

Pages : 89
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Enterprise no: NO 984 592 418 MVA

Test report : 45280-2
Item tested : MC-PLL-440C
Type of equipment : Radio Remote Control transmitter
Client : Cavotec Micro-control AS

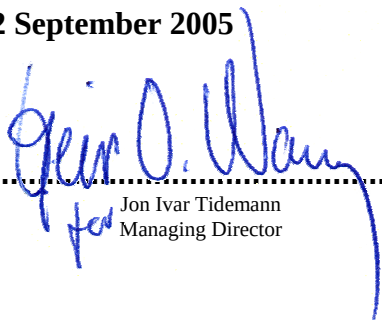
Tested according to :

FCC part 90.217 (b)

DSC Security/Remote control Transmitter

Date of issue : 22 September 2005

Authorized by :


Jon Ivar Tidemann
Managing Director
.....
Frode Sveinsen
Technical Supervisor

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1 GENERAL INFORMATION

1.1 Test house Info

Name : Nemko Comlab AS
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E-mail: <mailto:post@comlab.no>
Managing Director: Jon Ivar Tidemann
FCC test firm registration number : 994405
Industry Canada OATS registration number : 4443

1.2 Client Information

Name : Cavotec Micro-Control AS
Address : Wesselsv. 2, Boks 284 , N-7500 Stjørdal, Norway.
Telephone : +47 74 83 98 60
Fax : +47 74 83 98 99

Contact:

Name : Pål Berglund
Telephone : +47 74 83 98 70
E-mail : Pal.berglund@cavotec.com
Web site www.micro-control.no or www.cavotec.com

1.3 Manufacturer

Name : Cavotec Micro-.Control AS
Address : Wesselsv. 2, Boks 284 , N-7501 Stjørdal, Norway.
Telephone : +47 74 83 98 60
Fax : +47 74 83 98 99

2 Test Information

2.1 Tested Item

Name :	MC-PLL-440C
Model/version :	MC.PLL-440C
Serial number :	FCC1: 04005366 FCC2: 04001520
Hardware identity and/or version:	FCC1: M5-1012-4401, FCC2: M5-1012-4402
Software identity and/or version :	FCC1 12.5kHz: pll_c_12k5_fc1_041013.hex FCC2 12.5kHz: pll_c_12k5_fc2_041013.hex FCC1 25kHz: pll_c_fc1_020912.hex FCC2 25kHz: pll_c_fc2_020912.hex
Frequency Range FCC1:	450MHz - 460 MHz
Frequency Range FCC2:	460MHz – 470 MHz
Tunable Bands :	1
Number of Channels :	800
Channel separation:	12.5kHz & 25kHz
Modulation :	FSK
Emissions Designator :	12,5kHz version : 8K4F2D 25 kHz version : 20K8F2D
User Frequency Adjustment :	None, Software controlled.
Rated Output Power :	50 mW

2.2 Test Environment

Temperature: 20 - 23 °C
Relative humidity: 30 - 50 %
Normal test voltage: 7.2 V DC

The values are the limit registered during the test period.

2.3 Test Period

Item received date: 2005-05.23

Test period : from 2005-05-23 to 2005-05-31 and 2005-07-11

2.4 Theory of Operation

The FCC1 and FCC2 are radio remote control transmitter operating in frequency band 450MHz – 460MHz and 460MHz – 470MHz respectively.

The device is used for industrial applications such as overhead cranes, chain hoist, winches etc.

pllc_12k5_fc1_041013.hex FCC1 12.5kHz channel separation (Deviation =+-2.5 KHz)

pllc_12k5_fc2_041013.hex FCC2 12.5kHz channel separation (Deviation =+-2.5 KHz)

The software version for 25kHz is:

- pllc_fc1_020912.hex FCC1 25kHz channel separation (Deviation =+-4.7 KHz)

- pllc_fc2_020912.hex FCC2 25kHz channel separation (Deviation =+-4.7 KHz)

3 TEST REPORT SUMMARY

3.1 General

Manufacturer: Cavotec Micro-Control AS
Model No.: MC.PLL-440C
Serial No.: FCC1: 04005366, FCC2: 04001520

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC Part 90, Subpart I, paragraph 90.217 for FSK device.

Radiated tests were conducted in accordance with ANSI C63.4-1992. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3 and 10 meters.

☒ New Submission

☒ Production Unit

☐ Class II Permissive Change

☐ Pre-production Unit

DSC Equipment Code

☐ Family Listing

THIS TEST REPORT RELATES ONLY TO THE ITEM (S) TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".



NEMKO COMLAB REF: 45280-3

TESTED BY: 
G.Suhanthakumar, Test engineer

DATE: **13 July 2005**

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This report applies only to the items tested.

3.2 Test Summary

Name of test	FCC Part 90 reference	Result
Temperature variation -30 °C - + 60°C	2.1055	Complies
Supply voltage variations	2.1055	Complies
Occupied bandwidth	90.217 (b)	Complies
Frequency stability	90.217 (b)	Complies
Conducted peak out-put power	90.217 (b)	Complies ¹
Conducted spurious	90.217 (b)	Complies
Radiated spurious with 50 ohm load	90.217 (b)	Complies
Radiated spurious	2.1053 (a)	Complies
Radiated emission, in receiver	15 B	Complies

¹ The antenna connector is a SMB connector.

3.3 Description of modification for Modification Filing

Not Applicable.

3.4 Comments

The channels are selected with a test box that submitted by the manufacturer. The measurements are performed at channels near top 450MHz, near middle 455MHz and near bottom 460MHz for FCC1, and for FCC2 near top 460MHz, near middle 465MHz and near bottom 470MHz. The EUTs complies at these channels.

See page 80 to 81 for modulated spectrum.

The differences between the FCC1 and FCC2 are as follows:

- out-put filter (given in bill of materials).
- software.

3.5 Family List Rational

Not Applicable.

4 TEST RESULTS

4.1 Occupied bandwidth

Para. No.: 90.217(b)

Test Results: Complies

Test Performed By: G.Suwanthakumar	Date of Test: 23 – 26 May 2005
------------------------------------	--------------------------------

The EUT is designed to operate with a 12.5kHz or 25kHz channel bandwidth. The measured emissions at ± 25 kHz from assigned frequency is 40 dB below the unmodulated carrier.

$$B_n = 2M + 2DK$$

Where: B_n = Necessary Bandwidth

M = Maximum modulation frequency

For Data transmission, $M = B/2$, Where: B = Modulation rate in Baud

D = Peak deviation, K = Constant, For Data transmission this is typically 1.2

12.5kHz:

FSK, 2400bps with 2,5 kHz deviation

We have $B=9.6$, $D=2.5$, $K=1.2$ and

$B_n = 2,4 + 2 \times 2.5 \times 1.2 = 8,4$ kHz see plots on page 85 & 86 of the test report

25kHz:

FSK, 9600bps with 4.7 kHz deviation

We have $B=9.6$, $D=4,7$, $K=1.2$ and

$B_n = 9.6 + 2 \times 2.5 \times 1.2 = 20.88$ kHz see plots on page 87 to 88 of the test report.

The measurements are performed with voltages minimum (6.0Vdc). Nominal(7.2Vdc) and maximum (9.1Vdc). The temperature from -30 ° C to +60 ° C, with 10 ° C step.

Requirement:

For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

4.2 Frequency Stability

Para. No.: 90.217(b)

Test Results: Complies

Test Performed By: G.Suwanthakumar

Date of Test: 23 – 26 May 2005

The calculated frequency error in ppm:

FCC1:

	-30 ° C			-20 ° C			-10 ° C		
	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz
6.0Vdc	0.800	0.747	-1.544	0.800	0.747	0.739	0.800	0.440	0.761
7.2Vdc	0.778	0.747	-1.522	0.800	0.747	0.783	0.800	0.440	0.761
9.1Vdc	0.778	0.747	-1.522	0.822	0.747	0.783	0.800	0.659	0.761

	0 ° C			+10 ° C			+21 ° C		
	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz
6.0Vdc	0.244	0.220	0.239	0.222	0.220	0.000	-0.089	0.220	0.217
7.2Vdc	0.267	0.220	0.239	0.222	0.220	0.000	-0.089	0.220	0.217
9.1Vdc	0.267	0.220	0.239	0.222	0.220	0.217	-0.089	0.220	0.217

	+30 ° C			+40 ° C			+50 ° C		
	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz
6.0Vdc	0.222	0.220	0.217	-0.023	-0.220	-0.218	-0.445	-0.440	-0.435
7.2Vdc	0.222	0.220	0.217	-0.245	-0.220	-0.218	-0.445	-0.440	-0.435
9.1Vdc	0.222	0.220	0.217	-0.245	-0.220	-0.218	-0.445	-0.440	-0.435

	+60 ° C		
	450MHz	455MHz	460MHz
6.0Vdc	-0.689	-0.682	-0.674
7.2Vdc	-0.689	-0.682	-0.674
9.1Vdc	-0.689	-0.682	-0.674

FCC2:

	-30 ° C			-20 ° C			-10 ° C		
	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz
6.0Vdc	-1.392	-1.506	-1.873	0.217	0.000	-0.022	0.239	0.220	0.234
7.2Vdc	-1.370	-1.506	-1.852	0.435	0.000	-0.043	0.239	0.220	0.255
9.1Vdc	-1.370	-1.506	-1.852	0.435	0.000	0.000	0.239	0.220	0.234

	0 ° C			+10 ° C			+21 ° C		
	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz
6.0Vdc	0.217	0.215	0.213	0.217	0.215	0.213	0.217	0.215	-2.086
7.2Vdc	0.217	0.215	0.213	0.217	0.216	0.213	0.217	0.215	-2.086
9.1Vdc	0.217	0.215	0.213	0.217	0.215	0.213	0.217	0.215	-2.086

	+30 ° C			+40 ° C			+50 ° C		
	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz
6.0Vdc	0.217	0.215	0.213	-0.435	-0.216	-0.234	-0.218	-0.431	-1.703
7.2Vdc	0.217	0.215	0.213	-0.435	-0.216	-0.234	-0.218	-0.431	-1.703
9.1Vdc	0.217	0.215	0.213	-0.435	-0.216	-0.234	-0.218	-0.431	-1.703

	+60 ° C		
	460MHz	465MHz	470MHz
6.0Vdc	-0.261	-1.940	-1.920
7.2Vdc	-0.261	-1.940	-1.920
9.1Vdc	-0.261	-1.940	-1.920

ppm error = ((Measured carrier frequency in MHz/Assigned carrier frequency in MHz) – 1) * 10⁶

f.ex. ppm = ((450.00036/450)-1) *10⁶ = 0.8

The measurements are performed with voltages minimum (6.0Vdc). Nominal(7.2Vdc) and maximum (9.1Vdc). The temperature from -30 ° C to +60 ° C , with 10 ° C step.

The instrument used here is a frequency counter. (An external reference frequency of 10MHz is used.)

Requirement:

Less than or equal to 2.5 ppm

For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

4.3 Peak Power Output (Conducted)

Para. No.: 90.217 (b)

Test Performed By: G.Suwanthakumar

Date of Test: 23 – 26 May 2005

Test Results: Complies

Measurement Data:

Maximum Conducted Peak Output Power (unmodulated carrier frequency), mW

FCC1:

	-30 ° C			+21 ° C			+60 ° C		
	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz	450MHz	455MHz	460MHz
6.0Vdc	3.31	3.24	0.92	8.59	7.59	5.56	11.35	9.04	6.37
7.2Vdc	33.88	27.99	23.12	42.75	38.46	35.61	36.48	31.41	23.60
9.1Vdc	104.71	105.68	105.62	102.56	100	106.23	80.54	73.28	57.81

FCC2:

	-30 ° C			+21 ° C			+60 ° C		
	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz	460MHz	465MHz	470MHz
6.0Vdc	1.95	1.99	1.28	4.37	3.91	2.64	5.42	5.58	3.12
7.2Vdc	21.97	22.08	14.99	22.13	20.61	15.42	17.06	16.18	11.38
9.1Vdc	65.77	83.75	68.70	58.48	64.86	49.32	38.82	43.25	30.55

Please see the plots for FCC1 in from page 14 to 47.

Please see the plots for FCC2 in from page 48 to 72.

The measurements are performed with voltages minimum (6.0Vdc). Nominal(7.2Vdc) and maximum (9.1Vdc). The temperature from -30 ° C to +60 ° C , with 10 ° C step.

Requirement:

Less than 120 milliWatts (+20.792 dBm)

For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier

4.4 Spurious emissions (conducted & radiated)

Para. No.: 90.217 (b) , 15 B & 2.1053 (a)

Test Performed By: G.Suwanthakumar

Date of Test: 23 – 26 May 2005

Test Results: Complies

Measurement Data:

Conducted:

The measured 2nd and 3rd harmonics are over 50 dB below the out-put power. And none other spurious detected between 9kHz to 5GHz.

940 MHz (2 nd harmonic)	-69.31 dBm
1,41GHz (3 rd harmonic)	-80.06 dBm
Between 1.41 to 5 GHz	None detected
9kHz to 940 MHz	None detected

Please see page 75 to 76 for plots.

Radiated spurious emission (50 ohm load):

The measurements are performed from 30MHz to 5 GHz and detected spurious at 1.349GHz is over 40 dB below the out-put power. And none other radiated spurious detected between 30MHz to 5 GHz.

30MHz to 1.3 GHz	None detected
1.349 GHz	-60 dBm
1.4 GHz to 5 GHz	None detected

Please see page 77 to 81 for plots.

Radiated spurious emission (integral antenna):

30MHz to 5 GHz	None detected
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Please see page 82 to 84

Radiated spurious emission in receiver mode:

30MHz to 5GHz	None detected
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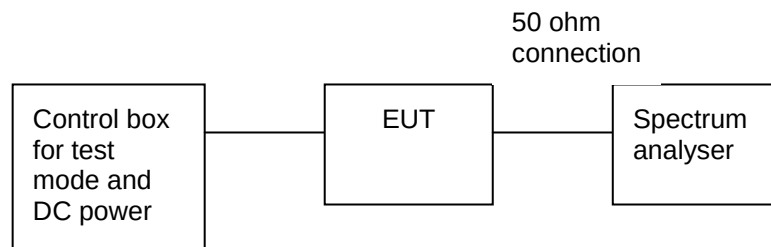
5 LIST OF TEST EQUIPMENT

To facilitate inclusion of the test equipment used for related tests on each page, each item is numbered by the test house.

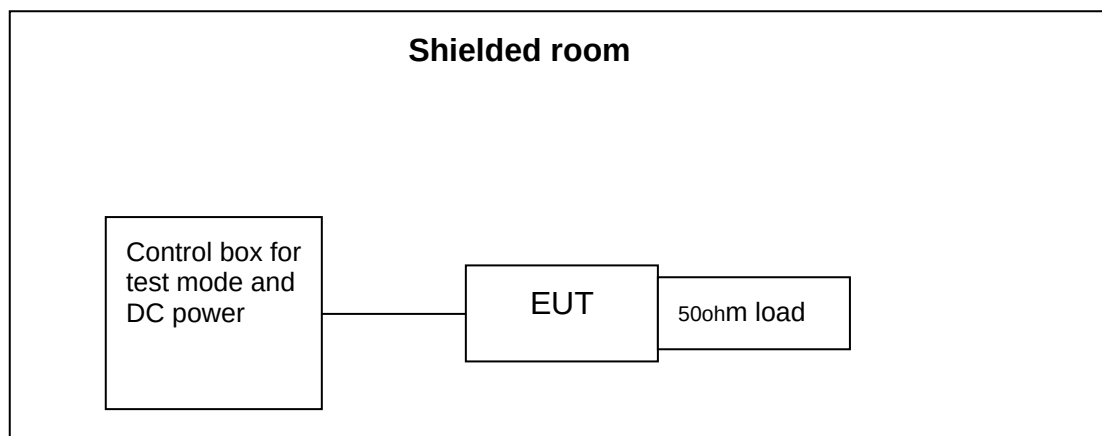
No.	Instrument/ancillary	Type of instrument/ancillary	Manufacturer	Ref. no.
1.	FSEK	Spectrum Analyzer	Rohde & Schwarz	LR 1337
2.	ESAI	Spectrum Analyzer	Rohde & Schwarz	LR 1090
3.	3115	Antenna horn	EMCO	LR 1330
4.	PM7320X	Antenna horn	Siverts lab	LR 103
5.	DBF-520-20	Antenna horn	Systron Donner	LR 101
6.	638	Antenna horn	Narda	LR 098
7.	8449B	Amplifier	Hewlett Packard	LR 1322
8.	959C	Printer	Hewlett Packard	LR 1414
9.	HFH2-Z2	Antenna loop	Rohde and Schwarz	LR 285
10.	10855A	Amplifier	Hewlett Packard	LR 1445
11.	HL223	Antenna log.per	Rohde & Schwarz	LR 1261
12.	3104C	Antenna biconical	EMCO	LR 1262
13.	R3271	Spectrum Analyzer	Advantest	LR 1123
14.	ESN	Test Receiver	R&S	LR1237
15.	HP6032A	Power Supply, program.	HP	1062
16.	5VF2000/400	Filter Band Pass	Texn	042
17.	5VF1000/2000	Filter Band Pass	Trilithic	1174
18.	643	Antenna Horn	Narda	93
19.	642	Antenna Horn	Narda	220
20.	PM 7320X	Antenna Horn	Sivers	102
21.	DBF-520-20	Antenna Horn	Systron	100

6 BLOCK DIAGRAM

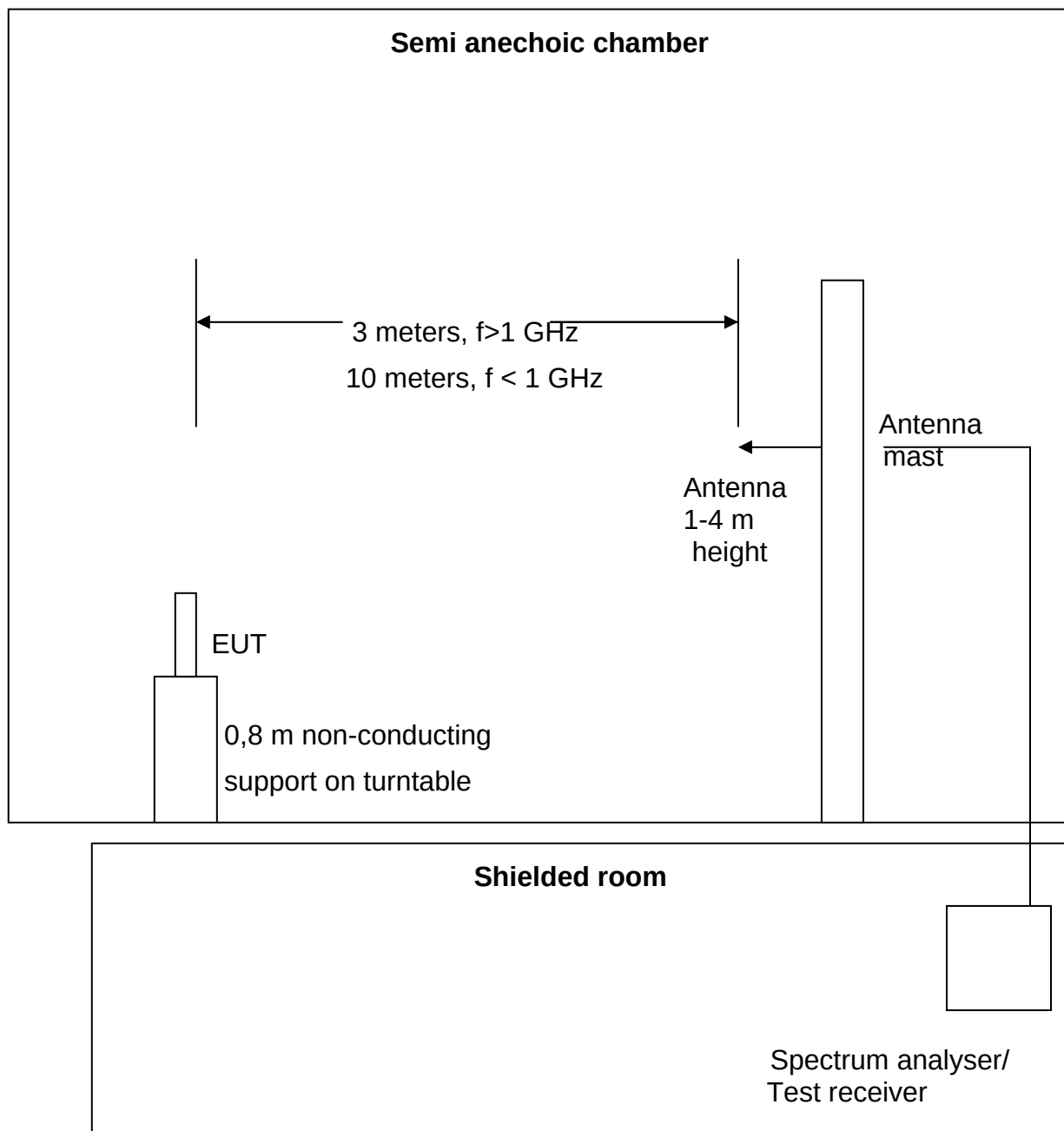
6.1 System set up (Conducted measurements)

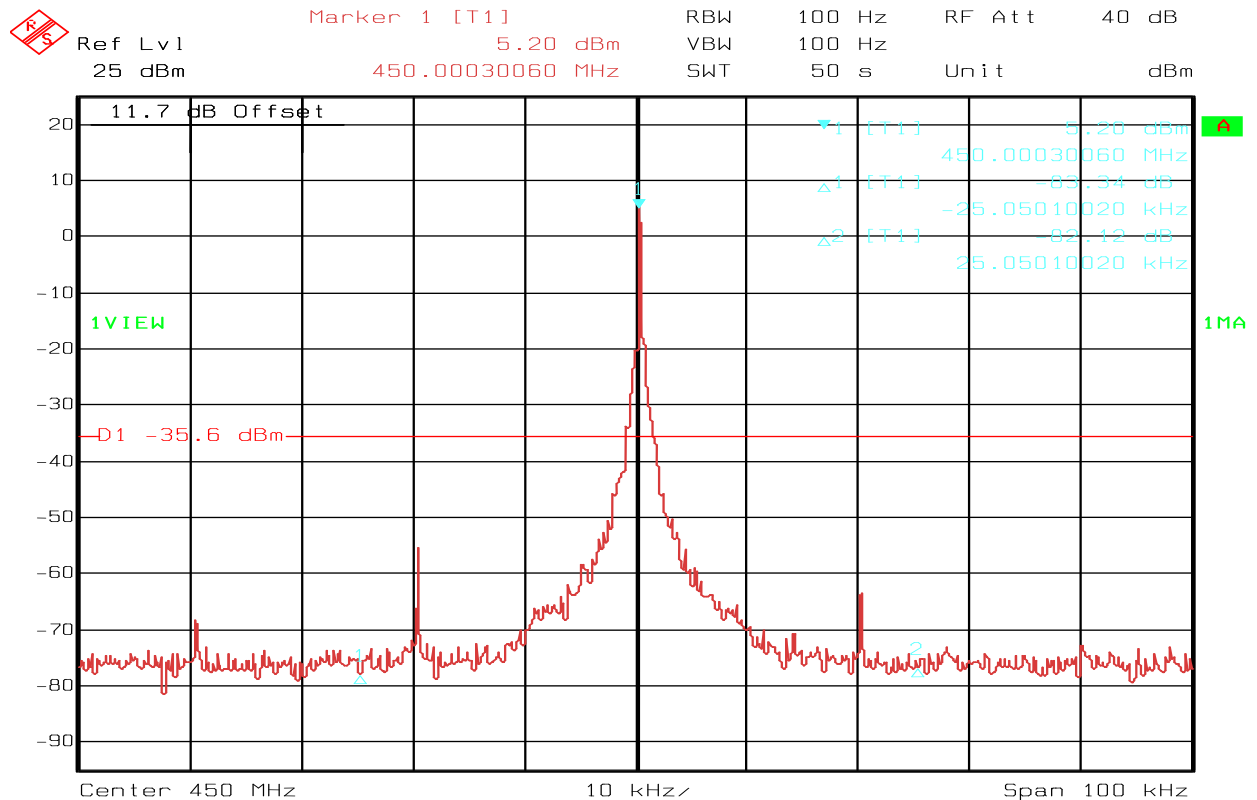


6.2 Radiated Emissions (with 50 ohm load)



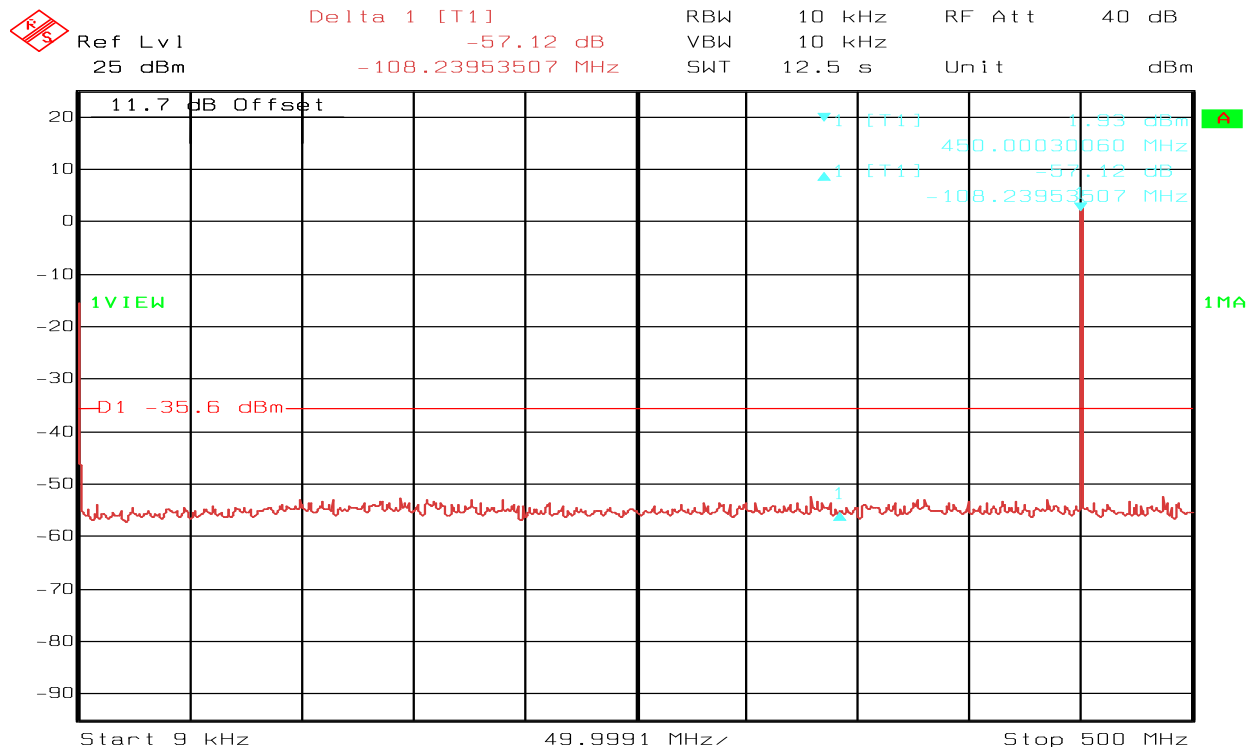
6.3 Test Site Radiated Emission





Date: 23.MAY.2005 15:03:29

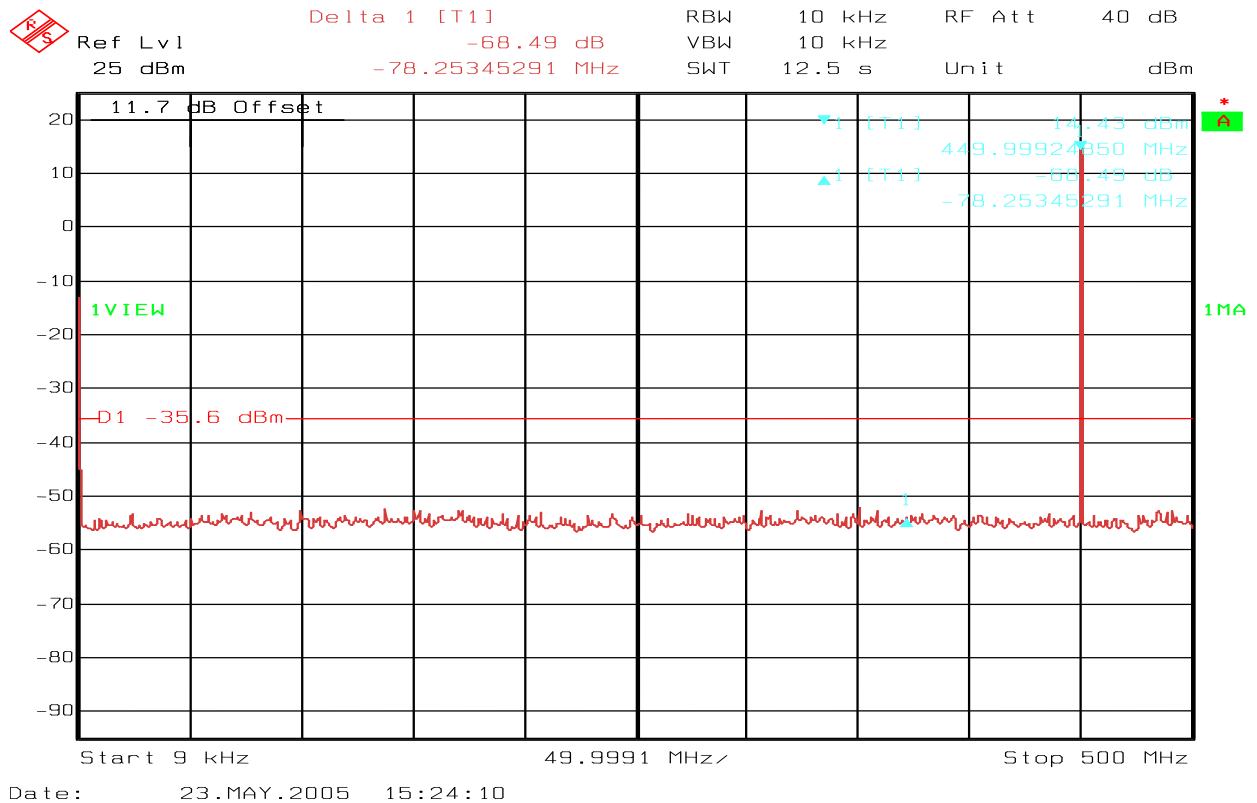
FCC1 - -30 °C , 6.0Vdc - Lower frequency 450MHz – conducted power +5.2 dBm



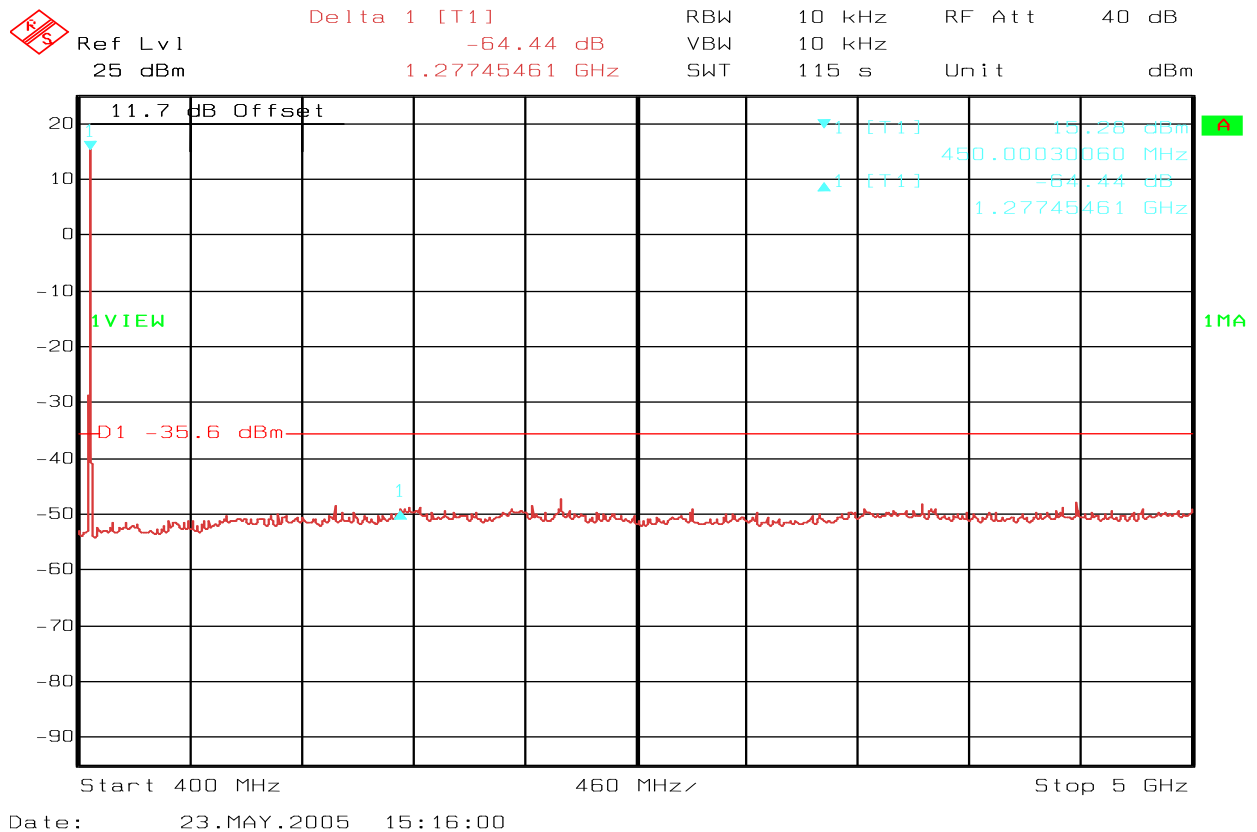
Date: 23.MAY.2005 15:07:49

FCC1 - -30 °C , 6.0Vdc - Lower frequency 450MHz – Scan from 9kHz to 500MHz

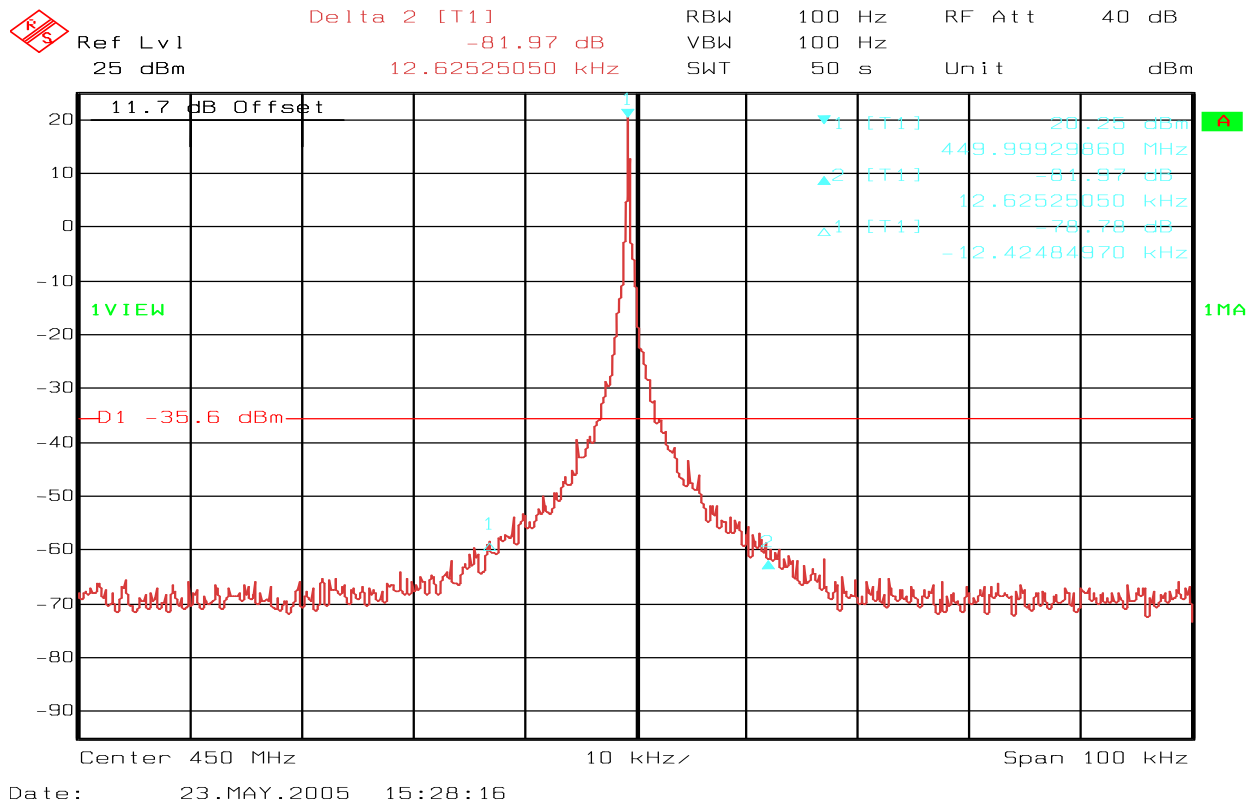




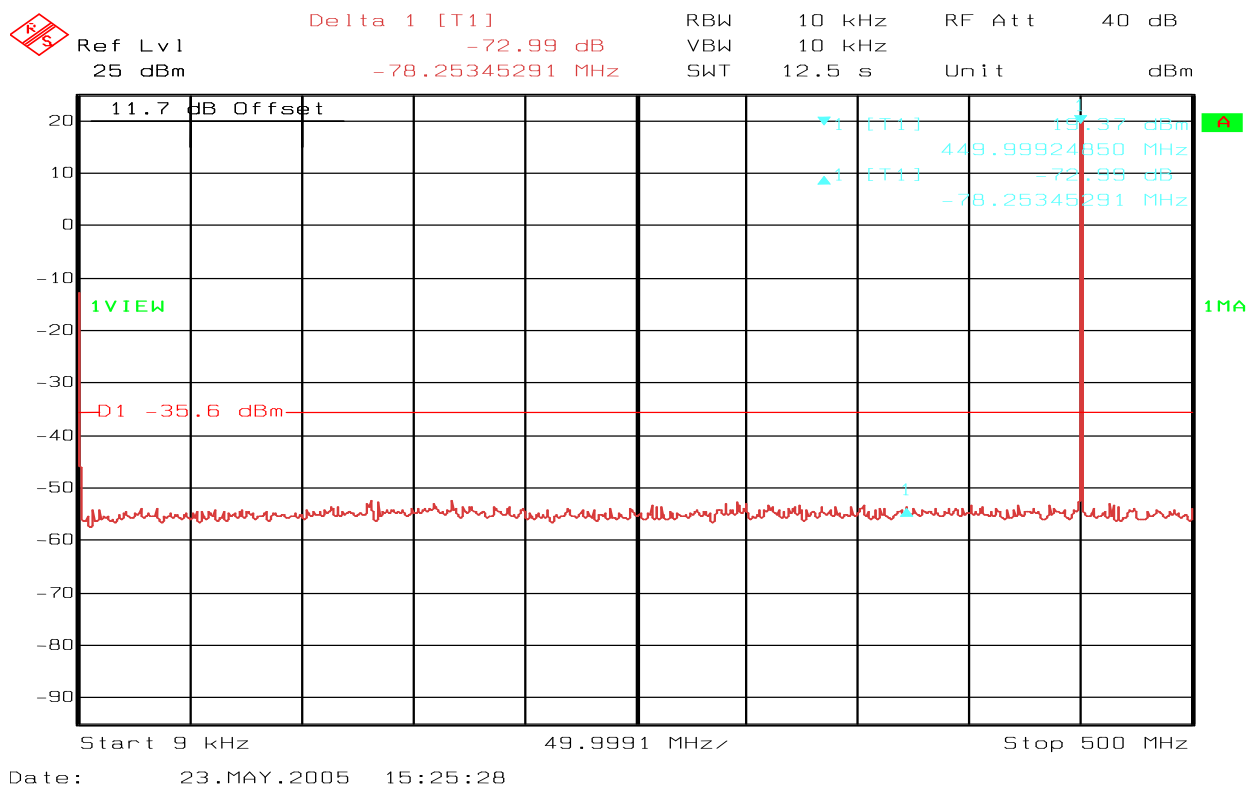
FCC1 - -30 °C , 7.2Vdc - Lower frequency 450MHz – scan from 9kHz – 500MHz



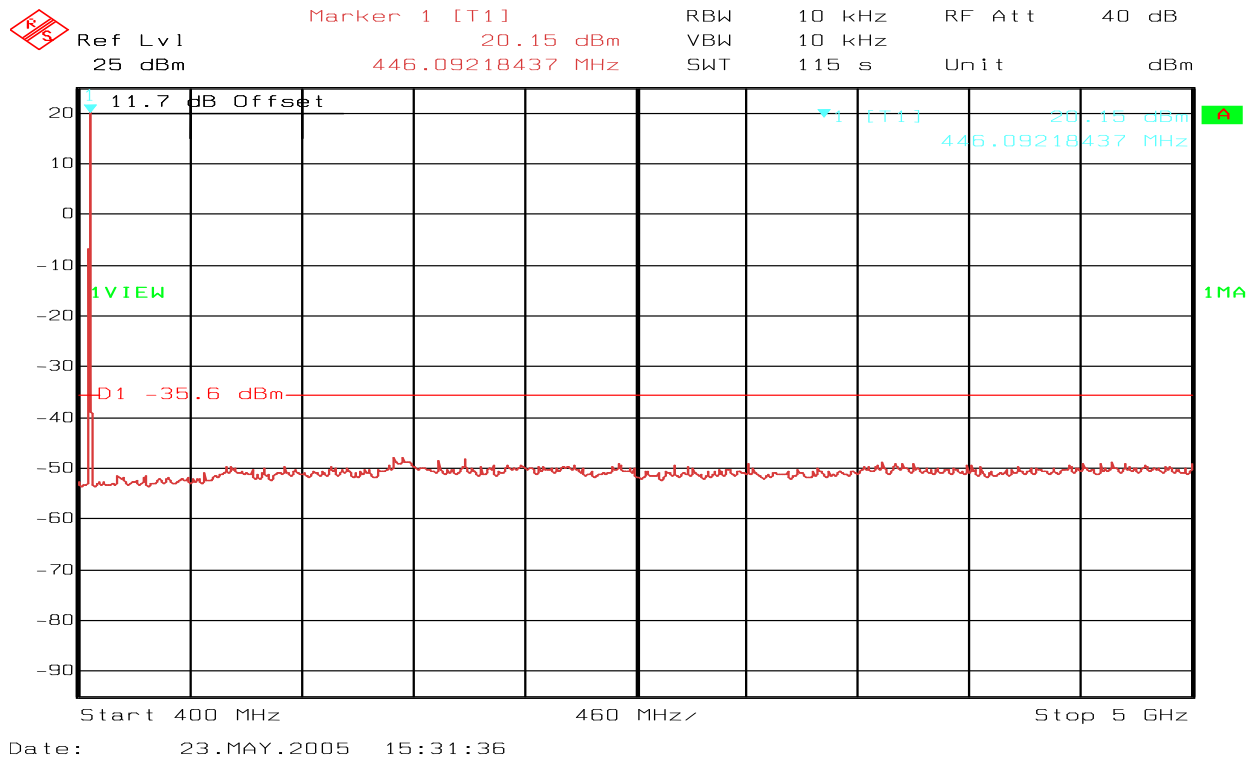
FCC1 - -30 °C , 7.2Vdc - Lower frequency 450MHz – scan from 400 MHz to 5GHz



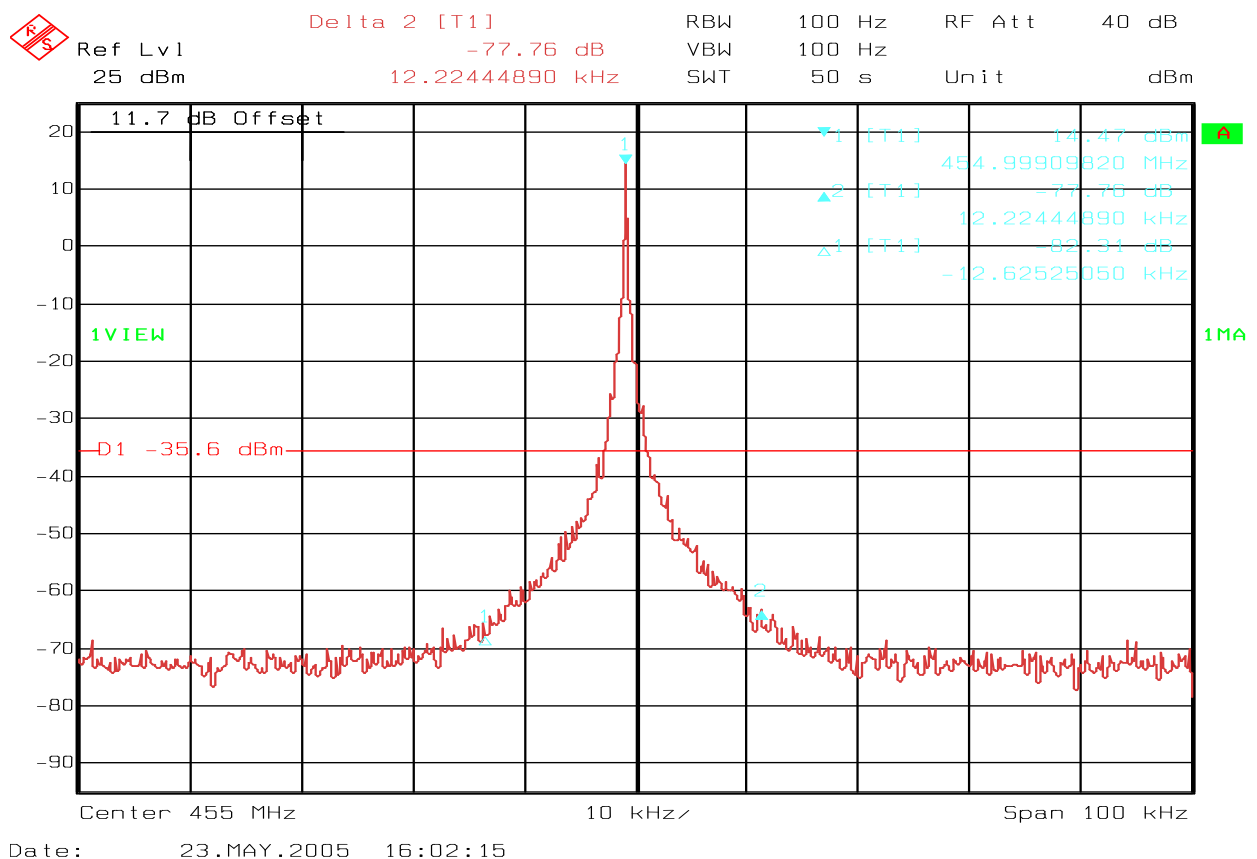
FCC1 - -30 °C , 9.1Vdc - Lower frequency 450MHz – conducted power +20.20 dBm



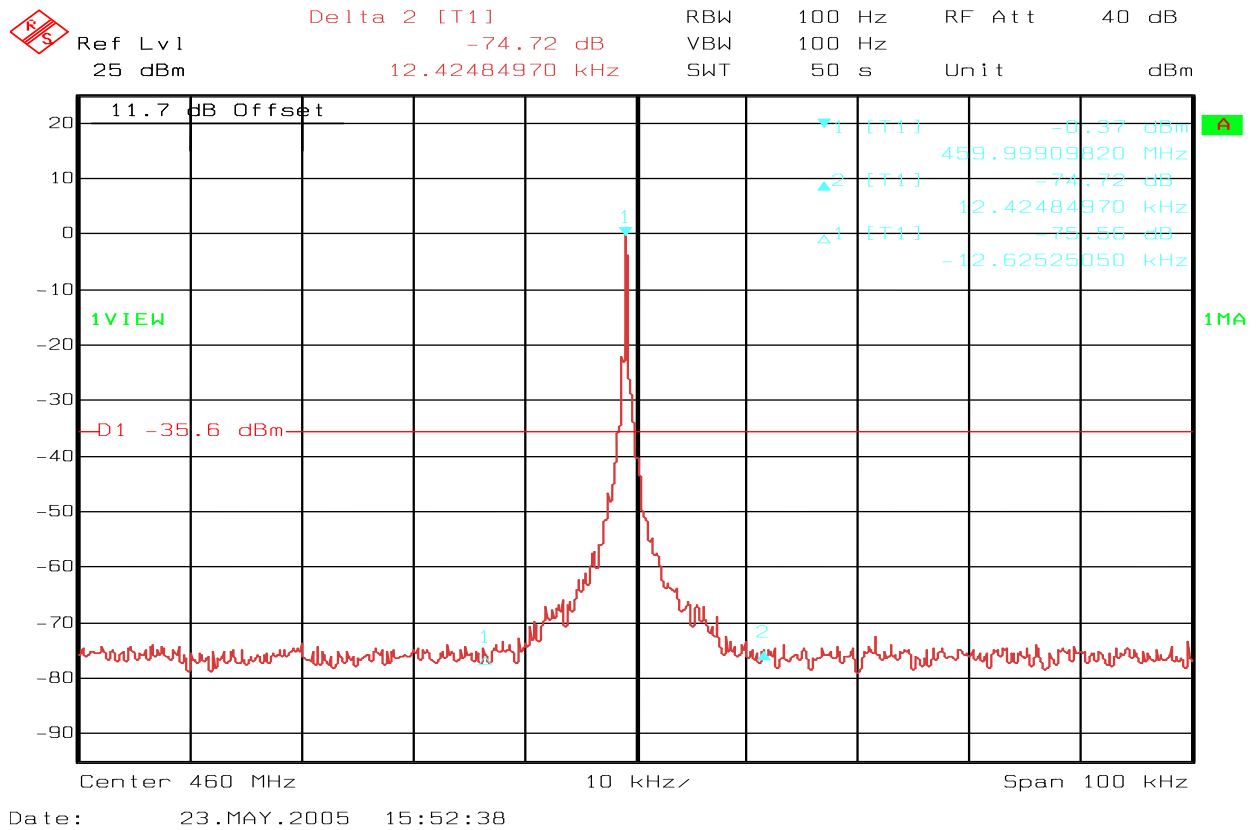
FCC1 - -30 °C , 9.1Vdc - Lower frequency 450MHz – scan 9kHz to 500MHz



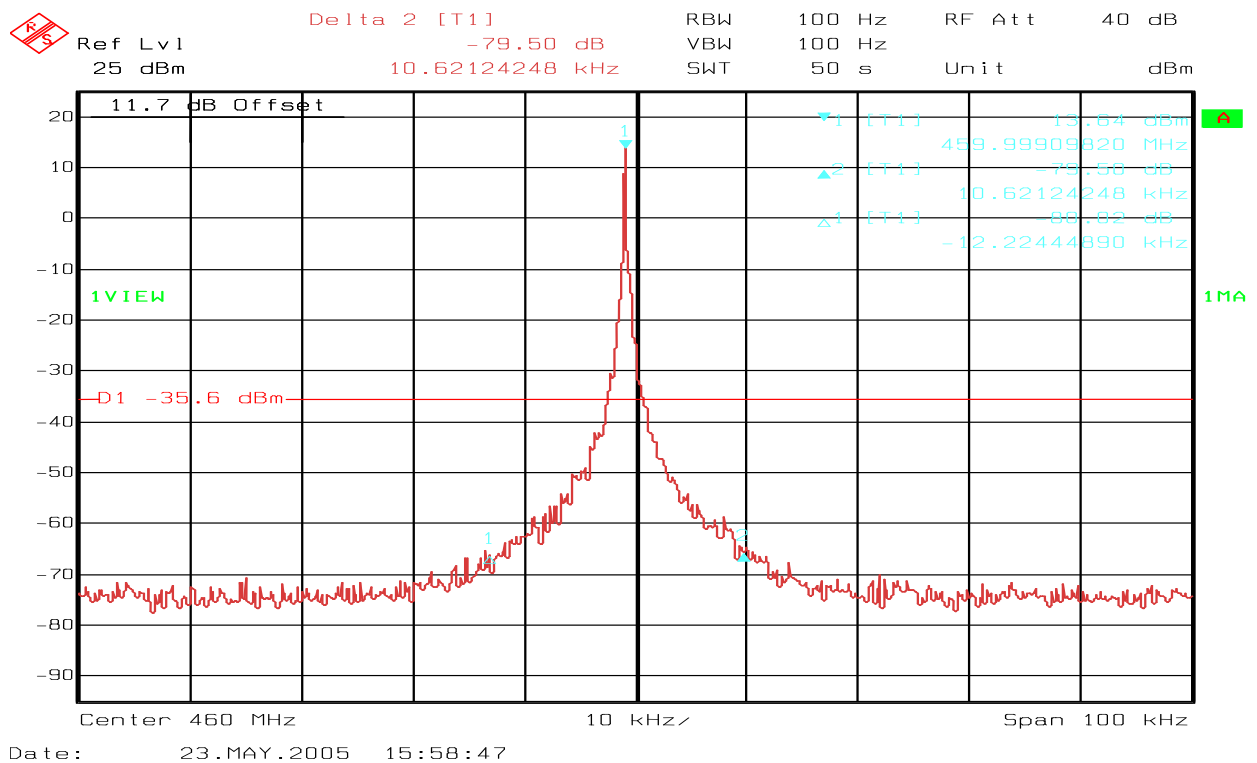
FCC1 - -30 °C , 9.1Vdc - Lower frequency 450MHz – scan 400MHz to 5GHz



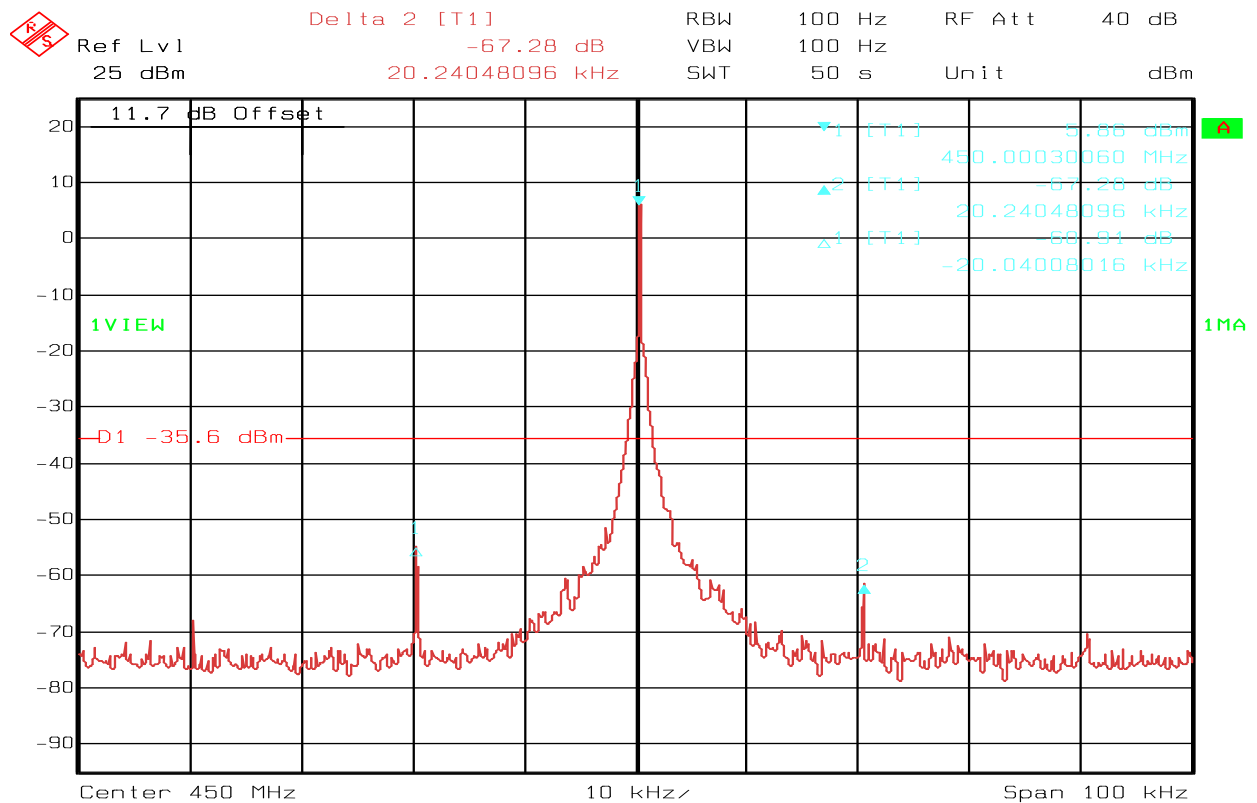
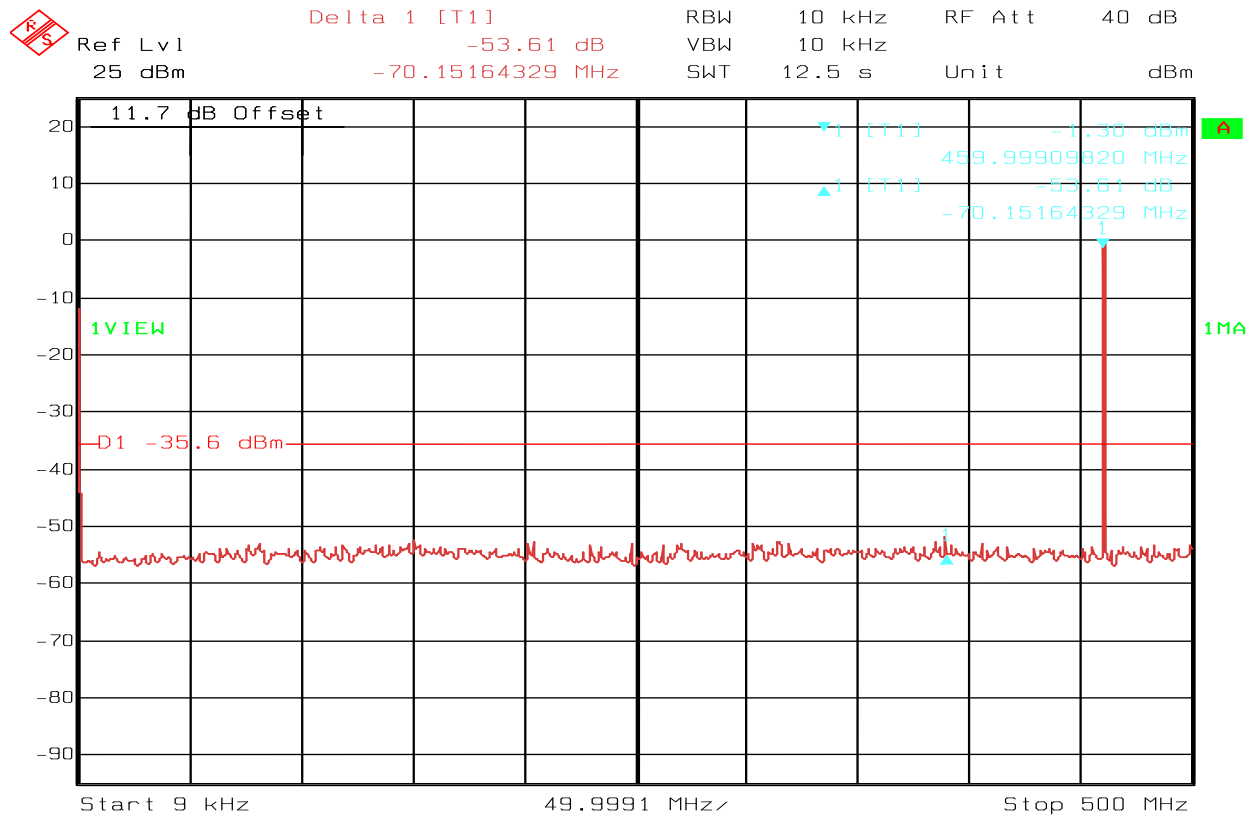
FCC1 - -30 °C , 7.2Vdc - Middele frequency 455MHz – conducted power +14.47 dBm

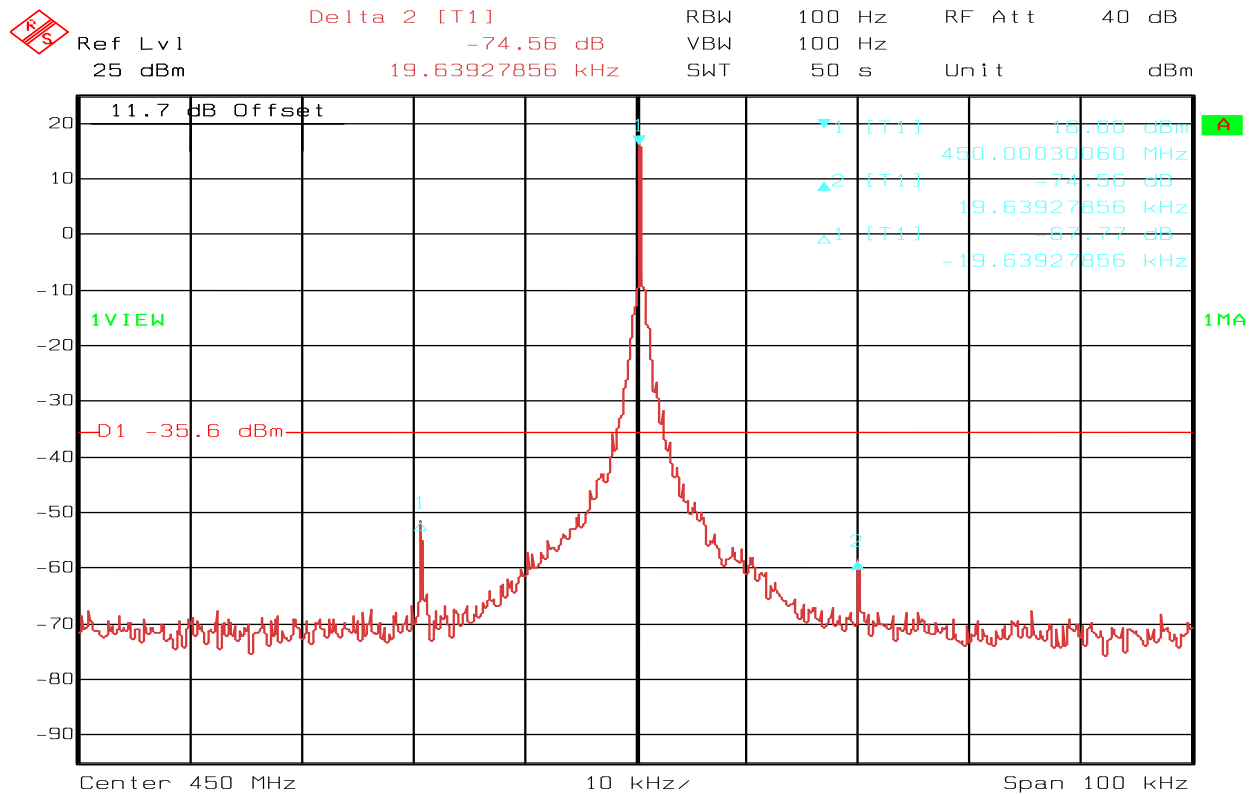


FCC1 - -30 °C , 6.0Vdc - Upper frequency 460MHz – conducted power -0.37 dBm

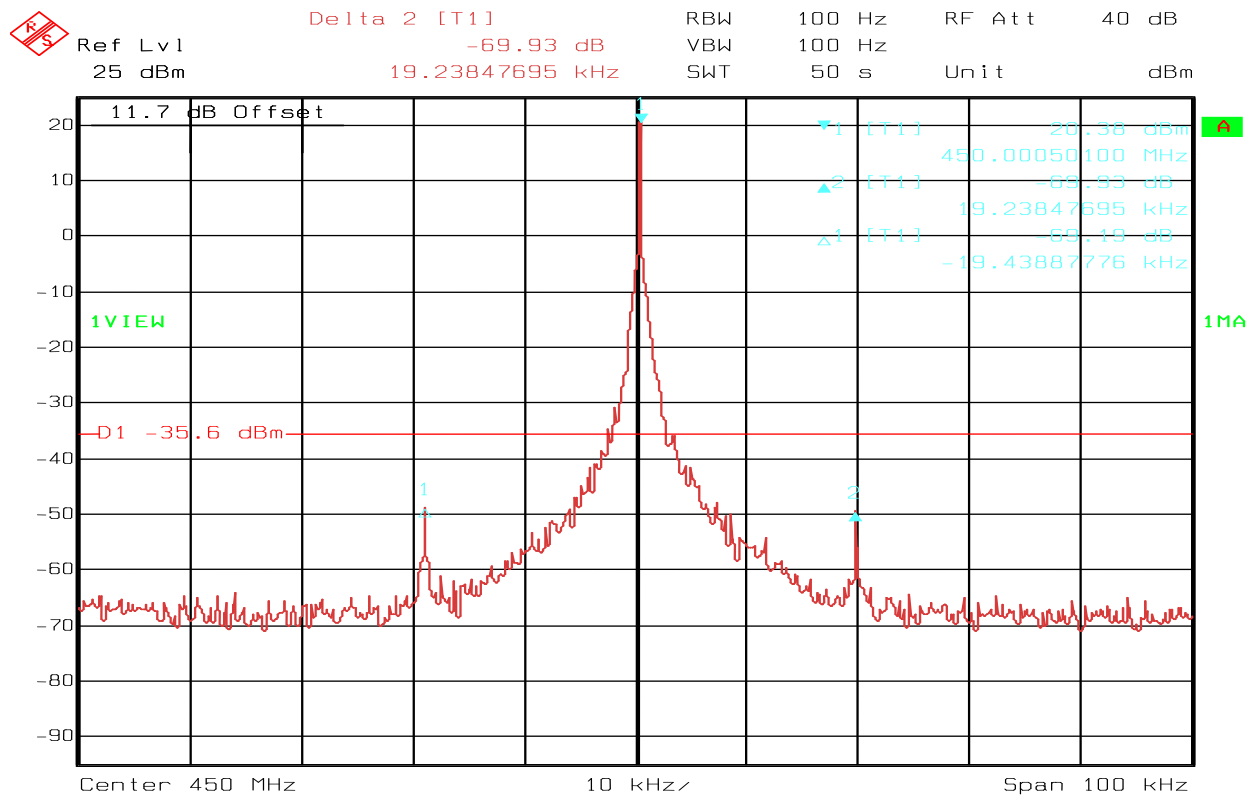


FCC1 - -30 °C , 7.2Vdc - Upper frequency 460MHz – conducted power +13.64 dBm



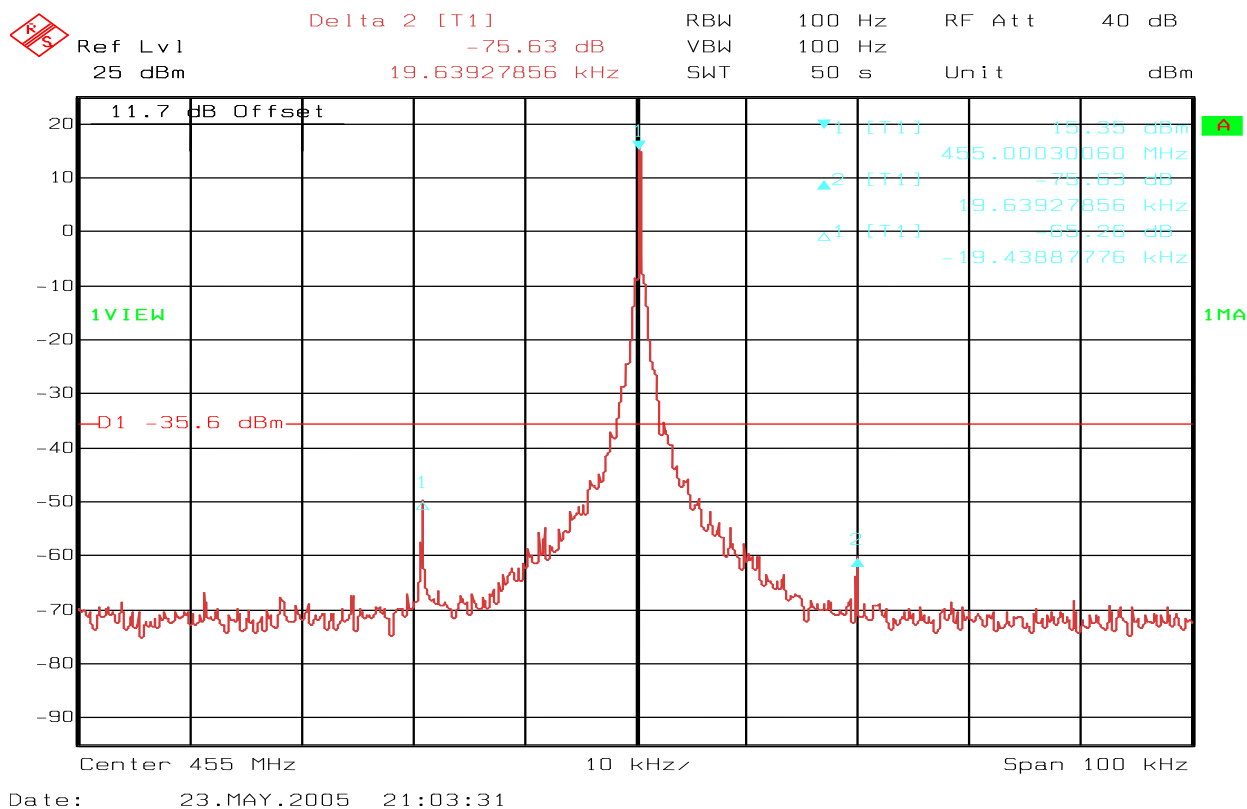
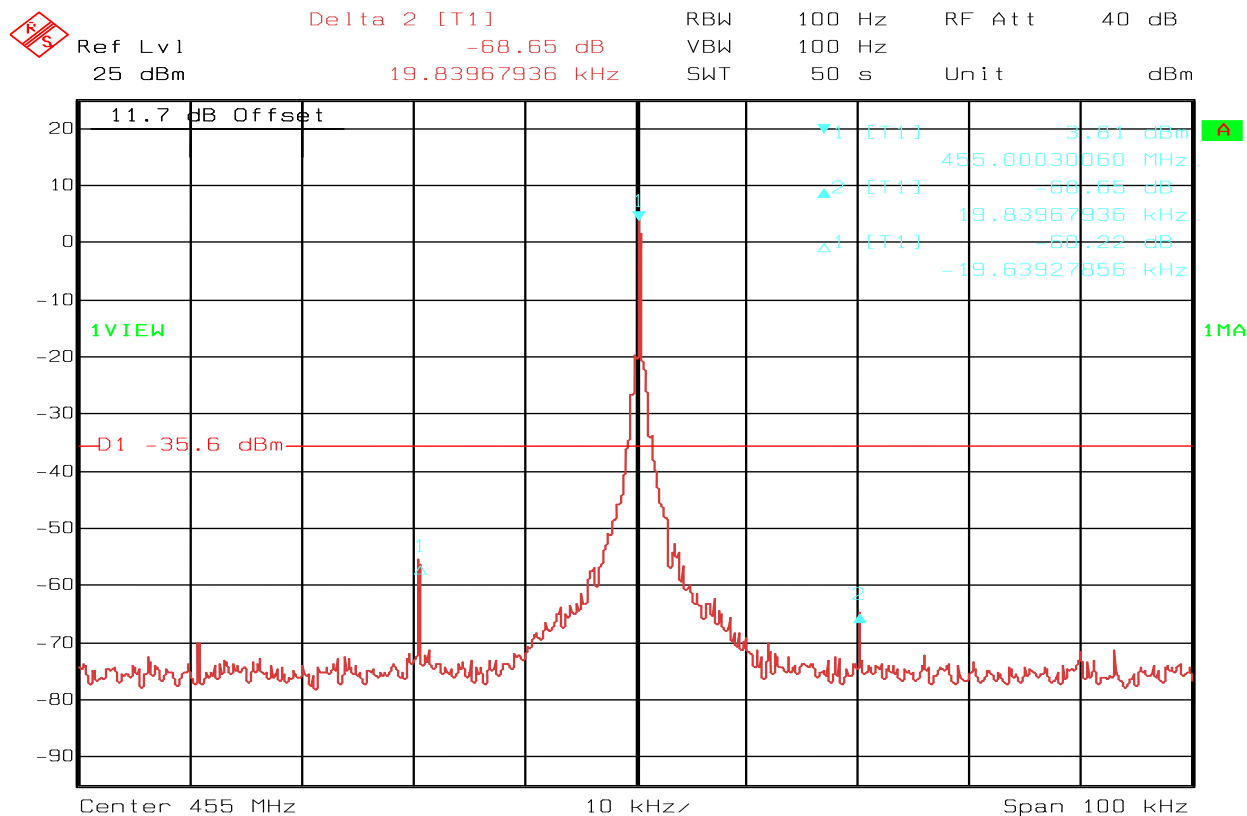


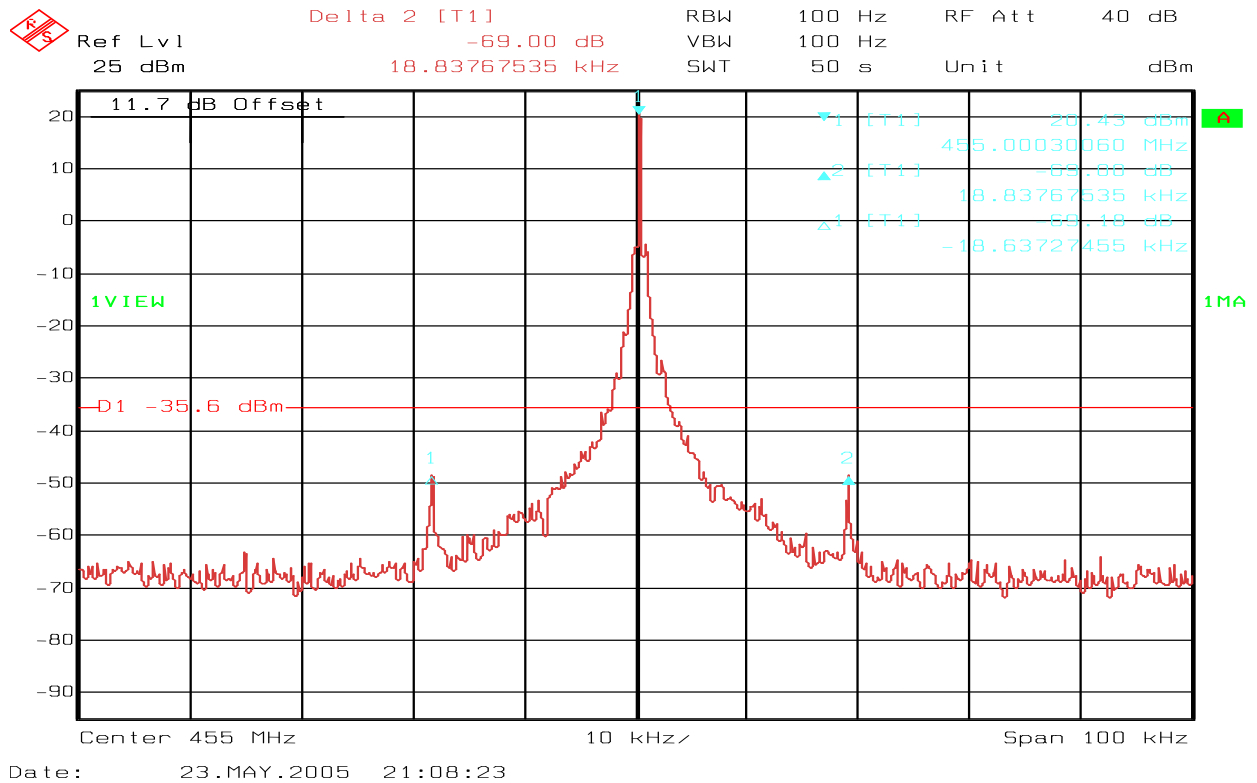
Date: 23.MAY.2005 21:00:39

FCC1 - -20 °C , 7.2 Vdc - Lower frequency 450MHz – conducted power +16.00 dBm

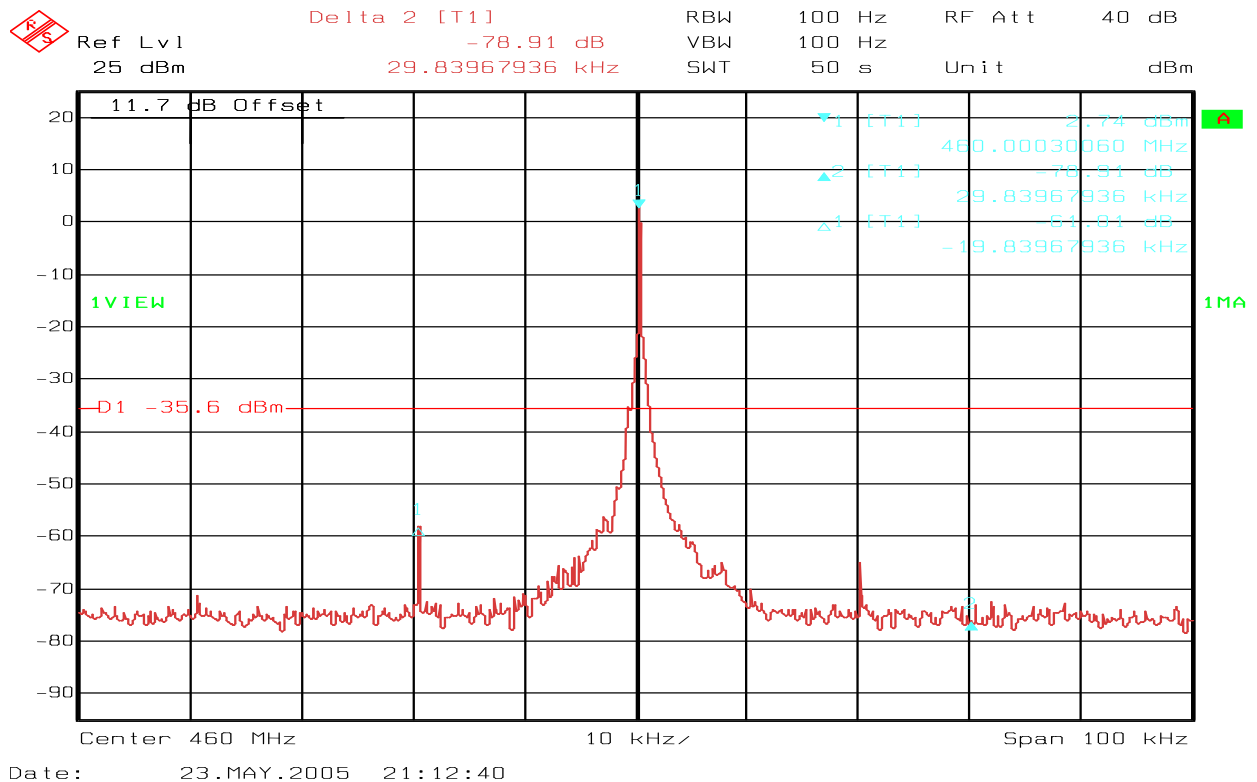
Date: 23.MAY.2005 20:58:19

FCC1 - -20 °C , 9.1Vdc - Lower frequency 450MHz – conducted power +20.38dBm

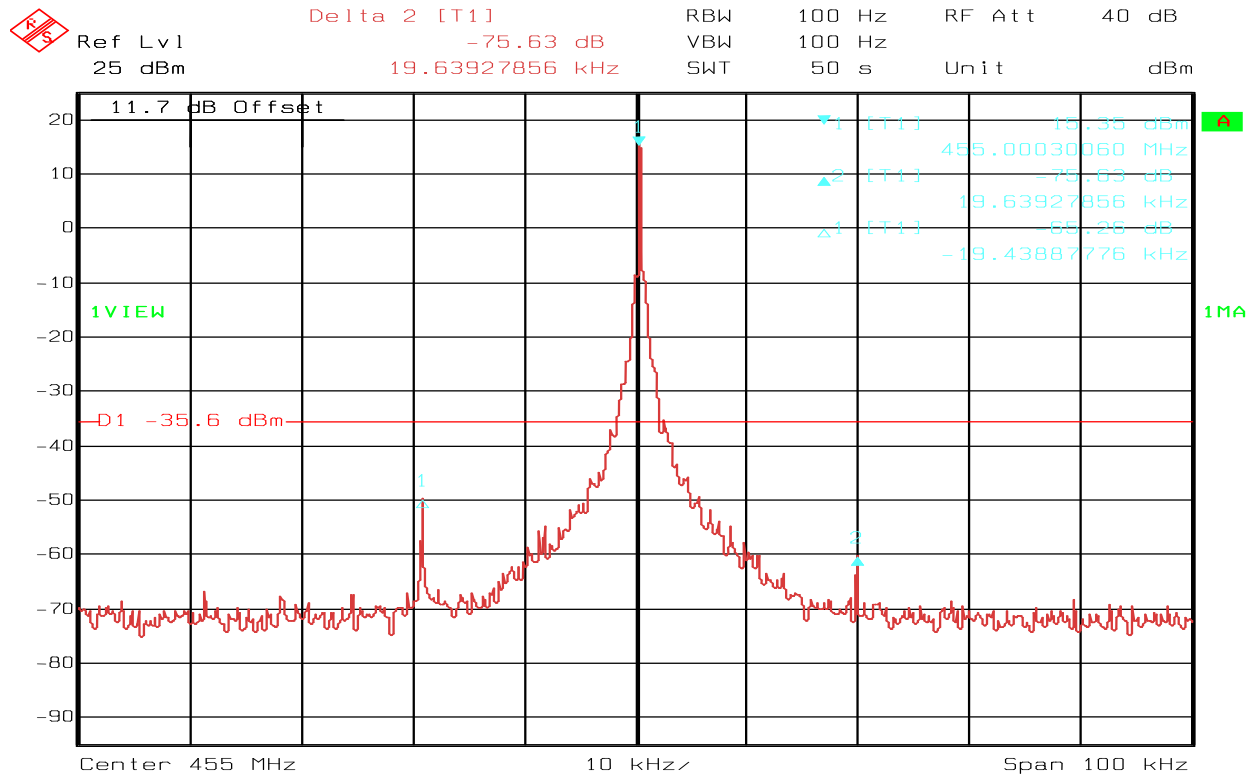




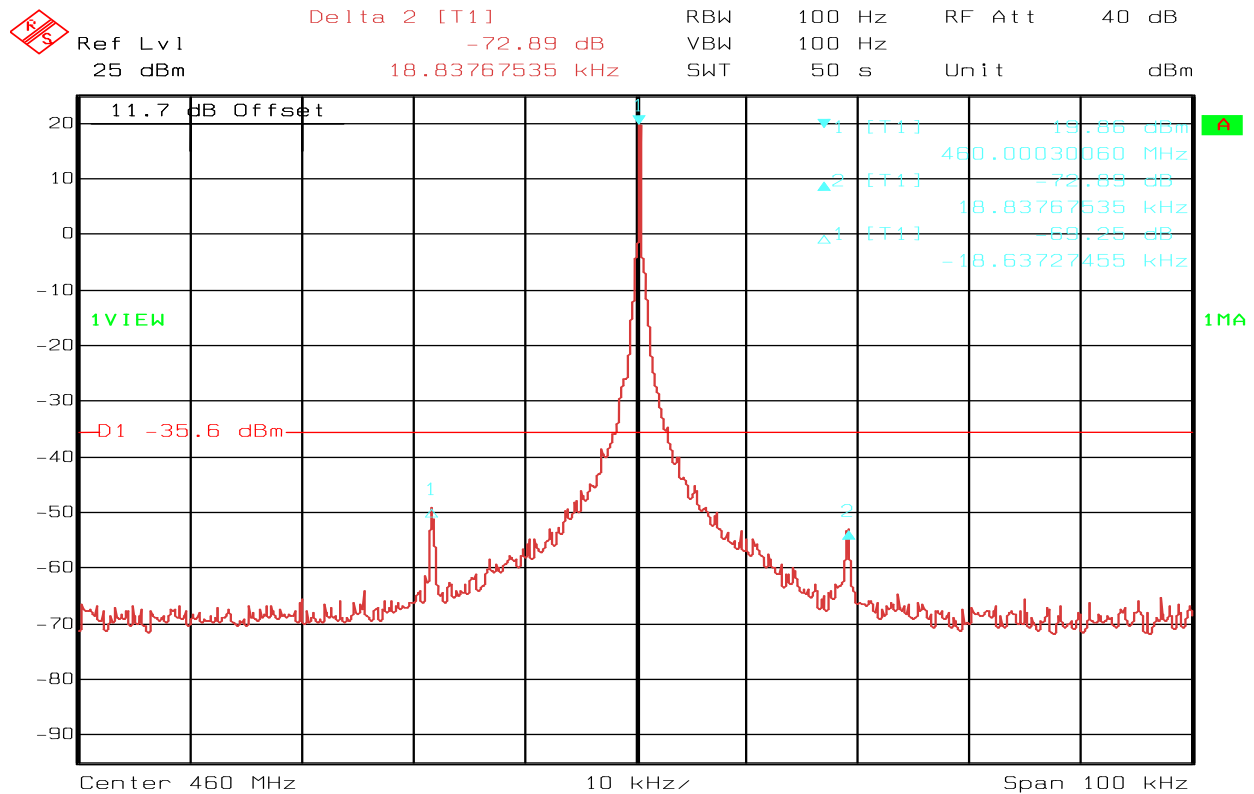
FCC1 - -20 °C , 9.1Vdc - Middle frequency 455MHz – conducted power +20.43 dBm



FCC1 - -20 °C , 6.0Vdc - Upper frequency 460MHz – conducted power +2.74 dBm

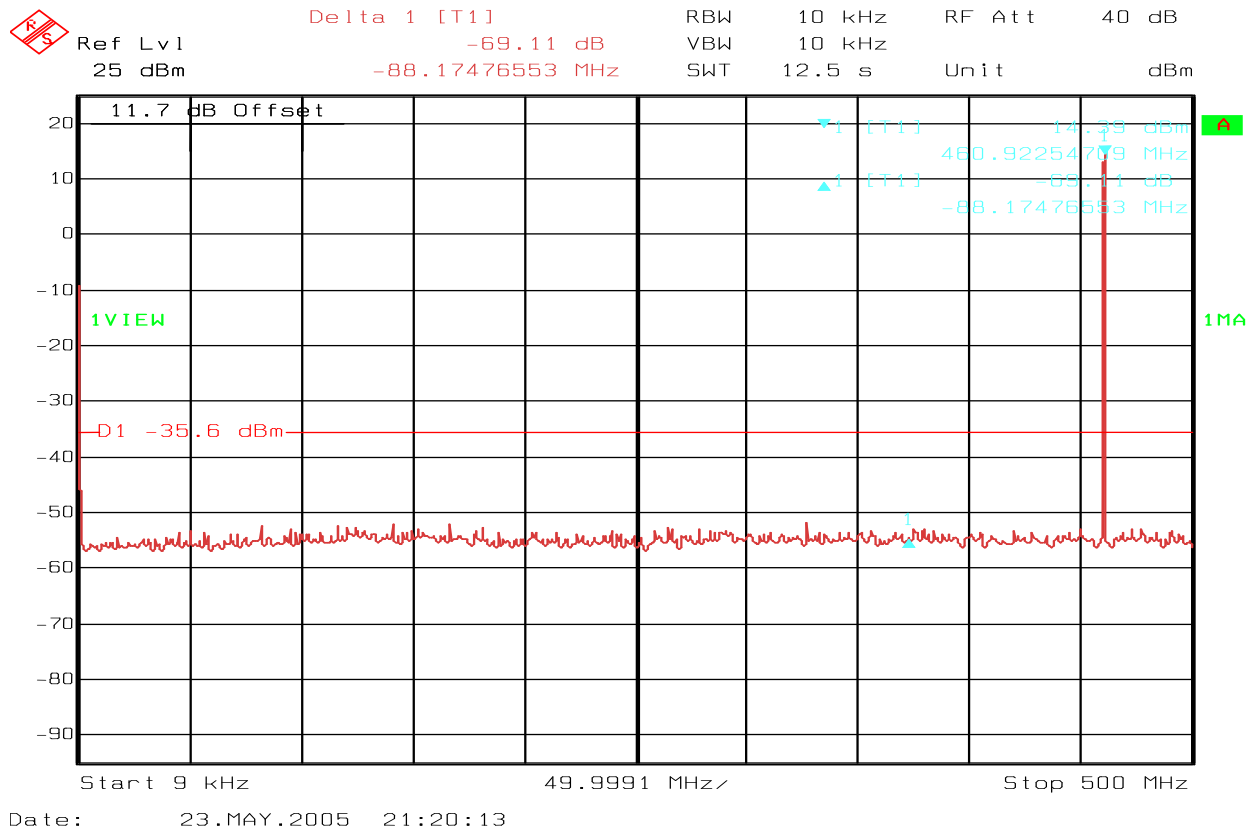
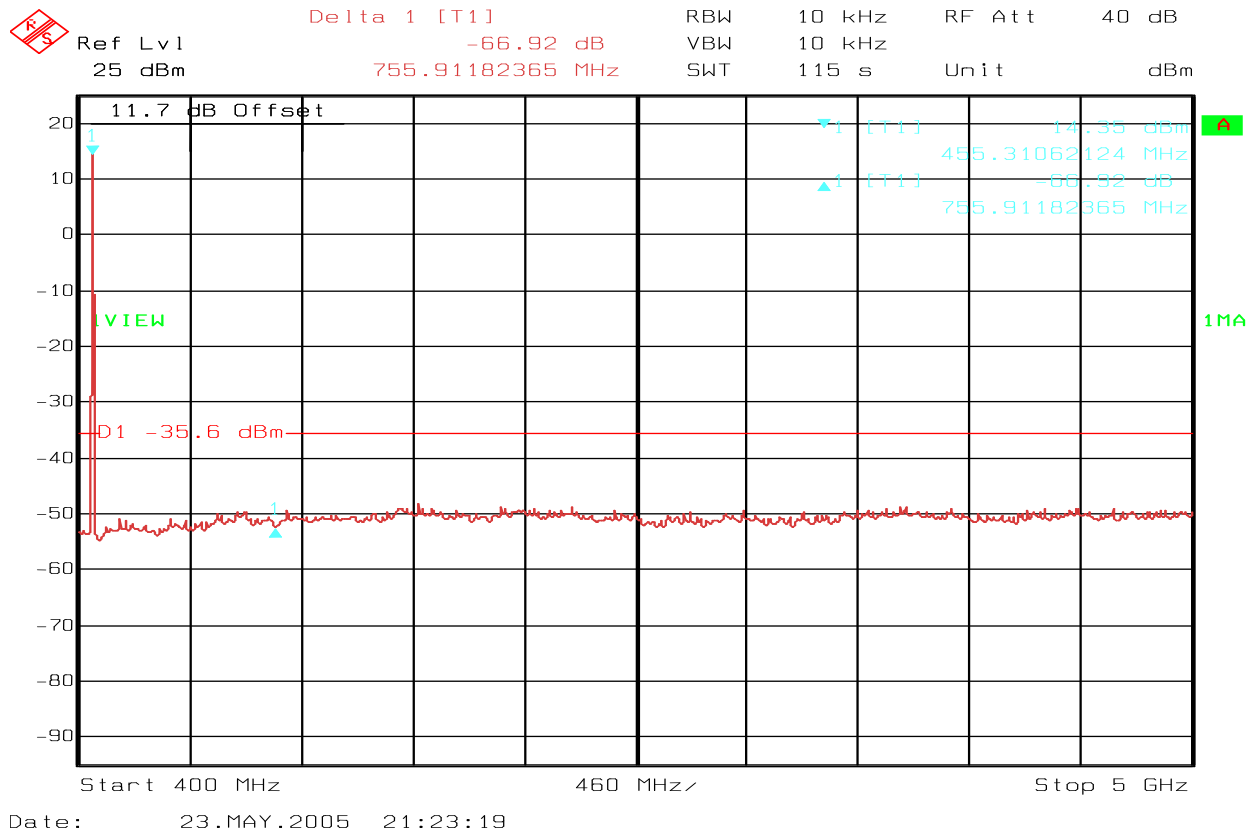


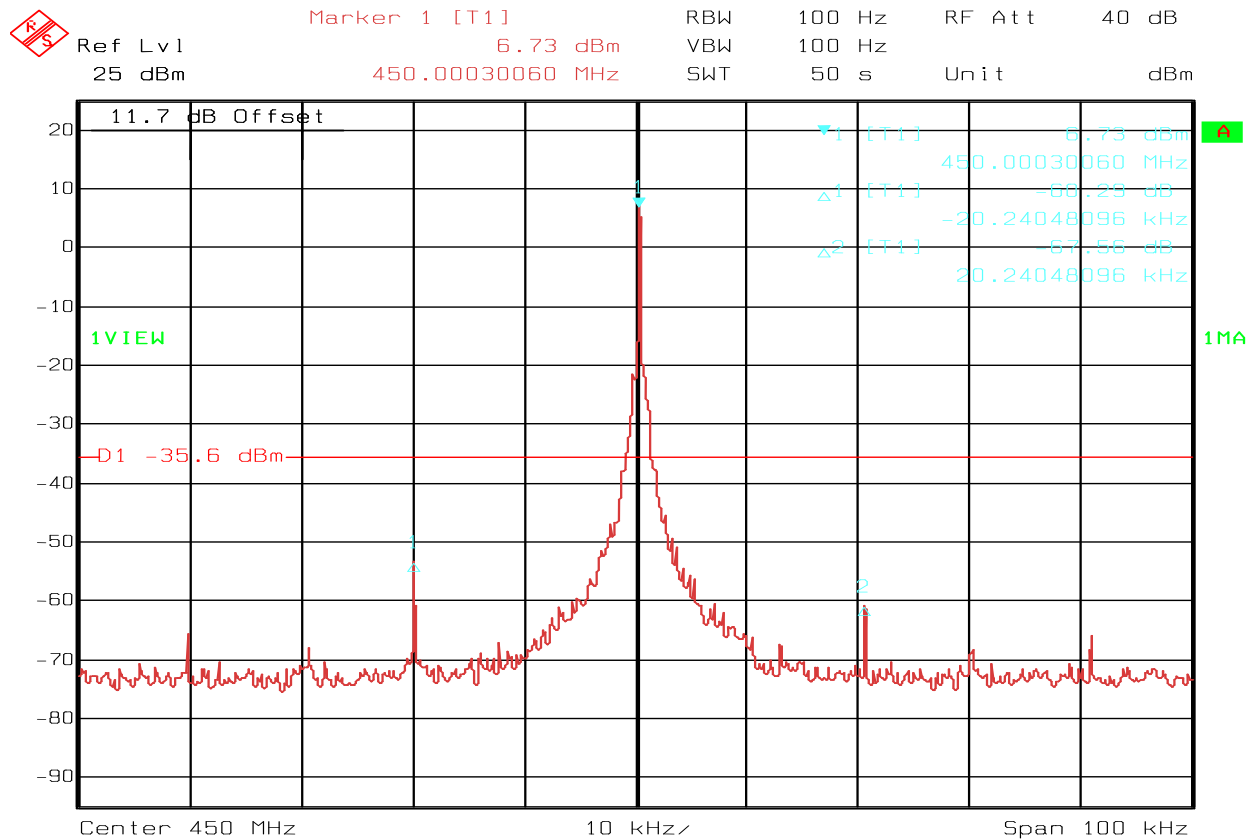
Date: 23.MAY.2005 21:03:31

FCC1 - -20 °C , 7.2Vdc - Upper frequency 460MHz - conducted power +15.35 dBm

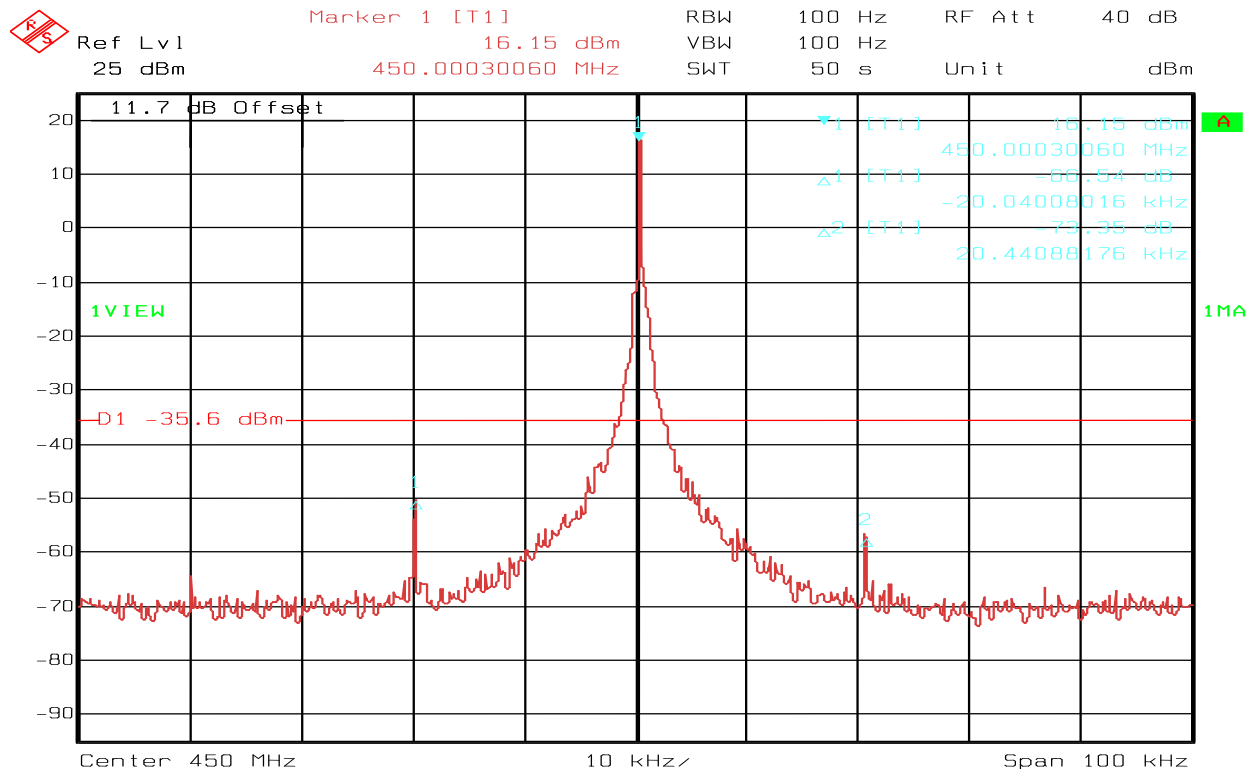
Date: 23.MAY.2005 21:18:26

FCC1 - -20 °C , 9.1Vdc - Upper frequency 460MHz - conducted power +19.86 dBm

**FCC1 - -20 °C , 7.2 Vdc - Upper frequency 460MHz - scan from 9 kHz to 500 MHz****FCC1 - -20 °C , 7.2 Vdc - Upper frequency 460MHz – scan from 400 MHz to 5GHz**

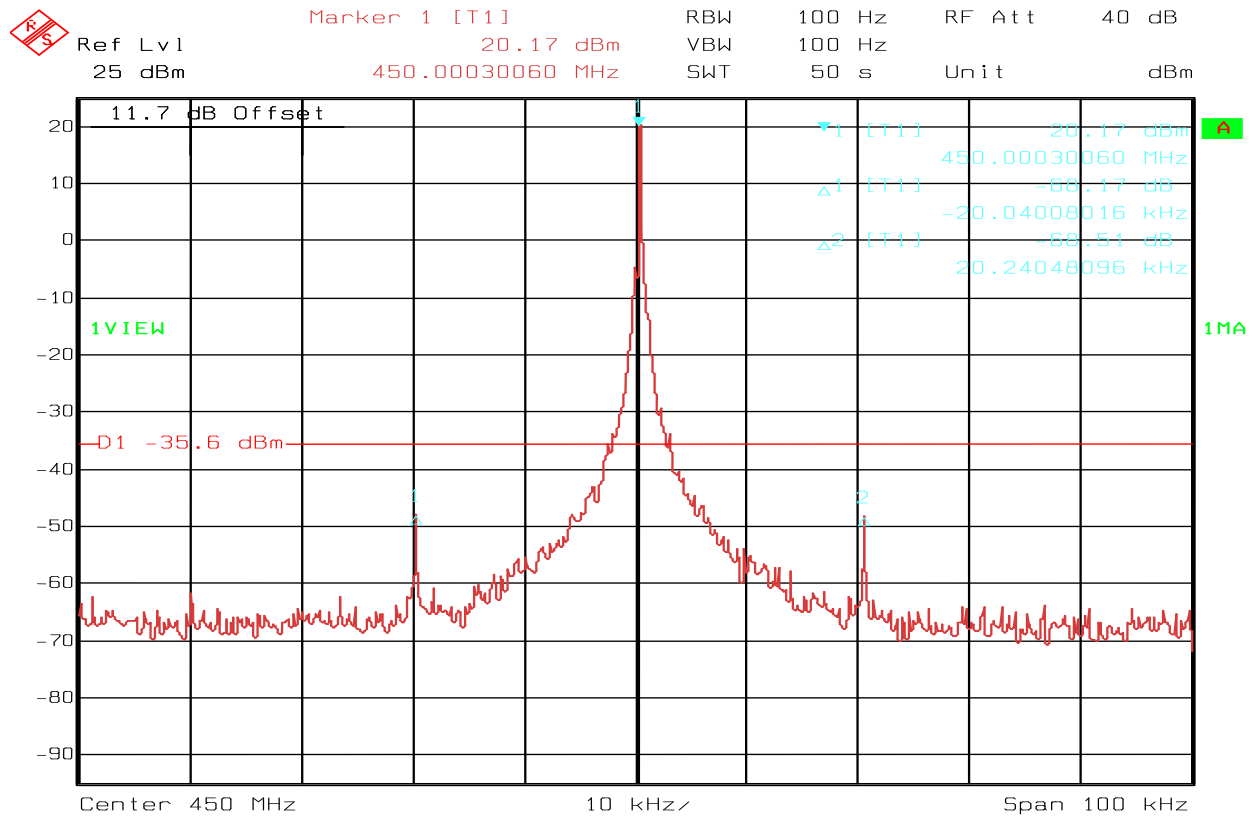


Date: 23.MAY.2005 22:43:07

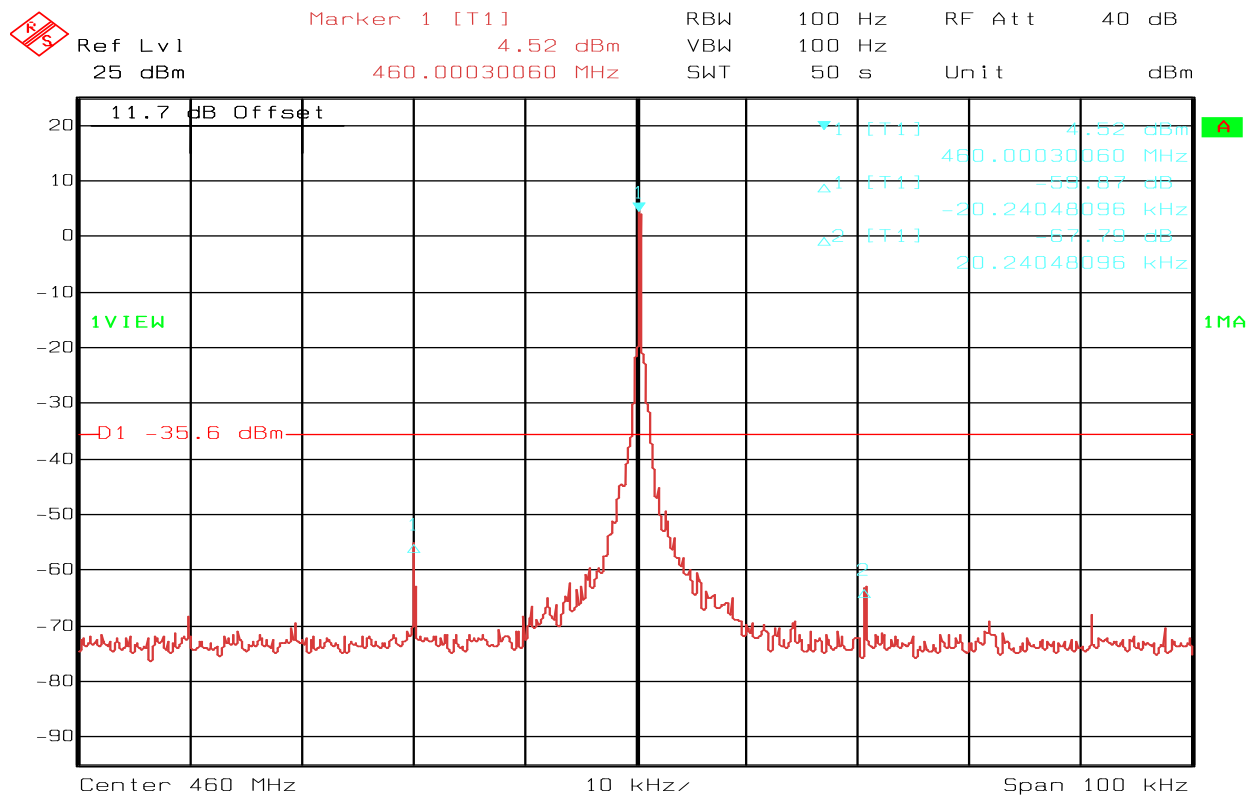
FCC1 - -10 °C , 6.0Vdc - Lower frequency 450MHz - conducted power +6.73 dBm

Date: 23.MAY.2005 22:38:29

FCC1 - -10 °C , 7.2Vdc - Lower frequency 450MHz - conducted power +16.15 dBm

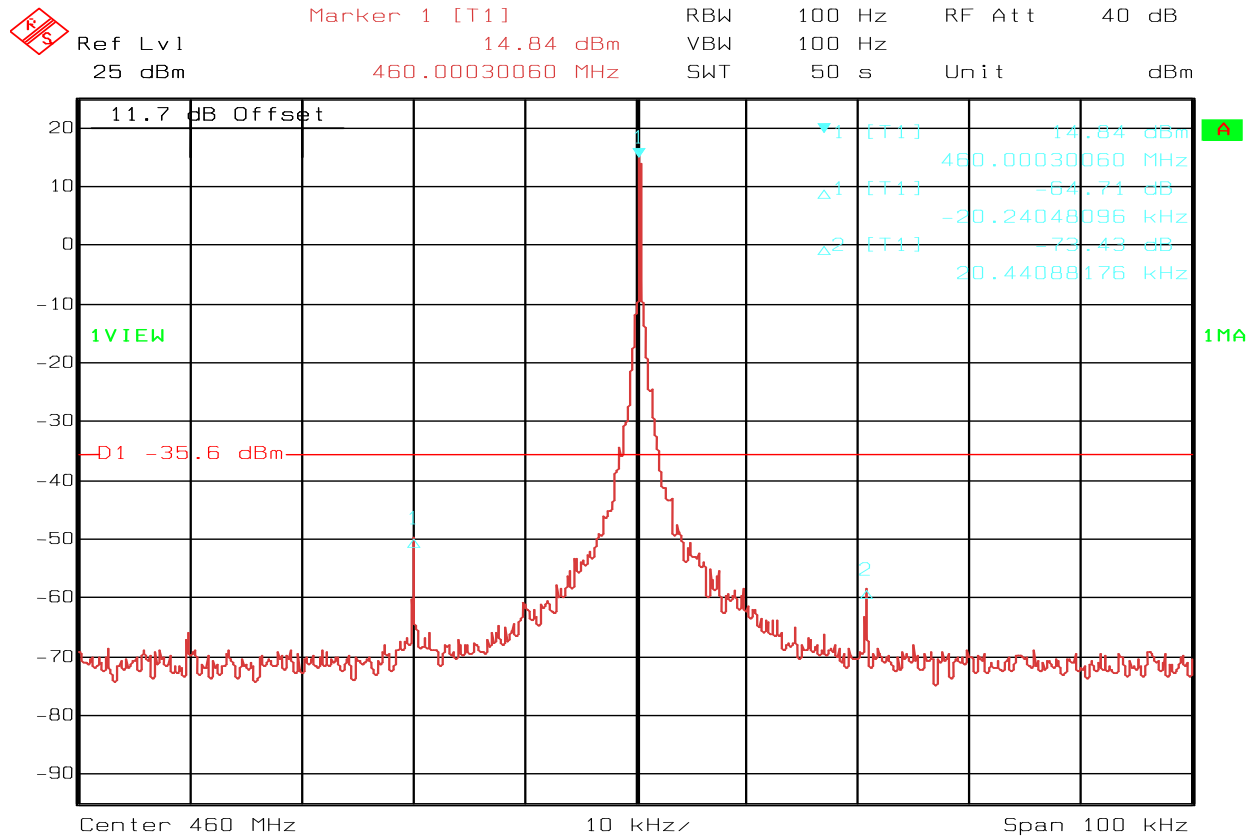


Date: 23.MAY.2005 22:41:19

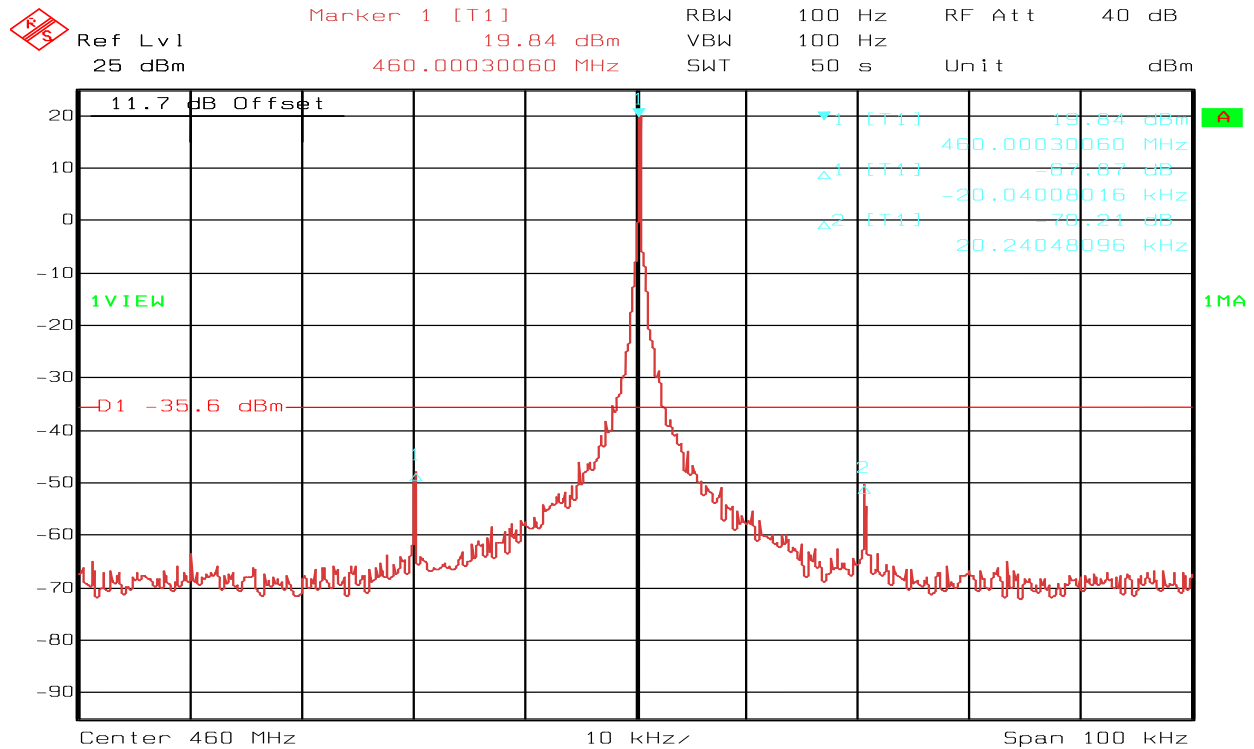
FCC1 - -10 °C , 9.1Vdc - Lower frequency 450MHz - conducted power +20.17 dBm

Date: 23.MAY.2005 22:45:23

FCC1 - -10 °C , 6.0Vdc - Upper frequency 460MHz - conducted power +4.52 dBm

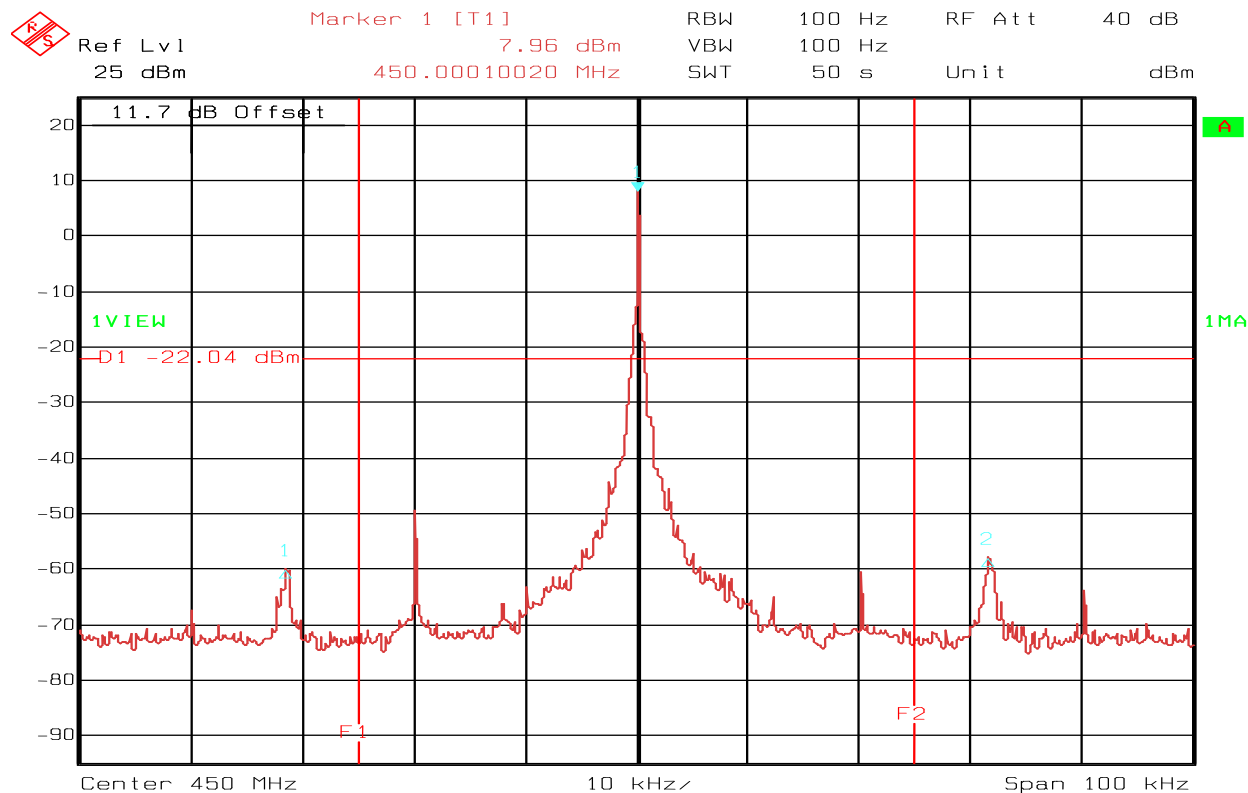


Date: 23.MAY.2005 22:49:38

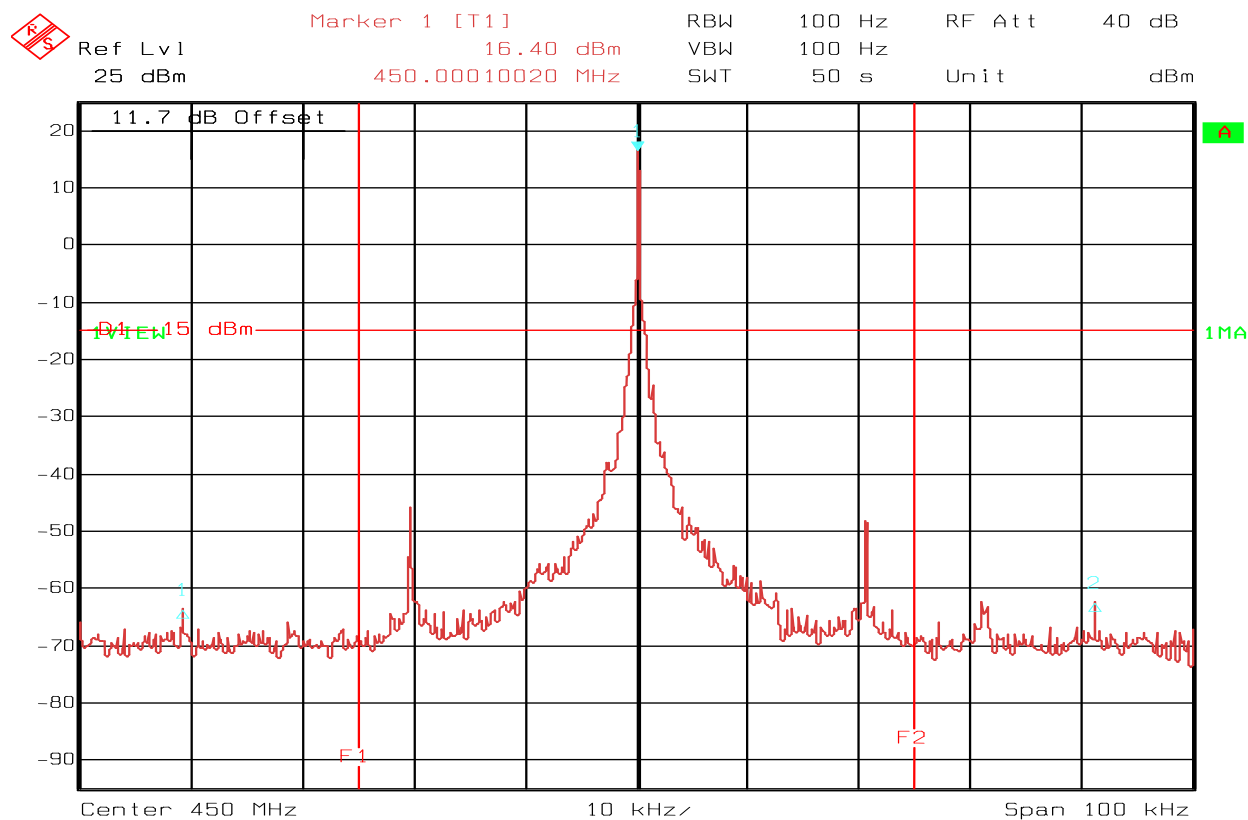
FCC1 - -10 °C , 7.2 Vdc - Upper frequency 460MHz - conducted power +14.84 dBm

Date: 23.MAY.2005 22:47:50

FCC1 - -10 °C , 9.1Vdc - Upper frequency 460MHz - conducted power +19.84 dBm

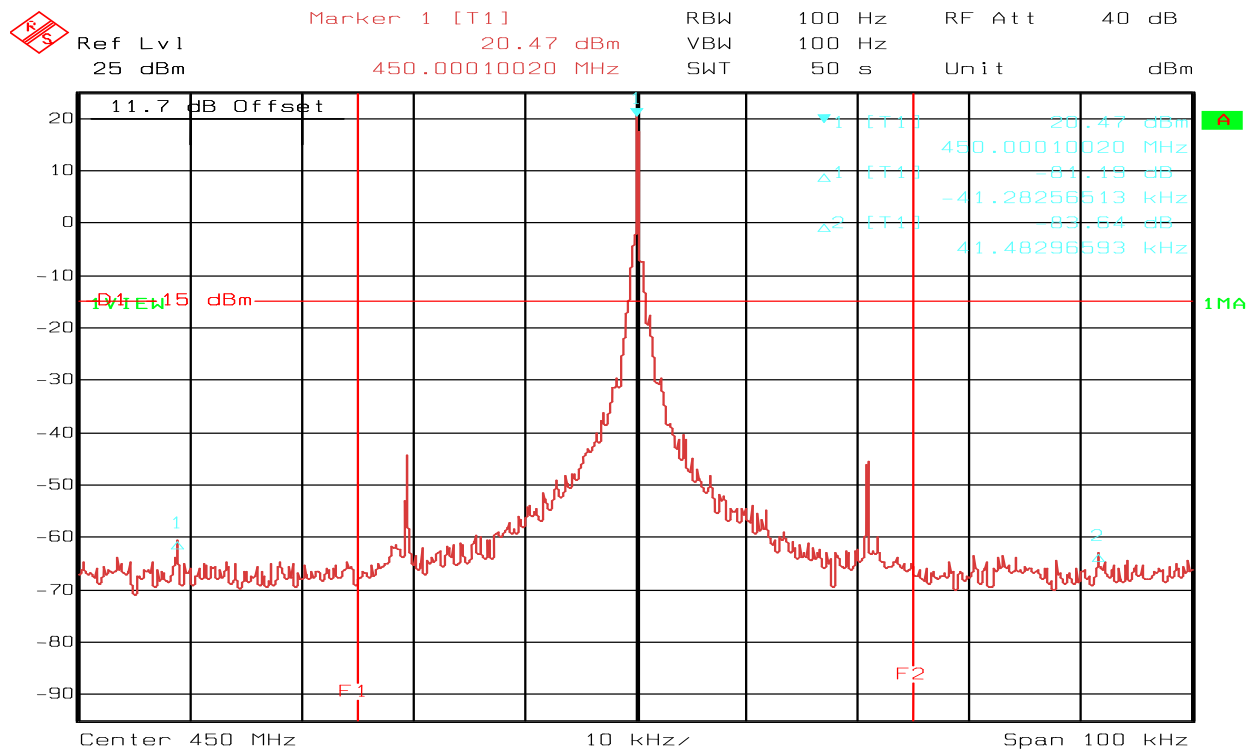
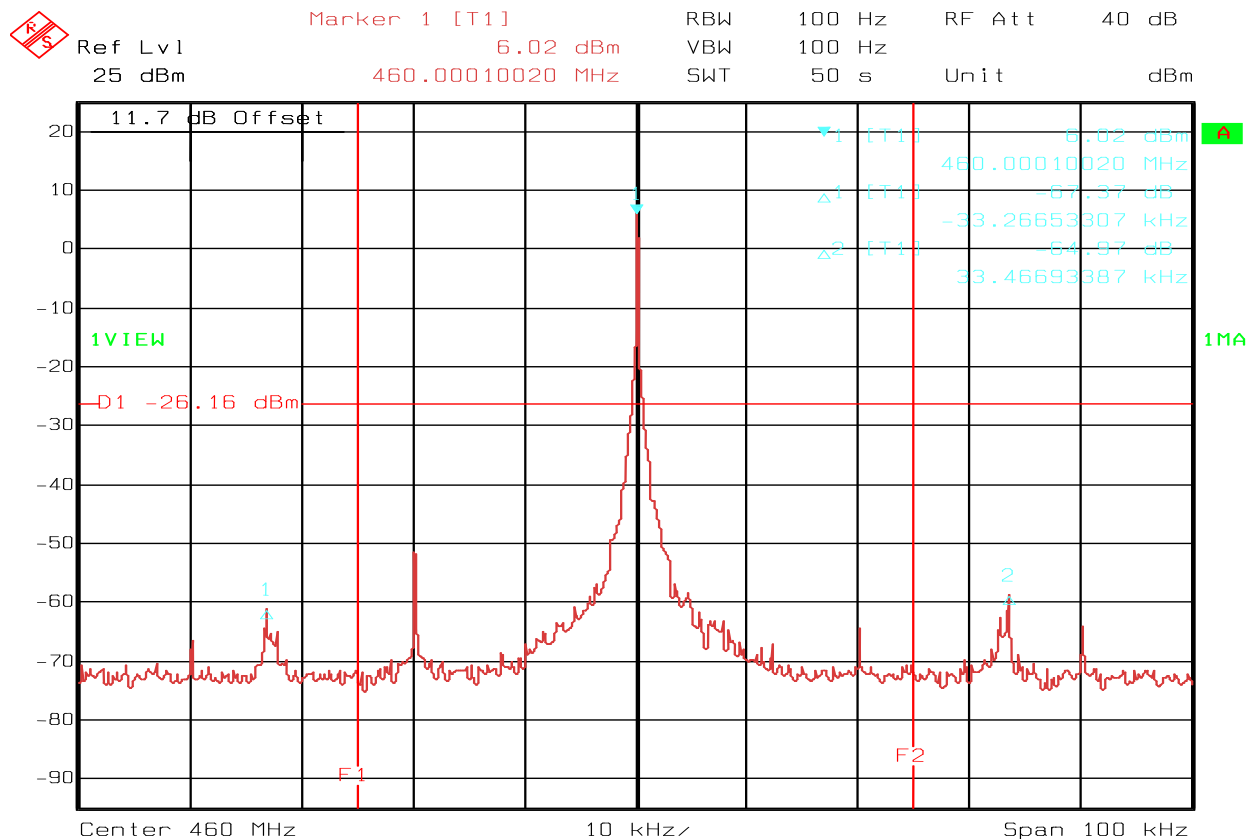


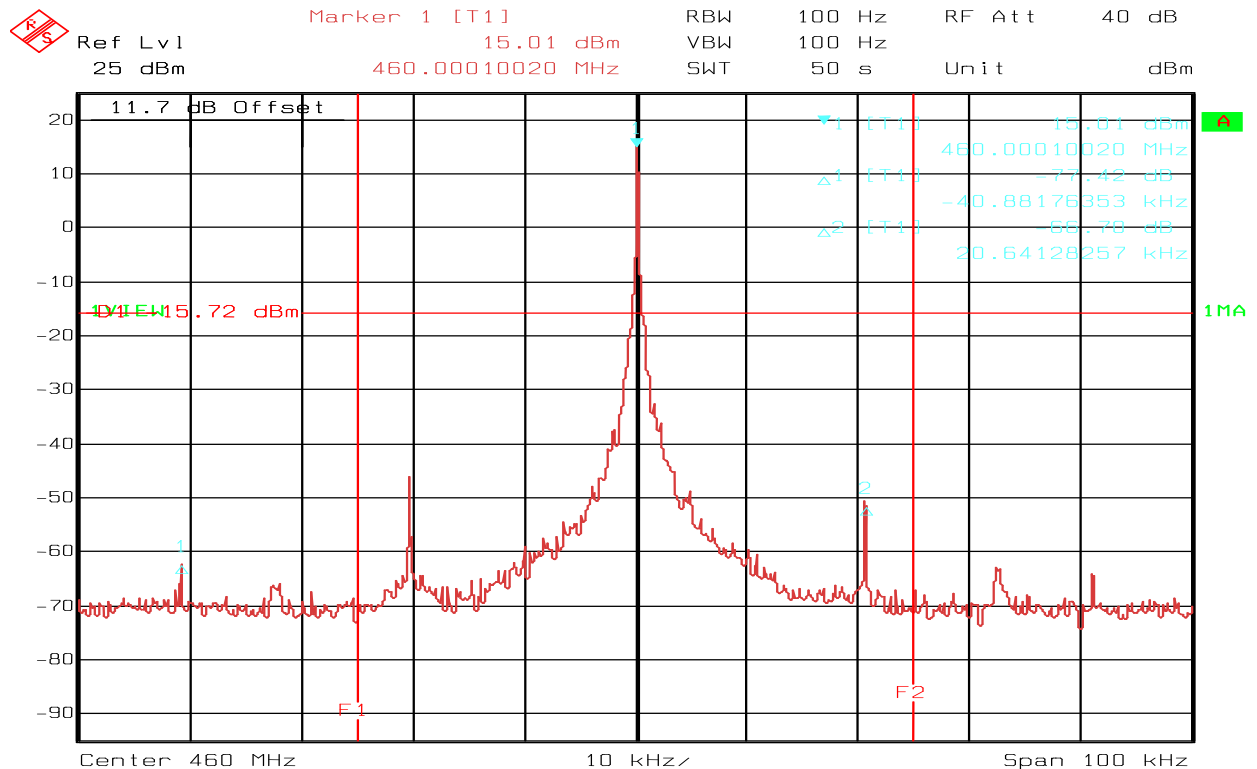
Date: 24.MAY.2005 9:32:45

FCC1 - 0 °C , 6.0Vdc - Lower frequency 450MHz - conducted power +7.96 dBm

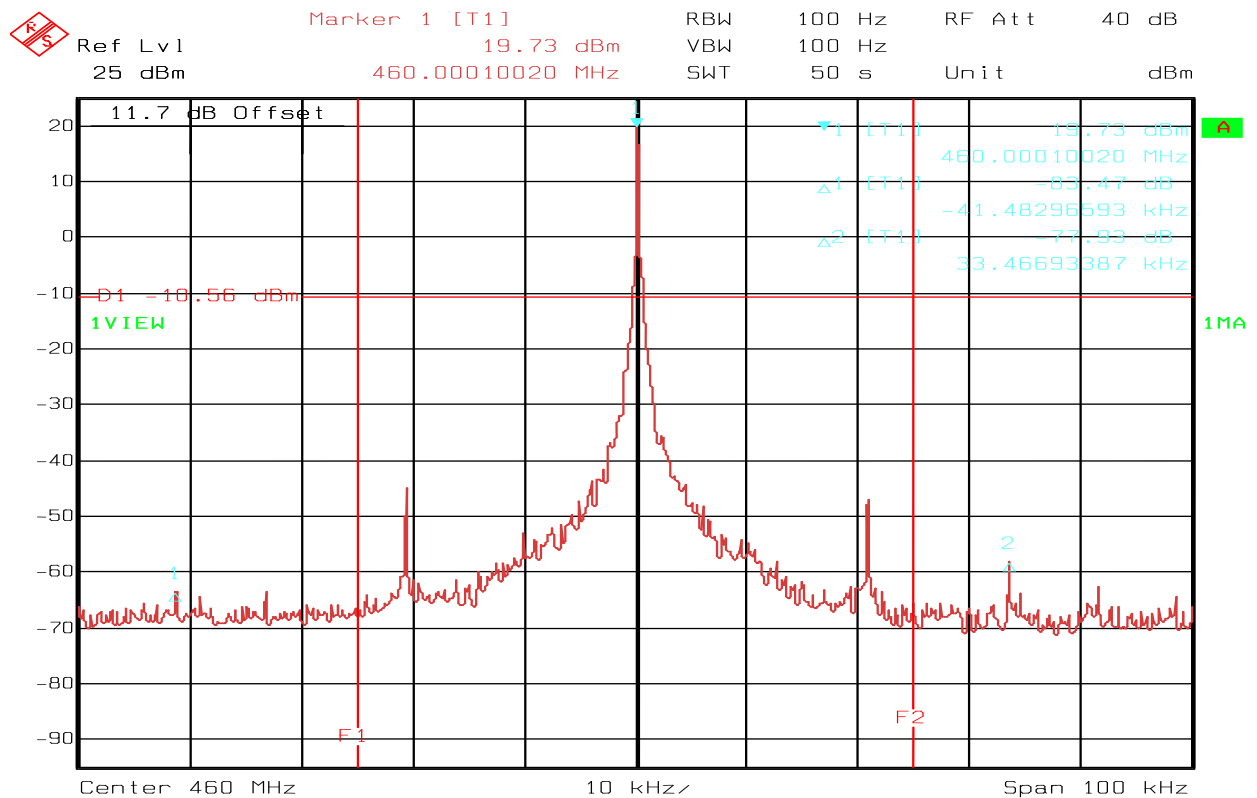
Date: 24.MAY.2005 9:35:10

FCC1 - 0 °C , 7.2Vdc - Lower frequency 450MHz - conducted power +16.40 dBm

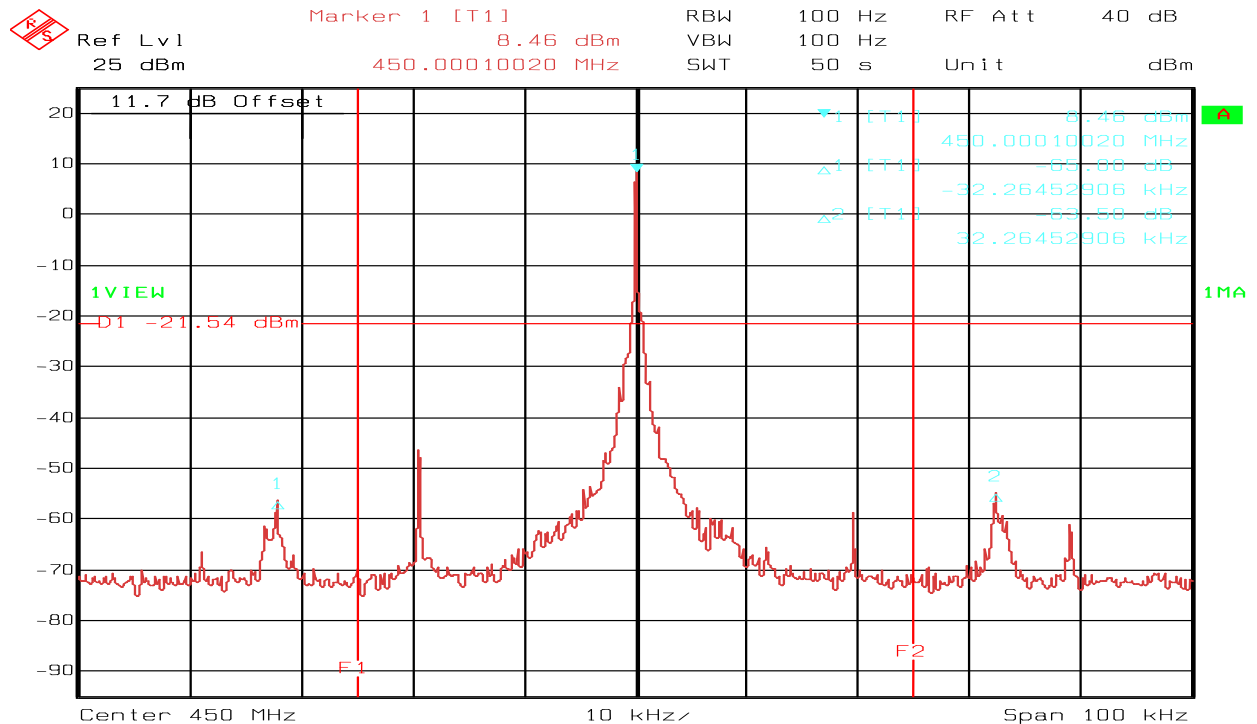
**FCC1 - 0 °C , 9.1Vdc - Lower frequency 450MHz - conducted power +20.47 dBm****FCC1 - 0 °C , 6.0Vdc - Upper frequency 460MHz - conducted power +6.02 dBm**



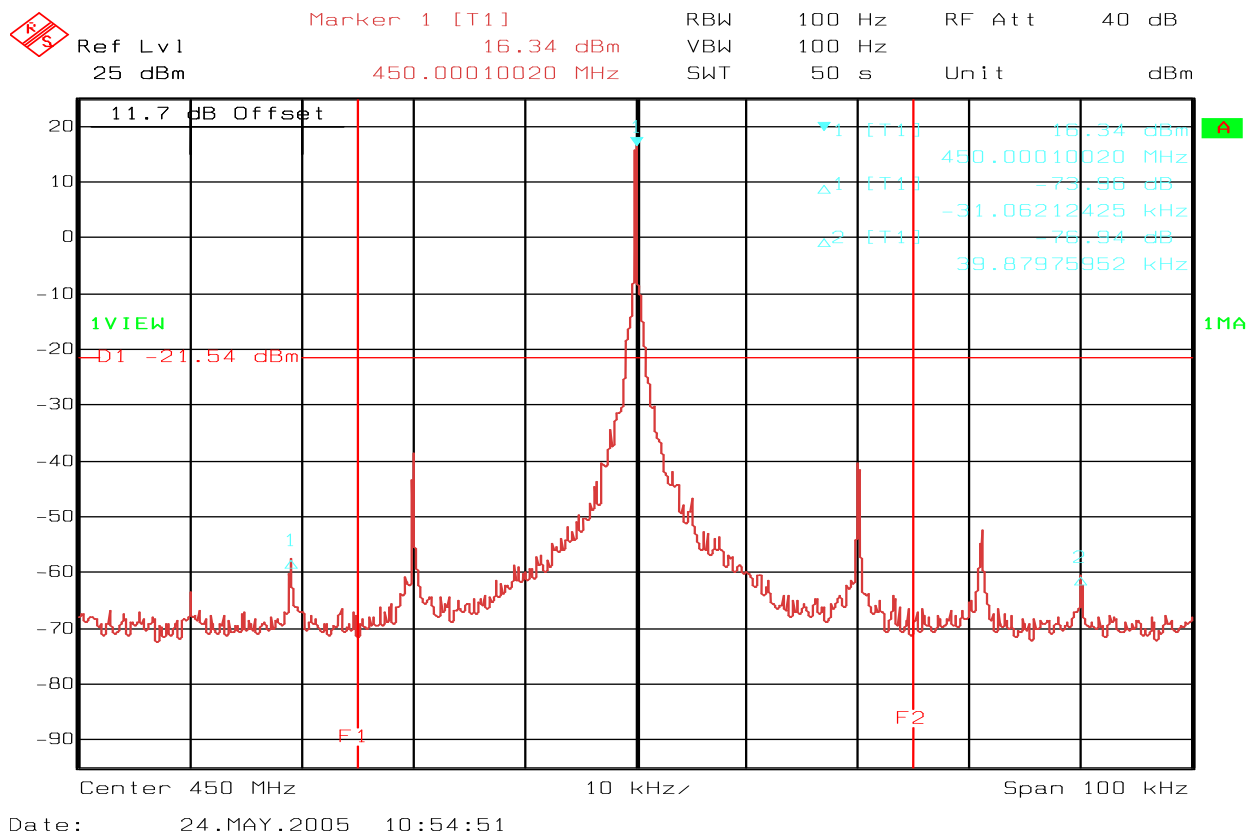
FCC1 - 0 °C , 7.2Vdc - Upper frequency 460MHz - conducted power +15.01 dBm



FCC1 - 0 °C , 9.10Vdc - Upper frequency 460MHz - conducted power +19.73 dBm



FCC1 - 10 °C ,6.0Vdc - Lower frequency 450MHz - conducted power +8.45 dBm



FCC1 - 10 °C , 7.2Vdc - Lower frequency 450MHz - conducted power +16.34 dBm



Ref Lvl 25 dBm

Marker 1 [T1] 6.68 dBm

RBW 100 Hz

VBW 100 Hz

SWT 50 s

Unit dBm

11.7 dB Offset

1VIEW

D1 -24.64 dBm

F1

F2

Center 460 MHz

10 kHz

Span 100 kHz

Marker 1 [T1] 6.68 dBm

460.00010020 MHz

-81.66 dB

-33.46693387 kHz

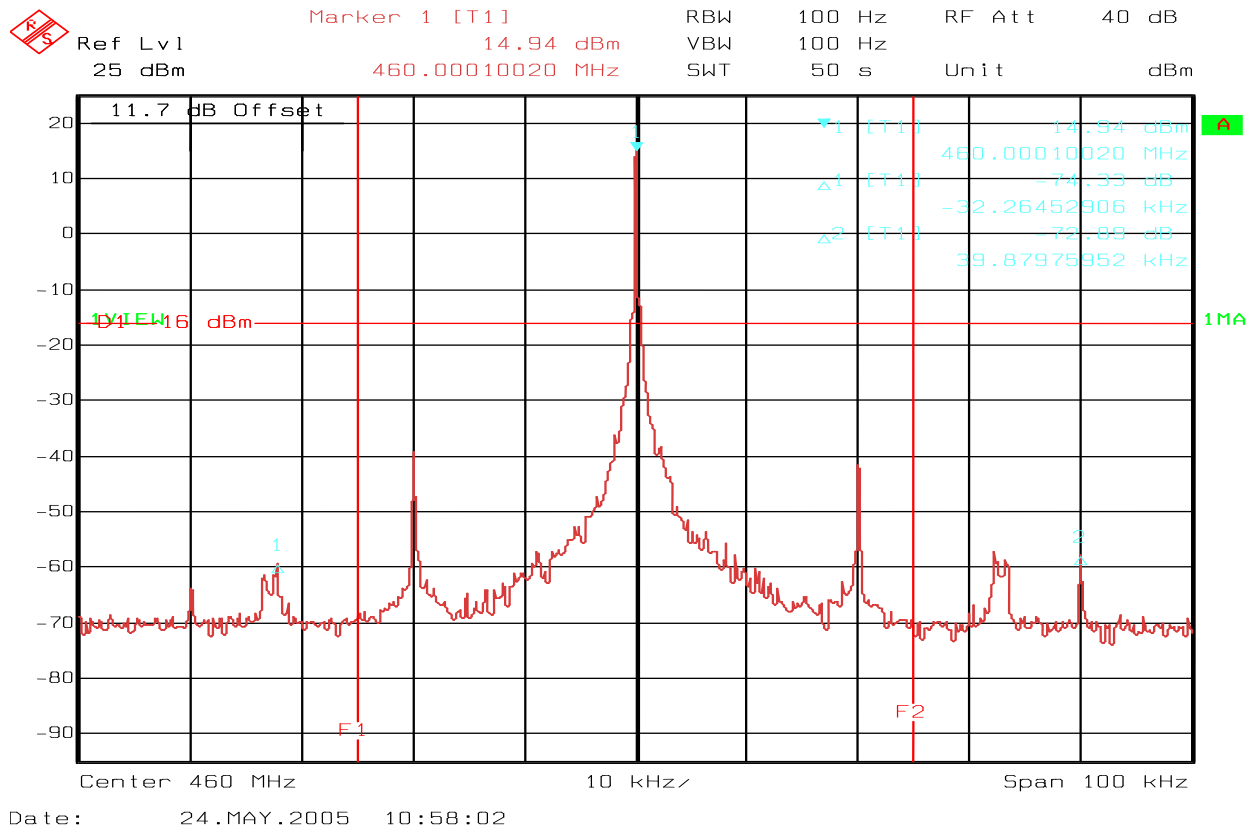
-60.95 dB

33.26653307 kHz

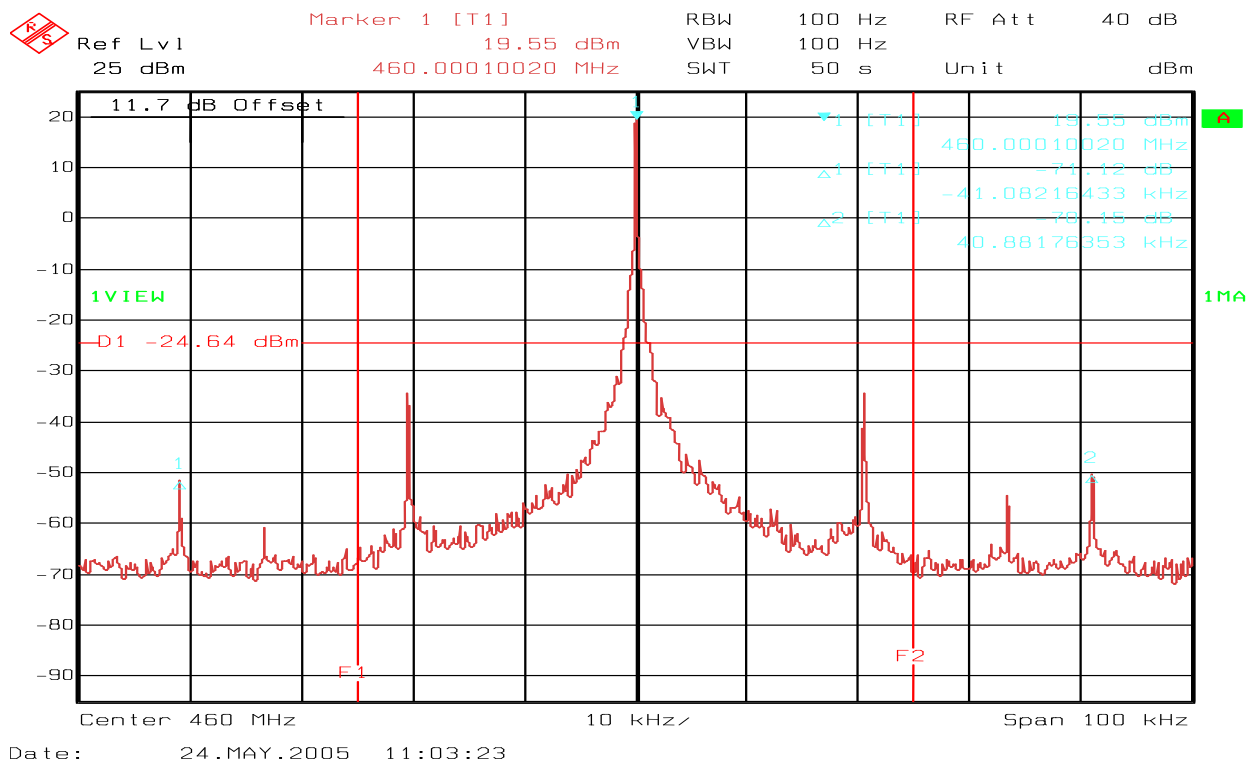
1MA

Date: 24.MAY.2005 11:01:12

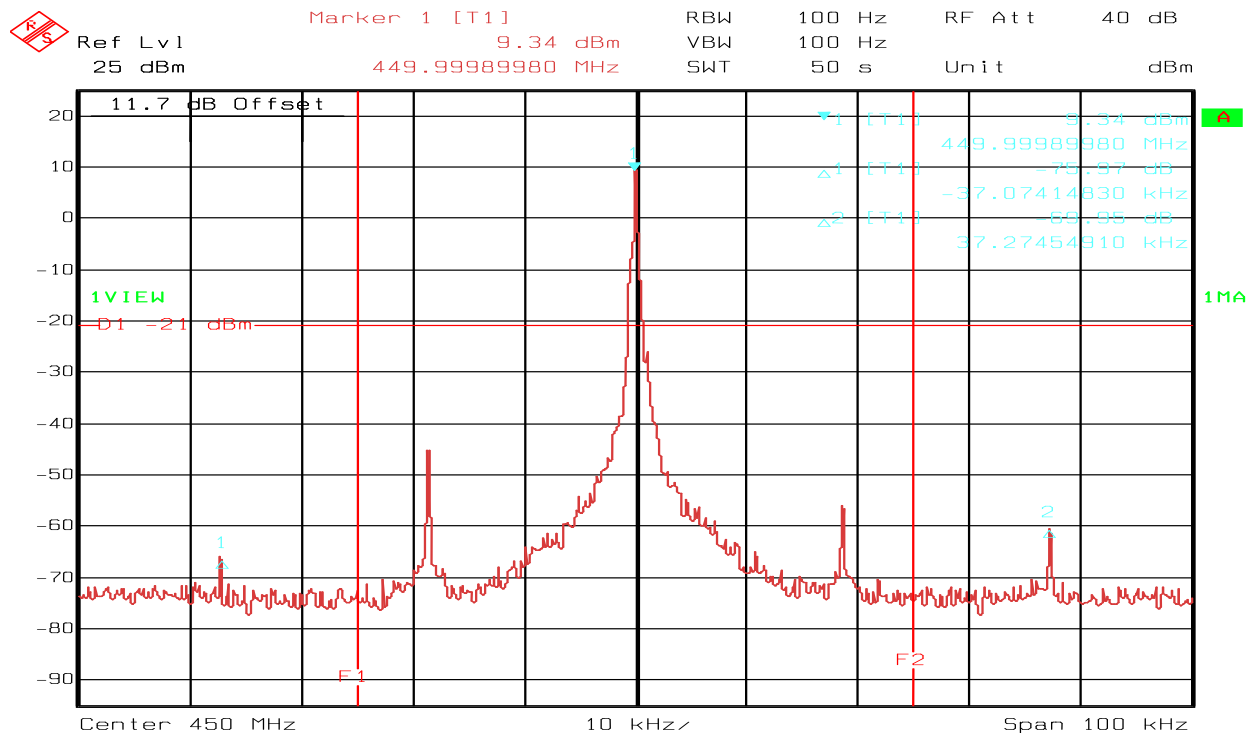
Nemko Comlab
Gåsevikveien 8, Kjeller, Norway
<mailto:post@comlab.no>



FCC1 - 10 °C , 7.2Vdc - Upper frequency 460MHz - conducted power +14.94 dBm

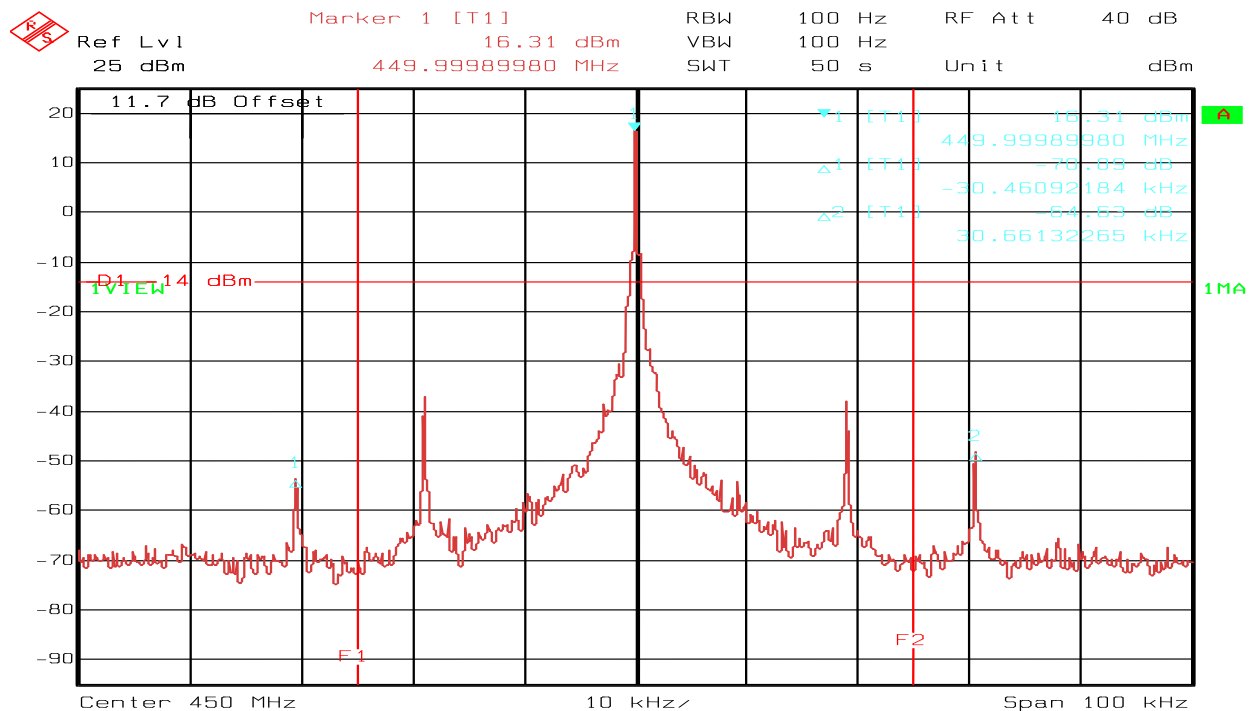


FCC1 - 10 °C , 9.1Vdc - Upper frequency 460MHz - conducted power +19.55 dBm



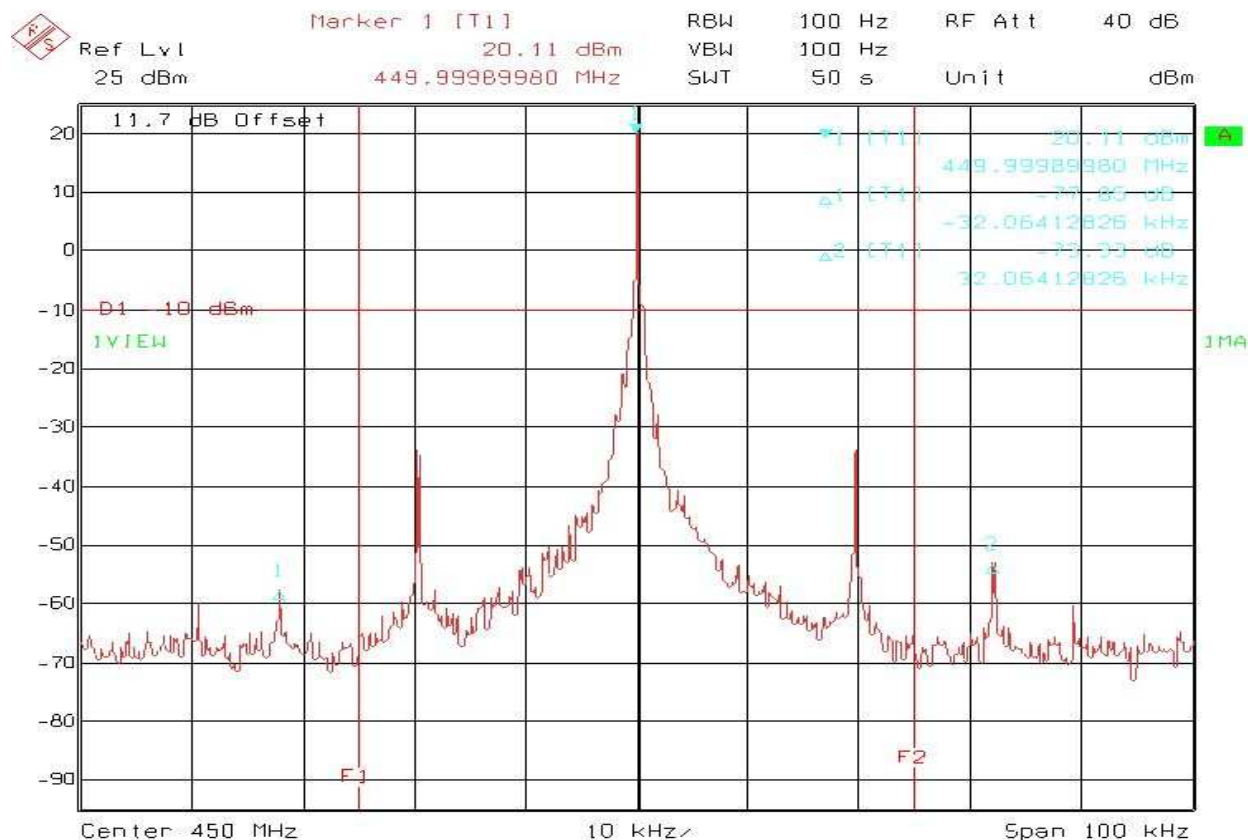
Date: 24.MAY.2005 16:05:14

FCC1 - 21 °C ,6.0Vdc - Lower frequency 450MHz - conducted power +9.34 dBm

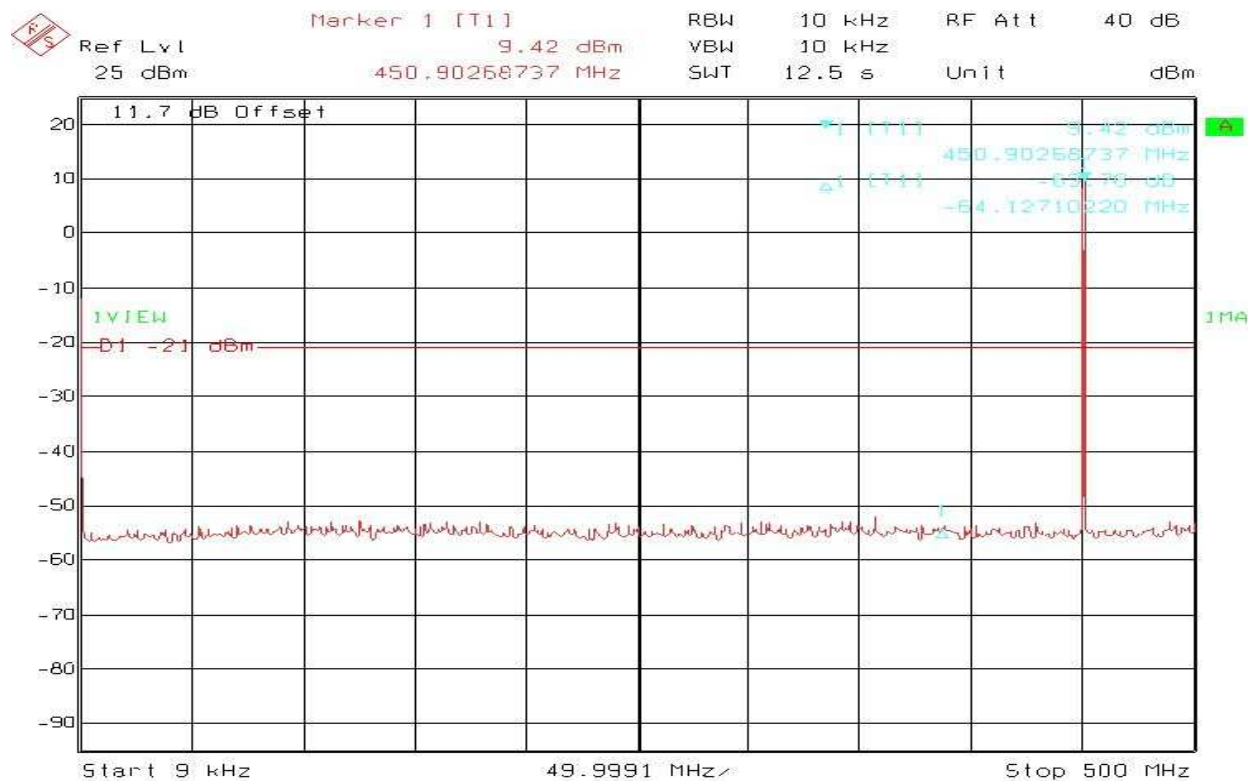


Date: 24.MAY.2005 16:07:50

FCC1 - 21 °C ,7.2Vdc - Lower frequency 450MHz - conducted power +16.31 dBm

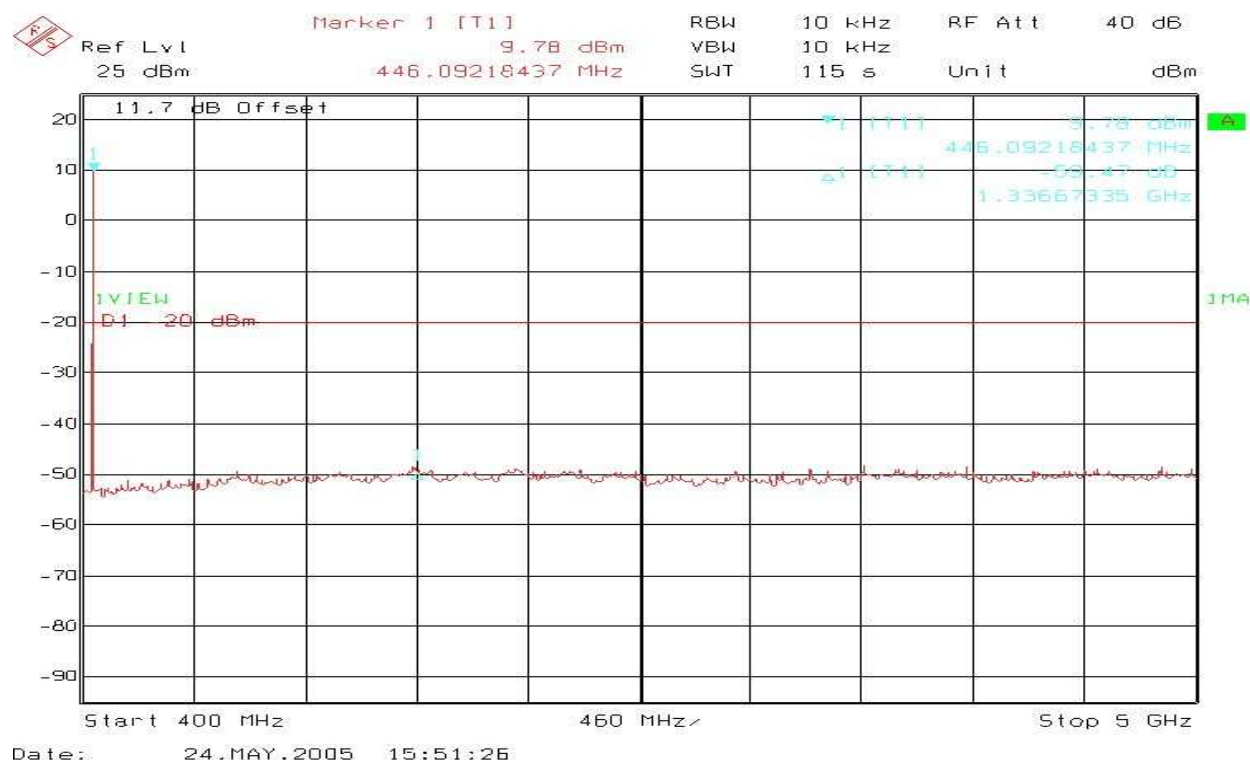


Date: 24.MAY.2005 16:10:00

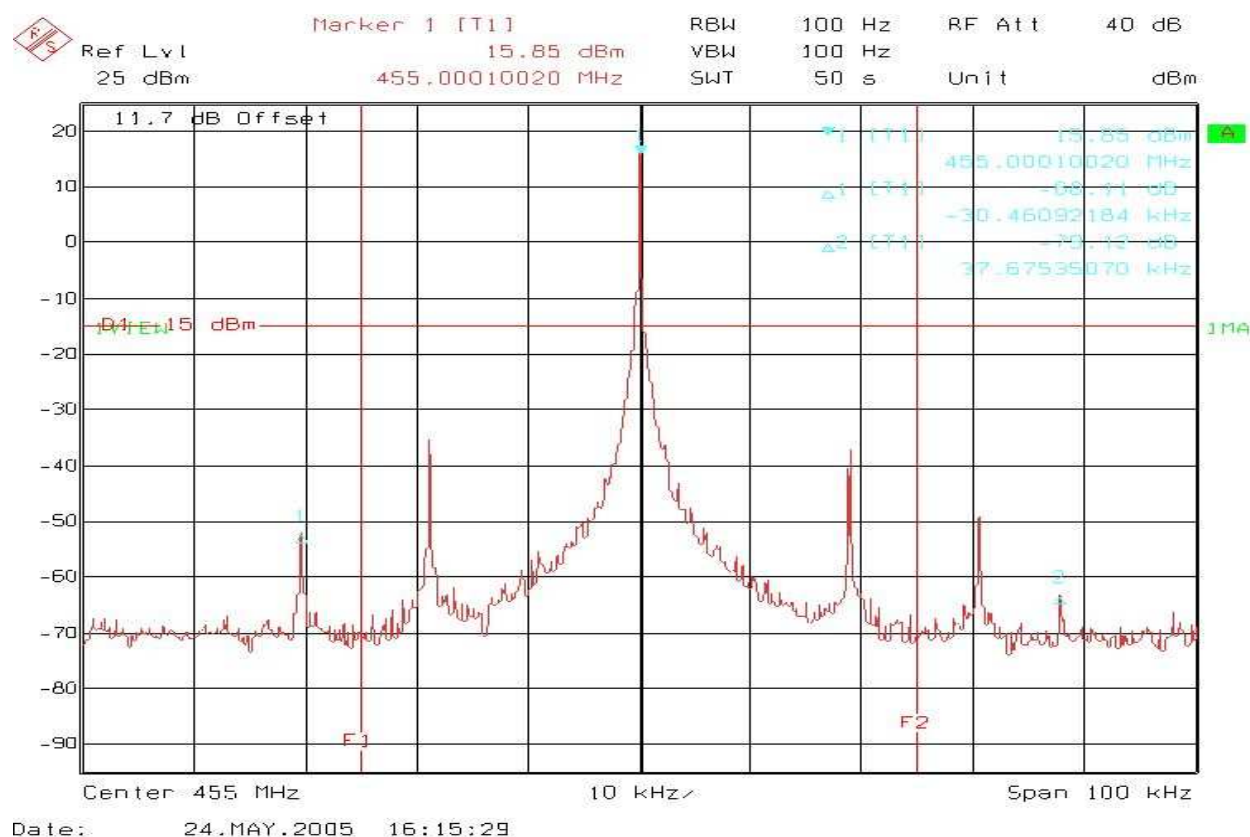
FCC1 - 21 °C , 9.1Vdc - Lower frequency 450MHz - conducted power +20.11 dBm

Date: 24.MAY.2005 16:02:51

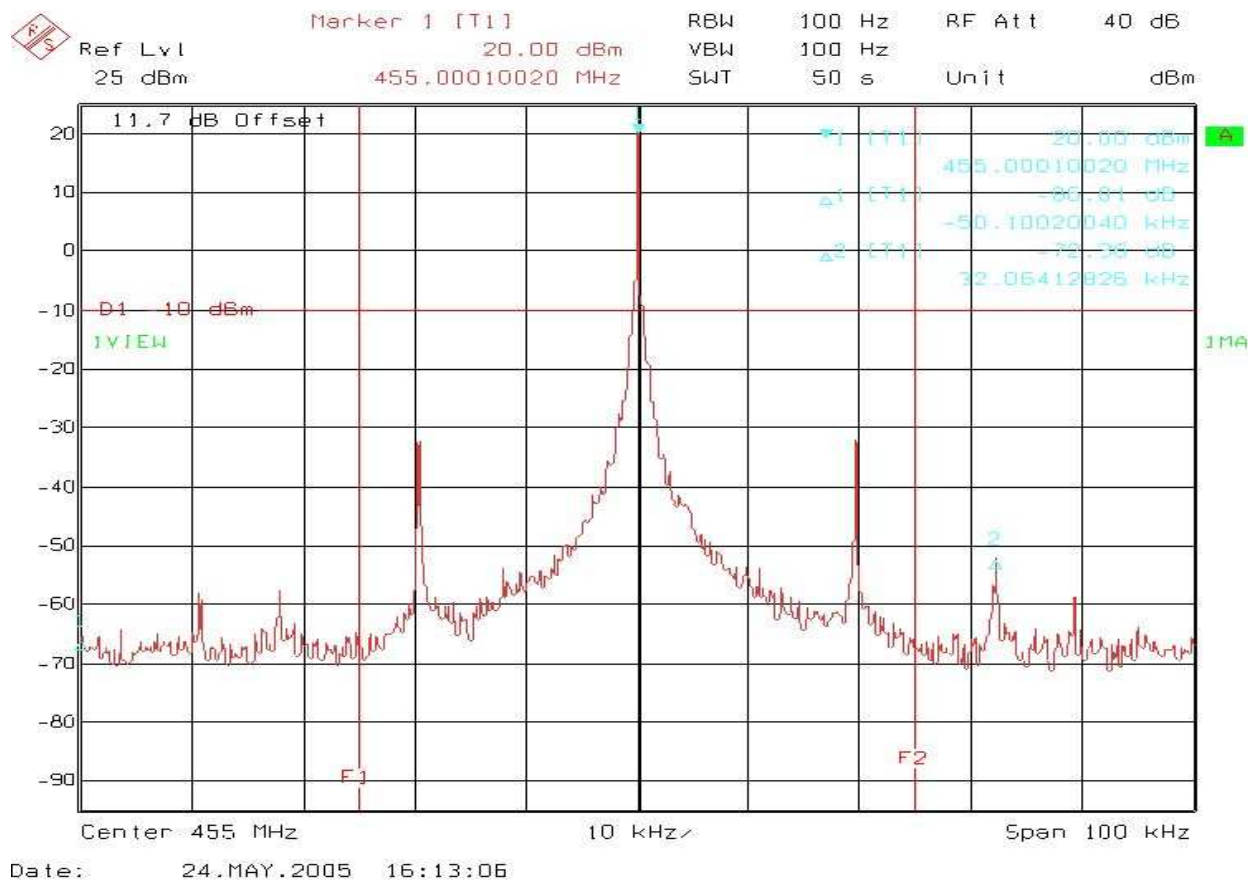
FCC1 - 21 °C , 7.2Vdc - Lower frequency 450MHz - Scan 9kHz – 500MHz



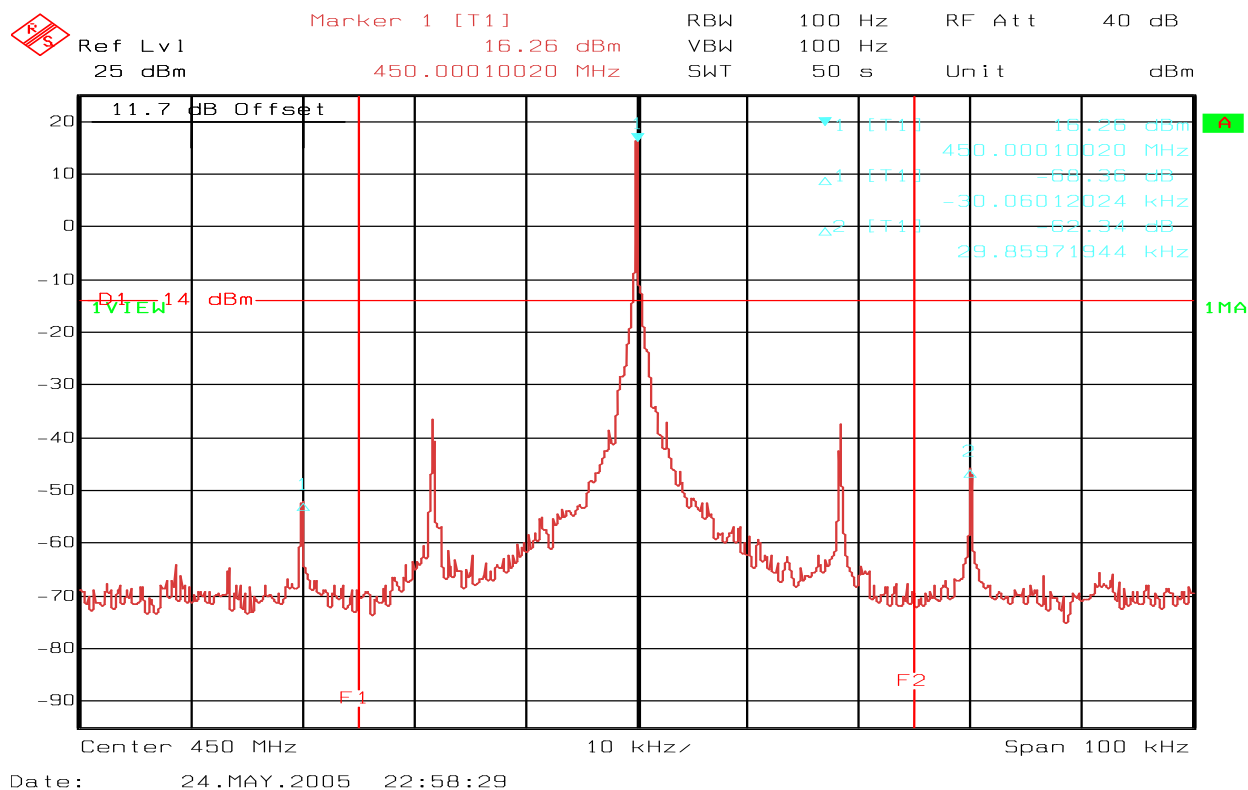
FCC1 - 21 °C , 7.2 Vdc - Lower frequency 450MHz - Scan 400MHz – 5GHz



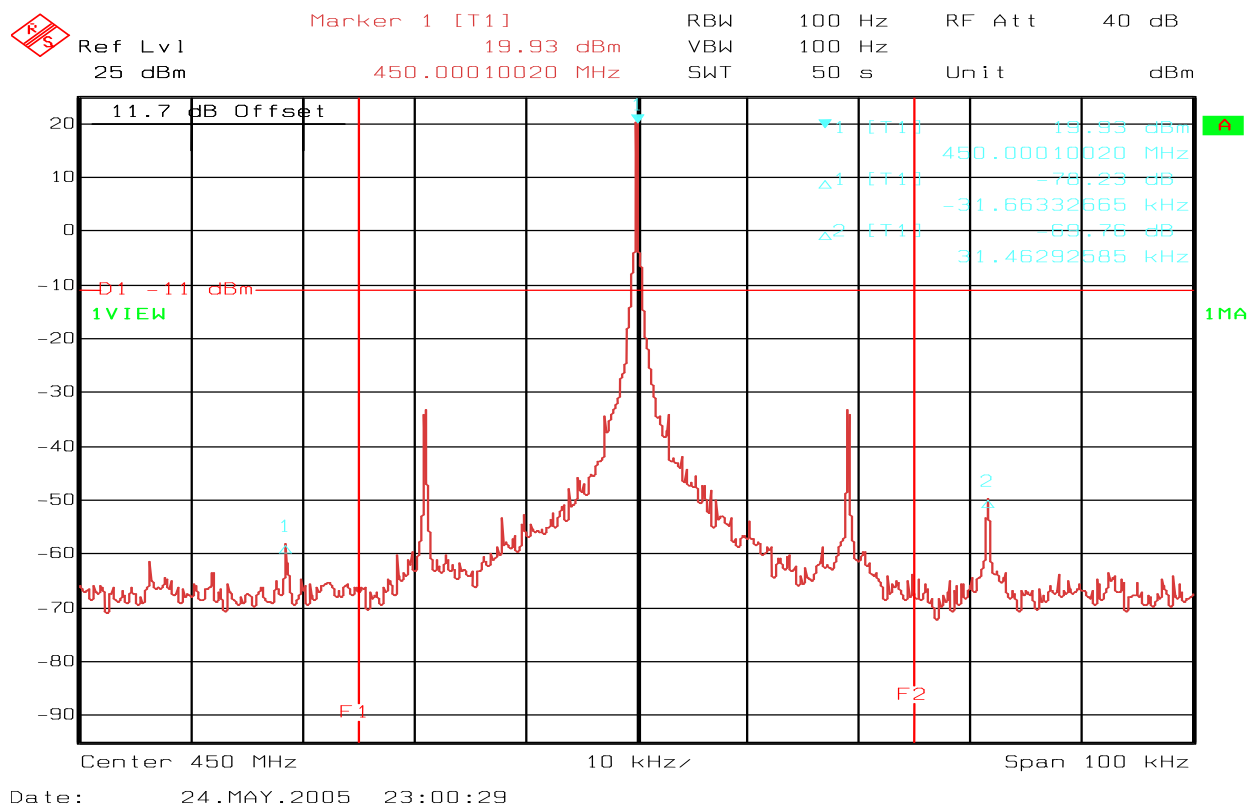
FCC1 - 21 °C , 7.2Vdc - Middle frequency 455MHz - conducted power +15.85 dBm



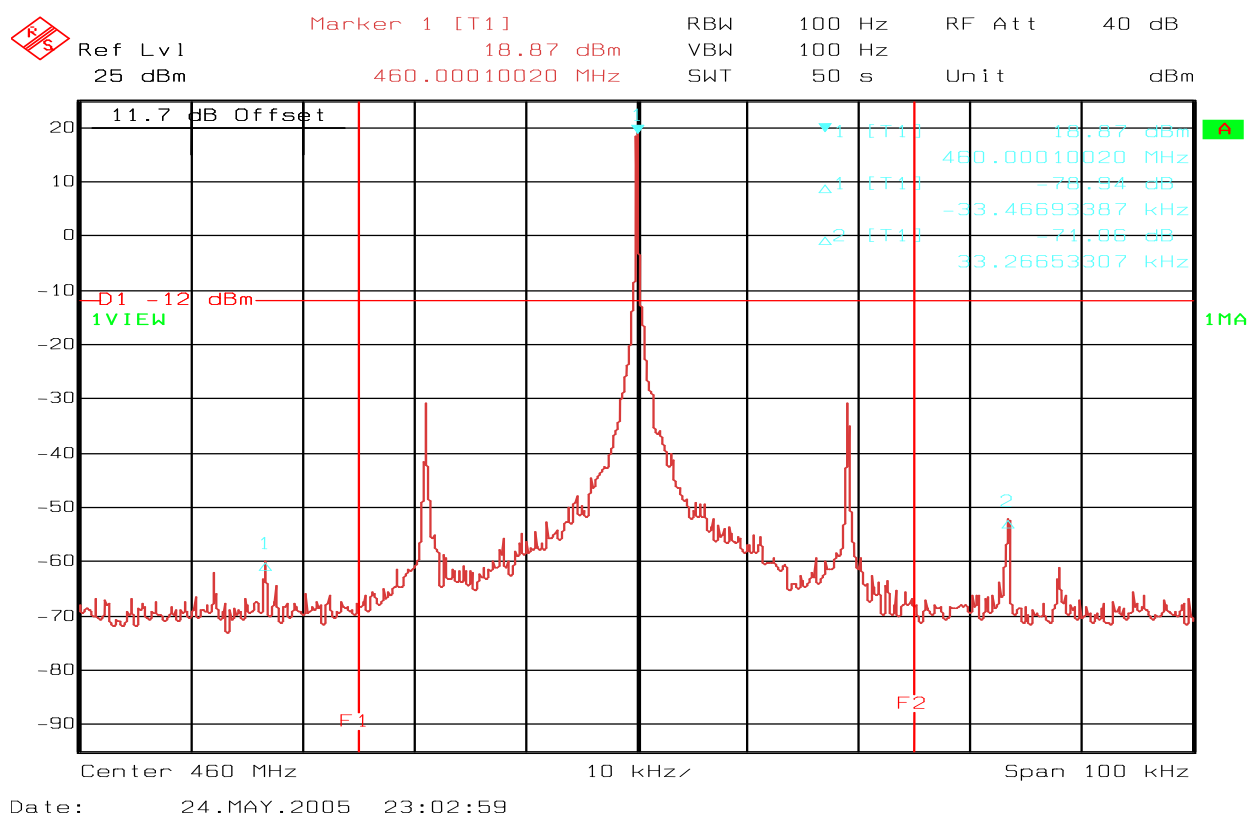
FCC1 - 21 °C , 9.1Vdc - Upper frequency 460MHz - conducted power +20.00 dBm



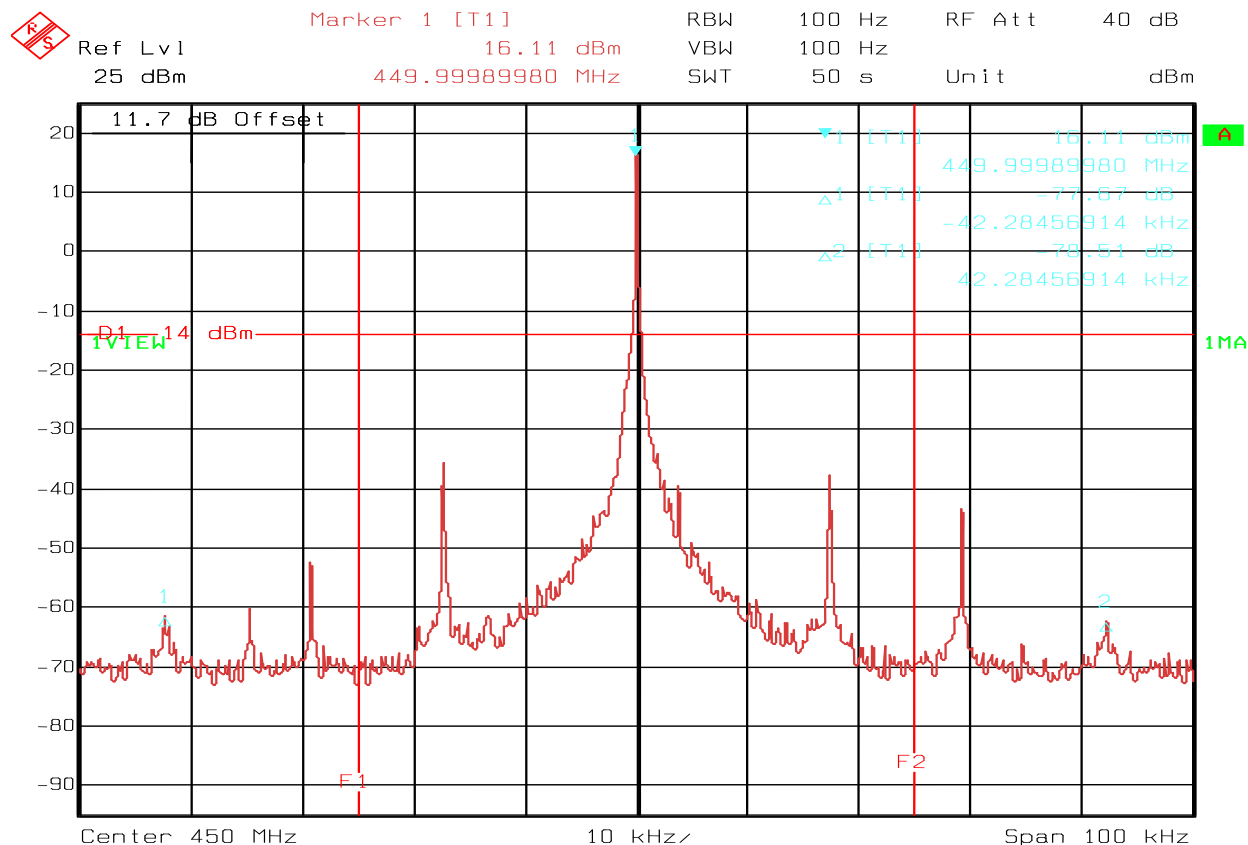
FCC1 - 30 °C , 7.2Vdc - Lower frequency 450MHz - conducted power +16.26 dBm



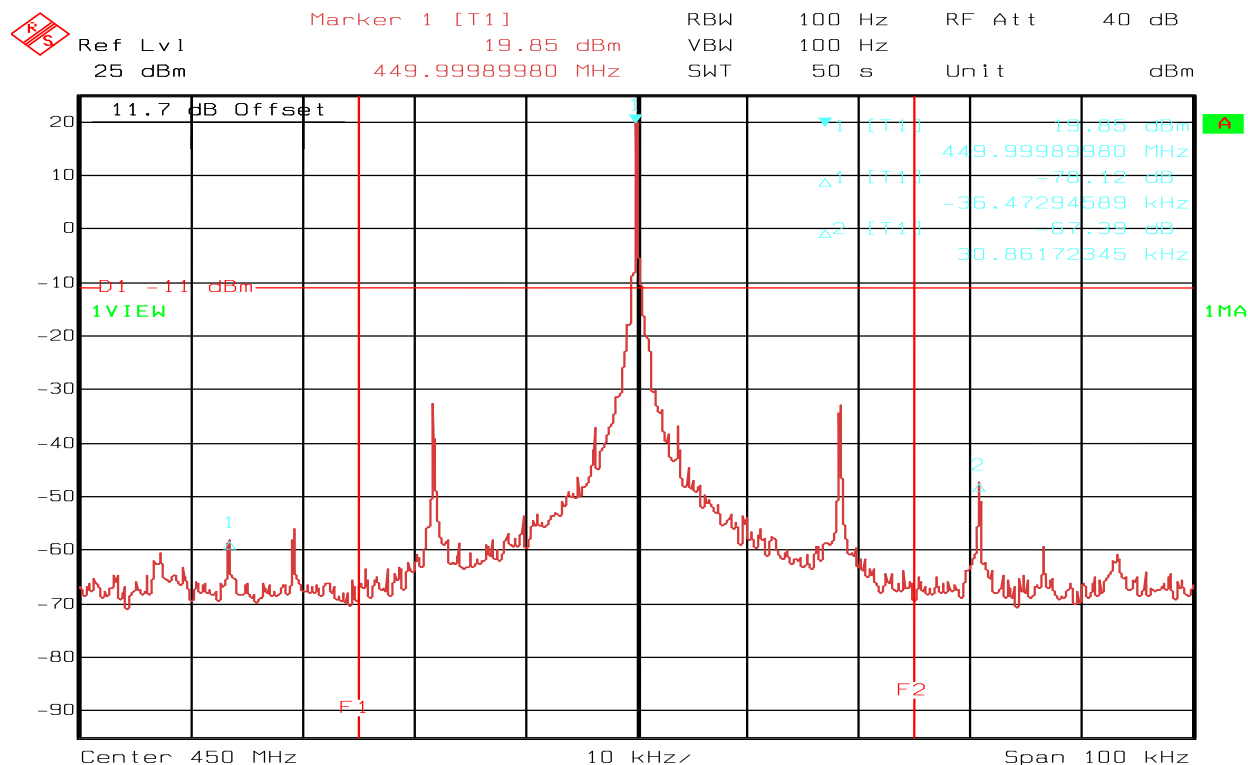
FCC1 - 30 °C , 9.1Vdc - Lower frequency 450MHz - conducted power +19.93 dBm



FCC1 - 30 °C , 9.1Vdc - Upper frequency 460MHz - conducted power +18.87 dBm

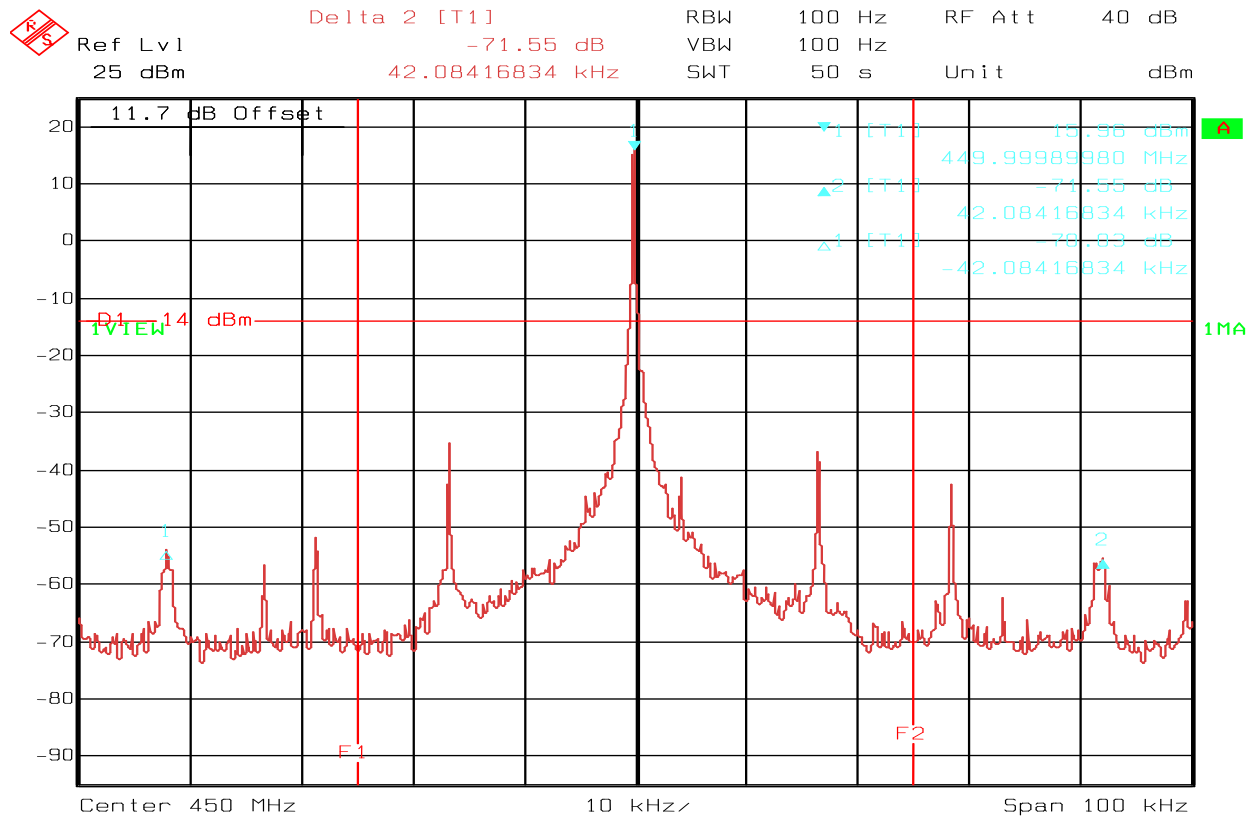
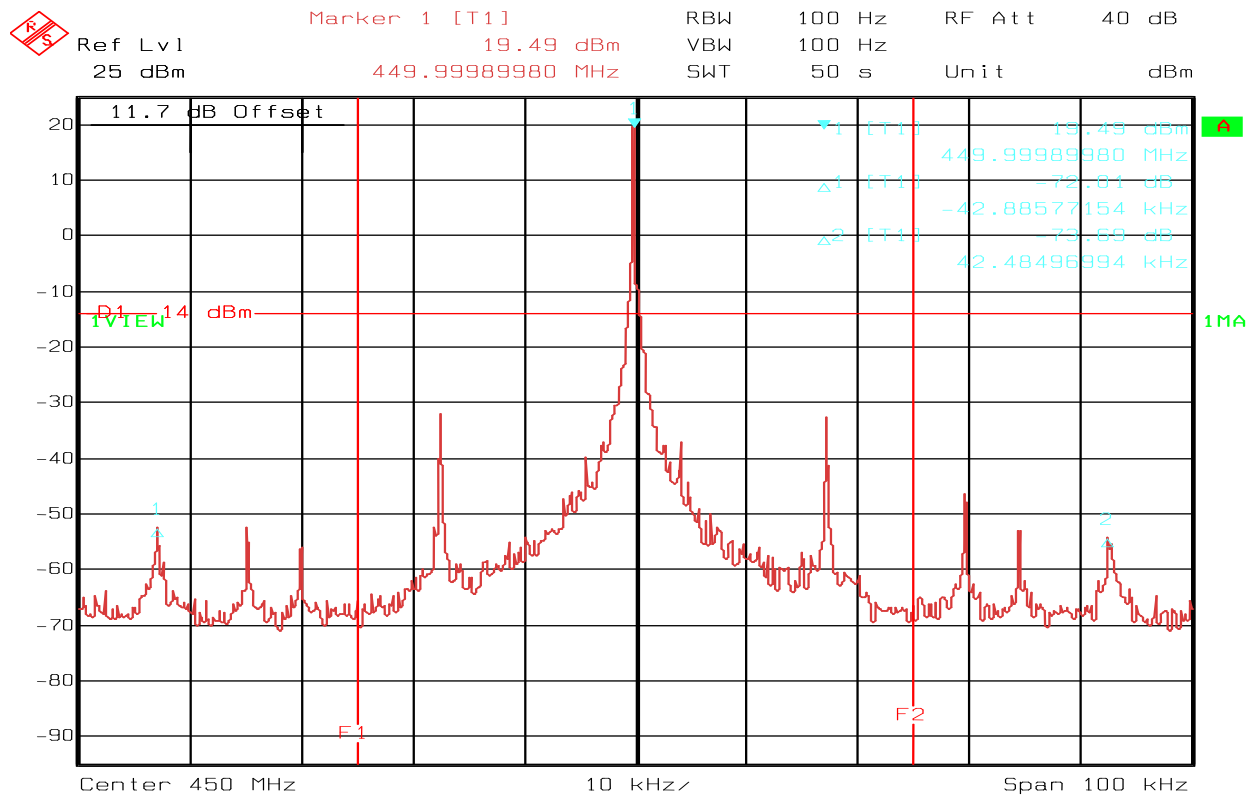


Date: 25.MAY.2005 8:34:50

FCC1 - 40 °C , 7.2Vdc - Lower frequency 450MHz - conducted power +16.11 dBm

Date: 25.MAY.2005 8:32:22

FCC1 - 40 °C , 9.1Vdc - Lower frequency 450MHz - conducted power +19.85 dBm

**FCC1 - 50 °C , 7.2Vdc - Lower frequency 450MHz - conducted power +15.96 dBm****FCC1 - 50 °C , 9.1Vdc - Lower frequency 450MHz - conducted power +19.49 dBm**