



Test Report

| | |
|--------------|-------------|
| Product Name | Dongle |
| Model No. | OM-100018/R |
| FCC ID | FSUKM016 |

| | |
|-----------|---|
| Applicant | KYE SYSTEMS CORP. |
| Address | No.492, Sec. 5, Chongxin Rd.Sanchong Dist., New Taipei City 24160, Taiwan (R.O.C.) |

| | |
|-----------------|----------------------|
| Date of Receipt | Dec. 20, 2010 |
| Issued Date | Jan. 07, 2011 |
| Report No. | 10C327R-RFUSP30V01-A |
| Report Version | V1.0 |

The test results relate only to the samples tested.

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Test Report Certification

Issued Date: Jan. 07, 2011

Report No.: 10C327R-RFUSP30V01-A



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|---------------------|---|
| Product Name | Dongle |
| Applicant | KYE SYSTEMS CORP. |
| Address | No.492, Sec. 5, Chongxin Rd.Sanchong Dist., New Taipei City 24160, Taiwan (R.O.C.) |
| Manufacturer | KYE SYSTEMS CORP. |
| Model No. | OM-100018/R |
| EUT Rated Voltage | DC 5V (Power by USB) |
| EUT Test Voltage | AC 120V/60Hz |
| Trade Name | Genius |
| Applicable Standard | FCC CFR Title 47 Part 15 Subpart C: 2009 ANSI C63.4: 2003 |
| Test Result | Complied |

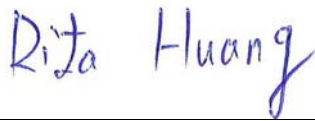


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Documented By :



(Senior Adm. Specialist / Rita Huang)



Tested By :



(Engineer / Eason Hung)



Testing Laboratory

0914

Approved By :



(Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

| | |
|--------------------|----------------|
| Product Name | Dongle |
| Trade Name | Genius |
| Model No. | OM-100018/R |
| FCC ID | FSUKM016 |
| Frequency Range | 2402~2480MHz |
| Channel Control | Auto |
| Channel Separation | 1MHz |
| Antenna Type | Printed on PCB |
| Channel Number | 79 |
| Type of Modulation | GFSK |

Antenna List

| No. | Manufacturer | Part No. | Peak Gain |
|-----|-------------------------------|----------|----------------------|
| 1 | KYE SYSTEMS CORP. (Genius) | N/A | -6.46dBi for 2.4 GHz |

Note: The antenna of EUT is conform to FCC 15.203

Frequency of Each Channel

| | | | | | | | |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| Channel 1: | 2402 MHz | Channel 22: | 2423 MHz | Channel 43: | 2444 MHz | Channel 64: | 2465 MHz |
| Channel 2: | 2403 MHz | Channel 23: | 2424 MHz | Channel 44: | 2445 MHz | Channel 65: | 2466 MHz |
| Channel 3: | 2404 MHz | Channel 24: | 2425 MHz | Channel 45: | 2446 MHz | Channel 66: | 2467 MHz |
| Channel 4: | 2405 MHz | Channel 25: | 2426 MHz | Channel 46: | 2447 MHz | Channel 67: | 2468 MHz |
| Channel 5: | 2406 MHz | Channel 26: | 2427 MHz | Channel 47: | 2448 MHz | Channel 68: | 2469 MHz |
| Channel 6: | 2407 MHz | Channel 27: | 2428 MHz | Channel 48: | 2449 MHz | Channel 69: | 2470 MHz |
| Channel 7: | 2408 MHz | Channel 28: | 2429 MHz | Channel 49: | 2450 MHz | Channel 70: | 2471 MHz |
| Channel 8: | 2409 MHz | Channel 29: | 2430 MHz | Channel 50: | 2451 MHz | Channel 71: | 2472 MHz |
| Channel 9: | 2410 MHz | Channel 30: | 2431 MHz | Channel 51: | 2452 MHz | Channel 72: | 2473 MHz |
| Channel 10: | 2411 MHz | Channel 31: | 2432 MHz | Channel 52: | 2453 MHz | Channel 73: | 2474 MHz |
| Channel 11: | 2412 MHz | Channel 32: | 2433 MHz | Channel 53: | 2454 MHz | Channel 74: | 2475 MHz |
| Channel 12: | 2413 MHz | Channel 33: | 2434 MHz | Channel 54: | 2455 MHz | Channel 75: | 2476 MHz |
| Channel 13: | 2414 MHz | Channel 34: | 2435 MHz | Channel 55: | 2456 MHz | Channel 76: | 2477 MHz |
| Channel 14: | 2415 MHz | Channel 35: | 2436 MHz | Channel 56: | 2457 MHz | Channel 77: | 2478 MHz |
| Channel 15: | 2416 MHz | Channel 36: | 2437 MHz | Channel 57: | 2458 MHz | Channel 78: | 2479 MHz |
| Channel 16: | 2417 MHz | Channel 37: | 2438 MHz | Channel 58: | 2459 MHz | Channel 79: | 2480 MHz |
| Channel 17: | 2418 MHz | Channel 38: | 2439 MHz | Channel 59: | 2460 MHz | | |
| Channel 18: | 2419 MHz | Channel 39: | 2440 MHz | Channel 60: | 2461 MHz | | |
| Channel 19: | 2420 MHz | Channel 40: | 2441 MHz | Channel 61: | 2462 MHz | | |
| Channel 20: | 2421 MHz | Channel 41: | 2442 MHz | Channel 62: | 2463 MHz | | |
| Channel 21: | 2422 MHz | Channel 42: | 2443 MHz | Channel 63: | 2464 MHz | | |

Note:

1. The EUT is a Dongle with a built-in 2.4GHz transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249 for spread spectrum devices.

1.2. Operational Description

The EUT is Dongle built-in 2.4GHz transceiver. The operation frequency is from 2402MHz to 2480MHz with GFSK modulation. The signal will be transmitted through 2.4GHz RF signal from the Printed on PCB antenna. DC 5V (Power by USB) shall be provided for EUT operation.

Joy is a 3-button 2.4GHz wireless optical mouse with nano receiver. Equipped with Pixart Magic Lens, Joy delivers excellent tracking performance on not only the regular office tables but also on special surfaces such as glossy marble stones and ceramic tile.

Joy is designed to be “plug & play”. Simply plug on the dongle to the computer and power on the mouse, the mouse will be detected automatically and start to work.

| | |
|-----------|------------------|
| Test Mode | Mode 1: Transmit |
|-----------|------------------|

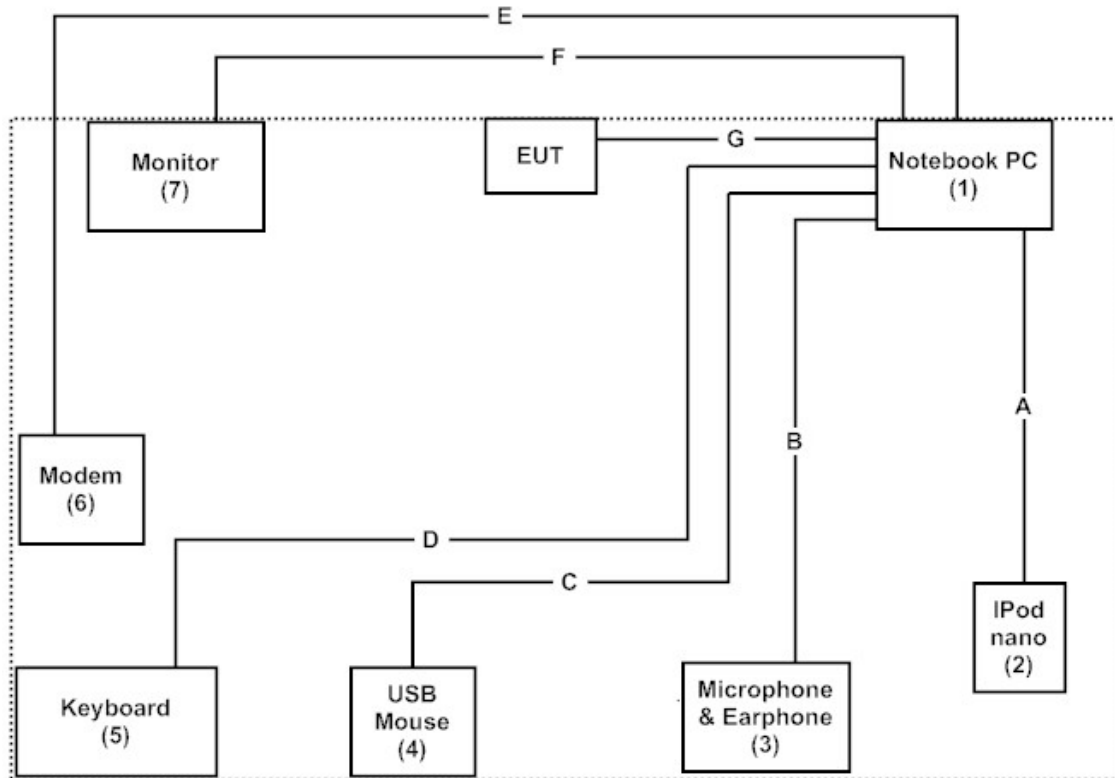
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

| | Product | Manufacturer | Model No. | Serial No. | Power Cord |
|-----|-----------------------|--------------|-----------|---------------|--------------------|
| (1) | Notebook PC | DELL | PPT | N/A | Non-Shielded, 0.8m |
| (2) | iPod nano | Apple | A1199 | YM73337EVQ5 | N/A |
| (3) | Microphone & Earphone | PCHOME | N/A | N/A | N/A |
| (4) | USB Mouse | Logitech | M-BE58 | HCA24311616 | N/A |
| (5) | Keyboard | Logitech | Y-UR83 | SY848UK | N/A |
| (6) | Modem | ACEEX | DM-1414 | 0102027532 | Non-Shielded, 1.8m |
| (7) | Monitor | CHIMEI | N-5221 | 22T51802N0401 | Non-Shielded, 1.8m |

| Signal Cable Type | Signal cable Description |
|--------------------------------|---|
| A. USB Cable | Non-Shielded, 0.8m |
| B. Microphone & Earphone Cable | Non-Shielded. 2.0m |
| C. Mouse Cable | Shielded, 2.0m |
| D. Keyboard Cable | Shielded, 2.0m |
| E. RS-232 Cable | Non-Shielded. 1.2m |
| F. VGA Cable | Shielded, 1.8m, with two ferrite cores bonded |
| G. USB Cable | Shielded, 1.7m, with one ferrite core bonded |

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute “Genius USB Device Test” program on the EUT.
- (3) Configure the test mode and the test channel
- (4) Press “Set One” to start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

| Items | Required (IEC 68-1) | Actual |
|----------------------------|---------------------|----------|
| Temperature (°C) | 15-35 | 20-35 |
| Humidity (%RH) | 25-75 | 50-65 |
| Barometric pressure (mbar) | 860-1060 | 950-1000 |

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :

<http://www.quietek.com/>

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195



Accreditation on NVLAP
NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation
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FCC Accreditation Number: TW1014



2. Conducted Emission

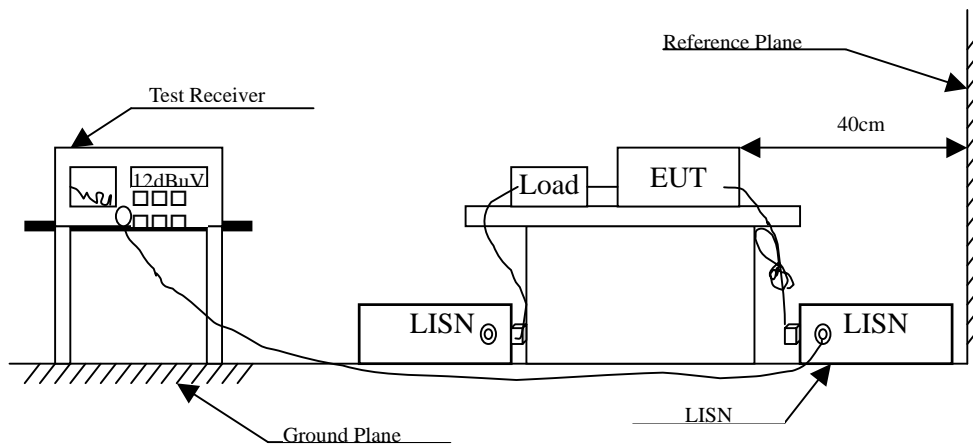
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

| Item | Instrument | Manufacturer | Type No./Serial No | Last Cal. | Remark |
|------|--------------------|--------------|--------------------|-----------|-------------|
| 1 | Test Receiver | R & S | ESCS 30/825442/17 | May, 2010 | |
| 2 | L.I.S.N. | R & S | ESH3-Z5/825016/6 | May, 2010 | EUT |
| 3 | L.I.S.N. | Kyoritsu | KNW-407/8-1420-3 | May, 2010 | Peripherals |
| 4 | Pulse Limiter | R & S | ESH3-Z2 | May, 2010 | |
| 5 | No.1 Shielded Room | | | N/A | |

Note: All instruments are calibrated every one year.

2.2. Test Setup



2.3. Limits

| FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit | | |
|---|--------|-------|
| Frequency MHz | Limits | |
| | QP | AV |
| 0.15 - 0.50 | 66-56 | 56-46 |
| 0.50-5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). 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. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. 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: 2003 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : Dongle
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Transmit

| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV | dB | dBuV |
| LINE 1 | | | | | |
| Quasi-Peak | | | | | |
| 0.150 | 9.766 | 43.050 | 52.816 | -13.184 | 66.000 |
| 0.166 | 9.746 | 40.060 | 49.805 | -15.738 | 65.543 |
| 0.197 | 9.709 | 33.580 | 43.289 | -21.368 | 64.657 |
| 0.271 | 9.662 | 32.770 | 42.432 | -20.111 | 62.543 |
| 0.459 | 9.640 | 24.850 | 34.490 | -22.681 | 57.171 |
| 0.580 | 9.640 | 26.960 | 36.600 | -19.400 | 56.000 |
| Average | | | | | |
| 0.150 | 9.766 | 27.130 | 36.896 | -19.104 | 56.000 |
| 0.166 | 9.746 | 28.160 | 37.905 | -17.638 | 55.543 |
| 0.197 | 9.709 | 14.770 | 24.479 | -30.178 | 54.657 |
| 0.271 | 9.662 | 31.020 | 40.682 | -11.861 | 52.543 |
| 0.459 | 9.640 | 13.130 | 22.770 | -24.401 | 47.171 |
| 0.580 | 9.640 | 22.250 | 31.890 | -14.110 | 46.000 |

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Dongle
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmit

| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV | dB | dBuV |
| LINE 2 | | | | | |
| Quasi-Peak | | | | | |
| 0.154 | 9.760 | 44.410 | 54.171 | -11.715 | 65.886 |
| 0.201 | 9.716 | 36.100 | 45.816 | -18.727 | 64.543 |
| 0.275 | 9.669 | 34.120 | 43.789 | -18.640 | 62.429 |
| 0.302 | 9.660 | 31.830 | 41.490 | -20.167 | 61.657 |
| 0.431 | 9.649 | 24.540 | 34.189 | -23.782 | 57.971 |
| 0.580 | 9.640 | 26.800 | 36.440 | -19.560 | 56.000 |
| Average | | | | | |
| 0.154 | 9.760 | 27.820 | 37.581 | -18.305 | 55.886 |
| 0.201 | 9.716 | 21.860 | 31.576 | -22.967 | 54.543 |
| 0.275 | 9.669 | 32.170 | 41.839 | -10.590 | 52.429 |
| 0.302 | 9.660 | 29.030 | 38.690 | -12.967 | 51.657 |
| 0.431 | 9.649 | 14.480 | 24.129 | -23.842 | 47.971 |
| 0.580 | 9.640 | 23.660 | 33.300 | -12.700 | 46.000 |

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Radiated Emission

3.1. Test Equipment

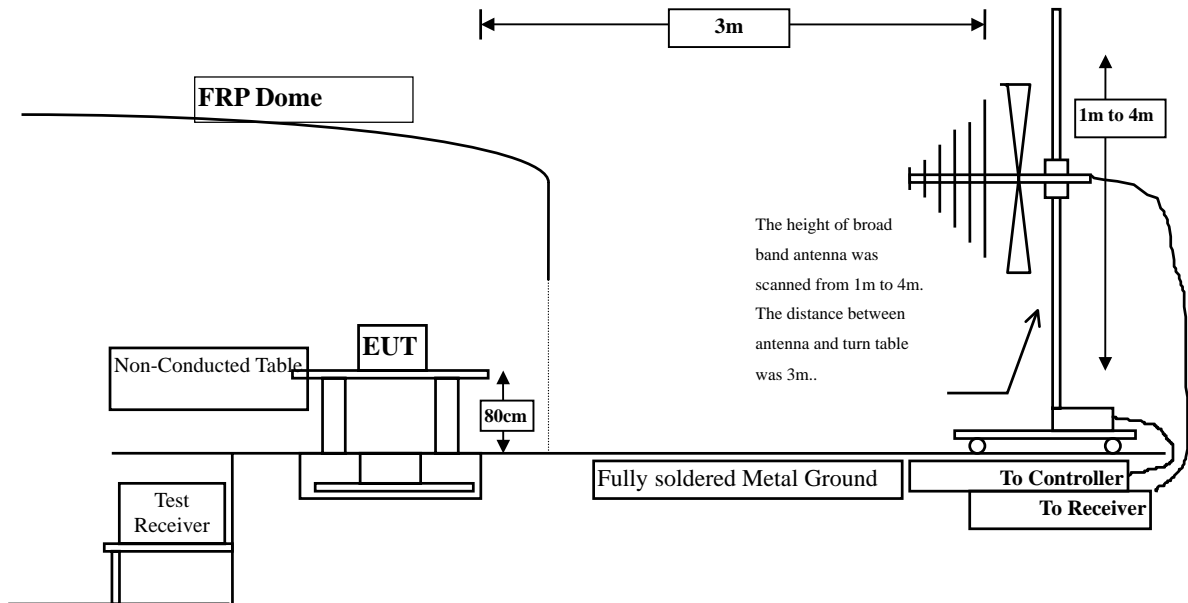
The following test equipment are used during the radiated emission test:

| Test Site | | Equipment | Manufacturer | Model No./Serial No. | Last Cal. |
|--|---|-------------------|-----------------|-----------------------|------------|
| <input checked="" type="checkbox"/> Site # 3 | X | Bilog Antenna | Schaffner Chase | CBL6112B/2673 | Sep., 2010 |
| | X | Horn Antenna | Schwarzbeck | BBHA9120D/D305 | Sep., 2010 |
| | X | Horn Antenna | Schwarzbeck | BBHA9170/208 | Jul., 2010 |
| | X | Pre-Amplifier | QTK | AP-180C / CHM_0906076 | Sep., 2010 |
| | X | Spectrum Analyzer | Agilent | E4407B / US39440758 | May, 2010 |
| | X | Test Receiver | R & S | ESCS 30/ 825442/018 | Sep., 2010 |
| | X | Coaxial Cable | Quietek | QTK-CABLE/ CAB5 | Feb., 2010 |
| | X | Controller | Quietek | QTK-CONTROLLER/ CTRL3 | N/A |
| | X | Coaxial Switch | Anritsu | MP59B/6200265729 | N/A |

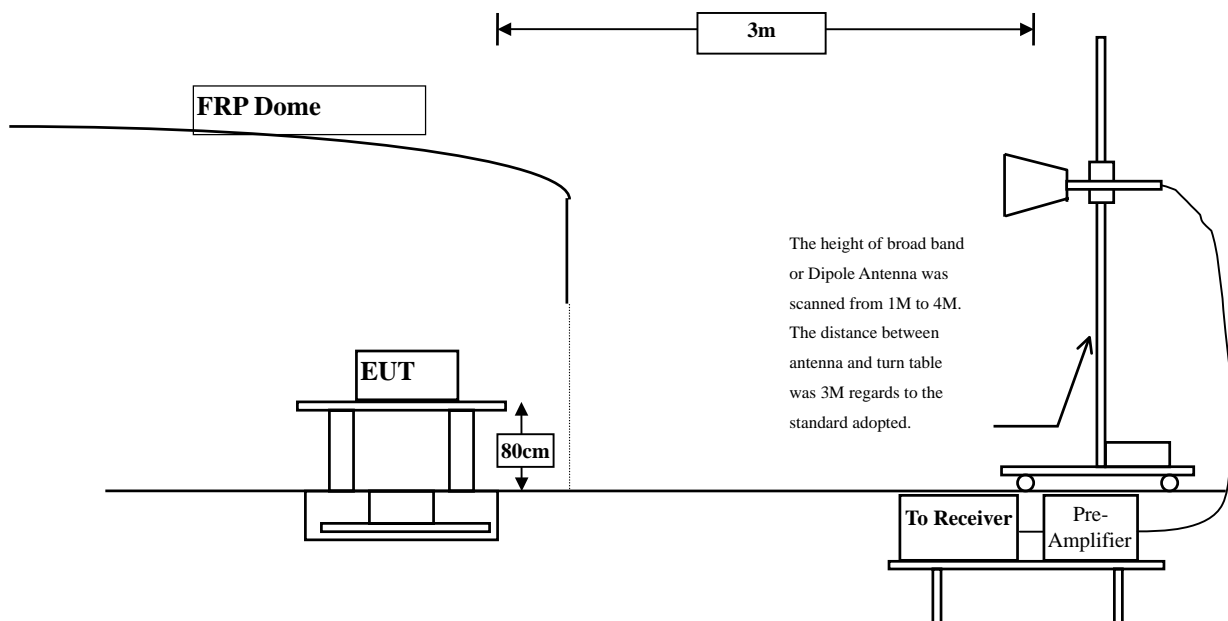
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

| FCC Part 15 Subpart C Paragraph 15.249 Limits | | | | |
|---|-------------------------------|--------------|-----------------------------|--------------|
| Frequency MHz | Field Strength of Fundamental | | Field Strength of Harmonics | |
| | (mV/m @3m) | (dBuV/m @3m) | (uV/m @3m) | (dBuV/m @3m) |
| 902-928 | 50 | 94 | 500 | 54 |
| 2400-2483.5 | 50 | 94 | 500 | 54 |
| 5725-5875 | 50 | 94 | 500 | 54 |

Remarks : 1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
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.

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

| FCC Part 15 Subpart C Paragraph 15.209(a) Limits | | |
|--|----------|-----------|
| Frequency MHz | uV/m @3m | dBuV/m@3m |
| 30-88 | 100 | 40 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46 |
| Above 960 | 500 | 54 |

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

3.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested compliance to FCC 47CFR 15.249 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

The measurement frequency range from 30MHz - 10th Harmonic of fundamental was investigated.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : Dongle
Test Item : Fundamental Radiated Emission
Test Site : No.3OATS
Test Mode : Mode 1: Transmit

| Frequency MHz | Correct Factor dB | Reading Level dBuV | Measurement Level dBuV/m | Margin dB | Limit dBuV/m |
|-----------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| Horizontal | | | | | |
| Peak Detector: | | | | | |
| 2402.000 | 31.573 | 44.920 | 76.493 | -37.506 | 114.000 |
| 2448.000 | 31.913 | 46.300 | 78.213 | -35.787 | 114.000 |
| 2480.000 | 32.155 | 45.160 | 77.316 | -36.684 | 114.000 |
| Average | | | | | |
| Detector: | | | | | |
| 2402.000 | 31.573 | 42.520 | 74.093 | -17.506 | 94.000 |
| 2448.000 | 31.913 | 44.200 | 76.113 | -17.887 | 94.000 |
| 2480.000 | 32.155 | 42.930 | 75.086 | -18.914 | 94.000 |

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

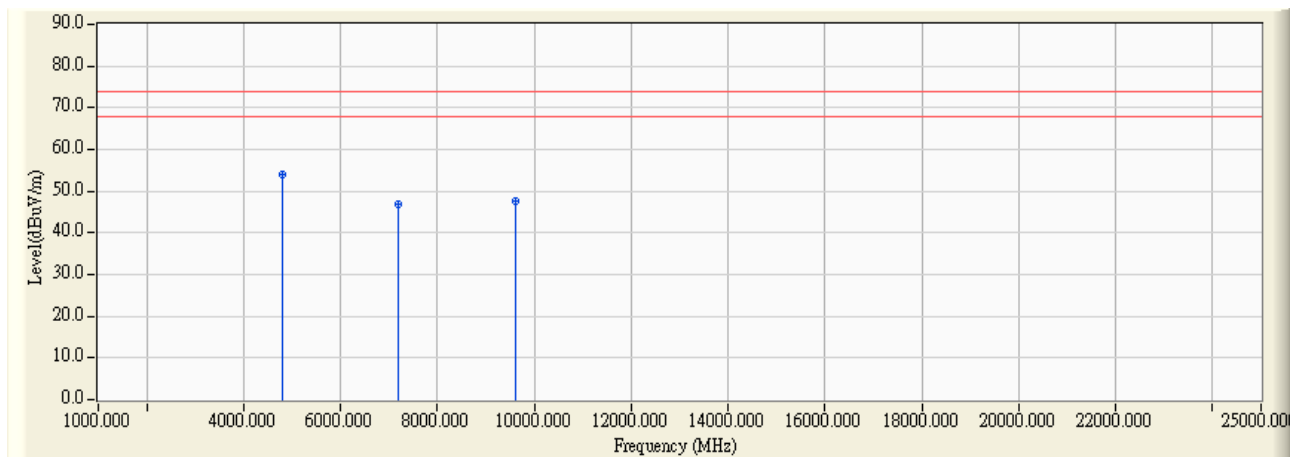
Product : Dongle
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit

| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-----------------------|---------|---------|-------------|---------|---------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV/m | dB | dBuV/m |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 2402.000 | 30.917 | 53.800 | 84.717 | -29.283 | 114.000 |
| 2448.000 | 31.193 | 55.140 | 86.334 | -27.666 | 114.000 |
| 2480.000 | 31.412 | 53.490 | 84.902 | -29.098 | 114.000 |
| Average | | | | | |
| Detector: | | | | | |
| 2402.000 | 30.917 | 51.420 | 82.337 | -11.663 | 94.000 |
| 2448.000 | 31.193 | 53.640 | 84.834 | -9.166 | 94.000 |
| 2480.000 | 31.412 | 52.380 | 83.792 | -10.208 | 94.000 |

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2402MHz)



| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-----------|---------|---------|-------------|--------|--------|
| | Factor | Level | Level | | |
| MHz | dB | dBuV | dBuV/m | dB | dBuV/m |

Horizontal

Peak Detector:

| | | | | | |
|----------|-------|--------|--------|---------|--------|
| 4804.000 | 0.511 | 43.210 | 43.720 | -30.280 | 74.000 |
| 7206.000 | 7.511 | 40.080 | 47.591 | -26.409 | 74.000 |
| 9608.000 | 8.394 | 40.230 | 48.624 | -25.376 | 74.000 |

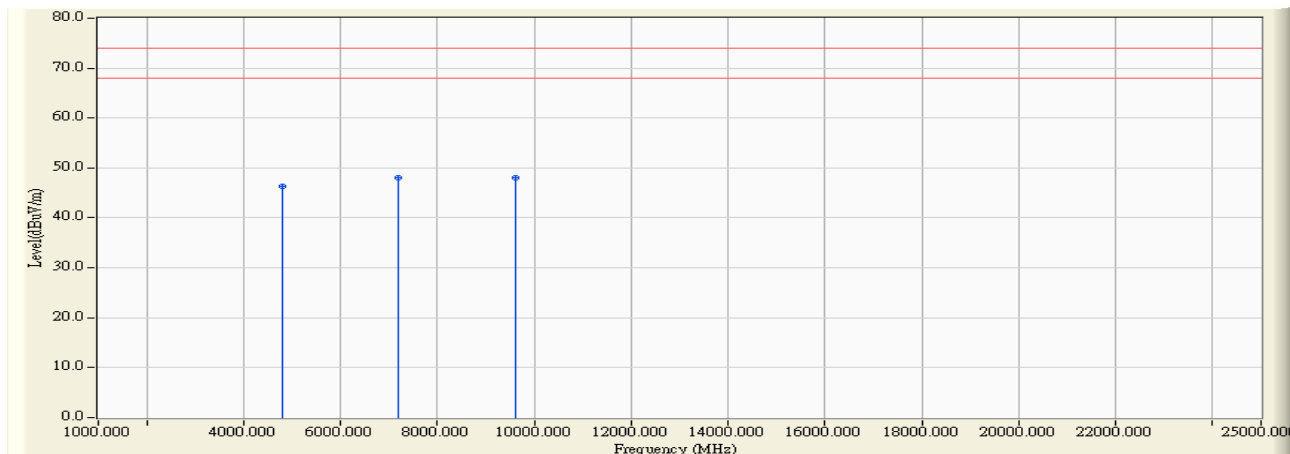
Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2402MHz)



| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-----------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV/m | dB | dBuV/m |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4804.000 | 0.923 | 45.430 | 46.352 | -27.648 | 74.000 |
| 7206.000 | 7.988 | 40.050 | 48.039 | -25.961 | 74.000 |
| 9608.000 | 8.847 | 39.240 | 48.087 | -25.913 | 74.000 |

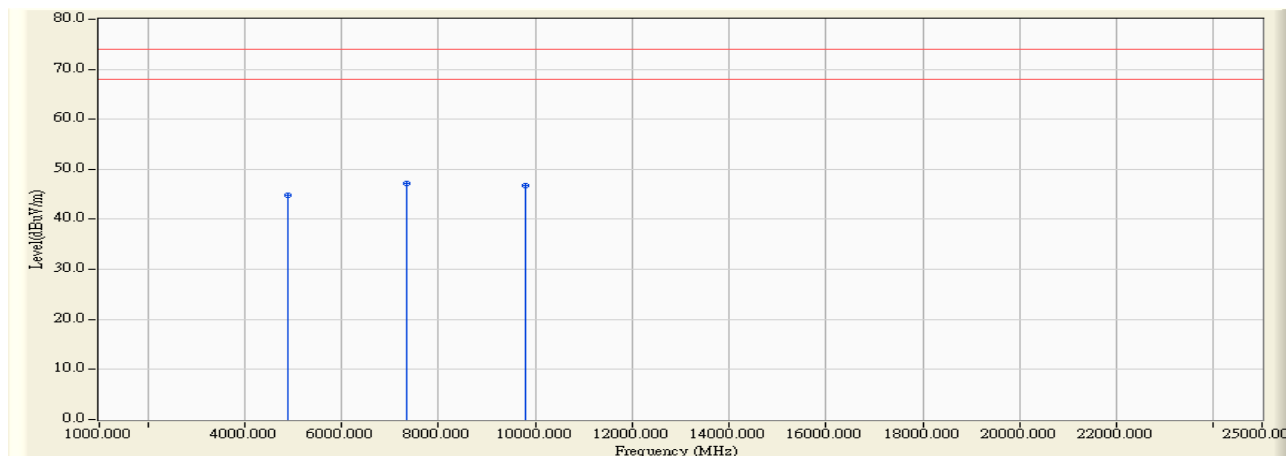
Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2448 MHz)



| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-----------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV/m | dB | dBuV/m |
| Horizontal | | | | | |
| Peak Detector: | | | | | |
| 4896.000 | -0.034 | 44.860 | 44.827 | -29.173 | 74.000 |
| 7344.000 | 8.167 | 39.080 | 47.247 | -26.753 | 74.000 |
| 9792.000 | 7.794 | 38.860 | 46.654 | -27.346 | 74.000 |

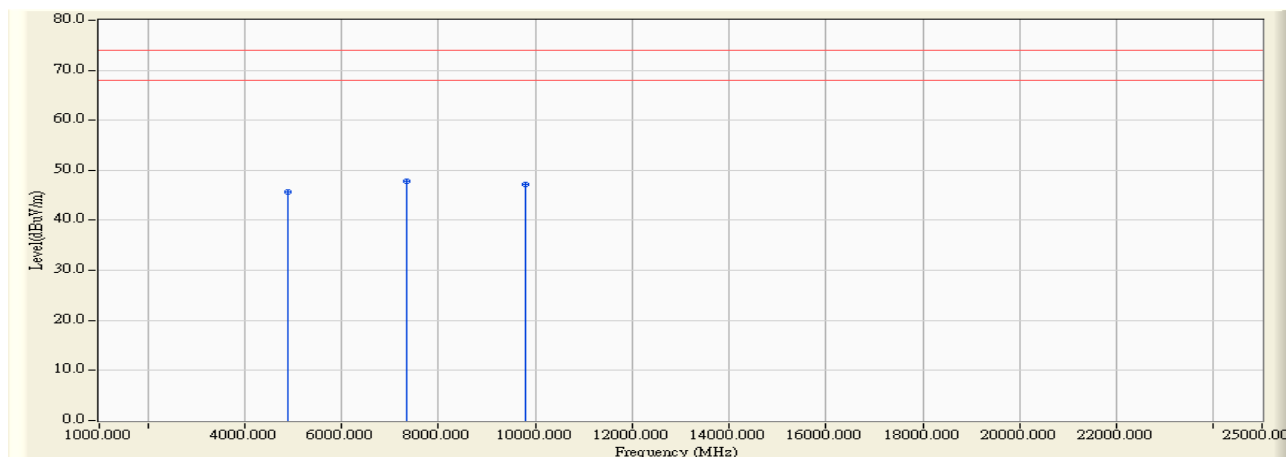
Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2448 MHz)

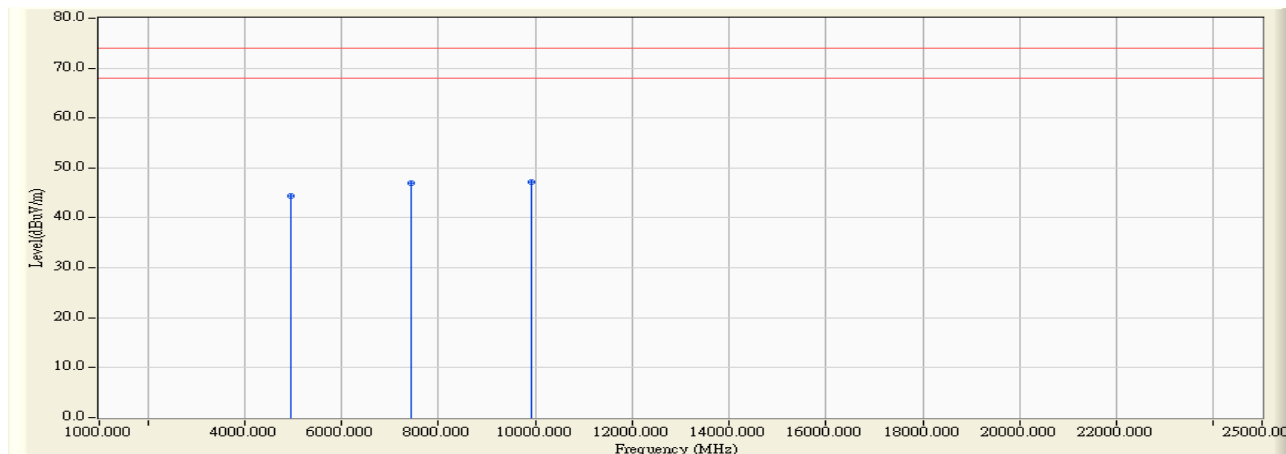


| Frequency | Correct | Reading | Measurement | Margin | Limit |
|--------------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV/m | dB | dBuV/m |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4896.000 | 0.450 | 45.260 | 45.711 | -28.289 | 74.000 |
| 7344.000 | 8.845 | 39.080 | 47.925 | -26.075 | 74.000 |
| 9792.000 | 8.428 | 38.780 | 47.207 | -26.793 | 74.000 |
| Average Detector: | | | | | |
| -- | | | | | |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2480 MHz)



| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-----------|---------|---------|-------------|--------|--------|
| MHz | Factor | Level | Level | | |
| MHz | dB | dBuV | dBuV/m | dB | dBuV/m |

Horizontal

Peak Detector:

| | | | | | |
|----------|-------|--------|--------|---------|--------|
| 4960.000 | 0.582 | 43.820 | 44.402 | -29.598 | 74.000 |
| 7440.000 | 8.555 | 38.510 | 47.065 | -26.935 | 74.000 |
| 9920.000 | 8.206 | 38.950 | 47.156 | -26.844 | 74.000 |

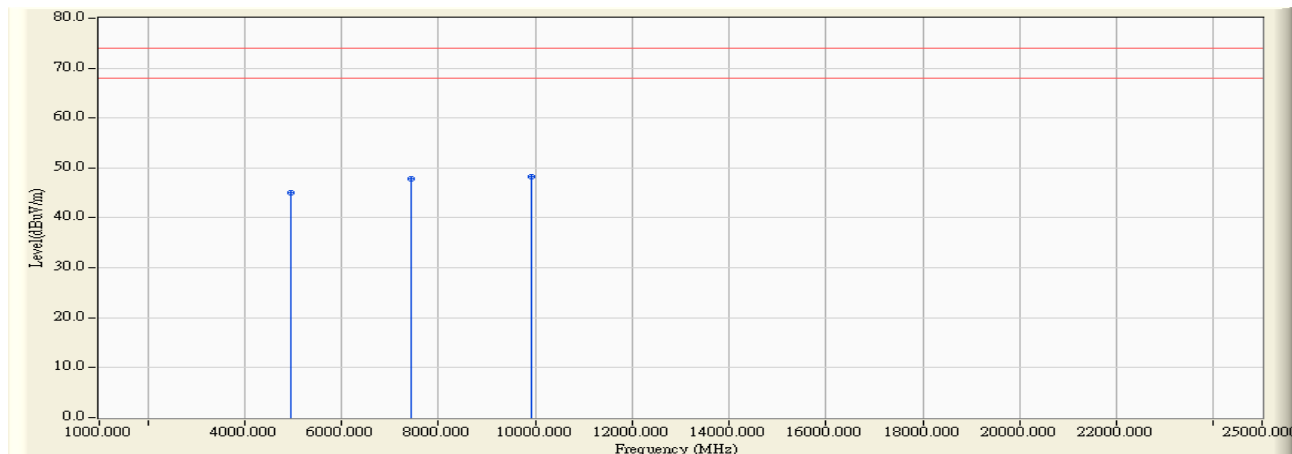
Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2480 MHz)



| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-----------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV/m | dB | dBuV/m |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4960.000 | 1.398 | 43.570 | 44.969 | -29.031 | 74.000 |
| 7440.000 | 9.214 | 38.690 | 47.904 | -26.096 | 74.000 |
| 9920.000 | 9.245 | 38.990 | 48.235 | -25.765 | 74.000 |

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Dongle
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2448 MHz)

| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | | |
| | dB | dBuV | dBuV/m | dB | dBuV/m |
| Horizontal | | | | | |
| 51.340 | -11.633 | 41.759 | 30.126 | -9.874 | 40.000 |
| 218.180 | -10.226 | 46.643 | 36.417 | -9.583 | 46.000 |
| 243.400 | -6.546 | 42.331 | 35.785 | -10.215 | 46.000 |
| 406.360 | 0.628 | 30.633 | 31.262 | -14.738 | 46.000 |
| 507.240 | 2.529 | 34.979 | 37.508 | -8.492 | 46.000 |
| 749.740 | 3.963 | 29.798 | 33.761 | -12.239 | 46.000 |
| Vertical | | | | | |
| 119.240 | -3.571 | 35.793 | 32.223 | -11.277 | 43.500 |
| 214.300 | -5.859 | 47.958 | 42.099 | -1.401 | 43.500 |
| 365.620 | 0.282 | 28.537 | 28.819 | -17.181 | 46.000 |
| 507.240 | 0.429 | 31.676 | 32.105 | -13.895 | 46.000 |
| 617.820 | 0.958 | 30.358 | 31.316 | -14.684 | 46.000 |
| 782.720 | 2.757 | 34.270 | 37.027 | -8.973 | 46.000 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

4. Band Edge

4.1. Test Equipment

RF Conducted Measurement

The following test equipments are used during the band edge tests:

| | Equipment | Manufacturer | Model No./Serial No. | Last Cal. |
|---|-------------------|--------------|----------------------|------------|
| | Spectrum Analyzer | R&S | FSP40 / 100170 | Jun, 2010 |
| | Spectrum Analyzer | Agilent | E4407B / US39440758 | Jun, 2010 |
| X | Spectrum Analyzer | Agilent | N9010A / MY48030495 | Apr., 2010 |

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

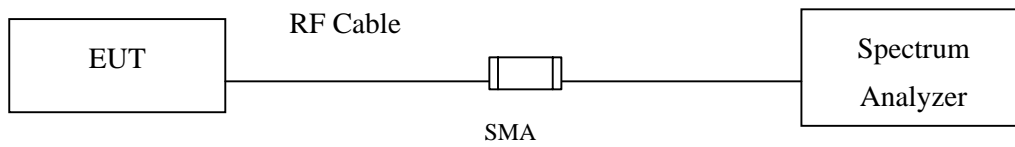
The following test equipments are used during the band edge tests:

| Test Site | | Equipment | Manufacturer | Model No./Serial No. | Last Cal. |
|------------|---|-------------------|-----------------|-----------------------|------------|
| ☒ Site # 3 | | Bilog Antenna | Schaffner Chase | CBL6112B/2673 | Sep., 2010 |
| | X | Horn Antenna | Schwarzbeck | BBHA9120D/D305 | Sep., 2010 |
| | | Horn Antenna | Schwarzbeck | BBHA9170/208 | Jul., 2010 |
| | X | Pre-Amplifier | QTK | AP-180C / CHM_0906076 | Sep., 2010 |
| | X | Spectrum Analyzer | Agilent | E4407B / US39440758 | May, 2010 |
| | | Test Receiver | R & S | ESCS 30/ 825442/018 | Sep., 2010 |
| | X | Coaxial Cable | QuieTek | QTK-CABLE/ CAB5 | Feb., 2010 |
| | X | Controller | QuieTek | QTK-CONTROLLER/ CTRL3 | N/A |
| | X | Coaxial Switch | Anritsu | MP59B/6200265729 | N/A |

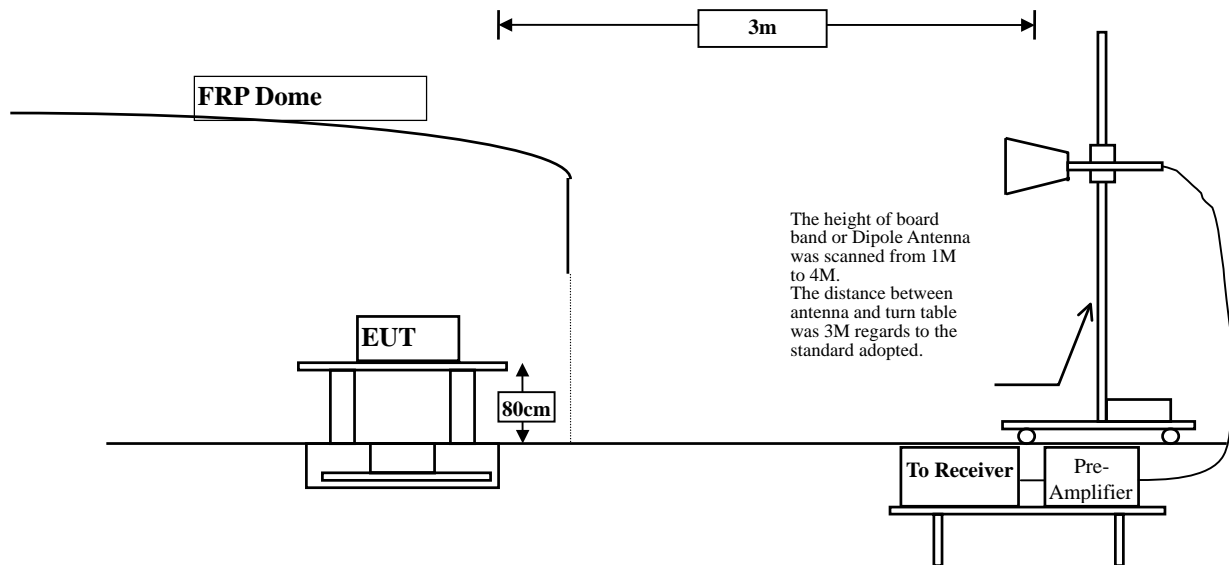
- Note:
1. All equipments are calibrated every one year.
 2. The test equipments marked by “X” are used to measure the final test results.

4.2. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



4.3. Limits

In any 100 kHz 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 50 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated measurement.

The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

4.5. Uncertainty

Conducted is ± 1.27 dB

Radiated is ± 3.9 dB

4.6. Test Result of Band Edge

Product : Dongle
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

Fundamental Filed Strength

| Antenna Pole | Frequency [MHz] | Correction Factor [dB/m] | Reading Level [dBuV] | Emission Level [dBuV/m] | Detector |
|--------------|-----------------|--------------------------|----------------------|-------------------------|----------|
| Horizontal | 2402 | 31.755 | 44.92 | 76.674 | Peak |
| Horizontal | 2402 | 31.755 | 41.53 | 73.284 | Average |
| Vertical | 2402 | 30.241 | 53.8 | 84.041 | Peak |
| Vertical | 2402 | 30.241 | 51.42 | 81.661 | Average |

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Band Edge Test Data

| Antenna Pole | Test Frequency (MHz) | Fundamental (dBuV/m) | Δ (dB) | Band Edge Field Strength (dBuV/m) | Detector |
|--------------|----------------------|----------------------|---------------|-----------------------------------|----------|
| Horizontal | 2400 | 76.674 | 31.97 | 44.704 | Peak |
| Horizontal | 2400 | 73.284 | 44.745 | 28.539 | Average |
| Vertical | 2400 | 84.041 | 31.97 | 52.071 | Peak |
| Vertical | 2400 | 81.661 | 44.745 | 36.916 | Average |

Note:

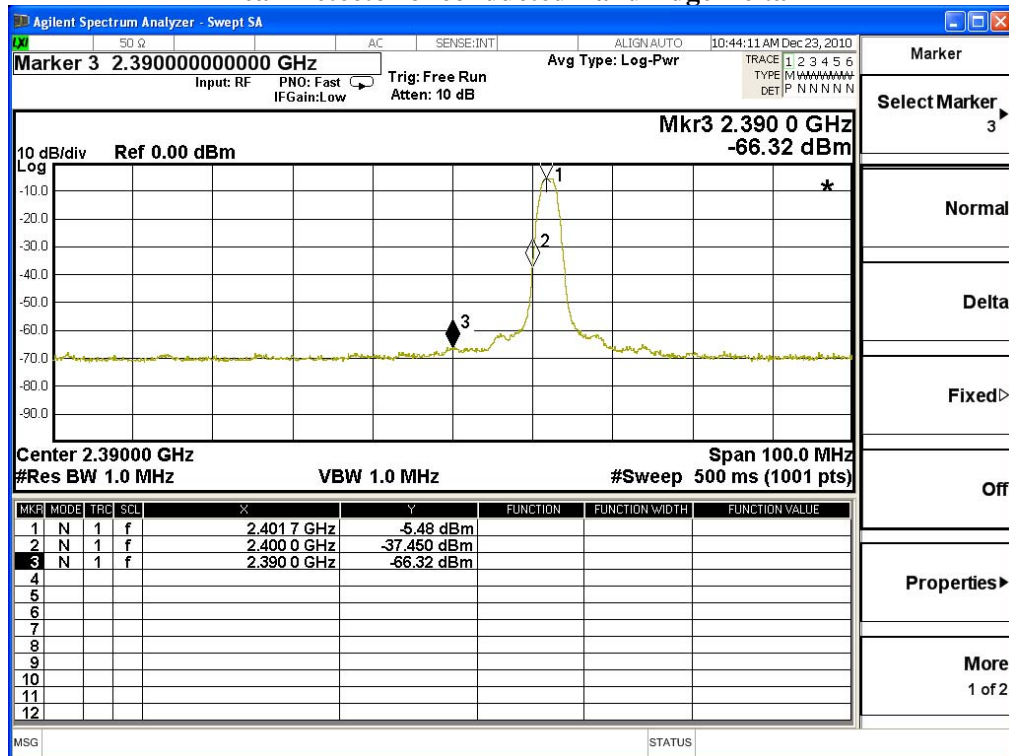
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

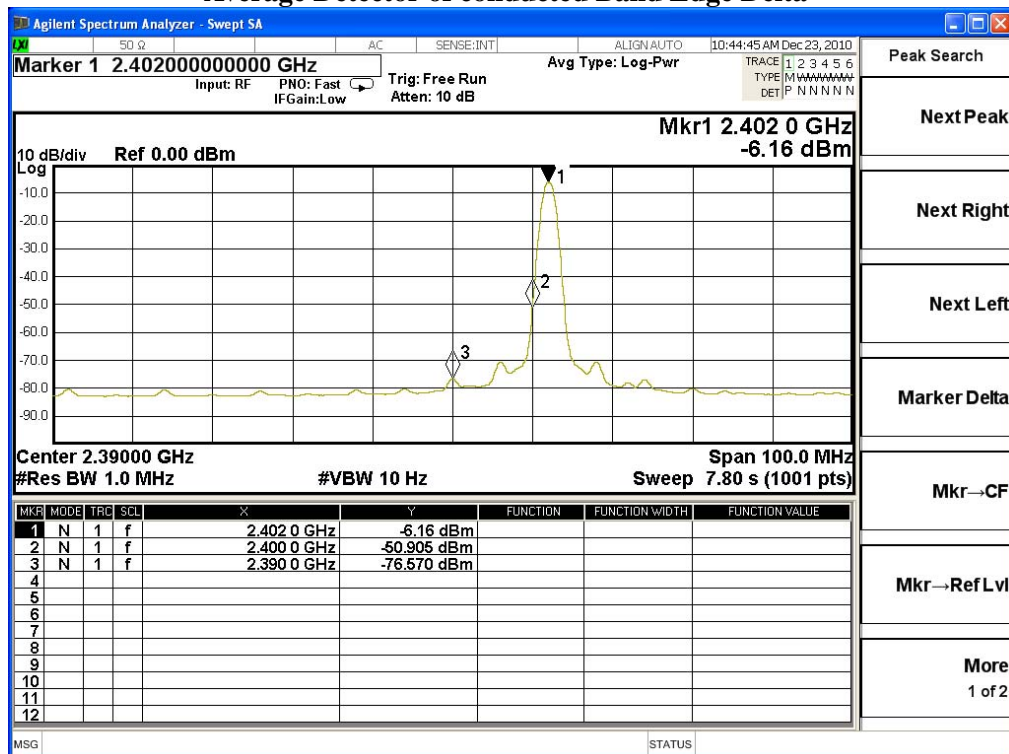
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



Average Detector of conducted Band Edge Delta



Product : Dongle
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit

Fundamental Filed Strength

| Antenna Pole | Frequency [MHz] | Correction Factor [dB/m] | Reading Level [dB(uV)] | Emission Level [dB(uV/m)] | Detector |
|--------------|-----------------|--------------------------|------------------------|---------------------------|----------|
| Horizontal | 2480 | 31.941 | 45.16 | 77.101 | Peak |
| Horizontal | 2480 | 31.941 | 42.93 | 74.871 | Average |
| Vertical | 2480 | 30.568 | 53.49 | 84.058 | Peak |
| Vertical | 2480 | 30.568 | 52.38 | 82.948 | Average |

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Band Edge Test Data

| Antenna Pole | Test Frequency (MHz) | Fundamental (dBuV/m) | Δ (dB) | Band Edge Field Strength (dBuV/m) | Detector |
|--------------|----------------------|----------------------|---------------|-----------------------------------|----------|
| Horizontal | 2483.5 | 77.101 | 54.41 | 22.691 | Peak |
| Horizontal | 2484.1 | 74.871 | 63.31 | 11.561 | Average |
| Vertical | 2483.5 | 84.058 | 54.41 | 29.648 | Peak |
| Vertical | 2484.1 | 82.948 | 63.31 | 19.638 | Average |

Note:

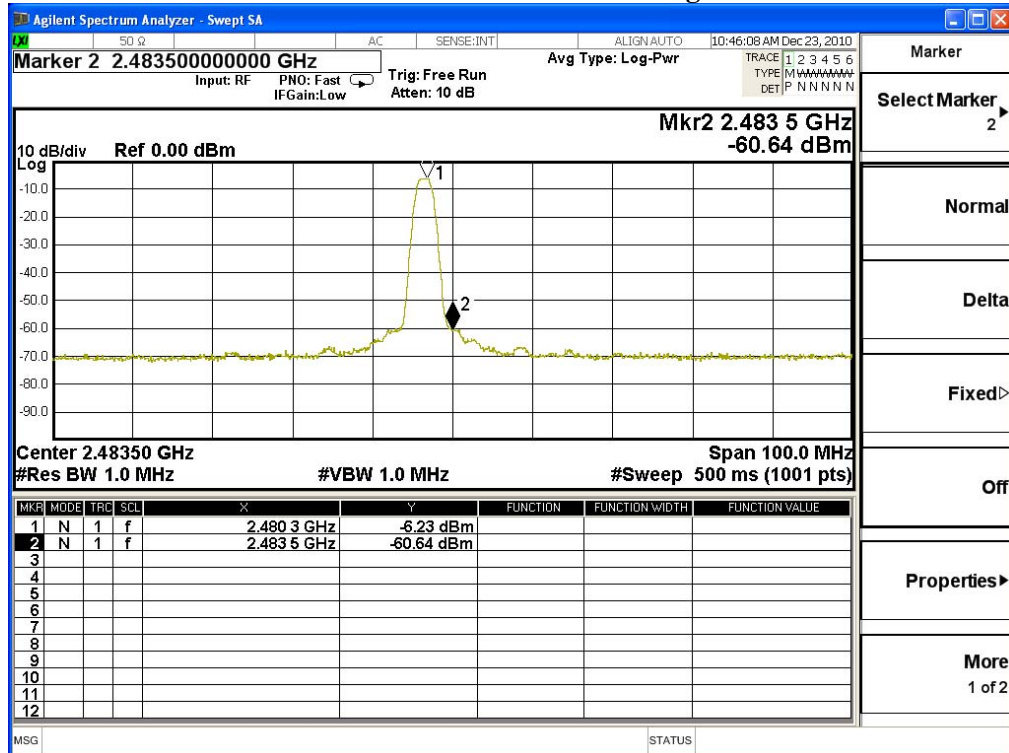
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

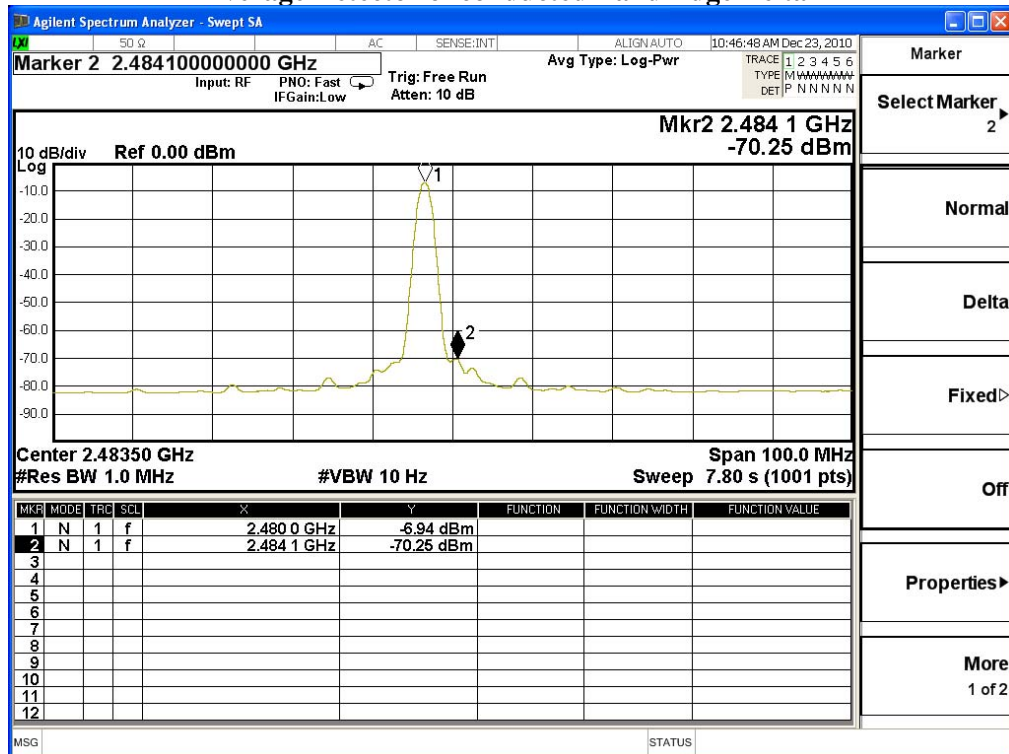
F = Fundamental field Strength (Peak or Average)

Δ = Conducted Band Edge Delta (Peak or Average)

Peak Detector of conducted Band Edge Delta



Average Detector of conducted Band Edge Delta



5. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs