



STC (Dongguan) Company Limited
EC VERIFICATION OF COMPLIANCE

Reference Number: EMC-D110736VOC

Applicant: Precision Mastech Enterprises(Hong Kong) Limited
Room 1708-1709, Hewlett Centre, 54 Hoi Yuen Road, Kwun Tong,
Kowloon, Hong Kong

Description: Digital Multimeter
Brand Name: Mastech
Model: MS8229

We verify that the mentioned product complies with the requirements of the
EC Council Directive on electromagnetic compatibility 2004/108/EC

Applicable Standard(s) with amendments:

EN61326-1:2006
EN61326-2-1: 2006

General Remarks:

This verification confirmation is only valid when used in conjunction with the technical file(s) refers to DM104922.

This document applies specifically to the sample(s) investigated in the technical report mentioned above, and not to the bulk.

The CE marking as shown below can be affixed on the product after preparation of necessary conformity documentation, as stipulated in Articles of the Council Directive 2004/108/EC.



Test Laboratory

LONG Yun Jie
Authorized Signatory
ElectroMagnetic Compatibility
For and on behalf of
STC (Dongguan) Company Limited



www.dgstc.org

Date of Issue: 2011-03-17



DAT-PL-294/09-00

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Applicant(C00513): Precision Mastech Enterprises(Hong Kong) Limited
Room 1708-1709, Hewlett Centre, 54 Hoi Yuen Road, Kwun
Tong, Kowloon, Hong Kong

Description of Sample(s): Submitted sample(s) said to be
Product: Digital Multimeter
Brand Name: Mastech
Model Number: MS8229

Date Sample(s) Received: 2011-03-09

Date Tested: 2011-03-14

Investigation Requested: Test for compliance with EMC requirements of
EN61326-1, EN61326-2-1.

Conclusion(s): The submitted product COMPLIED with the requirements of
EN61326-1:2006, EN61326-2-1: 2006. The EMC tests were
performed in accordance with the standards described above
and on Section 2.2 in this Test Report.

Remark(s): ---

LONG Yun Jian
Authorized Sign
ElectroMagnetic Compatibility
For and on behalf of
STC (Dongguan) Company Limited



STC (Dongguan) Company Limited

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Appendix A

List of Measurement Equipment

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Appendix B

Photograph(s) of Product
Front View of The Product
Rear View of The Product
Inner Circuit Top View
Inner Circuit Bottom View
Test Set Up

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1.1 Equipment Under Test [EUT]
Description of Sample(s)

Product:	Digital Multimeter
Manufacturer:	Dongguan Huayi Mastech Co., Ltd Yuliangwei Industrial Area, Qingxi Town, Dongguan, China
Brand Name:	Mastech
Model Number:	MS8229
Rating:	4.5Vd.c. ("AAA" size battery×3)

1.2 Date of Order

2011-03-09

1.3 Submitted Sample(s):

1 Sample

1.4 Test Duration

2011-03-14

1.5 Country of Origin

China

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2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference [EMI] & ElectroMagnetic Susceptibility [EMS] tests for CE Marking

2.2 Test Standards and Results Summary Tables

Test Standards	
EN61326-1: 2006	Electrical equipment for measurement, control and laboratory use - EMC requirements
EN61326-2-1: 2006	Electrical equipment for measurement, control and laboratory use - EMC requirements -- Part 2-1: Particular requirements - Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications

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2.2 Test Standards and Results Summary Tables

EMISSION Results Summary					
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result	
				Pass	Failed
Radiated Emission, 30MHz to 1GHz	EN61326-1: 2006	CISPR 11: 2004 +A2:2006	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>

IMMUNITY Results Summary					
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result	
				Pass	Failed
Electrostatic Discharge	EN61326-1: 2006 EN61326-2-1:2006	EN61000-4-2: 1995 +A1:1998 +A2:2001	Cont: $\pm 2.0\text{kV}$, $\pm 4.0\text{kV}$ Air: $\pm 2.0\text{kV}$, $\pm 4.0\text{kV}$, $\pm 8.0\text{kV}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Immunity, 80MHz to 1000MHz 1400MHz to 2700MHz	EN61326-1: 2006 EN61326-2-1:2006	EN61000-4-3: 2002	1V/m 3V/m	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Remark:
N/A: Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30MHz to 1000MHz)

Test Requirement: EN61326-1: 2006
Test Method: CISPR 11
Level: Class B

Test Date(s): 2011-03-14

Mode of Operation: Detect mode(Light) / Detect mode(Resistance) / Detect mode(Sound) / Detect mode(Voltage)

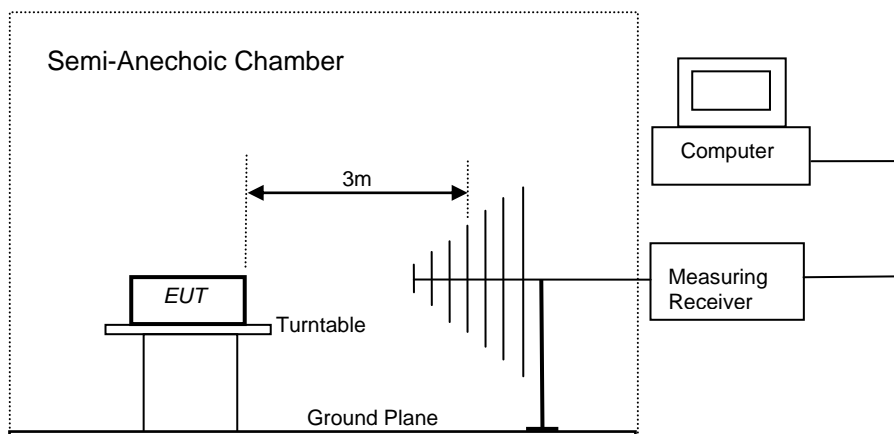
Test Method:

The test was performed in accordance with CISPR 11 at 3m test distance on a standard radiated emission test site, with quasi-peak measurements performed if the maximised peak measurements were less than 6dB from the corresponding Class B limit lines.

Test Procedure:

The EUT is a digital multimeter, the test was conducted during the detect(light) / detect(resistance) / detect (sound) / detect (voltage) function to simulate the normal usage as well as to produce the maximum electromagnetic disturbances.

Test Setup:



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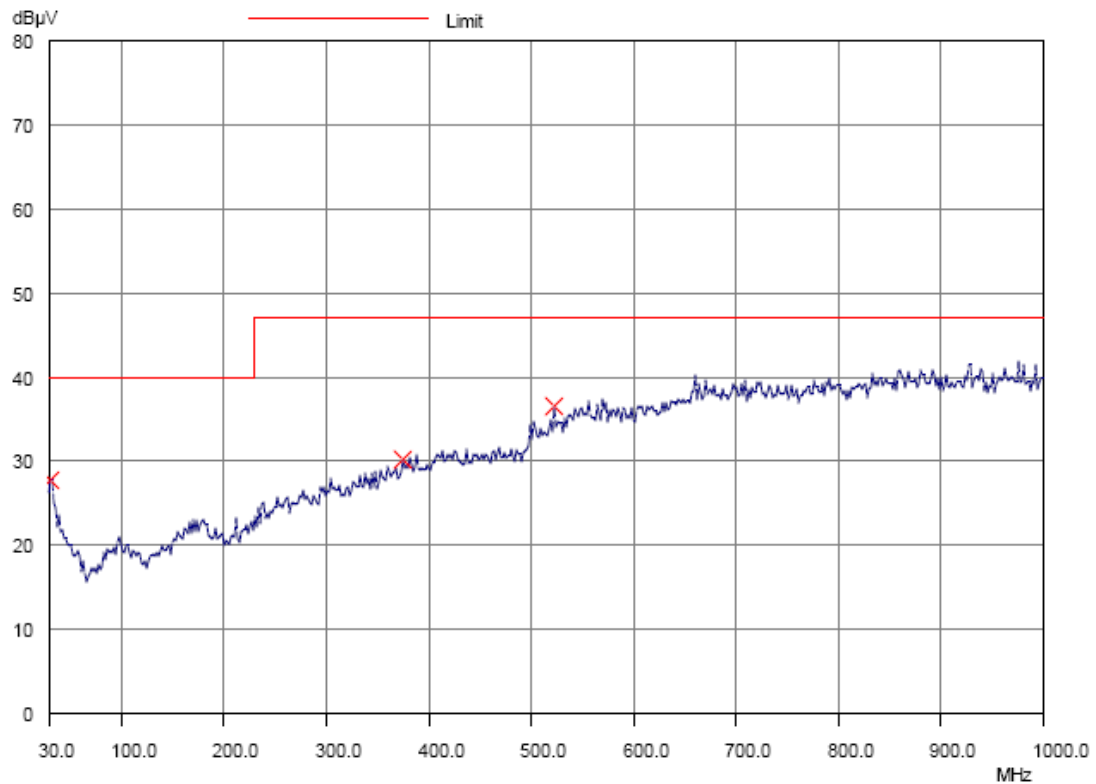
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Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Light): PASS
 Please refer to the following table for result details

Horizontal



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
30.1	27.9	40	-12.1	Horizontal
374.8	30.4	47	-16.6	Horizontal
522.2	36.6	47	-10.4	Horizontal

Remark:
 Calculated measurement uncertainty: 4.6dB

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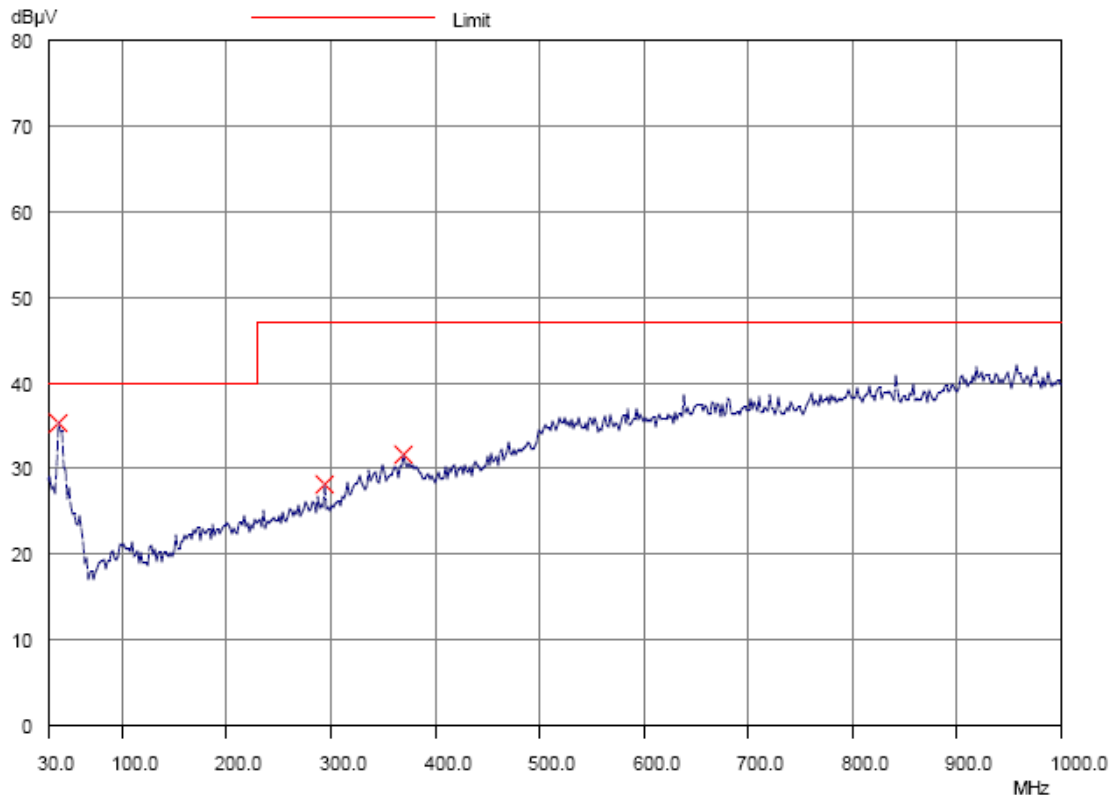
Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Light): **PASS**

Please refer to the following table for result details

Vertical



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
38.5	35.4	40	-4.6	Vertical
295.3	28.2	47	-18.8	Vertical
371.1	31.6	47	-15.4	Vertical

Remark:

Calculated measurement uncertainty: 4.6dB

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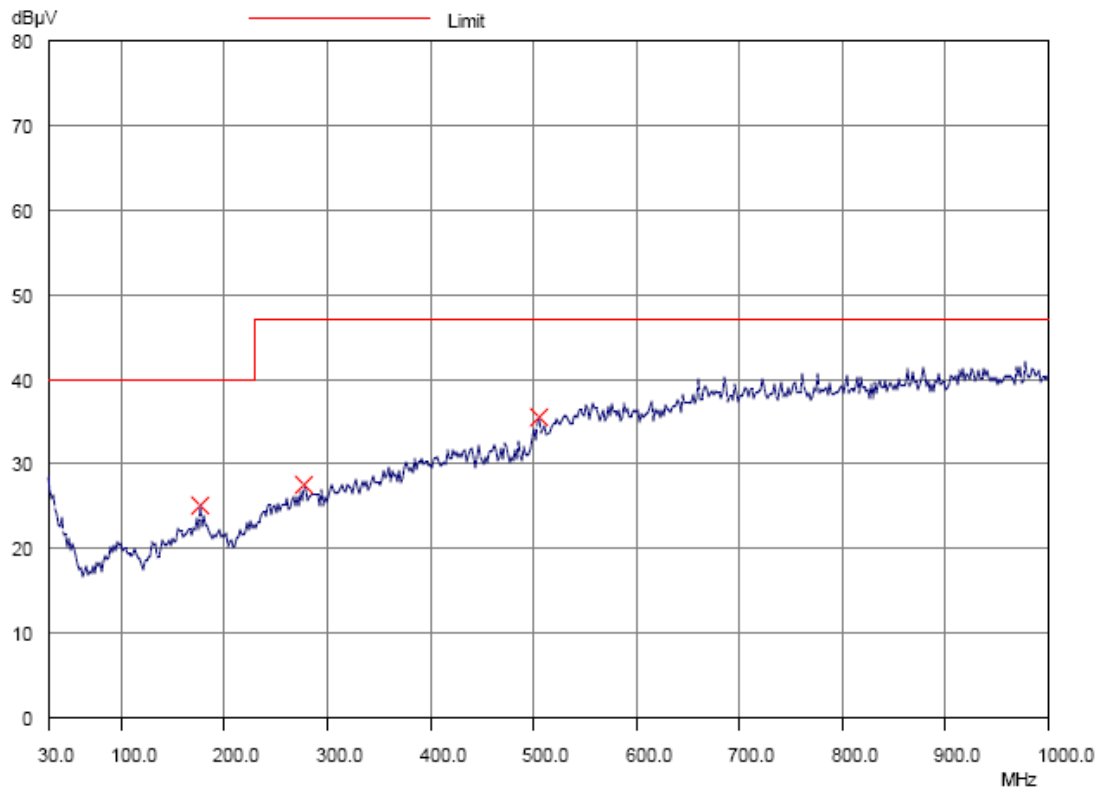
Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Resistance): PASS

Please refer to the following table for result details

Horizontal



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
177.7	25.1	40	-14.9	Horizontal
278.2	27.6	47	-19.4	Horizontal
506.9	35.7	47	-11.3	Horizontal

Remark:

Calculated measurement uncertainty: 4.6dB

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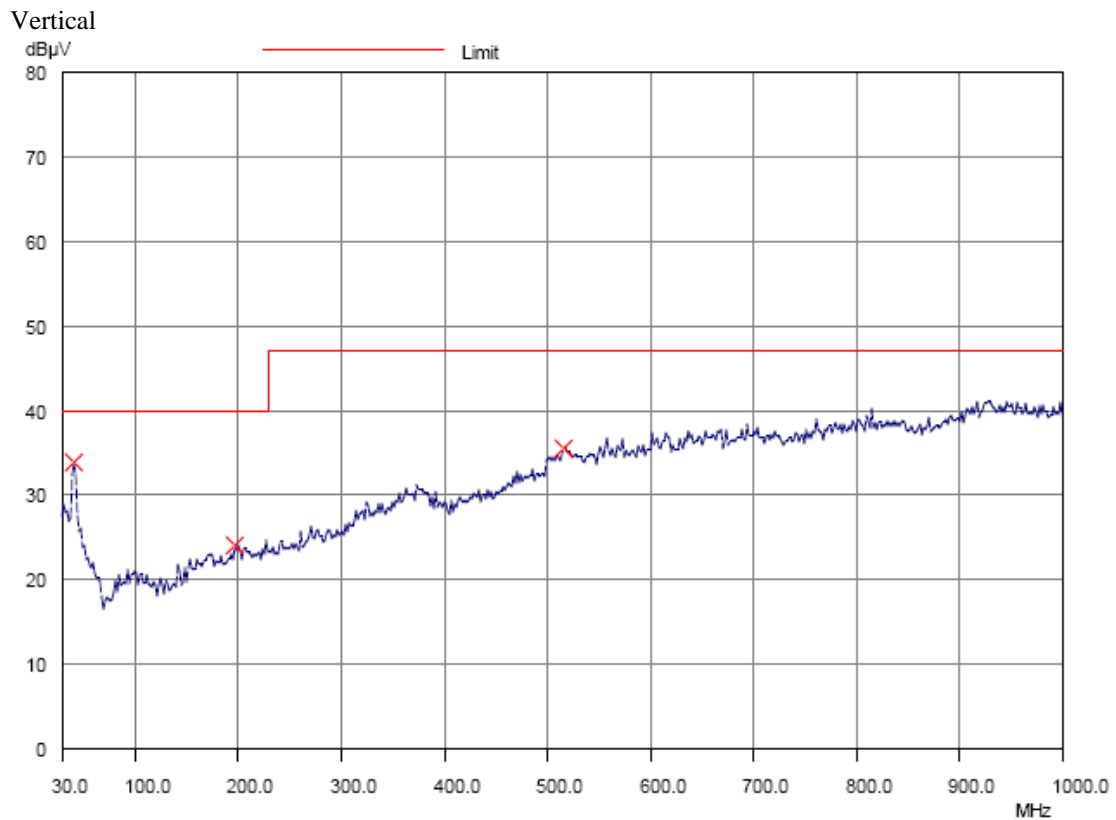
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Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Resistance): PASS

Please refer to the following table for result details



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
41.7	33.9	40	-6.1	Vertical
196.6	24.2	40	-15.8	Vertical
515.1	35.5	47	-11.5	Vertical

Remark:

Calculated measurement uncertainty: 4.6dB

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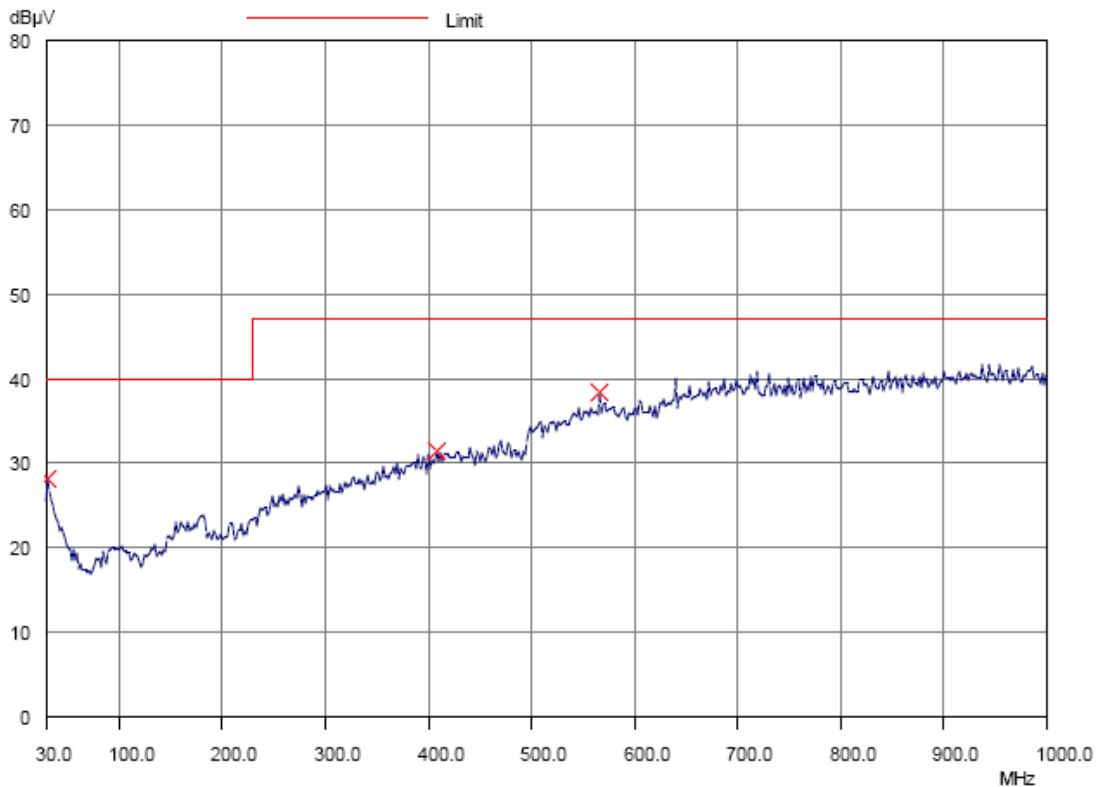
Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Sound): PASS

Please refer to the following table for result details

Horizontal



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
30.1	28.1	40	-11.9	Horizontal
408.7	31.6	47	-15.4	Horizontal
565.6	38.4	47	-8.6	Horizontal

Remark:

Calculated measurement uncertainty: 4.6dB

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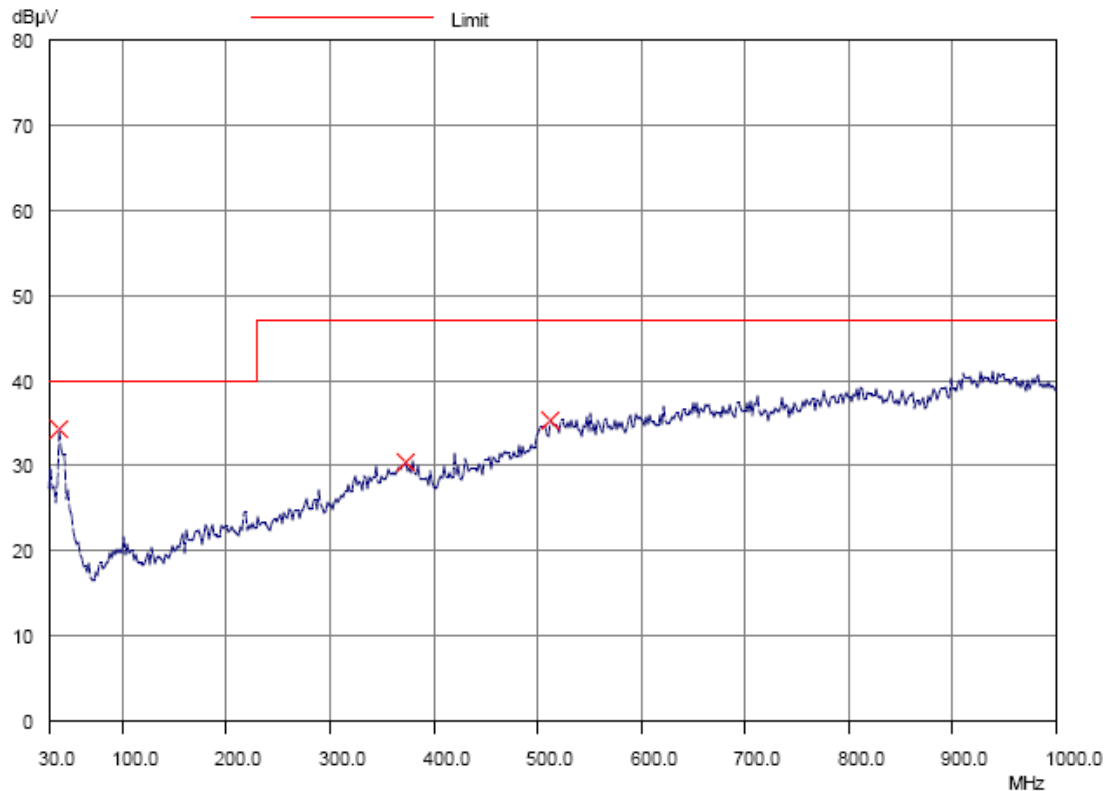
Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Sound): PASS

Please refer to the following table for result details

Vertical



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
38.5	34.3	40	-5.7	Vertical
374.0	30.5	47	-16.5	Vertical
513.0	35.5	47	-11.5	Vertical

Remark:

Calculated measurement uncertainty: 4.6dB

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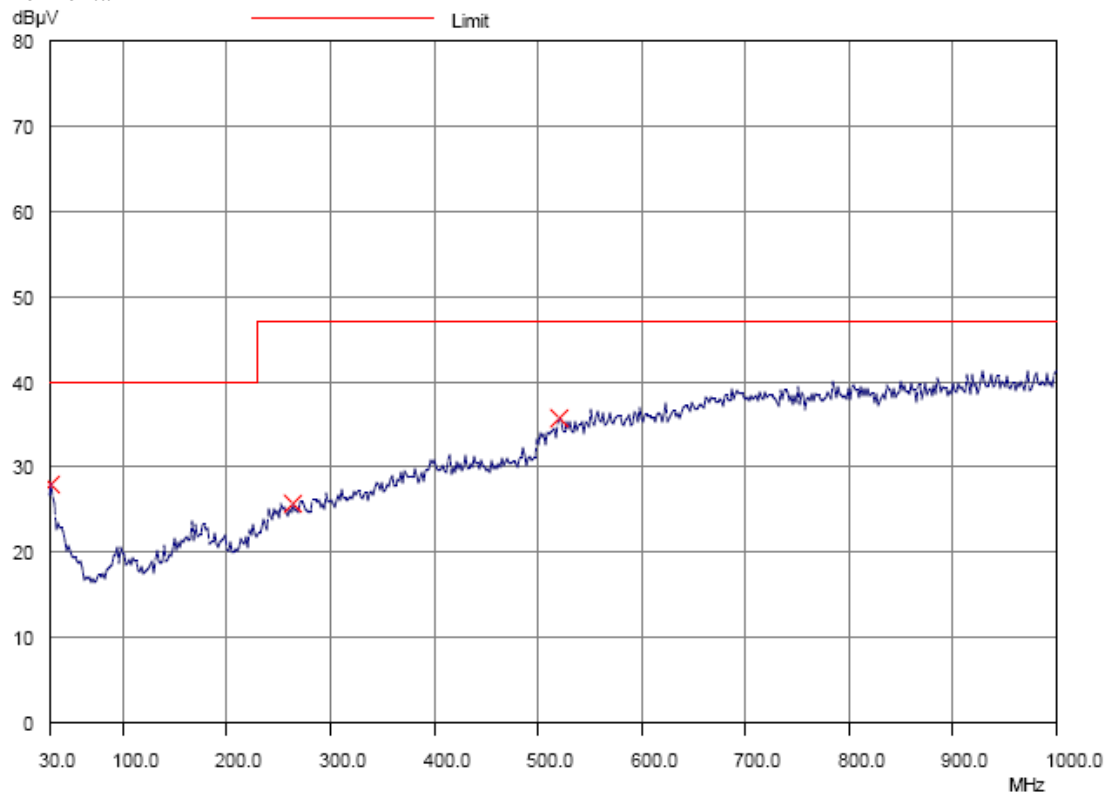
Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Voltage): PASS

Please refer to the following table for result details

Horizontal



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
30.1	28.0	40	-12.0	Horizontal
264.4	25.7	47	-21.3	Horizontal
520.0	35.8	47	-11.2	Horizontal

Remark:

Calculated measurement uncertainty: 4.6dB

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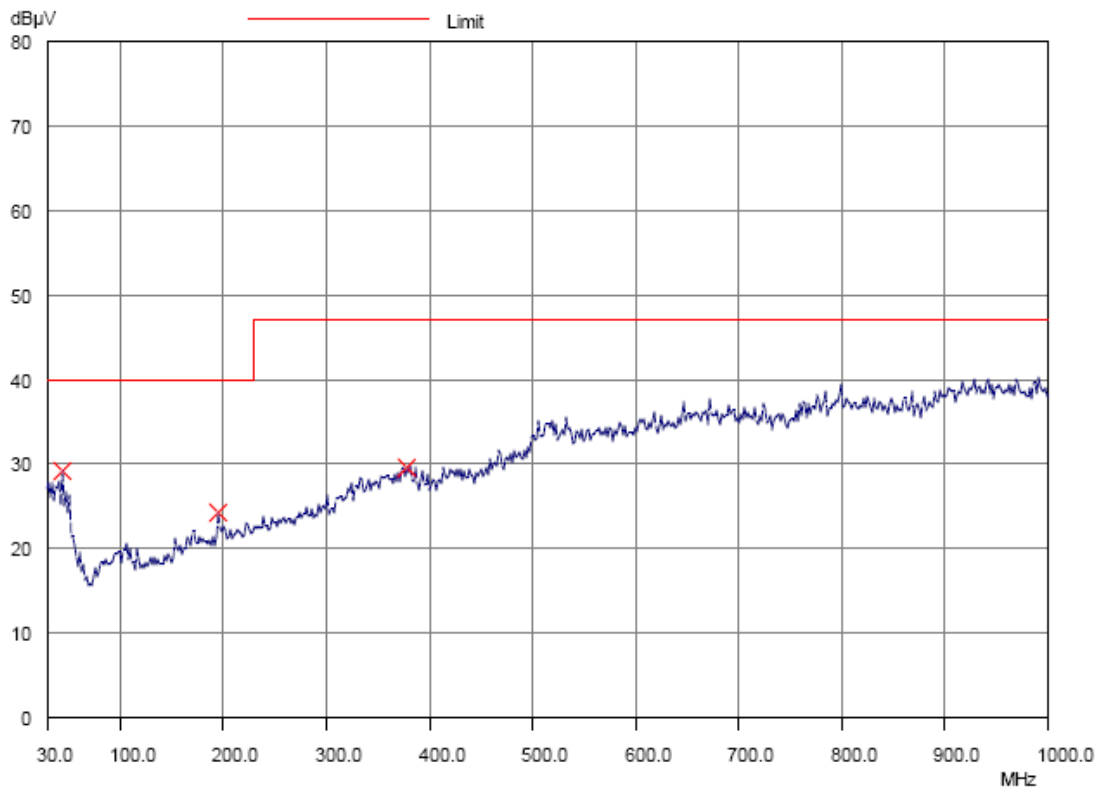
Limits for Radiated Emission:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]
30-230	40.0
230-1000	47.0

Results of Detect mode(Voltage): **PASS**

Please refer to the following table for result details

Vertical



The quasi-peak measurements were recorded as follows:

Frequency MHz	Level @3m dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
44.3	29.2	40	-10.8	Vertical
196.3	24.4	40	-15.6	Vertical
379.4	29.7	47	-17.3	Vertical

Remark:

Calculated measurement uncertainty: 4.6dB

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3.2 Immunity

3.2.1 Susceptibility Performance Criteria

A	Normal performance within the specification limits
B	Temporary degradation or loss of function or performance which is self-recoverable
C	Temporary degradation or loss of function or performance which requires operator intervention or system reset
D	Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

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3.2.2 Electrostatic Discharge

Test Requirement: EN61326-1, EN61326-2-1
Test Method: EN 61000-4-2
Severity: ±2kV, ±4kV for Direct & Indirect Contact Discharge
±2kV, ±4kV, ±8kV for Air Discharge

Performance Criterion Requirement: B

Temperature: 22 °C
Humidity: 54 %
Atmospheric Pressure: 101 kPa

Test Date(s): 2011-03-14

Mode of Operation: Detect mode(Light) / Detect mode(Resistance) /
Detect mode(Sound) / Detect mode(Voltage)

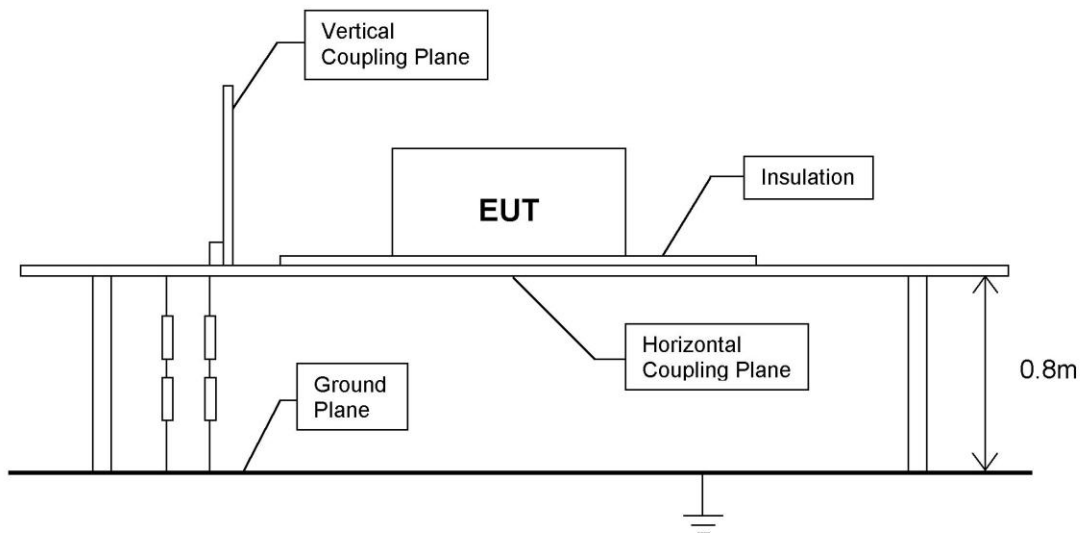
Test Method:

The test was performed in accordance with EN 61000-4-2.

Test Procedure:

The EUT is a digital multimeter, the test was conducted during the detect(light) / detect(resistance) / detect (sound) / detect (voltage) function to simulate the normal usage specified by the manufacturer.

Test Setup:



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Severity Levels for Electrostatic Discharge:

Level	Test Voltage Direct & Indirect Contact Discharge	Test Voltage Air Discharge
1	±2kV	±2kV
2	±4kV	±4kV
3	±6kV	±8kV
4	±8kV	±15kV

Results of Detect mode(Light) / Detect mode(Resistance) / Detect mode(Sound) / Detect mode(Voltage):

Pass

Please refer to the following table for individual results.

Location	Discharge Method	Test Voltage	Individual Results	
			Pass	Failed
HCP [Horizontal Coupling Plane]	Indirect Contact	±2kV, ±4kV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VCP [Vertical Coupling Plane]	Indirect Contact	±2kV, ±4kV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Screw(s)×1	Direct Contact	±2kV, ±4kV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Metal	Direct Contact	±2kV, ±4kV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Button	Air	±2kV, ±4kV, ±8kV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Display	Air	±2kV, ±4kV, ±8kV	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gap	Air	±2kV, ±4kV, ±8kV	<input checked="" type="checkbox"/>	<input type="checkbox"/>

***EUT Grounding	<input type="checkbox"/> Grounded	<input checked="" type="checkbox"/> Ungrounded
------------------	-----------------------------------	--

Remarks:

***For ungrounded EUT, the charge on the EUT shall be removed prior to each applied ESD pulse
Calculated measurement uncertainty: 7.1%

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3.2.3 Radiated Immunity [80MHz to 2700MHz]

Test Requirement: EN61326-1, EN61326-2-1
Test Method: EN 61000-4-3
Severity: Level 1 [1V/m]
Level 2 [3V/m]
Modulation: 80% 1kHz AM

Performance Criterion Requirement: A

Temperature: 21 °C
Humidity: 53 %

Test Date(s): 2011-03-14

Mode of Operation: Detect mode(Light) / Detect mode(Resistance) / Detect mode(Sound) / Detect mode(Voltage)

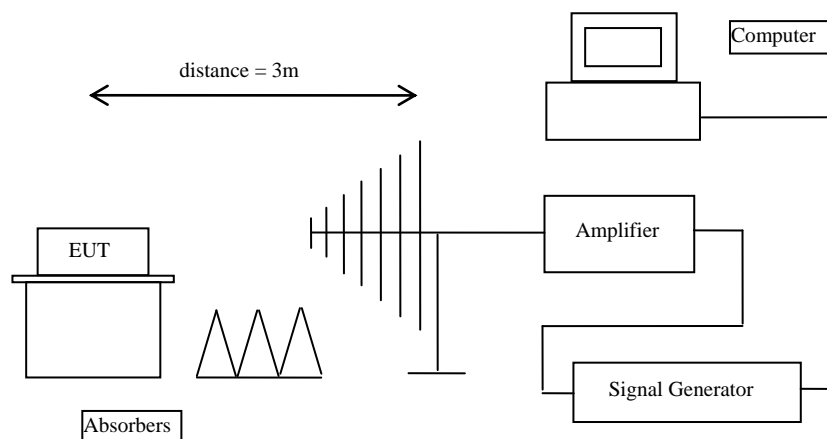
Test Method:

The test was performed in accordance with EN 61000-4-3.

Test Procedure:

The EUT is a digital multimeter, the test was conducted during the detect(light) / detect(resistance) / detect (sound) / detect (voltage) function to simulate the normal usage specified by the manufacturer.

Test Setup:



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Severity Levels for Radiated Immunity:

Level	Field Strength [V/m]
1	1
2	3
3	10

**Results of Detect mode(Light) / Detect mode(Resistance) /
Detect mode(Sound) / Detect mode(Voltage):**

Pass

Please refer to the following table for individual results.

Frequency (MHz)	Face of EUT	E-Field Polarity	Field Strength (V/m)	Dwell Time (sec.)	Frequency Step (%)	Individual Results	
						Pass	Failed
80-1000	0°	Horizontal	3	1	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1400-2000	0°	Horizontal	3	1	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2000-2700	0°	Horizontal	1	1	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
80-1000	0°	Vertical	3	1	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1400-2000	0°	Vertical	3	1	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2000-2700	0°	Vertical	1	1	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Remarks:

The dwell time at each frequency is according to the standard being applied and the basic standard
Calculated measurement uncertainty: 1.74dB

*******End of Test Report*******

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APPENDIX A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EMD022	EMI Test Receiver	ROHDE & SCHWARZ	ESCS 30	100314	2010.03.16
EMD061	Biconilog Antenna	ETS.LINDGREN	3142C	00060439	2010.11.20
EMD084	MULTI-DVICE CONTROLLER	ETS.LINDGREN	2090	00060107	N/A
EMD088	Video Contol Unit	ETS.LINDGREN	Y21953A	2601073	N/A
EMD093	Monitor	ViewSonic	VA9036	Q8X064201876	N/A
EMD102	Intelligent Frequency	Ainuo Instrument Co., Ltd	AN97005SS	79707454	N/A
EMD105	FACT-3 EMC Chamber	ETS.LINDGREN	FACT-3	3803	N/A

Electro Static Discharge

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EMD007	HIGH VOLTAGE OUTPUT ±30KV MAX	KIKUSUI	KES4021	LG001717	2010.07.29
EMD034	Dehumidifier	Kawasima electrical appliance Co.,Ltd	DH-820H	N/A	N/A
EMD100	Thermohygrograph	SATO KEIRYOKI MFG.CO.,LTD.	7210-00	1633581	2010.07.30
EMD109	BAROGRAPH	SATO KEIRYOKI MFG.CO.,LTD.	NSII-BQ	567719	2010.12.31

Radiated Field Immunity

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EMD111	Power meter	ROHDE & SCHWARZ	NRVD	102051	2010.03.16
EMD037	Signal Generator	ROHDE & SCHWARZ	SML03	102947	2010.07.16
EMD060	Biconilog Antenna	ETS.LINDGREN	3142C	00060445	2010.10.16
EMD063	Power Amplifier	BONN ELEKTRONIK	BLWA0840- 50/30D	066454B	2010.03.16
EMD064	Power Amplifier	BONN ELEKTRONIK	BLWA0810- 250/100D	066454A	2010.03.16

Remark:

N/A Not Applicable

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APPENDIX B

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PHOTOGRAPH (S) OF PRODUCT

Front View of The Product



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APPENDIX B

PHOTOGRAPH (S) OF PRODUCT

Rear View of The Product



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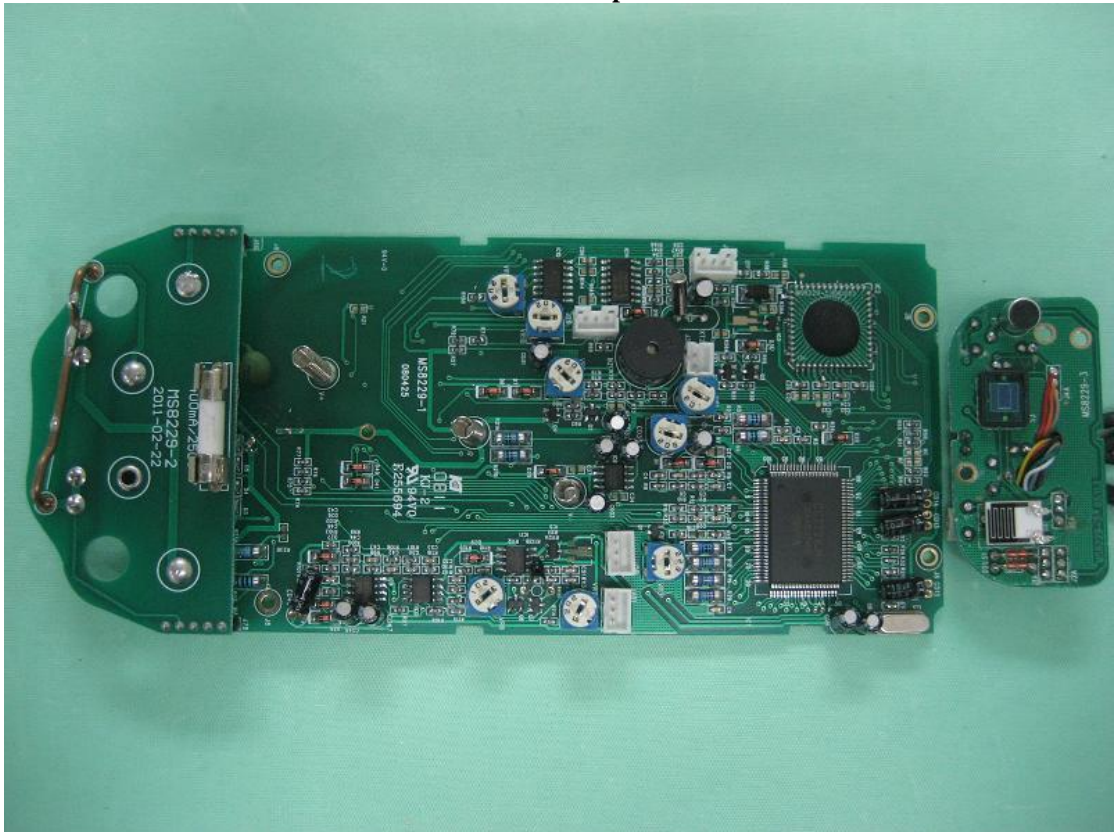
No.: DM104922

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APPENDIX B

PHOTOGRAPH (S) OF PRODUCT

Inner Circuit Top View



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APPENDIX B

PHOTOGRAPH (S) OF PRODUCT

Inner Circuit Bottom View



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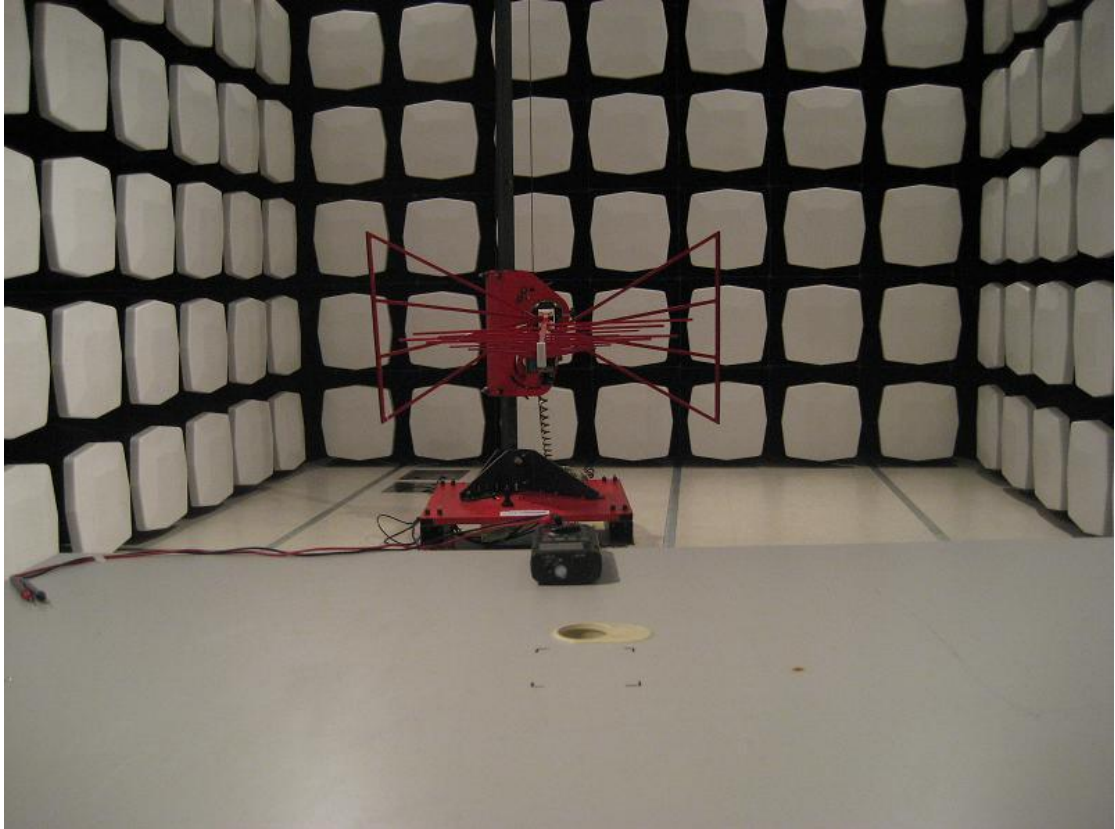
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APPENDIX B

PHOTOGRAPH (S) OF PRODUCT

Radiated Emissions Test Set Up



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APPENDIX B

PHOTOGRAPH (S) OF PRODUCT

Electro Static Discharge Test Set Up



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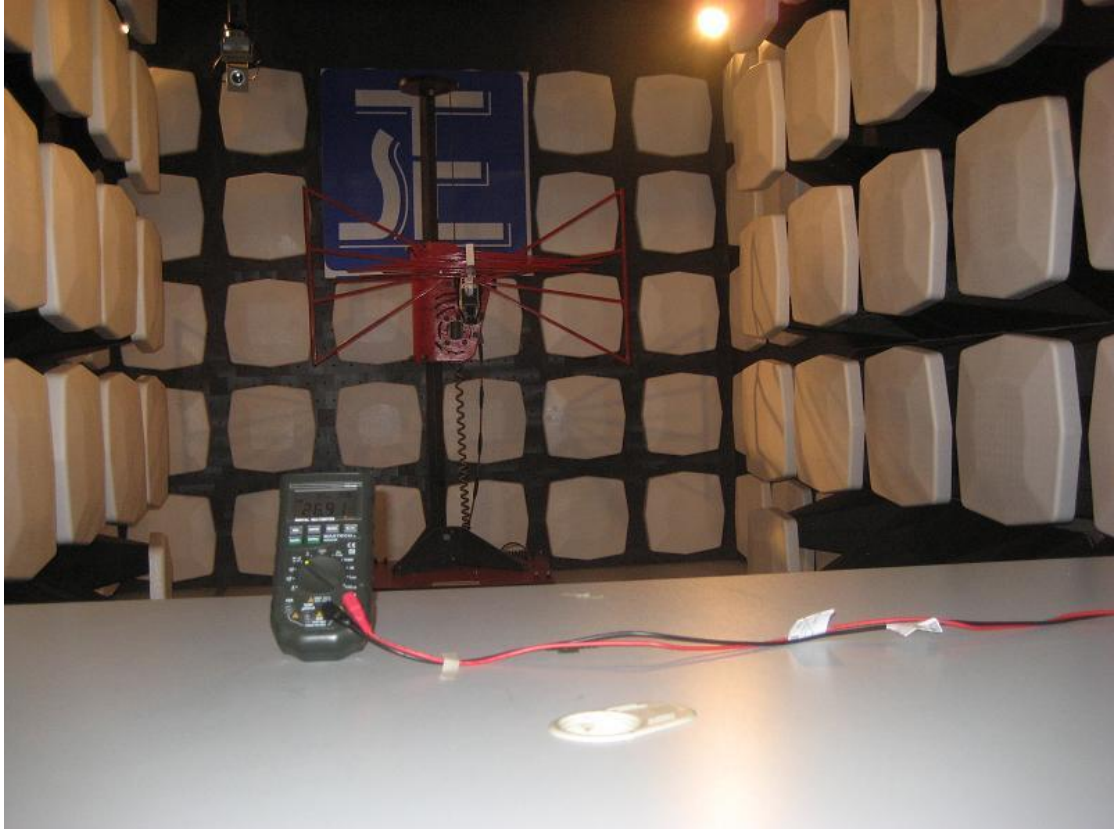
No.: DM104922

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APPENDIX B

PHOTOGRAPH (S) OF PRODUCT

Radiated Immunity Test Set Up



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