

*FCC PART 15, SUBPART B and C  
TEST REPORT*

*for*

**AirCast Auto FM**

**MODEL: F8M117**

Prepared for

**BELKIN INTERNATIONAL, INC.**  
12045 EAST WATERFRONT DRIVE  
PLAYA VISTA, CA 90094

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DATE: NOVEMBER 7, 2011

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
PAGES	20	2	2	2	12	57	<b>95</b>

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## GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: AirCast Auto FM  
Model: F8M117

Product Description: See Expository Statement.

Modifications: The EUT was not modified.

Manufacturer: BELKIN INTERNATIONAL, INC.  
12045 East Waterfront Drive  
Playa Vista, CA 90094

Test Dates: October 5, 7, 11, 12, 14, & November ,7 2011

Test Specifications: EMI requirements  
CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247

Test Procedure: ANSI C63.10: 2009

Test Deviations: The test procedure was not deviated from during the testing.

## SUMMARY OF TEST RESULTS

<i>TEST</i>	<b>DESCRIPTION</b>	<b>RESULTS</b>
1	Conducted RF Emissions, 150 kHz – 30 MHz	The EUT is battery powered; therefore this test was not performed.
2	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209
3	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 25000 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(d)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
5	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (d)
6	Carrier Frequency Separation	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)
7	20 dB Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(1) and (a)(1)(iii)
8	Average Time of Occupancy	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(iii)
9	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(1)
10	RF Conducted Antenna Test	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d)
11	Band Edge	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d)
12	Peak Power Spectral Density from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (f)

**1. PURPOSE**

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the AirCast Auto FM, Model: F8M117. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10: 2009. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47 Part 15 Subpart B and Subpart C sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15 Subpart B.

## 2. ADMINISTRATIVE DATA

### 2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 20621 Pascal Way, Lake Forest, California 92630.

### 2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

### 2.3 Cognizant Personnel

Belkin International, Inc.

Daniel Wesey                      EMC Regulatory Compliance Engineer

Compatible Electronics Inc.

Matt Harrison                      Test Technician  
Josh Hansen                        Lab Manager, Lake Forest Division  
Jeff Klinger                         Director of Engineering

### 2.4 Date Test Sample was received

The test sample was received prior to the date of testing.

### 2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics as of the date of this test report.

### 2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
N/A	Not Applicable

**3. APPLICABLE DOCUMENTS**

The following documents are referenced or used in the preparation of this EMI Test Report.

<b>SPEC</b>	<b>TITLE</b>
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.10 2009	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz

#### 4. DESCRIPTION OF TEST CONFIGURATION

##### 4.1 Description of Test Configuration - EMI

The AirCast Auto FM, Model: F8M117 (EUT) was set up in a tabletop configuration. The EUT was powered by a CLA receptacle connected to a 12V battery. The EUT was connected to a mobile phone (iPhone 4) via bluetooth communication and rebroadcasted the music from the mobile phone via FM modulation. The EUT antenna is intergrated in the PCB board design.

The low, middle, and high channels were investigated in each mode of operation and the X, Y, and Z axis were investigated and the worst case orientation is represented.

Operation of the EUT during the testing:

**For the intentional radiator portion of the test:** The EUT used a program that locked one channel at a time so that the low, middle, and high channels could be tested. This allowed the EUT to be in a mode where no frequency hopping was enabled. The carrier was modulated in the same way it would be when the EUT was in its normal frequency hopping mode.

**For the unintentional radiator and conducted emission portion of the test:** The EUT used a program that allowed the EUT to function as normal (the channels were frequency hopping) on a continuous basis. It was also programmed to disable the transmitter and enable only the receiver.

The final radiated as well as the conducted data was taken in the modes above. Please see Appendix E for the data sheets.

#### 4.1.1 Cable Construction and Termination

##### Cable 1

This is a 1.6-meter unshielded cable connecting the EUT to the CLA receptacle. It is hardwired into the EUT and the CLA. The cable was bundled to 1 meter from the EUT to the CLA.



**5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**

**5.1 EUT and Accessory List**

<b>EQUIPMENT</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>FCC ID</b>
AIRCAST AUTO FM (EUT)	Belkin International, Inc.	F8M117	N/A	K7SF8M117
iPhone 4	Apple, Inc.	MC676LL	C37F61RCDDP7	N/A
12v Battery	N/A	N/A	N/A	N/A

## 5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
<b>GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS</b>					
Computer	Hewlett Packard	Pavilion	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100172	1/13/2011	1/13/2012
Antenna, Active-Loop	Com Power	AL-130	17085	1/26/2011	1/26/2012
Antenna, CombiLog	Com Power	AC-220	003	6/07/2011	6/07/2012
Horn Antenna	Com-Power	AH-118	071250	10/1/2010	10/1/2012
Horn Antenna	Com-Power	AH-826	81033	N.C.R.	N.C.R.
Pre Amp	Com-Power	PA-122	25196	6/08/2011	6/08/2012
Pre Amp	Com-Power	PA-840	181289	6/07/2011	6/07/2012
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Antenna Mast	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	020808-1	N/A	N/A
Power Measuring Analyzer	Boonton Electronics	4500A-01	1282	5/05/2011	5/05/2013

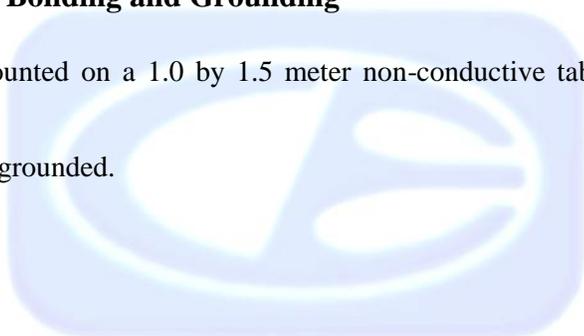
**6. TEST SITE DESCRIPTION1****6.1 Test Facility Description**

Please refer to section 2.1 and 7.1 of this report for EMI test location.

**6.2 EUT Mounting, Bonding and Grounding**

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.



## 7. CHARACTERISTICS OF THE TRANSMITTER

### 7.1 Transmitter Power

Transmit power is herein defined as the power delivered to a 50 ohm load at the RF output of the EUT.

Peak Power	Channel
5.68 dBm	LOW
5.51 dBm	MIDDLE
5.19 dBm	HIGH

### 7.2 Channel Number and Frequencies

There are a total of 79 channels. The low channel is at 2401.0 MHz and the high channel is at 2480.0 MHz. There is >1 MHz separation between channels.

Channel 1: 2401 MHz  
Channel 2: 2402 MHz  
(Etc.)

### 7.3 Antenna Gain

The antenna has a gain of 2 dBi.

## 8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

### 8.1 RF Emissions

#### 8.1.1 Conducted Emissions Test (AC mains)

*(This test was not performed)*

The receiver was used as a measuring meter. The receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps. The quasi-peak detector was used only where indicated in the data sheets. An attenuator was used for the protection of the receiver input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the receiver. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.10: 2009. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the receiver at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

#### **Test Results:**

The EUT is battery powered; therefore this test was not preformed.

### 8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The receiver was used as a measuring meter. The receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies above 18 GHz.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the receiver to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 1000 MHz	120 kHz	CombiLog Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

The Semi-Anechoic test site of Compatible Electronics, Inc, Lab P (Lake Forest) was used for radiated emission testing. This test site is set up according to ANSI C63.10: 2009. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gun sight method was used when measuring with the horn antenna in order to ensure accurate results. The EUT was tested at a 3 meter test distance from 10 kHz to 25 GHz to obtain the final test data.

#### Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.247 (d) for radiated emissions. There were no emissions found below 30MHz. Please see Appendix E for the data sheets.

## 8.2 20 dB Bandwidth

The 20 dB Bandwidth was measured using the EMI Receiver; with the frequency hopping operation turned off. The bandwidth was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1) and (a)(1)(iii). Please see the data sheets located in Appendix E.

## 8.3 Peak Output Power

The Peak Output Power was measured using the Power Measuring Analyzer; with the frequency hopping operation turned off. The peak output power was measured using a direct connection from the RF output of the EUT.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (b)(1). The maximum peak output power is less than 125 mw. Please see the data sheets located in Appendix E.

## 8.4 RF Antenna Conducted Test

The RF antenna conducted test was performed using the EMI Receiver. The RF antenna conducted test measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 100 kHz, and the video bandwidth was 1 MHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power that is produced by the intentional radiator is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power. Please see the radiated emission data sheets located in Appendix E.

## 8.5 RF Band Edges

The RF band edges were taken at the edges of the ISM spectrum (2400 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel) using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.1 of this test report was used to maximize the emission.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power at the band edges at 2400 MHz and 2483.5 MHz meet the requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). Please see the data sheets located in Appendix E.

## 8.6 Carrier Frequency Separation

The Channel Hopping Separation Test was measured using the EMI Receiver. The EUT was operating in its normal operating mode. The resolution bandwidth was 100 kHz, and the video bandwidth 300 kHz. The frequency span was wide enough to include the peaks of two adjacent channels.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1) and 15.247 (a)(1)(iii). Please see the data sheets located in Appendix D.

## 8.7 Number of Hopping Channels

The Number of Hopping Channels Test was measured using the EMI Receiver. The EUT was operating in its normal operating mode. The resolution bandwidth was 1 MHz, and the video bandwidth was 3 MHz. The frequency span was wide enough to include all of the peaks in the frequency band of operation.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1) and 15.247 (a)(1)(iii). The number of hopping frequencies is 79. Please see the data sheets located in Appendix E.

## 8.8 Average Time of Occupancy Test

The Average Time of Occupancy Test was measured using the EMI Receiver. The EUT was operating in normal operating mode. The frequency span was taken to 0 Hz with a sweep time of 5 ms to determine the time for each transmission.

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. This means the time of occupancy of any one channel cannot be greater than 0.4 seconds in a 31.6 second period (0.4 seconds \* 79 channels).

The sweep time was then changed to 2 seconds and the number of pulses taken. The number of pulses was then multiplied by 15.8 to determine the number of pulses in a 31.6 second period. The number of pulses in a 31.6 second period was then multiplied by the time for each pulse to determine the average time of occupancy.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(iii). The EUT does not transmit for more than 400 msec in a 31.6 second period on any frequency. Please see the data sheets located in Appendix E.

## 8.9 Spectral Density Test

The spectrum density output was measured using the EMI Receiver; with the frequency hopping operation turned off. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth 3 kHz, and the video bandwidth was 10 kHz. The highest 1.5 MHz of the signal was used as the frequency span with the sweep rate being 1 second for every 3 kHz of span.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (f).

## 9. CONCLUSIONS

The AirCast Auto FM Model: F8M117 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.





**APPENDIX A**

***LABORATORY RECOGNITIONS***

---

**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

**Agoura Division**  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

**Silverado Division**  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

**Lake Forest Division**  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

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## ***LABORATORY RECOGNITIONS***

### **Compatible Electronics has the following agency accreditations:**

National Voluntary Laboratory Accreditation Program - Lab Code: 200527-0

Voluntary Control Council for Interference - Registration Numbers: R-3276, C-3645, T-11758

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

### **Compatible Electronics is recognized or on file with the following agencies:**

Industry Canada  
Site Number: 2154C-1

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**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

**Agoura Division**  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

**Silverado Division**  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

**Lake Forest Division**  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400



**APPENDIX B**

***MODIFICATIONS TO THE EUT***

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## **MODIFICATIONS TO THE EUT**

There were no modifications made to the EUT during the testing.





**APPENDIX C**

***ADDITIONAL MODELS COVERED  
UNDER THIS REPORT***

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**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

**Agoura Division**  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

**Silverado Division**  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

**Lake Forest Division**  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## **ADDITIONAL MODELS COVERED UNDER THIS REPORT**

USED FOR THE PRIMARY TEST



AirCast Auto FM  
Model: F8M117  
S/N: N/A

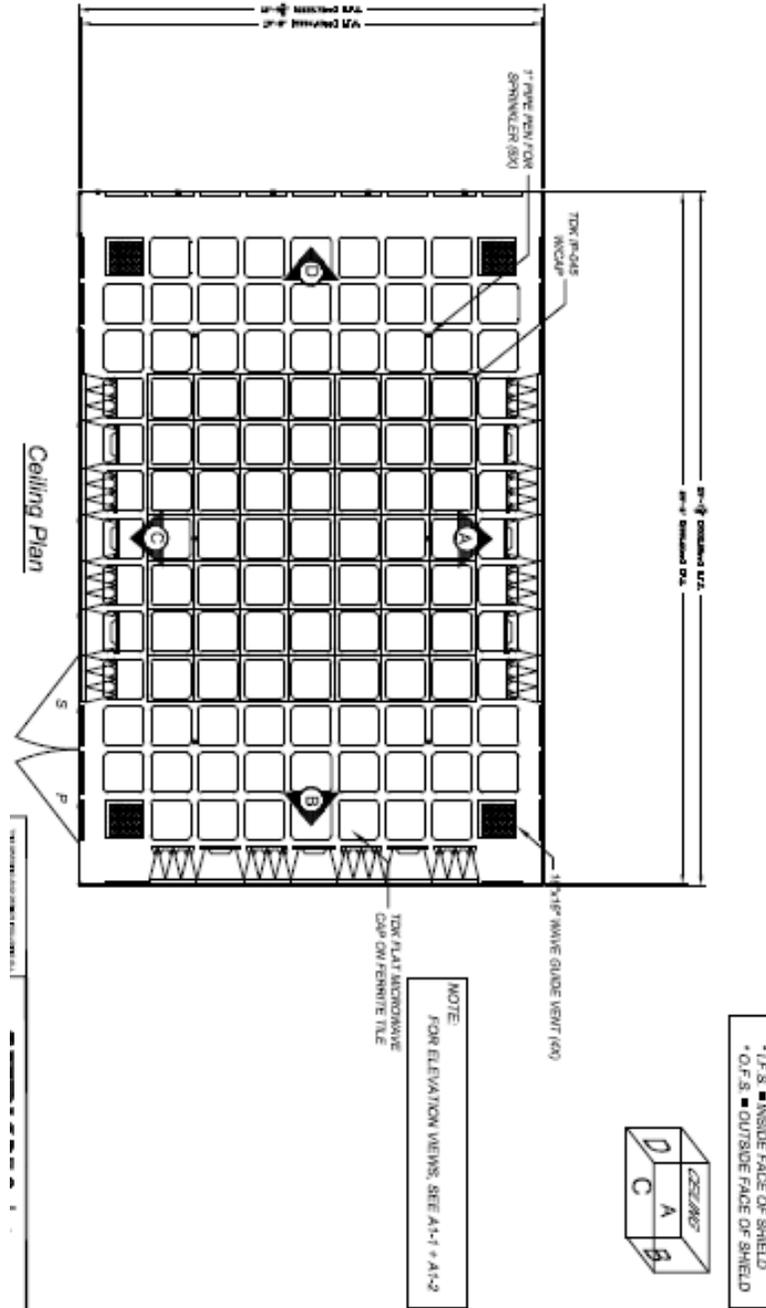
There were no additional models covered under this report.



**APPENDIX D**

***DIAGRAMS, CHARTS, AND PHOTOS***

**FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE**



*TDK FAC-3 test chamber*

**COM-POWER AL-130****LOOP ANTENNA****S/N: 17085****CALIBRATION DATE: JANUARY 26, 2011**

<b>FREQUENCY (MHz)</b>	<b>MAGNETIC (dB/m)</b>	<b>ELECTRIC (dB/m)</b>	<b>FREQUENCY (MHz)</b>	<b>MAGNETIC (dB/m)</b>	<b>ELECTRIC (dB/m)</b>
<b>0.009</b>	-41.14	10.36	<b>0.8</b>	-40.91	10.59
<b>0.01</b>	-40.98	10.52	<b>0.9</b>	-40.80	10.70
<b>0.02</b>	-40.87	10.63	<b>1</b>	-40.81	10.69
<b>0.03</b>	-40.13	11.37	<b>2</b>	-40.51	10.99
<b>0.04</b>	-40.42	11.08	<b>3</b>	-40.54	10.96
<b>0.05</b>	-41.06	10.44	<b>4</b>	-40.44	11.06
<b>0.06</b>	-41.07	10.43	<b>5</b>	-40.32	11.18
<b>0.07</b>	-41.12	10.38	<b>6</b>	-40.69	10.81
<b>0.08</b>	-41.03	10.47	<b>7</b>	-40.37	11.13
<b>0.09</b>	-41.04	10.46	<b>8</b>	-39.99	11.51
<b>0.1</b>	-41.26	10.24	<b>9</b>	-40.00	11.50
<b>0.2</b>	-41.23	10.27	<b>10</b>	-40.08	11.42
<b>0.3</b>	-41.26	10.24	<b>15</b>	-42.36	9.14
<b>0.4</b>	-41.14	10.36	<b>20</b>	-38.75	12.75
<b>0.5</b>	-41.24	10.26	<b>25</b>	-40.70	10.80
<b>0.6</b>	-41.22	10.28	<b>30</b>	-41.09	10.41
<b>0.7</b>	-41.12	10.38			

*Note: Factors applied to measurement. Where applicable for amplitude accuracy, readings shown on data have been corrected for antenna loss as well as cable loss.*

**COM-POWER AC-220****LAB P - COMBILOG ANTENNA****S/N: 003****CALIBRATION DATE: JUNE 07, 2011**

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
<b>30</b>	18.30	<b>180</b>	9.00
<b>35</b>	18.30	<b>200</b>	8.90
<b>40</b>	18.90	<b>250</b>	11.50
<b>45</b>	17.90	<b>300</b>	14.20
<b>50</b>	16.60	<b>300</b>	14.20
<b>60</b>	13.10	<b>400</b>	14.80
<b>70</b>	7.50	<b>500</b>	16.10
<b>80</b>	6.30	<b>600</b>	18.30
<b>90</b>	7.90	<b>700</b>	20.40
<b>100</b>	8.50	<b>800</b>	20.80
<b>120</b>	9.90	<b>900</b>	21.10
<b>140</b>	9.30	<b>1000</b>	22.10
<b>160</b>	10.30		

*Note: Factors applied to measurement. Where applicable for amplitude accuracy, readings shown on data have been corrected for antenna loss as well as cable loss.*

**COM POWER AH-118****HORN ANTENNA**

S/N: 071250

CALIBRATION DATE: OCTOBER 1, 2010

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
<b>1000</b>	24.00	<b>9500</b>	35.90
<b>1500</b>	23.90	<b>10000</b>	40.40
<b>2000</b>	27.90	<b>10500</b>	41.70
<b>2500</b>	29.60	<b>11000</b>	38.90
<b>3000</b>	30.70	<b>11500</b>	40.30
<b>3500</b>	30.30	<b>12000</b>	38.10
<b>4000</b>	28.60	<b>12500</b>	42.80
<b>4500</b>	30.70	<b>13000</b>	38.80
<b>5000</b>	33.00	<b>13500</b>	36.90
<b>5500</b>	32.90	<b>14000</b>	43.70
<b>6000</b>	34.10	<b>14500</b>	42.00
<b>6500</b>	37.20	<b>15000</b>	42.00
<b>7000</b>	37.90	<b>15500</b>	37.90
<b>7500</b>	38.30	<b>16000</b>	38.50
<b>8000</b>	38.50	<b>16500</b>	39.20
<b>8500</b>	36.90	<b>17000</b>	39.20
<b>9000</b>	40.20	<b>17500</b>	42.80
		<b>18000</b>	43.20

*Note: Factors applied to measurement. Where applicable for amplitude accuracy, readings shown on data have been corrected for antenna loss as well as cable loss.*

**COM-POWER PA-122****PREAMPLIFIER**

S/N: 25196

CALIBRATION DATE: JUNE 8, 2011

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
<b>500</b>	32.47	<b>11500</b>	27.94
<b>1000</b>	31.97	<b>12000</b>	29.54
<b>1500</b>	31.38	<b>12500</b>	29.32
<b>2000</b>	30.78	<b>13000</b>	27.47
<b>2500</b>	29.98	<b>13500</b>	27.17
<b>3000</b>	29.57	<b>14000</b>	28.06
<b>3500</b>	29.15	<b>14500</b>	28.82
<b>4000</b>	28.48	<b>15000</b>	28.37
<b>4500</b>	27.77	<b>15500</b>	28.11
<b>5000</b>	27.54	<b>16000</b>	28.04
<b>5500</b>	27.32	<b>16500</b>	26.37
<b>6000</b>	27.56	<b>17000</b>	25.34
<b>6500</b>	27.47	<b>17500</b>	25.01
<b>7000</b>	27.85	<b>18000</b>	24.74
<b>7500</b>	27.77	<b>18500</b>	24.4
<b>8000</b>	27.8	<b>19000</b>	24.96
<b>8500</b>	28.23	<b>19500</b>	24.46
<b>9000</b>	28.38	<b>20000</b>	22.98
<b>9500</b>	27.27	<b>20500</b>	21.35
<b>10000</b>	26.73	<b>21000</b>	19.28
<b>10500</b>	26.45	<b>21500</b>	16.6
<b>11000</b>	26.67	<b>22000</b>	12.17

*Note: Factors applied to measurement. Where applicable for amplitude accuracy, readings shown on data have been corrected for antenna loss as well as cable loss.*

**COM-POWER AH-826****LAB P - HORN ANTENNA**

S/N: 81033

CALIBRATION DATE: N.C.R.

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
<b>18000</b>	32.80	22500	32.70
<b>18500</b>	32.20	23000	32.70
<b>19000</b>	31.90	23500	32.00
<b>19500</b>	31.50	24000	32.90
<b>20000</b>	33.30	24500	33.70
<b>20500</b>	33.20	25000	34.10
<b>21000</b>	32.60	25500	33.60
<b>21500</b>	33.20	26000	35.10
<b>22000</b>	33.00	26500	33.60

*Note: Factors applied to measurement. Where applicable for amplitude accuracy, readings shown on data have been corrected for antenna loss as well as cable loss.*

**COM-POWER PA-840****18-40 GHz PREAMPLIFIER**

S/N: 181289

CALIBRATION DATE: JUNE 07, 2011

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
<b>18000</b>	31.47	<b>31500</b>	28.82
<b>19000</b>	31.17	<b>32000</b>	29.35
<b>20000</b>	30.71	<b>32500</b>	28.59
<b>21000</b>	33.32	<b>33000</b>	29.31
<b>22000</b>	32.09	<b>33500</b>	27.56
<b>23000</b>	30.97	<b>34000</b>	28.56
<b>24000</b>	30.35	<b>34500</b>	28.12
<b>25000</b>	31.42	<b>35000</b>	28.06
<b>26000</b>	32.53	<b>35500</b>	27.87
<b>26500</b>	31.67	<b>36000</b>	26.55
<b>27000</b>	32.51	<b>36500</b>	27.57
<b>27500</b>	31.44	<b>37000</b>	27.44
<b>28000</b>	32.15	<b>37500</b>	27.84
<b>28500</b>	30.61	<b>38000</b>	27.44
<b>29000</b>	30.38	<b>38500</b>	28.35
<b>29500</b>	30.28	<b>39000</b>	32.63
<b>30000</b>	30.02	<b>39500</b>	31.44
<b>30500</b>	29.79	<b>39999</b>	30.52
<b>31000</b>	29.78		

*Note: Factors applied to measurement. Where applicable for amplitude accuracy, readings shown on data have been corrected for antenna loss as well as cable loss.*



**VIEW 1**

**BELKIN INTERNATIONAL, INC.**  
AIRCAST AUTO FM  
MODEL: F8M117  
FCC SUBPART B AND C – RADIATED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**VIEW 2**

**BELKIN INTERNATIONAL, INC.**  
AIRCAS T AUTO FM  
MODEL: F8M117  
FCC SUBPART B AND C – RADIATED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**VIEW 1**

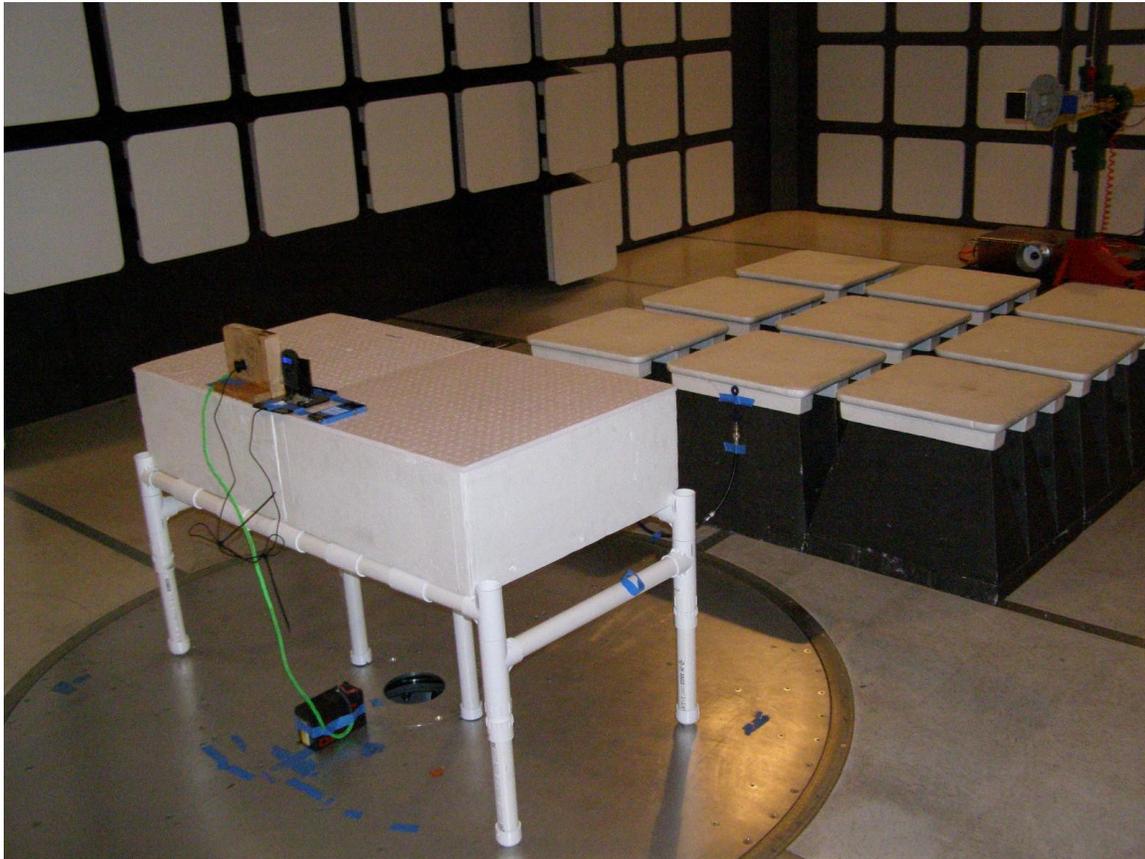
**BELKIN INTERNATIONAL, INC.**

**AIRCAST AUTO FM**

**MODEL: F8M117**

**FCC SUBPART B AND C – RADIATED EMISSIONS ABOVE 1 GHz**

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**VIEW 2**

**BELKIN INTERNATIONAL, INC.**

**AIRCAST AUTO FM**

**MODEL: F8M117**

**FCC SUBPART B AND C – RADIATED EMISSIONS ABOVE 1GHz**

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**APPENDIX E**

***DATA SHEETS***



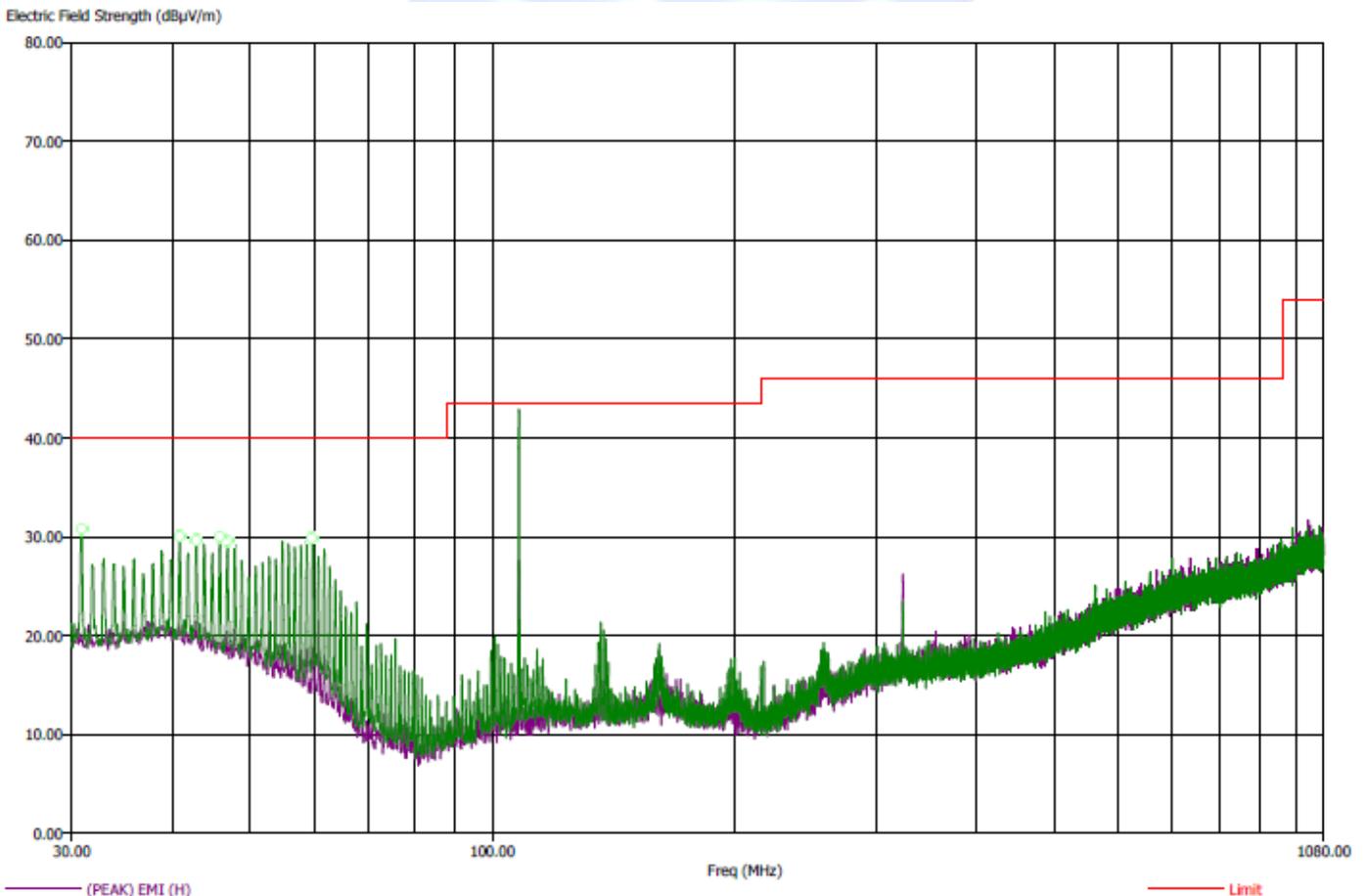
***RADIATED SPURIOUS EMISSIONS***

***DATA SHEETS***

**(TX)**

Title: FCC 15.209  
File: Radiated Pre-Scan 30-1080Mhz\_107.9.set  
Operator: Matt Harrison  
EUT Type: F8M117us Air Cast Auto  
EUT Condition: High Channel 107.9MHz  
Comments: Connected to iPhone 4 and Playing Song: Linkin Park-Don't Stay  
Temp: 68f  
Hum: 64%  
12VDC

10/11/2011 9:48:02 AM  
Sequence: Preliminary Scan



No radiated emissions found between 0.01 - 30 MHz

**(TX)**

Title: FCC 15.209

10/11/2011 10:12:49 AM

File: Radiated Final 30-1080Mhz\_107.9.set

Sequence: Final Measurements

Operator: Matt Harrison

EUT Type: F8M117us Air Cast Auto

EUT Condition: High Channel 107.9MHz

Comments: Connected to iPhone 4 and Playing Song: Linkin Park-Don't Stay

Temp: 68f

Hum: 64%

12VDC

Compatible Electronics, Inc. FAC-3 (LAB P)

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable (dB)
30.90	-10.25	29.75	32.12	40.00	V	156.25	101.70	18.30	0.39
40.90	-11.76	28.24	30.71	40.00	V	0.00	100.94	18.72	0.36
42.90	-11.22	28.78	31.38	40.00	V	65.75	107.47	18.32	0.38
45.90	-11.92	28.08	30.13	40.00	V	314.75	110.05	17.67	0.41
46.90	-13.07	26.93	30.02	40.00	V	82.00	120.41	17.41	0.42
59.80	-10.99	29.01	30.71	40.00	V	152.75	107.64	13.17	0.55

No radiated emissions found between 0.01 - 30 MHz

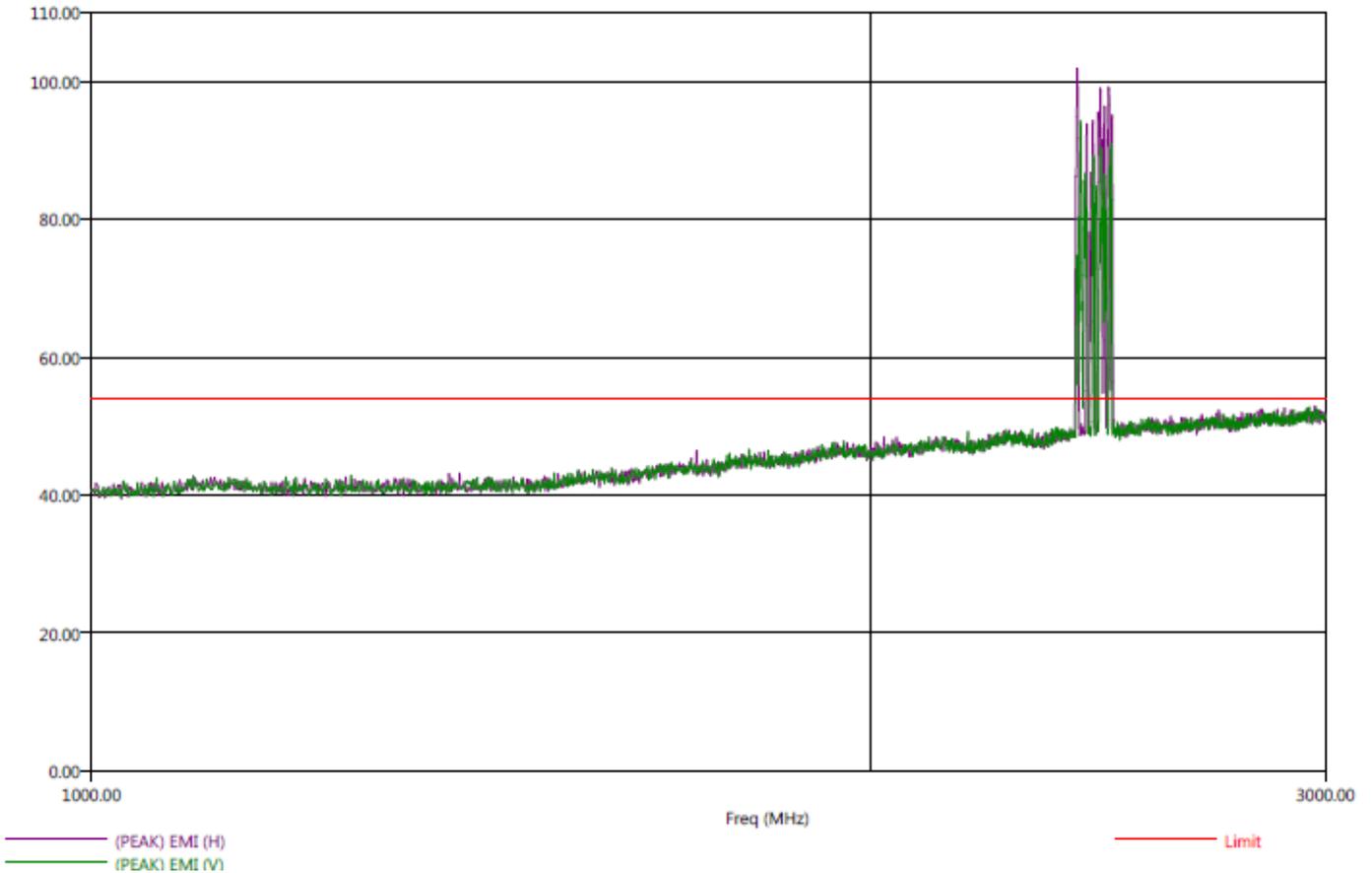
**(TX)**

Title: FCC 15.209  
File: Radiated Pre-scan 1-18GHz\_TX.set  
Operator: Matt Harrison  
EUT Type: F8M117us FM Transmitter with Bluetooth  
EUT Condition: Paired with iPhone 4, Playing Puff Daddy "I'll Be Missing You"  
Comments: Tuned to 107.9MHz  
Temp: 65f  
Hum: 56%  
12VDC

10/12/2011 8:36:38 AM  
Sequence: Preliminary Scan



Electric Field Strength (dBµV/m)



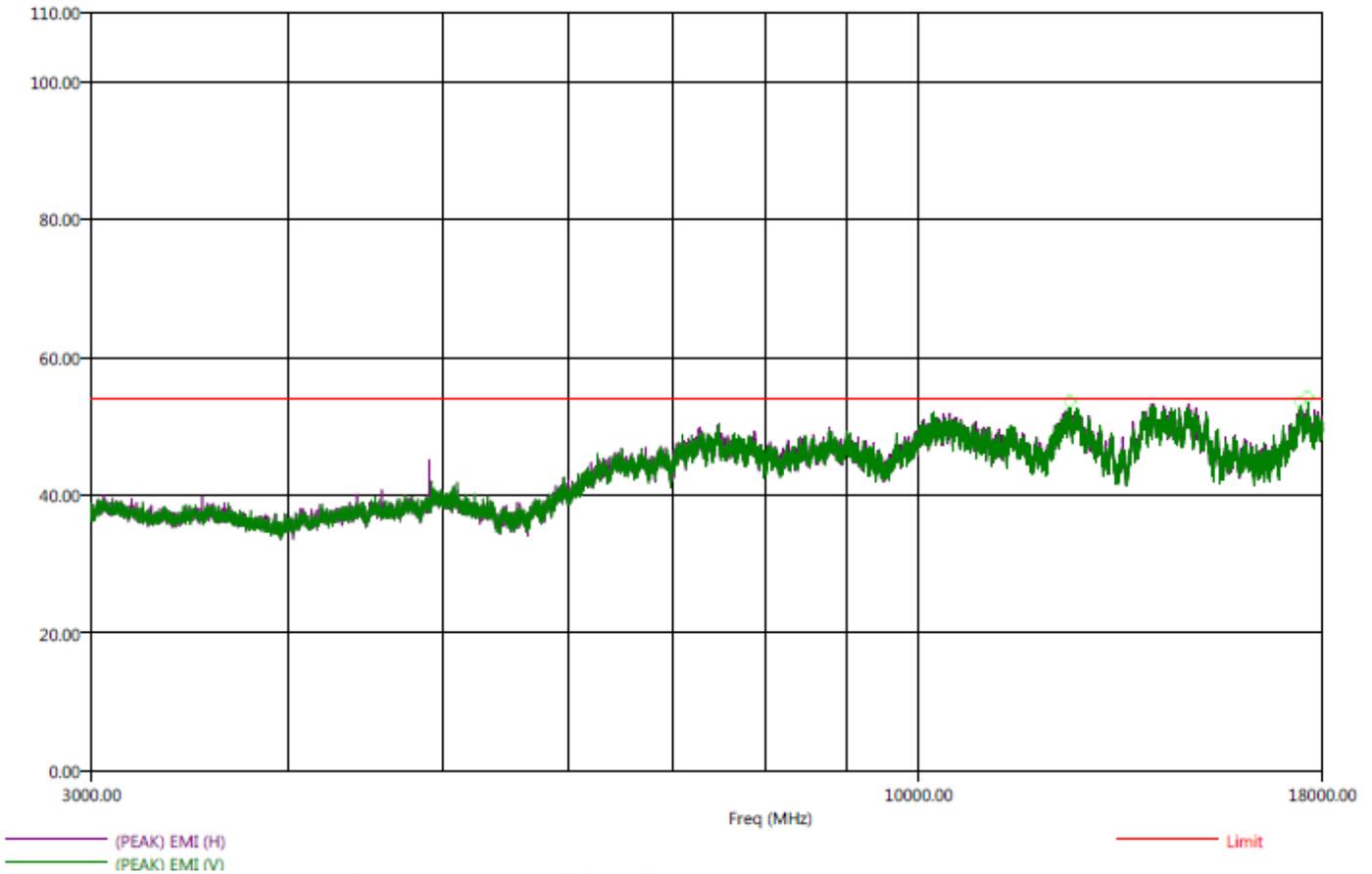
**(TX)**

Title: FCC 15.209  
File: Radiated Pre-scan 1-18GHz\_TX.set  
Operator: Matt Harrison  
EUT Type: F8M117us FM Transmitter with Bluetooth  
EUT Condition: Paired with iPhone 4, Playing Puff Daddy "I'll Be Missing You"  
Comments: Tuned to 107.9MHz  
Temp: 65f  
Hum: 56%  
12VDC

10/12/2011 8:36:38 AM  
Sequence: Preliminary Scan



Electric Field Strength (dB $\mu$ V/m)



No radiated emissions found between 18 - 25 GHz

**(TX)**

Title: FCC 15.209

10/12/2011 9:40:31 AM

File: Radiated Final 3-18GHz\_TX.set

Sequence: Final Measurements

Operator: Matt Harrison

EUT Type: F8M117us FM Transmitter with Bluetooth

EUT Condition: Paired with iPhone 4, Playing Puff Daddy "I'll Be Missing You"

Comments: Tuned to 107.9MHz

Temp: 65f

Hum: 56%

12VDC

Compatible Electronics, Inc. FAC-3 (LAB P)

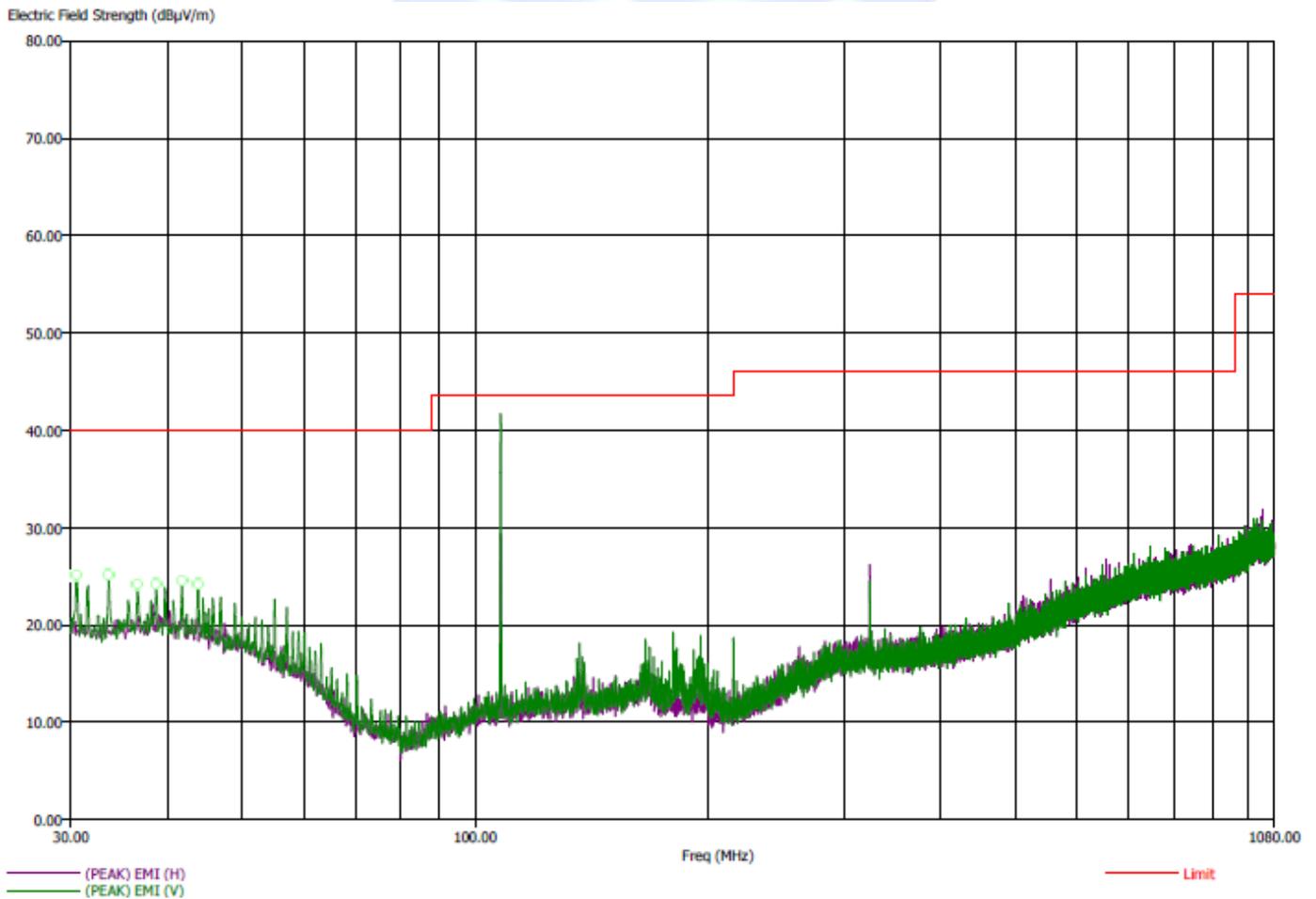
Freq (MHz)	(AVG) Margin (dB)	(AVG) EMI (dBµV/m)	(PEAK) Margin (dB)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable (dB)	Preamplifier (dB)	Filter (dB)
12460.00	-13.63	40.35	-0.56	53.42	53.98	V	19.75	155.35	42.44	19.31	64.24	0.45
17412.00	-15.15	38.83	-1.71	52.27	53.98	H	13.25	387.05	42.21	23.29	60.15	0.26
17629.00	-16.47	37.51	-4.07	49.91	53.98	H	3.00	162.88	42.91	23.30	59.49	0.34

No radiated emissions found between 18 - 25 GHz

**(RX)**

Title: FCC 15.209  
File: Radiated Pre-Scan 30-1080Mhz\_Rx.set  
Operator: Matt Harrison  
EUT Type: F8M117us Air Cast Auto  
EUT Condition: BT Off Rx, 107.9MHz  
Comments: Temp: 68f  
Hum: 64%  
12VDC

11/7/2011 12:19:03 PM  
Sequence: Preliminary Scan



**(RX)**

Title: FCC 15.209  
File: Radiated Final 30-1080Mhz\_Rx.set  
Operator: Matt Harrison  
EUT Type: F8M117us Air Cast Auto  
EUT Condition: BT Off Rx, 107.9MHz  
Comments: Temp: 68f  
Hum: 64%  
12VDC

11/7/2011 1:31:59 PM  
Sequence: Final Measurements

Compatible Electronics, Inc. FAC-3 (LAB P)

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dB $\mu$ V/m)	(PEAK) EMI (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable (dB)
30.50	-16.69	23.31	28.41	40.00	V	5.00	136.76	18.30	0.39
33.60	-19.92	20.08	23.44	40.00	V	69.00	194.35	18.30	0.38
36.60	-20.24	19.76	26.22	40.00	V	138.50	153.47	18.52	0.36
38.70	-18.88	21.12	25.44	40.00	V	95.75	125.82	18.76	0.36
41.80	-16.01	23.99	27.23	40.00	V	0.00	106.94	18.53	0.37
43.80	-16.63	23.37	26.47	40.00	V	121.75	110.11	18.13	0.39

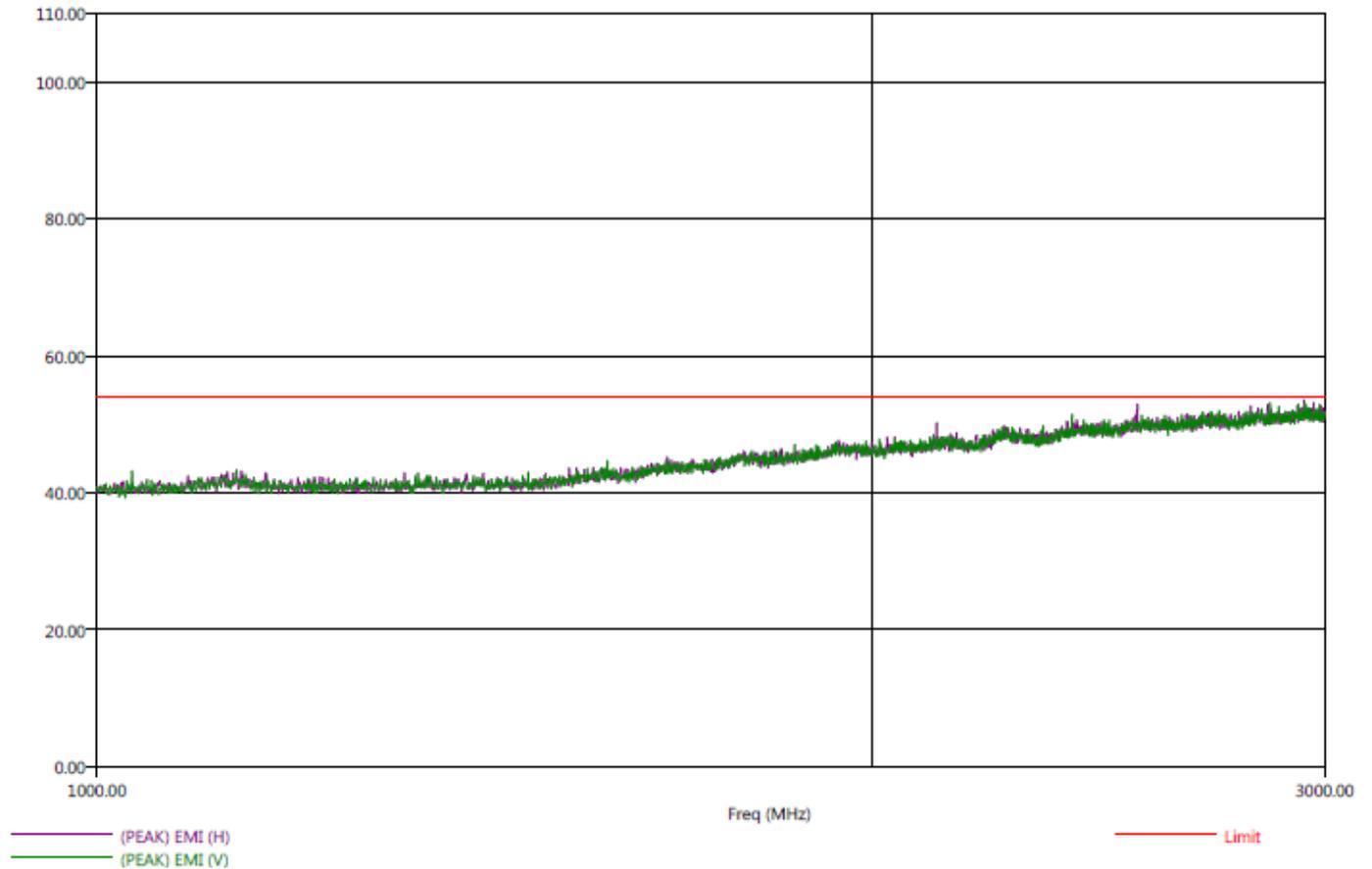
**(RX)**

Title: FCC 15.209  
File: Radiated Pre-scan 1-18GHz\_RX.set  
Operator: Matt Harrison  
EUT Type: F8M117us FM Transmitter with Bluetooth  
EUT Condition: Stand By Mode  
Comments: Tuned to 107.9MHz  
Temp: 65f  
Hum: 56%  
12VDC

10/12/2011 9:55:02 AM  
Sequence: Preliminary Scan



Electric Field Strength (dBμV/m)



No radiated emissions found between 18 - 25 GHz

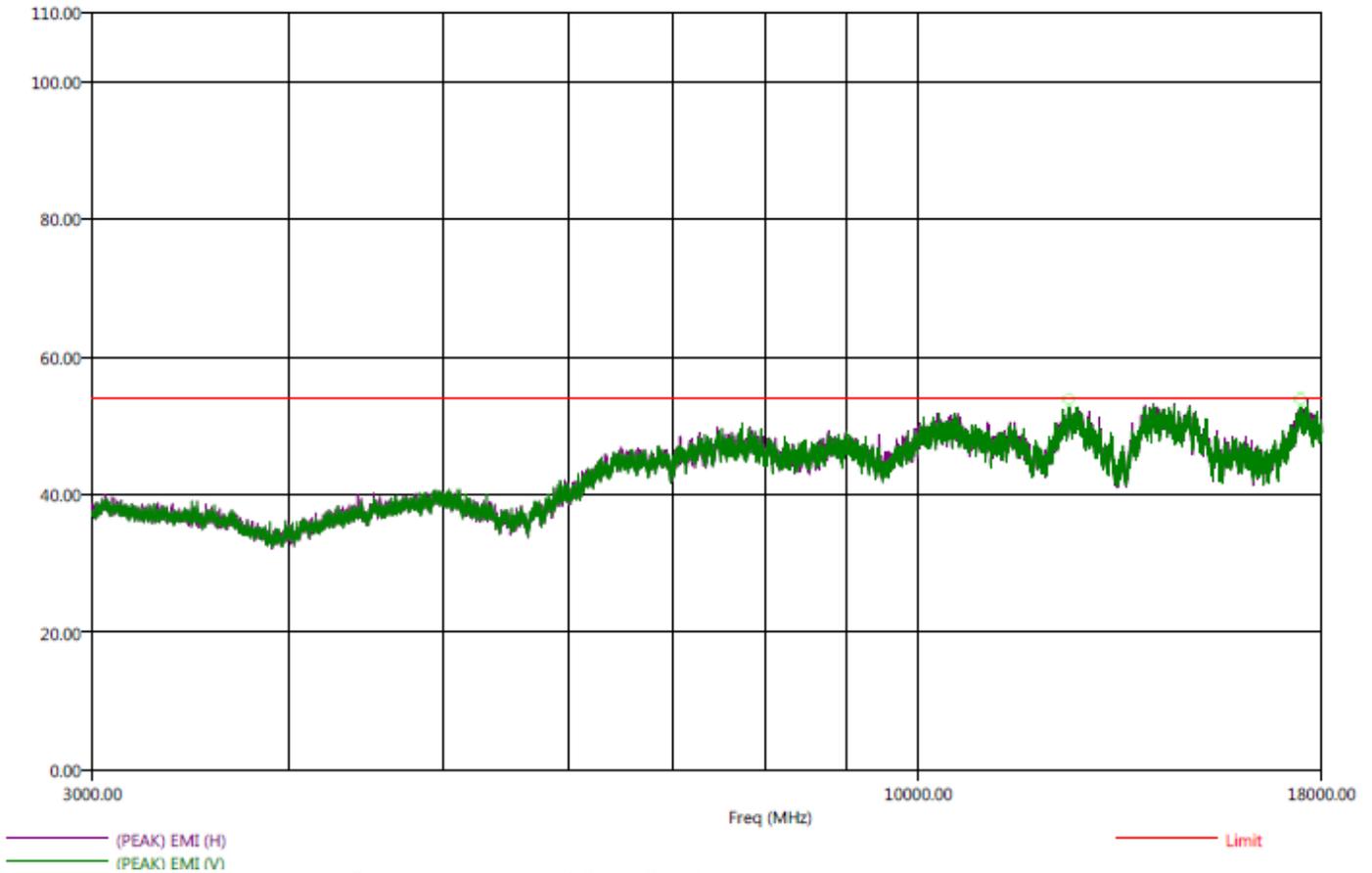
**(RX)**

Title: FCC 15.209  
File: Radiated Pre-scan 1-18GHz\_RX.set  
Operator: Matt Harrison  
EUT Type: F8M117us FM Transmitter with Bluetooth  
EUT Condition: Stand By Mode  
Comments: Tuned to 107.9MHz  
Temp: 65f  
Hum: 56%  
12VDC

10/12/2011 9:55:02 AM  
Sequence: Preliminary Scan



Electric Field Strength (dBμV/m)



No radiated emissions found between 18 - 25 GHz

**(RX)**

Title: FCC 15.209  
 File: Radiated Final 3-18GHz\_RX.set  
 Operator: Matt Harrison  
 EUT Type: F8M117us FM Transmitter with Bluetooth  
 EUT Condition: Stand By Mode  
 Comments: Tuned to 107.9MHz  
 Temp: 65f  
 Hum: 56%  
 12VDC

10/12/2011 11:00:29 AM  
 Sequence: Final Measurements

Compatible Electronics, Inc. FAC-3 (LAB P)

Freq (MHz)	(AVG) Margin (dB)	(AVG) EMI (dBµV/m)	(PEAK) Margin (dB)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable (dB)	Preamp (dB)	Filter (dB)
12452.00	-13.28	40.70	-0.68	53.30	53.98	H	331.00	397.52	42.34	19.27	64.21	0.45
17442.00	-15.45	38.53	-2.48	51.50	53.98	H	360.25	272.70	42.42	23.39	60.10	0.28
17444.00	-14.45	39.53	-1.13	52.85	53.98	H	168.75	396.11	42.40	23.38	60.11	0.28
17447.00	-14.76	39.22	-2.40	51.58	53.98	H	332.00	187.35	42.40	23.38	60.11	0.28
17452.00	-15.38	38.60	-2.98	51.00	53.98	V	360.25	227.64	42.42	23.39	60.10	0.28

No radiated emissions found between 18 - 25 GHz

**FCC 15.247****Belkin International, Inc.  
Bluetooth Device  
Model: Bluetooth Remote****Date: 10/04/2011****Lab: P****Tested By: Matt Harrison****Channel Low - Tx Mode - Peak Power Output Conducted****Channel Mid - Tx Mode - Peak Power Output Conducted****Channel High - Tx Mode - Peak Power Output Conducted**

<b>Freq (MHz)</b>	<b>PK Power (dBm)</b>
<b>2401</b>	<b>5.68</b>
<b>2441</b>	<b>5.51</b>
<b>2480</b>	<b>5.19</b>

**FCC 15.247**

Belkin International, Inc.  
 Bluetooth  
 Device  
 Model: Air Cast Auto F8M117us

Date: 10/12/2011

Lab: P  
 Tested By: Matt Harrison

**Channel Low - Tx Mode**

Freq. (MHz)	Level (dBµV)	PoI (V/H)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	51.95	V	74	-22.05	Peak	1.54	179	In Restricted Band
4802	38.78	V	54	-15.22	Avg	1.54	179	In Restricted Band
7203	46.28	V	74	-27.72	Peak	3.36	77	
7203	33.31	V	54	-20.69	Avg	3.36	77	
9604	45.8	V	74	-28.2	Peak	1.36	253	
9604	33.24	V	54	-20.76	Avg	1.36	253	
12005	42.3	V	74	-31.7	Peak	3.15	360	In Restricted Band
12005	29.79	V	54	-24.21	Avg	3.15	360	In Restricted Band
14406	49.12	V	74	-24.88	Peak	3.83	350	
14406	36.41	V	54	-17.59	Avg	3.83	350	
16807	45.46	V	74	-28.54	Peak	1.87	283	
16807	31.37	V	54	-22.63	Avg	1.87	283	
19208		V	74		Peak			No Emissions Found
19208		V	54		Avg			No Emissions Found
21609		V	74		Peak			No Emissions Found
21609		V	54		Avg			No Emissions Found
24010		V	74		Peak			No Emissions Found
24010		V	54		Avg			No Emissions Found

**FCC 15.247**

Belkin International, Inc.  
 Bluetooth  
 Device  
 Model: Air Cast Auto F8M117us

Date: 10/12/2011

Lab: P  
 Tested By: Matt Harrison

**Channel Low - Tx Mode**

Freq. (MHz)	Level (dBµV)	Pol (V/H)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	46.62	H	74	-27.38	Peak	1	0	In Restricted Band
4802	30.36	H	54	-23.64	Avg	1	0	In Restricted Band
7203	46.26	H	74	-27.74	Peak	2.31	357	
7203	33.19	H	54	-20.81	Avg	2.31	357	
9604	46.93	H	74	-27.07	Peak	1.22	16	
9604	33.87	H	54	-20.13	Avg	1.22	16	
12005	41.66	H	74	-32.34	Peak	1.91	360	In Restricted Band
12005	28.82	H	54	-25.18	Avg	1.91	360	In Restricted Band
14406	51.28	H	74	-22.72	Peak	4	84	
14406	38.2	H	54	-15.8	Avg	4	84	
16807	45.35	H	74	-28.65	Peak	2.86	217	
16807	32.59	H	54	-21.41	Avg	2.86	217	
19208		H	74		Peak			No Emissions Found
19208		H	54		Avg			No Emissions Found
21609		H	74		Peak			No Emissions Found
21609		H	54		Avg			No Emissions Found
24010		H	74		Peak			No Emissions Found
24010		H	54		Avg			No Emissions Found

**FCC 15.247**

Belkin International, Inc.  
 Bluetooth  
 Device  
 Model: Air Cast Auto F8M117us

Date: 10/12/2011

Lab: P  
 Tested By: Matt Harrison

**Channel Mid - Tx Mode**

Freq. (MHz)	Level (dBµV)	Pol (V/H)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4882	51.08	V	74	-22.92	Peak	1.21	170	In Restricted Band
4882	36.44	V	54	-17.56	Avg	1.21	170	In Restricted Band
7323	48.33	V	74	-25.67	Peak	3.71	334	In Restricted Band
7323	35.65	V	54	-18.35	Avg	3.71	334	In Restricted Band
9764	46.68	V	74	-27.32	Peak	1.6	344	
9764	34.14	V	54	-19.86	Avg	1.6	344	
12205	46.51	V	74	-27.49	Peak	3.18	180	In Restricted Band
12205	33.63	V	54	-20.37	Avg	3.18	180	In Restricted Band
14646	48.46	V	74	-25.54	Peak	3.24	302	
14646	35.67	V	54	-18.33	Avg	3.24	302	
17087	45.95	V	74	-28.05	Peak	2	312	
17087	33.4	V	54	-20.6	Avg	2	312	
19528		V	74		Peak			No Emissions Found
19528		V	54		Avg			No Emissions Found
21969		V	74		Peak			No Emissions Found
21969		V	54		Avg			No Emissions Found
24410		V	74		Peak			No Emissions Found
24410		V	54		Avg			No Emissions Found

**FCC 15.247**

Belkin International, Inc.  
 Bluetooth  
 Device  
 Model: Air Cast Auto F8M117us

Date: 10/12/2011

Lab: P  
 Tested By: Matt Harrison

**Channel Mid - Tx Mode**

Freq. (MHz)	Level (dBµV)	Pol (V/H)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4882	48.39	H	74	-25.61	Peak	1.1	33	In Restricted Band
4882	33.29	H	54	-20.71	Avg	1.1	33	In Restricted Band
7323	48.21	H	74	-25.79	Peak	1.11	0	In Restricted Band
7323	35.7	H	54	-18.30	Avg	1.11	0	In Restricted Band
9764	48.21	H	74	-25.79	Peak	1	53	
9764	34.85	H	54	-19.15	Avg	1	53	
12205	46.32	H	74	-27.68	Peak	2.71	360	In Restricted Band
12205	33.57	H	54	-20.43	Avg	2.71	360	In Restricted Band
14646	48.31	H	74	-25.69	Peak	2.16	255	
14646	36.07	H	54	-17.93	Avg	2.16	255	
17087	46.52	H	74	-27.48	Peak	2.05	264	
17087	33.55	H	54	-20.45	Avg	2.05	264	
19528		H	74		Peak			No Emissions Found
19528		H	54		Avg			No Emissions Found
21969		H	74		Peak			No Emissions Found
21969		H	54		Avg			No Emissions Found
24410		H	74		Peak			No Emissions Found
24410		H	54		Avg			No Emissions Found

**FCC 15.247**

Belkin International, Inc.  
 Bluetooth  
 Device  
 Model: Air Cast Auto F8M117us

Date: 10/12/2011

Lab: P  
 Tested By: Matt Harrison

**Channel High - Tx Mode**

Freq. (MHz)	Level (dBµV)	Pol (V/H)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	55.68	V	74	-18.32	Peak	1	166	In Restricted Band
4960	41.24	V	54	-12.76	Avg	1	166	In Restricted Band
7440	48.93	V	74	-25.07	Peak	3.54	200	In Restricted Band
7440	36.38	V	54	-17.62	Avg	3.54	200	In Restricted Band
9920	48.67	V	74	-25.33	Peak	2.9	275	
9920	36.28	V	54	-17.72	Avg	2.9	275	
12400	51.43	V	74	-22.57	Peak	3.78	28	In Restricted Band
12400	39.08	V	54	-14.92	Avg	3.78	28	In Restricted Band
14880	50.67	V	74	-23.33	Peak	1.59	0	
14880	38.03	V	54	-15.97	Avg	1.59	0	
17360	50.18	V	74	-23.82	Peak	3.1	360	
17360	37.75	V	54	-16.25	Avg	3.1	360	
19840		V	74		Peak			No Emissions Found
19840		V	54		Avg			No Emissions Found
22320		V	74		Peak			No Emissions Found
22320		V	54		Avg			No Emissions Found
24800		V	74		Peak			No Emissions Found
24800		V	54		Avg			No Emissions Found

**FCC 15.247**

Belkin International, Inc.  
 Bluetooth  
 Device  
 Model: Air Cast Auto F8M117us

Date: 10/12/2011

Lab: P  
 Tested By: Matt Harrison

**Channel High - Tx Mode**

Freq. (MHz)	Level (dBµV)	Pol (V/H)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	54.58	H	74	-19.42	Peak	1.56	4	In Restricted Band
4960	38.11	H	54	-15.89	Avg	1.56	4	In Restricted Band
7440	48.91	H	74	-25.09	Peak	2.40	0	In Restricted Band
7440	36.28	H	54	-17.72	Avg	2.40	0	In Restricted Band
9920	49.65	H	74	-24.35	Peak	3.91	92	
9920	36.61	H	54	-17.39	Avg	3.91	92	
12400	51.85	H	74	-22.15	Peak	1.93	333	In Restricted Band
12400	38.79	H	54	-15.21	Avg	1.93	333	In Restricted Band
14880	49.27	H	74	-24.73	Peak	1.26	119	
14880	36.84	H	54	-17.16	Avg	1.26	119	
17360	50.28	H	74	-23.72	Peak	1.45	29	
17360	37.77	H	54	-16.23	Avg	1.45	29	
19840		H	74		Peak			No Emissions Found
19840		H	54		Avg			No Emissions Found
22320		H	74		Peak			No Emissions Found
22320		H	54		Avg			No Emissions Found
24800		H	74		Peak			No Emissions Found
24800		H	54		Avg			No Emissions Found



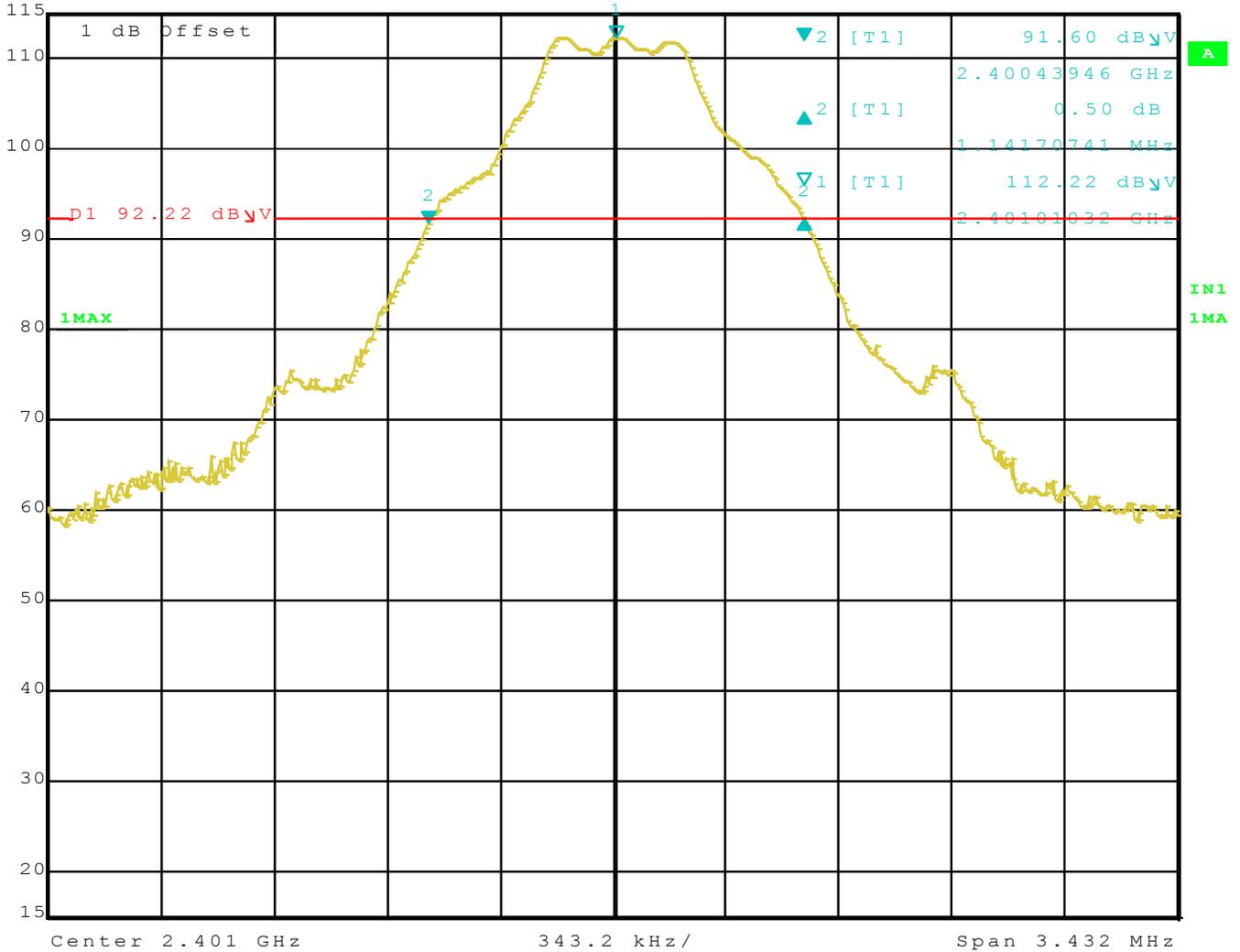
***-20 dB BANDWIDTH***

***DATA SHEETS***

### Low Channel -20 dB Bandwidth



Delta 2 [T1] RBW 100 kHz RF Att 30 dB  
 Ref Lvl 0.50 dB VBW 300 kHz  
 115 dB $\mu$ V 1.14170741 MHz SWT 5 ms Unit dB $\mu$ V

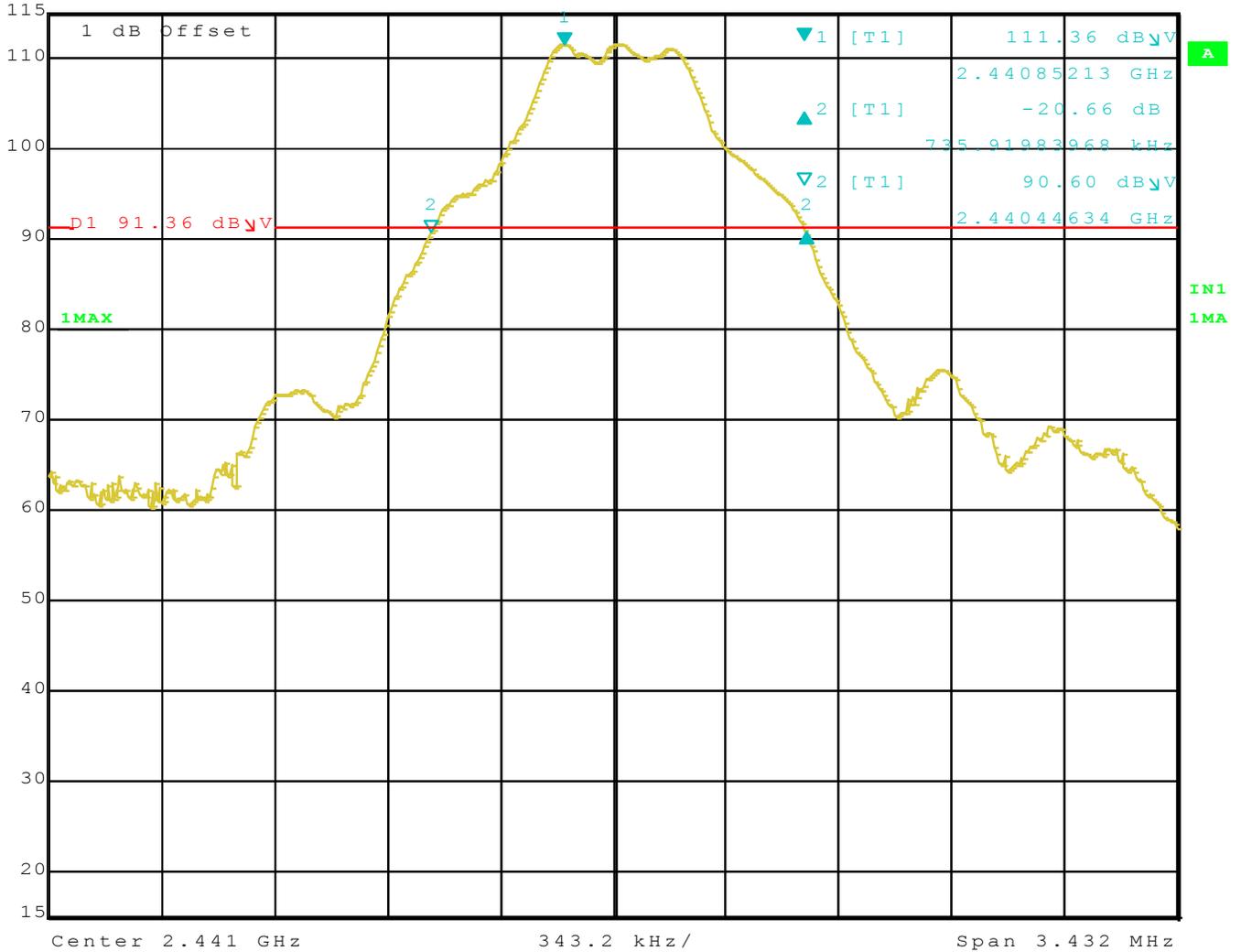


Title: F8M117  
 Comment A: 20dB Bandwidth Low Channel  
 Date: 14.OCT.2011 16:25:34

### Middle Channel -20 dB Bandwidth



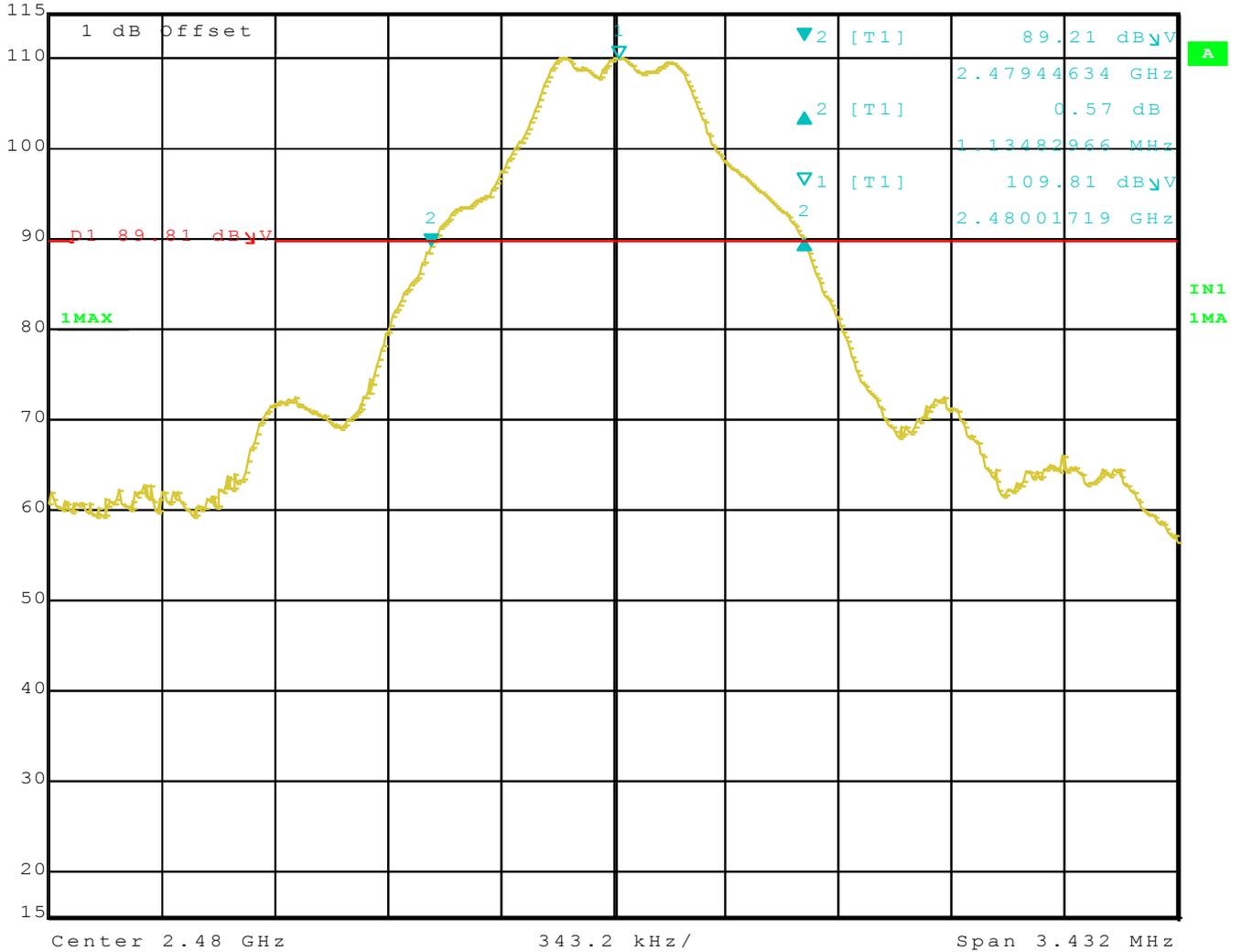
Delta 2 [T1] RBW 100 kHz RF Att 30 dB  
 Ref Lvl -20.66 dB VBW 300 kHz  
 115 dB $\mu$ V 735.91983968 kHz SWT 5 ms Unit dB $\mu$ V



Title: F8M117  
 Comment A: 20dB Bandwidth Mid Channel  
 Date: 14.OCT.2011 16:28:52

### High Channel -20 dB Bandwidth


 Ref Lvl 115 dB $\mu$ V  
 Delta 2 [T1] 0.57 dB  
 RBW 100 kHz  
 VBW 300 kHz  
 RF Att 30 dB  
 1.13482966 MHz  
 SWT 5 ms  
 Unit dB $\mu$ V



Title: F8M117  
 Comment A: 20dB Bandwidth High Channel  
 Date: 14.OCT.2011 16:27:50



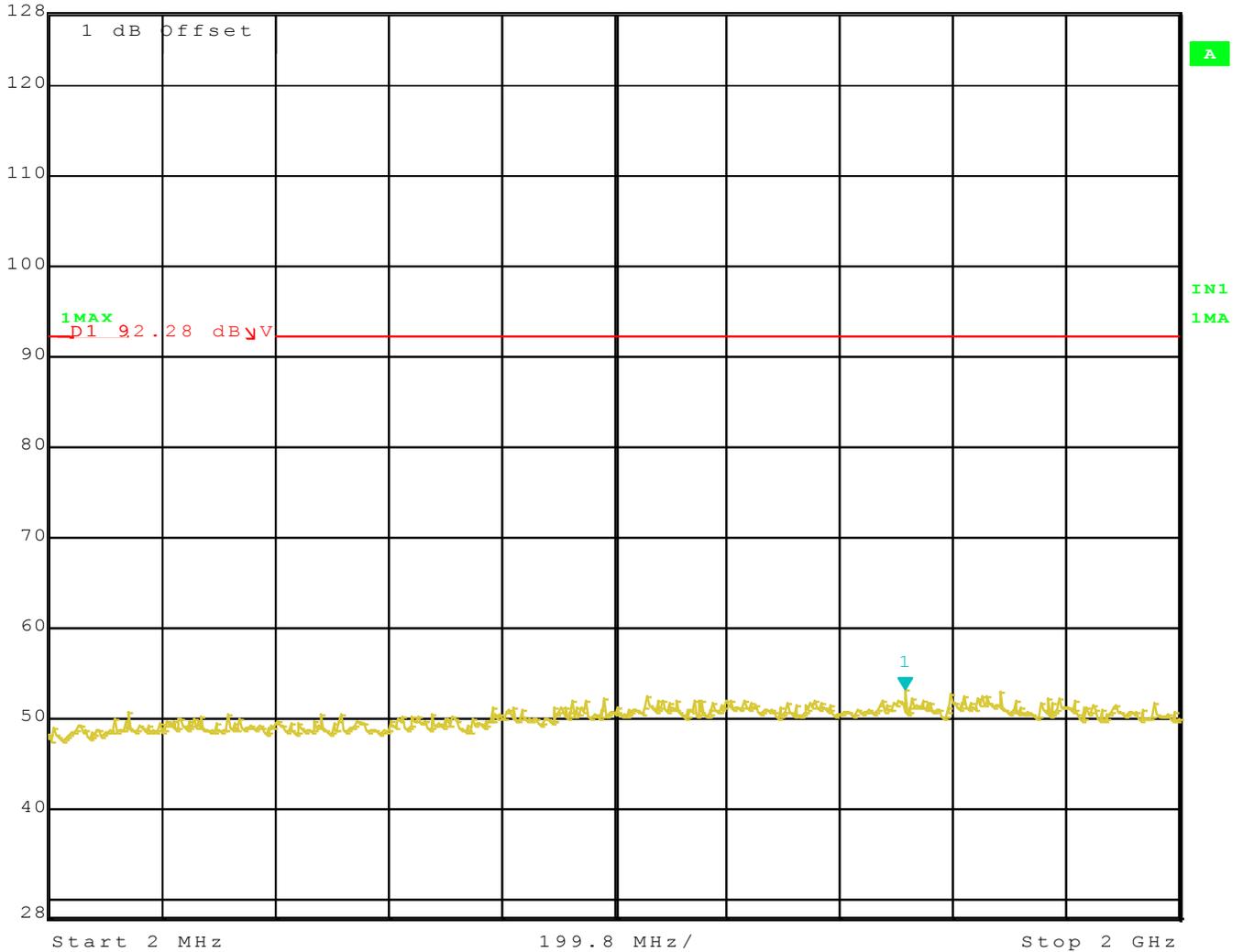
***RF CONDUCTED ANTENNA TEST***

***DATA SHEETS***

**Low Channel RF Antenna Conducted**  
**2 – 2000MHz**



Marker 1 [T1] RBW 100 kHz RF Att 30 dB  
 Ref Lvl 53.10 dB $\mu$ V VBW 1 MHz  
 128 dB $\mu$ V 1.51551503 GHz SWT 500 ms Unit dB $\mu$ V

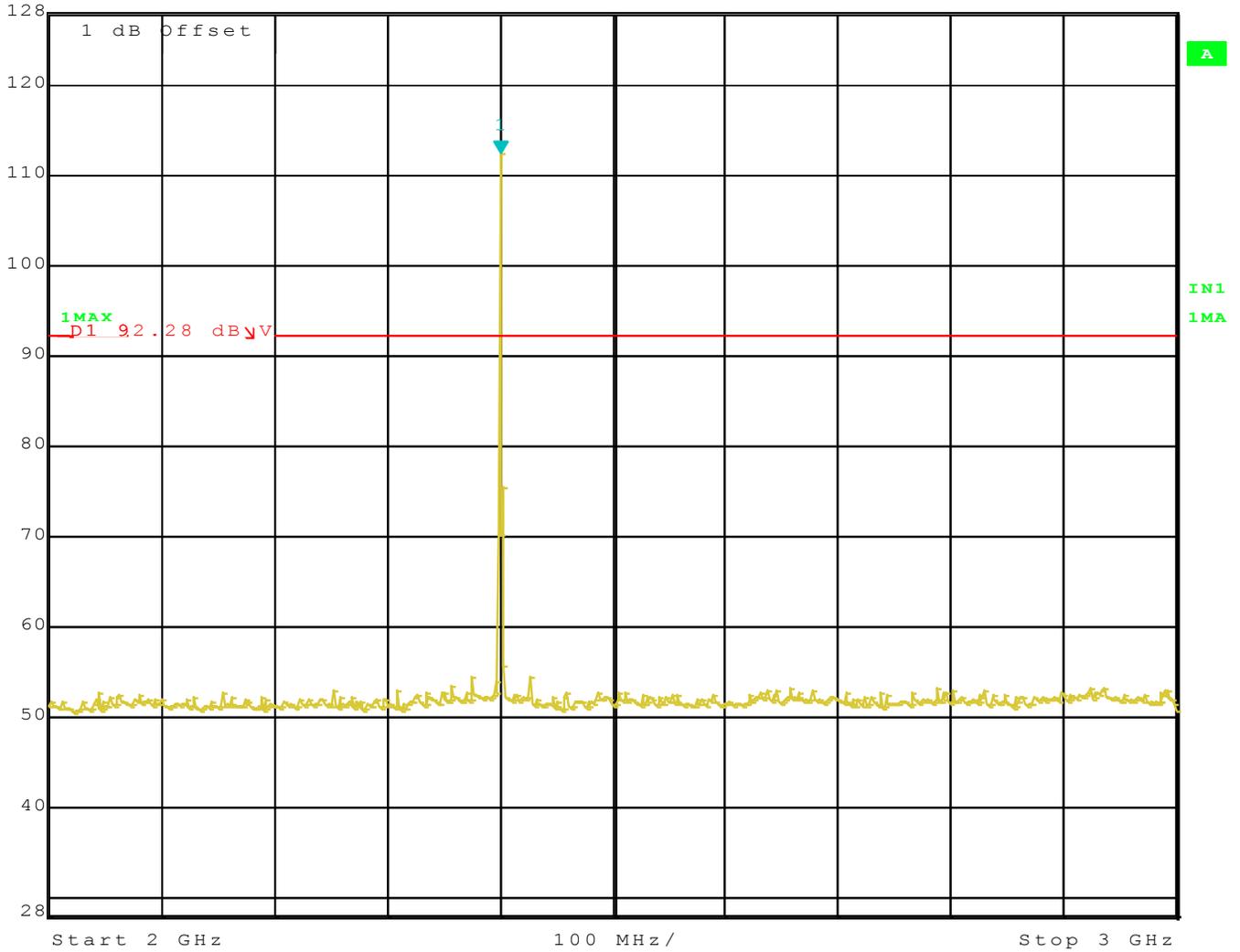


Title: F8M117  
 Comment A: Conducted Emissions at Antenna Terminals Low Channel  
 Date: 14.OCT.2011 15:10:44

## Low Channel RF Antenna Conducted 2 – 3 GHz



	Marker 1 [T1]	RBW	100 kHz	RF Att	30 dB
Ref Lvl	112.28 dB $\mu$ V	VBW	1 MHz		
128 dB $\mu$ V	2.40100000 GHz	SWT	250 ms	Unit	dB $\mu$ V

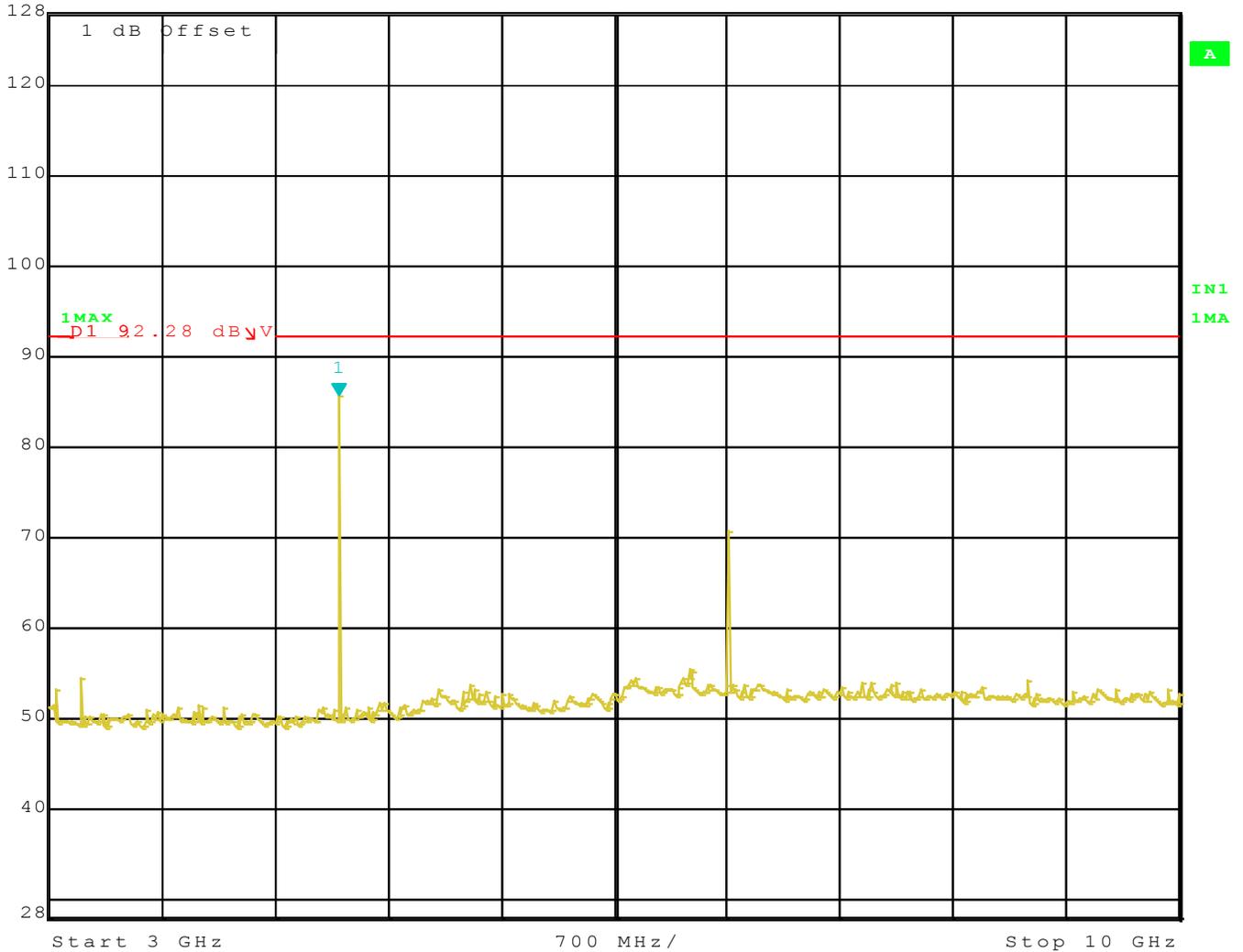


Title: F8M117  
 Comment A: Conducted Emissions at Antenna Terminals Low Channel  
 Date: 14.OCT.2011 15:10:27

**Low Channel RF Antenna Conducted**  
**3 – 10 GHz**



Marker 1 [T1] RBW 100 kHz RF Att 30 dB  
 Ref Lvl 85.75 dB $\mu$ V VBW 1 MHz  
 128 dB $\mu$ V 4.79559118 GHz SWT 1.75 s Unit dB $\mu$ V



Title: F8M117  
 Comment A: Conducted Emissions at Antenna Terminals Low Channel  
 Date: 14.OCT.2011 15:11:15











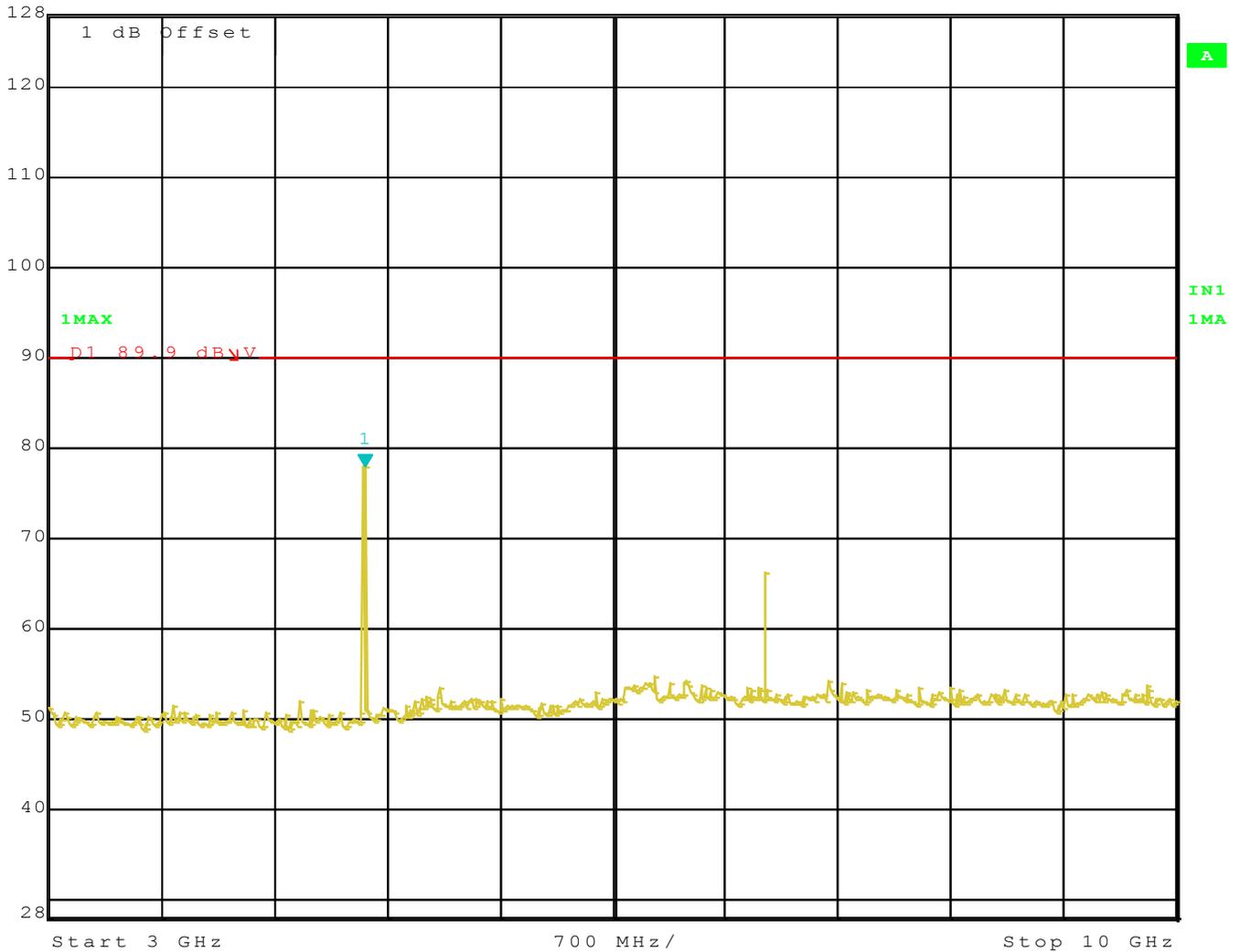




## High Channel RF Antenna Conducted 3 – 10 GHz



Marker 1 [T1] RBW 100 kHz RF Att 30 dB  
 Ref Lvl 77.87 dB $\mu$ V VBW 1 MHz  
 128 dB $\mu$ V 4.96392786 GHz SWT 1.75 s Unit dB $\mu$ V

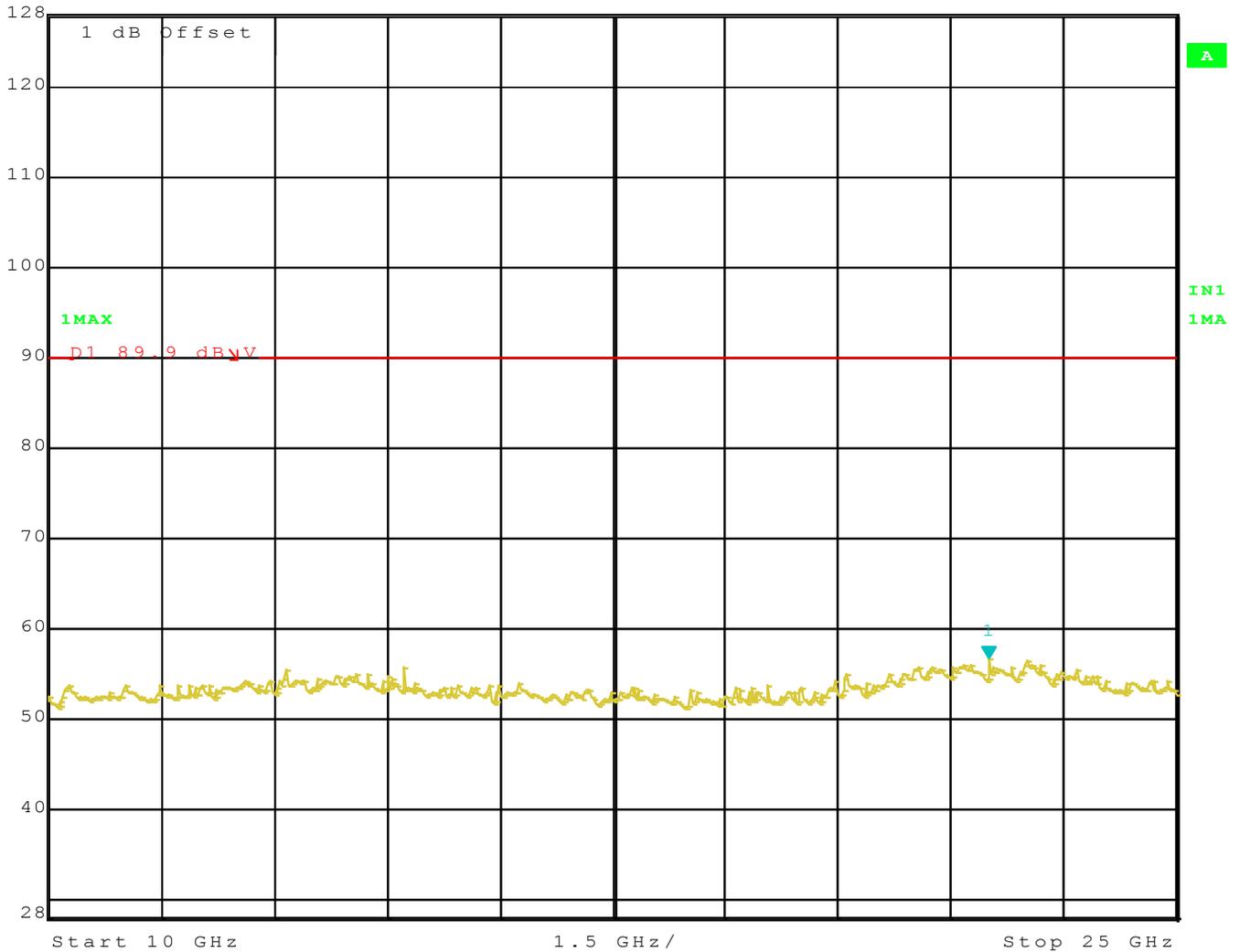


Title: F8M117  
 Comment A: Conducted Emissions at Antenna Terminals High Channel  
 Date: 14.OCT.2011 15:04:09

## High Channel RF Antenna Conducted 10 – 25GHz



Marker 1 [T1] RBW 100 kHz RF Att 30 dB  
 Ref Lvl 56.72 dB $\mu$ V VBW 1 MHz  
 128 dB $\mu$ V 22.50501002 GHz SWT 3.8 s Unit dB $\mu$ V



Title: F8M117  
 Comment A: Conducted Emissions at Antenna Terminals High Channel  
 Date: 14.OCT.2011 15:04:54



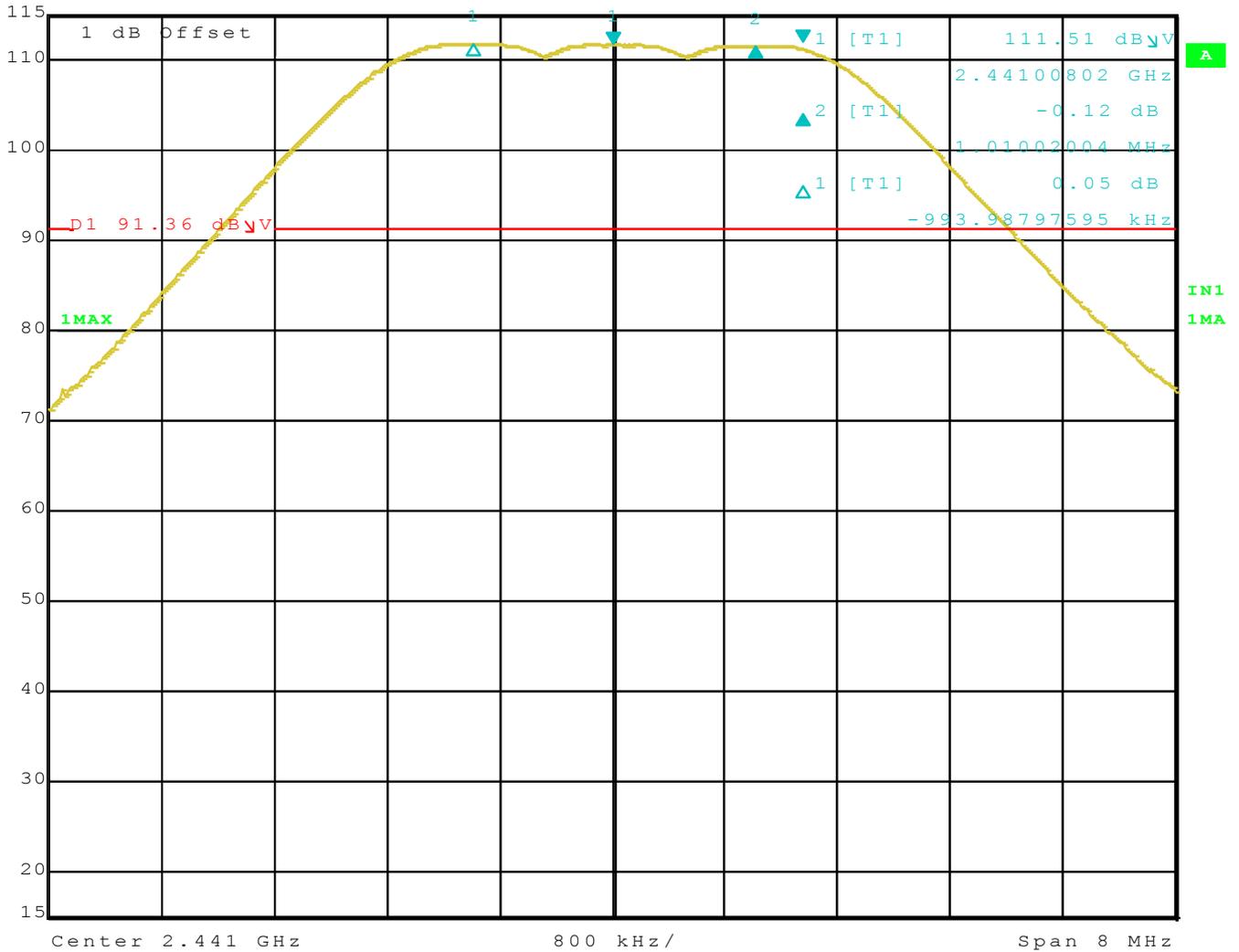
## ***CHANNEL HOPPING SEPARATION***

### ***DATA SHEET***



### Channel Hopping Separation (MID)

◆ Ref Lvl 115 dB $\mu$ V  
 Delta 2 [T1] -0.12 dB  
 RBW 1 MHz  
 RF Att 30 dB  
 VBW 3 MHz  
 Unit dB $\mu$ V  
 1.01002004 MHz  
 SWT 5 ms

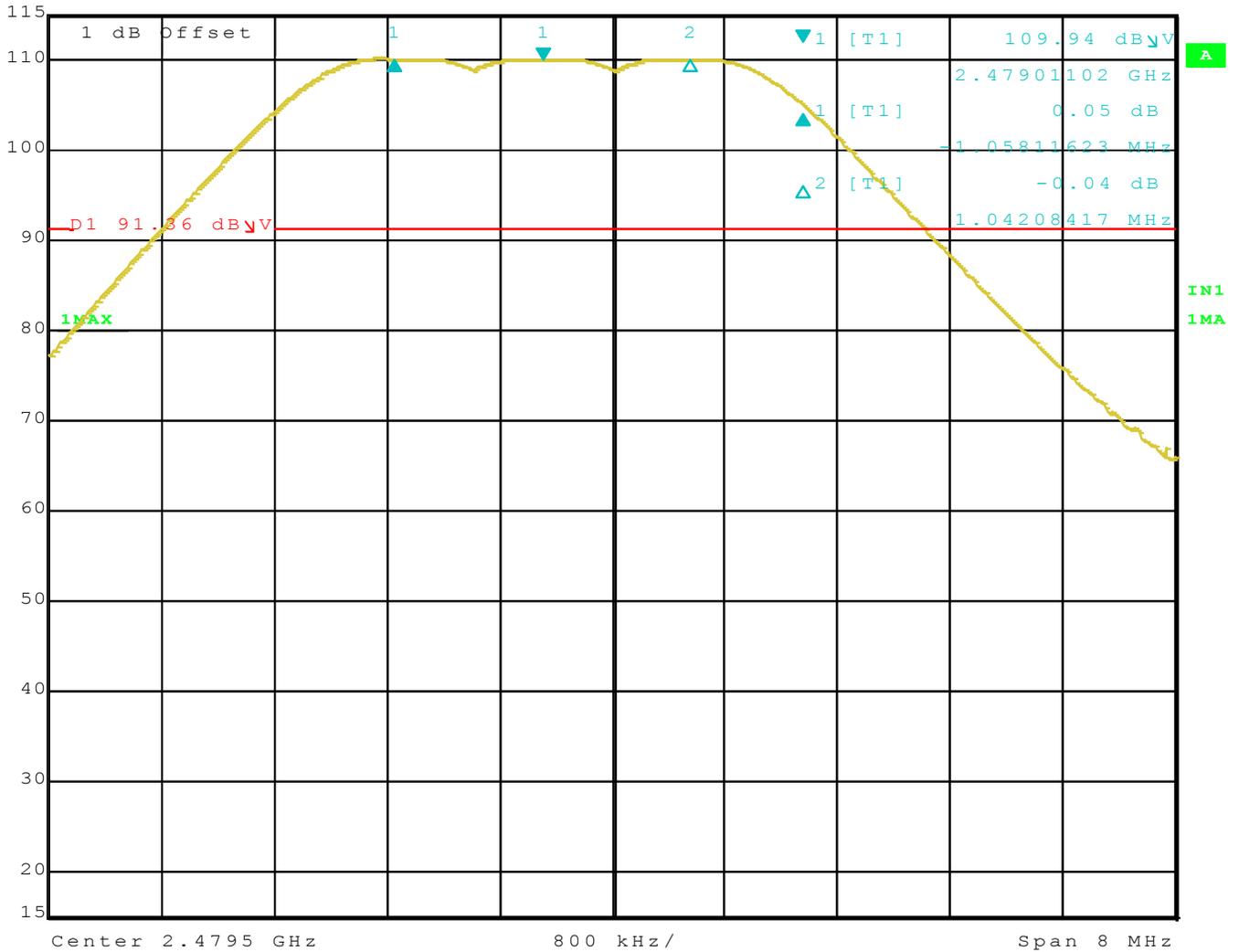


Title: F8M117  
 Comment A: Channel Separation Mid Channel  
 Date: 14.OCT.2011 16:56:07

### Channel Hopping Separation (HIGH)



Delta 1 [T1] RBW 1 MHz RF Att 30 dB  
 Ref Lvl 0.05 dB VBW 3 MHz  
 115 dB $\mu$ V -1.05811623 MHz SWT 5 ms Unit dB $\mu$ V



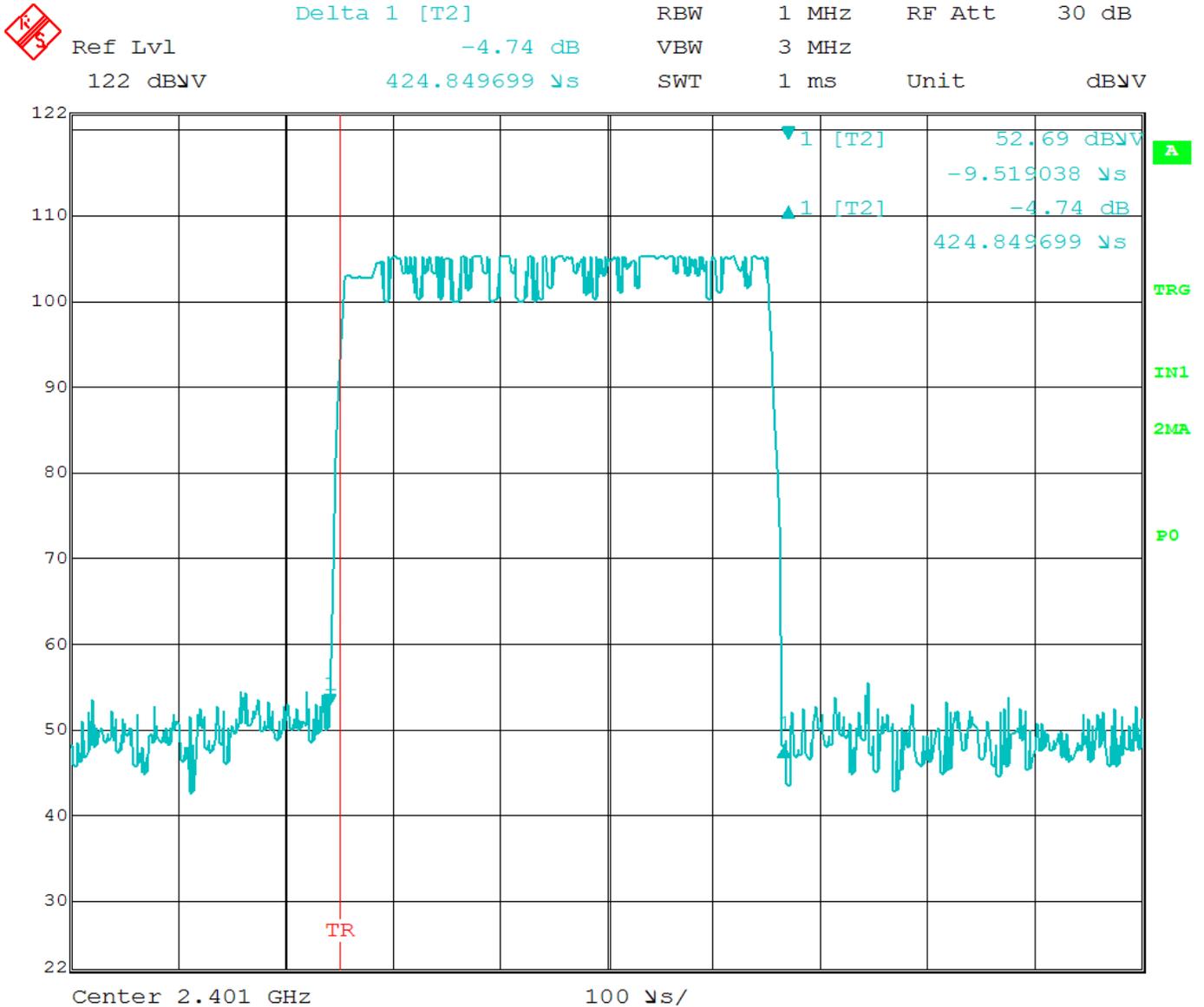
Title: F8M117  
 Comment A: Channel Separation High Channel  
 Date: 14.OCT.2011 16:54:18



***AVERAGE TIME OF OCCUPANCY***

***DATA SHEETS***

## Average Time of Occupancy



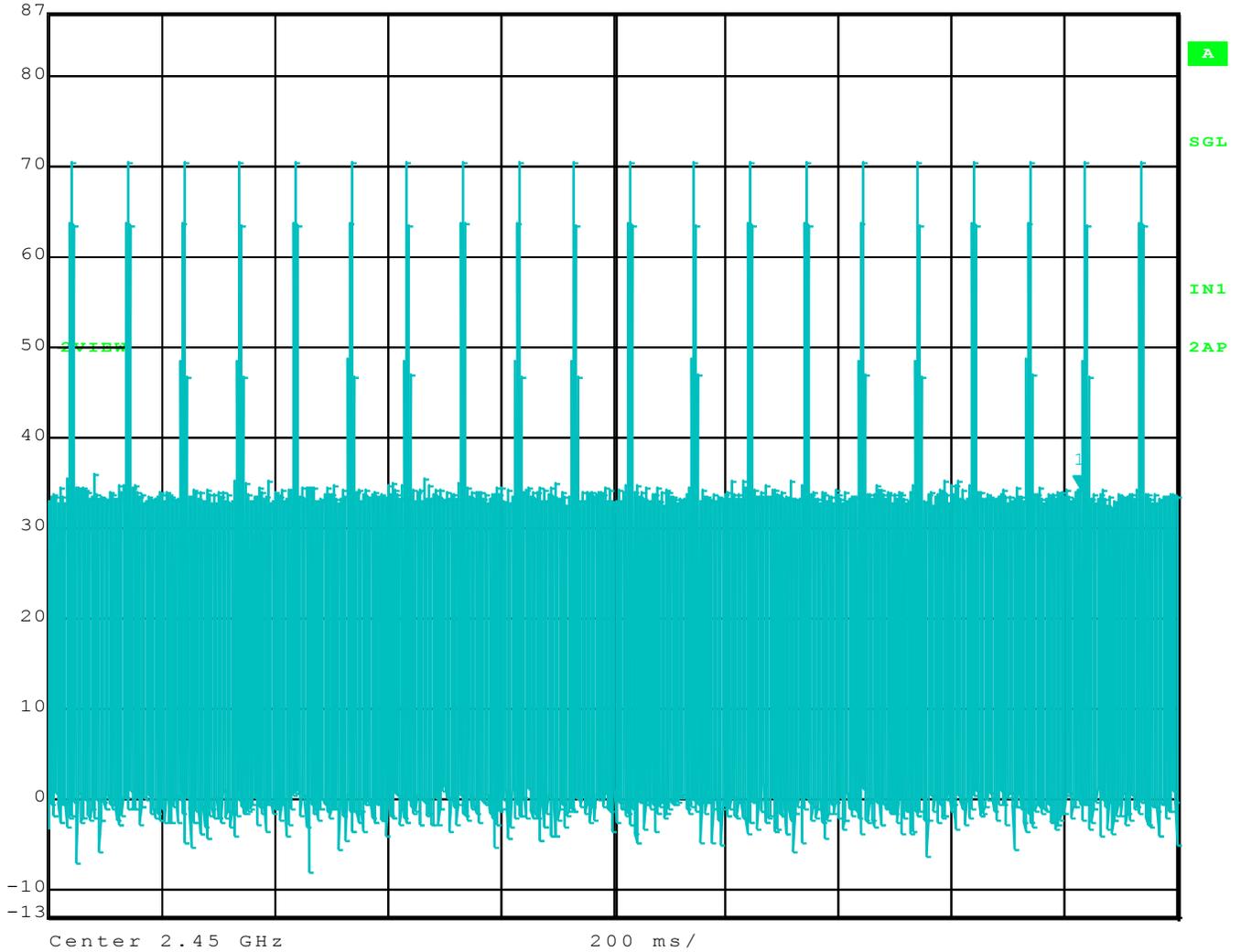
Title: F8M117cw FM Transmitter  
 Comment A: Dwell Time  
 Date: 6.OCT.2011 17:30:03

Time of 1 Pulse = 424.849699 μs

**Average Time of Occupancy**



Marker 1 [T2] RBW 1 MHz RF Att 10 dB  
 Ref Lvl 34.26 dB $\mu$ V VBW 1 MHz  
 87 dB $\mu$ V 1.827655 s SWT 2 s Unit dB $\mu$ V



Title: F8M117us  
 Comment A: Average Time of Occupancy  
 Date: 7.NOV.2011 15:41:41

Number of Pulses in 2 Seconds = 20  
 Number of Pulses in 31.6 Seconds = 20\*15.8 = 316 Pulses in a 31.6 Second Period  
 Time of Occupancy = 316\*424.849699 uS = 134.25 mS per 31.6 Second Period  
 Limit = 400 mS per 31.6 Second Period (79 Channel \* 400 mS)



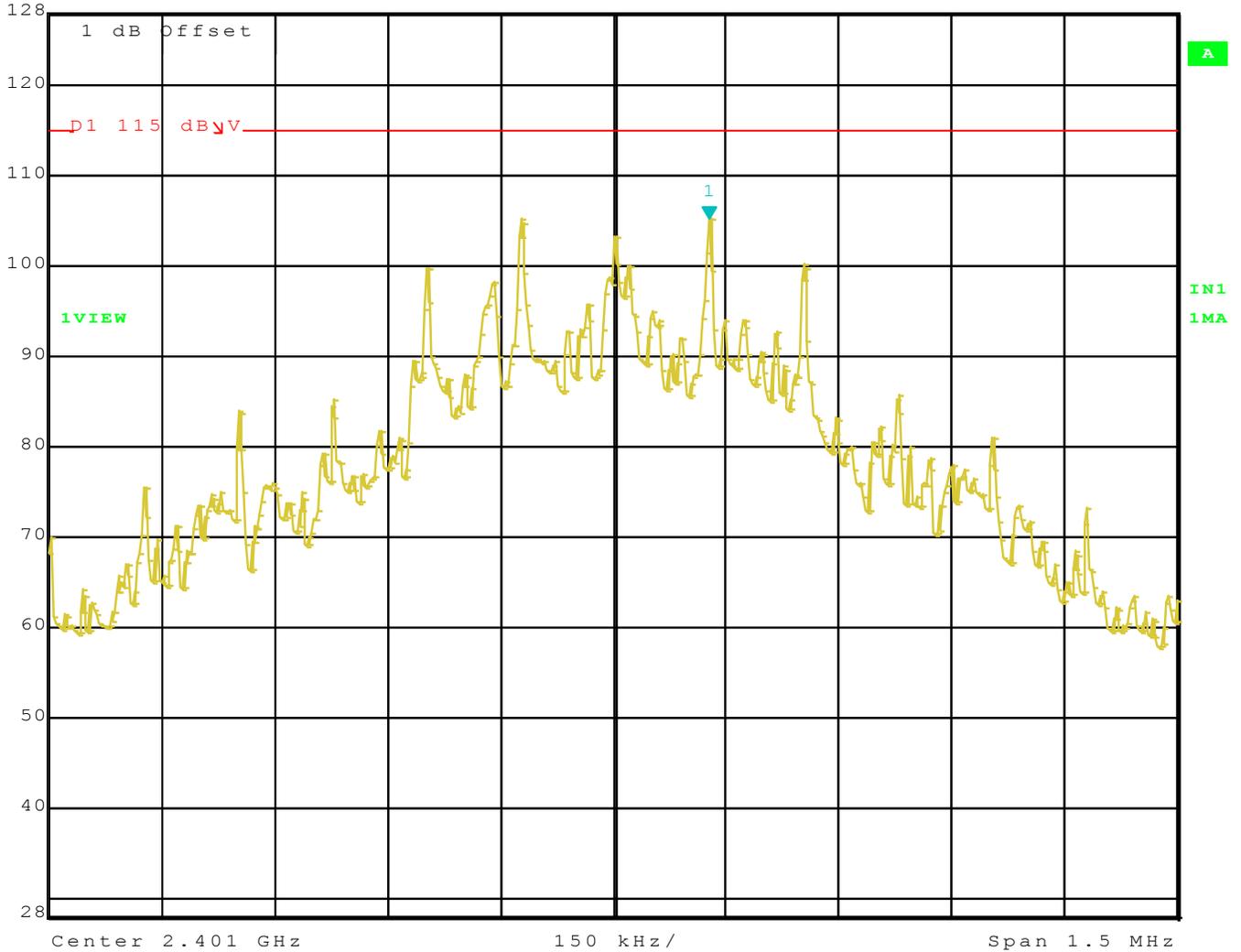
***SPECTRAL DENSITY OUTPUT***

***DATA SHEETS***

## Low Channel Spectral Density Output



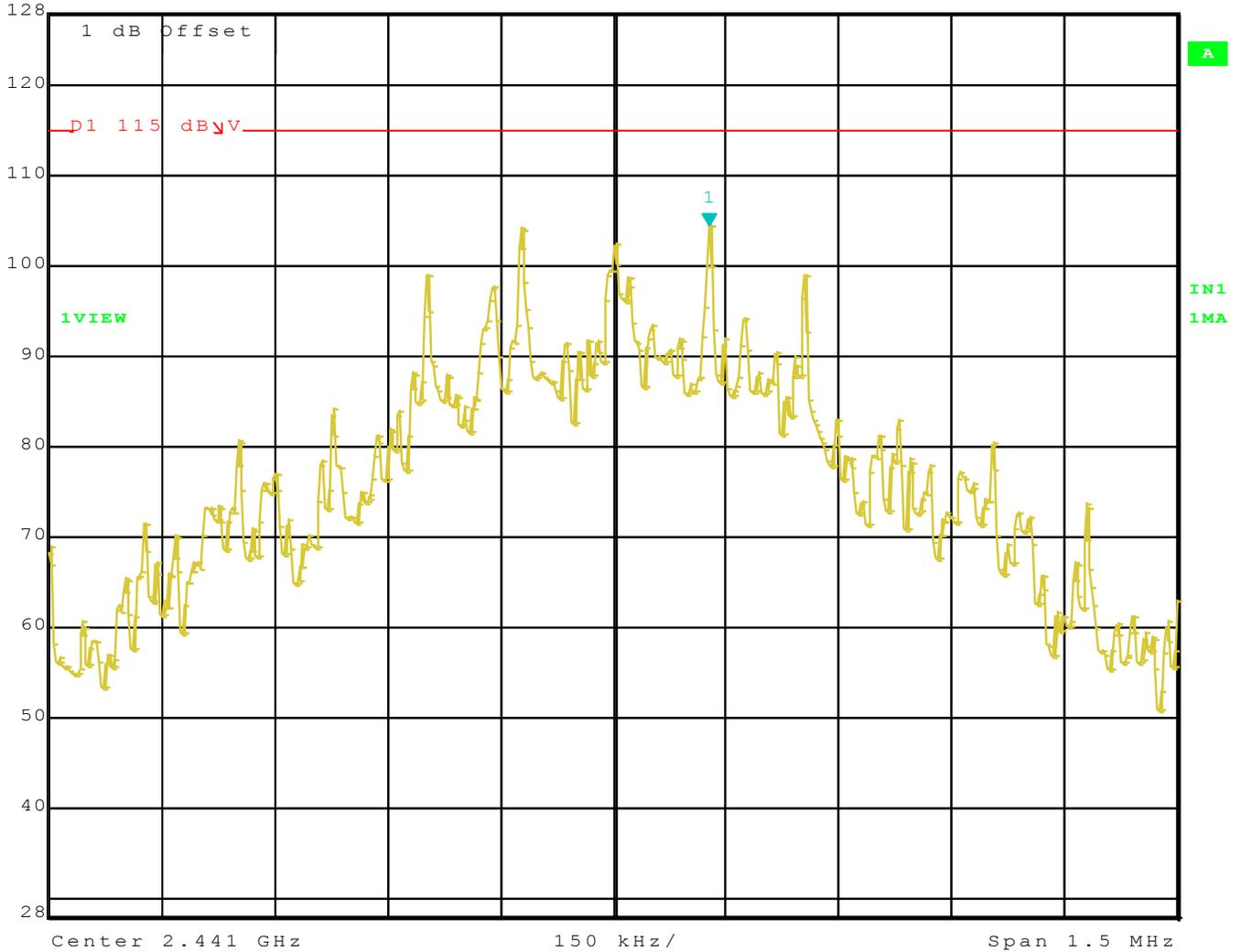
Marker 1 [T1]      RBW    3 kHz    RF Att    30 dB  
 Ref Lvl                    105.24 dB $\mu$ V      VBW    10 kHz  
 128 dB $\mu$ V                    2.40112776 GHz      SWT    500 s      Unit                    dB $\mu$ V



Title:            F8M117  
 Comment A: Spectral Density Low Channel  
 Date:            14.OCT.2011  14:31:13

## Middle Channel Spectral Density Output


 Marker 1 [T1]      RBW    3 kHz    RF Att    30 dB  
 Ref Lvl                    104.33 dB $\mu$ V      VBW    10 kHz  
 128 dB $\mu$ V                    2.44112776 GHz      SWT    500 s      Unit                    dB $\mu$ V

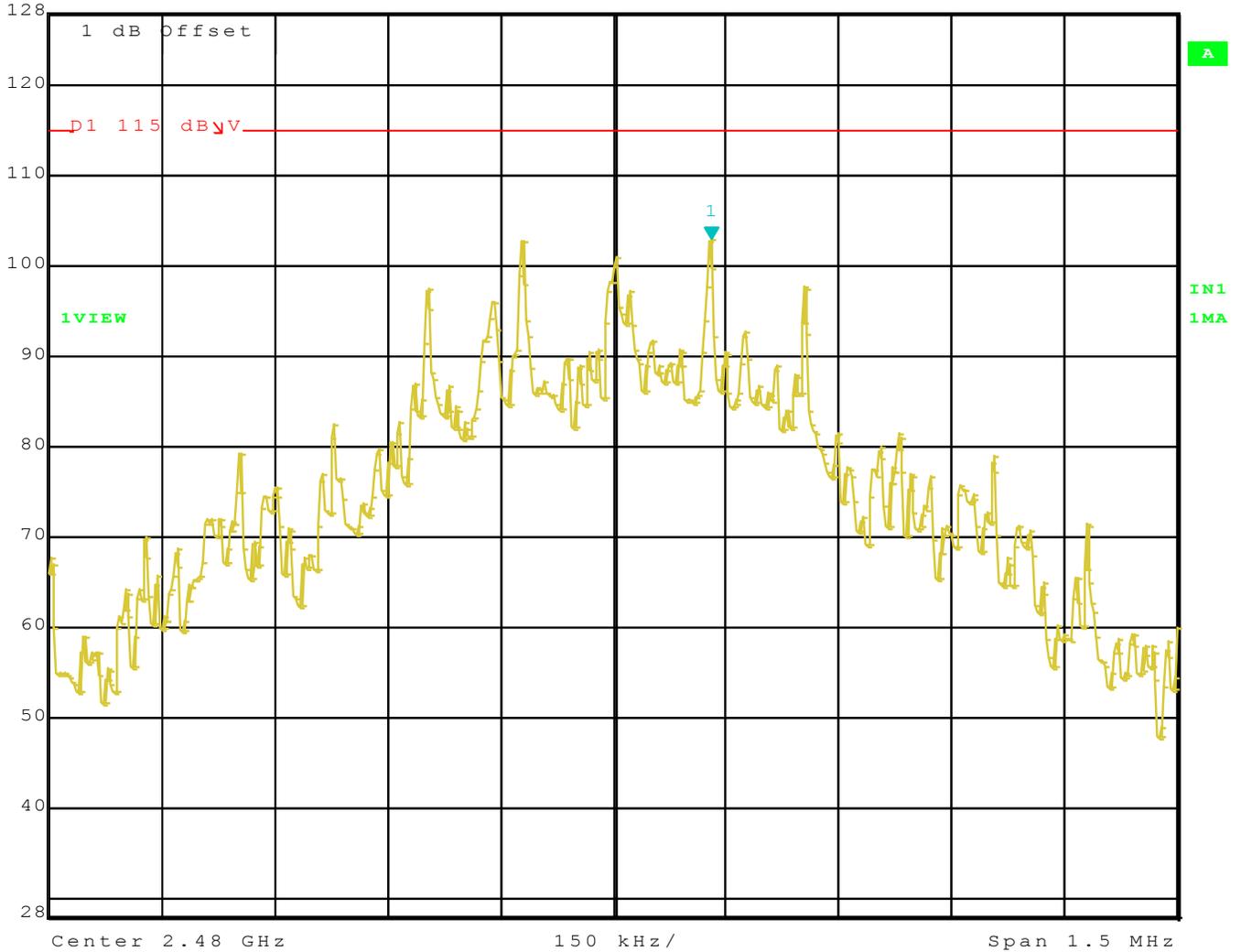


Title:            F8M117  
 Comment A:    Spectral Density Mid Channel  
 Date:            14.OCT.2011    14:40:36

## High Channel Spectral Density Output



Marker 1 [T1]      RBW      3 kHz      RF Att      30 dB  
 Ref Lvl      102.75 dB $\mu$ V      VBW      10 kHz  
 128 dB $\mu$ V      2.48013076 GHz      SWT      500 s      Unit      dB $\mu$ V



Title:      F8M117  
 Comment A: Spectral Density High Channel  
 Date:      14.OCT.2011    14:49:52

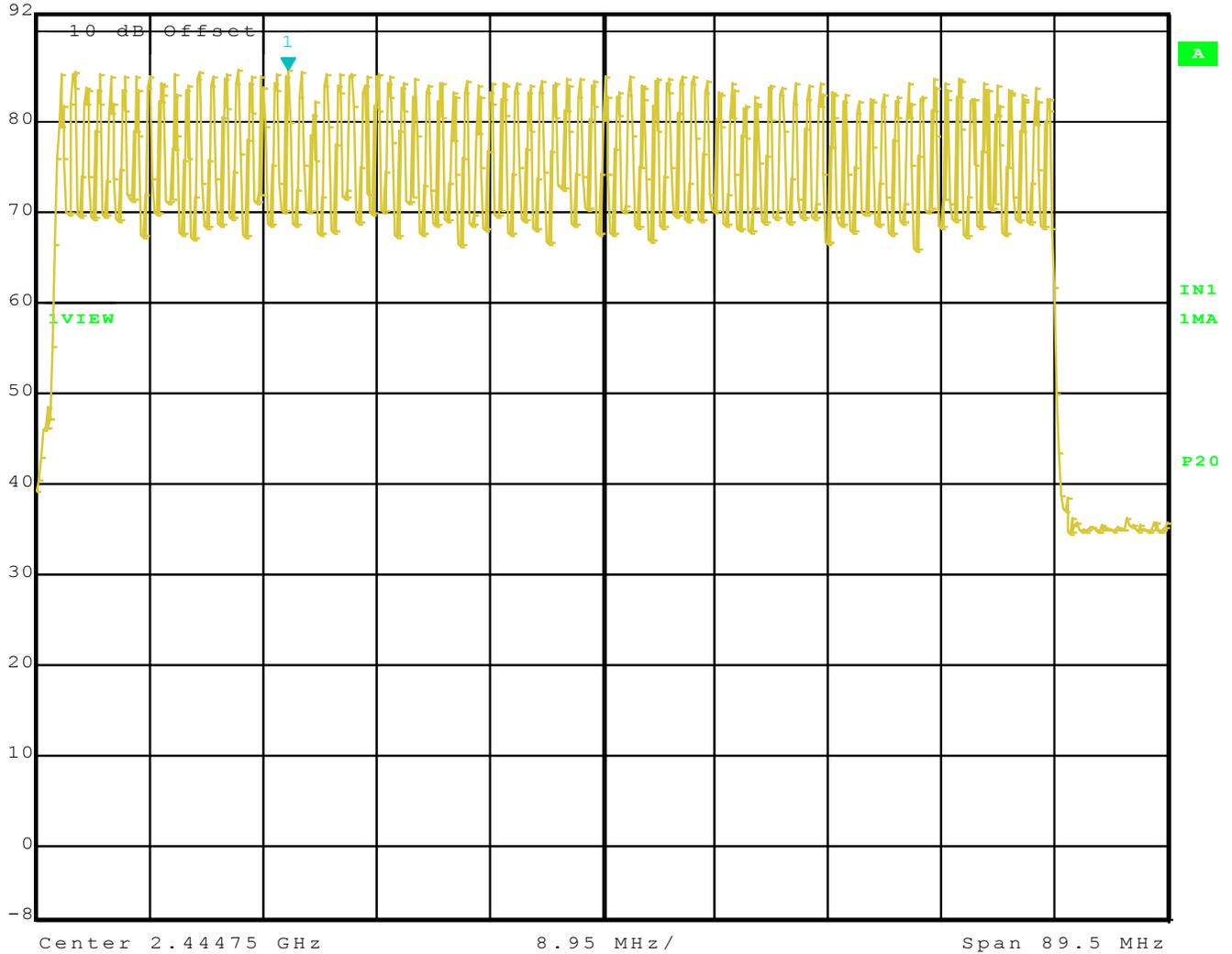


***NUMBER OF HOPPING FREQUENCIES***

***DATA SHEET***

## NUMBER OF HOPPING FREQUENCIES

RS Max/Ref Lvl    Marker 1 [T1]    RBW    100 kHz    RF Att    20 dB  
 92 dBμV    85.60 dBμV    VBW    300 kHz  
 82 dBμV    2.41990882 GHz    SWT    22.5 ms    Unit    dBμV



Title:            F8M117cw BT FM Transmitter  
 Comment A:    Hopping Channels  
 Date:            4.OCT.2011 16:18:34

Total Number of Channels = 79



***BAND EDGE***

***DATA SHEETS***

**FCC 15.247**

Belkin International, Inc.  
 Bluetooth  
 Device  
 Model: Air Cast Auto F8M117us

Date: 11/7/2011

Lab: P

Tested By: Matt Harrison

**Channel Low - Tx Mode - Fundamental and Band Edge**  
**Channel Mid - TX Mode - Fundamental**  
**Channel High - Tx Mode - Fundamental and Band Edge**

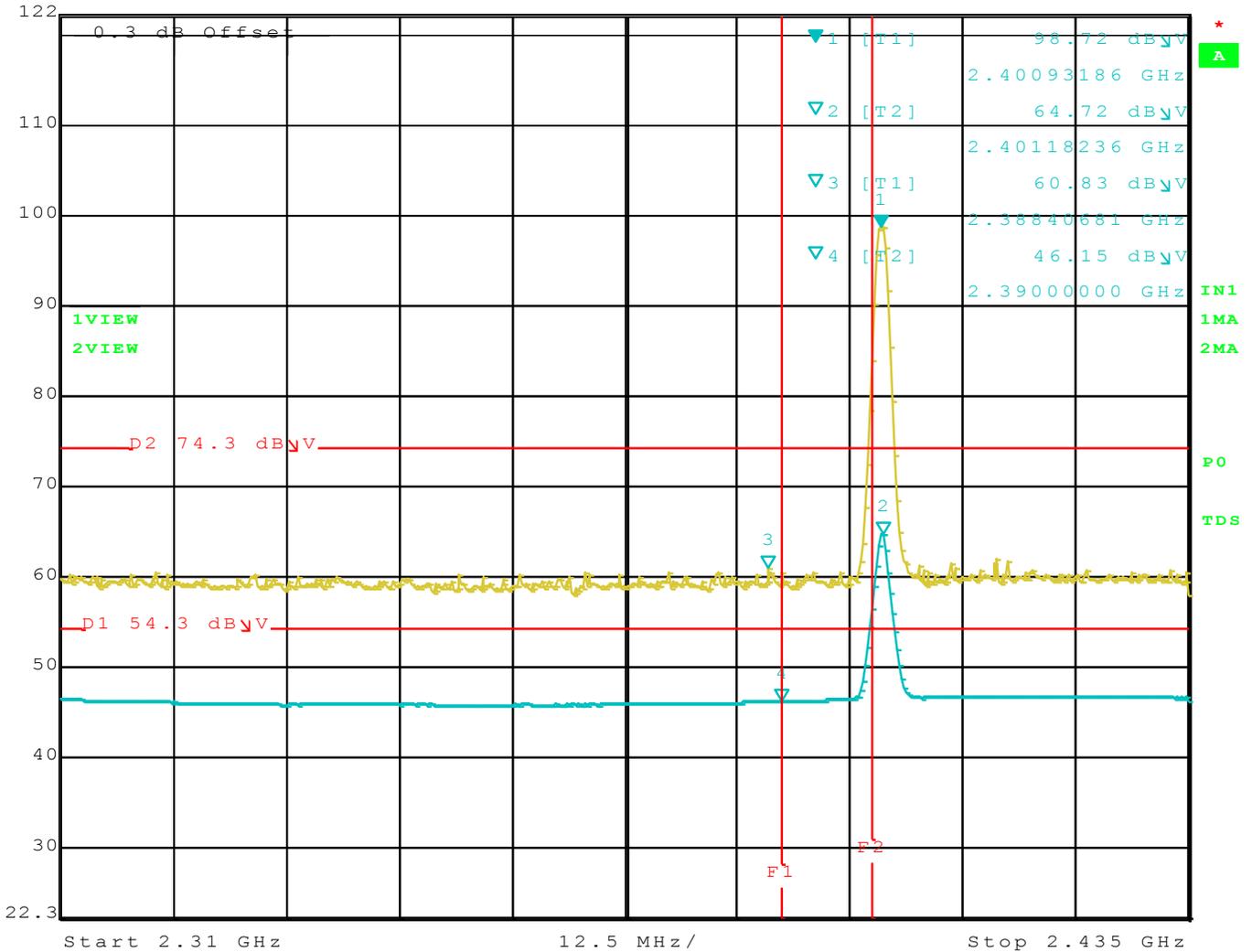
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2401	102.19	V	--	--	Peak	1.3	170	Fundamental of Channel 1
2401	66.2	V	--	--	Avg	1.3	170	@ 3 meters
2388	60.83	V	74	-13.81	Peak	1.3	170	See Marker Delta Method Below
2390	46.16	V	54	-7.84	Avg	1.3	170	See Marker Delta Method Below
2480	102.53	V	--	--	Peak	1.19	170	Fundamental of Channel 11
2480	64.61	V	--	--	Avg	1.19	170	@ 3 meters
2493	60.66	V	74	-13.34	Peak	1.19	170	No Marker Delta Method Used
2483.5	45.64	V	54	-8.36	Avg	1.19	170	No Marker Delta Method Used

PUB# 913591 Marker Delta Method Lower BAND EDGE								
2400	102.19	V	--	--	Peak	1.30	170	PK Marker Delta Method Step 1
Delta	-41.24	V	--	--	Peak	1.30	170	PK Marker Delta Method Step 2
2400	60.95	V	74	-13.05	Peak	1.30	170	PK Marker Delta Method Step 3

## Low Channel Horizontal Band Edge



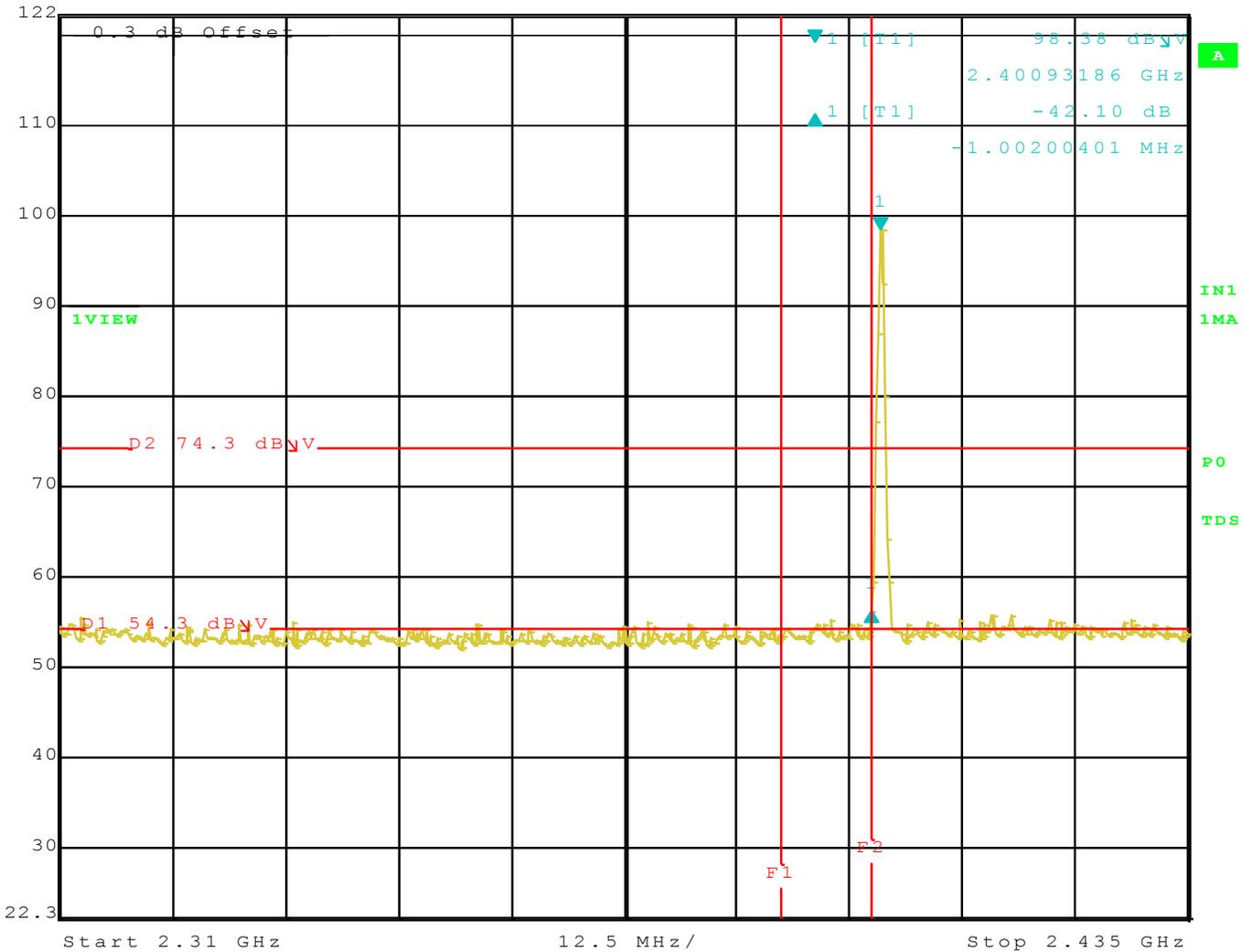
Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB
122.3 dB $\mu$ V	98.72 dB $\mu$ V	VBW	10 Hz		
92.3 dB $\mu$ V	2.40093186 GHz	SWT	32 s	Unit	dB $\mu$ V



Title: F8M117us Lower Band Edge Horizontal  
 Date: 7.NOV.2011 14:49:12

## Low Channel Horizontal Marker Delta

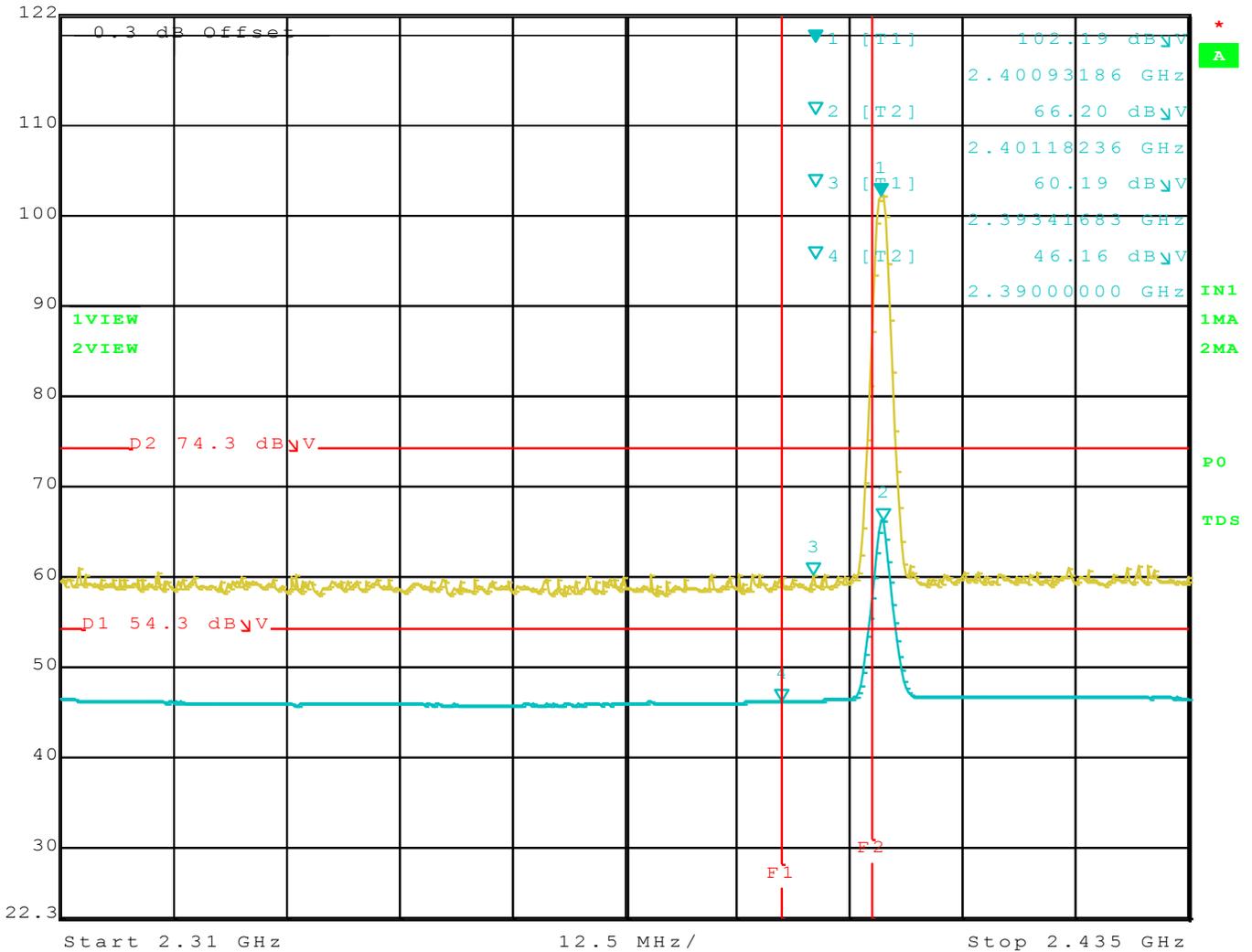
	Max/Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	0 dB
	122.3 dB $\mu$ V	-42.10 dB	VBW	100 kHz		
	92.3 dB $\mu$ V	-1.00200401 MHz	SWT	32 ms	Unit	dB $\mu$ V



Title: F8M117us  
 Comment A: Lower Band Edge Horizontal Marker Delta Method  
 Date: 7.NOV.2011 14:51:41

## Low Channel Vertical Band Edge

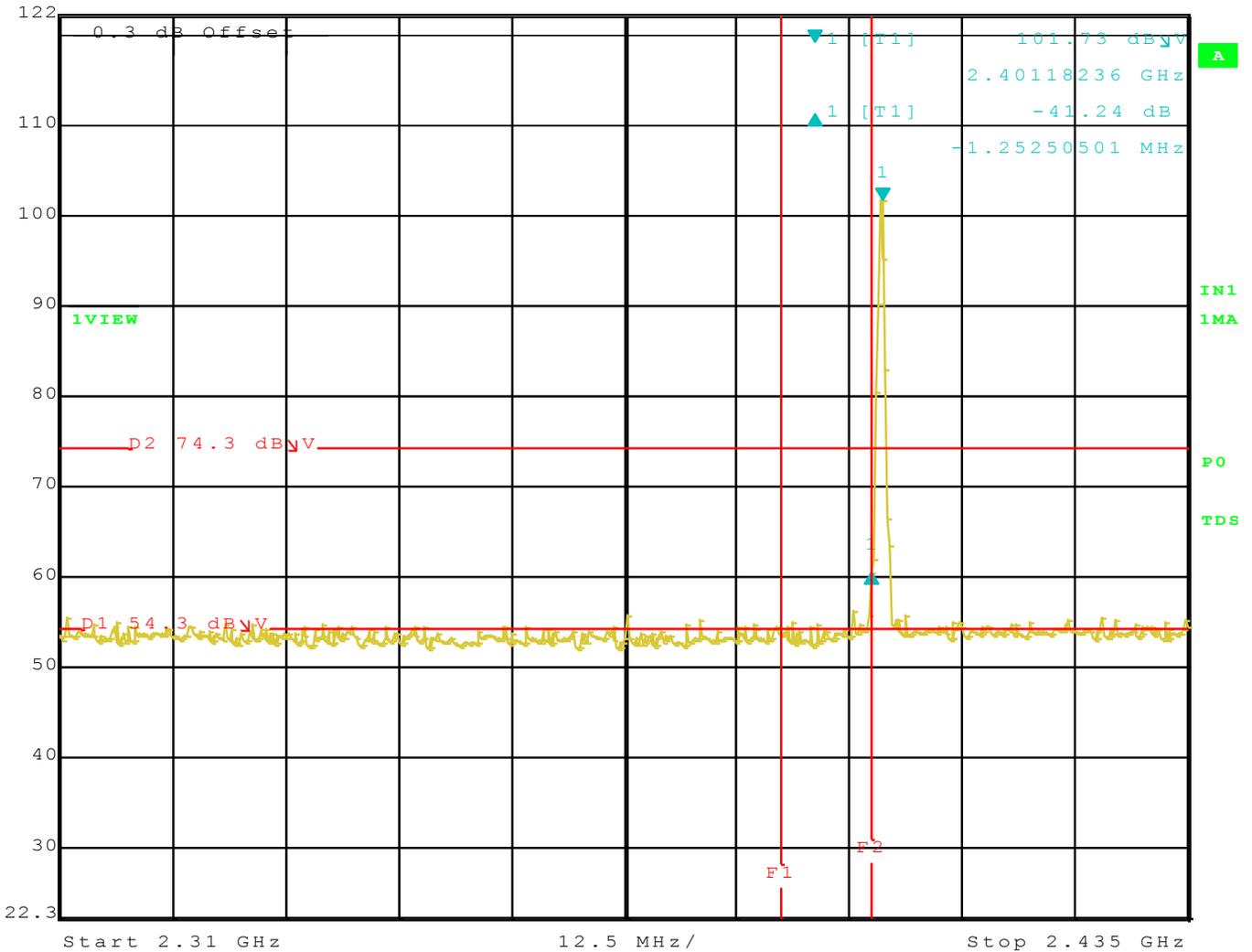
	Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB
	122.3 dB $\mu$ V	102.19 dB $\mu$ V	VBW	10 Hz		
	92.3 dB $\mu$ V	2.40093186 GHz	SWT	32 s	Unit	dB $\mu$ V



Title: F8M117us  
 Comment A: Lower Band Edge Horizontal Marker Delta Method  
 Date: 7.NOV.2011 15:00:36

## Low Channel Vertical Marker Delta

	Max/Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	0 dB
	122.3 dB $\mu$ V	-41.24 dB	VBW	100 kHz		
	92.3 dB $\mu$ V	-1.25250501 MHz	SWT	32 ms	Unit	dB $\mu$ V



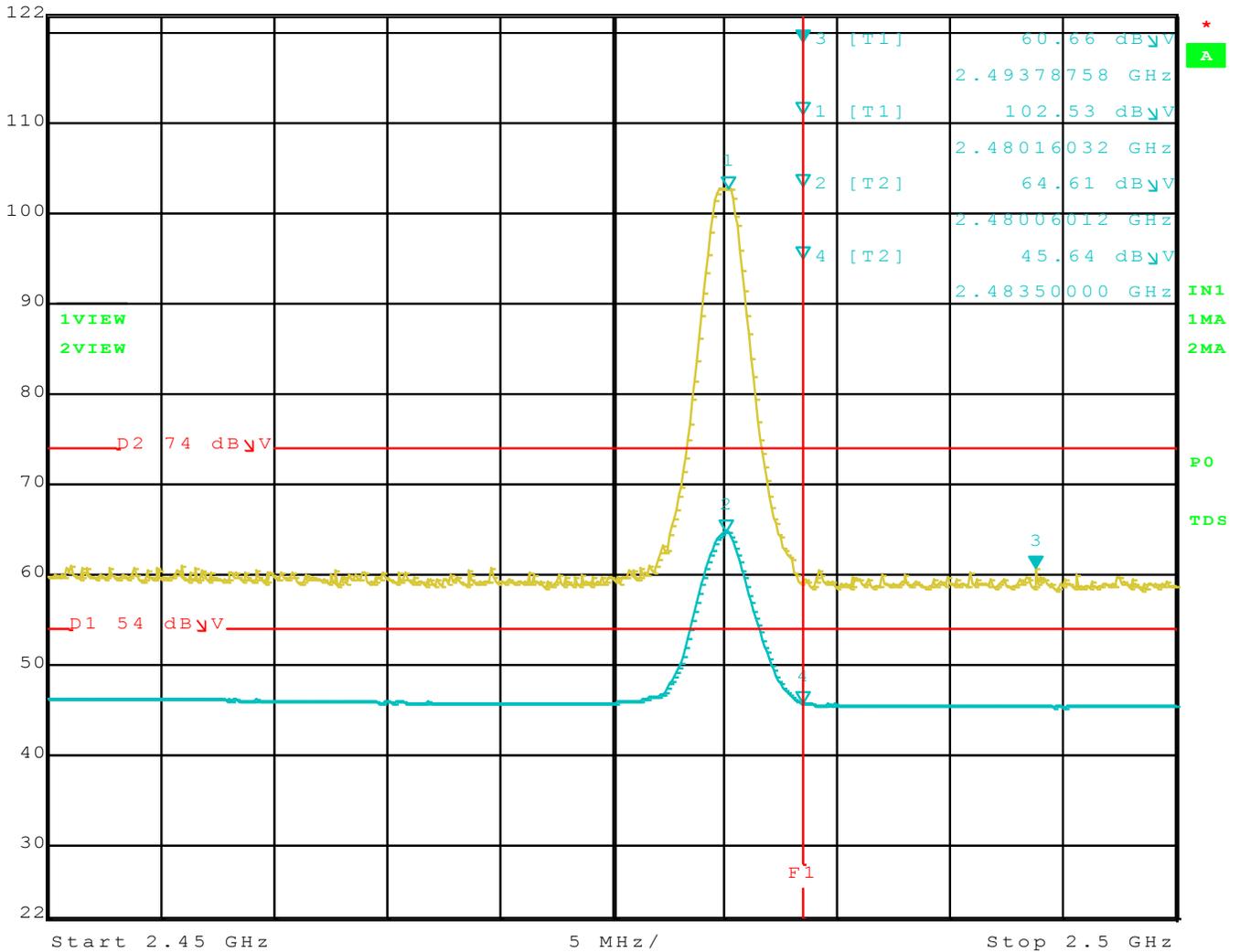
Title: F8M117us  
 Comment A: Lower Band Edge Vertical Marker Delta Method  
 Date: 7.NOV.2011 15:02:02



## High Channel Vertical Band Edge



Max/Ref Lvl      Marker 3 [T1]      RBW      1 MHz      RF Att      0 dB  
 122 dB $\mu$ V      60.66 dB $\mu$ V      VBW      10 Hz  
 92 dB $\mu$ V      2.49378758 GHz      SWT      12.5 s      Unit      dB $\mu$ V



Title: F8M117us Air Cast Auto  
 Comment A: Upper Band Edge Vertical  
 Date: 12.OCT.2011 16:45:27