REPORT

issued by an FCC listed Laboratory Reg. no. 93866
The test site complies with RSS-Gen, IC file no: 3482A-1

Contact person
Jörgen Wassholm
Electronics
+46 10 516 57 06
jorgen.wassholm@sp.se

Date	Reference	Page
2013-07-04	3P04412-F24	1 (2)

1002
ISO/IEC 17025

Ericsson AB
Klaes Holm
PDU HW
164 80 Stockholm

Class II permissive change on RRUS 11 B2 1900 MHz radio equipment with FCC ID: TA8AKRC161276-2 and IC: 287AB-AS1612762

(7 appendices)

Test object

RRUS 11 B2, product KRC 161 276/2, revision R1E

Summary

See appendix 1 for general information and appendix 7 for external photos.

Standard		Compliant	Appendix
FCC CFR 47 / IC RSS-133 Issue 6			
2.1046 / RSS-133 6.4	RF power output	Yes	2
2.1049 / RSS-Gen 4.6.1	Occupied bandwidth	Yes	3
2.1051 / RSS-133 6.5	Band edge	Yes	4
2.1051 / RSS-133 6.5	Spurious emission at antenna terminals	Yes	5
2.1053 / RSS-133 6.5	Field strength of spurious radiation	Yes	6

Note: Above RSS-133 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

Prepared by

Jörgen Wassholm

Examined by

Christer Karlsson

Table of contents

Appendix 1

Description of the test object

Equipment:	Radio equipment RRUS 11 B2
Operating bands:	TX: 1930 – 1990 MHz RX: 1850 – 1910 MHz
Antenna ports:	2 TX/RX ports, declared electrical idententical
LTE supports	
Modulations:	QPSK, 16QAM and 64QAM
Channel bandwidths:	1.4 MHz, 3 MHz, 5 MHz, 10 MHz,15 MHz and 20 MHz
Channel bandwidths supported in MSR mode	5 MHz, 10 MHz and 15 MHz
RF configurations	Single & multi carrier and MIMO mode
Nominal RF output power:	1x 46 dBm (1x 40 W) per antenna port 2x 43 dBm (2x 20W) per antenna port
WCDMA supports	
Modulations:	QPSK, 16QAM and 64QAM
Channel bandwidths:	4.2 to 5 MHz (configurable in steps of 100/200 kHz)
Channel spacings:	4.4 to 5 MHz (configurable in steps of 100/200 kHz)
RF configurations	Single & multi carrier and MIMO mode
Nominal RF output power:	1x 46 dBm (1x 40 W) per antenna port 2x 43 dBm (2x 20W) per antenna port 4x 40 dBm (4x 10W) per antenna port
Nominal supply voltage:	-48VDC

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 MIMO WCDMA and LTE, LTE single RAT multi carrier, MSR LTE and WCDMA access technologies, by verifying maintained compliance to the performance characteristics specified in applicable items of FCC CFR 47 and Industry Canada RSS-133 and RSS-Gen.

Operation modes

LTE single RAT

Measurements were performed with the test object transmitting test models as defined in 3GPP TS 36.141. Test model E-TM1.1 was used to represent QPSK, test model E-TM3.2 to represent 16QAM and test model E-TM3.1 to represent 64QAM modulation.

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number of carriers and RF configurations has been tested to find the worst case setting.The settings below were used for all measurements if not otherwise noted.

MIMO mode single carrier: E-TM1.1

MIMO mode multi carrier: 2 carriers E-TM1.1

Channel bandwidth 1.4 MHz

All measurements were performed with the test object configured for the maximum transmit power applicable for the tested configuration.

WCDMA single RAT

Measurements were performed with the test object transmitting test models as defined in 3GPP TS 25.141. Test model 1 (TM1) was used to represent QPSK. Test model 5 (TM5) to represent 16QAM modulation and Test model 6 (TM6) to represent 64QAM modulation.

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number of carriers and RF configurations has been tested to find the worst case setting.The settings below were used for all measurements if not otherwise noted.

MIMO mode Single carrier
TM5: 8 HS-PDSCH at 240 ksps + 30 DPCH:s at 30 ksps (SF=128)

Channel bandwidth 5 MHz

MIMO multicarrier compliance was deemed to be covered by the margin demonstrated in the original filing, no additional multi carrier measurements were done.

All measurements were performed with the test object configured for the maximum transmit power applicable for the tested configuration.

Appendix 1

LTE & WCDMA MSR

WCDMA measurements were performed with the test object transmitting test models as defined in 3GPP TS 25.141. Test model 1 (TM1) was used to represent QPSK. Test model 5 (TM5) to represent 16QAM modulation and Test model 6 (TM6) to represent 64QAM modulation.

LTE measurements were performed with the test object transmitting test models as defined in 3GPP TS 36.141. Test model E-TM1.1 was used to represent QPSK, test model E-TM3.2 to represent 16QAM and test model E-TM3.1 to represent 64QAM modulation.

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number of carriers and RF configurations has been tested to find the worst case setting.The settings below were used for all measurements if not otherwise noted.

WCDMA MIMO mode
TM5: 8 HS-PDSCH at 240ksps + 30 DPCH:s at 30 ksps (SF=128)

Channel bandwidth 5 MHz

LTE MIMO mode
E-TM1.1

Channel bandwidth 5 MHz.

Measurements were performed with the test object configured for the maximum transmit power applicable for the tested configuration.

Appendix 1

Test frequencies used for radiated measurements

WCDMA single RAT MIMO Port A and B common configuration	Configuration 1
	UARFCN (Frequency)
Downlink	9938 (1987.6 MHz)
Uplink	9538 (1907.6 MHz)
BW configuration	5 MHz
Test model	Test Model 5

LTE single RAT MIMO,single carrier: Port A and B common configuration	Configuration 2	Configuration 3	Configuration 4
	EARFCN (Frequency)	EARFCN (Frequency)	EARFCN (Frequency)
Downlink	607 (1930.7 MHz)	900 (1960.0 MHz)	1193 (1989.3 MHz)
Uplink	18607 (1850.7 MHz)	18900 (1880.0 MHz)	19193 (1909.3 MHz)
BW configuration	1.4 MHz	1.4 MHz	1.4 MHz
Test model	E-TM1.1	E-TM1.1	E-TM1.1

LTE single RAT MIMO, Multi carrier: Port A and B common configuration	Configuration 5	
	EARFCN (Frequency)	EARFCN (Frequency)
Downlink	1128 (1982.8 MHz)	1170 (1987.0 MHz)
Uplink	19128 (1902.8 MHz)	19170 (1907.0 MHz)
BW configuration	1.4 MHz	1.4 MHz
Test model	E-TM1.1	E-TM1.1

MSR WCDMA & LTE Port A and B	Configuration 6	
	WCDMA UARFCN (Frequency)	LTE EARFCN (Frequency)
Downlink	9863 (1972.6 MHz)	1175 (1987.5 MHz)
Uplink	9463 (1892.6 MHz)	19175 (1907.5 MHz)
BW configuration	5 MHz	5 MHz
Test model	Test Model 5	E-TM1.1

Appendix 1

Test frequencies used for conducted measurements

LTE MIMO single RAT, single carrier TX test frequencies

EARFCN Downlink	Frequency [MHz]	Symbolic name	Comment
607	1930.7	B	TX bottom frequency in 1.4 MHz BW configuration
615	1931.5	B	TX bottom frequency in 3 MHz BW configuration
625	1932.5	B	TX bottom frequency in 5 MHz BW configuration
900	1960.0	M	TX band mid frequency all BW configurations
1175	1987.5	T	TX top frequency in 5 MHz BW configuration
1185	1988.5	T	TX top frequency in 3 MHz BW configuration
1193	1989.3	T	TX top frequency in 1.4 MHz BW configuration

LTE MIMO single RAT, multi carrier TX test frequencies

EARFCN Downlink	Frequency [MHz]	Symbolic name	Comment
630 672	1933.0 1937.2	B_{IM1}	TX bottom frequencies in 1.4 MHz BW configuration
688 788	1938.8 1948.8	B_{IM2}	TX bottom frequencies in 1.4 MHz BW configuration
1128 1170	1982.8 1987.0	T_{IM1}	TX top frequencies in 1.4 MHz BW configuration
1012 1112	1971.2 1981.2	T_{IM2}	TX top frequencies in 1.4 MHz BW configuration

WCDMA MIMO single RATsingle carrier TX test frequencies

UARFCN Downlink	Frequency [MHz]	Symbolic name	Comment
9662	1932.4	B	TX bottom frequency
9800	1960.0	M	TX band mid frequency
9938	1987.6	T	TX top frequency

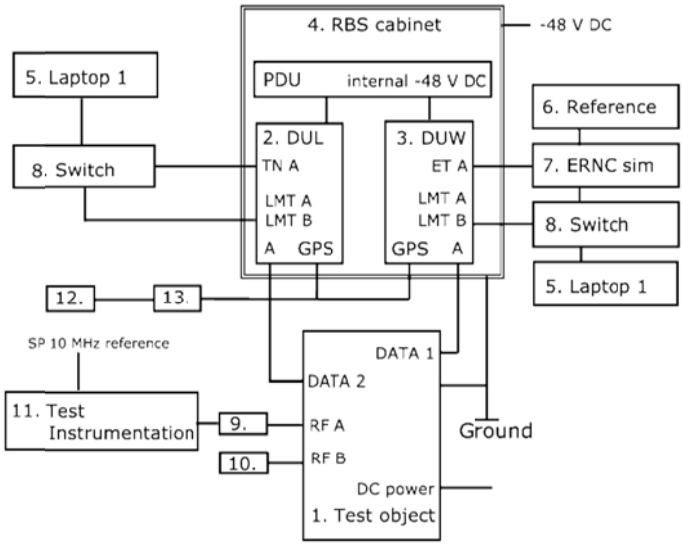
Appendix 1

WCDMA & LTE MSR TX test frequencies

WCDMA			LTE				
UARFCN Downlink	Frequency [MHz]	BW [MHz]	EARFCN Downlink	Frequency [MHz]	BW [MHz]	Symbolic name	Comment
9662	1932.4	5	775	1947.5	5	B	TX bottom constellation per LTE BW
9662	1932.4	5	750	1945.0	10	B	
9662	1932.4	5	725	1942.5	15	B	
9763	1952.6	5	975	1967.5	5	M	TX mid constellation per LTE BW
9763	1952.6	5	950	1965.0	10	M	
9763	1952.6	5	925	1962.5	15	M	
9863	1972.6	5	1175	1987.5	5	T	TX top constellation per LTE BW
9863	1972.6	5	1150	1985.0	10	T	
9863	1972.6	5	1125	1982.5	15	T	
9690	1938.0	5	775	1947.5	5	B_{IM}	TX constellation for bottom spurious IM
9862	1972.8	5	1120	1982.0	5	T_{IM}	TX constellation top for spurious IM

All RX frequencies were configured 80 MHz below the corresponding TX frequency according the appclicable duplex offset for the operating band.

Test set-up conducted measurements TX



Note: Above set-up shows connections for MSR mode. For single RAT, the data connection from DUW/DUL port A was connected to port DATA 1 only. Unconnected EUT interfaces were omitted in the picture for simplicity, but are listed in the interface table.

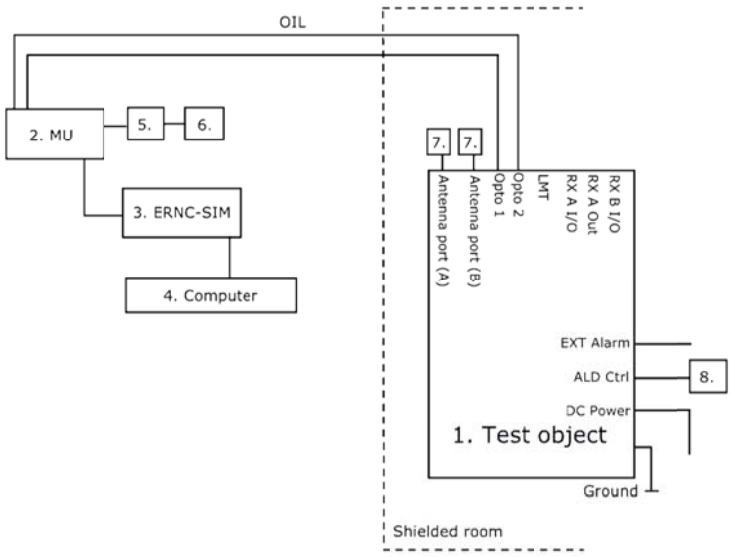
Test object:

1. RRUS 11 B2, product KRC 161 276/2, revision R1E, s/n: C825815973 (SRAT WCDMA and LTE), C826011243 (MSR WCDMA+LTE and SRAT LTE multi carrier).
   with PIS software CXP 901 7316/1 rev. R39UL,
   unlocked working software CXP 901 3268/6 R49EG
   (FCC ID: TA8AKRC161276-2 and IC: 287AB-AS1612762)

Functional test equipment:

2. DUL 20 01, product KDU 137 533/4, revision R1F, s/n TU8X787751
3. DUW 30 01, product KDU 127 161/3, revision R4C, s/n: C825194294
4. RBS 6201 cabinet, BAMS 1000778792.
   PDU 02 01, BMG 980 336/4, rev: R2A, s/n: BJ31528316
5. Controlling laptop HP Elitebook 8560w, BAMS 1001236858
   running software MOSHELL V9.0c for LTE and channel builder SW for WCDMA
6. Symmetricon 8040, BAMS 1000714189, reference
7. ERNC Sim 127, BAMS 1000660991
8. Fast Ethernet switch, Netgear FS726G
9. Attenuator, filter, directional coupler according respective appendix
10. Termination 50 ohm
11. SP test instrument according measurement equipment list
12. GPS Active Antenna, KRE 101 2082/1
13. GPS 02 01, NCD 901 41/1, rev. R1D, s/n: TU8K367393

Test setup radiated measurements MSR WCDMA + LTE



Note: Above set-up shows connections for MSR mode. For single RAT, the data connection from DUW/DUL port A was connected to port DATA 1 only. Unconnected EUT interfaces were omitted in the picture for simplicity, but are listed in the interface table.

Test object:

1. RRUS 11 B2, KRC 161 276/2, revision R1E, s/n: C826011243
   with PIS software CXP 901 7316/1 rev. R39UL,
   unlocked working software CXP 901 3268/6 R49EG
   (FCC ID: TA8AKRC161276-2 and IC: 287AB-AS1612762)

Functional test equipment:

2. Main Unit:
   SUP 6601, 1/BFL 901 009/4, rev. R1E, s/n: BR82081105
   DUL 20 01, KDU 137 533/4, rev. R1F, s/n: TU8X857127
   SUP 6601, 1/BFL 901 009/4, rev. R1E, s/n: BR82261785
   DUW 30 01, KDU 127 161/3, R4F, TU8XB20706

3. ERNC-SIM 127:
   Symmetricom SyncServer, BAMS – 1000714181
   Switch Netgear FS726T
   Switch Netgear GSM 7212
   10 MHz reference Symmetricom 8040, BAMS – 1000714186

4. Computer, EliteBook 8560w, BAMS – 1001236854

5. GPS 02 01, NCD 901 41/1, rev. R1D, s/n: TU8K356428

6. GPS Active Antenna, KRE 101 2082/1

7. Attenuator/ Termination 50 ohm

9. RET – Remote Electrical Tilt unit, KRY 121 67/2, rev. R1N

Interfaces:	Type of port:
Supply power -48 VDC	DC Power
Antenna port (A), 7/16 male connector, terminated	Antenna
Antenna port (B), 7/16 male connector, terminated	Antenna
Opto 1, Optical Interface Link, single mode opto fibre 1	Signal
Opto 2, for MSR Optical Interface Link, single mode opto fibre 2 for SR not connectetd	Signal
LMT, for maintenance use only	Signal
RX A Out, no cable attached	Antenna
RX A I/O, no cable attached	Antenna
RX B I/O, no cable attached	Antenna
EXT Alarm, shielded multi-wire	Signal
ALD Ctrl, shielded multi-wire	Signal
Ground wire	Ground

RBS software:

RAT	Software	Revision
LTE	CXP 102 151/18	R28AE
WCDMA	CXP 902 1719	R1CB18

References

Measurements were done according to relevant parts of the following standards:
ANSI 63.4-2009
ANSI/TIA/EIA-603-C-2004
CFR 47 part 2, October 1st , 2012
CFR 47 part 24, October 1st, 2012
3GPP TS 25.141, version 11.4.0
3GPP TS 36.141, version 11.4.0
3GPP TS 37.141, version 11.3.0
RSS-Gen Issue 3
RSS-133 Issue 6

Measurement equipment

	Calibration Due	SP number
Test site Tesla	2014-01	503 881
R&S FSIQ 40	2013-07	503 738
R&S ESI 26	2013-07	503 292
R&S ESU 26	2014-05	901 553
R&S FSQ 40	2014-03	504 143
Control computer with R&S software EMC32 version 8.52.0	-	503 479
High pass filter	2013-07	901 501
High pass filter	2013-07	901 502
High pass filter	2013-07	504 199
High pass filter	2013-08	901 373
High pass filter	2014-08	503 739
High pass filter	2013-07	503 740
RF attenuator	2013-07	504 159
RF attenuator	2013-09	900 233
RF attenuator	2013-08	900 691
RF attenuator	2013-12	901 508
Chase Bilog Antenna CBL 6111A	2014-10	503 182
EMCO Horn Antenna 3115	2014-01	502 175
Std.gain horn FLANN model 20240-20	2014-03	503 674
µComp Nordic, Low Noise Amplifier	2014-04	901 545
Schwarzbeck preamplifier BBV 9742	2014-03	504 085
MITEQ Low Noise Amplifier	2013-08	503 285
Temperature and humidity meter, Testo 635	2013-06	504 203
Temperature and humidity meter, Testo 625	2013-06	504 188
Temperature Chamber	2013-11	501 031
Datascan 7321	2013-11	502 698
Multimeter Fluke 87	2013-08	502 190

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). Compliance evaluation is based on a shared risk principle with respect to the measurement uncertainty.

Reservation

The test results in this report apply only to the particular test object as declared in the report.

Delivery of test object

The test object was delivered 2013-05-27.

Appendix 1

Manufacturer's representative

Christer Gustavsson, Ericsson AB

Test engineers

Jörgen Wassholm, Kexin Chen, Hyder Kahlaf and Tomas Lennhager, SP

Test participant

Adam Skoglund, Ericsson AB (partially during radiated tests)

RF power output measurements according to CFR 47 §2.1046 / IC RSS-133 6.4

Date	Temperature	Humidity
2013-05-29	23 °C ± 3 °C	51 % ± 5 %
2013-06-14	23 °C ± 3 °C	35 % ± 5 %
2013-06-17	23 °C ± 3 °C	46 % ± 5 %

Test set-up and procedure

The test object was connected to a signal analyzer measuring peak and RMS output power in CDF mode. A resolution bandwidth of 50 MHz was used.

Measurement equipment	SP number
Rohde & Schwarz signal analyzer FSQ40	504 143
RF attenuator	901 508
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 1.1 dB

Results

Single RAT, nominal output power 1x 46.0 dBm (40 W) per RF port:

Configuration	BW (MHz)	Measured RMS power (dBm)		
		Port RFA	Port RFB	RFA+RFB[1]
WCDMA single carrier per port, frequency M	5	45.88 (diagram 1)	45.98 (diagram 2)	48.86
LTE, single carrier per port, frequency M	1.4	45.75 (diagram 3)	45.72 (diagram 4)	48.75
	3	45.81 (diagram 5)	45.80 (diagram 6)	48.81
	5	45.84 (diagram 7)	45.80 (diagram 8)	48.83
	10	45.72 (diagram 9)	45.82 (diagram 10)	48.78
	15	45.78 (diagram 11)	45.81 (diagram 12)	48.81
	20	45.85 (diagram 13)	45.83 (diagram 14)	48.85

LTE MIMO mode, multi Carrier

Rated output power 2 x 43 dBm per RF port.Total nominal RF power 49.0 dBm

Tested configuration	Transmitter power RMS (dBm)		
BW and frequency	Port RFA	Port RFB	Total power[1)]
1.4 MHz, Bim1	45.25 (diagram 15)	45.13 (diagram 16)	48.13
1.4 MHz, Bim2	45.19 (diagram 17)	45.09 (diagram 18)	48.08
1.4 MHz, Tim1	45.40 (diagram 19)	45.38 (diagram 20)	48.40
1.4 MHz, Tim2	45.27 (diagram 21)	45.21 (diagram 22)	48.25

Multi RAT (MSR), 1x WCDMA and 1x LTE carrier per RF port
nominal accumulated output power, 46.0 dBm (40 W a 20 W per carrier) per RF port

MSR frequency	Transmitter power RMS (dBm)		
	Port RF A	Port RF B	Total power[1)]
B LTE BW 5 MHz	45.29 (diagram 23)	45.26 (diagram 24)	48.29
M LTE BW 5 MHz	45.36 (diagram 25)	45.34 (diagram 26)	48.36
M LTE BW 10 MHz	45.36 (diagram 27)	45.33 (diagram 28)	48.36
M LTE BW 15 MHz	45.35 (diagram 29)	45.33 (diagram 30)	48.35
T LTE BW 5 MHz	45.38 (diagram 31)	45.27 (diagram 32)	48.34

[1)]: summed output power according to FCC KDB662911 Multiple transmitter output v02

Limits

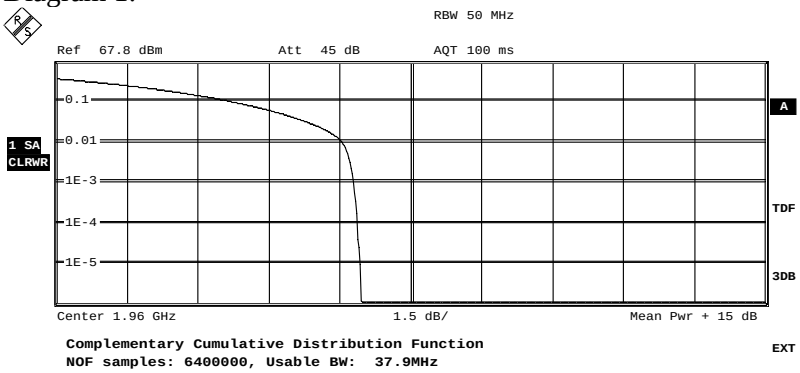
§24.232: The maximum equivalent isotropically radiated power (e.**i**.r.p.) may not exceed 3280 W (EIRP) / MHz.
The Peak to Average Ratio (PAR) may not exceed 13 dB.

RSS-133 6.4: The average equivalent isotropically radiated power (e.i.r.p.) limits in SRSP-510 apply. Base station transmitters operating in the band 1930 – 1995 MHz shall not have output power exceeding 100 Watts.
The Peak to Average Ratio (PAR) may not exceed 13 dB.

Complies?	Yes

Appendix 2

Diagram 1:

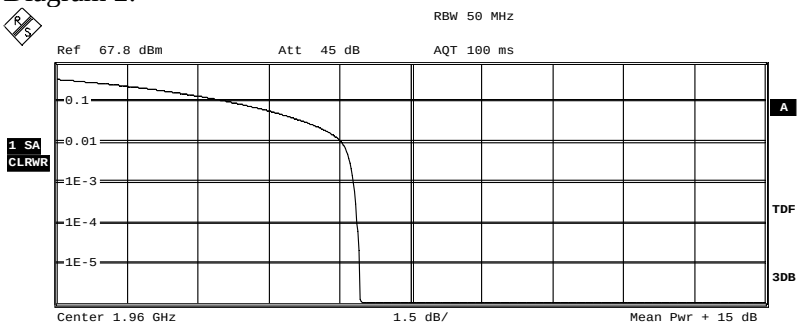


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.88 dBm
Peak	52.40 dBm
Crest	6.52 dB
10 %	3.75 dB
1 %	6.03 dB
.1 %	6.30 dB
.01 %	6.37 dB

Date: 29.MAY.2013 06:47:57

Diagram 2:



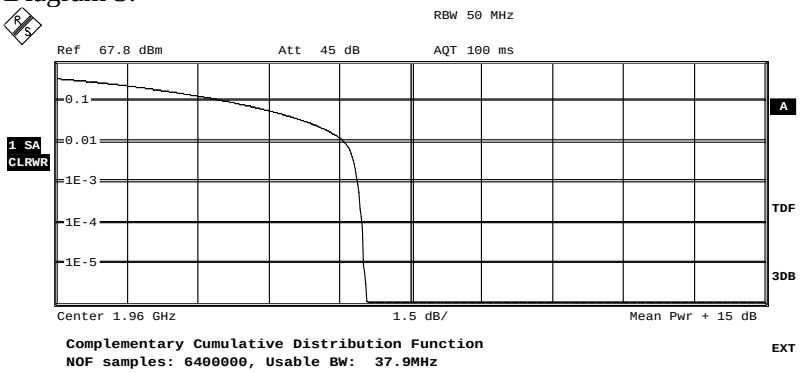
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.98 dBm
Peak	52.47 dBm
Crest	6.49 dB
10 %	3.75 dB
1 %	6.03 dB
.1 %	6.30 dB
.01 %	6.37 dB

Date: 29.MAY.2013 08:04:55

Appendix 2

Diagram 3:

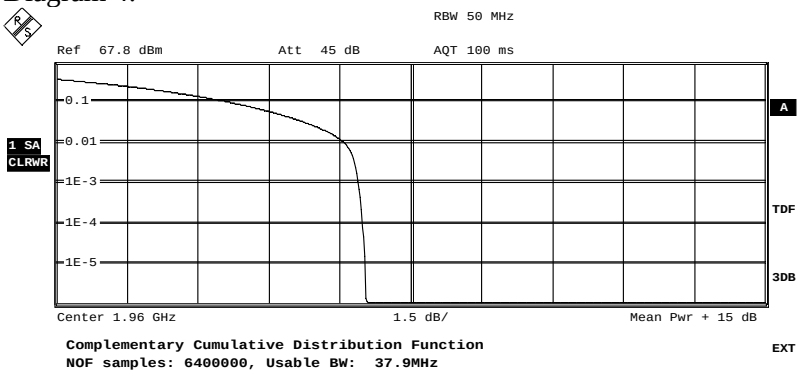


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.75 dBm
Peak	52.40 dBm
Crest	6.65 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.39 dB
.01 %	6.47 dB

Date: 29.MAY.2013 10:34:56

Diagram 4:



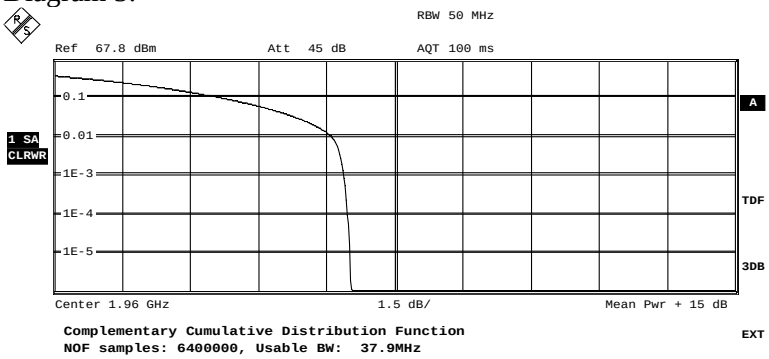
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.72 dBm
Peak	52.40 dBm
Crest	6.68 dB
10 %	3.73 dB
1 %	6.08 dB
.1 %	6.39 dB
.01 %	6.49 dB

Date: 29.MAY.2013 10:32:42

Appendix 2

Diagram 5:

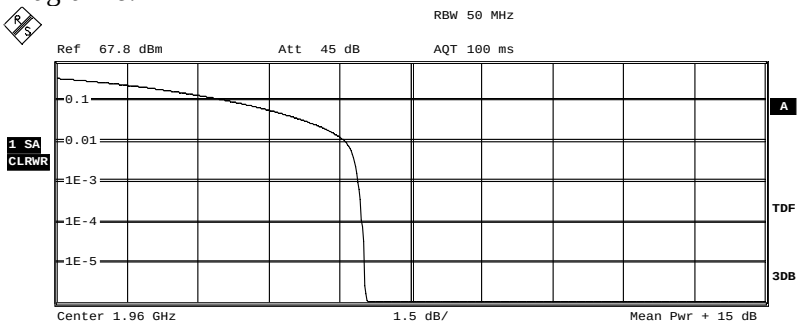


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.81 dBm
Peak	52.40 dBm
Crest	6.58 dB
10 %	3.73 dB
1 %	6.11 dB
.1 %	6.39 dB
.01 %	6.47 dB

Date: 29.MAY.2013 13:42:17

Diagram 6:



Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.80 dBm
Peak	52.40 dBm
Crest	6.59 dB
10 %	3.73 dB
1 %	6.11 dB
.1 %	6.39 dB
.01 %	6.47 dB

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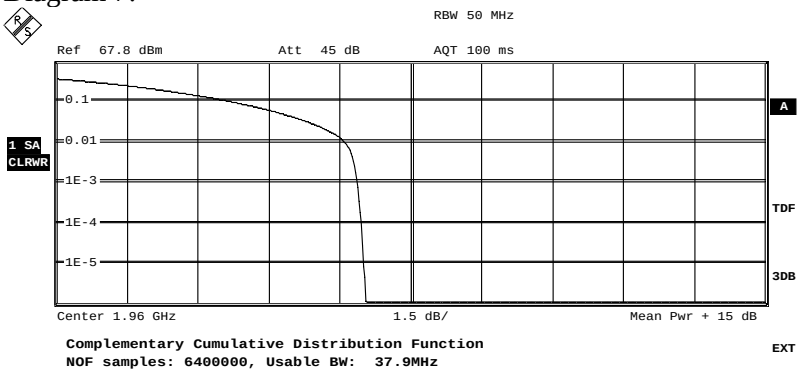
Appendix 2

Diagram 7:

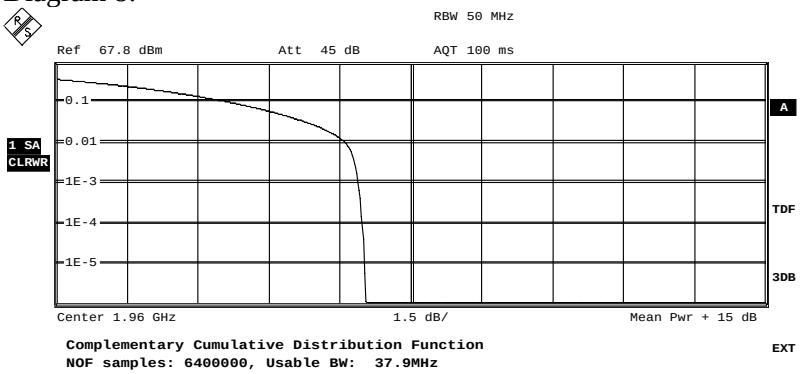


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.84 dBm
Peak	52.40 dBm
Crest	6.56 dB
10 %	3.75 dB
1 %	6.11 dB
.1 %	6.37 dB
.01 %	6.47 dB

Date: 29.MAY.2013 13:30:58

Diagram 8:



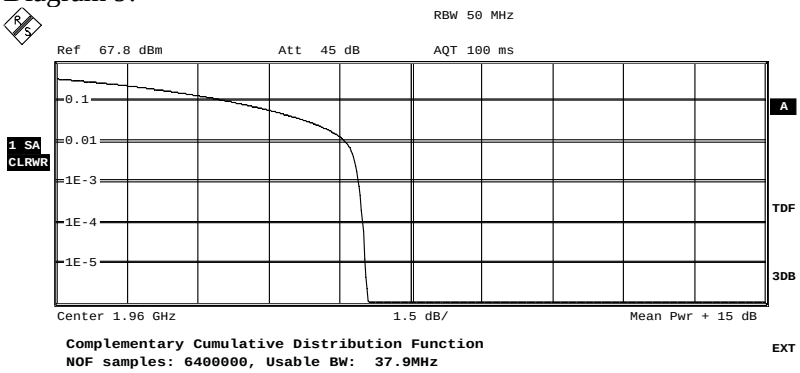
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.80 dBm
Peak	52.40 dBm
Crest	6.60 dB
10 %	3.73 dB
1 %	6.11 dB
.1 %	6.39 dB
.01 %	6.49 dB

Date: 29.MAY.2013 13:35:18

Appendix 2

Diagram 9:

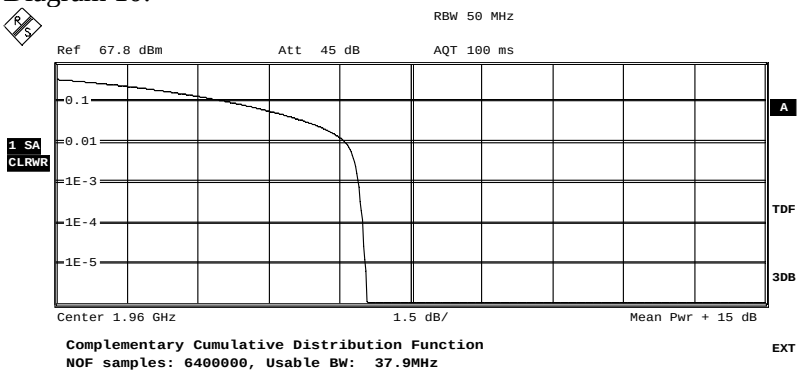


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.72 dBm
Peak	52.33 dBm
Crest	6.60 dB
10 %	3.75 dB
1 %	6.13 dB
.1 %	6.39 dB
.01 %	6.49 dB

Date: 29.MAY.2013 13:18:05

Diagram 10:



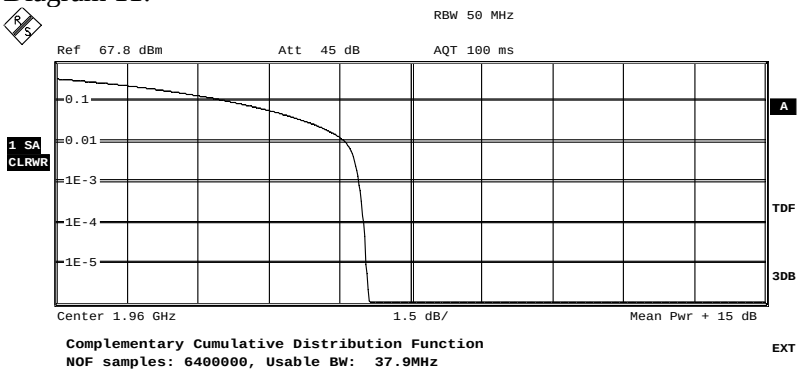
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.82 dBm
Peak	52.40 dBm
Crest	6.58 dB
10 %	3.73 dB
1 %	6.13 dB
.1 %	6.39 dB
.01 %	6.49 dB

Date: 29.MAY.2013 13:14:36

Appendix 2

Diagram 11:

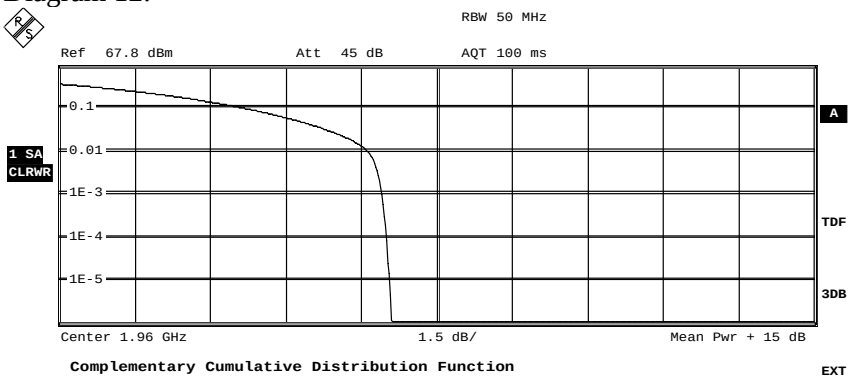


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.78 dBm
Peak	52.40 dBm
Crest	6.62 dB
10 %	3.73 dB
1 %	6.11 dB
.1 %	6.42 dB
.01 %	6.51 dB

Date: 29.MAY.2013 12:43:05

Diagram 12:



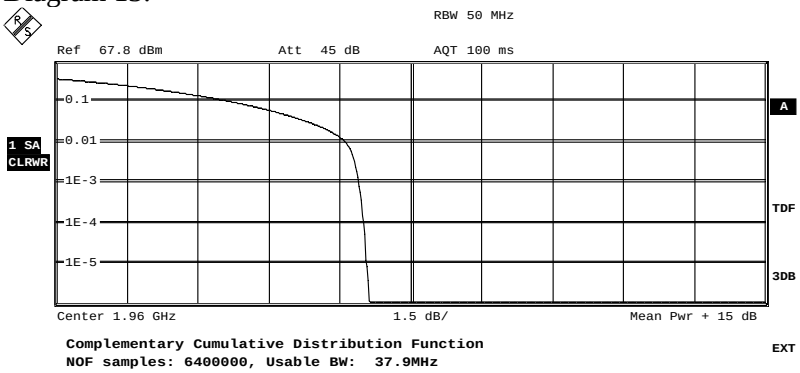
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.81 dBm
Peak	52.47 dBm
Crest	6.66 dB
10 %	3.73 dB
1 %	6.13 dB
.1 %	6.42 dB
.01 %	6.51 dB

Date: 29.MAY.2013 12:51:12

Appendix 2

Diagram 13:

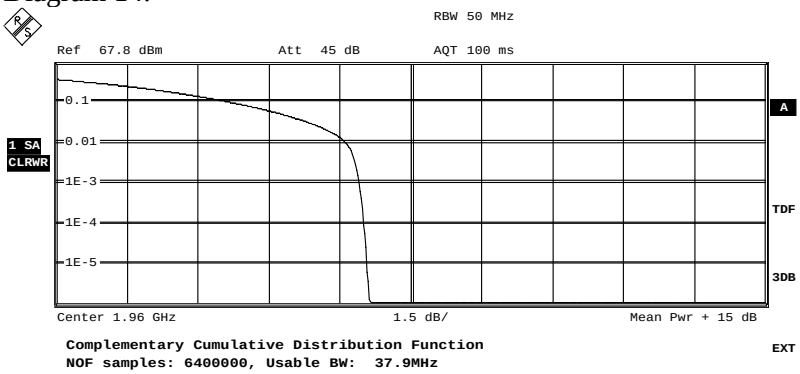


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.85 dBm
Peak	52.54 dBm
Crest	6.69 dB
10 %	3.75 dB
1 %	6.11 dB
.1 %	6.42 dB
.01 %	6.51 dB

Date: 29.MAY.2013 12:39:41

Diagram 14:



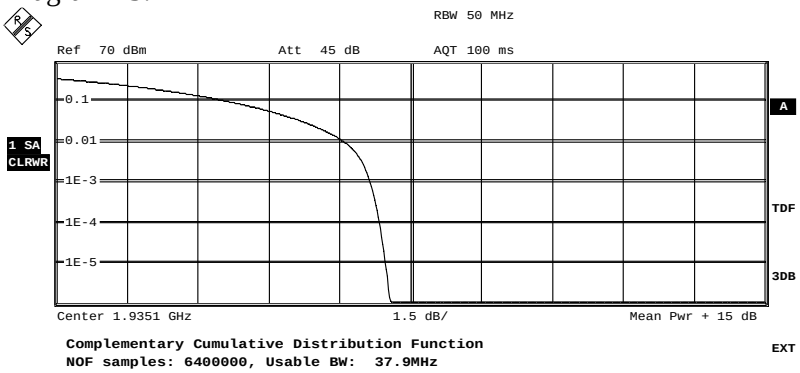
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.83 dBm
Peak	52.47 dBm
Crest	6.64 dB
10 %	3.75 dB
1 %	6.13 dB
.1 %	6.42 dB
.01 %	6.51 dB

Date: 29.MAY.2013 11:28:24

Appendix 2

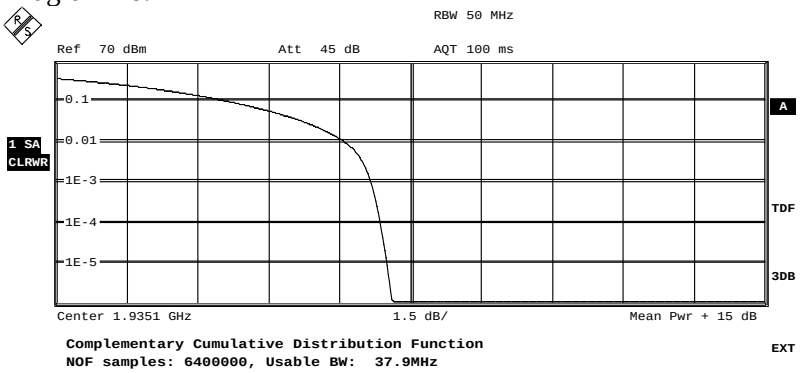
Diagram 15:



	Trace 1
Mean	45.25 dBm
Peak	52.43 dBm
Crest	7.18 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.66 dB
.01 %	6.85 dB

Date: 17.JUN.2013 16:24:41

Diagram 16:

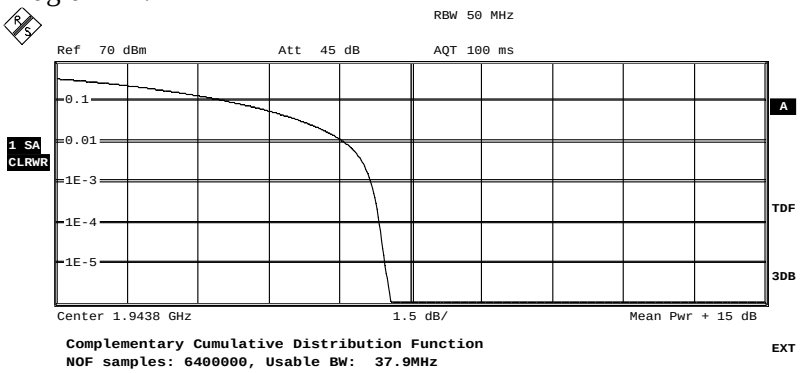


	Trace 1
Mean	45.13 dBm
Peak	52.43 dBm
Crest	7.30 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.66 dB
.01 %	6.88 dB

Date: 17.JUN.2013 16:31:26

Appendix 2

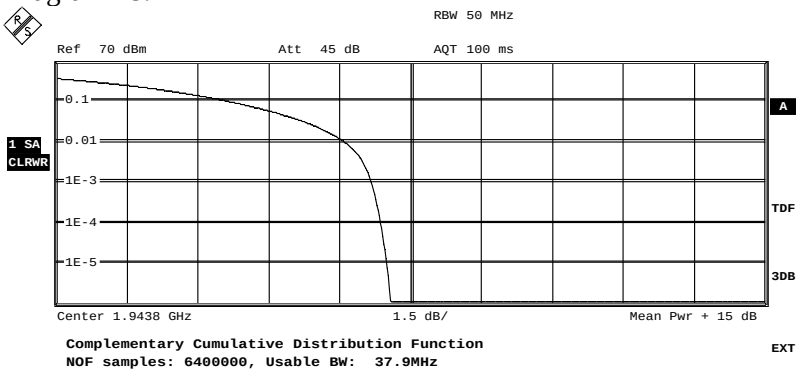
Diagram 17:



	Trace 1
Mean	45.19 dBm
Peak	52.37 dBm
Crest	7.18 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.66 dB
.01 %	6.85 dB

Date: 17.JUN.2013 17:54:52

Diagram 18:

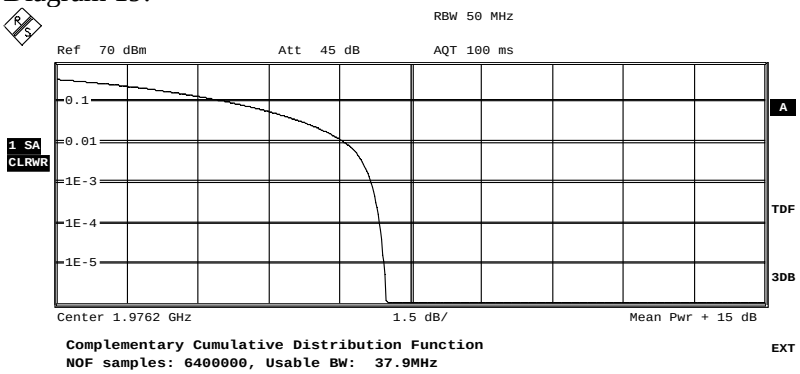


	Trace 1
Mean	45.09 dBm
Peak	52.23 dBm
Crest	7.14 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.68 dB
.01 %	6.88 dB

Date: 17.JUN.2013 17:53:40

Appendix 2

Diagram 19:

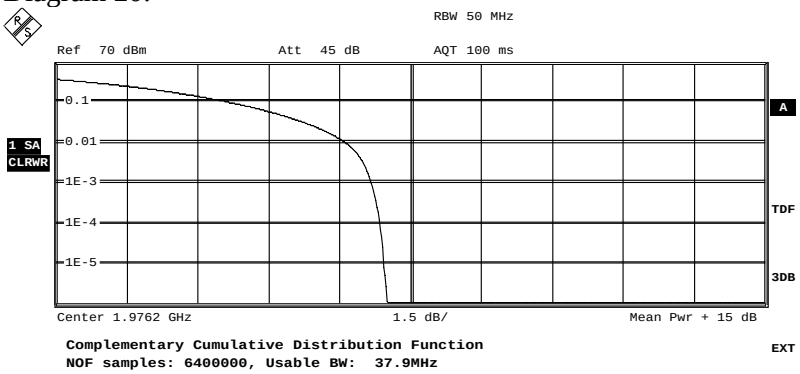


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.40 dBm
Peak	52.45 dBm
Crest	7.05 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.68 dB
.01 %	6.85 dB

Date: 17.JUN.2013 18:13:46

Diagram 20:



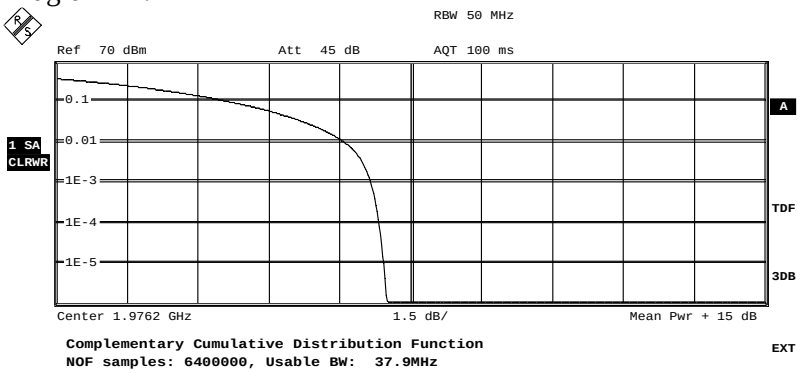
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.38 dBm
Peak	52.45 dBm
Crest	7.07 dB
10 %	3.70 dB
1 %	6.13 dB
.1 %	6.68 dB
.01 %	6.85 dB

Date: 17.JUN.2013 18:12:16

Appendix 2

Diagram 21:

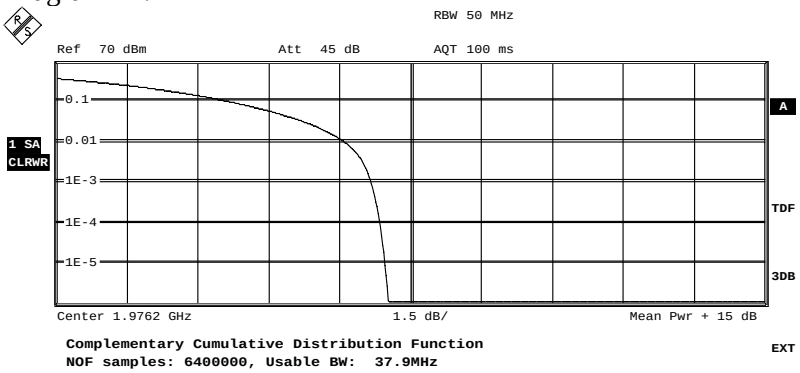


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.27 dBm
Peak	52.38 dBm
Crest	7.11 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.66 dB
.01 %	6.83 dB

Date: 17.JUN.2013 18:09:06

Diagram 22:



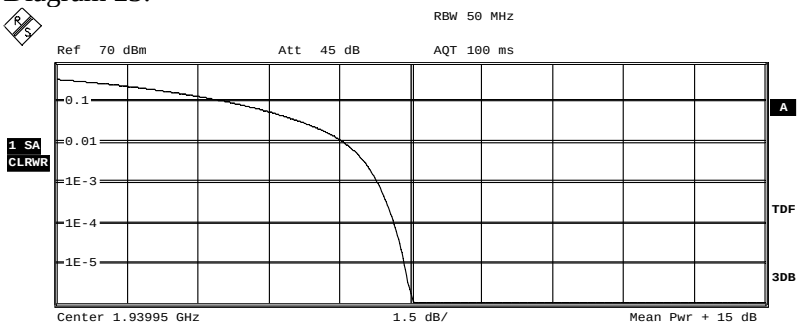
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.21 dBm
Peak	52.31 dBm
Crest	7.11 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.68 dB
.01 %	6.85 dB

Date: 17.JUN.2013 18:10:17

Appendix 2

Diagram 23:

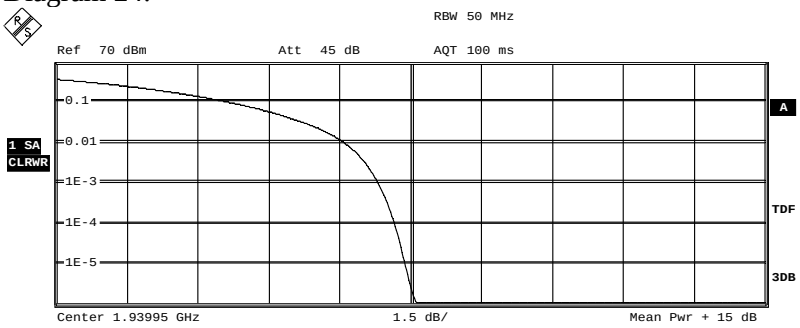


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.29 dBm
Peak	53.01 dBm
Crest	7.71 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.80 dB
.01 %	7.16 dB

Date: 17.JUN.2013 12:03:07

Diagram 24:



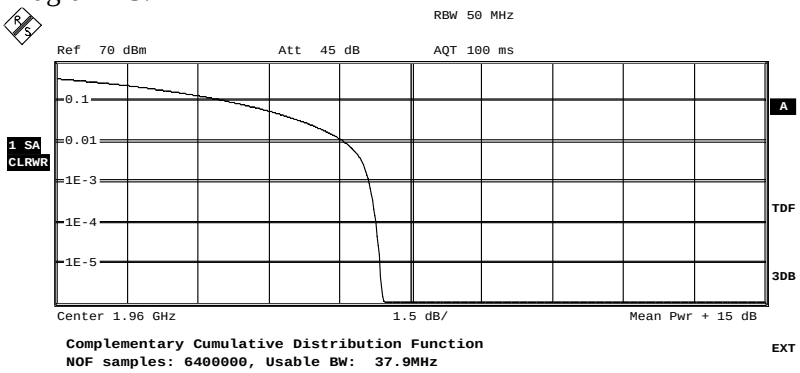
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.26 dBm
Peak	53.08 dBm
Crest	7.81 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.80 dB
.01 %	7.16 dB

Date: 17.JUN.2013 10:43:37

Appendix 2

Diagram 25:

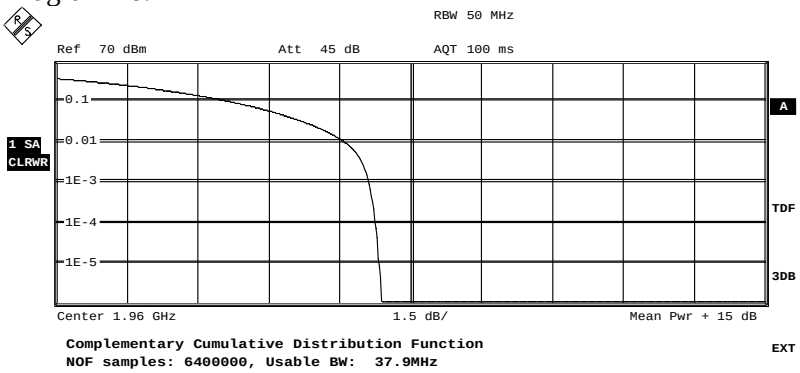


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.36 dBm
Peak	52.37 dBm
Crest	7.01 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.63 dB
.01 %	6.78 dB

Date: 14.JUN.2013 13:34:08

Diagram 26:



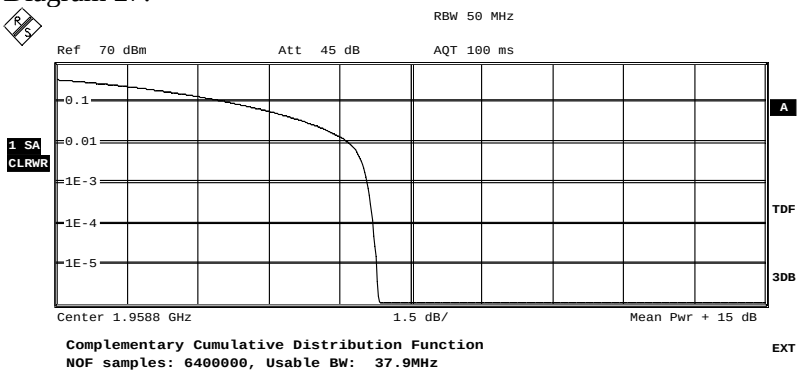
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.34 dBm
Peak	52.37 dBm
Crest	7.03 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.61 dB
.01 %	6.75 dB

Date: 17.JUN.2013 11:24:15

Appendix 2

Diagram 27:

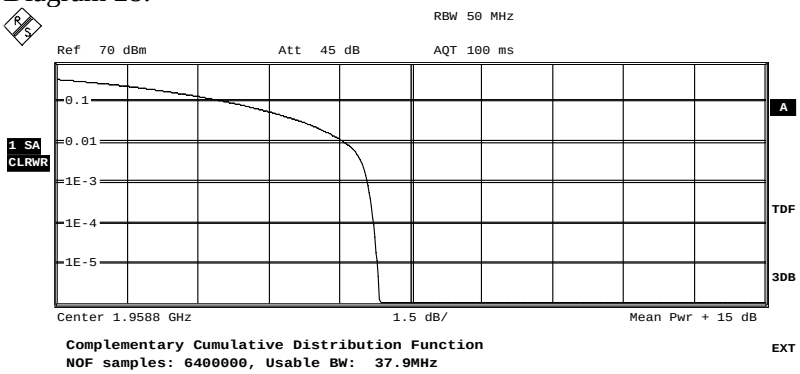


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.36 dBm
Peak	52.30 dBm
Crest	6.94 dB
10 %	3.70 dB
1 %	6.20 dB
.1 %	6.59 dB
.01 %	6.71 dB

Date: 14.JUN.2013 13:32:15

Diagram 28:



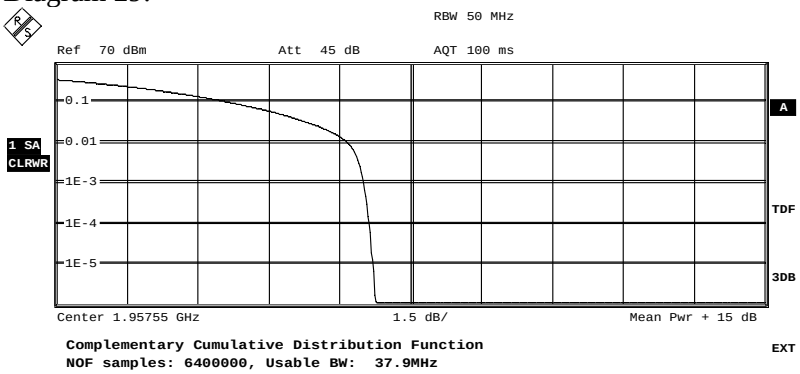
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.33 dBm
Peak	52.23 dBm
Crest	6.90 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.61 dB
.01 %	6.73 dB

Date: 17.JUN.2013 11:26:57

Appendix 2

Diagram 29:

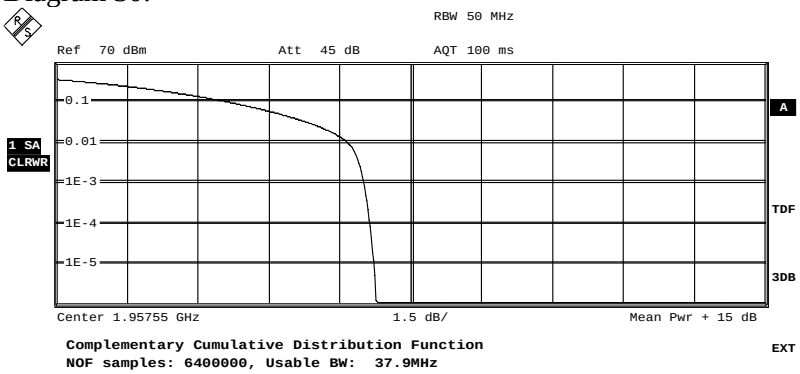


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.35 dBm
Peak	52.16 dBm
Crest	6.81 dB
10 %	3.73 dB
1 %	6.18 dB
.1 %	6.51 dB
.01 %	6.63 dB

Date: 14.JUN.2013 13:16:06

Diagram 30:



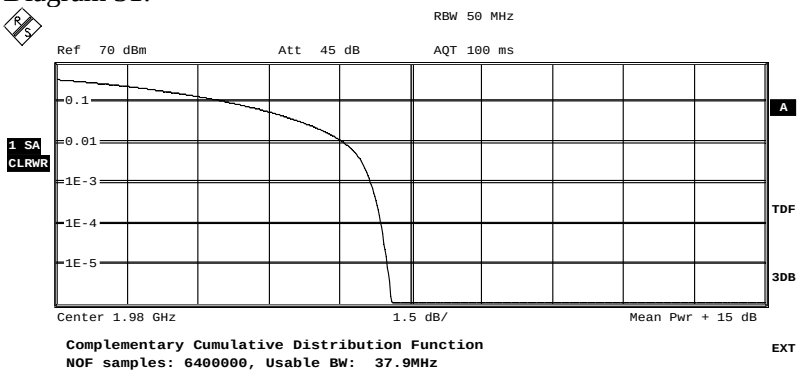
Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.33 dBm
Peak	52.16 dBm
Crest	6.83 dB
10 %	3.73 dB
1 %	6.18 dB
.1 %	6.51 dB
.01 %	6.63 dB

Date: 17.JUN.2013 11:29:32

Appendix 2

Diagram 31:

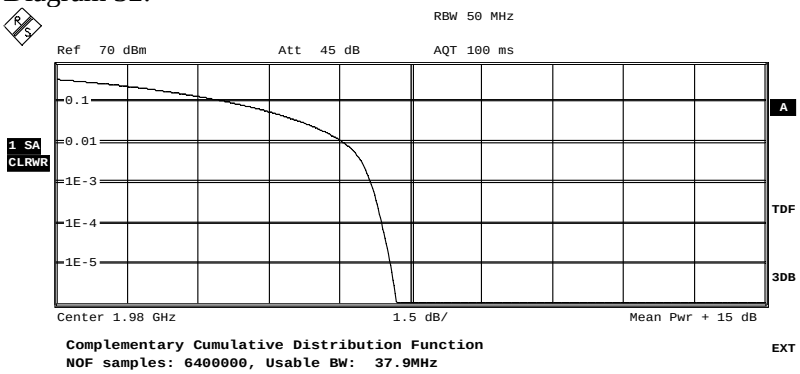


Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.38 dBm
Peak	52.53 dBm
Crest	7.15 dB
10 %	3.70 dB
1 %	6.11 dB
.1 %	6.66 dB
.01 %	6.88 dB

Date: 17.JUN.2013 07:15:59

Diagram 32:



Complementary Cumulative Distribution Function
NOF samples: 6400000, Usable BW: 37.9MHz

	Trace 1
Mean	45.27 dBm
Peak	52.53 dBm
Crest	7.26 dB
10 %	3.70 dB
1 %	6.08 dB
.1 %	6.66 dB
.01 %	6.90 dB

Date: 17.JUN.2013 11:56:52

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

Date	Temperature	Humidity
2013-05-29	23 °C ± 3 °C	51 % ± 5 %

Test set-up and procedure

The measurements were made per definition in §2.1049. The output was connected to a signal analyzer with the RMS detector activated. The signal analyzer was connected to an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
Rohde & Schwarz signal analyzer FSQ40	504 143
RF attenuator	901 508
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

WCDMA:

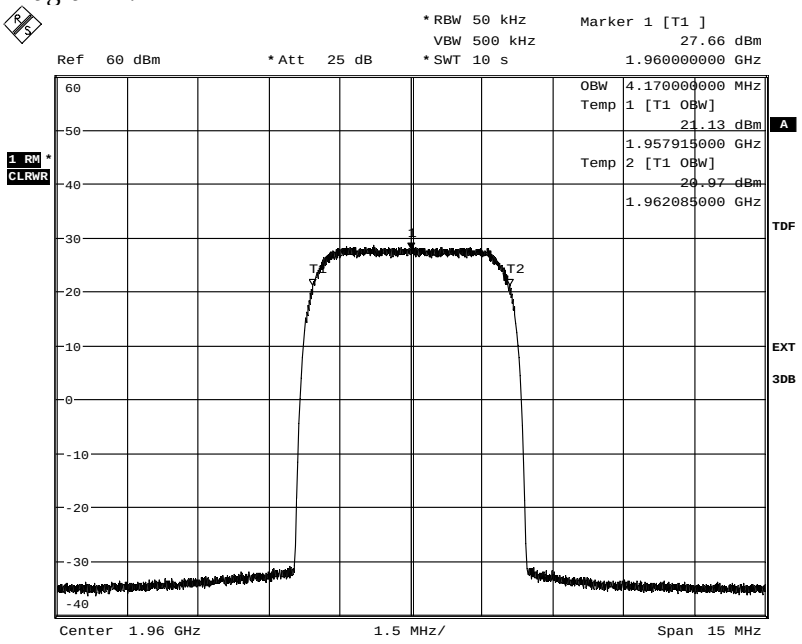
Diagram	BW / [MHz]	TX frequency	Tested Port	OBW (99%) / [MHz]
1	5 MHz	M	RF A	4.17
2	5 MHz	M	RF B	4.17

LTE:

Diagram	BW / [MHz]	TX frequency	Tested Port	OBW (99%) / [MHz]
3	1.4	M	RF A	1.09
4	3	M	RF A	2.69
5	5	M	RF A	4.48
6	10	M	RF A	8.93
7	15	M	RF A	13.43
8	20	M	RF A	17.86
9	1.4	M	RF B	1.09
10	20	M	RF B	17.86

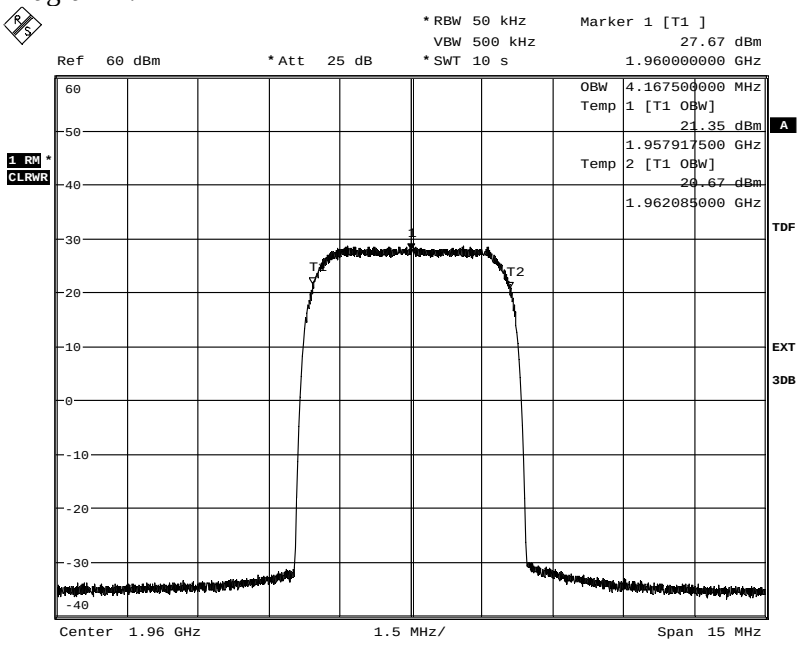
Appendix 3

Diagram 1:



Date: 29.MAY.2013 06:54:34

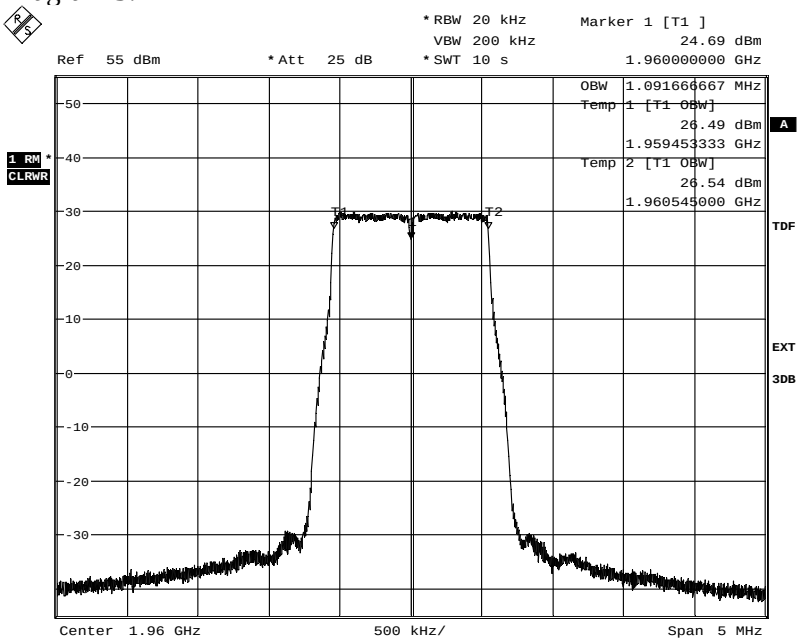
Diagram 2:



Date: 29.MAY.2013 08:02:39

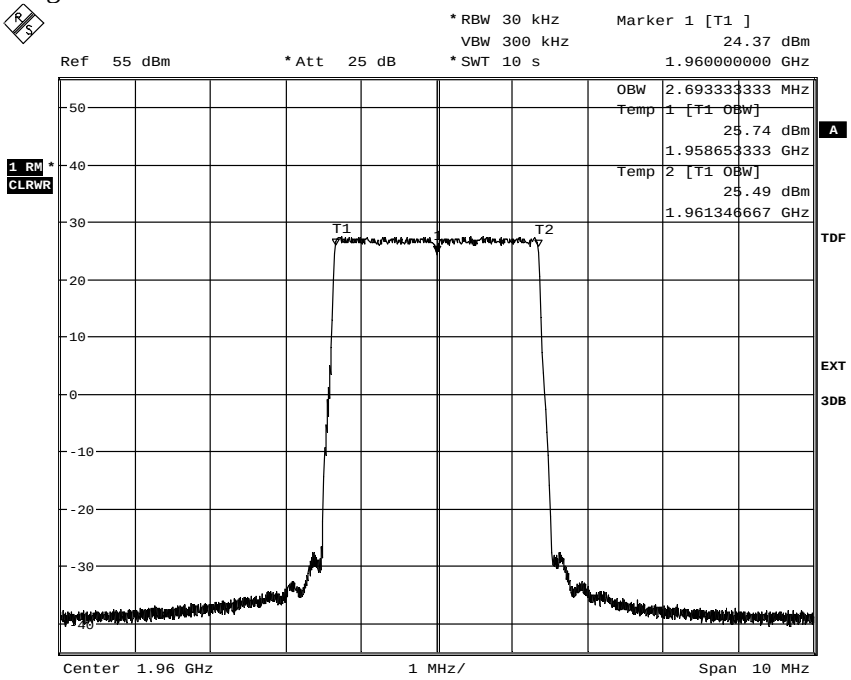
Appendix 3

Diagram 3:



Date: 29.MAY.2013 10:44:30

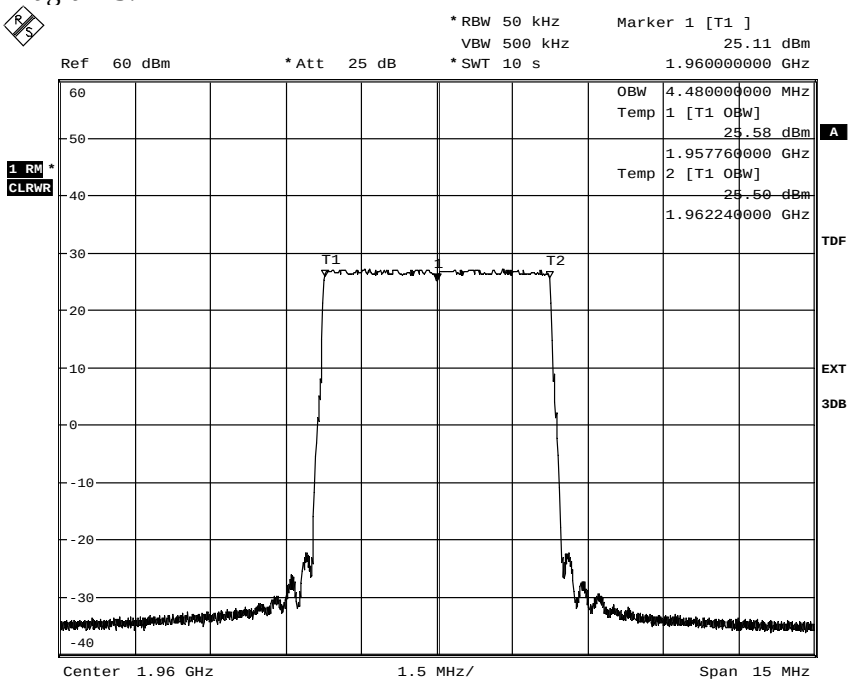
Diagram 4:



Date: 29.MAY.2013 13:45:32

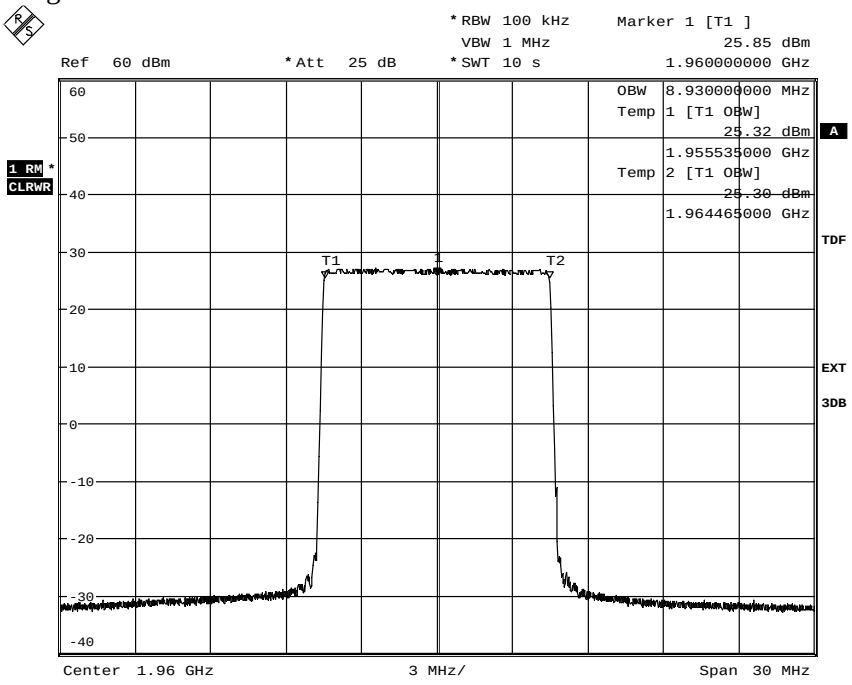
Appendix 3

Diagram 5:



Date: 29.MAY.2013 13:26:53

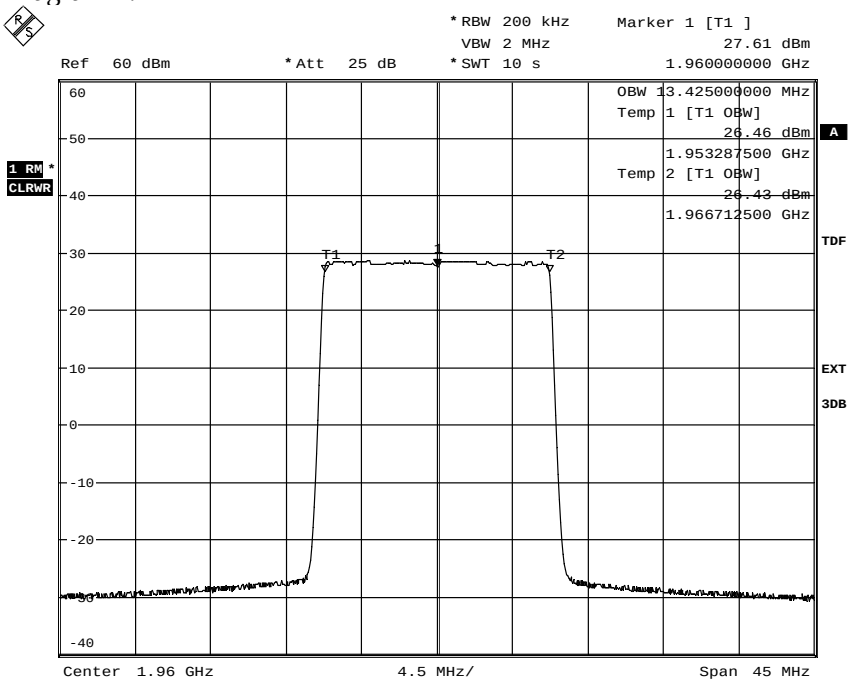
Diagram 6:



Date: 29.MAY.2013 13:20:56

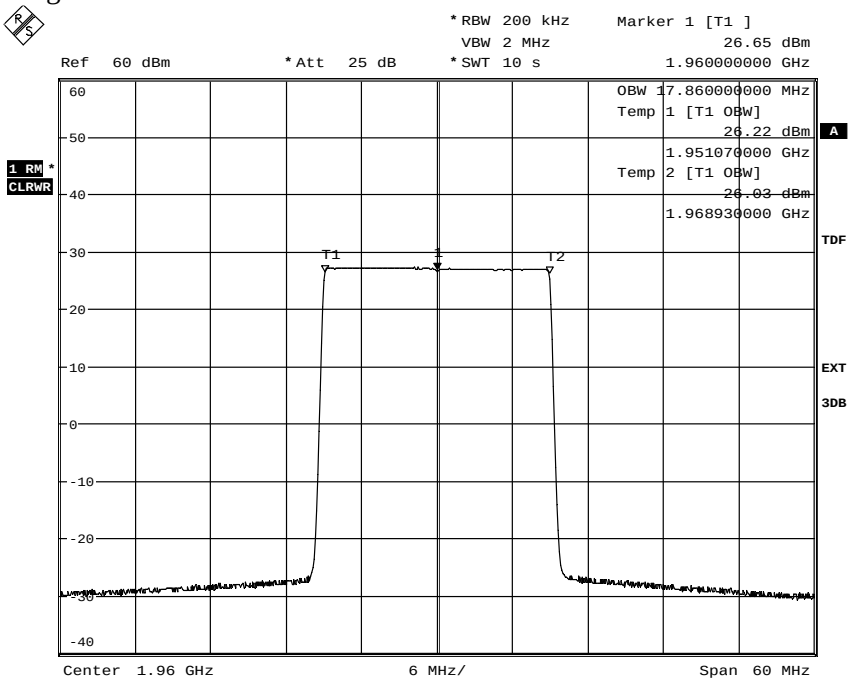
Appendix 3

Diagram 7:



Date: 29.MAY.2013 12:46:38

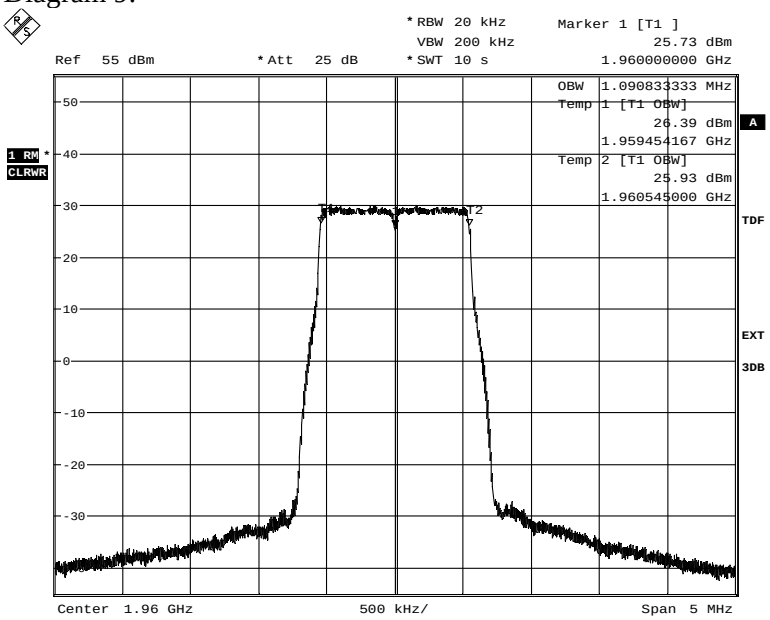
Diagram 8:



Date: 29.MAY.2013 12:36:56

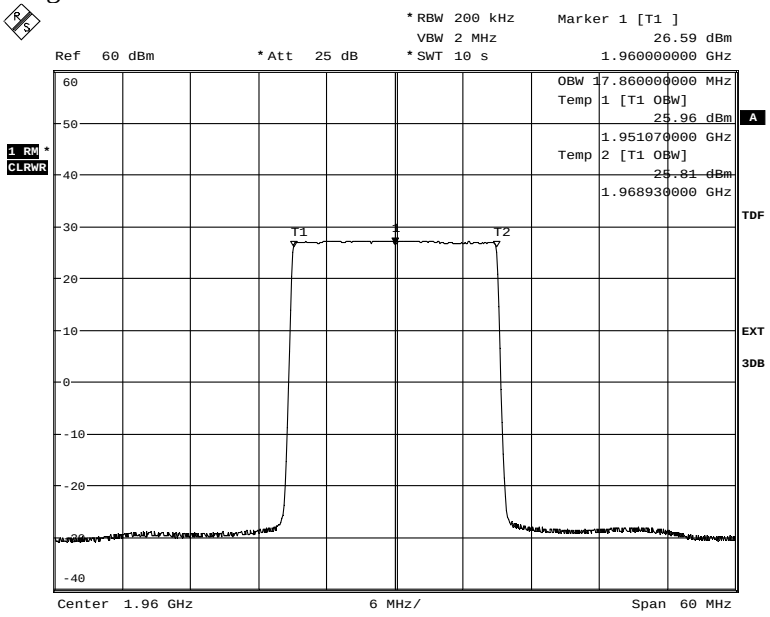
Appendix 3

Diagram 9:



Date: 29.MAY.2013 11:23:18

Diagram 10:



Date: 29.MAY.2013 11:32:11

Band edge measurements according to CFR 47 §2.1051 / IC RSS-133 6.5

Date	Temperature	Humidity
2013-05-29	23 °C ± 3 °C	51 % ± 5 %

Test set-up and procedure

The measurements were made per definition in §24.238. The test object was 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.

FCC rules specify a RBW of at least 1% of the fundamental emission bandwidth (EBW) for offsets up to 1 MHz from the band edge and a RBW of 1 MHz for bigger offsets.

Before comparing results to the limit, two mathematical adjustments need to be applied: Where a smaller RBW was used as compared to FCC rules the limit in the plot is to be adjusted by 10*log(RBWused/RBW1%EBW) [dB]. For diagrams denoted 'b:' this correction was applied using RBW 100 kHz instead of 1 MHz and limit -23 dBm instead of -13 dBm.

Before comparing the results to the limit, 3 dB [10 log (2)] should be added according to method E), 3), (iii) "measure and add 10 log(N_{ANT})" of FCC KDB662911 D01 Multiple Transmitter Output v02

LTE:

BW configuration	Emission BW [MHz]	RBW used	Adjusted limit [dBm]
1.4 MHz	1.12	20 kHz	-
3 MHz	2.73	20 kHz	-14.35
5 MHz	4.54	50 kHz	-

WCDMA:

BW configuration	Emission BW [MHz]	RBW used	Adjusted limit [dBm]
5 MHz	4.37	30 kHz	-14.63

Measurement equipment	SP number
Rohde & Schwarz signal analyzer FSQ40	504 143
RF attenuator	901 508
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

WCDMA SR, SC:

Diagram	Configuration BW TX power/ per RF port	Frequency	Tested Port
1 a-c	5 MHz, 1x 46.0 dBm	B	RF A
2 a-c	5 MHz, 1x 46.0 dBm	T	RF A
3 a-c	5 MHz, 1x 46.0 dBm	B	RF B
4 a-c	5 MHz, 1x 46.0 dBm	T	RF B

LTE SR, SC:

Diagram	Configuration BW TX power/ per RF port	Frequency	Tested Port
5 a-c	1.4 MHz, 1x 46.0 dBm	B	RF A
6 a-c	3 MHz, 1x 46.0 dBm	B	RF A
7 a-c	5 MHz, 1x 46.0 dBm	B	RF A
8 a-c	3 MHz, 1x 46.0 dBm	B	RF B
9 a+c	1.4 MHz, 1x 46.0 dBm	T	RF A
10 a+c	3 MHz, 1x 46.0 dBm	T	RF A
11 a+c	5 MHz, 1x 46.0 dBm	T	RF A
12 a+c	3 MHz, 1x 46.0 dBm	T	RF B

Limits

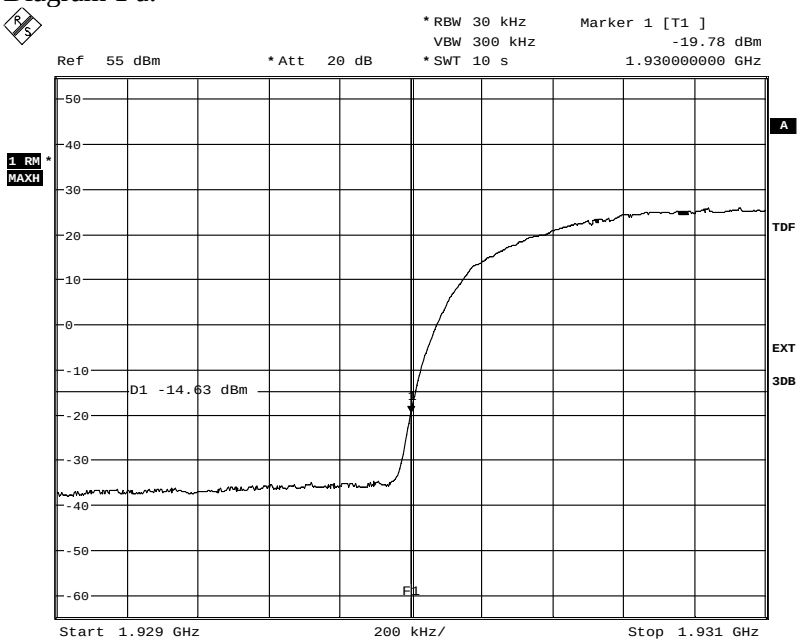
CFR 47 §24.238 and RSS-133 6.5

Outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, resulting in a limit of -13 dBm.

Complies?	Yes

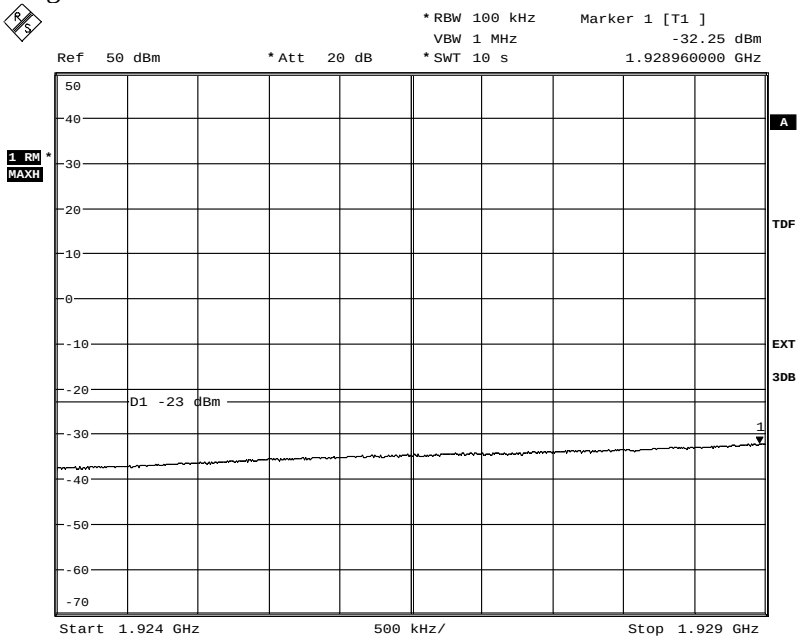
Appendix 4

Diagram 1 a:



Date: 29.MAY.2013 08:28:04

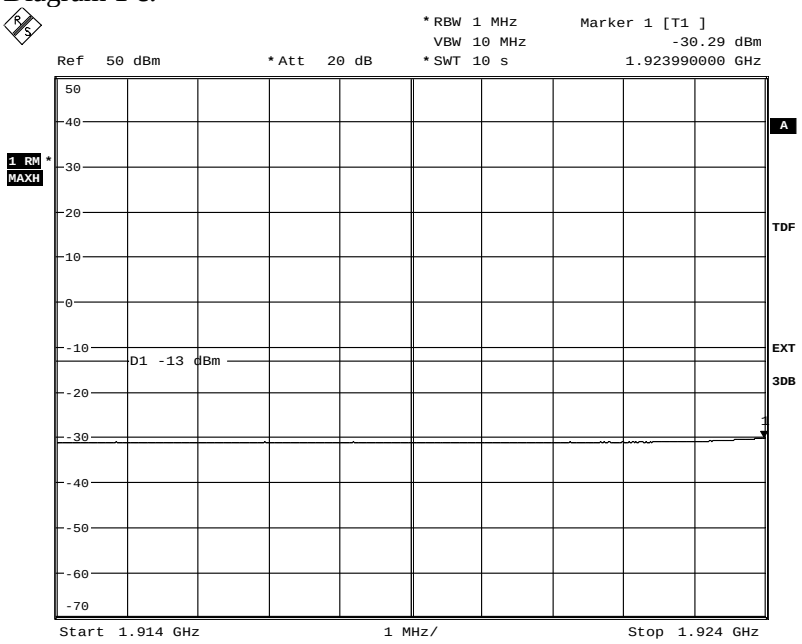
Diagram 1 b:



Date: 29.MAY.2013 08:35:06

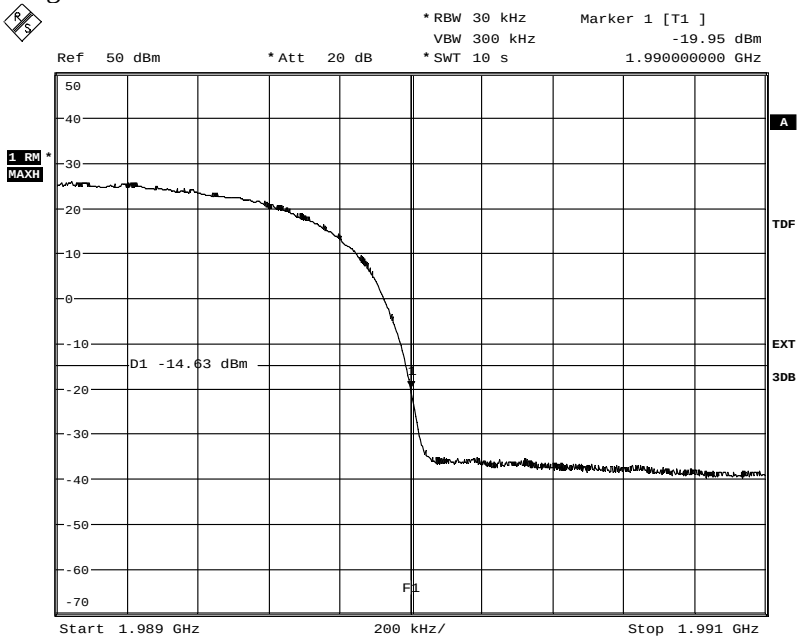
Appendix 4

Diagram 1 c:



Date: 29.MAY.2013 08:37:34

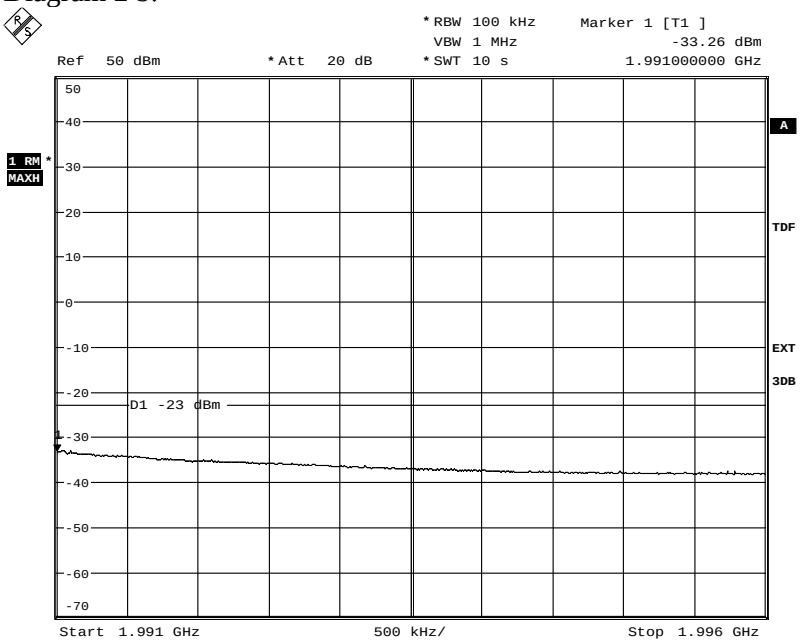
Diagram 2 a:



Date: 29.MAY.2013 09:04:38

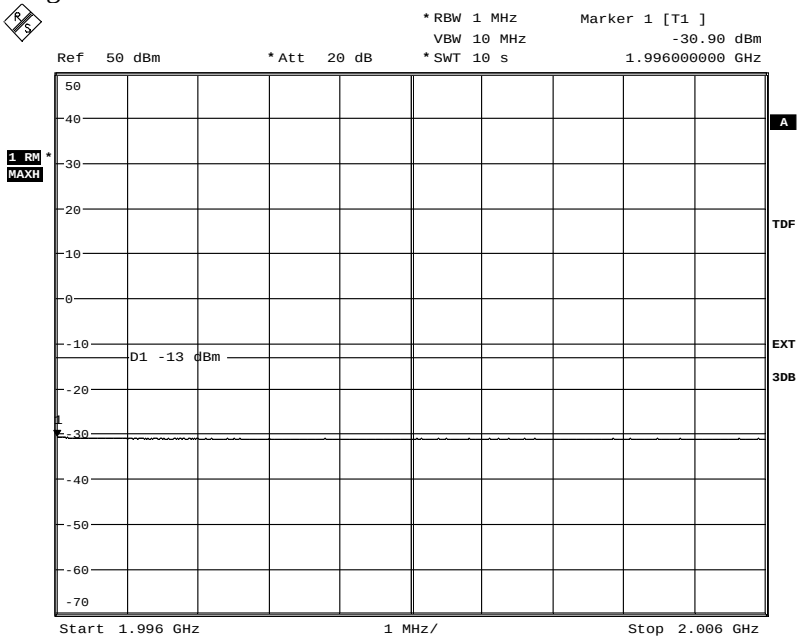
Appendix 4

Diagram 2 b:



Date: 29.MAY.2013 09:06:46

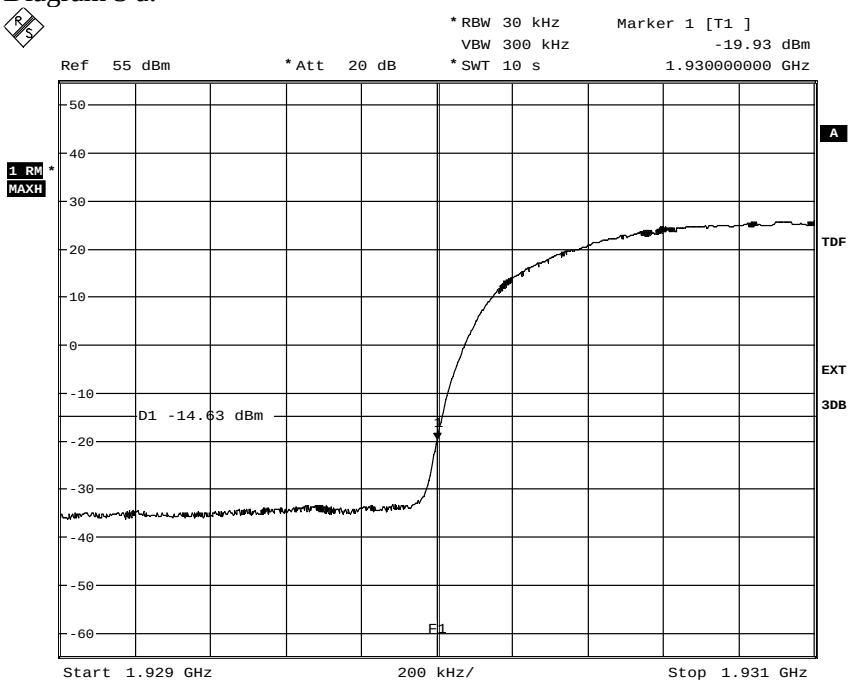
Diagram 2 c:



Date: 29.MAY.2013 09:09:05

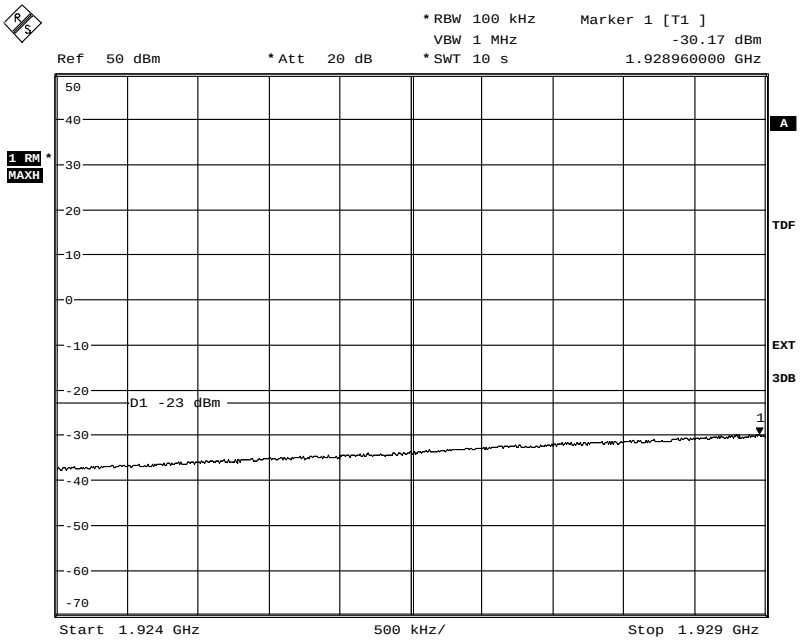
Appendix 4

Diagram 3 a:



Date: 29.MAY.2013 08:48:47

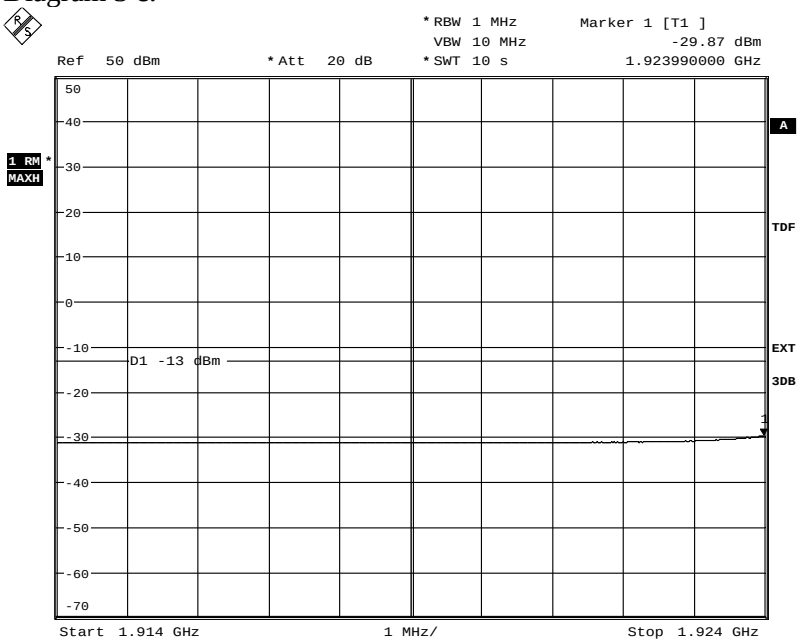
Diagram 3 b:



Date: 29.MAY.2013 08:49:49

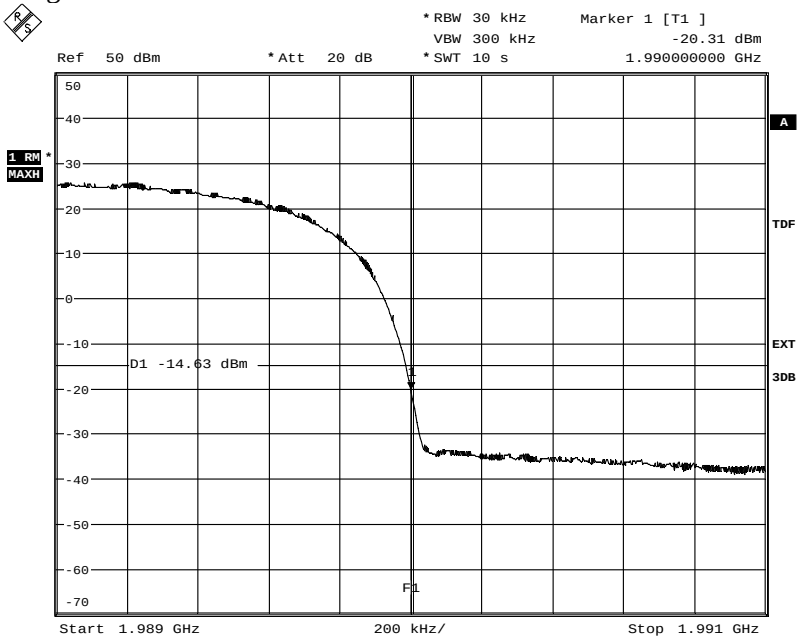
Appendix 4

Diagram 3 c:



Date: 29.MAY.2013 08:50:46

Diagram 4 a:



Date: 29.MAY.2013 09:26:10

Appendix 4

Diagram 4 b:

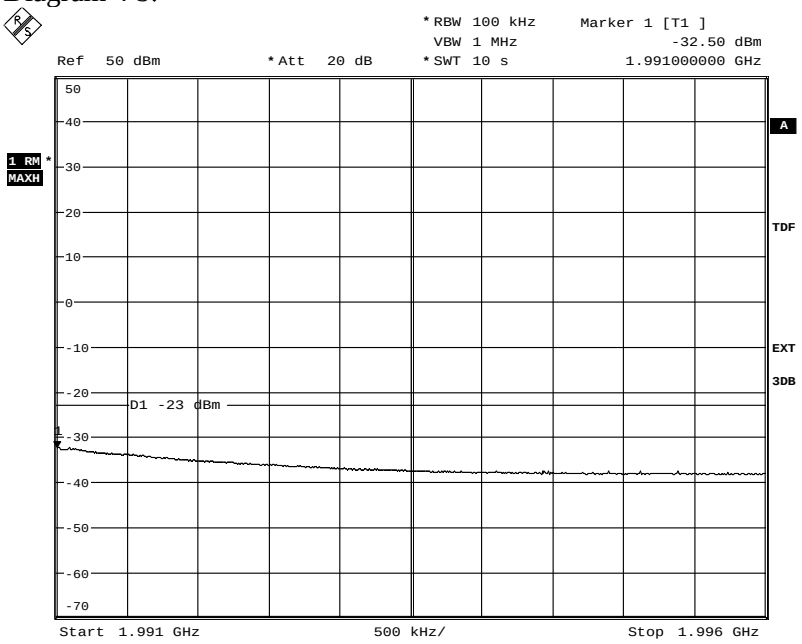


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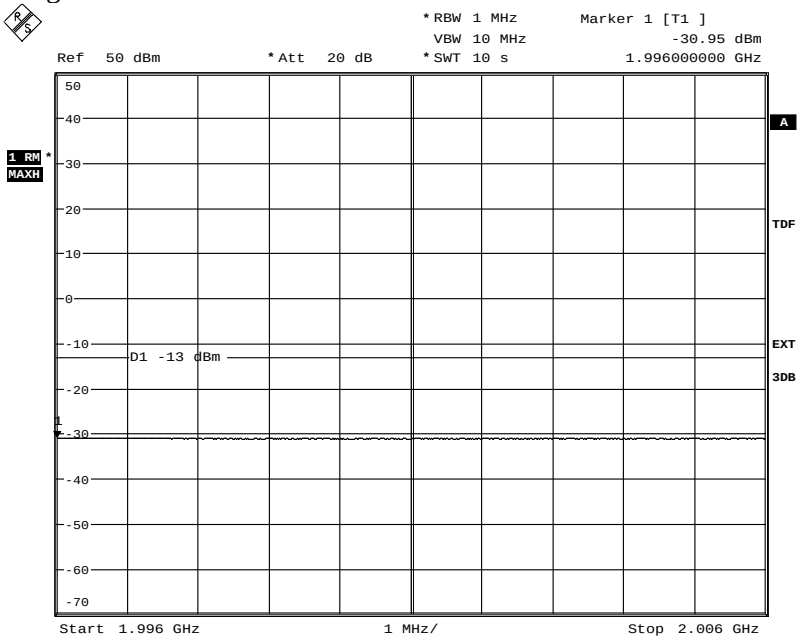
Diagram 4 c:



Date: 29.MAY.2013 09:14:22

Appendix 4

Diagram 5 a:

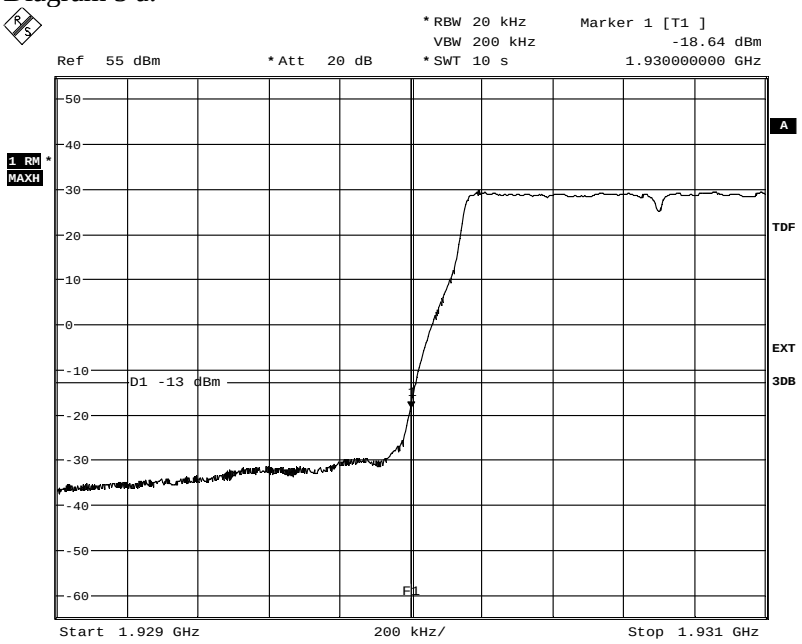


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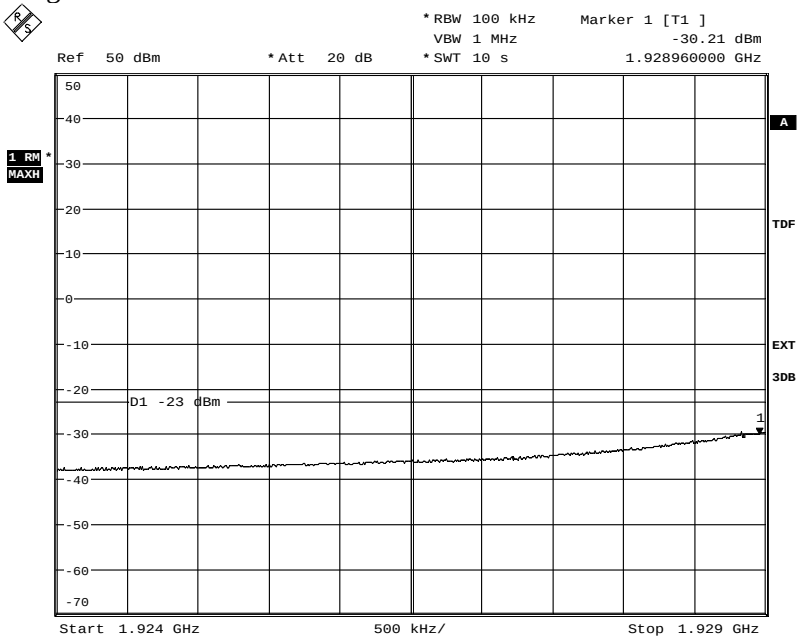
Diagram 5 b:



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Appendix 4

Diagram 5 c:

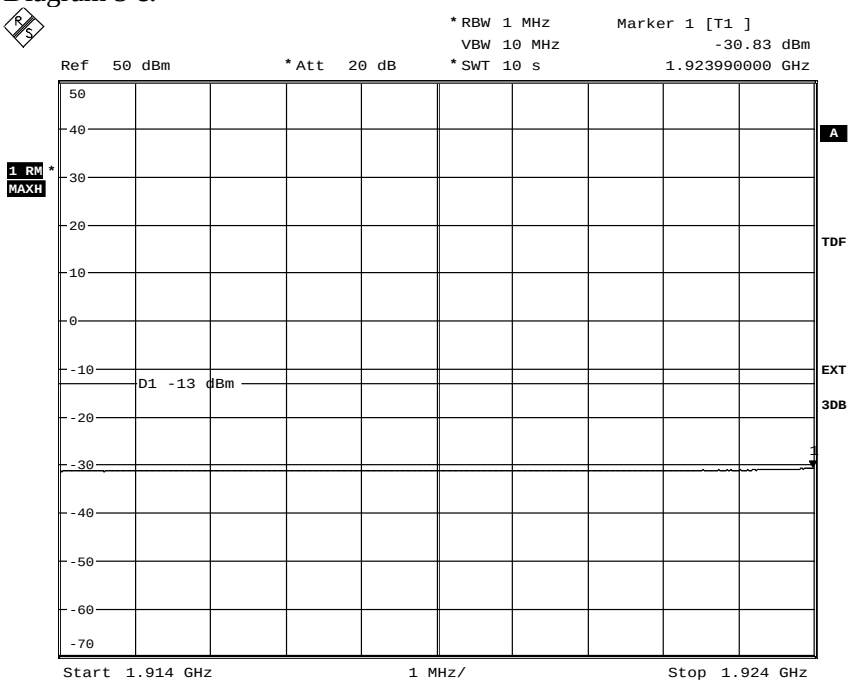

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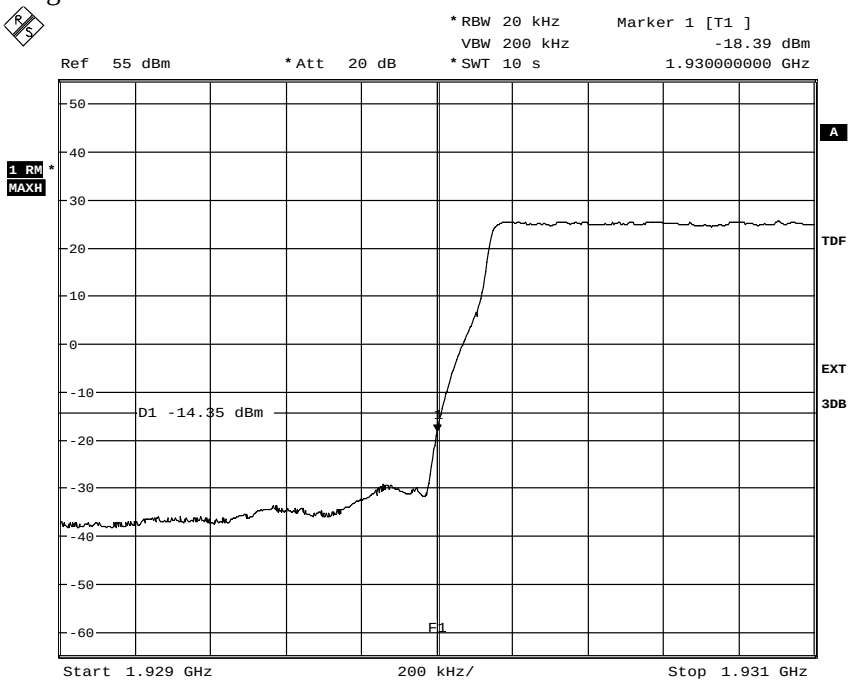
Diagram 6 a:



Date: 29.MAY.2013 14:27:39

Appendix 4

Diagram 6 b:

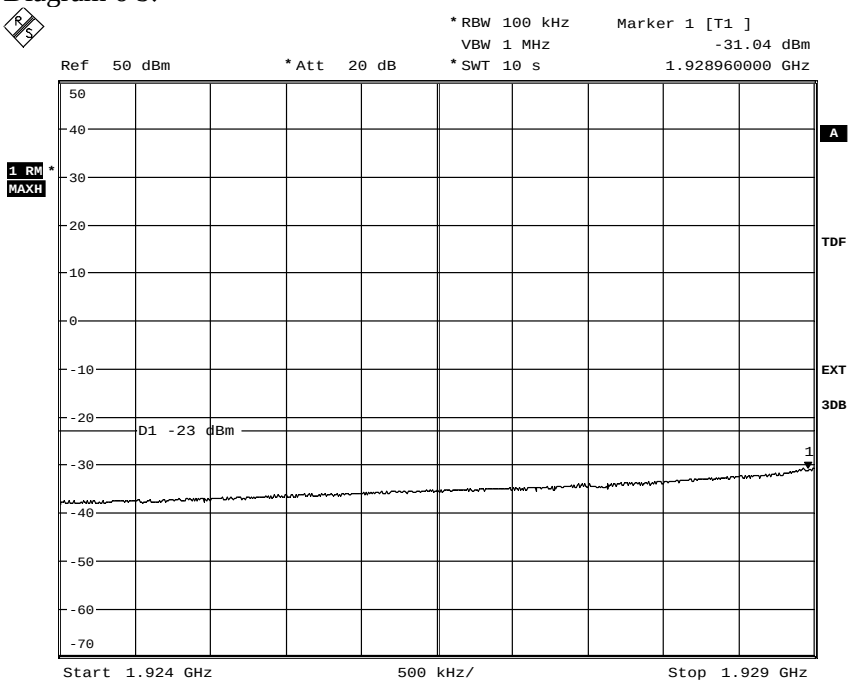


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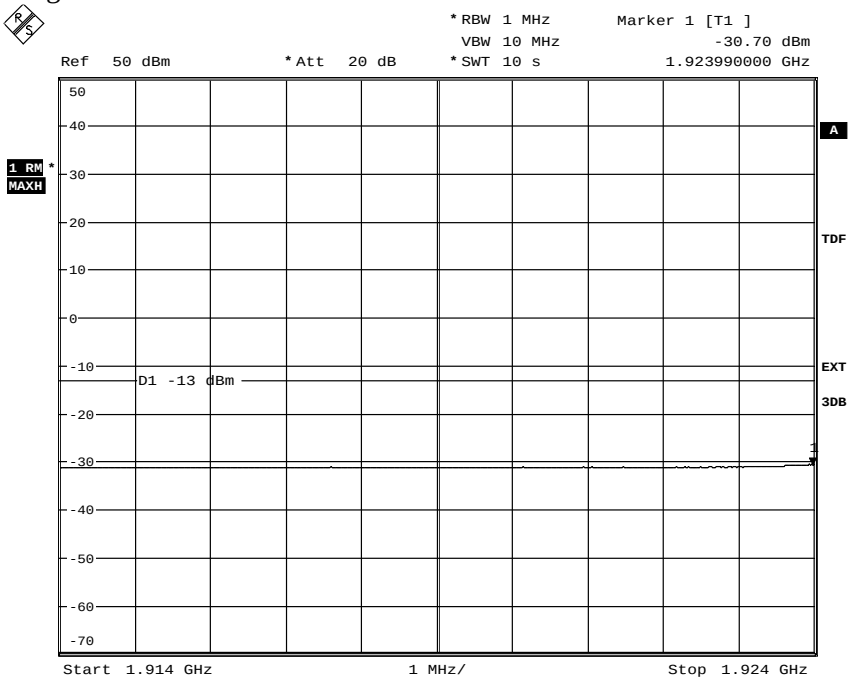
Diagram 6 c:



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Appendix 4

Diagram 7 a:

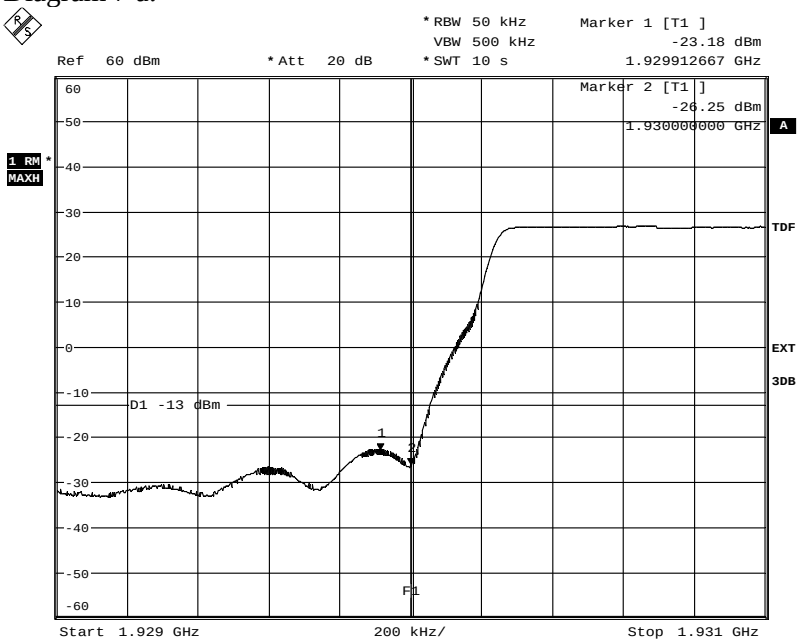

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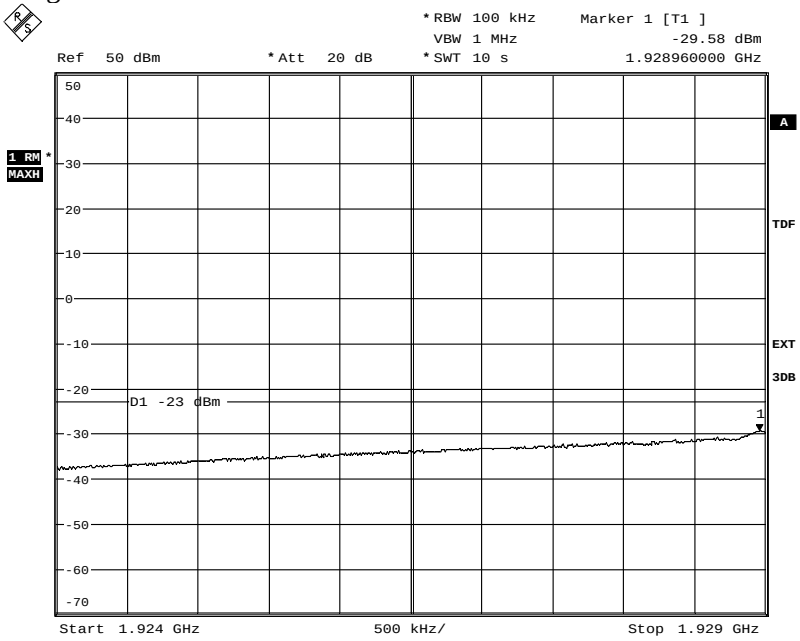
Diagram 7 b:



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Appendix 4

Diagram 7 c:

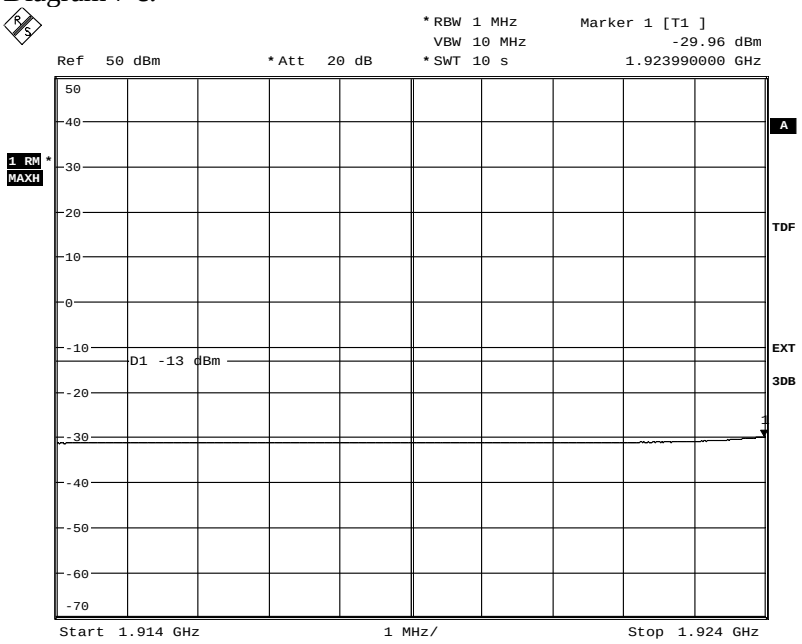

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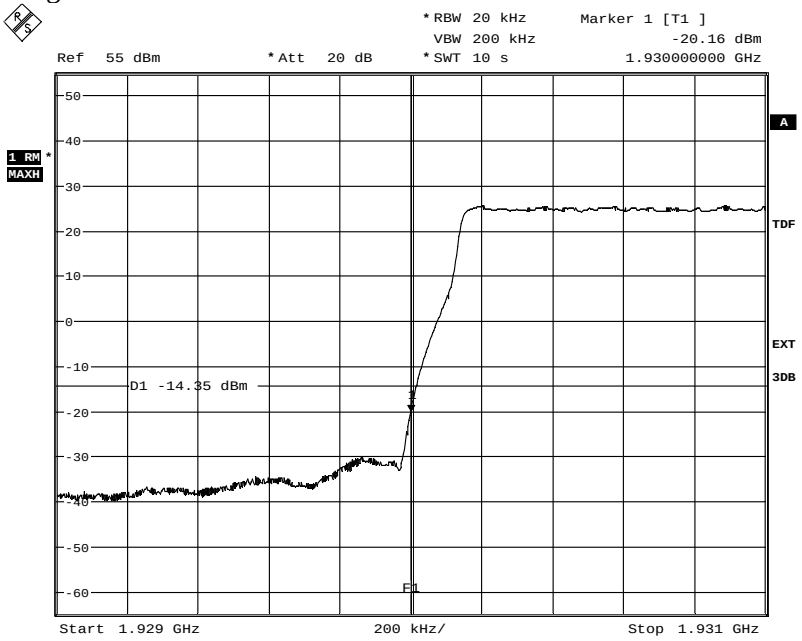
Diagram 8 a:



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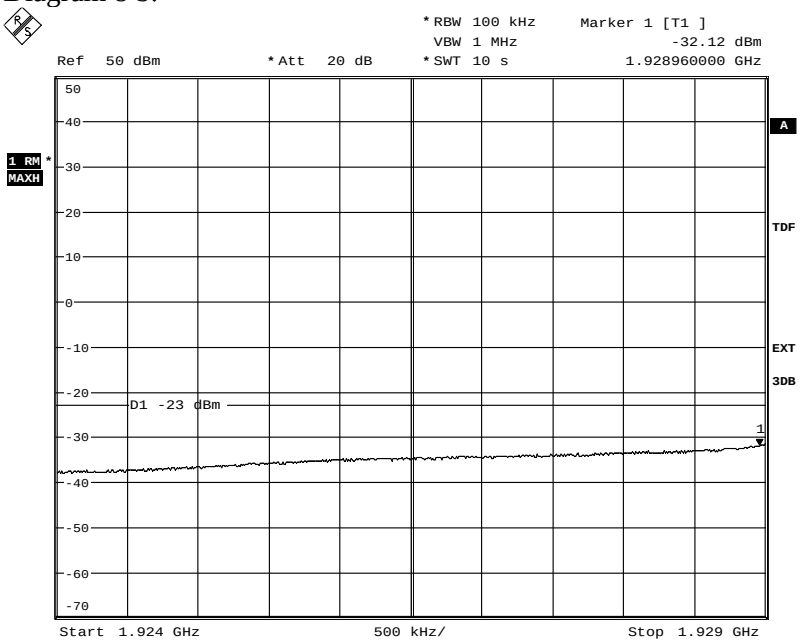
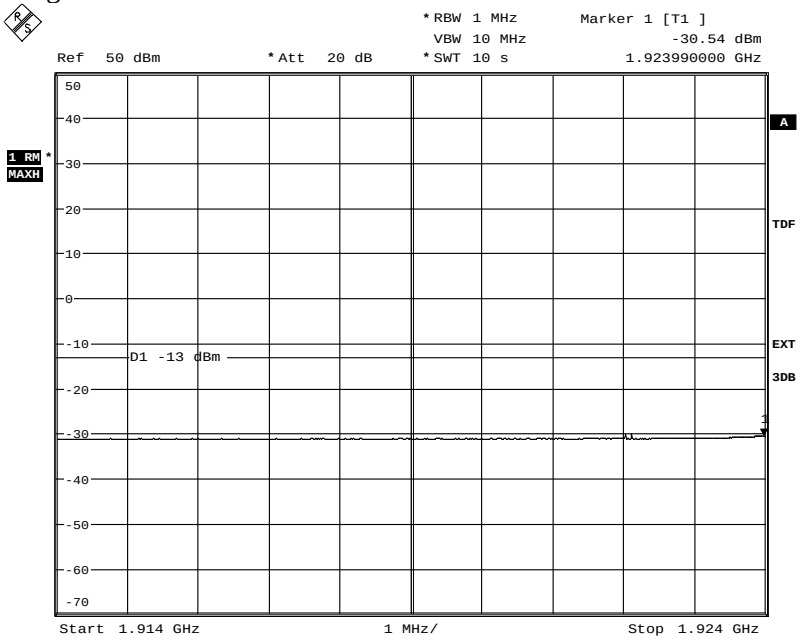
Appendix 4

Diagram 8 b:



Date: 29.MAY.2013 14:40:26

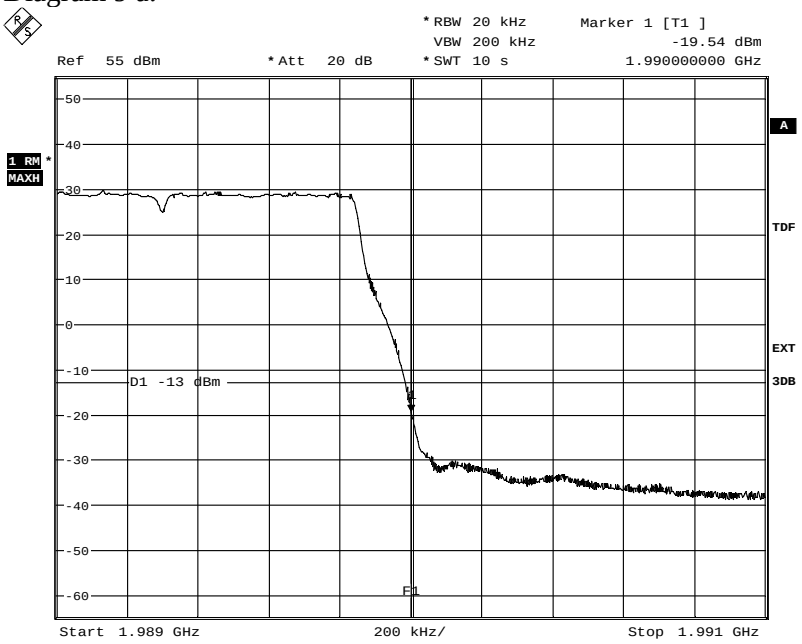
Diagram 8 c:



Date: 29.MAY.2013 14:38:56

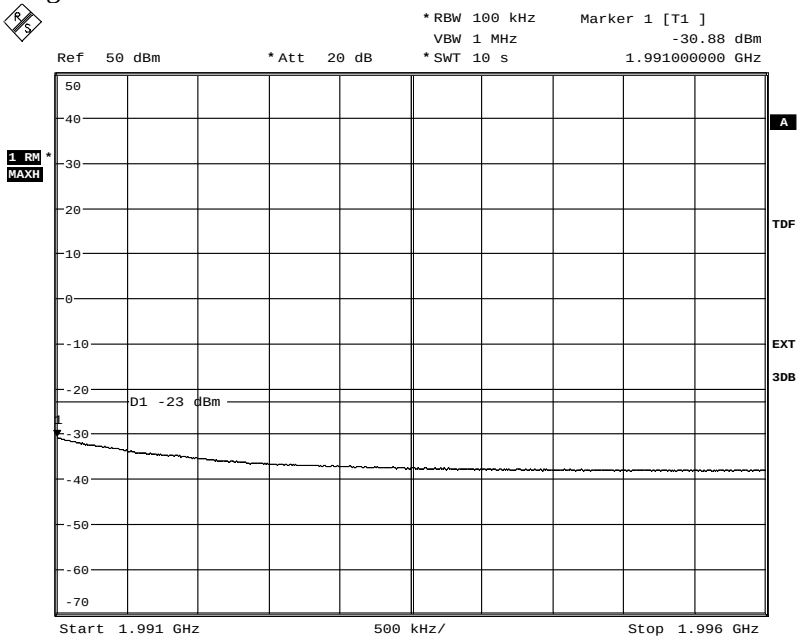
Appendix 4

Diagram 9 a:



Date: 29.MAY.2013 15:05:45

Diagram 9 b:



Date: 29.MAY.2013 15:03:41

Appendix 4

Diagram 9 c:

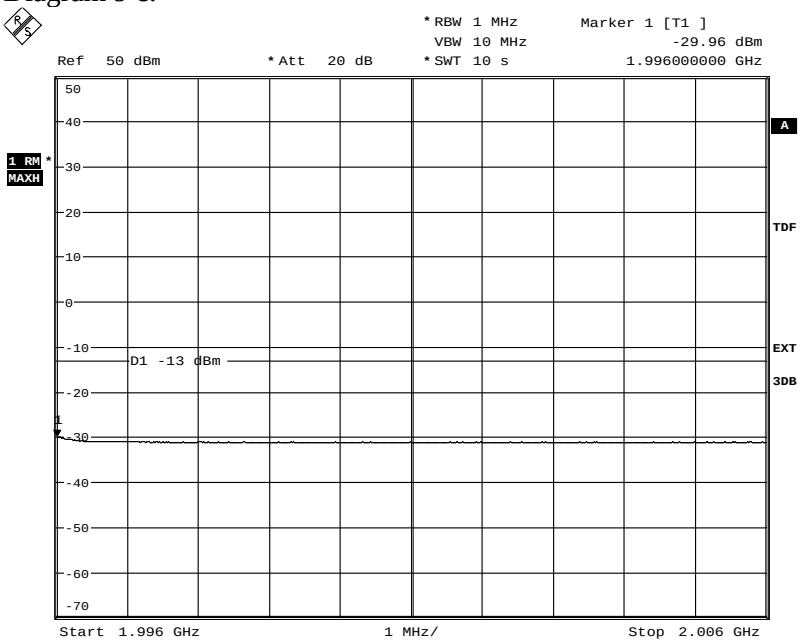


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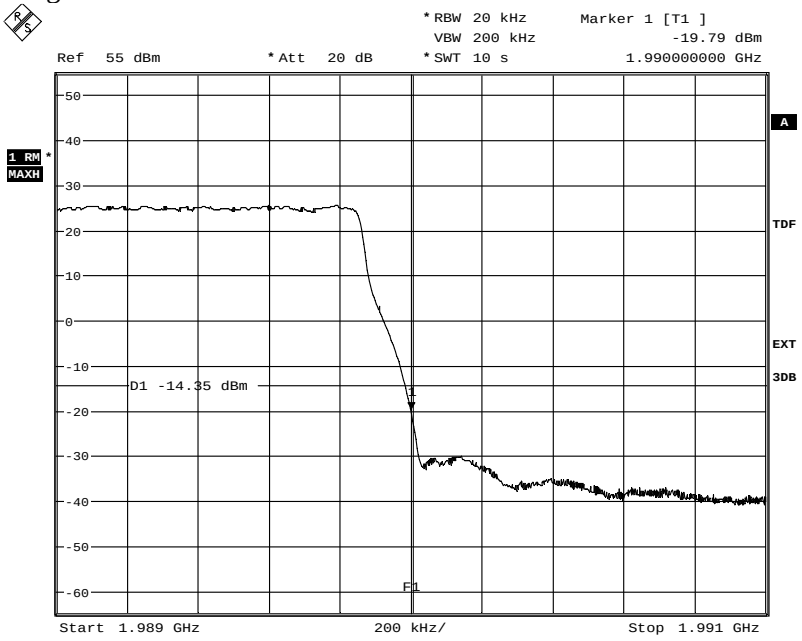
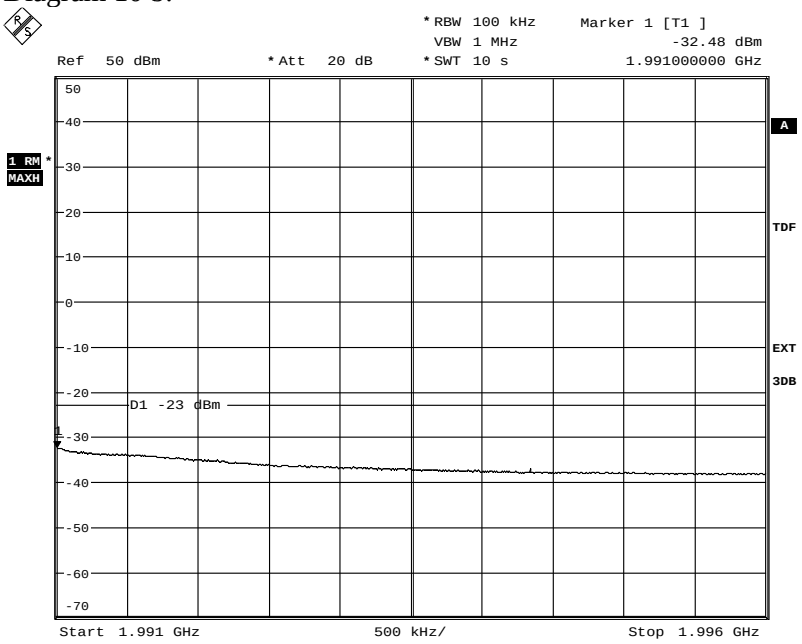
Diagram 10 a:



Date: 29.MAY.2013 14:55:27

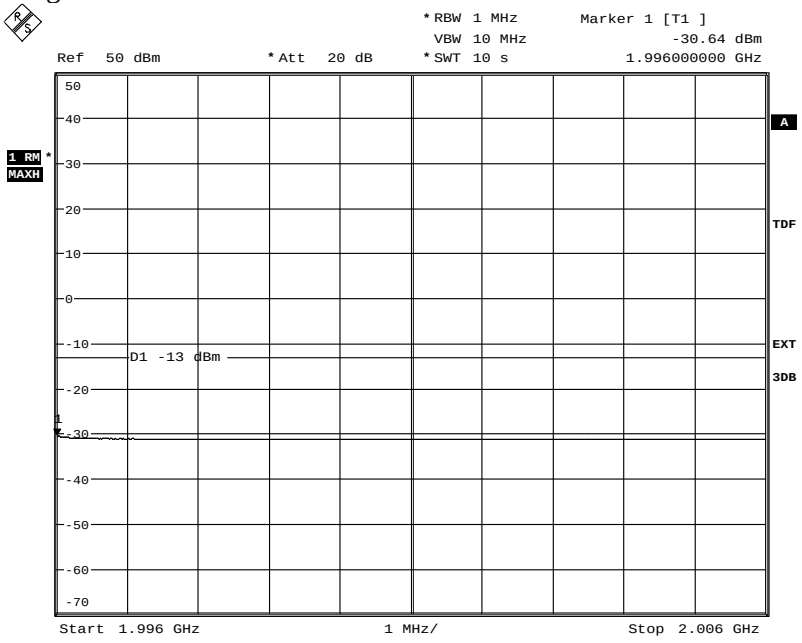
Appendix 4

Diagram 10 b:



Date: 29.MAY.2013 14:57:09

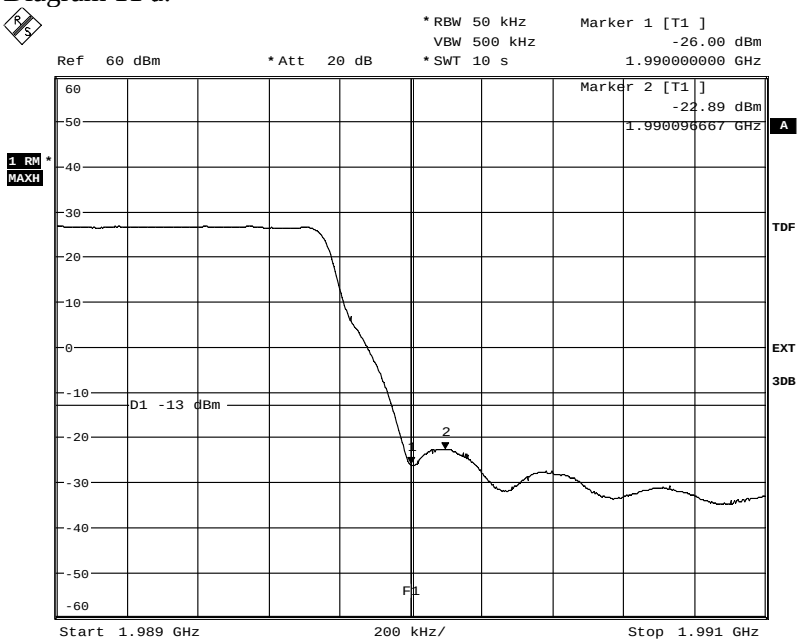
Diagram 10 c:



Date: 29.MAY.2013 14:58:29

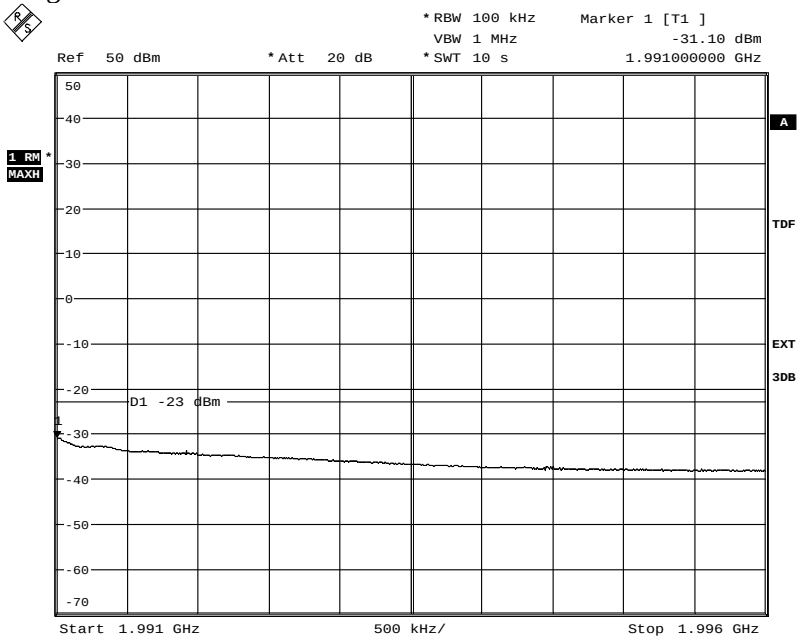
Appendix 4

Diagram 11 a:



Date: 29.MAY.2013 15:39:08

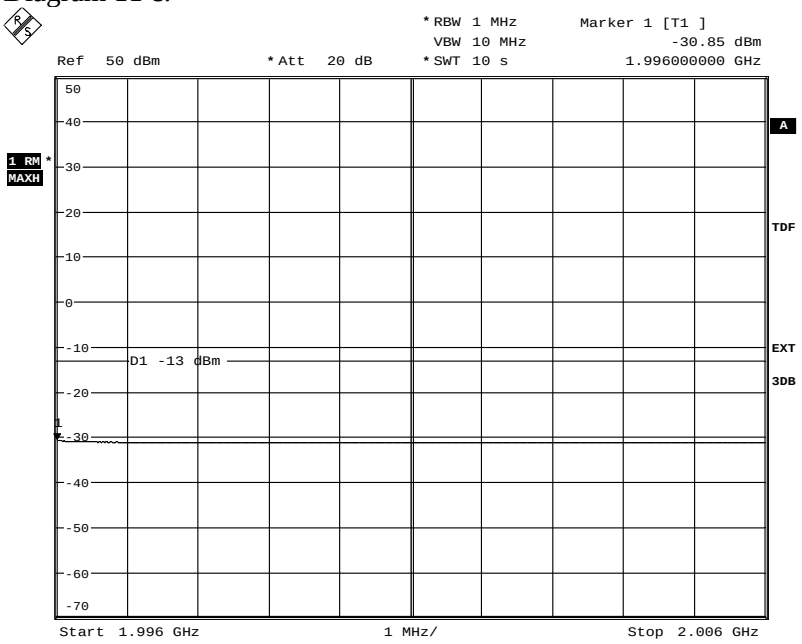
Diagram11 b:



Date: 29.MAY.2013 15:40:54

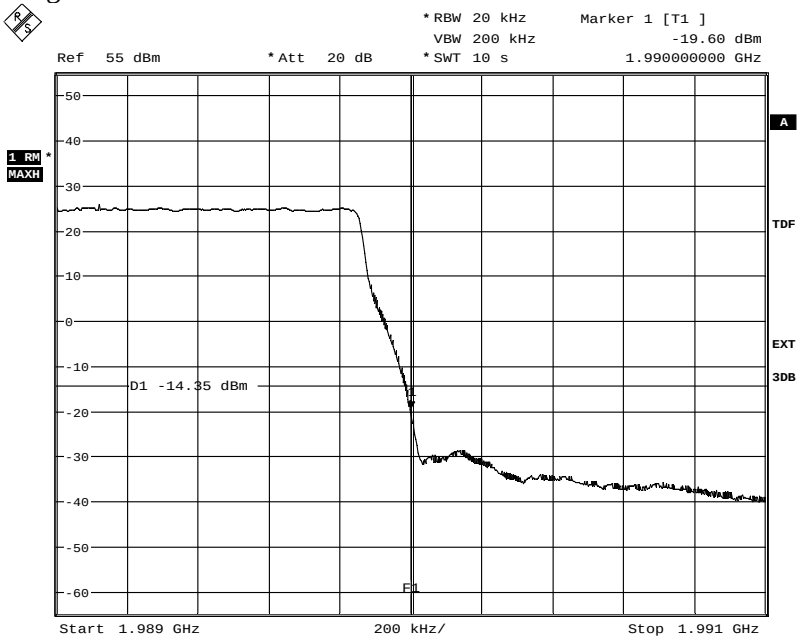
Appendix 4

Diagram 11 c:



Date: 29.MAY.2013 15:42:22

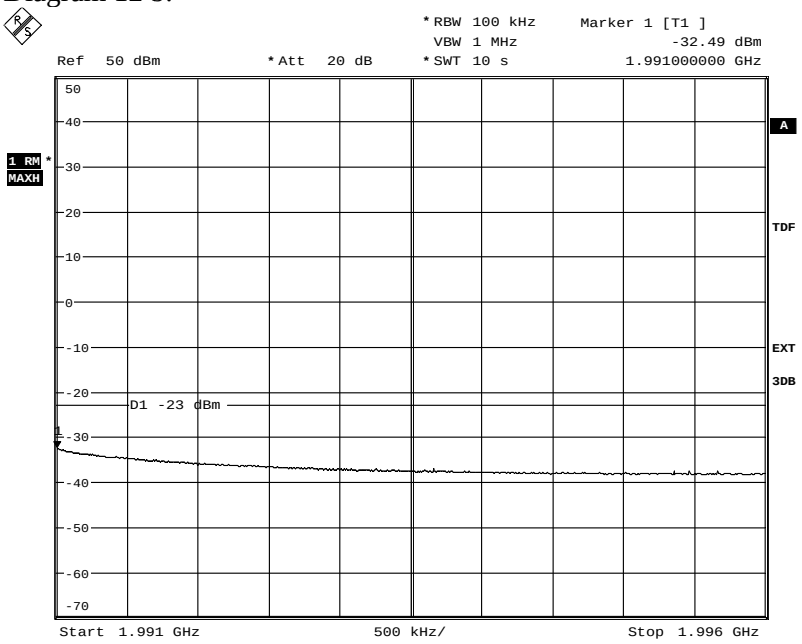
Diagram 12 a:



Date: 29.MAY.2013 14:46:27

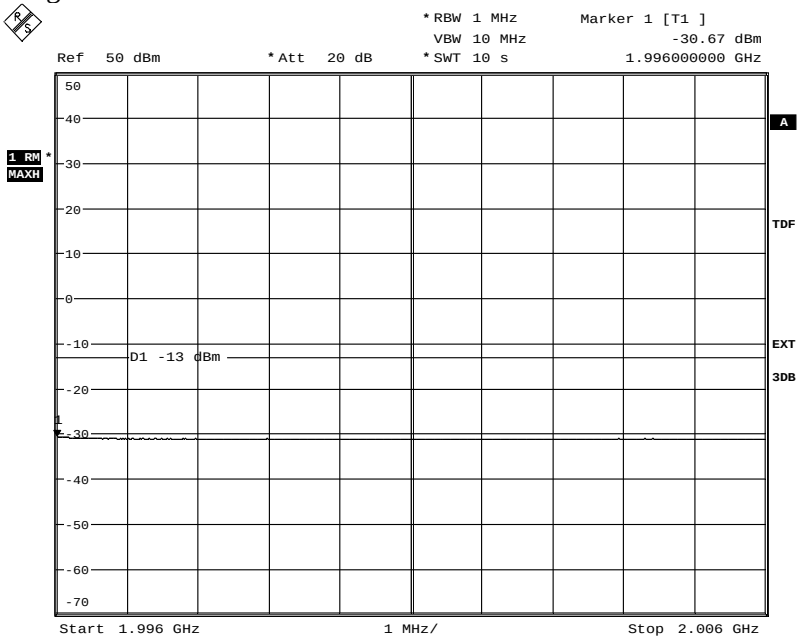
Appendix 4

Diagram 12 b:



Date: 29.MAY.2013 14:48:24

Diagram 12 c:



Date: 29.MAY.2013 14:49:22

Conducted spurious emission measurements according to CFR 47 §2.1051 / IC RSS-133 6.5

Date	Temperature	Humidity
2013-05-29	23 °C ± 3 °C	51 % ± 5 %
2013-06-14	23 °C ± 3 °C	35 % ± 5 %
2013-06-17	23 °C ± 3 °C	46 % ± 5 %

Test set-up and procedure

The measurements were made per definition in §24.238. The output was connected to a spectrum analyzer with a RBW setting of 1 MHz and RMS detector activated. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

Before comparing the results to the limit, 3 dB [10 log (2)] should be added according to method E), 3), (iii) “measure and add 10 log(N_{ANT})” of FCC KDB662911 D01 Multiple Transmitter Output v02

Measurement equipment	SP number
Rohde & Schwarz signal analyzer FSQ40	504 143
RF attenuator	901 508
High pass filter	901 502
Testo 635 temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

WCDMA single RAT MIMO

Diagrams	BW / [MHz]	TX frequency	Tested Port
1 a-d	5 MHz	M	RF A
2 a-d	5 MHz	M	RF B

LTE single RAT MIMO, single carrier

Diagrams	BW / [MHz]	TX frequency	Tested Port
3 a-d	1.4	M	RF A
4 a-d	20	M	RF A
5 a-d	1.4	M	RF B
6 a-d	20	M	RF B

LTE single RAT MIMO, multi carrier

Diagrams	BW / [MHz]	Symbolic frequency	Tested Port
7 a-e	1.4	B_{IM2}	RF A
8 a-e	1.4	T_{IM2}	RF A

WCDMA + LTE MSR

Diagrams	WCDMA BW/[MHz]	LTE BW/[MHz]	Symbolic frequency	Tested Port
9 a-d	5	5	B	RF A
10 a-d	5	10	B	RF A
11 a-d	5	15	B	RF A
12 a-d	5	5	M	RF A
13 a-d	5	10	M	RF A
14 a-d	5	15	M	RF A
15 a-d	5	5	T	RF A
16 a-d	5	10	T	RF A
17 a-d	5	15	T	RF A
18	5	5	B_{IM}	RF A
19	5	5	T_{IM}	RF A

The diagrams are shown on the following pages.

Remarks

The emission at 9 kHz on some of the 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 upper frequency boundary was chosen to cover 10x the highest TX fundamental frequency.

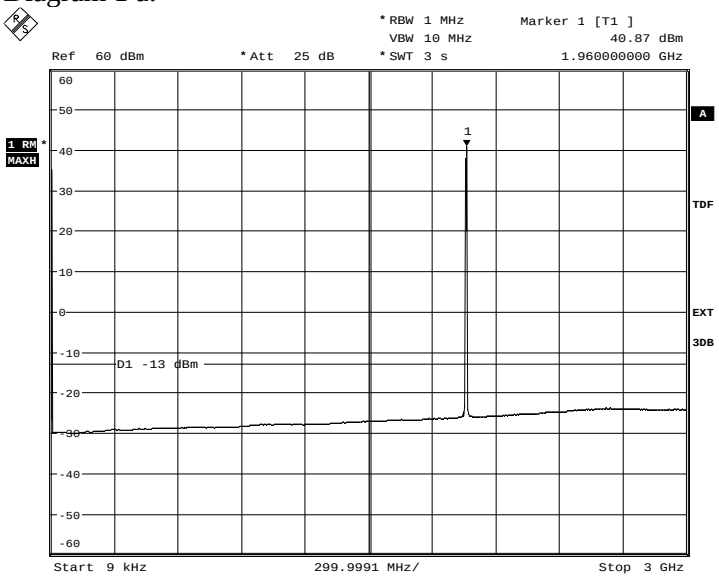
Limits

CFR 47 §24.238 and IC RSS-133 6.5
Outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, resulting in a limit of -13 dBm.

Complies?	Yes

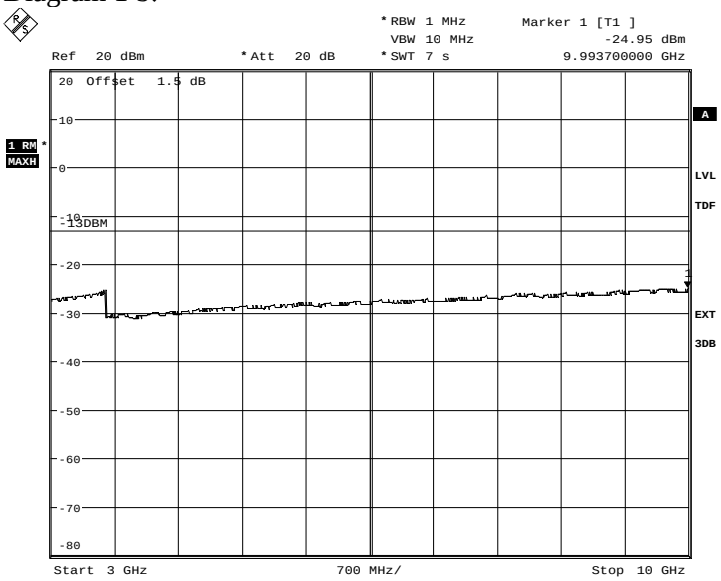
Appendix 5

Diagram 1 a:



Date: 29.MAY.2013 07:08:03

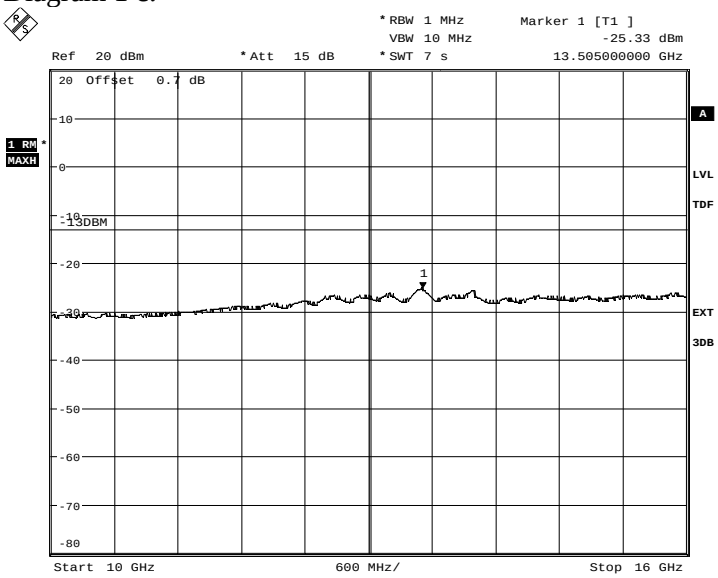
Diagram 1 b:



Date: 29.MAY.2013 07:21:12

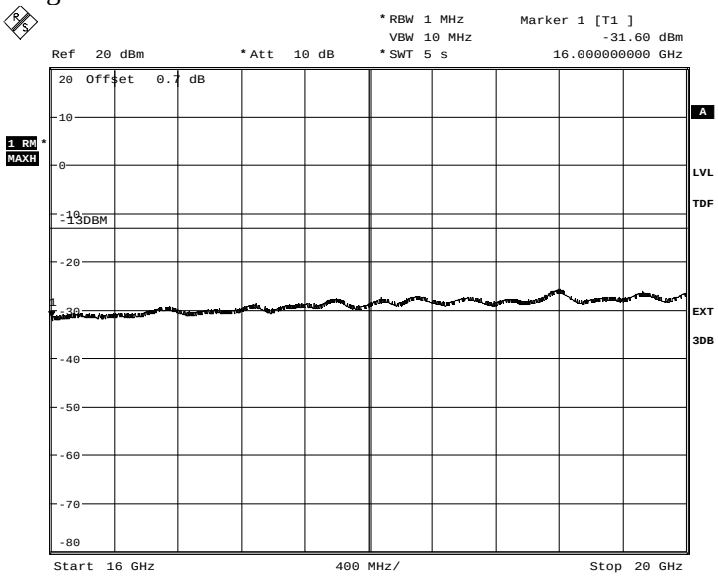
Appendix 5

Diagram 1 c:



Date: 29.MAY.2013 07:28:57

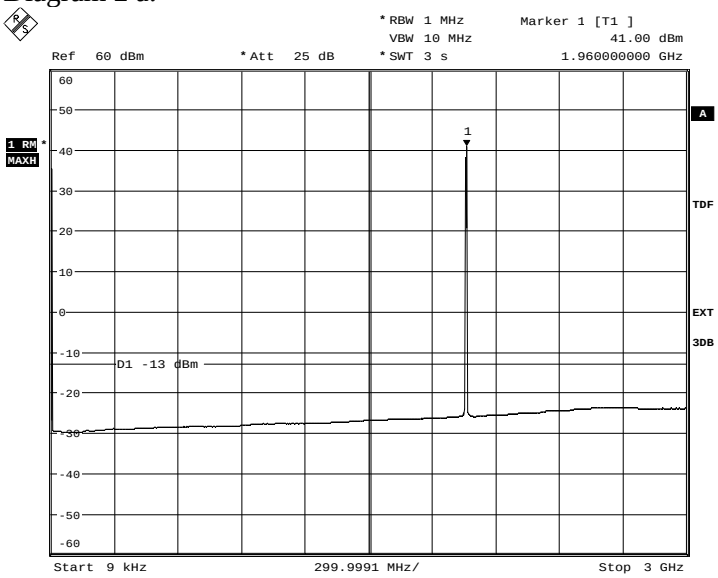
Diagram 1 d:



Date: 29.MAY.2013 07:32:59

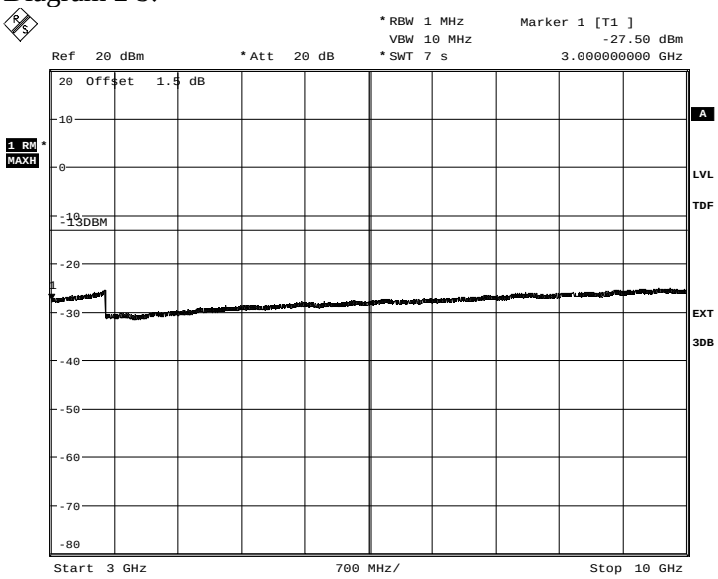
Appendix 5

Diagram 2 a:



Date: 29.MAY.2013 07:55:36

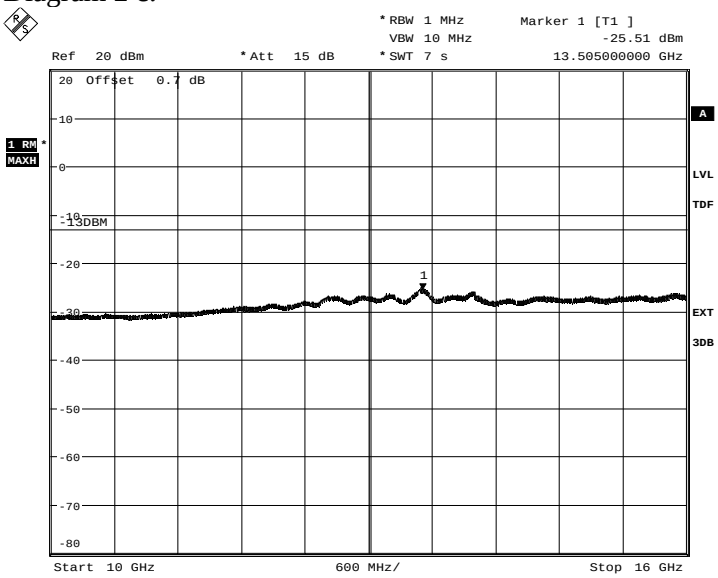
Diagram 2 b:



Date: 29.MAY.2013 07:48:00

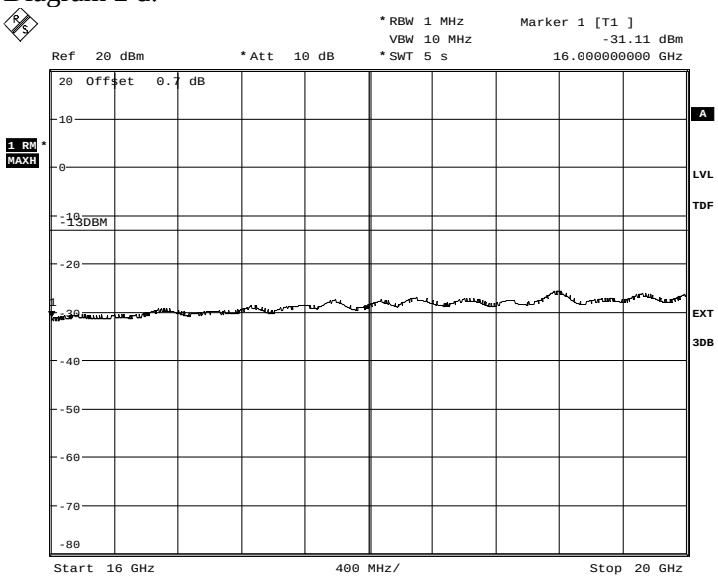
Appendix 5

Diagram 2 c:



Date: 29.MAY.2013 07:46:01

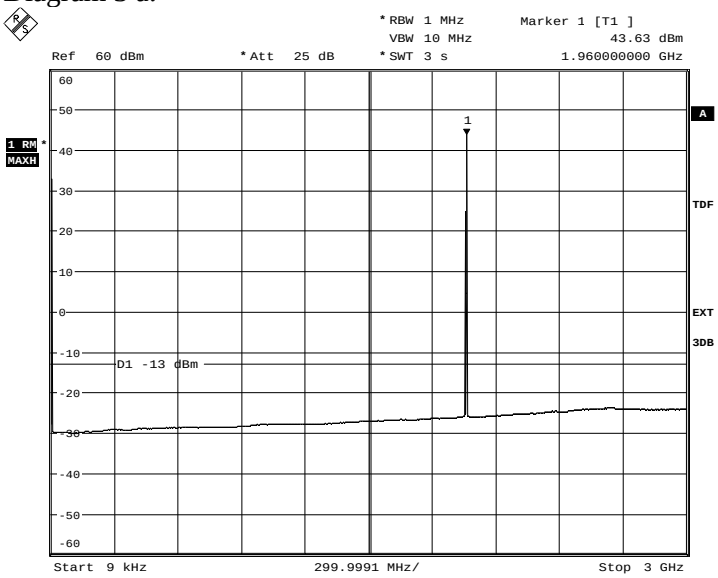
Diagram 2 d:



Date: 29.MAY.2013 07:44:01

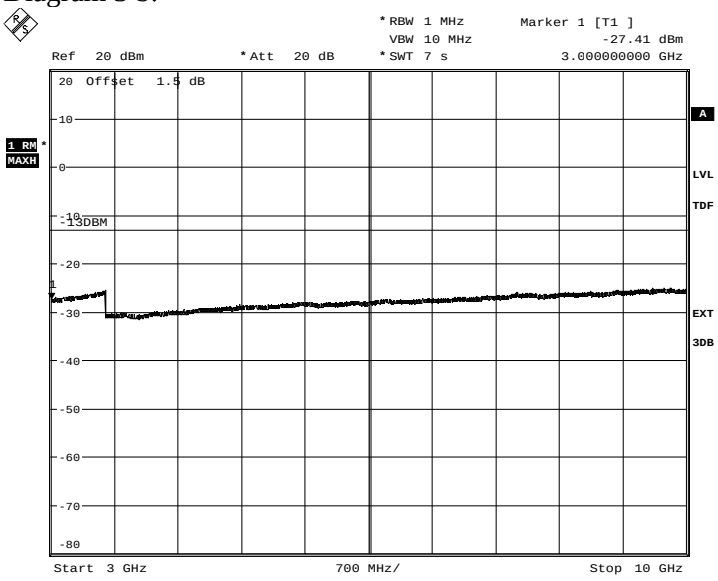
Appendix 5

Diagram 3 a:



Date: 29.MAY.2013 11:04:51

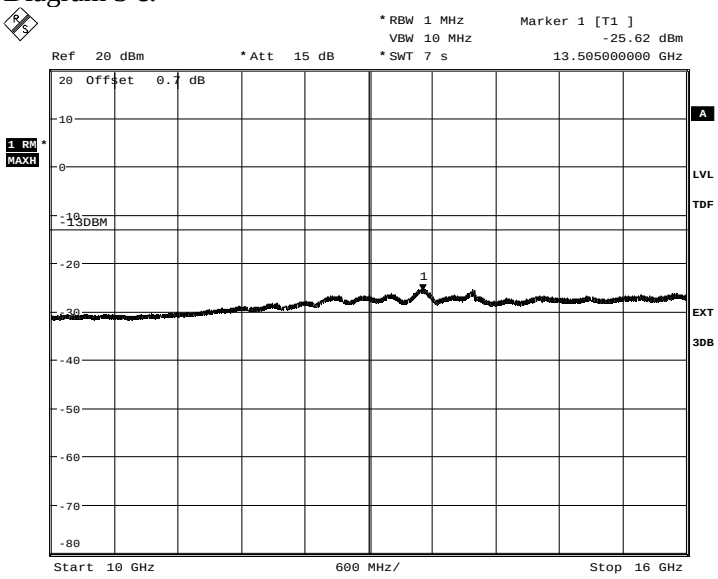
Diagram 3 b:



Date: 29.MAY.2013 11:07:15

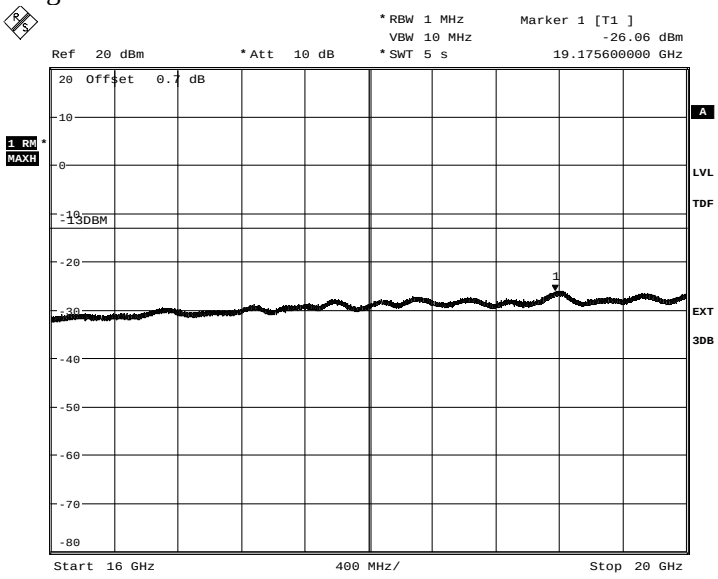
Appendix 5

Diagram 3 c:



Date: 29.MAY.2013 11:09:09

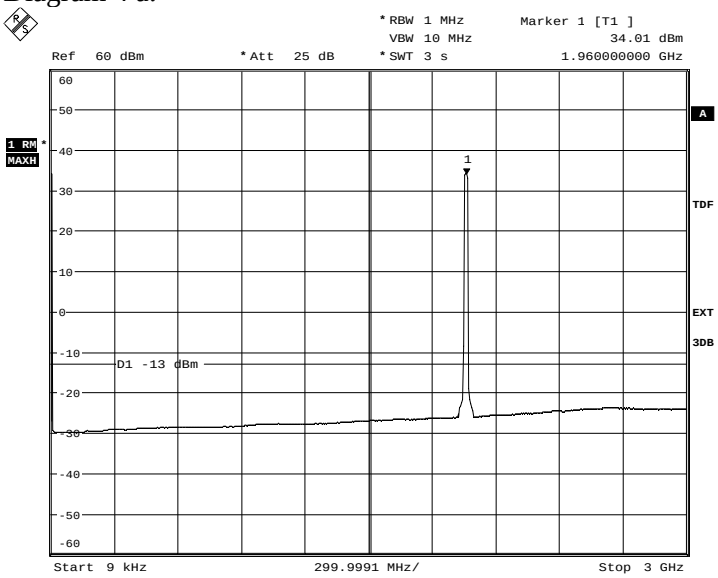
Diagram 3 d:



Date: 29.MAY.2013 11:11:22

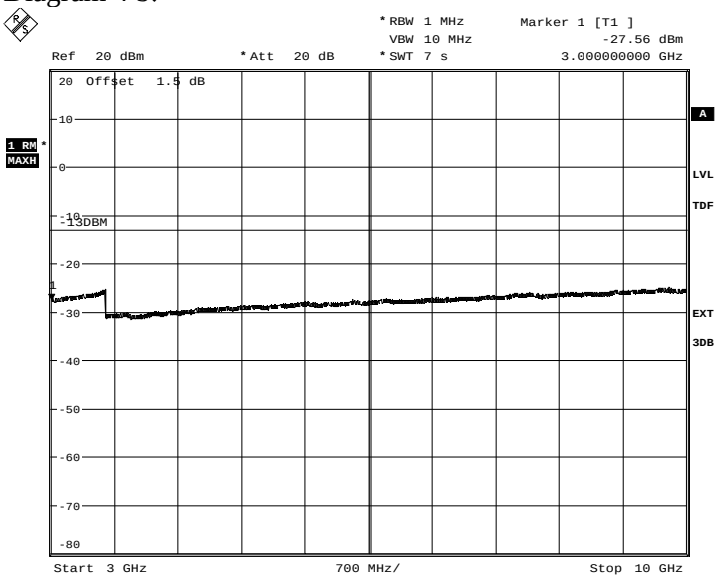
Appendix 5

Diagram 4 a:



Date: 29.MAY.2013 12:34:29

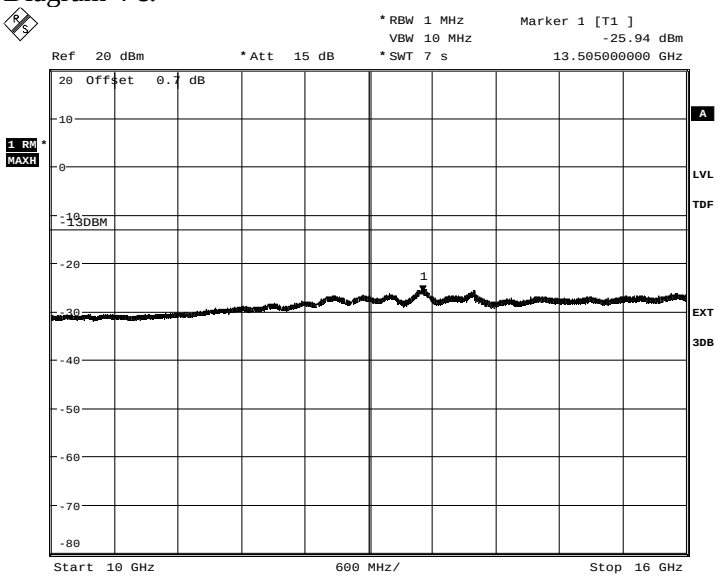
Diagram 4 b:



Date: 29.MAY.2013 12:32:40

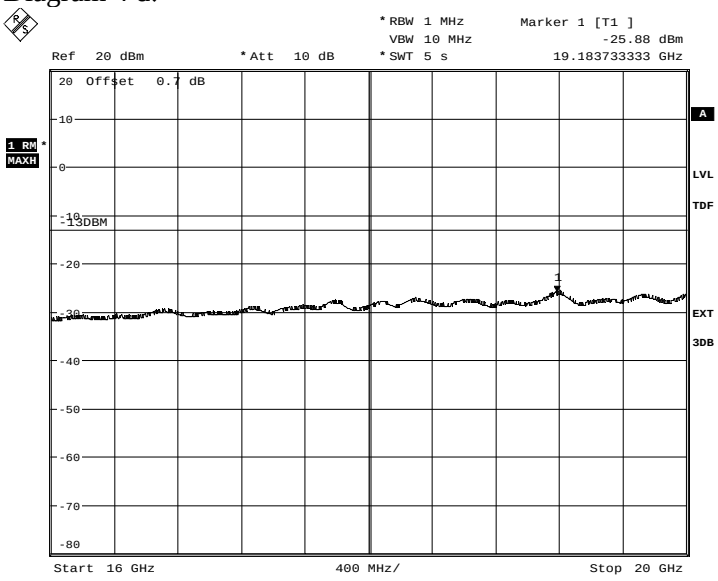
Appendix 5

Diagram 4 c:



Date: 29.MAY.2013 12:31:16

Diagram 4 d:



Date: 29.MAY.2013 12:29:53

Appendix 5

Diagram 5 a:

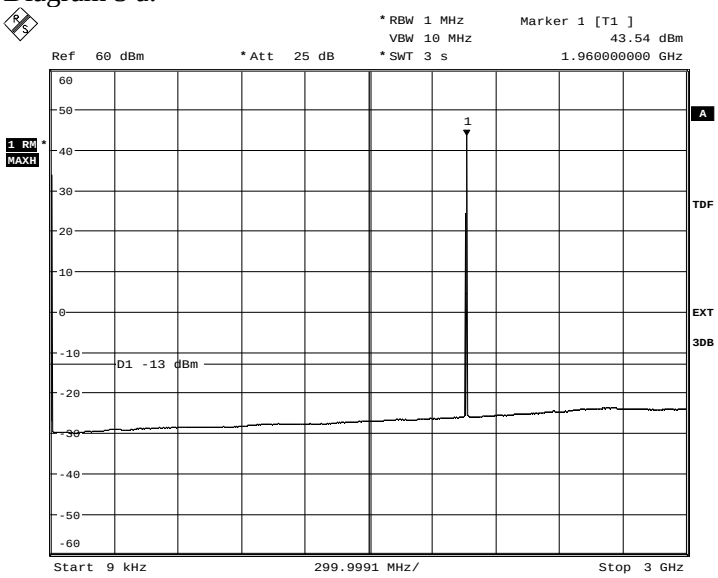


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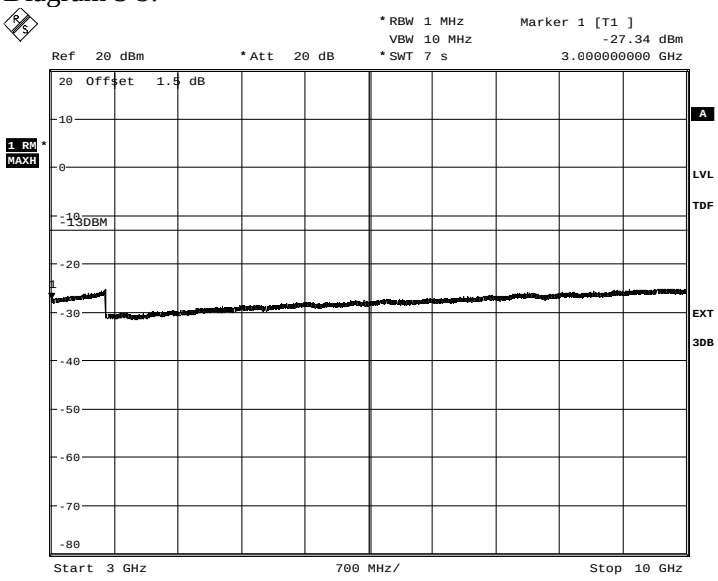
Diagram 5 b:



Date: 29.MAY.2013 11:16:12

Appendix 5

Diagram 5 c:

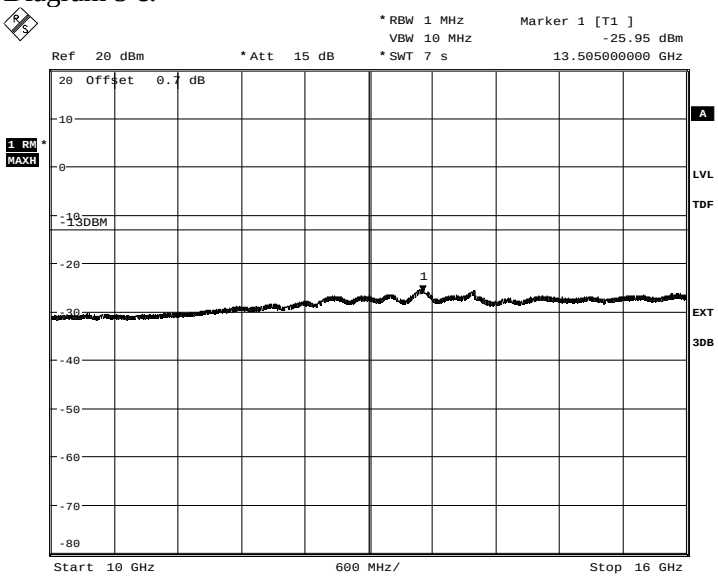


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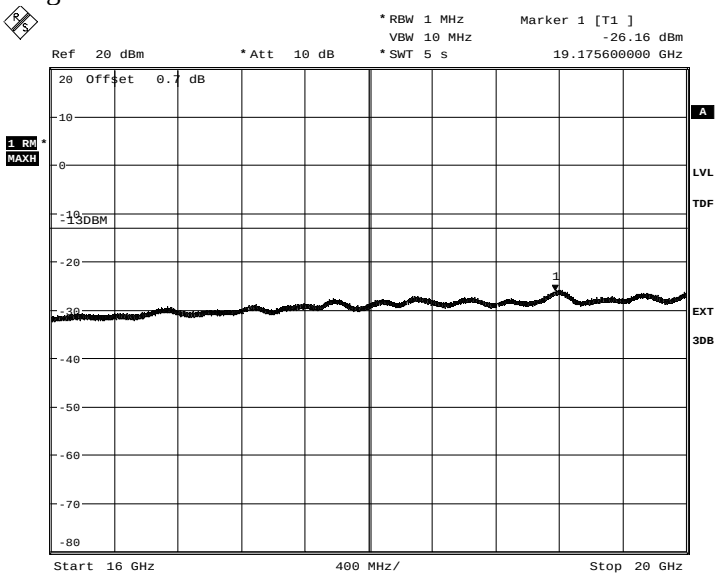
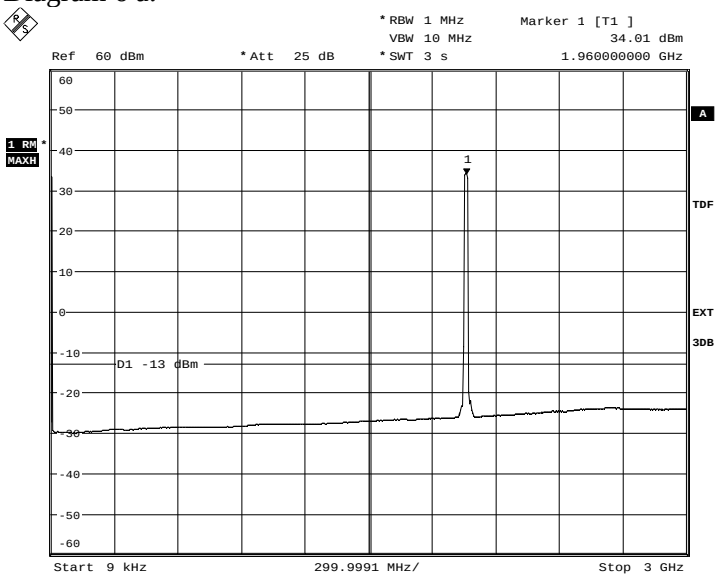
Diagram 5 d:



Date: 29.MAY.2013 11:14:20

Appendix 5

Diagram 6 a:



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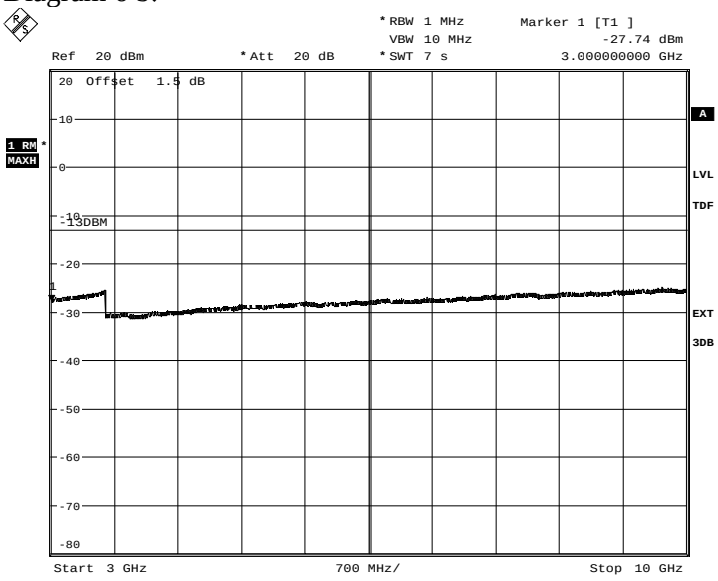

Date: 29.MAY.2013 12:18:55

Appendix 5

Diagram 6 c:

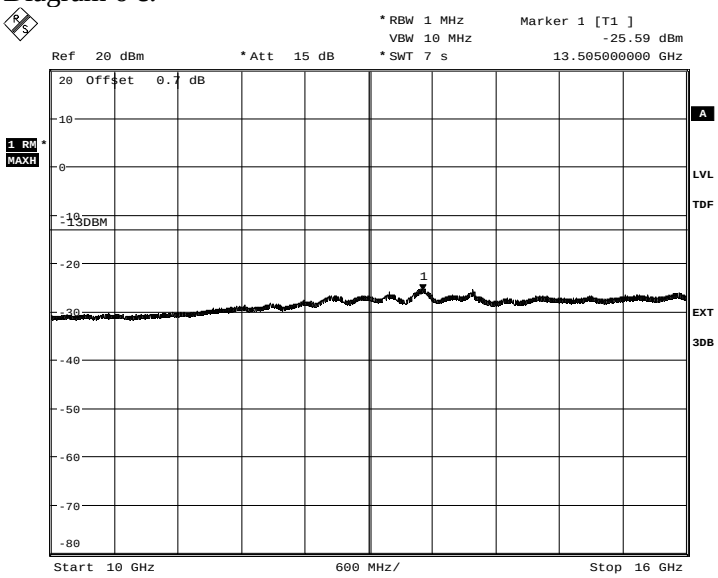

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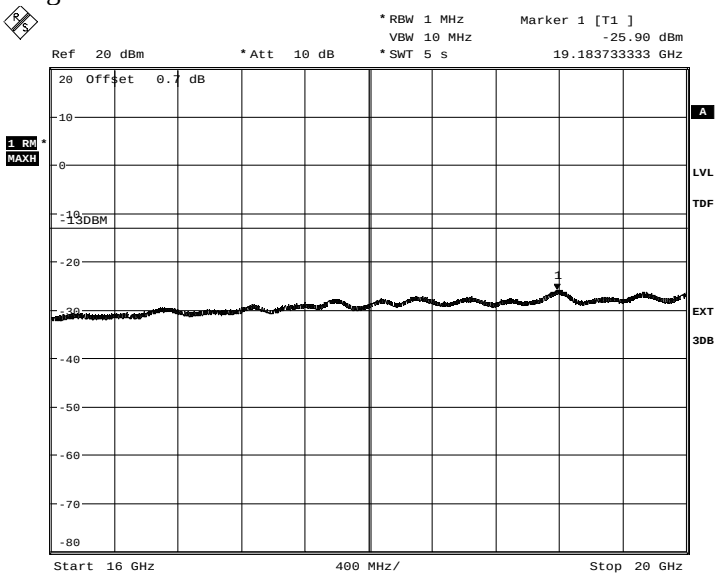
Diagram 6 d:



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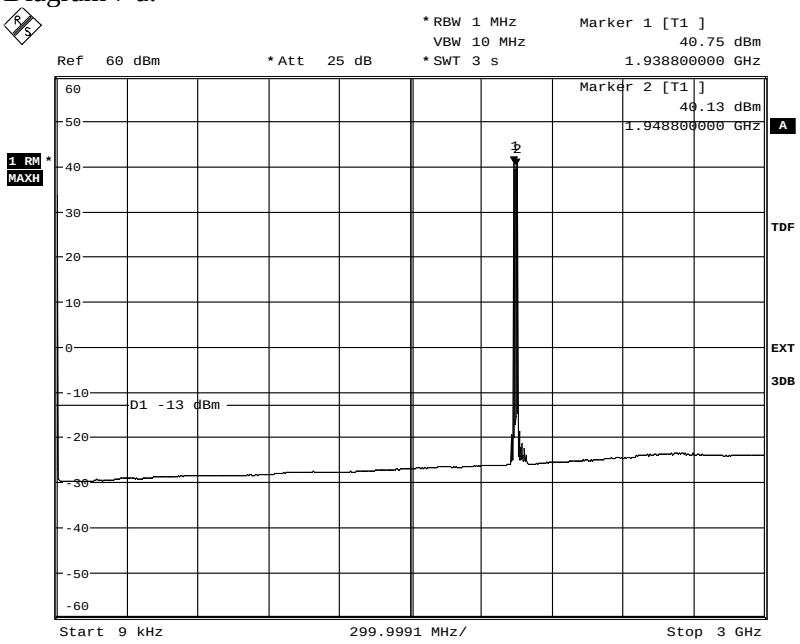
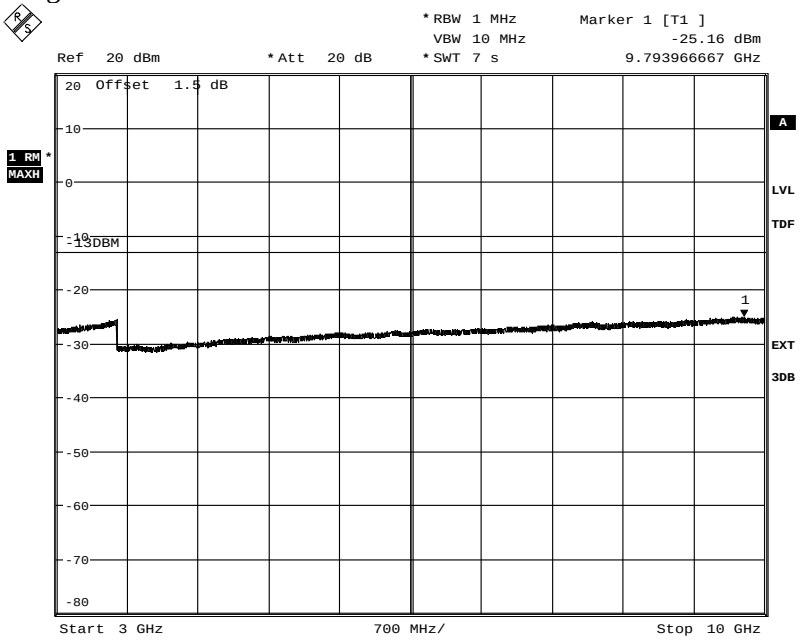
Appendix 5

Diagram 7 a:



Date: 17.JUN.2013 17:58:31

Diagram 7 b:



Date: 17.JUN.2013 17:59:42

Appendix 5

Diagram 7 c:

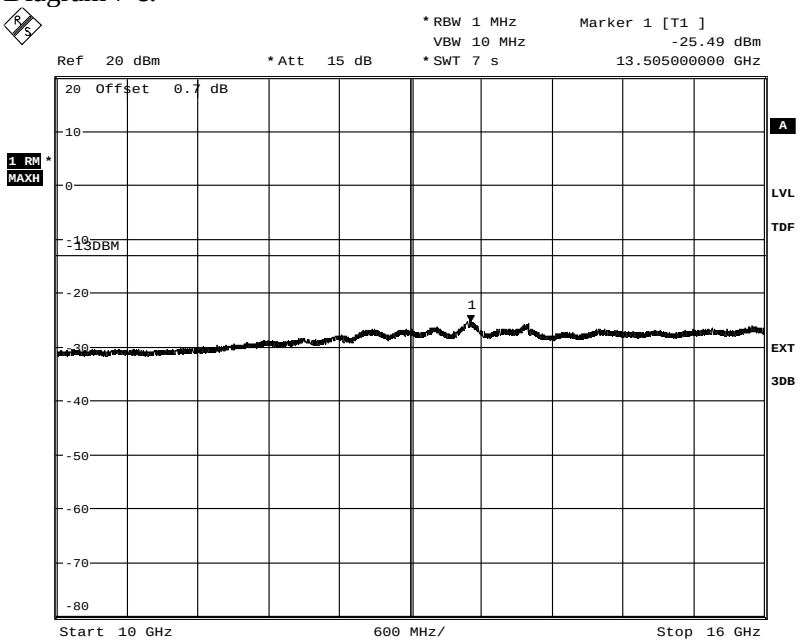


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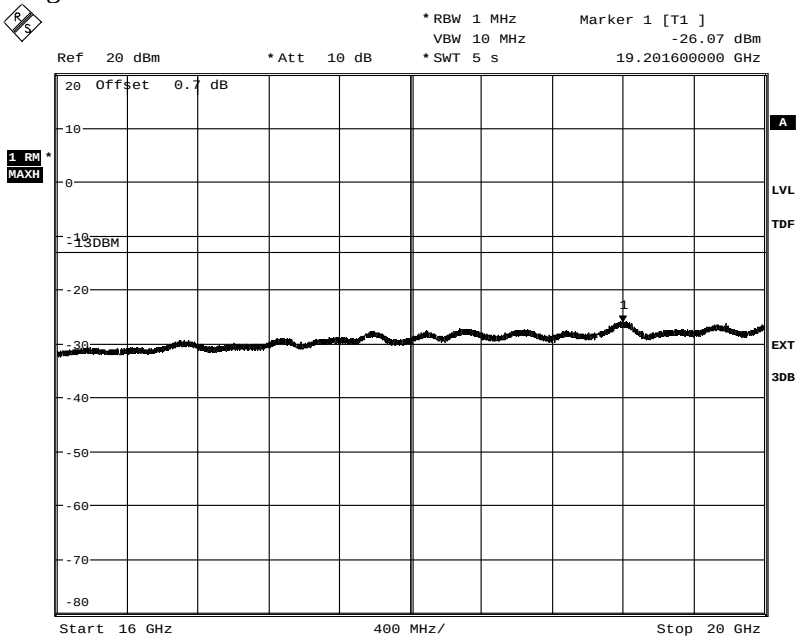
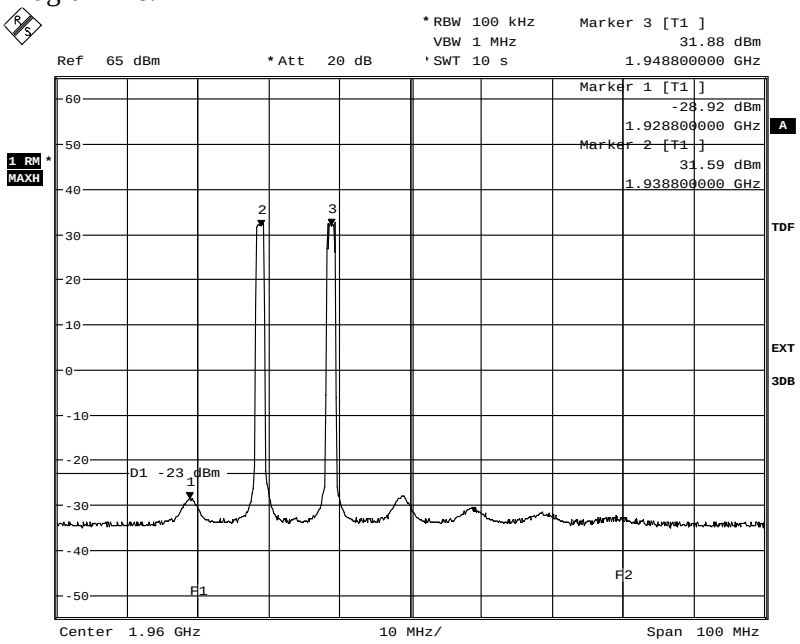
Diagram 7 d:



Date: 17.JUN.2013 18:01:16

Appendix 5

Diagram 7 e:



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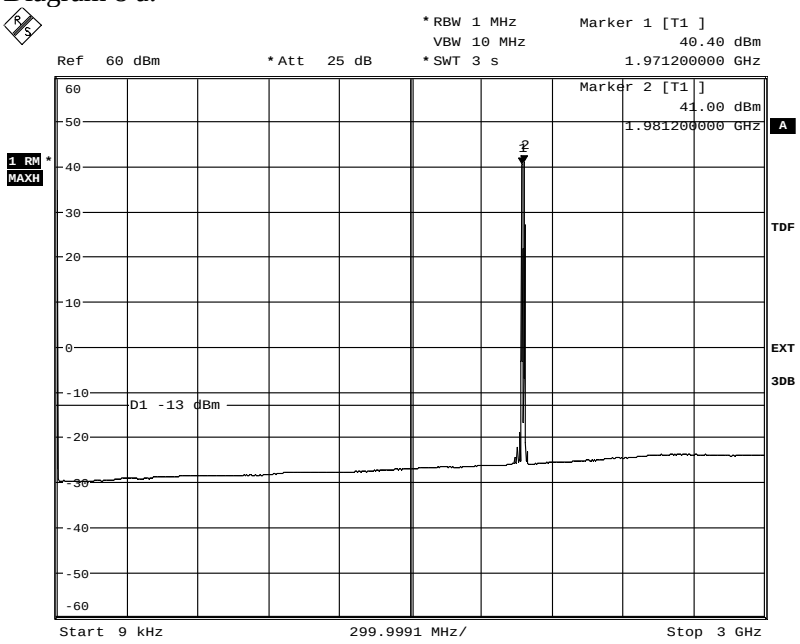
Appendix 5

Diagram 8 a:



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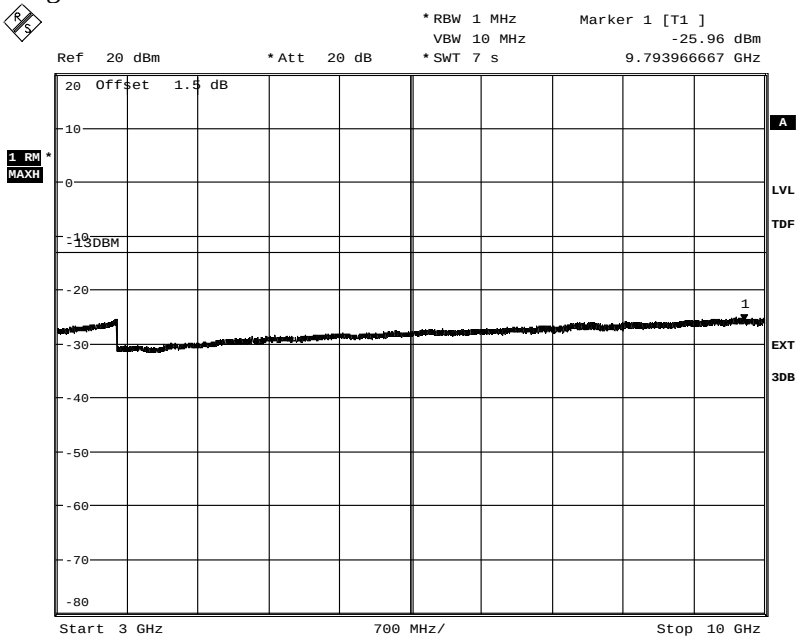
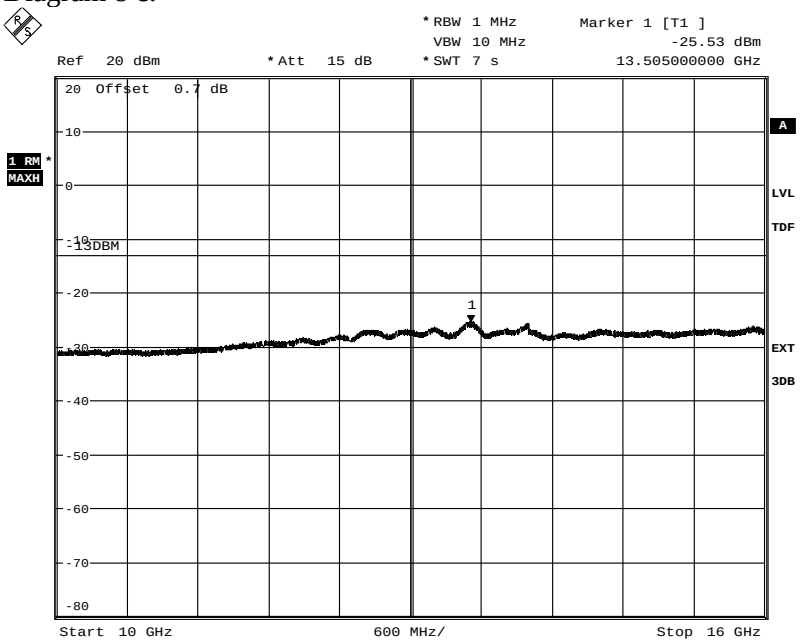


Date: 17.JUN.2013 18:05:31

Appendix 5

Diagram 8 c:



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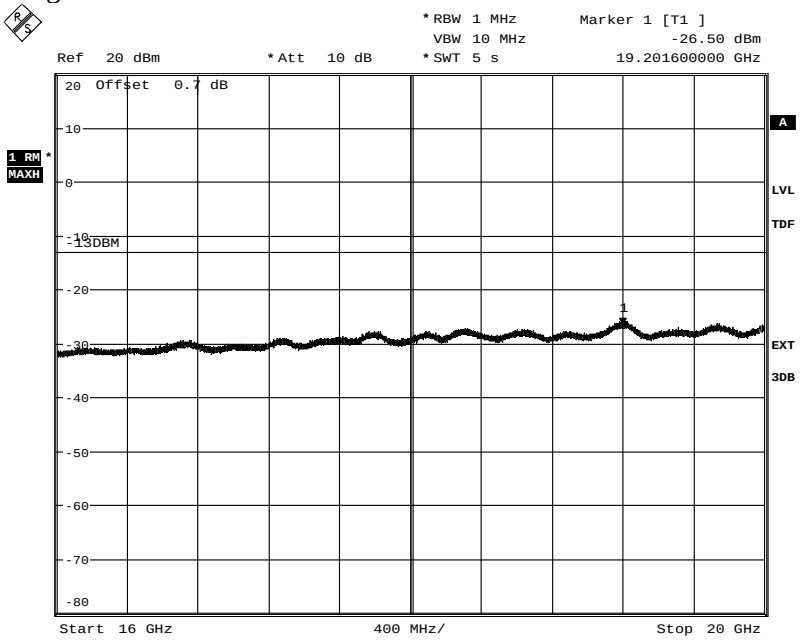
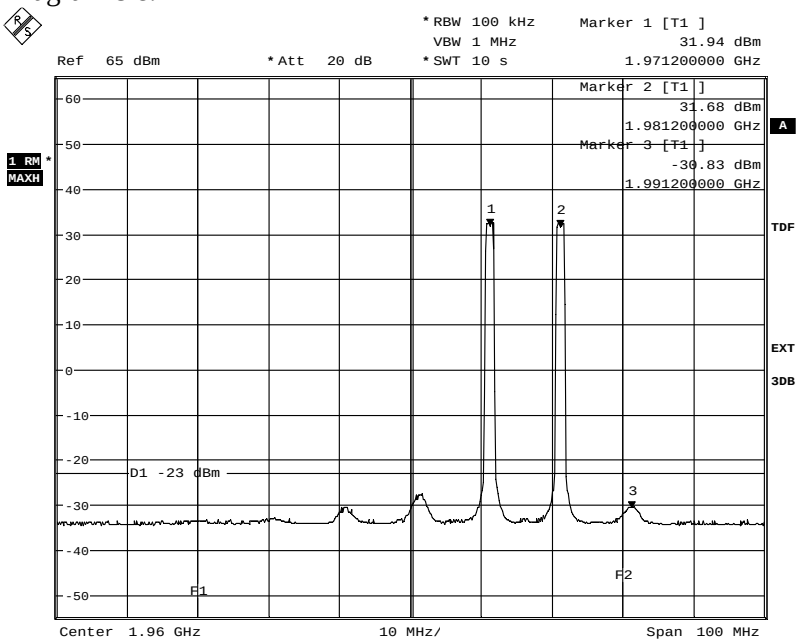


Date: 17.JUN.2013 18:03:58

Appendix 5

Diagram 8 e:



Date: 17.JUN.2013 18:08:02

Appendix 5

Diagram 9 a:

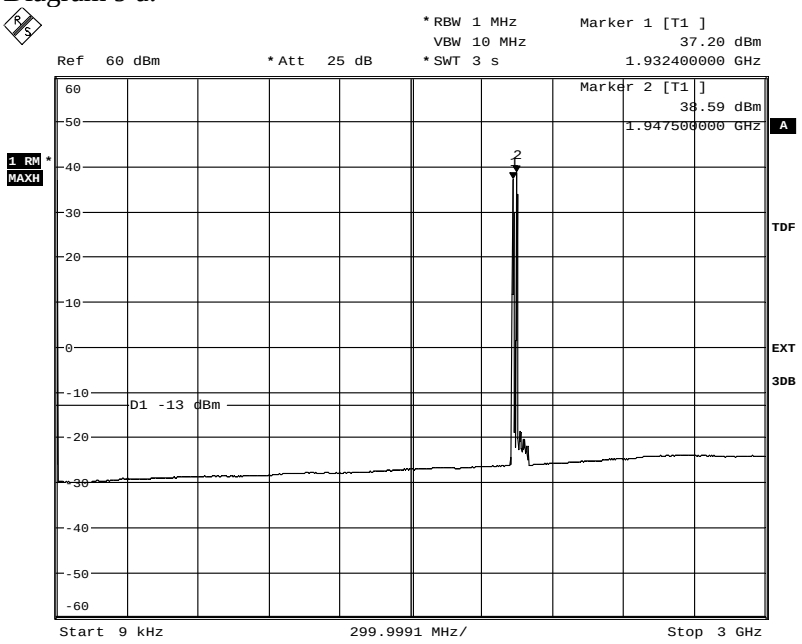


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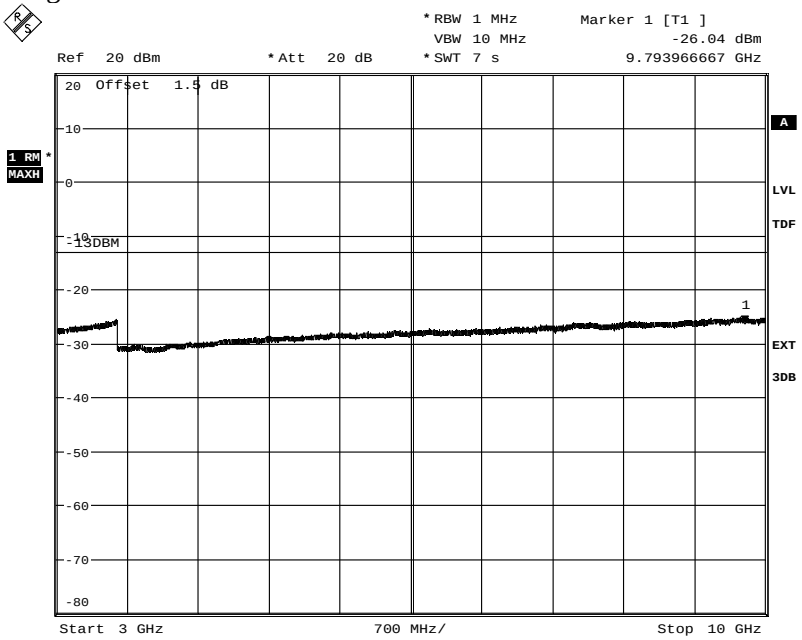
Diagram 9 b:



Date: 14.JUN.2013 12:46:29

Appendix 5

Diagram 9 c:

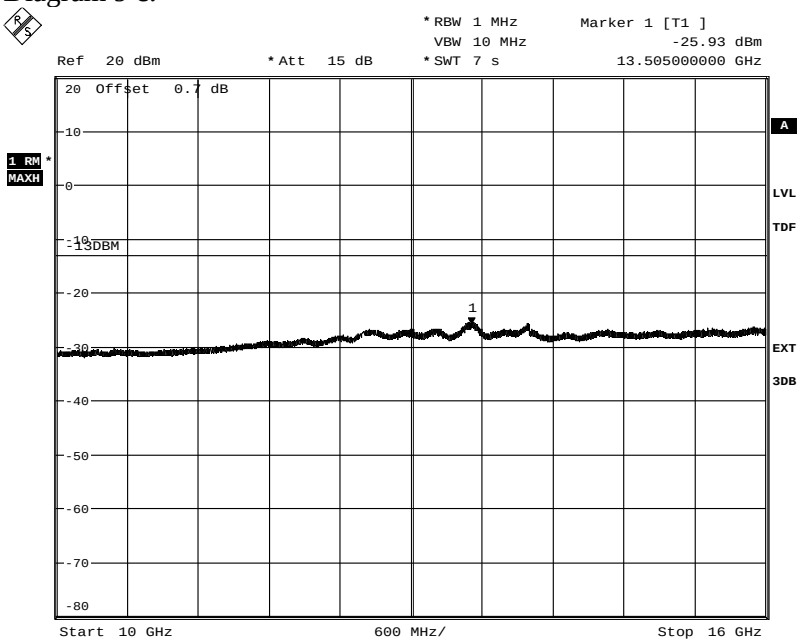


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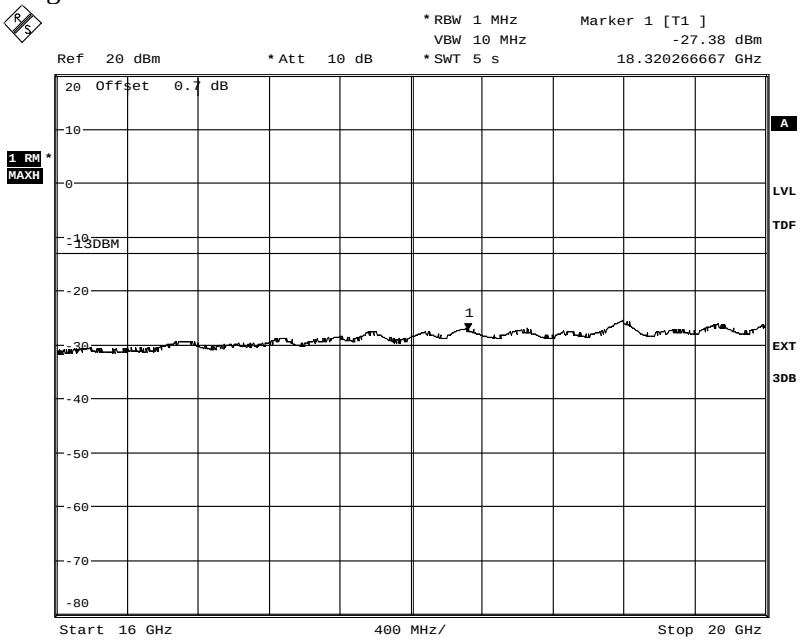
Diagram 9 d:



Date: 14.JUN.2013 12:44:29

Appendix 5

Diagram 10 a:

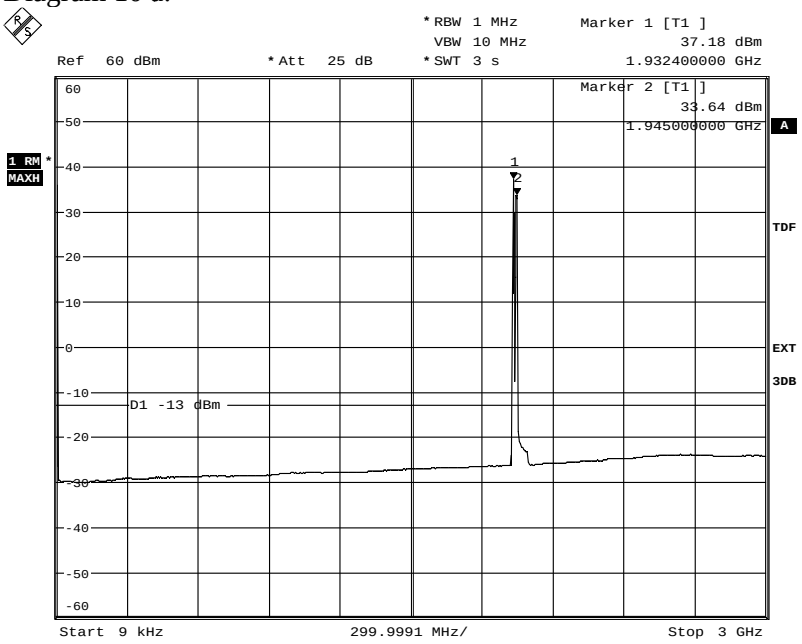


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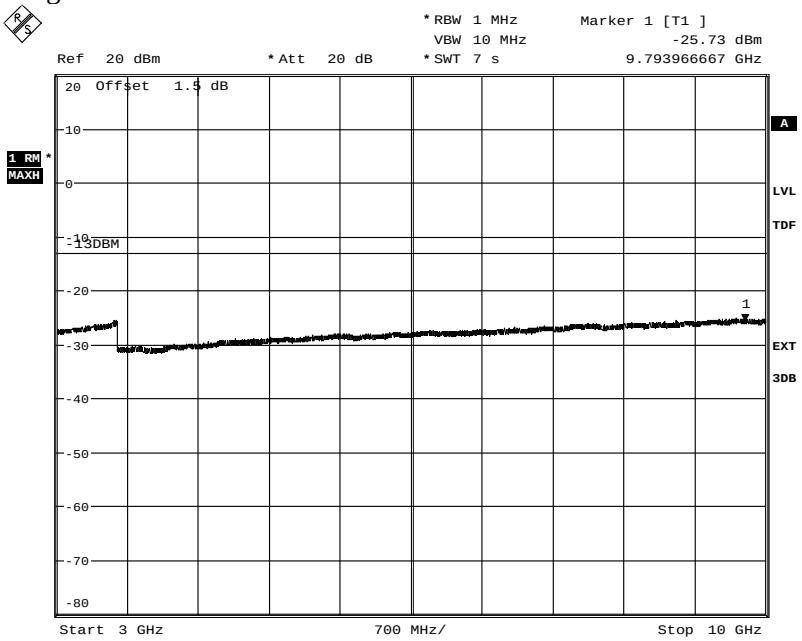
Diagram 10 b:



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Appendix 5

Diagram 10 c:

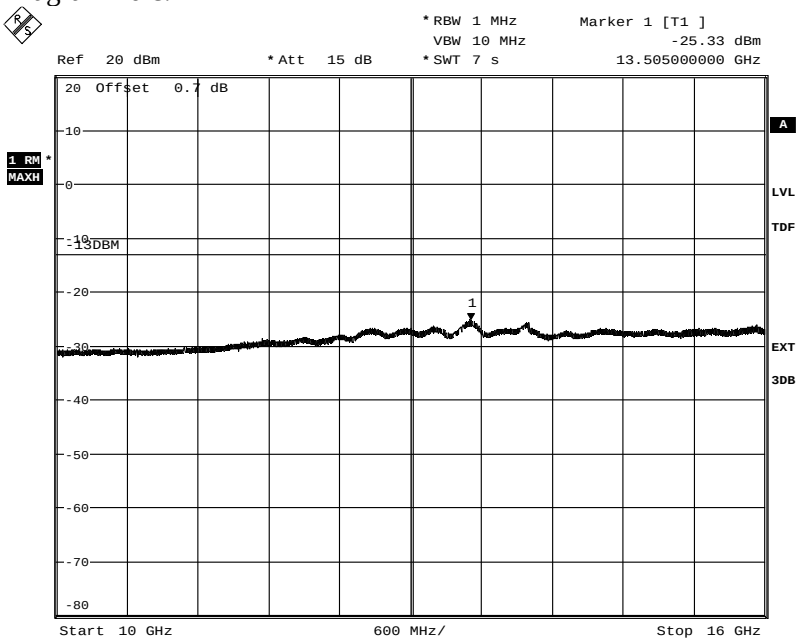

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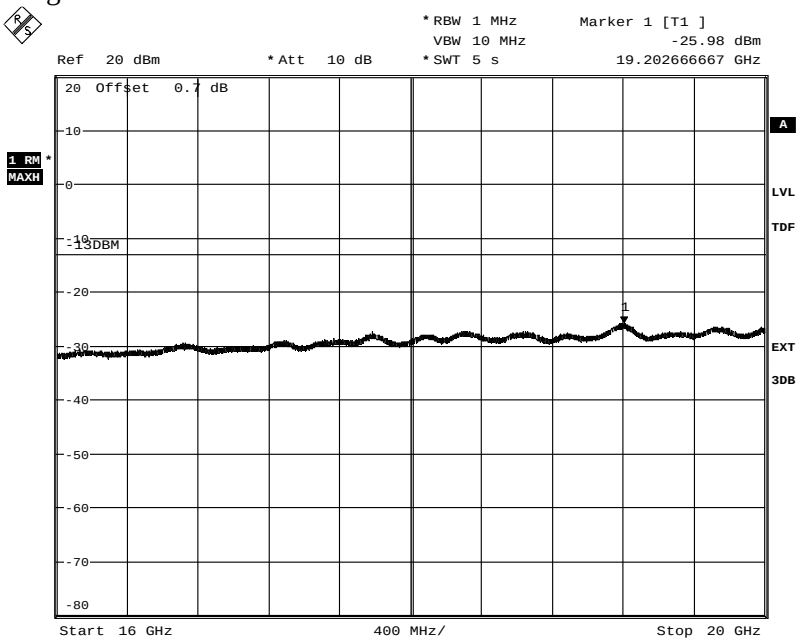
Diagram 10 d:



Date: 14.JUN.2013 12:58:54

Appendix 5

Diagram 11 a:

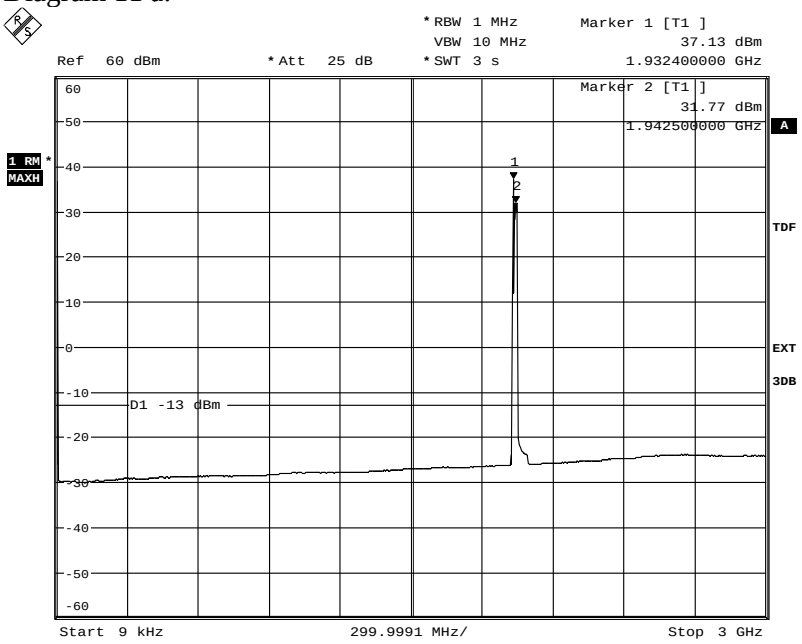


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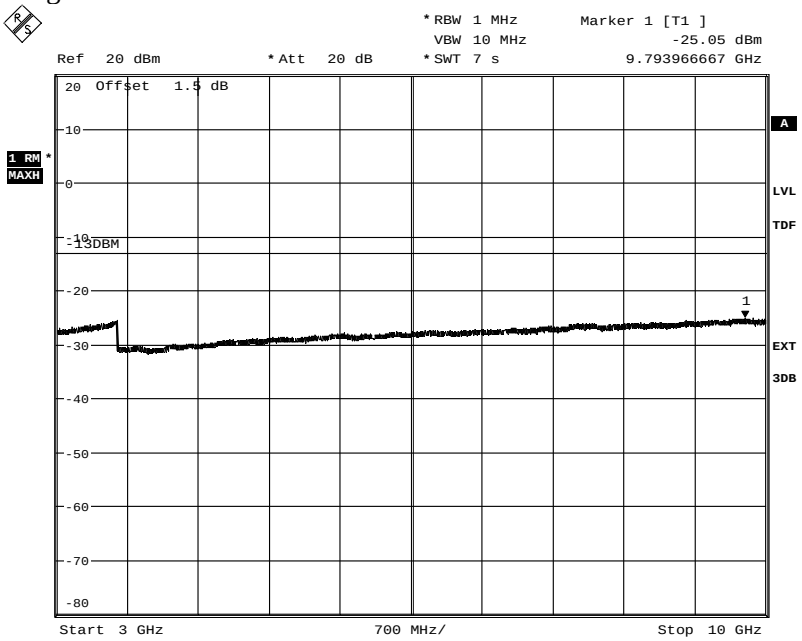
Diagram 11 b:



Date: 14.JUN.2013 13:06:02

Appendix 5

Diagram 11 c:

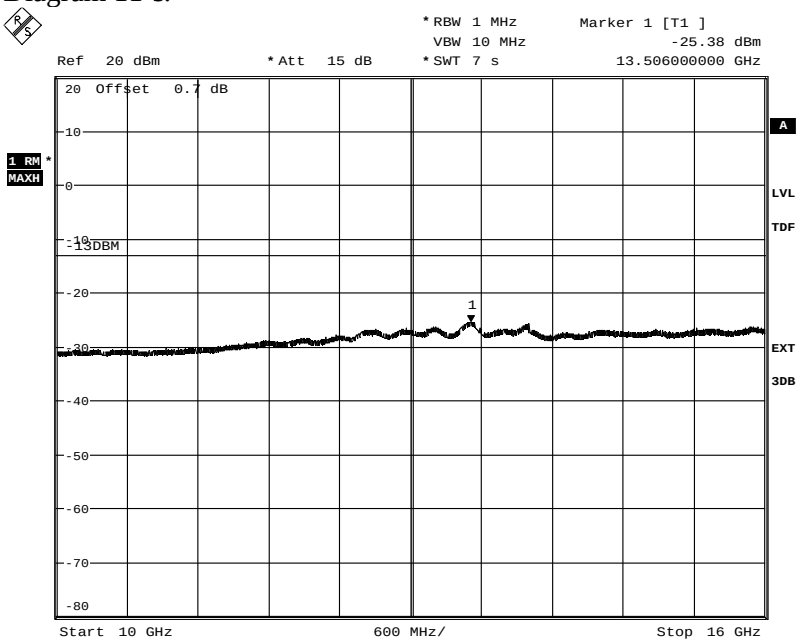


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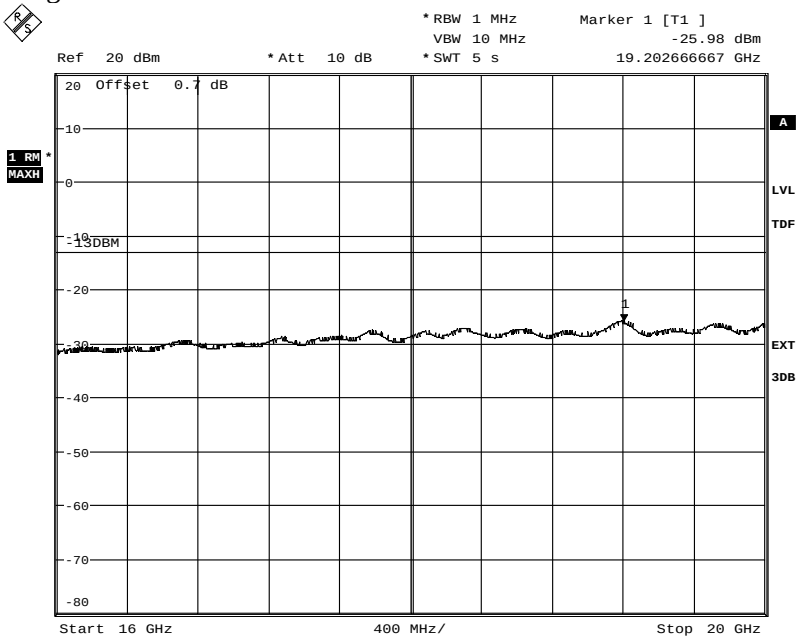
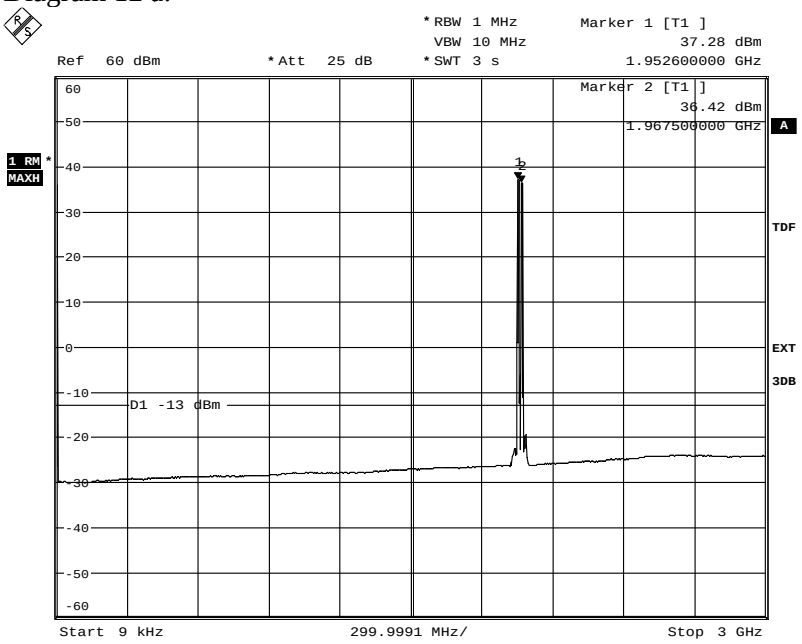
Diagram 11 d:



Date: 14.JUN.2013 13:03:44

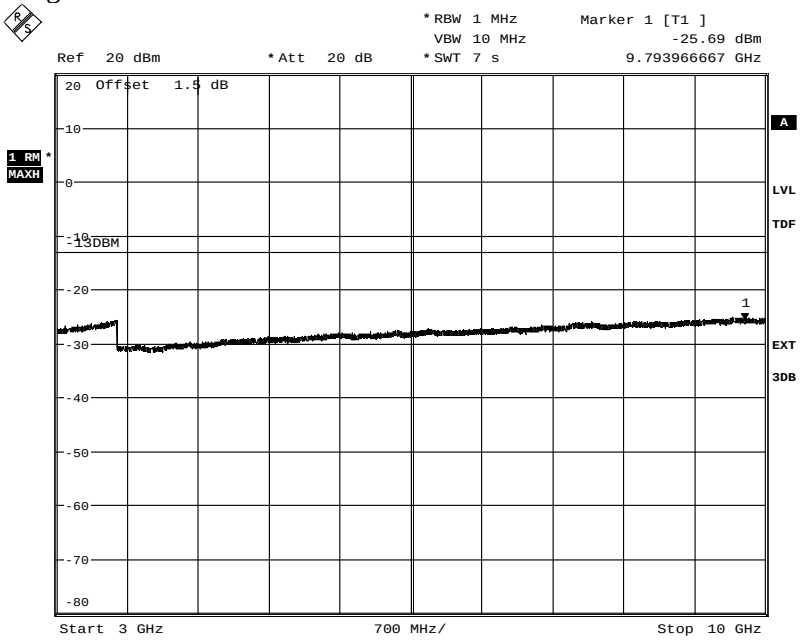
Appendix 5

Diagram 12 a:



Date: 14.JUN.2013 13:35:23

Diagram 12 b:



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Appendix 5

Diagram 12 c:

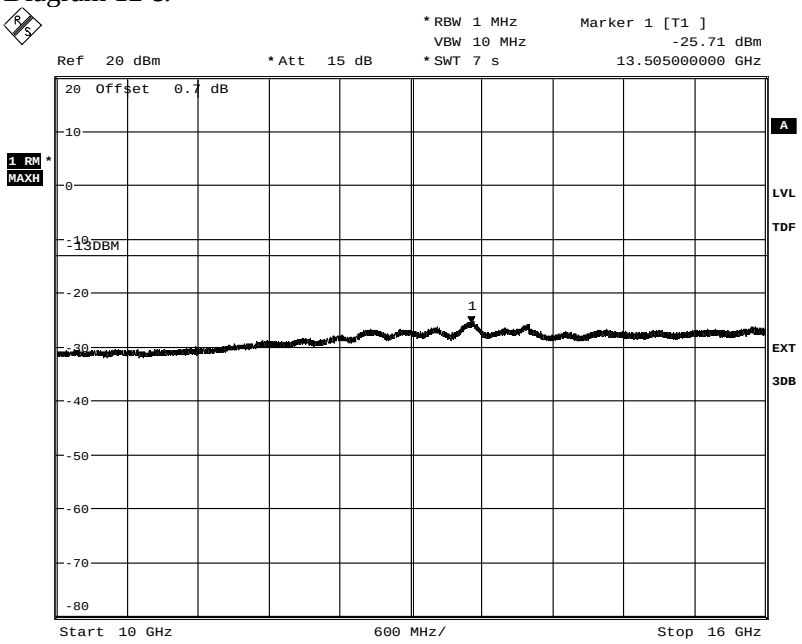

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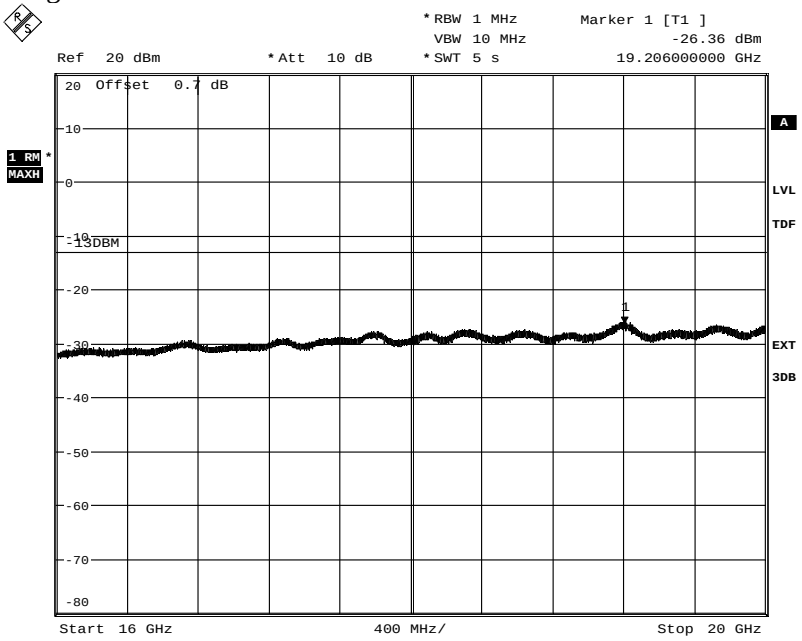
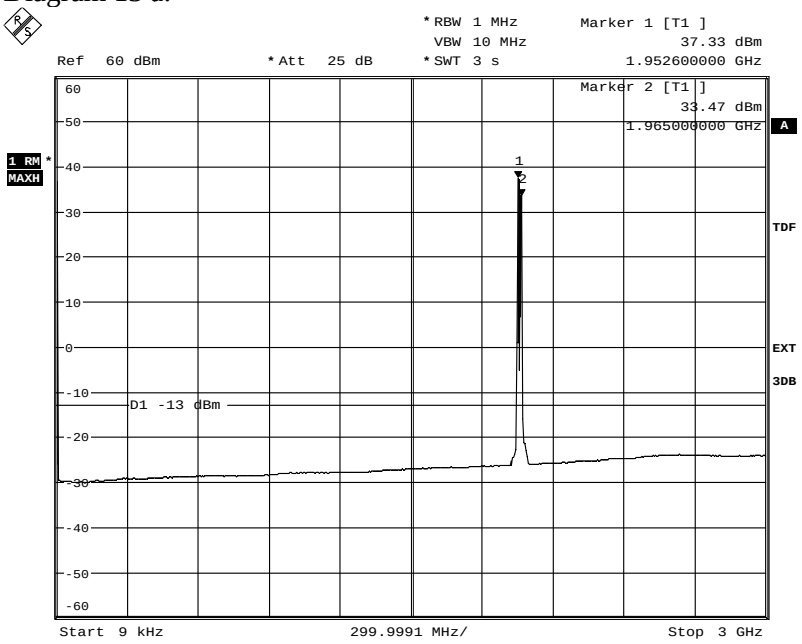
Diagram 12 d:



Date: 14.JUN.2013 13:27:04

Appendix 5

Diagram 13 a:



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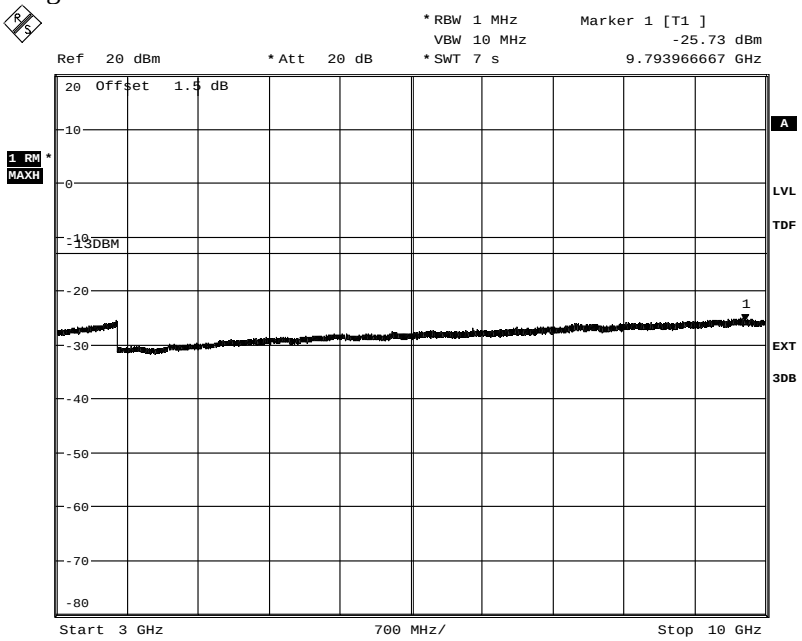

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Appendix 5

Diagram 13 c:

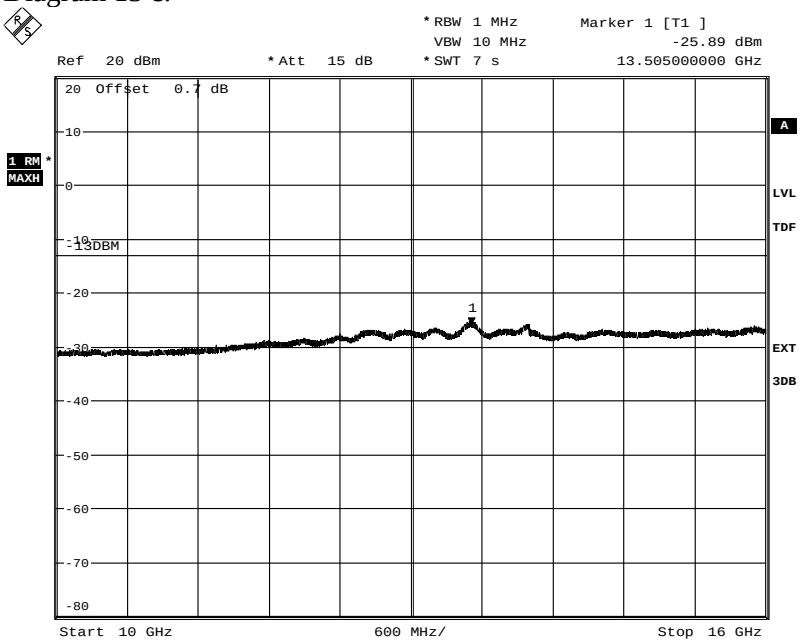

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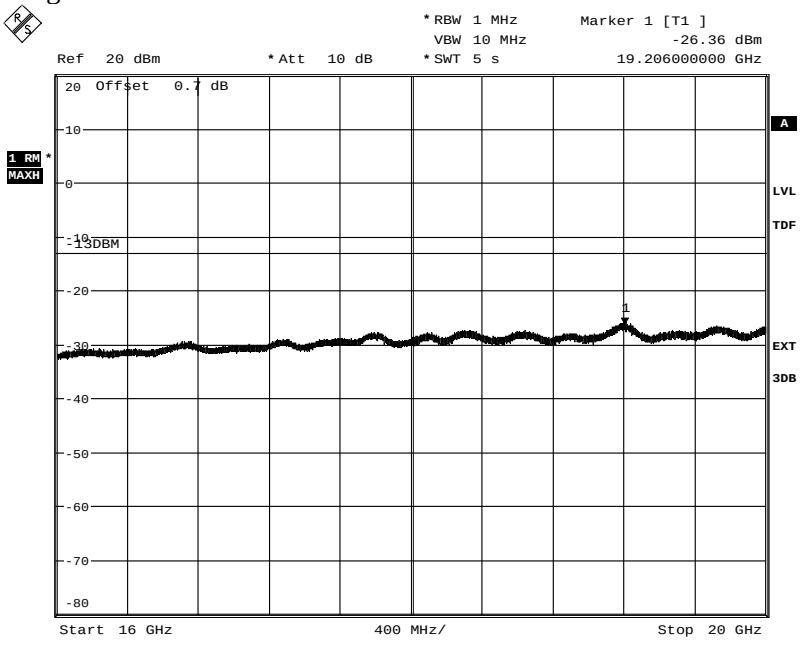
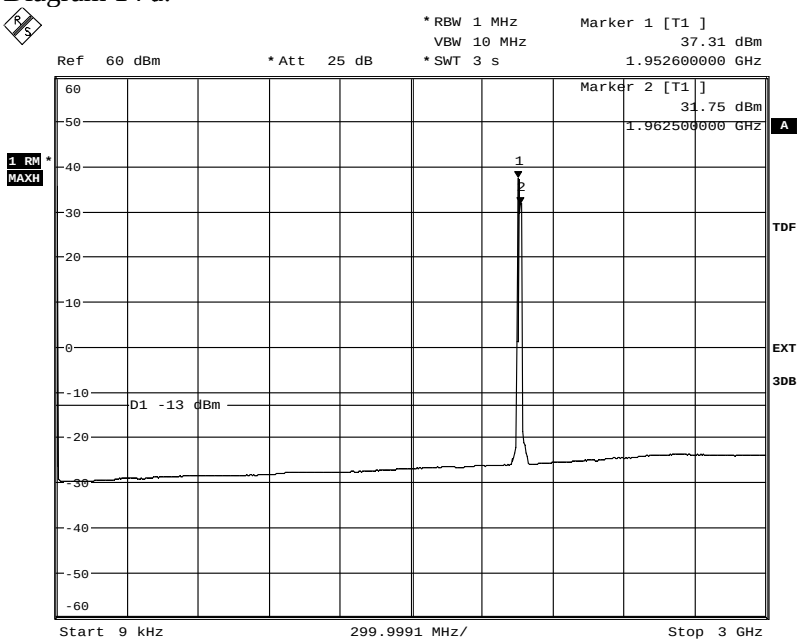
Diagram 13 d:



Date: 14.JUN.2013 13:27:04

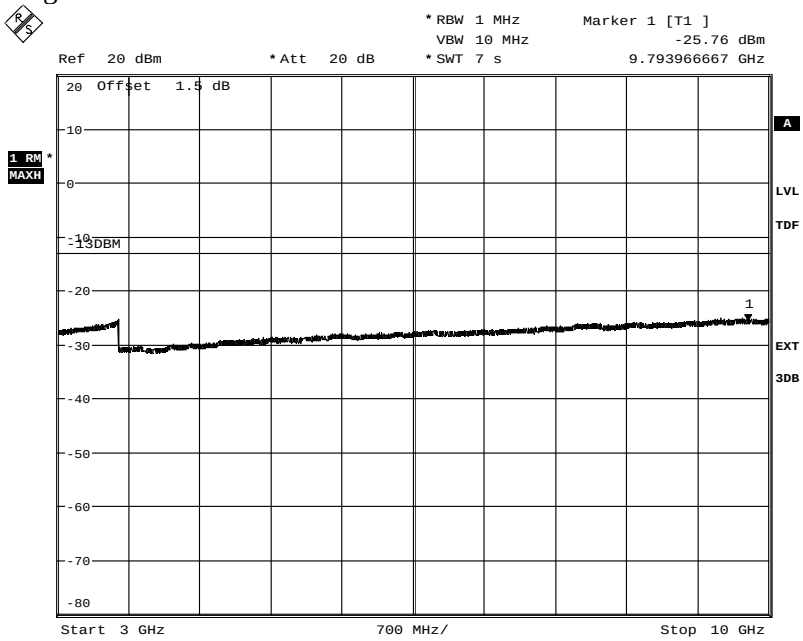
Appendix 5

Diagram 14 a:



Date: 14.JUN.2013 13:17:58

Diagram 14 b:



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Appendix 5

Diagram 14 c:

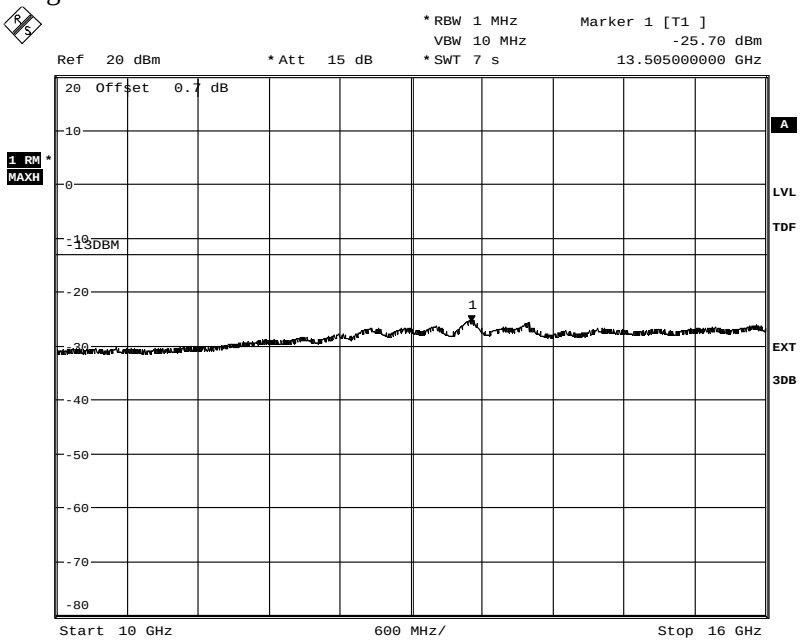

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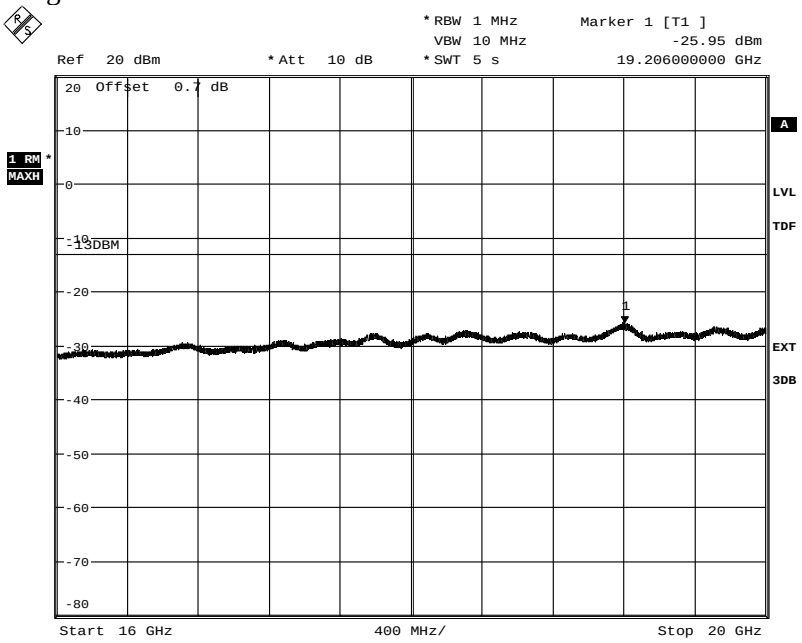
Diagram 14 d:



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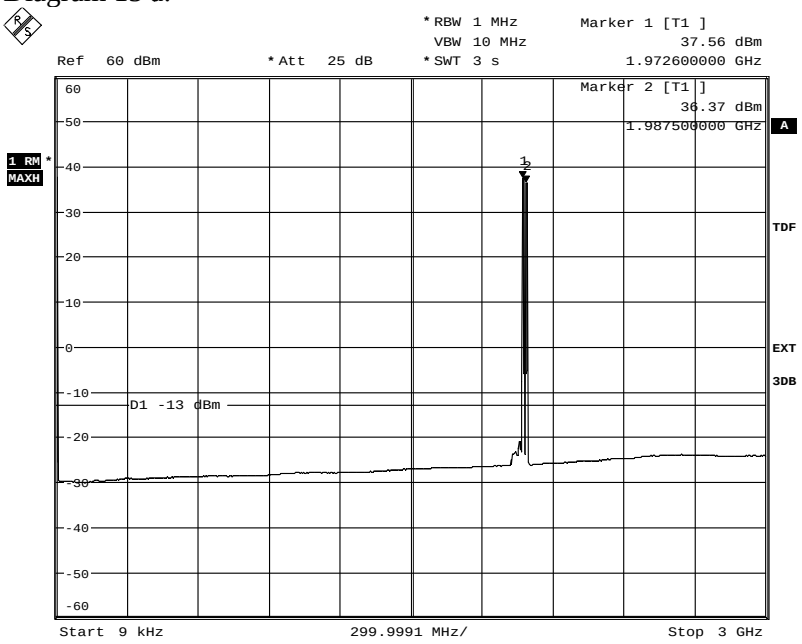
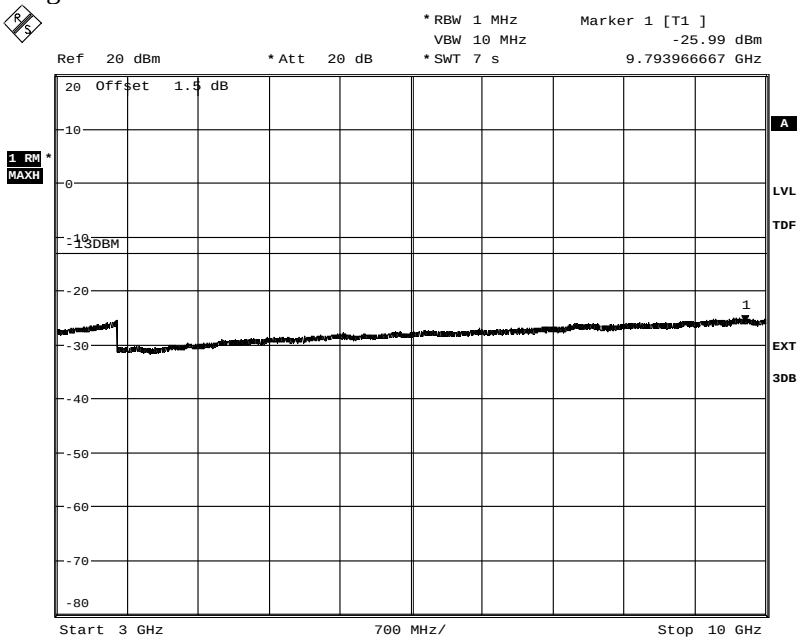
Appendix 5

Diagram 15 a:



Date: 17.JUN.2013 07:14:54

Diagram 15 b:



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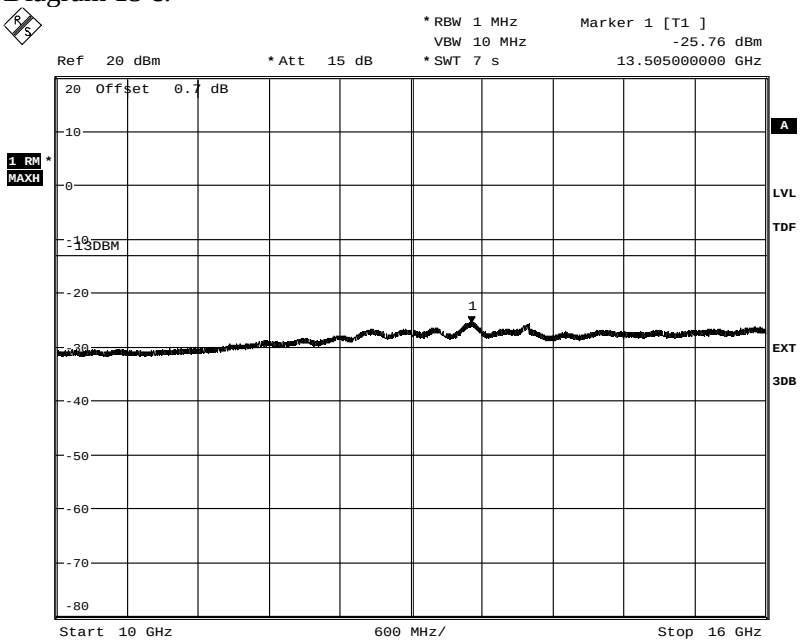
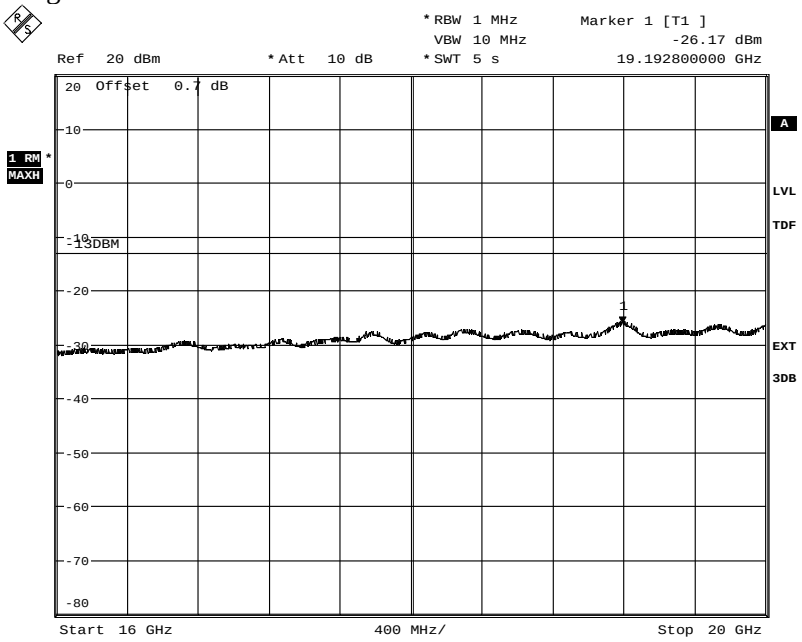
Appendix 5

Diagram 15 c:



Date: 17.JUN.2013 07:12:15

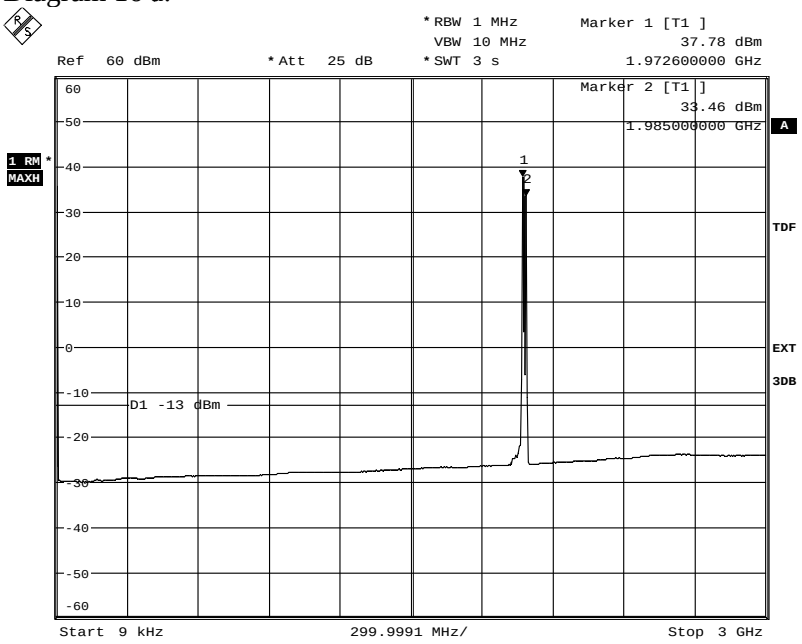
Diagram 15 d:



Date: 17.JUN.2013 07:10:36

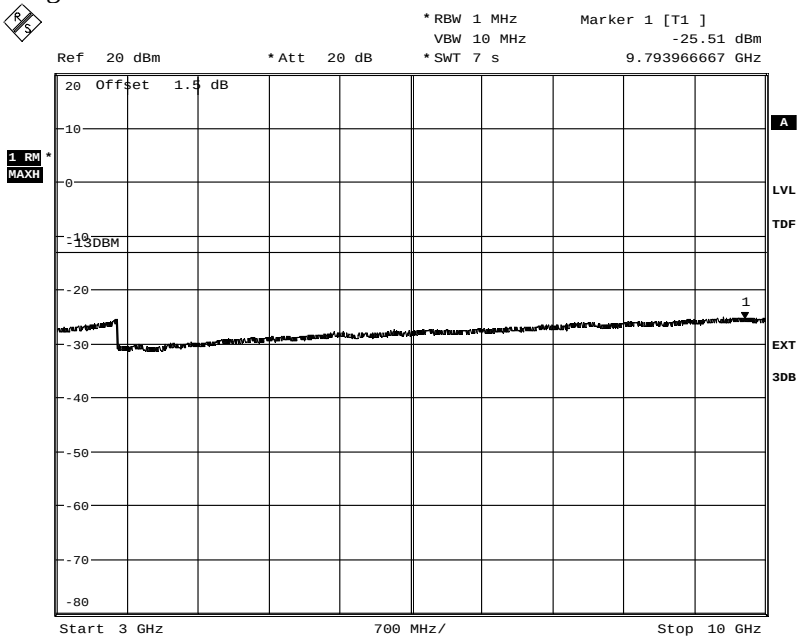
Appendix 5

Diagram 16 a:



Date: 17.JUN.2013 09:13:17

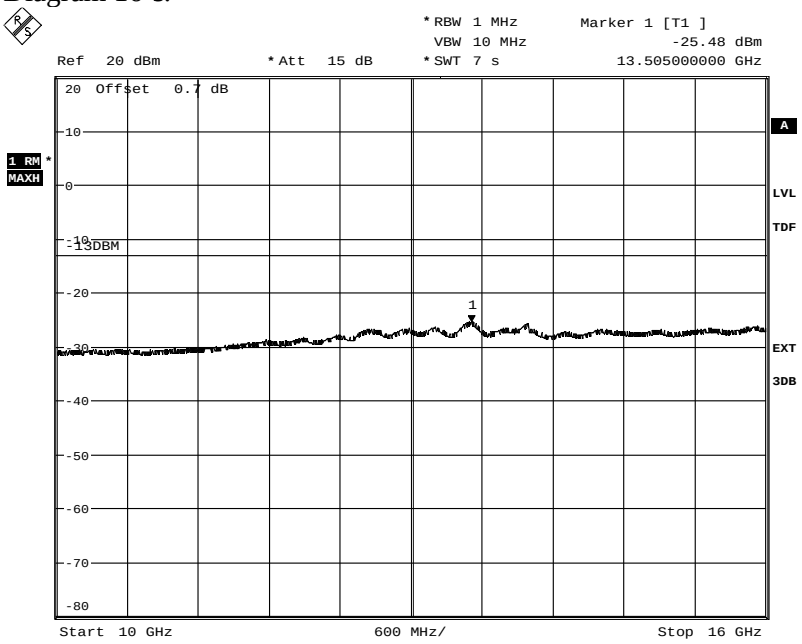
Diagram 16 b:



Date: 17.JUN.2013 09:16:02

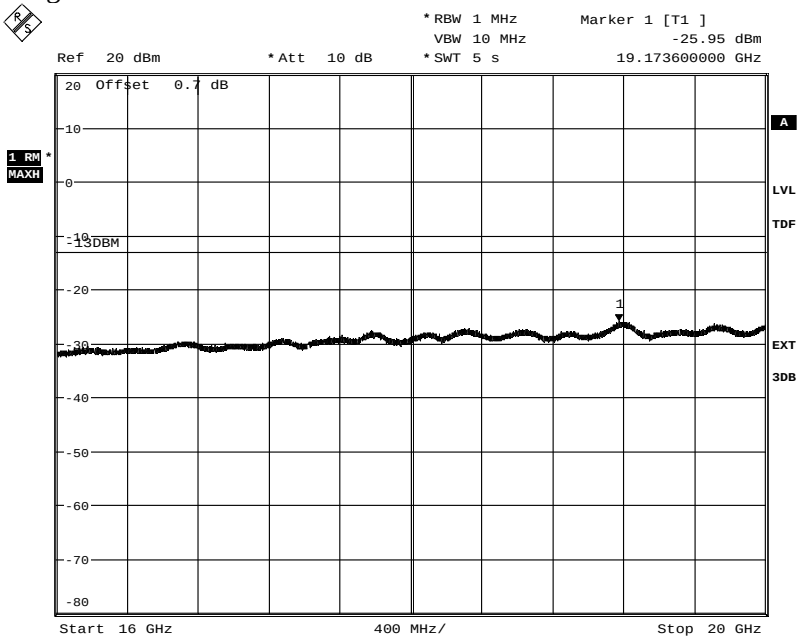
Appendix 5

Diagram 16 c:



Date: 17.JUN.2013 09:17:55

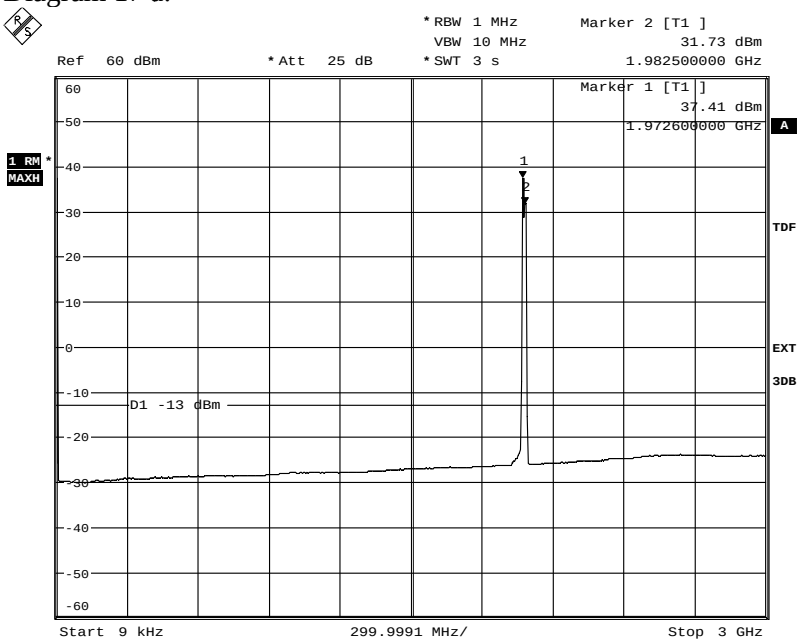
Diagram 16 d:



Date: 17.JUN.2013 09:18:45

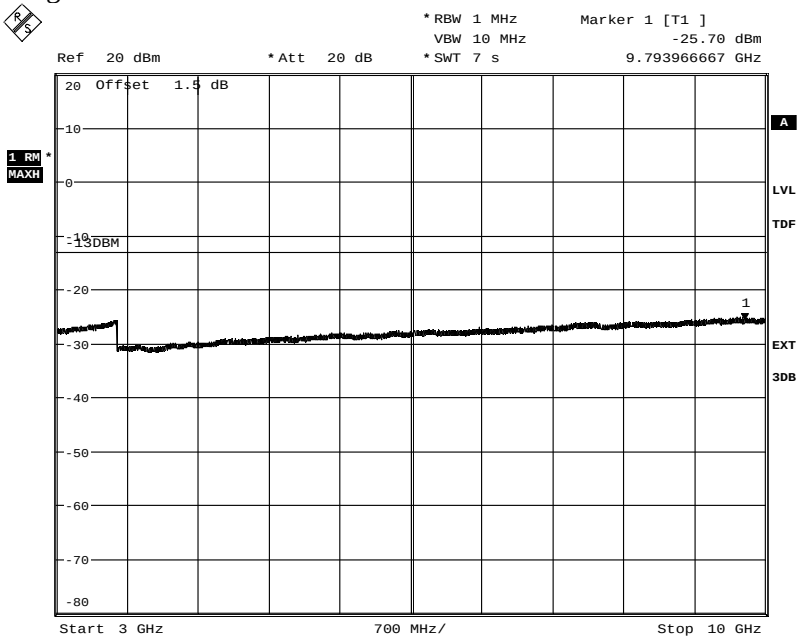
Appendix 5

Diagram 17 a:



Date: 17.JUN.2013 09:46:58

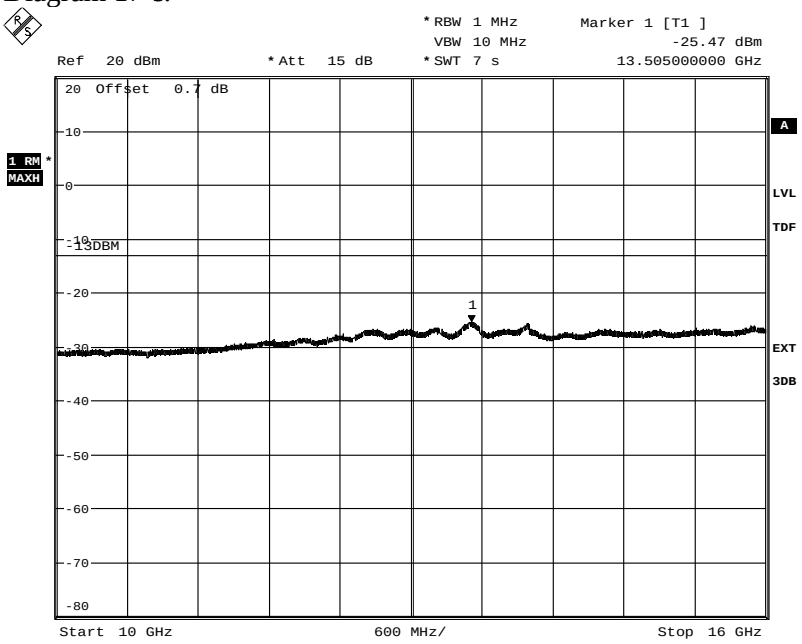
Diagram 17 b:



Date: 17.JUN.2013 09:44:21

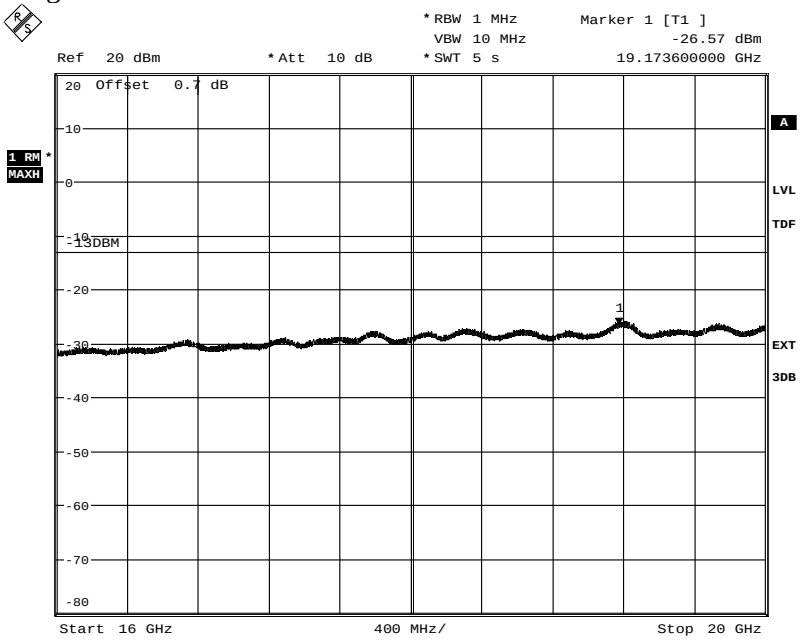
Appendix 5

Diagram 17 c:



Date: 17.JUN.2013 09:45:25

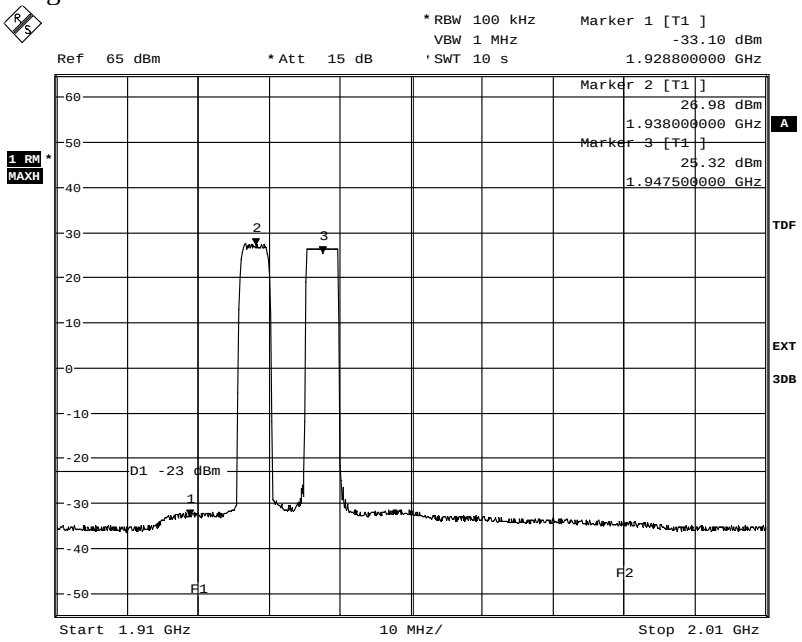
Diagram 17 d:



Date: 17.JUN.2013 09:43:01

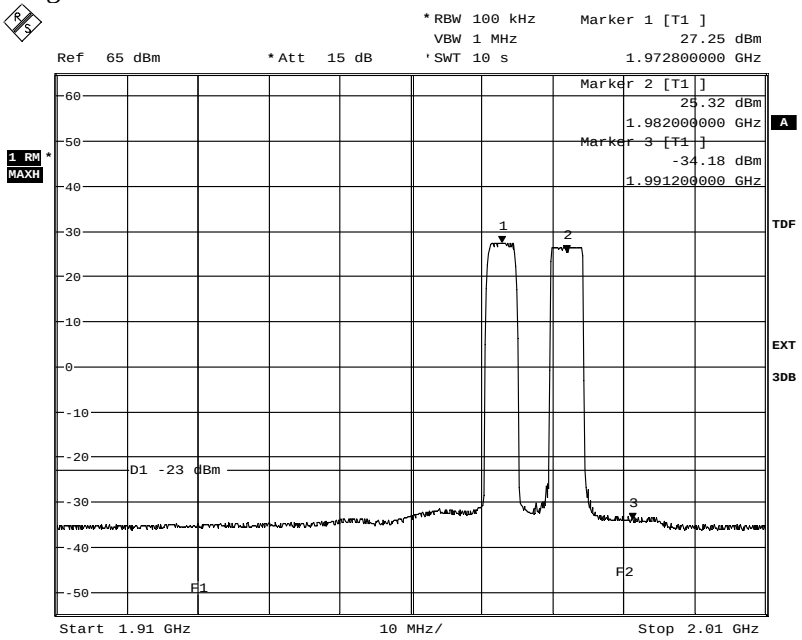
Appendix 5

Diagram 18:



Date: 17.JUN.2013 10:09:44

Diagram 19:



Date: 17.JUN.2013 10:29:53

Appendix 6

Field strength of spurious radiation measurements according to 47 CFR 2.1053 / IC RSS-139 6.5

Date	Temperature	Humidity
2013-06-10	24°C ± 3°C	34 % ± 5 %
2013-06-11	24°C ± 3°C	40 % ± 5 %

Test set-up and procedure

The test sites are listed at FCC, Columbia with registration number: 93866. The test site complies with RSS-Gen, Industry Canada file no. 3482A-1.

The measurements were performed with both horizontal and vertical polarization of the antenna. The antenna distance was 3 m in the frequency range 30 MHz – 18 GHz and 1m in the frequency range 18 - 20 GHz.

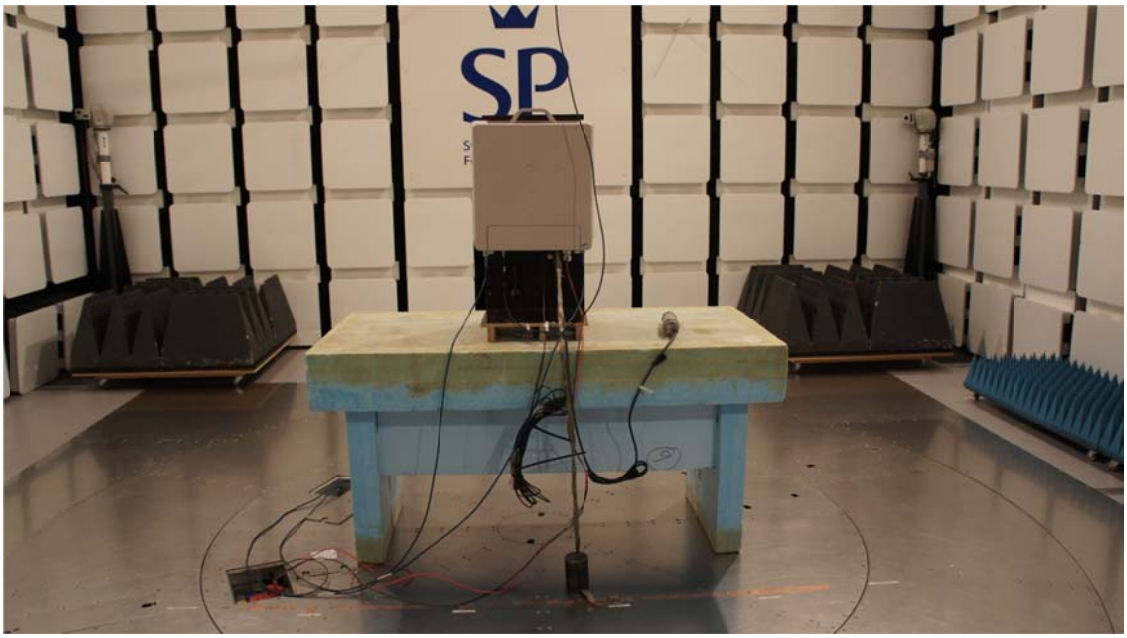
In the frequency range 30 MHz - 20 GHz the measurement was performed in power with a RBW of 1 MHz. A propagation loss in free space was calculated. The used formula was $\gamma = 20\log\left(\frac{4\pi D}{\lambda}\right)$, γ is the propagation loss and D is the antenna distance.

The measurement procedure was as the following:

1. The pre-measurement was first performed with peak detector. The EUT was measured in eight directions and with the antenna at three heights, 1.0 m, 1.5 m and 2.0 m.

2. Spurious radiation on frequencies closer than 20 dB to the limit in the pre-measurement is scanned 0-360 degrees and the antenna is scanned 1- 4 m for maximum response. The emission is then measured with the RMS detector and the RMS value is reported. Frequencies closer than 10 dB to the limit when measured with the RMS detector were measured with the substitution method according to the standard.

The test set-up during the spurious radiation measurements is shown in the picture below:



Measurement equipment

Measurement equipment	SP number
Semi anechoic chamber	503 881
R&S ESU 26	901 553
R&S FSIQ 40	503 738
EMC 32 ver. 8.52.0	503 745
Chase Bilog Antenna CBL 6111A	502 181
EMCO Horn Antenna 3115	502 175
Flann STD Gain Horn Antenna 20240-20	503 674
High pass filter, RLC Electronics	503 739
Miteq, Low Noise Amplifier	503 285
µComp Nordic, Low Noise Amplifier	901 545
Temperature and humidity meter, Testo 625	504 188

Results for worst emissions found

Diagram 1 a-d: LTE SR, SC, BW configuration 1.4 MHz with E-TM1.1 on frequency T
Diagram 2 a-d: LTE SR, MC, BW configuration 1.4 MHz with E-TM1.1, configuration 5
Diagram 3 a-d: WCDMA SR, SC, BW configuration 5 MHz with TM1 on frequency T
Diagram 4 a-d MSR WCDMA and LTE, configuration 6

Note: The LTE SR, SC measurement was repeated for frequencies B and M with lower emission levels compared to frequency T.

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-20000	All emission > 20 dB below limit	All emission > 20 dB below limit

Measurement uncertainty:

3.2 dB up to 18 GHz, 3.6 dB above 18 GHz

Limits

CFR 47 §24.238 and IC RSS-133 6.5

Outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, resulting in a limit of -13 dBm.

Complies?	Yes

Diagram 1 a:

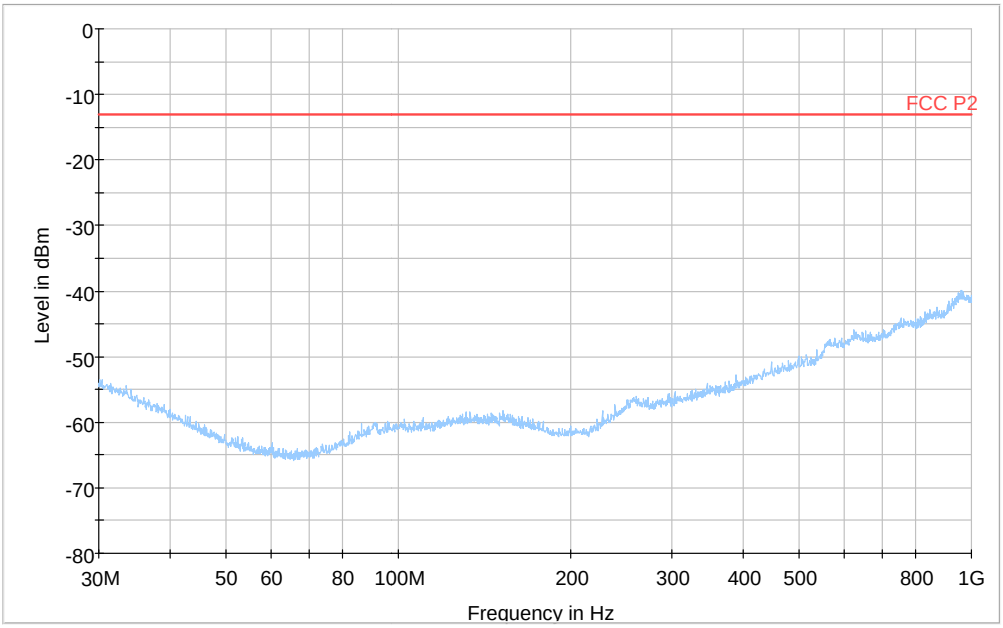
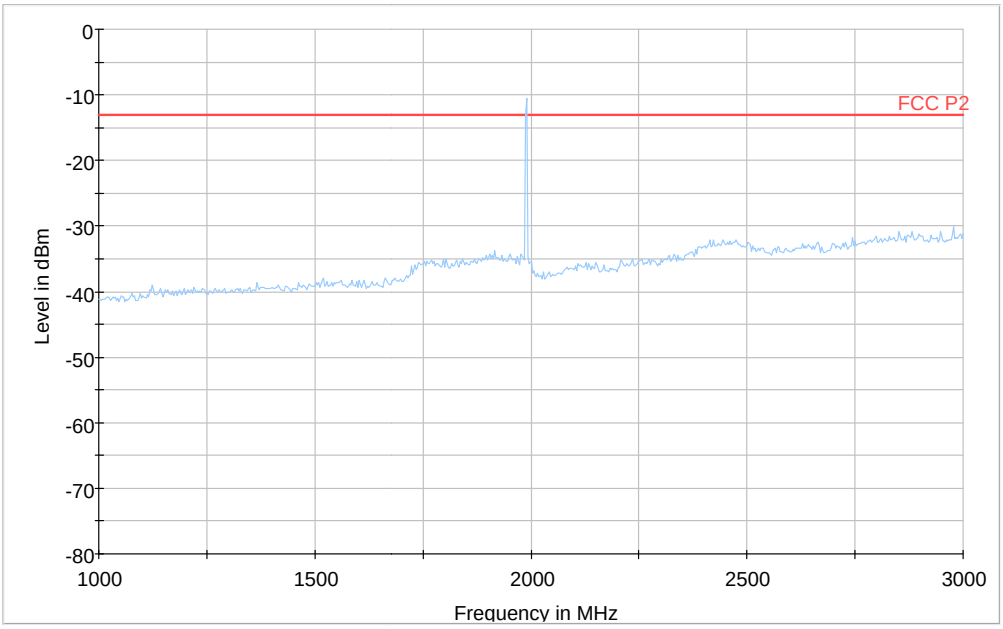


Diagram 1 b:



Note: The emission at 1983.3 MHz is the carrier frequency and shall be ignored in the context.

Appendix 6

Diagram 1 c:

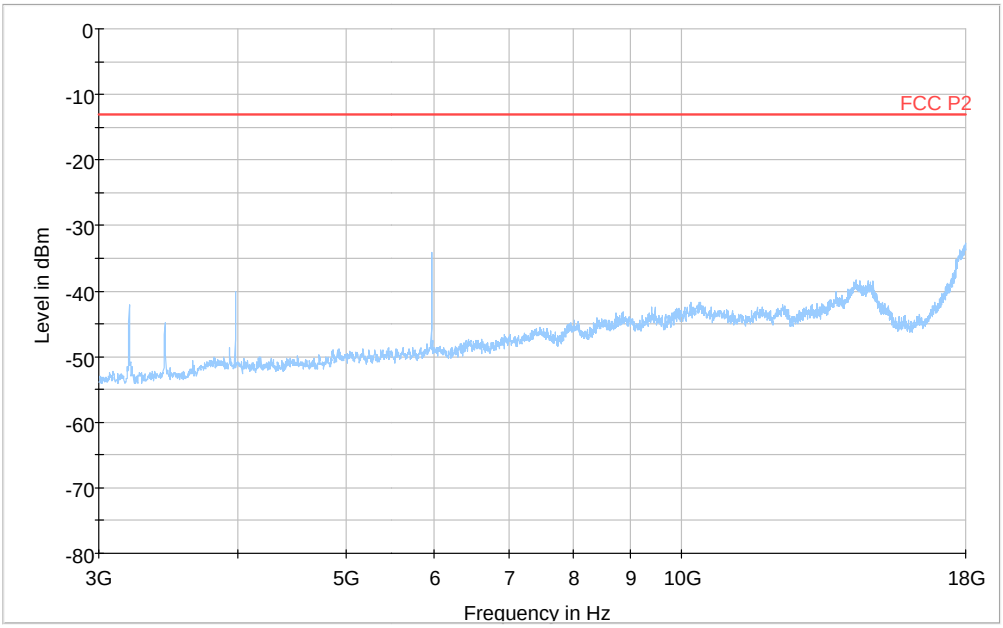


Diagram 1 d:

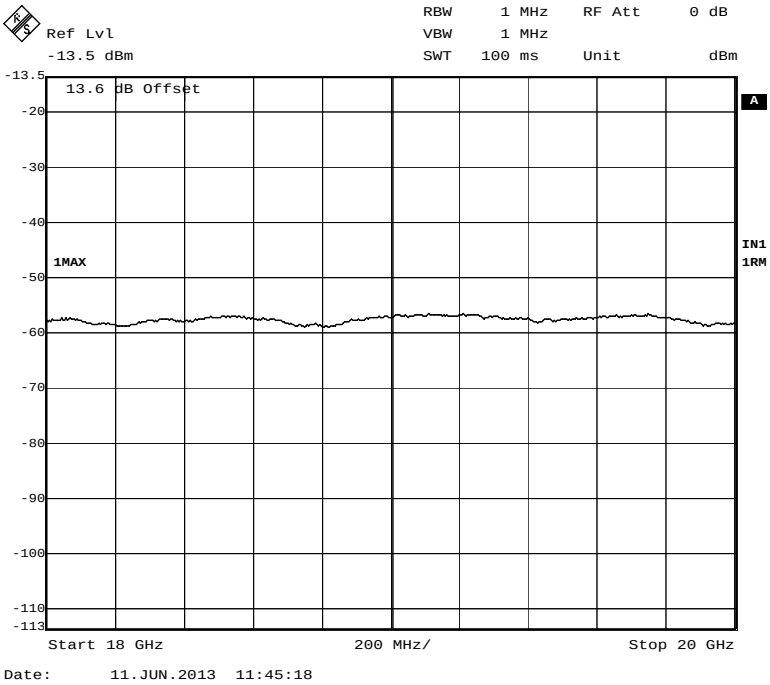


Diagram 2 a:

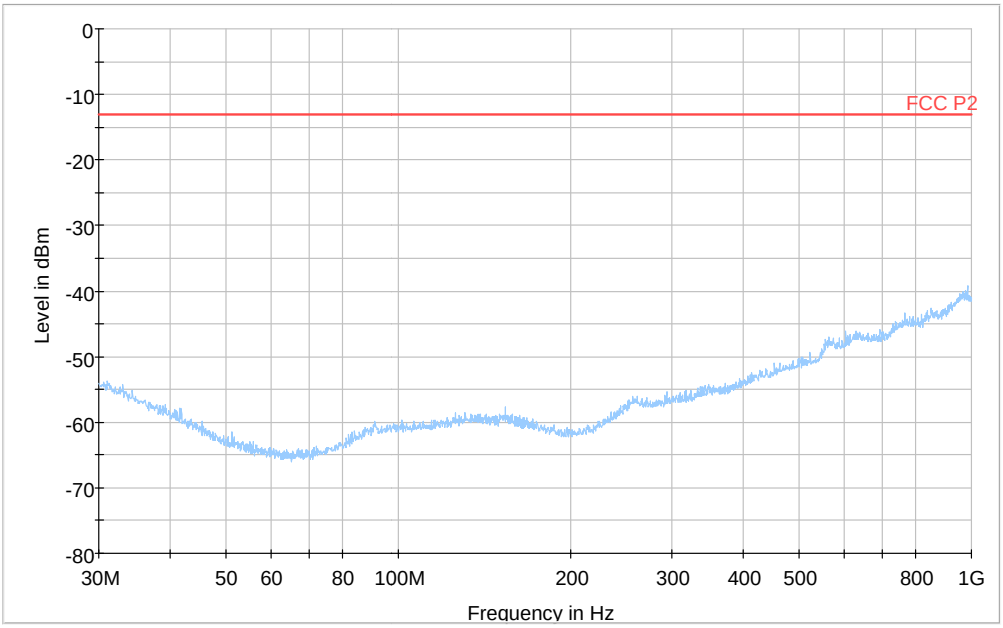
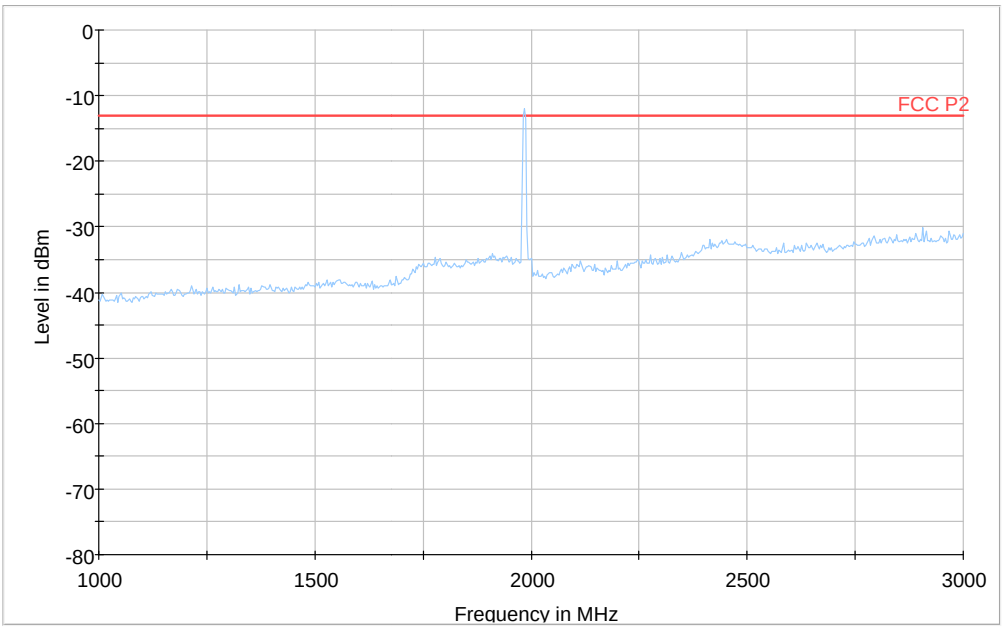


Diagram 2 b:



Note: The emission between 1982.8 and 1987.0 MHz are the carrier frequencies and shall be ignored in the context.

Appendix 6

Diagram 2 c:

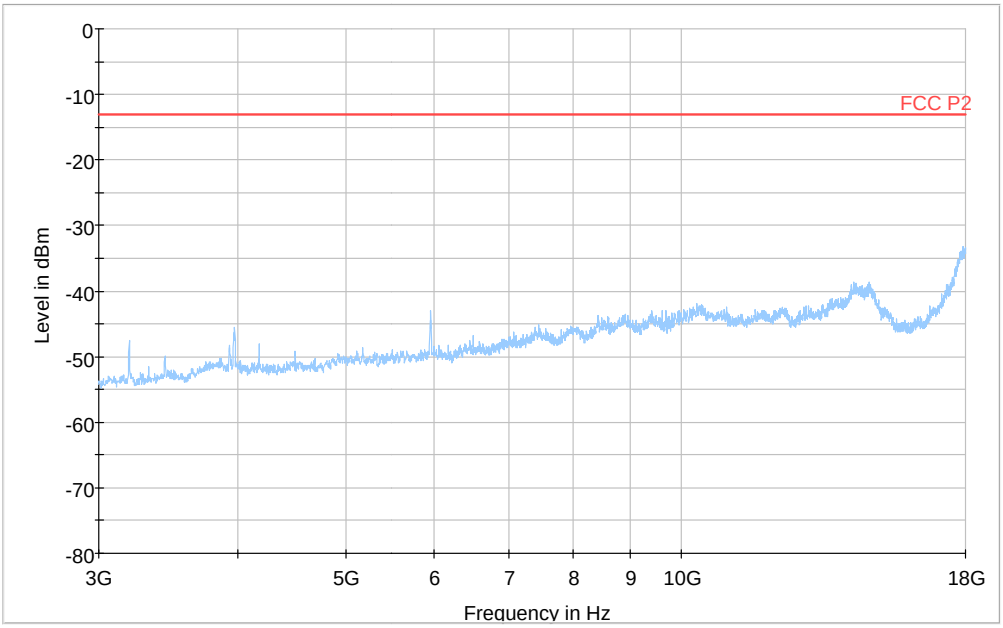


Diagram 2 d:

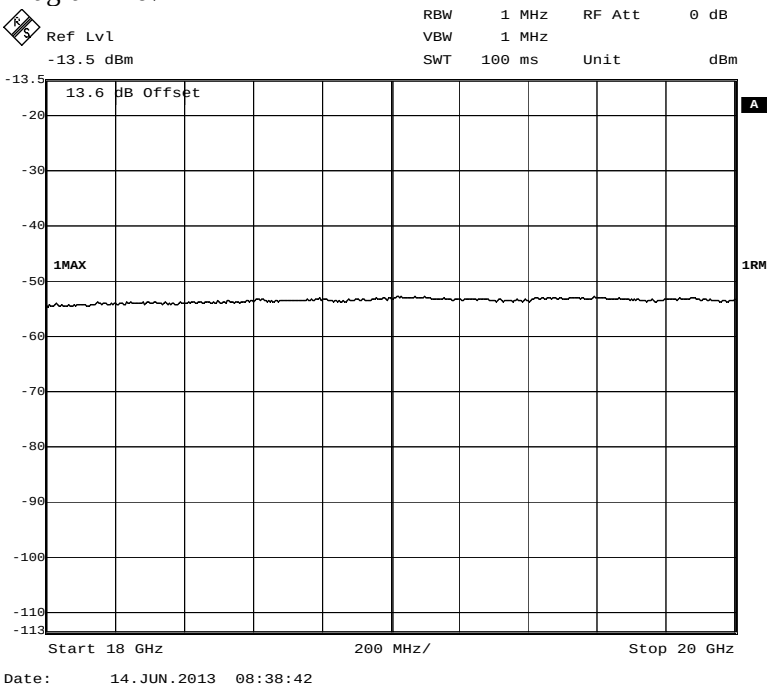


Diagram 3 a:

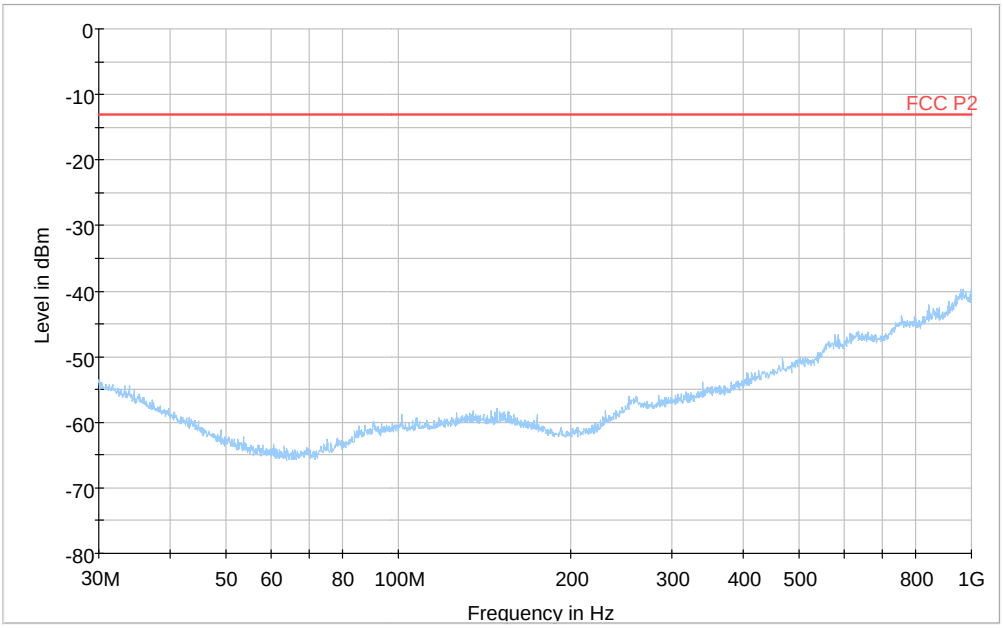
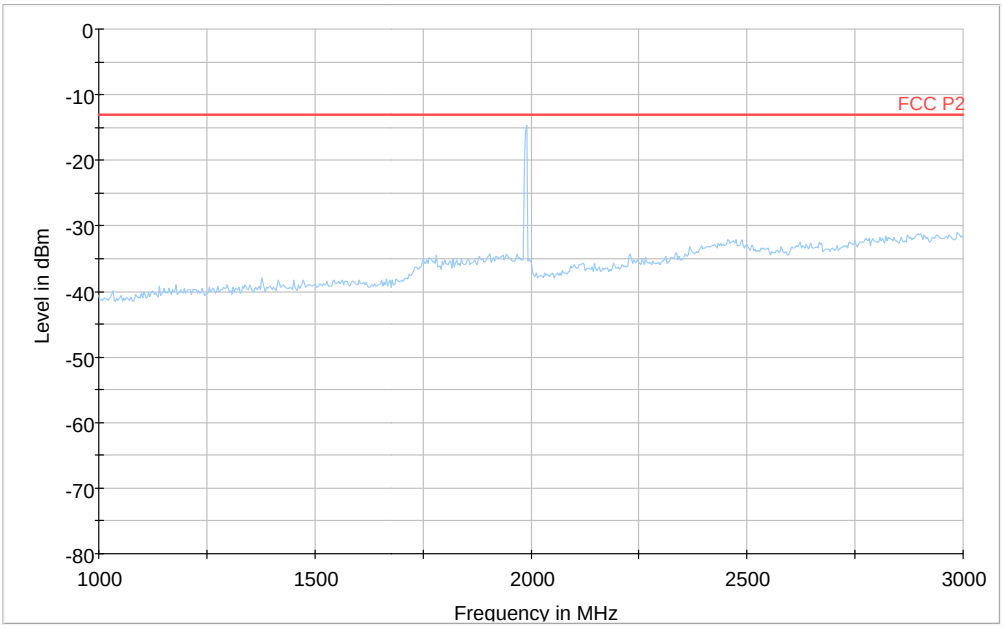


Diagram 3 b:



Note: The emission at 1987.6 MHz is the carrier frequency and shall be ignored in the context.

Appendix 6

Diagram 3 c:

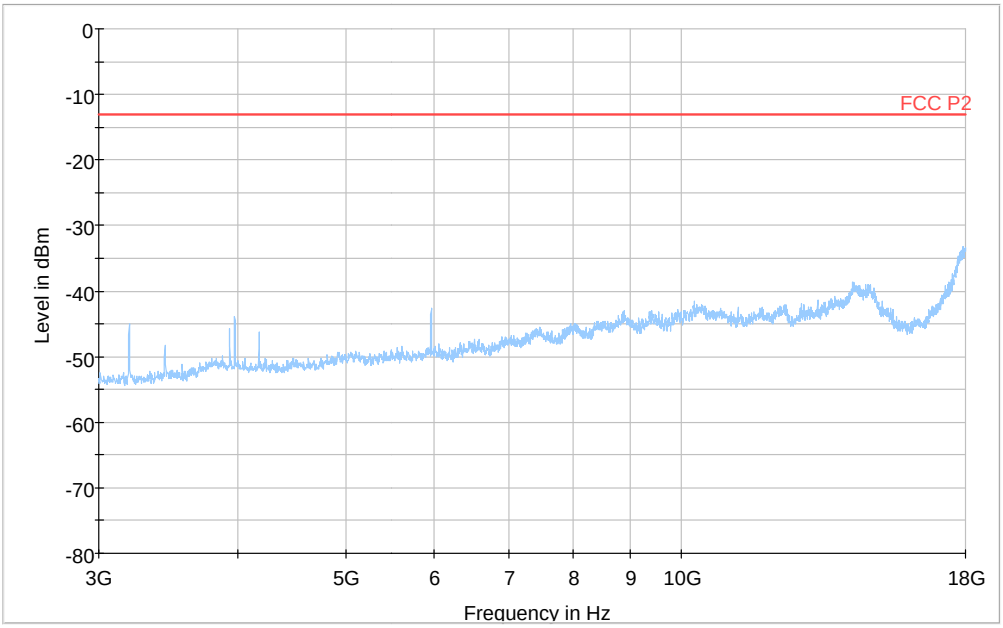
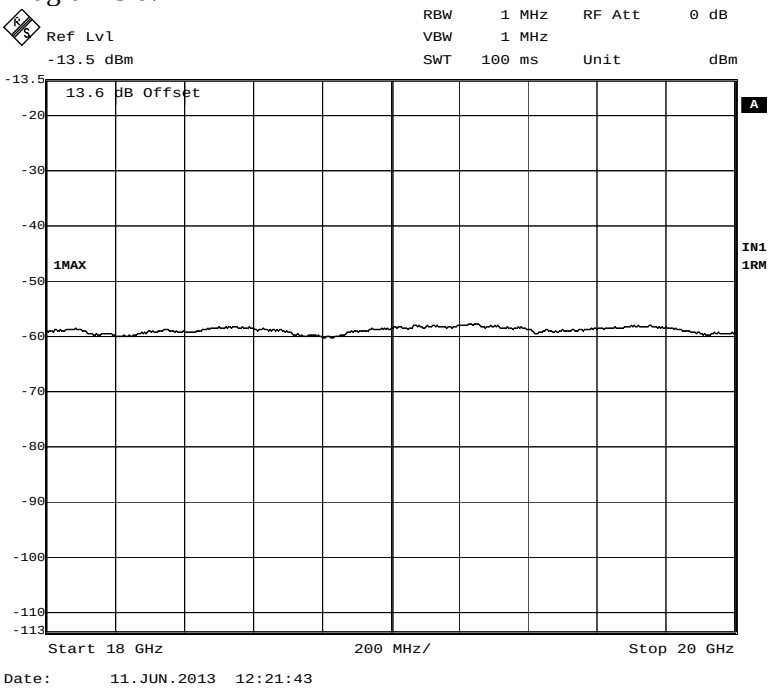


Diagram 3 d:



Appendix 6

Diagram 4 a:

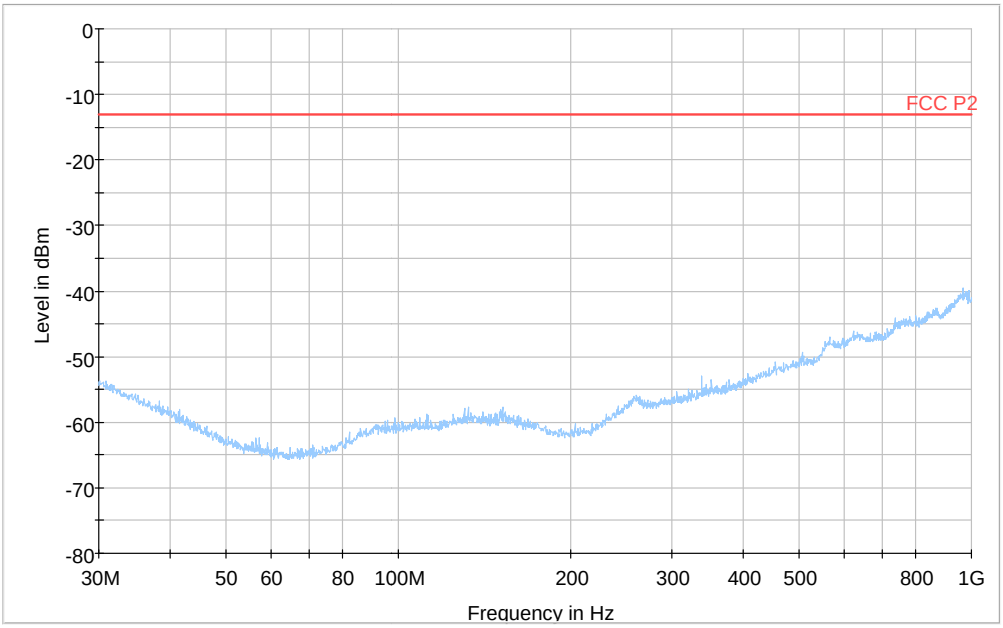
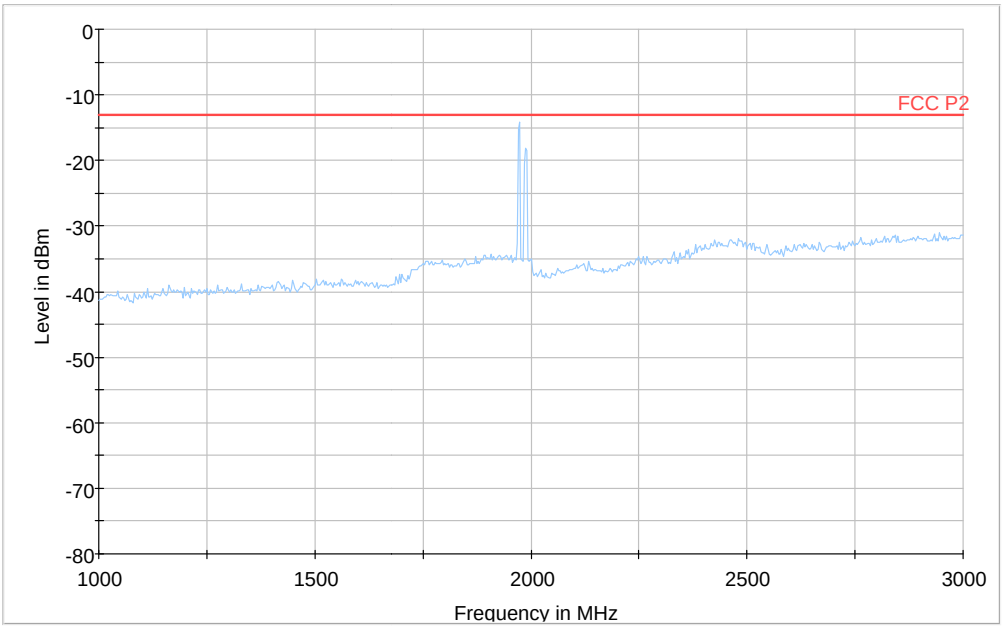


Diagram 4 b:



Note: The emission between 1972.6 and 1987.5 MHz are the carrier frequencies and shall be ignored in the context.

Appendix 6

Diagram 4 c:

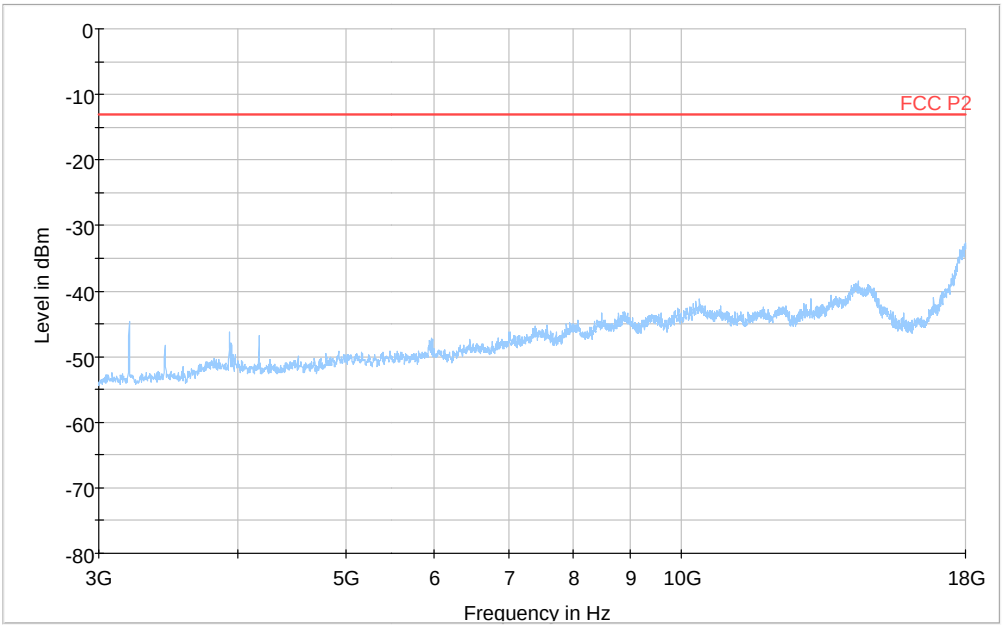
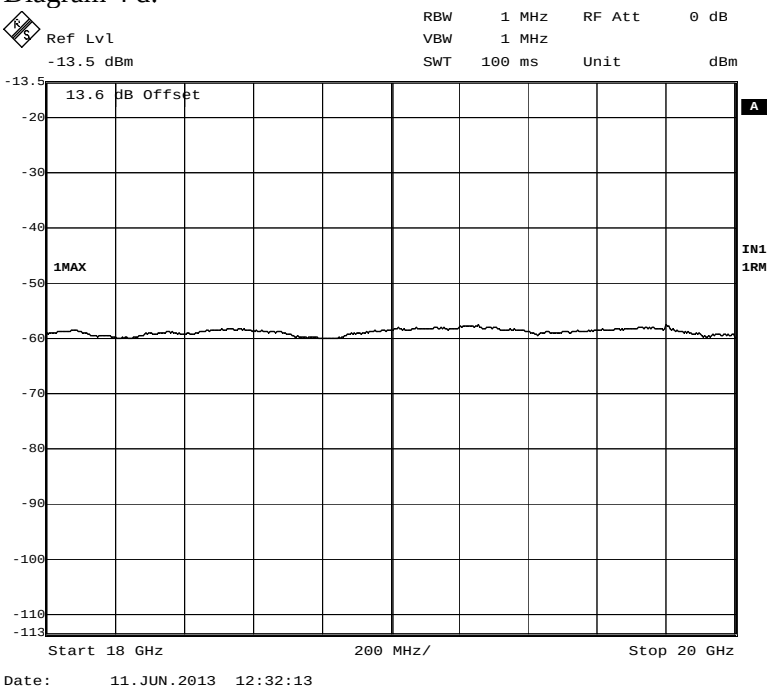


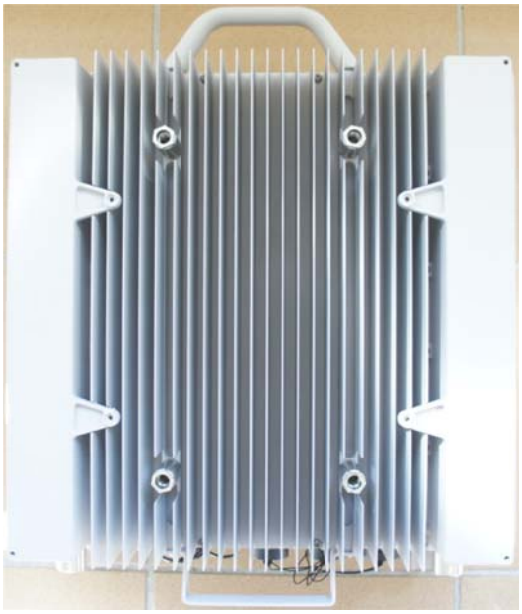
Diagram 4 d:

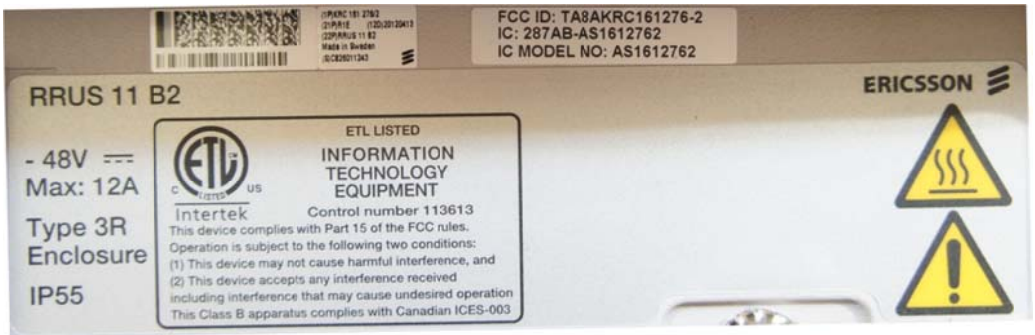


External photos

Front side

Rear side





Appendix 7

Top side

Bottom side

Appendix 7

Left side

Rigth side