

VERIFICATION



This is to certify that the product listed in follows was (were) tested in the Neutron EMC Laboratory to comply with the criteria limits Class A of conducted and radiated emissions of the Technical Standards FCC Part 15, Subpart B, established by the FCC, USA.

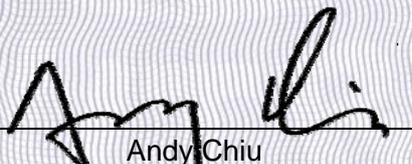
Equipment CPU MAINBOARD WITH ARM PROCESSOR
Model Name ARM-C2-FULL

Applicant C.J.B. Computer Job Srl
Address Via Ghislandi, 24 – 25125 BRESCIA - ITALY

Standard(s) FCC Part 15, Subpart B: 2013
ANSI C63.4: 2009
ICES-003 Issue 5: 2012
CISPR 22: 2008
CAN/CSA-CISPR 22-10

Report(s) NEI-FCCE-1-1404241

The test data, data evaluation, and equipment configuration contained in our test report(s) above was (were) obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s). The test data contained in the referenced test report relate only to the EUT sample and item(s) tested.


Andy Chiu
Authorized Signatory

Neutron Engineering Inc.
B1, No. 37, Lane 365, YangGuang St.,
NeiHu District 114, Taipei, Taiwan.
TEL: +886-2-2657-3299
FAX: +886-2-2657-3331



VERIFICATION



This is to certify that the product listed in follows was (were) tested in the Neutron EMC Laboratory to comply with the criteria limits Class A of conducted and radiated emissions of the Technical Standards FCC Part 15, Subpart B, established by the FCC, USA.

Equipment MotherBoard
Model Name ARM-C2-DEP

Applicant CJB Computer Job s.r.l.
Address Via Ghislandi 24-25125 Brescia (BS) ITALY

Standard(s) FCC Part 15, Subpart B: 2012
ANSI C63.4: 2009
ICES-003 Issue 5: 2012
CISPR 22: 2008
CAN/CSA-CISPR 22-10

Report(s) NEI-FCCE-1-1403073

The test data, data evaluation, and equipment configuration contained in our test report(s) above was (were) obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s). The test data contained in the referenced test report relate only to the EUT sample and item(s) tested.


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TEL: +886-2-2657-3299
FAX: +886-2-2657-3331





FCC Test Report

Issued Date : May. 05, 2014
Project No. : 1404241
Equipment : CPU MAINBOARD WITH ARM
PROCESSOR
Model Name : ARM-C2-FULL
Applicant : C.J.B. Computer Job Srl
Address : Via Ghislandi, 24 - 25125 BRESCIA -
ITALY

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Apr. 18, 2014
Date of Test: Apr. 18, 2014 ~ Apr. 30, 2014

Testing Engineer: Kevin Kao
(Kevin Kao)

Technical Manager: Jeff Yang
(Jeff Yang)

Authorized Signatory: Andy Chiu
(Andy Chiu)

Neutron Engineering Inc.
B1, No. 37, Lane 365, YangGuang St.,
NeiHu District 114, Taipei, Taiwan.
TEL: +886-2-2657-3299
FAX: +886-2-2657-3331





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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Neutron's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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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REPORT ISSUED HISTORY

| Issue No. | Description | Issued Date |
|--------------------|-----------------|---------------|
| NEI-FCCE-1-1404241 | Original Issue. | May. 05, 2014 |



1. VERIFICATION

Equipment : CPU MAINBOARD WITH ARM PROCESSOR
Brand Name : CJB ARM-C2
Model Name : ARM-C2-FULL
Applicant : C.J.B. Computer Job Srl
Date of Test : Apr. 18, 2014 ~ Apr. 30, 2014
Standard(s) : FCC Part 15, Subpart B: 2013 Class A
ICES-003 Issue 5: 2012 Class A
CAN/CSA CISPR 22-10 Class A
CISPR 22: 2008 Class A
ANSI C63.4-2009

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-FCCE-1-1404241) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).



2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| Emission | | | | |
|--|-------------------------------|---------|----------|----------|
| Standard(s) | Test Item | Limit | Judgment | Remark |
| FCC Part 15, Subpart B: 2013 ICES-003 Issue 5: 2012 CAN/CSA CISPR 22-10 CISPR 22: 2008 | Conducted emission | Class A | PASS | |
| | Radiated emission Below 1 GHz | Class A | PASS | |
| | Radiated emission Above 1 GHz | Class A | PASS | NOTE (2) |

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) If the EUT's max operating frequency does not exceed 108 MHz, the test will not be performed.



2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission Test:

C01: (VCCI RN: C-2918; FCC RN: 95335; FCC DN: TW1010)

No.132-1, Ln. 329, Sec. 2, Balian Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Below 1 GHz):

OS02: (VCCI RN: R-2669; FCC RN: 95335; FCC DN: TW1010)

No.132-1, Ln. 329, Sec. 2, Balian Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)

1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC/ Industry Canada rules and for reference only.

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

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

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

B. Radiated emission test:

| Test Site | Measurement Frequency Range | Ant. H / V | U , (dB) | NOTE |
|-----------|-----------------------------|------------|----------|------|
| OS02 | 30 MHz ~ 200 MHz | V | 2.48 | |
| | 30 MHz ~ 200 MHz | H | 2.16 | |
| | 200 MHz ~ 1, 000 MHz | V | 2.50 | |
| | 200 MHz ~ 1, 000 MHz | H | 2.66 | |

| Test Site | Item | Measurement Frequency Range | Uncertainty | NOTE | |
|-----------|-------------------------|-----------------------------|---------------|---------|--|
| CB08 | Radiated emission at 3m | Horizontal Polarization | 30 - 200MHz | 3.35 dB | |
| | | | 200 - 1000MHz | 3.11 dB | |
| | | | 1 - 18GHz | 3.97 dB | |
| | | | 18 - 40GHz | 4.01 dB | |
| | | Vertical Polarization | 30 - 200MHz | 3.22 dB | |
| | | | 200 - 1000MHz | 3.24 dB | |
| | | | 1 - 18GHz | 4.05 dB | |
| | | | 18 - 40GHz | 4.04 dB | |

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above.

These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR} .



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------|--|
| Equipment | CPU MAINBOARD WITH ARM PROCESSOR |
| Brand Name | CJB ARM-C2 |
| Model Name | ARM-C2-FULL |
| OEM Brand/Model Name | N/A |
| Model Difference | N/A |
| Product Description | More details of EUT technical specification please refer to the User's Manual. |
| Power Source | DC Voltage supplied from DC Source |
| Power Rating | I/P: DC 8-36V |
| Connecting I/O Port(s) | Please refer to the User's Manual |
| Products Covered | N/A |
| 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 generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

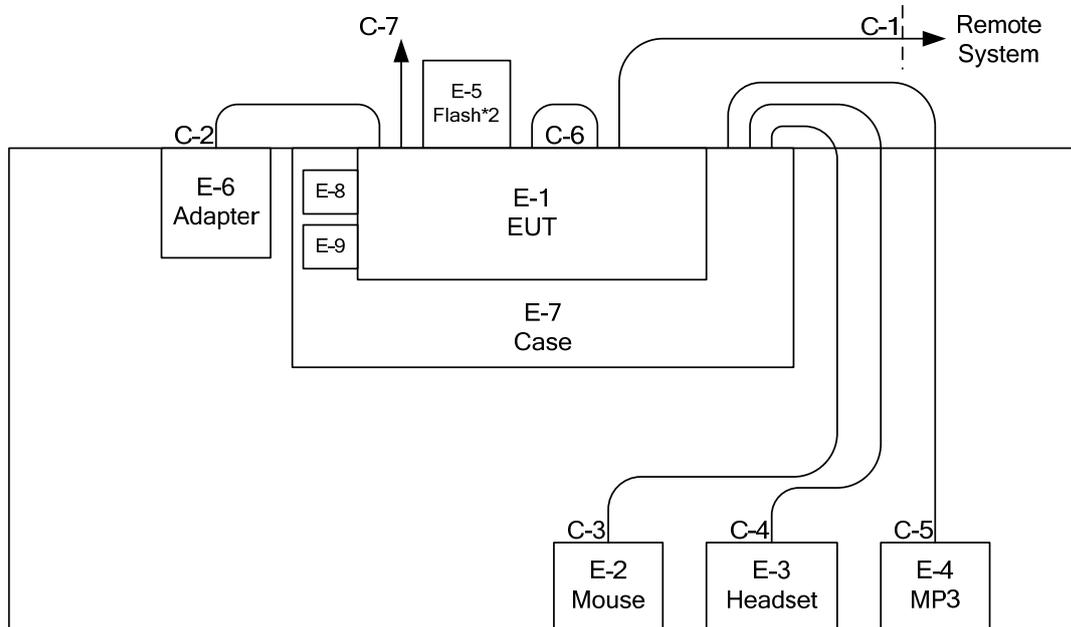
| Pretest Test Mode | Description |
|-------------------|-------------|
| Mode 1 | FULL SYSTEM |

| Conducted emission test | |
|--------------------------------|-------------|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM |

| Radiated emission test | |
|-------------------------------|-------------|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM |



3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



- C-1 RJ-45 Cable*2
- C-2 Power Cable
- C-3 USB Cable
- C-4 Audio Cable*2
- C-5 Audio Cable
- C-6 Data Cable
- C-7 Data Cable*4

- E-8 SD Card
- E-9 Micro SD Card



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 | Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|----------------------------------|------------|----------------|--------|--------------------------|------|
| E-1 | CPU MAINBOARD WITH ARM PROCESSOR | CJB ARM-C2 | ARM-C2-FULL | VER | N/A | EUT |
| E-2 | USB Mouse | DELL | MS111-L | DOC | CN-09RRC7-44751-17J-OH1F | |
| E-3 | Compact Earphone Mic | CJ | CJ-323 | N/A | N/A | |
| E-4 | USB Flash/MP3 Player | DELL | HV04T | DOC | 95NY781 | |
| E-5 | Flash | SP | SP8G | N/A | N/A | |
| E-6 | Adapter | LEAD YEAR | TG-6001-24V | DOC | 0503024837 R03 | |
| E-7 | Case | N/A | N/A | N/A | N/A | |
| E-8 | SD MEMORY CARD | Kingston | N/A | N/A | N/A | |
| E-9 | Micro SD Card | SanDisk | N/A | N/A | N/A | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| C-1 | NO | NO | 10M | |
| C-2 | YES | YES | 1.5M | |
| C-3 | YES | NO | 1.7M | |
| C-4 | NO | NO | 1.8M | |
| C-5 | NO | NO | 1.5M | |
| C-6 | NO | NO | 0.1M | |
| C-7 | NO | NO | 1.5M | |

Note:

- (1) The support equipment was authorized by Declaration of Conformity (DOC).



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 LIMITS (FREQUENCY RANGE 150 KHZ-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.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value – Limit Value

4.1.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|----------------------|--------------|--------------------------|------------|------------------|
| 1 | TWO-LINE V-NETWORK | R&S | ENV216 | 101050 | Apr. 21, 2015 |
| 2 | Test Cable | TIMES | CFD300-NL | C01 | Jun. 16, 2014 |
| 3 | EMI Test Receiver | R&S | ESCI | 100082 | Mar. 20, 2015 |
| 4 | Measurement Software | EZ | EZ_EMCC (Version NB-03A) | N/A | N/A |

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

4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 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.

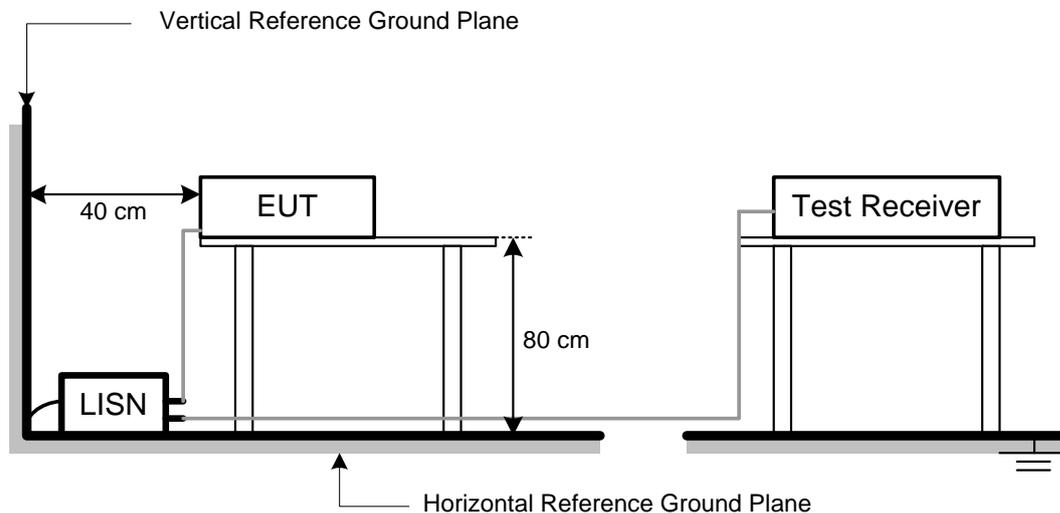
NOTE:

- a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn't perform.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP





4.1.6 EUT OPERATING CONDITIONS

The EUT used during radiated and/or conducted emission measurement was designed to exercise in a manner similar to a typical use. The sequence used is:

1. Read (write) from (to) mass storage device.
2. Send/Receive data to/from remote system.
3. Send/Receive audio to/from audio devices.
4. Repeated from 1 to 3 continuously.

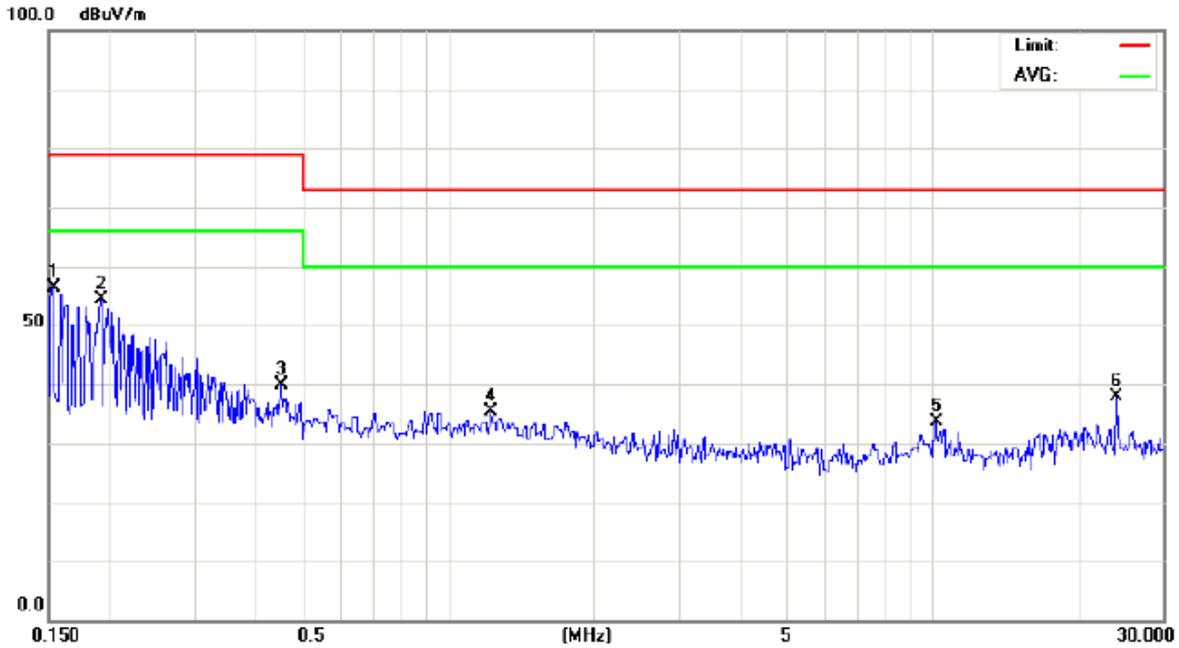
As the mouse is a strictly input device, no data is transmitted to (from) it during test. It is, however, continuously scanned for data input activity.



4.1.7 TEST RESULTS

| | | | |
|--------------|----------------------------------|-------------------|-------------|
| EUT | CPU MAINBOARD WITH ARM PROCESSOR | Model Name | ARM-C2-FULL |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Phase: Line

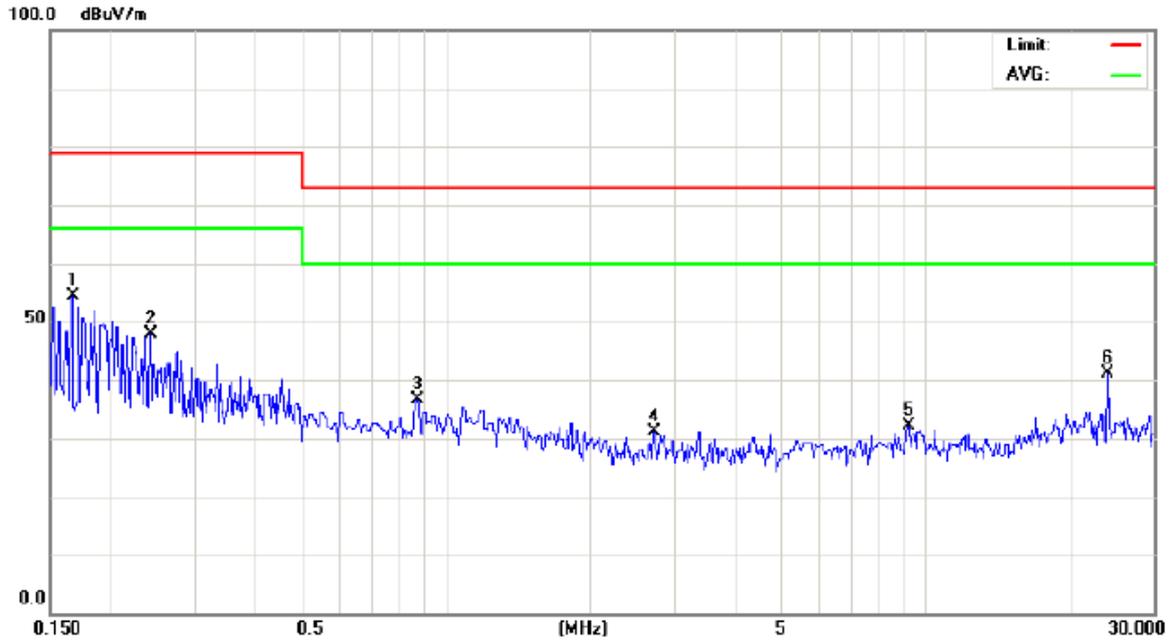


| No. | Mk. | Freq. MHz | Reading Level dBuV/m | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|----------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | * | 0.1528 | 46.64 | 9.73 | 56.37 | 79.00 | -22.63 | peak | |
| 2 | | 0.1920 | 44.36 | 10.14 | 54.50 | 79.00 | -24.50 | peak | |
| 3 | | 0.4510 | 30.20 | 9.71 | 39.91 | 79.00 | -39.09 | peak | |
| 4 | | 1.2290 | 25.75 | 9.65 | 35.40 | 73.00 | -37.60 | peak | |
| 5 | | 10.1500 | 23.82 | 9.90 | 33.72 | 73.00 | -39.28 | peak | |
| 6 | | 24.0000 | 28.06 | 9.85 | 37.91 | 73.00 | -35.09 | peak | |



| | | | |
|--------------|----------------------------------|-------------------|-------------|
| EUT | CPU MAINBOARD WITH ARM PROCESSOR | Model Name | ARM-C2-FULL |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Phase: Neutral



| No. | Mk. | Freq. MHz | Reading Level dBuV/m | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|----------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | * | 0.1661 | 44.63 | 9.86 | 54.49 | 79.00 | -24.51 | peak | |
| 2 | | 0.2417 | 37.91 | 9.96 | 47.87 | 79.00 | -31.13 | peak | |
| 3 | | 0.8690 | 27.07 | 9.62 | 36.69 | 73.00 | -36.31 | peak | |
| 4 | | 2.7139 | 21.49 | 9.70 | 31.19 | 73.00 | -41.81 | peak | |
| 5 | | 9.2500 | 22.28 | 9.87 | 32.15 | 73.00 | -40.85 | peak | |
| 6 | | 24.0000 | 31.19 | 9.88 | 41.07 | 73.00 | -31.93 | peak | |



4.2 RADIATED EMISSION TEST

4.2.1 LIMITS

Below 1 GHz

| FREQUENCY (MHz) | Class A (at 10m) | Class B (at 10m) |
|-----------------|------------------|------------------|
| | dBuV/m | dBuV/m |
| 30 - 230 | 40 | 30 |
| 230 - 1000 | 47 | 37 |

NOTE:

- (1) The limit for radiated test was performed according to as following:
FCC Part 15, Subpart B: 2013; ICES-003 Issue 5: 2012; CAN/CSA-CISPR 22-10; CISPR 22: 2008.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).
- (4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Above 1 GHz

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) | | Class A (dBuV/m) (at 10m) | |
|-----------------|--------------------------|---------|---------------------------|---------|
| | PEAK | AVERAGE | PEAK | AVERAGE |
| Above 1000 | 80 | 60 | 69.5 | 49.5 |
| FREQUENCY (MHz) | Class B (dBuV/m) (at 3m) | | | |
| | PEAK | AVERAGE | | |
| Above 1000 | 74 | 54 | | |

NOTE:

- (1) The limit for radiated test was performed according to as following:
FCC Part 15, Subpart B: 2013; ICES-003 Issue 5: 2012.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).
3m Emission level = 10m Emission level + 20log(10m/3m).
- (4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

| Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz) | Range (MHz) |
|---|---|
| Below 1.705 | 30 |
| 1.705 - 108 | 1000 |
| 108 - 500 | 2000 |
| 500 - 1000 | 5000 |
| Above 1000 | 5 th harmonic of the highest frequency or 40 GHz, whichever is lower |



4.2.2 MEASUREMENT INSTRUMENTS LIST

Below 1 GHz:

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|--------------------------|--------------|-------------------------|------------|------------------|
| 1 | Log-Bicon Antenna | Schwarzbeck | VULB 9160 | 3173 | Nov. 28, 2014 |
| 2 | Pre-Amplifier | Anritsu | MH648A | M98457 | Jun. 02, 2014 |
| 3 | Test Cable | TIMES | LMR-400 | 10M-OS01 | Jun. 02, 2014 |
| 4 | Test Cable | TIMES | LMR-400 | OS02 | Jun. 02, 2014 |
| 5 | EMI Test Receiver | R&S | ESCI | 100082 | Mar. 20, 2015 |
| 6 | System Controller (OS02) | CT | SC100 | N/A | N/A |
| 7 | Turn Table | Chance Most | CMTB-1.5 | N/A | N/A |
| 8 | Measurement Software | EZ | EZ EMC (Version NB-03A) | N/A | N/A |

Above 1 GHz:

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|----------------------|--------------------|-------------------------|------------|------------------|
| 1 | Pre_Amplifier | Agilent | 8449B | 3008A01714 | Apr. 15, 2015 |
| 2 | Microflex Cable | HARBOUR INDUSTRIES | 27478 LL142 | 1M | May. 13, 2014 |
| 3 | Microflex Cable | AISI | S104-SMAP-1 | 10M | May. 15, 2014 |
| 4 | Microflex Cable | HARBOUR INDUSTRIES | 27478 LL142 | 3M | May. 13, 2014 |
| 5 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Jun. 20, 2014 |
| 6 | Measurement Software | EZ | EZ EMC (Version NB-03A) | N/A | N/A |
| 7 | Horn Antenna | Schwarzbeck | BBHA 9120 D | 9120D-546 | Aug. 21, 2014 |

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



4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. 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.
- c. 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.
- d. 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.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE: (Below 1 GHz)

- a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz.
- b. 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.

NOTE: (Above 1 GHz)

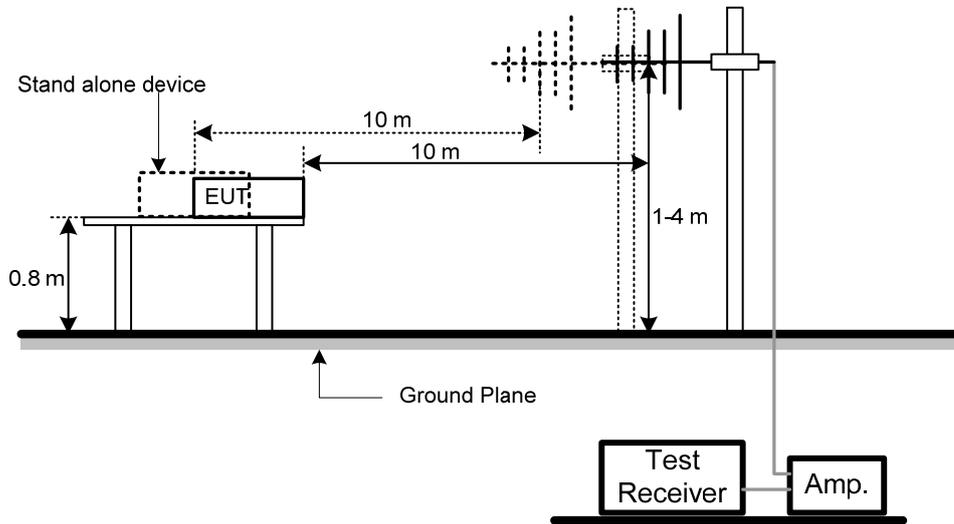
- a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz.
- b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

4.2.4 DEVIATION FROM TEST STANDARD

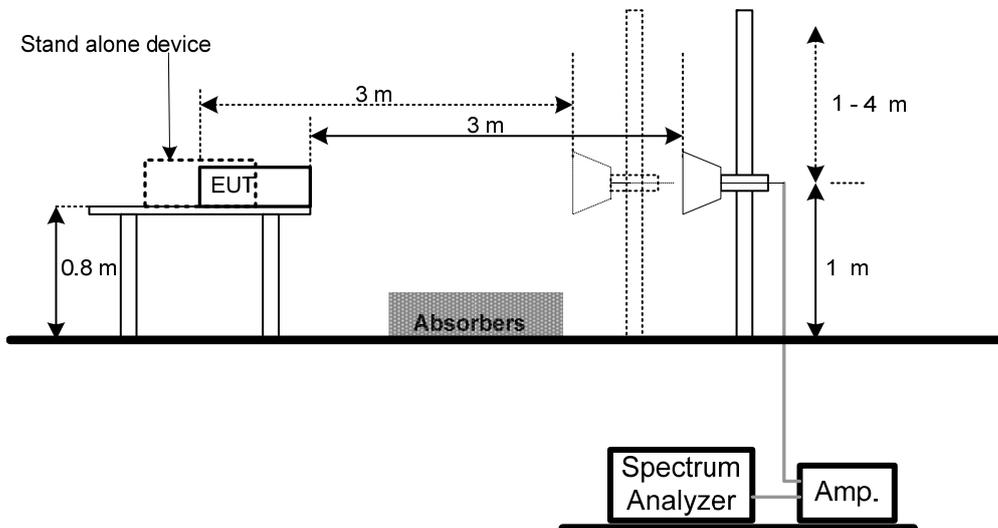
No deviation

4.2.5 TEST SETUP

Below 1 GHz



Above 1 GHz



4.2.6 EUT OPERATING CONDITIONS

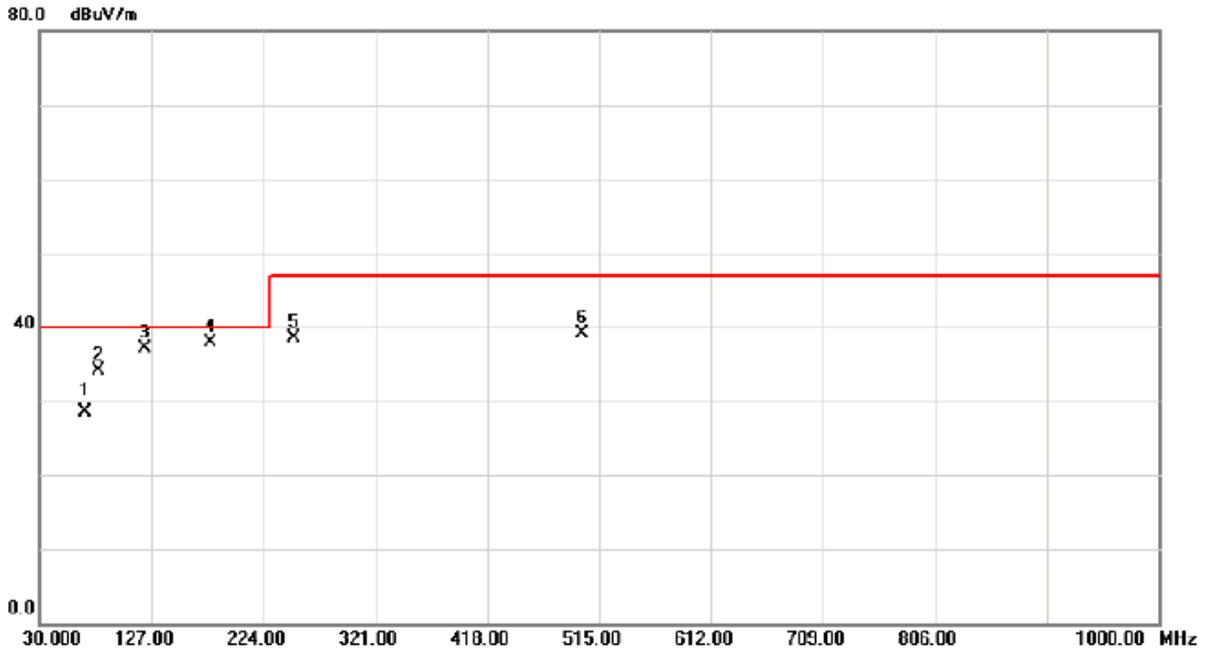
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



4.2.7 TEST RESULTS-BELOW 1 GHZ

| | | | |
|--------------|----------------------------------|-------------------|-------------|
| EUT | CPU MAINBOARD WITH ARM PROCESSOR | Model Name | ARM-C2-FULL |
| Temperature | 21° C | Relative Humidity | 54% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Polarization: Vertical

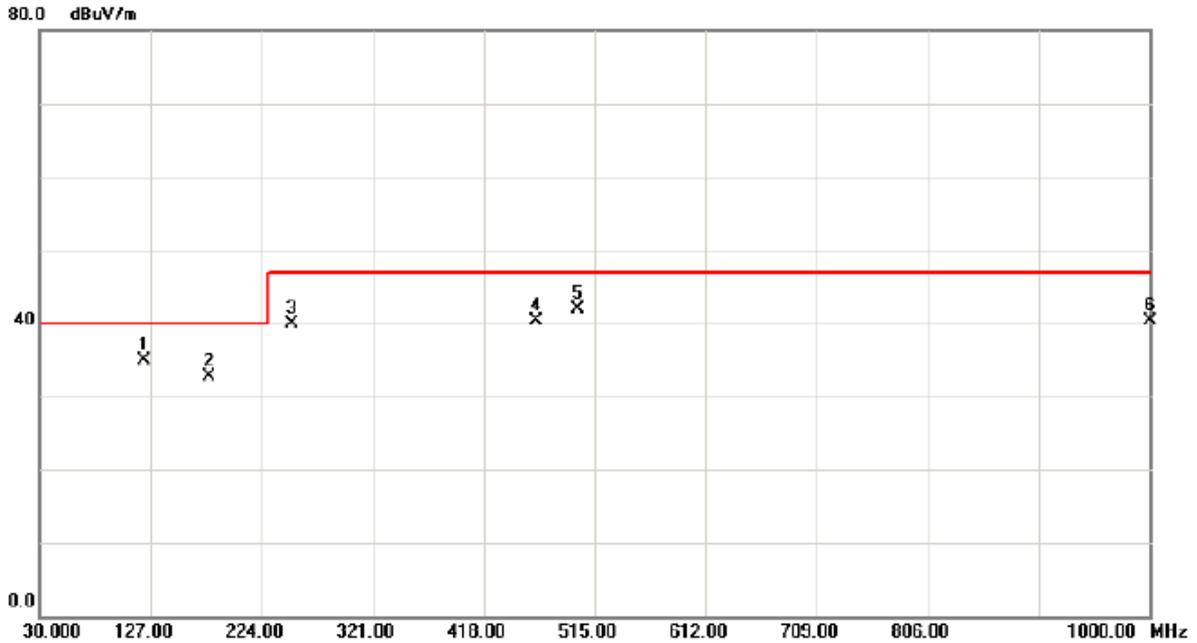


| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|---------|-----------|--------------------|-------------------|--------------------|--------------|---------|----------|---------|
| 1 | 67.5080 | 33.75 | -5.33 | 28.42 | 40.00 | -11.58 | QP | |
| 2 | 81.0080 | 41.57 | -7.43 | 34.14 | 40.00 | -5.86 | peak | |
| 3 | 121.4900 | 41.37 | -4.25 | 37.12 | 40.00 | -2.88 | peak | |
| 4 * | 178.6000 | 43.16 | -5.26 | 37.90 | 40.00 | -2.10 | peak | |
| 5 | 250.0100 | 43.98 | -5.54 | 38.44 | 47.00 | -8.56 | peak | |
| 6 | 500.0000 | 38.18 | 0.92 | 39.10 | 47.00 | -7.90 | peak | |



| | | | |
|--------------|----------------------------------|-------------------|-------------|
| EUT | CPU MAINBOARD WITH ARM PROCESSOR | Model Name | ARM-C2-FULL |
| Temperature | 21° C | Relative Humidity | 54% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Polarization: Horizontal



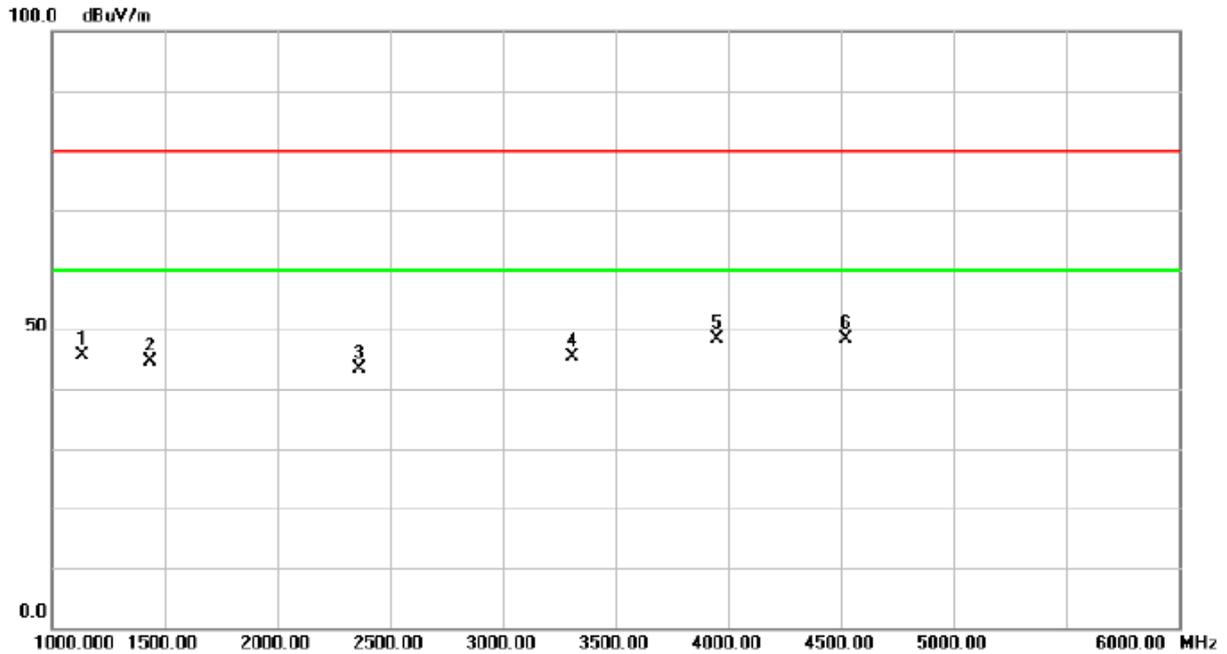
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 121.5160 | 39.15 | -4.24 | 34.91 | 40.00 | -5.09 | peak | |
| 2 | | 178.5000 | 38.02 | -5.24 | 32.78 | 40.00 | -7.22 | peak | |
| 3 | | 250.0000 | 45.53 | -5.54 | 39.99 | 47.00 | -7.01 | peak | |
| 4 | | 464.2100 | 39.84 | 0.45 | 40.29 | 47.00 | -6.71 | peak | |
| 5 | * | 500.0000 | 41.08 | 0.92 | 42.00 | 47.00 | -5.00 | peak | |
| 6 | | 1000.0000 | 29.81 | 10.42 | 40.23 | 47.00 | -6.77 | peak | |



4.2.8 TEST RESULTS-ABOVE 1 GHZ

| | | | |
|--------------|----------------------------------|-------------------|-------------|
| EUT | CPU MAINBOARD WITH ARM PROCESSOR | Model Name | ARM-C2-FULL |
| Temperature | 25 °C | Relative Humidity | 62% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Polarization: Vertical

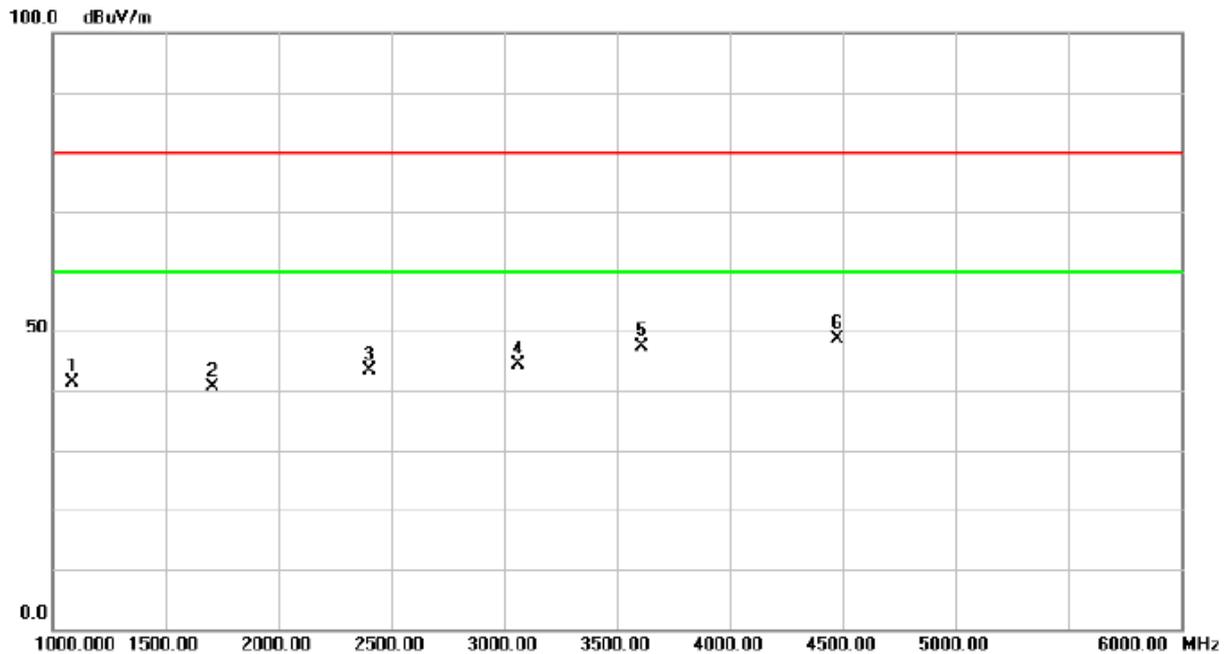


| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|---------|-----------|--------------------|-------------------|--------------------|--------------|---------|----------|---------|
| 1 | 1137.500 | 50.40 | -4.82 | 45.58 | 80.00 | -34.42 | peak | |
| 2 | 1437.500 | 47.79 | -3.20 | 44.59 | 80.00 | -35.41 | peak | |
| 3 | 2362.500 | 43.62 | -0.16 | 43.46 | 80.00 | -36.54 | peak | |
| 4 | 3312.500 | 43.33 | 2.00 | 45.33 | 80.00 | -34.67 | peak | |
| 5 | 3950.000 | 43.18 | 5.08 | 48.26 | 80.00 | -31.74 | peak | |
| 6 * | 4525.000 | 42.49 | 5.84 | 48.33 | 80.00 | -31.67 | peak | |



| | | | |
|--------------|----------------------------------|-------------------|-------------|
| EUT | CPU MAINBOARD WITH ARM PROCESSOR | Model Name | ARM-C2-FULL |
| Temperature | 25 °C | Relative Humidity | 62% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Polarization: Horizontal

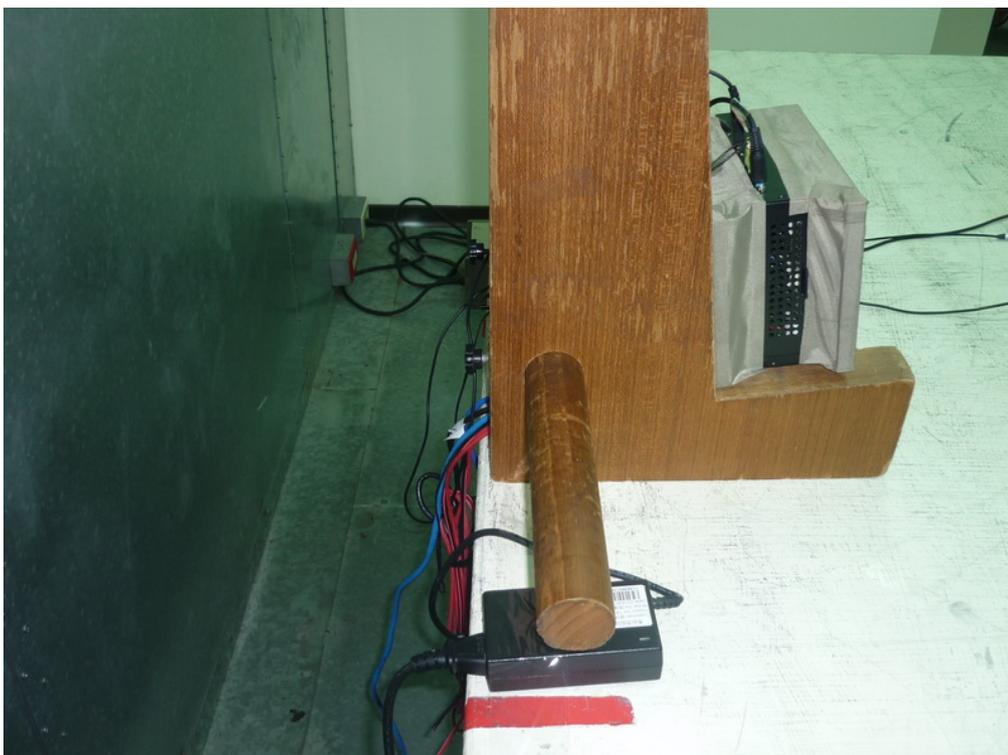


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 1087.500 | 46.54 | -5.08 | 41.46 | 80.00 | -38.54 | peak | |
| 2 | | 1712.500 | 42.89 | -2.28 | 40.61 | 80.00 | -39.39 | peak | |
| 3 | | 2400.000 | 43.37 | -0.03 | 43.34 | 80.00 | -36.66 | peak | |
| 4 | | 3062.500 | 43.53 | 0.89 | 44.42 | 80.00 | -35.58 | peak | |
| 5 | | 3612.500 | 43.88 | 3.39 | 47.27 | 80.00 | -32.73 | peak | |
| 6 | * | 4475.000 | 42.76 | 5.77 | 48.53 | 80.00 | -31.47 | peak | |

5. EUT TEST PHOTO

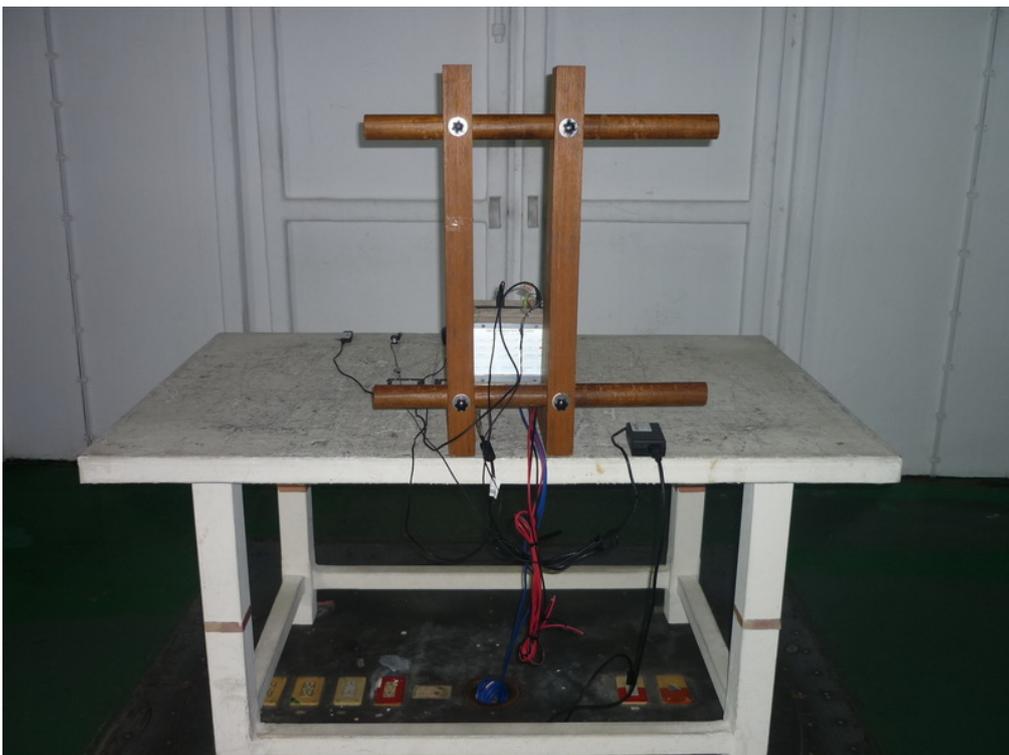
Conducted emission test photos

FULL SYSTEM



Radiated emission below 1 GHz test photos

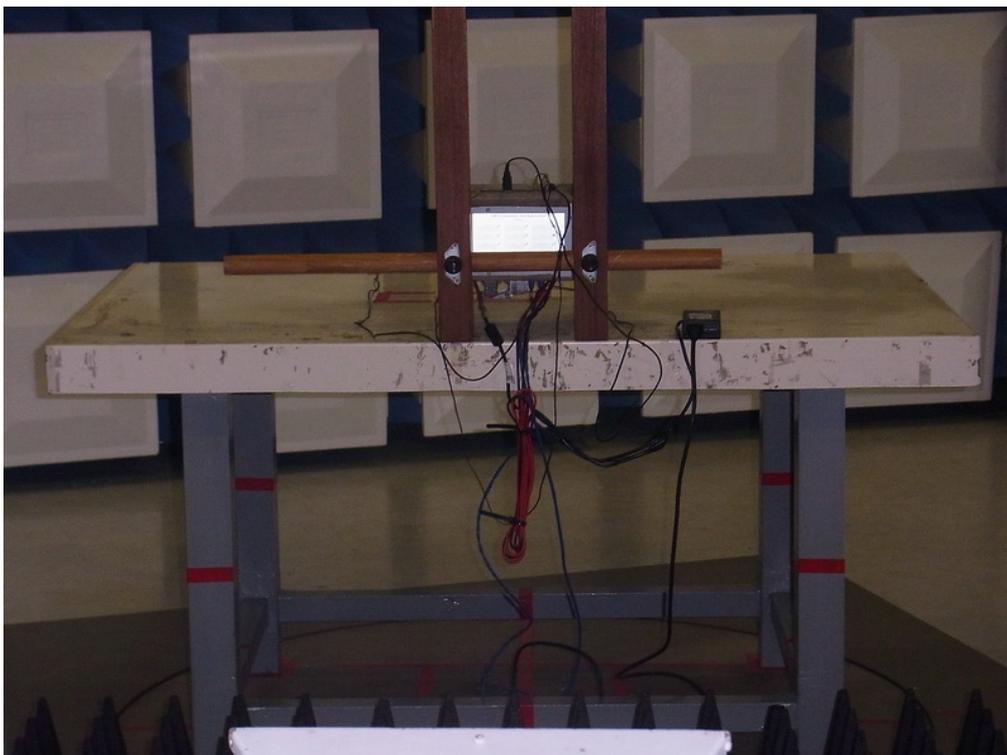
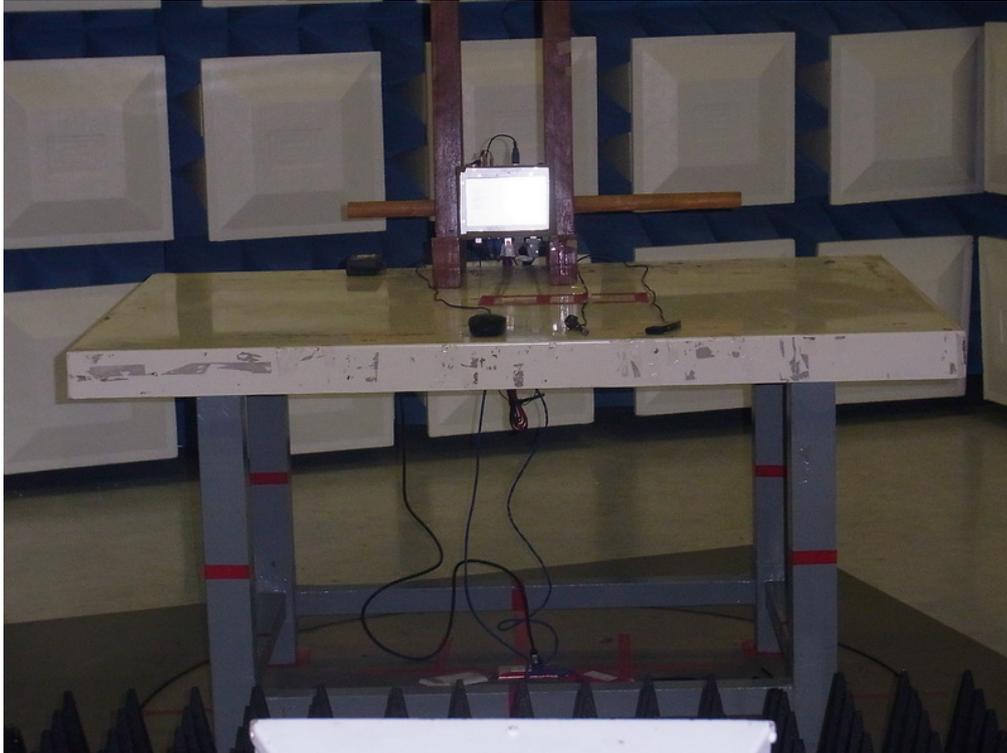
FULL SYSTEM





Radiated emission above 1 GHz test photos

FULL SYSTEM

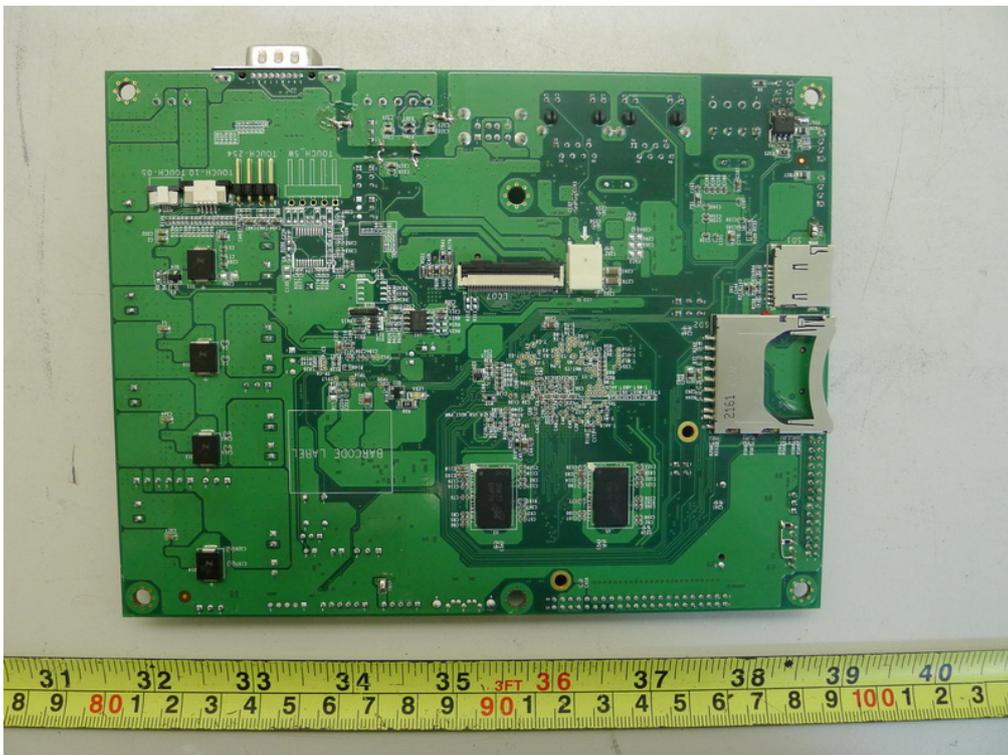


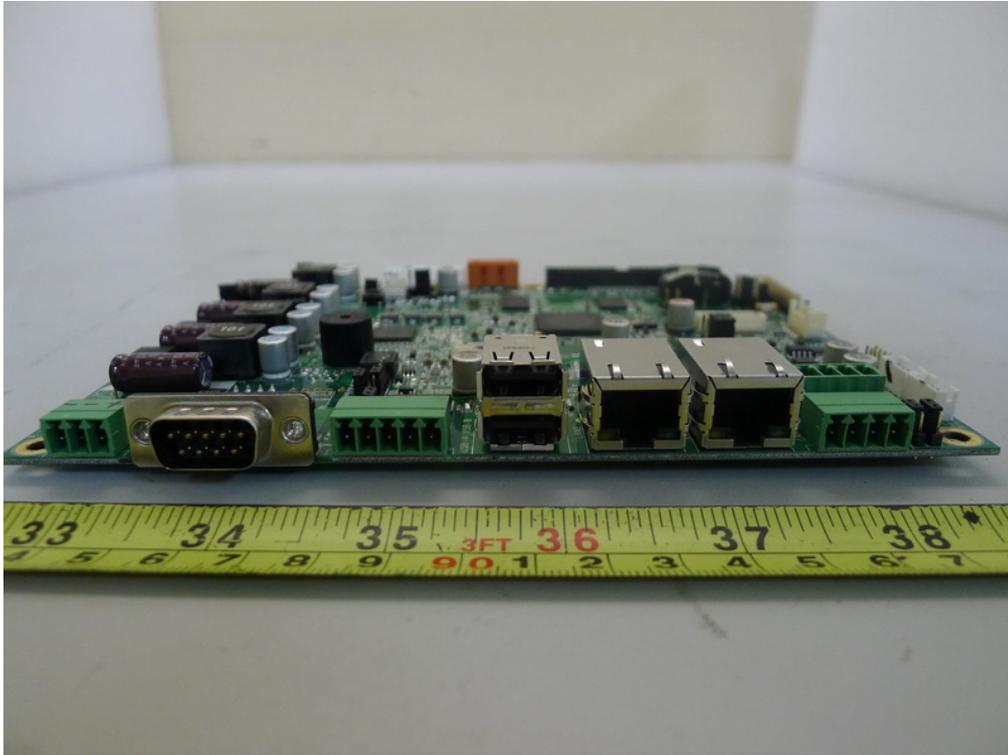


Neutron Engineering Inc.

ATTACHMENT

PHOTOGRAPHS OF EUT







FCC Test Report

Issued Date : Mar. 27, 2014
Project No. : 1403073
Equipment : MotherBoard
Model Name : ARM-C2-DEP

Applicant : CJB Computer Job s.r.l.
Address : Via Ghislandi 24-25125 Brescia (BS)
ITALY

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Mar. 12, 2014
Date of Test: Mar. 12, 2014 ~ Mar. 26, 2014

Testing Engineer: Kevin Kao
(Kevin Kao)

Technical Manager: Jeff Yang
(Jeff Yang)

Authorized Signatory: Andy Chiu
(Andy Chiu)

Neutron Engineering Inc.
B1, No. 37, Lane 365, YangGuang St.,
NeiHu District 114, Taipei, Taiwan.
TEL: +886-2-2657-3299
FAX: +886-2-2657-3331





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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REPORT ISSUED HISTORY

| Issue No. | Description | Issued Date |
|--------------------|-----------------|---------------|
| NEI-FCCE-1-1403073 | Original Issue. | Mar. 27, 2014 |



1. VERIFICATION

Equipment : MotherBoard
Brand Name : N/A
Model Name : ARM-C2-DEP
Applicant : CJB Computer Job s.r.l.
Date of Test : Mar. 12, 2014 ~ Mar. 26, 2014
Standard(s) : FCC Part 15, Subpart B: 2012 Class A
ICES-003 Issue 5: 2012 Class A
CAN/CSA CISPR 22-10 Class A
CISPR 22: 2008 Class A
ANSI C63.4-2009

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-FCCE-1-1403073) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).



2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| Emission | | | | |
|--|-------------------------------|--------------|-----------------|-----------------|
| Standard(s) | Test Item | Limit | Judgment | Remark |
| FCC Part 15, Subpart B: 2012 ICES-003 Issue 5: 2012 CAN/CSA CISPR 22-10 CISPR 22: 2008 | Conducted emission | Class A | PASS | |
| | Radiated emission Below 1 GHz | Class A | PASS | |
| | Radiated emission Above 1 GHz | Class A | PASS | NOTE (2) |

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) If the EUT's max operating frequency does not exceed 108 MHz, the test will not be performed.



2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission Test:

C03: (VCCI RN: C-4461)

B1, No. 37, Lane 365, YangGuang St., NeiHu District 114, Taipei, Taiwan.

Radiated emission Test (Below 1 GHz):

OS01: (VCCI RN: R-2829; FCC RN: 95335; FCC DN: TW1010)

No.132-1, Ln. 329, Sec. 2, Balian Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)

1F., No. 61, Ln. 77, Sing-ai Rd., NeiHu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC/ Industry Canada rules and for reference only.

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

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

| Test Site | Measurement Frequency Range | U , (dB) | NOTE |
|-----------|-----------------------------|----------|------|
| C03 | 150 kHz ~ 30 MHz | 1.94 | |

B. Radiated emission test:

| Test Site | Measurement Frequency Range | Ant. H / V | U , (dB) | NOTE |
|-----------|-----------------------------|------------|----------|------|
| OS01 | 30 MHz ~ 200 MHz | V | 2.86 | |
| | 30 MHz ~ 200 MHz | H | 2.56 | |
| | 200 MHz ~ 1, 000 MHz | V | 2.88 | |
| | 200 MHz ~ 1, 000 MHz | H | 2.98 | |

| Test Site | Item | Measurement Frequency Range | Uncertainty | NOTE | |
|-----------|-------------------------|-----------------------------|---------------|---------|--|
| CB08 | Radiated emission at 3m | Horizontal Polarization | 30 - 200MHz | 3.35 dB | |
| | | | 200 - 1000MHz | 3.11 dB | |
| | | | 1 - 18GHz | 3.97 dB | |
| | | | 18 - 40GHz | 4.01 dB | |
| | | Vertical Polarization | 30 - 200MHz | 3.22 dB | |
| | | | 200 - 1000MHz | 3.24 dB | |
| | | | 1 - 18GHz | 4.05 dB | |
| | | | 18 - 40GHz | 4.04 dB | |

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above.

These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR} .



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------|--|
| Equipment | MotherBoard |
| Brand Name | N/A |
| Model Name | ARM-C2-DEP |
| OEM Brand/Model Name | N/A |
| Model Difference | N/A |
| Product Description | More details of EUT technical specification please refer to the User's Manual. |
| Power Source | DC Voltage supplied from DC Source |
| Power Rating | I/P: DC 24V |
| Connecting I/O Port(s) | Please refer to the User's Manual |
| Products Covered | N/A |
| 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

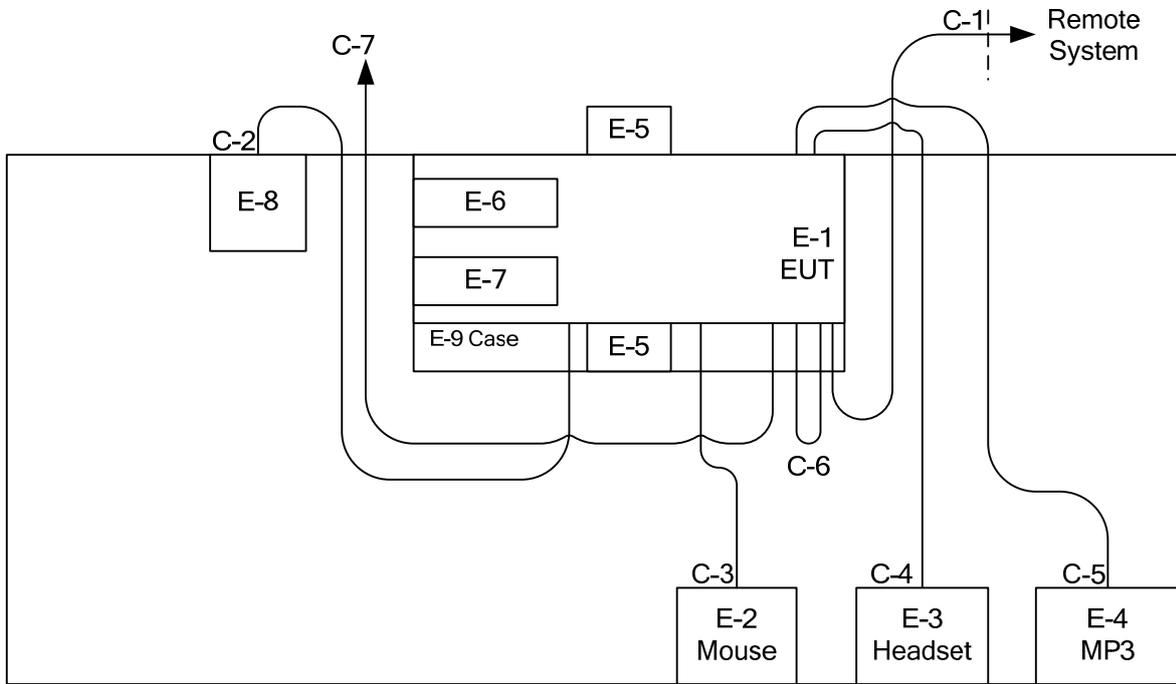
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

| Pretest Test Mode | Description |
|-------------------|-------------|
| Mode 1 | FULL SYSTEM |

| Conducted emission test | |
|--------------------------------|-------------|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM |

| Radiated emission test | |
|-------------------------------|-------------|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM |

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



C-1 RJ-45 Cable
 C-2 Power Cable
 C-3 USB Cable
 C-4 Audio Cable*2
 C-5 Audio Cable
 C-6 RS232 Cable
 C-7 DATA Cable*4

E-5 FLASH
 E-6 SD CARD
 E-7 MICRO SD
 E-8 Adapter



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 | Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|----------------------|---------------|----------------|--------|--------------------------|------|
| E-1 | MotherBoard | N/A | ARM-C2-DEP | VER | N/A | EUT |
| E-2 | USB Mouse | DELL | MS111-L | DOC | CN-09RRC7-44751-17J-OH1F | |
| E-3 | Compact Earphone Mic | CJ | CJ-323 | N/A | N/A | |
| E-4 | USB Flash/MP3 Player | DELL | HV04T | DOC | 95NY781 | |
| E-5 | FLASH | SP | SP8G | N/A | N/A | |
| E-6 | SD MEMORY CARD | Kingston | N/A | N/A | N/A | |
| E-7 | Micro SD Card | SanDisk | N/A | N/A | N/A | |
| E-8 | ADAPTER | LEAD YEAR ENT | TG-6001-24V | DOC | 0503024837 R03 | |
| E-9 | CASE | N/A | N/A | N/A | N/A | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| C-1 | NO | NO | 10M | |
| C-2 | YES | YES | 1.8M | |
| C-3 | YES | NO | 1.8M | |
| C-4 | NO | NO | 1.7M | |
| C-5 | NO | NO | 1.6M | |
| C-6 | YES | NO | 0.05M | |
| C-7 | NO | NO | 1M | |

Note:

- (1) The support equipment was authorized by Declaration of Conformity (DOC).



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 LIMITS (FREQUENCY RANGE 150 KHZ-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.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value – Limit Value

4.1.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|----------------------|--------------|--------------------------|------------|------------------|
| 1 | TWO-LINE V-NETWORK | R&S | ENV216 | 101051 | Jun. 16, 2014 |
| 2 | Test Cable | TIMES | CFD300-NL | C03 | Jun. 16, 2014 |
| 3 | EMI Test Receiver | R&S | ESCI | 100080 | Apr. 01, 2014 |
| 4 | Measurement Software | EZ | EZ_EMCC (Version NB-03A) | N/A | N/A |

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

4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 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.

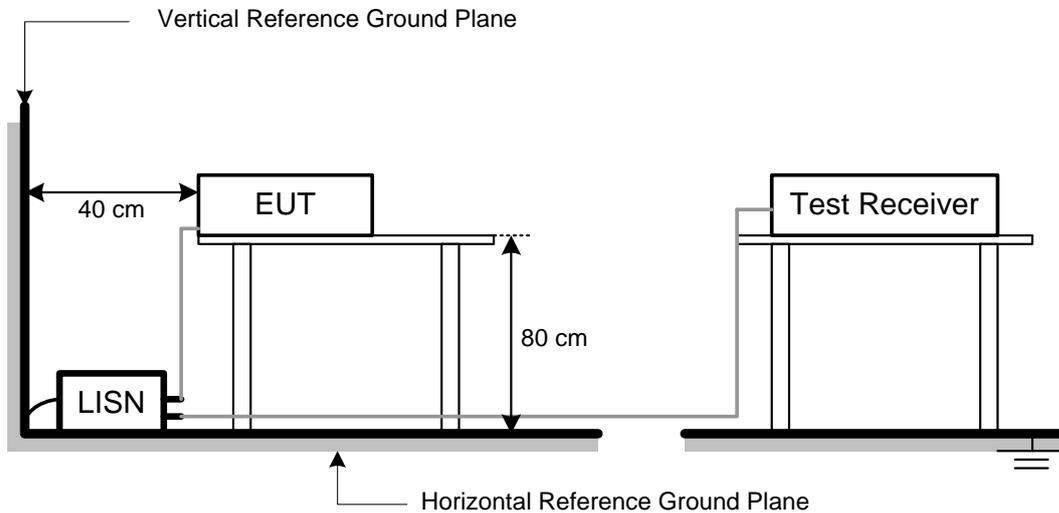
NOTE:

- a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn't perform.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP





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:

1. Send/Receive data to/from remote system.
2. Send/Receive audio to/from audio devices.
3. Repeated from 1 to 2 continuously.

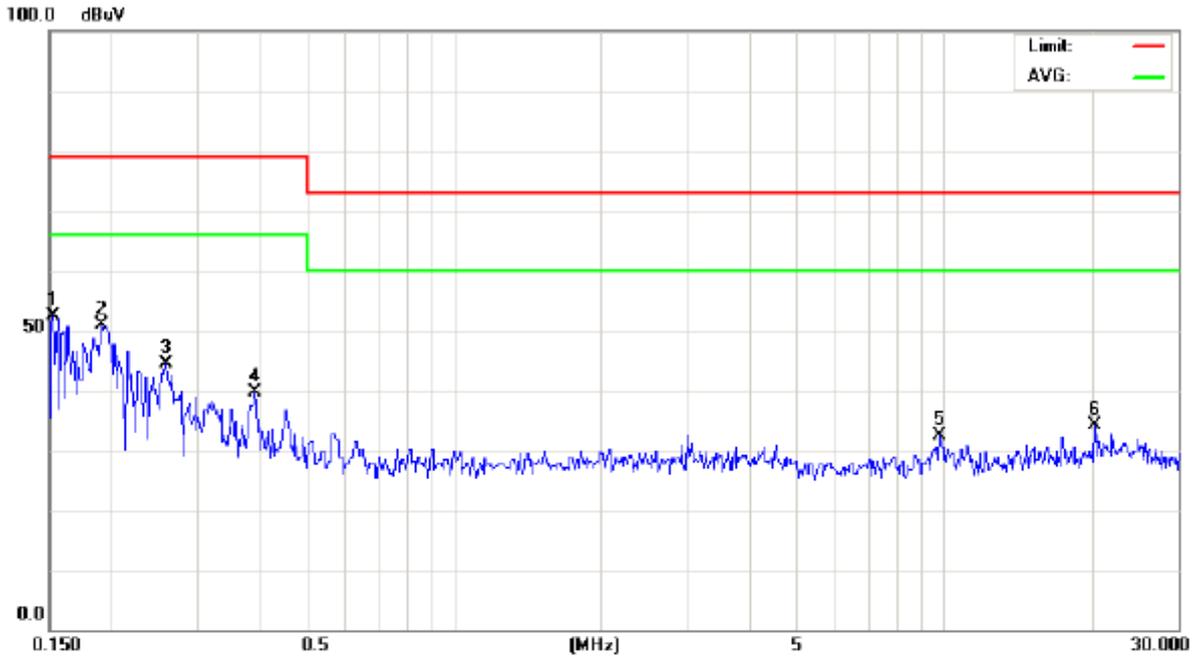
As the mouse is a strictly input device, no data is transmitted to (from) it during test. It is, however, continuously scanned for data input activity.



4.1.7 TEST RESULTS

| | | | |
|--------------|--------------|-------------------|------------|
| EUT | MotherBoard | Model Name | ARM-C2-DEP |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Phase: Line

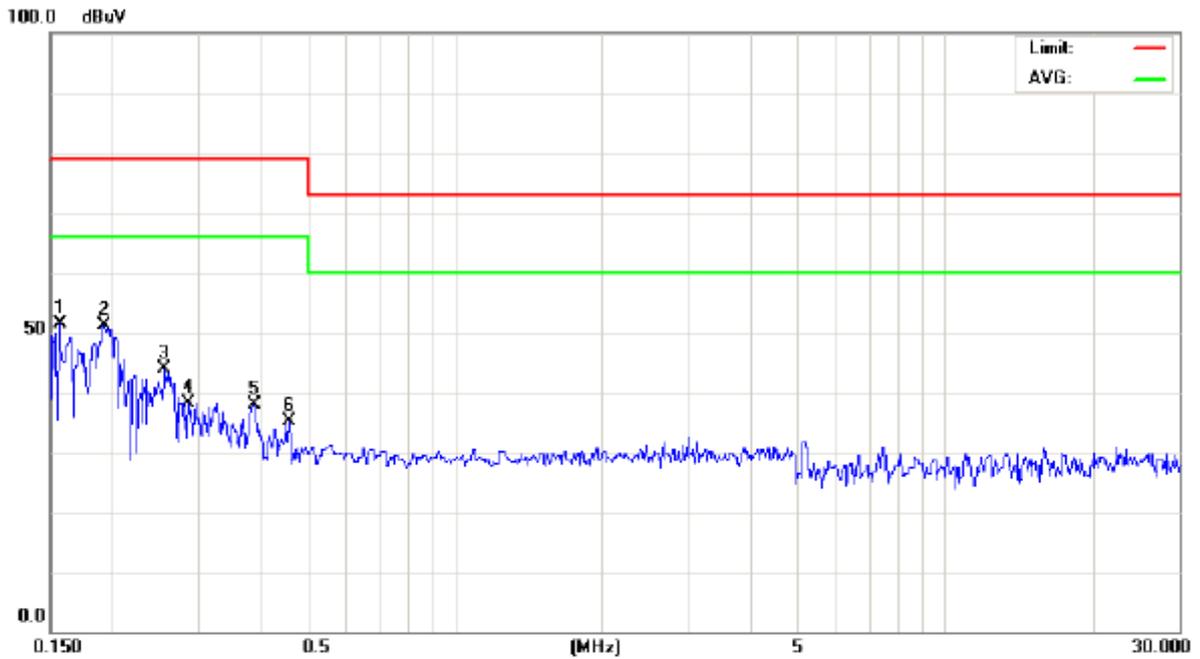


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | * | 0.1521 | 42.63 | 9.73 | 52.36 | 79.00 | -26.64 | peak | |
| 2 | | 0.1913 | 40.69 | 10.09 | 50.78 | 79.00 | -28.22 | peak | |
| 3 | | 0.2578 | 34.64 | 9.85 | 44.49 | 79.00 | -34.51 | peak | |
| 4 | | 0.3922 | 29.90 | 9.72 | 39.62 | 79.00 | -39.38 | peak | |
| 5 | | 9.8000 | 22.57 | 9.71 | 32.28 | 73.00 | -40.72 | peak | |
| 6 | | 20.2500 | 23.87 | 10.19 | 34.06 | 73.00 | -38.94 | peak | |



| | | | |
|--------------|--------------|-------------------|------------|
| EUT | MotherBoard | Model Name | ARM-C2-DEP |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Phase: Neutral



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | * | 0.1563 | 41.62 | 9.75 | 51.37 | 79.00 | -27.63 | peak | |
| 2 | | 0.1920 | 40.95 | 10.08 | 51.03 | 79.00 | -27.97 | peak | |
| 3 | | 0.2556 | 34.10 | 9.85 | 43.95 | 79.00 | -35.05 | peak | |
| 4 | | 0.2858 | 28.47 | 9.69 | 38.16 | 79.00 | -40.84 | peak | |
| 5 | | 0.3873 | 28.10 | 9.72 | 37.82 | 79.00 | -41.18 | peak | |
| 6 | | 0.4573 | 25.26 | 9.75 | 35.01 | 79.00 | -43.99 | peak | |



4.2 RADIATED EMISSION TEST

4.2.1 LIMITS

Below 1 GHz

| FREQUENCY (MHz) | Class A (at 10m) | Class B (at 10m) |
|-----------------|------------------|------------------|
| | dBuV/m | dBuV/m |
| 30 - 230 | 40 | 30 |
| 230 - 1000 | 47 | 37 |

NOTE:

- (1) The limit for radiated test was performed according to as following:
FCC Part 15, Subpart B: 2012; ICES-003 Issue 5: 2012; CAN/CSA-CISPR 22-10; CISPR 22: 2008.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).
- (4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Above 1 GHz

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) | | Class A (dBuV/m) (at 10m) | |
|-----------------|--------------------------|---------|---------------------------|---------|
| | PEAK | AVERAGE | PEAK | AVERAGE |
| Above 1000 | 80 | 60 | 69.5 | 49.5 |
| FREQUENCY (MHz) | Class B (dBuV/m) (at 3m) | | | |
| | PEAK | AVERAGE | | |
| Above 1000 | 74 | 54 | | |

NOTE:

- (1) The limit for radiated test was performed according to as following:
FCC Part 15, Subpart B: 2012; ICES-003 Issue 5: 2012.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).
3m Emission level = 10m Emission level + 20log(10m/3m).
- (4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

| Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz) | Range (MHz) |
|---|---|
| Below 1.705 | 30 |
| 1.705 - 108 | 1000 |
| 108 - 500 | 2000 |
| 500 - 1000 | 5000 |
| Above 1000 | 5 th harmonic of the highest frequency or 40 GHz, whichever is lower |



4.2.2 MEASUREMENT INSTRUMENTS LIST

Below 1 GHz:

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-------------------------------|--------------|-------------------------|------------|------------------|
| 1 | Log-Bicon Antenna | Schwarzbeck | VULB 9160 | 3176 | Jun. 13, 2014 |
| 2 | Pre-Amplifier | Anritsu | MH648A | M09961 | Jun. 02, 2014 |
| 3 | Test Cable | TIMES | LMR-400 | 30M | Jun. 02, 2014 |
| 4 | Test Cable | TIMES | LMR-400 | OS01-1 | Jun. 02, 2014 |
| 5 | EMI Measuring Receiver | SHCAFFNER | SCR 3501 | 408 | Jan. 7, 2015 |
| 6 | Spectrum Analyzer | ADVANTEST | R3162 | 140100131 | Sep. 24, 2014 |
| 7 | Positioning Controller (OS01) | CT | SC100 | N/A | N/A |
| 8 | Turn Table | Chance Most | CMTB-1.5 | N/A | N/A |
| 9 | Measurement Software | EZ | EZ EMC (Version NB-02A) | N/A | N/A |

Above 1 GHz:

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|----------------------|--------------------|-------------------------|------------|------------------|
| 1 | Horn Antenna (1G) | Schwarzbeck | BBHA 9120 D | 9120D-325 | Jun. 15, 2014 |
| 2 | Pre_Amplifier | Agilent | 8449B | 3008A01714 | Apr. 16, 2014 |
| 3 | Microflex Cable | HARBOUR INDUSTRIES | 27478 LL142 | 1M | May. 13, 2014 |
| 4 | Microflex Cable | AISI | S104-SMAP-1 | 10M | May. 15, 2014 |
| 5 | Microflex Cable | HARBOUR INDUSTRIES | 27478 LL142 | 3M | May. 13, 2014 |
| 6 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Jun. 20, 2014 |
| 7 | Measurement Software | EZ | EZ EMC (Version NB-03A) | N/A | N/A |

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



4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. 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.
- c. 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.
- d. 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.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE: (Below 1 GHz)

- a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz.
- b. 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.

NOTE: (Above 1 GHz)

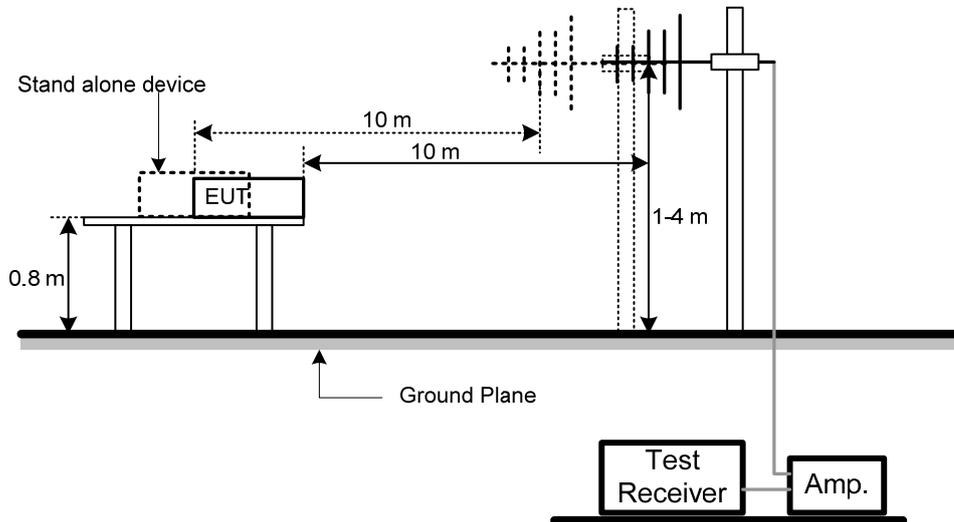
- a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz.
- b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

4.2.4 DEVIATION FROM TEST STANDARD

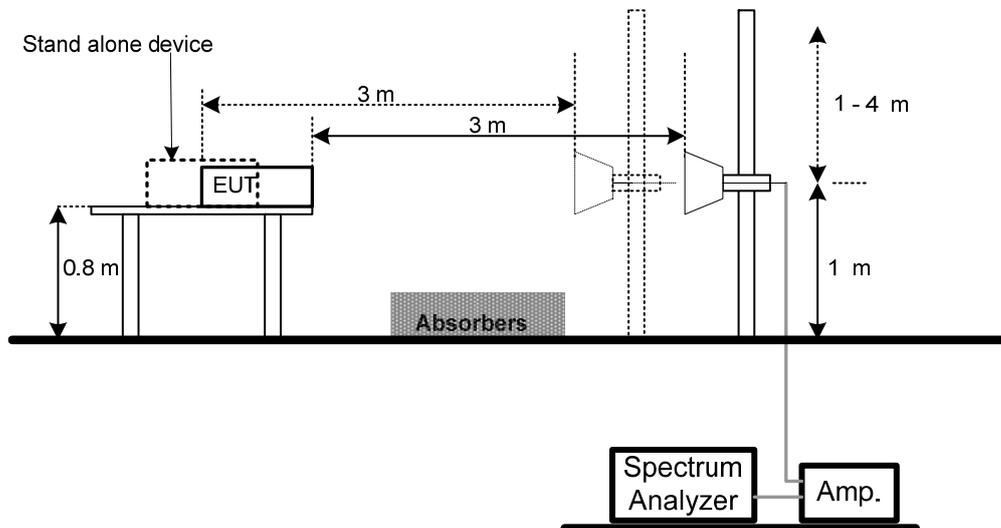
No deviation

4.2.5 TEST SETUP

Below 1 GHz



Above 1 GHz



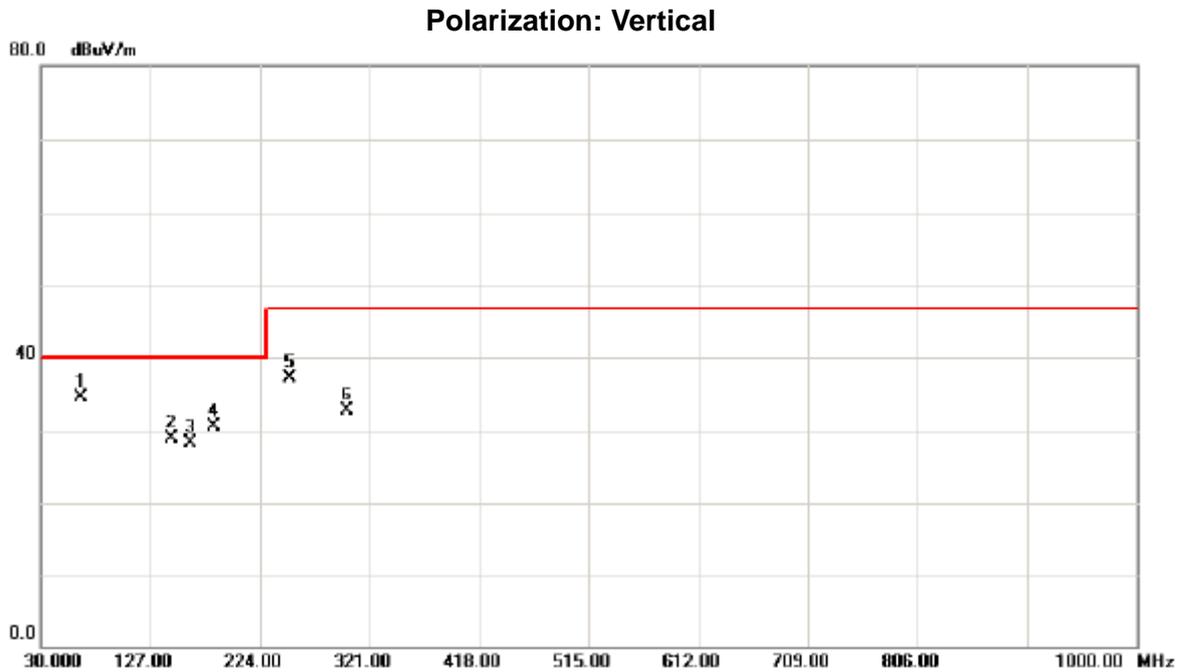
4.2.6 EUT OPERATING CONDITIONS

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-BELOW 1 GHZ

| | | | |
|--------------|--------------|-------------------|------------|
| EUT | MotherBoard | Model Name | ARM-C2-DEP |
| Temperature | 15 °C | Relative Humidity | 54% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

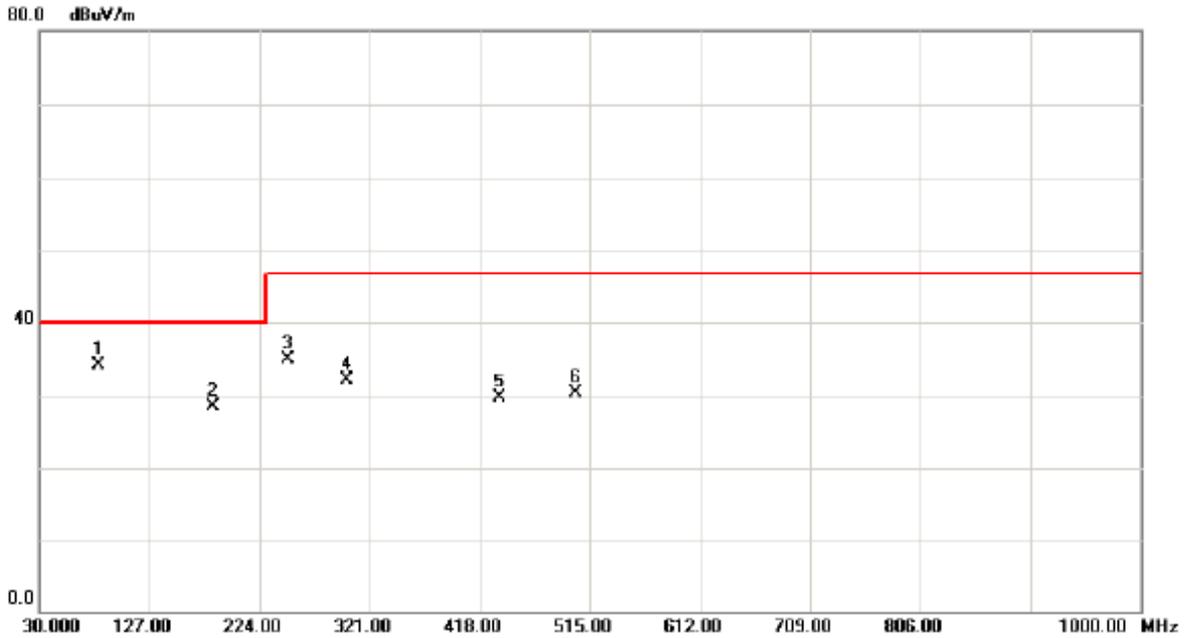


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | * | 66.1920 | 41.98 | -7.38 | 34.60 | 40.00 | -5.40 | peak | |
| 2 | | 145.1300 | 34.37 | -5.37 | 29.00 | 40.00 | -11.00 | peak | |
| 3 | | 162.1040 | 33.20 | -4.91 | 28.29 | 40.00 | -11.71 | peak | |
| 4 | | 183.7600 | 36.40 | -5.87 | 30.53 | 40.00 | -9.47 | peak | |
| 5 | | 249.9200 | 43.19 | -6.08 | 37.11 | 47.00 | -9.89 | peak | |
| 6 | | 301.2800 | 36.79 | -4.04 | 32.75 | 47.00 | -14.25 | peak | |



| | | | |
|--------------|--------------|-------------------|------------|
| EUT | MotherBoard | Model Name | ARM-C2-DEP |
| Temperature | 15 °C | Relative Humidity | 54% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Polarization: Horizontal



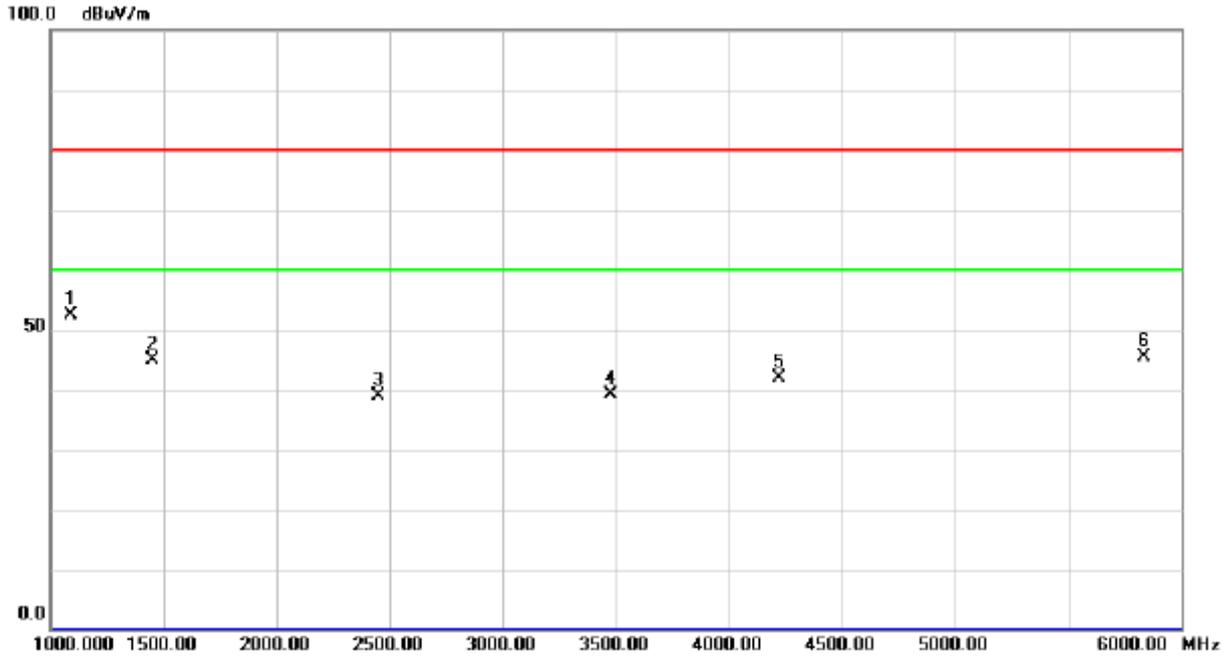
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | * | 82.2600 | 44.10 | -10.01 | 34.09 | 40.00 | -5.91 | peak | |
| 2 | | 183.9000 | 34.33 | -5.89 | 28.44 | 40.00 | -11.56 | peak | |
| 3 | | 249.7800 | 41.00 | -6.08 | 34.92 | 47.00 | -12.08 | peak | |
| 4 | | 301.4000 | 36.18 | -4.04 | 32.14 | 47.00 | -14.86 | peak | |
| 5 | | 435.5000 | 30.79 | -1.08 | 29.71 | 47.00 | -17.29 | peak | |
| 6 | | 502.4200 | 29.98 | 0.41 | 30.39 | 47.00 | -16.61 | peak | |



4.2.8 TEST RESULTS-ABOVE 1 GHZ

| | | | |
|--------------|--------------|-------------------|------------|
| EUT | MotherBoard | Model Name | ARM-C2-DEP |
| Temperature | 25 °C | Relative Humidity | 62% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Polarization: Vertical

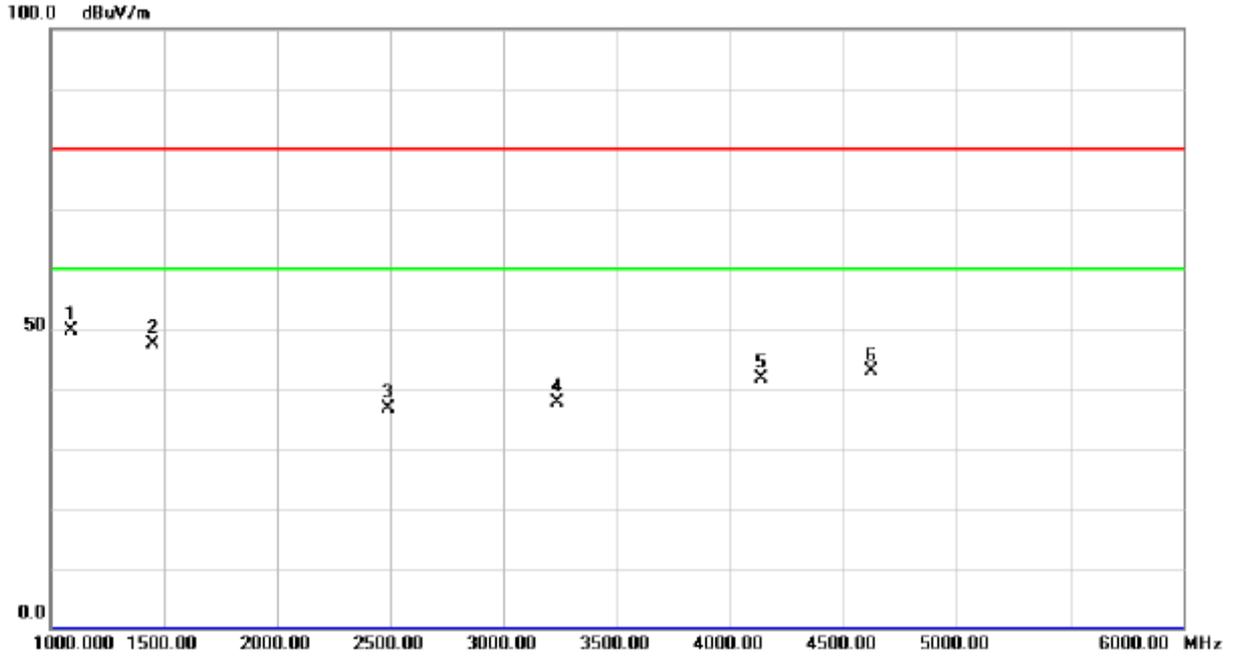


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | * | 1087.500 | 57.50 | -5.08 | 52.42 | 80.00 | -27.58 | peak | |
| 2 | | 1450.000 | 48.07 | -3.13 | 44.94 | 80.00 | -35.06 | peak | |
| 3 | | 2450.000 | 38.77 | 0.15 | 38.92 | 80.00 | -41.08 | peak | |
| 4 | | 3475.000 | 36.35 | 2.72 | 39.07 | 80.00 | -40.93 | peak | |
| 5 | | 4225.000 | 36.27 | 5.54 | 41.81 | 80.00 | -38.19 | peak | |
| 6 | | 5837.500 | 37.24 | 8.06 | 45.30 | 80.00 | -34.70 | peak | |



| | | | |
|--------------|--------------|-------------------|------------|
| EUT | MotherBoard | Model Name | ARM-C2-DEP |
| Temperature | 25 °C | Relative Humidity | 62% |
| Test Voltage | AC 120V/60Hz | | |
| Test Mode | FULL SYSTEM | | |

Polarization: Horizontal



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | * | 1087.500 | 54.69 | -5.08 | 49.61 | 80.00 | -30.39 | peak | |
| 2 | | 1450.000 | 50.43 | -3.13 | 47.30 | 80.00 | -32.70 | peak | |
| 3 | | 2487.500 | 36.29 | 0.30 | 36.59 | 80.00 | -43.41 | peak | |
| 4 | | 3237.500 | 35.92 | 1.68 | 37.60 | 80.00 | -42.40 | peak | |
| 5 | | 4137.500 | 36.15 | 5.46 | 41.61 | 80.00 | -38.39 | peak | |
| 6 | | 4625.000 | 37.01 | 5.97 | 42.98 | 80.00 | -37.02 | peak | |



5. EUT TEST PHOTO

Conducted emission test photos

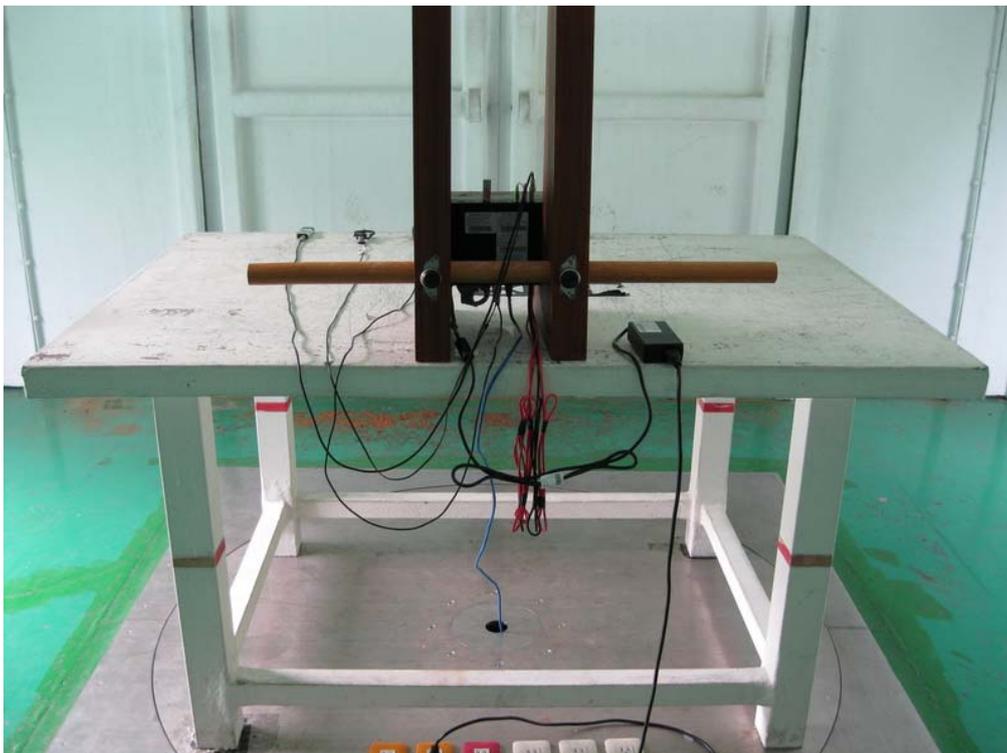
FULL SYSTEM





Radiated emission Below 1 GHz test photos

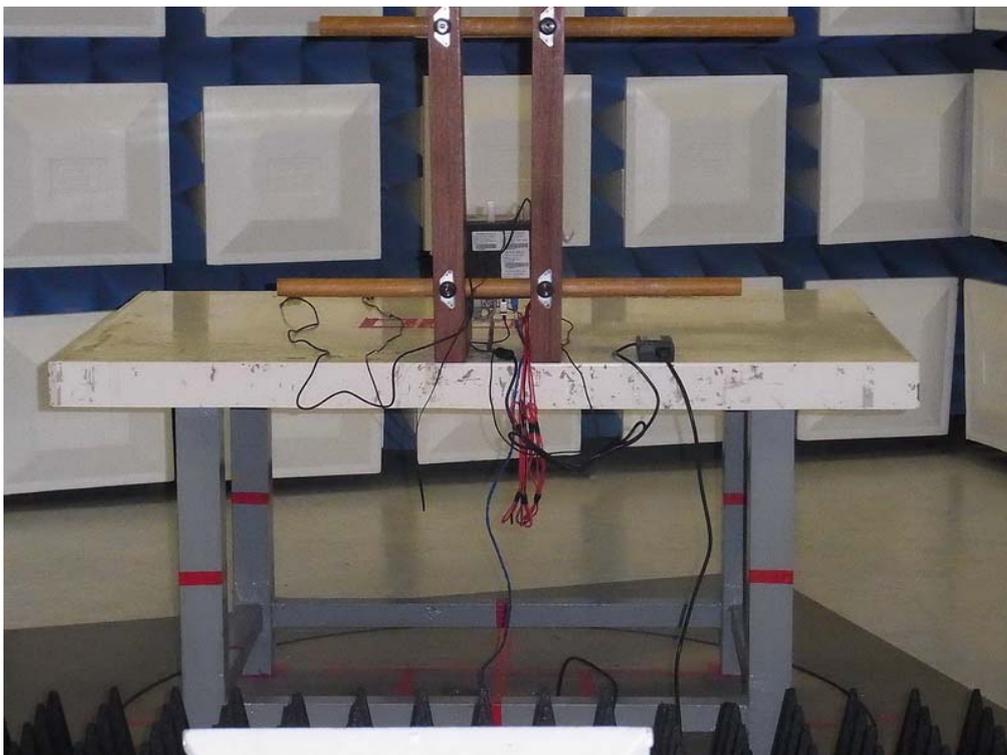
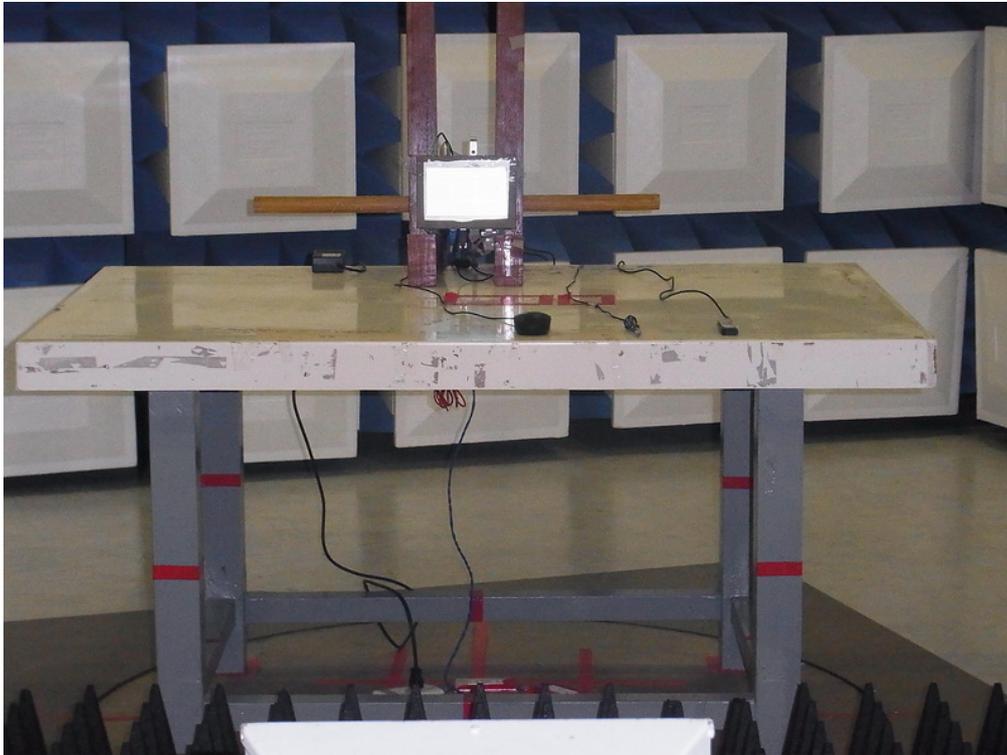
FULL SYSTEM





Radiated emission above 1 GHz test photos

FULL SYSTEM





Neutron Engineering Inc.

ATTACHMENT

PHOTOGRAPHS OF EUT

