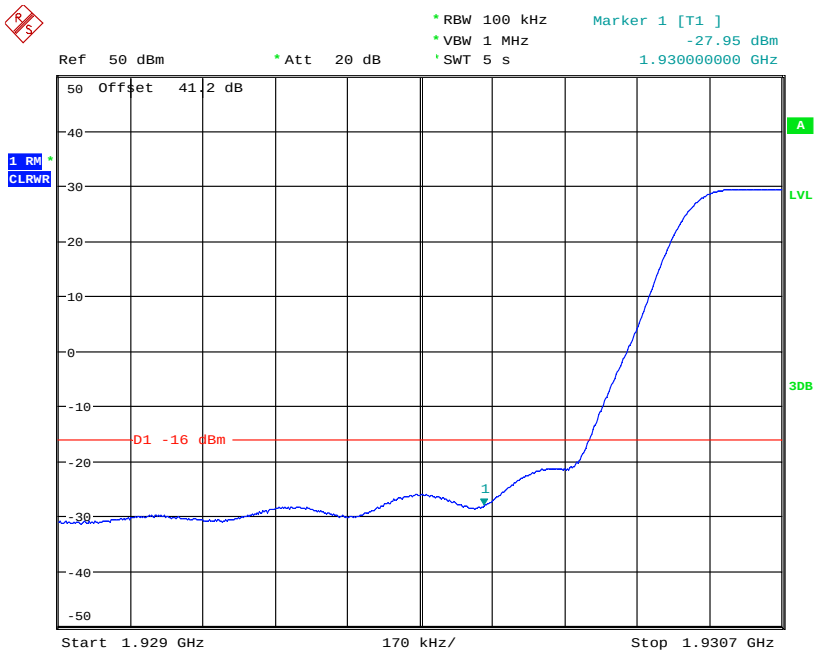


Date: 7.FEB.2013 03:50:15

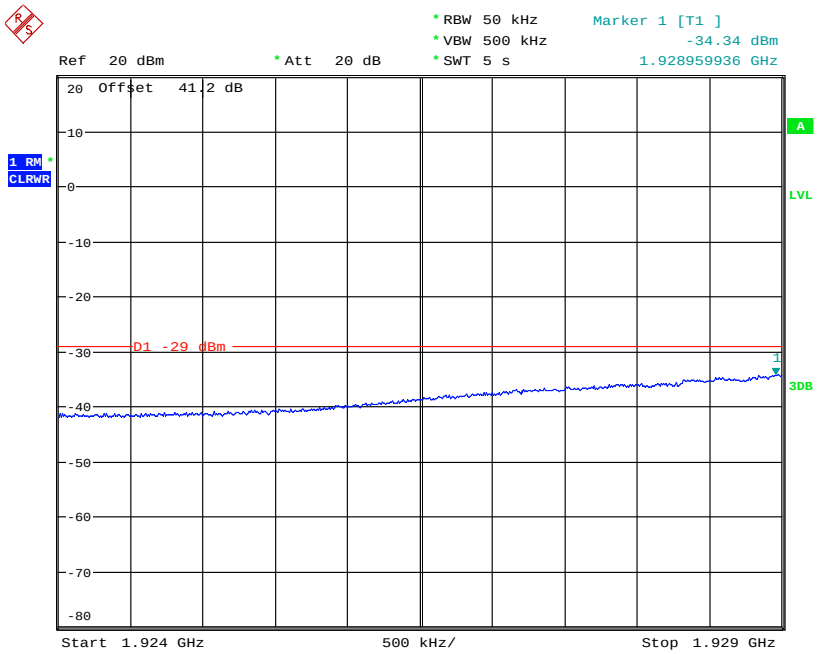
Product Service

10.0MHz Bandwidth

Configuration 1 - Mode 1 - 10



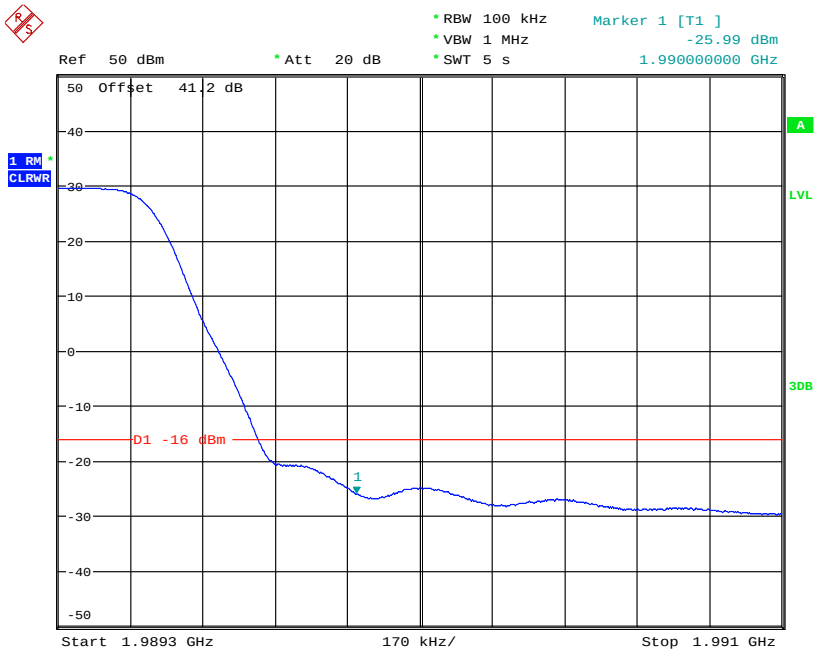
Date: 7.FEB.2013 03:58:48



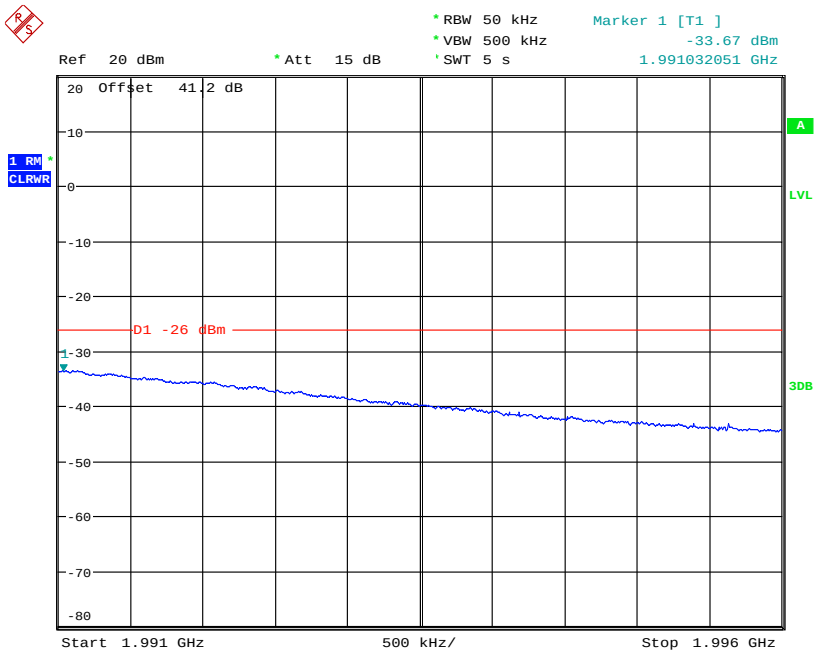
Date: 7.FEB.2013 03:56:41

Product Service

Configuration 1 - Mode 3 - 10



Date: 7.FEB.2013 04:01:08

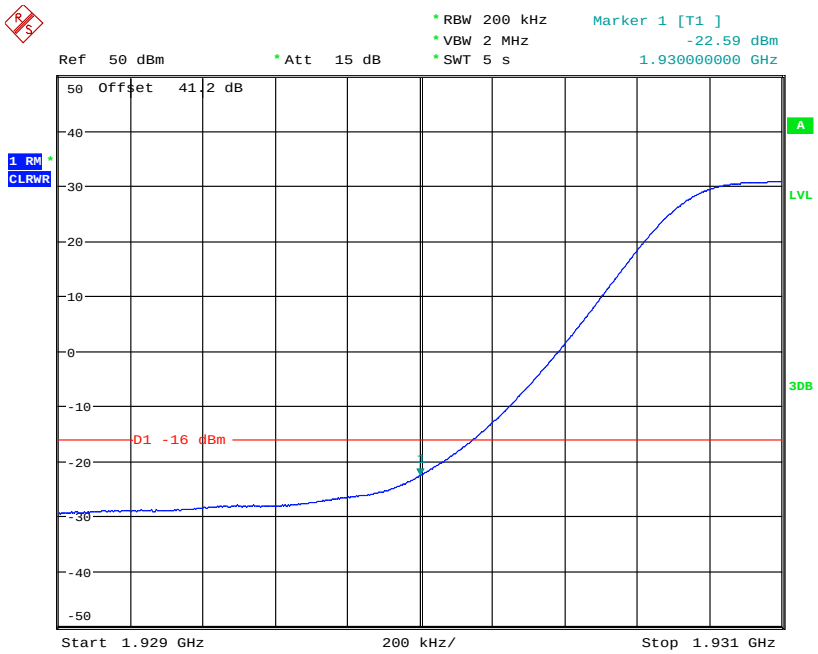


Date: 7.FEB.2013 04:02:20

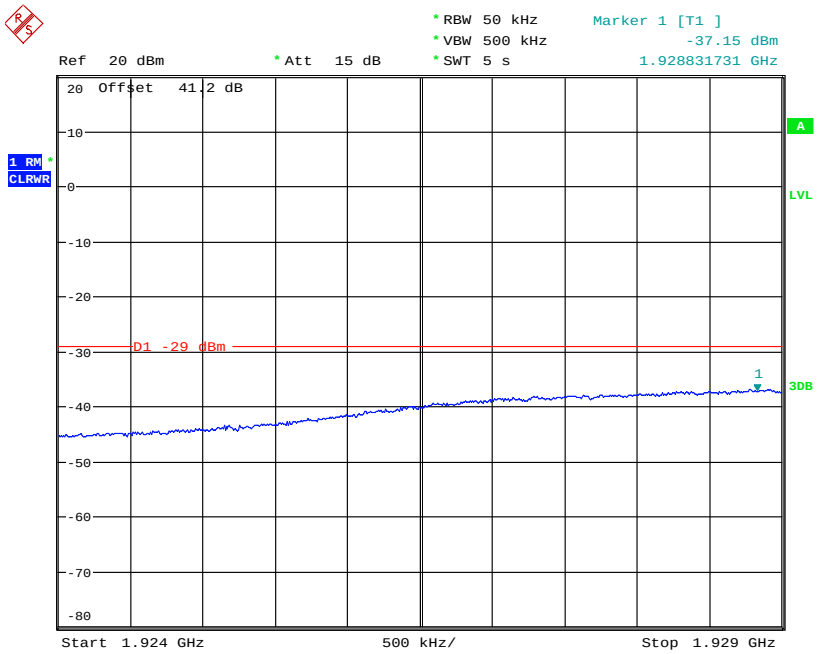
Product Service

15.0MHz Bandwidth

Configuration 1 - Mode 1 - 15



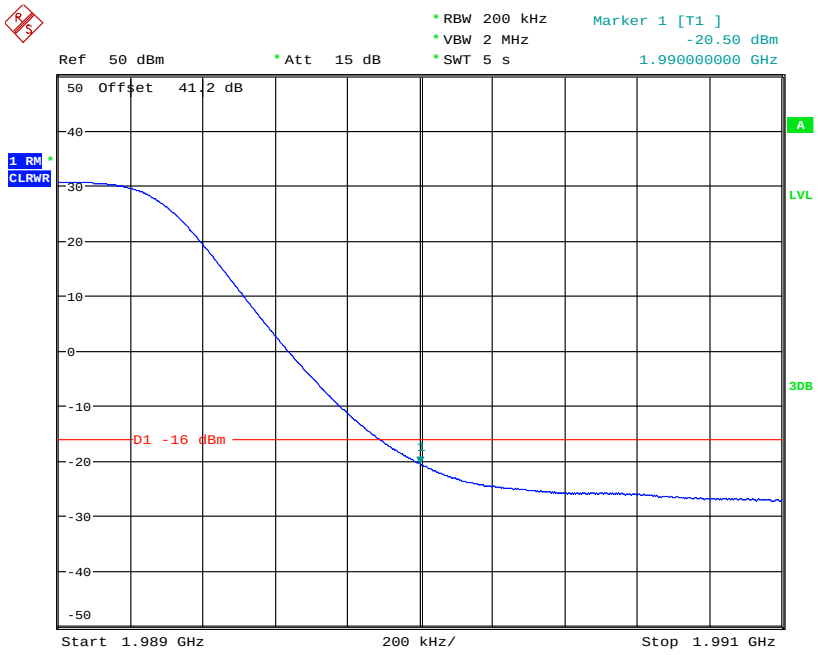
Date: 7.FEB.2013 04:11:16



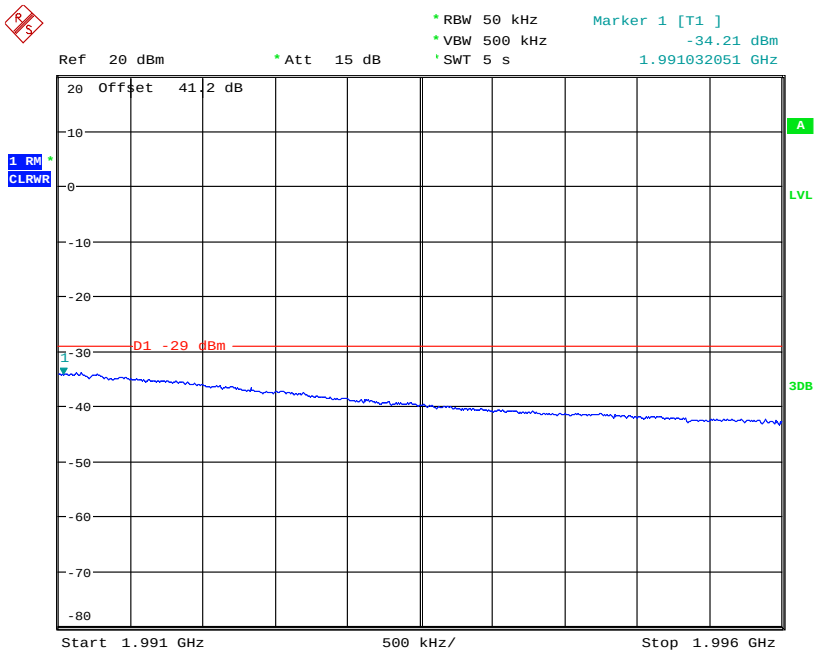
Date: 7.FEB.2013 04:12:46

Product Service

Configuration 1 - Mode 3 - 15



Date: 7.FEB.2013 04:05:55

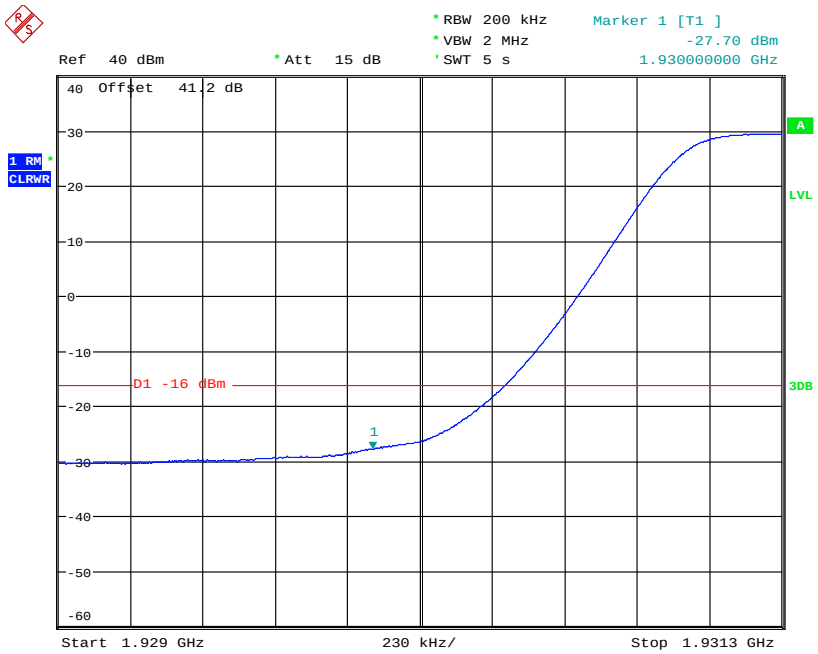


Date: 7.FEB.2013 04:04:10

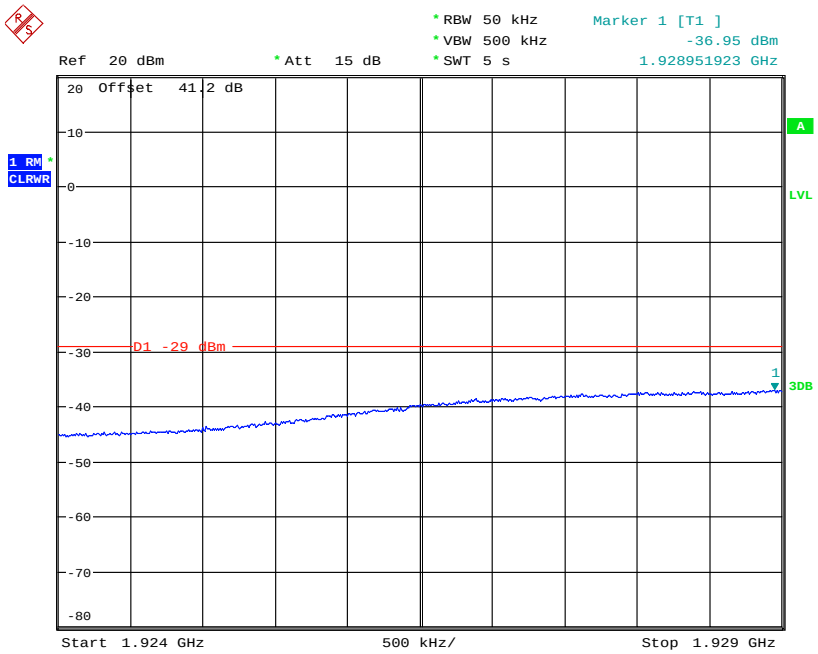
Product Service

20.0MHz Bandwidth

Configuration 1 - Mode 1 - 20



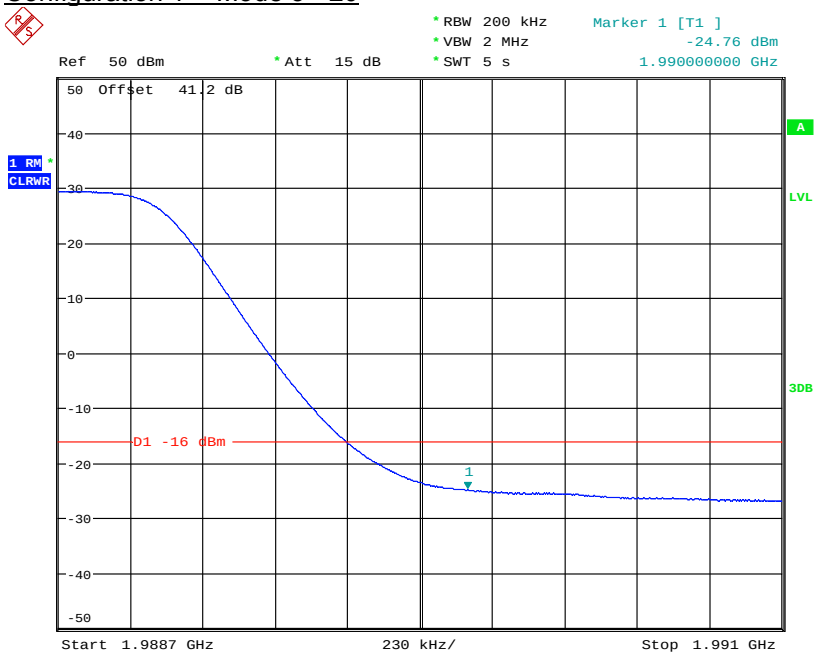
Date: 7.FEB.2013 03:33:01



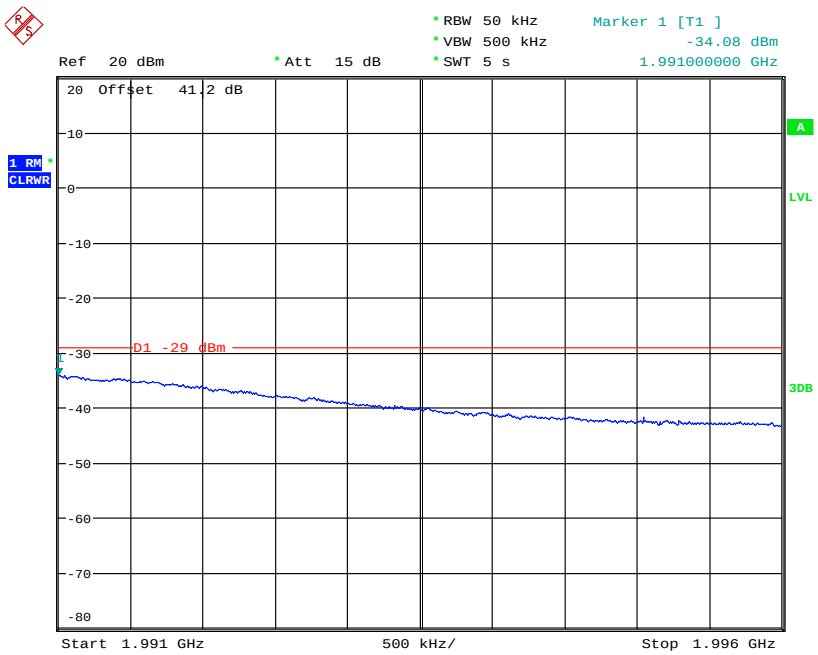
Date: 7.FEB.2013 03:35:25

Product Service

Configuration 1 - Mode 3 - 20



Date: 7.FEB.2013 03:41:20



Date: 7.FEB.2013 03:37:44

Limit

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

Product Service

2.6 RADIATED SPURIOUS EMISSIONS

2.6.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1053
FCC CFR 47 Part 24, 24.238 (a)
Industry Canada RSS-133, Clause 6.5

2.6.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655168, D164655167

2.6.3 Date of Test and Modification State

27 and 28 March 2013 – 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 24 and Industry Canada RSS-133.

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:

$E_{(v/m)}=(30 \times 1.64 \times 65.61)^{0.5} / 3 = 18.94V/m = 145.6dB\mu V/m$

As per 24.238 (a) the spurious emission must be attenuated by 43 + 10log (P_o) dB this gives:

43 + 10log(65.61) = 61.2dB

Therefore the limit at 3m measurement distance is:

145.6 – 61.2 = 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 operating on all modes in section 1.4.3 and record the result of the following configurations and modes of operation for worst case:

Configuration 1 - Mode 1 - 1.4, Mode 1 - 3,
- Mode 2 (1.4MHz, 5MHz, 10.0Mhz, 20.0MHz OBW)
- Mode 3 - 1.4, Mode 3 - 15

2.6.6 Environmental Conditions

	27 March 2013	28 March 2013
Ambient Temperature	20.0°C	22.4°C
Relative Humidity	24.0%	29.0%

Product Service

2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 & Part 24 and Industry Canada RSS-133 for Radiated Spurious Emissions.

The test results are shown below

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

E-TM1.1

1.4MHz Bandwidth

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

3.0MHz Bandwidth

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

5.0MHz Bandwidth

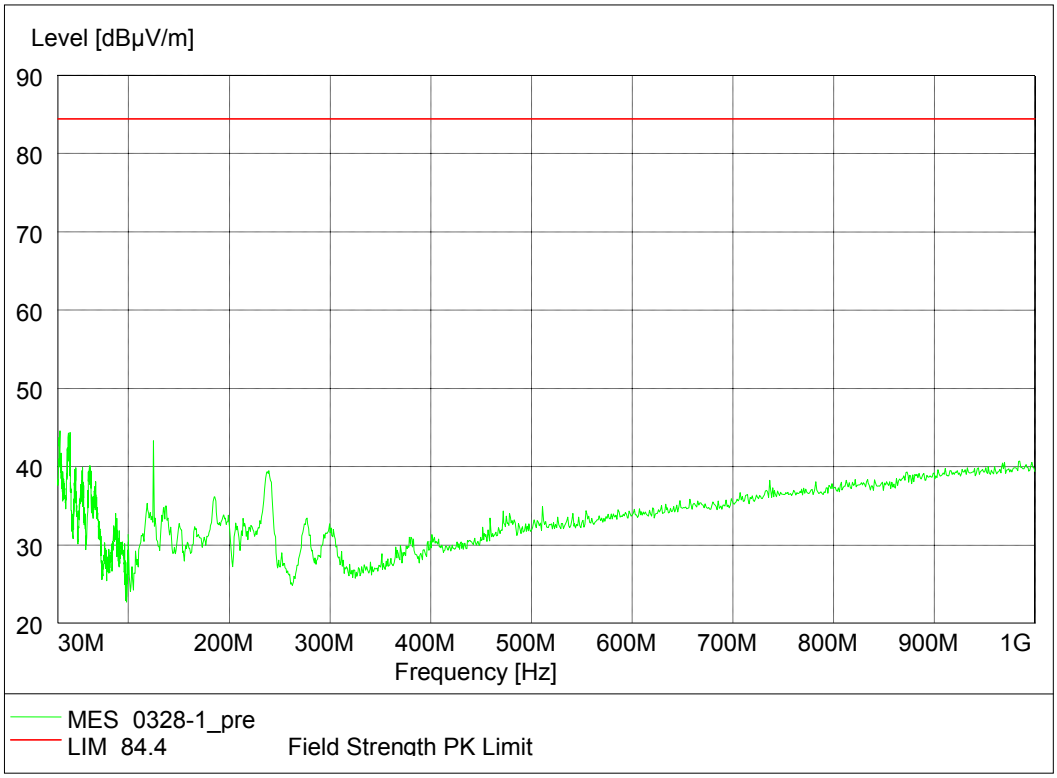
Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

10.0MHz Bandwidth

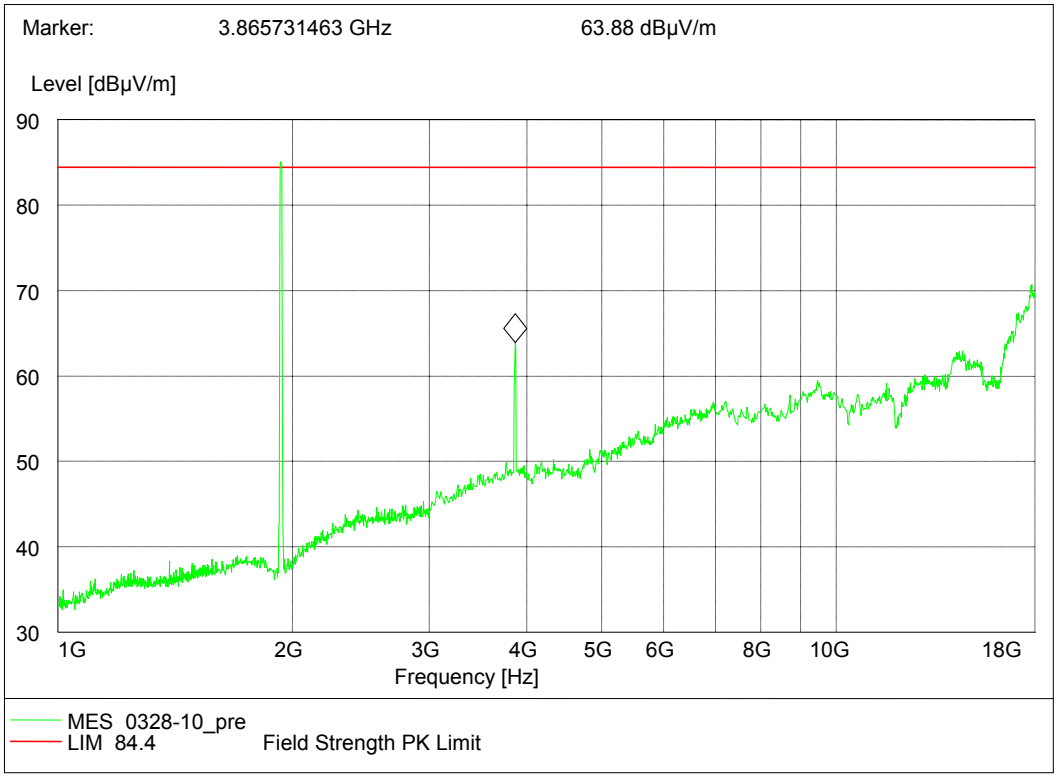
Configuration 1 - Mode 1

30MHz to 1GHz



Product Service

1GHz to 18GHz



18GHz to 25GHz

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

Product Service

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode3

No emissions were detected within 20dB of the limit.

15.0MHz Bandwidth

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

20.0MHz Bandwidth

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

E-TM3.2

10MHz Bandwidth

Configuration 1 - Mode 2

No emissions were detected within 20dB of the limit.

E-TM3.1

10MHz Bandwidth

Configuration 1 - Mode 2

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 24, 24.238 (a)
Industry Canada RSS-133, Clause 6.5

2.7.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655168, D164655167

2.7.3 Date of Test and Modification State

06 February 2013 – 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 24 and Industry Canada RSS-133.

In accordance with Part 2.1051, the spurious emissions from the antenna terminal were measured. The measurements were performed on the output connector RF A1. Limited complementary measurement were done at output connector RF A2 to verify identical performance for both transmitter chains. The EUT was set to transmit on maximum power. The transmitter output was attenuated using an attenuator and the frequency spectrum investigated from 9kHz to 25GHz. The EUT was tested on Bottom, Middle and Top channels for E-TM1.1 test model in 1.4MHz and 20MHz bandwidth configuations as the representative modes. The resolution was set to 1MHz from 9kHz to 25GHz thus meeting the requirements of Part 24.238(b). The spectrum analyser detector was set to peak and trace was kept on Max Hold as worst case.

The limit was adjusted with a correction of -3dB [10Log(2)] by using the Measure and Add 10Log(N) dB technique according to FCC KDB662911 D01 accounting for simultaneous transmission from antenna ports RF A1 and RF A2.

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 - 1.4, Mode 1 - 20
- Mode 2 (1.4MHz, 20.0MHz OBW)
- Mode 3 - 1.4, Mode 3 - 20

Product Service

2.7.6 Environmental Conditions

	06 February 2013
Ambient Temperature	23.0°C
Relative Humidity	31.0%

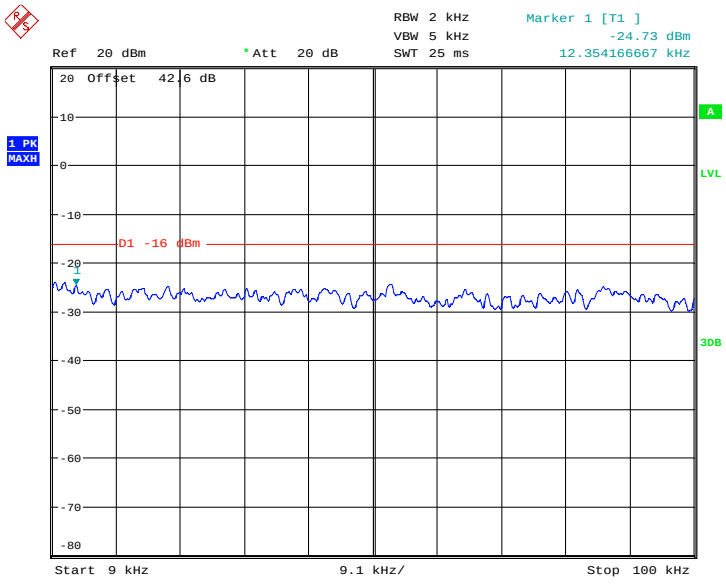
2.7.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133 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.



Date: 6.FEB.2013 03:50:08

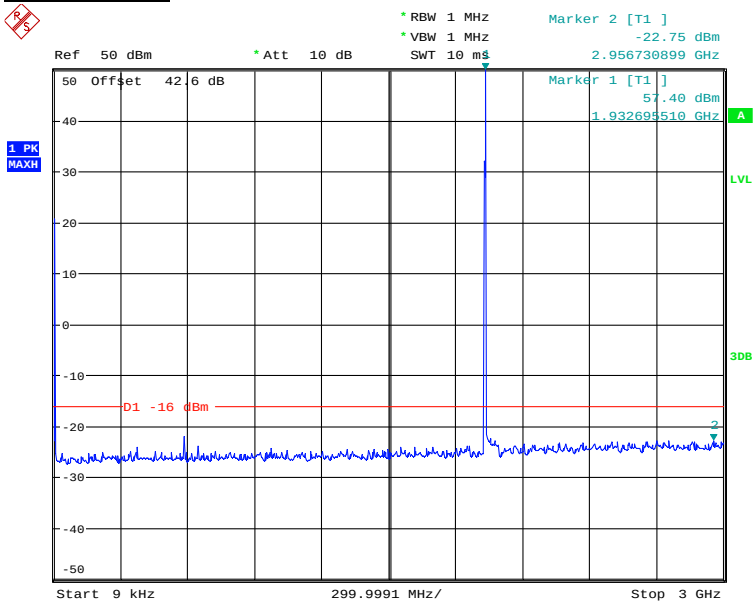
Product Service

E-TM1.1

1.4MHz Bandwidth

Configuration 1 - Mode 1 - 1.4

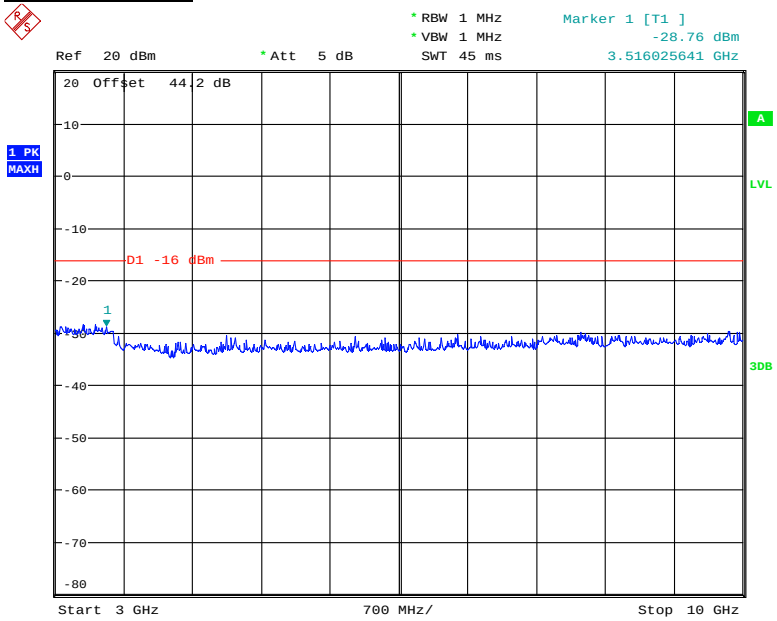
9kHz to 3GHz



Date: 6.FEB.2013 07:18:45

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

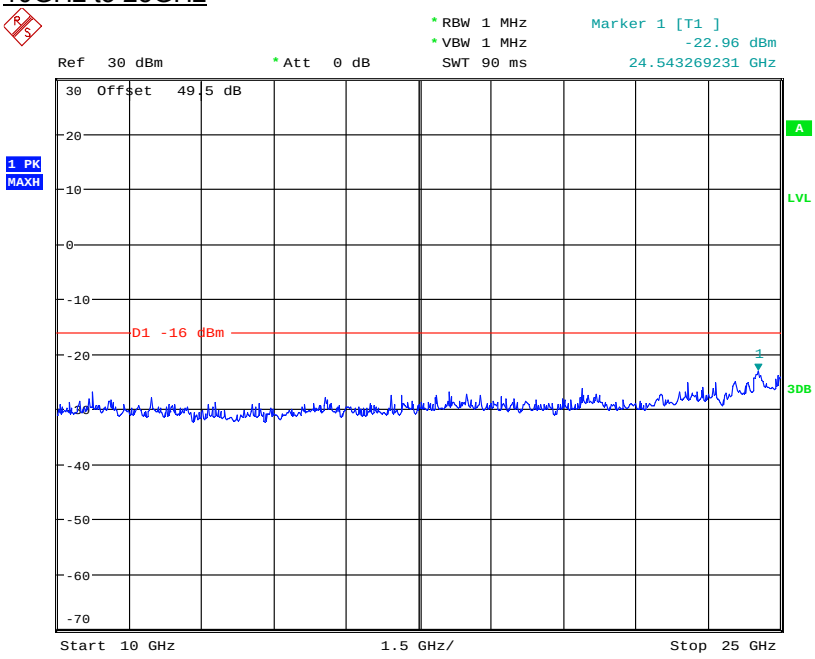
3GHz to 10GHz



Date: 6.FEB.2013 23:35:25

Product Service

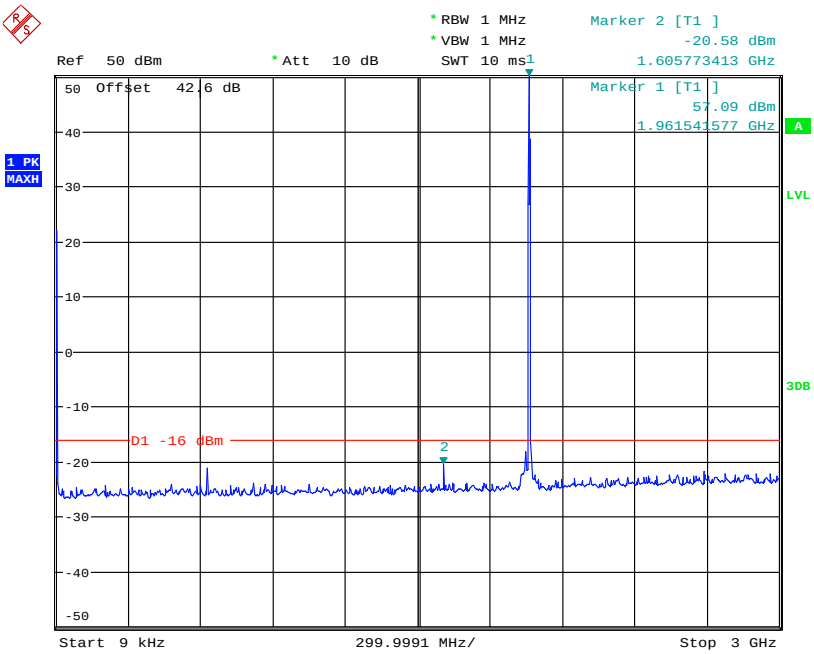
10GHz to 25GHz



Date: 6.FEB.2013 07:17:27

Configuration 1 - Mode 2

9kHz to 3GHz

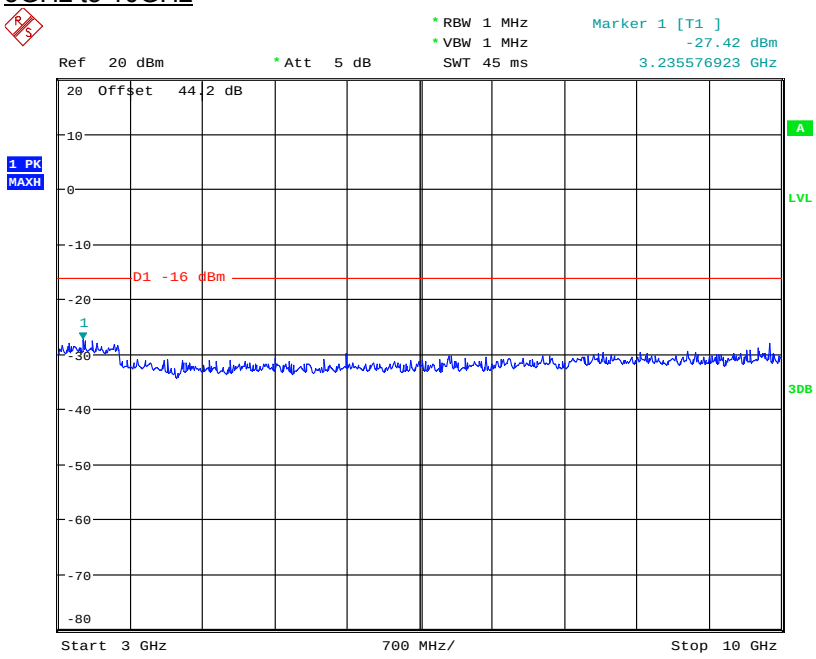


Date: 6.FEB.2013 03:48:41

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

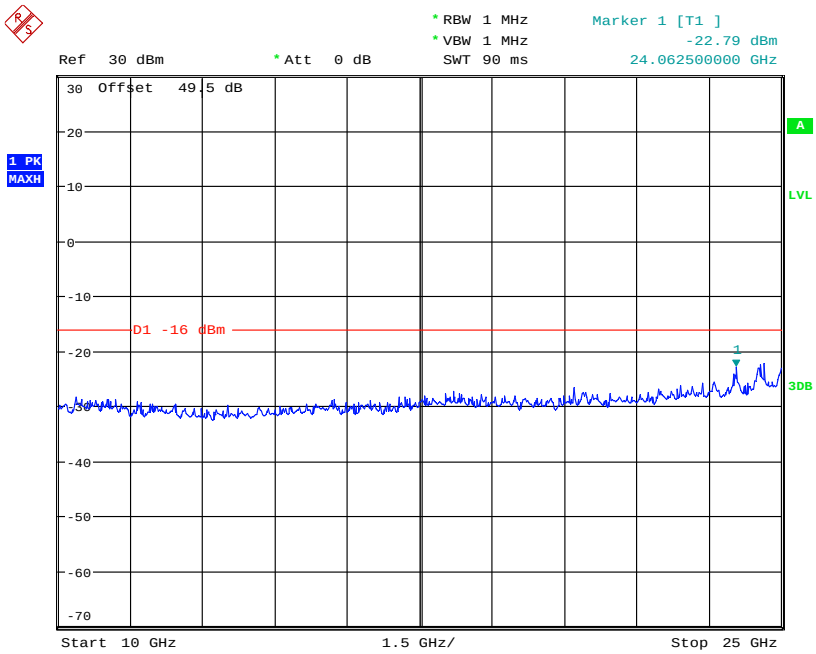
Product Service

3GHz to 10GHz



Date: 6.FEB.2013 23:34:59

10GHz to 25GHz

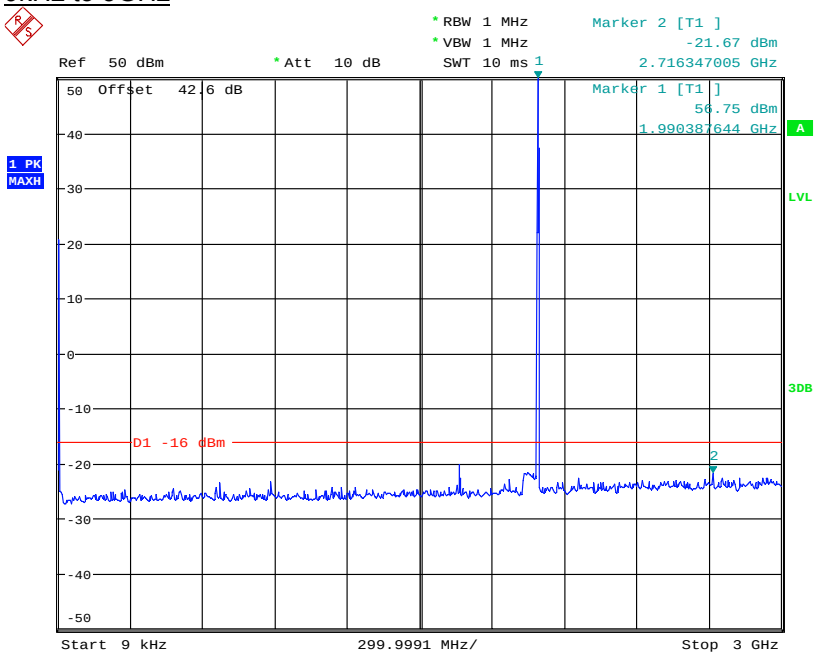


Date: 6.FEB.2013 03:53:07

Product Service

Configuration 1 - Mode 3 - 1.4

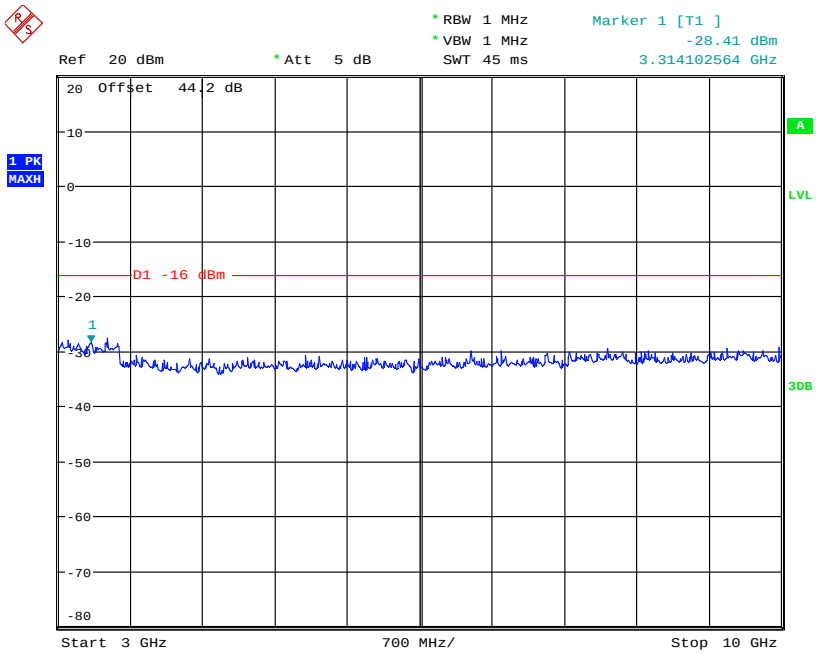
9kHz to 3GHz



Date: 6.FEB.2013 07:23:45

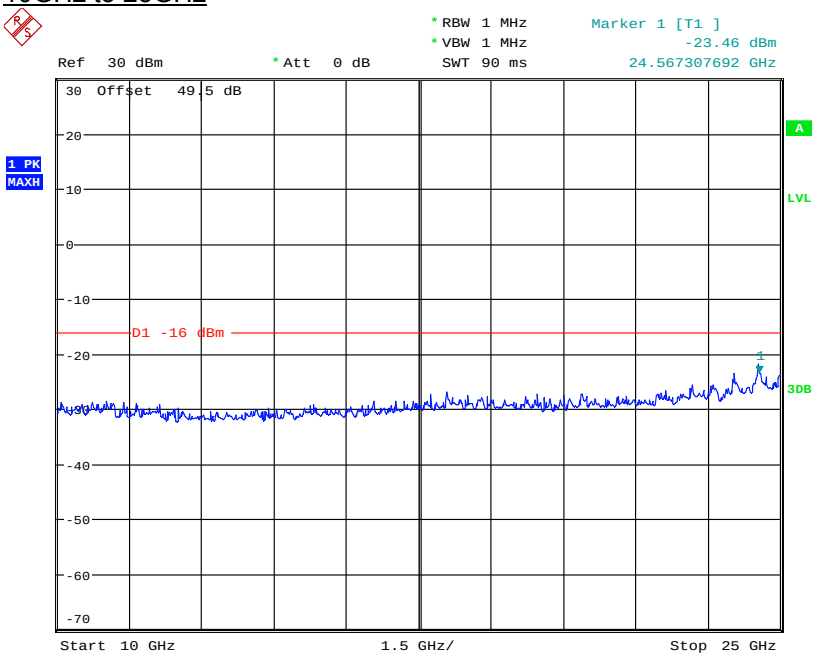
Note: The emission beyond the limit is the operating frequency.

3GHz to 10GHz



Date: 6.FEB.2013 23:34:28

10GHz to 25GHz

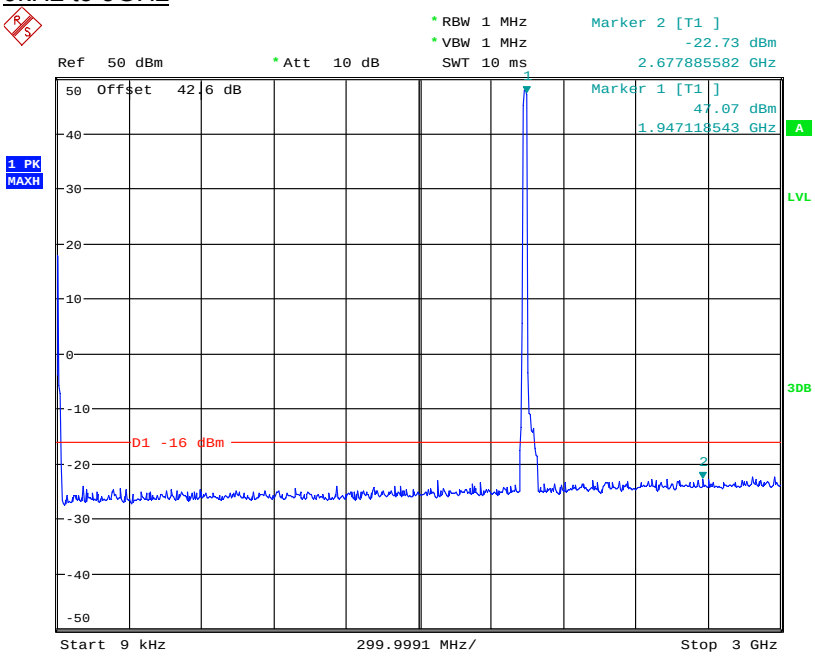


Date: 6.FEB.2013 07:22:37

20MHz Bandwidth

Configuration 1 - Mode 1 - 20

9kHz to 3GHz

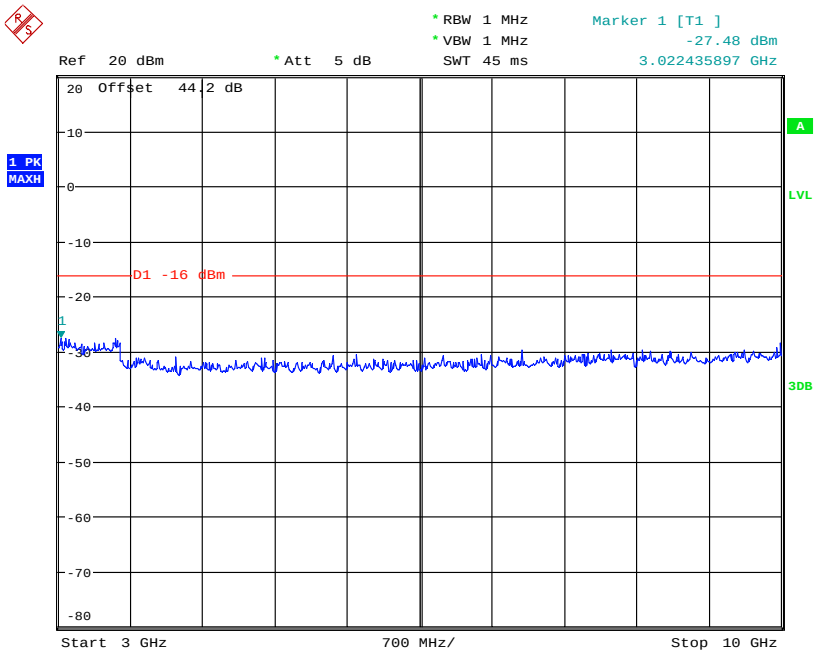


Date: 6.FEB.2013 23:27:09

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

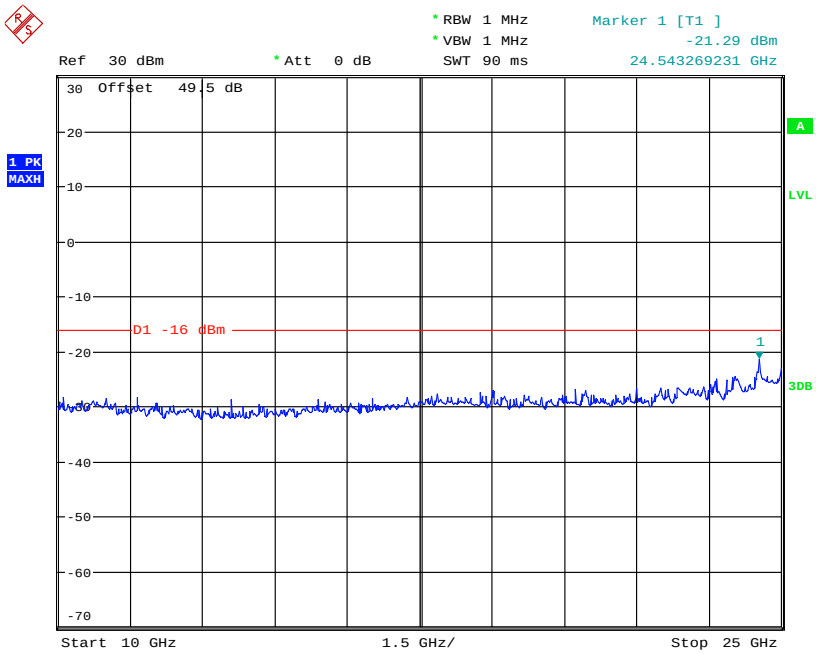
Product Service

3GHz to 10GHz



Date: 6.FEB.2013 23:34:04

10GHz to 25GHz

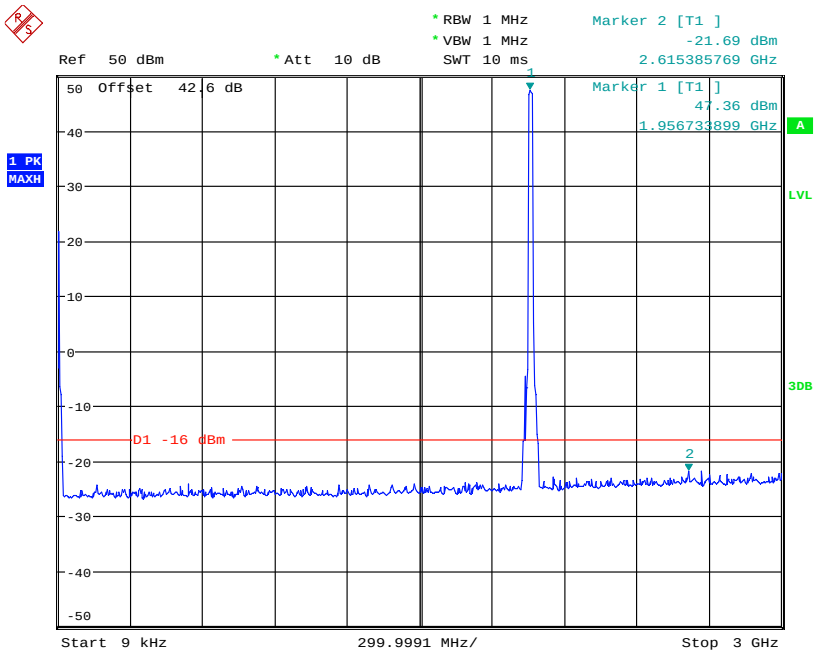


Date: 6.FEB.2013 23:29:20

Product Service

Configuration 1 - Mode 2

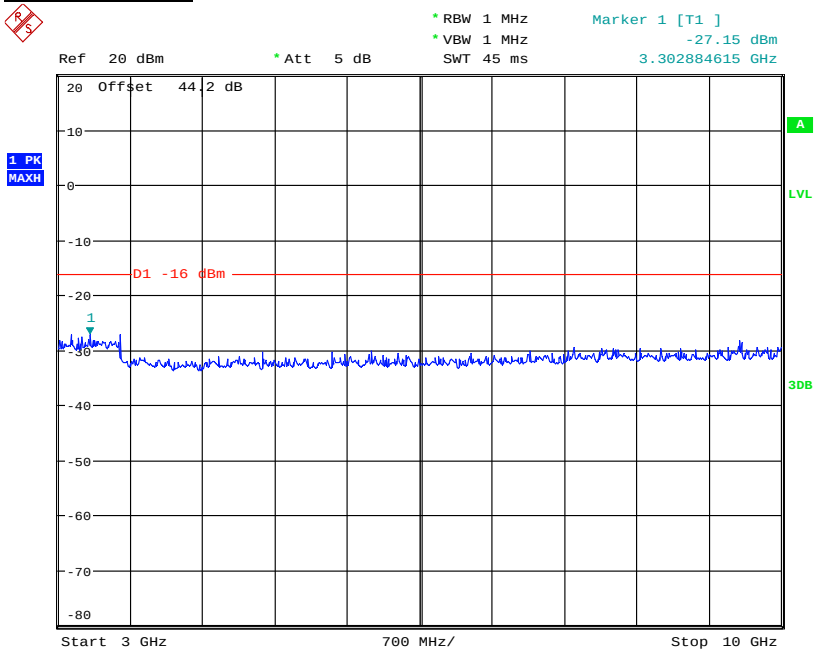
9kHz to 3GHz



Date: 6.FEB.2013 06:33:06

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

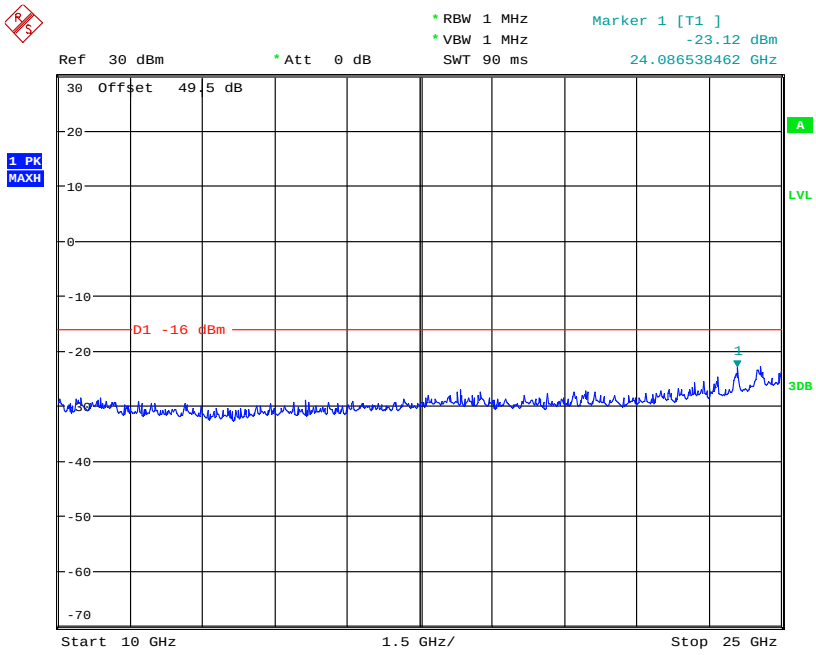
3GHz to 10GHz



Date: 6.FEB.2013 23:33:37

Product Service

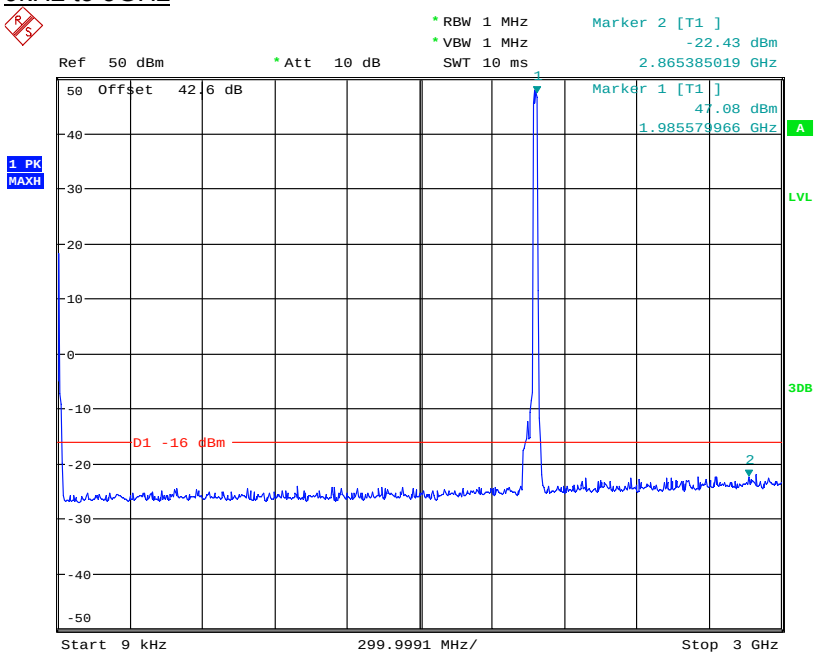
10GHz to 25GHz



Date: 6.FEB.2013 06:35:16

Configuration 1 - Mode 3 - 20

9kHz to 3GHz

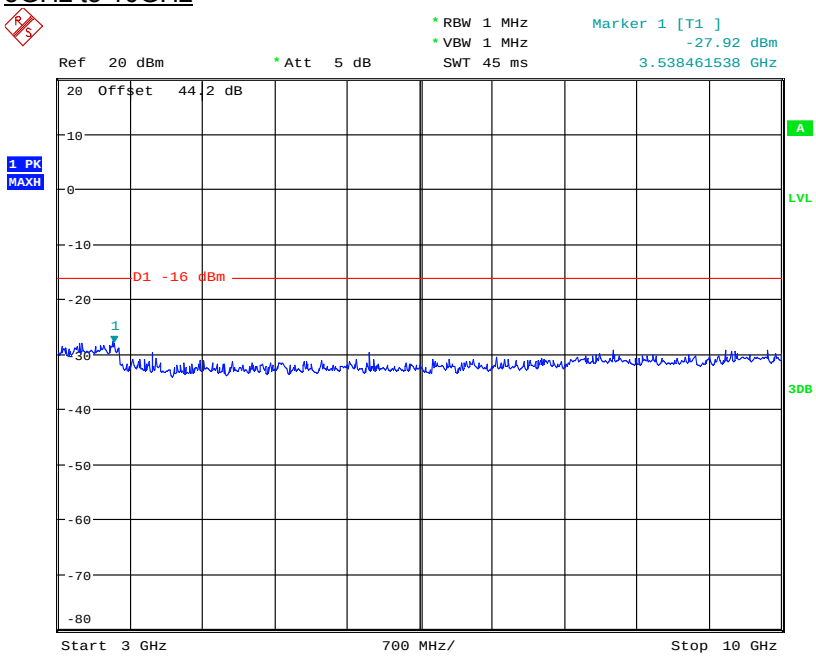


Date: 6.FEB.2013 23:36:30

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

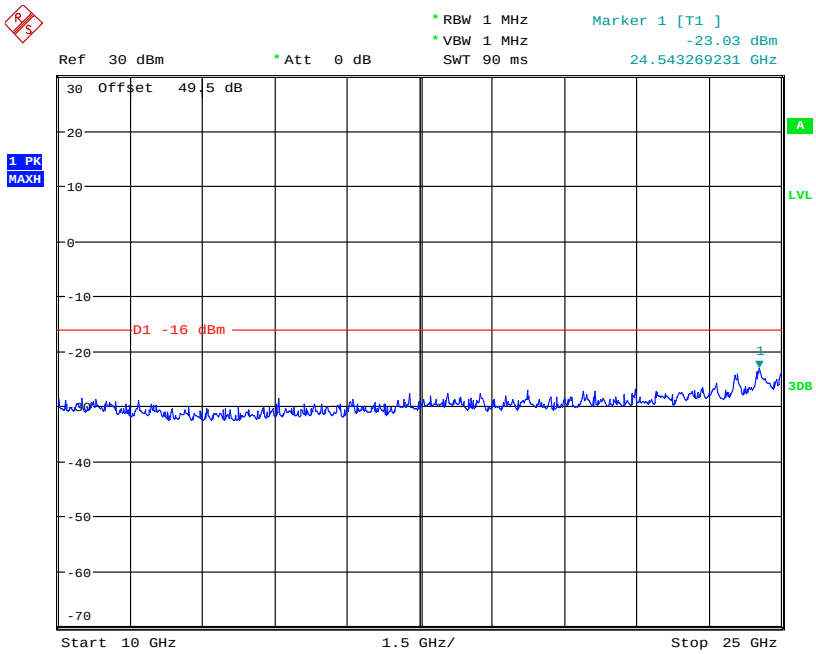
Product Service

3GHz to 10GHz



Date: 6.FEB.2013 23:32:54

10GHz to 25GHz



Date: 6.FEB.2013 23:30:47

Remarks

The EUT does not exceed -16dBm at the frequency range of 9kHz to 25GHz.

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 and 2.7 – Maximum Conducted Output Power, Peak – Average Ratio, Modulation Characteristics, Occupied Bandwidth, Spurious Emissions at Antenna Terminals (±1MHz) and Conducted Spurious Emissions.					
Spectrum Analyser	Rohde & Schwarz	FSQ26	200014	12	06-Sept-2013
Power Meter	Rohde & Schwarz	NRP	102438	12	12-Aug-2013
Power Sensor	Rohde & Schwarz	NRP-Z51	102434	12	12-Aug-2013
Network Analyzer	Agilent	8720D	US36140166	12	06-Sep-2013
40dB Attenuator	Aeroflex / Weinschel	48-40-43-LIM	BR5020	-	O/P MON
Load	Shanghai Huaxiang	DTS100-40-3	090323457	-	O/P MON
Load	Shanghai Huaxiang	TF100	09121602	-	O/P MON
Filter	K&L	ULK 904 098/2	16	-	O/P MON
Power Supply	Dahua	DH1716-5D	2008040003	-	O/P MON
Power Supply	Dahua	DH1716A-14	200380401	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	13-Dec-2013
Thermo-hygrometer	AZ Instruments	8705	9151655	12	16-Dec-2013
Section 2.6 – Radiated Spurious Emissions					
Load	Shanghai Huaxiang	DTS100-40-3	090323457	-	O/P MON
Load	Shanghai Huaxiang	TF100	09121602	-	O/P MON
Load	Shanghai Huaxiang	TFZ10-3R	20100908079	-	O/P MON
Load	Shanghai Huaxiang	TFE	090323010	-	O/P MON
EMI Receiver	Rohde & Schwarz	ESI 40	100015	12	19-Aug-2013
Ultra log test antenna	Rohde & Schwarz	HL562	100167	12	19-Aug-2013
Double-Ridged Wave-guide Horn Antenna	Rohde & Schwarz	HF 906	100029	12	19-Aug-2013
Pyramidal Horn Antenna	EMCO	3160-09	-	-	-
Antenna master	Frankonia	MA 260	-	-	19-Aug-2013
Relay Switch Unit	Rohde & Schwarz	331.1601.31	338965002	-	TU
Semi Anechoic Chamber	Frankonia	23.18m×16.88m×9.60m	-	12	19-Aug-2013
Power Supply	Dahua	DH1716-5D	2008040003	-	O/P MON
Digital Multimeter	FLUKE	179	91820401	12	13-Dec-2013
Thermo-hygrometer	AZ Instruments	8705	9151655	12	16-Dec-2013

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).