



## EMC Test Data

|                 |                    |               |             |
|-----------------|--------------------|---------------|-------------|
| Client:         | Bitrage            | Job Number:   | J42216      |
| Model:          | 5.3 & 5.8 GHz UNII | T-Log Number: | T42491      |
|                 |                    | Proj Eng:     | Mark Briggs |
| Contact:        | Chet Ferry         |               |             |
| Emissions Spec: | 15.407             | Class:        | N/A         |
| Immunity Spec:  | -                  | Environment:  | -           |

## EMC Test Data

For The

**Bitrage**

Model

**5.3 & 5.8 GHz UNII**



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| Emissions Spec: | 15.407             | Class:        | N/A         |
| Immunity Spec:  | -                  | Environment:  | -           |

### EUT INFORMATION

#### General Description

The EUT is a UNII radio which is designed to operate in fixed link, point-to-point applications in the 5.25-5.35 and 5.725-5.825 GHz bands. Normally, the EUT would be mounted to a pole during operation. During radiated emissions testing the EUT was mounted on a pole such that it was at a height of 1m above the ground. The EUT was connected to a 2' or 6' dish antenna as appropriate for the frequency band being tested.

The EUT is powered from a dual voltage dc supply. During testing a bench power supply was used. When installed the end-user is responsible for providing dc power from a distributed dc power network or other dc power source.

#### Equipment Under Test

| Manufacturer | Model     | Description              | Serial Number | FCC ID        |
|--------------|-----------|--------------------------|---------------|---------------|
| BitRage      | CR45-A-58 | 5.8GHz UNII Transceiver  | N/A           | PGK-CR45-A-58 |
| BitRage      | CR45-A-53 | 5.3GHz UNII Transceiver  | N/A           | PGK-CR45-A-53 |
| RadioWave    | SP2-5.2NS | 2' Dish antenna (28dBi)  | 297           | N/A           |
| RadioWave    | SP6-5.2   | 6' Dish antenna (37 dBi) | N/A           | N/A           |
| RadioWave    | SP3-5.2   | 3' Dish antenna (31 dBi) | N/A           | N/A           |

#### Other EUT Details

The EUT operates at T3 data rates (44.736 Mb/s). One side of the link transmits in the 5.25 - 5.35 GHz band using a 2' diameter dish antenna with a gain of 28dBi. The other side of the link transmits in the 5.725 - 5.825 GHz band at two different power levels. The low power level can utilize dish antennas up to a maximum diameter of 6' (gain = 37dBi). The higher power level can utilize a dish of up to 3' in diameter (31dBi gain).



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| Emissions Spec: | 15.407             | Class:        | N/A         |
| Immunity Spec:  | -                  | Environment:  | -           |

### EUT Enclosure

The EUT enclosure is primarily constructed of fabricated sheet steel. It measures approximately 10 cm wide by 10 cm deep by 25 cm high.

### Modification History

| Mod. # | Test | Date | Modificaiton |
|--------|------|------|--------------|
| 1      |      |      |              |



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| Emissions Spec: | 15.407             | Class:        | N/A         |
| Immunity Spec:  | -                  | Environment:  | -           |

### Test Configuration #1

#### Local Support Equipment

| Manufacturer | Model   | Description     | Serial Number | FCC ID |
|--------------|---------|-----------------|---------------|--------|
| Tenma        | 72-6615 | DC Power supply | 9912036       | N/A    |

#### Remote Support Equipment

| Manufacturer    | Model     | Description   | Serial Number | FCC ID |
|-----------------|-----------|---------------|---------------|--------|
| Sunrise Telecom | Sunset T3 | T3 BER tester | 9027          | DoC    |

#### EUT Interface Ports

| EUT Port | Connected To       | Cable(s)                                   |                        |           |
|----------|--------------------|--------------------------------------------|------------------------|-----------|
|          |                    | Description                                | Shielded or Unshielded | Length(m) |
| DC Power | DC Power meter     | Alpha 3223 SL005                           | Shielded               | 30        |
| T3 Rx/Tx | BER Tester         | 75 ohm coaxial (x2)                        | Shielded               | 15        |
| Antenna  | Antenna (note 1,2) | 50 ohm coaxial (Belden 9913 or equivalent) | Shielded               | 1         |

- Note 1: The antenna port was connected to the spectrum analyzer or power meter for measurements made directly on the antenna port. The antenna port was connected to an antenna for radiated spurious emissions.
- Note 2: The 5.3 GHz radio was connected to the 2' diameter dish, which represents the highest gain antenna that is intended to be used with the 5.3GHz radio. The 5.8 GHz radio was connected to a 6' dish and operated at full power. The high power setting is intended to be used with antennas up to 3' in diameter and the 6' dish is only intended to be used with the low power setting. For testing the purposes the combination of high power setting and high gain antenna were used since this configuration would represent the worst case configuration with respect to radiated spurious emissions.

#### EUT Operation During Emissions

The EUT was configured to constantly transmit a pseudo random data sequence generated by the BER tester at the output power detailed for each test.



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|          |                    |               |             |
|----------|--------------------|---------------|-------------|
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|          |                    | Proj Eng:     | Mark Briggs |
| Contact: | Chet Ferry         |               |             |
| Spec:    | 15.407             | Class:        | N/A         |

### FCC Part 15 Subpart E Tests - 5.8GHz Radio (Low Power)

#### Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 3/14/2001  
Test Engineer: J Martinez, M Briggs  
Test Location: Chamber #2

Config. Used: #1  
Config Change: N/A  
EUT Voltage: DC

#### General Test Configuration

The EUT was located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 15 meters from the EUT with all I/O connections running on top of the groundplane.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT unless stated otherwise.

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

**Ambient Conditions:** Temperature: 25°C  
Rel. Humidity: 51%

#### Summary of Results

| Run # | Test Performed                            | Limit         | Result | Margin             |
|-------|-------------------------------------------|---------------|--------|--------------------|
| 1     | Output Power                              | 15.407(a) (3) | Pass   |                    |
| 2     | Power Spectral Density (PSD)              | 15.407(a) (3) | Pass   |                    |
| 3     | 26dB Bandwidth                            | 15.407        | N/A    |                    |
| 4     | Peak Excursion Envelope                   | 15.407(a) (6) | Pass   |                    |
| 5     | Antenna Conducted - Out of Band Spurious  | 15.407(b)     | Pass   |                    |
| 6     | RE, 1000 - 40000 MHz - Spurious Emissions | 15.407(b)(6)  | Pass   | -13.7dB @ 23099MHz |



## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Modifications Made During Testing:

No modifications were made to the EUT during testing

### Deviations From The Standard

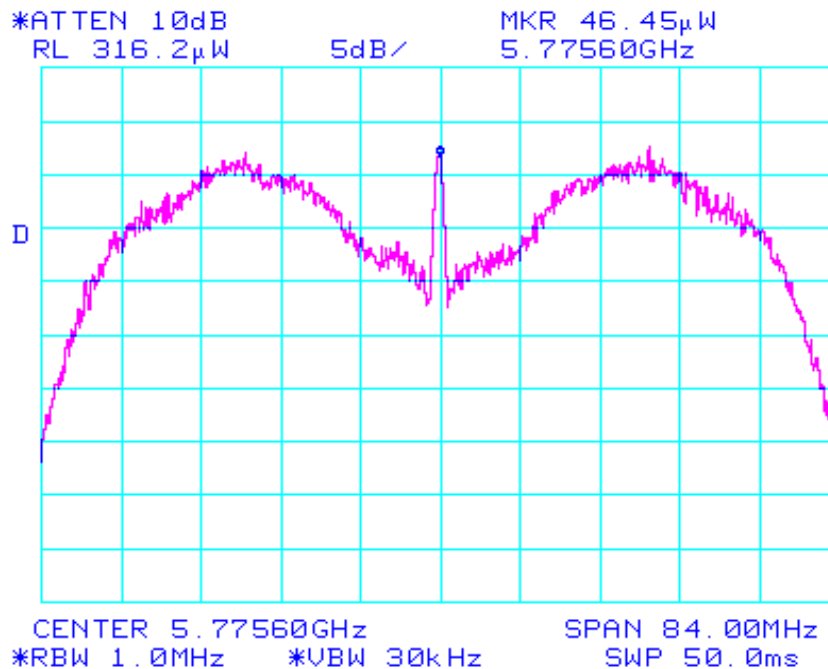
No deviations were made from the requirements of the standard.

### Run #1: Output Power

The maximum antenna gain that can be used with the 5.8 GHz radio at the low output power is 37dBi (6' dish). The maximum power output for this setting is, therefore, 30 - (37-23) dBm, which is 16dBm.

| Channel | Frequency (MHz) | Res BW | Output Power | Graph reference # |
|---------|-----------------|--------|--------------|-------------------|
| Low     | 5775            | N/A    | 1.7dBm       | Power Meter       |
| Low     | 5775            | N/A    | 1.2dBm       | Note 1            |

Note 1: Measured using spectrum analyzer (RBW = 1MHz, VBW = 30kHz) and summing the power in each 1MHz band across the entire emission bandwidth. Data is attached under "Output Power"





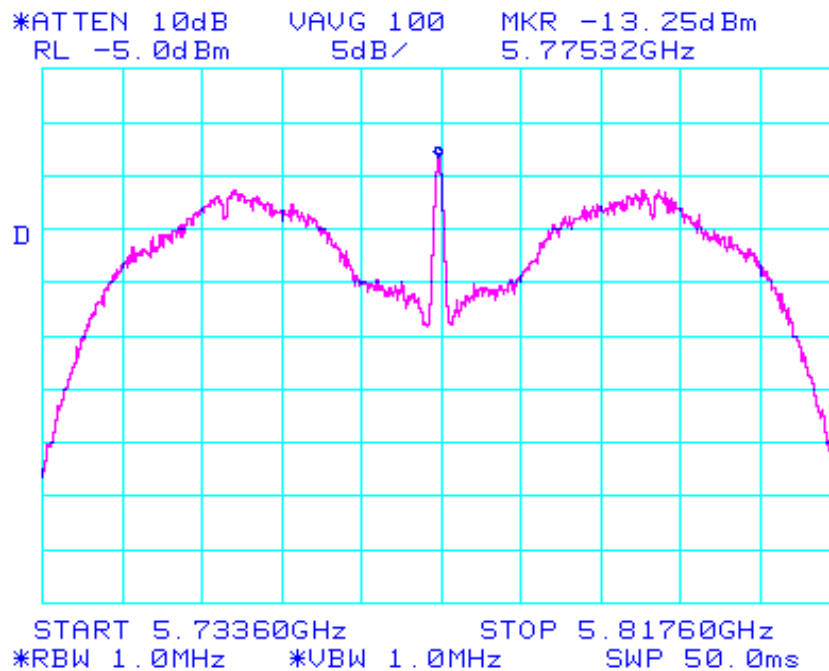
## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #2: Power Spectral Density

The maximum antenna gain that can be used with the 5.8 GHz radio at the low output power is 37dBi (6' dish). The maximum power spectral density for this setting is, therefore, 17 - (37-23) dBm, which is 3dBm.

| Channel | Frequency (MHz) | Res BW | P.S.D. in 1MHz, Video averaging of 100 samples. | Graph reference # |
|---------|-----------------|--------|-------------------------------------------------|-------------------|
| N/A     | 5775            | 1MHz   | -13.1dBm                                        | None              |



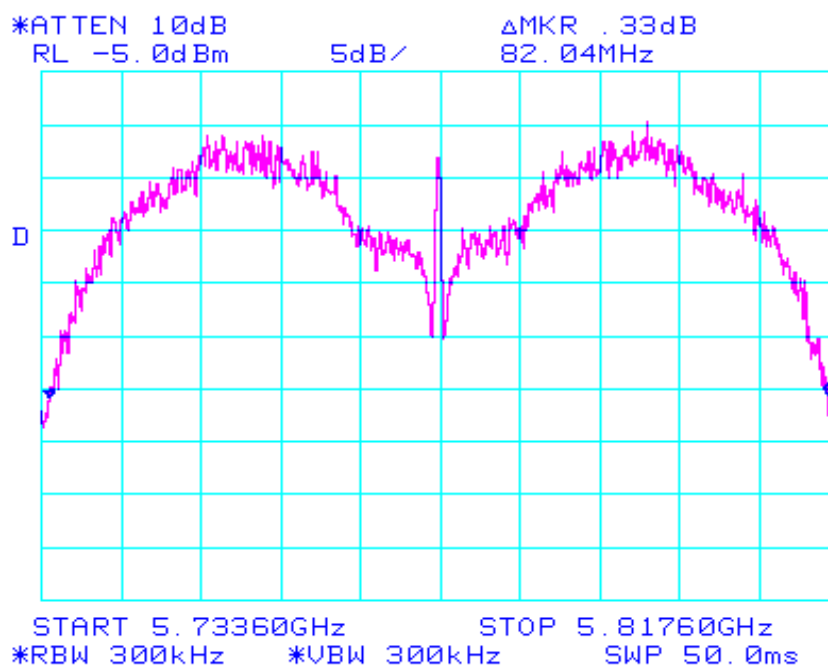


## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #3: Signal Bandwidth

| Channel | Frequency (MHz) | Resolution Bandwidth | 26dB Signal Bandwidth | Graph reference # |
|---------|-----------------|----------------------|-----------------------|-------------------|
| N/A     | 5775            | 300kHz               | 82.04 MHz             |                   |



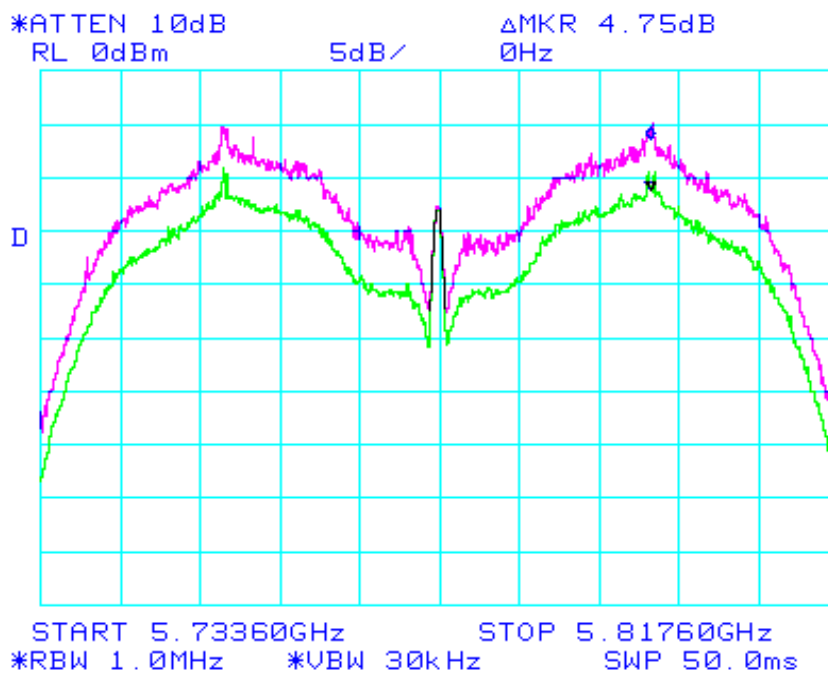


## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #4: Peak Excursion Measurement

The plot shows that the peak excursion was less than 13dB (approximately 4.5dB worst case)





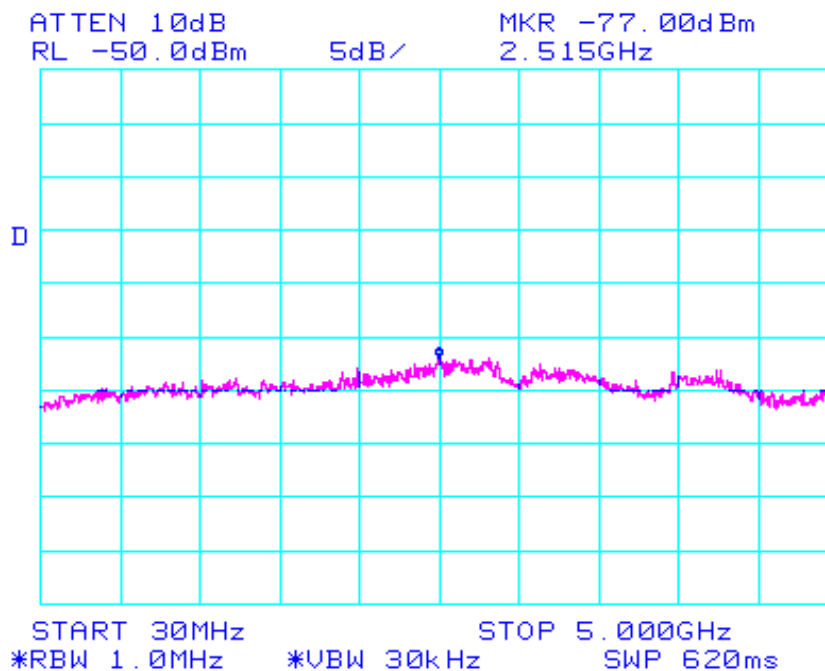
## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #5: Out Of Band Spurious Emissions - Antenna Conducted

The maximum antenna gain that can be used with the 5.8 GHz radio at the low output power is 37dBi (6' dish). The EIRP limit is -17dBm for signals within 10 MHz of the band edge and -27dBm/MHz for all other signal. For signals within 10MHz of the band edge a limit of -54 dBm was used and for all other signals within 100 MHz of the band edge a limit of -64dBm was used. These limits assumed that the antenna gain at the band edges is the same as the in-band antenna gain. For signals removed from the band edge by more than 100MHz, radiated measurements were made (refer to run #6).

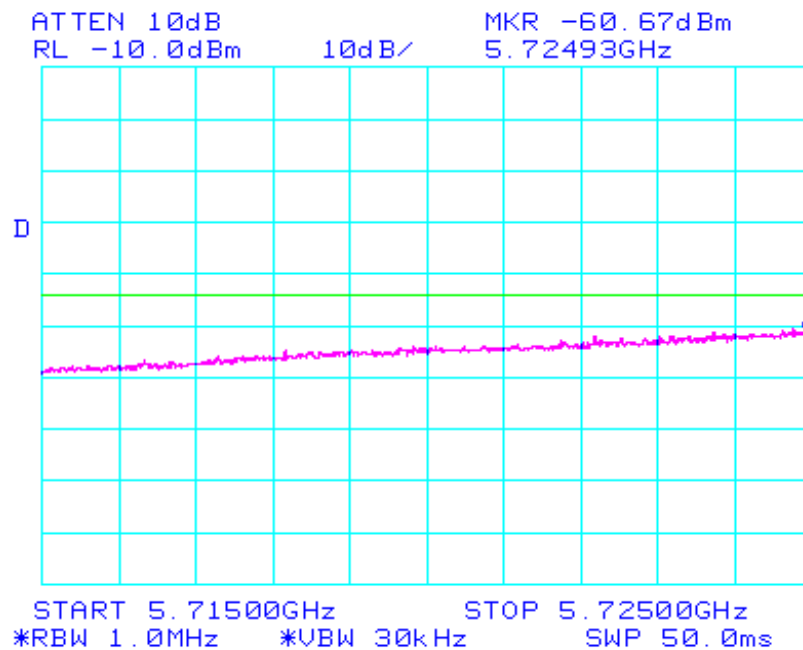
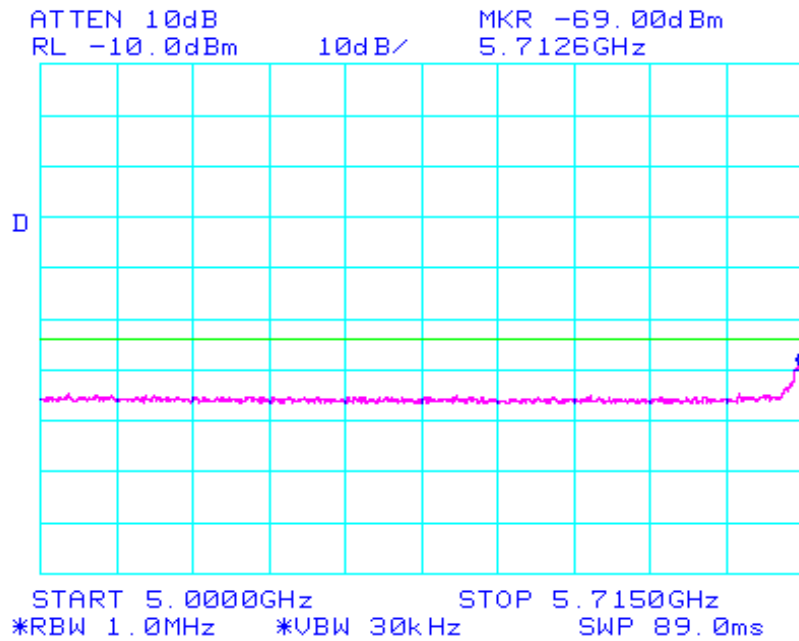
The highest signal within 10MHz of the band-edge was -60.7dBm. The highest signal removed by more than 10MHz but less than 100 MHz from the band edge was -67dBm. The only other signal observed above the instrumentation noise floor was at 28.875GHz (-68.9dBm). The EIRP was measured via a field strength measurement (refer to run #6).





## EMC Test Data

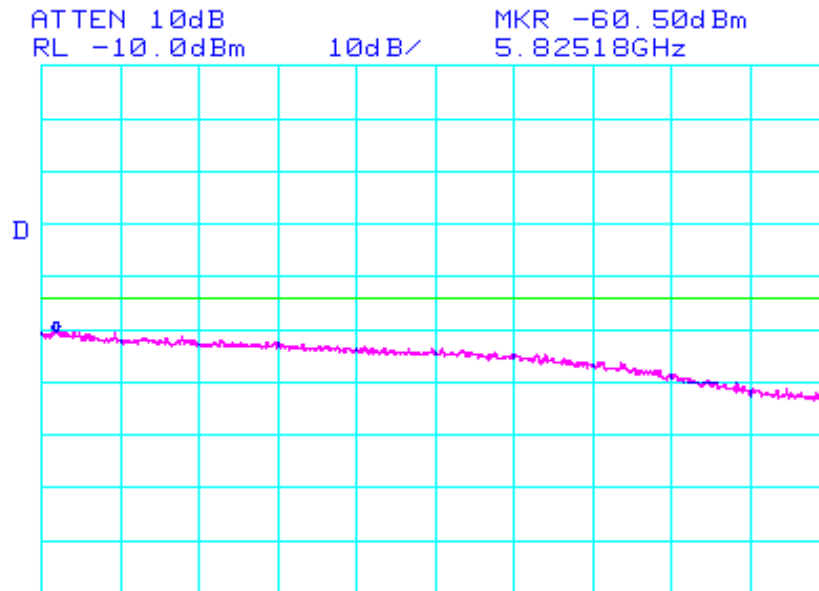
|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |



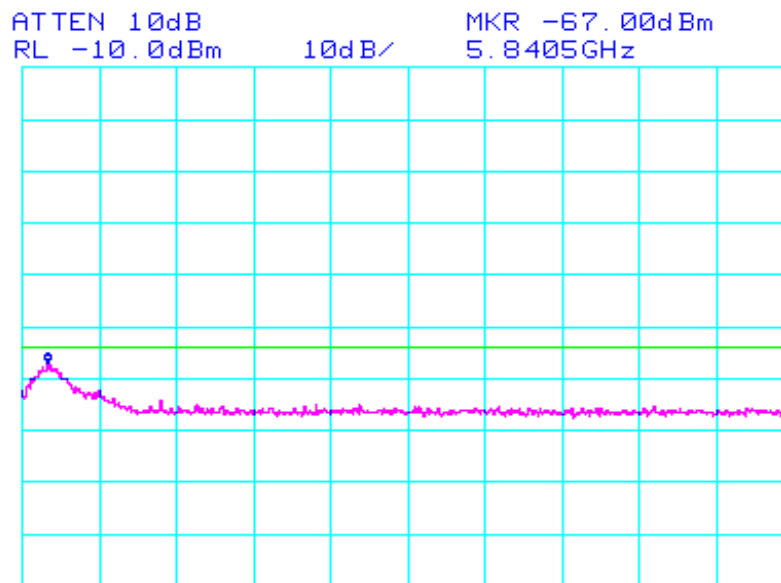


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| Client: Bitrage           | Job Number: J42216    |
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| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |



START 5.82500GHz STOP 5.83500GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 50.0ms

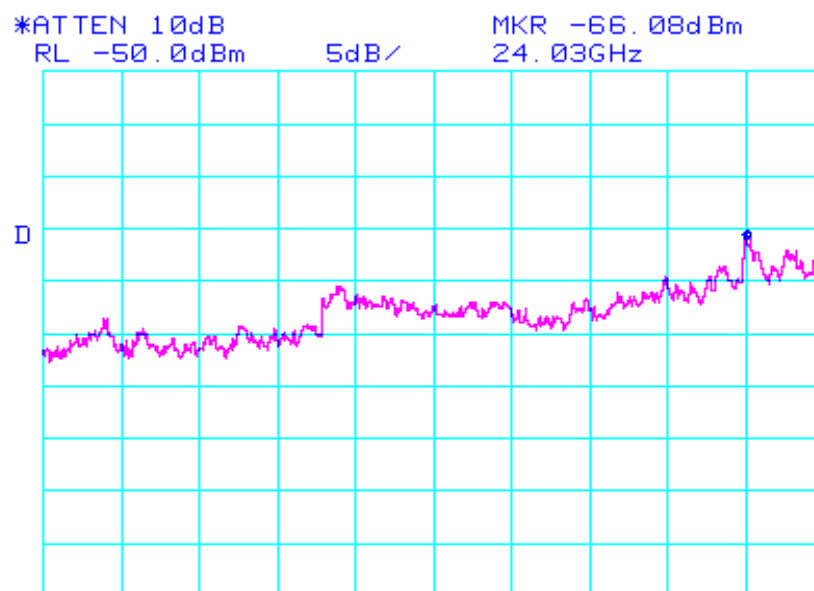


START 5.8350GHz STOP 6.0000GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 50.0ms

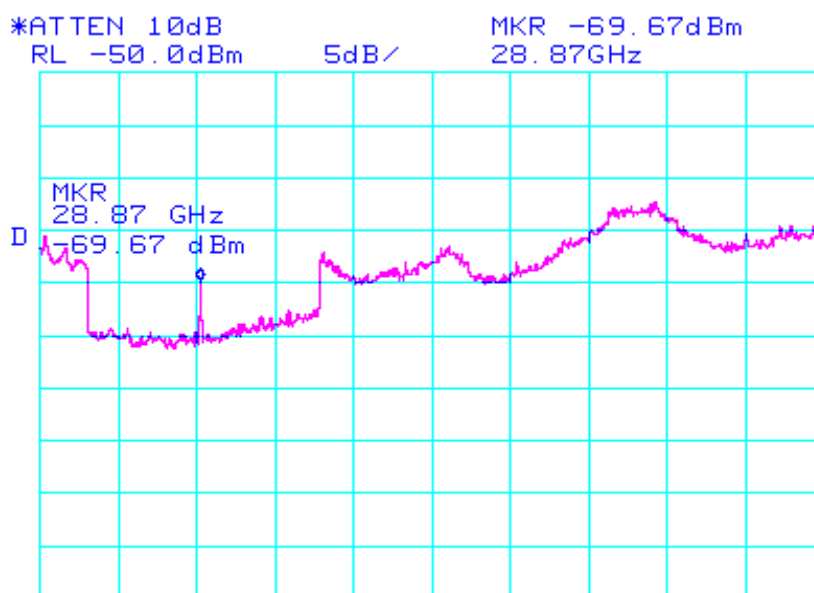


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| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |



START 6.00GHz STOP 26.00GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 2.50sec



START 26.00GHz STOP 40.00GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 1.80sec



## EMC Test Data

|          |                    |               |             |
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| Model:   | 5.3 & 5.8 GHz UNII | T-Log Number: | T42491      |
|          |                    | Proj Eng:     | Mark Briggs |
| Contact: | Chet Ferry         |               |             |
| Spec:    | 15.407             | Class:        | N/A         |

### Run #6: Radiated Spurious Emissions, 1000 - 40000 MHz

Spurious emissions from 30 - 1000 MHz were measured while performing emissions measurements of the digital device. The emissions were below the FCC Class B limit (refer to T42466).

Spurious emissions above 1000 MHz are covered by the radiated measurements performed on the 5.8GHz radio configured for maximum output power and connected to a 6' dish antenna (37dBi).

**Output Power - 5.8GHz Radio operating at Low Power:** Measured by summing the power measured on the analyzer (RBW=1MHz, VBW=30kHz)

| Frequency (MHz) | Power (mW) | Frequency (MHz) | Power (mW) |
|-----------------|------------|-----------------|------------|
| 5733.6          | 0.0001     | 5774.8          | 0.0071     |
| 5734.6          | 0.0002     | 5775.7          | 0.0341     |
| 5735.6          | 0.0004     | 5776.7          | 0.0026     |
| 5736.5          | 0.0006     | 5777.7          | 0.0041     |
| 5737.5          | 0.0017     | 5778.7          | 0.0046     |
| 5738.5          | 0.0019     | 5779.7          | 0.0053     |
| 5739.5          | 0.0030     | 5780.6          | 0.0042     |
| 5740.5          | 0.0053     | 5781.6          | 0.0048     |
| 5741.4          | 0.0076     | 5782.6          | 0.0046     |
| 5742.4          | 0.0091     | 5783.6          | 0.0060     |
| 5743.4          | 0.0086     | 5784.6          | 0.0081     |
| 5744.4          | 0.0096     | 5785.5          | 0.0136     |
| 5745.4          | 0.0121     | 5786.5          | 0.0117     |
| 5746.3          | 0.0181     | 5787.5          | 0.0224     |
| 5747.3          | 0.0136     | 5788.5          | 0.0203     |
| 5748.3          | 0.0150     | 5789.5          | 0.0266     |
| 5749.3          | 0.0185     | 5790.4          | 0.0266     |
| 5750.3          | 0.0220     | 5791.4          | 0.0287     |
| 5751.2          | 0.0299     | 5792.4          | 0.0271     |
| 5752.2          | 0.0362     | 5793.4          | 0.0335     |
| 5753.2          | 0.0369     | 5794.4          | 0.0299     |
| 5754.2          | 0.0430     | 5795.3          | 0.0261     |
| 5755.2          | 0.0414     | 5796.3          | 0.0406     |
| 5756.1          | 0.0341     | 5797.3          | 0.0348     |
| 5757.1          | 0.0266     | 5798.3          | 0.0362     |
| 5758.1          | 0.0304     | 5799.3          | 0.0348     |
| 5759.1          | 0.0211     | 5800.2          | 0.0246     |
| 5760.1          | 0.0271     | 5801.2          | 0.0211     |
| 5761.0          | 0.0282     | 5802.2          | 0.0261     |
| 5762.0          | 0.0256     | 5803.2          | 0.0207     |
| 5763.0          | 0.0168     | 5804.2          | 0.0117     |
| 5764.0          | 0.0141     | 5805.1          | 0.0136     |
| 5765.0          | 0.0133     | 5806.1          | 0.0121     |
| 5765.9          | 0.0075     | 5807.1          | 0.0144     |
| 5766.9          | 0.0054     | 5808.1          | 0.0112     |
| 5767.9          | 0.0063     | 5809.1          | 0.0098     |
| 5768.9          | 0.0047     | 5810.0          | 0.0079     |
| 5769.9          | 0.0066     | 5811.0          | 0.0046     |
| 5770.8          | 0.0049     | 5812.0          | 0.0029     |
| 5771.8          | 0.0060     | 5813.0          | 0.0019     |
| 5772.8          | 0.0049     | 5814.0          | 0.0013     |
| 5773.8          | 0.0044     | 5814.9          | 0.0005     |

Total (mW) 1.306

Total (dBm) 1.2



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|          |                    | Proj Eng:     | Mark Briggs |
| Contact: | Chet Ferry         |               |             |
| Spec:    | 15.407             | Class:        | N/A         |

### FCC Part 15 Subpart E Tests - 5.8GHz Radio (High Power)

#### Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 3/14/2001  
Test Engineer: J Martinez, M Briggs  
Test Location: Chamber #2, SV #3

Config. Used: #1  
Config Change: N/A  
EUT Voltage: 14Vdc and 18Vdc

#### General Test Configuration

The EUT was located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 15 meters from the EUT with all I/O connections running on top of the groundplane.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT unless stated otherwise.

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

**Ambient Conditions:** Temperature: 19.3°C  
Rel. Humidity: 66%

#### Summary of Results

| Run # | Test Performed                            | Limit         | Result | Margin             |
|-------|-------------------------------------------|---------------|--------|--------------------|
| 1     | Output Power                              | 15.407(a) (3) | Pass   |                    |
| 2     | Power Spectral Density (PSD)              | 15.407(a) (3) | Pass   |                    |
| 3     | 26dB Bandwidth                            | 15.407        | N/A    |                    |
| 4     | Peak Excursion Envelope                   | 15.407(a) (6) | Pass   |                    |
| 5     | Antenna Conducted - Out of Band Spurious  | 15.407(b)     | Pass   |                    |
| 6     | RE, 1000 - 40000 MHz - Spurious Emissions | 15.407(b)(6)  | Pass   | -13.7dB @ 23099MHz |



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| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Modifications Made During Testing:

No modifications were made to the EUT during testing

### Deviations From The Standard

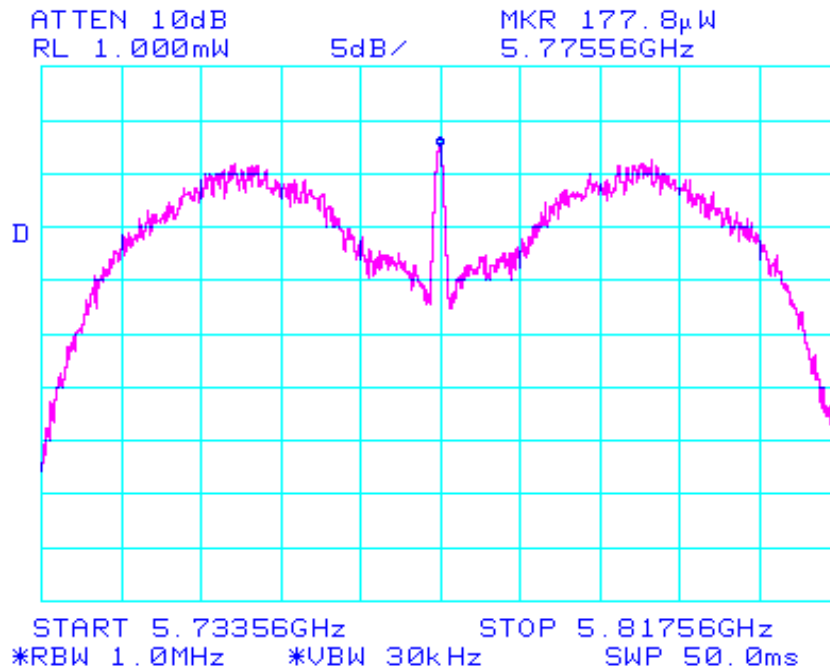
No deviations were made from the requirements of the standard.

### Run #1: Output Power

The maximum antenna gain that can be used with the 5.8 GHz radio at maximum output power is 31dBi (3' dish). The maximum power output is, therefore, 30 - (31-23) dBm, which is 22dBm.

| Channel | Frequency (MHz) | Res BW | Output Power | Graph reference # |
|---------|-----------------|--------|--------------|-------------------|
| Low     | 5775            | N/A    | 6.4 dBm      | Power Meter       |
| Low     | 5775            | N/A    | 5.5 dBm      | Note 1            |

Note 1: Measured using spectrum analyzer (RBW = 1MHz, VBW = 30kHz) and summing the power in each 1MHz band across the entire emission bandwidth. Data is attached under "Output Power"





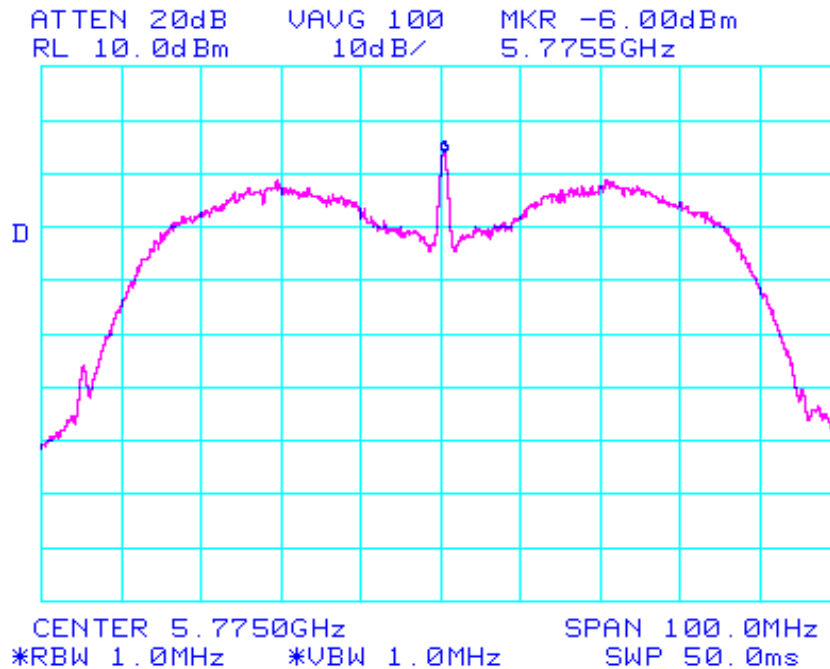
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| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #2: Power Spectral Density

The maximum antenna gain that can be used with the 5.8 GHz radio at maximum output power is 31dBi (3' dish). The maximum power output is, therefore, 17 - (31-23) dBm, which is 9dBm.

| Channel | Frequency (MHz) | Res BW | P.S.D. in 1MHz, Video averaging of 100 samples. | Graph reference # |
|---------|-----------------|--------|-------------------------------------------------|-------------------|
| Low     | 5775            | 1 MHz  | -6dBm                                           | None              |



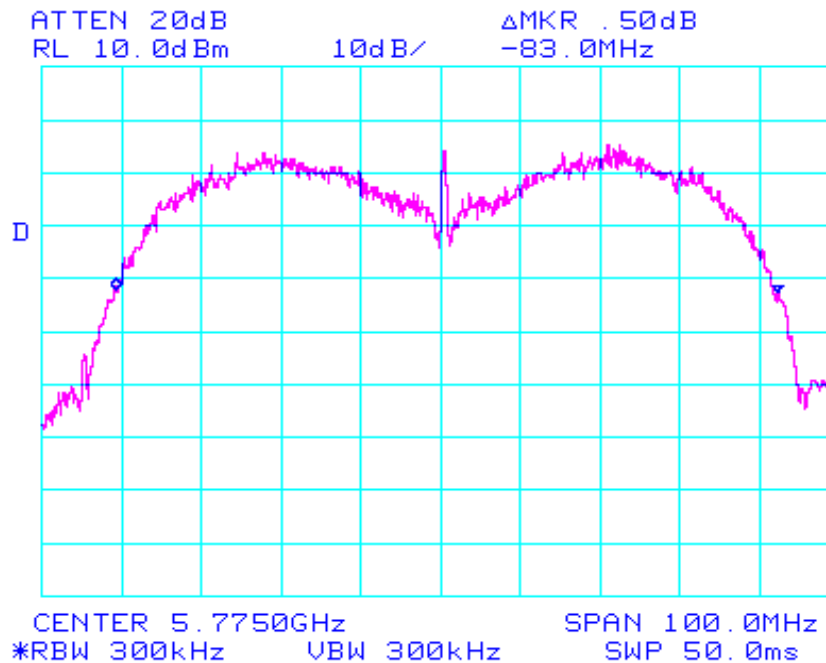


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|                           |                       |
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| Client: Bitrage           | Job Number: J42216    |
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| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #3: Signal Bandwidth

| Channel | Frequency (MHz) | Resolution Bandwidth | 26dB Signal Bandwidth | Graph reference # |
|---------|-----------------|----------------------|-----------------------|-------------------|
| NA      | 5775            | 300 kHz              | 83 MHz                | None              |



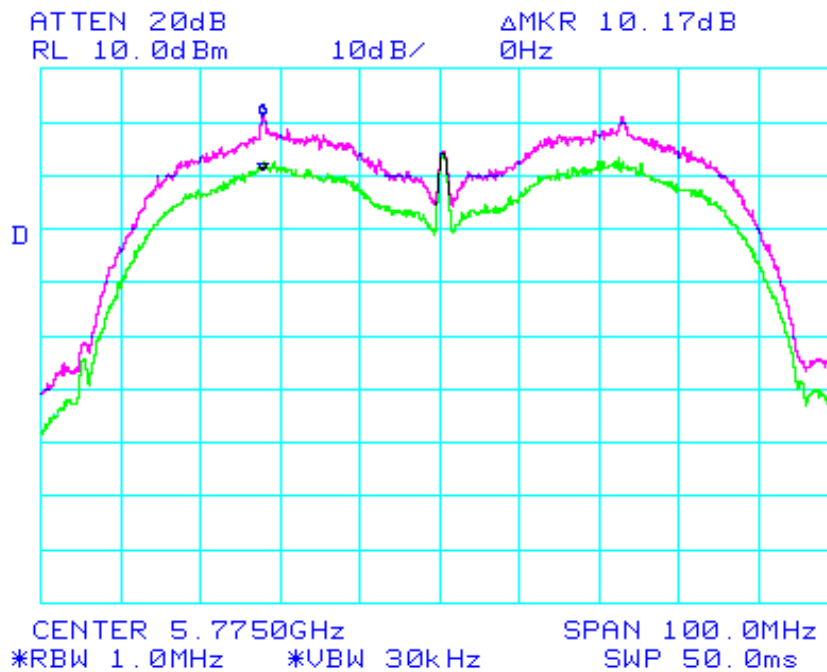


## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #4: Peak Excursion Measurement

The plot shows that the peak excursion was less than 13dB (approximately 10.2dB worst case)





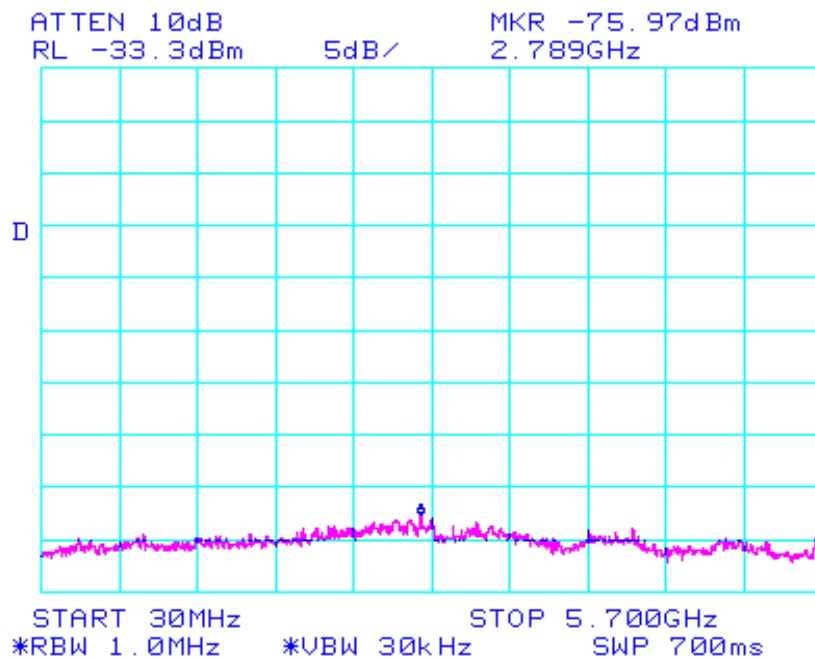
## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

### Run #5: Out Of Band Spurious Emissions - Antenna Conducted

The maximum antenna gain that can be used with the 5.8 GHz radio at the high output power is 31dBi (4' dish). The EIRP limit is -17dBm for signals within 10 MHz of the band edge and -27dBm/MHz for all other signal. For signals within 10MHz of the band edge a limit of -48 dBm was used and for all other signals within 100 MHz of the band edge a limit of -58dBm was used. These limits assumed that the antenna gain at the band edges is the same as the in-band antenna gain. For signals removed from the band edge by more than 100MHz, radiated measurements were made (refer to run #6).

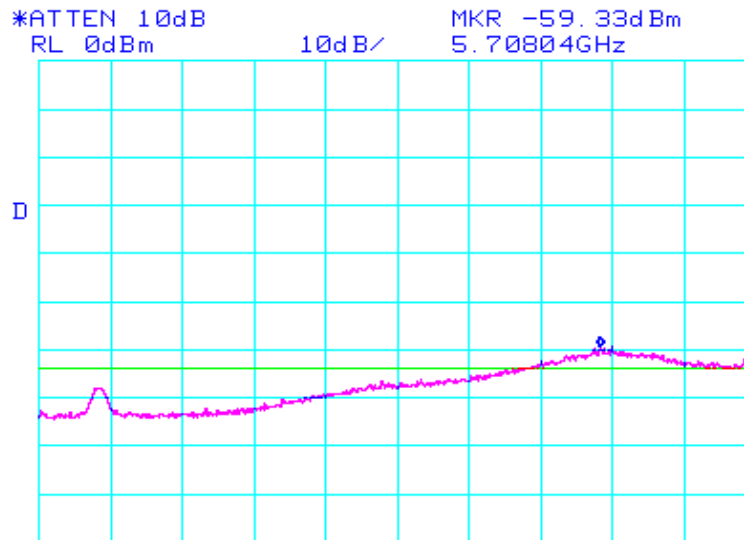
The highest signal within 10MHz of the band-edge was -56.9dBm. The highest signal removed by more than 10MHz but less than 100 MHz from the band edge was -59.3dBm. Outside of this band signals were observed at 23.099 GHz (-63.5dBm) and 28.875 GHz (-70.6dBm). The radiated field strength of these signals was measured during run #6.



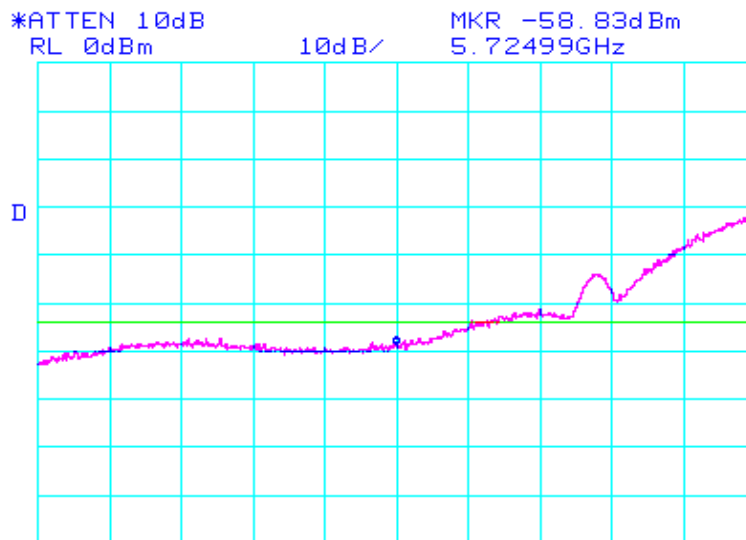


## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |



START 5.68287GHz STOP 5.71500GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 50.0ms

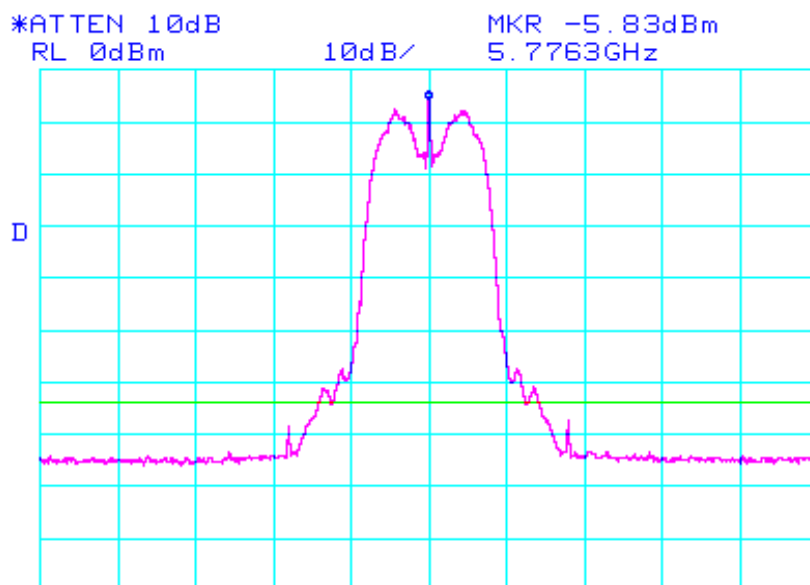


START 5.71500GHz STOP 5.73497GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 50.0ms

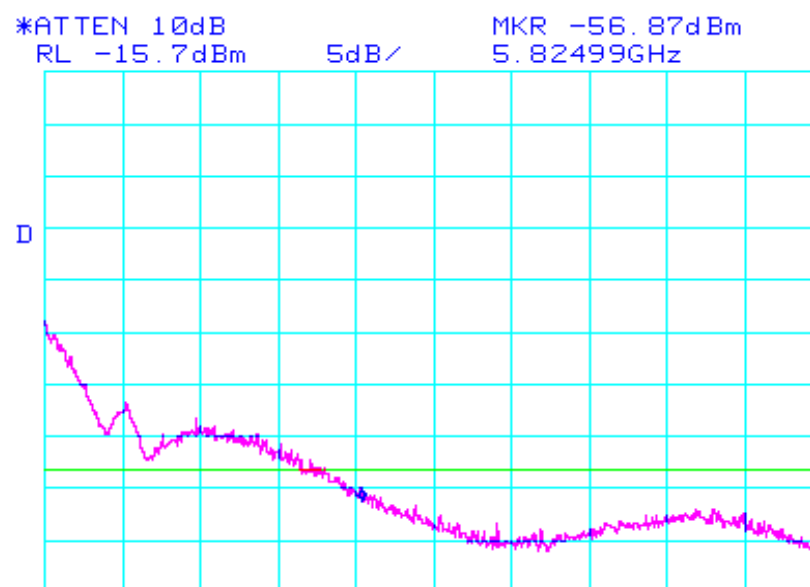


## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |



CENTER 5.7763GHz SPAN 500.0MHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 62.0ms



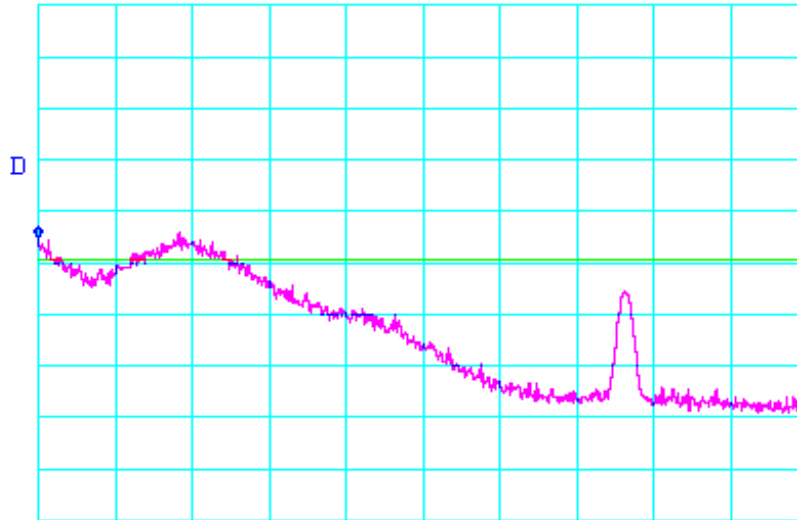
START 5.81808GHz STOP 5.83500GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 50.0ms



## EMC Test Data

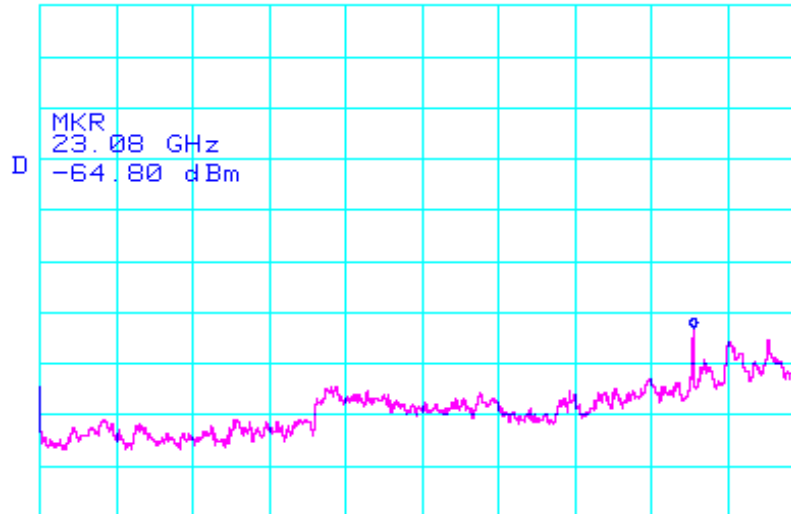
|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
| Contact: Chet Ferry       | Proj Eng: Mark Briggs |
| Spec: 15.407              | Class: N/A            |

\*ATTEN 10dB MKR -61.70dBm  
RL -39.2dBm 5dB/ 5.83500GHz



START 5.83500GHz STOP 5.87363GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 50.0ms

ATTEN 10dB MKR -64.80dBm  
RL -33.3dBm 5dB/ 23.08GHz

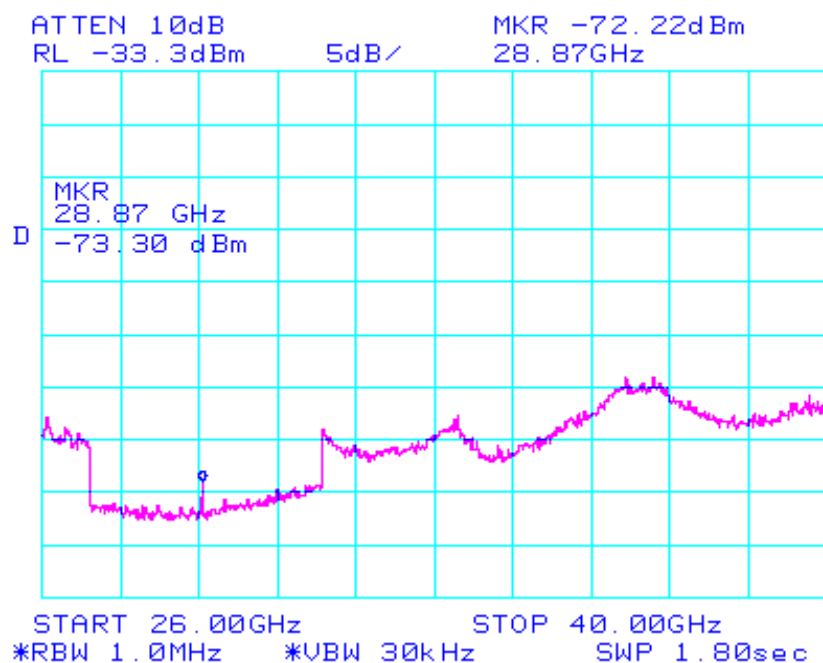


START 5.87GHz STOP 26.00GHz  
\*RBW 1.0MHz \*VBW 30kHz SWP 2.50sec



## EMC Test Data

|          |                    |               |             |
|----------|--------------------|---------------|-------------|
| Client:  | Bitrage            | Job Number:   | J42216      |
| Model:   | 5.3 & 5.8 GHz UNII | T-Log Number: | T42491      |
| Contact: | Chet Ferry         | Proj Eng:     | Mark Briggs |
| Spec:    | 15.407             | Class:        | N/A         |





## EMC Test Data

|                           |                       |
|---------------------------|-----------------------|
| Client: Bitrage           | Job Number: J42216    |
| Model: 5.3 & 5.8 GHz UNII | T-Log Number: T42491  |
|                           | Proj Eng: Mark Briggs |
| Contact: Chet Ferry       |                       |
| Spec: 15.407              | Class: N/A            |

### Run #6: Radiated Spurious Emissions, 1000 - 40000 MHz

Spurious emissions from 30 - 1000 MHz were measured while performing emissions measurements of the digital device. The emissions were below the FCC Class B limit (refer to T42466).

|                                                  |                    |
|--------------------------------------------------|--------------------|
| Limit for emissions in restricted bands:         | 54dBuV/m (Average) |
| Limit for emissions outside of restricted bands: | EIRP < -27dBm/MHz  |

| Frequency | Level  | Pol | 15.209 / 15.407 |        | Detector  | Azimuth | Height | Comments |
|-----------|--------|-----|-----------------|--------|-----------|---------|--------|----------|
| MHz       | dBuV/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |          |
| 23099.0   | 40.3   | h   | 54.0            | -13.7  | Avg       | 173     | 1.7    | Note 2   |
| 28875.0   | 53.0   | v   | 68.0            | -15.0  | Note 4    | 170     | 1.6    |          |
| 28875.0   | 51.0   | h   | 68.0            | -17.0  | Note 4    | 170     | 1.6    |          |
| 23099.0   | 34.3   | v   | 54.0            | -19.7  | Avg       | 171     | 1.6    | Note 2   |
| 23099.0   | 52.8   | h   | 74.0            | -21.2  | Pk        | 173     | 1.7    | Note 2   |
| 23099.0   | 48.8   | v   | 74.0            | -25.2  | Pk        | 171     | 1.6    | Note 2   |

|         |                                                                                                                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1: | For emissions falling in the restricted bands detailed in 15.205 the general limits of 15.209 apply. For all other emissions the limit is EIRP < -27dBm (equivalent to a field strength at 3m of 68dBuV/m) |
| Note 2: | Signal is in a restricted band                                                                                                                                                                             |
| Note 3: | All other harmonic emissions were 20 dB below the limit.                                                                                                                                                   |
| Note 4: | Restricted Band Peak Measurements: Resolution and Video BW: 1 MHz, Restricted Band Average Measurements: Resolution Bw: 1MHz and Video Bw: 10 Hz. All other measurements, RBW = 1MHz and VBW = 30kHz.      |

**Output Power - 5.8GHz Radio operating at High Power:** Measured by summing the power measured on the analyzer (RBW=1MHz, VBW=30kHz) at

| Frequency (MHz) | Power (mW) | Frequency (MHz) | Power (mW) |
|-----------------|------------|-----------------|------------|
| 5733.6          | 0.0003     | 5774.7          | 0.0192     |
| 5734.5          | 0.0006     | 5775.7          | 0.1468     |
| 5735.5          | 0.0010     | 5776.7          | 0.0060     |
| 5736.5          | 0.0019     | 5777.7          | 0.0093     |
| 5737.5          | 0.0035     | 5778.6          | 0.0133     |
| 5738.5          | 0.0081     | 5779.6          | 0.0147     |
| 5739.4          | 0.0104     | 5780.6          | 0.0098     |
| 5740.4          | 0.0158     | 5781.6          | 0.0153     |
| 5741.4          | 0.0224     | 5782.6          | 0.0181     |
| 5742.4          | 0.0168     | 5783.5          | 0.0203     |
| 5743.4          | 0.0246     | 5784.5          | 0.0228     |
| 5744.3          | 0.0246     | 5785.5          | 0.0299     |
| 5745.3          | 0.0287     | 5786.5          | 0.0287     |
| 5746.3          | 0.0398     | 5787.5          | 0.0541     |
| 5747.3          | 0.0383     | 5788.4          | 0.0430     |
| 5748.3          | 0.0511     | 5789.4          | 0.0492     |
| 5749.2          | 0.0573     | 5790.4          | 0.0531     |
| 5750.2          | 0.0668     | 5791.4          | 0.0492     |
| 5751.2          | 0.0858     | 5792.4          | 0.0722     |
| 5752.2          | 0.0874     | 5793.3          | 0.0891     |
| 5753.2          | 0.1019     | 5794.3          | 0.0926     |
| 5754.1          | 0.0981     | 5795.3          | 0.0962     |
| 5755.1          | 0.0810     | 5796.3          | 0.1144     |
| 5756.1          | 0.0858     | 5797.3          | 0.1039     |
| 5757.1          | 0.0668     | 5798.2          | 0.0891     |
| 5758.1          | 0.0764     | 5799.2          | 0.1019     |
| 5759.0          | 0.0909     | 5800.2          | 0.0810     |
| 5760.0          | 0.0681     | 5801.2          | 0.0810     |
| 5761.0          | 0.0607     | 5802.2          | 0.0681     |
| 5762.0          | 0.0562     | 5803.1          | 0.0541     |
| 5763.0          | 0.0473     | 5804.1          | 0.0391     |
| 5763.9          | 0.0422     | 5805.1          | 0.0369     |
| 5764.9          | 0.0329     | 5806.1          | 0.0391     |
| 5765.9          | 0.0192     | 5807.1          | 0.0369     |
| 5766.9          | 0.0188     | 5808.0          | 0.0271     |
| 5767.9          | 0.0131     | 5809.0          | 0.0233     |
| 5768.8          | 0.0171     | 5810.0          | 0.0168     |
| 5769.8          | 0.0128     | 5811.0          | 0.0102     |
| 5770.8          | 0.0168     | 5812.0          | 0.0079     |
| 5771.8          | 0.0119     | 5812.9          | 0.0055     |
| 5772.8          | 0.0121     | 5813.9          | 0.0046     |
| 5773.7          | 0.0078     | 5814.9          | 0.0015     |

Total (mW) 3.518

Total (dBm) 5.5