REPORT

issued by an Accredited Testing Laboratory, FCC listed with Reg. no. 93866 and IC recognized pursuant IC file no. 3482A.

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2012-02-23	FX108941-20	1 (2)

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No. 5 Lize East Street
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P. R. China

Class II permissive change measurements on RUS 01 B5 850 MHz cellular equipment with FCC ID: TA8AKRC11864-2 and IC: 287AB-AS118642

(7 appendices)

Test object

RUS 01 B5, product KRC 118 64/2, revision R2A

Summary

Standard		Compliant	Appendix
FCC CFR 47 / IC RSS-132			
2.1046 / RSS-132 4.4	RF power output	Yes	2
2.1049 / RSS-Gen 4.6.1	Occupied bandwidth	Yes	3
2.1051 / RSS-132 4.5	Band edge	Yes	4
2.1051 / RSS-132 4.5	Spurious emission at antenna terminals	Yes	5
2.1053 / RSS-132 4.5	Field strength of spurious radiation	Yes	6

Note 1: Above RSS-132 items are given as cross-reference only. Measurements were performed according to ANSI procedures referenced by FCC and covered by SP's accreditation.

SP Technical Research Institute of Sweden
Electronics - EMC

Performed by

Reinhold Reul

Examined by

Christer Karlsson

Table of contents

Description - Equipment Under Test (EUT)

Equipment:	RUS 01 B5 radio equipment 850 MHz single and multi-carrier, operating in GSM mode.
TX frequency band:	869 – 894 MHz
Modulations:	GMSK, 8PSK, 16QAM, 32QAM and AQPSK

Nominal maximum output power:

Per configuration and modulation, RMS value in [dBm]

	GMSK	8PSK	16QAM	32QAM	AQPSK
Mode: Single carrier, 1 x	47.8	47.8	47.8	47.8	47.8
Mode: Multi carrier, 2 x	44.8	44.8	44.5	44.1	44.8
Mode: Multi carrier, 3 x	43.0	42.4	41.0	40.6	42.3
Mode: Multi carrier, 4 x	41.8	39.9	38.5	38.1	39.8

Nominal supply voltage: -48 V DC

Purpose of test

The purpose of this test is to justify a Class II Permissive Change of the test object to include the use of the modulations 16QAM, 32QAM and AQSPK in SCPIR 0 dB. This report verifies maintained performance characteristics of affected items by re-testing the updated equipment and comparing results for GMSK modulation with results for the new modulations.

Tested configurations and set-ups

Single and multi-carrier modes were used as documented in the respective appendix. The EUT was activated at the maximum nominal RF output power per activated carrier and random data was transmitted in all time slots, with the various modulations being tested one at a time. Connections and reference points for measurements are shown in the set-ups below.

Test frequencies used

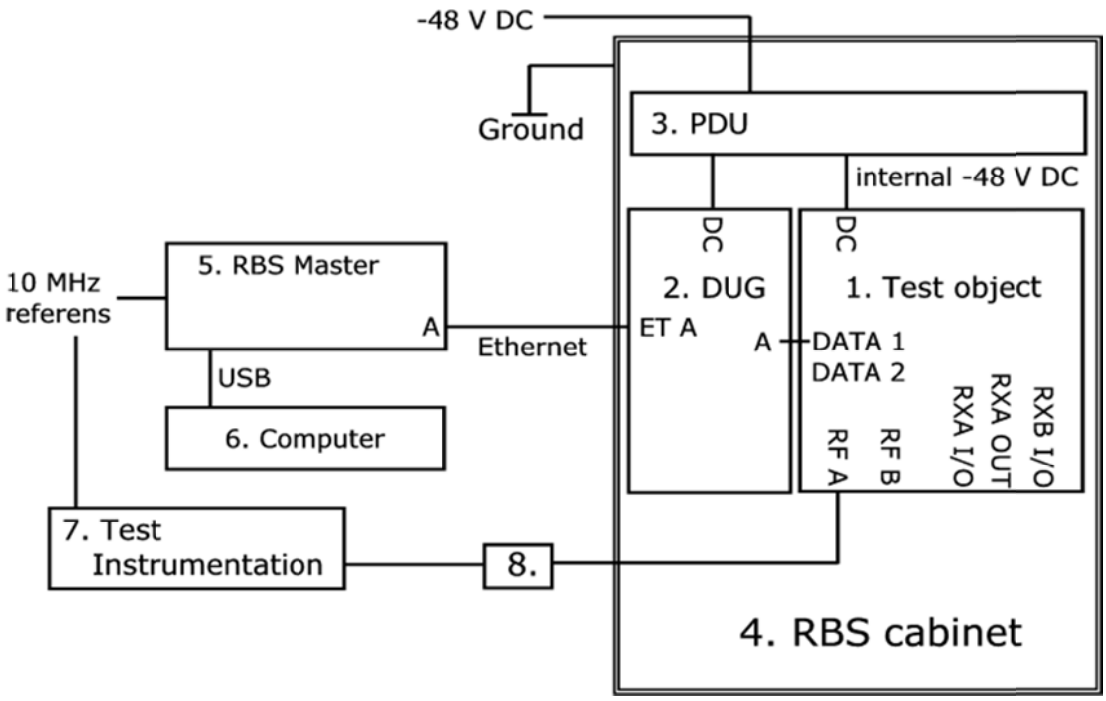
In single carrier mode:

Channel	ARFCN	Frequency	Comment
B	128	869.2 MHz	TX band lowest possible frequency
B+1	129	869.4 MHz	TX alternate low frequency
M	190	881.6 MHz	TX band center frequency
T-1	250	893.6 MHz	TX alternate high frequency
T	251	893.8 MHz	TX band highest possible frequency

In multi-carrier mode:

Channel	ARFCN	Frequency	Comment
B+1	129	869.4 MHz	TX low multi-carrier bottom frequency used
B+9	137	871.0 MHz	TX high multi-carrier bottom frequency used
M-4	186	880.8 MHz	TX low multi-carrier mid frequency used
M+4	194	882.4 MHz	TX high multi-carrier mid frequency used
T-9	242	892.0 MHz	TX low multi-carrier top frequency used
T-1	250	893.6 MHz	TX high multi-carrier top frequency used

Test set-up, conducted measurements



Test object

1. RUS 01 B5, product KRC 118 64/2, revision R2A, SN C824169690 with FCC ID: TA8AKRC11864-2 and IC: 287AB-AS118642

Functional test equipment

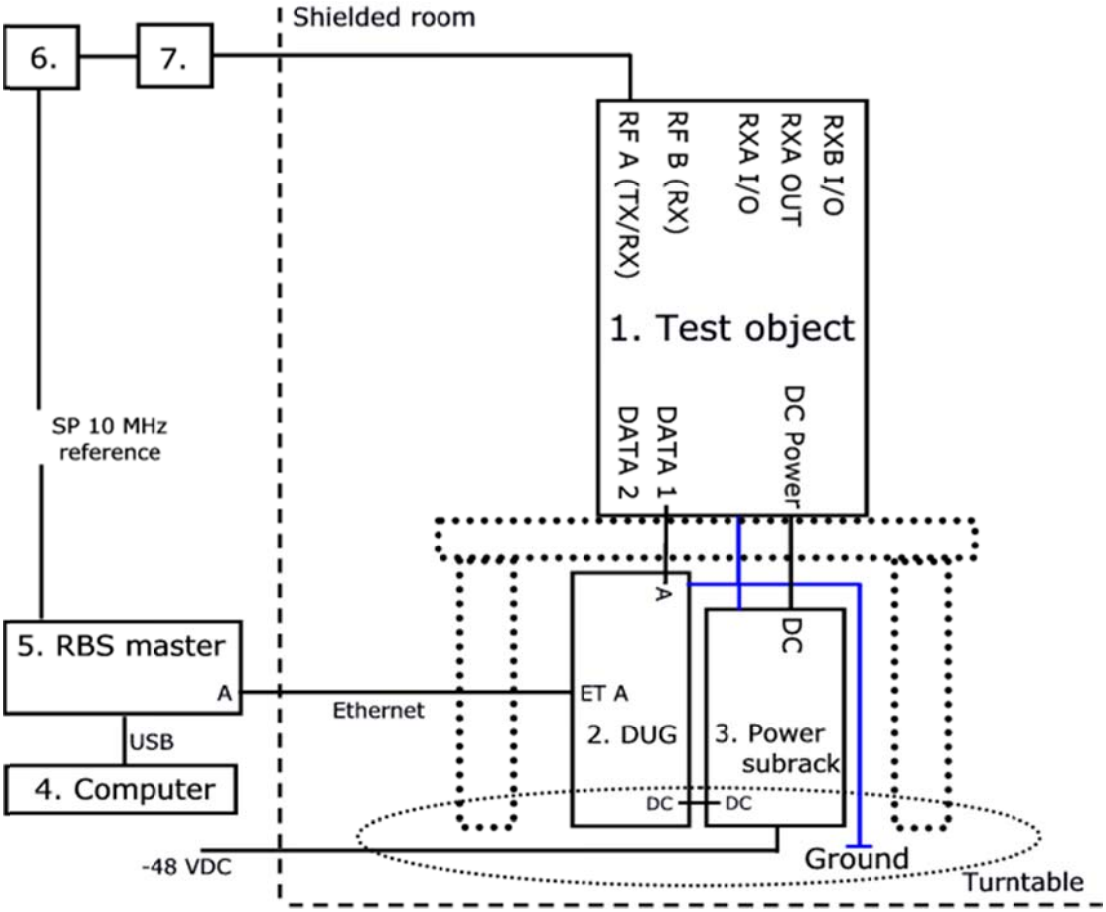
2. Digital unit DUG 20 01,
   product KDU 137 569/1, revision R2A, SN C823667528
3. Power distribution unit PDU 02 01,
   product BMG 980 336/4, revision R2A, SN BJ31528316
4. RBS 6201 cabinet, BAMS 1000778792, external connections:

Interface	Type of port:
-48 V DC to internal DC connection port	DC power
Ground strap to frame grounding point	Ground
DUG port ET A to RBS master 2E port A using shielded Ethernet multi-wire RJ-45 connectors, using transmission mode E1	Telecom

5. RBS Master 2E hardware,
   product LPY 107 1007/3, revision R1C/A, SN T01E6555543, BAMS 1000878432
6. Laptop Compaq nc6220, S/N: CNU54722NZ, BAMS 1000208319,
   with RBS Master 2E control software

7. Measurement equipment specified in respective appendix or
   client supplied Agilent MXA Signal Analyser model N9020A 20 Hz – 3.6 GHz,
   BAMS 1000785533 used to verify the modulation schemes
8. Attenuator / filter listed under test equipment in respective appendix

Test set-up, radiated emission



Test object

1. RUS 01 B5, product KRC 118 64/2, revision R2A, SN C824169690 with FCC ID: TA8AKRC11864-2 and IC: 287AB-AS118642

Functional test equipment

2. Digital unit DUG 20 01, product KDU 137 569/1, revision R2A, SN C823667528
3. Power sub-rack, details see below
4. Laptop Compaq nc6220, S/N: CNU54722NZ, BAMS 1000208319, with software RBS Master 2E control software
5. RBS Master 2E hardware, product LPY 107 1007/3, revision R1C/A, SN T01E6555543, BAMS 1000878432, using shielded Ethernet multi-wire with RJ-45 connectors and transmission mode E1 to DUG port ET A
6. Rohde & Schwarz ESI40 (SP 503 125) for signal monitoring or 50 ohm termination
7. Attenuator 30 dB, SP 900229

Power sub-rack modules:

Pos.	Unit	Product Number	Revision	Serial Number
	Power subrack	SXK 109 8115/1	R2A	-
1	PDU 01 01	BMG 980 336/2	R4F	BJ31532384
2	PDU 01 01	BMG 980 336/2	R4F	BJ31532382
3	SHU 01 01	BGK 901 18/1	R3C	BJ31446269
4	DUMMY	SXK 109 8257/1	R1F	-
5	DUMMY	SXK 109 8257/1	R1F	-
6	PFU	KFE 101 11621	R1B	BR80910495
7	DUMMY	SXK 109 8257/1	R1F	-
8	DUMMY	SXK 109 8257/1	R1F	-
9	PCF 02 01	KFE 101 1157/1	R1C	BW95301450

Test object connections

Interface	Type of port
-48.0 V DC	DC power
Ground strap connected to shell in stand-alone radiated test, Grounding through RBS cabinet frame in conducted test	Ground
RF A, 7/16” female RF connector, combined TX/RX	RF/Antenna
RF B, 7/16” female RF connector, unconnected, RX only	RF/Antenna
Data 1, connected to DUG port A	Signal
Data 2, unconnected	Signal
RXA I/O, unconnected	Signal
RXA OUT, unconnected	Signal
RXB I/O, unconnected	Signal

Test object software

Software	Revision
CXP 104 0013/07	R65F

References

Measurements were done according to relevant parts of the following standards:

ANSI C63.4-2009
ANSI/TIA/EIA-603-C-2004
ANSI/TIA/EIA 136-280-D-2002
CFR 47 part 2, October 1st, 2010
CFR 47 part 22, October 1st, 2010
RSS-Gen, Issue 3
RSS-132, Issue 2

Reservation

The test results in this report apply only to the particular Equipment Under Test (EUT) as declared in the report.

Delivery of test object

The test object was delivered: 2011-12-07

Test equipment

Measurement equipment	Calibration Due	SP number
Anechoic chamber, Hertz	2013-10	15:116
Boonton 4500A RF Peak power meter/analyser	2012-11	503 144
Boonton Power sensor 56518-S/4	2012-11	503 146
Rohde & Schwarz FSQ40	2012-07	504 143
Rohde & Schwarz FSIQ40	2012-07	503 738
Rohde & Schwarz ESI40	2012-07	503 125
Rohde & Schwarz Vector Network Analyser	2012-07	503 687
Chase bilog antenna CBL 6121A	2014-10	502 460
Schaffner Reference Dipole BSRD6500	2012-03	502 181
EMCO Horn Antenna 3115	2014-01	502 175
EMCO Horn Antenna 3115	2014-01	501 548
MITEQ Low Noise Amplifier	2012-08	503 277
Flann Std gain horn 20240-20	2014-03	503 674
Attenuator 40 dB	2012-08	504 159
Attenuator 30 dB	2012-08	900 229
Attenuator 30 dB	2012-05	503 870
Attenuator 10 dB	2012-08	900 118
High pass filter	2012-08	504 199
High pass filter	2012-08	504 200
High pass filter	2012-08	502 758
High pass filter	2012-10	503 740
Multimeter Fluke 87	2012-05	502 190
Testo 615 temperature and humidity meter	2012-03	503 498
Testo 635 temperature and humidity meter	2013-05	504 203

Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation ”SP-QD 10885”. The uncertainties are calculated with a coverage factor k=2 (95% level of confidence).

Test engineers

Jörgen Wassholm, Martin Nilsson, Martin Forsberg and Reinhold Reul, SP

Manufacturer's representative

Hua Yang, Ericsson (China) Communications Company Ltd

RF Power output measurements according to CFR 47 2.1046 / RSS-132 4.4

Date	Temperature	Humidity
2011-12-08	23 °C ± 3 °C	23 ± 5 %
2011-12-12	23 °C ± 3 °C	23 ± 5 %

Test set-up and procedure

Measurements were made at EUT port RF A. The output was connected to a peak power analyser via 50 ohm attenuators.

Measurement equipment	SP number
Boonton 4500A RF Peak power meter/analyzer	503 144
Boonton Power sensor 56518-S/4	503 146
Attenuator	503 870
Attenuator	900 118
Multimeter Fluke 87	502 190
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 0.7 dB

Results

Single carrier, 1 x 47.8 dBm, RBS master 2E setting 48

Transmitter power (dBm) Peak / RMS			
Channel: / Modulation:	B	M	T
GMSK	48.2 / 47.3	48.1 / 47.3	47.8 / 46.9
16QAM	52.3 / 47.2	52.3 / 47.2	52.0 / 46.8
32QAM	52.4 / 47.1	52.4 / 47.2	52.3 / 46.8
AQPSK	51.2 / 47.2	51.2 / 47.3	50.9 / 46.8

Multi carrier, 2 x 44.8 dBm, RBS master 2E setting 45 (per carrier), channels M-4 and M+4

Modulation:	Aggregated transmitter power (dBm) Peak / RMS
GMSK	51.0 / 47.4
16QAM	54.9 / 46.9
32QAM	54.5 / 46.5
AQPSK	54.1 / 47.3

The theoretical RMS power per carrier is 3 dB below the aggregated measured RMS values.

Limits

CFR 47 § 22.913: 500 W ERP shall not be exceeded.

Complies?	Yes

Occupied bandwidth measurements according to 47CFR 2.1049 / RSS-Gen 4.6.1

Date	Temperature	Humidity
2011-12-09	23 °C ± 3 °C	23 % ± 5 %

Test set-up and procedure

Measurements were made at EUT port RF A. The output was via 50 ohm attenuators connected to a spectrum analyser with the RMS detector activated. The spectrum analyser was supplied an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
R&S FSQ	504 143
Attenuator	503 870
Attenuator	900 118
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB, 1.33 kHz

Results

Configuration: Single Carrier, RBS master 2E setting 48

Diagram	Channel (Frequency)	Modulation	OBW
1:	B (869.2 MHz)	GMSK	241 kHz
2:	M (881.6 MHz)	GMSK	241 kHz
3:	M (881.6 MHz)	16QAM	240 kHz
4.	M (881.6 MHz)	32QAM	241 kHz
5.	M (881.6 MHz)	AQPSK	239 kHz
6.	T (893.8 MHz)	GMSK	241 kHz

The diagrams are shown on the following pages.

Diagram 1:

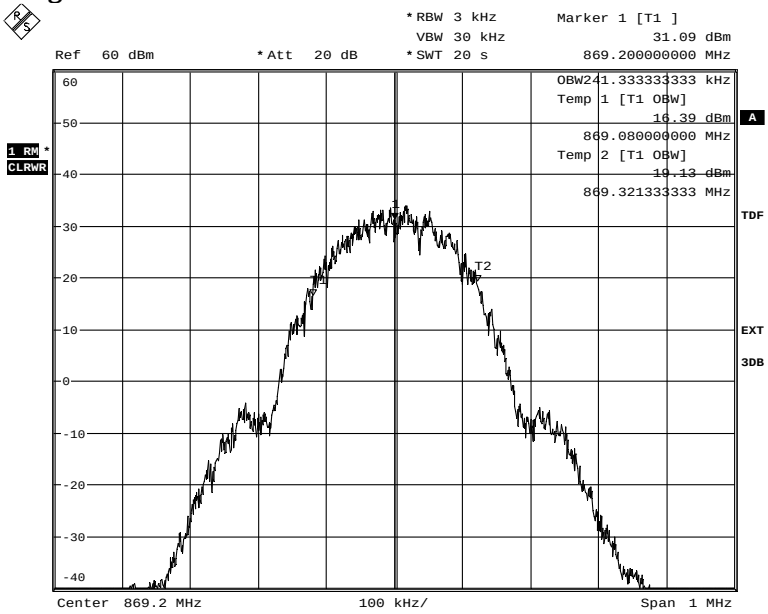


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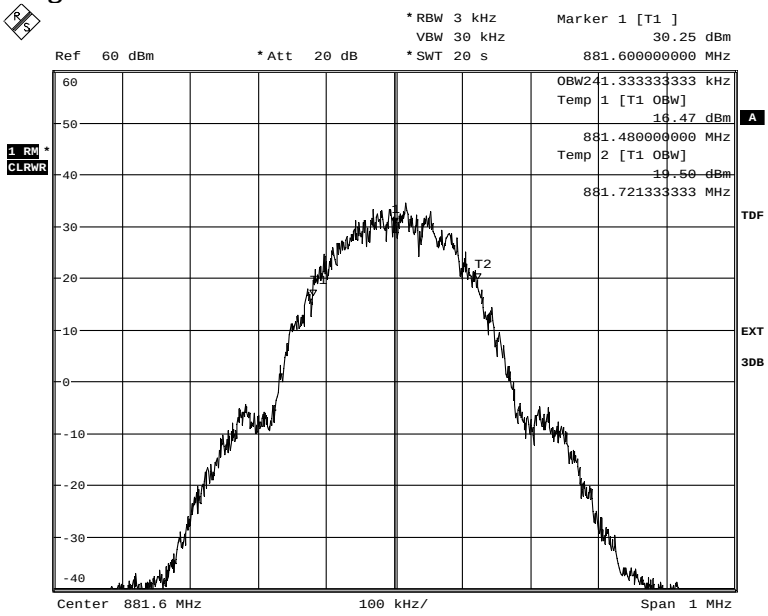
Diagram 2:



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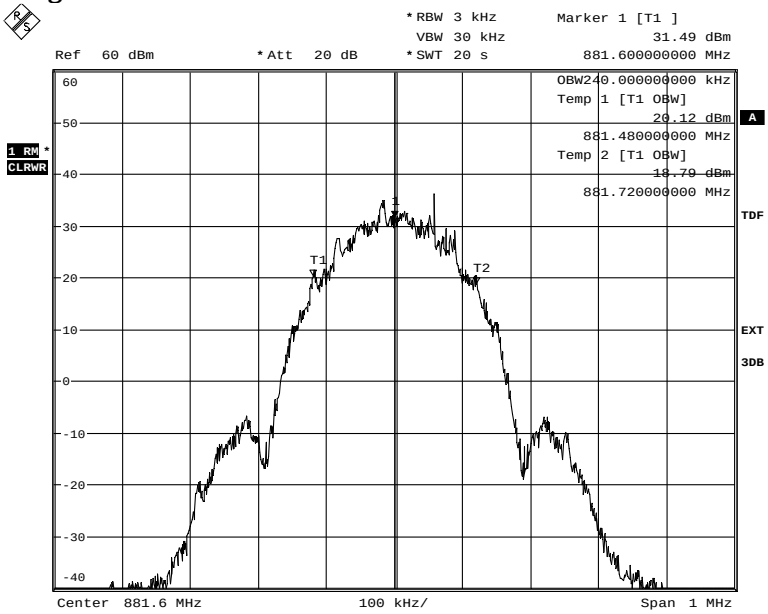

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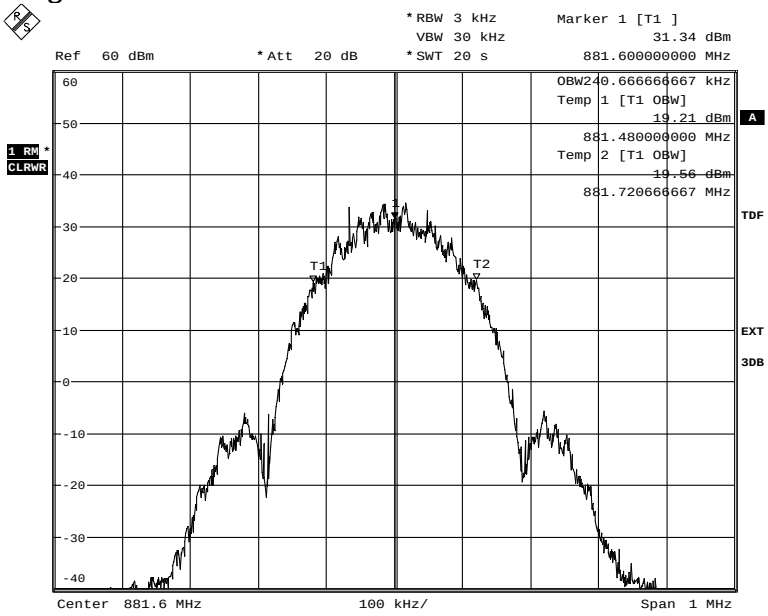

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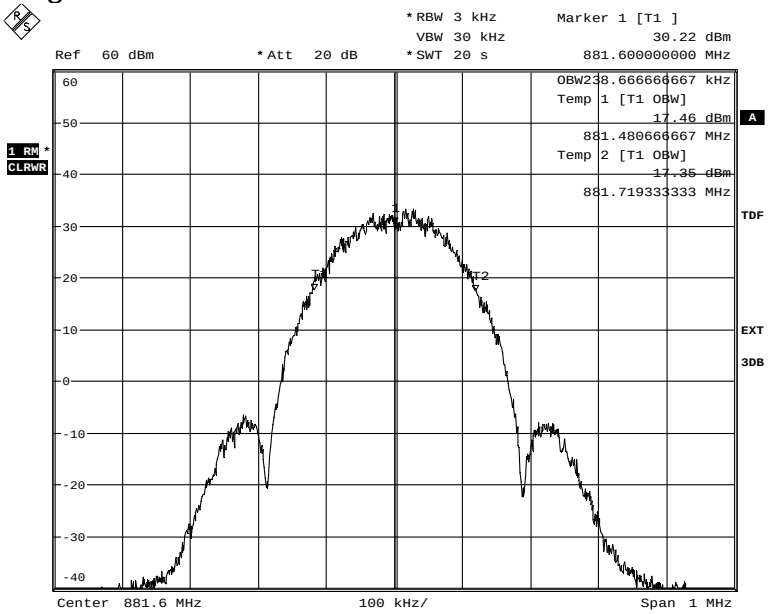

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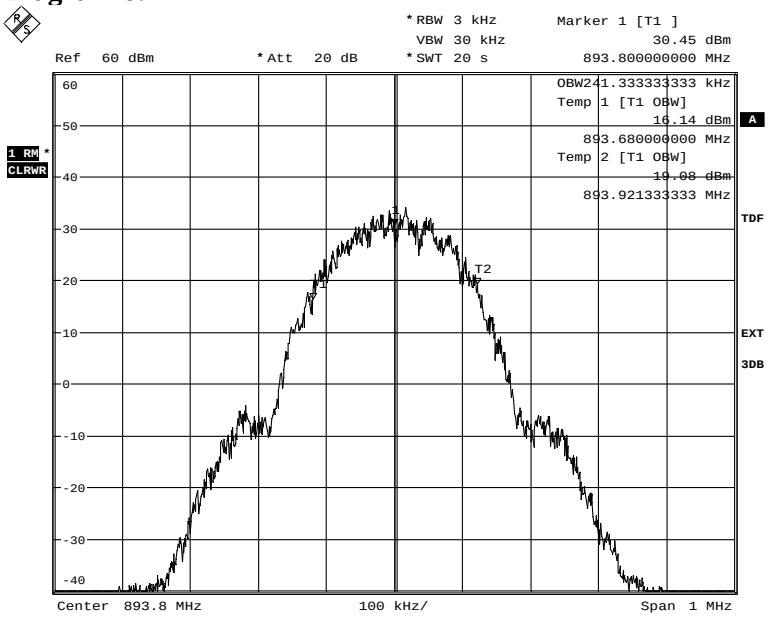


Date: 9.DEC.2011 09:53:21

Band edge measurements according to 47CFR 2.1051 / RSS-132 4.5

Date	Temperature	Humidity
2011-12-08	23 °C ± 3 °C	23 ± 5 %

Test set-up and procedure

The measurements were made per definition in §22.917, with the EUT port RF A via attenuators connected to a spectrum analyzer with the RMS detector activated. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
R&S FSQ	504 143
Attenuator	503 870
Attenuator	900 118
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

Configuration single carrier 1x47.8 dBm:

Modulation 16QAM:

Diagram	Channel	Power setting	RMS power measured
1 a, b	B	40	39.1
2 a, b	B+1	48	47.3
3 a, b	T-1	48	46.9
4 a, b	T	39	38.3

Modulation 32QAM:

Diagram	Channel	Power setting	RMS power measured
5 a, b	B	40	39.5
6 a, b	B+1	48	47.1
7 a, b	T-1	48	47.0
8 a, b	T	40	39.2

Modulation AQPSK:

Diagram	Channel	Power setting	RMS power measured
9 a, b	B	40	39.5
10 a, b	B+1	48	47.3
11 a, b	T-1	48	47.1
12 a, b	T	41	40.3

The diagrams are shown on the following pages.

Remark

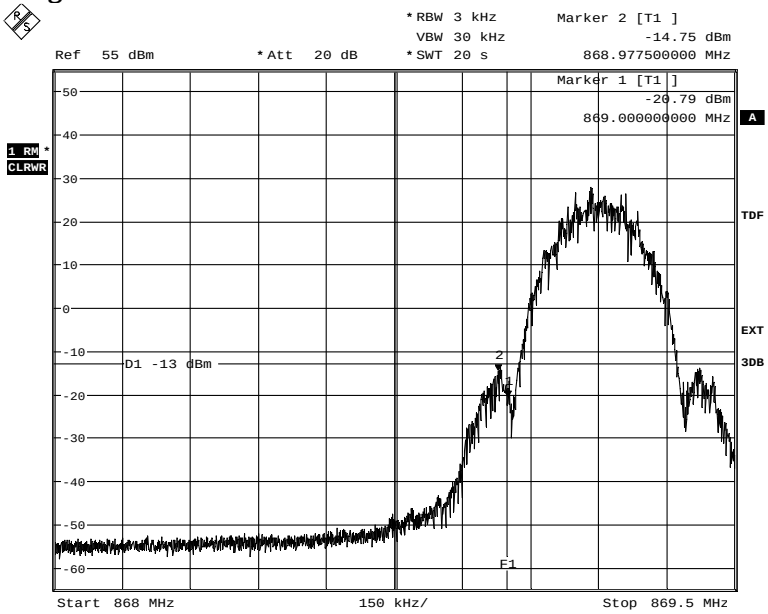
Above measured RMS values for the channels B and T adjacent to the frequency band edges are the maximum RMS output power to be used on the respective channel to meet band-edge requirements.

Limits

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

Complies?	Yes

Diagram 1 a:



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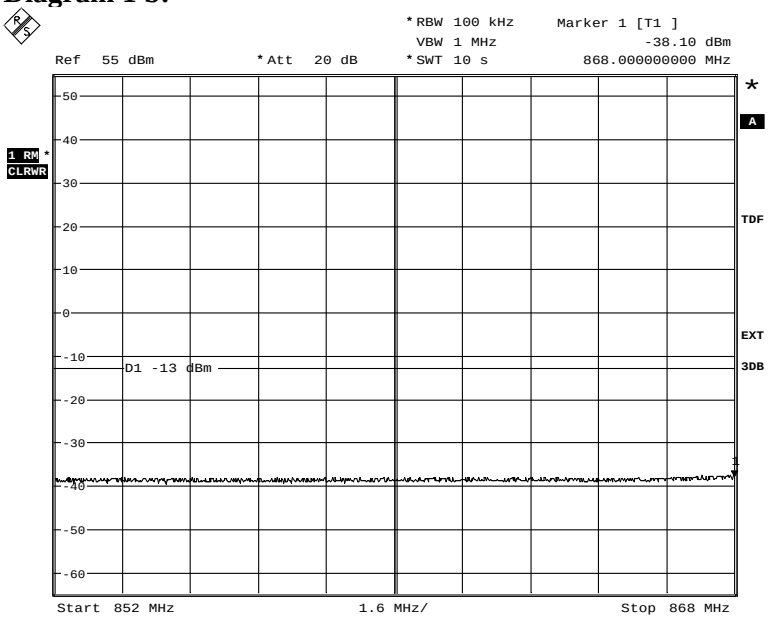

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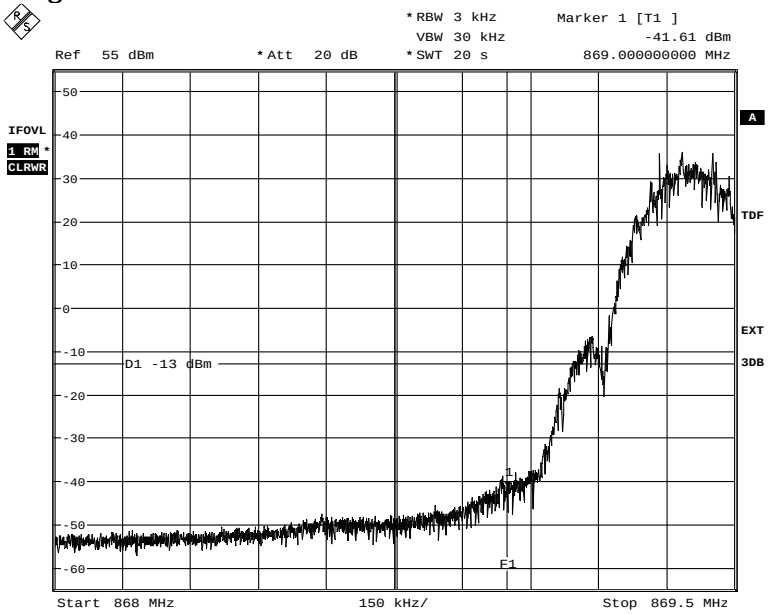

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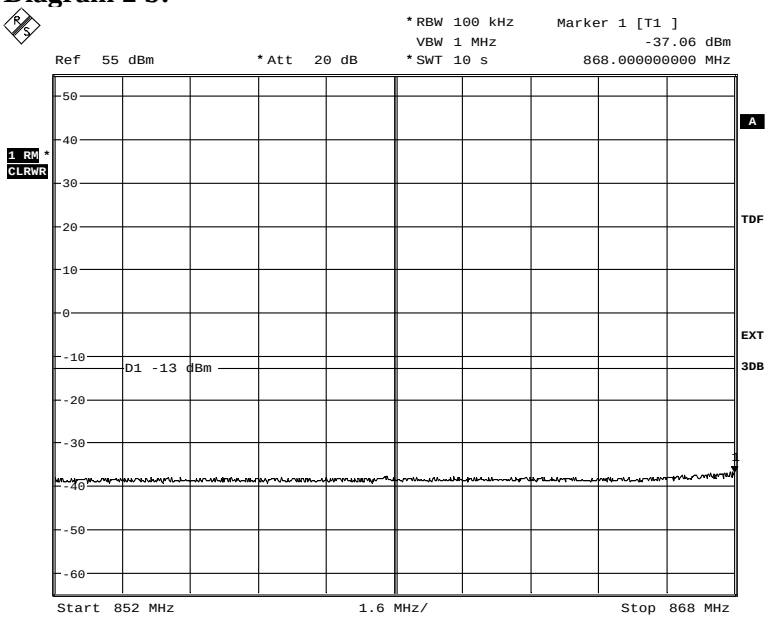

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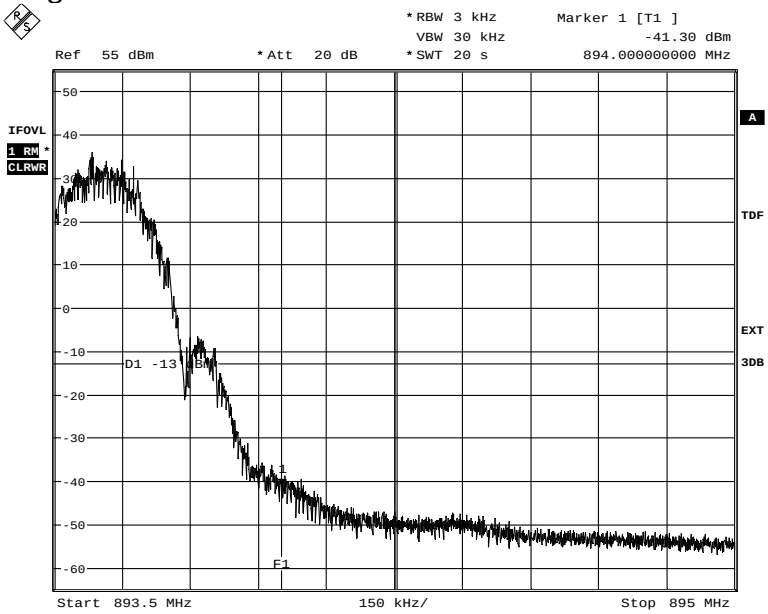

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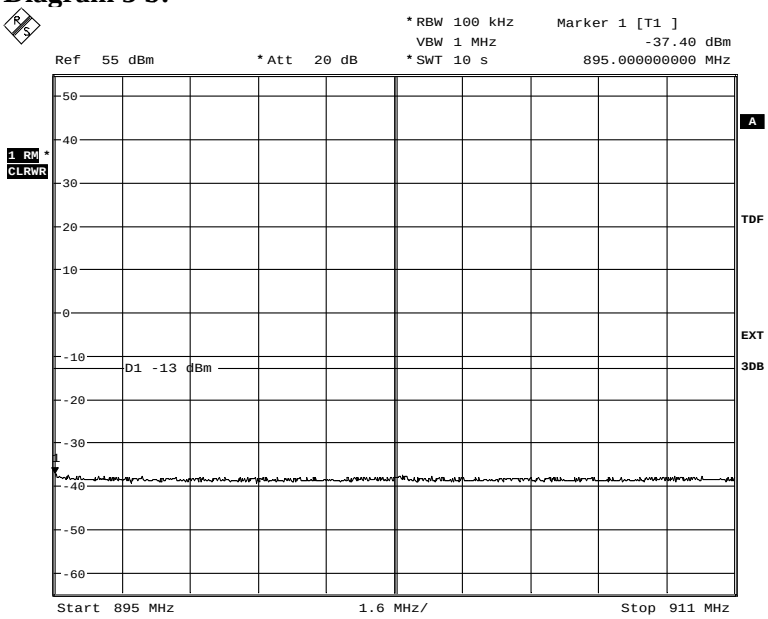

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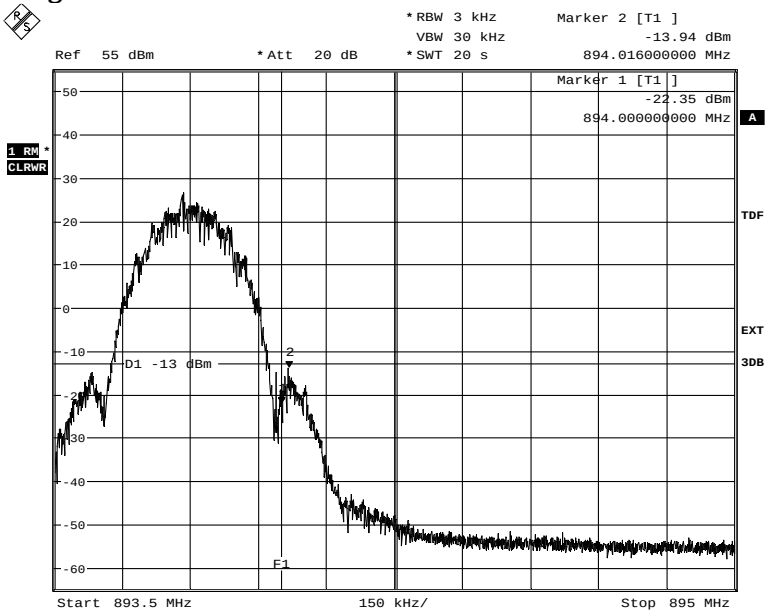

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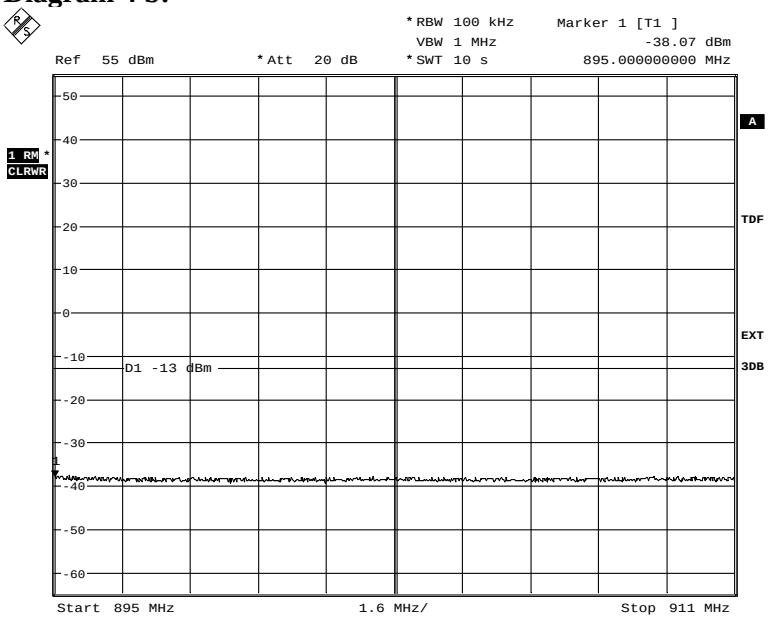

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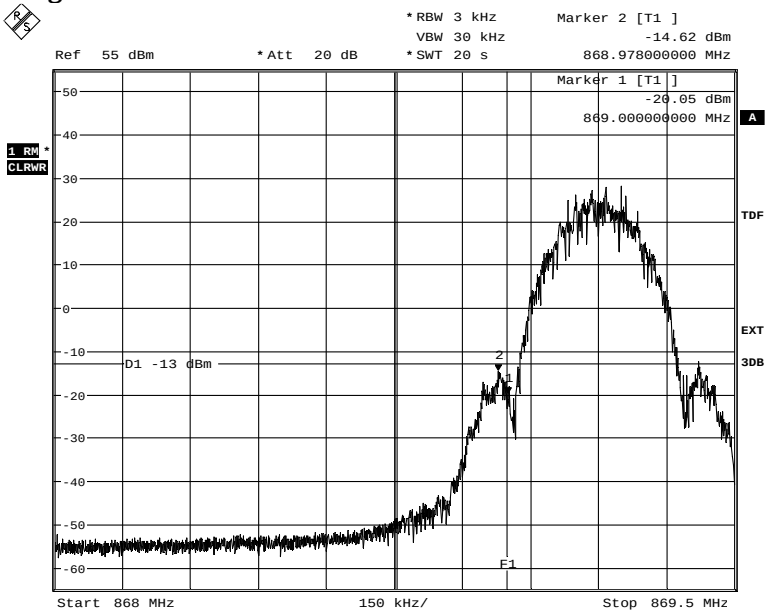

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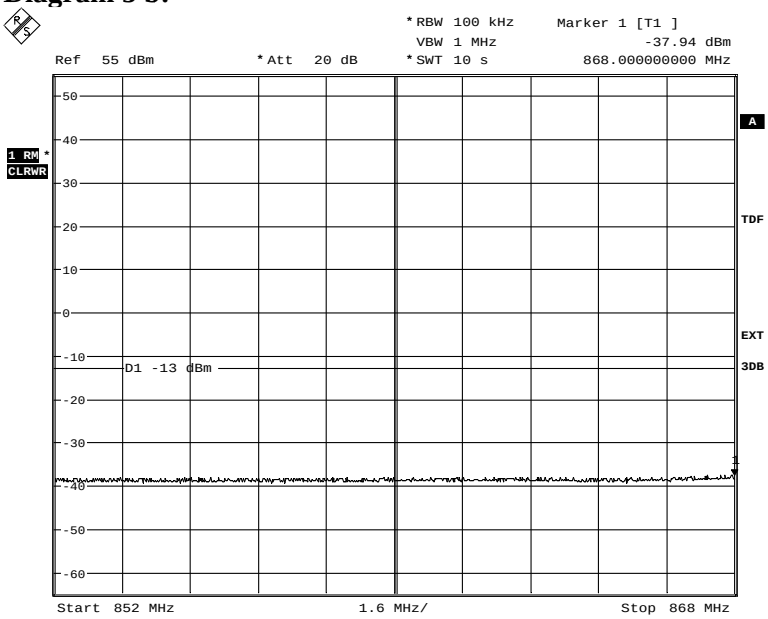

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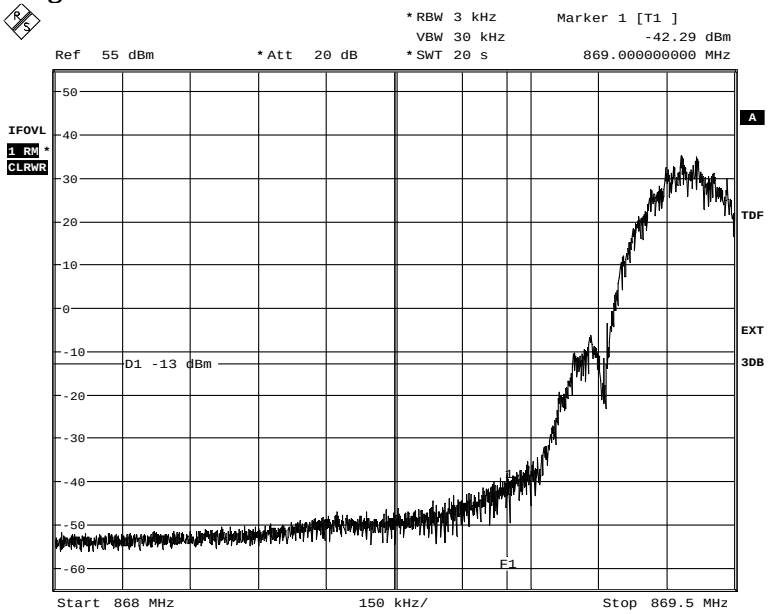

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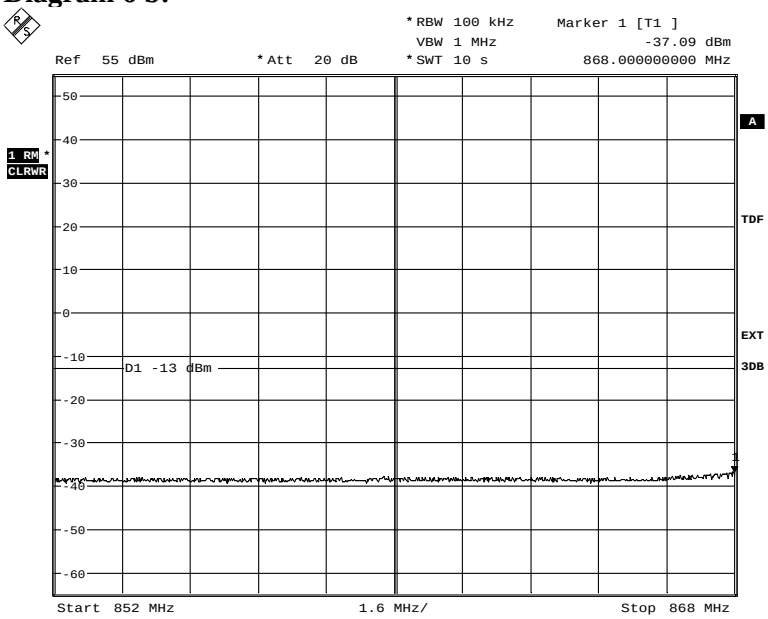

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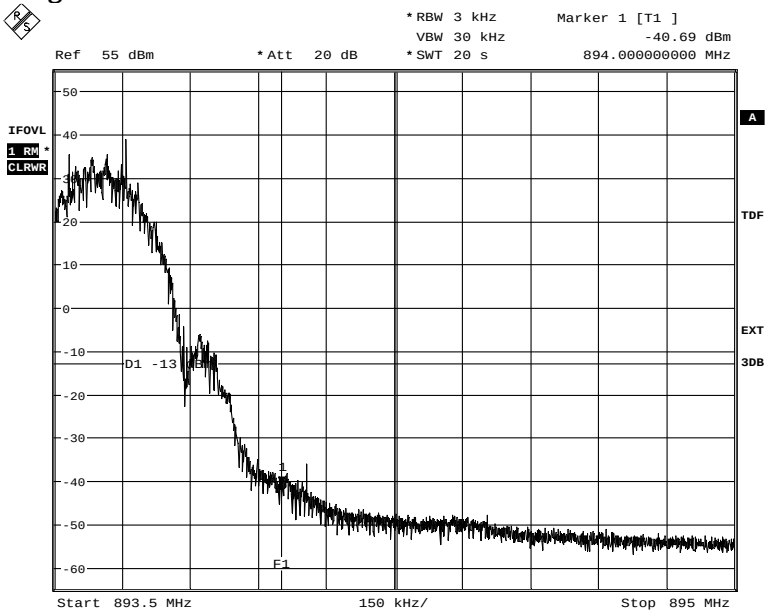

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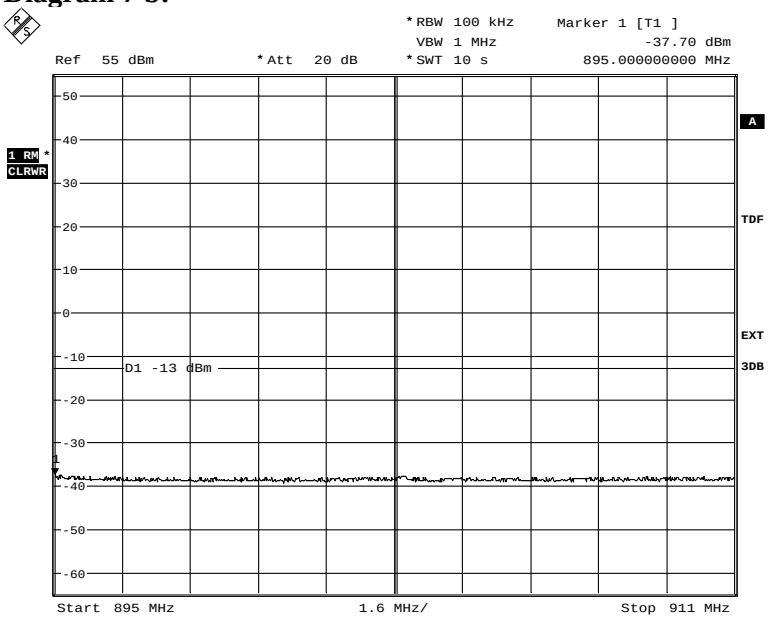

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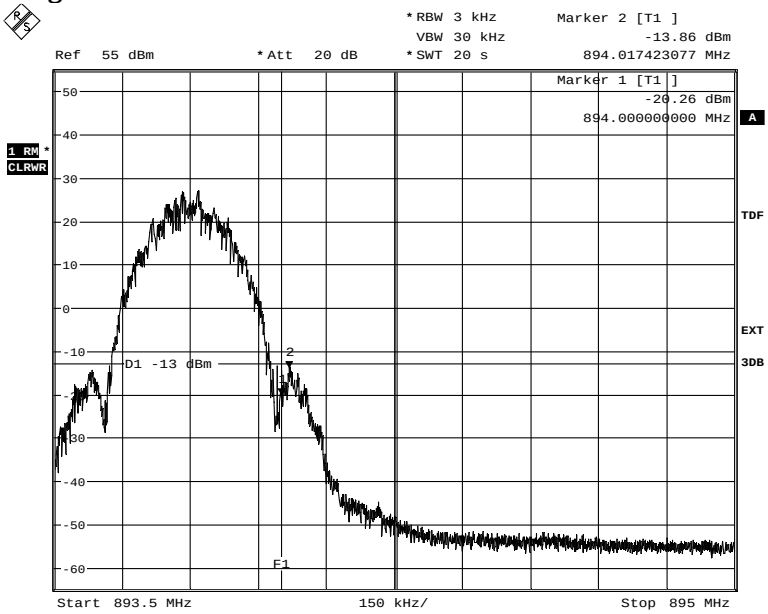

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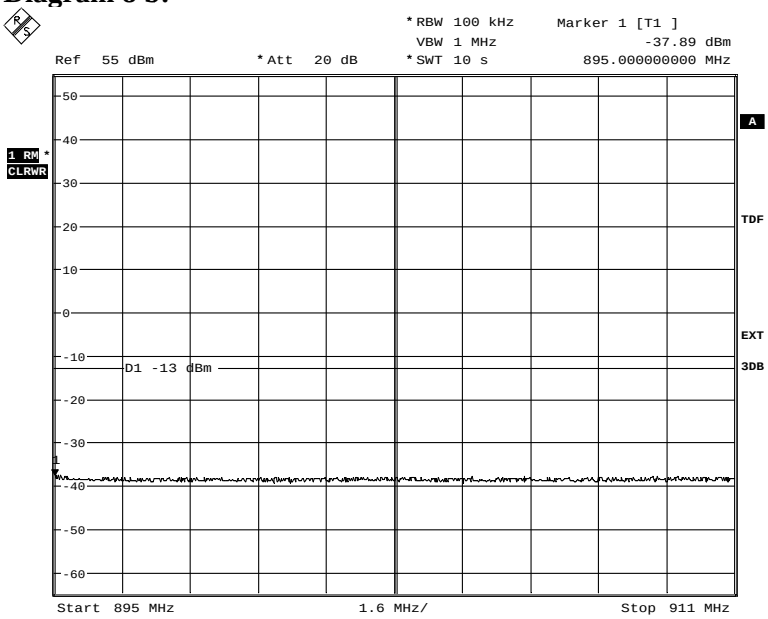

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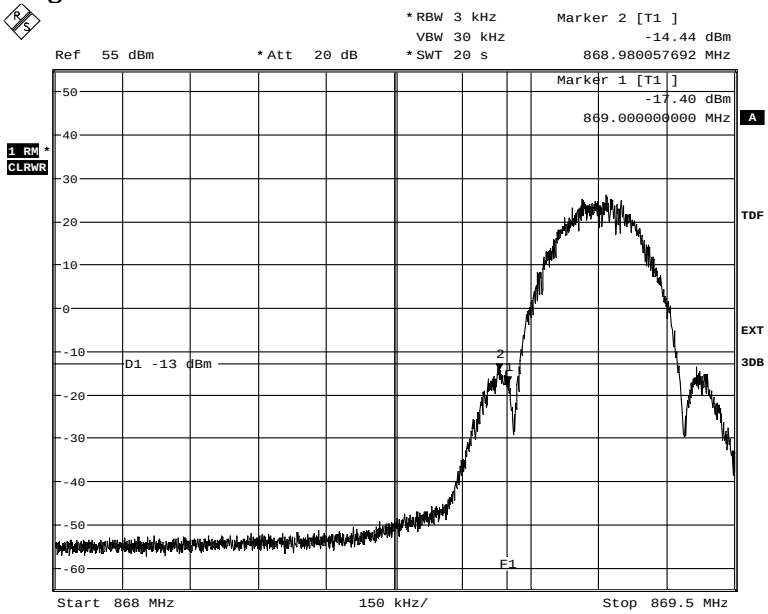

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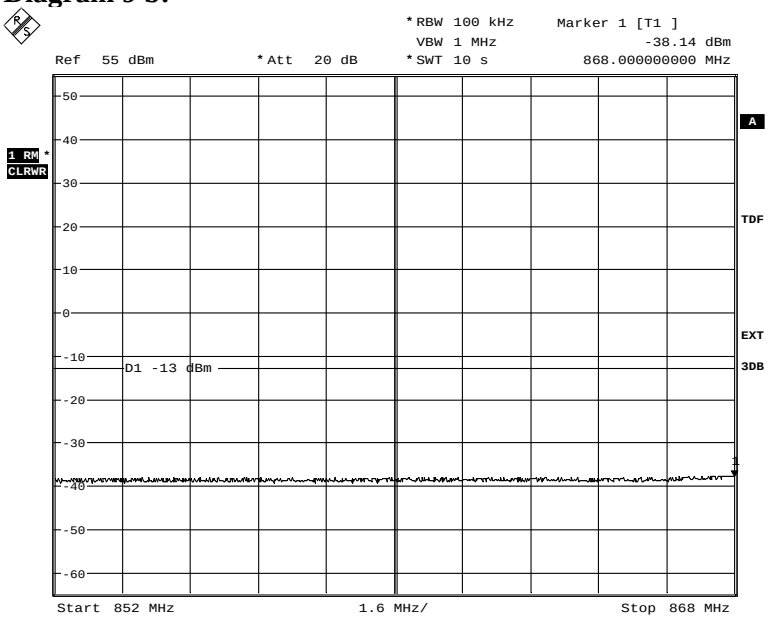
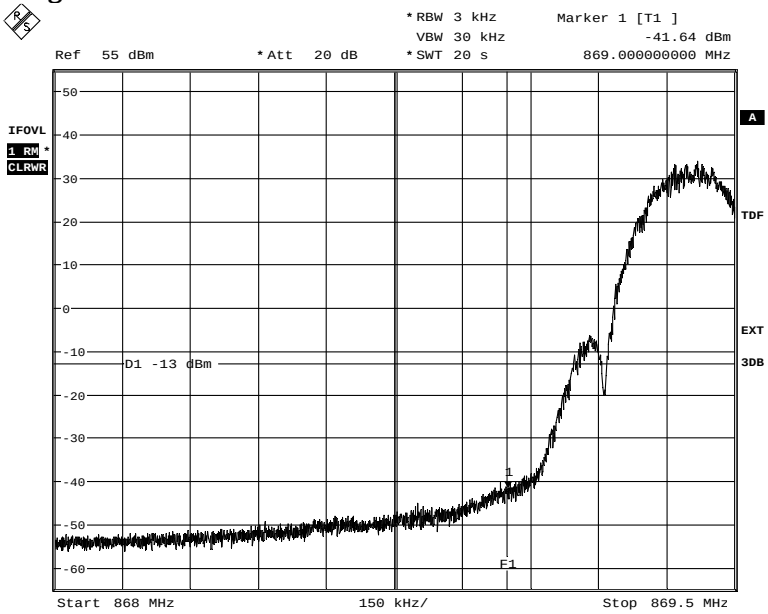


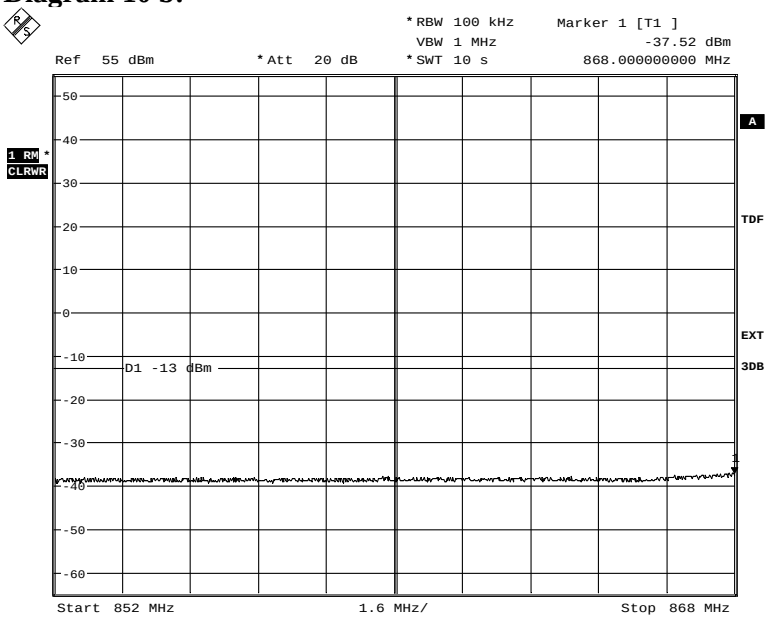
Date: 8.DEC.2011 14:09:13

Diagram 10 a:



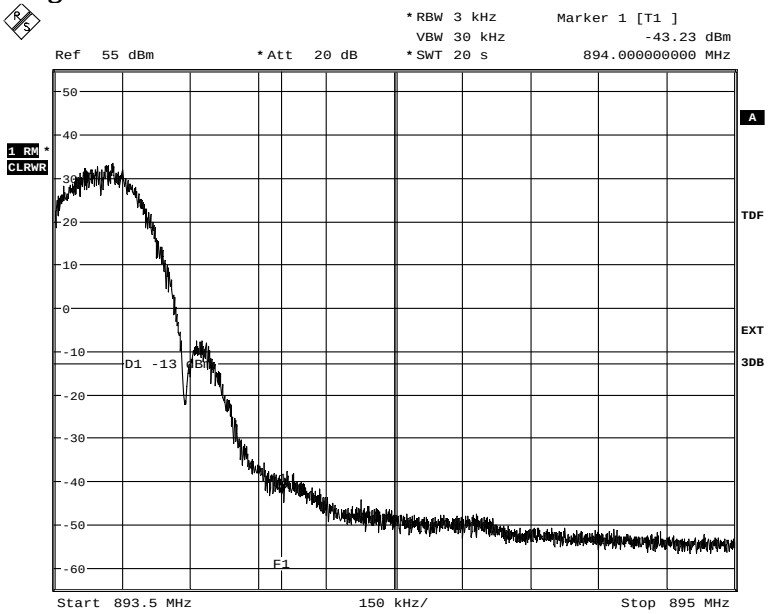
Date: 8.DEC.2011 14:38:21

Diagram 10 b:



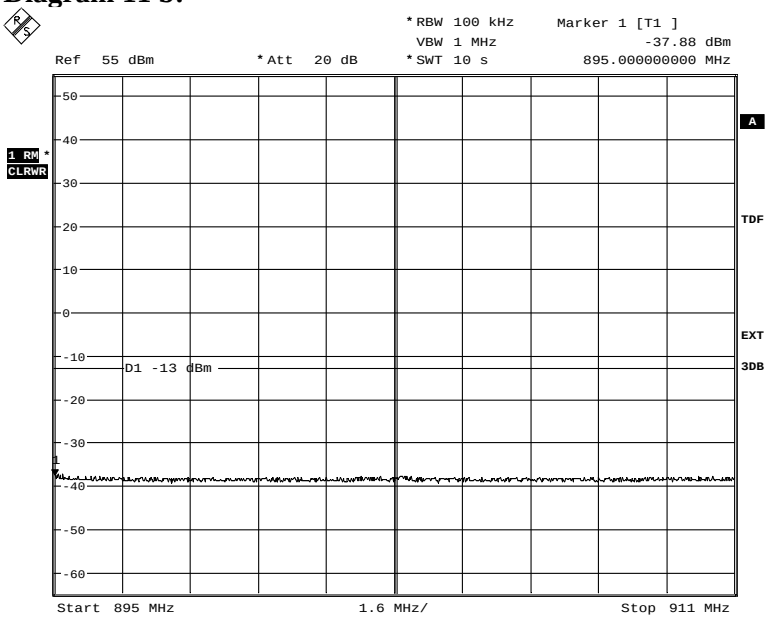
Date: 8.DEC.2011 14:40:00

Diagram 11 a:



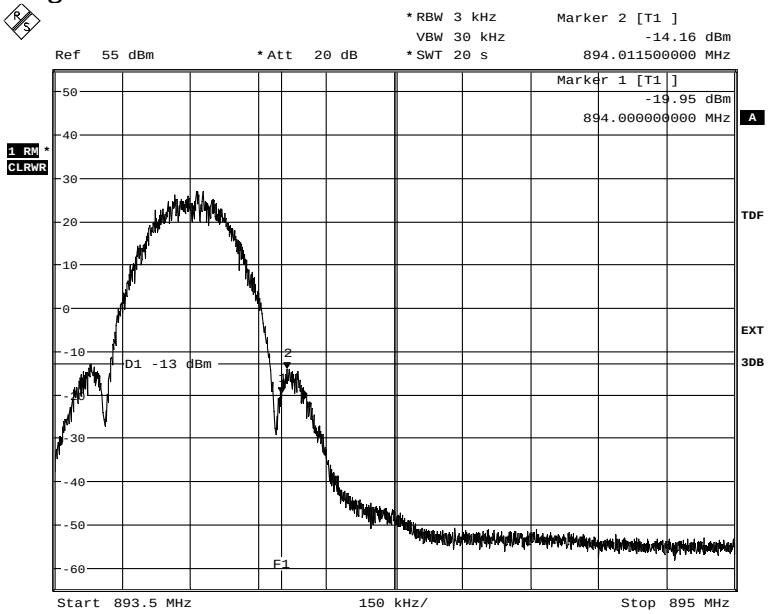
Date: 8.DEC.2011 14:47:27

Diagram 11 b:



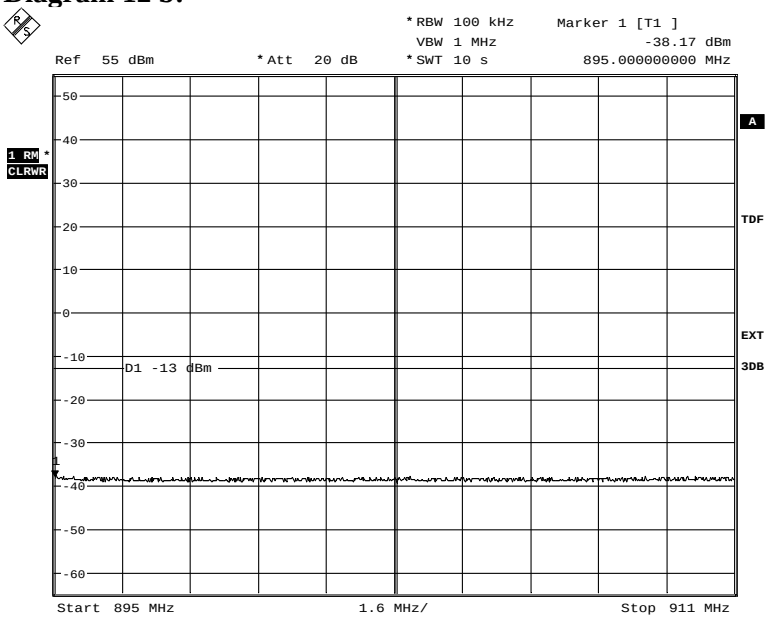
Date: 8.DEC.2011 14:48:36

Diagram 12 a:



Date: 8.DEC.2011 15:01:07

Diagram 12 b:



Date: 8.DEC.2011 15:02:15

Conducted spurious emission measurements according to 47CFR 2.1051 / RSS-132 4.5

Date	Temperature	Humidity
2011-12-07	23 °C ± 3 °C	23 % ± 5 %
2011-12-09	23 °C ± 3 °C	23 % ± 5 %
2011-12-12	23 °C ± 3 °C	23 % ± 5 %

Test set-up and procedure

The measurements were made with EUT port RF A via attenuators connected to a spectrum analyser. The spectrum analyser had the RMS detector activated and an external 10 MHz reference standard supplied.

Measurement equipment	SP number
R&S FSQ	504 143
Attenuator	503 870
Attenuator	900 118
Attenuator	900 691
High pass filter	504 199
High pass filter	504 200
High pass filter	503 740
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

Single carrier 1 x 47.8 dBm, RBS master 2E setting 48

Diagram	Channel (Frequency)	Modulation	Measured range
1 a – e	M (881.6 MHz)	GMSK	9 kHz – 25 GHz
2 a – e	M (881.6 MHz)	16QAM	9 kHz – 25 GHz
3 a – e	M (881.6 MHz)	32QAM	9 kHz – 25 GHz
4 a – e	M (881.6 MHz)	AQPSK	9 kHz – 25 GHz
5 a – e	B (869.2 MHz)	16QAM	9 kHz – 25 GHz
6 a – e	T (893.8 MHz)	16QAM	9 kHz – 25 GHz

Multi carrier 2 x 44.8 dBm, RBS master 2E setting 45

Diagram	Channel (Frequencies)	Modulation	Measured range
7 a – f	(B+1) + (B+9)	16QAM	9 kHz – 25 GHz
8 a – f	(T-1) + (T-9)	16QAM	9 kHz – 25 GHz
9 a – f	(B+1) + (B+9)	32QAM	9 kHz – 25 GHz
10 a – f	(T-1) + (T-9)	32QAM	9 kHz – 25 GHz
11 a – f	(B+1) + (B+9)	AQPSK	9 kHz – 25 GHz
12 a – f	(T-1) + (T-9)	AQPSK	9 kHz – 25 GHz

The diagrams are shown on the following pages.

Remarks

The emission at 9 kHz on some plots was not generated by the test object. A complementary measurement with a smaller RBW showed that it was related to the LO feed-through.

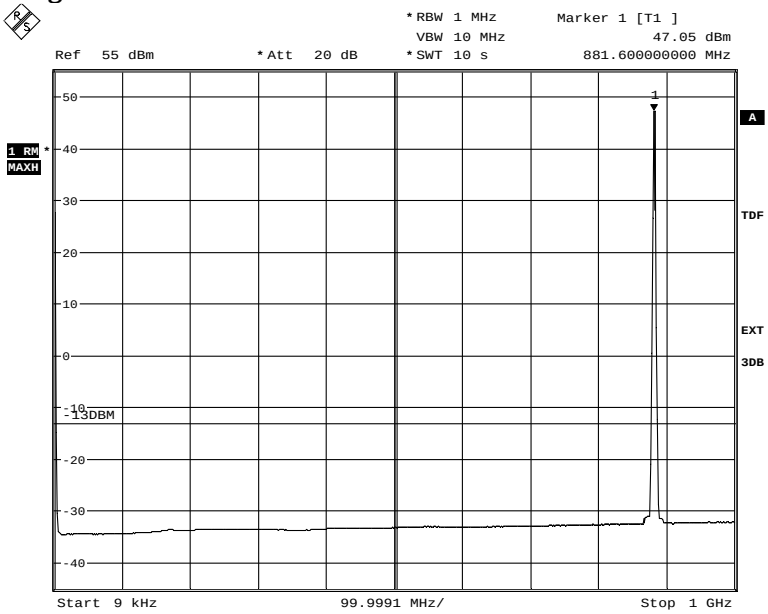
The highest internal frequency as declared by the client was 2.4576 GHz, thus the upper frequency boundary was set to cover 10 x 2.5 GHz = 25 GHz for emission measurements.

Limits

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

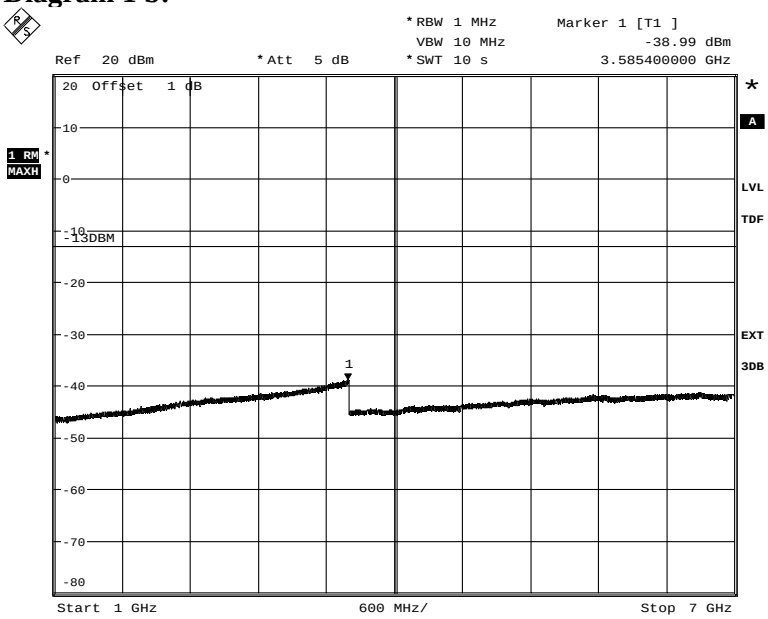
Complies?	Yes

Diagram 1 a:



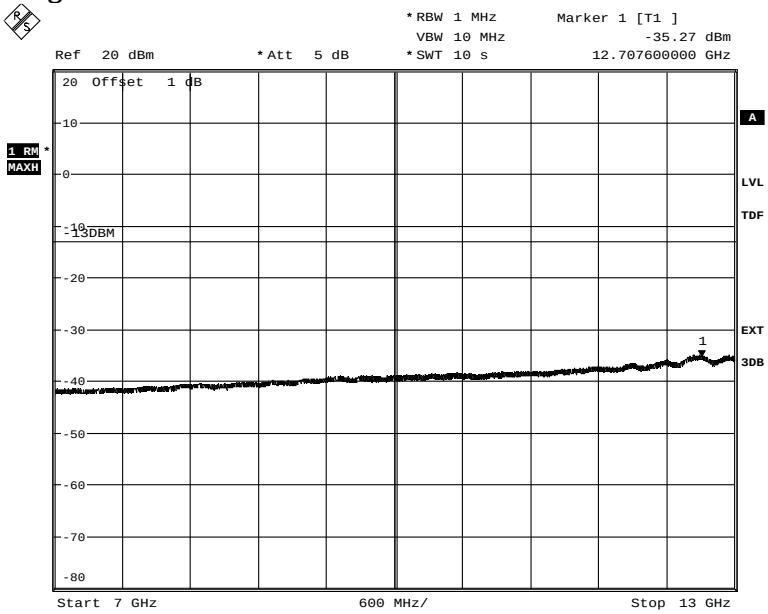
Date: 9.DEC.2011 10:05:50

Diagram 1 b:



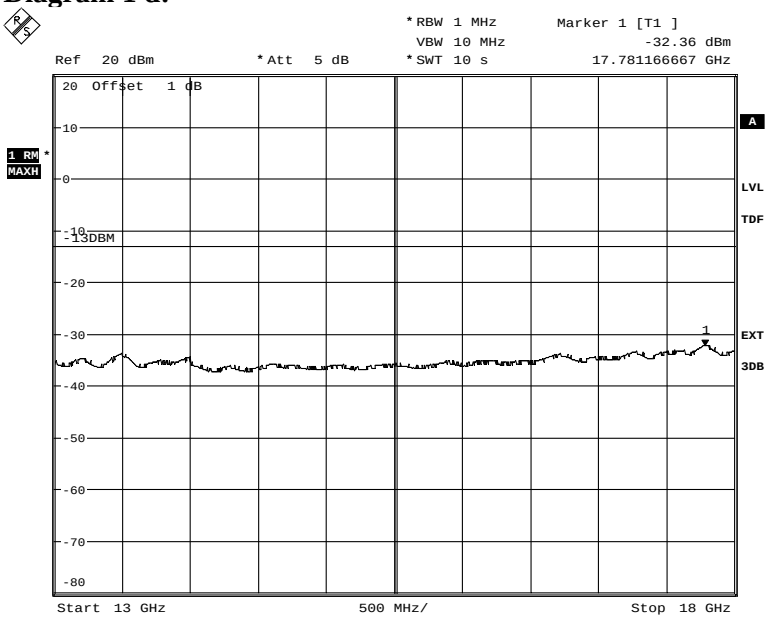
Date: 9.DEC.2011 10:32:31

Diagram 1 c:



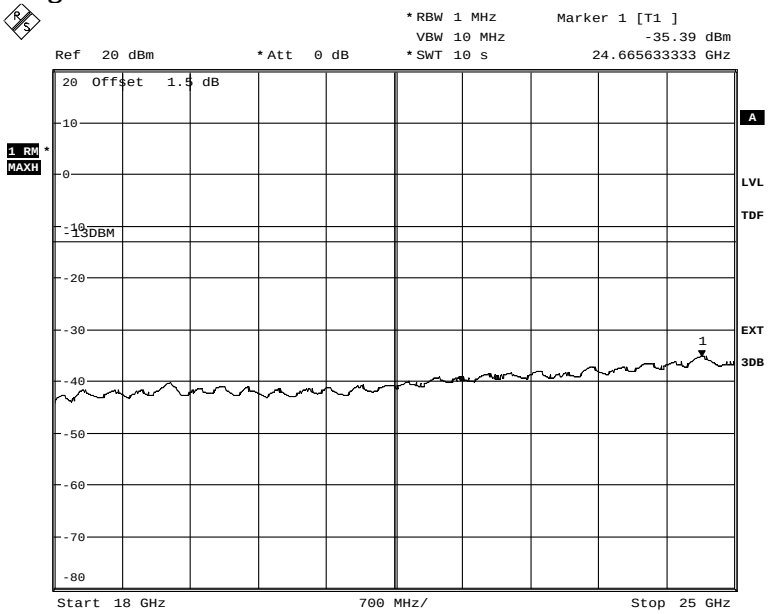
Date: 9.DEC.2011 10:46:29

Diagram 1 d:



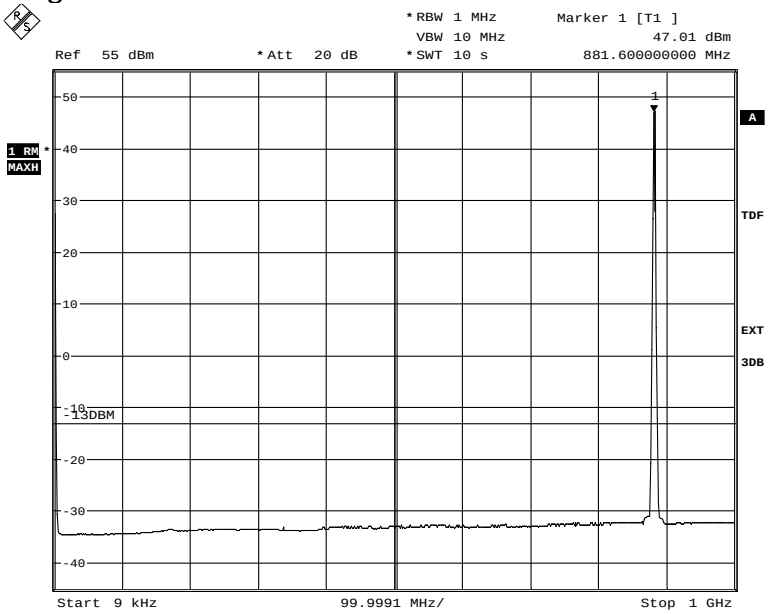
Date: 9.DEC.2011 10:49:56

Diagram 1 e:



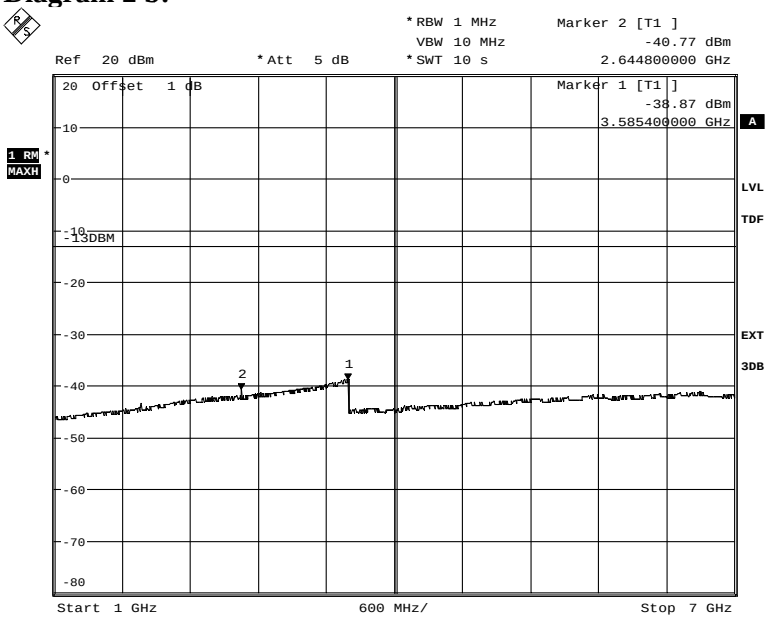
Date: 9.DEC.2011 11:11:22

Diagram 2 a:



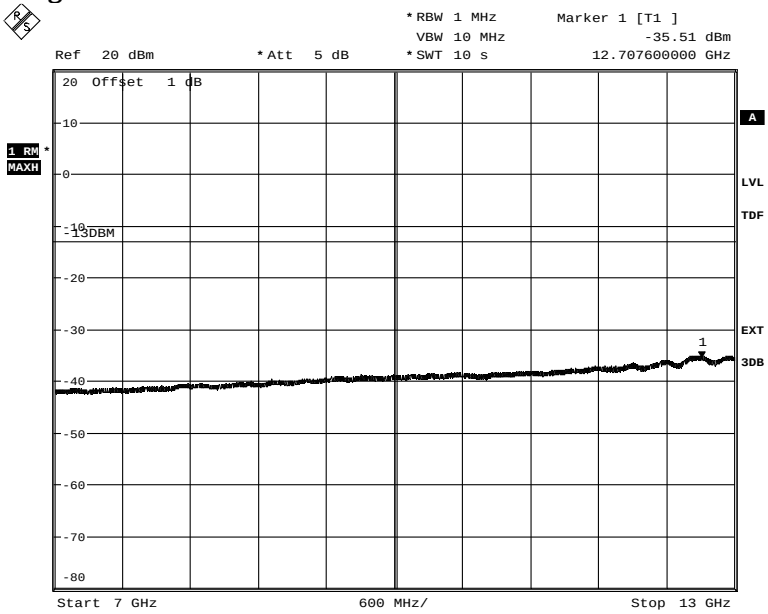
Date: 9.DEC.2011 10:12:41

Diagram 2 b:



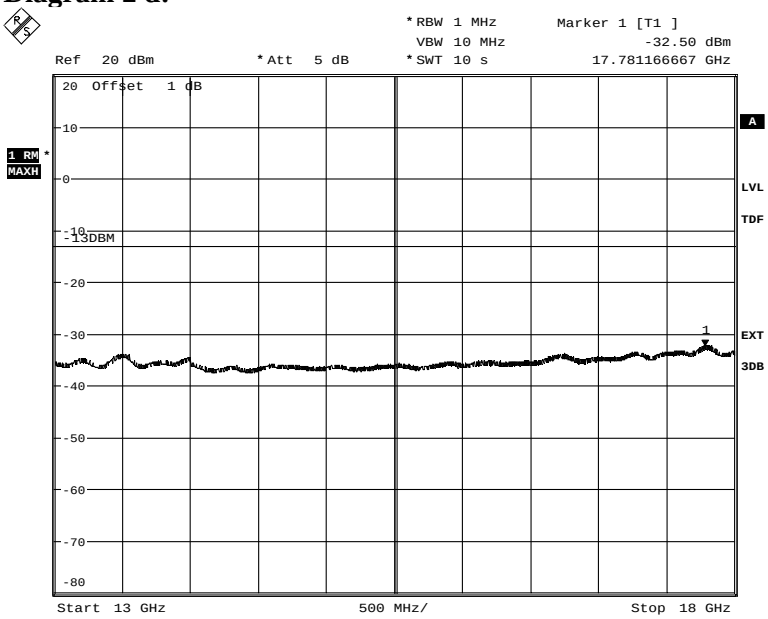
Date: 9.DEC.2011 10:37:34

Diagram 2 c:



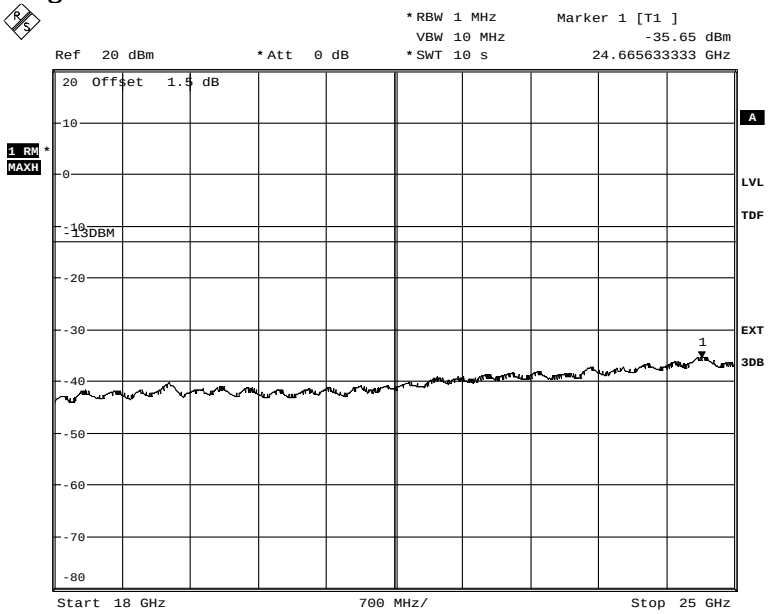
Date: 9.DEC.2011 10:42:57

Diagram 2 d:



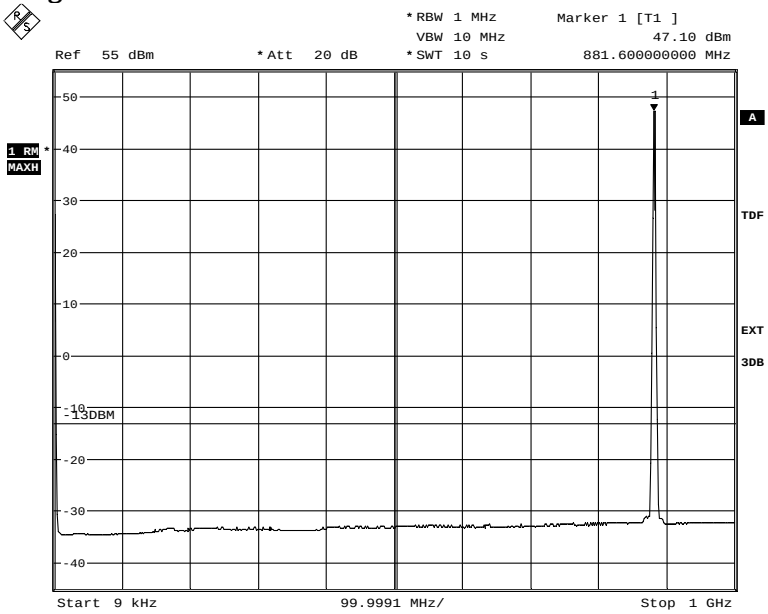
Date: 9.DEC.2011 10:55:29

Diagram 2 e:



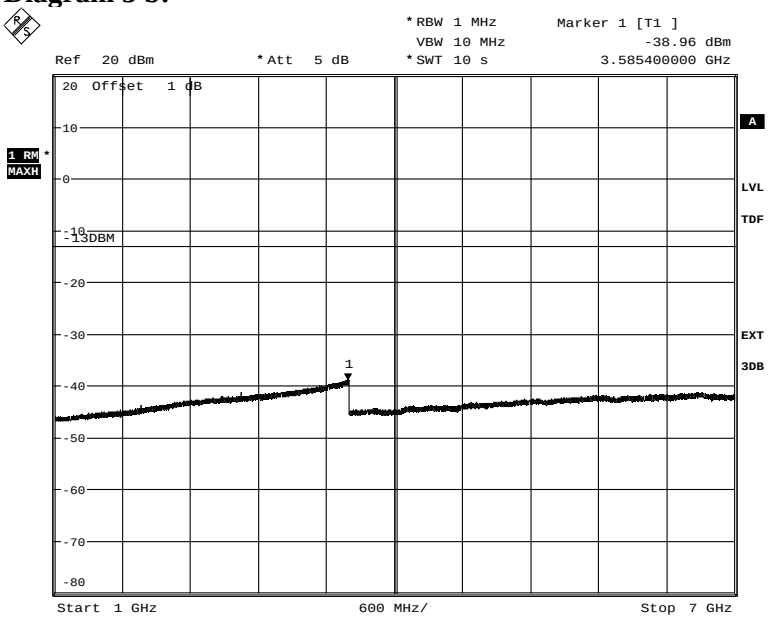
Date: 9.DEC.2011 11:01:56

Diagram 3 a:



Date: 9.DEC.2011 10:15:10

Diagram 3 b:



Date: 9.DEC.2011 10:39:47

Diagram 3 c:

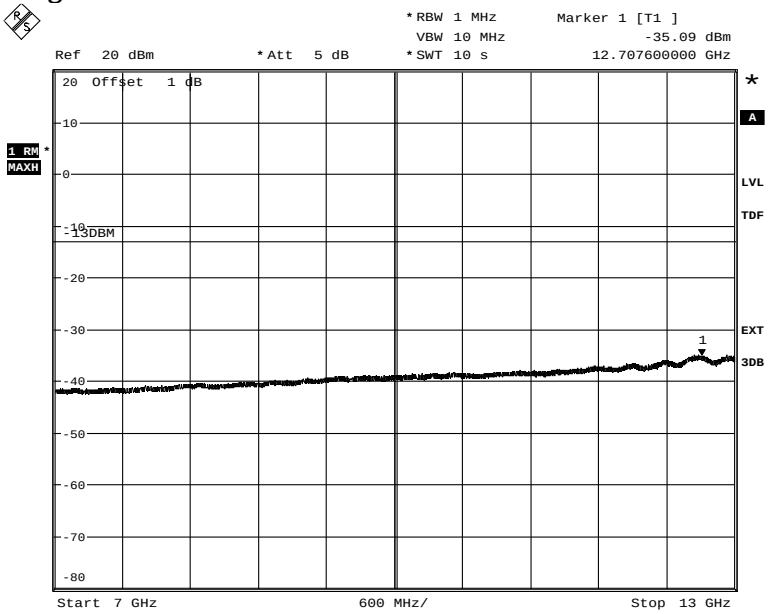


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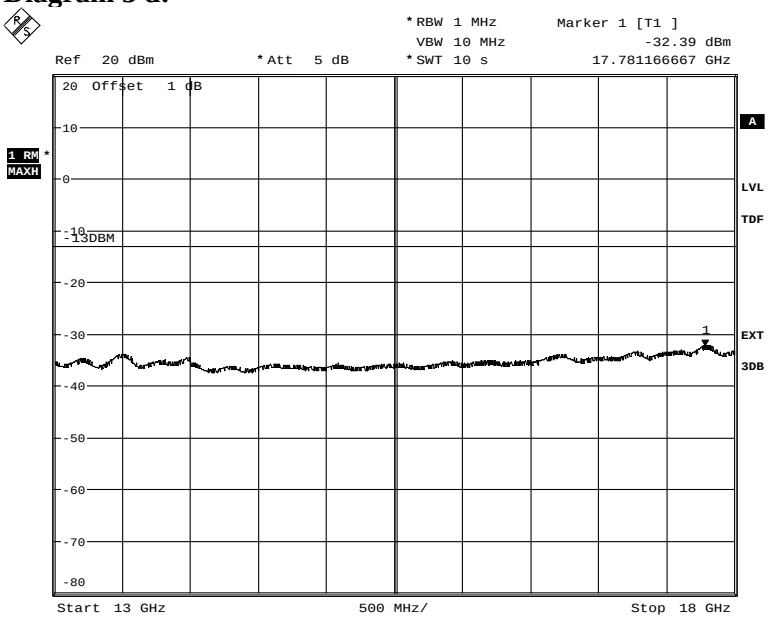
Diagram 3 d:



Date: 9.DEC.2011 10:57:11

Diagram 3 e:

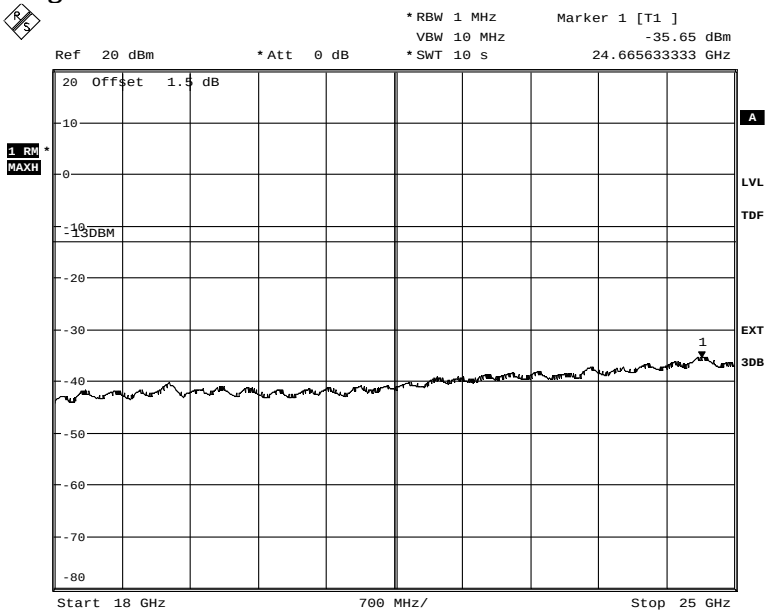


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Diagram 4 a:

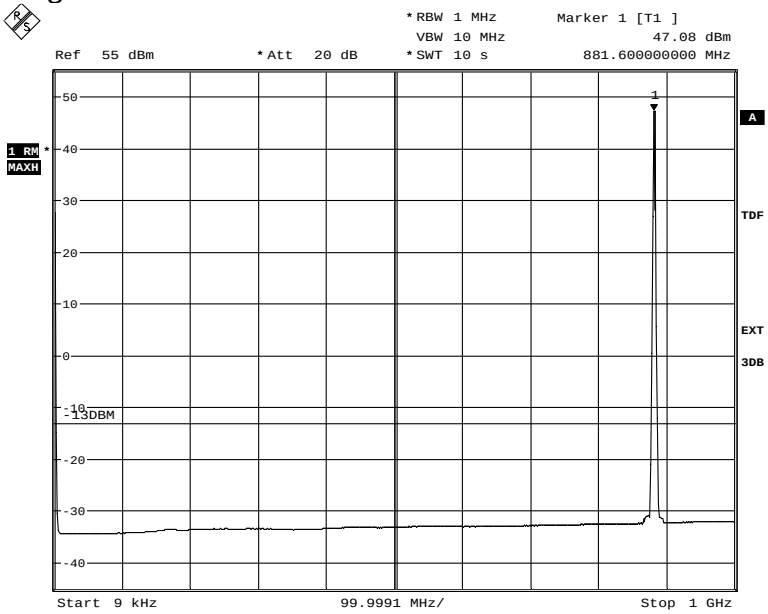

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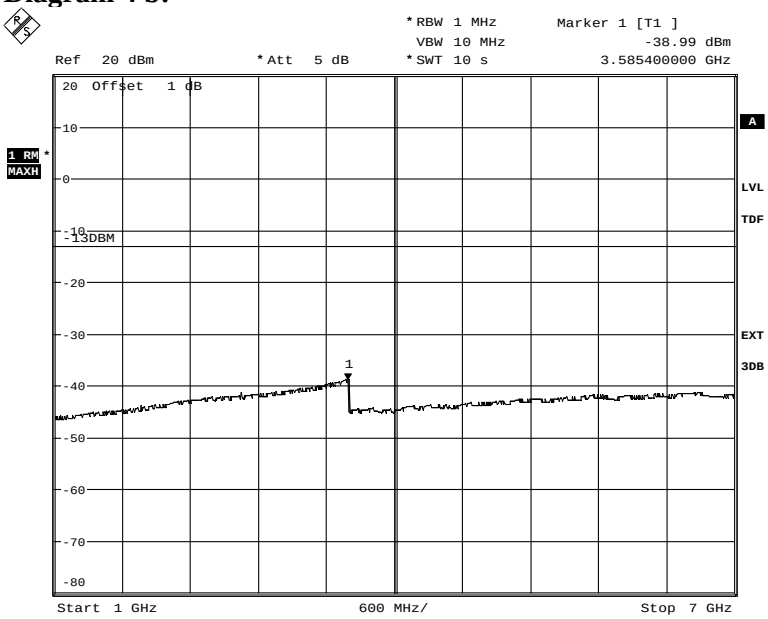
Diagram 4 b:



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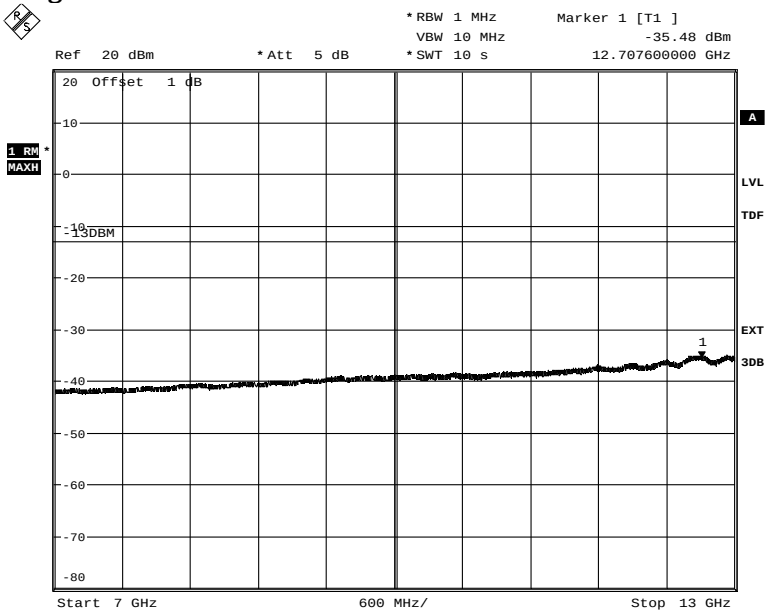

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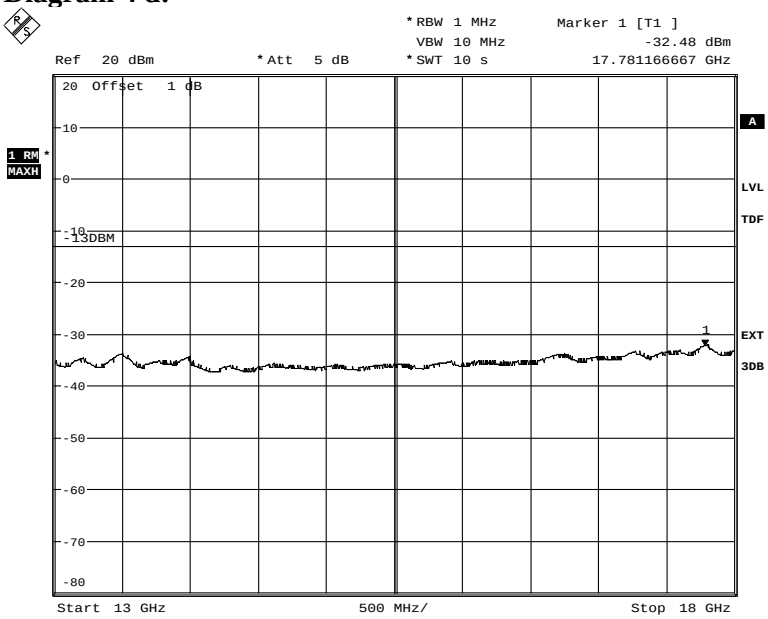

Date: 9.DEC.2011 10:53:15

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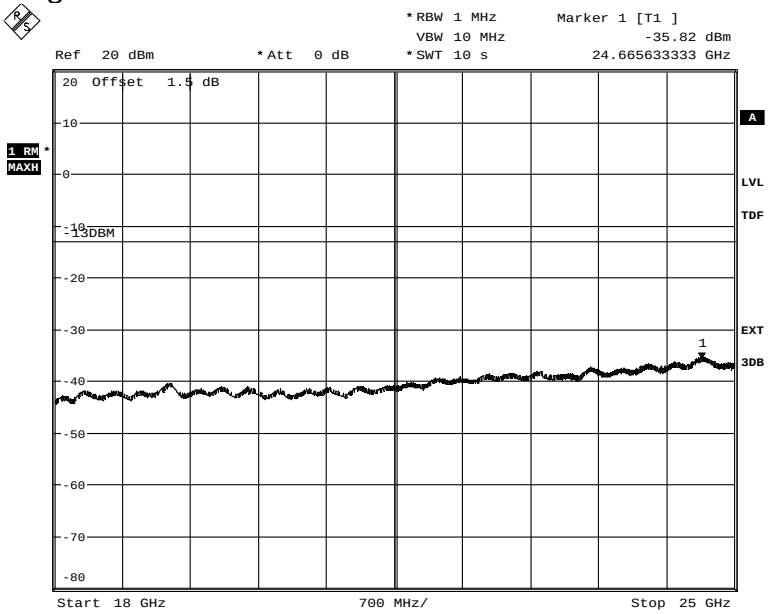
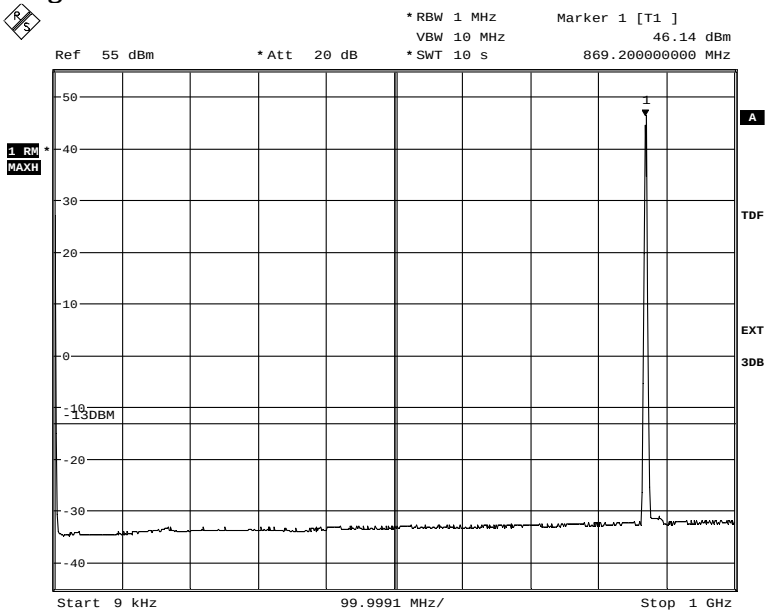


Date: 9.DEC.2011 11:07:42

Diagram 5 a:



Date: 9.DEC.2011 11:39:22

Diagram 5 b:

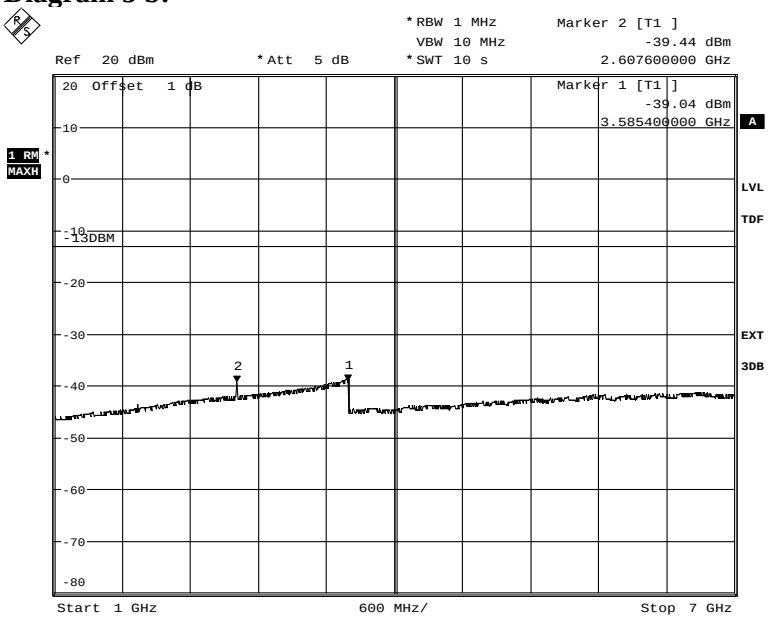


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Diagram 5 c:

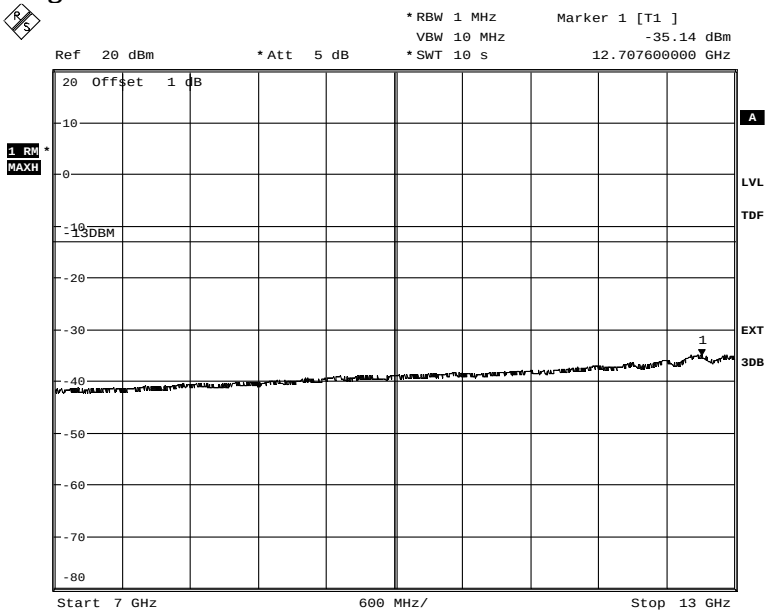

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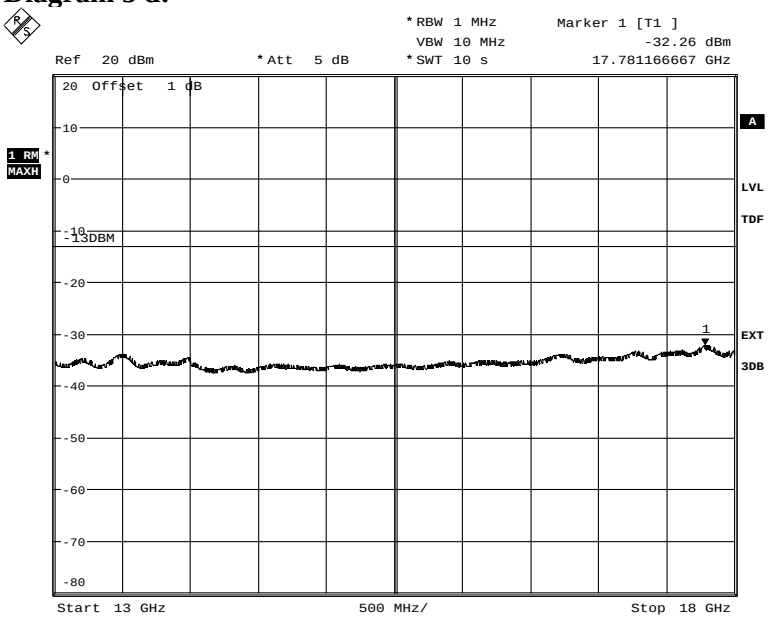
Diagram 5 d:



Date: 9.DEC.2011 11:23:18

Diagram 5 e:

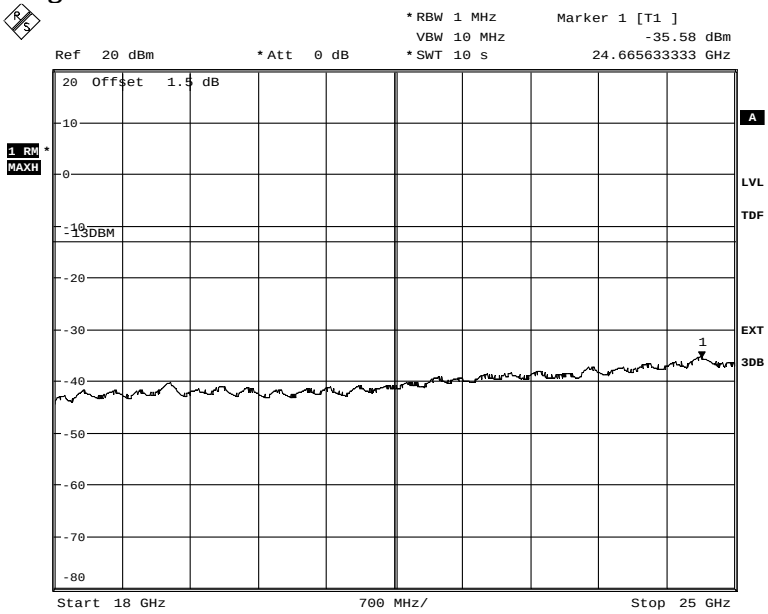


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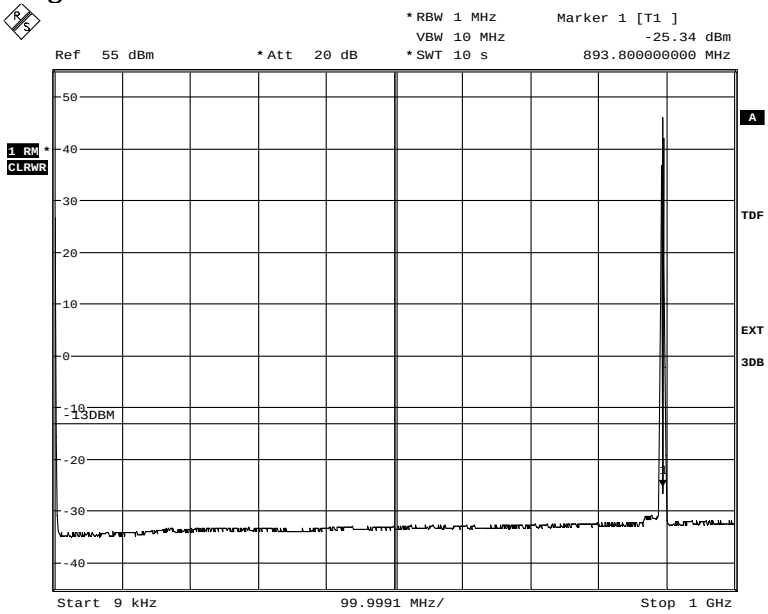
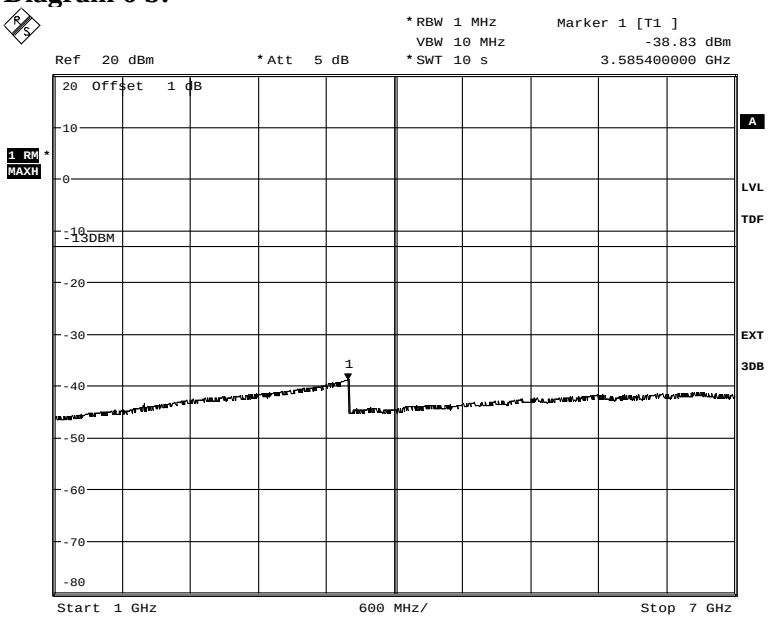
Diagram 6 a:



Date: 9.DEC.2011 11:36:31

Diagram 6 b:



Date: 9.DEC.2011 11:30:34

Diagram 6 c:

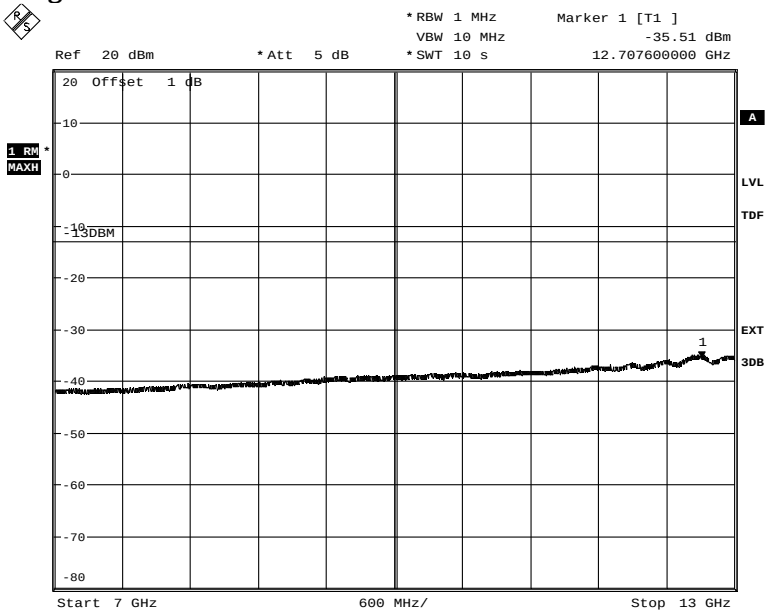


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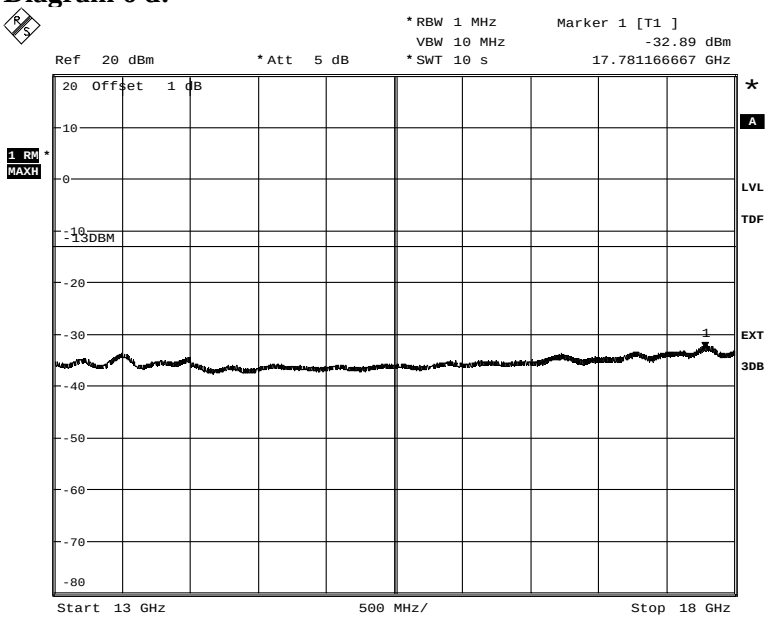
Diagram 6 d:



Date: 9.DEC.2011 11:21:03

Diagram 6 e:

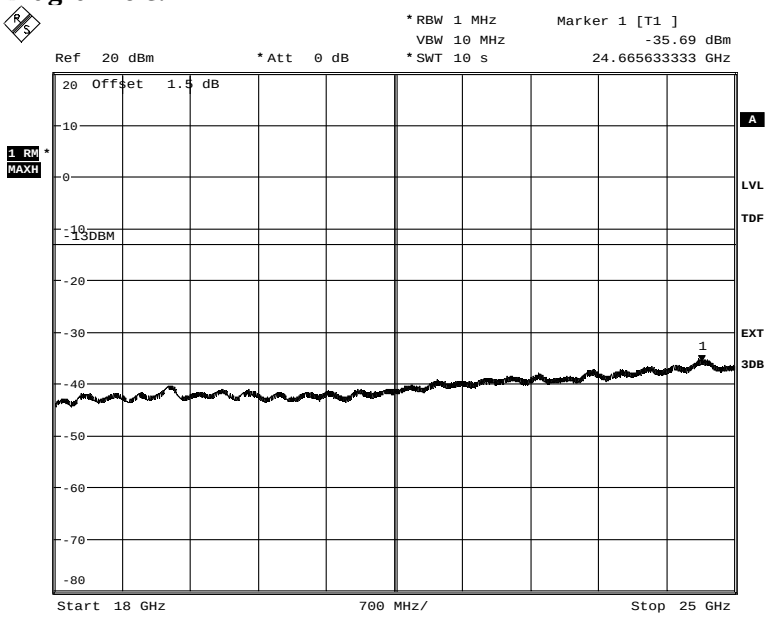


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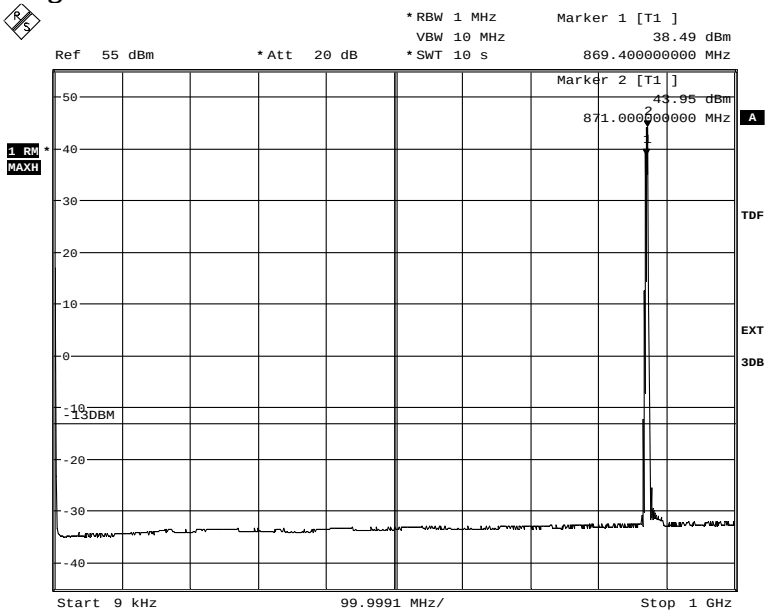
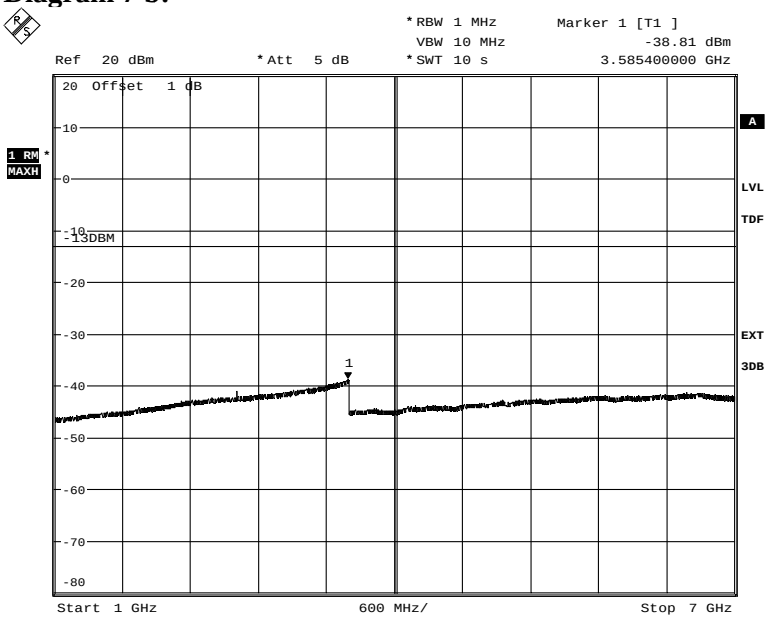
Diagram 7 a:



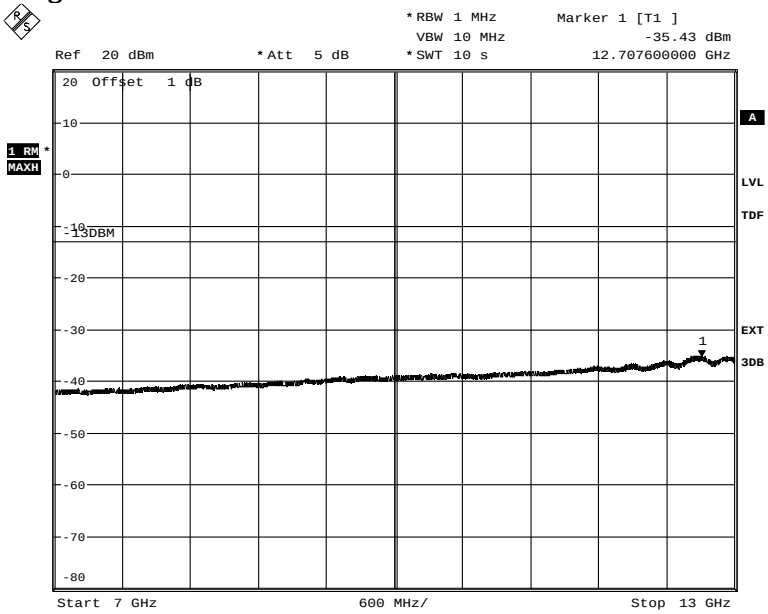
Date: 12.DEC.2011 11:52:47

Diagram 7 b:



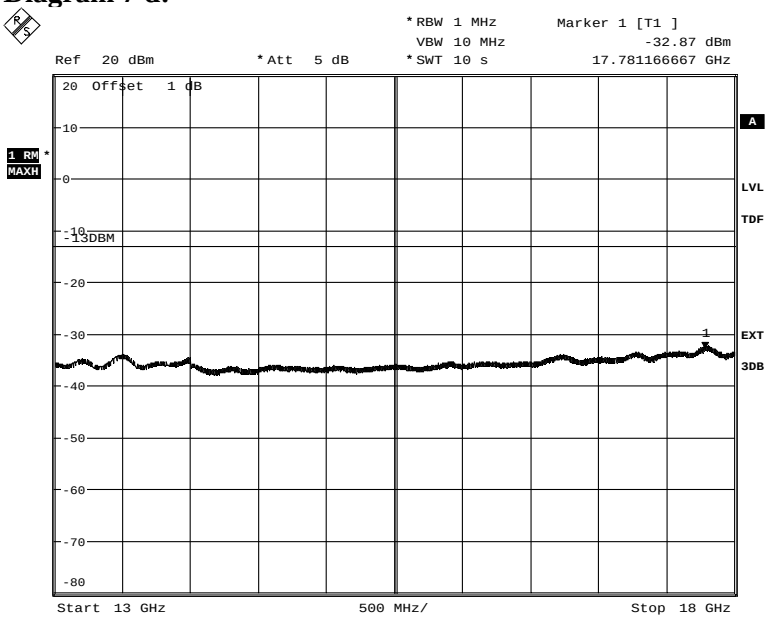
Date: 12.DEC.2011 12:14:23

Diagram 7 c:



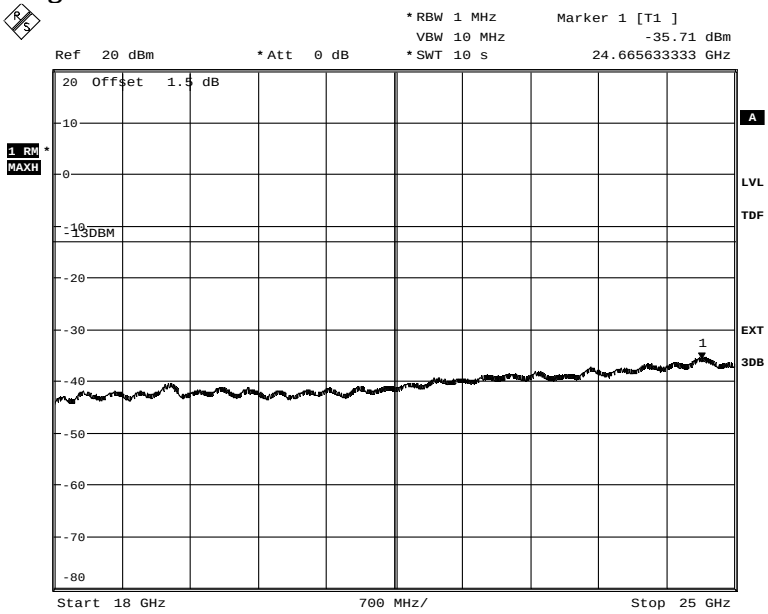
Date: 12.DEC.2011 12:13:35

Diagram 7 d:



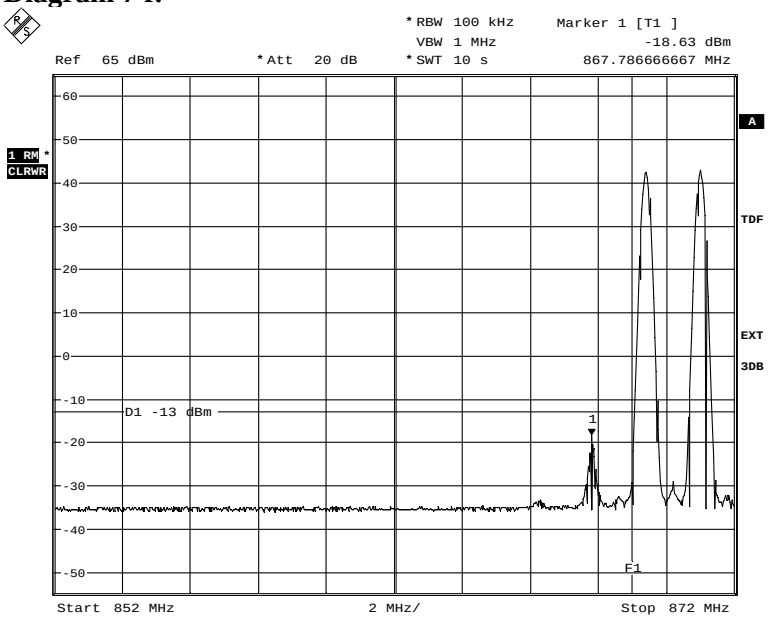
Date: 12.DEC.2011 12:28:51

Diagram 7 e:



Date: 12.DEC.2011 14:30:12

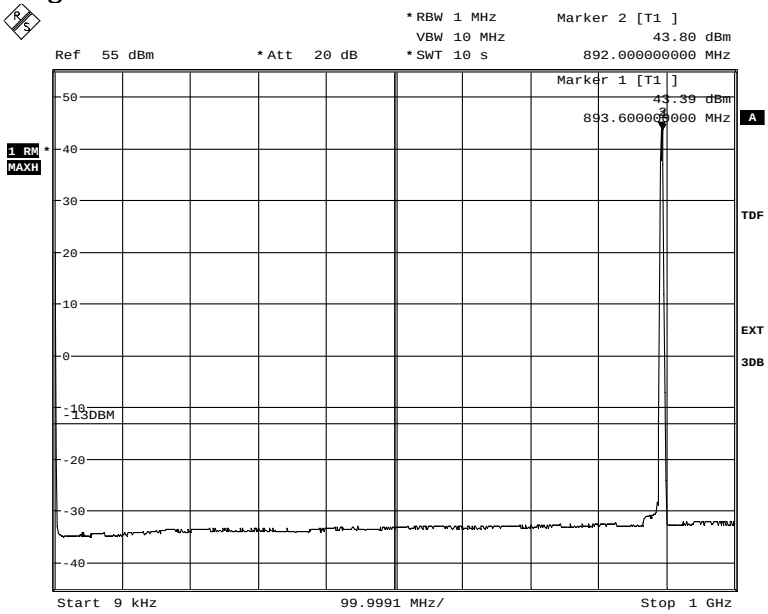
Diagram 7 f:



Date: 7.DEC.2011 19:30:32

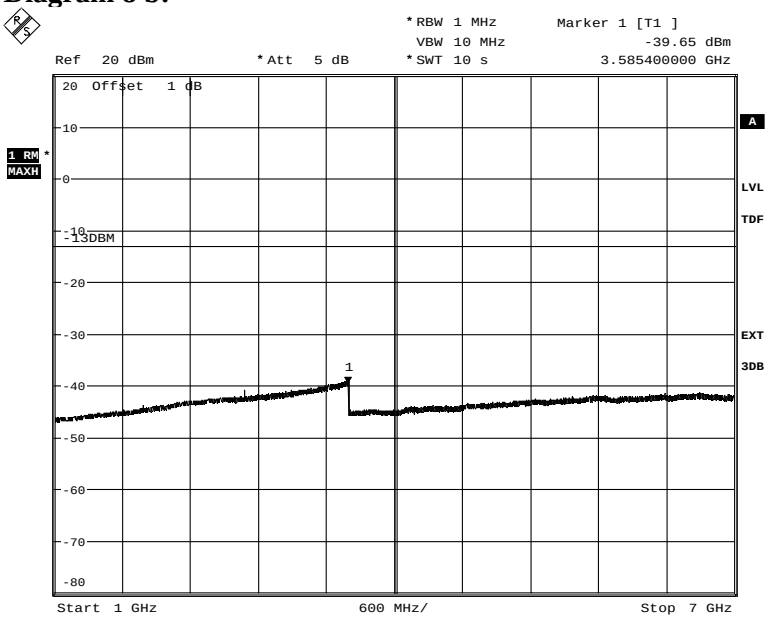
Note: Above zoom to determine the RMS level of out-of-band intermodulation products is not intended to verify band-edge performance.

Diagram 8 a:



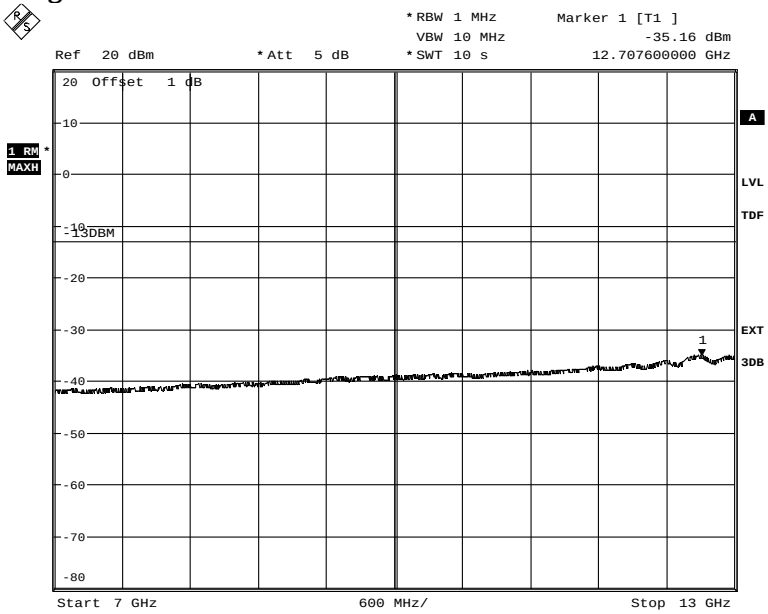
Date: 12.DEC.2011 13:25:36

Diagram 8 b:



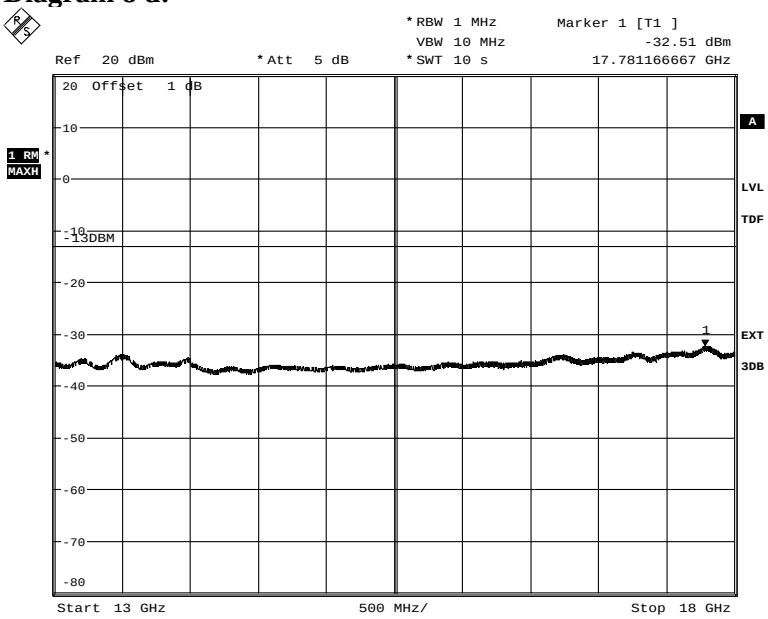
Date: 12.DEC.2011 13:01:54

Diagram 8 c:



Date: 12.DEC.2011 13:03:54

Diagram 8 d:



Date: 12.DEC.2011 12:50:35

Diagram 8 e:

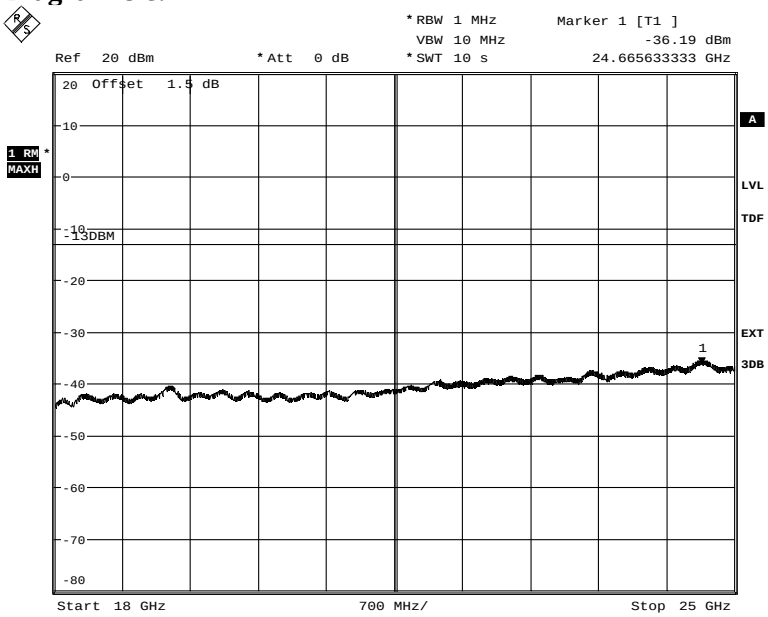


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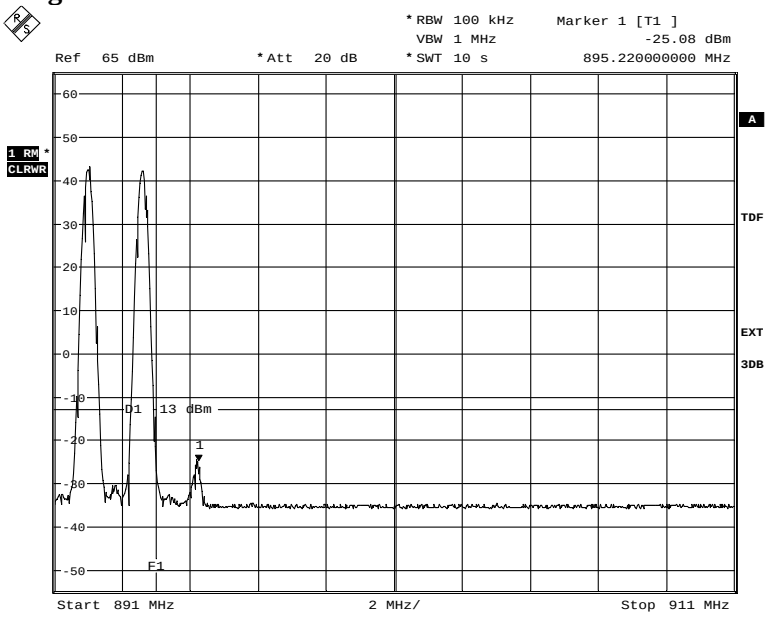
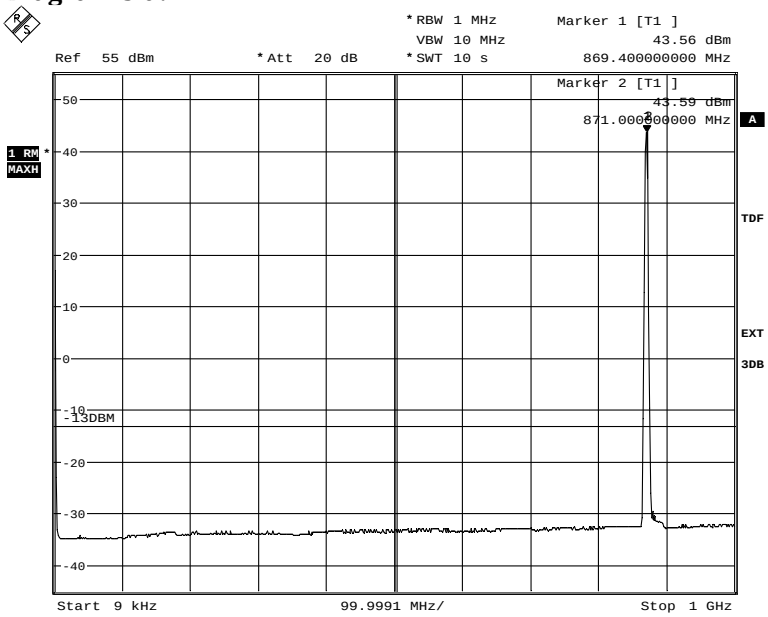
Diagram 8 f:



Date: 7.DEC.2011 19:47:31

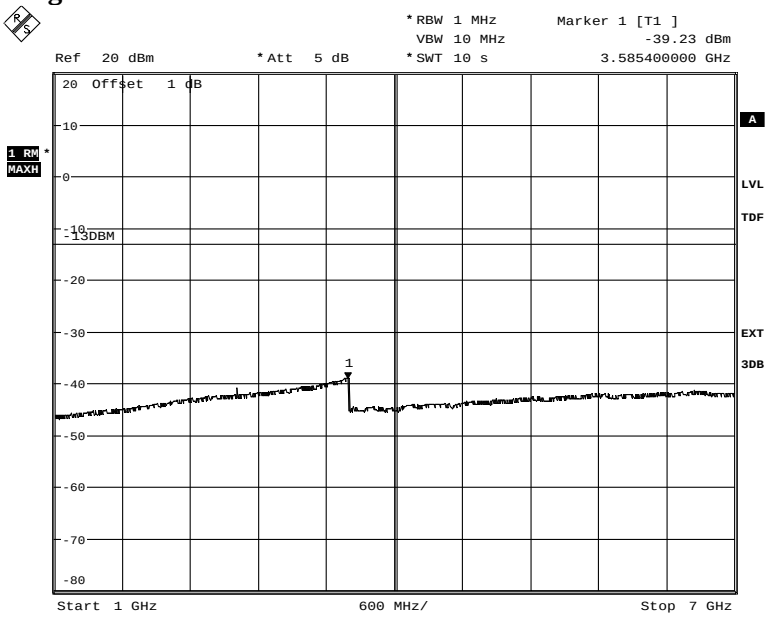
Note: Above zoom to determine the RMS level of out-of-band intermodulation products is not intended to verify band-edge performance.

Diagram 9 a:



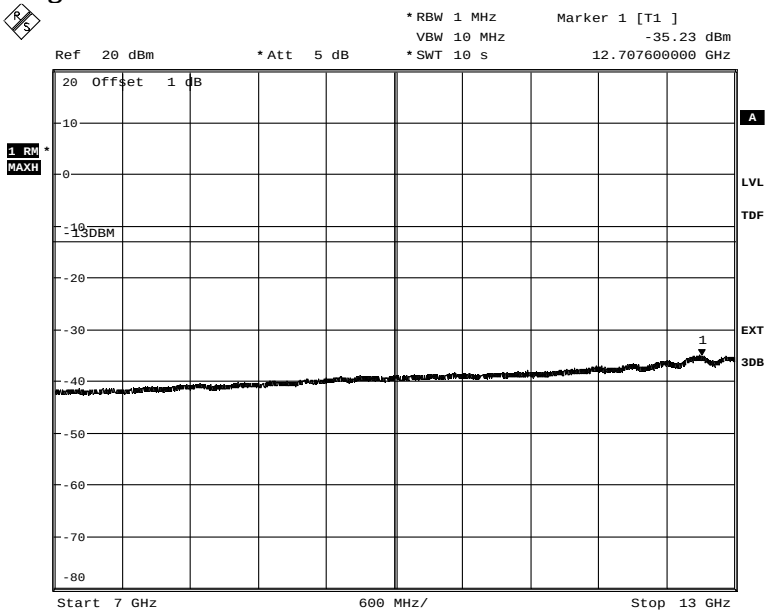
Date: 12.DEC.2011 11:55:02

Diagram 9 b:



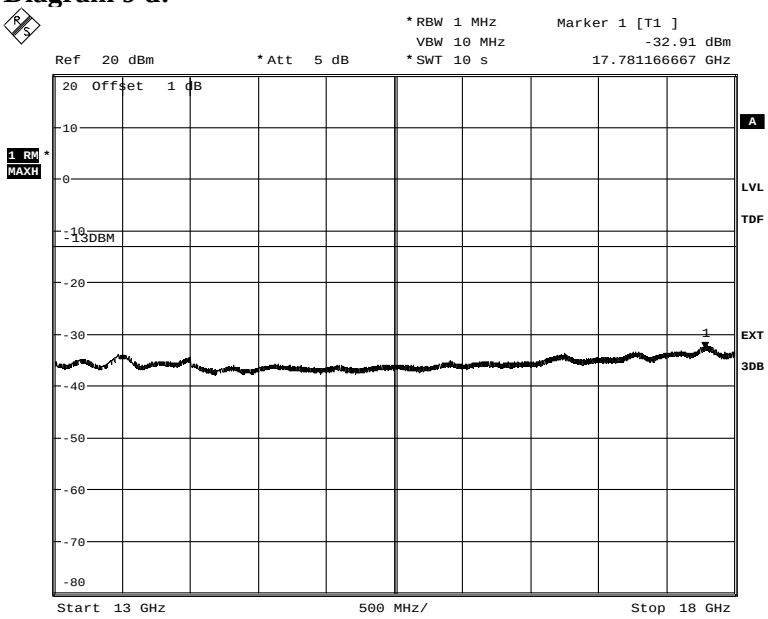
Date: 12.DEC.2011 12:10:07

Diagram 9 c:



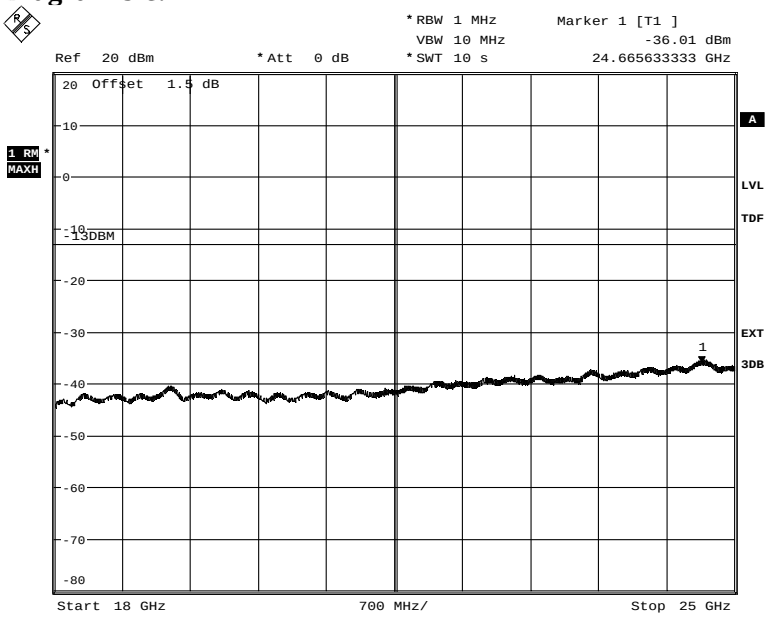
Date: 12.DEC.2011 12:11:20

Diagram 9 d:



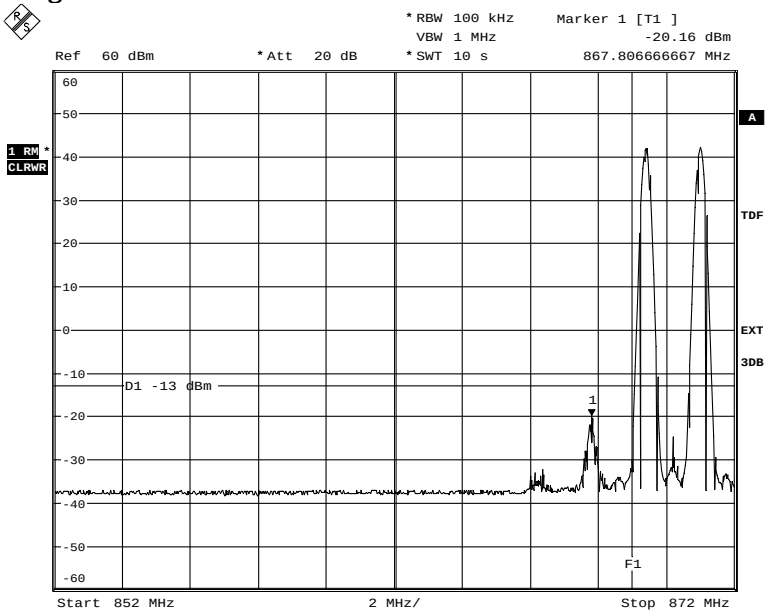
Date: 12.DEC.2011 12:30:35

Diagram 9 e:



Date: 12.DEC.2011 14:32:28

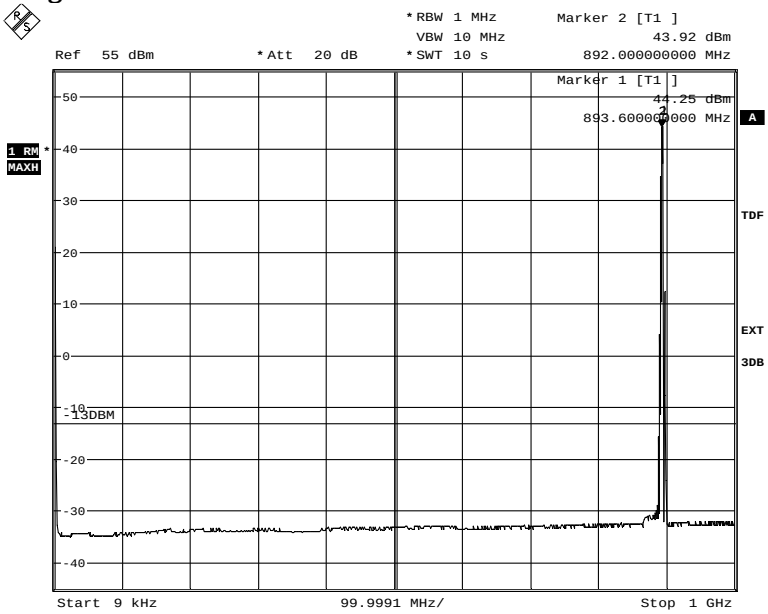
Diagram 9 f:



Date: 7.DEC.2011 19:21:39

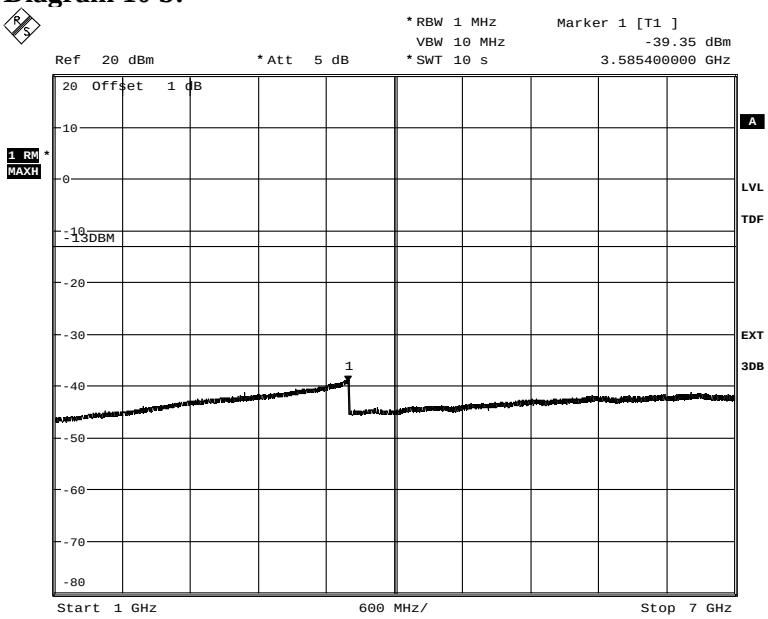
Note: Above zoom to determine the RMS level of out-of-band intermodulation products is not intended to verify band-edge performance.

Diagram 10 a:



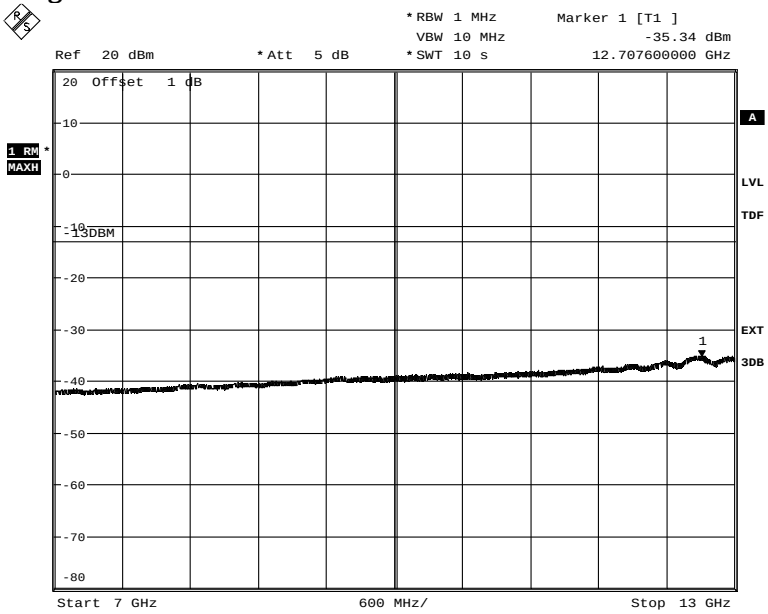
Date: 12.DEC.2011 13:27:29

Diagram 10 b:



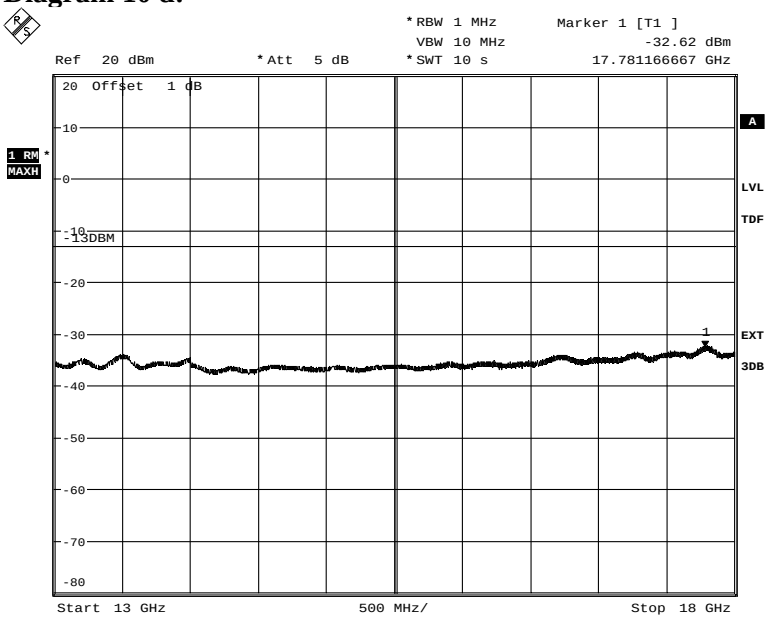
Date: 12.DEC.2011 12:58:55

Diagram 10 c:



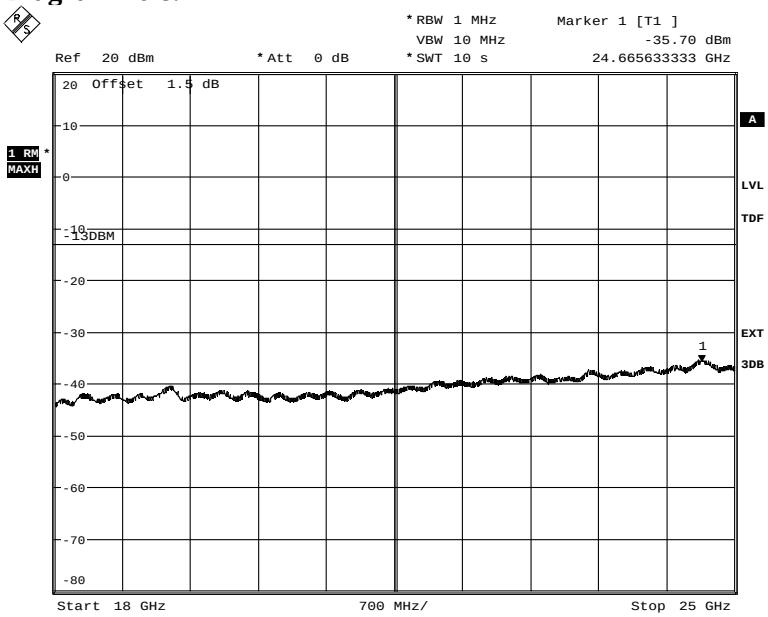
Date: 12.DEC.2011 12:55:17

Diagram 10 d:



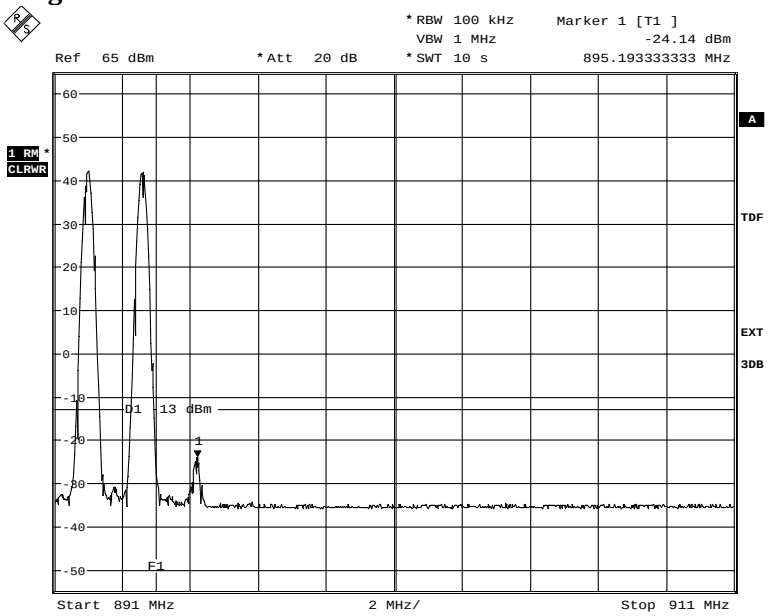
Date: 12.DEC.2011 12:52:34

Diagram 10 e:



Date: 12.DEC.2011 13:36:56

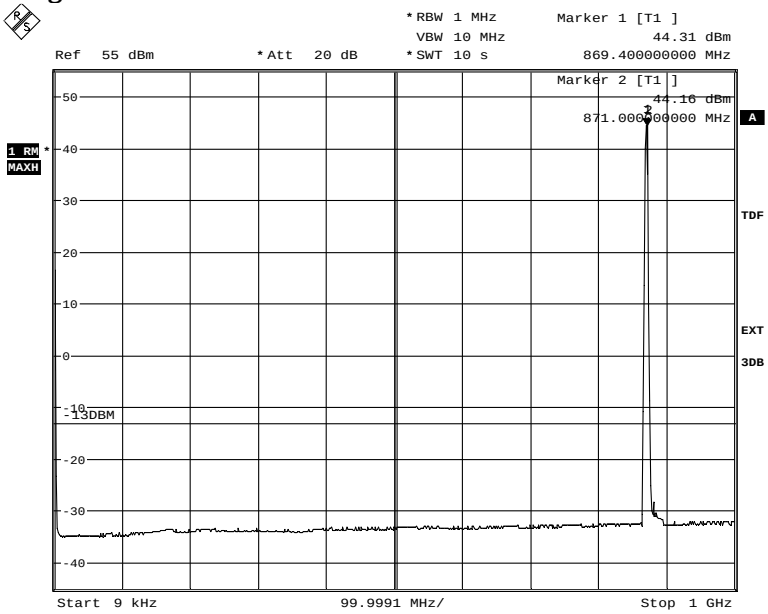
Diagram 10 f:



Date: 7.DEC.2011 19:51:31

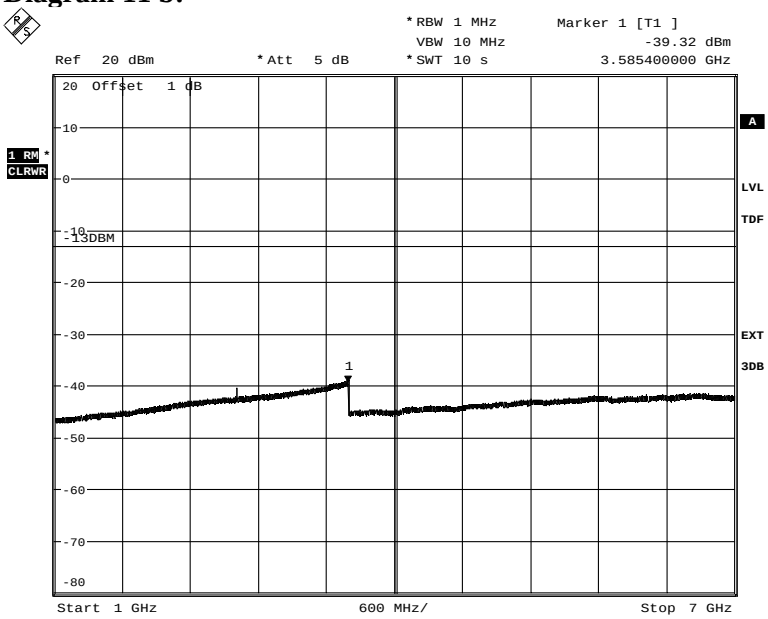
Note: Above zoom to determine the RMS level of out-of-band intermodulation products is not intended to verify band-edge performance.

Diagram 11 a:



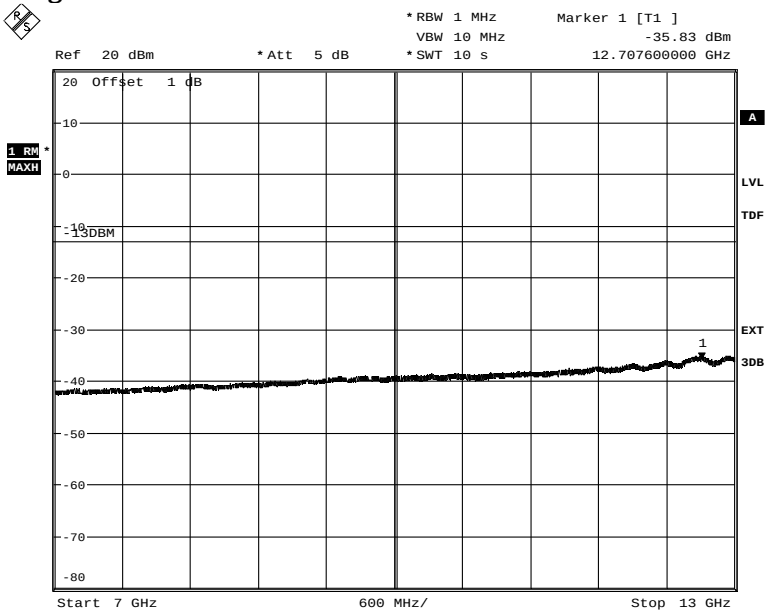
Date: 12.DEC.2011 11:47:19

Diagram 11 b:



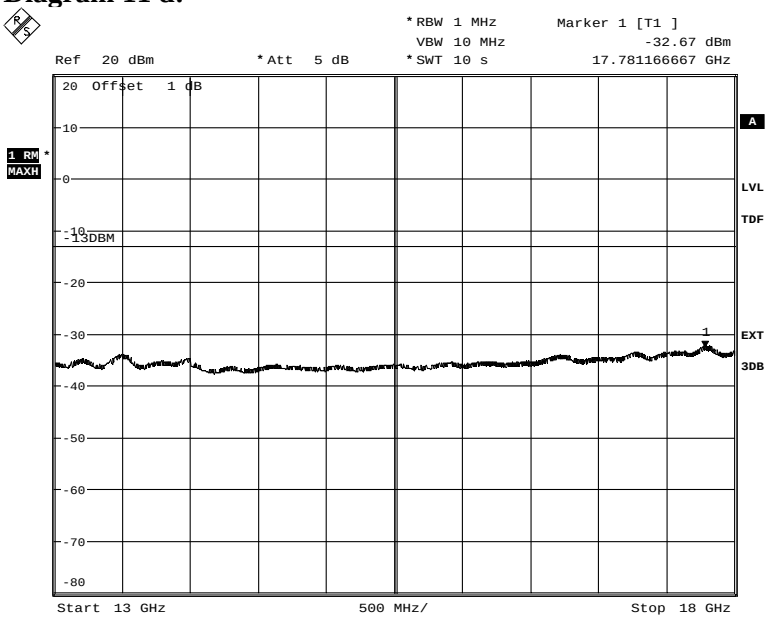
Date: 12.DEC.2011 12:18:04

Diagram 11 c:



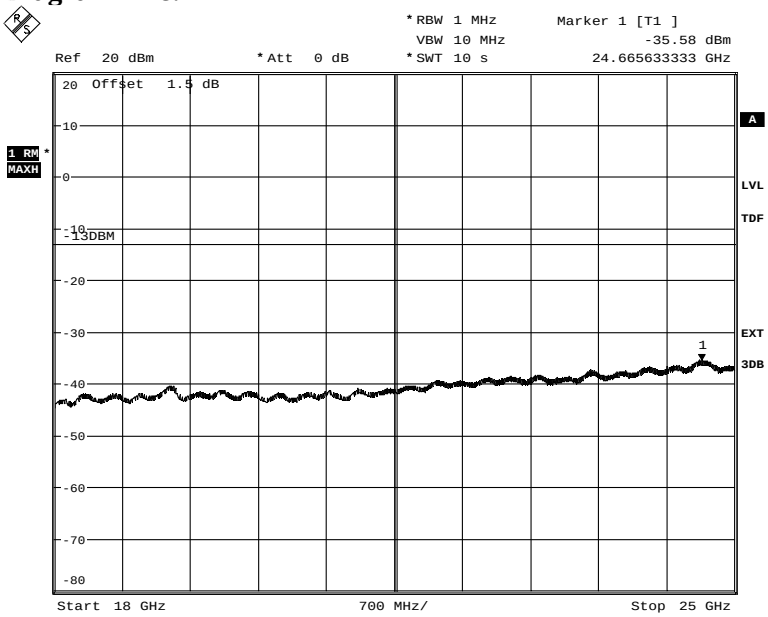
Date: 12.DEC.2011 12:22:30

Diagram 11 d:



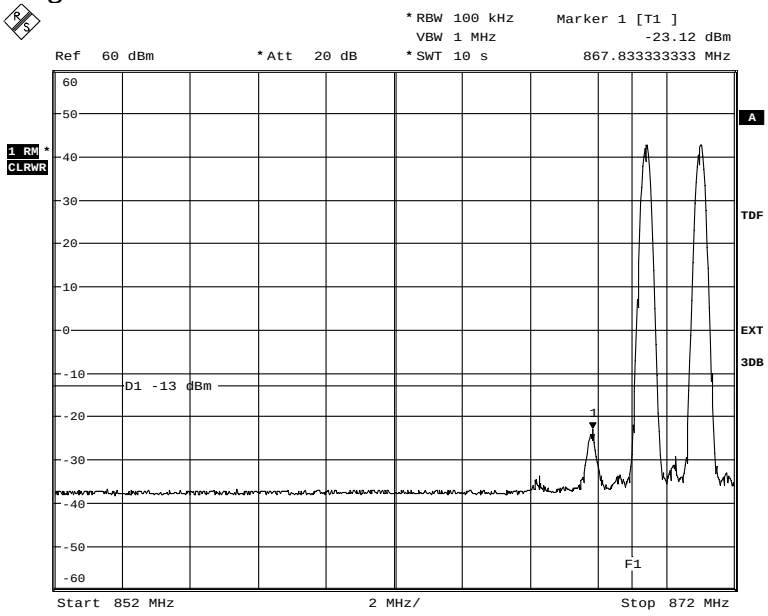
Date: 12.DEC.2011 12:25:18

Diagram 11 e:



Date: 12.DEC.2011 14:35:17

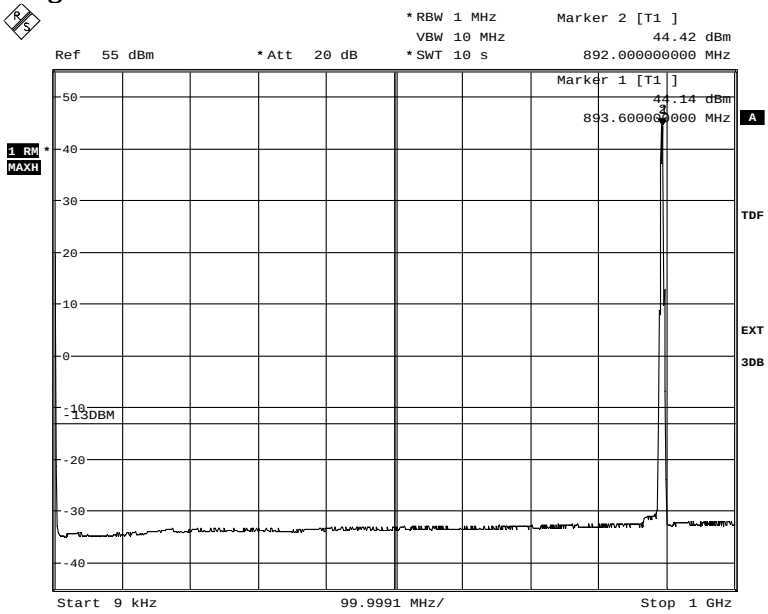
Diagram 11 f:



Date: 7.DEC.2011 19:16:23

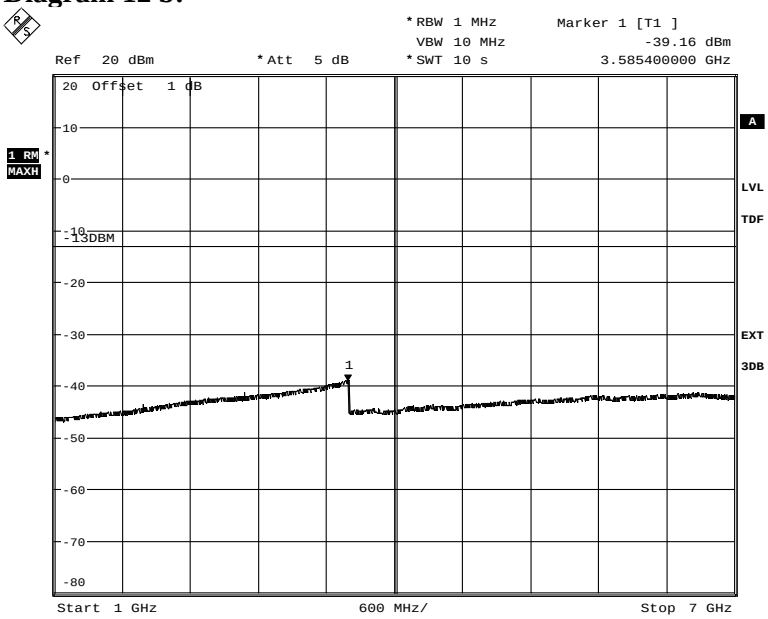
Note: Above zoom to determine the RMS level of out-of-band intermodulation products is not intended to verify band-edge performance.

Diagram 12 a:



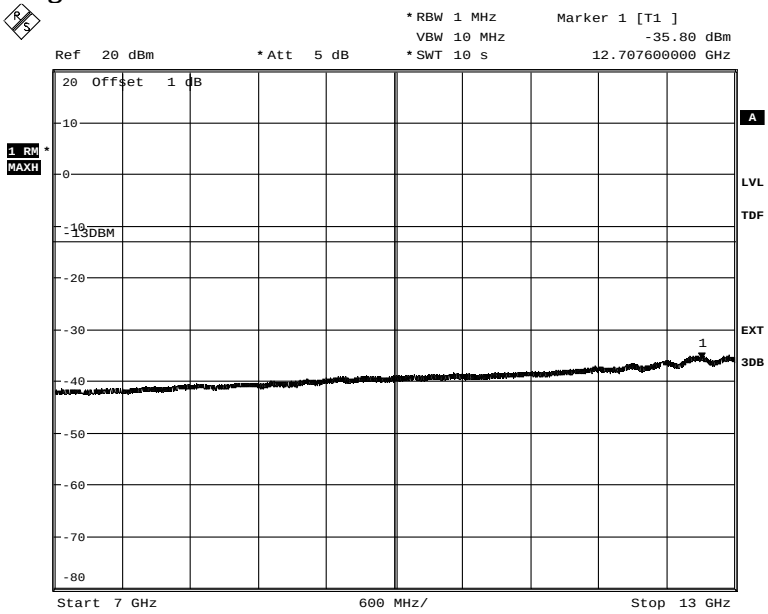
Date: 12.DEC.2011 13:17:08

Diagram 12 b:



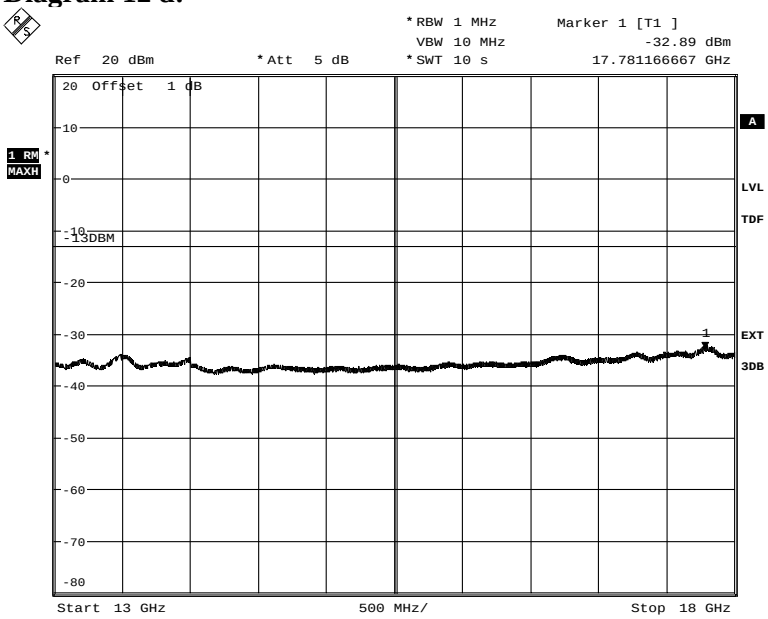
Date: 12.DEC.2011 13:13:48

Diagram 12 c:



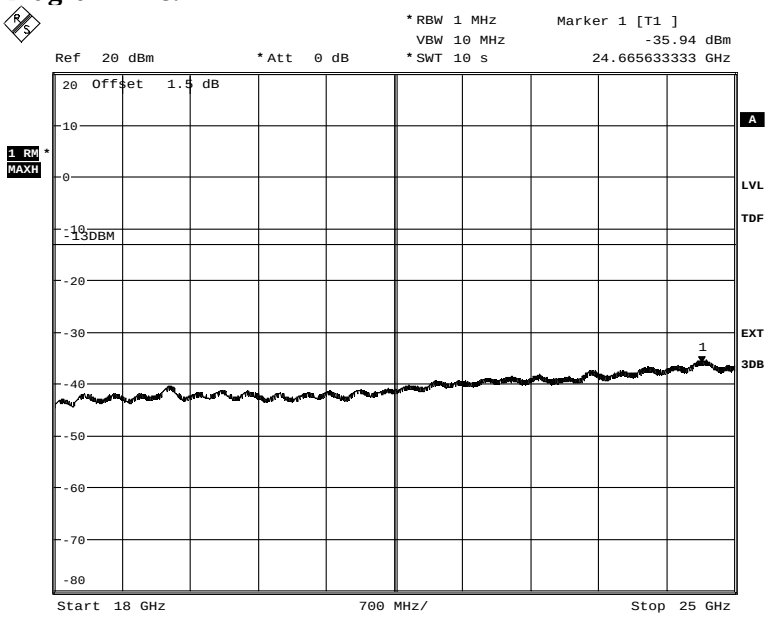
Date: 12.DEC.2011 13:11:49

Diagram 12 d:



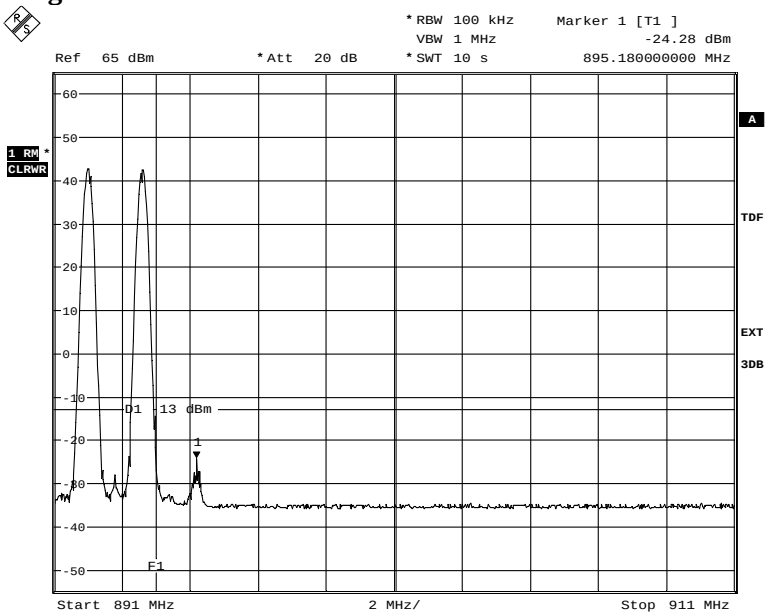
Date: 12.DEC.2011 12:47:15

Diagram 12 e:



Date: 12.DEC.2011 13:45:08

Diagram 12 f:



Date: 7.DEC.2011 19:59:22

Note: Above zoom to determine the RMS level of out-of-band intermodulation products is not intended to verify band-edge performance.

Field strength of spurious radiation measurements according to 47CFR 2.1053 / RSS-132 4.5

Date	Temperature	Humidity
2012-01-11	26 °C ± 3 °C	23 % ± 5 %

Test set-up and procedure

The measurements were performed with both horizontal and vertical polarisation of the antenna. The antenna distance was 3 m in the frequency range 30 MHz – 18 GHz and 1 m in the frequency range 18 – 25 GHz. The measurements were performed in Effective Radiated Power (ERP). A fully anechoic chamber was used during the measurements. The chamber is regularly calibrated with the substitution method and from that calibration an ERP correction factor is derived. The correction factor was used as a transducer to get the readings in ERP.

The measurement procedure was as the following:

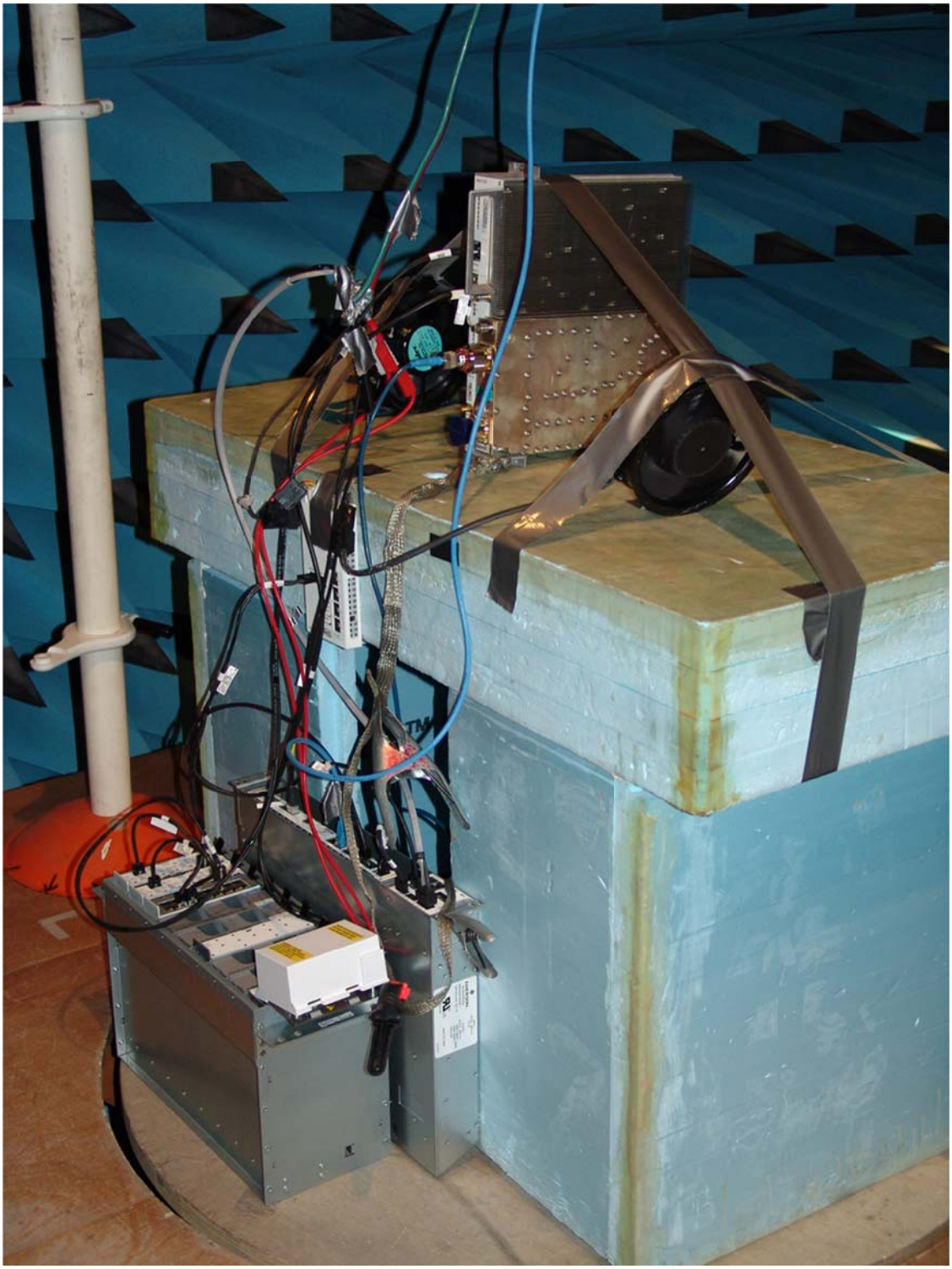
1. A pre-measurement was first performed with peak detector. The EUT was continuously measured in 360 degrees.
2. Spurious radiation on frequencies closer than 6 dB to the limit was re-measured with RMS detector and with the substitution method according to the standard.

EUT configuration: Single carrier, 1x47.8 dBm, TX channel M, ARFCN 190, 881.6 MHz

The highest internal frequency as declared by the client was 2.4576 GHz, thus the choice of the upper frequency boundary was set to 10 x 2.5 GHz = 25 GHz for emission measurements.

Measurement equipment	SP number
Anechoic chamber, Hertz	15:116
R&S FSIQ40 Signal Analyser	503 738
R&S EMI Test Receiver ESI40	503 125
Chase bilog antenna CBL 6121A	502 460
Schaffner Reference Dipole BSRD6500	503 649
EMCO Horn Antenna 3115	502 175
EMCO Horn Antenna 3115	501 548
MITEQ Low Noise Amplifier	503 277
R&S Vector Network Analyser	503 687
High pass filter	504 199
Attenuator	900 229
Testo 615 temperature and humidity meter	503 498

The test set-up is shown in the picture below:



Results

Modulation GMSK

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-25 000	All emission > 20 dB below limit	All emission > 20 dB below limit

Modulation 16QAM

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-25 000	All emission > 20 dB below limit	All emission > 20 dB below limit

Modulation 32QAM

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-25 000	All emission > 20 dB below limit	All emission > 20 dB below limit

Modulation AQPSK

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-25 000	All emission > 20 dB below limit	All emission > 20 dB below limit

Measurement uncertainty: 3.1 dB

Limits

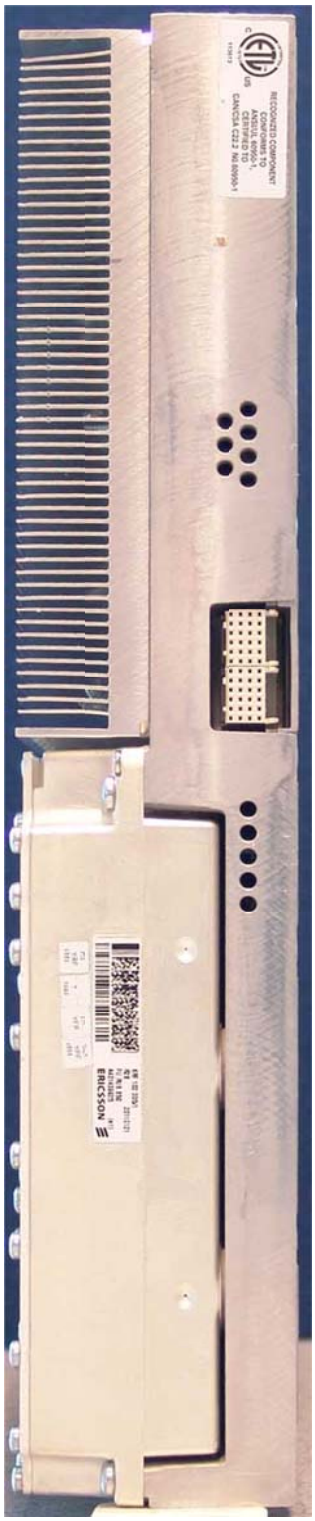
The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least 43 + 10 log P dB.

Complies?	Yes

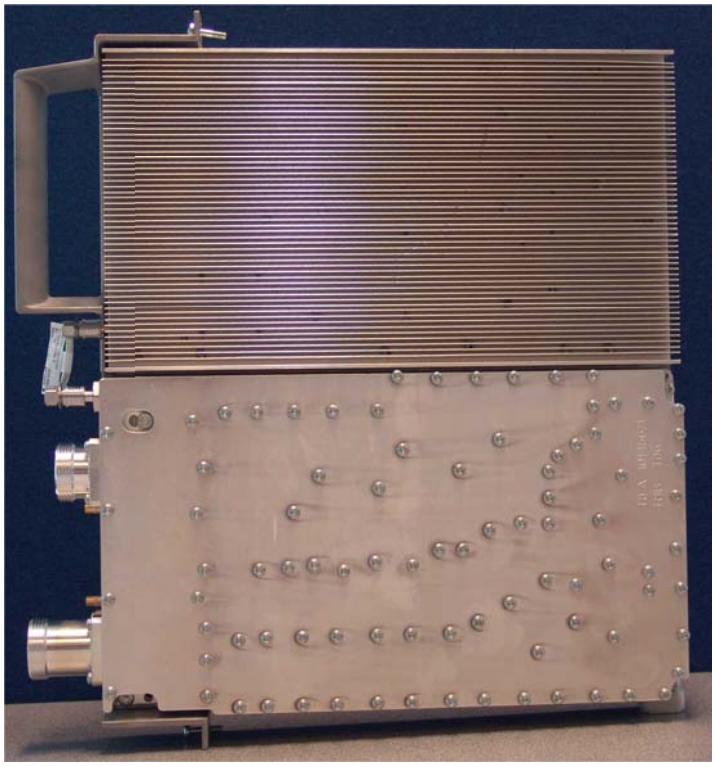
Photos of the test object

Front side

Rear side



Left side



Right side