



FCC Test Report

FCC Part 15.247 & IC RSS-210, issue 7 for FHSS systems

for
Hand Held Products, Inc.

Barcode Cordless Base-I.T.E. equipment

Model Number: 2020-5

FCC ID: HD5MXTY3B

IC-ID: 1693B-TY3B

TEST REPORT #: EMC_HANDH_049_07002-02_FCC-IC_BT.
DATE: January 09, 2008



Certificate # 2135.01



LAB CODE 20020328-00

FCC listed
A2LA certified
IC recognized #
3462B

CETECOM Inc.

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Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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1 Assessment

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

Company	Description	Model #
Hand Held Products, Inc.	Barcode Cordless Base- I.T.E. equipment	2020-5

Technical responsibility for area of testing:

01/09/2008	EMC & Radio	Lothar Schmidt (Director Antenna and Regulatory Services)
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Date **Section** **Name** **Signature**

This report is prepared by:

01/09/2008	EMC & Radio	Val Tankov (Project Engineer)
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Date **Section** **Name** **Signature**

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 SAR Assessment Report

Company Name:	CETECOM Inc.
Department:	SAR
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

2.2 Identification of the Client

Applicant's Name:	Hand Held Products, Inc.
Address:	700 Visions Dr. Skaneateles Falls / 13153-0208, USA
Contact Person:	Michaels Robinson
Phone No.	+1 315 554 6387
Fax:	+1 315 554 6393
e-mail:	Michael.robinson@handneld.coml

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as an Applicant
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3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Product Type	Barcode Cordless Base-I.T.E. equipment
Marketing Name:	Same as model numbers
Model No:	2020-5
FCC-ID:	HD5MXTY3B
IC-ID :	1693B-TY3B
Frequency Range:	2400 – 2483.5 MHz
Number of Channels	79
Type(s) of Modulation:	GFSK, DQPSK, 8PSK
Antenna Type:	Intergral SMD
Output Power:	-0.45 dBm (0.901mW) EIRP 2.79 dBm (1.90mW) Conducted

3.2 Identification of the Equipment Under Test (EUT)

EUT #	TYPE	MANF.	MODEL	IMEI #
1	EUT	Hand Held Products Inc.	2020-5	NA

3.3 Identification of Accessory equipment

AE #	TYPE	MANF.	MODEL	SERIAL #
1	Power Adapter	DVE	DSA-0151D-09	N/A

4 Subject of Investigation

All testing was performed on the product referred to in Section 3 as EUT.

Unless otherwise noted during the testing process the EUT was tested on a single channel using PRBS9 payload using DH5 packets, all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations. The maximization of portable equipment is conducted in accordance with ANSI C63.4.

5 Measurements (Radiated)

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 Test Results

EIRP: GFSK

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2441	2480
T _{nom} (23)°C	V _{nom} VDC	-3.67	-3.24	-4.15
Measurement uncertainty		±0.5dBm		

EIRP: π / 4 DQPSK

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2441	2480
T _{nom} (23)°C	V _{nom} VDC	-0.85	-0.92	-2.36
Measurement uncertainty		±0.5dBm		

EIRP: 8DPSK

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2441	2480
T _{nom} (23)°C	V _{nom} VDC	-0.45	-0.83	-2.30
Measurement uncertainty		±0.5dBm		

EIRP BT low channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products Inc.

Test Mode: BT GFSK Low ch.

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

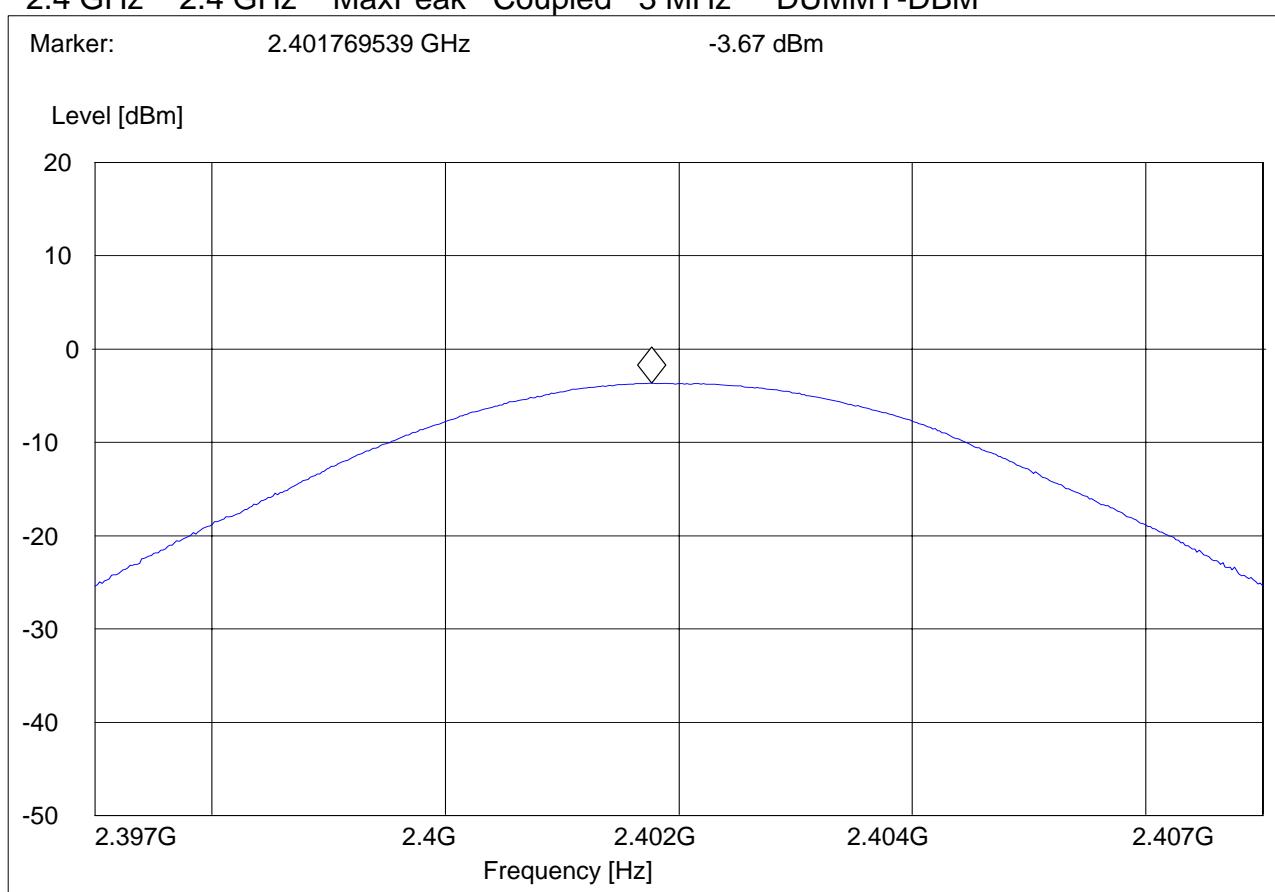
SWEEP TABLE: "EIRP BT low channel"

Short Description: EIRP Bluetooth channel-2402MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.4 GHz 2.4 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



EIRP BT mid channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products Inc.

Test Mode: BT GFSK mid ch.

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

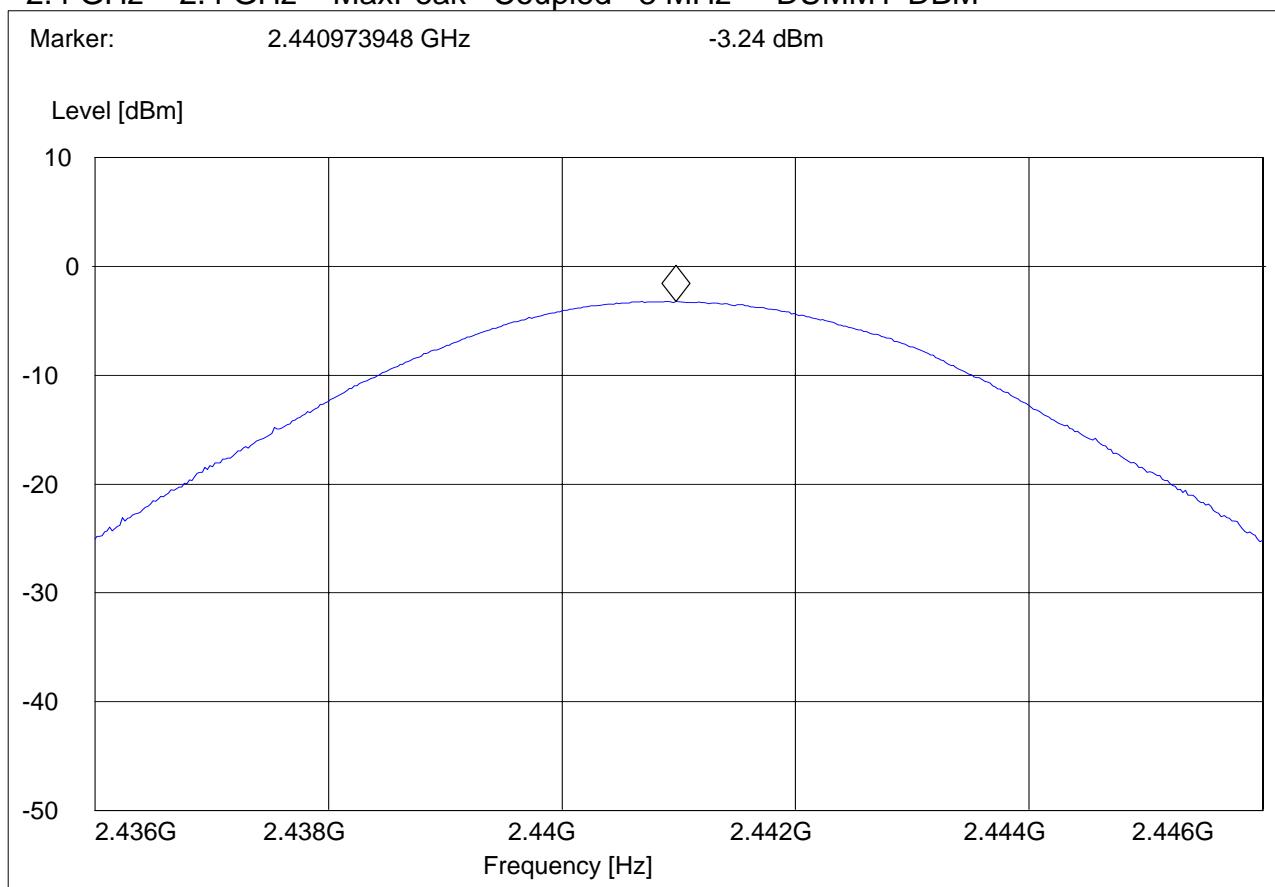
SWEEP TABLE: "EIRP BT mid channel"

Short Description: EIRP Bluetooth channel-2441MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.4 GHz 2.4 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



EIRP BT high channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products Inc.

Test Mode: BT GFSK high ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

SWEEP TABLE: "EIRP BT high channel"

Short Description: EIRP Bluetooth channel-2480MHz

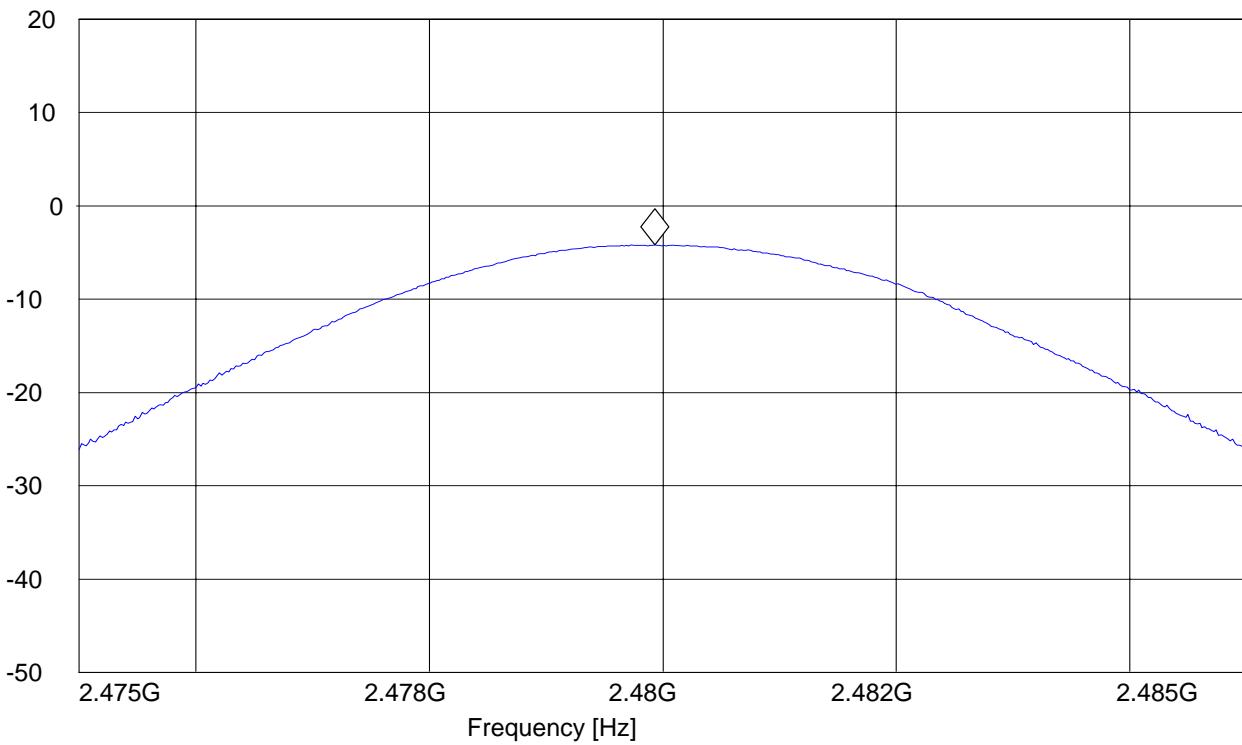
Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.5 GHz 2.5 GHz MaxPeak Coupled 3 MHz DUMMY-DBM

Marker: 2.47992986 GHz -4.15 dBm

Level [dBm]



EIRP BT low channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer:: Hand Held Products Inc.

Test Mode: BT DQPSK low ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

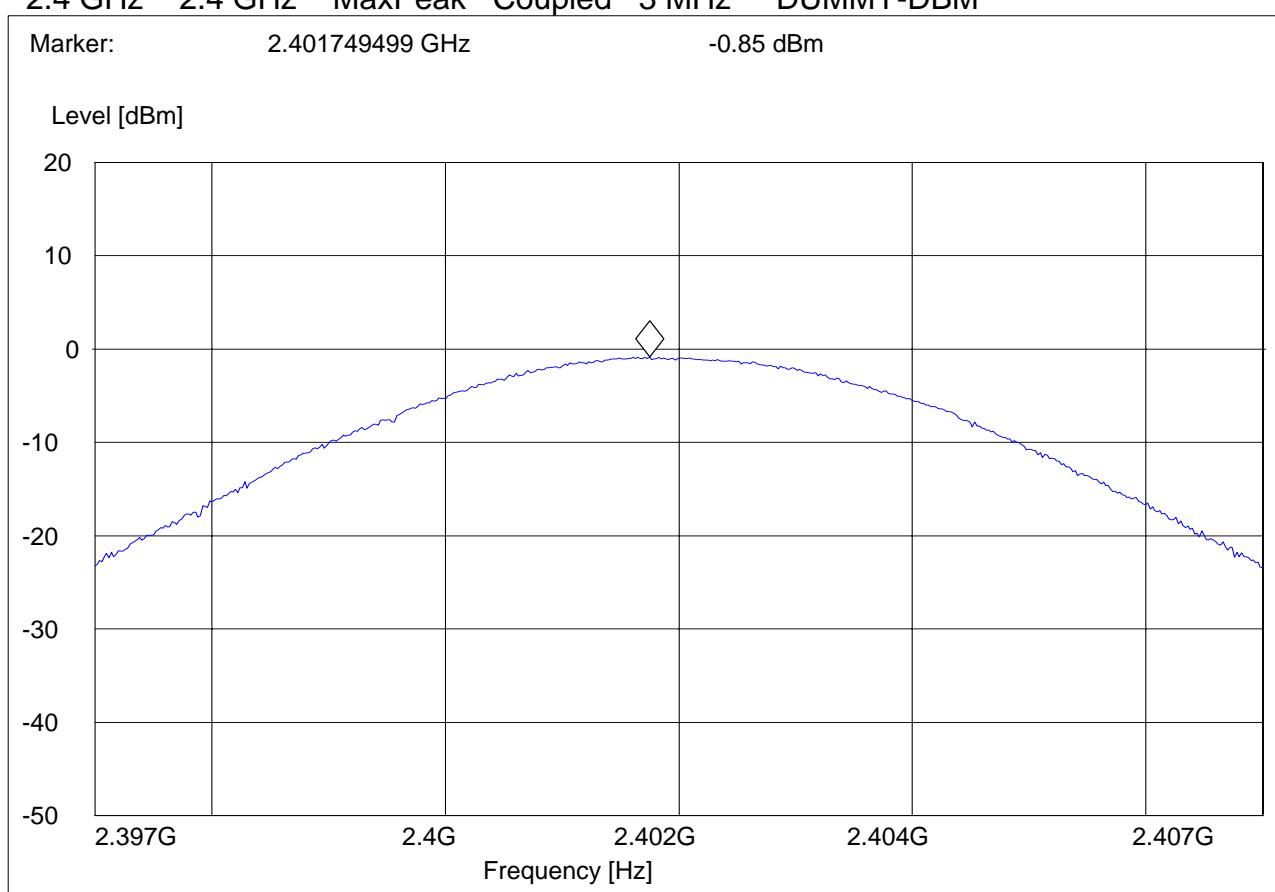
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Short Description: EIRP Bluetooth channel-2402MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.4 GHz 2.4 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



EIRP BT mid channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products inc.

Test Mode: BT DQPSK mid ch.

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

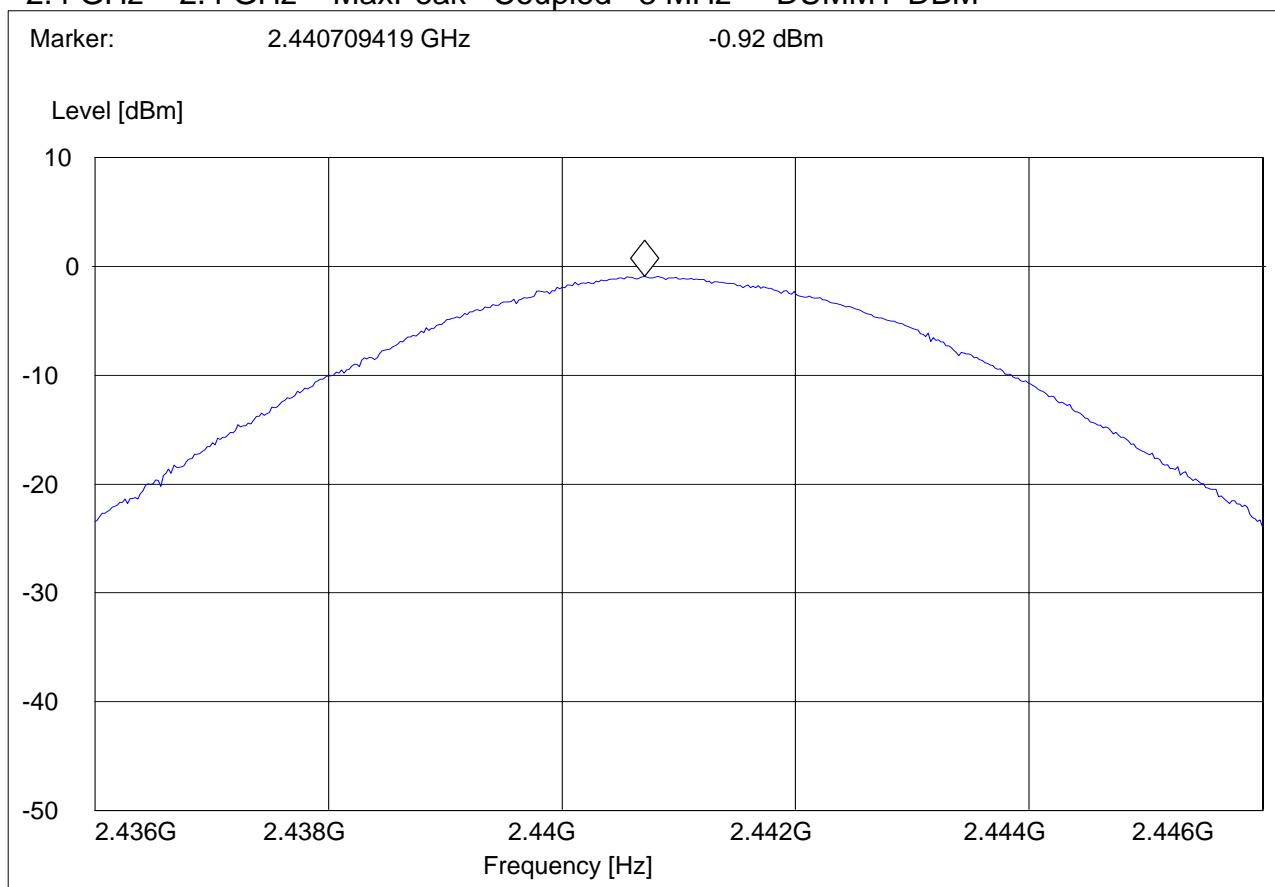
SWEEP TABLE: "EIRP BT mid channel"

Short Description: EIRP Bluetooth channel-2441MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.4 GHz 2.4 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



EIRP BT high channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products inc.

Test Mode: BT DQPSK high ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

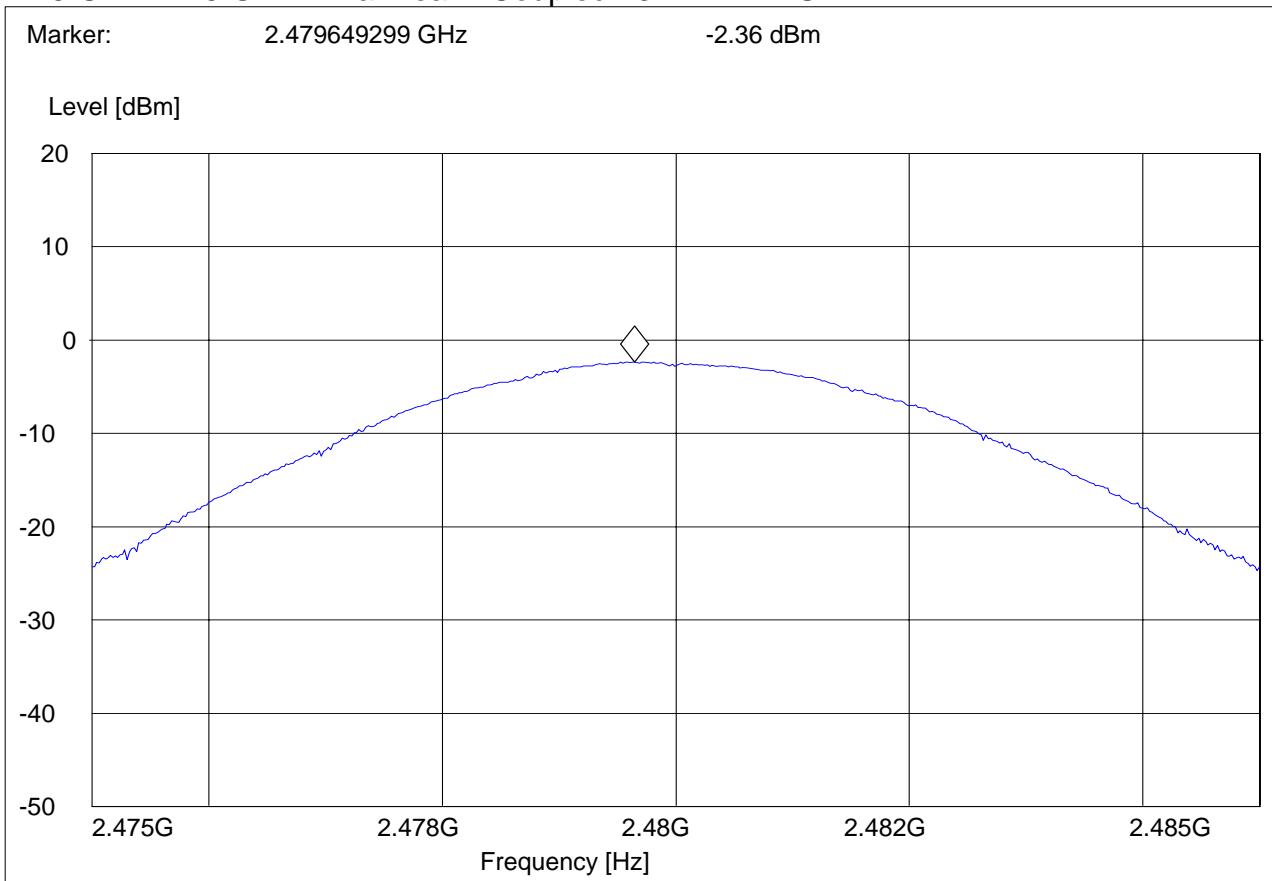
SWEEP TABLE: "EIRP BT high channel"

Short Description: EIRP Bluetooth channel-2480MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.5 GHz 2.5 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



EIRP BT low channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products Inc.

Test Mode: BT 8DPSK low ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

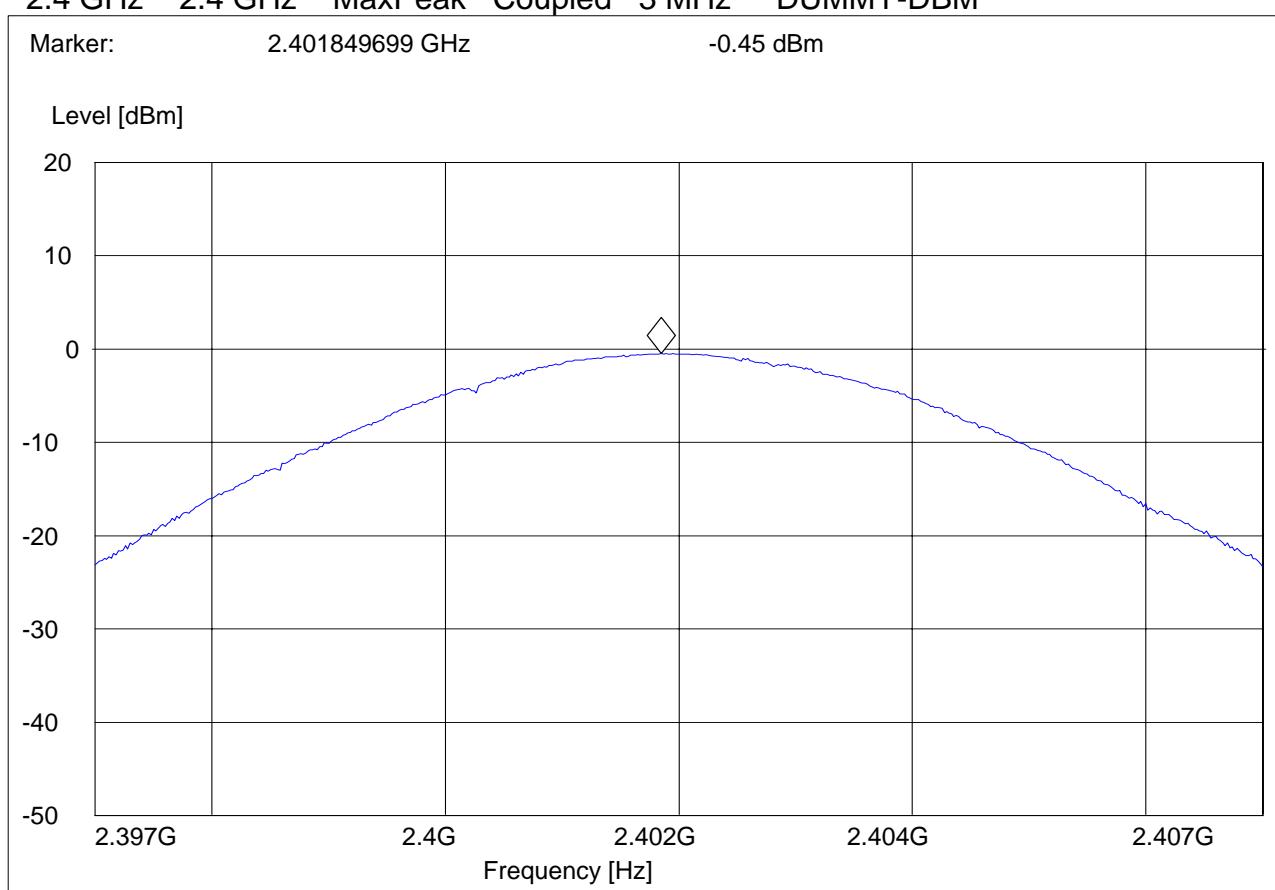
SWEEP TABLE: "EIRP BT low channel"

Short Description: EIRP Bluetooth channel-2402MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.4 GHz 2.4 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



EIRP BT mid channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products inc.

Test Mode: BT 8DPSK mid ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

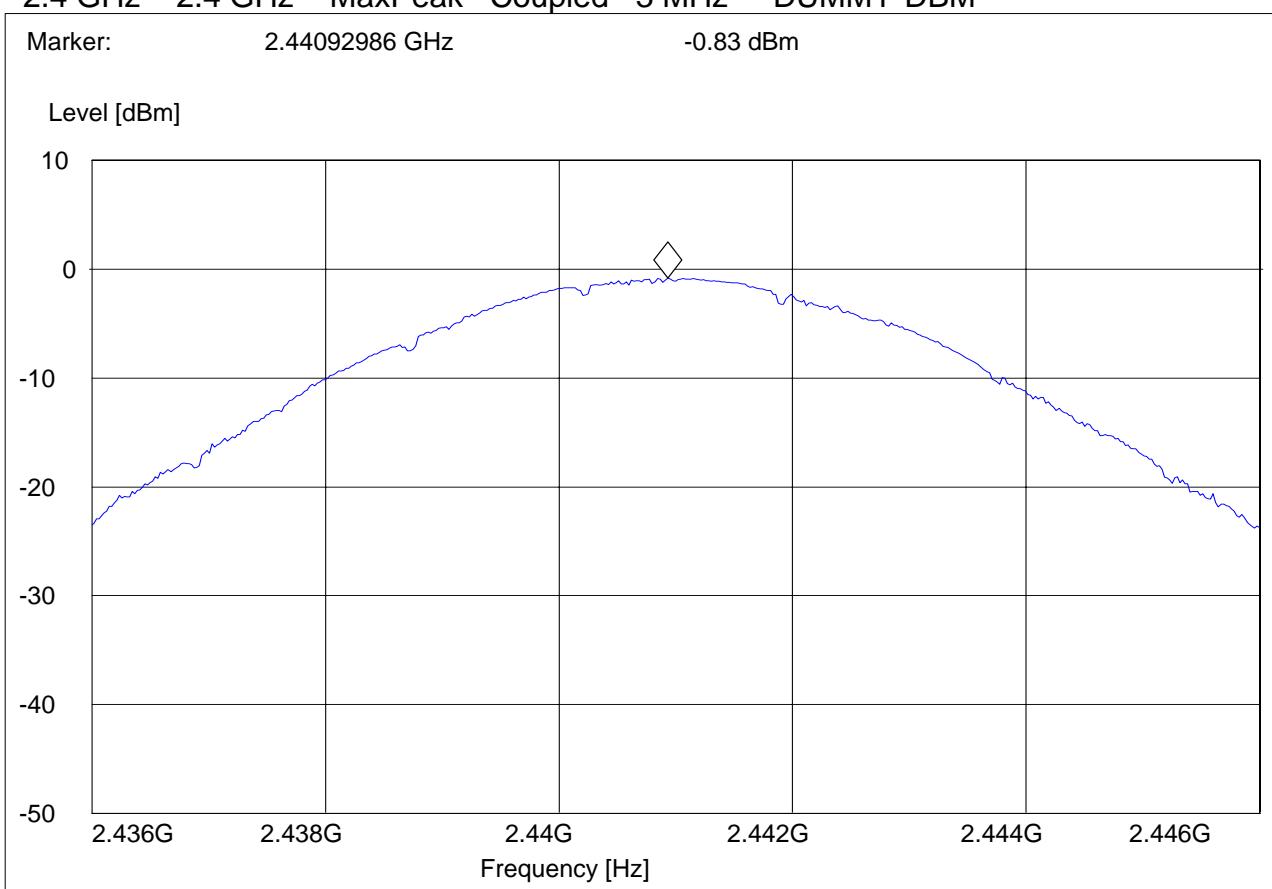
SWEEP TABLE: "EIRP BT mid channel"

Short Description: EIRP Bluetooth channel-2441MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.4 GHz 2.4 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



EIRP BT high channel

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products Inc.

Test Mode: BT 8DPSK High ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

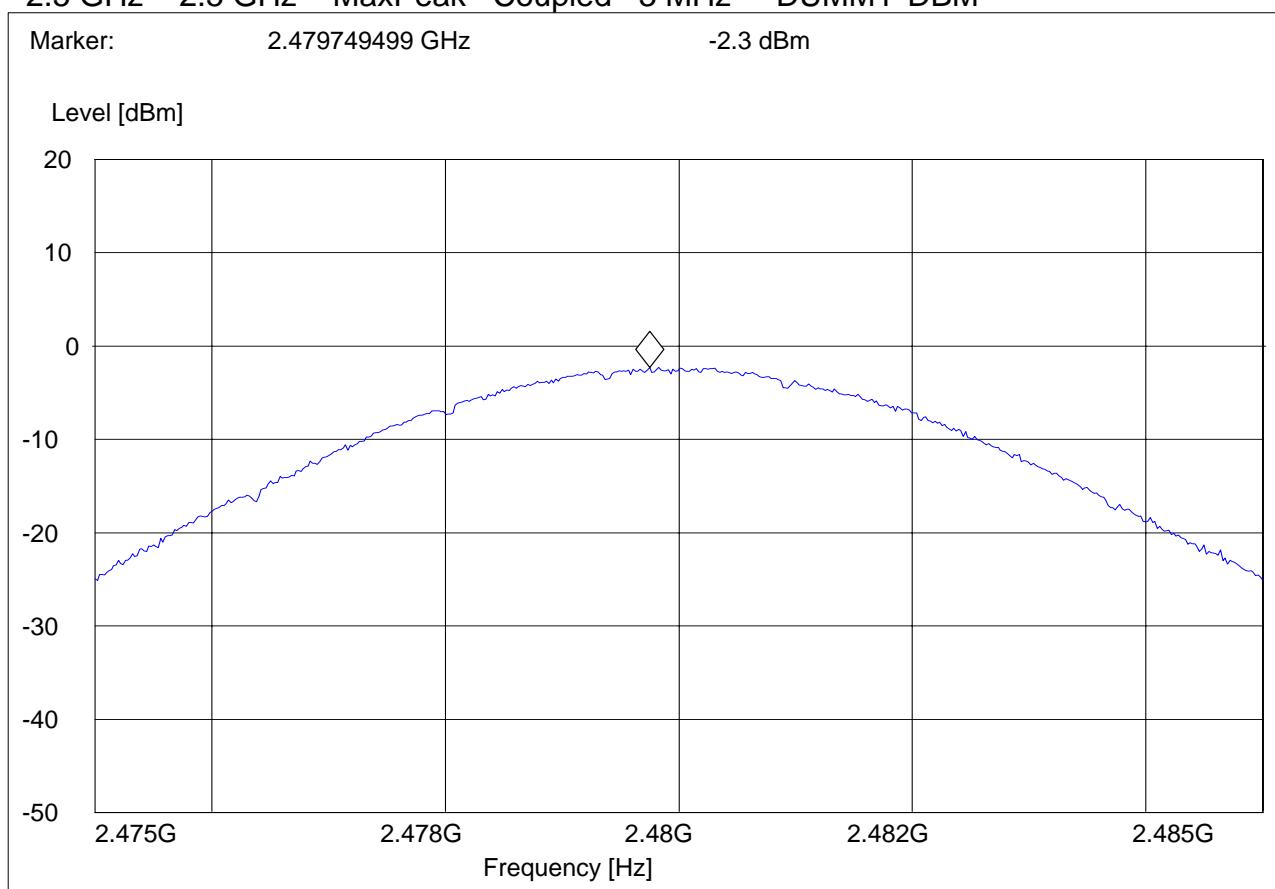
SWEEP TABLE: "EIRP BT high channel"

Short Description: EIRP Bluetooth channel-2480MHz

Start Stop Detector Meas. IF Transducer

Frequency Frequency Time Bandw.

2.5 GHz 2.5 GHz MaxPeak Coupled 3 MHz DUMMY-DBM



5.2 RESTRICTED BAND EDGE COMPLIANCE RADIATED §15.247/15.205

5.2.1 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			

Notes:

1. Radiated emissions are maximized by rotating the EUT 360° at 0.5 meter height increments between 1 and 4 meters.
2. Measurements were performed with the EUT in X, Y and Z orientations with the measurement antenna in both horizontal and vertical polarity. The plots below show the results of the worst case orientation and polarity.

5.2.2 Results Lower Restricted Band 2310 MHz to 2390 MHz

GFSK (2402MHz) PEAK

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT GFSK Low ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

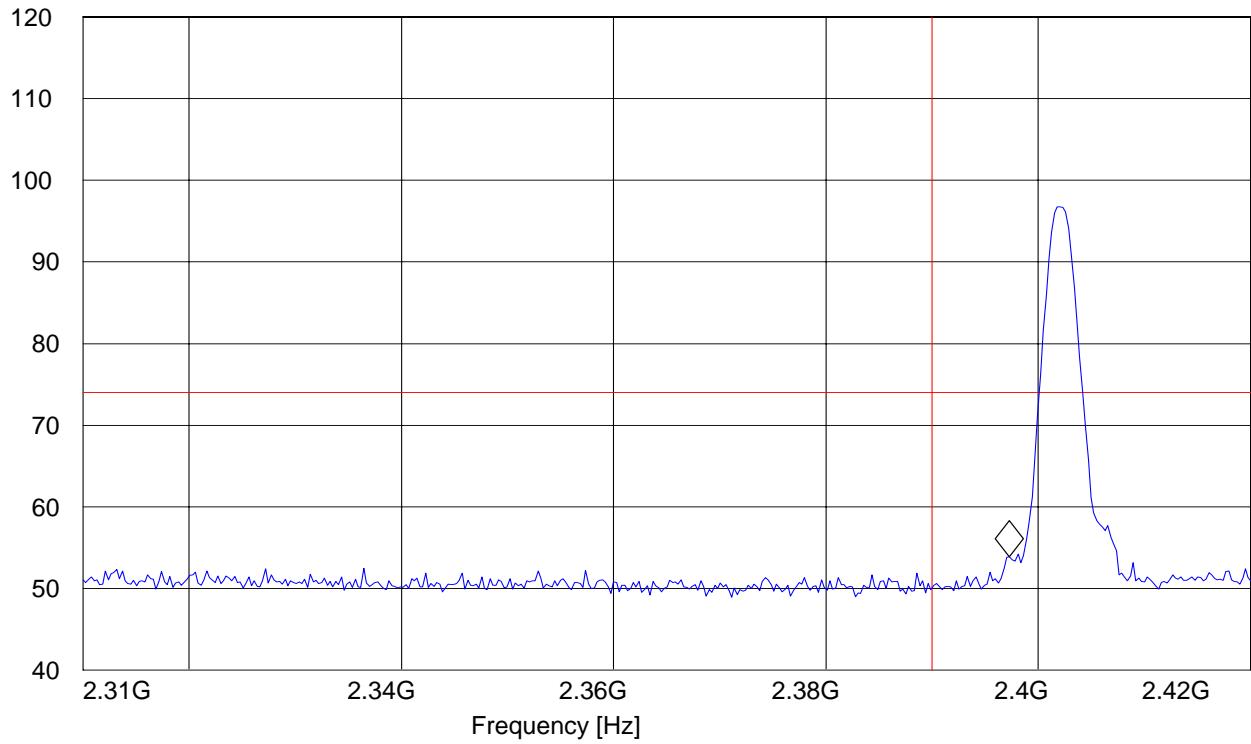
Comments: Base only

SWEEP TABLE: "FCC15.247 LBE_PK"

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

Marker: 2.397294589 GHz 53.87 dB μ V/m

Level [dB μ V/m]



GFSK (2402MHz) AVG

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT GFSK Low ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

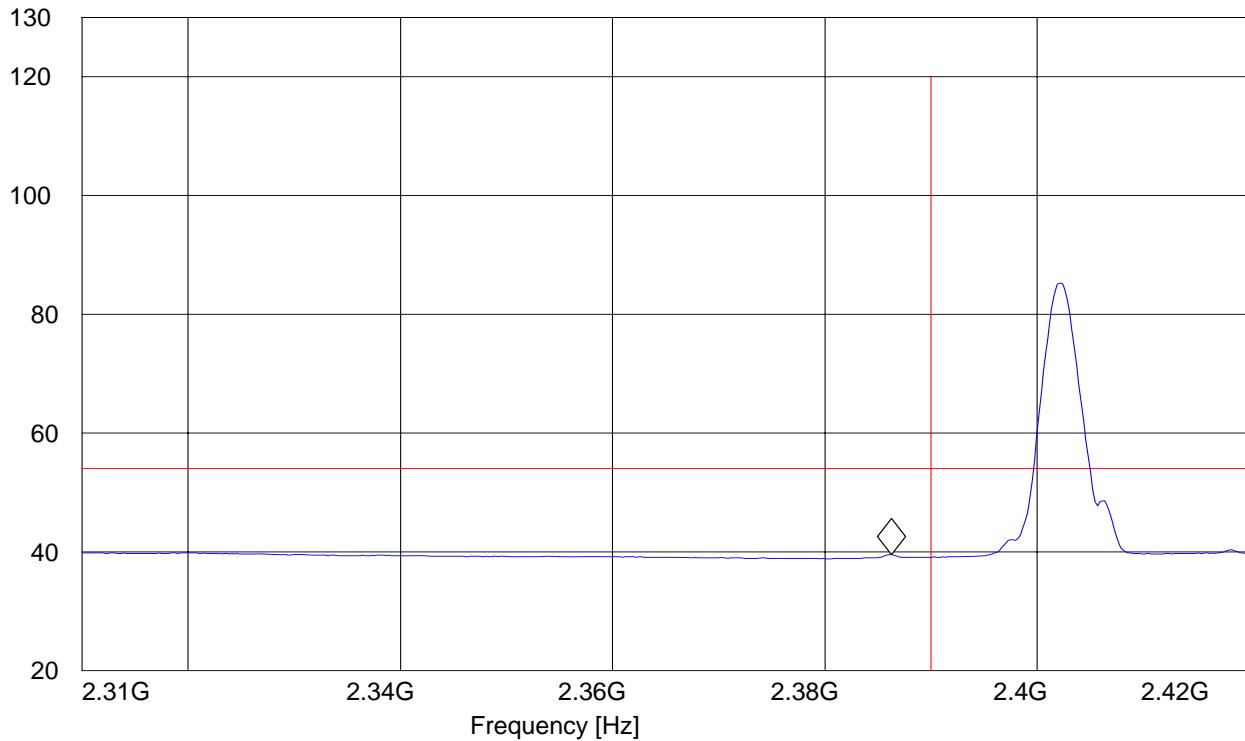
Comments: Base only

SWEEP TABLE: "FCC15.247 LBE_AVG"

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

Marker: 2.386272545 GHz 39.55 dB μ V/m

Level [dB μ V/m]



Pi/4 DQPSK (2402MHz) PEAK

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT DQPSK low ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

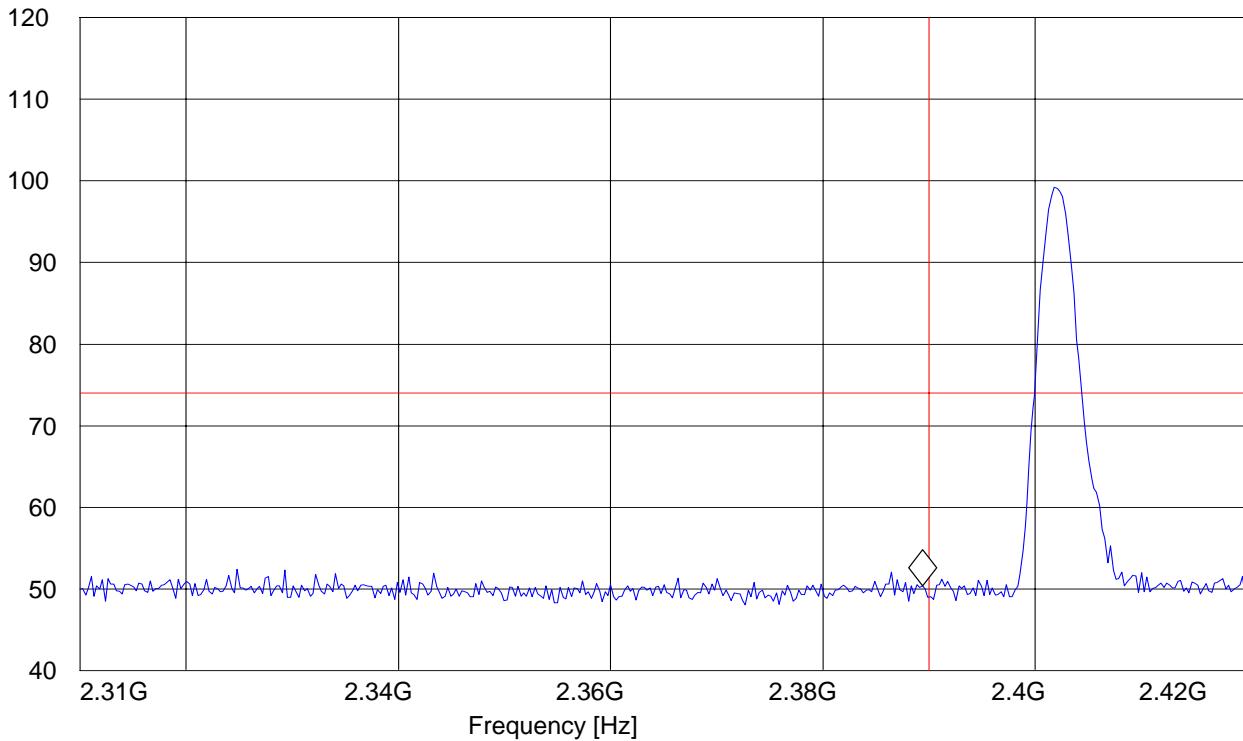
Comments: Base only

SWEEP TABLE: "FCC15.247 LBE_PK"

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

Marker: 2.389358717 GHz 50.41 dB μ V/m

Level [dB μ V/m]



Pi/4 DQPSK (2402MHz) AVG

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT DQPSK low ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

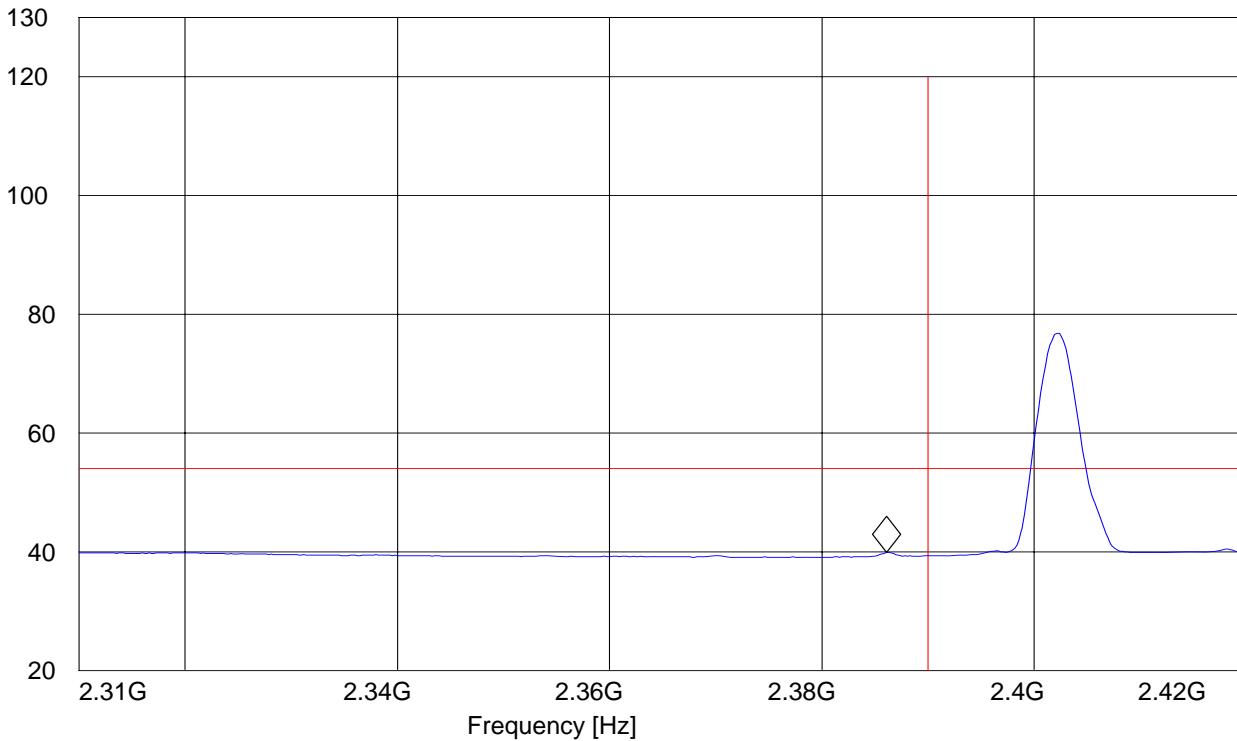
Comments: Base only

SWEEP TABLE: "FCC15.247 LBE_AVG"

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

Marker: 2.386052104 GHz 39.9 dB μ V/m

Level [dB μ V/m]



8DPSK (2402MHz) PEAK

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK low ch

ANT Orientation: H

EUT Orientation: H

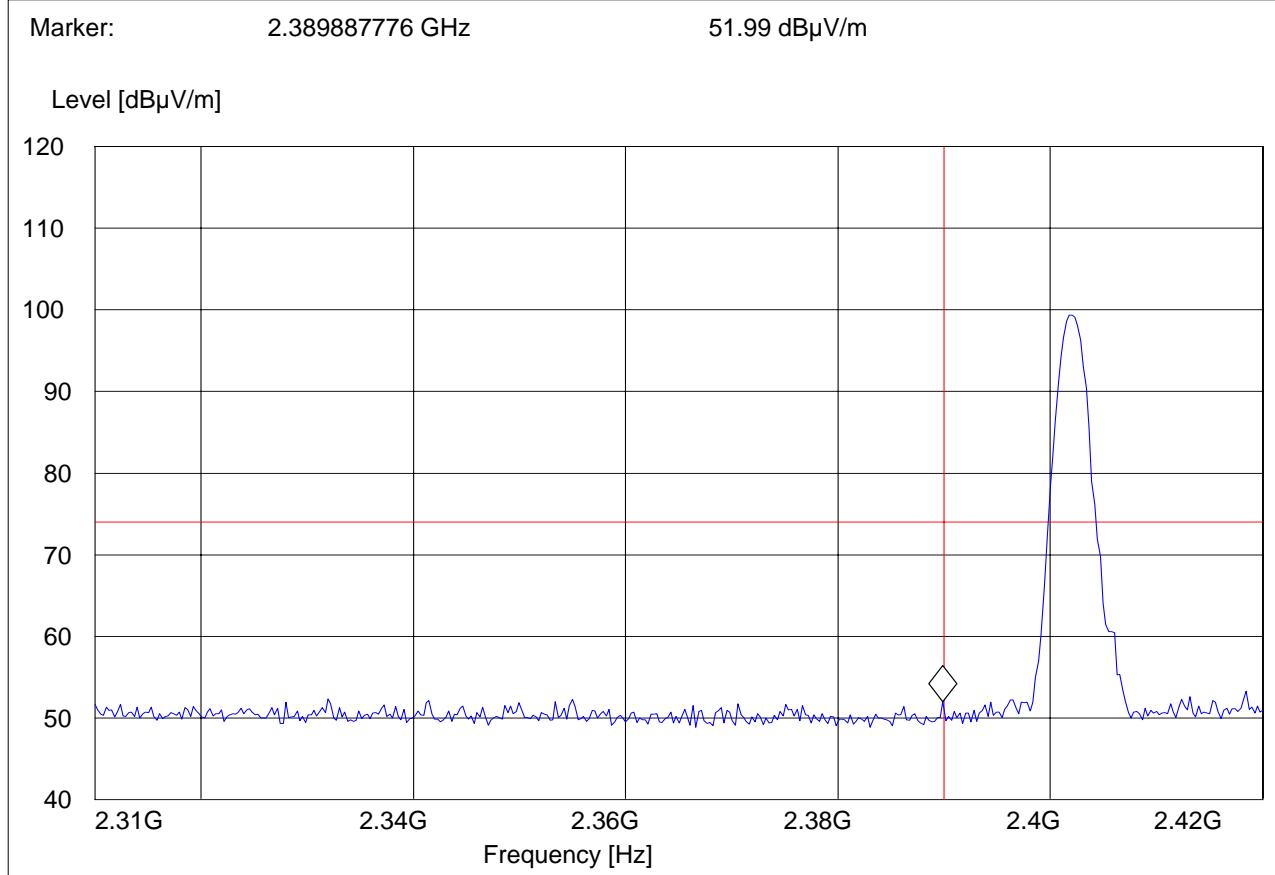
Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

SWEEP TABLE: "FCC15.247 LBE_PK"

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



8DPSK (2402MHz) AVG

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK low ch

ANT Orientation: H

EUT Orientation: H

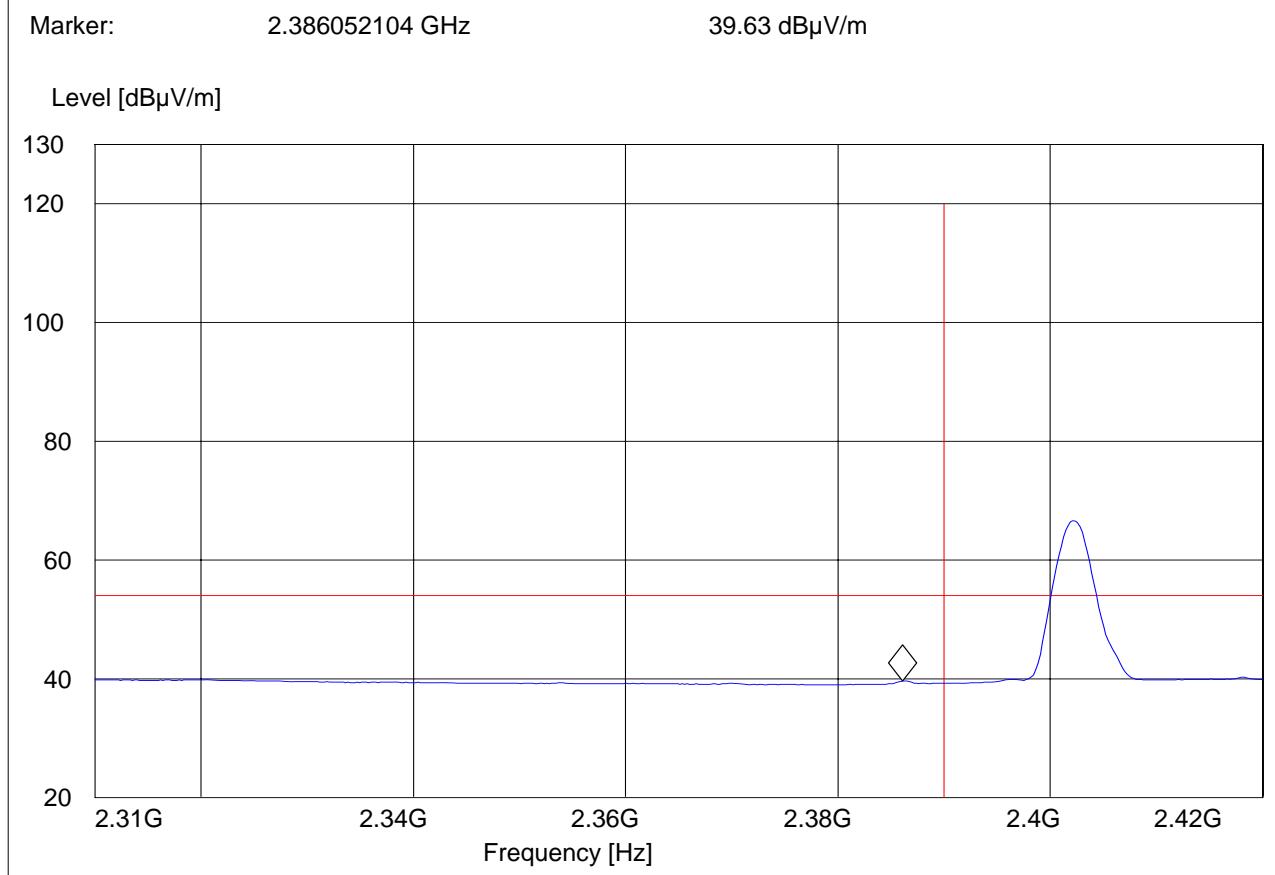
Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

SWEEP TABLE: "FCC15.247 LBE_AVG"

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



5.2.3 Results Upper Restricted Band 2483.5 MHz to 2500 MHz

GFSK (2480MHz) PEAK

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT GFSK high ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

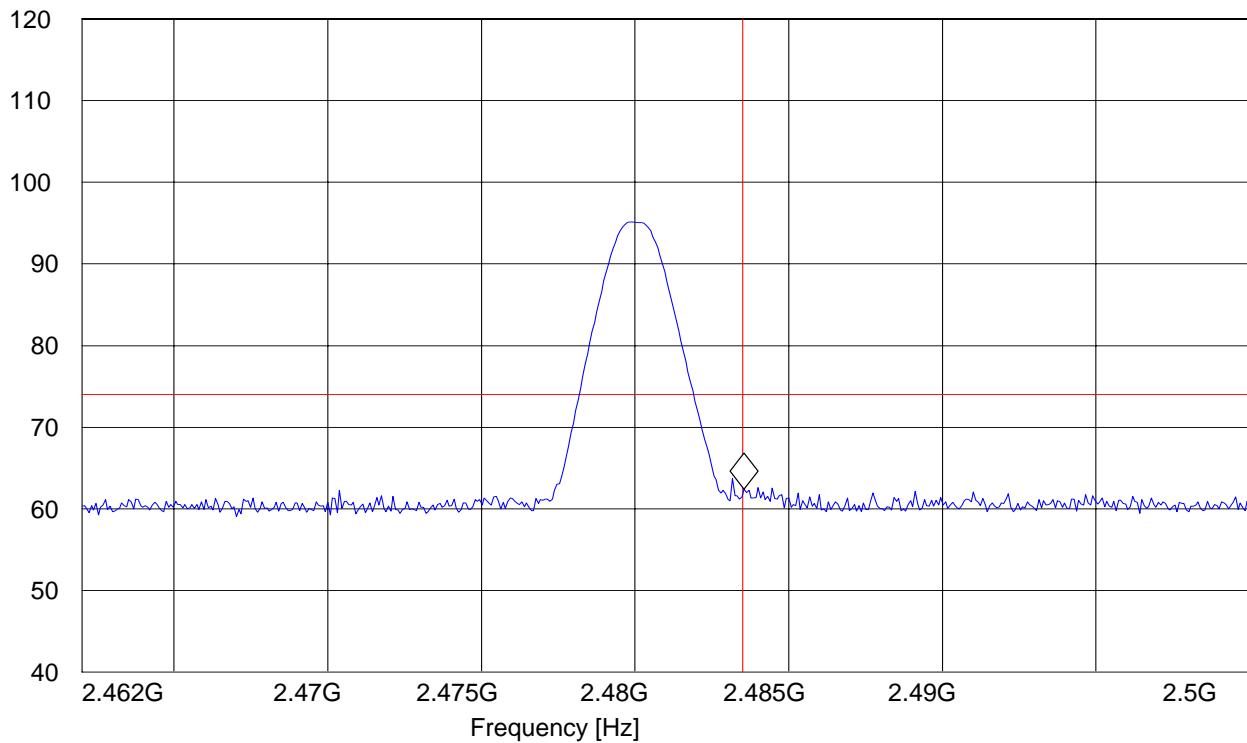
Comments: Base only

SWEEP TABLE: "FCC15.247 HBE_PK"

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

Marker: 2.483551102 GHz 62.37 dB μ V/m

Level [dB μ V/m]



GFSK (2480MHz) AVG

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT GFSK high ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

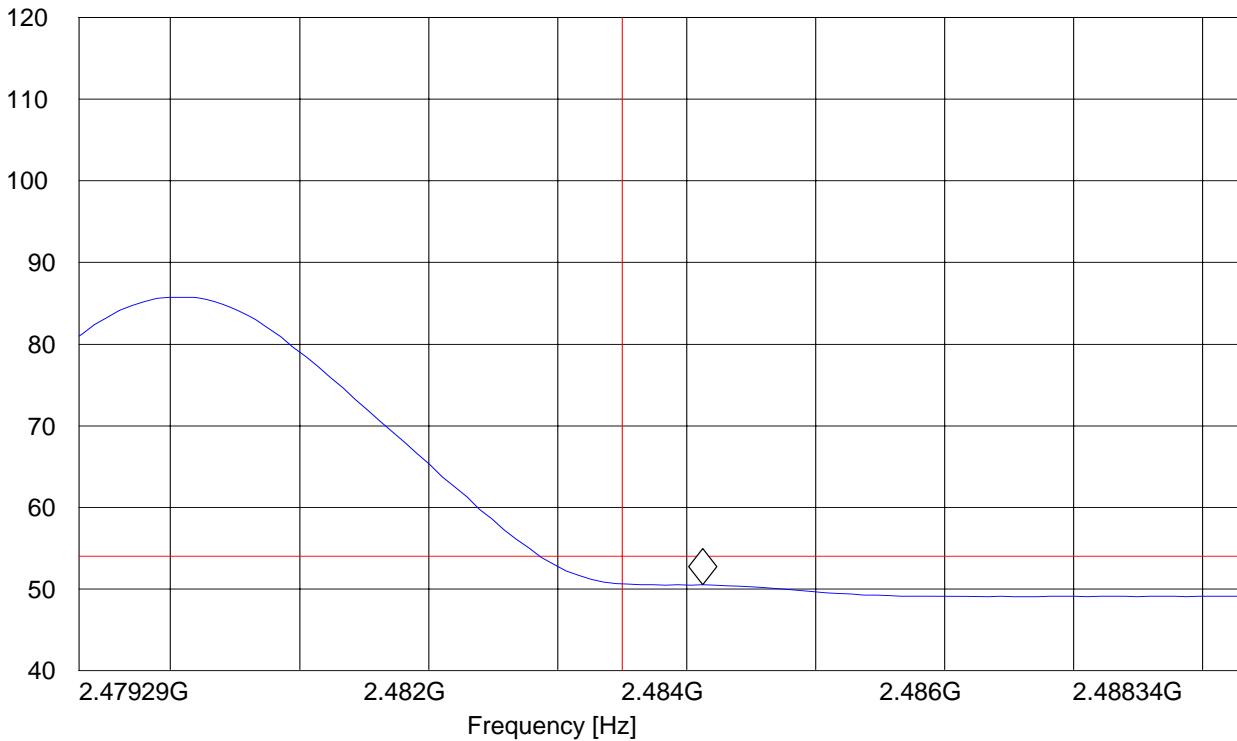
Comments: Base only

SWEEP TABLE: "FCC15.247 HBE_AVG"

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

Marker: 2.484124248 GHz 50.5 dB μ V/m

Level [dB μ V/m]



Pi/4 DQPSK (2480MHz) PEAK

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: HHP 4820

Customer: Hand Held Products, Inc.

Test Mode: BT DQPSK high ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

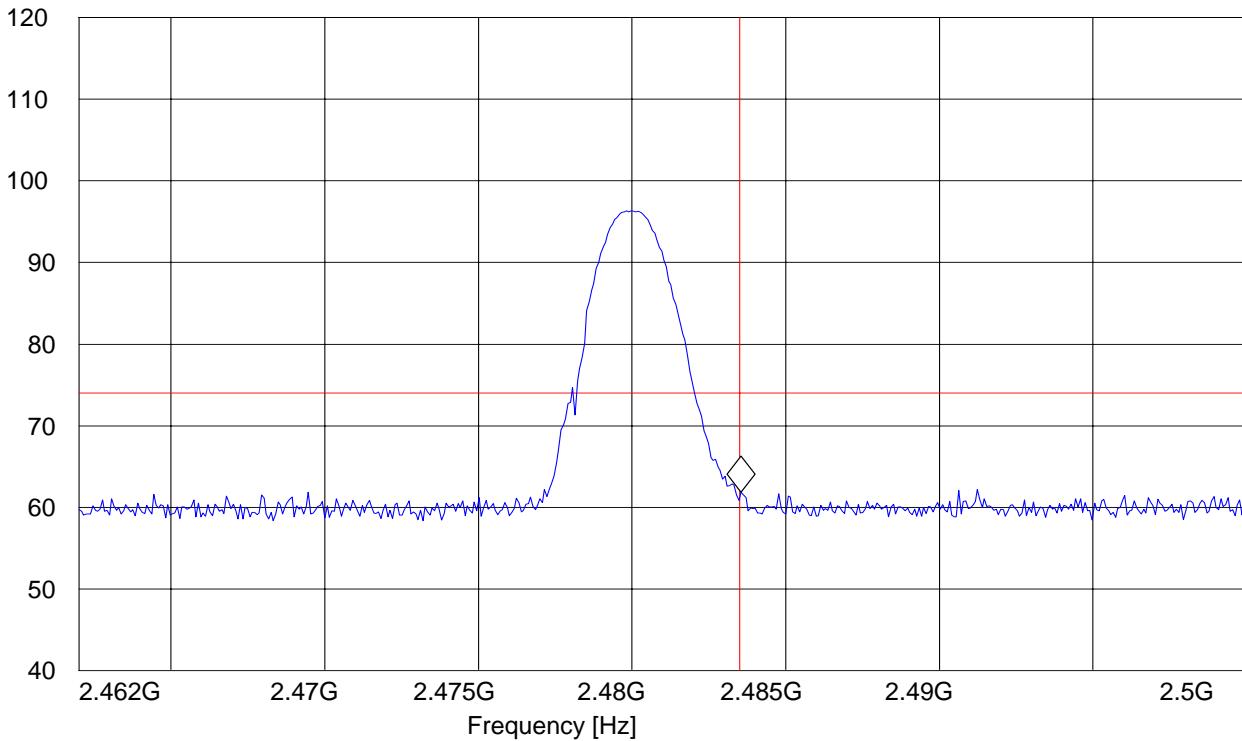
Comments: Base only

SWEEP TABLE: "FCC15.247 HBE_PK"

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

Marker: 2.483551102 GHz 61.86 dB μ V/m

Level [dB μ V/m]



Pi/4 DQPSK (2480MHz) AVG

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT DQPSK high ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

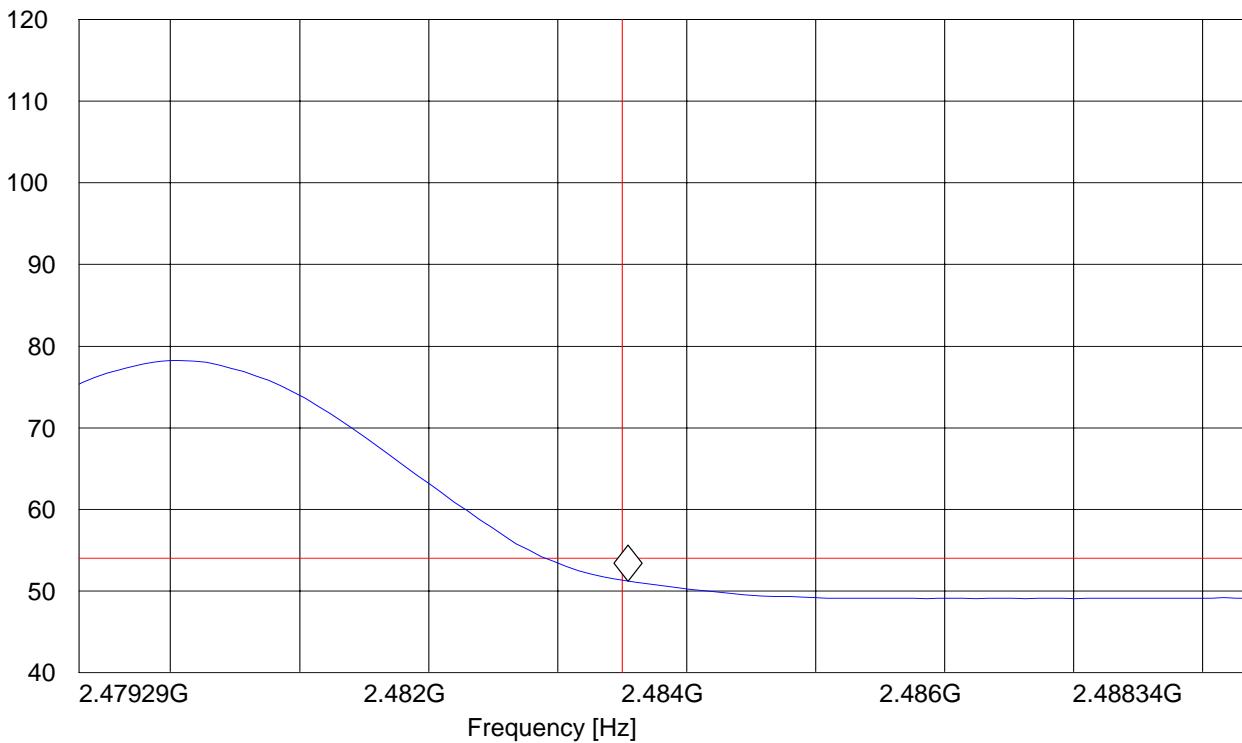
Comments: Base only

SWEEP TABLE: "FCC15.247 HBE_AVG"

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

Marker: 2.483547094 GHz 51.22 dB μ V/m

Level [dB μ V/m]



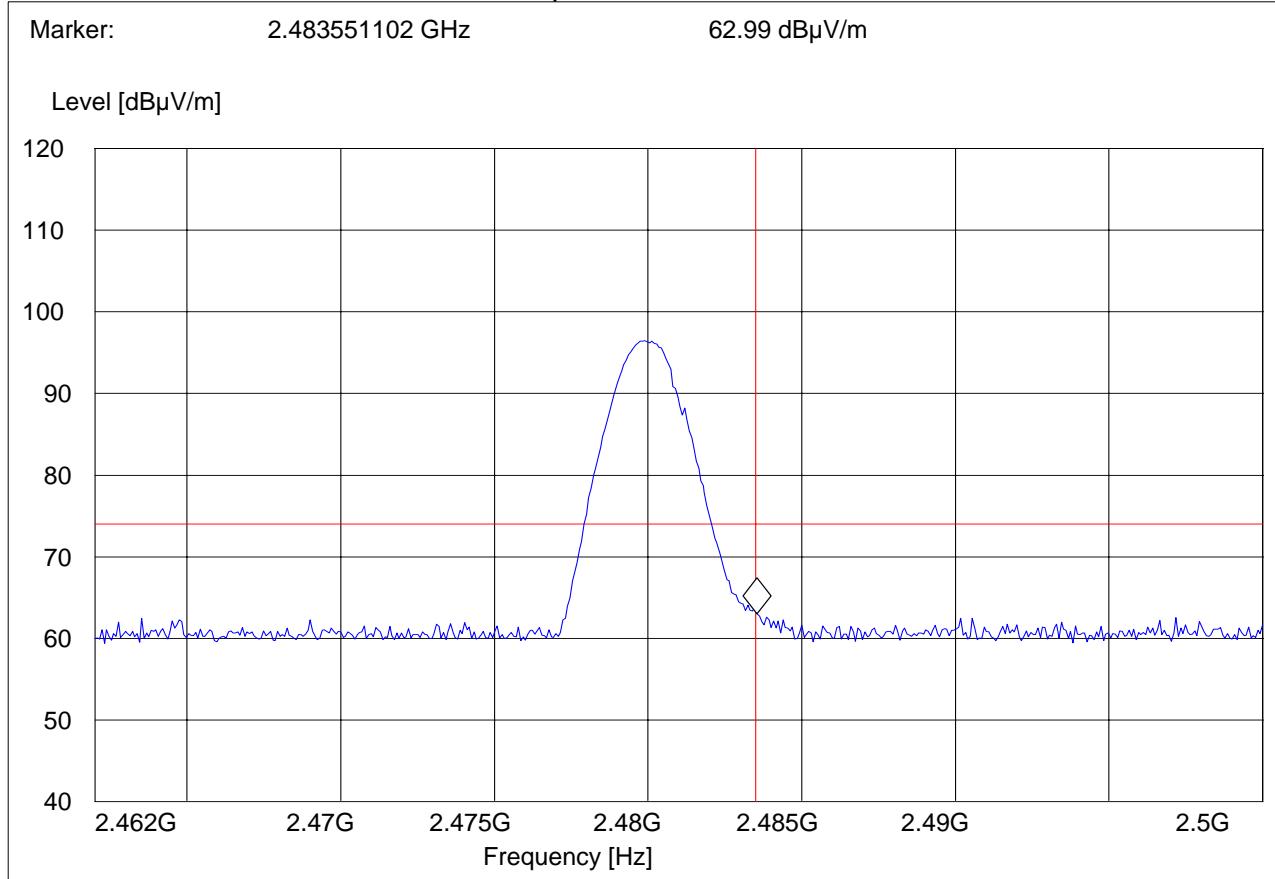
8DPSK (2480MHz) PEAK

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5
Customer: Hand Held Products, Inc.
Test Mode: BT 8DPSK High ch
ANT Orientation: H
EUT Orientation: H
Test Engineer: Marc
Voltage: AC Adapter
Comments: Base only

SWEEP TABLE: "FCC15.247 HBE_PK"

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



8DPSK (2480MHz) AVG

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK High ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

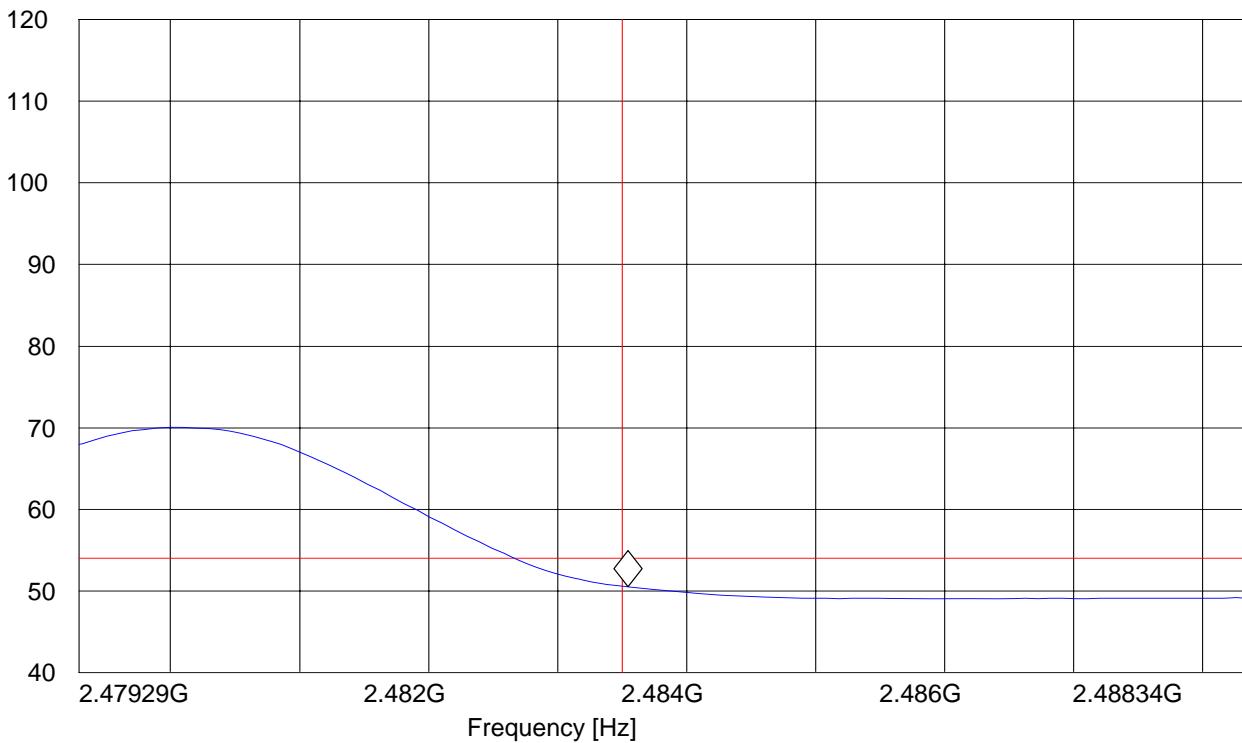
Comments: Base only

SWEEP TABLE: "FCC15.247 HBE_AVG"

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

Marker: 2.483547094 GHz 50.52 dB μ V/m

Level [dB μ V/m]



5.3 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.247/15.205/15.209

5.3.1 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			

Notes:

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.
3. Radiated emissions are maximized by rotating the EUT 360° at 0.5 meter height increments between 1 and 4 meters.
4. Measurements were performed with the EUT in X, Y and Z orientations with the measurement antenna in both horizontal and vertical polarity. The plots below show the results of the worst case orientation and polarity

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

5.3.2 RESULTS

30MHz – 1GHz Antenna: vertical

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

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT, CH 39

ANT Orientation: V

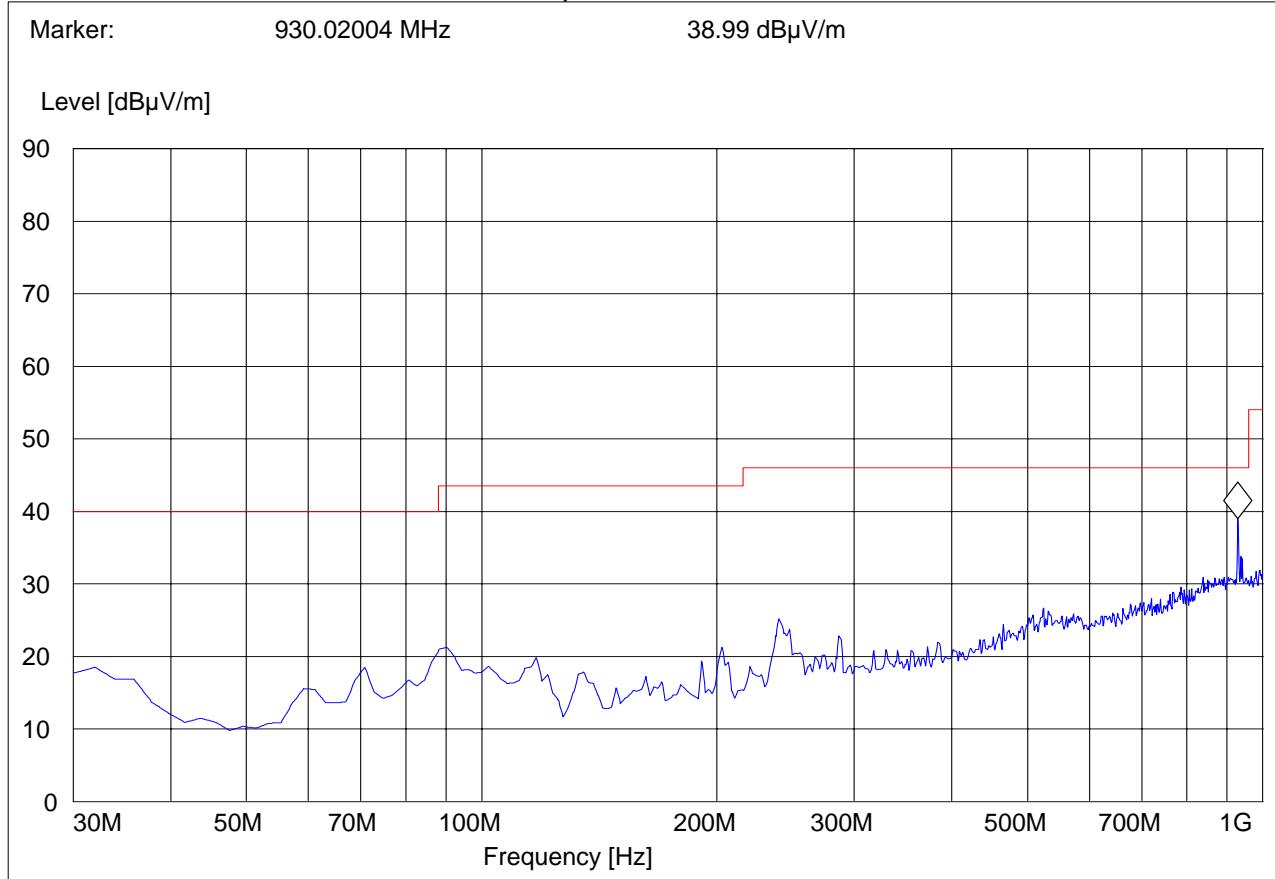
EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

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

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



30MHz – 1GHz

Antenna: horizontal

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

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT, CH 78

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

SWEEP TABLE: "FCC15.247 30M-1G Hor"

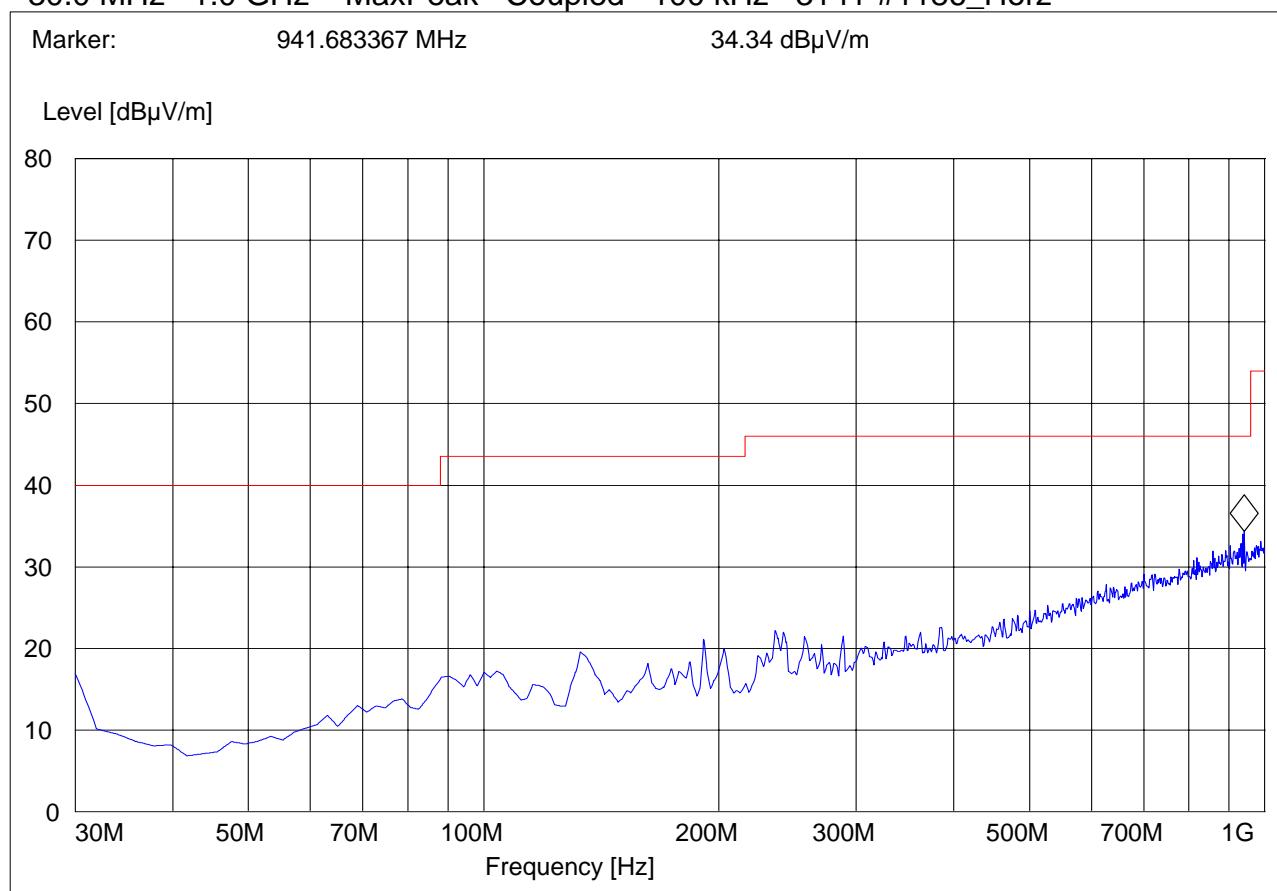
Start Stop Detector Meas. IF Transducer

Start Stop Detector Meas. Δ Time Bandw.

Frequency, Frequency, Time, Bandwidth
30.0 MHz 1.0 GHz MaxPeak Coupled 100 kHz 3141-#1186 Horz

Marker: 941.683367 MHz

Local [dR₁]/V/m³



1-3GHz (2402MHz)

Note: Peak Reading vs. Average limit. The peak above the limit line is the carrier freq.

Note: This plot is valid for Horizontal and Vertical Ant. polarization (worst-case plot)

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK ch.0

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

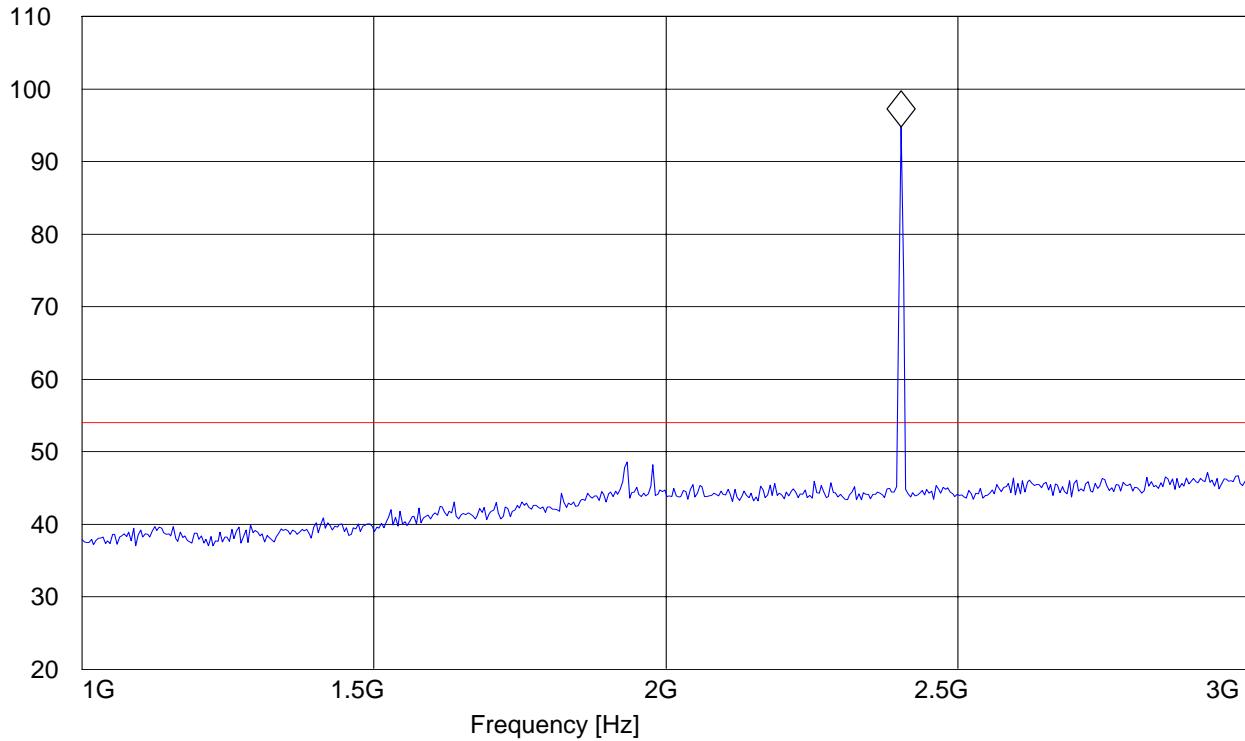
Comments: Base only, marker on Tx. ch 0

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

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

Marker: 2.402805611 GHz 94.8 dB μ V/m

Level [dB μ V/m]



1-3GHz (2441MHz)

Note: Peak Reading vs. Average limit. The peak above the limit line is the carrier freq.

Note: This plot is valid for Horizontal and Vertical Ant. polarization (worst-case plot)

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK ch.39

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

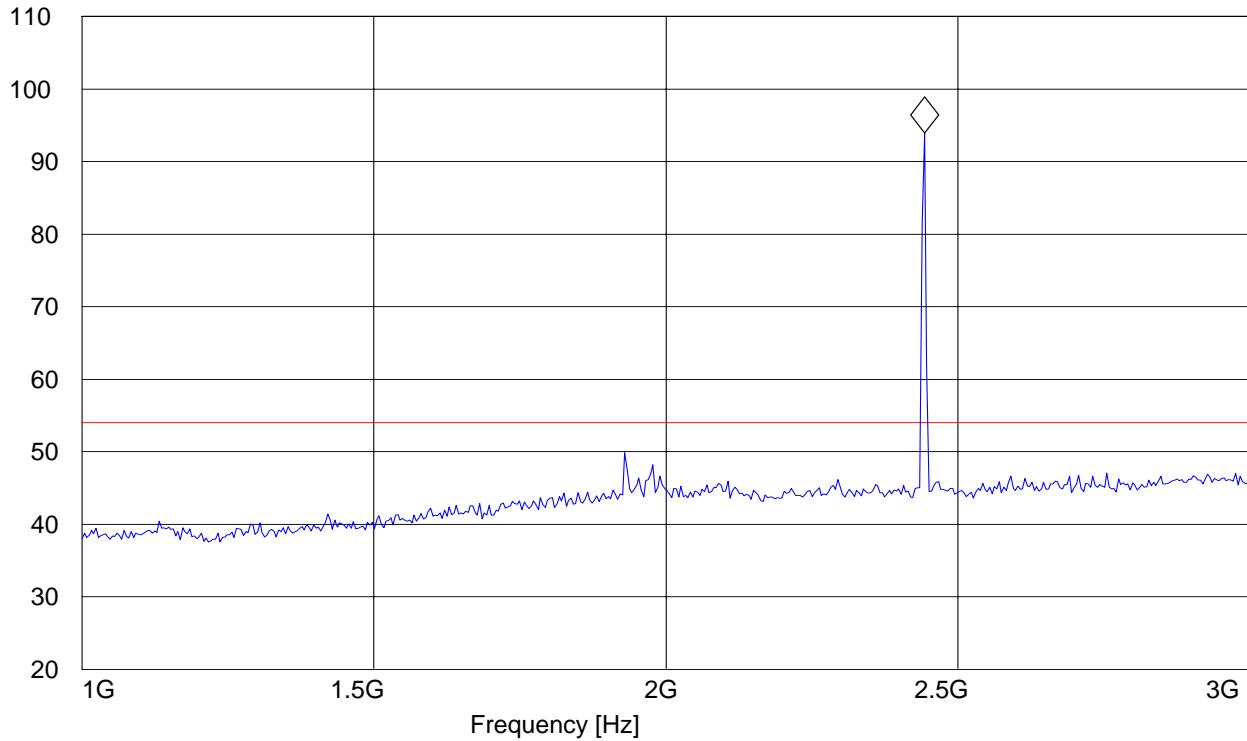
Comments: Base only, marker on Tx. ch39

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

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

Marker: 2.442885772 GHz 93.91 dB μ V/m

Level [dB μ V/m]



1-3GHz (2480MHz)

Note: Peak Reading vs. Average limit. The peak above the limit line is the carrier freq.

Note: This plot is valid for Horizontal and Vertical Ant. polarization (worst-case plot)

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK High ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

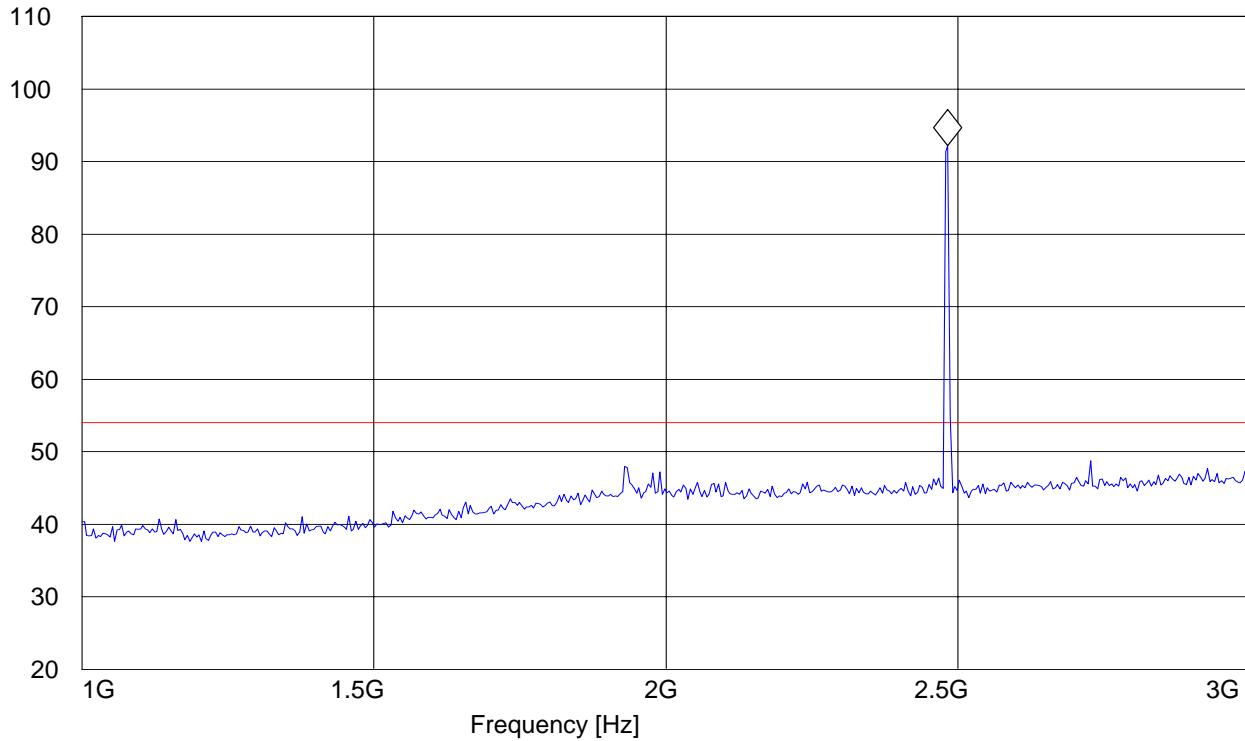
Comments: Base only, Marker on Tx ch.78

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

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

Marker: 2.482965932 GHz 92.2 dB μ V/m

Level [dB μ V/m]



3-18GHz (2402MHz)

Note: Peak Reading vs. Average limit

Note: This plot is valid for Horizontal and Vertical Ant. polarization (worst-case plot)

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK ch.0

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

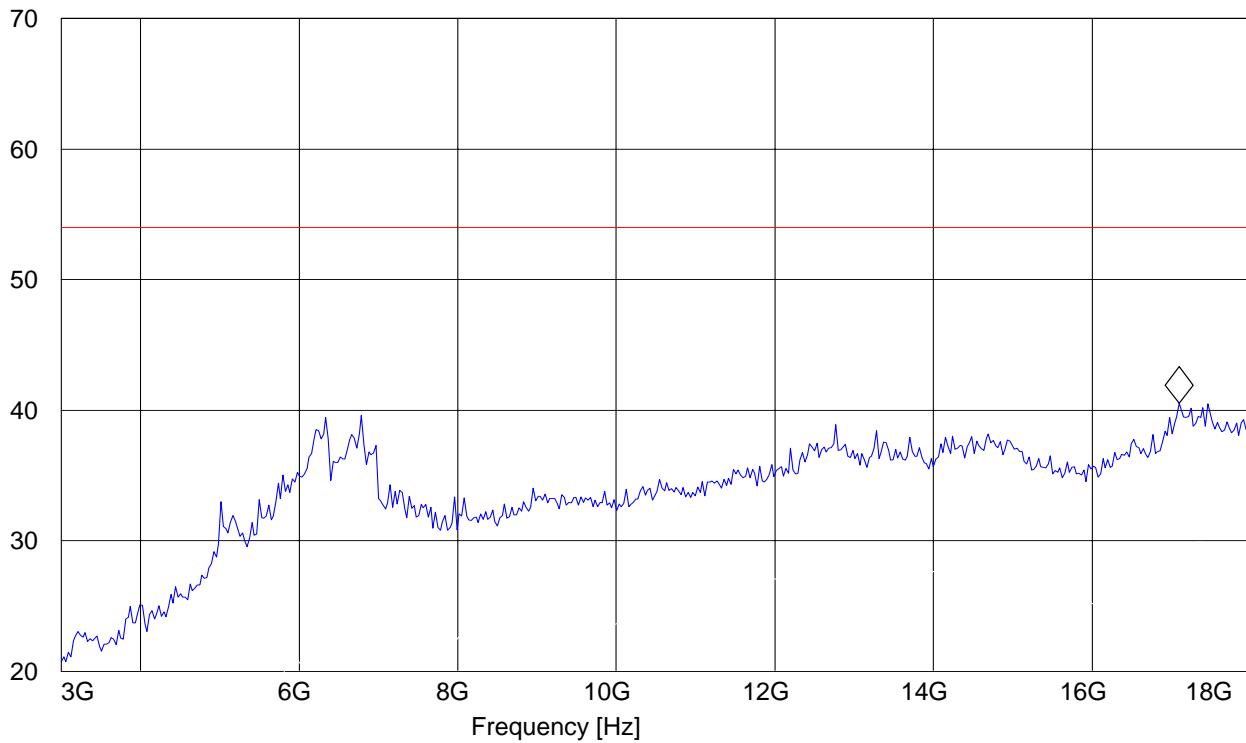
Comments: Base only

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

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

Marker: 17.098196393 GHz 40.52 dB μ V/m

Level [dB μ V/m]



3-18GHz (2441MHz)

Note: Peak Reading vs. Average limit

Note: This plot is valid for Horizontal and Vertical Ant. polarization (worst-case plot)

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK ch.39

ANT Orientation: H

EUT Orientation: H

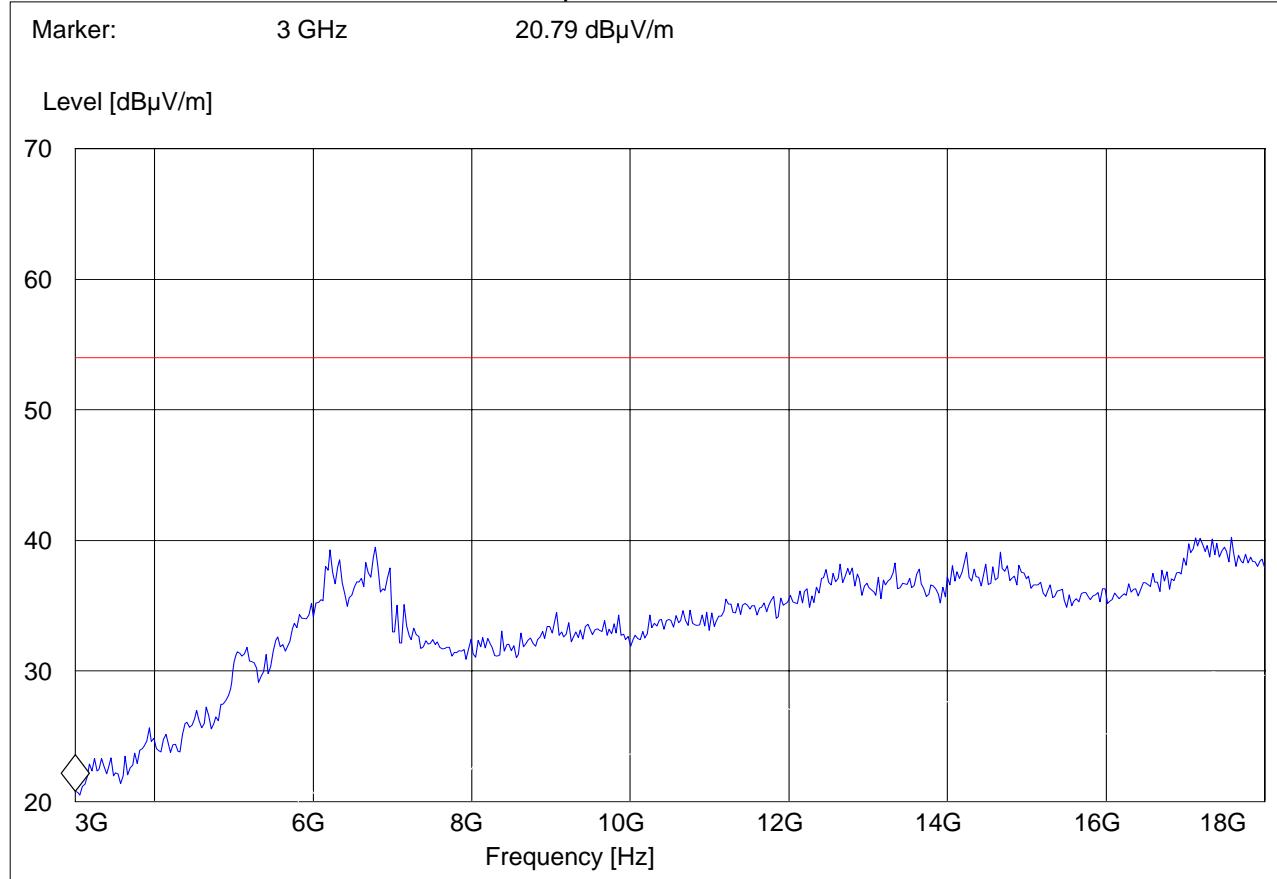
Test Engineer: Marc

Voltage: AC Adapter

Comments: Base only

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

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



3-18GHz (2441MHz)

Note: Peak Reading vs. Average limit

Note: This plot is valid for Horizontal and Vertical Ant. polarization (worst-case plot)

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK High ch

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

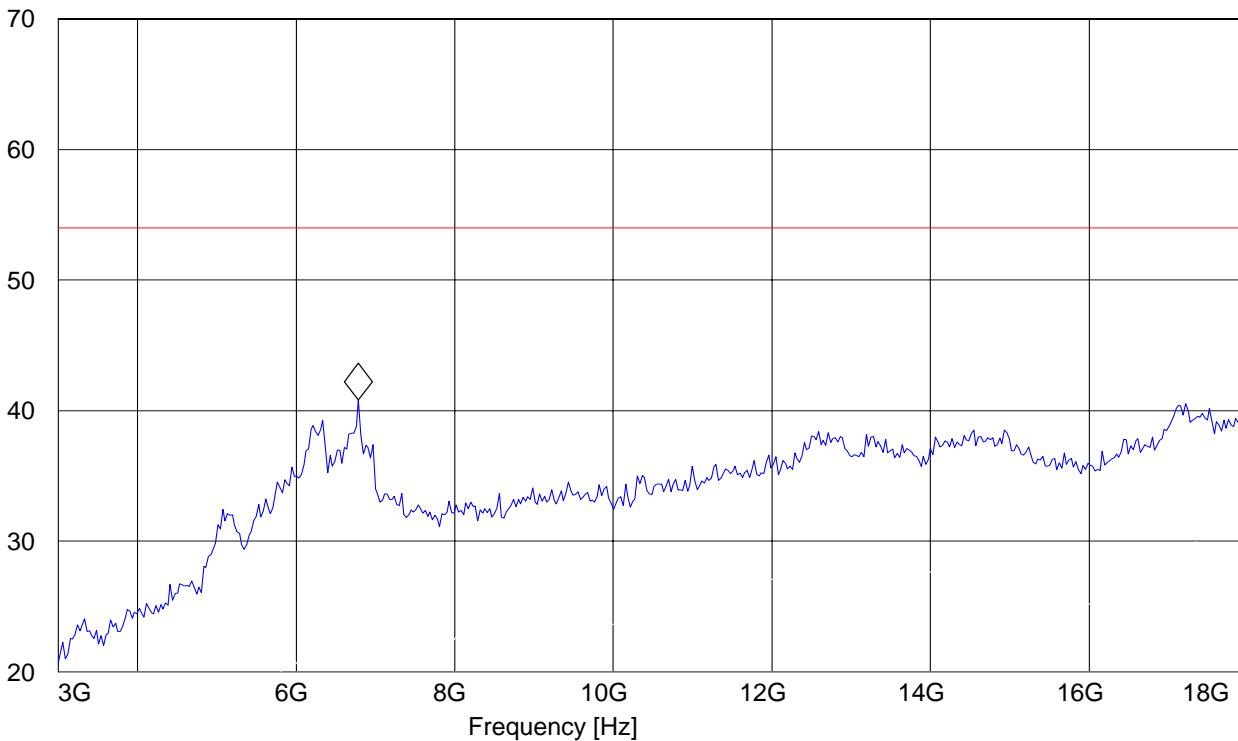
Comments: Base only

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

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

Marker: 6.78757515 GHz 40.83 dB μ V/m

Level [dB μ V/m]



18-25GHz

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

Note: Peak Reading vs. Average limit

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT 8DPSK ch.39

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

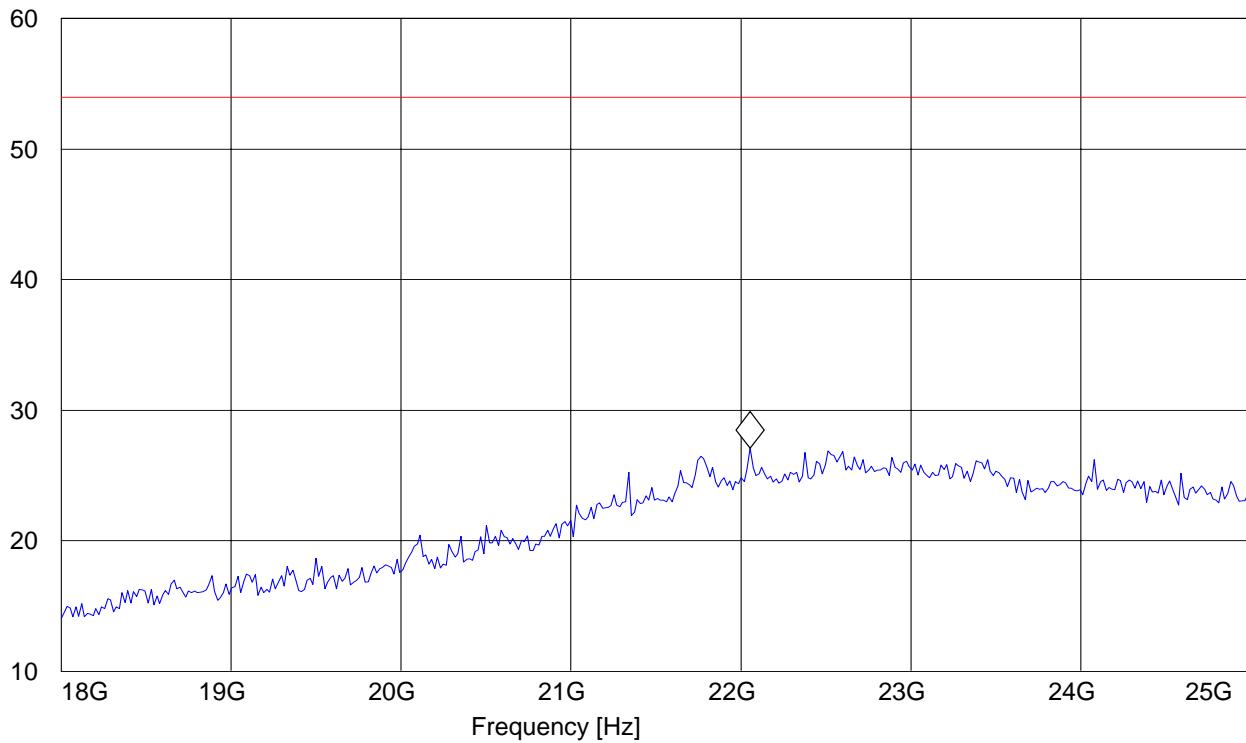
Comments: Base only

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

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
18.0 GHz	26.5 GHz	MaxPeak	Coupled	1 MHz	#572 horn AF

Marker: 22.054108216 GHz 27.12 dB μ V/m

Level [dB μ V/m]



5.4 RECEIVER SPURIOUS EMISSIONS

Limits RSS-GEN (4.10) & (6):

Frequency (MHz)	Field strength (dB μ V/m)
30 - 88	40.00
88 - 216	43.52
216 - 960	46.02
above 960	53.97

Limits are based on a 3 meter distance

Note 1: Per FCC 15.101(b) receiver emissions are only required if the device operates between 30 – 960 MHz. Since the radio operated at 2.4GHz and 5GHz the receiver is exempt from FCC testing. But, receiver emissions are required by RSS-GEN (4.10) for all types of radios no matter where it operates.

Note 2: Per RSS-GEN (4.10) peak measurements above 1GHz are taken with a RBW=VBW= 1MHz and average measurements above 1GHz with a RBW=1MHz, VBW=10Hz or an average detector

30MHz – 1GHz

Antenna: horizontal

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT, Rx MODE

ANT Orientation: H

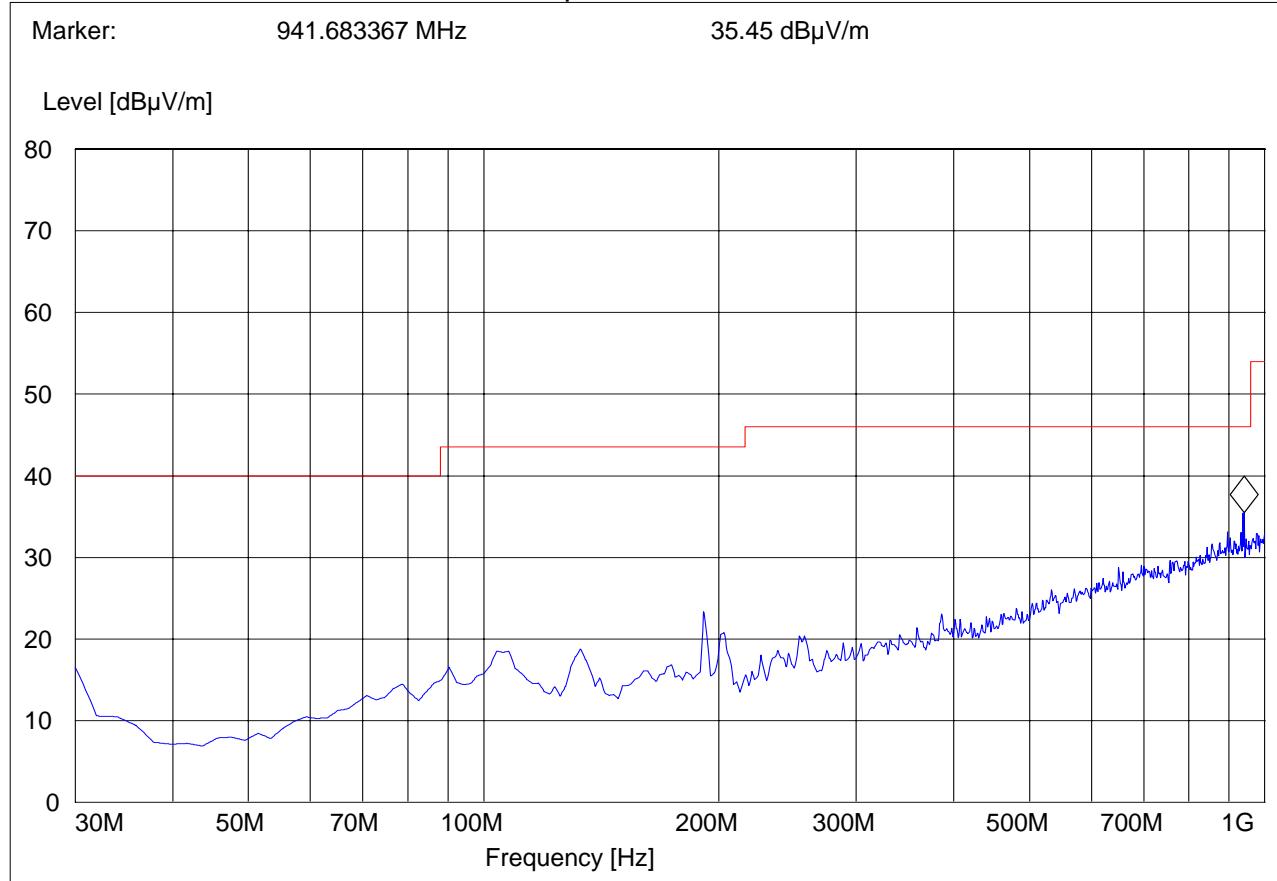
EUT Orientation: H

Test Engineer: Marc

Voltage: AC Adapter

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

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



30MHz – 1GHz

Antenna: vertical

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT, Rx MODE

ANT Orientation: v

EUT Orientation: H

Test Engineer: Marc

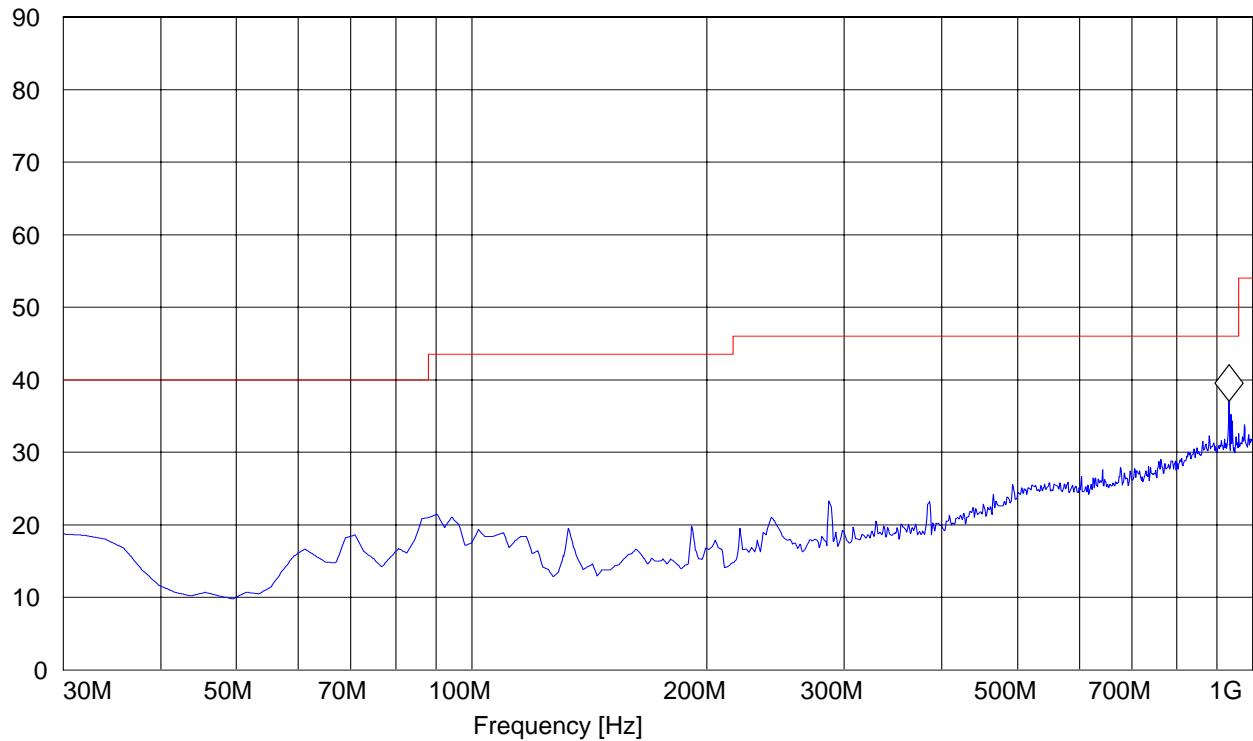
Voltage: AC Adapter

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

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

Marker: 931.963928 MHz 37.04 dB μ V/m

Level [dB μ V/m]



1-3GHz

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

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT, Rx MODE

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

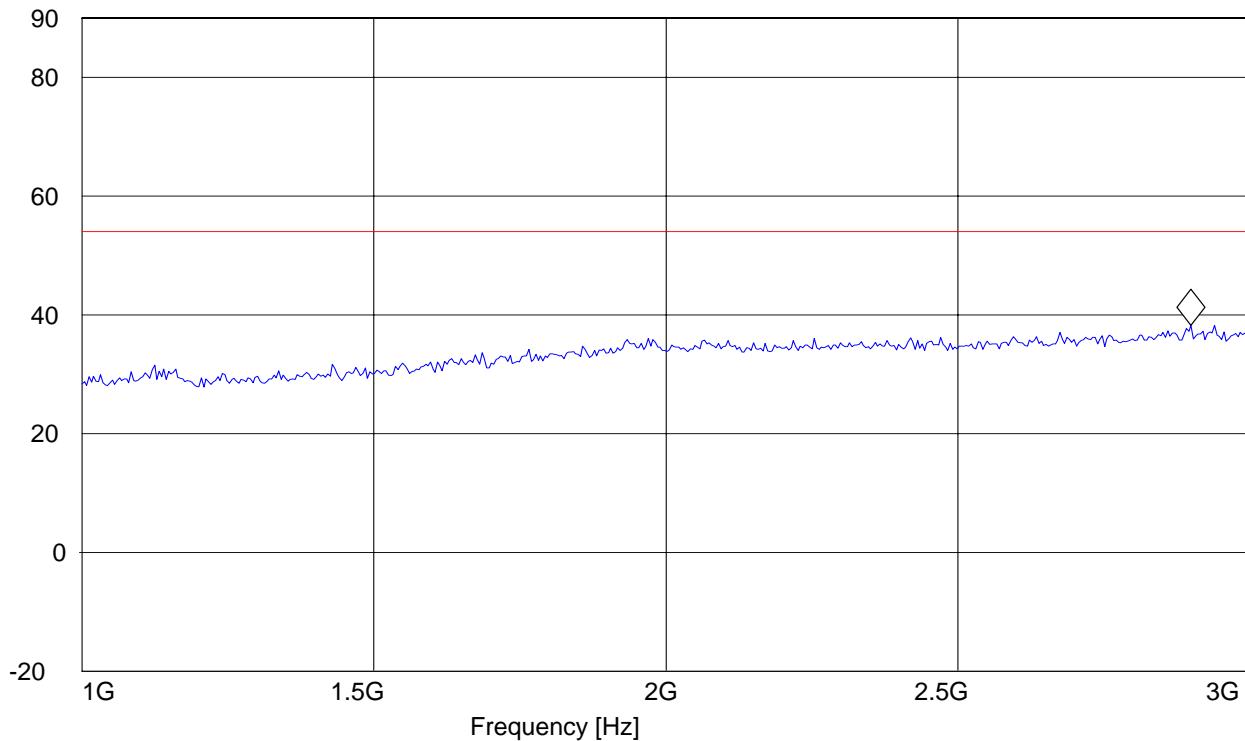
Voltage: AC Adapter

SWEEP TABLE: "CANADA RE_1-3G"

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

Marker: 2.899799599 GHz 38.27 dB μ V/m

Level [dB μ V/m]



3-18GHz

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

411 Dixon Landing Road, Milpitas CA 95035, USA

EUT: 2020-5

Customer: Hand Held Products, Inc.

Test Mode: BT, Rx MODE

ANT Orientation: H

EUT Orientation: H

Test Engineer: Marc

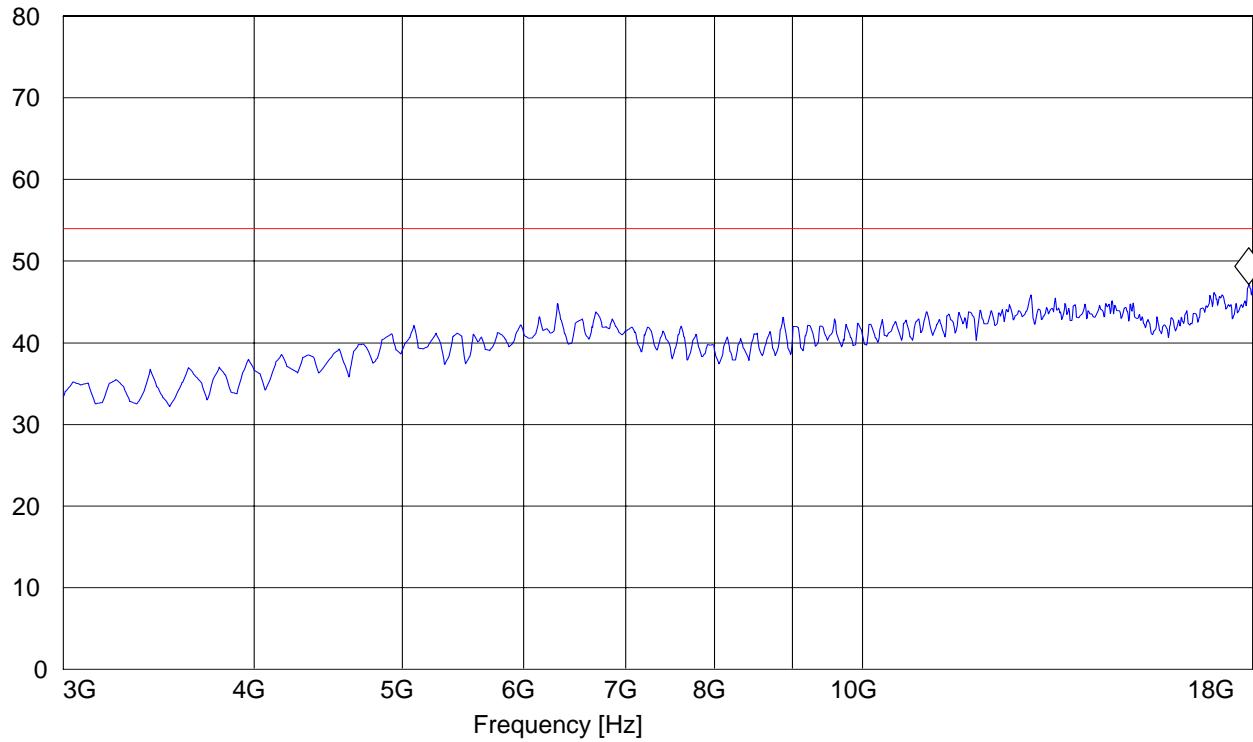
Voltage: AC Adapter

SWEEP TABLE: "CANADA RE_3-18G"

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

Marker: 17.897795591 GHz 47.16 dB μ V/m

Level [dB μ V/m]



6 Measurements (CONDUCTED)

6.1 MAXIMUM PEAK OUTPUT POWER § 15.247 (CONDUCTED)

6.1.1 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.**

Notes:

1. Measurements were performed with a spectrum analyzer.
2. Measurements for all supported modulations (GFSK, Pi/4 DQPSK and 8DPSK) were performed with device controlled via software and connected directly to the spectrum analyzer.

6.1.2 RESULTS:

GFSK

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	0.96	0.76	0.34

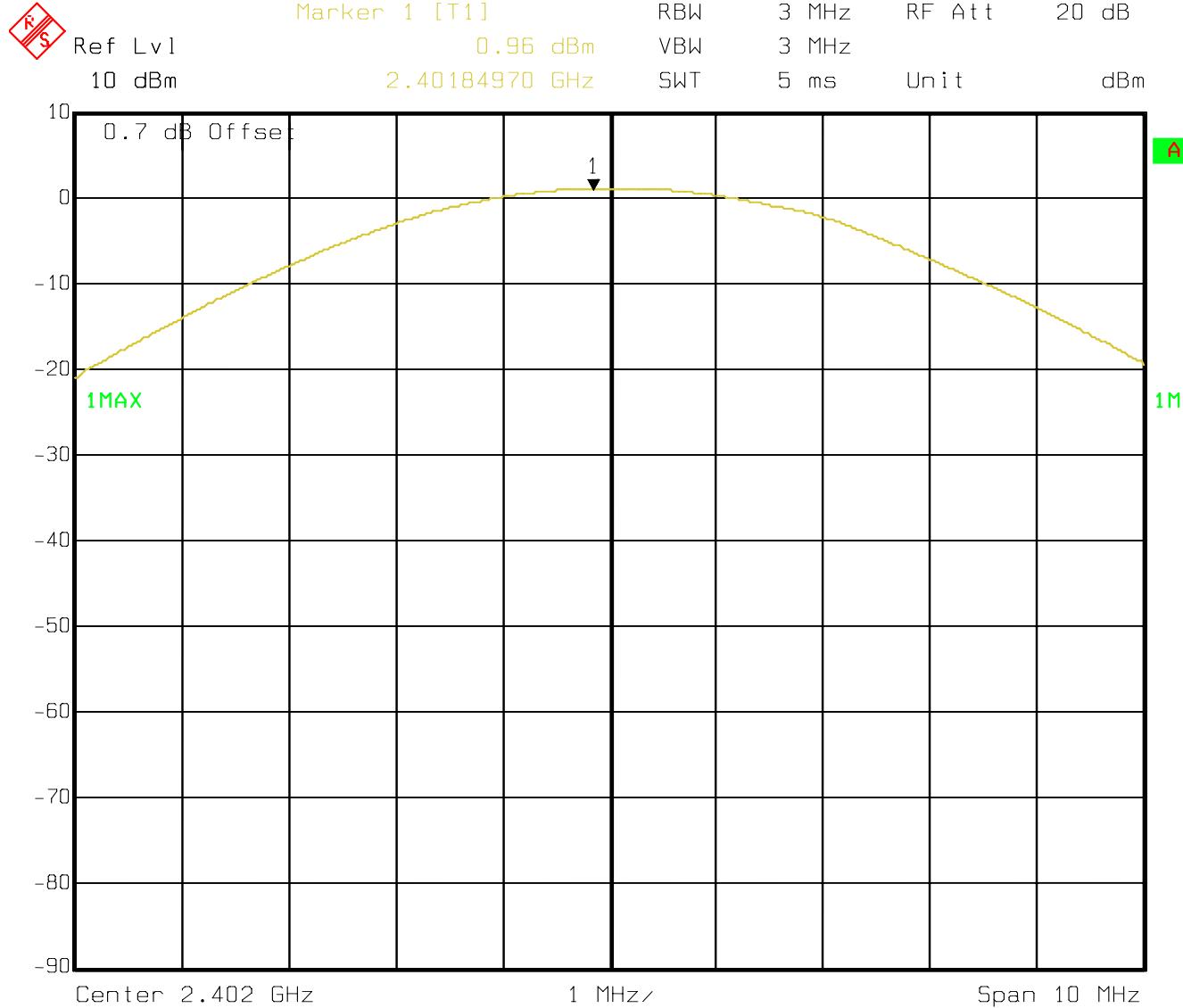
Pi/4 DQPSK

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	2.42	2.31	1.96

8DPSK

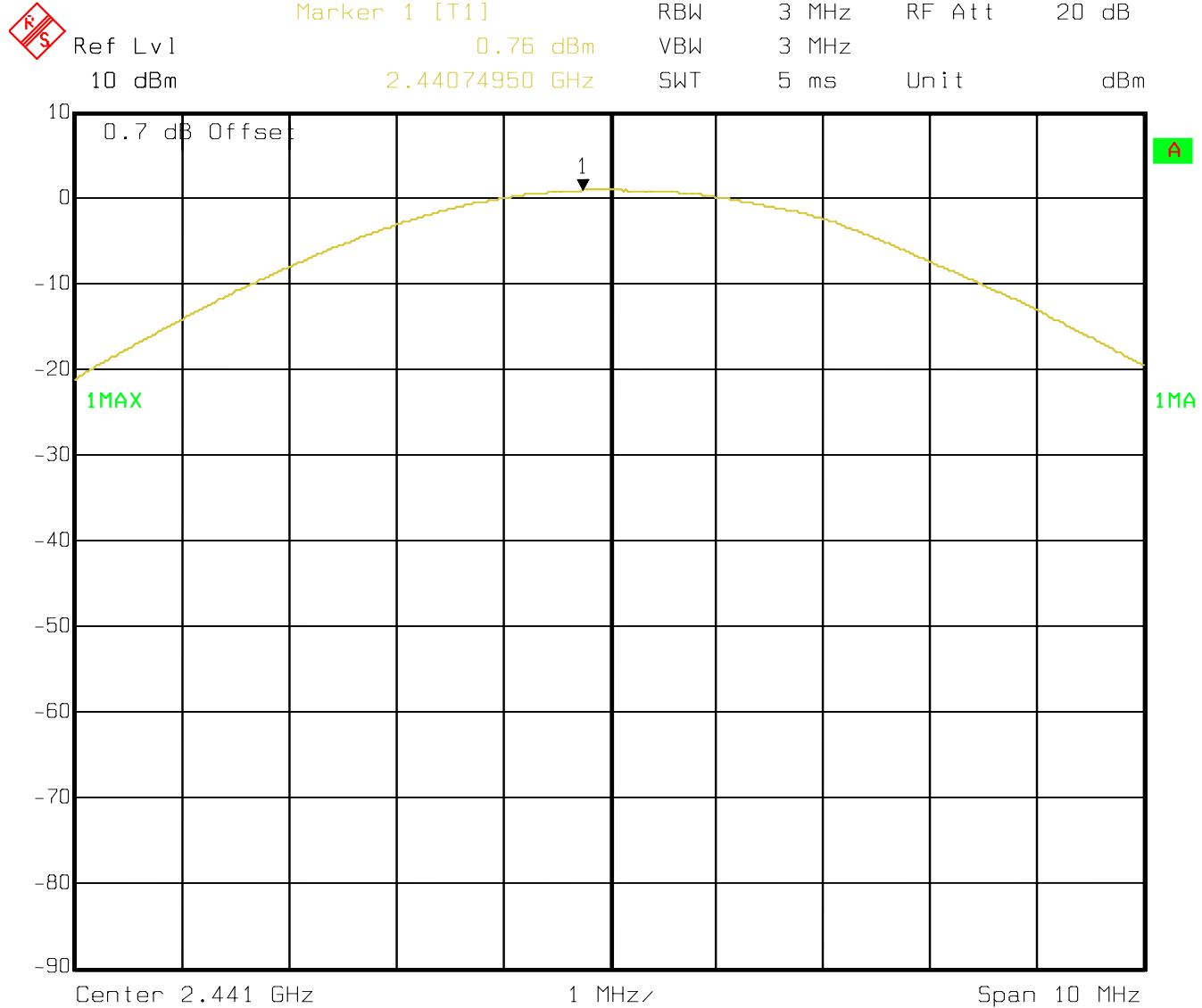
TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	2.79	2.79	2.24

GFSK (2402 MHz)



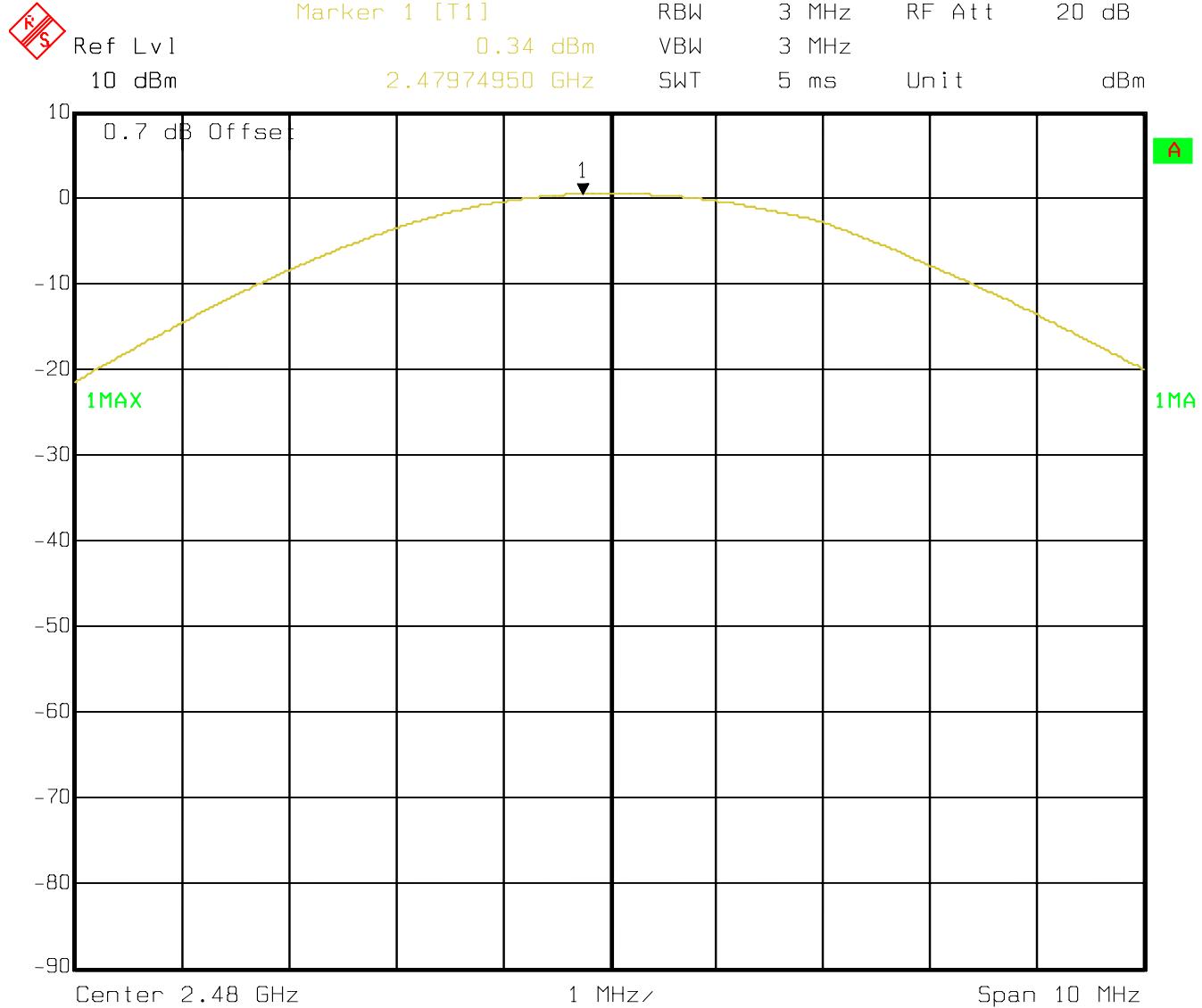
Date: 18.NOV.2007 16:01:44

GFSK (2441 MHz)



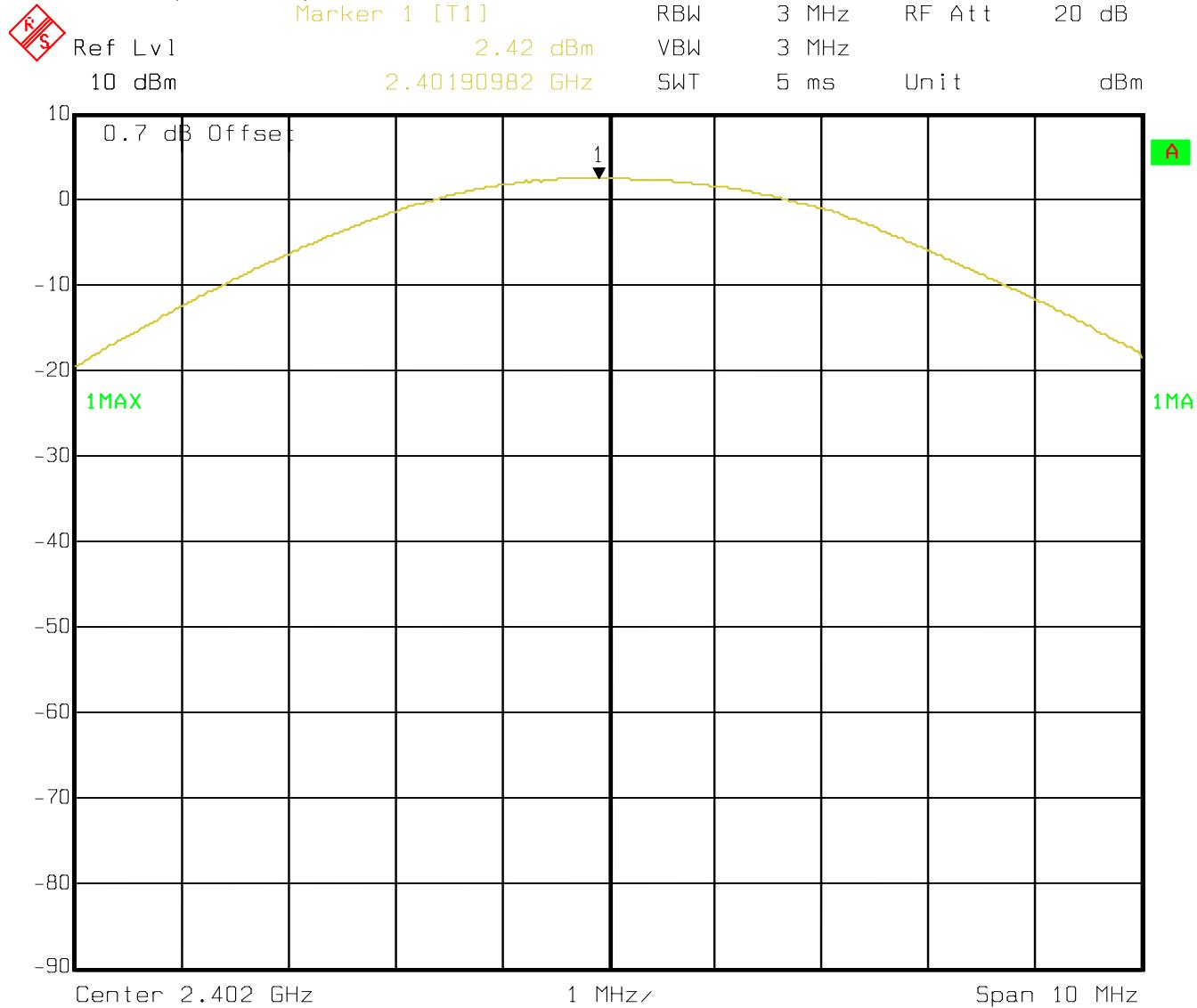
[

GFSK (2480 MHz)



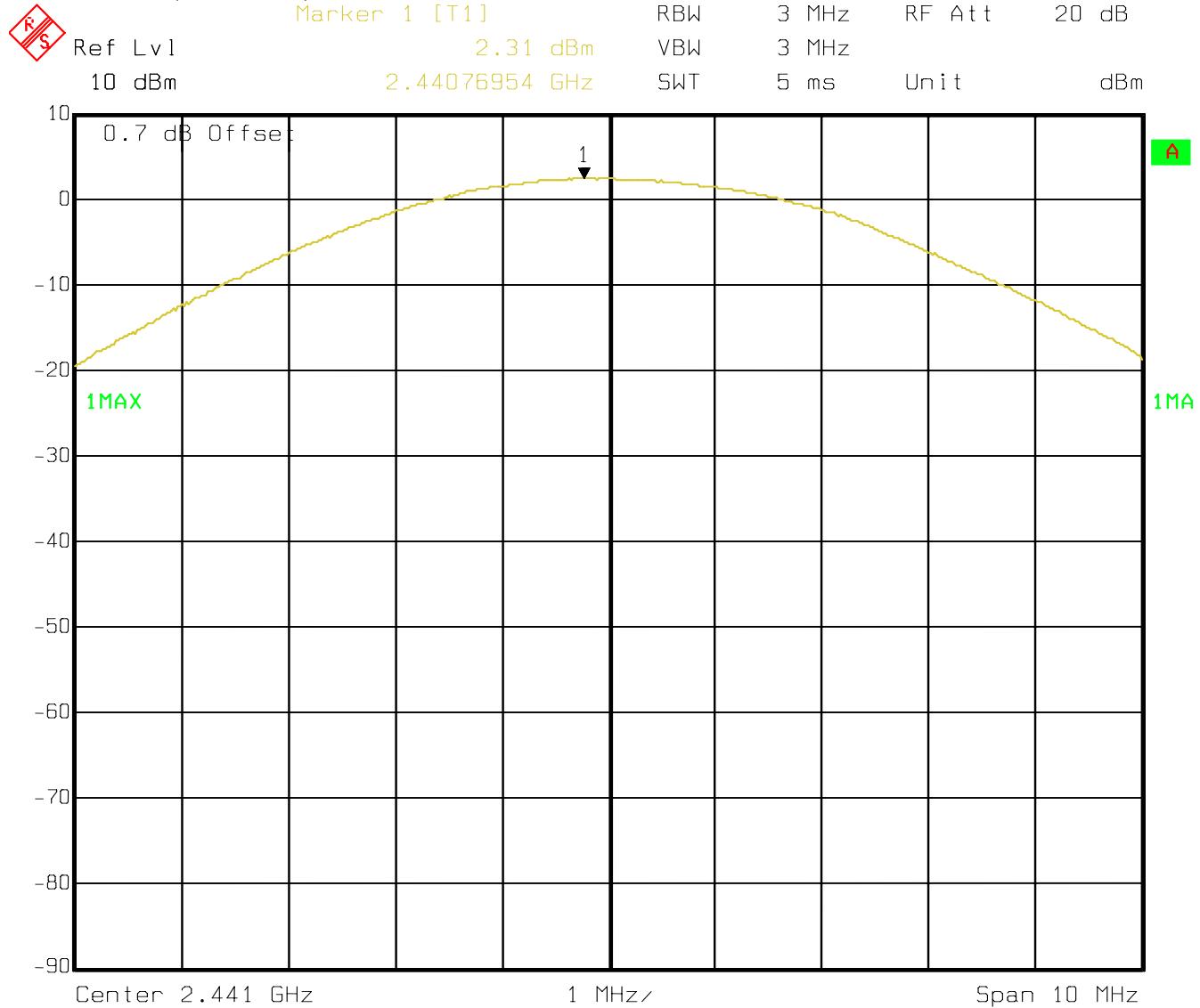
[

Pi/4 DQPSK (2402 MHz)



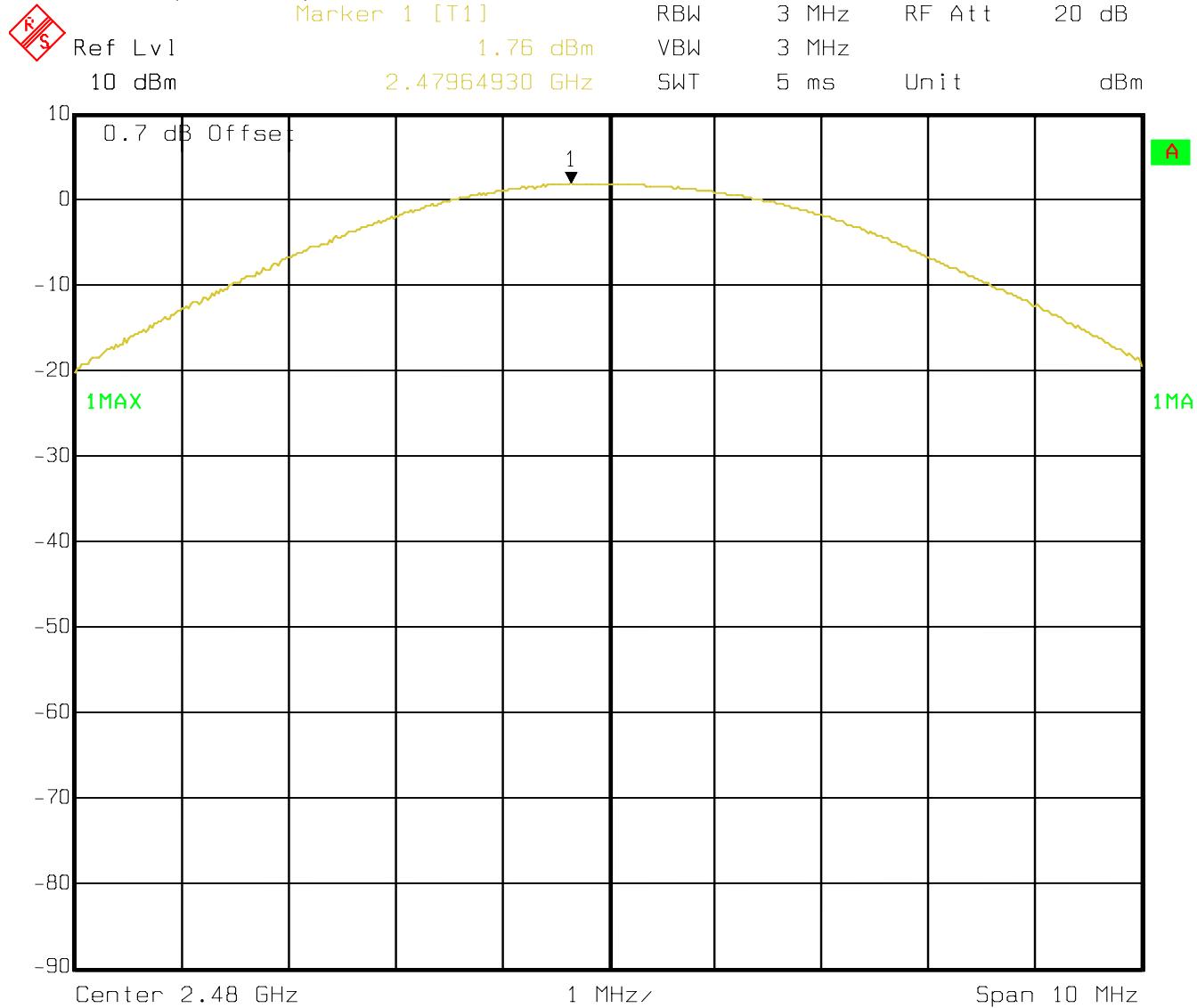
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Pi/4 DQPSK (2441 MHz)



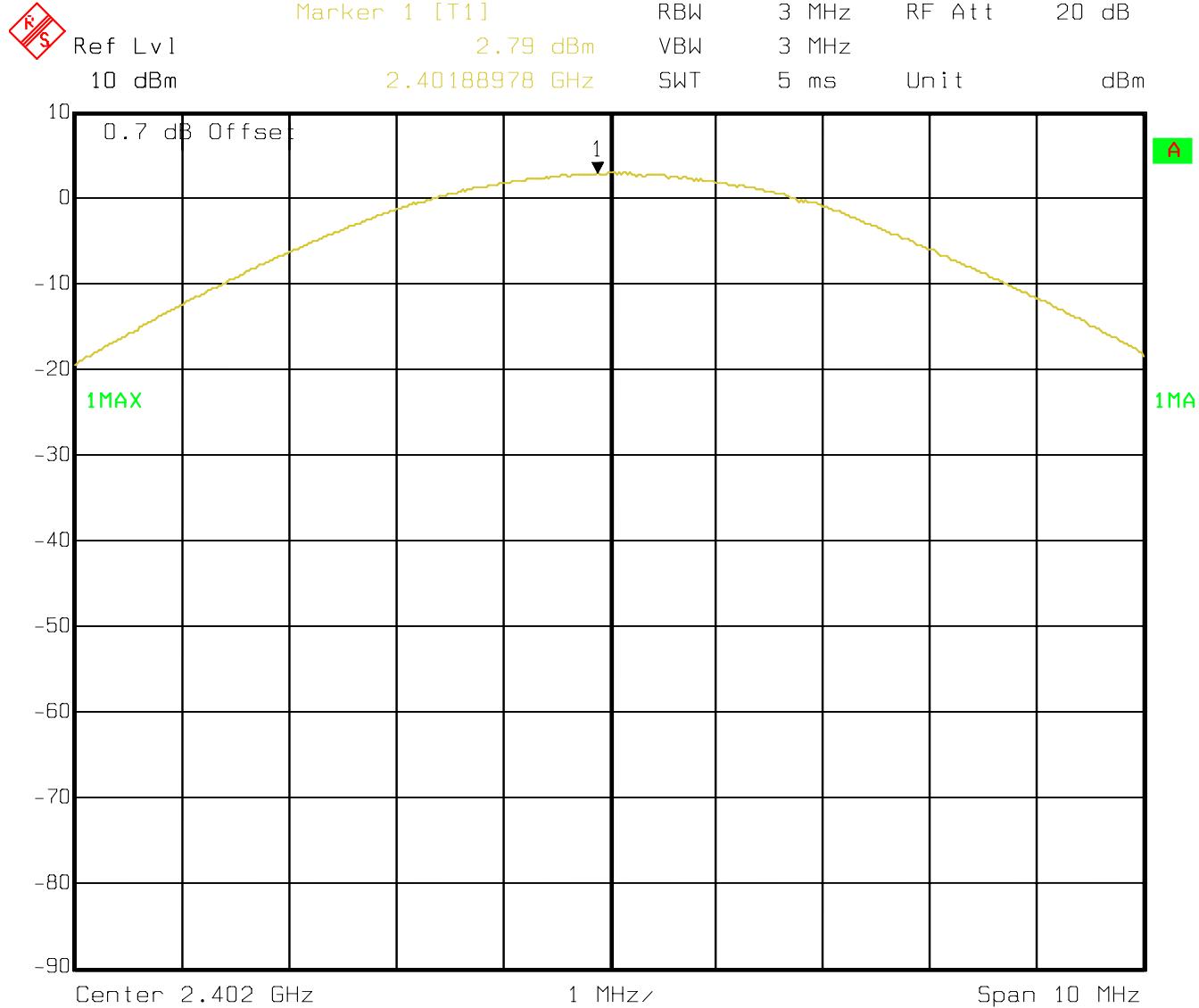
[

Pi/4 DQPSK (2480 MHz)



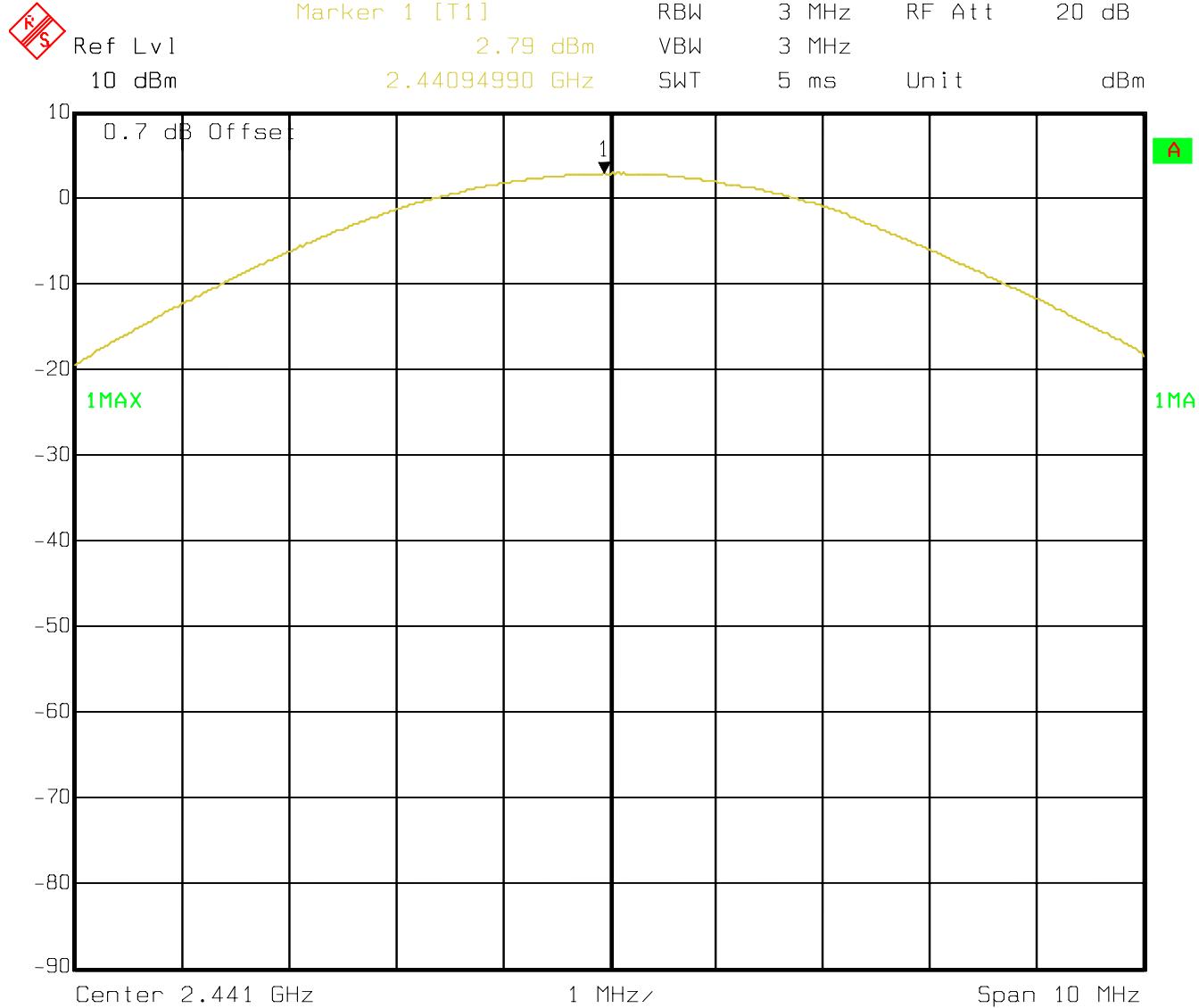
[

8DPSK (2402 MHz)

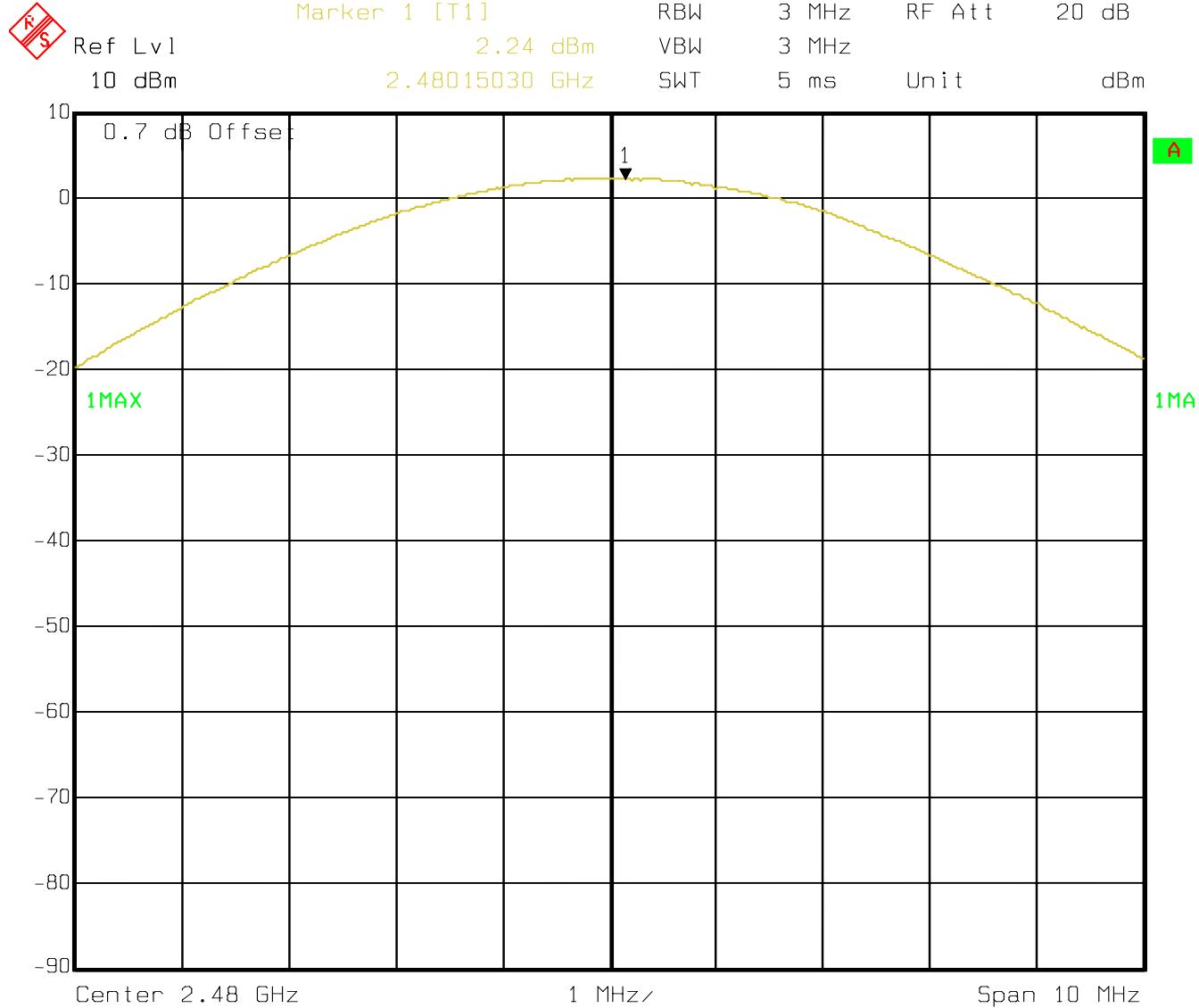


[

8DPSK (2441 MHz)



8DPSK (2480 MHz)



[

6.2 20dB BANDWIDTH

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

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Notes:

1. Measurements were performed with a spectrum analyzer.
2. Measurements for all supported modulations (GFSK, Pi/4 DQPSK and 8DPSK) were performed with device controlled via software and connected directly to the spectrum analyzer.

6.2.2 RESULTS:

GFSK

TEST CONDITIONS		BANDWIDTH (MHz)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	825.651	821.643	829.659

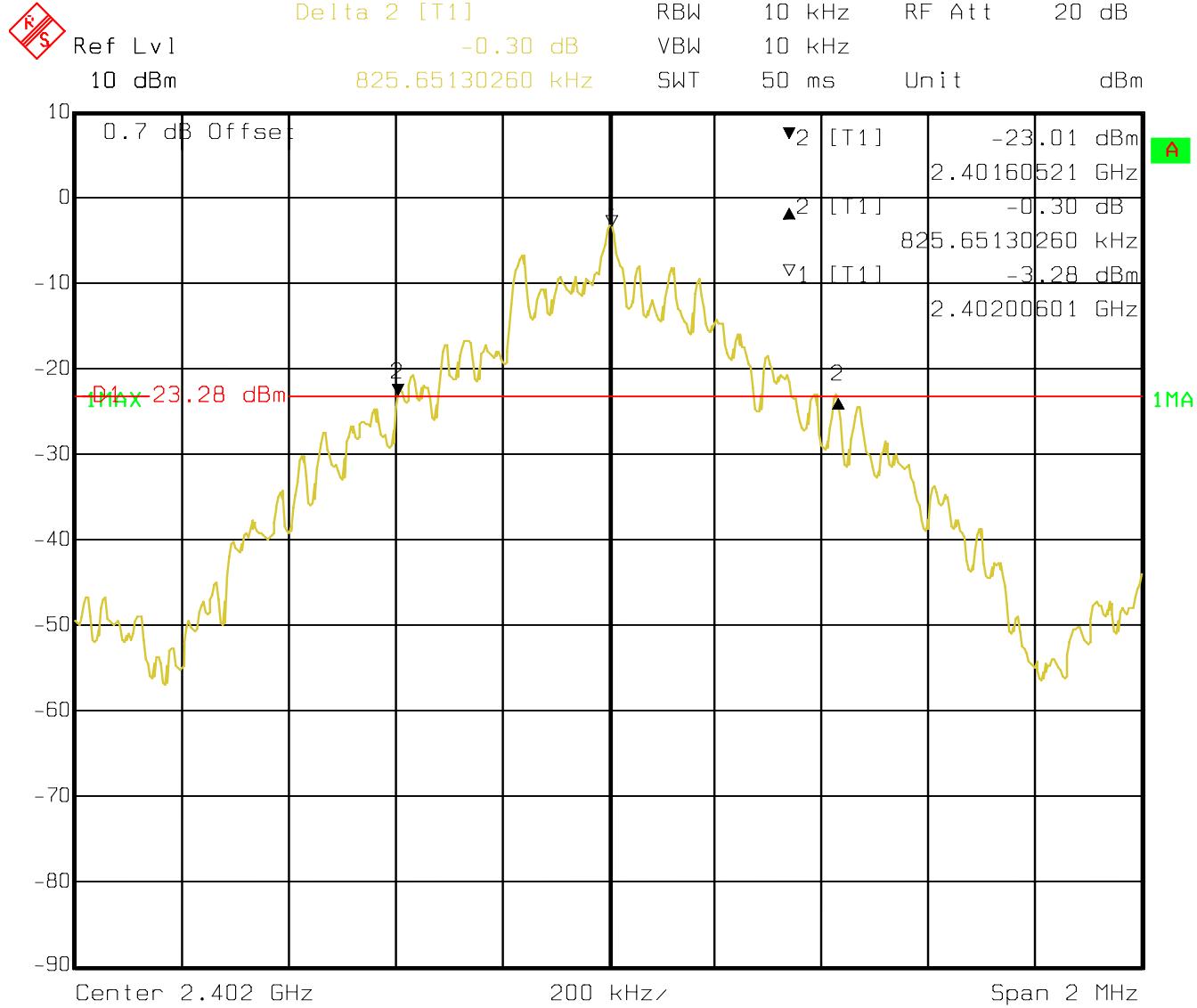
Pi/4 DQPSK

TEST CONDITIONS		BANDWIDTH (MHz)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	1.130	1.110	1.110

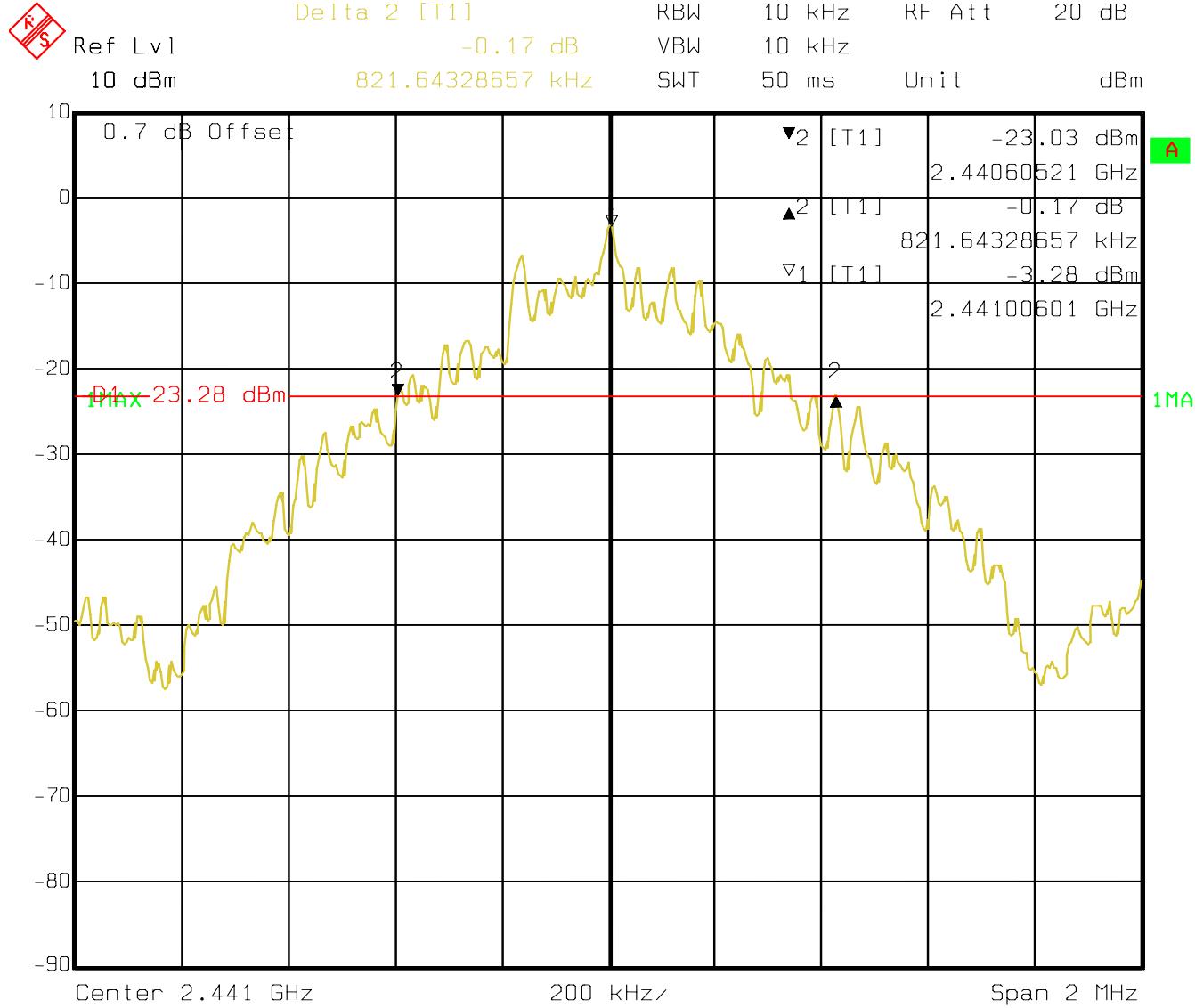
8DPSK

TEST CONDITIONS		BANDWIDTH (MHz)		
Frequency (MHz)		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} VDC	1.158	1.154	1.162

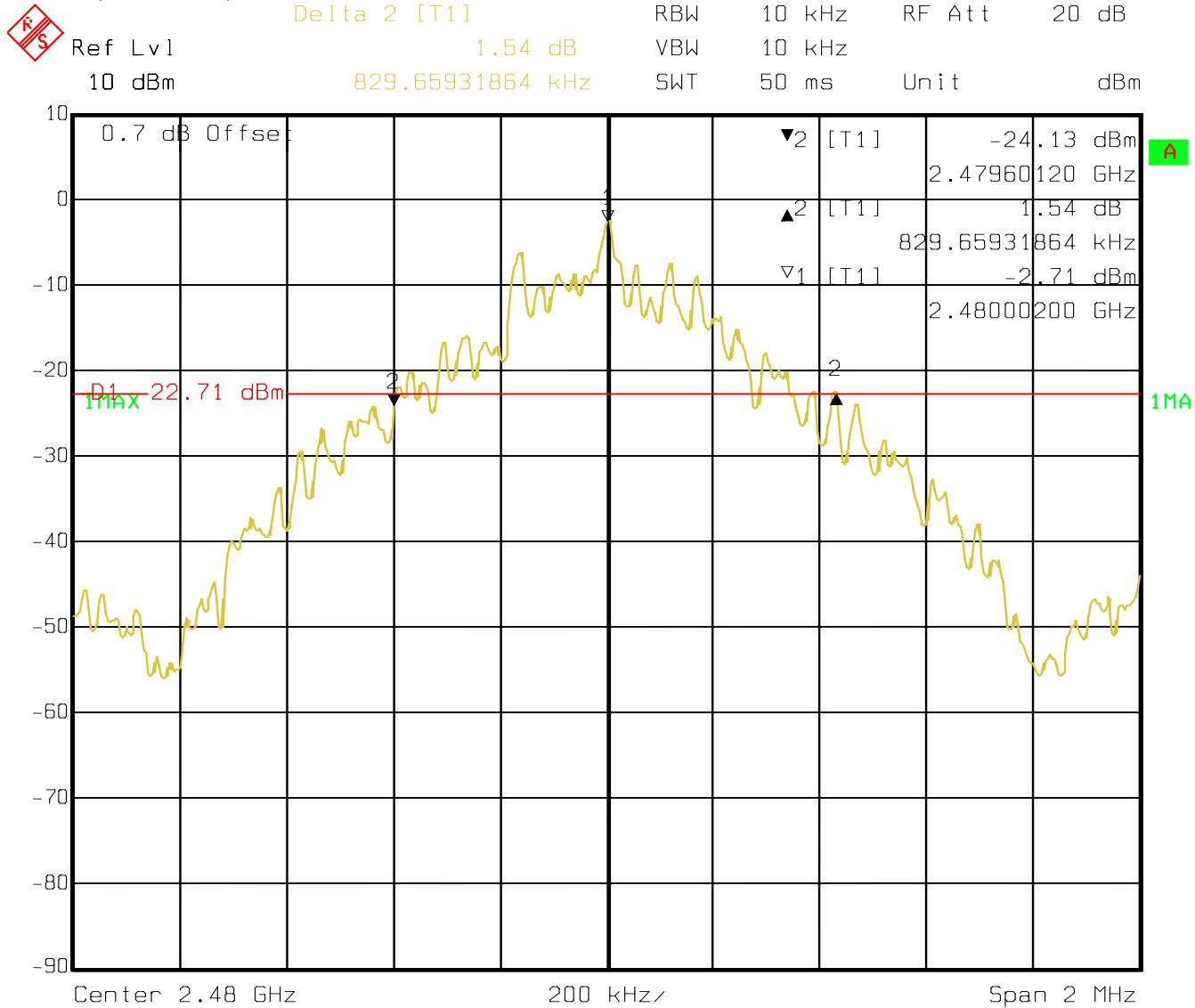
GFSK (2402 MHz)



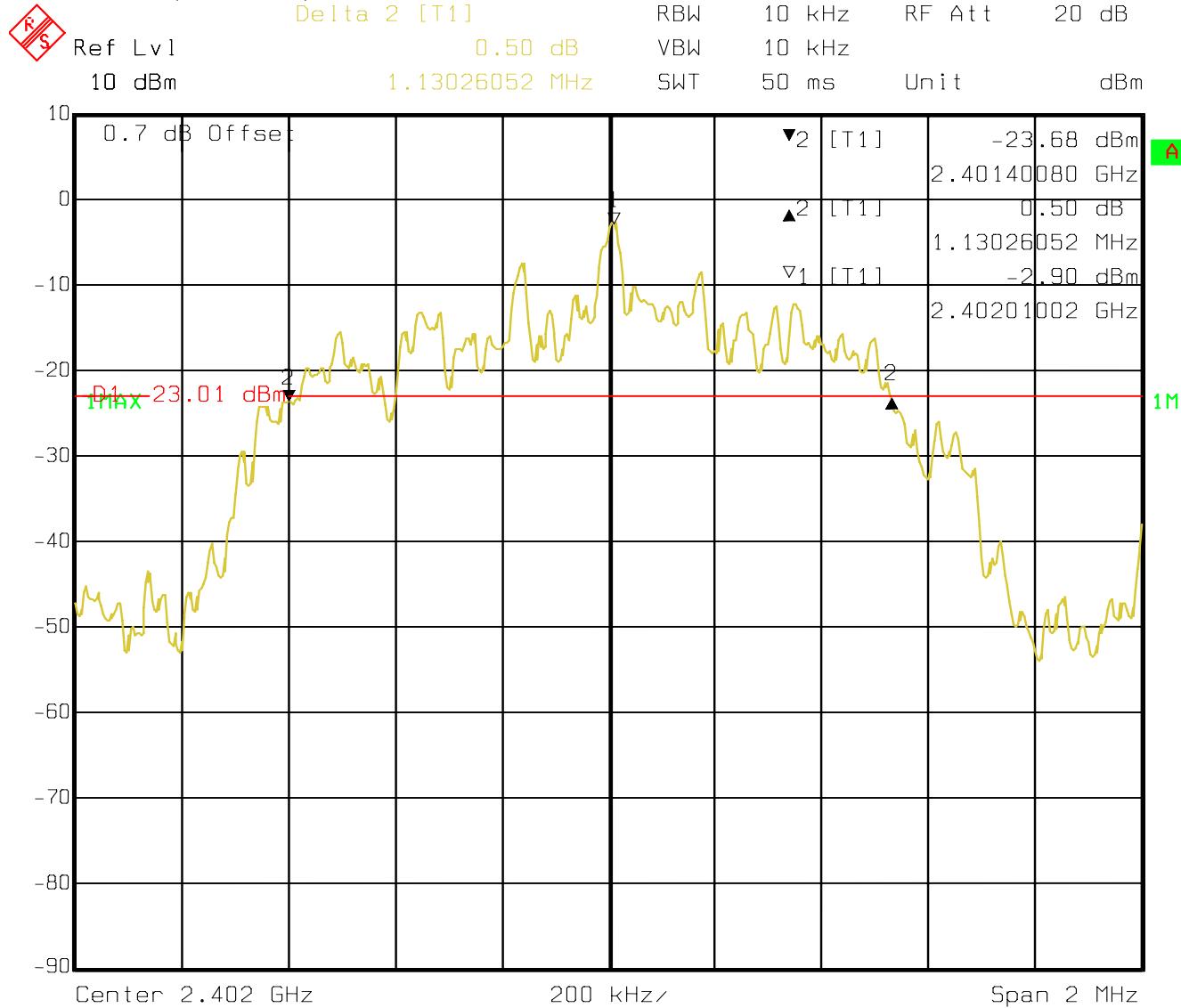
GFSK (2441 MHz)



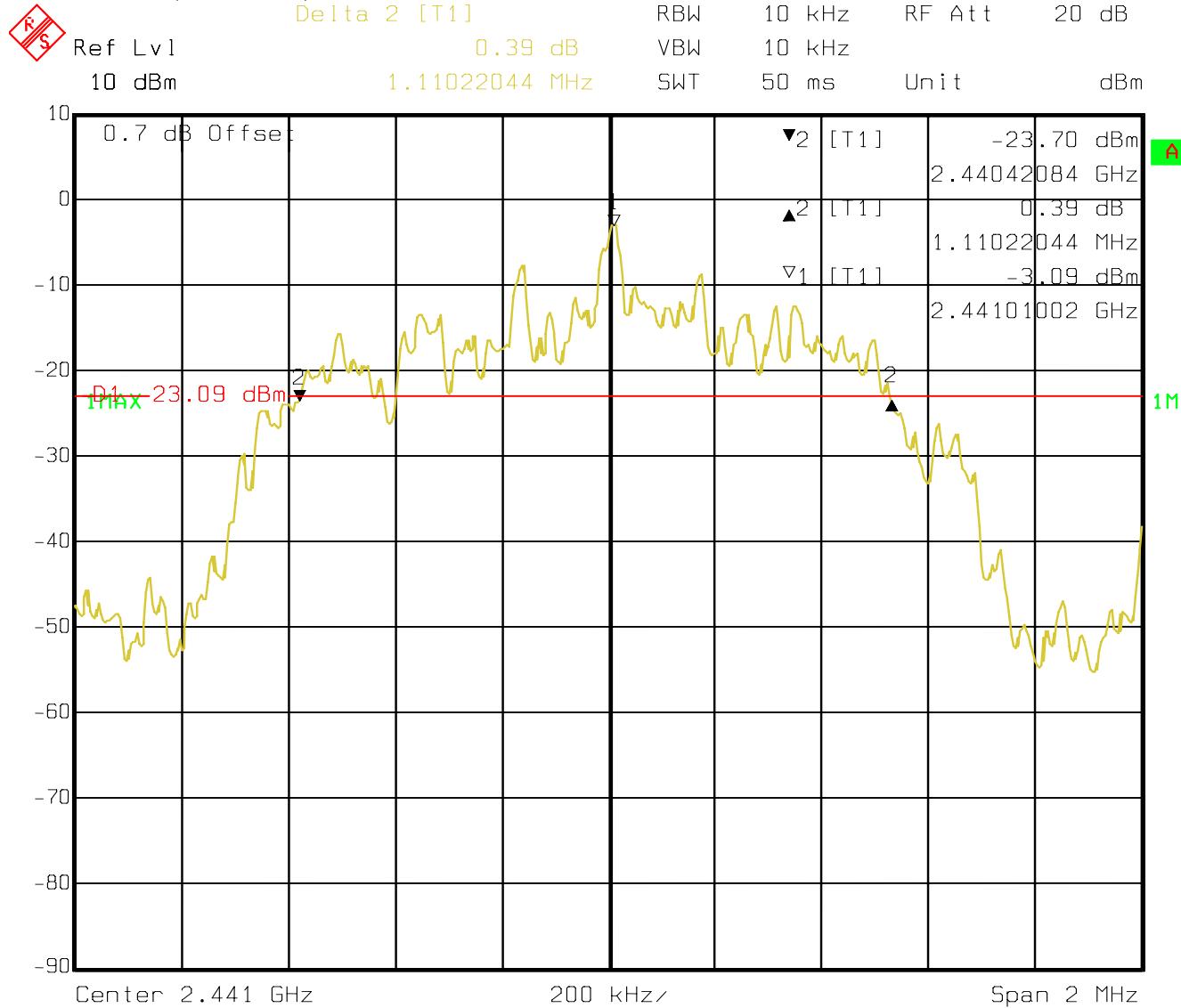
GFSK (2480 MHz)



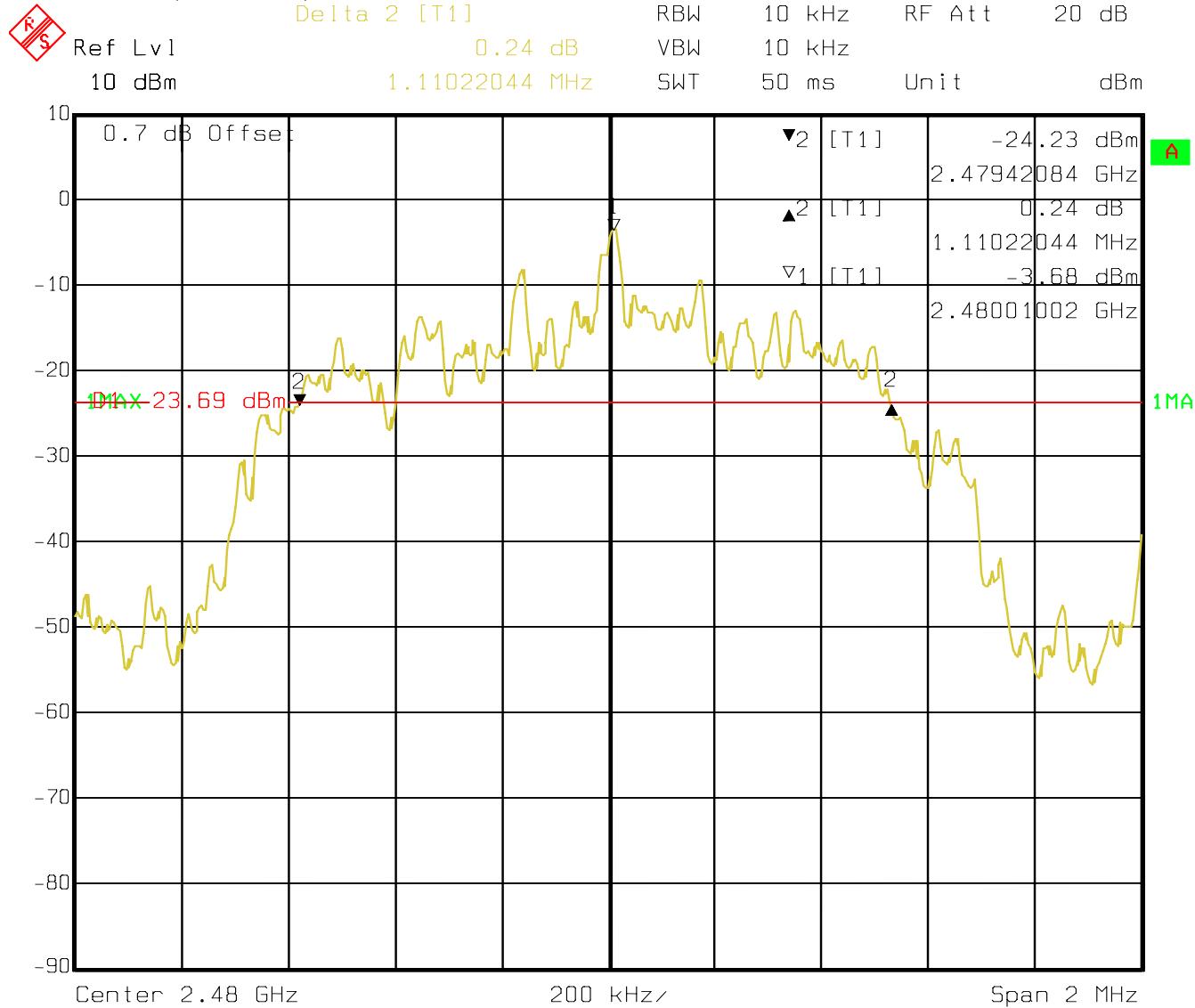
Pi/4 DQPSK (2402 MHz)



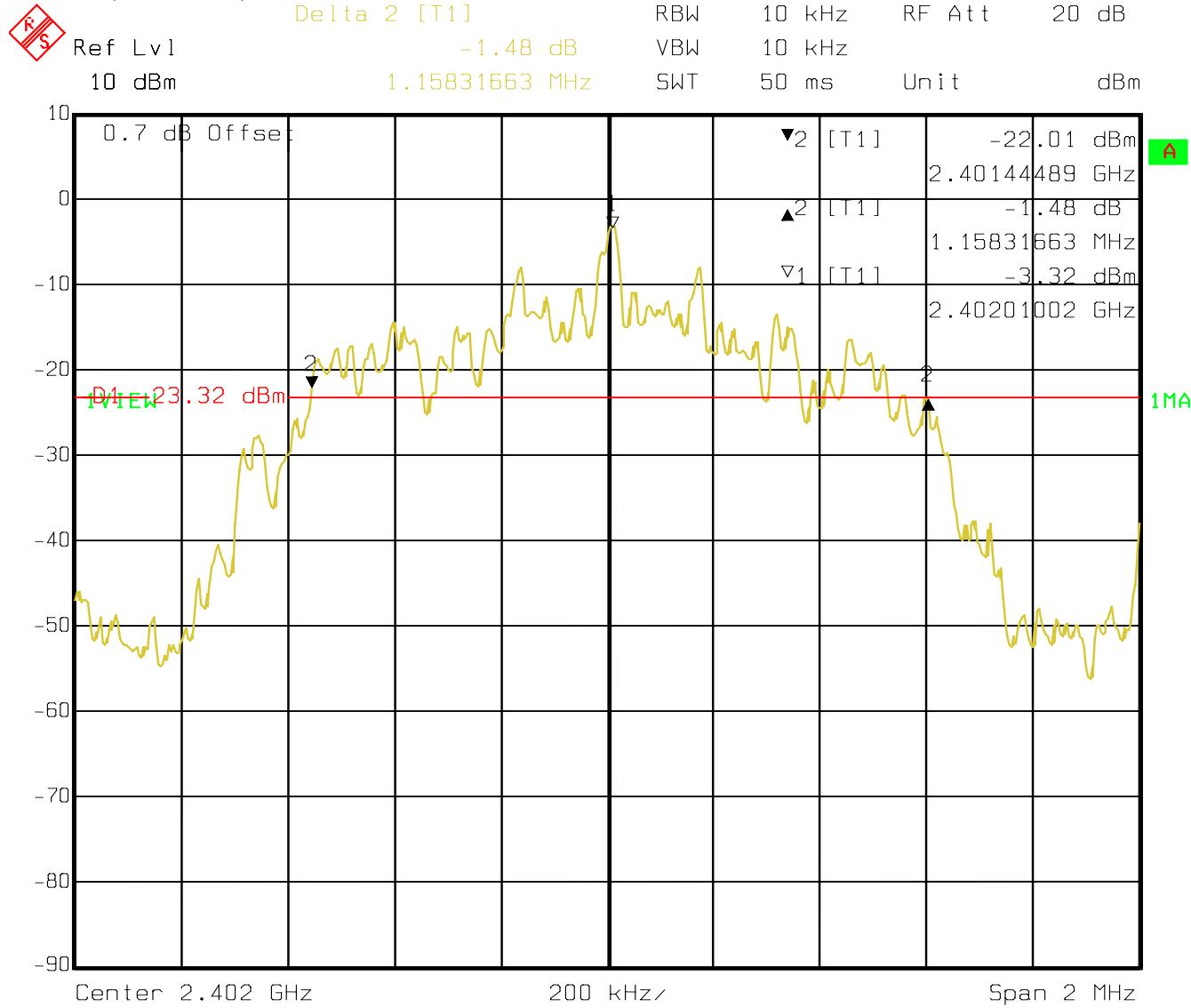
Pi/4 DQPSK (2441 MHz)



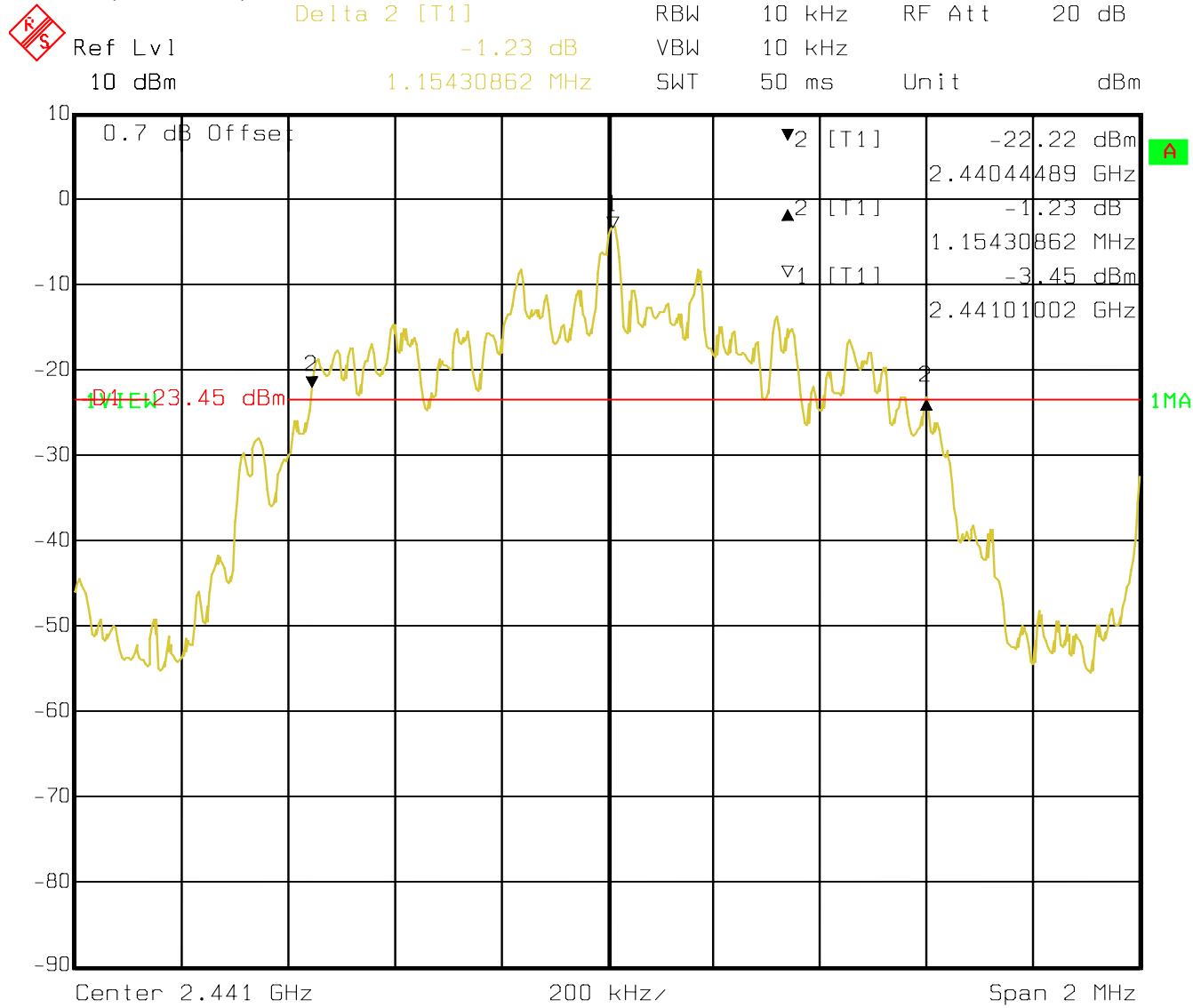
Pi/4 DQPSK (2480 MHz)



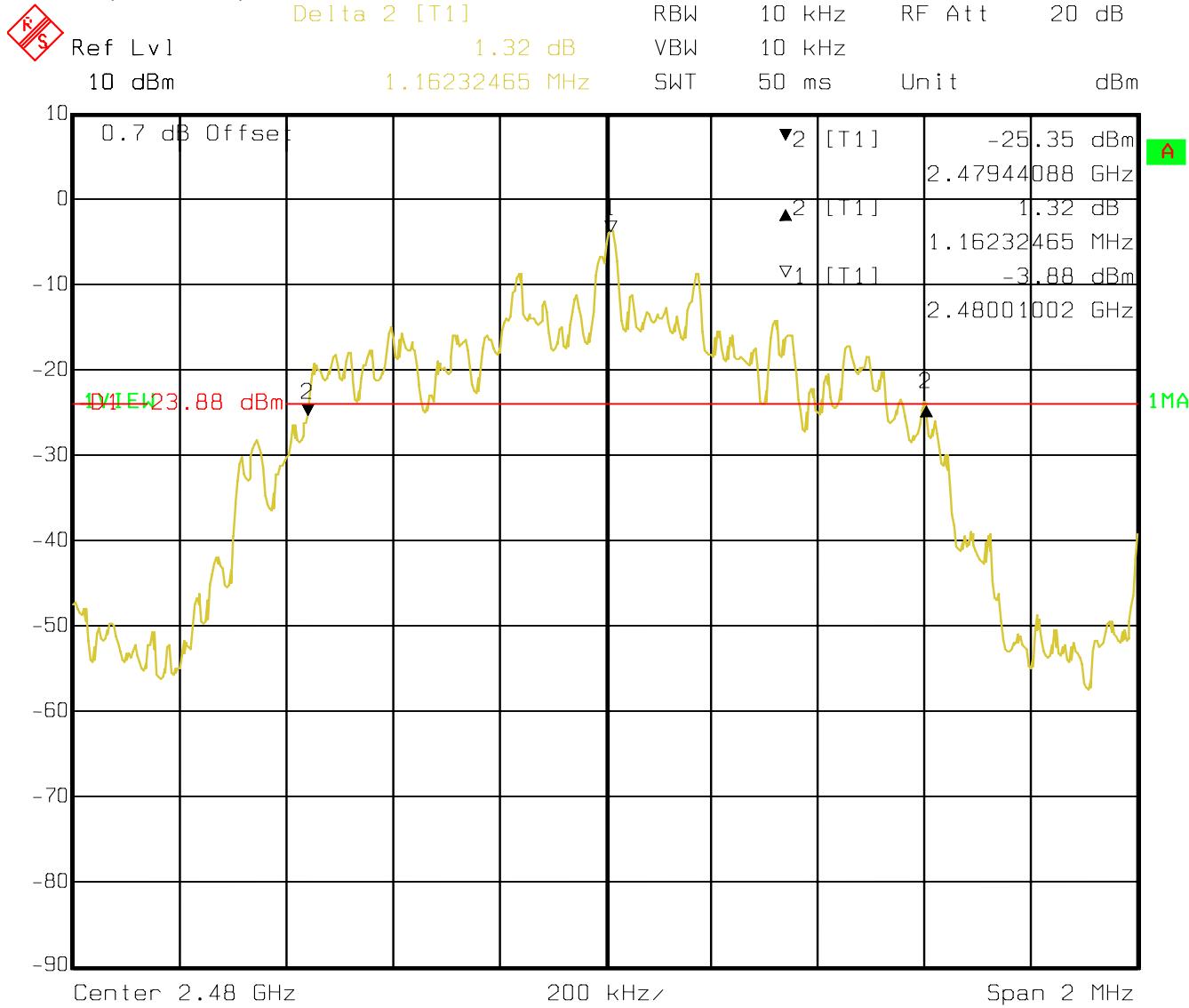
8DPSK (2402 MHz)



8DPSK (2441 MHz)



8DPSK (2480 MHz)



6.3 EMISSION LIMITATIONS

§ 15.247 (c) (1)

Transmitter (Conducted)

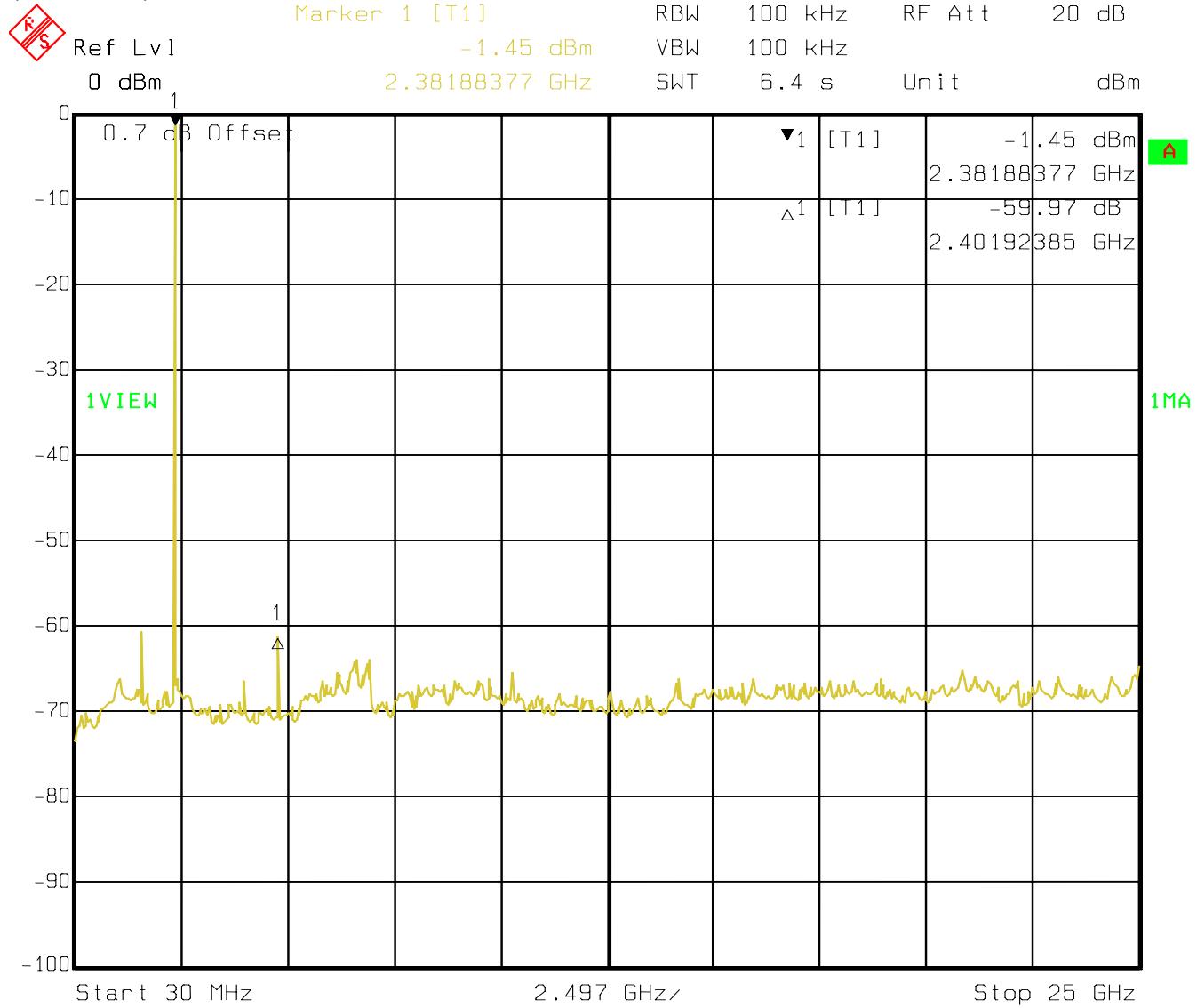
LIMITS

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions, which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

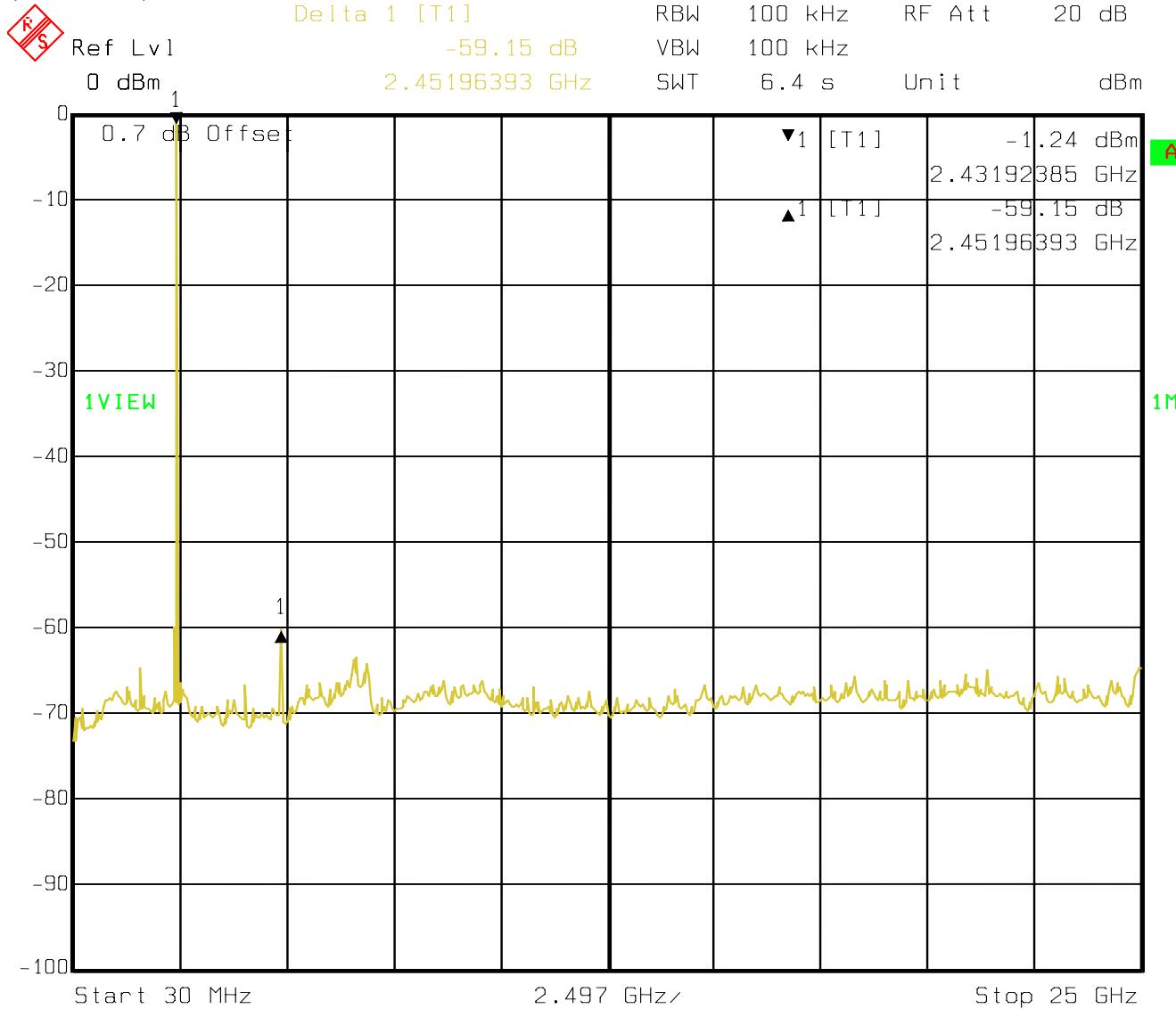
Notes:

1. Measurements were performed with a spectrum analyzer.
2. During measurements the equipment was configured as shown in the block diagram of section 8 of this report.

(2402 MHz)

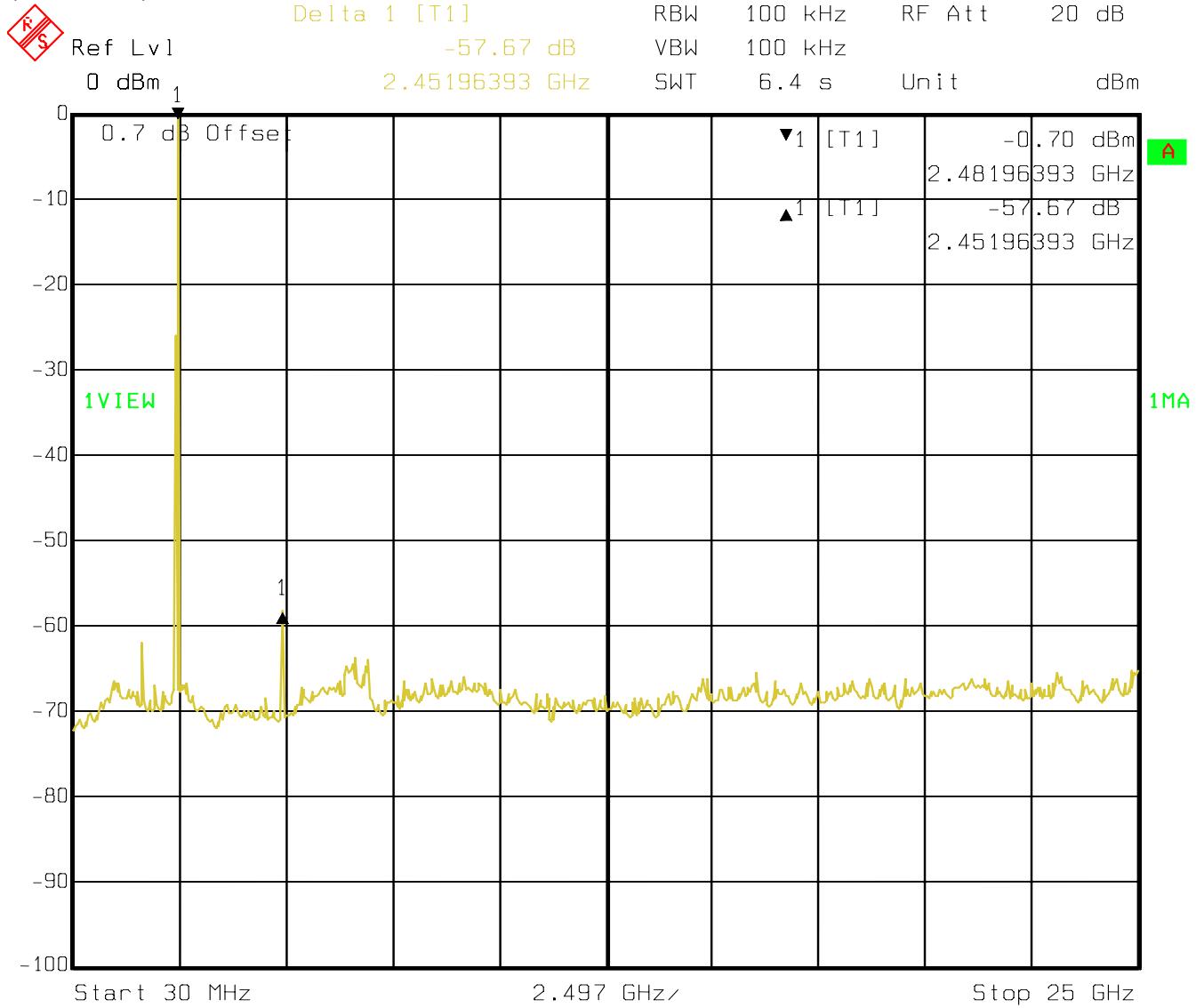


(2441 MHz)



Date: 19.NOV.2007 11:04:56

(2480 MHz)



6.4 CARRIER FREQUENCY SEPARATION

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

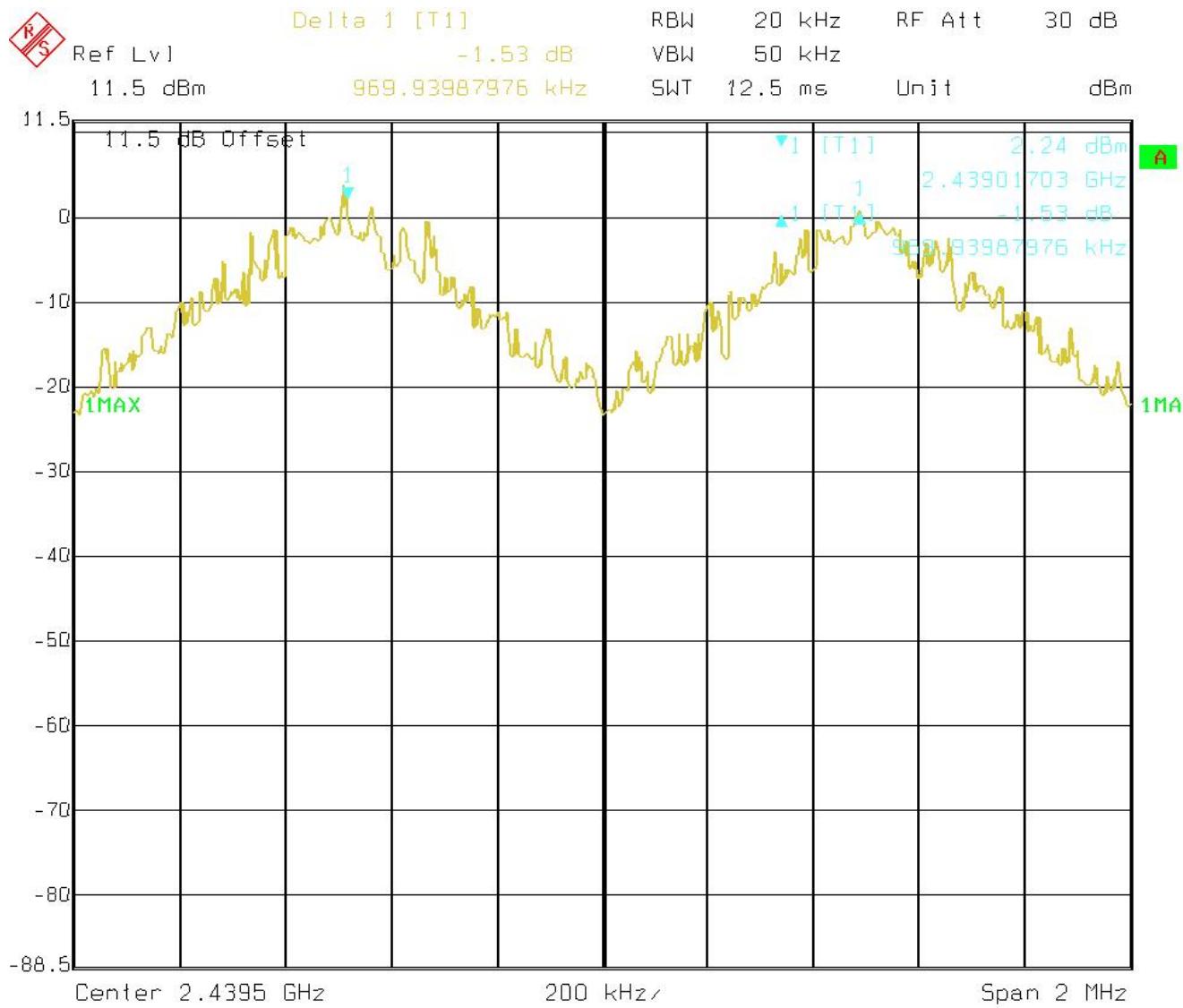
(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Notes:

1. Measurements were performed with a spectrum analyzer.

6.4.2 RESULTS:

TEST CONDITIONS		SEPARATION (MHz)
T_{nom}(23)°C	V_{nom}VDC	0.969



6.5 NUMBER OF HOPPING CHANNELS

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

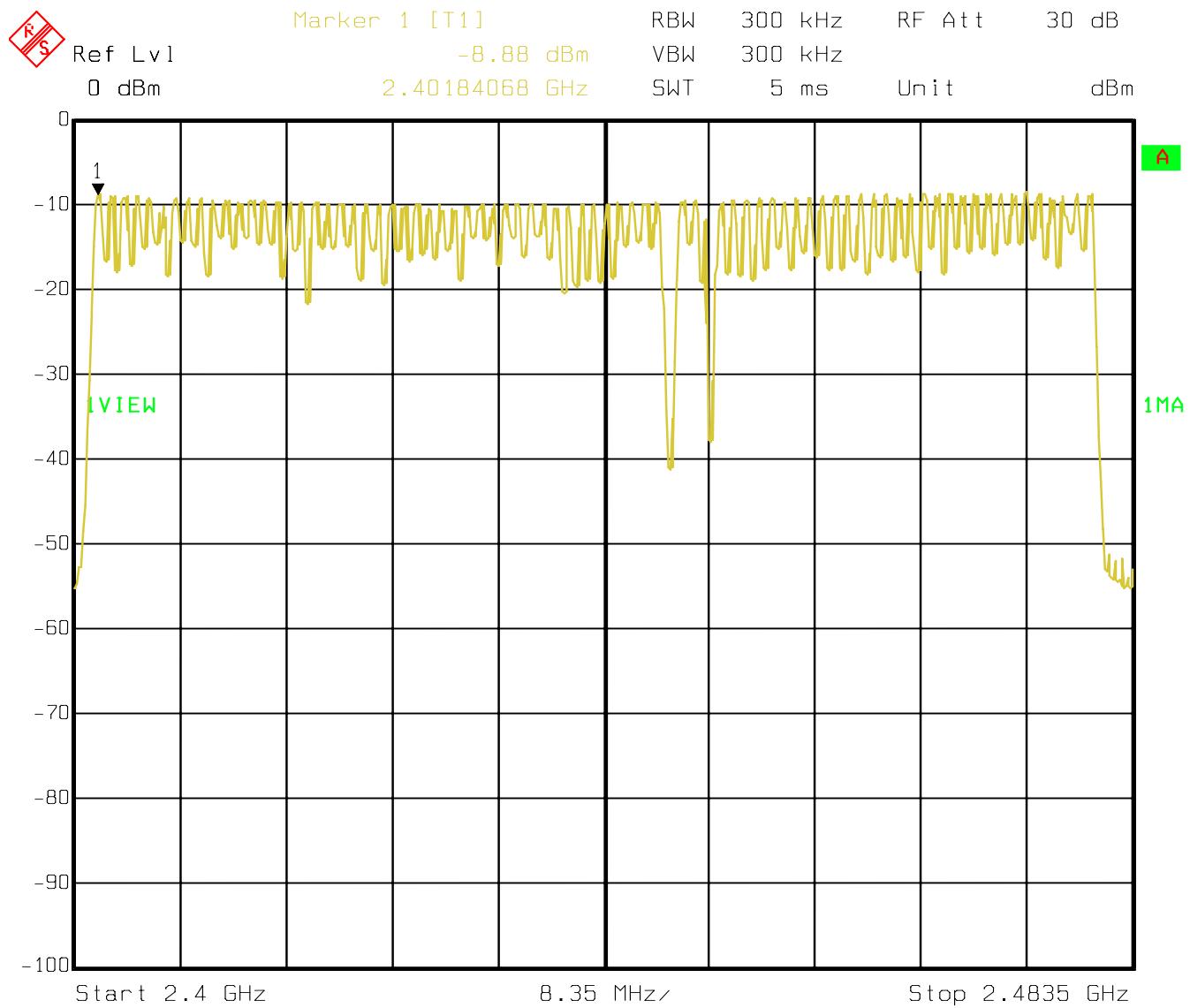
NUMBER OF CHANNELS
> 15

Notes:

1. Measurements were performed with a spectrum analyzer.

6.5.2 RESULTS:

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



Date: 04.DEC.2007 10:39:48

6.6 TIME OF OCCUPANCY (DWELL TIME)

6.6.1 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

6.6.2 RESULTS:

TEST CONDITIONS	
PACKET TYPE	
$T_{\text{nom}}(23)^\circ\text{C}$	$V_{\text{nom}}\text{VDC}$

For Bluetooth devices:

The dwell time of 0.4 s within a 31.6 second period in data mode is independent from the packet type (packet length). The calculation for a 31.6 second period is as follows:

Dwell time = time slot length * hop rate / number of hopping channels * 31.6 s

Example for a DH1 packet (with a maximum length of one time slot)

Dwell time = $625 \mu\text{s} * 1600 \text{ 1/s} / 79 * 31.6 \text{ s} = 0.4 \text{ s}$ (in a 31.6 s period)

For multi-slot packet the hopping is reduced according to the length of the packet.

Example for a DH5 packet (with a maximum length of five time slots)

Dwell time = $5 * 625 \mu\text{s} * 1600 * 1/5 * 1/\text{s} / 79 * 31.6 \text{ s} = 0.4 \text{ s}$ (in a 31.6 s period)

This is the same for all BT devices and therefore all BT devices satisfy FCC requirement on time of occupancy (dwell time).

6.7 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

6.7.1 Limits

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

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

OPERATING MODE

The testing was performed with the EUT operated in Tx and Rx modes.

EUT: 2020-5
Manufacturer: Hand Held Products iInc.
Operating Condition: BT CH39
ANT Orientation: Conducted – Tx.
EUT Orientation: H
Test Engineer: Val
Power Supply: 120V AC L
Comments:

MEASUREMENT RESULT: "55022 V AV QPK"

1/7/2008 1:48PM

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB μ V	dB	dB μ V	dB		

0.262000	50.60	0.3	61	10.8	---	---
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LIMIT LINE: "EN 55022 V AV"

Short Description: Voltage AV Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V

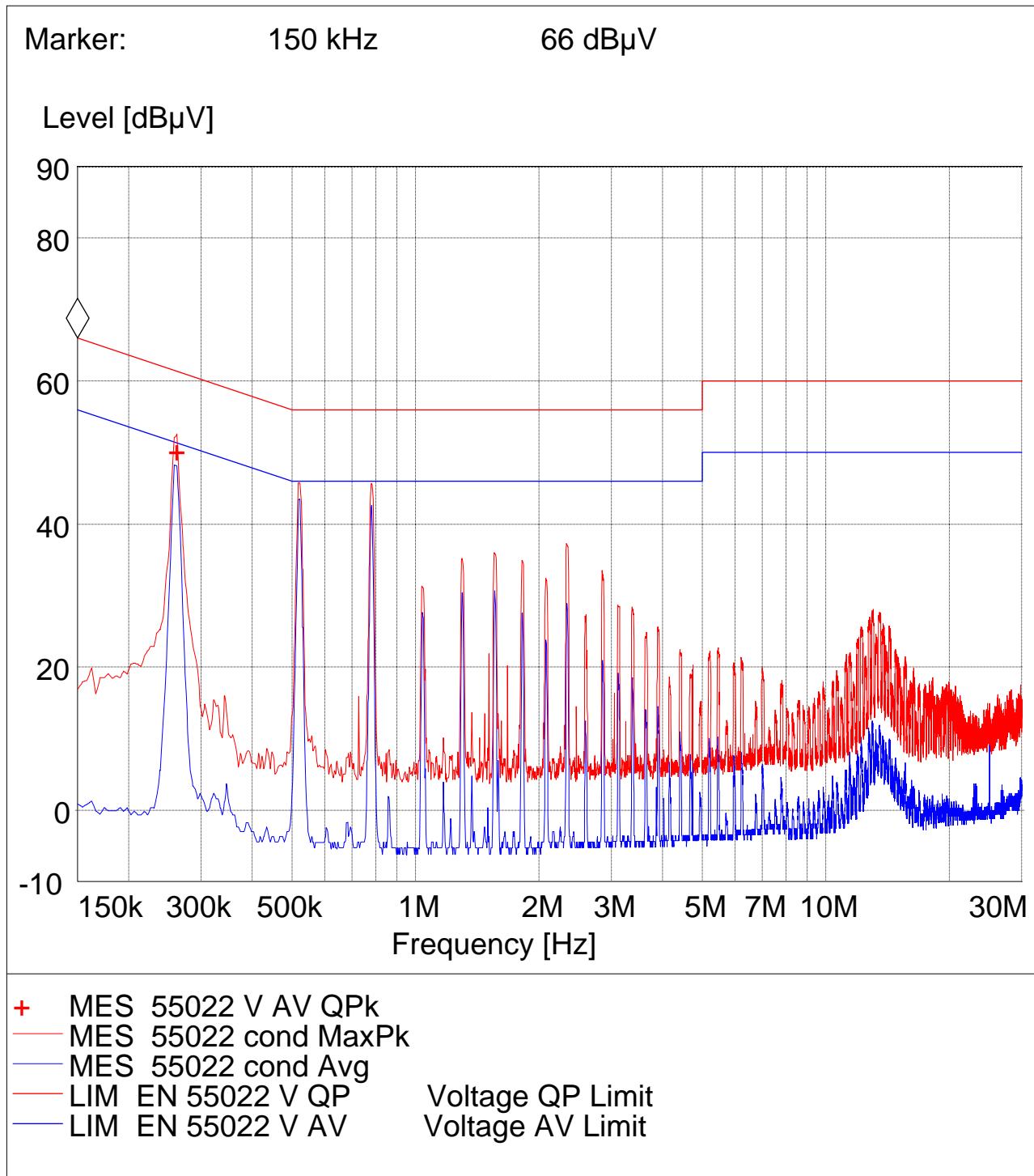
0.150000	56.00
0.500000	46.00
5.000000	46.00
5.000000	50.00
30.000000	50.00

LIMIT LINE: "EN 55022 V QP"

Short Description: Voltage QP Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V

0.150000	66.00
0.500000	56.00
5.000000	56.00
5.000000	60.00
30.000000	60.00



EUT: 2020-5
Manufacturer: Hand Held Products inc.
Operating Condition: BT CH39
ANT Orientation: Conducted – Tx.
EUT Orientation: H
Test Engineer: Val
Power Supply: 120V AC N
Comments: :

MEASUREMENT RESULT: "55022 V AV QPK"

1/7/2008 1:42PM

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB μ V	dB	dB μ V	dB		
0.262000	51.30	0.3	61	10.1	---	---

LIMIT LINE: "EN 55022 V AV"

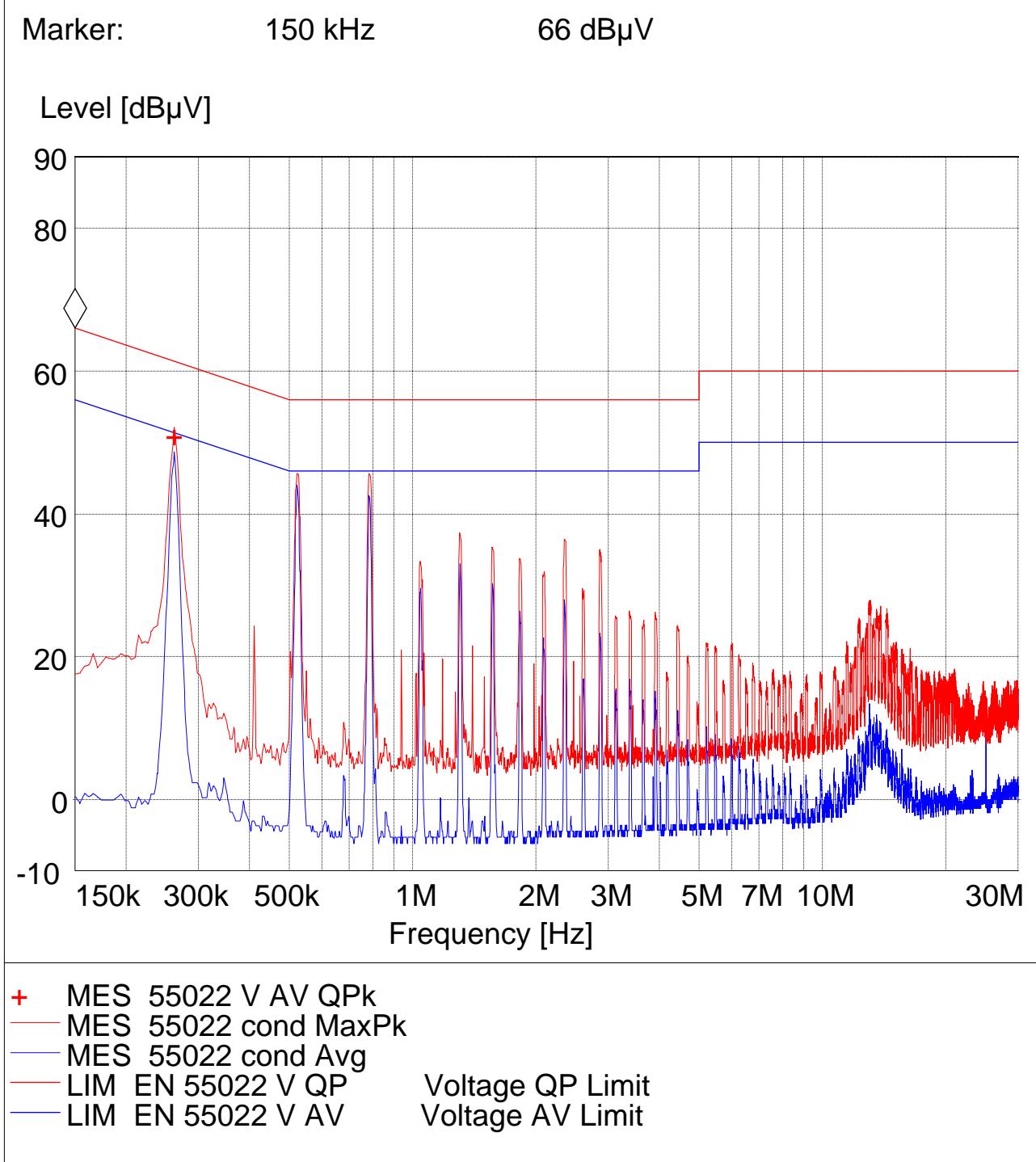
Short Description: Voltage AV Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V
0.150000	56.00
0.500000	46.00
5.000000	46.00
5.000000	50.00
30.000000	50.00

LIMIT LINE: "EN 55022 V QP"

Short Description: Voltage QP Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V
0.150000	66.00
0.500000	56.00
5.000000	56.00
5.000000	60.00
30.000000	60.00



EUT: 2020-5
Manufacturer: Hand Held Products Inc.
Operating Condition: BT CH39
ANT Orientation: Conducted - RX
EUT Orientation: H
Test Engineer: Val
Power Supply: 120V AC L
Comments:

MEASUREMENT RESULT: "55022 V AV QPK"

1/7/2008 2:05PM

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB μ V	dB	dB μ V	dB		

0.262000	50.70	0.3	61	10.7	---	---
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LIMIT LINE: "EN 55022 V AV"

Short Description: Voltage AV Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V

0.150000	56.00
0.500000	46.00
5.000000	46.00
5.000000	50.00
30.000000	50.00

LIMIT LINE: "EN 55022 V QP"

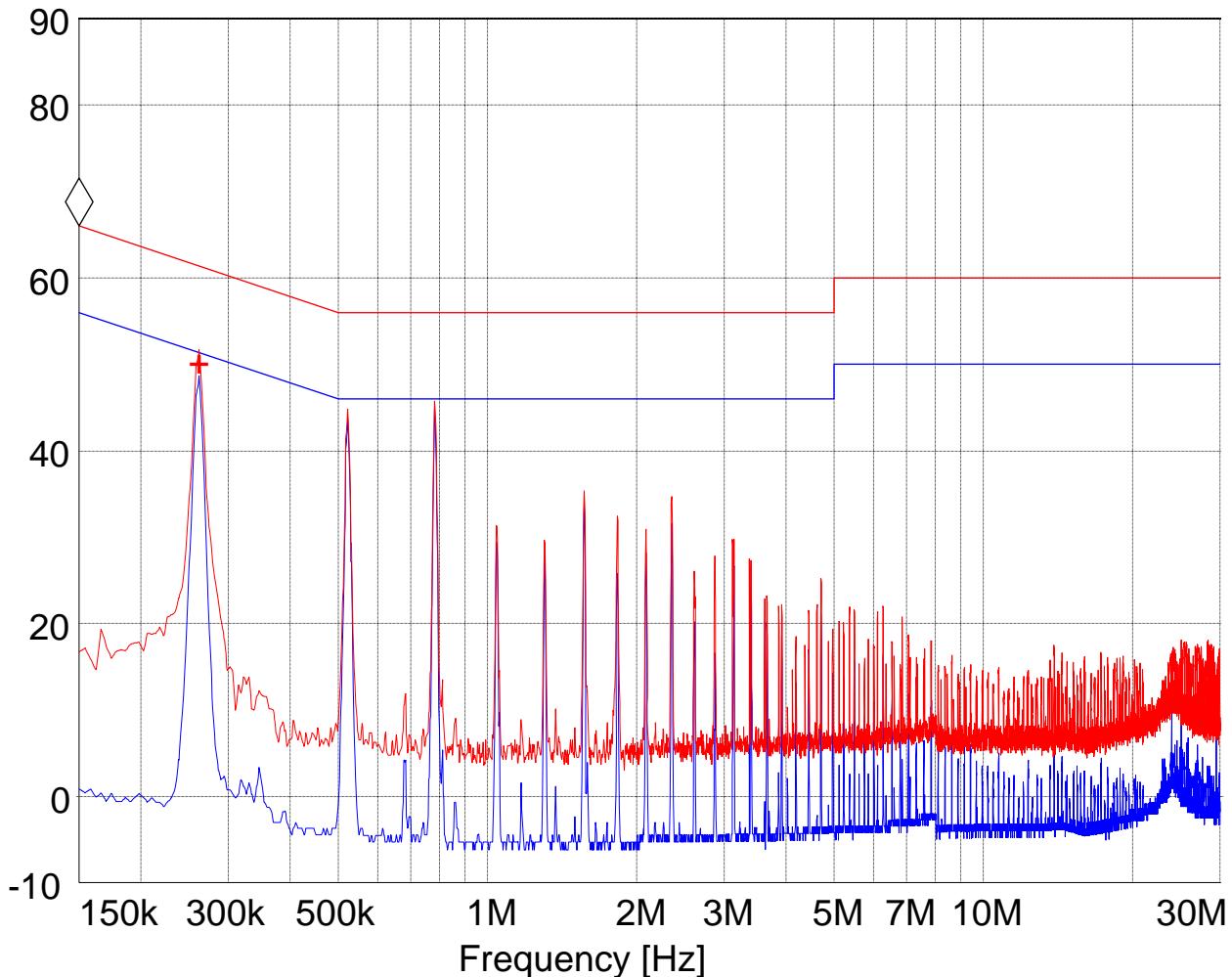
Short Description: Voltage QP Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V

0.150000	66.00
0.500000	56.00
5.000000	56.00
5.000000	60.00
30.000000	60.00

Marker: 150 kHz 66 dB μ V

Level [dB μ V]



- + MES 55022 V AV QPk
- MES 55022 cond MaxPk
- MES 55022 cond Avg
- LIM EN 55022 V QP Voltage QP Limit
- LIM EN 55022 V AV Voltage AV Limit

EUT: 2020-5
Manufacturer: Hand Held Products Inc.
Operating Condition: BT CH39
ANT Orientation: Conducted - RX
EUT Orientation: H
Test Engineer: Val
Power Supply: 120V AC N
Comments:

MEASUREMENT RESULT: "55022 V AV QPk"

1/7/2008 2:05PM

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB μ V	dB	dB μ V	dB		
0.261000	50.10	0.3	61	10.9	---	---

LIMIT LINE: "EN 55022 V AV"

Short Description: Voltage AV Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V
0.150000	56.00
0.500000	46.00
5.000000	46.00
5.000000	50.00
30.000000	50.00

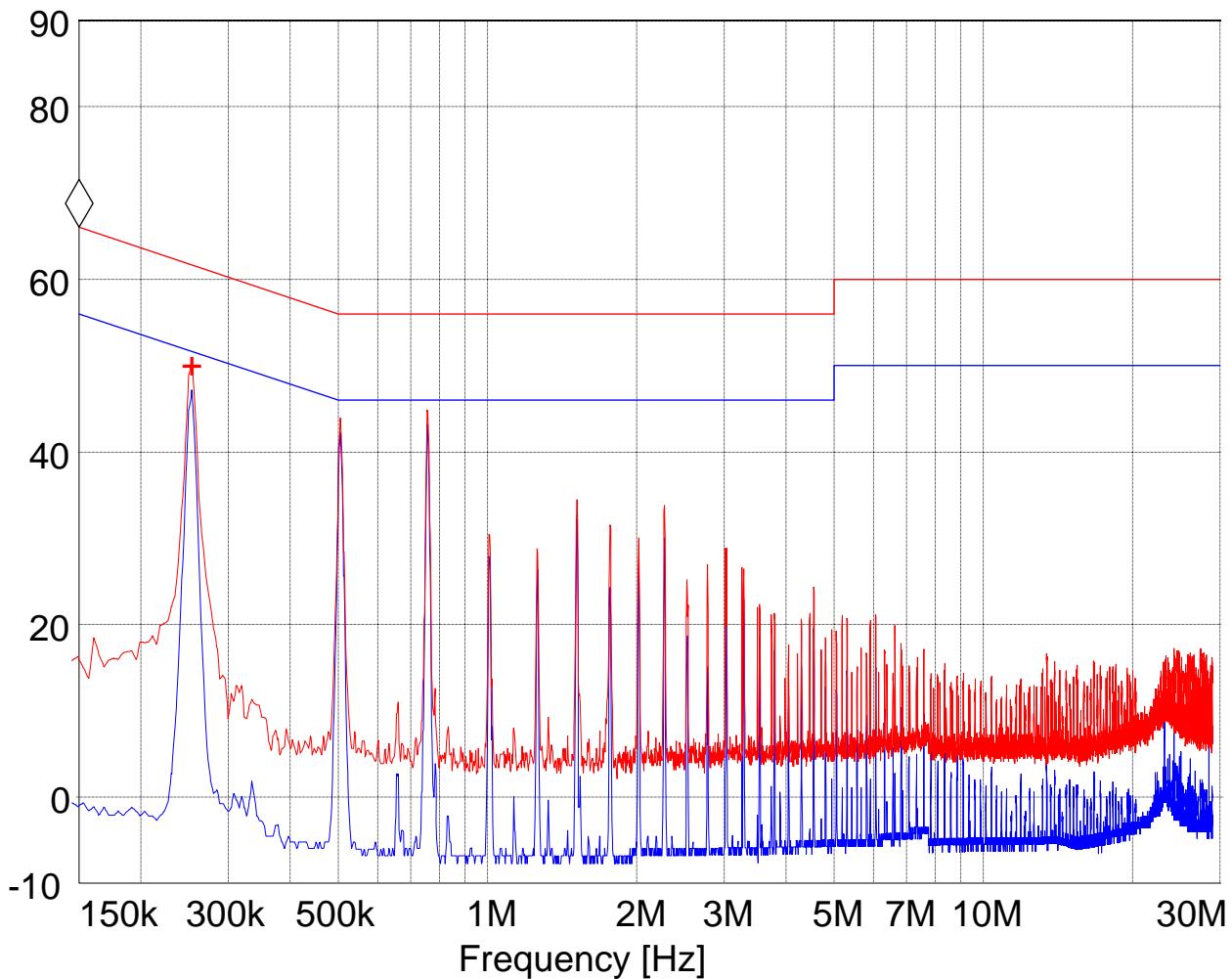
LIMIT LINE: "EN 55022 V QP"

Short Description: Voltage QP Limit
4/27/1998 2:24PM

Frequency	Level
MHz	dB μ V
0.150000	66.00
0.500000	56.00
5.000000	56.00
5.000000	60.00
30.000000	60.00

Marker: 150 kHz 66 dB μ V

Level [dB μ V]



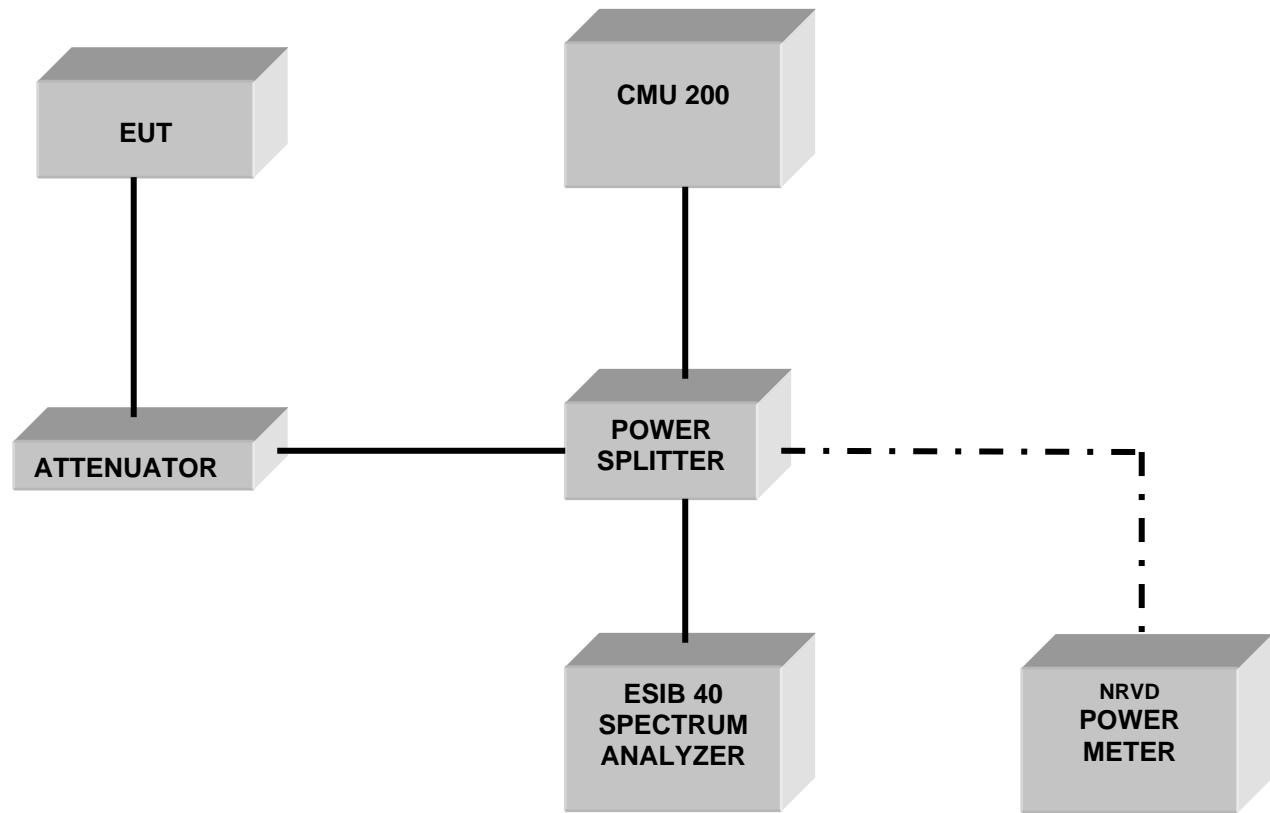
+ MES 55022 V AV QPk
— MES 55022 cond MaxPk
— MES 55022 cond Avg
— LIM EN 55022 V QP Voltage QP Limit
— LIM EN 55022 V AV Voltage AV Limit

7 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 2008	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2008	1 year
03	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2008	1 year
04	Biconilog Antenna	3141	EMCO	0005-1186	June 2008	1 year
05	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2008	1 year
06	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2008	1 year
07	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
08	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
09	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
10	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2008	1 year
11	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2008	1 year
12	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	Aug. 2008	1 year

8 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing

