

FCC Radio Test Report

FCC ID: Q3N-M0010A

This report concerns (check one) : ☒ Original Grant ☐ Class II Change

Issued Date : Jan. 31, 2008

Report No. : R0801008

Equipment : Terminal

Model Name : M0010

Applicant : CIPHERLAB CO., LTD

Address : 12F., 333, Sec. 2, Dunhua S. Rd., Taipei, Taiwan
106

Tested by:

Neutron Engineering Inc. EMC Laboratory


Date of Test:

Jan. 14, 2008 ~ Jan. 30, 2008

Testing Engineer: _____


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Authorized Signatory: _____


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Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of R.O.C., or National Institute of Standards and Technology (NIST) of U.S.A.

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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1. CERTIFICATION

Equipment : Terminal
Trade Name : CIPHERLAB
Model Name : M0010
Applicant : CIPHERLAB CO., LTD
Date of Test : Jan. 14, 2008 ~ Jan. 30, 2008
Standards : FCC Part15, Subpart C (15.225)/ ANCI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-5-R0801008) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and CNLA according to the ISO-17025 quality assessment standard and technical standard(s).

Test result included in this report is only for the RFID part of the product.

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards: (Antenna to EUT distance is 3 m)

| FCC Part15, Subpart C | | |
|----------------------------------|---------------------|--------|
| Standard | Test Item | Remark |
| 15.207 | Conducted Emission | PASS |
| 15.35 / 15.205 / 15.209 / 15.225 | Radiated Emission | PASS |
| 15.225(e) | Frequency Stability | PASS |
| 15.203 | Antenna Requirement | PASS |

NOTE:

(1) " N/A" denotes test is not applicable in this Test Report.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **C01/OS01** at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

Neutron's test firm number is: 95335.

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95%**.

A. Conducted Measurement :

| Test Site | Method | Measurement Frequency Range | U , (dB) | NOTE |
|-----------|--------|-----------------------------|----------|------|
| C01 | ANSI | 150 KHz ~ 30MHz | 1.94 | |

B. Radiated Measurement :

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U , (dB) | NOTE |
|-----------|--------|-----------------------------|------------|----------|------|
| OS-01 | ANSI | 30MHz ~ 200MHz | V | 3.82 | |
| | | 30MHz ~ 200MHz | H | 3.60 | |
| | | 200MHz ~ 1,000MHz | V | 3.86 | |
| | | 200MHz ~ 1,000MHz | H | 3.94 | |
| OS-02 | ANSI | 30MHz ~ 200MHz | V | 2.48 | |
| | | 30MHz ~ 200MHz | H | 2.16 | |
| | | 200MHz ~ 1,000MHz | V | 2.50 | |
| | | 200MHz ~ 1,000MHz | H | 2.66 | |

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | | |
|------------------------|--|------------------|
| Equipment | Terminal | |
| Brand Name | CIPHERLAB | |
| Model Name | M0010 | |
| OEM Brand/Model Name | N/A | |
| Model Difference | N/A | |
| Product Description | The EUT is a Terminal. | |
| | A. Operation Frequency | 13.56 MHz |
| | B. Modulation Type | ASK |
| | C. Antenna Designation | Integral Antenna |
| | Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. | |
| Power Source | DC Voltage supplied from AC/DC adapter & Li-ion battery | |
| | #AC DC Adapter | |
| | Brand name:LEADER ;Model name:NU40-2060330-I3 | |
| Power Rating | #Li-ion battery | |
| | Brand name:CIPHERLAB ;Model name:BA-0011A8 | |
| | #AC/DC Adapter | |
| Connecting I/O Port(s) | I/P 100-240VAC~ 50/60Hz, 1.2A O/P 6.0V, 3.3A | |
| | # Li-ion battery | |
| | 3.7Vdc 1800mAh | |
| EUT Modification(s) | N/A | |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Test Mode | Description |
|-------------------|---|
| Mode 1 | TX Mode-13.56MHz |
| Mode 2 | Normal Link with cradle use (full system) |

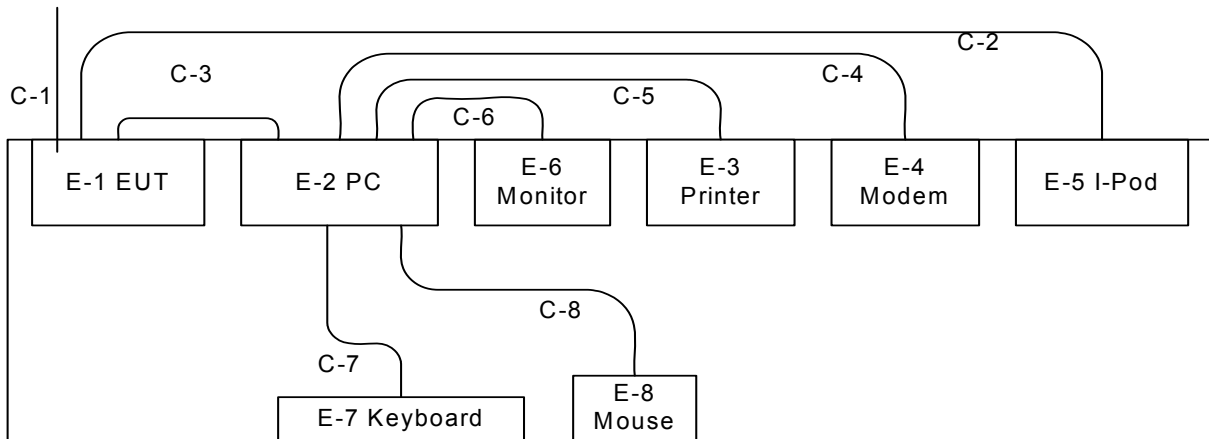
| For Conducted / Radiated Test | |
|-------------------------------|---|
| Final Test Mode | Description |
| Mode 2 | Normal Link with cradle use (full system) |

| For Radiated Test | |
|-------------------|------------------|
| Final Test Mode | Description |
| Mode 1 | TX Mode-13.56MHz |

(1) The EUT is considered a portable unit; it was pre-tested on the position of each 3 axis. The worst case was found positioned on Z-plane. Therefore only the test data of this Z-plane was used for radiated emission measurement test.

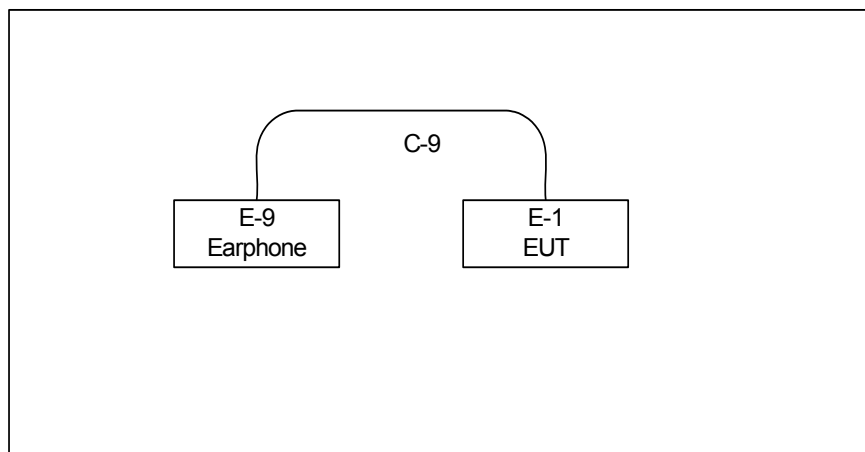
3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conduction: Normal Link with cradle use (full system)



C-1 Power Line
C-2 USB Cable
C-3 USB Cable
C-4 RS-232 Cable
C-5 LPT Cable
C-6 D-sub Cable
C-7 PS/2 Cable
C-8 PS/2 Cable

Radiated:CTX Mode



C-9 Audio Line

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|-----------------|-----------|---------------------|------------|------------------|------|
| E-1 | Terminal | CIPHERLAB | M0010 | Q3N-M0010A | N/A | EUT |
| E-2 | PC | HP | HP Compaq dx7300 MT | DOC | SGH71505 LH | |
| E-3 | Modem | ACEEX | DM-1414V | DOC | 8041708 | |
| E-4 | Printer | SII | DPU-414 | DOC | 1045105A | |
| E-5 | iPod | Apple | A1059 | DOC | JQ509DCJ PS9 | |
| E-6 | 19" LCD Monitor | Samsung | SyncMaster 193P | GH19PH | DI19H4JXC 05517A | |
| E-7 | PS/2 K/B | DELL | M-SAW34 | DOC | N/A | |
| E-8 | PS/2 Mouse | Logitech | M-SBF69 | DOC | HCA446011 56 | |
| E-9 | Earphone | KOKA | DM-510 | DOC | N/A | |
| E-10 | Cradle | CIPHERLAB | A1010 | DOC | N/A | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| C-1 | NO | YES | 1.8M | |
| C-2 | YES | NO | 1.8M | |
| C-3 | YES | NO | 1.8M | |
| C-4 | YES | NO | 1.8M | |
| C-5 | YES | NO | 1.8M | |
| C-6 | NO | NO | 1.8M | |
| C-7 | NO | NO | 1.8M | |
| C-8 | NO | NO | 1.8M | |
| C-9 | NO | NO | 1.8M | |

Note:

- (1) The support equipment was authorized by Declaration of Conformity.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (FREQUENCY RANGE 150KHZ-30MHZ)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|-----------------|----------------|---------|----------------|-----------|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 |

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

4.1.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-------------------|-----------------|----------|------------|------------------|
| 1 | LISN | EMCO | 3816/2 | 00042991 | Jan. 24, 2009 |
| 2 | LISN | EMCO | 3816/2 | 00042990 | Jan. 24, 2009 |
| 3 | Pulse Limiter | Electro-Metrics | EM-7600 | 112644 | Nov. 27, 2008 |
| 4 | 50Ω Terminator | N/A | N/A | N/A | May.13, 2009 |
| 5 | Test Cable | N/A | C01 | N/A | Nov. 27, 2008 |
| 6 | EMI Test Receiver | R&S | ESCI | 100082 | Mar. 08, 2008 |

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

The following table is the setting of the receiver

| Receiver Parameters | Setting |
|---------------------|----------|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

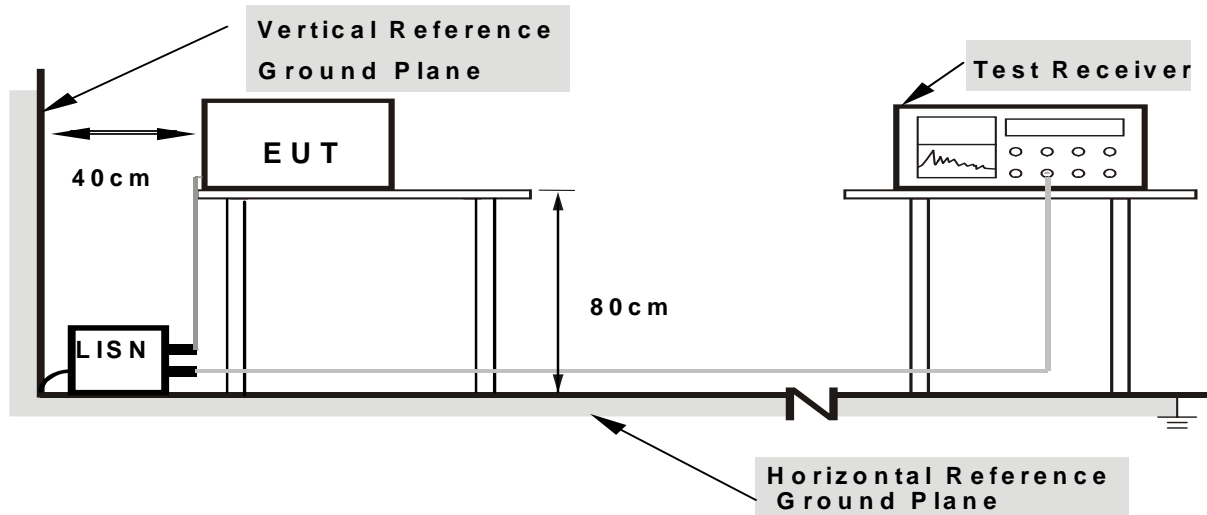
4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

4.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The program contained on a PC hard disk and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

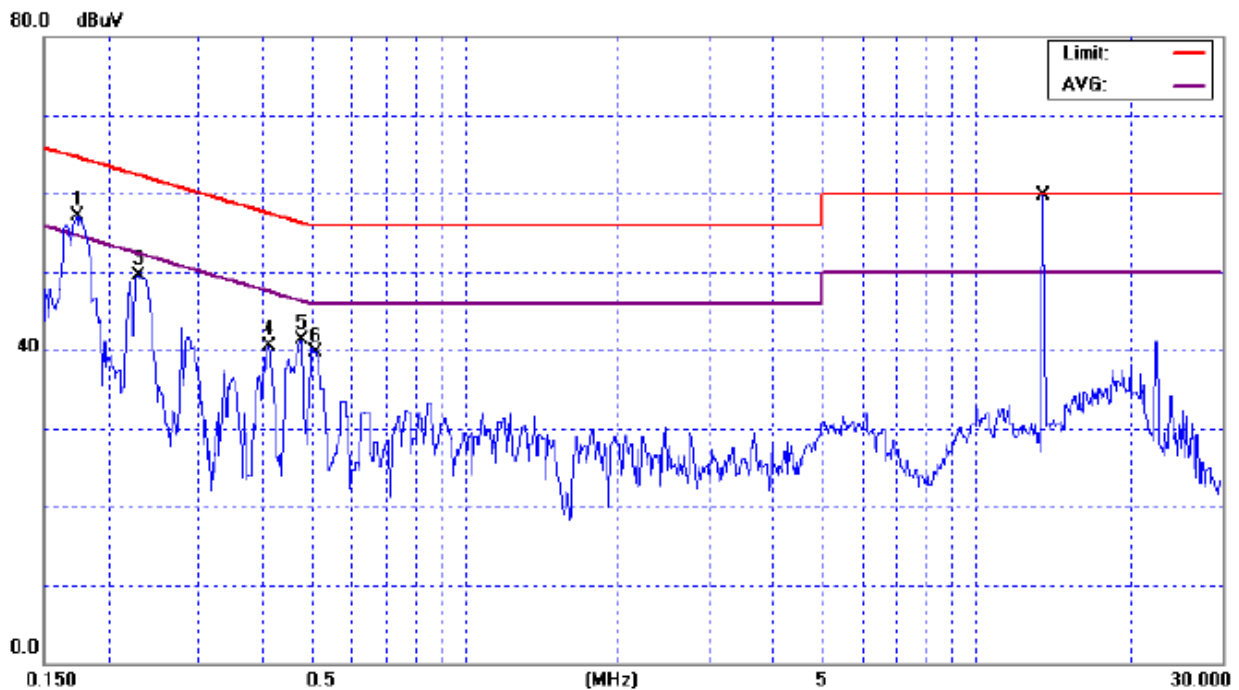
4.1.7 TEST RESULTS

| | | | |
|---------------|--|---------------------|--------------|
| EUT : | Terminal | Model Name. : | M0010 |
| Temperature : | 18 °C | Relative Humidity : | 60% |
| Pressure : | 1008hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | Mode 2 - Normal Link with cradle use (full system) | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|----------------|-----------------|----------------|---------|--------------|---------|----------------|----------|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.17 | Line | 57.10 | 40.82 | 64.78 | 54.78 | -13.96 | (QP) |
| 0.23 | Line | 49.59 | * | 62.51 | 52.51 | -12.92 | (QP) |
| 0.41 | Line | 40.42 | * | 57.61 | 47.61 | -17.19 | (QP) |
| 0.48 | Line | 41.21 | * | 56.41 | 46.41 | -15.20 | (QP) |
| 0.51 | Line | 39.66 | * | 56.00 | 46.00 | -16.34 | (QP) |
| 13.55 | Line | 59.15 | 58.95 | 60.00 | 50.00 | 8.95 | Note (3) |

Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “*” marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) Tx Fundamental, For reference only. Please refer to the next page.

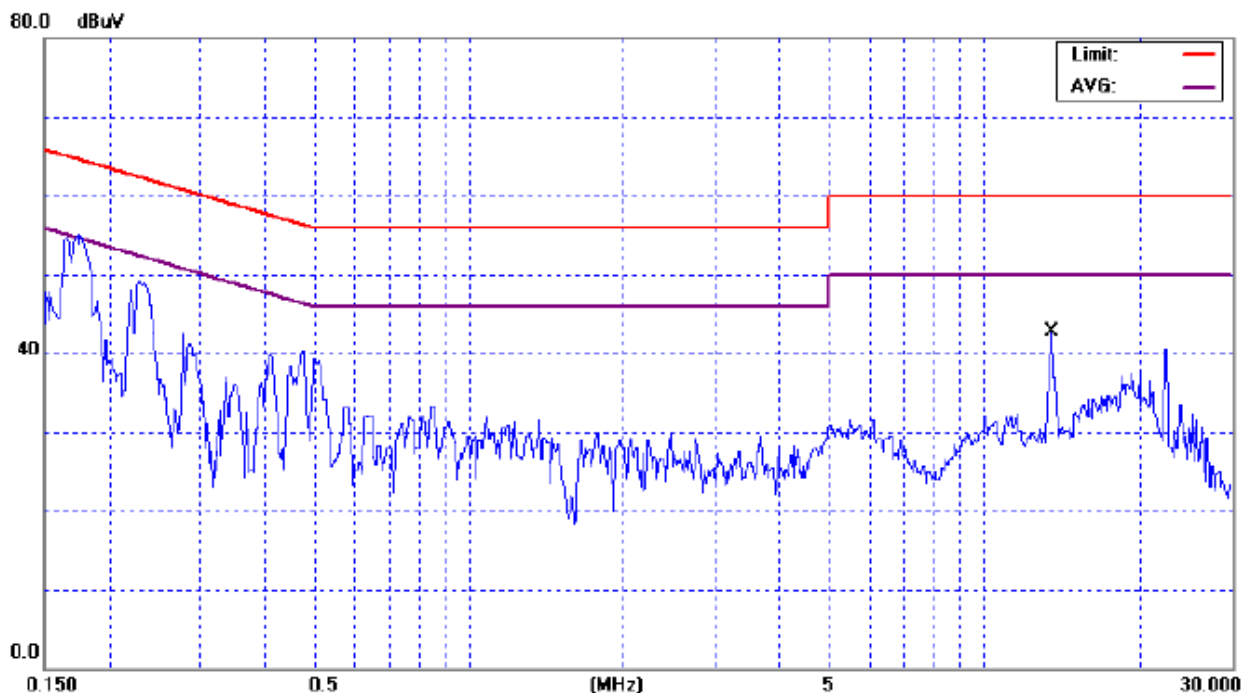


| | | | |
|---------------|--|---------------------|--------------|
| EUT : | Terminal | Model Name. : | M0010 |
| Temperature : | 18 °C | Relative Humidity : | 60% |
| Pressure : | 1008hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | Mode 2 - Normal Link with cradle use (full system) | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|----------------|-----------------|----------------|---------|--------------|---------|----------------|------|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 13.55 | Line | 43.16 | 36.63 | 60.00 | 50.00 | -13.37 | (AV) |

Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) a) First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the conducted limits outside the transmitter's fundamental emission band.
b) Second, retest with a dummy load to make sure the device complies with the conducted limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.

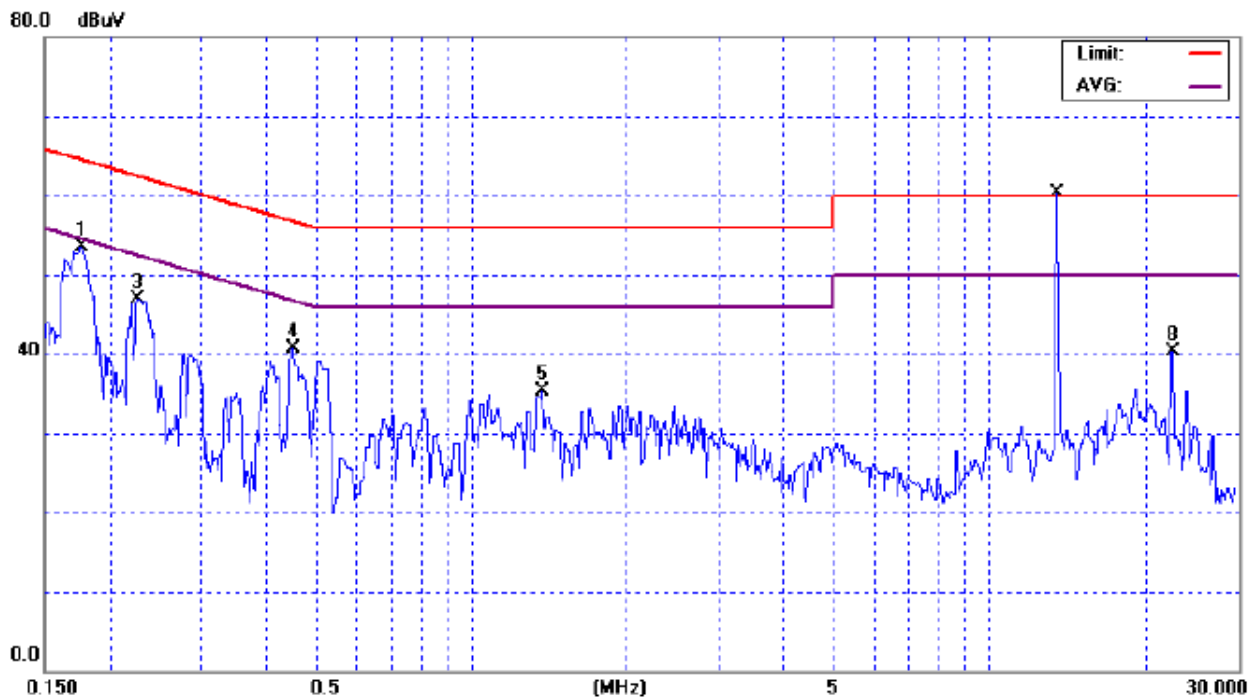


| | | | |
|---------------|--|---------------------|--------------|
| EUT : | Terminal | Model Name. : | M0010 |
| Temperature : | 18 °C | Relative Humidity : | 60% |
| Pressure : | 1008hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | Mode 2 - Normal Link with cradle use (full system) | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|----------------|-----------------|----------------|---------|--------------|---------|----------------|----------|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.18 | Neutral | 53.49 | 37.34 | 64.68 | 54.68 | -17.39 | (AV) |
| 0.23 | Neutral | 46.82 | * | 62.58 | 52.58 | -15.76 | (QP) |
| 0.45 | Neutral | 40.61 | * | 56.88 | 46.88 | -16.27 | (QP) |
| 1.37 | Neutral | 35.25 | * | 56.00 | 46.00 | -20.75 | (QP) |
| 13.55 | Neutral | 59.39 | 59.39 | 60.00 | 50.00 | 9.39 | Note (3) |
| 22.55 | Neutral | 40.28 | * | 60.00 | 50.00 | -19.72 | (QP) |

Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of "Note". If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a "*" marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) Tx Fundamental, For reference only. Please refer to the next page.

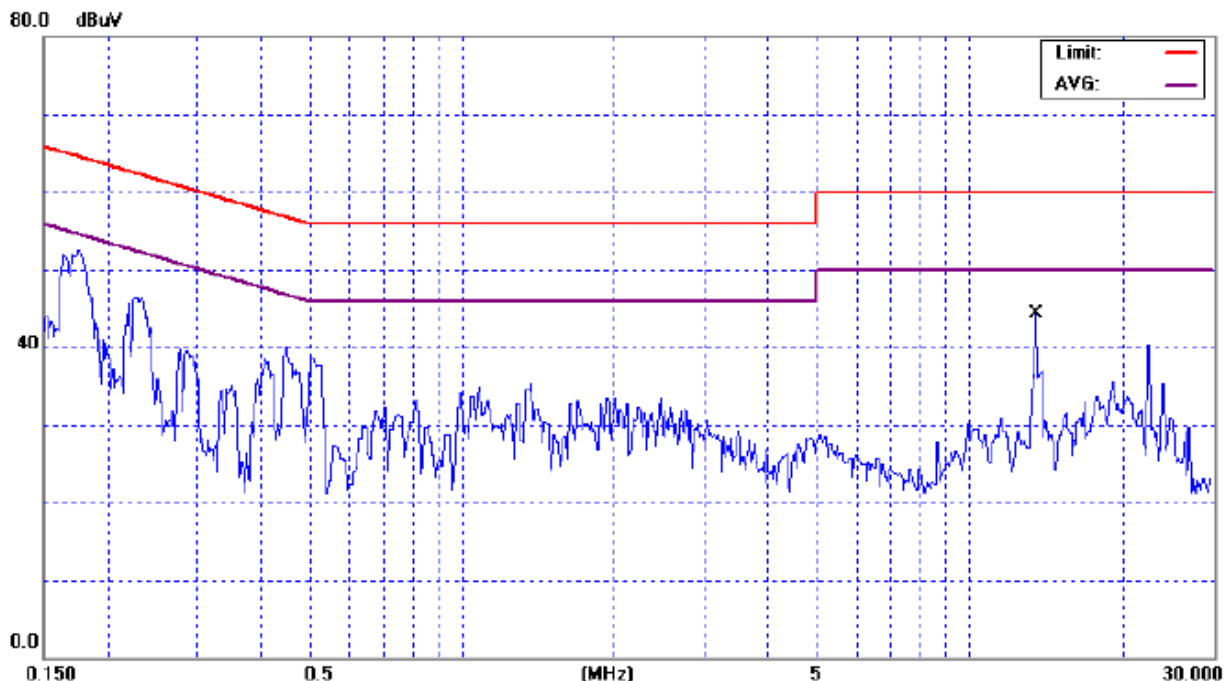


| | | | |
|---------------|--|---------------------|--------------|
| EUT : | Terminal | Model Name. : | M0010 |
| Temperature : | 18 °C | Relative Humidity : | 60% |
| Pressure : | 1008hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | Mode 2 - Normal Link with cradle use (full system) | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|----------------|-----------------|----------------|---------|--------------|---------|----------------|------|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 13.55 | Neutral | 33.67 | 28.14 | 60.00 | 50.00 | -11.27 | (AV) |

Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) a) First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the conducted limits outside the transmitter's fundamental emission band.
b) Second, retest with a dummy load to make sure the device complies with the conducted limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (Frequency Range 30MHz-1000MHz)

| FCC Part 15.209 | | | | |
|------------------------------------|------------------------------|------|--|-------------------------|
| Frequency (MHz) | Field Strength Limitation | | Field Strength Limitation at 3m Measurement Dist | |
| | (uV/m) | Dist | (uV/m) | (dBuV/m) |
| 0.009 – 0.490 | 2400 / F(KHz) | 300m | 10000 * 2400/F(KHz) | 20log 2400/F(KHz) + 80 |
| 0.490 – 1.705 | 24000 / F(KHz) | 30m | 100 * 24000/F(KHz) | 20log 24000/F(KHz) + 40 |
| 1.705 – 30.00 | 30 | 30m | 100* 30 | 20log 30 + 40 |
| 30.0 – 88.0 | 100 | 3m | 100 | 20log 100 |
| 88.0 – 216.0 | 150 | 3m | 150 | 20log 150 |
| 216.0 – 960.0 | 200 | 3m | 200 | 20log 200 |
| Above 960.0 | 500 | 3m | 500 | 20log 500 |
| FCC Part 15.225(a)/(b)/(c) | | | | |
| Frequency (MHz) | Field Strength Limitation | | Field Strength Limitation at 3m Measurement Dist | |
| | (uV/m) | Dist | (uV/m) | (dBuV/m) |
| 13.553 – 13.567 | 15,848 | 30 m | 15,848*100 | 124 |
| 13.567 – 13.710 | 334 | 30 m | 334*100 | 90.5 |
| 13.110 – 13.410 13.710 – 14.010 | 106 | 30 m | 106*100 | 80.5 |

Notes:

- (1) The tighter limit shall apply at the boundary between two frequency range.
- (2) Limitation expressed in dBuV/m is calculated by 20log Emission Level (uV/m).
- (3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $L_{d1} = L_{d2} * (d_2/d_1)^2$.

Example:

F.S Limit at 30m distance is 30uV/m , then F.S Limitation at 3m distance is adjusted as $L_{d1} = L_1 = 30\text{uV/m} * (10)^2 = 100 * 30 \text{ uV/m}$

4.2.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-------------------|--------------|-----------|------------|------------------|
| 1 | Spectrum Analyzer | R&S | FSP_40 | 100129 | Jan, 23, 2009 |
| 2 | Log-Bicon Antenna | Schwarzbeck | VULB 9160 | 3176 | Feb. 05, 2008 |
| 3 | Loop Ant | EMCO | 6502 | 00042960 | Jan. 12, 2009 |
| 4 | Test Cable | N/A | 10M_OS01 | N/A | Nov. 27, 2008 |
| 5 | Test Cable | N/A | OS01-1/-2 | N/A | Nov. 27, 2008 |
| 6 | EMI Test Receiver | R&S | ESCI | 100080 | Mar. 08, 2008 |

Remark: " N/A" denotes No Model Name / Serial No. and No Calibration specified.

4.2.3 TEST PROCEDURE

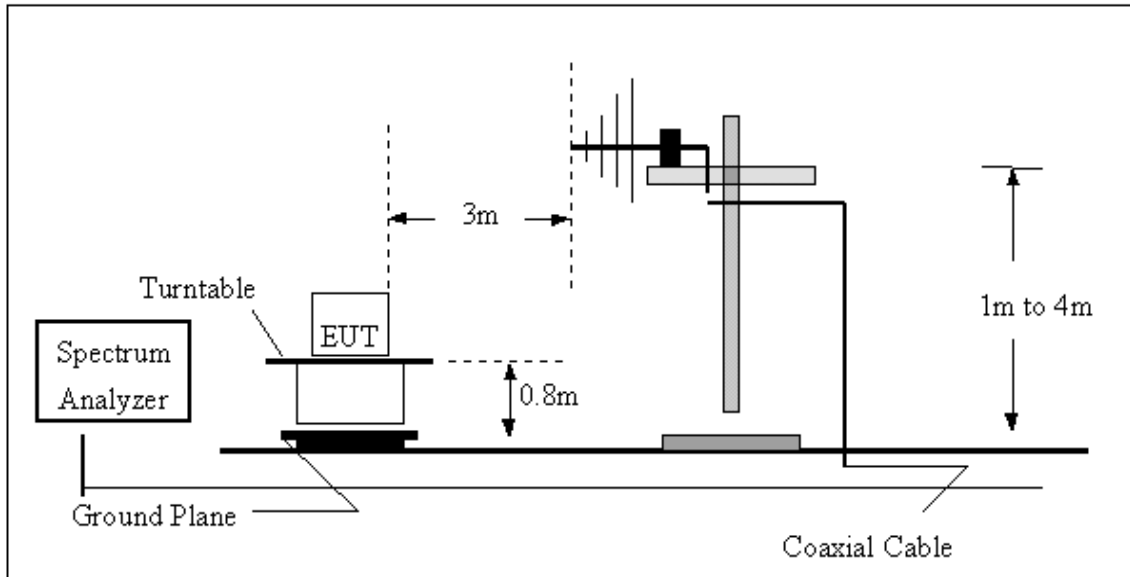
- The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.4 DEVIATION FROM TEST STANDARD

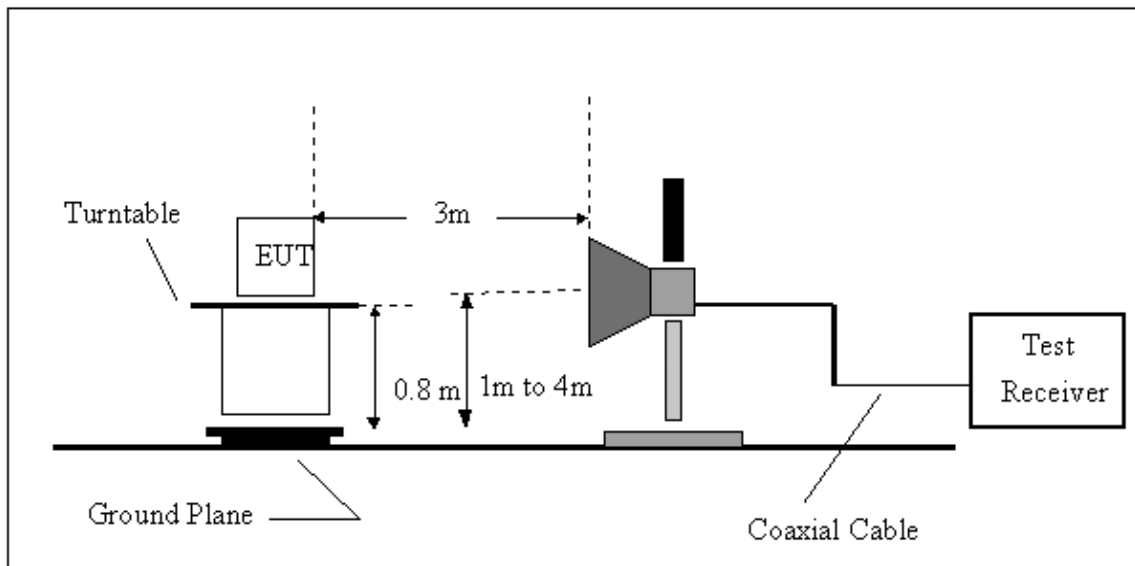
No deviation

4.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

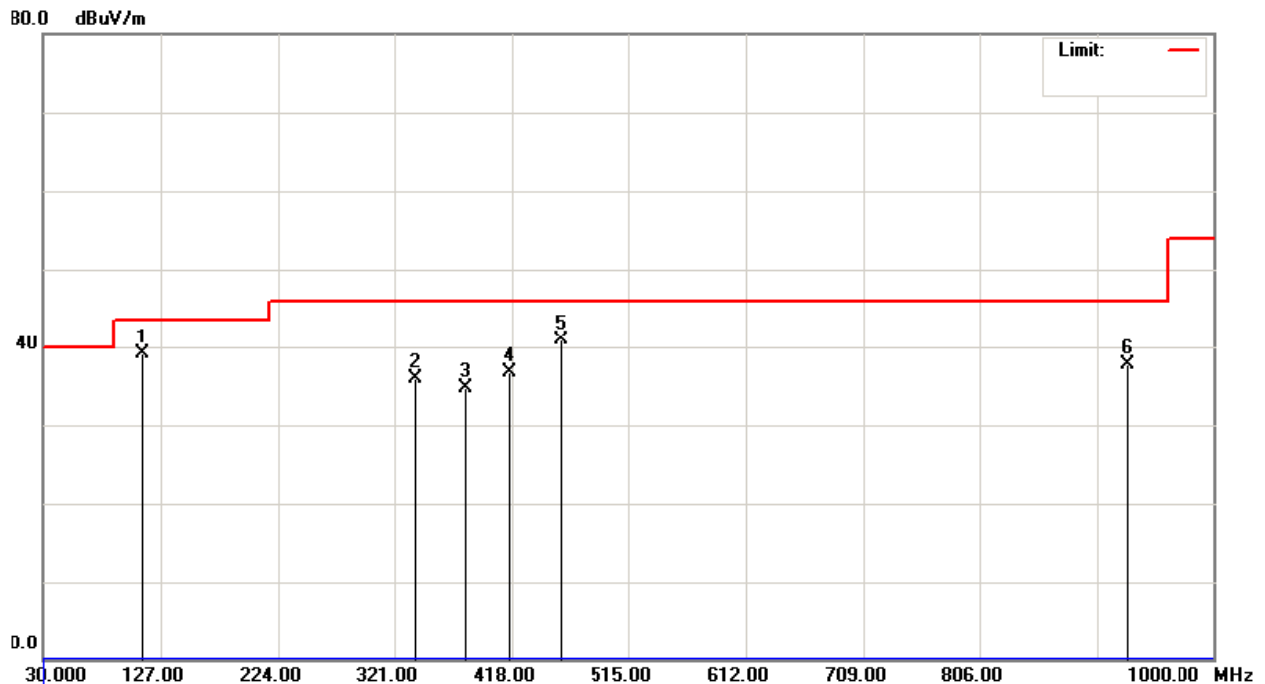
4.2.7 TEST RESULTS- FCC PART 15.209(30MHZ~1000MHZ)

| | | | |
|---------------|----------|---------------------|--------------|
| E.U.T : | Terminal | Model Name : | M0010 |
| Temperature : | 19 °C | Relative Humidity : | 66% |
| Pressure : | 1003 hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | TX | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|----------------|-----------------|-------------------------|-------------------|-------------------------|-----------------------|----------------------|--------------------------|------|
| 111.48 | V | Peak | 49.90 | - 10.73 | 39.17 | 43.50 | - 4.33 | |
| 338.46 | V | Peak | 42.61 | - 6.61 | 36.00 | 46.00 | - 10.00 | |
| 379.20 | V | Peak | 40.37 | - 5.72 | 34.65 | 46.00 | - 11.35 | |
| 416.06 | V | Peak | 41.50 | - 4.76 | 36.74 | 46.00 | - 9.26 | |
| 458.74 | V | Peak | 44.56 | - 3.68 | 40.88 | 46.00 | - 5.12 | |
| 928.22 | V | Peak | 35.96 | 1.80 | 37.76 | 46.00 | - 8.24 | |

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .

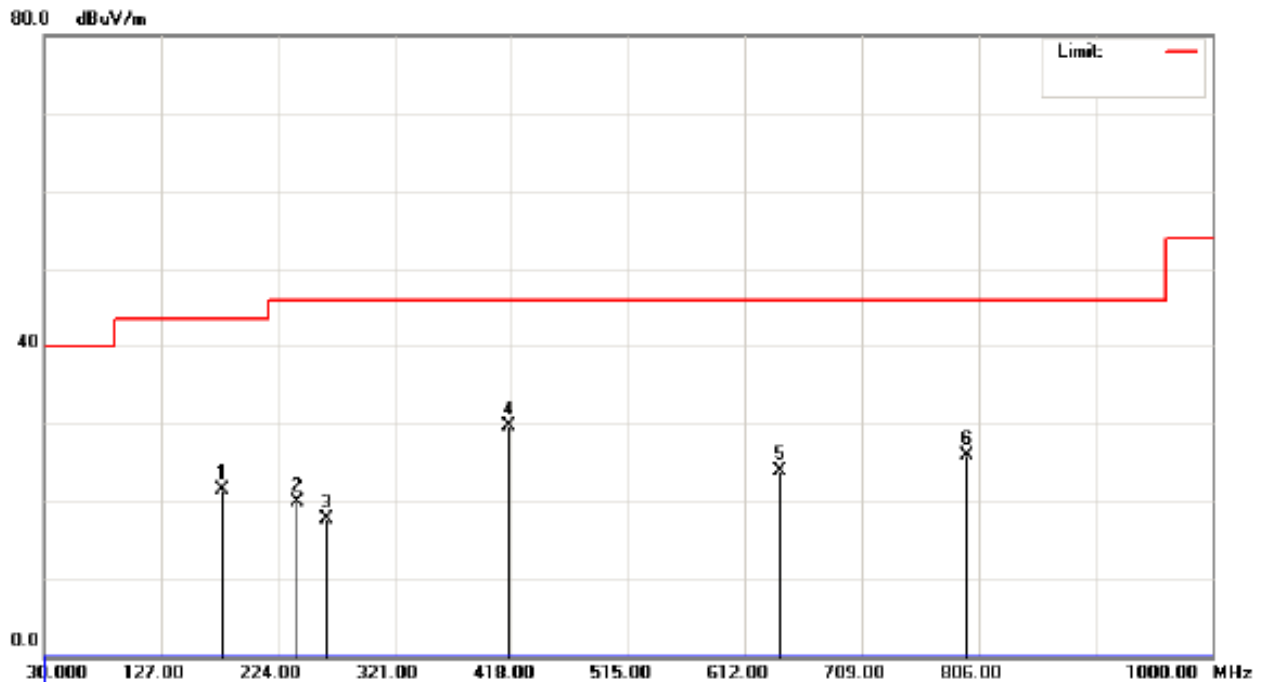


| | | | |
|---------------|----------|---------------------|--------------|
| E.U.T : | Terminal | Model Name : | M0010 |
| Temperature : | 19 °C | Relative Humidity : | 66% |
| Pressure : | 1003 hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | TX | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|-------------|--------------|----------------------|----------------|----------------------|--------------------|-------------------|-----------------------|------|
| 177.40 | H | Peak | 30.34 | - 8.84 | 21.50 | 43.50 | - 22.00 | |
| 239.52 | H | Peak | 29.50 | - 9.54 | 19.96 | 46.00 | - 26.04 | |
| 264.74 | H | Peak | 26.57 | - 8.86 | 17.71 | 46.00 | - 28.29 | |
| 416.06 | H | Peak | 34.45 | - 4.76 | 29.69 | 46.00 | - 16.31 | |
| 641.10 | H | Peak | 23.74 | 0.23 | 23.97 | 46.00 | - 22.03 | |
| 796.30 | H | Peak | 25.52 | 0.42 | 25.94 | 46.00 | - 20.06 | |

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .



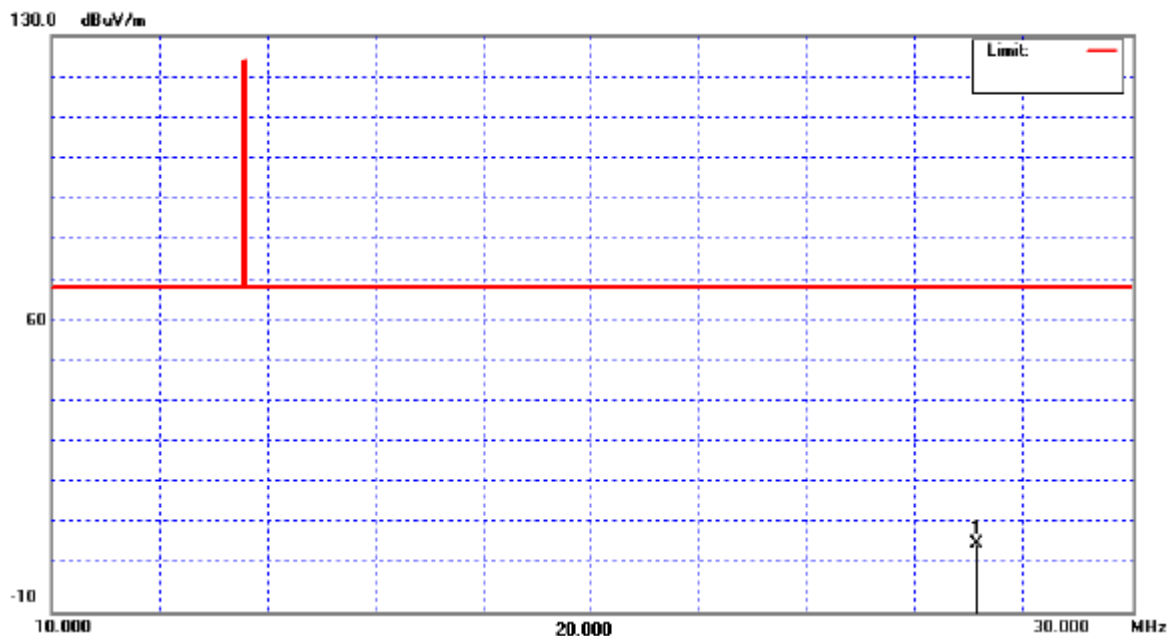
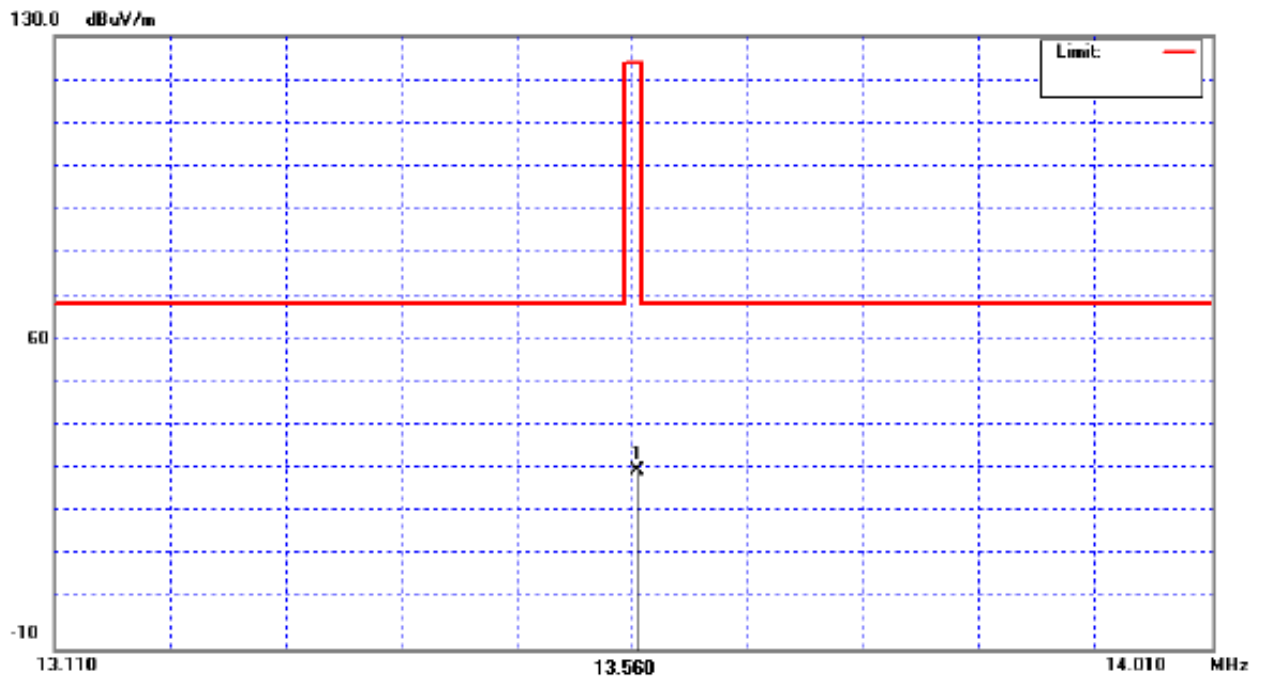
4.2.8 TEST RESULTS- FCC PART 15.225(9KHZ~30MHZ)

| | | | |
|---------------|----------|---------------------|--------------|
| E.U.T : | Terminal | Model Name : | M0010 |
| Temperature : | 25 ° C | Relative Humidity : | 60% |
| Pressure : | 1003 hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | TX | | |

| Freq. (MHz) | Detector Mode | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|----------------|---------------|-------------------|-------------------------|-----------------------|----------------------|--------------------------|------|
| 13.56 | QP | 63.88 | - 33.26 | 30.62 | 124.00 | - 93.38 | |
| 27.12 | QP | 39.46 | - 32.68 | 6.78 | 69.00 | - 62.22 | |

Remark :

- (1) Spectrum Setting:
 9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
 150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
 30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform °
- (3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table °



4.3 FREQUENCY STABILITY MEASUREMENT

4.3.1 FREQUENCY STABILITY LIMITS

FCC Part 15.225(e)

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

4.3.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|--------------------------------|--------------|----------|------------|------------------|
| 1 | Spectrum Analyzer | R&S | FSP_40 | 100129 | Jan, 23, 2009 |
| 2 | Temperature & Humidity Chamber | GIANT FORCE | GTH-056P | GF-94454-1 | Jul. 23, 2008 |

Remark: " N/A" denotes No Model No. / Serial No. and No Calibration specified.

4.3.3 TEST PROCEDURE

- The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber.
After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.
- At room temperature ($25\pm5^{\circ}\text{C}$), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

4.3.6 TEST RESULTS

| | | | |
|---------------|----------|---------------------|--------------|
| E.U.T : | Terminal | Model Name : | M0010 |
| Temperature : | 26 °C | Relative Humidity : | 60% |
| Pressure : | 1003 hPa | Test Voltage : | AC 120V/60Hz |
| Test Mode : | TX Mode | | |

| Frequency Stability Versus Environmental Temperature | | | | | | |
|--|------------------|---------------|-----------------|------------------|-------------|-------------|
| | Temperature (°C) | Voltage (Vac) | Frequency (MHz) | Freq Error (KHz) | Limit (KHz) | Results |
| | 20 | 120V | 13.56040 | | | |
| 0 min | 50 | 120V | 13.56042 | 0.020 | +/- 1.356 | PASS |
| | -20 | 120V | 13.56042 | 0.020 | +/- 1.356 | PASS |
| 2 min | 50 | 120V | 13.56043 | 0.030 | +/- 1.356 | PASS |
| | -20 | 120V | 13.56043 | 0.030 | +/- 1.356 | PASS |
| 5 min | 50 | 120V | 13.56043 | 0.030 | +/- 1.356 | PASS |
| | -20 | 120V | 13.56039 | -0.010 | +/- 1.356 | PASS |
| 10 min | 50 | 120V | 13.56044 | 0.040 | +/- 1.356 | PASS |
| | -20 | 120V | 13.56042 | 0.020 | +/- 1.356 | PASS |

| Frequency Stability Versus Input Voltage | | | | | | |
|--|---------------|-----|-----------------|------------------|-------------|-------------|
| Temperature(°C) | Voltage (Vac) | | Frequency (MHz) | Freq Error (KHz) | Limit (KHz) | Results |
| 20 | V-nom | 120 | 13.5604 | | | |
| 20 | V-min | 102 | 13.56048 | 0.08 | +/- 1.356 | PASS |
| 20 | V-max | 138 | 13.56041 | 0.01 | +/- 1.356 | PASS |

5. EUT TEST PHOTO

**Conducted Measurement Photos
Normal Link with cradle use (full system)**



**Radiated Measurement Photos
EUT Orthogonal Axis : Z**

