FCC Test Report

FCC Part 15.247 for FHSS systems/ CANADA RSS-210

FOR:

Tri-band GSM/EDGE Mobile Phone with Bluetooth

MODEL #: C81

BenQ Mobile GmbH & Co OHG
Haidenauplatz 181667 München
GERMANY

FCC ID: PWX-C81

IC ID: 6175C-C81

TEST REPORT #: EMC_BENQ0_009_06001_C81_Bluetooth
DATE: May 10th, 2006

ACCREDITED
Certificate # 2135.01

Bluetooth Qualification Test Facility (BQTF)

Authorized Testing Laboratory

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

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	**T Tri-band GSM/EDGE Mobile Phone with Bluetooth**	**C81**

Michael Grings
Deputy Test Lab Manager

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:	Pete Krebill
Date of test:	05/09/2006 & 005/10/2006

2.2 Identification of the Client

Applicant's Name:	BenQ Mobile GmbH & Co OHG
Street Address:	Haidenauplatz 1
City/Zip Code	81667 München
Country	GERMANY
Contact Person:	Martin Weinberger
Phone No.	+49 89 722 37148
Fax:	+49 89 722 24799
e-mail:	martin.weinberger@benq.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	BenQ Mobile GmbH & Co. OHG
Manufacturers Address:	Südstr. 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:	BenQ-Siemens C81
Description:	Tri-band GSM/EDGE Mobile Phone with Bluetooth
Model No:	C81
FCC ID:	PWX-C81
IC ID:	6175C-C81
Frequency Range:	2400-2483.5MHz
Type(s) of Modulation:	GFSK
Number of Channels:	79
Antenna Type:	Internal
Output Power:	FCC 15.247: 0.0009 Watts Peak Conducted Powerz

4 Subject Of Investigation

The objective of the measurements done by Cetecom Inc. was to measure the performance of the C81 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.

The EUT is able to operate in open and closed position. The worst case was found working in open position. Therefore the testing was conducted in open position.

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		EIRP (dBm)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T_{nom}(23)°C	V_{nom}VDC	-5.32	-6.26	-8.28
Measurement uncertainty		±0.5dBm		

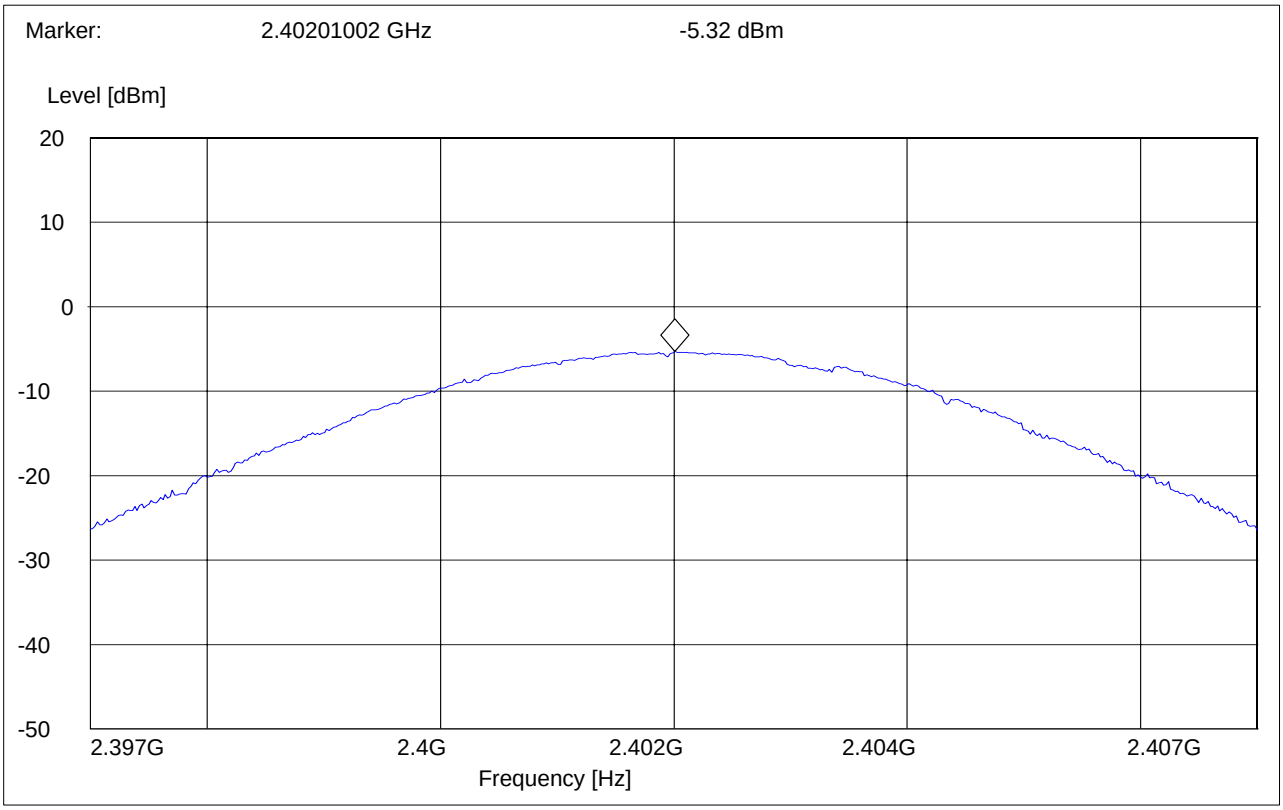
EIRP (2402 MHz)

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81 (#169) + AC charger A5BHTN00102612
Customer: BenQ Mobile
Operating Mode: Bluetooth testmode, CH: 0
Antenna: H
EUT: H
Test operator: Willmes
Voltage: AC 110 V
Sweep: EIRP

SWEEP TABLE: "EIRP BT low channel"

Short Description: EIRP Bluetooth channel-2402MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.4 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			

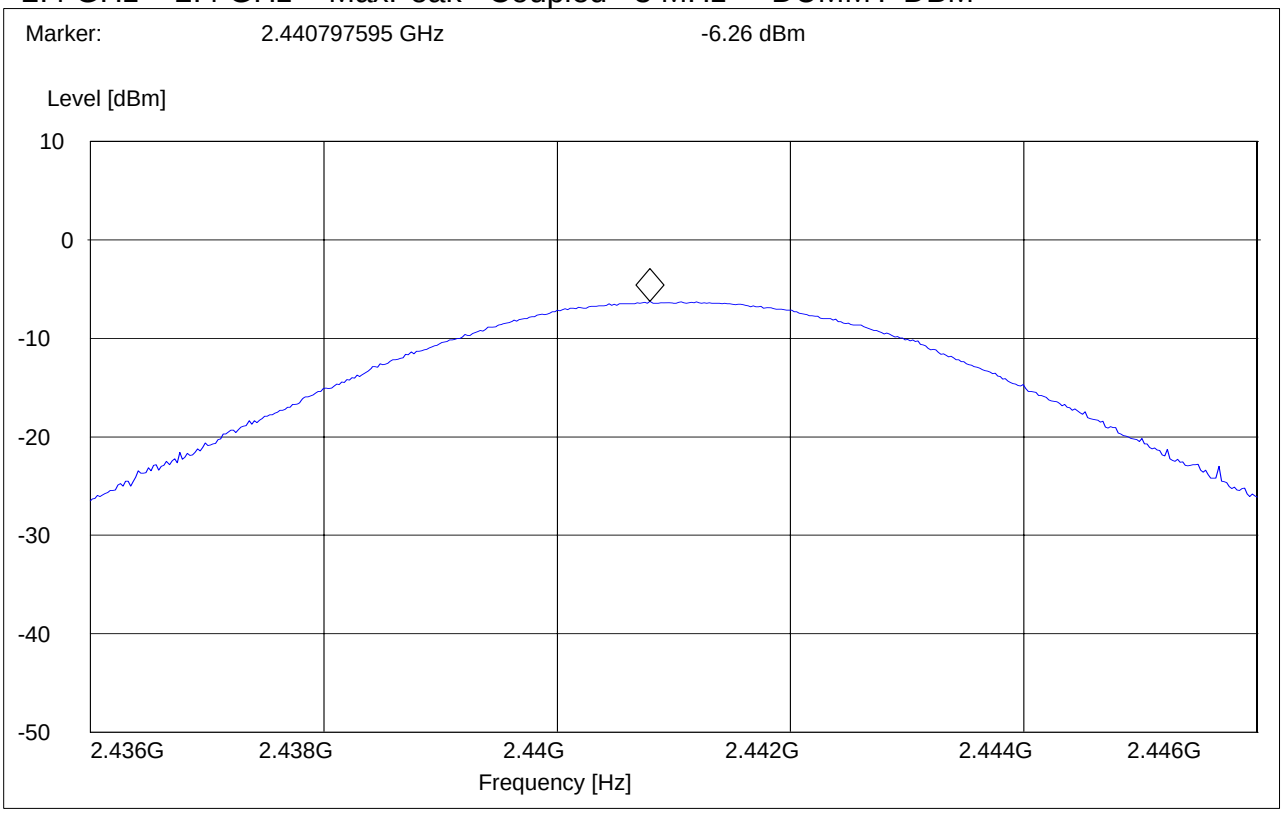


EIRP (2441 MHz)
CETECOM Inc.

411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81 (#169) + AC charger A5BHTN00102612
Customer: BenQ Mobile
Operating Mode: Bluetooth testmode, CH: 39
Antenna: H
EUT: H
Test operator: Willmes
Voltage: AC 110 V
Sweep: EIRP

SWEEP TABLE: "EIRP BT mid channel"
Short Description: EIRP Bluetooth channel-2441MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.4 GHz	2.4 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM



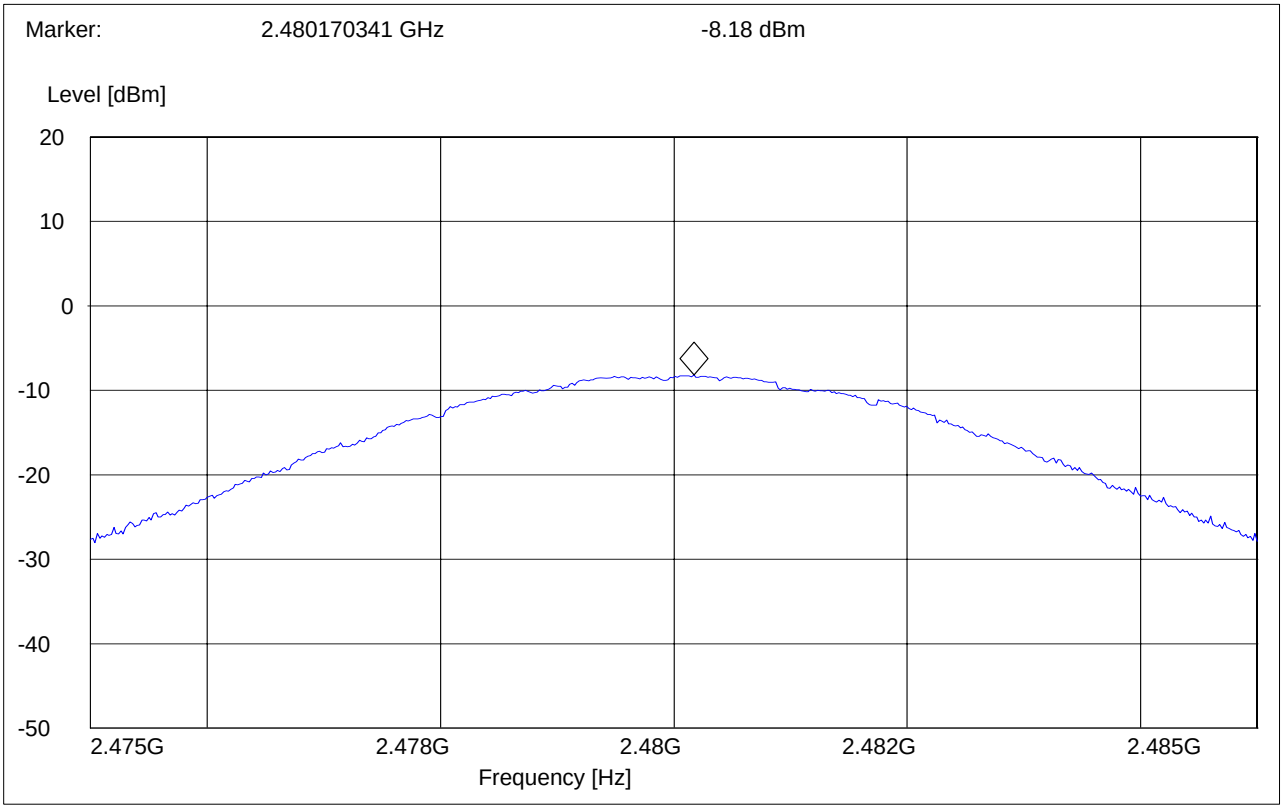
EIRP (2480 MHz)

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81 (#169) + AC charger A5BHTN00102612
Customer: BenQ Mobile
Operating Mode: Bluetooth testmode, CH: 78
Antenna: H
EUT: H
Test operator: Willmes
Voltage: AC 110 V
Sweep: EIRP

SWEEP TABLE: "EIRP BT high channel"

Short Description: EIRP Bluetooth channel-2480MHz

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			



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

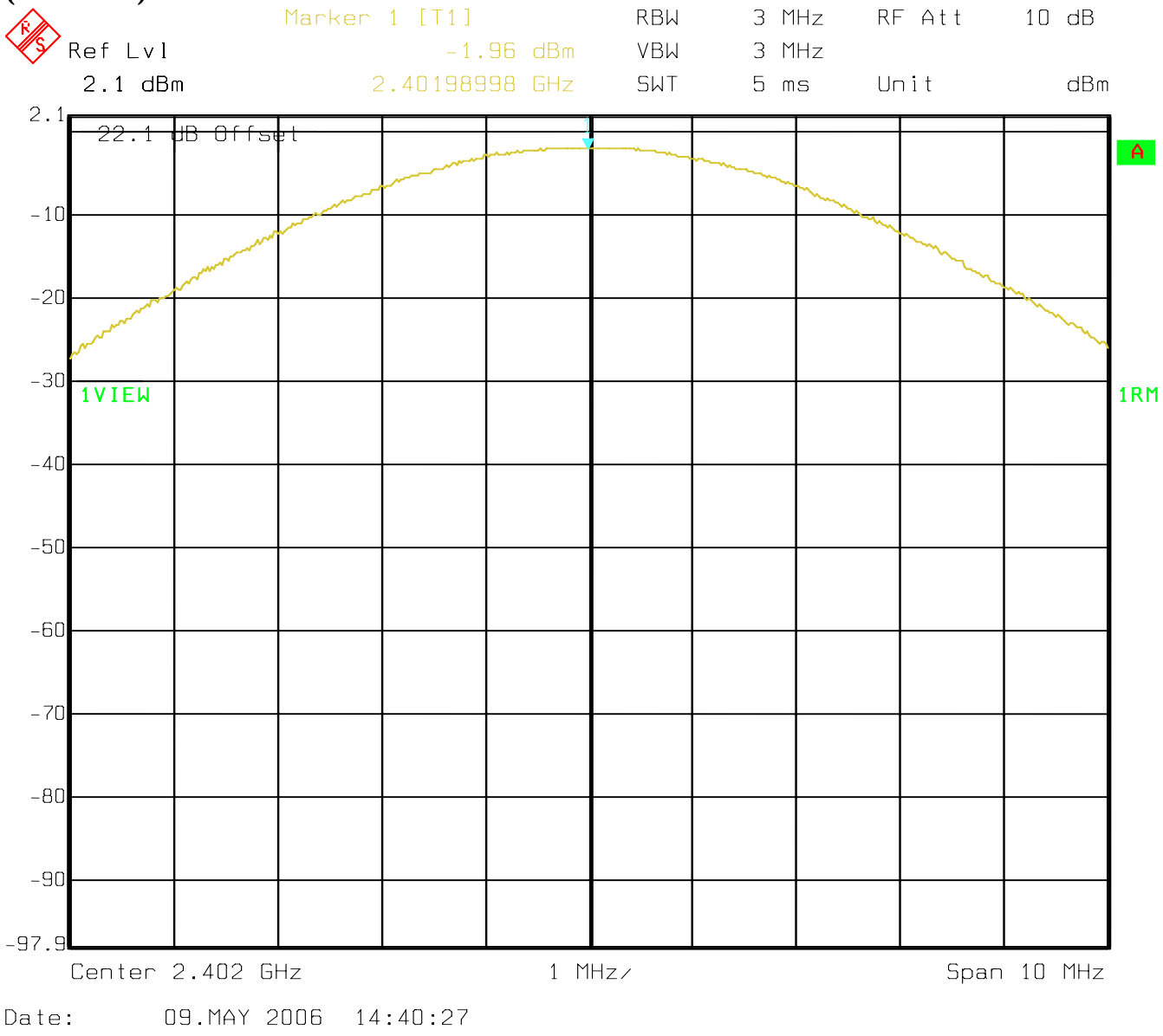
***limit is based upon antenna gain of less than or equal to 6dBi.**

5.2.2 RESULTS:

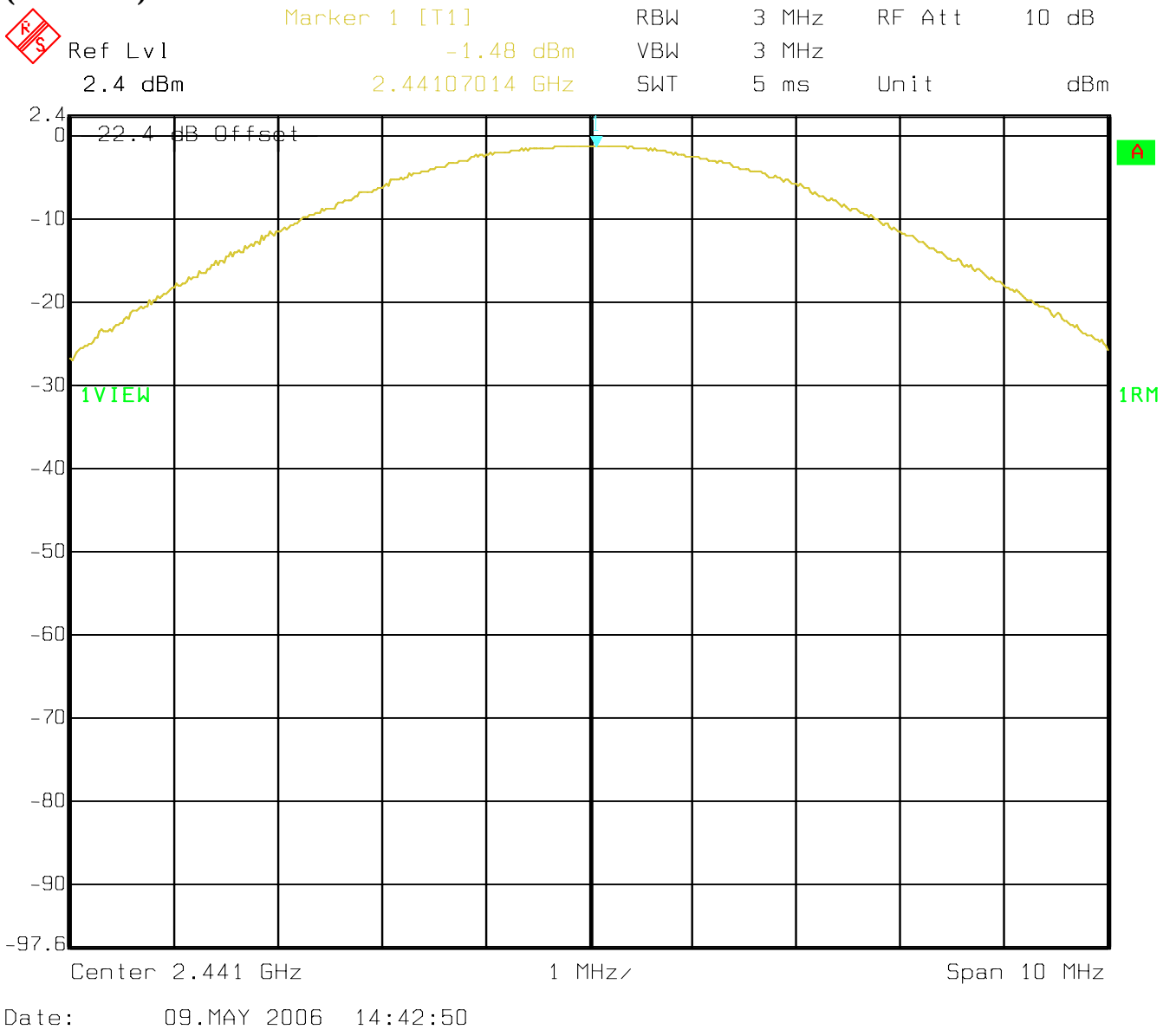
TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T_{nom}(23)°C	V_{nom}VDC	-1.96	-1.48	-0.69

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

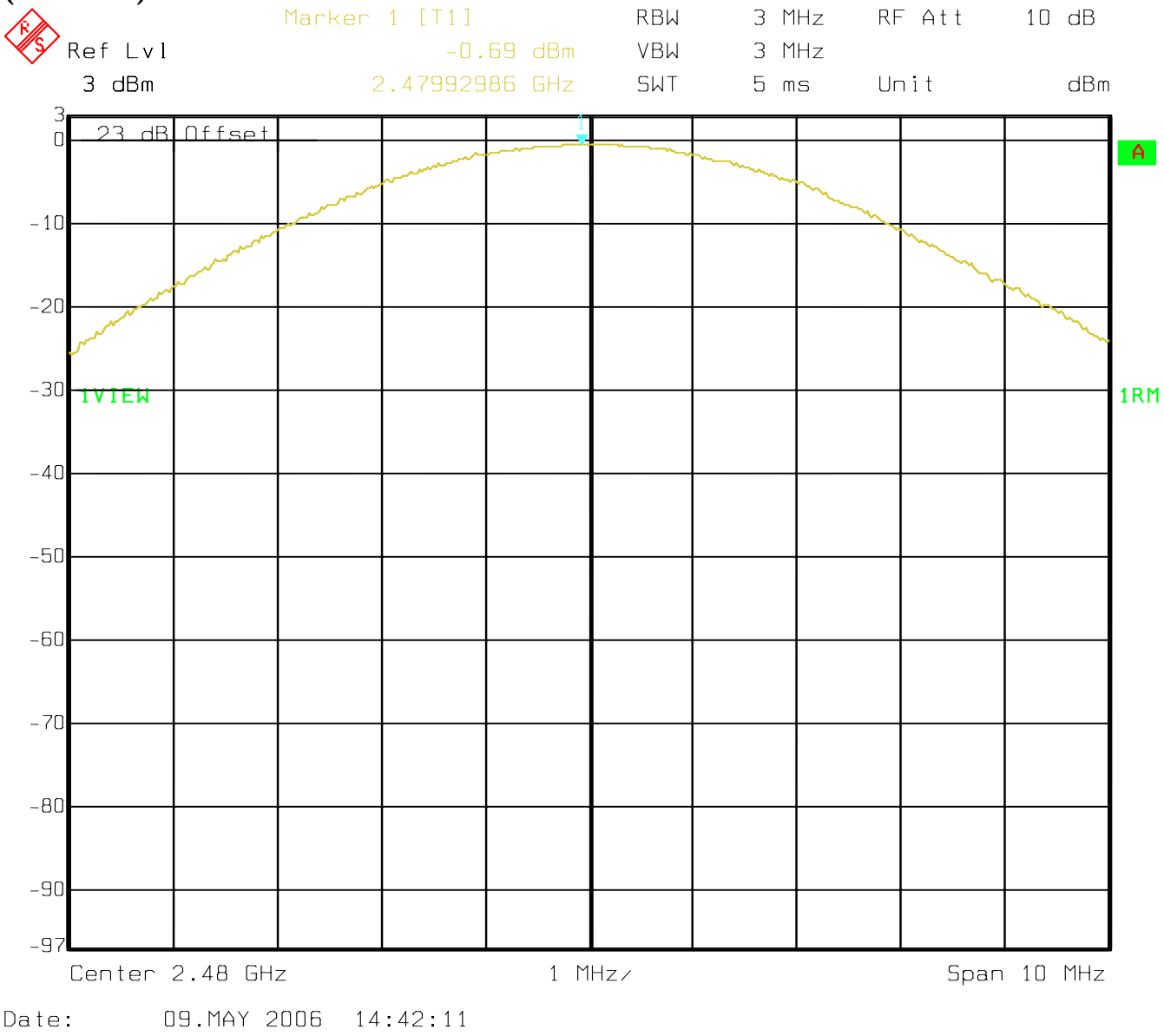
(2402 MHz)


Marker 1 [T1]
-1.96 dBm
2.40198998 GHz
RBW 3 MHz
VBW 3 MHz
SWT 5 ms
RF Att 10 dB
Unit dBm
Ref Lvl
2.1 dBm
22.1 dB Offset
2.1
-10
-20
-30
-40
-50
-60
-70
-80
-90
-97.9
1VIEW
A
1RM
Center 2.402 GHz
1 MHz/
Span 10 MHz
Date: 09.MAY 2006 14:40:27

(2441 MHz)


Marker 1 [T1]
-1.48 dBm
2.44107014 GHz
RBW 3 MHz
VBW 3 MHz
SWT 5 ms
RF Att 10 dB
Unit dBm
Ref Lvl
2.4 dBm
22.4 dB Offset
1VIEW
1RM
A
2.4
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-97.6
Center 2.441 GHz
1 MHz/
Span 10 MHz
Date: 09.MAY 2006 14:42:50

(2480 MHz)


Marker 1 [T1]
-0.69 dBm
2.47992986 GHz
RBW 3 MHz
VBW 3 MHz
SWT 5 ms
RF Att 10 dB
Unit dBm
Ref Lvl
3 dBm
23 dB Offset
1VIEW
1RM
A
3
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-97
Center 2.48 GHz
1 MHz/
Span 10 MHz
Date: 09.MAY 2006 14:42:11

5.3 20dB BANDWIDTH

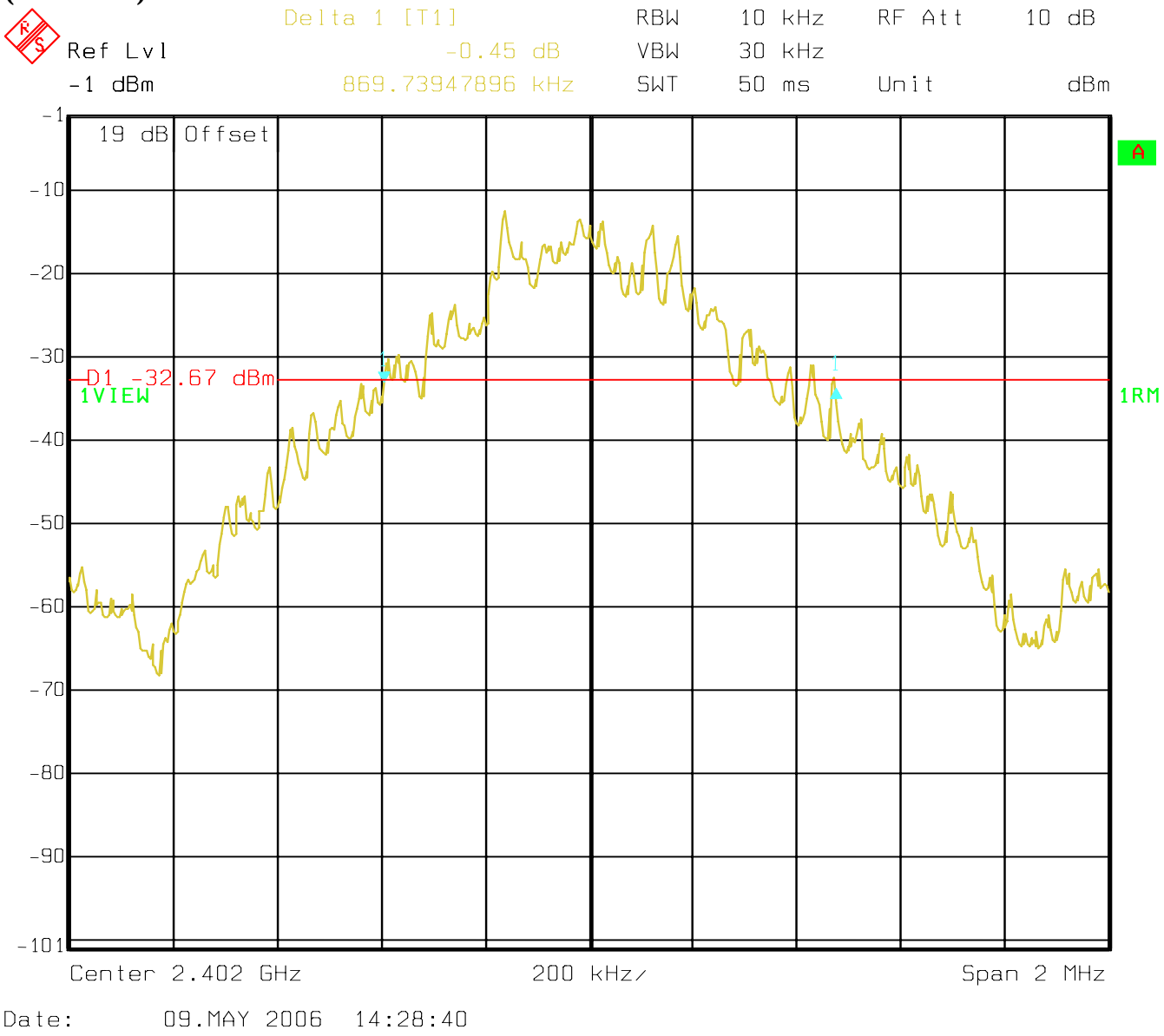
5.3.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)

NUMBER OF CHANNELS	BANDWIDTH
79	<1MHz

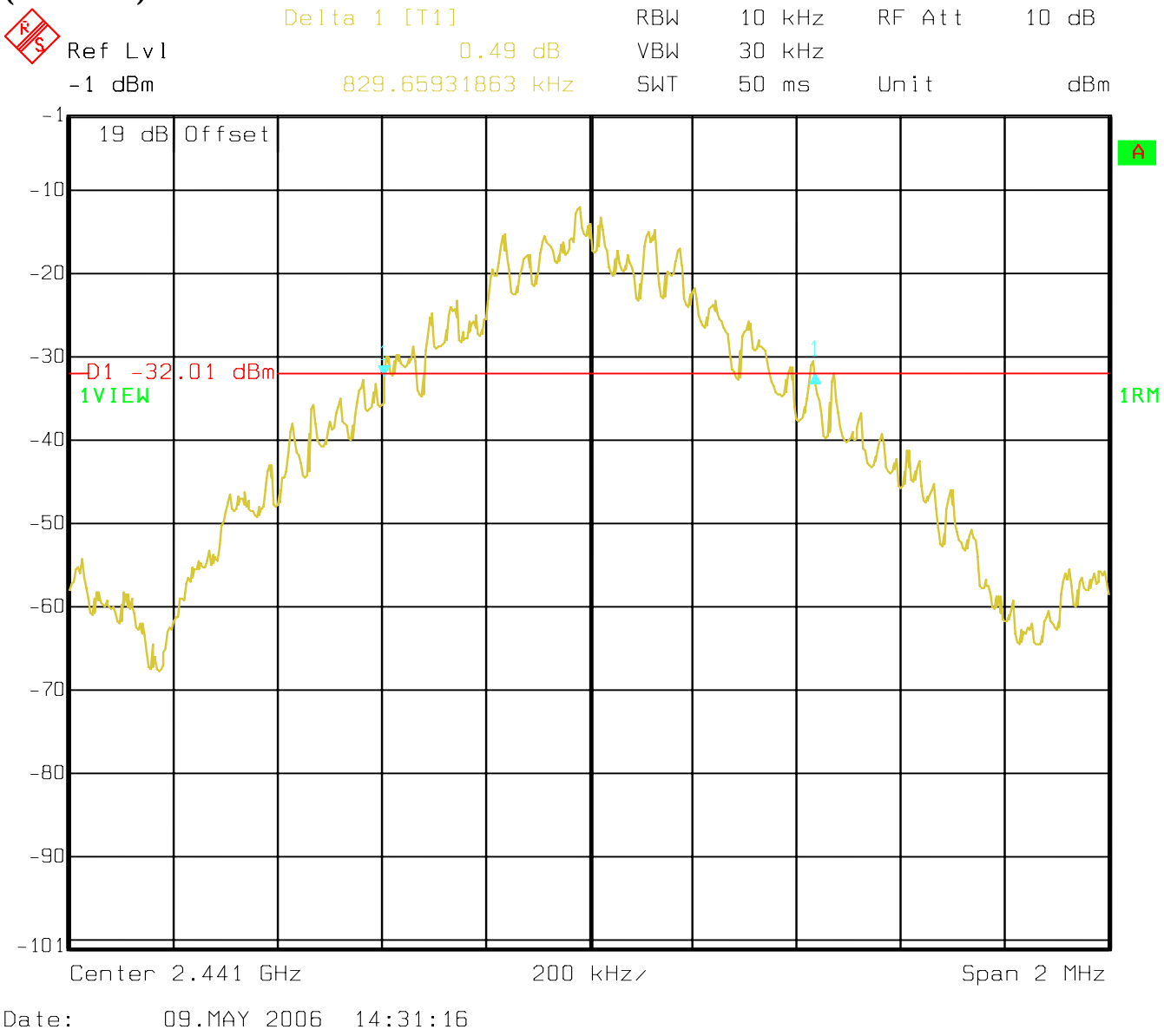
5.3.2 RESULTS:

TEST CONDITIONS		BANDWIDTH (KHz)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T_{nom}(23)°C	V_{nom}VDC	869.74	829.66	829.66

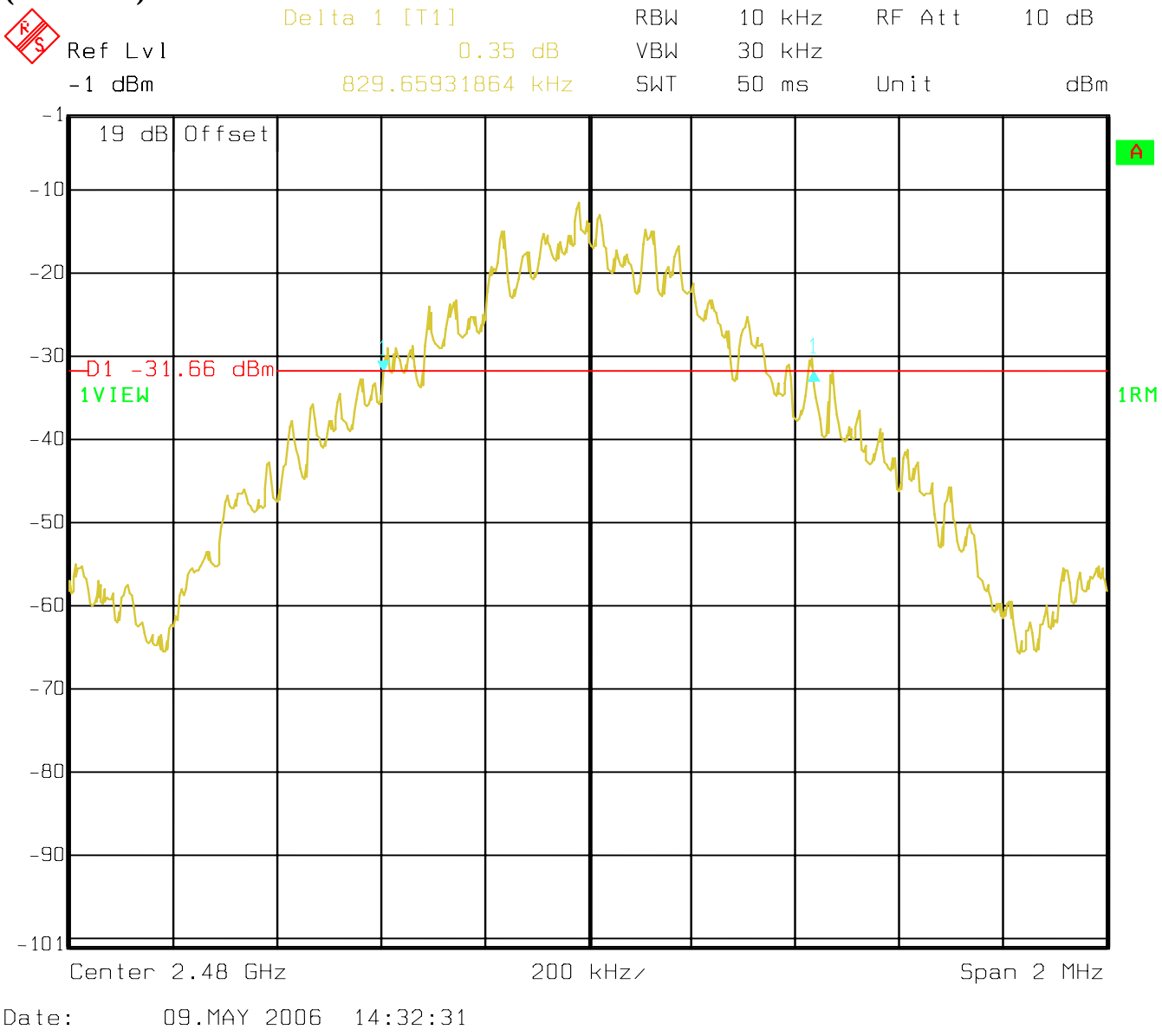
(2402 MHz)


Delta 1 [T1]
-0.45 dB
869.73947896 kHz
RBW 10 kHz
VBW 30 kHz
SWT 50 ms
RF Att 10 dB
Unit dBm
Ref Lvl
-1 dBm
19 dB Offset
D1 -32.67 dBm
1VIEW
1RM
A
-1
-10
-20
-30
-40
-50
-60
-70
-80
-90
-101
Center 2.402 GHz
200 kHz/
Span 2 MHz
Date: 09.MAY 2006 14:28:40

(2441 MHz)


Delta 1 [T1]
0.49 dB
829.65931863 kHz
RBW 10 kHz
VBW 30 kHz
SWT 50 ms
RF Att 10 dB
Unit dBm
Ref Lvl
-1 dBm
19 dB Offset
D1 -32.01 dBm
1VIEW
A
1RM
-1
-10
-20
-30
-40
-50
-60
-70
-80
-90
-101
Center 2.441 GHz
200 kHz/
Span 2 MHz
Date: 09.MAY 2006 14:31:16

(2480 MHz)


Delta 1 [T1]
0.35 dB
829.65931864 kHz
RBW 10 kHz
VBW 30 kHz
SWT 50 ms
RF Att 10 dB
Unit dBm
Ref Lvl
-1 dBm
19 dB Offset
D1 -31.66 dBm
1VIEW
1RM
A
-1
-10
-20
-30
-40
-50
-60
-70
-80
-90
-101
Center 2.48 GHz
200 kHz/
Span 2 MHz
Date: 09.MAY 2006 14:32:31

5.4 CARRIER FREQUENCY SEPARATION

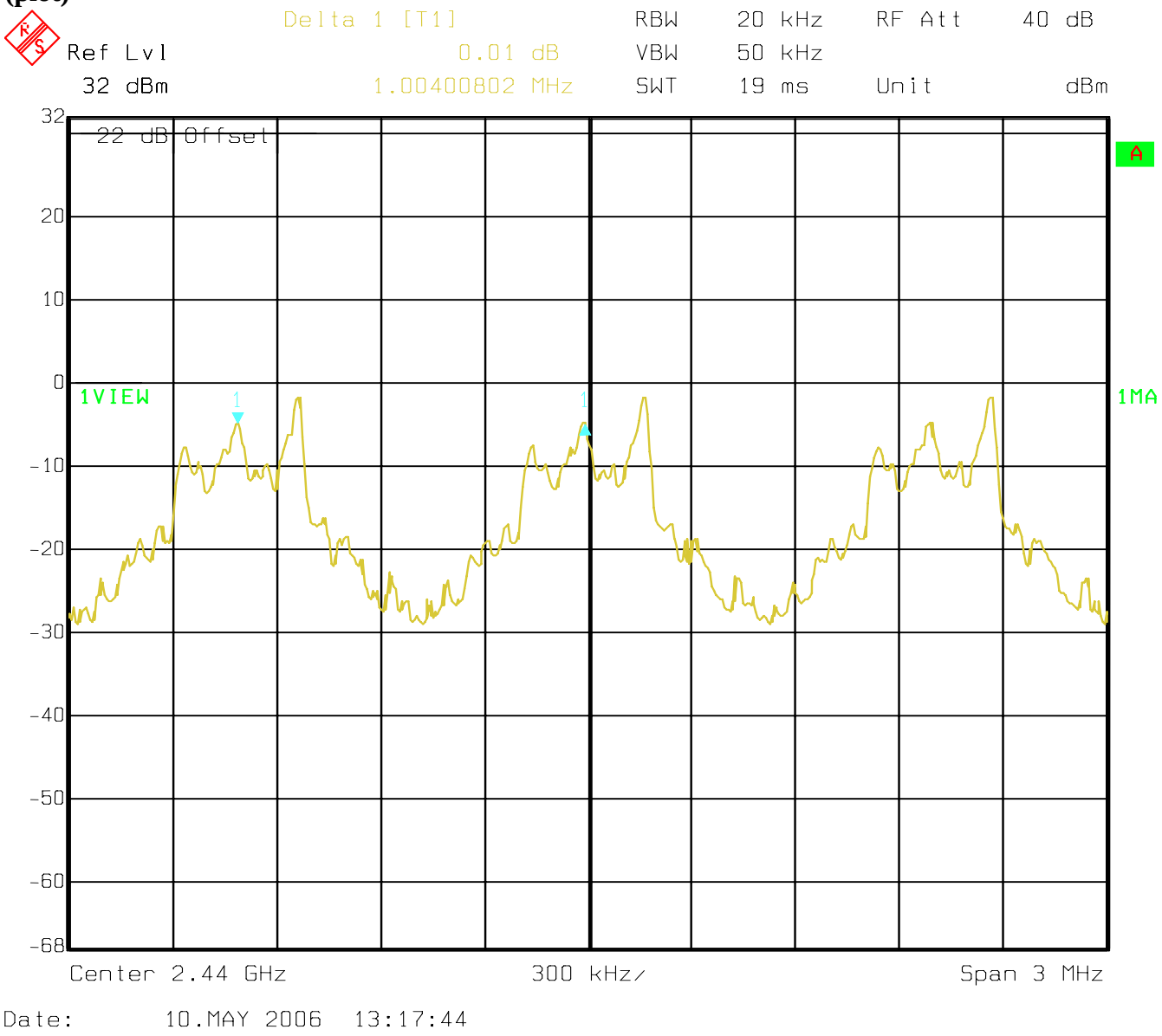
5.4.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)

SEPARATION
> 25 KHz or > 20 dB BANDWIDTH

5.4.2 RESULTS:

TEST CONDITIONS		SEPARATION (MHz)
T_{nom}(23)°C	V_{nom}VDC	1.004

(plot)


Delta 1 [T1]
RBW 20 kHz
RF Att 40 dB
Ref Lvl
0.01 dB
VBW 50 kHz
32 dBm
1.00400802 MHz
SWT 19 ms
Unit dBm
22 dB Offset
A
1VIEW
1MA
Center 2.44 GHz
300 kHz/
Span 3 MHz
Date: 10.MAY 2006 13:17:44

5.5 NUMBER OF HOPPING CHANNELS

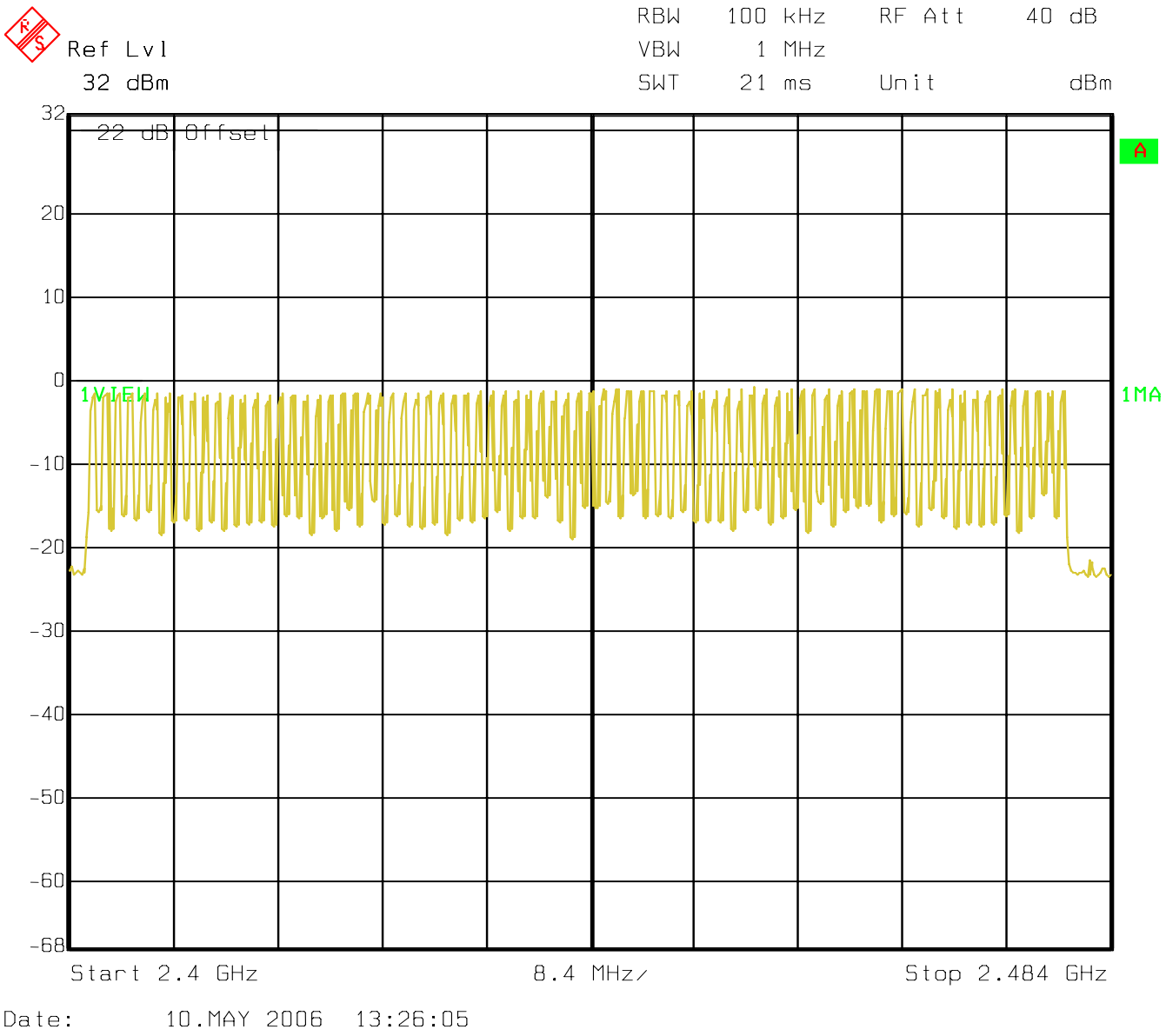
5.5.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (iii)

NUMBER OF CHANNELS
> 15

5.5.2 RESULTS:

TEST CONDITIONS		NUMBER OF CHANNELS
T_{nom}(23)°C	**V_{nom}VDC**	**79**

Plot


RBW 100 kHz
RF Att 40 dB
VBW 1 MHz
SWT 21 ms
Unit dBm
Ref Lvl
32 dBm
22 dB Offset
1VIEW
1MA
A
32
20
10
0
-10
-20
-30
-40
-50
-60
-68
Start 2.4 GHz
8.4 MHz/
Stop 2.484 GHz
Date: 10.MAY 2006 13:26:05

5.6 TIME OF OCCUPANCY (DWELL TIME)

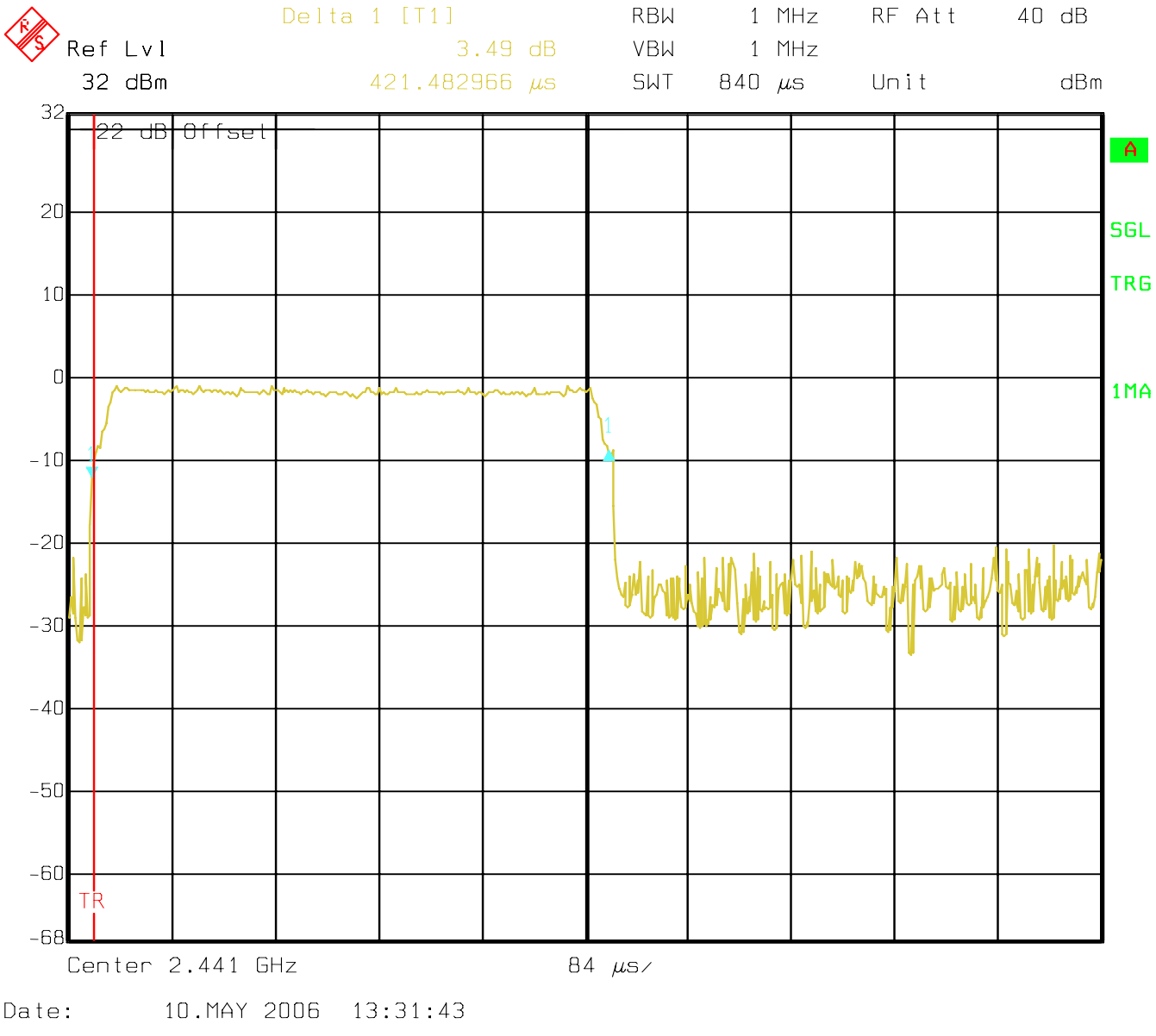
5.6.1 LIMIT SUB CLAUSE § 15.247 (a) (1) (i) (ii) (iii)

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	134.9ms	270.8	310.6

(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.
<u>So we have 320.108 * 421.48µs = 134.9ms per 31.6 seconds.</u>

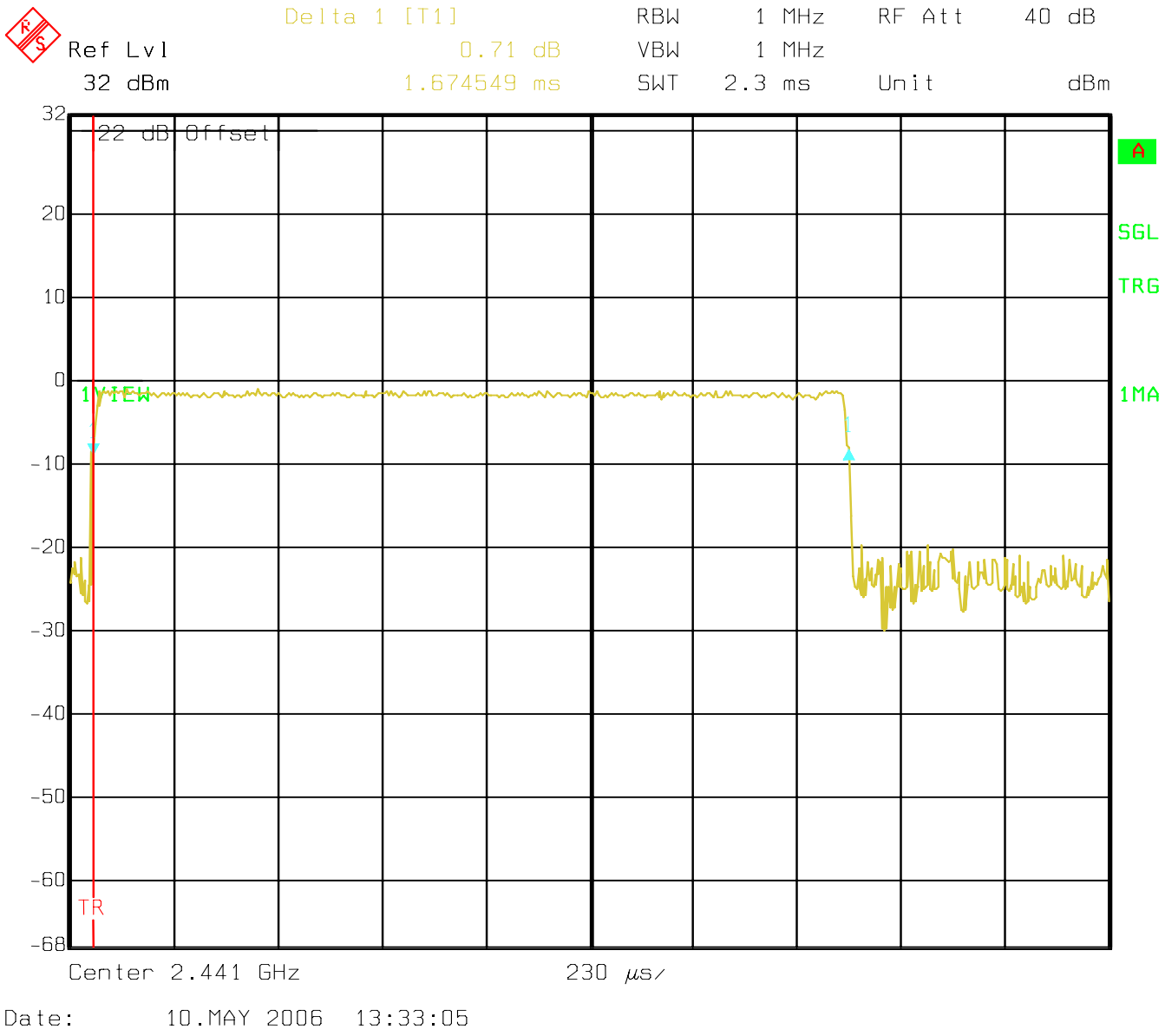


(DH3)

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.

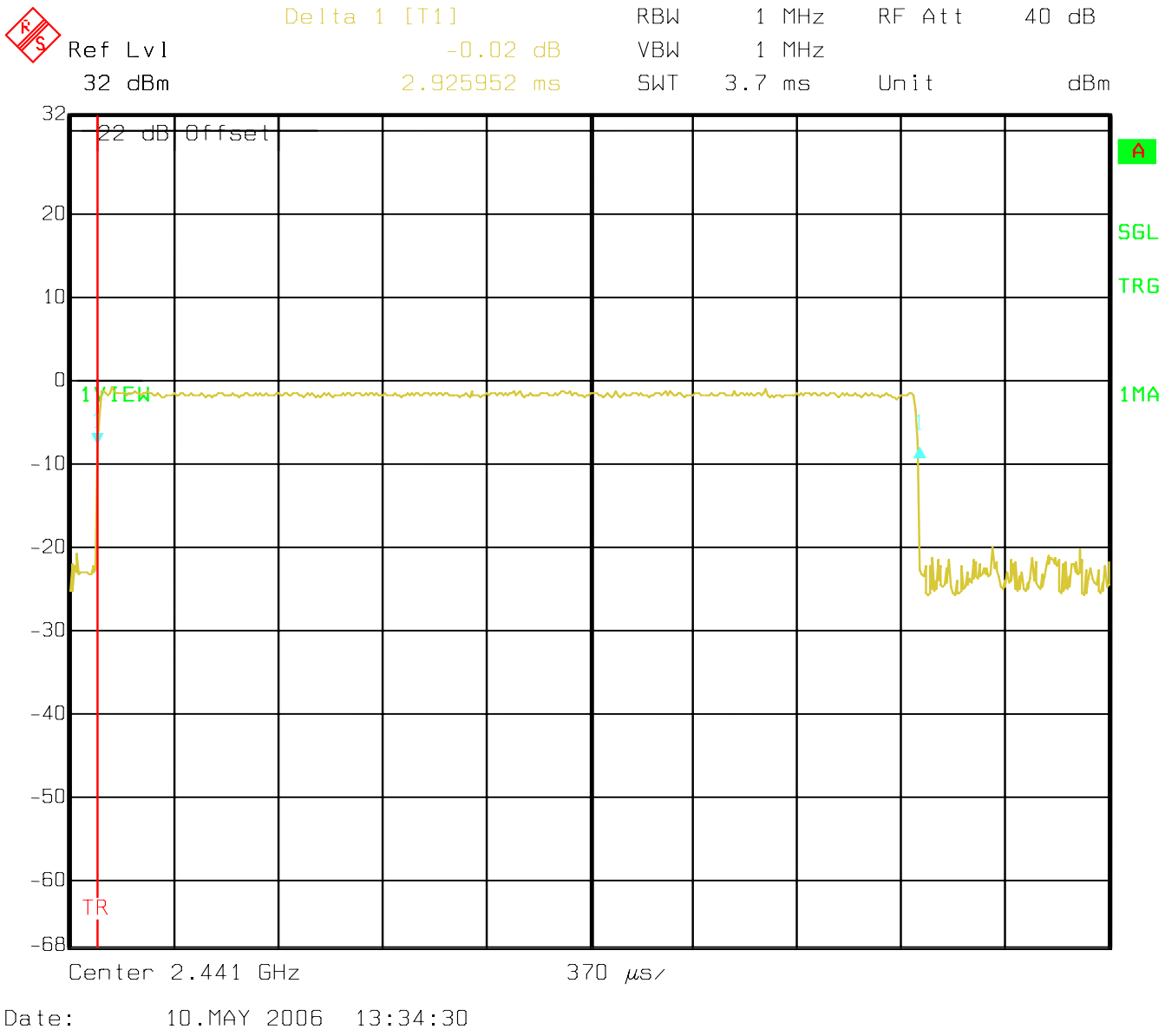
Each Tx-time per appearance is 1.693ms.

So we have 161.16 * 1.68ms = 270.8ms per 31.6 seconds.



(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 * 2.925ms = 310.6ms per 31.6 seconds.



5.7 CONDUCTED SPURIOUS EMISSIONS

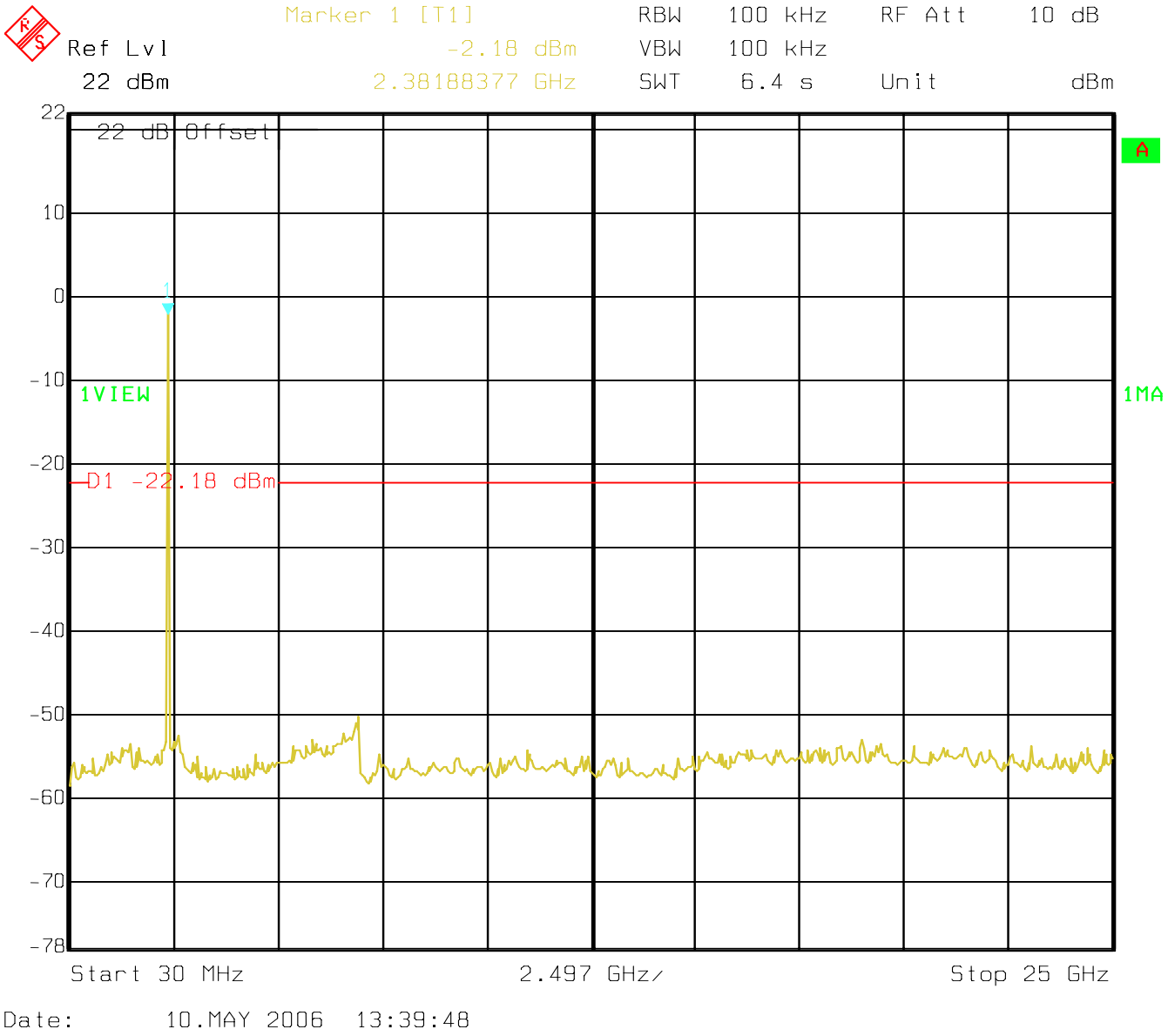
5.7.1 LIMIT SUB CLAUSE § 15.247 (d)

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)).

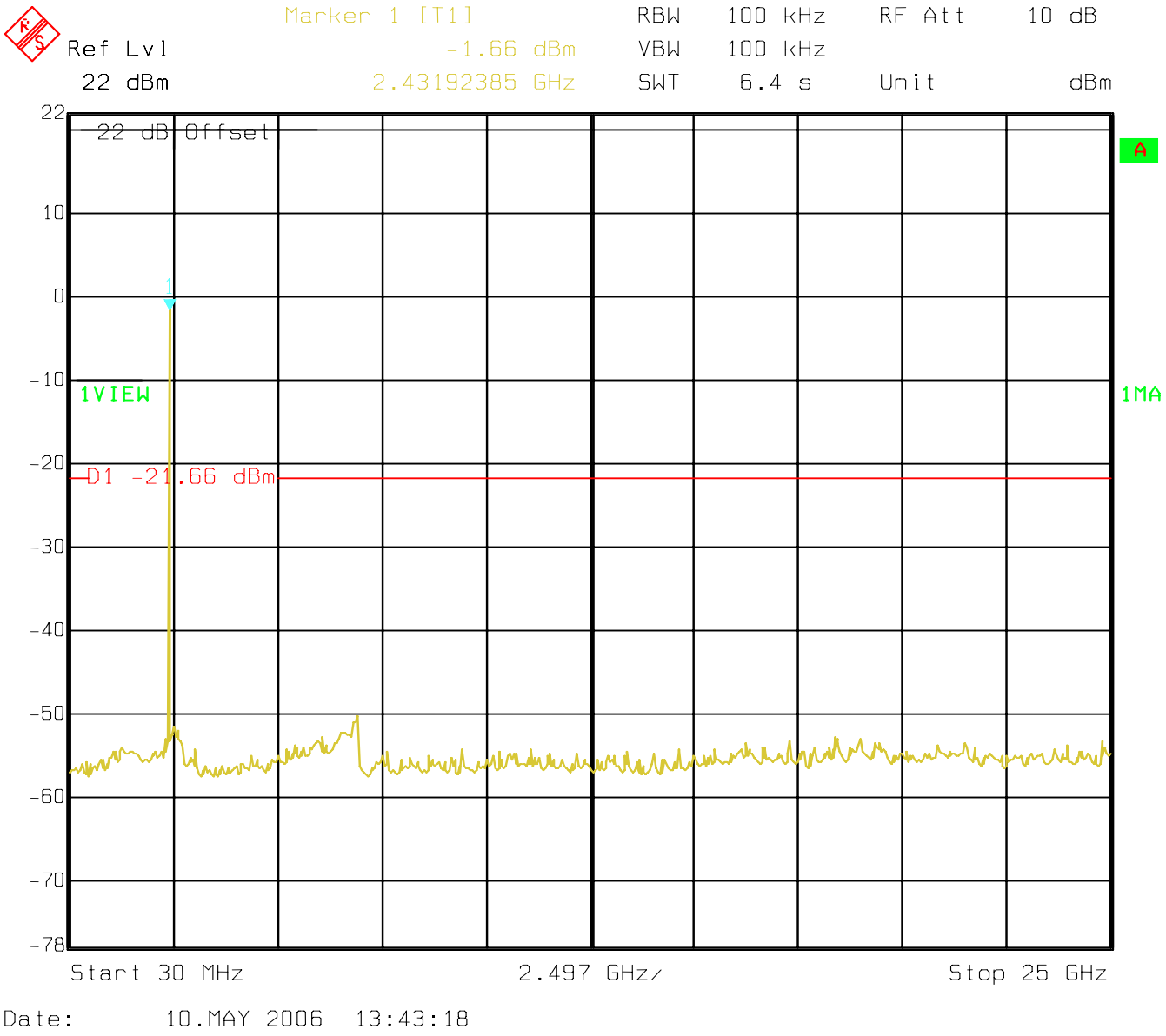
***ref level offset is based upon BT coupler loss + splitter**

5.7.2 RESULTS

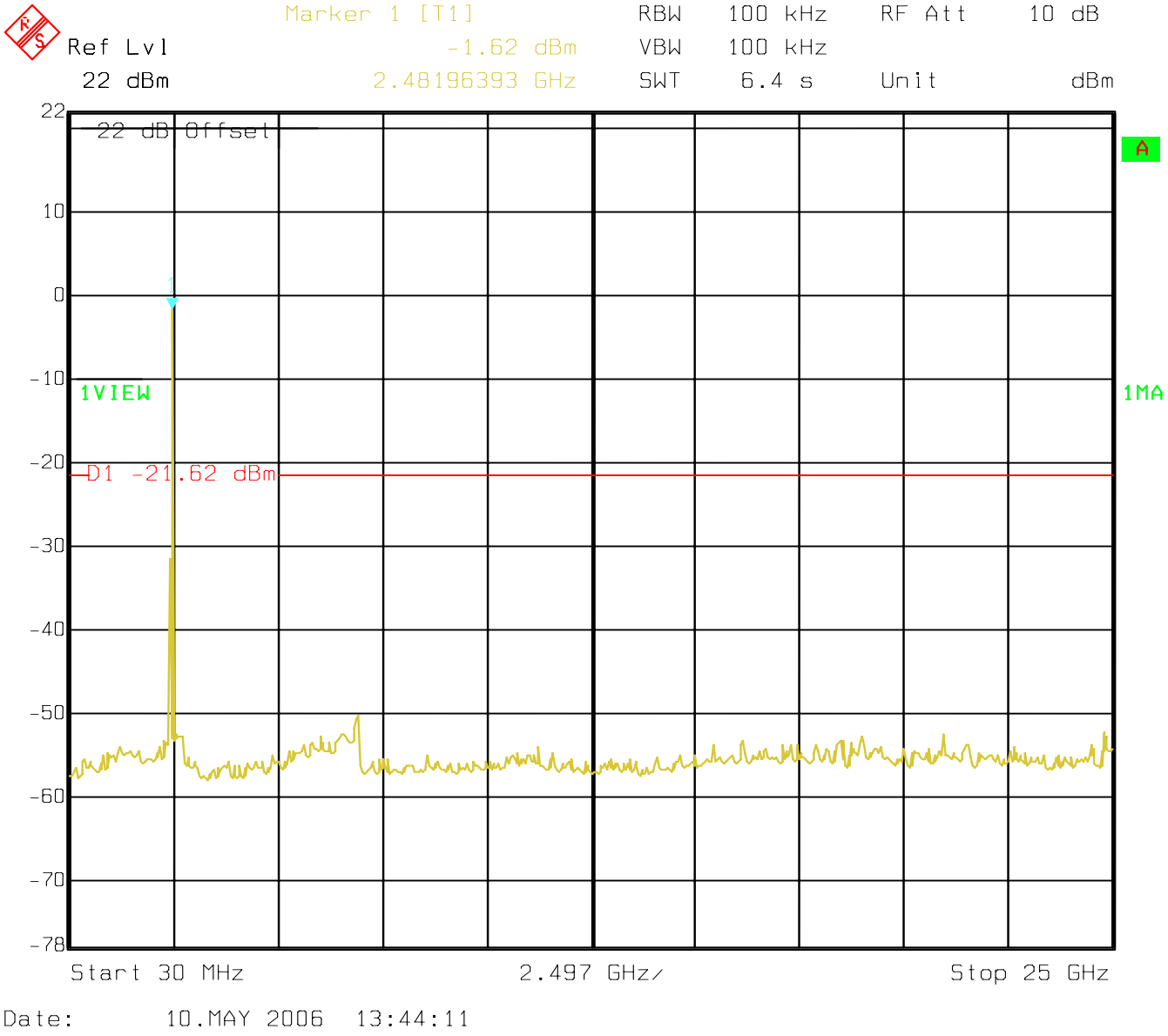
CONDUCTED SPURIOUS 2402 MHz



CONDUCTED SPURIOUS 2441 MHz



CONDUCTED SPURIOUS 2480 MHz



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			

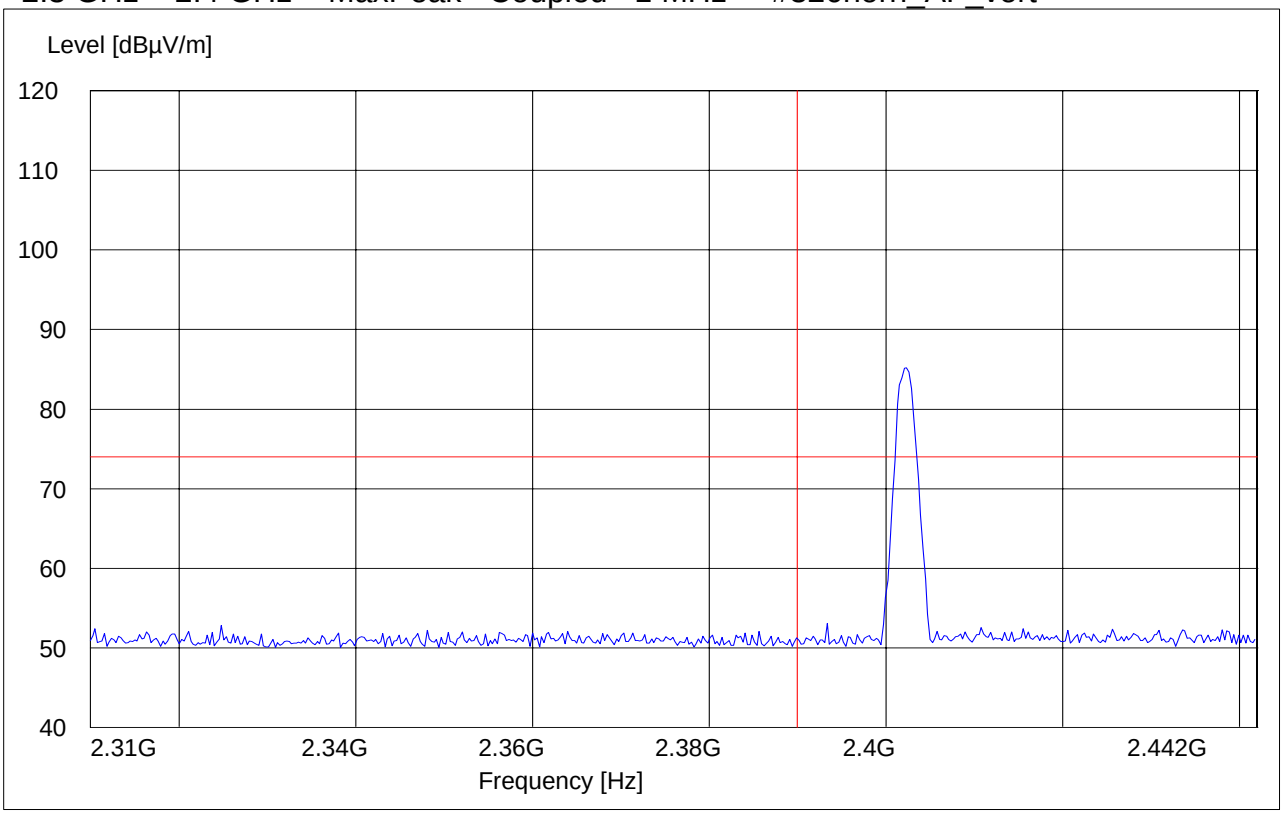
***PEAK LIMIT= 74dBuV/m**
***AVG. LIMIT= 54dBuV/m**

5.8.2 RESULTS (2402MHz)

PEAK
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch0
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: LBE PK

SWEEP TABLE: "FCC15.247 LBE_PK"

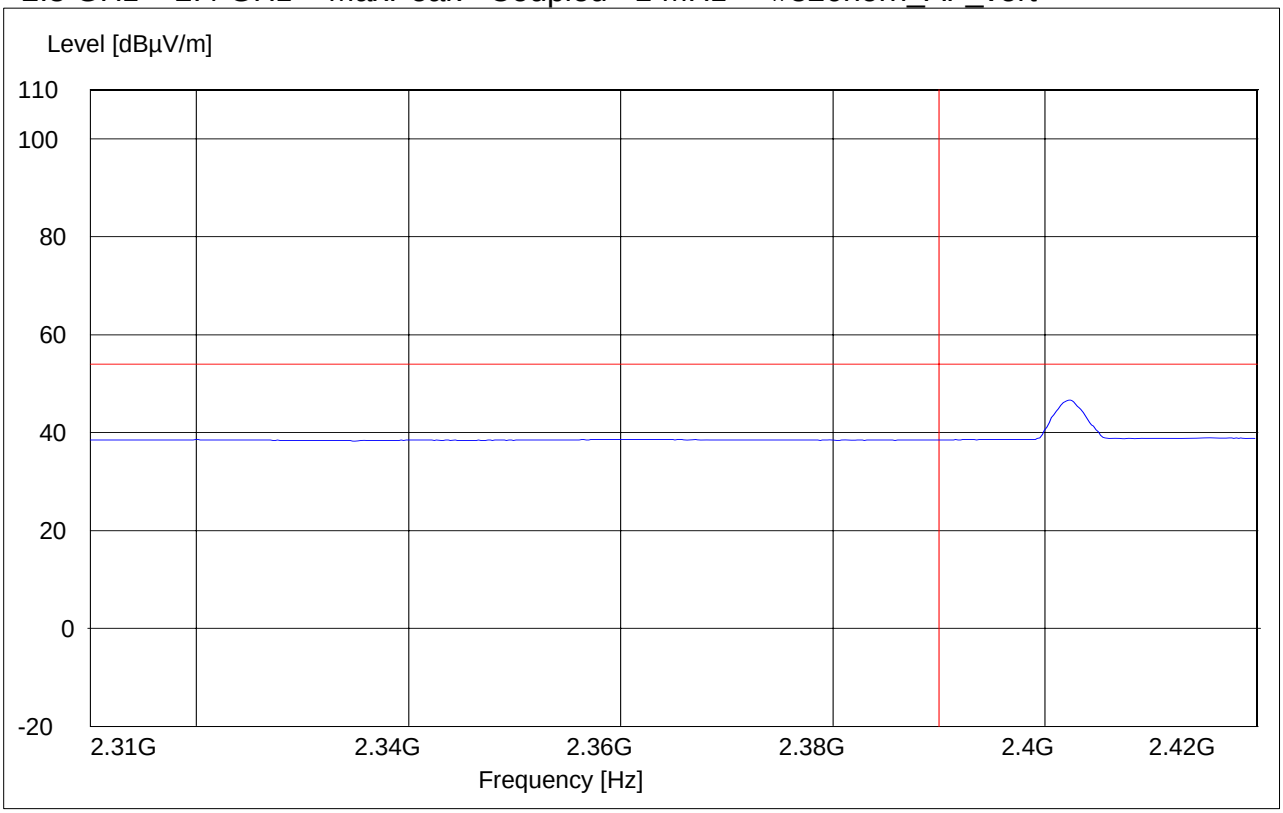
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.3 GHz	2.4 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert



AVG
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch0
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: LBE AVG

SWEEP TABLE: "FCC15.247 LBE_AVG"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.3 GHz	2.4 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

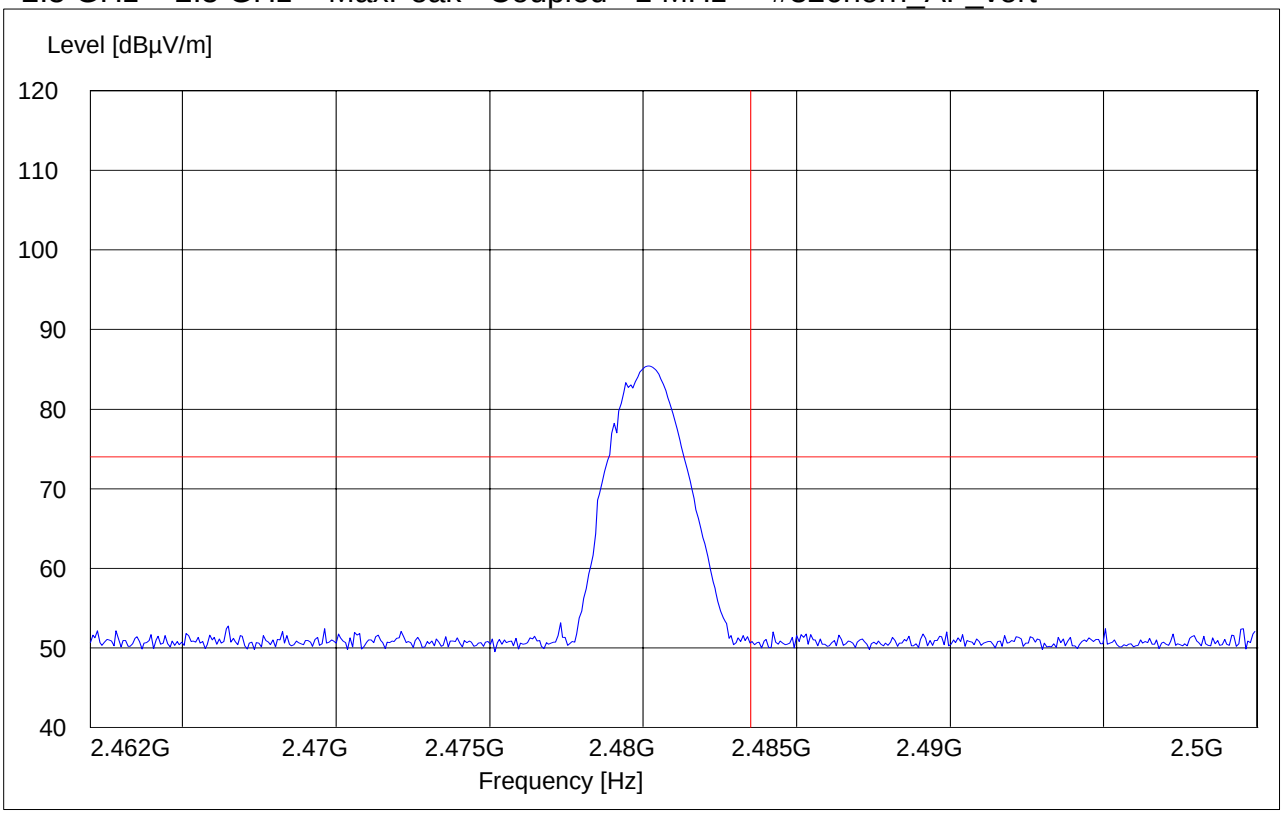


5.8.3 RESULTS (2480MHz)

PEAK
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch78
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: HBE PK

SWEEP TABLE: "FCC15.247 HBE_PK"

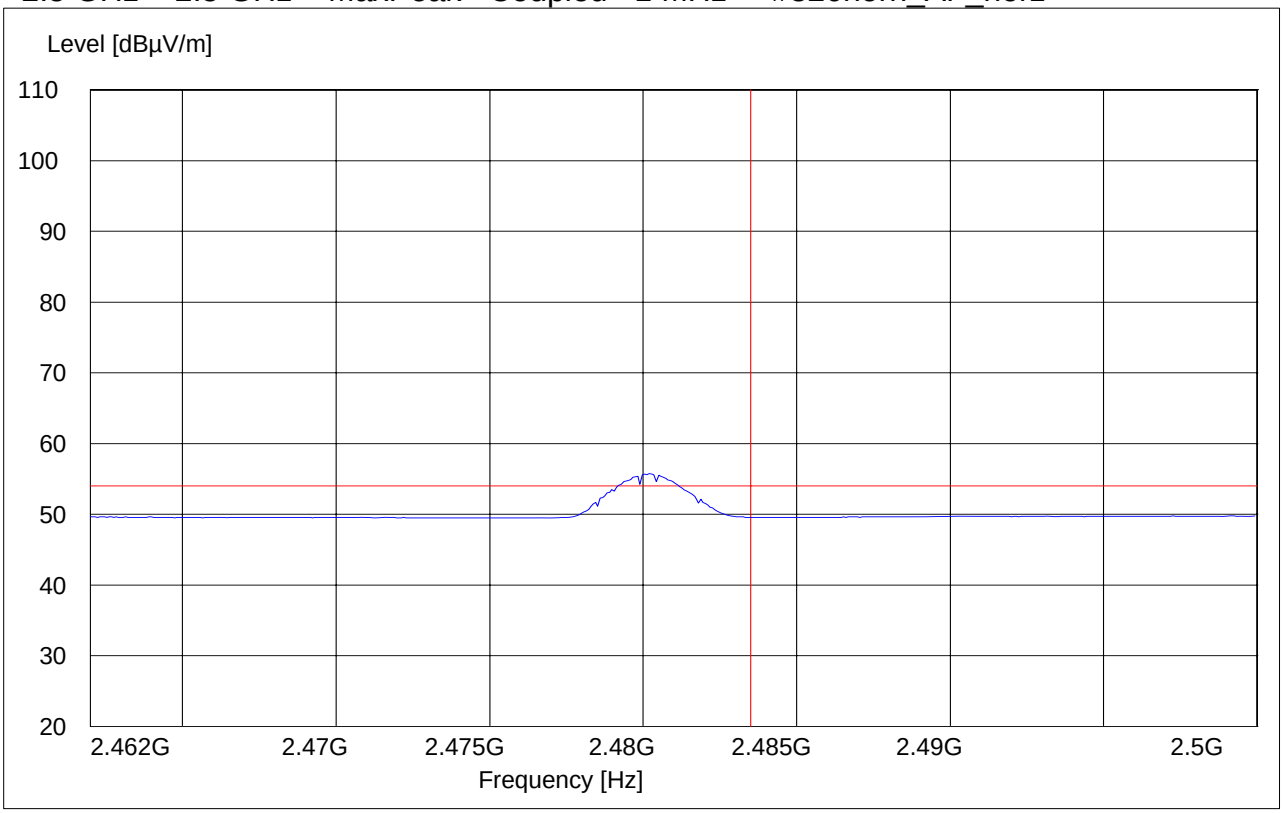
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert



AVG
CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch78
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: HBE AVG

SWEEP TABLE: "FCC15.247 HBE_AVG"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
2.5 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_horz



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

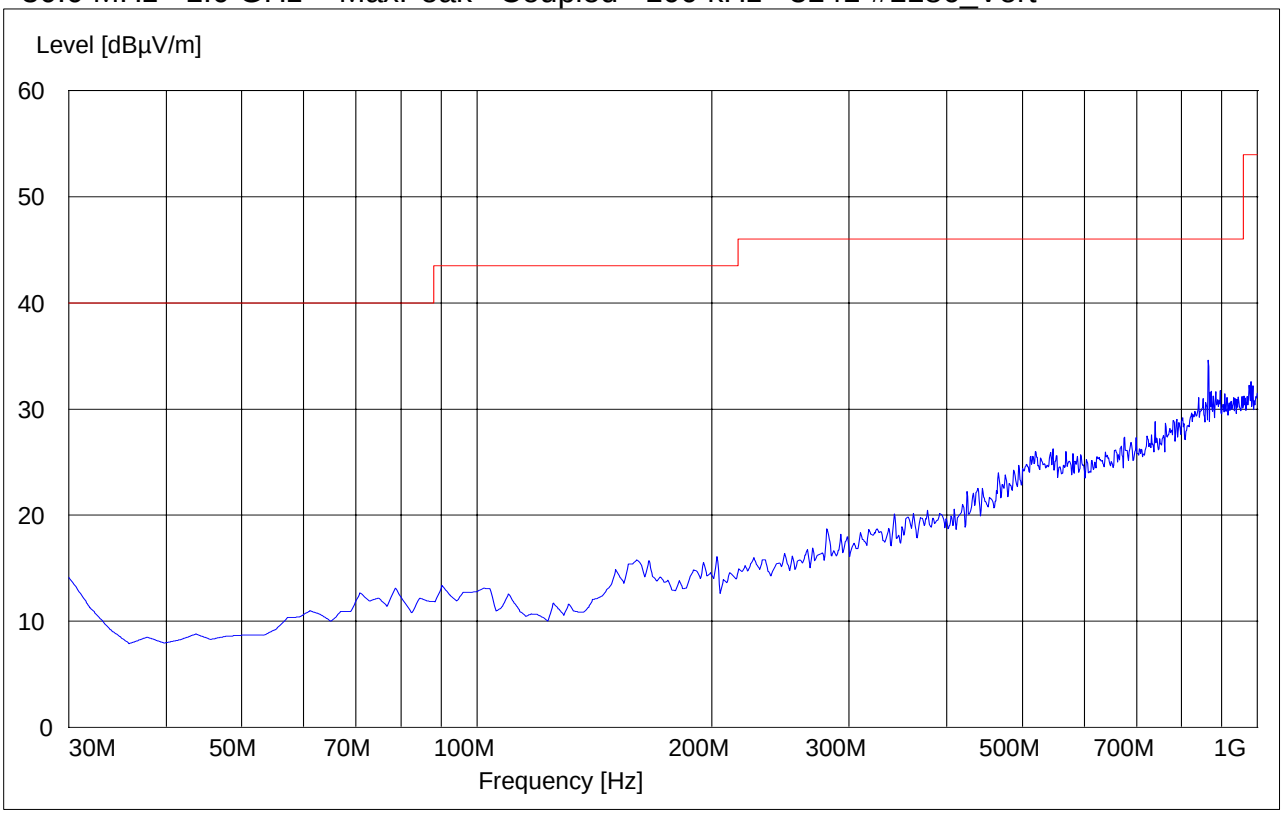
5.9.2 RESULTS

30MHz – 1GHz
Antenna: vertical
Note: This plot is valid for low, mid, high channels (worst-case plot)
Note: Peak reading vs. Quasi-peak limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch0
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 30-1000 MHz

SWEEP TABLE: "FCC15.247_30M-1G_Ver"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert

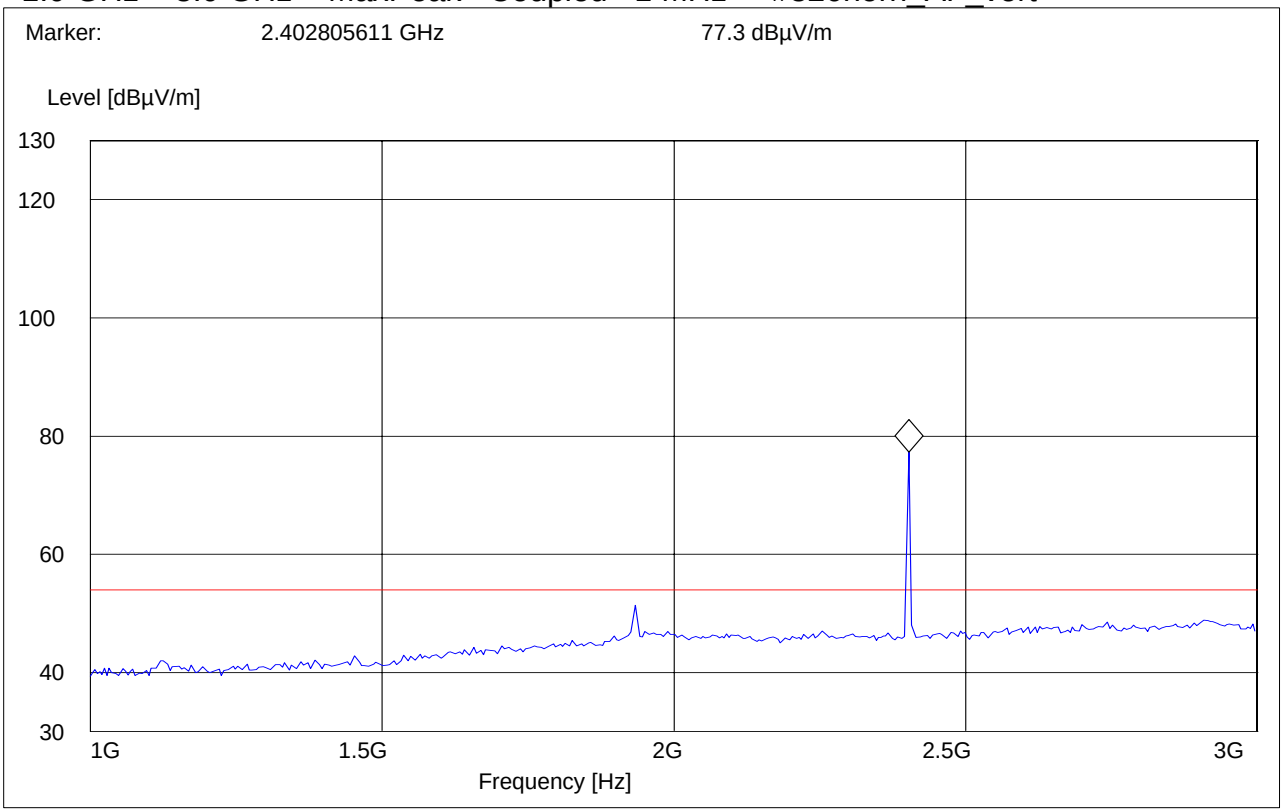


1-3GHz (2402MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch0
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 1-3 GHz

SWEEP TABLE: "FCC15.247_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

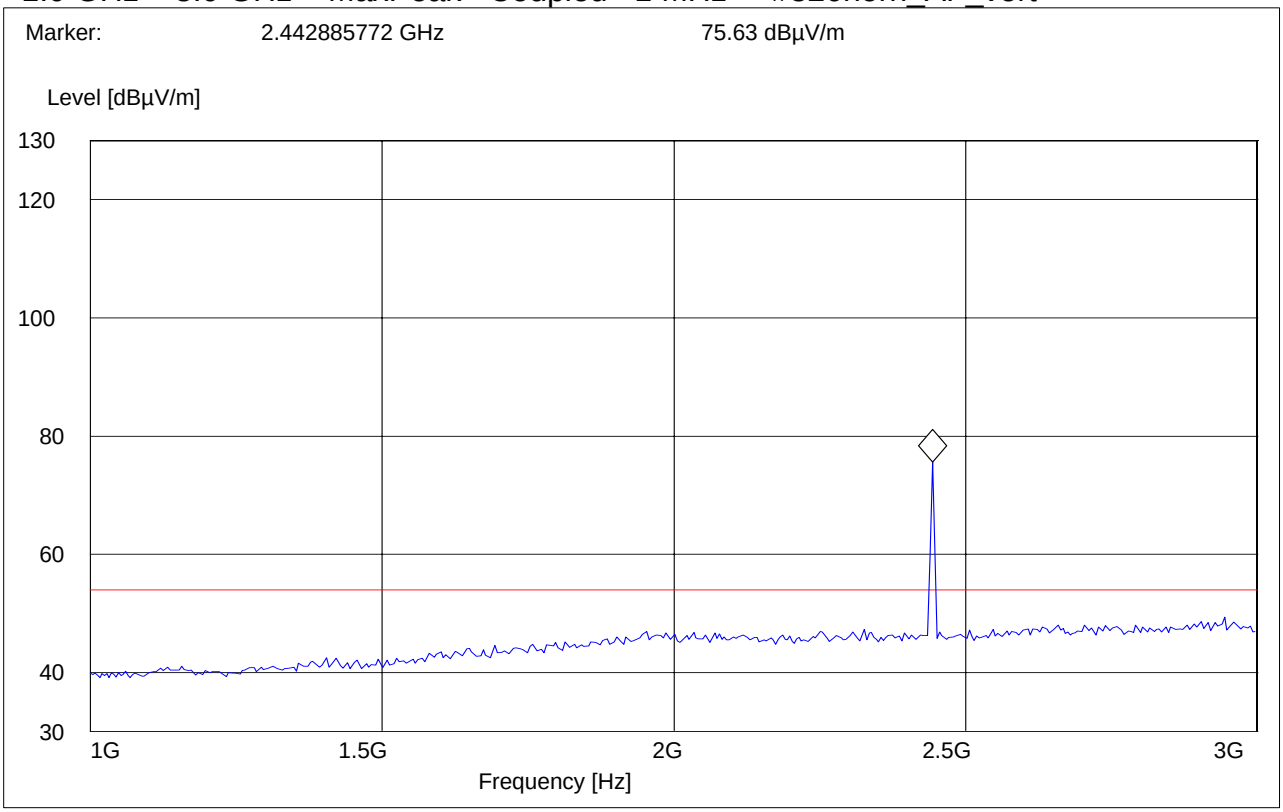


1-3GHz (2441MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch39
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 1-3 GHz

SWEEP TABLE: "FCC15.247_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

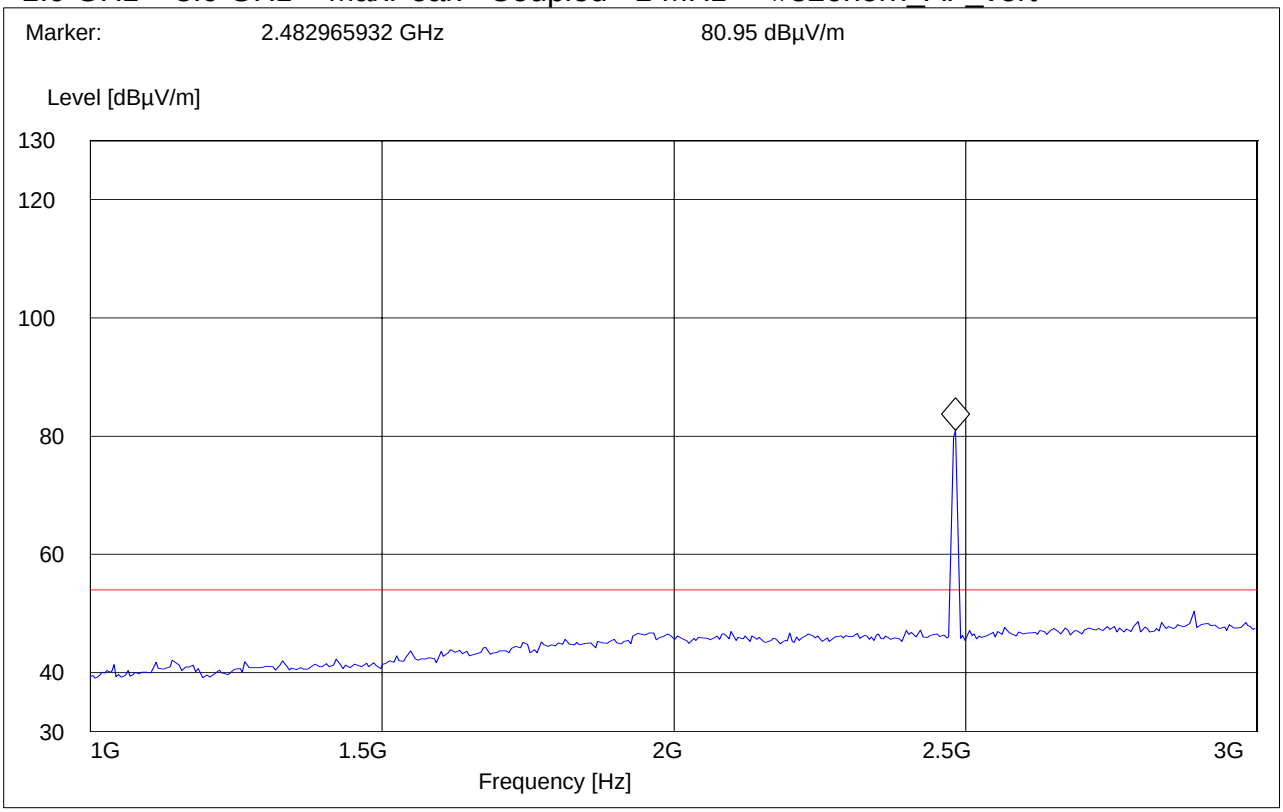


1-3GHz (2480MHz)
Note: The peaks above the limit line is the carrier freq.
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch78
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 1-3 GHz

SWEEP TABLE: "FCC15.247_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert



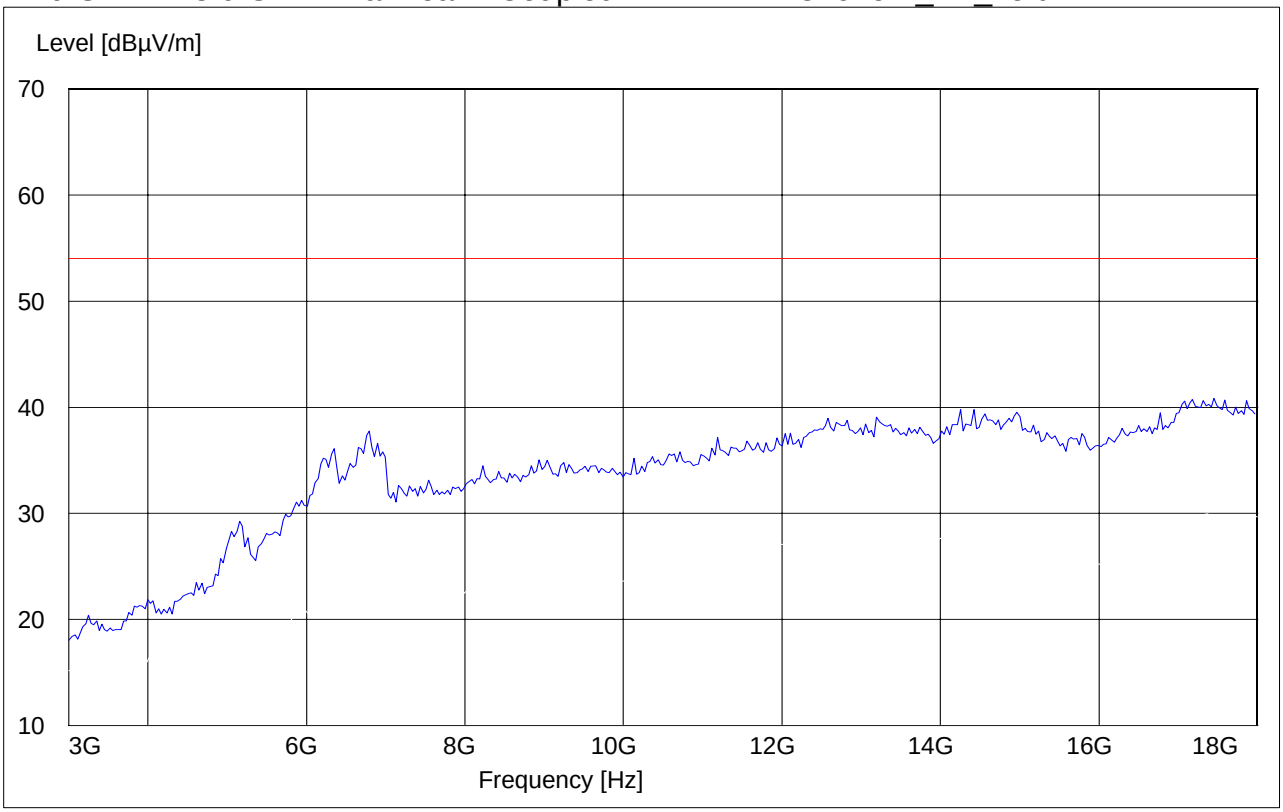
3-18GHz (2402MHz)

Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch0
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 3-18 GHz

SWEEP TABLE: "FCC15.247_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

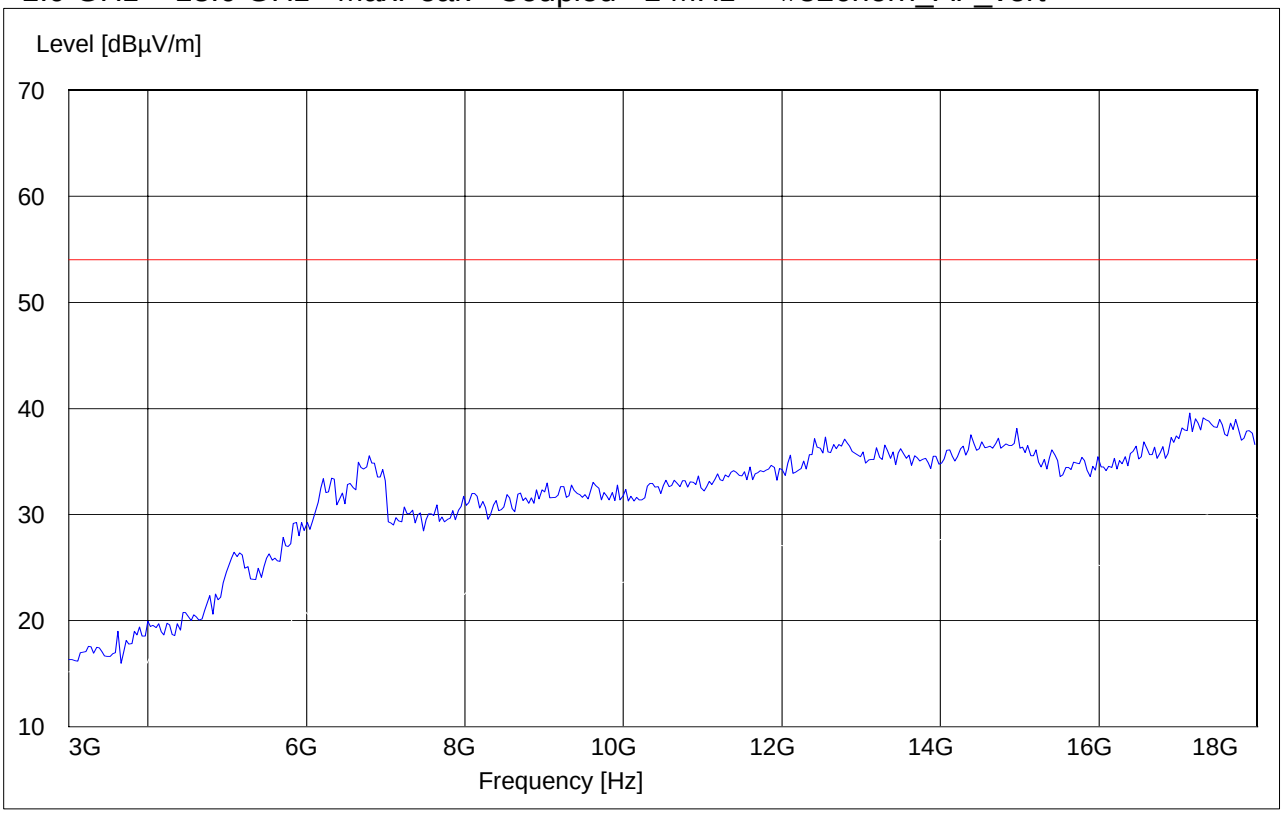


3-18GHz (2441MHz)
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch39
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 3-18 GHz

SWEEP TABLE: "FCC15.247_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert



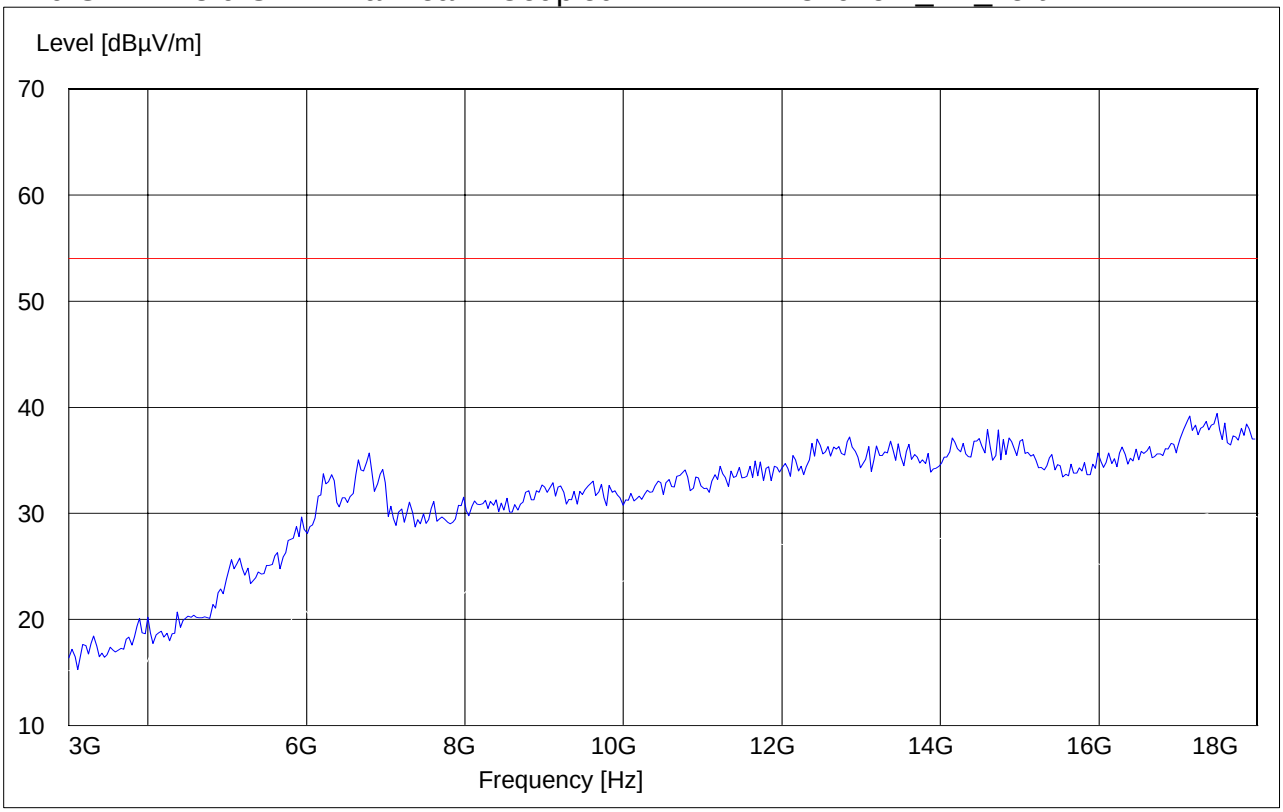
3-18GHz (2480MHz)

Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch78
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 3-18 GHz

SWEEP TABLE: "FCC15.247_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert



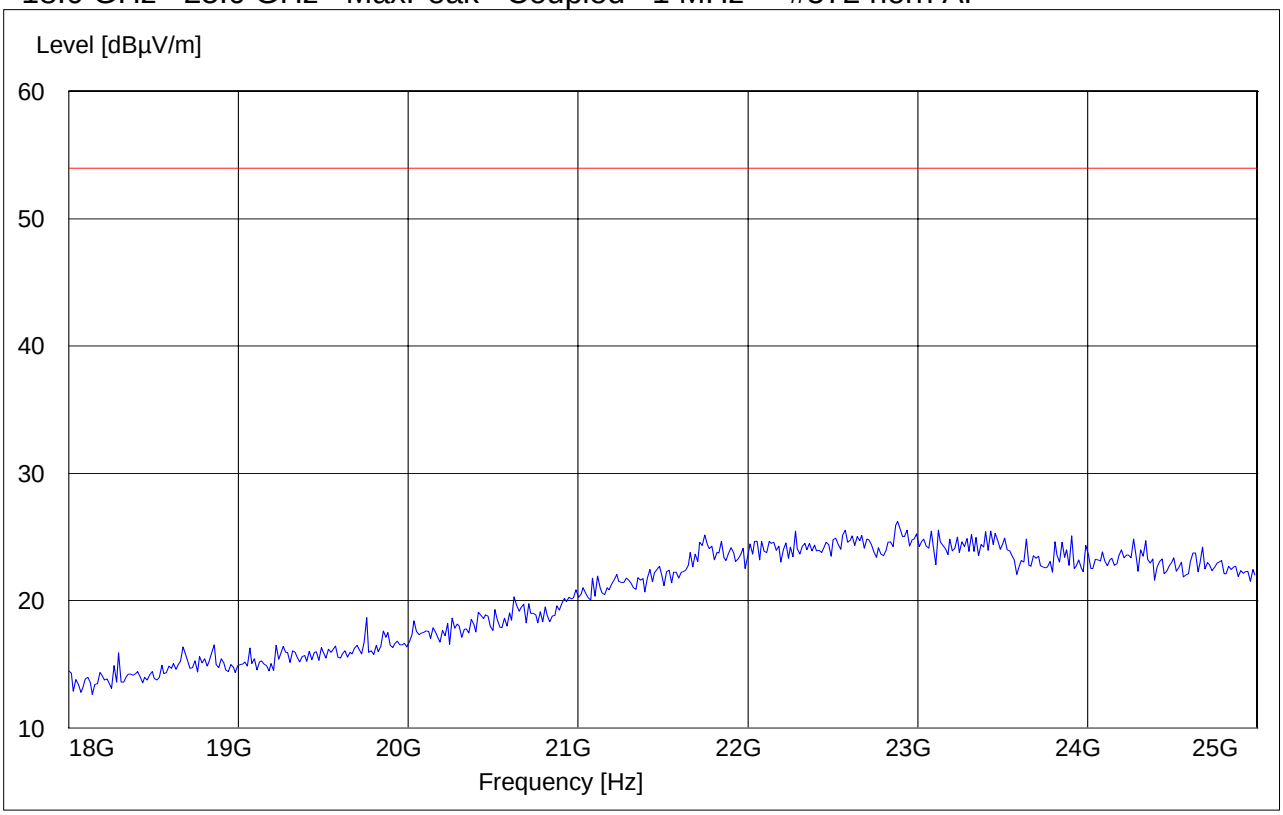
18-25GHz

Note: This plot is valid for low, mid, high channels (worst-case plot)
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: TX Ch0
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 18-25 GHz

SWEEP TABLE: "FCC15.247_18-26.5G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	25.0 GHz	MaxPeak	Coupled	1 MHz	#572 horn AF



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.

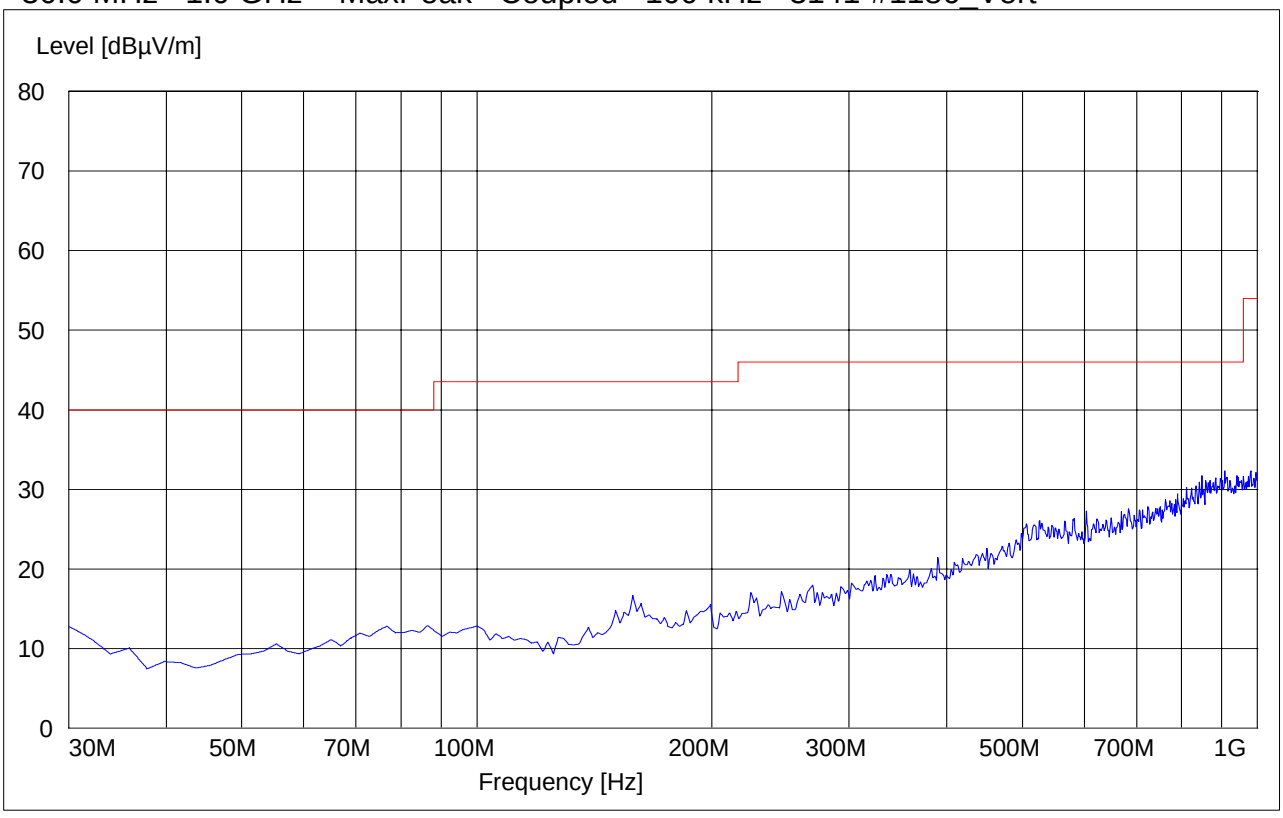
5.10.2 RESULTS

30MHz – 1GHz
Antenna: vertical
Note: Peak Reading vs. Quasi-peak limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: RX
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 30-1000 MHz

SWEEP TABLE: "CANADA RE_30M-1G_Ver"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Vert

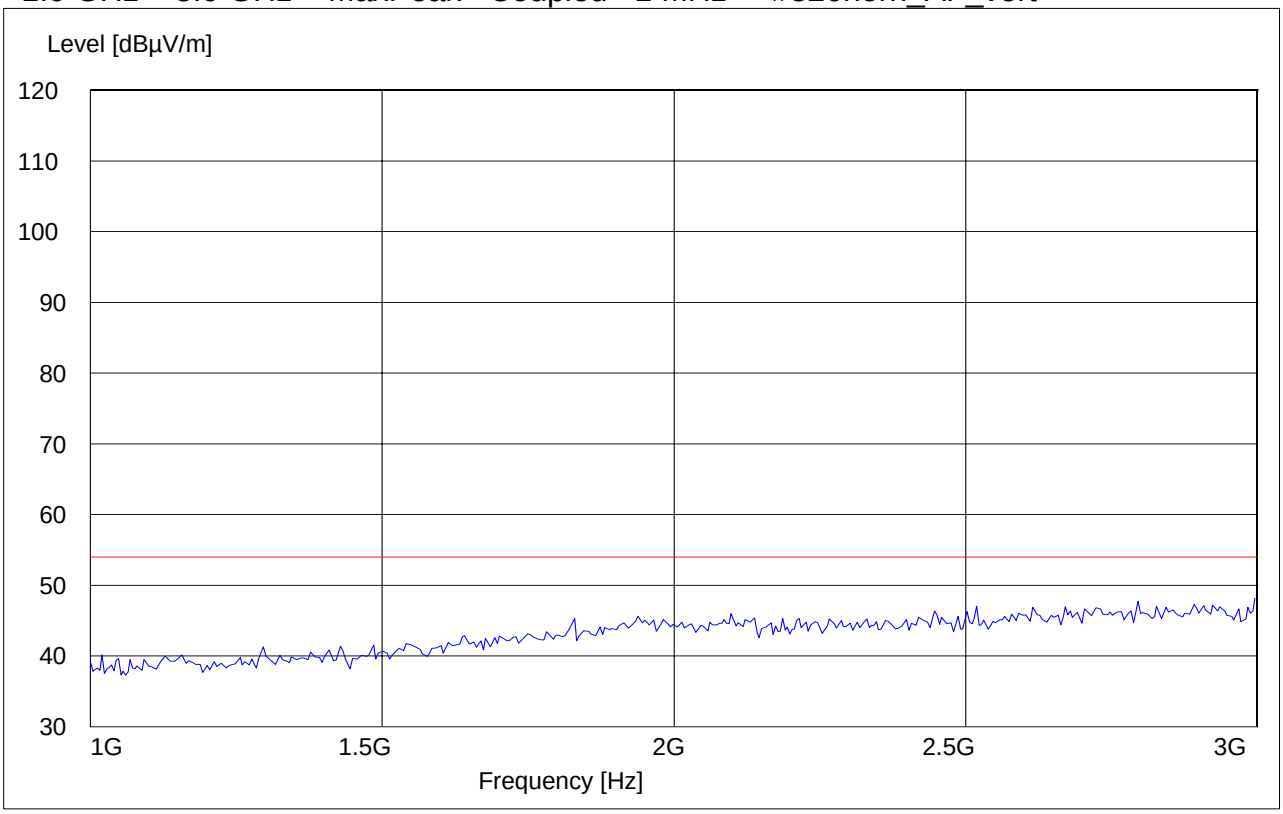


1-3GHz
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: RX
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 1-3 GHz

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

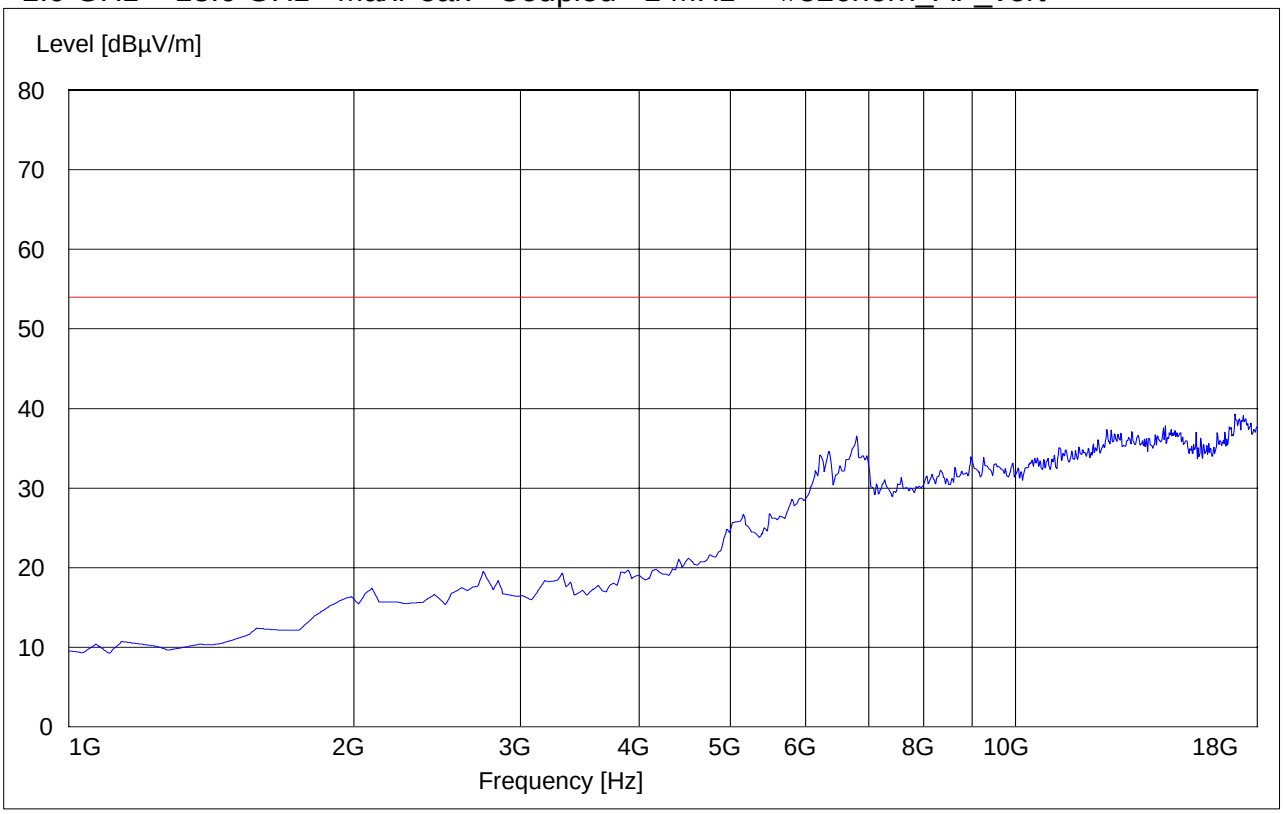


3-18GHz
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: RX
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 3-18 GHz

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326horn_AF_vert

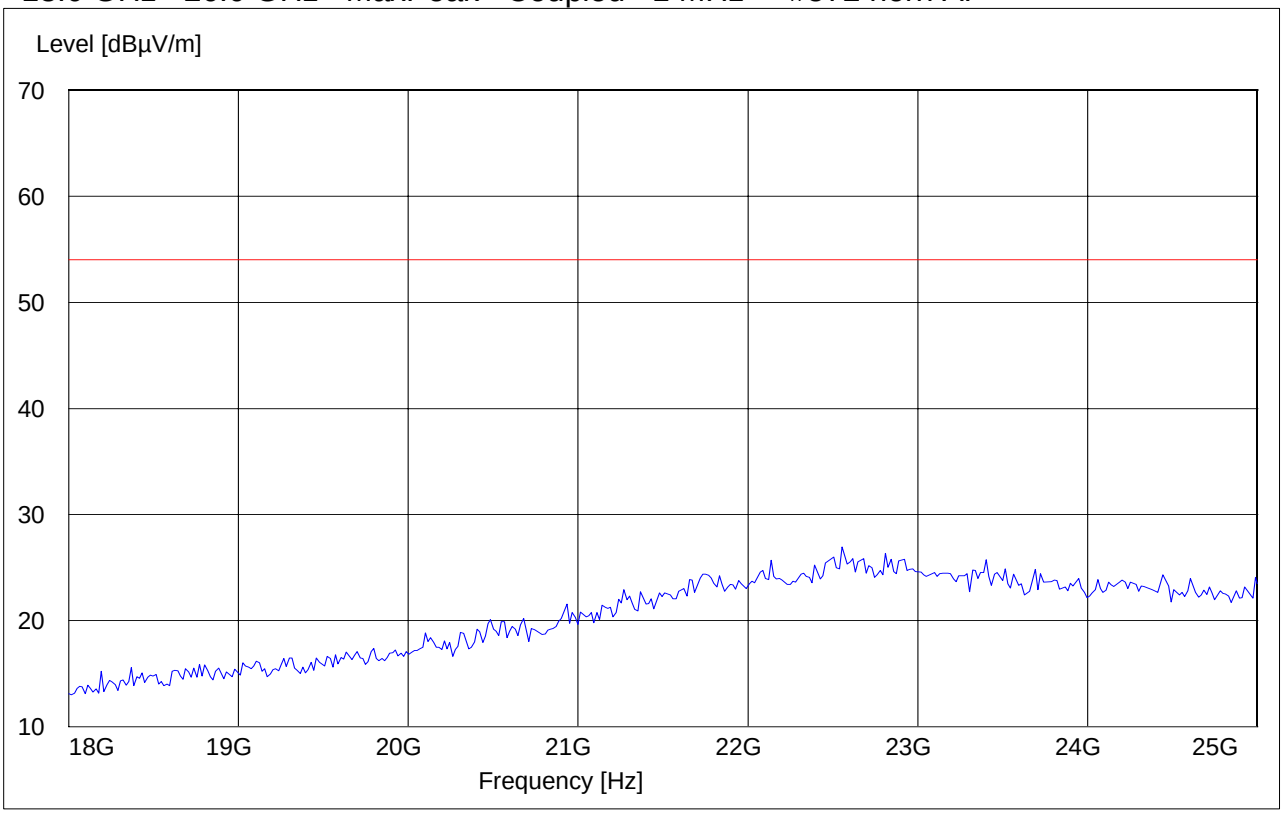


18-25GHz
Note: Peak Reading vs. Average limit

CETECOM Inc.
411 Dixon Landing Road, Milpitas CA 95035, USA
EUT / Description: C81
Customer: BenQ
Operating Mode: RX
Antenna: V
EUT: V
Test operator: Pete
Voltage: DC 4
Sweep: 18-25 GHz

SWEEP TABLE: "CANADA RE_18-26.5G"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
18.0 GHz	26.0 GHz	MaxPeak	Coupled	1 MHz	#572 horn AF



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 (dBµV)	
	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		

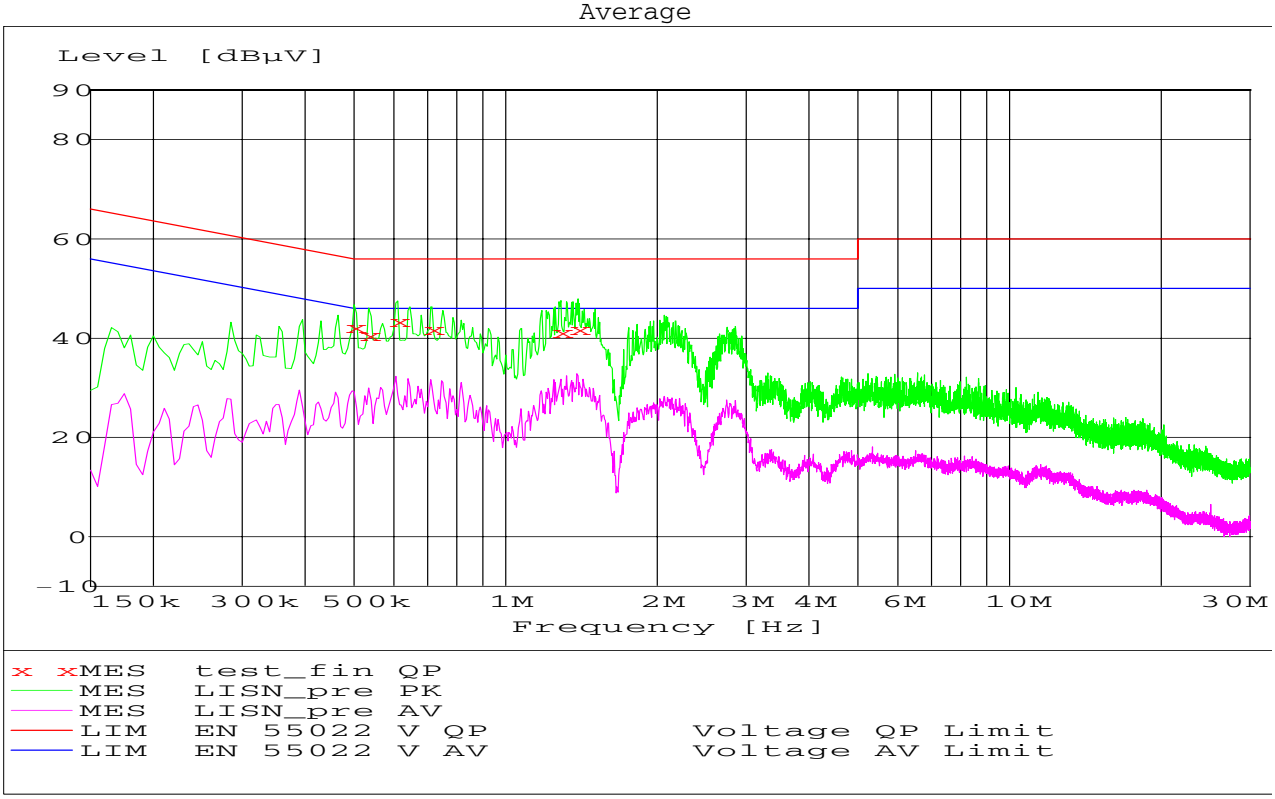
ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz

TYPE	MANF.	MODEL	FCC ID
AC ADAPTER	SIEMENS	A5BHTN00102612	DoC

5.11.2 RESULTS

SCAN TABLE: "EN 55022 Voltage"

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



MEASUREMENT RESULT: "test_fin QP"

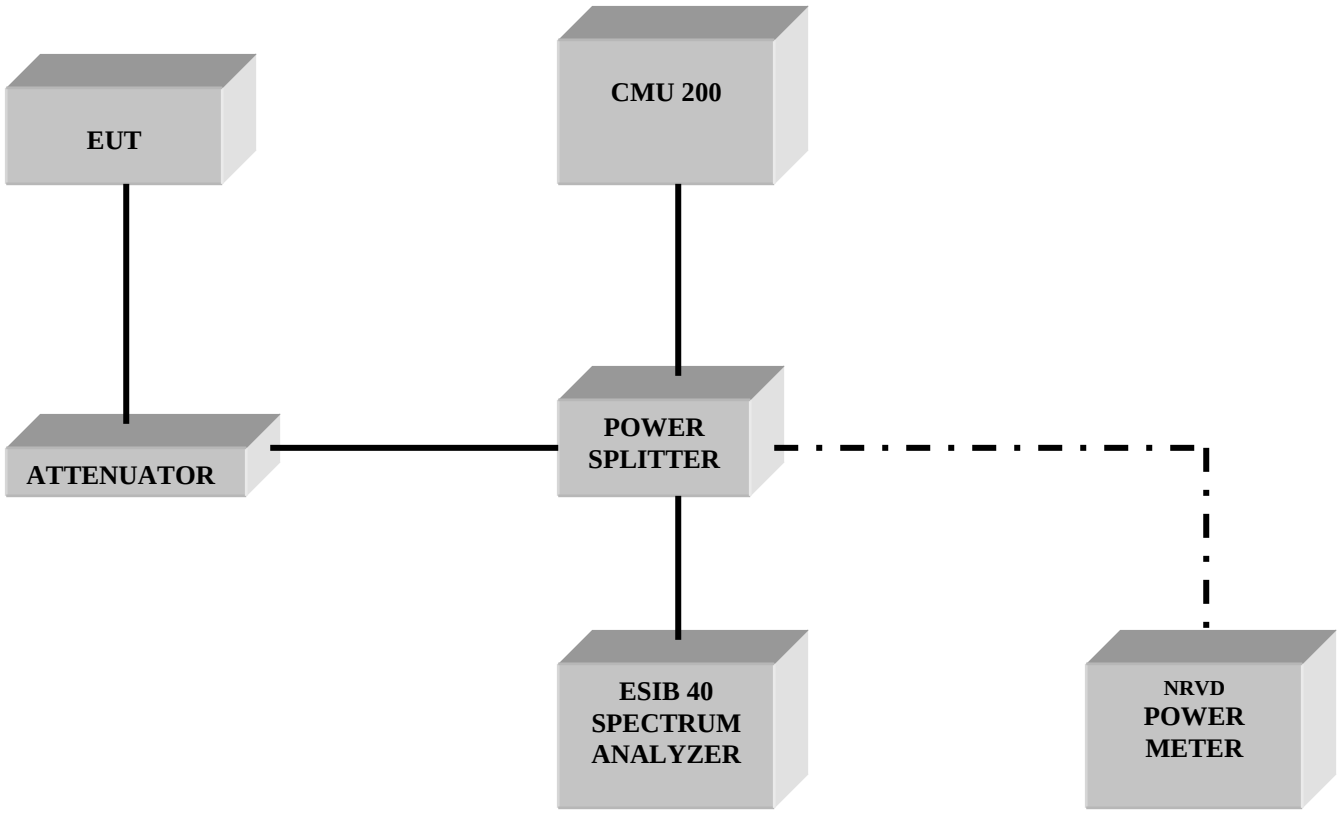
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.500000	42.10	0.0	56	13.9	N	GND
0.535000	40.60	0.0	56	15.4	L1	GND
0.610000	43.50	0.0	56	12.5	L1	GND
0.715000	41.80	0.0	56	14.2	N	GND
1.285000	41.20	0.0	56	14.8	N	GND
1.390000	41.80	0.0	56	14.2	L1	GND

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 2007	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2006	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2007	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2007	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 2007	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 2007	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2007	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2007	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2007	1 year

5.13 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing