



# FCC Test Report

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

for  
Hand Held Products, Inc.

Bar code verifier-I.T.E test equipment

Model Number: QC890 Verifier

FCC ID: HD5QC900B

IC-ID: 1693B-QC900B

TEST REPORT #: EMC\_HANDH\_049\_07002\_FCC-IC\_BT.  
DATE: December 06, 2007



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.**

<b>Company</b>	<b>Description</b>	<b>Model #</b>
<b>Hand Held Products,Inc.</b>	<b>Bar code verifier- I.T.E test equipment</b>	<b>QC890.</b>

**Technical responsibility for area of testing:**

<b>12/6/2007</b>	<b>EMC &amp; Radio</b>	<b>Juan Martinez</b> <b>(Project Engineer)</b>
<b>Date</b>	<b>Section</b>	<b>Name</b>

**This report is prepared by:**

<b>12/6/2007</b>	<b>EMC &amp; Radio</b>	<b>Val Tankov</b> <b>(Project Engineer)</b>
<b>Date</b>	<b>Section</b>	<b>Name</b>

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
Manufacturer's Address:	Same as an Applicant

### **3 Equipment under Test (EUT)**

#### **3.1 Specification of the Equipment under Test**

Product Type	Bar code verifier-I.T.E test equipment
Marketing Name:	QC890 Verifier
Model No:	QC890.
FCC-ID:	HD5QC900B
IC-ID :	1693B-QC900B
Frequency Range:	2400 – 2483.5 MHz
Number of Channels	79
Type(s) of Modulation:	GFSK, DQPSK, 8PSK
Antenna Type:	Intergral SMD
Output Power:	-3.99 dBm (0.399mW) EIRP 2.79 dBm (1.90mW) Conducted

#### **3.2 Identification of the Equipment Under Test (EUT)**

<b>EUT #</b>	<b>TYPE</b>	<b>MANF.</b>	<b>MODEL</b>	<b>IMEI #</b>
1	EUT	<b>Hand Held Products Inc.</b>	<b>QC890</b>	NA

#### **3.3 Identification of Accessory equipment**

<b>AE #</b>	<b>TYPE</b>	<b>MANF.</b>	<b>MODEL</b>	<b>SERIAL #</b>
1	AC/DC ADAPTER	DVE	DSA-0151D-05xxx	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 <sub>nom</sub> (23)°C	V <sub>nom</sub> VDC	-5.3	-3.99	-4.08
Measurement uncertainty		±0.5dBm		

##### **EIRP: π / 4 DQPSK**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2441	2480
T <sub>nom</sub> (23)°C	V <sub>nom</sub> VDC	-5.32	-4.18	-4.21
Measurement uncertainty		±0.5dBm		

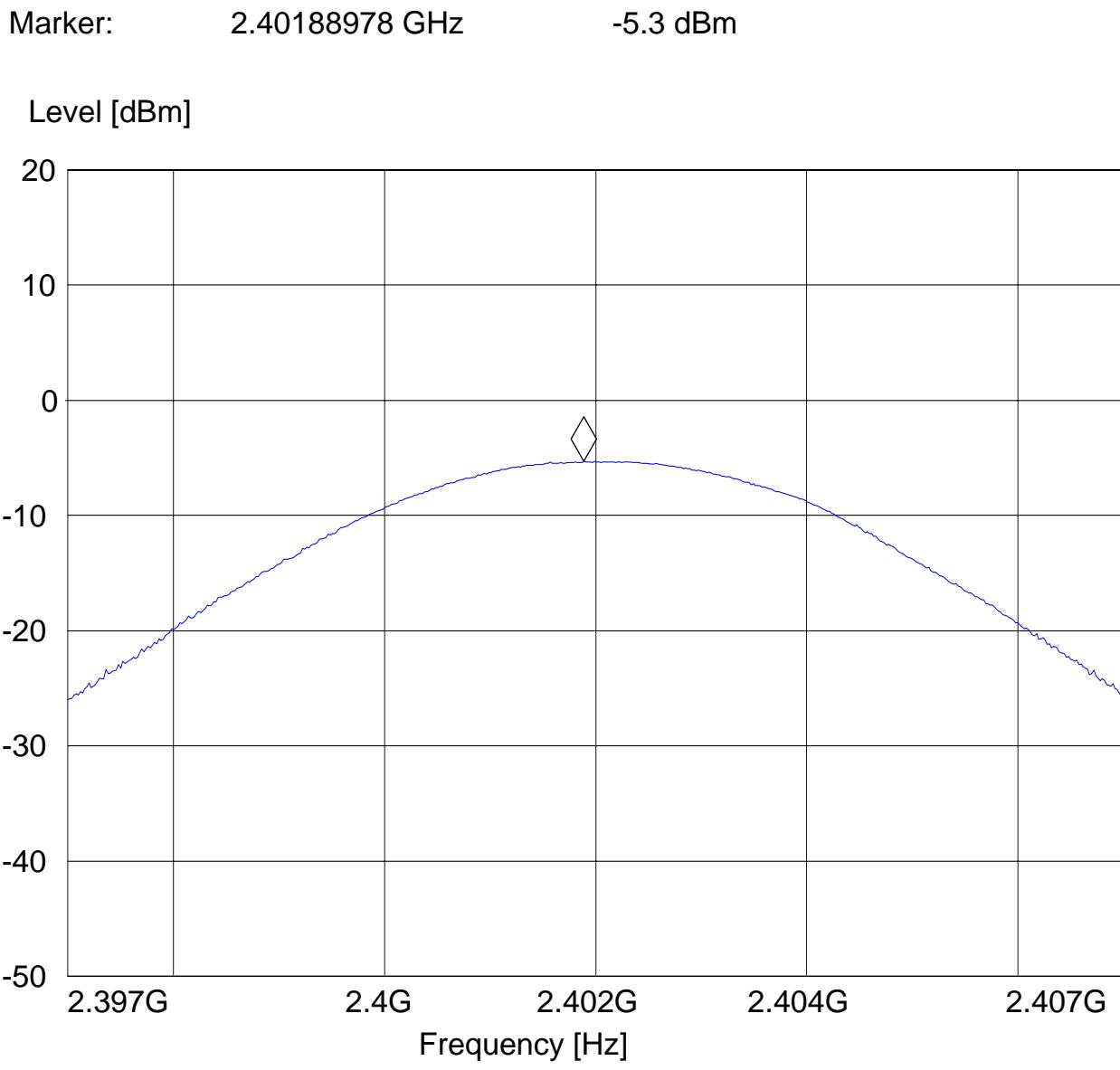
##### **EIRP: 8DPSK**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2402	2441	2480
T <sub>nom</sub> (23)°C	V <sub>nom</sub> VDC	-5.31	-4.25	-4.46
Measurement uncertainty		±0.5dBm		

**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890  
Customer: HAND HELD PRODUCTS, INC.  
Test Mode: BT; GFSK; CH 0  
ANT Orientation: V  
EUT Orientation: H  
Test Engineer: SAM  
Voltage: AC ADAPTER  
Comments: TT 277°

***SWEEP TABLE: "EIRP BT low channel"***



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; GFSK; CH 39

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

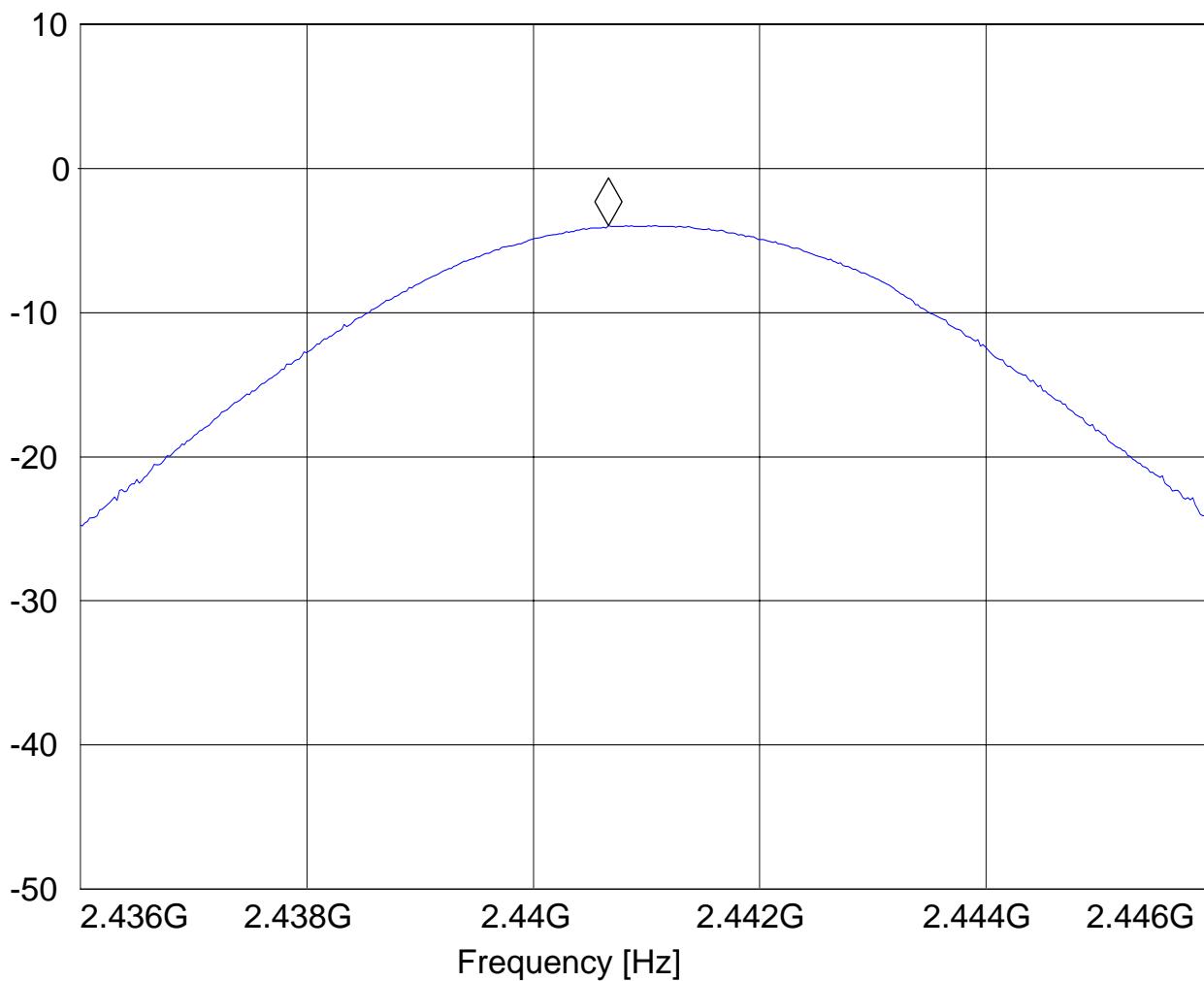
Voltage: AC ADAPTER

Comments: TT 277°

**SWEEP TABLE: "EIRP BT mid channel"**

Marker: 2.440665331 GHz -3.99 dBm

Level [dBm]



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; GFSK; CH 78

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

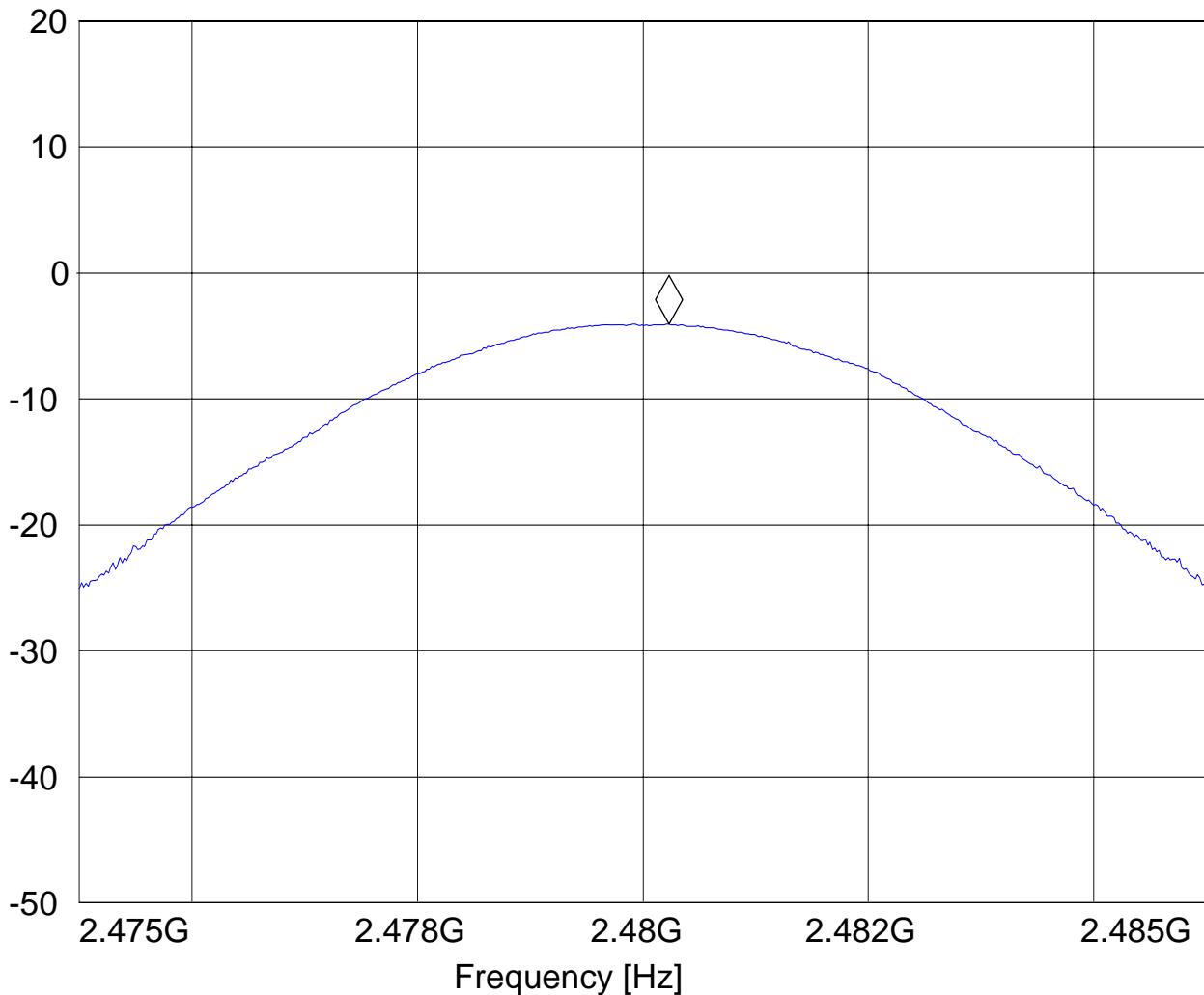
Voltage: AC ADAPTER

Comments: TT 277°

**SWEEP TABLE: "EIRP BT high channel"**

Marker: 2.480230461 GHz -4.08 dBm

Level [dBm]



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; DQPSK; CH 0

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

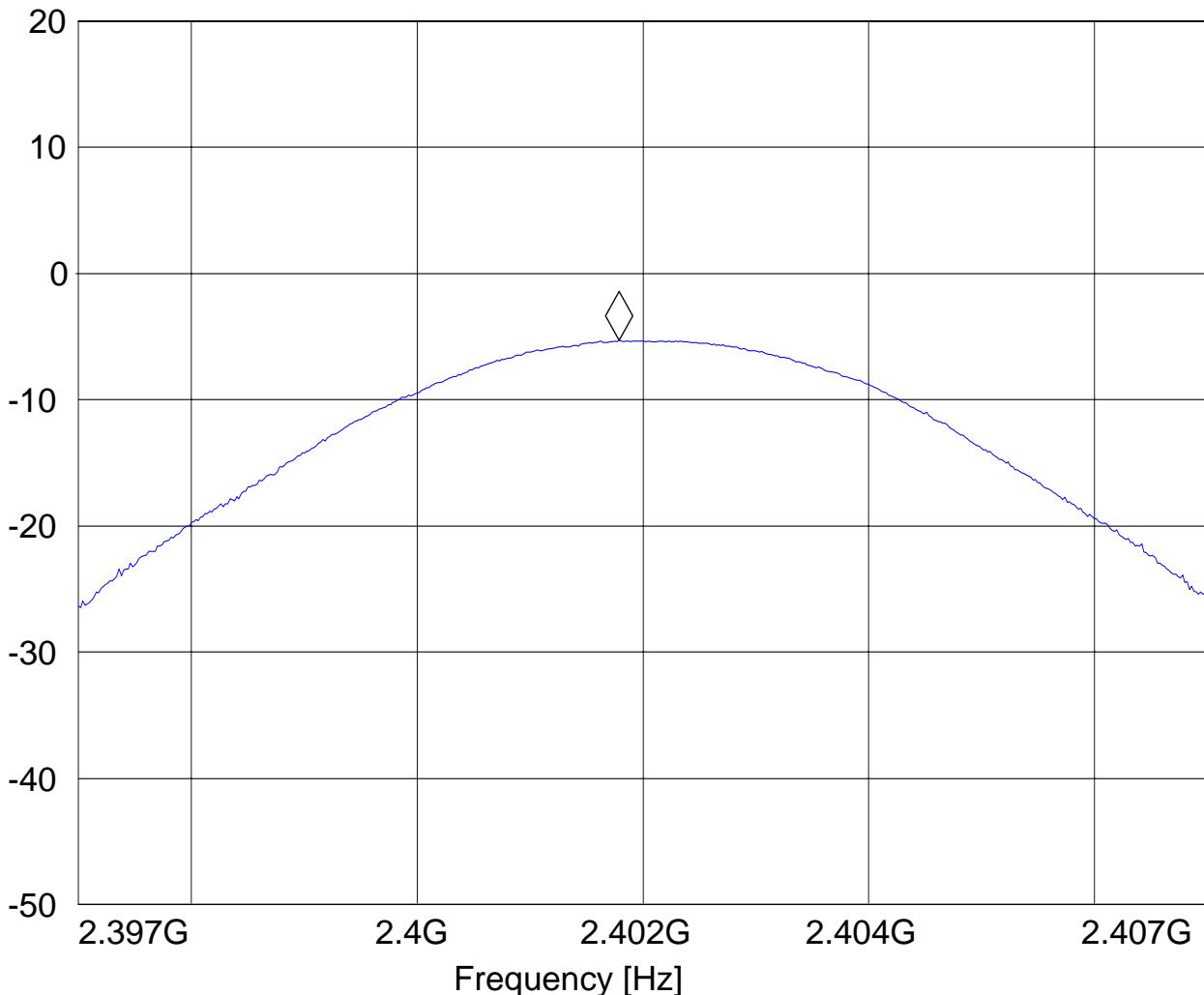
Voltage: AC ADAPTER

Comments: TT 277°

***SWEEP TABLE: "EIRP BT low channel"***

Marker: 2.401789579 GHz -5.32 dBm

Level [dBm]



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; DQPSK; CH 39

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

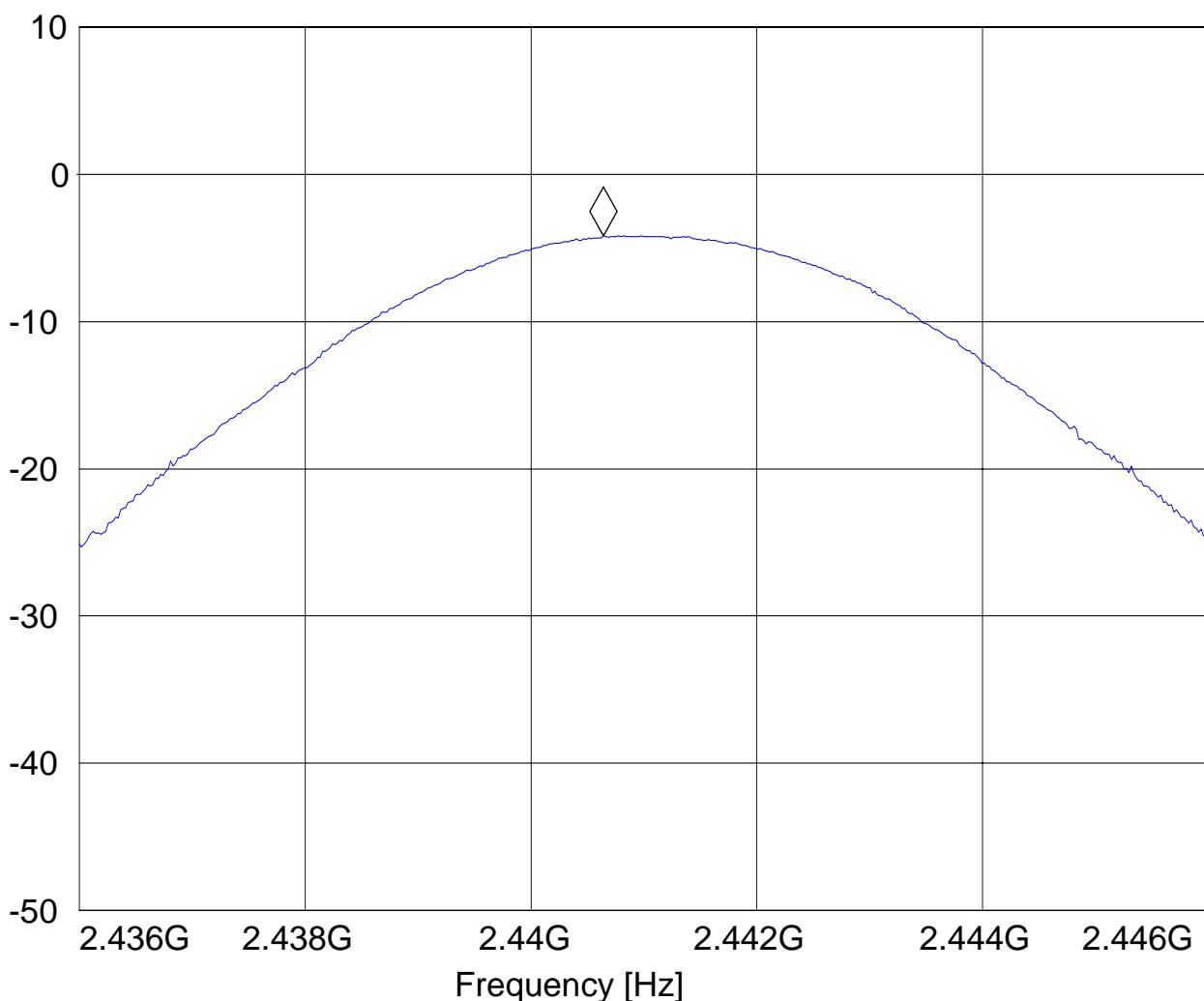
Voltage: AC ADAPTER

Comments: TT 277°

**SWEEP TABLE: "EIRP BT mid channel"**

Marker: 2.440643287 GHz -4.18 dBm

Level [dBm]



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; DQPSK; CH 78

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

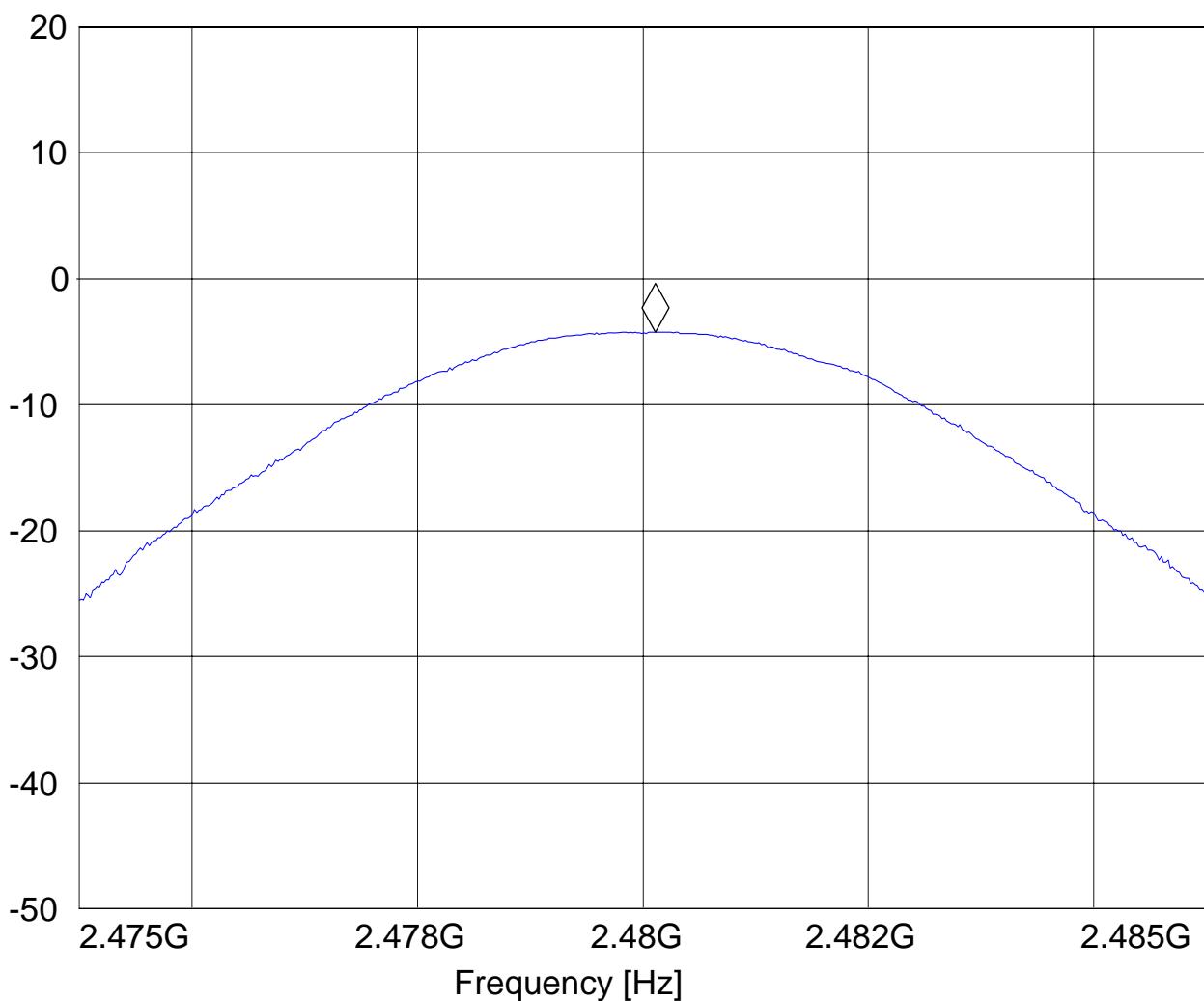
Voltage: AC ADAPTER

Comments: TT 277°

**SWEEP TABLE: "EIRP BT high channel"**

Marker: 2.48011022 GHz -4.21 dBm

Level [dBm]



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; 8DPSK; CH 0

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

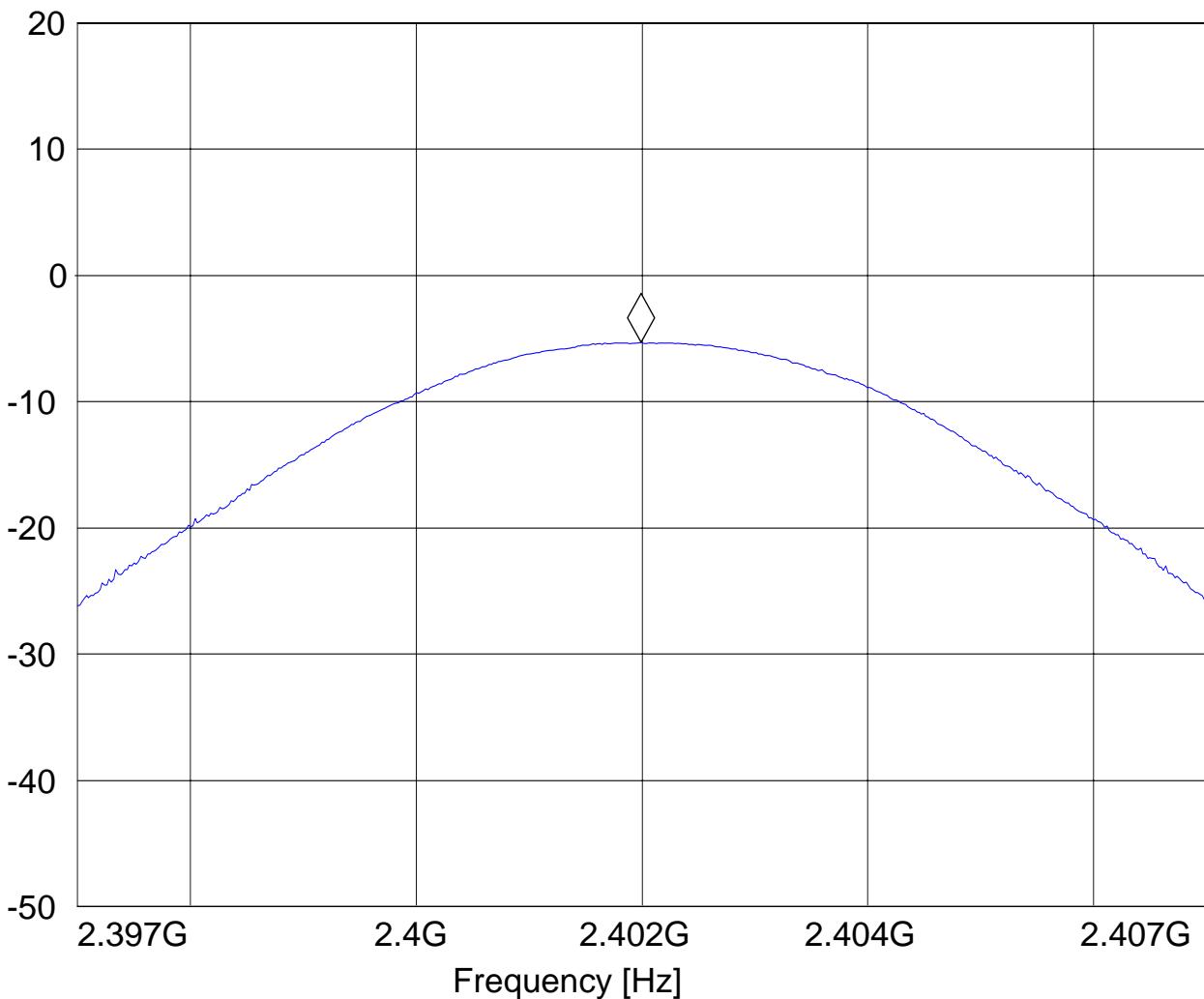
Voltage: AC ADAPTER

Comments: TT 277°

***SWEEP TABLE: "EIRP BT low channel"***

Marker: 2.40198998 GHz -5.31 dBm

Level [dBm]



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; 8DPSK; CH 39

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

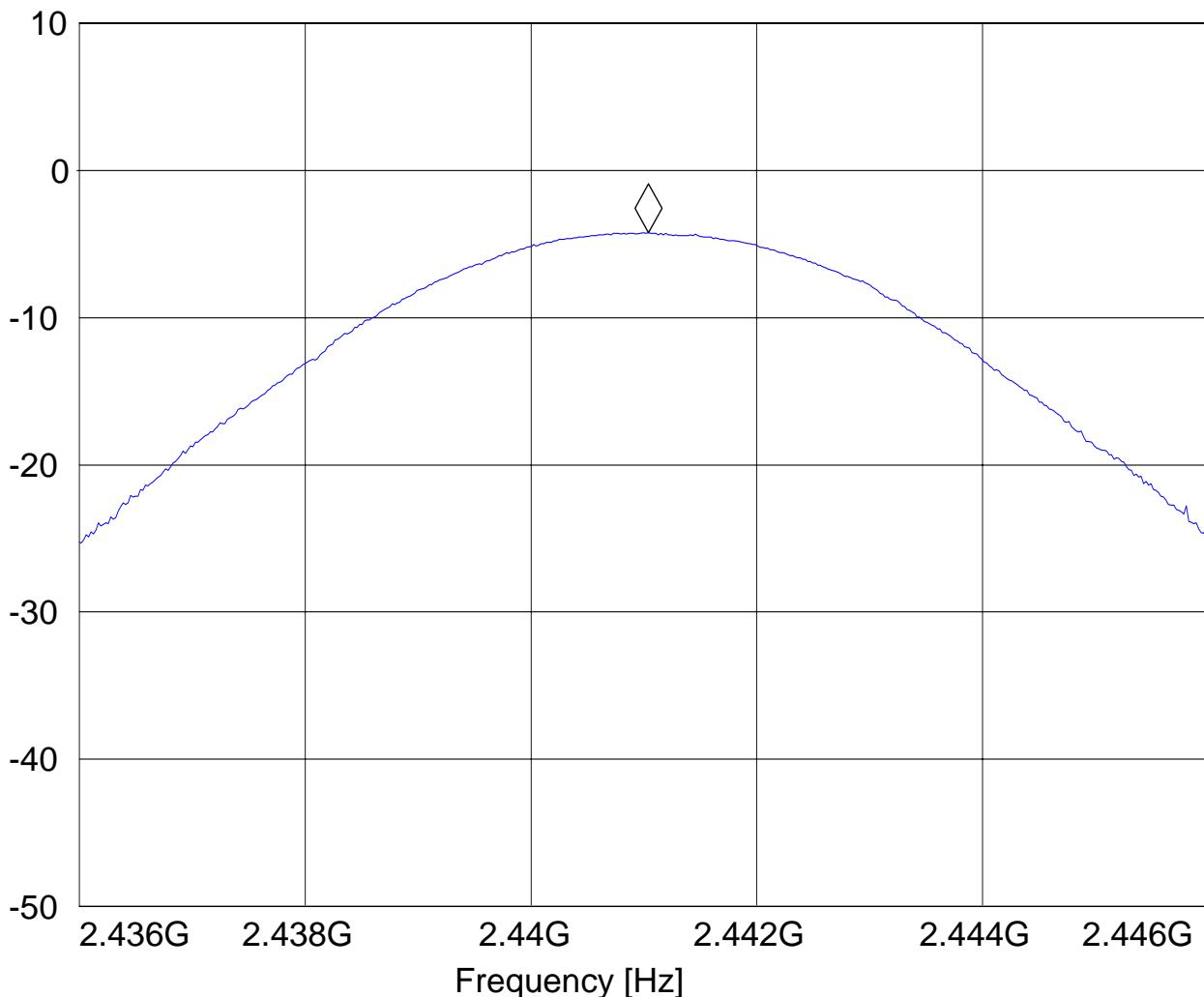
Voltage: AC ADAPTER

Comments: TT 277°

**SWEEP TABLE: "EIRP BT mid channel"**

Marker: 2.44104008 GHz -4.25 dBm

Level [dBm]



**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; 8DPSK; CH 78

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

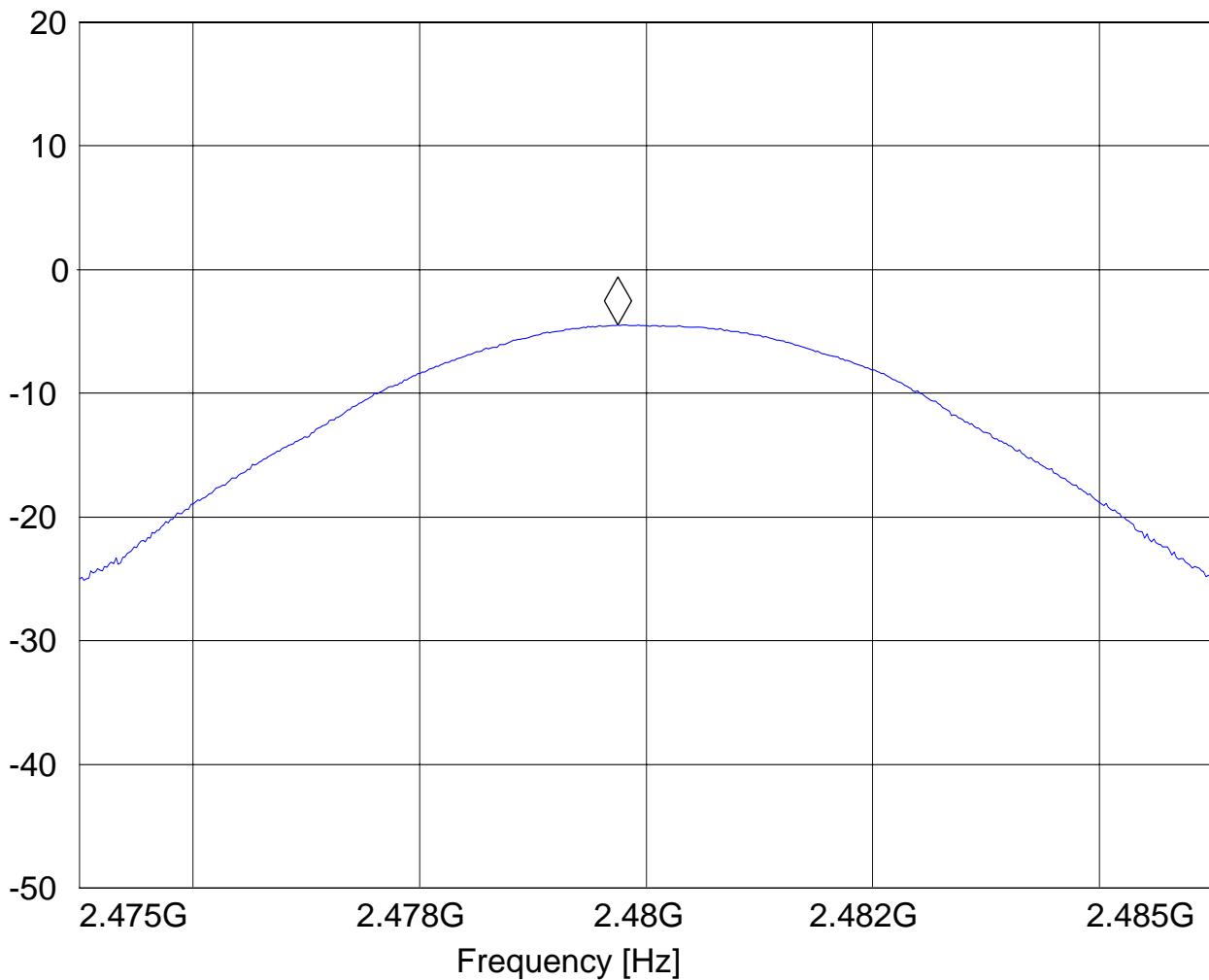
Voltage: AC ADAPTER

Comments: TT 277°

***SWEEP TABLE: "EIRP BT high channel"***

Marker: 2.479749499 GHz -4.46 dBm

Level [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
<sup>1</sup> 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	( <sup>2</sup> )
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: QC890

Customer: HAND HELD PRODUCTS, INC.

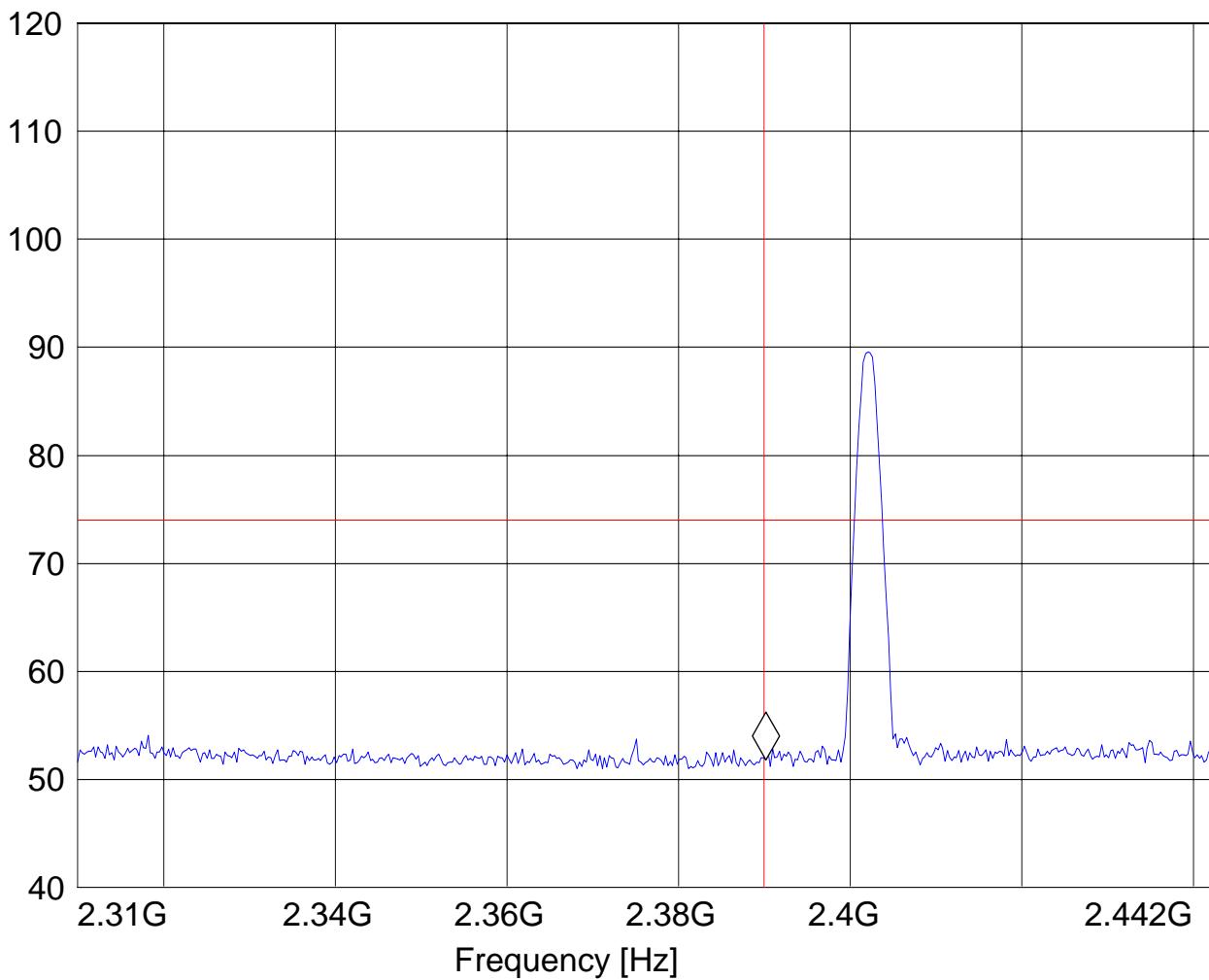
Test Mode: BT, CH 0

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

**SWEEP TABLE: "FCC15.247 LBE\_PK"**Marker: 2.390152305 GHz 51.83 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**GFSK (2402MHz) AVG****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

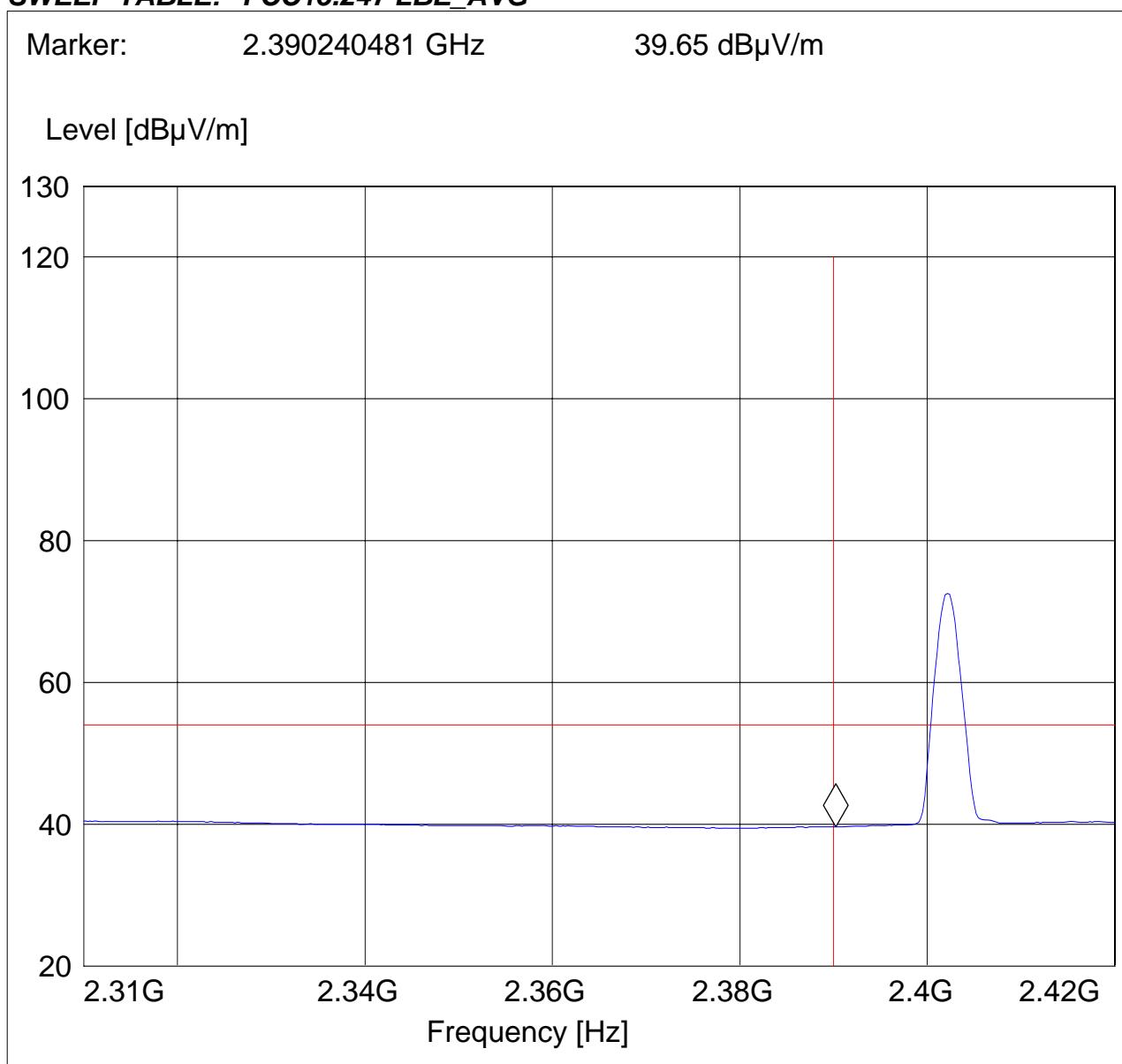
Test Mode: BT, CH 0

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

**SWEEP TABLE: "FCC15.247 LBE\_AVG"**

**Pi/4 DQPSK (2402MHz) PEAK****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 0

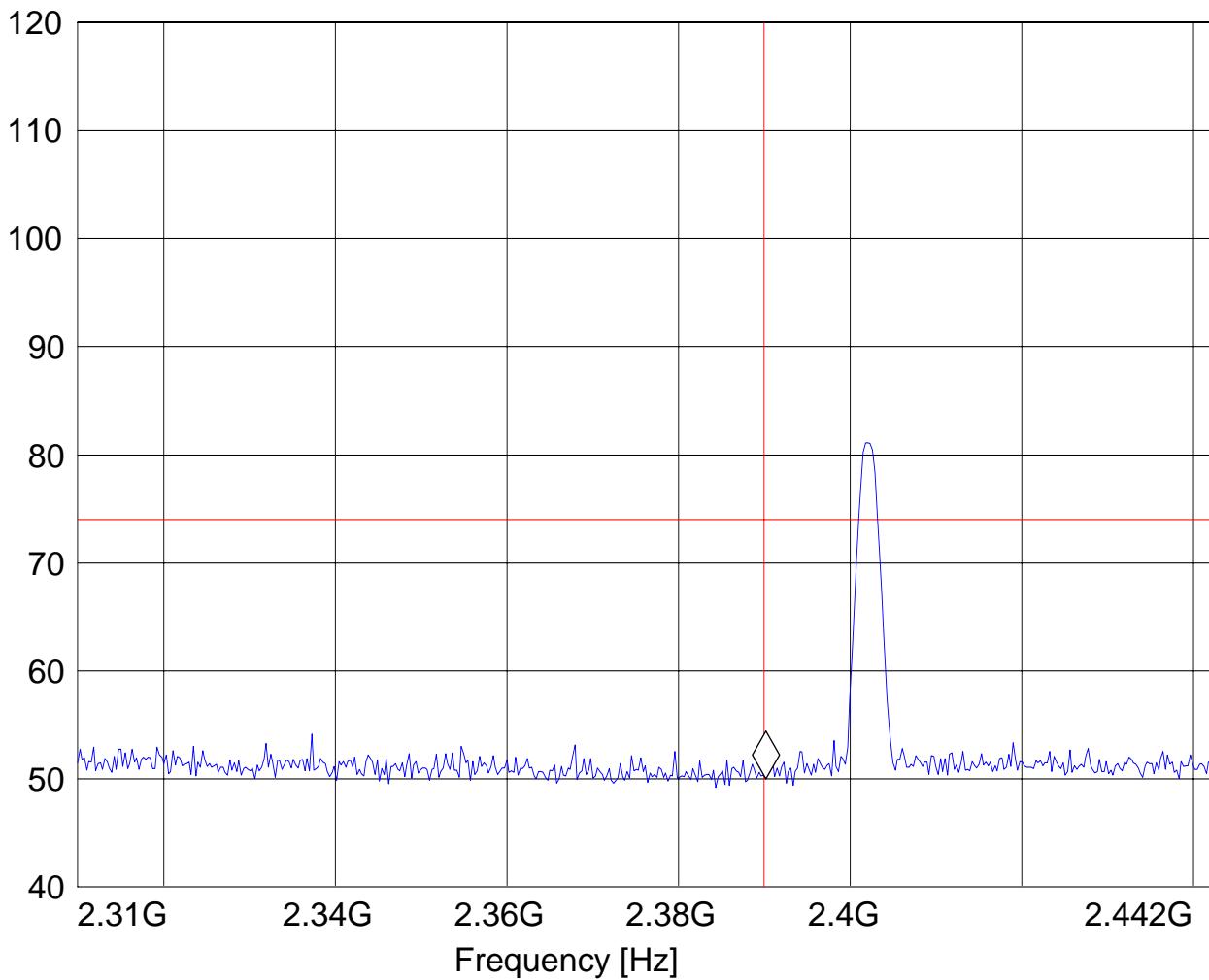
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: DQPSK

**SWEEP TABLE: "FCC15.247 LBE\_PK"**Marker: 2.390152305 GHz 50.02 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**Pi/4 DQPSK (2402MHz) AVG****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 0

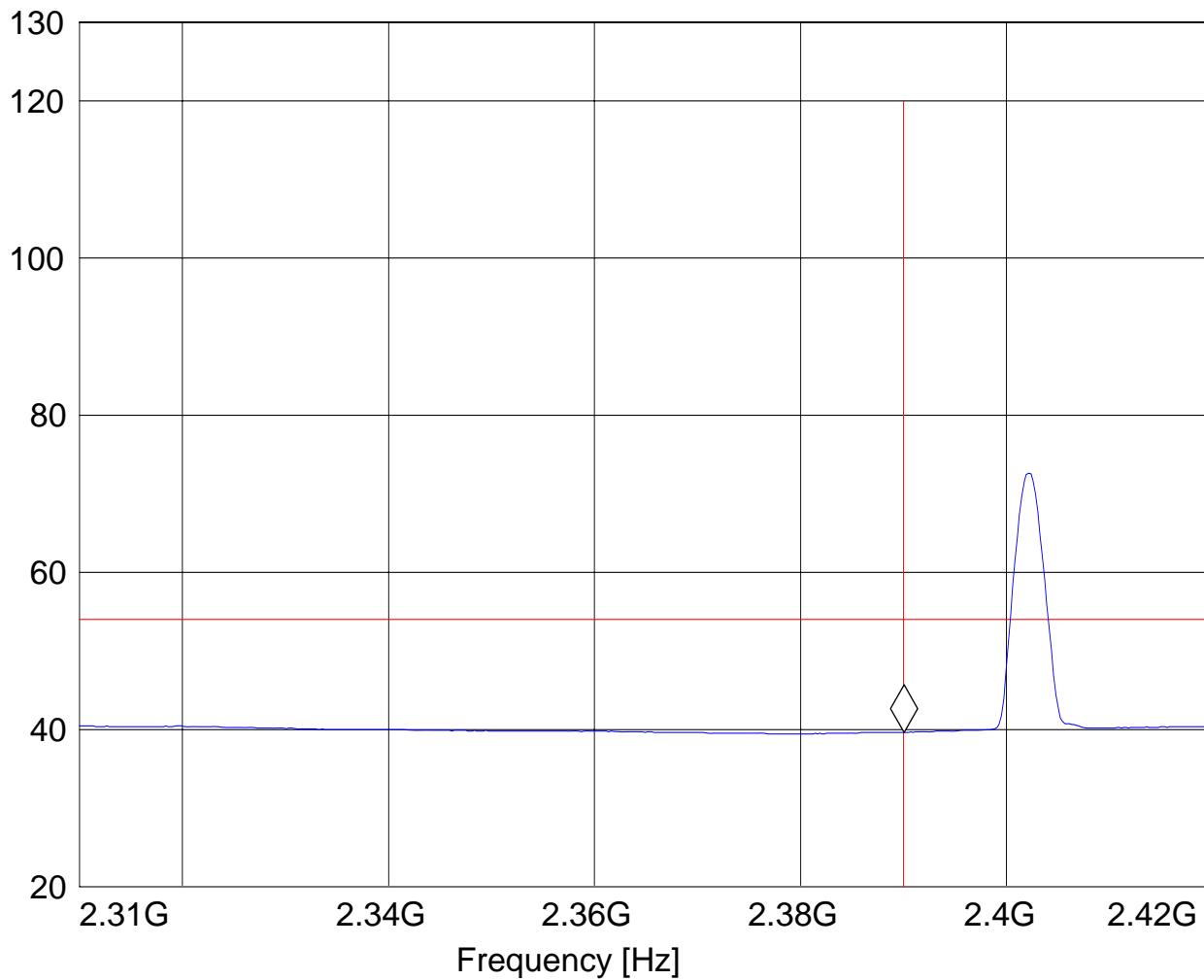
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: DQPSK

**SWEEP TABLE: "FCC15.247 LBE\_AVG"**Marker: 2.39002004 GHz 39.67 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**8DPSK (2402MHz) PEAK****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 0

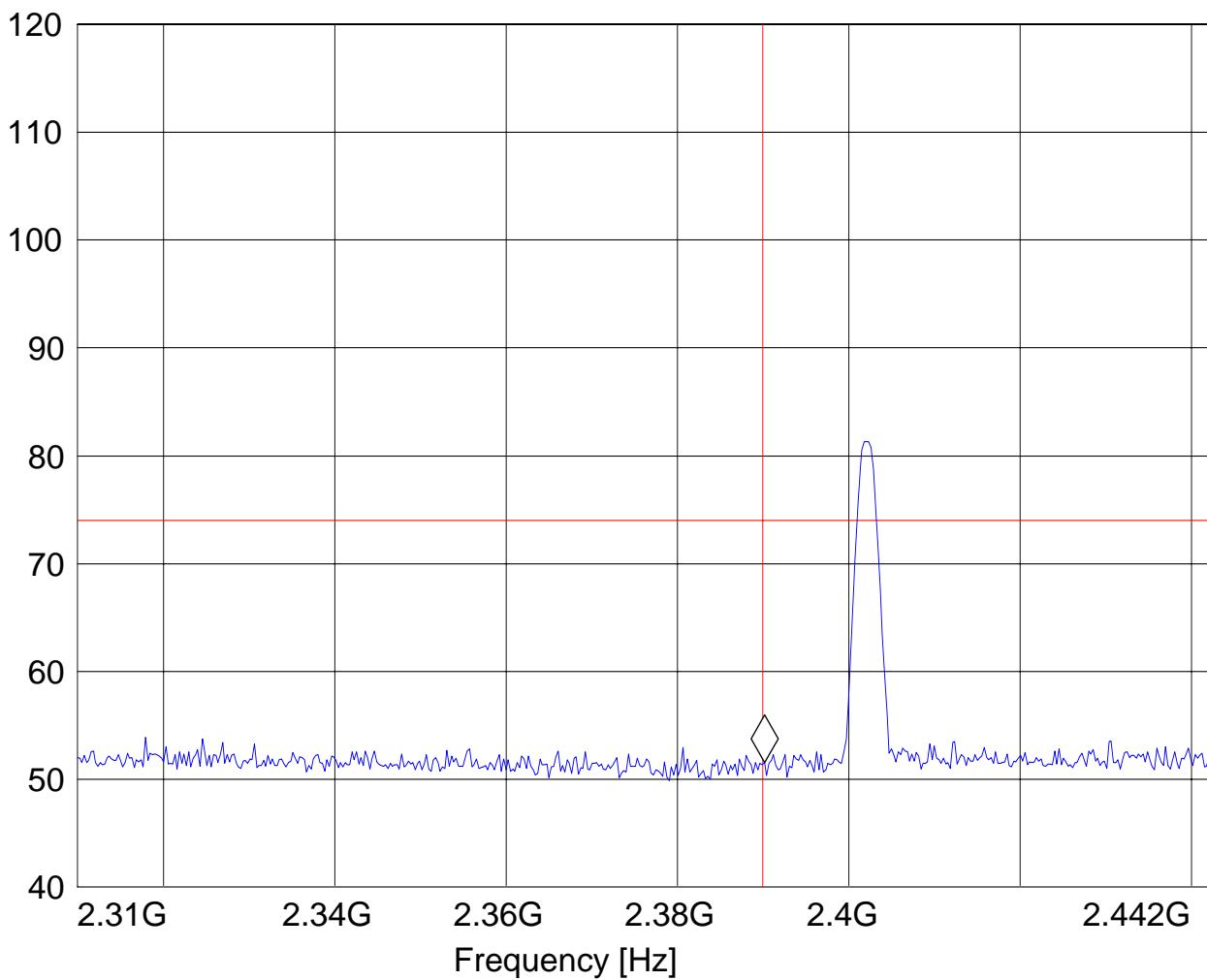
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: 8DPSK

**SWEEP TABLE: "FCC15.247 LBE\_PK"**Marker: 2.390152305 GHz 51.53 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**8DPSK (2402MHz) AVG****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 0

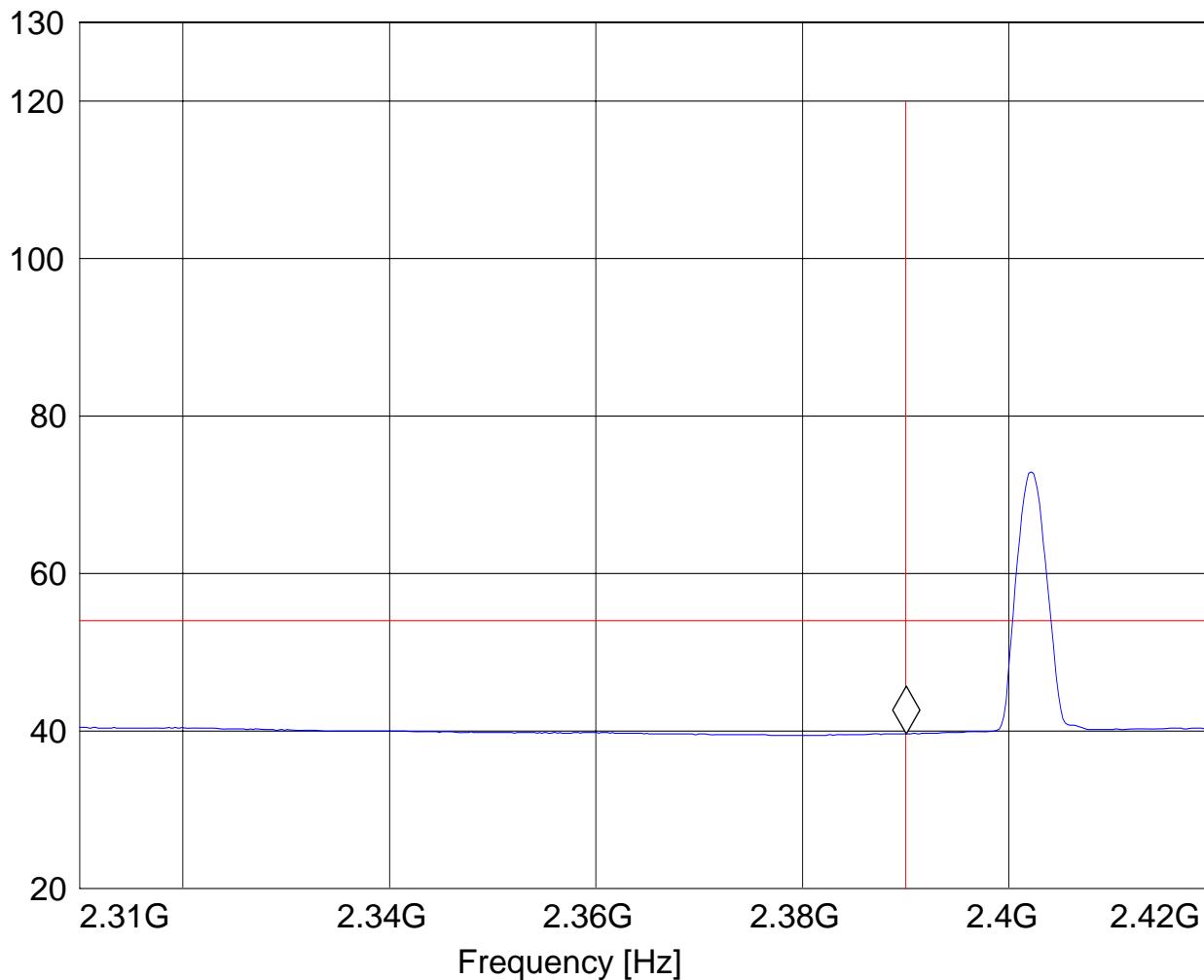
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: 8DPSK

**SWEEP TABLE: "FCC15.247 LBE\_AVG"**Marker: 2.39002004 GHz 39.66 dB $\mu$ V/mLevel [dB $\mu$ V/m]

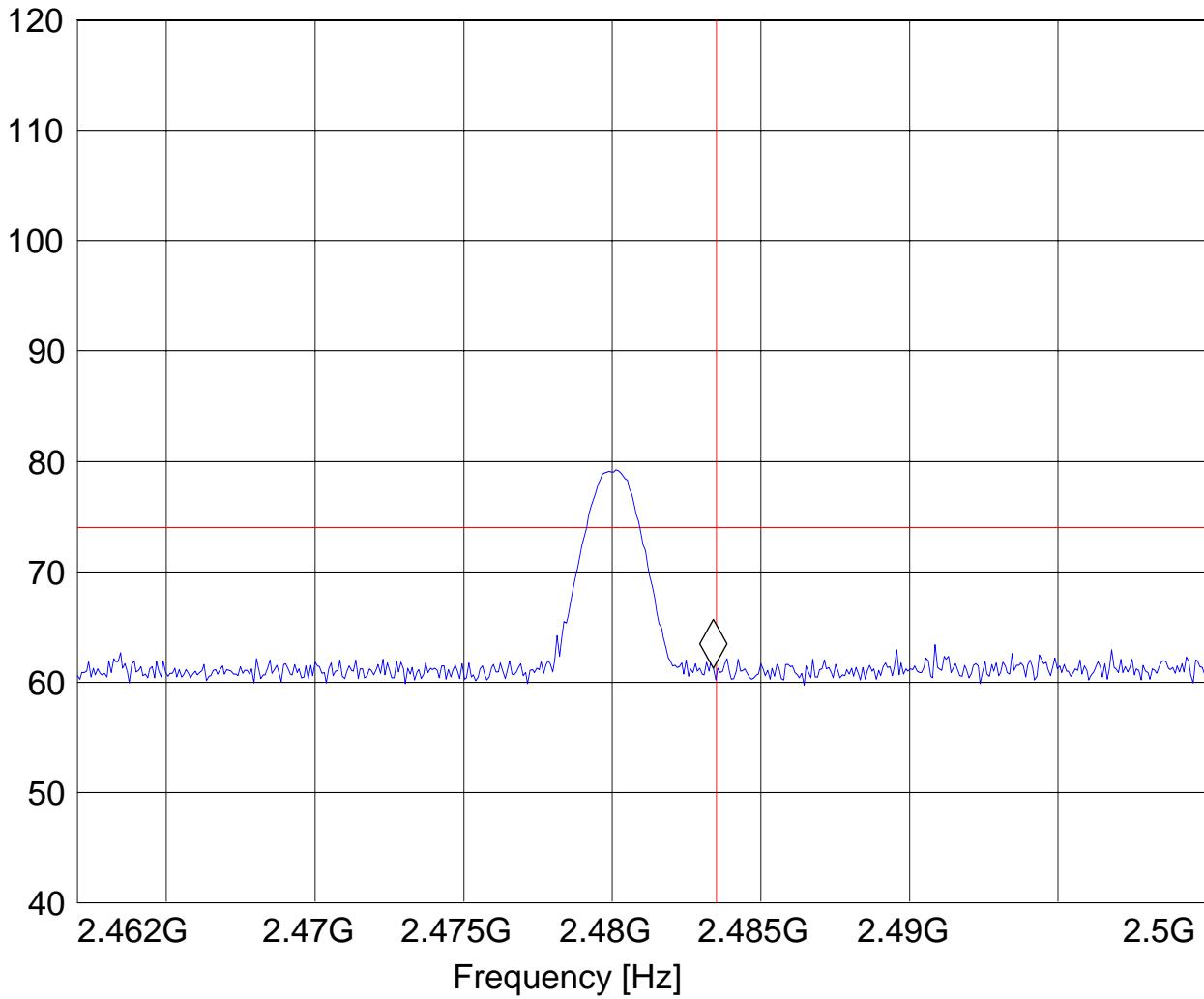
**5.2.3 Results Upper Restricted Band 2483.5 MHz to 2500 MHz****GFSK (2480MHz) PEAK***411 Dixon Landing Road, Milpitas CA 95035, USA*

EUT: QC890  
Customer: HAND HELD PRODUCTS, INC.  
Test Mode: BT, CH 78  
ANT Orientation: V  
EUT Orientation: H  
Test Engineer: SAM  
Voltage: AC ADAPTOR  
Comments:

*SWEET TABLE: "FCC15.247 HBE\_PK"*

Marker: 2.483398798 GHz 61.25 dB $\mu$ V/m

Level [dB $\mu$ V/m]



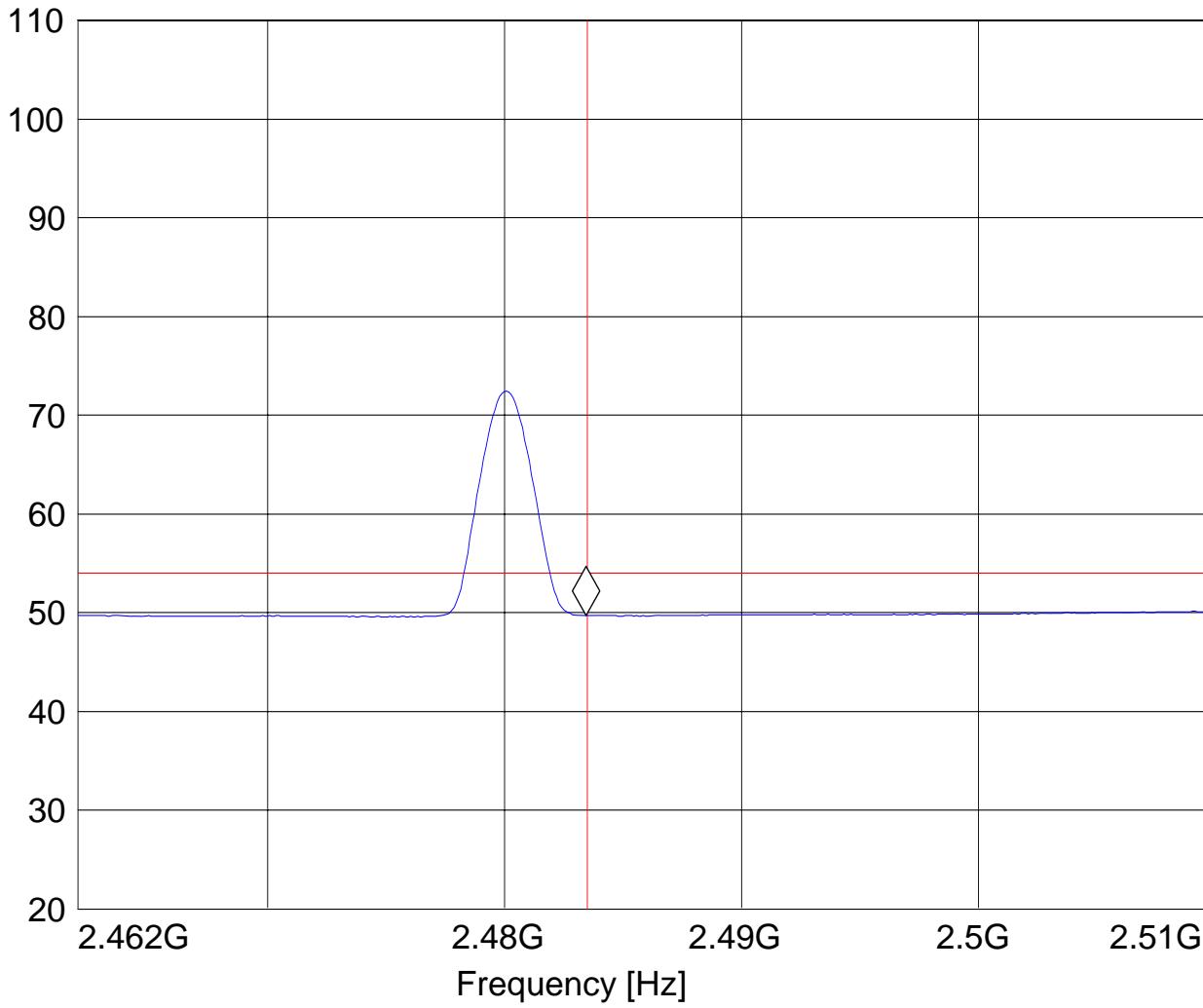
**GFSK (2480MHz) AVG***411 Dixon Landing Road, Milpitas CA 95035, USA*

EUT: QC890  
Customer: HAND HELD PRODUCTS, INC.  
Test Mode: BT, CH 78  
ANT Orientation: V  
EUT Orientation: H  
Test Engineer: SAM  
Voltage: AC ADAPTOR  
Comments:

***SWEEP TABLE: "FCC15.247 HBE\_AVG"***

Marker: 2.483450902 GHz 49.71 dB $\mu$ V/m

Level [dB $\mu$ V/m]



**Pi/4 DQPSK (2480MHz) PEAK****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 78

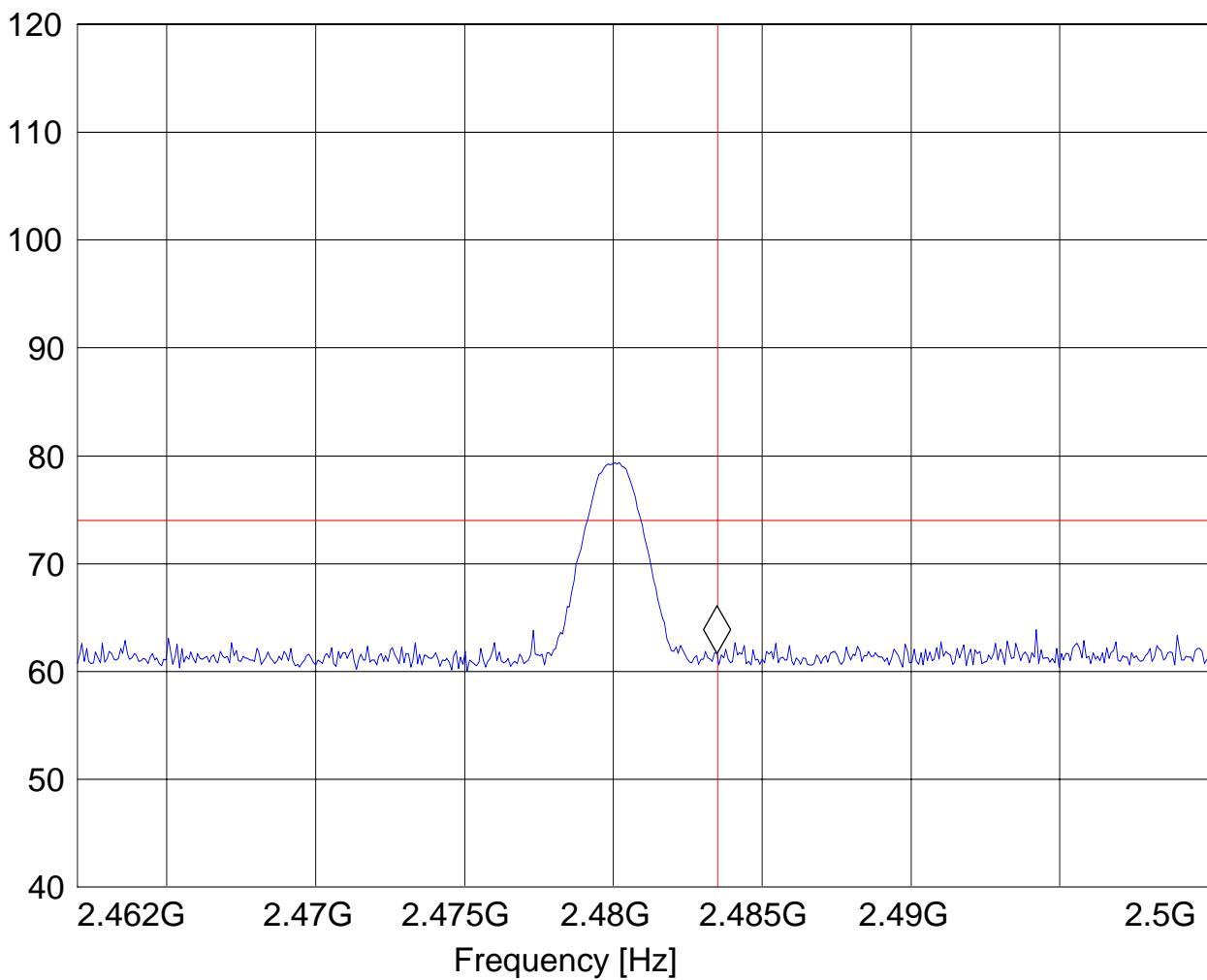
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: DQPSK

**SWEEP TABLE: "FCC15.247 HBE\_PK"**Marker: 2.48347495 GHz 61.69 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**Pi/4 DQPSK (2480MHz) AVG****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 78

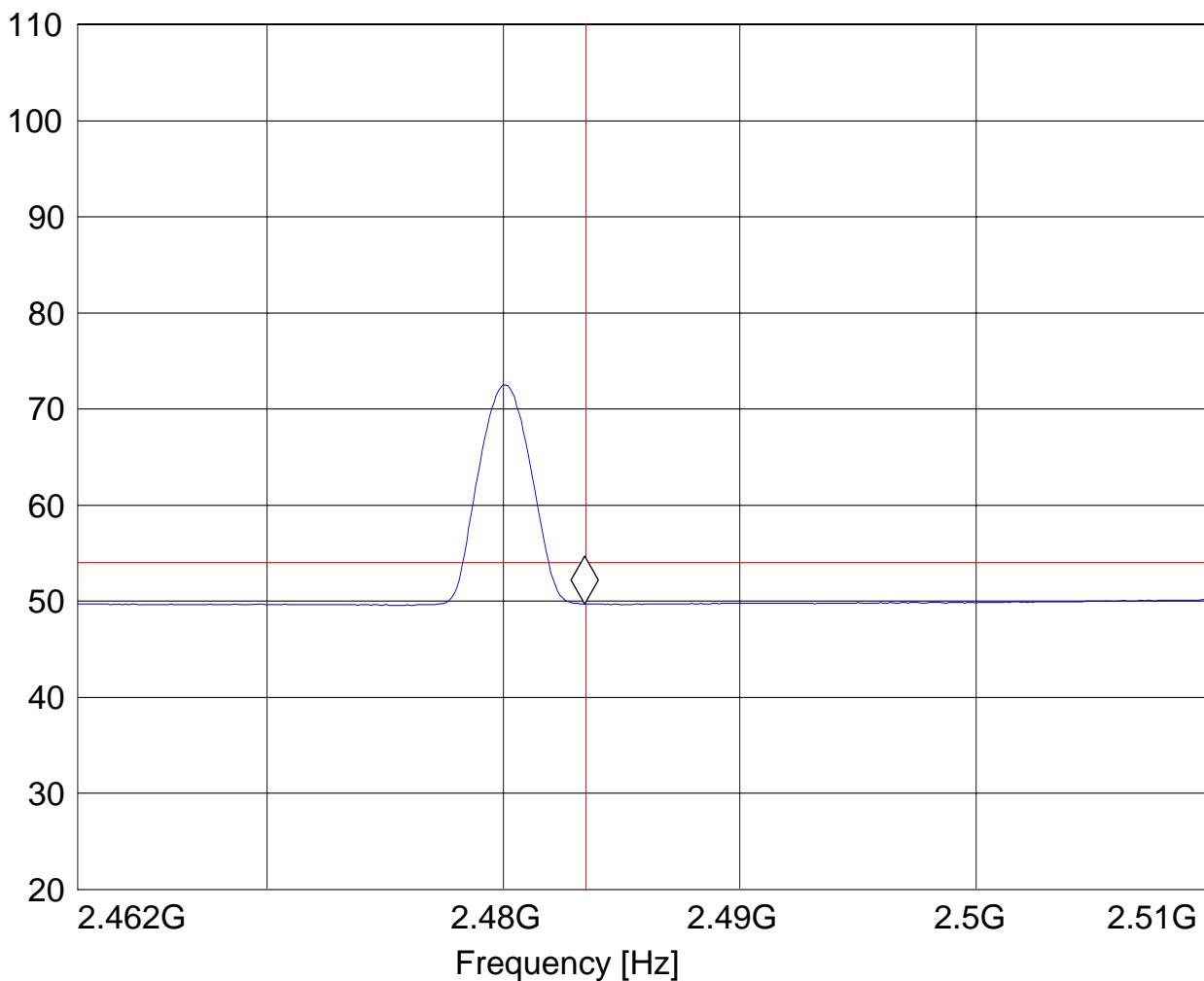
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: DQPSK

**SWEEP TABLE: "FCC15.247 HBE\_AVG"**Marker: 2.483450902 GHz 49.71 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**8DPSK (2480MHz) PEAK****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 78

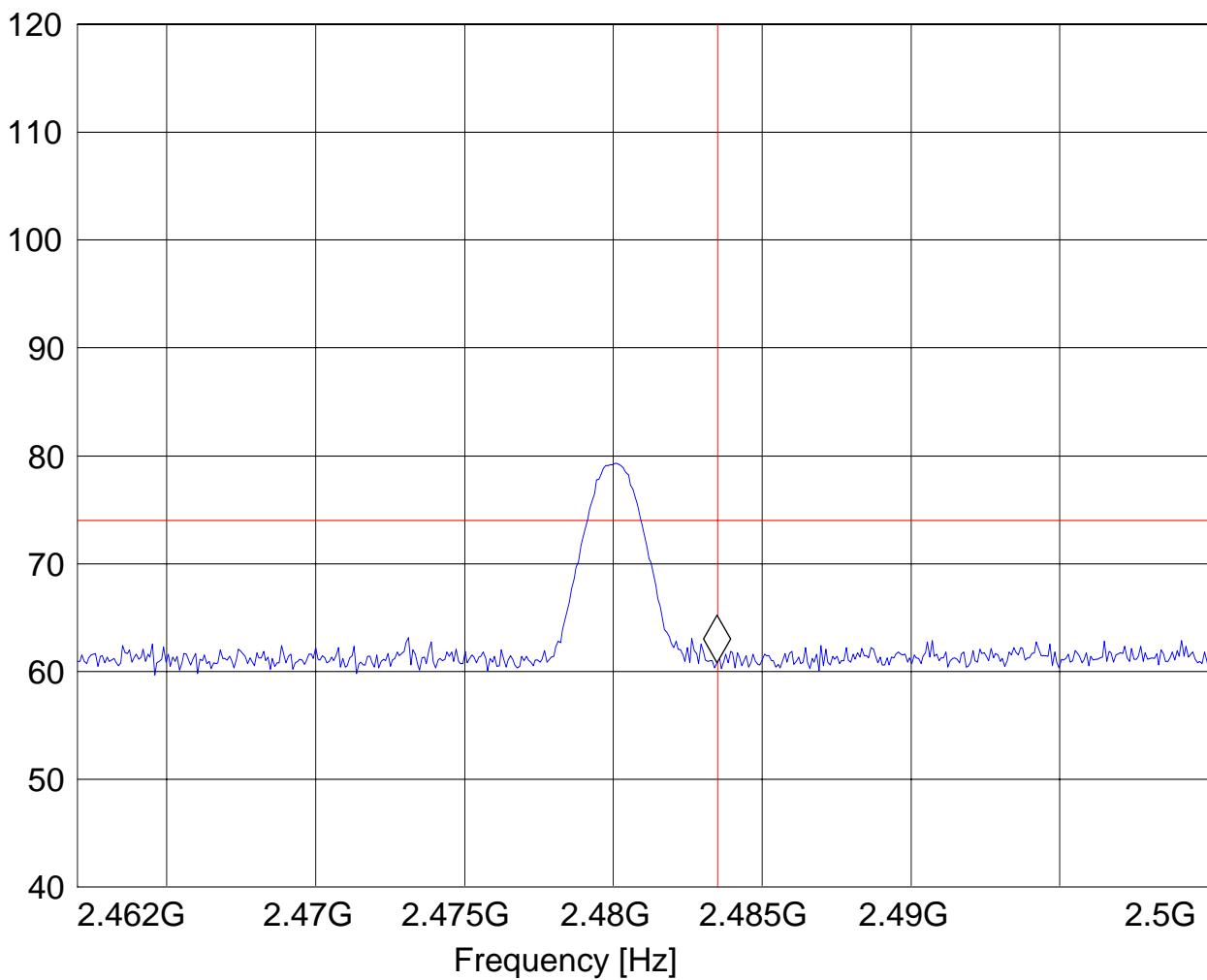
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: 8DPSK

**SWEEP TABLE: "FCC15.247 HBE\_PK"**Marker: 2.48347495 GHz 60.78 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**8DPSK (2480MHz) AVG****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 78

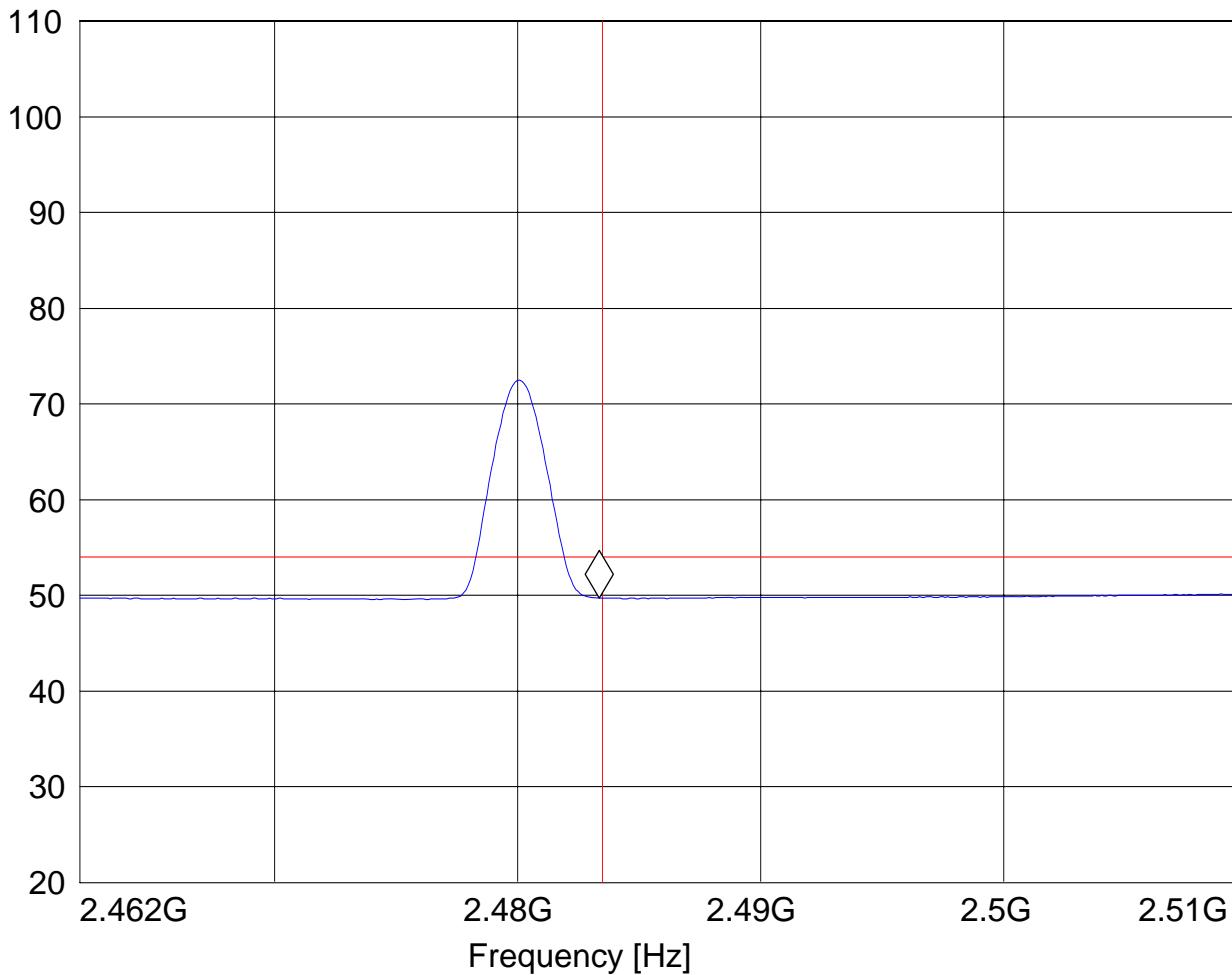
ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: 8DPSK

**SWEEP TABLE: "FCC15.247 HBE\_AVG"**Marker: 2.483354709 GHz 49.7 dB $\mu$ V/mLevel [dB $\mu$ 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
<sup>1</sup> 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	( <sup>2</sup> )
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: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 39

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

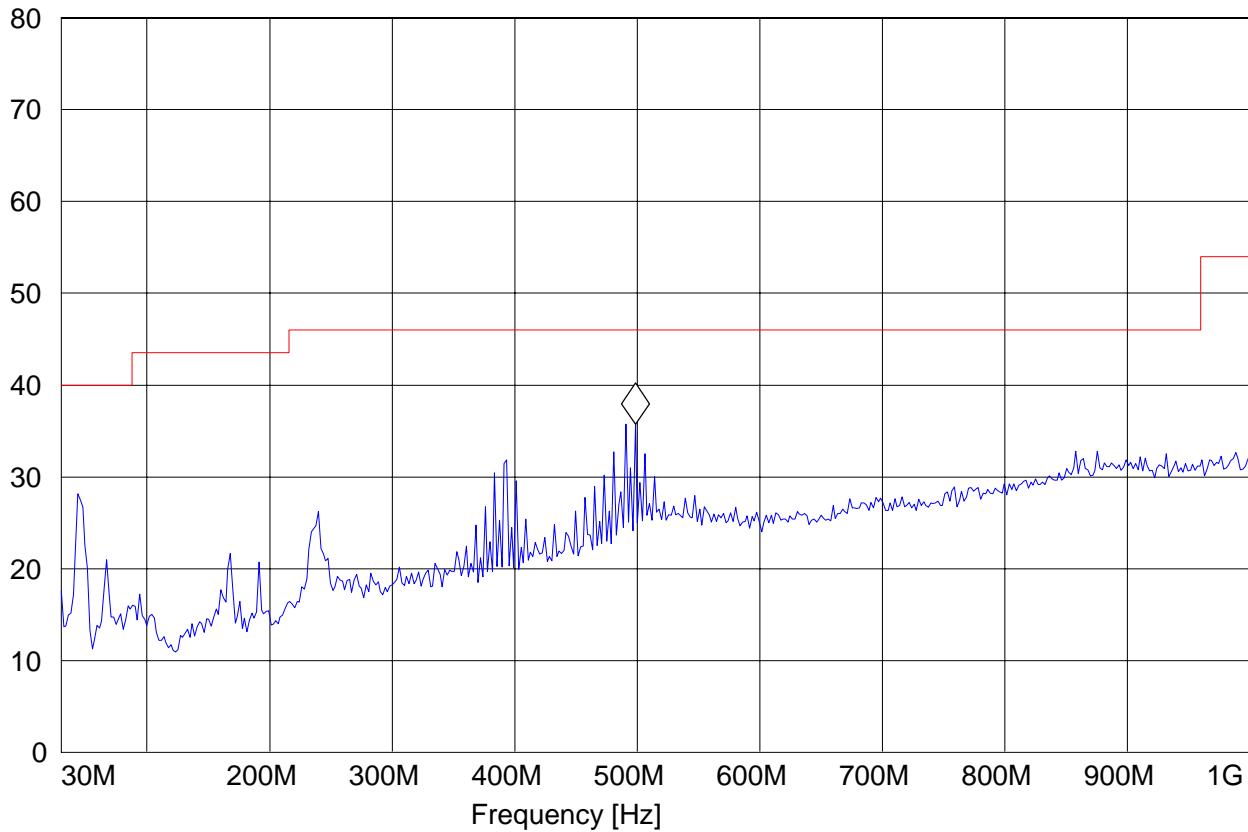
Comments: Scanner on

#### ***SWEEP TABLE: "FCC15.247\_30M-1G\_Ver"***

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

Marker: 498.476954 MHz 35.77 dB $\mu$ V/m

Level [dB $\mu$ V/m]



**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: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH 0

ANT Orientation: H

EUT Orientation: H

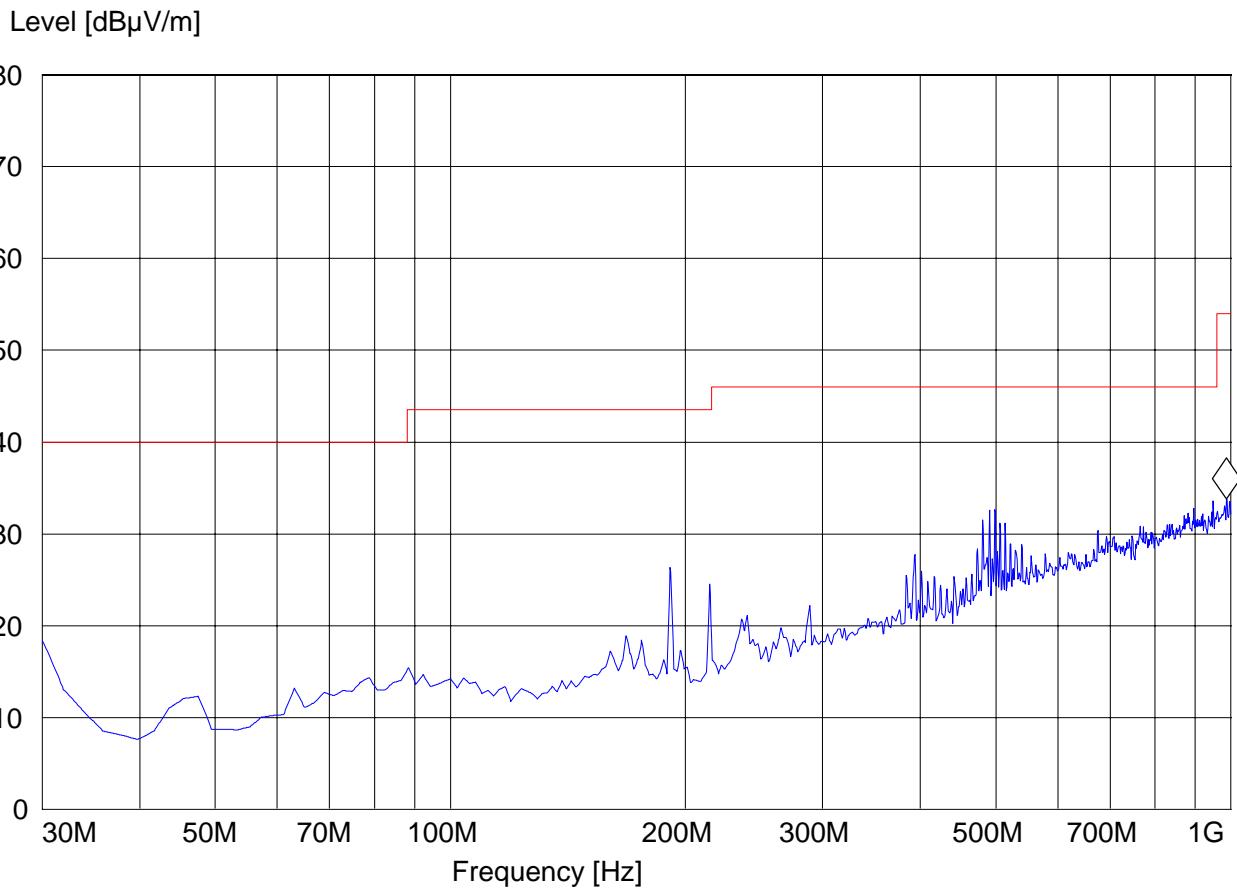
Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: Canner on

***SWEEP TABLE: "FCC15.247\_30M-1G\_Hor"***

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

Marker: 986.392786 MHz 33.77 dB $\mu$ V/m

**1-3GHz (2402MHz)****Note: The peaks above the limit line is the carrier freq.****Note: Peak Reading vs. Average limit****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; GFSK; CH 0

ANT Orientation: V

EUT Orientation: H

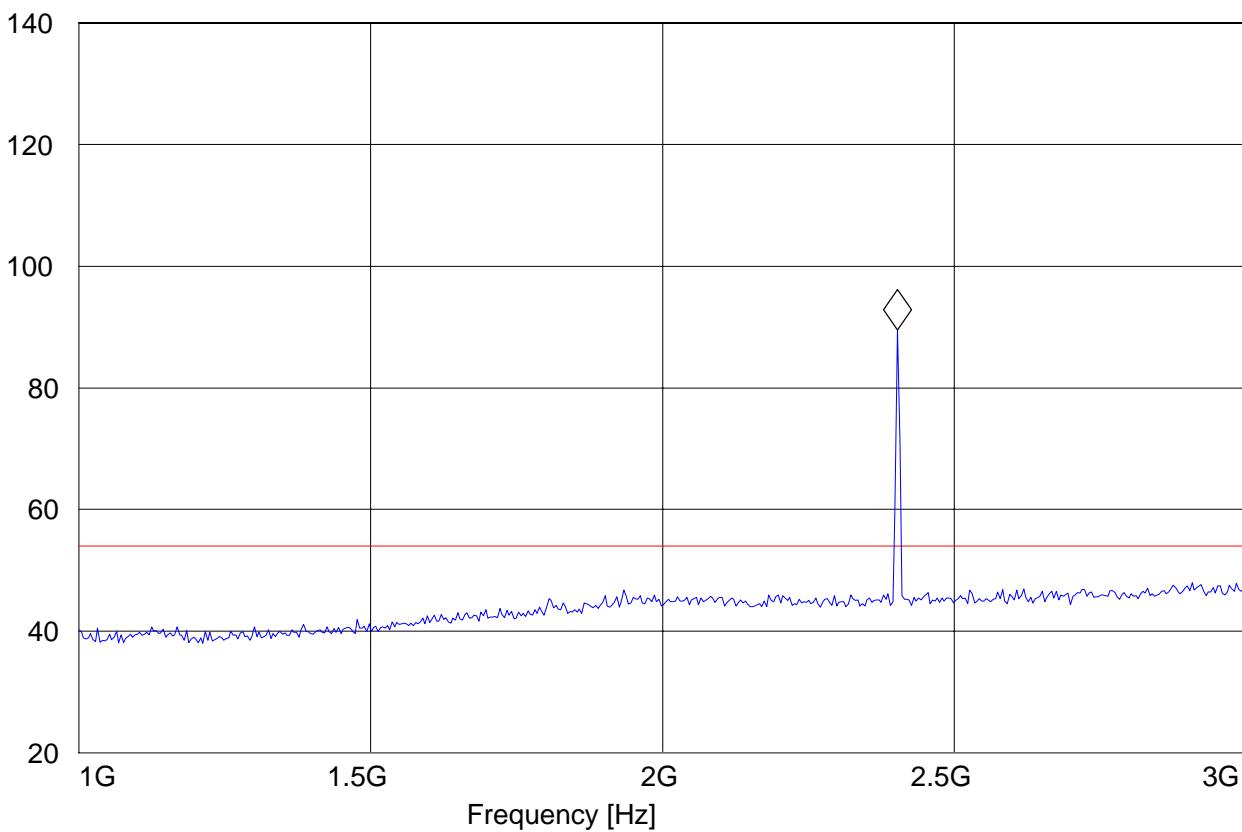
Test Engineer: SAM

Voltage: AC ADAPTER

Comments: TT 277°

***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 89.53 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**1-3GHz (2441MHz)****Note: The peaks above the limit line is the carrier freq.****Note: Peak Reading vs. Average limit****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; GFSK; CH 39

ANT Orientation: V

EUT Orientation: H

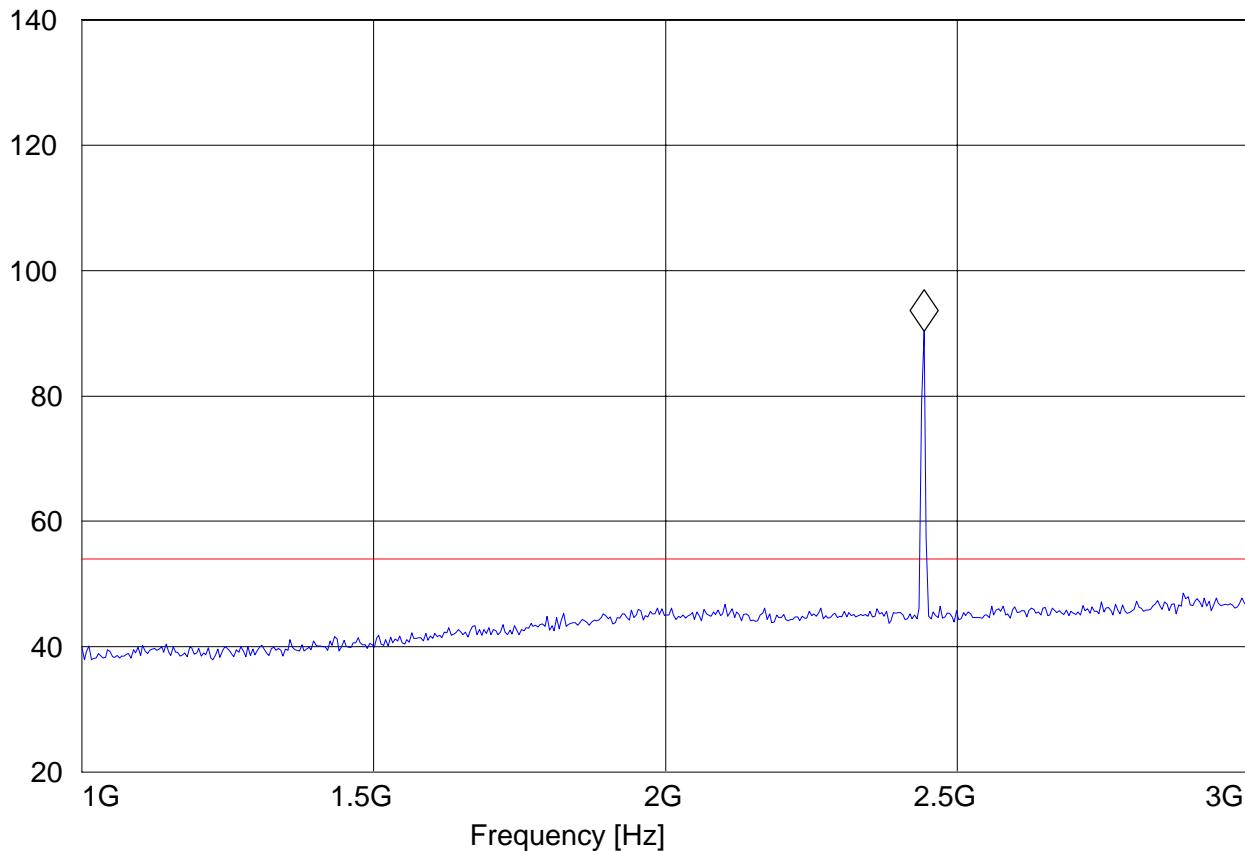
Test Engineer: SAM

Voltage: AC ADAPTER

Comments: TT 277°

***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 90.28 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**1-3GHz (2480MHz)****Note: The peaks above the limit line is the carrier freq.****Note: Peak Reading vs. Average limit****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH78

ANT Orientation: V

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

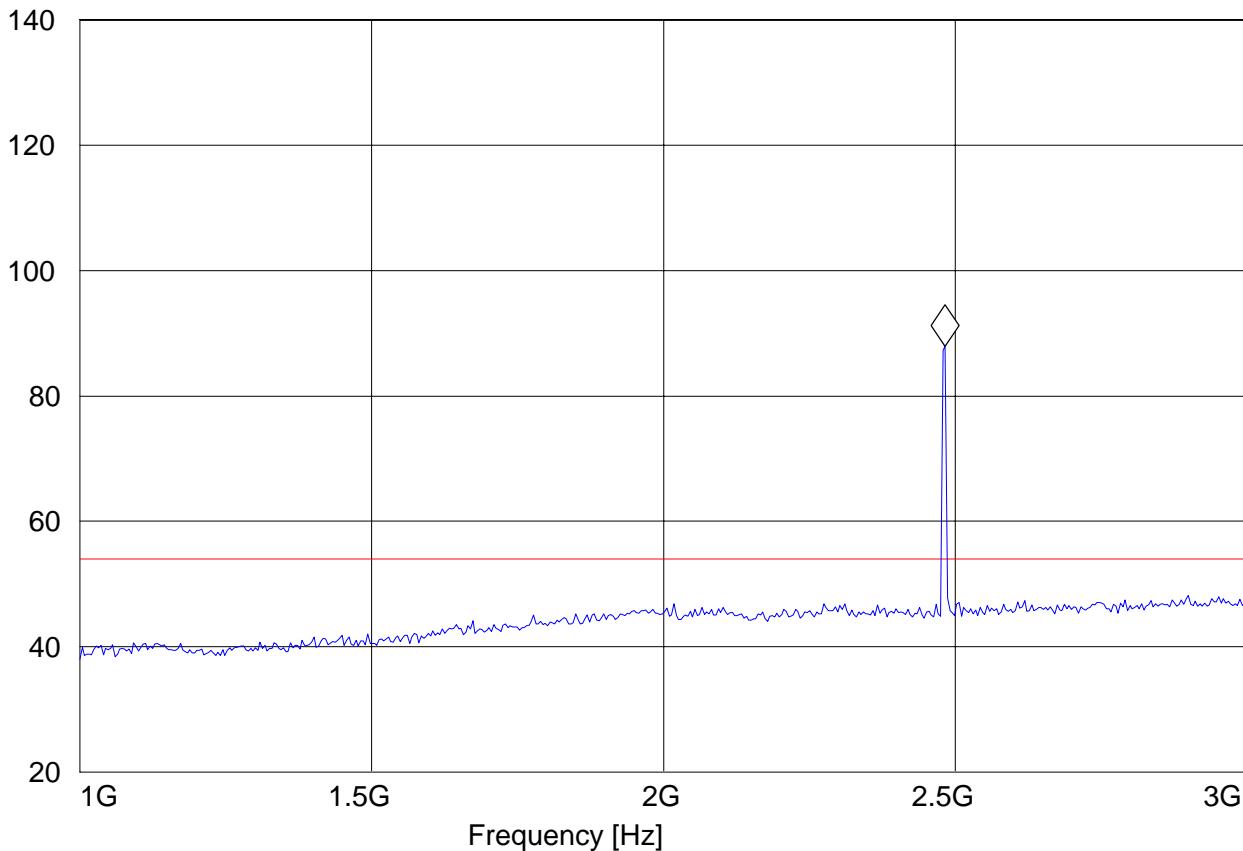
Comments: marker placed on uplink

***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 87.88 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**3-18GHz (2402MHz)****Note: Peak Reading vs. Average limit****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; GFSK; CH 0

ANT Orientation: H

EUT Orientation: H

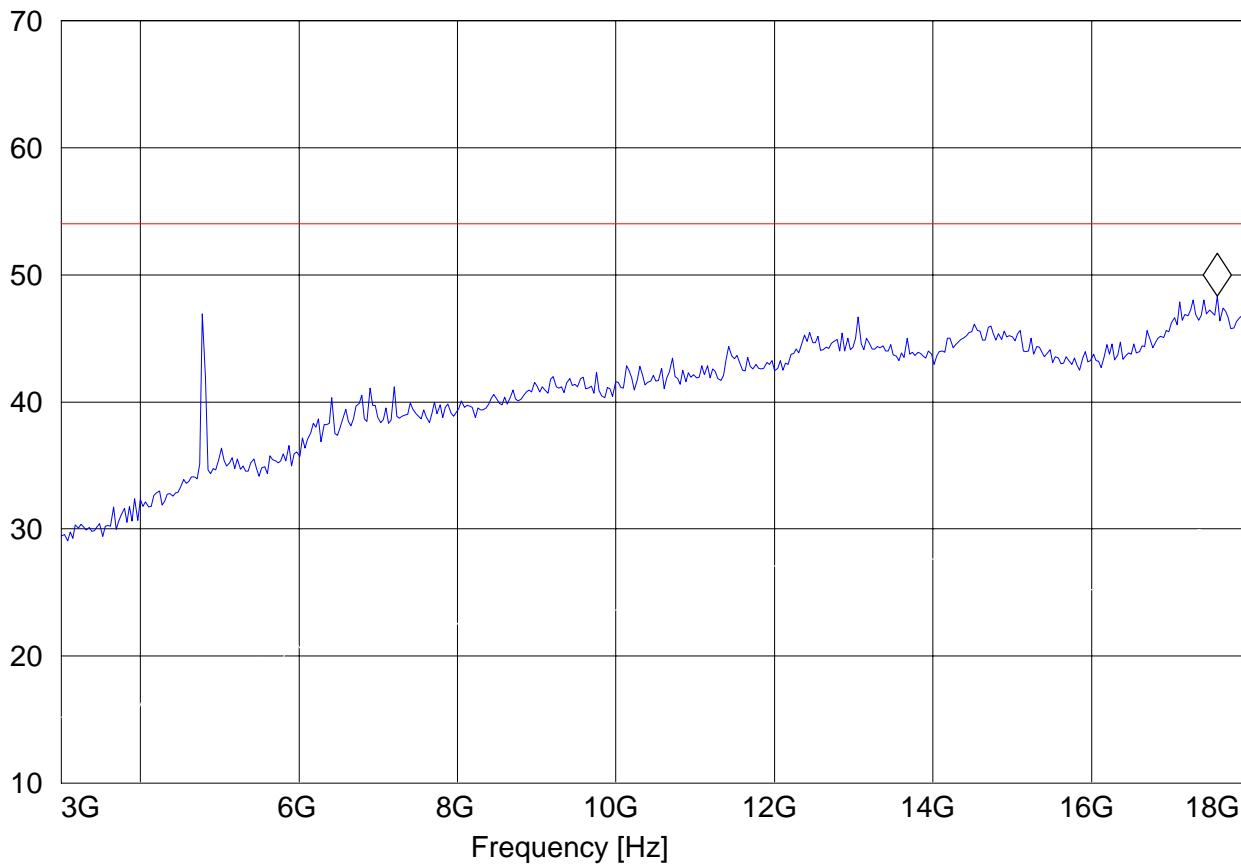
Test Engineer: SAM

Voltage: AC ADAPTER

Comments: TT 277°

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

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

Marker: 17.591182365 GHz 48.31 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; GFSK; CH 0

ANT Orientation: V

EUT Orientation: H

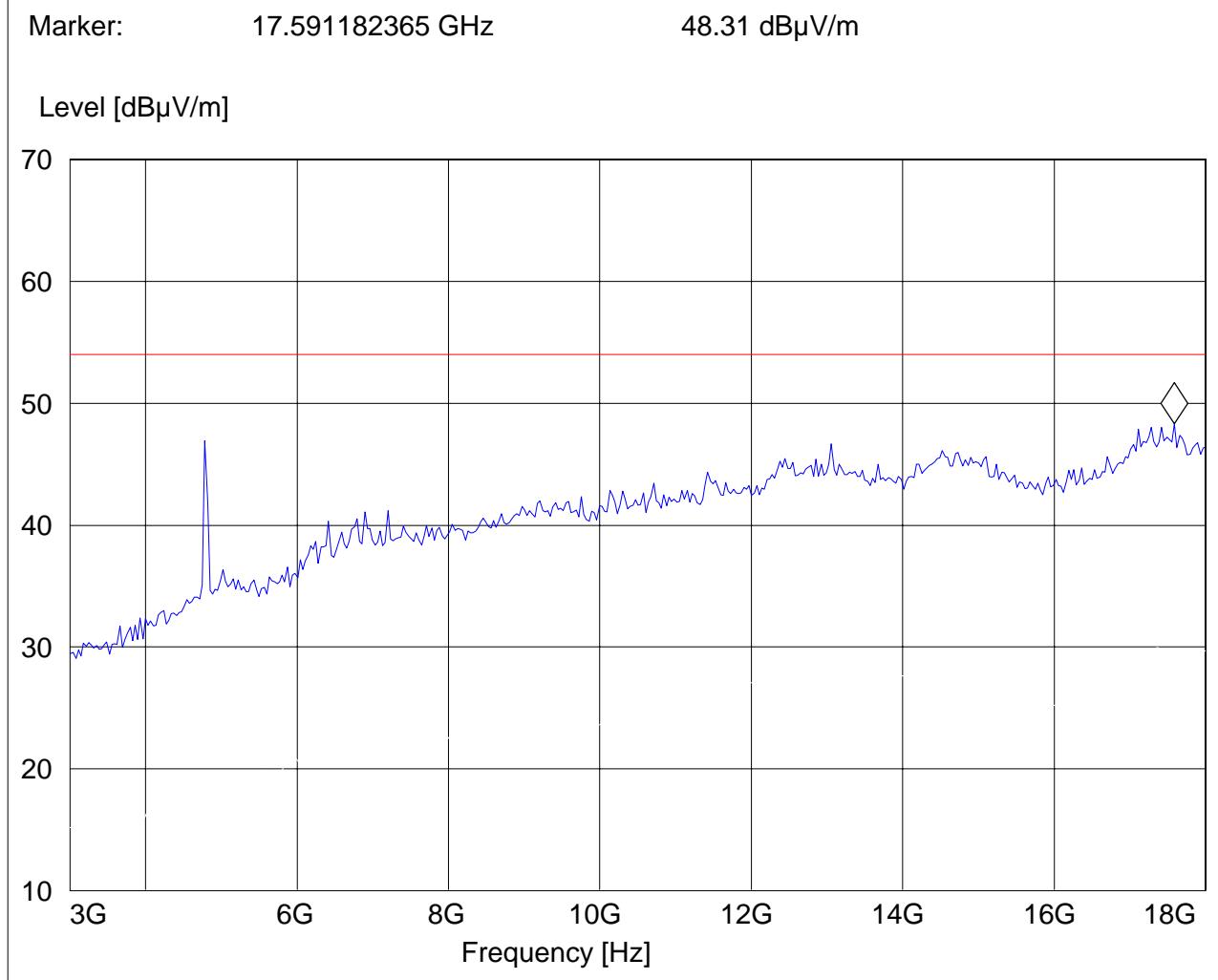
Test Engineer: SAM

Voltage: AC ADAPTER

Comments: TT 277°

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

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



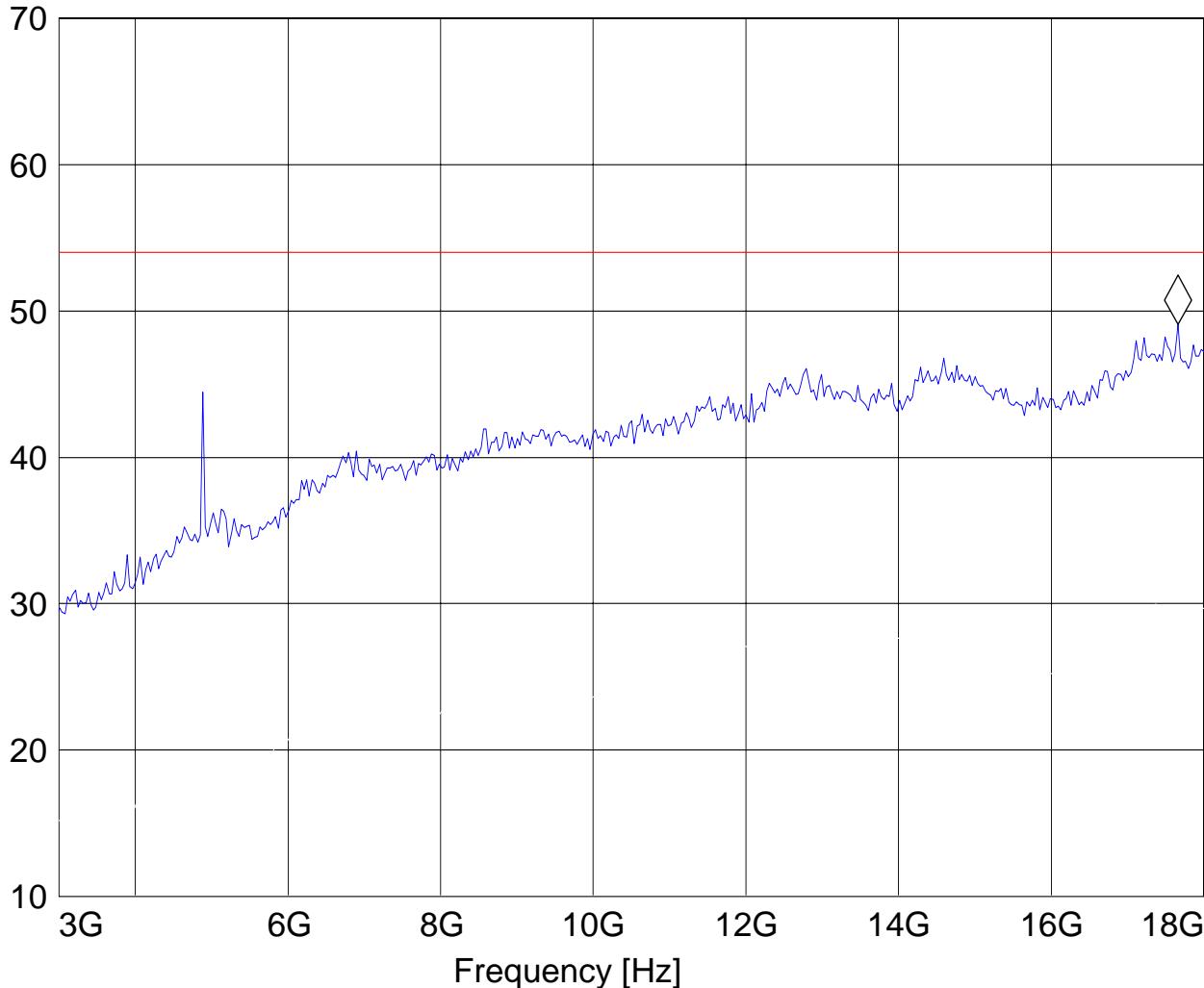
**3-18GHz (2441MHz)****Note: Peak Reading vs. Average limit***411 Dixon Landing Road, Milpitas CA 95035, USA*

EUT: QC890  
Customer: HAND HELD PRODUCTS, INC.  
Test Mode: BT, CH39  
ANT Orientation: H  
EUT Orientation: H  
Test Engineer: SAM  
Voltage: AC ADAPTOR  
Comments:

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

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

Marker: 17.659318637 GHz 49.08 dB $\mu$ V/m

**Level [dB $\mu$ V/m]**

**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT; GFSK; CH 39

ANT Orientation: V

EUT Orientation: H

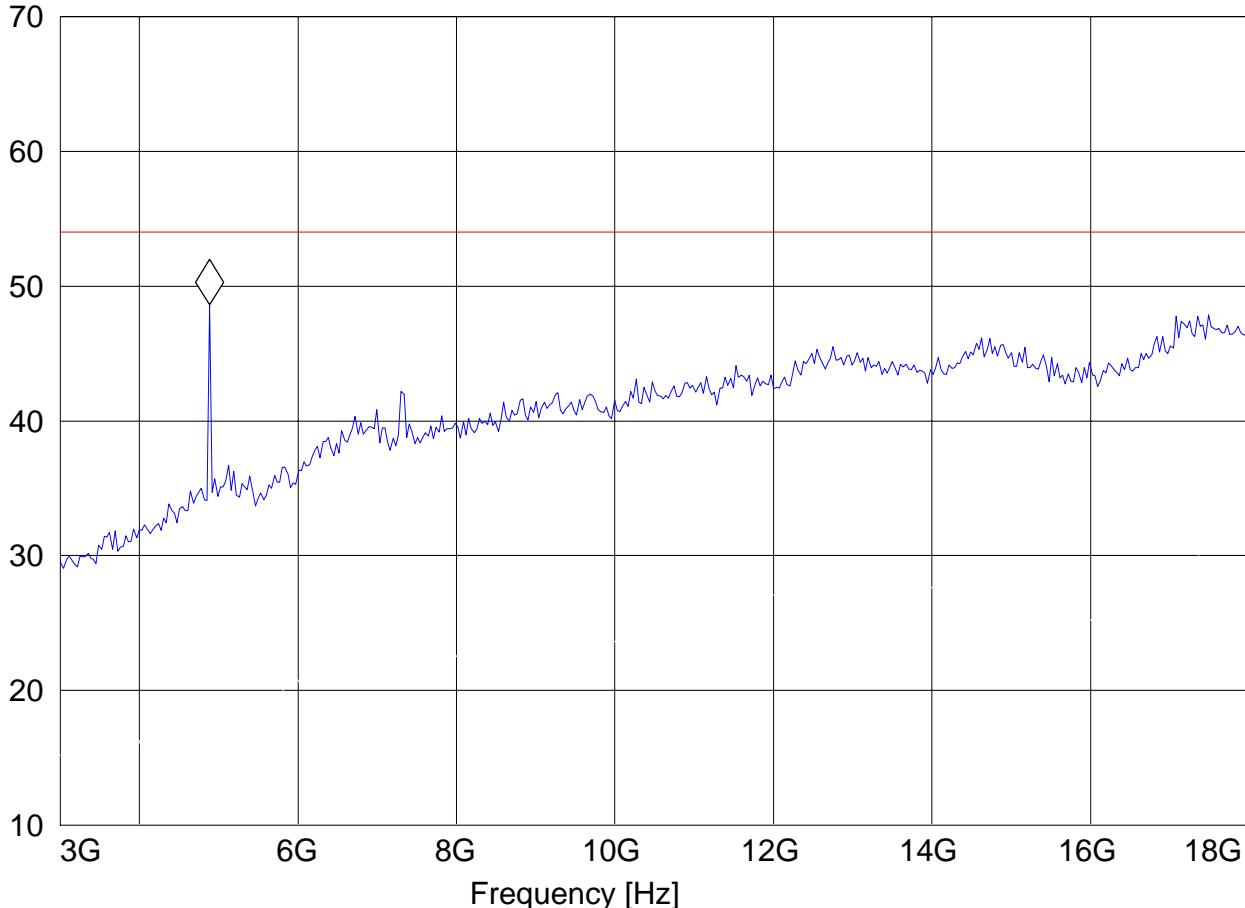
Test Engineer: SAM

Voltage: AC ADAPTER

Comments: TT 277°

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

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

Marker: 4.883767535 GHz 48.62 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**3-18GHz (2480MHz)****Note: Peak Reading vs. Average limit****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH78

ANT Orientation: V

EUT Orientation: H

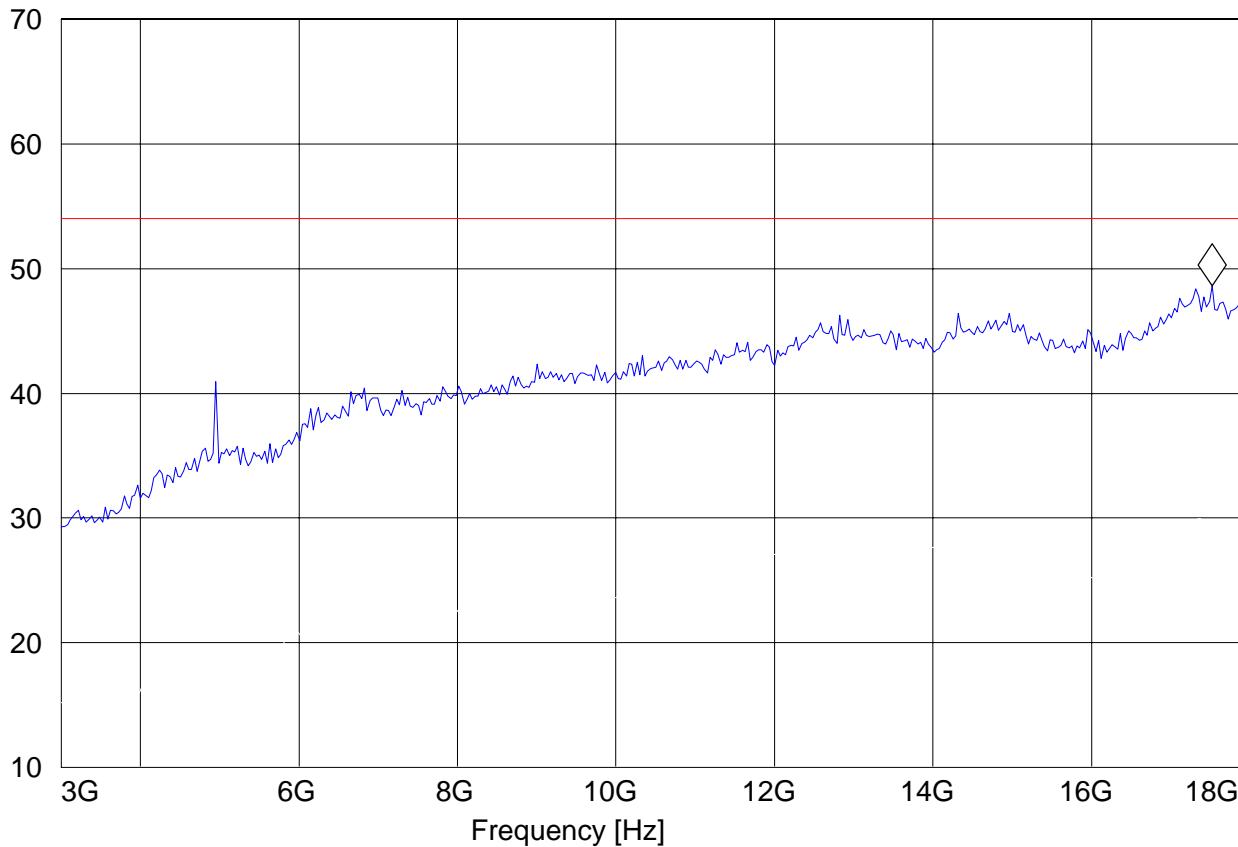
Test Engineer: SAM

Voltage: AC ADAPTOR

Comments:

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

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

Marker: 17.523046092 GHz 48.64 dB $\mu$ V/mLevel [dB $\mu$ 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: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH78

ANT Orientation: V

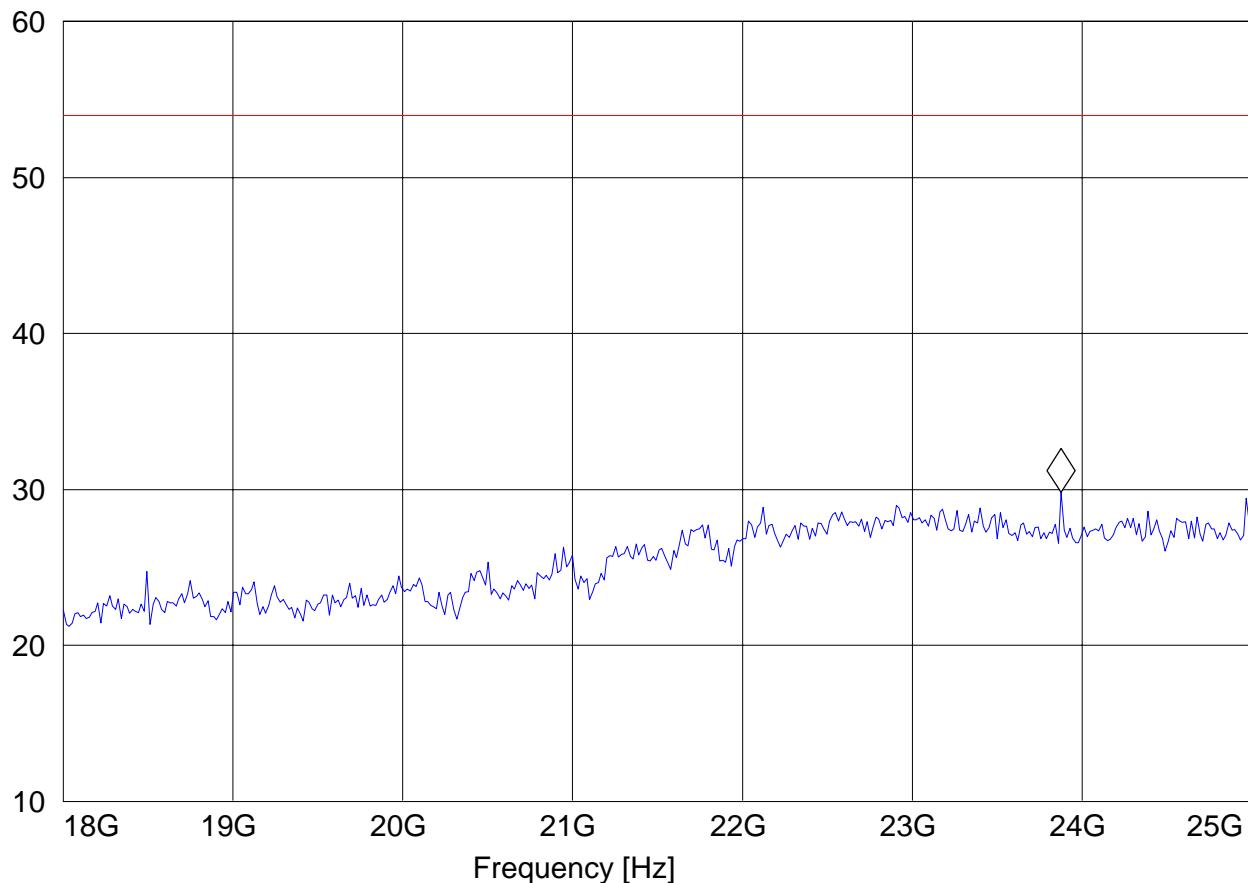
EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

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

Start Frequency	Stop Frequency	Detector Meas.	IF	Transducer
18.0 GHz	26.50 GHz	MaxPeak	Coupled	1 MHz #527horn_AF

Marker: 23.876753507 GHz 29.84 dB $\mu$ V/mLevel [dB $\mu$ V/m]

## 5.4 RECEIVER SPURIOUS EMISSIONS

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

Frequency (MHz)	Field strength (dB $\mu$ 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: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH39

ANT Orientation: H

EUT Orientation: H

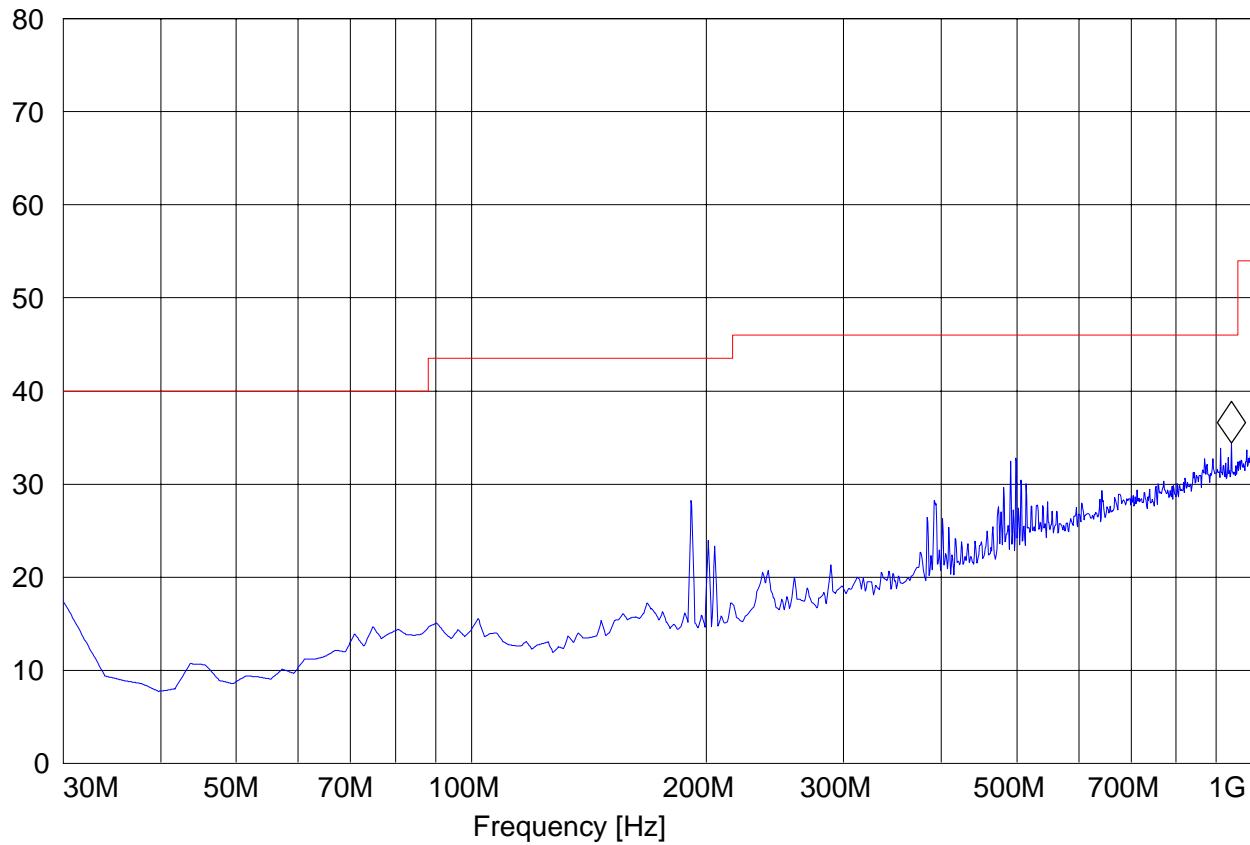
Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: Receive mode

***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

Marker: 941.683367 MHz 34.39 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**30MHz – 1GHz****Antenna: vertical****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH39

ANT Orientation: V

EUT Orientation: V

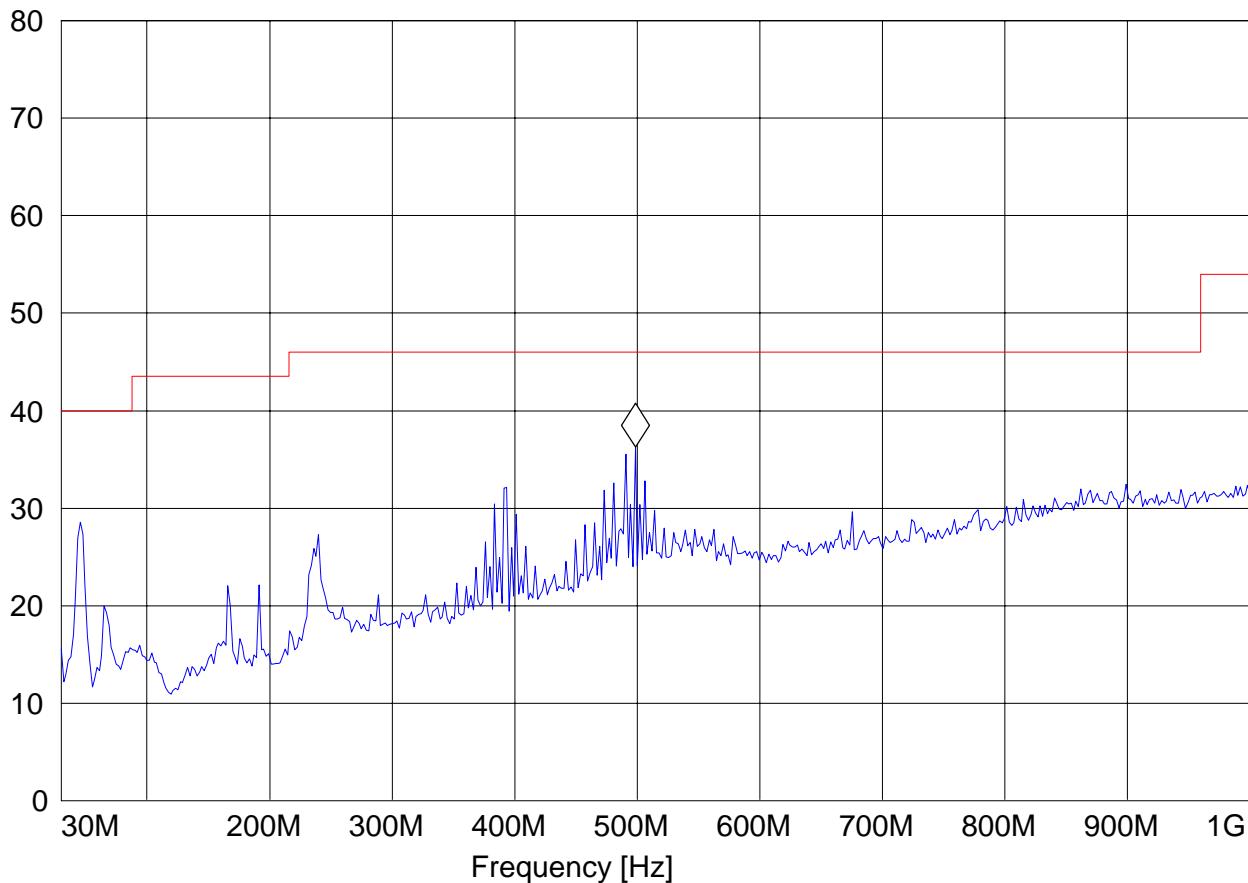
Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: Receive mode

***SWEEP TABLE: "FCC15.247\_30M-1G\_Ver"***

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

Marker: 498.476954 MHz 36.25 dB $\mu$ V/mLevel [dB $\mu$ V/m]

**1-3GHz****Note: This plot is valid for vertical and horizontal antenna polarizations (worst-case plot)****411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH39

ANT Orientation: H

EUT Orientation: H

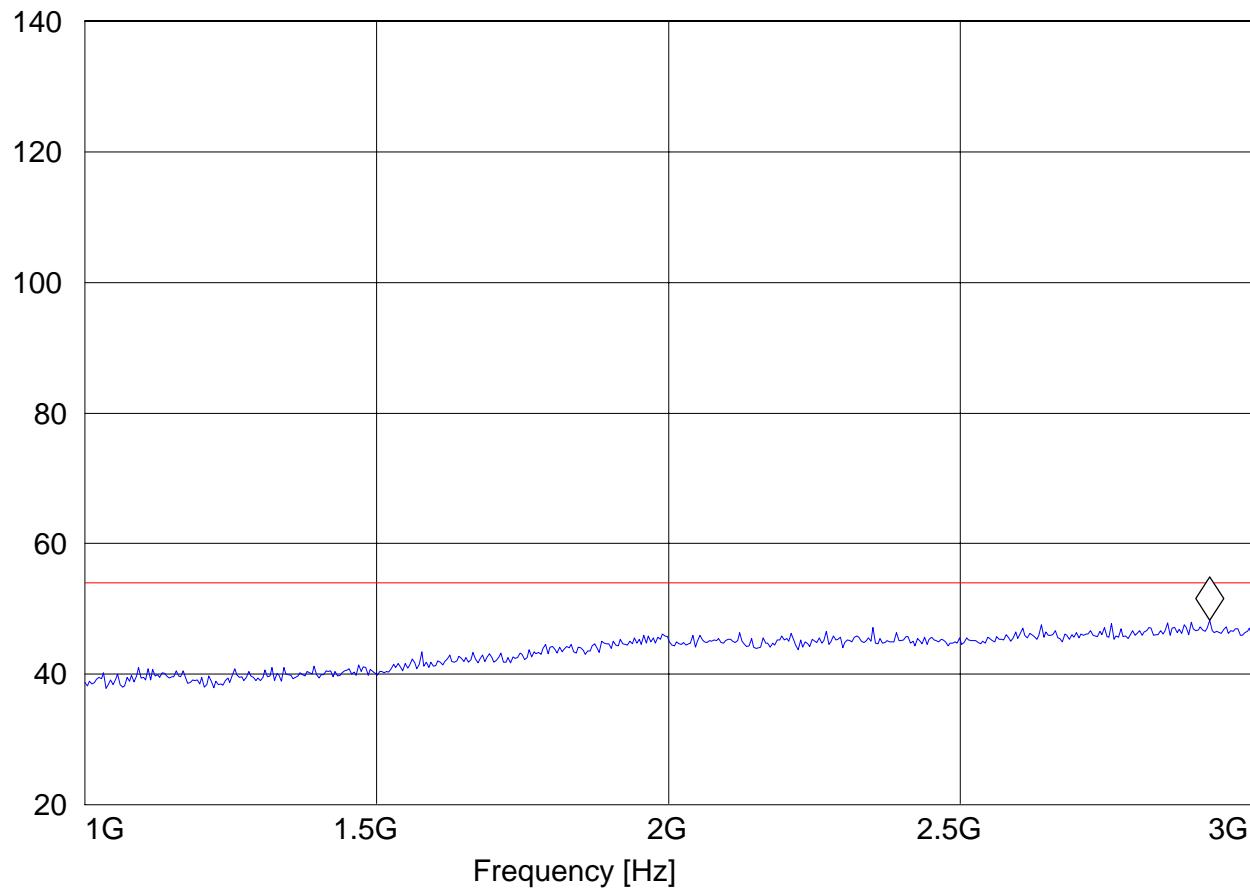
Test Engineer: SAM

Voltage: AC ADAPTOR

Comments: Receive mode

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

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

Marker: 2.927855711 GHz 48.3 dB $\mu$ V/mLevel [dB $\mu$ V/m]**3-18GHz**

**Note: This plot is valid for vertical and horizontal antenna polarizations (worst-case plot)**

**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT: QC890

Customer: HAND HELD PRODUCTS, INC.

Test Mode: BT, CH39

ANT Orientation: H

EUT Orientation: H

Test Engineer: SAM

Voltage: AC ADAPTOR

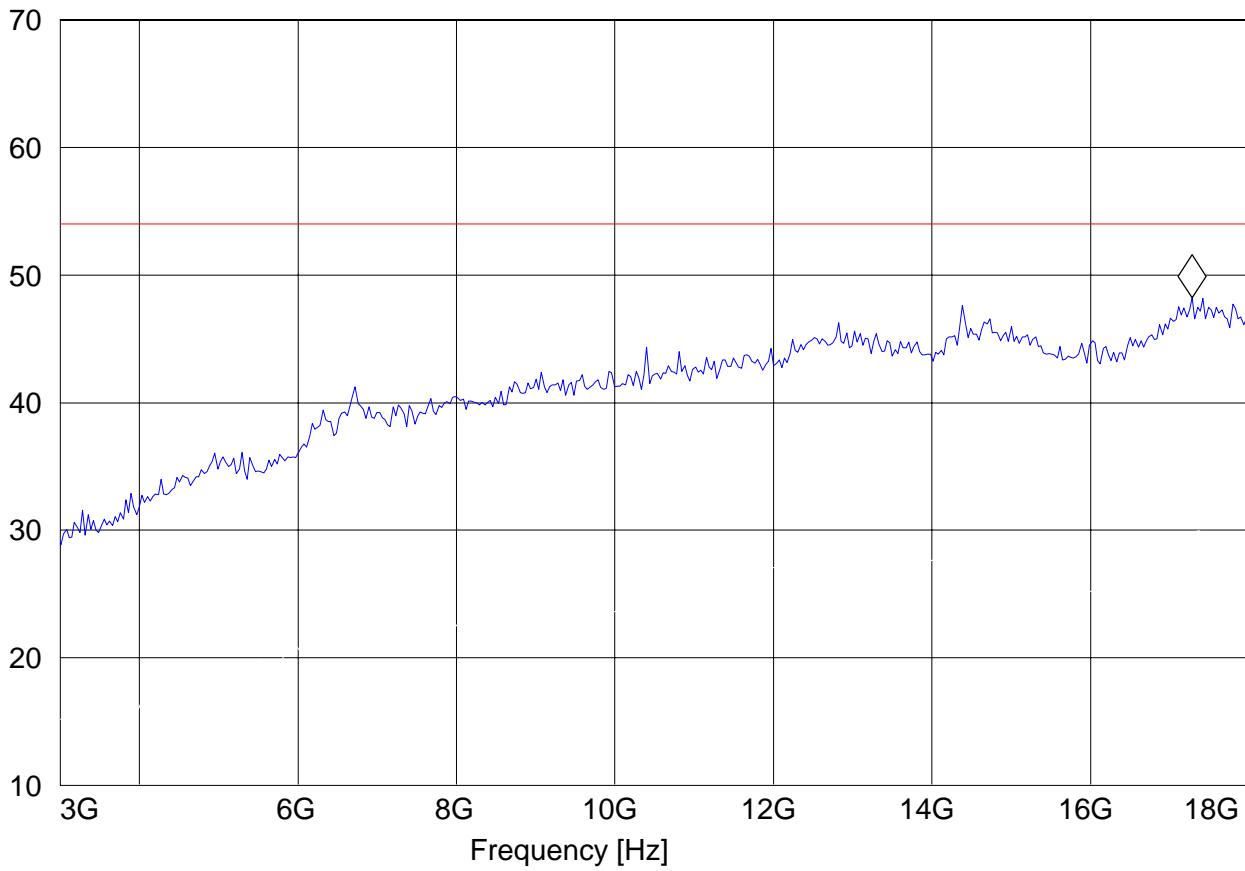
Comments: Receive mode

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

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

Marker: 17.284569138 GHz 48.2 dB $\mu$ V/m

Level [dB $\mu$ 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
<b>2400-2483.5 MHz</b>	<b>30dBm</b>

**\*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 <sub>nom</sub> (23)°C	V <sub>nom</sub> VDC	0.96	0.76	0.34

##### **Pi/4 DQPSK**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		2402 MHz	2441 MHz	2480 MHz
T <sub>nom</sub> (23)°C	V <sub>nom</sub> VDC	2.42	2.31	1.96

##### **8DPSK**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		2402 MHz	2441 MHz	2480 MHz
T <sub>nom</sub> (23)°C	V <sub>nom</sub> VDC	2.79	2.79	2.24

**GFSK (2402 MHz)**Ref Lvl  
10 dBm

Marker 1 [T1]

0.96 dBm  
2.40184970 GHz

RBW

3 MHz

RF Att

20 dB

VBW

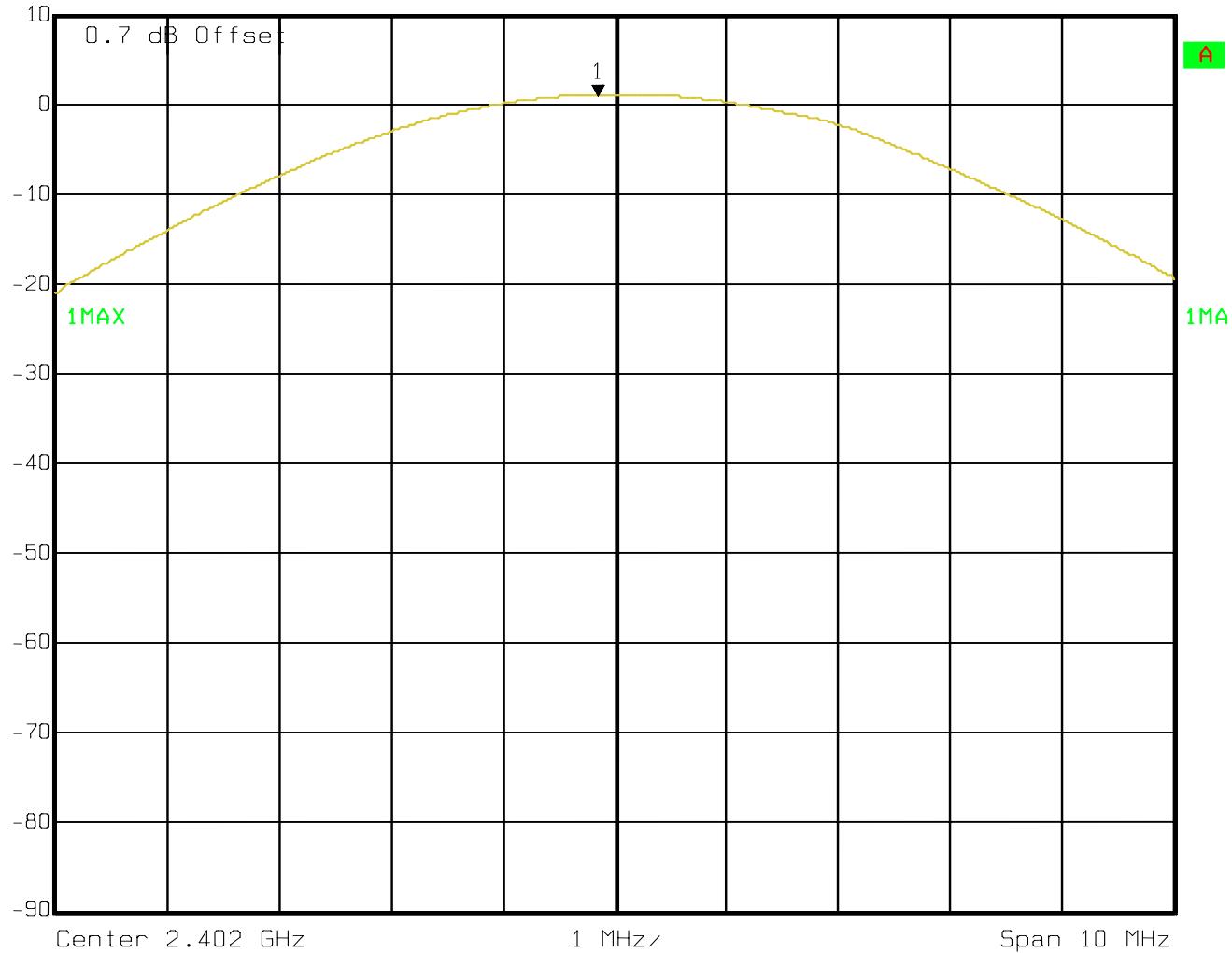
3 MHz

SWT

5 ms

Unit

dBm



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

**GFSK (2441 MHz)**Ref Lvl  
10 dBm

Marker 1 [T1]

0.76 dBm  
2.44074950 GHz

RBW

3 MHz

RF Att

20 dB

VBW

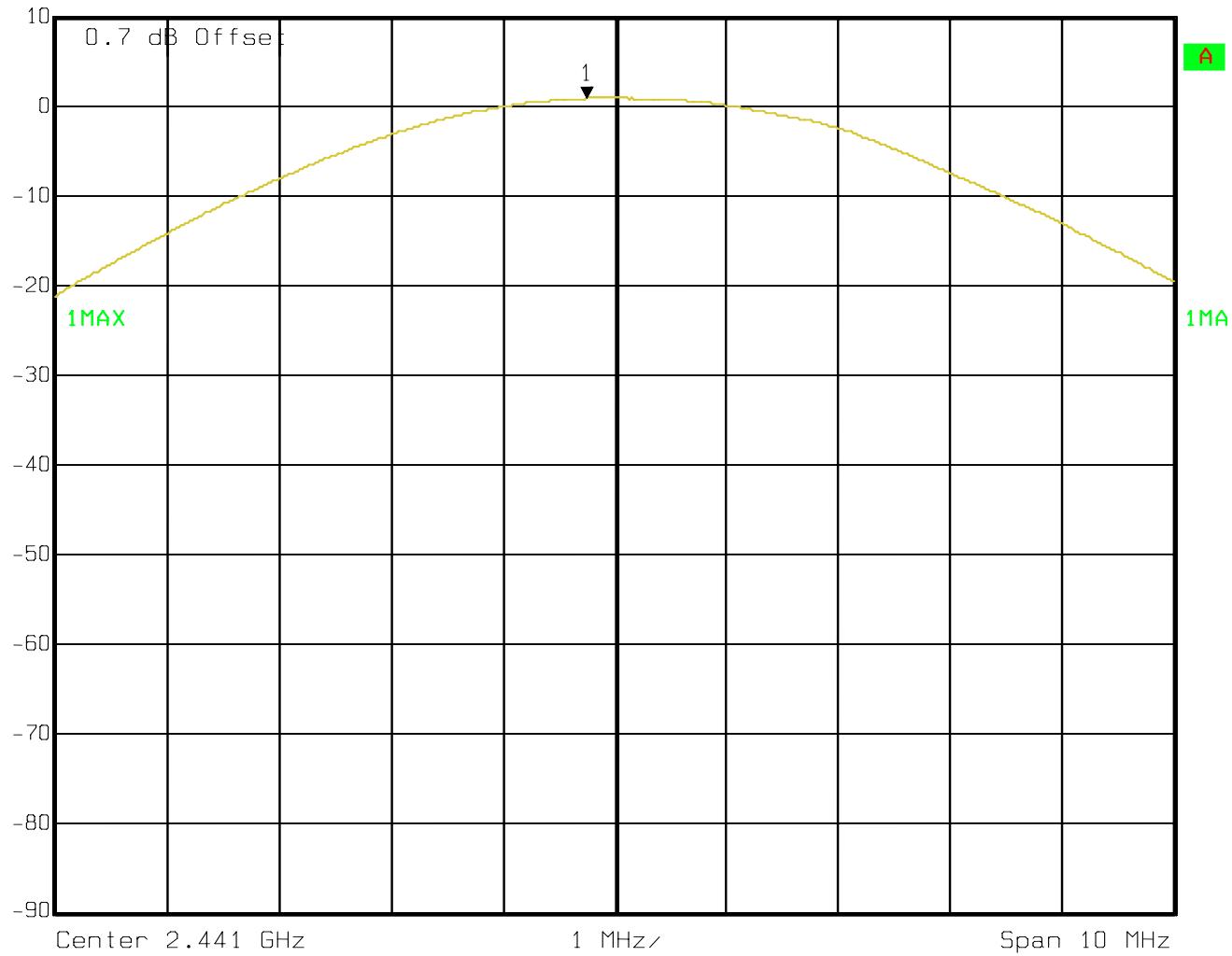
3 MHz

SWT

5 ms

Unit

dBm



[

**GFSK (2480 MHz)**Ref Lvl  
10 dBm

Marker 1 [T1]

0.34 dBm

RBW

3 MHz

RF Att

20 dB

VBW

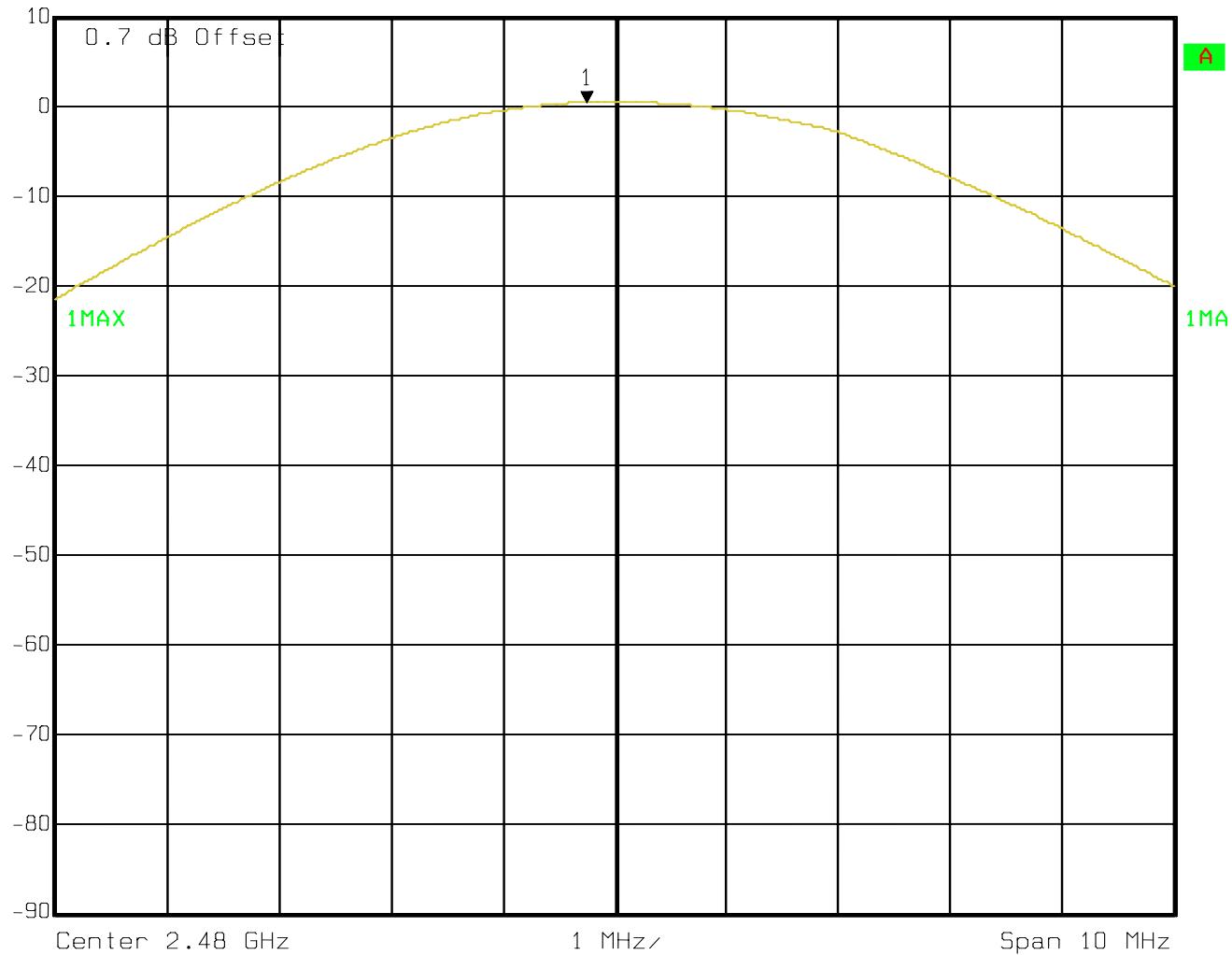
3 MHz

SWT

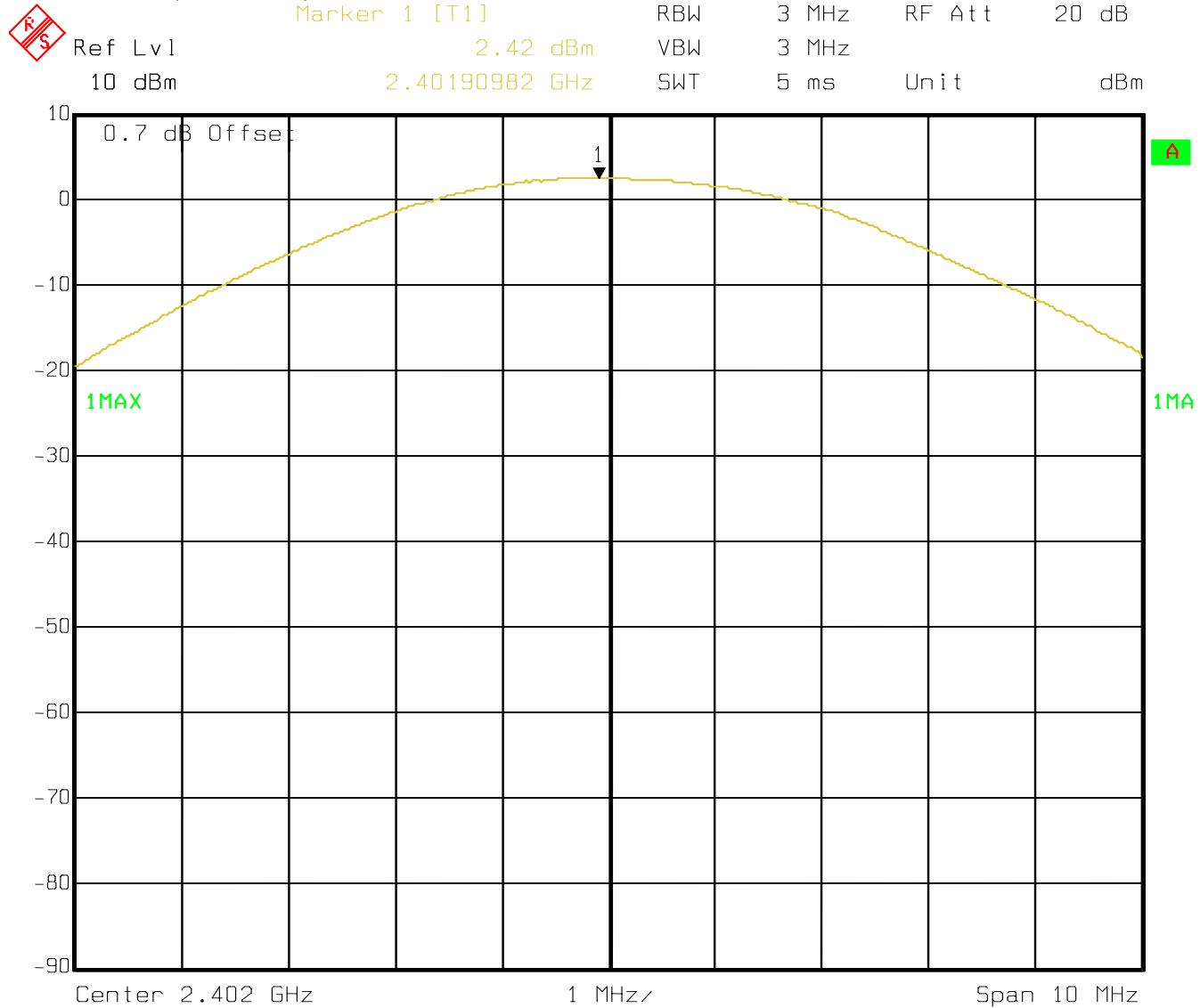
5 ms

Unit

dBm



[

**Pi/4 DQPSK (2402 MHz)**

[

**Pi/4 DQPSK (2441 MHz)**Ref Lvl  
10 dBm

Marker 1 [T1]

2.31 dBm

RBW

3 MHz

RF Att

20 dB

VBW

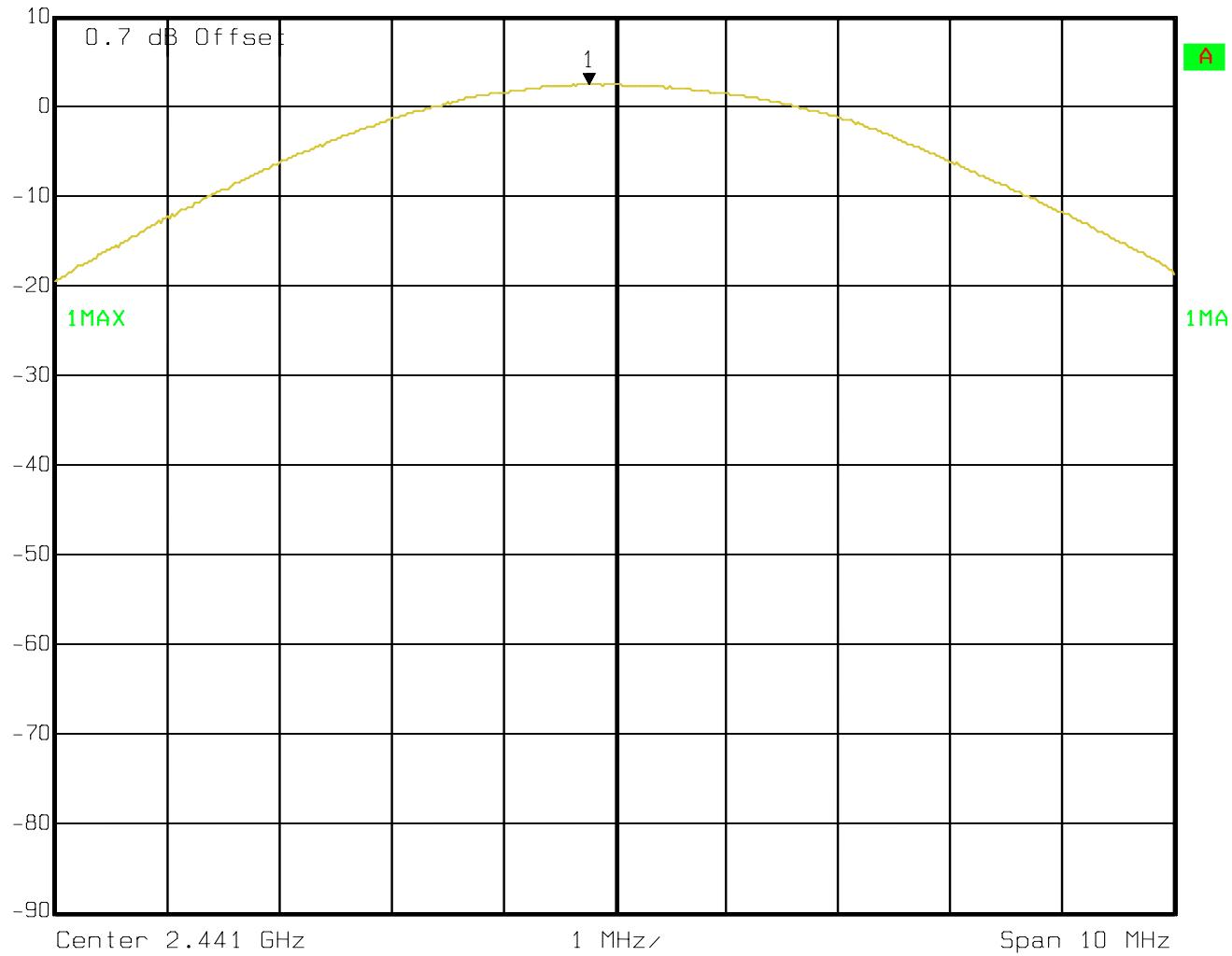
3 MHz

SWT

5 ms

Unit

dBm



[

**Pi/4 DQPSK (2480 MHz)**Ref Lvl  
10 dBm

Marker 1 [T1]

1.76 dBm

RBW

3 MHz

RF Att

20 dB

VBW

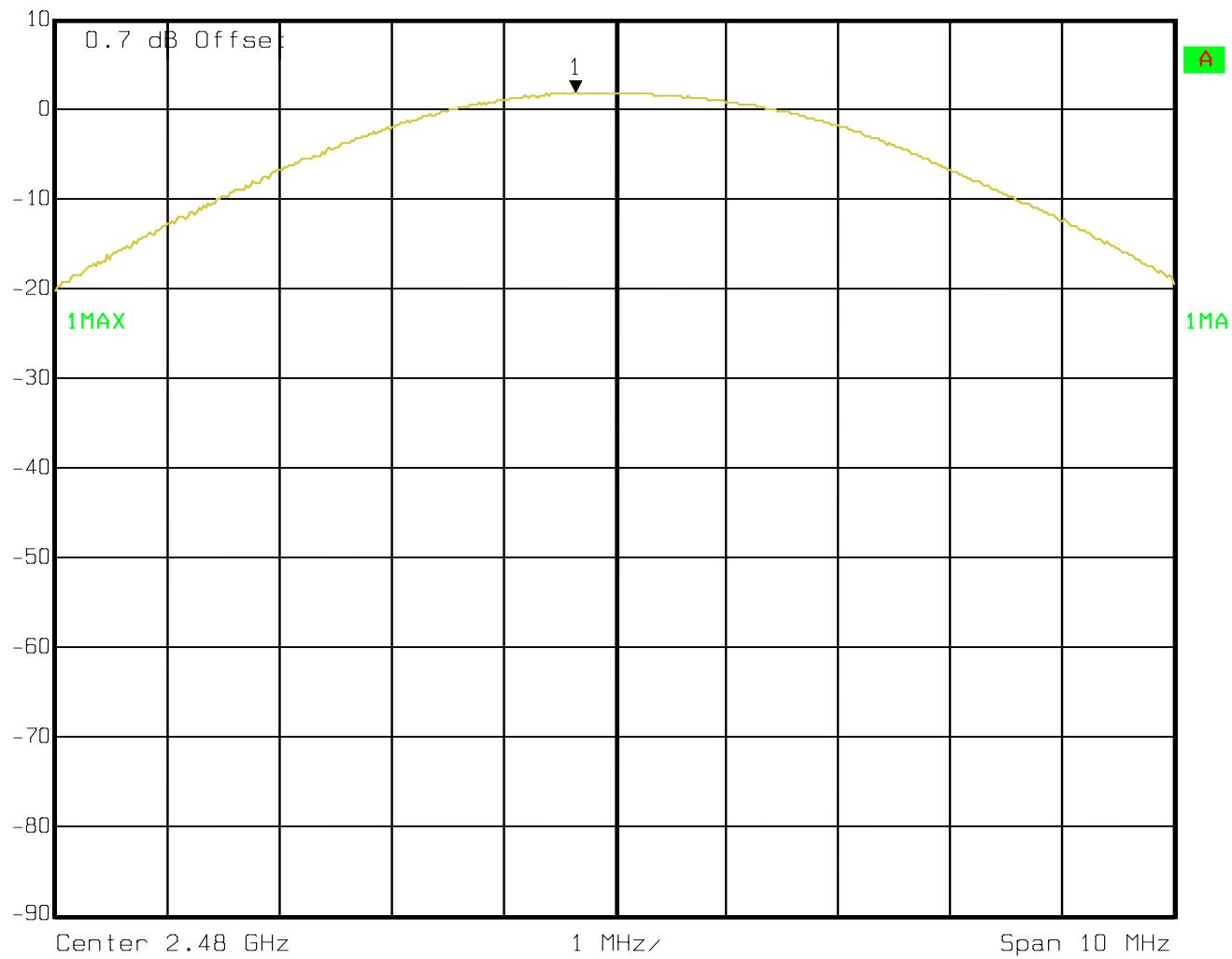
3 MHz

SWT

5 ms

Unit

dBm



[

**8DPSK (2402 MHz)**Ref Lvl  
10 dBm

Marker 1 [T1]

2.79 dBm

RBW

3 MHz

RF Att

20 dB

VBW

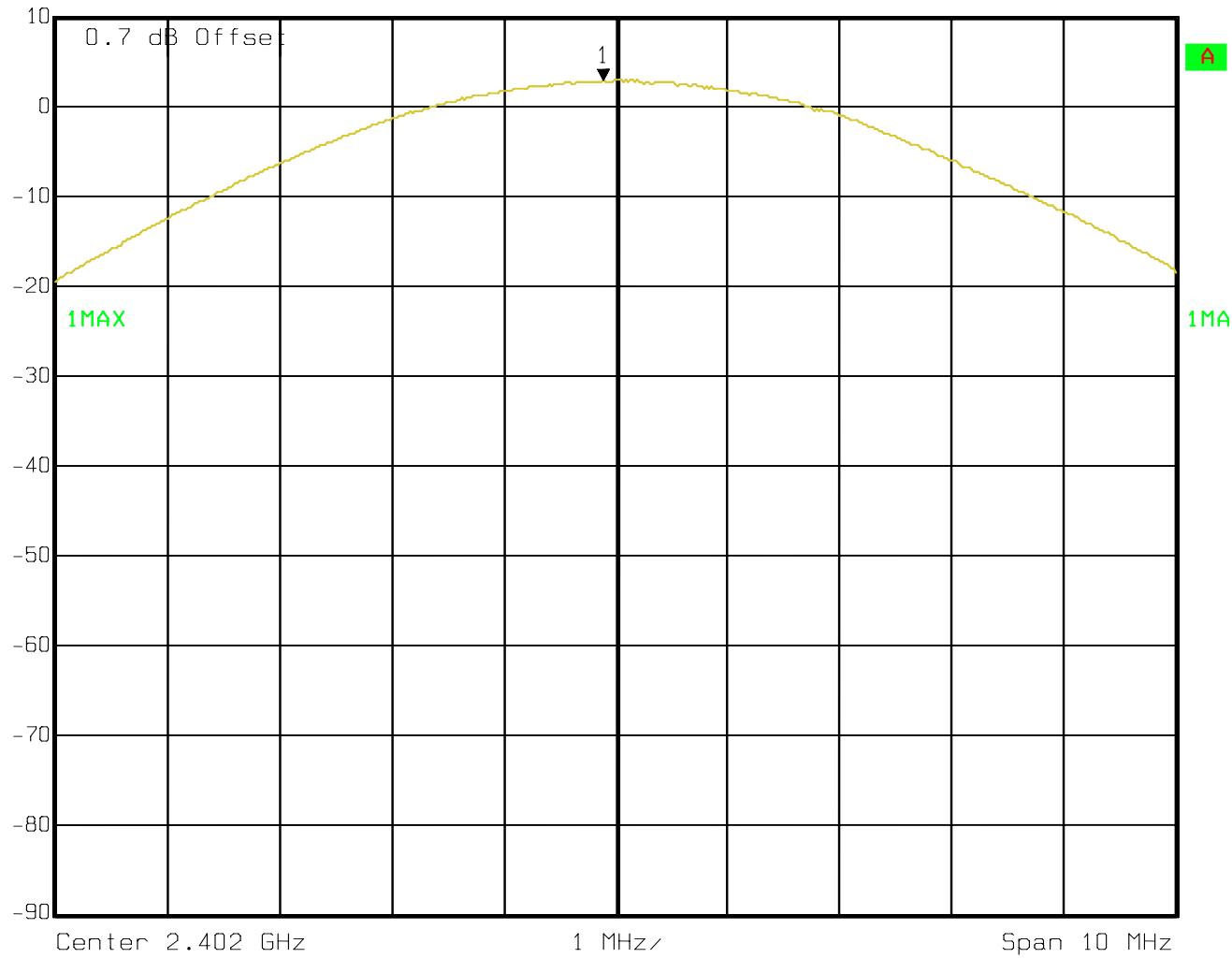
3 MHz

SWT

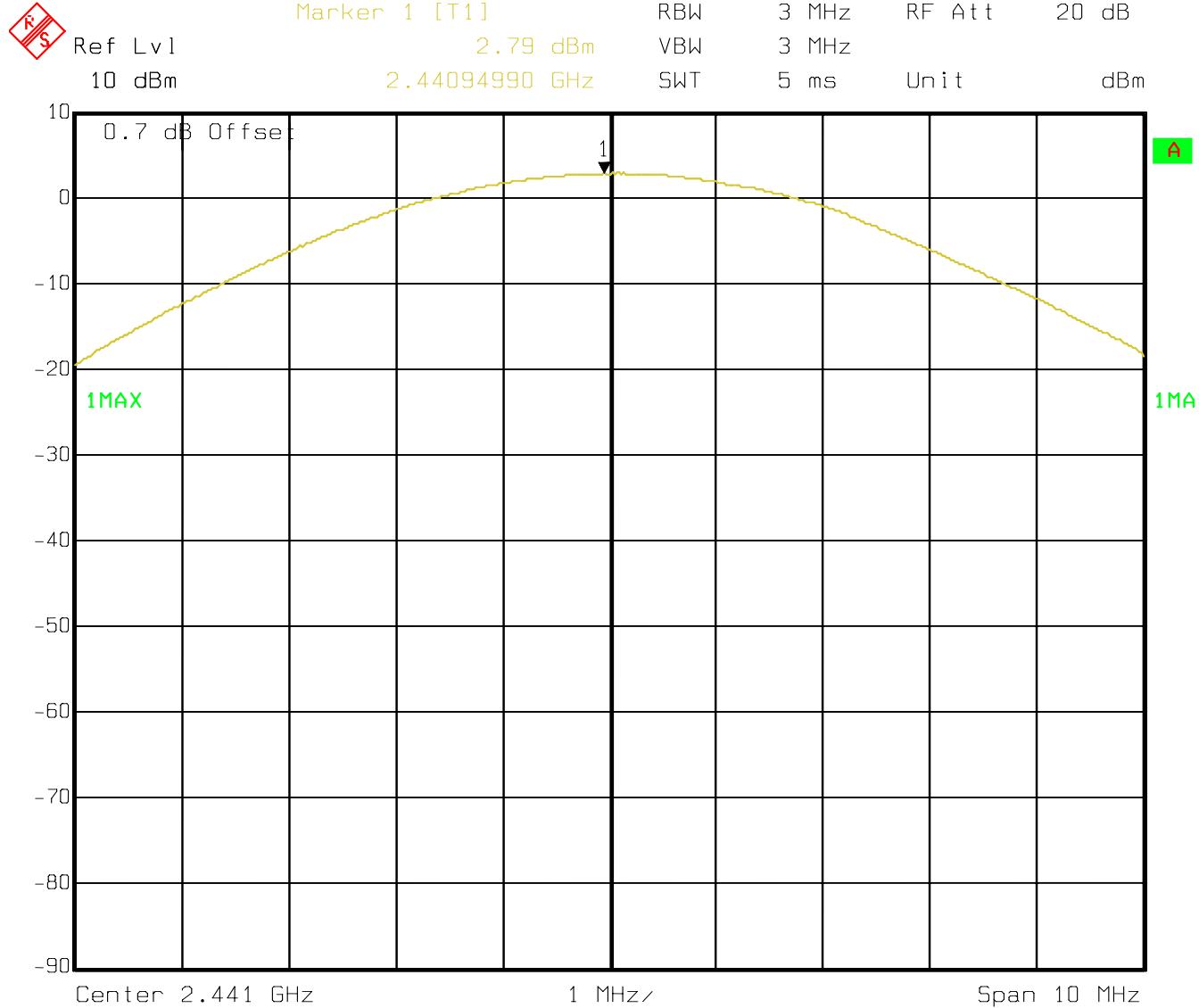
5 ms

Unit

dBm



[

**8DPSK (2441 MHz)**

**8DPSK (2480 MHz)**Ref Lvl  
10 dBm

Marker 1 [T1]

2.24 dBm

RBW

3 MHz

RF Att

20 dB

VBW

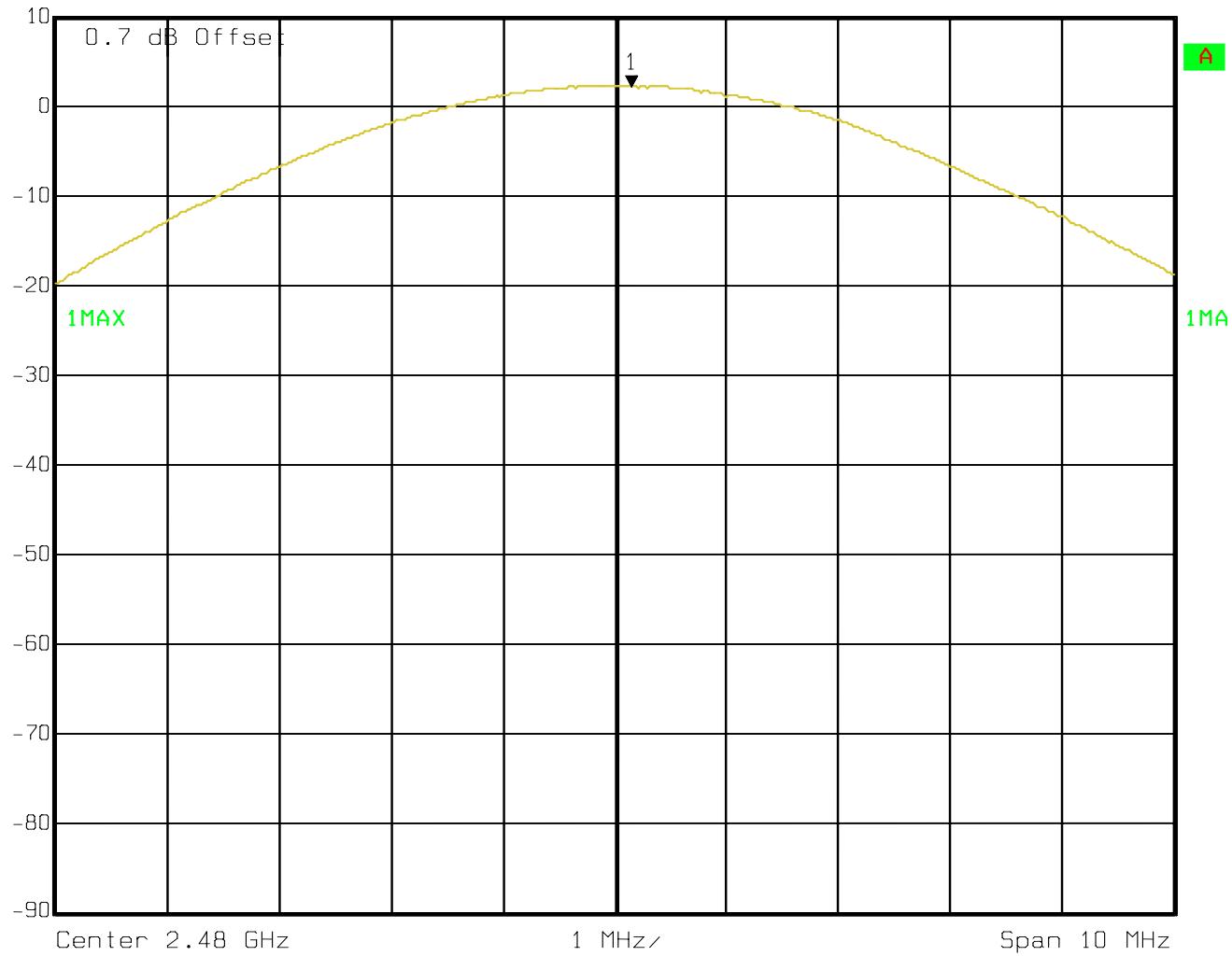
3 MHz

SWT

5 ms

Unit

dBm



[

## 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)		
		2402 MHz	2441 MHz	2480 MHz
Frequency (MHz)				
$T_{\text{nom}}(23)^\circ\text{C}$	$V_{\text{nom}}\text{VDC}$	825.651	821.643	829.659

#### Pi/4 DQPSK

TEST CONDITIONS		BANDWIDTH (MHz)		
		2402 MHz	2441 MHz	2480 MHz
Frequency (MHz)				
$T_{\text{nom}}(23)^\circ\text{C}$	$V_{\text{nom}}\text{VDC}$	1.130	1.110	1.110

#### 8DPSK

TEST CONDITIONS		BANDWIDTH (MHz)		
		2402 MHz	2441 MHz	2480 MHz
Frequency (MHz)				
$T_{\text{nom}}(23)^\circ\text{C}$	$V_{\text{nom}}\text{VDC}$	1.158	1.154	1.162

**GFSK (2402 MHz)**

Ref Lvl

10 dBm

Delta 2 [T1]

-0.30 dB

RBW 10 kHz

VBW 10 kHz

RF Att

20 dB

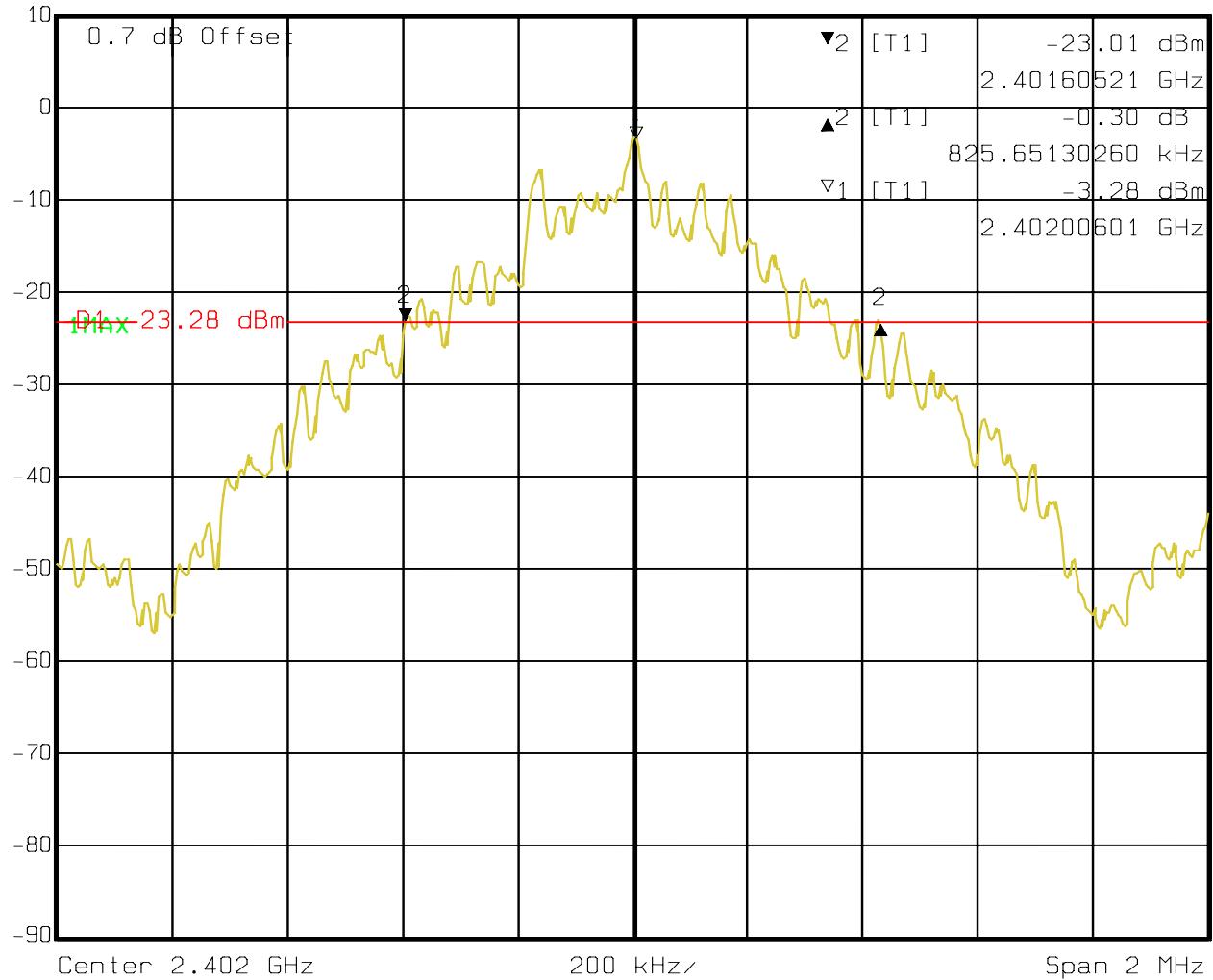
825.65130260 kHz

SWT

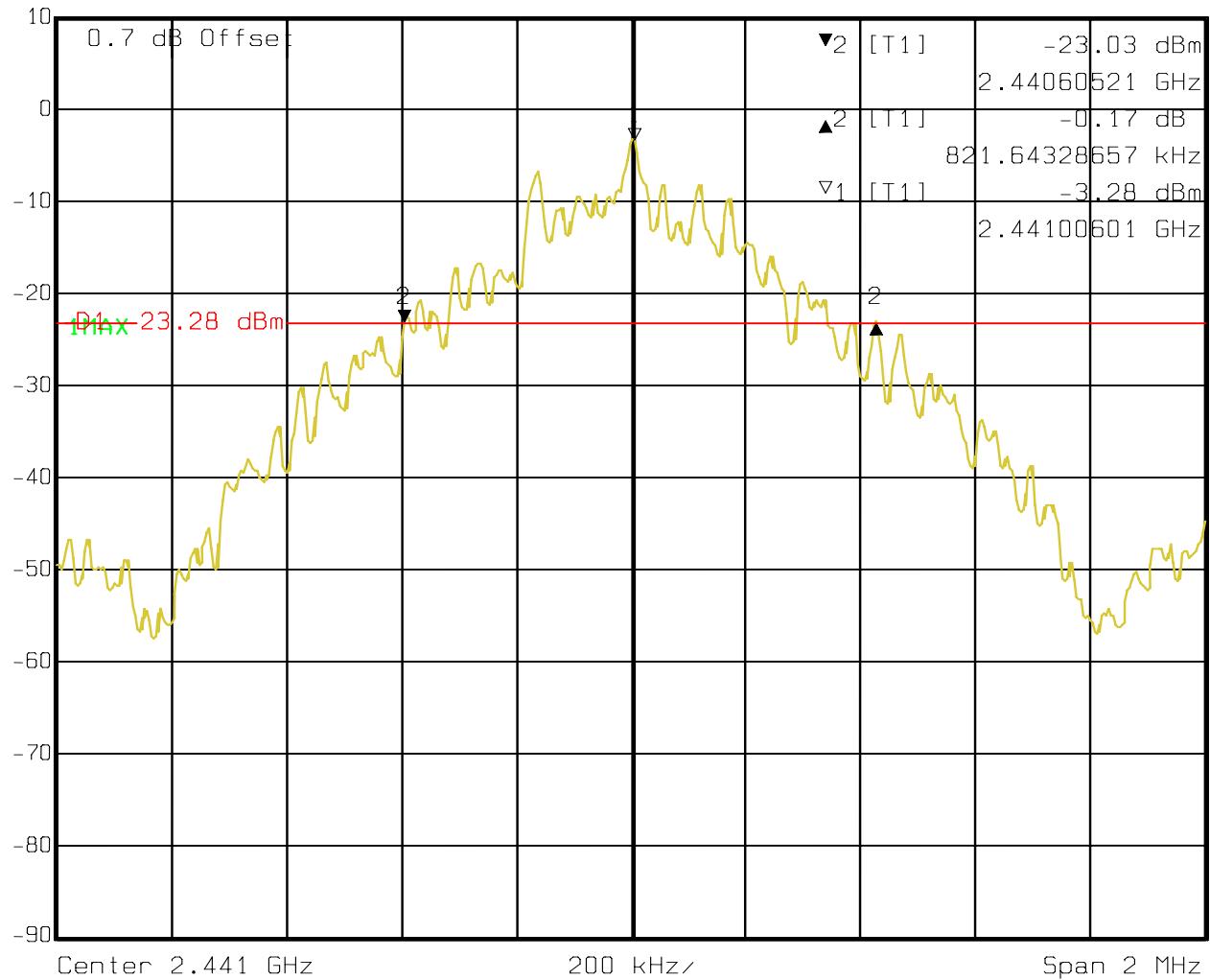
50 ms

Unit

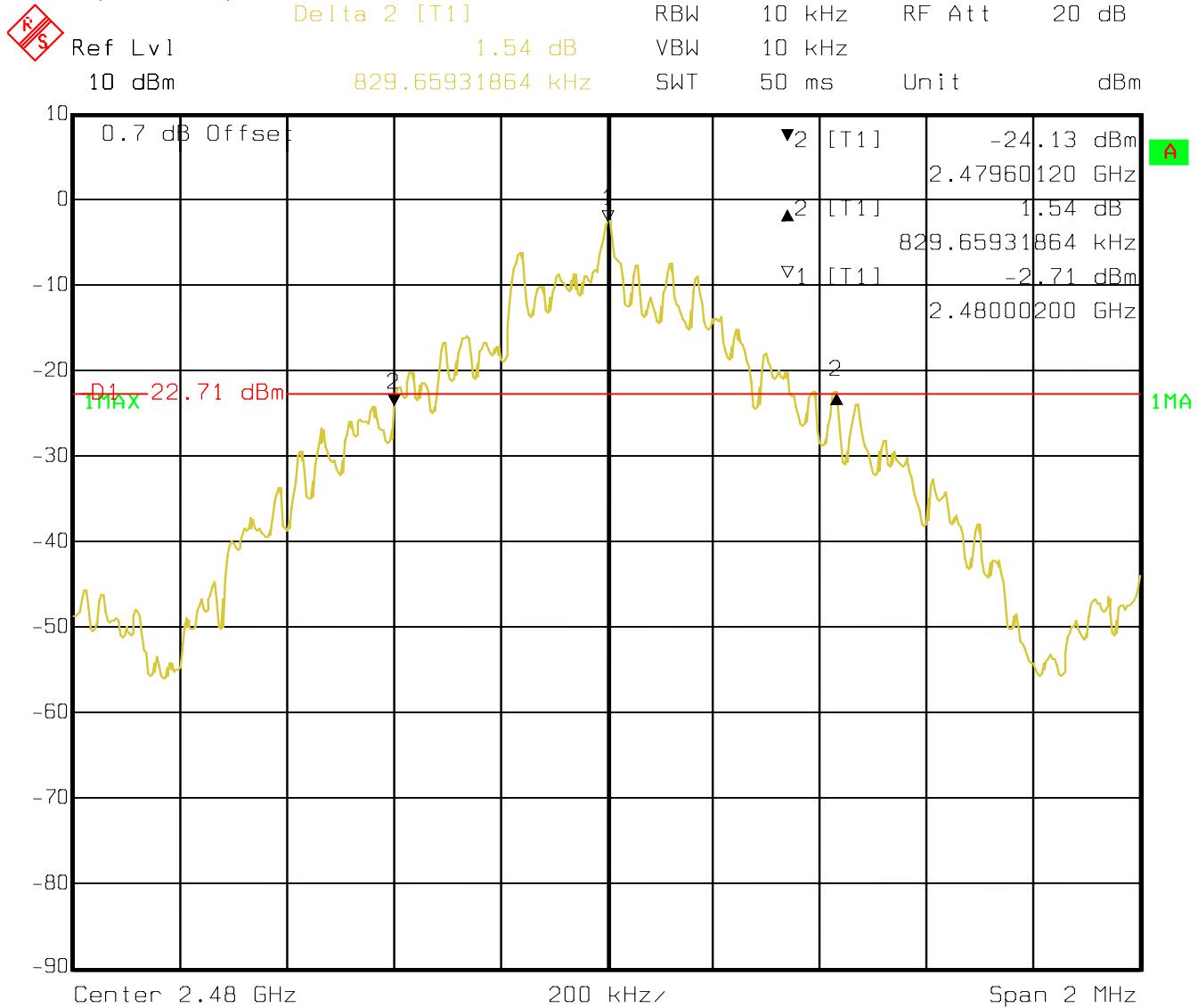
dBm

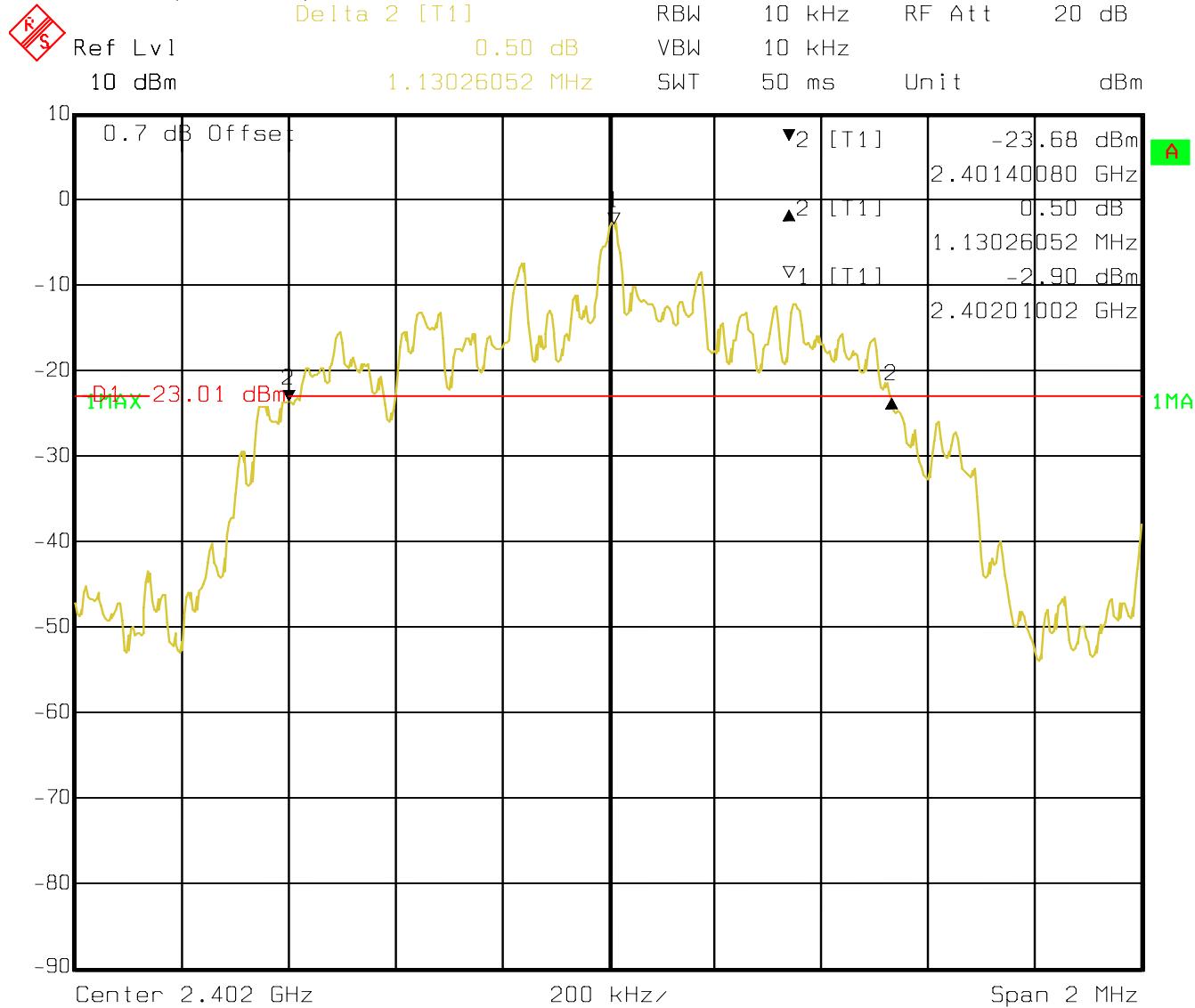


[

**GFSK (2441 MHz)**Ref Lvl  
10 dBmDelta 2 [T1]  
-0.17 dB  
821.64328657 kHzRBW 10 kHz  
VBW 10 kHz  
SWT 50 ms  
RF Att Unit  
20 dB  
dBm

[

**GFSK (2480 MHz)**

**Pi/4 DQPSK (2402 MHz)**

**Pi/4 DQPSK (2441 MHz)**Ref Lvl  
10 dBm

Delta 2 [T1]

0.39 dB

RBW

10 kHz

RF Att

20 dB

VBW

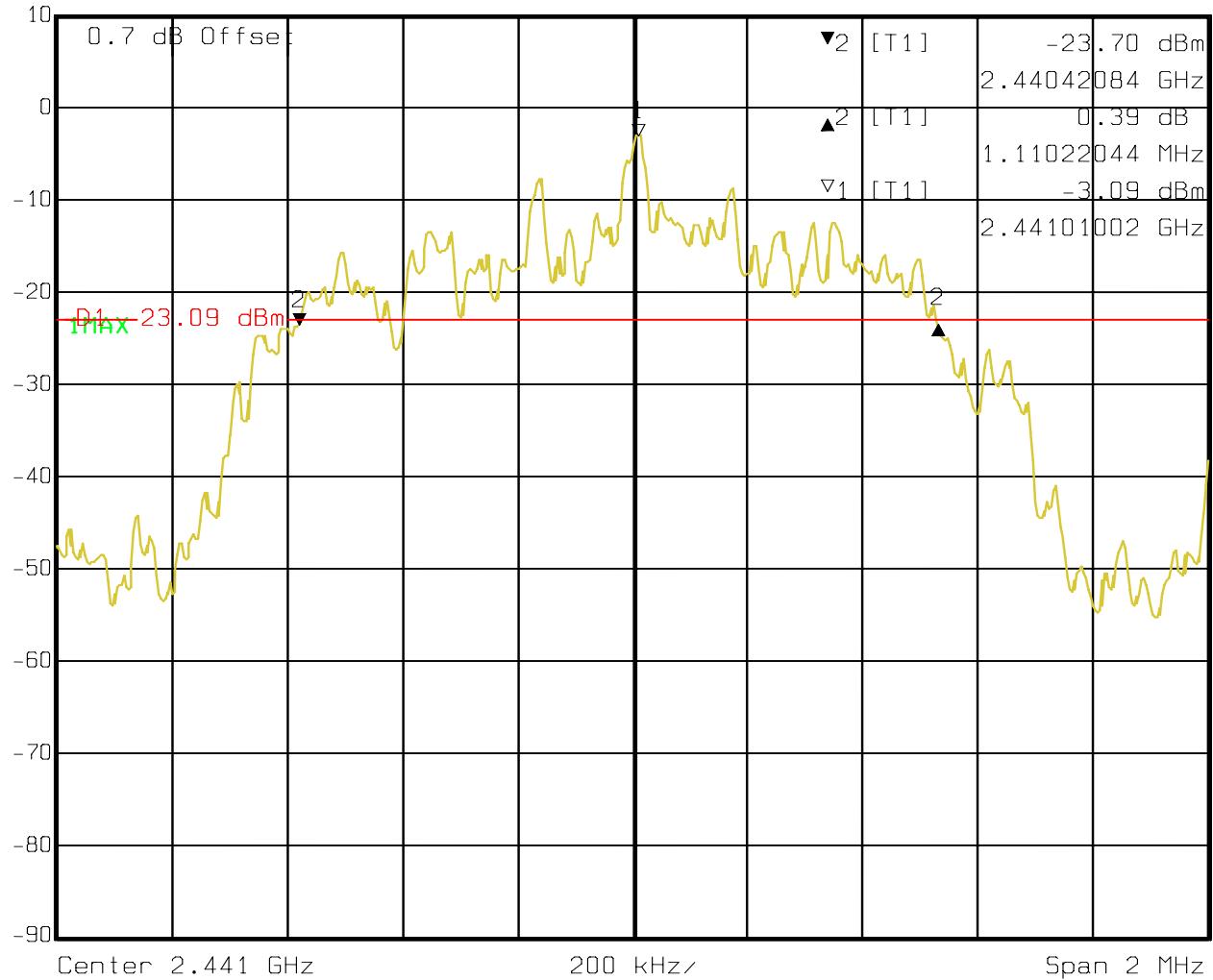
10 kHz

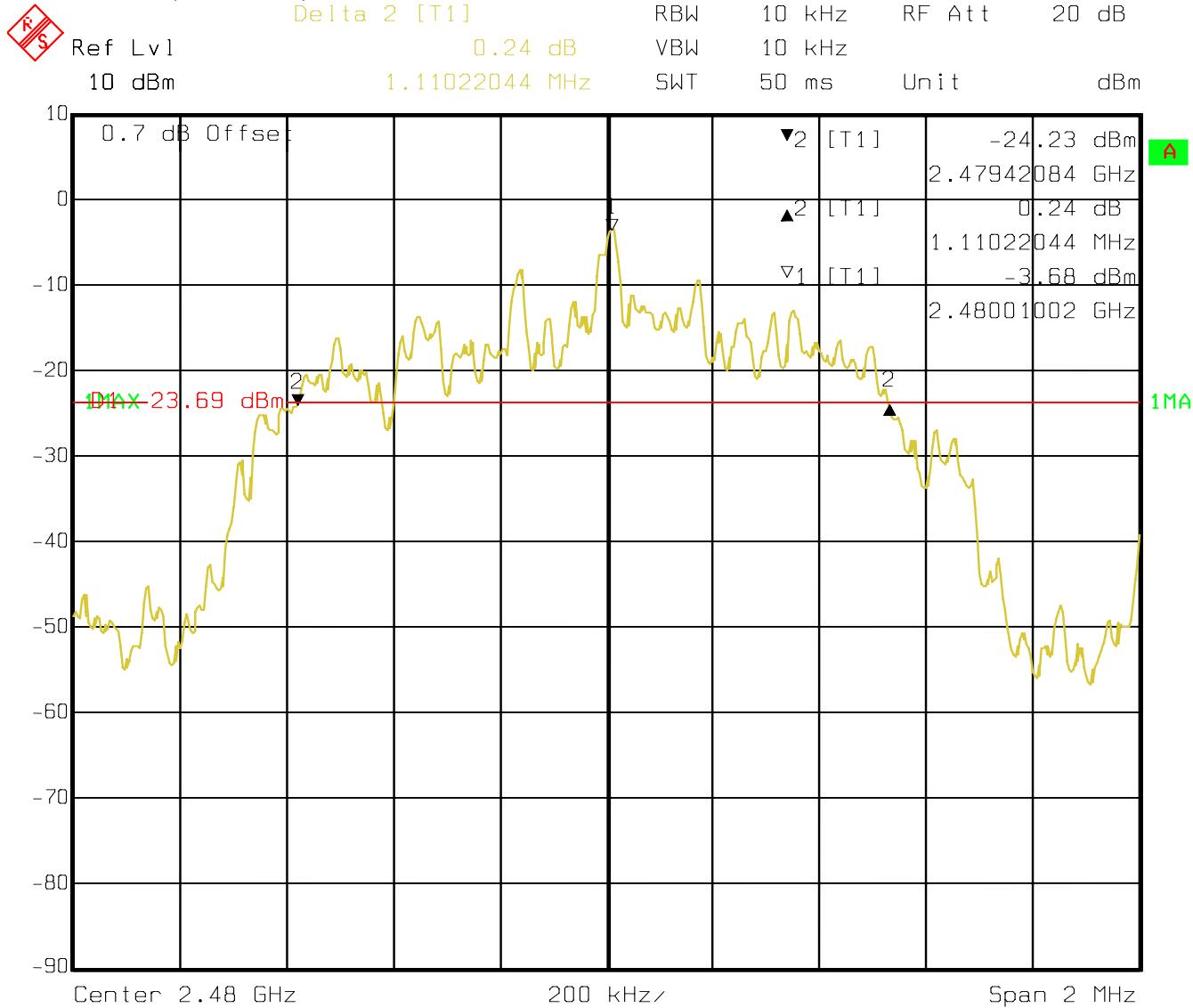
SWT

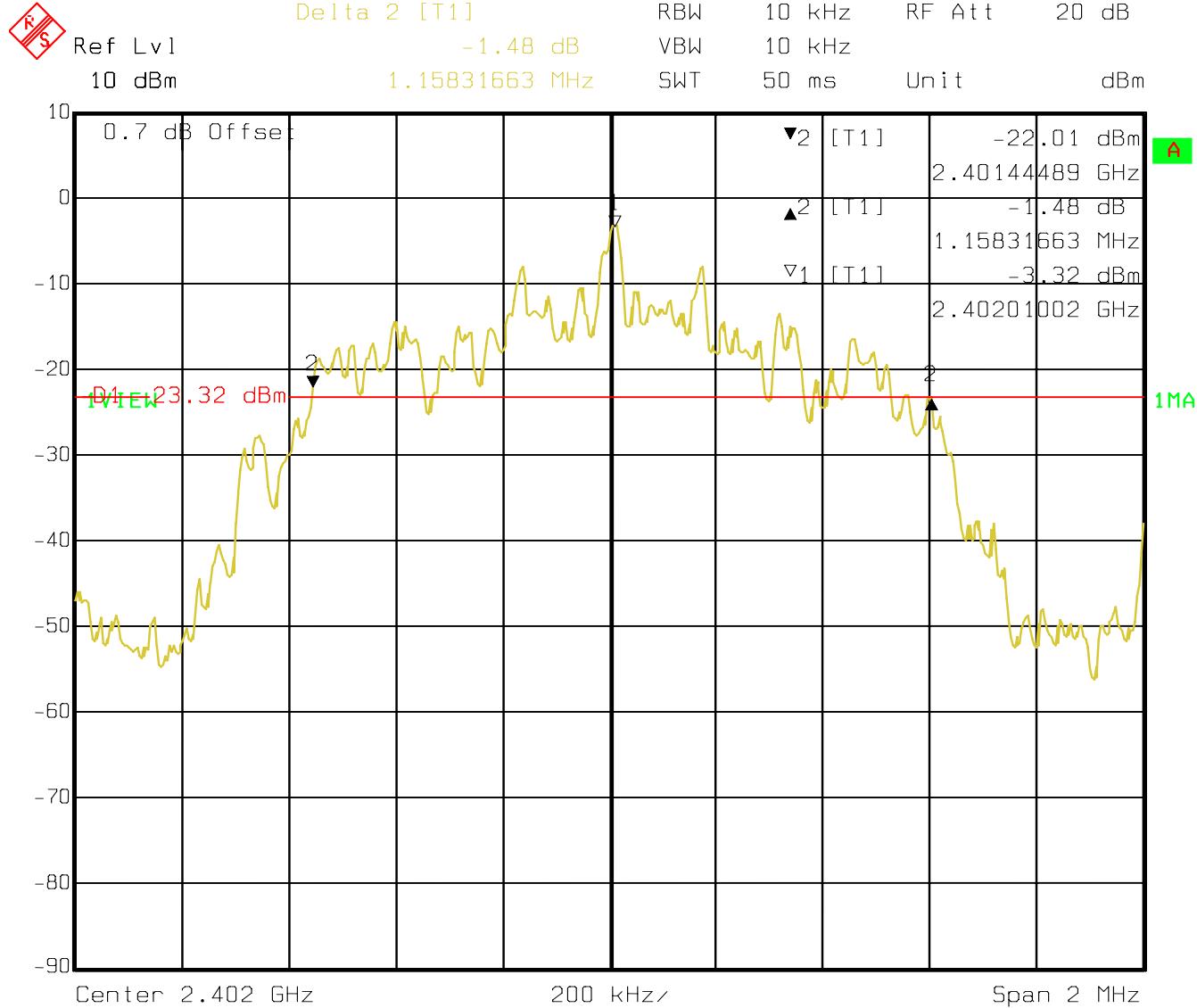
50 ms

Unit

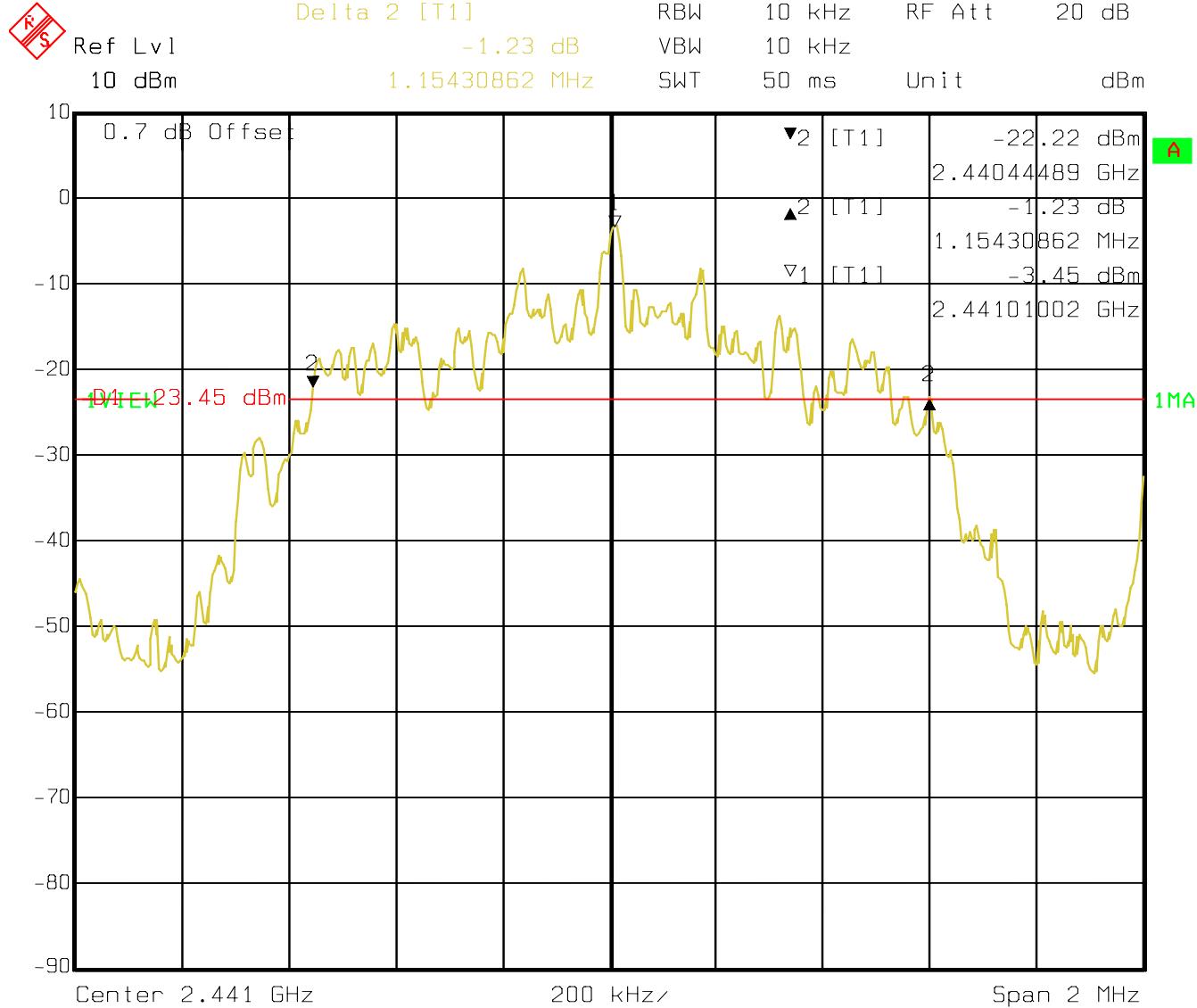
dBm



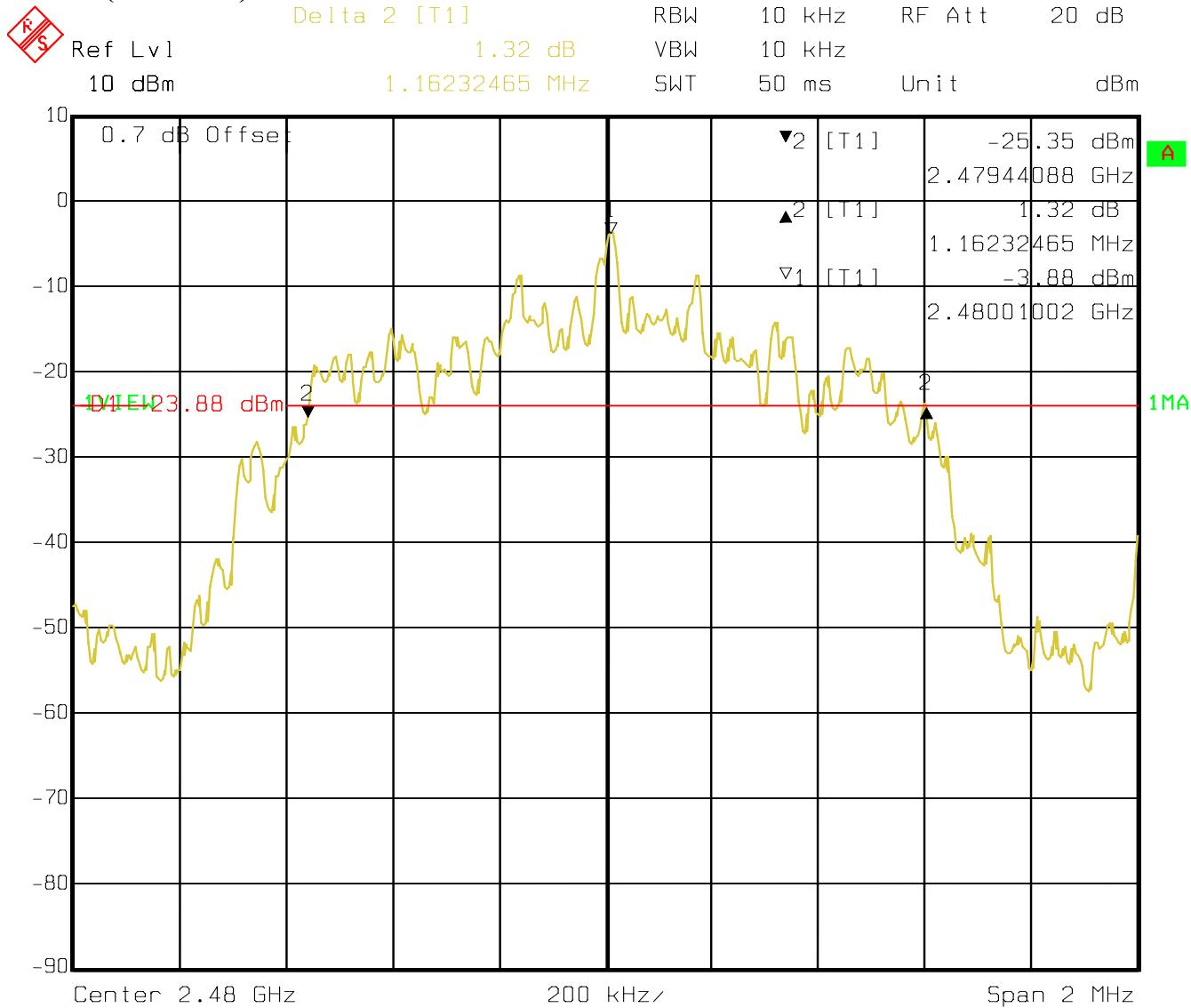
**Pi/4 DQPSK (2480 MHz)**

**8DPSK (2402 MHz)**

[

**8DPSK (2441 MHz)**

[

**8DPSK (2480 MHz)**

### **6.3 EMISSION LIMITATIONS**

**§ 15.247 (c) (1)**

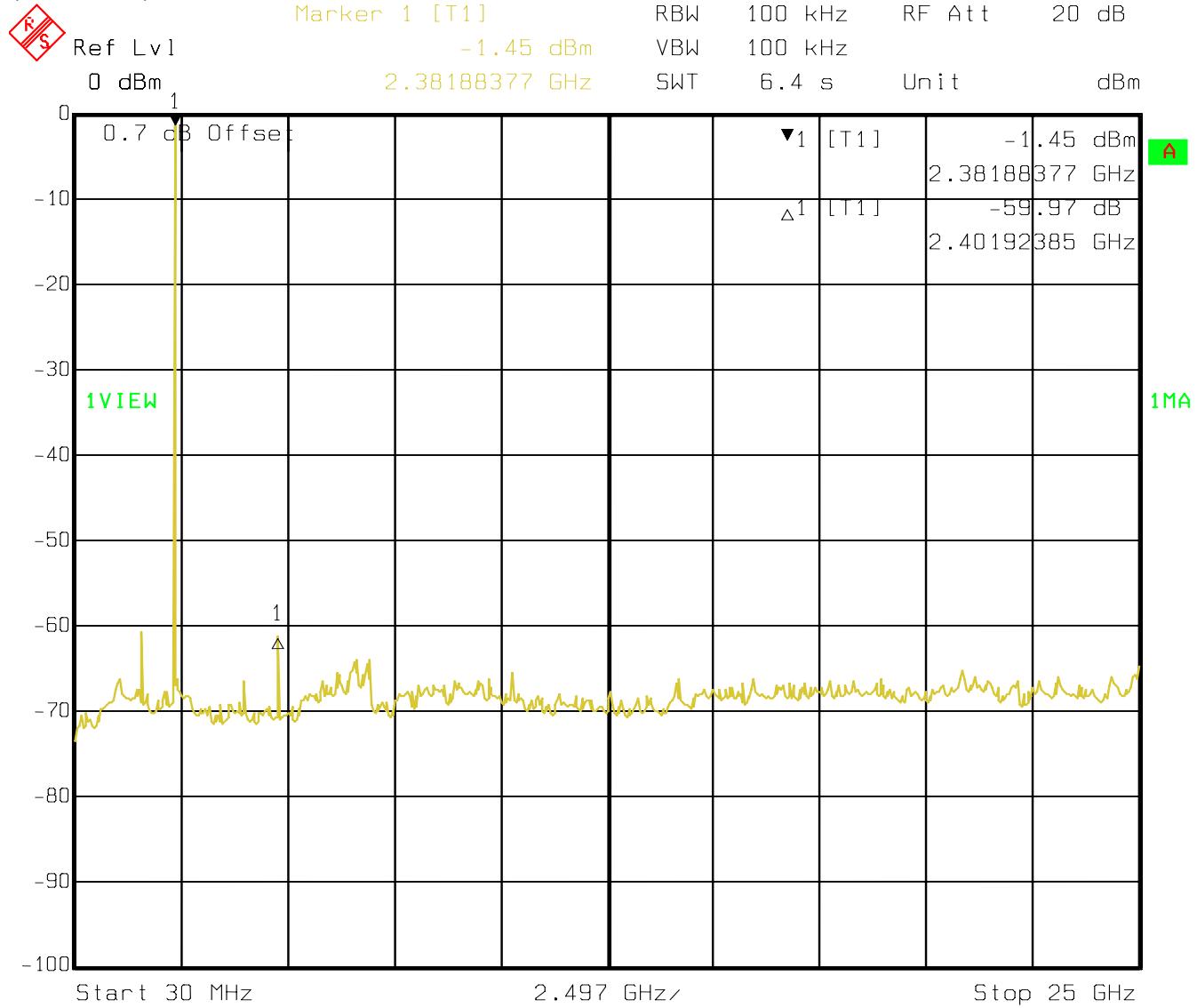
#### **Transmitter (Conducted)**

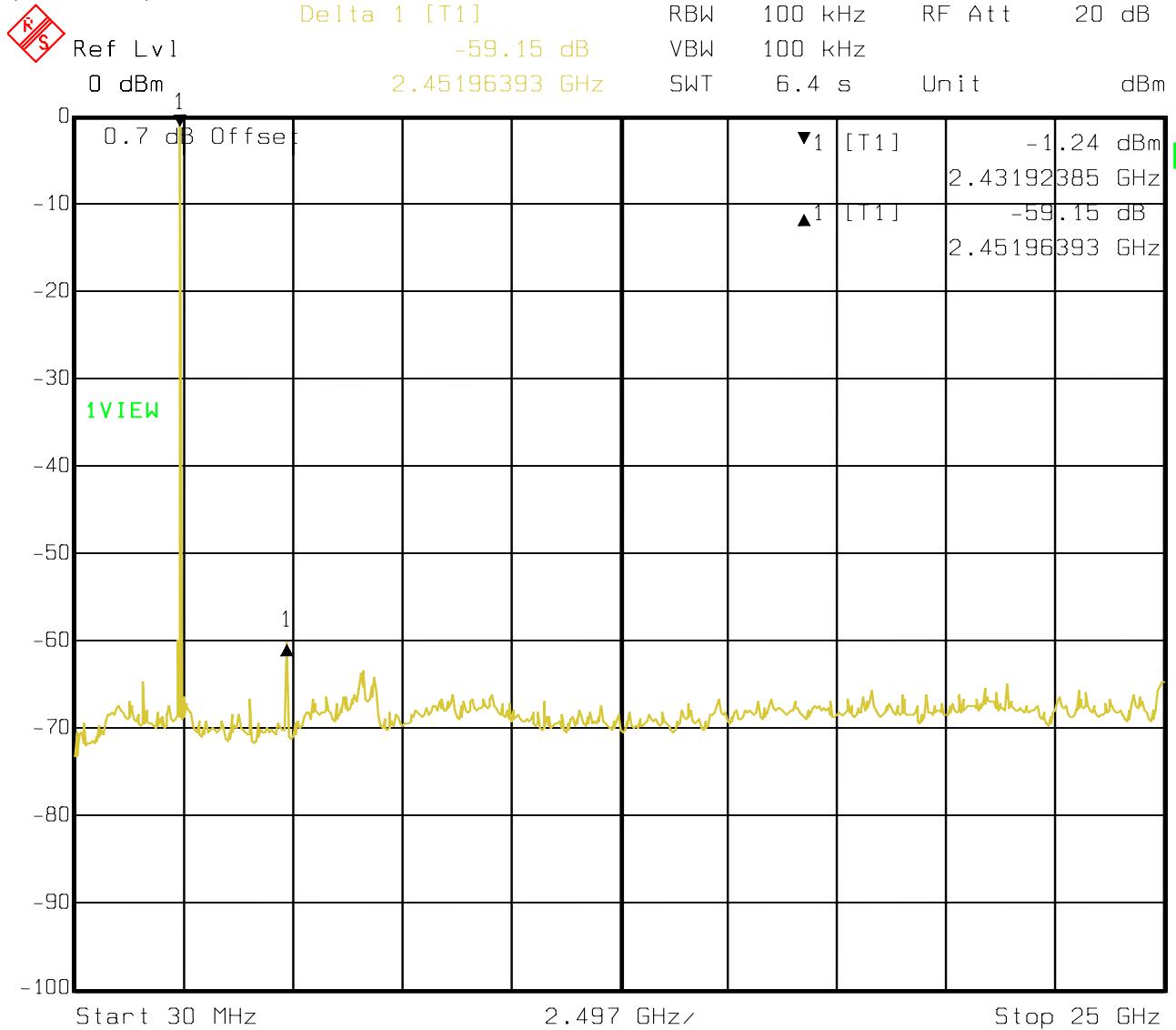
#### **LIMITS**

**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)).**

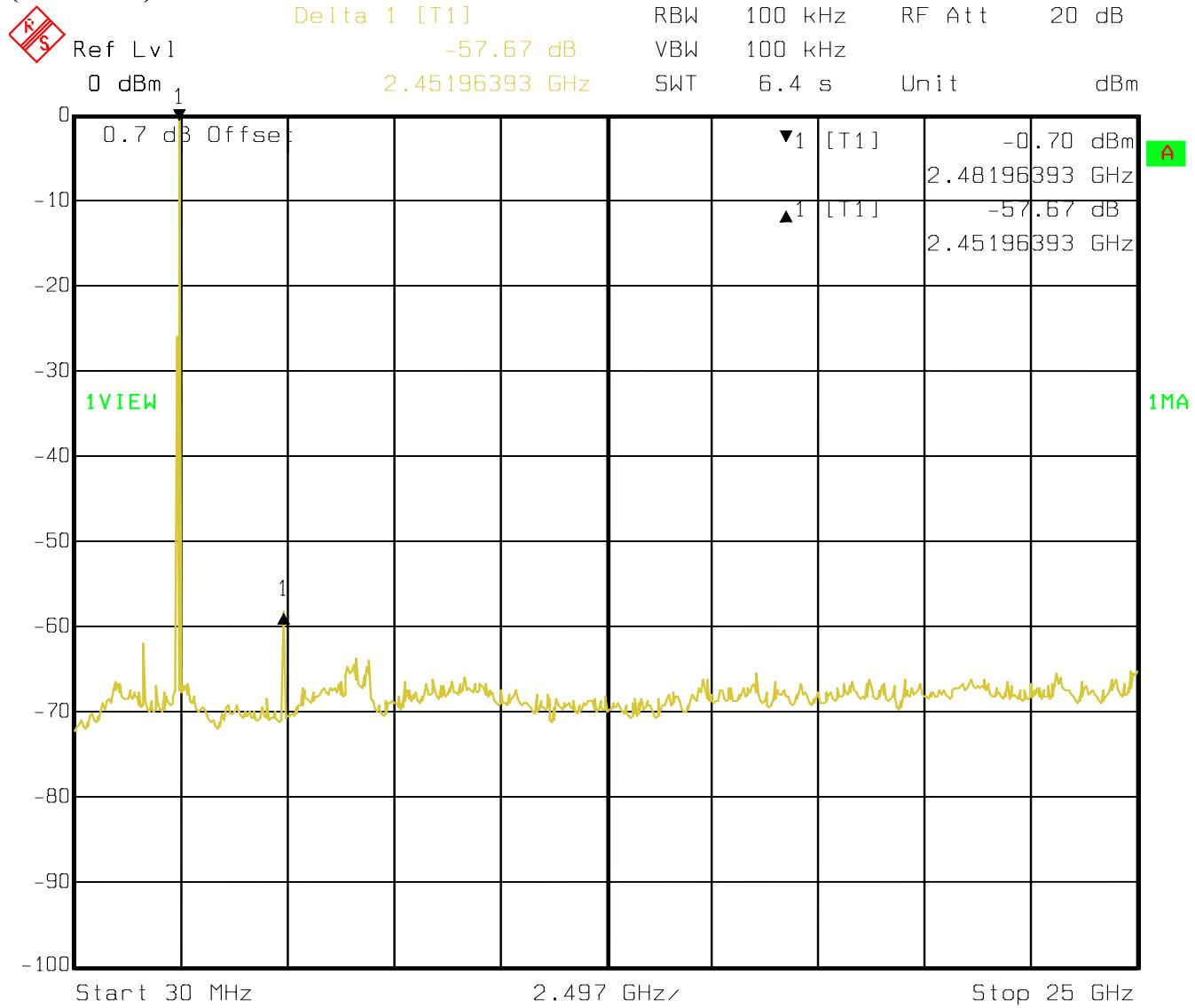
#### **Notes:**

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)

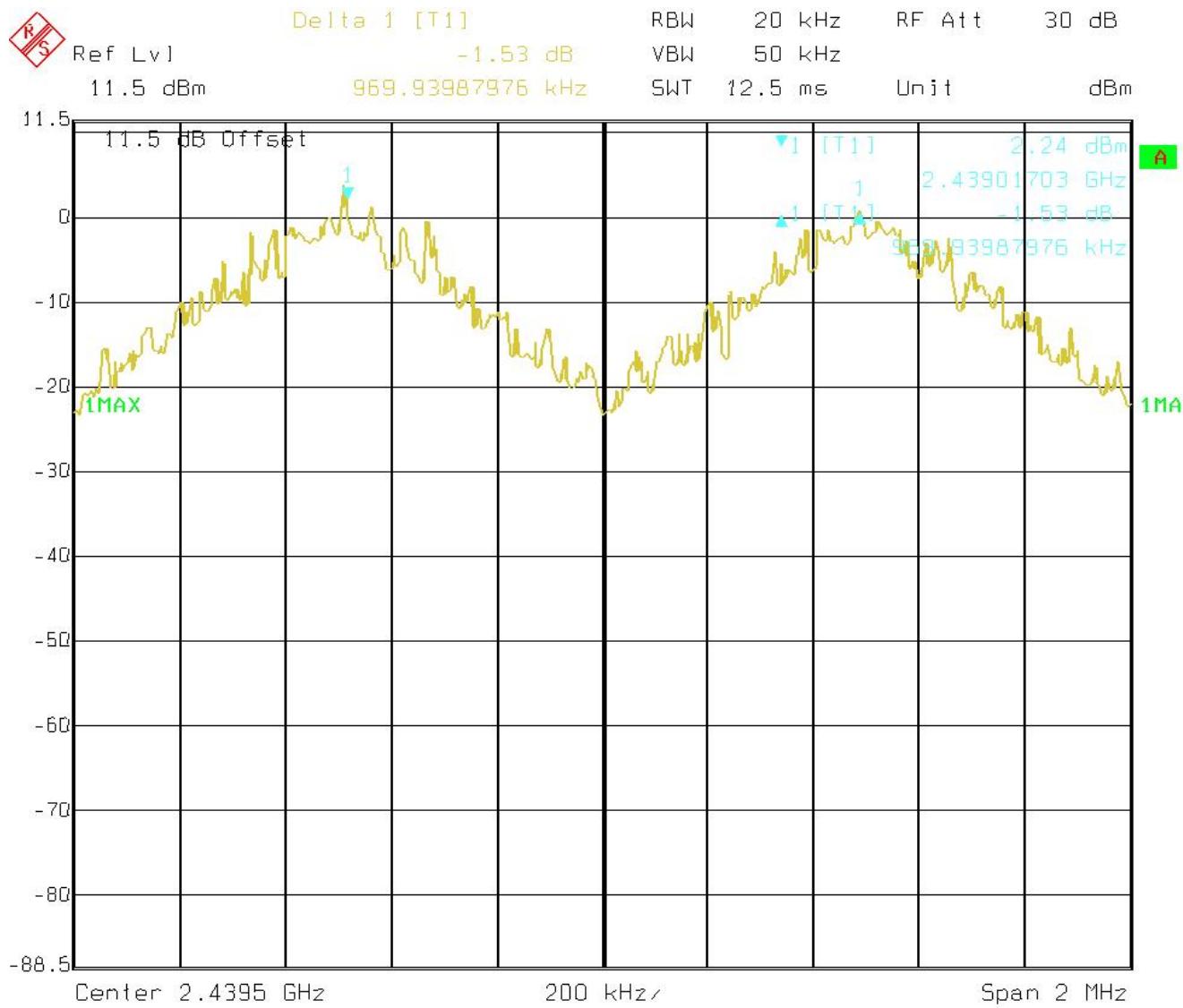
(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies 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:

<b>TEST CONDITIONS</b>		<b>SEPARATION (MHz)</b>
$T_{\text{nom}}(23)^\circ\text{C}$	$V_{\text{nom}}\text{VDC}$	<b>0.969</b>



## **6.5 NUMBER OF HOPPING CHANNELS**

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

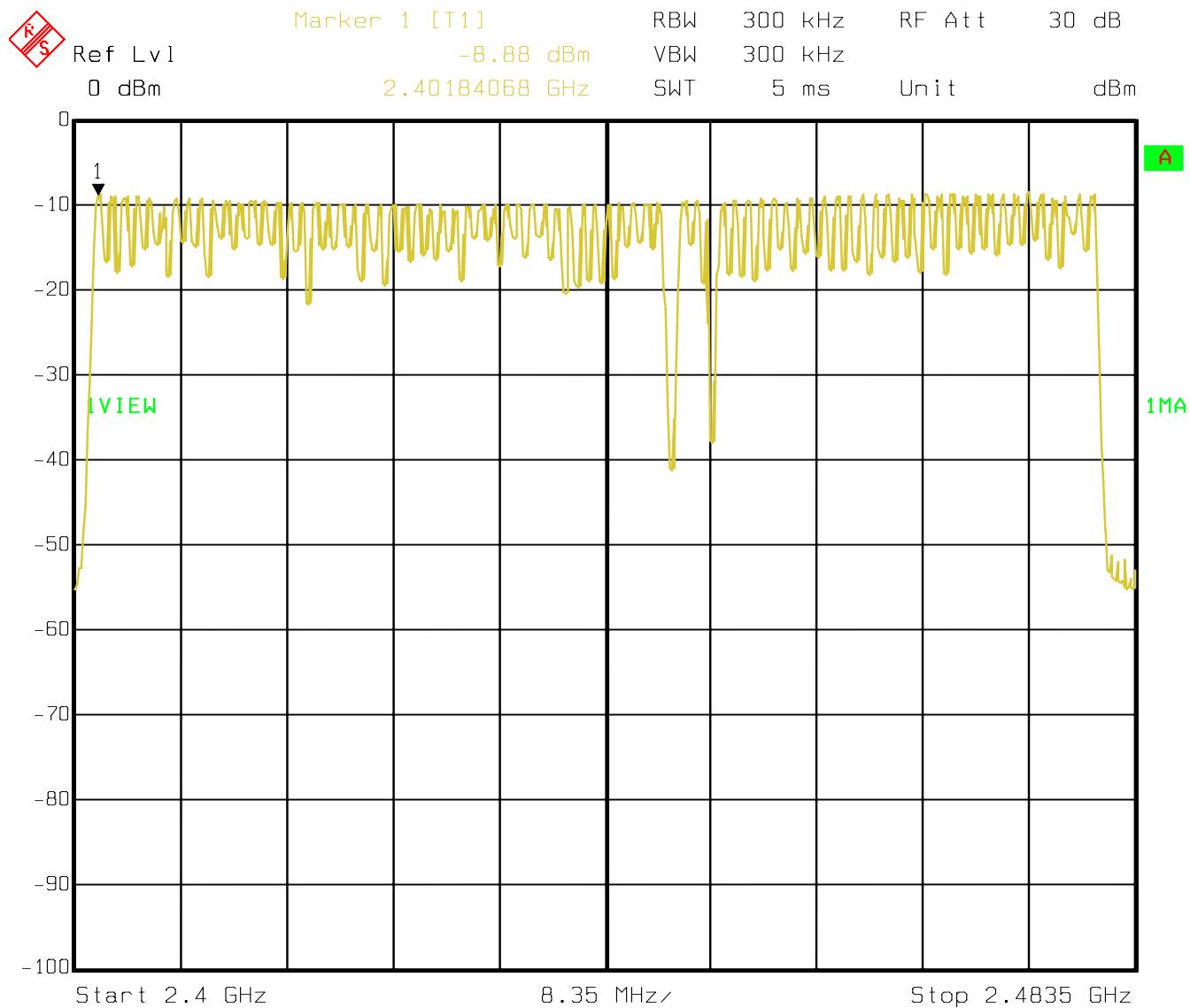
<b>NUMBER OF CHANNELS</b>
<b>&gt; 15</b>

**Notes:**

1. Measurements were performed with a spectrum analyzer.

### **6.5.2 RESULTS:**

<b>TEST CONDITIONS</b>	<b>NUMBER OF CHANNELS</b>
<b>T<sub>nom</sub>(23)°C</b>	<b>V<sub>nom</sub>VDC</b>



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  $\mu$ 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 $\mu$ 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

Conducted AC emissions testing was performed with 110 VAC @ 60 Hz with the EUT in battery charging mode. During the testing an uncharged battery was installed in the EUT.

### 6.7.2 Results

*Line - Tx mode:*

**CETECOM Inc. Milpitas, USA**

EUT: QC890

Manufacturer: Hand Held Products, Inc.

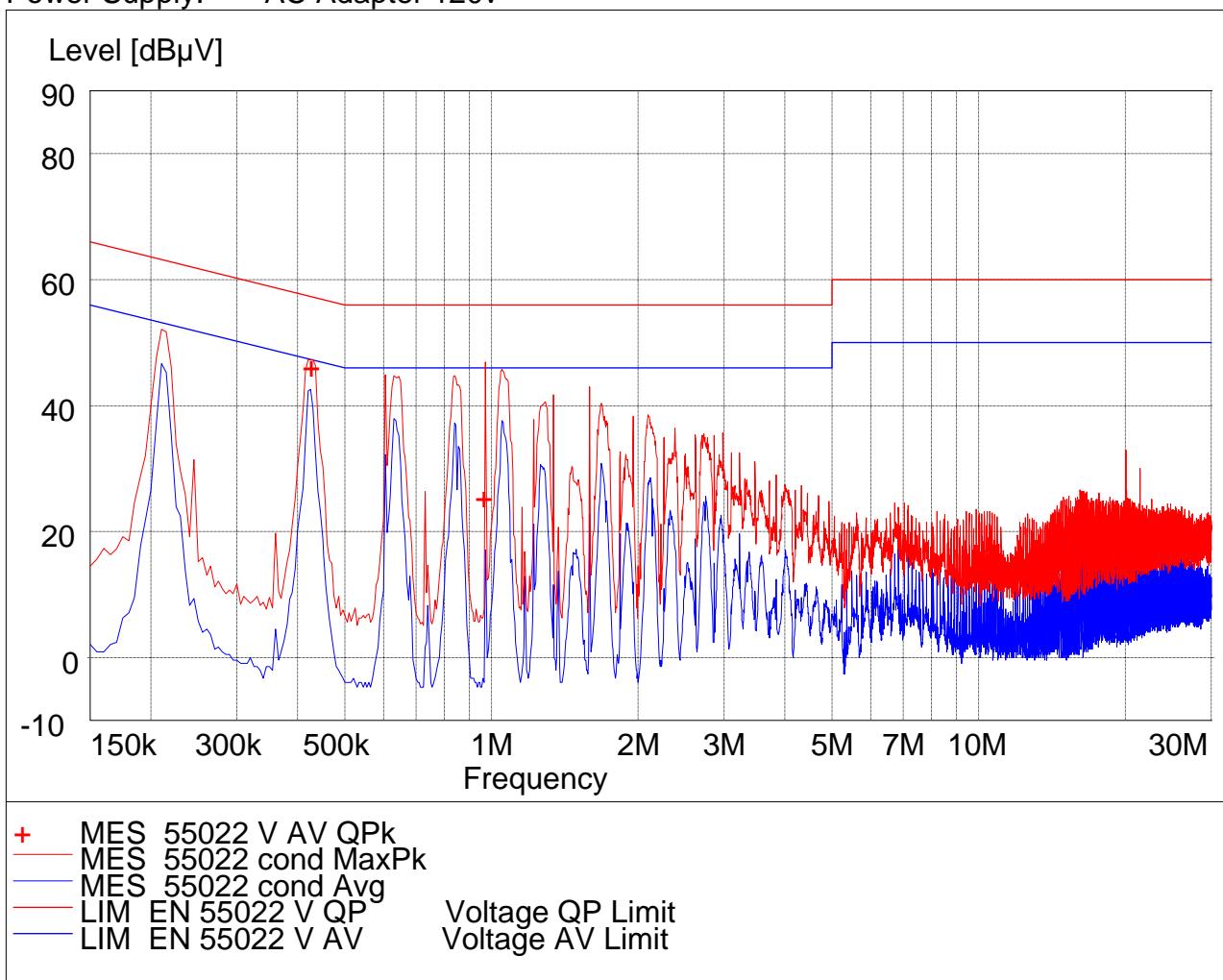
Operating Condition: Line, Ch.39 DH3

ANT Orientation: Conducted

EUT Orientation: H

Test Engineer: Chris

Power Supply: AC Adapter 120v



#### **MEASUREMENT RESULT: "55022 V AV QPk" - 10/25/2007 10:07AM**

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB $\mu$ V	dB	dB $\mu$ V	dB		

0.430000	46.80	0.0	57	10.4	---	---
0.970000	26.20	0.0	56	29.8	---	---

***Neutral – Tx mode:*****CETECOM Inc. Milpitas, USA**

EUT: QC890

Manufacturer: Hand Held Products, Inc.

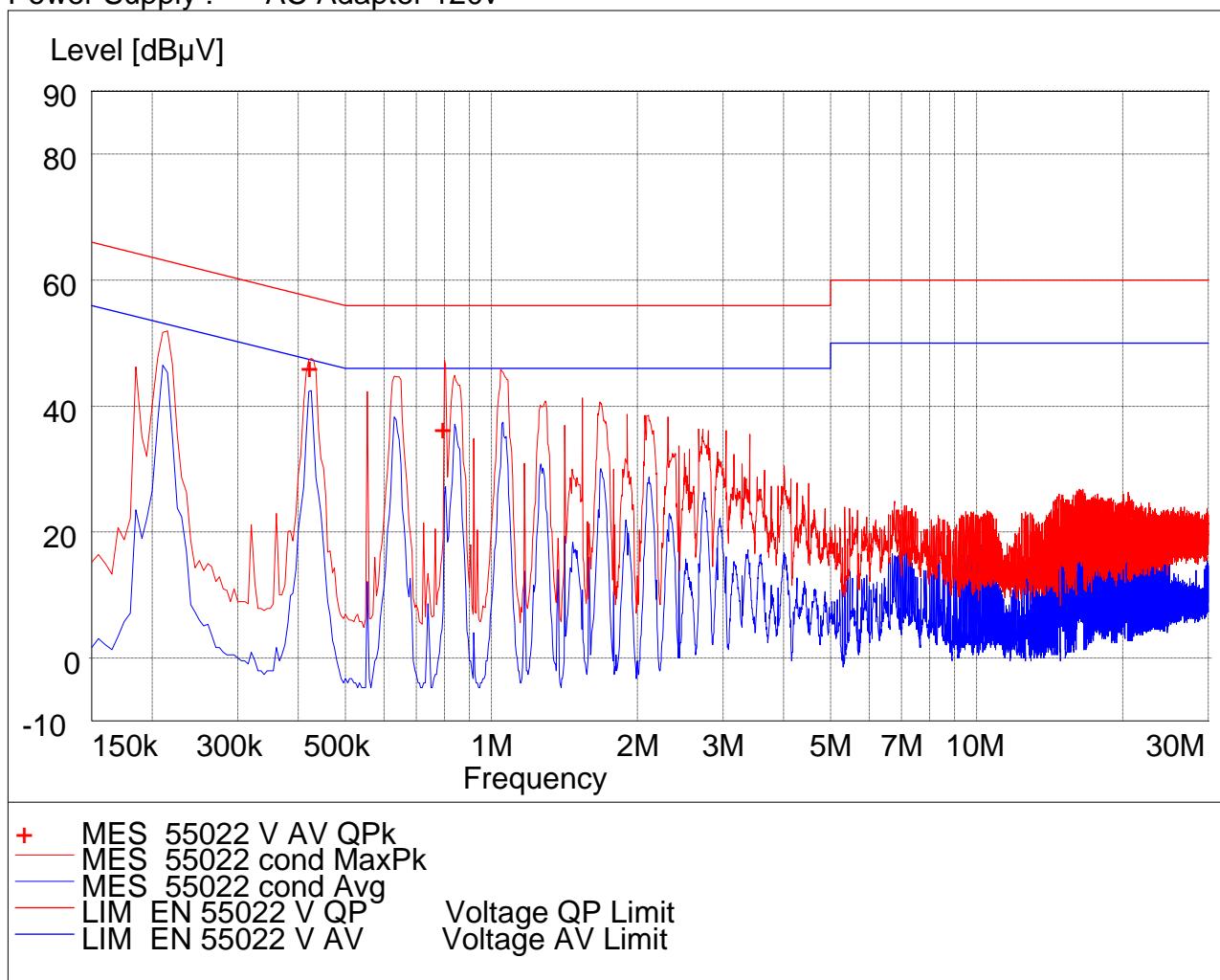
Operating Condition: Neutral, Ch.39 DH3

ANT Orientation: Conducted

EUT Orientation: H

Test Engineer: Chris

Power Supply : AC Adapter 120v

**MEASUREMENT RESULT: "55022 V AV QPk" - 10/25/2007 10:02AM**

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB $\mu$ V	dB	dB $\mu$ V	dB		

0.425000	46.90	0.0	57	10.5	---	---
0.800000	37.10	0.0	56	18.9	---	---

**Line – Rx mode:****CETECOM Inc. Milpitas, USA**

EUT: QC890

Manufacturer: Hand Held Products, Inc.

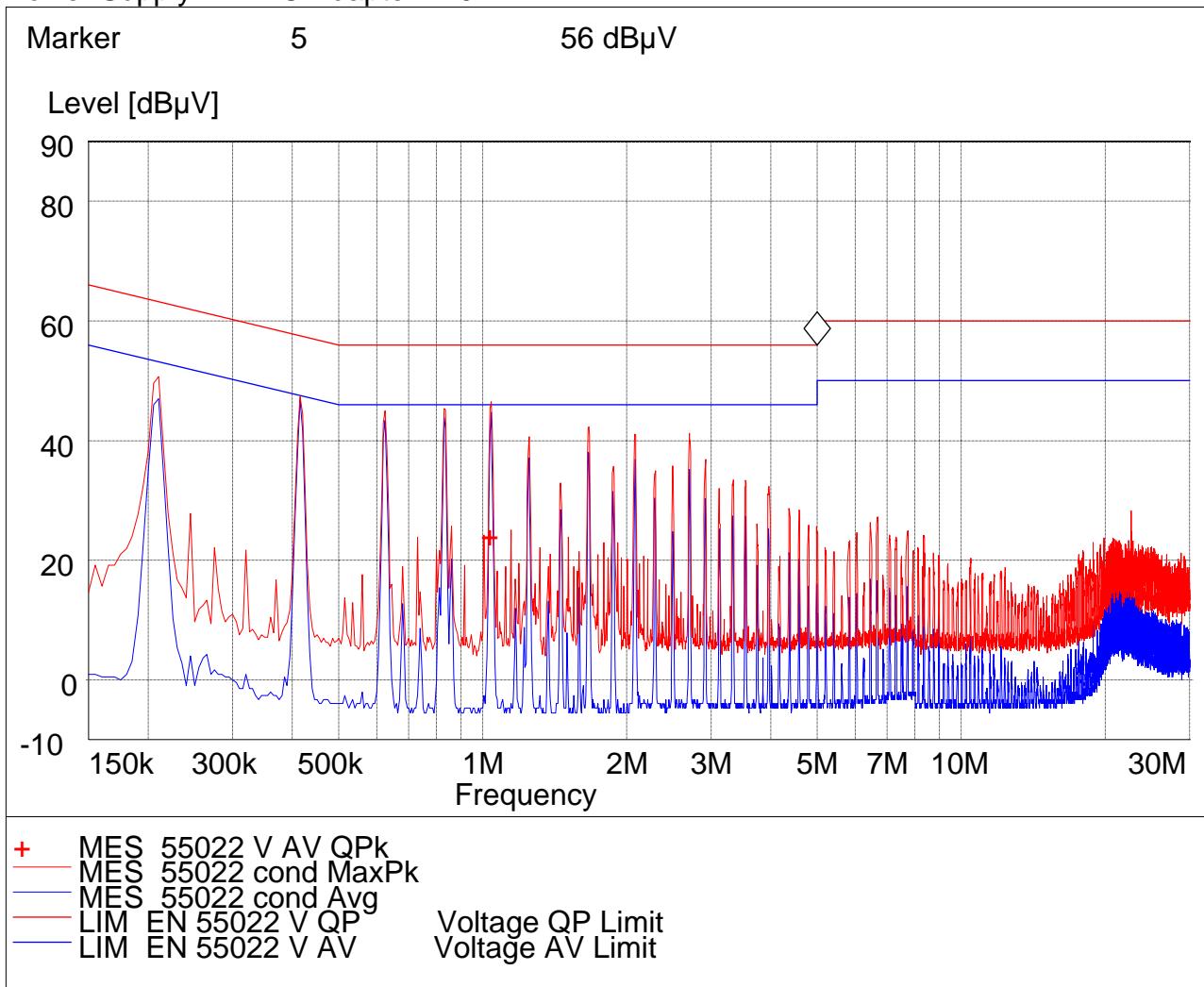
Operating Condition: Line

ANT Orientation: Conducted

EUT Orientation: H

Test Engineer: Chris

Power Supply : AC Adapter 120v

**MEASUREMENT RESULT: "55022 V AV QPk" - 10/25/2007 9:44AM**

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB $\mu$ V	dB	dB $\mu$ V	dB		

1.040000	44.90	0.0	56	11.1	---	---
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**Neutral - Rx mode:****CETECOM Inc. Milpitas, USA**

EUT: QC890

Manufacturer: Hand Held Products, Inc.

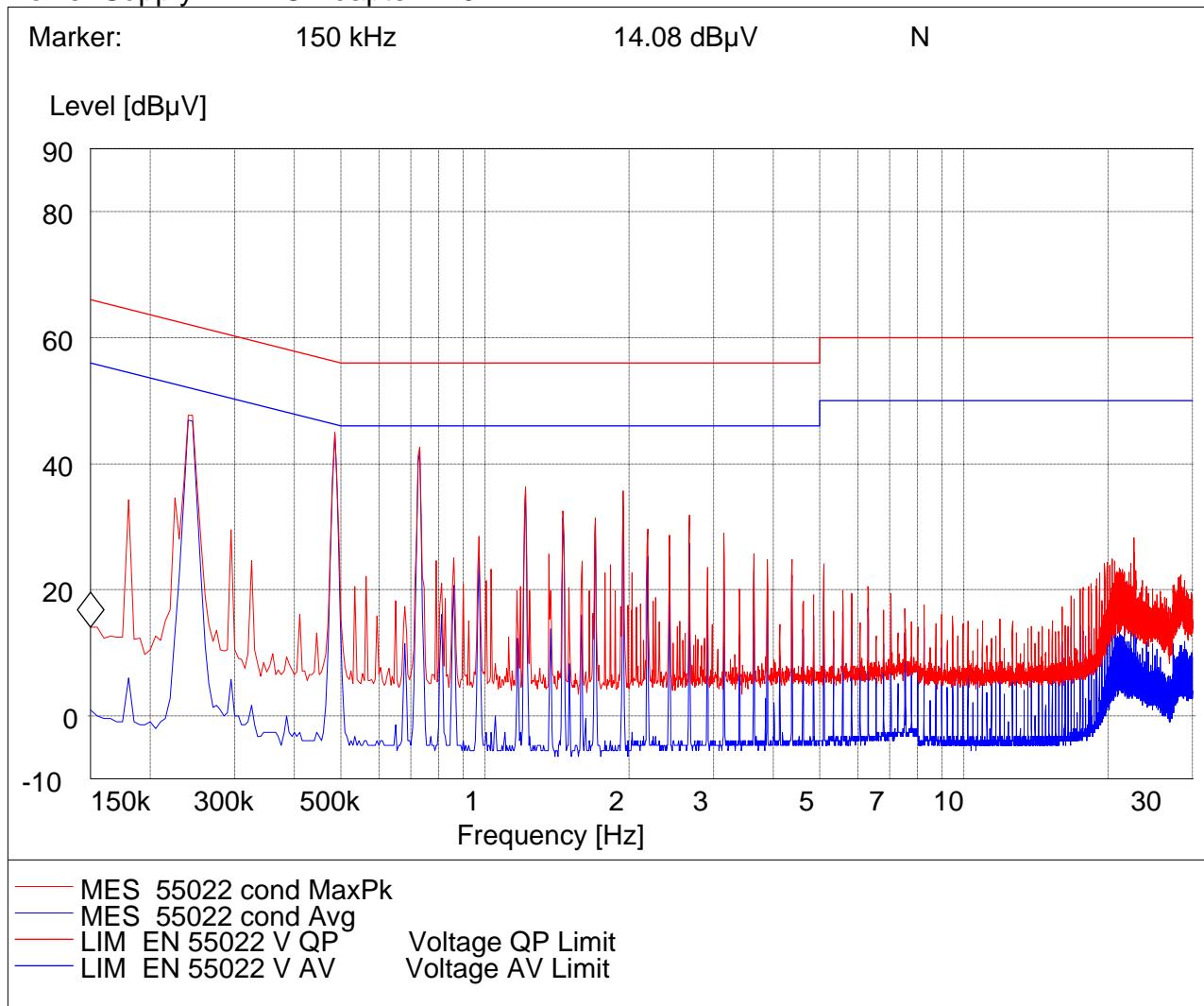
Operating Condition: Neutral, Ch.39 DH3

ANT Orientation: Conducted

EUT Orientation: H

Test Engineer: Chris

Power Supply : AC Adapter 120v

**MEASUREMENT RESULT: "55022 V AV QPk" - 10/25/2007 9:45AM**

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB $\mu$ V	dB	dB $\mu$ V	dB		

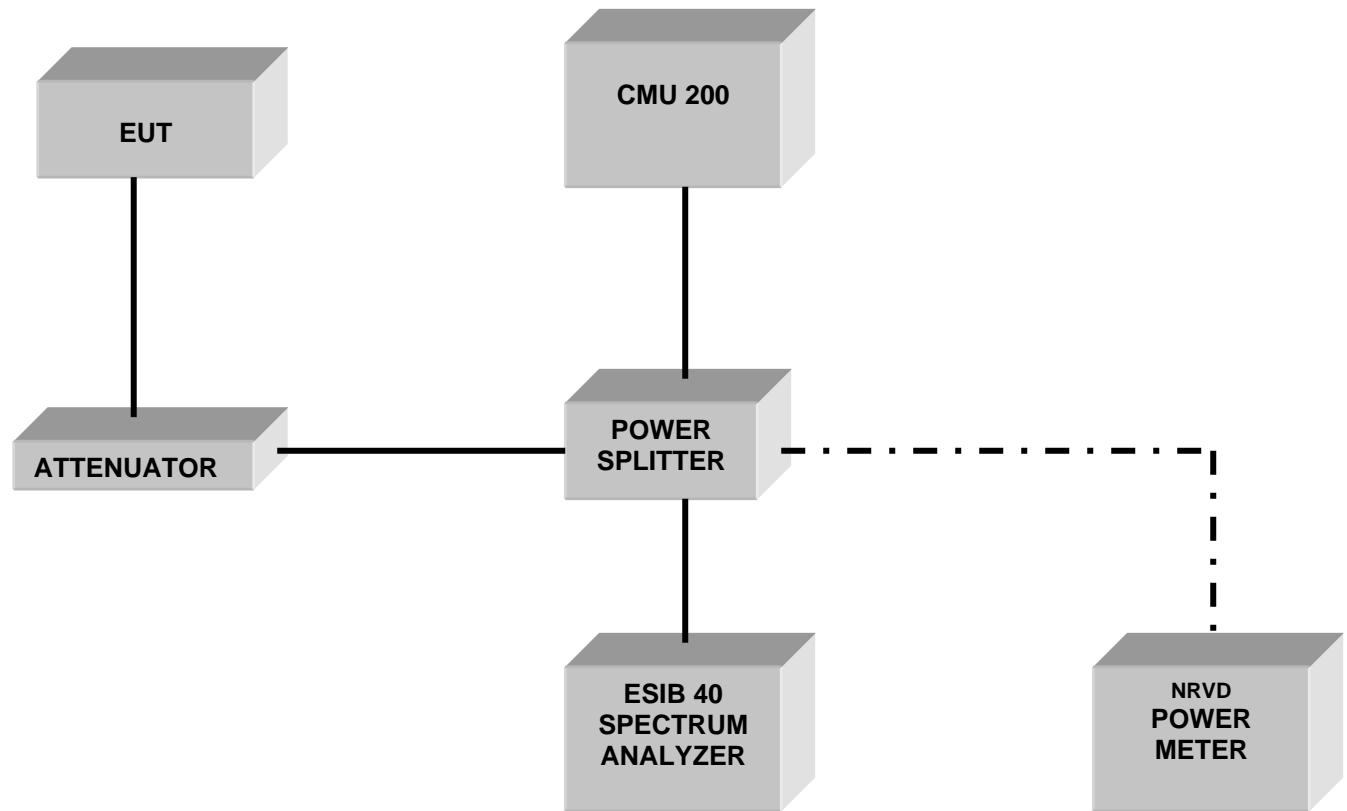
0.240000	49.8	0.0	56	6.21	---	---
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## **7 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
<b>01</b>	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2008	1 year
<b>02</b>	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2008	1 year
<b>03</b>	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2008	1 year
<b>04</b>	Biconilog Antenna	3141	EMCO	0005-1186	June 2008	1 year
<b>05</b>	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2008	1 year
<b>06</b>	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2008	1 year
<b>07</b>	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
<b>08</b>	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
<b>09</b>	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
<b>10</b>	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2008	1 year
<b>11</b>	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2008	1 year
<b>12</b>	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	Aug. 2008	1 year

## **8 BLOCK DIAGRAMS**

### **Conducted Testing**



**Radiated Testing****ANECHOIC CHAMBER**