EMC Test Report

Product Type	:	Smart Meter
Applicant	:	ICP DAS CO., LTD.
Address	:	No. 111, Guangfu N. Rd., Hukou Township, Hsinchu County 30351, Taiwan, R.O.C.
Trade Name	:	ICP DAS
Model Number	:	PM-31zz-xxx-yyyy / PM-31zz-xxxP-yyyy / PM-31zzP-yyyy (zz can be 33 or 12 or 14 ; xxx can be 100 , 160, 240, or 360 ; yyyy can be -CAN,-CPS,-MTCP or blank)
Test Specification	:	EN 55022: 2010 +AC:2011 / Class A EN 55024: 2010 EN 61000-3-2: 2006 +A1:2009 + A2: 2009 EN 61000-3-3: 2013 EN 61000-4-2:2009 EN 61000-4-3:2006 +A1:2008 +A2:2010 EN 61000-4-4:2012 EN 61000-4-5:2006 EN 61000-4-6:2009 EN 61000-4-8:2010 EN 61000-4-11:2004
Receive Date	:	Aug. 28, 2014
Test Period	:	Sep. 01 ~ 23, 2014
Issue Date	:	Sep. 29, 2014

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade City,
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Taiwan Accreditation Foundation accreditation number: 1330

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Sep. 29, 2014	Initial Issue	

Verification of Compliance

Issued Date: 09/29/2014

Product Type	:	Smart Meter
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Trade Name	:	ICP DAS
Model Number	:	PM-31zz-xxx-yyyy / PM-31zz-xxxP-yyyy / PM-31zzP-yyyy (zz can be 33 or 12 or 14 ; xxx can be 100 , 160, 240, or 360 ; yyyy can be -CAN,-CPS,-MTCP or blank)
EUT Rated Voltage	:	AC 100-250V, 50-60Hz, 2.0A
Test Voltage	:	230 Vac / 50 Hz
Applicable Standard	:	EN 55022:2010 +AC:2011 / Class A EN 55024:2010 EN 61000-3-2:2006+A1:2009+A2:2009 EN 61000-3-3:2013 EN 61000-4-2:2009 EN 61000-4-3:2006 +A1:2008 +A2:2010 EN 61000-4-4:2012 EN 61000-4-5:2006 EN 61000-4-6:2009 EN 61000-4-8:2010 EN 61000-4-11:2004
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade City, Taoyuan County 334, Taiwan R.O.C. Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

The above equipment has been tested by A Test Lab Techno Corp., and found compliance with the requirements set forth in the Electromagnetic Compatibility Directive 2004/108/EC and 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	:	Roy Chen	Reviewed By	:	Frank Lin
(Manager)		(Roy Chen)	(Testing Engineer)		(Frank Lin)

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1 General Information

1.1. Summary of Test Result

Emission			
Standard	Item	Result	Remark
EN 55022:2010 +AC:2011	Conducted Emission	PASS	Meet Class A limit
EN 55022: 2010+AC:2011	Radiated Emission	PASS	Meet Class A limit
EN 61000-3-2: 2006 +A1:2009 + A2: 2009	Harmonic current emissions	N/A	EUT power <75W so do not test.
EN 61000-3-3: 2013	Voltage fluctuations & flicker	PASS	Meets the requirements

Immunity			
Standard	Item	Result	Remark
EN 61000-4-2:2009	ESD	PASS	Meets the requirements of Criterion B
EN 61000-4-3:2006 +A1:2008 +A2:2010	RS	PASS	Meets the requirements of Criterion A
EN 61000-4-4:2012	EFT	PASS	Meets the requirements of Criterion B
EN 61000-4-5:2006	Surge	PASS	Meets the requirements of Criterion B
EN 61000-4-6:2009	CS	PASS	Meets the requirements of Criterion A
EN 61000-4-8:2010	PMF	PASS	Meets the requirements of Criterion A
EN 61000-4-11:2004	Voltage dips & voltage variations	PASS	Meets the requirements of Voltage Dips: 1) >95% reduction Criterion B 2) 30% reduction Criterion C Voltage Interruptions: 1) >95% reduction Criterion C

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2. Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.02 dB.

Conducted Emissions (Telecommunication Ports)

The measurement uncertainty is evaluated as ± 2.02 dB.

Radiated Emission

The Vertical measurement uncertainty of 30MHz - 1GHz is evaluated as ± 3.62 dB.

The Horizontal measurement uncertainty of 30MHz - 1GHz is evaluated as ± 3.98 dB.

The Vertical measurement uncertainty of 1GHz - 6GHz is evaluated as ± 3.07 dB.

The Horizontal measurement uncertainty of 1GHz - 6GHz is evaluated as ± 3.11 dB.

Harmonic Current Emission

The measurement uncertainty is evaluated as ± 1.2 %.

Voltage Fluctuations and Flicker

The measurement uncertainty is evaluated as ± 1.5 %.

Electrostatic Discharge

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025: 2005[E], the requirements for measurement uncertainty in ESD testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant ESD standards. The immunity test signal from the ESD system meet the required specifications in IEC 61000-4-2 through the calibration report with the calibrated uncertainty for the waveform of voltage and timing as being 1.52 % and 2.69%.

Radiated susceptibility

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025: 2005[E], the requirements for measurement uncertainty in RS testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant RS standards. The immunity test signal from the RS system meet the required specifications in IEC 61000-4-3 through the calibration for the uniform field strength and monitoring for the test level with the uncertainty evaluation report for the electrical filed strength as being 2.65 dB.

Electrical fast transient/burst

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025: 1999[2], the requirements for measurement uncertainty in EFT/Burst testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant FT/Burst standards. The immunity test signal from the FT/Burst system meet the required specifications in IEC 61000-4-4 through the calibration report with the calibrated uncertainty for the waveform of voltage. Frequency and timing as being 1.57% and 2.73%.

Surge

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025: 2005[E], the requirements for measurement uncertainty in Surge testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant Surge standards. The immunity test signal from the Surge system meet the required specifications in IEC 61000-4-5 through the calibration report with the calibrated uncertainty for the waveform of voltage and timing as being 1.58 % and 2.71%.

Conducted susceptibility

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025: 2005[E], the requirements for measurement uncertainty in CS testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant CS standards. The immunity test signal from the CS system meet the required specifications in IEC 61000-4-6 through the calibration for unmodulated signal and monitoring for the test level with the uncertainty evaluation report for the injected modulated signal level through CDN and EM Clamp/Direct Injection as being 3.68 dB and 2.72 dB.

Power frequency magnetic field

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025: 2005[E], the requirements for measurement uncertainty in PFM testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant PFM standards. The immunity test signal from the PFM system meet the required specifications in IEC 61000-4-8 through the calibration report with the calibrated uncertainty for the Gauss Meter to verify the output level of magnetic field strength as being 1.8 %.

Voltage dips and interruption

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025: 2005[E], the requirements for measurement uncertainty in DIP testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant DIP standards. The immunity test signal from the DIP system meet the required specifications in IEC 61000-4-11 through the calibration report with the calibrated uncertainty for the waveform of voltage and timing as being 1.58 % and 2.72%.

2 EUT Description

Product Type	:	Smart Meter
Trade Name	:	ICP DAS
Model Number	:	PM-31zz-xxx-yyyy / PM-31zz-xxxP-yyyy / PM-31zzP-yyyy (zz can be 33 or 12 or 14 ; xxx can be 100 , 160, 240, or 360 ; yyyy can be -CAN,-CPS,-MTCP or blank) (*Those model numbers differ from each other in selling region.)
Applicant	:	ICP DAS CO., LTD. No. 111, Guangfu N. Rd., Hukou Township, Hsinchu County 30351, Taiwan, R.O.C.
Manufacturer	:	ICP DAS CO., LTD. No. 111, Guangfu N. Rd., Hukou Township, Hsinchu County 30351, Taiwan, R.O.C.

I/O Port Description：

I/O Port Types	Q'TY	Test Description
1). LAN Port	1	Connected to PC
2). D-SUB Port	1	Connected to PC
3). USB Port	1	Connected to PC
4). AC Power Port	1	Connected to AC input
5). DC Power Port	1	Connected to EUT
6). Signal Port	1	Connected to EUT

Feature of Equipment under Test：

The model listed below is series model to PM-3133-100.

Main	Software	Diversity	Mode 1
ET-7261	---	Ethernet I/O Module with 2-port Ethernet Switch, with 11-channels Relay	V
PET-7261	---	PoE Ethernet I/O Module with 2-port Ethernet Switch, with 11-channels Relay	
ET-6052D	---	8-channel Digital Output and 14-channel Digital Input	V
ET-6060D	---	8-channel Digital Output and 10-channel Digital Input	V
ET2-6064D	---	24-channel Relay Output	V
GPS-721	---	GPS Receiver and 1 DO, 1 PPS Output Module	
GPS-721-MRTU	---	GPS Receiver and 1 DO, 1 PPS Output Module includes a GPS Active External Antenna (ANT-115-03)	V
I-7014D	---	1-channe Transmitter Input with 7-segment LED Display using the DCON and Modbus Protocols	V
I-7014D-X	---	1-channe Transmitter Input with 7-segment LED Display using the DCON and Modbus Protocols (X：The Cover is mean any color)	
M-7014D	---	M-7014D with 7-segment LED Display	
M-7014D-X	---	M-7014D with 7-segment LED Display (X：The Cover is mean any color)	
I-7522	---	Embedded communication controller with one RS-485 and two RS-232	
I-7522D	---	I-7522 + LED display	V
I-7520U4	---	Isolated RS-232 to 4 Channels RS-485 Active Hub	V
I-7520U4-X	---	Isolated RS-232 to 4 Channels RS-485 Active Hub (X：The Cover is mean any color)	
I-7520U4-CA	---	I-7520U4-G CR with CA-0915 cable x 1	
I-7520U4-CA-X	---	I-7520U4-G CR with CA-0915 cable x 1 (X：The Cover is mean any color)	
I-7065A	---	4-channel Isolated Digital Input and 5-channel AC SSR Output Module using the DCON Protocol	
I-7065AD	---	I-7065A with LED Display	V
I-7066	---	7-channel Photo-Mos Relay Output Module with DCON Protocol	
I-7066-X	---	7-channel Photo-Mos Relay Output Module with DCON Protocol (X：The Cover is mean any color)	
I-7066D	---	I-7066 with LED Display	V
I-7066D-X	---	I-7066 with LED Display (X：The Cover is mean any color)	
M-7066P	---	7-channel Photo-Mos Relay Output Module with DCON and Modbus Protocols	
M-7066P-X	---	7-channel Photo-Mos Relay Output Module with DCON and Modbus Protocols (X：The Cover is mean any color)	
M-7066PD	---	M-7066P with LED Display	
M-7066PD-X	---	M-7066P with LED Display (X：The Cover is mean any color)	
I-7083	---	3-axis, 32 bits encoder counter	
M-7083	---	3-axis, 32 bits encoder counter with DCON and Modbus Protocols	
I-7083D	---	3-axis, 32 bits encoder counter with LED Display	V

Main	Software	Diversity	Mode 1
M-7083D	---	M-7083D with LED Display	
I-7083B	---	3-axis, 32 bits encoder counter	
I-7083BD	---	3-axis, 32 bits encoder counter with LED Display	V
I-7011	---	1-channel Thermocouple Input Module using the DCON Protocol	
I-7011-X	---	1-channel Thermocouple Input Module using the DCON Protocol (X：The Cover is mean any color)	
I-7011D	---	I-7011 with with 7-segment LED Display	
I-7011D-X	---	I-7011 with with 7-segment LED Display (X：The Cover is mean any color)	
I-7011P	---	1-channel Thermocouple Input Module using the DCON Protocol	
I-7011P-X	---	1-channel Thermocouple Input Module using the DCON Protocol (X：The Cover is mean any color)	
I-7011PD	---	I-7011P with 7-segment LED Display	
I-7011PD-X	---	I-7011P with 7-segment LED Display (X：The Cover is mean any color)	
M-7011	---	1-channel Thermocouple Input Module using the DCON and Modbus Protocols	
M-7011-X	---	1-channel Thermocouple Input Module using the DCON and Modbus Protocols (X：The Cover is mean any color)	
M-7011D	---	M-7011 with 7-segment LED Display	V
M-7011D-X	---	M-7011 with 7-segment LED Display (X：The Cover is mean any color)	
M-7019Z	---	10-channel Universal Analog Input Module	V
M-7019Z-X	---	10-channel Universal Analog Input Module (X：The Cover is mean any color)	
M-7019Z-G/S	---	10-channel Universal Analog Input Module Includes the M-7019Z module and a DB-1820 Daughter Board	
M-7019Z-G/S2	---	10-channel Universal Analog Input Module Includes the M-7019Z module, a DN-1822 Daughter Board and a 1.8 m Cable	
M-7026	---	6-channel Analog Input, 2-channel Analog Output, 3-channel Digital Input and 3-channel Digital Output Module using the DCON and Modbus Protocol	V
I-7041P	---	14-channel Isolated Digital Input Module with DCON Protocol	
I-7041P-X	---	14-channel Isolated Digital Input Module with DCON Protocol (X：The Cover is mean any color)	
I-7041PD	---	I-7041P with LED Display	
I-7041PD-X	---	I-7041P with LED Display (X：The Cover is mean any color)	
M-7041P	---	14-channel Isolated Digital Input Module with DCON and Modbus Protocol	
M-7041P-X	---	14-channel Isolated Digital Input Module with DCON and Modbus Protocol (X：The Cover is mean any color)	
M-7041PD	---	M-7041P with LED Display	V
M-7041PD-X	---	M-7041P with LED Display (X：The Cover is mean any color)	
M-7041-A5	---	14-channel High Voltage Isolated Digital Input Module with DCON and Modbus Protocol	

Main	Software	Diversity	Mode 1
M-7041-A5-X	---	14-channel High Voltage Isolated Digital Input Module with DCON and Modbus Protocol (X：The Cover is mean any color)	
M-7041D-A5	---	M-7041-A5 with LED Display	V
M-7041D-A5-X	---	M-7041-A5 with LED Display (X：The Cover is mean any color)	
I-7058	---	8-channel Isolated Digital Input Module using the DCON Protocol	
I-7058D	---	I-7058 with LED Display	
I-7058D-X	---	I-7058 with LED Display (X：The Cover is mean any color)	
M-7058	---	8-channel Isolated Digital Input Module using the DCON and Modbus Protocols	
M-7058D	---	M-7058 with LED Display	V
M-7058D-X	---	M-7058 with LED Display (X：The Cover is mean any color)	
I-7059	---	8-channel Isolated Digital Input Module using the DCON Protocol	
I-7059-X	---	8-channel Isolated Digital Input Module using the DCON Protocol (X：The Cover is mean any color)	
I-7059D	---	I-7059 with LED Display	
I-7059D-X	---	I-7059 with LED Display (X：The Cover is mean any color)	
M-7059	---	8-channel Isolated Digital Input Module using the DCON and Modbus Protocols	
M-7059-X	---	8-channel Isolated Digital Input Module using the DCON and Modbus Protocols (X：The Cover is mean any color)	
M-7059D	---	M-7059 with LED Display	V
M-7059D-X	---	M-7059 with LED Display (X：The Cover is mean any color)	
M-7060P	---	4-channel Isolated Digital Input and 4-channel Relay Output Module using the DCON and Modbus Protocols	
M-7060P-X	---	4-channel Isolated Digital Input and 4-channel Relay Output Module using the DCON and Modbus Protocols (X：The Cover is mean any color)	
M-7060PD	---	M-7060P-G with LED Display	V
M-7060PD-X	---	M-7060P-G with LED Display (X：The Cover is mean any color)	
I-7065B	---	4-channel Isolated Digital Input and 5-channel DC SSR Output Module with 16-bit Counters	
I-7065B-X	---	4-channel Isolated Digital Input and 5-channel DC SSR Output Module with 16-bit Counters (X：The Cover is mean any color)	
I-7065BD	---	I-7065BD with LED Display	
I-7065BD-X	---	I-7065BD with LED Display (X：The Cover is mean any color)	
M-7065B	---	4-channel Isolated Digital Input and 5-channel DC SSR Output Module with 16-bit Counters	
M-7065B-X	---	4-channel Isolated Digital Input and 5-channel DC SSR Output Module with 16-bit Counters (X：The Cover is mean any color)	
M-7065BD	---	M-7065BD with LED Display	V

Main	Software	Diversity	Mode 1
M-7065BD-X	---	M-7065BD with LED Display (X：The Cover is mean any color)	
I-7067	---	7-channel Signal Relay Output Module with DCON Protocol	
I-7067-X	---	7-channel Signal Relay Output Module with DCON Protocol (X：The Cover is mean any color)	
M-7067	---	7-channel Signal Relay Output Module with DCON and Modbus Protocols	
M-7067-X	---	7-channel Signal Relay Output Module with DCON and Modbus Protocols (X：The Cover is mean any color)	
I-7067D	---	I-7067 with LED Display	
I-7067D-X	---	I-7067 with LED Display (X：The Cover is mean any color)	
M-7067D	---	M-7067 with LED Display	V
M-7067D-X	---	M-7067 with LED Display (X：The Cover is mean any color)	
I-7088	---	8-channel PWM Output and 8-channel High-speed Counter Module using the DCON Protocol	
I-7088-X	---	8-channel PWM Output and 8-channel High-speed Counter Module using the DCON Protocol (X：The Cover is mean any color)	
I-7088D	---	I-7088 with 7-segment LED Display	
I-7088D-X	---	I-7088 with 7-segment LED Display (X：The Cover is mean any color)	
I-7088-G/S	---	I-7088 with DN-8P8C-CA External Board	
I-7088D-G/S	---	I-7088D with DN-8P8C-CA External Board	
M-7088	---	8-channel PWM Output and 8-channel High-speed Counter Module using the DCON and Modbus Protocols	
M-7088-X	---	8-channel PWM Output and 8-channel High-speed Counter Module using the DCON and Modbus Protocols (X：The Cover is mean any color)	
M-7088D	---	M-7088 with 7-segment LED Display	V
M-7088D-X	---	M-7088 with 7-segment LED Display (X：The Cover is mean any color)	
M-7088-G/S	---	M-7088 with DN-8P8C-CA External Board	
M-7088D-G/S	---	M-7088D with DN-8P8C-CA External Board	
DN-8P8C	---	8-channel Digital Output and 8-channel Counter Input Board, including two CA-090910-A Cable and two CA-3813 Connector Casing.	
DN-8P8C-CA	---	8-channel Digital Output and 8-channel Counter Input Board, including two CA-090910-A Cable and two CA-3813 Connector Casing.	
DN-8P8C/S	---	8-channel Digital Output and 8-channel Counter Input Board, including DB-8820 Daughterboard and a CA-2520D Cable.	
NS-209FCS	---	Single-mode 30 km, SC Connector, 8-port 10/100 Mbps with 1 fiber port Switch	V
NSM-209FCS	---	Single-mode 30 km, SC Connector, 8-port 10/100 Mbps with 1 fiber port Switch; metal case	
NS-200AFC-T	---	Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 multi mode, SC connector	V
NS-200AFT-T	---	Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 multi mode, ST connector	
NS-200WDM-A	---	10/100BaseT(X) to 100BaseFX Single-Strand Media Converter, TX 1310 nm, RX 1550 nm, SC	

Main	Software	Diversity	Mode 1
NS-200WDM-B	---	10/100BaseT(X) to 100BaseFX Single-Strand Media Converter, TX 1550 nm, RX 1310 nm, SC	
NS-200AFCS-T	---	Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 single mode, SC connector	
NS-200AFCS-60T	---	Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 (60 km) single mode, SC connector	V
PM-3112-xxx-yyyy	---	2 loops single-phase Power Meter (xxx can be 100 , 160, 240, or 360; yyyy can be -CAN,-CPS,-MTCP or blank	
PM-3112-xxxP-yyyy	---	2 loops single-phase Power Meter with 333mV CT (xxx can be 100 , 160, 240, or 360; yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3112P-yyyy	---	2 loops single-phase Power Meter without CT (yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3112-100-MTCP	---	2 loops single-phase Power Meter	V
PM-3114-xxx-yyyy	---	4 loops single-phase Power Meter (xxx can be 100 , 160, 240, or 360; yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3114-xxxP-yyyy	---	4 loops single-phase Power Meter with 333mV CT (xxx can be 100 , 160, 240, or 360; yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3114P-yyyy	---	4 loops single-phase Power Meter without CT (yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3114-100-MTCP	---	4 loops single-phase Power Meter	V
PM-3133-xxx-yyyy	---	3 Phase Compact Smart Meter (xxx can be 100 , 160, 240, or 360; yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3133-xxxP-yyyy	---	3 Phase Compact Smart Meter with 333mV CT (xxx can be 100 , 160, 240, or 360; yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3133P-yyyy	---	3 Phase Compact Smart Meter with without CT (yyyy can be -CAN,-CPS,-MTCP or blank)	
PM-3133-100	---	3 Phase Compact Smart Meter	V
PETL-7060	---	Ethernet module with PoE, 6-ch isolated DI and 6-ch form-A power relay	V
PW-3090-5S-R	---	Output Power Voltage +5 V @ 2000 mA (max.) Accuracy : 2%	
PW-3090-5S	---	Output Power Voltage +5 V @ 2000 mA (max.) Accuracy : 2%	V
PW-3090-5D-R	---	Output Power Voltage 5 V @ 1000 mA (max.) Accuracy : 2%	
PW-3090-5D	---	Output Power Voltage 5 V @ 1000 mA (max.) Accuracy : 2%	V
PW-3090-12S-R	---	Output Power Voltage +12 V @ 800 mA (max.) Accuracy : 2%	
PW-3090-12S	---	Output Power Voltage +12 V @ 800 mA (max.) Accuracy : 2%	V
PW-3090-15D-R	---	Output Power Voltage 15 V @ 300 mA (max.) Accuracy : 2%	
PW-3090-15D	---	Output Power Voltage 15 V @ 300 mA (max.) Accuracy : 2%	V
PW-3090-24S-R	---	Output Power Voltage +24 V @ 400 mA (max.) Accuracy : 2%	
PW-3090-24S	---	Output Power Voltage +24 V @ 400 mA (max.) Accuracy : 2%	V
tET-P6	---	Tiny Ethernet module with 6-ch DI (Wet Contact)	
tET-PD6	---	Tiny Ethernet module with 6-ch DI (Dry Contact)	V
tPET-P6	---	Tiny Ethernet module with PoE, and 6-ch DI (Wet Contact)	
tPET-PD6	---	Tiny Ethernet module with PoE, and 6-ch DI (Dry Contact)	

Main	Software	Diversity	Mode 1
tET-P2POR2	---	Tiny Ethernet module with 2-ch DI (Wet Contact) and 2-ch Form-A PhotoMos relay	
tET-PD2POR2	---	Tiny Ethernet module with 2-ch DI (Dry Contact) and 2-ch Form-A PhotoMos relay	V
tET-P2R2	---	Tiny Ethernet module with 2-ch DI (Wet Contact) and 2-ch Form-A relay	
tET-PD2R1	---	Tiny Ethernet module 2-ch DI (Dry Contact) and 1-ch Form-A relay	
tPET-P2POR2	---	Tiny Ethernet module with PoE, 2-ch DI (Wet Contact) and 2-ch Form-A PhotoMos relay	
tPET-PD2POR2	---	Tiny Ethernet module with PoE, 2-ch DI (Dry Contact) and 2-ch Form-A PhotoMos relay	
tPET-P2R2	---	Tiny Ethernet module with PoE, 2-ch DI (Wet Contact) and 2-ch Form-A relay	
tPET-PD2R1	---	Tiny Ethernet module with PoE, 2-ch DI (Dry Contact) and 1-ch Form-A relay	
TP-3080	---	8.4" (800 x 600) resistive touch panel monitor with RS-232 or USB interface Accessories: Power supply, VGA cable, RS-232 cable, USB cable, Mounting clamps and screws	V
TP-3080/NP	---	TP-3080 without Power supply	
WP-5141	---	Standard WinPAC-5000	
WP-5141-EN	Windows CE 5.0	Standard WinPAC-5000 (English Version of OS)	
WP-5141-TC	Windows CE 5.0	Standard WinPAC-5000 (Traditional Version of OS)	
WP-5141-SC	Windows CE 5.0	Standard WinPAC-5000 (Simplified Version of OS)	
WP-5141-XW107	Windows CE 5.0	Standard WinPAC-5000 add XW107	V
WP-5146	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000	
WP-5146-EN	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 (English Version of OS)	
WP-5146-TC	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 (Traditional Version of OS)	
WP-5146-SC	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 (Simplified Version of OS)	
WP-5146-XW107	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 add XW107	
WP-5147	Windows CE 5.0	ISaGRAF based WinPAC-5000	
WP-5147-EN	Windows CE 5.0	ISaGRAF based WinPAC-5000 (English Version of OS)	
WP-5147-TC	Windows CE 5.0	ISaGRAF based WinPAC-5000 (Traditional Version of OS)	
WP-5147-SC	Windows CE 5.0	ISaGRAF based WinPAC-5000 (Simplified Version of OS)	
WP-5147-XW107	Windows CE 5.0	ISaGRAF based WinPAC-5000 add XW107	
WP-5149	Windows CE 5.0	InduSoft based WinPAC-5149	

Main	Software	Diversity	Mode 1
WP-5149-EN	Windows CE 5.0	InduSoft based WinPAC-5149 (English Version of OS)	
WP-5149-TC	Windows CE 5.0	InduSoft based WinPAC-5149 (Traditional Version of OS)	
WP-5149-SC	Windows CE 5.0	InduSoft based WinPAC-5149 (Simplified Version of OS)	
WP-5149-XW107	Windows CE 5.0	InduSoft based WinPAC-5149 add XW107	
LP-5131-EN	Linux kernel 2.6.19	PAC with Linux kernel 2.6.19 and one LAN port (English Version of OS)	
LP-5141-EN	Linux kernel 2.6.19	PAC with Linux kernel 2.6.19 and two LAN ports (English Version of OS)	
WP-5141-OD	Windows CE 5.0	Standard WinPAC-5000 with Audio	V
WP-5141-OD-EN	Windows CE 5.0	Standard WinPAC-5000 with Audio (English Version of OS)	
WP-5141-OD-TC	Windows CE 5.0	Standard WinPAC-5000 with Audio (Traditional Version of OS)	
WP-5141-OD-SC	Windows CE 5.0	Standard WinPAC-5000 with Audio (Simplified Version of OS)	
WP-5141-OD-XW107	Windows CE 5.0	Standard WinPAC-5000 with Audio add XW107	
WP-5146-OD	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 with Audio	
WP-5146-OD-EN	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 with Audio (English Version of OS)	
WP-5146-OD-TC	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 with Audio (Traditional Version of OS)	
WP-5146-OD-SC	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 with Audio (Simplified Version of OS)	
WP-5146-OD-XW107	Windows CE 5.0	InduSoft and ISaGRAF based WinPAC-5000 with Audio add XW107	
WP-5147-OD	Windows CE 5.0	ISaGRAF based WinPAC-5000 with Audio	
WP-5147-OD-EN	Windows CE 5.0	ISaGRAF based WinPAC-5000 with Audio (English Version of OS)	
WP-5147-OD-TC	Windows CE 5.0	ISaGRAF based WinPAC-5000 with Audio (Traditional Version of OS)	
WP-5147-OD-SC	Windows CE 5.0	ISaGRAF based WinPAC-5000 with Audio (Simplified Version of OS)	
WP-5147-OD-XW107	Windows CE 5.0	ISaGRAF based WinPAC-5000 with Audio add XW107	
WP-5149-OD	Windows CE 5.0	InduSoft based WinPAC-5149 with Audio	
WP-5149-OD-EN	Windows CE 5.0	InduSoft based WinPAC-5149 with Audio (English Version of OS)	
WP-5149-OD-TC	Windows CE 5.0	InduSoft based WinPAC-5149 with Audio (Traditional Version of OS)	
WP-5149-OD-SC	Windows CE 5.0	InduSoft based WinPAC-5149 with Audio (Simplified Version of OS)	

Main	Software	Diversity	Mode 1
WP-5149-OD-XW107	Windows CE 5.0	InduSoft based WinPAC-5149 with Audio add XW107	
LP-5131-OD-EN	Linux kernel 2.6.19	PAC with Linux kernel 2.6.19 and one LAN port and Audio (English Version of OS)	
LP-5141-OD-EN	Linux kernel 2.6.19	PAC with Linux kernel 2.6.19 and two LAN ports and Audio (English Version of OS)	
XW107	---	8-channel Non-Isolation Digital Input and 8-channel Non-Isolation Digital Output	

3 Test Methodology

3.1. Decision of Test Mode

The following test mode(s) were scanned during the preliminary test:

Pre-Test Mode
Mode 1: Normal Operation Mode

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
	Harmonic current emissions	N/A
	Voltage fluctuations & flicker	Mode 1
Immunity	ESD	Mode 1
	RS	Mode 1
	EFT	Mode 1
	Surge	Mode 1
	CS	Mode 1
	PMF	Mode 1
	Voltage dips & voltage variations	Mode 1

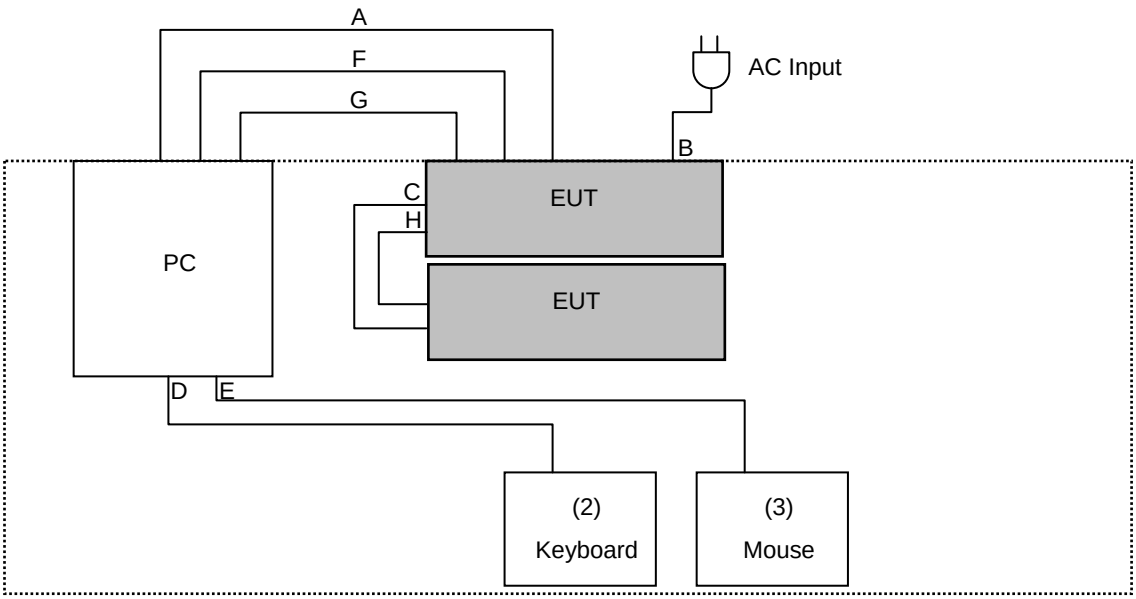
Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

3.2. EUT Exercise Software

1. Setup the EUT and simulators as shown on 3.3.
2. Turn on the power of all equipment.
3. The EUT will start to operate function.

3.3. Configuration of Test System

Mode 1



Signal Cable Type		Signal Cable Description
A	LAN Cable	Non-Shielded, 1.0m with one core
B	AC Power Cable	Non-Shielded, 1.5m
C	DC Power Cable	Non-Shielded, 0.5m with one core
D	PS/2 Cable	Shielded, 1.8m
E	PS/2 Cable	Shielded, 1.8m
F	D-SUB Cable	Shielded, 1.8m with two cores
G	USB Cable	Shielded, 1.0m with one core
H	Signal Cable	Shielded, 0.8m with one core

Devices Description					
Product		Manufacturer	Model Number	Serial Number	Power Cord
(1)	Keyboard	DELL	SK-8110	07N2443884232J7Q39	Power by PC
(2)	Mouse	DELL	MO71KC	511091717	Power by PC
(3)	PC	ICP DAS	VB-115H	N/A	Non-Shielded, 1.7m

※ PC Keypart information				
Main		Software	Diversity	Mode 1
(3)-1	VXC-118U	---	Universal PCI, Serial Communication card with 8 RS-232 ports (RoHS) Includes one CA-PC62M D-Sub connector.	V
(3)-2	VXC-118U/D2	---	Universal PCI, Serial Communication card with 8 RS-232 ports (RoHS) Includes one CA-9-6210 cable.	
(3)-3	PIO-D24U	---	Universal PCI bus, 24-channel DIO board	
(3)-4	PIO-D56U	---	Universal PCI bus, 56-channel DIO board	V
(3)-5	PISO-813	---	PCI Bus, 32 channel isolated analog input board. (RoHS) Includes one CA-4002 D-Sub connector.	
(3)-6	PISO-813/S	---	PCI Bus, 32 channel isolated analog input board. (RoHS) Includes one DB-8325 screw terminal board.	
(3)-7	PISO-813U	---	Universal PCI, 32-channel isolated analog input board. (RoHS) Includes one CA-4002 D-Sub connector.	V
(3)-8	PISO-813U/S	---	Universal PCI, 32-channel isolated analog input board. (RoHS) Includes one DB-8325 screw terminal board.	
(3)-9	ISO-P32C32	---	32-channel isolated digital I/O board Includes one CA-4037W cable and two CA-4002 D-Sub connectors.	V
(3)-10	DIO-64/3	---	32-channel Digital Input & 32-channel Digital Output,3 Timer/Counter Board	
(3)-11	DIO-64/6	---	32-channel Digital Input & 32-channel Digital Output,6 Timer/Counter Board	V

Support Unit					
Product		Manufacturer	Model Number	Serial Number	Power Cord
1.	Industrial Power Supply	ICP DAS	DP-1200	N/A	Non-Shielded, 1.7m with one core

3.4. Test Site Environment

Items	Test Item	Required (IEC 60068-1)	Actual
Temperature (°C)	EN 55022 CE	15-35	26.0
Humidity (%RH)		25-75	60.0
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	EN 55022 RE	15-35	26.0
Humidity (%RH)		25-75	60.0
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	EN 61000-3-3	--	26.0
Humidity (%RH)		--	60.0
Barometric pressure (mbar)		--	950
Temperature (°C)	EN 61000-4-2	15-35	26.8
Humidity (%RH)		30-60	44.6
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	EN 61000-4-3	--	22.6
Humidity (%RH)		--	50.2
Barometric pressure (mbar)		--	950
Temperature (°C)	EN 61000-4-4	15-35	24.6
Humidity (%RH)		30-60	46.6
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	EN 61000-4-5	15-35	24.6
Humidity (%RH)		10-75	46.6
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	EN 61000-4-6	--	22.6
Humidity (%RH)		--	50.2
Barometric pressure (mbar)		--	950
Temperature (°C)	EN 61000-4-8	15-35	24.6
Humidity (%RH)		25-75	46.6
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	EN 61000-4-11	15-35	24.6
Humidity (%RH)		25-75	46.6
Barometric pressure (mbar)		860-1060	950

4 Emission Test

4.1. Conducted Emission Measurement

4.1.1. Limit

A.C. Mains Conducted Interference Limit：

Frequency (MHz)	Class A Equipment (dBuV)		Class B Equipment (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.

Telecommunication Port Conducted Interference Limits:

Requirement (MHz)	Class A Equipment				Class B Equipment			
	Voltage Limit (dBμV)		Current Limit (dBμA)		Voltage Limit (dBμV)		Current Limit (dBμA)	
	QP	Avg.	QP	Avg.	QP	Avg.	QP	Avg.
0.15 to 0.50	97 to 87	84 to 74	53 to 43	40 to 30	84 to 74	74 to 64	40 to 30	30 to 20
0.50 to 30	87	74	43	30	74	64	30	20

4.1.2. Test Instruments

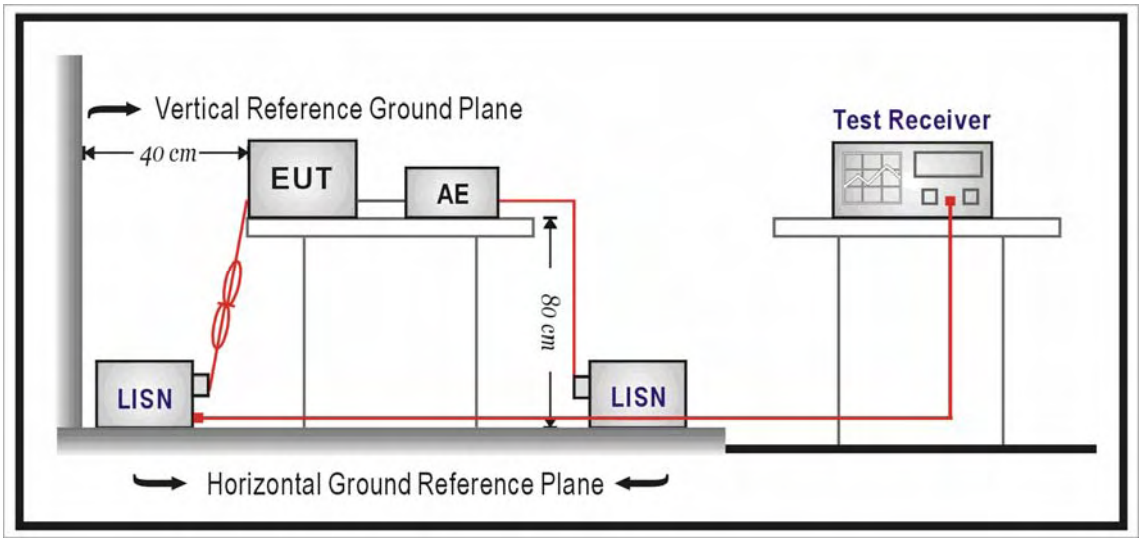
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/12/2014	(1)
LISN	R&S	ENV216	101040	03/07/2014	(1)
LISN	R&S	ENV216	101041	03/07/2014	(1)
T-LISN	FCC	FCC-TLISN-T2-02	20574	04/03/2014	(1)
T-LISN	FCC	FCC-TLISN-T4-02	20529	04/03/2014	(1)
T-LISN	TESQ	ISN-T8	34413	04/23/2014	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

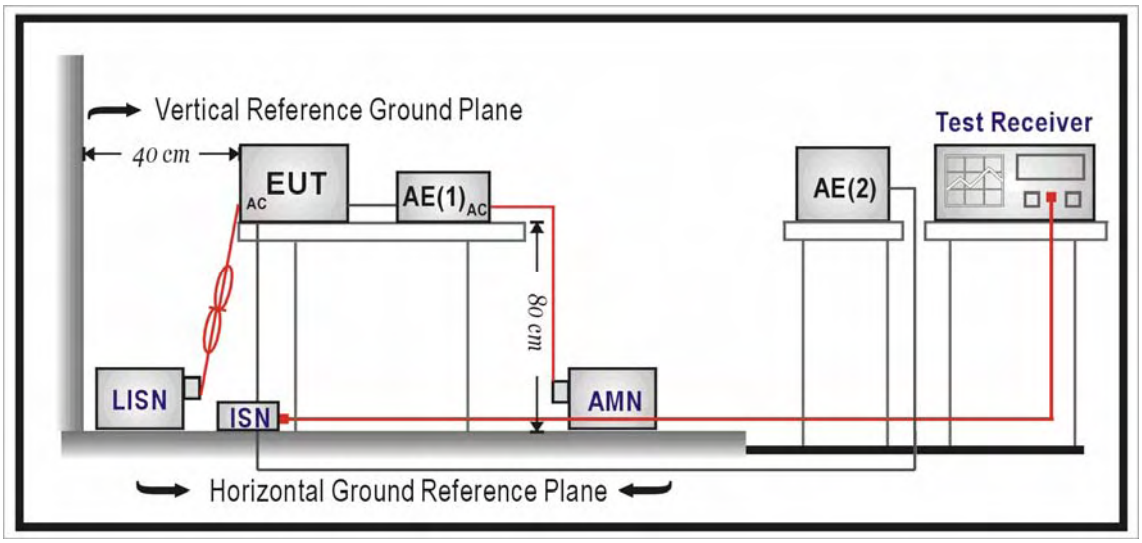
NOTE: N.C.R. = No Calibration Request.

4.1.3. Test Setup

A.C. Mains Setup



Telecommunication Port Setup



4.1.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
The mains voltage shall be supplied to the EUT via the LISN when the measurement of telecommunication port is performed. The common mode disturbances at the telecommunication port shall be connected to the ISN.

For A.C. mains conducted interference, measured both sides of A.C. lines and carried out using quasi-peak and average detector receivers of maximum conducted interference.

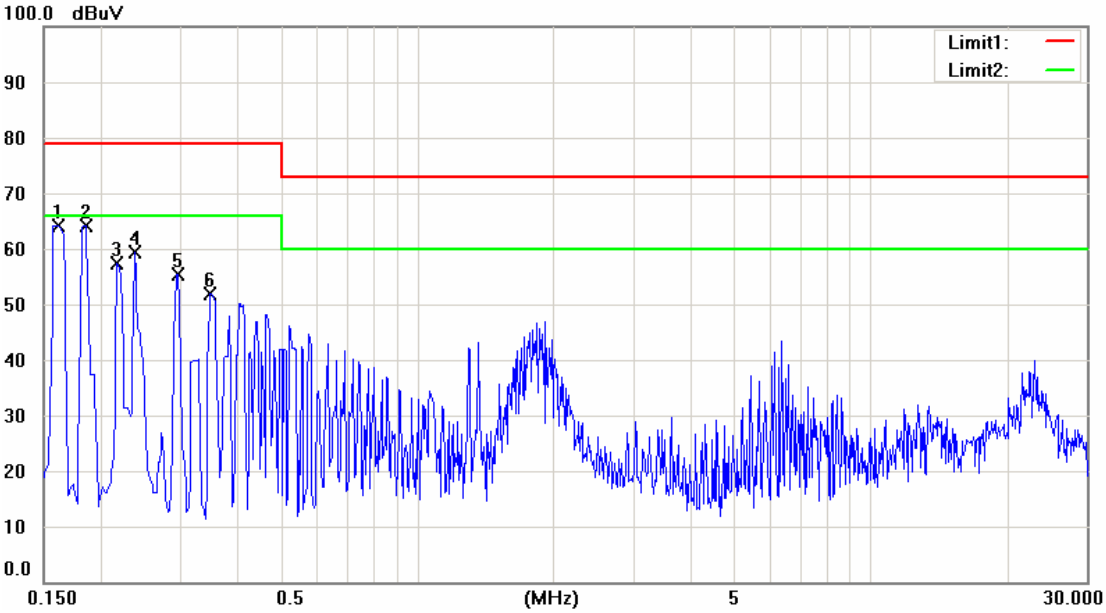
For telecommunication port interference measurement, using ISNs with suitable longitudinal conversion losses (LCL) as defined in the port of specification from manufacture, and the LCL shall be meet the related standard requirement. Measured the line and carried out using quasi-peak and average detector receivers of maximum conducted interference.

Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1.2, as applicable, including the average limit and the quasi-peak limit when using respectively (A.C. mains and telecommunication port), an average detector and quasi-peak detector measured in accordance with the methods described of related standard. Either the voltage limits or the current limits shall be met. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

4.1.5. Test Result

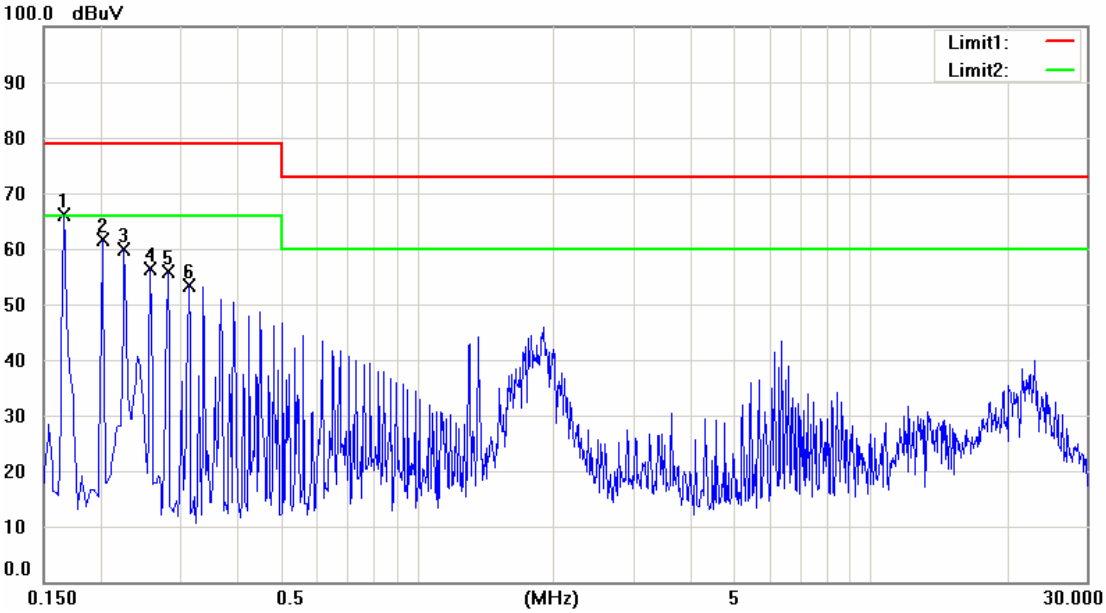
Standard:	EN 55022	Line:	L1
Test item:	Conducted Emission	Power:	AC 230V/50Hz
Model Number:	PM-3133-100	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	2014/09/01
		Test By:	Frank Lin
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1620	49.60	17.77	9.60	59.20	27.37	79.00	66.00	-19.80	-38.63	Pass
2	0.1860	46.65	15.30	9.60	56.25	24.90	79.00	66.00	-22.75	-41.10	Pass
3	0.2180	43.54	18.17	9.60	53.14	27.77	79.00	66.00	-25.86	-38.23	Pass
4	0.2380	42.22	29.04	9.60	51.82	38.64	79.00	66.00	-27.18	-27.36	Pass
5	0.2980	38.24	11.87	9.61	47.85	21.48	79.00	66.00	-31.15	-44.52	Pass
6	0.3500	35.20	9.61	9.61	44.81	19.22	79.00	66.00	-34.19	-46.78	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).
2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	EN 55022	Line:	N
Test item:	Conducted Emission	Power:	AC 230V/50Hz
Model Number:	PM-3133-100	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	2014/09/01
		Test By:	Frank Lin
Description:			

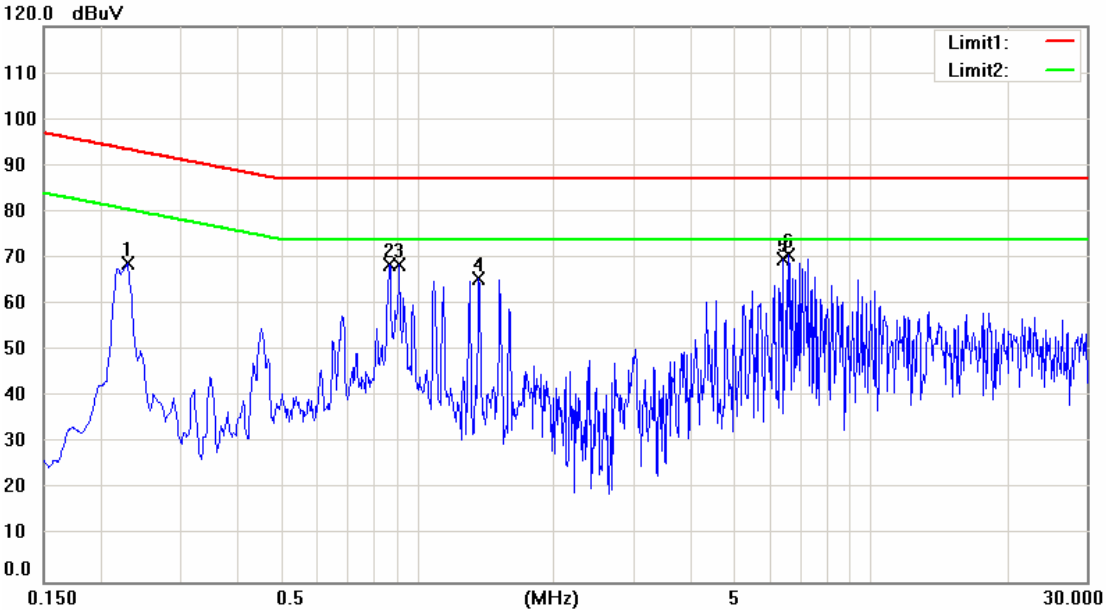


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1660	49.16	17.49	9.60	58.76	27.09	79.00	66.00	-20.24	-38.91	Pass
2	0.2020	45.33	14.20	9.60	54.93	23.80	79.00	66.00	-24.07	-42.20	Pass
3	0.2260	43.39	21.61	9.60	52.99	31.21	79.00	66.00	-26.01	-34.79	Pass
4	0.2580	40.90	11.87	9.61	50.51	21.48	79.00	66.00	-28.49	-44.52	Pass
5	0.2820	39.24	13.16	9.61	48.85	22.77	79.00	66.00	-30.15	-43.23	Pass
6	0.3140	37.21	9.43	9.61	46.82	19.04	79.00	66.00	-32.18	-46.96	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	EN 55022	Line:	N/A
Test item:	Conducted Emission	Power:	AC 230V/50Hz
Model Number:	PM-3133-100	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1 (ISN 100M)	Date:	2014/09/01
		Test By:	Frank Lin
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2300	57.25	56.39	9.95	67.20	66.34	93.45	80.45	-26.25	-14.11	Pass
2	0.8700	57.61	56.60	9.95	67.56	66.55	87.00	74.00	-19.44	-7.45	Pass
3	0.9140	57.11	56.31	9.95	67.06	66.26	87.00	74.00	-19.94	-7.74	Pass
4	1.3700	55.38	55.59	9.97	65.35	65.56	87.00	74.00	-21.65	-8.44	Pass
5	6.3980	58.94	58.47	10.10	69.04	68.57	87.00	74.00	-17.96	-5.43	Pass
6	6.6260	60.00	60.05	10.11	70.11	70.16	87.00	74.00	-16.89	-3.84	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

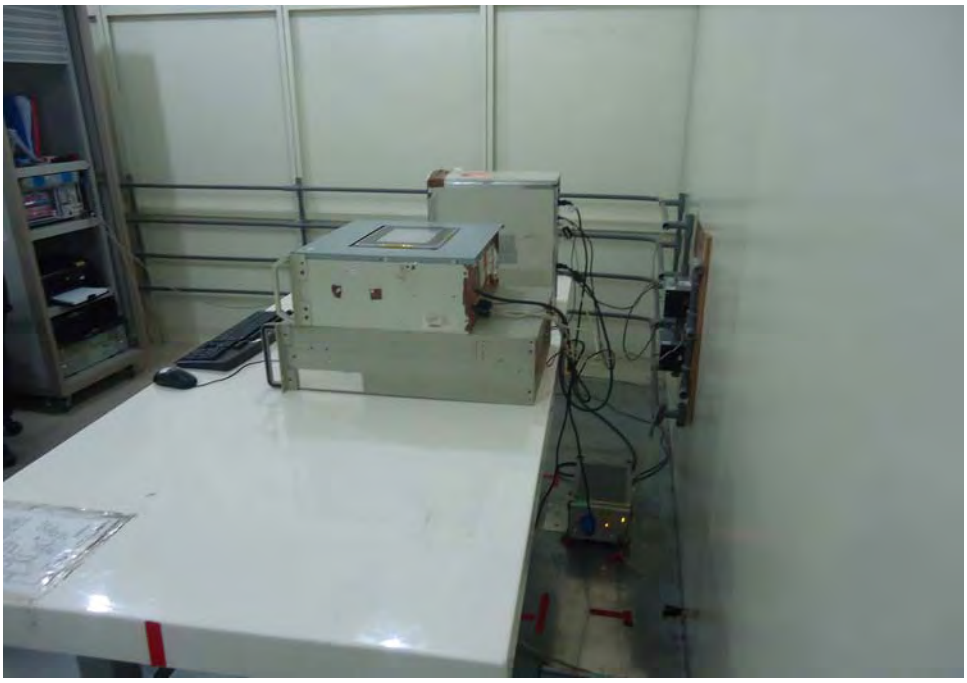
4.1.6. Test Photograph

Test Mode: Mode 1

Description: Front View of Conducted Test

Test Mode: Mode 1

Description: Back View of Conducted Test



4.2. Radiated Interference Measurement

4.2.1. Limit

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

NOTE: The lower limit shall apply at the transition frequencies.

Frequency (MHz)	dBuV/m (Distance 3m)			
	Class A		Class B	
	Average	Peak	Average	Peak
1000 ~ 3000	56	76	50	70
3000 ~ 6000	60	80	54	74

NOTE: The lower limit shall apply at the transition frequencies.

4.2.2. Test Instruments

10 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Pre Amplifier	Agilent	8447D	2944A11120	01/10/2014	(1)
Pre Amplifier	Agilent	8447D	2944A11119	01/10/2014	(1)
Test Receiver	R&S	ESCI	100722	10/26/2013	(1)
Test Receiver	R&S	ESCI	101000	12/03/2013	(1)
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3268	06/03/2014	(1)
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3273	12/13/2013	(1)
Test Site	ATL	TE06	TE06	08/09/2014	(1)

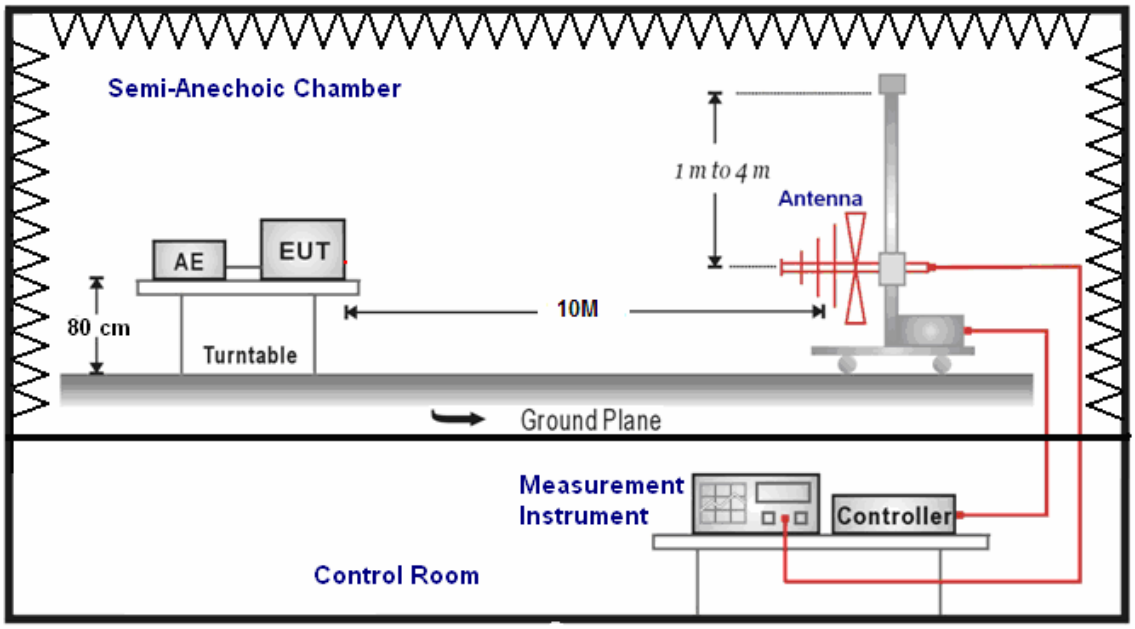
Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2014	(1)
Amplifier	EM	EM330	060545	11/18/2013	(1)
Amplifier	Mini-Circuits	ZVA-213-S+	467900926	05/26/2014	(1)
RF Pre-selector	Agilent	N9039A	MY46520255	05/10/2014	(1)
Horn Antenna (1~18GHz)	ETS-Lindgren	3117	00128055	08/11/2014	(1)
Test Site	ATL	TE09	TE09	05/10/2014	(1)

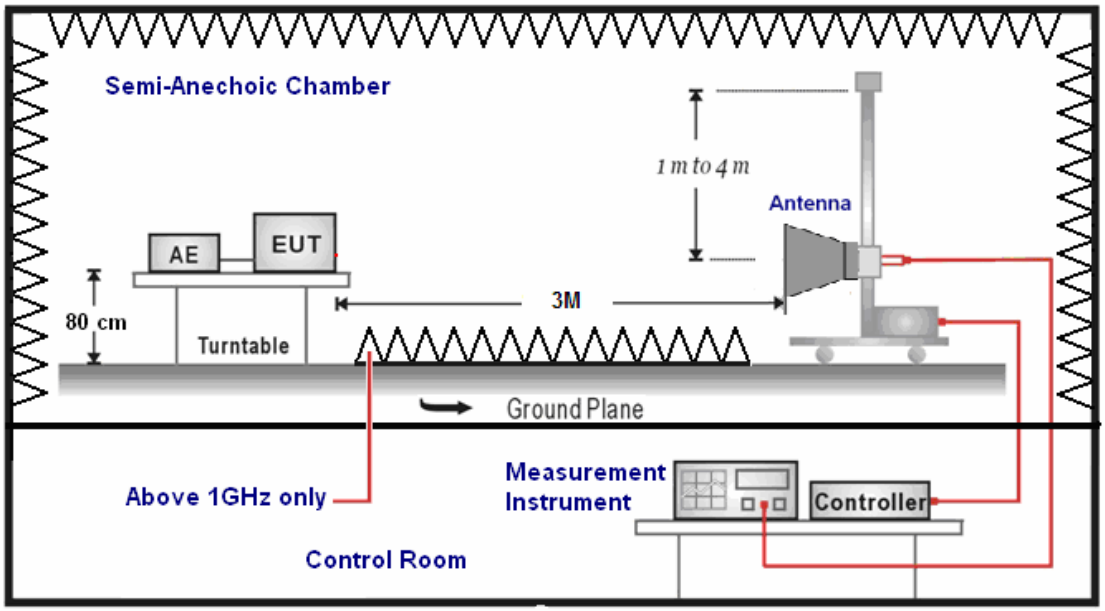
Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

4.2.3. Setup

Below 1GHz



Above 1GHz



4.2.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. When the EUT is floor- standing equipment, it is placed on the ground plane which has a 15 cm non-conductive covering to insulate the EUT from the ground plane.

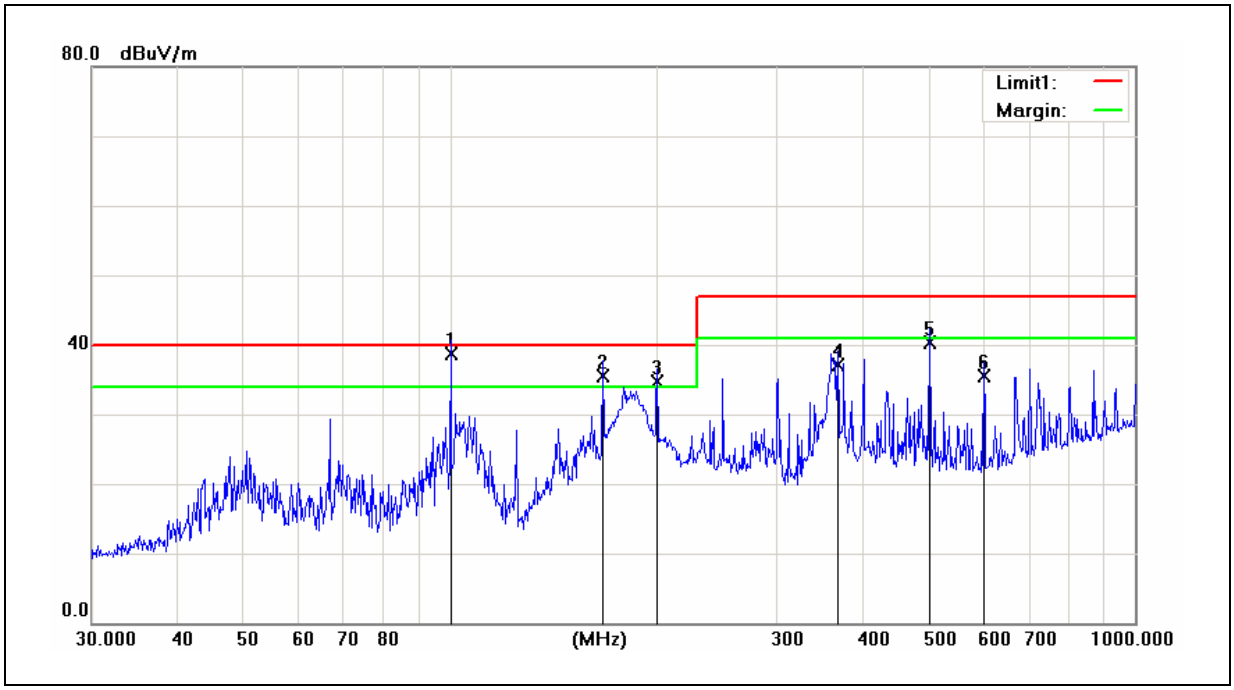
The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters for under 1GHz, and 3 meter for above 1GHz if the highest internal source frequency of the EUT is higher than 108 MHz. The highest internal source of a EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

Radiated emissions were invested over the frequency range from 30MHz to1GHz using a receiver bandwidth of 120 kHz. Radiated was performed at an antenna to EUT distance of 10 meters.

4.2.5. Test Result

Standard:	EN 55022	Test Distance:	10m
Test item:	Radiated Emission	Power:	AC 230V/50Hz
Model Number:	PM-3133-100	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	2014/09/22
Ant.Polar.:	Horizontal	Test By:	Frank Lin

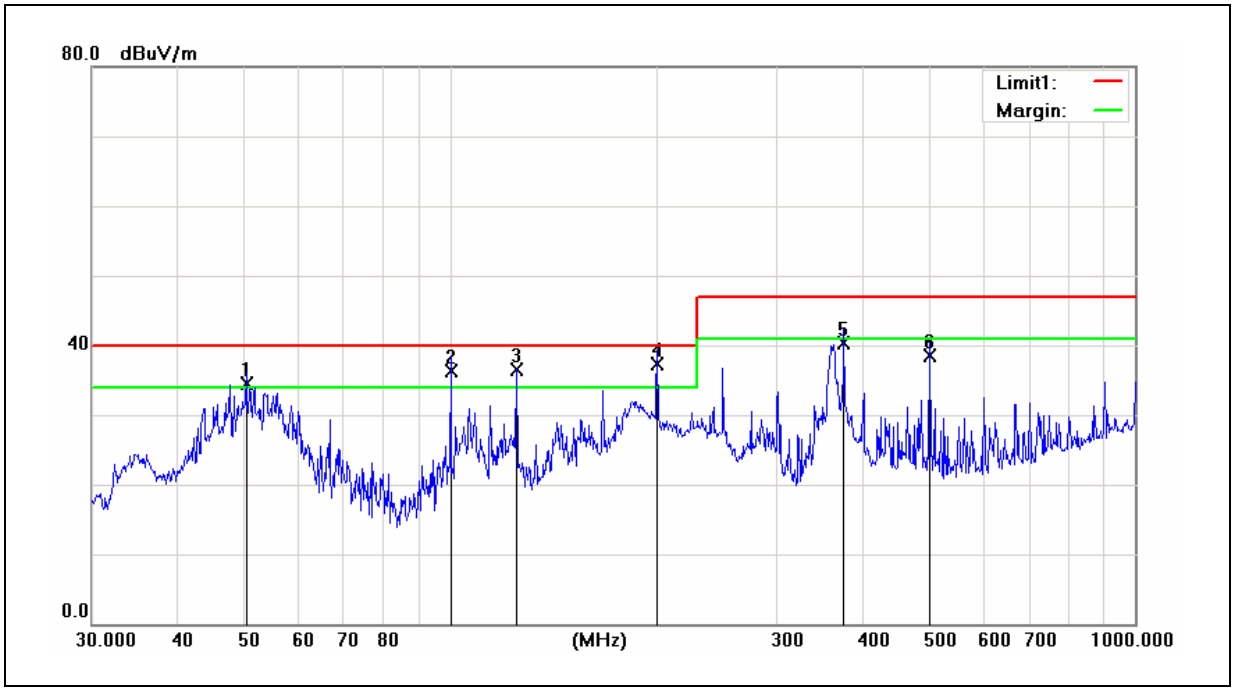


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	100.2286	55.84	-17.04	38.80	40.00	-1.20	400	337	QP
2	167.2368	48.12	-12.52	35.60	40.00	-4.40	400	105	QP
3	200.6881	50.26	-15.46	34.80	40.00	-5.20	400	142	QP
4	368.1116	46.48	-9.28	37.20	47.00	-9.80	200	53	QP
5	501.1790	46.62	-6.22	40.40	47.00	-6.60	200	64	QP
6	601.4265	39.51	-3.91	35.60	47.00	-11.40	100	68	QP

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

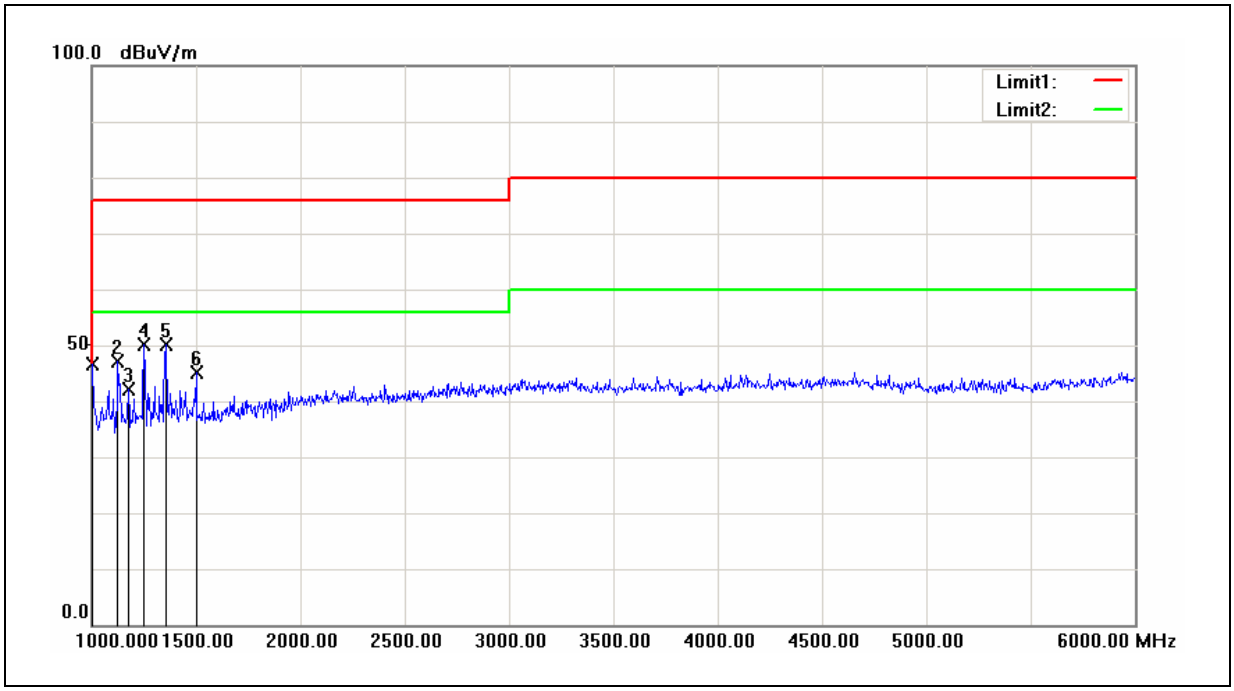
Standard:	EN 55022	Test Distance:	10m
Test item:	Radiated Emission	Power:	AC 230V/50Hz
Model Number:	PM-3133-100	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	2014/09/22
Ant.Polar.:	Vertical	Test By:	Frank Lin



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	50.4090	48.19	-13.69	34.50	40.00	-5.50	100	47	QP
2	100.2286	52.81	-16.51	36.30	40.00	-3.70	100	290	QP
3	125.0066	49.93	-13.33	36.60	40.00	-3.40	100	37	QP
4	200.6881	52.17	-14.87	37.30	40.00	-2.70	100	73	QP
5	375.9385	48.50	-8.20	40.30	47.00	-6.70	100	2	QP
6	501.1790	43.57	-5.07	38.50	47.00	-8.50	100	145	QP

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).
2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	EN 55022	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 230V/50Hz
Model Number:	PM-3133-100	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1 (1GHz~6GHz)	Date:	2014/09/01
Ant.Polar.:	Horizontal	Test By:	Frank Lin

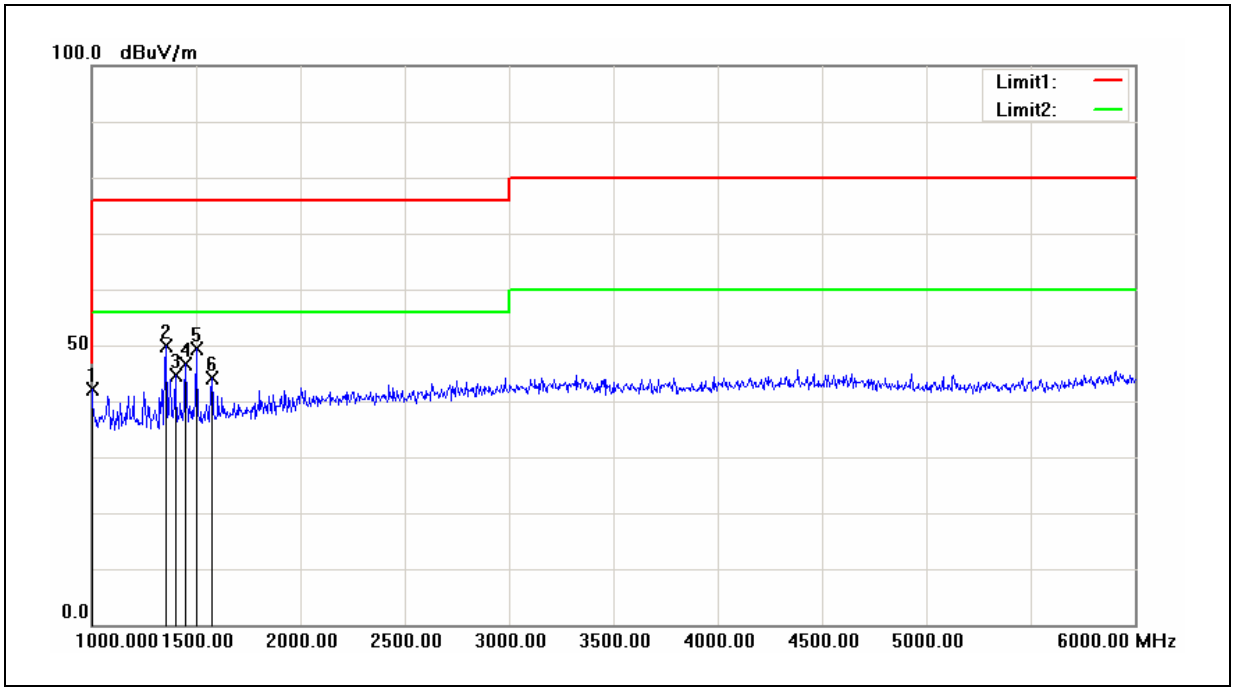


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1000.010	72.65	-26.00	46.65	76.00	-29.35	peak
2	1125.000	72.85	-25.75	47.10	76.00	-28.90	AVG
3	1175.000	67.74	-25.65	42.09	76.00	-33.91	peak
4	1250.000	75.67	-25.50	50.17	76.00	-25.83	peak
5	1355.000	75.54	-25.29	50.25	76.00	-25.75	peak
6	1500.000	70.22	-25.00	45.22	76.00	-30.78	peak

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	EN 55022	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 230V/50Hz
Model Number:	PM-3133-100	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1 (1GHz~6GHz)	Date:	2014/09/01
Ant.Polar.:	Vertical	Test By:	Frank Lin



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1000.010	68.13	-26.00	42.13	76.00	-33.87	peak
2	1355.000	75.07	-25.29	49.78	76.00	-26.22	AVG
3	1400.000	69.89	-25.20	44.69	76.00	-31.31	peak
4	1450.000	71.64	-25.10	46.54	76.00	-29.46	peak
5	1500.000	74.33	-25.00	49.33	76.00	-26.67	peak
6	1575.000	68.66	-24.45	44.21	76.00	-31.79	peak

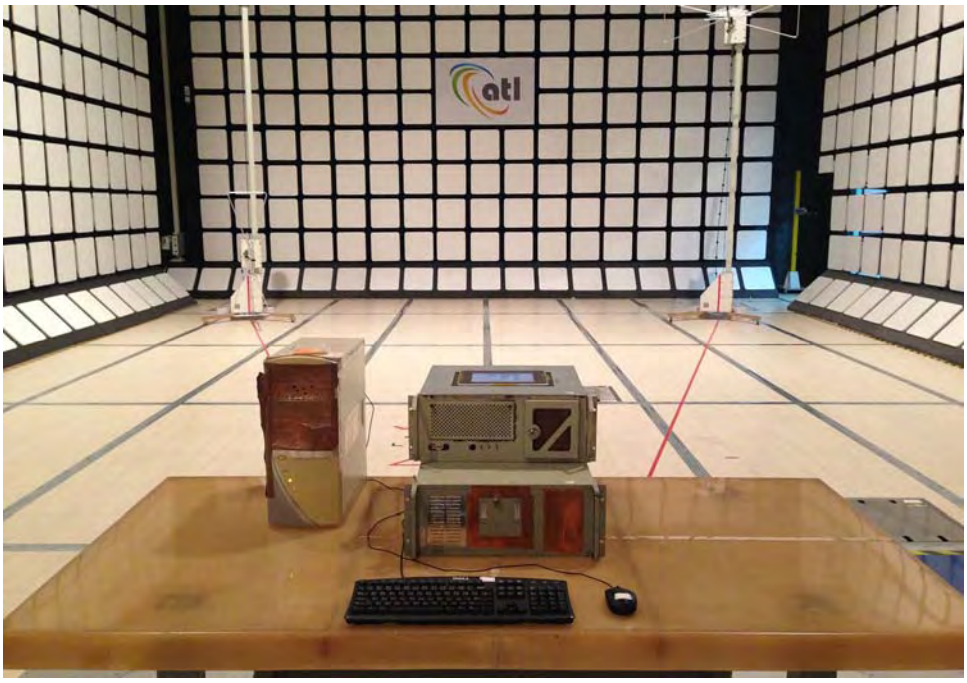
Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

4.2.6. Test Photograph

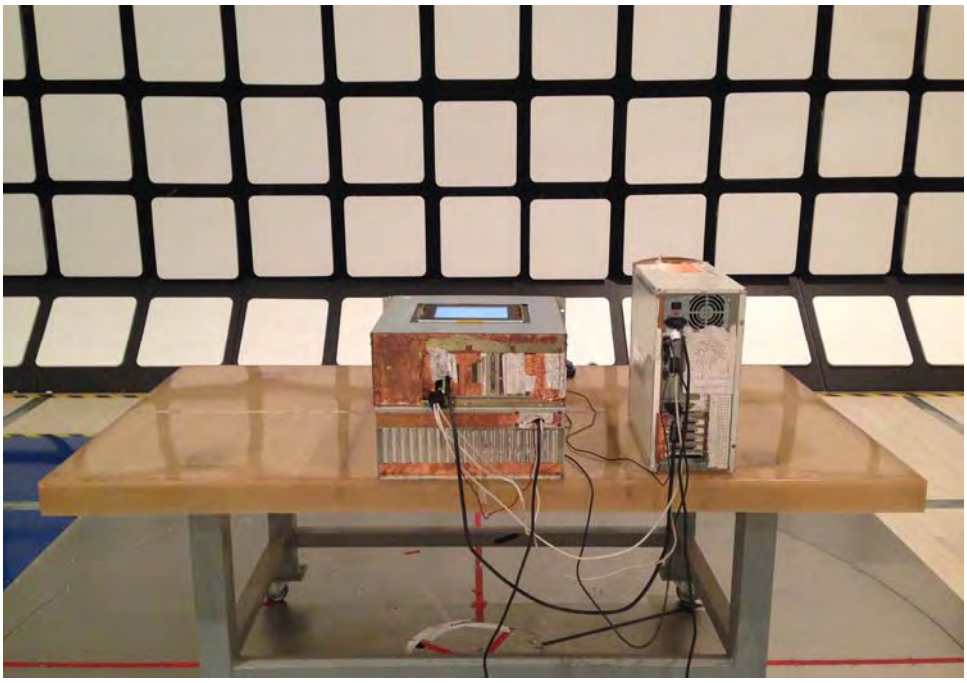
Test Mode: Mode 1

Description: Front View of Radiated Emission Test _ Below 1GHz



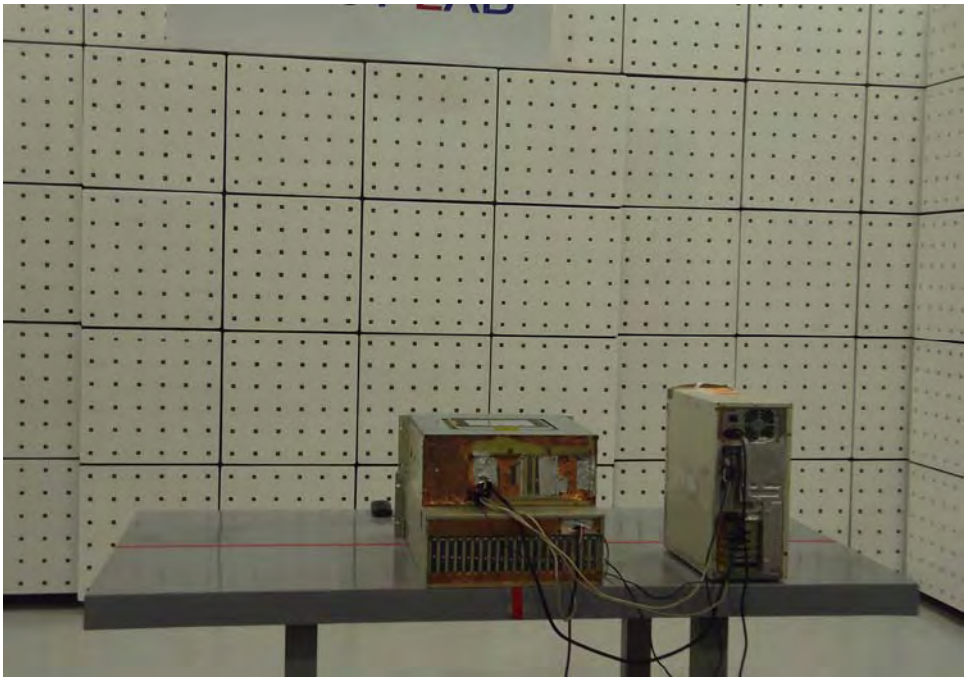
Test Mode: Mode 1

Description: Back View of Radiated Emission Test _ Below 1GHz



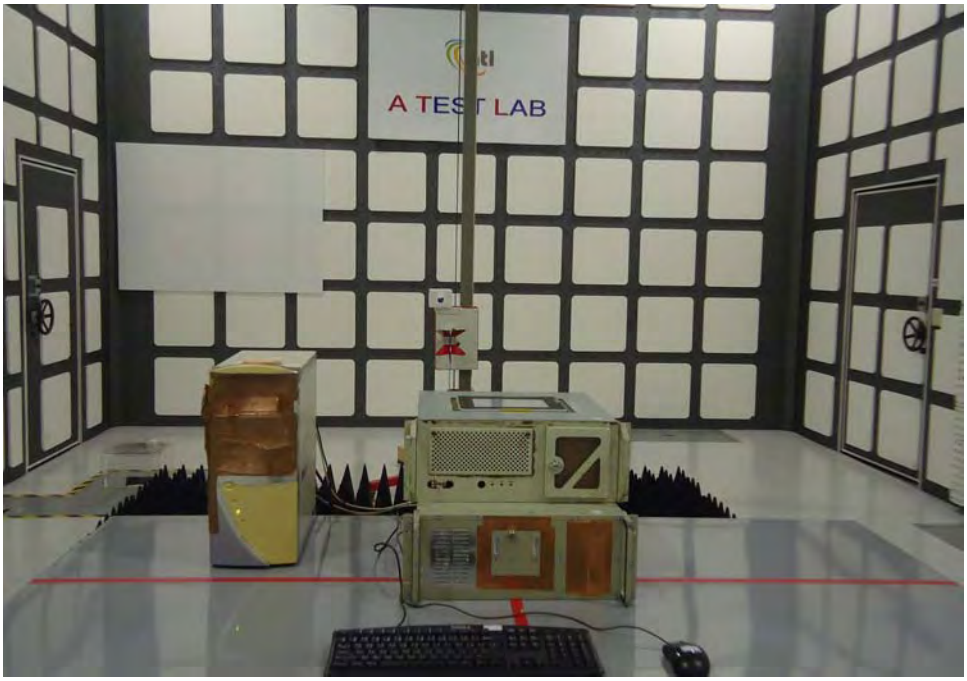
Test Mode: Mode 1

Description: Front View of Radiated Emission Test _ Above 1GHz



Test Mode: Mode 1

Description: Back View of Radiated Emission Test _ Above 1GHz



4.3. Voltage Fluctuation and Flicker

4.3.1. Limit

The following limits apply:

-- the value of P_{st} shall not be greater than 1.0;

-- the value of P_{lt} shall not be greater than 0.65;

-- the value of d(t) during a voltage change shall not exceed 3.3 % for more than 500 ms;

-- the relative steady-state voltage change, d_c, shall not exceed 3.3 %;

-- the maximum relative voltage change, d_{max}, shall not exceed;

a) 4 % without additional conditions;

b) 6 % for equipment which is:

-- switched manually, or

-- switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the P_{st} and P_{1t} limit.

For example: a d_{max} of 6%producing a rectangular voltage change characteristic twice per hour will give a P_{1t} of about 0.65.

c) 7 % for equipment which is:

-- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or

-- switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

P_{st} and P_{1t} requirements shall not be applied to voltage changes caused by manual switching.

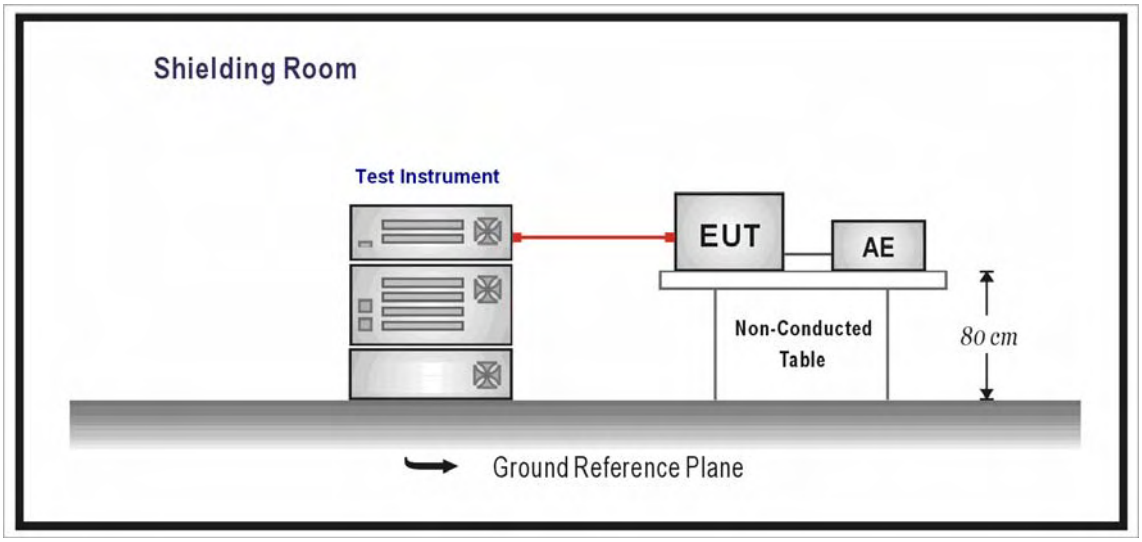
4.3.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Power Harmonics Analyzers	EMC-Partner AG	HAR1000-1P	171	02/07/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

4.3.3. Setup



4.3.4. Test Procedure

The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

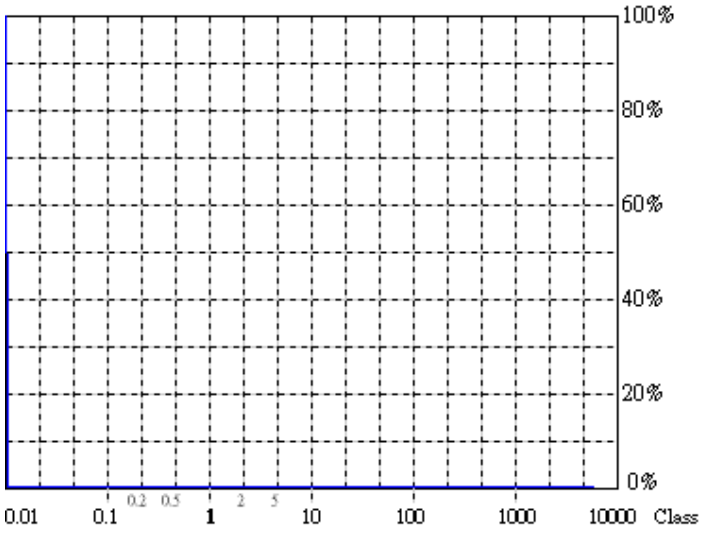
During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

4.3.5. Test Result

Model Number	PM-3133-100		
Test Item	Flicker		
Test Mode	Mode 1		
Date of Test	2014/09/22	Test Site	TE05

Test Result: Pass Status: Test Completed

Plt and limit line



Actual Flicker (Fli): **0.00**

Short-term Flicker (Pst): **0.07**
Limit (Pst): 1.00

Long-term Flicker (Plt): **0.07**
Limit (Plt): 0.65

Maximum Relative Volt. Change (dmax): **0.00%**
Limit (dmax): 4.00%

Relative Steady-state Voltage Change (dc): **0.03%**
Limit (dc): 3.00%

Maximum Interval exceeding 3.00% (dt): **0.00ms**
Limit (dt>Lim): 200ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3

2014/9/22 PM 02:09:4

Urms = 230.9 V P = 67.20 W
Irms = 0.327 A pf = 0.891

Range: 1 A
V-nom: 231 V
TestTime: 10 min (100%)

14-0798-EO

Test completed, Result: PASSED

HAR-1000 EMC-Retest

Urms = 230.9V Freq = 49.987 Range: 1 A
Irms = 0.327A Ipk = 0.522A cf = 1.598
P = 67.20W S = 75.42VA pf = 0.891

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.00 %
dtLim: 3.00 % dt>Lim: 200ms

Test completed, Result: PASSED

4.3.6. Test Photograph

Test Mode: Mode 1

Description: Front View of Flicker Test

5 Immunity Test

5.1. Electrostatic Discharge (ESD)

5.1.1. Test Specification

EN 61000-4-2			
Environmental Phenomena	Units	Test Specification	Performance Criterion
Enclosure Port			
Electrostatic Discharge	kV (Charge Voltage)	±8 Air Discharge ±4 Contact Discharge	B

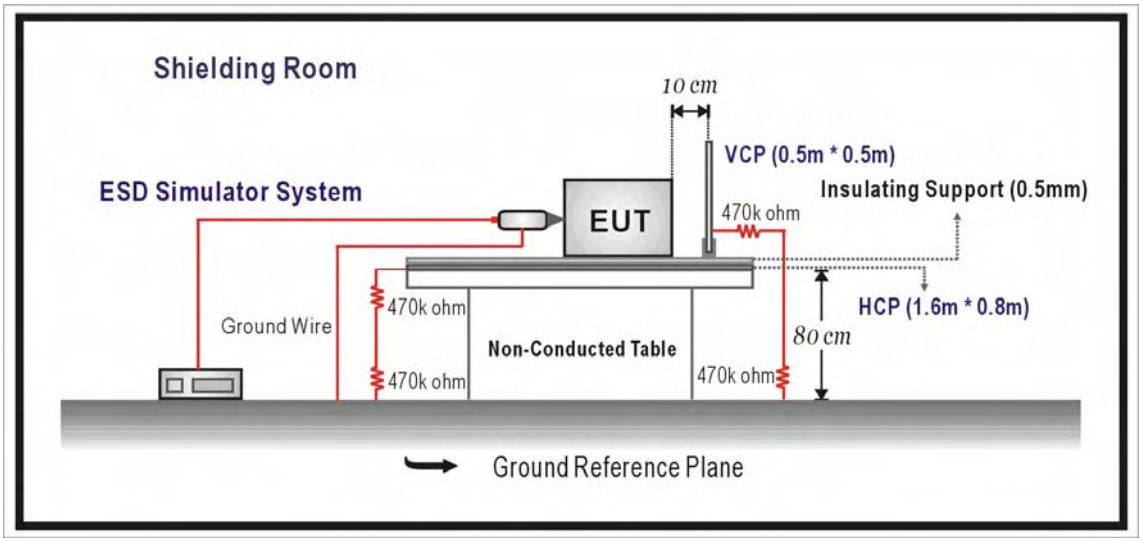
5.1.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Discharge Gun	Noiseken	ESS-2002	ESS05Y4736	03/14/2014	(1)
0.8m Height Wooden Table	N/A	N/A	N/A	N.C.R.	-----
Test Site	ATL	TE04	TE04	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

5.1.3. Setup



5.1.4. Test Procedure

The discharges shall be applied in two ways:

a) Contact discharges to the conductive surfaces and coupling planes:
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 (HCP). The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test point be 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.

b) Air discharges at slots and apertures and insulating surfaces:
On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The basic test procedure was in accordance with IEC 61000-4-2:

a) The EUT was located 0.1 m minimum from all side of the HCP (dimensions 1.6m x 0.8m).

b) The support units were located another table 30 cm away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10 cm with EUT.

c) The time interval between two successive single discharges was at least 1 second.

d) Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

e) Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

f) At least ten single discharges (in the most sensitive polarity) were applied at the front edge of each HCP opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge electrode was in the plane of the HCP and perpendicular to its front edge during the discharge.

g) At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane (VCP) in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

5.1.5. Test Result

Model Number	PM-3133-100		
Test Item	Electrostatic Discharge		
Test Mode	Mode 1		
Date of Test	2014/09/23	Test Site	TE04

Air Discharge												
Test Points	Test Levels								Results			
	± 2 kV	Performance Criterion		± 4 kV	Performance Criterion		± 8 kV	Performance Criterion		Pass	Fail	Observation
LAN Port	☒	☒A	☐B	☒	☒A	☐B	☒	☒A	☐B	☒	☐	Note1
D-SUB Port	☒	☒A	☐B	☒	☒A	☐B	☒	☒A	☐B	☒	☐	Note1
Panel	☒	☒A	☐B	☒	☐A	☒B	☒	☐A	☒B	☒	☐	Note2
CASE	☒	☒A	☐B	☒	☒A	☐B	☒	☒A	☐B	☒	☐	Note1
USB Port	☒	☒A	☐B	☒	☒A	☐B	☒	☒A	☐B	☒	☐	Note1

Contact Discharge												
Test Points	Test Levels								Results			
	± 2 kV	Performance Criterion		± 4 kV	Performance Criterion		± 8 kV	Performance Criterion		Pass	Fail	Observation
Screws	☒	☒A	☐B	☒	☒A	☐B	☐	☐A	☐B	☒	☐	Note1

For the tested points to EUT, please refer to attached page.
(Blue arrow mark for Air Discharge and red arrow mark for Contact Discharge)

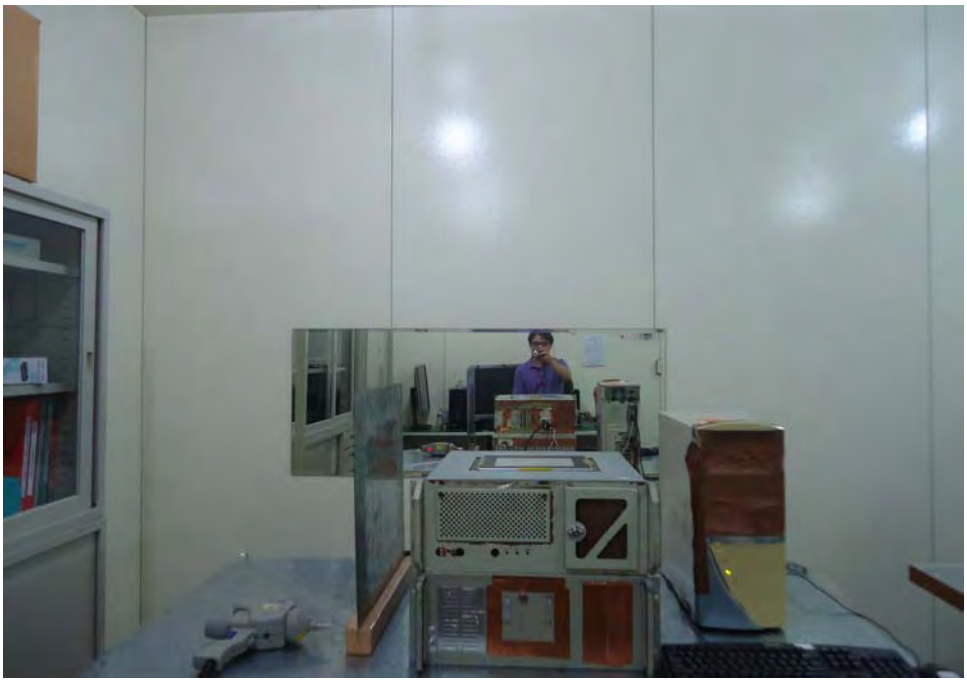
Discharge To Horizontal Coupling Plane									
Side of EUT	Test Levels				Results				
	± 2 kV	± 4 kV	± 6 kV	± 8 kV	Pass	Fail	Performance Criterion		Observation
Front	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1
Back	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1
Left	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1
Right	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1

Discharge To Vertical Coupling Plane									
Side of EUT	Test Levels				Results				
	± 2 kV	± 4 kV	± 6 kV	± 8 kV	Pass	Fail	Performance Criterion		Observation
Front	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1
Back	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1
Left	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1
Right	☒	☒	☐	☐	☒	☐	☒A	☐B	Note1

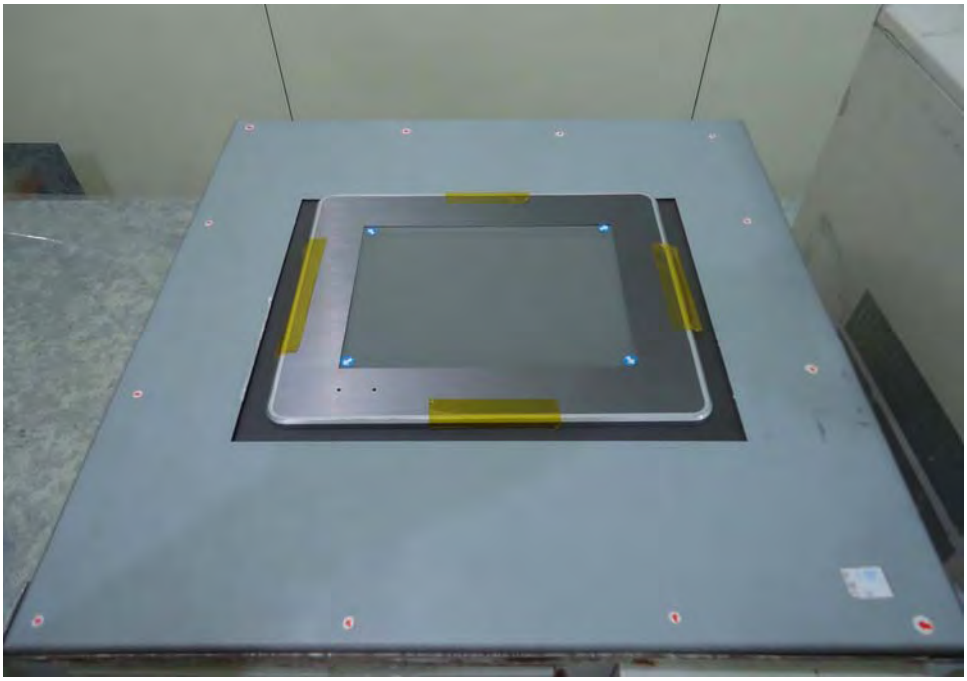
Note1 : Criterion A : There was no change compared with initial operation during the test.
Note2 : Criterion A : There was no change compared with initial operation during the test.
Criterion B : Panel will be twinkle and display disappear.
After test will be recover.

5.1.6. Test Photograph

Test Mode:	Mode 1
Description:	Front View of ESD Test



Test Mode:	Mode 1
Description:	Close View of ESD Test



Test Mode: Mode 1

Description: Close View of ESD Test

Test Mode: Mode 1

Description: Close View of ESD Test

Test Mode: Mode 1

Description: Close View of ESD Test

Test Mode: Mode 1

Description: Close View of ESD Test

Test Mode:	Mode 1
Description:	Close View of ESD Test

Test Mode:	Mode 1
Description:	Close View of ESD Test

Test Mode:	Mode 1
Description:	Close View of ESD Test

Test Mode:	Mode 1
Description:	Close View of ESD Test

Test Mode:	Mode 1
Description:	Close View of ESD Test

5.2. Radiated Electromagnetic Field (RS)

5.2.1. Test Specification

EN 61000-4-3			
Environmental Phenomena	Units	Test Specification	Performance Criterion
Enclosure Port			
Test Frequency Range	MHz	80-1000	A
RF Electromagnetic Field	V/m(Un-modulated, rms)	3	
Amplitude Modulated	% AM (1kHz)	80	

EUT tested in accordance with the specifications given by the standard of EN 61000-4-3.

Step : 1%

Step time : 3 Second

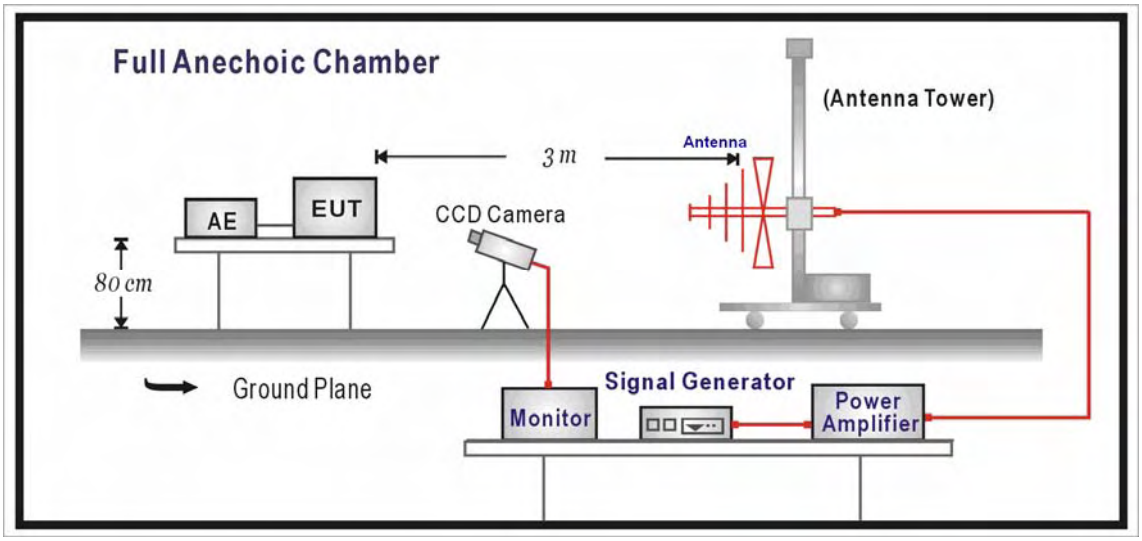
5.2.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
SMB 100A SIGNAL GENERATOR	R&S	SMB100A	100724	03/07/2014	(1)
NRP-Z91 POWER SENSOR	R&S	NRP-Z91	100611	07/19/2014	(1)
NRP-Z91 POWER SENSOR	R&S	NRP-Z91	100612	07/19/2014	(1)
NRP POWER METER	R&S	NRP	101591	07/19/2014	(1)
Solid State Power Amplifier	BONN ELEKTRONIK	BLWA 0830-160/100/40D	87050	N.C.R.	-----
Signal Generator Module	R&S	SM300 Module	102209	N.C.R.	-----
Broad-Band Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA 9120	BBHA 9120 E388	N.C.R.	-----
Test Site	ATL	TE07	888009	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

5.2.3. Setup



5.2.4. Test Procedure

The test procedure was in accordance with EN 61000-4-3

a) The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

b) The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine-wave. The rate of sweep did not exceed 1.5 x 10 -3 decade/s, where the frequency range is swept incrementally, the step size was 1% of preceding frequency value.

c) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

d) The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

5.2.5. Test Result

Model Number	PM-3133-100				
Test Item	Radiated Susceptibility				
Test Mode	Mode 1				
Date of Test	2014/09/19			Test Site	TE07
Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Performance Criterion	Result
80 ~ 1000	H	0	3	☒A ☐B	PASS
80 ~ 1000	V	0	3	☒A ☐B	PASS
80 ~ 1000	H	90	3	☒A ☐B	PASS
80 ~ 1000	V	90	3	☒A ☐B	PASS
80 ~ 1000	H	180	3	☒A ☐B	PASS
80 ~ 1000	V	180	3	☒A ☐B	PASS
80 ~ 1000	H	270	3	☒A ☐B	PASS
80 ~ 1000	V	270	3	☒A ☐B	PASS

Note: The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

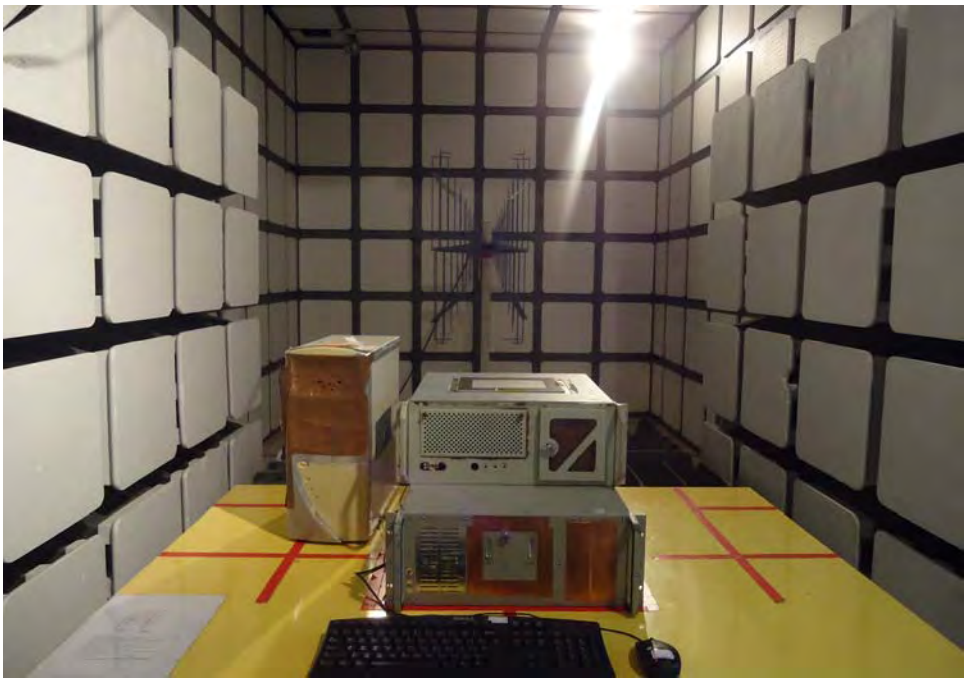
Criterion A: Operate as intended during and after the test
Criterion B: Operate as intended after the test
Criterion C: Loss/Error of function

☐ Additional Information
☐ There was no observable degradation in performance.
☐ EUT stopped operation and could / could not be reset by operator at _____ V/m at frequency _____MHz.
☒ No false alarms or other malfunctions were observed during or after the test.

5.2.6. Test Photograph

Test Mode: Mode 1

Description: Front View of RS Test



5.3. Electrical Fast Transient/Burst (EFT)

5.3.1. Test Specification

EN 61000-4-4				
Item	Environmental Phenomena	Units	Test Specification	Performance Criterion
I/O and communication ports				
	Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	±0.5 5/50 5	B
Input DC Power Ports				
	Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	±0.5 5/50 5	B
Input AC Power Ports				
	Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	±1 5/50 5	B

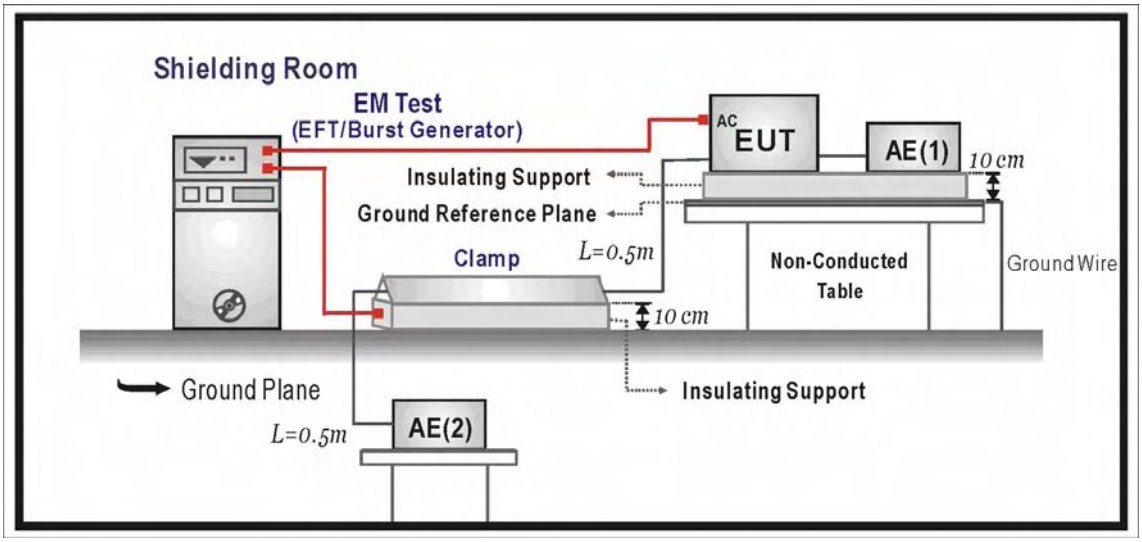
5.3.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
EMC Immunity Tester	EMC-PARTNER AG	TRANSIENT 2000IN6	952	02/06/2014	(1)
Test Site	ATL	TE08	TE08	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

5.3.3. Setup



5.3.4. Test Procedure

a) Both positive and negative polarity discharges were applied.
b) The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1 meter.
c) The duration time of each test sequential was 1 minute.
d) The transient/burst waveform was in accordance with EN 61000-4-4, 5/50ns.

5.3.5. Test Result

Model Number	PM-3133-100					
Test Item	Electrical Fast Transient/Burst					
Test Mode	Mode 1					
Date of Test	2014/09/24			Test Site	TE08	
Test Point	Polarity	Test Level (kV)	Inject Time (Second)	Inject Method	Performance Criterion	Result
L	±	1	60	Direct	☒A ☐B	PASS
N	±	1	60	Direct	☒A ☐B	PASS
PE	±	1	60	Direct	☒A ☐B	PASS
L+N	±	1	60	Direct	☒A ☐B	PASS
L+PE	±	1	60	Direct	☒A ☐B	PASS
N+PE	±	1	60	Direct	☒A ☐B	PASS
L+N+PE	±	1	60	Direct	☒A ☐B	PASS

Note: The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

Criterion A : Operate as intended during and after the test

Criterion B : Operate as intended after the test

Criterion C : Loss/Error of function

☐ Additional Information

☐ EUT stopped operation and could be reset by itself at_____ kV of Line.

☒ No false alarms or other malfunctions were observed during or after the test.

5.3.6. Test Photograph

Test Mode:	Mode 1
Description:	Front View of EFT Test – AC Mains Port

5.4. Surge

5.4.1. Test Specification

EN 61000-4-5				
Item	Environmental Phenomena	Units	Test Specification	Performance Criterion
Signal Ports and Telecommunication Ports(See 1) and 2))				
	Surges Line to Ground	Tr/Th us kV	1.2/50 (8/20) ± 1	B
Input DC Power Ports				
	Surges Line to Ground	Tr/Th us kV	1.2/50 (8/20) ± 0.5	B
Input AC Power Ports				
	Surges Line to Line Line to Ground	Tr/Th us kV kV	1.2/50 (8/20) ± 1 ± 2	B

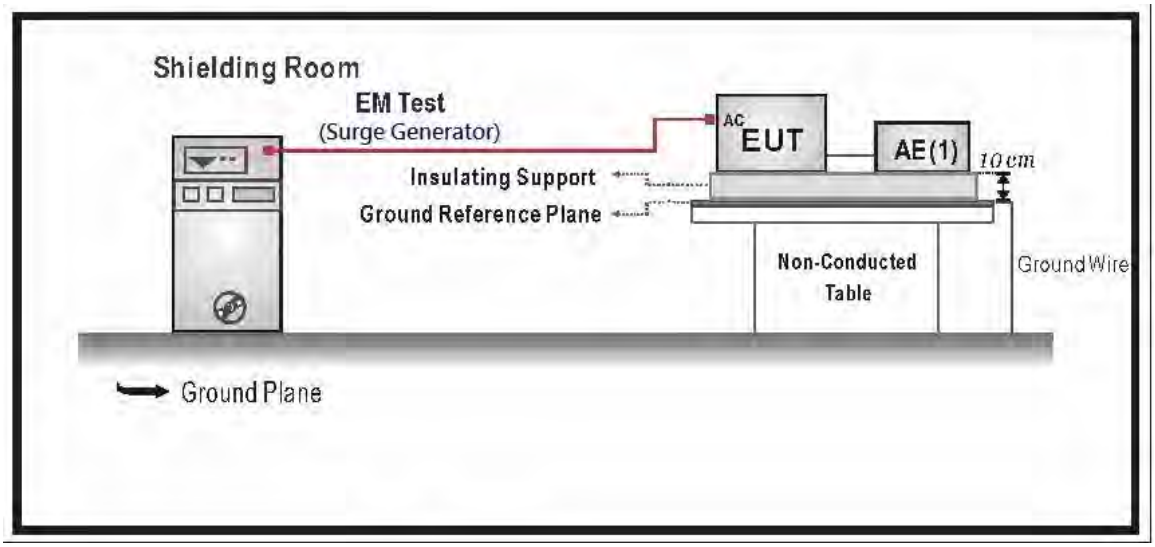
5.4.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
EMC Immunity Tester	EMC-PARTNER AG	TRANSIENT 2000IN6	952	02/06/2014	(1)
Test Site	ATL	TE08	TE08	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

5.4.3. Setup



5.4.4. Test Procedure

a) For EUT power supply:

The surge is 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 was shorter than 2 meters in length.

b) For test applied to unshielded un-symmetrically operated interconnection lines of EUT:
The surge was applied to the lines via the capacitive coupling. The coupling / decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

c) For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT:
The surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

5.4.5. Test Result

Model Number	PM-3133-100				
Test Item	Surge				
Test Mode	Mode 1				
Angle	0, 90, 180, 270				
Date of Test	2014/09/22		Test Site	TE08	

Inject Line	Polarity	Voltage kV	Time Interval (Second)	Inject Method	Performance Criterion	Result
L-N	±	1	60	Direct	☒A ☐B	Pass
L-PE	±	2	60	Direct	☒A ☐B	Pass
N-PE	±	2	60	Direct	☒A ☐B	Pass
L+N-PE	±	2	60	Direct	☒A ☐B	Pass

Note: The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

Criterion A : Operate as intended during and after the test
Criterion B : Operate as intended after the test
Criterion C : Loss/Error of function

☐ Additional Information

☐ EUT stopped operation and could / could not be reset by operator at_____kV of Line_____.

☒ No false alarms or other malfunctions were observed during or after the test.

5.4.6. Test Photograph

Test Mode:	Mode 1
Description:	Front View of Surge Test – AC Mains Port

5.5. Conducted Susceptibility (CS)

5.5.1. Test Specification

EN 61000-4-6			
Environmental Phenomena	Units	Test Specification	Performance Criterion
Signal Ports and Telecommunication Ports			
Radio-Frequency Continuous Conducted	MHz	0.15-80	A
	V (rms, Un-modulated)	3	
	% AM (1kHz)	80	
Input DC Power Ports			
Radio-Frequency Continuous Conducted	MHz	0.15-80	A
	V (rms, Un-modulated)	3	
	% AM (1kHz)	80	
Input AC Power Ports			
Radio-Frequency Continuous Conducted	MHz	0.15-80	A
	V (rms, Un-modulated)	3	
	% AM (1kHz)	80	

EUT tested in accordance with the specifications given by the standard of EN 61000-4-6.

Step : 1%
Step time : 3 Second

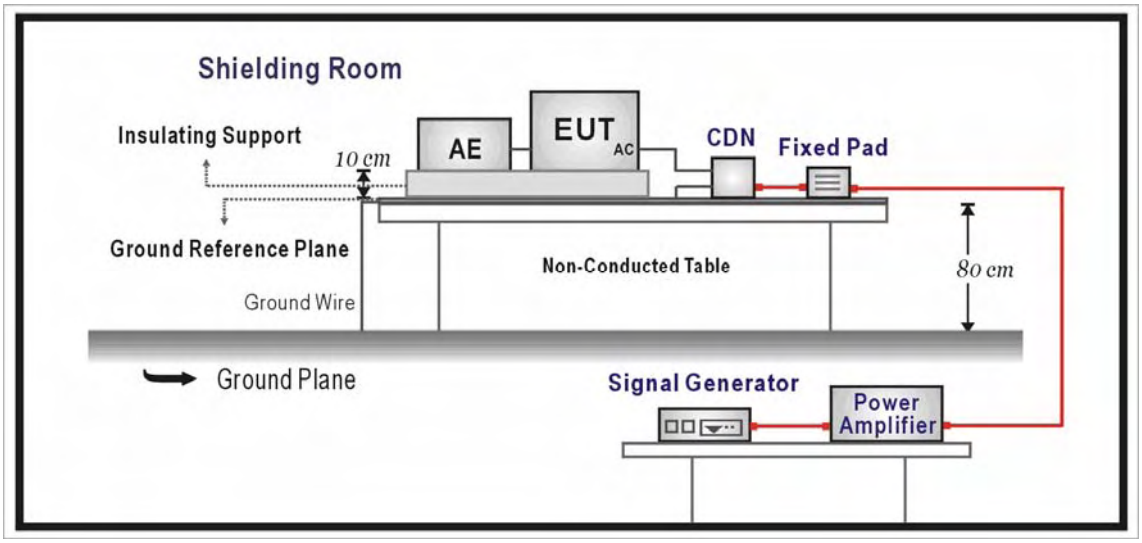
5.5.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Signal Line Coupling Decoupling Network	FCC	FCC-801--T2-RJ11	8017	07/17/2014	(1)
Signal Line Coupling Decoupling Network	FCC	FCC-801--T4-RJ45	8018	07/17/2014	(1)
Signal Line Coupling Decoupling Network	FCC	FCC-801-M2/M3-16A 8030	8030	07/17/2014	(1)
EM Injection Clamp	FCC	F-203I-23MM	8576	07/17/2014	(1)
NRP-Z91 POWER SENSOR	R&S	NRP-Z91	100613	07/19/2014	(1)
Amplifiers	ar	75A250A	328729	N.C.R.	-----
De-coupling Network	FCC	F-203I-23MM-DCN	8234	N.C.R.	-----
Test Site	ATL	TE08	TE08	N.C.R.	-----

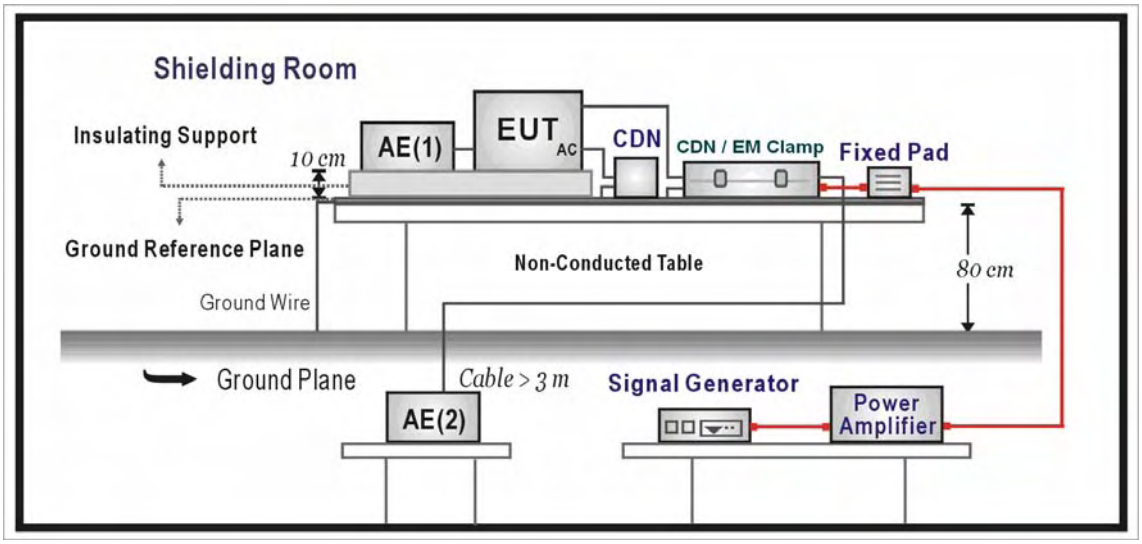
Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

5.5.3. Setup

CDN Method



EM Clamp Method



5.5.4. Test Procedure

The EUT shall be tested within its intended operating and climatic conditions.

The test shell performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.

The frequency range was swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal was modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate was 1.5 x 10^{-3} decades/s. Where the frequency range is swept incrementally, the step size was 1 % of preceding frequency value from 150 kHz to 80 MHz.

The dwell time at each frequency was less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency and harmonics or frequencies of dominant interest, was analyzed separately.

Attempts was made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

5.5.5. Test Result

Model Number	PM-3133-100				
Test Item	Conducted Susceptibility				
Test Mode	Mode 1				
Date of Test	2014/09/19		Test Site	TE08	
Frequency Band (MHz)	Field Strength (Vrms)	Inject Port	Inject Method	Performance Criterion	Result
0.15 ~ 80	3	AC Mains	CDN-M3	☒A ☐B	PASS
0.15 ~ 80	3	LAN Port	CDN-T4	☒A ☐B	PASS

Note: The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

Criterion A : Operate as intended during and after the test

Criterion B : Operate as intended after the test

Criterion C : Loss/Error of function

☐ Additional Information

☐ EUT stopped operation and could / could not be reset by operator at_____kV of Line_____.

☒ No false alarms or other malfunctions were observed during or after the test.

5.5.6. Test Photograph

Test Mode:	Mode 1
Description:	Front View of CS Test – AC Mains Port, LAN Port

5.6. Power Frequency Magnetic Field (PMF)

5.6.1. Test Specification

EN 61000-4-8				
Item	Environmental Phenomena	Units	Test Specification	Performance Criterion
Enclosure Port				
	Power-Frequency Magnetic Field	Hz A/m (r.m.s.)	50 1	A

EUT tested in accordance with the specifications given by the standard of EN 61000-4-8.

Orientation : X, Y, Z

Test time : 180 Second

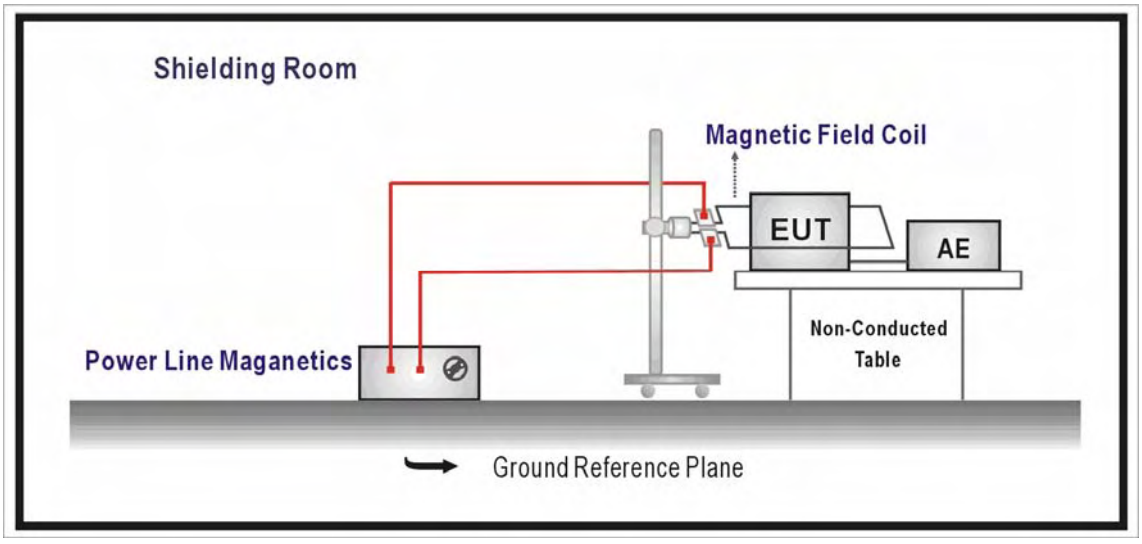
5.6.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
EMC Immunity Tester	EMC-PARTNER AG	TRANSIENT 2000IN6	952	02/06/2014	(1)
Magentic Field Antenna	EMC-PARTNER AG	MF1000-1	155	02/06/2014	(1)
Test Site	ATL	TE08	TE08	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

5.6.3. Setup



5.6.4. Test Procedure

a). The equipment was configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m-thick insulating support.

b). The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.

c). The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.

d). 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.

5.6.5. Test Result

Model Number	PM-3133-100			
Test Item	Power Frequency Magnetic Field			
Test Mode	Mode 1			
Date of Test	2014/09/22		Test Site	TE08
Polarization	Frequency (Hz)	Magnetic Strength (A/m)	Performance Criterion	Result
X Orientation	50	1	☒A ☐B	PASS
Y Orientation	50	1	☒A ☐B	PASS
Z Orientation	50	1	☒A ☐B	PASS

Note:

Criterion A : Operate as intended during and after the test

Criterion B : Operate as intended after the test

Criterion C : Loss/Error of function

☐ Additional Information

☐ EUT stopped operation and could / could not be reset by operator at _____ dBuV (V) at frequency ____ MHz.

☒ No false alarms or other malfunctions were observed during or after the test.
The acceptance criteria were met, and the EUT passed the test.

5.6.6. Test Photograph

Test Mode: Mode 1

Description: Front View of PMF Test

5.7. Voltage Dips and Interruption

5.7.1. Test Specification

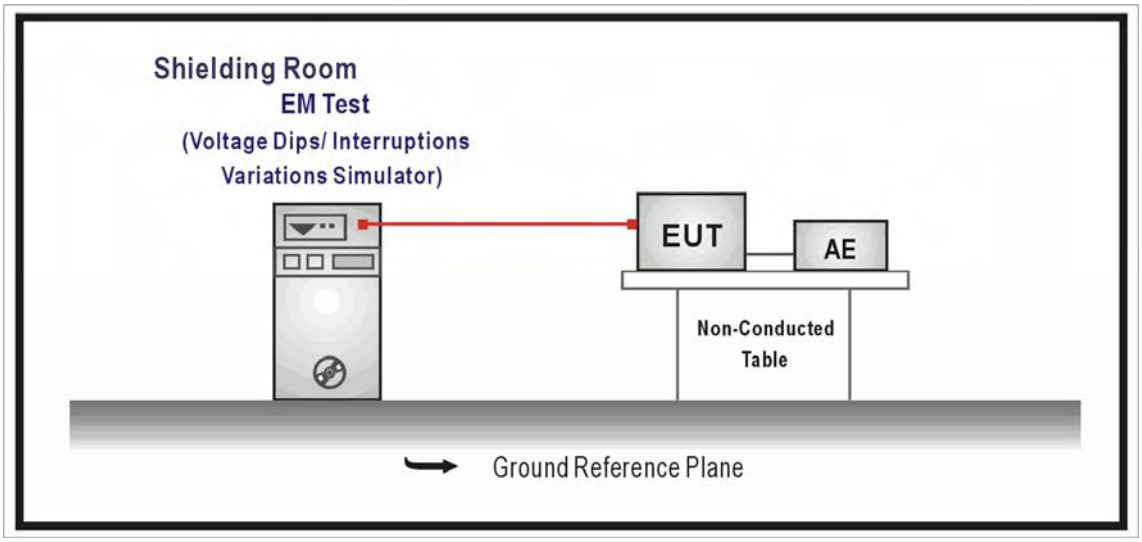
EN 61000-4-11			
Environmental Phenomena	Units	Test Specification	Performance Criterion
Input AC Power Ports			
Voltage Dips	0	% Reduction	B
	0.5	Period	
	70	% Reduction	C
	25	Period	
Voltage Interruptions	0	% Reduction	C
	250	Period	

5.7.2. Test Instrument

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
EMC Immunity Tester	EMC-PARTNER AG	TRANSIENT 2000IN6	952	02/06/2014	(1)
Test Site	ATL	TE08	TE08	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
NOTE: N.C.R. = No Calibration Request.

5.7.3. Setup



5.7.4. Test Procedure

The EUT and its load are placed on a table which is 0.8 meter above a metal ground plane measured 1m*1m min. And 0.65mm thick min. And projected beyond the EUT by at least 0.1m on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage Dips/ Interruptions test:

The selection of test voltage is based on the rated power range. If the operation range is large than 20% of lower power range, both end of specified voltage shall be tested. Otherwise, the typical voltage specification is selected as test voltage.

The EUT is connected to the power mains through a coupling device that directly couples to the Voltage Dips and Interruption Generator.

The EUT shall be tested for 30% voltage dip of supplied voltage and duration 25 Periods,

for 95% voltage dip of supplied voltage and duration 0.5 Periods with a sequence of three voltage dips with intervals of 10 seconds, and for 95% voltage interruption of supplied voltage and duration 250 Periods with a sequence of three voltage interruptions with intervals of 10 seconds.

Voltage phase shifting are shall occur at 0^0, 45^0, 90^0, 135^0, 180^0, 225^0, 270^0, 315^0 of the voltage.

5.7.5. Test Result

Model Number	PM-3133-100				
Test Item	Voltage Dips and Interruption Measurement				
Test Mode	Mode 1				
Angle	0~360 degree		Step	45 degree	
Date of Test	2014/09/22		Test Site	TE08	
Test Voltage (Vac)	Voltage Reduction (%)	Test Duration (ms)	Performance Criterion	Test Result	Observation
230	>95	10	☒A ☐B ☐C	Pass	Note1
	30	500	☒A ☐B ☐C	Pass	Note1
	>95	5000	☐A ☐B ☒C	Pass	Note2
100	>95	10	☒A ☐B ☐C	Pass	Note1
	30	500	☒A ☐B ☐C	Pass	Note1
	>95	5000	☐A ☐B ☒C	Pass	Note2

Note 1: The acceptance criteria were met, and the EUT passed the test.

Criterion A : Operate as intended during and after the test

Criterion B : Operate as intended after the test

Criterion C : Loss/Error of function

☐ Additional Information

☐ EUT stopped operation and could / could not be reset by operator at_____dBuV(V) at frequency_____MHz.

☒ No false alarms or other malfunctions were observed during or after the test.

Note 2: After test, EUT was restart and recover by manually.

5.7.6. Test Photograph

Test Mode:	Mode 1
Description:	Front View of Dips Test

6 EUT Photograph

(1) EUT Photo

(2) EUT Photo

(3) EUT Photo

(4) EUT Photo

(5) EUT Photo

(6) EUT Photo

(7) EUT Photo

(8) EUT Photo

(9) EUT Photo

(10)EUT Photo

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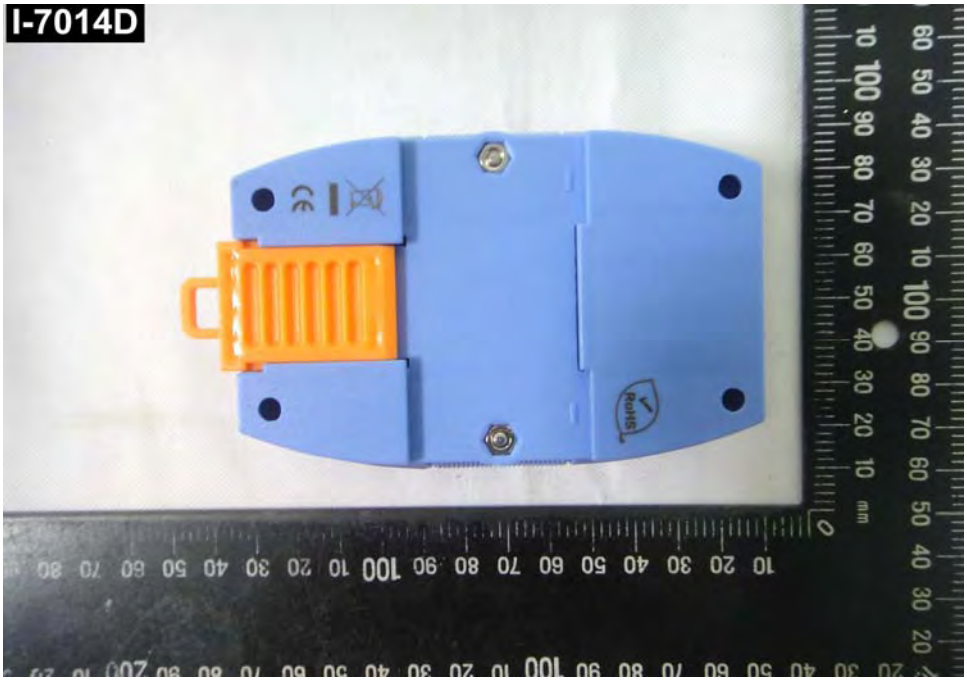

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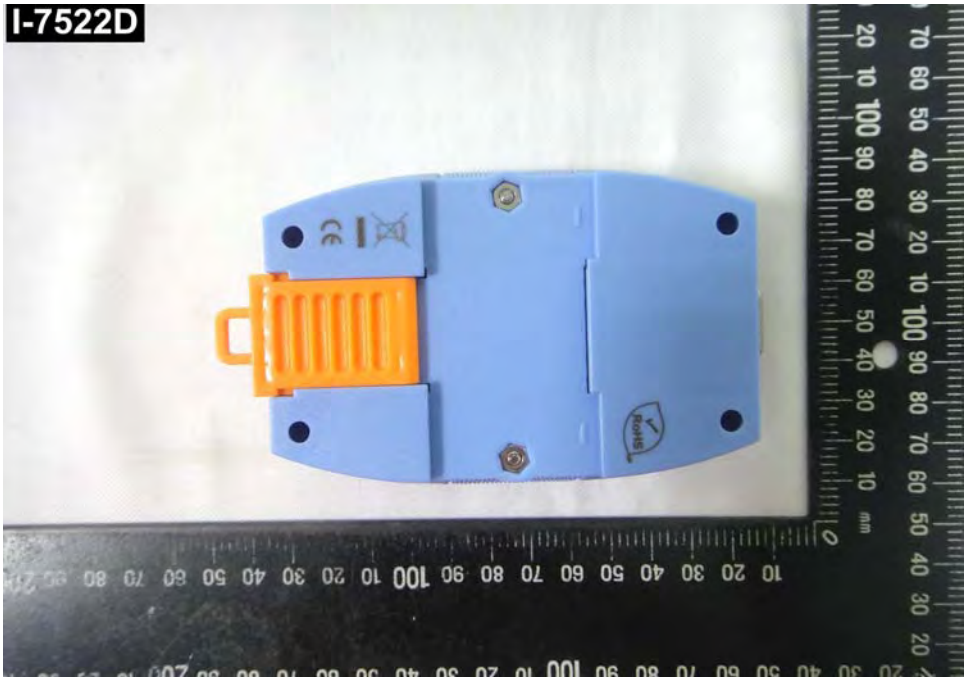
(25)EUT Photo

(26)EUT Photo



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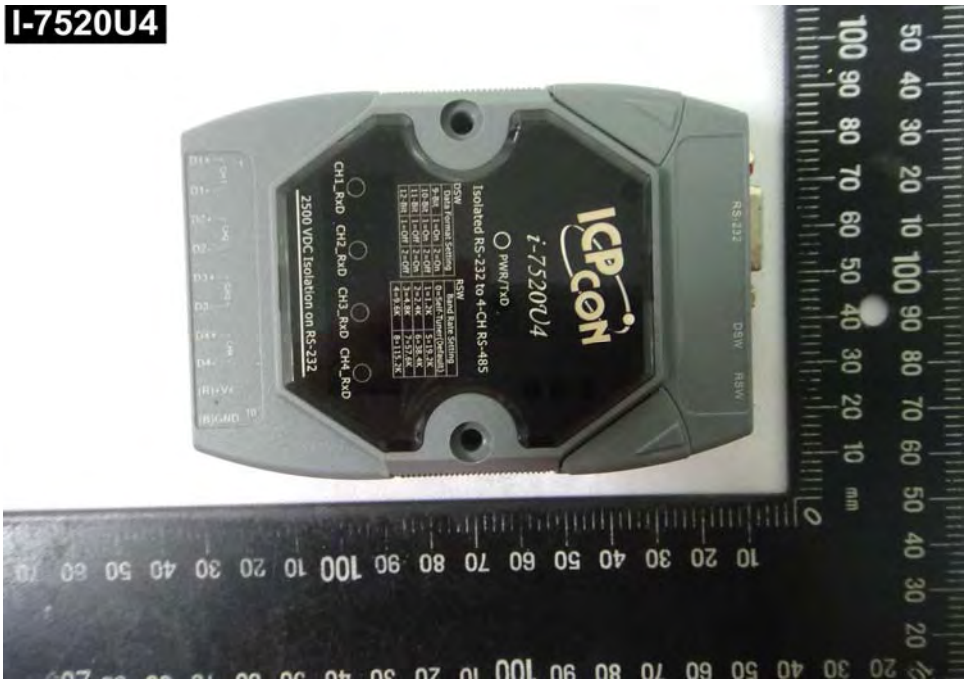
(29)EUT Photo



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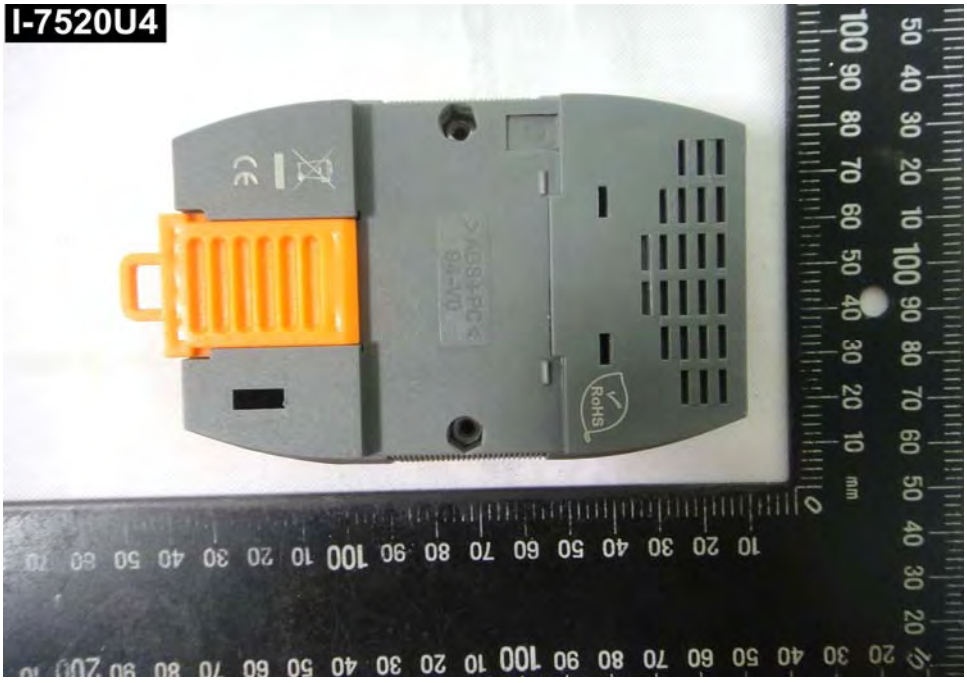
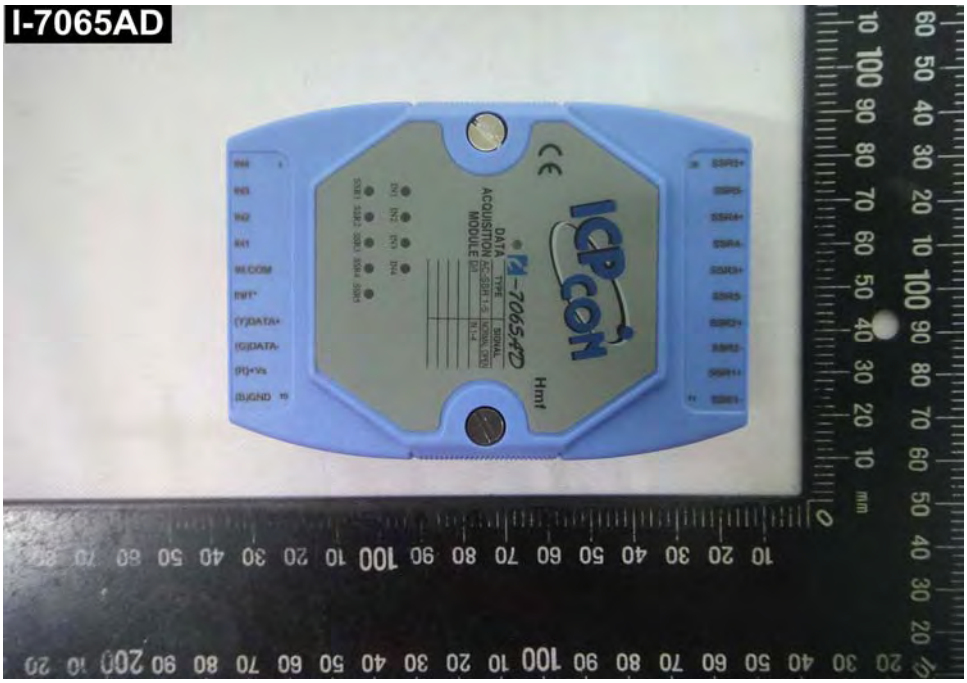


(31)EUT Photo

(32)EUT Photo

(33)EUT Photo



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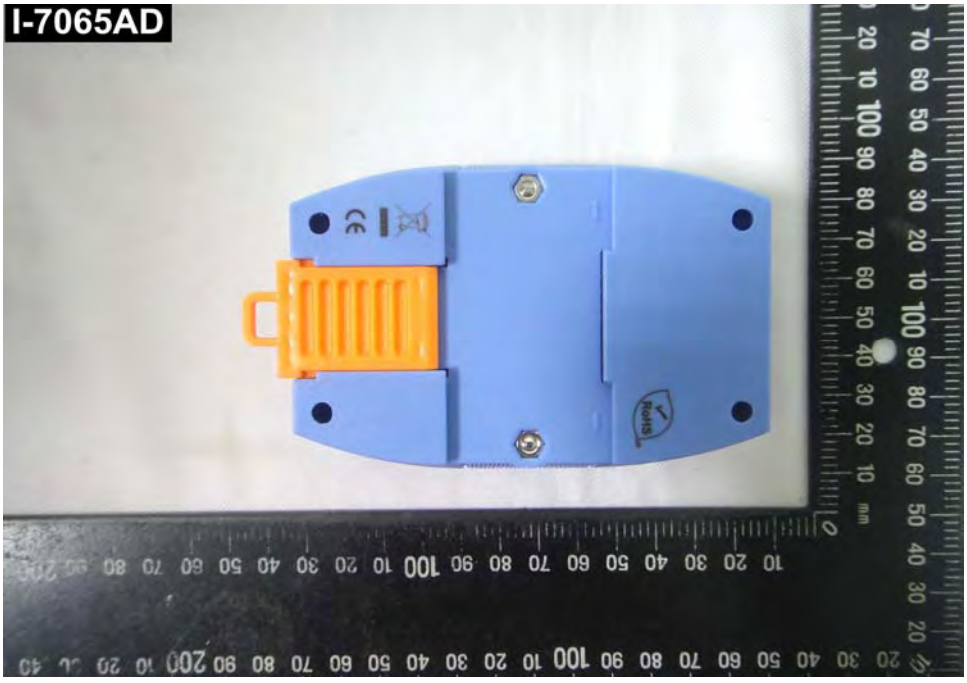

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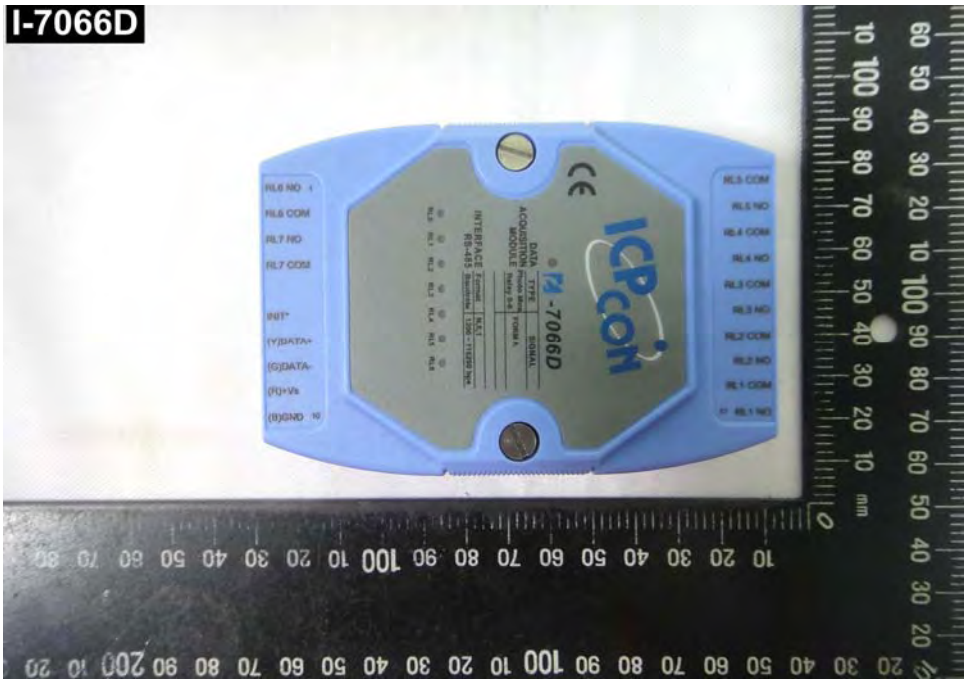
(36)EUT Photo

(37)EUT Photo



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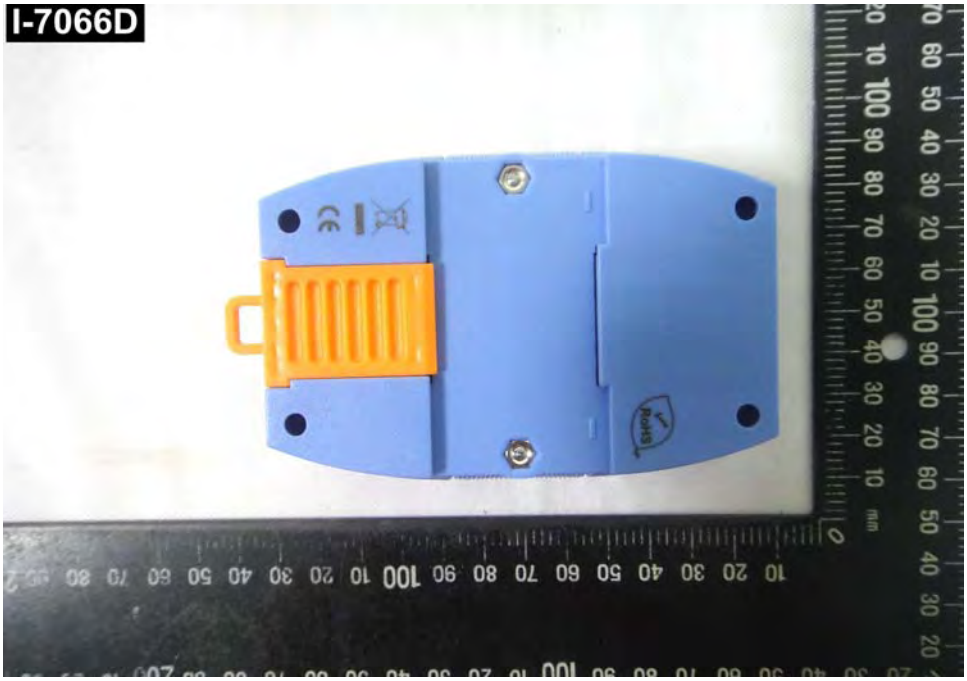
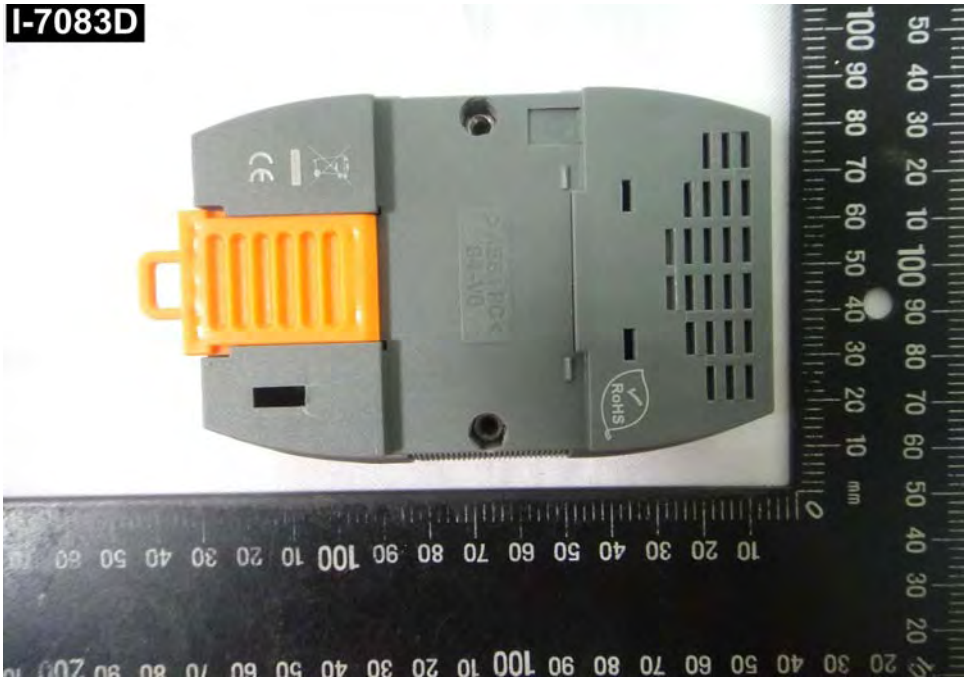


(39)EUT Photo

(40)EUT Photo

(41)EUT Photo

(42)EUT Photo



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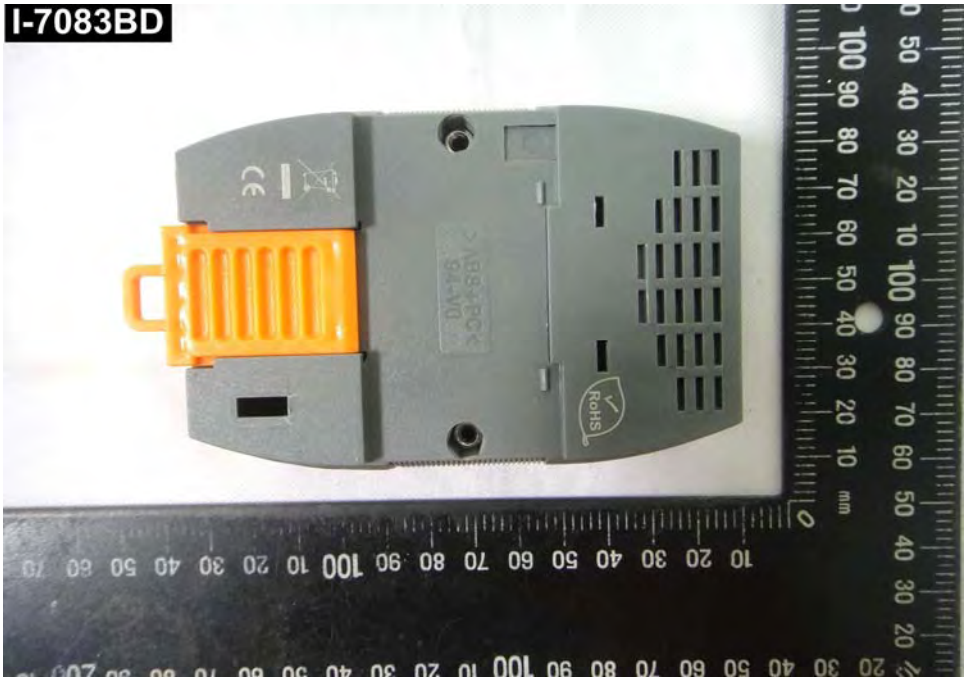
(44)EUT Photo

(45)EUT Photo

(46)EUT Photo



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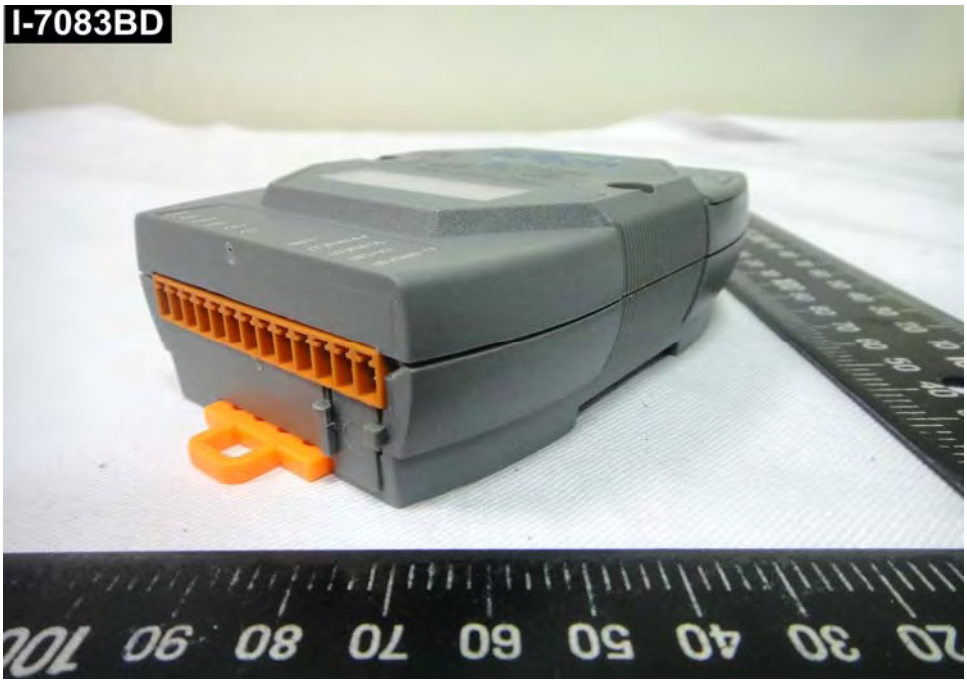


(48)EUT Photo

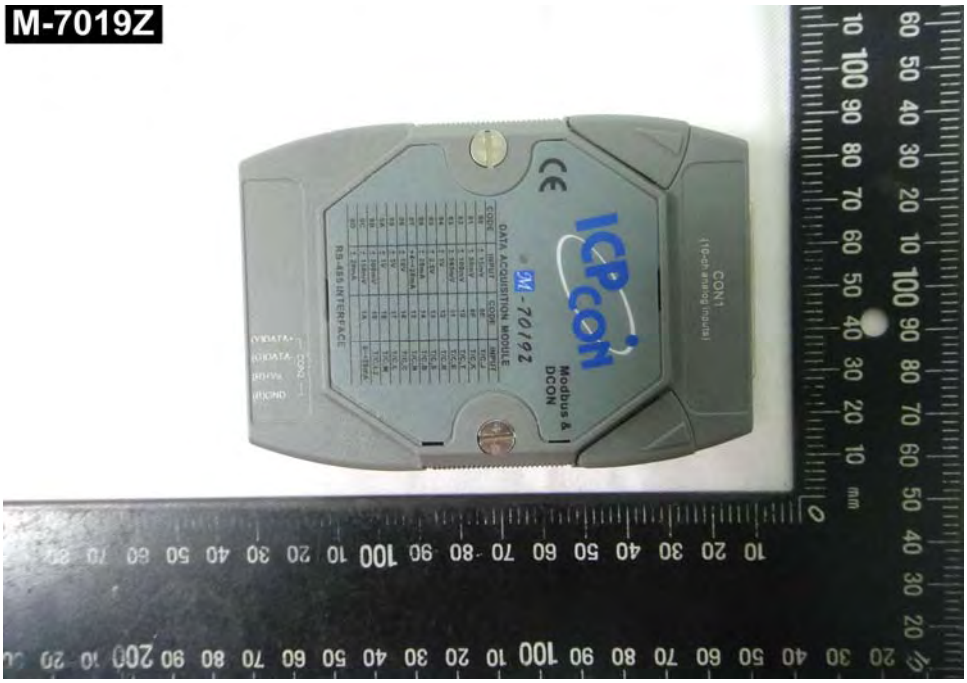
(49)EUT Photo

(50)EUT Photo

(51)EUT Photo

(52)EUT Photo

(53)EUT Photo



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(55)EUT Photo

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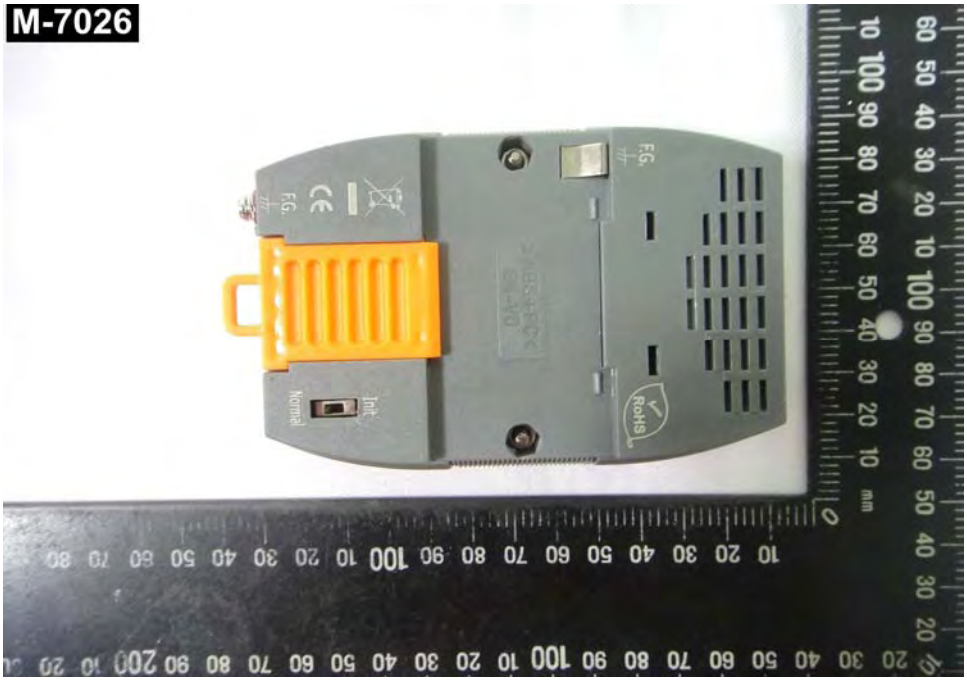
(57)EUT Photo

(58)EUT Photo



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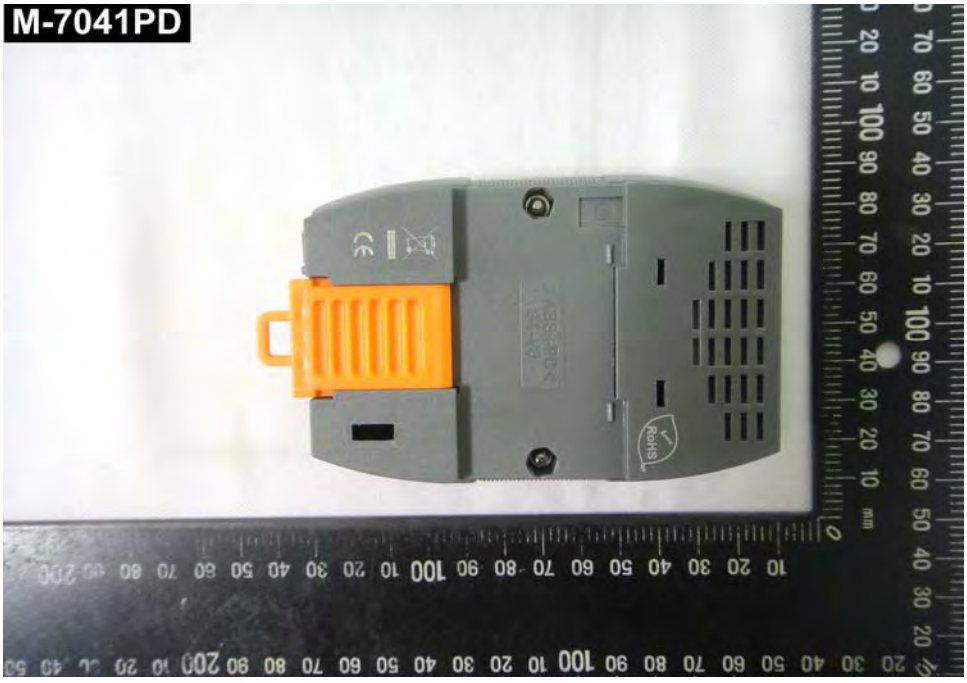
(61)EUT Photo

(62)EUT Photo



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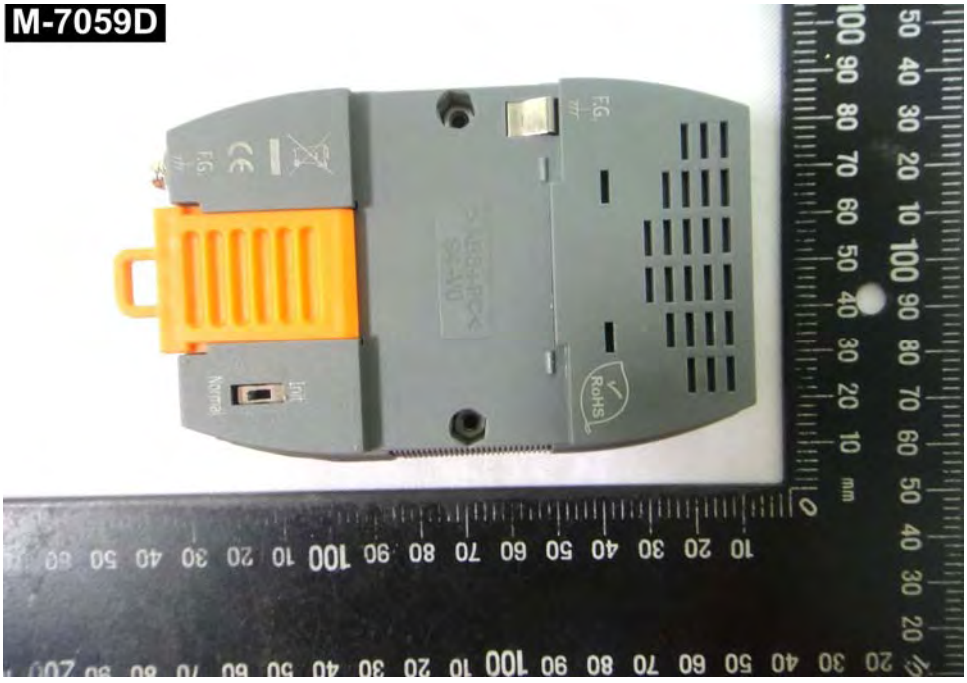

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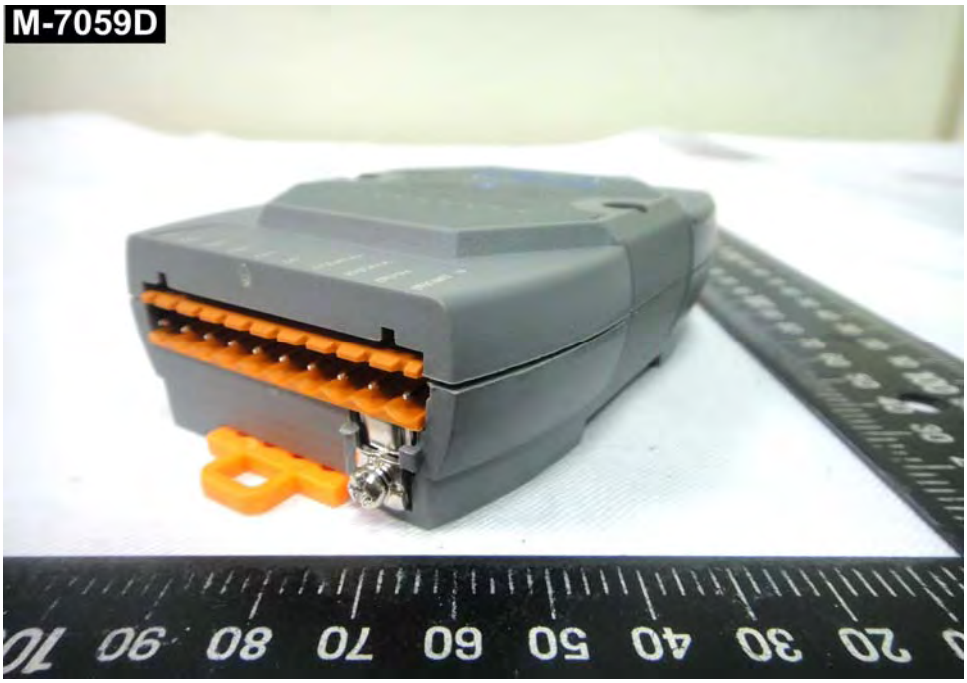

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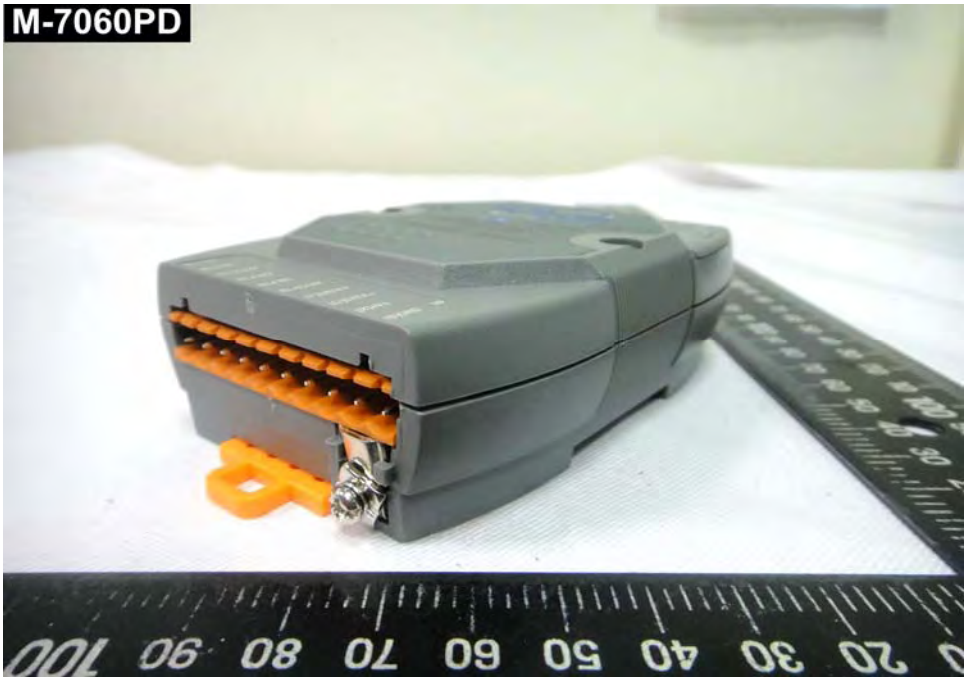
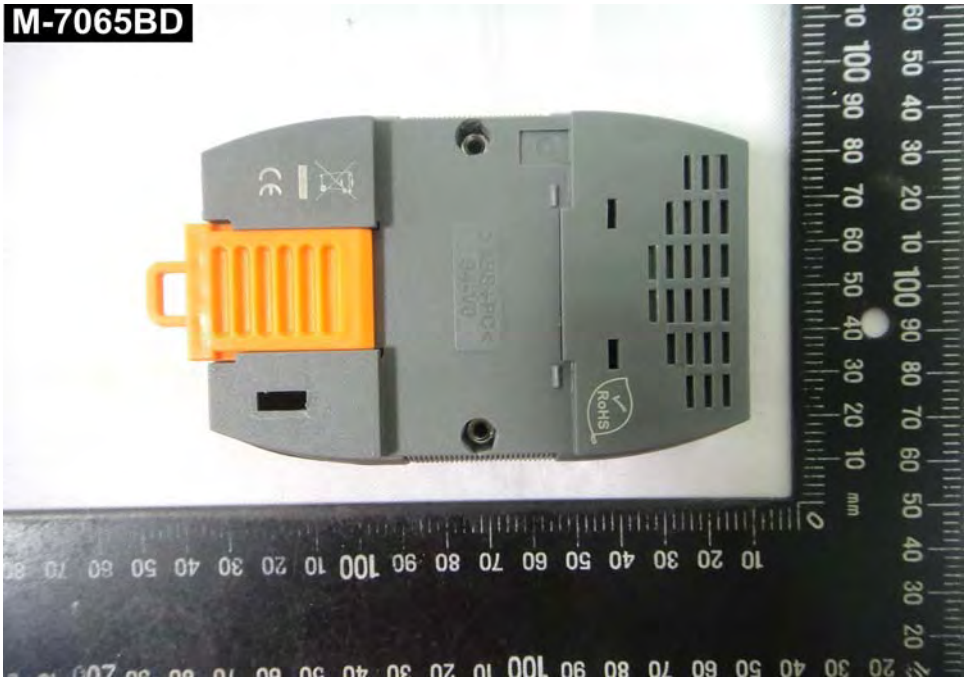
(80)EUT Photo



(81)EUT Photo

(82)EUT Photo



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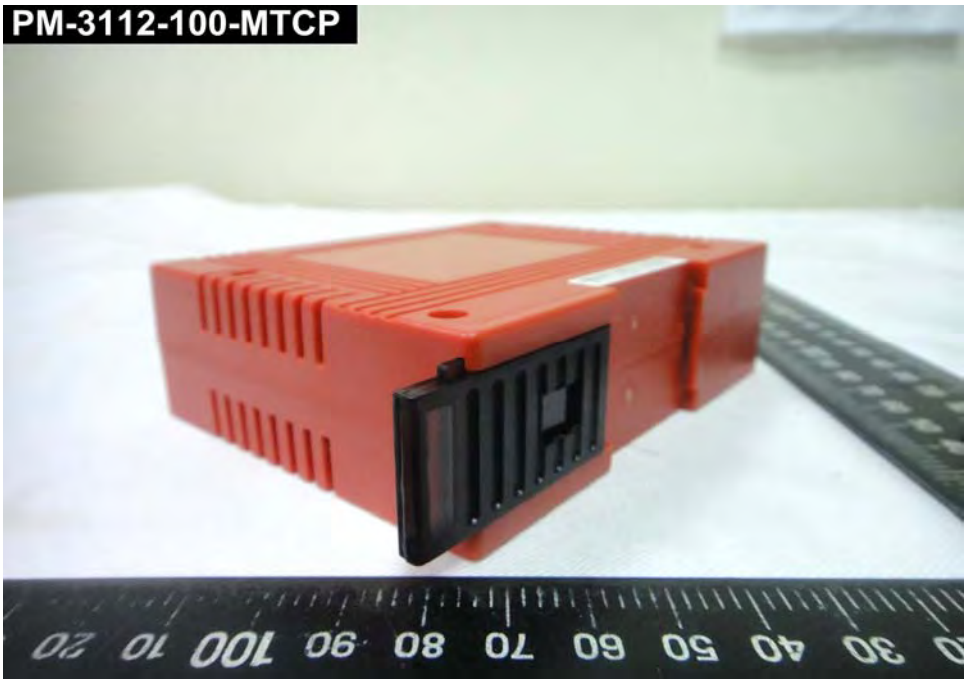

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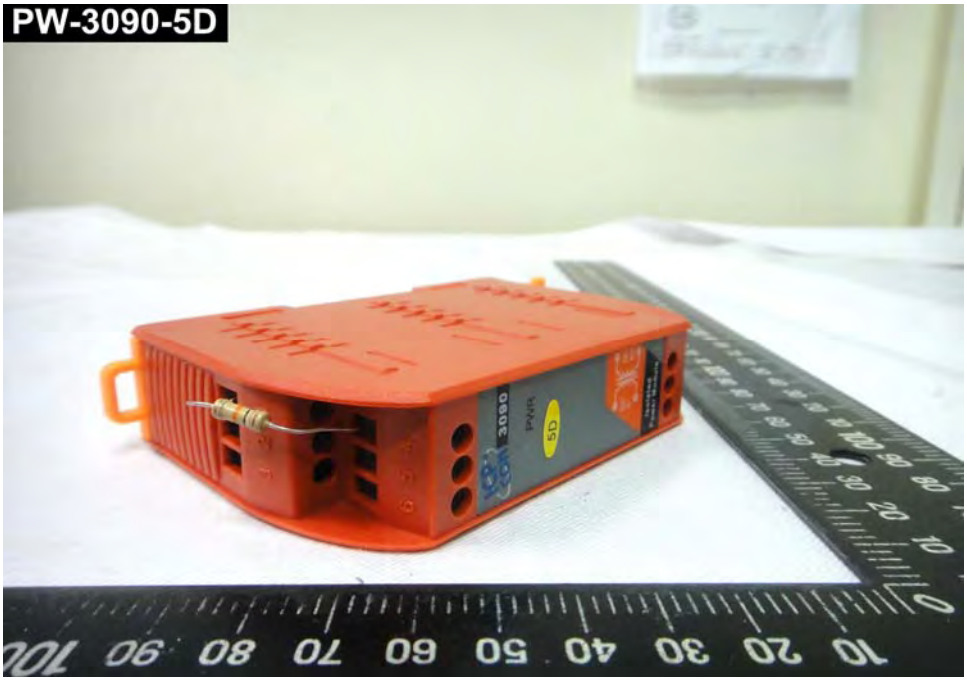

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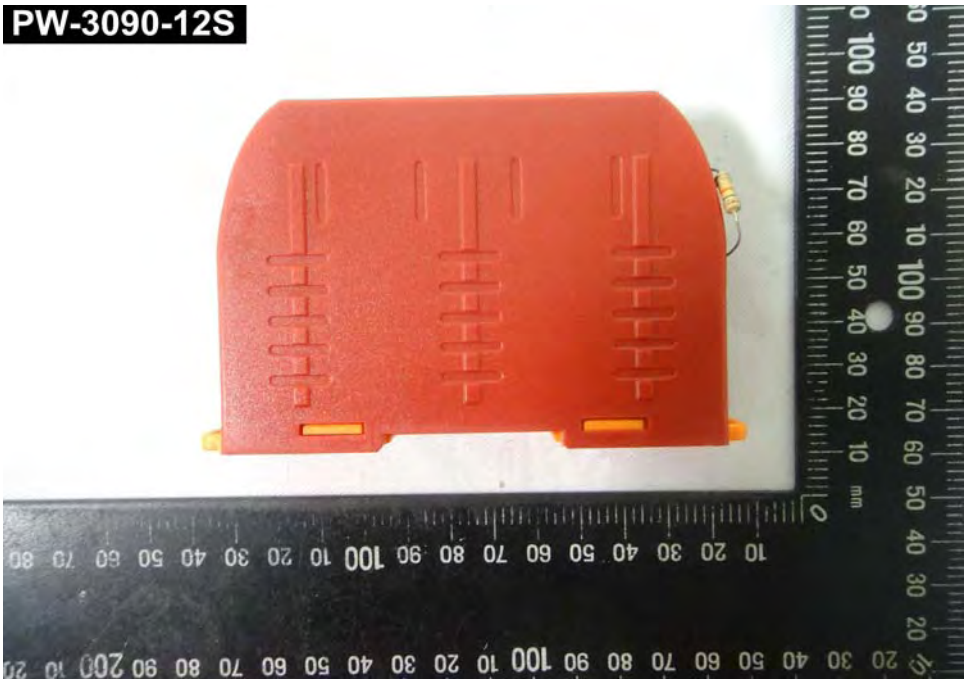

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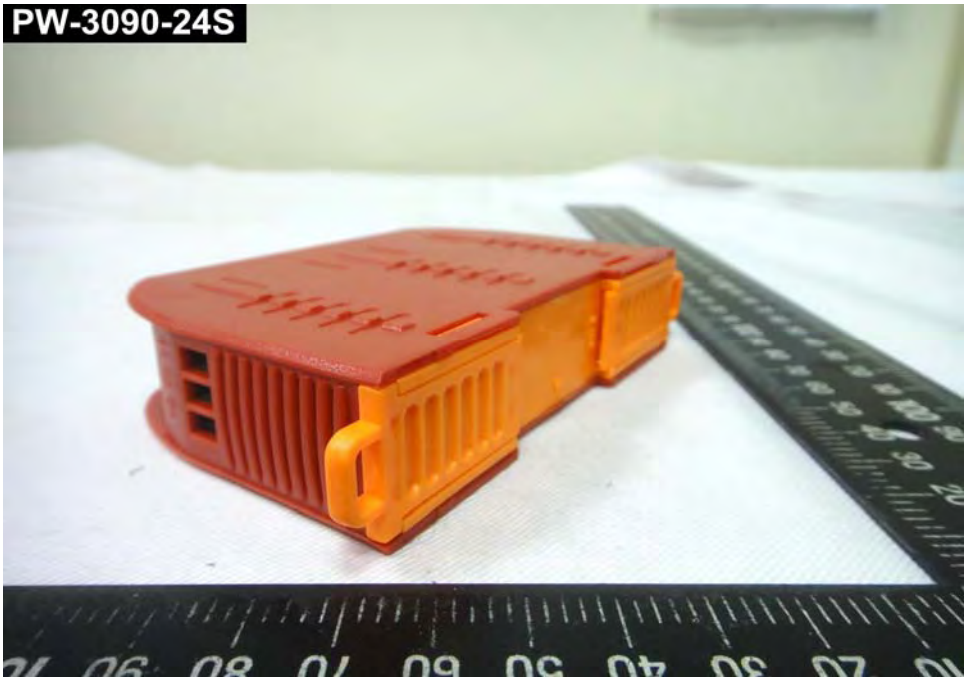

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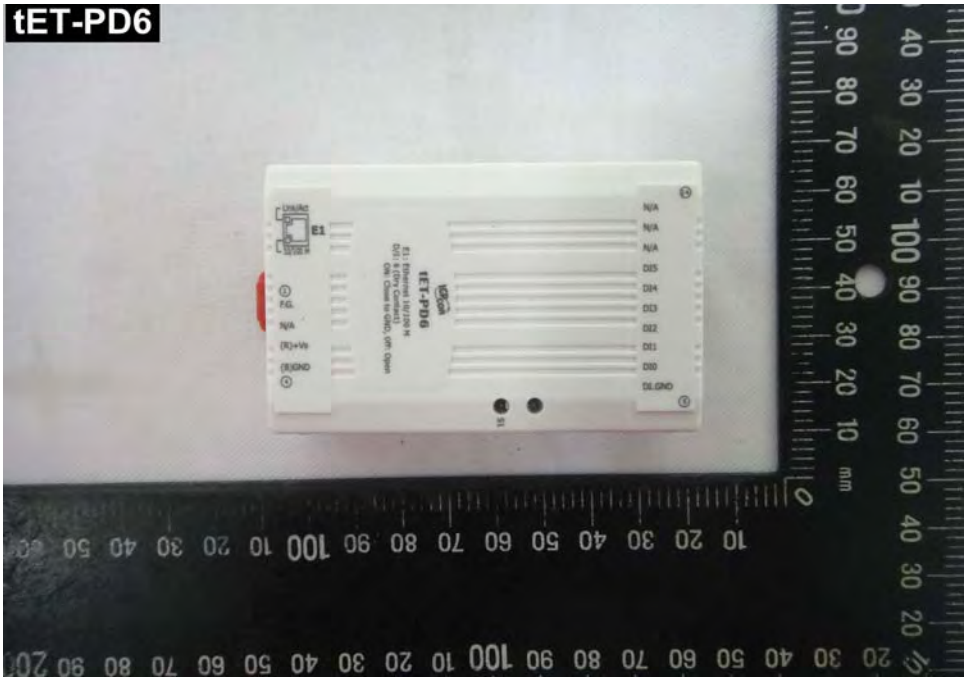

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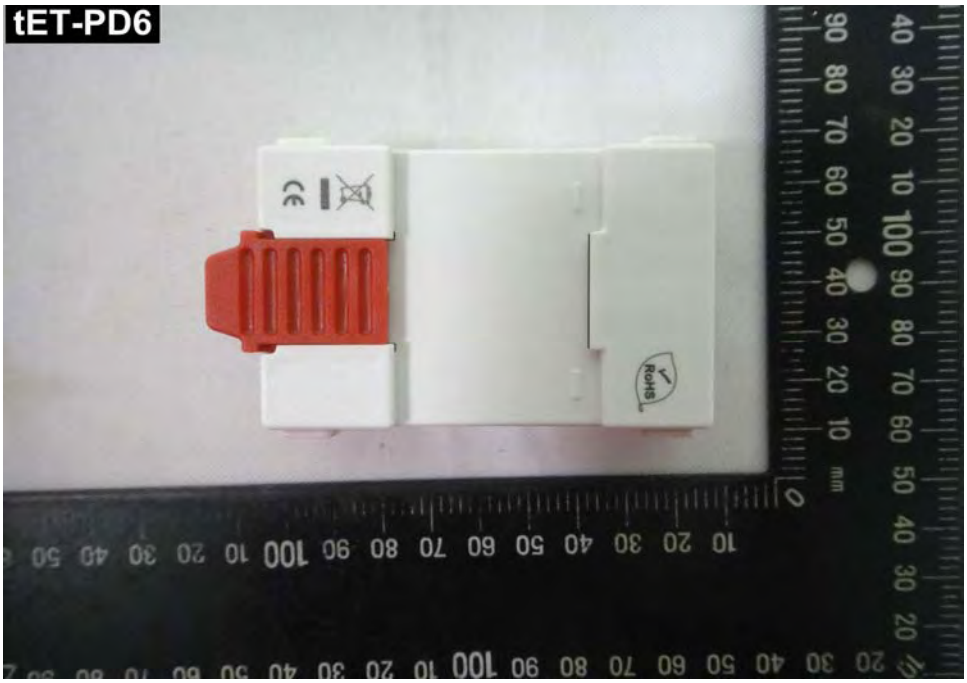

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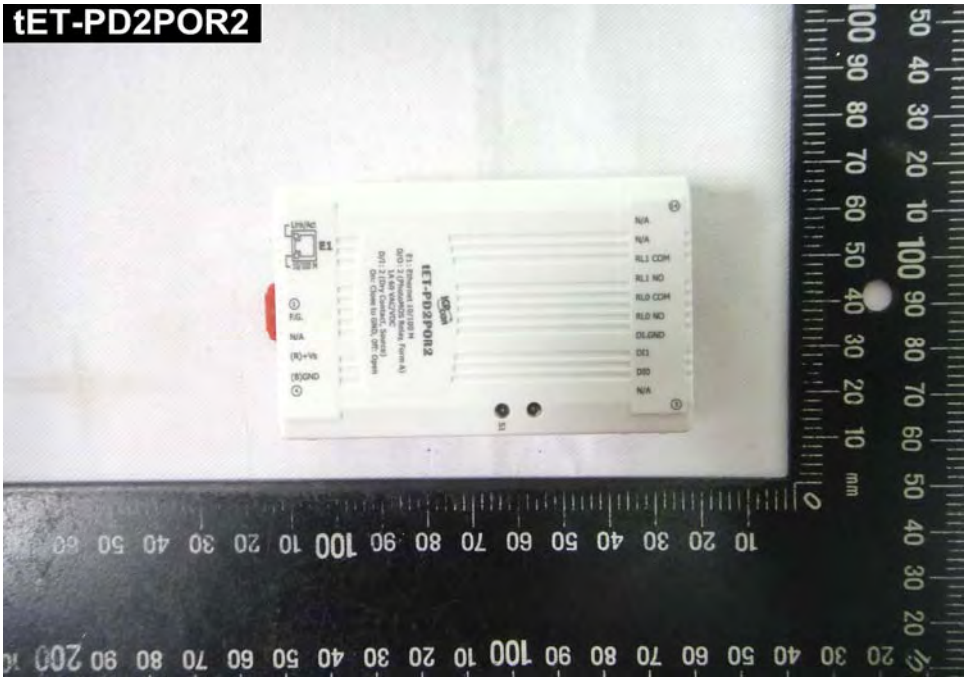

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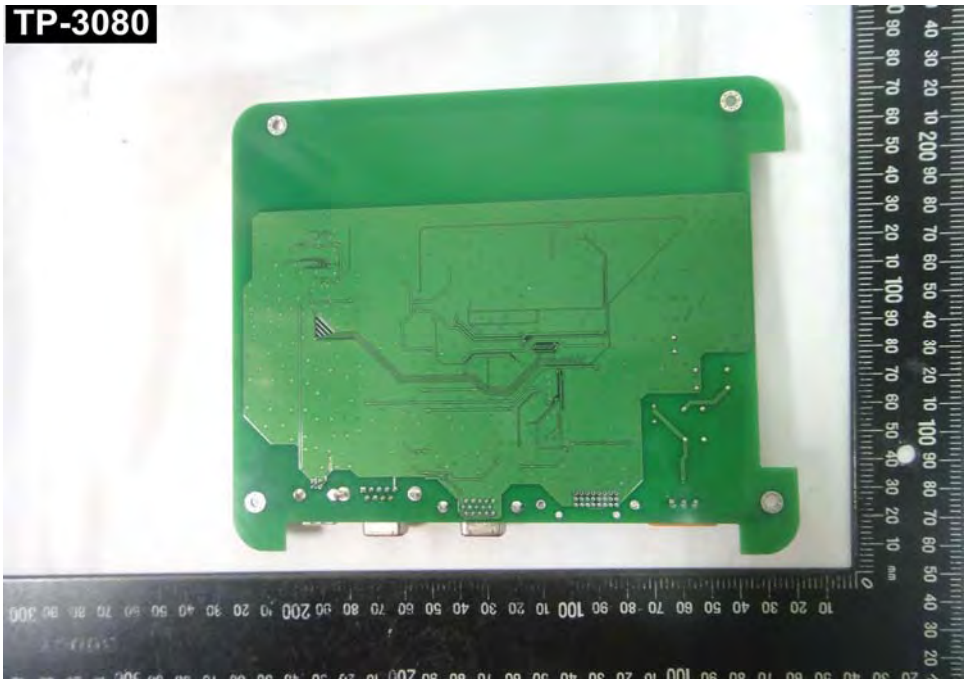

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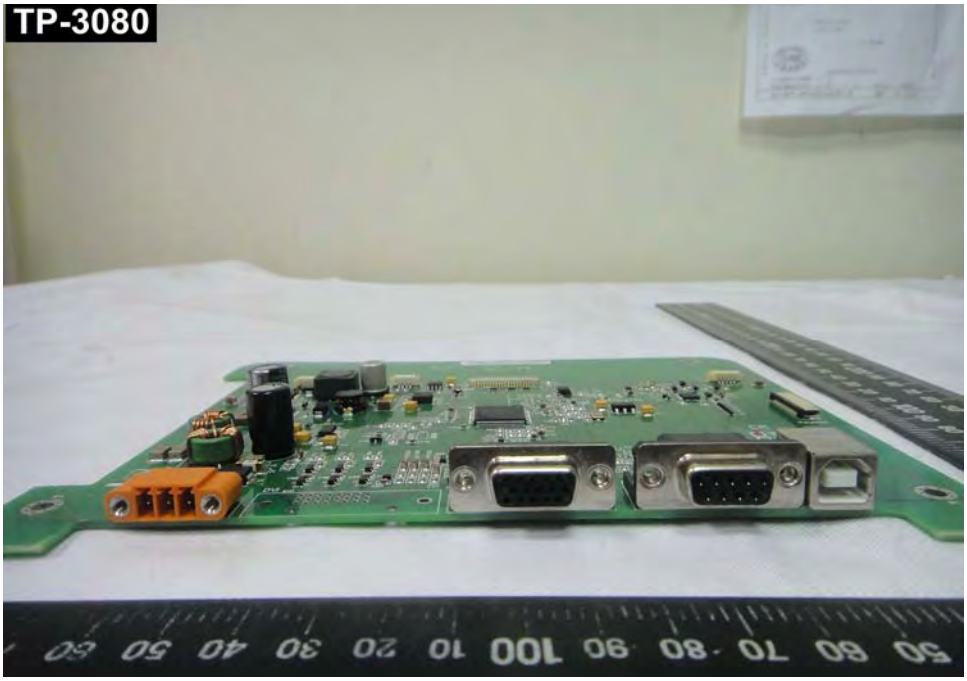

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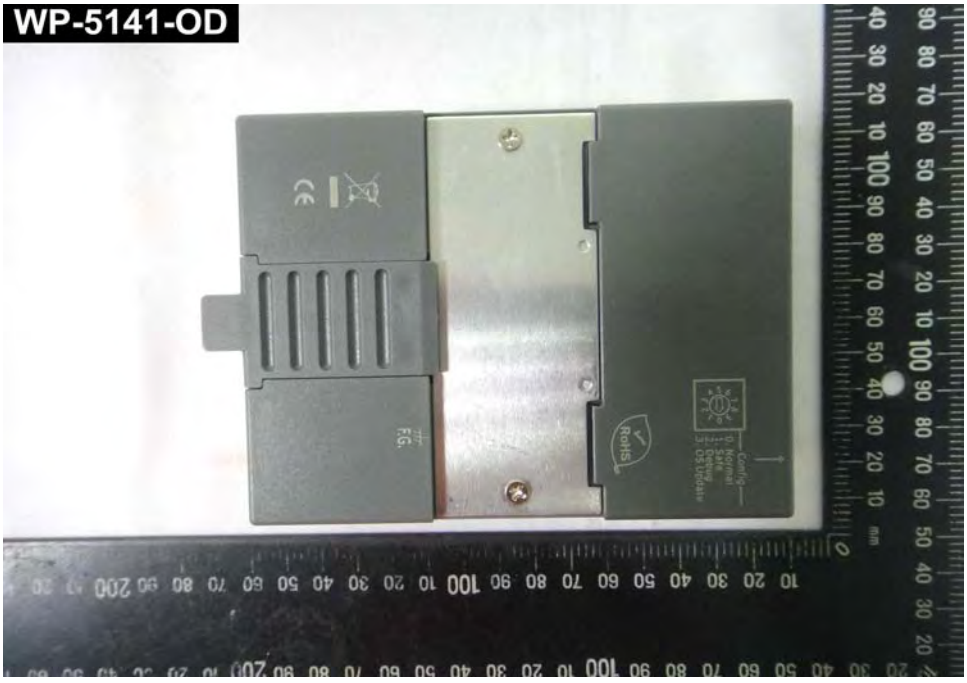
(168) EUT Photo



(169) EUT Photo

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