



Declaration of Conformity



Type of equipment: Network Camera
Brand Name /Trade Mark: SAMSUNG
Type designation /model: SNV-5084P
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 61000-3-3:2008	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
/ July 05, 2013

Authorized Signatory: Name : Jei Soon, Kang
Title : Principal Research Engineer

Signature :

EMC TEST REPORT

Test report No : EMC-CE-4157
Type of Equipment : Network Camera
Model Name : SNV-5084P
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 61000-3-3:2008
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. 06. 20

Date of testing: 2013. 07. 01 ~ 07. 04

Issued date: 2013. 07. 05

Tested by:

JUNG, YOUNG-JUN

Approved by:

YEOM, HAN-SEOK

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1. Applicant information

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Contact name: **Kang Jei Soon**

Manufacturer#1: SAMSUNG TECHWIN CO., LTD.
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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

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

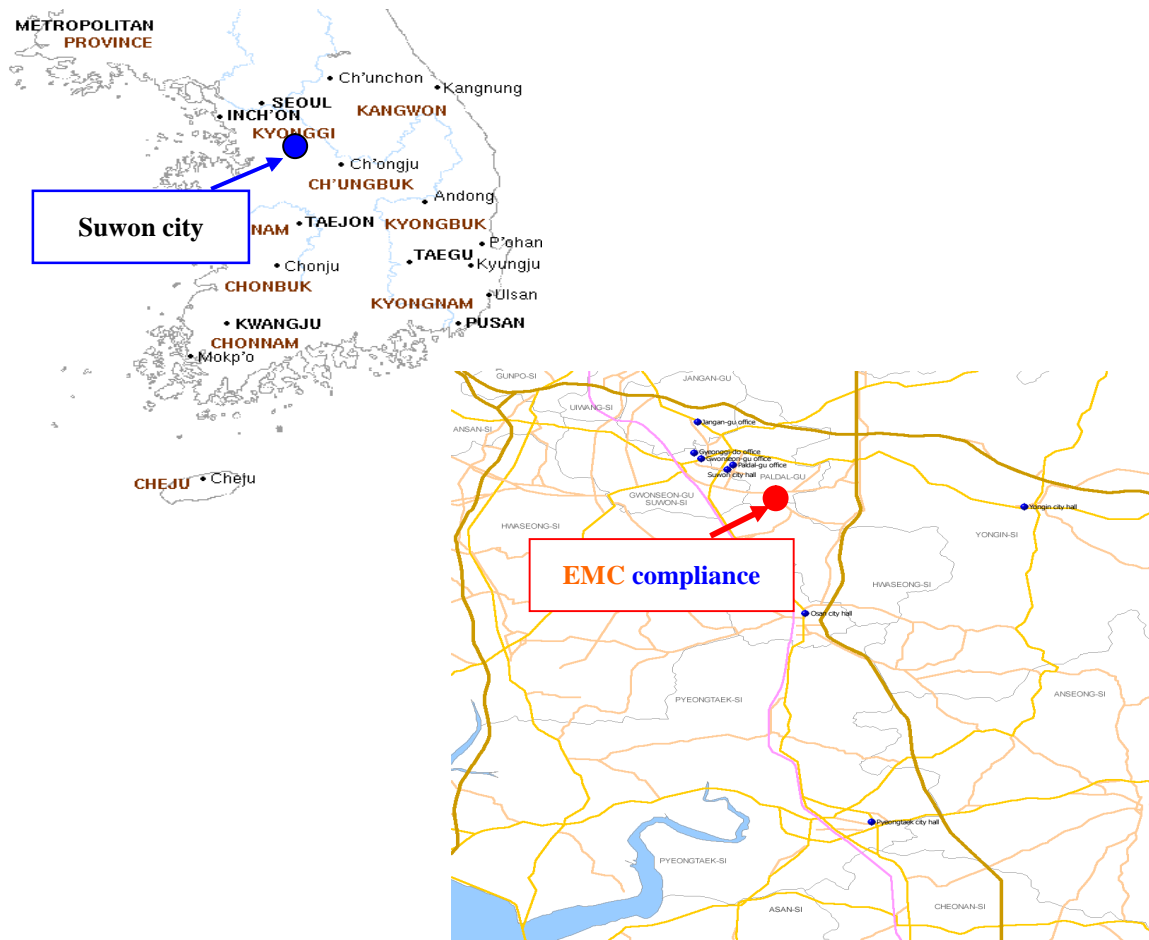
FCC CAB.: KR0040

VCCI Registration No. : R-3327, G-198, C-3706, T-1849

Industry Canada Registration No. : 8035A

KOLAS NO.: 231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
Chamber(10 m)	: 24 °C	41 % R.H.	-
Shielded room(CE)	: 24 °C	38 % R.H.	-
Shielded room(ESD)	: 25 °C	40 % R.H.	99.2 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

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

4. Description of E.U.T.

4.1 General information

Video	
Imaging Device	1/3" 1.3M PS CMOS
Total Pixels	1,384(H) x 1,076(V)
Effective Pixels	1,329(H) x 1,049(V)
Scanning System	Progressive
Min. Illumination	Color : 0.05 Lux (1/30sec, F1.2, 50IRE), 0.0008Lux (2sec, 50IRE) B/W : 0.005 Lux (1/30sec, F1.2, 50IRE)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - DIP connector type
Lens	
Focal Length (Zoom Ratio)	3~ 8.5mm (2.8X) Motorized Varifocal
Max. Aperture Ratio	F1.2
Angular Field of View	H: 93.3°(Wide)~33.2°(Tele), V: 73.7°(Wide)~26.6°(Tele) (TBD)
Min. Object Distance	0.5m (TBD)
Focus Control	Simple Focus (Motorized V/F) / Manual - Remote control via network, Button control (Manual, Simple Focus)
Lens Type	DC Auto Iris
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan Range	0 ° ~ +354 °
Tilt Range	0 ° ~ +67 °
Rotate Range	0 ° ~ +355 °
Operational	
Camera Title	Off / On (Displayed up to 40 characters)
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC
Wide Dynamic Range	130dB ↑
Contrast Enhancement	SDDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNR III (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On
Defog	Auto/Manual/Off
Motion Detection	Off / On (4ea 4 Points Polygonal zones)
Privacy Masking	Off / On (32 Zones with 4 Points of Polygonal)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital Zoom	-
Flip / Mirror	Off / On
Intelligent Video Analytics	Tampering, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection
Alarm I/O	Input 1ea / Output 1ea

Audio In	Selectable (Mic IN/Line IN), Max output level: 1 Vrms Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out (3.5mm stereo mini jack)
Alarm Triggers	Motion detection, Tampering, Audio Detection, Face Detecton, Video Analytics, Alarm Input, Network Disconnection
Alarm events	File upload via FTP and E-Mail Notification via E-Mail, TCP and HTTP local storage(SD/SDHC/SDXC) recording at Network disconnected & Event (Alarm Triggers) External output
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	1280x1024, 1280x720P(HD), 1024x768, 800x600, 640x480, 320x240
Max. Framerate	H.264 : Max 60fps at all resolutions Motion JPEG : 1280x1024 / 1280x720 / 1024x768 : Max. 15 fps 800x600 / 640x480 / 320x240 : Max. 30fps
Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method	H.264 : CBR or VBR MJPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio Compression Format	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps
Audio Communication	Bi-directional

IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication
Streaming Method	Unicast / Multicast
Max. User Access	15 users at Unicast Mode
Memory Slot	SD/SDHC/SDXC - motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.
Application Programming Interface	ONVIF Profile S & G HTTP API v2.0 SVNP 1.2
Web Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Finnish, Norwegian
Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7 Supported Browser : Microsoft Internet Explorer (Ver. 7~10), Mozilla Firefox (Ver. 9~19), Google Chrome (Ver. 15~25), Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 Only), 5.1.7) * Mac OS X Only
Central Management Software	SmartViewer 4.0

Environmental	
Operating Temperature / Humidity	PoE,AC24, DC12V : -40°C to +55°C (-40°F ~ +131°F) / Less than 90% RH * Start up should be done at above -35°C
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66 Grade
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	AC24V, DC12V, PoE(IEEE802.3af)
Power Consumption	Max 12.95W(PoE, Heater On) Max 14.0W(AC 24V,DC 12V, Heater On)
Mechanical	
Color / Material	Ivory / Aluminum
Dimension (WxHxD)	180 x H118.5
Weight	980g

4.2 Product description

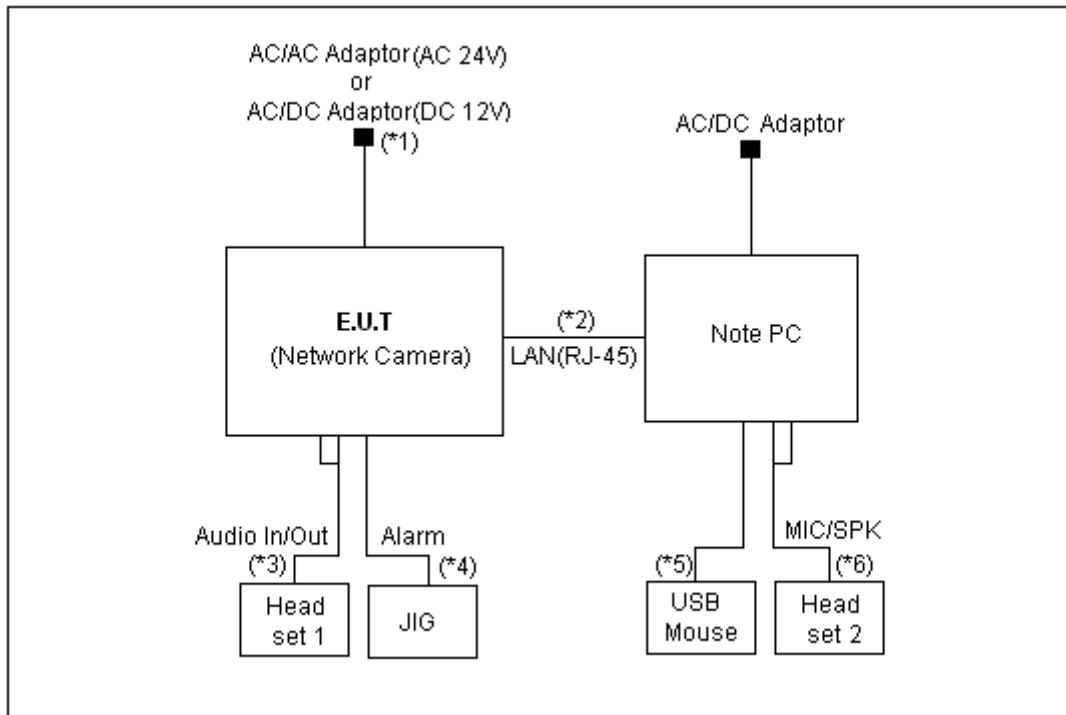
Type of product	Network Camera
Model name (Basic)	SNV-5084P
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 V , AC 24 V , PoE
Product rating	DC 12 V , AC 24 V , PoE
Internal clock frequency	Above 108 Mhz
Note	* AC/DC adaptor was not provided by the manufacturer. * AC/AC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	Satellite L730	3B134626W	TOSHIBA
JIG	-	-	-
USB Mouse	1088	8165906051240	Microsoft
Headset 1	SHS-250V	-	SAMSUNG
Headset 2	SHS-250V	-	SAMSUNG
AC/AC Adaptor (AC 24V)	EO-2412	-	EO Electronics
AC/DC Adaptor (DC 12V)	DAD12050STW	-	Samsung Techwin
PoE Switch	FS108P	1DL2093R00C1C	NETGEAR

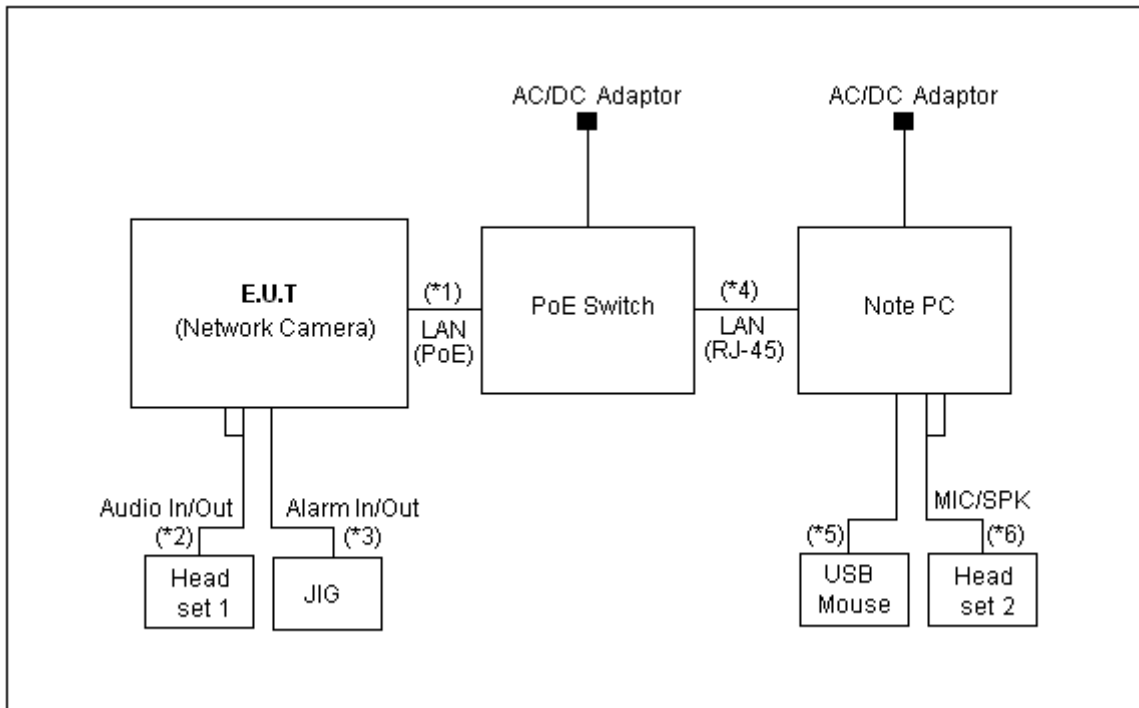
4.4 Test configuration

#1- DC 12V, #2- AC 24V



Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (Network Camera)	Power	AC/AC Adaptor or AC/DC Adaptor	Power	1.4	Non-Shield	-
2		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield	-
3		Audio In/Out	Headset 1	Audio In/Out	3.0	Non-Shield	Out-door
4		Alarm	JIG	Alarm	3.0	Non-Shield	Out-door
5	Note PC	USB	USB Mouse	USB	1.8	Shield	-
6		MIC/SPK	Headset 2	MIC/SPK	2.0	Non-Shield	-

#3- PoE



* Power supplied from PoE Switch

Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (Network Camera)	LAN(PoE)	PoE Switch	LAN(PoE)	3.0	Non-Shield	-
2		Audio In/Out	Headset 1	Audio In/Out	3.0	Non-Shield	Out-door
3		Alarm	JIG	Alarm	3.0	Non-Shield	Out-door
4	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	3.0	Non-Shield	-
5		USB	USB Mouse	USB	1.8	Shield	-
6		MIC/SPK	Headset 2	MIC/SPK	2.0	Non-Shield	-

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Camera monitoring test. (Web viewer)
	Alarm status monitoring test
	Audio In/Out test.

* Note: 3 types of powers are available for the product, that are DC 12 V, AC 24 V, PoE.

Therefore, tests were performed for 3 different types of powers.

5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
<input checked="" type="checkbox"/>	Conducted Emission	EN 55022:2010	Complied
<input checked="" type="checkbox"/>	Radiated Emission	EN 55022:2010	Complied
<input type="checkbox"/>	Harmonics current	EN 61000-3-2:2006+A2:2009	N/A
<input checked="" type="checkbox"/>	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			
<input checked="" type="checkbox"/>	Electrostatic discharge	EN 61000-4-2:2009	Complied
<input checked="" type="checkbox"/>	Radiated RF immunity	EN 61000-4-3:2006+A2:2010	Complied
<input checked="" type="checkbox"/>	Electric Fast Transient/BURST	EN 61000-4-4:2004+A1:2010	Complied
<input checked="" type="checkbox"/>	Surge	EN 61000-4-5:2006	Complied
<input checked="" type="checkbox"/>	Conducted RF immunity	EN 61000-4-6:2009	Complied
<input checked="" type="checkbox"/>	Voltage dip/interruption	EN 61000-4-11:2004	Complied
<input type="checkbox"/>	Mains supply voltage variations	EN 50130-4:2011	N/A

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

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 $U = 130 \text{ dB}\mu\text{V}$.

For component of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at $U = 140 \text{ dB}\mu\text{V}$, 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 $U = 130 \text{ dB}\mu\text{V}$, 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 $U = 120 \text{ dB}\mu\text{V}$.

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.

6. Test results

6.1 Conducted Emission

Test specification	EN 55022:2010, Class A		
Testing voltage	DC 12 V, AC 24 V, PoE		
Test facility	Shielded room (CE#2)		
Date	2013. 07. 02		
Temperature (°C)	24 °C	Humidity (% R.H.)	38 % R.H.
Remarks	Complied		

6.1.1 Limits of conducted emission measurement

AC 24 V

Frequency [MHz]	Class A (dB(μV))		Class B (dB(μV))	
	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 [MHz]	Class A Voltage Limits (dB(μV))		Current Limits (dB(μA))	
	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 [MHz]	Class B Limits (dB(μV))		Current Limits (dB(μA))	
	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 MHz to 0.5 MHz

* 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).

6.1.2 Measurement procedure

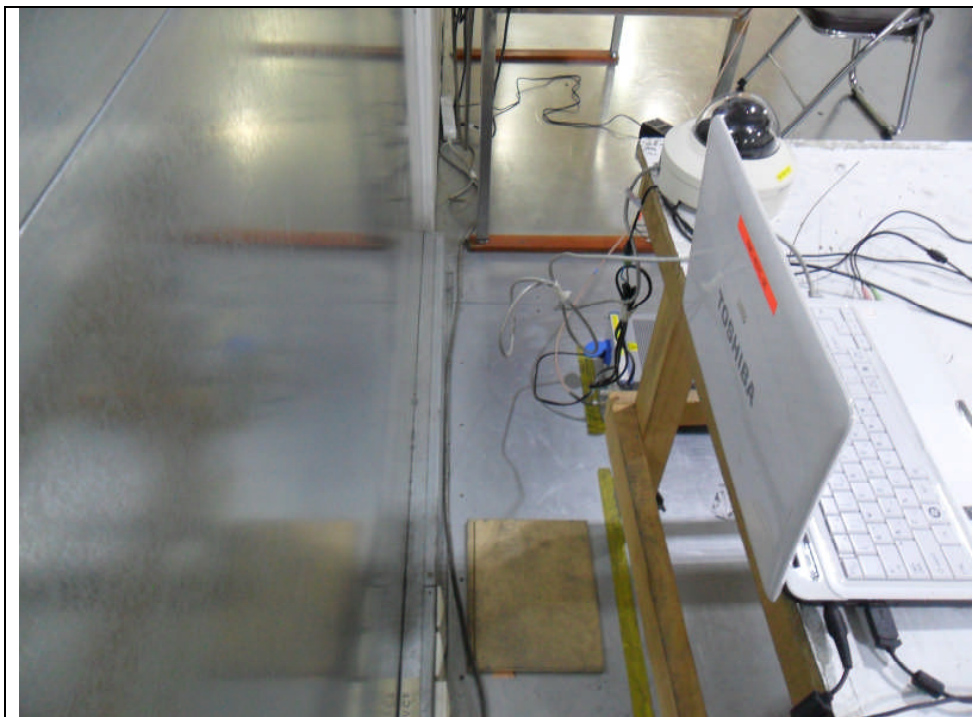
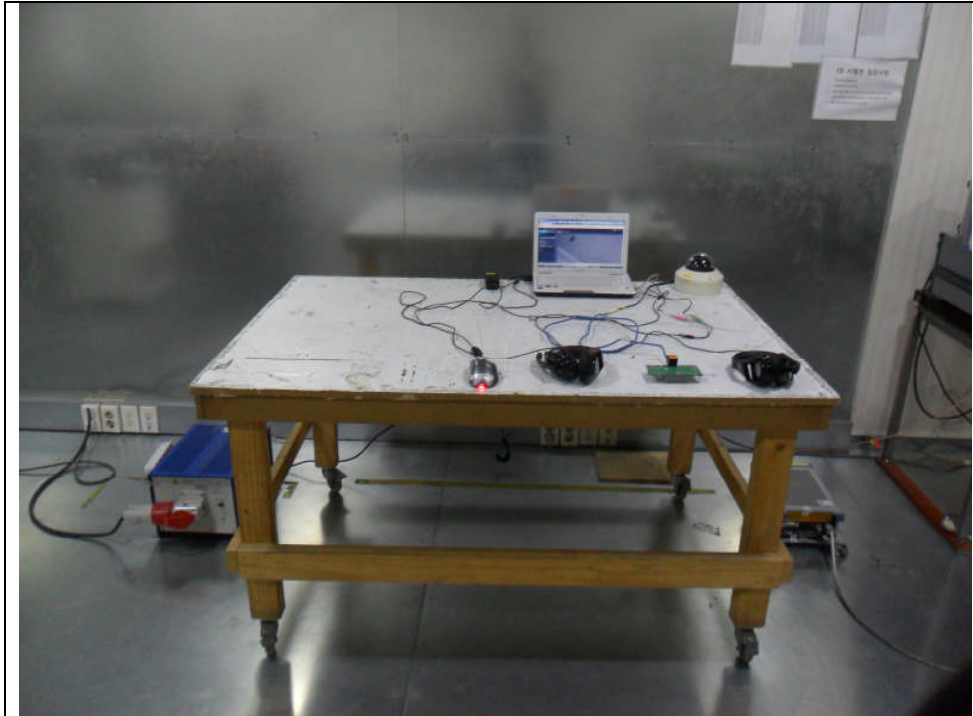
The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground 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	ESHS30	844827/011	R&S	2013.08.06	<input type="checkbox"/>
Test Receiver	ESCI7	100732	R&S	2014.02.18	<input type="checkbox"/>
Test Receiver	ESCI	100001	R&S	2013.07.10	<input checked="" type="checkbox"/>
Test Receiver	ESCI	100710	R&S	2013.11.06	<input type="checkbox"/>
LISN	ENV216	101352	R&S	2014.01.07	<input checked="" type="checkbox"/>
LISN	L3-32	0120J20305	PMM	-	<input checked="" type="checkbox"/>
8-WIRE ISN	NTFM 8158 CAT5	CAT5-8158-0048	SCHWARZBECK	2013.10.30	<input checked="" type="checkbox"/>
8-WIRE ISN	NTFM 8158 CAT3	CAT3-8158-0033	SCHWARZBECK	2013.10.30	<input checked="" type="checkbox"/>
ISN	ST08	24342	TESEQ	2014.06.21	<input type="checkbox"/>
ISN	ENY81	101545	R&S	2013.08.29	<input type="checkbox"/>

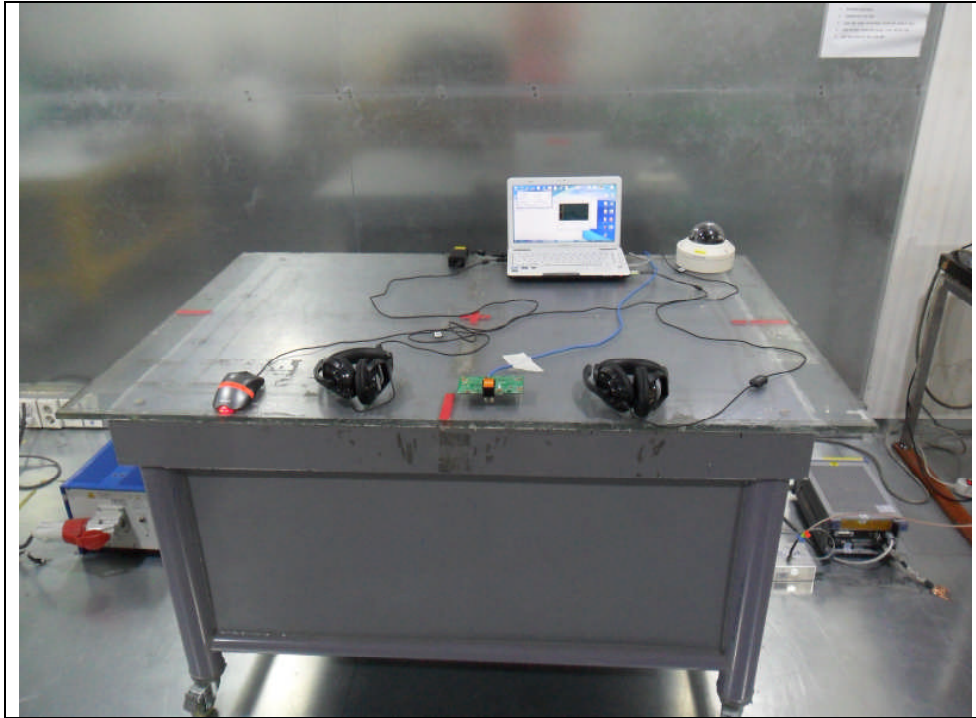
6.1.4 Photographs of test setup

* AC Line (#2- AC 24V)

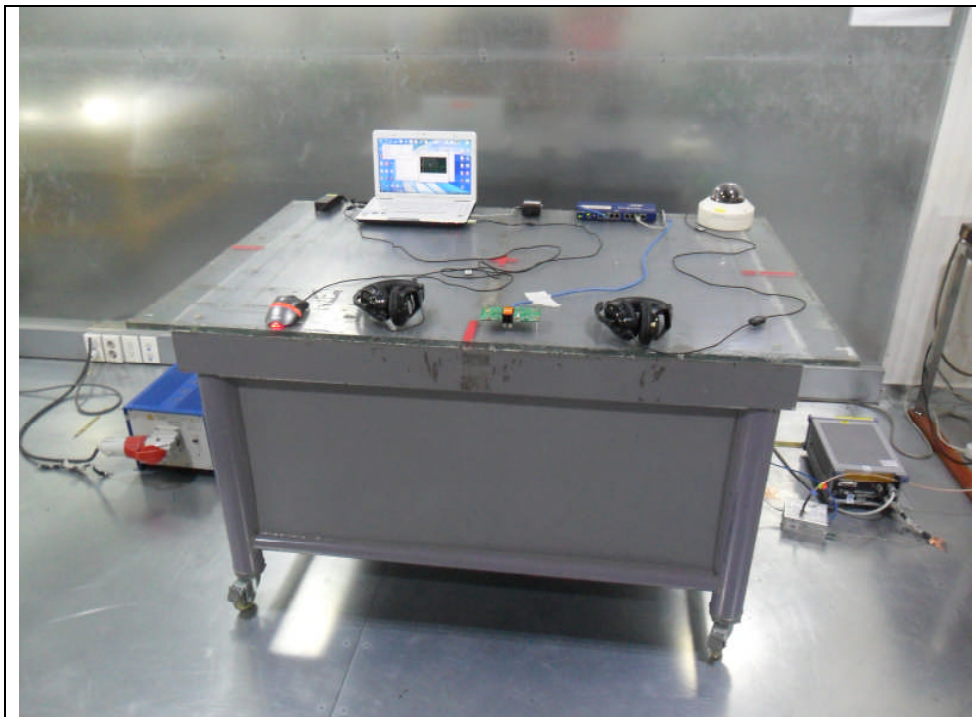


* Telecommunication

#1- DC 12V, #2- AC 24V

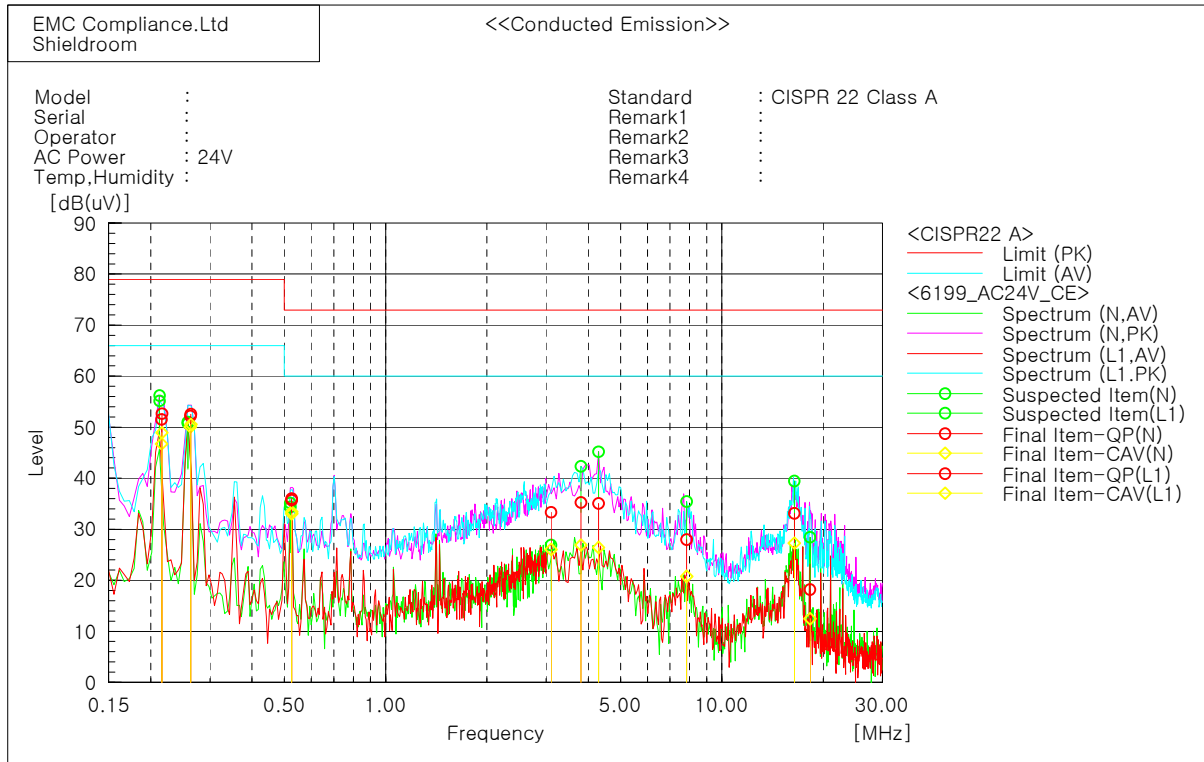


#3-PoE



6.1.5 Conducted emission measurement result

* AC Line (#2- AC 24V)_SNV-5084P



Final Result

--- N Phase ---

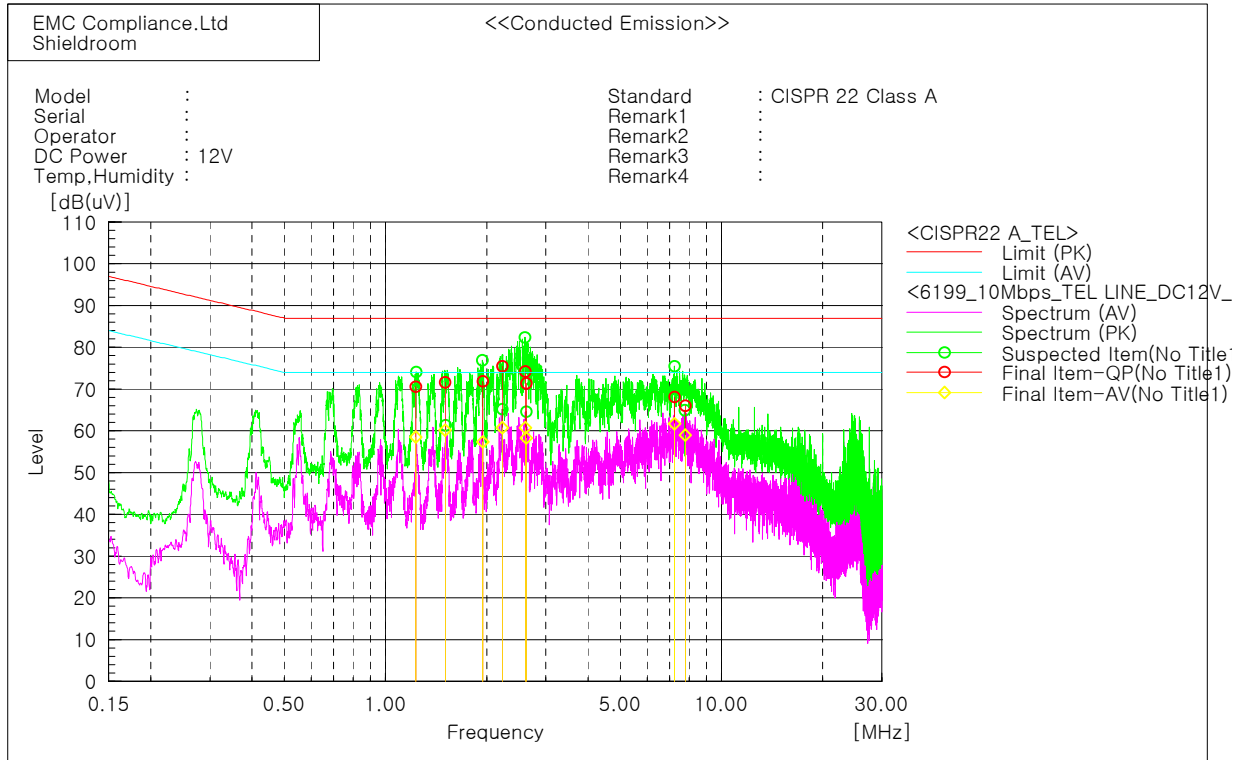
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.2157	41.6	36.8	9.9	51.5	46.7	79.0	66.0	27.5	19.3
2	0.26224	42.3	40.2	9.9	52.2	50.1	79.0	66.0	26.8	15.9
3	0.52502	26.0	23.4	10.0	36.0	33.4	73.0	60.0	37.0	26.6
4	4.30052	25.4	16.7	9.7	35.1	26.4	73.0	60.0	37.9	33.6
5	16.38832	23.4	17.5	9.8	33.2	27.3	73.0	60.0	39.8	32.7
6	18.2771	8.2	2.5	9.9	18.1	12.4	73.0	60.0	54.9	47.6

--- 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	0.21644	42.7	39.0	9.9	52.6	48.9	79.0	66.0	26.4	17.1
2	0.26314	42.7	40.6	9.9	52.6	50.5	79.0	66.0	26.4	15.5
3	0.52526	25.7	23.0	10.0	35.7	33.0	73.0	60.0	37.3	27.0
4	3.1073	23.6	16.4	9.7	33.3	26.1	73.0	60.0	39.7	33.9
5	3.81196	25.5	17.3	9.7	35.2	27.0	73.0	60.0	37.8	33.0
6	7.85616	18.3	11.0	9.7	28.0	20.7	73.0	60.0	45.0	39.3

* Telecommunication port (SNV-5084P)

#1- DC 12V _ LAN Port (LCL 55 dB)_10 Mbps

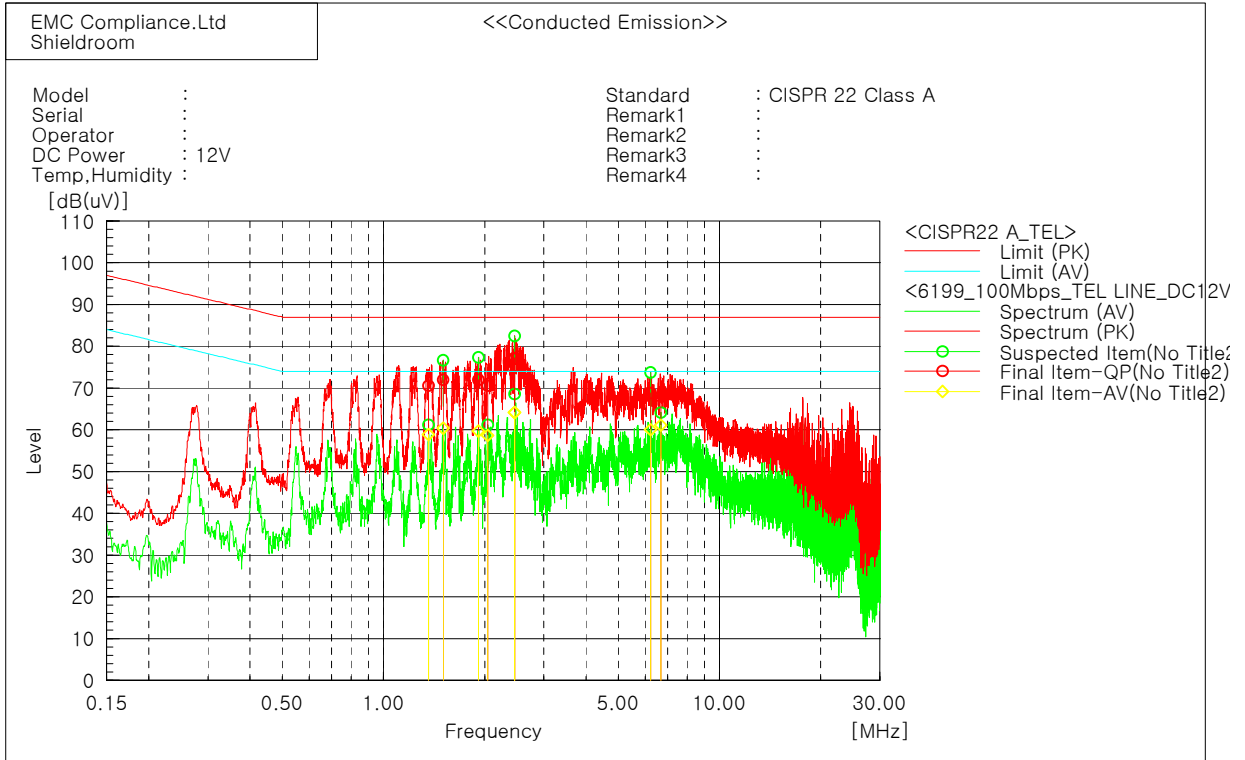


Final Result

--- 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	1.23192	60.6	48.6	9.9	70.5	58.5	87.0	74.0	16.5	15.5
2	1.50569	61.8	50.3	9.8	71.6	60.1	87.0	74.0	15.4	13.9
3	1.94894	62.1	47.5	9.8	71.9	57.3	87.0	74.0	15.1	16.7
4	2.22545	65.6	51.0	9.8	75.4	60.8	87.0	74.0	11.6	13.2
5	2.60284	64.4	51.0	9.8	74.2	60.8	87.0	74.0	12.8	13.2
6	2.62492	61.5	48.5	9.8	71.3	58.3	87.0	74.0	15.7	15.7
7	7.23821	58.4	51.9	9.7	68.1	61.6	87.0	74.0	18.9	12.4
8	7.79057	56.3	49.3	9.7	66.0	59.0	87.0	74.0	21.0	15.0

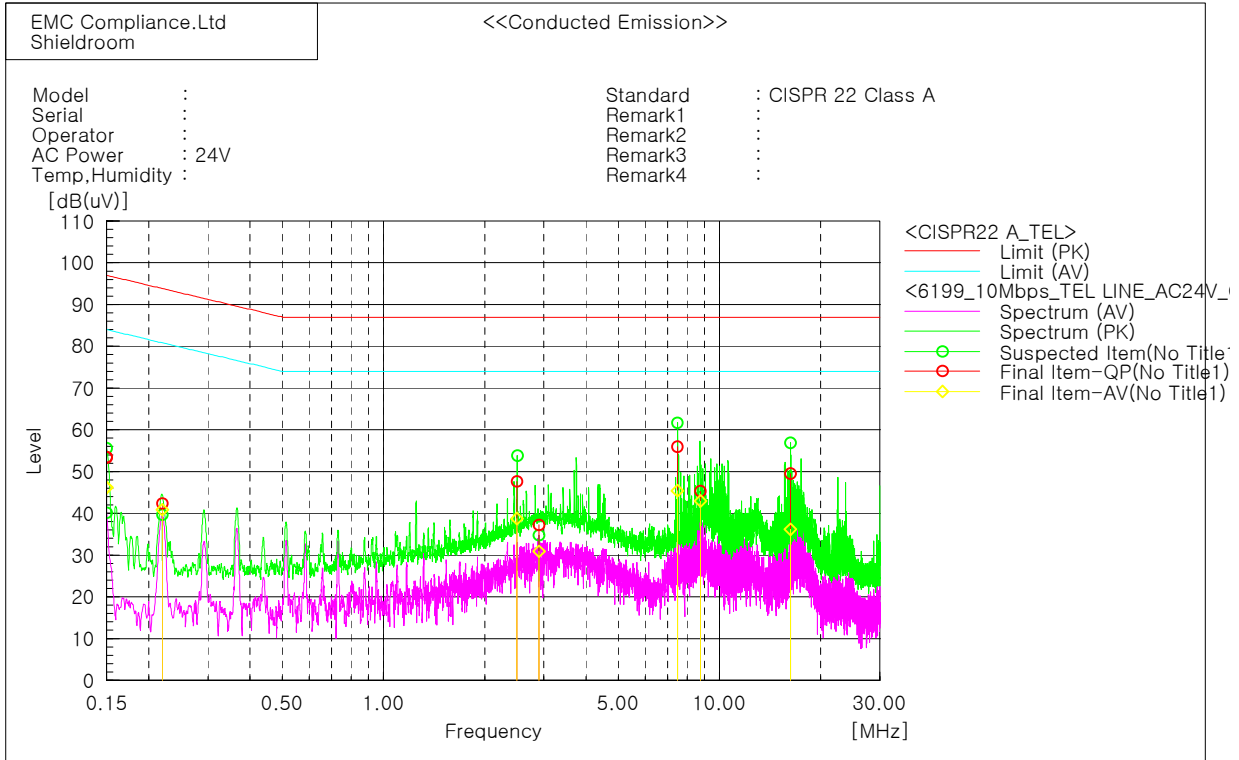
#1- DC 12V _ LAN Port (LCL 65 dB)_100 Mbps



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	1.36241	60.8	49.1	9.8	70.6	58.9	87.0	74.0	16.4	15.1
2	1.50448	62.1	50.6	9.8	71.9	60.4	87.0	74.0	15.1	13.6
3	1.91481	62.2	49.9	9.8	72.0	59.7	87.0	74.0	15.0	14.3
4	2.04164	60.8	48.8	9.8	70.6	58.6	87.0	74.0	16.4	15.4
5	2.45058	67.2	54.3	9.8	77.0	64.1	87.0	74.0	10.0	9.9
6	2.4517	67.4	54.3	9.8	77.2	64.1	87.0	74.0	9.8	9.9
7	6.23182	59.1	50.3	9.7	68.8	60.0	87.0	74.0	18.2	14.0
8	6.68402	58.2	51.4	9.7	67.9	61.1	87.0	74.0	19.1	12.9

#2- AC 24V _ LAN Port (LCL 55 dB)_10 Mbps

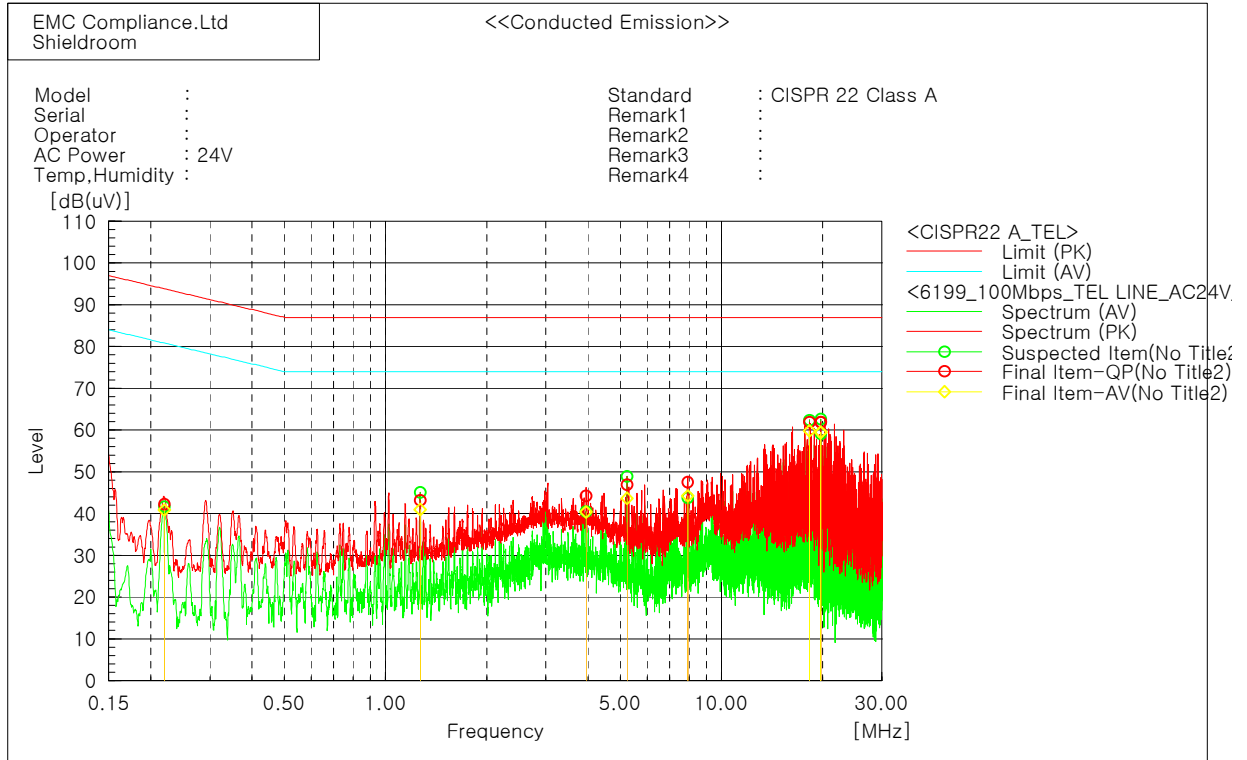


Final Result

--- 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	0.150	42.9	35.7	10.5	53.4	46.2	97.0	84.0	43.6	37.8
2	0.15004	42.8	35.6	10.5	53.3	46.1	97.0	84.0	43.7	37.9
3	0.21944	32.0	30.6	10.3	42.3	40.9	93.8	80.8	51.5	39.9
4	2.49971	37.9	28.9	9.8	47.7	38.7	87.0	74.0	39.3	35.3
5	2.90133	27.4	21.1	9.8	37.2	30.9	87.0	74.0	49.8	43.1
6	7.50019	46.3	35.7	9.7	56.0	45.4	87.0	74.0	31.0	28.6
7	8.7728	35.6	33.2	9.7	45.3	42.9	87.0	74.0	41.7	31.1
8	16.25033	39.9	26.5	9.6	49.5	36.1	87.0	74.0	37.5	37.9

#2- AC 24V _ LAN Port (LCL 65 dB)_100 Mbps

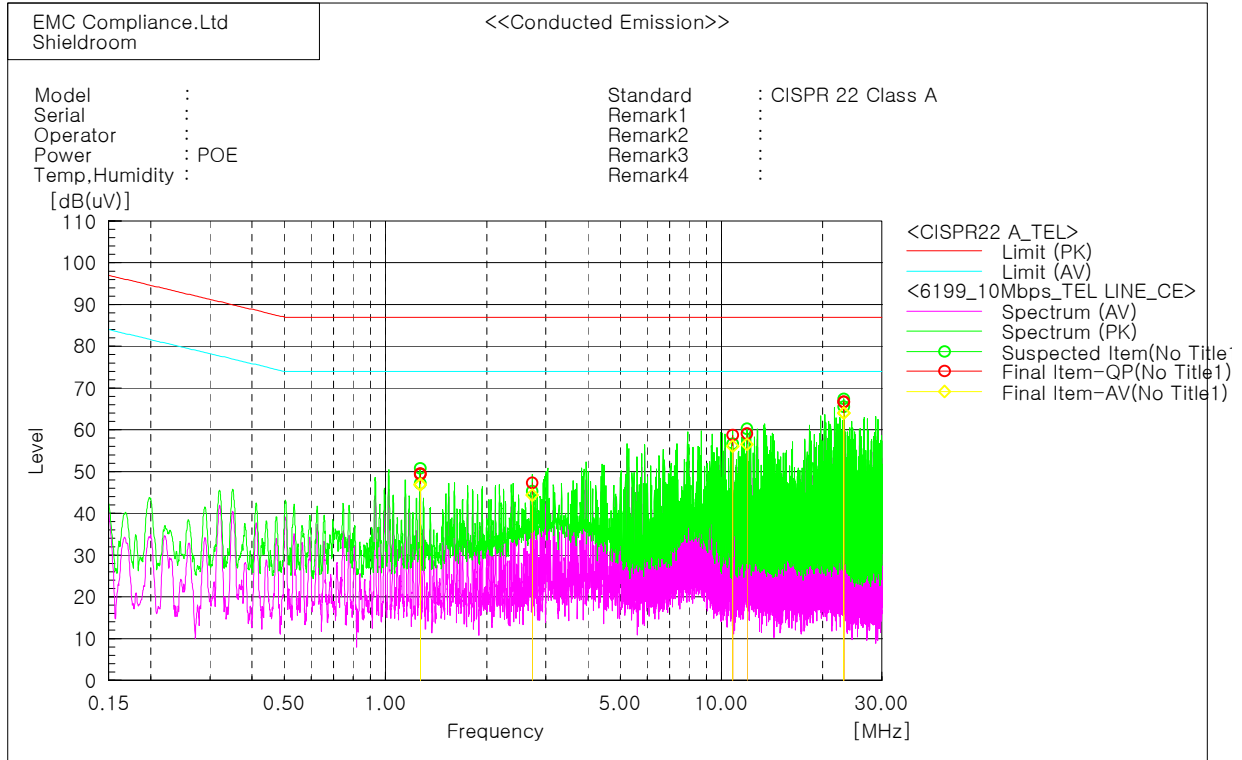


Final Result

--- 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	0.21987	32.0	30.6	10.2	42.2	40.8	93.8	80.8	51.6	40.0
2	1.26707	33.3	31.1	9.8	43.1	40.9	87.0	74.0	43.9	33.1
3	3.95306	34.6	30.7	9.7	44.3	40.4	87.0	74.0	42.7	33.6
4	5.23566	37.3	33.9	9.7	47.0	43.6	87.0	74.0	40.0	30.4
5	7.92299	37.8	34.5	9.7	47.5	44.2	87.0	74.0	39.5	29.8
6	18.24379	52.2	50.1	9.7	61.9	59.8	87.0	74.0	25.1	14.2
7	19.70843	52.2	49.7	9.7	61.9	59.4	87.0	74.0	25.1	14.6
8	19.70848	52.2	49.7	9.7	61.9	59.4	87.0	74.0	25.1	14.6

#3- PoE _ LAN Port (LCL 55 dB)_10 Mbps

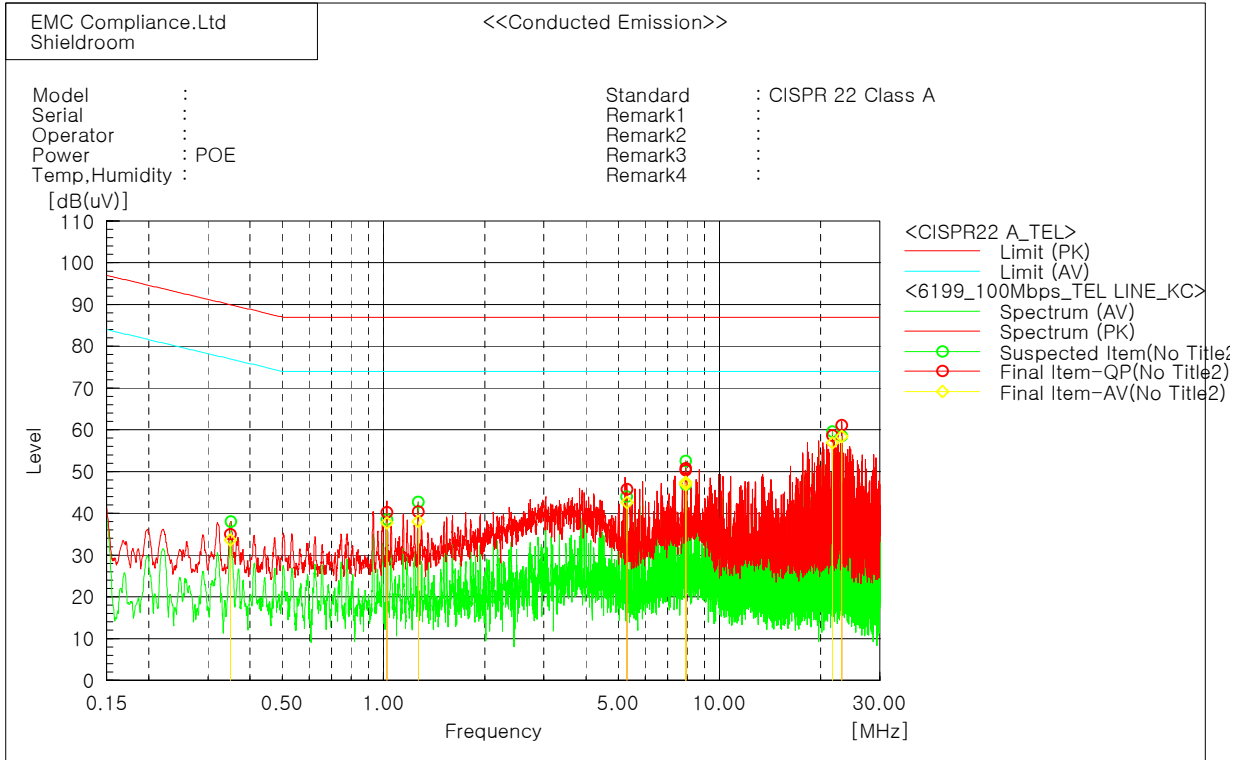


Final Result

--- 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	1.26673	39.6	36.9	9.9	49.5	46.8	87.0	74.0	37.5	27.2
2	1.2666	39.5	37.0	9.9	49.4	46.9	87.0	74.0	37.6	27.1
3	2.73247	37.5	34.6	9.8	47.3	44.4	87.0	74.0	39.7	29.6
4	10.79322	49.2	46.5	9.6	58.8	56.1	87.0	74.0	28.2	17.9
5	11.89277	49.5	46.9	9.6	59.1	56.5	87.0	74.0	27.9	17.5
6	23.1284	57.1	54.4	9.6	66.7	64.0	87.0	74.0	20.3	10.0
7	23.12849	57.1	54.4	9.6	66.7	64.0	87.0	74.0	20.3	10.0

#3- PoE _ LAN Port (LCL 65 dB)_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	0.35004	25.0	23.5	10.0	35.0	33.5	90.0	77.0	55.0	43.5
2	1.02195	30.4	27.7	9.9	40.3	37.6	87.0	74.0	46.7	36.4
3	1.26787	30.5	28.3	9.8	40.3	38.1	87.0	74.0	46.7	35.9
4	5.29733	36.1	32.9	9.7	45.8	42.6	87.0	74.0	41.2	31.4
5	7.92304	41.1	37.7	9.7	50.8	47.4	87.0	74.0	36.2	26.6
6	7.92452	40.6	37.2	9.7	50.3	46.9	87.0	74.0	36.7	27.1
7	21.66292	49.0	47.1	9.7	58.7	56.8	87.0	74.0	28.3	17.2
8	23.12906	51.3	48.6	9.7	61.0	58.3	87.0	74.0	26.0	15.7

6.2 Radiated Emission

Test specification	EN 55022:2010, Class A		
Testing voltage	DC 12 V, AC 24 V, PoE		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2013. 07. 01		
Temperature (°C)	24 °C	Humidity (% R.H.)	41 % 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.

6.2.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2014.02.18	<input checked="" type="checkbox"/>
Test Receiver	ESCI	100001	R&S	2013.07.10	<input type="checkbox"/>
Test Receiver	ESCI	100710	R&S	2013.11.06	<input type="checkbox"/>
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2013.10.04	<input checked="" type="checkbox"/>
Amplifier	310N	293004	SONOMA INSTRUMENT	2013.11.06	<input checked="" type="checkbox"/>
3 dB Attenuator	8491B	22981	HP	2014.03.19	<input checked="" type="checkbox"/>
Antenna Mast	MA4000-EP	303	Innco Systems	-	<input checked="" type="checkbox"/>
Turn Table	DT2000S-1t	079	Innco Systems	-	<input checked="" type="checkbox"/>
Amplifier	8449B	3008A02343	AGILENT	2013.11.06	<input checked="" type="checkbox"/>
Horn ANT	3115	00086706	ETS	2013.11.21	<input checked="" type="checkbox"/>

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:

$$\text{Result} = \text{M.R} + \text{C.F}(\text{A.F} + \text{C.L} + 3 \text{ dB Att} - \text{A.G})$$

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

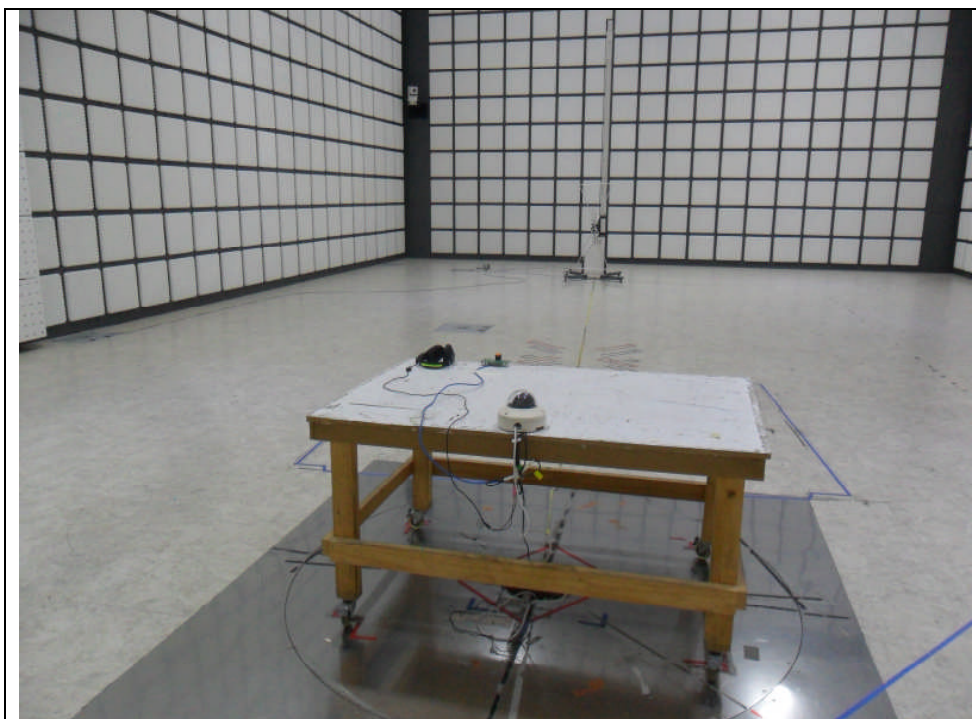
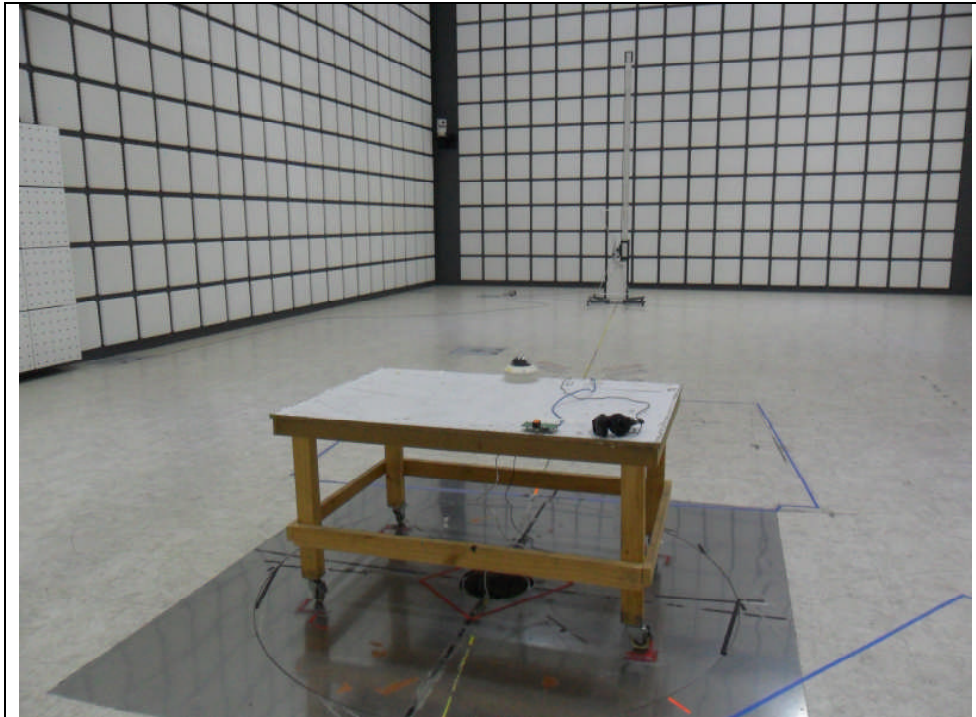
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

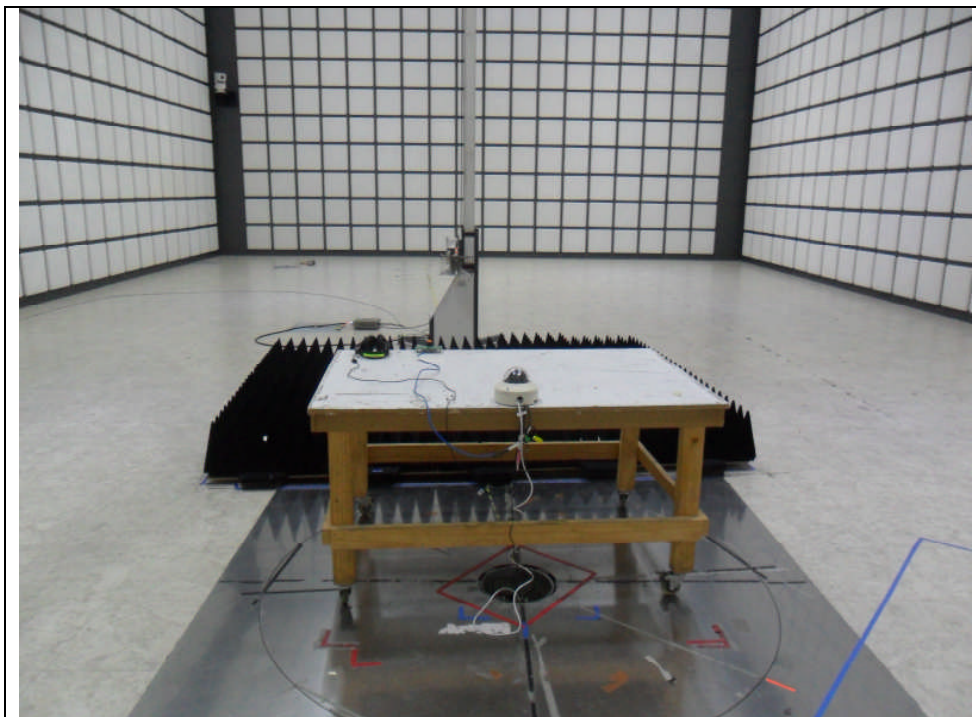
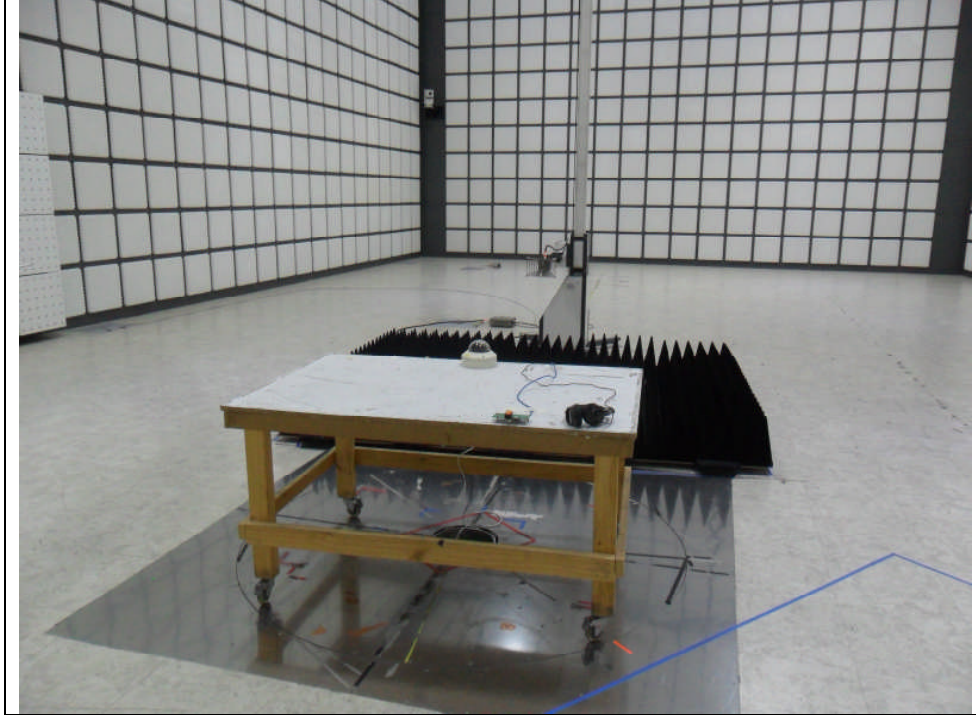
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$$

6.2.5 Photographs of test setup

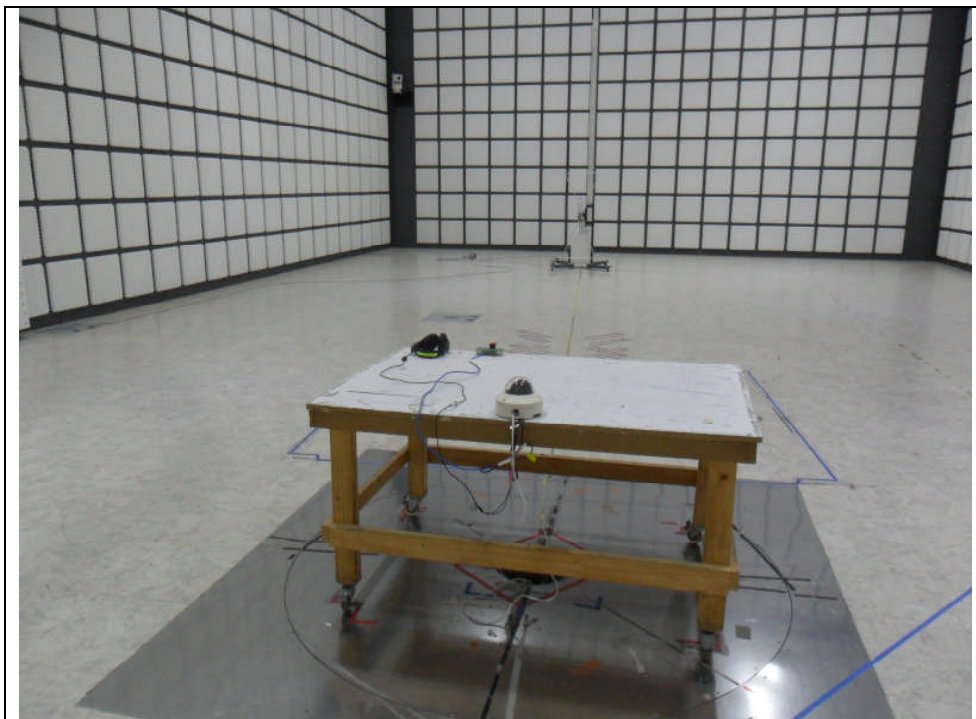
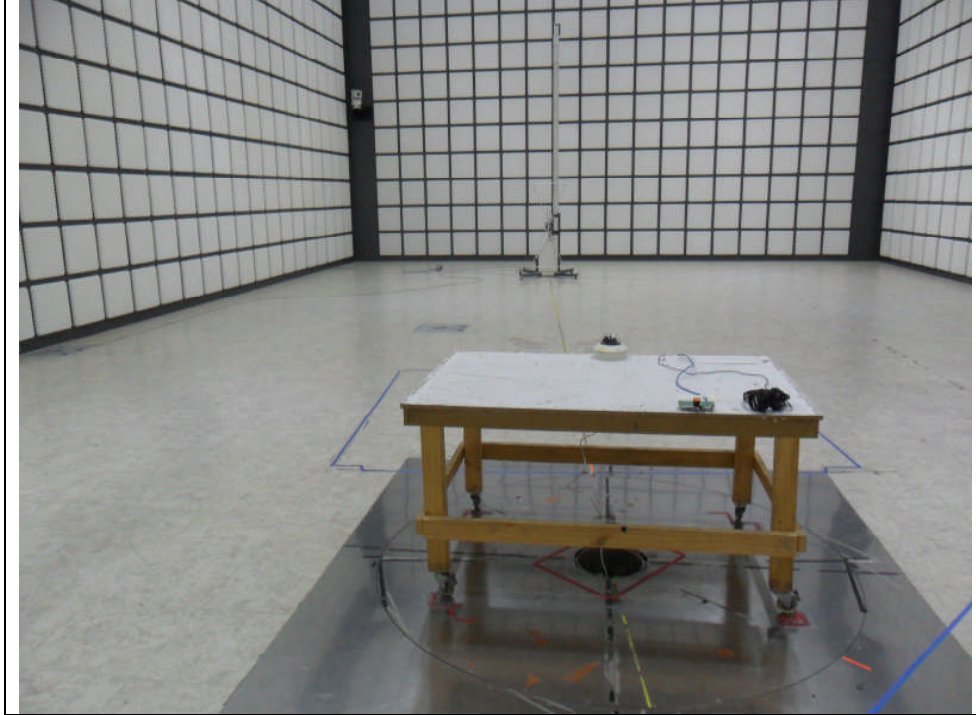
* 30 MHz ~ 1 GHz (#1- DC 12V, #2- AC 24V)



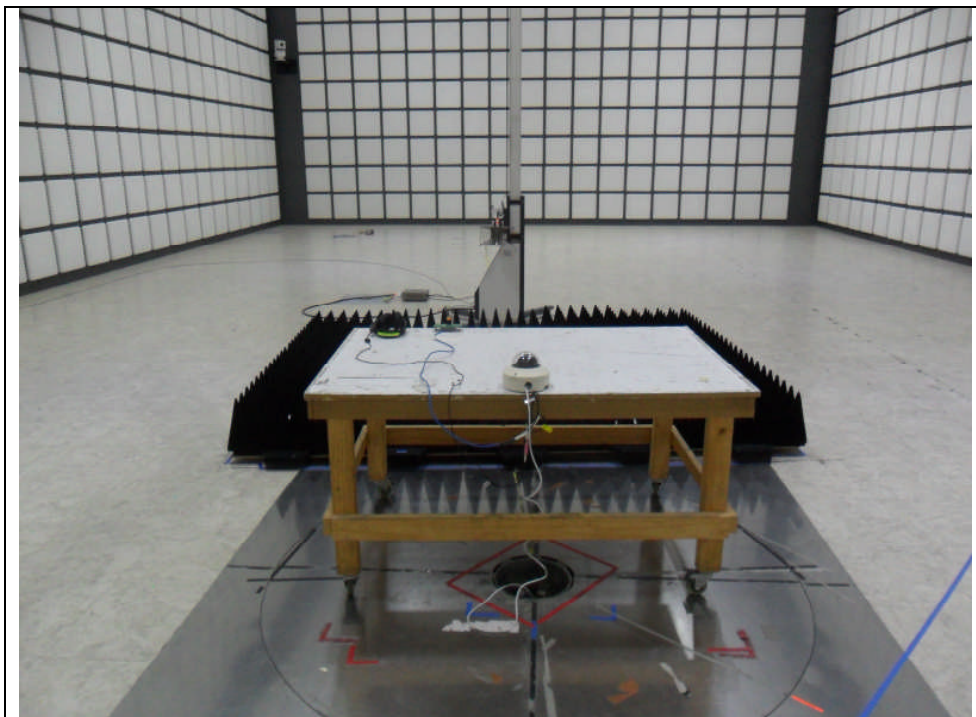
* 1 GHz ~ 6 GHz (#1- DC 12V, #2- AC 24V)



* 30 MHz ~ 1 GHz (#3-PoE)



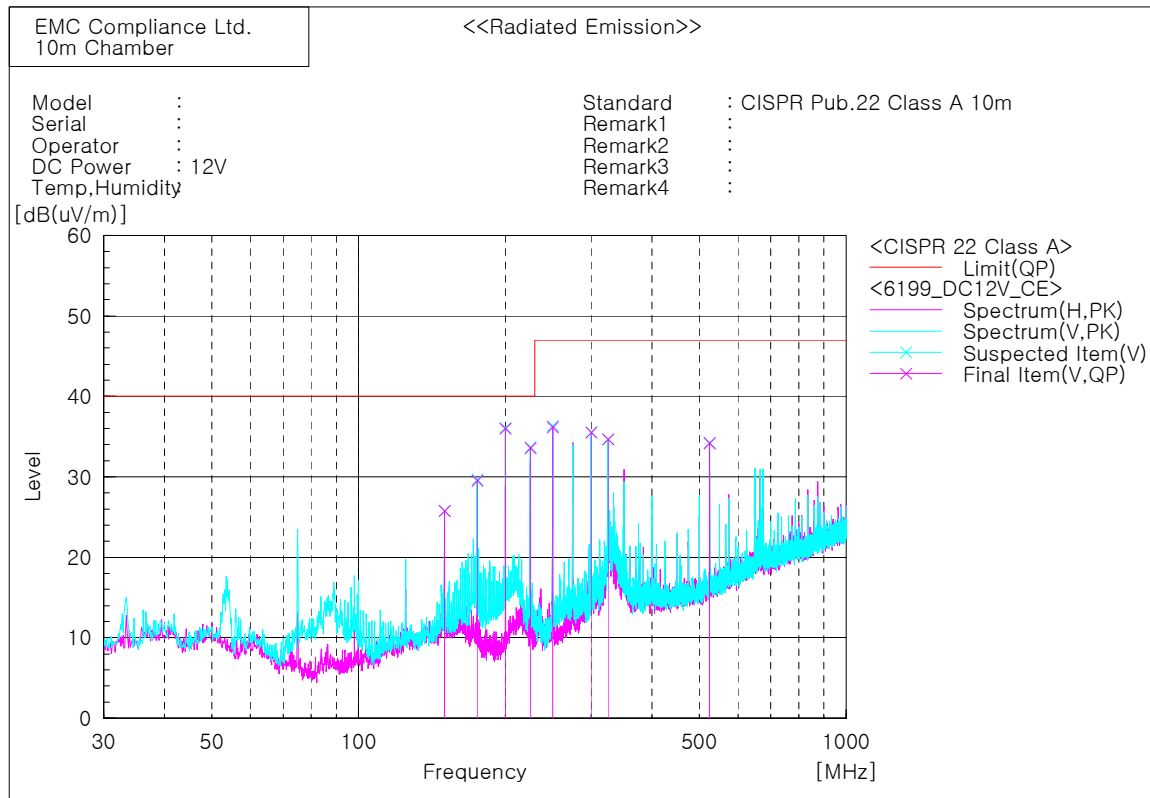
* 1 GHz ~ 6 GHz (#3-PoE)



6.2.6 Radiated emission measurement result

* Graph and Data

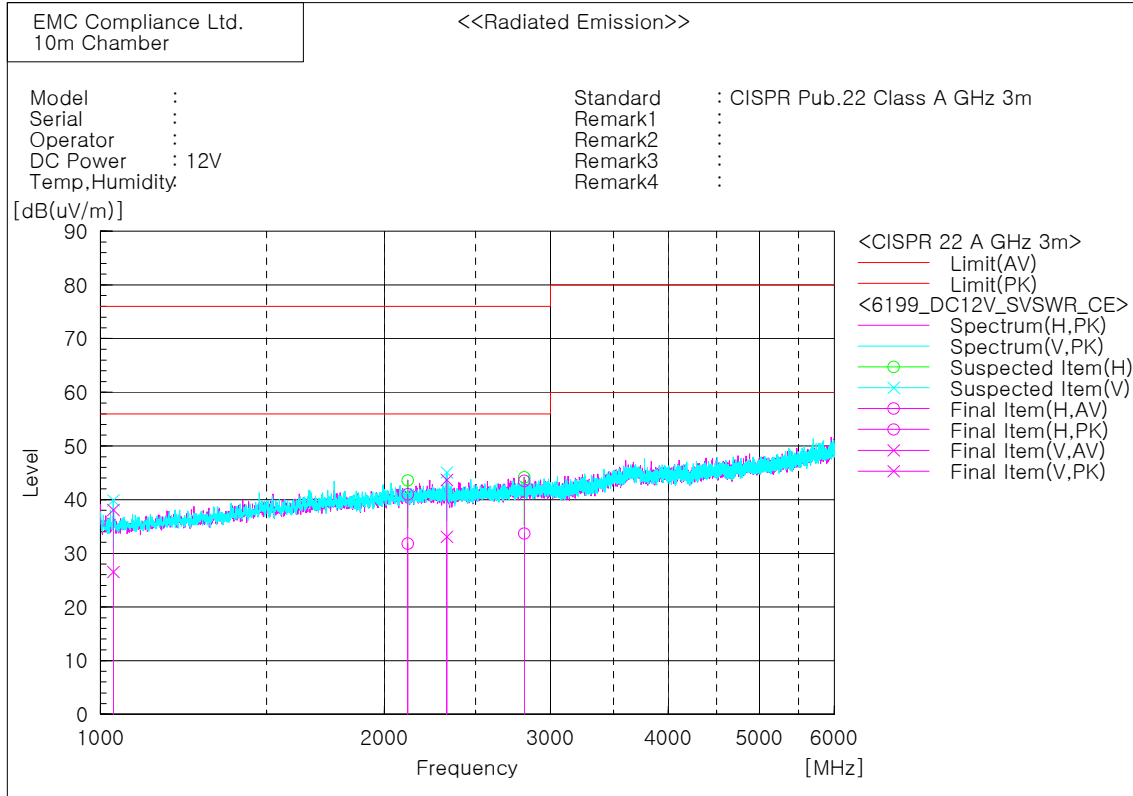
* 30 MHz ~ 1 GHz (#1- DC 12V)_SNV-5084P



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]	Remark
1	150.038	V	39.4	-13.6	25.8	40.0	14.2	100.0	195.5	
2	175.015	V	44.6	-15.1	29.5	40.0	10.5	100.0	159.6	
3	199.993	V	53.3	-17.3	36.0	40.0	4.0	100.0	39.6	
4	224.970	V	49.5	-15.9	33.6	40.0	6.4	100.0	39.6	
5	249.947	V	51.1	-14.9	36.2	47.0	10.8	100.0	217.7	
6	300.024	V	48.5	-13.0	35.5	47.0	11.5	100.0	210.1	
7	325.001	V	47.0	-12.3	34.7	47.0	12.3	100.0	203.2	
8	525.064	V	41.2	-7.0	34.2	47.0	12.8	100.0	275.8	

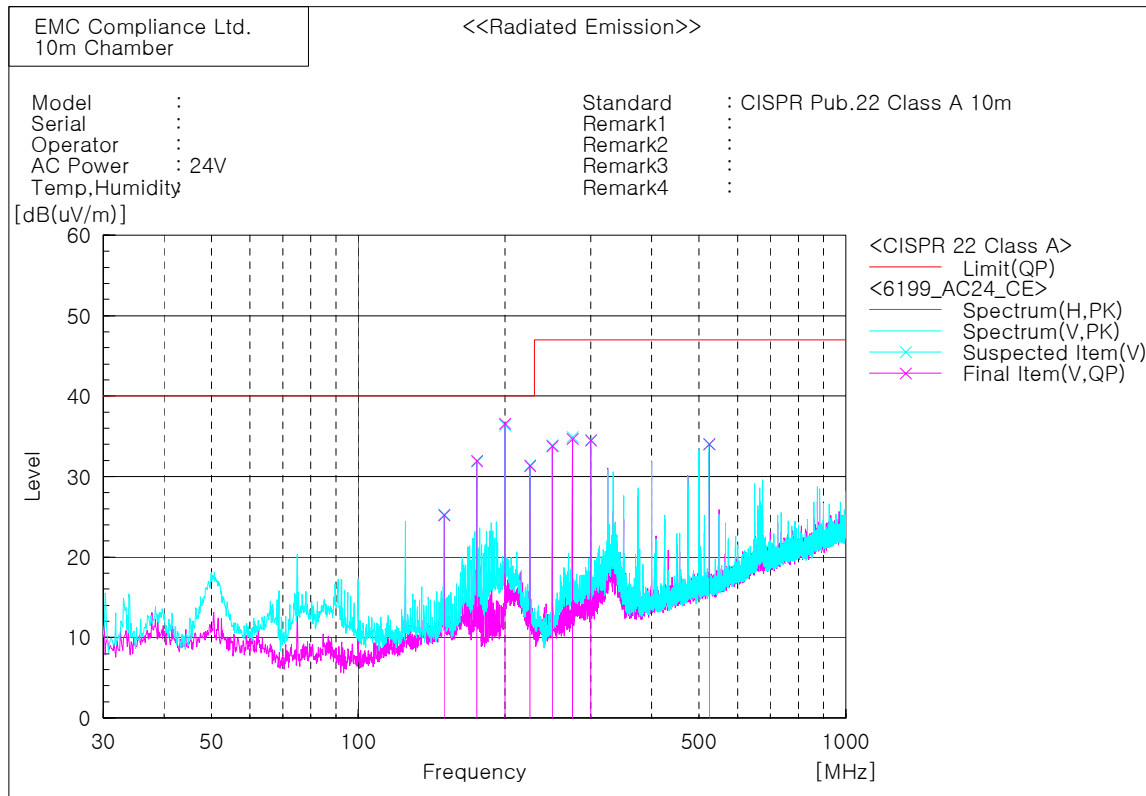
* 1 GHz ~ 6 GHz (#1- DC 12V) _ SNV-5084P



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	1031.875	V	35.6	47.2	-9.1	26.5	38.1	56.0	76.0	29.5	37.9	100.0	11.5
2	2118.125	H	33.6	42.8	-1.8	31.8	41.0	56.0	76.0	24.2	35.0	100.0	260.1
3	2330.625	V	34.5	45.1	-1.4	33.1	43.7	56.0	76.0	22.9	32.3	100.0	140.0
4	2815.000	H	34.7	44.5	-1.0	33.7	43.5	56.0	76.0	22.3	32.5	100.0	45.4

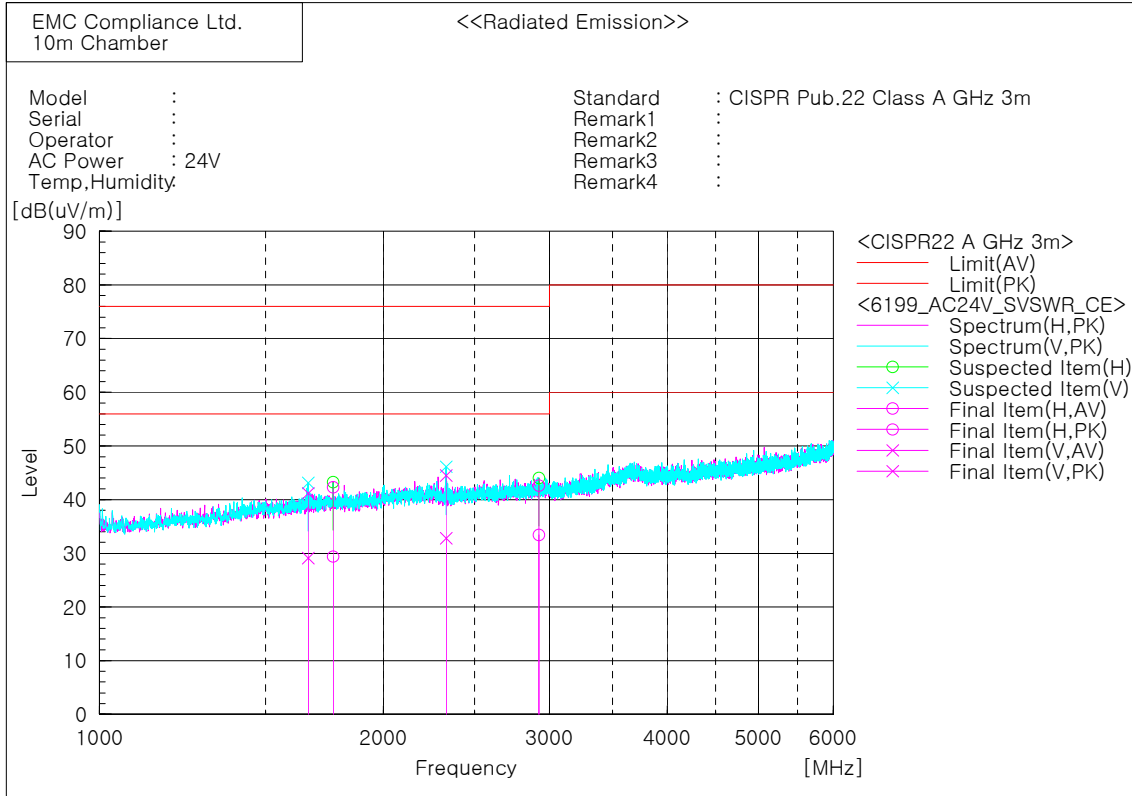
* 30 MHz ~ 1 GHz (#2- AC 24V) _ SNV-5084P



Final Result

No.	Frequency (P)	Reading QP	c. f	Result QP	Limit QP	Margin QP	Height	Angle	Remark
	[MHz]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	150.038	V 38.8	-13.6	25.2	40.0	14.8	100.0	235.5	
2	175.015	V 47.1	-15.1	32.0	40.0	8.0	100.0	110.3	
3	199.993	V 53.9	-17.3	36.6	40.0	3.4	100.0	45.2	
4	224.970	V 47.2	-15.9	31.3	40.0	8.7	100.0	58.0	
5	249.947	V 48.7	-14.9	33.8	47.0	13.2	100.0	74.0	
6	275.046	V 48.5	-13.8	34.7	47.0	12.3	100.0	287.9	
7	300.024	V 47.5	-13.0	34.5	47.0	12.5	100.0	300.1	
8	525.064	V 41.0	-7.0	34.0	47.0	13.0	100.0	178.6	

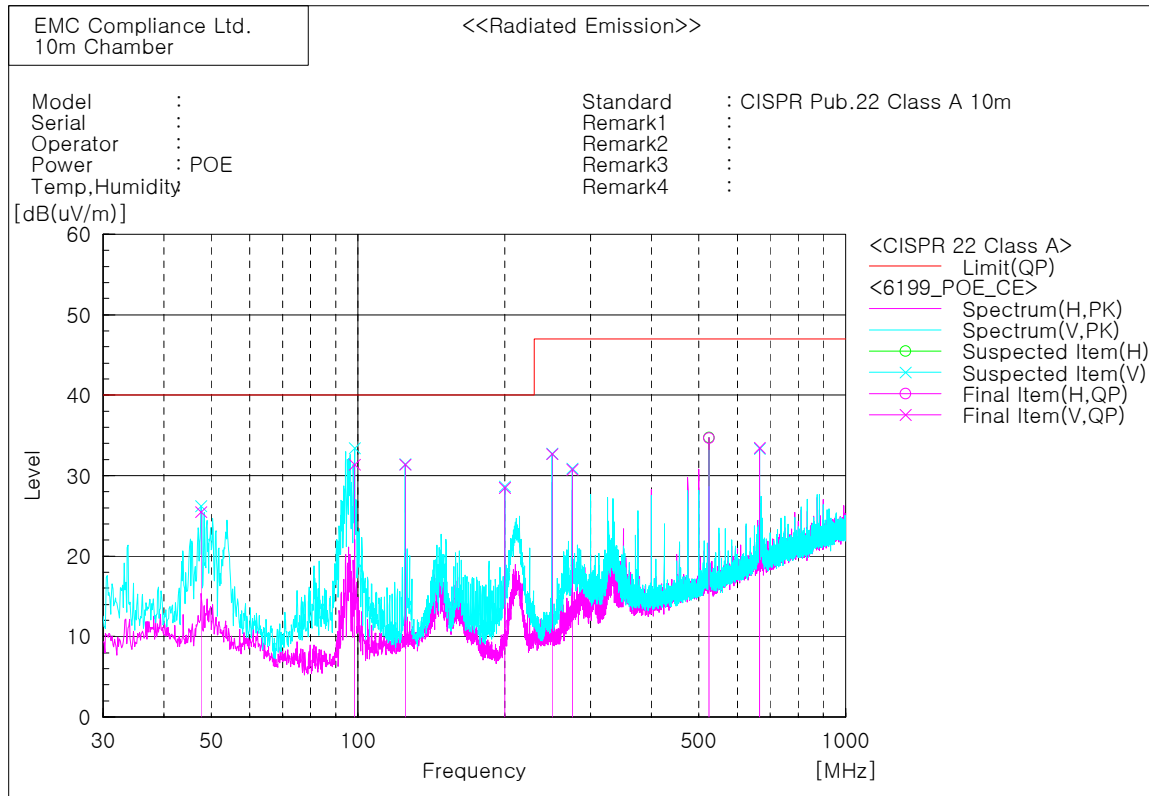
* 1 GHz ~ 6 GHz (#2- AC 24V) _ SNV-5084P



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	1665.000	V	33.1	45.2	-4.0	29.1	41.2	56.0	76.0	26.9	34.8	100.0	171.6
2	1769.375	H	32.8	45.7	-3.4	29.4	42.3	56.0	76.0	26.6	33.7	100.0	190.3
3	2331.250	V	34.2	45.9	-1.4	32.8	44.5	56.0	76.0	23.2	31.5	100.0	140.1
4	2925.625	H	34.4	43.6	-1.0	33.4	42.6	56.0	76.0	22.6	33.4	100.0	313.0

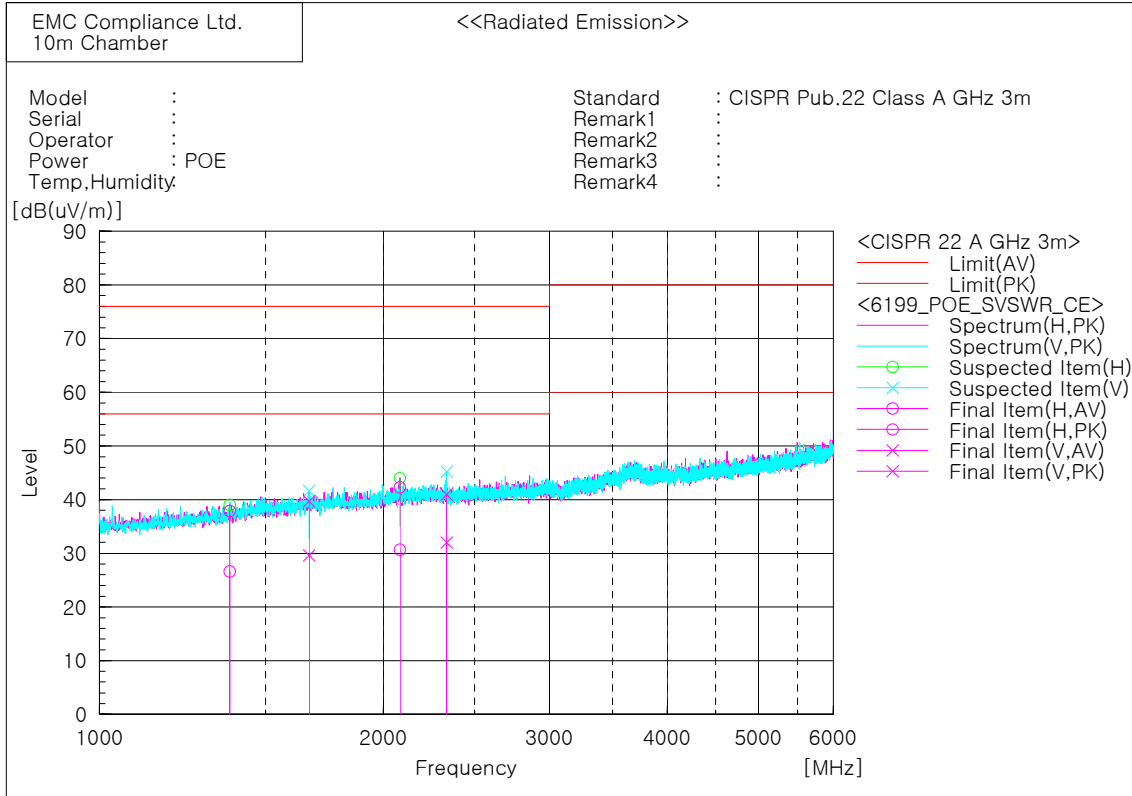
* 30 MHz ~ 1 GHz (#3- PoE) _ SNV-5084P



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]	Remark
1	47.703	V	40.9	-15.4	25.5	40.0	14.5	100.0	267.8	
2	98.385	V	49.7	-18.3	31.4	40.0	8.6	100.0	271.6	
3	124.939	V	46.8	-15.4	31.4	40.0	8.6	100.0	264.1	
4	199.993	V	45.8	-17.3	28.5	40.0	11.5	202.0	197.8	
5	249.947	V	47.6	-14.9	32.7	47.0	14.3	100.0	259.5	
6	275.046	V	44.6	-13.8	30.8	47.0	16.2	100.0	235.1	
7	525.064	H	41.7	-7.0	34.7	47.0	12.3	198.0	297.2	
8	666.078	V	37.5	-4.0	33.5	47.0	13.5	202.0	103.8	

* 1 GHz ~ 6 GHz (#3- PoE) _ SNV-5084P



Final Result

No.	Frequency [MHz]	(P)	Reading		c.f	Result		Limit		Margin		Height [cm]	Angle [deg]
			AV [dB(uV)]	PK [dB(uV)]		AV [dB(uV/m)]	PK [dB(uV/m)]	AV [dB(uV/m)]	PK [dB(uV/m)]	AV [dB]	PK [dB]		
1	1375.000	H	32.8	44.1	-6.2	26.6	37.9	56.0	76.0	29.4	38.1	100.0	143.8
2	1668.125	V	33.5	43.6	-3.9	29.6	39.7	56.0	76.0	26.4	36.3	100.0	354.1
3	2083.125	H	32.7	44.3	-2.0	30.7	42.3	56.0	76.0	25.3	33.7	100.0	133.3
4	2333.750	V	33.4	42.4	-1.4	32.0	41.0	56.0	76.0	24.0	35.0	100.0	140.3

6.3 Flicker

Test specification	EN 61000-3-3:2008				
Testing voltage	230 V, 50 Hz (From AC/AC Adaptor)				
Test facility	Immunity area				
Date	2013. 07. 03				
Temperature(°C)	24 °C	Humidity (% R.H.)	43 % R.H.	Pressure (kPa)	99.1 kPa
Remarks	Complied				

6.3.1 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.

$$P_{lt} = 2 \text{ h}$$

$$P_{st} = 10 \text{ min}$$

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.

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	<input checked="" type="checkbox"/>

6.3.3 Photographs of test setup

#2- AC 24 V



6.4 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	<input checked="" type="checkbox"/> Contact: ± 6 kV <input checked="" type="checkbox"/> Air: ± 2 kV, ± 4 kV, ± 8 kV <input type="checkbox"/> HCP: ± 2 kV, ± 4 kV, ± 6 kV <input checked="" type="checkbox"/> VCP: ± 2 kV, ± 4 kV, ± 6 kV				
Discharge impedance	330 Ω / 150 pF				
Number of discharge (Each polarity)	<input checked="" type="checkbox"/> Contact: 10 <input checked="" type="checkbox"/> Air: 10 <input checked="" type="checkbox"/> HCP / VCP: 10				
Interval between discharges	1 s				
Testing voltage	DC 12 V, AC 24 V, PoE				
Test facility	Shielded room				
Date	2013. 07. 04				
Temperature($^{\circ}$ C)	25 $^{\circ}$ C	Humidity (% R.H.)	40 % R.H.	Pressure (kPa)	99.2 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.4.1 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.

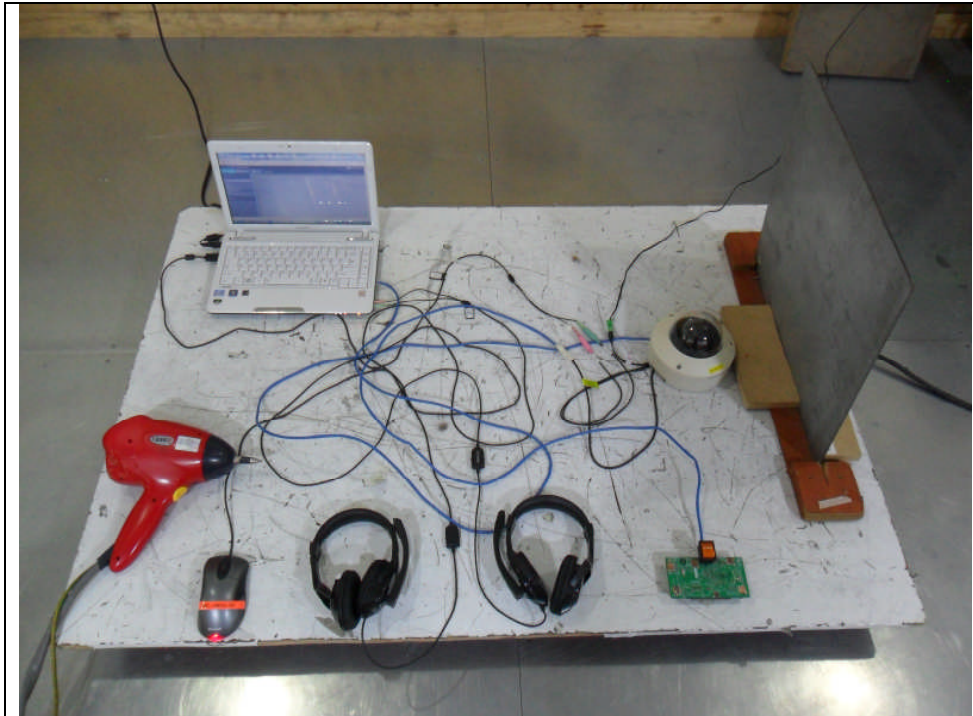
In case of floor standing equipment, EUT was placed on the reference plane on 0.1 m of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 m above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference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

6.4.2 Used equipments

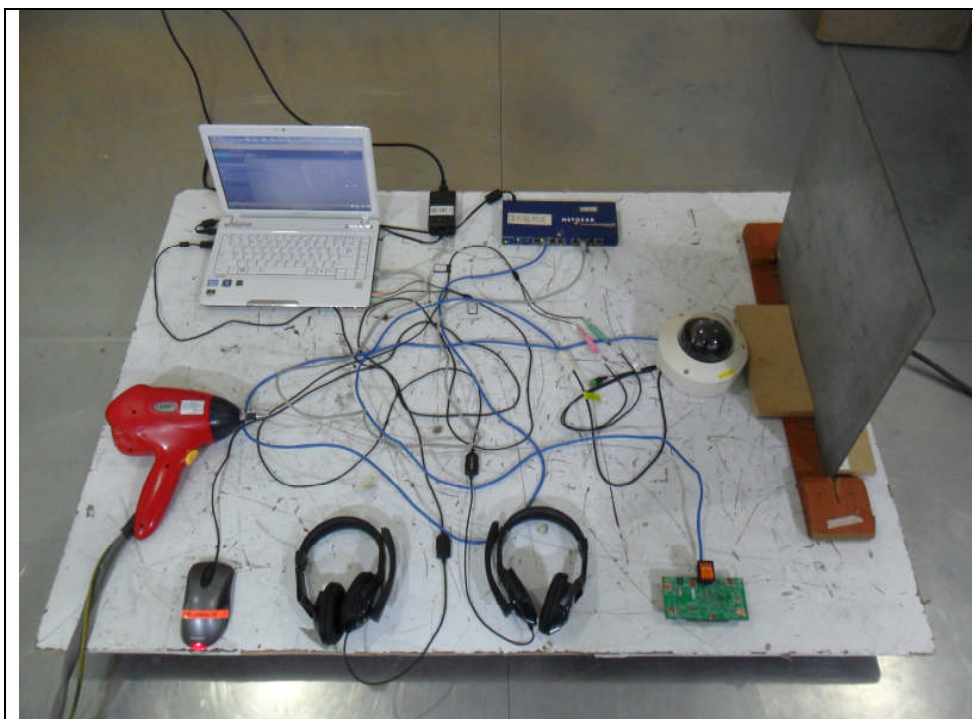
Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	PESD 1600	H011 309	HAEFELY	2013.07.18	<input type="checkbox"/>
ESD Tester	NSG 437	182	TESEQ	2014.05.21	<input checked="" type="checkbox"/>
HCP	-	-	-	-	<input type="checkbox"/>
VCP	-	-	-	-	<input checked="" type="checkbox"/>

6.4.3 Photographs of test setup

#1- DC 12V, #2- AC 24V



#3-PoE

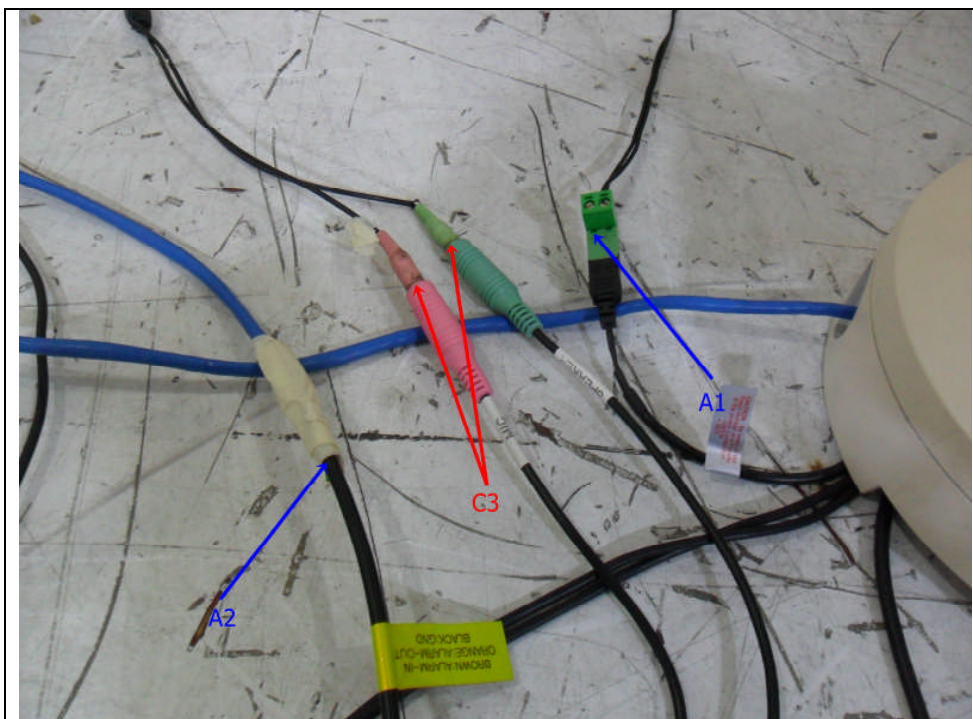
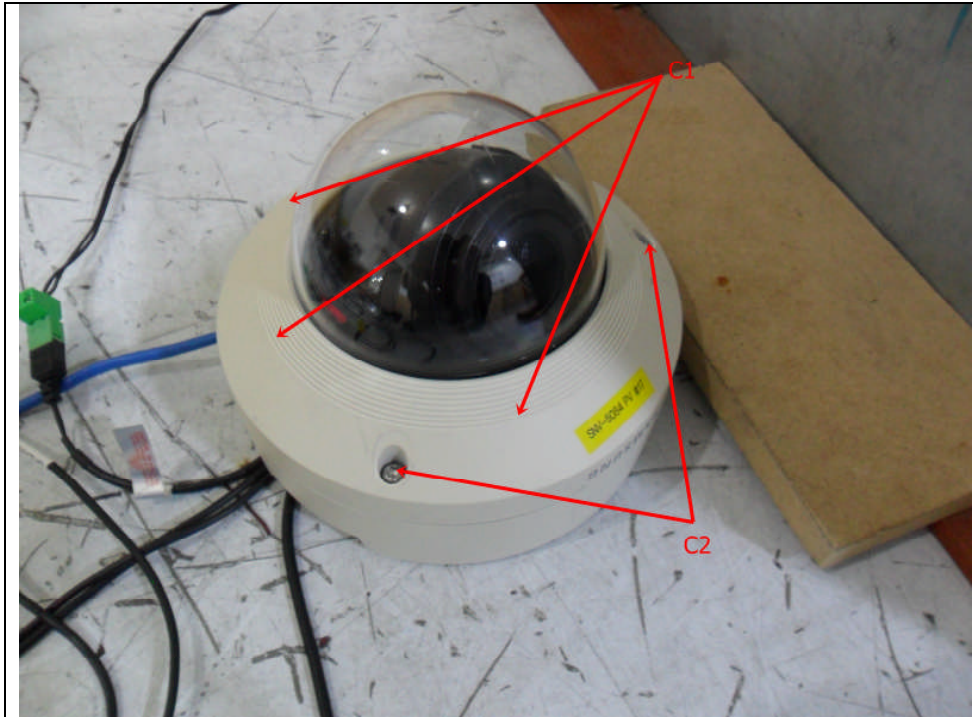


6.4.4 Measurement result

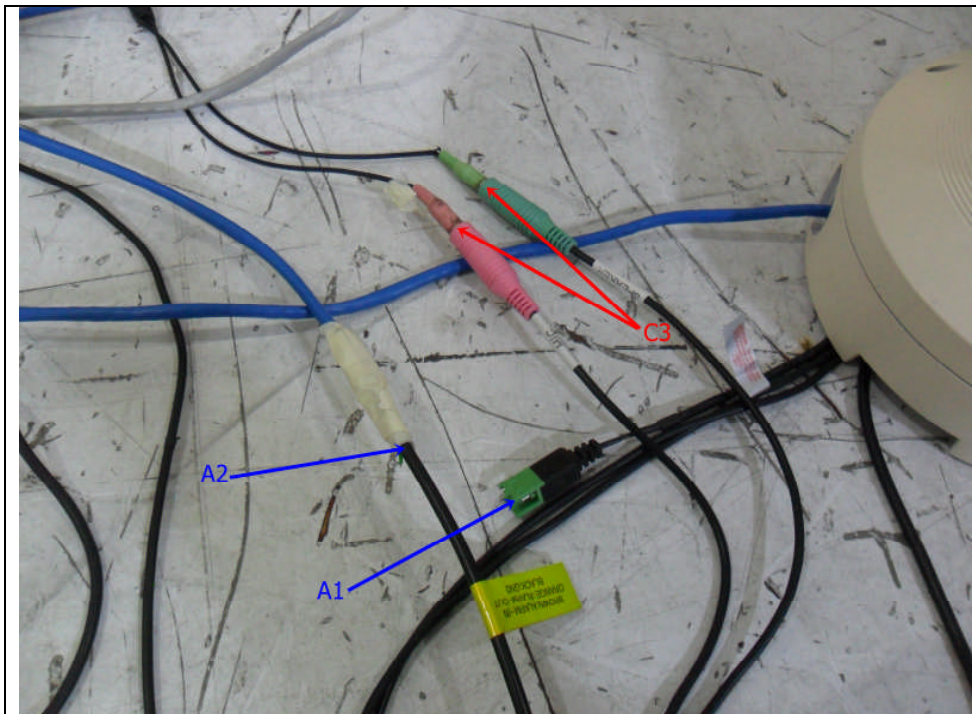
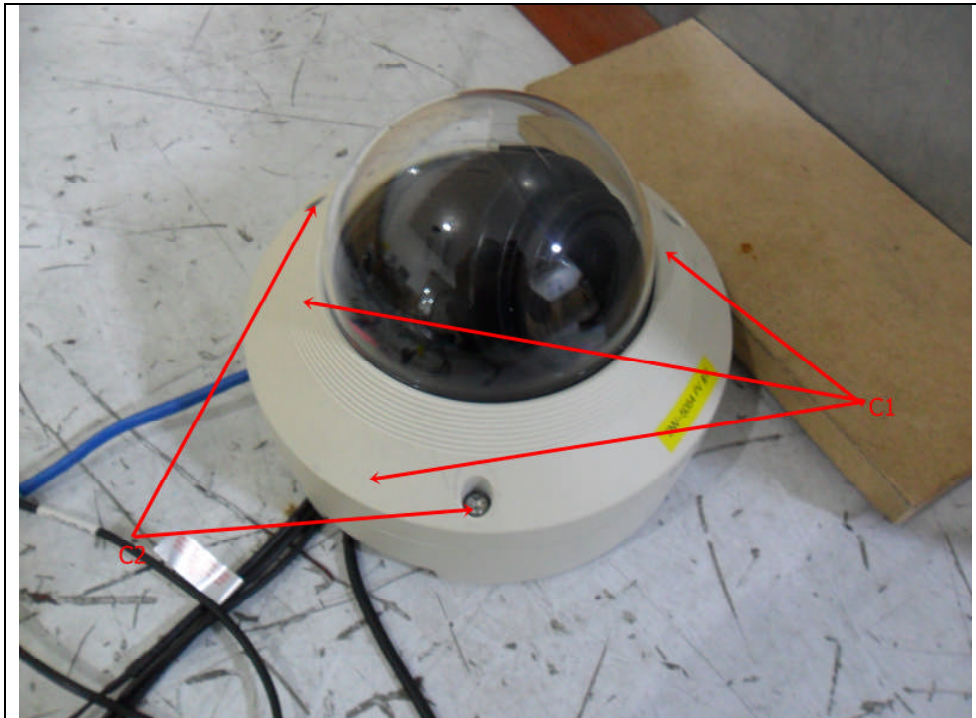
Electrostatic Discharge (Test Point)

Air discharge	→
Contact discharge	→

#1- DC 12V, #2- AC 24V



#3-PoE



#1- DC 12 V , #2- AC 24 V , #3- PoE

HCP/VCP discharge

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

Contact discharge

Location(EUT)	Applied level (±)	Result
C1 Enclosure(Case)	± 6 kV	Complied
C2 Screw	± 6 kV	Complied
C3 Audio In/Out Port	± 6 kV	Complied

Air discharge

Location(EUT)	Applied level (±)	Result
A1 Power Port	± 2 kV, ± 4 kV, ± 8 kV	Complied
A2 Alarm Port	± 2 kV, ± 4 kV, ± 8 kV	Complied

6.5 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006+A2:2010				
Tested frequency	80 MHz ~ 1 GHz, 1 GHz ~ 2.7 GHz				
Test level & Modulation	1 V/m, 3 V/m, 10 V/m, 80 % Amplitude Modulation (1 kHz) 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	DC 12 V, AC 24 V, PoE				
Test facility	Fully anechoic chamber (3 m)				
Date	2013. 07. 03				
Temperature(°C)	26 °C	Humidity (% R.H.)	40 % R.H.	Pressure (kPa)	99.1 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.5.1 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.

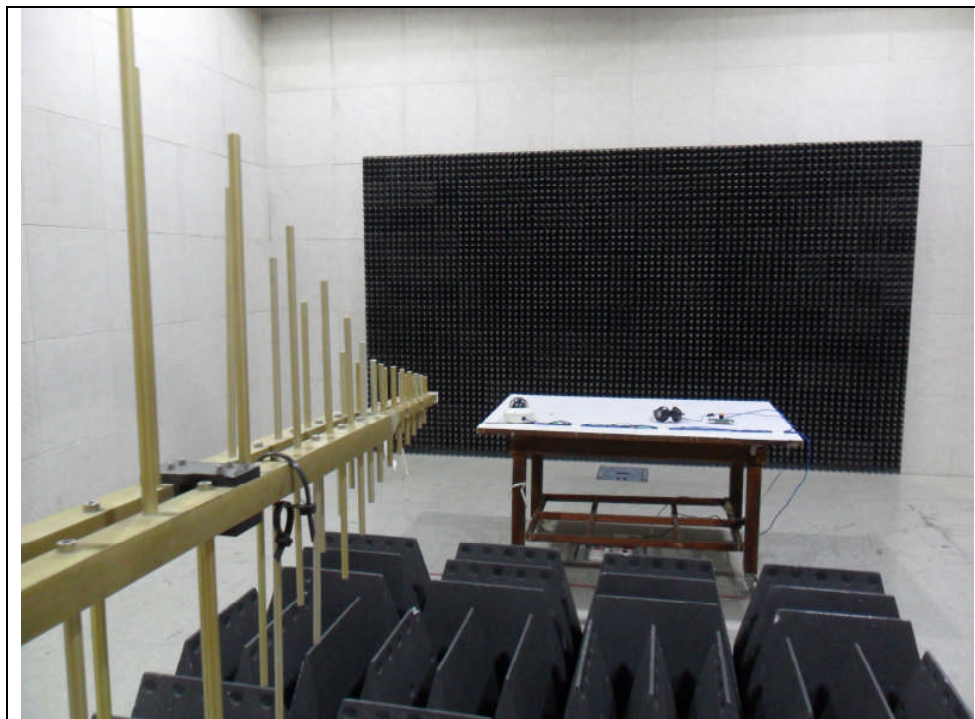
The EUT was tested all sides, horizontal and vertical polarization.

6.5.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	2014.04.05	<input checked="" type="checkbox"/>
Power sensor	PH2000	303224	AR	2014.04.05	<input checked="" type="checkbox"/>
Power sensor	PH2000	311217	AR	2014.04.05	<input checked="" type="checkbox"/>
Directional coupler	DC6180	303976	AR	2014.04.08	<input checked="" type="checkbox"/>
Directional coupler	DC7144M1	320279	AR	2014.02.07	<input checked="" type="checkbox"/>
Signal generator	E4421B	GB40052295	AGILENT	2013.10.11	<input checked="" type="checkbox"/>
Amplifier	BBA100	100996-1	R&S	2014.02.12	<input checked="" type="checkbox"/>
Amplifier	60S1G3M2	320444	AR	2014.04.09	<input checked="" type="checkbox"/>
Broadband Ant.	LPDA-0803	130269	ETS	-	<input checked="" type="checkbox"/>
Fiber Optic Modem	HI-4413P	-	ETS- LINDGREM	-	<input checked="" type="checkbox"/>
Antenna master	-	-	ETS	-	<input checked="" type="checkbox"/>

6.5.3 Photographs of test setup

#1- DC 12 V, #2- AC 24 V



#3- PoE



6.5.4 Measurement result

#1- DC 12 V , #2- AC 24 V , #3- PoE

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

6.6 Electric Fast Transient/BURST

Test specification	EN 61000-4-4:2004+A1:2010				
Coupling	<input checked="" type="checkbox"/> DC 12 V, AC 24 V <input checked="" type="checkbox"/> Signal: Clamp <input checked="" type="checkbox"/> Telecommunication: Clamp				
Test level	<input checked="" type="checkbox"/> DC 12 V, AC 24 V : ± 1 kV Peak <input checked="" type="checkbox"/> Signal: ± 1 kV Peak <input checked="" type="checkbox"/> Telecommunication: ± 1 kV Peak				
Repetition frequency	100 kHz, Tr/Th = 5 / 50 ns				
Coupling time	60 s				
Testing Voltage	DC 12 V, AC 24 V, PoE				
Test facility	Shielded room				
Date	2013. 07. 04				
Temperature(°C)	23 °C	Humidity (% R.H.)	46 % R.H.	Pressure (kPa)	99.2 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.6.1 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 m wooden table.

For tabletop equipment, EUT was placed on a 0.1 m 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 m.

6.6.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500 M6	V0545100858	EM TEST	2014.01.31	<input checked="" type="checkbox"/>
Ultra compact simulator	UCS 500 M6	0701-03	EM TEST	2014.06.21	<input type="checkbox"/>
Capacitive Coupling Clamp	-	-	EM TEST	-	<input checked="" type="checkbox"/>

6.6.3 Photographs of test setup

#1- DC 12 V, #2- AC 24 V



#3- PoE



6.6.4 Measurement result

* AC/DC Line (#1- DC 12 V, #2- AC 24 V)

EFT coupling point	(+)	(-)	Result
DC 12 V	+ 1 kV	- 1 kV	Complied
AC 24 V	+ 1 kV	- 1 kV	Complied

* Signal (#1- DC 12 V, #2- AC 24 V, #3- PoE)

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

* Telecommunication (#1- DC 12 V, #2- AC 24 V, #3- PoE)

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

6.7 Surge

Test specification	EN 61000-4-5:2006				
Coupling	<input checked="" type="checkbox"/> DC 12 V, AC 24 V : CDN <input checked="" type="checkbox"/> Signal: CDN				
Test level	<input checked="" type="checkbox"/> DC 12 V, AC 24 V : ± 0.5 kV, ± 1 kV <input checked="" type="checkbox"/> Signal: ± 0.5 kV, ± 1 kV				
Coupling Impedance	<input type="checkbox"/> Differential mode: $18 \mu\text{F}$		<input type="checkbox"/> Common mode: $10 \Omega + 9 \mu\text{F}$		
	<input checked="" type="checkbox"/> $40 \Omega + 0.5 \mu\text{F}$		<input type="checkbox"/> Direct		
Surge pulse shape	Tr/Th = 1.2 / 50 μs				
Number of surge	5				
Coupling time	1 min				
Testing Voltage	DC 12 V, AC 24 V, PoE				
Test facility	Shielded room				
Date	2013. 07. 04				
Temperature($^{\circ}\text{C}$)	23 $^{\circ}\text{C}$	Humidity (% R.H.)	46 % R.H.	Pressure (kPa)	99.2 kPa
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. 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.

6.7.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500 M6	V0545100858	EM TEST	2014.01.31	<input checked="" type="checkbox"/>
Ultra compact simulator	UCS 500 M6	0701-03	EM TEST	2014.06.21	<input type="checkbox"/>
CDN	CNV 508 N1	V1108108861	EM TEST	2014.01.03	<input checked="" type="checkbox"/>

6.7.3 Photographs of test setup

#1- DC 12 V, #2- AC 24 V



#3-PoE



6.7.4 Measurement result

* AC /DC Line (#1- DC 12 V , #2- AC 24 V)

Coupling point	(+)	(-)	Result
DC 12 V	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
AC 24 V	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied

* Signal (#1- DC 12 V , #2- AC 24 V , #3- PoE)

Coupling point	(+)	(-)	Result
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

6.8 Conducted Immunity

Test specification	EN 61000-4-6:2009				
Tested frequency	0.15 MHz ~ 100 MHz				
Test level & Modulation	1 V, 3 V, 10 V, 80 % Amplitude Modulation (1 kHz) 1 V, 3 V, 10 V, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Frequency Step	log 1 % step				
Coupling method	<input checked="" type="checkbox"/> DC 12 V, AC 24 V : CDN(M2) <input checked="" type="checkbox"/> Signal: Clamp <input checked="" type="checkbox"/> Telecommunication: CDN(T8-RJ45)				
Testing Voltage	DC 12 V, AC 24 V, PoE				
Test facility	Shielded room				
Date	2013. 07. 03				
Temperature(°C)	24 °C	Humidity (% R.H.)	43 % R.H.	Pressure (kPa)	99.1 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.

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 MHz to 100 MHz. This frequency range was Modulated with 1 kHz sine wave at 80 %.

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

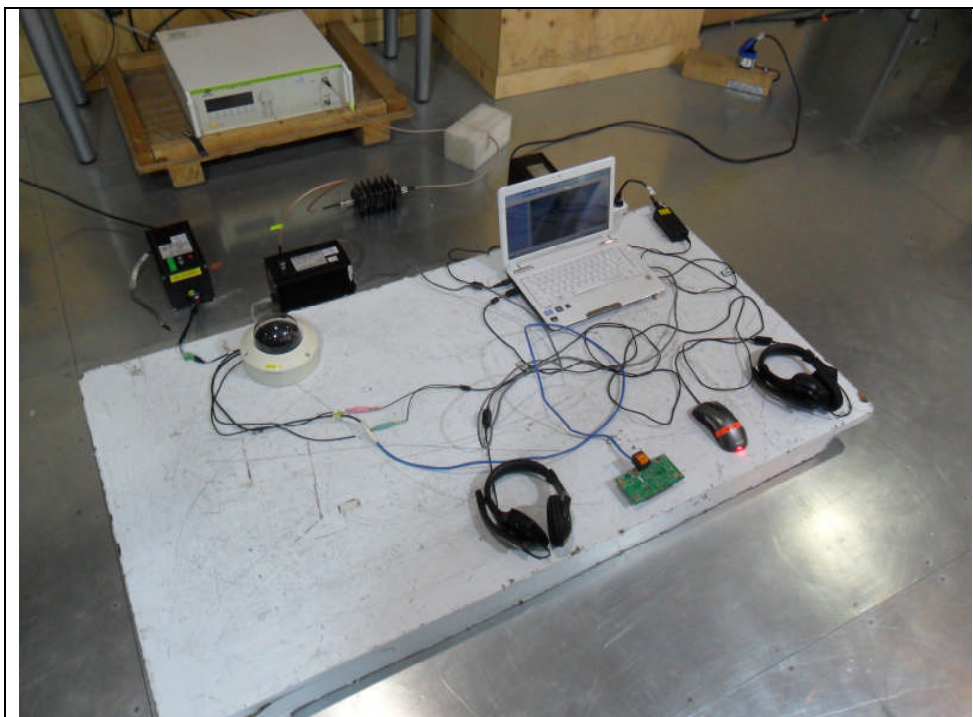
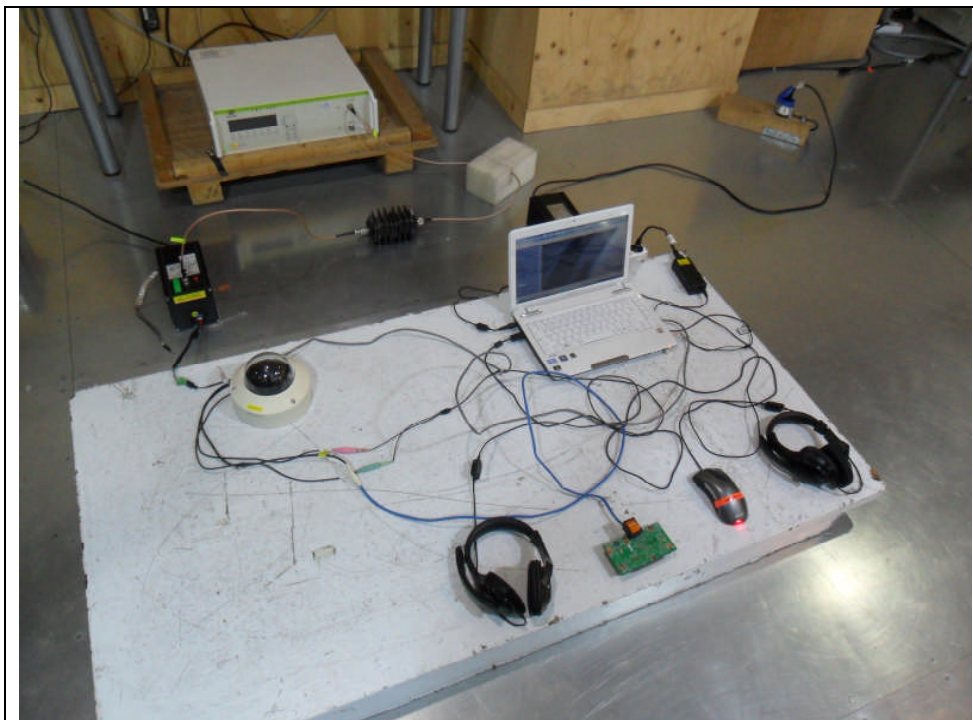
The power and all network cable, I/O cables longer than 3 m length were tested.

6.8.2 Used equipments

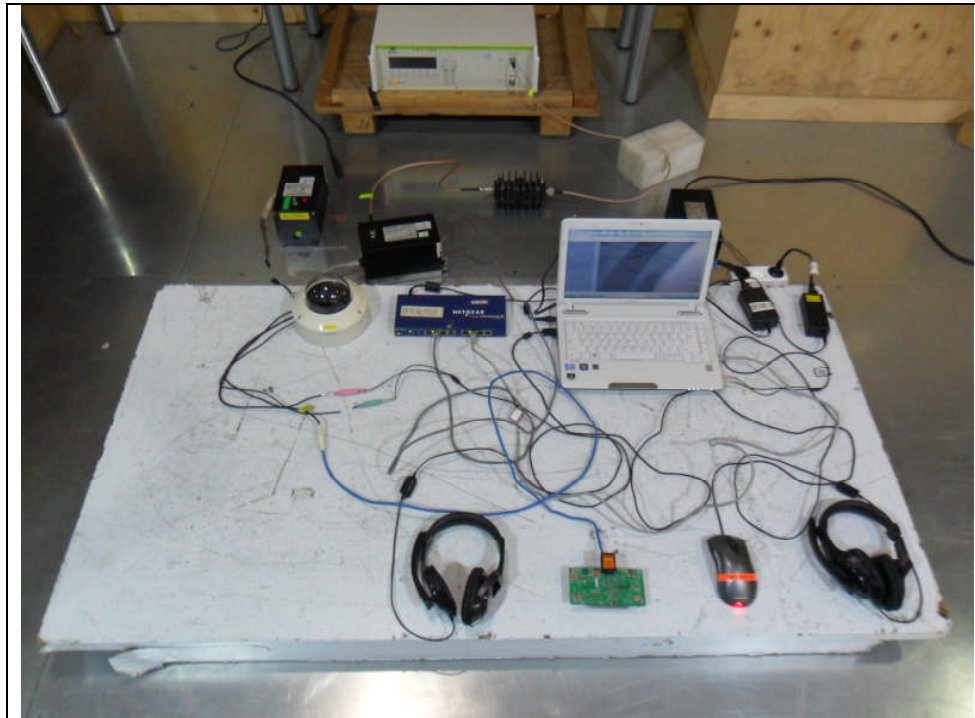
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	CWS 500	V0635101750	EM TEST	2014.01.17	<input checked="" type="checkbox"/>
CDN	CDN L-801 M2/M3	2936	EM TEST	2014.02.06	<input checked="" type="checkbox"/>
CDN	CDN M2/M3	0906-12	EM TEST	2013.10.11	<input checked="" type="checkbox"/>
Attenuator	73-6-34	MU918	MCE/WEINSCHEL	2013.10.11	<input checked="" type="checkbox"/>
EM Clamp	KEMZ 801	17643	Schaffner	2014.04.17	<input checked="" type="checkbox"/>
CDN	CDN S1/75	0410-28	EM TEST	2014.05.13	<input type="checkbox"/>
CDN	CDN-T8-RJ45	0113-22	EM TEST	2014.02.22	<input checked="" type="checkbox"/>

6.8.3 Photographs of test setup

#1- DC 12 V, #2- AC 24 V



#3- PoE



6.8.4 Measurement result

* AC/DC Line (#1- DC 12 V , #2- AC 24 V)

Coupling point	Coupling method	Result
DC 12 V	CDN(M2)	Complied
AC 24 V	CDN(M2)	Complied

* Signal (#1- DC 12 V , #2- AC 24 V , #3- PoE)

Coupling point	Coupling method	Result
Alarm	Clamp	Complied
Audio In/Out	Clamp	Complied

* Telecommunication (#1- DC 12 V , #2- AC 24 V , #3- PoE)

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

6.9 Dips and Interruptions

Test specification	EN 61000-4-11:2004				
Number of dips	3 T				
Duration	10 s				
Phase	Zero crossing (0 °)				
Testing Voltage	230 V , 50 Hz (From AC/AC Adaptor)				
Test facility	Shielded room				
Test Date	2013. 07. 04				
Temperature (°C)	23 °C	Humidity (% R.H.)	46 % R.H.	Pressure (kPa)	99.2 kPa
Remarks	Complied				

6.9.1 Measurement procedure

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

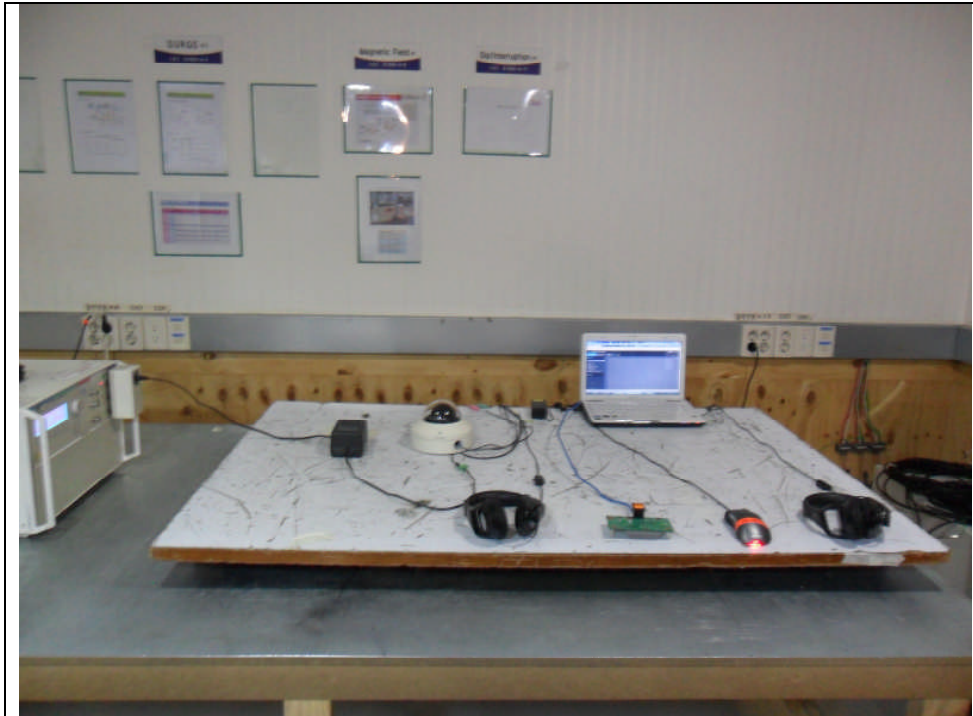
The dips/interruptions were applied at zero crossing.

6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500 M6	V0545100858	EM TEST	2014.01.31	<input checked="" type="checkbox"/>
Ultra compact simulator	UCS 500 M6	0701-03	EM TEST	2014.06.21	<input type="checkbox"/>

6.9.3 Photographs of test setup

#2- AC 24 V



6.9.4 Measurement result

* 230 V , 50 Hz (From AC/AC Adaptor)

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⁾, 25 Period, 10 Period)
- The power of EUT is off during the test. After the test, EUT is getting back to normal operation. (250 Period⁽²⁾)

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

7. E.U.T. photographs

Front View



Rear View



Left View



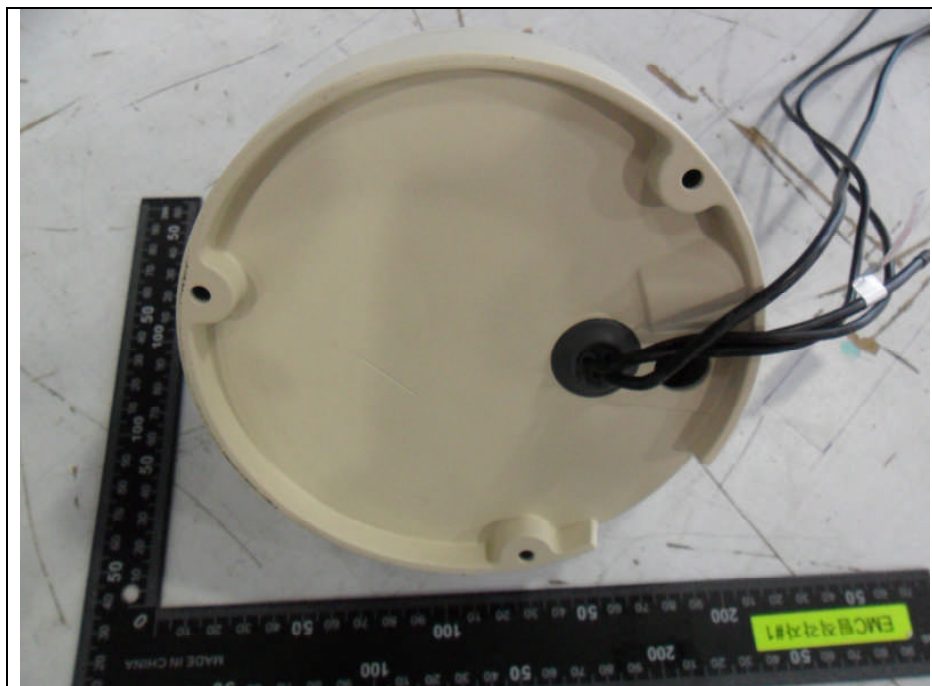
Right View



Top View



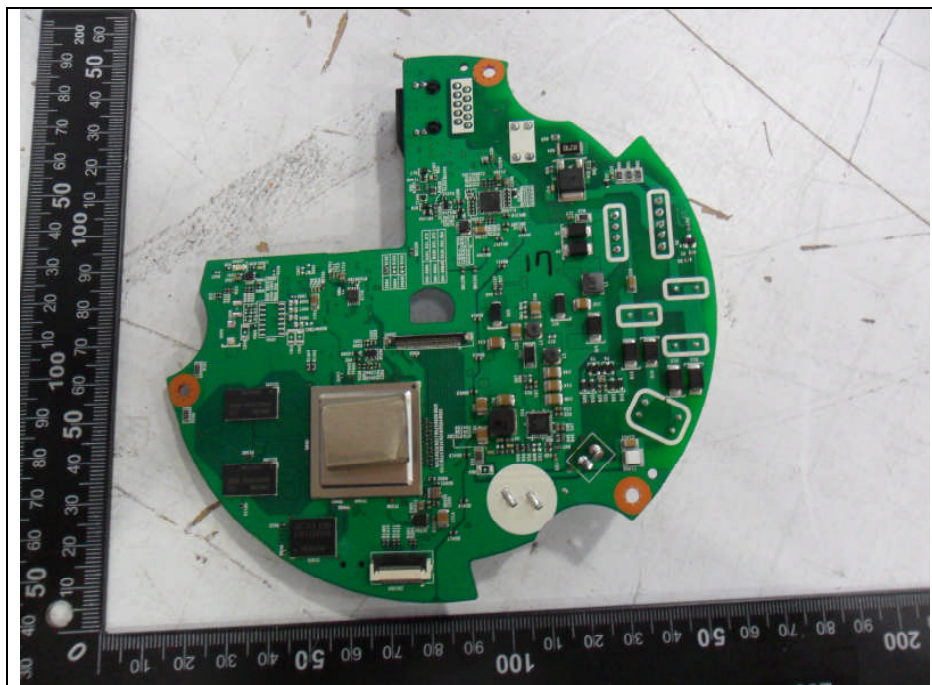
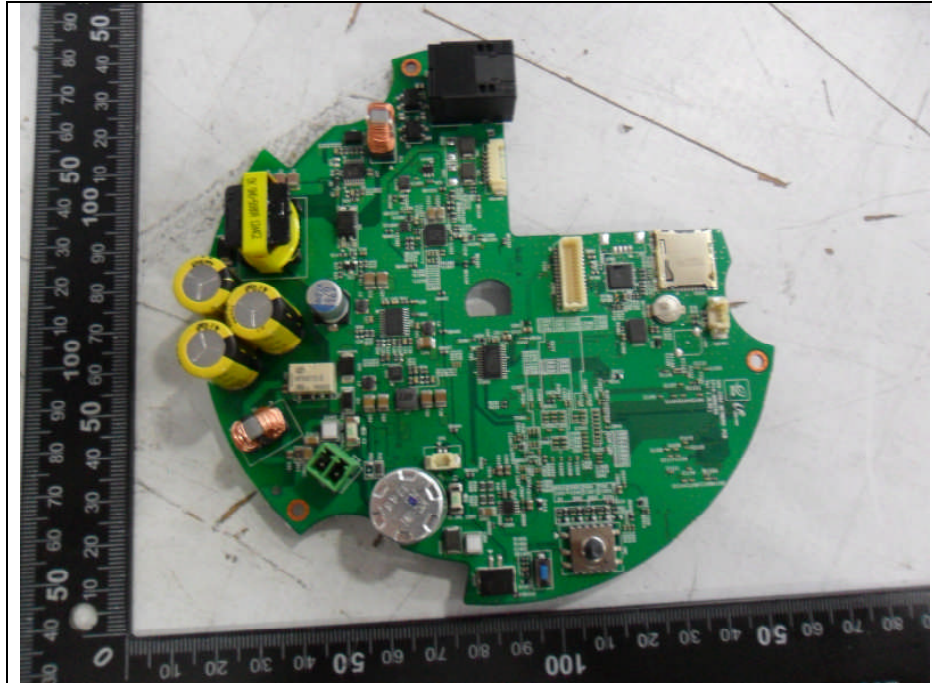
Bottom View



Inside



Main Board



CCD Board

