



CERTIFICATE OF COMPLIANCE



Report No.: NEI-EMC-1-E1103030C

Issued Date: Jul. 08, 2011

This is to certify that the product listed in follows was (were) tested in the Neutron EMC Laboratory to comply with the required criteria levels of the follow-mentioned Generic Standards or Product Family Standard(s) and/or Basic Standard(s) based-on the essential conformity requirements of EMC Directive of 2004/108/EC.

Equipment	Embedded Automation Computer / Computer
Model Name	UNO-1172A; UNO-1172AE; UNO-1172AH; UNO-1172 XXXXXXXXXXXXXXXXXX (where "X" may be any alphanumeric character or blank or "-".)
Brand Name	Advantech
Applicant	Advantech Co., Ltd.
Address	No. 1, Alley 20, Lane 26, Rueiguang Road, NeiHu District, Taipei, Taiwan 11491, R.O.C.
Measurement Method	EN 55011: 2007 +A2: 2007 (Group 1 Class A) EN 55022: 2006 +A1: 2007 Class A / EN 61000-6-4: 2007 EN 55024: 1998 +A1: 2001 +A2: 2003 / EN 61000-6-2: 2005 IEC 61000-4-2: 2008 / IEC 61000-4-3: 2006 +A1: 2007 +A2: 2010 IEC 61000-4-4: 2004 +A1: 2010 / IEC 61000-4-5: 2005 IEC 61000-4-6: 2008 / IEC 61000-4-8: 2009

The test data, data evaluation, and equipment configuration contained in our test report (Report No. NEI-EMC-1-E1103030C) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TUV Rheinland and 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

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EMC Test Report

Issued Date : Jul. 08, 2011
Project No. : E1103030C
Equipment : Embedded Automation Computer /
Computer
Model Name : UNO-1172A; UNO-1172AE;
UNO-1172AH; UNO-1172
XXXXXXXXXXXXXXXXXXXX (where "X" may
be any alphanumeric character or blank
or "-".)
Applicant : Advantech Co., Ltd.
Address : No. 1, Alley 20, Lane 26, Rueiguang
Road, NeiHu District, Taipei, Taiwan
11491, R.O.C.

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Mar. 08, 2011
Date of Test: Mar. 08, 2011 ~ Apr. 14, 2011

Testing Engineer: Peter Li
(Peter Li)

Technical Manager: Jeff Yang
(Jeff Yang)

Authorized Signatory: Andy Chiu
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C-2918 G-91 R-2669
R-2829 T-1666 T-1667



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.**

Neutron's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **Neutron** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **Neutron** issued reports.

Neutron's reports must not be used by the client to claim product endorsement by the authorities or any agency of the Government.

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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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1. CERTIFICATION

Equipment : Embedded Automation Computer / Computer
Brand Name : Advantech
Model Name : UNO-1172A; UNO-1172AE; UNO-1172AH; UNO-1172
XXXXXXXXXXXXXXXXXX (where "X" may be any alphanumeric character or
blank or "-".)
Applicant : Advantech Co., Ltd.
Date of Test : Mar. 08, 2011 ~ Apr. 14, 2011
Standards : EN 55011: 2007 +A2: 2007 (Group 1 Class A)
EN 55022: 2006 +A1: 2007 Class A
EN 61000-6-4: 2007
EN 55024: 1998 +A1: 2001 +A2: 2003
EN 61000-6-2: 2005
IEC 61000-4-2: 2008
IEC 61000-4-3: 2006 +A1: 2007 +A2: 2010
IEC 61000-4-4: 2004 +A1: 2010
IEC 61000-4-5: 2005
IEC 61000-4-6: 2008
IEC 61000-4-8: 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-EMC-1-E1103030C) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and 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 EN 61000-6-4: 2007				
Standard	Test Item	Limit	Judgment	Remark
EN 55011: 2007 +A2: 2007 EN 55022: 2006 +A1: 2007	Conducted Emission	Class A	N/A	
	Conducted Emission At Telecommunication Ports	Class A	PASS	
	Radiated Emission	Class A	PASS	
Immunity EN 55024:1998 +A1: 2001 +A2: 2003 / EN 61000-6-2: 2005				
Section	Test Item	Performance Criteria	Judgment	Remark
IEC 61000-4-2: 2008	Electrostatic Discharge	B	PASS	
IEC 61000-4-3: 2006 +A1: 2007 +A2: 2010	RF electromagnetic field	A	PASS	
IEC 61000-4-4: 2004 +A1: 2010	Fast transients	B	PASS	
IEC 61000-4-5: 2005	Surges	B	PASS	
IEC 61000-4-6: 2008	Injected Current	A	PASS	
IEC 61000-4-8: 2009	Power Frequency Magnetic Field	A	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:

- C01:** (VCCI RN: C-2918; T-1666; FCC RN: 95335; FCC DN: TW1010)
No.132-1, Lane 329, Sec. 2, Palian Road, Shijr City, Taipei, Taiwan.
- OS02:** (VCCI RN: R-2669; FCC RN: 95335; FCC DN: TW1054)
No.132-1, Lane 329, Sec. 2, Palian Road, Shijr City, Taipei, Taiwan.
- 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.)
- CB05:** B1, No. 37, Lane 365, YangGuang St., NeiHu District 114, Taipei, Taiwan.
- CB06:** B1, No. 37, Lane 365, YangGuang St., NeiHu District 114, Taipei, Taiwan.

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%.

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

A. Conducted Measurement :

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

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
OS-01	ANSI	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	
OS-02	ANSI	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	

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	Embedded Automation Computer / Computer
Brand Name	Advantech
Model Name	UNO-1172A; UNO-1172AE; UNO-1172AH; UNO-1172XXXXXXXXXXXXXXXX (where "X" may be any alphanumeric character or blank or "-".)
OEM Brand/Model Name	N/A
Model Difference	Model UNO-1172A, UNO-1172AH, UNO-1172AE and UNO-1172 XXXXXXXXXXXXXXXXXXXX are designed based on similar electrical circuit but different aspect of enclosure. Model UNO-1172A was used for final testing and collecting test data included in this report.
Product Description	The EUT is a Embedded Automation Computer / Computer. 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 DC Source
Power Rating	I/P: DC 12V~30V
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	1 * CPU: Intel Atom D510 1.66GHz 1M 1 * RAM: Transcend / 96SD2-2G667NN-TR1 1 * Memory: ADVANTECH / SQFlash 4GB
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.

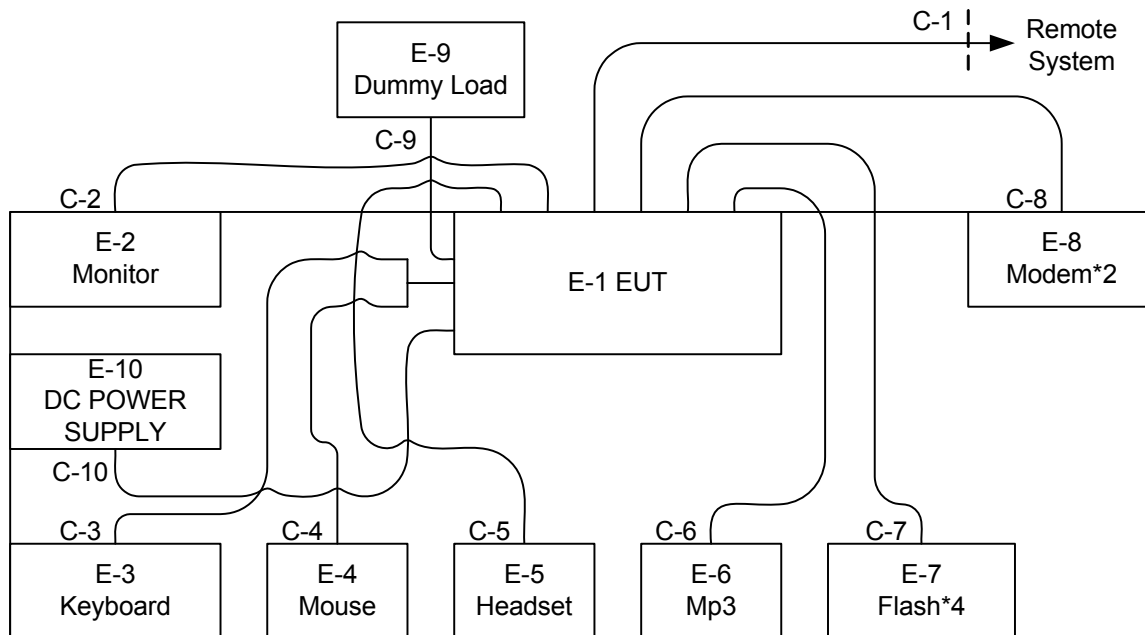
Pretest Test Mode	Description
Mode 1	FULL SYSTEM D-SUB 1024*768/60Hz

For ISN Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM D-SUB 1024*768/60Hz (ETHERNET 1G-1G)
Mode 1	FULL SYSTEM D-SUB 1024*768/60Hz (ETHERNET 100M-100M)
Mode 1	FULL SYSTEM D-SUB 1024*768/60Hz (ETHERNET 10M-10M)

For Radiated Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM D-SUB 1024*768/60Hz

For EMS Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM D-SUB 1024*768/60Hz

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



C-1 RJ-45 Cable*3
 C-2 D-Sub Cable
 C-3 PS/2 Cable
 C-4 PS/2 Cable
 C-5 Audio Cable*2
 C-6 Audio Cable
 C-7 USB Cable*4
 C-8 RS232 Cable*2
 C-9 DATA Cable
 C-10 Power Cable



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	Embedded Automation Computer / Computer	Advantech	UNO-1172A	N/A	N/A	EUT
E-2	24" LCD Monitor	DELL	2408WFPb	DOC	071863-11	
E-3	PS/2 K/B	Logitech	Y-SJ17(ACK260A)	DOC	SYU44664880	
E-4	PS/2 Mouse	Logitech	M-SBF69	DOC	HCA44601156	
E-5	Headset	i-Acon	HOH-323-BK	N/A	N/A	
E-6	USB Flash/MP3 Player	DELL	HV04T	DOC	95NY781	
E-7	USB Flash Drives	Silicon Power	SP004GBUF2M01V1K	N/A	N/A	
E-8	Modem	ACEEX	DM-1414V	DOC	8041708	
E-9	Dummy Load	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	1.6M	
C-4	YES	NO	1.8M	
C-5	NO	NO	1.8M	
C-6	NO	NO	1.5M	
C-7	YES	NO	1.8M	
C-8	YES	NO	1.7M	
C-9	YES	NO	1.5M	
C-10	NO	NO	1M	

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 AT TELECOMMUNICATION PORTS

4.1.1 LIMITS OF DISTURBANCE AT TELECOMMUNICATION PORTS

Voltage Limit:

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	97-87*	84-74*	84-74*	74-64*
0.5 -30.0	87	74	74	64

Current Limit:

FREQUENCY (MHz)	Class A (dBuA)		Class B (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	53-43*	40-30*	40-30*	30-20*
0.5 -30.0	43	30	30	20

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	LISN	EMCO	3816/2	00042991	Feb. 16, 2012
2	Test Cable	TIMES	LMR-400	SR03_C_01&02	Aug. 20, 2011
3	EMI Test Receiver	R&S	ESCI	100082	Mar. 15, 2012
4	50Ω BNC TYPE Terminator	N/A	N/A	01	May 25, 2011
5	50Ω BNC TYPE Terminator	N/A	N/A	03	May 25, 2011
6	DC_LISN_1	messtec	AN20200	04/10187	Mar. 8, 2012
7	DC_LISN_2	messtec	AN2020	04/10031	Mar. 8, 2012
8	ISN	FCC	FCC-TLISN-T8-02	20432	Jul.14, 2011

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

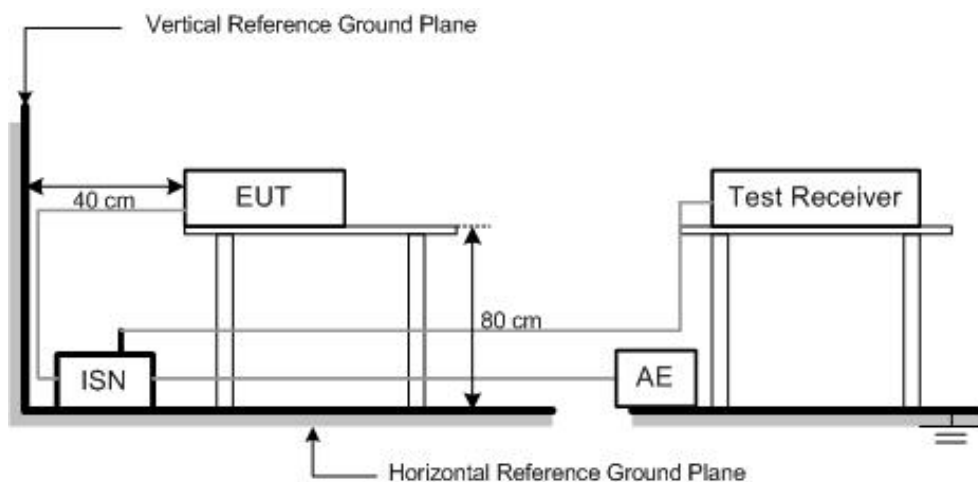
4.1.3 TEST PROCEDURE

- 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.
- 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.
- 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.
- ISN at least 80 cm from nearest part of EUT chassis.
- The communication function of EUT was executed and ISN was connected between EUT and associated equipment and the ISN was connected directly to reference ground plane.
- 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



4.1.6 EUT OPERATING CONDITIONS

The EUT exercise program (EMC.exe) 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. Read (write) from (to) mass storage device (Flash).
2. Send "H" pattern to video port device (Monitor).
3. Send " H " pattern to serial port device (Modem).
4. Send/Received audio to/from audio port device.
5. Send/Received data to/from remote system.
6. Repeated from 2 to 5 continuously.

As the keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.



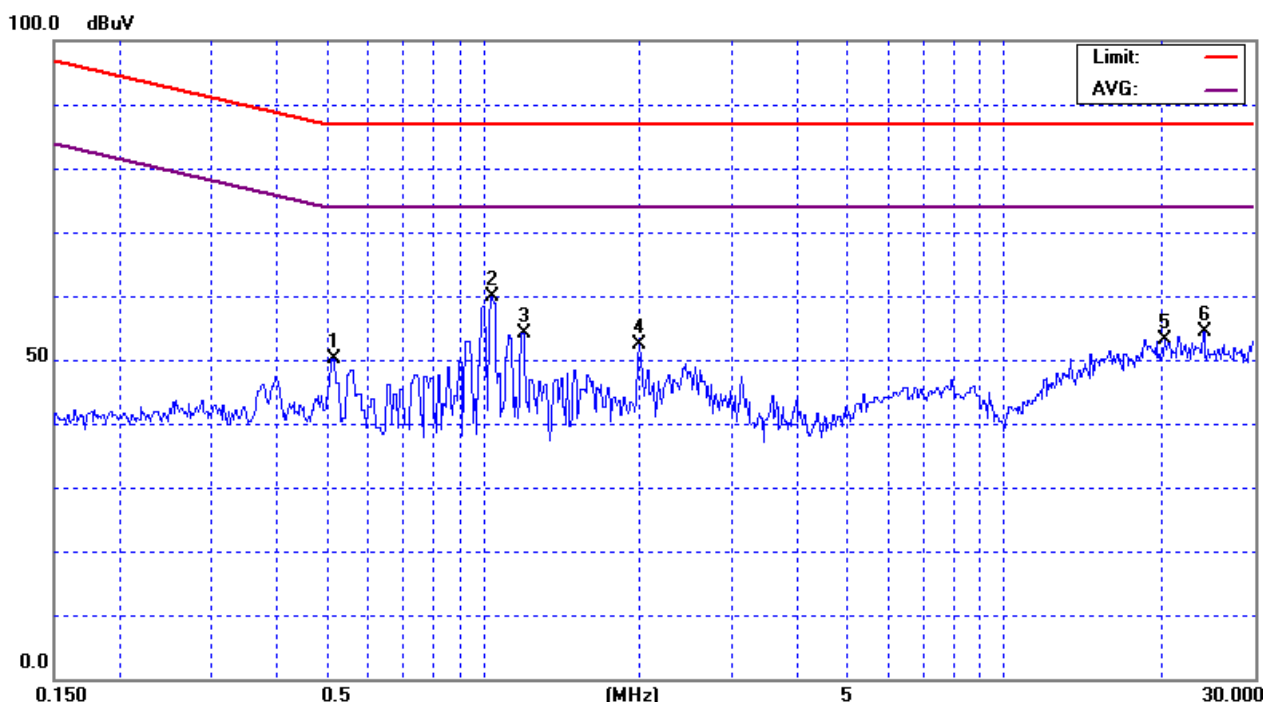
4.1.7 TEST RESULTS

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	24 °C	Relative Humidity :	42%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz (ETHERNET 1G-1G)		

Freq. (MHz)	Reading Level(dBuV)		Correct Factor(dB)	Measurement(dBuV)		Limit(dBuV)		Margin (dB)	Note
	QP-Mode	AV-Mode		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.5180	40.04	*	10.01	50.05	*	87.00	74.00	-36.95	(QP)
1.0400	49.90	*	9.96	59.86	*	87.00	74.00	-27.14	(QP)
1.1930	44.20	*	9.96	54.16	*	87.00	74.00	-32.84	(QP)
1.9940	42.38	*	9.96	52.34	*	87.00	74.00	-34.66	(QP)
20.3500	43.20	*	9.95	53.15	*	87.00	74.00	-33.85	(QP)
24.1500	44.52	*	9.96	54.48	*	87.00	74.00	-32.52	(QP)

Remark

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.2 sec./ MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.2 sec./ MHz.
- (2) 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.
- (3) In the “Note” column, QP means the margin value of QP is higher than Average and the “Margin” column shows the margin value of QP; AV means the margin value of Average is higher than QP and the “Margin” column shows the margin value of Average.



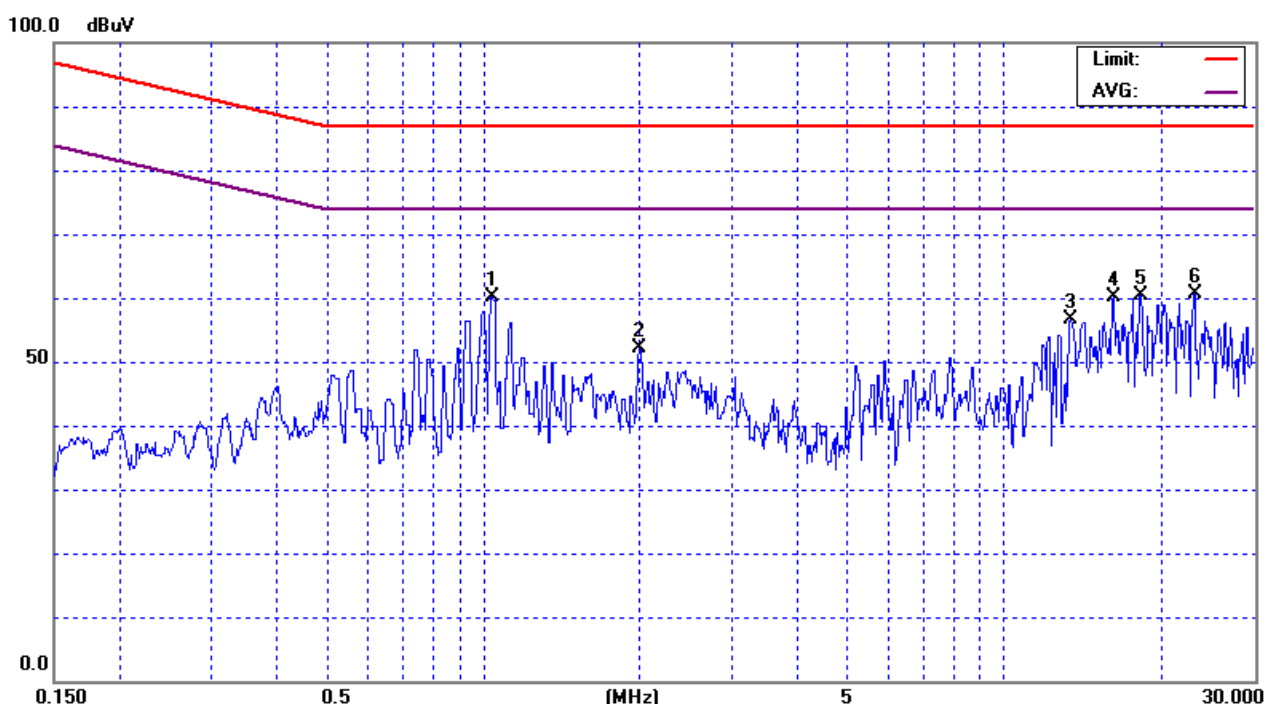


E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	24 °C	Relative Humidity :	42%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz (ETHERNET 100M-100M)		

Freq. (MHz)	Reading Level(dBuV)		Correct Factor(dB)	Measurement(dBuV)		Limit(dBuV)		Margin (dB)	Note
	QP-Mode	AV-Mode		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
1.0400	50.12	*	9.96	60.08	*	87.00	74.00	-26.92	(QP)
1.9940	42.09	*	9.96	52.05	*	87.00	74.00	-34.95	(QP)
13.4500	46.63	*	9.94	56.57	*	87.00	74.00	-30.43	(QP)
16.2500	50.23	*	9.95	60.18	*	87.00	74.00	-26.82	(QP)
18.2500	50.36	*	9.95	60.31	*	87.00	74.00	-26.69	(QP)
23.1500	50.79	*	9.96	60.75	*	87.00	74.00	-26.25	(QP)

Remark

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.2 sec./ MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.2 sec./ MHz.
- (2) 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.
- (3) In the “Note” column, QP means the margin value of QP is higher than Average and the “Margin” column shows the margin value of QP; AV means the margin value of Average is higher than QP and the “Margin” column shows the margin value of Average.



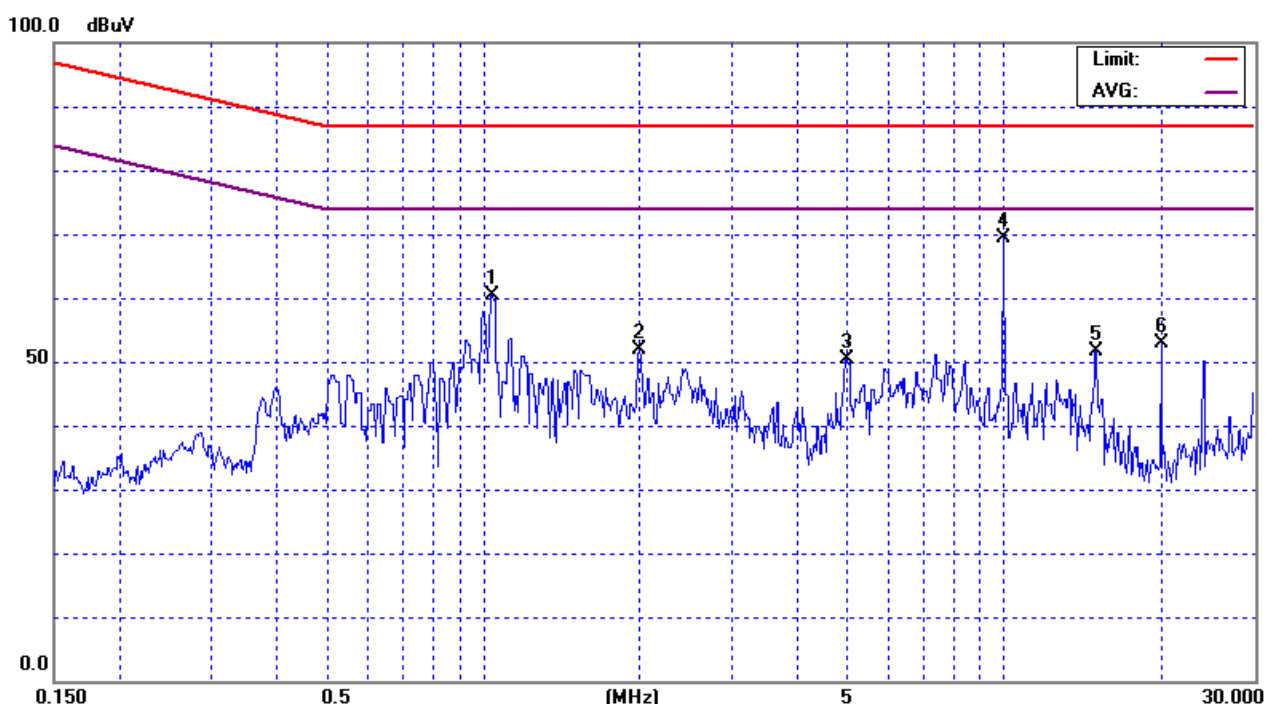


E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	24 °C	Relative Humidity :	42%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz (ETHERNET 10M-10M)		

Freq. (MHz)	Reading Level(dBuV)		Correct Factor(dB)	Measurement(dBuV)		Limit(dBuV)		Margin (dB)	Note
	QP-Mode	AV-Mode		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
1.0400	50.52	*	9.96	60.48	*	87.00	74.00	-26.52	(QP)
1.9940	41.80	*	9.96	51.76	*	87.00	74.00	-35.24	(QP)
5.0000	40.48	*	9.94	50.42	*	87.00	74.00	-36.58	(QP)
10.0000	59.58	*	9.91	69.49	*	87.00	74.00	-17.51	(QP)
15.0000	41.66	*	9.95	51.61	*	87.00	74.00	-35.39	(QP)
20.0000	42.96	*	9.95	52.91	*	87.00	74.00	-34.09	(QP)

Remark

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.2 sec./ MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.2 sec./ MHz.
- (2) 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.
- (3) In the “Note” column, QP means the margin value of QP is higher than Average and the “Margin” column shows the margin value of QP; AV means the margin value of Average is higher than QP and the “Margin” column shows the margin value of Average.





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (BELOW 1000 MHZ)

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

Notes:

- (1) The limit for radiated test was performed according to as following:
CISPR 22/ FCC PART 15B /ICES-003.
- (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

LIMITS OF RADIATED EMISSION MEASUREMENT (ABOVE 1000 MHZ)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1000-3000	76	56	70	50
3000-6000	80	60	74	54

Notes:

- (1) The lower limit applies at the transition frequency.
- (2) 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 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 6 GHz, whichever is lower



4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	Anritsu	MH648A	M98457	Dec. 13, 2011
2	Test Cable	TIMES	LMR-400	10M-OS01	Jun. 17, 2011
3	Test Cable	TIMES	LMR-400	OS02	Jun. 17, 2011
4	EMI Test Receiver	R&S	ESCI	100082	Mar. 15, 2012
5	System Controller (OS02)	CT	SC100	N/A	N/A
6	Turn Table	Chance Most	CMTB-1.5	N/A	N/A
7	Pre-Amplifier	EMC	EMC330	980001	Jun. 03, 2011
8	Test Cable	TIMES	LMR-400	966_12m	Jun. 17, 2011
9	Test Cable	TIMES	LMR-400	966_3m	Jun. 17, 2011
10	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 31, 2011
11	EMI Measuring Receiver	SHCAFFNER	SCR 3501	408	Dec. 16, 2011
12	Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-546	Jun. 26, 2011

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

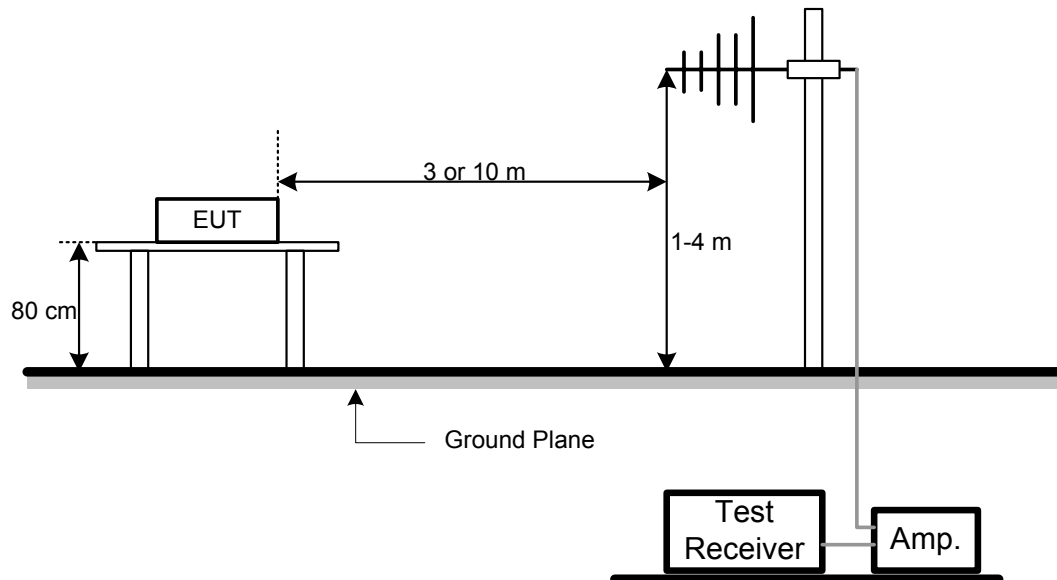
4.2.3 TEST PROCEDURE

- 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 3m or 10 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



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.



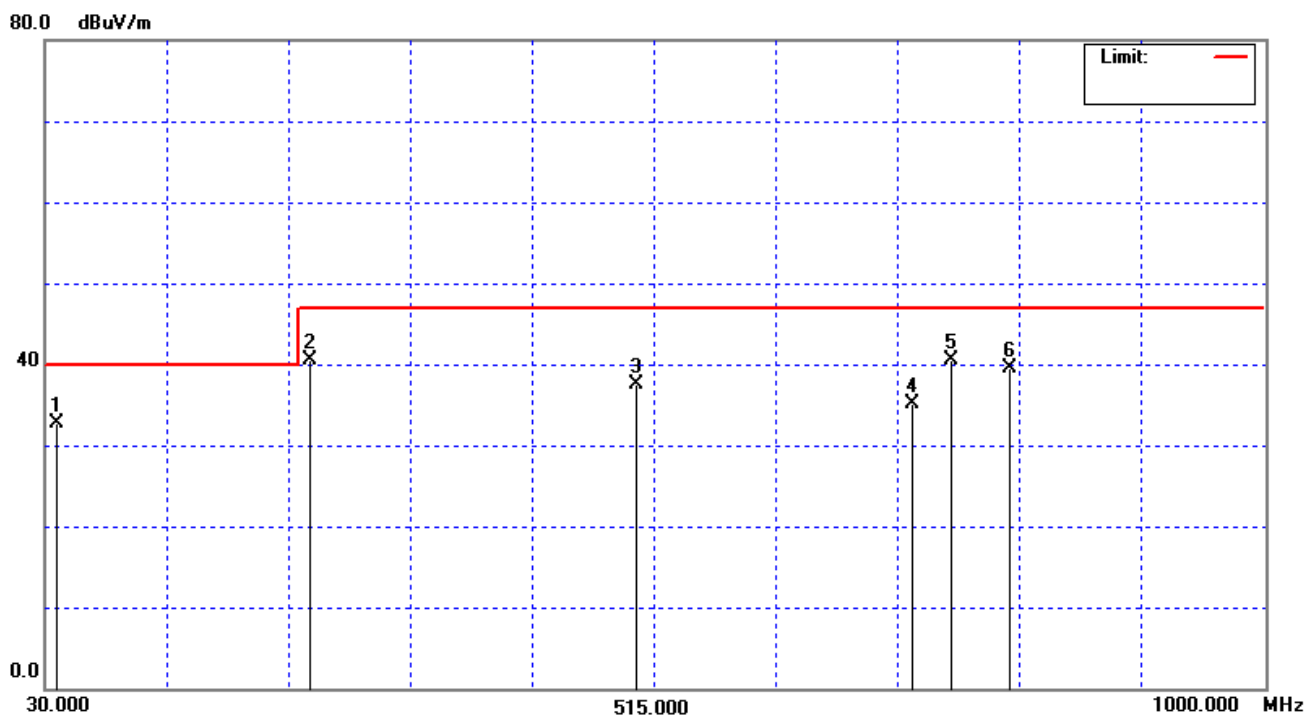
4.2.7 TEST RESULTS-BETWEEN 30MHZ AND 1000MHZ

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	19 °C	Relative Humidity :	65%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

Freq. (MHz)	Polarization H/V	Reading Level (dBuV)	Correct Factor(dB)	Measurement (dBuV/m)	Limit(Quasi-Peak) (dBuV/m)	Margin (dB)	Note
38.8960	V	39.49	-6.74	32.75	40.00	- 7.25	
240.0060	V	46.30	-5.80	40.50	47.00	- 6.50	(QP)
500.0000	V	36.77	0.67	37.44	47.00	- 9.56	
719.9940	V	30.60	4.59	35.19	47.00	- 11.81	(QP)
750.0040	V	35.30	5.23	40.53	47.00	- 6.47	
797.9000	V	33.69	5.75	39.44	47.00	- 7.56	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120 kHz; SPA setting in RBW=120 kHz, VBW =120 kHz, 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 30 MHz to 1000 MHz.
- (4) If the peak scan value is under the limit for more than 20dB, the signal will not show in table.



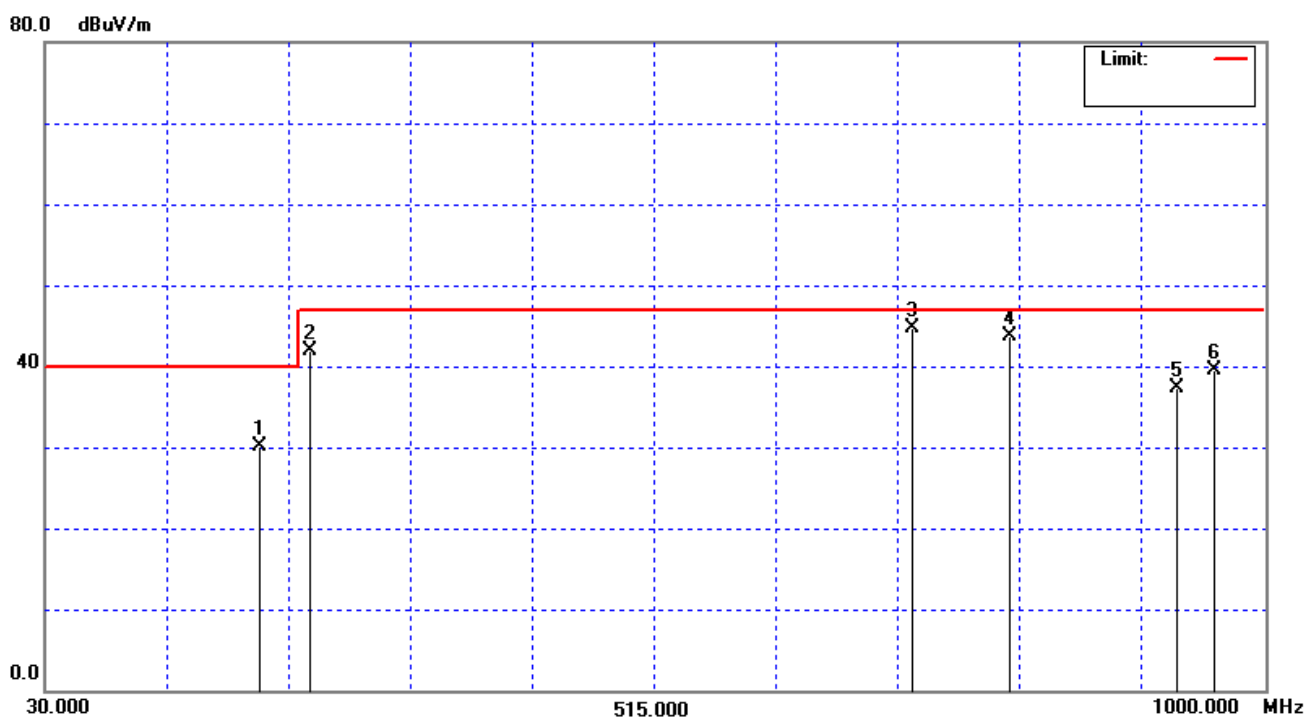


E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	19 °C	Relative Humidity :	65%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

Freq. (MHz)	Polarization H/V	Reading Level (dBuV)	Correct Factor(dB)	Measurement (dBuV/m)	Limit(Quasi-Peak) (dBuV/m)	Margin (dB)	Note
199.9900	H	37.39	-7.25	30.14	40.00	- 9.86	
240.0040	H	47.70	-5.80	41.90	47.00	- 5.10	(QP)
719.9980	H	40.11	4.59	44.70	47.00	- 2.30	
798.0400	H	38.03	5.75	43.78	47.00	- 3.22	
932.0400	H	29.42	7.81	37.23	47.00	- 9.77	
960.0320	H	31.20	8.37	39.57	47.00	- 7.43	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120 kHz; SPA setting in RBW=120 kHz, VBW =120 kHz, 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 30 MHz to 1000 MHz.
- (4) If the peak scan value is under the limit for more than 20dB, the signal will not show in table.





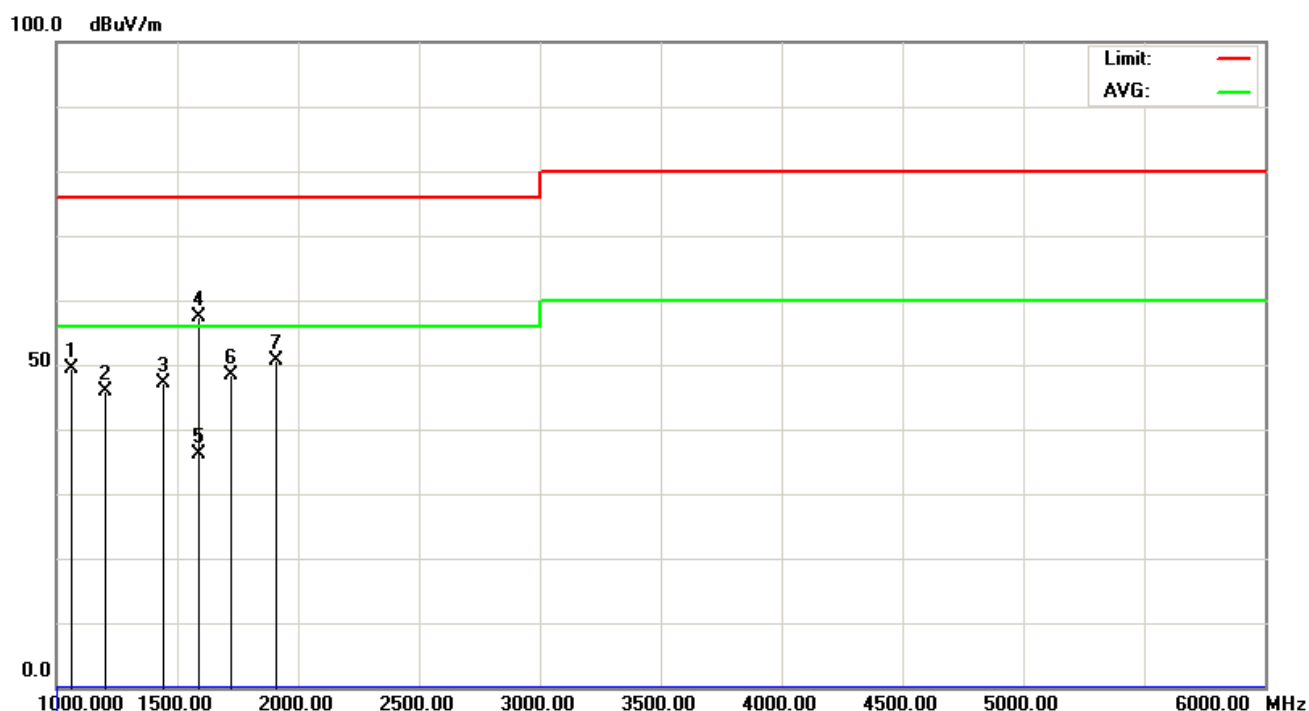
4.2.8 TEST RESULTS-ABOVE 1000MHZ

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	25 °C	Relative Humidity :	31%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

Freq. (MHz)	Polarization H/V	Reading Level(dBuV)		Correct Factor(dB)	Measurement(dBuV/m)		Limit(dBuV/m)		Margin (dB)	Note
		Peak	AV		Peak	AV	Peak	AV		
1060.000	V	57.35	*	-7.91	49.44	*	76.00	56.00	- 26.56	Peak
1200.000	V	53.36	*	-7.39	45.97	*	76.00	56.00	- 30.03	Peak
1440.000	V	53.57	*	-6.49	47.08	*	76.00	56.00	- 28.92	Peak
1590.000	V	63.32	42.16	-6.04	57.28	36.12	76.00	56.00	- 18.72	Peak
1720.000	V	54.21	*	-5.72	48.49	*	76.00	56.00	- 27.51	Peak
1910.000	V	55.83	*	-5.25	50.58	*	76.00	56.00	- 25.42	Peak

Remark :

- (1) Reading in which marked as PK means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
- (2) All readings are PK Mode value unless otherwise stated AVG in column of Note. If the PK Mode Measured value compliance with the PK Limits and lower than AVG Limits, the EUT shall be deemed to meet both PK & AVG Limits and then only PK Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.
- (3) In the "Note" column, Peak means the margin value of Peak is higher than Average and the "Margin" column shows the margin value of Peak; AV means the margin value of Average is higher than Peak and the "Margin" column shows the margin value of Average.



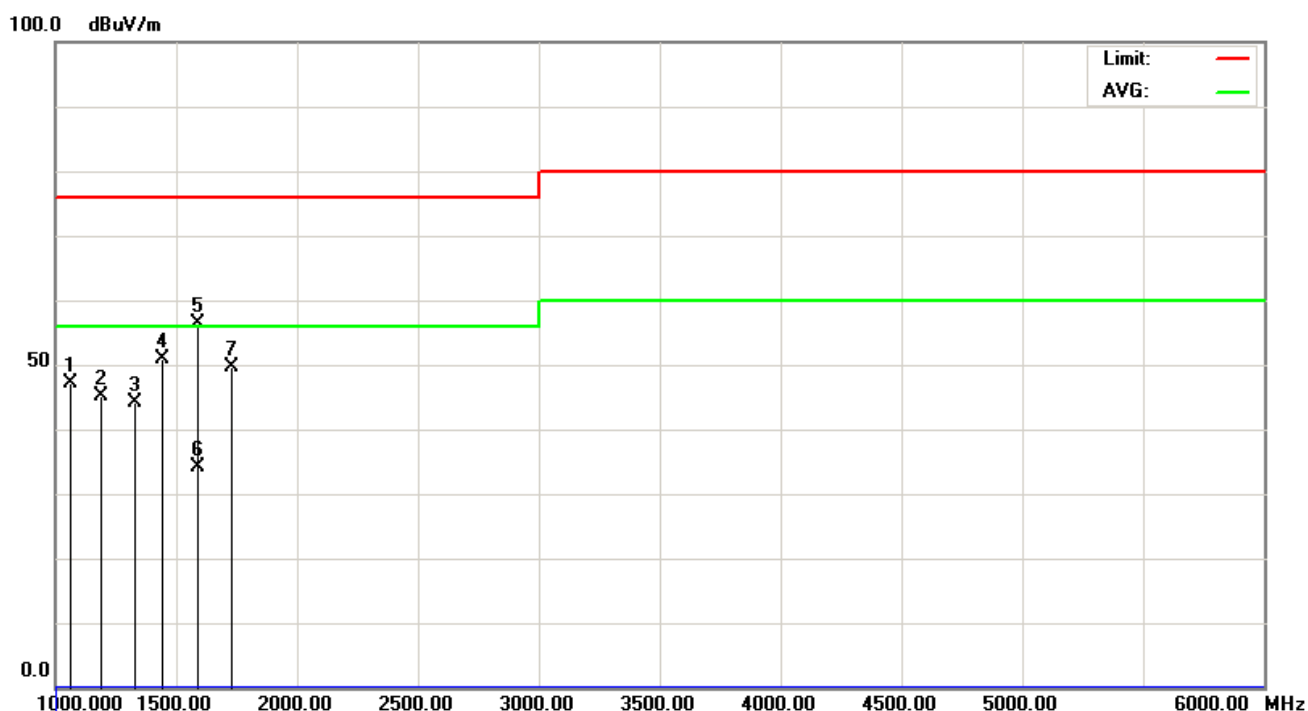


E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	25 °C	Relative Humidity :	31%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

Freq. (MHz)	Polarization H/V	Reading Level(dBuV)		Correct Factor(dB)	Measurement(dBuV/m)		Limit(dBuV/m)		Margin (dB)	Note
		Peak	AV		Peak	AV	Peak	AV		
1060.000	H	55.16	*	-7.91	47.25	*	76.00	56.00	- 28.75	Peak
1190.000	H	52.58	*	-7.43	45.15	*	76.00	56.00	- 30.85	Peak
1330.000	H	51.01	*	-6.90	44.11	*	76.00	56.00	- 31.89	Peak
1440.000	H	57.36	*	-6.49	50.87	*	76.00	56.00	- 25.13	Peak
1590.000	H	62.42	40.25	-6.04	56.38	34.21	76.00	56.00	- 19.62	Peak
1730.000	H	55.33	*	-5.69	49.64	*	76.00	56.00	- 26.36	Peak

Remark :

- (1) Reading in which marked as PK means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
- (2) All readings are PK Mode value unless otherwise stated AVG in column of Note. If the PK Mode Measured value compliance with the PK Limits and lower than AVG Limits, the EUT shall be deemed to meet both PK & AVG Limits and then only PK Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.
- (3) In the "Note" column, Peak means the margin value of Peak is higher than Average and the "Margin" column shows the margin value of Peak; AV means the margin value of Average is higher than Peak and the "Margin" column shows the margin value of Average.





5. EMC IMMUNITY TEST

5.1 STANDARD COMPLIANCE/SERVIRITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION Level	Test Mode Test Ports	Perform. Criteria	Remark
1. ESD IEC/EN 61000-4-2	8kV air discharge 4kV contact discharge	Direct Mode	B	
	4kV HCP discharge 4kV VCP discharge	Indirect Mode	B	
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz 3 or 10 V/m(rms), 1 kHz, 80%, AM modulated	Enclosure	A	
	1400 MHz to 2000 MHz 3 V/m(rms), 1 kHz, 80%, AM modulated		A	
	2000 MHz to 2700 MHz 1 V/m(rms), 1 kHz, 80%, AM modulated		A	
3. EFT/Burst IEC/EN 61000-4-4	1.0 or 2.0 kV(peak) 5/50ns Tr/Th 5 kHz Repetition Freq.	Power Supply Port	B	
	0.5 or 1.0 kV(peak) 5/50ns Tr/Th 5 kHz Repetition Freq.	CTL/Signal Data Line Port	B	
4. Surges IEC/EN 61000-4-5	1 kV(5P/5N) 1.2/50(8/20) Tr/Th us	L-N	B	
	2 kV(5P/5N) 1.2/50(8/20) Tr/Th us	L-PE N-PE	B	
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz 3 or 10 V(rms), 1 kHz 80%, AM Modulated 150Ω source impedance	CTL/Signal Port	A	
		AC Power Port	A	
		DC Power Port	A	N/A
6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50 Hz, 1 A/m or 50/60 Hz, 30 A/m	Enclosure	A	

* Remark:

N/A : denotes test is not applicable in this Test Report

(1) : The EUT is a battery operating device and no any other cable connection to PC device.

(2) : Applicable only to cables which according to the manufacturer's specification supports communication on cables lengths greater than 3 m.

(3) : Applicable only to equipment containing devices susceptible to magnetic fields



5.2 GENERAL PERFORMANCE CRITERIA

According to **EN 55024** and **EN 61000-6-2** standard, the general performance criteria as following:

Criterion A	<p>The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p>
Criterion B	<p>After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>During the test, degradation of performance is allowed. However, no change of operating state if stored data allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p>
Criterion C	<p>Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>

5.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

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.



5.4 ESD TESTING

5.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge : 2kV/4kV/8kV (Direct) Contact Discharge : 2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

5.4.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Simulator	Schaffner	NSG435	1224	Sep. 05, 2011

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

5.4.3 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. Contact discharge was applied to conductive surfaces (Direct) and coupling planes (Indirect) of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.

If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

- b. Air discharges at insulation surfaces of the EUT.

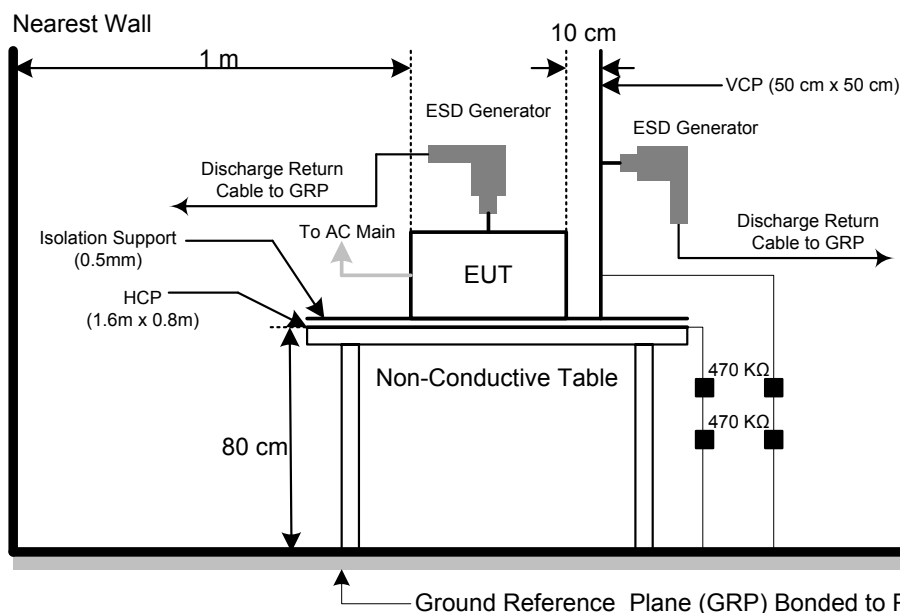
It was at least ten single discharges with positive and negative at the same selected point.

- c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.



5.4.6 TEST RESULTS

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 °C	Relative Humidity :	45%
Pressure :	1039 hPa	Test Voltage :	DC 30V
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 55024 & EN 61000-6-2																
Mode	Air Discharge								Contact Discharge							
	2kV		4kV		8kV		15kV		2kV		4kV		6kV		8kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	A	A			A	A	A	A				
2	A	A	A	A	A	A			A	A	A	A				
3									A	A	A	A				
4									A	A	A	A				
5									A	A	A	A				
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23									A	A	A	A				
24									A	A	A	A				
25									A	A	A	A				
26									A	A	A	A				
27									A	A	A	A				
28									A	A	A	A				
Criteria	B								B							
Result	A								A							
Judgment	PASS								PASS							

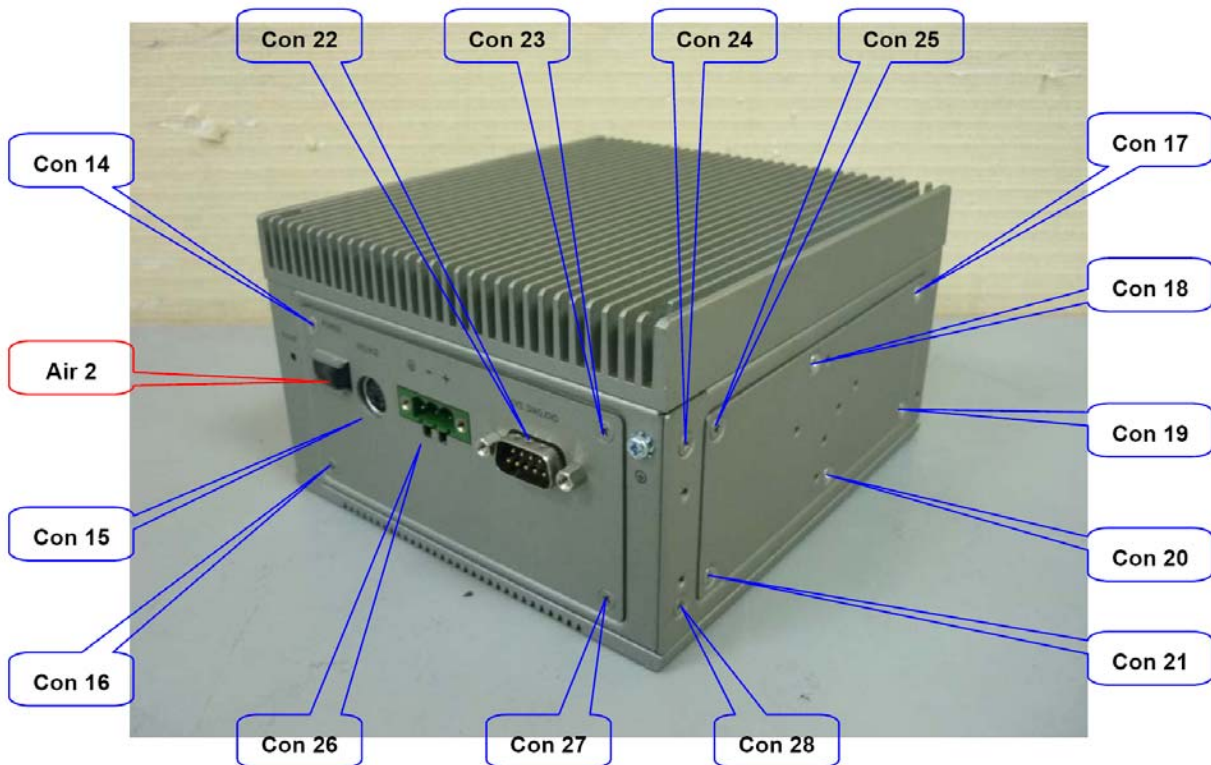
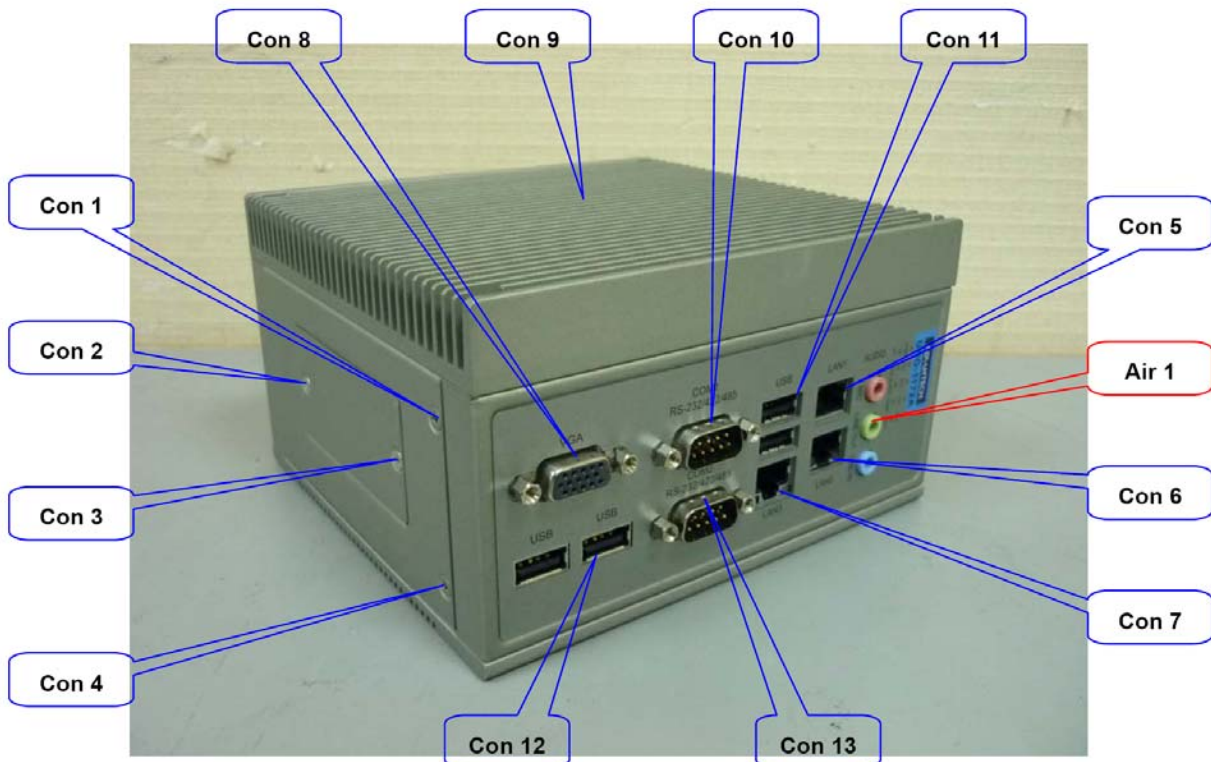


Mode	HCP Discharge								VCP Discharge							
	2kV		4kV		6kV		8kV		2kV		4kV		6kV		8kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A					A	A	A	A				
2	A	A	A	A					A	A	A	A				
3	A	A	A	A					A	A	A	A				
4	A	A	A	A					A	A	A	A				
Criteria	B								B							
Result	A								A							
Judgment	PASS								PASS							

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) Test condition:
Direct / Indirect (HCP/VCP) discharges: Minimum 25 times (Positive/Negative) at each point. Air discharges: Minimum 10 times (Positive/Negative) at each point.
- 3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 4) The Indirect (HCP/VCP) discharges description of test point as following:
1.left side 2.right side 3.front side 4.rear side
- 5) N/A - denotes test is not applicable in this test report
- 6) Criteria A: There was no change operated with initial operating during the test.
- 7) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 8) Criteria C: The system shut down during the test.

5.4.7 PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED





5.5 RS TESTING

5.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz & 1400 MHz - 2000 MHz & 2000 MHz - 2700 MHz
Field Strength:	1 V/m & 3 V/m & 10 V/m
Modulation:	1 kHz Sine Wave, 80%, AM Modulation & Duty cycle 50% Repetition frequency: 200 Hz
Frequency Step:	1% of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

5.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	R&S	SMT06	832080/007	Aug. 02, 2011
2	Log-Bicon Antenna	Schwarzbeck	VULB 9161	4022	Jun. 04, 2011
3	Power Amplifier	AR	150W1000M1	320946	Jun. 04, 2011
4	Microwave Horn Antenna	AR	AT4002A	321467	Jun. 04, 2011
5	Power Amplifier	AR	25S1G4A	308598	Jun. 04, 2011
6	Measurement Software	AR	SW1006 (Version 1.22)	321779	N/A

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

5.5.3 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

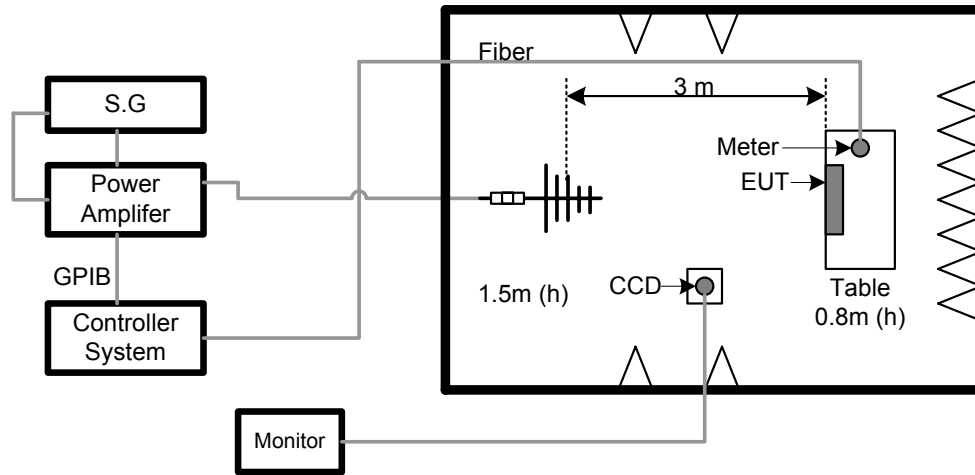
The other condition as following manner:

- The field strength level was 3V/m.
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.



5.5.6 TEST RESULTS

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	26 ° C	Relative Humidity :	53%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 55024						
Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80 - 1000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	0	A	A	PASS
			90			
			180			
			270			

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report.
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.



E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	26 °C	Relative Humidity :	53%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 61000-6-2						
Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80 - 87 87 - 108 108 - 174 174 - 230 230 - 470 470 - 790 790 - 1000	H / V	10 V/m (rms) 3 V/m (rms)	0	A	A	PASS
		10 V/m (rms) 3 V/m (rms)	90			
		10 V/m (rms) 3 V/m (rms)	180			
		10 V/m (rms) AM Modulated 1 kHz, 80%	270			
1400 - 2000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	0	A	A	PASS
			90			
			180			
			270			
2000 - 2700	H / V	1 V/m (rms) AM Modulated 1000Hz, 80%	0	A	N/A	N/A
			90			
			180			
			270			

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report.
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.



5.6 EFT/BURST TESTING

5.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage :	Power Line: 0.5 kV or 1 kV or 2 kV Signal/Control Line: 0.5 kV or 1 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

5.6.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMC Immunity Test System	Thermo	EMCPRO PLUS	0502176	Mar. 09, 2012
2	Capacitive Clamp	Thermo	CCL	0502218	N/A
3	Measurement Software	KeyTek	CEWare32 (Version 4.00)	N/A	N/A

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

5.6.3 TEST PROCEDURE

The EUT and support equipment(s) are placed on a table that is 0.8 meter high above a metal ground plane and should be located 0.1 m+/- 0.01m high above the Ground Reference Plane (1m*1m min. and 0.65mm thick min).

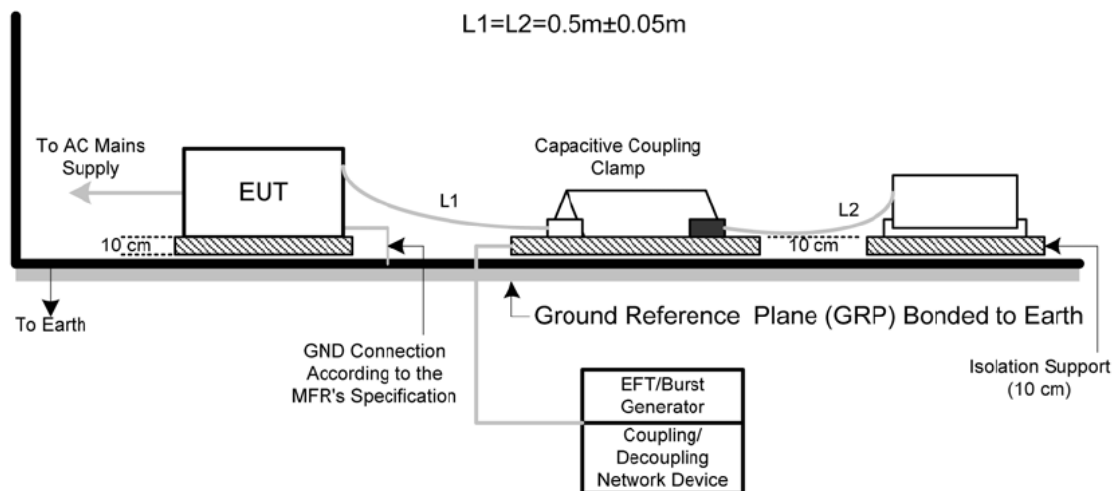
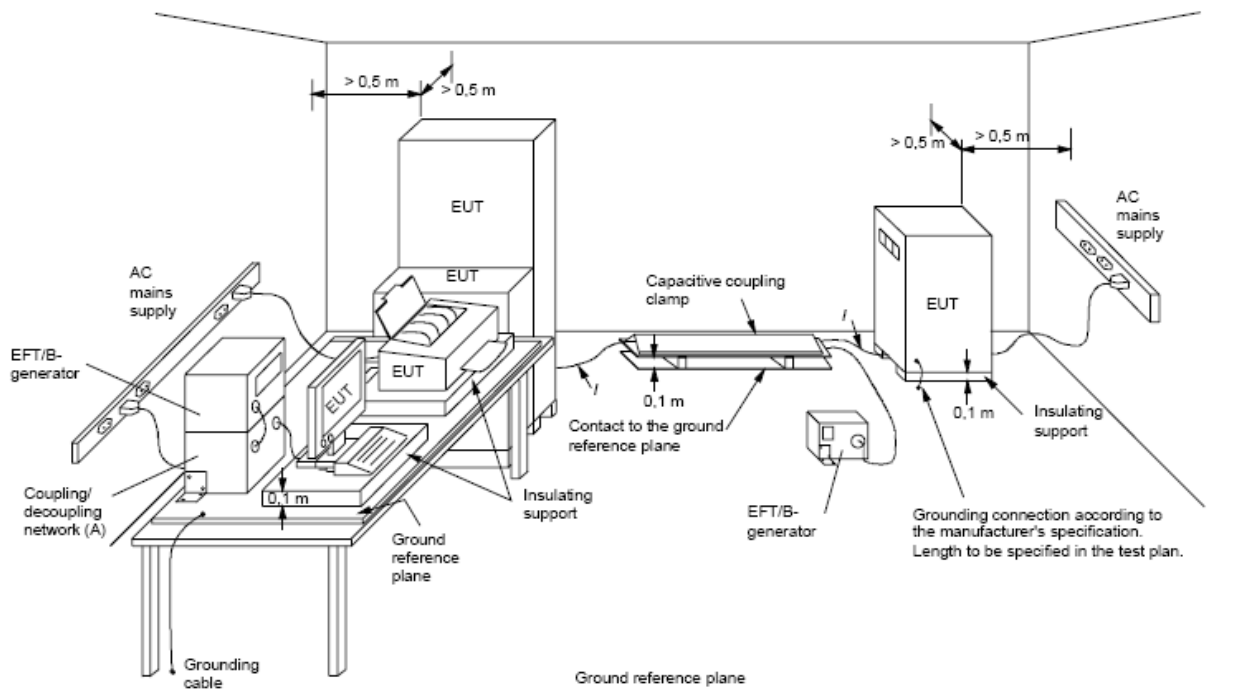
The other condition as following manner:

- The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m+/- 0.01m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.



5.6.6 TEST RESULTS

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 °C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 55024						
Mode	() AC Power Line		(X) DC Power Line		(X) Signal/Control Line	
Test Level	1 kV		0.5 kV		0.5 kV	
Port(s)	Polarity	Results	Polarity	Results	Polarity	Results
Line (L)	P		P	A	P	
	N		N	A	N	
Neutral (N)	P		P	A	P	
	N		N	A	N	
Ground (PE)	P		P	A	P	
	N		N	A	N	
Signal/Control Line	P		P		P	A
	N		N		N	A
Criteria	B		B		B	
Result	N/A		A		A	
Judgment	N/A		PASS		PASS	

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.



E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 °C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 61000-6-2						
Mode	() AC Power Line		(X) DC Power Line		(X) Signal/Control Line	
Test Level	2 kV		2 kV		1 kV	
Port(s)	Polarity	Results	Polarity	Results	Polarity	Results
Line (L)	P		P	B	P	
	N		N	B	N	
Neutral (N)	P		P	B	P	
	N		N	B	N	
Ground (PE)	P		P	B	P	
	N		N	B	N	
Signal/Control Line	P		P		P	B
	N		N		N	B
Criteria	B		B		B	
Result	N/A		B		B	
Judgment	N/A		PASS		PASS	

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.



5.7 SURGE TESTING

5.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage :	Power Line : 0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L1-L2, L1-PE, L2-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

5.7.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMC Immunity Test System	Thermo	EMC PRO PLUS	0502176	Mar. 09, 2012
2	Measurement Software	KeyTek	CEWare32 (Version 4.00)	N/A	N/A

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

5.7.3 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

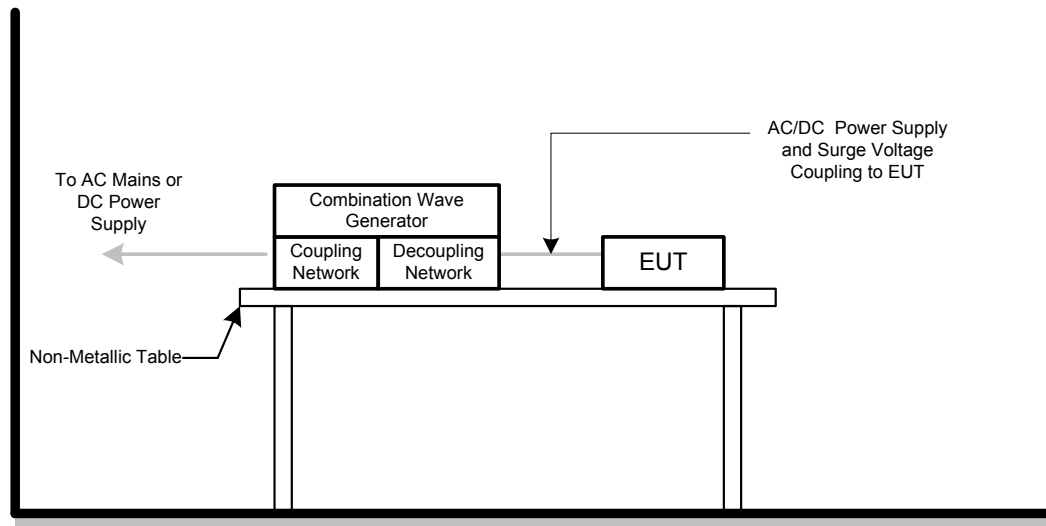
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.



5.7.4 DEVIATION FROM TEST STANDARD

No deviation

5.7.5 TEST SETUP





5.7.6 TEST RESULTS

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 °C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 55024									
Wave Form EUT Ports Tested		1.2/50(8/20)Ti/Th us						Criteria	Judgment
		Polarity	Phase	Voltage					
				0.5kV	1kV	2kV	4kV		
AC	L – N (2 ohm)	+/-	0°					B	N/A
		+/-	90°						
		+/-	180°						
		+/-	270°						
	L – PE (12 ohm)	+/-	0°					B	N/A
		+/-	90°						
		+/-	180°						
		+/-	270°						
	N – PE (12 ohm)	+/-	0°					B	N/A
		+/-	90°						
		+/-	180°						
		+/-	270°						
DC	L – PE (12 ohm)	+/-	N/A	A				B	PASS
Signal Line	RJ-45 (42 ohm)	+/-	N/A	A				B	PASS

Note:

- 1) Polarity and Numbers of Impulses : 5 Pst / Ngst at each tested mode
- 2) N/A - denotes test is not applicable in this Test Report
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.



E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 °C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN61000-6-2									
Wave Form EUT Ports Tested		1.2/50(8/20)Ti/Th us						Criteria	Judgment
		Polarity	Phase	Voltage					
				0.5kV	1kV	2kV	4kV		
AC	L – N (2 ohm)	+/-	0°					B	N/A
		+/-	90°						
		+/-	180°						
		+/-	270°						
	L – PE (12 ohm)	+/-	0°					B	N/A
		+/-	90°						
		+/-	180°						
		+/-	270°						
	N – PE (12 ohm)	+/-	0°					B	N/A
		+/-	90°						
		+/-	180°						
		+/-	270°						
DC	L – PE (2 ohm)	+/-	N/A	A				B	PASS
DC	L – PE (12 ohm)	+/-	N/A	A				B	PASS
Signal Line	N/A (42 ohm)	+/-	N/A					B	N/A

Note:

- 1) Polarity and Numbers of Impulses : 5 Pst / NgT at each tested mode
- 2) N/A - denotes test is not applicable in this Test Report
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.



5.8 INJECTION CURRENT TESTING

5.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of fundamental
Dwell Time:	at least 3 seconds

5.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Amplifier	AR	75A250AM1	0320709	Sep. 22, 2011
2	CDN(M3)	FCC	FCC-801-M2/M3-16A	100266	May. 06, 2011
3	CDN	FCC	F-090407-1004-1	100520	Apr. 15, 2011
4	Measurement Software	AR	SW1006 (Version 1.13)	321778	N/A
5	Signal Generator	R&S	SMT06	832080/007	Aug. 2, 2011

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

5.8.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

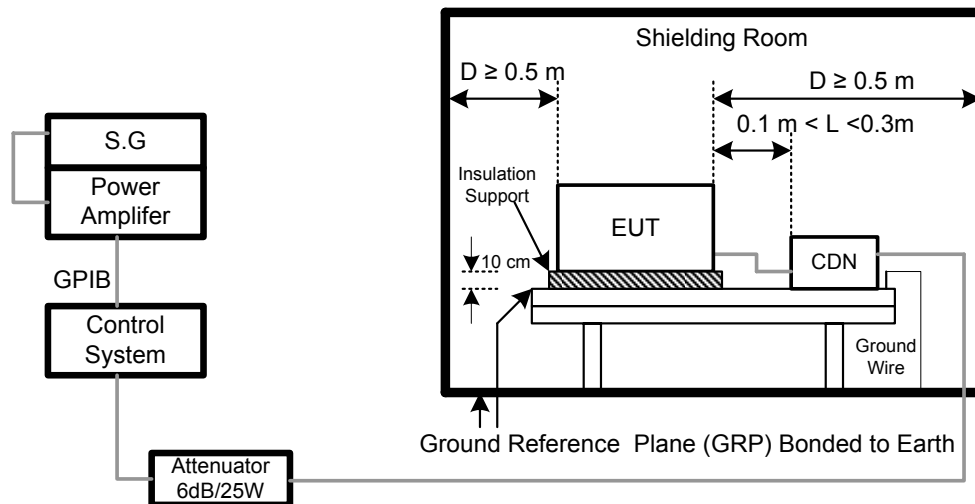
The other condition as following manner:

- The field strength level was 3V.
- The frequency range is swept from 150 kHz to 80 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.8.4 DEVIATION FROM TEST STANDARD

No deviation

5.8.5 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.



5.8.6 TEST RESULTS

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 ° C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 55024					
Test Ports (Mode)	Freq. Range (MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 - 80	3V(rms) AM Modulated 1000Hz, 80%	A	N/A	N/A
Input/ Output DC. Power Port			A	A	PASS
Signal Line (RJ-45)			A	A	PASS

Note:

- 1) N/A - denotes test is not applicable in this Test Report.
- 2) Criteria A: There was no change operated with initial operating during the test.
- 3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 4) Criteria C: The system shut down during the test.



E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 °C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 61000-6-2					
Test Ports (Mode)	Freq. Range (MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 – 47 47 – 68 68 – 80	10V (rms) 3V (rms) 10V (rms) AM Modulated 1kHz, 80%	A	N/A	N/A
Input/ Output DC. Power Port	0.15 – 47 47 – 68 68 – 80	10V (rms) 3V (rms) 10V (rms) AM Modulated 1kHz, 80%	A	A	PASS
Signal Line (RJ-45)	0.15 – 47 47 – 68 68 – 80	10V (rms) 3V (rms) 10V (rms) AM Modulated 1kHz, 80%	A	A	PASS

Note:

- 1) N/A - denotes test is not applicable in this Test Report.
- 2) Criteria A: There was no change operated with initial operating during the test.
- 3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 4) Criteria C: The system shut down during the test.



5.9 POWER FREQUENCY MAGNETIC FIELD TESTING

5.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-8
Required Performance	A
Frequency Range:	50 Hz or 50/60 Hz
Field Strength:	1 A/m & 30 A/m
Observation Time:	1 minute
Inductance Coil:	Rectangular type, 1mx1m

5.9.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Triaxial ELF Magnetic Field Meter	F.W. BELL	4190	0845014	Feb. 17, 2012
2	Magnetic Field Test Generator	FCC	F-1000-4-8-G-1 25A	04029	Feb. 17, 2012
3	Magnetic Field Immunity Loop	FCC	F-1000-4-8/9/10-L -1M	04018	Feb. 17, 2012

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

5.9.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

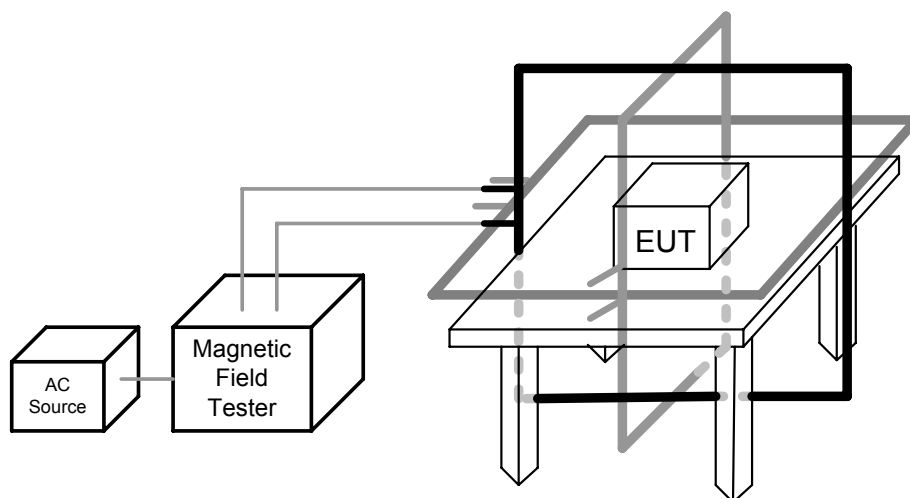
The other condition as following manner:

- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.9.4 DEVIATION FROM TEST STANDARD

No deviation

5.9.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50% of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.



5.9.6 TEST RESULTS

E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 °C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 55024						
Test Mode	Test Level	Antenna aspect	Duration (s)	Perform Criteria	Results	Judgment
Enclosure	1 A/m	X	60	A	A	PASS
		Y		A	A	PASS
		Z		A	A	PASS

Note:

- 1) N/A - denotes test is not applicable in this test report
- 2) Criteria A: There was no change operated with initial operating during the test.
- 3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 4) Criteria C: The system shut down during the test.



E.U.T :	Embedded Automation Computer / Computer	Model Name :	UNO-1172A
Temperature :	22 ° C	Relative Humidity :	45%
Test Voltage :	DC 30V		
Test Mode :	FULL SYSTEM D-SUB 1024*768/60Hz		

For EN 61000-6-2						
Test Mode	Test Level	Antenna aspect	Duration (s)	Perform Criteria	Results	Judgment
Enclosure	30 A/m 50/60Hz	X	60	A	A	PASS
		Y		A	A	PASS
		Z		A	A	PASS

Note:

- 1) N/A - denotes test is not applicable in this test report
- 2) Criteria A: There was no change operated with initial operating during the test.
- 3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 4) Criteria C: The system shut down during the test.



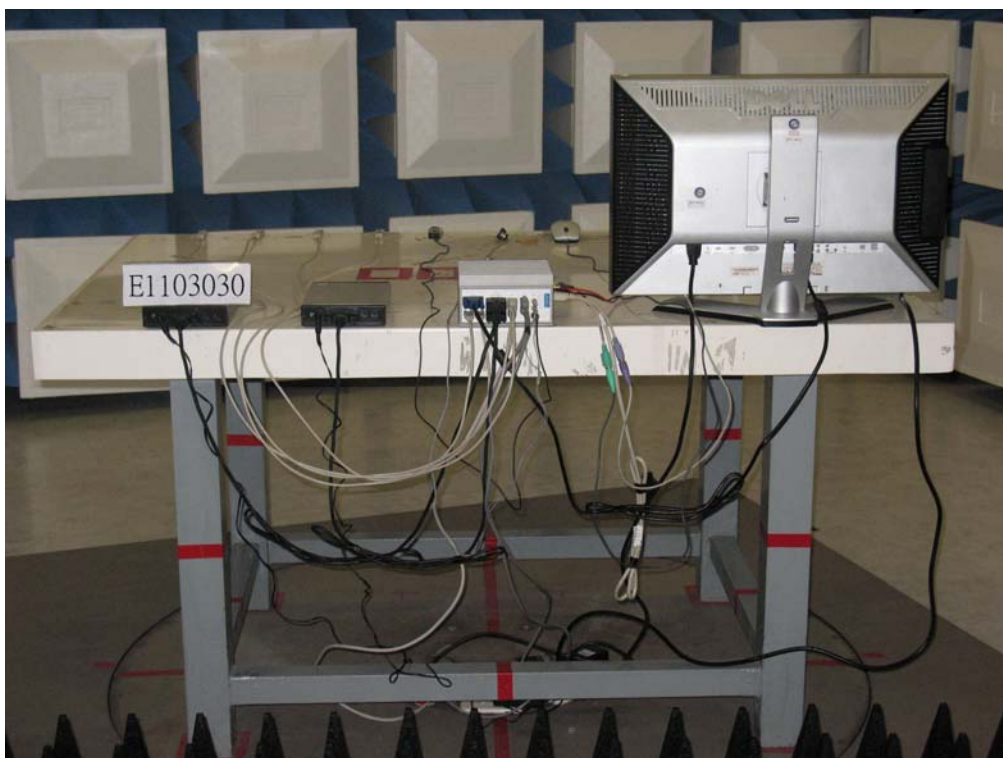
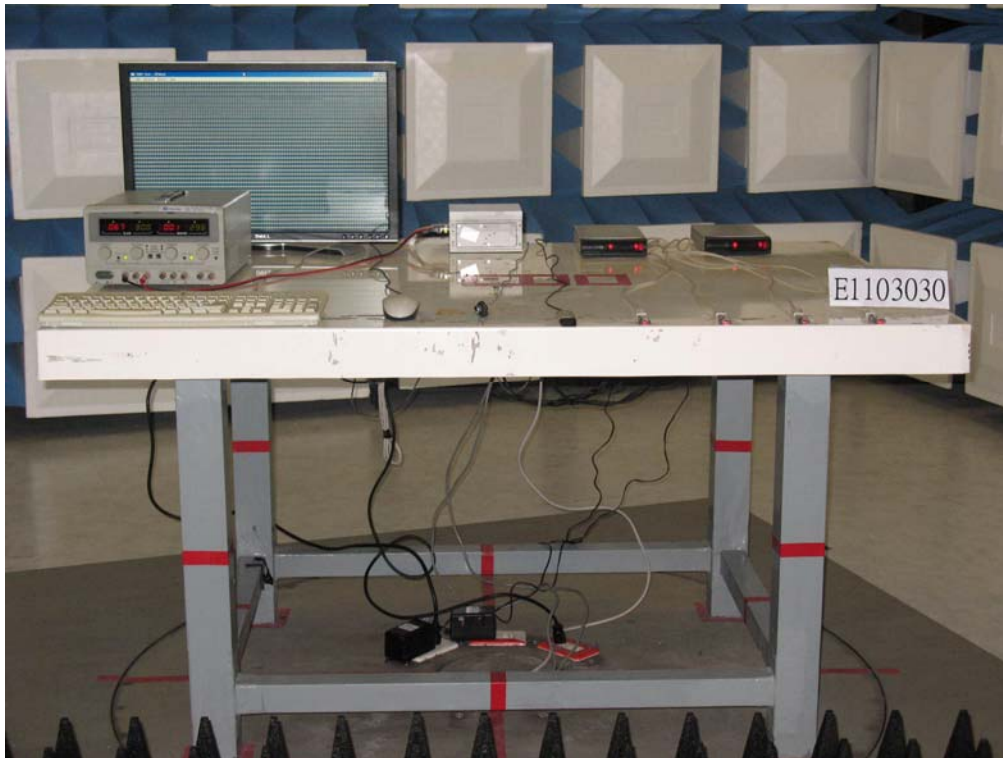
6. EUT TEST PHOTO

**Radiated Measurement Photos
BETWEEN 30MHZ AND 1000MHZ**



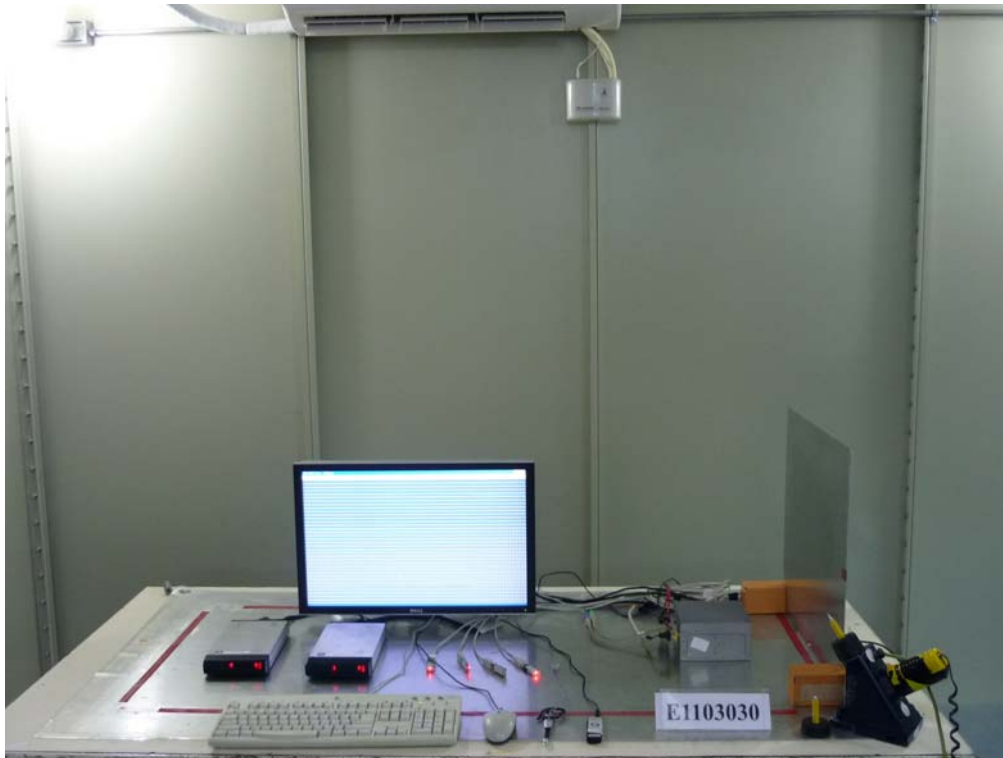
Radiated Measurement Photos

ABOVE 1000MHZ

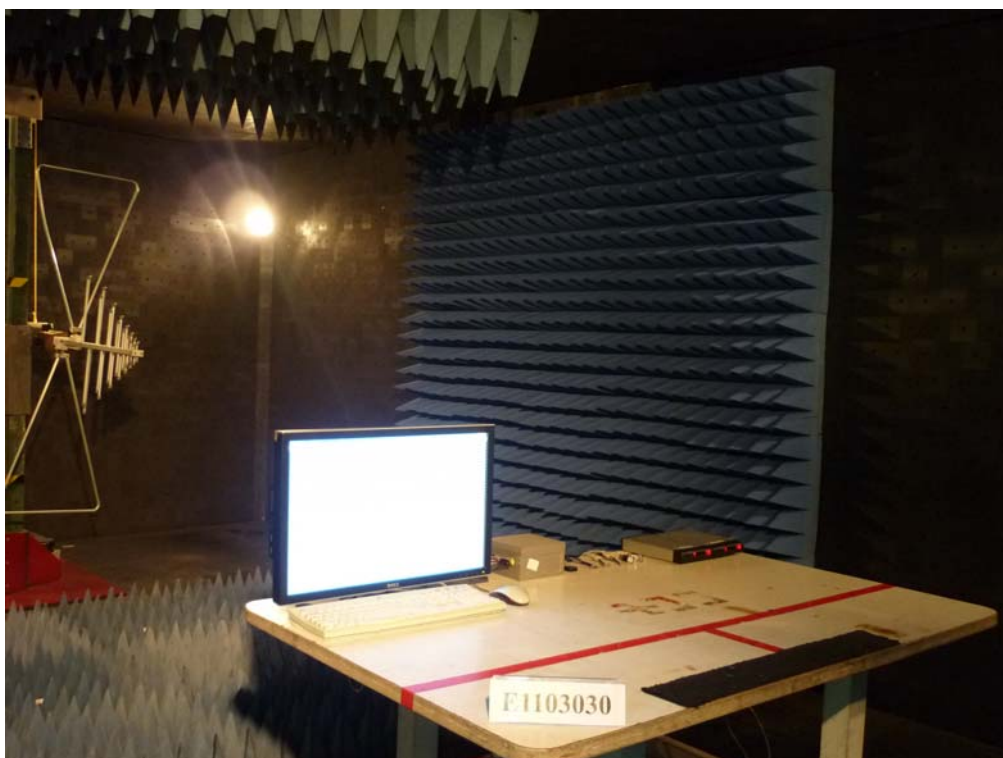


EMS Measurement Photos

ESD



RS



EFT



SURGE



CS



PMF





Neutron Engineering Inc.

ATTACHMENT

PHOTOGRAPHS OF EUT



Model No.: UNO-1172A



Model No.: UNO-1172A





Model No.: UNO-1172AH



Model No.: UNO-1172AH



