# EMC
# TEST REPORT

**Report No. : EME-040135**
**Model No. : BM56S**
**Issued Date : Mar. 4, 2004**

**Applicant : Socket Communications, Inc.**
**37400 Central Court, Newark, California, U.S.A., 94560**

**Test By : Intertek Testing Services Taiwan Ltd.**
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# Table of Contents

**Summary of Tests**

## Socket Bluetooth 56K Modem-Model: BM56S
## FCC ID: LUB-BM56S

| Test | Reference | Results |
|---|---|---|
| Carrier Frequency Separation test | 15.247(a)(1) | Complies |
| Number of hopping frequencies test | 15.247(a)(1) | Complies |
| Time of Occupancy (dwell time) test | 15.247(a)(1) | Complies |
| 20dB Bandwidth test | 15.247(a)(1) | Complies |
| Radiated Spurious Emission test | 15.205, 15.209 | Complies |
| Power Line Conducted Emission test | 15.207 | Complies |

## 1. General information

### 1.1 Identification of the EUT

| | |
|---|---|
| Applicant | : Socket Communications, Inc. |
| Product | : Socket Bluetooth 56K Modem |
| Model No. | : BM56S |
| FCC ID. | : LUB-BM56S |
| Frequency Range | : 2400MHz ~ 2483.5MHz |
| Channel Number | : 79 channels |
| Frequency of Each Channel | : 2402+k MHz; k=0~78 |
| Type of Modulation | : FHSS |
| Rated Power | : 3.6Vdc from battery or<br>100-240Vac, 50-60Hz with adapter (PSC05R-050, SL05A105-U) |
| Power Cord | : N/A |
| Sample Received | : Feb. 19, 2004 |
| Test Date(s) | : Feb. 19, 2004 ~ Mar. 2, 2004 |

A FCC DoC report has been generated for the client.

### 1.2 Additional information about the EUT

The EUT is a Socket Bluetooth 56k Modem, and was defined as information technology equipment.

There are 2 adapters and 2 transformers, the details please refer to the following table:

| | Model No. |
|---|---|
| Adapter 1 | PSC05R-100 |
| Adapter 2 | SL05A105-U |

| | Model No. |
|---|---|
| Transformer 1 | 632364 |
| Transformer 2 | P632017 |

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

### 1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 2dBi max
Antenna Type : Ceramic antenna
Connector Type : MMCX

### 1.4 Peripherals equipment

| Peripherals | Manufacturer | Product No. | Serial No. |
|---|---|---|---|
| Notebook | Dell | PP01L | CN-06P83-48643-33V-0112 |
| Notebook | Dell | PP01L | CN-03P83-48643-33O-3930 |

### 1.5 Supporting equipment

| Peripherals | Manufacturer | Product No. | Serial No. |
|---|---|---|---|
| Exchange Board | Tentel | 250-00193-07 | 94948 |

## 2. Test specifications

### 2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section § 15.205、§15.207、§15.209、§15.247 and ANSI C63.4/2001.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

### 2.2 Operation mode

During the radiated spurious, it worked in the status of continuously transmitting. While in other tests, it worked in normal hopping mode.

For radiated emission test, we verity 2 adapters and 2 transformers, the worst case comes up when the EUT is equipped with adapter 1 & transformer 1.

For conducted emission test, we conducted both adapter 1 & adapter 2.

## 2.3 Test equipment

| Equipment | Brand | Frequency range | Model No. | Intertek ID No. | Last Cal. Date |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | 9kHz~2.75GHz | ESCS 30 | EC303 | 6/16/2003 |
| EMI Test Receiver | Rohde & Schwarz | 20Hz~26.5GHz | ESMI | EC317 | 6/24/2003 |
| Spectrum Analyzer | Rohde & Schwarz | 9kHz~30GHz | FSP 30 | EC353 | 7/19/2003 |
| Spectrum Analyzer | Rohde & Schwarz | 20Hz~40GHz | FSEK 30 | EC365 | 10/20/2003 |
| Horn Antenna | EMCO | 1GHz~18GHz | 3115 | EC332 | 10/15/2003 |
| Horn Antenna | SCHWARZBECK | 15GHz~40GHz | BBHA 9170 | EC351 | 6/21/2003 |
| Bilog Antenna | SCHWARZBECK | 25MHz~1.7GHz | VULB 9160 | EC350 | 6/21/2003 |
| Turn Table | HDGmbH | N/A | DS 420S | EP317-3 | N/A |
| Antenna Tower | HDGmbH | N/A | MA 240 | EP317-2 | N/A |
| Pre-Amplifier | MITER | 100MHz~26.5GHz | 919981 | EC373 | 5/13/2003 |
| Pre-Amplifier | MITER | 26GHz~40GHz | 828825 | EC374 | 5/13/2003 |
| Crystal Detector | Agilent | 10MHz~18GHz | 8472B | | N/A |
| Signal Generator | Rohde & Schwarz | 20MHz~27GHz | SMR27 | EC354 | 8/16/2003 |
| Two Channel Digital Storage Oscilloscope | Tektronix | N/A | TDS1012 | | 8/16, 2003 |
| LISN | Rohde & Schwarz | 9KHz~30MHz | ESH3-Z5 | EC344 | 1/20, 2004 |

Note: The above equipments are within the valid calibration period.

## 3. 20dB Bandwidth test

### 3.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 22 | ℃ |
| Relative Humidity: | 58 | % |
| Atmospheric Pressure | 1023 | hPa |

### 3.2 Test setup & procedure

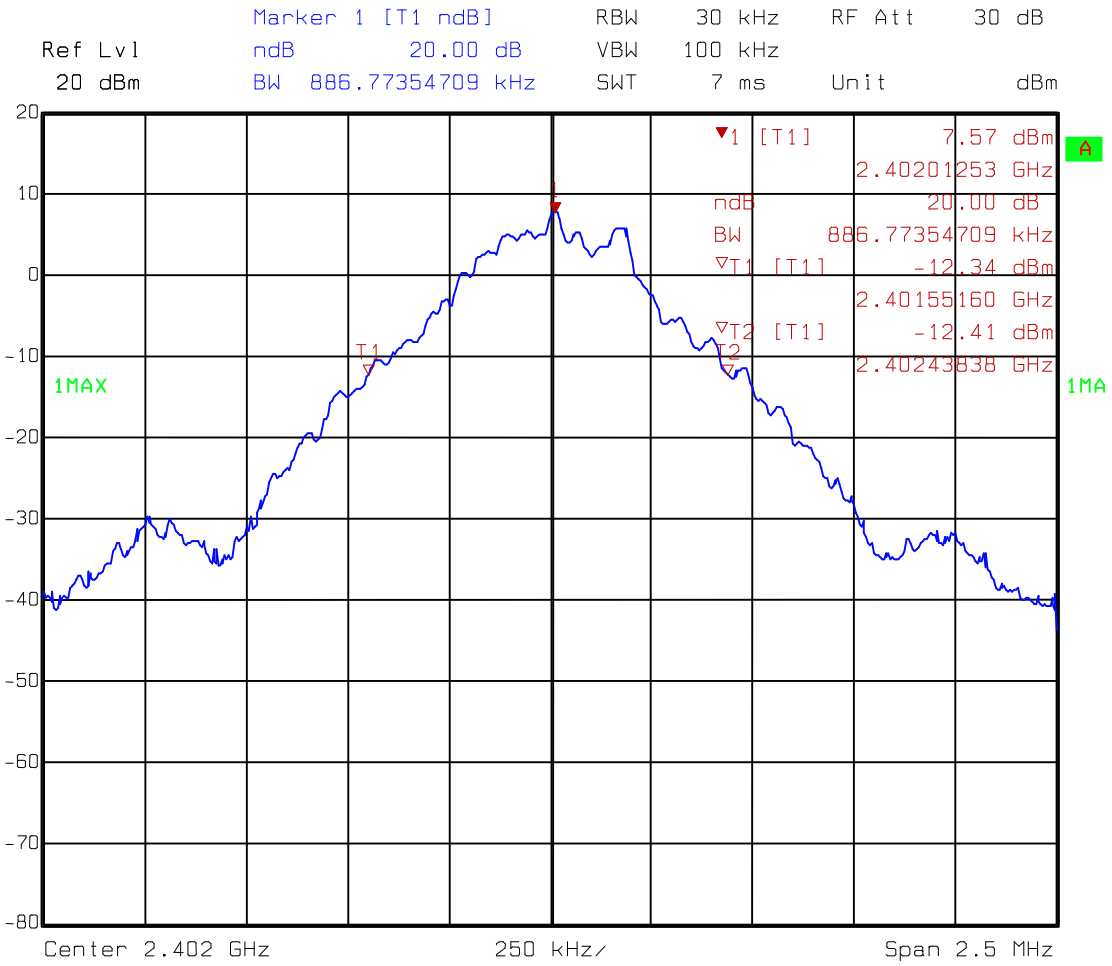
The 20dB bandwidth per FCC §15.247(a)(1)(i) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100 kHz, the video bandwidth≧RBW, and the SPAN may equal to approximately 2 to 3 times the 20dB bandwidth. The test was performed at 3 channels (lowest, middle and highest channel). The maximum 20dB modulation bandwidth is in the following Table.

### 3.3 Measured data of modulated bandwidth test results

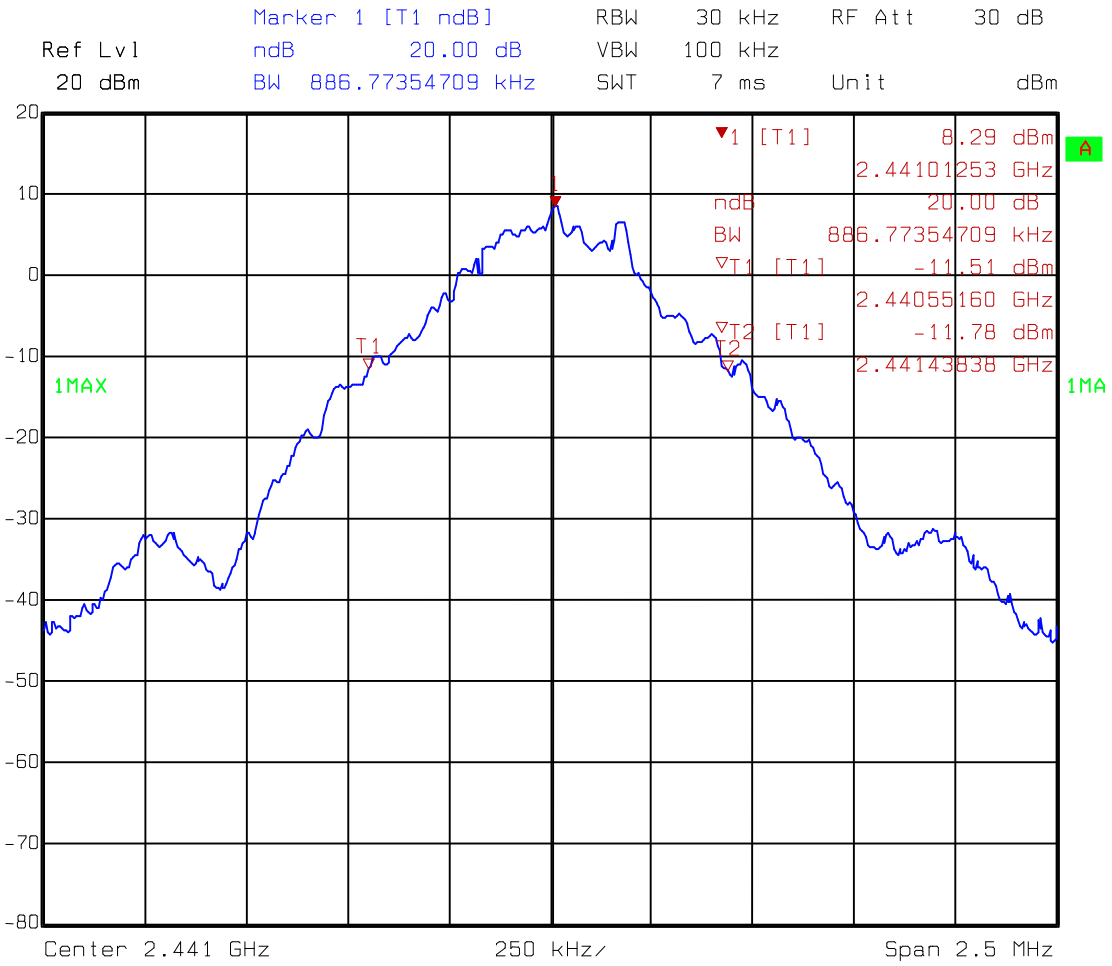
| Channel | Frequency (MHz) | Bandwidth (KHz) | Limit |
|---|---|---|---|
| Low | 2402 | 886.7735 | 1MHz |
| Middle | 2441 | 886.7735 | 1MHz |
| High | 2480 | 886.7735 | 1MHz |

∗ The EUT has its hopping function disable.

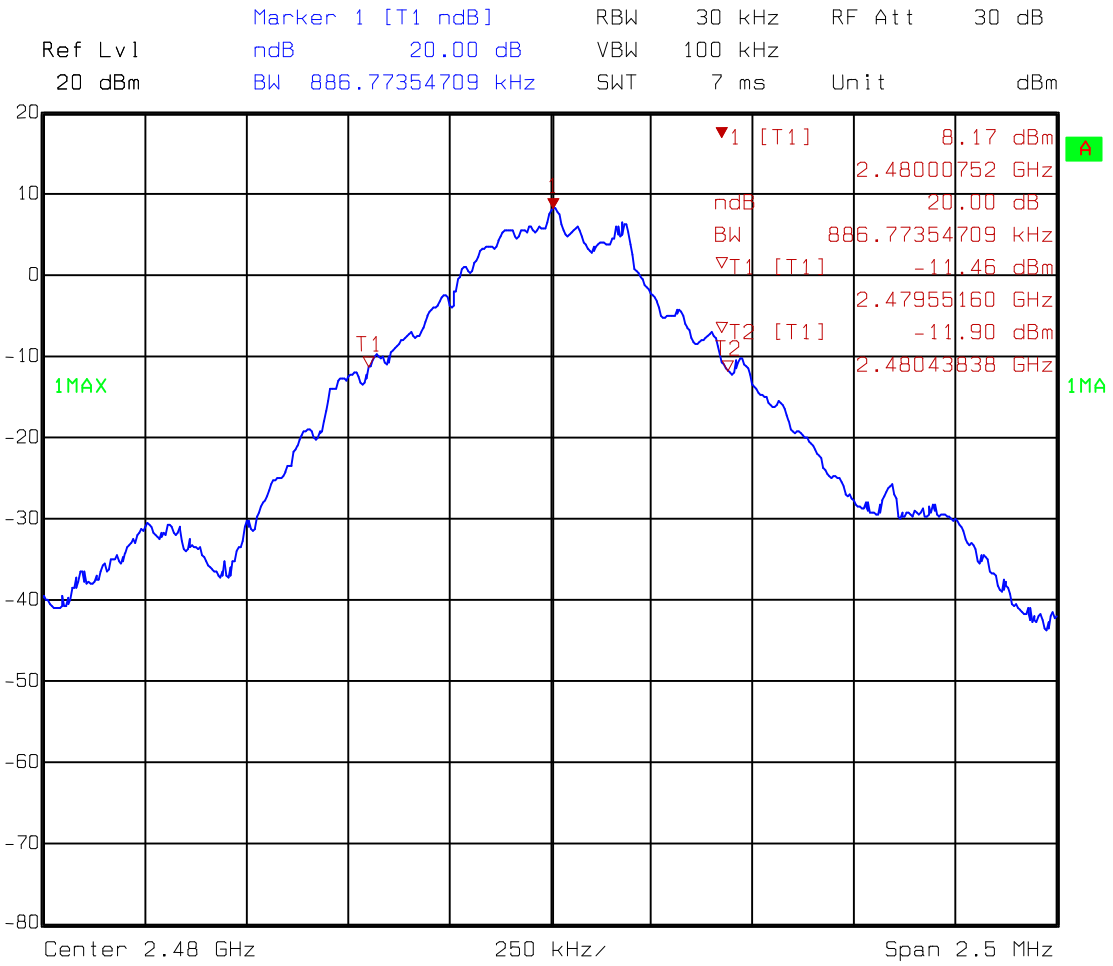
Please see the plot below.




Comment A: 20dB bandwidth at low channel
Date: 26.FEB.2004 15:59:50




Comment A: 20dB bandwidth at middle channel
Date: 26.FEB.2004 16:02:35




Comment A: 20dB bandwidth at high channel
Date: 26.FEB.2004 16:01:32

## 4. Carrier Frequency Separation test

### 4.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 22 | ℃ |
| Relative Humidity: | 58 | % |
| Atmospheric Pressure | 1023 | hPa |

### 4.2 Test setup & procedure

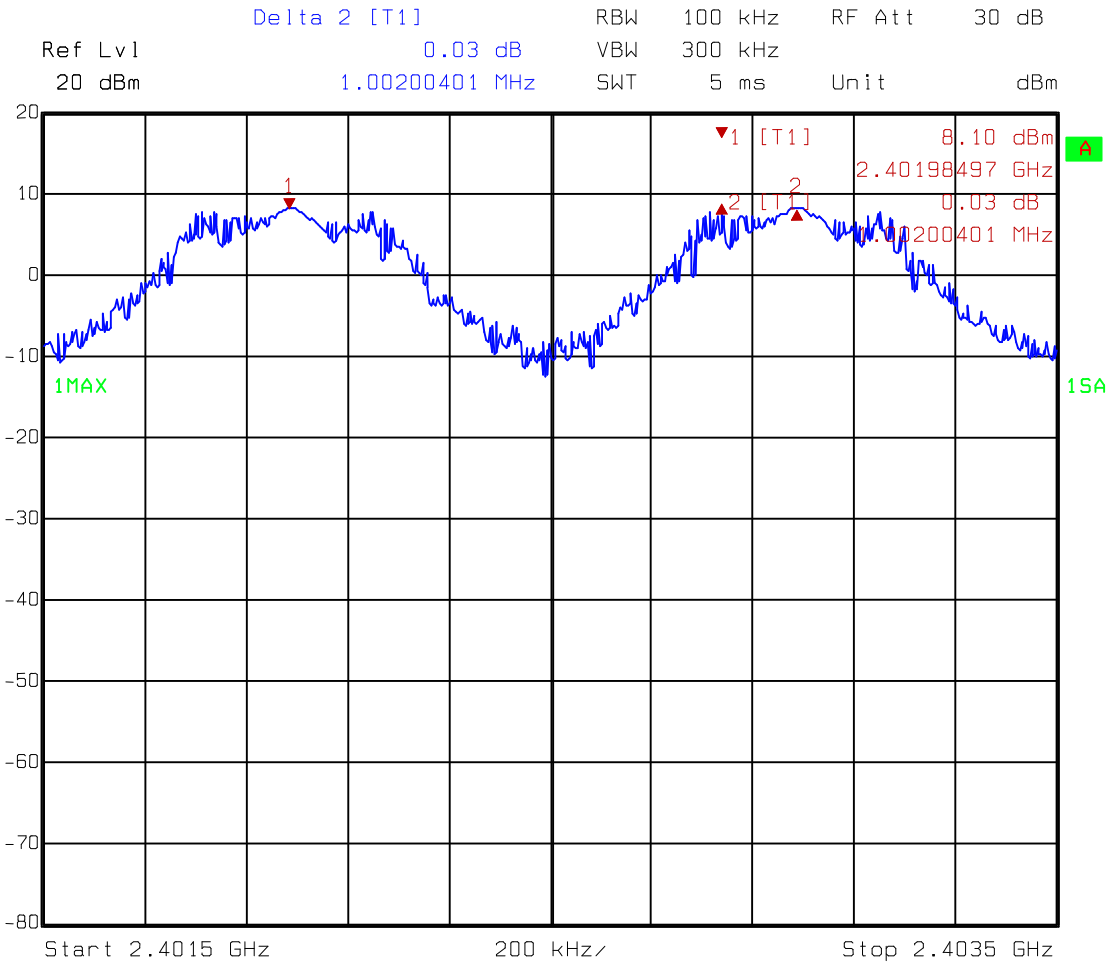
The carrier frequency separation per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at ≧1% of the span, the video bandwidth≧RBW, and the SPAN was wide enough to capture the peaks of two adjacent channels. The carrier frequency separation result is in the following Table.

### 4.3 Measured data of Carrier Frequency Separation test result

| Channel | Frequency (MHz) | Measurement Frequency separation (MHz) |
|---|---|---|
| 1 | 2401.98 | 1.002 |
| 2 | 2403.00 | |

＊ The EUT has its hopping function enable.

Please see the plot below.




Comment A: Carrier frequencies separation between CH1 and CH2
Date: 26.FEB.2004 15:23:03

## 5. Number of hopping frequencies test

### 5.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 22 | ℃ |
| Relative Humidity: | 58 | % |
| Atmospheric Pressure | 1023 | hPa |

### 5.2 Test setup & procedure

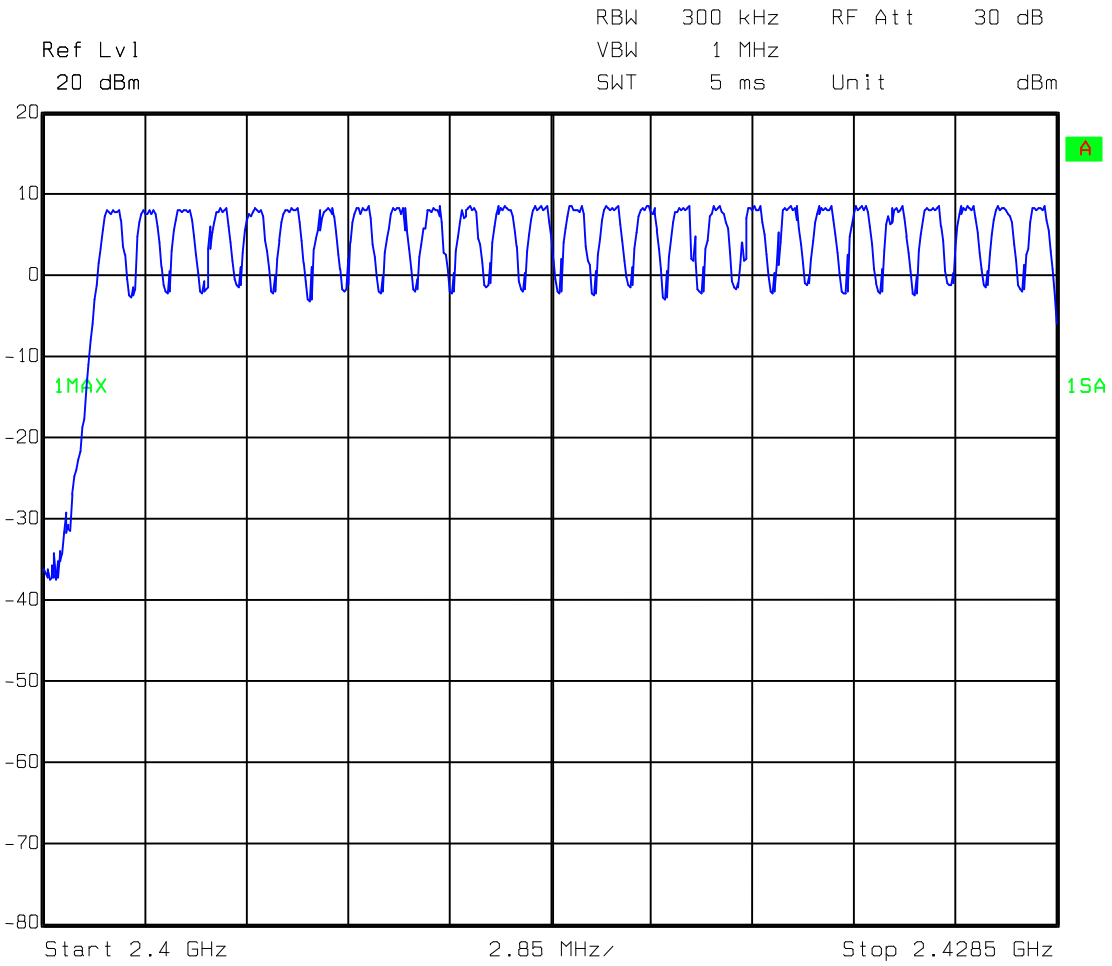
The number of hopping frequencies per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at ≧1% of the span, the video bandwidth≧RBW, and the SPAN was the frequency band of operation. The carrier frequency separation result is in the following Table.

### 5.3 Measured data of number of hopping frequencies test result

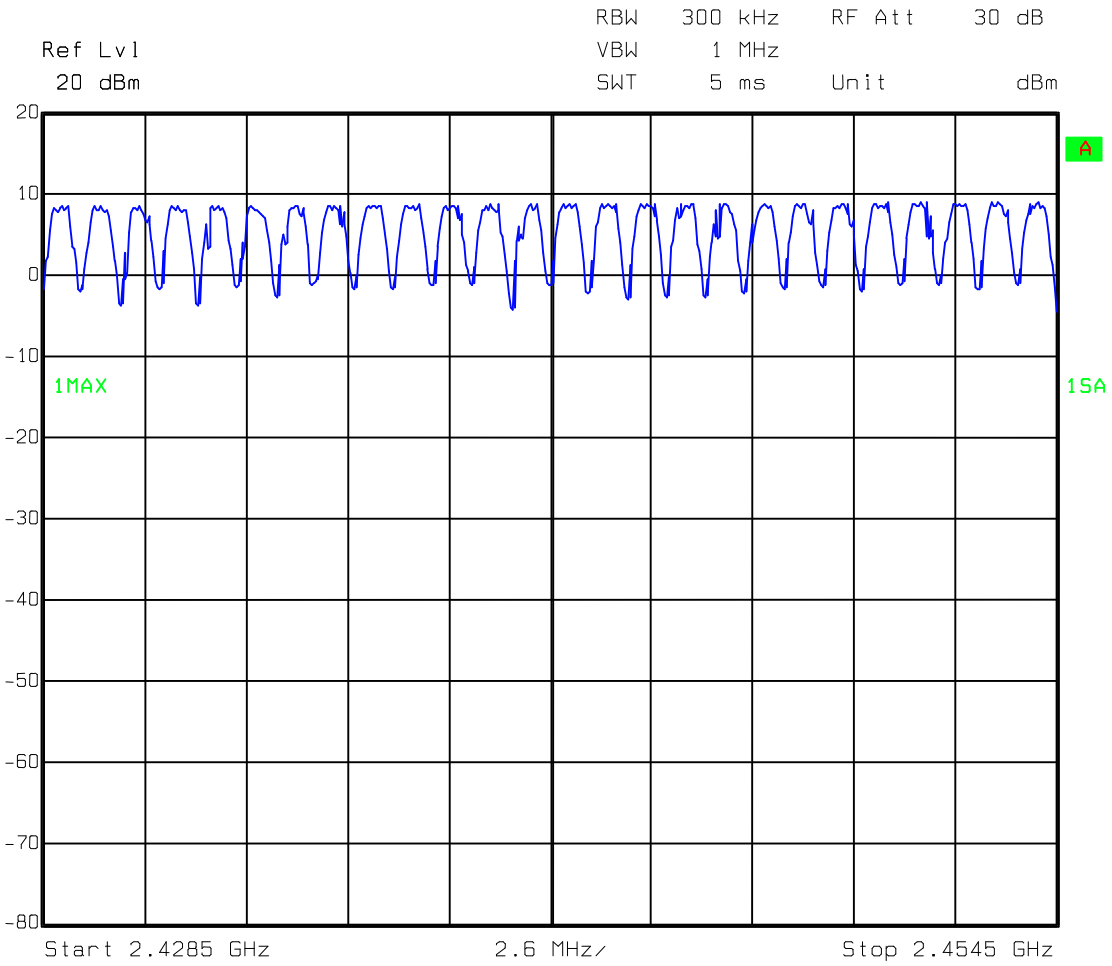
| Frequency Range (MHz) | Number of hopping frequencies | Total hopping channels |
|---|---|---|
| 2400 ~ 2428.5 | 27 | 79 |
| 2429~ 2454.5 | 26 | |
| 2455 ~ 2483.5 | 26 | |

＊ The EUT has its hopping function enable.

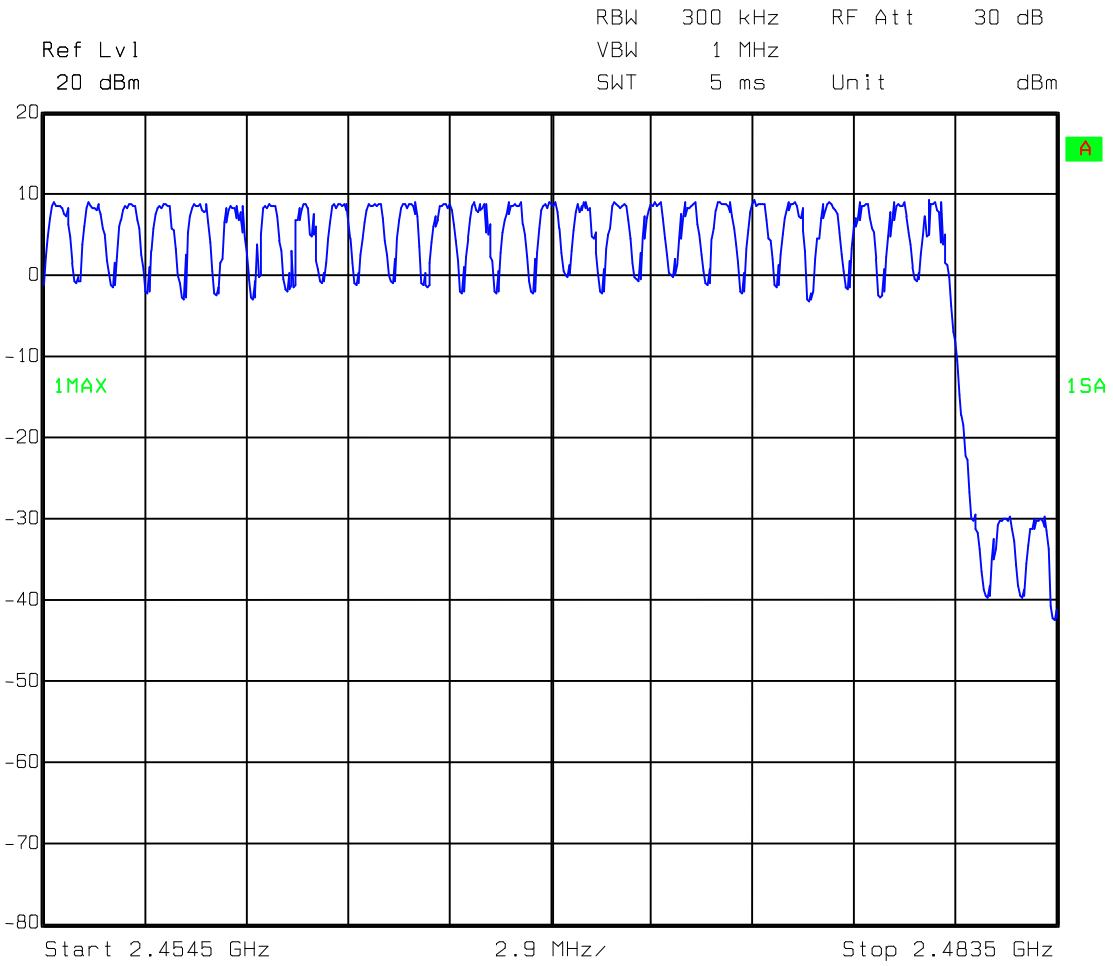
Please see the plot below.




Comment A: Number of hopping channel
Date: 26.FEB.2004 15:37:41




Comment A: Number of hopping channel
Date: 26.FEB.2004 15:31:40




Comment A: Number of hopping channel
Date: 26.FEB.2004 15:34:02

## 6. Time of Occupancy (dwell time) test

### 6.1 Operating environment

| | | |
|---|---|---|
| Temperature: | 22 | ℃ |
| Relative Humidity: | 58 | % |
| Atmospheric Pressure | 1023 | hPa |

### 6.2 Test setup & procedure

The time of occupancy (dwell time) per FCC §15.247(a)(1)(iii) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth≧RBW, and the zero span function of spectrum analyzer was enable. The EUT has its hopping function enable.

The average time of occupancy on any channel shall not greater than 0.4 seconds within a period of 0.4 seconds multiplied by number of hopping channels employed.

The system makes worst case 1600 hops per second or 1 time slot has a length of 625μs with 79 channels. So, the calculation for a 31.6 second period is follows.

Dwell time = time slot length × hop rate / number of hopping channels × 31.6s.

**Time of occupancy (dwell time) for DH1**

A DH1 packet needs 1 time slot for transmit and 1 time slot for receice, then the hop rate is 1600/2 = 800 1/s

Dwell time = 420.841683 μs × 800 1/s / 79 × 31.6s
= 134.67 ms (in a 31.6s period)

**Time of occupancy (dwell time) for DH3**

A DH3 packet needs 3 time slots for transmit and 1 time slot for receice, then the hop rate is 1600/4 = 400 1/s

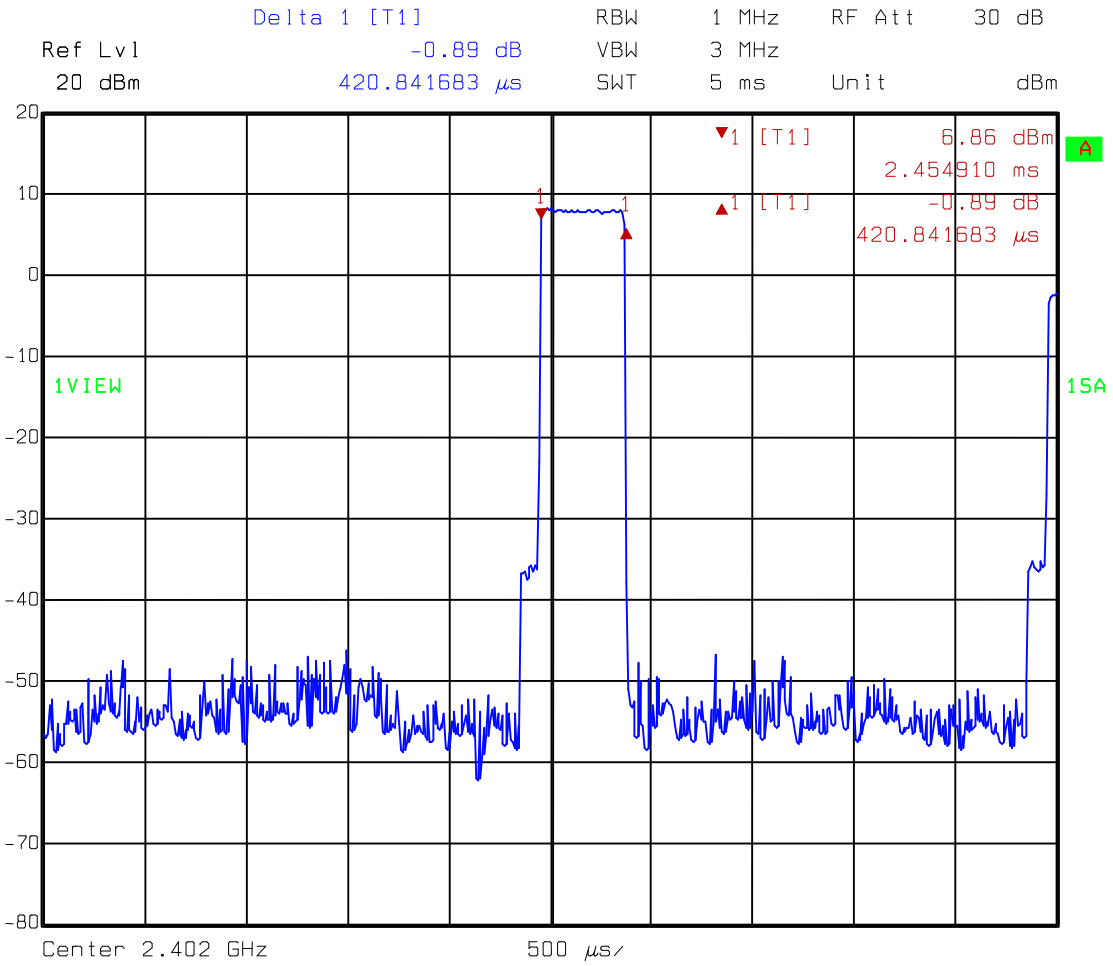
Dwell time = 1.673347 ms × 400 1/s / 79 × 31.6s
= 267.74 ms (in a 31.6s period)

**Time of occupancy (dwell time) for DH5**

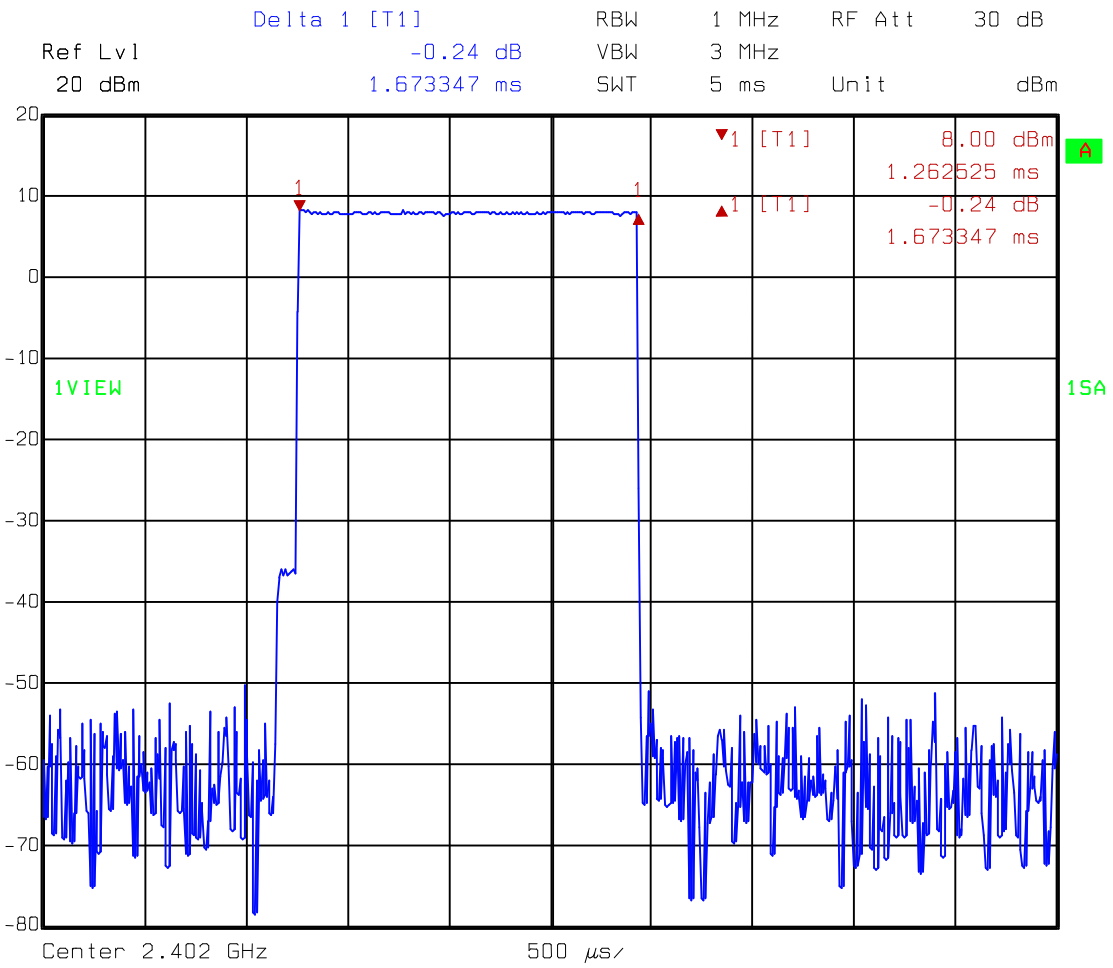
A DH5 packet needs 5 time slots for transmit and 1 time slot for receice, then the hop rate is 1600/6 = 266.67 1/s

Dwell time = 2.921844 ms × 266.67 1/s / 79 × 31.6s
= 311.66 ms (in a 31.6s period)

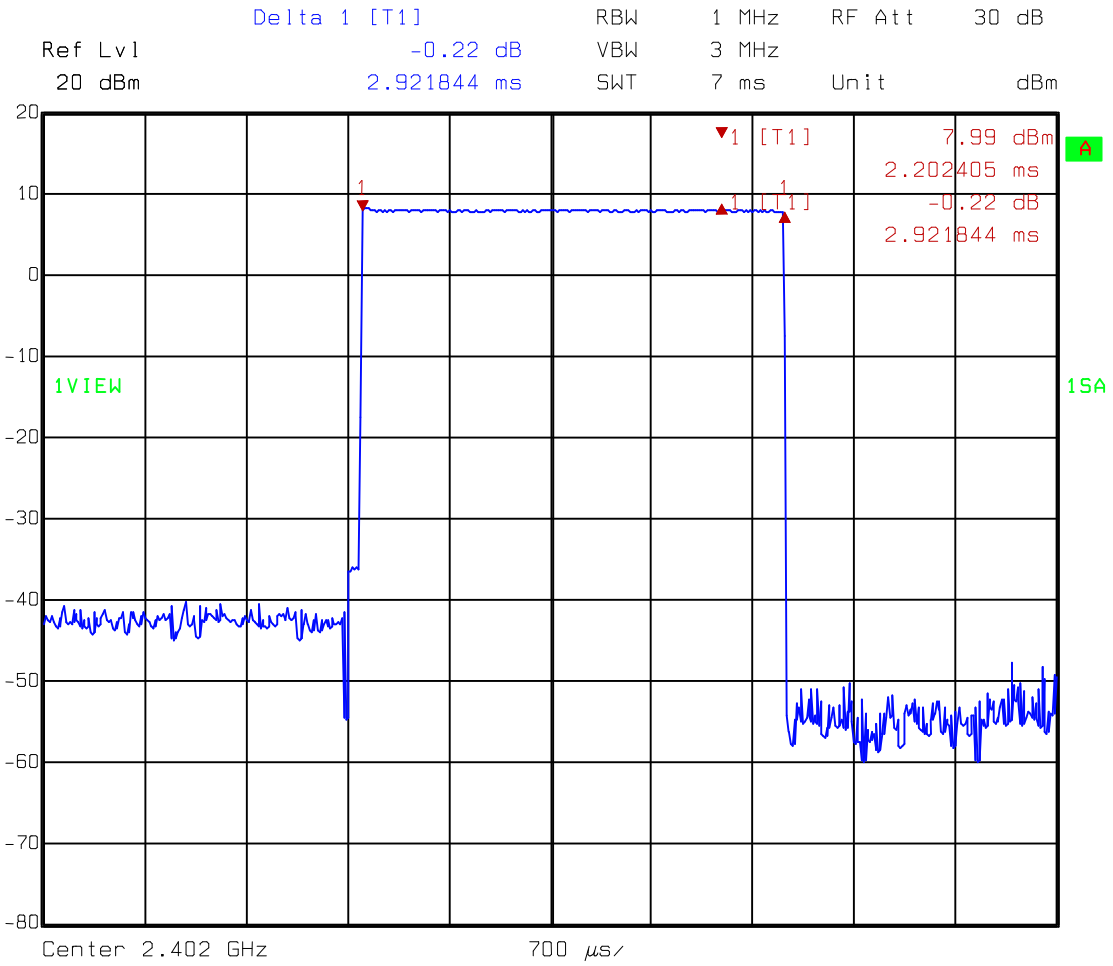
Please see the plot below.




Comment A: Dwell time of DH1 mode
Date: 26.FEB.2004 15:47:12




Comment A: Dwell time of DH3 mode
Date: 26.FEB.2004 15:51:15




Comment A: Dwell time of DH5 mode
Date: 26.FEB.2004 15:56:46

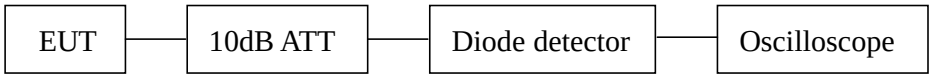
## 7. Maximum Output Power test

### 7.1 Operating environment

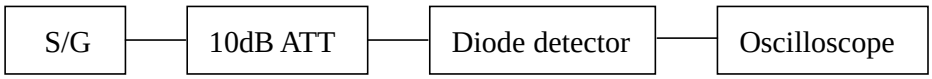
| | | |
|---|---|---|
| Temperature: | 22 | ℃ |
| Relative Humidity: | 60 | % |
| Atmospheric Pressure | 1023 | hPa |

### 7.2 Test setup & procedure

A:




B:




1. The output of the transmitter via a 10 dB attenuator and coupled to a diode detector.
2. The output of the diode detector connected to the vertical channel of and oscilloscope. The observed trace of the oscilloscope shall be recorded as “A”.
3. The transmitter replaced by a signal generator. The output frequency of the signal made equal to the center of the frequency range occupied by the transmitter and unmodulated.
4. The output of the signal generator raised to reach the peak of trace “A” named X.
5. The signal generator output level X (dBm) is the transmitter peak output power.

### 7.3 Measured data of Maximum Output Power test results

| Channel | Frequency (MHz) | Reading (dBm) | Output Power | | Limit (W) |
|---|---|---|---|---|---|
| | | | (dBm) | (mW) | |
| Lowest | 2412 | 11.58 | 11.58 | 14.39 | 1 |
| Middle | 2437 | 12.19 | 12.19 | 16.56 | 1 |
| Highest | 2462 | 12.56 | 12.56 | 18.03 | 1 |

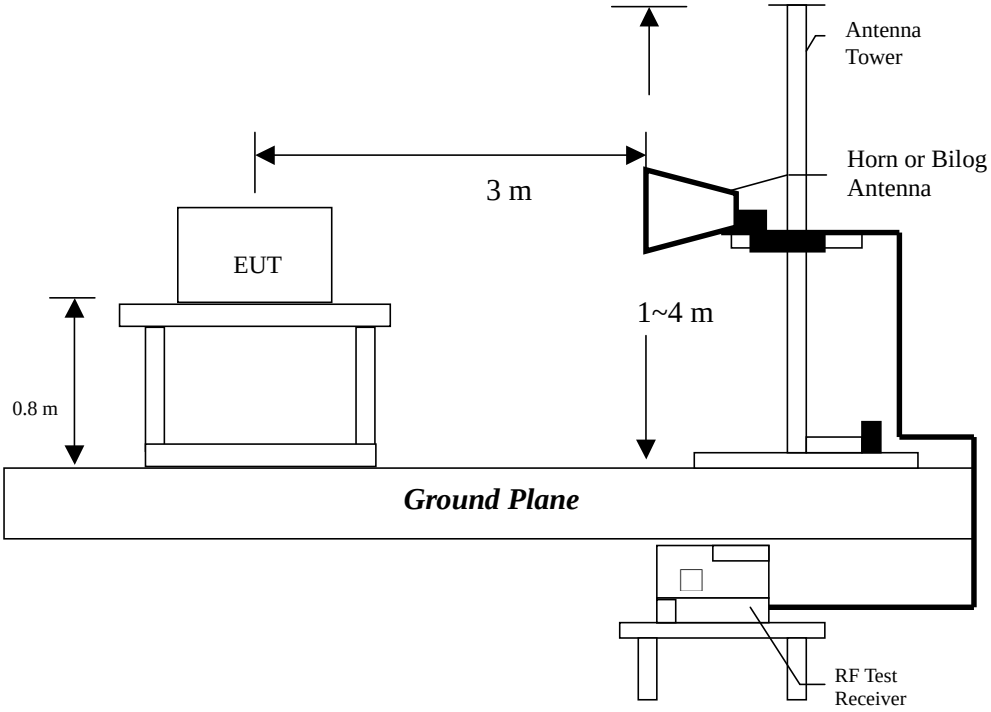
## 8. Radiated Emission test

### 8.1 Operating environment

| | | | |
|---|---|---|---|
| Temperature: | 23 | ℃ | (10-40℃) |
| Relative Humidity: | 58 | % | (10-90%) |
| Atmospheric Pressure | 1023 | hPa | (860-1060hPa) |

### 8.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.




Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

The EUT configuration please refer to the "Spurious set-up photo.pdf".

**8.3 Emission limits**

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

| Frequency (MHz) | Limits (dB $\mu$ V/m@3m) |
|---|---|
| 30-88 | 40 |
| 88-216 | 43.5 |
| 216-960 | 46 |
| Above 960 | 54 |

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of radiated emission measurement is ±4.98 dB.
Expanded uncertainty (k=2) of conducted emission measurement is ±2.02 dB.

### 8.4 Radiated spurious emission test data

### 8.4.1 Measurement results: frequencies equal to or less than 1 GHz

EUT : BM56S
Worst Case Condition : hopping frequency mode

| Frequency (MHz) | Spectrum Analyzer Detector | Antenna Polariz. (H/V) | Correction Factor (dB/m) | Reading (dBuV) | Corrected Level (dBuV) | Limit @ 3 m (dBuV) | Margin (dB) | Antenna high (cm) | Turn Table angle (degree) |
|---|---|---|---|---|---|---|---|---|---|
| 47.280 | QP | V | 13.05 | 15.31 | 28.36 | 40.00 | -11.64 | 100 | 56 |
| 62.860 | QP | V | 13.22 | 15.57 | 28.79 | 40.00 | -11.21 | 101 | 255 |
| 133.100 | QP | V | 13.34 | 8.30 | 21.64 | 43.50 | -21.86 | 100 | 160 |
| 176.940 | QP | V | 14.29 | 6.19 | 20.48 | 43.50 | -23.02 | 100 | 293 |
| 233.940 | QP | V | 11.82 | 2.31 | 14.13 | 46.00 | -31.87 | 101 | 0 |
| 254.700 | QP | V | 12.85 | 6.14 | 18.99 | 46.00 | -27.01 | 102 | 177 |
| 110.980 | QP | H | 11.80 | 7.01 | 18.81 | 43.50 | -24.69 | 225 | 265 |
| 132.690 | QP | H | 13.34 | 10.36 | 23.70 | 43.50 | -19.80 | 228 | 96 |
| 176.930 | QP | H | 14.29 | 14.09 | 28.38 | 43.50 | -15.12 | 153 | 99 |
| 192.060 | QP | H | 12.03 | 8.43 | 20.46 | 43.50 | -23.04 | 193 | 95 |
| 223.990 | QP | H | 11.82 | 8.51 | 20.33 | 46.00 | -25.67 | 127 | 201 |
| 398.980 | QP | H | 16.40 | 4.11 | 20.51 | 46.00 | -25.49 | 263 | 127 |

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss

**8.4.2 Measurement results: frequency above 1GHz**

**The radiated spurious emissions at**

| Frequency(MHz) | Margin |
|---|---|
| 4804 | -4.36 |

**are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.**

EUT : BM56S
Test Condition : Tx at low channel

| Frequency (MHz) | Spectrum Analyzer Detector | Antenna Polariz. (H/V) | Preamp (dB) | Correction Factor (dB/m) | Reading (dBuV) | Corrected Level (dBuV) | Limit @ 3 m (dBuV) | Margin (dB) | Antenna high (cm) | Turn Table angle (degree) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4804 | PK | V | 32.265 | 35.742 | 41.243 | 44.72 | 74 | -29.28 | 122 | 111 |
| 4804 | AV | V | 32.265 | 35.742 | 37.603 | 41.08 | 54 | -12.92 | 122 | 111 |
| 7206 | PK | V | 34.17 | 39.966 | 42.034 | 47.83 | 74 | -26.17 | 148 | 115 |
| 7206 | AV | V | 34.17 | 39.966 | 36.224 | 42.02 | 54 | -11.98 | 148 | 115 |
| 9608 | PK | V | 35.753 | 43.384 | 37.5985 | 45.23 | 74 | -28.77 | 103 | 105 |
| 9608 | AV | V | 35.753 | 43.384 | 25.1885 | 32.82 | 54 | -21.18 | 103 | 105 |
| 4804 | PK | H | 32.265 | 35.742 | 47.823 | 51.3 | 74 | -22.7 | 177 | 111 |
| 4804 | AV | H | 32.265 | 35.742 | 46.163 | 49.64 | 54 | -4.36 | 177 | 111 |
| 7206 | PK | H | 34.17 | 39.966 | 42.164 | 47.96 | 74 | -26.04 | 135 | 101 |
| 7206 | AV | H | 34.17 | 39.966 | 37.554 | 43.35 | 54 | -10.65 | 135 | 101 |
| 9608 | PK | H | 35.753 | 43.384 | 41.8385 | 49.47 | 74 | -24.53 | 143 | 105 |
| 9608 | AV | H | 35.753 | 43.384 | 35.9485 | 43.58 | 54 | -10.42 | 143 | 105 |

Remark:
1. Corrected Level = Reading Level + Correction Factor－Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

**The radiated spurious emissions at**

| Frequency(MHz) | Margin |
|---|---|
| 4882 | -0.16 |

**are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.**

EUT : BM56S
Test Condition : Tx at middle channel

| Frequency (MHz) | Spectrum Analyzer Detector | Antenna Polariz. (H/V) | Preamp (dB) | Correction Factor (dB/m) | Reading (dBuV) | Corrected Level (dBuV) | Limit @ 3 m (dBuV) | Margin (dB) | Antenna high (cm) | Turn Table angle (degree) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4882 | PK | V | 32.265 | 35.742 | 43.933 | 47.41 | 74 | -26.59 | 161 | 18 |
| 4882 | AV | V | 32.265 | 35.742 | 40.773 | 44.25 | 54 | -9.75 | 161 | 18 |
| 7324 | PK | V | 34.17 | 39.966 | 44.544 | 50.34 | 74 | -23.66 | 155 | 115 |
| 7324 | AV | V | 34.17 | 39.966 | 40.894 | 46.69 | 54 | -7.31 | 155 | 115 |
| 4882 | PK | H | 32.265 | 35.742 | 52.623 | 56.1 | 74 | -17.9 | 152 | 113 |
| 4882 | AV | H | 32.265 | 35.742 | 50.363 | 53.84 | 54 | -0.16 | 152 | 113 |
| 7324 | PK | H | 34.17 | 39.966 | 44.814 | 50.61 | 74 | -23.39 | 147 | 111 |
| 7324 | AV | H | 34.17 | 39.966 | 41.244 | 47.04 | 54 | -6.96 | 147 | 111 |

Remark:
1. Corrected Level = Reading Level + Correction Factor－Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

**The radiated spurious emissions at**

| Frequency(MHz) | Margin |
|---|---|
| 4960 | -1.09 |

**are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.**

EUT : BM56S
Test Condition : Tx at high channel

| Frequency (MHz) | Spectrum Analyzer Detector | Antenna Polariz. (H/V) | Preamp (dB) | Correction Factor (dB/m) | Reading (dBuV) | Corrected Level (dBuV) | Limit @ 3 m (dBuV) | Margin (dB) | Antenna high (cm) | Turn Table angle (degree) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4960 | PK | V | 32.265 | 35.742 | 45.083 | 48.56 | 74 | -25.44 | 115 | 109 |
| 4960 | AV | V | 32.265 | 35.742 | 42.663 | 46.14 | 54 | -7.86 | 115 | 109 |
| 7440 | PK | V | 34.17 | 39.966 | 43.294 | 49.09 | 74 | -24.91 | 105 | 110 |
| 7440 | AV | V | 34.17 | 39.966 | 37.294 | 43.09 | 54 | -10.91 | 105 | 110 |
| 4960 | PK | H | 32.265 | 35.742 | 52.163 | 55.64 | 74 | -18.36 | 139 | 108 |
| 4960 | AV | H | 32.265 | 35.742 | 49.433 | 52.91 | 54 | -1.09 | 139 | 108 |
| 7440 | PK | H | 34.17 | 39.966 | 42.854 | 48.65 | 74 | -25.35 | 148 | 109 |
| 7440 | AV | H | 34.17 | 39.966 | 36.904 | 42.7 | 54 | -11.3 | 148 | 109 |

Remark:
1. Corrected Level = Reading Level + Correction Factor－Preamp
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

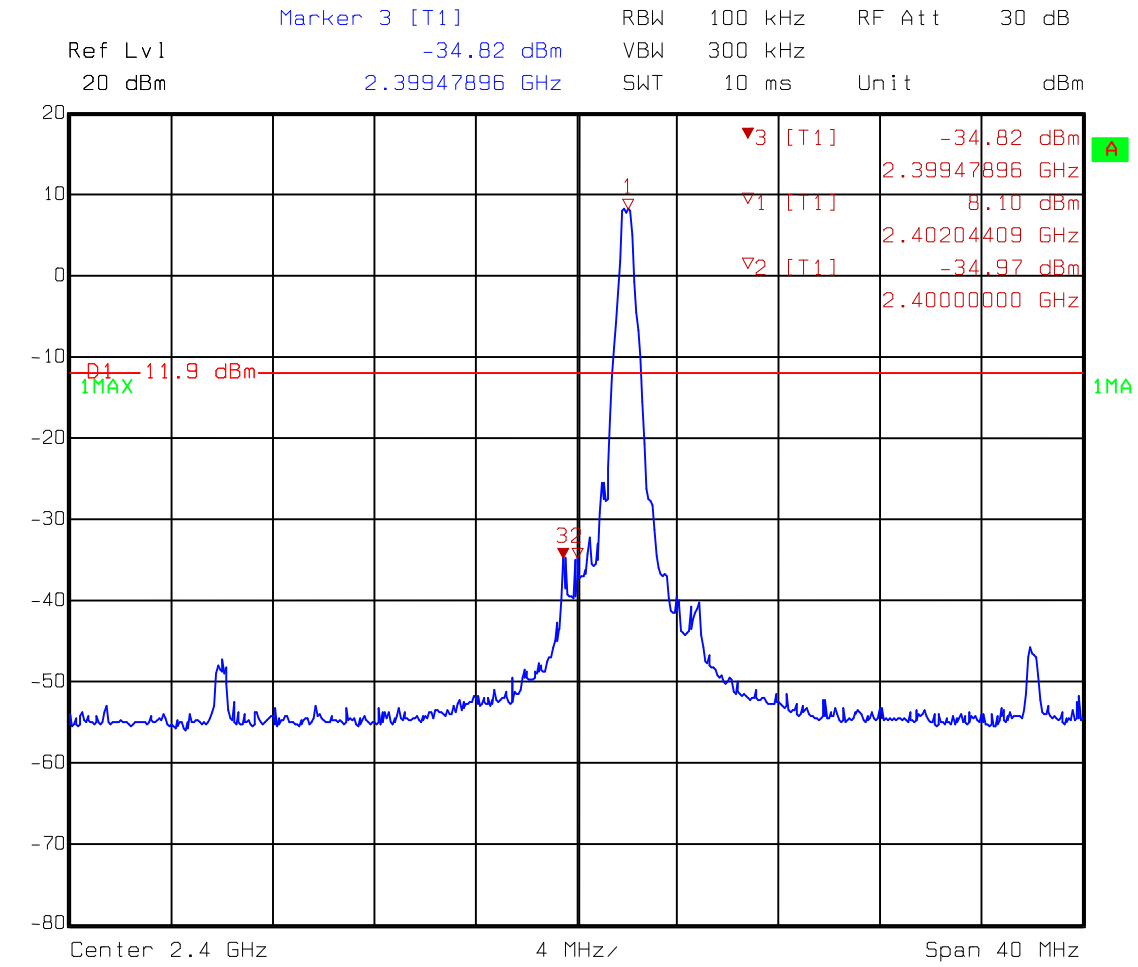
For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

## 9. Emission on the band edge §FCC 15.247(C)

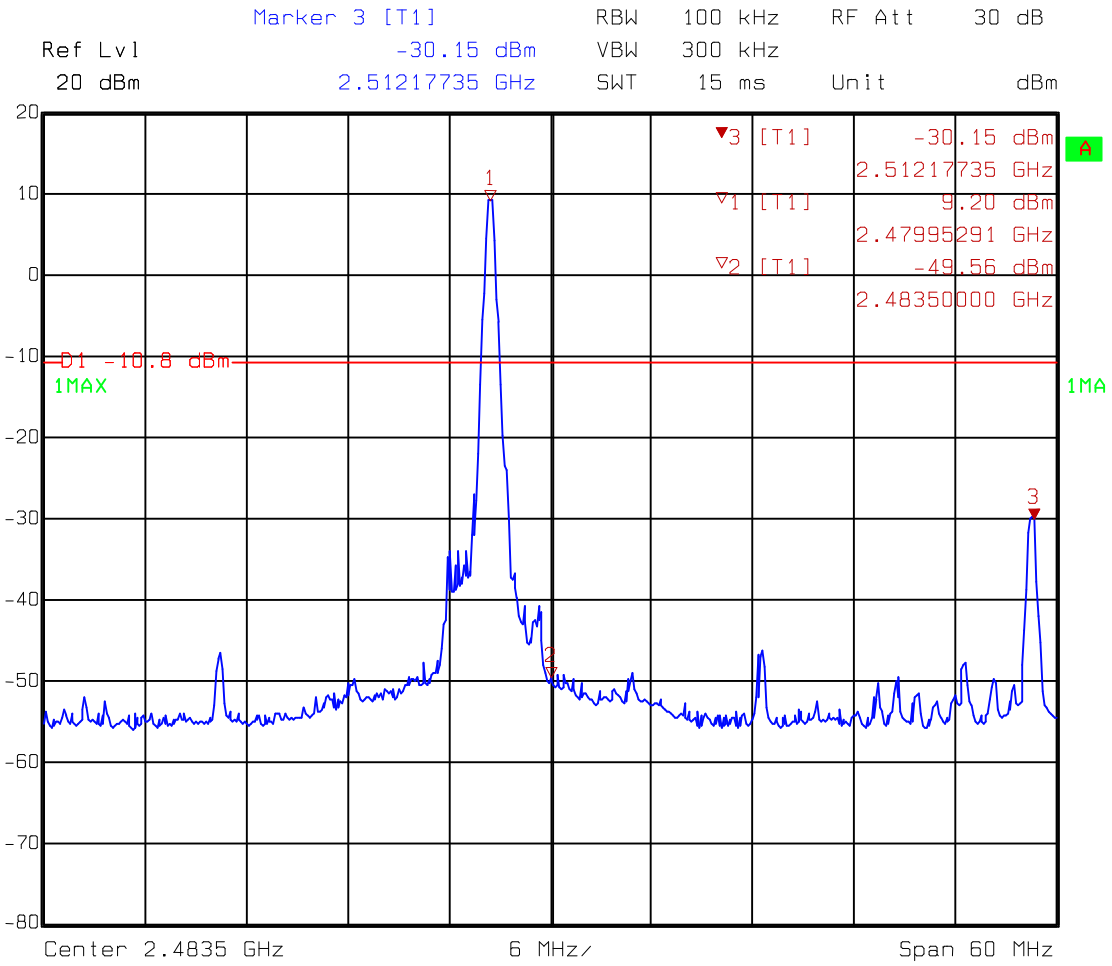
In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Please see the plot below.

## 7.1 Band-edge (Conducted method)




Comment A: Band-edge at low channel
Date: 26.FEB.2004 16:54:38



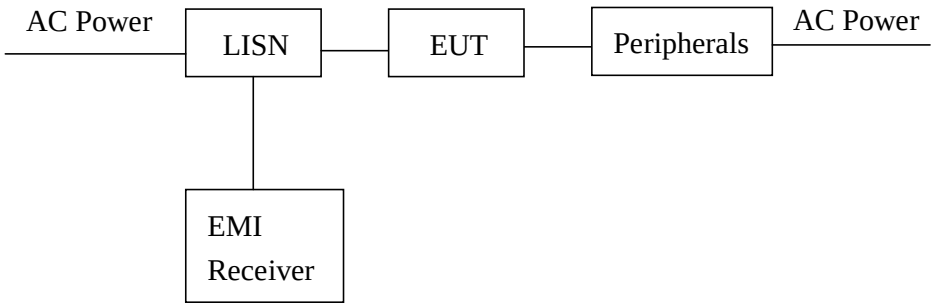

Comment A: Band-edge at high channel
Date: 26.FEB.2004 16:56:09

## 10. Power Line Conducted Emission test §FCC 15.207

### 10.1 Operating environment

| | | | |
|---|---|---|---|
| Temperature: | 21 | ℃ | (10-40℃) |
| Relative Humidity: | 52 | % | (10-90%) |
| Atmospheric Pressure | 1023 | hPa | (860-1061hPa) |

### 10.2 Test setup & procedure




The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement. The AC power conducted emissions was invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz. (15.207 paragraph)

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

Please see the plot below.

Emission Limit

| Freq. (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Q.P. | Ave. |
| 0.15~0.50 | 66 – 56* | 56 – 46* |
| 0.50~5.00 | 56 | 46 |
| 5.00~30.0 | 60 | 50 |

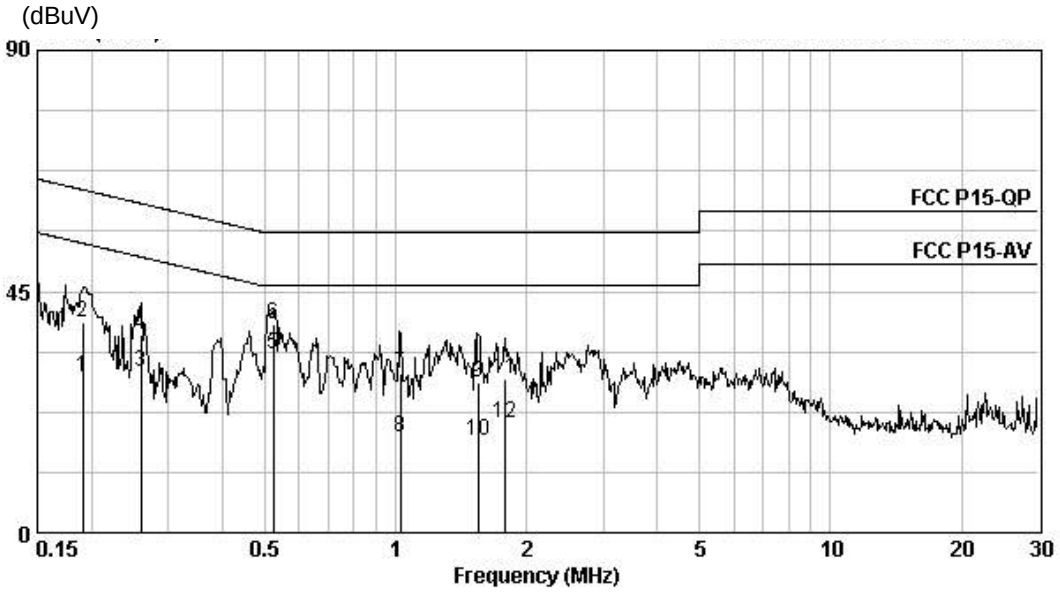
*Decreases with the logarithm of the frequency.

**10.3 Power Line Conducted Emission test data**

Phase: Line
Model No.: BM56S
Test Condition: Normal operation mode with adapter 1

| Freq. (MHz) | Correction Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|
| 0.191 | 0.10 | 39.30 | 64.01 | -24.71 | QP |
| 0.191 | 0.10 | 29.10 | 54.01 | -24.91 | AVERAGE |
| 0.260 | 0.10 | 36.82 | 61.43 | -24.61 | QP |
| 0.260 | 0.10 | 29.88 | 51.43 | -21.55 | AVERAGE |
| 0.524 | 0.10 | 38.82 | 56.00 | -17.18 | QP |
| 0.524 | 0.10 | 33.24 | 46.00 | -12.76 | AVERAGE |
| 1.023 | 0.10 | 29.56 | 56.00 | -26.44 | QP |
| 1.023 | 0.10 | 17.82 | 46.00 | -28.18 | AVERAGE |
| 1.549 | 0.10 | 27.88 | 56.00 | -28.12 | QP |
| 1.549 | 0.10 | 17.14 | 46.00 | -28.86 | AVERAGE |
| 1.788 | 0.10 | 28.57 | 56.00 | -27.43 | QP |
| 1.788 | 0.10 | 20.38 | 46.00 | -25.62 | AVERAGE |

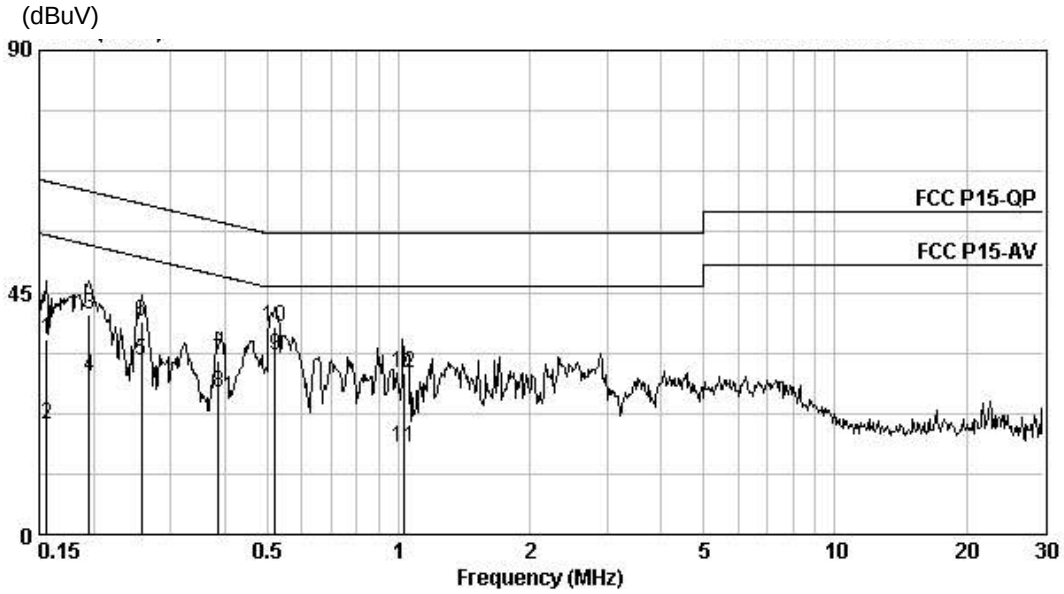
Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase: Neutral
Model No.: BM56S
Test Condition: Normal operation mode with adapter 1

| Freq. (MHz) | Correction Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|
| 0.156 | 0.10 | 36.29 | 65.67 | -29.38 | QP |
| 0.156 | 0.10 | 20.59 | 55.67 | -35.08 | AVERAGE |
| 0.195 | 0.10 | 40.96 | 63.82 | -22.86 | QP |
| 0.195 | 0.10 | 29.35 | 53.82 | -24.47 | AVERAGE |
| 0.258 | 0.10 | 39.58 | 61.50 | -21.92 | QP |
| 0.258 | 0.10 | 32.47 | 51.50 | -19.03 | AVERAGE |
| 0.387 | 0.10 | 32.40 | 58.12 | -25.72 | QP |
| 0.387 | 0.10 | 26.32 | 48.12 | -21.80 | AVERAGE |
| 0.520 | 0.10 | 38.72 | 56.00 | -17.28 | QP |
| 0.520 | 0.10 | 33.15 | 46.00 | -12.85 | AVERAGE |
| 1.023 | 0.10 | 29.93 | 56.00 | -26.07 | QP |
| 1.023 | 0.10 | 16.15 | 46.00 | -29.85 | AVERAGE |

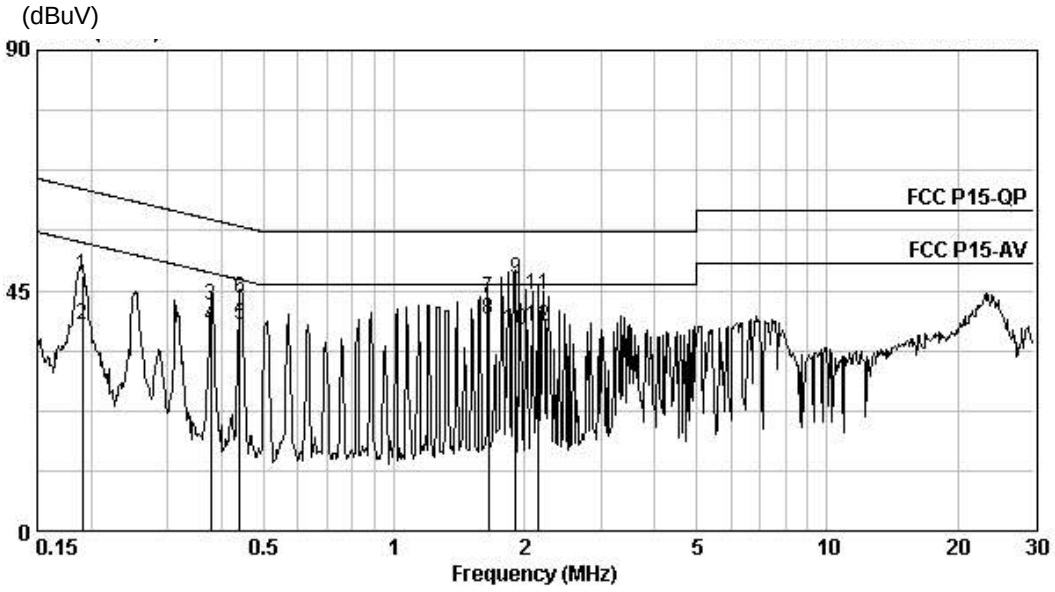
Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase: Line
Model No.: BM56S
Test Condition: Normal operation mode with adapter 2

| Freq. (MHz) | Correction Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|
| 0.191 | 0.10 | 47.87 | 64.01 | -16.14 | QP |
| 0.191 | 0.10 | 38.58 | 54.01 | -15.43 | AVERAGE |
| 0.378 | 0.10 | 42.25 | 58.32 | -16.07 | QP |
| 0.378 | 0.10 | 38.10 | 48.32 | -10.22 | AVERAGE |
| 0.440 | 0.10 | 43.54 | 57.07 | -13.53 | QP |
| 0.440 | 0.10 | 38.58 | 47.07 | -8.49 | AVERAGE |
| 1.651 | 0.10 | 43.49 | 56.00 | -12.51 | QP |
| 1.651 | 0.10 | 39.57 | 46.00 | -6.43 | AVERAGE |
| 1.905 | 0.10 | 47.00 | 56.00 | -9.00 | QP |
| 1.905 | 0.10 | 37.62 | 46.00 | -8.38 | AVERAGE |
| 2.148 | 0.11 | 44.33 | 56.00 | -11.67 | QP |
| 2.148 | 0.11 | 38.27 | 46.00 | -7.73 | AVERAGE |

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase: Neutral
Model No.: BM56S
Test Condition: Normal operation mode with adapter 2

| Freq. (MHz) | Correction Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|
| 0.189 | 0.10 | 47.69 | 64.08 | -16.39 | QP |
| 0.189 | 0.10 | 39.51 | 54.08 | -14.57 | AVERAGE |
| 0.378 | 0.10 | 41.34 | 58.32 | -16.98 | QP |
| 0.378 | 0.10 | 36.53 | 48.32 | -11.79 | AVERAGE |
| 0.443 | 0.10 | 44.93 | 57.00 | -12.07 | QP |
| 0.443 | 0.10 | 44.40 | 47.00 | -2.60 | AVERAGE |
| 1.774 | 0.10 | 44.94 | 56.00 | -11.06 | QP |
| 1.774 | 0.10 | 41.95 | 46.00 | -4.05 | AVERAGE |
| 1.967 | 0.10 | 46.81 | 56.00 | -9.19 | QP |
| 1.967 | 0.10 | 21.70 | 46.00 | -24.30 | AVERAGE |
| 2.031 | 0.10 | 46.02 | 56.00 | -9.98 | QP |
| 2.031 | 0.10 | 44.91 | 46.00 | -1.09 | AVERAGE |

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)