



**FCC CFR47 PART 90**  
**CERTIFICATION TEST REPORT**  
**FOR**  
**COMPACT SURVEILLANCE RADAR**  
**MODEL NUMBER: M600C**

**FCC ID: CO6-M600C**  
**REPORT NUMBER: 12U14355-1, Revision A**  
**ISSUE DATE: SEPTEMBER 5, 2012**

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Revision History

| Rev. | Issue Date  | Revisions        | Revised By |
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| --   | 07/20/2012  | Initial Issue    | T. LEE     |
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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SPOTTERRF LLC  
709 E. TECHNOLOGY AVE. BLDG E 3100  
OREM, UTAH 84097 USA

**EUT DESCRIPTION:** COMPACT SURVEILLANCE RADAR

**MODEL:** M600C

**SERIAL NUMBER:** SP0169 (CONDUCTED), SP0210 (RADIATED)

**DATE TESTED:** MAY 22<sup>ND</sup> - JULY 18<sup>TH</sup>, 2012

| APPLICABLE STANDARDS |              |
|----------------------|--------------|
| STANDARD             | TEST RESULTS |
| CFR 47 Part 90       | Pass         |

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



TIMOTHY K. LEE  
STAFF ENGINEER  
UL CCS

STEVE AGUILAR  
EMC TECHNICIAN  
UL CCS

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 90, RSS-GEN Issue 3, and RSS-210 Issue 8.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB     |
| Radiated Disturbance, 30 to 1000 MHz  | 4.94 dB     |

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is 10 GHz medium range Compact Surveillance Radar (CSR). The unit operates only between channel 3 through 7 (10.125 GHz to 10.325 GHz)

The radio module is manufactured by SpotterRF LLC.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

| Frequency (MHz) | Channel | Output Power (dBm) | Output Power (mW) |
|-----------------|---------|--------------------|-------------------|
| 10125           | 3       | 25.88              | 387.26            |
| 10225           | 5       | 26.02              | 399.94            |
| 10325           | 7       | 26.26              | 422.67            |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a patch antenna, with a maximum gain of 14 dBi.

### 5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was ElusiveElephant\_v3.0.0-beta.00115\_2012-02-20.bin and greater.

## **5.5. WORST-CASE CONFIGURATION AND MODE**

Radiated emission was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

All final radiated testing was performed with the EUT in upright orientation as indicated by the installation instructions.

Based on the baseline scan, the worst-case channel for radiated emissions was channel 7.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List      |              |              |                 |        |
|-----------------------------|--------------|--------------|-----------------|--------|
| Description                 | Manufacturer | Model        | Serial Number   | FCC ID |
| Laptop                      | Toshiba      | PT324U03900R | 2C165037H       | DoC    |
| AC Adapter                  | Toshiba      | PA3714U-1ACA | T0412032003150A | DoC    |
| Power Over Ethernet Adapter | APC          | AP9302-WM    | --              | --     |
| AC Adapter                  | V-infinity   | ETSA200200UD | --              | --     |

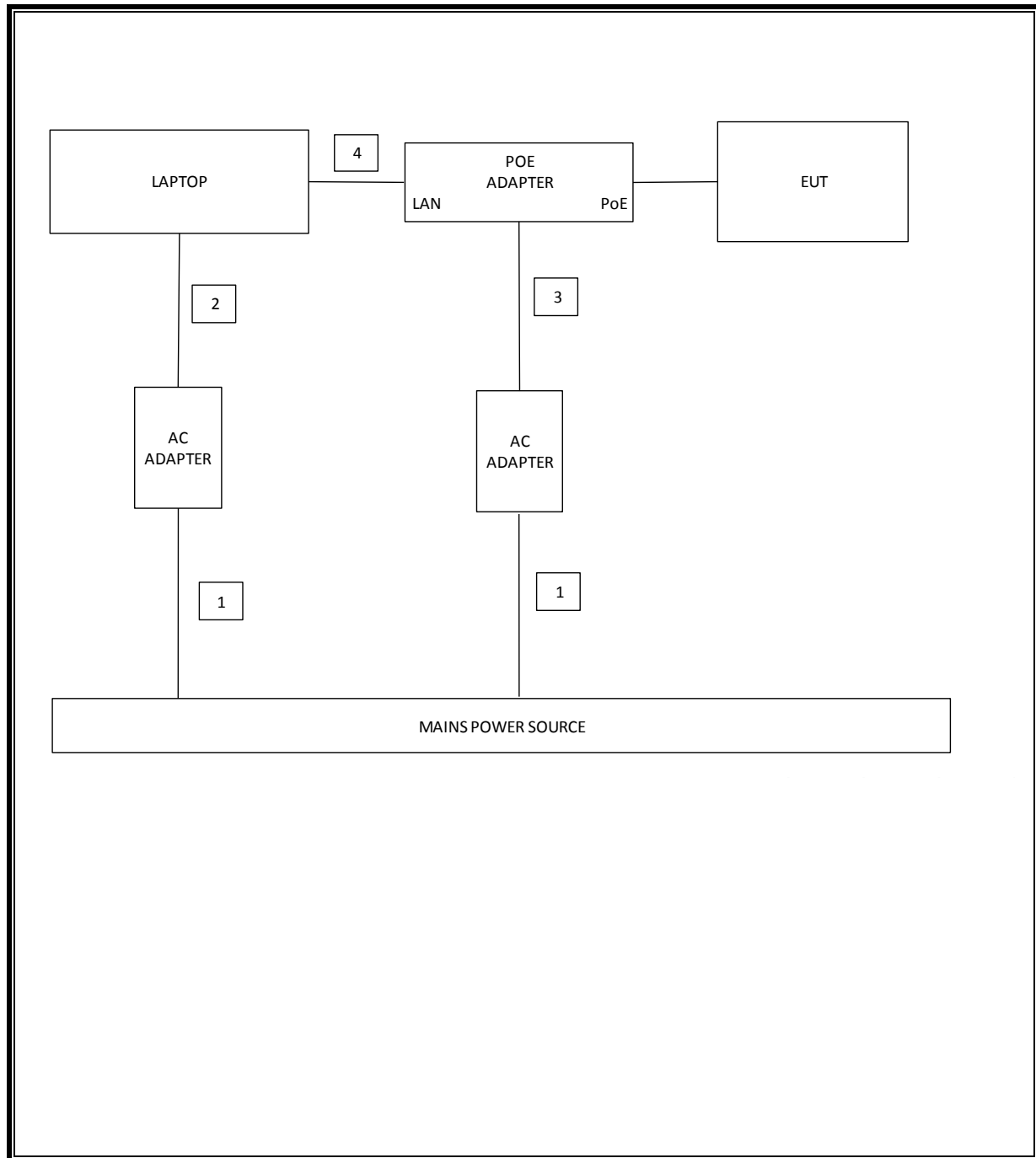
### I/O CABLES

| I/O Cable List |      |                      |                |            |                  |  |
|----------------|------|----------------------|----------------|------------|------------------|--|
| Cable No       | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks                                      |
| 1              | AC   | 2                    | AC 2P          | Unshielded | 1.8m             | None   |
| 2              | DC   | 1                    | DC             | Shielded   | 1.8m             | Ferrite on Laptop end                        |
| 3              | DC   | 1                    | DC             | Unshielded | 1.8m             | Ferrite on Adapter end                       |
| 4              | LAN  | 1                    | CAT5           | Unshielded | 2m               | None   |
| 5              | LAN  | 1                    | CAT5           | Shielded   | 7.5m             | Screw on weatherproof connector for EUT side |

### TEST SETUP

The EUT is powered via the POE adapter. Test software exercised using the Laptop controlled through the Ethernet cables.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List             |                |              |          |            |
|---------------------------------|----------------|--------------|----------|------------|
| Description                     | Manufacturer   | Model        | Asset    | Cal Due    |
| Spectrum Analyzer, 26.5 GHz     | Agilent / HP   | E4440A       | C01161   | 12/16/2012 |
| Preamplifier, 26.5 GHz          | Agilent / HP   | 8449B        | C01052   | 11/11/2012 |
| Antenna, Bilog, 30MHz-1 GHz     | Sunol Sciences | JB1          | --       | 2/7/2013   |
| Preamplifier, 1300 MHz          | Agilent / HP   | 8447D        | C00885   | 11/11/2012 |
| Antenna, Horn, 18 GHz           | EMCO           | 3115         | C00945   | 10/6/2012  |
| Spectrum Analyzer, 44 GHz       | Agilent / HP   | E4446A       | C01069   | 12/15/2012 |
| P-Series single channel Power   | Agilent / HP   | N1911A       | 1260847C | 8/4/2012   |
| Spectrum Analyzer, 26.5 GHz     | Agilent / HP   | E4440A       | C01176   | 8/4/2012   |
| Temperature / Humidity Chamber  | Thermotron     | SE 600-10-10 | C00930   | 10/20/2012 |
| Preamplifier, 40 GHz            | Miteq          | NSP4000-SP2  | C00990   | 8/2/2012   |
| Downconverter, 67 GHz           | Agilent        | MT-463       | 12020    | 10/10/2012 |
| Analog Signal Generator, 40 GHz | Agilent / HP   | E8257D       | C01177   | 8/18/2012  |
| Harmonic Mixer, 50 GHz          | Agilent / HP   | 11970Q       | C00769   | 5/11/2013  |
| Harmonic Mixer, 75 GHz          | Agilent / HP   | 11970V       | C00768   | 1/31/2014  |

## 7. ANTENNA PORT TEST RESULTS

### 7.1. 10 GHz BAND

#### 7.1.1. 99% BANDWIDTH

##### LIMITS

FCC § 90.209(b)(5)

None; for reporting purposes only. Bandwidth for radiolocation stations will be reviewed and authorized on a case-by-case basis.

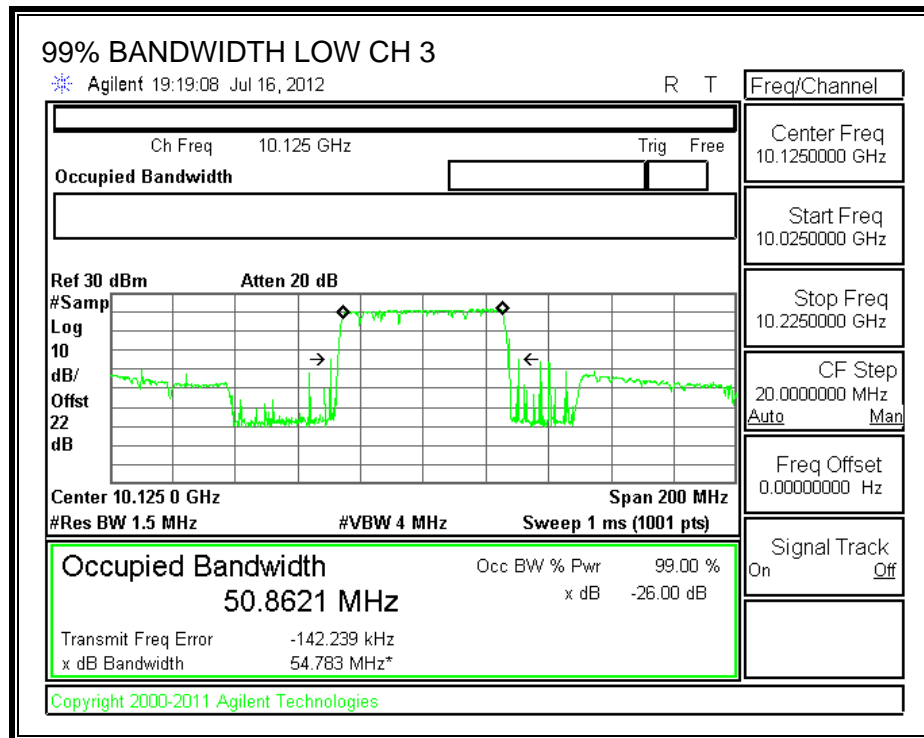
##### TEST PROCEDURE

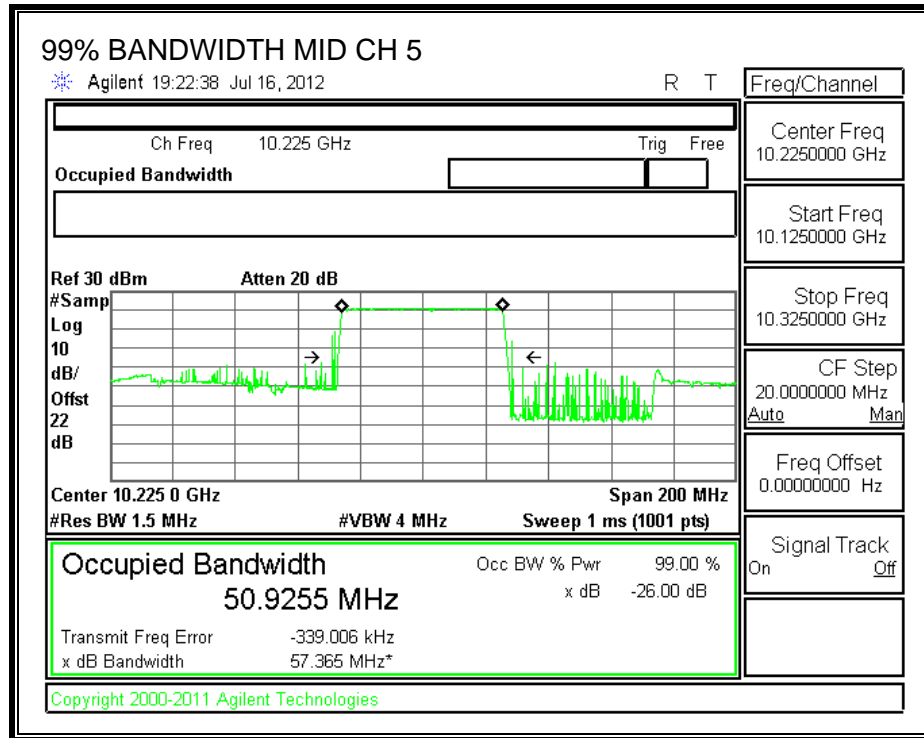
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

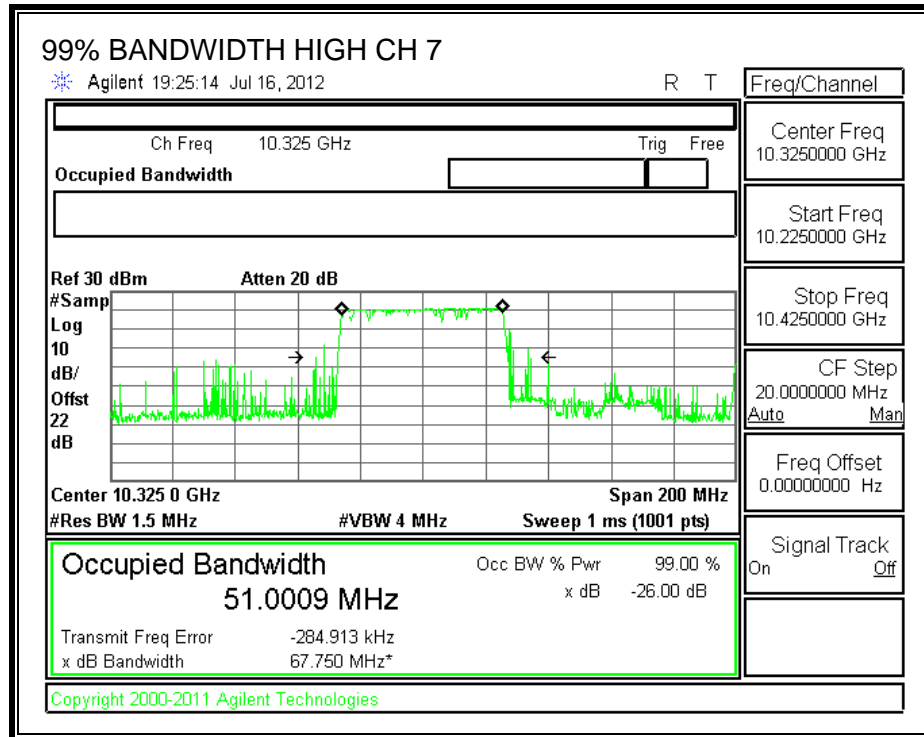
##### RESULTS

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| 3       | 10125           | 50.8621             |
| 5       | 10225           | 50.9255             |
| 7       | 10325           | 51.0009             |

**99% BANDWIDTH**







## 7.1.2. OUTPUT POWER

### LIMITS

FCC §90.103(c) (13)

The maximum power into the antenna port shall be less than 5 W.

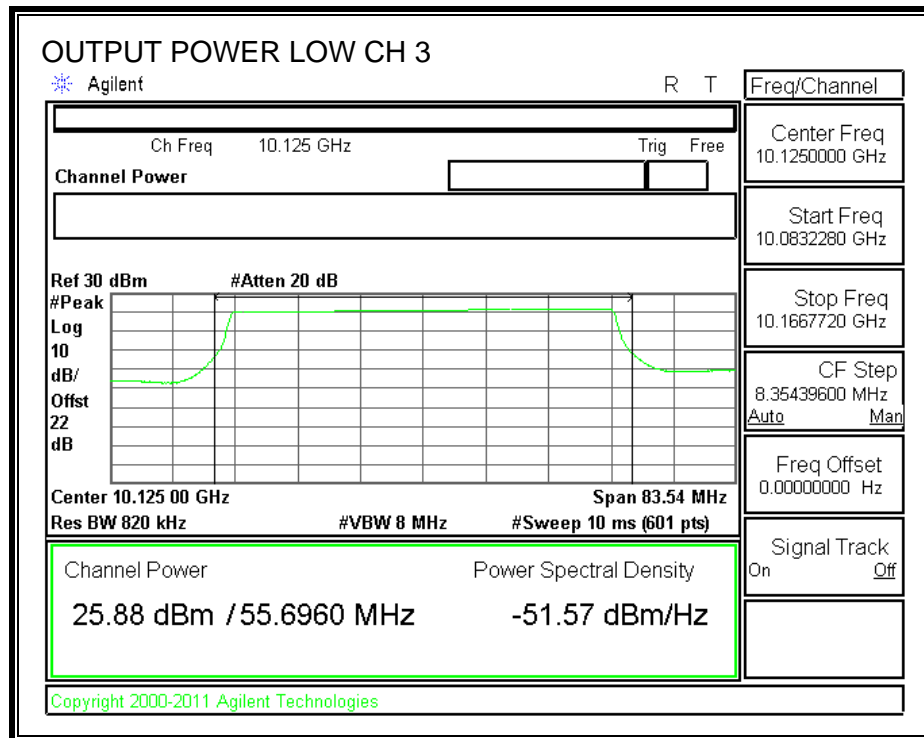
### TEST PROCEDURE

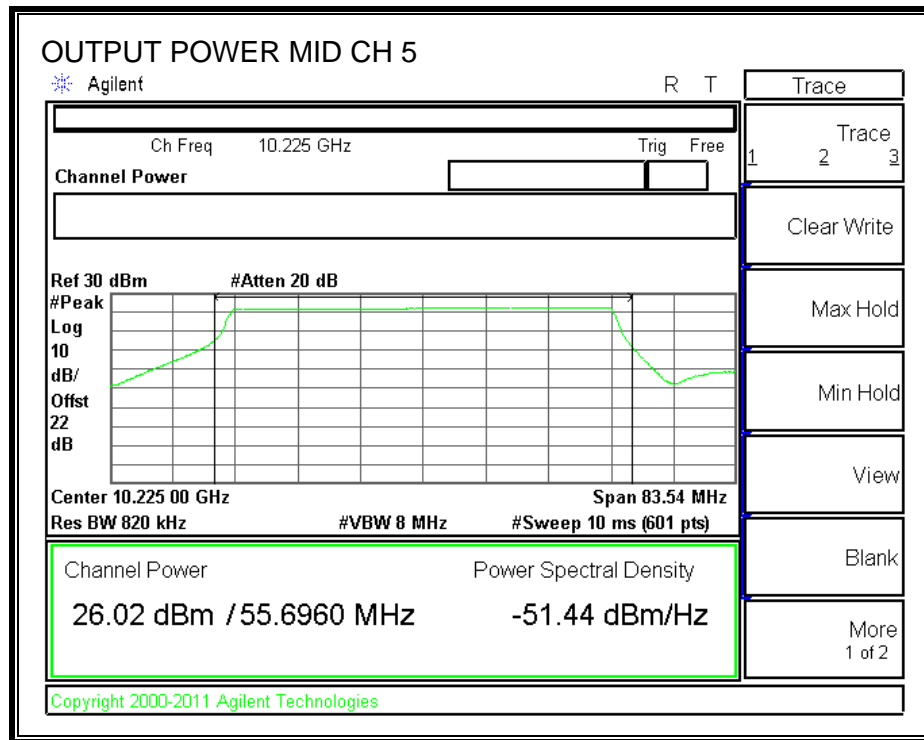
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

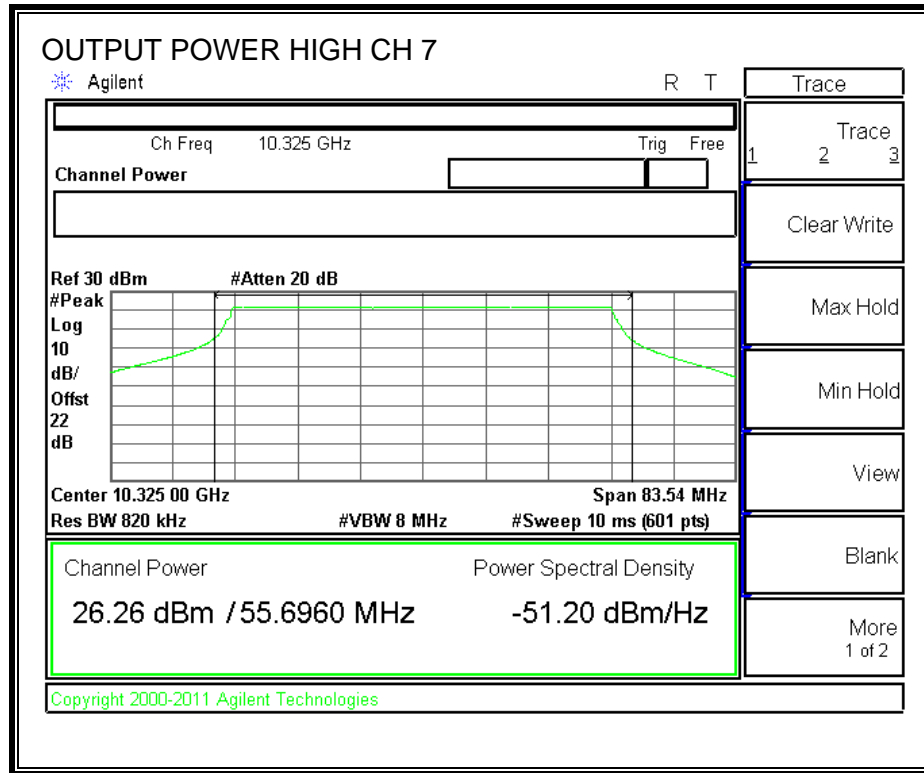
### RESULTS

| Channel | Frequency<br>(MHz) | Peak Power<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|--------------------------------|----------------|----------------|
| 3       | 10125              | 25.880                         | 37             | -11.120        |
| 5       | 10225              | 26.020                         | 37             | -10.980        |
| 7       | 10325              | 26.260                         | 37             | -10.740        |

**OUTPUT POWER**







### 7.1.3. AVERAGE POWER

#### LIMITS

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

#### RESULTS

The cable assembly insertion loss of 22 dB (including 20dB pad and 2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| Channel | Frequency<br>(MHz) | AV power<br>(dBm) |
|---------|--------------------|-------------------|
| 3       | 10125              | 20.88             |
| 5       | 10225              | 21.81             |
| 7       | 10325              | 20.96             |

#### **7.1.4. CONDUCTED SPURIOUS EMISSIONS**

##### **LIMITS**

FCC §90.210

Attenuation below carrier of  $43 + 10 \log (P)$  dB or -13dBm

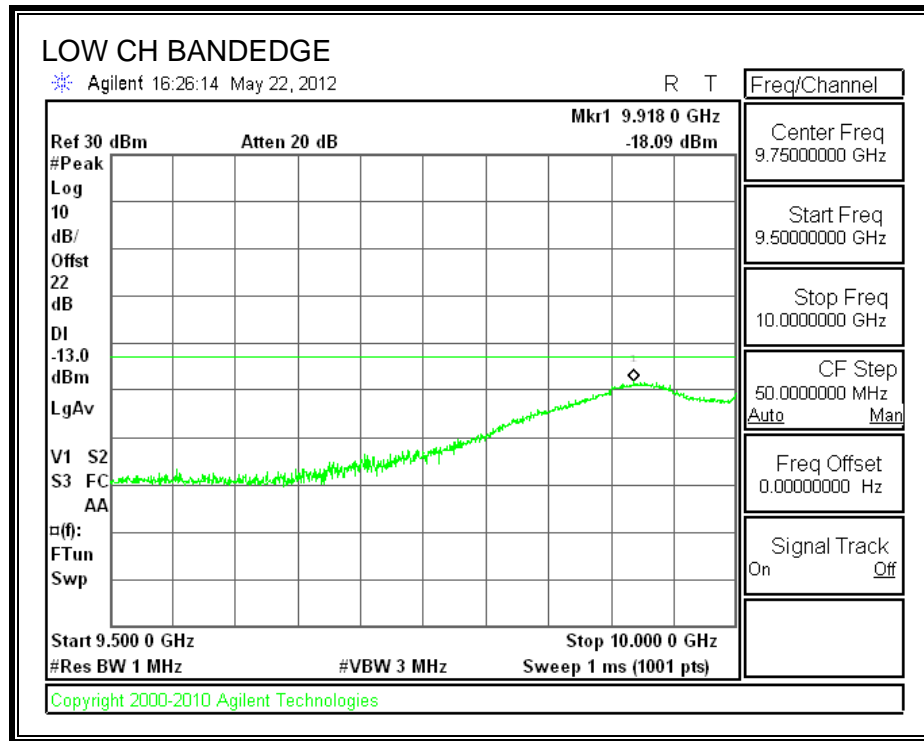
##### **TEST PROCEDURE**

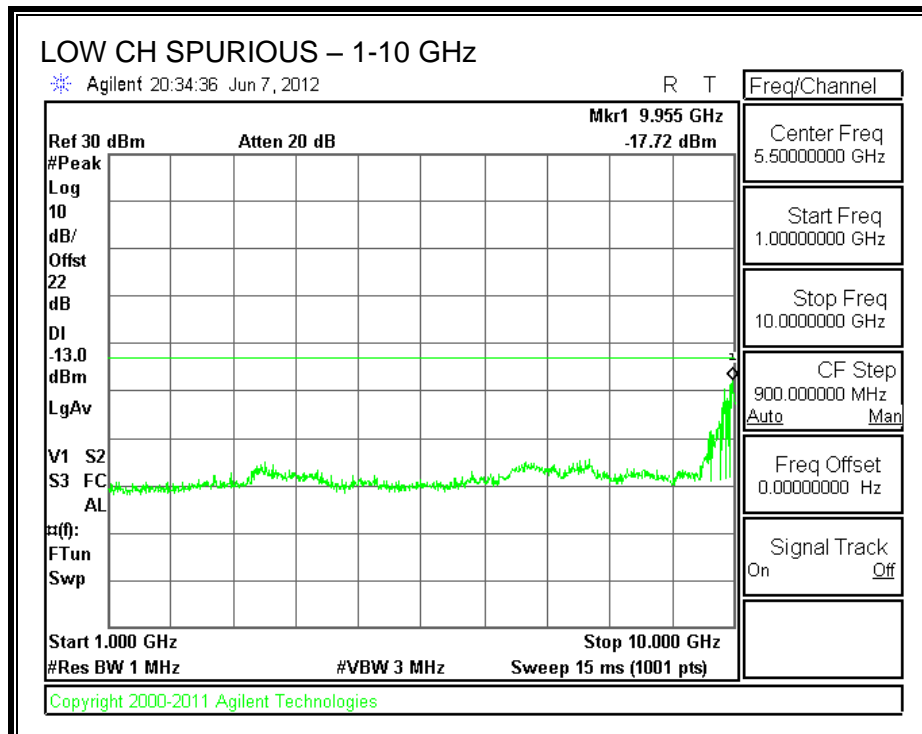
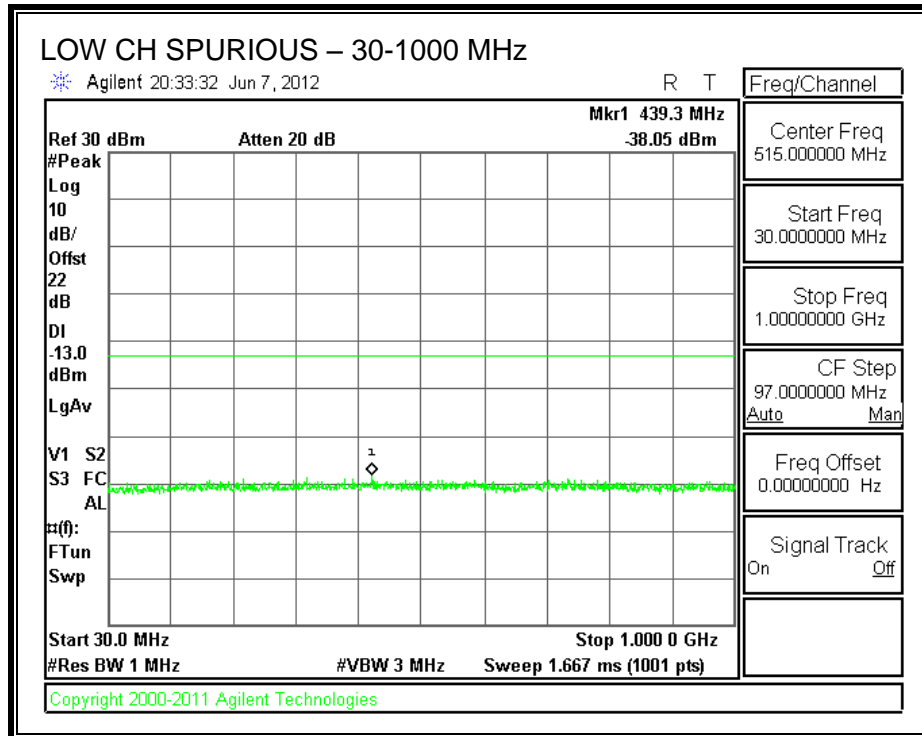
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

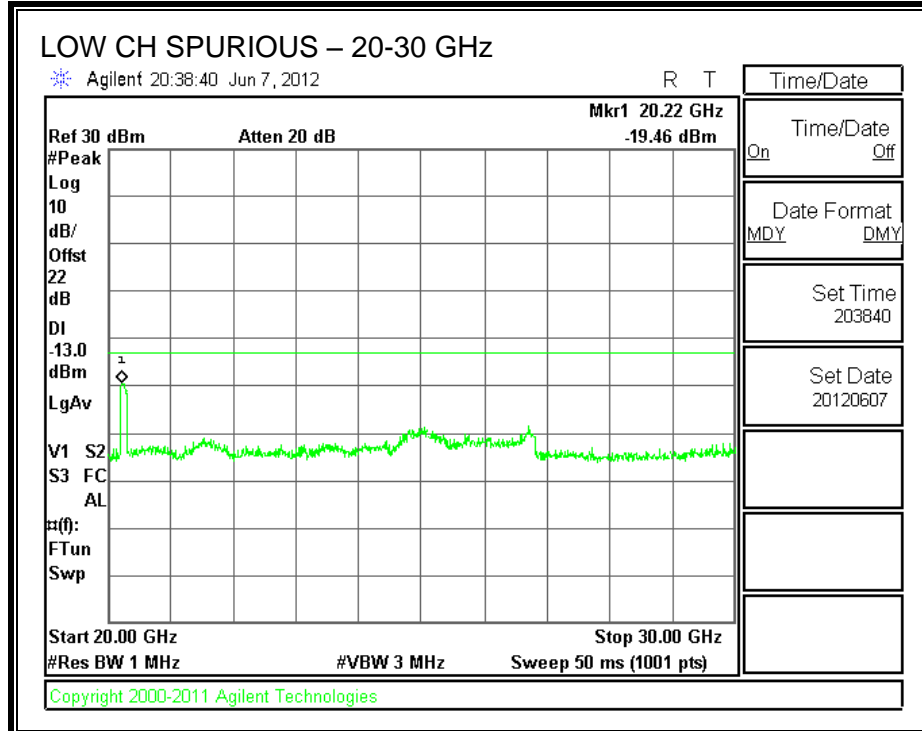
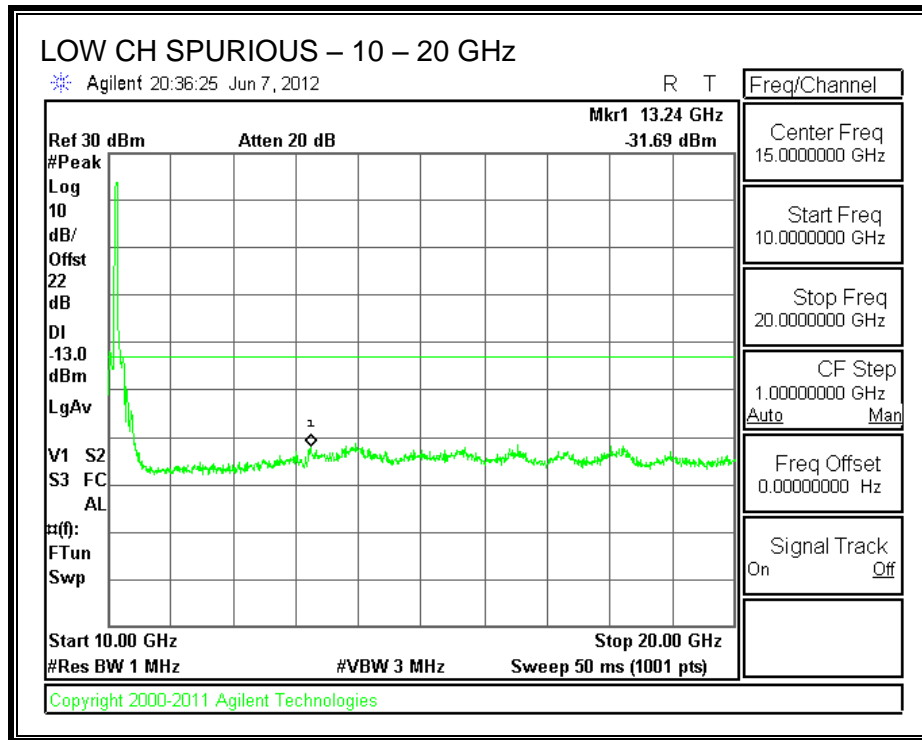
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

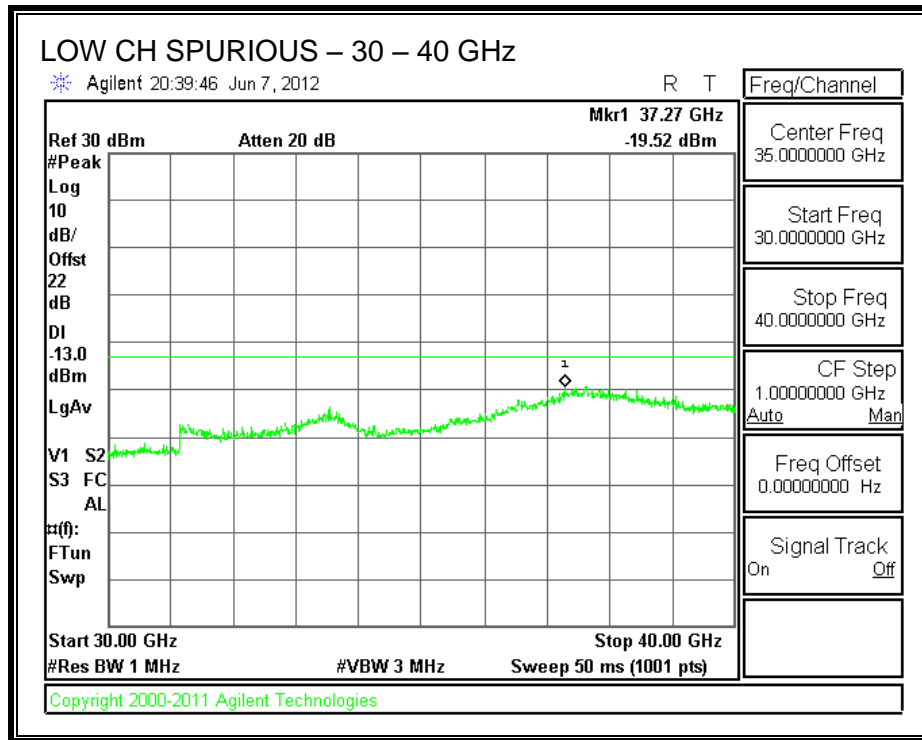
## RESULT

### SPURIOUS EMISSIONS, LOW CHANNEL

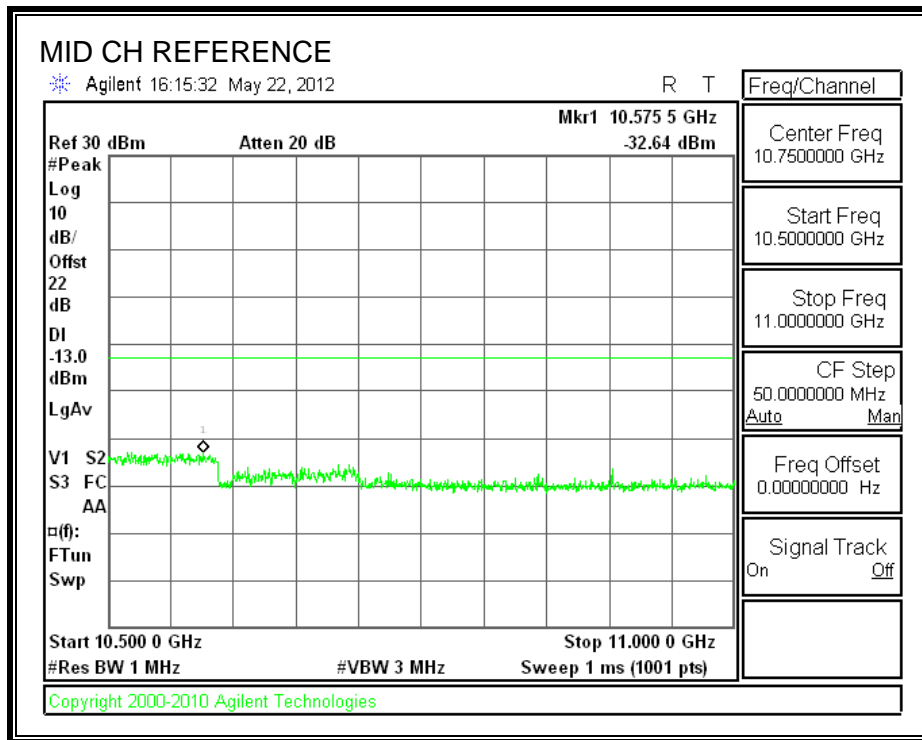


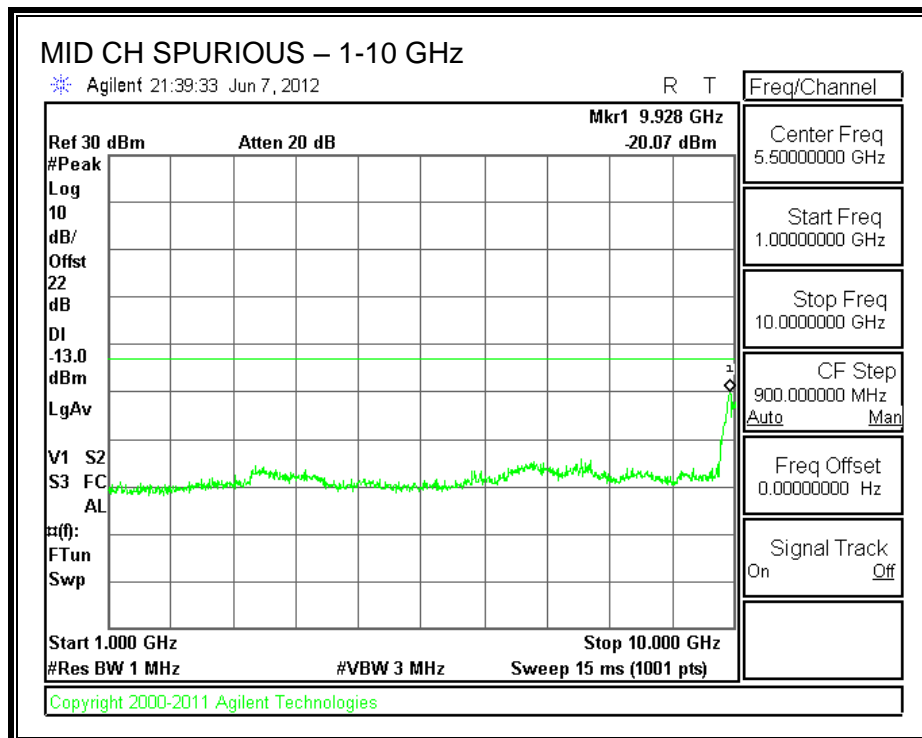
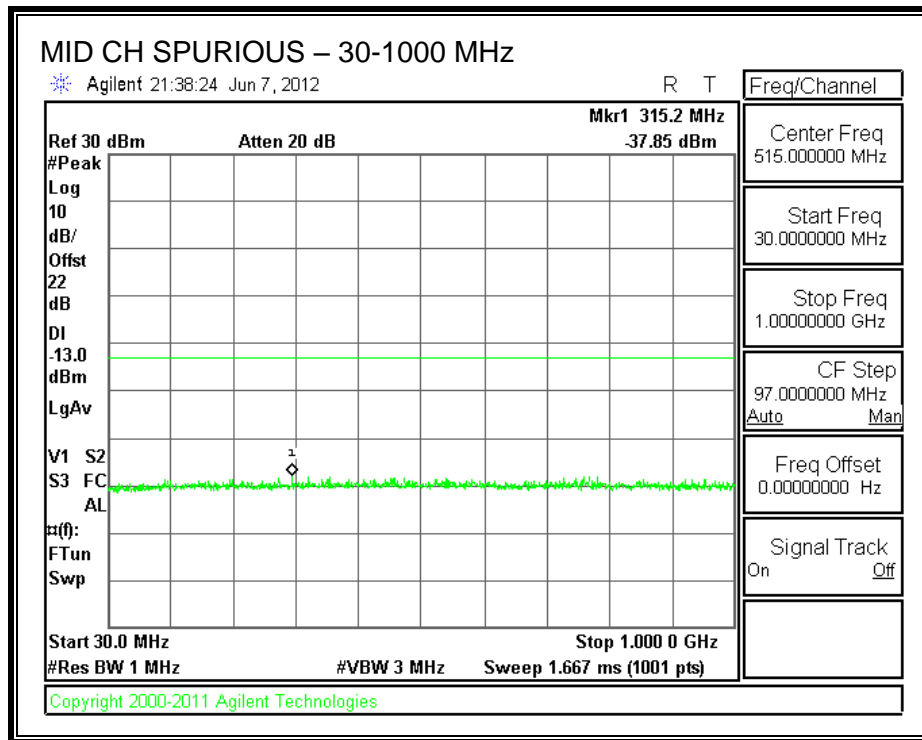


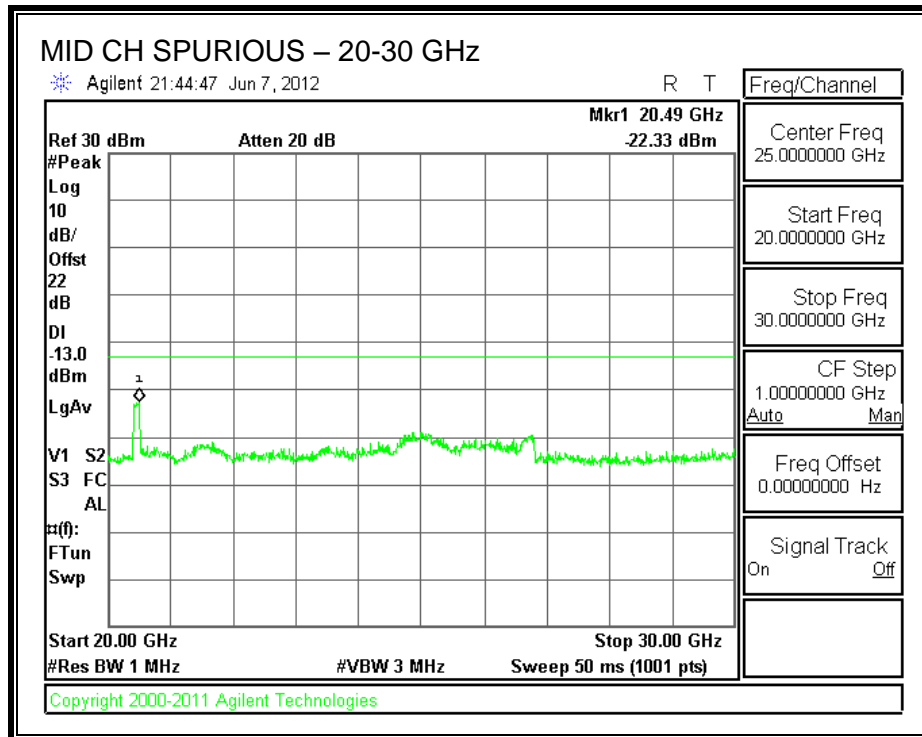
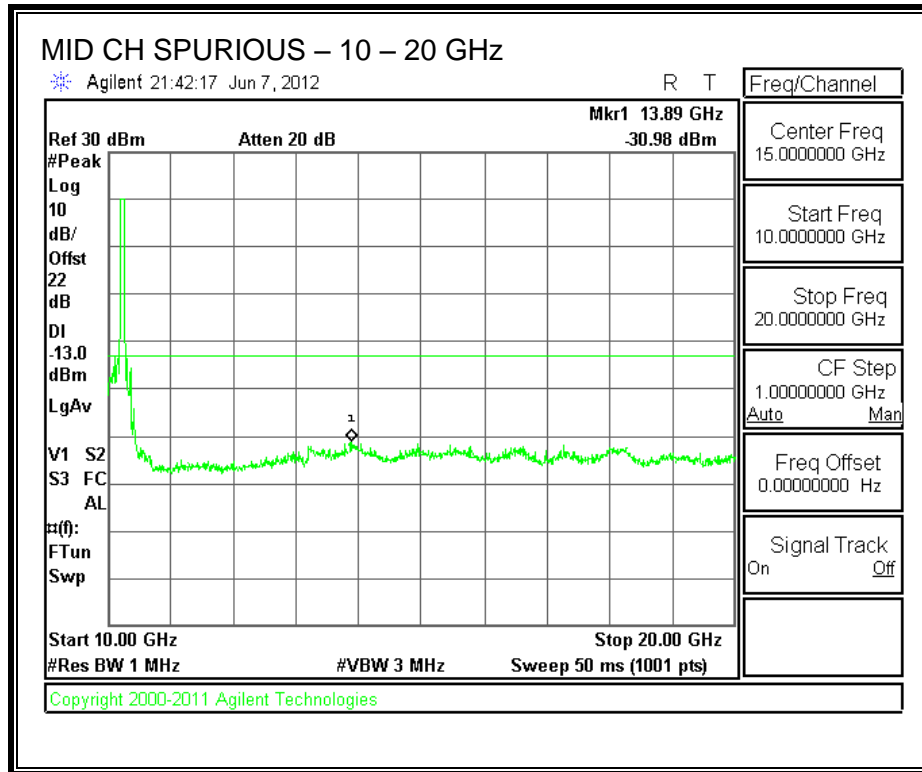


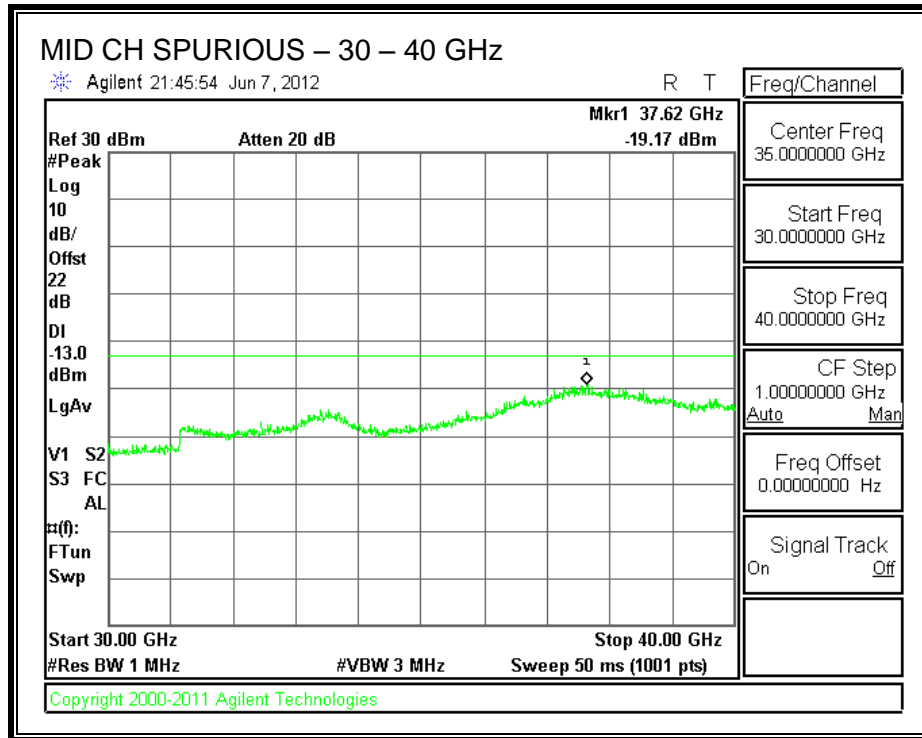


**SPURIOUS EMISSIONS, MID CHANNEL**

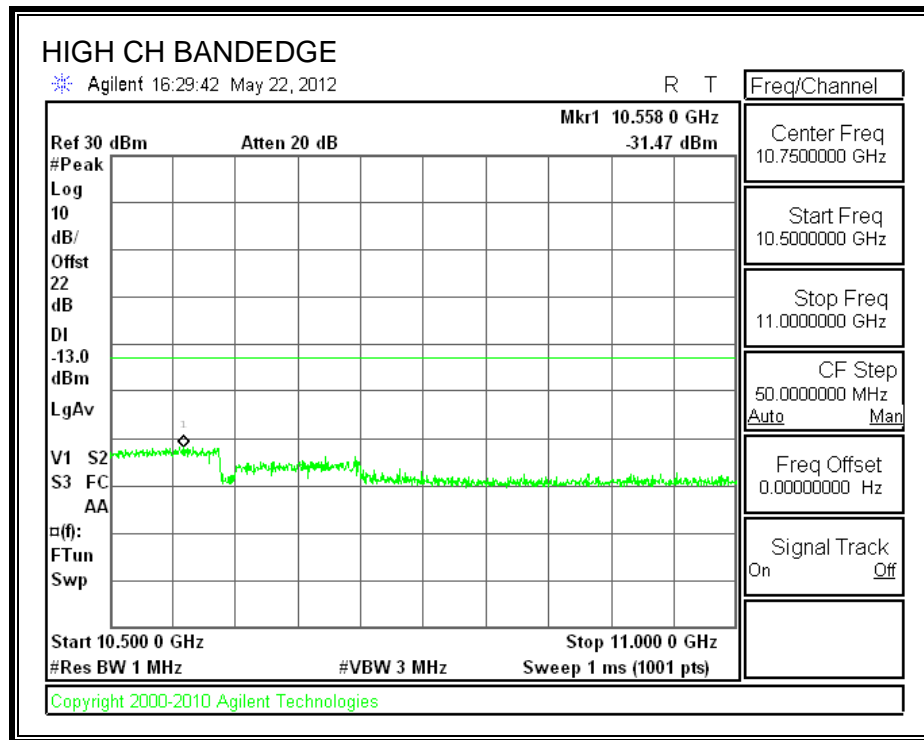


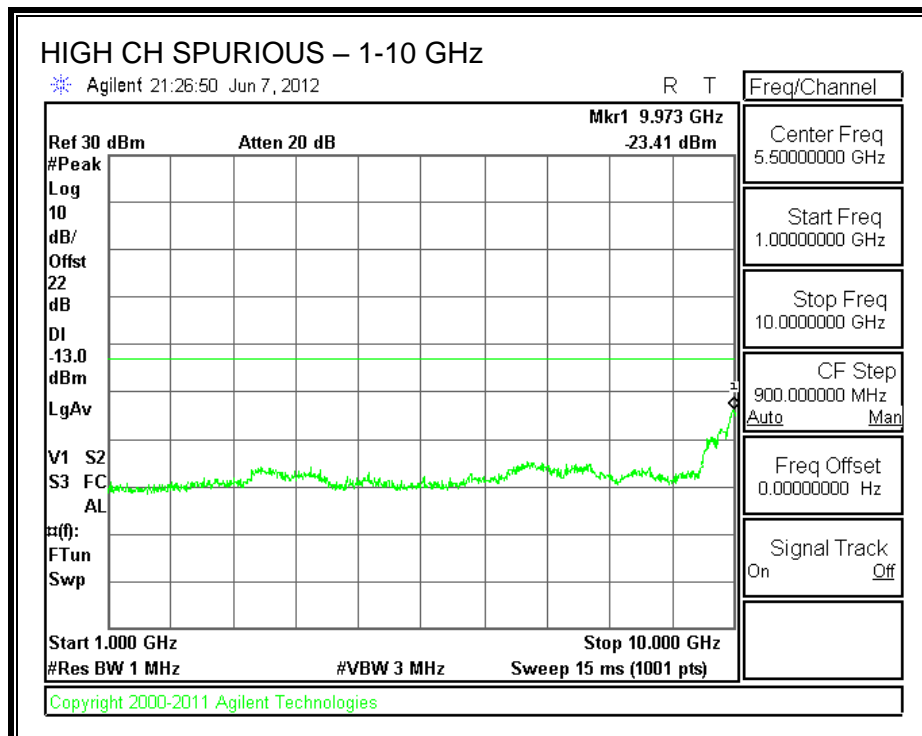
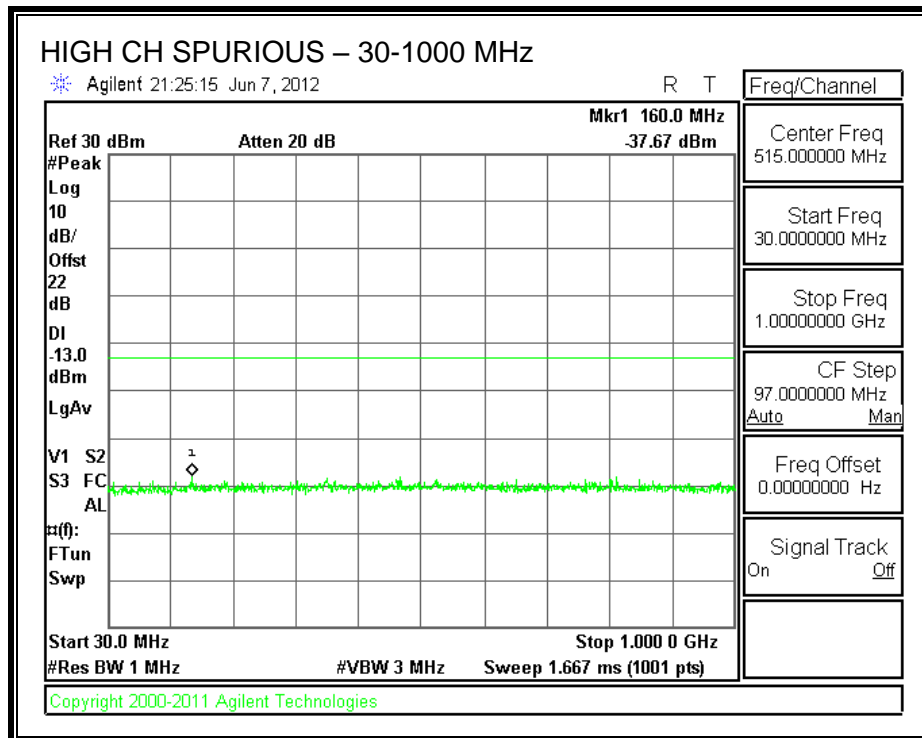


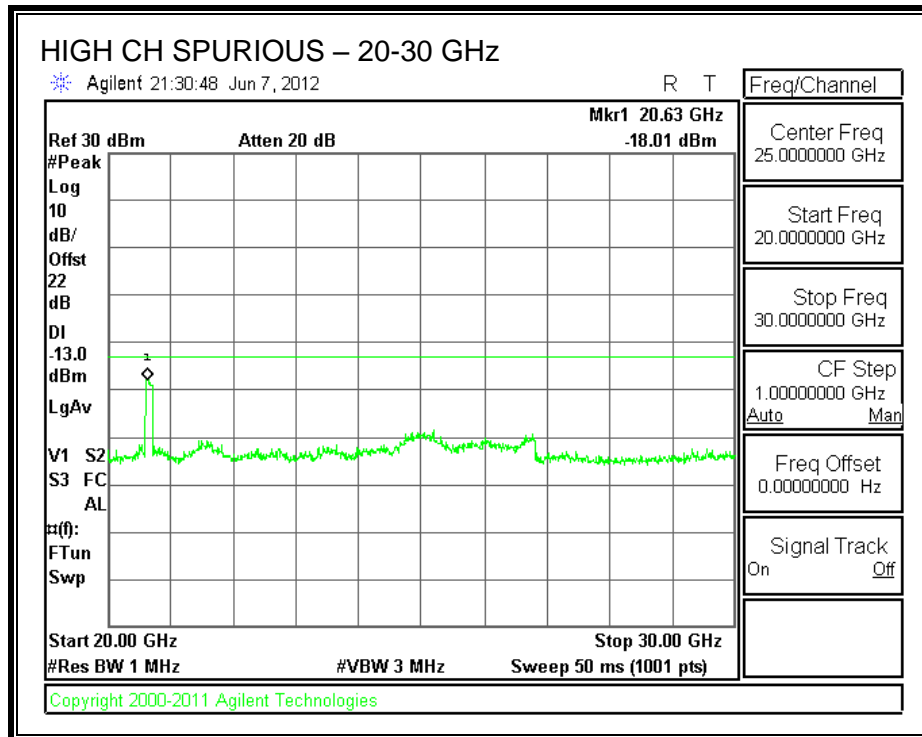
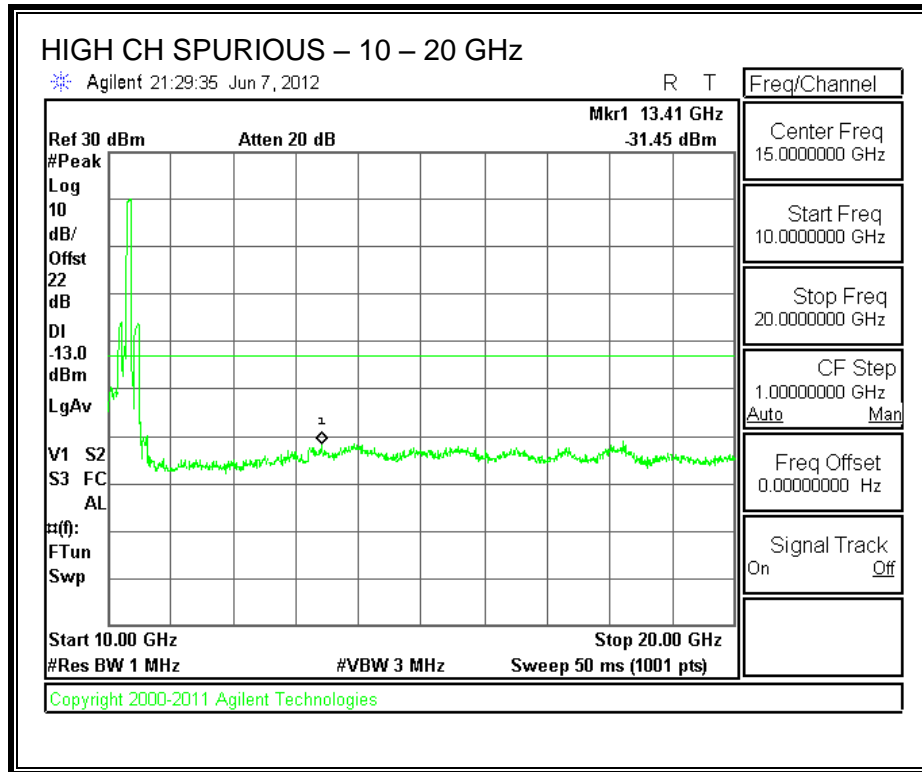


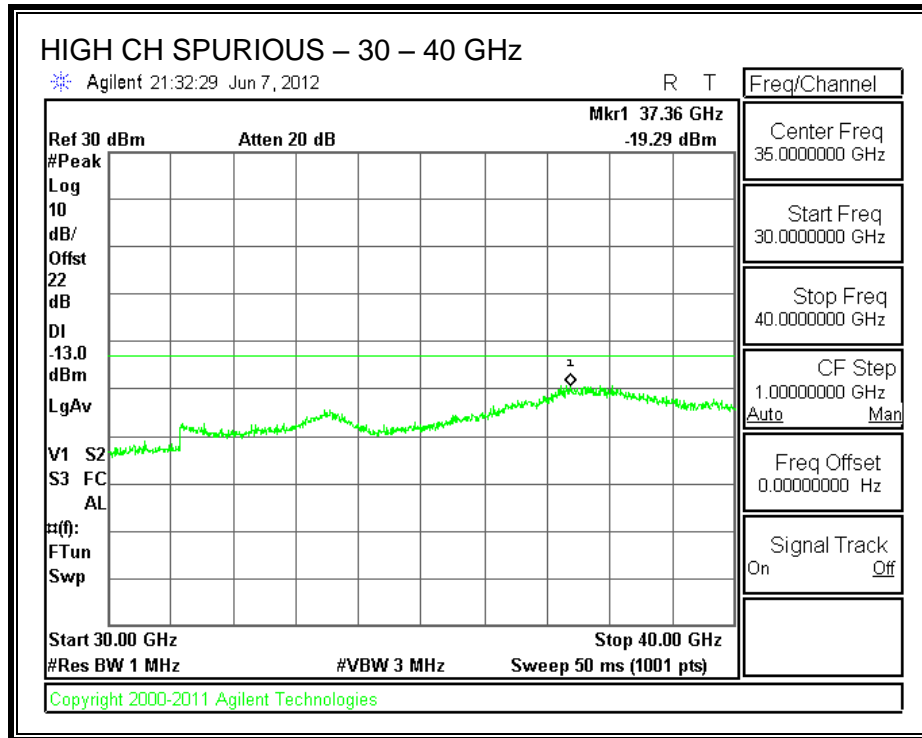


**SPURIOUS EMISSIONS, HIGH CHANNEL**









## 7.1.5. FREQUENCY STABILITY

### LIMIT

§90.213 (a) The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency, over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.3.1 and 2.3.2

### RESULTS

| Reference Frequency: EUT Channel 5 @ 20°C<br>Limit: $\pm 100$ ppm = 101447.224 kHz |                                 |   |              |                             |
|--|---------------------------------|---|--------------|-----------------------------|
| Power Supply<br>(Vac)  | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |              |                             |
|  |                                 | (MHz)   | Delta (ppm)  | Limit (ppm)                 |
| 115.00   | 60                              | 10144.6208900                                 | 0.100        | $\pm 100$                   |
| 115.00   | 50                              | 10144.6726100                                 | 0.049        | $\pm 100$                   |
| 115.00   | 40                              | 10144.7233100                                 | -0.001       | $\pm 100$                   |
| 115.00   | 30                              | 10144.7224000                                 | 0.000        | $\pm 100$                   |
| <b>115.00</b>  | <b>20</b>                       | <b>10144.7223700</b>                          | <b>0.000</b> | <b><math>\pm 100</math></b> |
| 115.00   | 10                              | 10144.8198200                                 | -0.096       | $\pm 100$                   |
| 115.00   | 0                               | 10144.7943800                                 | -0.071       | $\pm 100$                   |
| 115.00   | -10                             | 10144.7696400                                 | -0.047       | $\pm 100$                   |
| 115.00   | -20                             | 10144.7707100                                 | -0.048       | $\pm 100$                   |

## 8. RADIATED TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §90.210

13dBm (~ 82dBuV/m)

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 55 GHz is investigated with the transmitter set at the worst case channel.

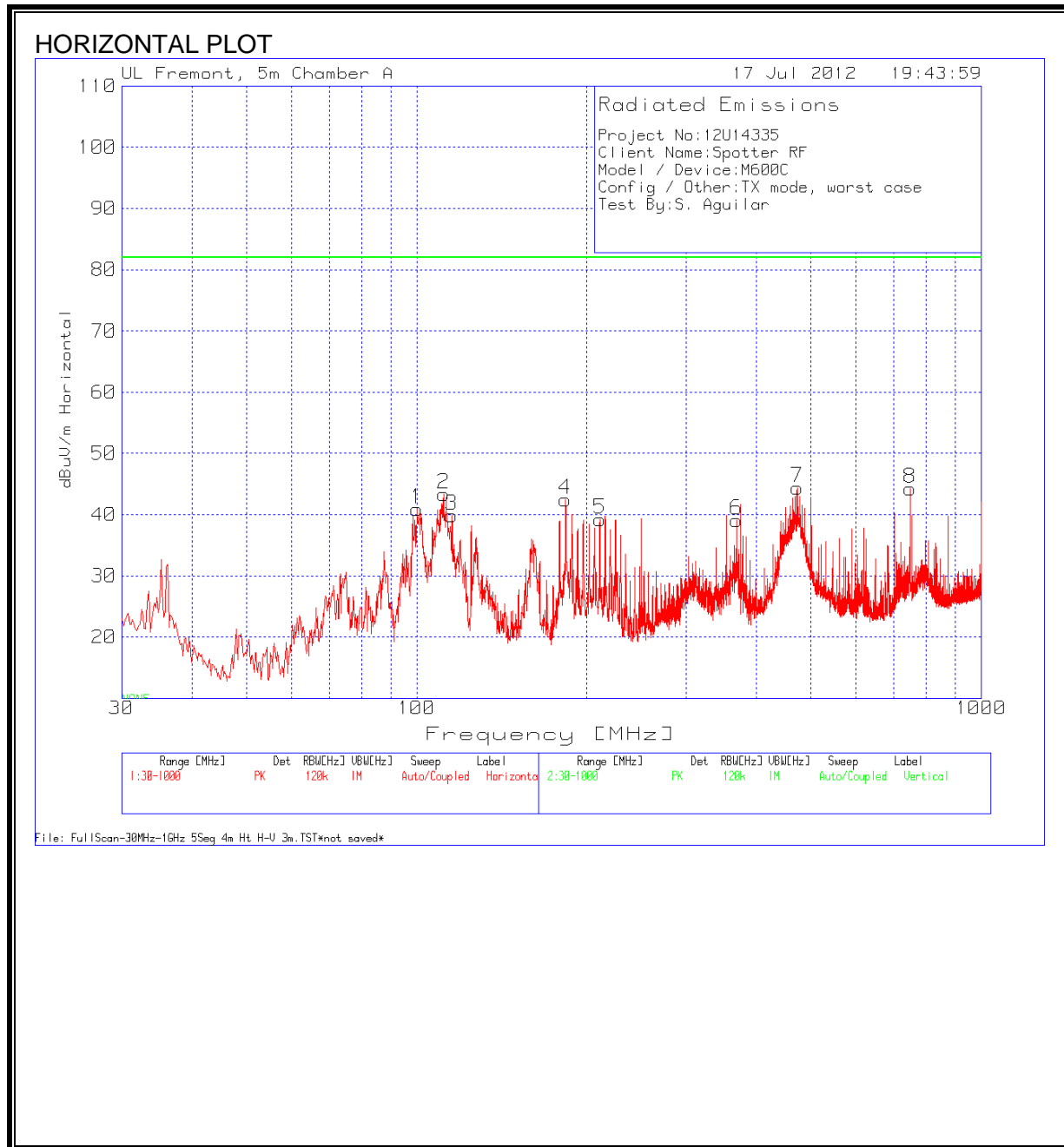
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

## 8.2. TRANSMITTER ABOVE 1 GHz

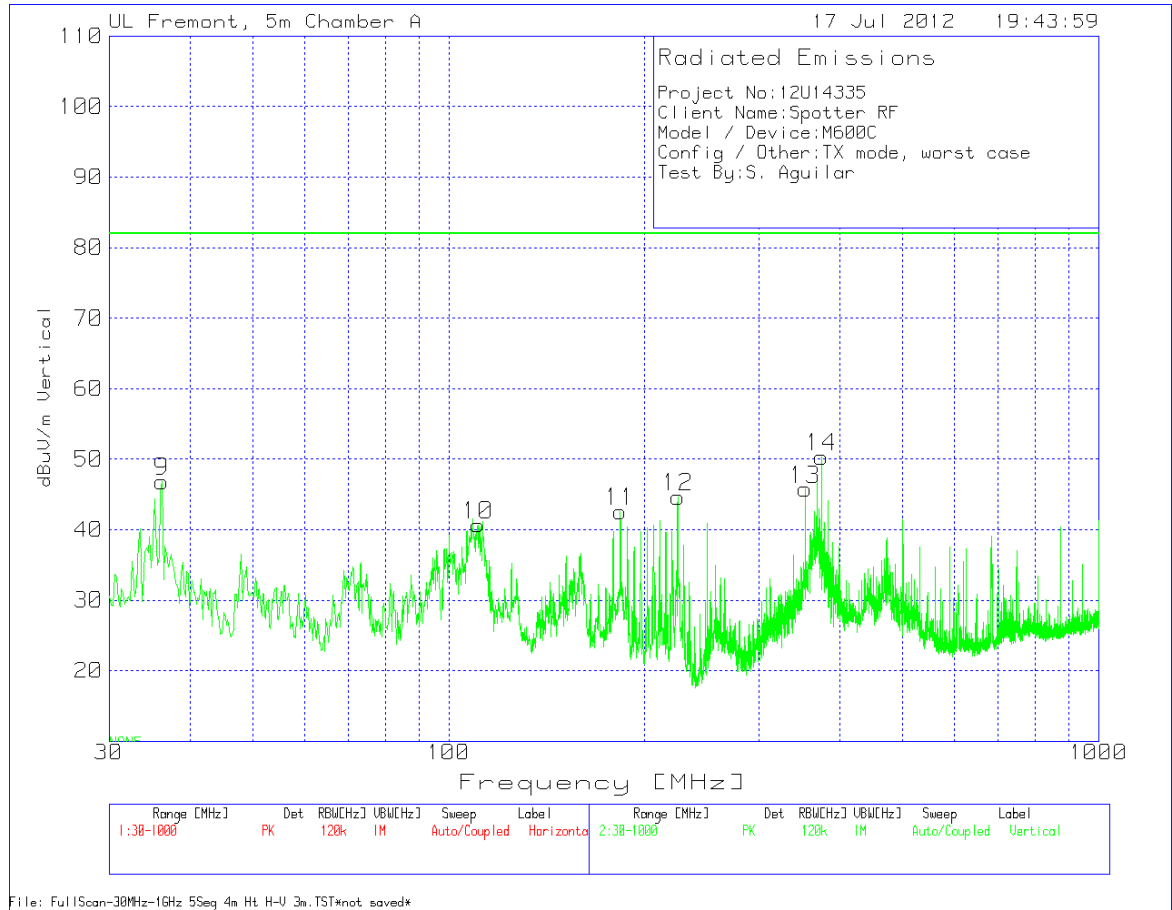
| <b>High Frequency Measurement</b><br>Compliance Certification Services, Fremont 5m Chamber-A  |                       |  |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
|---|-----------------------|--|--------------------------------|-----------------------|------------------------------|-----------|--------------|------------------------|----------------|---------------|------------------|-----------------------------|--------------|---------------|----------------|--|-----------------------|-----|-------------|---------|------------------------------|------|---------------------|--------|------------------------------|--------|---------------------------|------|------------------|-----|------------------------------|---------|--------------------------|----|----------------|------|--------------------------------|--------|-----------------------|----|------------|-----|------------------|--|--|
| Company:  |                       | Spotter RF                                     |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Project #:  |                       | 12U14355                                       |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Date:   |                       | 7/17/2012                                      |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Test Engineer:  |                       | S. Aguilar                                     |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Configuration:  |                       | EUT + POE module + laptop                      |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Mode:   |                       | TX Mode Worst Case. EUT normal op. orientation |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| <b>Test Equipment:</b>  |                       |  |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Horn 1-18GHz  |                       |  |                                | Pre-amplifier 1-26GHz |                              |           |              | Pre-amplifier 26-40GHz |                |               |                  | Horn > 18GHz                |              |               |                | Limit                                    |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| T73; S/N: 6717 @3m  |                       |  |                                | T144 Miteq 3008A00931 |                              |           |              | T88 Miteq 26-40GHz     |                |               |                  | T89; ARA 18-26GHz; S/N:1049 |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Hi Frequency Cables   |                       |  |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 3' cable 22807700   |                       |  |                                | 12' cable 22807600    |                              |           |              | 20' cable 22807500     |                |               |                  | HPF                         |              | Reject Filter |                | <u>Peak Measurements</u><br>RBW=VBW=1MHz |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 3' cable 22807700   |                       |  |                                | 12' cable 22807600    |                              |           |              | 20' cable 22807500     |                |               |                  |                             |              | R_001         |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| f<br>GHz  | Dist<br>(m)           | Read Pk<br>dBuV                                | Read Avg.<br>dBuV              | AF<br>dB/m            | CL<br>dB                     | Amp<br>dB | D Corr<br>dB | Ftr<br>dB              | Peak<br>dBuV/m | Avg<br>dBuV/m | Pk Lim<br>dBuV/m | Avg Lim<br>dBuV/m           | Pk Mar<br>dB | Avg Mar<br>dB | Notes<br>(V/H) |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 1.544   | 3.0                   | 46.08  | 32.73                          | 25.8                  | 3.4                          | -38.1     | 0.0          | 0.0                    | 37.2           | 23.8          | 82.0             |                             | -44.8        |               | H              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 13.614  | 3.0                   | 35.03  | 21.91                          | 40.6                  | 11.6                         | -34.8     | 0.0          | 0.0                    | 52.5           | 39.3          | 82.0             |                             | -29.5        |               | H              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 13.614  | 3.0                   | 35.03  | 21.91                          | 40.6                  | 11.6                         | -34.8     | 0.0          | 0.0                    | 52.5           | 39.3          | 82.0             |                             | -29.5        |               | H              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 20.650  | 3.0                   | 59.47  | 22.01                          | 33.3                  | 14.7                         | -34.1     | 0.0          | 0.0                    | 73.4           | 35.9          | 82.0             |                             | -8.6         |               | H              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 30.975  | 3.0                   | 43.06  | 30.68                          | 39.0                  | 12.7                         | -41.4     | 0.0          | 0.0                    | 53.4           | 41.0          | 82.0             |                             | -28.6        |               | H              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
|   |                       |  |                                |                       |                              |           |              |                        |                |               | 82.0             |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 1.579   | 3.0                   | 45.44  | 32.92                          | 25.9                  | 3.4                          | -38.0     | 0.0          | 0.0                    | 36.7           | 24.2          | 82.0             |                             | -45.3        |               | V              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 13.619  | 3.0                   | 35.01  | 21.92                          | 40.6                  | 11.6                         | -34.8     | 0.0          | 0.0                    | 52.5           | 39.4          | 82.0             |                             | -29.5        |               | V              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 20.650  | 3.0                   | 60.43  | 21.95                          | 33.3                  | 14.7                         | -34.1     | 0.0          | 0.0                    | 74.3           | 35.8          | 82.0             |                             | -7.7         |               | V              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| 30.975  | 3.0                   | 44.54  | 30.74                          | 39.0                  | 12.7                         | -41.4     | 0.0          | 0.0                    | 54.9           | 41.1          | 82.0             |                             | -27.1        |               | V              |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
|   |                       |  |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Rev. 11.10.11 <span style="float: right;">No other emissions above the noise floor detected up to 55 GHz.</span>  |                       |  |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">f</td> <td style="width: 35%;">Measurement Frequency</td> <td style="width: 15%;">Amp</td> <td style="width: 35%;">Preamp Gain</td> <td style="width: 15%;">Avg Lim</td> <td style="width: 35%;">Average Field Strength Limit</td> </tr> <tr> <td>Dist</td> <td>Distance to Antenna</td> <td>D Corr</td> <td>Distance Correct to 3 meters</td> <td>Pk Lim</td> <td>Peak Field Strength Limit</td> </tr> <tr> <td>Read</td> <td>Analyzer Reading</td> <td>Avg</td> <td>Average Field Strength @ 3 m</td> <td>Avg Mar</td> <td>Margin vs. Average Limit</td> </tr> <tr> <td>AF</td> <td>Antenna Factor</td> <td>Peak</td> <td>Calculated Peak Field Strength</td> <td>Pk Mar</td> <td>Margin vs. Peak Limit</td> </tr> <tr> <td>CL</td> <td>Cable Loss</td> <td>HPF</td> <td>High Pass Filter</td> <td></td> <td></td> </tr> </table> |                       |  |                                |                       |                              |           |              |                        |                |               |                  |                             |              |               |                | f  | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit | Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit | Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | Avg Mar | Margin vs. Average Limit | AF | Antenna Factor | Peak | Calculated Peak Field Strength | Pk Mar | Margin vs. Peak Limit | CL | Cable Loss | HPF | High Pass Filter |  |  |
| f   | Measurement Frequency | Amp  | Preamp Gain                    | Avg Lim               | Average Field Strength Limit |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Dist  | Distance to Antenna   | D Corr   | Distance Correct to 3 meters   | Pk Lim                | Peak Field Strength Limit    |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| Read  | Analyzer Reading      | Avg  | Average Field Strength @ 3 m   | Avg Mar               | Margin vs. Average Limit     |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| AF  | Antenna Factor        | Peak   | Calculated Peak Field Strength | Pk Mar                | Margin vs. Peak Limit        |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |
| CL  | Cable Loss            | HPF  | High Pass Filter               |                       |                              |           |              |                        |                |               |                  |                             |              |               |                |  |                       |     |             |         |                              |      |                     |        |                              |        |                           |      |                  |     |                              |         |                          |    |                |      |                                |        |                       |    |            |     |                  |  |  |

### 8.3. WORST-CASE BELOW 1 GHz

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION,)



### VERTICAL PLOT



# HORIZONTAL AND VERTICAL DATA

**Company Name:** Spotter RF  
**Project:** 12U14335  
**Date:** 7/17/2012  
**Configuraiton:** EUT + POE adapter + EUT  
**Mode:** TX, worst case  
**Tested by:** S.Aguilar

| Test Frequency [MHz]        | Meter Reading [dB(μV)] | Detector | Pre Amp Factor [dB] | Antenna Factor [dB/m] | Corrected [dB(μV/m)] | Class B PK limit [dB(μV/m)] | QP Margin [dB] | Height [cm] | Polarity |
|-----------------------------|------------------------|----------|---------------------|-----------------------|----------------------|-----------------------------|----------------|-------------|----------|
| <b>Range 1 30 - 1000MHz</b> |                        |          |                     |                       |                      |                             |                |             |          |
| 100.1719                    | 57.45                  | PK       | -26.9               | 10.3                  | 40.85                | 82                          | -41.15         | 300         | Horz     |
| 111.6087                    | 57.01                  | PK       | -26.7               | 13                    | 43.31                | 82                          | -38.69         | 300         | Horz     |
| 115.4856                    | 53.18                  | PK       | -26.8               | 13.5                  | 39.88                | 82                          | -42.12         | 300         | Horz     |
| 183.5252                    | 57.69                  | PK       | -26.4               | 11.1                  | 42.39                | 82                          | -39.61         | 100         | Horz     |
| 211.245                     | 54.99                  | PK       | -26.1               | 10.3                  | 39.19                | 82                          | -42.81         | 100         | Horz     |
| 368.6471                    | 49.4                   | PK       | -25.5               | 15.2                  | 39.1                 | 82                          | -42.9          | 300         | Horz     |
| 471.9664                    | 52.17                  | PK       | -25                 | 17.2                  | 44.37                | 82                          | -37.63         | 200         | Horz     |
| 749.94                      | 46.88                  | PK       | -23.3               | 20.7                  | 44.28                | 82                          | -37.72         | 100         | Horz     |
|                             |                        |          |                     |                       |                      |                             |                |             |          |
| <b>Range 2 30 - 1000MHz</b> |                        |          |                     |                       |                      |                             |                |             |          |
| 36.203                      | 57.5                   | PK       | -27.5               | 16.8                  | 46.8                 | 82                          | -35.2          | 100         | Vert     |
| 110.8333                    | 54.5                   | PK       | -26.7               | 12.9                  | 40.7                 | 82                          | -41.3          | 100         | Vert     |
| 183.719                     | 57.86                  | PK       | -26.4               | 11.1                  | 42.56                | 82                          | -39.44         | 100         | Vert     |
| 225.2018                    | 60.07                  | PK       | -26                 | 10.6                  | 44.67                | 82                          | -37.33         | 100         | Vert     |
| 353.9149                    | 56.63                  | PK       | -25.6               | 14.7                  | 45.73                | 82                          | -36.27         | 100         | Vert     |
| 374.8501                    | 60.5                   | PK       | -25.4               | 15.2                  | 50.3                 | 82                          | -31.7          | 100         | Vert     |
|                             |                        |          |                     |                       |                      |                             |                |             |          |

PK - Peak detector  
QP - Quasi-peak detector

## 9. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

| Frequency of Emission (MHz) | Conducted Limit (dBuV) |                       |
|-----------------------------|------------------------|-----------------------|
|                             | Quasi-peak             | Average               |
| 0.15-0.5                    | 66 to 56 <sup>*</sup>  | 56 to 46 <sup>*</sup> |
| 0.5-5                       | 56                     | 46                    |
| 5-30                        | 60                     | 50                    |

<sup>\*</sup> Decreases with the logarithm of the frequency.

### TEST PROCEDURE

ANSI C63.4

### RESULTS

Test not required as EUT is powered using the Ethernet connection.