

**COMPLIANCE WORLDWIDE INC.  
TEST REPORT 514-16R1**

In Accordance with the Requirements of  
**FCC PART 90:2015 Subpart R**  
**Operation in the 758 to 768 MHz and 788 to 798 MHz**  
**Public Safety Broadband (PS-BB)**  
**Operation in the 769 to 775 MHz and 799 to 805 MHz bands**  
**Public Safety Narrowband**  
**and PART 20:2015**

Issued to

**Westell, Inc.**  
**750 North Commons Drive**  
**Aurora, IL 60504**

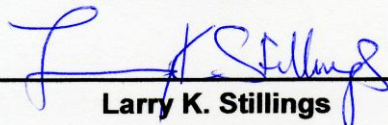
for

**2 Watt Public Safety Signal Booster**  
**Model: PS71090-PS78**


**FCC ID: NVRPS71090-PS78**

**Original Report Issued on February 7, 2017**

Tested by

  
\_\_\_\_\_  
**Larry K. Stillings**

Reviewed By

  
\_\_\_\_\_  
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**1. Scope**

This test report certifies that the Westell 2 Watt Public Safety Signal Booster Model PS71090-PS78, as tested, meets the FCC Part 90 Subpart R and Part 20 requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required. Revision R1 updates the company address on the cover page, and adds the DC power input information to Section 2.8 on this page.

**2. Product Details**

**2.1. Manufacturer:** Westell, Inc.

**2.2. Model Numbers:** PS71090-PS78

**2.3. Serial Number:** 1610002S

**2.4. Description:** The PS71090-PS78 2 Watt Public Safety Signal Booster is an in-building signal booster with NFPA72-compliant features such as antenna monitoring and alarming and 24-hour battery back-up capabilities. The unit, which also meets future FirstNet requirements, is provided in a NEMA Type 4 red enclosure. The PS71090-PS78 supports uplink bands of 788-805 or 806-816/806-824 MHz and downlink bands of 758-775 or 851-861/851-869 MHz.

**2.5. Power Source:** 120 VAC, 60 Hz

**2.6. Software Version:** 0.1

**2.7. EMC Modifications:** None

**2.8. DC voltages and currents of final transmitter stage @ 25°C**

|                        |   |
|------------------------|---|
| Frequency Range        | 758 -775 MHz / 851~869 MHz & 788 – 824 MHz  |
| DC Input Voltage Range | +27VDC , 5.3VDC   |
| DC Current             | 1.1(Typ.), 1.5A (Max.) @CW 36.5dBm / 27V<br>120mA (Typ.), 0.15A (Max.) @CW 36.5dBm / 5.3V |

### 3. Product Configuration

#### 3.1. Support Equipment

| Device       | Manufacturer     | Model         | Serial No. | Comment          |
|--------------|------------------|---------------|------------|------------------|
| Power Supply | APX Technologies | SP130P966ER   | n/a        |                  |
| Notebook PC  | Dell             | Latitude C400 | 9760689253 | Configuring Unit |

#### 3.2. Cables

| Cable Type                | Length  | Shield | From | To               |
|---------------------------|---------|--------|------|------------------|
| RF, 50 Ω, N male – N male | 1M      | Yes    | EUT  | Signal Generator |
| RF, 50 Ω, N male – N male | 1M      | Yes    | EUT  | 50 Ω Load        |
| Power Supply              | 2M + 2M | Yes    | EUT  | 120 VAC, 60 Hz   |
| Ethernet                  | 2M      | No     | EUT  | Notebook PC      |
| DB-9 Alarm Relays         | 2M      | Yes    | EUT  | Un-terminated    |

Notebook PC is connected only during setup and configuration

#### 3.3. Operational Characteristics & Software

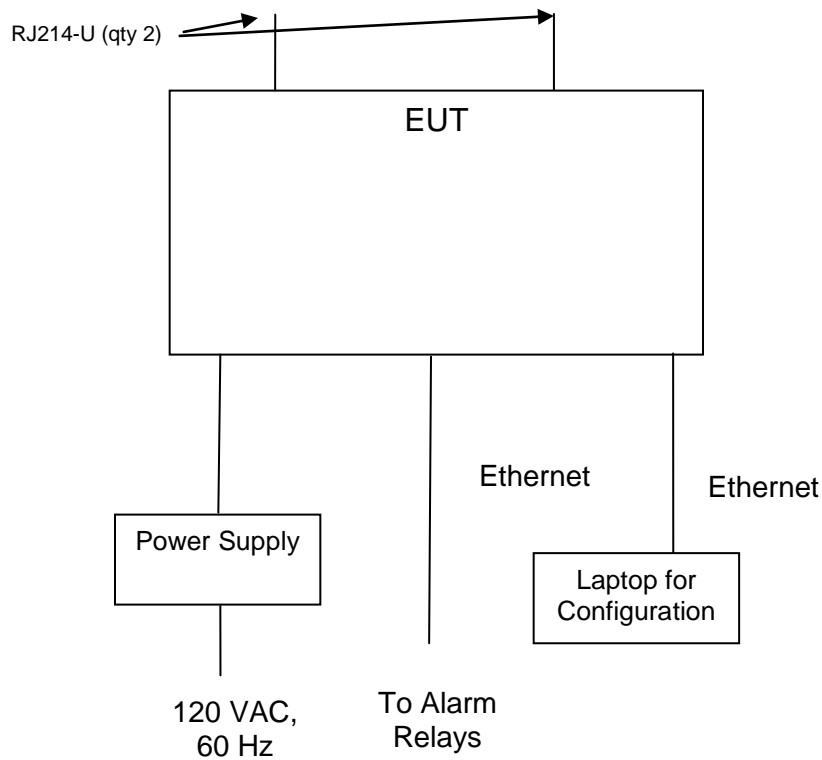
- (1) The unit was allowed to power up normally and go through its configuration cycle.
- (2) Using an RF Signal Generator on the Input and a Spectrum Analyzer on the output Downlink or Uplink frequencies a signal was generated over the intended bandwidth of operation.
- (3) The signal generator was configured to provide a 4.1 MHz AWGN signal to the input of the amplifier across the public safety broad bands (PS-BB) and a CW, 6.25, 12.5, 25 kHz FM modulated, CPAO P25 Phase 1 and Phase 2 signals to the input of the amplifier across the public safety narrow bands to be used by the product.
- (4) The units internal AGC threshold was determined by applying an input signal until a 1 dB increase in input signal did not cause a 1 dB in output signal for each of the Uplink and Downlink frequencies.

**3. Product Configuration (continued)**

**3.3. Operational Characteristics & Software**

| Emission Designator | Modulation     | Occupied Bandwidth | Channel Bandwidth | Audio Frequency |
|---------------------|----------------|--------------------|-------------------|-----------------|
| 16K0F3E             | FM             | 16.0 kHz           | 25 kHz            | 1 kHz           |
| 11K3F3E             | FM             | 11.3 kHz           | 12.5 kHz          | 1 kHz           |
| 4K04F1E             | FM             | 4.04 kHz           | 6.25 kHz          | 1 kHz           |
| N/A                 | CW             | N/A                | N/A               | N/A             |
| 8K16F1D             | C4FM           | 8.16 kHz           | 12.5 kHz          | N/A             |
| 9K82G1D             | $\pi/4$ -DQPSK | 9.82 kHz           | 12.5 kHz          | N/A             |
| 4M18F9W             | AWGN           | 4.18 MHz           | 5 MHz             |                 |

**3.4. Block Diagram (Signal Booster's final stage uses 3.3 and 5 Volts DC)**



#### 4. Measurements Parameters

##### 4.1. Measurement Equipment Used to Perform Test

| Device  | Manufacturer        | Model No.   | Serial No. | Cal Due    | Interval |
|---|---------------------|-------------|------------|------------|----------|
| EMI Test Receiver, 9kHz – 7GHz <sup>1</sup>     | Rohde & Schwarz     | ESR7        | 101156     | 7/23/2017  | 2 Years  |
| Spectrum Analyzer 20 Hz – 40 GHz <sup>2</sup>   | Rohde & Schwarz     | FSV40       | 100899     | 7/23/2017  | 2 Years  |
| Spectrum Analyzer, 9 kHz to 40 GHz <sup>3</sup> | Rohde & Schwarz     | FSVR40      | 100909     | 7/23/2017  | 2 Years  |
| EMI Receiver, 9 kHz to 6.5 GHz                  | Hewlett Packard     | 8546A       | 3650A00360 | 6/4/2017   | 3 Years  |
| Biconilog Antenna, 30 MHz to 2 GHz              | Sunol Sciences Corp | JB1         | A050913    | 6/3/2019   | 3 Years  |
| Horn Antenna, 960 MHz – 18 GHz                  | Electro-Metrics     | RGA-50 / 60 | 2813       | 10/13/2017 | 2 Years  |
| Preamplifier, 1 GHz to 26.5 GHz                 | Hewlett Packard     | 8449B       | 3008A01323 | 7/21/2017  | 2 Years  |
| RF Signal Generator 5kHz to 6 GHz               | Rohde & Schwarz     | SMIQ06B     | 10090      | 7/23/2017  | 2 Years  |
| Noise Source 10 MHz to 6 GHz                    | Micronetics         | NS346B      | 17883      | 10/15/2017 | 1 Year   |
| Digital Barometer                               | Control Company     | 4195        | ID236      | 10/8/2017  | 2 Years  |

<sup>1</sup> ESR7 Firmware revision: V2.28.SP1 Date installed: 9/2/2016 Previous V2.26, installed 8/15/2014.  
<sup>2</sup> FSV40 Firmware revision: V2.30 SP4, Date installed: 5/4/2016 Previous V2.30 SP1, installed 10/22/2014.  
<sup>3</sup> FSVR40 Firmware revision: V2.23, Date installed: 10/20/2014 Previous V1.63 SP1, installed 8/28/2013.

##### 4.2. Measurement & Equipment Setup

Test Dates: 11/21/2016, 11/22/2016, 11/23/2016,  
 11/30/2016, 1/20/2017, 2/6/2017

Test Engineers: Larry Stillings, Cody Merry, Mark McSweeney

Normal Site Temperature (15 – 35°C): 24

Relative Humidity (20 -75%RH): 33

##### 4.3. Test Procedure

The test measurements contained in this report are based on the requirements detailed in FCC Part 90 & Subpart R.

The test methods used to generate the data in this test report are in accordance with ANSI C63.26:2015, American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services, FCC OET KDB 935210 D05 Indus Booster Basic Meas v01r01 dated 2-12-2016, Measurements Guidance for Industrial and Non-Consumer Signal Booster, Repeater and Amplifier Devices, FCC OET KDB 971168 D01 Power Meas License Digital Systems v02r02 dated 10-17-2014 and ANSI/TIA-102.CAAA-D-2013, Digital C4FM/CQPSK Transceiver Measurement Methods.

Measurements were also made in accordance with ANSI/TIA-603-D 2010 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard.

**5. Measurement Summary**

| Section Description or Test Requirement          | FCC Part 90 Reference                     | Test Report Section | Result    | Comment  |
|--|---|---------------------|-----------|--|
| Broadband Transmitting Power Limits              | 90.219(e)(1)<br>90.541<br>90.542          | 6.1                 | Compliant |  |
| Occupied Bandwidth and Emission Mask             | 90.219(e)(4)(ii)<br>Part 2.1049<br>90.210 | 6.2                 | Compliant |  |
| Spurious Emissions at Antenna Terminals          | 90.219(e)(3)<br>90.543                    | 6.3                 | Compliant |  |
| Field Strength of Spurious Emissions             | 90.219(e)(3)<br>90.543                    | 6.4                 | Compliant |  |
| Frequency Stability                              | 90.539                                    | 6.5                 | N/A       | The EUT does not translate the frequency of the input signal |
| Out of Band Rejection                            | N/A                                       | 6.6                 | Compliant |  |
| Noise Figure                                     | 90.219(e)(2)                              | 6.7                 | Compliant |  |
| Public Exposure to Radio Frequency Energy Levels | Section 1.1307<br>(b)(1)                  | 6.8                 | Compliant |  |

**6. Measurement Data**

**6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542**

Requirement: The transmitter output power of mobile and control transmitters operating in the 758 to 768 MHz, 769 to 775 MHz, 788 to 798 MHz and 799 to 805 MHz bands must not exceed 30 Watts.

The output power capability of a signal booster must be designed for deployments providing a radiated power not exceeding 5 Watts ERP for each retransmitted channel.

Measurement of AGC Threshold

Test Method: KDB 935210 Section 4.2 & KDB 971168 Section 5.2

**6.1.1. Mean Transmitter Output Power, Transmitter Only**

| Modulation Type           | Center Frequency | Output Power |         | Input Power (dBm) | Result    |
|---------------------------|------------------|--------------|---------|-------------------|-----------|
|                           | (MHz)            | (dBm)        | (Watts) |                   |           |
| AWGN Modulation           | 766              | 33.20        | 2.089   | -56.35            | Compliant |
| FM Modulation             | 771              | 32.95        | 1.972   | -57.53            | Compliant |
| CW                        | 771              | 33.06        | 2.023   | -57.51            | Compliant |
| C4FM Modulation           | 771              | 33.09        | 2.037   | -57.43            | Compliant |
| $\pi/4$ -DQPSK Modulation | 771              | 32.87        | 1.936   | -57.78            | Compliant |
| AWGN Modulation           | 796              | 33.32        | 2.148   | -56.40            | Compliant |
| FM Modulation             | 802              | 32.65        | 1.841   | -57.66            | Compliant |
| CW                        | 802              | 32.66        | 1.845   | -57.65            | Compliant |
| C4FM Modulation           | 802              | 32.72        | 1.871   | -57.50            | Compliant |
| $\pi/4$ -DQPSK Modulation | 802              | 32.55        | 1.799   | -57.78            | Compliant |

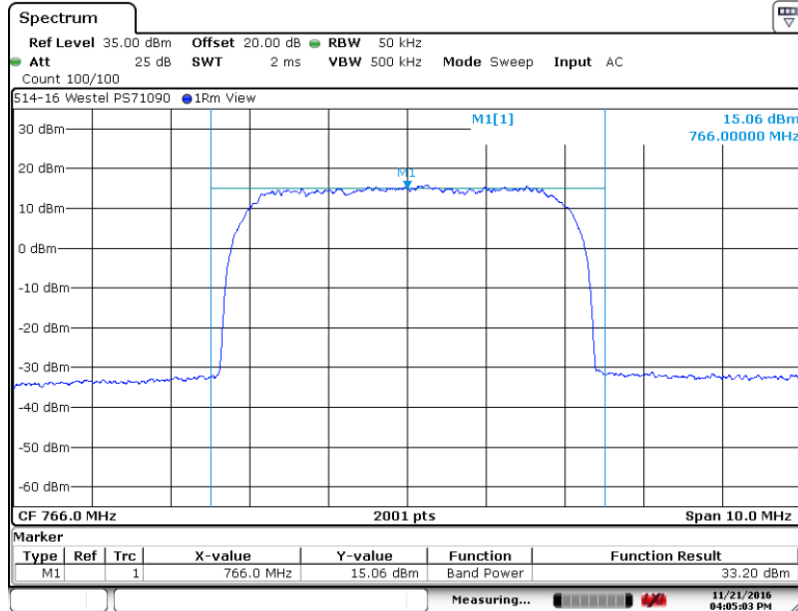
**Note: Input Power is at the 1 dB AGC threshold Level**



6. Measurement Data

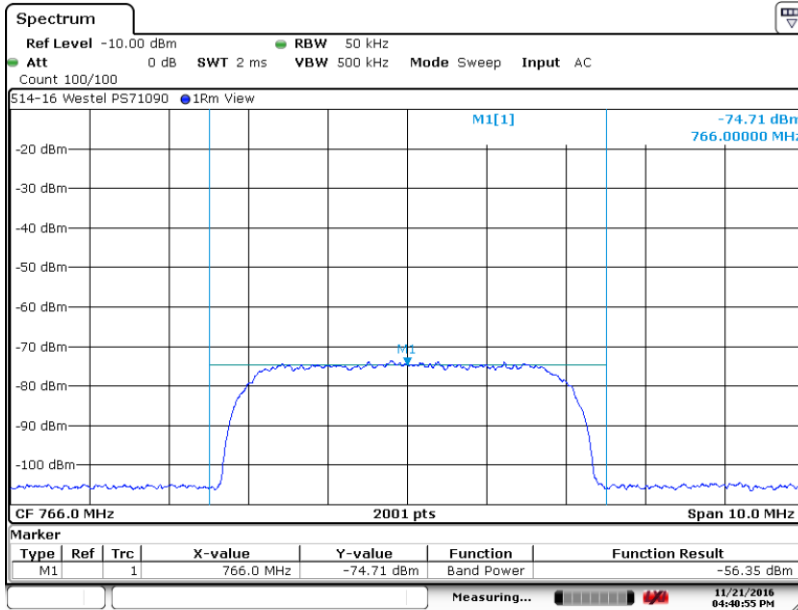
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.2. Mean Transmitter Output Power, 766 MHz, AWGN Modulation



Date: 21.NOV.2016 16:05:02

6.1.3. Mean Transmitter Input Power, 766 MHz, AWGN Modulation

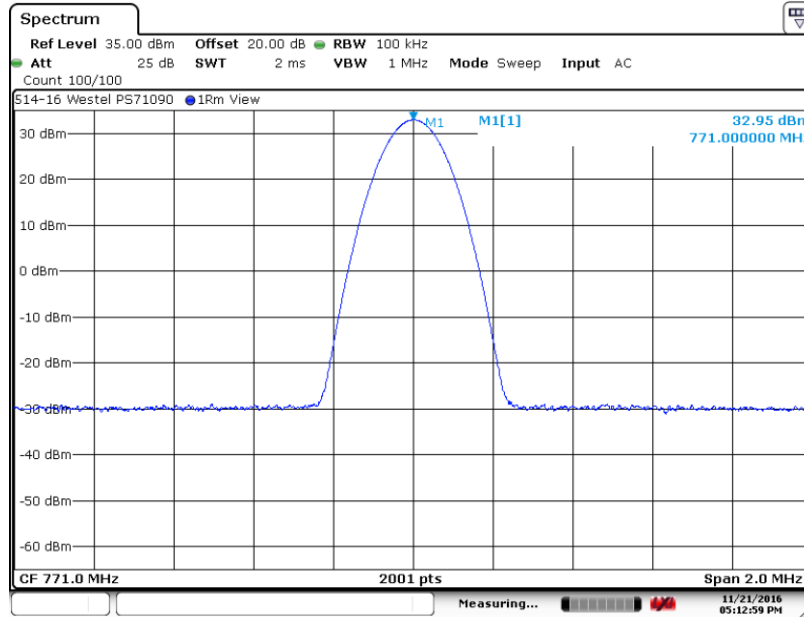


Date: 21.NOV.2016 16:40:54

6. Measurement Data

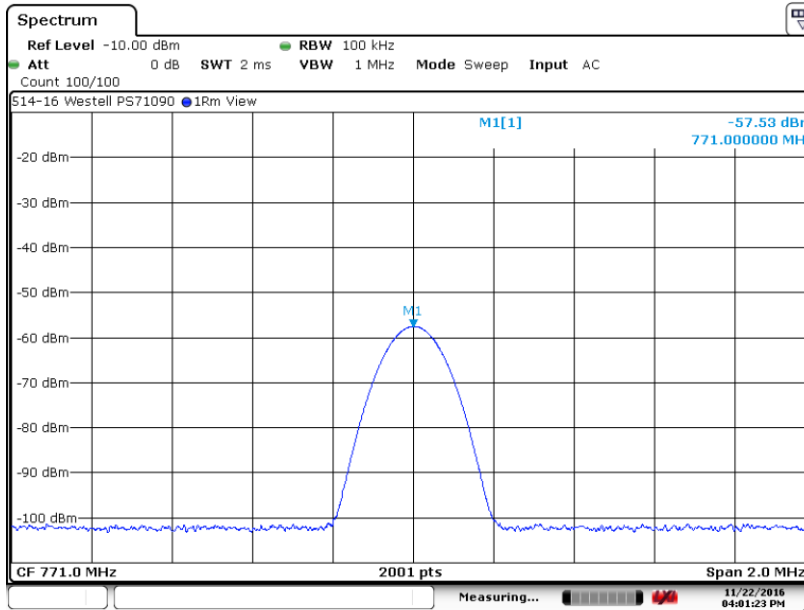
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.4. Mean Transmitter Output Power, 771 MHz, FM Modulation



Date: 21.NOV.2016 17:12:58

6.1.5. Mean Transmitter Input Power, 771 MHz, FM Modulation

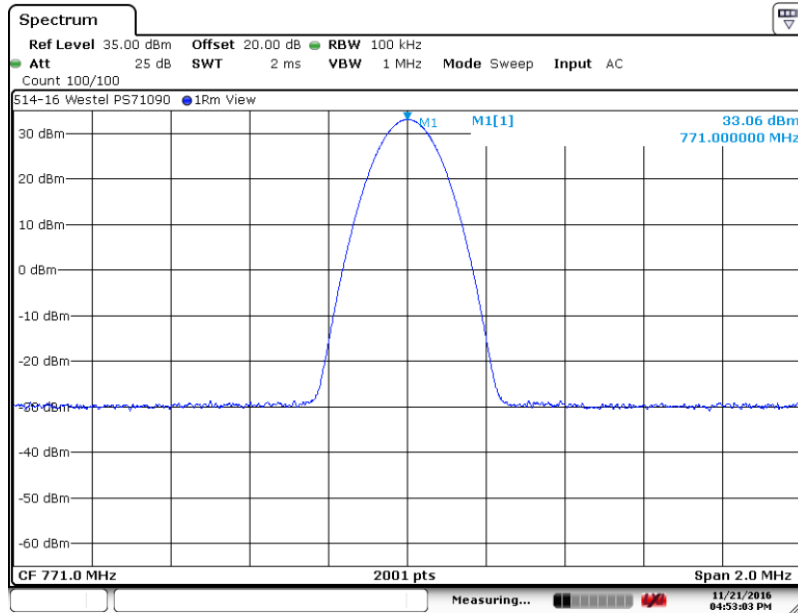


Date: 22.NOV.2016 16:01:22

6. Measurement Data

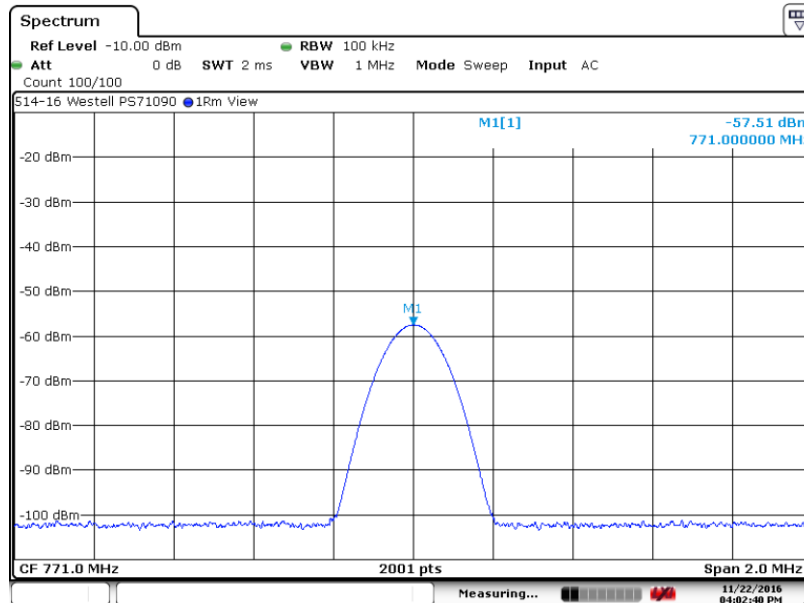
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.6. Mean Transmitter Output Power, 771 MHz, CW Signal



Date: 21.NOV.2016 16:53:02

6.1.7. Mean Transmitter Input Power, 771 MHz, CW Signal

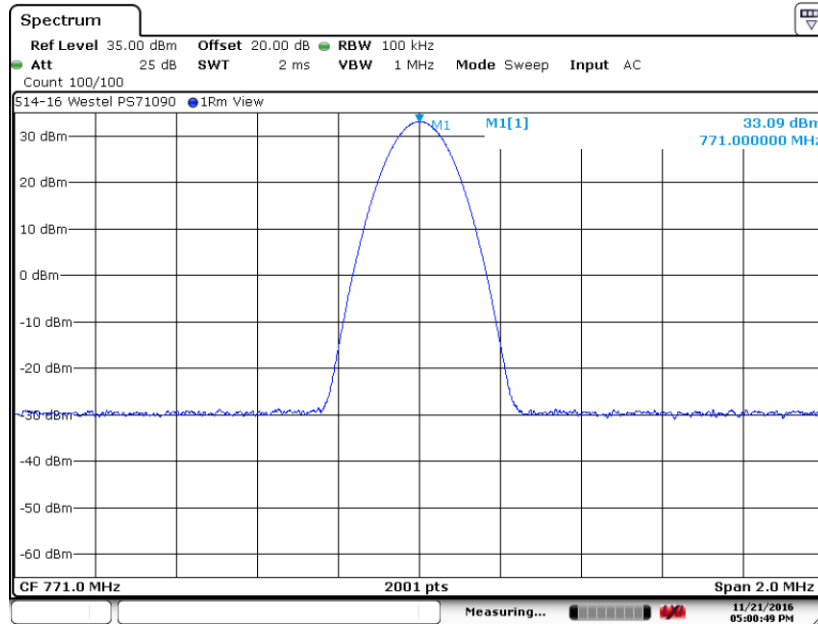


Date: 22.NOV.2016 16:02:39

6. Measurement Data

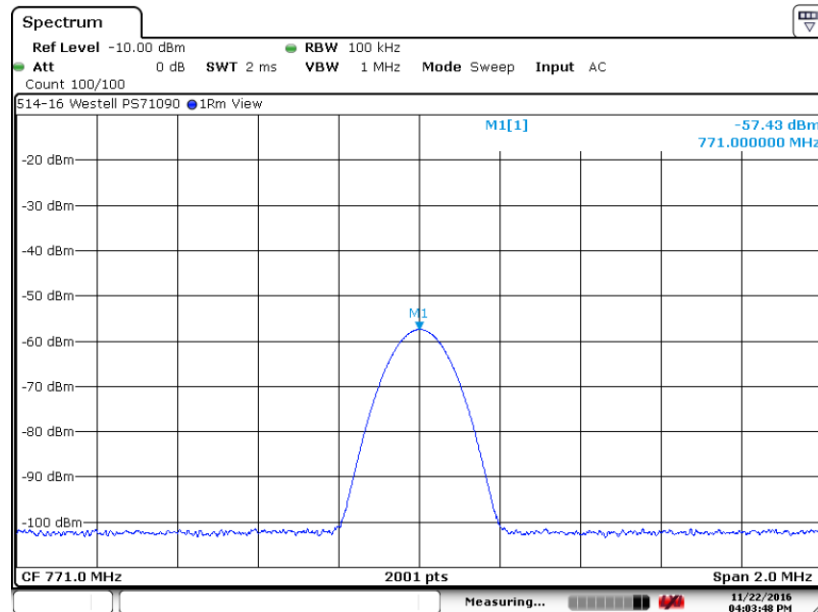
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.8. Mean Transmitter Output Power, 771 MHz, C4FM Modulation



Date: 21.NOV.2016 17:00:48

6.1.9. Mean Transmitter Input Power, 771 MHz, C4FM Modulation

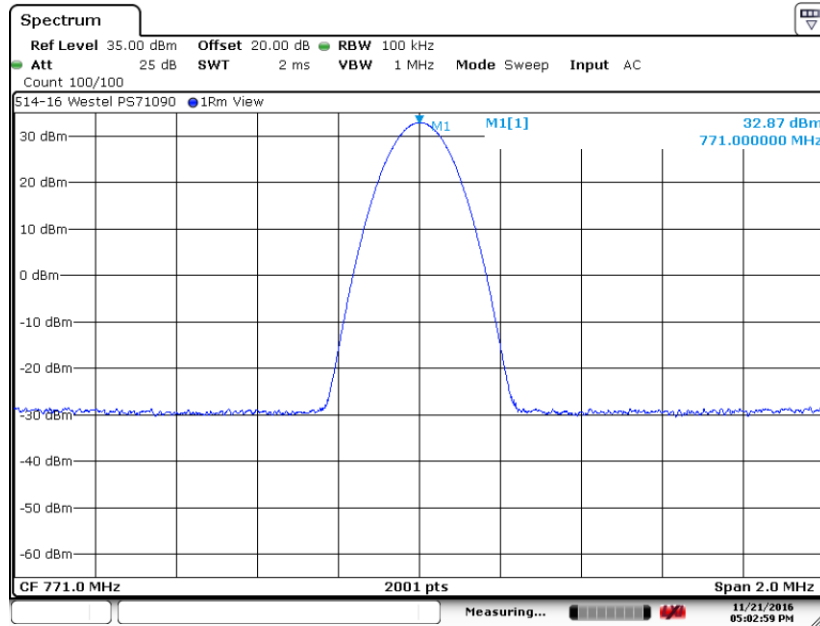


Date: 22.NOV.2016 16:03:47

6. Measurement Data

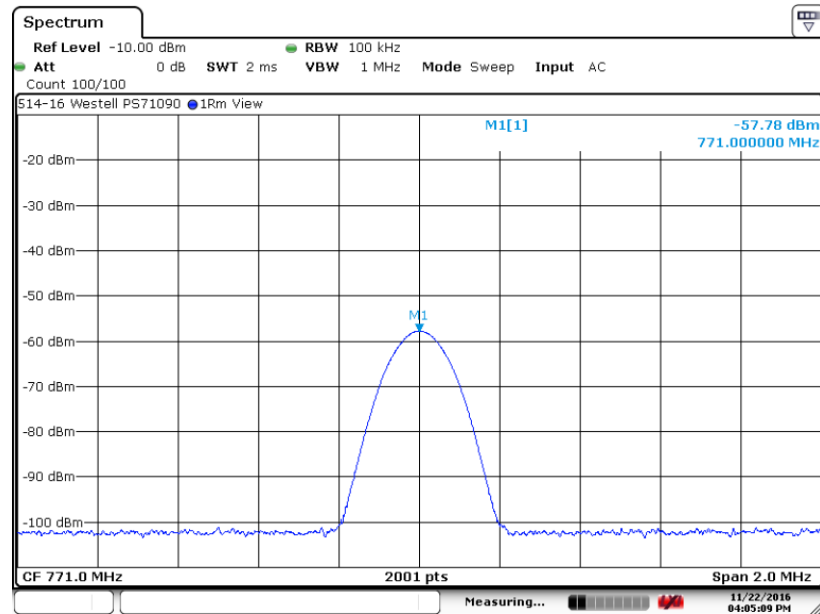
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.10. Mean Transmitter Output Power, 771 MHz,  $\pi/4$ -DQPSK Modulation



Date: 21.NOV.2016 17:02:58

6.1.11. Mean Transmitter Input Power, 771 MHz,  $\pi/4$ -DQPSK Modulation

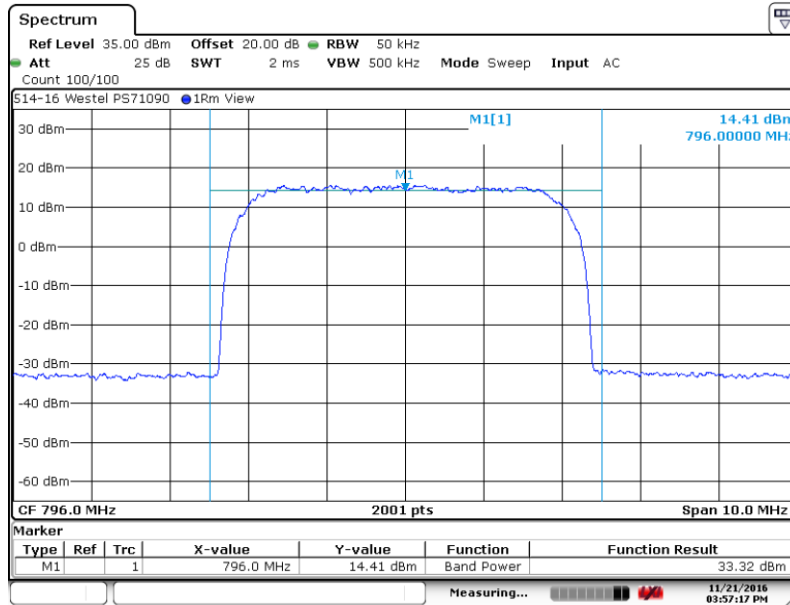


Date: 22.NOV.2016 16:05:08

6. Measurement Data

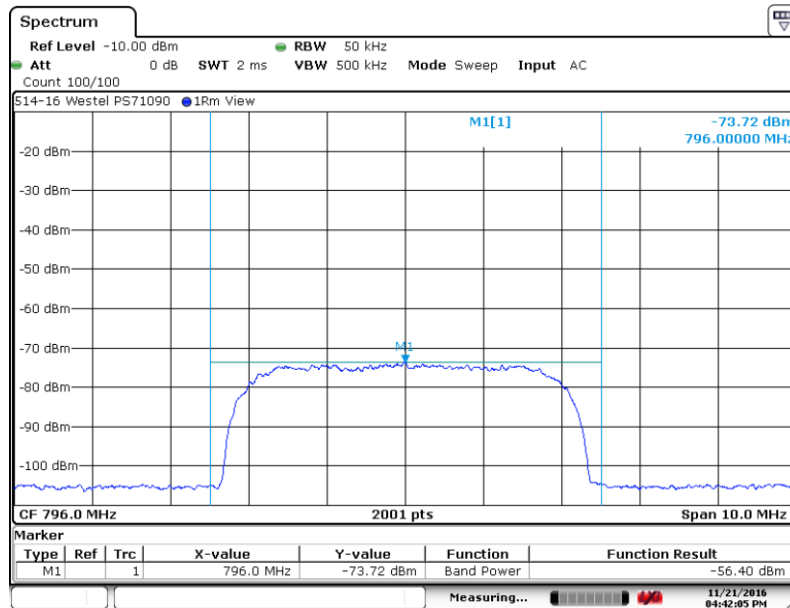
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.12. Mean Transmitter Output Power, 796 MHz, AWGN Modulation



Date: 21.NOV.2016 15:57:16

6.1.13. Mean Transmitter Input Power, 796 MHz, AWGN Modulation

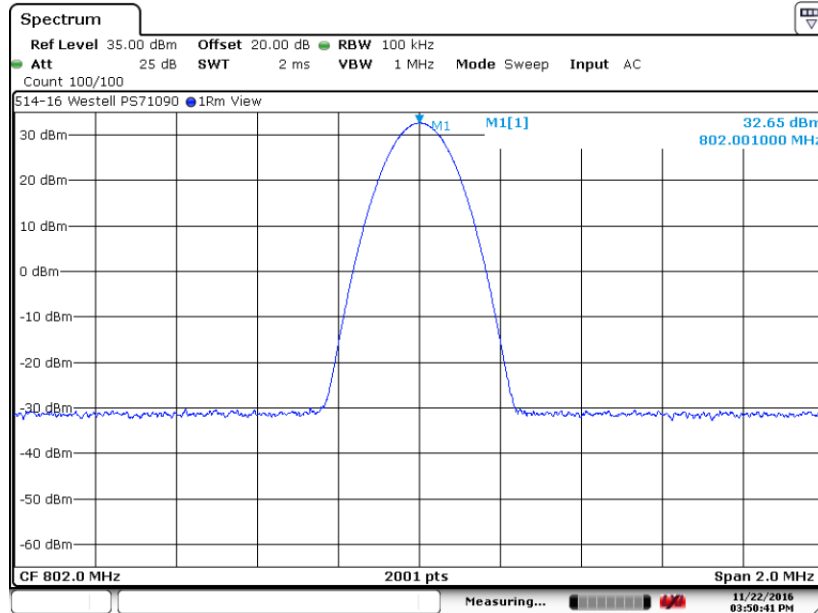


Date: 21.NOV.2016 16:42:04

6. Measurement Data

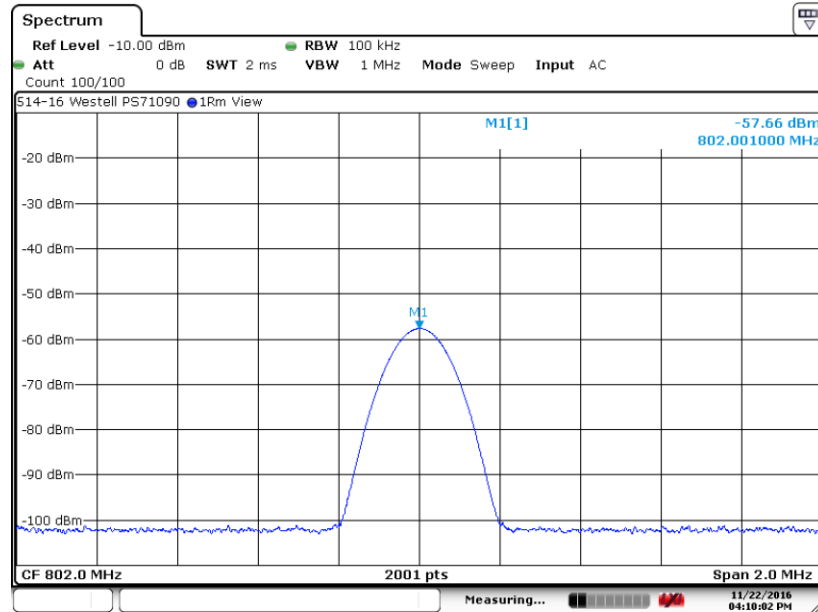
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.14. Mean Transmitter Output Power, 802 MHz, FM Modulation



Date: 22.NOV.2016 15:50:40

6.1.15. Mean Transmitter Input Power, 802 MHz, FM Modulation

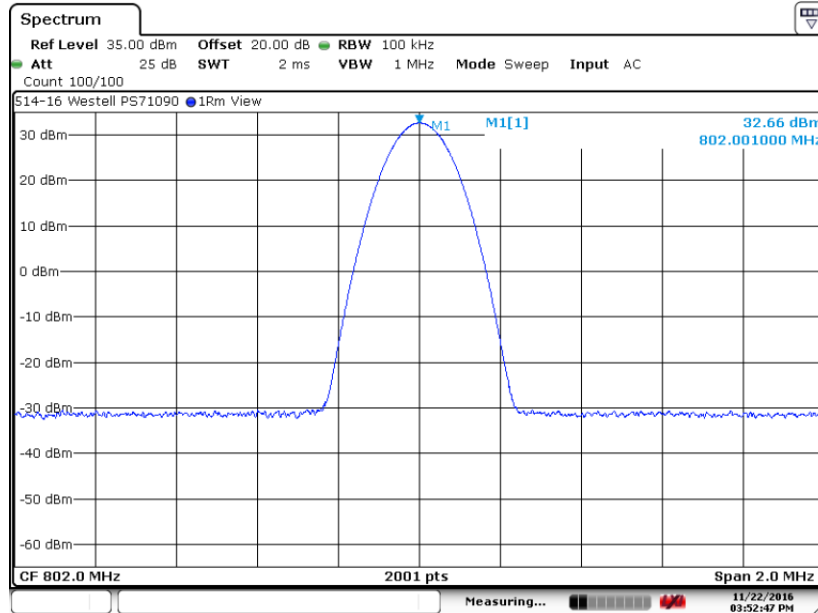


Date: 22.NOV.2016 16:10:01

6. Measurement Data

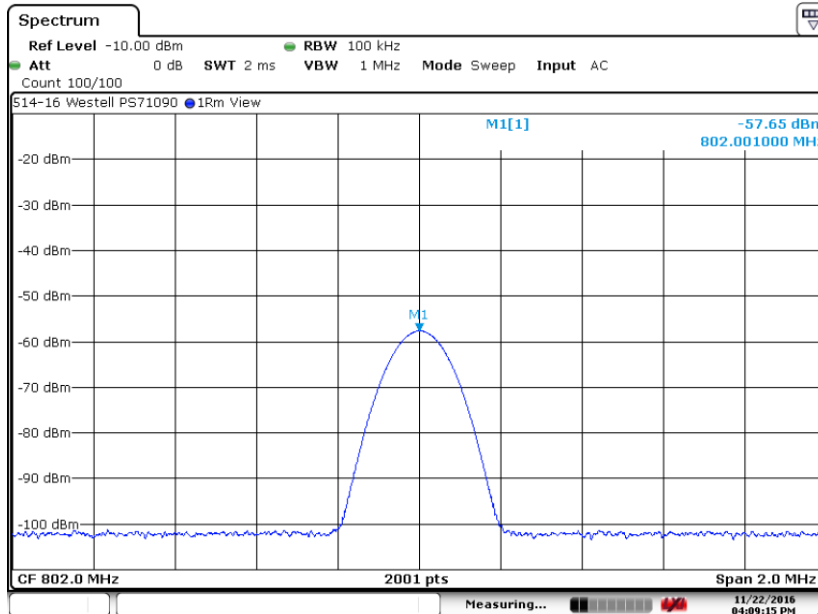
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.16. Mean Transmitter Output Power, 802 MHz, CW Signal



Date: 22.NOV.2016 15:52:45

6.1.17. Mean Transmitter Input Power, 802 MHz, CW Signal



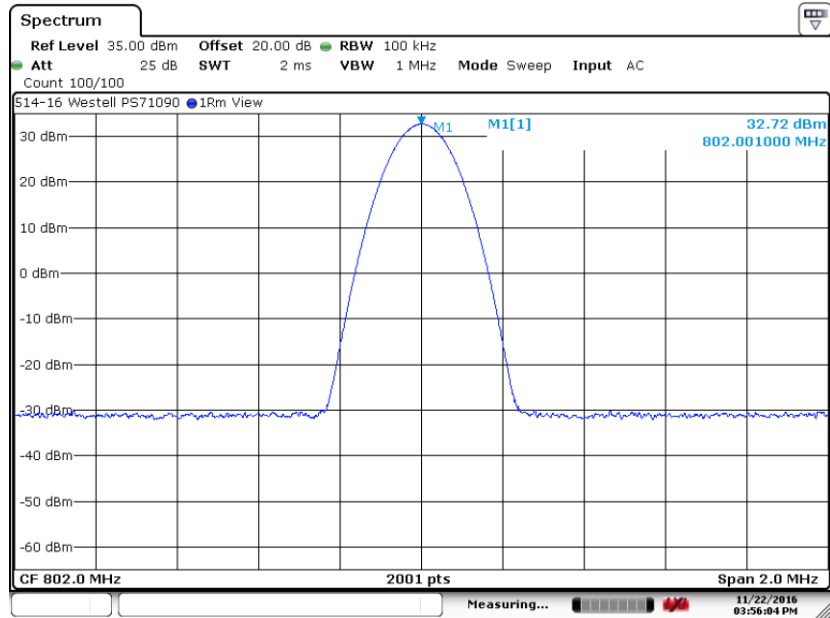
Date: 22.NOV.2016 16:09:14



6. Measurement Data

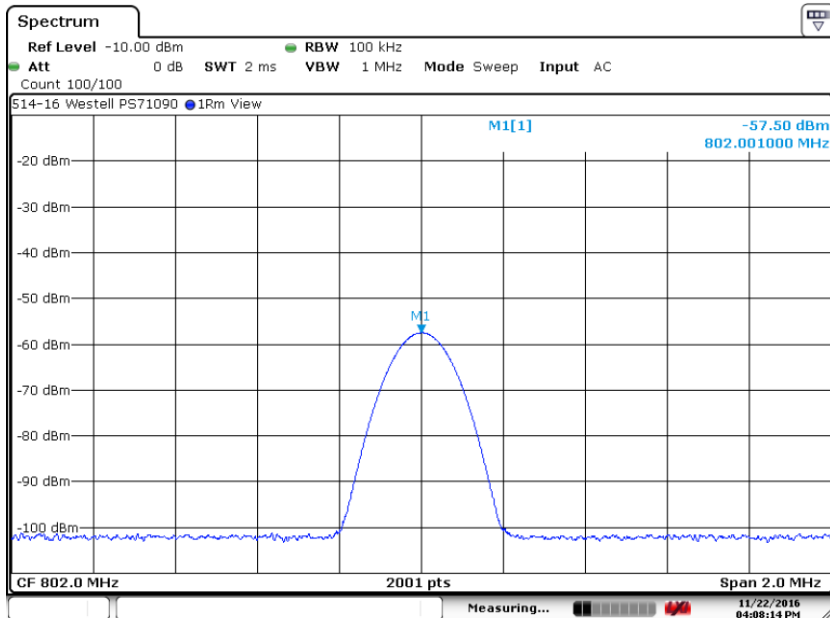
6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.18. Mean Transmitter Output Power, 802 MHz, C4FM Modulation



Date: 22.NOV.2016 15:56:03

6.1.19. Mean Transmitter Input Power, 802 MHz, C4FM Modulation

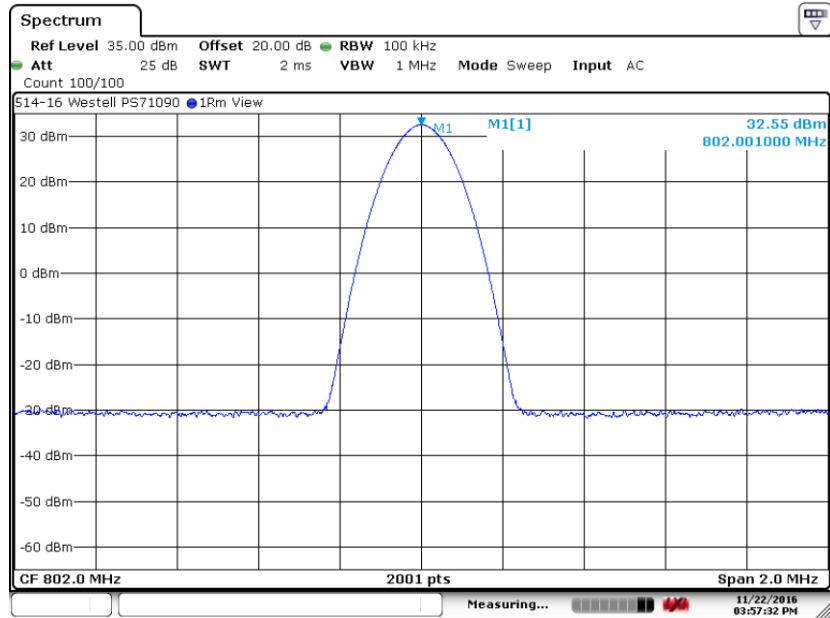


Date: 22.NOV.2016 16:08:13

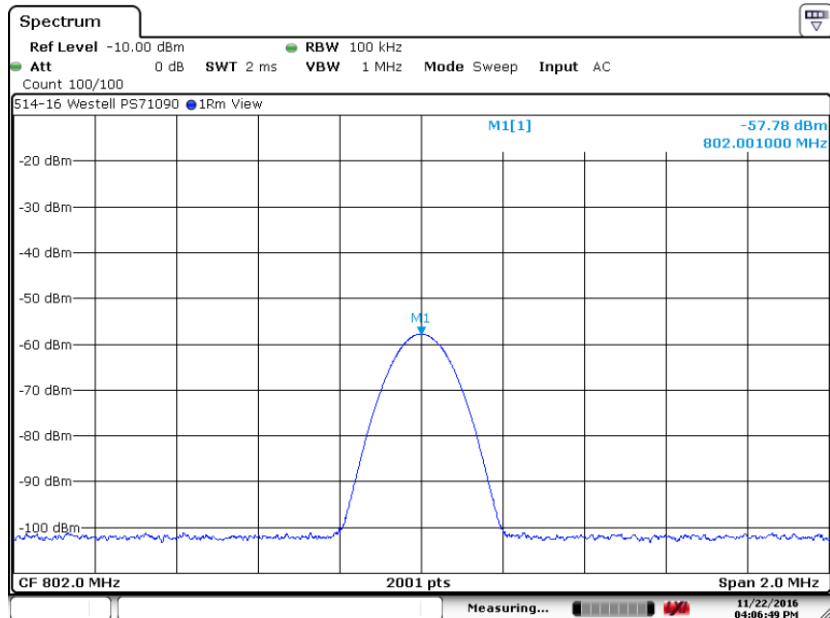
6. Measurement Data

6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (cont)

6.1.20. Mean Transmitter Output Power, 802 MHz,  $\pi/4$ -DQPSK Modulation



6.1.21. Mean Transmitter Input Power, 802 MHz,  $\pi/4$ -DQPSK Modulation



**6. Measurement Data**

**6.1. Broadband Transmitting Power Limits 90.219(e)(1), 90.541, 90.542 (continued)**

**6.1.2. Maximum ERP**

ERP is defined in FCC Title 47, Chapter I, Part 2, Subpart A, Section 2.1 as “Effective Radiated Power. The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction.”

$$ERP = \text{Transmitter Power (dBm)} - \text{Cable Loss (dB)} + \text{Antenna Gain (dBi)}$$

The manufacturer of the device under test recommends one antenna and cable combination for use with their product. The following table provides the worst case effective radiated power based on the measured transmitter output power and the antenna gain:

| Modulation Type           | Center Frequency | Transmitter Power | Cable Insertion Loss | Antenna Gain | Total Output Power |       |
|---------------------------|------------------|-------------------|----------------------|--------------|--------------------|-------|
|                           | MHz              | dBm               | dB                   | dBi          | dBm                | Watts |
| AWGN Modulation           | 766              | 33.20             | 0.00                 | 3.00         | 36.20              | 4.17  |
| FM Modulation             | 771              | 32.95             | 0.00                 | 3.00         | 35.95              | 3.94  |
| CW                        | 771              | 33.06             | 0.00                 | 3.00         | 36.06              | 4.04  |
| C4FM Modulation           | 771              | 33.09             | 0.00                 | 3.00         | 36.09              | 4.06  |
| $\pi/4$ -DQPSK Modulation | 771              | 32.87             | 0.00                 | 3.00         | 35.87              | 3.86  |
| AWGN Modulation           | 796              | 33.32             | 0.00                 | 3.00         | 36.32              | 4.29  |
| FM Modulation             | 802              | 32.65             | 0.00                 | 3.00         | 35.65              | 3.67  |
| CW                        | 802              | 32.66             | 0.00                 | 3.00         | 35.66              | 3.68  |
| C4FM Modulation           | 802              | 32.72             | 0.00                 | 3.00         | 35.72              | 3.73  |
| $\pi/4$ -DQPSK Modulation | 802              | 32.55             | 0.00                 | 3.00         | 35.55              | 3.59  |

<sup>1</sup> Measured. See section 6.1.1.

<sup>2</sup> Customer supplied 3 dBi. Factor is a combination of both antenna gain and cable loss.

**6.1.3. Booster gain – 90 dB Nominal**

| Modulation Type           | Center Frequency | Output Power | Input Power | Gain  |
|---------------------------|------------------|--------------|-------------|-------|
|                           | (MHz)            | (dBm)        | (dBm)       | dB    |
| AWGN Modulation           | 766              | 33.20        | -56.35      | 89.55 |
| FM Modulation             | 771              | 32.95        | -57.53      | 90.48 |
| CW                        | 771              | 33.06        | -57.51      | 90.57 |
| C4FM Modulation           | 771              | 33.09        | -57.43      | 90.52 |
| $\pi/4$ -DQPSK Modulation | 771              | 32.87        | -57.78      | 90.65 |
| AWGN Modulation           | 796              | 33.32        | -56.40      | 89.72 |
| FM Modulation             | 802              | 32.65        | -57.66      | 90.31 |
| CW                        | 802              | 32.66        | -57.65      | 90.31 |
| C4FM Modulation           | 802              | 32.72        | -57.50      | 90.22 |
| $\pi/4$ -DQPSK Modulation | 802              | 32.55        | -57.78      | 90.33 |

**6. Measurement Data (continued)****6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 and Emission Mask 90.210**

Requirement: Each authorization issued to a station licensed under this part will show an emission designator representing the class of emission authorized. The designator will be prefixed by a specified necessary bandwidth. This number does not necessarily indicate the bandwidth occupied by the emission at any instant.

There is no significant change in the occupied bandwidth of the retransmitted signal.

Emission Mask shall also be met for each modulation type. Emission Mask C is used for the 758 to 775 MHz and 788 to 805 MHz bands per the table in section 90.210.

FM modulation at 16 kHz was used as worst case against emission mask C at AGC threshold and 3 dB above AGC threshold as the other modulations are narrower.

Test Method: KDB 935210 Section 4.4

**6. Measurement Data (continued)**

**6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)**

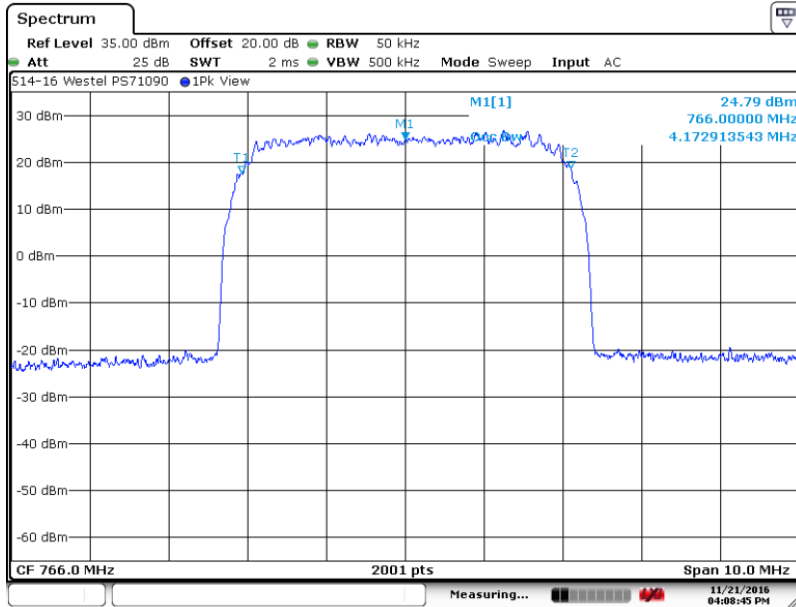
**6.2.1. Occupied (99% Power) Bandwidth**

| Modulation Type | Frequency | Output Occupied Bandwidth | Input Occupied Bandwidth | Difference | Result    |
|-----------------|-----------|---------------------------|--------------------------|------------|-----------|
|                 | MHz       | kHz                       | kHz                      | kHz        |           |
| AWGN            | 766       | 4173                      | 4198                     | -25.000    | Compliant |
| FM 16K0F3E      | 771       | 16.017                    | 16.017                   | 0.000      | Compliant |
| FM 11K3F3E      | 771       | 11.334                    | 11.334                   | 0.000      | Compliant |
| FM 4K04F1E      | 771       | 4.040                     | 4.033                    | 0.007      | Compliant |
| C4FM            | 771       | 8.126                     | 8.111                    | 0.015      | Compliant |
| $\pi/4$ -DQPSK  | 771       | 9.820                     | 9.820                    | 0.000      | Compliant |
| AWGN            | 796       | 4178                      | 4208                     | -30.000    | Compliant |
| FM 16K0F3E      | 802       | 16.017                    | 16.017                   | 0.000      | Compliant |
| FM 11K3F3E      | 802       | 11.334                    | 11.334                   | 0.000      | Compliant |
| FM 4K03F1E      | 802       | 4.033                     | 4.040                    | -0.007     | Compliant |
| C4FM            | 802       | 8.156                     | 8.111                    | 0.045      | Compliant |
| $\pi/4$ -DQPSK  | 802       | 9.775                     | 9.835                    | -0.060     | Compliant |

6. Measurement Data (continued)

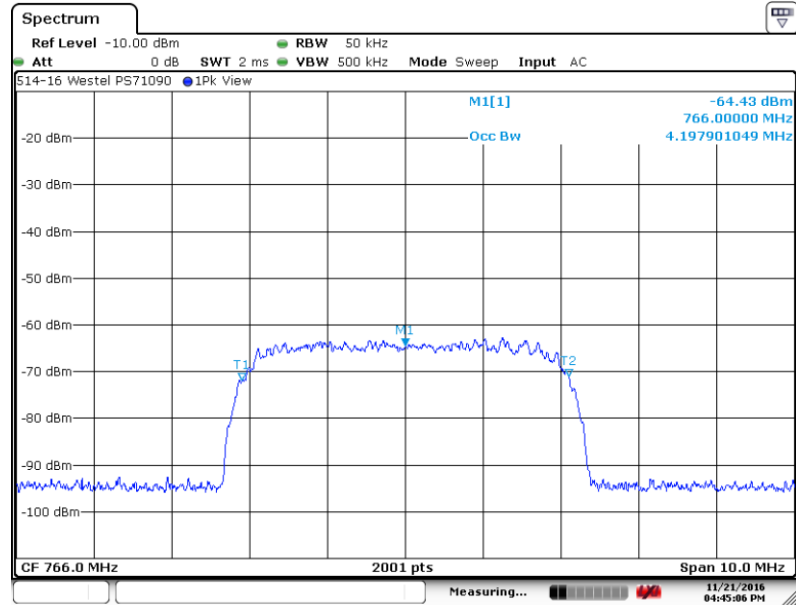
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.1. Occupied (99% Power) Bandwidth Measurement, 766 MHz, AWGN



Date: 21.NOV.2016 16:08:44

6.2.1.2. Occupied (99% Power) Bandwidth Input, 766 MHz, AWGN

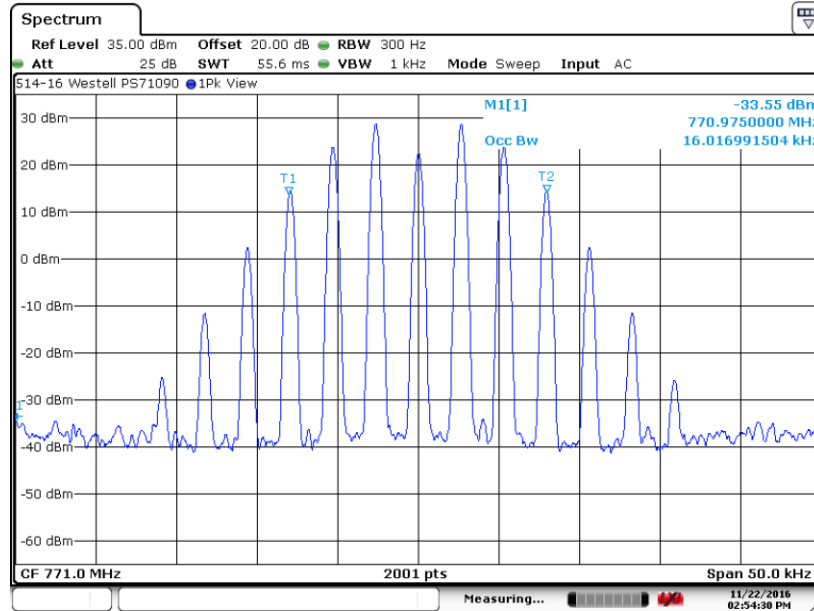


Date: 21.NOV.2016 16:45:05

6. Measurement Data (continued)

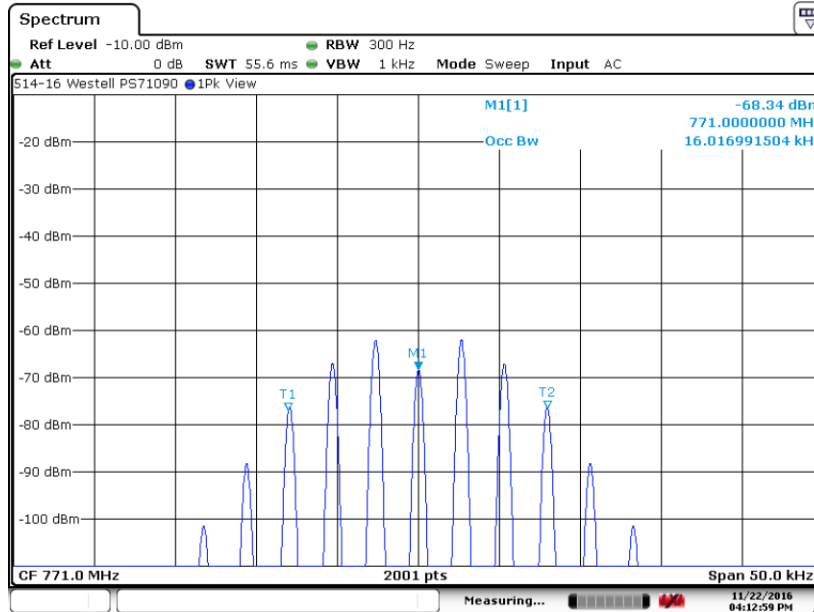
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.3. Occupied (99% Power) Bandwidth Measurement, 771 MHz, 16k FM



Date: 22.NOV.2016 14:54:29

6.2.1.4. Occupied (99% Power) Bandwidth Input, 771 MHz, 16k FM

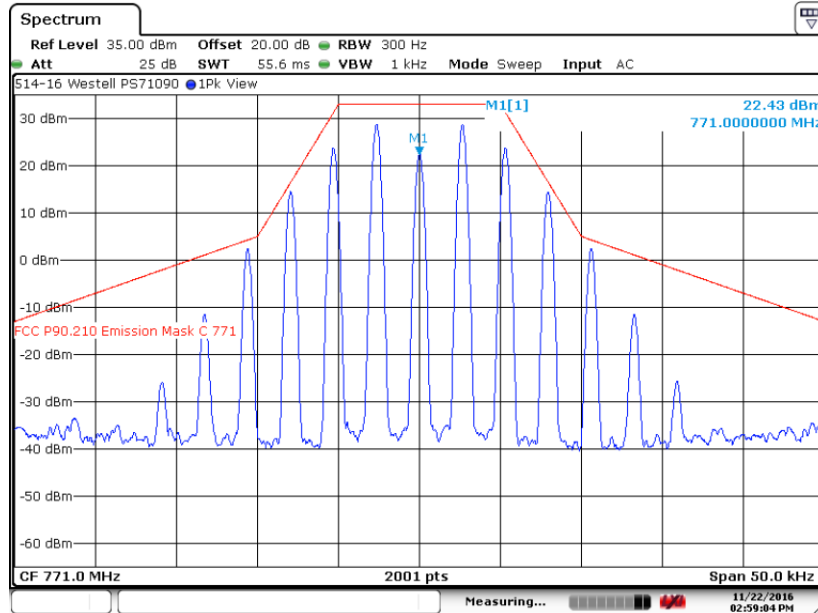


Date: 22.NOV.2016 16:12:58

6. Measurement Data (continued)

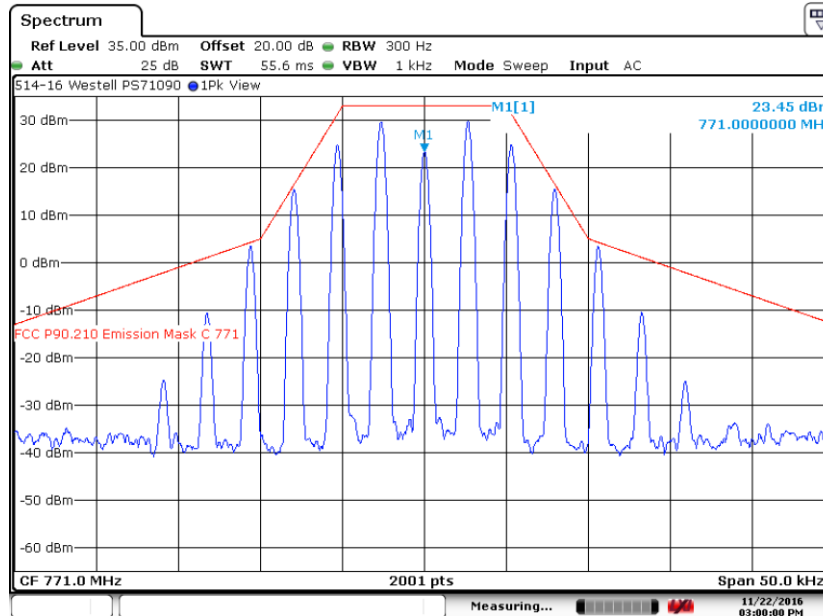
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.5. Occupied (99% Power) Emissions Mask C, 771 MHz, 16k FM



Date: 22.NOV.2016 14:59:03

6.2.1.6. Occupied (99% Power) Emissions Mask C Plus 3 dB, 771 MHz, 16k FM



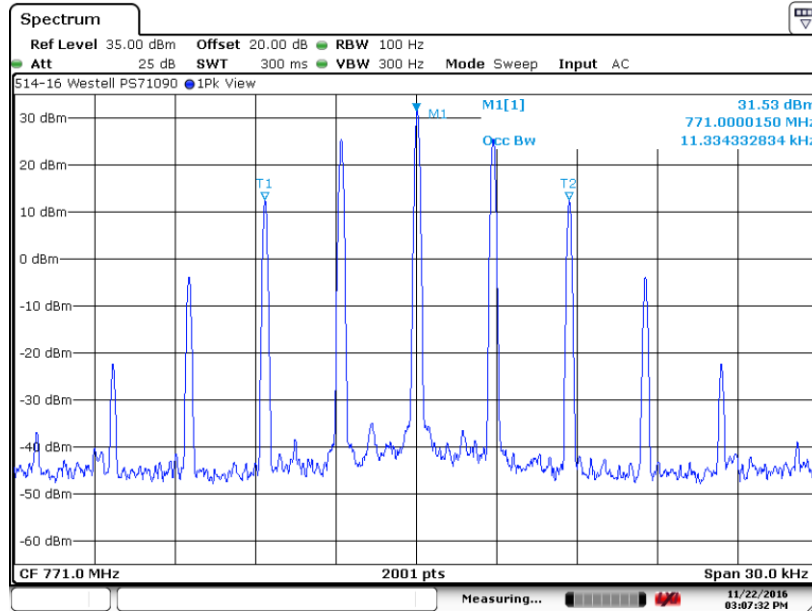
Date: 22.NOV.2016 14:59:59



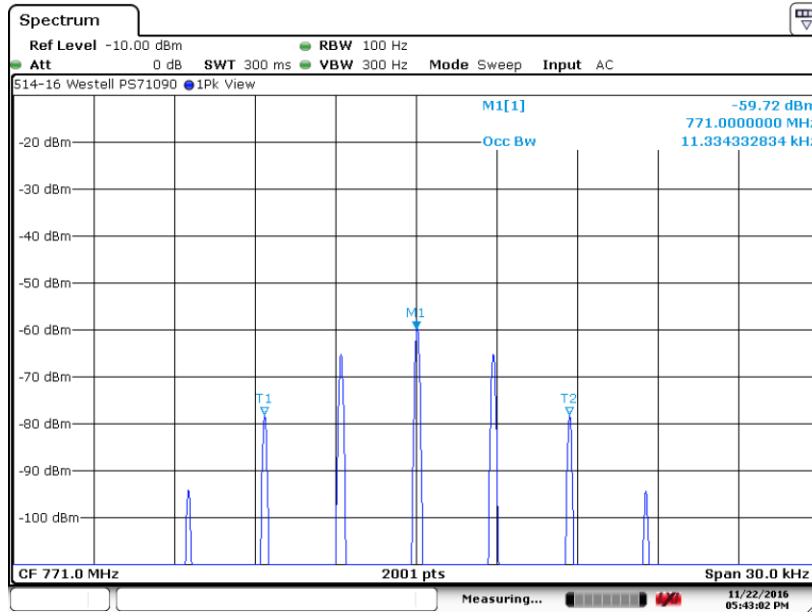
6. Measurement Data (continued)

6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.7. Occupied (99% Power) Bandwidth Measurement, 771 MHz, 11k FM



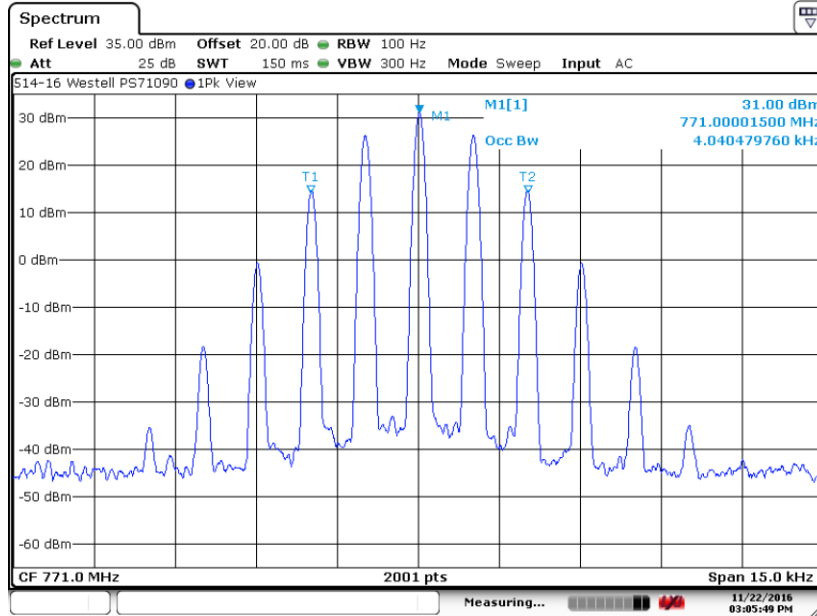
6.2.1.8. Occupied (99% Power) Bandwidth Input, 771 MHz, 11k FM



6. Measurement Data (continued)

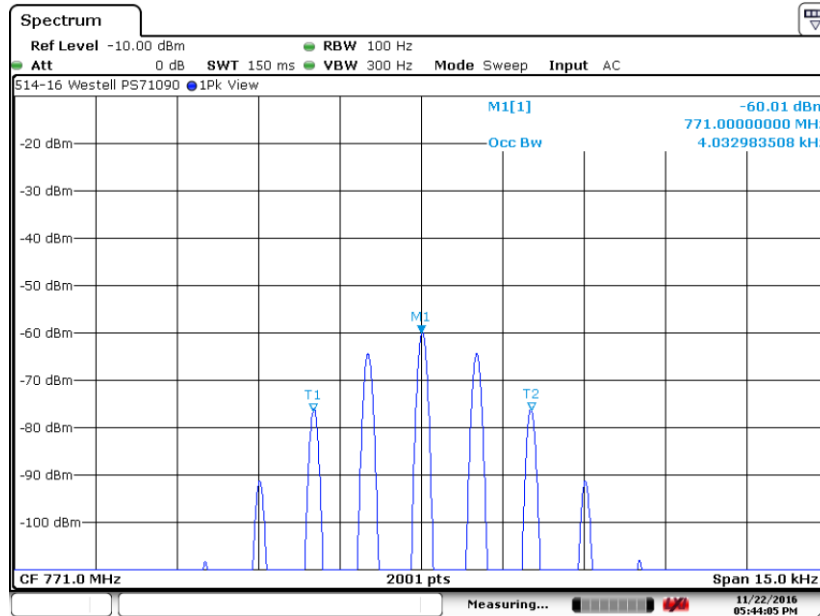
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.9. Occupied (99% Power) Bandwidth Measurement, 771 MHz, 4k FM



Date: 22.NOV.2016 15:05:48

6.2.1.10. Occupied (99% Power) Bandwidth Input, 771 MHz, 4k FM

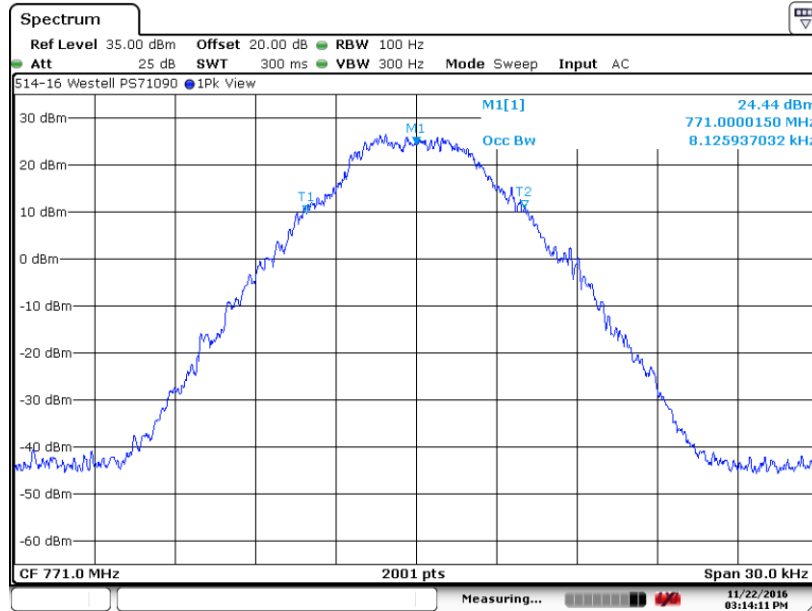


Date: 22.NOV.2016 17:44:04

6. Measurement Data (continued)

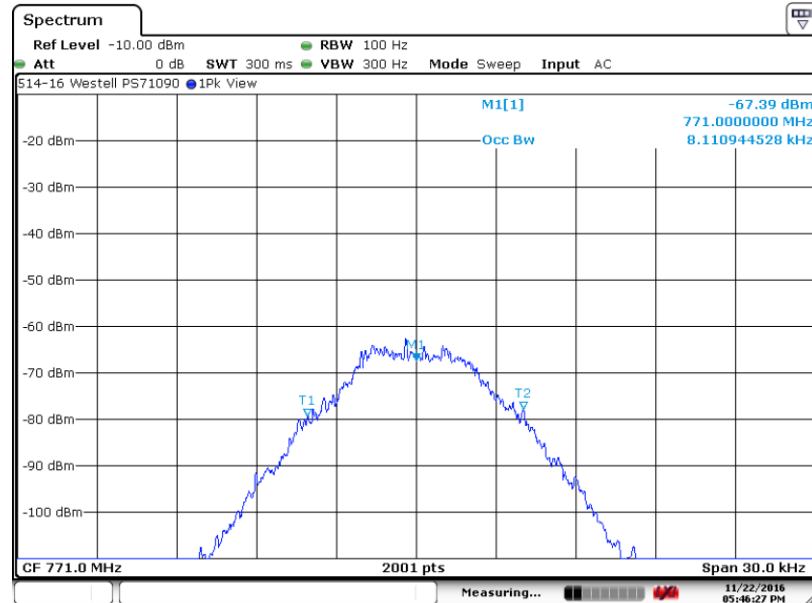
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.11. Occupied (99% Power) Bandwidth Measurement, 771 MHz, C4FM



Date: 22.NOV.2016 15:14:10

6.2.1.12. Occupied (99% Power) Bandwidth Input, 771 MHz, C4FM

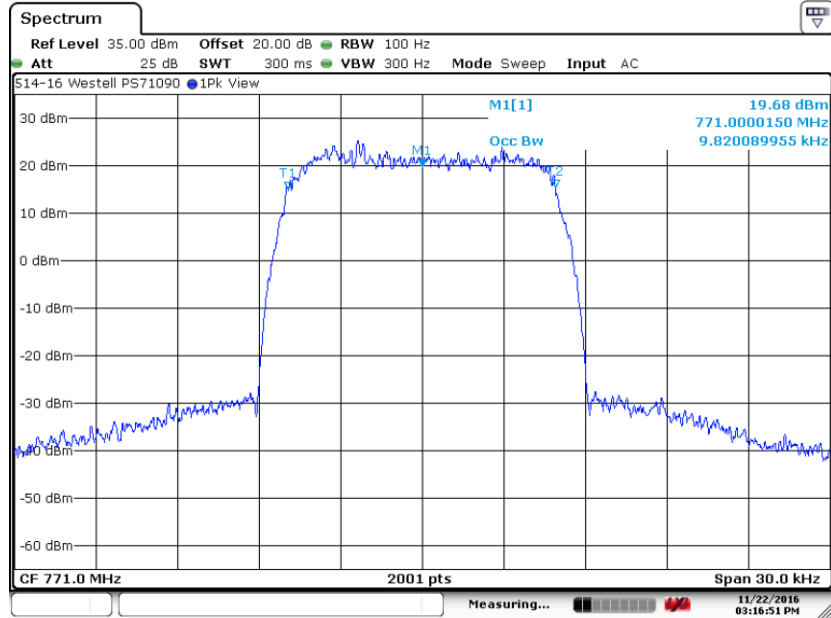


Date: 22.NOV.2016 17:46:26

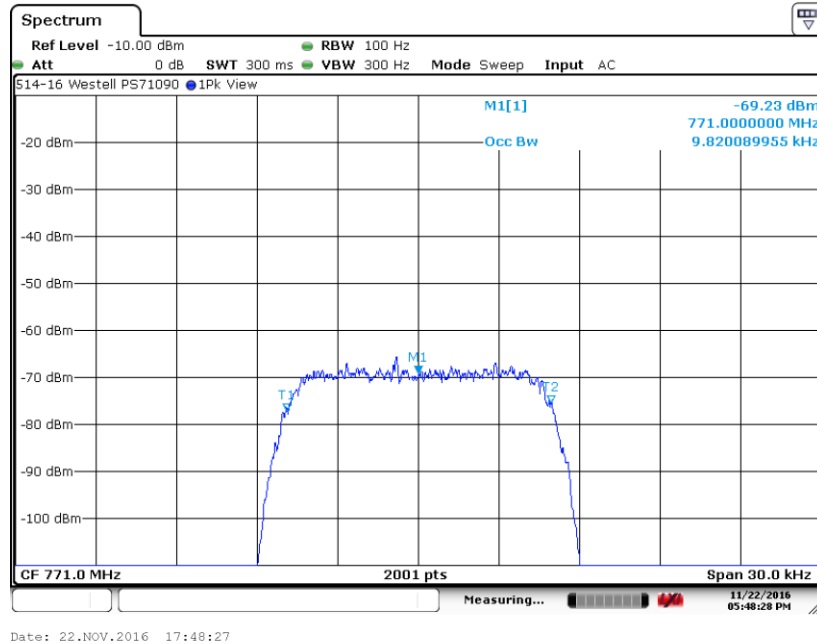
6. Measurement Data (continued)

6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.13. Occupied (99% Power) Bandwidth Measurement, 771 MHz,  $\pi/4$ -DQPSK



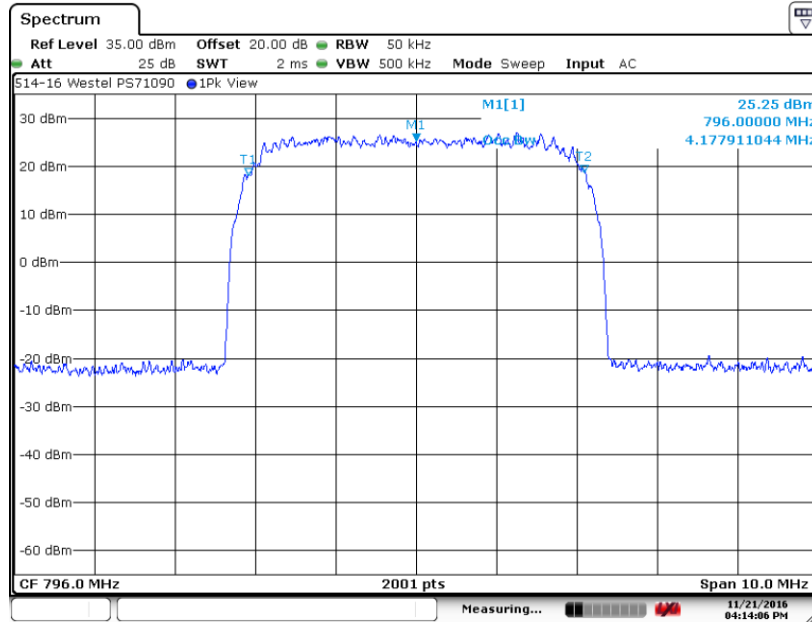
6.2.1.14. Occupied (99% Power) Bandwidth Input, 771 MHz,  $\pi/4$ -DQPSK



6. Measurement Data (continued)

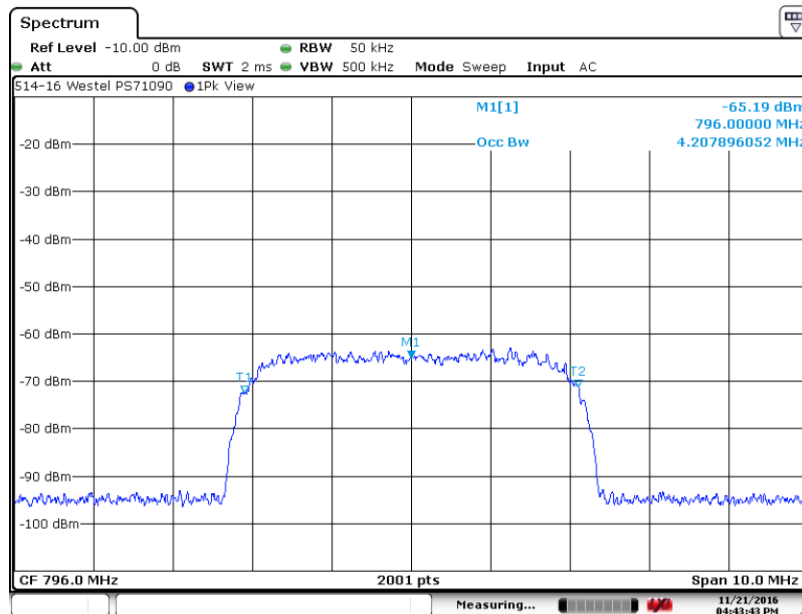
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.15. Occupied (99% Power) Bandwidth Measurement, 796 MHz, AWGN



Date: 21.NOV.2016 16:14:05

6.2.1.16. Occupied (99% Power) Bandwidth Input, 796 MHz, AWGN

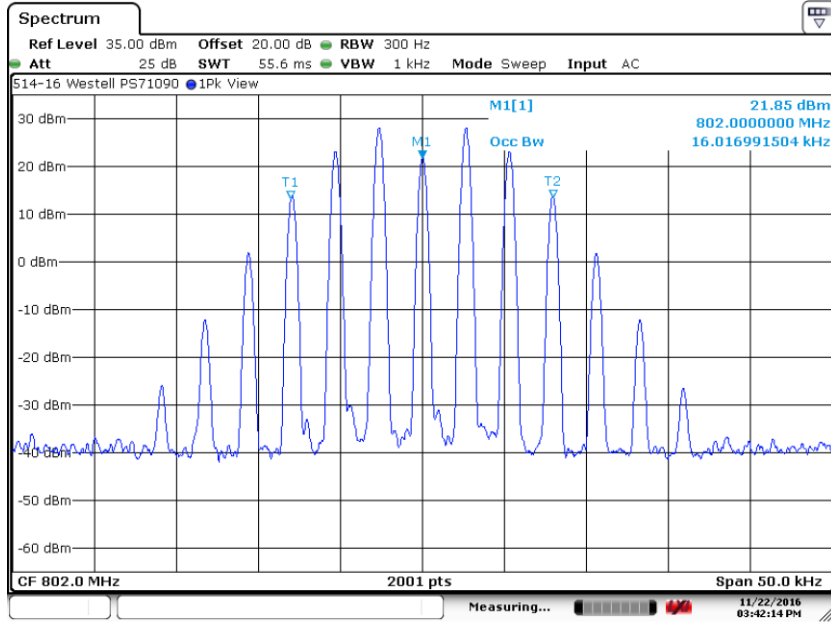


Date: 21.NOV.2016 16:43:42

6. Measurement Data (continued)

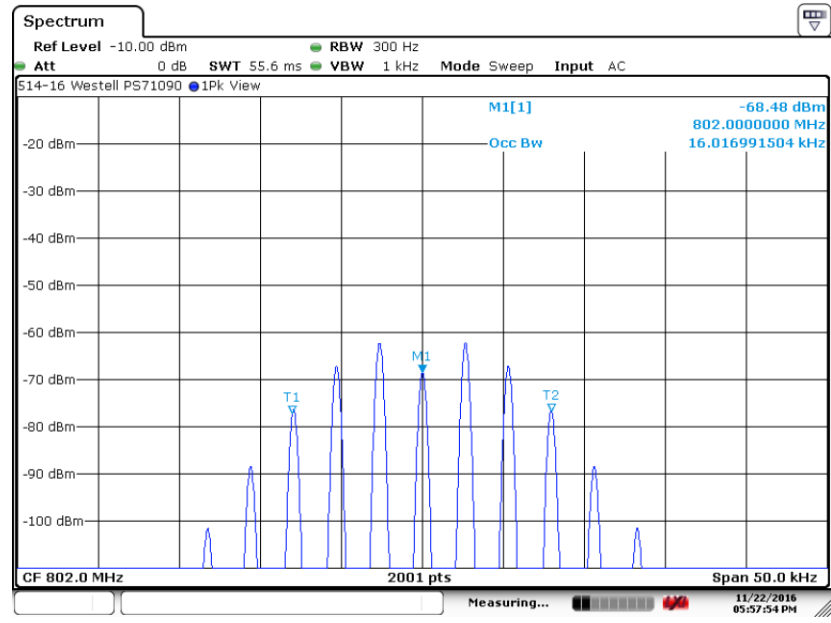
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.17. Occupied (99% Power) Bandwidth Measurement, 802 MHz, 16k FM



Date: 22.NOV.2016 15:42:13

6.2.1.18. Occupied (99% Power) Bandwidth Input, 802 MHz, 16k FM



Date: 22.NOV.2016 17:57:53

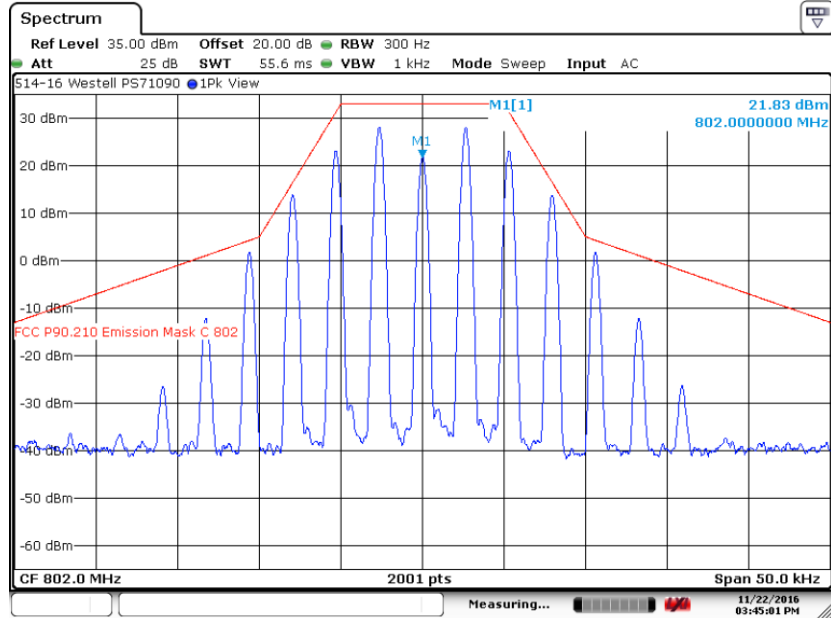
Test Number: 514-16R1

Issue Date: 2/7/2017

6. Measurement Data (continued)

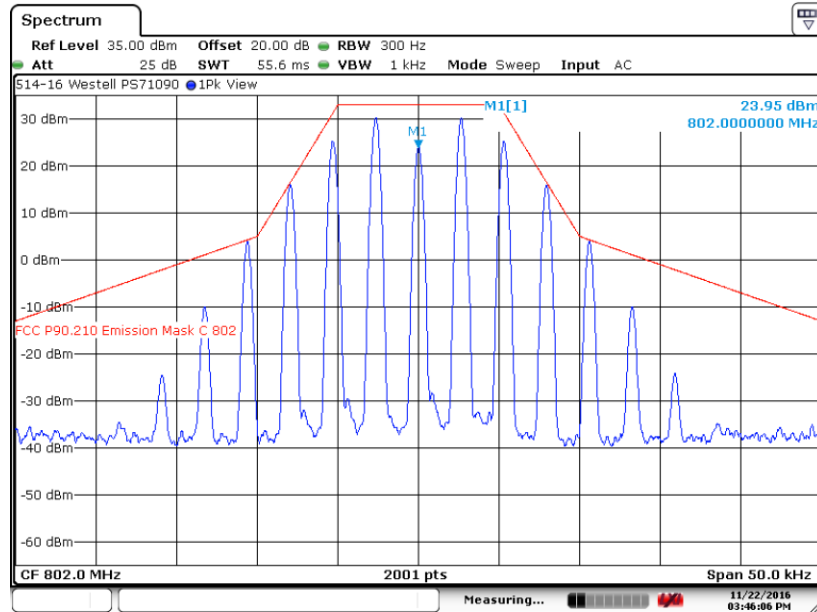
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.19. Occupied (99% Power) Emissions Mask C, 802 MHz, 16k FM



Date: 22.NOV.2016 15:45:00

6.2.1.20. Occupied (99% Power) Emissions Mask C Plus 3 dB, 802 MHz, 16k FM

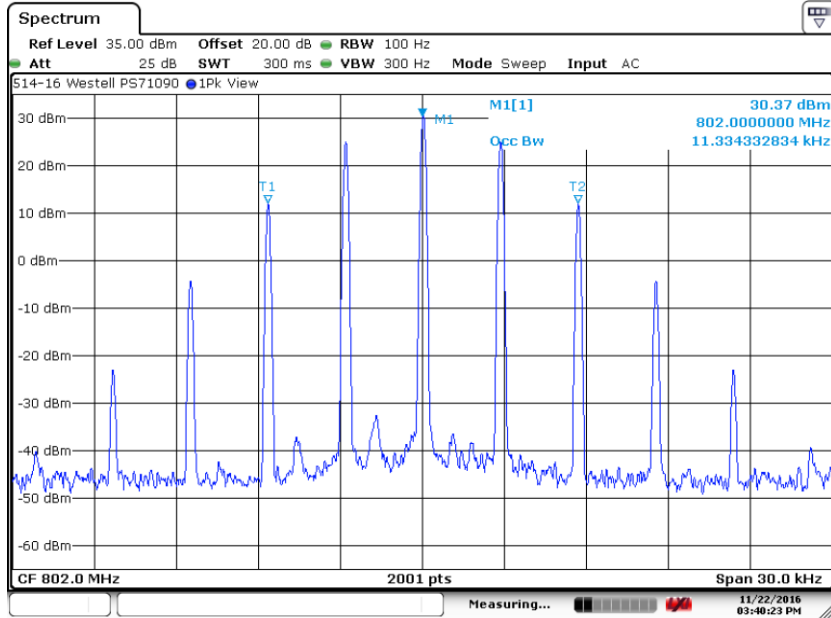


Date: 22.NOV.2016 15:46:05

6. Measurement Data (continued)

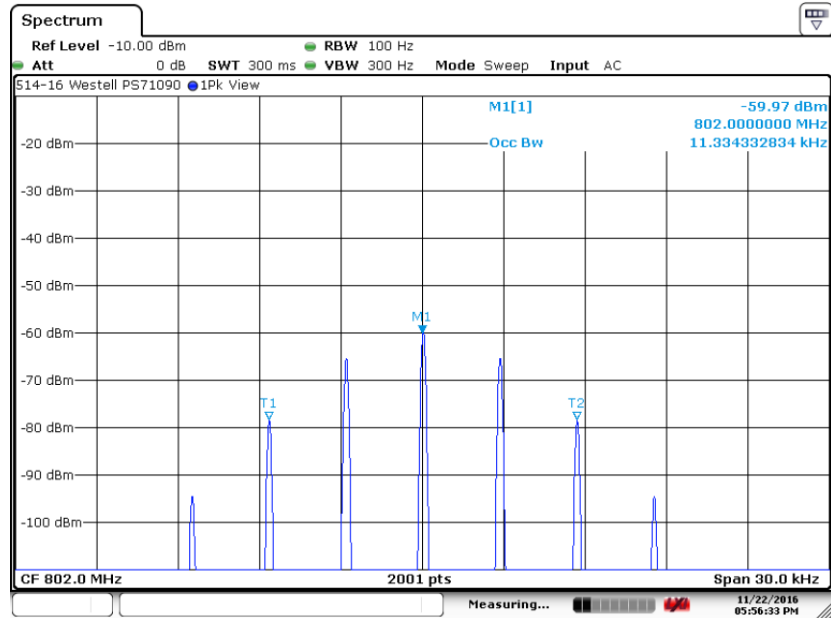
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.21. Occupied (99% Power) Bandwidth Measurement, 802 MHz, 11k FM



Date: 22.NOV.2016 15:40:22

6.2.1.22. Occupied (99% Power) Bandwidth Input, 802 MHz, 11k FM



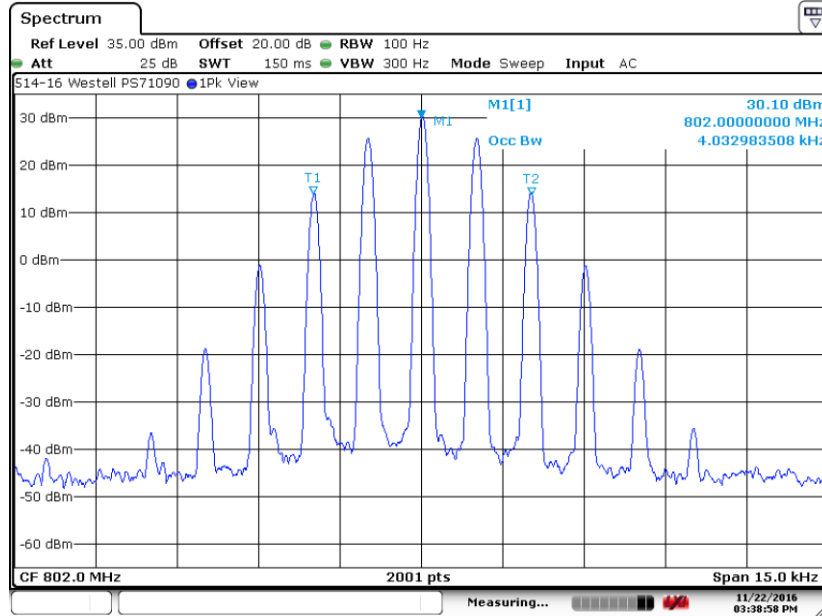
Date: 22.NOV.2016 17:56:32



6. Measurement Data (continued)

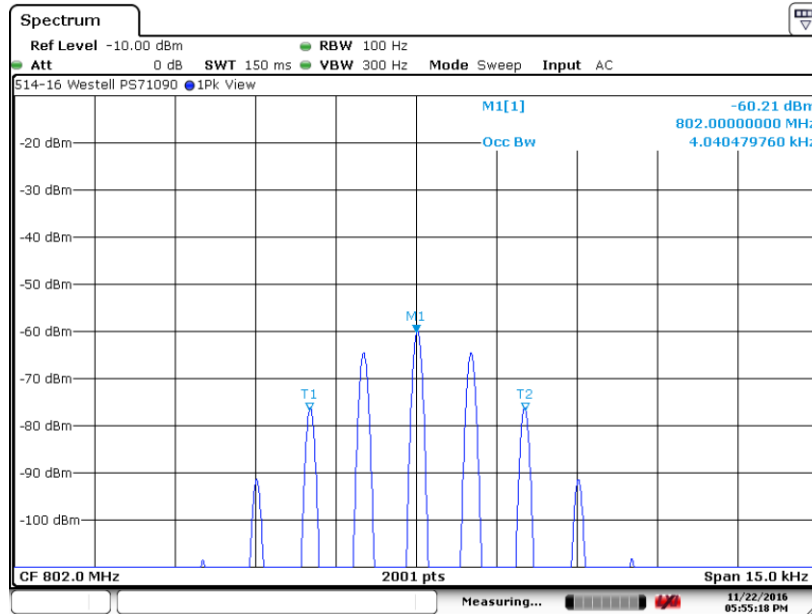
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.23. Occupied (99% Power) Bandwidth Measurement, 802 MHz, 4k FM



Date: 22.NOV.2016 15:38:57

6.2.1.24. Occupied (99% Power) Bandwidth Input, 802 MHz, 4k FM

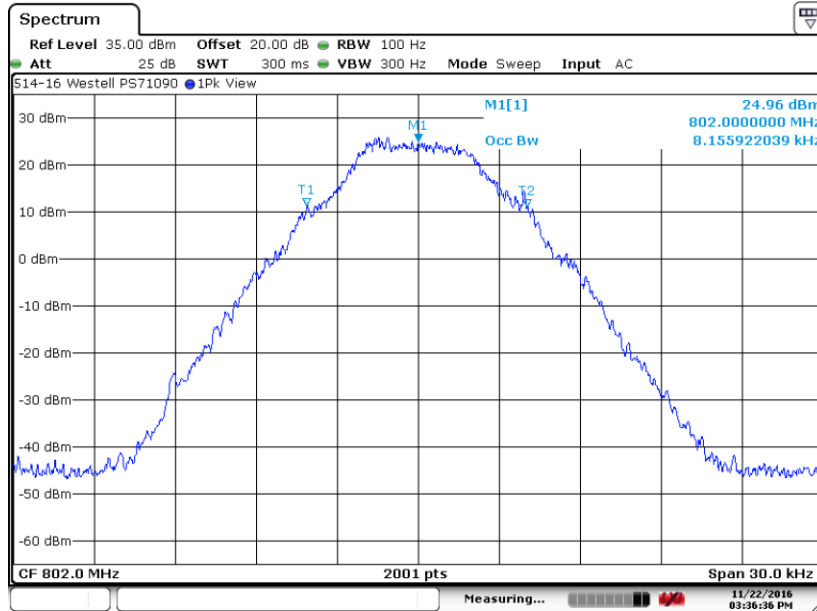


Date: 22.NOV.2016 17:55:17

6. Measurement Data (continued)

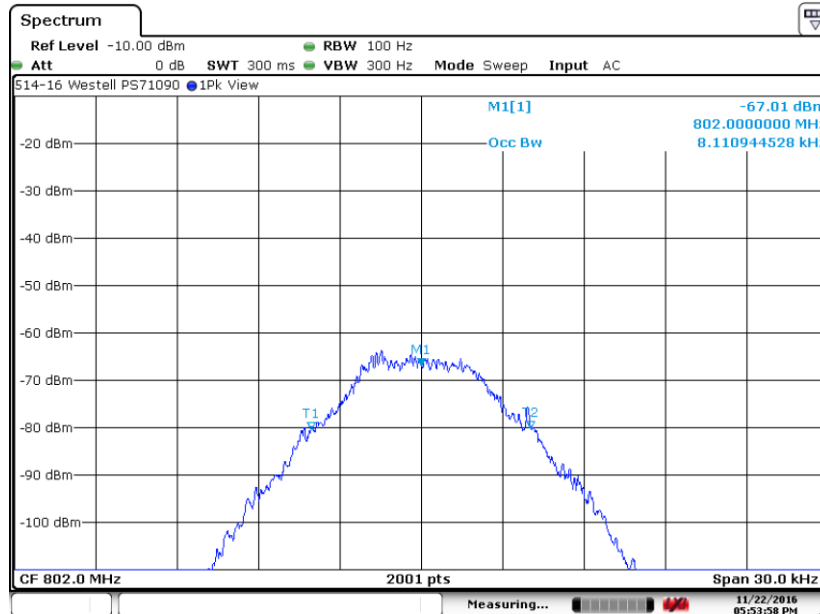
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.25. Occupied (99% Power) Bandwidth Measurement, 802 MHz, C4FM



Date: 22.NOV.2016 15:36:35

6.2.1.26. Occupied (99% Power) Bandwidth Input, 802 MHz, C4FM

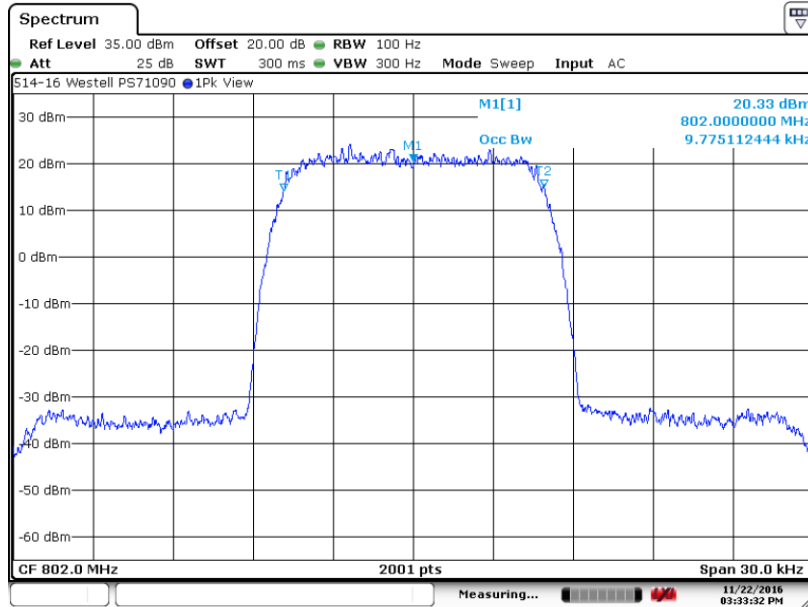


Date: 22.NOV.2016 17:53:56

6. Measurement Data (continued)

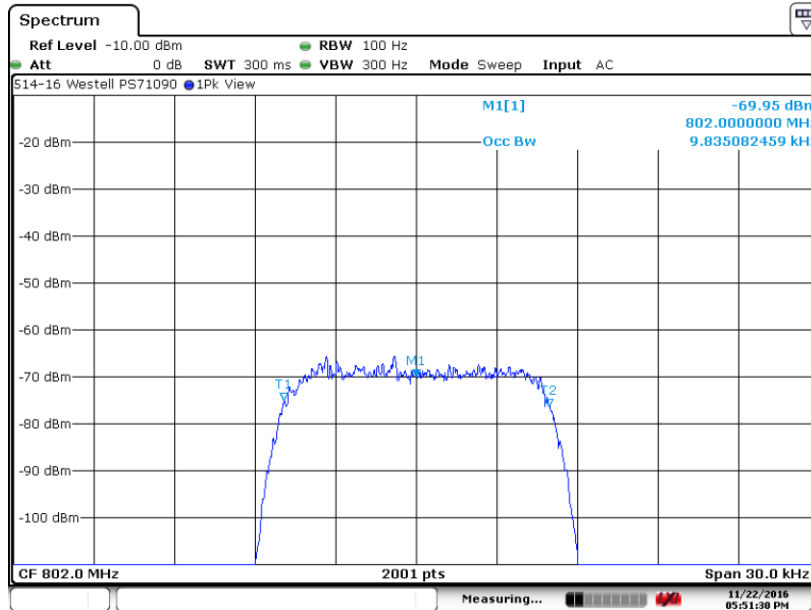
6.2. Bandwidth Limitations 90.219(e)(4)(ii), FCC Part 2.1049 (continued)

6.2.1.27. Occupied (99% Power) Bandwidth Measurement, 802 MHz,  $\pi/4$ -DQPSK



Date: 22.NOV.2016 15:33:31

6.2.1.28. Occupied (99% Power) Bandwidth Input, 802 MHz,  $\pi/4$ -DQPSK



Date: 22.NOV.2016 17:51:28

## 6. Measurement Data (continued)

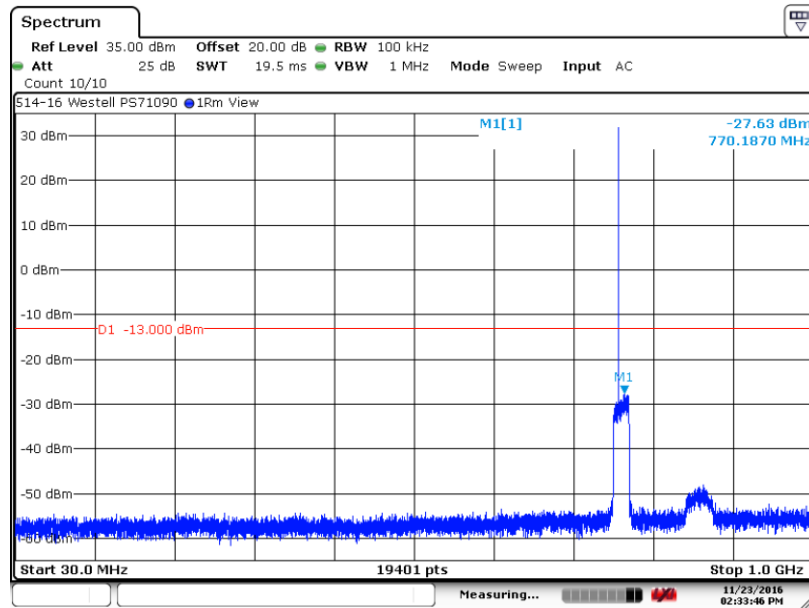
### 6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c)

**Requirement:** Transmitters designed to operate in the 758 to 768 MHz, 769 to 775 MHz, 788 to 798 MHz and 799 to 805 MHz bands, any emission outside of the ACP tables in this section shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB.

Compliance with this provision is based upon the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

Test Method: KDB 935210 Section 4.7.3

#### 6.3.1. 763 MHz, 30 MHz to 1 GHz

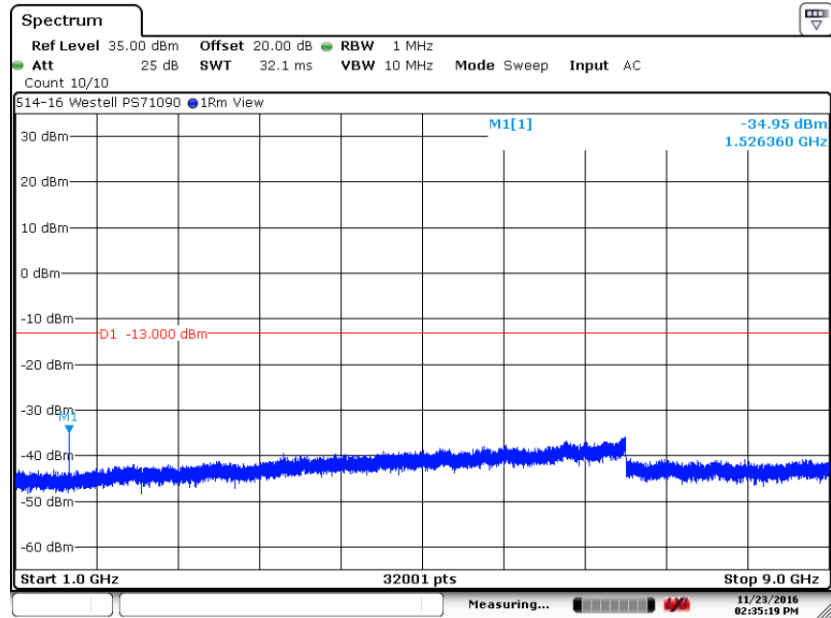


Date: 23.NOV.2016 14:33:45

6. Measurement Data (continued)

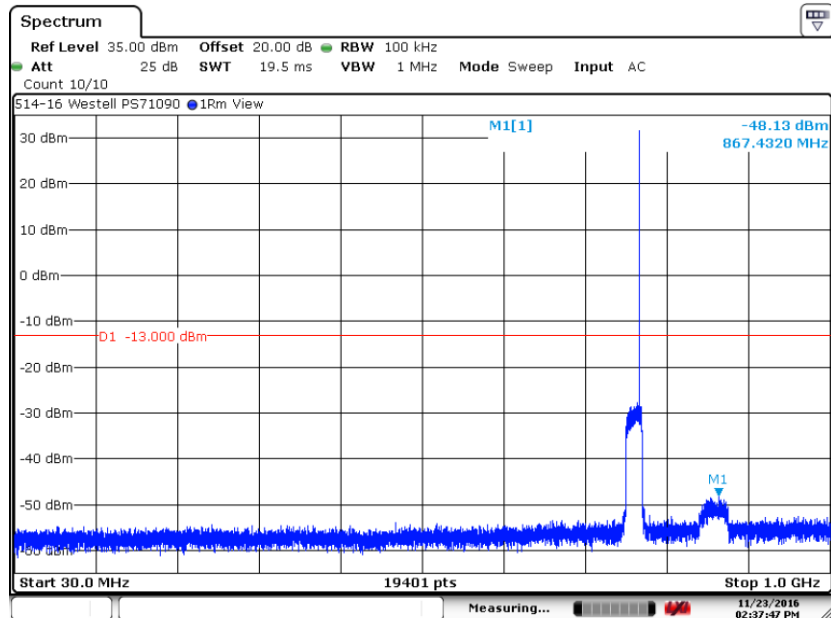
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.2. 763 MHz, 1 to 9 GHz



Date: 23.NOV.2016 14:35:17

6.3.3. 773 MHz, 30 MHz to 1 GHz

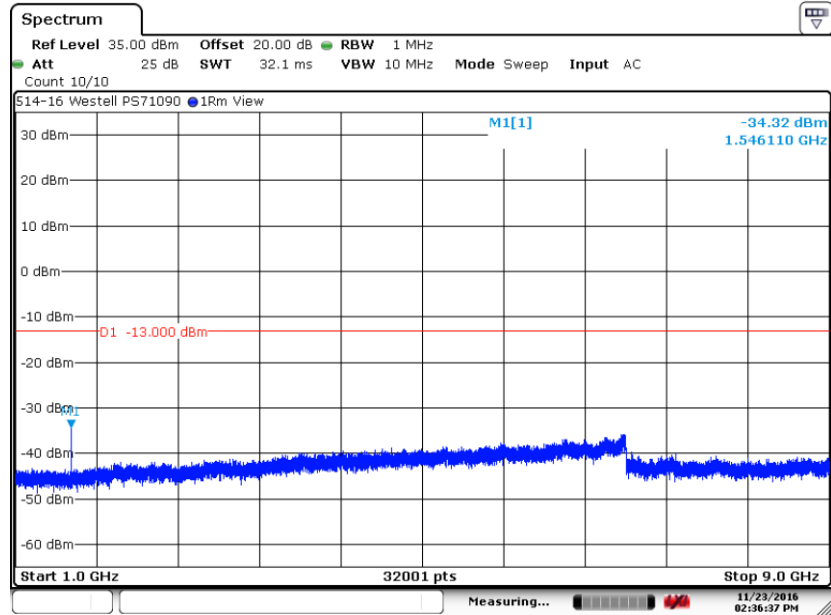


Date: 23.NOV.2016 14:37:45

6. Measurement Data (continued)

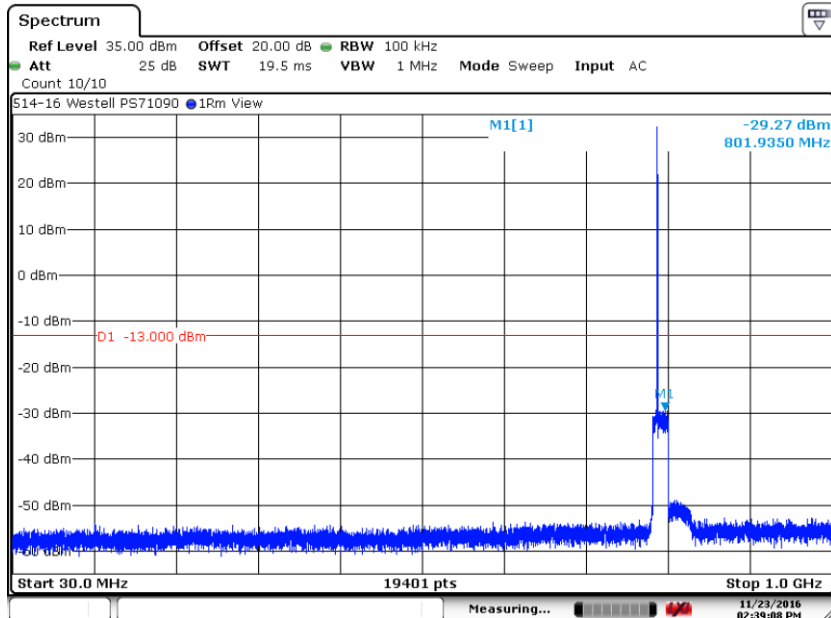
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.4. 773 MHz, 1 to 9 GHz



Date: 23.NOV.2016 14:36:36

6.3.5. 793 MHz, 30 MHz to 1 GHz

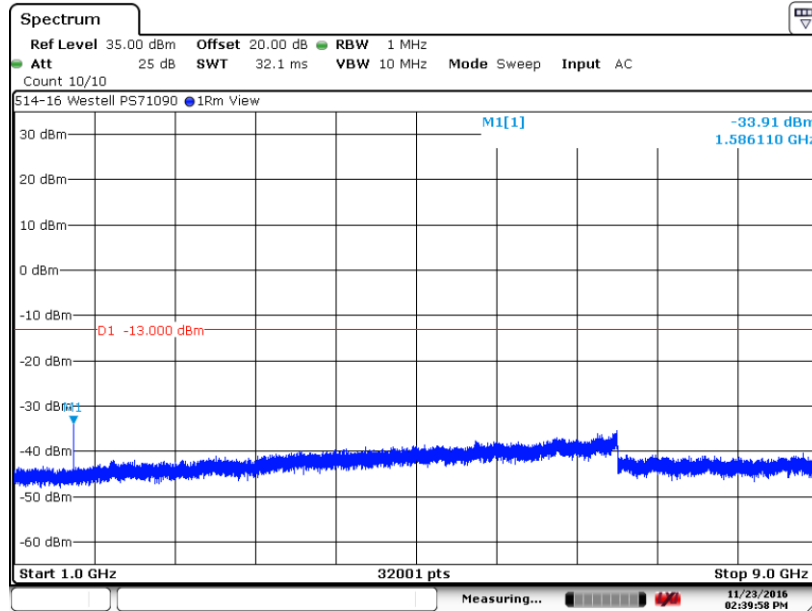


Date: 23.NOV.2016 14:39:06

6. Measurement Data (continued)

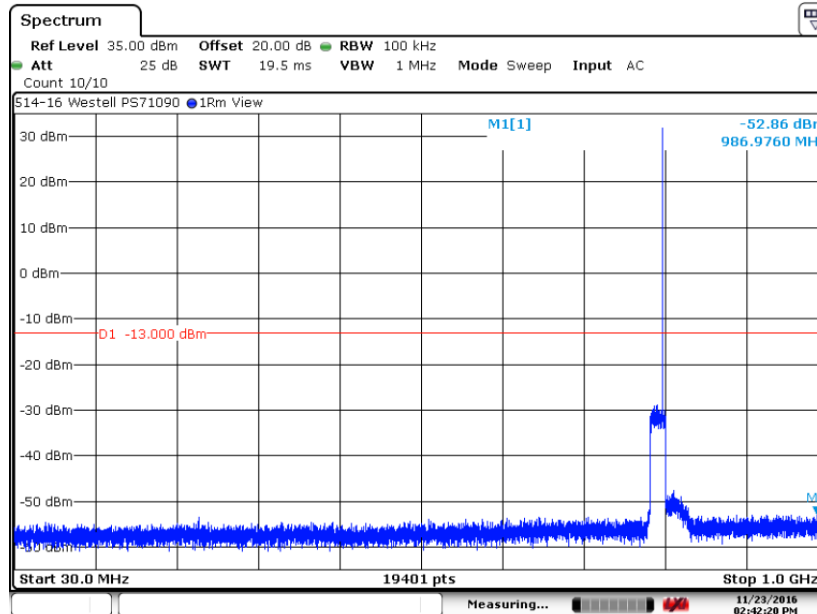
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.6. 793 MHz, 1 to 9 GHz



Date: 23.NOV.2016 14:39:57

6.3.7. 802 MHz, 30 MHz to 1 GHz

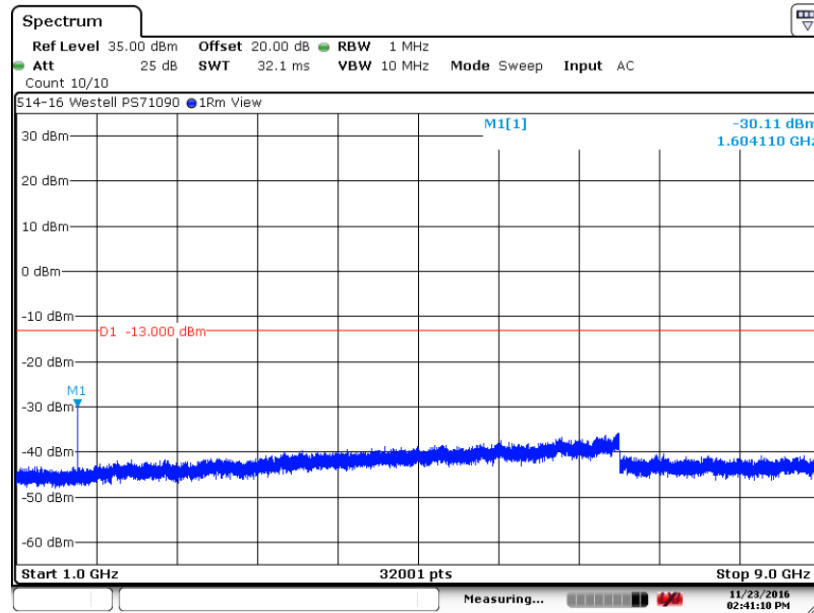


Date: 23.NOV.2016 14:42:19

6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.8. 802 MHz, 1 to 9 GHz



Date: 23.NOV.2016 14:41:08

Out of Band / Out of Block Inter-modulation

**Requirement:** The mean power Inter-modulation products shall be measured using two CW signals with each of the available channel spacing's of 6.25 kHz, 12.5 kHz and 25 kHz on a center frequency of each applicable band over a 100 kHz span when measured in a 300 Hz RBW. This shall be verified at AGC threshold and 3 dB above AGC threshold. See next pages for plots.

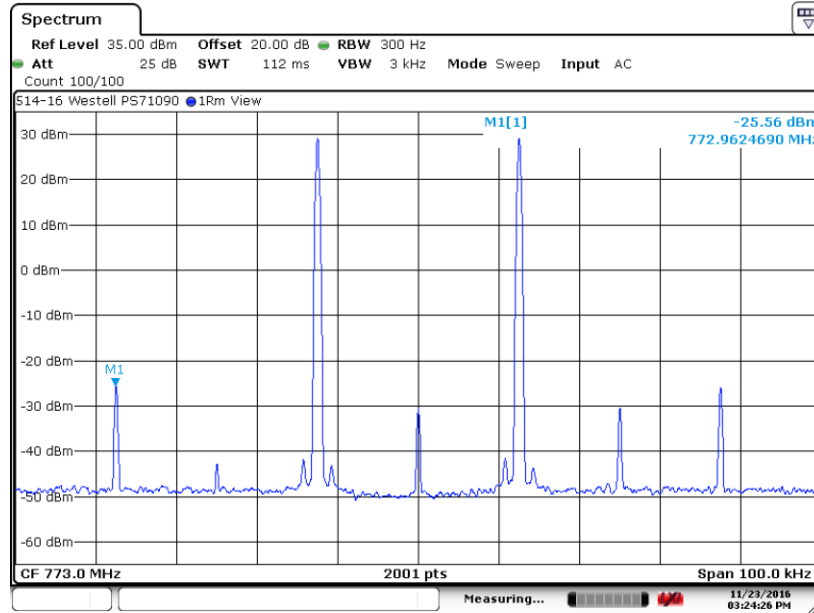
Test Method: KDB 935210 Section 4.7.1, 4.7.2



6. Measurement Data (continued)

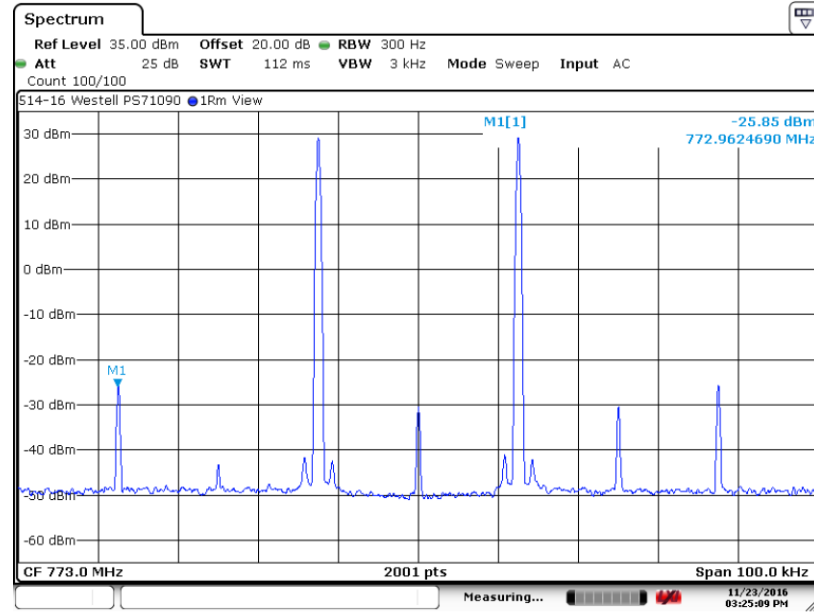
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.9. 773 MHz Two Tone Modulation, 25 kHz Spacing



Date: 23.NOV.2016 15:24:25

6.3.10. 773 MHz Two Tone Modulation plus 3 dB, 25 kHz Spacing

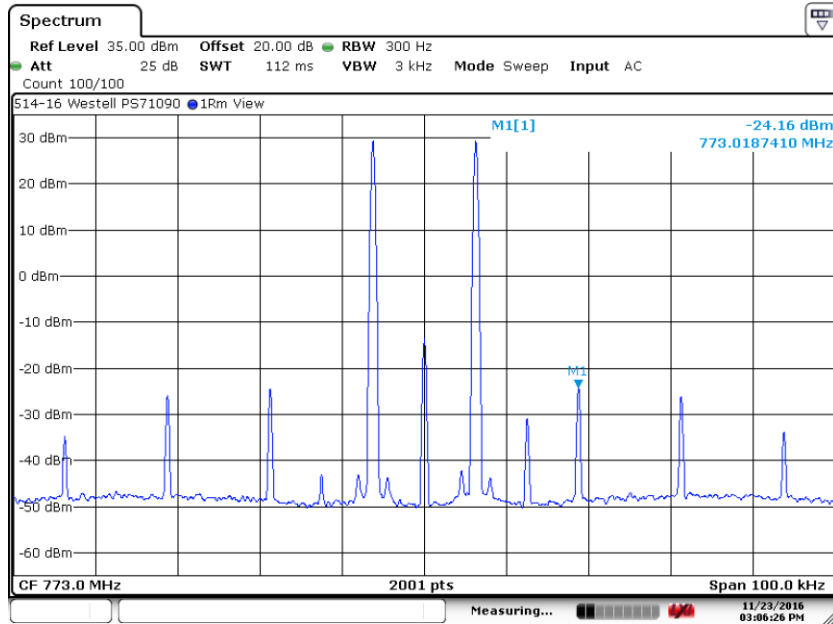


Date: 23.NOV.2016 15:25:07

6. Measurement Data (continued)

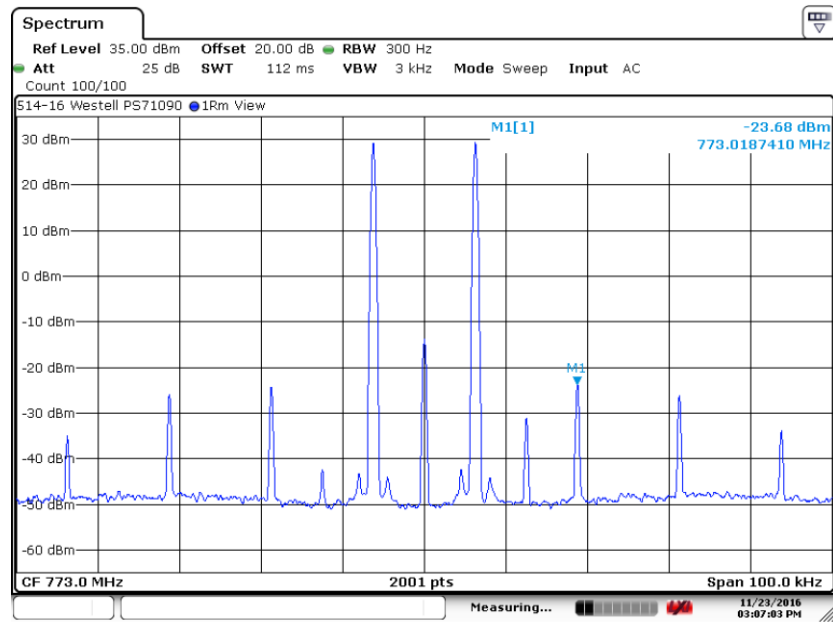
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.11. 773 MHz Two Tone Modulation, 12.5 kHz Spacing



Date: 23.NOV.2016 15:06:25

6.3.12. 773 MHz Two Tone Modulation plus 3 dB, 12.5 kHz Spacing

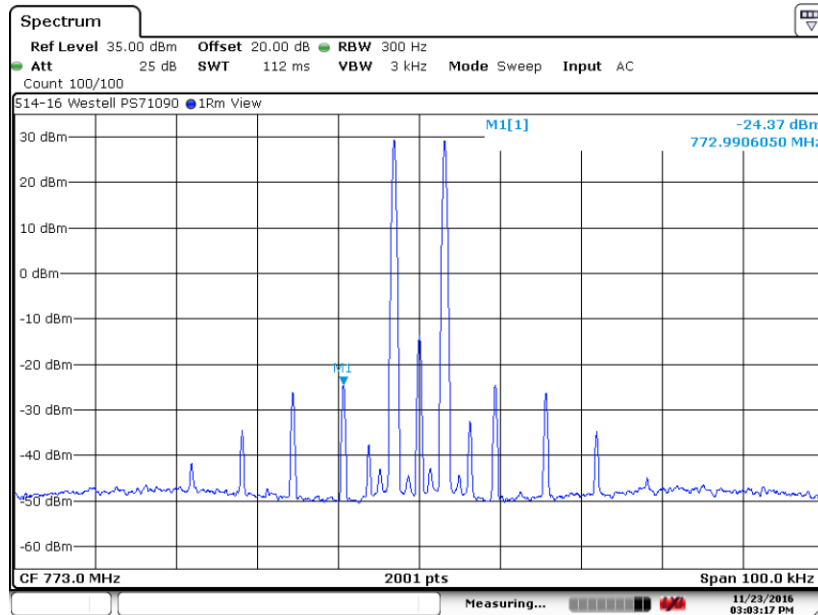


Date: 23.NOV.2016 15:07:01

6. Measurement Data (continued)

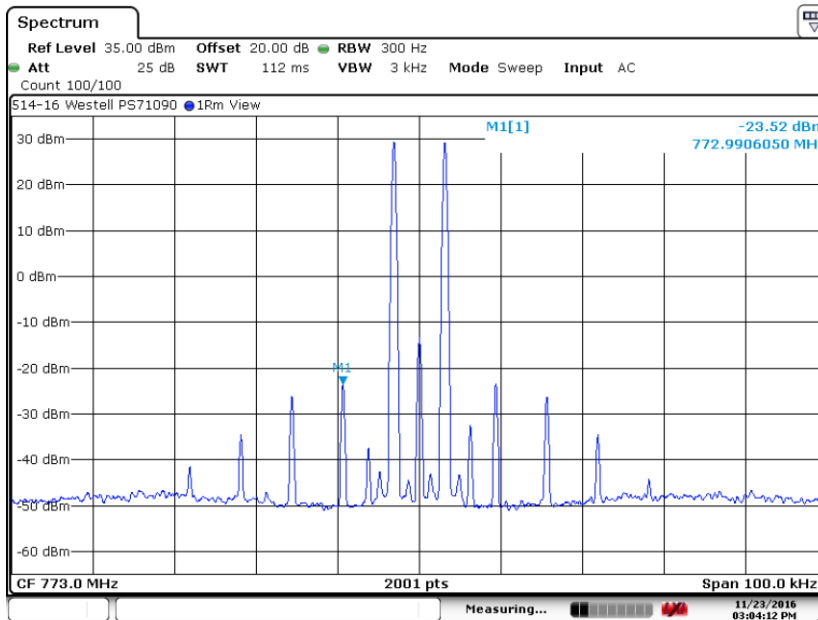
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.13. 773 MHz Two Tone Modulation, 6.25 kHz Spacing



Date: 23.NOV.2016 15:03:15

6.3.14. 773 MHz Two Tone Modulation plus 3 dB, 6.25 kHz Spacing

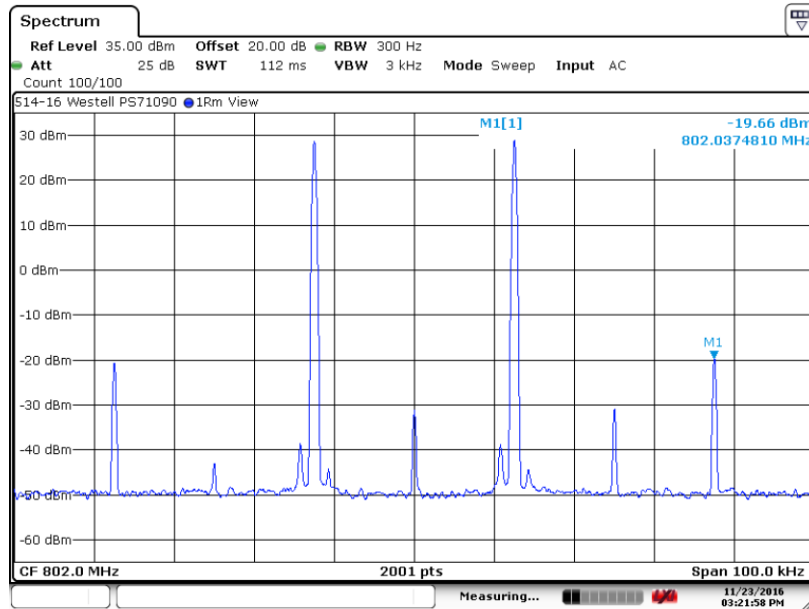


Date: 23.NOV.2016 15:04:10

6. Measurement Data (continued)

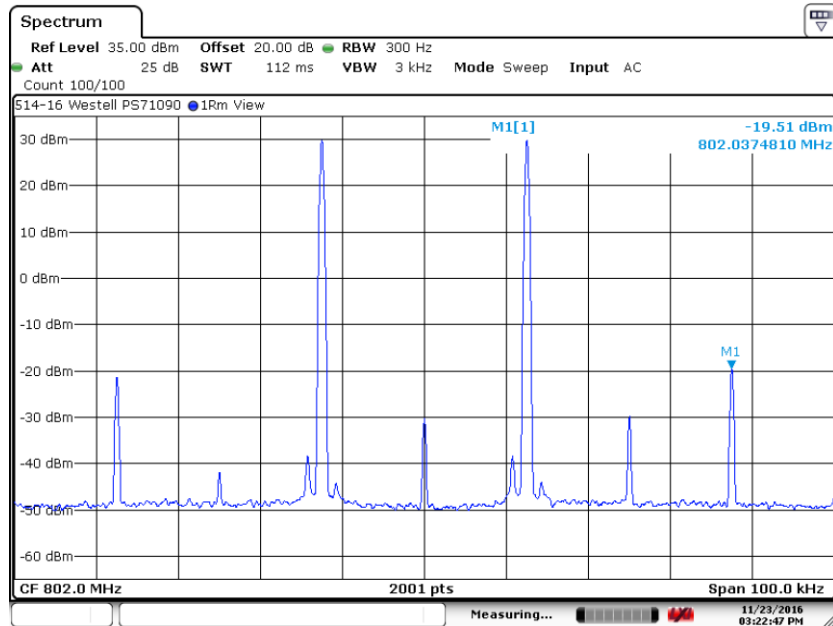
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.15. 802 MHz 2 Tone Modulation, 25 kHz Spacing



Date: 23.NOV.2016 15:21:56

6.3.16. 802 MHz 2 Tone Modulation plus 3 dB, 25 kHz Spacing

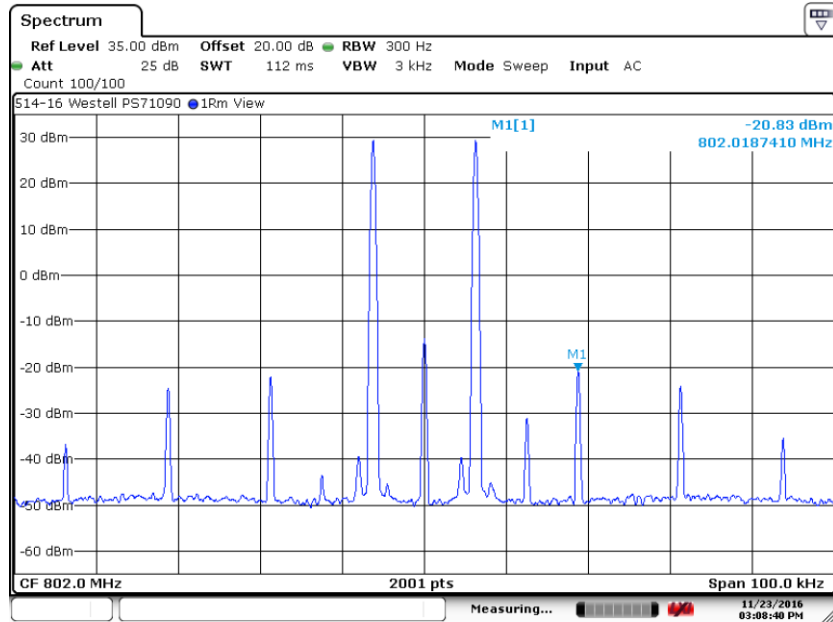


Date: 23.NOV.2016 15:22:45

6. Measurement Data (continued)

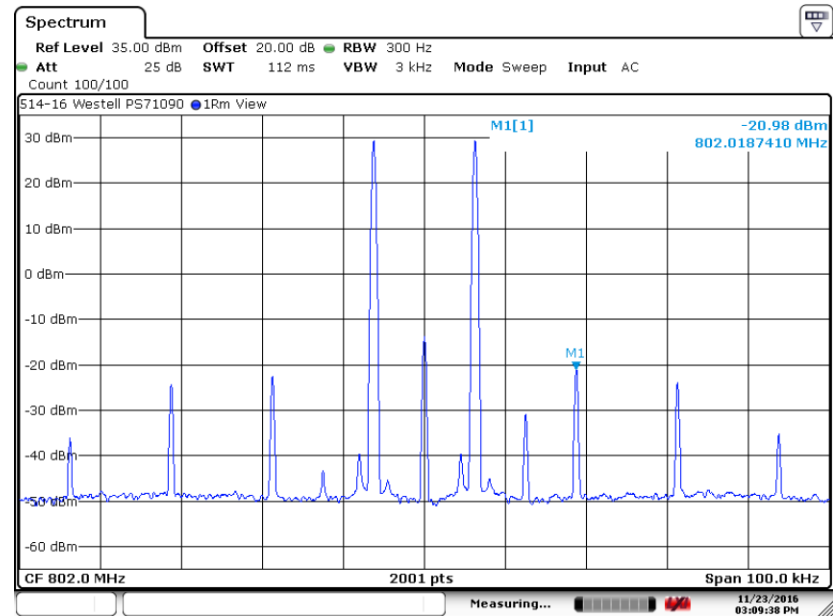
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.17. 802 MHz 2 Tone Modulation, 12.5 kHz Spacing



Date: 23.NOV.2016 15:08:39

6.3.18. 802 MHz 2 Tone Modulation plus 3 dB, 12.5 kHz Spacing

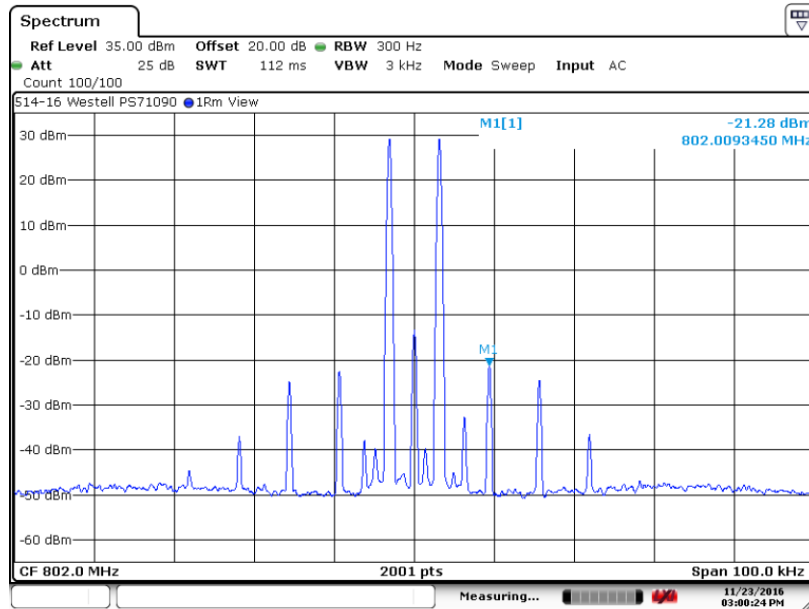


Date: 23.NOV.2016 15:09:36

6. Measurement Data (continued)

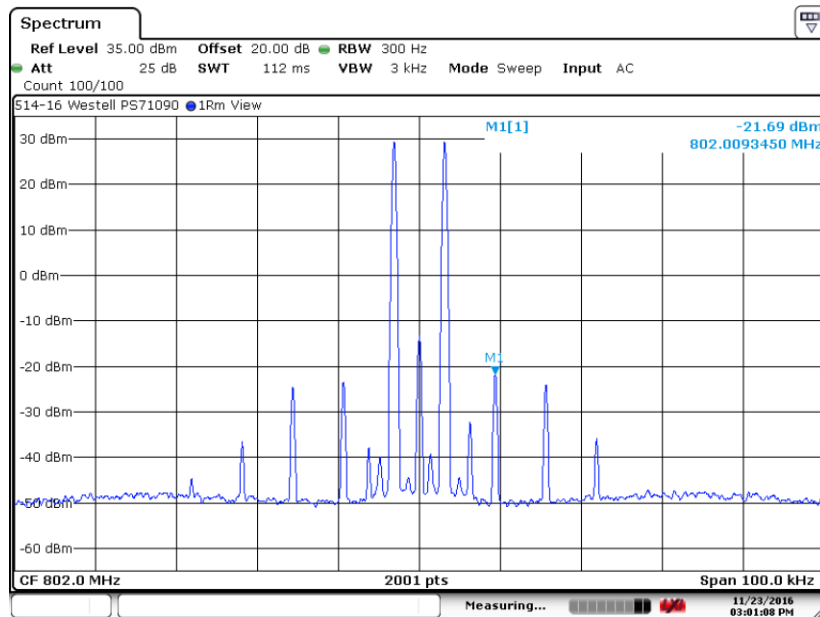
6.3. Spurious Emissions at the Antenna Terminals 90.219(e)(3), 90.543 (c) (continued)

6.3.19. 802 MHz 2 Tone Modulation, 6.25 kHz Spacing



Date: 23.NOV.2016 15:00:22

6.3.20. 802 MHz 2 Tone Modulation plus 3 dB, 6.25 kHz Spacing



Date: 23.NOV.2016 15:01:07

**6. Measurement Data (continued)****6.4. Field Strength of Spurious Emissions 90.219(e)(3), 90.543 (c)**

**Requirement:** Transmitters designed to operate in the 758 to 768 MHz, 769 to 775 MHz, 788 to 798 MHz and 799 to 805 MHz bands, any emission outside of the ACP tables in this section shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB.

Compliance with this provision is based upon the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

Test Method: KDB 935210 Section 4.9

**6.4.1. Measurement and Equipment Setup**

|                             |                            |
|-----------------------------|----------------------------|
| Test Date:                  | 11/30/2016, 1/20/2017      |
| Test Engineer:              | Cody Merry, Mark McSweeney |
| Site Temperature (°C):      | 22                         |
| Relative Humidity (%RH):    | 32                         |
| Frequency Range:            | 30 MHz to 1 GHz            |
| Measurement Distance:       | 3 Meters                   |
| EMI Receiver IF Bandwidth:  | 120 kHz / 100 kHz          |
| EMI Receiver Avg Bandwidth: | 300 kHz / 300 kHz          |
| Detector Functions:         | Peak and Quasi-Peak.       |
| Antenna Height:             | 1 to 4 meters              |

**6.4.2 Test Procedure**

Test measurements were made in accordance with ANSI/TIA-603-D 2010 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards and ANSI C63.26 2015 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services, Substitution Methodology.

**6. Measurement Data (continued)**

**6.4. Field Strength of Spurious Emissions 90.219(e)(3), 90.543 (c) (continued)**

6.4.3. Horizontal Polarity

| Frequency (MHz) | Antenna Height (cm) | Signal Gen Amp (dBm) | At Antenna Level (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|---------------------|----------------------|------------------------|--------------------|------------|-------------|-------------|
|                 |                     |                      |                        |                    |            |             |             |
| 43.3800         | 400                 | -79.80               | -80.00                 | -7.6               | -87.60     | -13.00      | -74.60      |
| 70.4655         | 290                 | -67.50               | -68.06                 | -7.7               | -75.76     | -13.00      | -62.76      |
| 113.4313        | 253                 | -64.21               | -65.36                 | -8.4               | -73.76     | -13.00      | -60.76      |
| 126.0933        | 236                 | -69.30               | -70.35                 | -8.4               | -78.75     | -13.00      | -65.75      |
| 140.1336        | 213                 | -63.50               | -64.90                 | -7.7               | -72.60     | -13.00      | -59.60      |
| 149.9884        | 200                 | -60.82               | -62.33                 | -7.7               | -70.03     | -13.00      | -57.03      |
| 170.3058        | 166                 | -66.97               | -68.23                 | -7.2               | -75.43     | -13.00      | -62.43      |
| 224.9936        | 108                 | -71.50               | -72.60                 | -7.9               | -80.50     | -13.00      | -67.50      |
| 249.9800        | 100                 | -58.90               | -61.00                 | -8.4               | -69.40     | -13.00      | -56.40      |
| 444.0456        | 157                 | -81.00               | -81.62                 | -7.7               | -89.32     | -13.00      | -76.32      |
| 996.5413        | 106                 | -64.50               | -68.54                 | -8.2               | -76.74     | -13.00      | -63.74      |



**6. Measurement Data (continued)**

**6.4. Field Strength of Spurious Emissions 90.219(e)(3), 90.543 (c) (continued)**

6.4.4. Vertical Polarity

| Frequency (MHz) | Antenna Height (cm) | Signal Gen Amp (dBm) | At Antenna Level (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|---------------------|----------------------|------------------------|--------------------|------------|-------------|-------------|
| 36.8845         | 100                 | -59.90               | -60.84                 | -7.6               | -68.44     | -13.00      | -55.44      |
| 70.1944         | 100                 | -59.00               | -60.21                 | -7.7               | -67.91     | -13.00      | -54.91      |
| 114.6105        | 100                 | -59.20               | -60.65                 | -8.4               | -69.05     | -13.00      | -56.05      |
| 128.2111        | 100                 | -56.00               | -57.56                 | -8.4               | -65.96     | -13.00      | -52.96      |
| 136.8173        | 100                 | -62.00               | -63.42                 | -7.7               | -71.12     | -13.00      | -58.12      |
| 150.0207        | 100                 | -63.30               | -64.76                 | -7.5               | -72.26     | -13.00      | -59.26      |
| 174.9861        | 100                 | -61.00               | -62.53                 | -7.2               | -69.73     | -13.00      | -56.73      |
| 224.9713        | 230                 | -51.00               | -52.99                 | -7.9               | -60.89     | -13.00      | -47.89      |
| 249.9838        | 197                 | -49.10               | -51.20                 | -8.4               | -59.60     | -13.00      | -46.60      |
| 996.5315        | 100                 | -70.00               | -73.56                 | -8.2               | -81.76     | -13.00      | -68.76      |

**6. Measurement Data (continued)****6.4. Field Strength of Spurious Emissions 90.219(e)(3), 90.543 (c) (continued)**

## 6.4.5. Measurement and Equipment Setup

|                             |                  |
|-----------------------------|------------------|
| Test Date:                  | 11/30/2016       |
| Test Engineer:              | Cody Merry       |
| Site Temperature (°C):      | 24               |
| Relative Humidity (%RH):    | 33               |
| Frequency Range:            | Above 1 GHz      |
| Measurement Distance:       | 3 Meters         |
| EMI Receiver IF Bandwidth:  | 1 MHz            |
| EMI Receiver Avg Bandwidth: | 3 MHz            |
| Detector Functions:         | Peak and Average |
| Antenna Height:             | 1 to 4 meters    |

## 6.4.6. Radiated Emissions above 1 GHz

There were no measureable spurious emissions above 1 GHz

## 6. Measurement Data (continued)

### 6.4. Field Strength of Spurious Emissions 90.543 (f) (continued)

**Requirement:** For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz (-40 dBm/MHz) equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW (-50 dBm) EIRP for discrete emissions of less than 700 Hz bandwidth.

For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation. 3 dBi 700 MHz antennas were used with the unit. Narrowband and wideband measurements were made horizontal & vertical polarities.

A 1 kHz RBW was used for the narrowband emissions measurements. A BW Correction factor of  $10 \log B1/B2 = 10 \log 700 / 1000 = -1.55$  dB may be applied to the narrowband measurements.

Test Method: KDB 935210 Section 4.9

#### 6.4.7. Measurement and Equipment Setup

|                             |                  |
|-----------------------------|------------------|
| Test Date:                  | 11/30/2016       |
| Test Engineer:              | Larry Stillings  |
| Site Temperature (°C):      | 24               |
| Relative Humidity (%RH):    | 33               |
| Frequency Range:            | 1559 – 1610 MHz  |
| Measurement Distance:       | 3 Meters         |
| EMI Receiver IF Bandwidth:  | 1 MHz, 1 kHz     |
| EMI Receiver Avg Bandwidth: | 3 MHz, 10 kHz    |
| Detector Functions:         | Peak and Average |
| Antenna Height:             | 1 to 4 meters    |

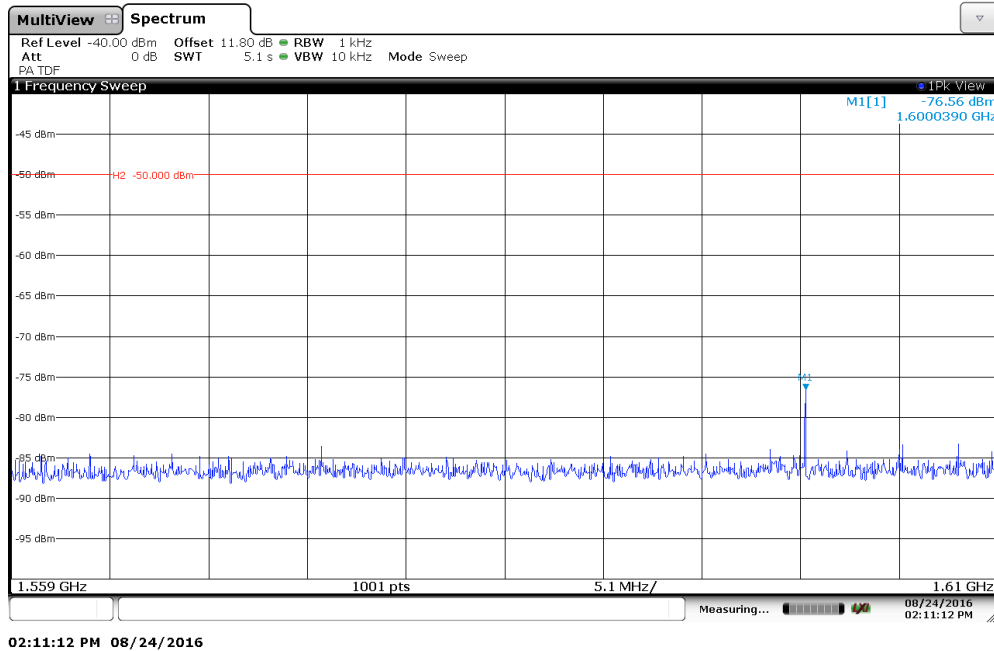
#### 6.4.8 Test Procedure

Test measurements were made in accordance with ANSI/TIA-603-D 2010 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards and ANSI C63.26 2015 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.

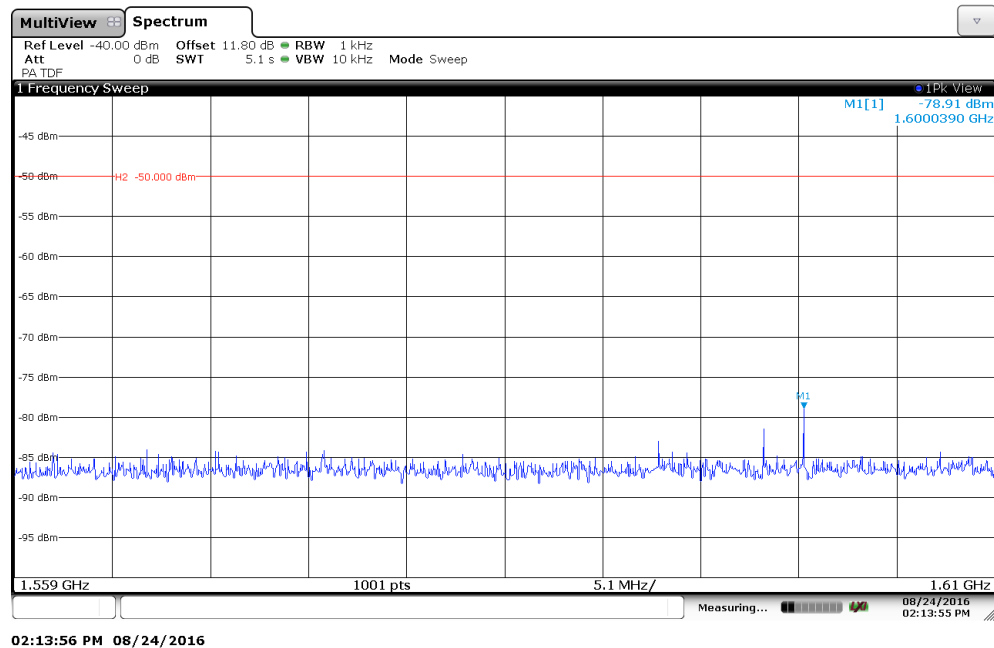
6. Measurement Data (continued)

6.4. Field Strength of Spurious Emissions 90.543 (f) (continued)

6.4.9. Narrowband Emissions 1559 to 1610 MHz Horizontal



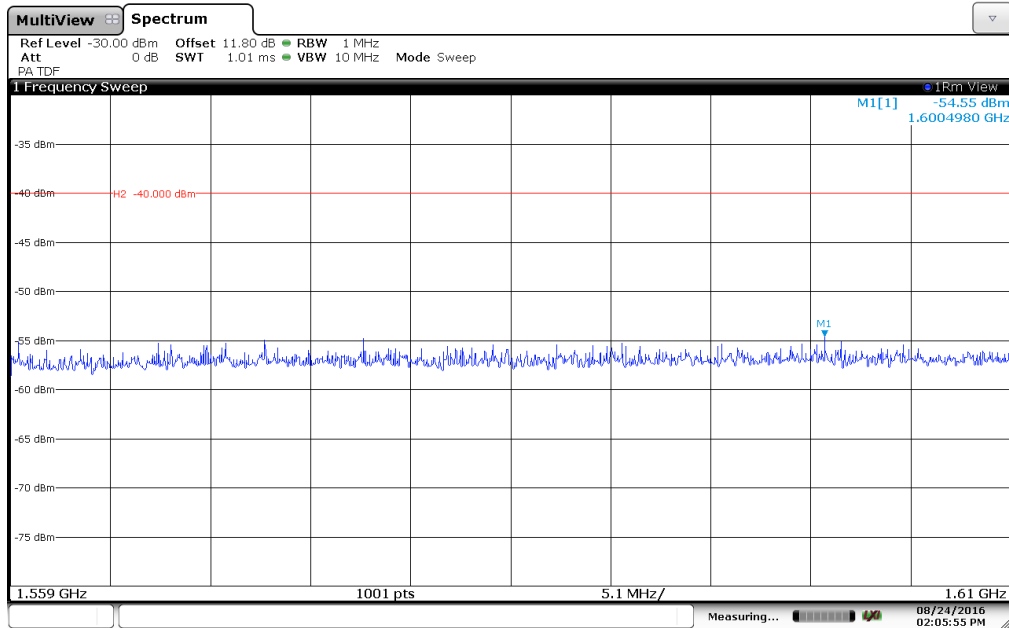
6.4.10. Narrowband Emissions 1559 to 1610 MHz Vertical



6. Measurement Data (continued)

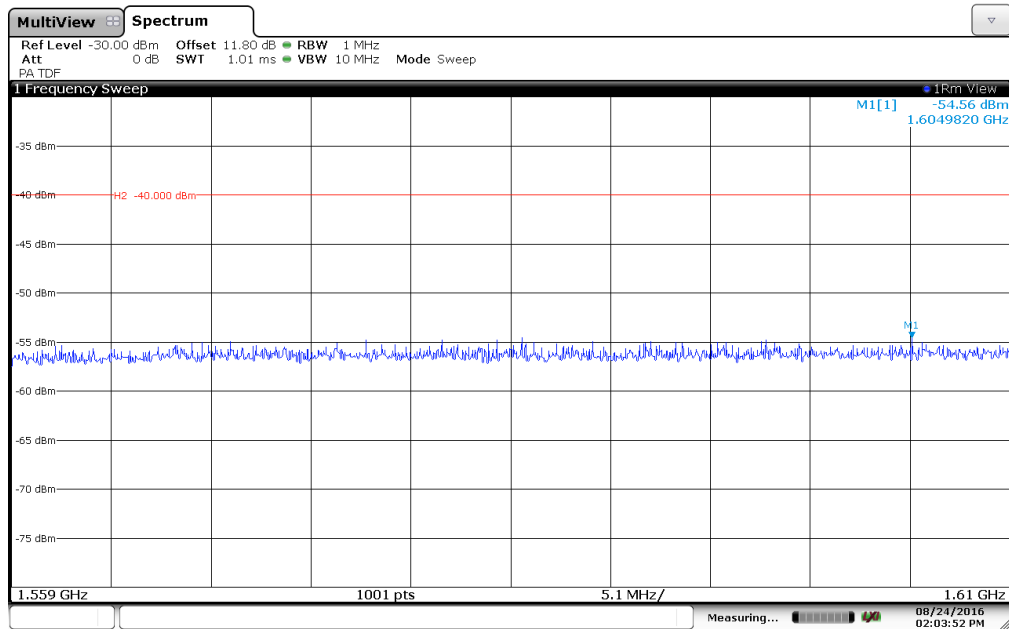
6.4. Field Strength of Spurious Emissions 90.543 (f) (continued)

6.4.11. Wideband Emissions 1559 to 1610 MHz Horizontal



02:05:55 PM 08/24/2016

6.4.12. Wideband Emissions 1559 to 1610 MHz Vertical



02:03:52 PM 08/24/2016

**6. Measurement Data (continued)**

**6.5. Frequency Stability 90.539**

Requirement: Transmitters designed to operating in the 769 to 775 MHz and 799 to 805 MHz frequency bands must meet the frequency stability requirements of this section. The frequency stability of base transmitters operating in the wideband segment must be 1 part per million or better.

Test Method: KDB 935210 Section 4.8

Note: The EUT does not translate the input frequency and therefore this testing was not performed.

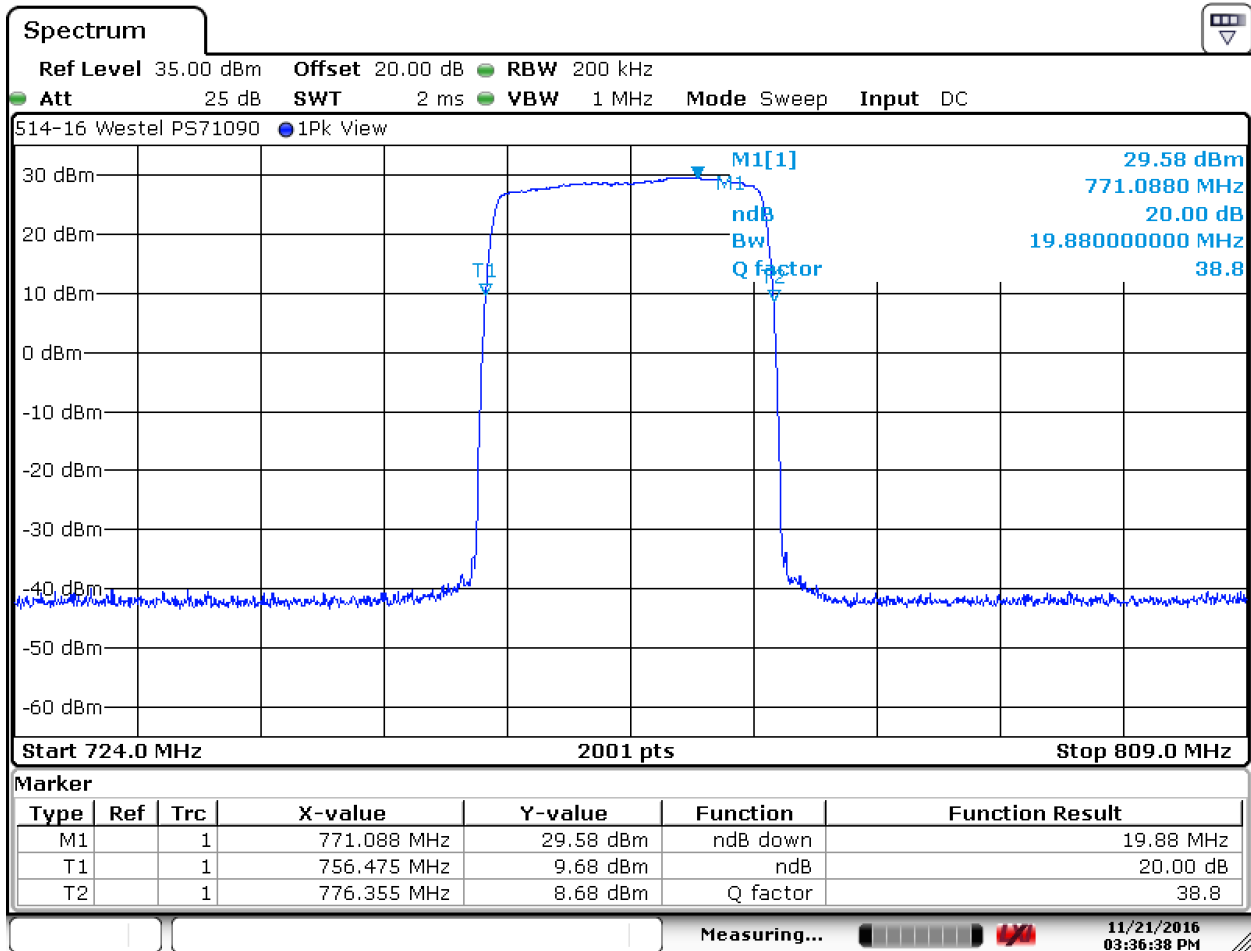
6. Measurement Data (continued)

6.6. Out of Band Rejection

Requirement: Over a +/- 250 % span of the passband of the EUT measure the 20 dB bandwidth of the pass band of the EUT.

Test Method: KDB 935210 Section 4.3

6.6.1. 766.5 MHz Center Frequency,  $f_o = 771.088$  MHz



Date: 21.NOV.2016 15:36:37

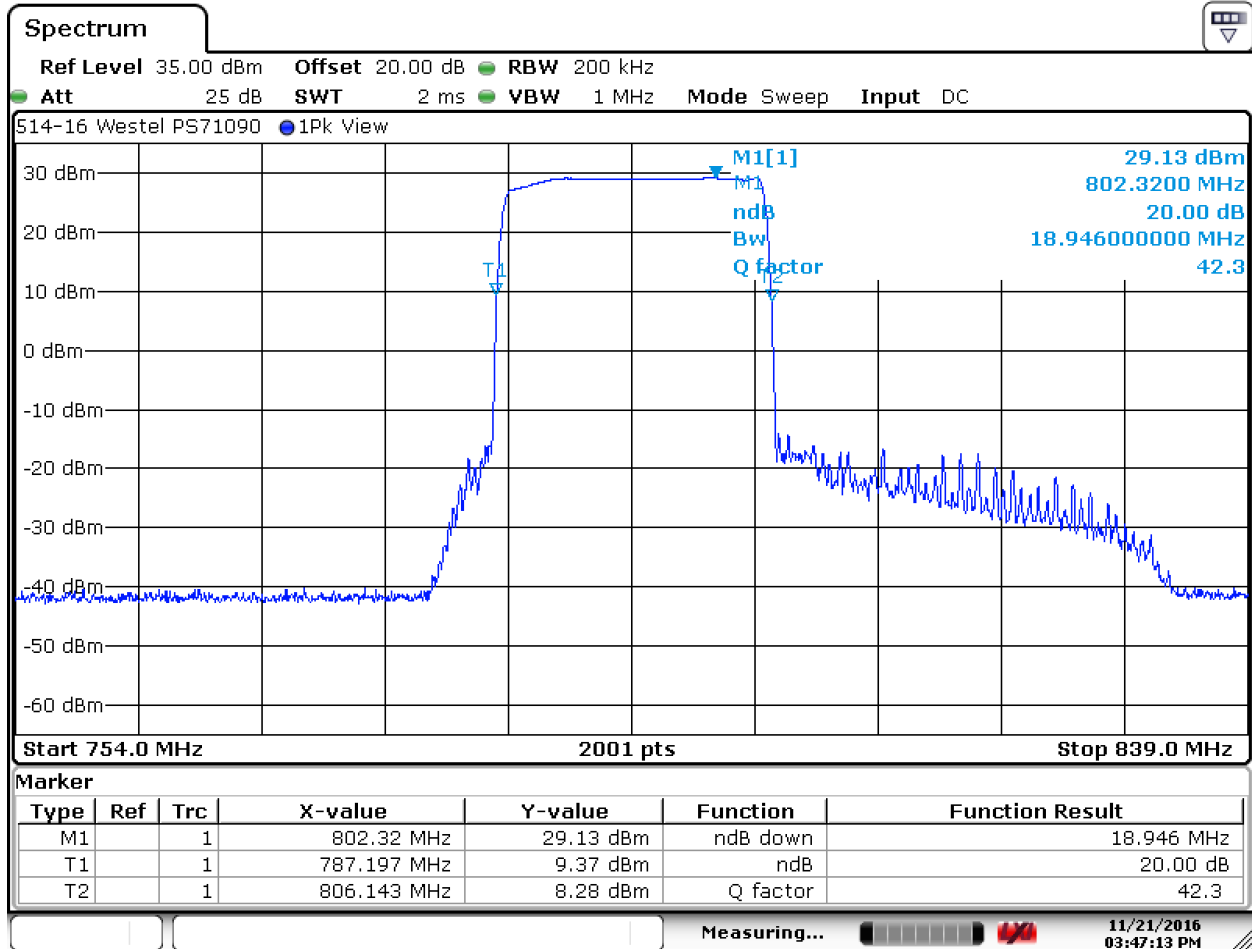
Test Number: 514-16R1

Issue Date: 2/7/2017

6. Measurement Data (continued)

6.6. Out of Band Rejection (continued)

6.6.2. 796.5 MHz, Center Frequency,  $f_o = 802.320$  MHz



Date: 21.NOV.2016 15:47:12



6. Measurement Data (continued)

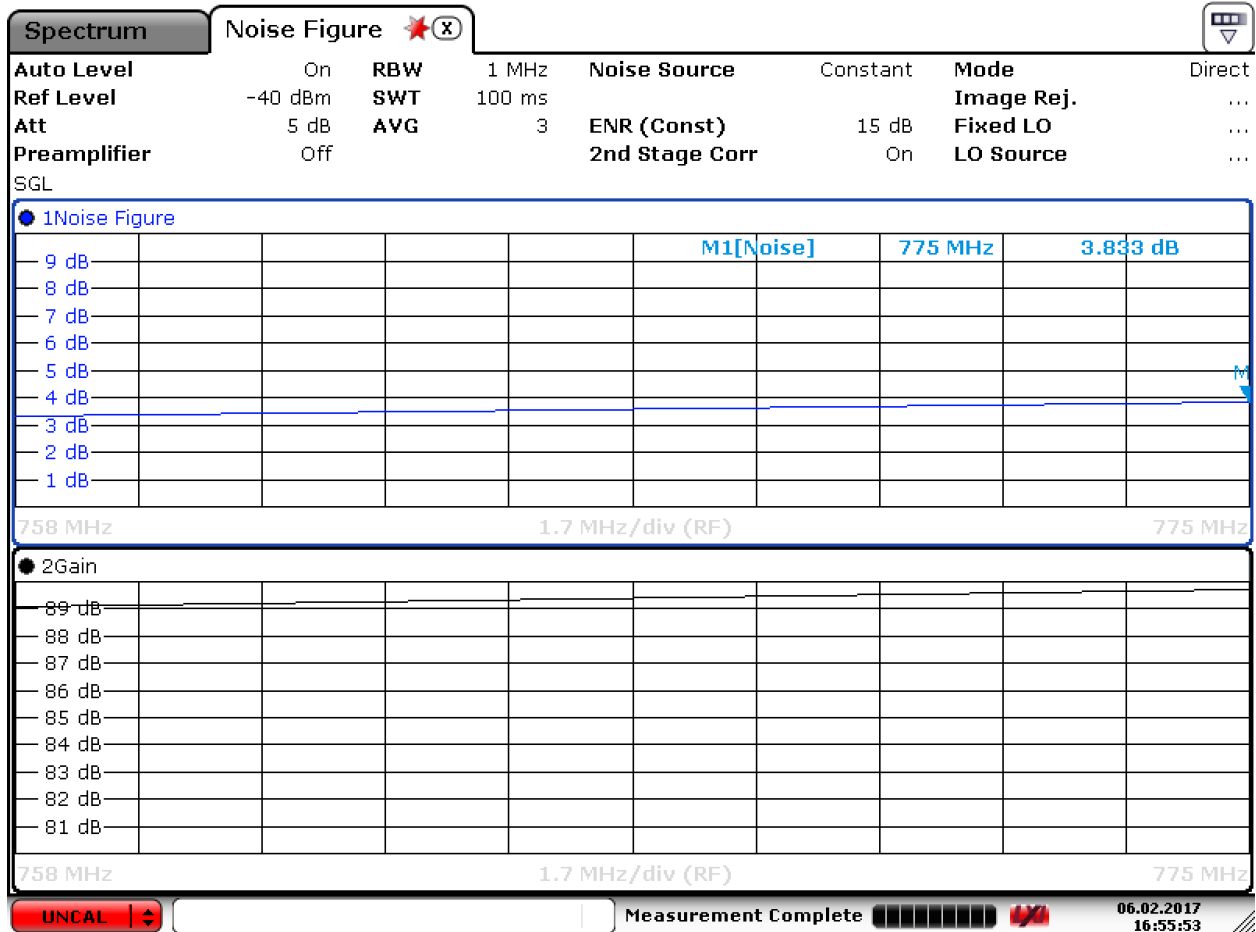
6.7. Noise Figure

Requirement: The noise figure of a signal booster must not exceed 9 dB in either direction.

Test Method: KDB 935210 Section 4.6

Result: Compliant, 3.833 dB

6.7.1. 758 to 775 MHz band



Date: 6.FEB.2017 16:55:52

6. Measurement Data (continued)

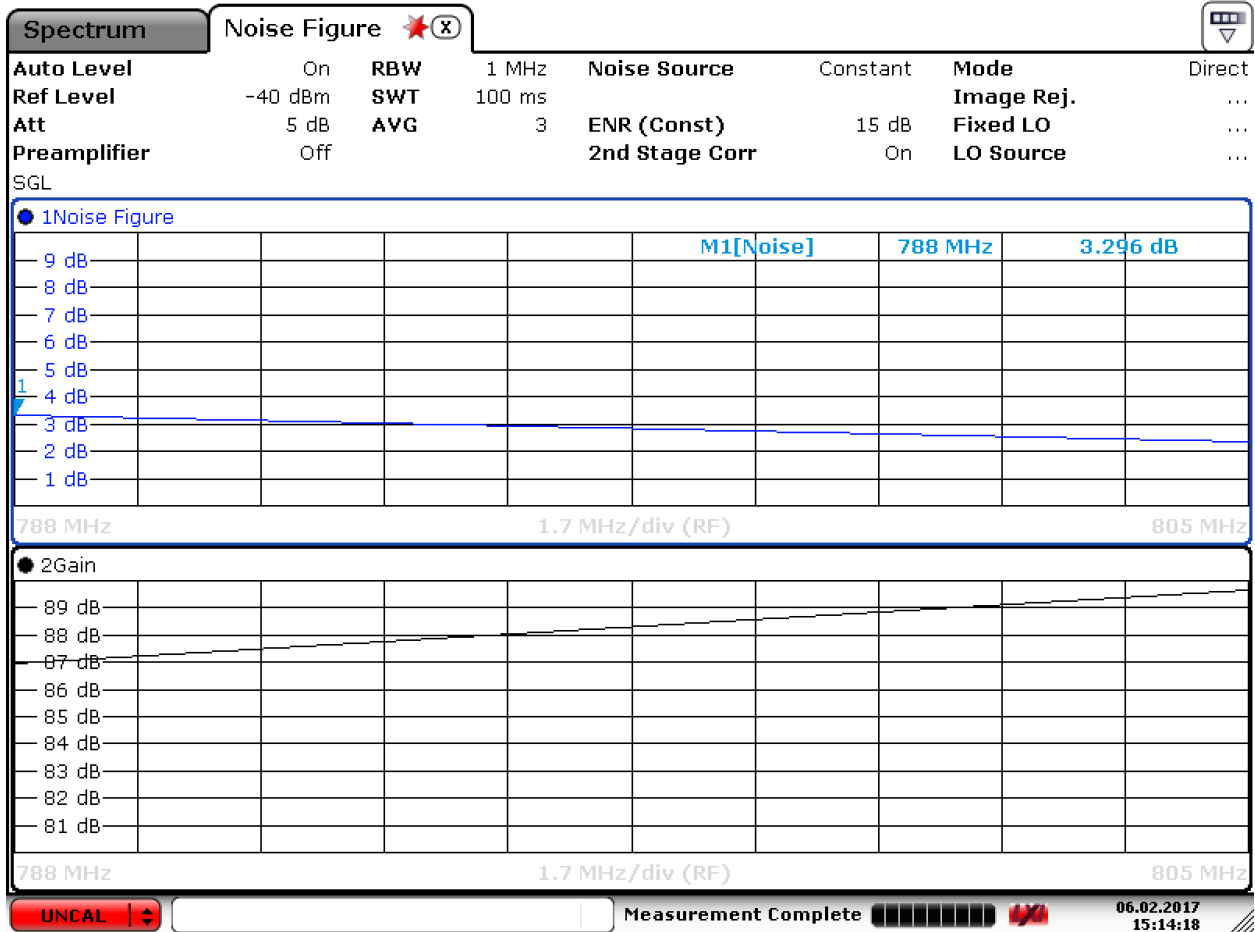
6.7. Noise Figure (continued)

Requirement: The noise figure of a signal booster must not exceed 9 dB in either direction.

Test Method: KDB 935210 Section 4.6

Result: Compliant, 3.296 dB

6.7.2. 788 to 805 MHz band



Date: 6.FEB.2017 15:14:16

**6. Measurement Data (continued)**

**6.8. Public Exposure to Radio Frequency Energy Levels 1.1307 (b)(1)**

| Center Frequency (MHz) | MPE Distance (cm) | DUT Output Power (dBm) | DUT Antenna Gain (dBi) | Power Density         |                     | Limit (mW/cm <sup>2</sup> ) | Result    |
|------------------------|-------------------|------------------------|------------------------|-----------------------|---------------------|-----------------------------|-----------|
|                        |                   |                        |                        | (mW/cm <sup>2</sup> ) | (W/m <sup>2</sup> ) |                             |           |
|                        | (1)               | (2)                    | (3)                    | (4)                   |                     | (5)                         |           |
| 766                    | 20.0              | 33.20                  | 3.00                   | 0.8293353             | 8.2933529           | 2.55                        | Compliant |
| 771                    | 20.0              | 32.95                  | 3.00                   | 0.7829430             | 7.8294300           | 2.57                        | Compliant |
| 771                    | 20.0              | 33.06                  | 3.00                   | 0.8030270             | 8.0302699           | 2.57                        | Compliant |
| 771                    | 20.0              | 33.09                  | 3.00                   | 0.8085933             | 8.0859331           | 2.57                        | Compliant |
| 771                    | 20.0              | 32.87                  | 3.00                   | 0.7686527             | 7.6865268           | 2.57                        | Compliant |
| 796                    | 20.0              | 33.32                  | 3.00                   | 0.8525702             | 8.5257019           | 2.65                        | Compliant |
| 802                    | 20.0              | 32.65                  | 3.00                   | 0.7306849             | 7.3068492           | 2.67                        | Compliant |
| 802                    | 20.0              | 32.66                  | 3.00                   | 0.7323693             | 7.3236932           | 2.67                        | Compliant |
| 802                    | 20.0              | 32.72                  | 3.00                   | 0.7425576             | 7.4255760           | 2.67                        | Compliant |
| 802                    | 20.0              | 32.55                  | 3.00                   | 0.7140525             | 7.1405250           | 2.67                        | Compliant |

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.
2. Section 6.1.2 of this test report. Note that the value has been adjusted to include the cable insertion loss.
3. Data supplied by the client for combination of cable loss and antenna gain.
4. Power density is calculated from field strength measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (A): Limits for Occupational/Controlled Exposure.  $f/300$  where  $f$  is in MHz

## 7. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with the Federal Communications Commission (FCC) and Industry Canada standards. Through our American Association for Laboratory Accreditation (A2LA) ISO Guide 17025:2005 Accreditation our test sites are designated with the FCC (designation number **US1091**), Industry Canada (file number **IC 3023A-1**) and VCCI (Member number 3168) under registration number A-0208.

Compliance Worldwide is also designated as a Phase 1 CAB under APEC-MRA (US0132) for Australia/New Zealand AS/NZS CISPR 22, Chinese-Taipei (Taiwan) BSMI CNS 13438 and Korea (RRA) KN 11, KN 13, KN 14-1, KN 22, KN 32, KN 61000-6-3, KN 61000-6-4.

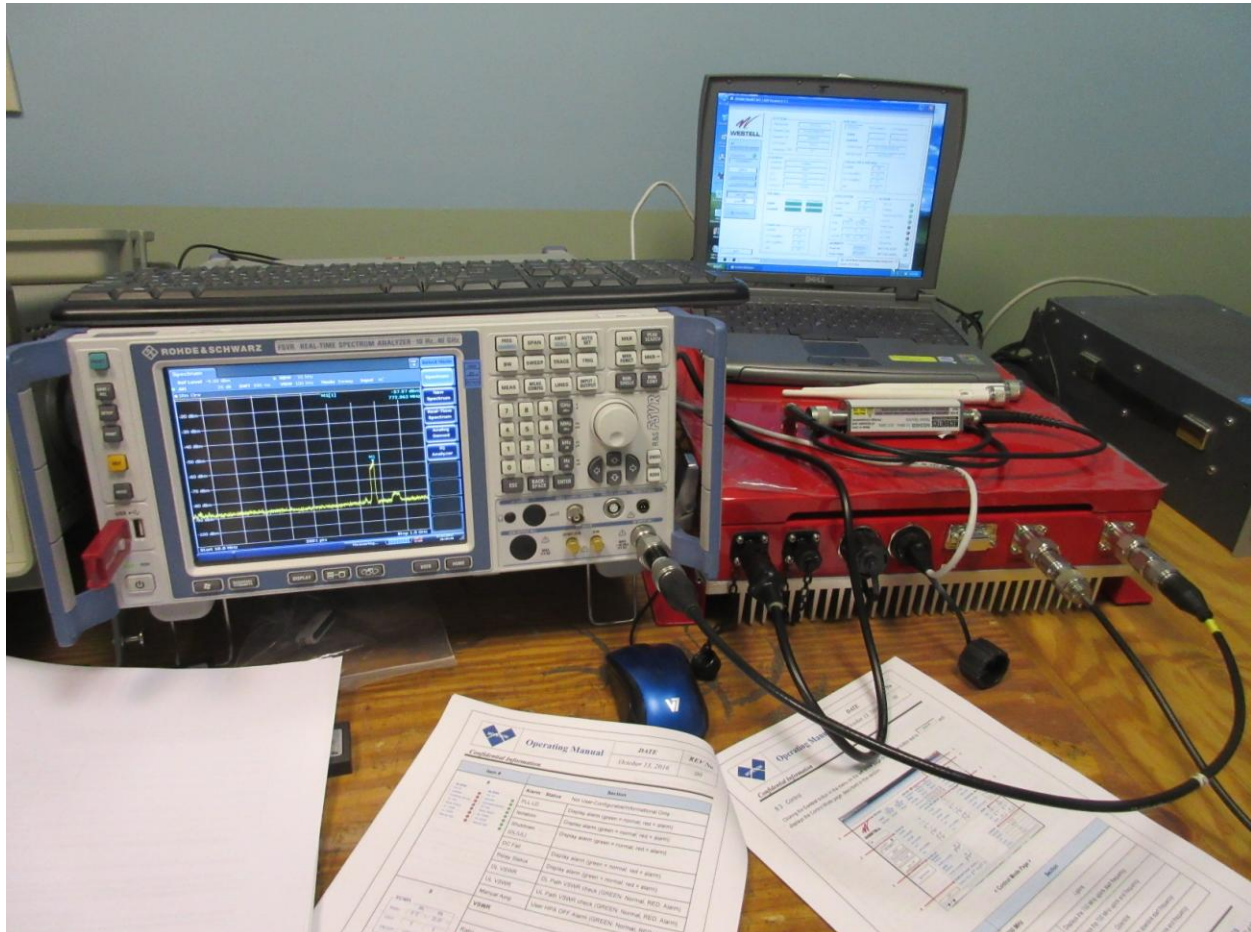
The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022. A second conducted emissions site is also located in the basement of the OATS site with a 2.3 x 2.5 meter ground plane and a 2.4 x 2.4 meter vertical wall.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.

## 8. Test Setup Photographs

### 8.1 Antenna Port Conducted Emissions



8. Test Setup Photographs (cont)

8.2 Radiated Emissions (Front)





**8. Test Setup Photographs (cont)**

**8.3 Radiated Emissions (Rear)**



**8. Test Setup Photographs (cont)**

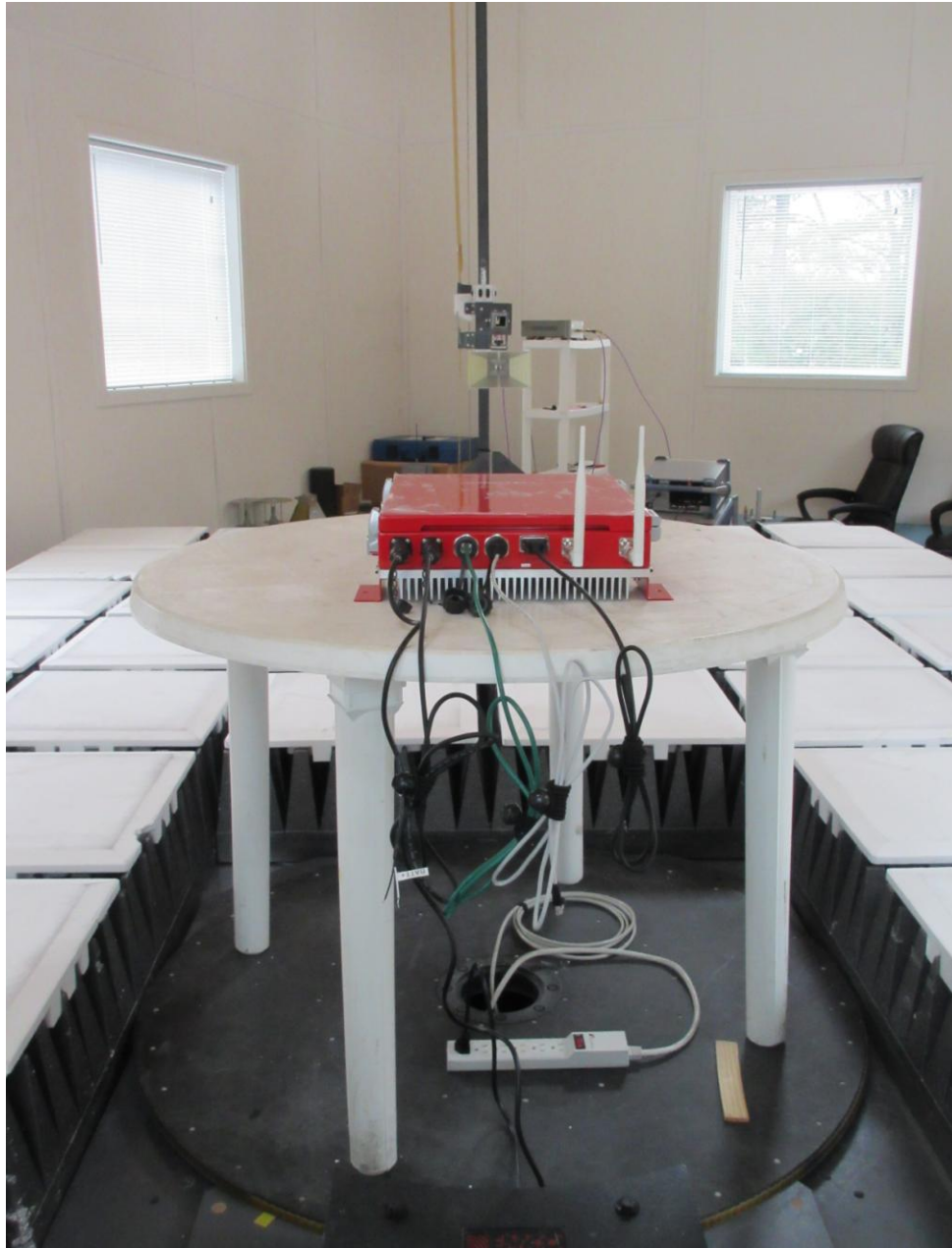
**8.4 Radiated Emissions Above 1 GHz (Front)**





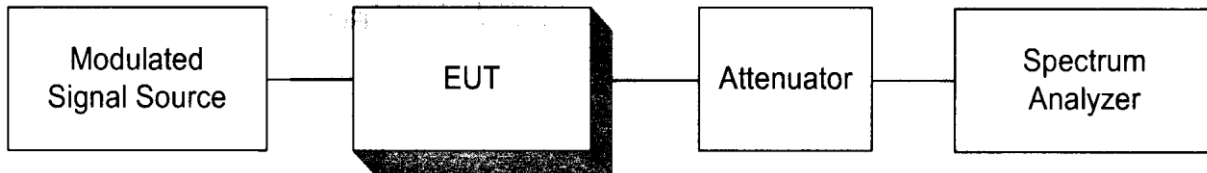
**8. Test Setup Photographs (cont)**

**8.5 Radiated Emissions Above 1 GHz (Rear)**

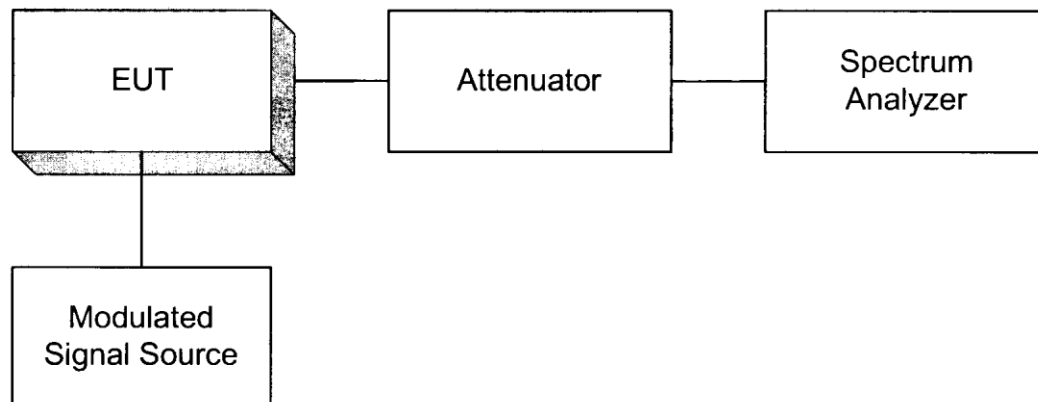


Appendix A

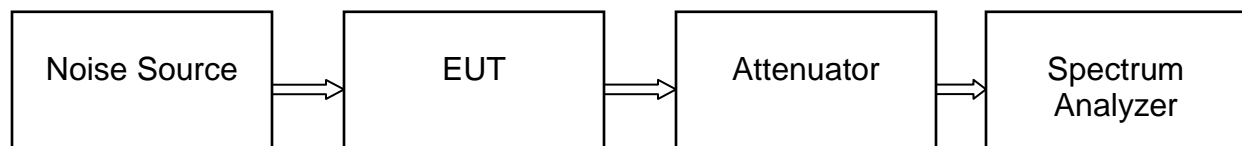
RF Output Power



Occupied Bandwidth

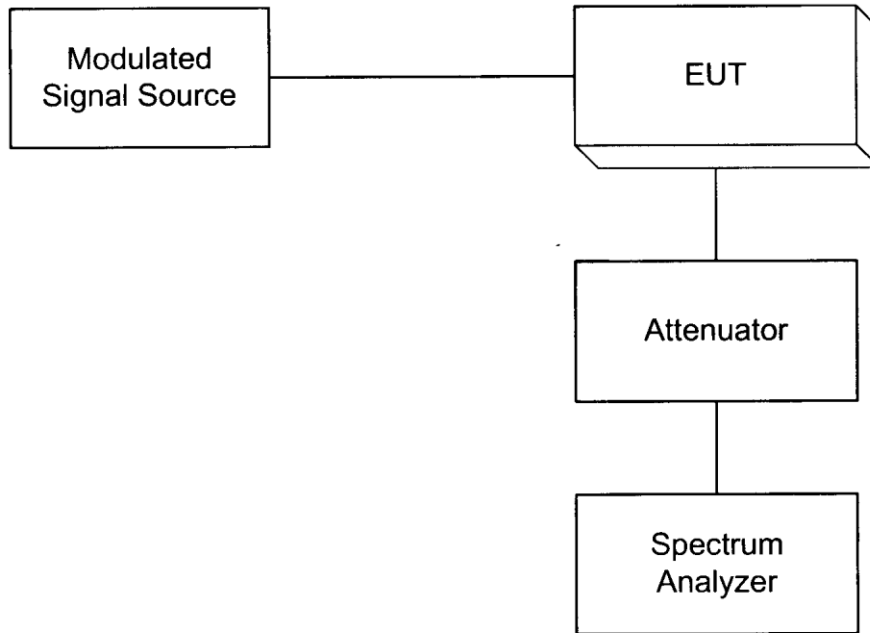


Noise Figure



### Appendix A

#### Spurious Emissions at the Antenna Terminals



#### Field Strength of Spurious Radiation

