Declaration of Conformity

SAMSUNG TECHWIN

CE

Type of equipment:	**Digital Video Recorder**
Brand Name /Trade Mark:	**SAMSUNG**
Type designation /model:	**SRD-842P**
Applicant:	**SAMSUNG TECHWIN CO., LTD.**

In accordance with the following Directives:

2004/108/EC	The Electromagnetic Compatibility Directive

Including amendments by the CE Marking Directive 93/68/EEC

2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)

The following harmonized European standards or technical specifications have been applied:

EN 55022:2010	Limits and methods of measurement of radio disturbance characteristics of information technology equipment
EN 50581:2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN 50130-4:2011	Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
EN 61000-3-2:2006+A2:2009	Limits for harmonic current emissions
EN 61000-3-3:2008	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <=16 A per phase and not subject to conditional connection
EN 61000-4-2:2009	Electrostatic discharge immunity test
EN 61000-4-3:2006+A2:2010	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2004+A1:2010	Electrical fast transient/burst immunity test
EN 61000-4-5:2006	Surge immunity test
EN 61000-4-6:2009	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11:2004	Voltage dips, short interruptions and voltage variations immunity tests

The CE Marking on the products and/or their packaging signifies that SAMSUNG TECHWIN CO., LTD. holds the reference technical file available to the European Union authorities.

Place and date of issue: #42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do, Korea / December 30, 2013

Authorized Signatory: Name : Jei Soon, Kang

Title : Principal Research Engineer

Signature :



EMC TEST REPORT

Test report No	:	**EMC-CE-4467**
Type of Equipment	:	**Digital Video Recorder**
Model Name	:	**SRD-842P**
Applicant	:	**Samsung Techwin Co., Ltd.** **#42 Seongju-Dong, Changwon-Shi,** **Kyungsangnam-Do, Korea**
Manufacturer #1	:	**Samsung Techwin Co., Ltd.** **#42 Seongju-Dong, Changwon-Shi,** **Kyungsangnam-Do, Korea**
Manufacturer #2	:	**TIANJIN SAMSUNG TECHWIN** **OPTO-ELECTRONIC CO., LTD** **No.11 Weiliu Road. Micro-Electronic Industrial** **Park Jingang Road Tianjin 300385, China**
Test standards	:	**EN 55022:2010, Class A** **EN 50130-4:2011** **EN 61000-3-2:2006+A2:2009** **EN 61000-3-3:2008**
Testing Laboratory	:	**EMC Compliance Ltd.**
Test result	:	**Complied**

This product complies with the requirements of the EMC Directive 2004/108/ EC.
The results in this report apply only to the sample tested.
This test report shall not be reproduced, except in full, without the written approval of EMC compliance Laboratory.

Date of receipt: 2013. 12. 17

Date of testing: 2013. 12. 20 ~ 12.23

Issued date: 2013. 12. 30

Tested by: KIM, JIN-WON

Approved by: YEOM, HAN-SEOK

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Contents

1. Applicant information 3
2. Laboratory information 4
3. Test system configuration 5
3.1 Operation environment 5
3.2 Measurement Uncertainty 6
4. Description of E.U.T. 7
4.1 General information 7
4.2 Product description 8
4.3 Auxiliary equipments 8
4.4 Test configuration 9
4.5 Operating conditions 10
5. Summary of test results 11
5.1 Summary of EMI emission test results 11
5.2 Summary of immunity test results 11
5.3 Performance criteria 12
6. Test results 14
6.1 Conducted Emission 14
6.2 Radiated Emission 22
6.3 Harmonics 28
6.4 Flicker 33
6.5 Electrostatic Discharge 36
6.6 Radio Frequency Electromagnetic Fields 41
6.7 Electric Fast Transient/BURST 44
6.8 Surge 47
6.9 Conducted Immunity 50
6.10 Dips and Interruptions 53
6.11 Mains supply voltage variations 55
7. E.U.T. photographs 56

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1. Applicant information

Applicant: Samsung Techwin Co., Ltd.
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Telephone: +82-70-7147-8361
Fax: +82-31-277-2784
E-mail: js2002.kang@samsung.com
Contact name: **Kang Jei Soon**

Manufacturer#1: Samsung Techwin Co., Ltd.
Address: #42 Seongju-Dong, Changwon-Shi,
Kyungsangnam-Do, Korea
Telephone: +82-70-7147-8361
Fax: +82-31-277-2784
E-mail: js2002.kang@samsung.com
Contact name: **Kang Jei Soon**

Manufacturer#2: TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
Address: No.11 Weiliu Road. Micro-Electronic Industrial Park
Jingang Road Tianjin 300385, China

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2. Laboratory information

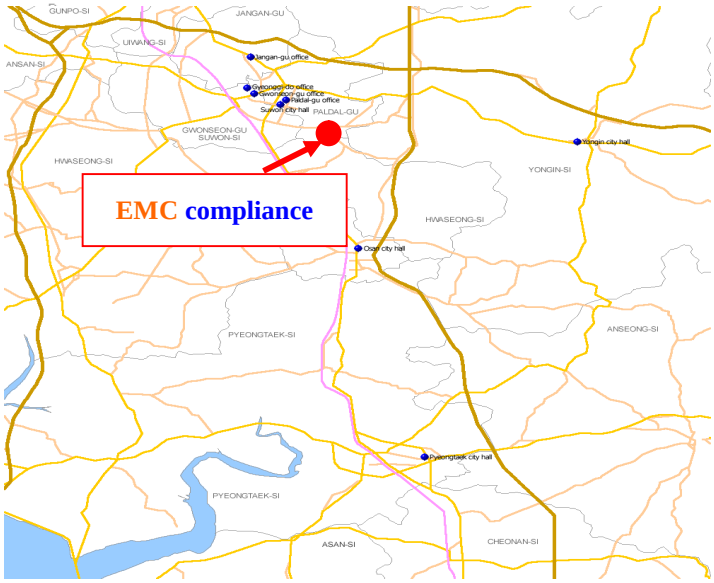
Address

EMC compliance Ltd.
480-5 Sin-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, 443-390, Korea
Telephone Number: 82 31 336 9919
Facsimile Number: 82 505 299 8311

FCC CAB.: KR0040
VCCI Registration No. : R-3327, G-198, C-3706, T-1849
Industry Canada Registration No. : 8035A
KOLAS NO.: 231

SITE MAP





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3. Test system configuration

3.1 Operation environment

		Temperature	Humidity	Pressure
Chamber(10 m)	:	17.9 °C	17.9 % R.H.	-
Shielded room(CE)	:	19.3 °C	21.2 % R.H.	-
Shielded room(ESD)	:	20.7 °C	34.4 % R.H.	102.0 kPa

Test site

These testing items were performed following locations;

Test item	Test site
Conducted Emission	Shielded Room
Radiated Emission	10 m Chamber
Harmonics current	Immunity area
Voltage fluctuations and flickers	Immunity area
Electrostatic discharge	Shielded Room
Radiated RF immunity	Fully anechoic chamber (3 m)
Electric Fast Transient/BURST	Shielded Room
Surge	Shielded Room
Conducted RF immunity	Shielded Room
Voltage dip/interruption	Shielded Room
Mains supply voltage variations	Shielded Room

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3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.
The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95 % confidence level was applied.

Conducted emission measurement (C.L: Approx 95 %, k = 2)		
Shielded Room (CE#1)	9 ㎑ ~ 150 ㎑: ± 3.82 dB 150 ㎑ ~ 30 ㎒: ± 3.43 dB	
Shielded Room (CE#2)	9 ㎑ ~ 150 ㎑: ± 3.82 dB 150 ㎑ ~ 30 ㎒: ± 3.43 dB	
Shielded Room (CE#3)	9 ㎑ ~ 150 ㎑: ± 4.00 dB 150 ㎑ ~ 30 ㎒: ± 3.63 dB	
Radiated Emission measurement (C.L: Approx 95 %, k = 2)		
10 m Chamber (#F4)	30 ㎒ ~ 300 ㎒	3 m: + 4.56 dB, - 4.58 dB 10 m: + 4.56 dB, - 4.56 dB
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.84 dB, - 4.85 dB 10 m: + 4.71 dB, - 4.72 dB
	1 ㎓ ~ 6 ㎓	3 m: + 6.19 dB, - 6.20 dB
10 m Chamber (#F2)	30 ㎒ ~ 300 ㎒	3 m: + 4.86 dB, - 4.88 dB 10 m: + 4.86 dB, - 4.86 dB
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.98 dB, - 4.99 dB 10 m: + 4.85 dB, - 4.87 dB
	1 ㎓ ~ 6 ㎓	3 m: + 6.19 dB, - 6.20 dB
Radio Frequency Electromagnetic Fields (C.L: Approx 95 %, k = 2)		
± 1.82 dB		
Disturbance power Electromagnetic Fields (C.L: Approx 95 %, k = 2)		
± 3.73 dB		

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4. Description of E.U.T.

4.1 General information

		SRD-842
Video	Inputs	8 composite video 0.5–1 Vpp, 75 ohm
	Resolution	960x480 NTSC, 960x576 PAL / 720x480 NTSC, 720x576 PAL
Live	Frame rate	240fps NTSC, 200fps PAL
	Resolution	960x480 NTSC, 960x576 PAL, 704x480 NTSC, 704x576 PAL
	Multi Screen display	1/4/6/8/SEQUENCE/PIP
Performance		
Operating System	Embedded	Linux
Recording	Compression	H.264
	Record Rate	NTSC: Up to 60fps @ 960x480 / PAL: Up to 50fps @ 960x576
		NTSC: Up to 60fps @ 704x480 / PAL: Up to 50fps @ 704x576
		NTSC: Up to 120fps @ 704x240 / PAL: Up to 100fps @ 704x288
		NTSC: Up to 240fps @ 352x240 / PAL: Up to 200fps @ 352x288
	Mode	NTSC: Manual, Schedule (Continuous/Event), Event(Pre/Post)
		PAL: Manual, Schedule (Continuous/Event), Event(Pre/Post)
	Event	Video Loss, Motion(Level 1~10), Alarm
	Overwrite modes	Continuous, Selectable (Stop/Continuous)
	Pre-alarm	Up to 5 sec.
	Post-Alarm	Up to 6 hour. (5,10,20,30 sec,1,3,5,10,20 min,1,2,3,4,5,6hour)
Search & Playback	Search mode	Date/time, Event(Alarm/Motion), Back up, POS (※ All Search Included Prview Function)
	Playback function	Fast Forward/Backward (x2,x4,x8,x16,x32,x64) ※Backward Play with I-frame Only, Slow Forward/Backward (x1/2,x1/4,x1/8)
Network (IPv4)	Transmission speed	960H/4CIF/2CIF/CIF(240fps NTSC, 200fps PAL)
	Bandwidth	Up to (32)Mbps, Unlimited(8M)/2/1.5/1 Mbps/800/600/500/400/300/200/100/50 kbps
	Bandwidth control	Automatic
	Stream	CIF (H.264)
	Remote users Maximum	4 Persons (Search up to (2), Live Unicast/Live Multicast available)
	Protocol support	TCP/IP,UDP,DHCP,PPPoE,SMTP,NTP,HTTP,DDNS,RTP,RTSP,SNMP
	Monitoring	Webviewer,CMS(Smart viewer,Net-I)
Smart phone	Platform	Android , iOS
	Protocol support	RTP,RTSP,HTTP,CGI
	Remote users Maximum	Live(1)
Storage	Internal HDD	Up to 2 SATA HDDs
	External (e-SATA Interface)	Not Support
	DVD Writer (Back-up)	Not Support
	USB (Back-up)	2 USB Ports
	File Format (Back-up)	BU(DVR Player), EXE(Include Player), AVI
Security	Password Protection	1 Admin, 10 Group , 10 User per 1 Group
	Data Authentication	Watermark
Interface		
Monitors	VGA	1 VGA (1280x720, 1280x1024, 1920x1080)
	HDMI	1 HDMI (1280x720, 1280x1024, 1920x1080)
	Main Composite	1 BNC (1 Vp-p, 75 ohm)
	Spot Composite	Analgo Spot (1 BNC, 1 Vp-p, 75 ohm)
	Loop Outputs	Not Support
Audio	Inputs/Output	4 line in / 1 line out
	Compression	G.711
	Sampling rate	8KHz
Alarm	Inputs/Outputs	Terminal 8 inputs (NO/NC) / Terminal 2 relay outputs (NO), Rating : 24VDC/1A, 125V AC/0.5A
	Remote notification	Notification via e-mail
Connections	Ethernet	1 RJ45 10/100 Base-T
	Serial interface	RS-485(Half) for PTZ, System Keyboard, RS-232 Support for POS Interface (VSI-Pro)
	USB	USB 2.0, 2 ports (Front)
	e-SATA	Not Support
	Application Supoort	Mouse, Remote Controller
	Protocol support	Samsung-E/ Samsung-T/ Pelco-D/ Pelco-p/Panasonic/ Phillips/ AD/ DIAMOND/ ERNA/ KALATEL/ VCL TP/VICON/ ELMO
		PTZ Control via Coaxial Cable (Samsung CCVC, Pelco-C (Coaxitron))
General		
Electrical	Input Voltage/Current	DC12V Adaptor,4A,100~250VAC, 50~60Hz, 48watt
	Power consumption	Normal 19 W (with 1x HDD)
Environmental	Operating Temperature/Humidity	+0°C to +40°C (+32°F to +104°F)/ 20%RH to 85%RH
Mechanical	Dimension (W x H x D)	375x52x255mm
	Weight (With hard disks)	Approx.1.7kg
	Rack mount kit	2EA
Lauguage		English, French, German, Spanish, Italian, Russian, Polish, Czech, Turkish, Netherlands Portuguese, Swedish, Danish, Rumania, Serbia, Croatia, Hungary, Greek, Finnish, Norwegian, Korean, Japanese, Chinese(Traditional), Thailland , Taiwanese(25 Language)

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4.2 Product description

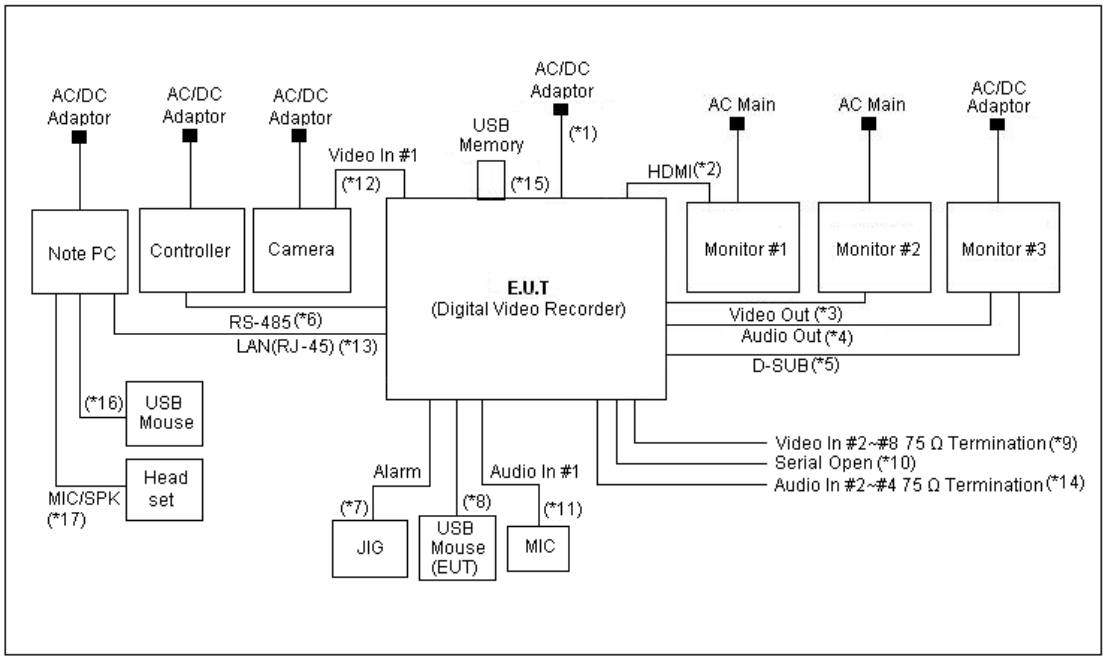
Type of product	Digital Video Recorder
Model name (Basic)	SRD-842P
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	230 Ⅴ, 50 Hz
Product rating	* AC/DC Adaptor (ADS-65LSI-12-1 12048G) Input: 100 - 240 Ⅴ, 50/60 Hz, 1.5 A Output: DC 12 Ⅴ, 4.0A
Internal clock frequency	Above 108 ㎒
Note	* AC/DC Adaptor was provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor #1	2693HM	N935H1KQ700971L	SAMSUNG
Monitor #2	PM24KO	YER8HVDBA00057E	SAMSUNG
Monitor #3	LML15MP	N077H4VR301393	SAMSUNG
Note PC	Satellite L730	3B134626W	TOSHIBA
Controller	SCC-1000	EW089028913	SAMSUNG
Camera	-	-	-
USB Mouse	-	-	-
Headset	KCC-D27	C05071800091	KOCOM
MIC	SMH-210UB	M2UBTAKQ335306R	SAMSUNG
JIG	SHS-250V	-	SAMSUNG
USB Memory	-	-	-

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4.4 Test configuration



Note *	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	**EUT** (Digital Video Recorder)	Power	AC/DC Adaptor	Power	1.5	Non-Shield	-
2		HDMI	Monitor #1	HDMI	1.5	Shield	-
3		Video Out	Monitor #2	Video In	3.0	Shield	Out-door
4		Audio Out	Monitor #2	Audio In	1.5	Shield	Out-door
5		D-SUB	Monitor #3	D-SUB	3.0	Shield	-
6		RS-485	Controller	RS-485	3.0	Non-Shield	Out-door
7		Alarm	JIG	Alarm	3.0	Non-Shield	Out-door
8		USB	USB Mouse(EUT)	USB	1.5	Shield	-
9		Video In #2~#8	75 Ω Termination	-	3.0	Shield	Out-door
10		Serial	Open	-	2.0	Shield	-
11		Audio In #1	MIC	Audio Out #1	3.0	Shield	Out-door
12		Video In #1	Camera	Video Out #1	3.0	Shield	Out-door
13		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield	Out-door
14		Audio In #2~#4	75 Ω Termination	-	3.0	Shield	Out-door
15		USB	USB Memory	USB	Direct	-	-
16	Note PC	USB	USB Mouse	USB	1.5	Shield	-
17		MIC/SPK	Headset	MIC/SPK	2.0	Non-Shield	-

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4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Monitoring test.
	Ping test.
	Audio In/Out Test
	Alarm Test
	RS-485 Test

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5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
☒	Conducted Emission	EN 55022:2010	Complied
☒	Radiated Emission	EN 55022:2010	Complied
☒	Harmonics current	EN 61000-3-2:2006+A2:2009	Complied
☒	Voltage fluctuations and flickers	EN 61000-3-3:2008	Complied

5.2 Summary of immunity test results

Applied	Test items	Test method	Result
*** EN 50130-4:2011**			
☒	Electrostatic discharge	EN 61000-4-2:2009	Complied
☒	Radiated RF immunity	EN 61000-4-3:2006+A2:2010	Complied
☒	Electric Fast Transient/BURST	EN 61000-4-4:2004+A1:2010	Complied
☒	Surge	EN 61000-4-5:2006	Complied
☒	Conducted RF immunity	EN 61000-4-6:2009	Complied
☒	Voltage dip/interruption	EN 61000-4-11:2004	Complied
☒	Mains supply voltage variations	EN 50130-4:2011	Complied

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5.3 Performance criteria

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.
If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.
A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change,

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such
Flickering of indicators occurs at a field strength of 3 V/m. For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT
(e.g. no corruption of memory or changes to programmable setting etc.)
(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and
(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as

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Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change,
and no such flickering of indicators oeuvres at U = 130 dBμV.
For component of CCTV systems, where the status is monitored by observing the TV picture,
then deterioration of the picture is allowed at U = 140 dBμV, providing:

(a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings etc.)
(b) at U = 130 dBμV, any deterioration of the picture is so minor that the system could still be used; and
(c) there in no observable deterioration of the picture at U = 120 dBμV.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

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6. Test results

6.1 Conducted Emission

Test specification	EN 55022:2010, Class A		
Testing voltage	230 V, 50 Hz		
Test facility	Shielded room (CE#1)		
Date	2013. 12. 20		
Temperature (°C)	19.3 °C	Humidity (% R.H.)	21.2 % R.H.
Remarks	Complied		

6.1.1 Limits of conducted emission measurement

☒ AC main

Frequency [㎒]	Class A (dB(㎶))		Class B (dB(㎶))	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	79	66	66 ~ 56 *	56 ~ 46*
0.5 ~ 5	73	60	56	46
5 ~ 30	73	60	60	50

*The limit decreases linearly with the logarithm of frequency.

☒ Telecommunication

Frequency [㎒]	Class A Voltage Limits (dB(㎶))		Current Limits (dB(㎂))	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	97 to 87	84 to 74	53 to 43	40 to 30
0.5 ~ 30	87	74	43	30
Frequency [㎒]	Class B Limits (dB(㎶))		Current Limits (dB(㎂))	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	84 to 74	74 to 64	40 to 30	30 to 20
0.5 ~ 30	74	64	30	20

* The limits decrease linearly with the logarithm of the frequency in the range 0.15 ㎒ to 0.5 ㎒

* The current and voltage disturbance limits are derived for use with an impedance stabilization Network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is 20 $\log_{10}$ 150/I = 44 dB).

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6.1.2 Measurement procedure

The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground plane. The LISN power was filtered. Each EUT power lead, except ground (safety) lead was individually connected through a LISN to input power source. EUT signal cables that hung closer than 0.4 m to the Horizontal metal ground 0.3 m ~ 0.4 m long. The power cord was bundles in the center. All peripheral equipment was powered from a sub LISN. The LISN and ISN were positioned 0.8 m from the EUT. Peak and Average detection were used in preliminary testing and Quasi-peak and Average detections were used at final measurement.
Both lines of power cord, hot and neutral, were measured.

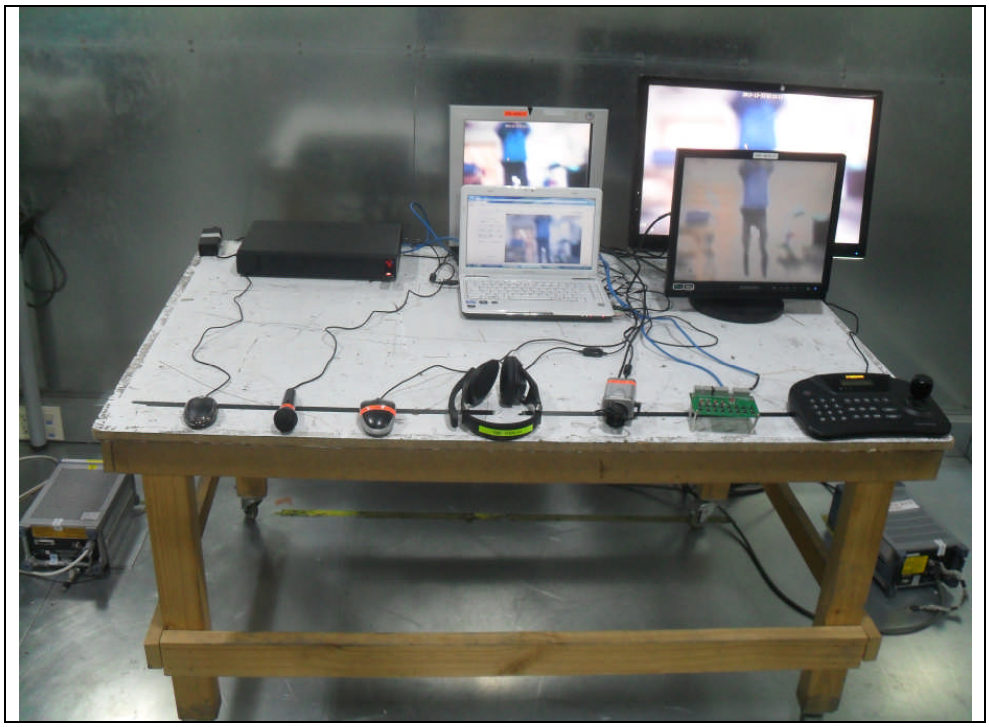
6.1.3 Used equipments

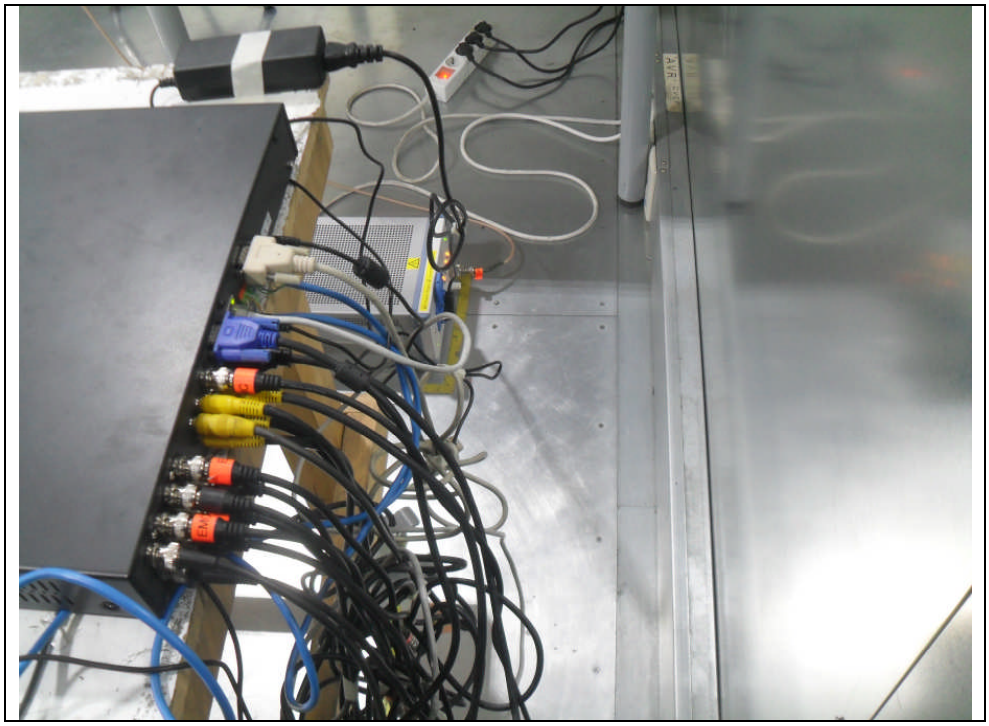
Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2014.02.18	☐
Test Receiver	ESCI	100001	R&S	2014.07.25	☒
Test Receiver	ESCI	100710	R&S	2014.10.28	☐
LISN	ENV216	101358	R&S	2014.10.04	☒
LISN	ESH3-Z5	100267	R&S	2014.07.08	☒
8-WIRE ISN	NTFM 8158 CAT5	CAT5-8158-0048	SCHWARZBECK	2014.10.28	☒
8-WIRE ISN	NTFM 8158 CAT3	CAT3-8158-0033	SCHWARZBECK	2014.10.28	☒
ISN	ST08	24342	TESEQ	2014.06.21	☐
ISN	ENY81	101545	R&S	2014.08.29	☒

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6.1.4 Photographs of test setup

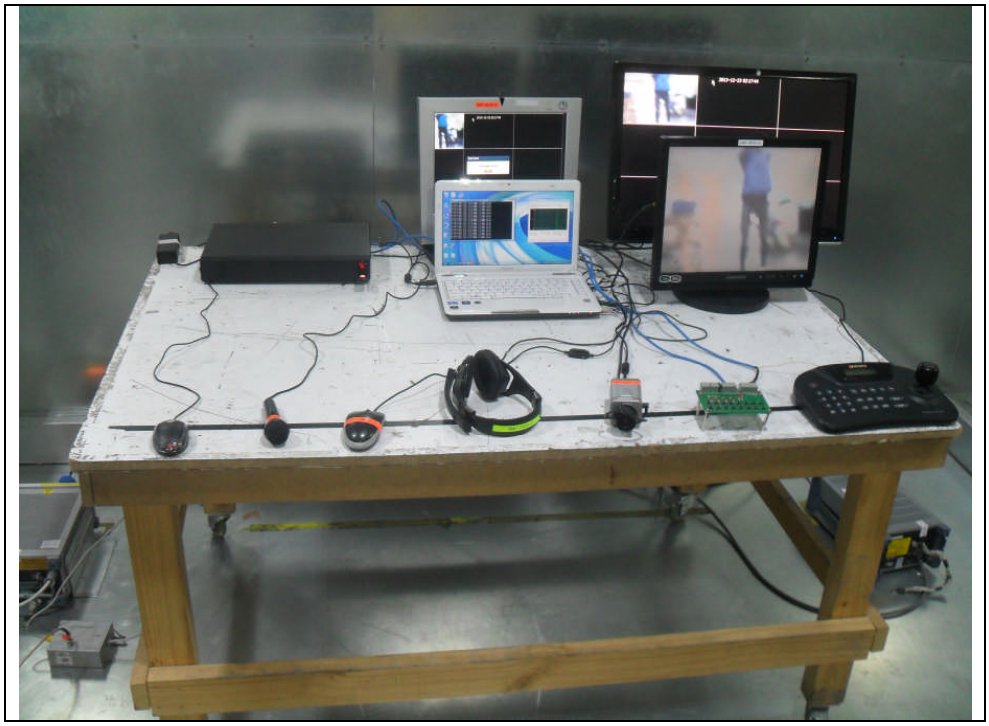
* AC Main





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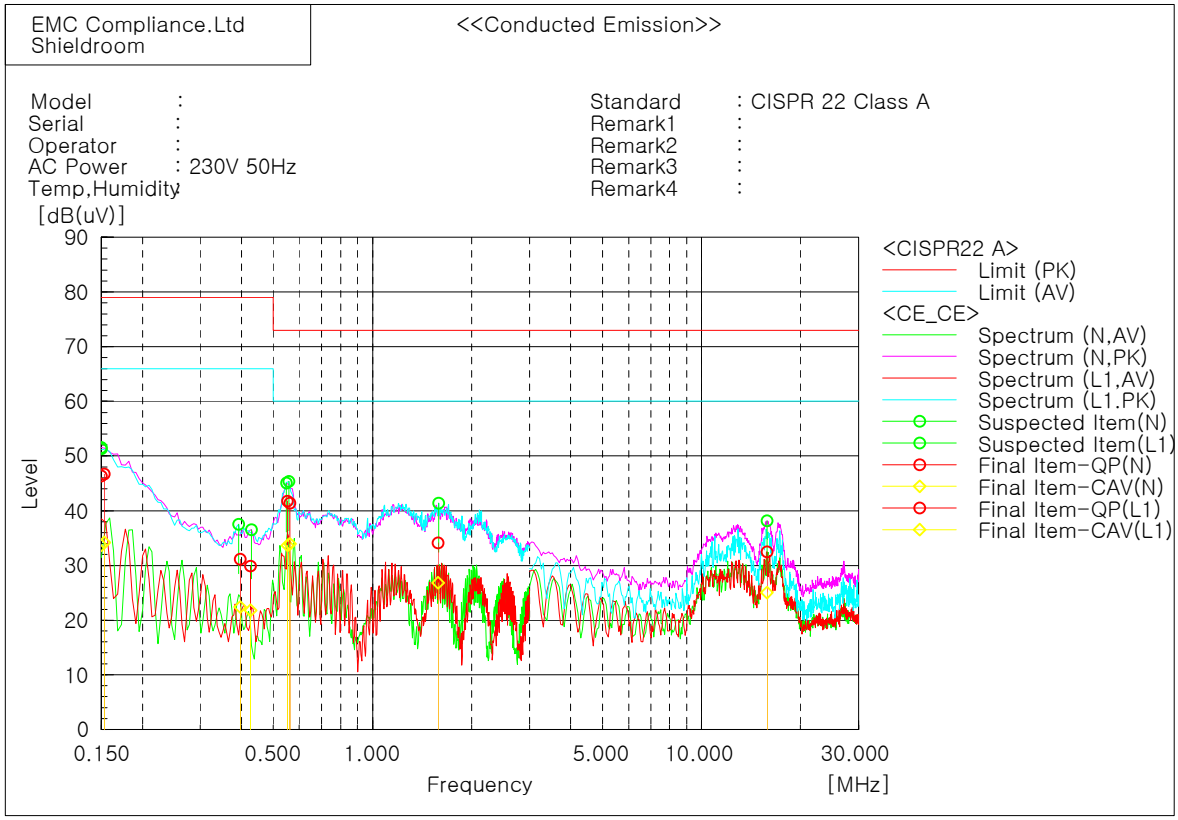
* Telecommunication



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6.1.5 Conducted emission measurement result

* AC Main (SRD-842P)



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.15332	36.7	24.2	10.0	46.7	34.2	79.0	66.0	32.3	31.8
2	0.42651	19.9	11.8	10.0	29.9	21.8	79.0	66.0	49.1	44.2
3	0.55155	31.7	23.7	10.0	41.7	33.7	73.0	60.0	31.3	26.3
4	15.80873	22.6	15.2	9.9	32.5	25.1	73.0	60.0	40.5	34.9

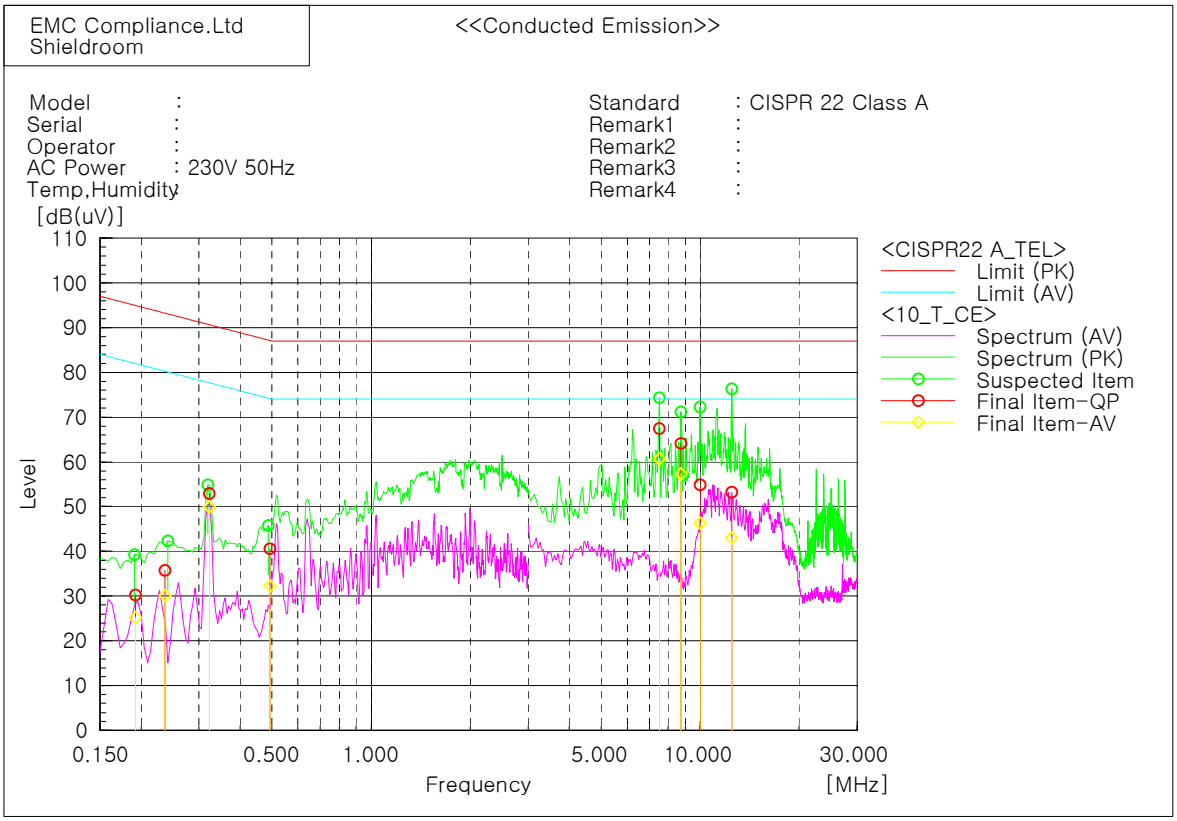
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.1502	36.4	23.7	10.0	46.4	33.7	79.0	66.0	32.6	32.3
2	0.39661	21.1	12.3	10.1	31.2	22.4	79.0	66.0	47.8	43.6
3	0.56148	31.3	23.8	10.1	41.4	33.9	73.0	60.0	31.6	26.1
4	1.58533	24.3	17.0	9.8	34.1	26.8	73.0	60.0	38.9	33.2

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* Telecommunication port (SRD-842P)

LCL 55 dB (LAN(RJ-45) Port) _10 Mbps



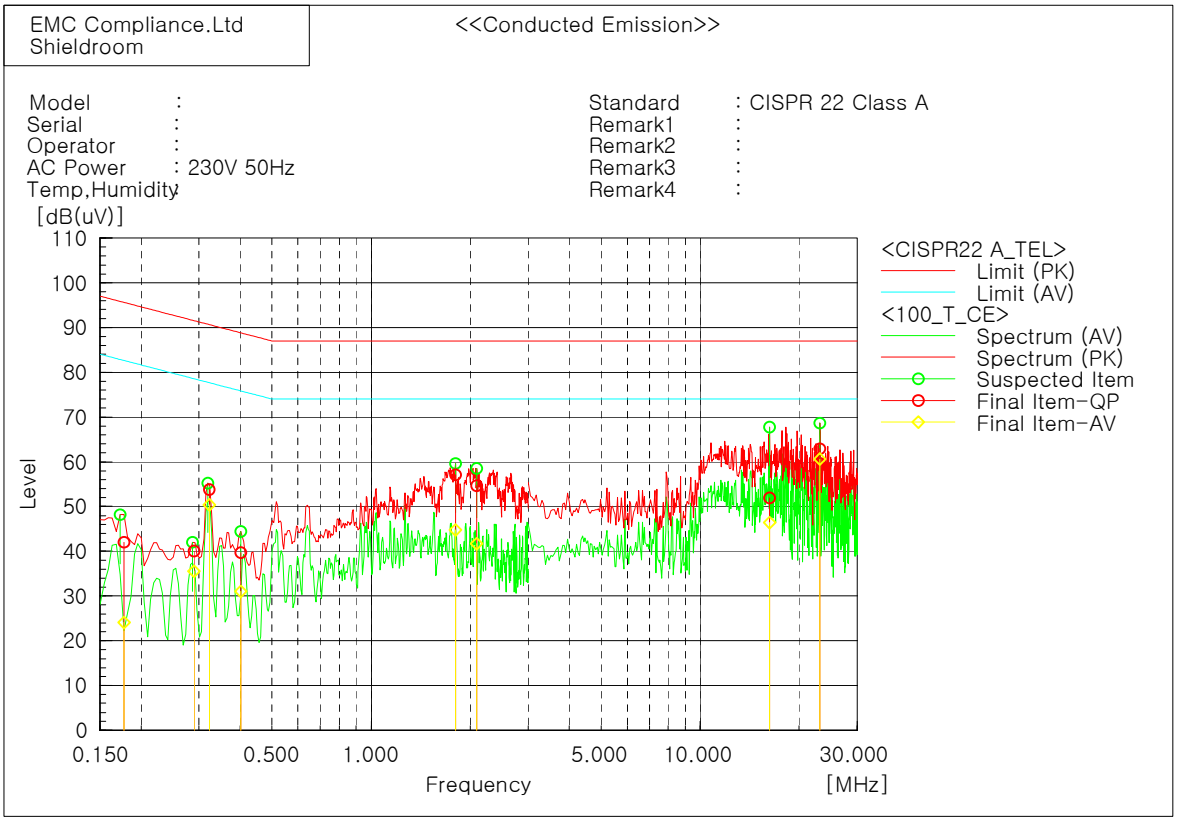
Final Result

--- ISN-CAT3 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.19251	20.3	15.3	9.9	30.2	25.2	94.9	81.9	64.7	56.7
2	0.23635	25.9	20.3	9.8	35.7	30.1	93.2	80.2	57.5	50.1
3	0.32192	43.2	40.3	9.7	52.9	50.0	90.7	77.7	37.8	27.7
4	0.49297	30.9	22.5	9.7	40.6	32.2	87.1	74.1	46.5	41.9
5	7.49992	58.0	51.3	9.4	67.4	60.7	87.0	74.0	19.6	13.3
6	8.74998	54.7	47.9	9.4	64.1	57.3	87.0	74.0	22.9	16.7
7	10.00463	45.4	36.8	9.5	54.9	46.3	87.0	74.0	32.1	27.7
8	12.47118	43.7	33.5	9.5	53.2	43.0	87.0	74.0	33.8	31.0

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LCL 65 dB (LAN(RJ-45) Port) _100 Mbps



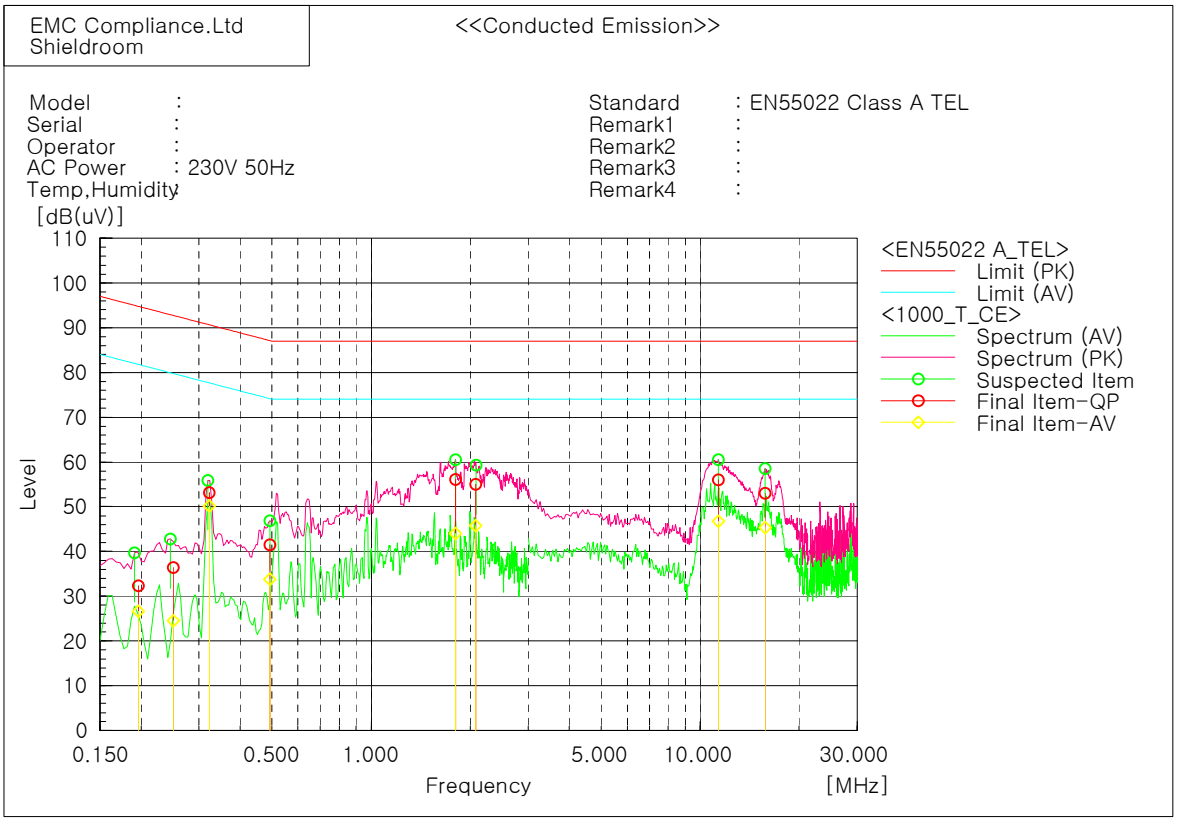
Final Result

--- ISN-CAT5 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.17738	31.7	13.7	10.3	42.0	24.0	95.6	82.6	53.6	58.6
2	0.29003	30.0	25.4	10.1	40.1	35.5	91.5	78.5	51.4	43.0
3	0.32203	43.7	40.3	10.1	53.8	50.4	90.7	77.7	36.9	27.3
4	0.40149	29.7	21.0	10.0	39.7	31.0	88.8	75.8	49.1	44.8
5	1.80183	47.4	35.0	9.7	57.1	44.7	87.0	74.0	29.9	29.3
6	2.09465	45.0	32.0	9.7	54.7	41.7	87.0	74.0	32.3	32.3
7	16.23539	42.3	36.8	9.6	51.9	46.4	87.0	74.0	35.1	27.6
8	23.12518	53.2	51.0	9.7	62.9	60.7	87.0	74.0	24.1	13.3

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LCL 75 dB (LAN(RJ-45) Port) _1000 Mbps



Final Result

--- ENY81-CAT6 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.1961	22.4	16.6	10.0	32.4	26.6	94.8	81.8	62.4	55.2
2	0.25091	26.5	14.7	9.9	36.4	24.6	92.7	79.7	56.3	55.1
3	0.32229	43.3	40.3	9.9	53.2	50.2	90.6	77.6	37.4	27.4
4	0.49282	31.7	24.0	9.8	41.5	33.8	87.1	74.1	45.6	40.3
5	1.80236	46.5	34.4	9.6	56.1	44.0	87.0	74.0	30.9	30.0
6	2.07698	45.4	36.2	9.6	55.0	45.8	87.0	74.0	32.0	28.2
7	11.35522	46.4	37.1	9.6	56.0	46.7	87.0	74.0	31.0	27.3
8	15.75943	43.5	35.8	9.6	53.1	45.4	87.0	74.0	33.9	28.6

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6.2 Radiated Emission

Test specification	EN 55022:2010, Class A		
Testing voltage	230 V, 50 Hz		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2013. 12. 20		
Temperature (°C)	17.9 °C	Humidity (% R.H.)	17.9 % R.H.
Remarks	Complied		

6.2.1 Limits of radiated emission measurement

☒ Limits below 1 GHz

Frequency [MHz]	Class A (dB(μV/m)) @ 10 m	Class B (dB(μV/m)) @ 10 m
30 ~ 230	40	30
230 ~ 1 000	47	37

☒ Limits above 1 GHz

Frequency [GHz]	Class A @ 3 m		Class B @ 3 m	
	Average limit (dB(μV/m))	Peak limit (dB(μV/m))	Average limit (dB(μV/m))	Peak limit (dB(μV/m))
1 ~ 3	56	76	50	70
3 ~ 6	60	80	54	74
Note - The lower limit applies at the transition frequency.				

6.2.2 Measurement procedure

The test was done at a 10 m chamber with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane. Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane.
Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

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6.2.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2014.02.18	☒
Test Receiver	ESCI	100001	R&S	2014.07.25	☐
Test Receiver	ESCI	100710	R&S	2014.10.28	☐
Test Receiver	ESR	101078	R&S	2014.10.17	☐
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2015.10.16	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2014.10.31	☒
3 dB Attenuator	8491B	22981	HP	2014.03.19	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A02343	AGILENT	2014.10.31	☒
Horn ANT	3115	00155772	ETS	2014.03.20	☒

6.2.4 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follow:

Result = M.R + C.F(A.F + C.L +3 dB Att – A.G)

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G= Amplifier Gain

3 dB Att = 3 dB Attenuator

If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

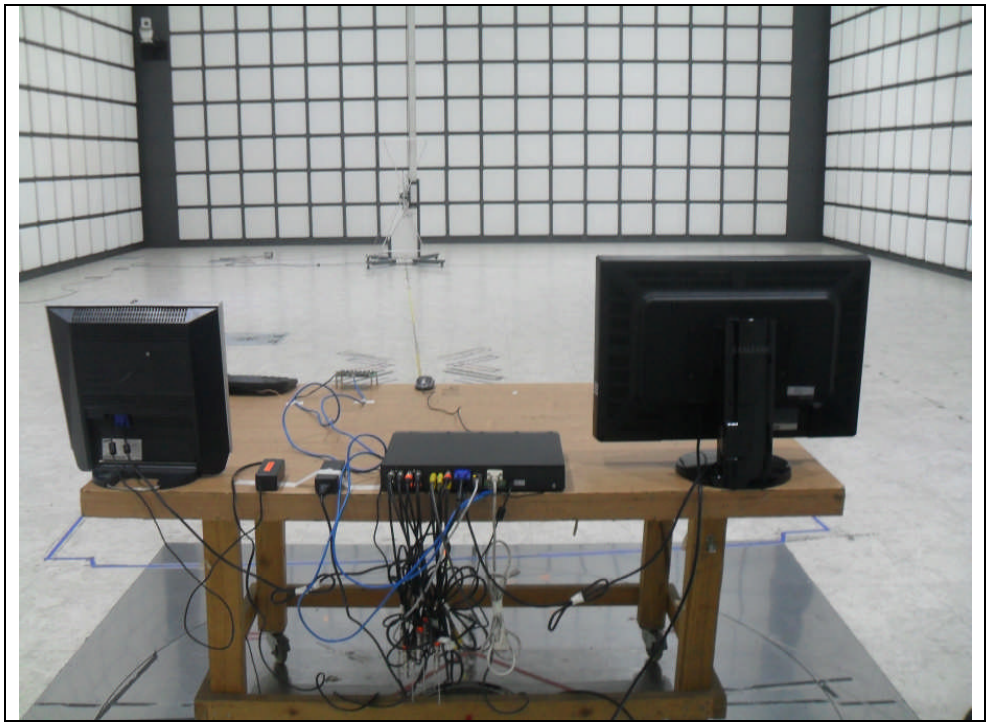
30 + 12 + 5 + 3 – 35 = 15 dB(μV/m)

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6.2.5 Photographs of test setup

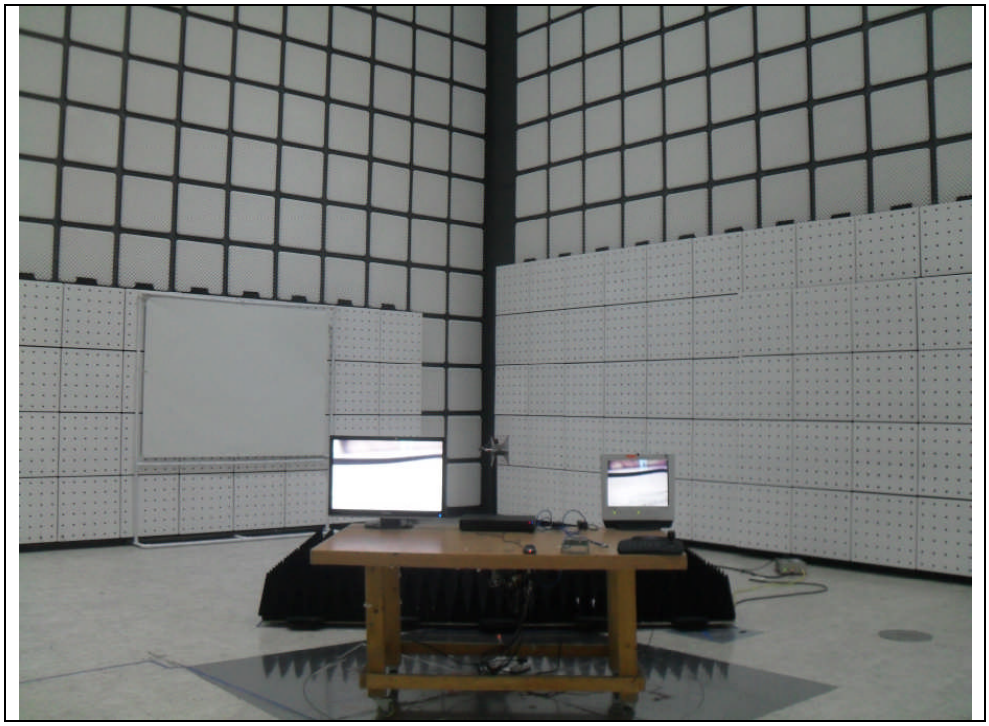
* 30 ㎒ ~ 1 ㎓

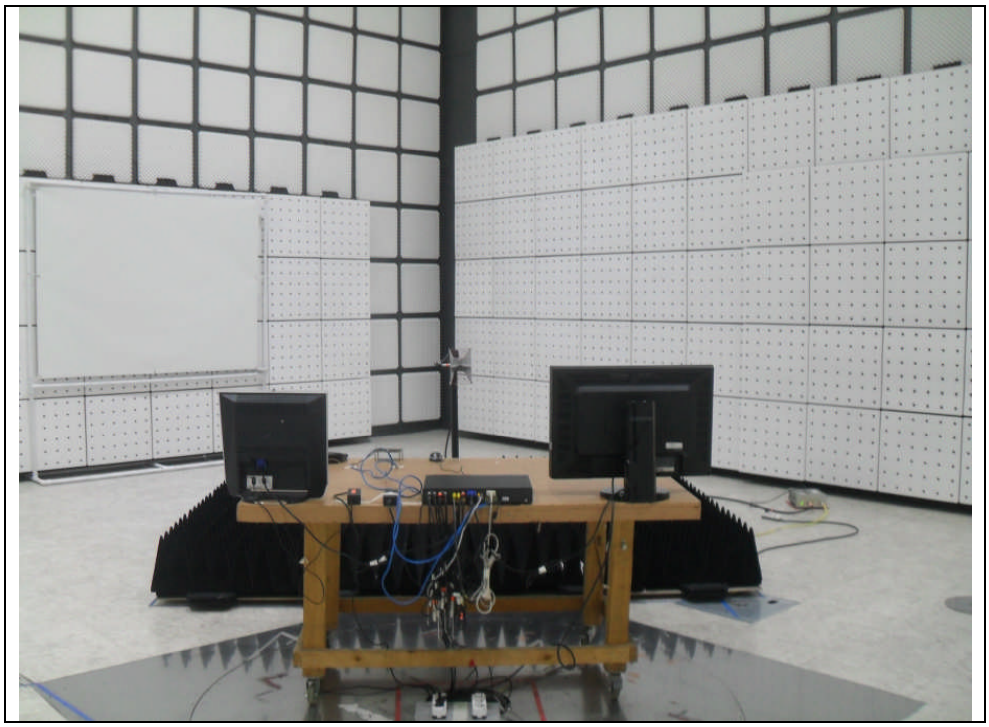




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* 1 ㎓ ~ 6 ㎓



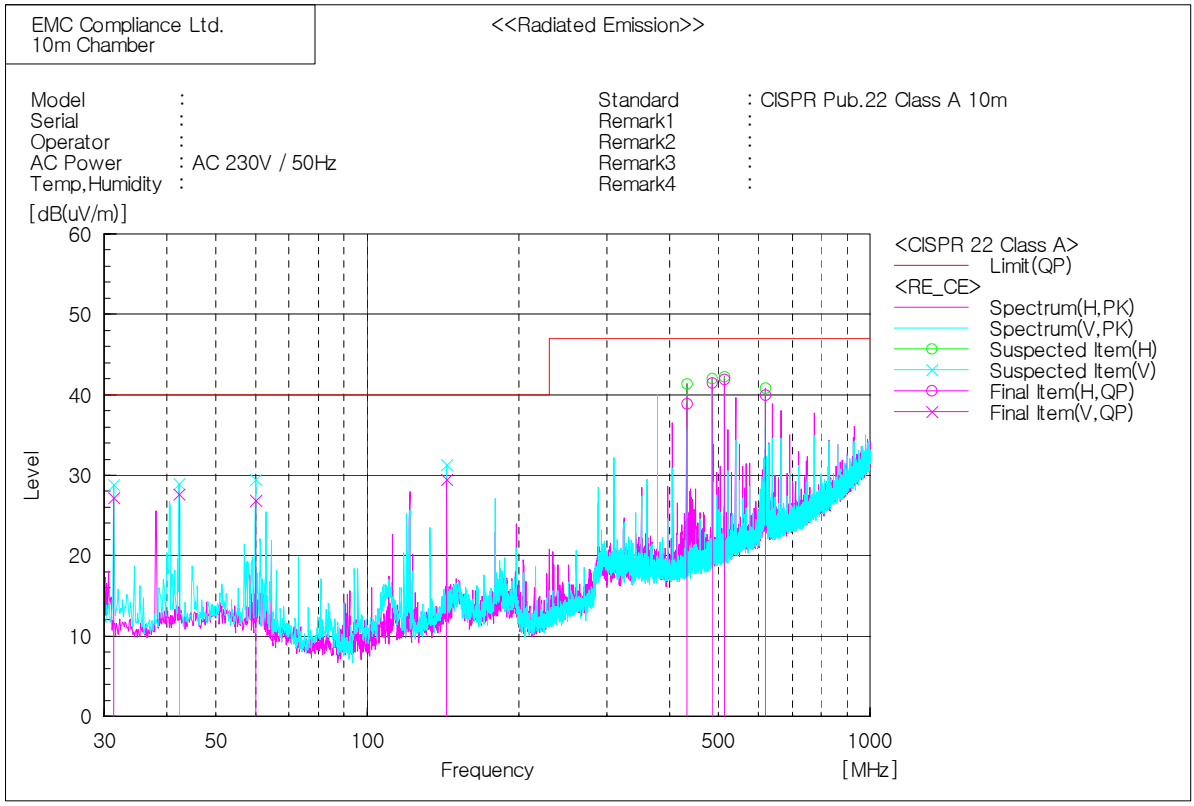


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6.2.6 Radiated emission measurement result

*** Graph and Data**

* 30 ㎒ ~ 1 ㎓ (SRD-842P)

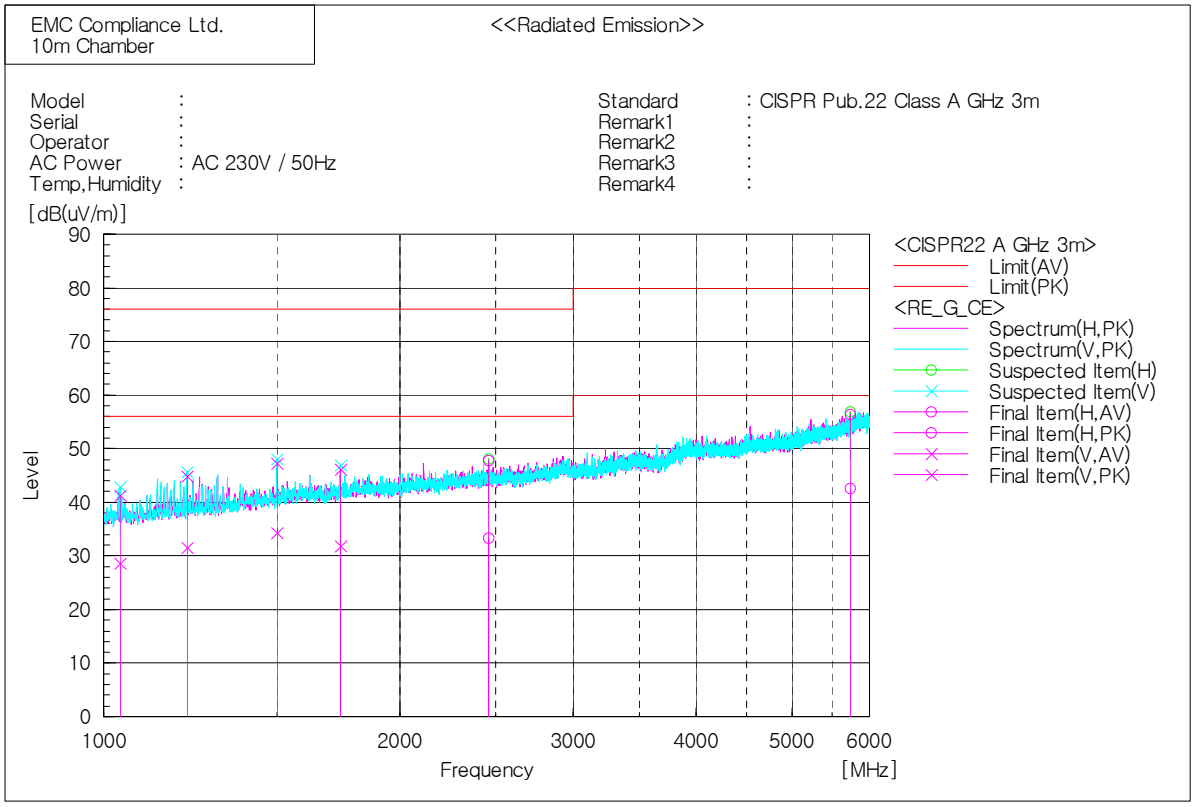


Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	31.334	V	42.2	-15.0	27.2	40.0	12.8	400.0	161.8
2	42.246	V	41.1	-13.5	27.6	40.0	12.4	400.0	312.6
3	59.949	V	41.1	-14.2	26.9	40.0	13.1	100.0	104.9
4	143.975	V	42.7	-13.2	29.5	40.0	10.5	100.0	350.3
5	431.944	H	45.2	-6.3	38.9	47.0	8.1	201.0	65.3
6	486.021	H	46.4	-4.9	41.5	47.0	5.5	201.0	57.8
7	513.060	H	46.2	-4.3	41.9	47.0	5.1	201.0	178.6
8	620.003	H	41.5	-1.5	40.0	47.0	7.0	201.0	226.3

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* 1 ㎓ ~ 6 ㎓ (SRD-842P)



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	c.f [dB(1/m)]	Result AV [dB(uV/m)]	Result PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1039.375	V	35.1	47.7	-6.5	28.6	41.2	56.0	76.0	27.4	34.8	100.0	182.0
2	1215.000	V	36.1	49.4	-4.6	31.5	44.8	56.0	76.0	24.5	31.2	100.0	60.1
3	1500.000	V	36.2	49.3	-2.0	34.2	47.3	56.0	76.0	21.8	28.7	100.0	114.4
4	1740.000	V	32.2	46.5	-0.3	31.9	46.2	56.0	76.0	24.1	29.8	100.0	111.3
5	2463.750	H	30.3	44.7	3.0	33.3	47.7	56.0	76.0	22.7	28.3	100.0	11.7
6	5736.250	H	27.4	41.2	15.1	42.5	56.3	60.0	80.0	17.5	23.7	100.0	228.7

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6.3 Harmonics

Test specification	EN 61000-3-2:2006+A2:2009				
Testing voltage	230 V, 50 Hz				
Test facility	Immunity area				
Date	2013. 12. 23				
Temperature(°C)	19.9 °C	Humidity (% R.H.)	26.3 % R.H.	Pressure (kPa)	102.2 kPa
Remarks	Complied				

6.3.1 Measurement procedure

The equipment is supplied in series with shunt(s) Rm or current transformer(s) from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the equipment. Measurements shall be made under normal load, or conditions for adequate heat discharge, and under normal operating conditions. User's operation controls or automatic programmers shall be set to produce the maximum harmonic component, for each successive harmonic component in turn. For the purpose of harmonic current limitation, equipment is classified as follows :

Class A : Equipment not specified in one of the three other Classes shall be considered as Class A equipment.

- Balanced three-phase equipment;
- Household appliances excluding equipment identified as Class D;
- Tools excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Class B : Portable tools; Arc welding equipment which is not professional equipment.

Class C : Lighting equipment.

Class D : Equipment having a specified power according to 6.2.2 less than or equal to 600 w, of the following types:

- Personal computers and personal computer monitors;
- Television receivers.

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6.3.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter	5001x-CTS -400-413	54984	C.I.	2014.05.22	☒

6.3.3 Photographs of test setup



This test report shall not be reproduced, except in full, without the written approval.

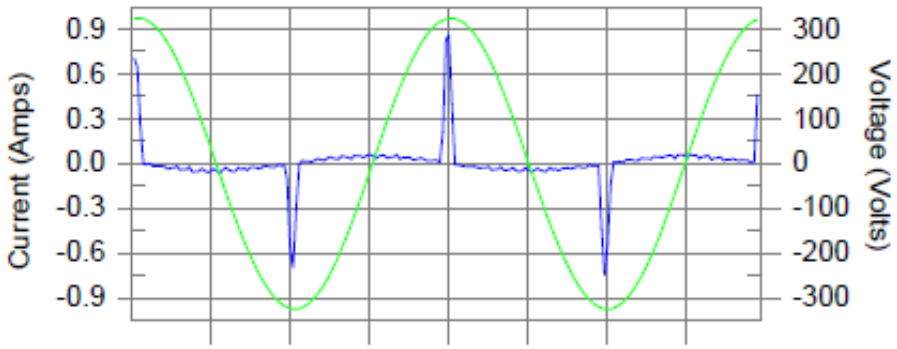
6.3.4 Measurement result

Harmonics – Class-A per Ed. 3.2 (2009)(Run time) incl. inter-harmonics

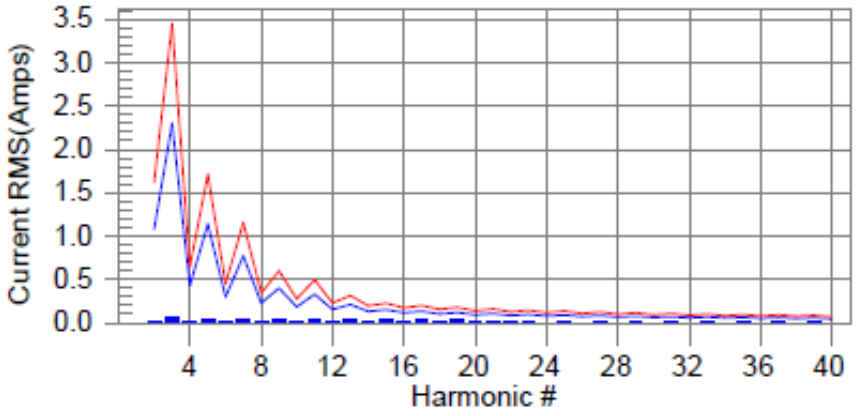
EUT: SRD-842P
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test date: 2013-12-23
Start time: 오후 3:05:30
End time: 오후 3:08:20
Test duration (min): 2.5
Data file name: H-000608.cts_data
Comment: Comments
Customer: Samsung Techwin Co., Ltd.
Tested by: Test Operator
Test Margin: 100

Test Result: Pass
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line
European Limits



Test result: Pass
Worst harmonic was #19 with 24.20% of the limit.

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Current Test Result Summary (Run time)

EUT: SRD-842P
Tested by: Test Operator
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test Margin: 100
Test date: 2013-12-23
Start time: 오후 3:05:30
End time: 오후 3:08:20
Test duration (min): 2.5
Data file name: H-000608.cts_data
Comment: Comments
Customer: Samsung Techwin Co., Ltd.

Test Result: Pass
Source qualification: Normal
THC(A): 0.13
I-THD(%): 214.30
POHC(A): 0.045
POHC Limit(A): 0.260
Highest parameter values during test:

V_RMS (Volts):	229.51	Frequency(Hz):	50.00
I_Peak (Amps):	0.934	I_RMS (Amps):	0.149
I_Fund (Amps):	0.061	Crest Factor:	6.468
Power (Watts):	11.3	Power Factor:	0.340

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	0.0	0.003	1.620	0.16	Pass
3	0.048	2.300	2.1	0.049	3.450	1.42	Pass
4	0.002	0.430	0.0	0.003	0.645	0.43	Pass
5	0.046	1.140	4.1	0.048	1.710	2.79	Pass
6	0.002	0.300	0.0	0.002	0.450	0.55	Pass
7	0.045	0.770	5.8	0.046	1.155	4.00	Pass
8	0.002	0.230	0.0	0.002	0.345	0.72	Pass
9	0.043	0.400	10.7	0.044	0.600	7.37	Pass
10	0.002	0.184	0.0	0.002	0.276	0.90	Pass
11	0.041	0.330	12.3	0.042	0.495	8.45	Pass
12	0.002	0.153	0.0	0.003	0.230	1.13	Pass
13	0.038	0.210	18.1	0.039	0.315	12.40	Pass
14	0.002	0.131	0.0	0.003	0.197	1.28	Pass
15	0.035	0.150	23.4	0.036	0.225	16.00	Pass
16	0.002	0.115	0.0	0.002	0.173	1.40	Pass
17	0.032	0.132	24.2	0.033	0.199	16.44	Pass
18	0.002	0.102	0.0	0.002	0.153	1.61	Pass
19	0.029	0.118	24.2	0.029	0.178	16.48	Pass
20	0.002	0.092	0.0	0.002	0.138	1.68	Pass
21	0.025	0.107	23.6	0.026	0.161	16.06	Pass
22	0.002	0.084	0.0	0.002	0.125	1.76	Pass
23	0.022	0.098	22.5	0.022	0.147	15.25	Pass
24	0.002	0.077	0.0	0.002	0.115	1.80	Pass
25	0.019	0.090	20.8	0.019	0.135	14.10	Pass
26	0.002	0.071	0.0	0.002	0.106	1.85	Pass
27	0.016	0.083	18.7	0.016	0.125	12.68	Pass
28	0.002	0.066	0.0	0.002	0.099	1.85	Pass
29	0.013	0.078	16.3	0.013	0.116	11.05	Pass
30	0.001	0.061	0.0	0.002	0.092	2.07	Pass
31	0.010	0.073	13.7	0.010	0.109	9.30	Pass
32	0.001	0.058	0.0	0.001	0.086	1.72	Pass
33	0.008	0.068	11.1	0.008	0.102	7.51	Pass
34	0.001	0.054	0.0	0.001	0.081	1.62	Pass
35	0.005	0.064	8.5	0.006	0.096	5.85	Pass
36	0.001	0.051	0.0	0.001	0.077	1.74	Pass
37	0.004	0.061	0.0	0.004	0.091	4.28	Pass
38	0.001	0.048	0.0	0.001	0.073	1.68	Pass
39	0.002	0.058	0.0	0.003	0.087	3.17	Pass
40	0.001	0.046	0.0	0.001	0.069	1.23	Pass

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Voltage Source Verification Data (Run time)

EUT: SRD-842P
Tested by: Test Operator
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test Margin: 100
Test date: 2013-12-23
Start time: 오후 3:05:30
End time: 오후 3:08:20
Test duration (min): 2.5
Data file name: H-000608.cts_data
Comment: Comments
Customer: Samsung Techwin Co., Ltd.

Test Result: Pass
Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.51	Frequency(Hz):	50.00
I_Peak (Amps):	0.934	I_RMS (Amps):	0.149
I_Fund (Amps):	0.061	Crest Factor:	6.468
Power (Watts):	11.3	Power Factor:	0.340

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.101	0.459	22.07	OK
3	0.546	2.066	26.46	OK
4	0.021	0.459	4.51	OK
5	0.012	0.918	1.34	OK
6	0.023	0.459	4.98	OK
7	0.020	0.689	2.94	OK
8	0.017	0.459	3.63	OK
9	0.035	0.459	7.66	OK
10	0.007	0.459	1.54	OK
11	0.030	0.230	12.94	OK
12	0.023	0.230	9.88	OK
13	0.047	0.230	20.32	OK
14	0.011	0.230	4.67	OK
15	0.032	0.230	13.96	OK
16	0.011	0.230	4.67	OK
17	0.033	0.230	14.50	OK
18	0.021	0.230	9.25	OK
19	0.037	0.230	16.33	OK
20	0.010	0.230	4.51	OK
21	0.028	0.230	12.39	OK
22	0.013	0.230	5.63	OK
23	0.027	0.230	11.90	OK
24	0.014	0.230	6.20	OK
25	0.025	0.230	11.07	OK
26	0.019	0.229	8.13	OK
27	0.023	0.230	10.05	OK
28	0.005	0.230	2.14	OK
29	0.015	0.230	6.46	OK
30	0.018	0.230	7.89	OK
31	0.017	0.230	7.62	OK
32	0.005	0.230	2.28	OK
33	0.013	0.230	5.73	OK
34	0.007	0.230	2.95	OK
35	0.013	0.230	5.76	OK
36	0.010	0.230	4.39	OK
37	0.010	0.230	4.57	OK
38	0.010	0.230	4.46	OK
39	0.018	0.230	7.70	OK
40	0.011	0.230	4.89	OK

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6.4 Flicker

Test specification	EN 61000-3-3:2008				
Testing voltage	230 V, 50 Hz				
Test facility	Immunity area				
Date	2013. 12. 23				
Temperature(°C)	19.9 °C	Humidity (% R.H.)	26.3 % R.H.	Pressure (kPa)	102.2 kPa
Remarks	Complied				

6.4.1 Measurement procedure

EUT was connected to the power analyzer system.

Measurement was performed to obtain the desired flicker parameters.

The measuring time depends on which parameters are to be measured.

P_{lt} = 2 h

P_{st} = 10 min

Controls and automatic programs shall be set to produce the most unfavorable sequence of voltage changes, using only those combinations of controls and programs are mentioned by the manufacturer in the instruction manual.

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6.4.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter	5001x-CTS -400-413	54984	C.I.	2014.05.22	☒

6.4.3 Photographs of test setup



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6.4.4 Measurement result

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: SRD-842P
Test category: All parameters (European limits)
Test date: 2013-12-23
Test duration (min): 10
Comment: Comments
Customer: Samsung Techwin Co., Ltd.

Tested by: Test Operator
Test Margin: 100
Start time: 오후 3:11:24
End time: 오후 3:21:45
Data file name: F-000609.cts_data

Test Result: Pass
Status: Test Completed

Pst and limit line
European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.50			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650	Pass

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6.5 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	☒ Contact: ± 6 ㎸ ☒ Air: ± 2 ㎸, ± 4 ㎸, ± 8 ㎸ ☒ HCP: ± 2 ㎸, ± 4 ㎸, ± 6 ㎸ ☒ VCP: ± 2 ㎸, ± 4 ㎸, ± 6 ㎸				
Discharge impedance	330 Ω / 150 ㎊				
Number of discharge (Each polarity)	☒ Contact: 10 ☒ Air: 10 ☒ HCP / VCP: 10				
Interval between discharges	1 s				
Testing voltage	230 ㅿ, 50 ㎐				
Test facility	Shielded room				
Date	2013. 12. 22				
Temperature(°C)	20.7 °C	Humidity (% R.H.)	34.4 % R.H.	Pressure (㎪)	102.0 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.5.1 Measurement procedure

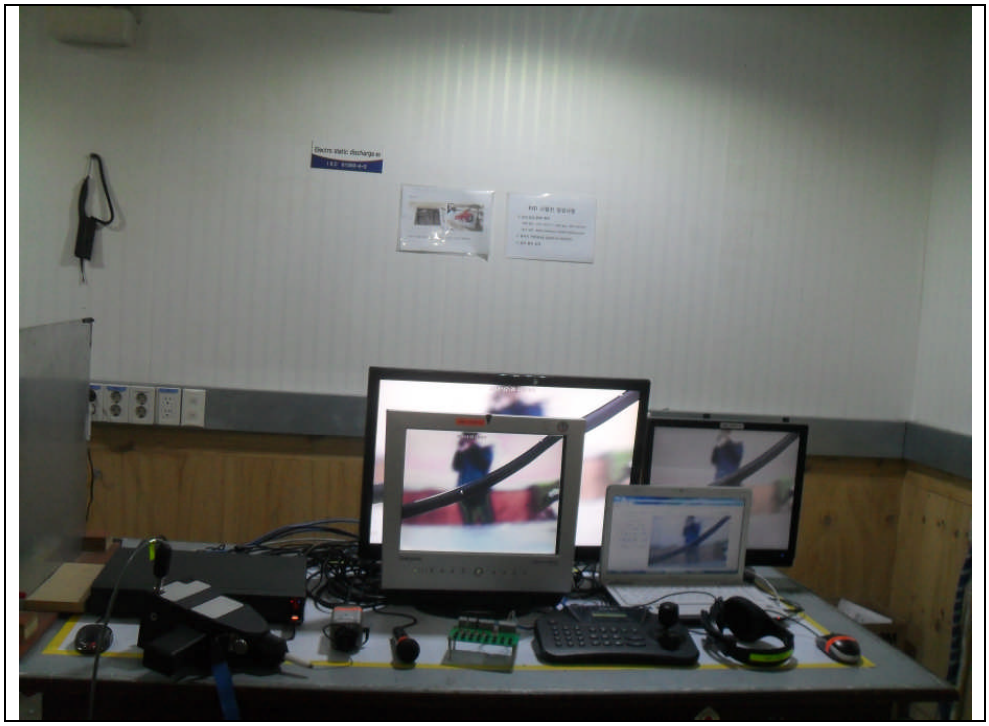
A ground reference plane was located on the floor, and connected to earth via a low Impedance connection. The return cable of the ESD generator was connected to the reference plane.
In case of floor standing equipment, EUT was placed on the reference plane on 0.1 ㎡ of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 ㎡ above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference plane via a 470 ㏀ resistor located in each end (0.5 ㎜ insulating support between EUT and HCP). In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5 ㎡ was located 0.1 ㎡ from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

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6.5.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	PESD 1600	H011 309	HAEFELY	2014.07.15	☒
ESD Tester	NSG 437	182	TESEQ	2014.05.21	☐
HCP	-	-	-	-	☒
VCP	-	-	-	-	☒

6.5.3 Photographs of test setup

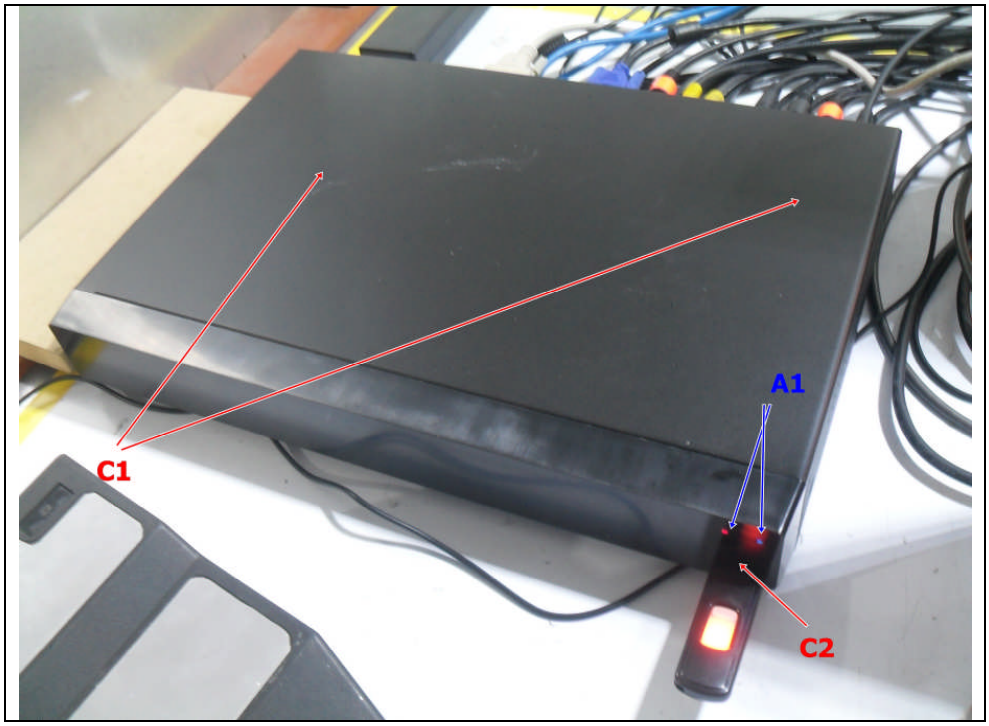


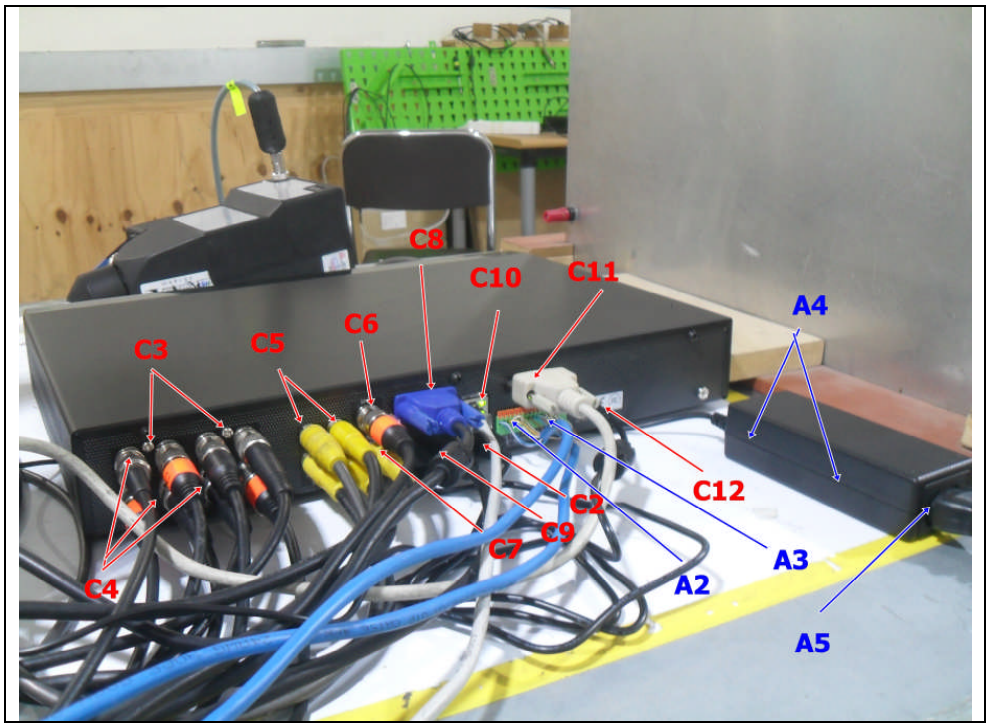
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6.5.4 Measurement result

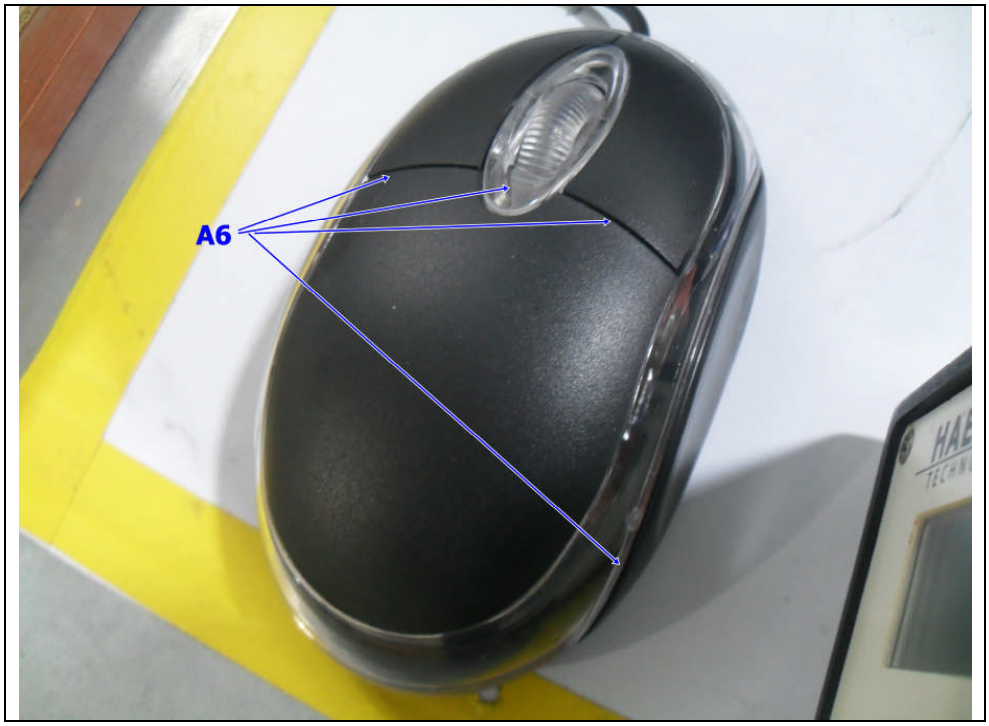
Electrostatic Discharge (Test Point)

Air discharge	→
Contact discharge	→





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HCP/VCP discharge

Location(EUT)	Applied level (±)	Result
HCP (All 4 sides)	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied
VCP (All 4 sides)	± 2 ㎸, ± 4 ㎸, ± 6 ㎸	Complied

Contact discharge

Location(EUT)		Applied level (±)	Result
C1	Enclosure(Case)	± 6 ㎸	Complied
C2	USB Port	± 6 ㎸	Complied
C3	Screw	± 6 ㎸	Complied
C4	Video In Port	± 6 ㎸	Complied
C5	Audio In Port	± 6 ㎸	Complied
C6	Video Out Port	± 6 ㎸	Complied
C7	Audio Out Port	± 6 ㎸	Complied
C8	D-SUB Port	± 6 ㎸	Complied
C9	HDMI Port	± 6 ㎸	Complied
C10	LAN(RJ-45) Around	± 6 ㎸	Complied
C11	Serial Port	± 6 ㎸	Complied
C12	Power Port around	± 6 ㎸	Complied

Air discharge

Location(EUT)		Applied level (±)	Result
A1	LED	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A2	RS-485 Port	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A3	Alarm Port	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A4	Adaptor_Enclosure(Case)	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A5	Adaptor_Power Port	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied
A6	Mouse_Enclosure(Case)	± 2 ㎸, ± 4 ㎸, ± 8 ㎸	Complied

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6.6 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006+A2:2010				
Tested frequency	80 ㎒ ~ 2.7 ㎓				
Test level & Modulation	1 V/m, 3 V/m, 10 V/m, 80 % Amplitude Modulation (1 ㎑) 1 V/m, 3 V/m, 10 V/m, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Frequency Step	log 1 % step				
Dwell time	3 s				
Distance	3 m from EUT to tip of antenna				
Testing Voltage	230 V, 50 Hz				
Test facility	Fully anechoic chamber (3 m)				
Date	2013. 12. 22				
Temperature(°C)	19.9 °C	Humidity (% R.H.)	26.3 % R.H.	Pressure (㎪)	102.0 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.6.1 Measurement procedure

The test was performed at 3 m full anechoic chamber.

For floor standing equipment, the EUT was standing on the floor.

For tabletop equipment, the EUT was located on a wooden table 0.8 m above the floor.

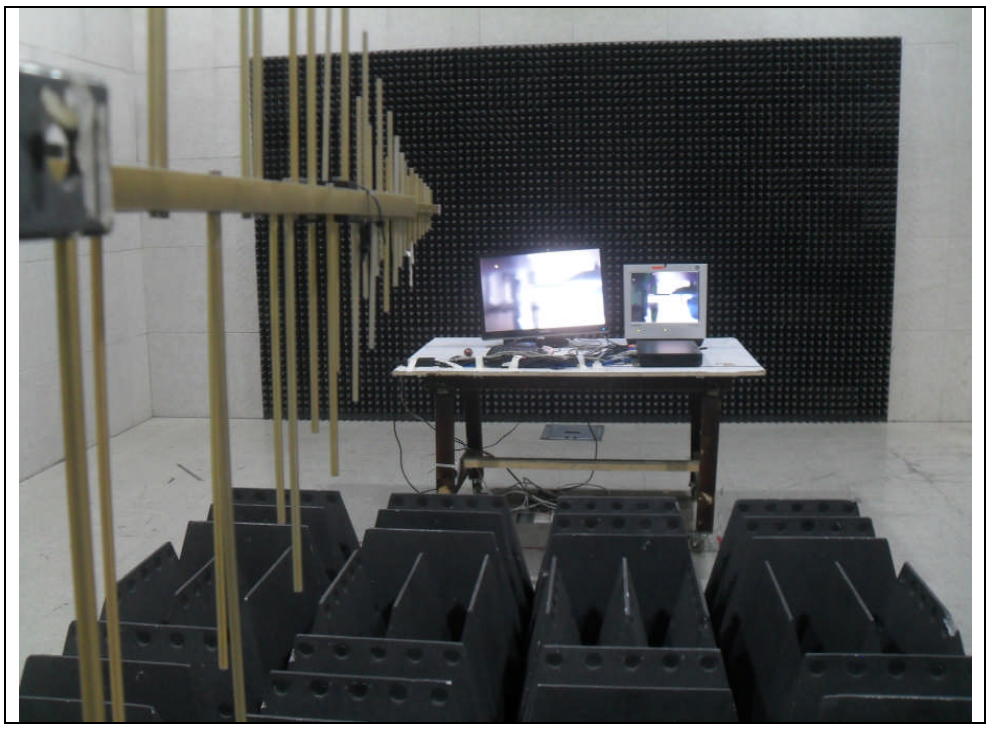
The EUT was tested all sides, horizontal and vertical polarization.

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6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	2014.04.05	☒
Power sensor	PH2000	303224	AR	2014.04.05	☒
Power sensor	PH2000	311217	AR	2014.04.05	☒
Directional coupler	DC6180	303976	AR	2014.04.08	☒
Directional coupler	DC7144M1	320279	AR	2014.02.07	☒
Signal generator	E4421B	GB40052295	AGILENT	2014.10.08	☒
Amplifier	BBA100	100996-1	R&S	2014.02.12	☒
Amplifier	60S1G3M2	320444	AR	2014.04.09	☒
Broadband Ant.	LPDA-0803	130269	ETS	-	☒
Fiber Optic Modem	HI-4413P	-	ETS-LINDGREM	-	☒
Antenna master	-	-	ETS	-	☒

6.6.3 Photographs of test setup



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6.6.4 Measurement result

Location(EUT)	Antenna polarization	Result
Front side	Horizontal	Complied
	Vertical	Complied
Rear side	Horizontal	Complied
	Vertical	Complied
Left side	Horizontal	Complied
	Vertical	Complied
Right side	Horizontal	Complied
	Vertical	Complied

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6.7 Electric Fast Transient/BURST

Test specification	EN 61000-4-4:2004+A1:2010				
Coupling	☒ AC main ☒ Signal/Control: Clamp ☒ Telecommunication: Clamp				
Test level	☒ AC main: ± 2 ㎸ Peak ☒ Signal/Control: ± 1 ㎸ Peak ☒ Telecommunication: ± 1 ㎸ Peak				
Repetition frequency	100 ㎑, Tr/Th = 5 / 50 ㎱				
Coupling time	60 s				
Testing Voltage	230 Ⅴ, 50 ㎐				
Test facility	Shielded room				
Date	2013. 12. 23				
Temperature(°C)	23.0 °C	Humidity (% R.H.)	21.8 % R.H.	Pressure (㎪)	102.0 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.7.1 Measurement procedure

A ground reference plane was located on the floor.
EFT generator was connected to reference ground plane via low impedance connection.
For floor standing equipment, EUT was placed on a 0.1 ㎜ wooden table.
For tabletop equipment, EUT was placed on a 0.1 ㎜ above the ground reference plane.
Test generator and coupling/decoupling network was placed on, and bounded to, the ground reference plane. When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces, except the ground reference plane beneath the coupling clamp, Shall be 0.5 ㎜.

6.7.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500-M	V0545100858	EM TEST	2014.01.31	☒
Ultra compact simulator	UCS500M	0701-03	EM TEST	2014.06.21	☐
Capacitive Coupling Clamp	-	-	EM TEST	-	☒

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6.7.3 Photographs of test setup





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6.7.4 Measurement result

* AC main

EFT coupling point	(+)	(-)	Result
L+N+PE	+ 2 ㎸	- 2 ㎸	Complied

* Signal/Control

EFT coupling point	(+)	(-)	Result
Video In/Out	+ 1 ㎸	- 1 ㎸	Complied
RS-485	+ 1 ㎸	- 1 ㎸	Complied
Alarm	+ 1 ㎸	- 1 ㎸	Complied
Audio In/Out	+ 1 ㎸	- 1 ㎸	Complied

* Telecommunication

EFT coupling point	(+)	(-)	Result
LAN(RJ-45)	+ 1 ㎸	- 1 ㎸	Complied

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6.8 Surge

Test specification	EN 61000-4-5:2006				
Coupling	☒ AC main: Direct ☒ Signal/Control: Direct, CDN				
Test level	☒ AC main: ☒Differential mode: ± 0.5 kV, ± 1 kV ☒Common mode: ± 0.5 kV, ± 1 kV, ± 2 kV ☒ Signal/Control: ± 0.5 kV, ± 1 kV				
Coupling Impedance	☒ Differential mode: 18 μF ☒ Common mode: 10 Ω + 9 μF ☒ 40 Ω + 0.5 μF ☒ Direct				
Surge pulse shape	Tr/Th = 1.2 / 50 μs				
Angles	0 °, 90 °, 180 °, 270 °				
Number of surge	5				
Coupling time	1 min				
Testing Voltage	230 V, 50 Hz				
Test facility	Shielded room				
Date	2013. 12. 23				
Temperature(°C)	23.0 °C	Humidity (% R.H.)	21.8 % R.H.	Pressure (kPa)	102.0 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.8.1 Measurement procedure

A ground reference plane was located on the floor. SURGE generator was connected to reference ground plane via low impedance connection. For floor standing equipment & table top equipment, EUT was placed on a wooden table.

6.8.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500-M	V0545100858	EM TEST	2014.01.31	☒
Ultra compact simulator	UCS500M	0701-03	EM TEST	2014.06.21	☐
CDN	CNV 508 N1	V1108108861	EM TEST	2014.01.03	☒

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6.8.3 Photographs of test setup





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6.8.4 Measurement result

* AC main

Coupling point	(+)	(-)	Result
L+N	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
L+PE	+ 0.5 kV, + 1 kV, + 2 kV	- 0.5 kV, - 1 kV, - 2 kV	Complied
N+PE	+ 0.5 kV, + 1 kV, + 2 kV	- 0.5 kV, - 1 kV, - 2 kV	Complied

* Signal/Control

Coupling point	(+)	(-)	Result
Video In/Out	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
RS-485	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
Alarm	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
Audio In/Out	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied

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6.9 Conducted Immunity

Test specification	EN 61000-4-6:2009				
Tested frequency	0.15 ㎒ ~ 100 ㎒				
Test level & Modulation	1 Ⅴ, 3 Ⅴ, 10 Ⅴ, 80 % Amplitude Modulation (1 ㎑) 1 Ⅴ, 3 Ⅴ, 10 Ⅴ, Pulse Modulation (1 ㎐ (0.5 s ON: 0.5 s OFF))				
Frequency Step	log 1 % step				
Coupling method	☒ AC main: CDN(M3) ☒ Signal/Control: CDN(S1/75), Clamp ☒ Telecommunication: CDN(T8-RJ45)				
Testing Voltage	230 Ⅴ, 50 ㎐				
Test facility	Shielded room				
Date	2013. 12. 22				
Temperature(°C)	20.7 °C	Humidity (% R.H)	34.4 % R.H	Pressure(㎪)	102.0 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.9.1 Measurement procedure

A ground reference plane was located on the floor.

The test was performed on a ground reference plane on a 0.1 m wooden table. This test were Performed using CDN for mains, clamp for signal and injection probe. The frequency range was swept from 0.15 ㎒ to 100 ㎒. This frequency range was Modulated with 1 ㎑ sine wave at 80 %.

The signal generators provided the modulated frequency at a 1 % step size.

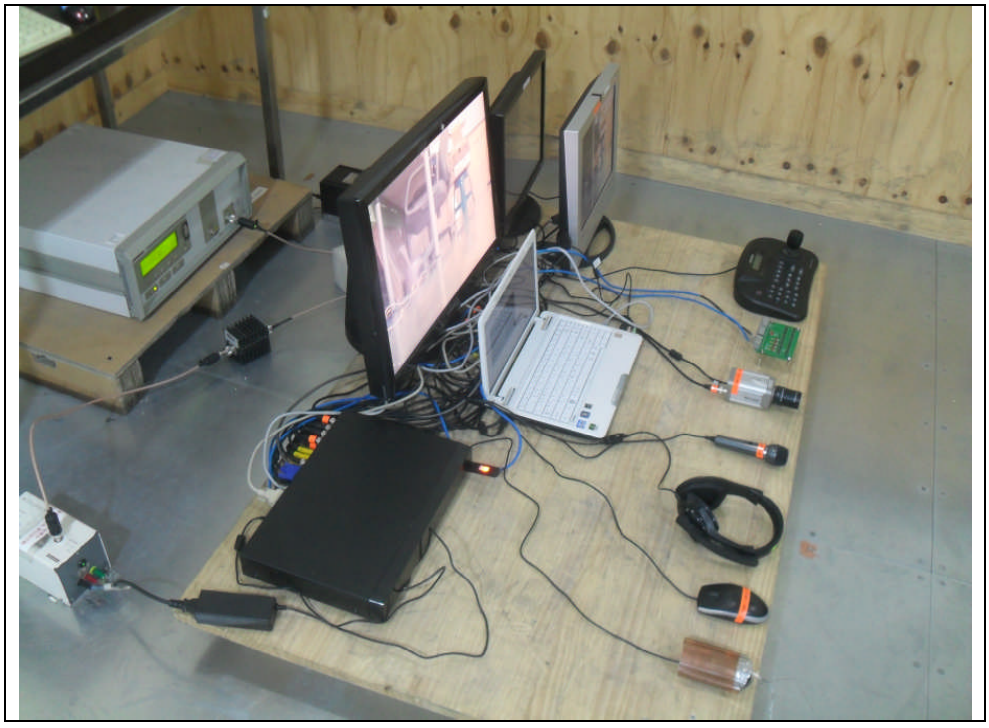
The power and all network cable, I/O cables longer than 3 m length were tested.

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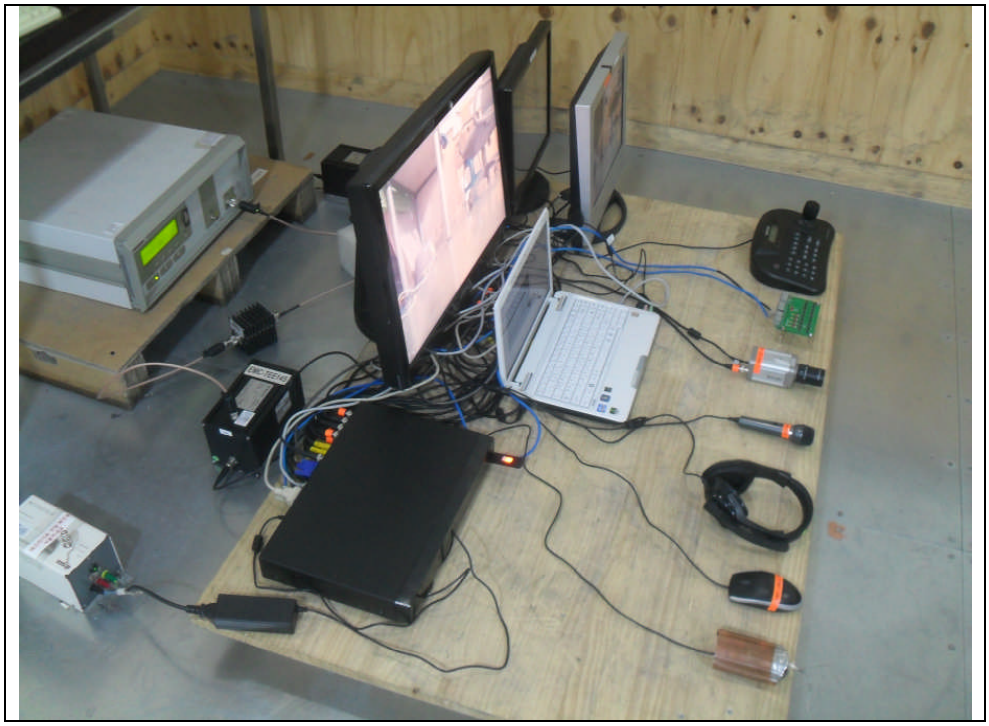
6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	NSG 2070	1054	Schaffner	2014.03.12	☒
CDN	M016	16674	Schaffner	2014.03.11	☒
CDN	CDN M2/M3N	0111-04	EM TEST	2014.02.08	☒
Attenuator	INA2070-1	2054	Schaffner	2014.03.11	☒
EM Clamp	KEMZ 801	17643	Schaffner	2014.04.17	☒
CDN	CDN S1/75	0410-28	EM TEST	2014.05.13	☒
CDN	CDN-T8-RJ45	0113-22	EM TEST	2014.02.22	☒

6.9.3 Photographs of test setup



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6.9.4 Measurement result

* AC main

Coupling point	Coupling method	Result
Power	CDN(M3)	Complied

* Signal/Control

Coupling point	Coupling method	Result
Video In/Out	CDN(S1/75)	Complied
RS-485	Clamp	Complied
Alarm	Clamp	Complied
Audio In/Out	CDN(S1/75)	Complied

* Telecommunication

Coupling point	Coupling method	Result
LAN(RJ-45)	CDN(T8-RJ45)	Complied

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6.10 Dips and Interruptions

Test specification	EN 61000-4-11:2004				
Number of dips	3 T				
Duration	10 s				
Phase	Zero crossing (0 °)				
Testing Voltage	100 Ⅴ, 50 ㎐ / 240 Ⅴ, 50 ㎐				
Test facility	Shielded room				
Test Date	2013. 12. 23				
Temperature (°C)	23.0 °C	Humidity (% R.H.)	21.2 % R.H.	Pressure (㎪)	102.0 ㎪
Remarks	Complied				

6.10.1 Measurement procedure

The dips/interruption test is only applicable to AC mains.

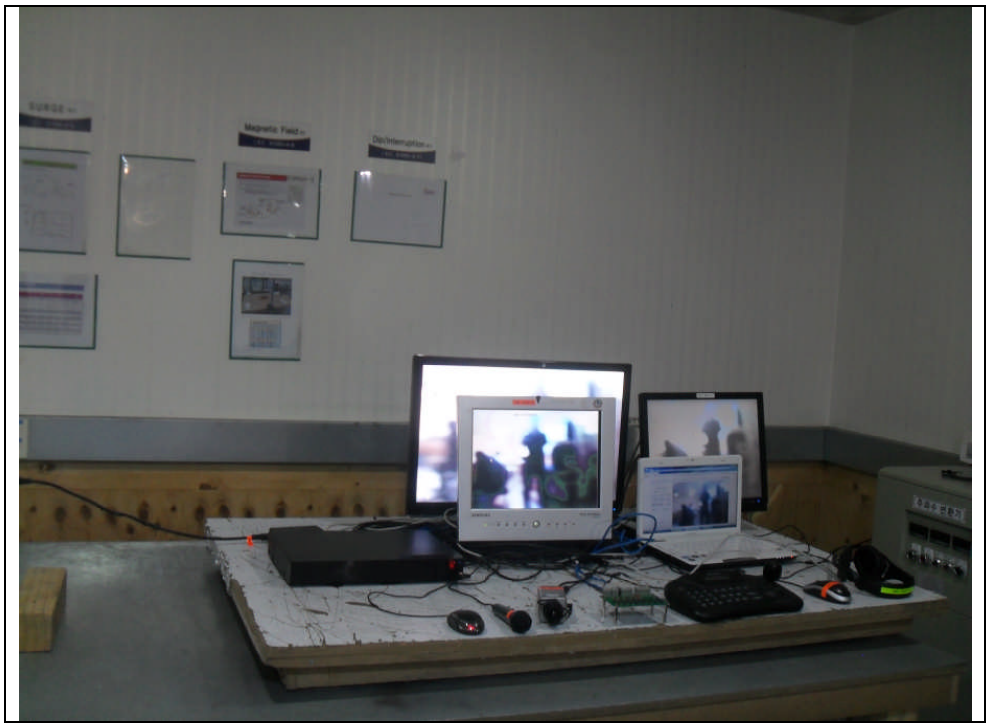
The dips/interruptions were applied at zero crossing.

6.10.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500-M	V0545100858	EM TEST	2014.01.31	☒
Ultra compact simulator	UCS500M	0701-03	EM TEST	2014.06.21	☐

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6.10.3 Photographs of test setup



6.10.4 Measurement result

* 100 V, 50 Hz / 240 V, 50 Hz

Test Level (%UT)	Dip/Int. (%UT)	Duration /Period	Phase (°)	Count number	Result
80 %	20%	250 Period (1)	0	3T	Complied
70 %	30 %	25Period	0	3T	Complied
40 %	60 %	10 Period	0	3T	Complied
0%	100 %	250 Period (2)	0	3T	Note*

Comment:

- There was no change of operation status during above testing. (250 Period (1), 25Period, 10 Period)
- Note* (250 Period (2))

The power of EUT is off during the test. After the test, EUT is getting back to normal operation.

It fully recorded using ancillary Power source equipment to content with Manufacturer`s set up manual.

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6.11 Mains supply voltage variations

Test specification	EN 50130-4:2011				
Supply voltage	*U nom* + 10 %, *U nom* - 15 %				
Testing voltage	100 V, 50 Hz / 240 V, 50 Hz				
Test Date	2013. 12. 23				
Temperature (°C)	23.0 °C	Humidity (% R.H.)	21.2 % R.H.	Pressure (kPa)	102.0 kPa
Remarks	Complied				

6.11.1 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500-M	V0545100858	EM TEST	2014.01.31	☒
Ultra compact simulator	UCS500M	0701-03	EM TEST	2014.06.21	☐

6.11.2 Measurement result

* 240 V, 50 Hz

Supply voltage		Result
+ 10 %	264 V	Complied
- 15 %	204 V	Complied

Comment:

- There was no change of operation status during above testing.

* 100 V, 50 Hz

Supply voltage		Result
+ 10 %	110 V	Complied
- 15 %	85 V	Complied

Comment:

- There was no change of operation status during above testing.

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7. E.U.T. photographs

Front View



Rear View



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Left View



Right View



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Top View



Bottom View



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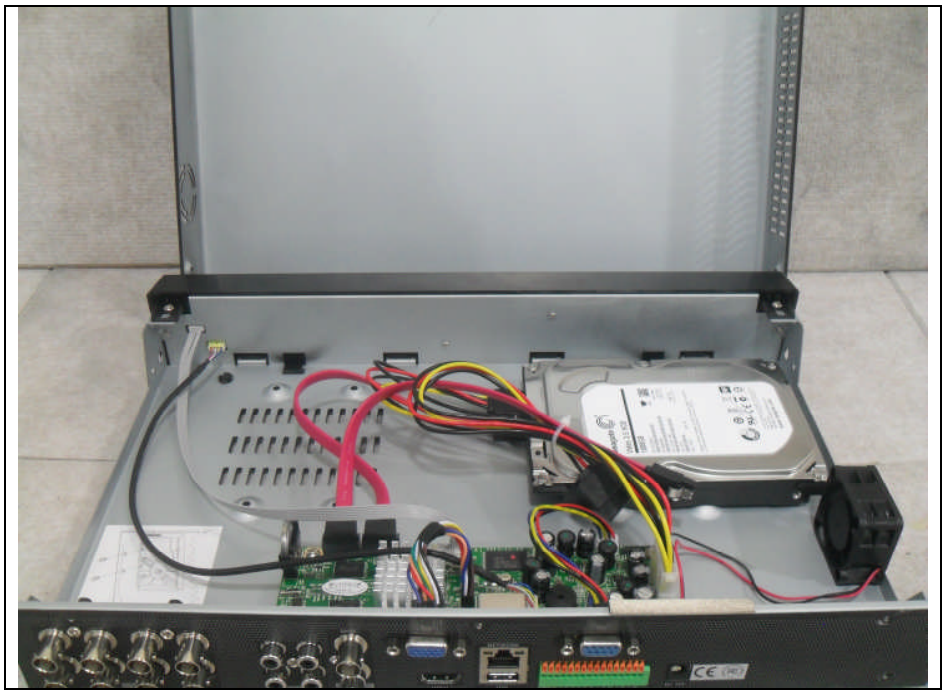
Port





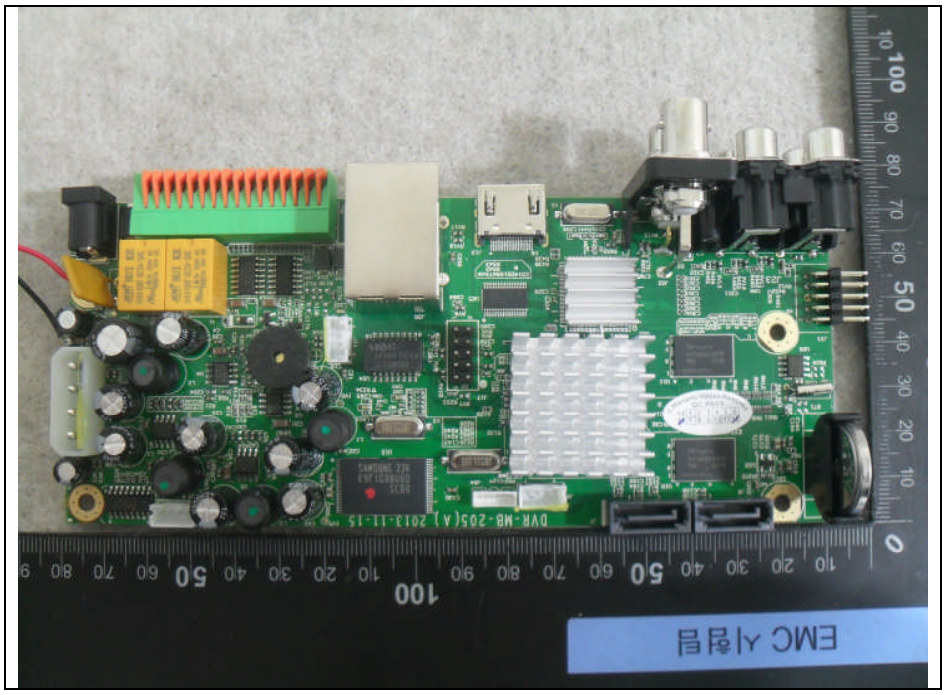
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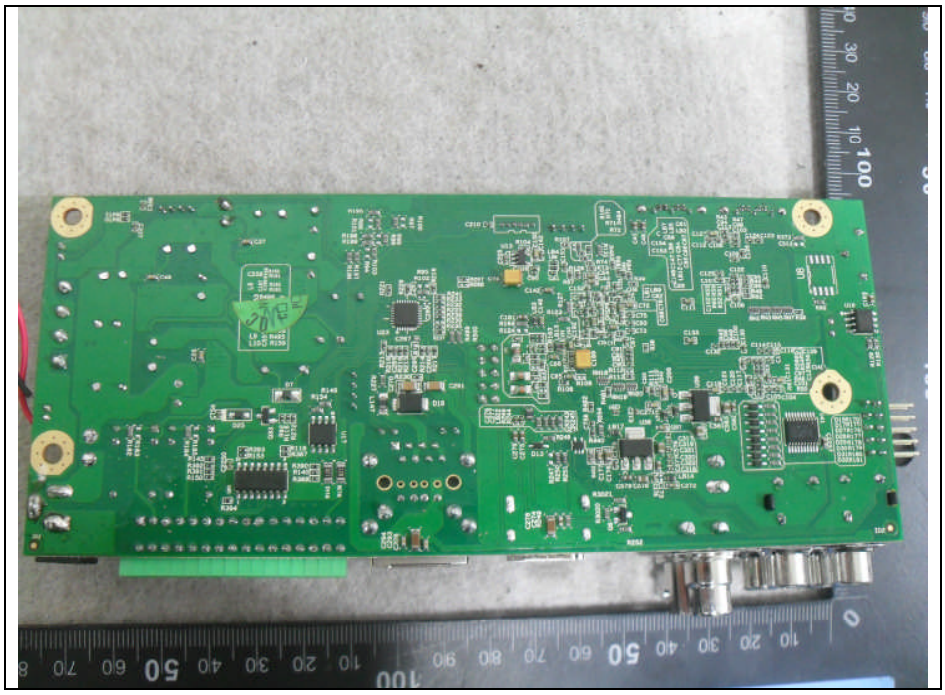
Inside



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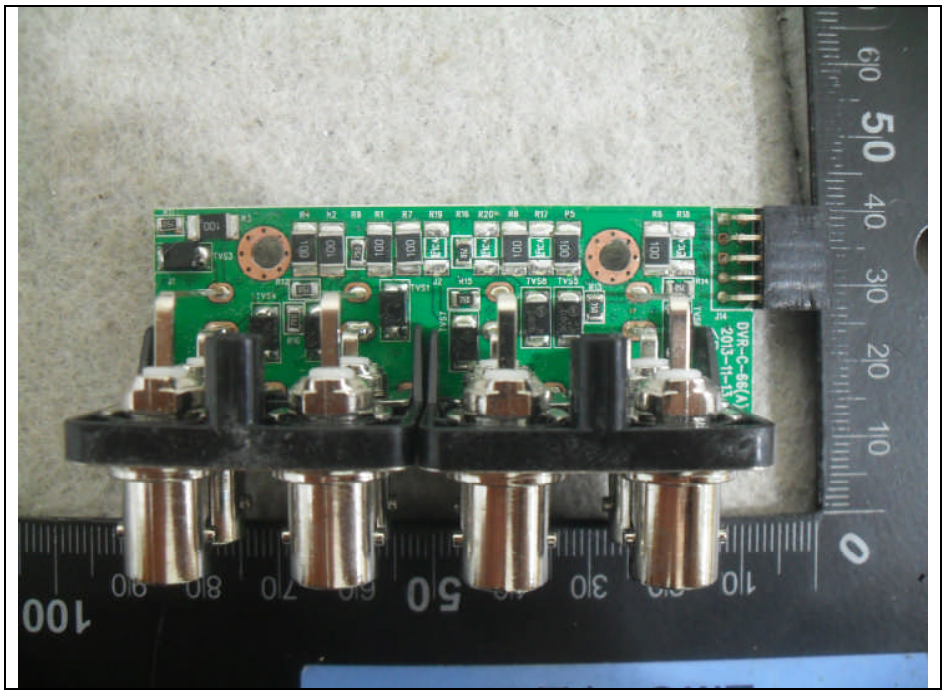
Main Board

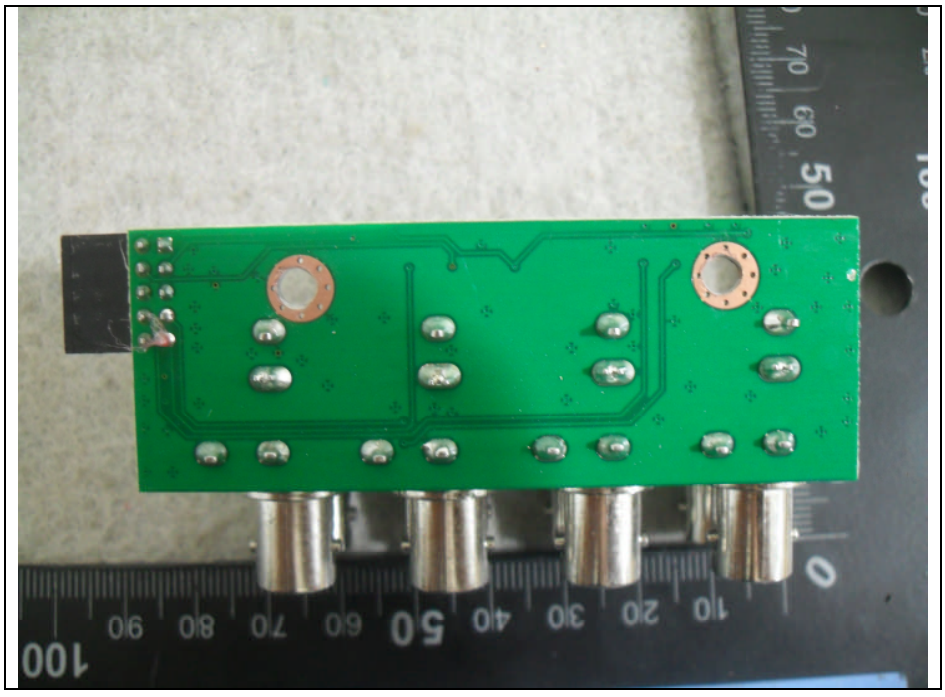




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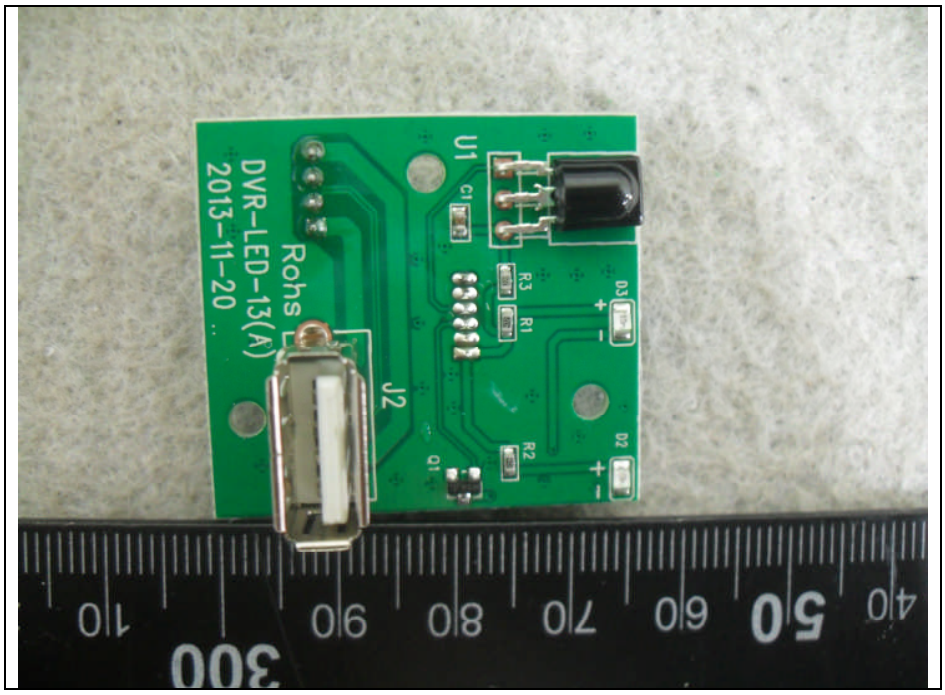
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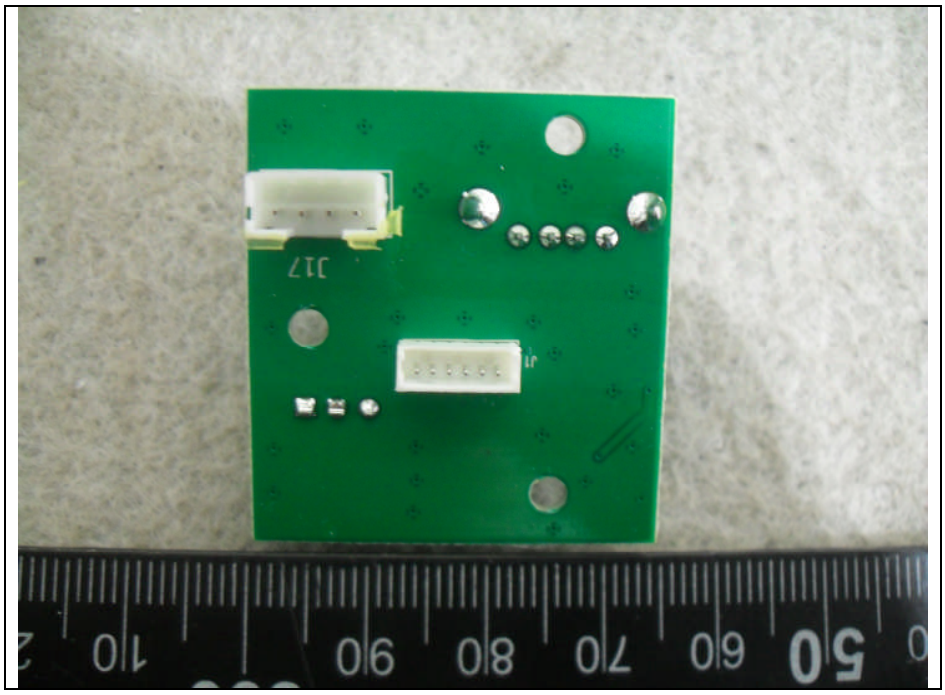




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SUB Board#2

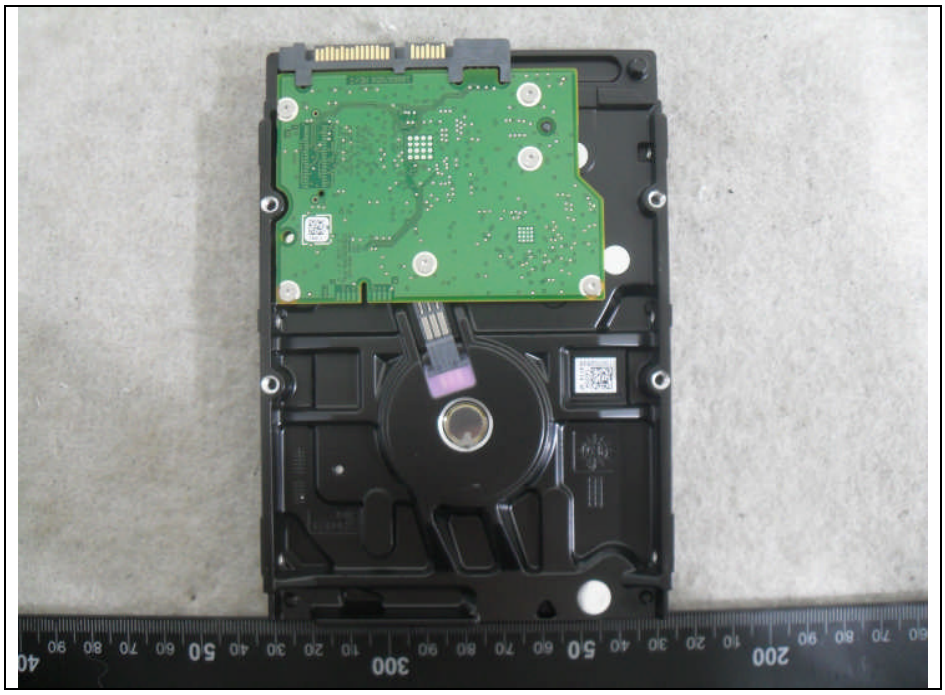




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HDD(1000GB)





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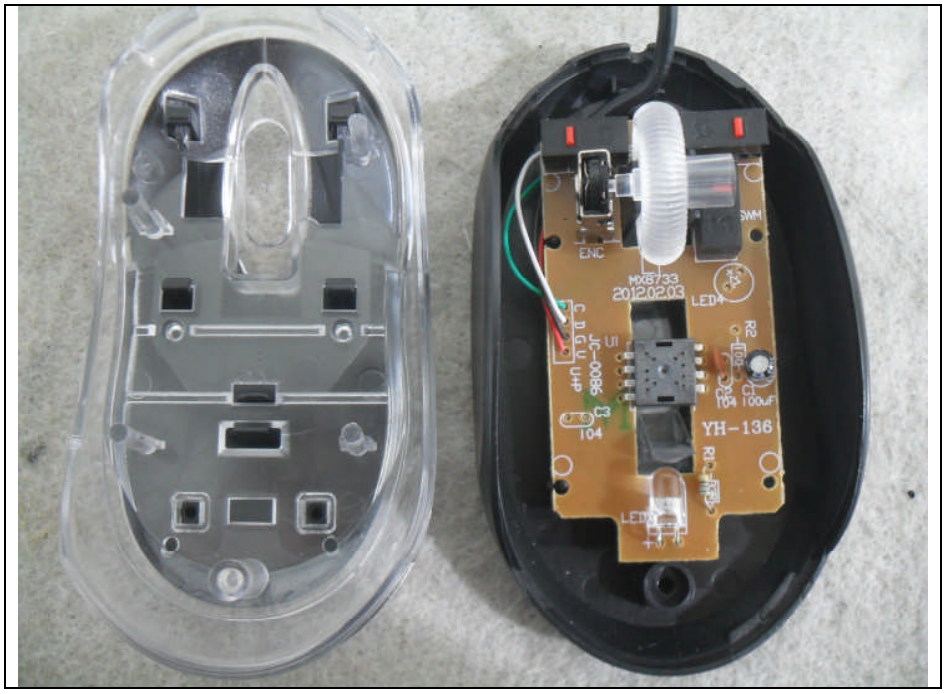
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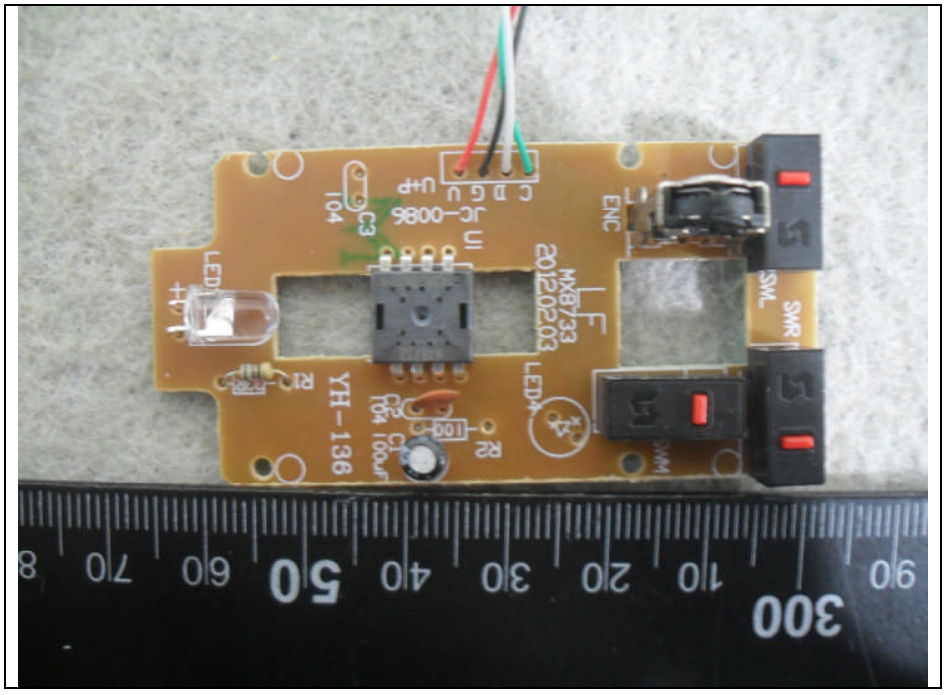
USB Mouse



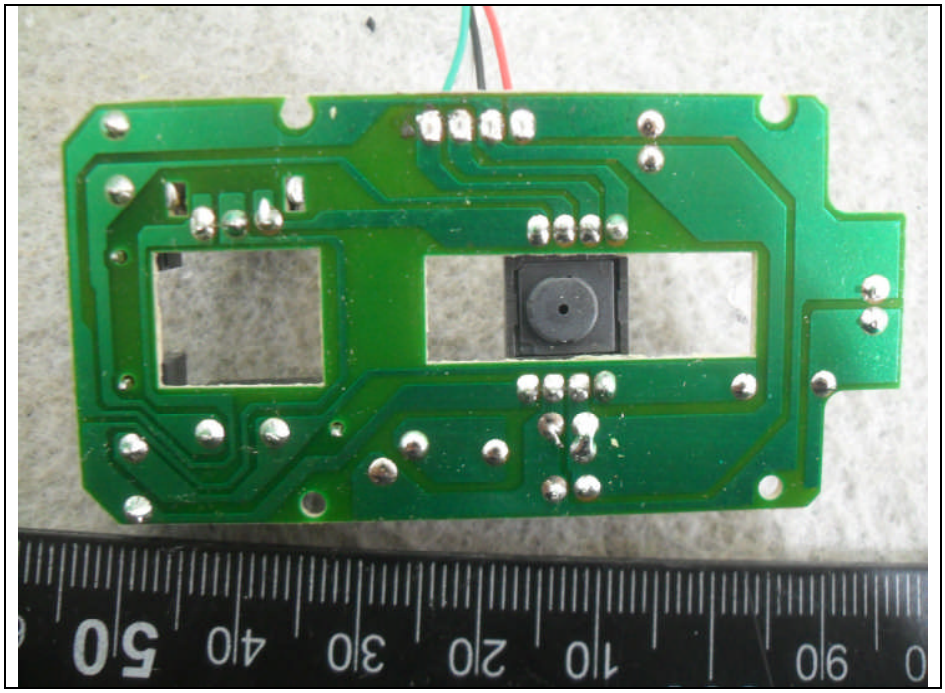


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AC/DC Adaptor





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