



Test Report

Product Name : RFID CF TYPE READER

Model No. : SLC-10200

FCC ID. : T39SLC-10200

Applicant : Sunlit SystemTechnology Corp.

Address : 8F., No. 19, Land 120, Sec. 1, Neihu Rd., Taipei 114, Taiwan

R.O.C.

Date of Receipt : Oct. 24, 2005

Issued Date : Sep. 26, 2006

Report No. : 05AL172FI

The Test Results relate only to the samples tested.

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Test Report Certification

Issued Date: Sep. 26, 2006
Report No. : 05AL172FI



Accredited by NIST (NVLAP)
NVLAP Lab Code: 200533-0

Product Name : RFID CF TYPE READER
Applicant : Sunlit SystemTechnology Corp.
Address : 8F., No. 19, Land 120, Sec. 1, Neihu Rd., Taipei 114, Taiwan R.O.C.
Manufacturer : Sunlit SystemTechnology Corp.
Model No. : SLC-10200
Rated Voltage : AC 120V/60Hz
Working Voltage : DC 5V (via CF card socket)
Trade Name :  日晶科技股份有限公司 / Sunlit System Technology Corp.
µ-Chip System Development
Applicable Standard : FCC Part 15 Subpart C Paragraph 15.249: 2005
ANSI C63.4: 2003
Test Result : Complied



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1. GENERAL INFORMATION

1.1. EUT Description

Product Name : RFID CF TYPE READER
Trade Name :  日晶科技股份有限公司 / Sunlit System Technology Corp.
p-Chip System Development

FCC ID. : T39SLC-10200
Model No. : SLC-10200
Frequency Range : 2435 – 2465MHz
Number of Channels : 31
Channel Separation : 1 MHz
Channel Control : Auto
Type of Modulation : FHSS
Antenna Type : Printed on the PCB
Antenna Gain : -2.056 dBi

Frequency of Each Channel

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------|
| Channel 01: | 2435 MHz | Channel 02: | 2436 MHz | Channel 03: | 2437 MHz | Channel 04: | 2438 MHz | |
| Channel 05: | 2439 MHz | Channel 06: | 2440 MHz | Channel 07: | 2441 MHz | Channel 08: | 2442 MHz | |
| Channel 09: | 2443 MHz | Channel 10: | 2444 MHz | Channel 11: | 2445 MHz | Channel 12: | 2446 MHz | |
| Channel 13: | 2447 MHz | Channel 14: | 2448 MHz | Channel 15: | 2449 MHz | Channel 16: | 2450 MHz | |
| Channel 17: | 2451 MHz | Channel 18: | 2452 MHz | Channel 19: | 2453 MHz | Channel 20: | 2454 MHz | |
| Channel 21: | 2455 MHz | Channel 22: | 2456 MHz | Channel 23: | 2457 MHz | Channel 24: | 2458 MHz | |
| Channel 25: | 2459 MHz | Channel 26: | 2460 MHz | Channel 27: | 2461 MHz | Channel 28: | 2462 MHz | |
| Channel 29: | 2463 MHz | Channel 30: | 2464 MHz | Channel 31: | 2465 MHz | | | |

Note:

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

| | |
|---------------|---------------------|
| EMI Test Mode | Mode 1: Transmitter |
|---------------|---------------------|

1.2. Operation Description

The EUT is RFID CF TYPE READER. The operation frequency is 2.435GHz to 2.465GHz.

Thirty-one channels are built in the EUT. The signals modulated by FHSS / GFSK are transmitted from the printed antenna on the PCB of the EUT. DC 5V (via CF card socket) shall be provided for EUT operation.

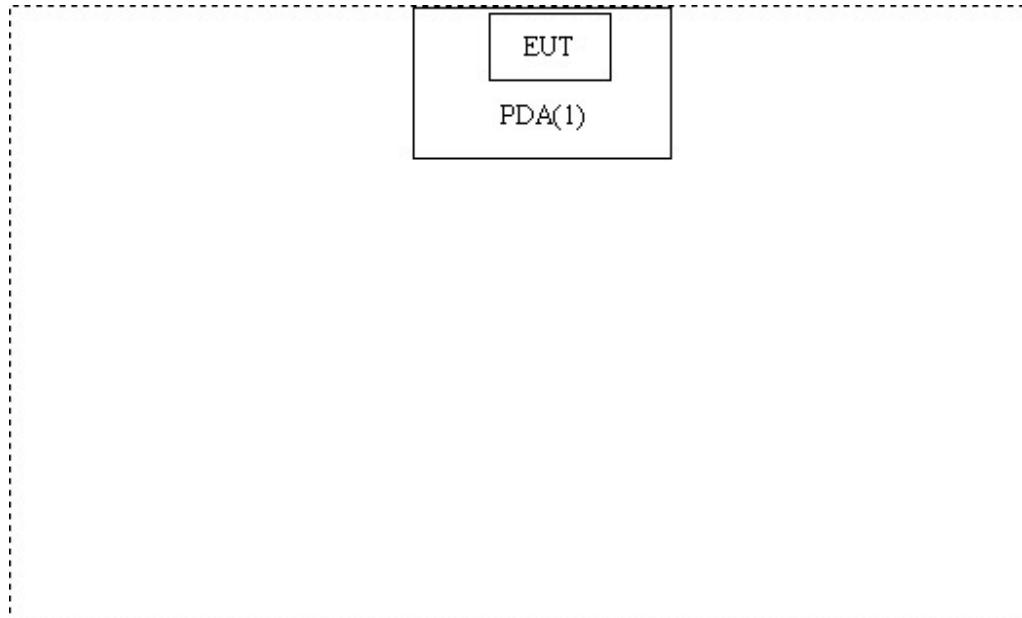
1.3. Tested System Details

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. | FCC ID | Power Cord |
|---------|--------------|-------------|------------|--------|--------------------|
| (1) PDA | HP | IPAQ hx2100 | 2CK52107R2 | DOC | Non-Shielded, 1.8m |

| Signal Cable Type | Signal Cable Description |
|-------------------|--------------------------|
| (A) N/A | N/A |

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Plug the EUT into the PDA as shown in Section 1.4.
- (2) Execute DLLTestVC.exe on the PDA.
- (3) Configure the test channel.
- (4) Press “OK” to start continuous transmission.
- (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 |

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2



Accreditation on NVLAP
NVLAP Lab Code: 200533-0



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E-Mail : service@quietek.com



2. Conducted Emission

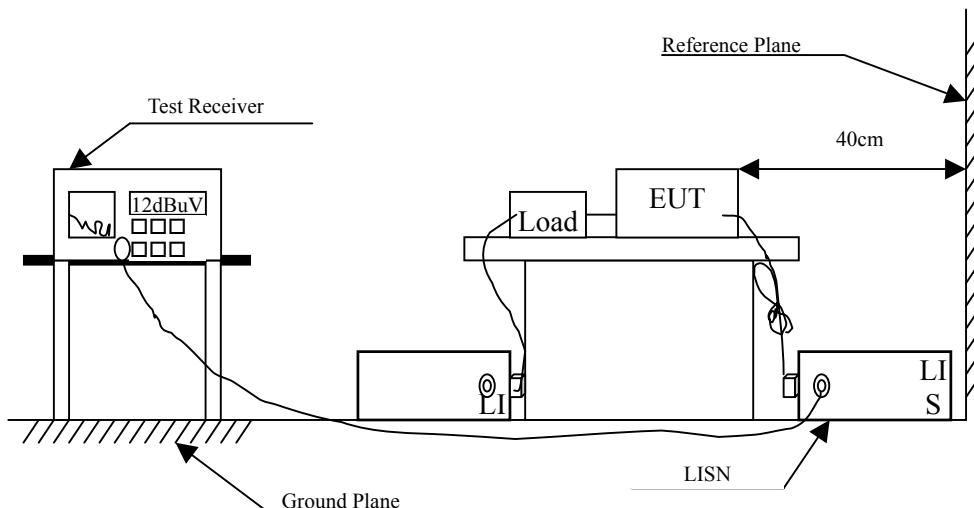
2.1. Test Equipment

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, 2006 | |
| 2 | L.I.S.N. | R & S | ESH3-Z5/825016/6 | May, 2006 | EUT |
| 3 | L.I.S.N. | Kyoritsu | KNW-407/8-1420-3 | May, 2006 | Peripherals |
| 4 | Pulse Limiter | R & S | ESH3-Z2 | May, 2006 | |
| 5 | No.4 Shielded Room | | | | N/A |

Note: All equipments 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 : RFID CF TYPE READER
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmitter (2450MHz)

| Frequency | Correct Factor | Reading Level | Measurement Level | Margin | Limit |
|-------------------|----------------|---------------|-------------------|---------|--------|
| MHz | dB | dBuV | dBuV | dB | dBuV |
| Quasi-Peak | | | | | |
| 0.220 | 0.202 | 45.310 | 45.512 | -18.488 | 64.000 |
| 0.445 | 0.216 | 44.130 | 44.346 | -13.226 | 57.571 |
| 0.673 | 0.228 | 38.950 | 39.178 | -16.822 | 56.000 |
| 0.893 | 0.232 | 39.180 | 39.412 | -16.588 | 56.000 |
| 1.873 | 0.274 | 31.650 | 31.924 | -24.076 | 56.000 |
| 6.373 | 0.465 | 26.100 | 26.565 | -33.435 | 60.000 |
| Average | | | | | |
| 0.220 | 0.202 | 39.680 | 39.882 | -14.118 | 54.000 |
| 0.445 | 0.216 | 36.540 | 36.756 | -10.816 | 47.571 |
| 0.673 | 0.228 | 29.750 | 29.978 | -16.022 | 46.000 |
| 0.893 | 0.232 | 28.510 | 28.742 | -17.258 | 46.000 |
| 1.873 | 0.274 | 9.780 | 10.054 | -35.946 | 46.000 |
| 6.373 | 0.465 | 12.620 | 13.085 | -36.915 | 50.000 |

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 : RFID CF TYPE READER
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmitter (2450MHz)

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

Quasi-Peak

| | | | | | |
|-------|-------|--------|--------|---------|--------|
| 0.224 | 0.202 | 47.310 | 47.512 | -16.373 | 63.886 |
| 0.444 | 0.216 | 44.070 | 44.286 | -13.314 | 57.600 |
| 0.669 | 0.218 | 40.330 | 40.549 | -15.451 | 56.000 |
| 0.907 | 0.232 | 37.860 | 38.092 | -17.908 | 56.000 |
| 1.122 | 0.244 | 39.820 | 40.064 | -15.936 | 56.000 |
| 1.920 | 0.275 | 40.060 | 40.335 | -15.665 | 56.000 |

Average

| | | | | | |
|-------|-------|--------|--------|---------|--------|
| 0.224 | 0.202 | 42.930 | 43.132 | -10.753 | 53.886 |
| 0.444 | 0.216 | 35.960 | 36.176 | -11.424 | 47.600 |
| 0.669 | 0.218 | 31.370 | 31.589 | -14.411 | 46.000 |
| 0.907 | 0.232 | 20.640 | 20.872 | -25.128 | 46.000 |
| 1.122 | 0.244 | 29.590 | 29.834 | -16.166 | 46.000 |
| 1.920 | 0.275 | 19.160 | 19.435 | -26.565 | 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

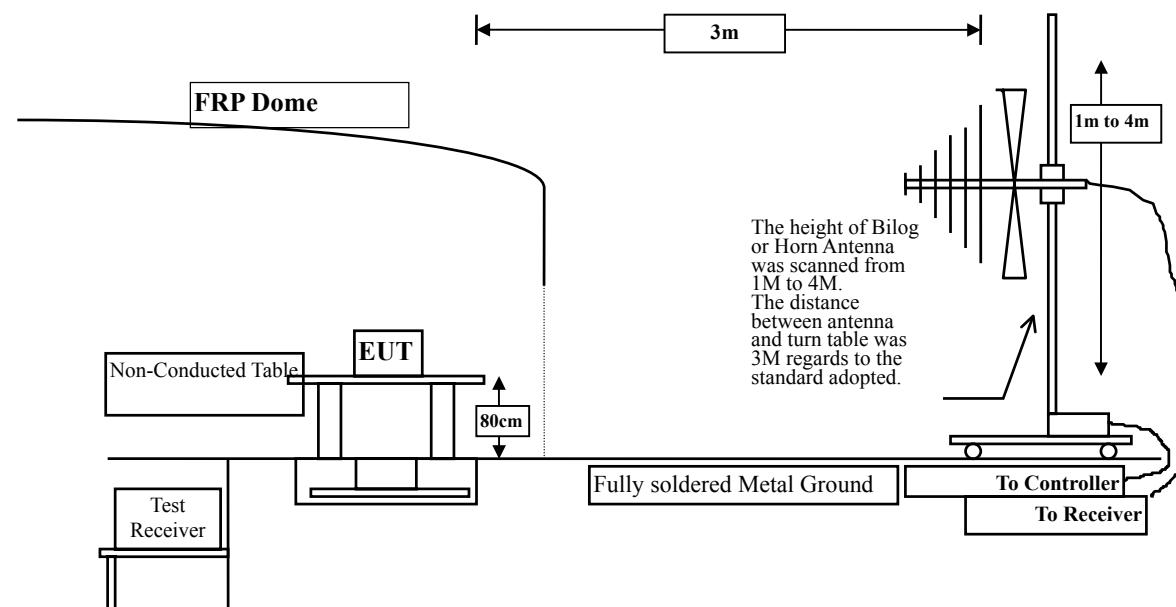
3.1. Test Equipment

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

| Test Site | Equipment | Manufacturer | Model No./Serial No. | Last Cal. |
|-----------|---------------------|--------------|-----------------------|------------|
| Site # 1 | Test Receiver | R & S | ESCS 30 / 825442/14 | May, 2006 |
| | Spectrum Analyzer | Advantest | R3261C / 71720140 | May, 2006 |
| | Pre-Amplifier | HP | 8447D/3307A01812 | May, 2006 |
| | Bilog Antenna | Chase | CBL6112B / 12452 | Sep., 2006 |
| | Horn Antenna | EM | EM6917 / 103325 | May, 2006 |
| | Test Receiver | R & S | ESCS 30 / 825442/17 | May, 2006 |
| Site # 2 | Spectrum Analyzer | Advantest | R3261C / 71720609 | May, 2006 |
| | Pre-Amplifier | HP | 8447D/3307A01814 | May, 2006 |
| | Bilog Antenna | Chase | CBL6112B / 2455 | Sep., 2006 |
| | Horn Antenna | EM | EM6917 / 103325 | May, 2006 |
| Site # 3 | X Test Receiver | R & S | ESI 26 / 838786 / 004 | May, 2006 |
| | X Spectrum Analyzer | Advantest | R3162 / 100803480 | May, 2006 |
| | X Biolog Antenna | SCHAFFNER | CBL6112B / 2697 | May, 2006 |
| | X Horn Antenna | Schwarzbeck | BBHA9120D / 305, 306 | July, 2006 |
| | X Horn Antenna | Schwarzbeck | BBHA9170 / 208, 209 | July, 2006 |
| | X Pre-Amplifier | QTK | QTK-AMP-01 / 0001 | July, 2006 |
| | X Pre-Amplifier | HP | 8449B / 3008A01123 | July, 2006 |

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

3.2. Test Setup



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

| FCC Part 15 Subpart B 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 B Paragraph 15.209 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 : 1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. 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.

Radiated emissions were invested over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 3 meters.

The frequency range from 30MHz to 10th harmonics is checked.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : RFID CF TYPE READER
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmitter

| Frequency MHz | Correct Factor dB | Reading Level dBuV | Measurement Level dBuV/m | Margin dB | Average Limit dBuV/m |
|-------------------------|-------------------------|--------------------------|--------------------------------|--------------|----------------------------|
| Horizontal | | | | | |
| Peak Detector: | | | | | |
| Channel 01 | | | | | |
| 2435.000 | -2.158 | 106.100 | 103.942 | -10.058 | 114.000 |
| Channel 16 | | | | | |
| 2450.000 | -2.088 | 101.400 | 99.313 | -14.687 | 114.000 |
| Channel 31 | | | | | |
| 2465.000 | -2.020 | 102.300 | 100.281 | -13.719 | 114.000 |
| Average Detector | | | | | |
| Channel 01 | | | | | |
| 2435.000 | -2.158 | 86.030 | 83.872 | -10.128 | 94.000 |
| Channel 16 | | | | | |
| 2450.000 | -2.088 | 81.700 | 79.613 | -14.387 | 94.000 |
| Channel 31 | | | | | |
| 2465.000 | -2.020 | 83.700 | 81.681 | -12.319 | 94.000 |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| Channel 01 | | | | | |
| 2435.000 | -2.158 | 107.700 | 105.542 | -8.458 | 114.000 |
| Channel 16 | | | | | |
| 2450.000 | -2.088 | 108.100 | 106.013 | -7.987 | 114.000 |
| Channel 31 | | | | | |
| 2465.000 | -2.020 | 103.600 | 101.581 | -12.419 | 114.000 |
| Average Detector | | | | | |
| Channel 01 | | | | | |
| 2435.000 | -2.158 | 77.500 | 75.342 | -18.658 | 94.000 |
| Channel 16 | | | | | |
| 2450.000 | -2.088 | 78.060 | 75.973 | -18.027 | 94.000 |
| Channel 31 | | | | | |
| 2465.000 | -2.020 | 82.670 | 80.651 | -13.349 | 94.000 |

Note:

1. Emission Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : RFID CF TYPE READER
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2435MHz)

| Frequency MHz | Correct Factor dB | Reading Level dBuV | Measurement Level dBuV/m | Margin dB | Average Limit dBuV/m |
|-------------------------|-------------------------|--------------------------|--------------------------------|--------------|----------------------------|
| Horizontal | | | | | |
| Peak Detector: | | | | | |
| 4870.000 | 14.319 | 38.749 | 53.068 | -20.902 | 74.000 |
| 7305.000 | 17.962 | 37.809 | 55.771 | -18.199 | 74.000 |
| 9740.000 | 22.635 | 36.523 | 59.159 | -14.811 | 74.000 |
| Average Detector | | | | | |
| 4870.000 | 14.319 | 36.660 | 50.979 | -2.991 | 54.000 |
| 7305.000 | 17.962 | 28.043 | 46.005 | -7.965 | 54.000 |
| 9740.000 | 22.635 | 28.026 | 50.662 | -3.308 | 54.000 |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4870.000 | 14.319 | 38.799 | 53.118 | -20.852 | 74.000 |
| 7305.000 | 17.962 | 37.809 | 55.771 | -18.199 | 74.000 |
| 9740.000 | 22.635 | 36.575 | 59.211 | -14.759 | 74.000 |
| Average Detector | | | | | |
| 4870.000 | 14.319 | 36.400 | 50.719 | -3.251 | 54.000 |
| 7305.000 | 17.962 | 28.112 | 46.074 | -7.896 | 54.000 |
| 9740.000 | 22.635 | 27.392 | 50.028 | -3.942 | 54.000 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. 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 : RFID CF TYPE READER
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2450MHz)

| Frequency MHz | Correct Factor dB | Reading Level dBuV | Measurement Level dBuV/m | Margin dB | Average Limit dBuV/m |
|-------------------------|-------------------------|--------------------------|--------------------------------|--------------|----------------------------|
| Horizontal | | | | | |
| Peak Detector: | | | | | |
| 4900.000 | 14.411 | 37.742 | 52.153 | -21.817 | 74.000 |
| 7350.000 | 18.007 | 37.484 | 55.491 | -18.479 | 74.000 |
| 9800.000 | 22.807 | 37.689 | 60.496 | -13.474 | 74.000 |
| Average Detector | | | | | |
| 4900.000 | 14.411 | 36.150 | 50.561 | -3.409 | 54.000 |
| 7350.000 | 18.007 | 28.041 | 46.048 | -7.922 | 54.000 |
| 9800.000 | 22.807 | 27.295 | 50.102 | -3.868 | 54.000 |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4900.000 | 14.411 | 37.139 | 51.550 | -22.420 | 74.000 |
| 7350.000 | 18.007 | 37.730 | 55.737 | -18.233 | 74.000 |
| 9800.000 | 22.807 | 37.097 | 59.904 | -14.066 | 74.000 |
| Average Detector | | | | | |
| 4900.000 | 14.411 | 36.390 | 50.801 | -3.169 | 54.000 |
| 7350.000 | 18.007 | 27.946 | 45.953 | -8.017 | 54.000 |
| 9800.000 | 22.807 | 27.349 | 50.156 | -3.814 | 54.000 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz .
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz .
4. Emission Level = Reading Level + Correct Factor.
5. 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 : RFID CF TYPE READER
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2465MHz)

| Frequency MHz | Correct Factor dB | Reading Level dBuV | Measurement Level dBuV/m | Margin dB | Average Limit dBuV/m |
|-------------------------|-------------------------|--------------------------|--------------------------------|--------------|----------------------------|
| Horizontal | | | | | |
| Peak Detector: | | | | | |
| 4930.000 | 14.493 | 37.573 | 52.067 | -21.903 | 74.000 |
| 7395.000 | 18.049 | 37.290 | 55.338 | -18.632 | 74.000 |
| 9860.000 | 22.979 | 36.930 | 59.909 | -14.061 | 74.000 |
| Average Detector | | | | | |
| 4930.000 | 14.493 | 36.410 | 50.904 | -3.066 | 54.000 |
| 7395.000 | 18.049 | 27.988 | 46.036 | -7.934 | 54.000 |
| 9860.000 | 22.979 | 27.311 | 50.290 | -3.680 | 54.000 |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4930.000 | 14.493 | 36.385 | 50.879 | -23.091 | 74.000 |
| 7395.000 | 18.049 | 37.653 | 55.701 | -18.269 | 74.000 |
| 9860.000 | 22.979 | 37.110 | 60.089 | -13.881 | 74.000 |
| Average Detector | | | | | |
| 4930.000 | 14.493 | 36.990 | 51.484 | -2.486 | 54.000 |
| 7395.000 | 18.049 | 27.956 | 46.004 | -7.966 | 54.000 |
| 9860.000 | 22.979 | 27.277 | 50.256 | -3.714 | 54.000 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz .
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz .
4. Emission Level = Reading Level + Correct Factor.
5. 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 : RFID CF TYPE READER
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2450MHz)

| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-------------------|---------|---------|-------------|---------|--------|
| | Factor | Level | Level | | |
| MHz | dB | dBuV | dBuV/m | dB | dBuV/m |
| Horizontal | | | | | |
| 115.100 | 12.862 | 22.380 | 35.242 | -8.258 | 43.500 |
| 520.000 | 18.594 | 12.600 | 31.194 | -14.806 | 46.000 |
| 540.000 | 19.517 | 11.100 | 30.617 | -15.383 | 46.000 |
| 550.000 | 20.182 | 11.400 | 31.582 | -14.418 | 46.000 |
| 675.000 | 20.785 | 13.800 | 34.585 | -11.415 | 46.000 |
| 830.000 | 21.904 | 11.800 | 33.704 | -12.296 | 46.000 |
| Vertical | | | | | |
| 205.000 | 9.941 | 21.100 | 31.041 | -12.459 | 43.500 |
| 480.000 | 18.475 | 16.400 | 34.875 | -11.125 | 46.000 |
| 500.000 | 18.389 | 15.200 | 33.589 | -12.411 | 46.000 |
| 566.100 | 21.249 | 18.300 | 39.549 | -6.451 | 46.000 |
| 675.000 | 20.085 | 16.200 | 36.285 | -9.715 | 46.000 |
| 830.000 | 21.443 | 14.100 | 35.543 | -10.457 | 46.000 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

4. Band Edge

4.1. Test Equipment

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

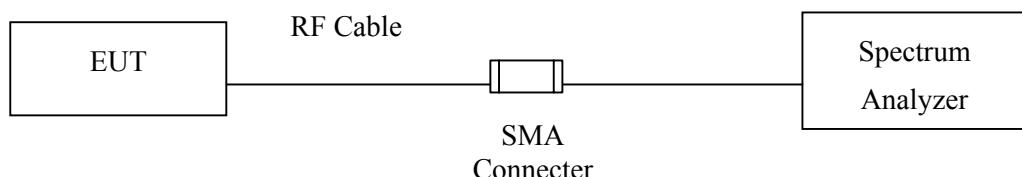
| Equipment | Manufacturer | Model No./Serial No. | Last Cal. |
|---------------------|--------------|-----------------------|------------|
| X Test Receiver | R & S | ESI 26 / 838786 / 004 | May, 2006 |
| X Spectrum Analyzer | Advantest | R3162 / 100803480 | May, 2006 |
| X Bilog Antenna | SCHAFFNER | CBL6112B / 2697 | May, 2006 |
| X Horn Antenna | Schwarzbeck | BBHA9120D / 305, 306 | July, 2006 |
| X Horn Antenna | Schwarzbeck | BBHA9170 / 208, 209 | July, 2006 |
| X Pre-Amplifier | QTK | QTK-AMP-01 / 0001 | July, 2006 |
| X Pre-Amplifier | HP | 8449B / 3008A01123 | July, 2006 |

Note:

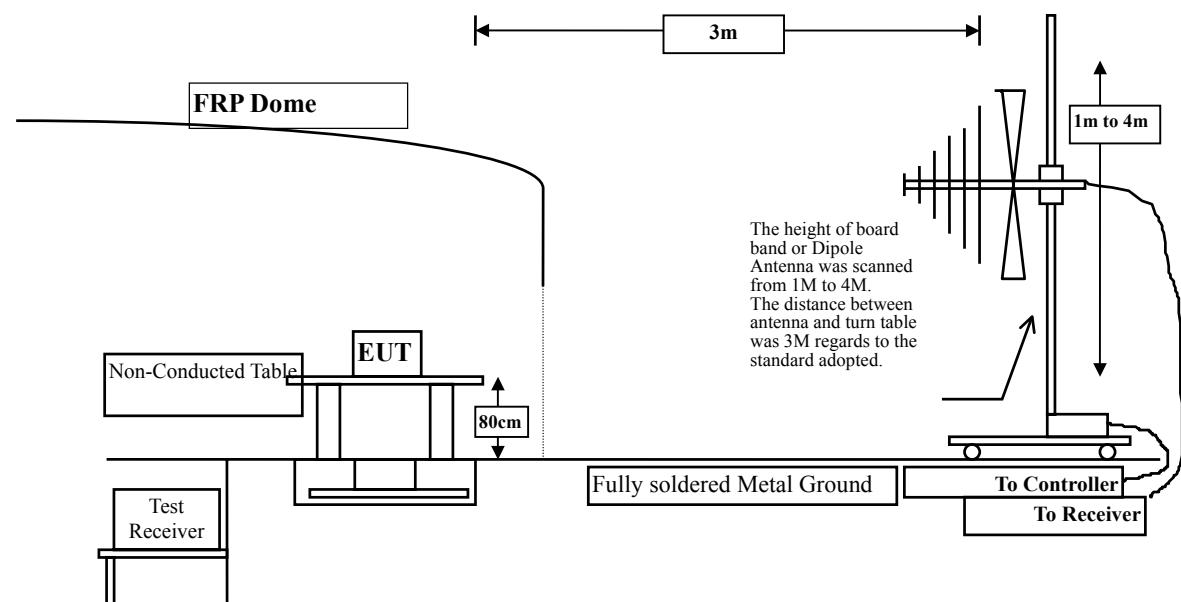
1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

4.2. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



4.3. Limit

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 below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz.

4.5. Uncertainty

Conducted is \pm 1.27 dB

Radiated is \pm 3.9 dB.

4.6. Test Result of Band Edge

Product : RFID CF TYPE READER
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (2435MHz)

RF Radiated Measurement

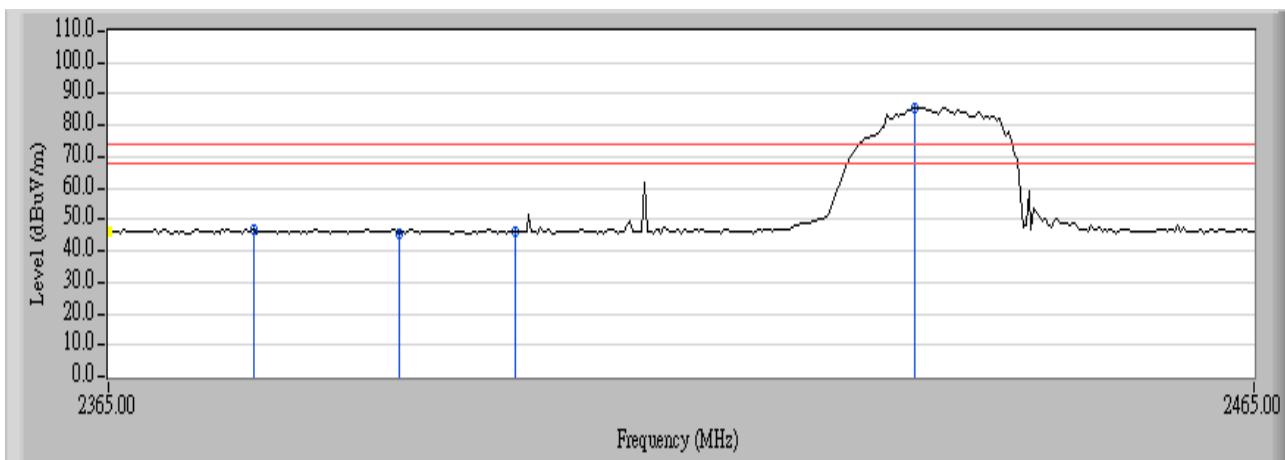
| Channel No. | Frequency (MHz) | Required Limit (dBc) | Result |
|-------------|-----------------|----------------------|--------|
| 01 | <2400 | >20 | Pass |

RF Radiated Measurement (Horizontal):

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01(Peak) | 2377.500 | 9.313 | 37.778 | 47.090 | 74.00 | 54.00 | Pass |
| 01(Avg) | -- | -- | -- | -- | 74.00 | 54.00 | Pass |

Figure Channel 01:

Horizontal



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Product : RFID CF TYPE READER
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (2435MHz)

RF Radiated Measurement

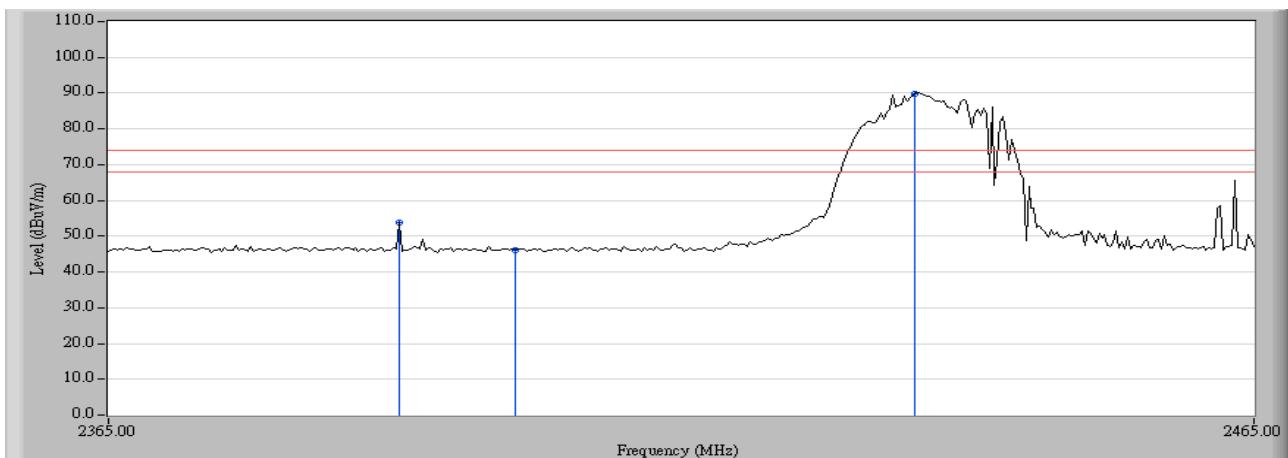
| Channel No. | Frequency (MHz) | Required Limit (dBc) | Result |
|-------------|-----------------|----------------------|--------|
| 01 | <2400 | >20 | Pass |

RF Radiated Measurement (Vertical):

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01(Peak) | 2390.000 | 9.368 | 44.392 | 53.760 | 74.00 | 54.00 | Pass |
| 01(Avg) | -- | -- | -- | -- | 74.00 | 54.00 | Pass |

Figure Channel 01:

Vertical



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Product : RFID CF TYPE READER
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (2465MHz)

RF Radiated Measurement

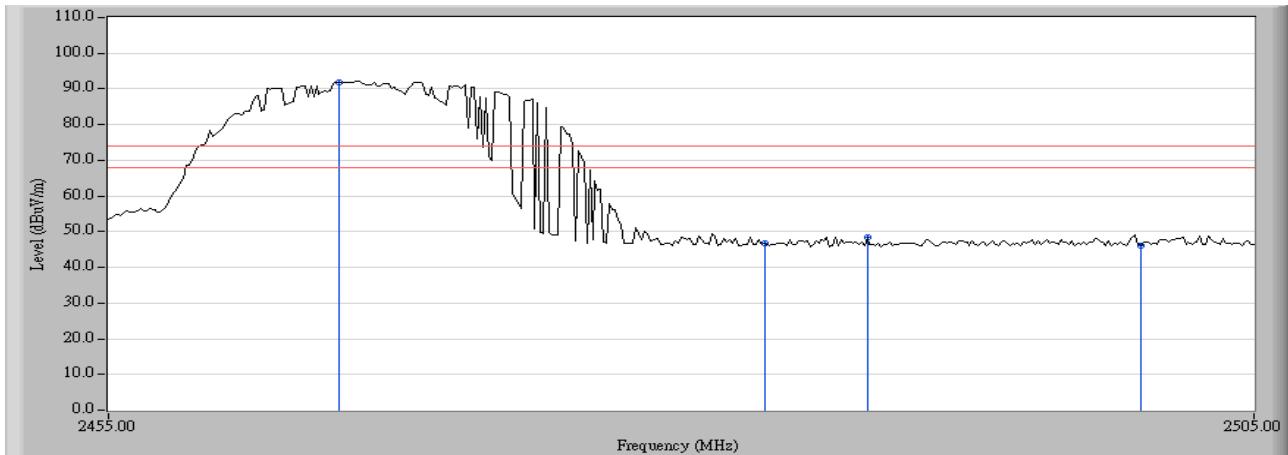
| Channel No. | Frequency (MHz) | Required Limit (dBc) | Result |
|-------------|-----------------|----------------------|--------|
| 31 | >2483.5 | >20 | Pass |

RF Radiated Measurement (Horizontal):

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 31(Peak) | 2488.000 | 9.785 | 38.755 | 48.540 | 74.00 | 54.00 | Pass |
| 31(Avg) | -- | -- | -- | -- | 74.00 | 54.00 | Pass |

Figure Channel 78:

Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Product : RFID CF TYPE READER
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (2465MHz)

RF Radiated Measurement

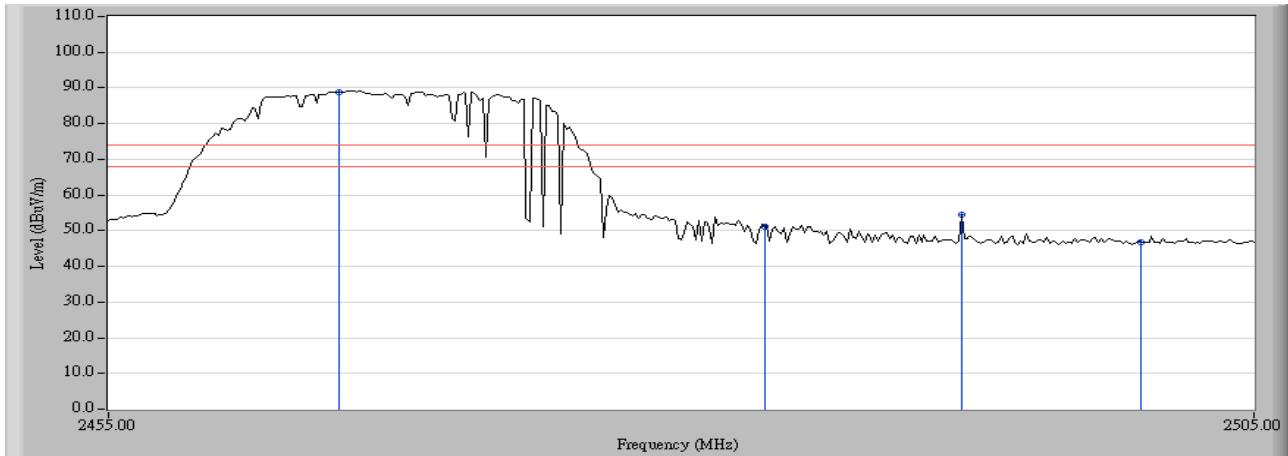
| Channel No. | Frequency (MHz) | Required Limit (dBc) | Result |
|-------------|-----------------|----------------------|--------|
| 31 | >2483.5 | >20 | Pass |

RF Radiated Measurement (Vertical):

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 31(Peak) | 2492.120 | 9.808 | 44.712 | 54.520 | 74.00 | 54.00 | Pass |
| 31(Avg) | 2492.120 | 9.808 | 27.757 | 37.565 | 74.00 | 54.00 | Pass |

Figure Channel 78:

Vertical (Peak)

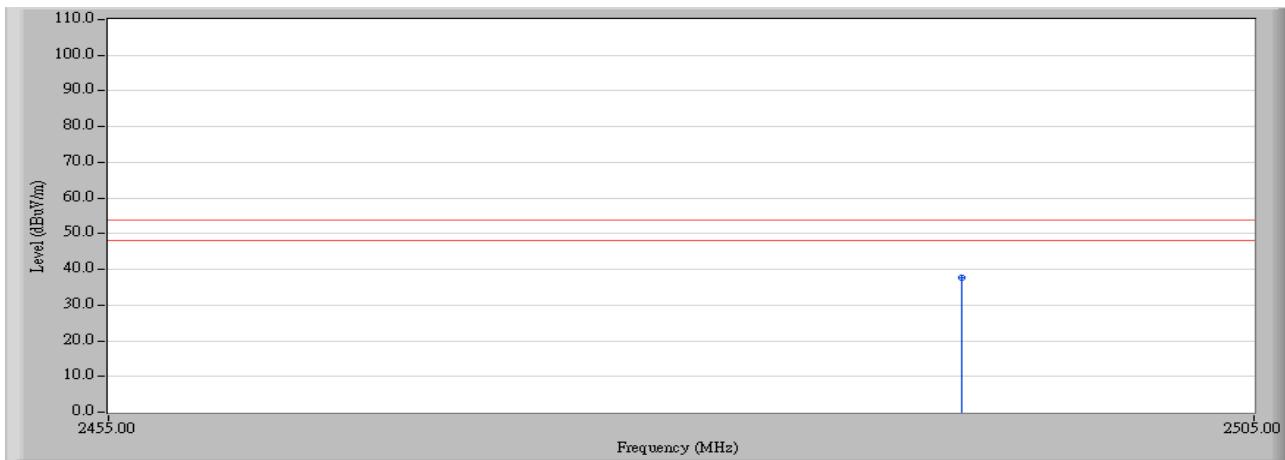


Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Figure Channel 78:

Vertical (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms

Note: 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.

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1 : EUT Test Photographs

Attachment 2 : EUT Detailed Photographs