

FCC 47 CFR PART 15 SUBPART B TEST REPORT

for

POE

MODEL: MIT-07XX-WWVVCC

(Please see page 6)

Test Report Number:

71105004-D

Issued for

MSTronic CO., LTD.

2F., NO.12, Gongshang Rd., Wugu Township Taipei
County 248, Taiwan (R.O.C)

Issued By:

Compliance Certification Services Inc.

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Issued Date: November 21, 2007



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	November 21, 2007	Initial Issue	ALL	Jessica Ho

TABLE OF CONTENTS

1	TEST RESULT CERTIFICATION	4
2	EUT DESCRIPTION.....	5
3	TEST METHODOLOGY	6
3.1.	DECISION OF FINAL TEST MODE	6
3.2.	EUT SYSTEM OPERATION	6
4	SETUP OF EQUIPMENT UNDER TEST	7
4.1.	DESCRIPTION OF SUPPORT UNITS	7
4.2.	CONFIGURATION OF SYSTEM UNDER TEST	8
5	FACILITIES AND ACCREDITATIONS	9
5.1.	FACILITIES	9
5.2.	ACCREDITATIONS.....	9
5.3.	MEASUREMENT UNCERTAINTY	10
6	CONDUCTED EMISSION MEASUREMENT	11
6.1.	LIMITS OF CONDUCTED EMISSION MEASUREMENT	11
6.2.	TEST INSTRUMENTS	11
6.3.	TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-031)	12
6.4.	TEST SETUP	13
6.5.	DATA SAMPLE:	13
6.6.	TEST RESULTS.....	14
7	RADIATED EMISSION MEASUREMENT	16
7.1.	LIMITS OF RADIATED EMISSION MEASUREMENT	16
7.2.	TEST INSTRUMENTS	16
7.3.	TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-031)	17
7.4.	TEST SETUP	18
7.5.	DATA SAMPLE:	18
7.6.	TEST RESULTS.....	19
8	PHOTOGRAPHS OF THE TEST CONFIGURATION	21



1 TEST RESULT CERTIFICATION

Product:	POE
Model:	MIT-07XX-WWVCC (Please see page 6)
Brand:	MSE
Applicant:	MSTronic CO., LTD. 2F., NO.12, Gongshang Rd., Wugu Township Taipei County 248, Taiwan (R.O.C)
Manufacturer:	MSTronic CO., LTD. 2F., NO.12, Gongshang Rd., Wugu Township Taipei County 248, Taiwan (R.O.C)
Tested:	October 16 ~ November 13, 2007

EMISSION			
Standard	Item	Result	Remarks
FCC 47 CFR Part 15 Subpart B (August 14, 2006), ICES-003 Issue 4 ANSI C63.4-2003	Conducted (Main Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

Note: 1. The test result judgment is decided by the limit of measurement standard
2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Rex Lai
Section Manager

Reviewed by:

Amanda Wu
Section Manager

2 EUT DESCRIPTION

Product	POE
Brand Name	MSE
Model	MIT-07XX-WWVVCC
Applicant	MSTronic CO., LTD.
Housing material	Plastic
Serial Number	71105004
Received Date	November 5, 2007
EUT Power Rating	Powered from host device.

Remark: 1. The detail descriptions please see as below.

Model	Means
XX can be D, T, R, H, C or blank	D means signal detector, T means signal processor, R means reverse, H means hi-temp and C means current indicator;
WW can be 17, 18, 20, 24	Power in watt
VV can be 48, 18, 24 and 12;	Different output voltage in volt;
CC can be 0-9, a-z, A-Z or blank	Different supplier

2. Client consigns only one sample to test (model number: MIT-07T-2448). Therefore, the testing Lab. just guarantees the unit, which has been tested.

I/O PORT

I/O PORT TYPES	Q'TY	TESTED WITH
1).AC Port	1	1
2).Data Input Port	1	1
3).LAN Port	1	1

3 TEST METHODOLOGY

3.1. DECISION OF FINAL TEST MODE

1. The following test mode was scanned during the preliminary test:

Pre-Test Mode
Mode 1: Data Transceiving via EUT

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Conducted Emission	Mode 1
	Radiated Emission	Mode 1

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

3.2. EUT SYSTEM OPERATION

1.	The EUT was connected between AP at local side and Notebook pc at the remote side via LAN Cable via LAN cable.
2.	The LAN communication driver was loaded and executed to communicate on AP and with remote equipment.
3.	Data transmit between AP and Notebook PC via EUT.
4.	Repeat 2 to 3.

Note: Test program is self-repeating throughout the test.



4 SETUP OF EQUIPMENT UNDER TEST

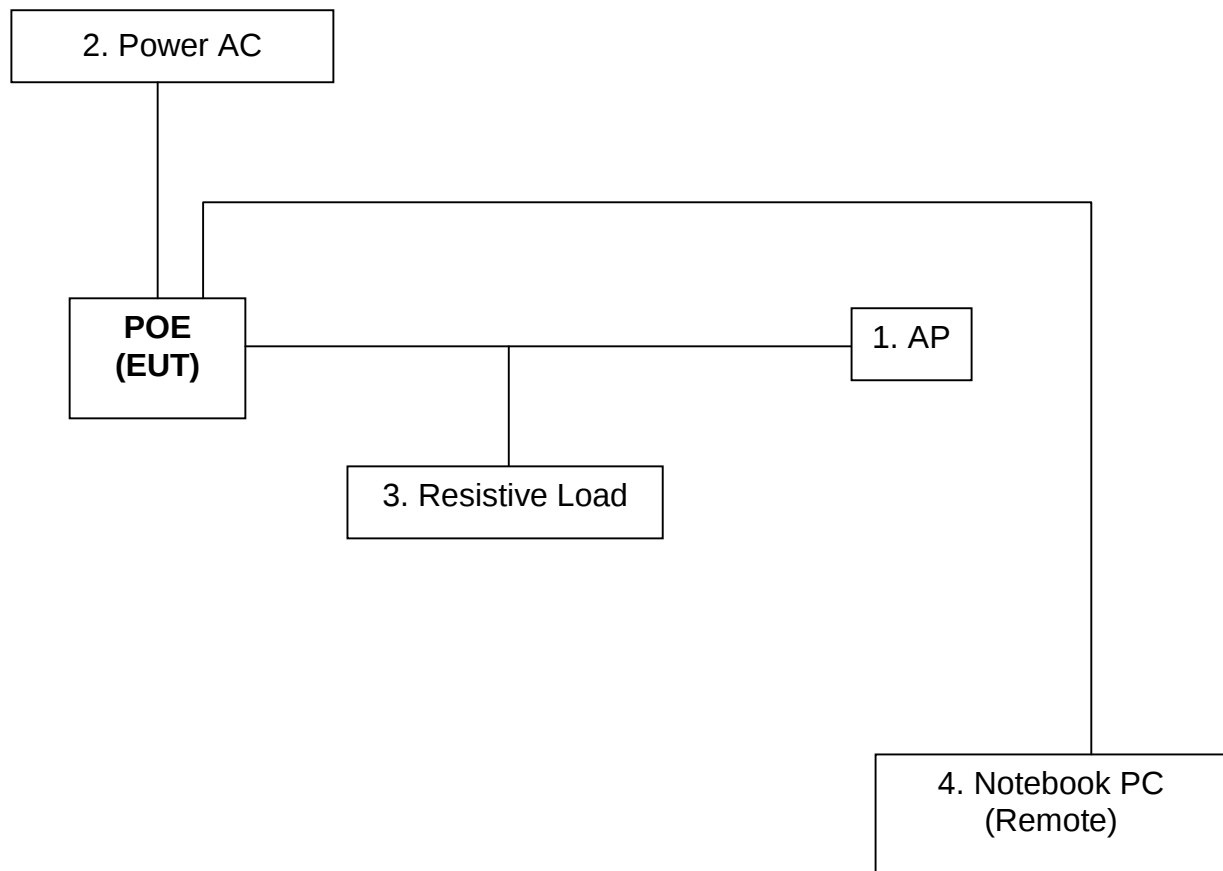
4.1. DESCRIPTION OF SUPPORT UNITS

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.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	AP	BLW-04SAG	40DDA0421	FCC DoC	PLANEX	N/A	Unshielded, 1.8m
2.	Power AC	N/A	N/A	N/A	N/A	N/A	Unshielded, 1.2m
3.	Resistive Load	N/A	N/A	N/A	N/A	Unshielded, 1m *2	N/A
4.	Notebook PC (Remote)	2672 (X31)	9985H9M	WLAN: ANO20030400LEG Bluetooth: ANO20020100MTN	IBM	LAN Cable: Unshielded, 10m Line Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Note: Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2. CONFIGURATION OF SYSTEM UNDER TEST





5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at:

- ☒ No. 81-1, Lane 210, Pa-De 2nd Rd., Luchu Hsiang, Taoyuan Shien, Taiwan.
- ☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, A2LA
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA
Taiwan	TAF, BSMI, NCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsemc.com>

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	+/-2.81dB
Radiated emissions	30~200MHz	+/-3.8881 dB
	200~1000MHz	+/-3.8724 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.



6 CONDUCTED EMISSION MEASUREMENT

6.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.
(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

6.2. TEST INSTRUMENTS

Conducted Emission Room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver 9kHz-30MHz	Rohde & Schwarz	ESHS30	828144/003	10/31/2008
Two-Line V-Network 9kHz-30MHz	Schaffner	NNB41	03/10013	06/12/2008
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/01/2008
ISN 9kHz-30MHz	FCC	FCC-TLISN-T4	20167	09/15/2008
Test S/W	LABVIEW (V 6.1)			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

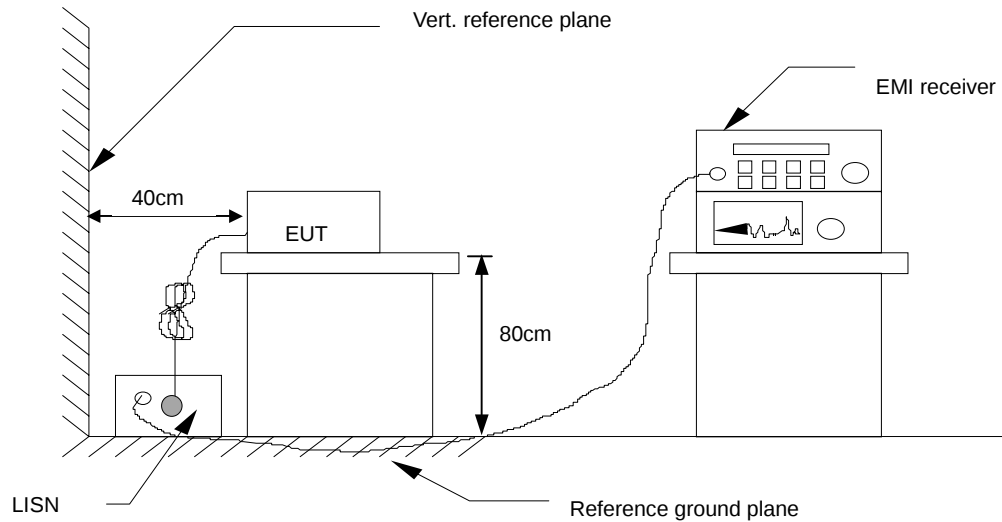
6.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-031)**Procedure of Preliminary Test**

- The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed by AC main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
- All support equipment power by from a second LISN.
- The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

6.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

6.5. DATA SAMPLE:

Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correctrion factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
x.xx	43.95	33.00	10.00	53.95	43.00	56.00	46.00	-2.05	-3.00	Pass

Frequency (MHz) = Emission frequency in MHz

Reading (dBuV) = Uncorrected Analyzer/Receiver reading + Insertion loss of LISN, if it > 0.5 dB

Correction Factor (dB) = LISN Factor + Cable loss

Result (dBuV) = Raw reading converted to dBuV and CF added

Limit (dBuV) = Limit stated in standard

Margin (dB) = Result (dBuV) – Limit (dBuV)



6.6. TEST RESULTS

CCS Conduction Test

Job No.: 71105004-FCC-L1-1.1

Special Note: The test data is for reference only.

Date: 2007/11/13

Time: PM 07:09

Temp.()/Hum.(%):25 / 55 %

Tested by: Eric Cheng

Standard: FCC Part 15B Class B

Power Source: 110 Vac / 60Hz

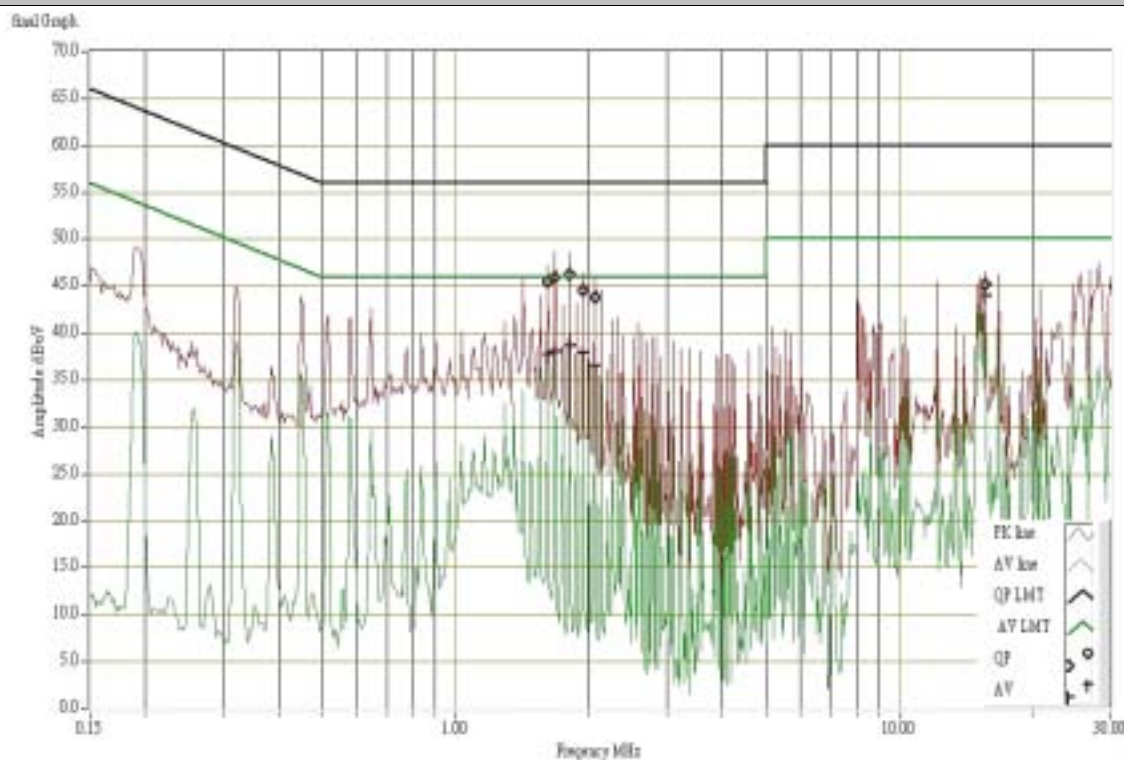
Measured Line: L1

Company: MStronic CO., LTD.

Product: POE

Model: MIT-07T-2448

Test Mode: 1



Freq. (MHz)	QP Reading	AV Reading	Corr. factor	QP Result	AV Result	QP Limit	AV Limit	QP Margin	AV Margin	Remark
1.612	45.510	37.770	0.006	45.516	37.776	56.000	46.000	-10.484	-8.224	PASS
1.677	45.920	38.060	0.007	45.927	38.067	56.000	46.000	-10.073	-7.933	PASS
1.802	46.300	38.630	0.008	46.308	38.638	56.000	46.000	-9.692	-7.362	PASS
1.936	44.630	37.940	0.009	44.639	37.949	56.000	46.000	-11.361	-8.051	PASS
2.064	43.870	36.500	0.012	43.882	36.512	56.000	46.000	-12.118	-9.488	PASS
15.616	45.160	44.000	0.426	45.586	44.426	60.000	50.000	-14.414	-5.574	PASS

REMARKS: L1 = Line One (Live Line)



CCS Conduction Test

Job No.: 71105004-FCC-L2-1.1

Special Note: The test data is for reference only.

Date: 2007/11/13

Time: PM 07:27

Temp.()/Hum.(%):25 / 55 %

Tested by: Eric Cheng

Standard: FCC Part 15B Class B

Power Source:110 Vac / 60Hz

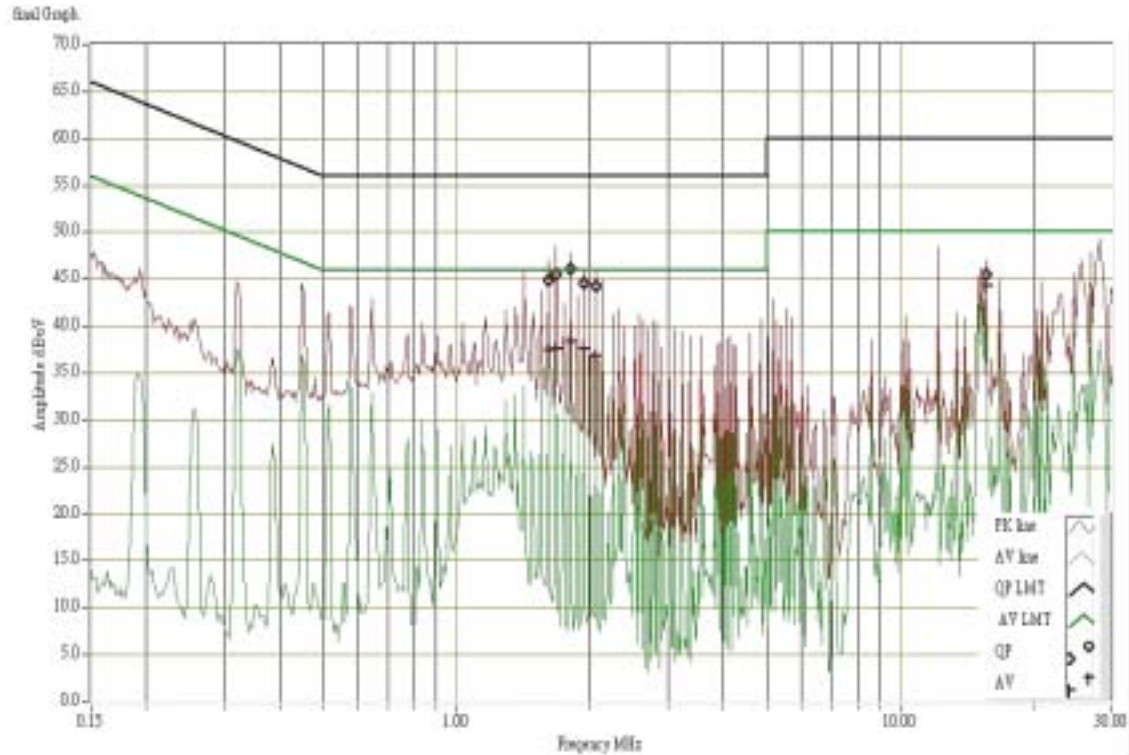
Measured Line: L2

Company: MStronic CO., LTD.

Product: POE

Model: MIT-07T-2448

Test Mode: 1



Freq. (MHz)	QP Reading	AV Reading	Corr. factor	QP Result	AV Result	QP Limit	AV Limit	QP Margin	AV Margin	Remark
1.612	44.880	37.390	0.006	44.886	37.396	56.000	46.000	-11.114	-8.604	PASS
1.677	45.480	37.570	0.007	45.487	37.577	56.000	46.000	-10.513	-8.423	PASS
1.802	46.180	38.350	0.008	46.188	38.358	56.000	46.000	-9.812	-7.642	PASS
1.936	44.570	37.570	0.009	44.579	37.579	56.000	46.000	-11.421	-8.421	PASS
2.064	44.220	36.840	0.012	44.232	36.852	56.000	46.000	-11.768	-9.148	PASS
15.616	45.490	44.340	0.426	45.916	44.766	60.000	50.000	-14.084	-5.234	PASS

REMARKS: L2 = Line Two (Neutral Line)



7 RADIATED EMISSION MEASUREMENT

7.1. LIMITS OF RADIATED EMISSION MEASUREMENT

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

Frequency (MHZ)	Class A (dBuV/m) (At 10m)		Class B (dBuV/m) (At 3m)	
	Average	Peak	Average	Peak
Above 960	59.5	79.5	54	74

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

7.2. TEST INSTRUMENTS

Open Area Test Site # 2				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	ADVANTEST	R3261A	N/A	N.C.R
EMI Test Receiver	R&S	ESVS10	834468/006	04/15/2008
Pre-Amplifier	HP	8447D	2944A08780	07/20/2008
Bilog Antenna	TESEQ	CBL 6112D	23189	07/06/2008
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R
RF Switch	ANRITSU	MP59B	M76890	N.C.R
Site NSA	CCS	N/A	N/A	08/10/2008
Test S/W	LabVIEW 6.1 (CCS OATS EMI SW V2.6)			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

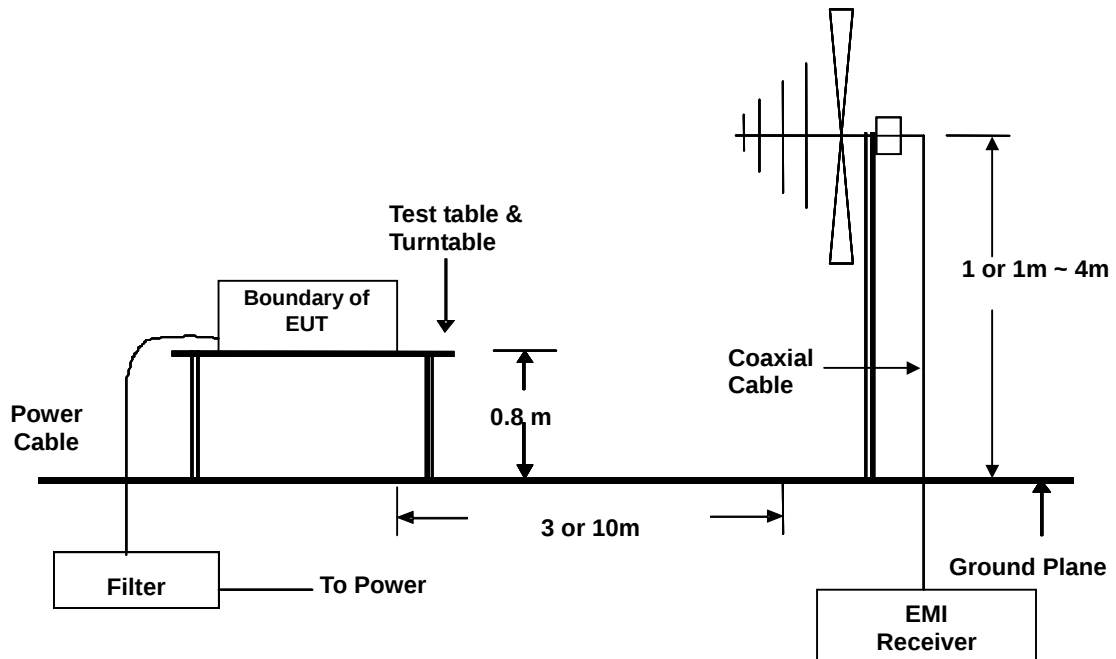
7.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-031)**Procedure of Preliminary Test**

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 or 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

7.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.5. DATA SAMPLE:

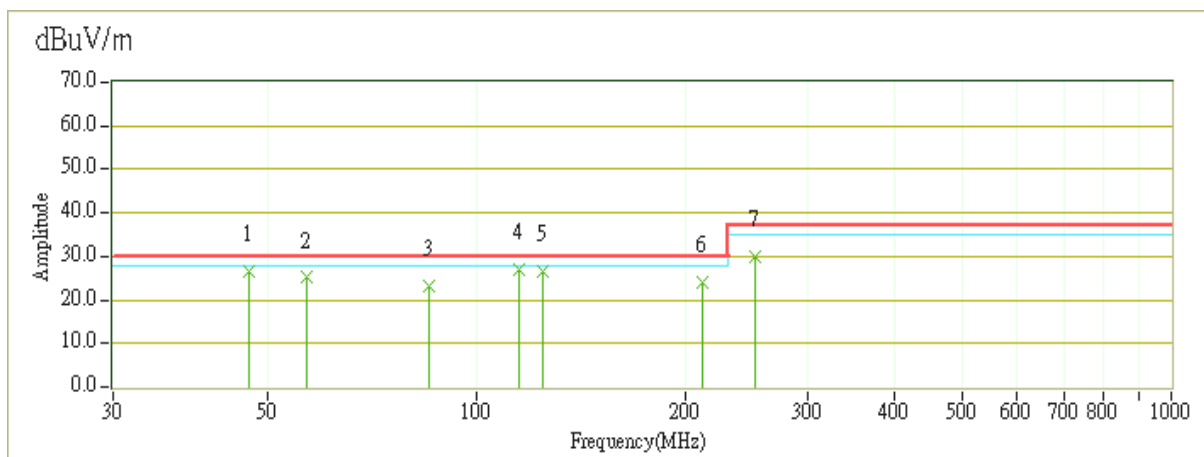
Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
xx.xx	16.49	9.86	26.35	30.00	-3.65	116.00	101.00	QP

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
 Q.P. = Quasi-Peak

7.6. TEST RESULTS

CCS Radiated Test OATS 2

Job No.:	71105004	Ant. Polar.:	Ver.
Standard:	EN 55022 Class B	Tested Distance:	10m
Test Item:	Radiated Emission	Date:	2007/10/16
Temp.(°C)/Hum.(%RH):	26°C/55%RH	Time:	AM 10:47
Company:	MSTronic CO., LTD.	Tested By:	Alex Tsai
Model:	MIT-07T-2448	Test Mode:	1

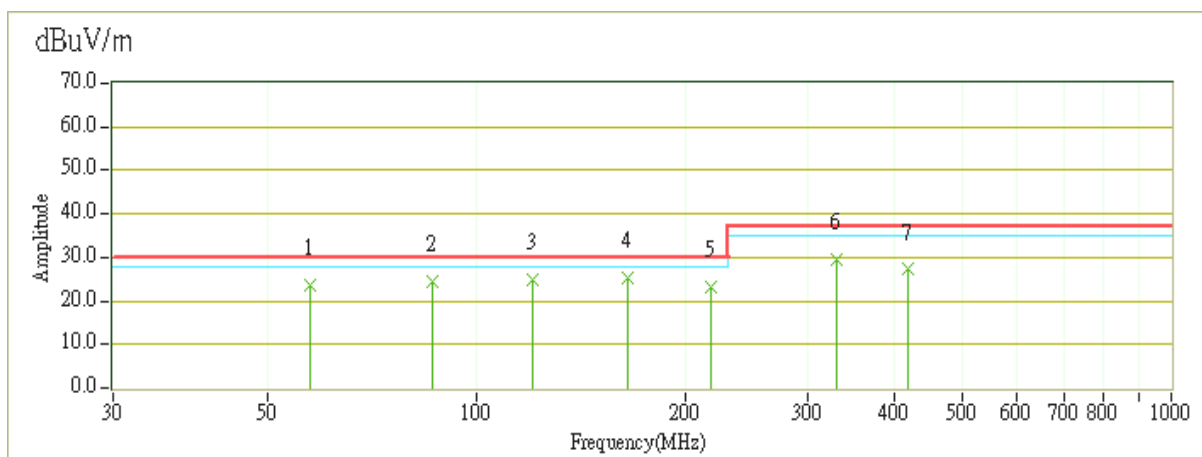


No.	Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	47.11	15.67	10.83	26.50	30.00	-3.50	183.00	100.00	Peak
2	57.11	17.73	7.37	25.10	30.00	-4.90	202.00	100.00	Peak
3	85.30	13.58	9.69	23.27	30.00	-6.73	162.00	100.00	Peak
4	114.89	13.44	13.66	27.10	30.00	-2.90	59.00	100.00	Peak
5	124.32	12.79	13.93	26.72	30.00	-3.28	167.00	100.00	Peak
6	211.60	12.39	11.53	23.92	30.00	-6.08	195.00	100.00	Peak
7	251.70	14.27	15.73	30.00	37.00	-7.00	269.00	100.00	Peak

REMARKS: The other emission levels were very low against the limit.

CCS Radiated Test OATS 2

Job No.:	71105004	Ant. Polar.:	Hor.
Standard:	EN 55022 Class B	Tested Distance:	10m
Test Item:	Radiated Emission	Date:	2007/10/16
Temp.(°C)/Hum.(%RH):	26°C/55%RH	Time:	AM 10:41
Company:	MSTronic CO., LTD.	Tested By:	Alex Tsai
Model:	MIT-07T-2448	Test Mode:	1



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	57.76	16.59	7.18	23.77	30.00	-6.23	221.00	400.00	Peak
2	86.26	14.68	9.89	24.57	30.00	-5.43	88.00	400.00	Peak
3	120.56	10.69	14.03	24.72	30.00	-5.28	156.00	352.00	Peak
4	164.99	13.86	11.64	25.50	30.00	-4.50	137.00	352.00	Peak
5	217.74	11.73	11.44	23.17	30.00	-6.83	218.00	352.00	Peak
6	330.30	11.59	18.01	29.60	37.00	-7.40	300.00	297.00	Peak
7	417.68	7.14	20.06	27.20	37.00	-9.80	161.00	297.00	Peak

REMARKS: The other emission levels were very low against the limit.

8 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST

