



FCC Test Report

FCC Part 15.247 for FHSS systems/ CANADA RSS-210

FOR:

TRI-BAND GSM MOBILE PHONE WITH BLUETOOTH

MODEL #: S68

BENQ MOBILE GmbH & Co. OHG
HAIDENAUPLATZ 1
81667 MUNCHEN
GERMANY

FCC ID: PWS-S68
IC ID: 6175C-S68

TEST REPORT #: BENQ0_003_05001_BLUETOOTH
DATE: FEBRUARY 01, 2006



TTI-P-G 081/94-A0

Accredited according to ISO/IEC 17025



Bluetooth Qualification
Test Facility
(BQTF)



FCC listed # 101450

IC recognized # 3925

CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.

Phone: + 1 (408) 586 6200 • Fax: + 1 (408) 586 6299 • E-mail: info@cetecomusa.com • <http://www.cetecom.com>

CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686
Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

TABLE OF CONTENTS

1	Assessment	4
2	Administrative Data	5
2.1	Identification of the Testing Laboratory Issuing the EMC Test Report	5
2.2	Identification of the Client	5
2.3	Identification of the Manufacturer	5
3	Equipment under Test (EUT)	6
3.1	Identification of the Equipment under Test	6
4	Subject Of Investigation	7
5	Measurements	8
5.1	MAXIMUM PEAK OUTPUT POWER § 15.247 (RADIATED)	8
5.1.1	LIMIT SUB CLAUSE § 15.247 (b) (1) (2) (3) (4)	8
5.1.2	RESULTS:	8
5.2	MAXIMUM PEAK OUTPUT POWER § 15.247 (CONDUCTED)	12
5.2.1	LIMIT SUB CLAUSE § 15.247 (b) (1)	12
5.2.2	RESULTS:	12
5.3	20dB BANDWIDTH	16
5.3.1	LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)	16
5.3.2	RESULTS:	16
5.4	CARRIER FREQUENCY SEPARATION	20
5.4.1	LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)	20
5.4.2	RESULTS:	20
5.5	NUMBER OF HOPPING CHANNELS	22
5.5.1	LIMIT SUB CLAUSE § 15.247 (a) (1) (iii)	22
5.5.2	RESULTS:	22
5.6	TIME OF OCCUPANCY (DWELL TIME)	27
5.6.1	LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)	27
5.6.2	RESULTS:	27
5.7	CONDUCTED SPURIOUS EMISSIONS	31
5.7.1	LIMIT SUB CLAUSE § 15.247 (d)	31
5.7.2	RESULTS	32
5.8	RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205	38
5.8.1	LIMITS	38
5.8.2	RESULTS (2402MHz)	39
5.8.3	RESULTS (2480MHz)	41
5.9	TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209	43
5.9.1	LIMITS	43
5.9.2	RESULTS	44
5.10	RECEIVER SPURIOUS RADIATION § 15.209/RSS210	53
5.10.1	LIMITS	53
5.10.2	RESULTS	54



5.11	AC POWER LINE CONDUCTED EMISSIONS § 15.107/207	59
5.11.1	LIMITS	59
5.11.2	RESULTS	60
5.12	TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS	61
5.13	BLOCK DIAGRAMS	62

1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Part 15.247 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS210.

Company	Description	Model #
BENQ MOBILE GmbH & Co. OHG	TRI-BAND GSM MOBILE PHONE WITH BLUETOOTH	S68



2006-02-01
Neelesh Raj
Project Leader



2006-02-01
Lothar Schmidt
Test Lab Manager

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	EMC
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Lothar Schmidt
Responsible Project Leader:	Neelesh Raj
Date of test:	2006-01-16 to 2006-02-01

2.2 Identification of the Client

Applicant's Name:	BENQ MOBILE GmbH & Co. OHG
Street Address:	HAIDENAUPLATZ 1
City/Zip Code	81667 MUNCHEN
Country	GERMANY
Contact Person:	MARTIN WEINBERGER
Phone No.	49.89.722.37148
Fax:	--
e-mail:	Martin.weinberger@siemens.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	BENQ MOBILE GmbH & Co. OHG
Manufacturers Address:	SUDSTR.9
City/Zip Code	D-47475 KAMP-LINTFORT
Country	GERMANY

3 Equipment under Test (EUT)

3.1 Identification of the Equipment under Test

Marketing Name:	S68
Description:	TRI-BAND GSM MOBILE PHONE WITH BLUETOOTH
Model No:	S68
FCC ID:	PWS-S68
IC ID:	6175C-S68
Frequency Range:	2400-2483.5MHz
Type(s) of Modulation:	GFSK
Number of Channels:	79
Antenna Type:	Internal
Output Power:	FCC 15.247: 0.001567W CONDUCTED@2402MHz

TYPE	MANF.	MODEL	FCC ID
AC ADAPTER	SIEMENS	A5BHTN00102612	DoC



4 Subject Of Investigation

The objective of the measurements done by Cetecom Inc. was to measure the performance of the S68 referred to as EUT as specified by requirements listed in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS210.

The EUT was maximized in the X,Y, Z positions , all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

5 Measurements

5.1 MAXIMUM PEAK OUTPUT POWER § 15.247 (RADIATED)

5.1.1 LIMIT SUB CLAUSE § 15.247 (b) (1) (2) (3) (4)

Frequency range	RF power output
2400-2483.5 MHz	36dBm EIRP

*limit is based upon antenna gain of less than or equal to 6dBi.

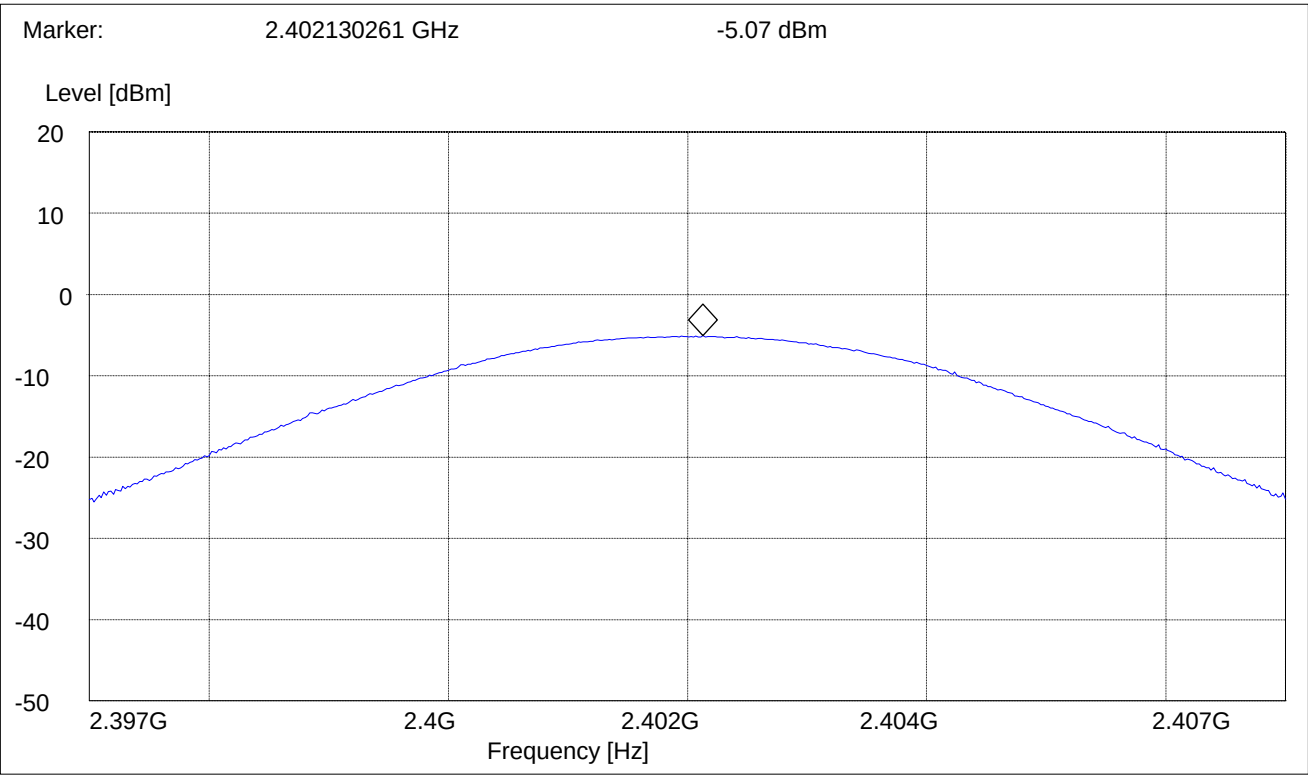
5.1.2 RESULTS:

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	-5.07	-5.42	-5.43
Measurement uncertainty		±0.5dBm		



EIRP (2402 MHz)

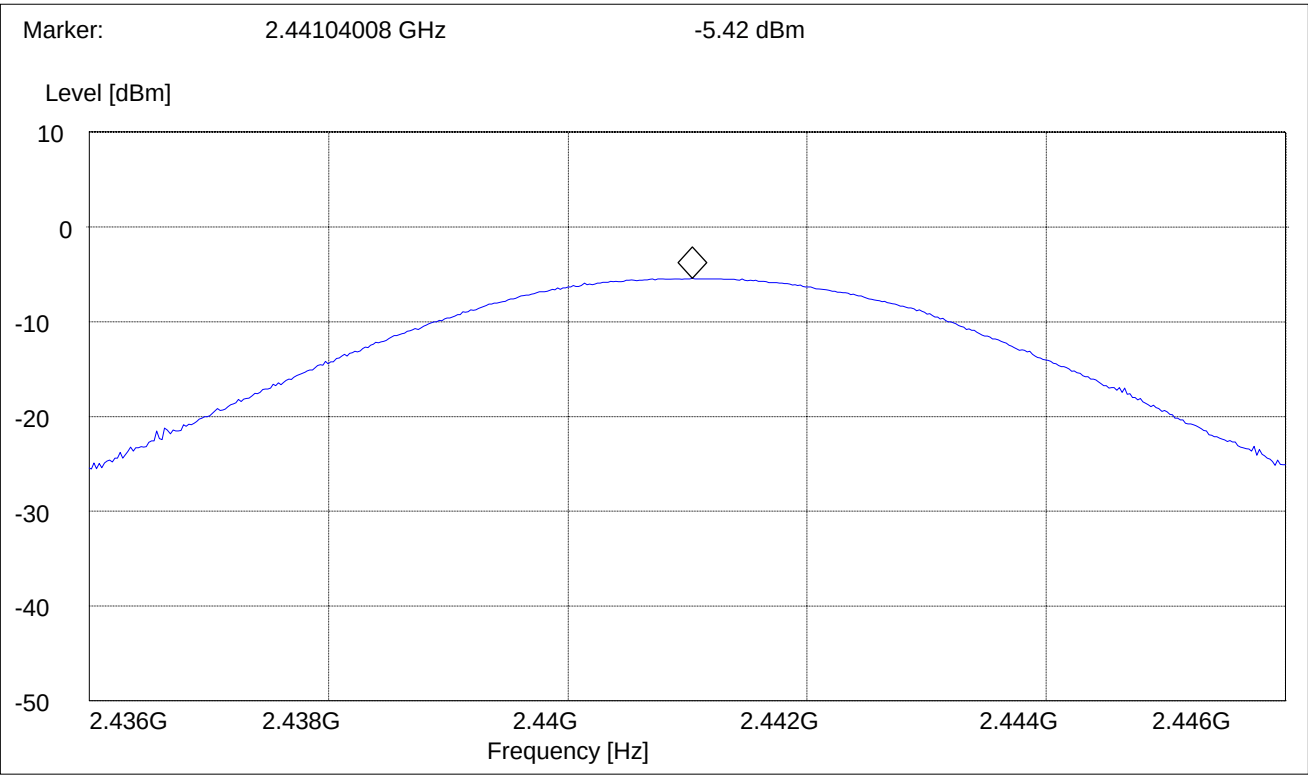
Start Frequency	Stop Frequency	Detector	Meas. Time	IF BW
2397 MHz	2407 MHz	Max Peak	Coupled	3 MHz





EIRP (2441 MHz)

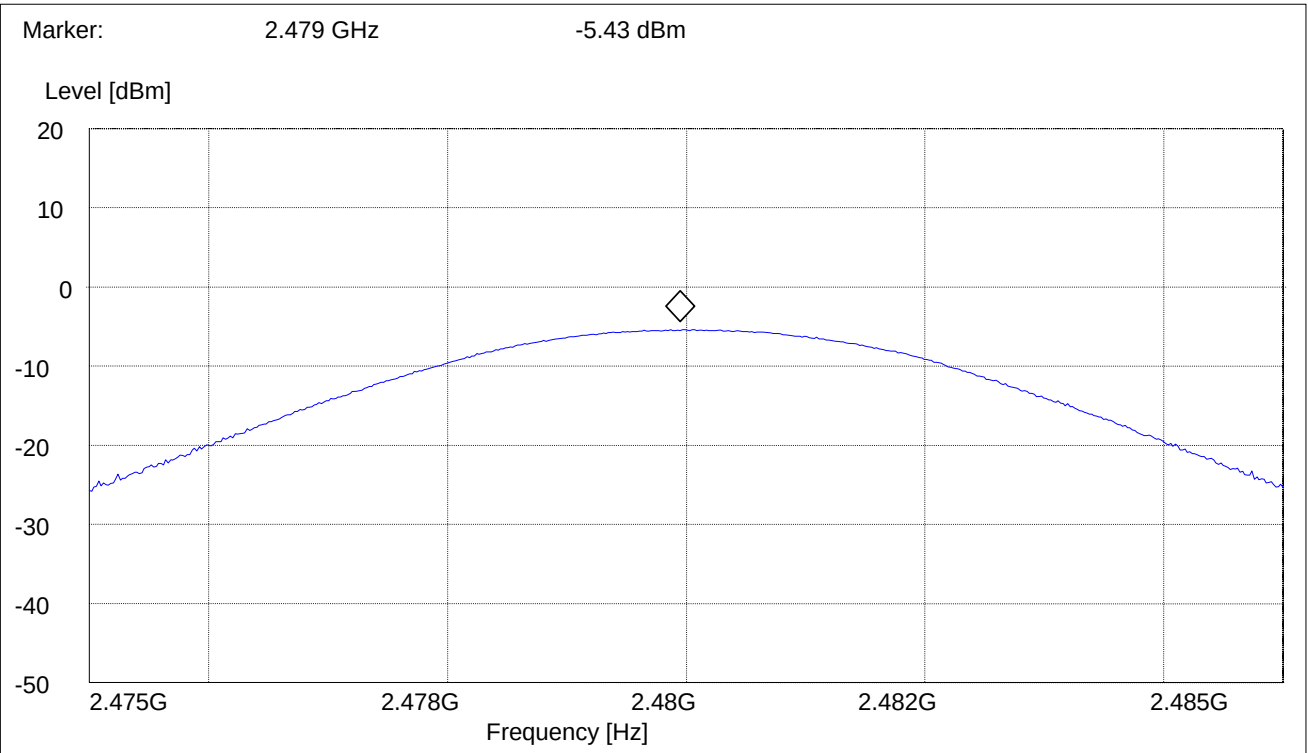
Start Frequency	Stop Frequency	Detector	Meas. Time	IF BW
2436 MHz	2446 MHz	Max Peak	Coupled	3 MHz





EIRP (2480 MHz)

Start Frequency	Stop Frequency	Detector	Meas. Time	IF BW
2475 MHz	2485 MHz	Max Peak	Coupled	3 MHz





5.2 MAXIMUM PEAK OUTPUT POWER § 15.247 (CONDUCTED)

5.2.1 LIMIT SUB CLAUSE § 15.247 (b) (1)

Frequency range	RF power output
2400-2483.5 MHz	30dBm

*limit is based upon antenna gain of less than or equal to 6dBi.

5.2.2 RESULTS:

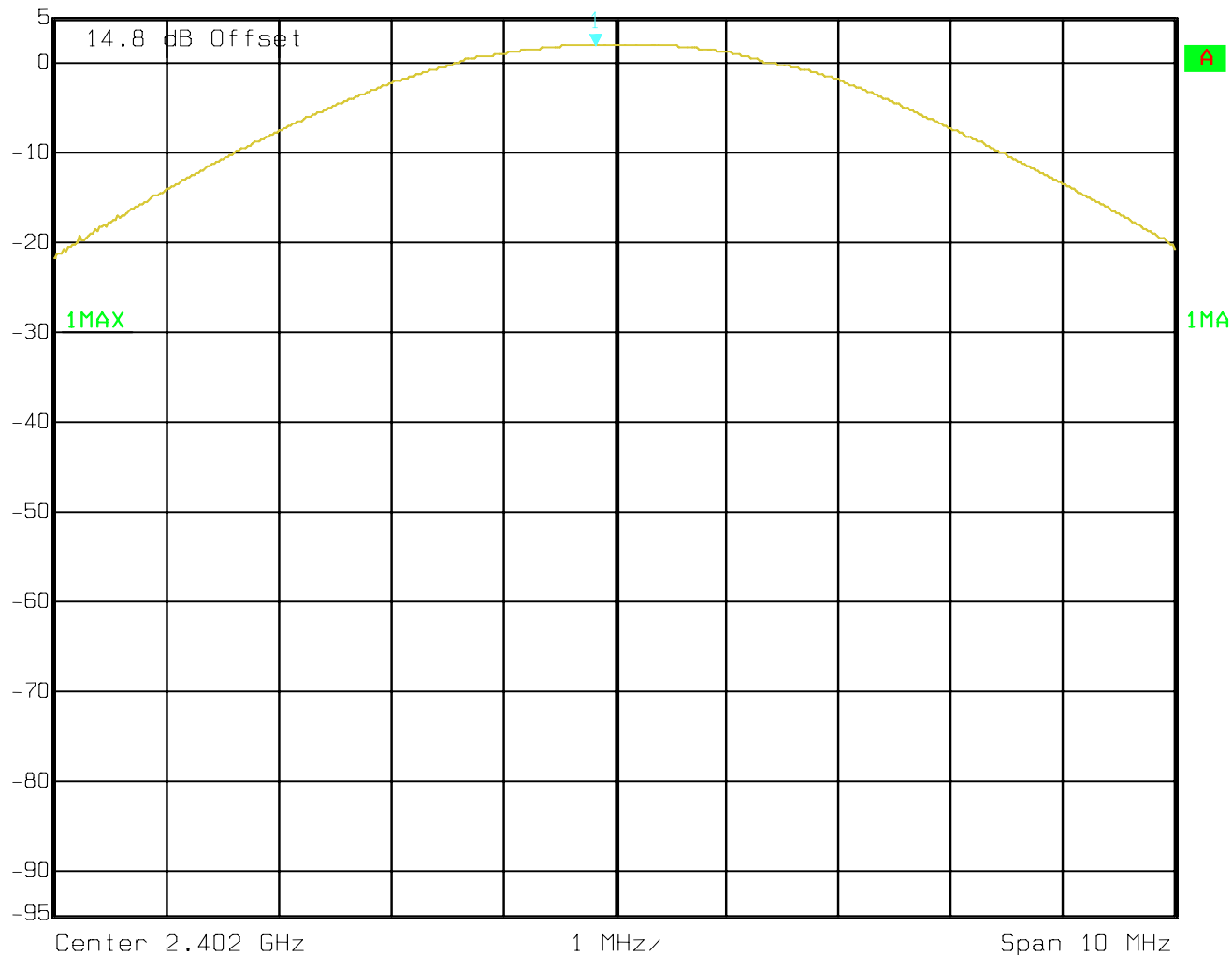
TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	1.95	1.08	1.19

*ref level offset is based upon BT coupler loss + splitter

(2402 MHz)



Ref Lvl 5 dBm
 Marker 1 [T1] 1.95 dBm
 2.40182966 GHz
 RBW 3 MHz RF Att 20 dB
 VBW 3 MHz
 SWT 5 ms Unit dBm

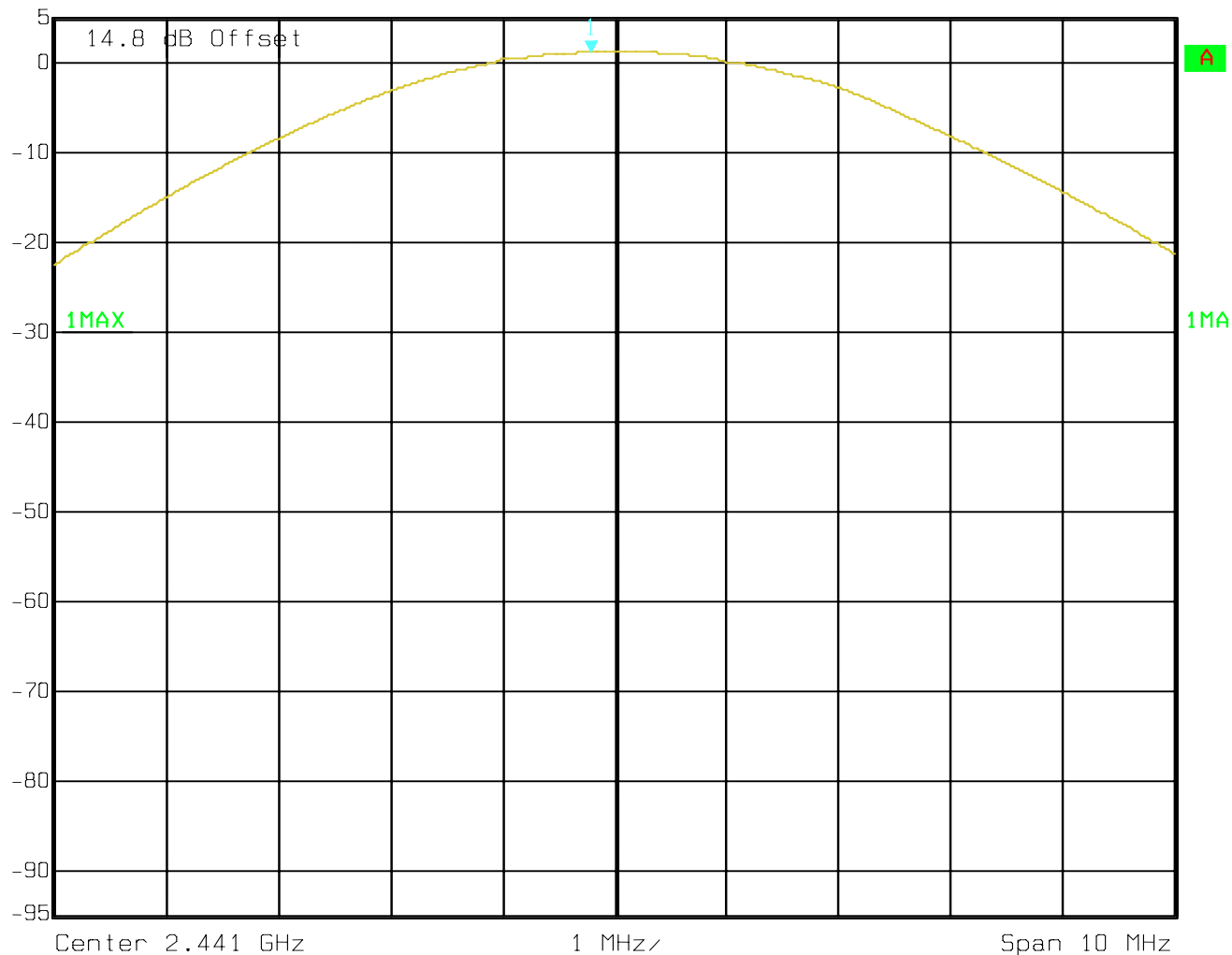


Date: 29.JAN.2006 16:55:04

(2441 MHz)

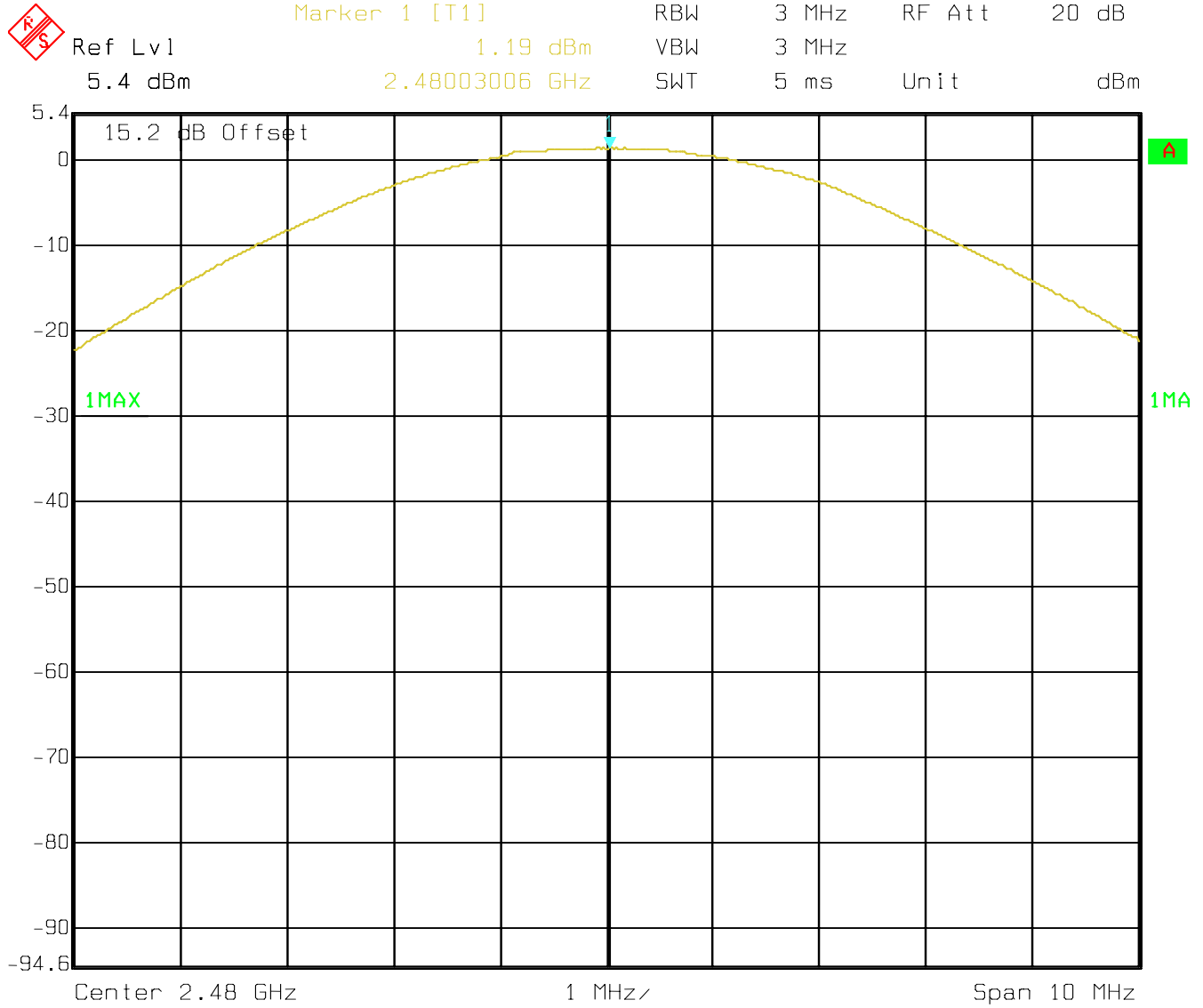


Marker 1 [T1] RBW 3 MHz RF Att 20 dB
 Ref Lvl 1.08 dBm VBW 3 MHz
 5 dBm 2.44078958 GHz SWT 5 ms Unit dBm



Date: 29.JAN.2006 16:56:20

(2480 MHz)



Date: 29.JAN.2006 16:57:07

5.3 20dB BANDWIDTH

5.3.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)

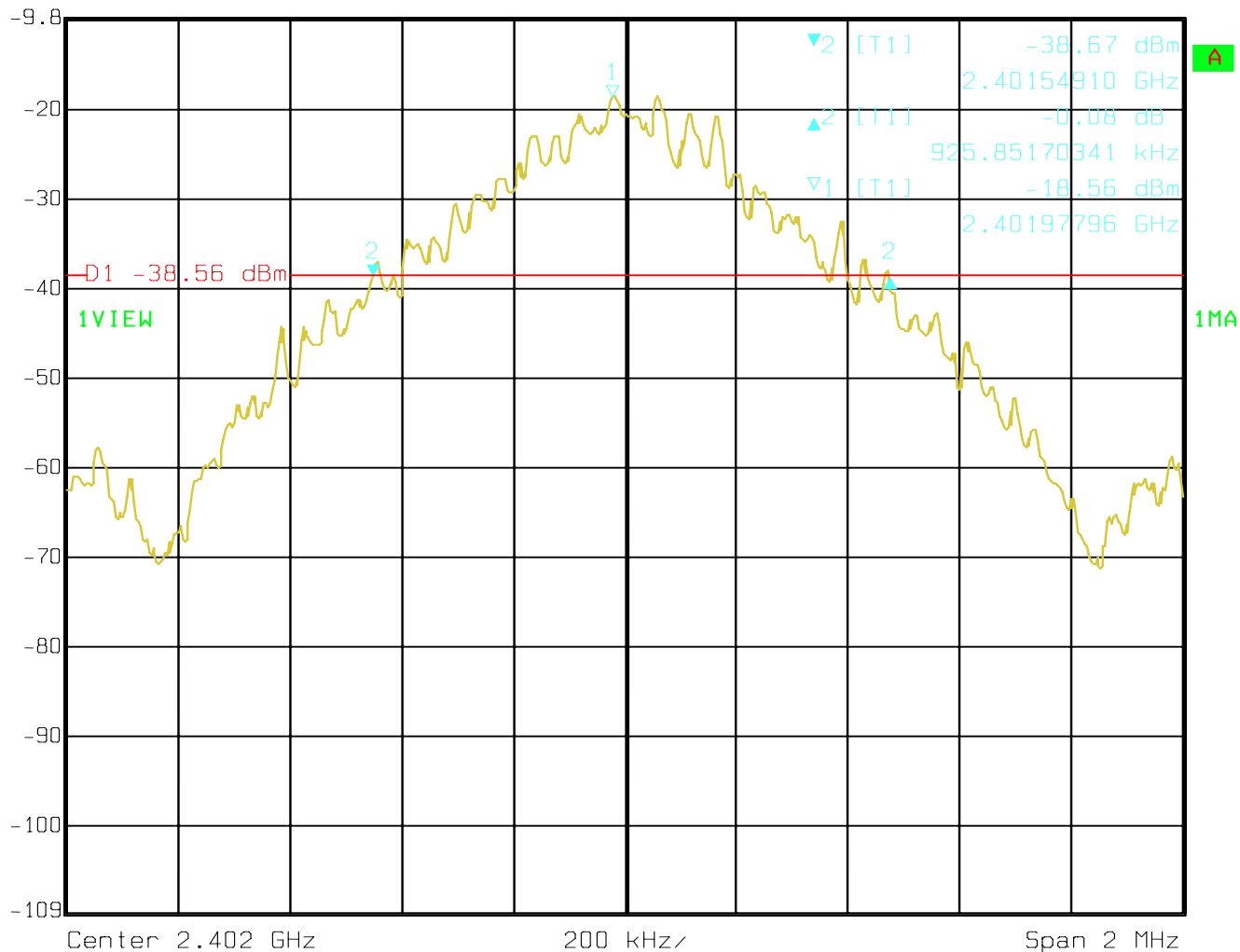
NUMBER OF CHANNELS	BANDWIDTH
79	<1MHz

5.3.2 RESULTS:

TEST CONDITIONS		BANDWIDTH (KHz)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	925.8	925.8	925.8

(2402 MHz)

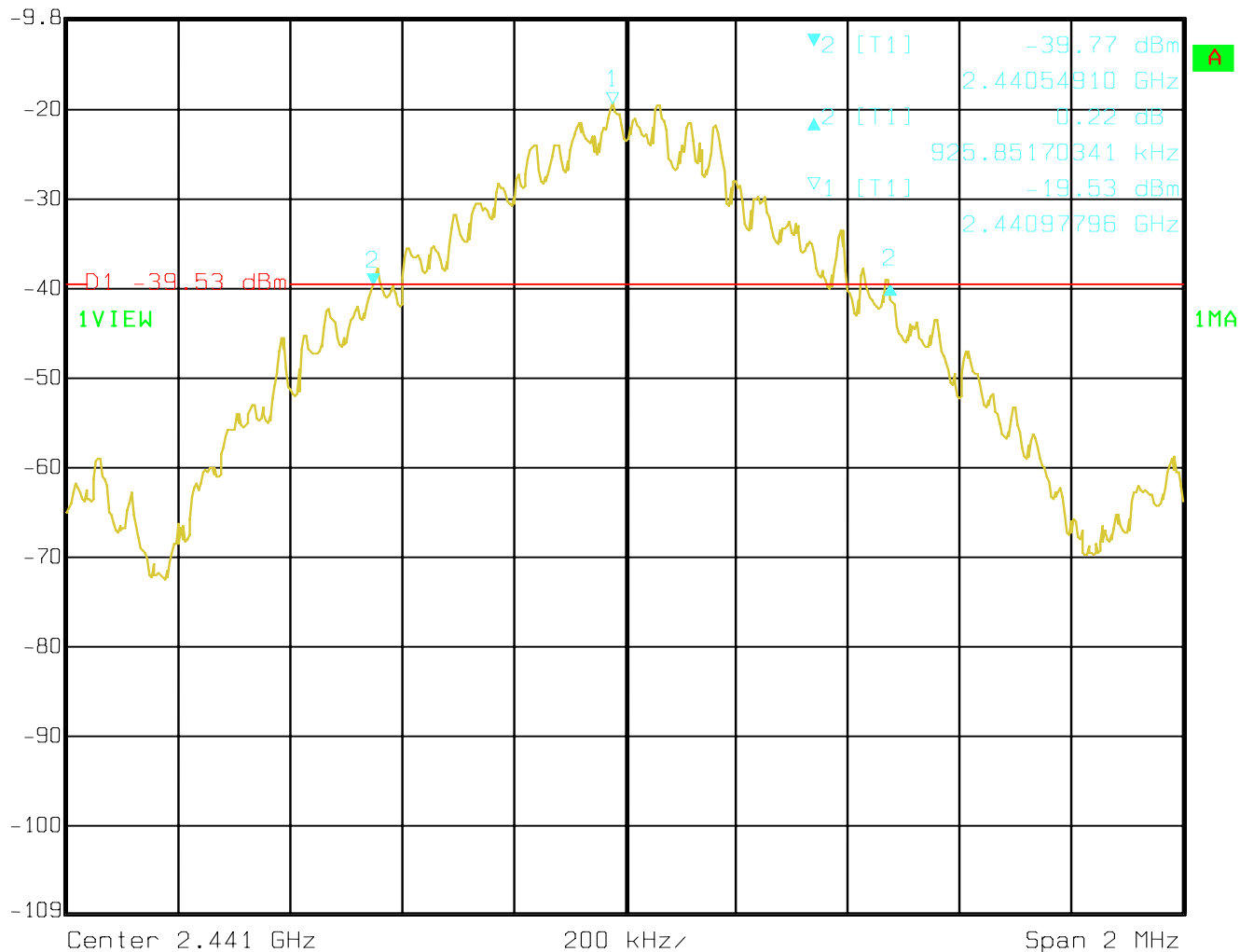

 Delta 2 [T1] RBW 10 kHz RF Att 20 dB
 Ref Lvl -9.8 dBm -0.08 dB VBW 30 kHz
 925.85170341 kHz SWT 50 ms Unit dBm



Date: 29.JAN.2006 17:03:18

(2441 MHz)


 Delta 2 [T1] RBW 10 kHz RF Att 20 dB
 Ref Lvl 0.22 dB VBW 30 kHz
 -9.8 dBm 925.85170341 kHz SWT 50 ms Unit dBm

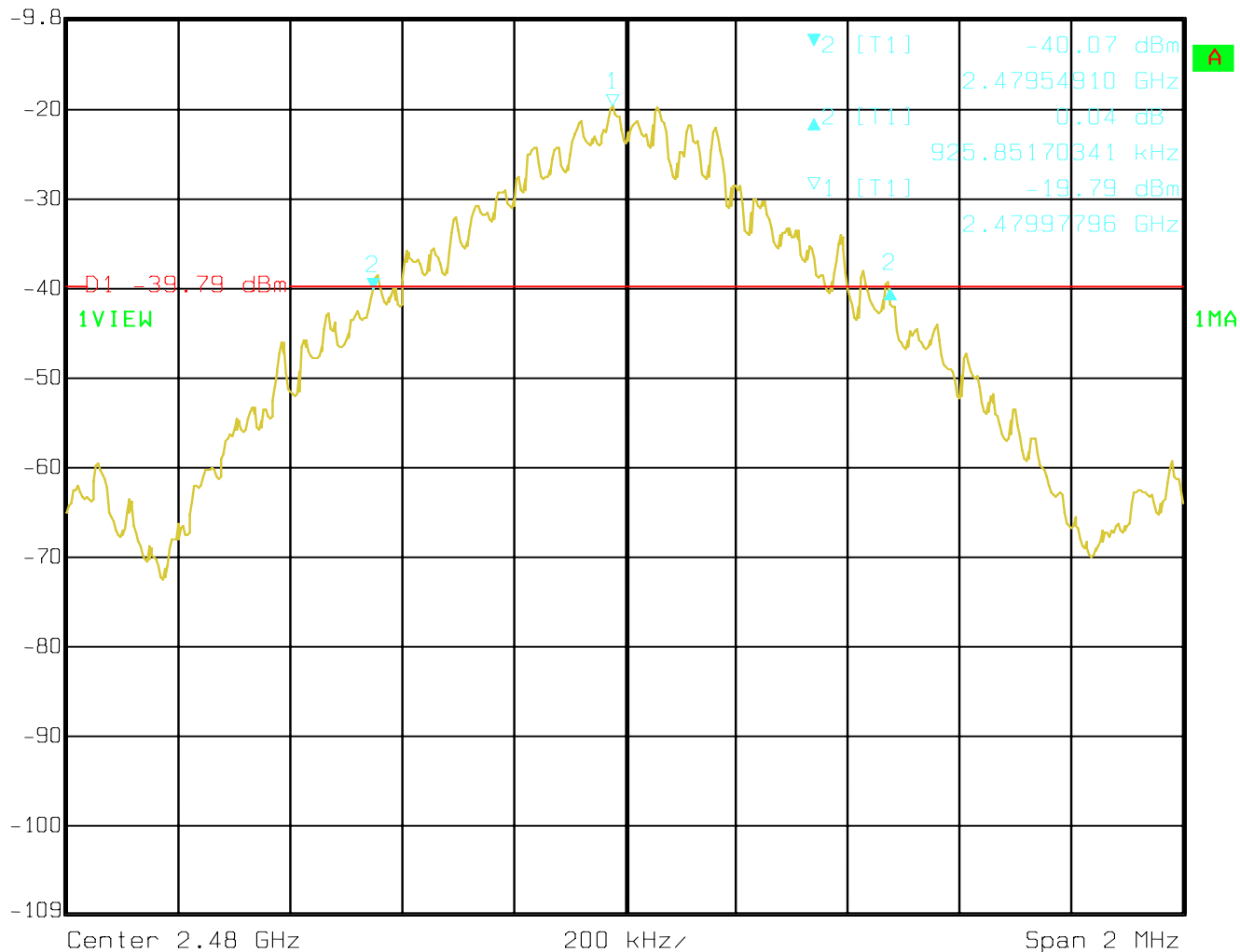


Date: 29.JAN.2006 17:04:57



(2480 MHz)

 Ref Lvl Delta 2 [T1] RBW 10 kHz RF Att 20 dB
-9.8 dBm 0.04 dB VBW 30 kHz
925.85170341 kHz SWT 50 ms Unit dBm



Date: 29.JAN.2006 17:07:14



5.4 CARRIER FREQUENCY SEPARATION

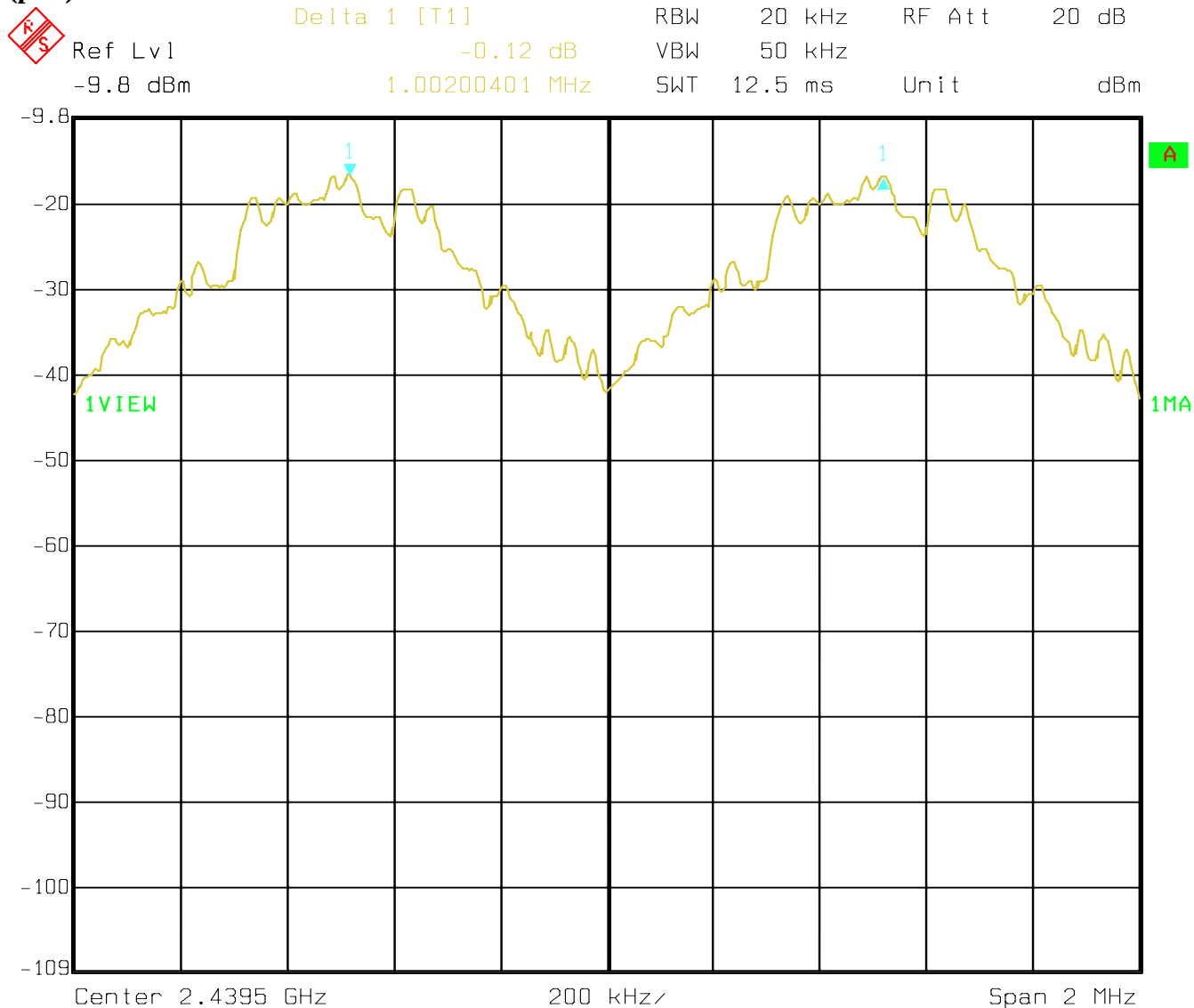
5.4.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)

SEPARATION
> 25 KHz or > 20 dB BANDWIDTH

5.4.2 RESULTS:

TEST CONDITIONS		SEPARATION (MHz)
T _{nom} (23)°C	V _{nom} VDC	1.002

(plot)



Date: 29.JAN.2006 17:14:26



5.5 NUMBER OF HOPPING CHANNELS

5.5.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (iii)

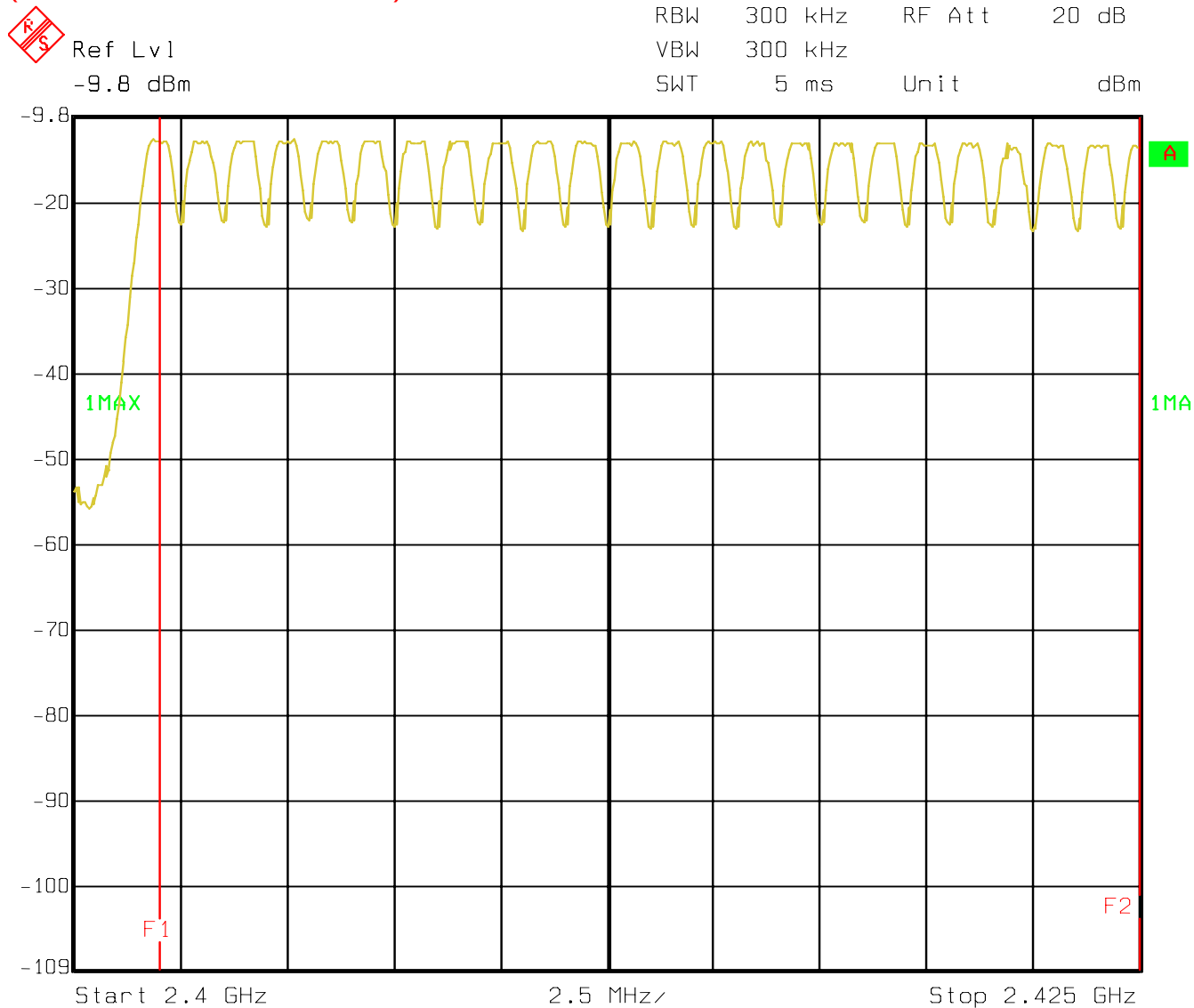
NUMBER OF CHANNELS
> 15

5.5.2 RESULTS:

TEST CONDITIONS		NUMBER OF CHANNELS
T _{nom} (23)°C	V _{nom} VDC	79

(PLOT 1)

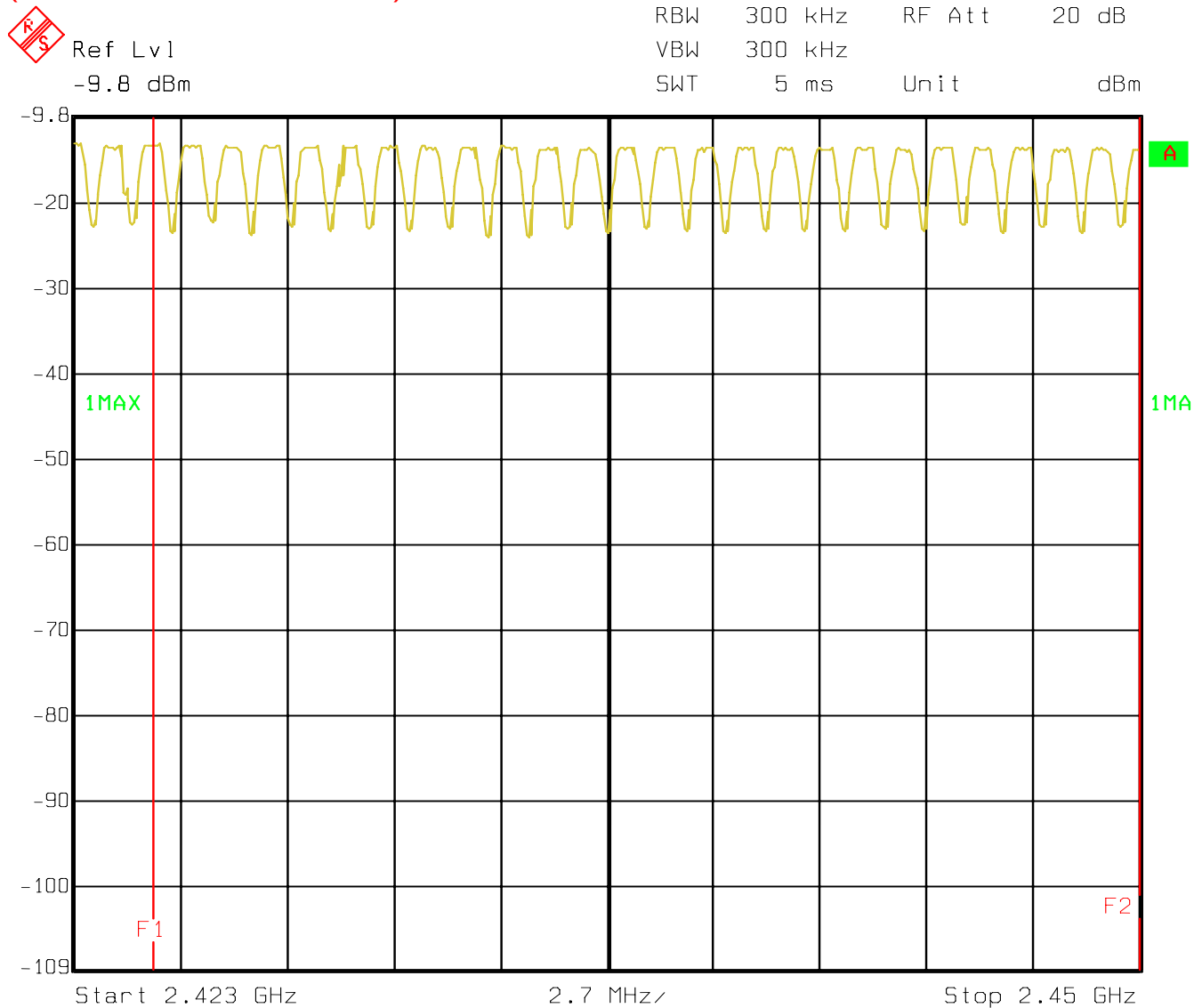
(F1-F2=2402MHz to 2425MHz)



Date: 29.JAN.2006 17:18:36

(PLOT 2)

(F1-F2=2425MHz to 2450MHz)



Date: 29.JAN.2006 17:20:06

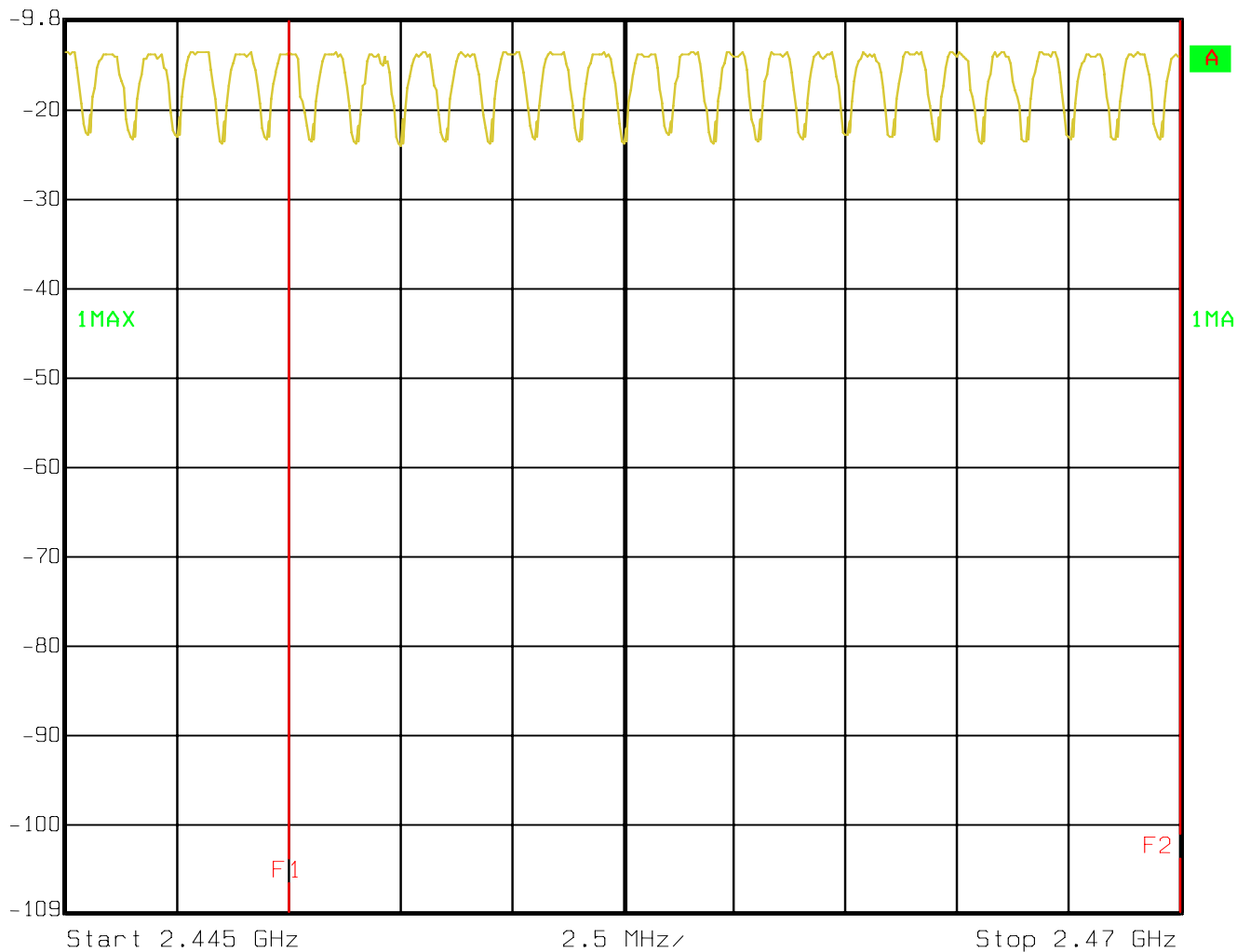
(PLOT 3)

(F1-F2=2450MHz to 2470MHz)



Ref Lvl
-9.8 dBm

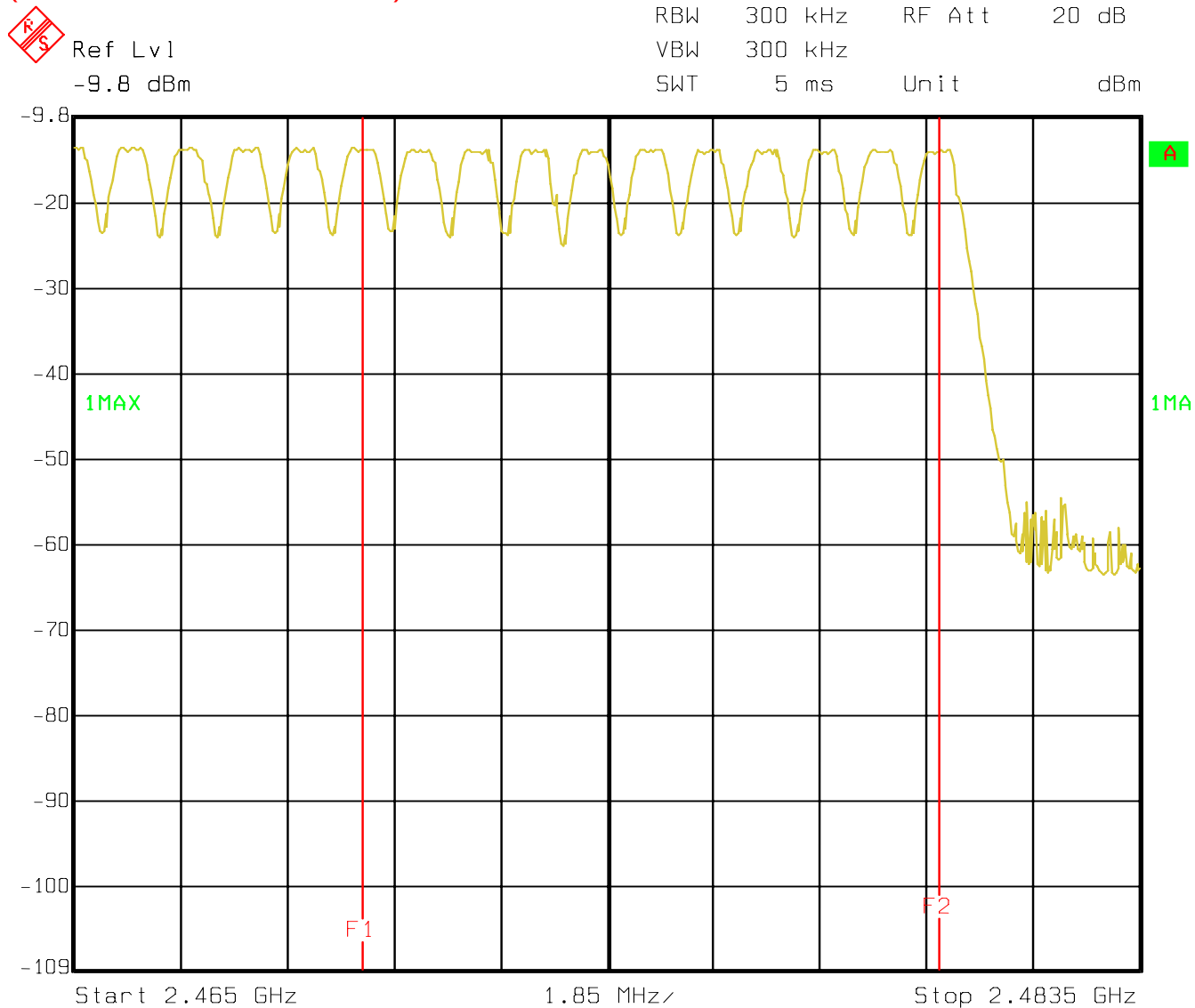
RBW 300 kHz RF Att 20 dB
VBW 300 kHz
SWT 5 ms Unit dBm



Date: 29.JAN.2006 17:21:30

(PLOT 4)

(F1-F2=2470MHz to 2480MHz)



Date: 29.JAN.2006 17:24:37

5.6 TIME OF OCCUPANCY (DWELL TIME)

5.6.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)

FREQUENCY RANGE	AVERAGE TIME OF OCCUPANCY PER 31.6 SECONDS (LIMIT)
2400-2483.5	0.4 SECONDS

5.6.2 RESULTS:

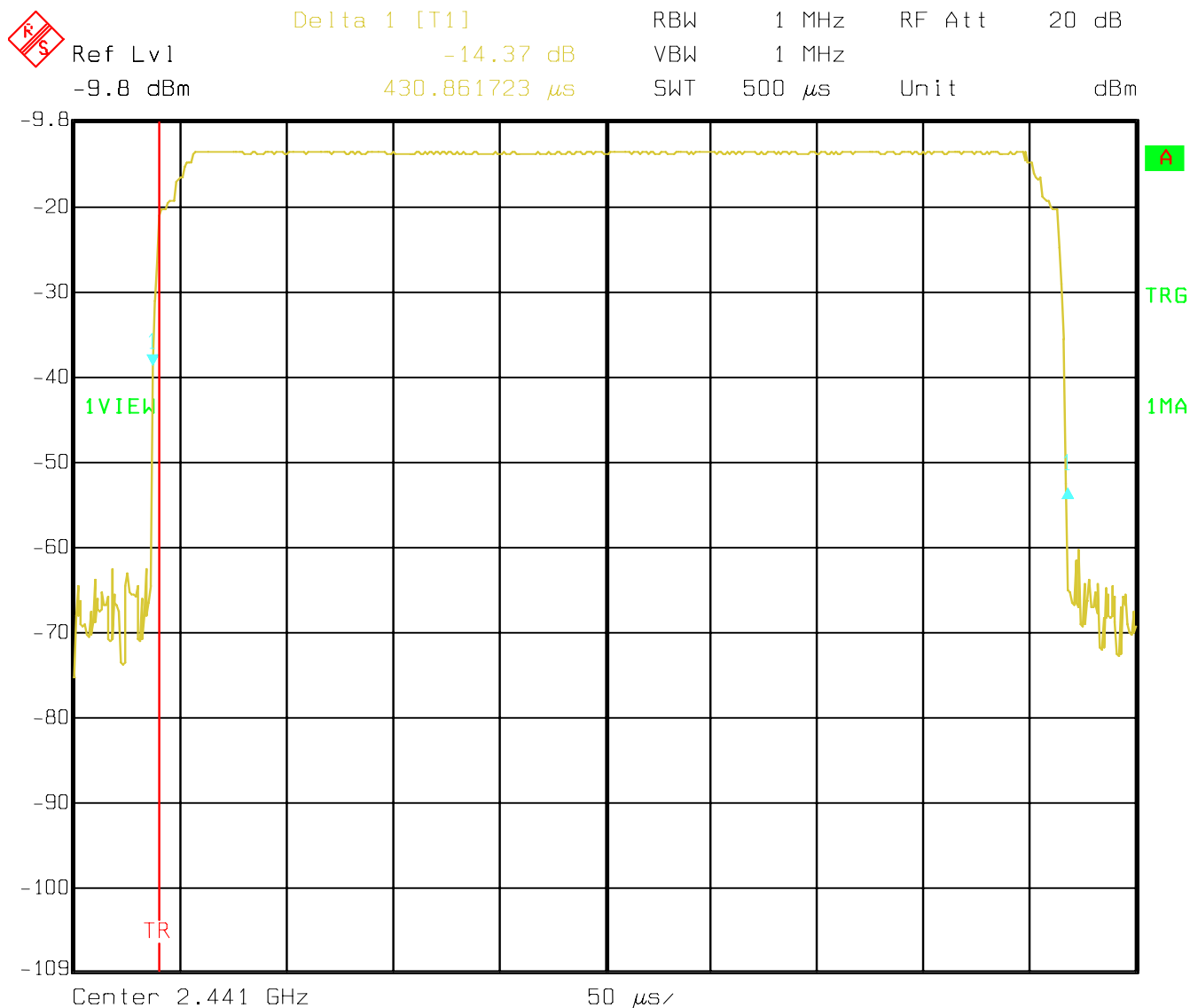
TEST CONDITIONS		TIME OF OCCUPANCY IN 31.6 SECONDS		
PACKET TYPE		DH1	DH3	DH5
T _{nom} (23)°C	V _{nom} VDC	153.9ms	272.84ms	312.26ms

(DH1)

The system makes worst case 1600 hops per second or 1 time slot has a length of 625μs with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 800 hops per second with 79 channels. So you have each channel 10.13 times per second and so for 31.6 seconds you have 320.108 times of appearance.

Each Tx-time per appearance is 430.86μs.

So we have $320.108 * 480.86\mu s = 153.9ms$ per 31.6 seconds.



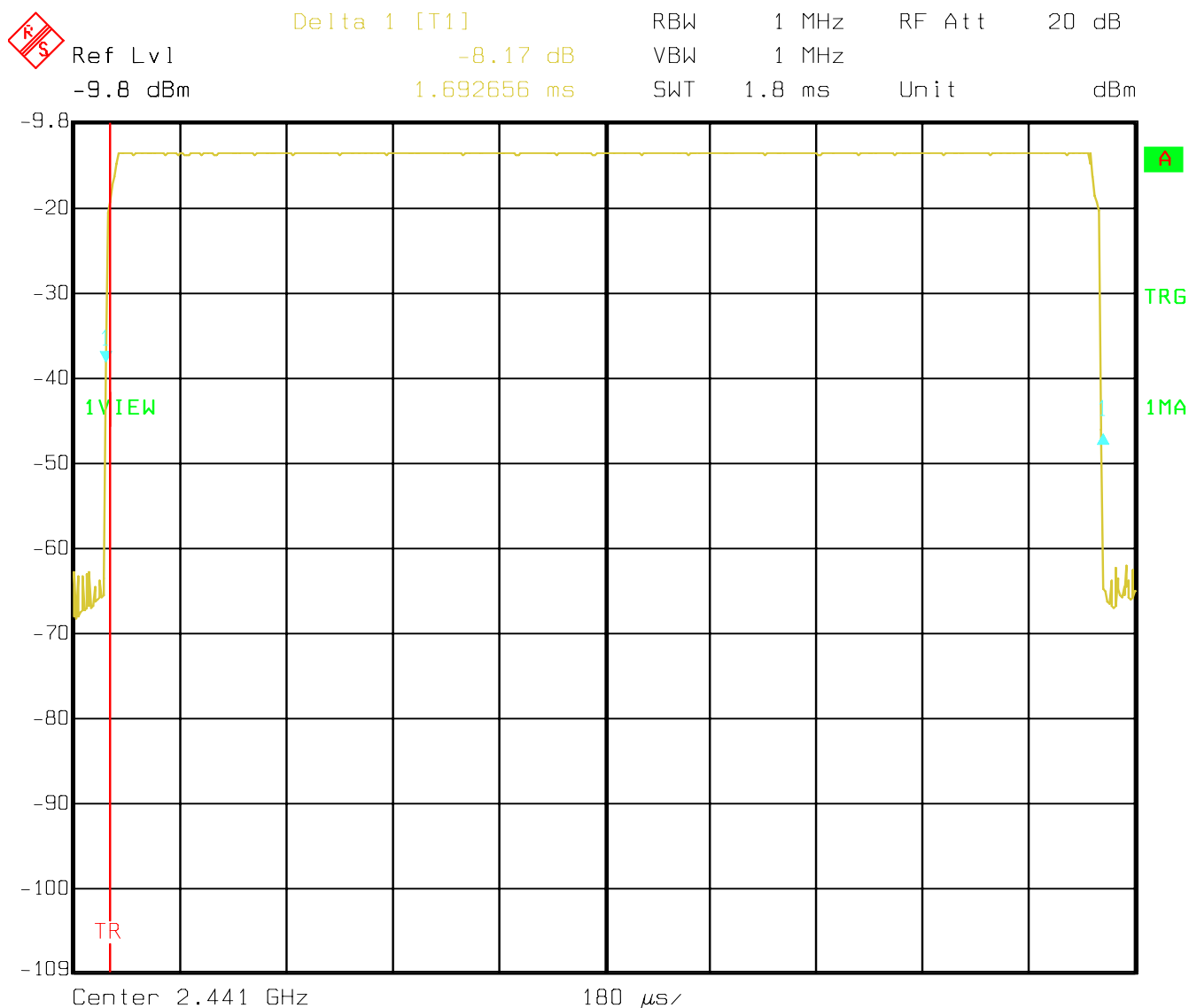
Date: 29.JAN.2006 17:32:12

(DH3)

A DH3 Packets need 3 time slots for transmit and 1 for receiving, then the system makes worst case 400 hops per second with 79 channels. So you have each channel 5.1 times per second and so for 31.6 seconds you have 161.16 times of appearance.

Each Tx-time per appearance is 1.693ms.

So we have $161.16 * 1.693\text{ms} = 272.84\text{ms}$ per 31.6 seconds.



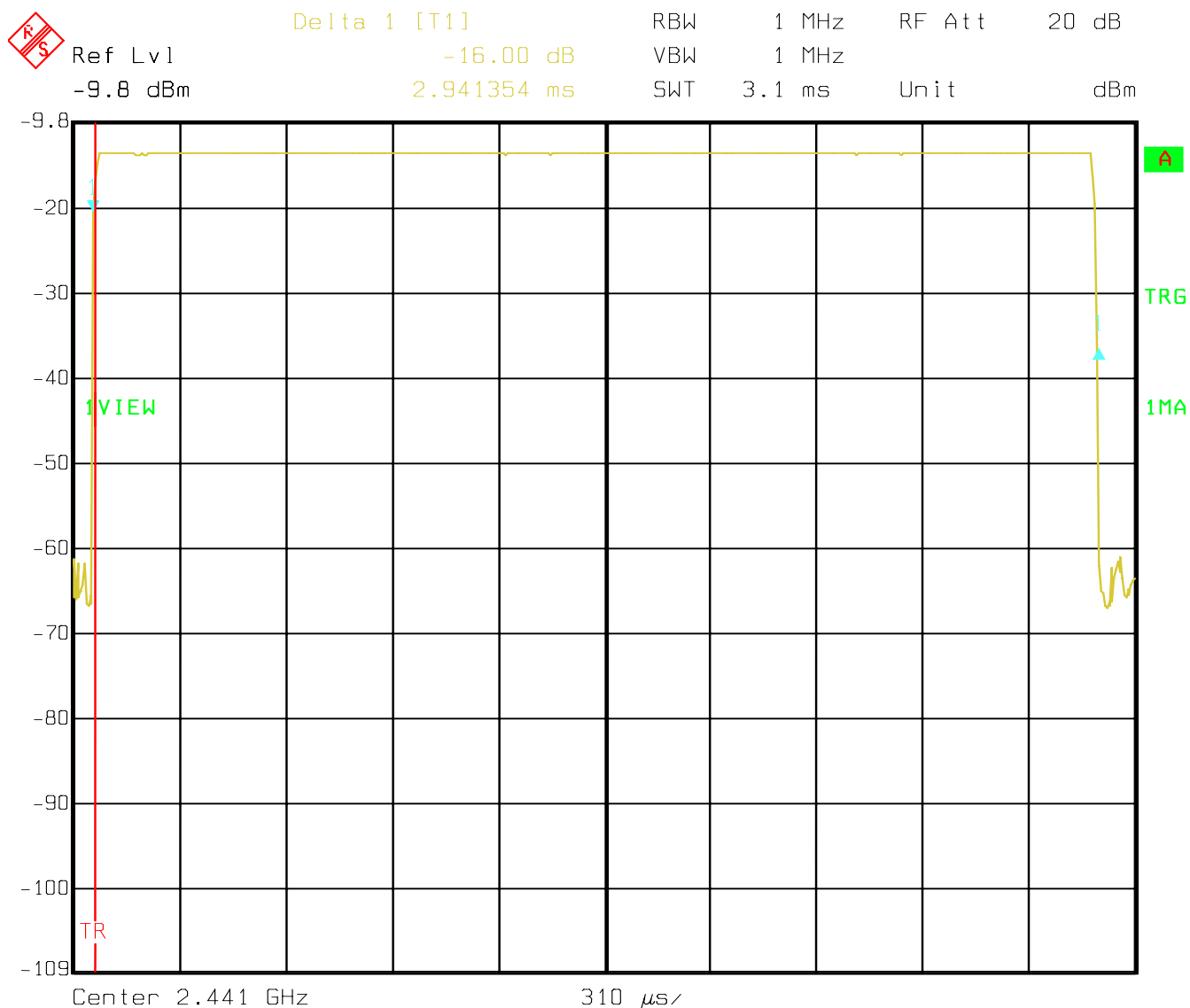
Date: 29.JAN.2006 17:34:08

(DH5)

At DH5 Packets you need 5 time slots for transmit and 1 for receiving, then the system makes worst case 266.7 hops per second with 79 channels. So you have each channel 3.36 times per second and so for 30 seconds you have 106.176 times of appearance.

Each Tx-time per appearance is 2.941ms.

So we have $106.176 * 2.941\text{ms} = 312.26\text{ms}$ per 31.6 seconds.



Date: 29.JAN.2006 17:36:30

5.7 CONDUCTED SPURIOUS EMISSIONS

5.7.1 LIMIT SUB CLAUSE § 15.247 (d)

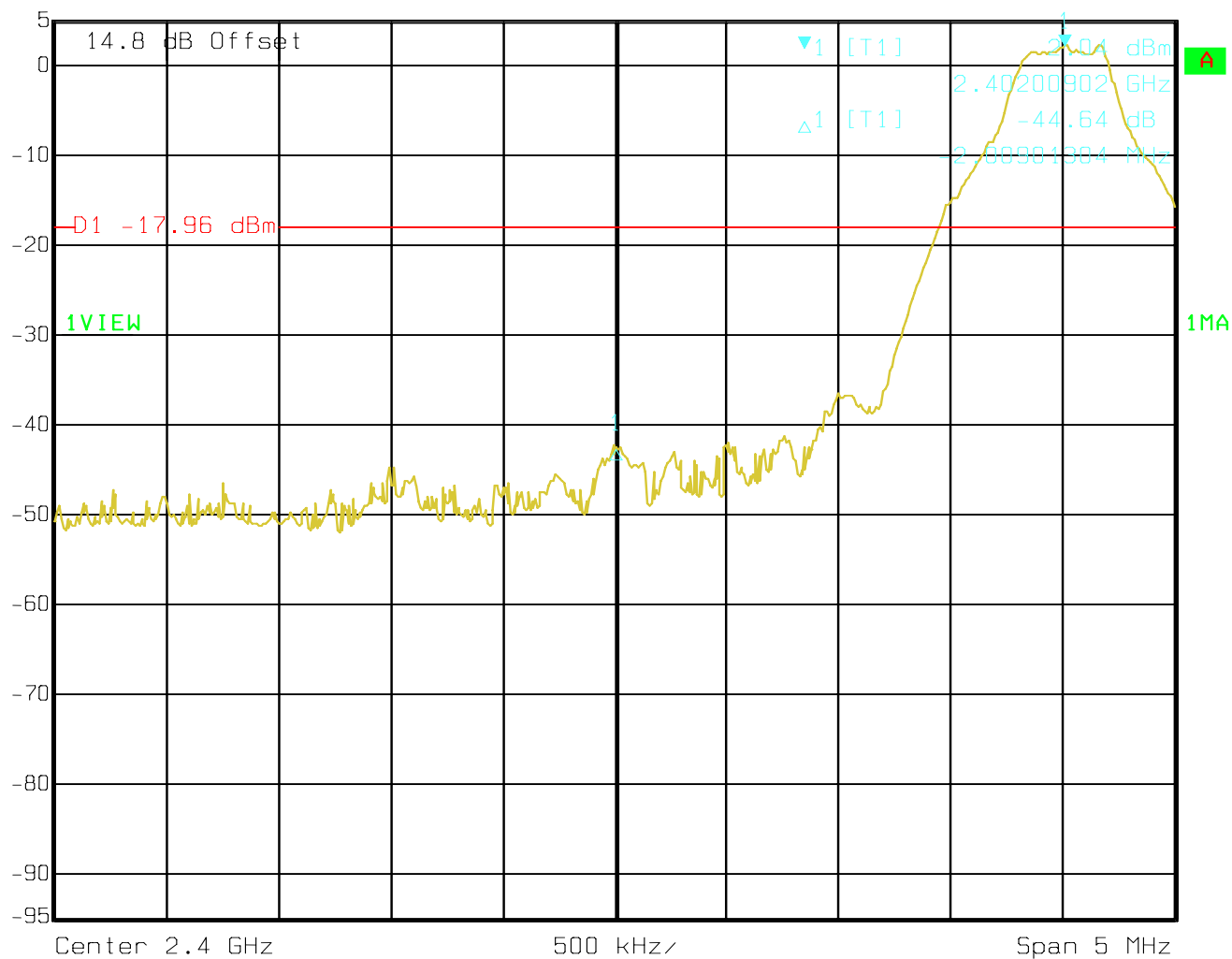
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

*ref level offset is based upon BT coupler loss + splitter

5.7.2 RESULTS

CONDUCTED BANDEGDE COMPLIANCE 2402 MHz

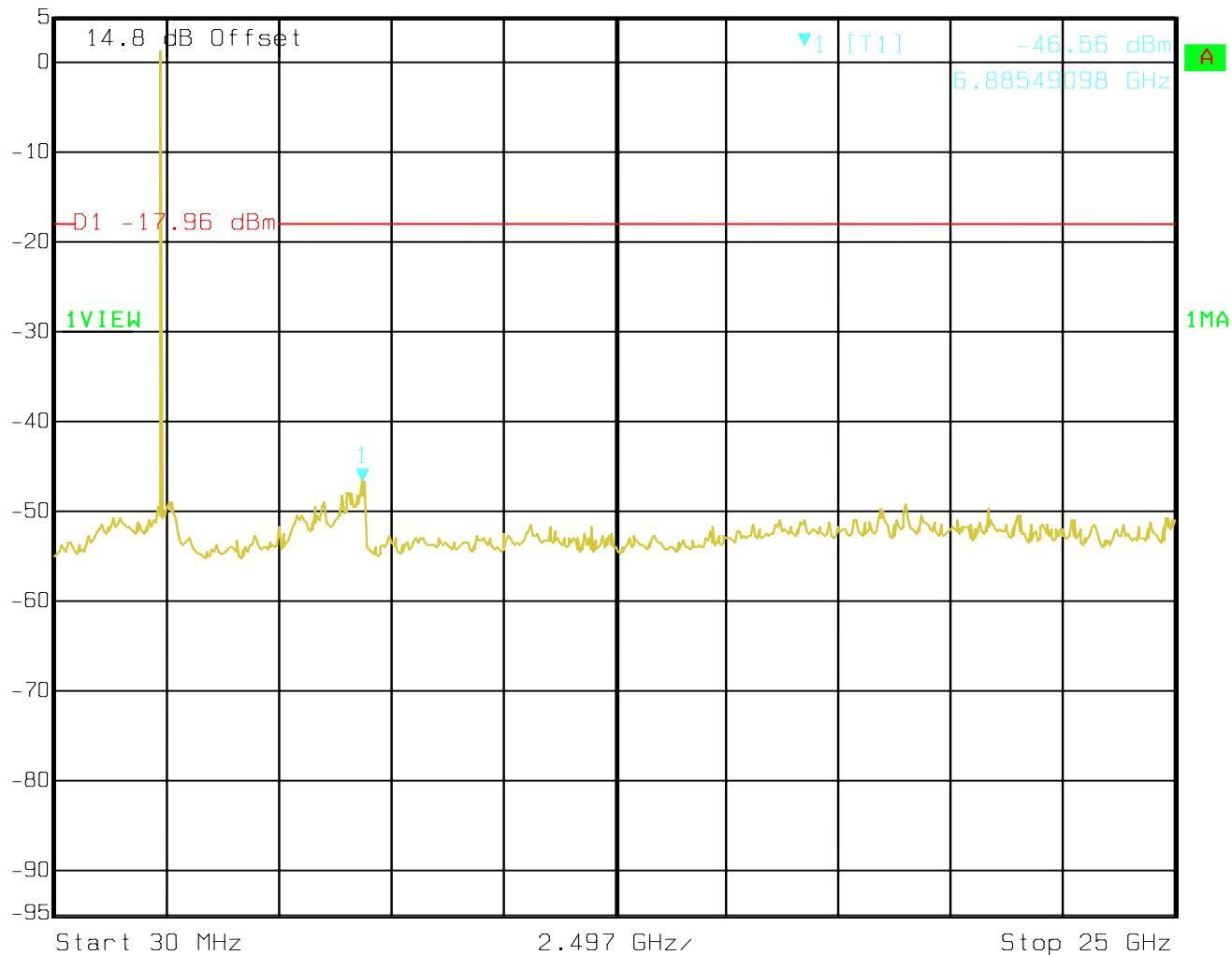

 Ref Lvl 5 dBm
 Marker 1 [T1] 2.04 dBm
 RBW 100 kHz RF Att 20 dB
 VBW 300 kHz
 2.40200902 GHz
 SWT 5 ms Unit dBm



Date: 29.JAN.2006 17:40:38

CONDUCTED SPURIOUS 2402 MHz

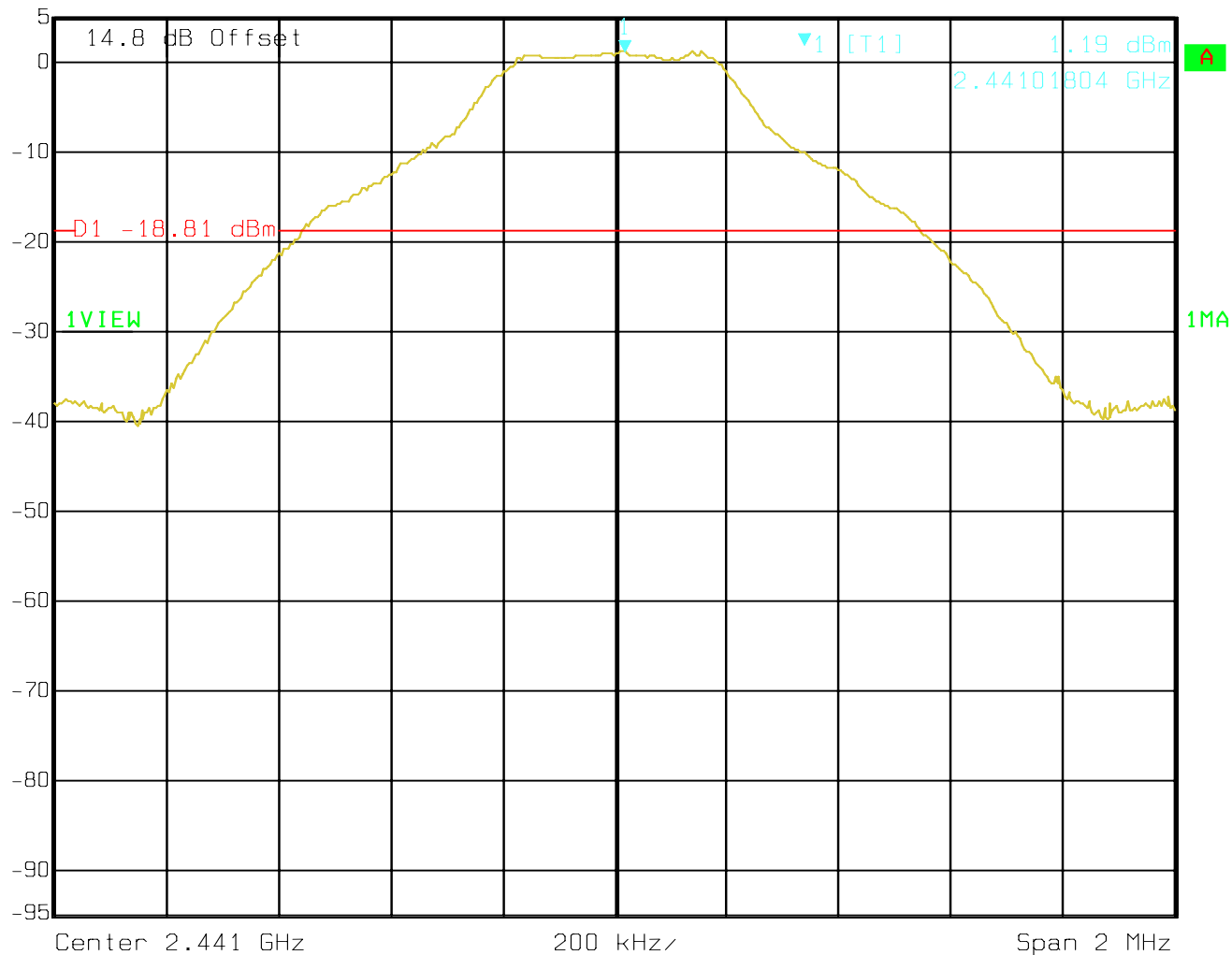

 Marker 1 [T1] RBW 100 kHz RF Att 20 dB
 Ref Lvl -46.56 dBm VBW 300 kHz
 5 dBm 6.88549098 GHz SWT 6.4 s Unit dBm



Date: 29.JAN.2006 17:41:52

REFERENCE 2441 MHz

 Marker 1 [T1] RBW 100 kHz RF Att 20 dB
 Ref Lvl 1.19 dBm VBW 300 kHz
 5 dBm 2.44101804 GHz SWT 5 ms Unit dBm

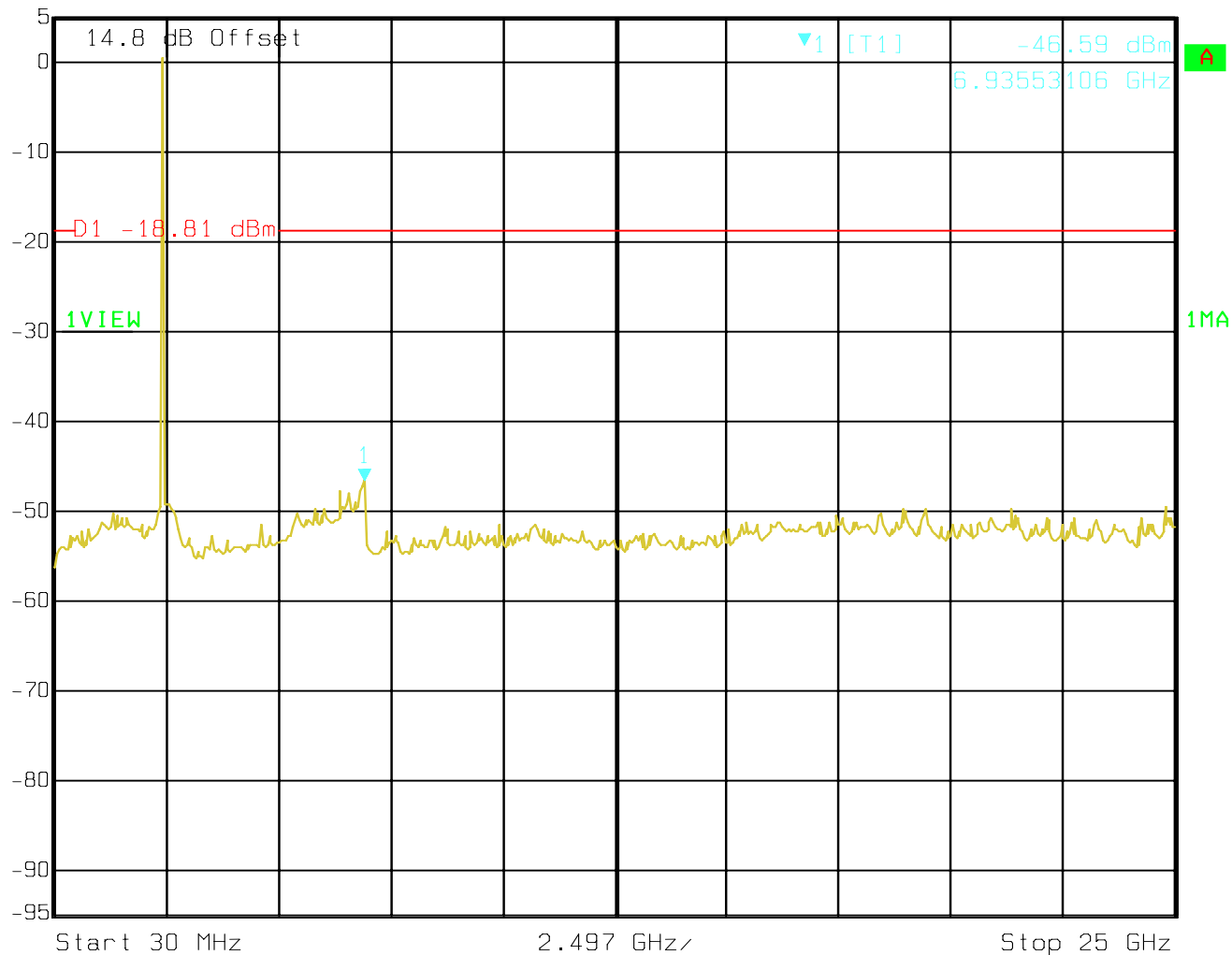


Date: 29.JAN.2006 17:45:46



CONDUCTED SPURIOUS 2441 MHz

 Marker 1 [T1] RBW 100 kHz RF Att 20 dB
Ref Lvl -46.59 dBm VBW 300 kHz
5 dBm 6.93553106 GHz SWT 6.4 s Unit dBm

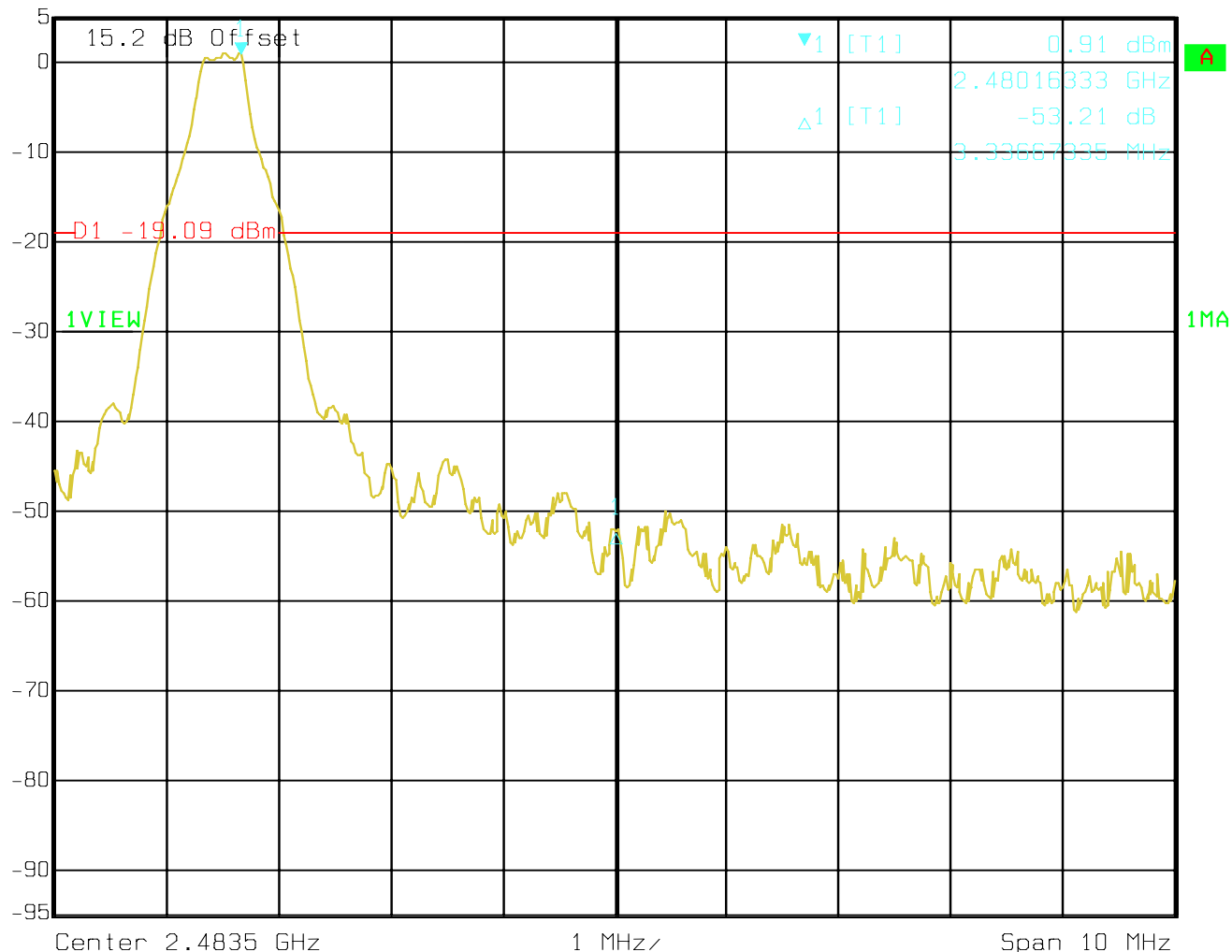


Date: 29.JAN.2006 17:46:40



CONDUCTED BANDEGDE COMPLIANCE 2480 MHz

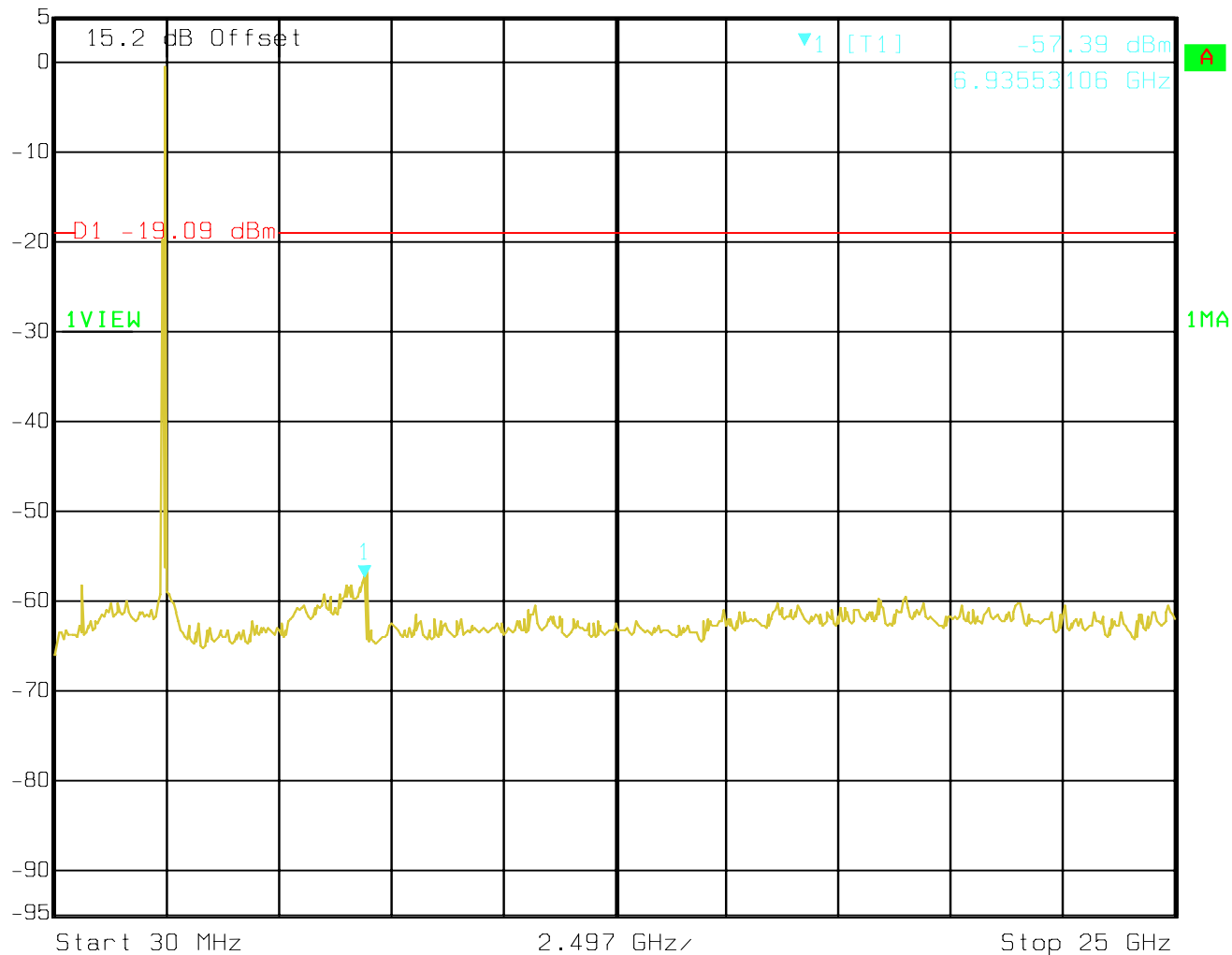

 Ref Lvl 5 dBm
 Marker 1 [T1] 0.91 dBm
 RBW 100 kHz RF Att 10 dB
 VBW 300 kHz
 2.48016333 GHz
 SWT 5 ms Unit dBm



Date: 29.JAN.2006 18:17:07

CONDUCTED SPURIOUS 2480 MHz

 Ref Lvl 5 dBm Marker 1 [T1] -57.39 dBm RBW 100 kHz RF Att 10 dB
6.93553106 GHz VBW 300 kHz Unit dBm
SWT 6.4 s



Date: 29.JAN.2006 18:17:53

5.8 RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205

5.8.1 LIMITS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

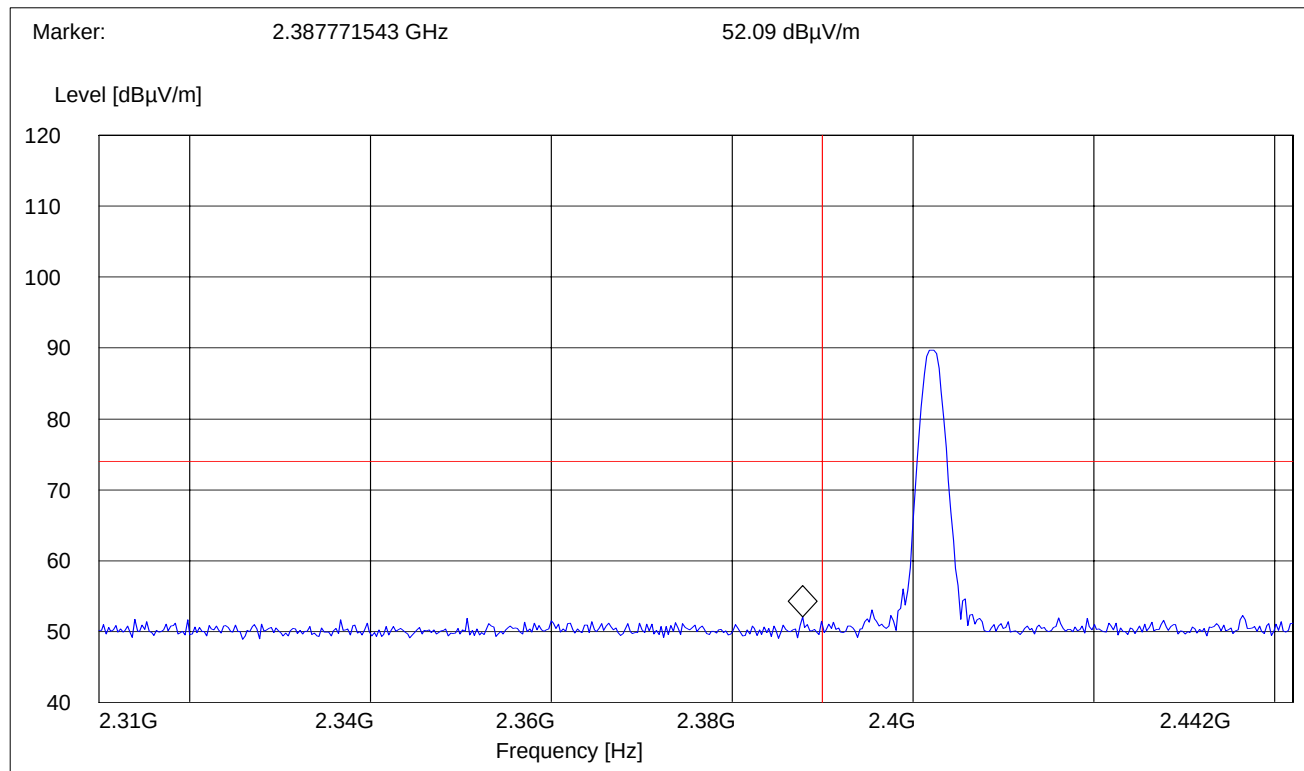
***PEAK LIMIT= 74dBuV/m**

***AVG. LIMIT= 54dBuV/m**

5.8.2 RESULTS (2402MHz)

PEAK

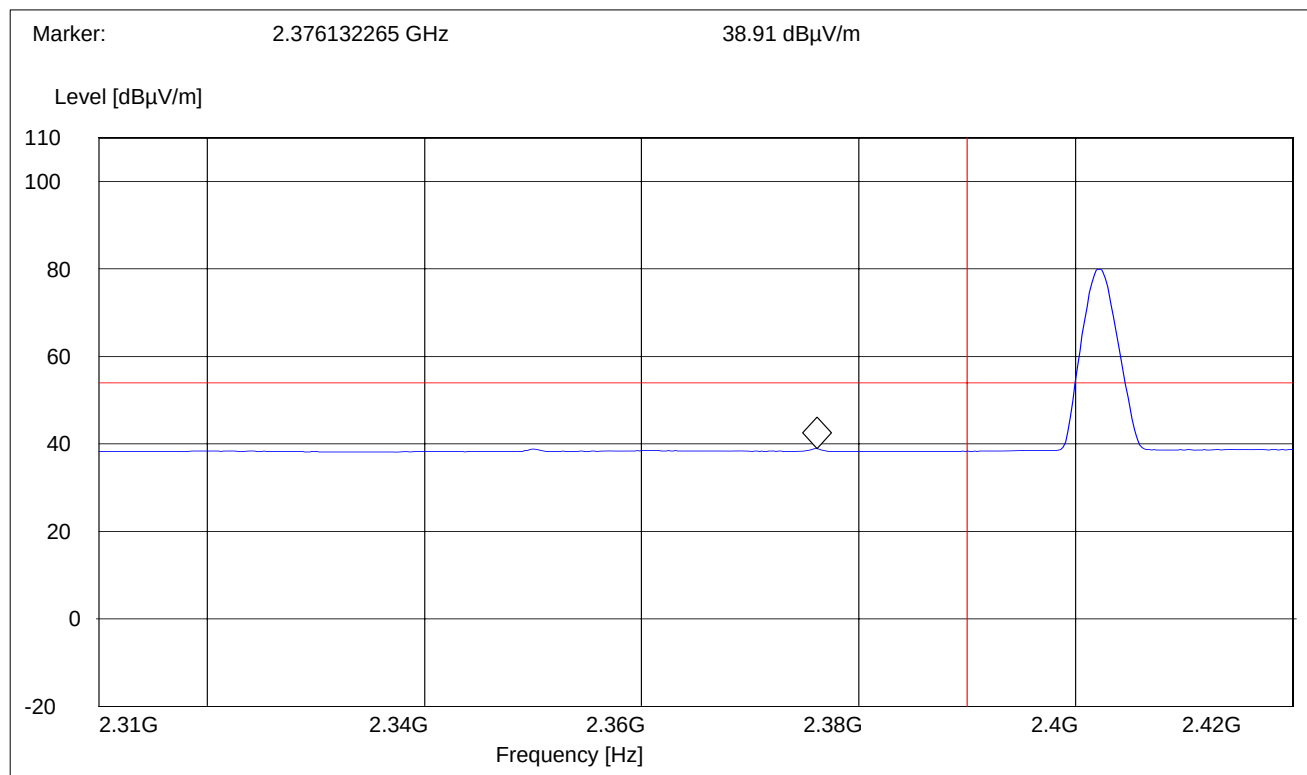
Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
2310 MHz	2442 MHz	Max Peak	Coupled	1 MHz	1 MHz





AVG

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
2310 MHz	2420 MHz	Max Peak	Coupled	1 MHz	10 Hz

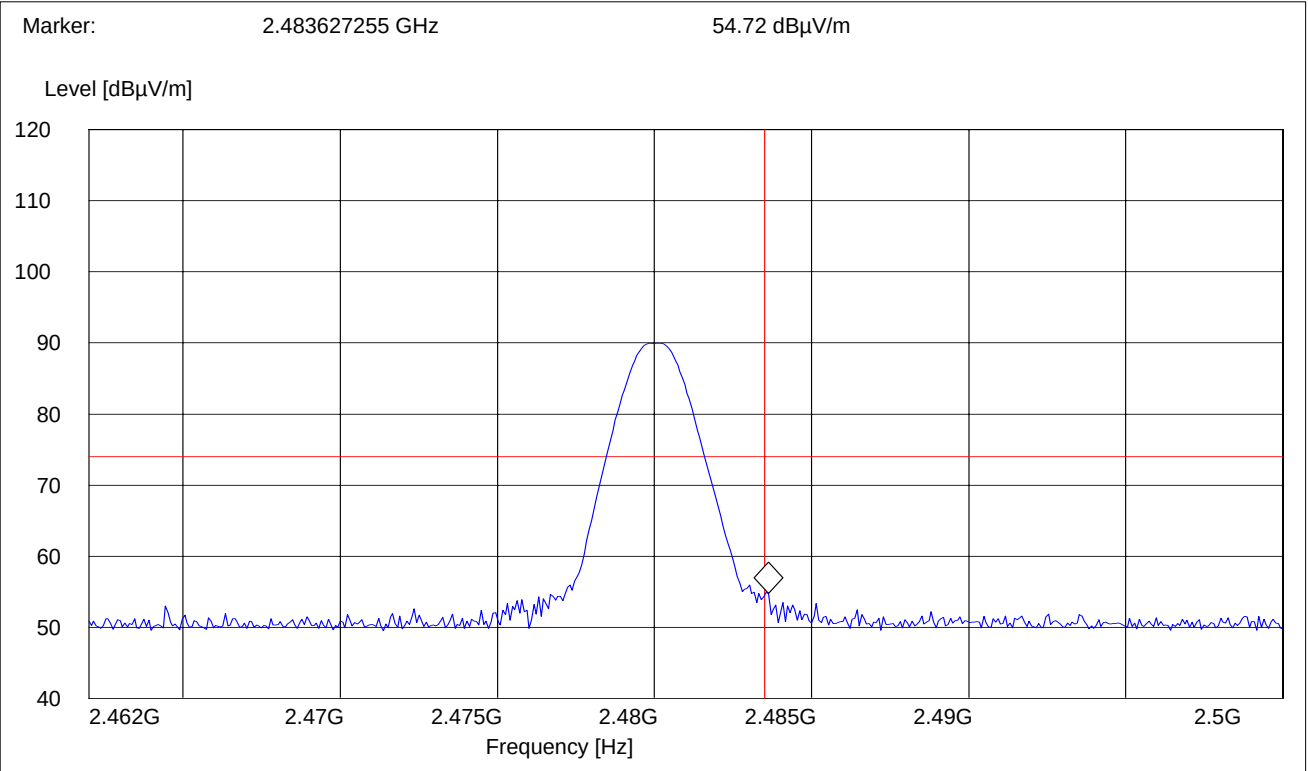




5.8.3 RESULTS (2480MHz)

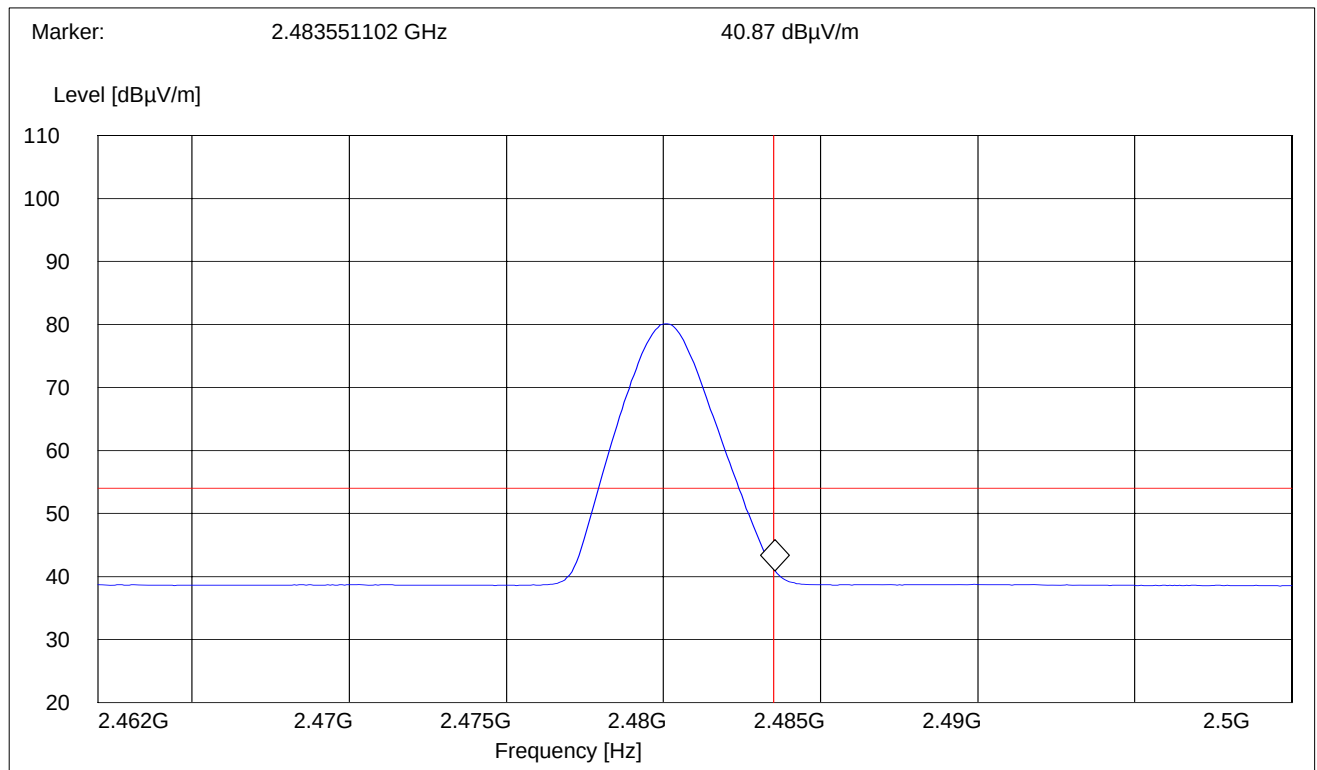
PEAK

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
2462 MHz	2500 MHz	Max Peak	Coupled	1 MHz	1 MHz



AVG

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
2462 MHz	2500 MHz	Max Peak	Coupled	1 MHz	10 Hz



5.9 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209

5.9.1 LIMITS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

***PEAK LIMIT= 74dBuV/m**

***AVG. LIMIT= 54dBuV/m**

NOTE:

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

2. All measurements are done in peak mode using an average limit , unless specified with the plots.

Results for the radiated measurements below 30MHz according § 15.33

Frequency	Measured values	Remarks
9KHz – 30MHz	No emissions found, caused by the EUT	This is valid for all the tested channels

5.9.2 RESULTS

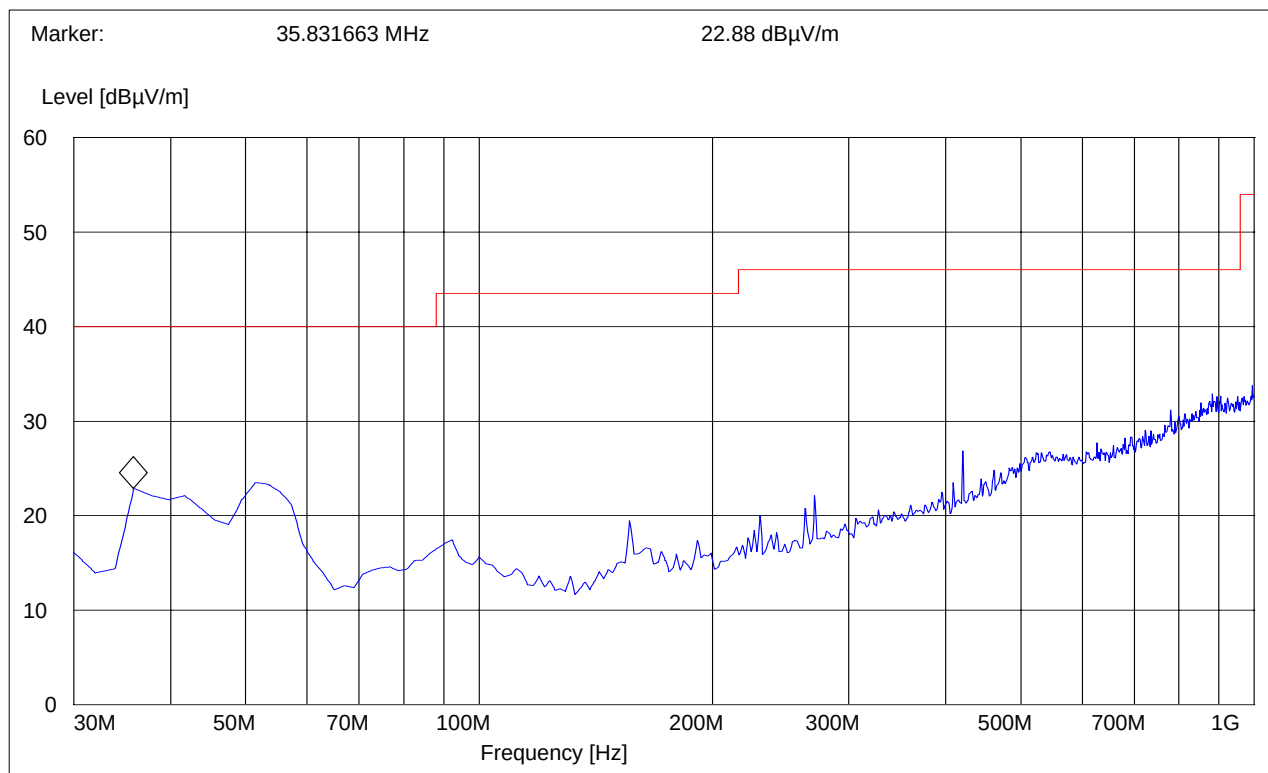
30MHz – 1GHz

Antenna: vertical

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
30MHz	1GHz	Max Peak	Coupled	100 KHz	100 KHz

Note: This plot is valid for low, mid, high channels (worst-case plot)

Note: Peak reading vs. Quasi-peak limit

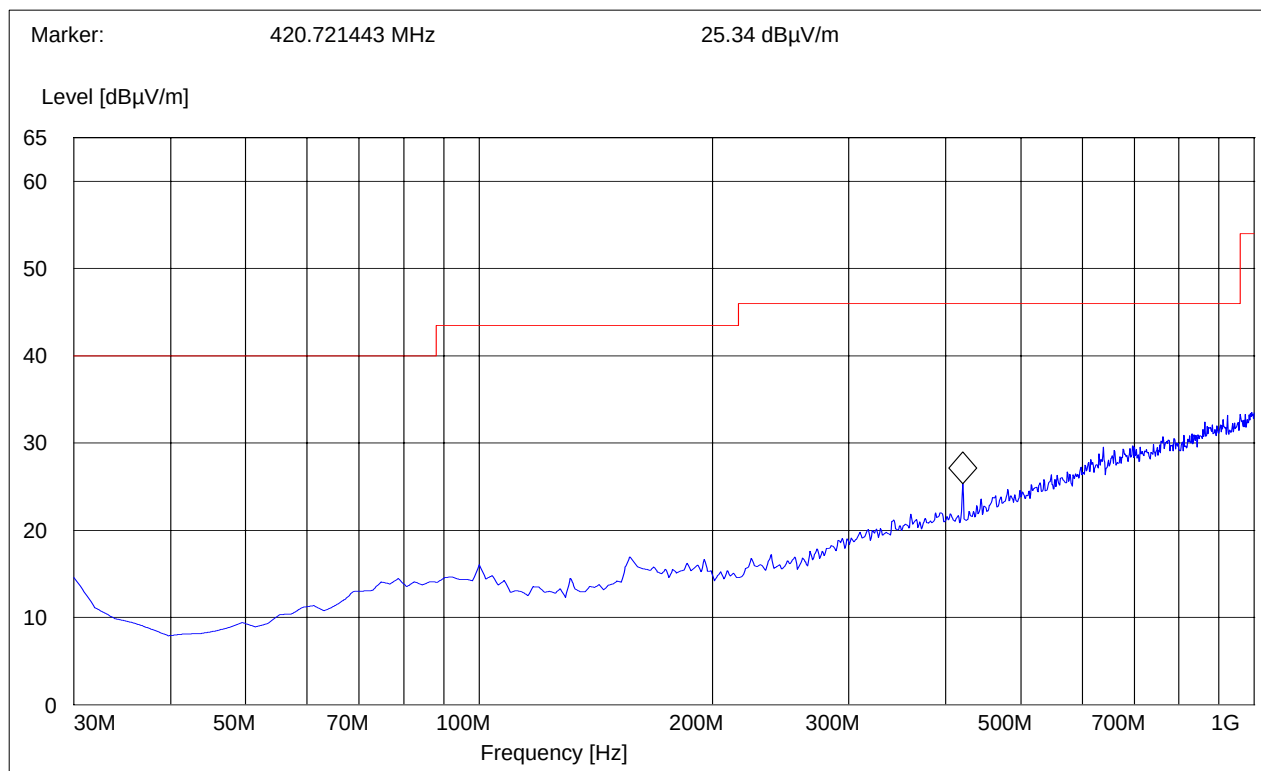


30MHz – 1GHz
Antenna: horizontal

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
30MHz	1GHz	Max Peak	Coupled	100 KHz	100 KHz

Note: This plot is valid for low, mid, high channels (worst-case plot)

Note: Peak reading vs. Quasi-peak limit

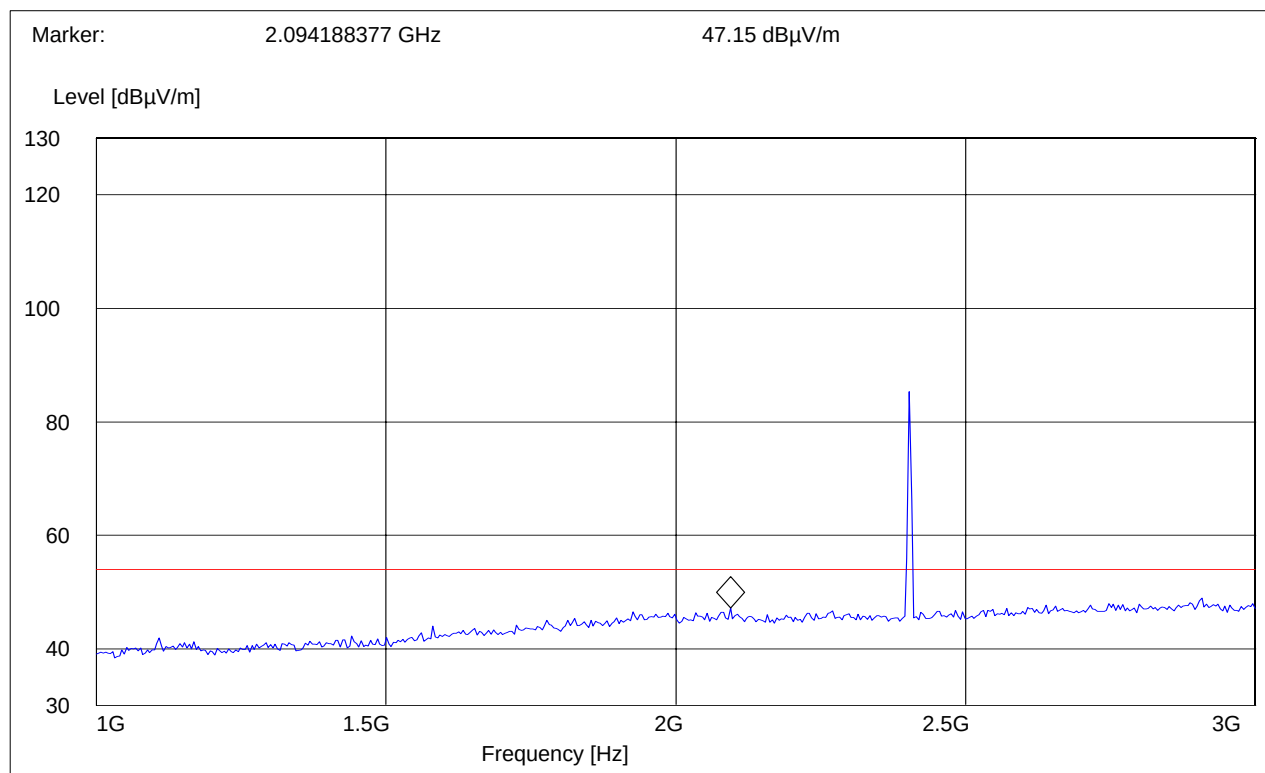


1-3GHz (2402MHz)

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
1GHz	3GHz	Max Peak	Coupled	1 MHz	1 MHz

Note: The peaks above the limit line is the carrier freq.

Note: Peak Reading vs. Average limit



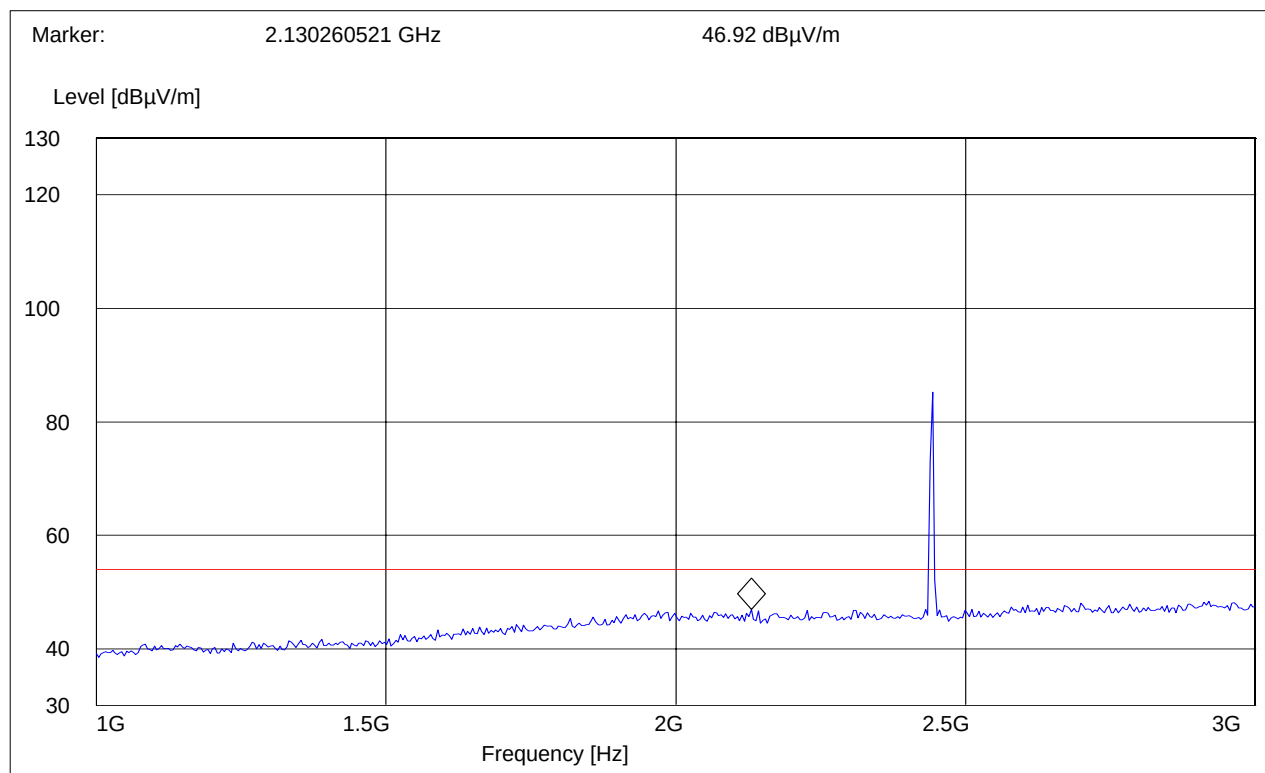


1-3GHz (2441MHz)

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
1GHz	3GHz	Max Peak	Coupled	1 MHz	1 MHz

Note: The peaks above the limit line is the carrier freq.

Note: Peak Reading vs. Average limit

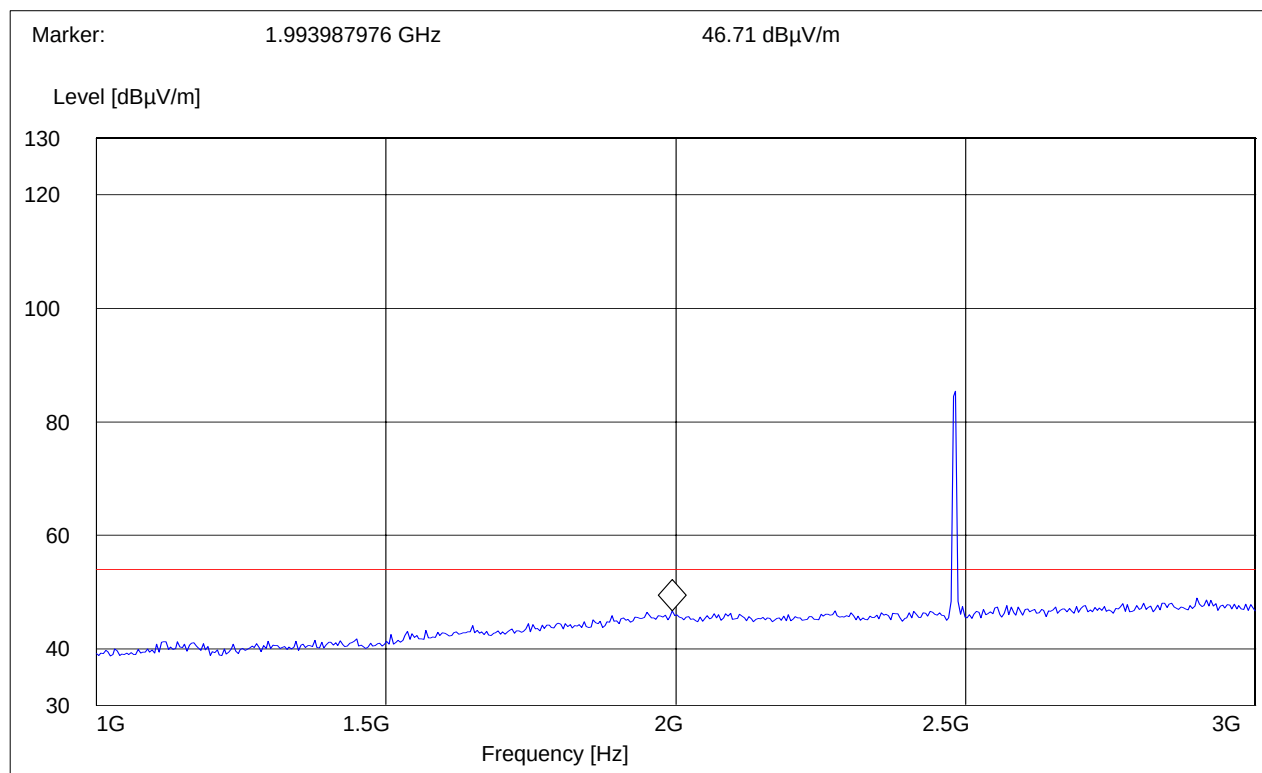


1-3GHz (2480MHz)

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
1GHz	3GHz	Max Peak	Coupled	1 MHz	1 MHz

Note: The peaks above the limit line is the carrier freq.

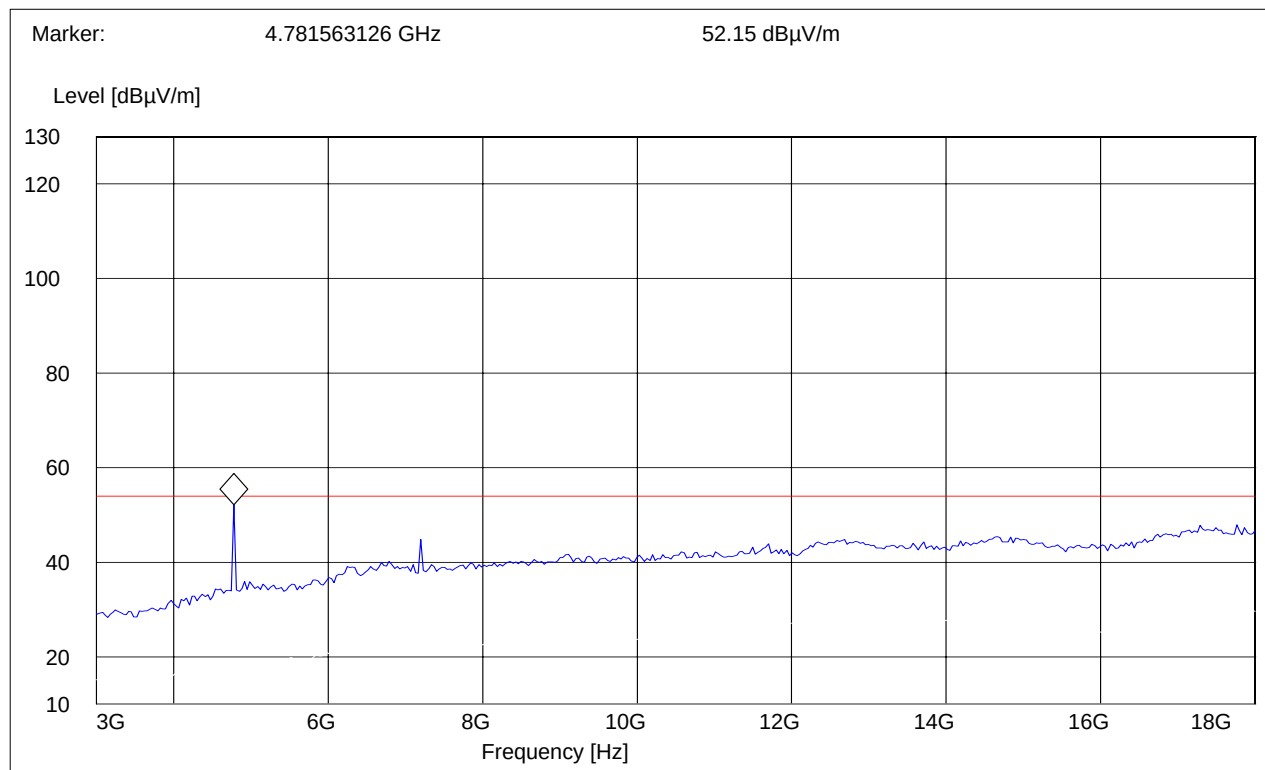
Note: Peak Reading vs. Average limit



3-18GHz (2402MHz)

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
3GHz	18GHz	Max Peak	Coupled	1 MHz	1 MHz

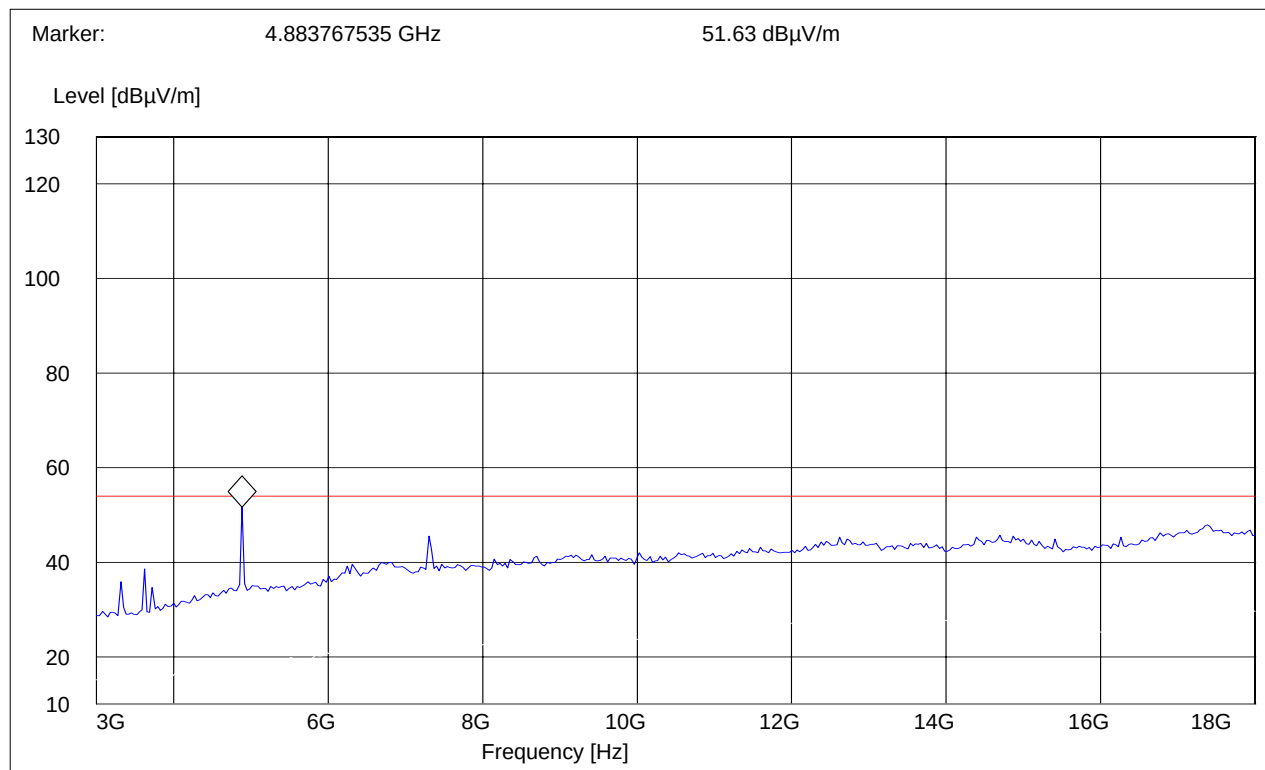
Note: Peak Reading vs. Average limit



3-18GHz (2441MHz)

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
3GHz	18GHz	Max Peak	Coupled	1 MHz	1 MHz

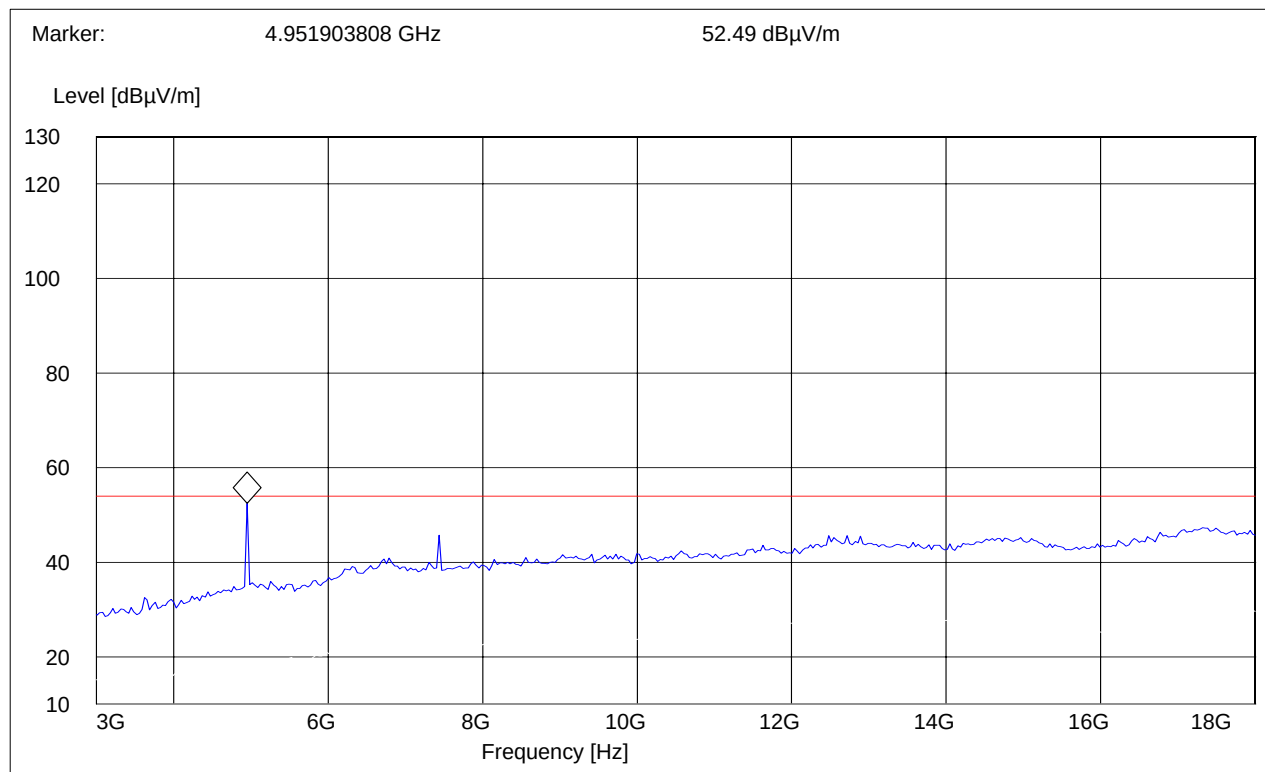
Note: Peak Reading vs. Average limit



3-18GHz (2480MHz)

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
3GHz	18GHz	Max Peak	Coupled	1 MHz	1 MHz

Note: Peak Reading vs. Average limit



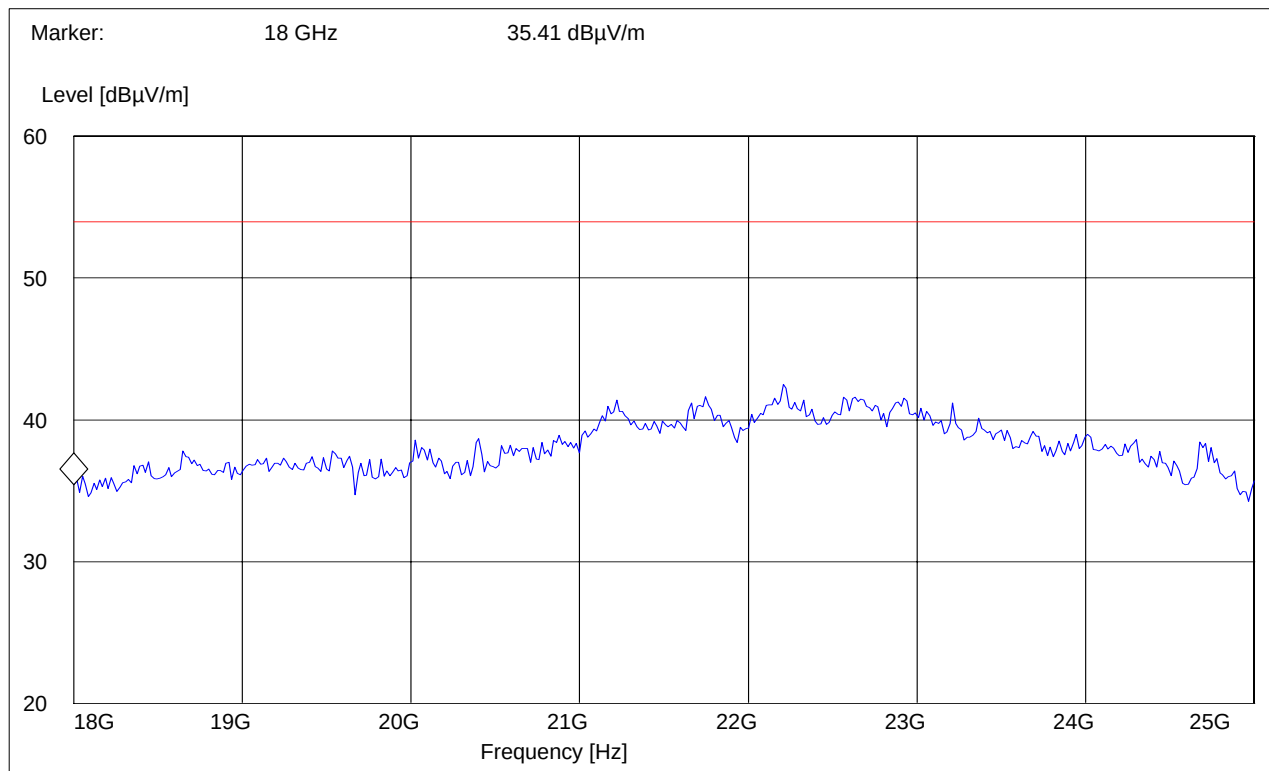


18-25GHz

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
18GHz	25GHz	Max Peak	Coupled	1 MHz	1 MHz

Note: This plot is valid for low, mid, high channels (worst-case plot)

Note: Peak Reading vs. Average limit



5.10 RECEIVER SPURIOUS RADIATION § 15.209/RSS210

5.10.1 LIMITS

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

NOTE:

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.
2. All measurements are done in peak mode using a quasi-peak or average limit , unless specified with the plots.

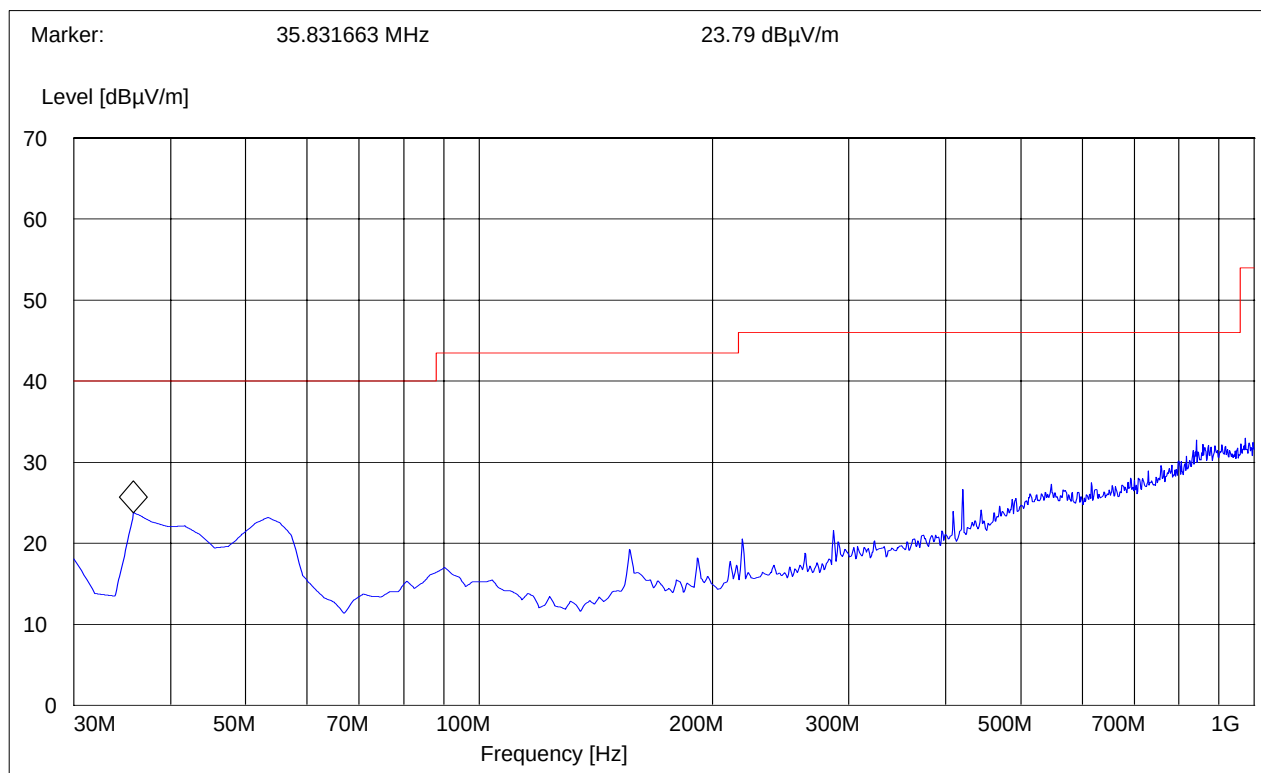
5.10.2 RESULTS

30MHz – 1GHz

Antenna: vertical

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
30MHz	1GHz	Max Peak	Coupled	100 KHz	100 KHz

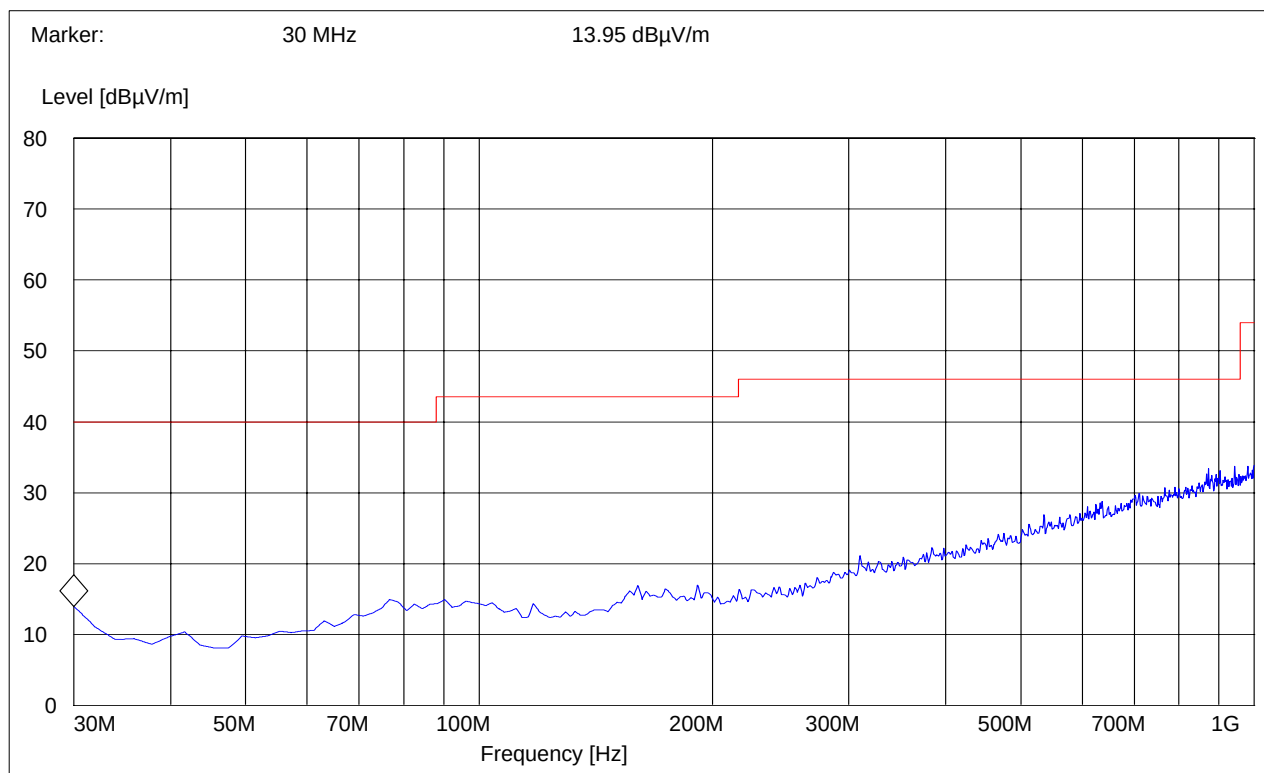
Note: Peak Reading vs. Quasi-peak limit



30MHz – 1GHz
Antenna: horizontal

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
30MHz	1GHz	Max Peak	Coupled	100 KHz	100 KHz

Note: Peak Reading vs. Quasi-peak limit

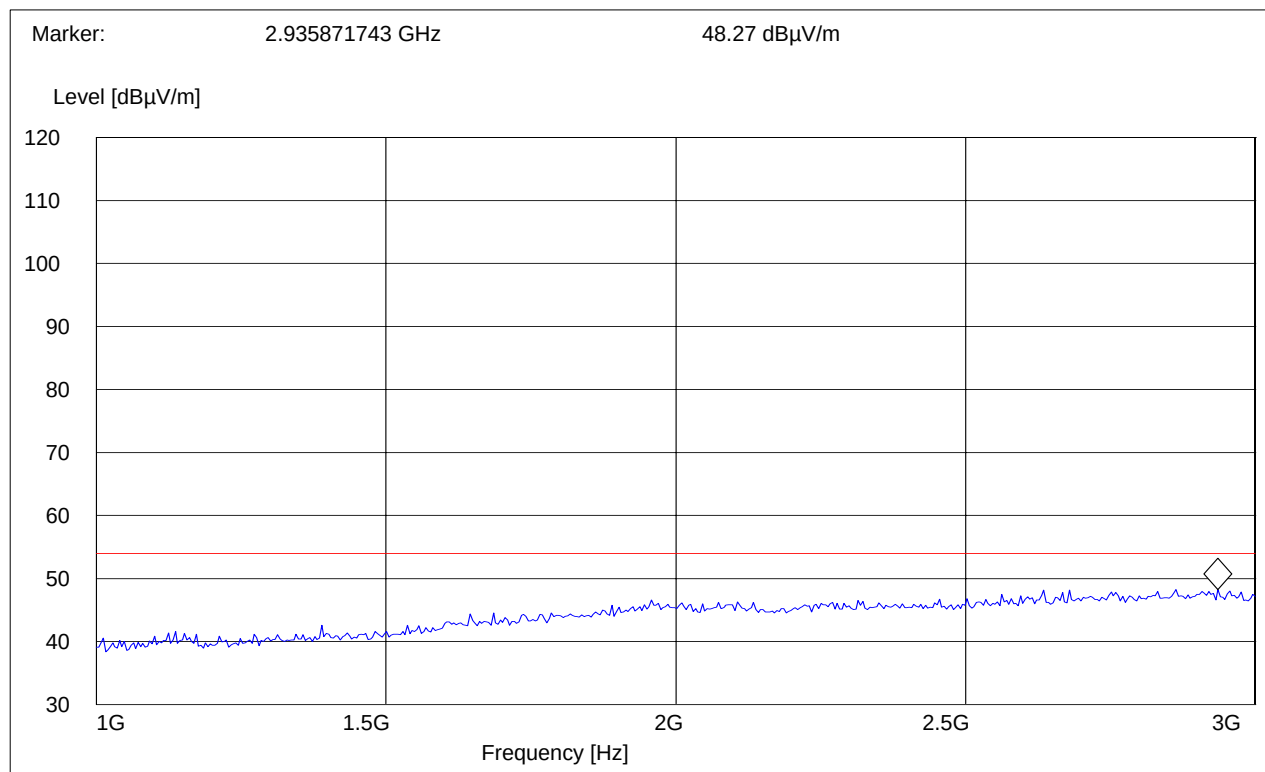




1-3GHz

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
1GHz	3GHz	Max Peak	Coupled	1 MHz	1 MHz

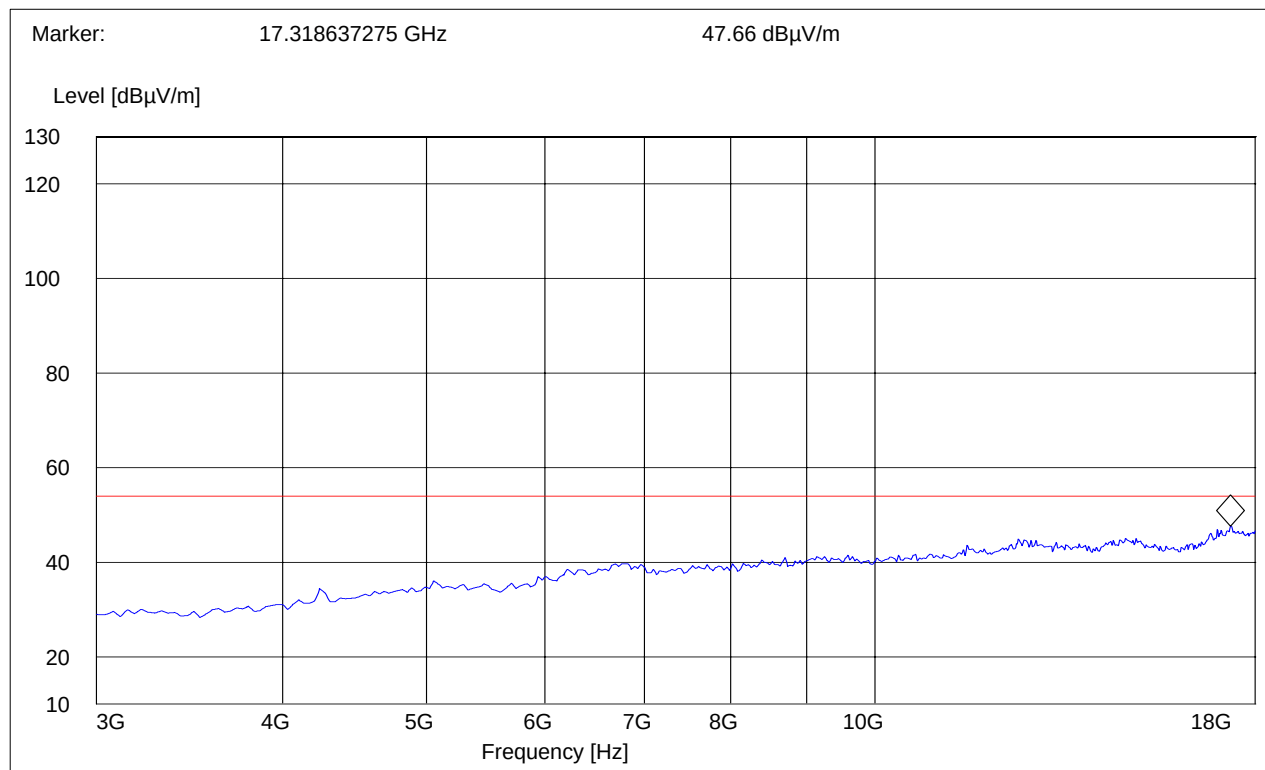
Note: Peak Reading vs. Average limit



3-18GHz

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
3GHz	18GHz	Max Peak	Coupled	1 MHz	1 MHz

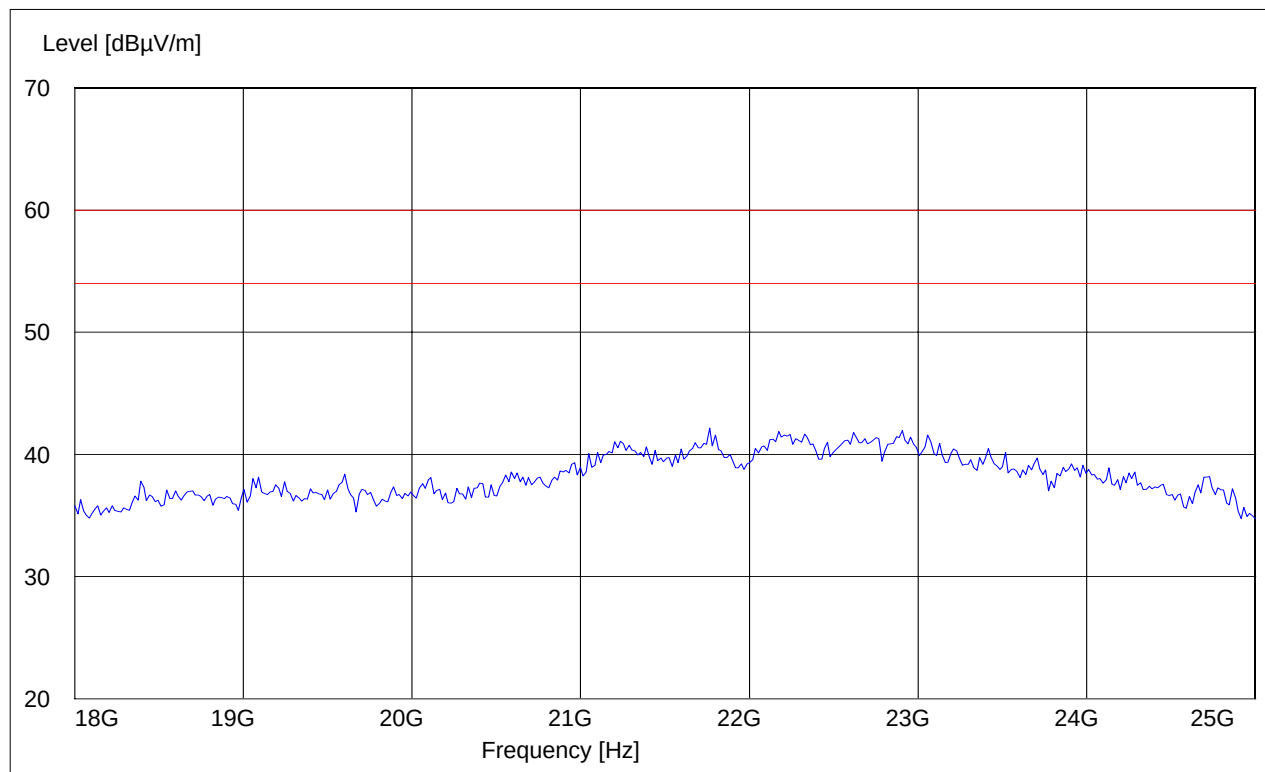
Note: Peak Reading vs. Average limit



18-25GHz

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW
18GHz	25GHz	Max Peak	Coupled	1 MHz	1 MHz

Note: Peak Reading vs. Average limit



5.11 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.11.1 LIMITS

Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)

Limit

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with logarithm of the frequency		

ANALYZER SETTINGS: RBW = 10KHz

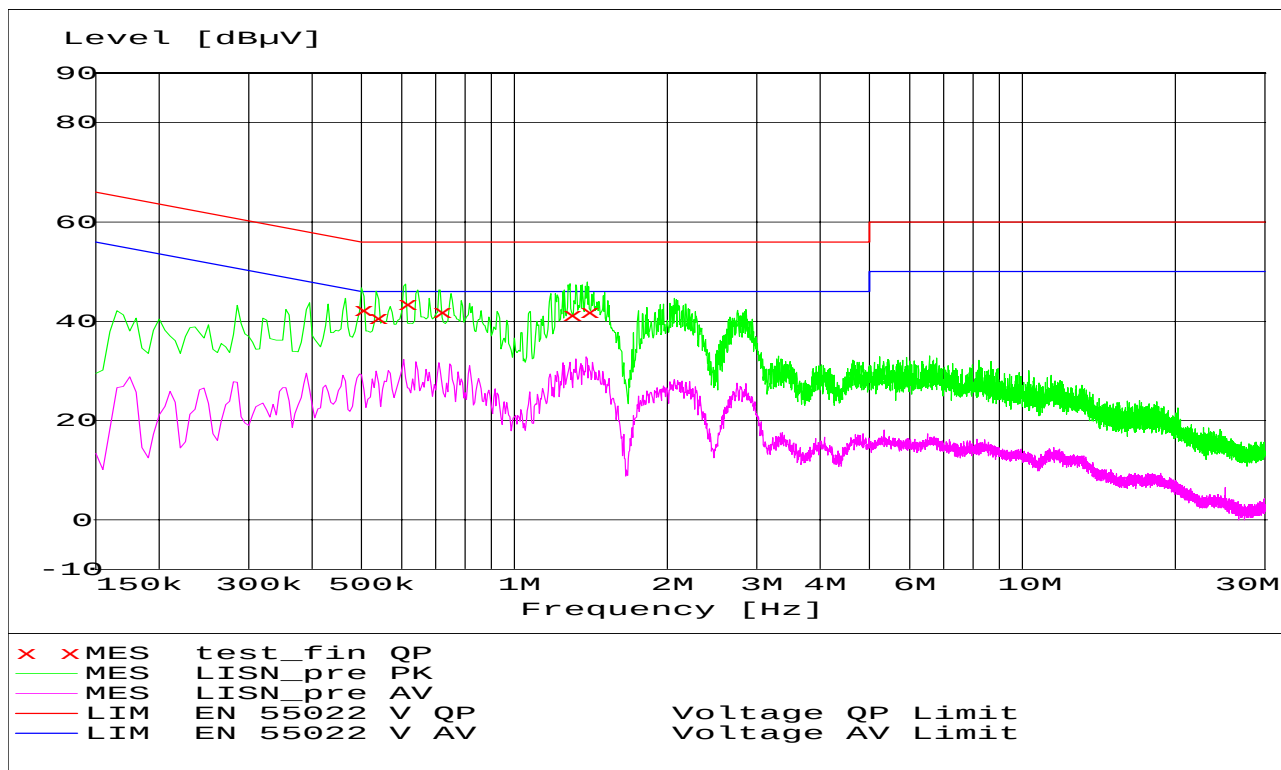
VBW = 10KHz



5.11.2 RESULTS

SCAN TABLE: "EN 55022 Voltage"

Short Description:			EN 55022 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "test_fin QP"

1/26/2006 2:12PM

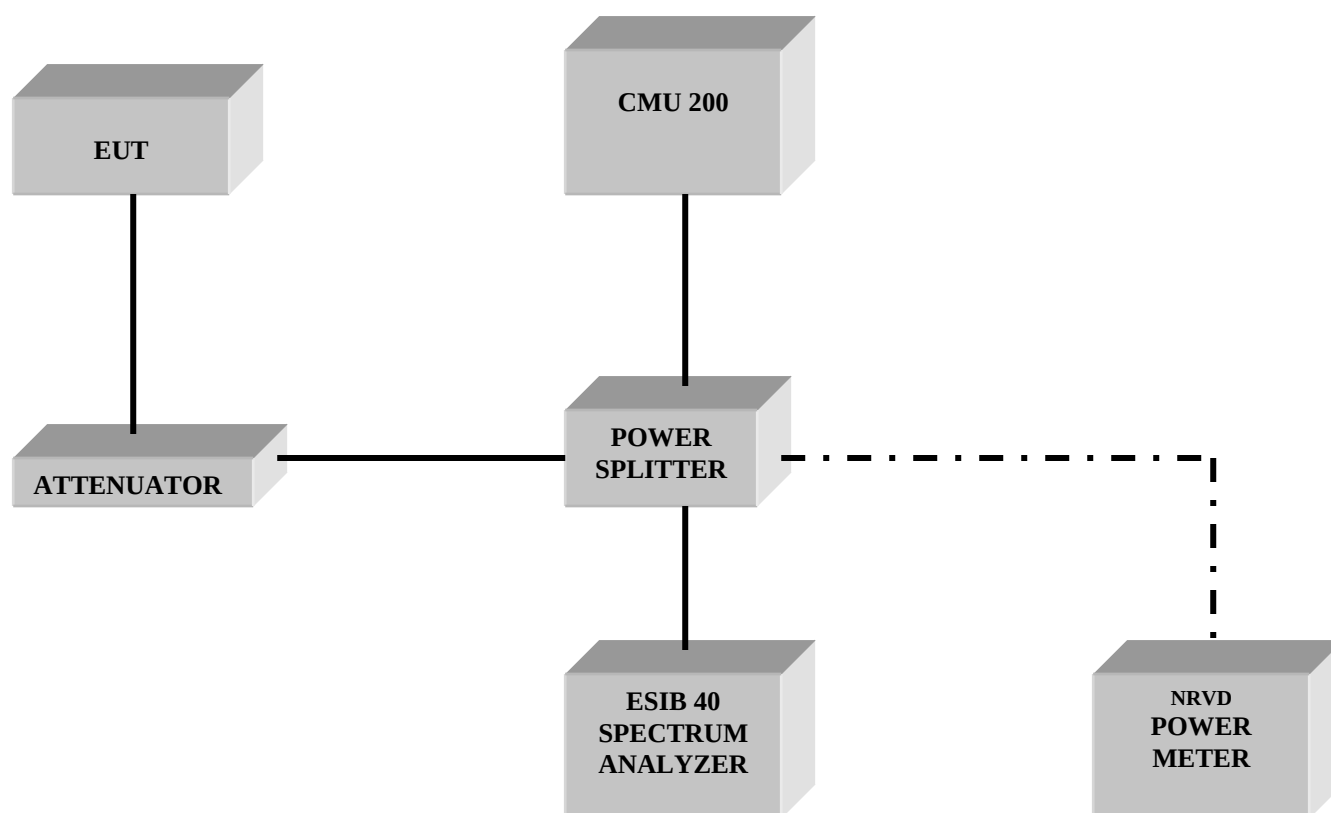
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.500000	42.10	0.0	56	13.9	N	GND
0.535000	40.60	0.0	56	15.4	L1	GND
0.610000	43.50	0.0	56	12.5	L1	GND
0.715000	41.80	0.0	56	14.2	N	GND
1.285000	41.20	0.0	56	14.8	N	GND
1.390000	41.80	0.0	56	14.2	L1	GND

5.12 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2006	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2006	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2006	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2006	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2006	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2006	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2006	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2006	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2006	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2006	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2006	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2006	1 year

5.13 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing

ANECHOIC CHAMBER

