RADIO TEST REPORT

No. 1211824 Ed. 3

RF performance

EQUIPMENT UNDER TEST

Equipment :	DAS Remote
Type / model :	DDS xxx
Manufacturer :	Deltanode Solutions AB
Tested by request of :	Deltanode Solutions AB

SUMMARY

Referring to the emission limits and the operating mode during the tests specified in this report the equipment complies with the requirements according to

47 CFR Part 22, Subpart H

47 CFR Part 24, Subpart E

47 CFR Part 27, Subpart C

Date of issue: 2013-06-28

Tested by: Åke Carlson
Stefan Andersson

Approved by: Niklas Boström

Revision History

Edition	Date	Description
1	**2012-08-20**	**First release**
2	**2012-11-30**	**Reference to product serie in report**
3	**2013-06-28**	**Correction of errors**

CONTENTS

1 CLIENT INFORMATION

The EUT has been tested by request of

Company:	Deltanode Solutions AB Hammarby fabriksväg 61 6tr 120 33 Stockholm SVERIGE
Name of contact:	Daniel Kerek

2 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT according to the manufacturer/client declaration

Equipment:	DAS Remote
Type/Model:	DDS xxx (DDS 100, 200. 300, 400 series)
Brand name:	Deltanode
Serial number:	DDS 499: 99001
Manufacturer:	Deltanode Solutions AB

Transmitter frequency range:	746 – 757 MHz 869 – 894 MHz 1930 – 1990 MHz 2110 – 2155 MHz	
Frequency agile or hopping:	☐ Yes	☒ No
Antenna connector:	☐ None, internal antenna	☒ Yes, type: N adapter

Rating RF output power:	700 MHz band	41 dBm
	850 MHz band	41 dBm
	1900 MHz band	41 dBm
	AWS band	41 dBm
Type of modulation:	700 MHz band	LTE GSM
	850 MHz band	CDMA GSM
	1900 MHz band	CDMA GSM
	AWS band	LTE WCDMA

Temperature range:
☐ Category I (General): -20°C to +55°C
☐ Category II (Portable equipment): -10°C to +55°C
☐ Category III (Equipment for normal indoor use): +5°C to +35°C
☒ Other: -30°C to +55°C

2.2 Additional hardware information about the EUT

DDS 100, 200, 300, 400 series are tested for the US frequency bands 700, 850, 1900 and AWS. The product structure allows free configuration of the four bands up to four RF line-up's in one unit.

The part number
DDS 1xx is equipped with 1 RF line up
DDS 2xx is equipped with two RF line up's
DDS 3xx is equipped with three RF line up's
DDS 4xx is equipped with four RF line up's.

The tested unit DDH 499 is a four RF line up´s with frequency bands 700, 850, 1900 and AWS.

3 TEST SPECIFICATIONS

3.1 Standards

FCC
47 CFR Part 2 (2012)

47 CFR Part 22 (2012), Subpart H

47 CFR Part 24 (2012), Subpart E

47 CFR Part 27 (2012), Subpart C

Test methods in:

ANSI C63.4-2009: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3.2 Additions, deviations and exclusions from standards and accreditation

No additions, deviations or exclusions have been made from standards and accreditation.

3.3 Test site

Measurements were performed at:

Intertek Semko AB.
Torshamnsgatan 43,
P.O. Box 1103
SE-164 22 Kista

Intertek Semko AB is a FCC listed test site with site registration number 90913
Intertek Semko AB is a Industry Canada listed test facility with IC assigned code 2042G

Measurement chambers

Measurement Chamber	Type of chamber	IC Site filing #
STORA HALLEN a.k.a. BIG CHAMBER	Semi-anechoic 10m and 3m	2042G-2

3.4 Test conditions

If not additionally specified, the tests were performed under the following environmental conditions:

Parameter	Normal	Extreme
Supplying voltage, V	120	102 – 138
Air temperature, ^{o}C	20	-30 - +55

4 TEST SUMMARY

The results in this report apply only to the tested sample:

4.1 Amplifier 700 MHz band

FCC reference	Test	Result	Note
2.1046 and 27.50(b)	RF Output power	Pass	
2.1049	Occupied bandwidth	Pass	
-	Out of band rejection	Pass	
2.1051 and 27.53(g)	Intermodulation	Pass	Note 1
2.1051 and 27.53(g)	Out of band spurious emission, conducted	Pass	
2.1053 and 27.53(g)	Out of band spurious emission, radiated	Pass	
2.1055 and 27.54	Frequency stability	Pass	

4.2 Amplifier 850 MHz band

FCC reference	Test	Result	Note
2.1046 and 22.913(a)	RF Output power	Pass	
2.1049	Occupied bandwidth	Pass	
-	Out of band rejection	Pass	
2.1051 and 22.917(a)	Intermodulation	Pass	Note 1
2.1051 and 22.917(a)	Out of band spurious emission, conducted	Pass	
2.1053 and 22.917(a)	Out of band spurious emission, radiated	Pass	
2.1055	Frequency stability	Pass	

4.3 Amplifier 1900 MHz band

FCC reference	Test	Result	Note
2.1046 and 24.232	RF Output power	Pass	
2.1049	Occupied bandwidth	Pass	
-	Out of band rejection	Pass	
2.1051 and 24.238	Intermodulation	Pass	Note 1
2.1051 and 24.238	Out of band spurious emission, conducted	Pass	
2.1053 and 24.238	Out of band spurious emission, radiated	Pass	
2.1055	Frequency stability	Pass	

4.4 Amplifier AWS band

FCC reference	Test	Result	Note
2.1046 and 27.50(d)	RF Output power	Pass	
2.1049	Occupied bandwidth	Pass	
-	Out of band rejection	Pass	
2.1051 and 27.53(g)	Intermodulation	Pass	Note 1
2.1051 and 27.53(g)	Out of band spurious emission, conducted	Pass	
2.1053 and 27.53(g)	Out of band spurious emission, radiated	Pass	
2.1055 and 27.54	Frequency stability	Pass	

Note 1: The measured result is below the upper limit, but by a margin less than half of the uncertainty interval; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than noncompliance.

5 RF OUTPUT POWER

Date of test:	2012-04-12	Test location:	Big Chamber
EUT Serial:	99001	Ambient temp.	22 °C
Tested by:	Åke Carlson	Relative humidity	29 %
Test result:	Pass		

5.1 Requirement

Amplifier	Rule	Limit
700	2.1046 and 27.50(b)	1000 W (60 dBm) ERP
850	2.1046 and 22.913(a)	500 W (57 dBm) ERP
1900	2.1046 and 24.232	1640 W (62 dBm) EIRP
AWS	2.1046 and 27.50(d)	1640 W (62 dBm) EIRP

5.2 Test data

Amplifier	Input signal	RF Ouput Power (dBm)	Limit value (dBm)
700	LTE	40.2	60
700	GSM	40.3	60
850	CDMA	40.1	57
850	GSM	40.1	57
1900	CDMA	39.2	62
1900	GSM	39.3	62
AWS	LTE	39.2	62
AWS	WCDMA	39.2	62

Measurement results are corrected for attenuation in the set-up configuration.

Example calculation:

Rf output power [dBm] = Power meter reading [dBm] + cable loss [dB] + attenuator loss [dB]

6 OCCUPIED BANDWIDTH

Date of test:	2012-05-02	Test location:	Big Chamber
EUT Serial:	99001	Ambient temp.	22 °C
Tested by:	Åke Carlson	Relative humidity	29 %
Test result:	Pass		

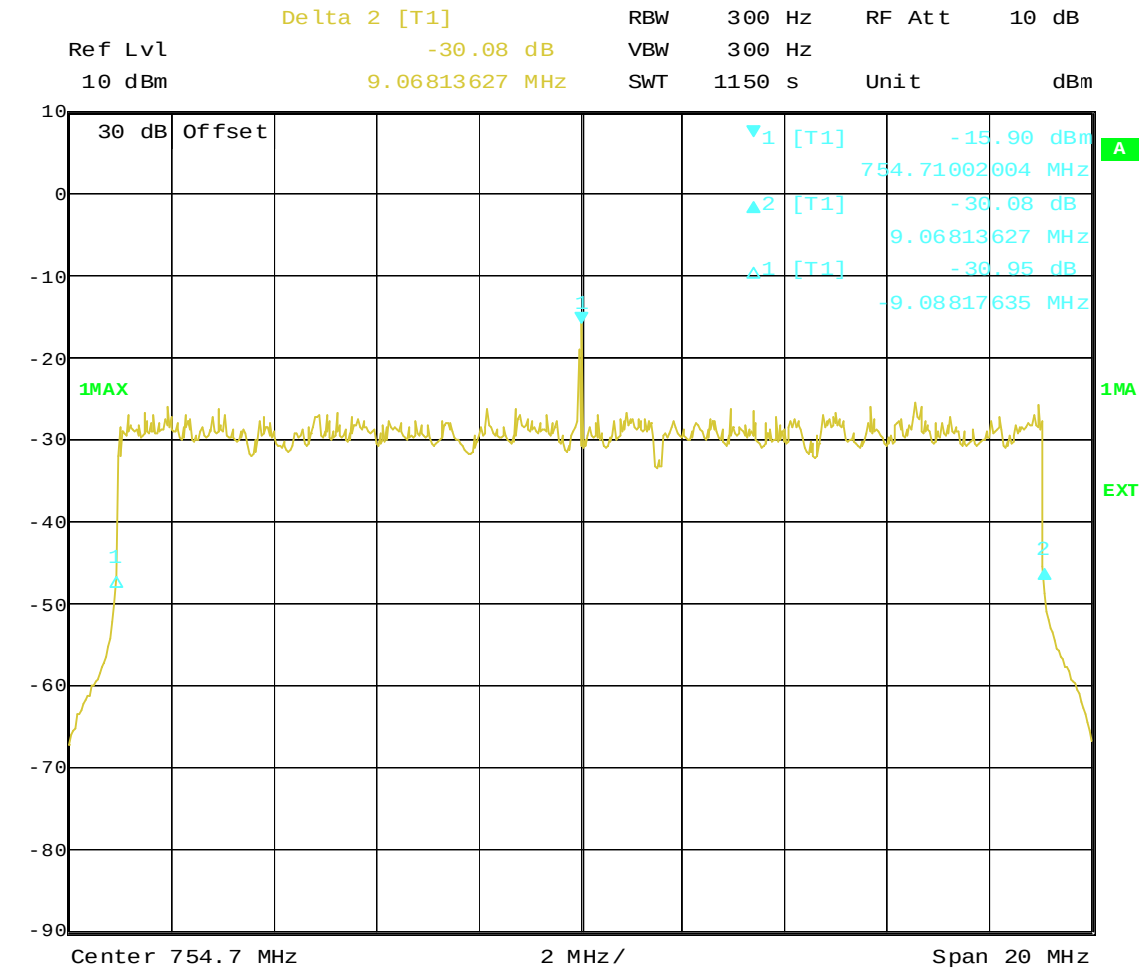
6.1 Requirement

47 CFR 2.1049
The spectral shape of the output should look similar to input for all modulations using 300 Hz RBW (or 1 % of occupied bandwidth)

6.2 Test data

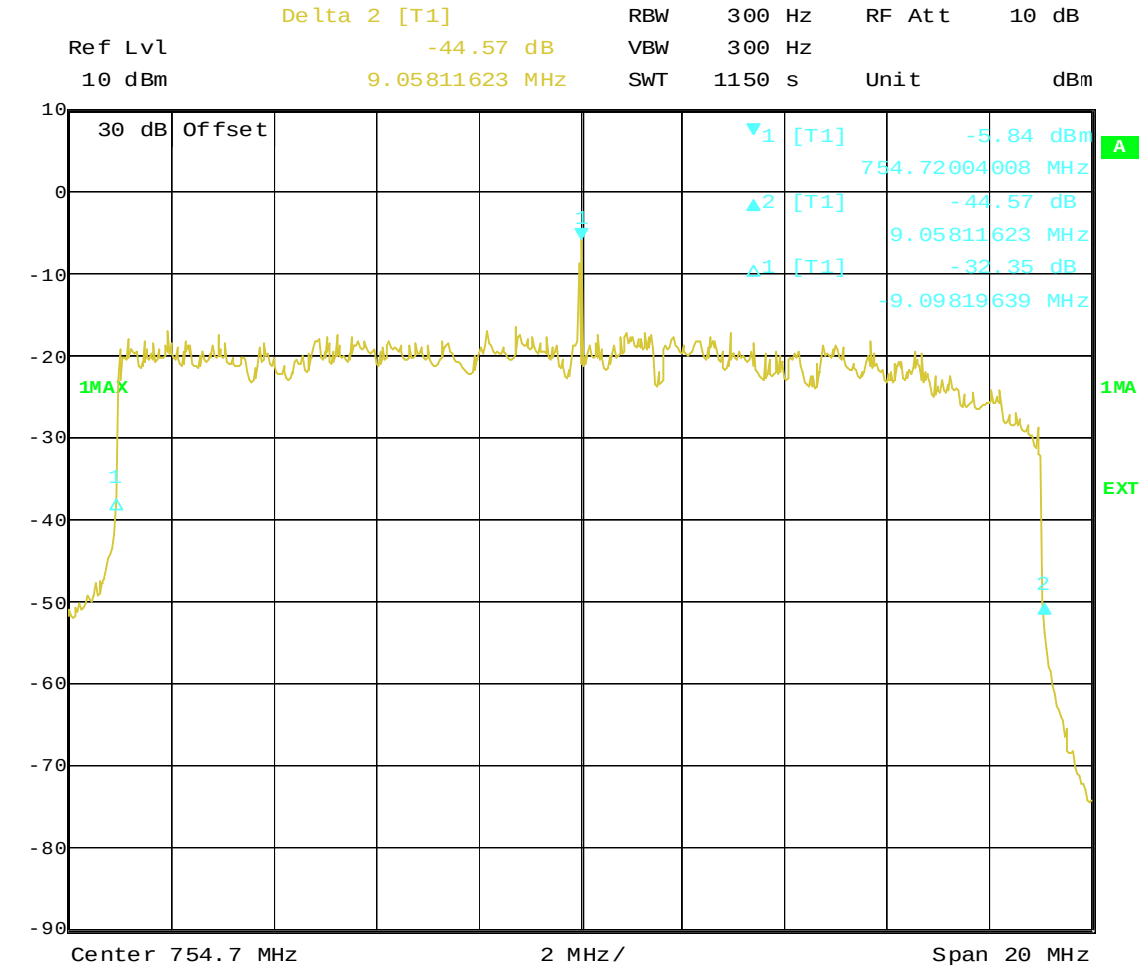
Amplifier	Input signal	26 dB bandwidth		Plots
		Input (kHz)	Output (kHz)	
700	LTE	1815.63		Plot 6:1
			1815.63	Plot 6:2
700	GSM	322.346		Plot 6:3
			322.346	Plot 6:4
850	CDMA	1430.86		Plot 6:5
			1430.86	Plot 6:6
850	GSM	320.642		Plot 6:7
			318.368	Plot 6:8
1900	CDMA	1434.87		Plot 6:9
			1430.862	Plot 6:10
1900	GSM	310.622		Plot 6:11
			312.626	Plot 6:12
AWS	WCDMA	4599.198		Plot 6:13
			4599.198	Plot 6:14
AWS	LTE	1850.00		Plot 6:15
			1815.63	Plot 6:16

Plot 6:1

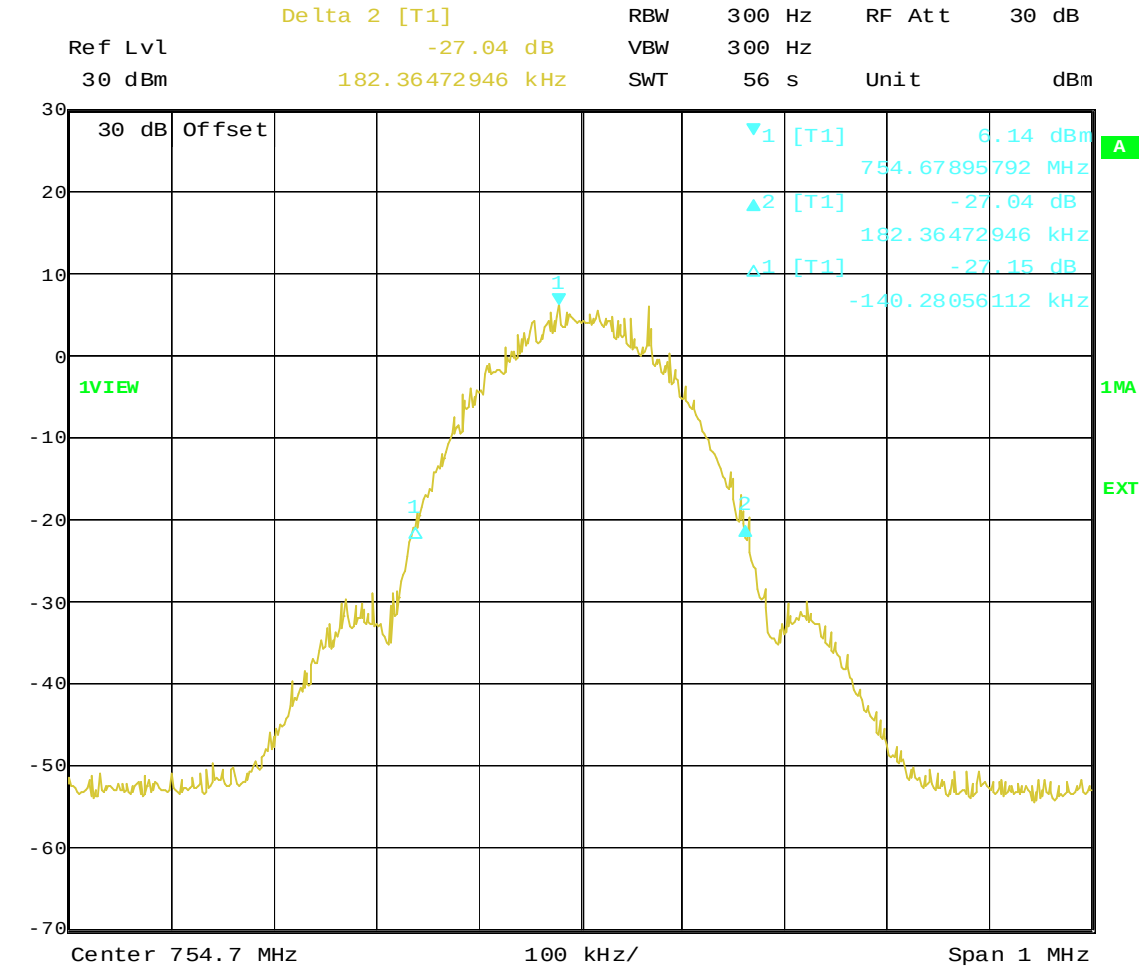


Date: 2.MAY.2012 08:43:22

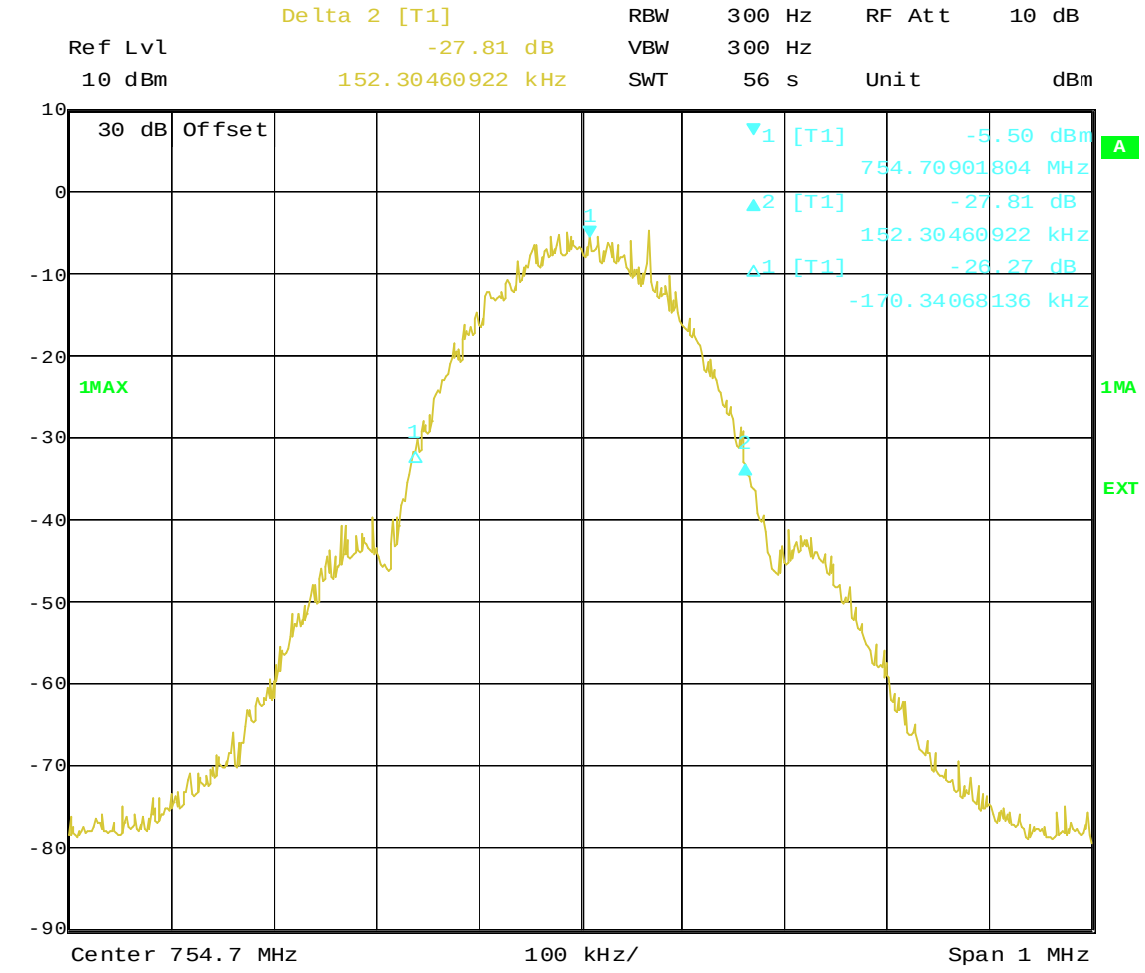
Plot 6:2


Delta 2 [T1]
RBW 300 Hz
RF Att 10 dB
Ref Lvl
-44.57 dB
VBW 300 Hz
10 dBm
9.05811623 MHz
SWT 1150 s
Unit dBm
30 dB Offset
1 [T1] -5.84 dBm
754.72004008 MHz
2 [T1] -44.57 dB
9.05811623 MHz
1 [T1] -32.35 dB
-9.09819639 MHz
A
1MAX
1MA
EXT
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 754.7 MHz
2 MHz/
Span 20 MHz
Date: 2.MAY.2012 10:28:14

Plot 6:3

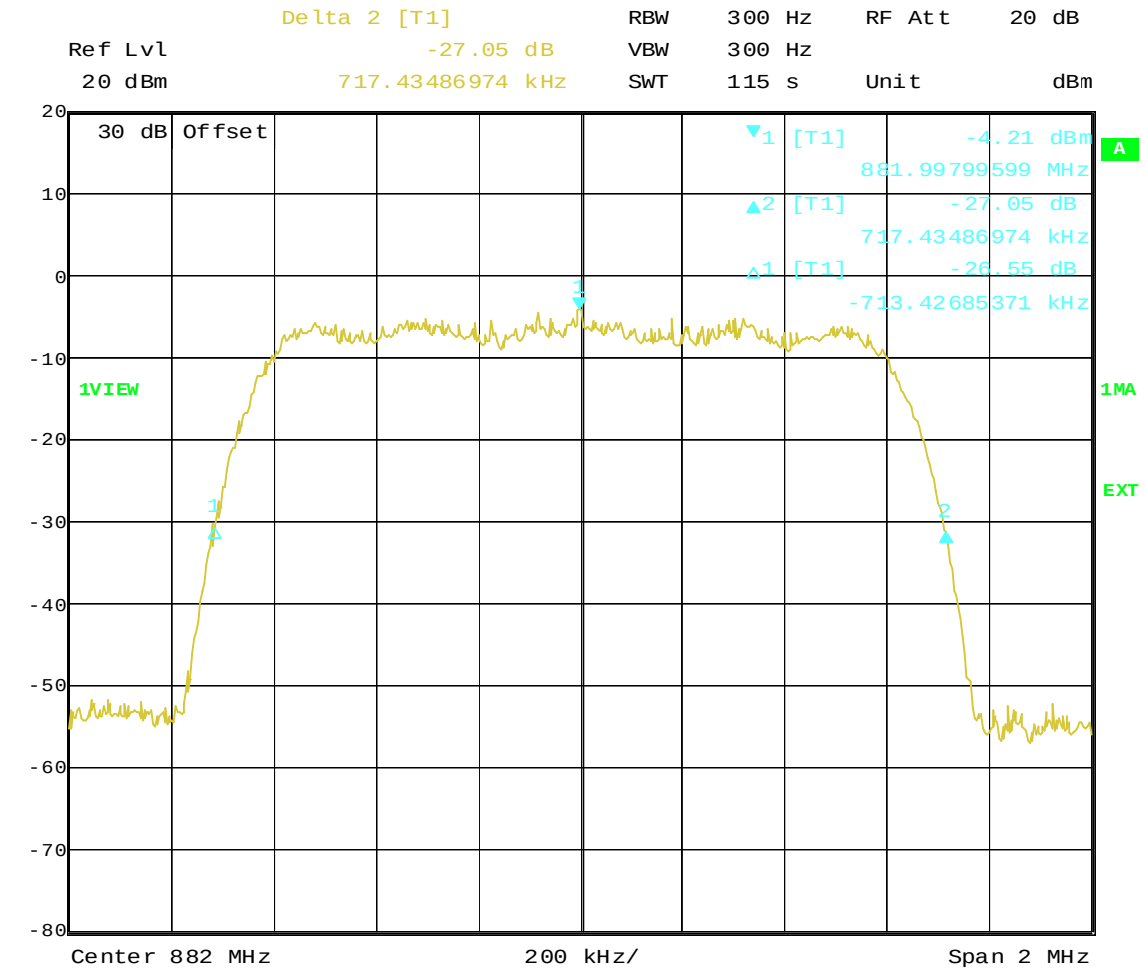

Delta 2 [T1]
RBW 300 Hz
RF Att 30 dB
Ref Lvl
-27.04 dB
VBW 300 Hz
30 dBm
182.36472946 kHz
SWT 56 s
Unit dBm
30 dB Offset
1 [T1] 6.14 dBm
754.67895792 MHz
2 [T1] -27.04 dB
182.36472946 kHz
1 [T1] -27.15 dB
-140.28056112 kHz
A
1VIEW
1MA
EXT
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
Center 754.7 MHz
100 kHz/
Span 1 MHz
Date: 27.APR.2012 12:30:05

Plot 6:4

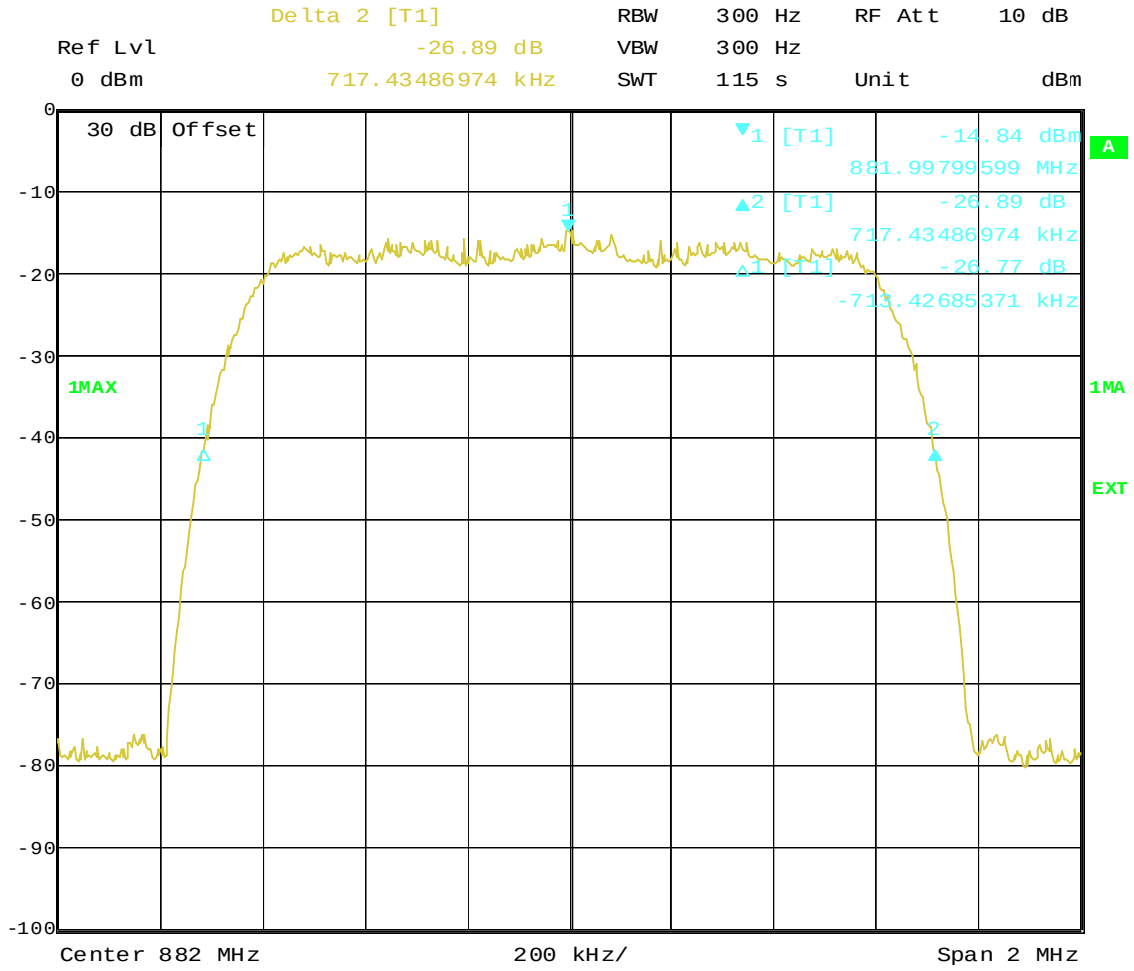


Date: 27.APR.2012 15:45:24

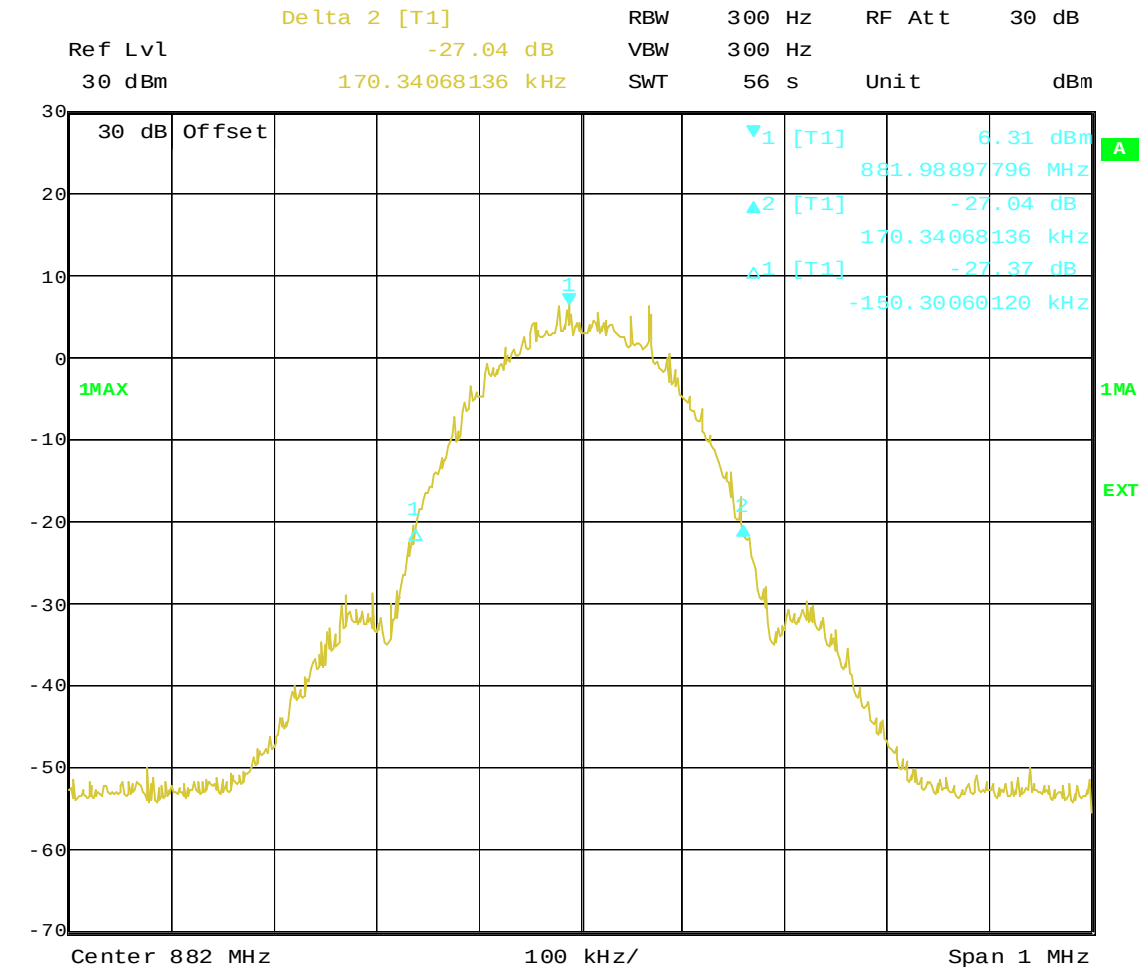
Plot 6:5


Delta 2 [T1]
RBW 300 Hz
RF Att 20 dB
Ref Lvl
-27.05 dB
VBW 300 Hz
20 dBm
717.43486974 kHz
SWT 115 s
Unit dBm
30 dB Offset
1 [T1] -4.21 dBm
881.99799599 MHz
2 [T1] -27.05 dB
717.43486974 kHz
Δ1 [T1] -26.55 dB
-713.42685371 kHz
A
1VIEW
1MA
EXT
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 882 MHz
200 kHz/
Span 2 MHz
Date: 27.APR.2012 14:25:30

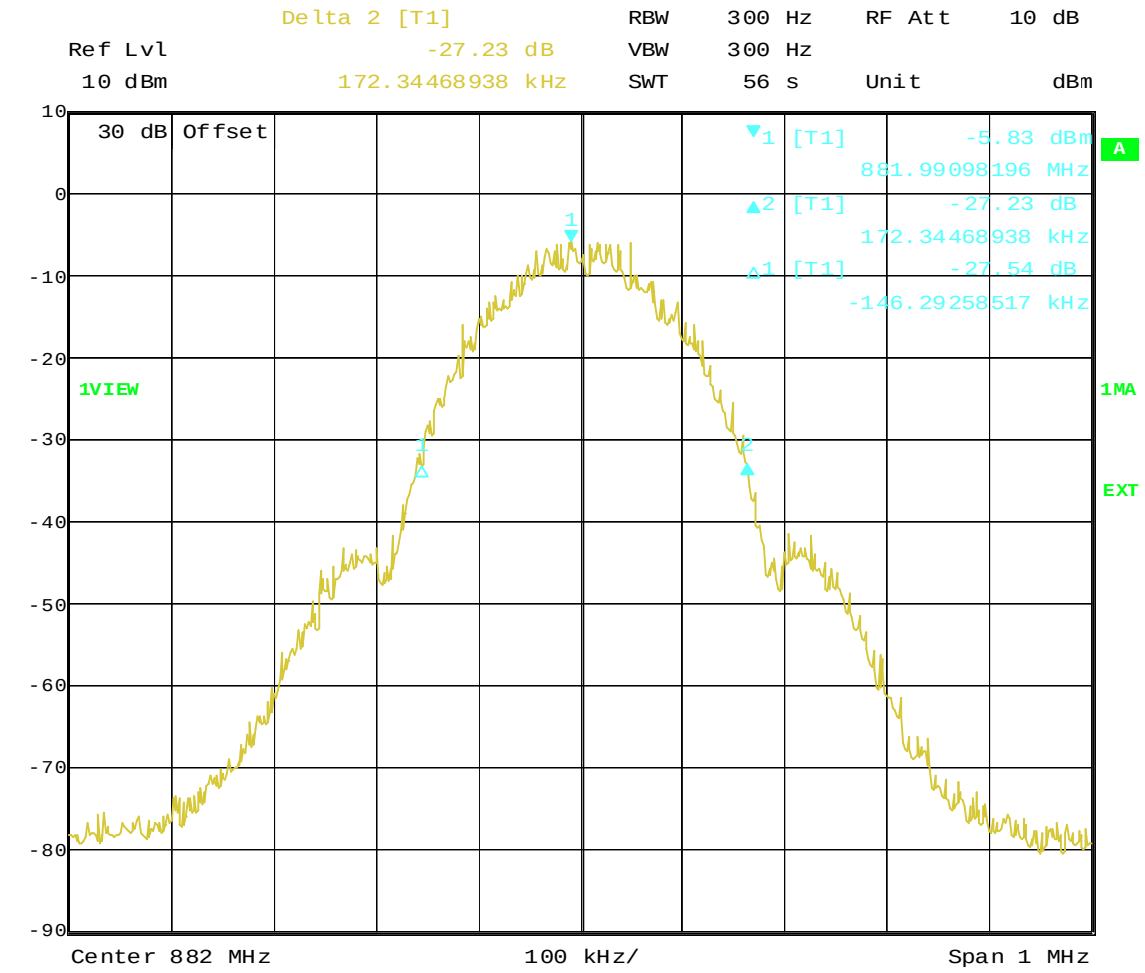
Plot 6:6


Delta 2 [T1]
RBW 300 Hz
RF Att 10 dB
Ref Lvl
-26.89 dB
VBW 300 Hz
0 dBm
717.43486974 kHz
SWT 115 s
Unit dBm
30 dB Offset
1 [T1] -14.84 dBm
881.99799599 MHz
2 [T1] -26.89 dB
717.43486974 kHz
1 [T1] -26.77 dB
-713.42685371 kHz
A
1MAX
1MA
EXT
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 882 MHz
200 kHz/
Span 2 MHz
Date: 27.APR.2012 15:33:35

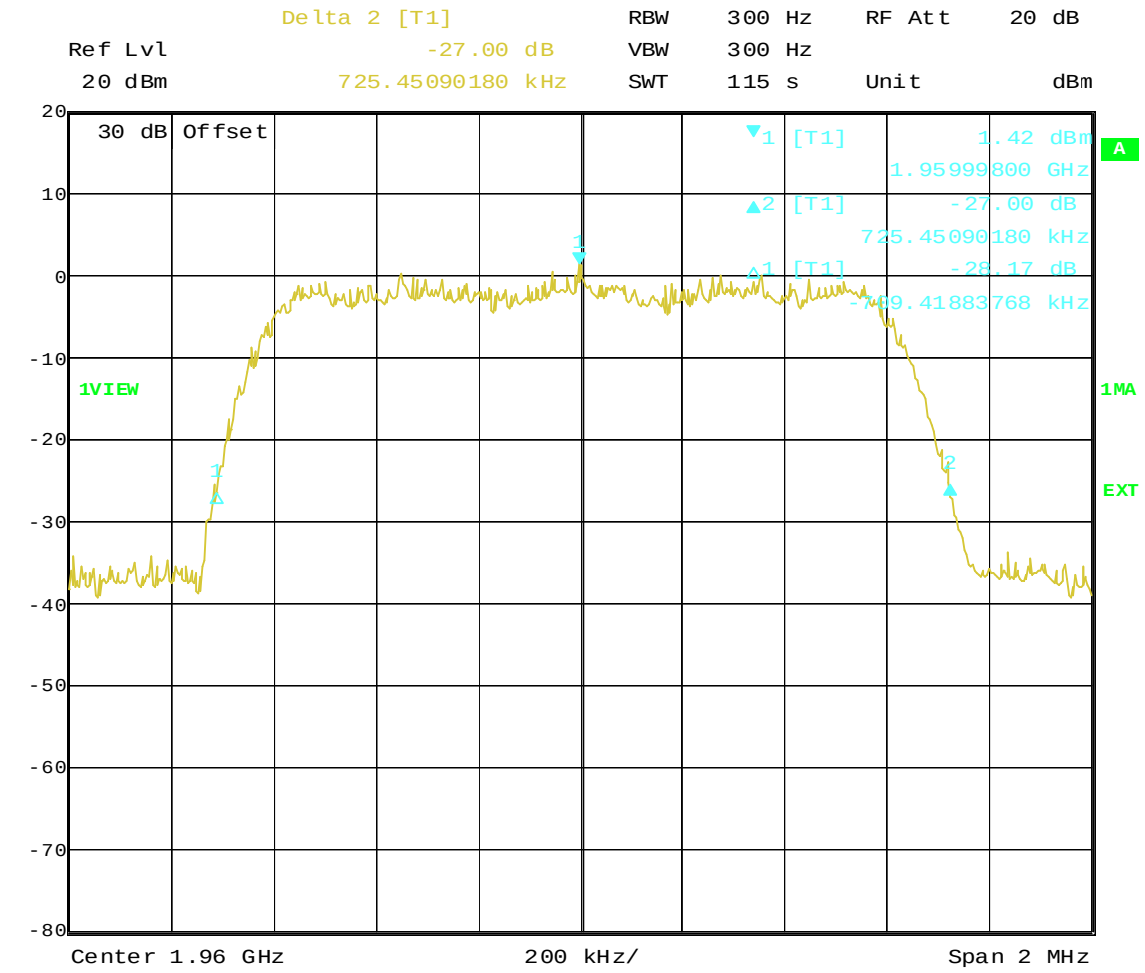
Plot 6:7


Delta 2 [T1]
RBW 300 Hz
RF Att 30 dB
Ref Lvl
-27.04 dB
VBW 300 Hz
30 dBm
170.34068136 kHz
SWT 56 s
Unit dBm
30 dB Offset
1 [T1] 6.31 dBm
881.98897796 MHz
2 [T1] -27.04 dB
170.34068136 kHz
Δ1 [T1] -27.37 dB
-150.30060120 kHz
A
1MAX
1MA
EXT
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
Center 882 MHz
100 kHz/
Span 1 MHz
Date: 27.APR.2012 12:50:59

Plot 6:8

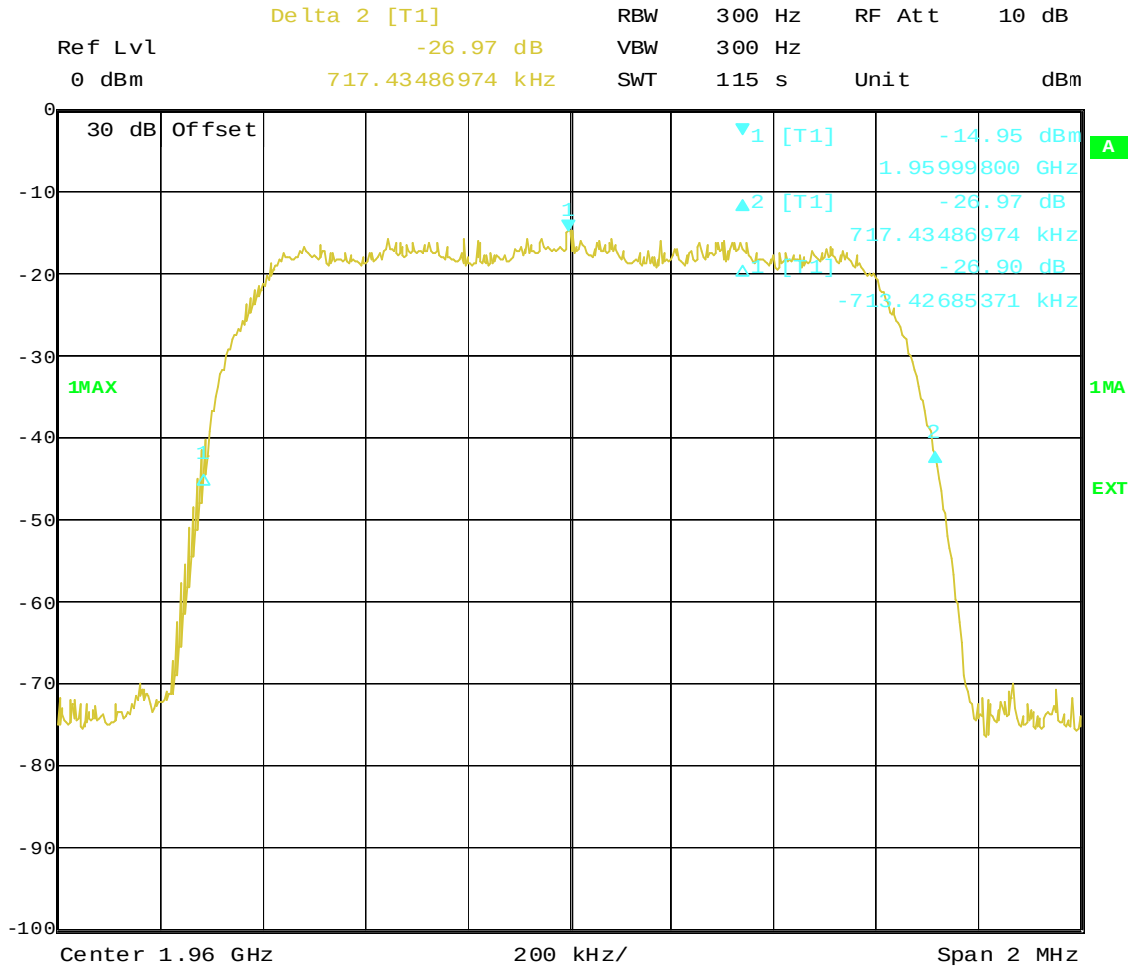

Delta 2 [T1]
RBW 300 Hz
RF Att 10 dB
Ref Lvl
-27.23 dB
VBW 300 Hz
10 dBm
172.34468938 kHz
SWT 56 s
Unit dBm
30 dB Offset
1 [T1] -5.83 dBm
881.99098196 MHz
2 [T1] -27.23 dB
172.34468938 kHz
1 [T1] -27.54 dB
-146.29258517 kHz
A
1VIEW
1MA
EXT
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 882 MHz
100 kHz/
Span 1 MHz
Date: 27.APR.2012 15:41:16

Plot 6:9

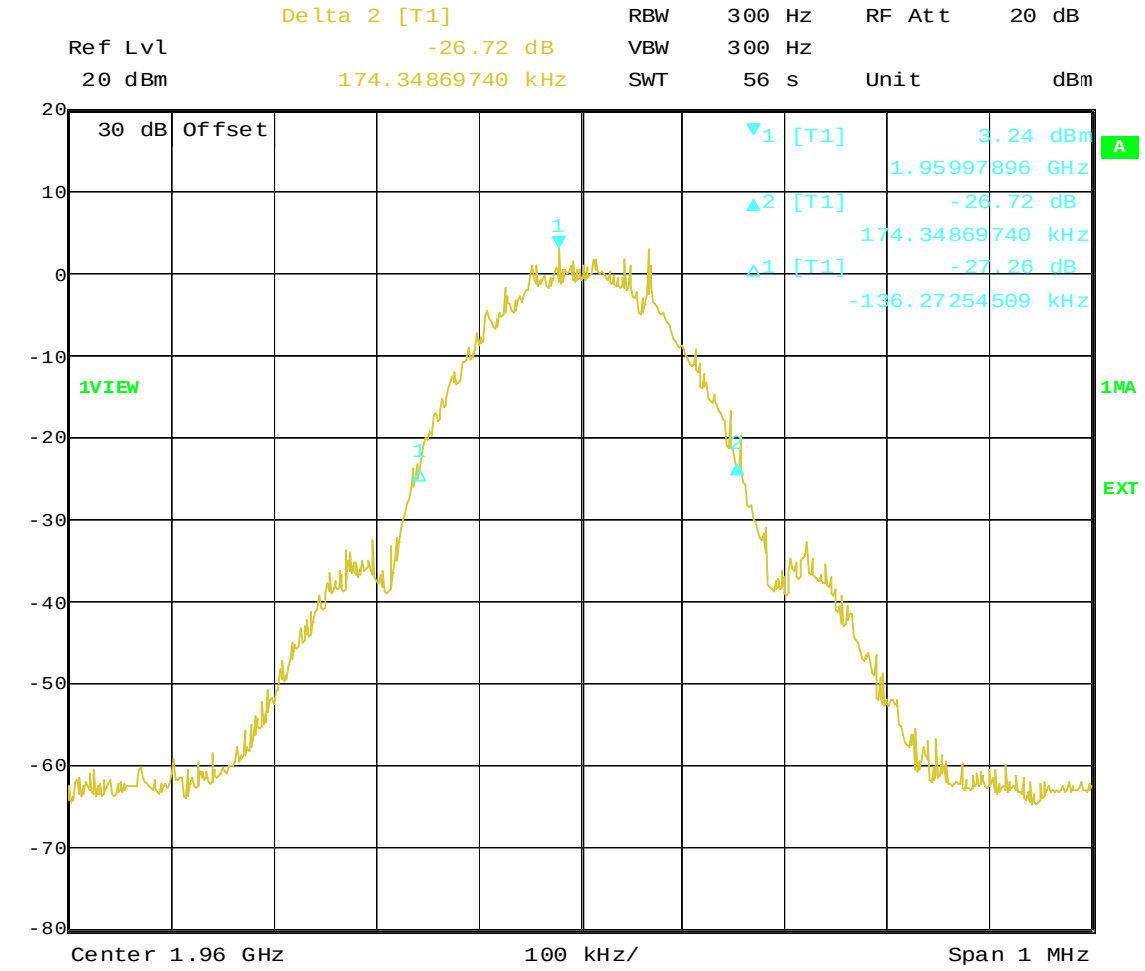


Date: 27.APR.2012 14:18:12

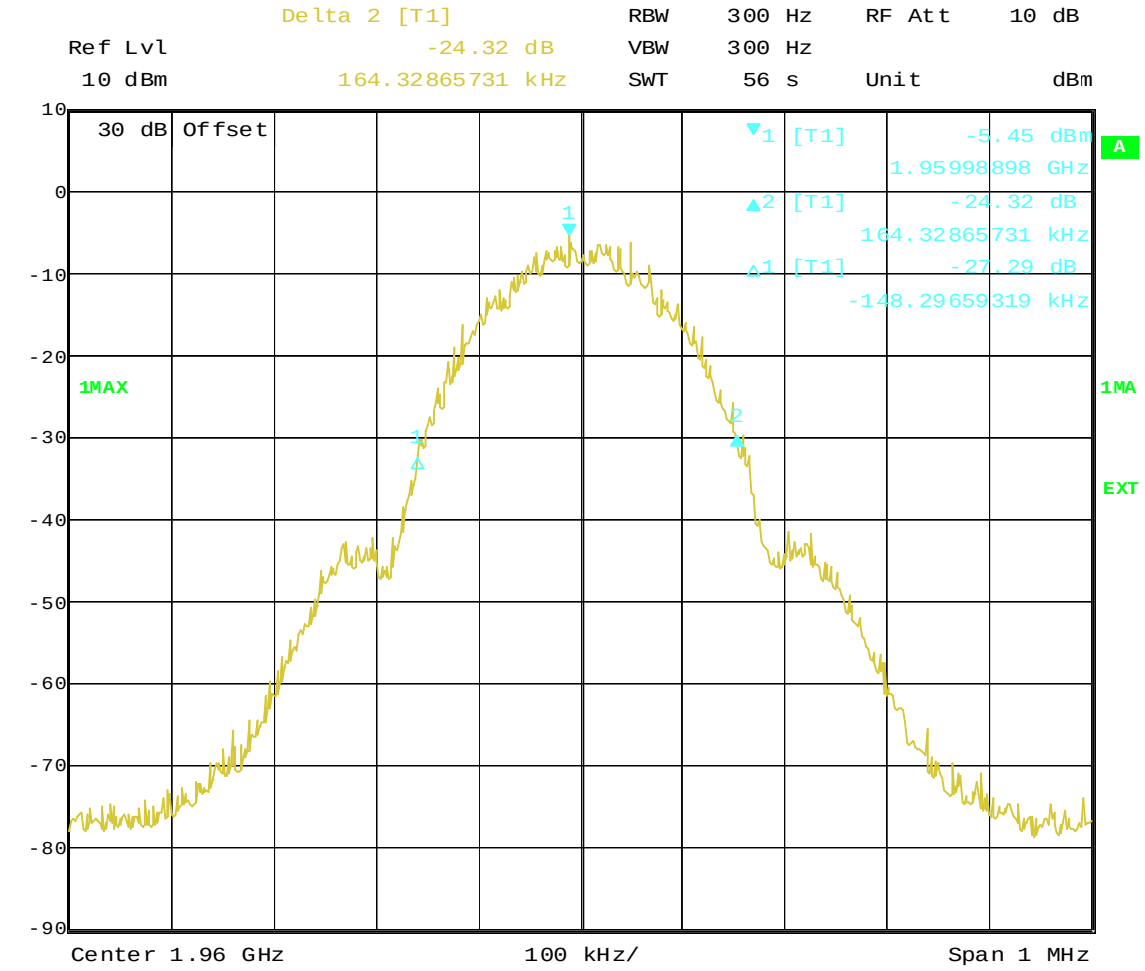
Plot 6:10


Delta 2 [T1]
RBW 300 Hz
RF Att 10 dB
Ref Lvl
-26.97 dB
VBW 300 Hz
0 dBm
717.43486974 kHz
SWT 115 s
Unit dBm
30 dB Offset
1 [T1] -14.95 dBm
1.95999800 GHz
2 [T1] -26.97 dB
717.43486974 kHz
Δ1 [T1] -26.90 dB
-713.42685371 kHz
A
1MAX
1MA
EXT
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 1.96 GHz
200 kHz/
Span 2 MHz
Date: 27.APR.2012 15:21:19

Plot 6:11

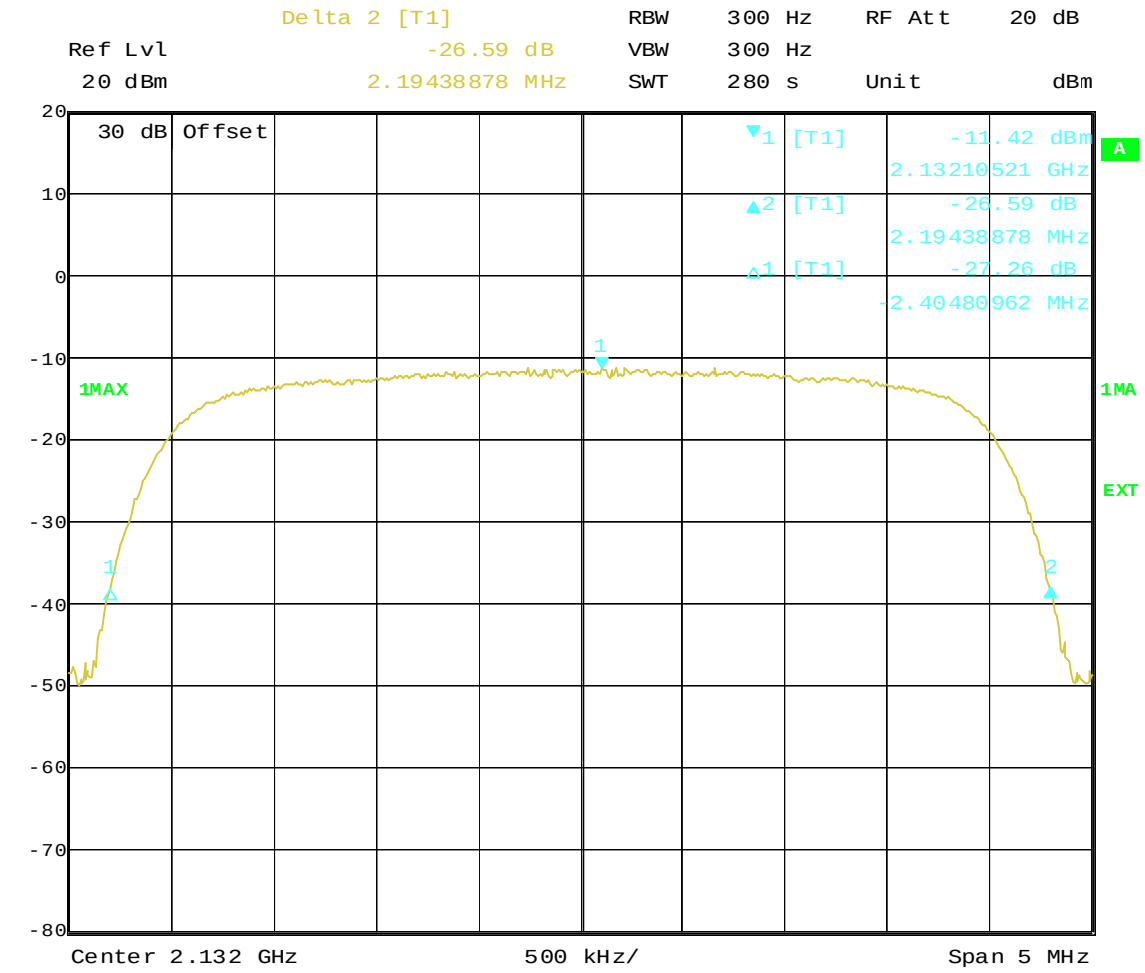

Delta 2 [T1]
RBW 300 Hz
RF Att 20 dB
Ref Lvl
-26.72 dB
VBW 300 Hz
20 dBm
174.34869740 kHz
SWT 56 s
Unit dBm
30 dB Offset
1 [T1] 3.24 dBm
1.95997896 GHz
2 [T1] -26.72 dB
174.34869740 kHz
1 [T1] -27.26 dB
-136.27254509 kHz
A
1VIEW
1MA
EXT
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 1.96 GHz
100 kHz/
Span 1 MHz
Date: 27.APR.2012 13:00:18

Plot 6:12

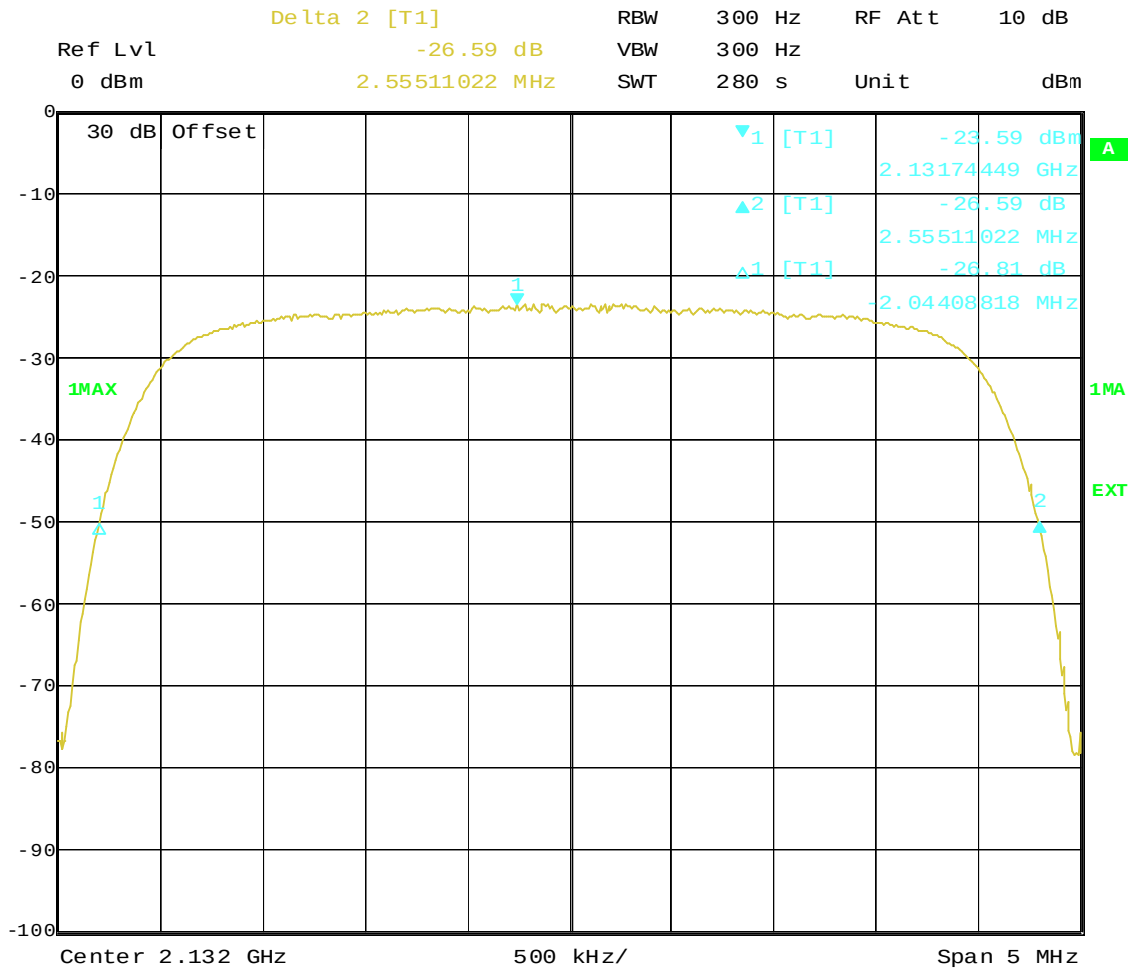


Date: 27.APR.2012 15:50:54

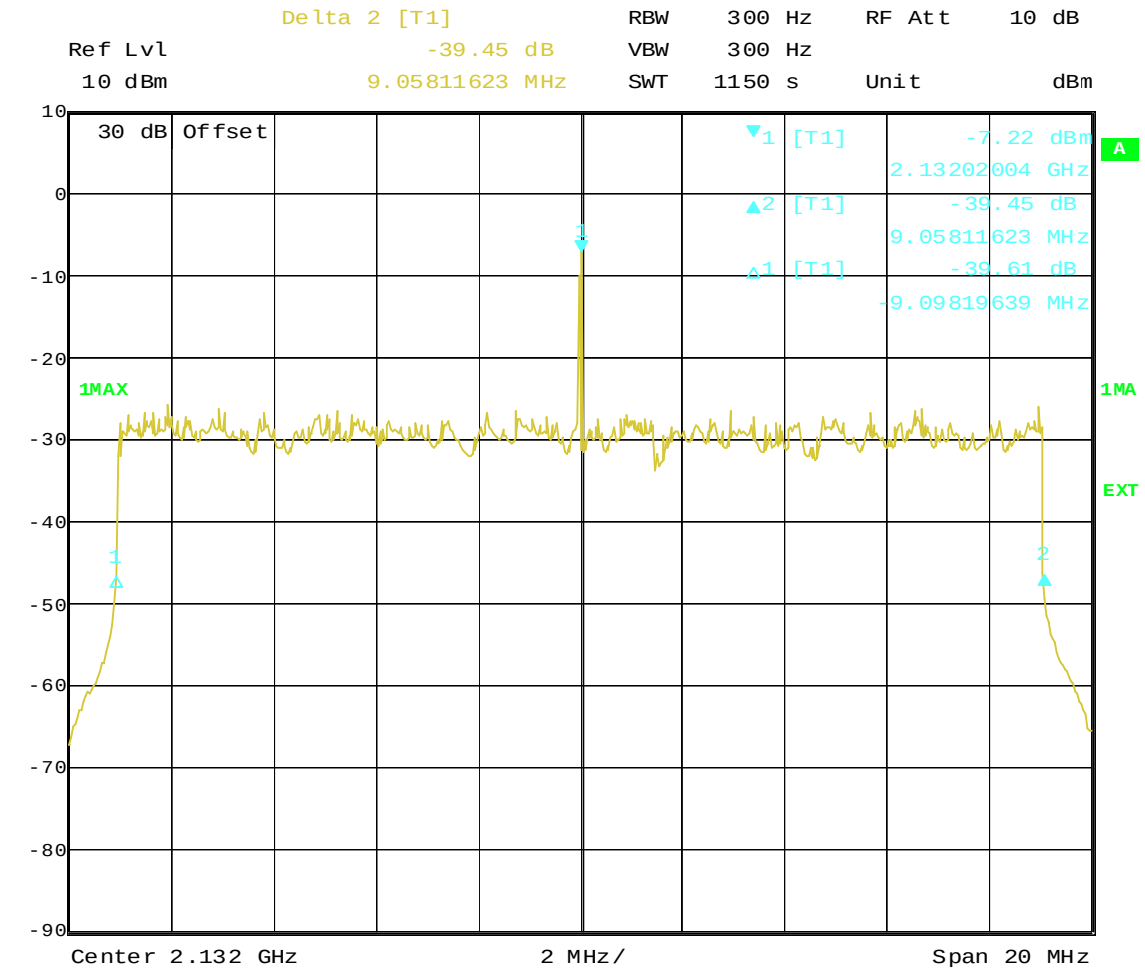
Plot 6:13


Delta 2 [T1]
RBW 300 Hz
RF Att 20 dB
Ref Lvl
-26.59 dB
VBW 300 Hz
20 dBm
2.19438878 MHz
SWT 280 s
Unit dBm
30 dB Offset
1 [T1] -11.42 dBm
2.13210521 GHz
2 [T1] -26.59 dB
2.19438878 MHz
1 [T1] -27.26 dB
-2.40480962 MHz
A
1MAX
1MA
EXT
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.132 GHz
500 kHz/
Span 5 MHz
Date: 27.APR.2012 14:35:41

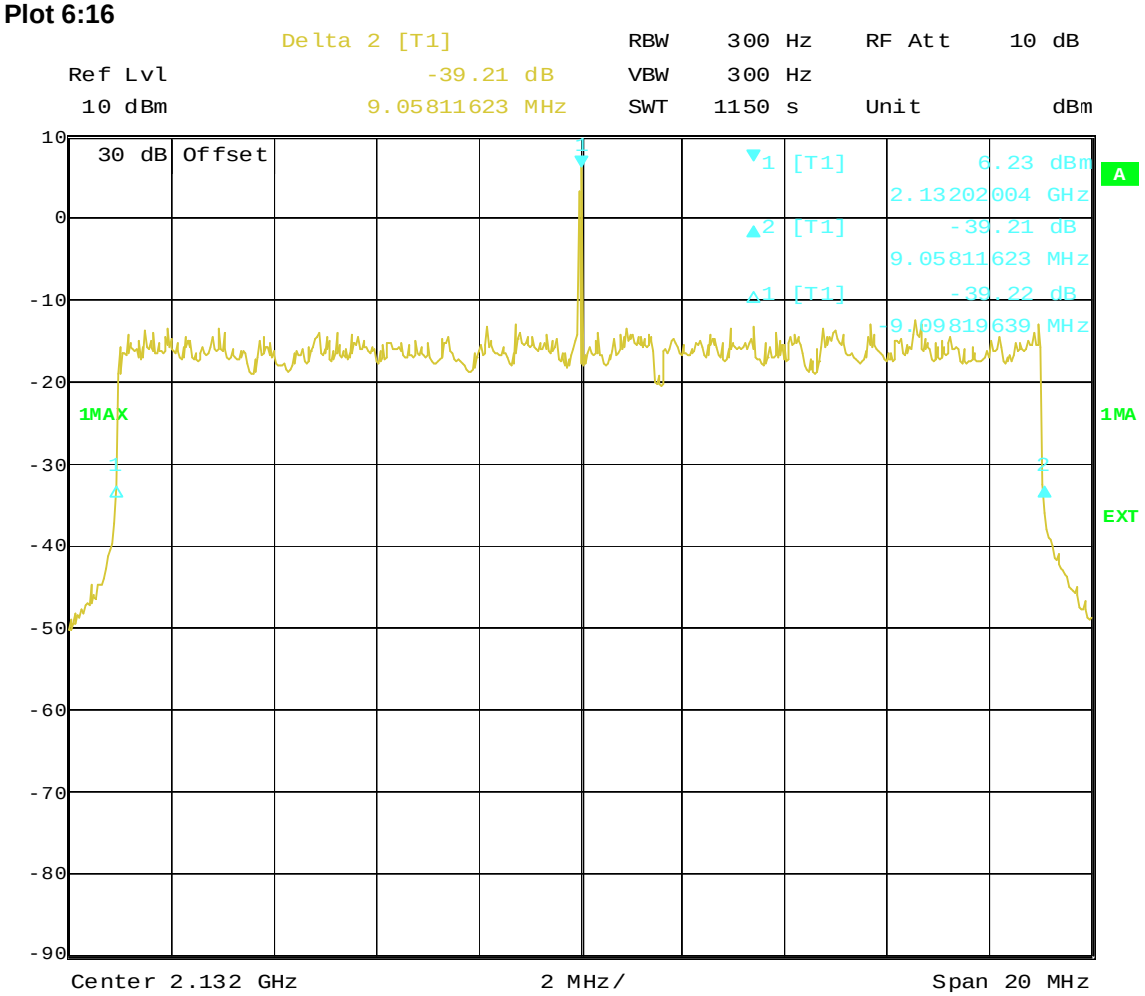
Plot 6:14


Delta 2 [T1]
RBW 300 Hz
RF Att 10 dB
Ref Lvl
-26.59 dB
VBW 300 Hz
0 dBm
2.55511022 MHz
SWT 280 s
Unit dBm
30 dB Offset
1 [T1] -23.59 dBm
2.13174449 GHz
2 [T1] -26.59 dB
2.55511022 MHz
Δ1 [T1] -26.81 dB
-2.04408818 MHz
A
1MAX
1MA
EXT
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 2.132 GHz
500 kHz/
Span 5 MHz
Date: 27.APR.2012 15:16:58

Plot 6:15


Delta 2 [T1]
RBW 300 Hz
RF Att 10 dB
Ref Lvl -39.45 dB
VBW 300 Hz
10 dBm 9.05811623 MHz
SWT 1150 s
Unit dBm
30 dB Offset
1 [T1] -7.22 dBm
2.13202004 GHz
2 [T1] -39.45 dB
9.05811623 MHz
1 [T1] -39.61 dB
-9.09819639 MHz
A
1MAX
1MA
EXT
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.132 GHz
2 MHz/
Span 20 MHz
Date: 2.MAY.2012 09:15:16

Plot 6:16


Delta 2 [T1]
RBW 300 Hz
RF Att 10 dB
Ref Lvl
-39.21 dB
VBW 300 Hz
10 dBm
9.05811623 MHz
SWT 1150 s
Unit dBm
30 dB Offset
1 [T1] 6.23 dBm
2.13202004 GHz
2 [T1] -39.21 dB
9.05811623 MHz
Δ1 [T1] -39.22 dB
-9.09819639 MHz
A
1MAX
1MA
EXT
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.132 GHz
2 MHz/
Span 20 MHz
Date: 2.MAY.2012 09:45:01

7 OUT OF BAND REJECTION

Date of test:	2012-05-02	Test location:	Big Chamber
EUT Serial:	99001	Ambient temp.	23 °C
Tested by:	Åke Carlson	Relative humidity	30 %

7.1 Test data

The tracking generator in the spectrum analyzer was used to measure the frequency response of the duplex filter in the EUT.

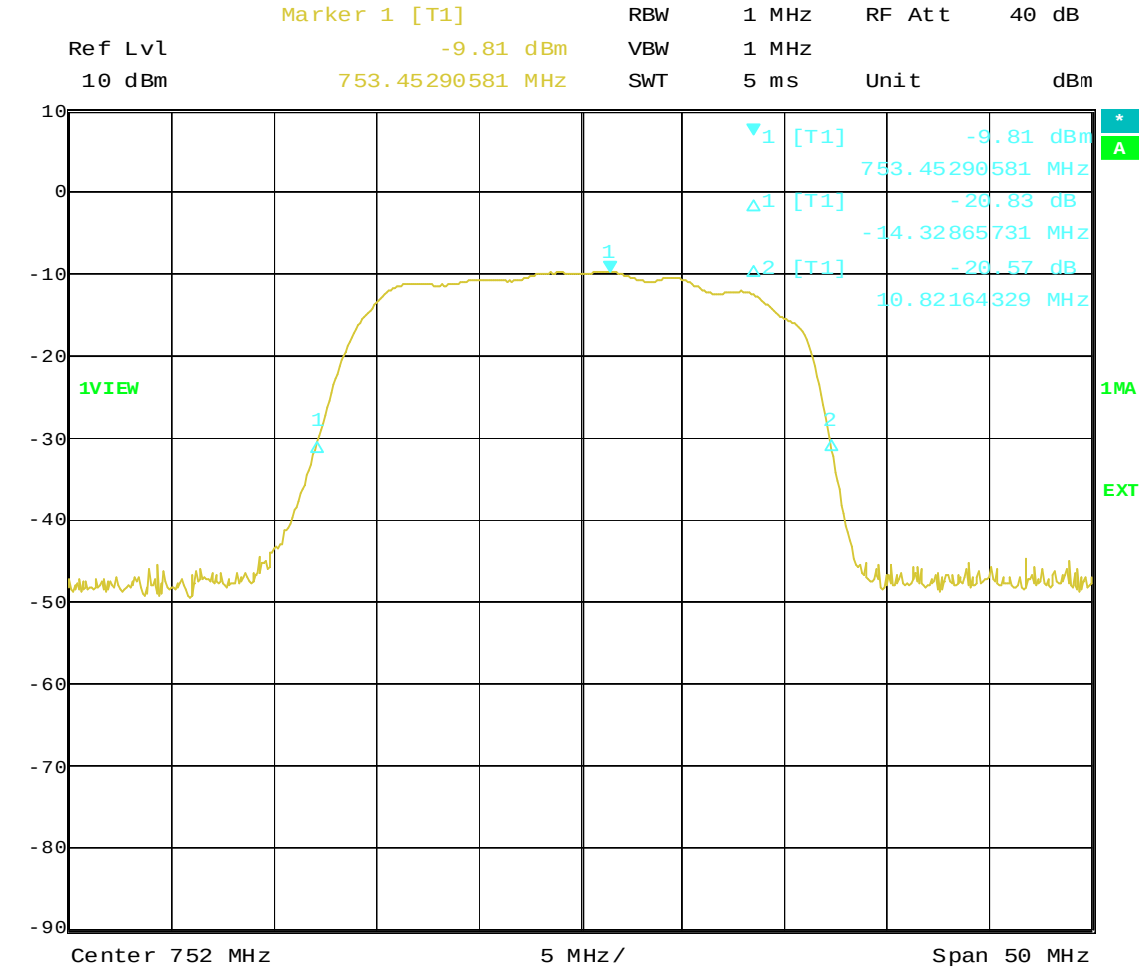
Amplifier	20 dB Bandwidth (MHz)	Plots
700	25.150	Plot 7.1
850	49.786	Plot 7.2
1900	85.927	Plot 7.3
AWS	62.264	Plot 7.4

Measurement results are corrected for attenuation in the set-up configuration.

Example calculation:

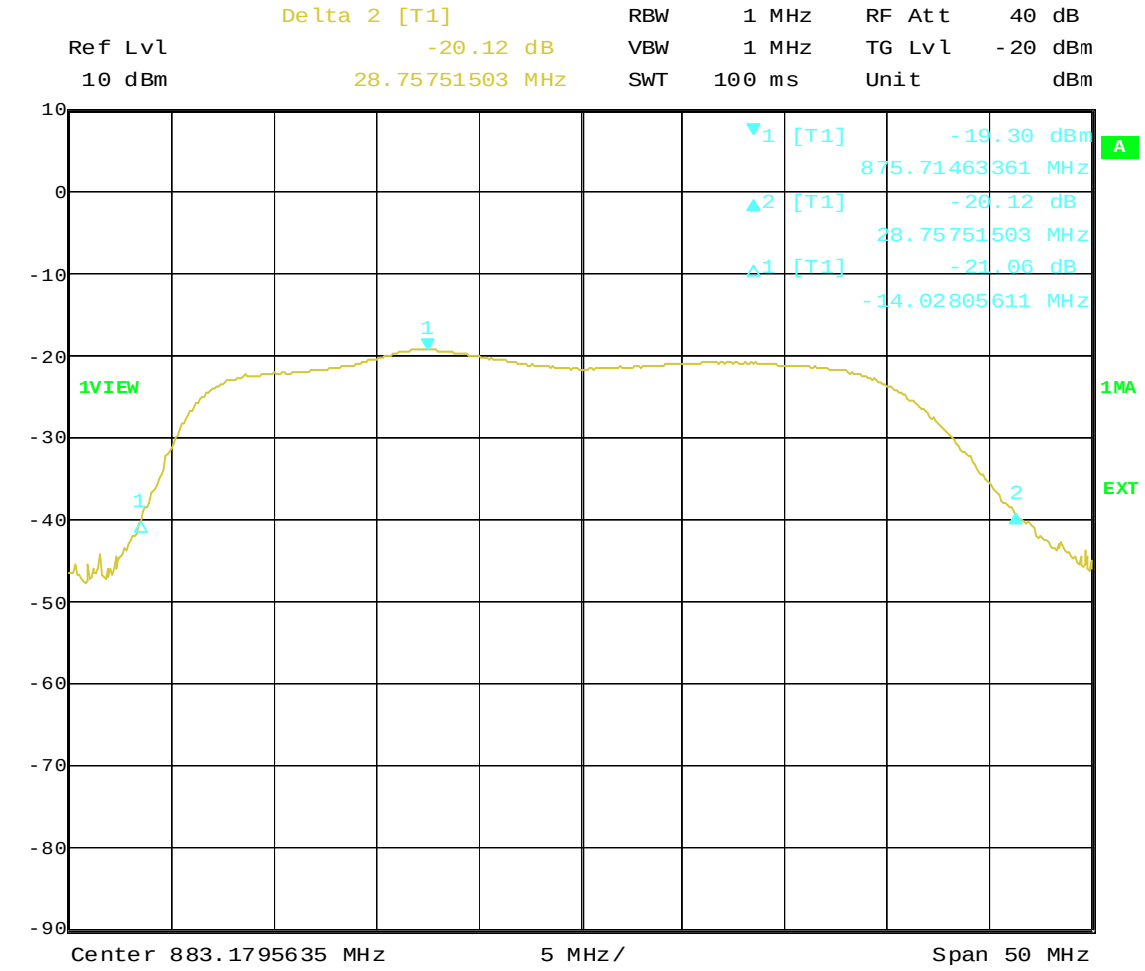
Measured level [dB] = Analyser reading [dBm] - Tracking Generator signal level [dBm]

Plot 7:1

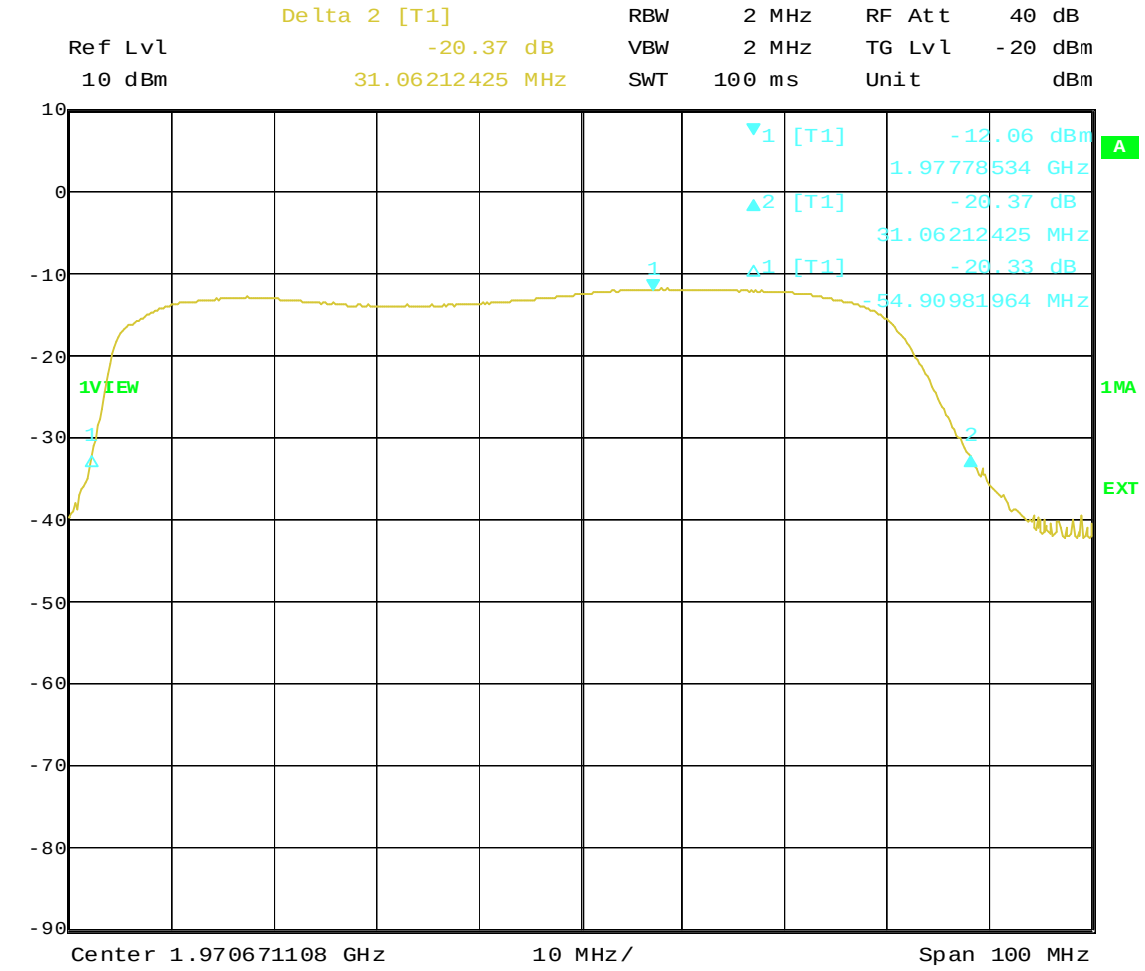


Date: 2.MAY.2012 15:31:28

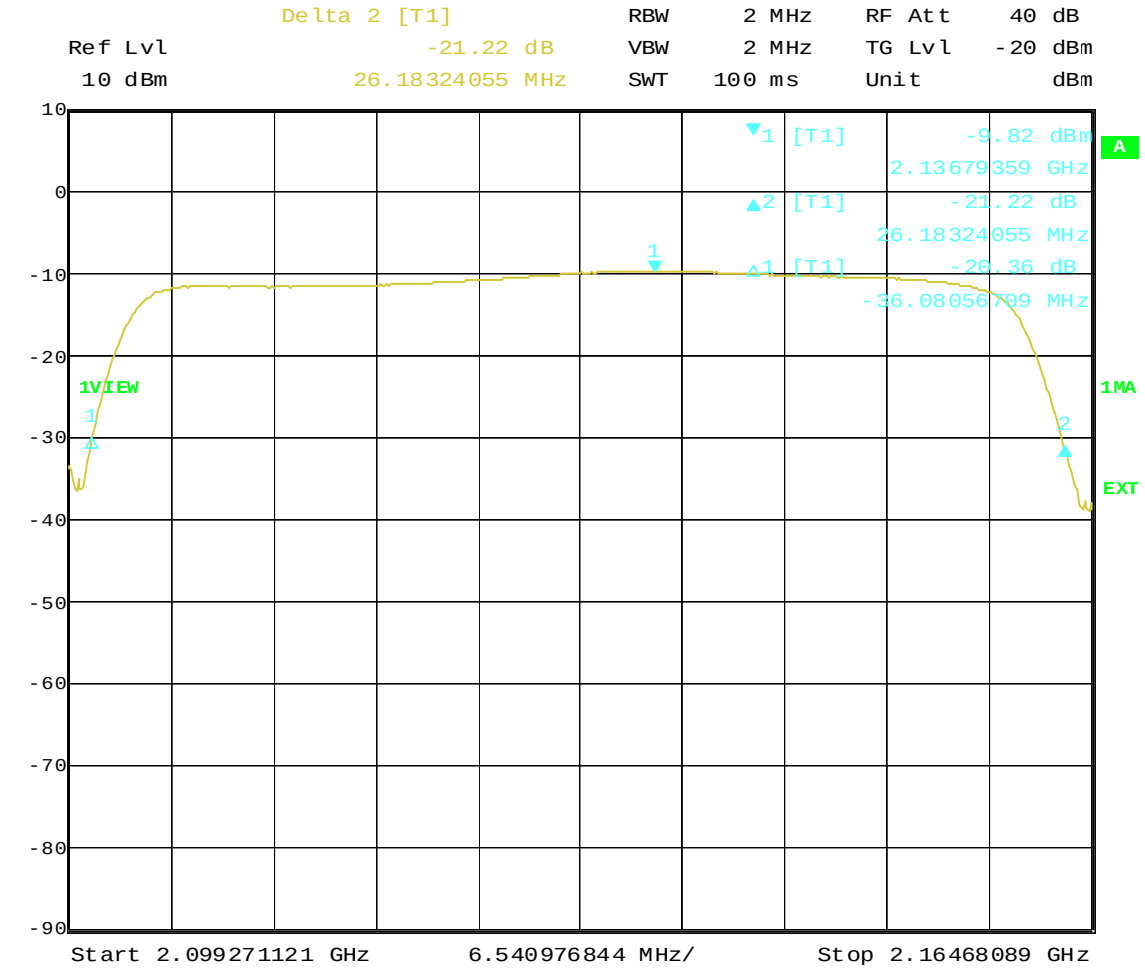
Plot 7:2


Delta 2 [T1]
Ref Lvl
10 dBm
-20.12 dB
28.75751503 MHz
RBW 1 MHz
VBW 1 MHz
SWT 100 ms
RF Att 40 dB
TG Lvl -20 dBm
Unit dBm
1 [T1] -19.30 dBm
875.71463361 MHz
2 [T1] -20.12 dB
28.75751503 MHz
1 [T1] -21.06 dB
-14.02805611 MHz
A
1MA
EXT
1VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 883.1795635 MHz
5 MHz/
Span 50 MHz
Date: 2.MAY.2012 15:53:54

Plot 7:3


Delta 2 [T1]
Ref Lvl
10 dBm
-20.37 dB
31.06212425 MHz
RBW 2 MHz
VBW 2 MHz
SWT 100 ms
RF Att 40 dB
TG Lvl -20 dBm
Unit dBm
1 [T1] -12.06 dBm
1.97778534 GHz
2 [T1] -20.37 dB
31.06212425 MHz
Δ1 [T1] -20.33 dB
-54.90981964 MHz
A
1MA
EXT
1VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 1.970671108 GHz
10 MHz/
Span 100 MHz
Date: 2.MAY.2012 15:45:48

Plot 7:4


Delta 2 [T1]
RBW 2 MHz
RF Att 40 dB
Ref Lvl -21.22 dB
VBW 2 MHz
TG Lvl -20 dBm
10 dBm 26.18324055 MHz
SWT 100 ms
Unit dBm
1 [T1] -9.82 dBm
2.13679359 GHz
2 [T1] -21.22 dB
26.18324055 MHz
1 [T1] -20.36 dB
-36.08056709 MHz
A
1VIEW
1MA
EXT
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Start 2.099271121 GHz
6.540976844 MHz/
Stop 2.16468089 GHz
Date: 2.MAY.2012 15:42:11

8 INTERMODULATION

Date of test:	2012-05-04	Test location:	Big Chamber
EUT Serial:	99001	Ambient temp.	23 °C
Tested by:	Åke Carlson	Relative humidity	30 %
Test result:	Pass	Margin:	> 1.9 dB

8.1 Test data

700 MHz band.

Intermodulation

Test signal(s)	Frequency [MHz]	RBW [kHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
LTE carrier at 750.00 and CW at 746.00 MHz	746 – 751	30	-16.3	-13	Plot 8.1-8.2	
LTE carrier at 753.00 and CW at 757.00 MHz	751 – 753	30	-16.8	-13	Plot 8.3-8.4	
CW at 746.00 MHz and CW at 748.00 MHz	746 – 751	30	-19.1	-13	Plot 8.5-8.6	
CW at 755.00 MHz and CW at 757.00 MHz	751 – 757	30	-17.6	-13	Plot 8.7-8.8	

850 MHz band.

Intermodulation

Test signal(s)	Frequency [MHz]	RBW [kHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
2 CDMA carriers at 871.00 and 873.00 MHz	869 – 882	30	No peaks above noise level	-13	Plot 8.9-8.10	
2 CDMA carriers at 892.00 and 894.00 MHz	884 – 894	30	No peaks above noise level	-13	Plot 8.11-8.12	
CW at 871.00 MHz and CW at 873.00 MHz	869 – 882	30	-22.4	-13	Plot 8.13-8.14	
CW at 892.00 MHz and CW at 894.00 MHz	884 – 894	30	-20.6	-13	Plot 8.15-8.16	

1900 MHz band.

Intermodulation

Test signal(s)	Frequency [MHz]	RBW [kHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
2 CDMA carriers at 1932.00 and 1934.00 MHz	1930 – 1935	30	-24.4	-13	Plot 8.17-8.19	
2 CDMA carriers at 1988.00 and 1990.00 MHz	1975 – 1990	30	-24.5	-13	Plot 8.20-8.22	
CW at 1932.00 MHz and CW at 1934.00 MHz	1930 – 1935	30	-19.0	-13	Plot 8.23-8.25	
CW at 1988.00 MHz and CW at 1934.00 MHz	1975 – 1990	30	-17.4	-13	Plot 8.26-8.28	

AWS band.

Intermodulation

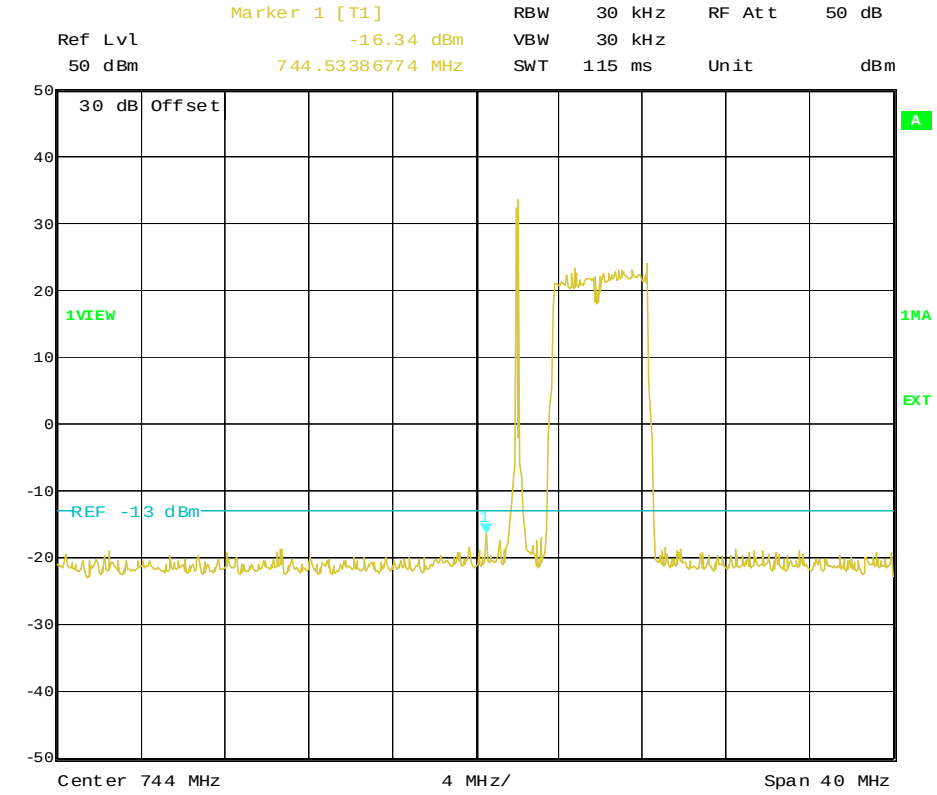
Test signal(s)	Frequency [MHz]	RBW [kHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
LTE carrier at 2114.00 and CW at 2110.00 MHz	2110 – 2132	30	-18.2	-13	Plot 8.29-8.31	
LTE carrier at 2115.00 and CW at 2155.00 MHz	2134 – 2155	30	-14.9	-13	Plot 8.32-8.34	Note 1
CW at 2110.00 MHz and CW at 2112.00 MHz	2110 – 2132	30	-15.2	-13	Plot 8.35-8.37	Note 1
CW at 2153.00 MHz and CW at 2155.00 MHz	2134 – 2155	30	-15.4	-13	Plot 8.38-8.40	Note 1

Note 1: The measured result is below the upper limit, but by a margin less than half of the uncertainty interval; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than noncompliance.

Measurement results are corrected for attenuation in the set-up configuration.

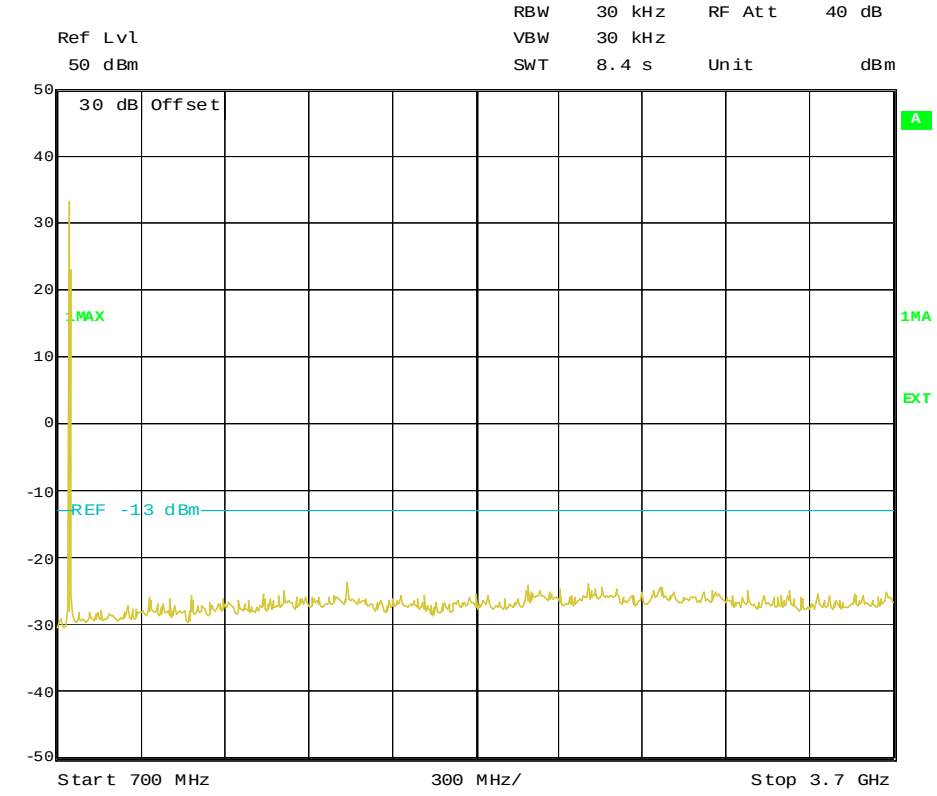
Example calculation:
Measured level [dBm] = Analyser reading [dBm] + cable loss [dB] + attenuator loss [dB]

Plot 8.1



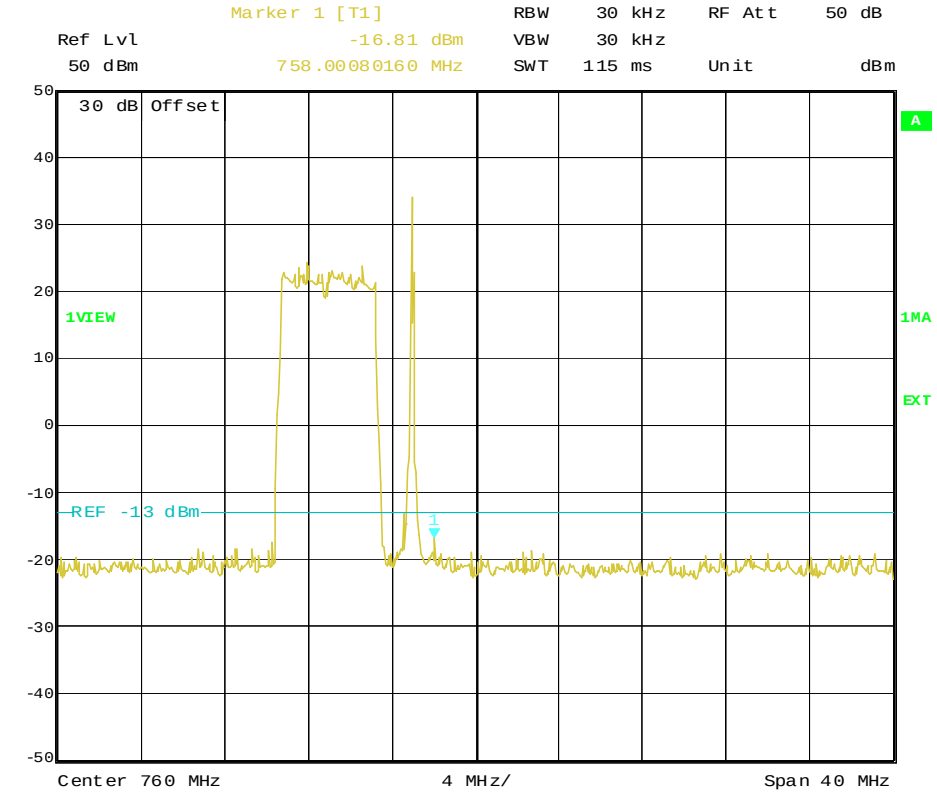
Date: 4.MAY.2012 10:45:26

Plot 8.2



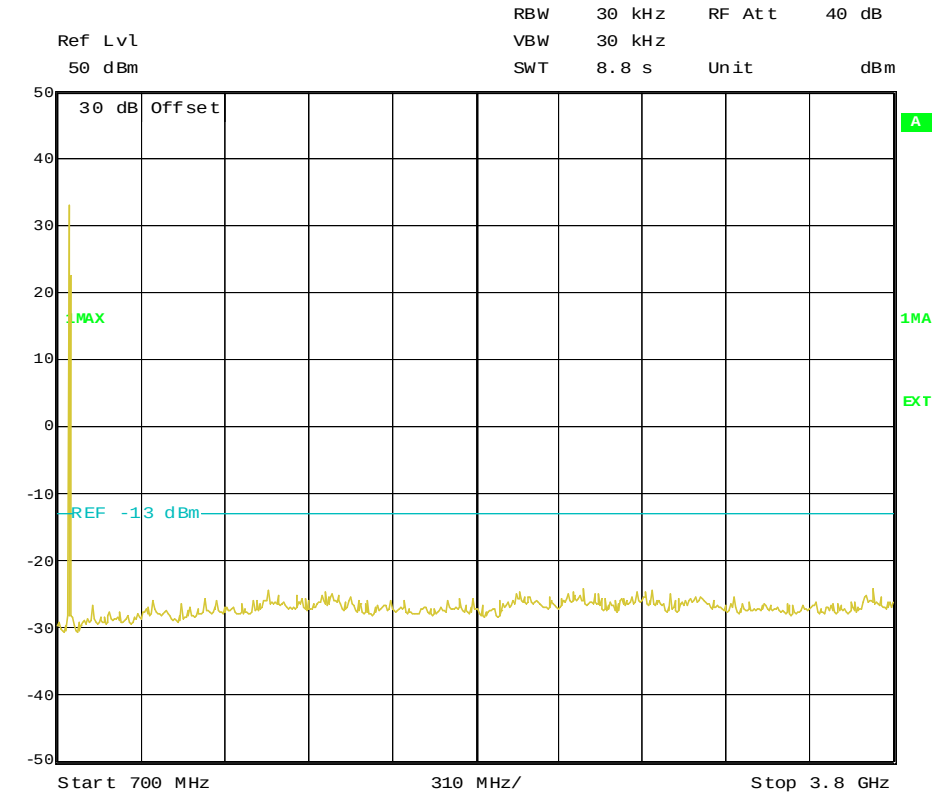
Date: 4.MAY.2012 12:31:31

Plot 8.3



Date: 4.MAY.2012 10:43:50

Plot 8.4



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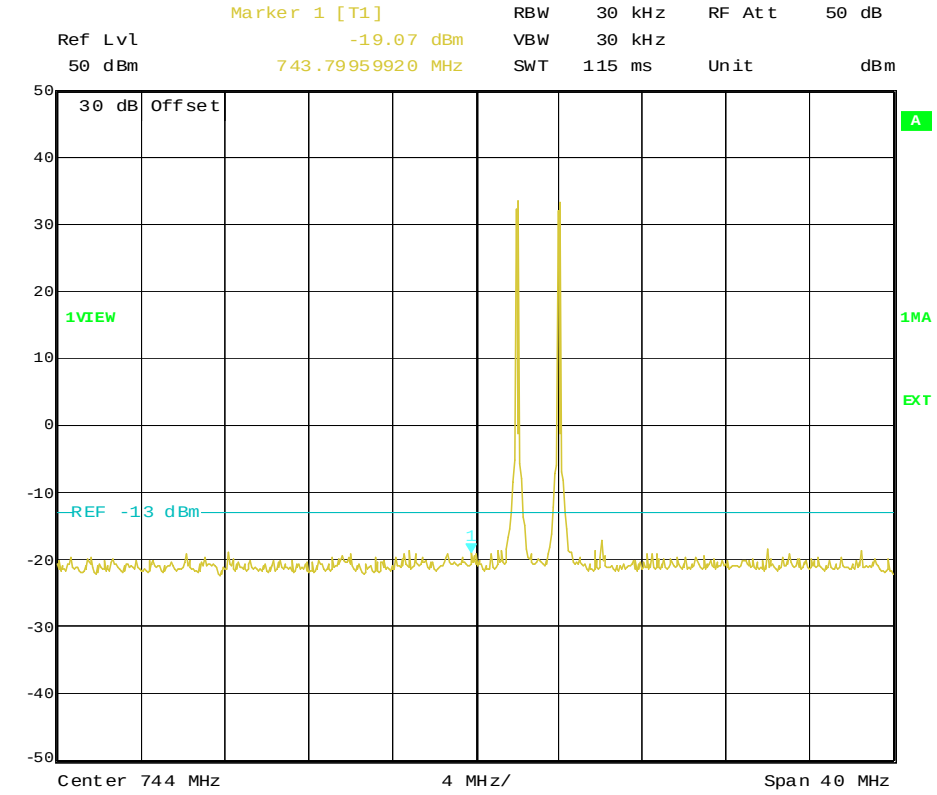
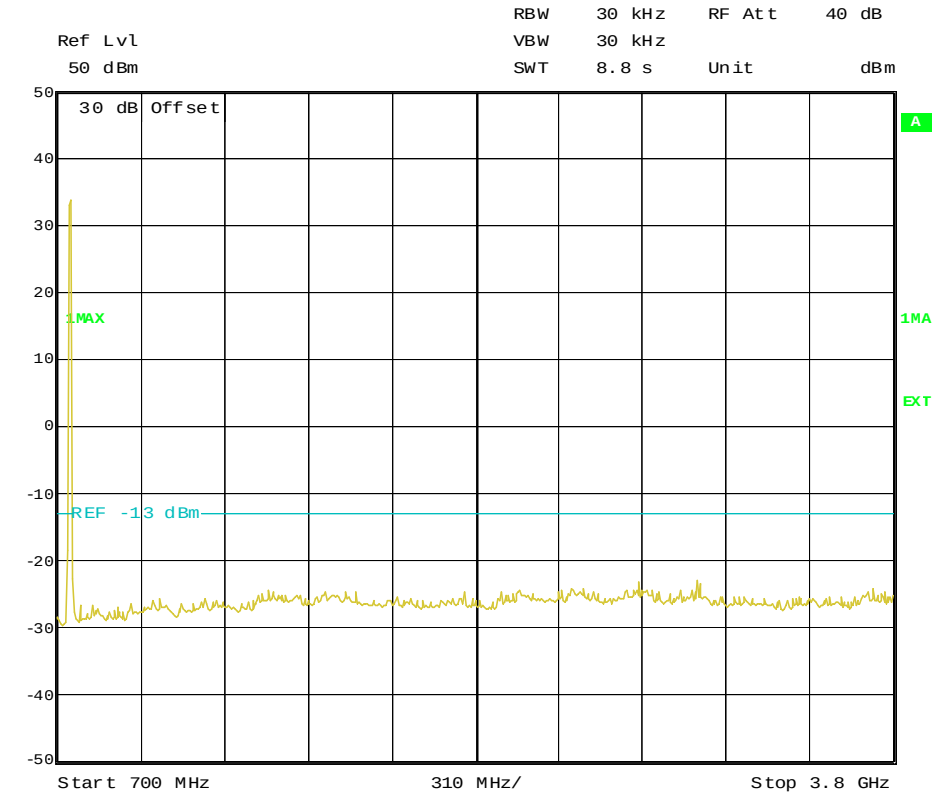
Plot 8.5



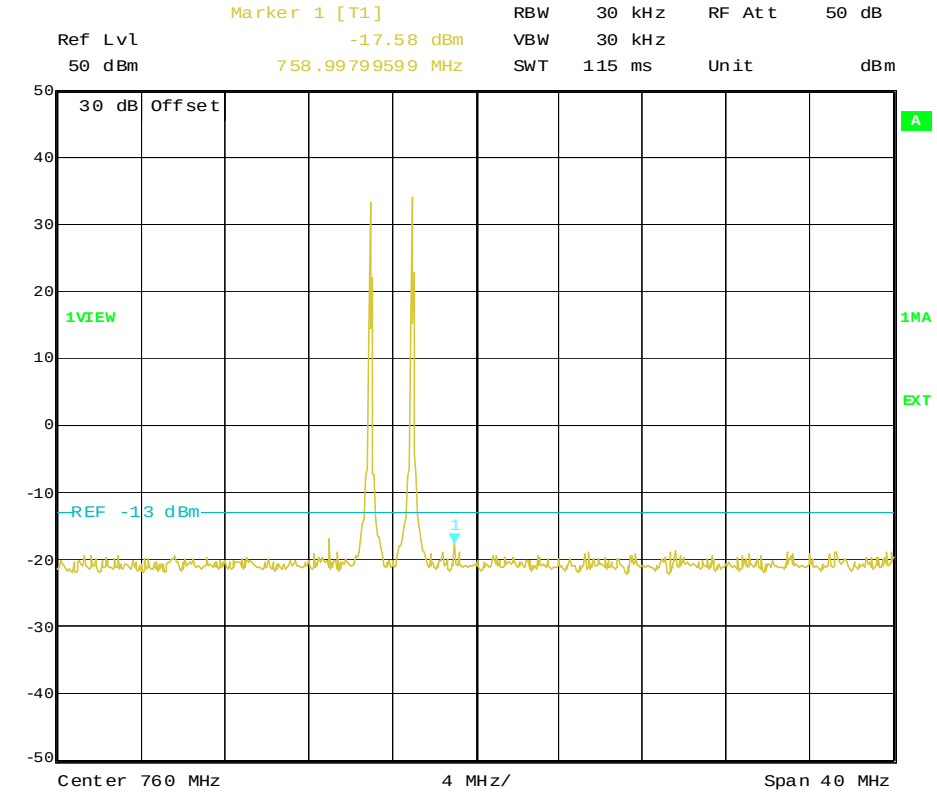
Date: 4.MAY.2012 10:47:52

Plot 8.6



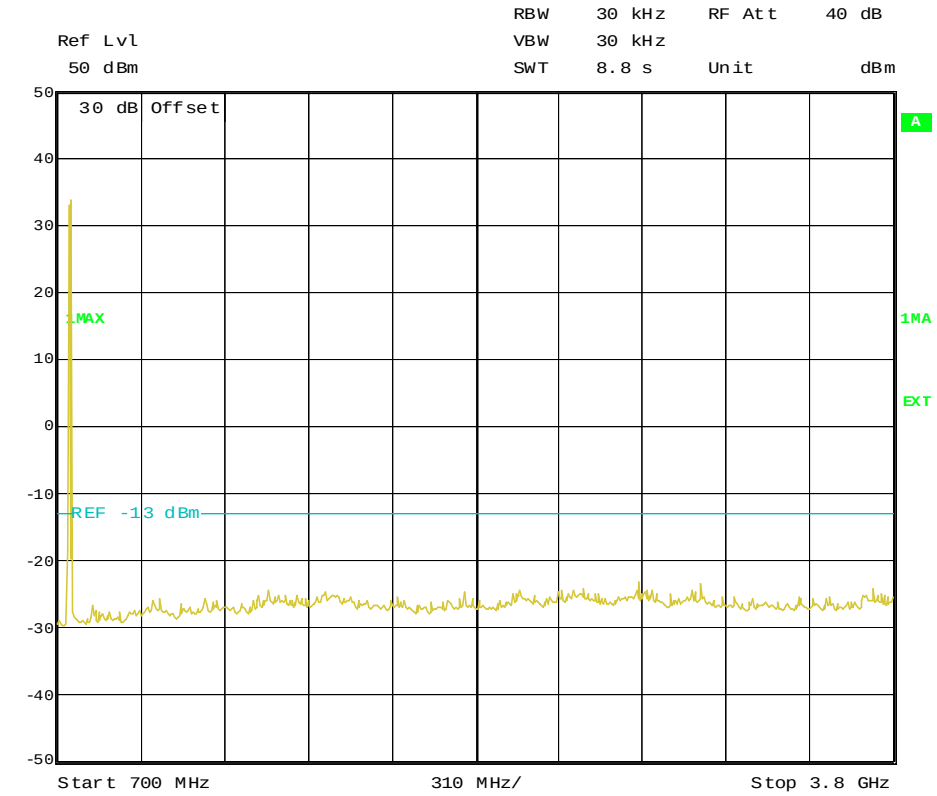
Date: 4.MAY.2012 12:35:39

Plot 8.7



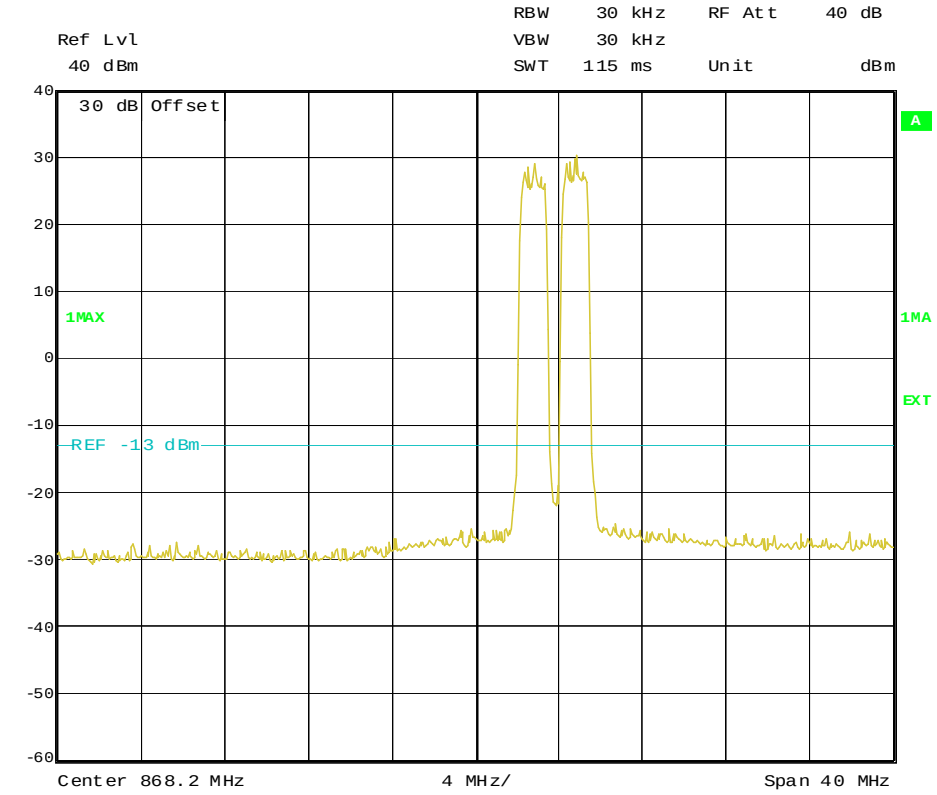
Date: 4.MAY.2012 10:49:39

Plot 8.8



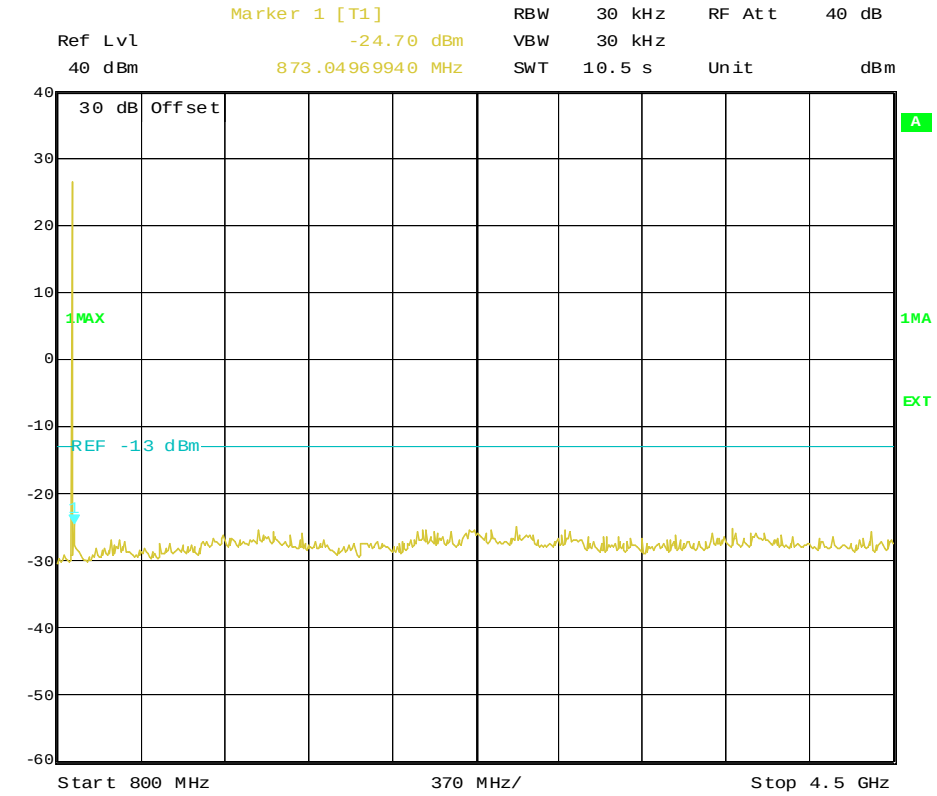
Date: 4.MAY.2012 12:34:40

Plot 8.9



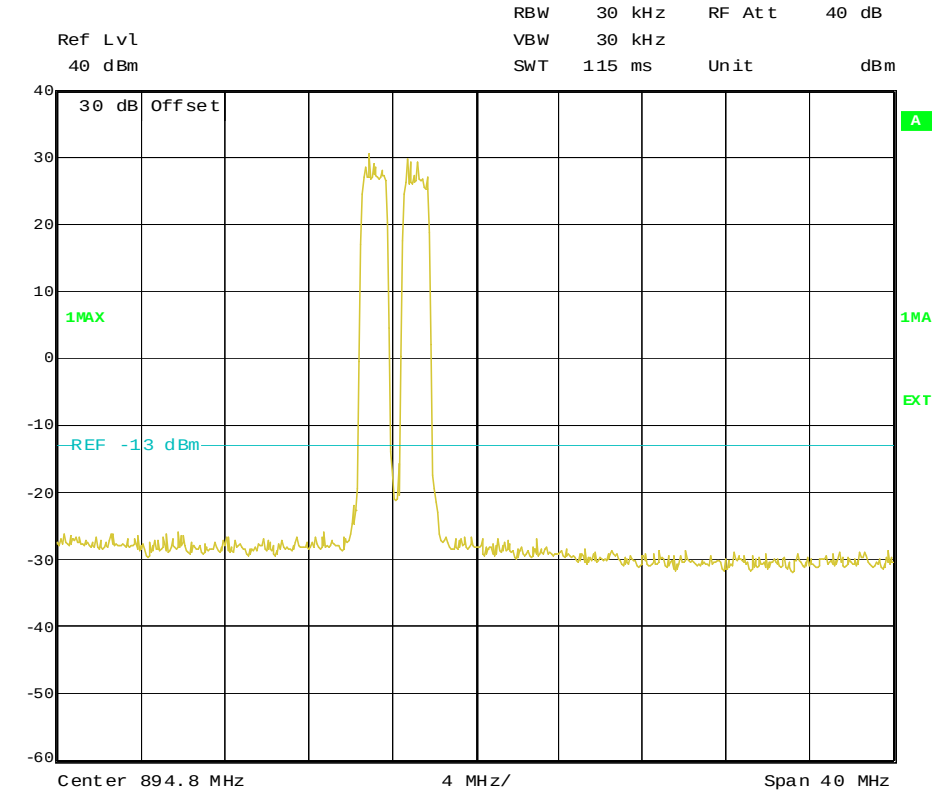
Date: 4.MAY.2012 14:15:07

Plot 8.10



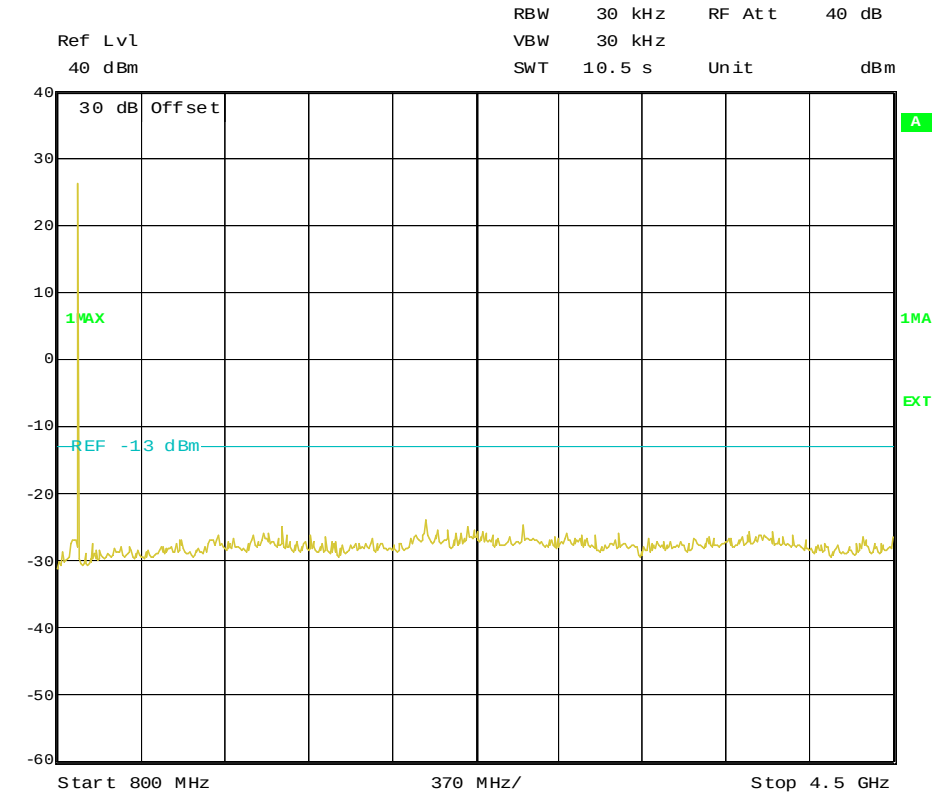
Date: 4.MAY.2012 14:17:23

Plot 8.11



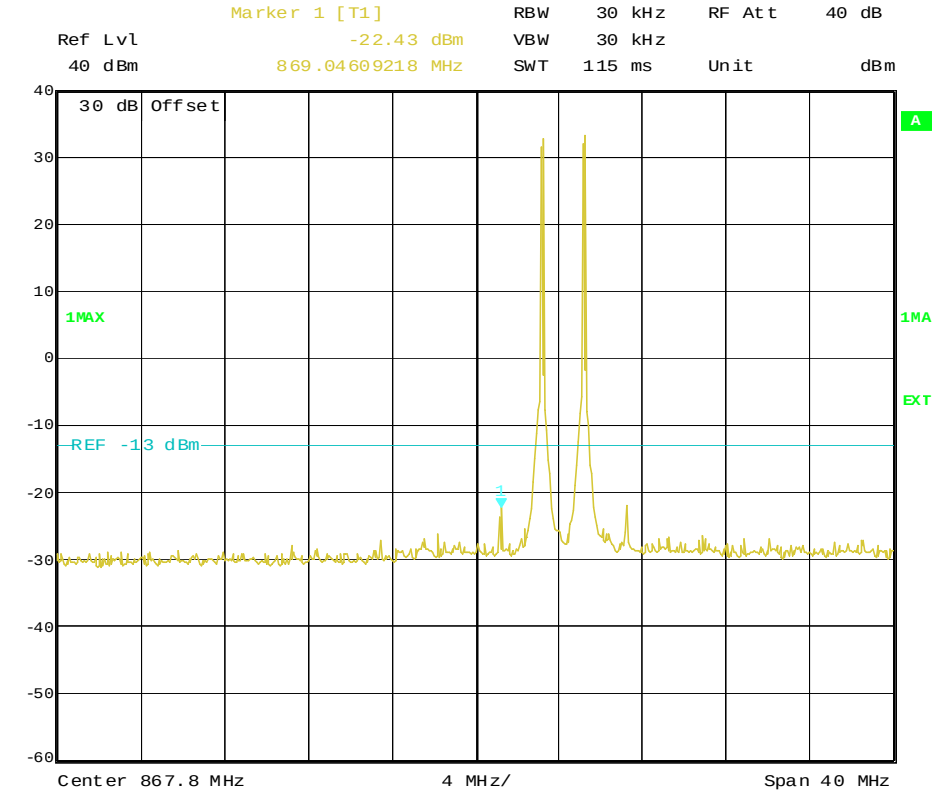
Date: 4.MAY.2012 14:26:53

Plot 8.12



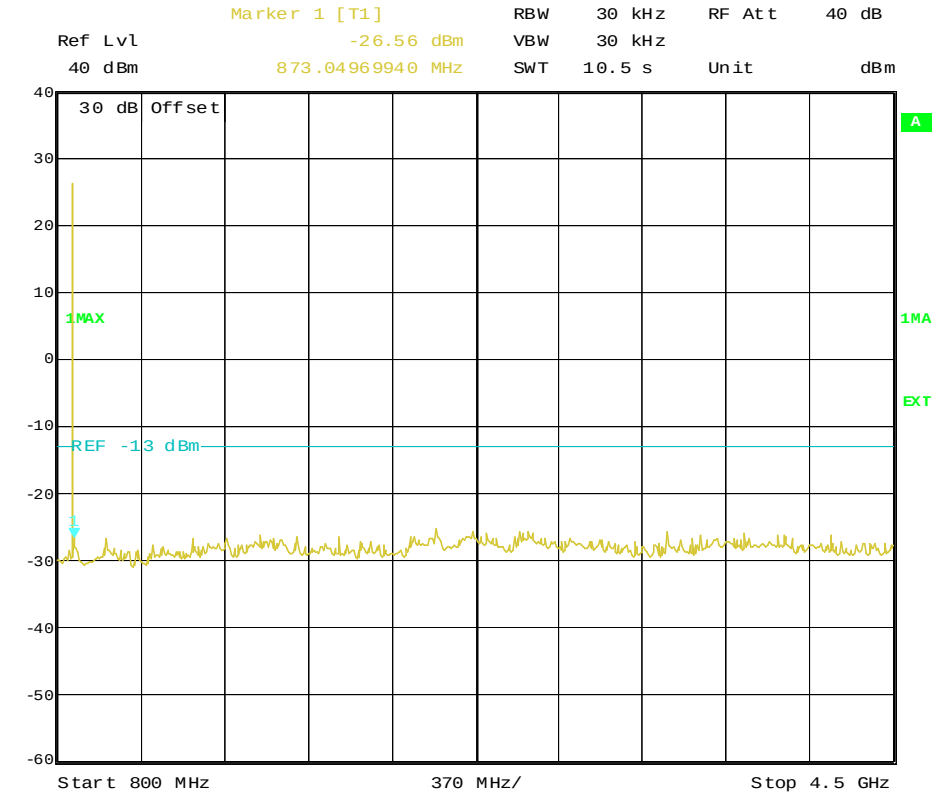
Date: 4.MAY.2012 14:25:09

Plot 8.13



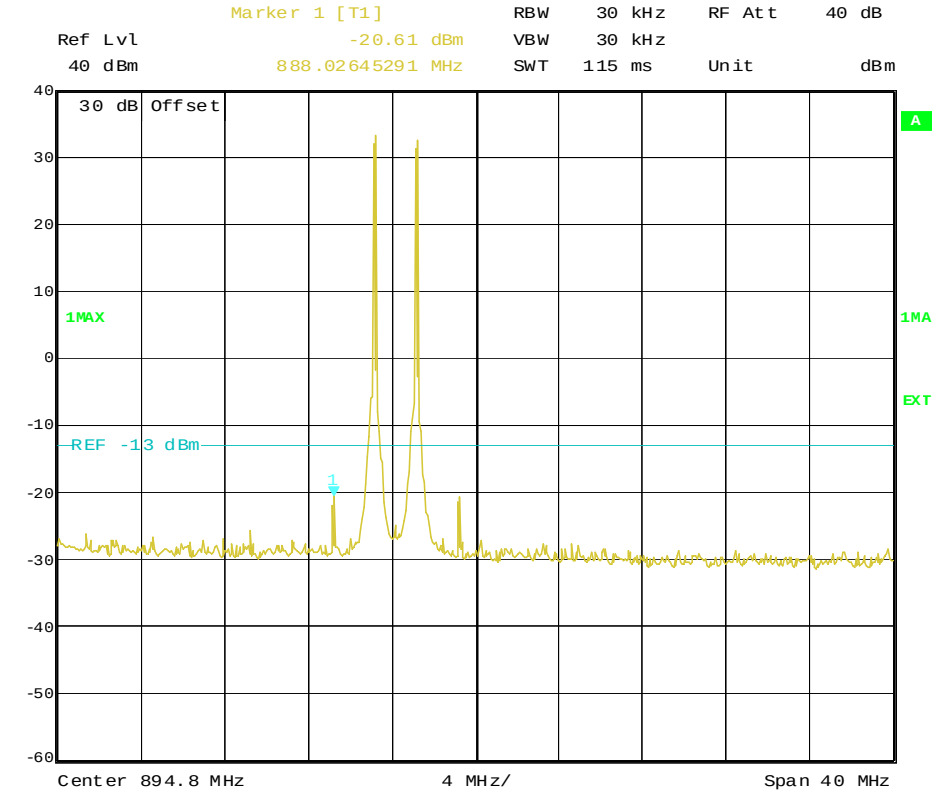
Date: 4.MAY.2012 14:20:05

Plot 8.14



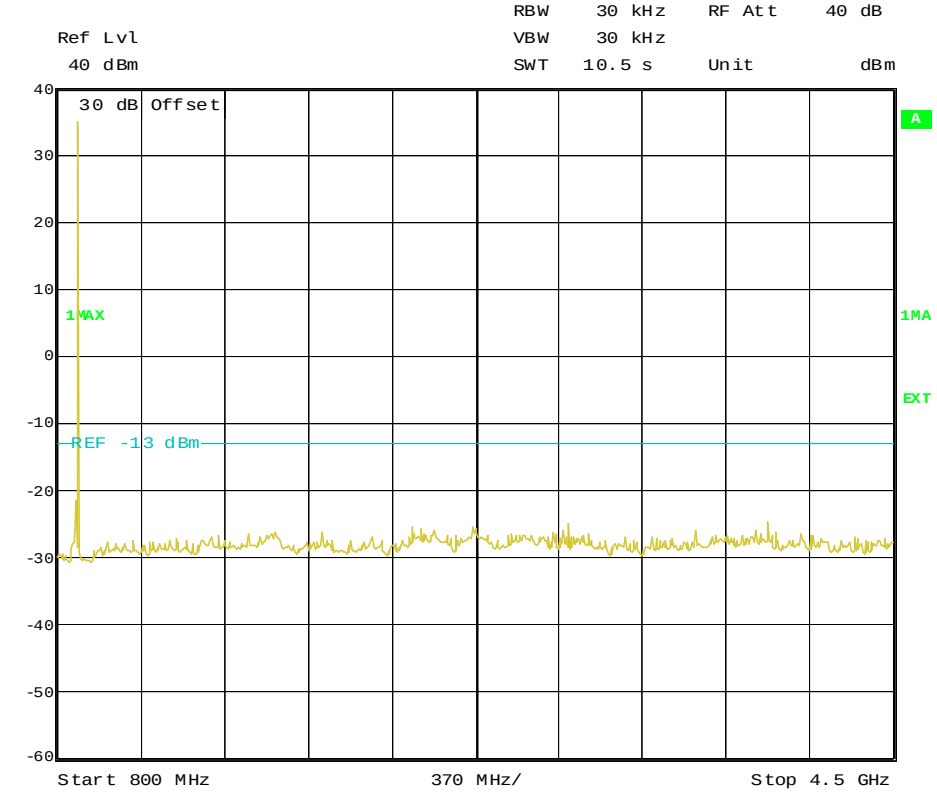
Date: 4.MAY.2012 14:18:26

Plot 8.15



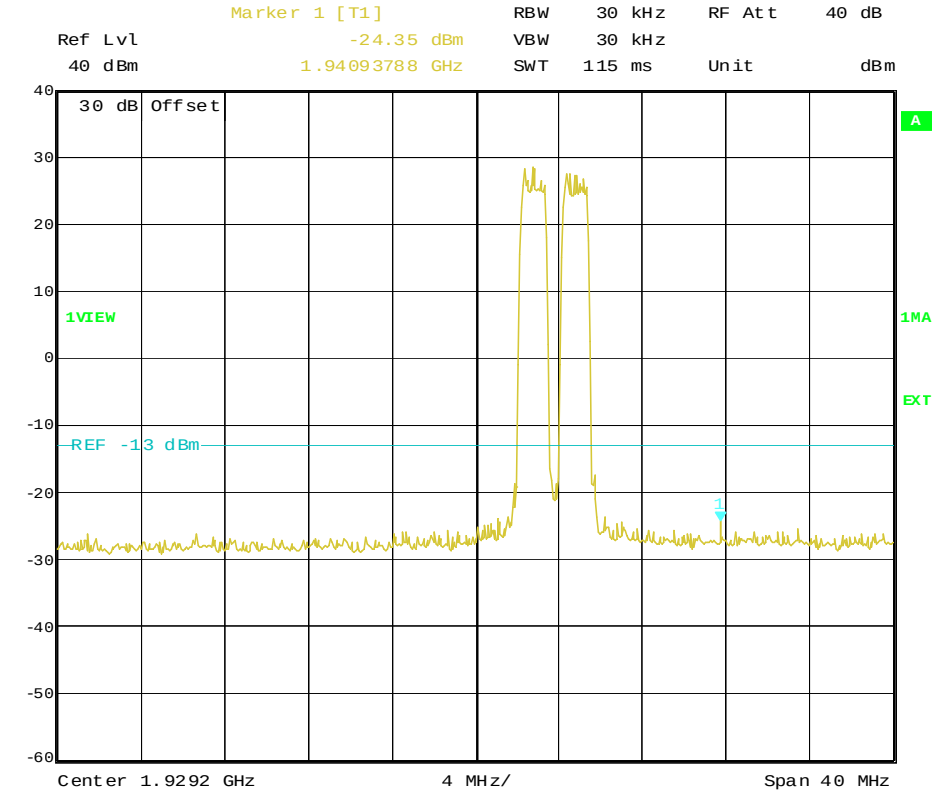
Date: 4.MAY.2012 14:23:39

Plot 8.16



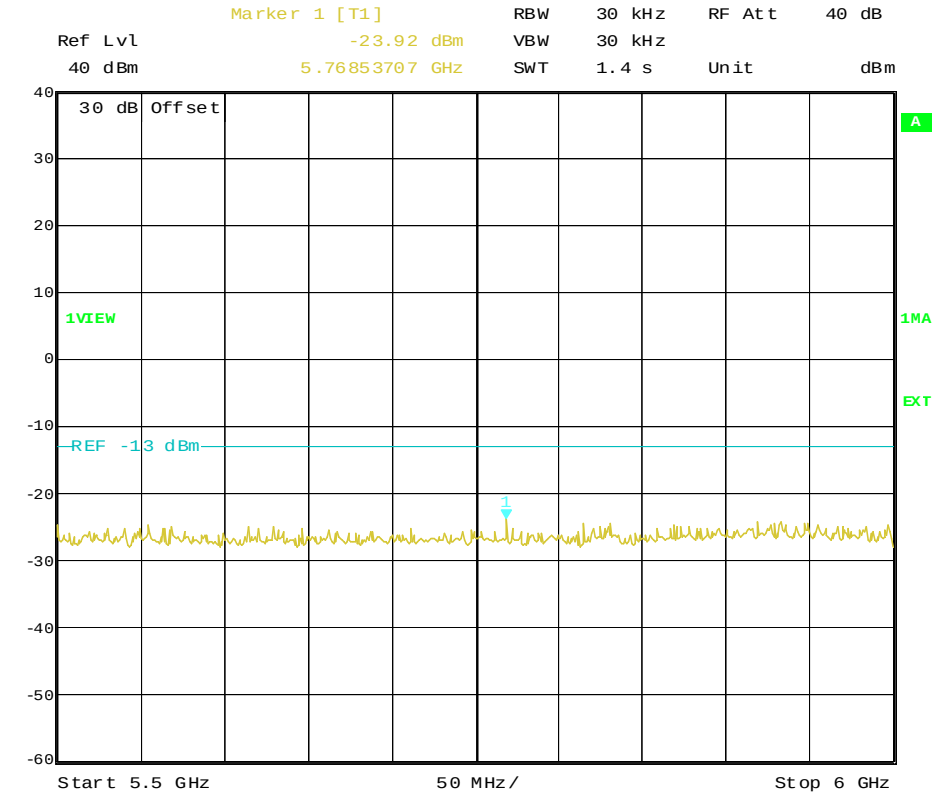
Date: 4.MAY.2012 14:24:20

Plot 8.17



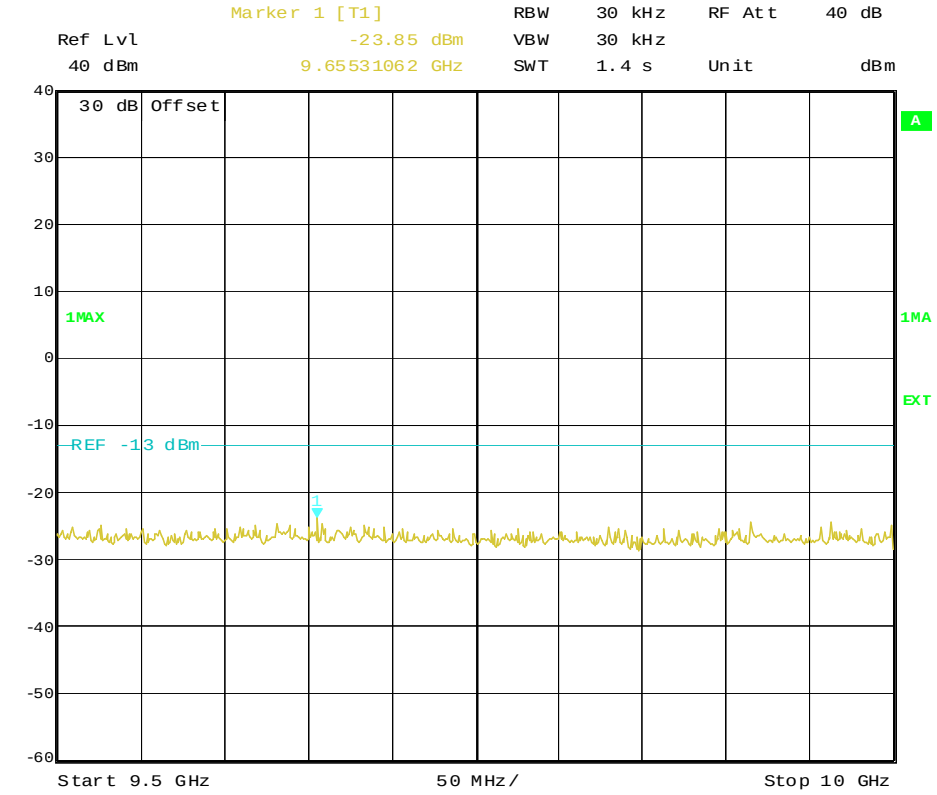
Date: 4.MAY.2012 13:47:31

Plot 8.18



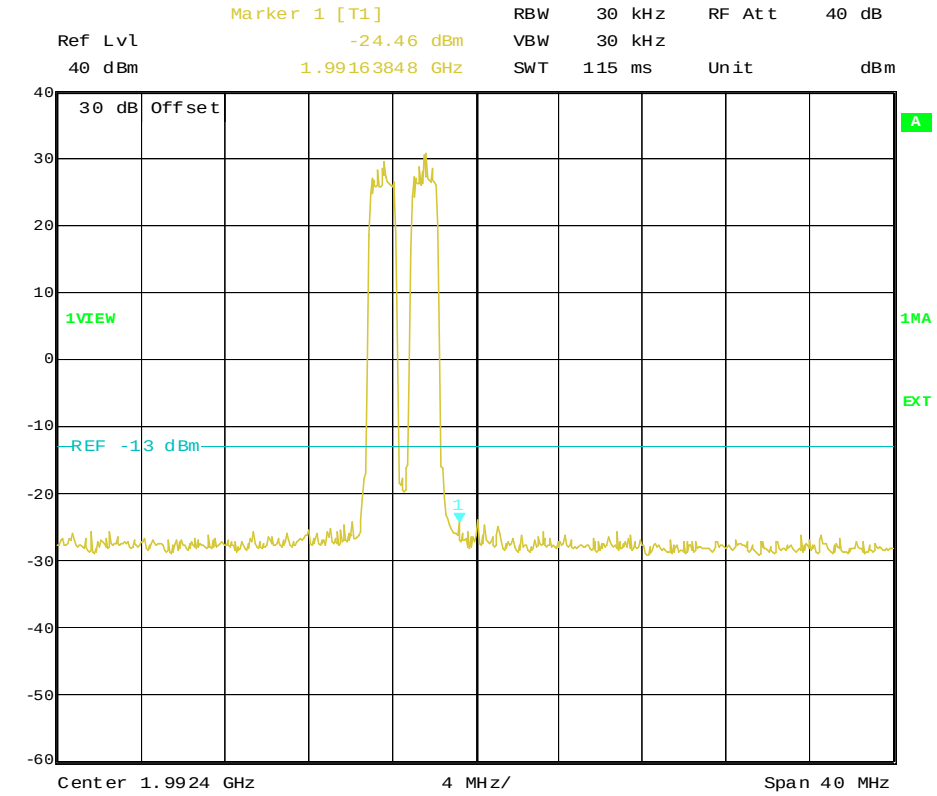
Date: 4.MAY.2012 13:48:36

Plot 8.19



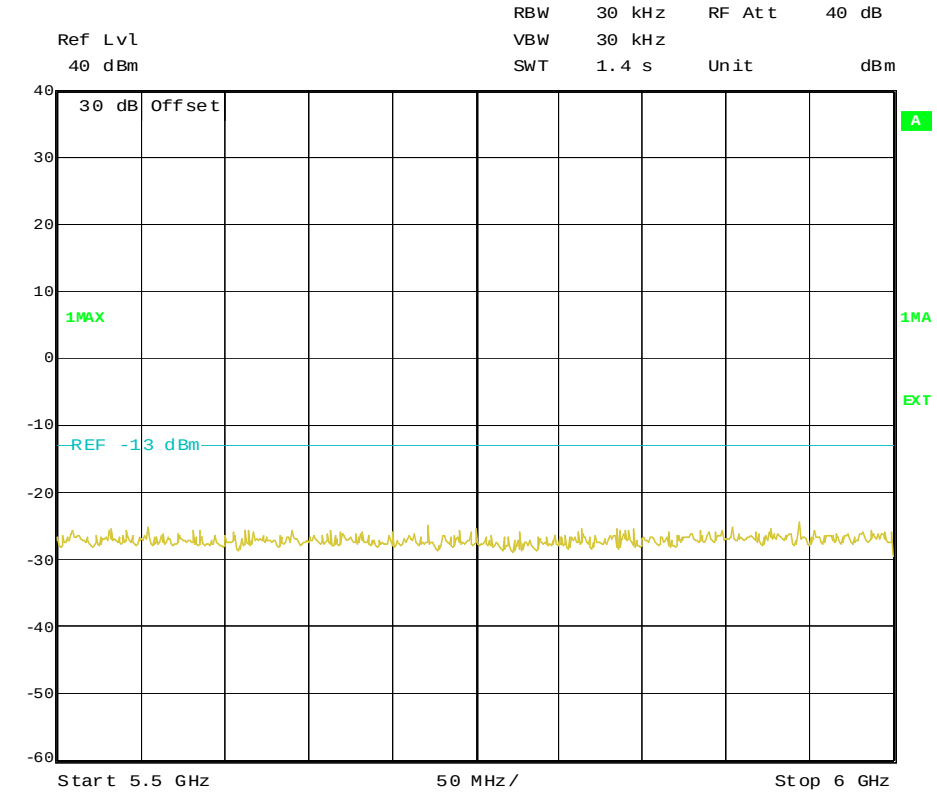
Date: 4.MAY.2012 13:49:17

Plot 8.20



Date: 4.MAY.2012 14:01:59

Plot 8.21



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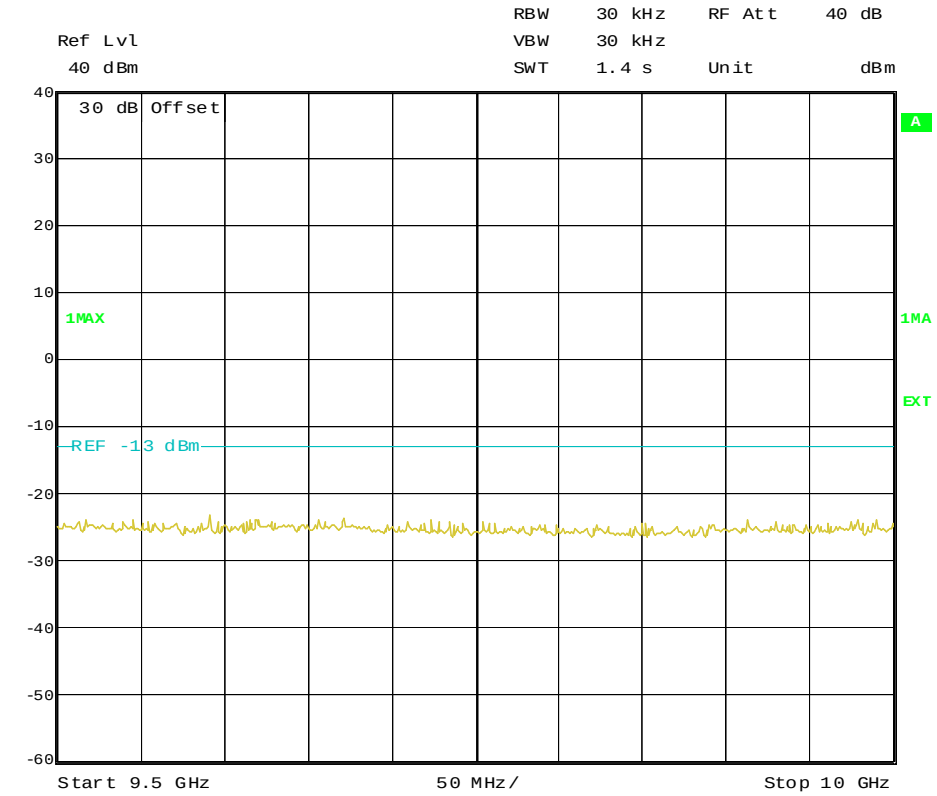
Plot 8.22



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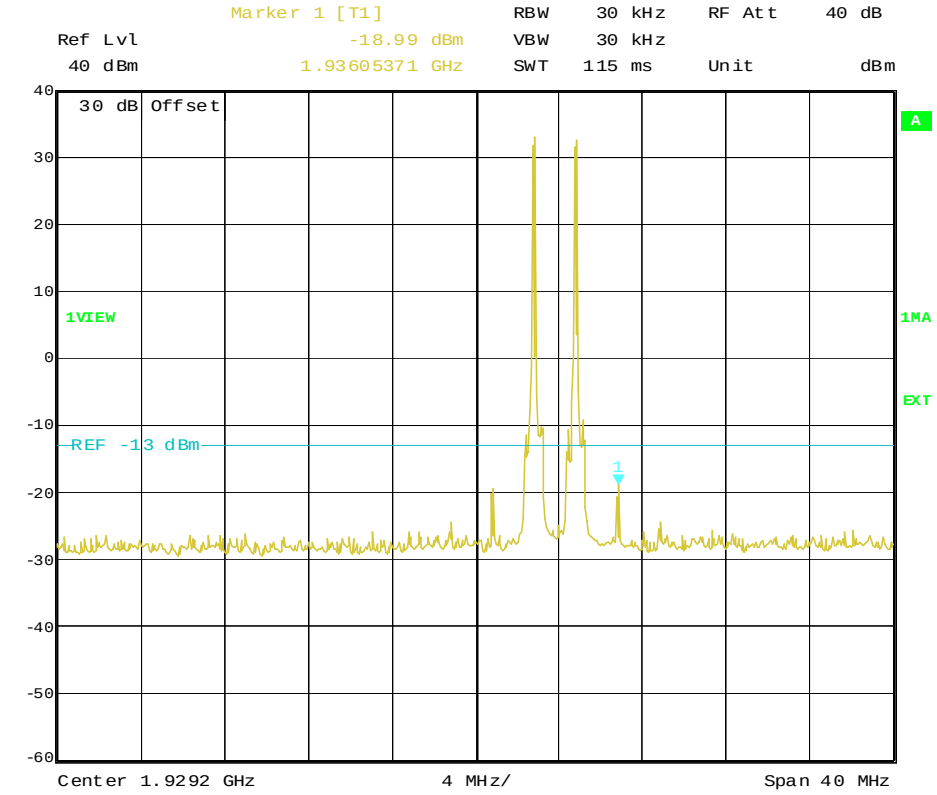
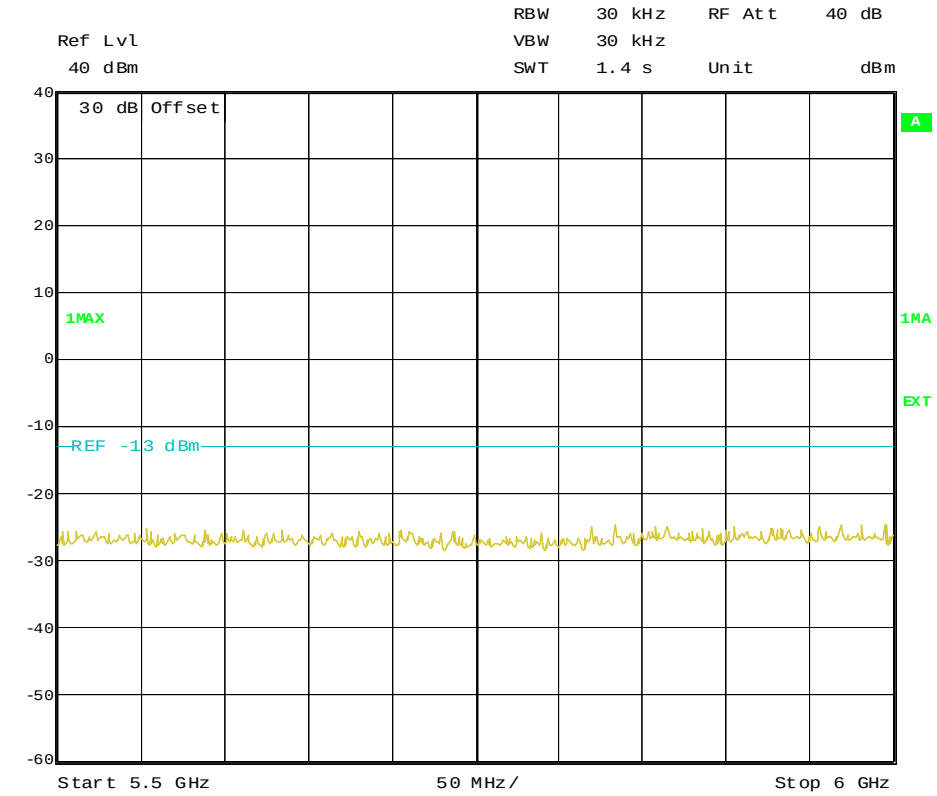
Plot 8.23



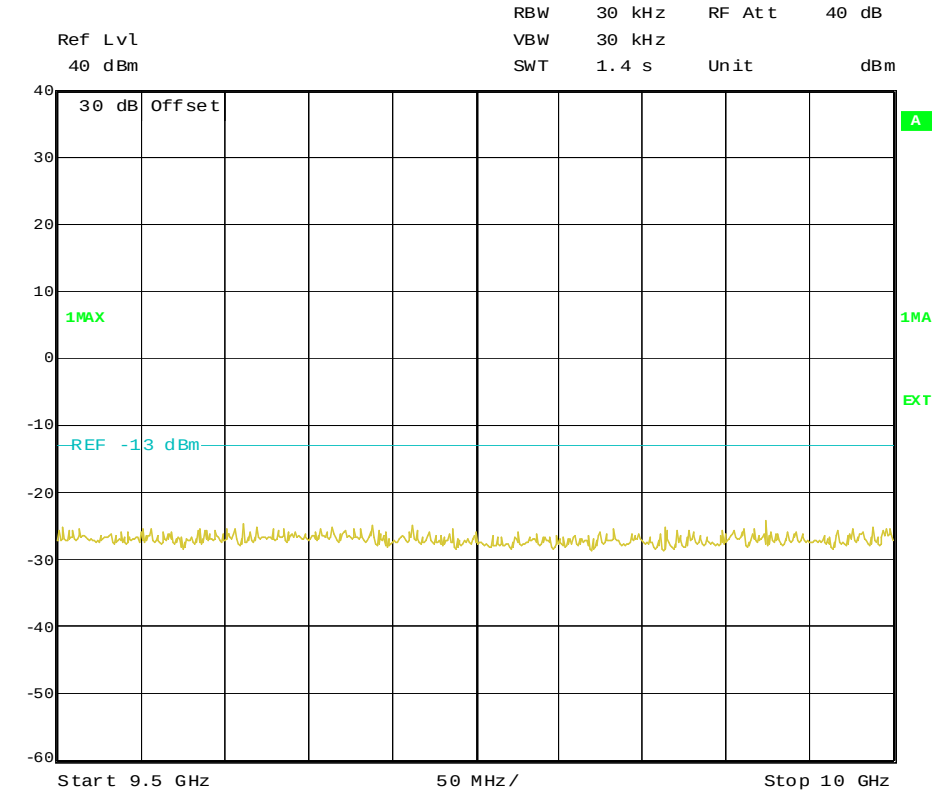
Date: 4.MAY.2012 13:52:11

Plot 8.24



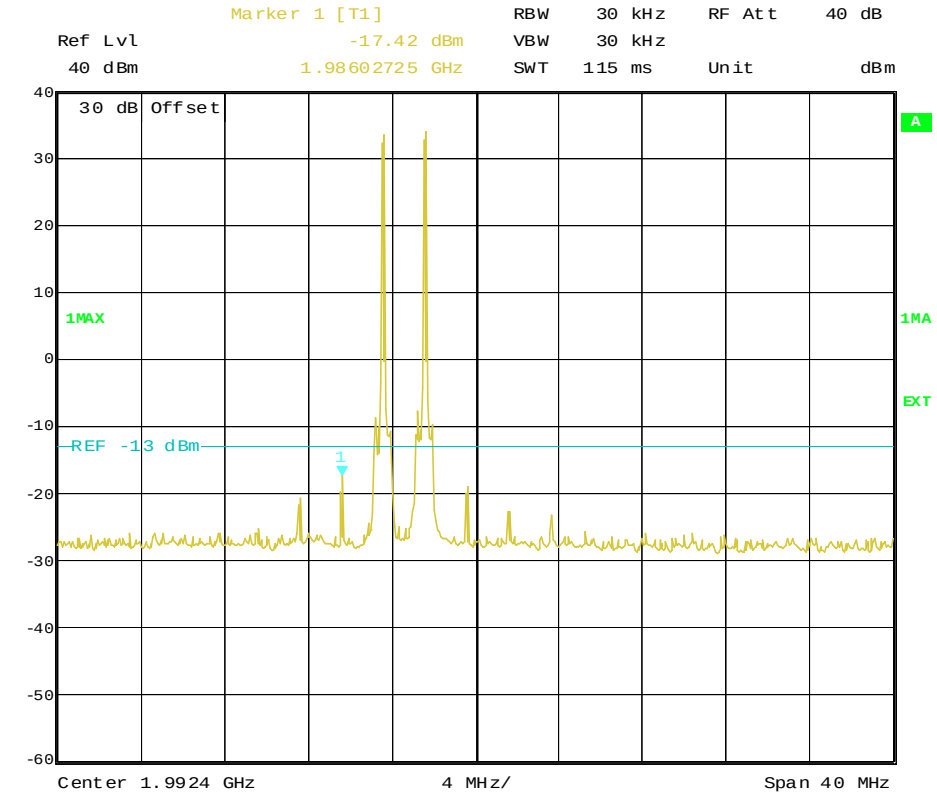
Date: 4.MAY.2012 13:50:43

Plot 8.25



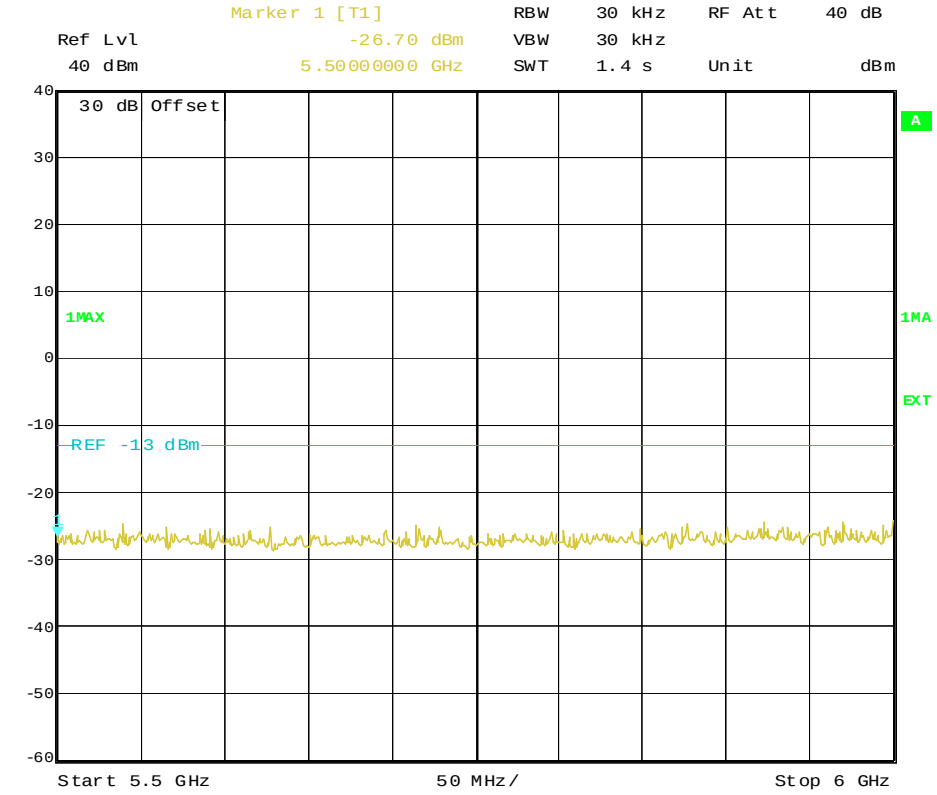
Date: 4.MAY.2012 13:50:05

Plot 8.26



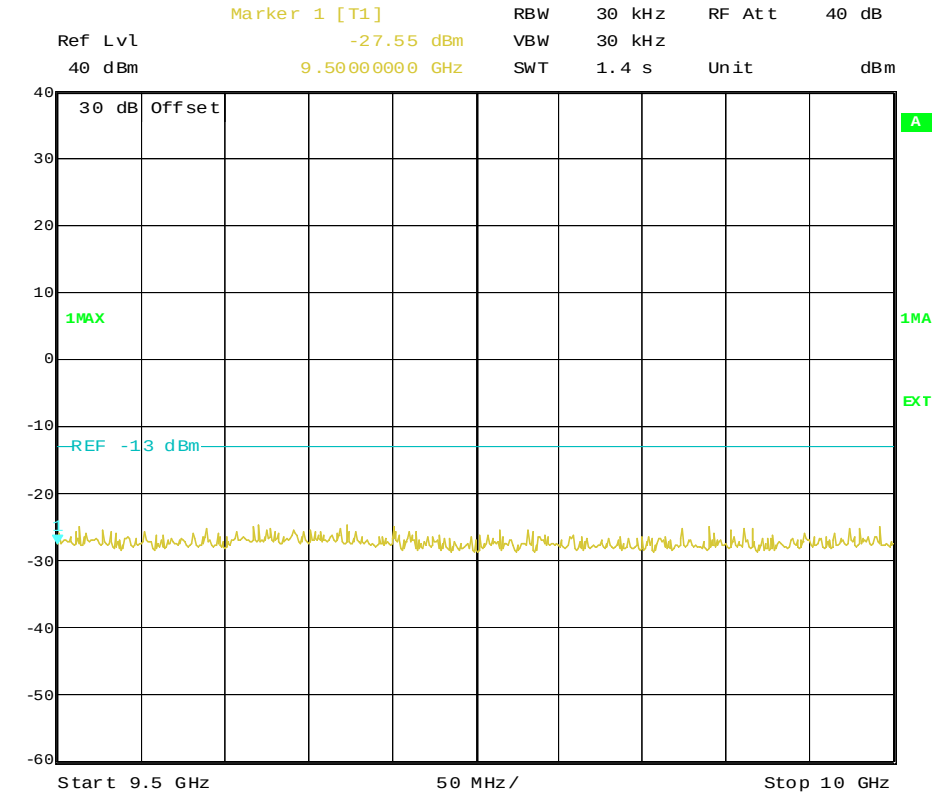
Date: 4.MAY.2012 13:58:34

Plot 8.27



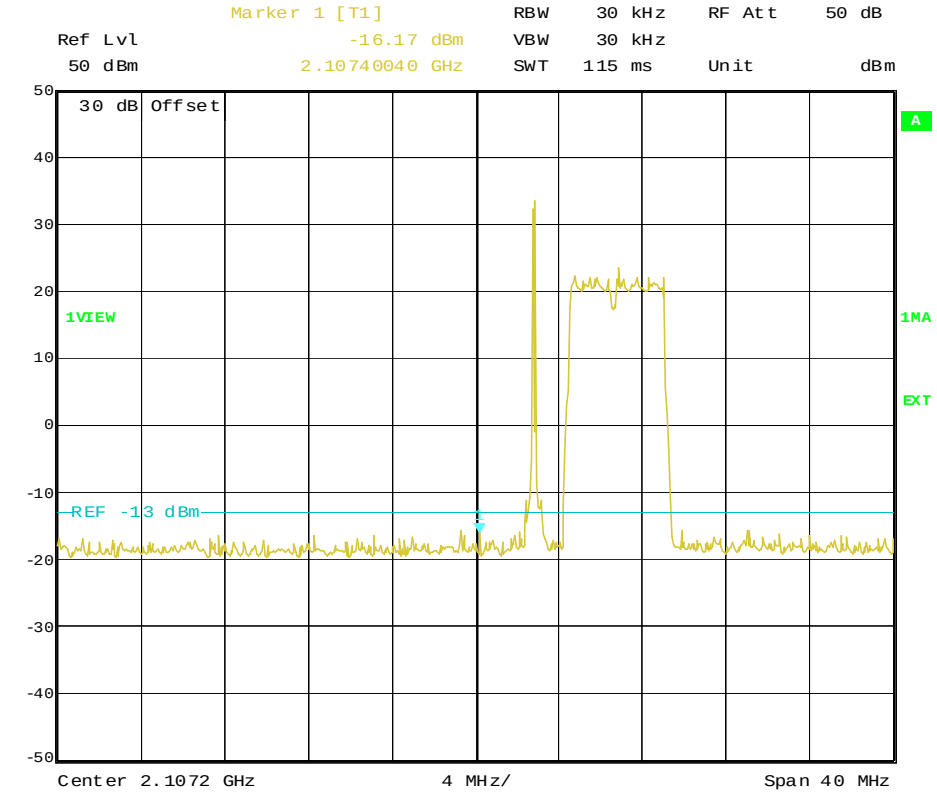
Date: 4.MAY.2012 13:56:13

Plot 8.28



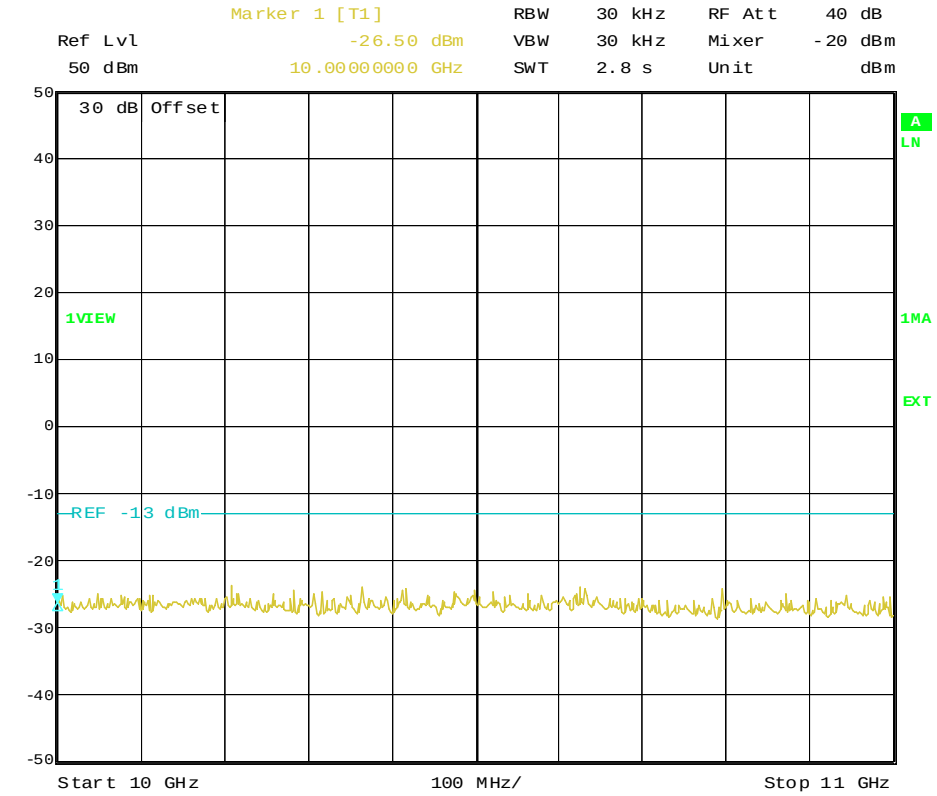
Date: 4.MAY.2012 13:57:08

Plot 8.29



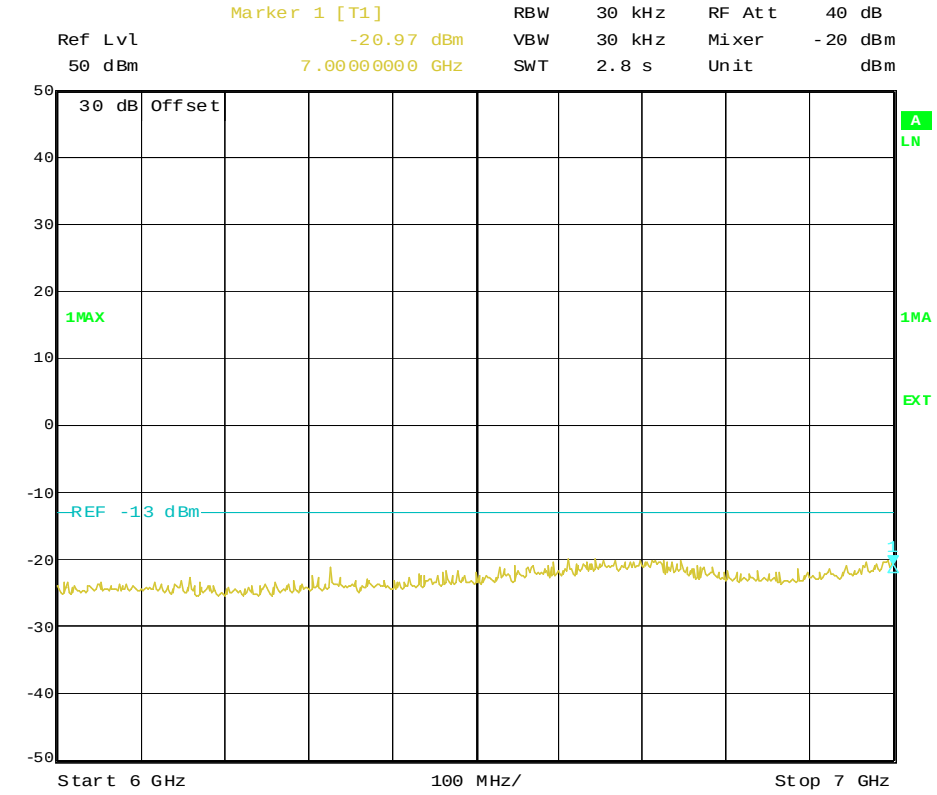
Date: 4.MAY.2012 10:54:26

Plot 8.30



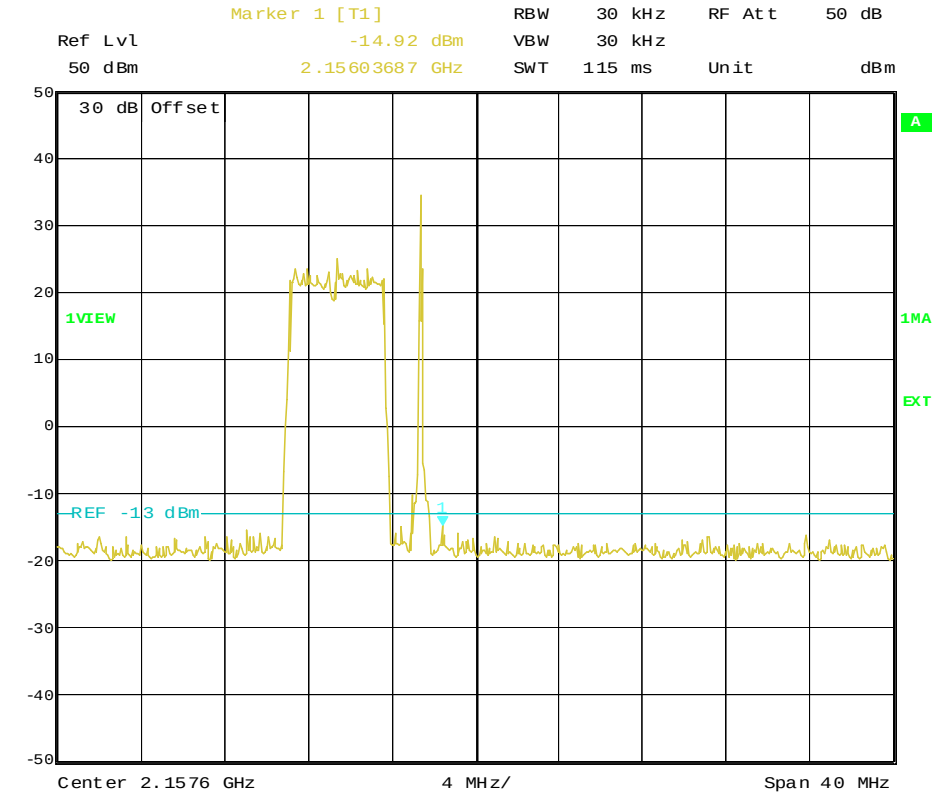
Date: 4.MAY.2012 12:15:05

Plot 8.31



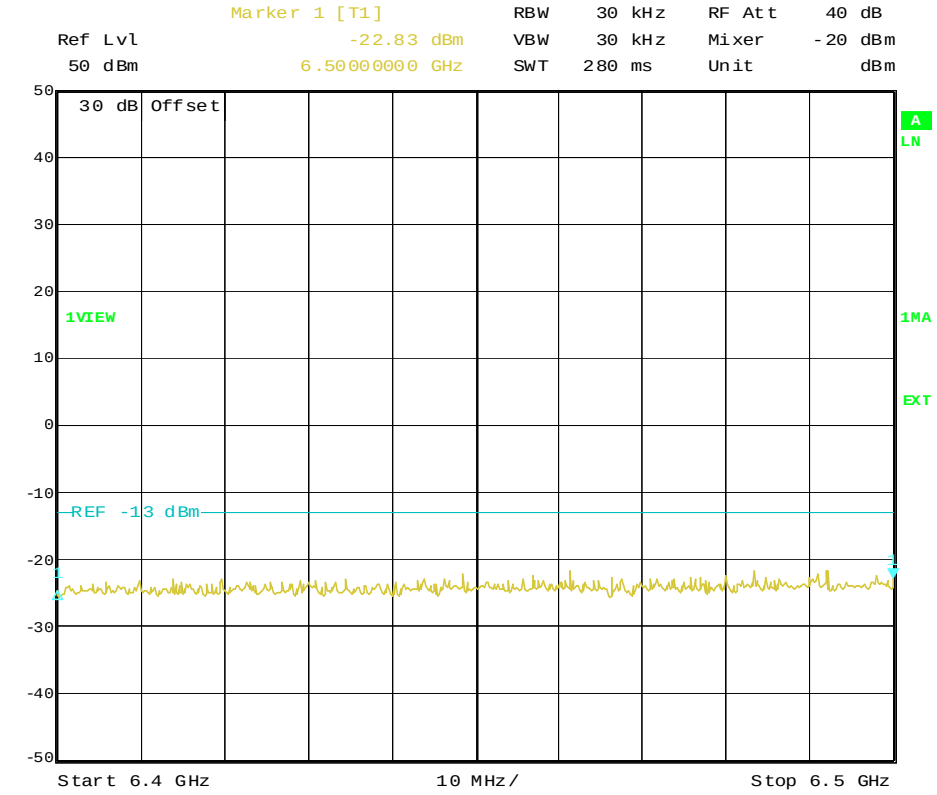
Date: 4.MAY.2012 12:17:04

Plot 8.32



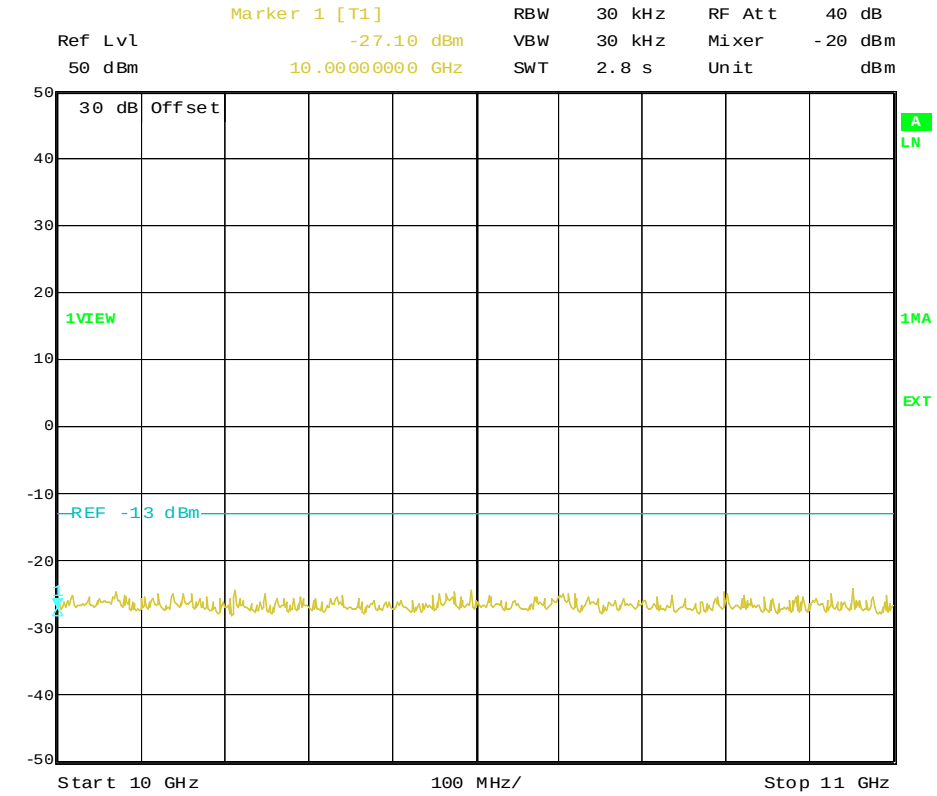
Date: 4.MAY.2012 11:08:38

Plot 8.33



Date: 4.MAY.2012 12:13:07

Plot 8.34



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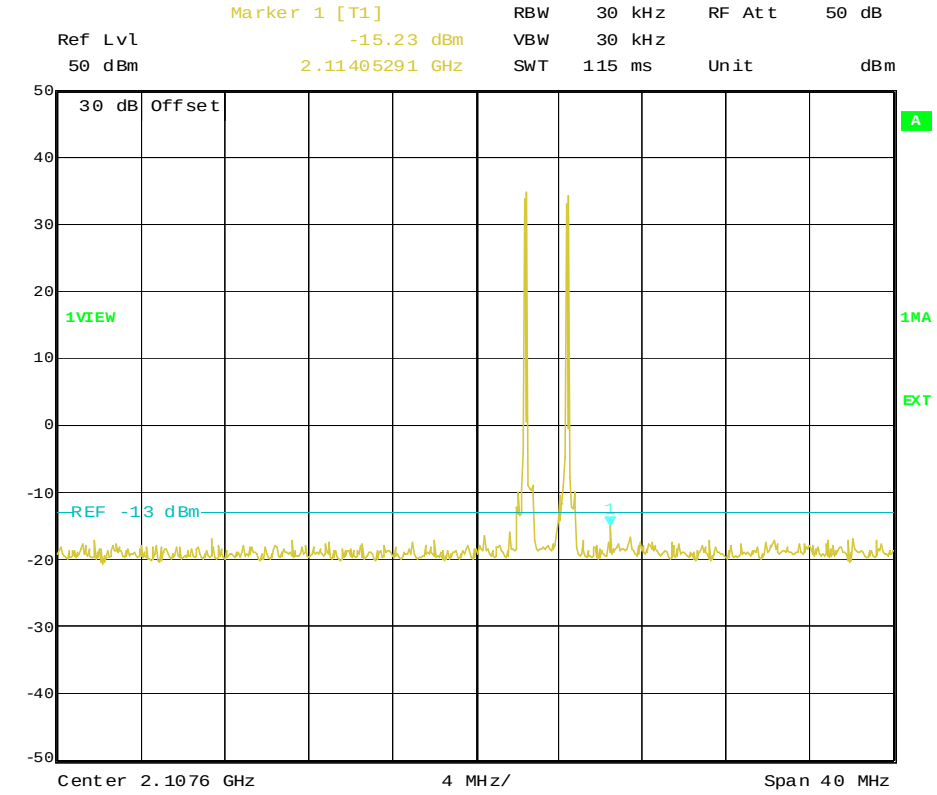
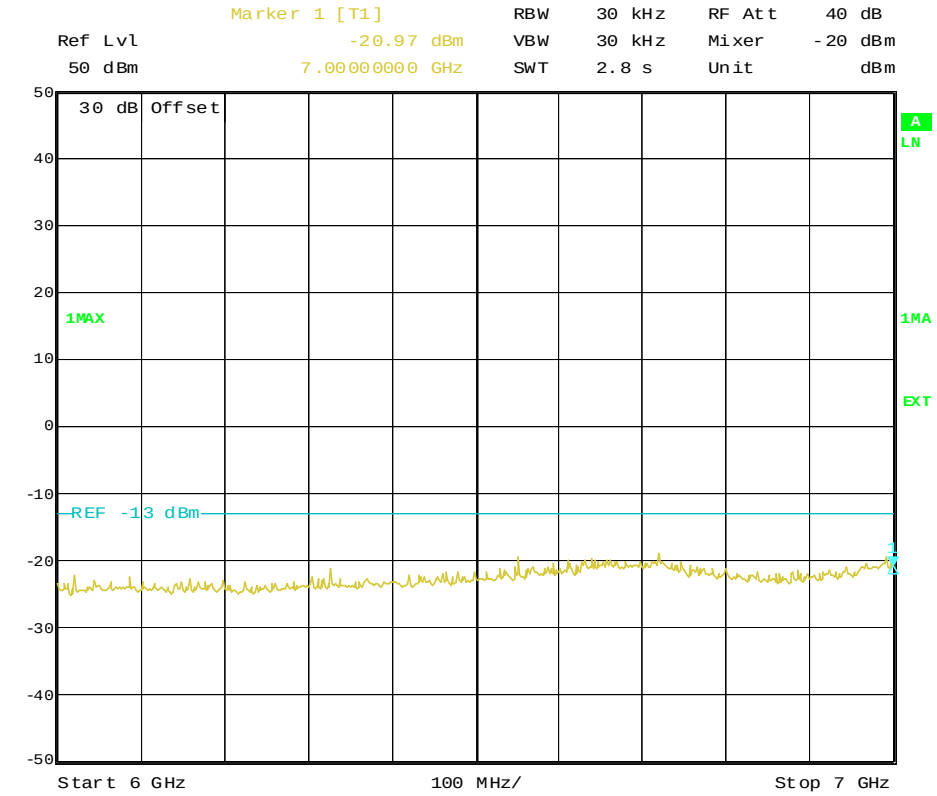
Plot 8.35



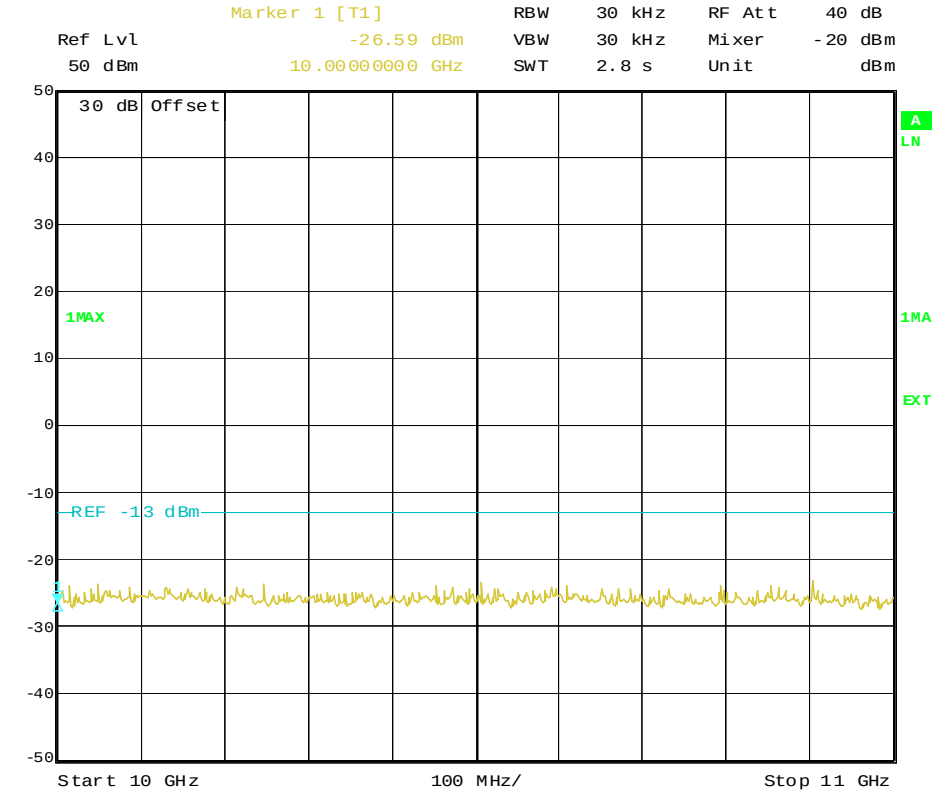
Date: 4.MAY.2012 12:23:24

Plot 8.36



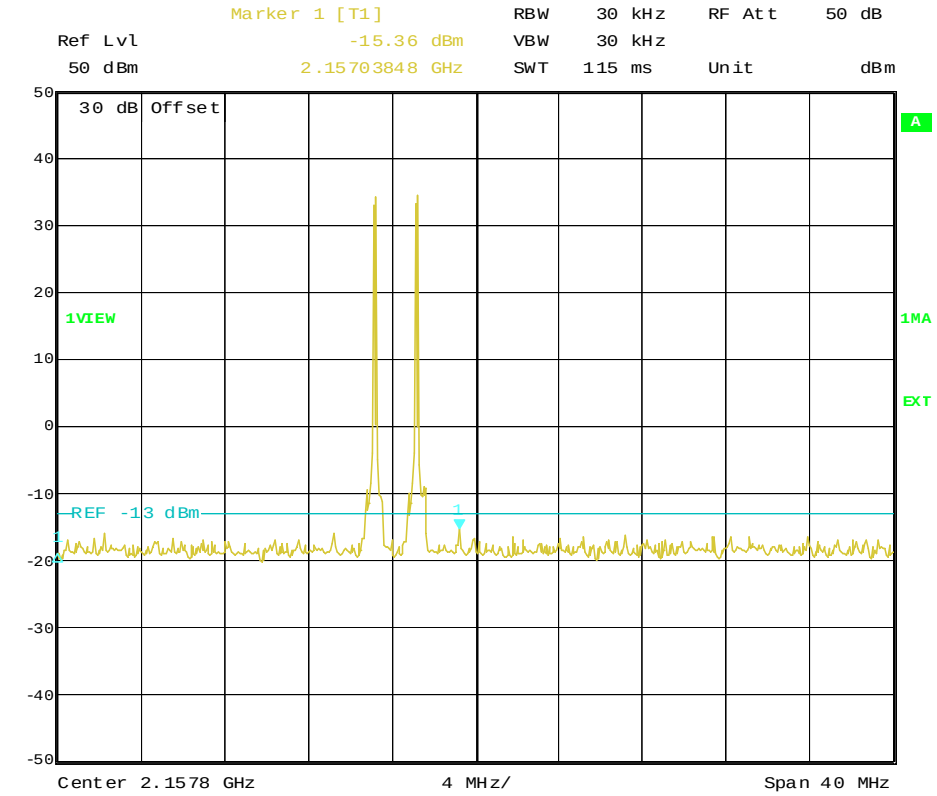
Date: 4.MAY.2012 12:18:24

Plot 8.37



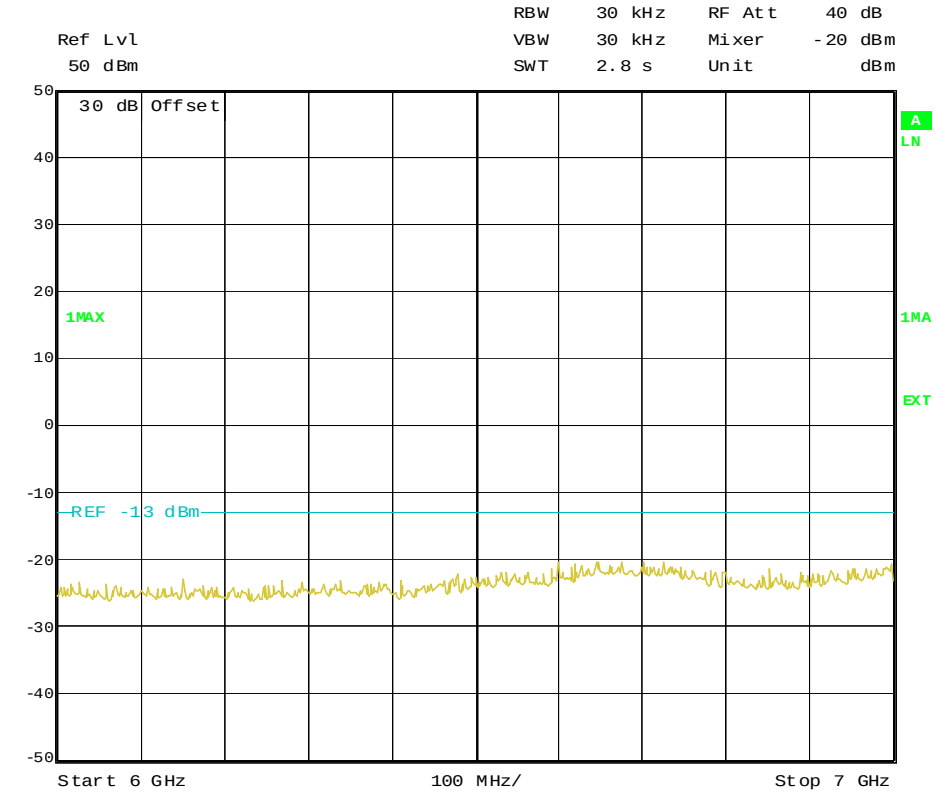
Date: 4.MAY.2012 12:19:15

Plot 8.38



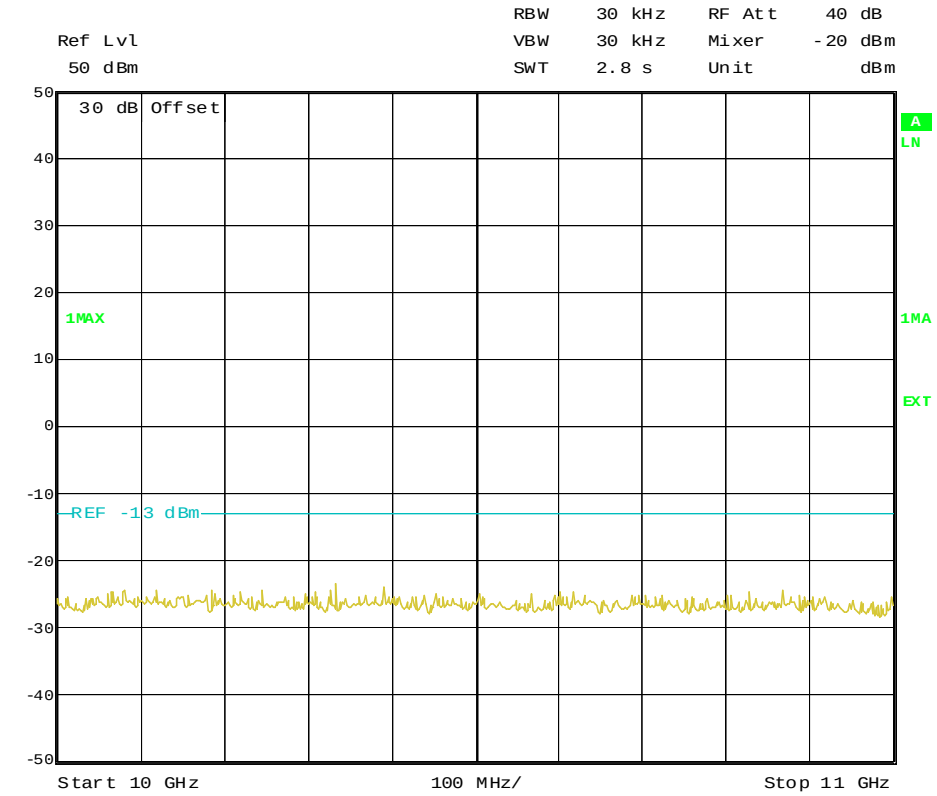
Date: 4.MAY.2012 12:22:07

Plot 8.39



Date: 4.MAY.2012 12:25:30

Plot 8.40



Date: 4.MAY.2012 12:26:03

9 OUT OF BAND SPURIOS EMISSION, CONDUCTED

Date of test:	2012-04-11	Test location:	Big Chamber
EUT Serial:	99001	Ambient temp.	22 °C
Tested by:	Åke Carlson	Relative humidity	29 %
Test result:	Pass	Margin:	>9.2 dB

9.1 Requirement

Spurious emissions should be attenuated below the transmitter power (P) in watts by at least 43 + 10 log (P)

This gives a limit at -13 dBm at the antenna port.

The frequency range to be inspected is from 9 kHz up to the tenth harmonics of the highest fundamental frequency according to 47 CFR 2.1057.

9.2 Test data

700 MHz band

Modulated carriers

Test signal	Frequency [MHz]	RBW [MHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
LTE, low ch.	9kHz – 3 000	1	-25.1	-13	Plot 9.1	
LTE, low ch.	3 000 – 10 000	1	-26.1	-13	Plot 9.2	
LTE, mid. ch.	9kHz – 3 000	1	-24.7	-13	Plot 9.3	
LTE, mid. ch.	3 000 – 10 000	1	-26.2	-13	Plot 9.4	
LTE, high ch.	9kHz – 3 000	1	-23.8	-13	Plot 9.5	
LTE, high ch.	3 000 – 10 000	1	-26.0	-13	Plot 9.6	
GSM, low ch.	9kHz – 3 000	1	-25.9	-13	Plot 9.7	
GSM, low ch.	3 000 – 10 000	1	-25.9	-13	Plot 9.8	
GSM, mid. ch.	9kHz – 3 000	1	-25.3	-13	Plot 9.9	
GSM, mid. ch.	3 000 – 10 000	1	-25.2	-13	Plot 9.10	
GSM, high ch.	9kHz – 3 000	1	-26.9	-13	Plot 9.11	
GSM, high ch.	3 000 – 10 000	1	-26.3	-13	Plot 9.12	

850 MHz band

Modulated carriers

Test signal	Frequency [MHz]	RBW [MHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
CDMA, low ch.	9kHz – 3 000	1	-22.8	-13	Plot 9.13	
CDMA, low ch.	3 000 – 10 000	1	-25.7	-13	Plot 9.14	
CDMA, mid. ch.	9kHz – 3 000	1	-21.6	-13	Plot 9.15	
CDMA, mid. ch.	3 000 – 10 000	1	-25.8	-13	Plot 9.16	
CDMA, high ch.	9kHz – 3 000	1	-22.2	-13	Plot 9.17	
CDMA, high ch.	3 000 – 10 000	1	-26.1	-13	Plot 9.18	
GSM, low ch.	9kHz – 3 000	1	-22.9	-13	Plot 9.19	
GSM, low ch.	3 000 – 10 000	1	-25.2	-13	Plot 9.20	
GSM, mid. ch.	9kHz – 3 000	1	-22.3	-13	Plot 9.21	
GSM, mid. ch.	3 000 – 10 000	1	-26.0	-13	Plot 9.22	
GSM, high ch.	9kHz – 3 000	1	-22.2	-13	Plot 9.23	
GSM, high ch.	3 000 – 10 000	1	-26.8	-13	Plot 9.24	

1900 MHz band

Modulated carriers

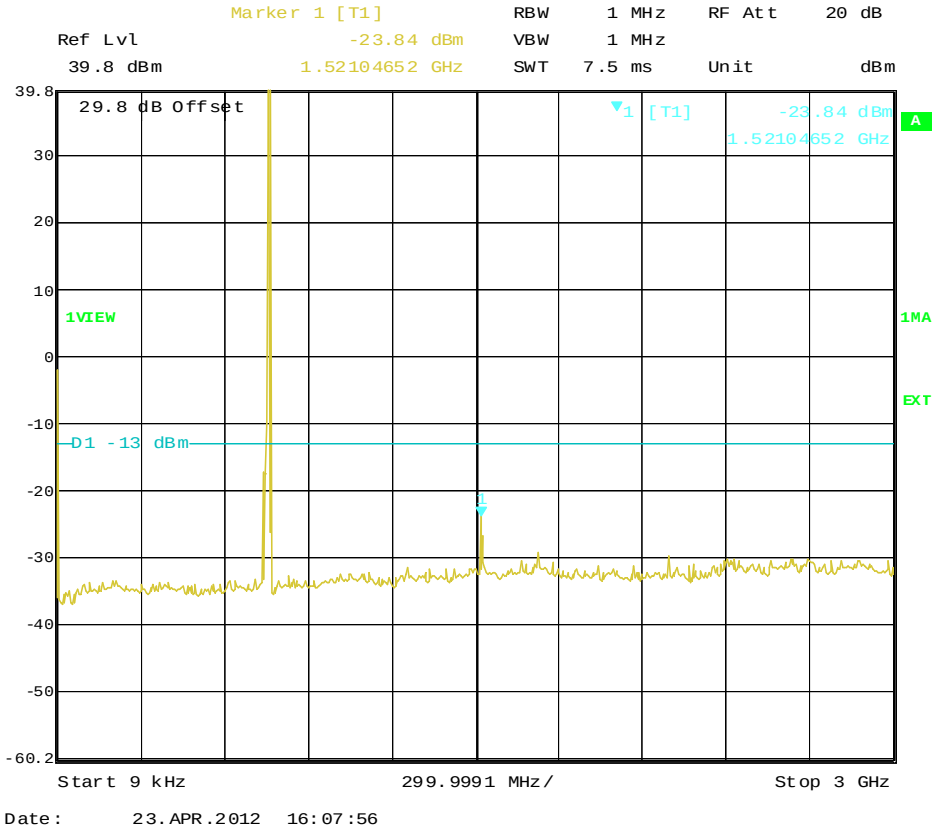
Test signal	Frequency [MHz]	RBW [MHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
CDMA, low ch.	9kHz – 3 000	1	-29.6	-13	Plot 9.25	
CDMA, low ch.	3 000 – 10 000	1	-26.1	-13	Plot 9.26	
CDMA, low ch.	10 000 – 20 000	1	-26.3	-13	Plot 9.27	
CDMA, mid. ch.	9kHz – 3 000	1	-29.6	-13	Plot 9.28	
CDMA, mid. ch.	3 000 – 10 000	1	-29.3	-13	Plot 9.29	
CDMA, mid. ch.	10 000 – 20 000	1	-27.0	-13	Plot 9.30	
CDMA, high ch.	9kHz – 3 000	1	-28.8	-13	Plot 9.31	
CDMA, high ch.	3 000 – 10 000	1	-25.7	-13	Plot 9.32	
CDMA, high ch.	10 000 – 20 000	1	27.1	-13	Plot 9.33	
GSM, low ch.	9kHz – 3 000	1	-28.8	-13	Plot 9.34	
GSM, low ch.	3 000 – 10 000	1	-25.5	-13	Plot 9.35	
GSM, low ch.	10 000 – 20 000	1	-26.2	-13	Plot 9.36	
GSM, mid. ch.	9kHz – 3 000	1	-29.7	-13	Plot 9.37	
GSM, mid. ch.	3 000 – 10 000	1	-25.7	-13	Plot 9.38	
GSM, mid. ch.	10 000 – 20 000	1	-26.6	-13	Plot 9.39	
GSM, high ch.	9kHz – 3 000	1	-29.2	-13	Plot 9.40	
GSM, high ch.	3 000 – 10 000	1	-26.1	-13	Plot 9.41	
GSM, high ch.	10 000 – 20 000	1	26.7	-13	Plot 9.42	

AWS band

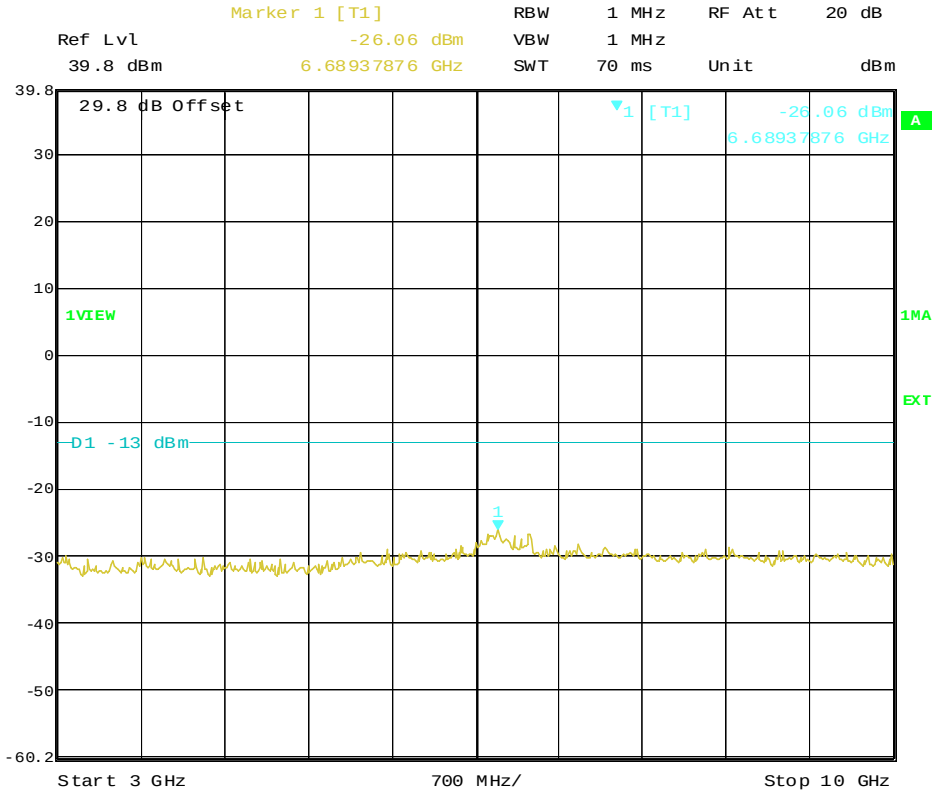
Modulated carriers

Test signal	Frequency [MHz]	RBW [MHz]	Measured peak level (dBm)	Limit (dBm)	Plots	Comment
WCDMA, low ch.	9kHz – 3 000	1	-29.1	-13	Plot 9.43	
WCDMA, low ch.	3 000 – 10 000	1	-25.7	-13	Plot 9.44	
WCDMA, low ch.	10 000 – 20 000	1	-27.0	-13	Plot 9.45	
WCDMA, low ch.	20 000 – 23 000	1	-25.0	-13	Plot 9.46	
WCDMA, mid. ch.	9kHz – 3 000	1	-29.2	-13	Plot 9.47	
WCDMA, mid. ch.	3 000 – 10 000	1	-26.4	-13	Plot 9.48	
WCDMA, mid. ch.	10 000 – 20 000	1	-26.8	-13	Plot 9.49	
WCDMA, mid. ch.	20 000 – 23 000	1	-25.5	-13	Plot 9.50	
WCDMA, high ch.	9kHz – 3 000	1	-29.6	-13	Plot 9.51	
WCDMA, high ch.	3 000 – 10 000	1	-26.1	-13	Plot 9.52	
WCDMA, high ch.	10 000 – 20 000	1	-27.0	-13	Plot 9.53	
WCDMA, high ch.	20 000 – 23 000	1	-25.4	-13	Plot 9.54	

Plot 9.1

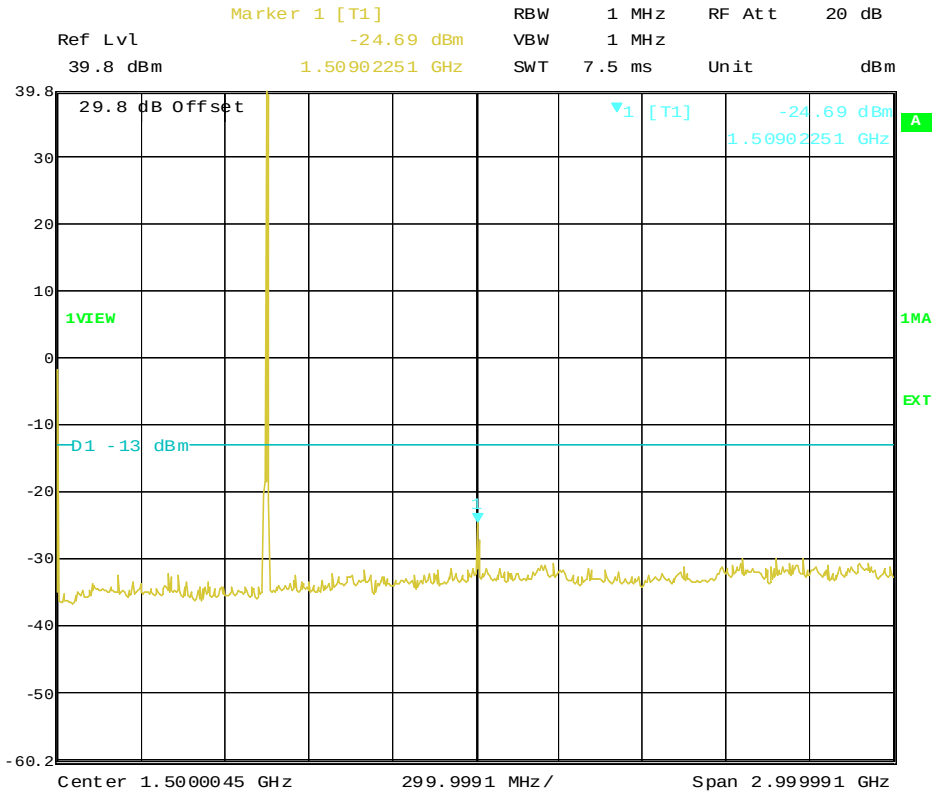


Plot 9.2



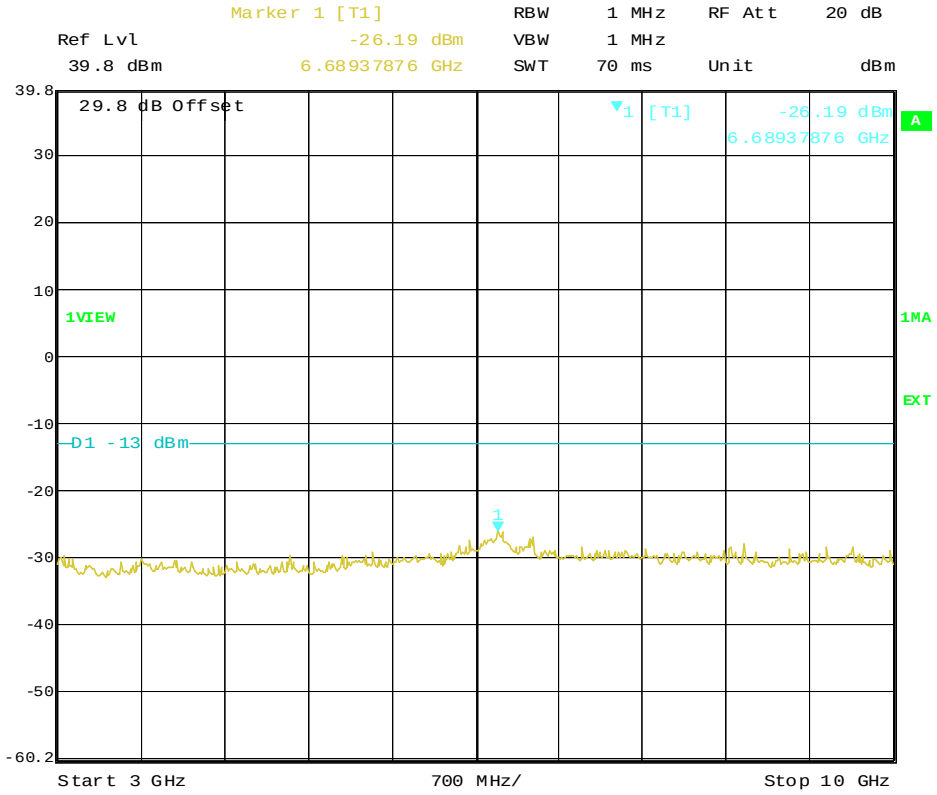
Date: 24.APR.2012 08:42:15

Plot 9.3



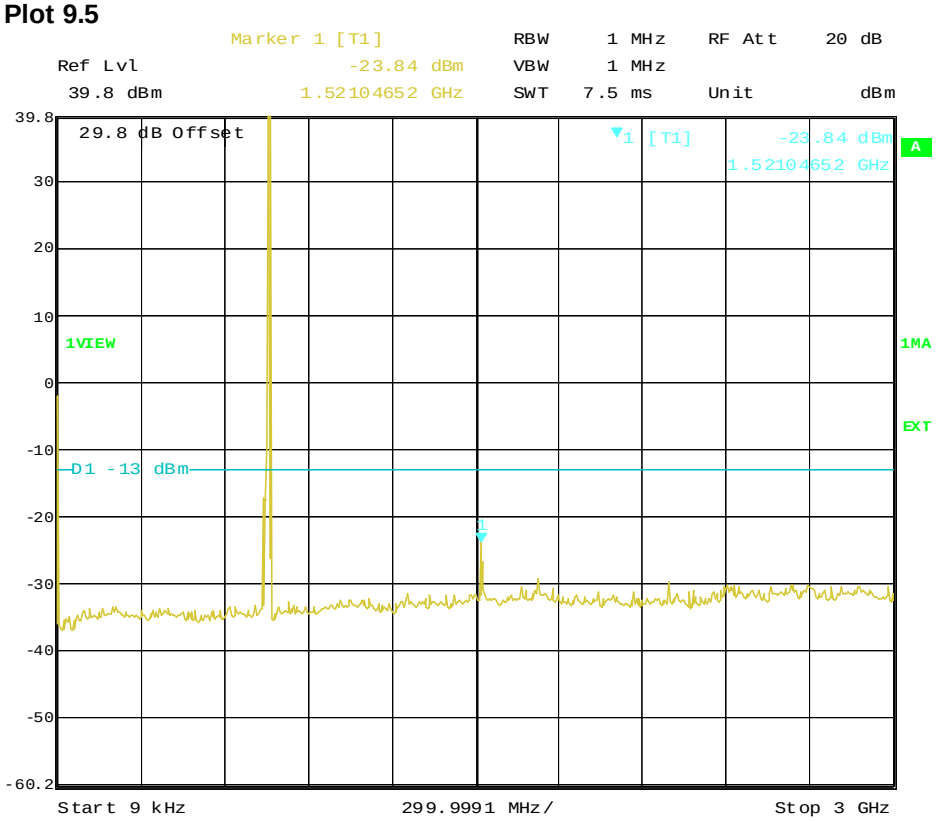
Date: 23.APR.2012 16:05:39

Plot 9.4



Date: 24.APR.2012 08:41:00

Plot 9.5



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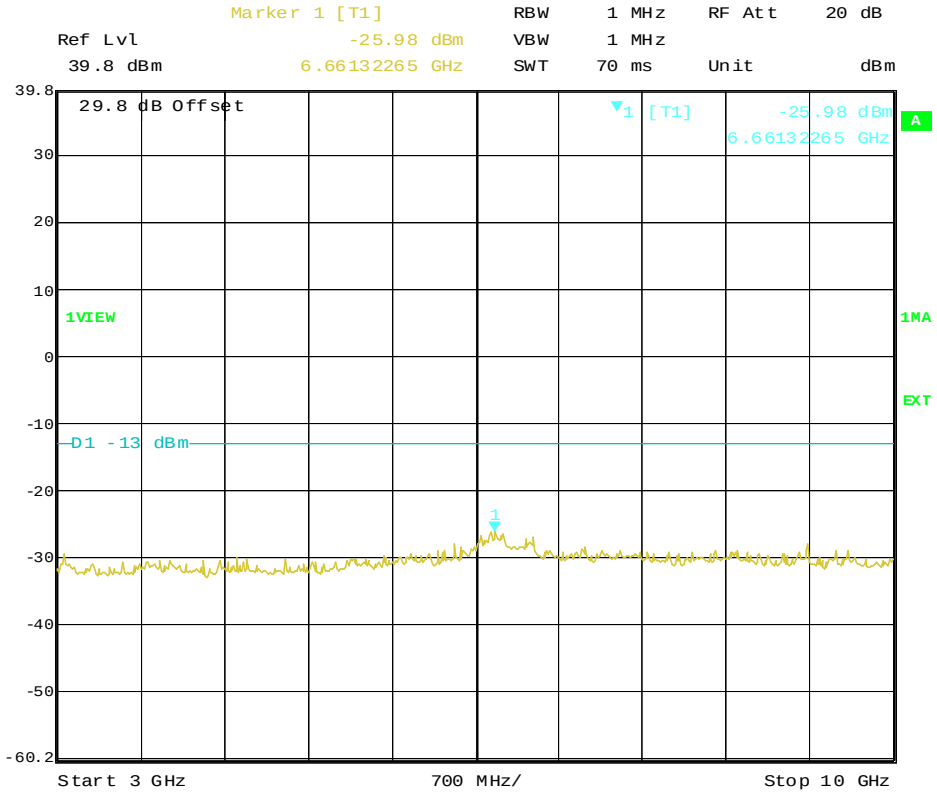
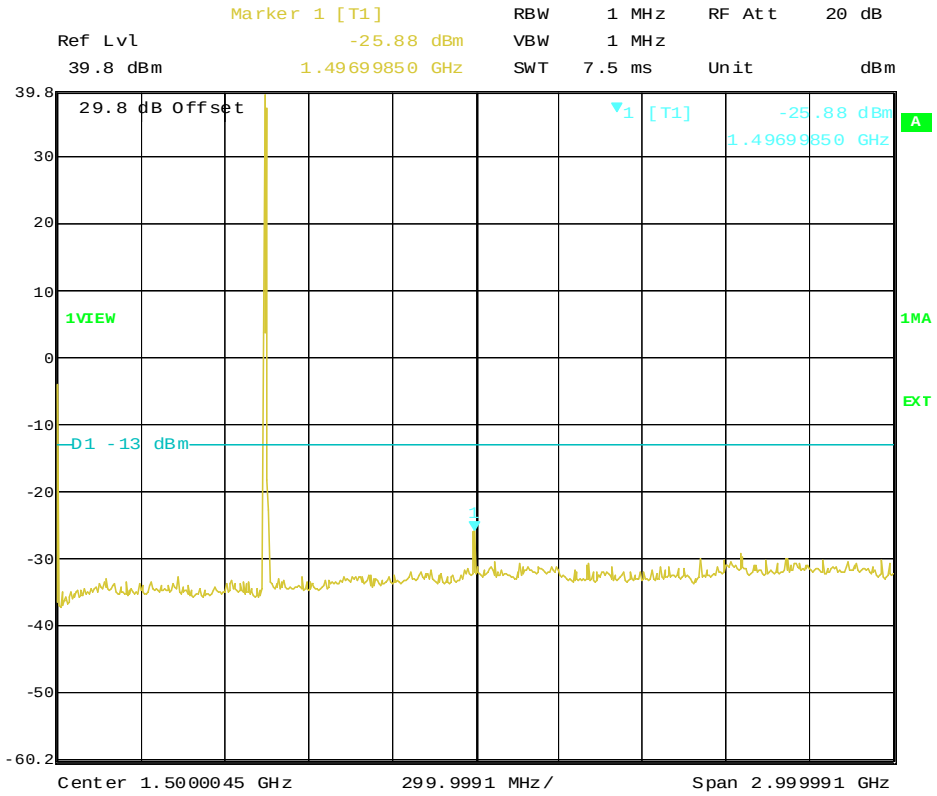
Plot 9.6



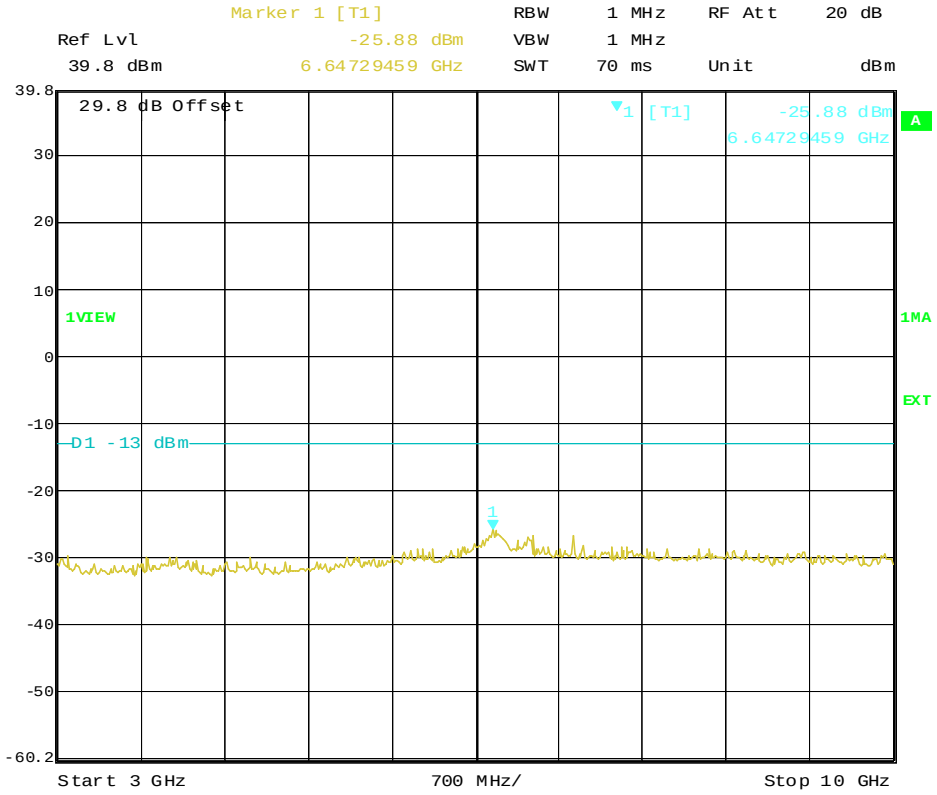
Date: 24.APR.2012 08:38:04

Plot 9.7



Date: 24.APR.2012 08:32:11

Plot 9.8



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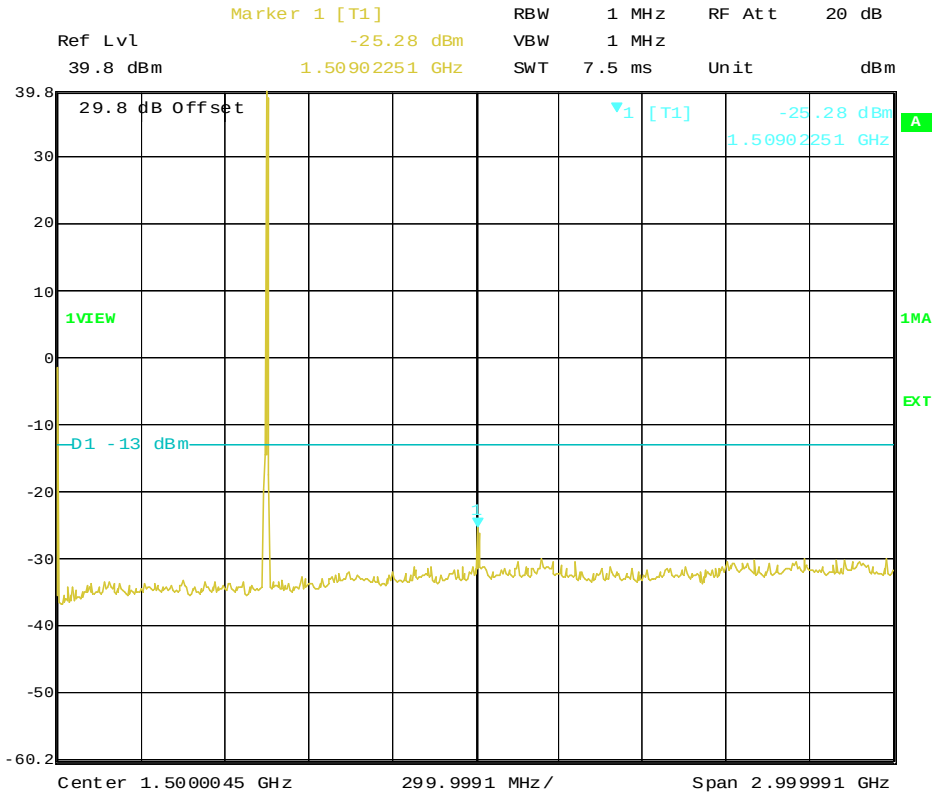
Plot 9.9



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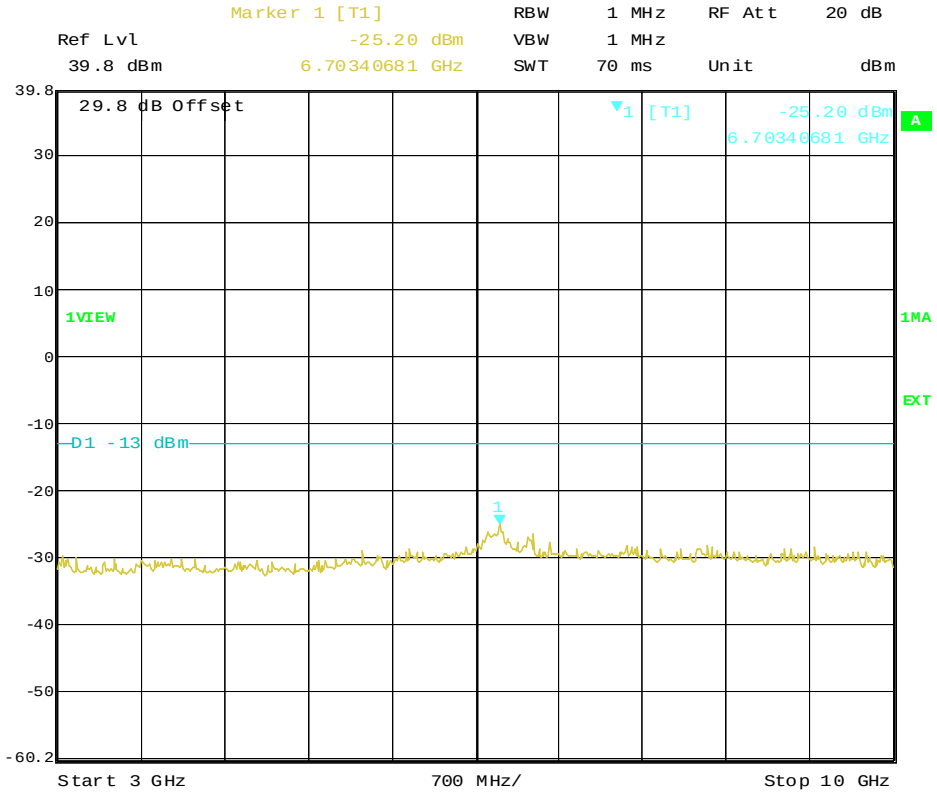
Plot 9.10



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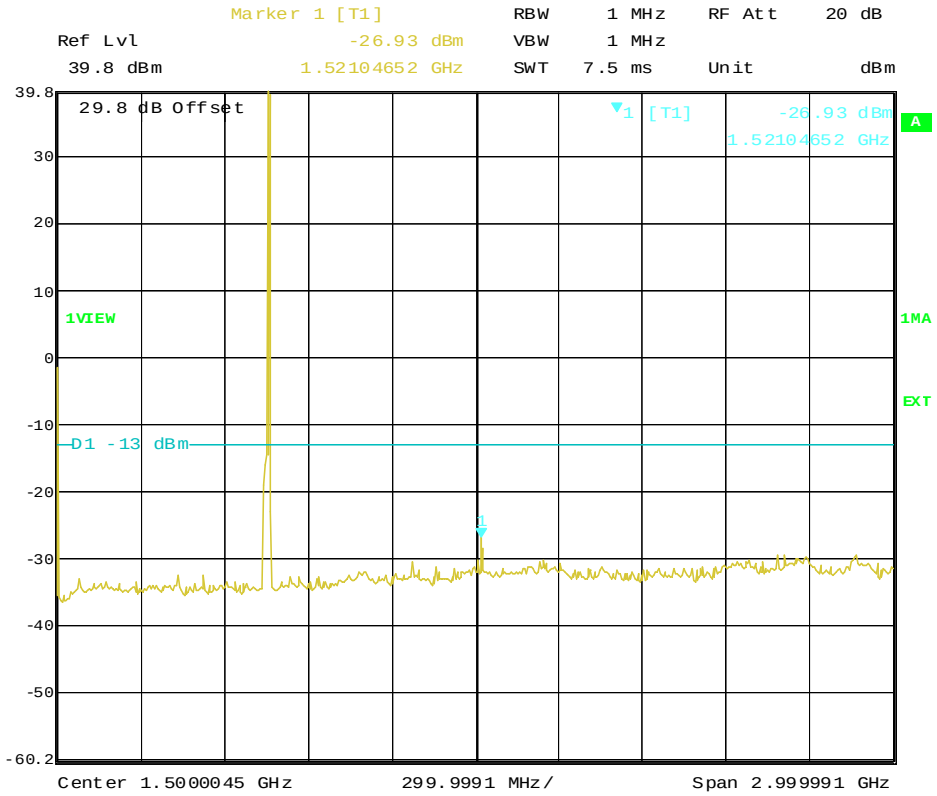
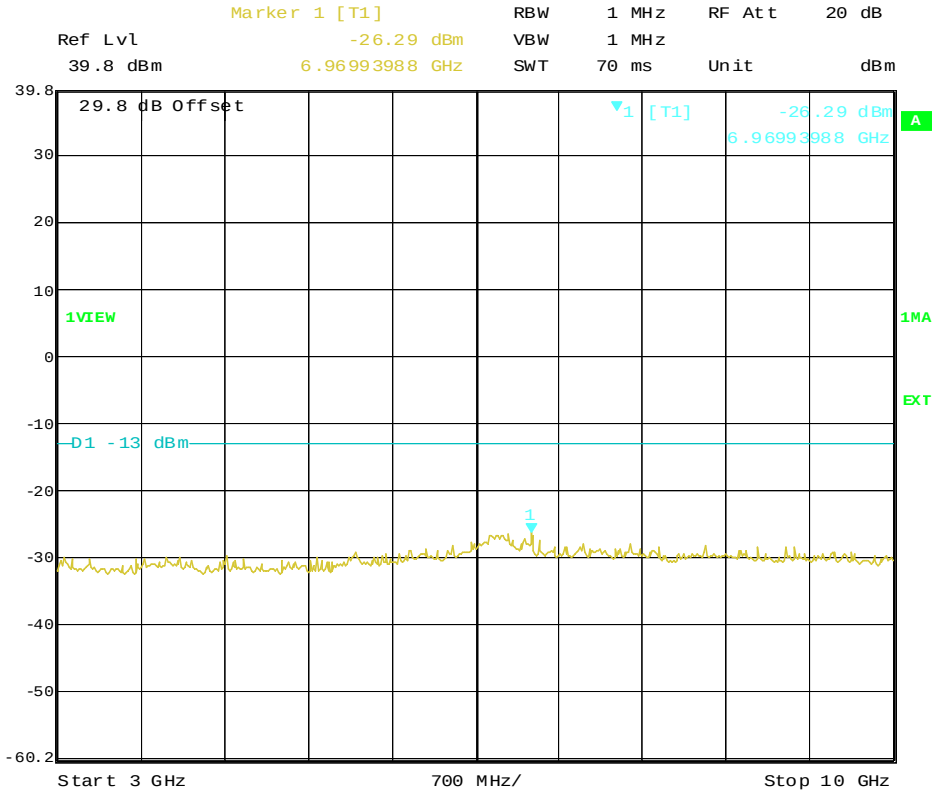
Plot 9.11



Date: 24.APR.2012 08:21:43

Plot 9.12



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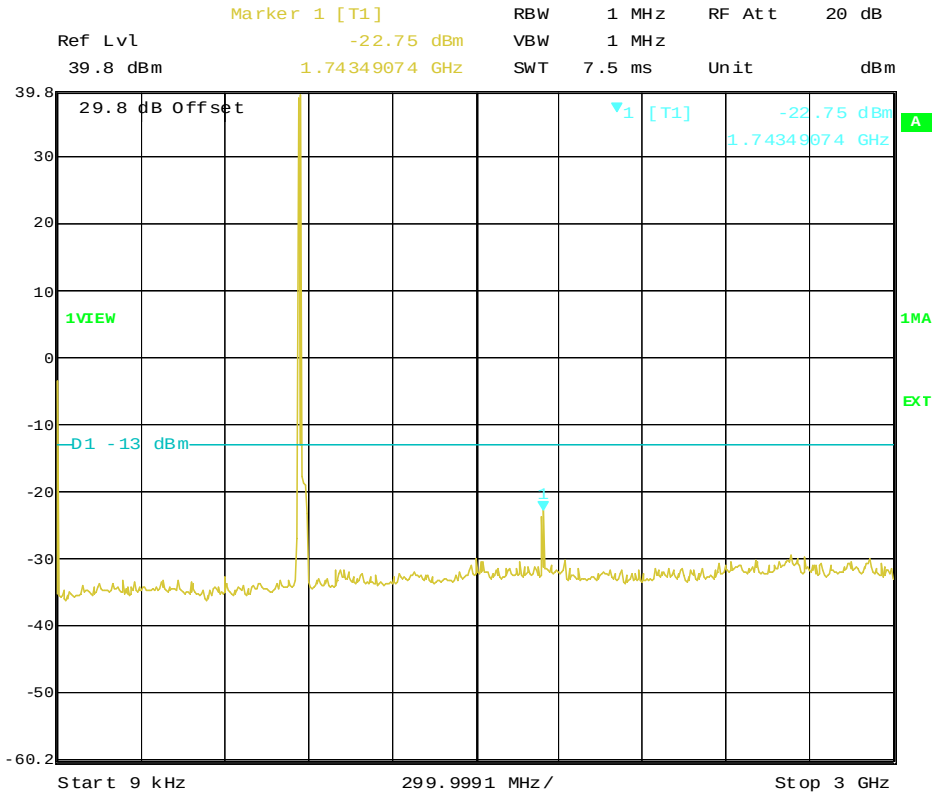
Plot 9.13



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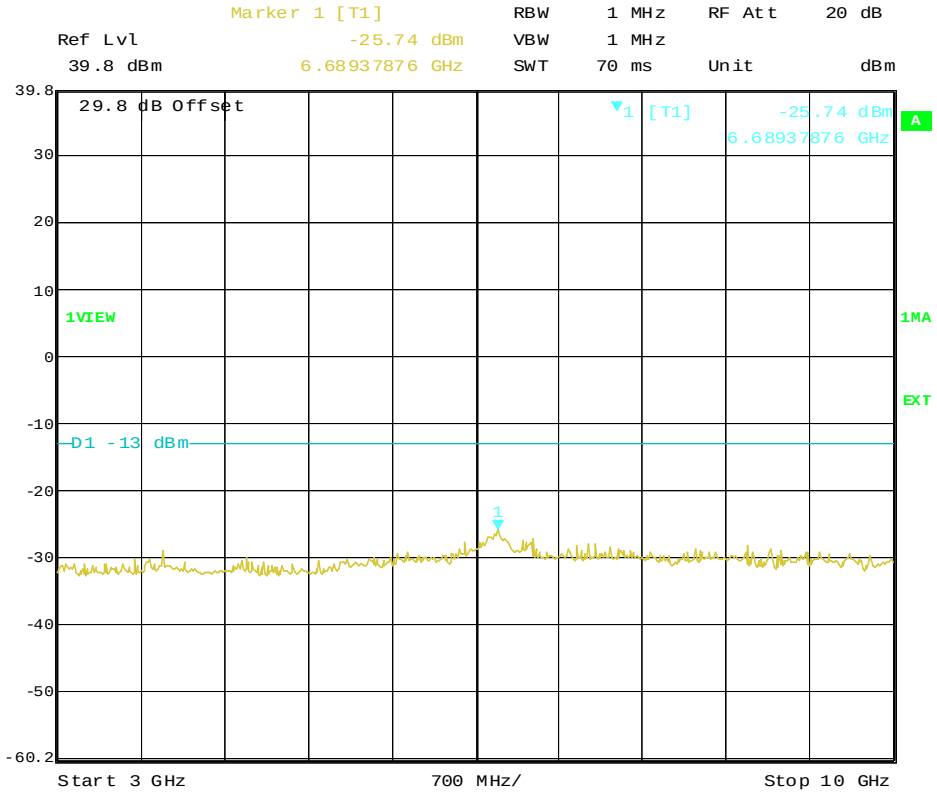
Plot 9.14



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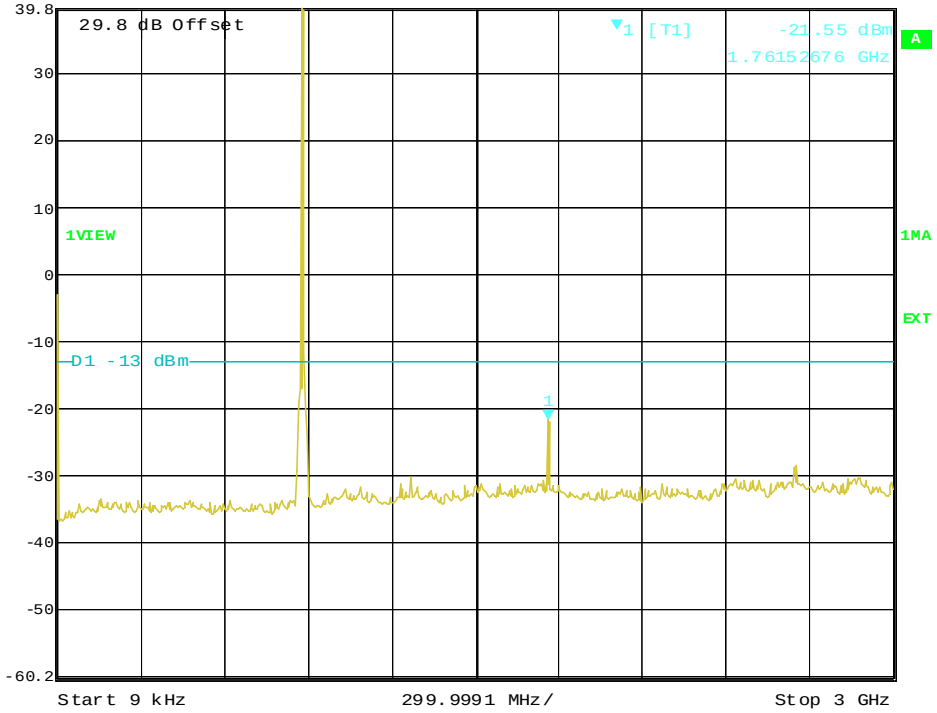
Plot 9.15



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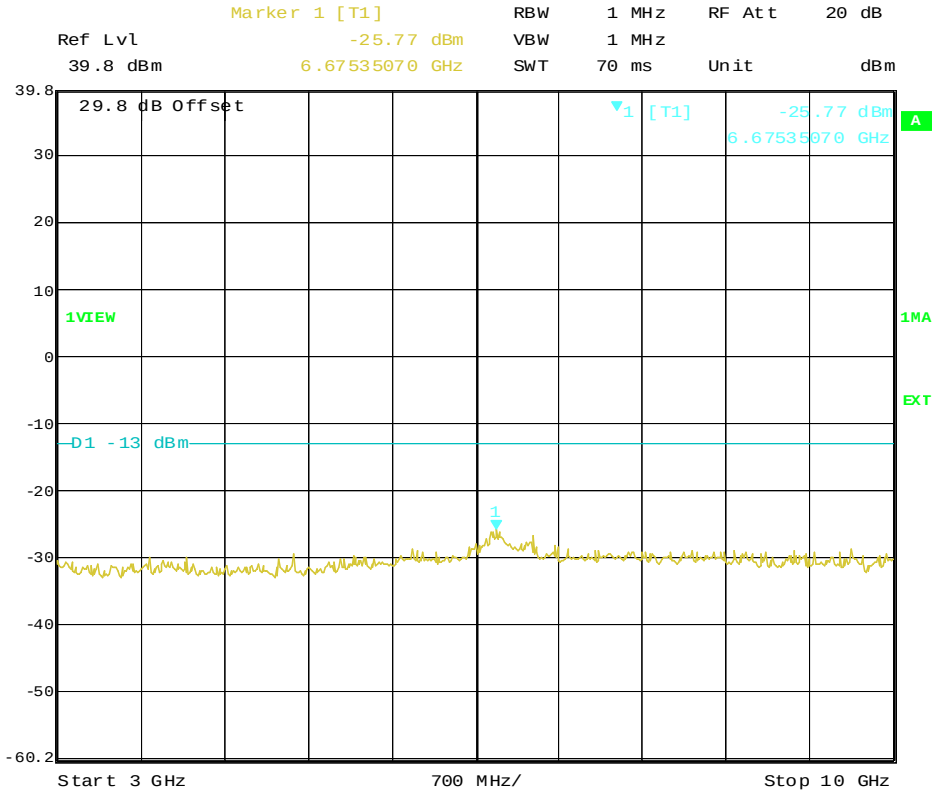
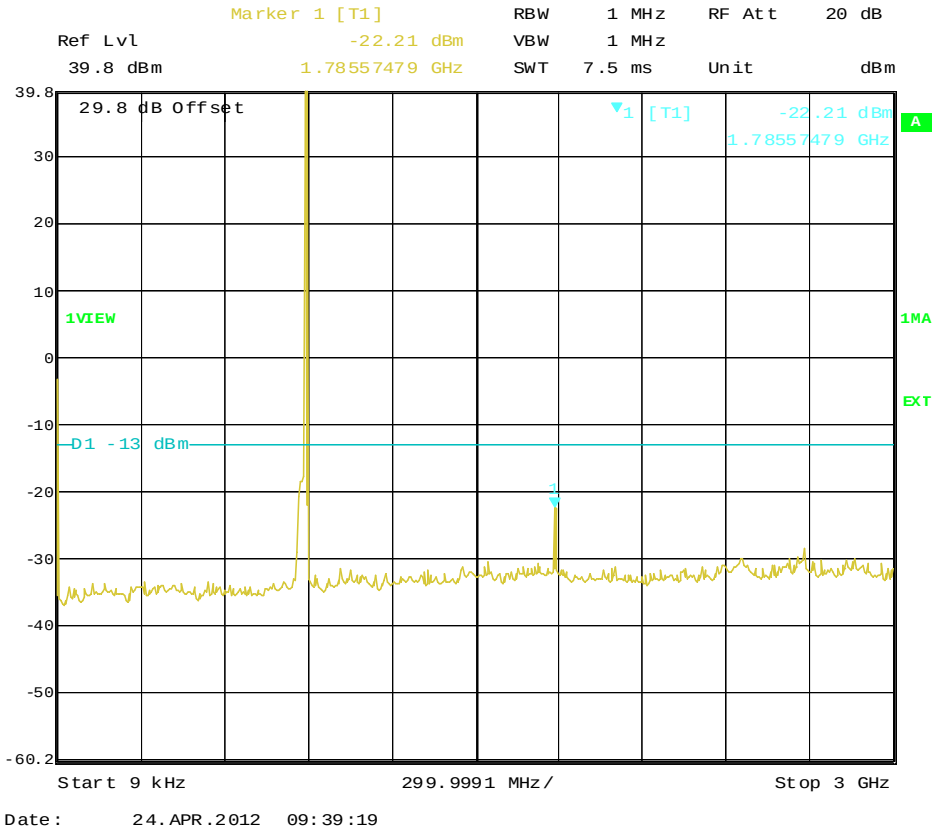
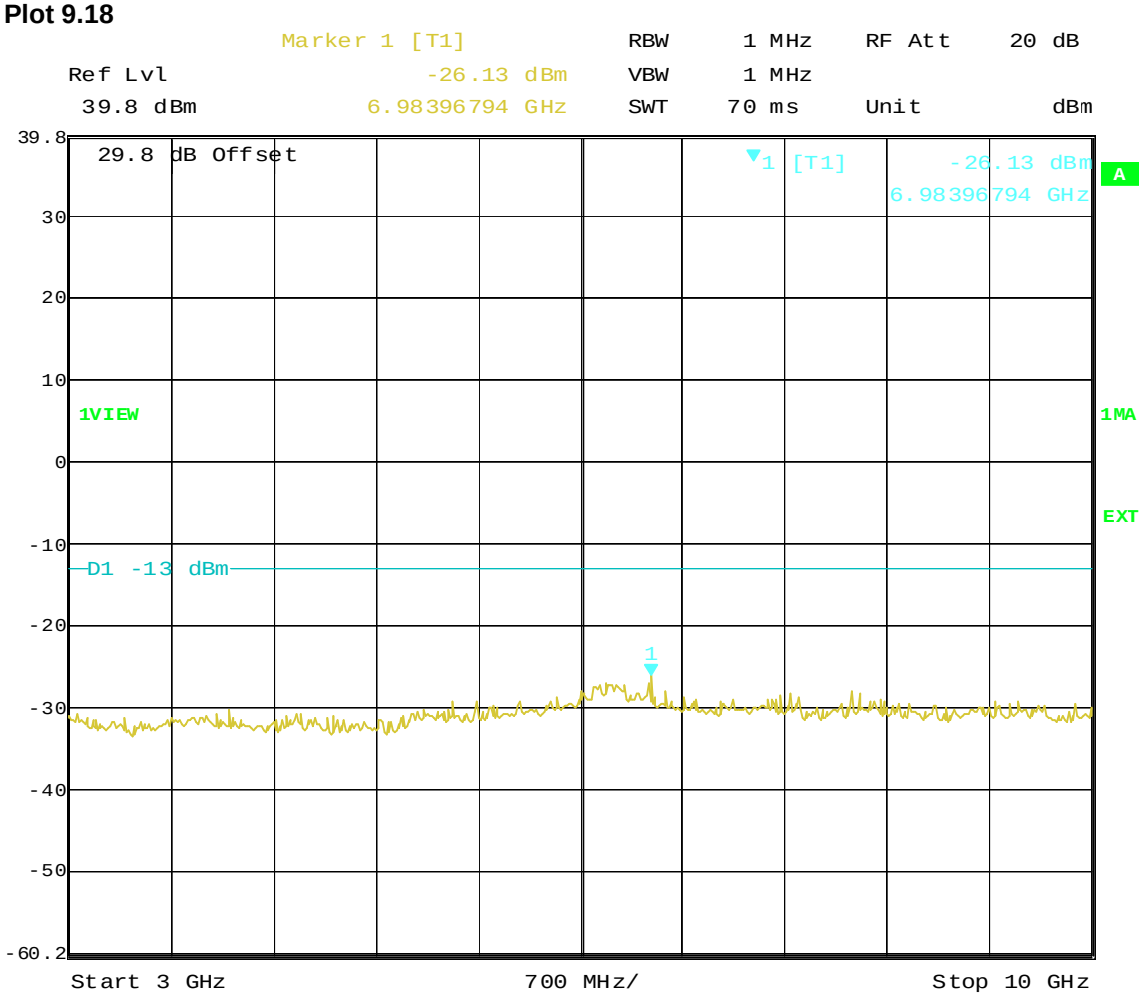
Plot 9.16



Plot 9.17



Plot 9.18



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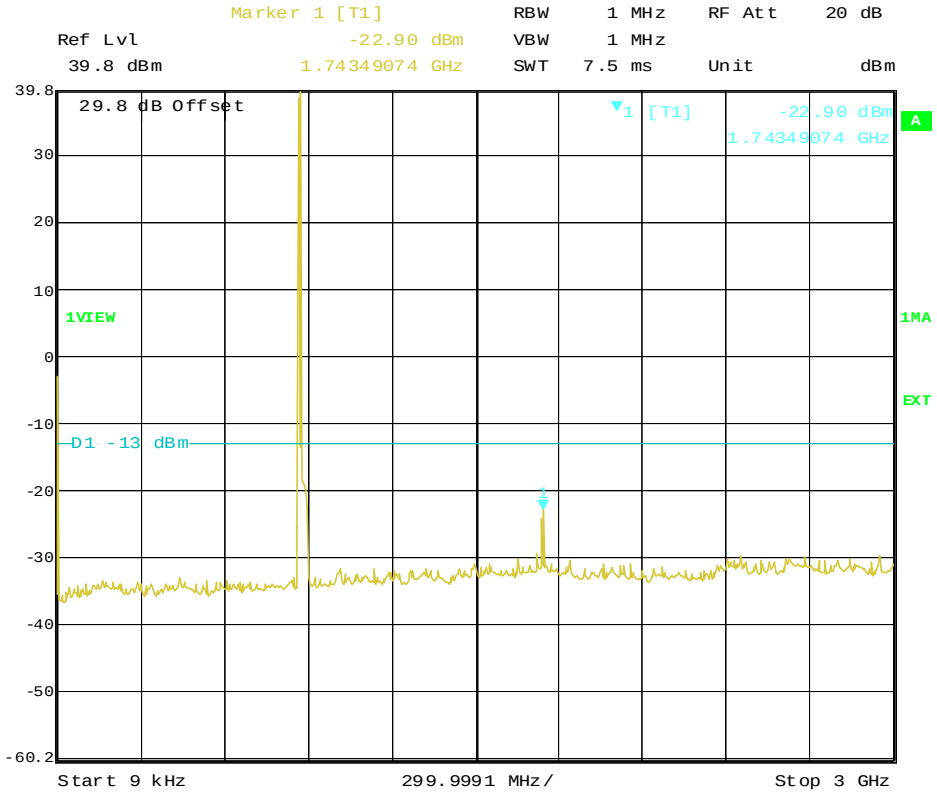
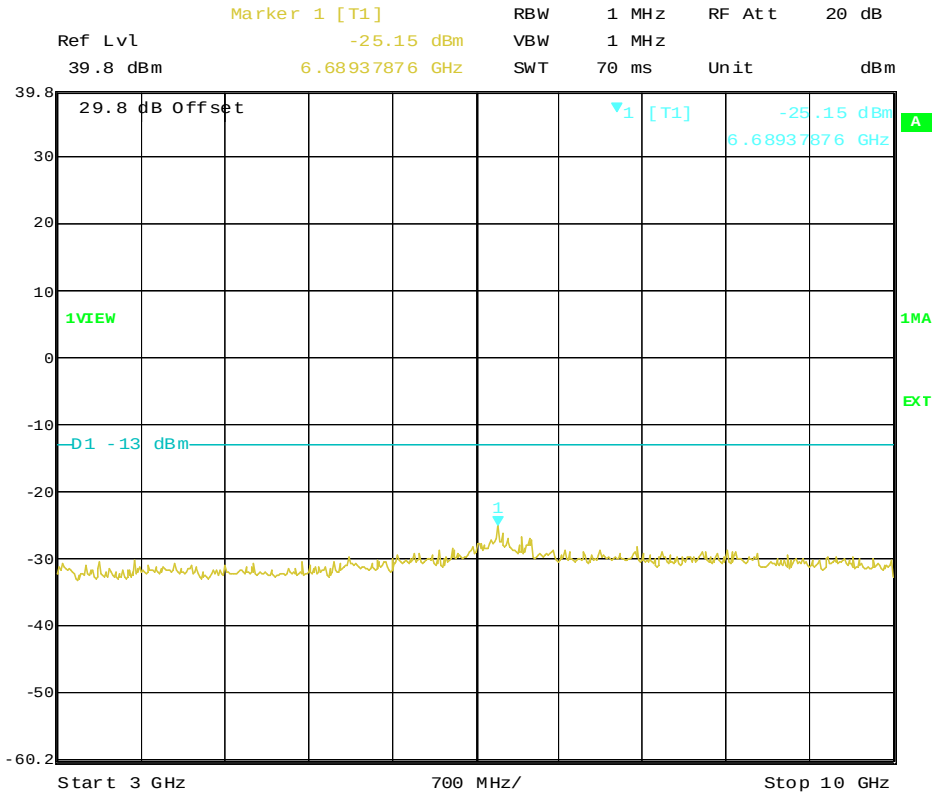
Plot 9.19



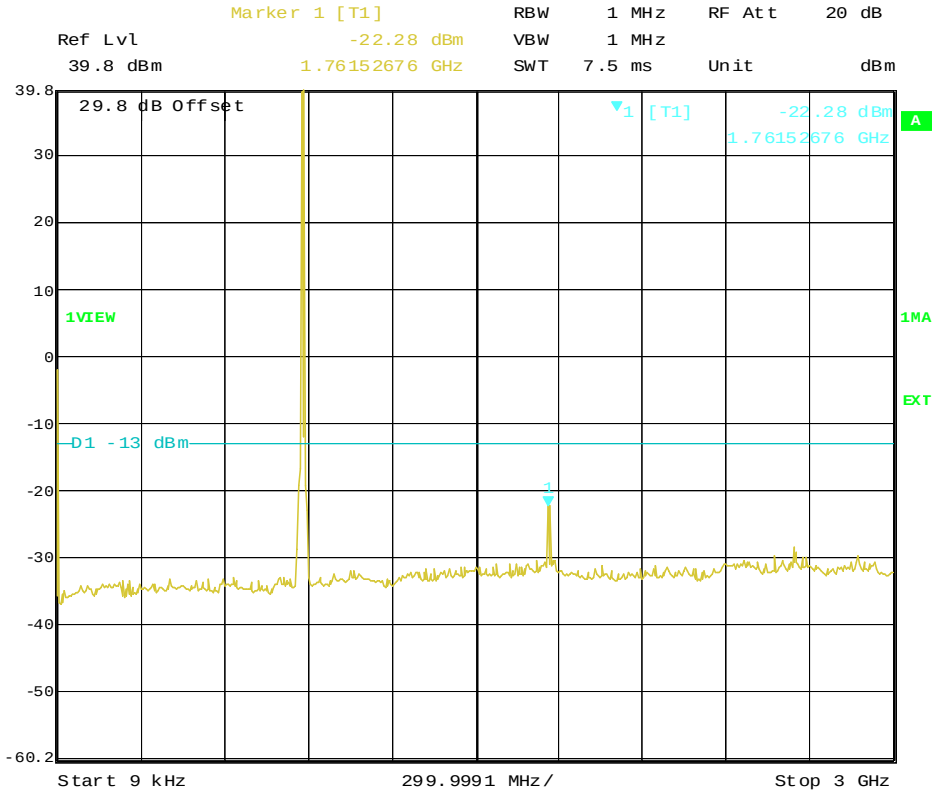
Date: 24.APR.2012 09:44:05

Plot 9.20

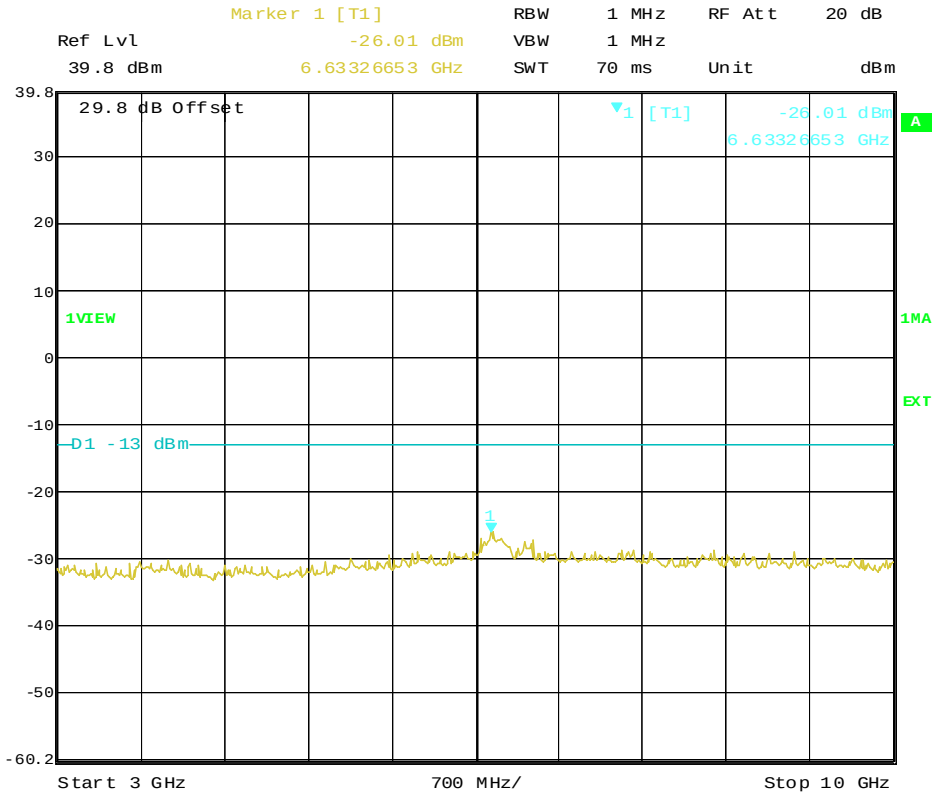


Date: 24.APR.2012 09:23:43

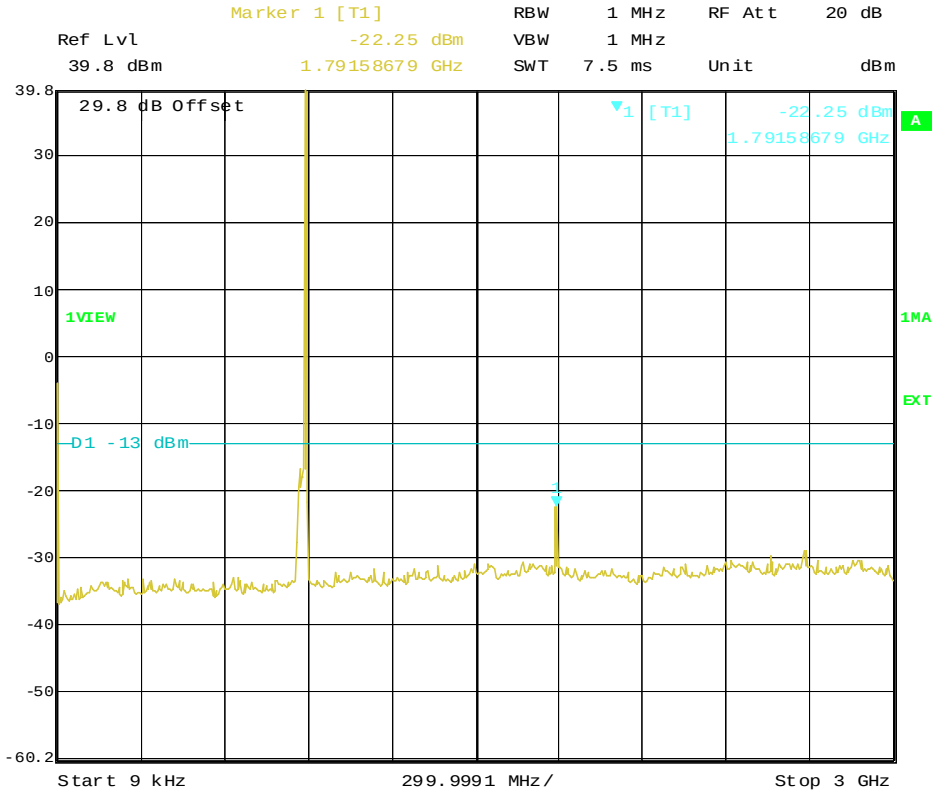
Plot 9.21



Plot 9.22

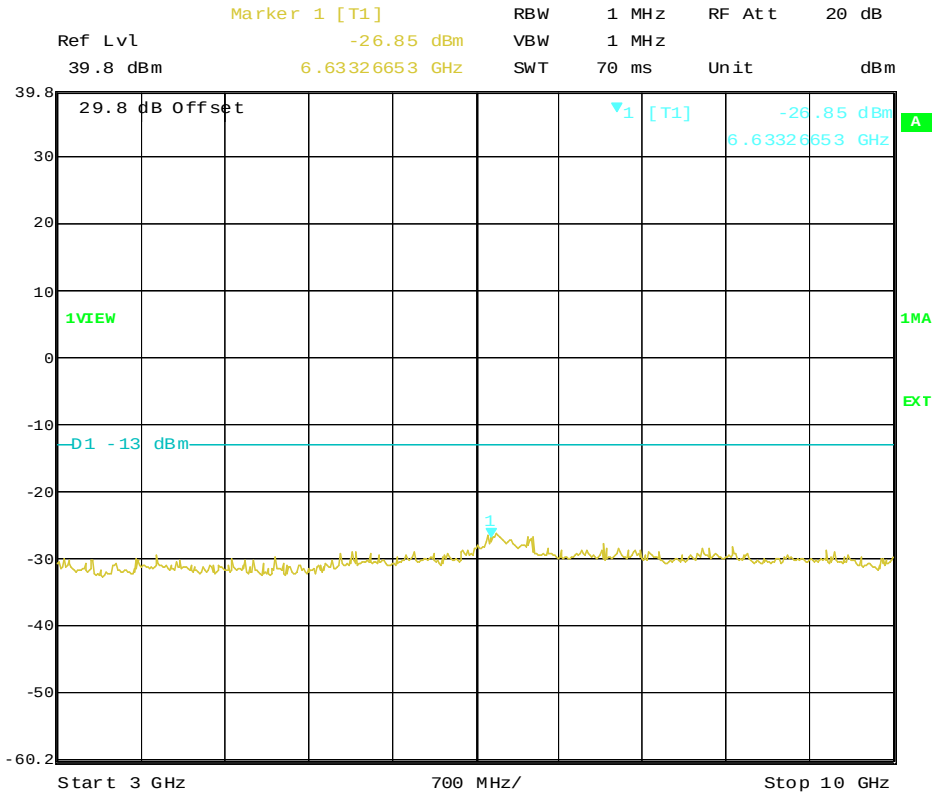


Plot 9.23



Date: 24.APR.2012 09:45:13

Plot 9.24



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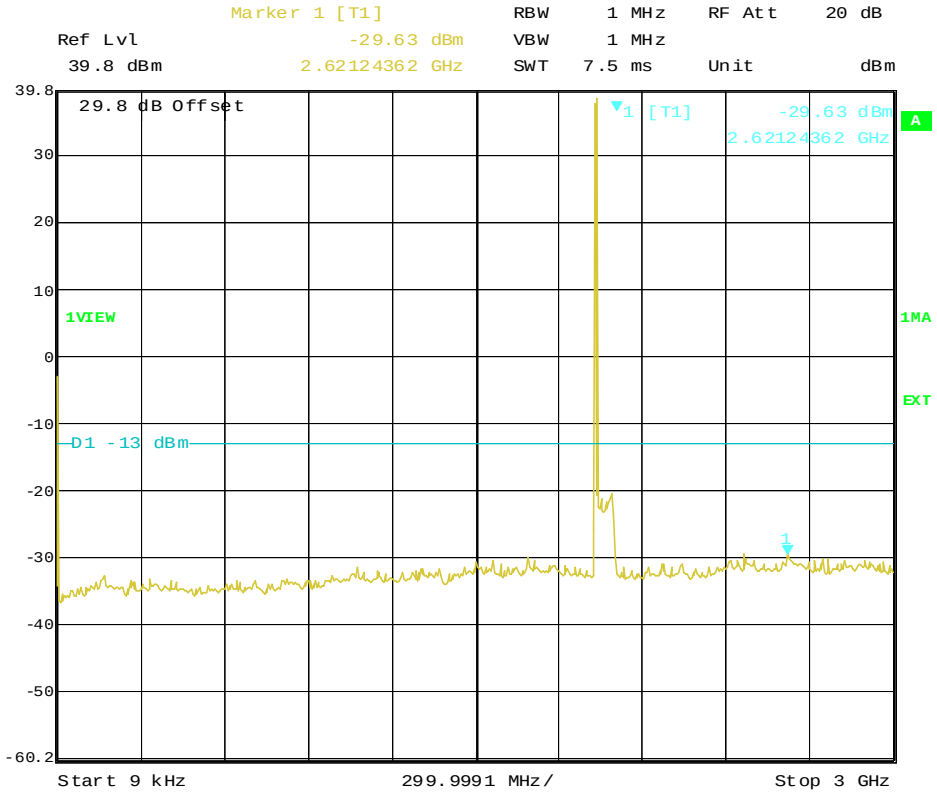
Plot 9.25



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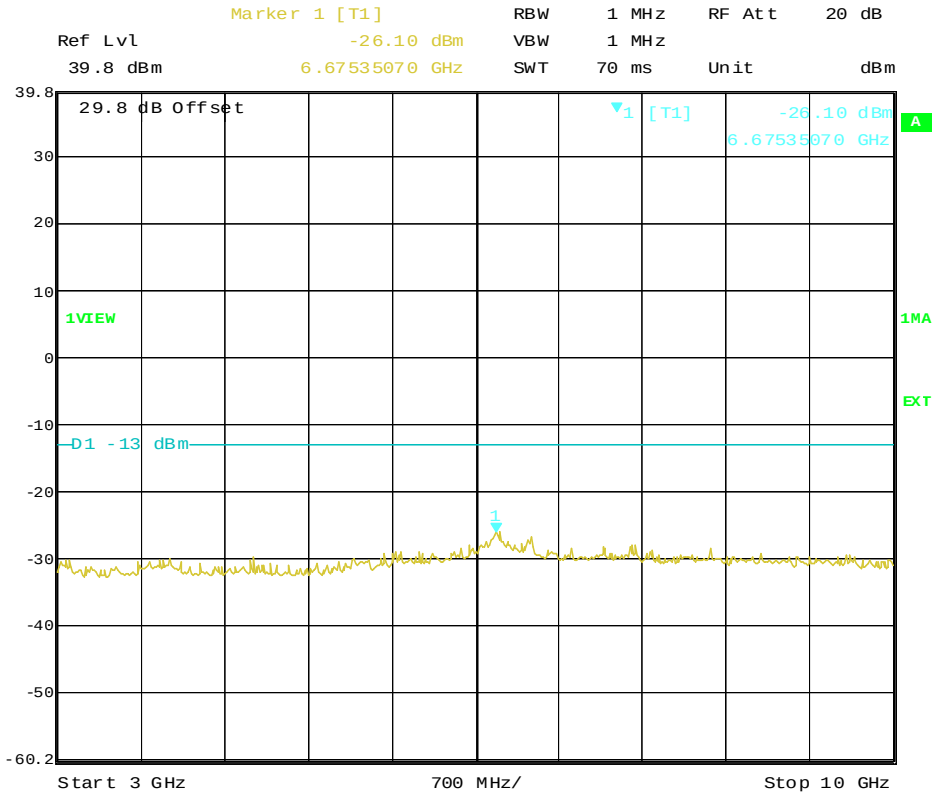
Plot 9.26



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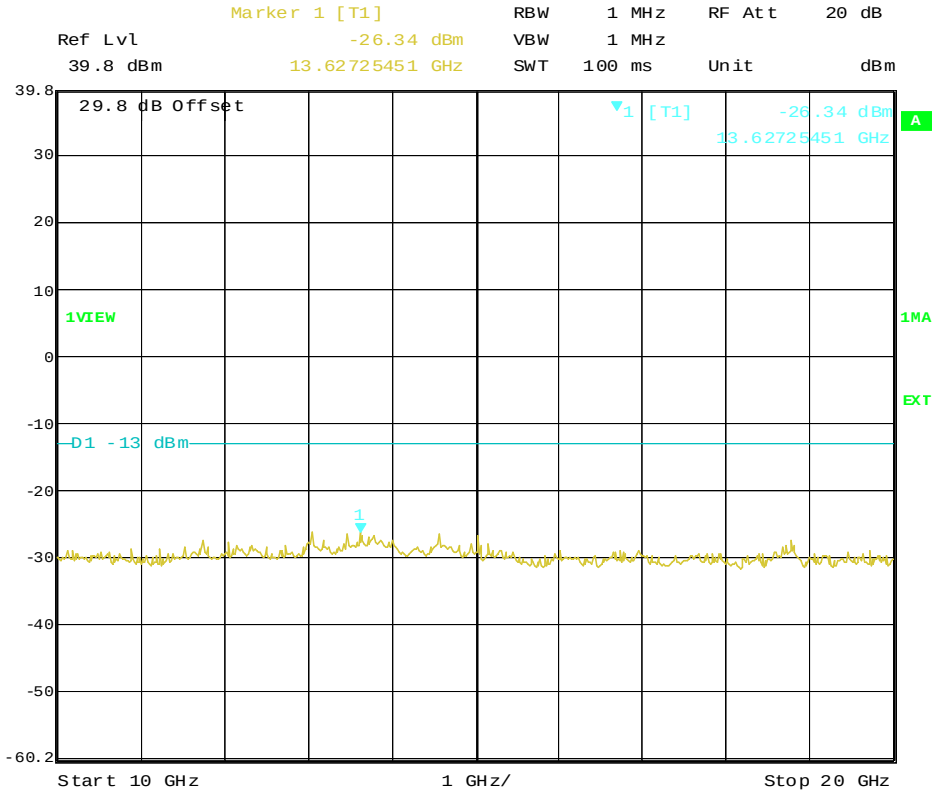
Plot 9.27



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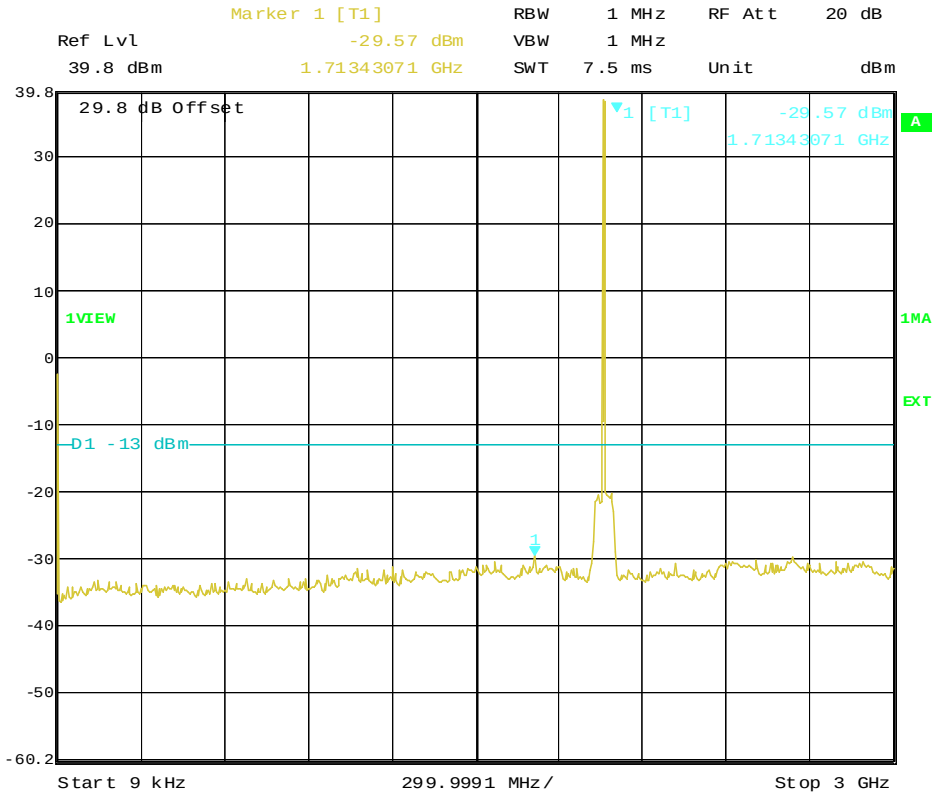
Plot 9.28



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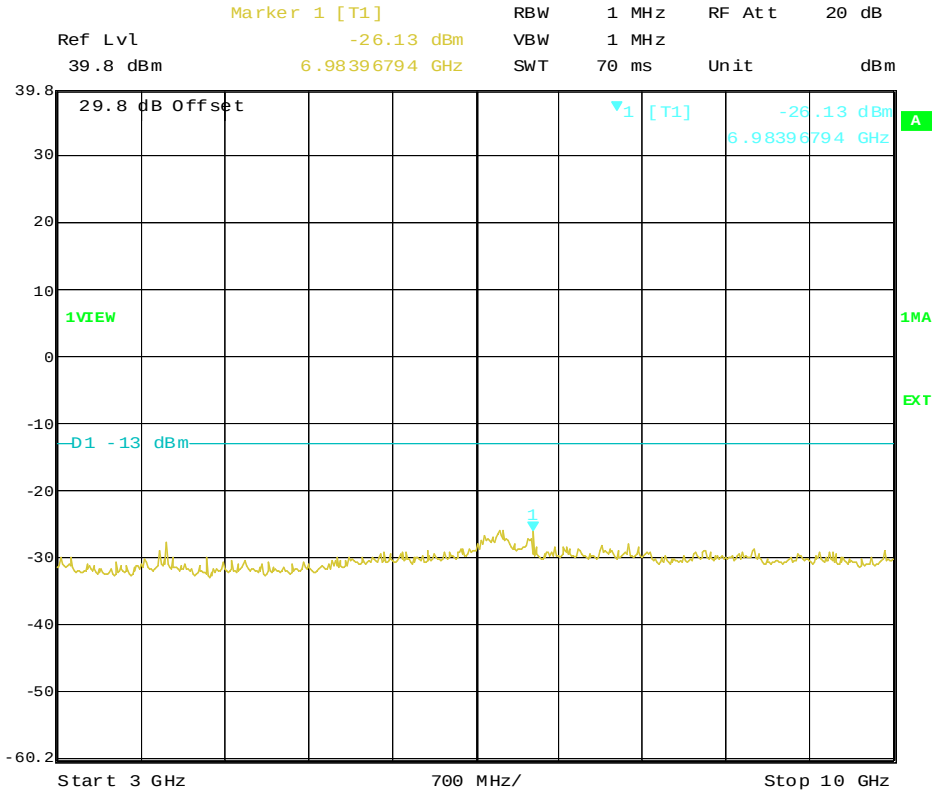
Plot 9.29



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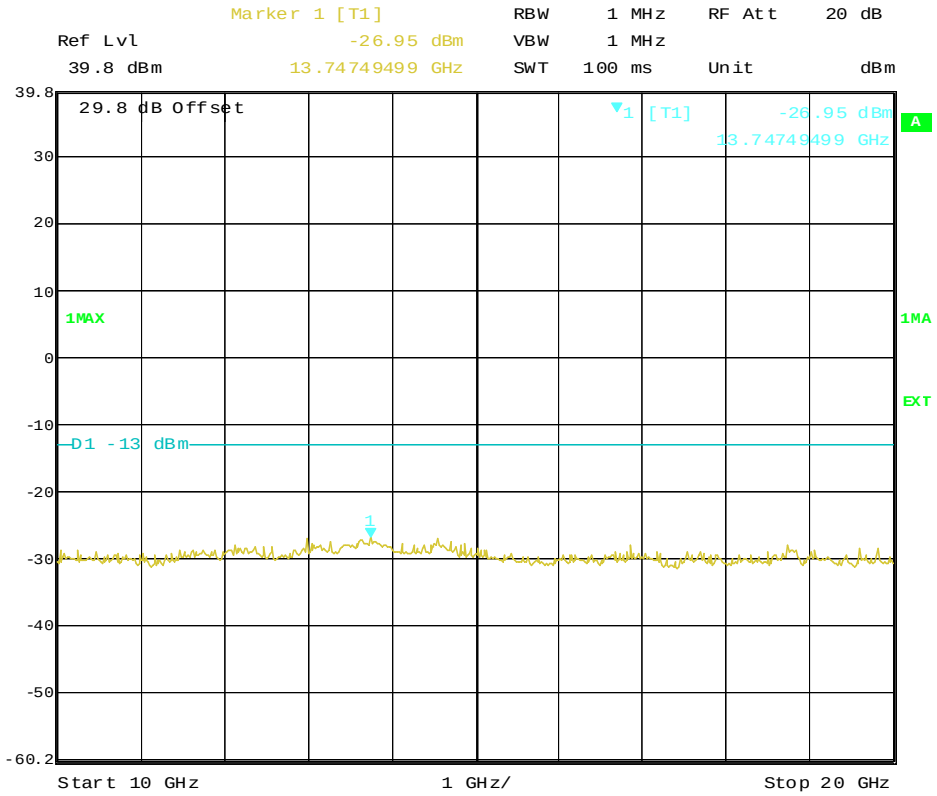
Plot 9.30



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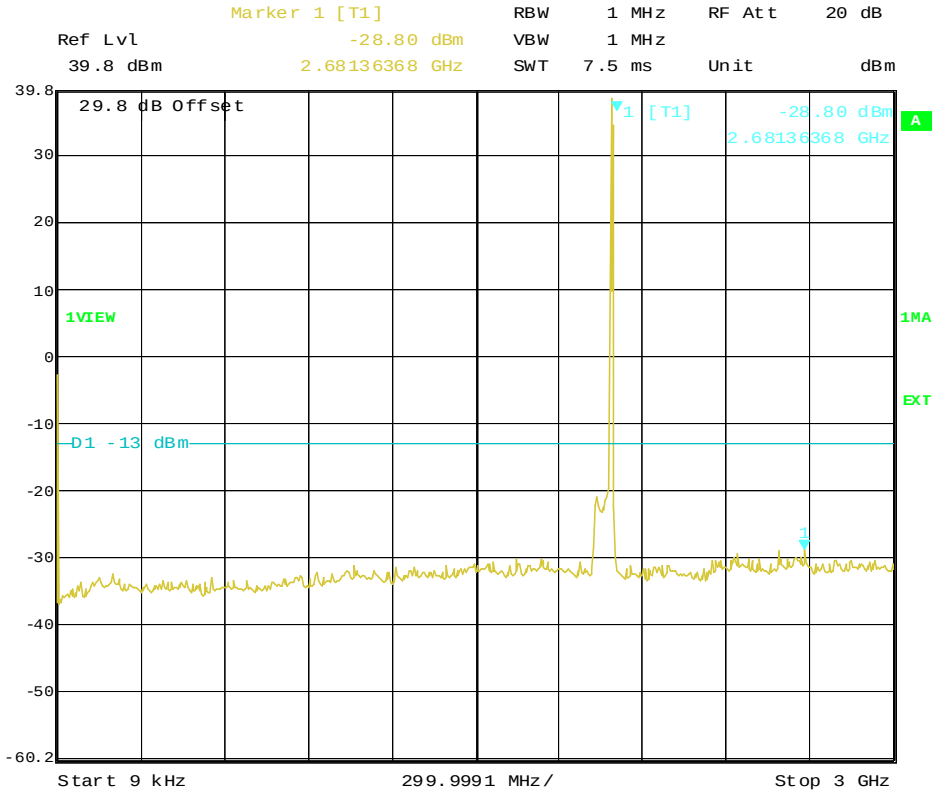
Plot 9.31



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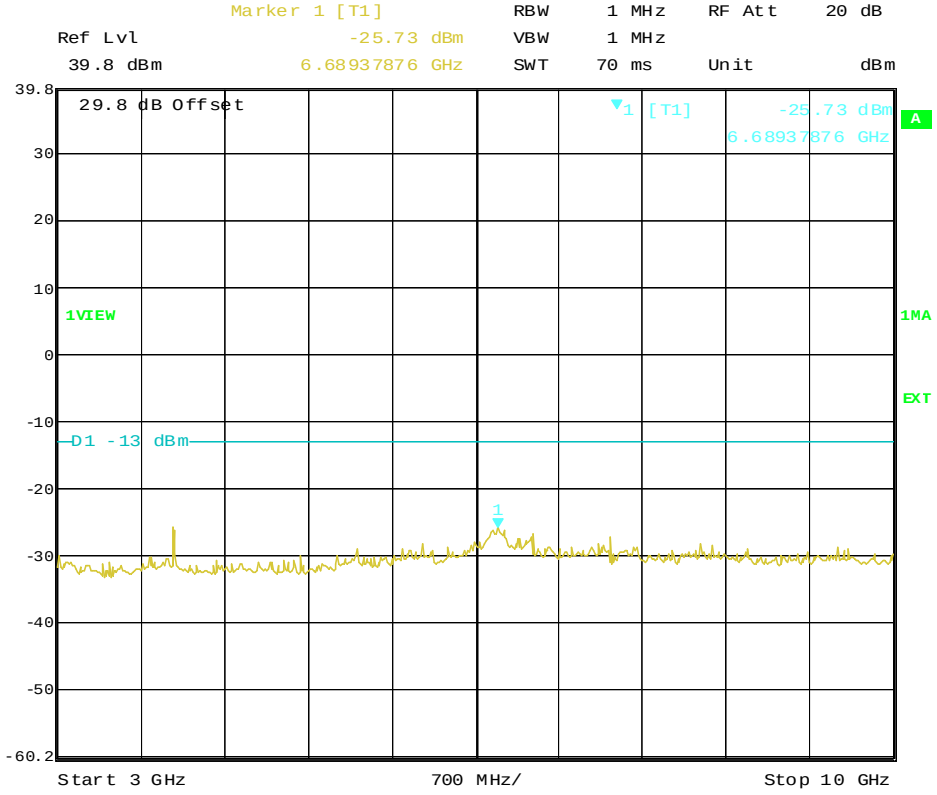
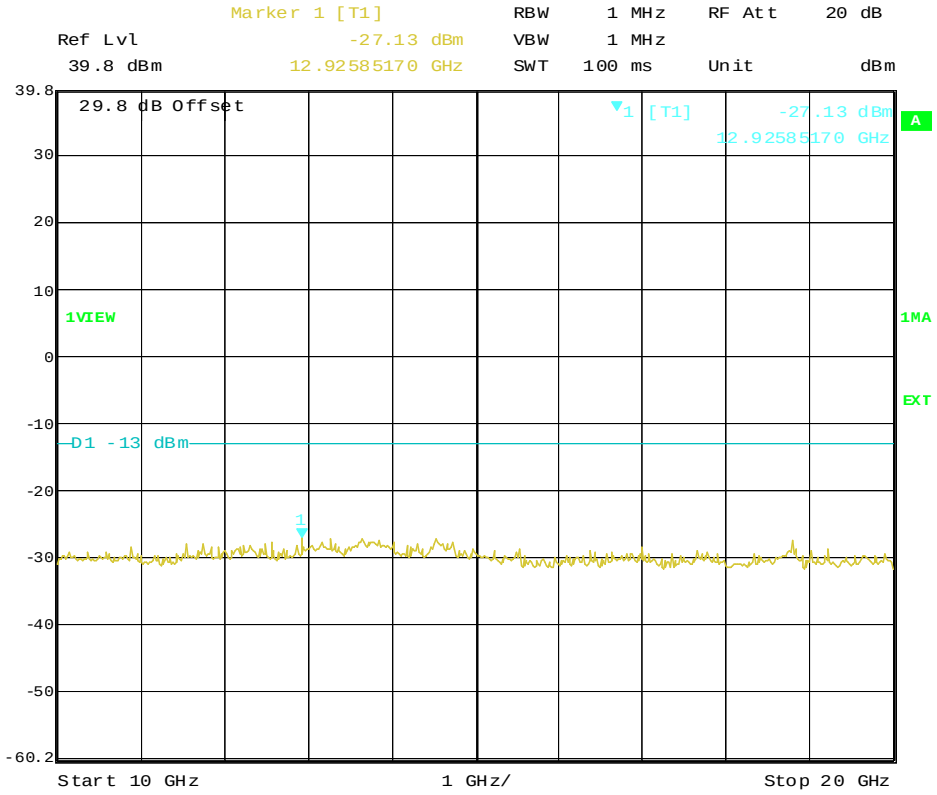
Plot 9.32



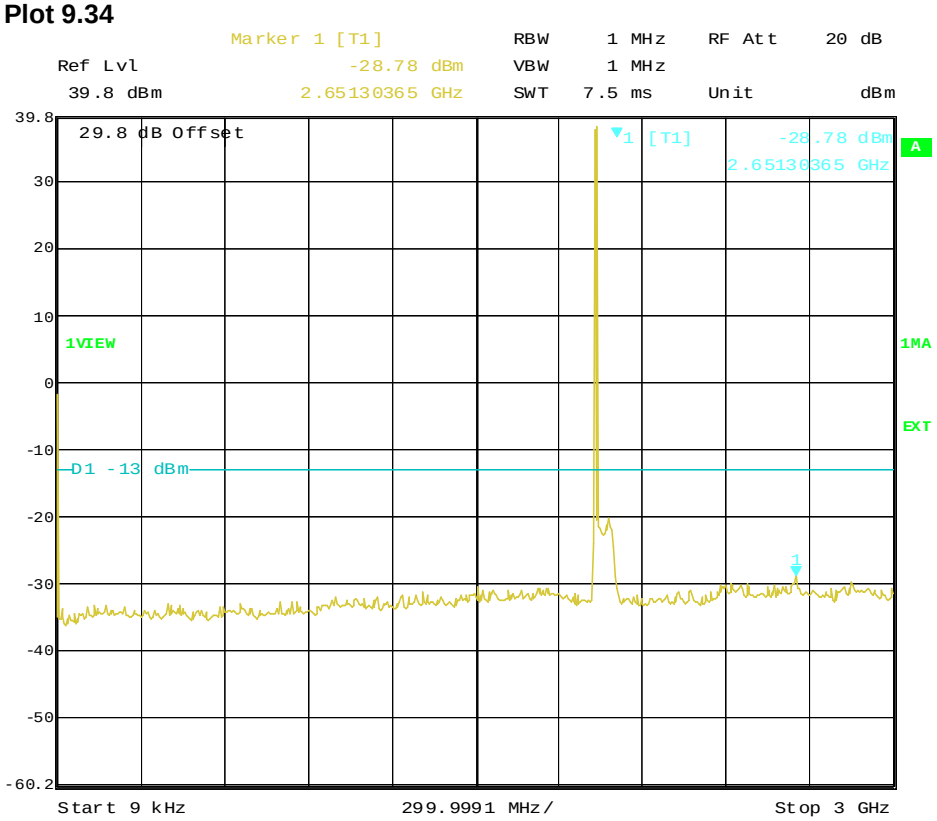
Date: 24.APR.2012 13:19:31

Plot 9.33



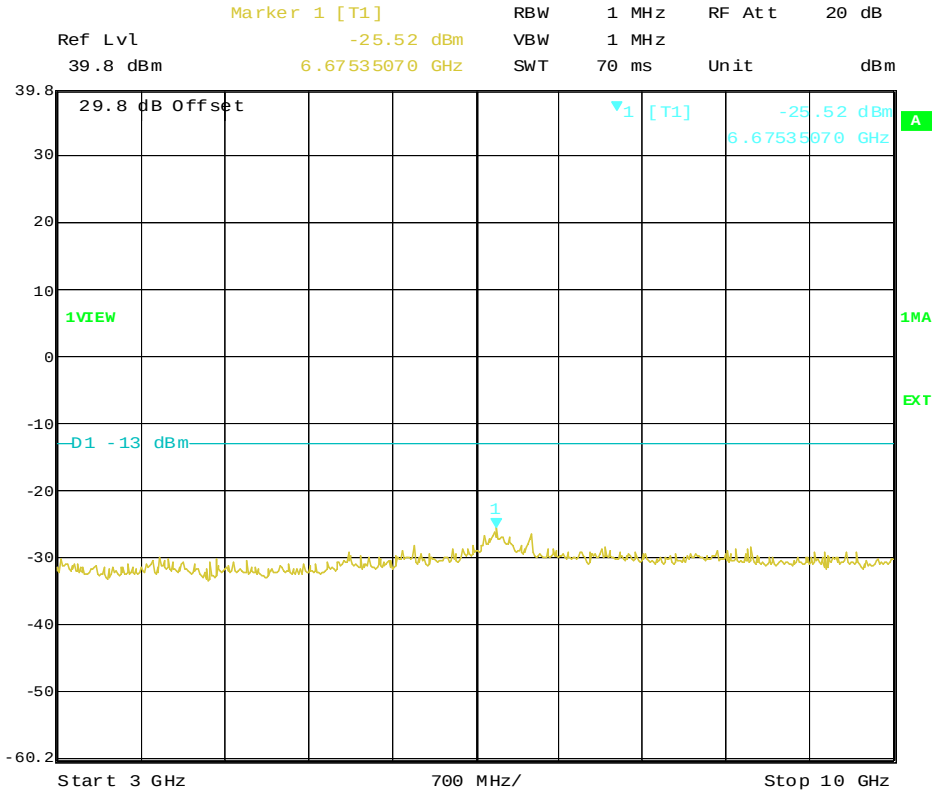
Date: 24.APR.2012 13:39:54

Plot 9.34



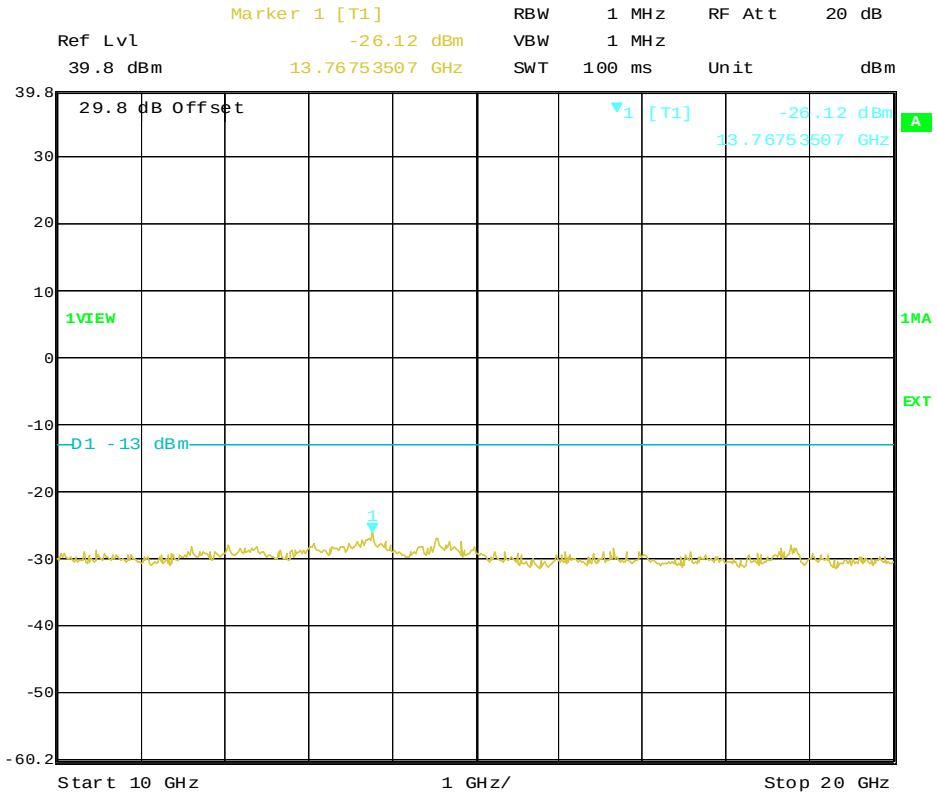
Date: 24.APR.2012 13:07:04

Plot 9.35



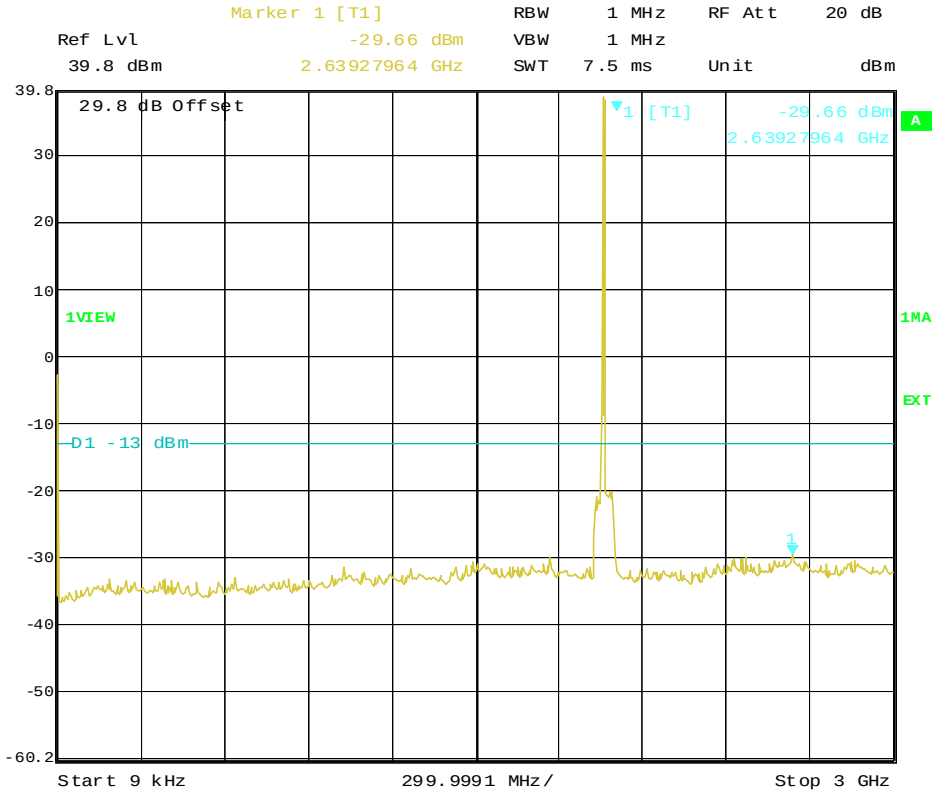
Date: 24.APR.2012 13:21:55

Plot 9.36



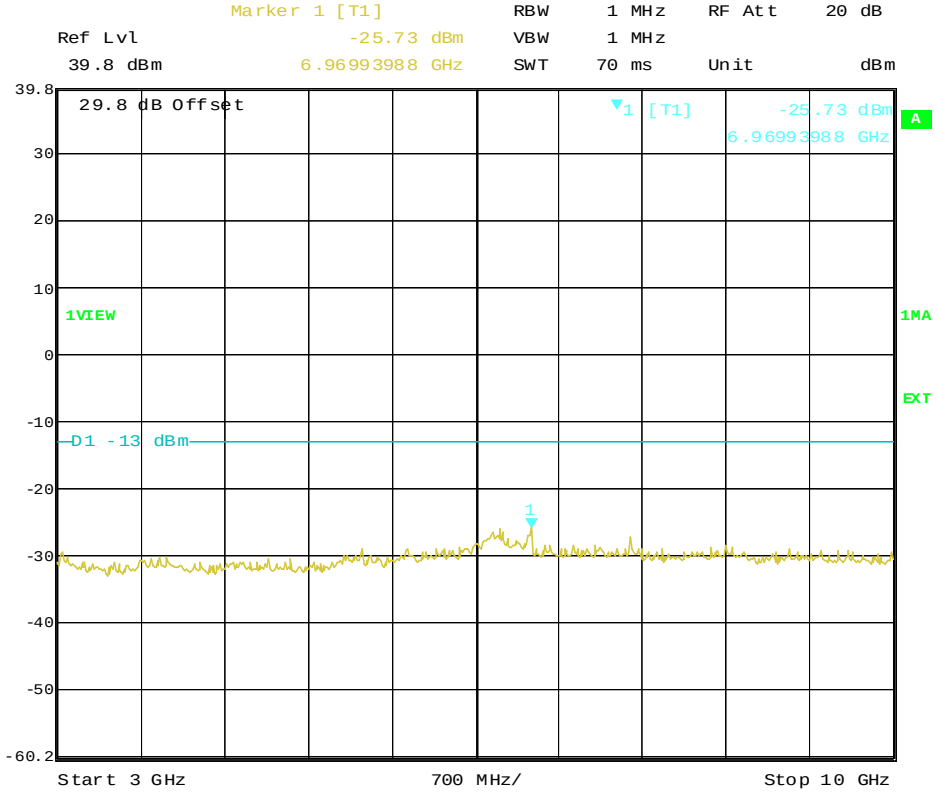
Date: 24.APR.2012 13:24:10

Plot 9.37



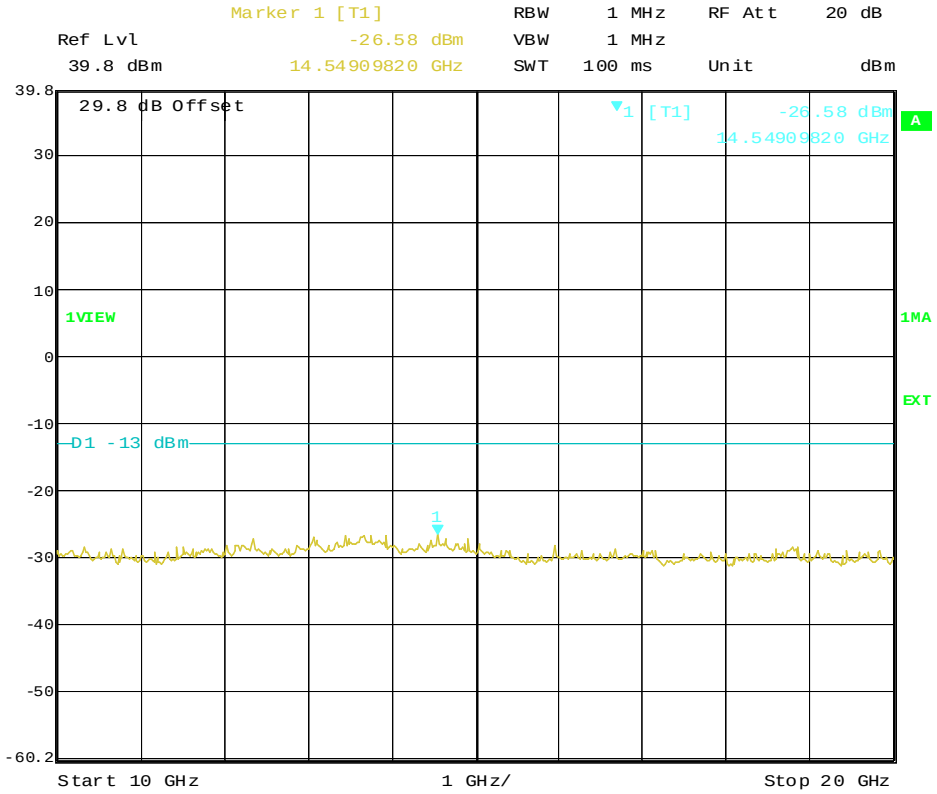
Date: 24.APR.2012 13:08:08

Plot 9.38



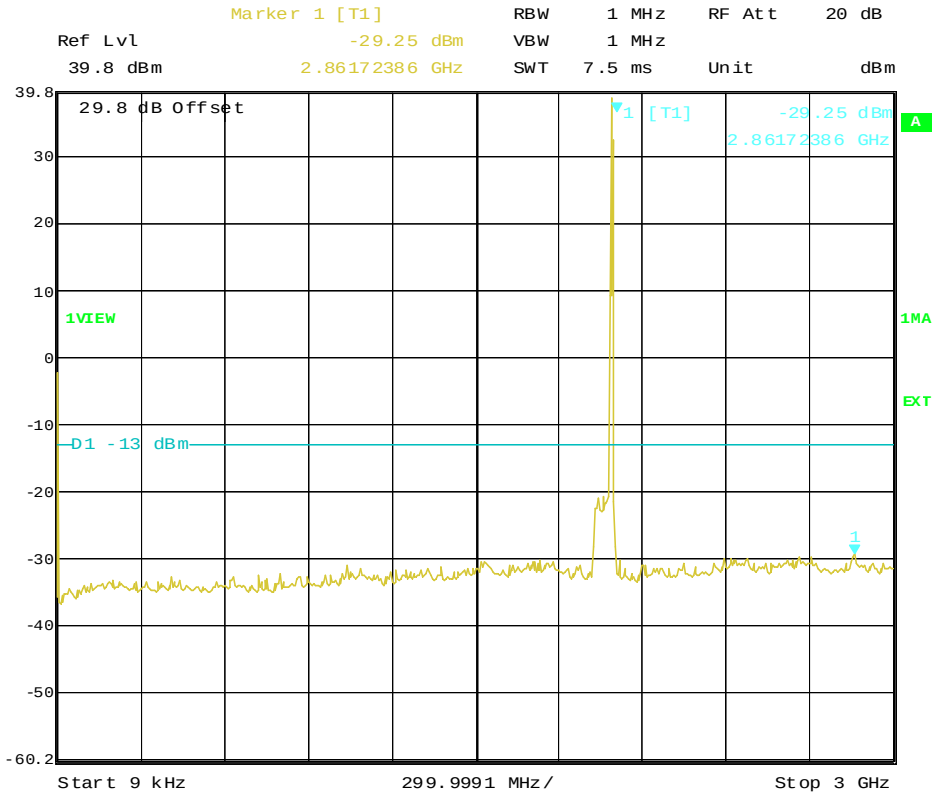
Date: 24.APR.2012 13:23:01

Plot 9.39



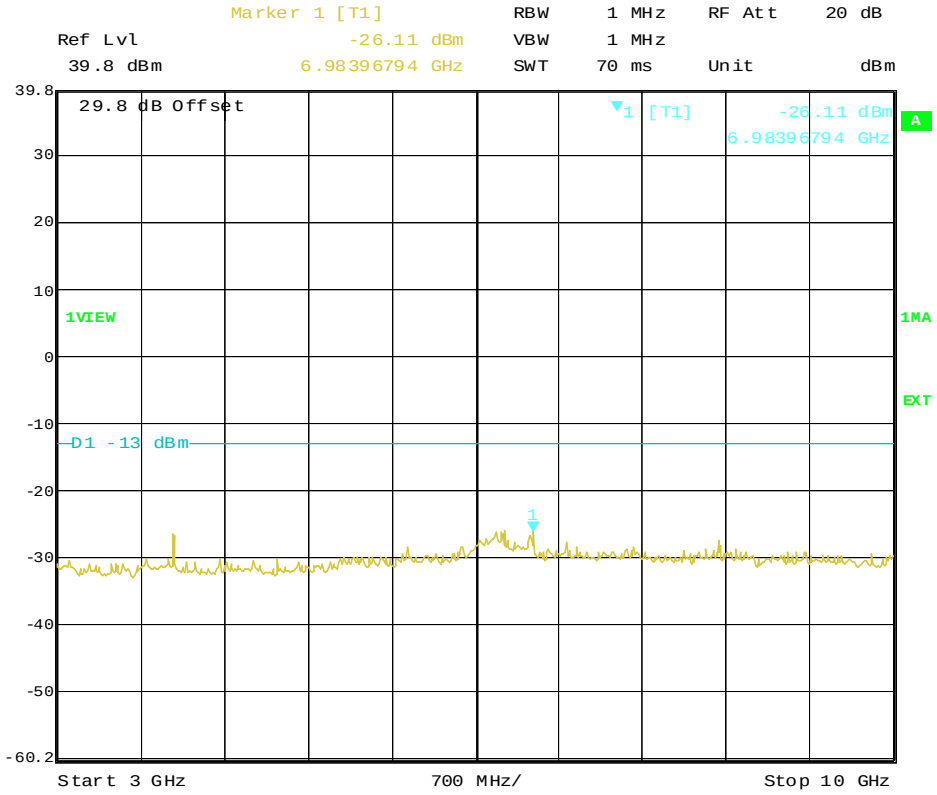
Date: 24.APR.2012 13:26:06

Plot 9.40



Date: 24.APR.2012 13:09:43

Plot 9.41



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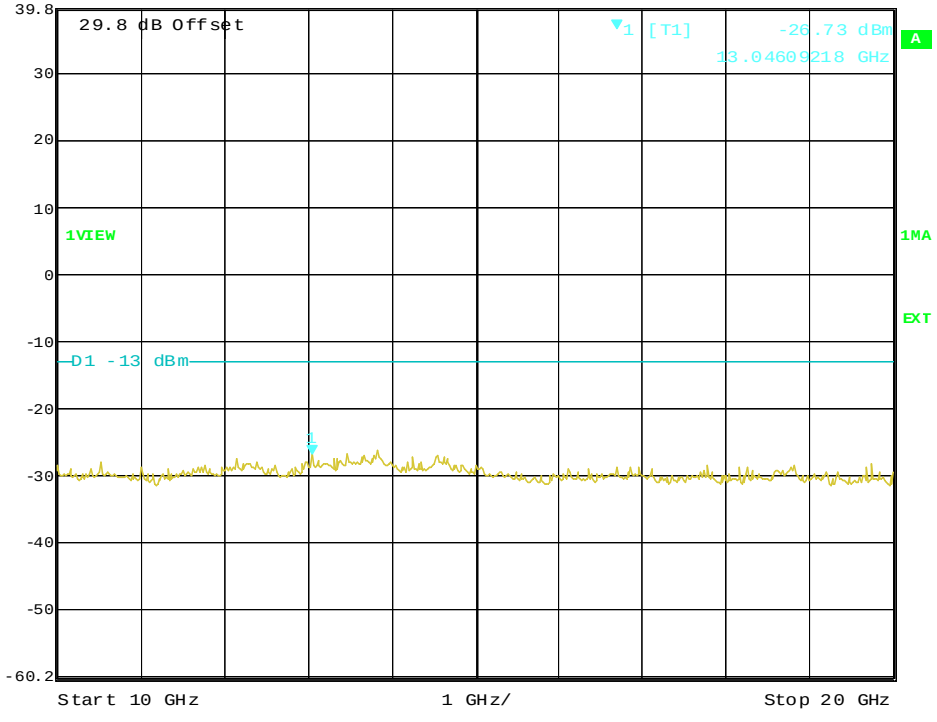
Plot 9.42



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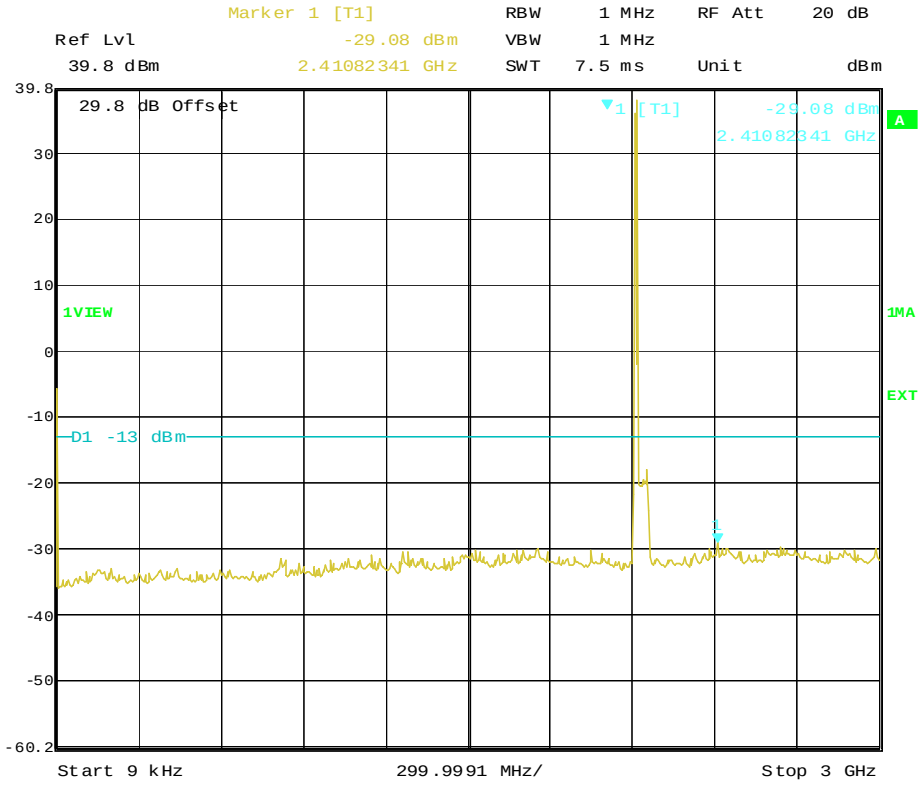
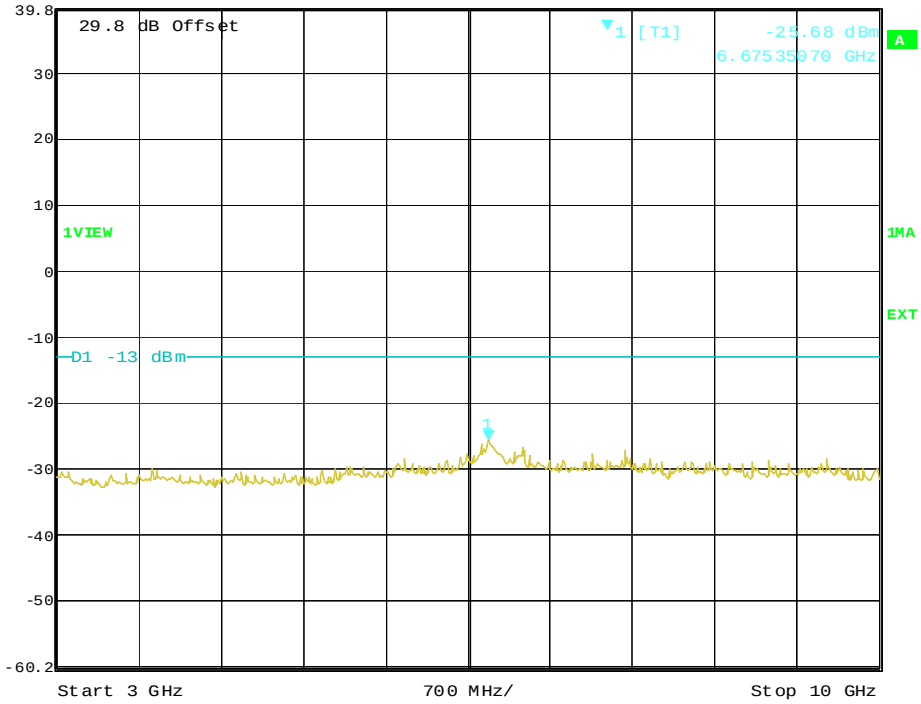
Plot 9.43



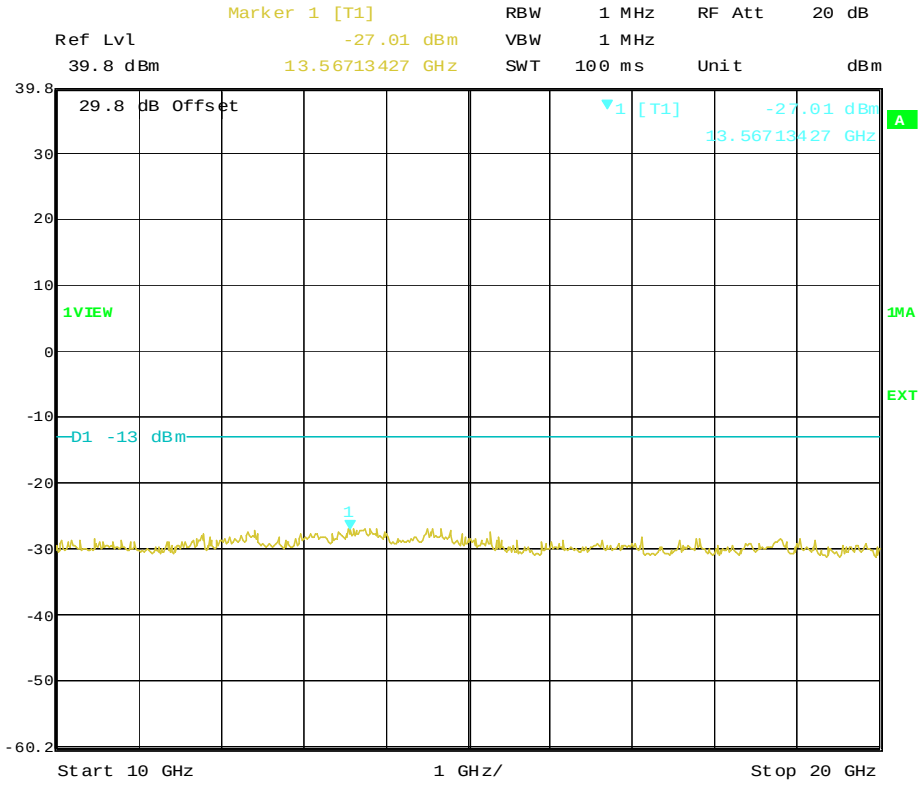
Date: 24.APR.2012 10:29:22

Plot 9.44



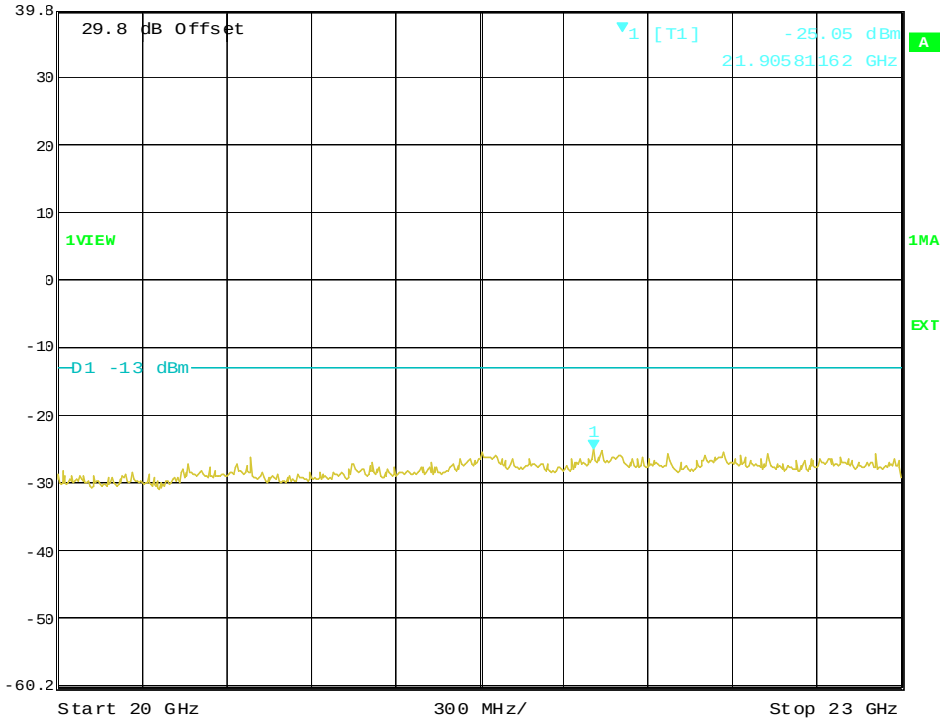
Date: 24.APR.2012 10:34:27

Plot 9.45



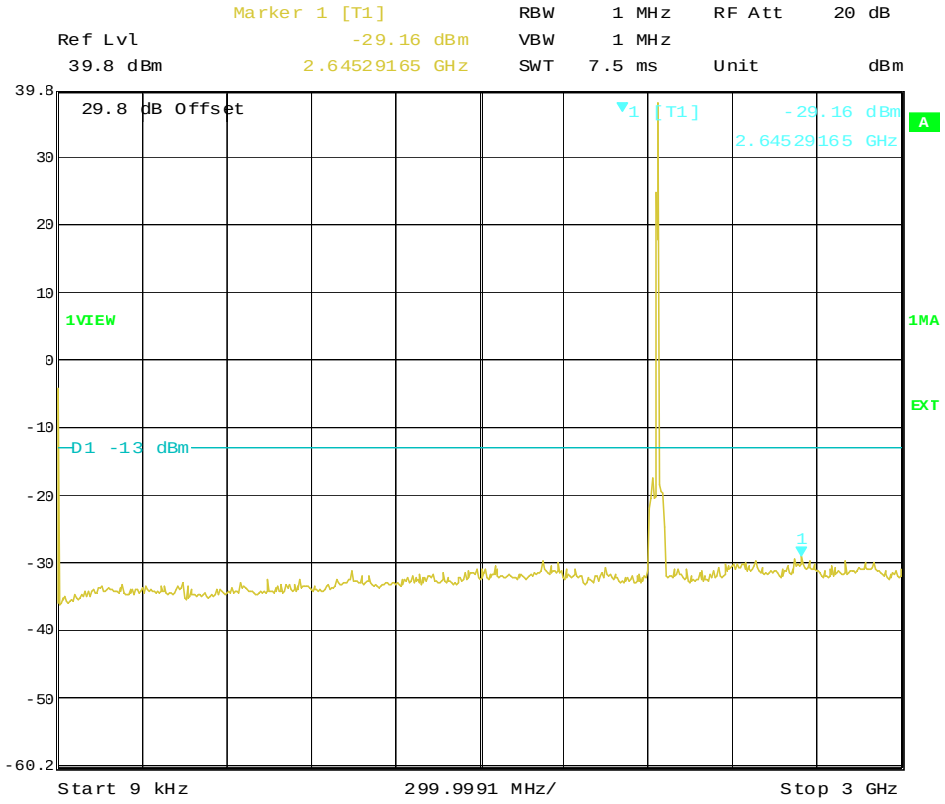
Date: 24.APR.2012 11:01:41

Plot 9.46



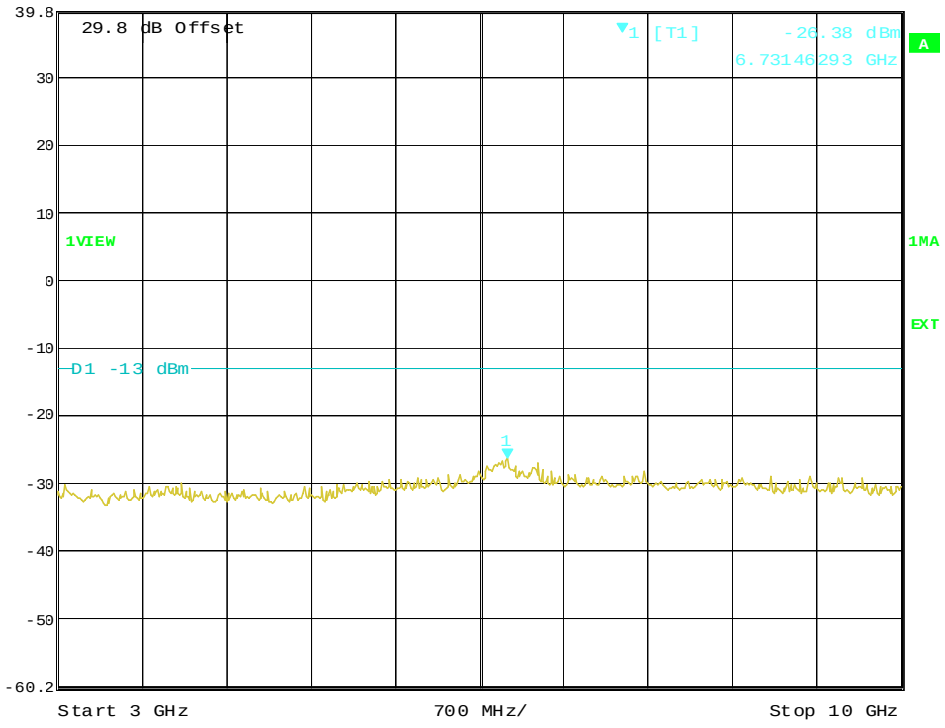
Date: 24.APR.2012 11:05:40

Plot 9.47



Date: 24.APR.2012 10:30:48

Plot 9.48



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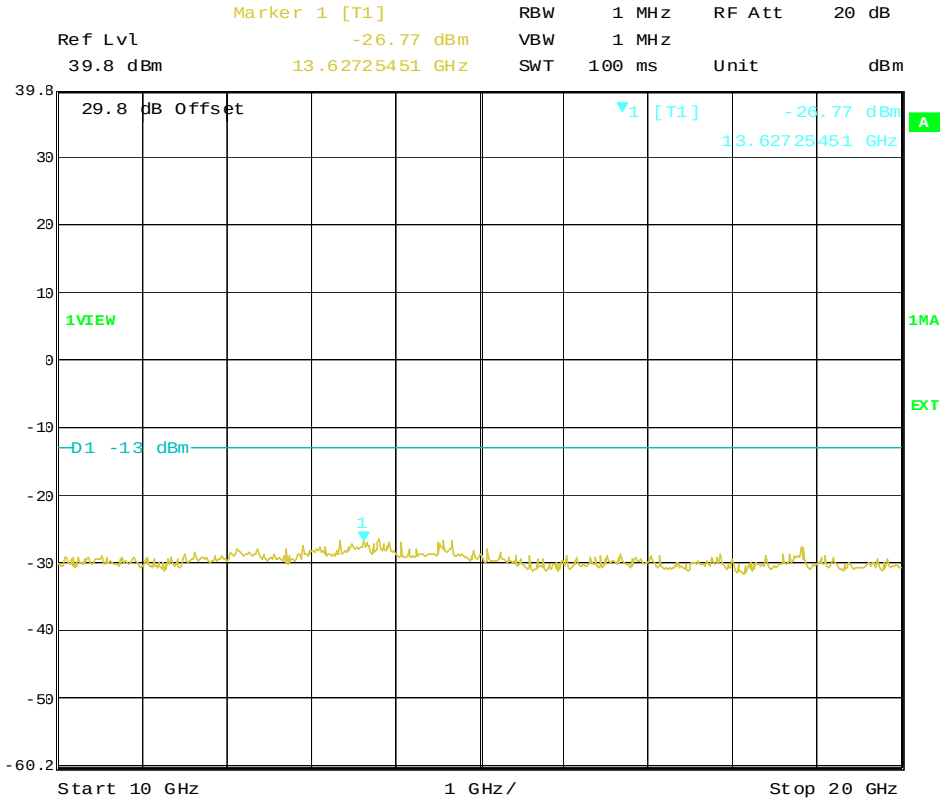
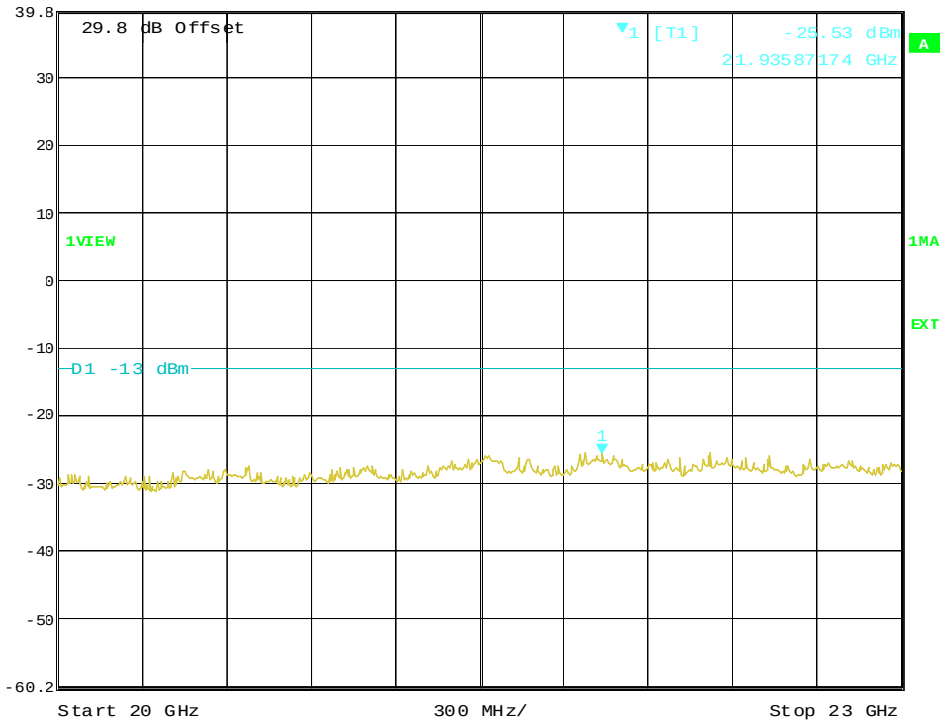
Plot 9.49



Date: 24.APR.2012 11:00:30

Plot 9.50



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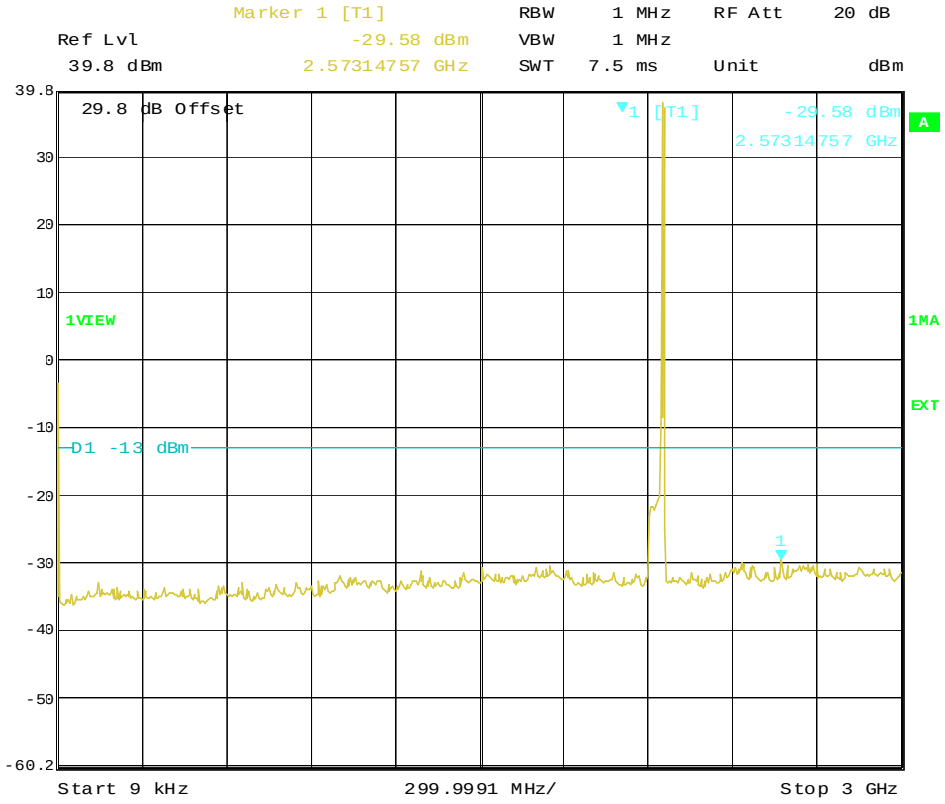
Plot 9.51



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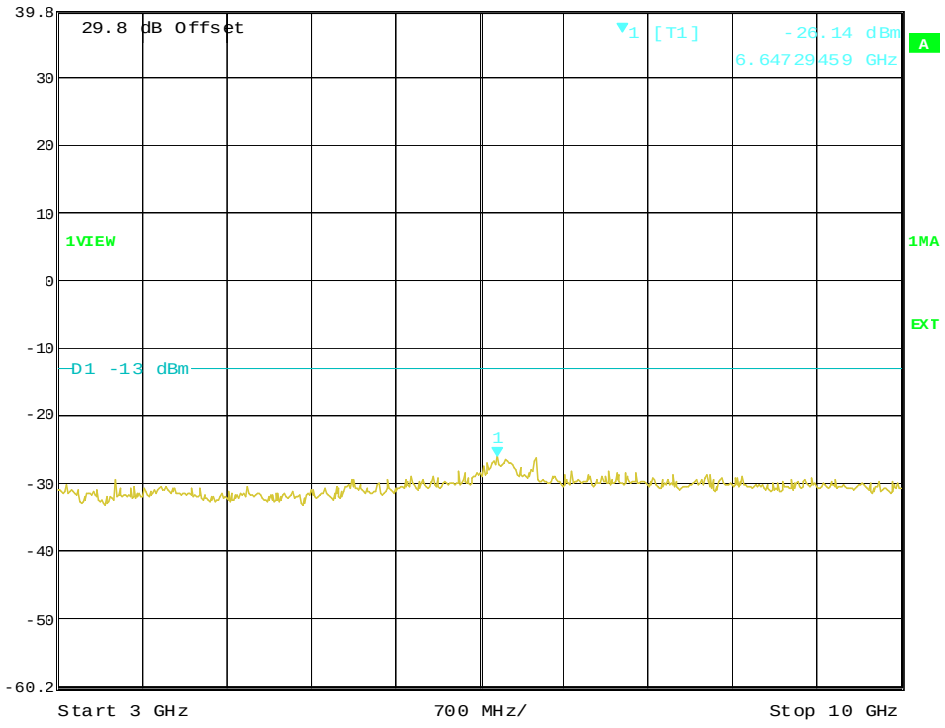
Plot 9.52



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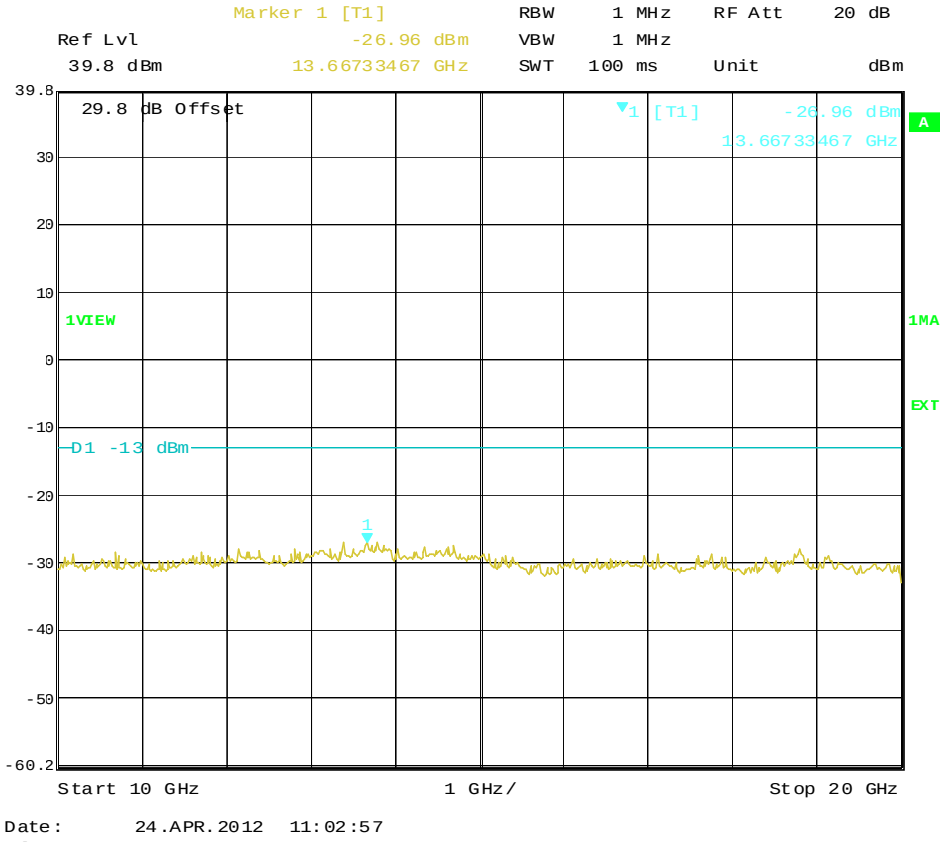
Plot 9.53



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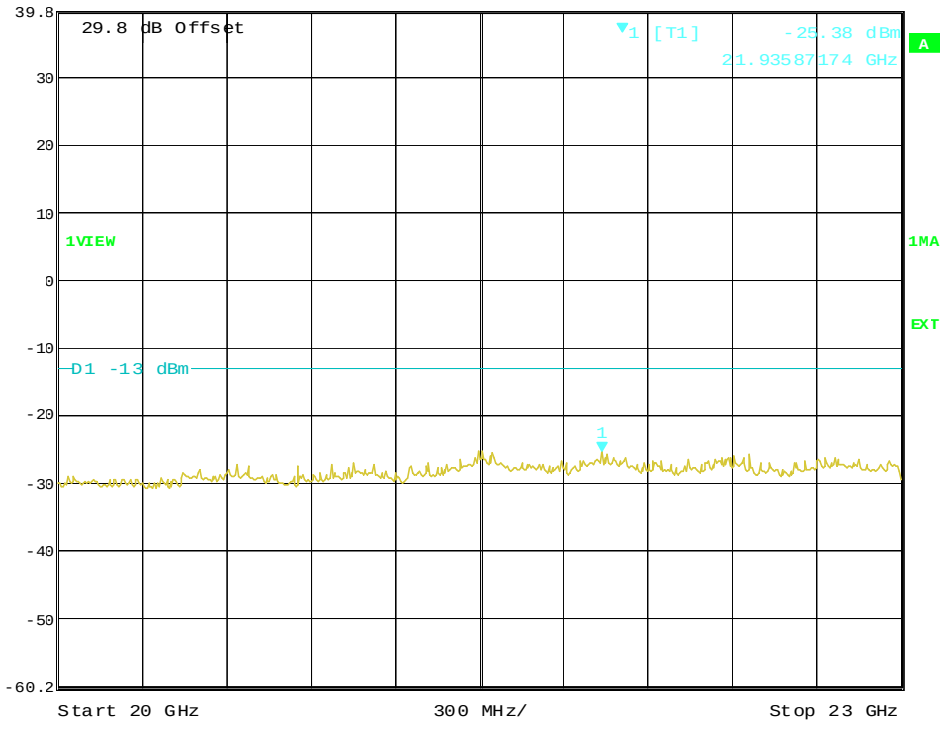
Plot 9.54



Date: 24.APR.2012 11:03:57

10 OUT OF BAND SPURIOS EMISSION, RADIATED

Date of test:	2012-04-19	Test location:	Big Chamber
EUT Serial:	99001	Ambient temp.	23 °C
Tested by:	Åke Carlson	Relative humidity	48 %
Test result:	Pass	Margin:	>14 dB

10.1 Test specifications

47 CFR 2.1051 and 22.917(a)
47 CFR 2.1051 and 24.238
47 CFR 2.1051 and 27.53(g)

Spurious emissions should be attenuated below the transmitter power (P) in watts by at least 43 + 10 log (P)

This gives a limit at -13 dBm.

The frequency range to be inspected up to the tenth harmonics of the highest fundamental frequency according to 47 CFR 2.1057.

The field strength limit is calculated using the plane wave relation.

$GP/4\pi R^2 = E^2 / 120\pi$

G: antenna gain
P: power (W)
R: measurement distance (m)

-13 dBm EIRP gives a field strength limit of 77.8 dBμV/m at a 10m measurement distance in an semi anechoic chamber, assuming 6dB addition from the reflection in the ground floor.

-13 dBm EIRP gives a field strength limit of 82.2 dBμV/m at a 3m measurement distance in an anechoic chamber.

10.2 Test equipment

Equipment	Manufacturer	Type	SEMKO No.
Test site: "Big Chamber" *Semi-anechoic shielded chamber, 10 x 20 x 8,5 m (W x L x H)*			
Software:	Rohde & Schwarz	EMC 32	
Measurement receiver:	Rohde & Schwarz	ESU 8	12866
Antenna:	Chase	CBL 6111	8578
Preamplifier:	Chase	CBL 6111	8578

10.3 Measurement set-up

Test site: “Big Chamber” Semi-anechoic shielded chamber (30 – 1000 MHz)

The radiated disturbance electric field intensity was measured in a semi-anechoic chamber at a distance of 10 m and the EUT was placed on a non-metallic table, 0.8 m above the reference ground plane. The specified test mode was enabled. Test set-up photos are given below.

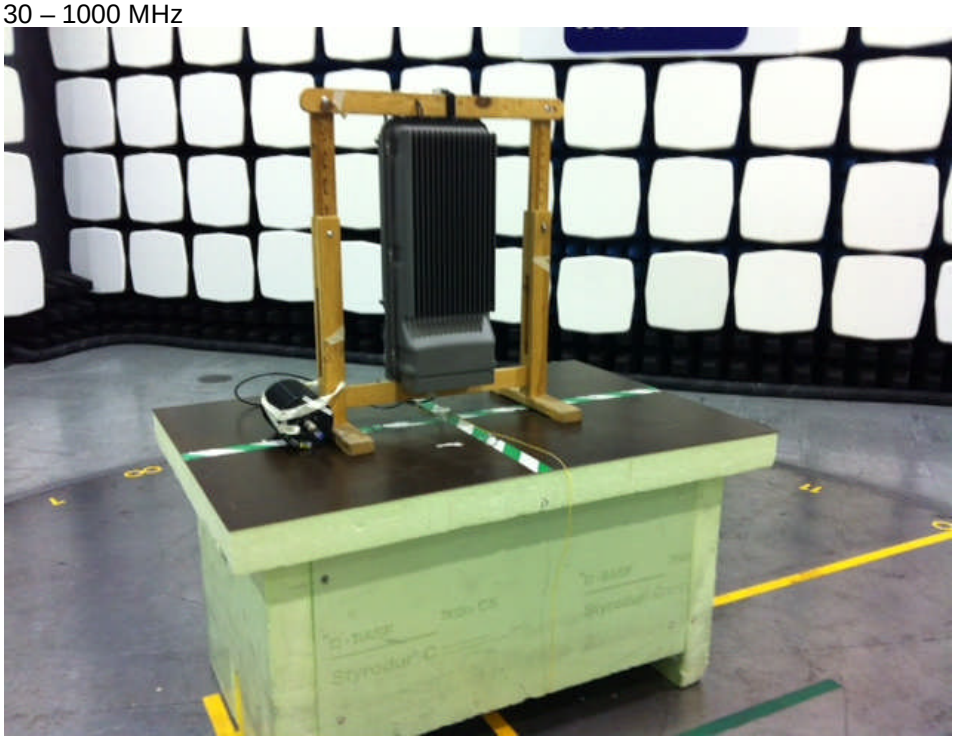
An overview sweep with peak detection of the electric field intensity was performed with the measurement receiver in max-hold and with the antenna placed 1.5 m, 2.5 m and 3.5 m above the floor. The polarisation was horizontal and vertical. The measurements were repeated with the EUT rotated in 90-degree steps.

At the frequencies where high disturbance levels were found a search for max disturbance level was performed. With the EUT and antenna in the worst-case configuration new measurements with quasi-peak detector were carried out.

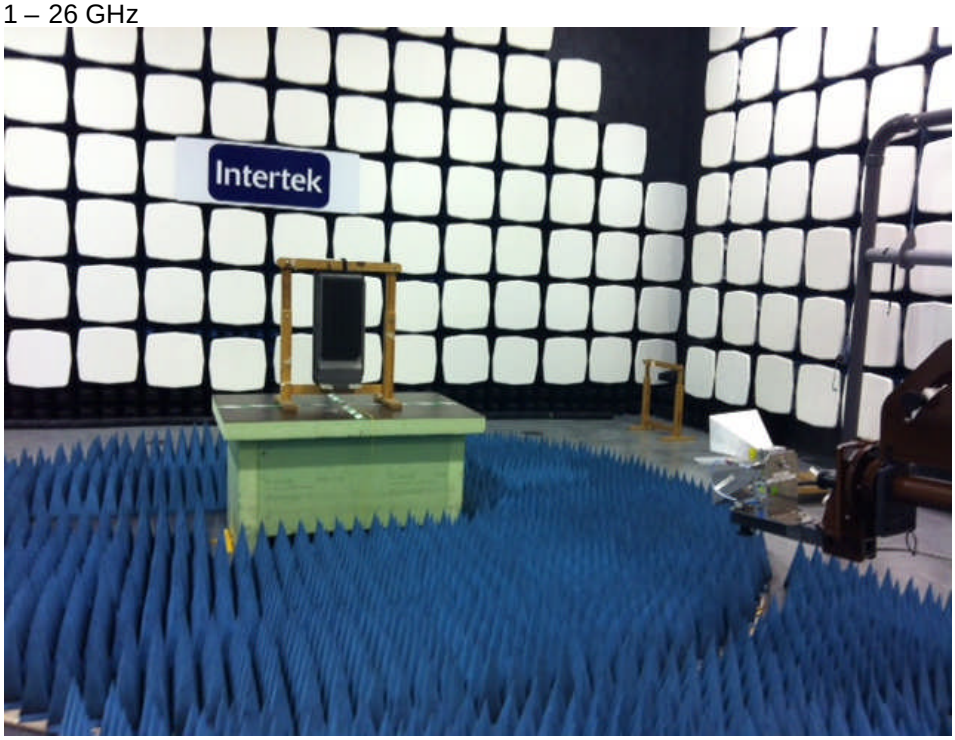
The EUT was supplied with 120 V AC (60 Hz) during the test.

Test set-up photo:

30 – 1000 MHz



1 – 26 GHz



10.4 Test data

Data summary

700 MHz, Field strength of spurious emissions low channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
1491.90	1000	41.9	82.2	

700 MHz, Field strength of spurious emissions middle channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
1501.85	1000	47.2	82.2	

700 MHz, Field strength of spurious emissions high channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
1514.10	1000	46.7	82.2	

850 MHz, Field strength of spurious emissions low channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
1783.00	1000	48.4	82.2	

850 MHz, Field strength of spurious emissions middle channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
1762.00	1000	42.8	82.2	
2643.05	1000	42.5	82.2	

850 MHz, Field strength of spurious emissions high channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
1000 - 13000	1000	-	82.2	Noise floor

1900 MHz, Field strength of spurious emissions low channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
3859.95	1000	51.8	82.2	
5789.85	1000	49.8	82.2	
7720.00	1000	55.6	82.2	
18000 - 26000	1000	-	82.2	Noise floor

1900 MHz, Field strength of spurious emissions middle channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
3919.95	1000	52.3	82.2	
5880.00	1000	47.1	82.2	
18000 - 26000	1000	-	82.2	Noise floor

1900 MHz, Field strength of spurious emissions high channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
3979.95	1000	48.6	82.2	
5970.10	1000	50.0	82.2	
18000 - 26000	1000	-	82.2	Noise floor

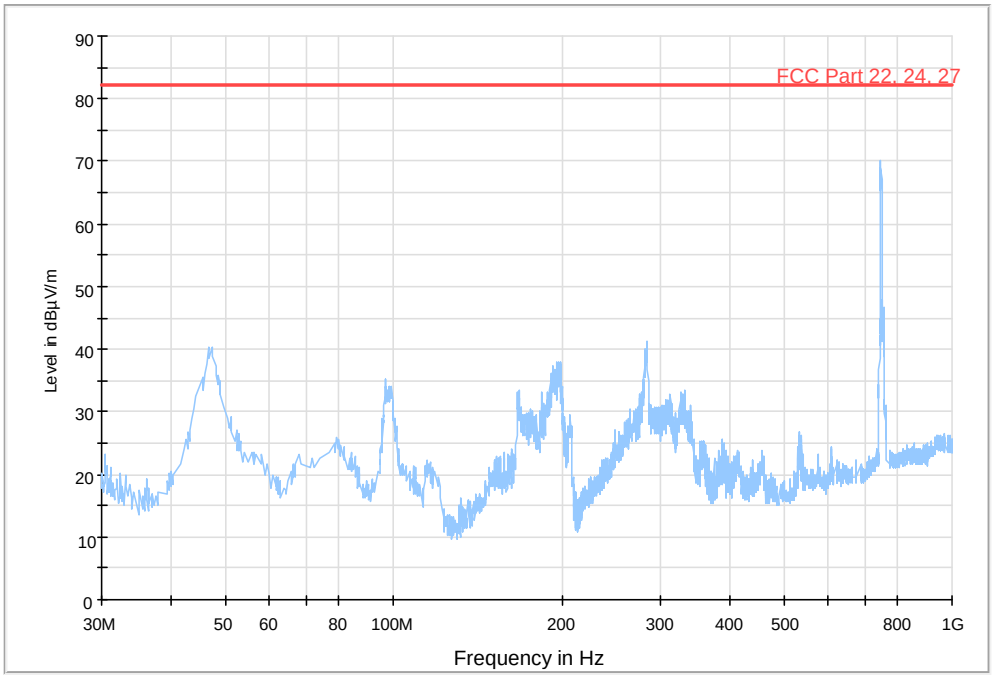
AWS, Field strength of spurious emissions low channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(μV/m)]	Limit [dB(μV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
4220.00	1000	68.6	82.2	
6330.15	1000	54.6	82.2	
8440.00	1000	62.3	82.2	
18000 - 26000	1000	-	82.2	Noise floor

AWS, Field strength of spurious emissions middle channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(µV/m)]	Limit [dB(µV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
4264.00	1000	68.2	82.2	
6396.00	1000	56.0	82.2	
8527.95	1000	55.6	82.2	
18000 - 26000	1000	-	82.2	Noise floor

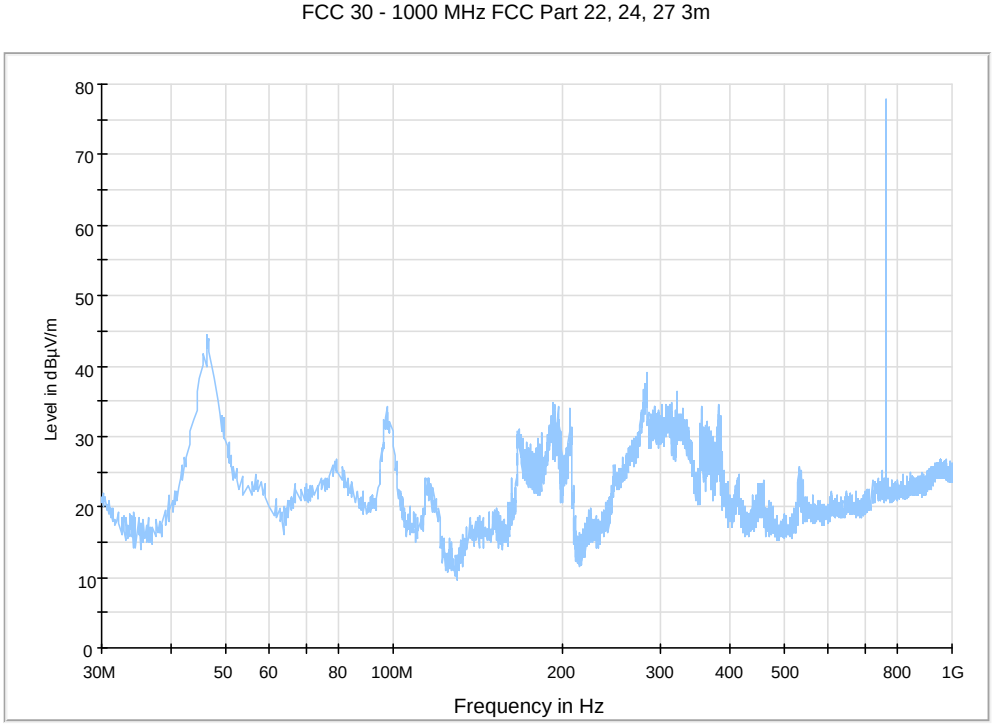
AWS, Field strength of spurious emissions high channel				
Frequency [MHz]	RBW [kHz]	Measured level [dB(µV/m)]	Limit [dB(µV/m)]	Note
30 - 1000	120	-	77.8	Noise floor
4310.10	1000	63.7	82.2	
6465.05	1000	55.3	82.2	
8620.00	1000	52.1	82.2	
18000 - 26000	1000	-	82.2	Noise floor

Semi-anechoic shielded chamber
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the 700 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m

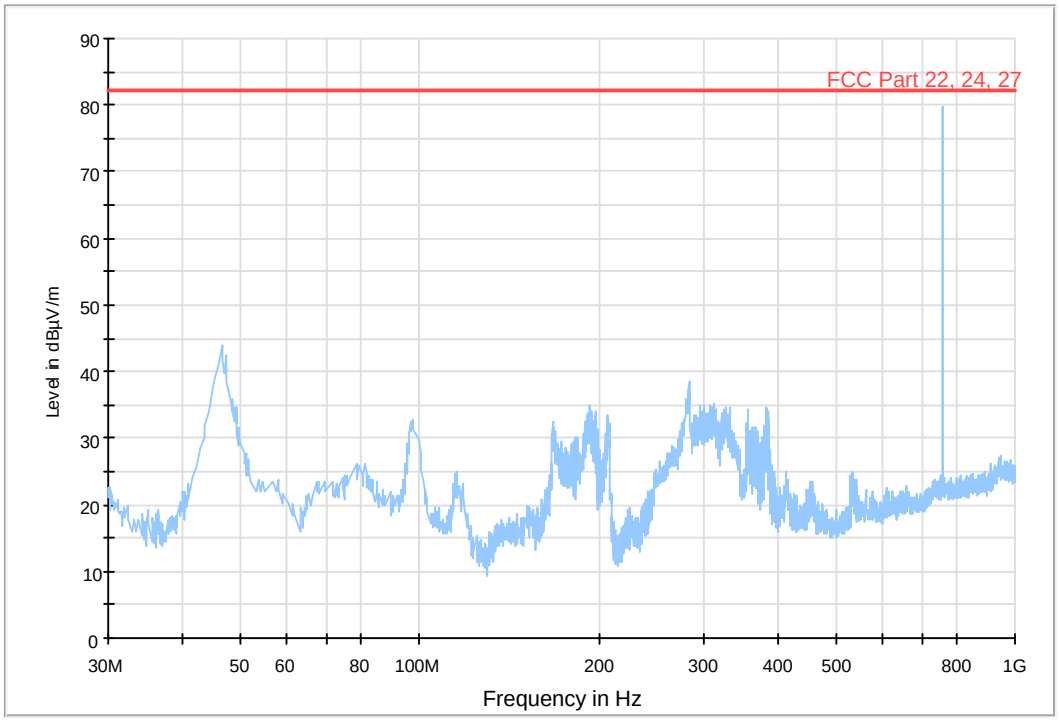


30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the 700 MHz pass band.



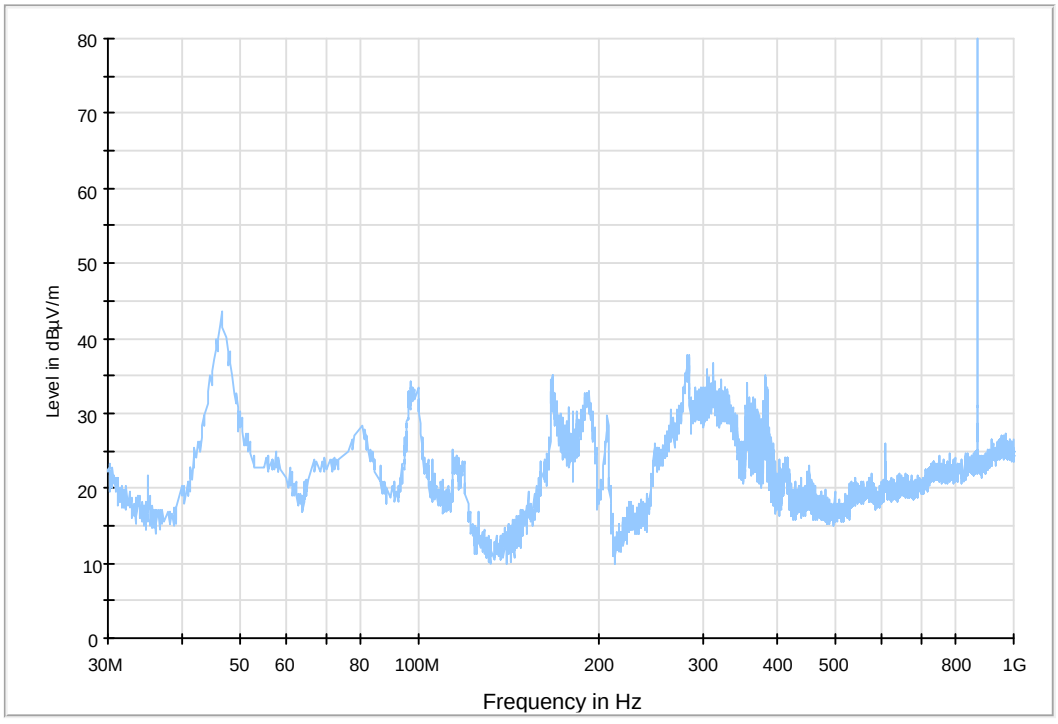
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the 700 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



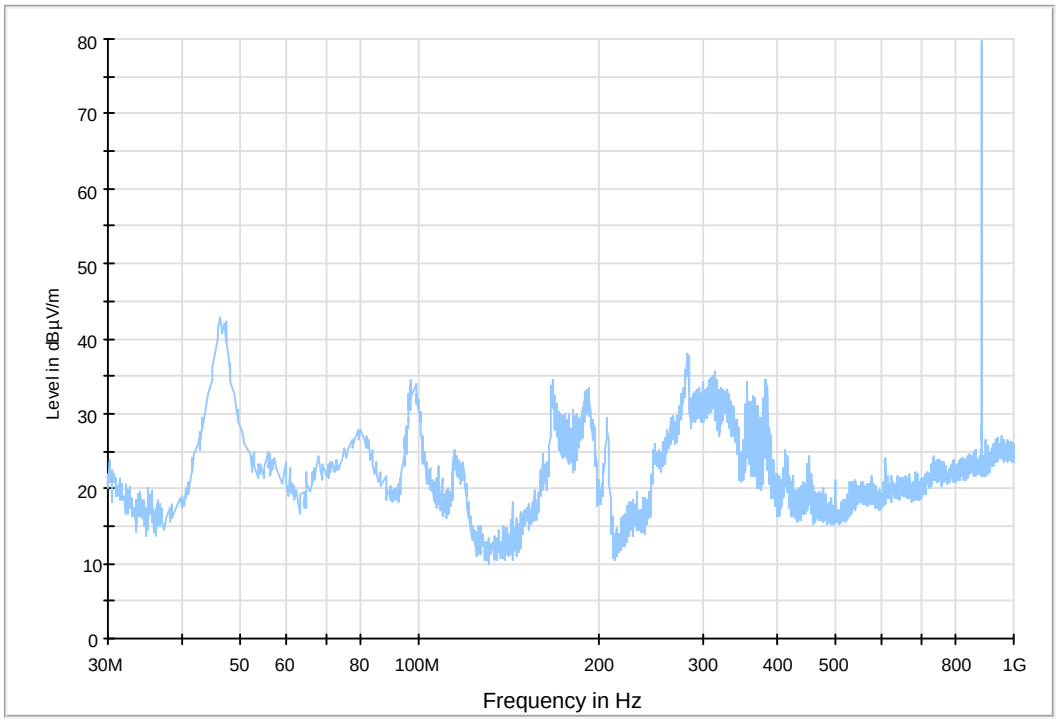
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the 850 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



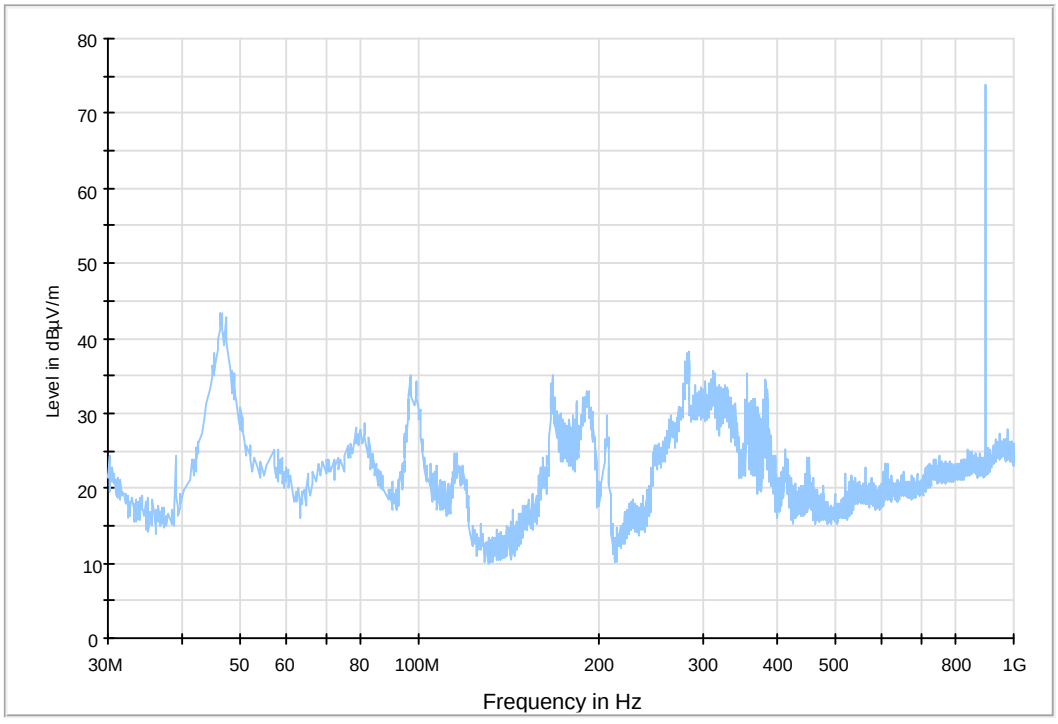
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the 850 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



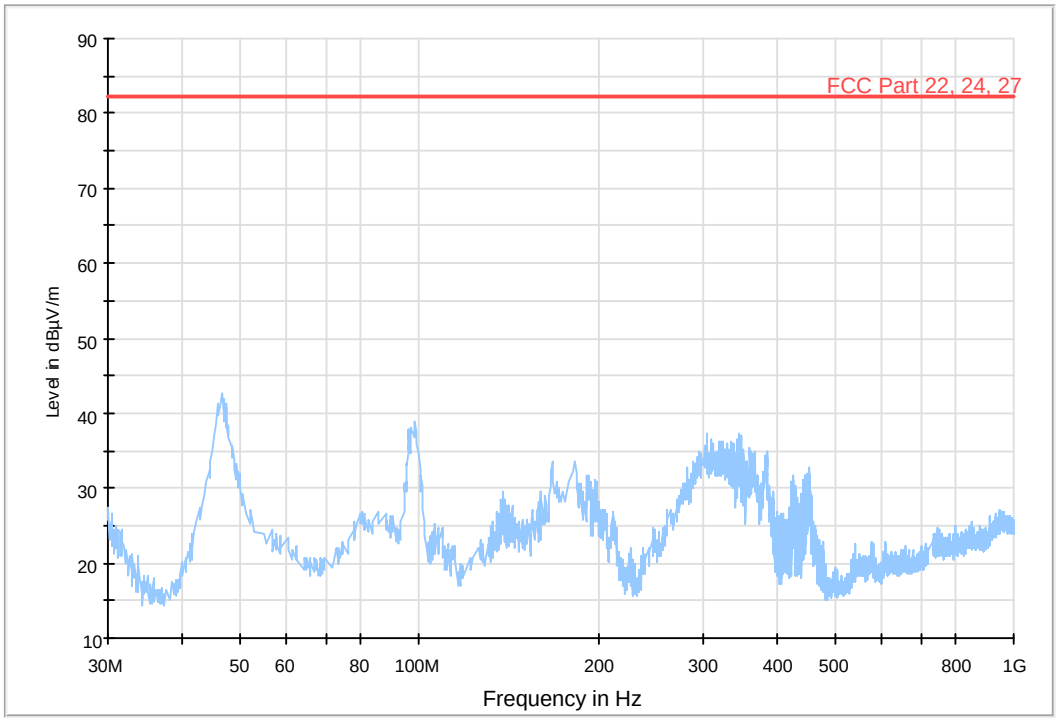
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the 850 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



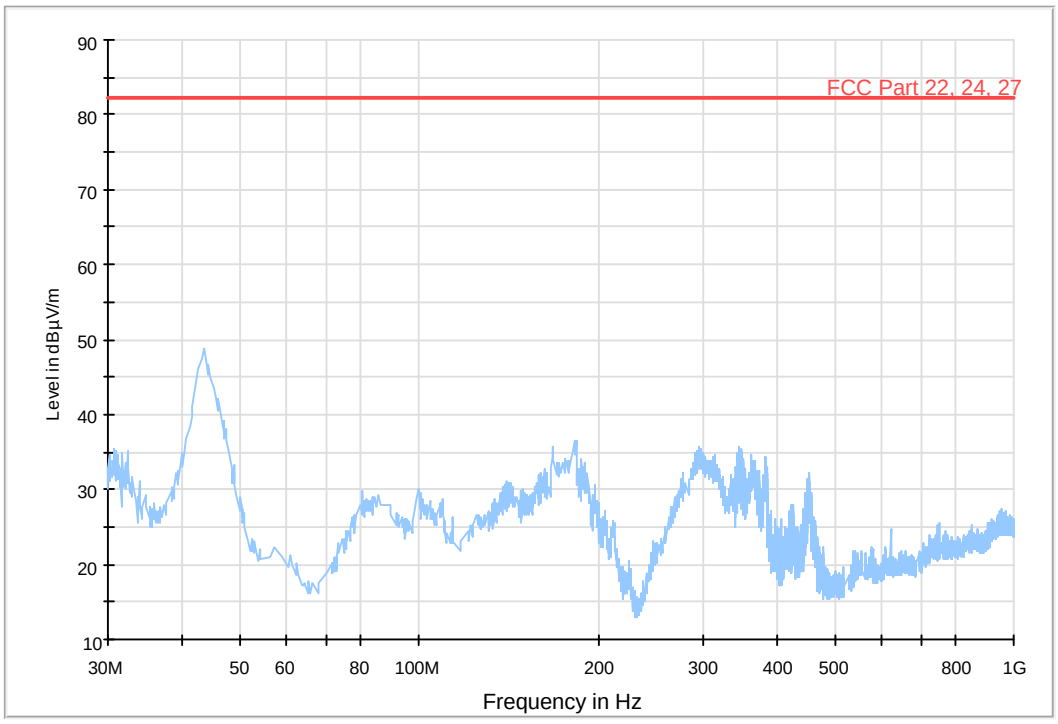
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the 1900 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



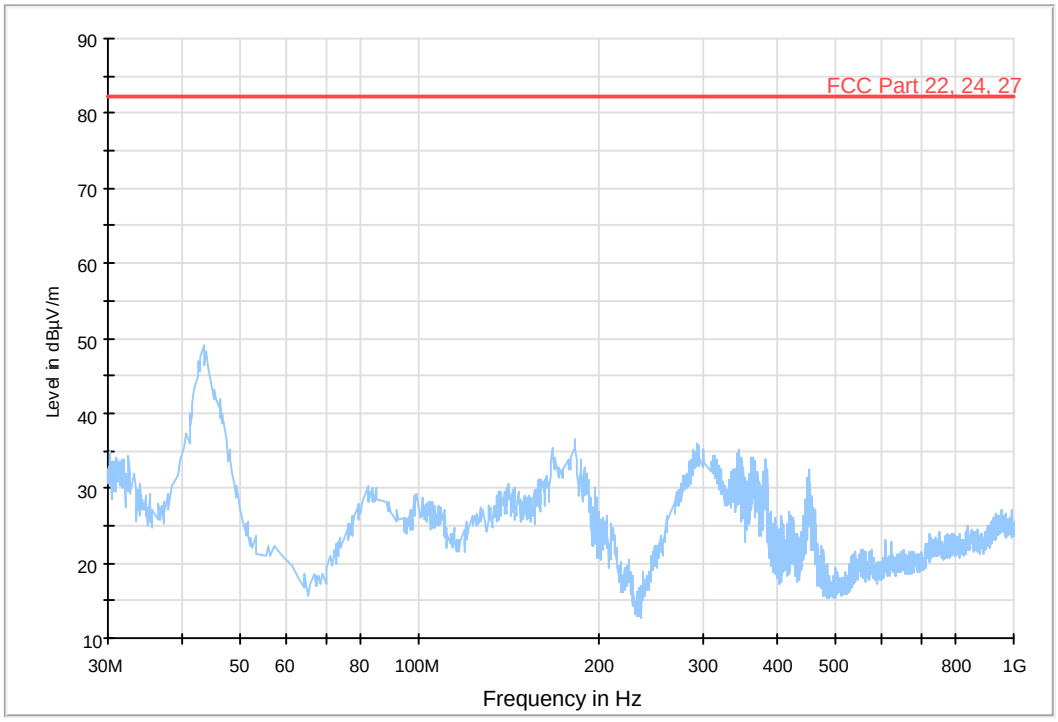
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the 1900 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



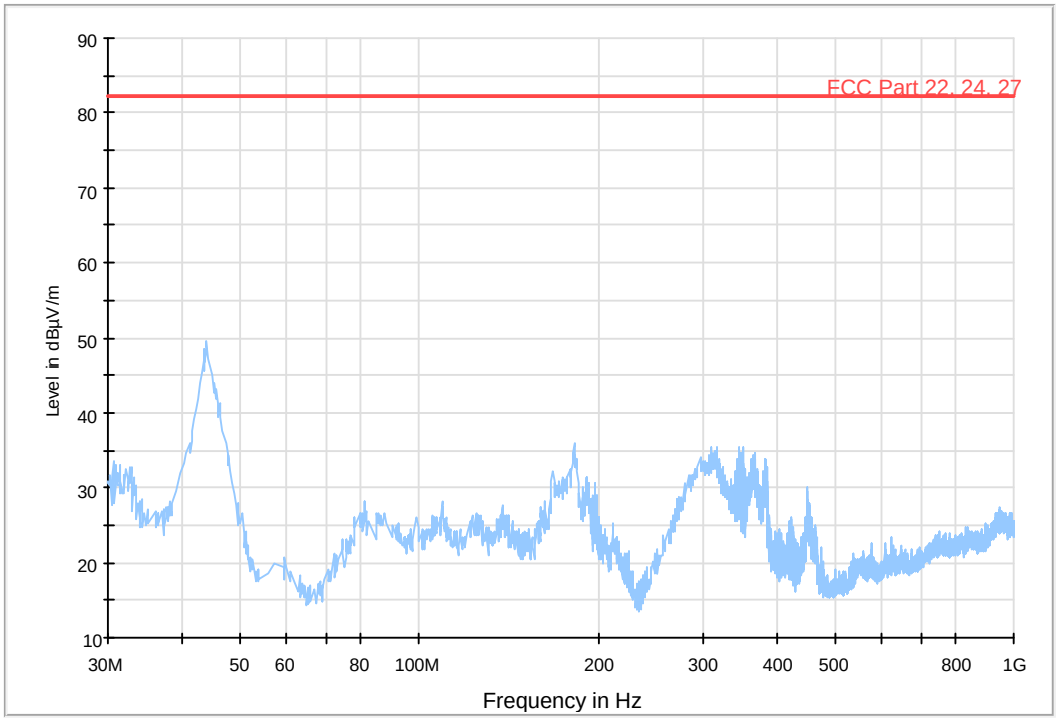
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the 1900 MHz pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



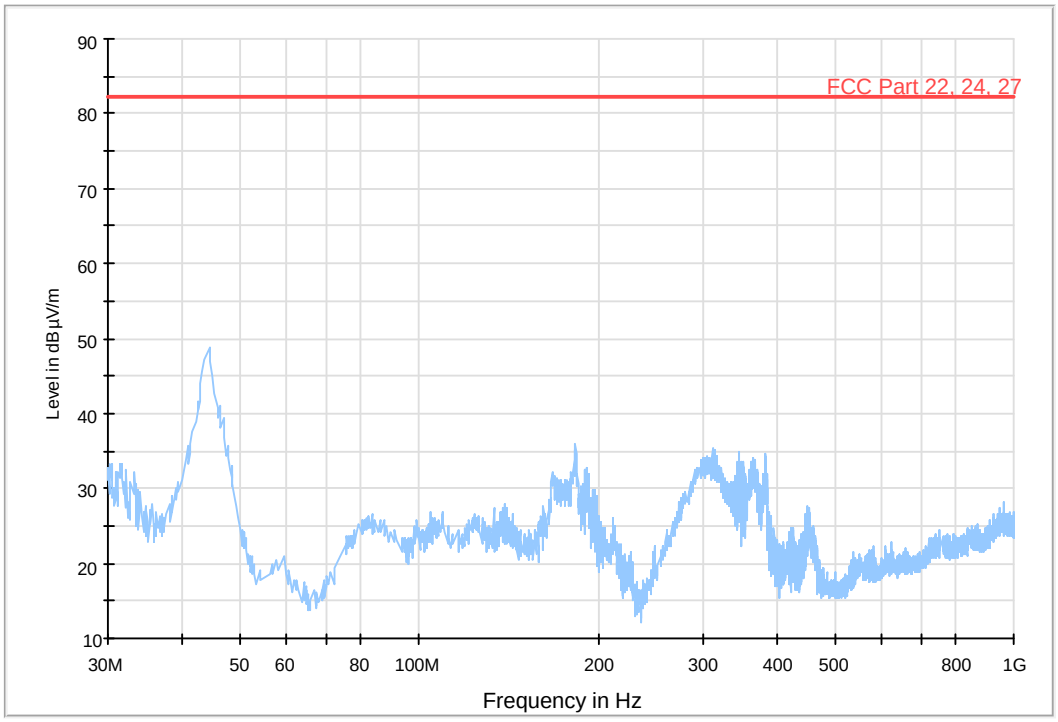
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the AWS pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



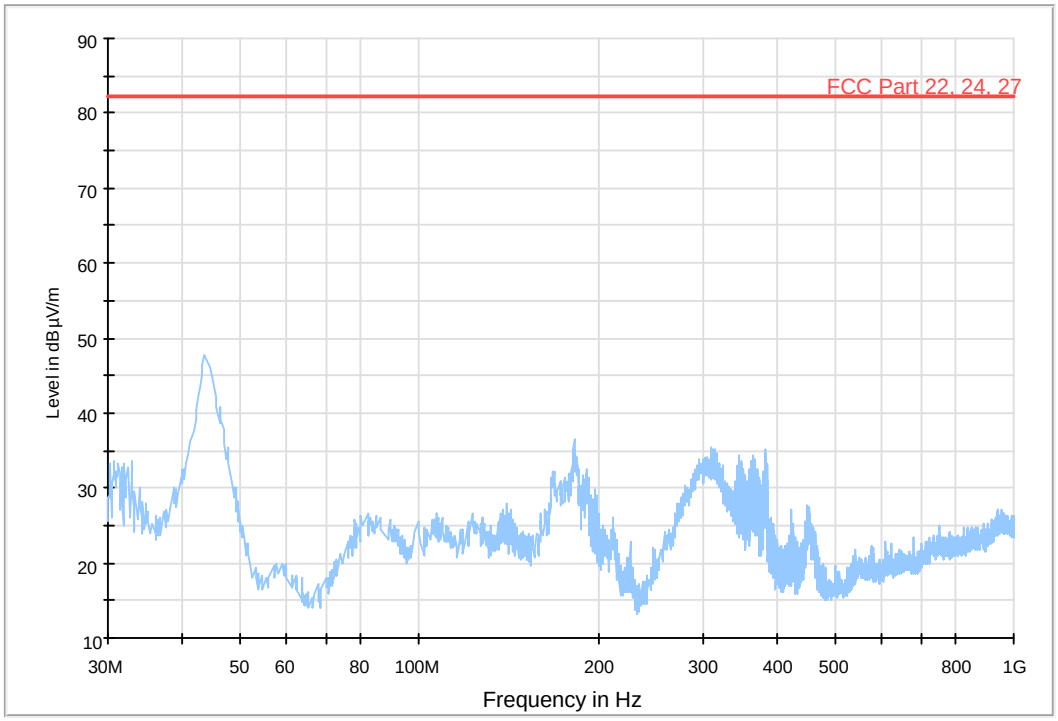
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the AWS pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



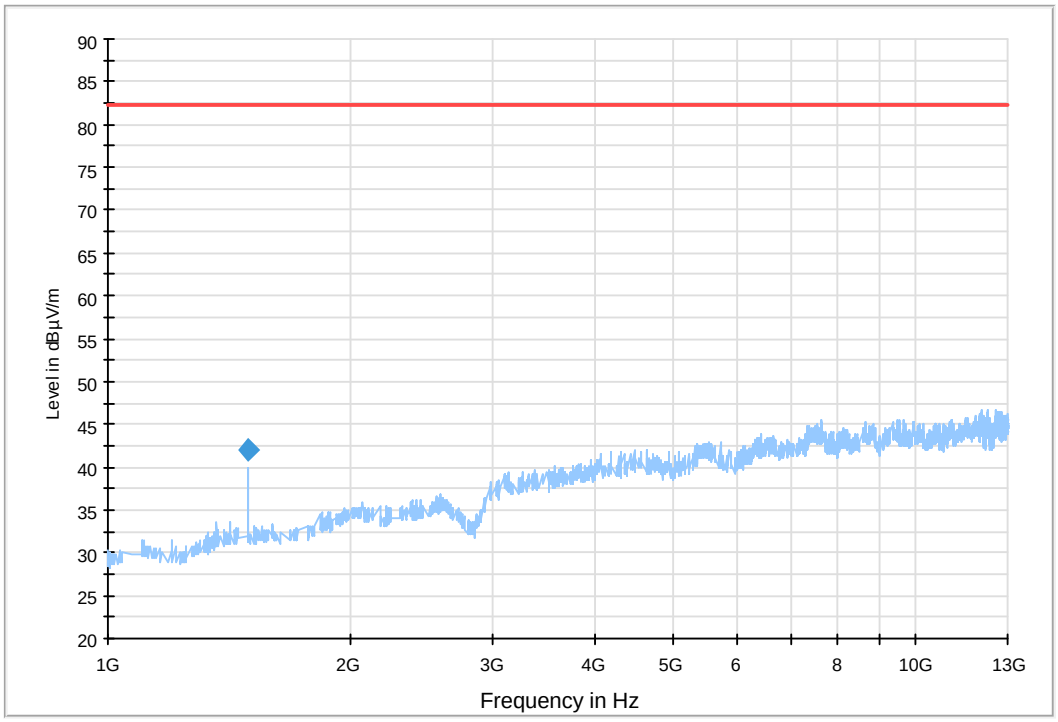
30 – 1000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the AWS pass band.

FCC 30 - 1000 MHz FCC Part 22, 24, 27 3m



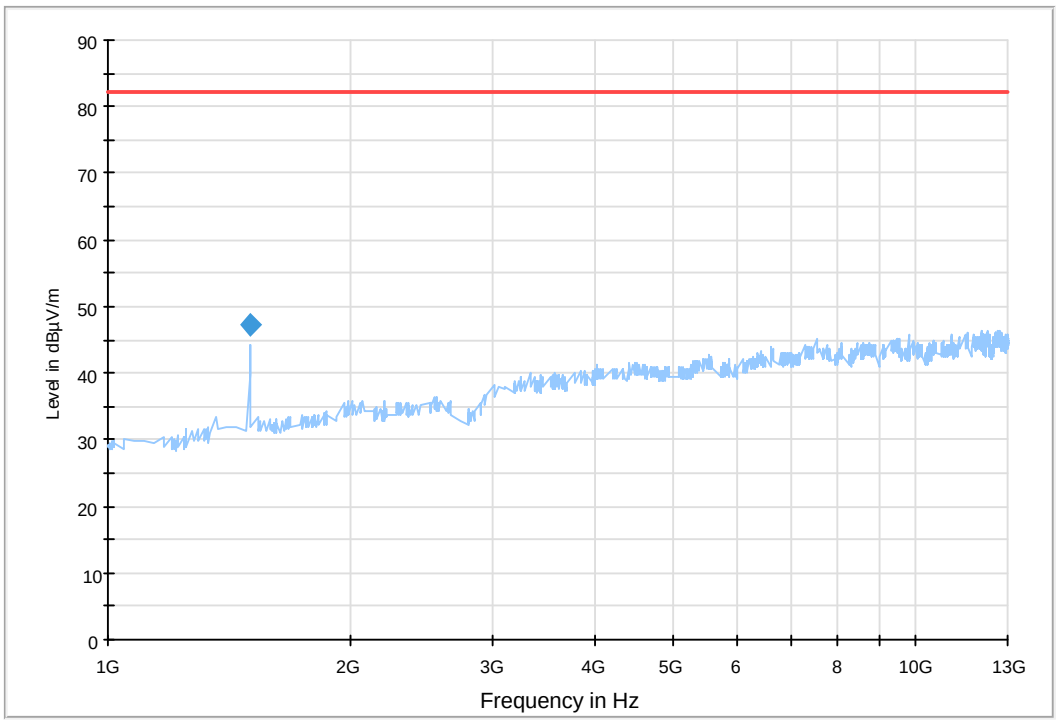
700 MHz band
1000 – 13000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the 700 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



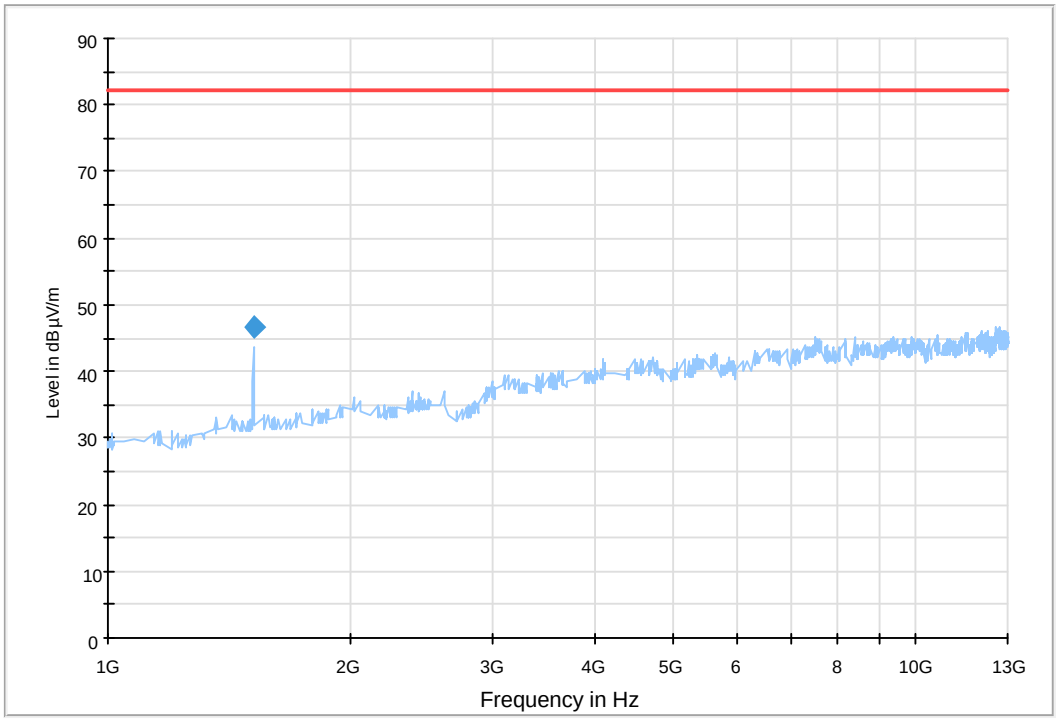
1000 – 13000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the 700 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



1000 – 13000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the 700 MHz pass band.

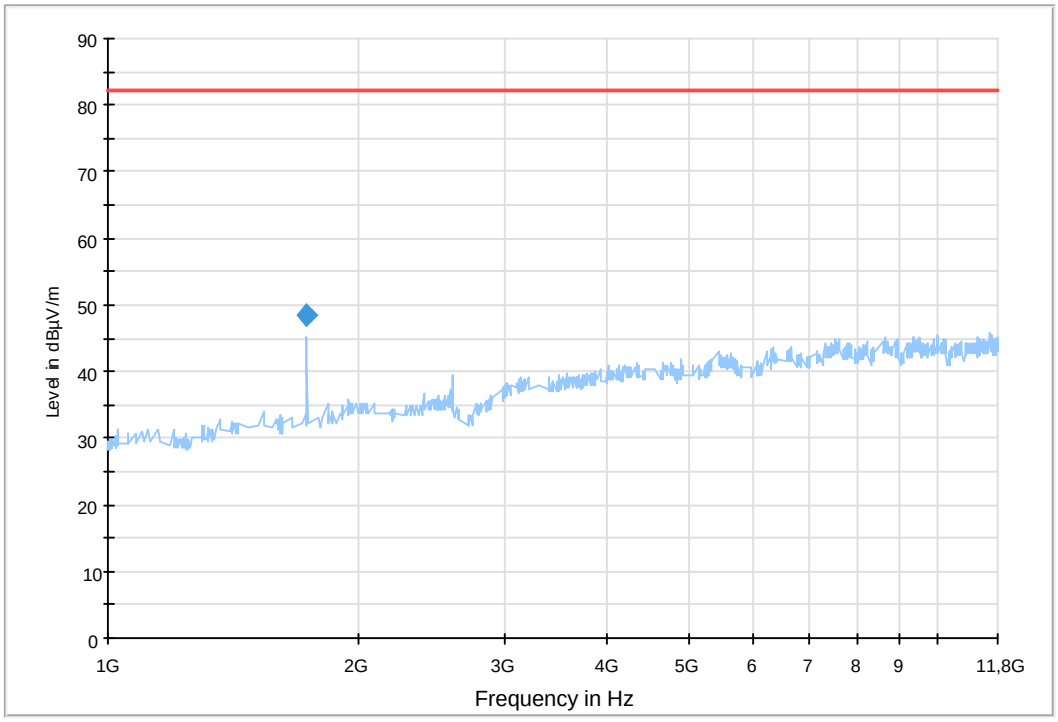
FCC Part 22-24-27 1G - 18 G 3m ESU40



850 MHz band

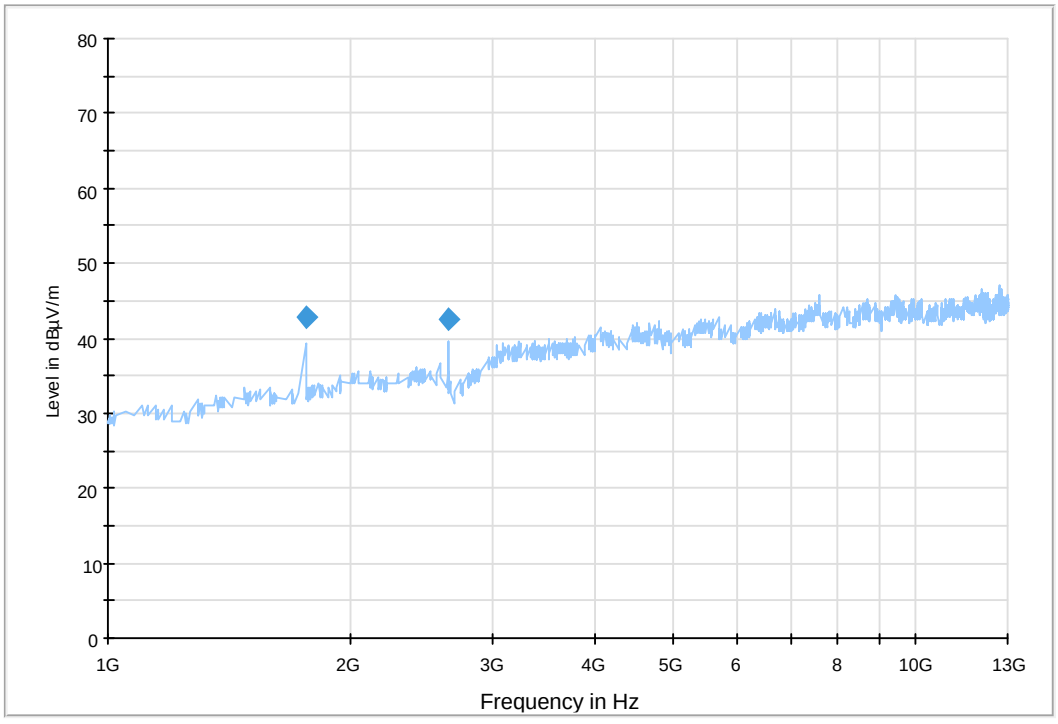
1000 – 13000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the 850 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



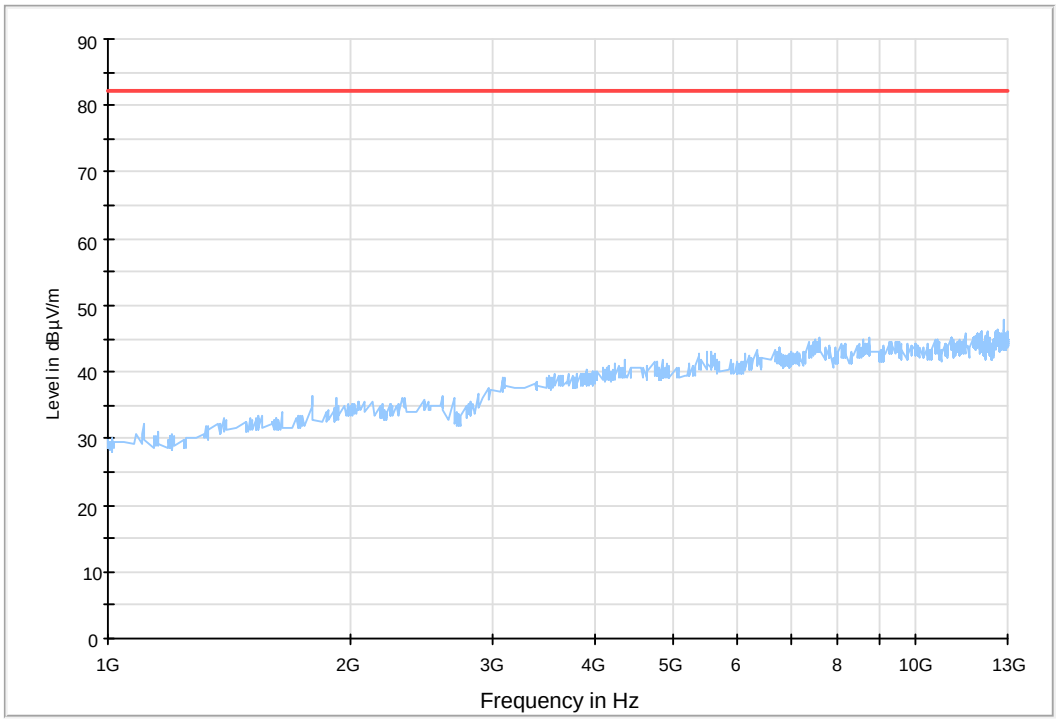
1000 – 13000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the 850 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



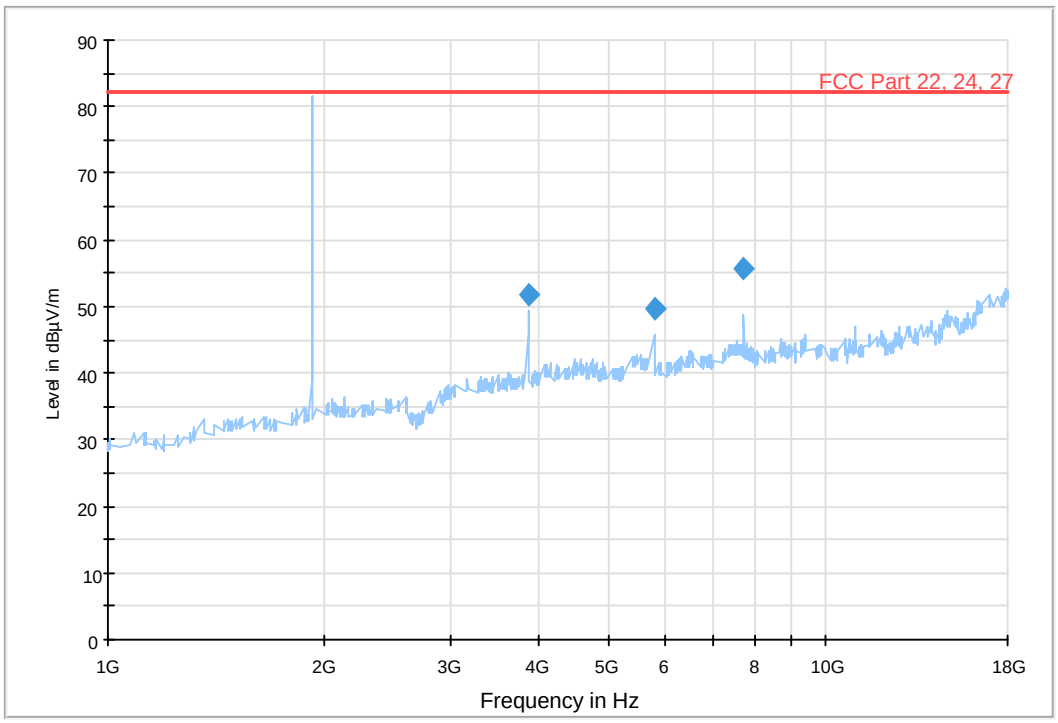
1000 – 13000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the 850 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



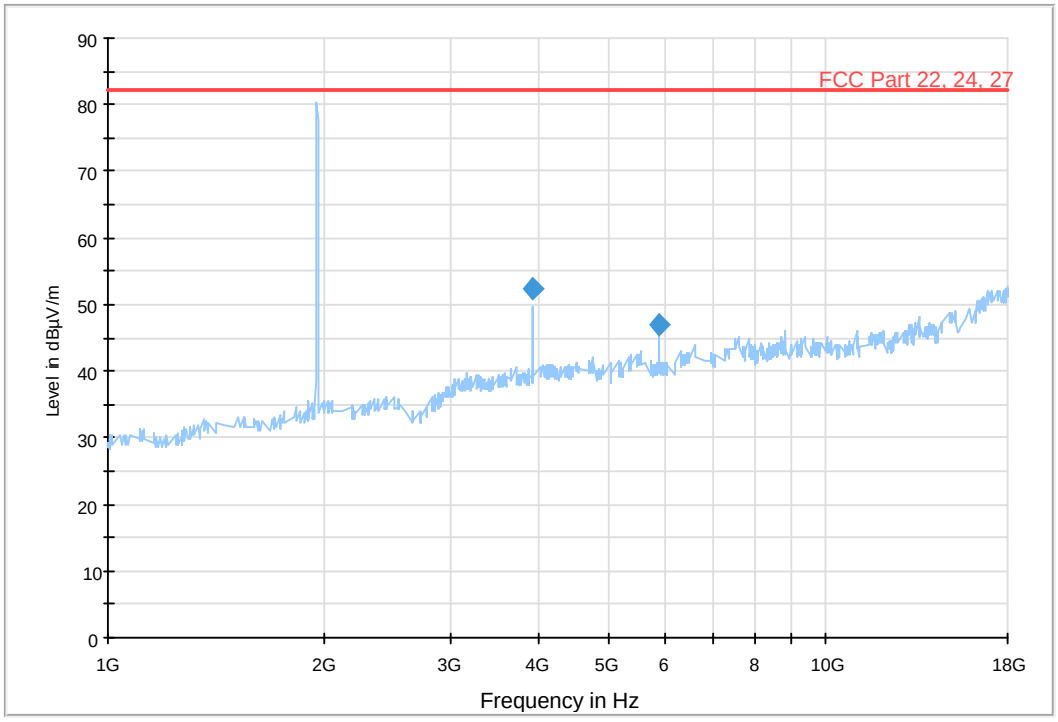
1900 MHz band
1000 – 18000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the 1900 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



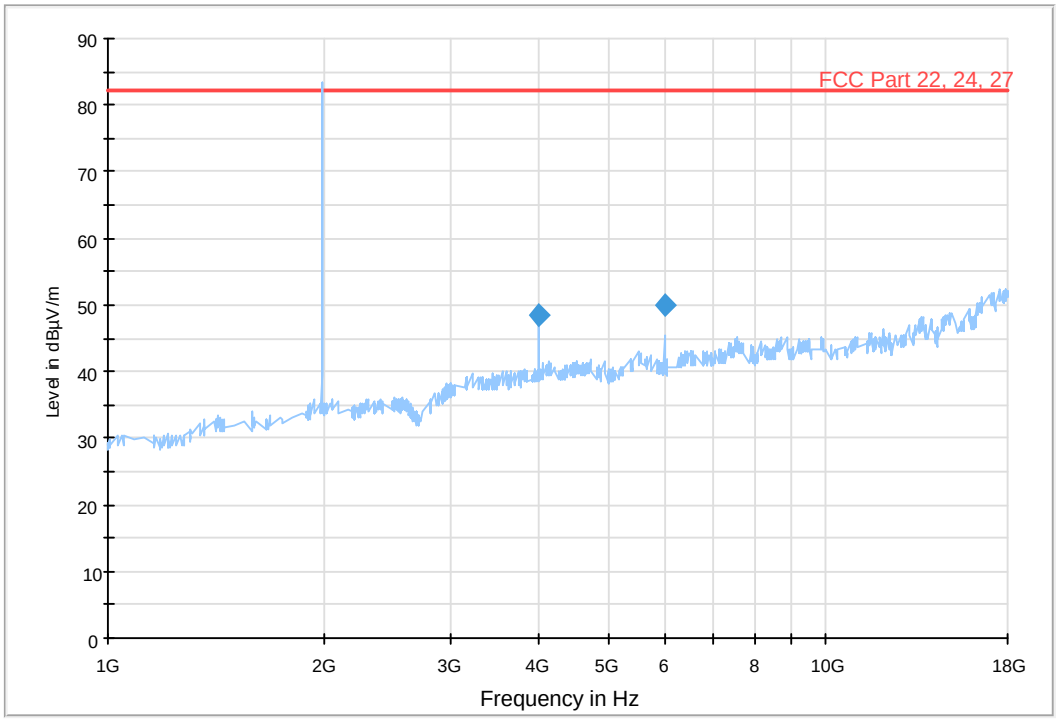
1000 – 18000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the 1900 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



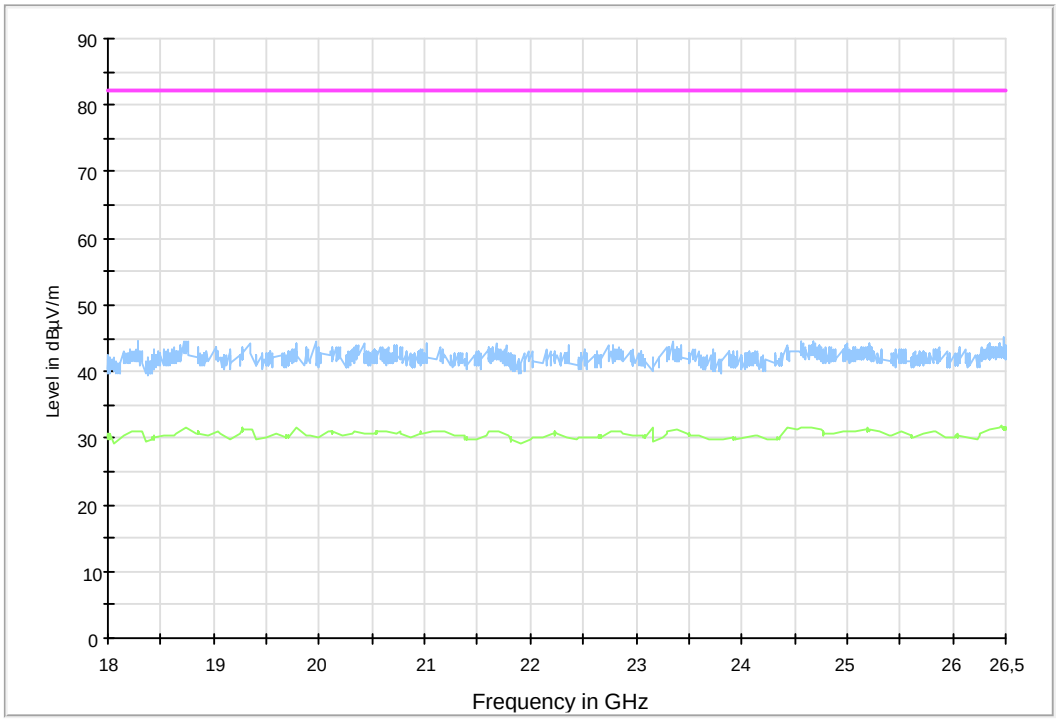
1000 – 18000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the 1900 MHz pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40

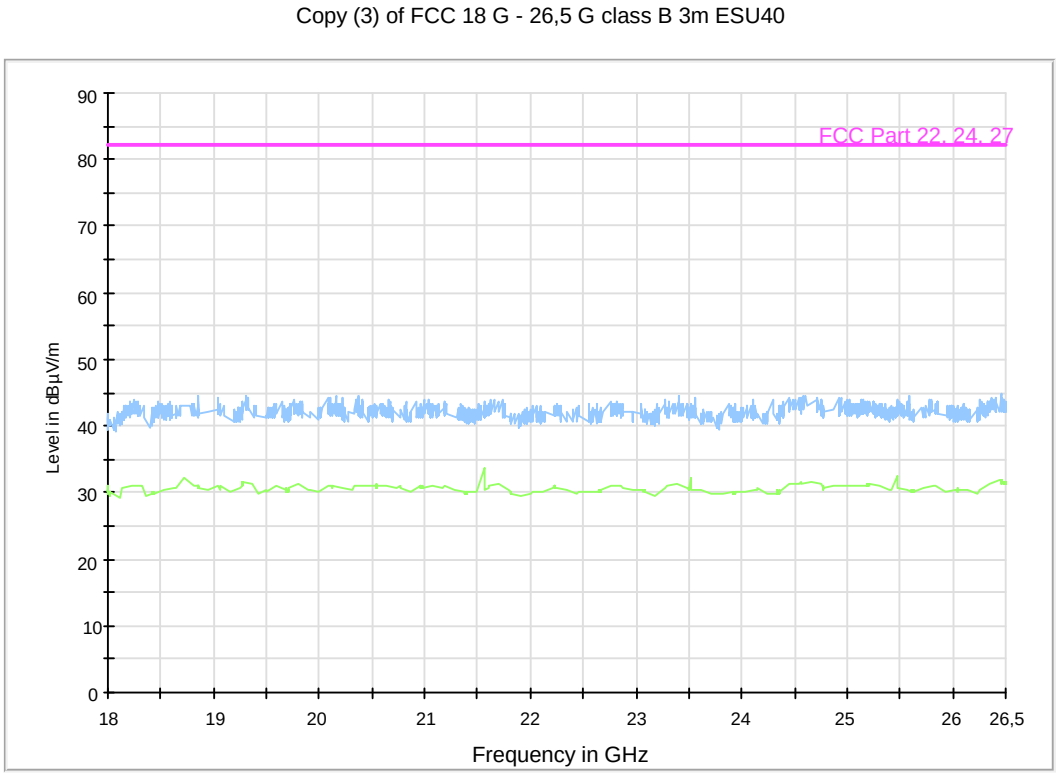


18000 – 26000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the 1900 pass band.

Copy (3) of FCC 18 G - 26,5 G class B 3m ESU40

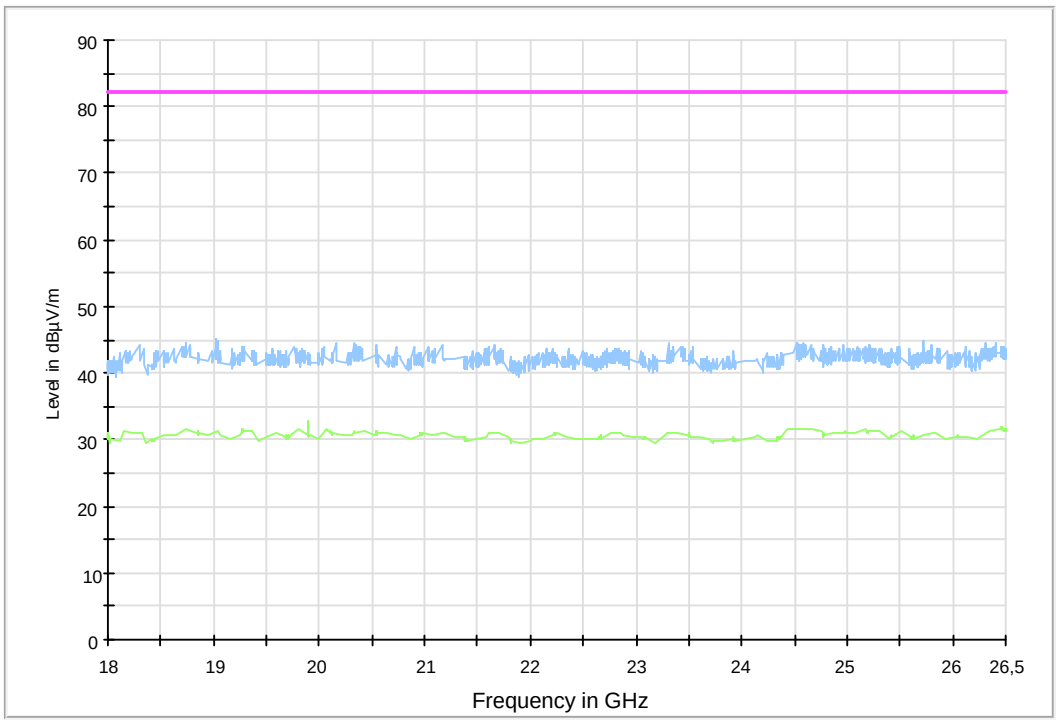


18000 – 26000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the 1900 pass band.



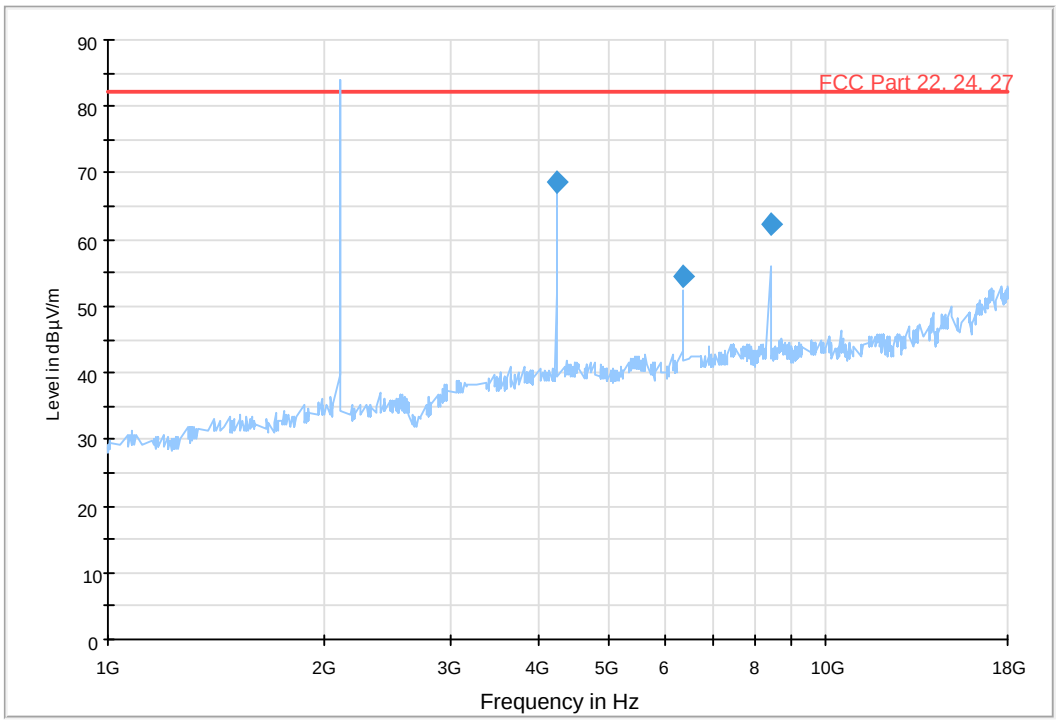
18000 – 26000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the 1900 pass band.

Copy (3) of FCC 18 G - 26,5 G class B 3m ESU40



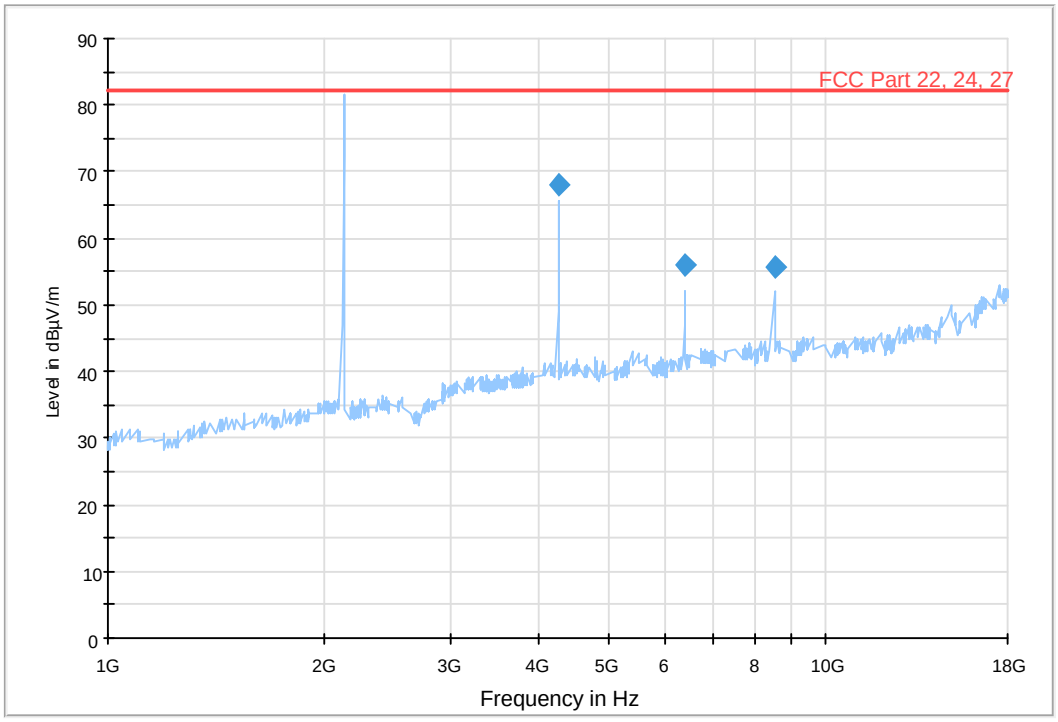
AWS
1000 – 18000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the AWS pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



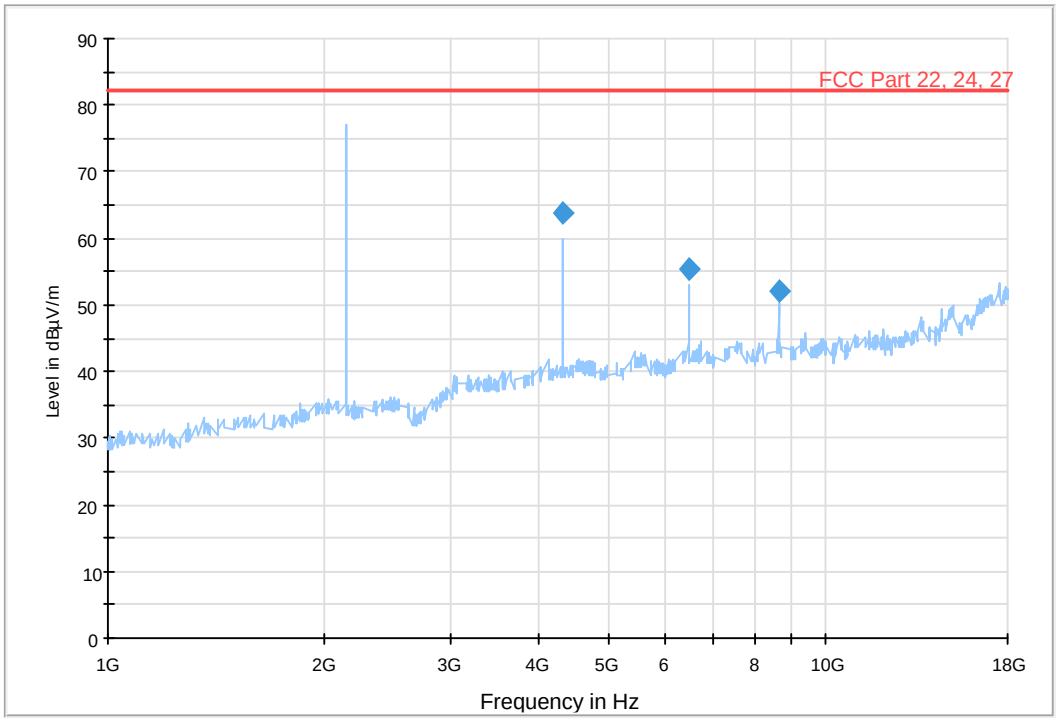
1000 – 18000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the AWS pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



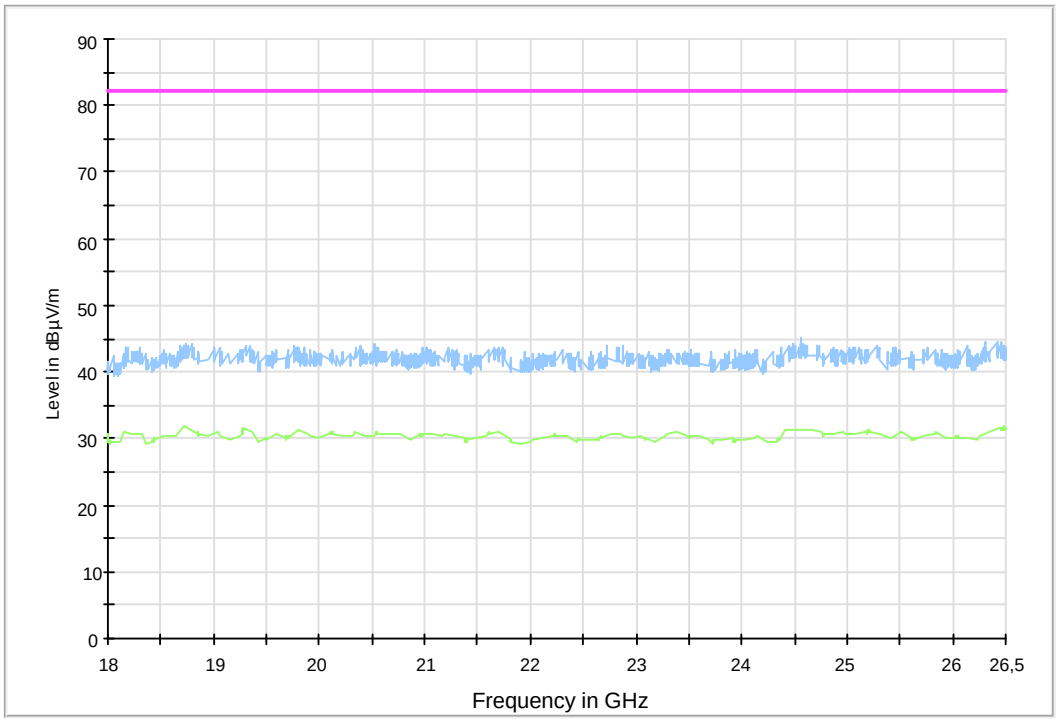
1000 – 18000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the AWS pass band.

FCC Part 22-24-27 1G - 18 G 3m ESU40



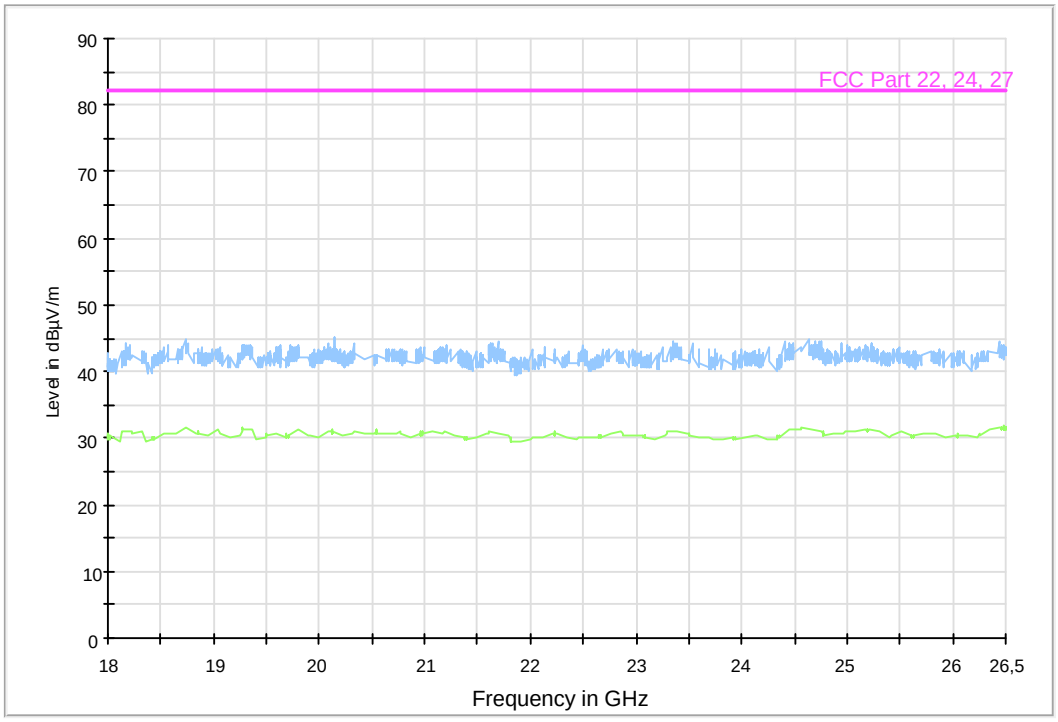
18000 – 26000 MHz, max peak at a distance of 3 m. CW carrier in lower part of the AWS pass band.

Copy (3) of FCC 18 G - 26,5 G class B 3m ESU40



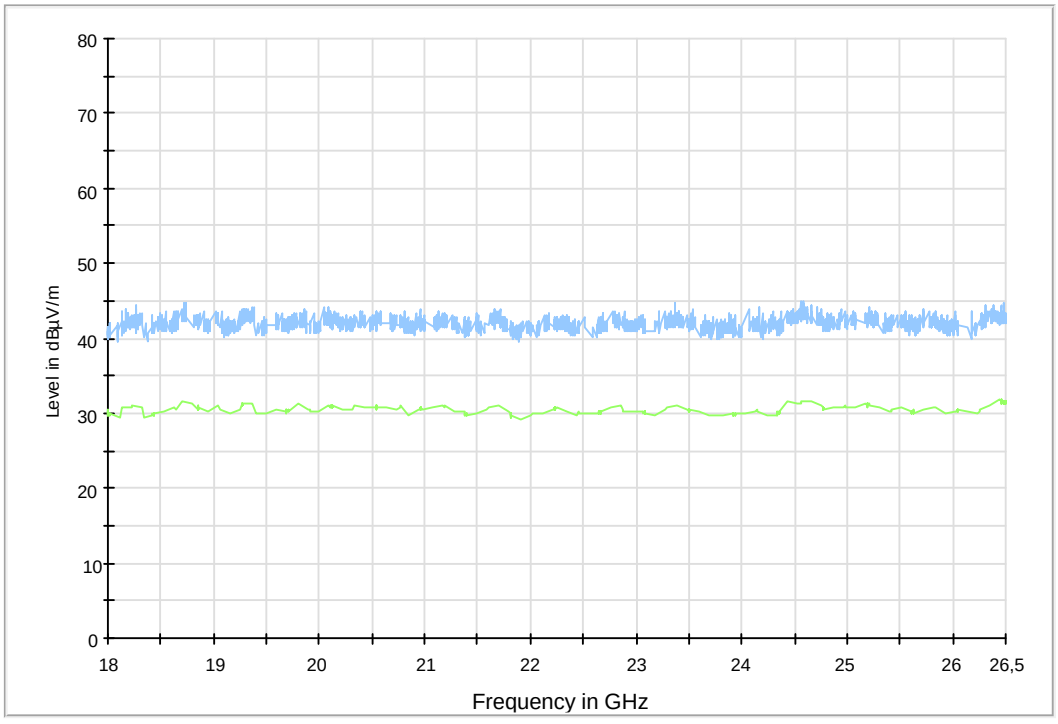
18000 – 26000 MHz, max peak at a distance of 3 m. CW carrier in middle part of the AWS pass band.

Copy (3) of FCC 18 G - 26,5 G class B 3m ESU40



18000 – 26000 MHz, max peak at a distance of 3 m. CW carrier in higher part of the AWS pass band.

Copy (3) of FCC 18 G - 26,5 G class B 3m ESU40



11 FREQUENCY STABILITY

Date of test:	2012-04-26	Ambient temp.	22 °C
EUT Serial:	99001	Relative humidity	29 %
Tested by:	Åke Carlson	Test result:	Pass

11.1 Requirement

11.2 Test protocol

The test was done with two different input signals:

- First test was with a modulated carrier and the frequency error was measured with a signal analyzer.

- Second test was with a CW signal and the frequency error was measured with a frequency counter.

11.3 Limits

The frequency tolerance for a fixed Base transmitter in 47 CFR §22.255 is 1.5 ppm, at 894MHz that equals 1.34 kHz.

11.4 Test data

Amplifier 700 MHz band

Input signal: modulated carrier at 754.7 MHz
CW at 754.7 MHz

Frequency error			
Ambient temperature (°C)	CDMA frequency error (Hz)	GSM frequency error (Hz)	CW frequency error (Hz)
-30	< 20	< 20	+2
-20	< 10	< 10	+3
-10	< 10	< 10	+3
0	< 10	< 10	+3
10	< 10	< 10	+3
20	< 10	< 10	+3
30	< 10	< 10	+3
40	< 10	< 10	+3
50	< 10	< 10	+3
55	< 10	< 10	+3

Frequency error Nominal voltage: 120 VAC		
Voltage (V AC)	GSM frequency error (Hz)	CW frequency error (Hz)
85% of nominal = 102	< 10	+3
90% of nominal = 108	< 10	+3
95% of nominal = 114	< 10	+3
100% of nominal = 120	< 10	+3
105% of nominal = 126	< 10	+3
110% of nominal = 132	< 10	+3
115% of nominal = 138	< 10	+3

Amplifier 850 MHz band
Input signal: GSM carrier at 882.0 MHz
CW at 882.0 MHz

Frequency error		
Ambient temperature (°C)	GSM frequency error (Hz)	CW frequency error (Hz)
-30	< 10	+2
-20	< 10	+3
-10	< 10	+3
0	< 10	+3
10	< 10	+3
20	< 10	+3
30	< 10	+3
40	< 10	+3
50	< 10	+3
55	< 10	+3

Frequency error Nominal voltage: 120 VAC		
Voltage (V AC)	GSM frequency error (Hz)	CW frequency error (Hz)
85% of nominal = 102	< 10	+3
90% of nominal = 108	< 10	+3
95% of nominal = 114	< 10	+3
100% of nominal = 120	< 10	+3
105% of nominal = 126	< 10	+3
110% of nominal = 132	< 10	+3
115% of nominal = 138	< 10	+3

Amplifier 1900 MHz band

Input signal: GSM carrier at 1960.0 MHz
CW at 1960.0 MHz

Frequency error		
Ambient temperature (°C)	GSM frequency error (Hz)	CW frequency error (Hz)
-30	< 10	+3
-20	< 10	+3
-10	< 10	+3
0	< 10	+3
10	< 10	+3
20	< 10	+3
30	< 10	+3
40	< 10	+3
50	< 10	+3
55	< 10	+3

Frequency error Nominal voltage: 120 VAC		
Voltage (V AC)	GSM frequency error (Hz)	CW frequency error (Hz)
85% of nominal = 102	< 10	+3
90% of nominal = 108	< 10	+3
95% of nominal = 114	< 10	+3
100% of nominal = 120	< 10	+3
105% of nominal = 126	< 10	+3
110% of nominal = 132	< 10	+3
115% of nominal = 138	< 10	+3

Amplifier AWS band

Input signal: WCDMA carrier at 2132.0 MHz
CW at 2132.0 MHz

Frequency error		
Ambient temperature (°C)	WCDMA frequency error (Hz)	CW frequency error (Hz)
-30	< 10	+2
-20	< 10	+3
-10	< 10	+3
0	< 10	+3
10	< 10	+3
20	< 10	+3
30	< 10	+3
40	< 10	+3
50	< 10	+3
55	< 10	+3

Frequency error Nominal voltage: 120 VAC		
Voltage (V AC)	GSM frequency error (Hz)	CW frequency error (Hz)
85% of nominal = 102	< 10	+3
90% of nominal = 108	< 10	+3
95% of nominal = 114	< 10	+3
100% of nominal = 120	< 10	+3
105% of nominal = 126	< 10	+3
110% of nominal = 132	< 10	+3
115% of nominal = 138	< 10	+3

12 UNCERTAINTIES SUMMARY

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT.
Measurement uncertainty is calculated in accordance with EA-4/02-1997.
The measurement uncertainty is given with a confidence of 95% (k=2).

Radiated disturbance, field strength, 30 MHz - 1000 MHz	
30 to 300 MHz at 1 m and at a fixed height ≤ 1,5 m	± 5,3 dB
200 to 1000 MHz at 1 m	± 6,2 dB
30 to 300 MHz at 3 m	± 4,7 dB
200 to 1000 MHz at 3 m	± 4,8 dB
30 to 300 MHz at 10 m	± 4,6 dB
200 to 1000 MHz at 10 m	± 4,6 dB
Radiated disturbance, field strength, 1 to 40 GHz in Semi Anechoic Chambers "Stora Hallen"and "Björkhallen"	
1 to 18 GHz with filter or attenuator	± 5,4 dB
1 to 18 GHz without filter or attenuator	± 5,2 dB
18 to 26 GHz without filter or attenuator	± 5,5 dB
26 to 40 GHz without filter or attenuator	± 5,6 dB
Conducted disturbances at the antenna port on radio equipment	
Frequency range 9 kHz – 1 GHz	± 0,9 dB
Frequency range 1 GHz – 7 GHz	± 1,4 dB
Frequency range 7 GHz -18GHz	± 2,4 dB
Frequency range 18 GHz -26,5GHz	± 3,0 dB
Frequency range 26,5 GHz - 40 GHz	± 3,6 dB
Radiated power	
25 MHz - 1000 MHz	± 3,7 dB
1 – 18 GHz at 3 m	± 3,4 dB
Radiated emission with loop antenna, magnetic field, 9 kHz - 30 MHz	± 3,2 dB
Intermodulation attenuation	± 4,1 dB
Out of band gain	± 2,6 dB
Adjacent channel power	
Amplitude	± 2,0 dB
Frequency, 9 kHz - 30 MHz:	± 0,8 %
Frequency, 20 MHz - 1 GHz:	± 0,002 %
Frequency error	
With frequency counter	± 150 Hz
Frequency range	
HP 8593E	± 0,2 %
HP 8566B	± 2,3 %
R&S FSIQ	± 0,2 %
Output power	
Analog signals, conducted:	
RF-power meter	± 0,6 dB
Spectrum analyser	± 3,5 dB

Analog signals, radiated:	
25 MHz - 1000 MHz	± 3,7 dB
1 GHz - 18 GHz	± 3,4 dB
Digital signals, conducted	± 0,6 dB
Digital signals, radiated:	
25 MHz - 1000 MHz	± 3,7 dB
1 GHz - 18 GHz	± 3,4 dB

Peak power density

Conducted:	
8593E	± 2,5 dB
8566B	± 2,7 dB
Radiated:	
8593E & 8566B, 25 - 1000 MHz	± 4,5 dB
8593E & 8566B, 1 - 18 GHz	± 4,7 dB

Spurious response rejection ± 3,6 dB

Modulation accuracy

Phase error (RMS) for GSM GMSK	± 1,4 º
Phase error (Peak) for GSM GMSK	± 3,7 º
EVM for GSM EDGE	± 2,2 %

13 PHOTO OF THE EUT