



Declaration of Conformity



Type of equipment: IR NETWORK CAMERA
Brand Name /Trade Mark: SAMSUNG
Type designation /model: SNO-1080RP
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

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

EN 55022:2006+A1:2007	Limits and methods of measurement of radio disturbance characteristics of information technology equipment
EN 50130-4:1995 +A1:1998 +A2:2003	Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
EN 61000-4-2:2009	Electrostatic discharge immunity test
EN 61000-4-3:2006	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2004	Electrical fast transient/burst immunity test
EN 61000-4-5:2006	Surge immunity test
EN 61000-4-6:2007	Immunity to conducted disturbances, induced by radio-frequency fields

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
/ November 23, 2011

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

EMC TEST REPORT

Test report No: EMC-CE-2847
Type of Equipment: IR NETWORK CAMERA
Model Name: SNO-1080RP
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 55022:2006+A1:2007, Class A
EN 50130-4:1995+A1:1998+A2:2003
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: 2011. 11. 22

Date of testing: 2011. 11. 22 ~ 11. 23

Issued date: 2011. 11. 23

Tested by:



AHN, DO-WON

Approved by:



YEOM, HAN-SEOK

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	9
4.3 Auxiliary equipments.....	9
4.4 Test configuration	10
4.5 Operating conditions	12
5. Summary of test results	13
5.1 Modification to the E.U.T.	13
5.2 Summary of EMI emission test results.....	13
5.3 Summary of immunity test results	13
5.4 Performance criteria	14
6. Test results	16
6.1 Conducted Emission.....	16
6.2 Radiated Emission	21
6.3 Electrostatic Discharge.....	31
6.4 Radio Frequency Electromagnetic Fields	38
6.5 Electric Fast Transient/BURST	41
6.6 Surge.....	44
6.7 Conducted Immunity	47
7. E.U.T. photographs	50

1. Applicant information

Applicant: 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#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

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 31 336 4767

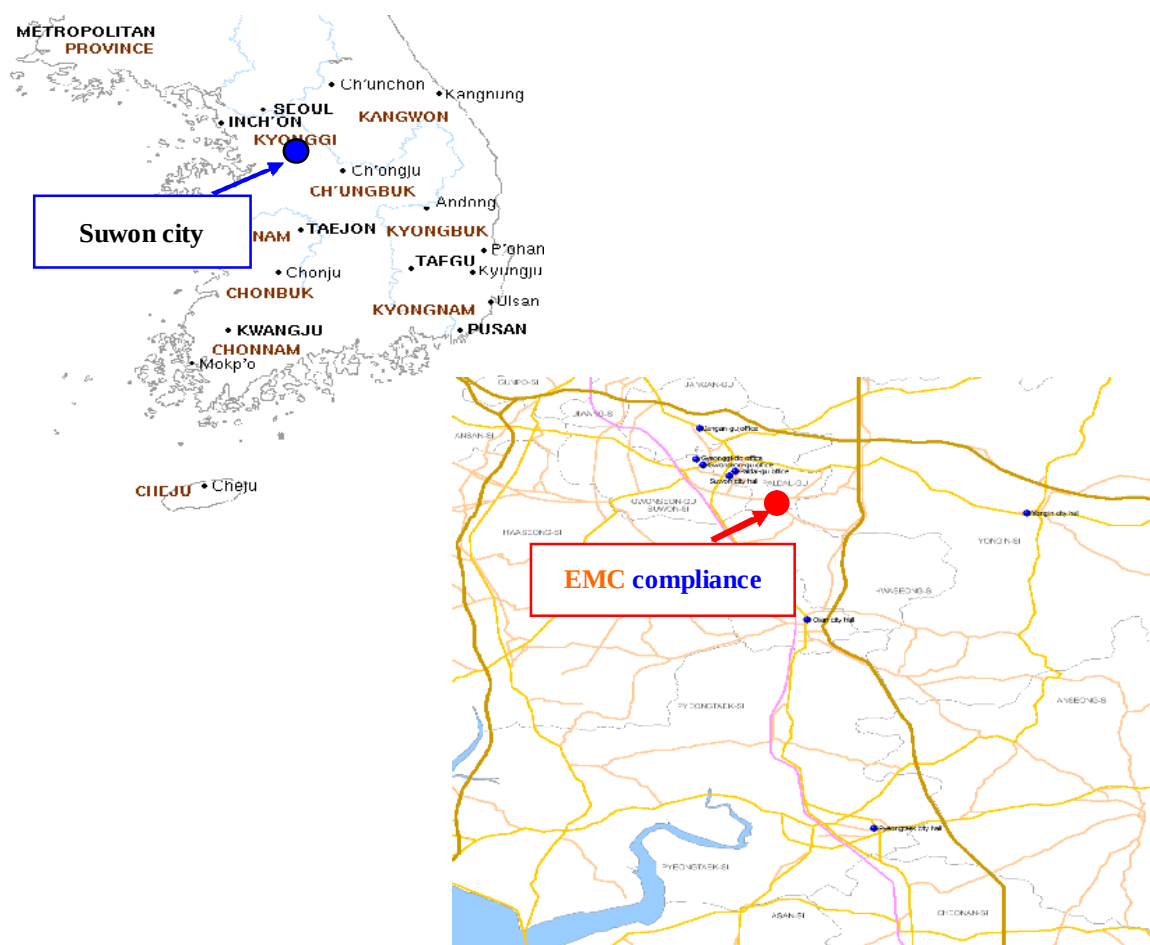
FCC CAB.: KR0040

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)	: 22 °C	21 % R.H.	-
Shielded room(CE)	: 24 °C	24 % R.H.	-
Shielded room(ESD)	: 23 °C	31 % R.H.	101.3 kPa

Test site

These testing items were performed following locations;

Shielded Room : Conducted Emission, ESD, EFT/Burst, Surge, CS
Chamber (10 m) : Radiated Emission (Test distance: 10 m, 3 m)
Fully anechoic chamber (3 m) : RS

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 : ($k = 2$, 95 %)

9 kHz ~ 150 kHz: ± 3.95 [dB]

150 kHz ~ 30 MHz: ± 3.55 [dB]

* 30 MHz ~ 1 GHz

Radiated Emission measurement : ($k = 2$, 95 %)

30 MHz ~ 300 MHz: 3 m: $+ 4.28$ [dB], $- 4.30$ [dB]

10 m: $+ 4.27$ [dB], $- 4.28$ [dB]

300 MHz ~ 1 000 MHz: 3 m: $+ 4.56$ [dB], $- 4.57$ [dB]

10 m: $+ 4.41$ [dB], $- 4.43$ [dB]

* 1 GHz ~ 6 GHz

Radiated Emission measurement : ($k = 2$, 95 %)

1 GHz ~ 6 GHz: 3 m: $+ 5.94$ [dB], $- 5.95$ [dB]

Radio Frequency Electromagnetic Fields : ($k = 2$, 95 %)

± 1.82 [dB]

4. Description of E.U.T.

4.1 General information

	SNO-1080RN/P
Video	
Imaging Device	1/4" PS CMOS
Total Pixels	680(H) x 512(V)
Effective Pixels	640(H) x 480(V)
Scanning System	Progressive
Min. Illumination	0 lux
S / N Ratio	50dB
Video Out	SMD Connector, for installation
Lens	
Focal Length (Zoom Ratio)	2.2~7.7mm (3.5x) Vari-focal
Max. Aperture Ratio	F1.2
Angular Field of View	H : 94° (W) ~ 26.5° (T) , V : 70° (W) ~ 20° (T)
Min. Object Distance	500 mm
Focus Control	-
Zoom Movement Speed	-
Lens Type	DC Auto Iris
Mount Type	Board type(Ø14)
Pan / Tilt / Rotate	
Pan Range	0°~355°
Pan Speed	-
Tilt Range	0°~90°
Tilt Speed	-
Rotate Range	0°~355°
Preset	-
Preset Accuracy	-
Auto Tracking	-
Operational	
IR LED	15 ea
Viewable Length	15m
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	Auto (ICR) / Color / B/W
Backlight Compensation	Off / BLC
Wide Dynamic Range	-
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNR III (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	-
Motion Detection	Off / On (4 programmable zones)
Privacy Masking	Off / On (32ea 4 Points Polygonal)
Sens-up (Frame Integration)	Off / Auto (x2~x60)
Gain Control	Off / Low / Medium / High

White Balance	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Auto / A.FLK / Manual (x60~1/12000sec)
Digital Zoom	
Flip / Mirror	Off / On
Intelligent Video Analytics	Face Detection
Alarm I/O	Input 1ea
Remote Control Interface	
RS-485 Protocol	
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264, MJPEG
Resolution	<H.264> 4:3 Mode : 640x480 / 320x240 / 160x120 <MJPEG> 4:3 Mode : 640x480 / 320x240 / 160x120
Max. Framerate	Max. 30fps at all resolutions
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 I/O	
Audio Compression Format	
Audio Communication	
IP	Pv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTSP, NTP HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication
Streaming Method	Unicast / Multicast
Max. User Access	10 users at Unicast Mode
Memory Slot	
ONVIF Conformance	Yes
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek
Web Viewer	Supported OS : Windows XP / VISTA / 7, MAC OS Supported Browser : Internet Explorer 7.0 or Higher, Firefox Google Chrome, Apple Safari
Central Management Software	NET-i viewer
Environmental	
Operating Temperature / Humidity	10°C ~ +50°C (+14°F ~ +122°F) / 20% ~80 RH
Ingress Protection	
Electrical	
Input Voltage / Current	12V DC, PoE(IEEE802.3af)
Power Consumption	TBD
Mechanical	
Color / Material	Dark gray, Aluminum
Dimension (WxHxD)	86 * 86.8 * 304.6
Weight	990g

4.2 Product description

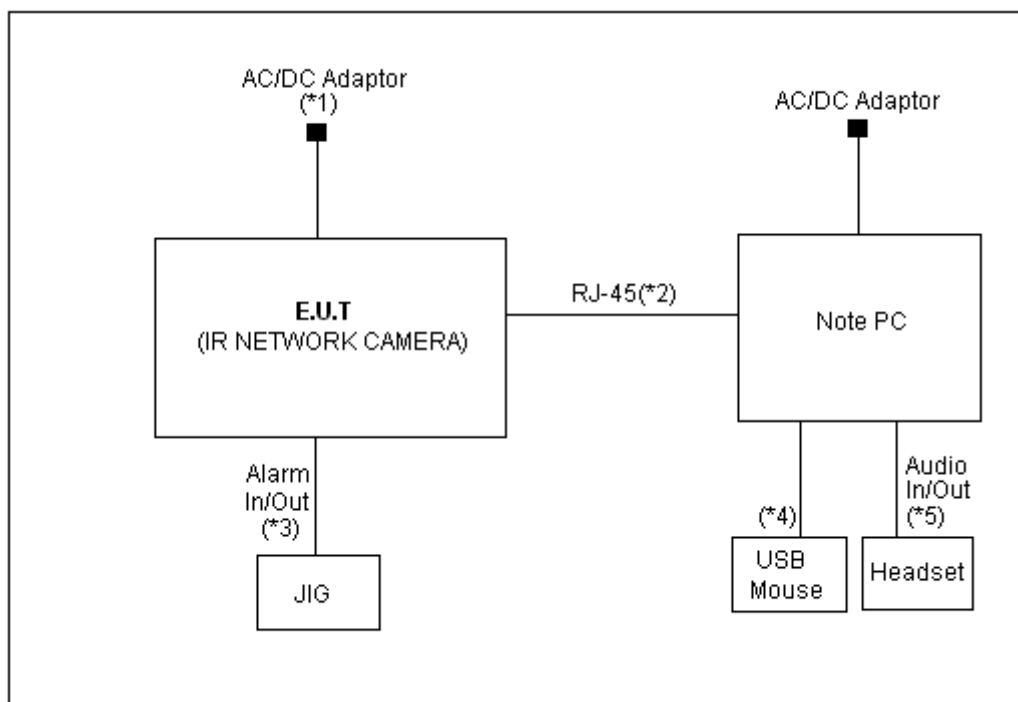
Type of product	IR NETWORK CAMERA
Model name (Basic)	SNO-1080RP
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 V / PoE
Product rating	DC 12 V / PoE
Internal clock frequency	27 MHz
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	C1321	472680432036	FUJITSU
USB Mouse	M-UV69a	HCA51201503	LG
Headset	ES-303	-	inkel
JIG	-	-	-
PoE Switch	FS108P	1DL20C3U0053B	NETGEAR
AC/DC Adaptor(DC 12 V)	DAD12050DKA	-	Dream Electronic

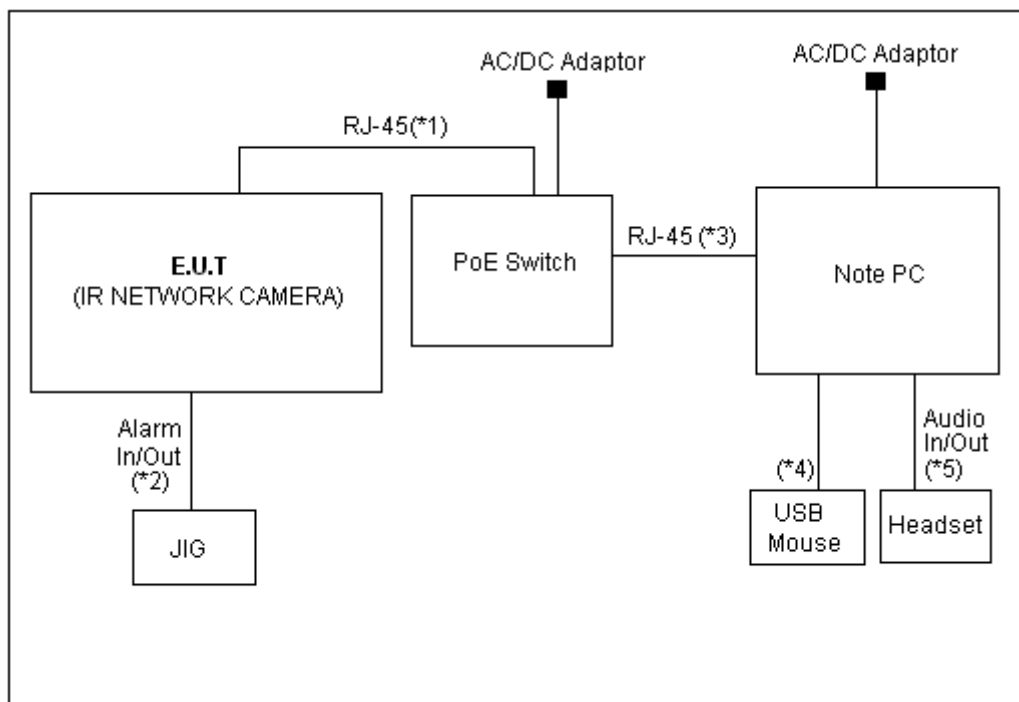
4.4 Test configuration

* DC 12 V



Note *	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (IR NETWORK CAMERA)	Power	AC/DC Adaptor	Power	1.5	Non-Shield	-
2		RJ-45	Note PC	RJ-45	3.0	Non-Shield	-
3		Alarm In/Out	JIG	Alarm In/Out	3.0	Non-Shield	Out-door
4	Note PC	USB	USB Mouse	USB	1.8	Shield	-
5		Audio In/Out	Headset	Audio In/Out	2.0	Non-Shield	-

* PoE



* Power supplied from PoE Switch*

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

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operation
1	Camera operating mode

* 2 types of powers are available for the product that are AC/DC adaptor (DC 12 V), PoE switch.

Therefore, tests were performed for 2 different types of powers.

5. Summary of test results

5.1 Modification to the E.U.T.

None

5.2 Summary of EMI emission test results

Application	Test method	Test result
Conducted emission - Telecommunication	EN 55022:2006+A1:2007, Class A	Complied
Radiated emission - DC 12 V, PoE	EN 55022:2006+A1:2007, Class A	Complied
Harmonics current	EN 61000-3-2:2006+A2:2009	N/A
Voltage fluctuations and flickers	EN 61000-3-3:2008	N/A

5.3 Summary of immunity test results

Items	Application	Test method	Test result
Electrostatic discharge	Enclosure	EN 61000-4-2:2009	Complied
Radiated RF immunity	Enclosure	EN 61000-4-3:2006	Complied
Electric Fast Transient/BURST	DC 12 V, PoE, Signal Telecommunication	EN 61000-4-4:2004	Complied
Surge	DC 12 V, Signal	EN 61000-4-5:2006	Complied
Conducted RF immunity	DC 12 V, PoE, Signal Telecommunication	EN 61000-4-6:2007	Complied
Voltage dip/interruption	DC 12 V	EN 61000-4-11:2004	N/A
Voltage variation	DC 12 V	EN 50130-4:1995+A1:1998+A2:2003	N/A

5.4 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 occurs 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 is 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 55022:2006+A1:2007, Class A		
Test mode	Camera operating mode		
Date	2011. 11. 22		
Testing voltage	DC 12 V / PoE		
Test facility	Shielded room (CE#2)		
Temperature (°C)	24 °C	Humidity (% R.H.)	24 % R.H.
Remarks	Complied		

6.1.1 Limits of conducted emission measurement

- Telecommunication

Frequency [MHz]	Class A Voltage Limits (dB(μ V))		Current Limits (dB(μ A))	
	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

* 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.

6.1.3 Used equipments

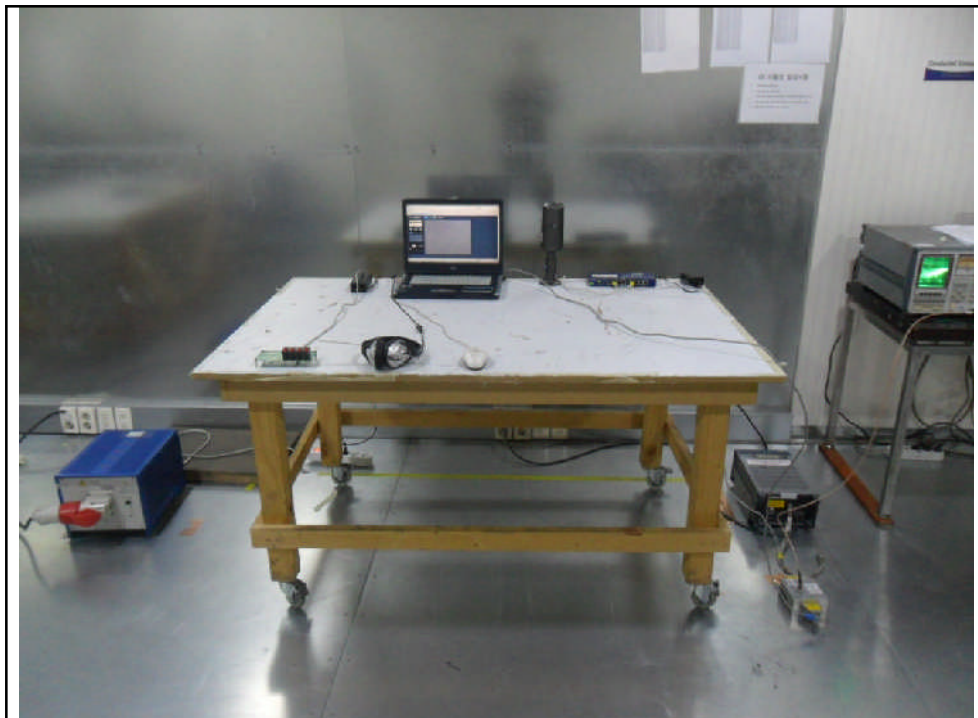
Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESHS30	844827/011	R&S	12.08.16	☒
LISN	ESH3-Z5	846125/024	R&S	12.08.04	☒
LISN	L3-32	0120J20305	PMM	-	☒
ISN	T800	24314	TESEQ	11.12.06	☒

6.1.4 Photographs of test setup

* DC 12 V



* PoE



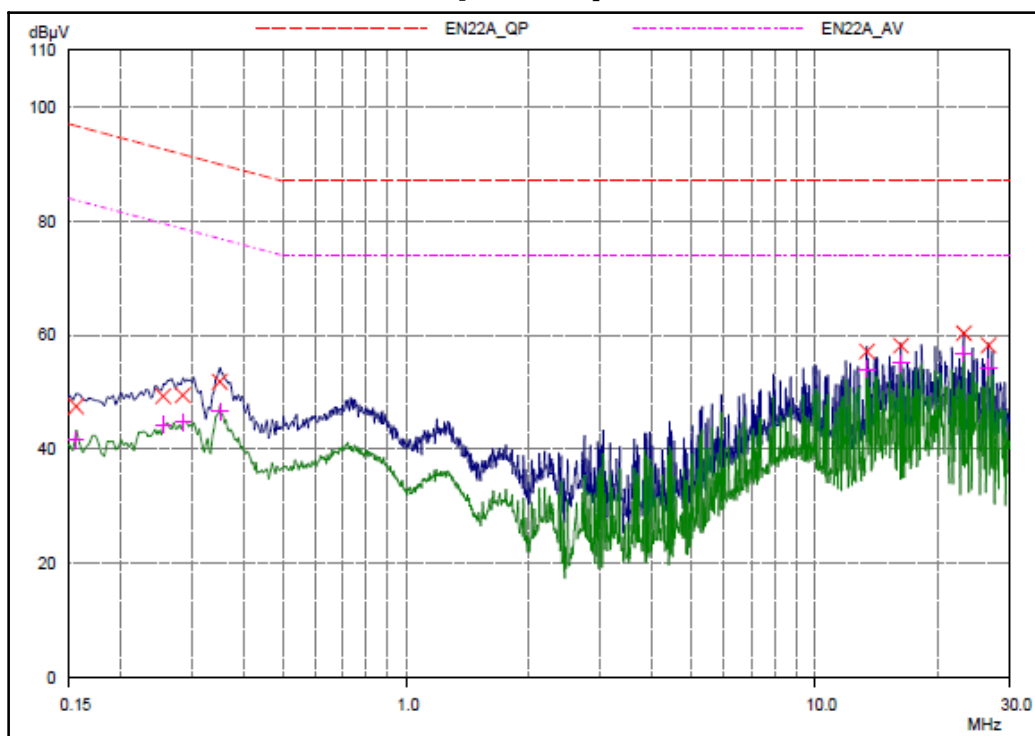
6.1.5 Conducted emission measurement result

* Telecommunication port

* DC 12 V _LAN Port_RJ-45(LCL 65 dB)

Frequency	Correction Factor	Quasi-peak				Average			
		Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[MHz]	Cable	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB]
0.156	0.02	96.67	47.50	47.52	49.15	83.67	41.56	41.58	42.09
0.255	0.03	92.59	49.24	49.27	43.32	79.59	44.29	44.32	35.27
0.285	0.03	91.67	49.46	49.49	42.18	78.67	44.61	44.64	34.03
0.351	0.03	89.94	51.80	51.83	38.11	76.94	46.58	46.61	30.33
13.420	0.13	87.00	57.11	57.24	29.76	74.00	54.04	54.17	19.83
16.230	0.14		58.13	58.27	28.73		54.97	55.11	18.89
23.130	0.14		60.28	60.42	26.58		56.69	56.83	17.17
26.610	0.15		58.20	58.35	28.65		54.34	54.49	19.51

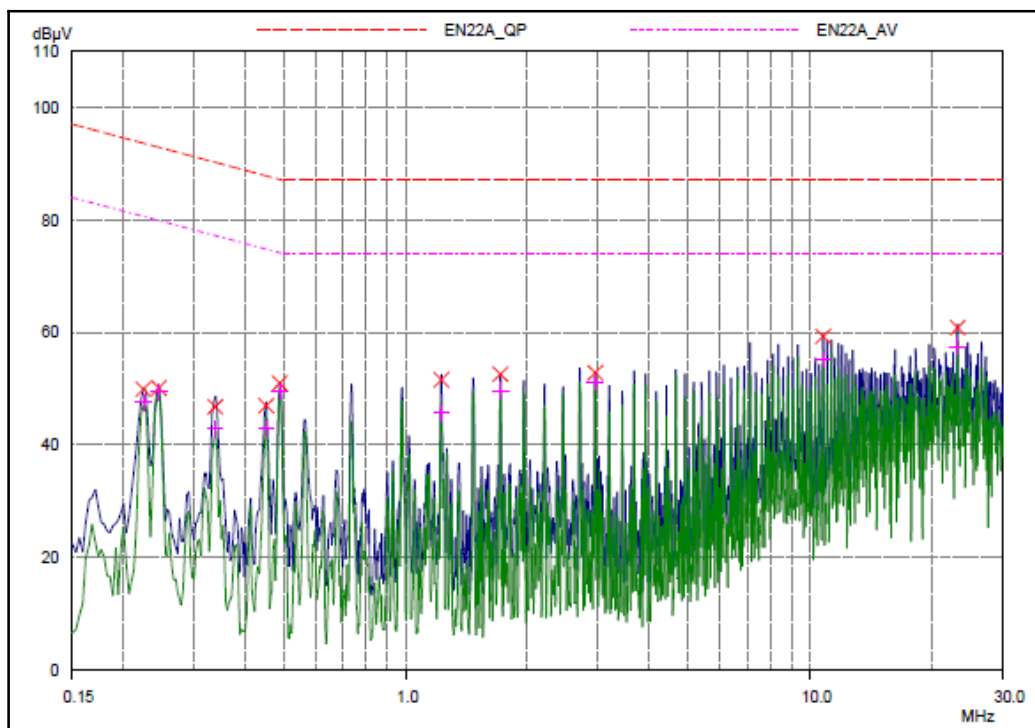
[TEL-Line]



* PoE_LAN Port_RJ-45(LCL 65 dB)

Frequency	Correction Factor	Quasi-peak				Average			
		Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[MHz]	Cable	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB]
0.225	0.03	93.63	49.86	49.89	43.74	80.63	47.53	47.56	33.07
0.246	0.03	92.89	50.10	50.13	42.76	79.89	49.40	49.43	30.46
0.339	0.03	90.23	46.74	46.77	43.46	77.23	42.83	42.86	34.37
0.453	0.04	87.82	46.95	46.99	40.83	74.82	42.93	42.97	31.85
0.489	0.04	87.18	50.93	50.97	36.21	74.18	49.42	49.46	24.72
1.227	0.06	87.00	51.55	51.61	35.39	74.00	45.60	45.66	28.34
1.716	0.08		52.53	52.61	34.39		49.60	49.68	24.32
2.943	0.08		52.81	52.89	34.11		51.07	51.15	22.85
10.790	0.12		59.27	59.39	27.61		55.13	55.25	18.75
23.130	0.14		60.81	60.95	26.05		57.52	57.66	16.34

[TEL-Line]



6.2 Radiated Emission

Test specification	EN 55022:2006+A1:2007, Class A		
Test mode	Camera operating mode		
Date	2011. 11. 22		
Testing voltage	DC 12 V / PoE		
Test facility	10 m Chamber (Test distance: 10 m, 3 m)		
Temperature (°C)	22 °C	Humidity (% R.H.)	21 % R.H.
Remarks	Complied		

6.2.1 Limits of radiated emission measurement

* Limits below 1 GHz

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

* Limits above 1 GHz

Frequency [GHz]	Average limit (dB(μ V/m))	Peak limit (dB(μ V/m))
1 ~ 3	56	76
3 ~ 6	60	80
Note - The lower limit applies at the transition frequency.		

6.2.2 Measurement procedure

The test was done at a 10 m, 3 m distance at 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	ESCI	100710	R&S	11.12.01	☒
Bi-Log Antenna	VULB 9168	9168-440	SCHWARZBECK	13.10.04	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	11.12.01	☒
3 dB Attenuator	8491A	27444	HP	11.11.30	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A01802	AGILENT	12.05.11	☒
Horn ANT	3115	62589	ETS	13.09.06	☒
Spectrum Analyzer	FSP7	100289	R&S	11.12.17	☒

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

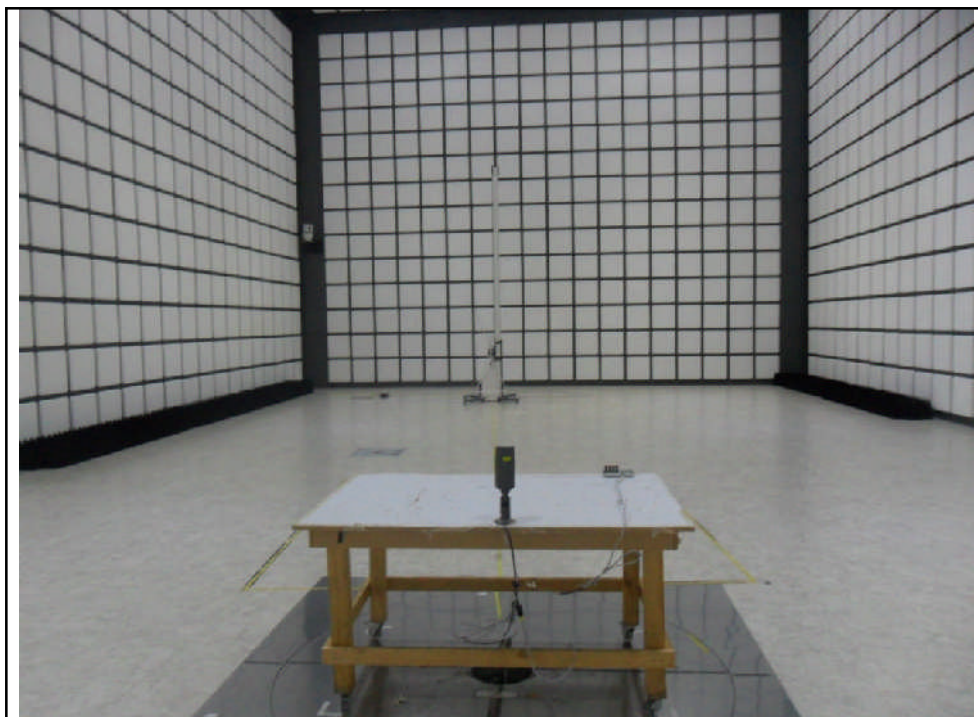
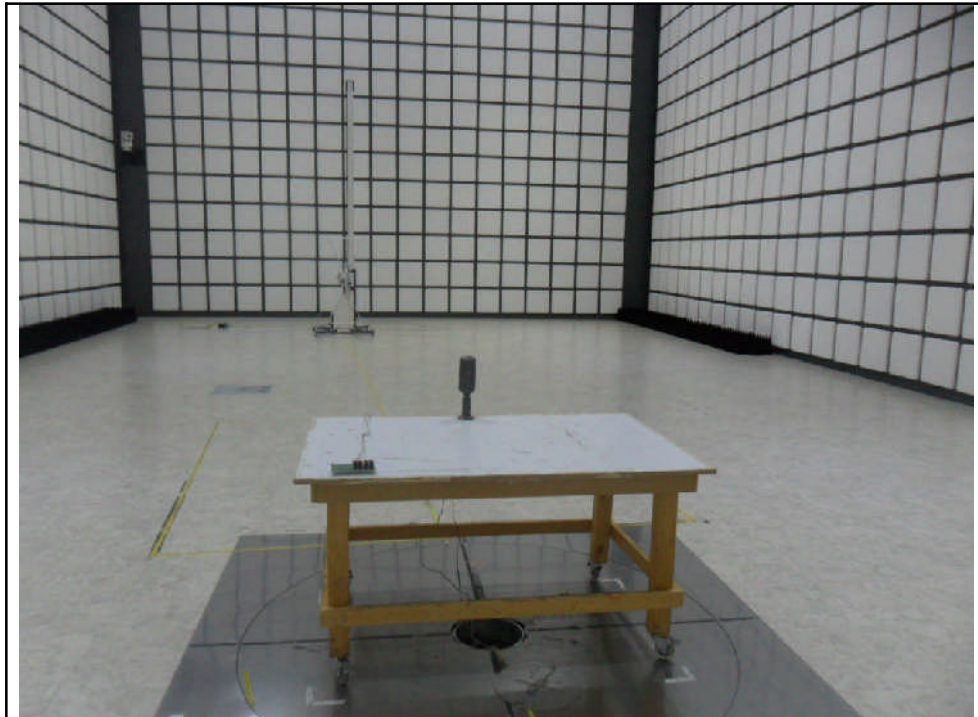
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

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

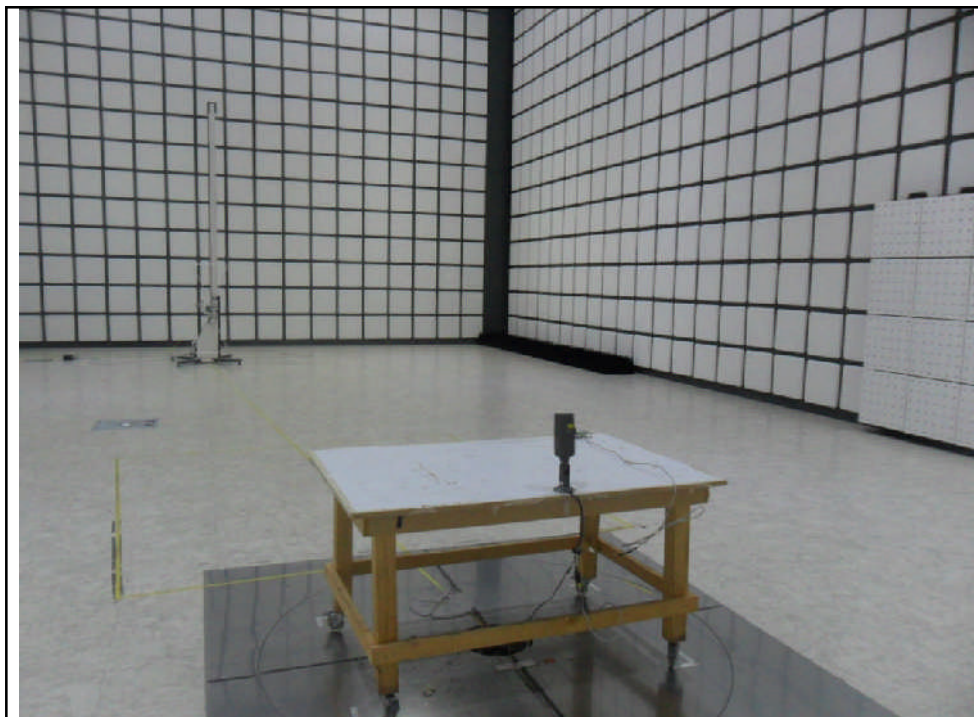
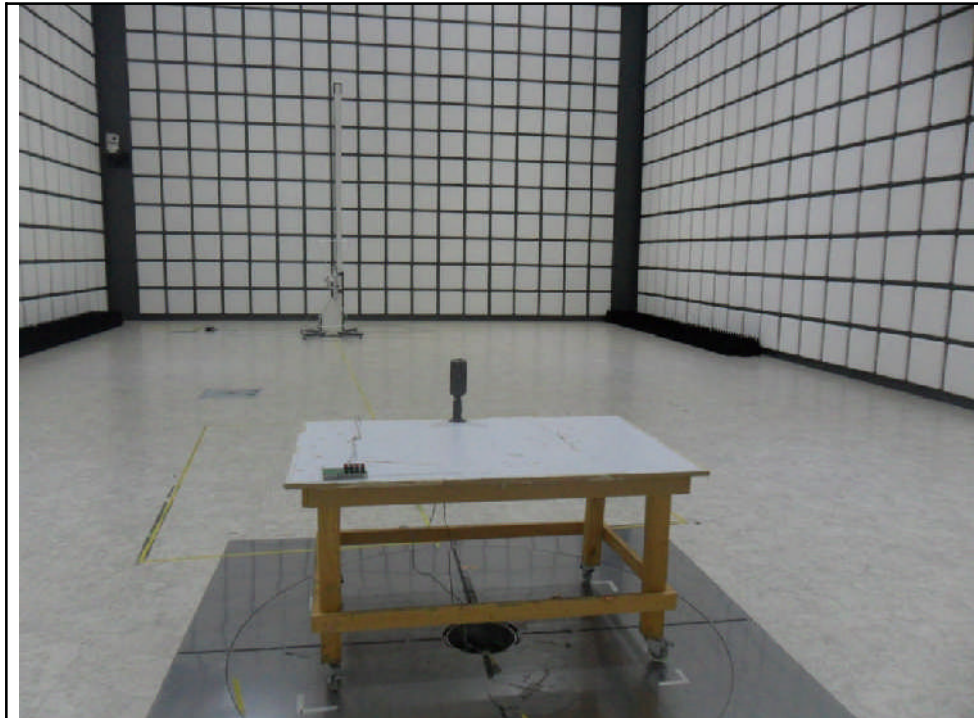
6.2.5 Photographs of test setup

* 30 MHz ~ 1 GHz

* DC 12 V

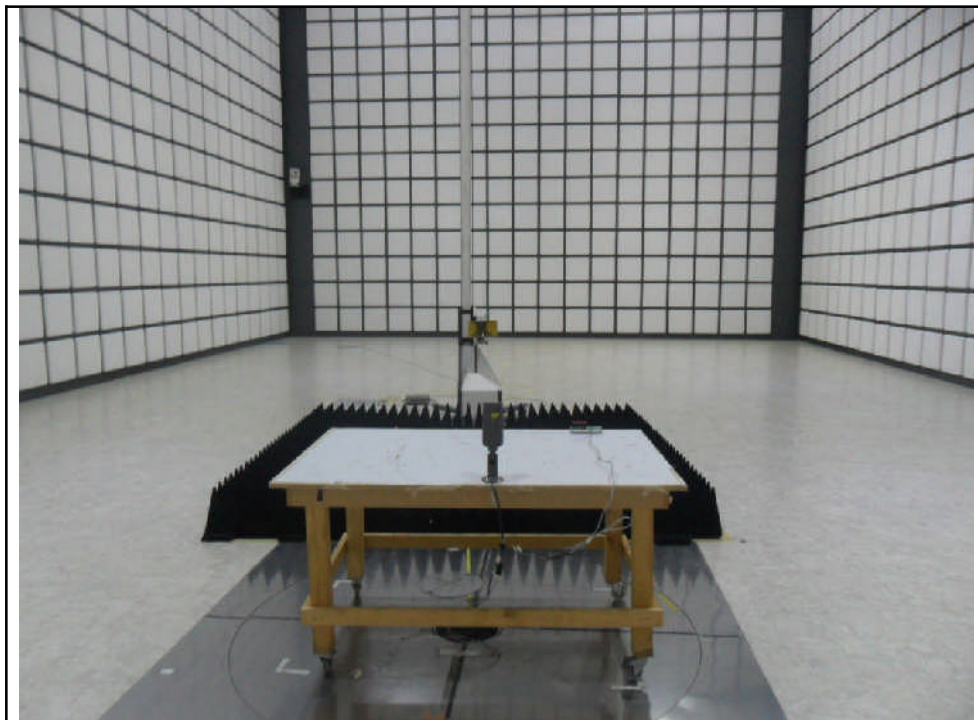
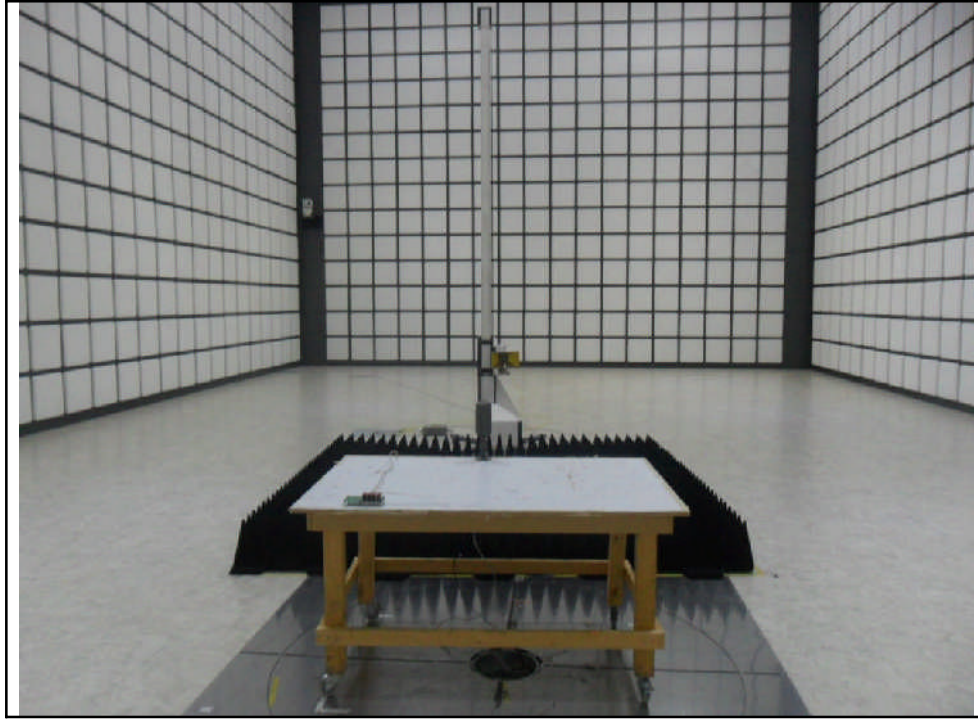


* PoE

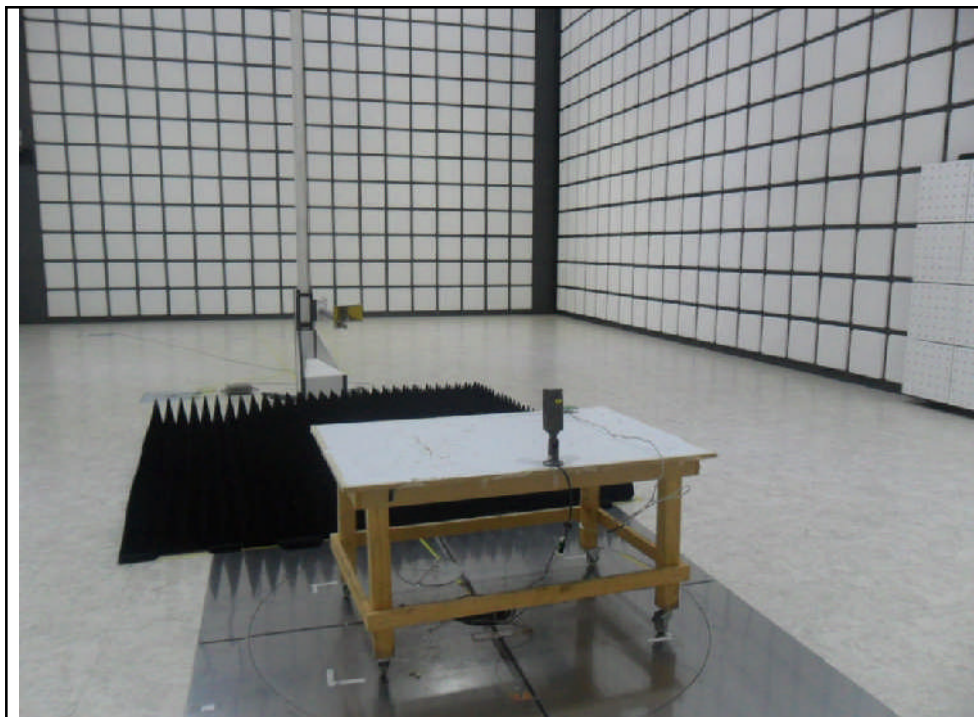
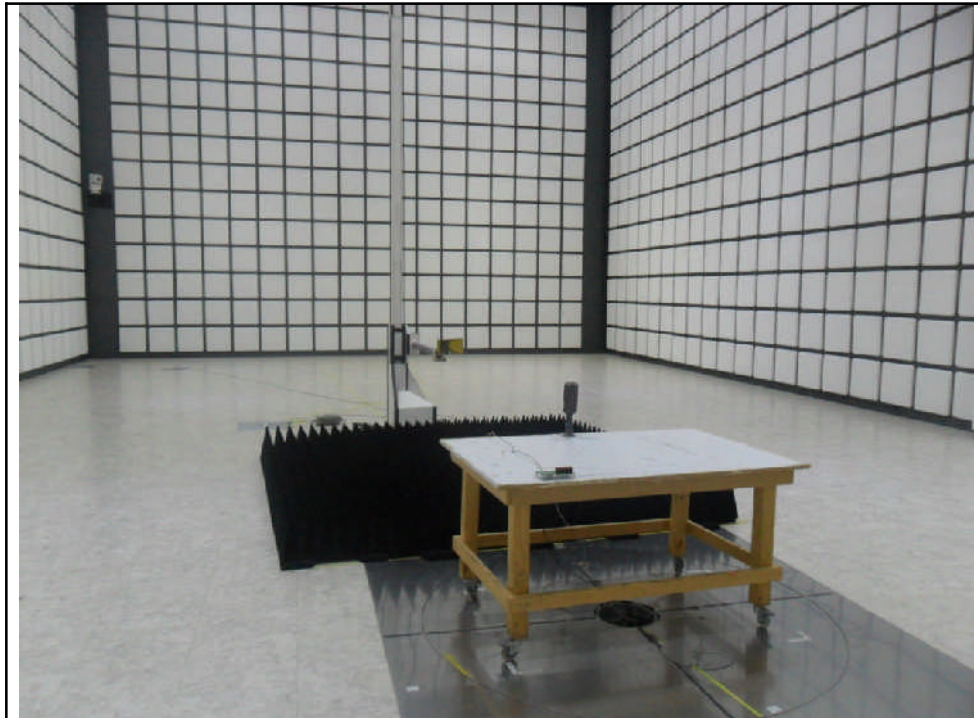


* 1 GHz ~ 6 GHz

* DC 12 V



* PoE

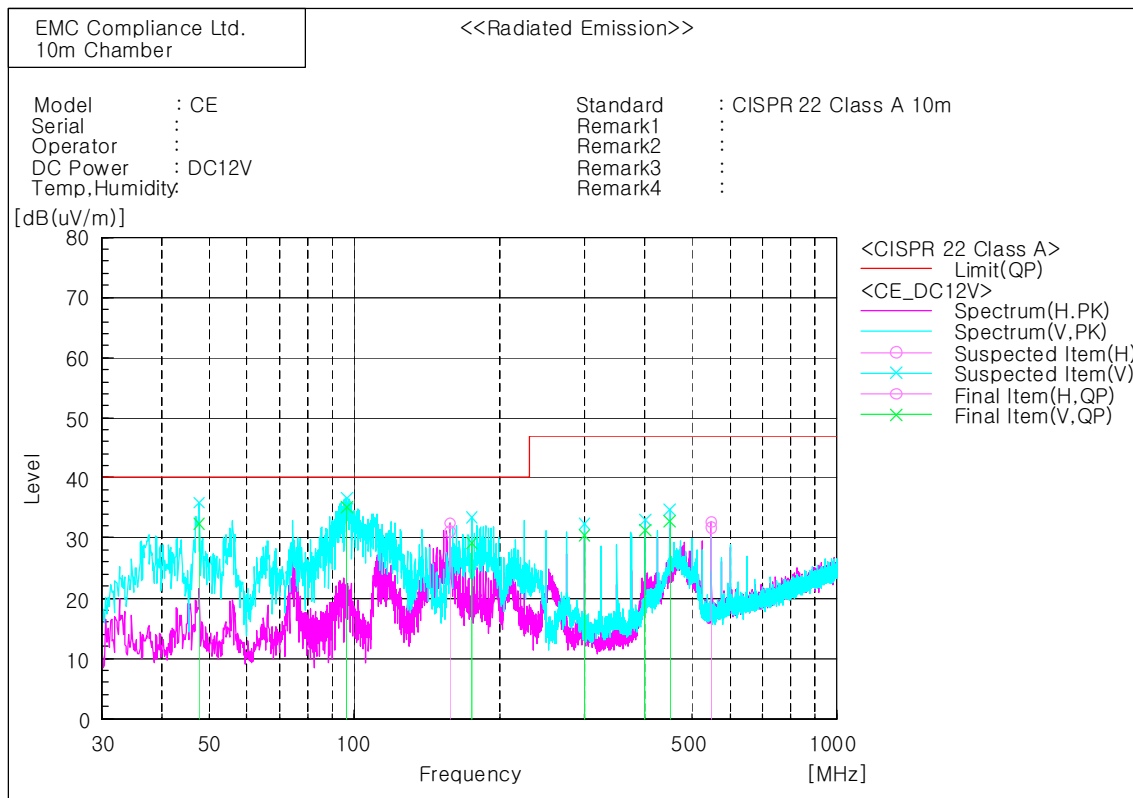


6.2.6 Radiated emission measurement result

* Graph and Data

* 30 MHz ~ 1 GHz

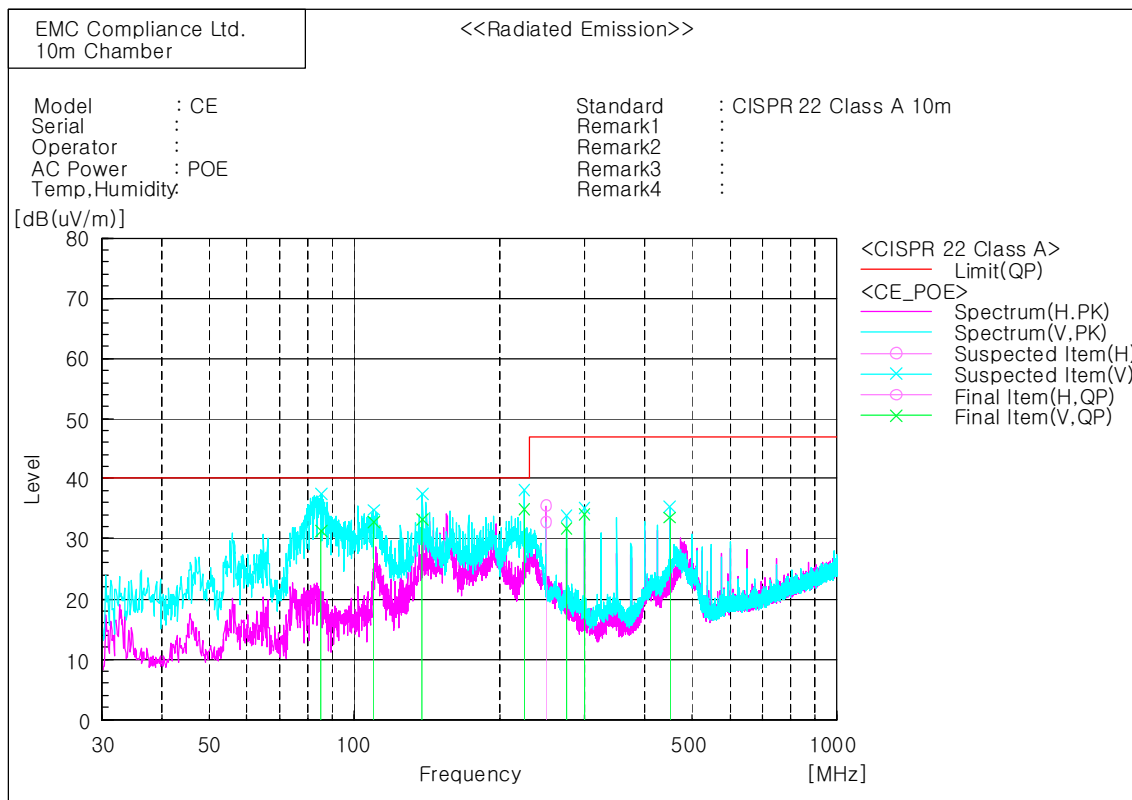
* DC 12 V



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	48.0	-15.6	32.4	40.0	7.6	295.0	197.1	
2	96.445	V	55.6	-20.4	35.2	40.0	4.8	195.0	163.3	
3	157.919	H	46.2	-15.1	31.1	40.0	8.9	306.0	87.1	
4	175.015	V	45.1	-15.9	29.2	40.0	10.8	195.0	82.8	
5	300.024	V	44.6	-14.1	30.5	47.0	16.5	195.0	248.7	
6	400.055	V	42.9	-11.6	31.3	47.0	15.7	195.0	153.2	
7	450.010	V	43.2	-10.3	32.9	47.0	14.1	400.0	12.4	
8	550.041	H	39.6	-7.9	31.7	47.0	15.3	206.0	119.7	

* PoE

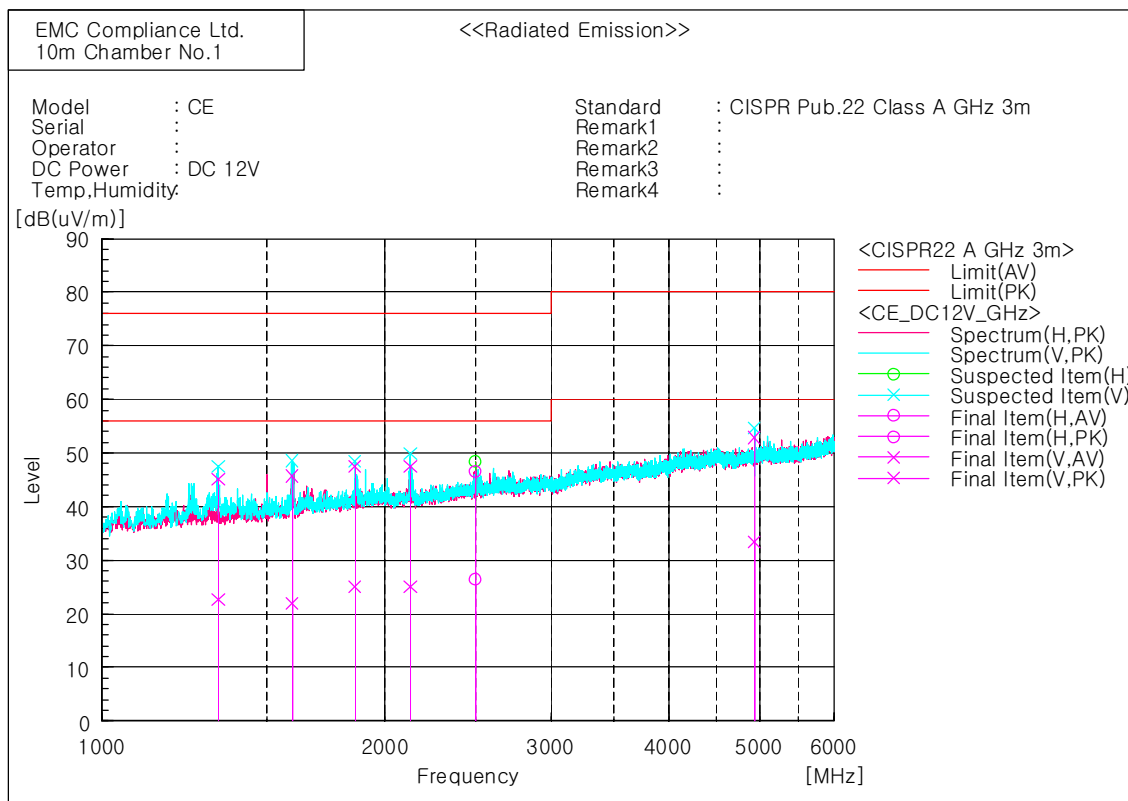


Final Result

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	85.290	V	51.9	-20.5	31.4	40.0	8.6	195.0	71.1	
2	109.419	V	51.5	-18.7	32.8	40.0	7.2	195.0	60.6	
3	138.519	V	49.1	-15.9	33.2	40.0	6.8	100.0	83.2	
4	224.970	V	52.1	-17.2	34.9	40.0	5.1	100.0	47.1	
5	249.947	H	48.8	-16.0	32.8	47.0	14.2	400.0	66.6	
6	275.046	V	46.8	-15.0	31.8	47.0	15.2	100.0	294.9	
7	300.024	V	48.2	-14.1	34.1	47.0	12.9	100.0	308.4	
8	450.010	V	43.9	-10.3	33.6	47.0	13.4	400.0	50.7	

* 1 GHz ~ 6 GHz

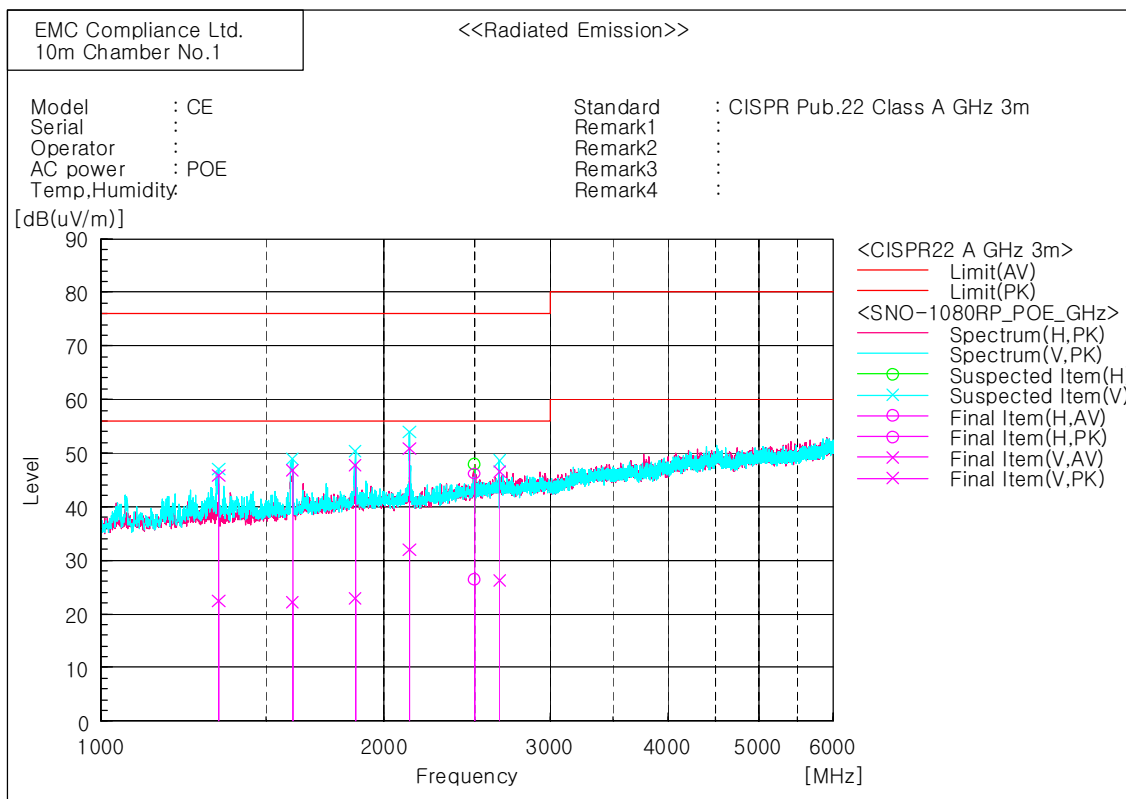
* DC 12 V



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	1329.354	V	54.1	31.6	-8.9	45.2	22.7	56.0	76.0	10.8	53.3	100.0	346.4
2	1593.315	V	52.6	28.8	-6.9	45.7	21.9	56.0	76.0	10.3	54.1	100.0	151.6
3	1858.778	V	52.6	30.2	-5.1	47.5	25.1	56.0	76.0	8.5	50.9	100.0	130.6
4	2127.532	V	51.2	28.7	-3.6	47.6	25.1	56.0	76.0	8.4	50.9	100.0	151.6
5	2495.631	H	48.6	28.4	-2.0	46.6	26.4	56.0	76.0	9.4	49.6	100.0	241.4
6	4934.375	V	46.5	27.1	6.4	52.9	33.5	60.0	80.0	7.1	46.5	201.0	310.7

* PoE



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1333.753	V	54.7	31.2	-8.8	45.9	22.4	56.0	76.0	10.1	53.6	100.0	348.0
2	1598.131	V	53.6	28.9	-6.8	46.8	22.1	56.0	76.0	9.2	53.9	100.0	158.6
3	1862.500	V	52.9	27.9	-5.1	47.8	22.8	56.0	76.0	8.2	53.2	100.0	274.0
4	2127.500	V	35.5	54.5	-3.6	31.9	50.9	56.0	76.0	24.1	25.1	100.0	274.0
5	2494.375	H	48.3	28.5	-2.1	46.2	26.4	56.0	76.0	9.8	49.6	201.0	203.0
6	2652.566	V	48.1	27.8	-1.5	46.6	26.3	56.0	76.0	9.4	49.7	100.0	274.0

6.3 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	Contact: ± 2 kV, ± 4 kV, ± 6 kV Air: ± 2 kV, ± 4 kV, ± 8 kV VCP: ± 2 kV, ± 4 kV, ± 6 kV				
Discharge impedance	330 Ω / 150 pF				
Testing voltage	DC 12 V / PoE				
Date	2011. 11. 23				
Number of discharge (Each polarity)	10				
Interval between discharges	1 s				
Temperature(°C)	23 °C	Humidity (% R.H.)	31 % R.H.	Pressure (kPa)	101.3 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.3.1 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.

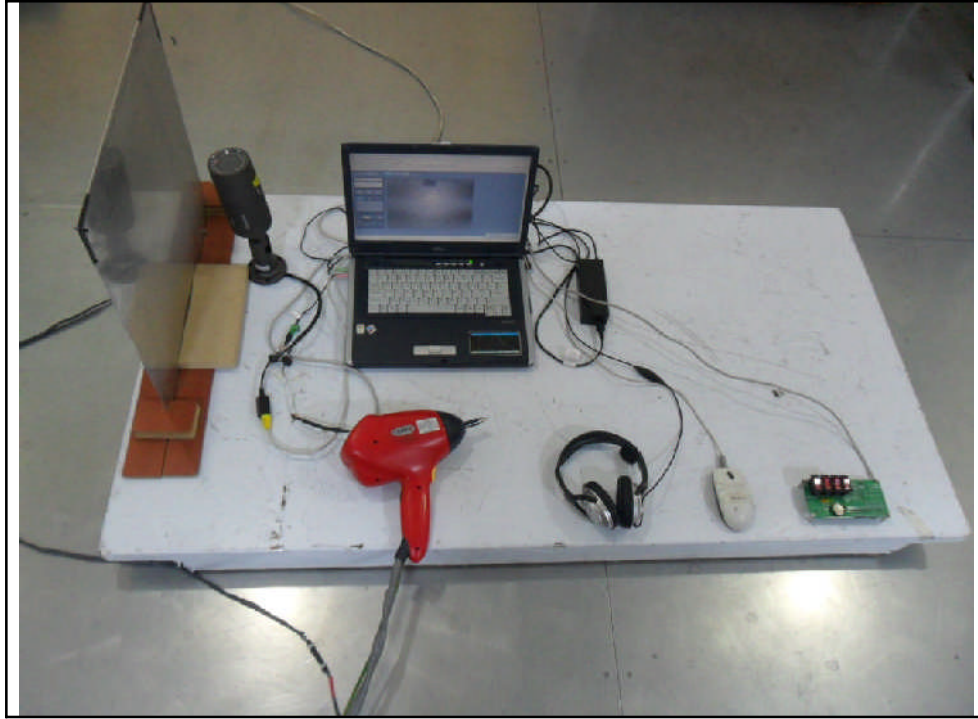
In case of floor standing equipment, EUT was placed on the reference plane on 0.1 m of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 m above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference 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.

6.3.2 Used equipments

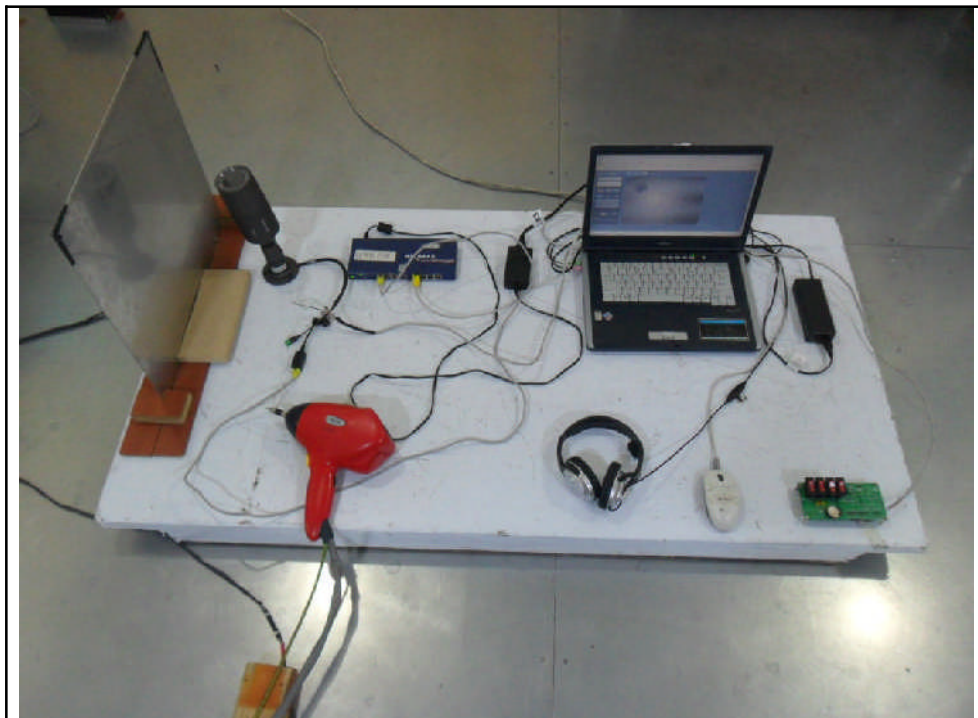
Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	NSG 437	182	TESEQ	12.05.23	☒
VCP	-	-	-	-	☒

6.3.3 Photographs of test setup

* DC 12 V



* PoE

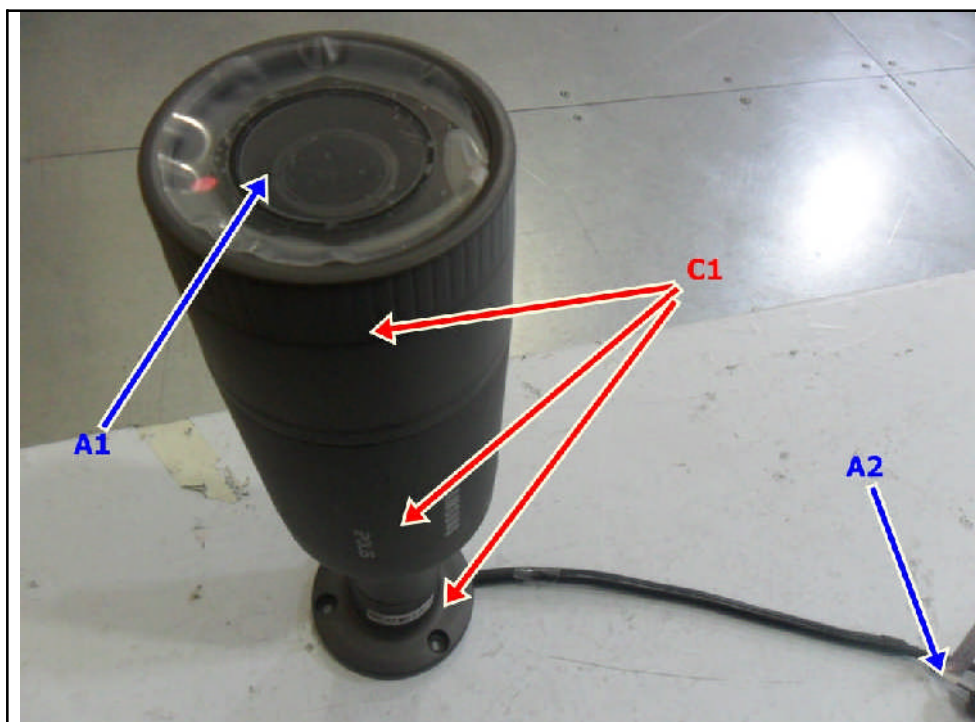
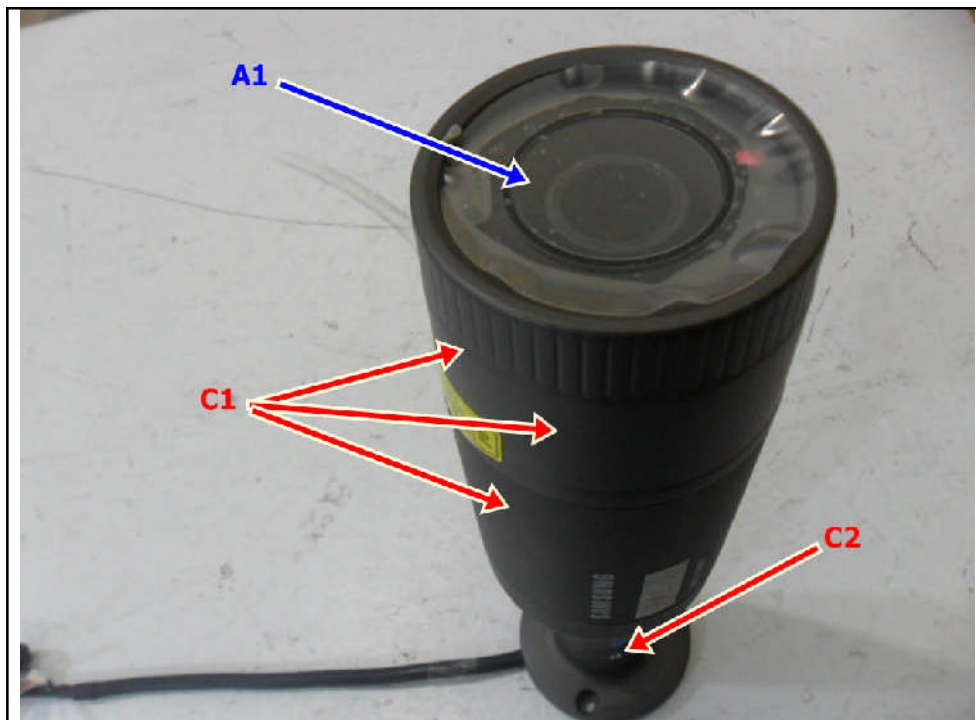


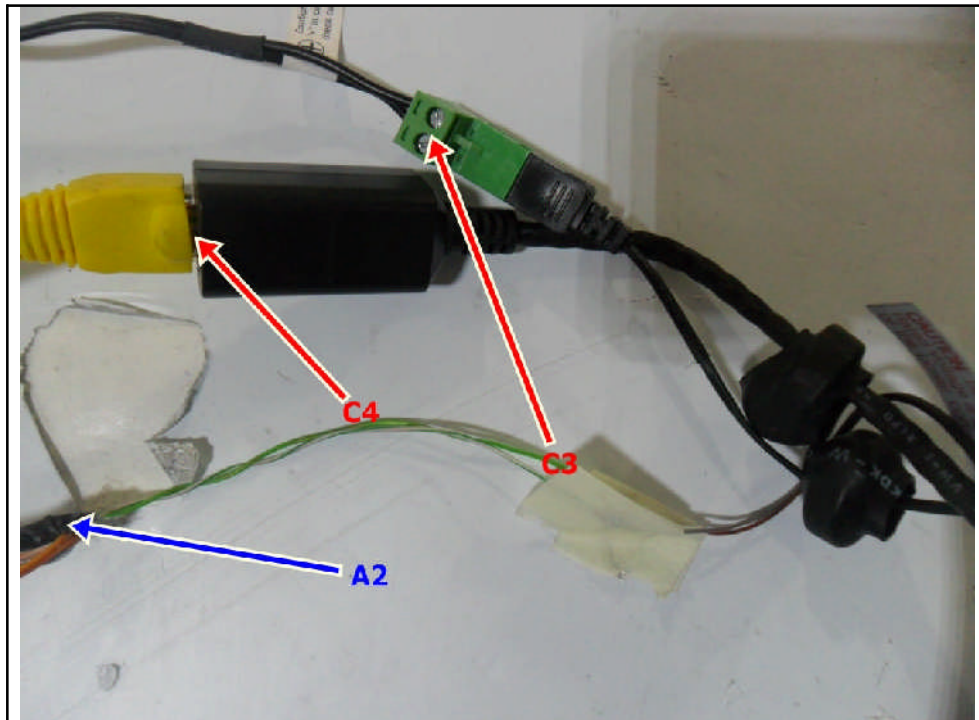
6.3.4 Measurement result

Electrostatic Discharge (Test Point)

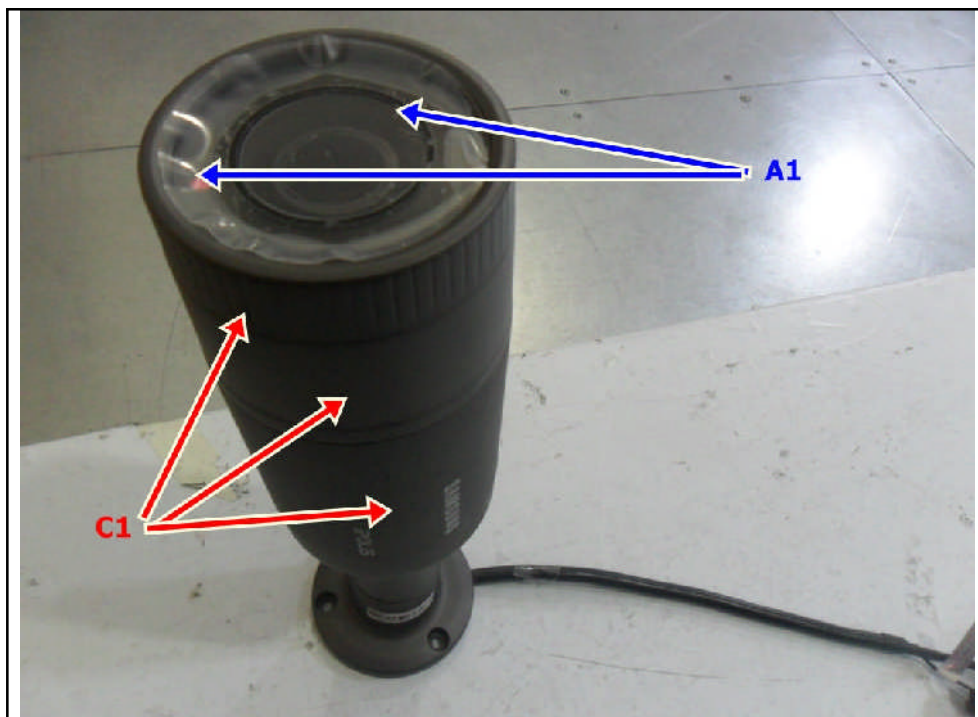
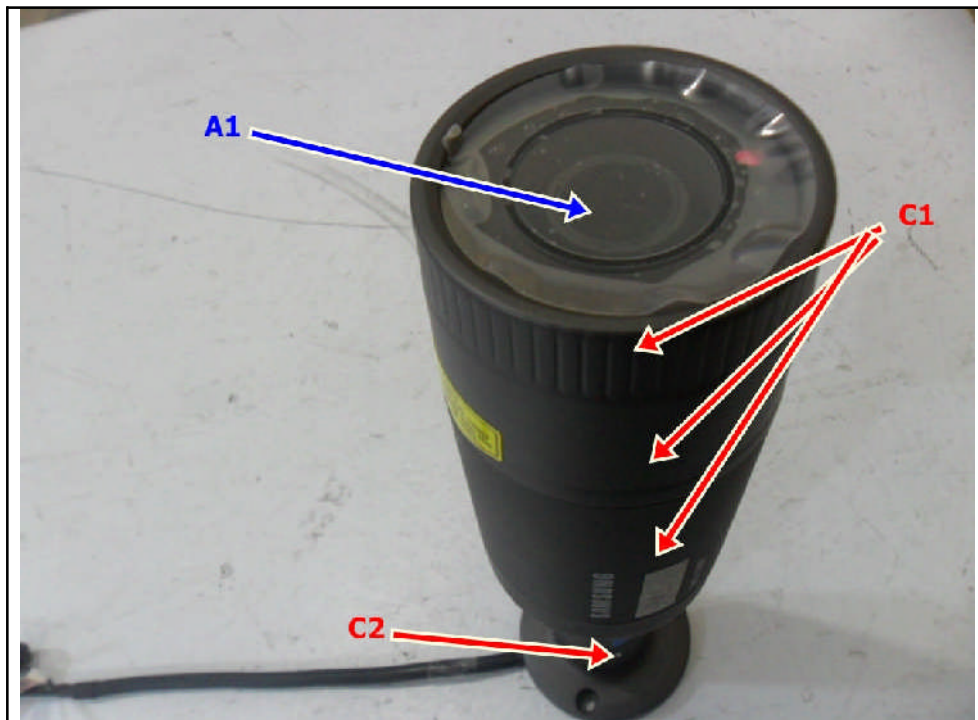
Air discharge	→
Contact discharge	→

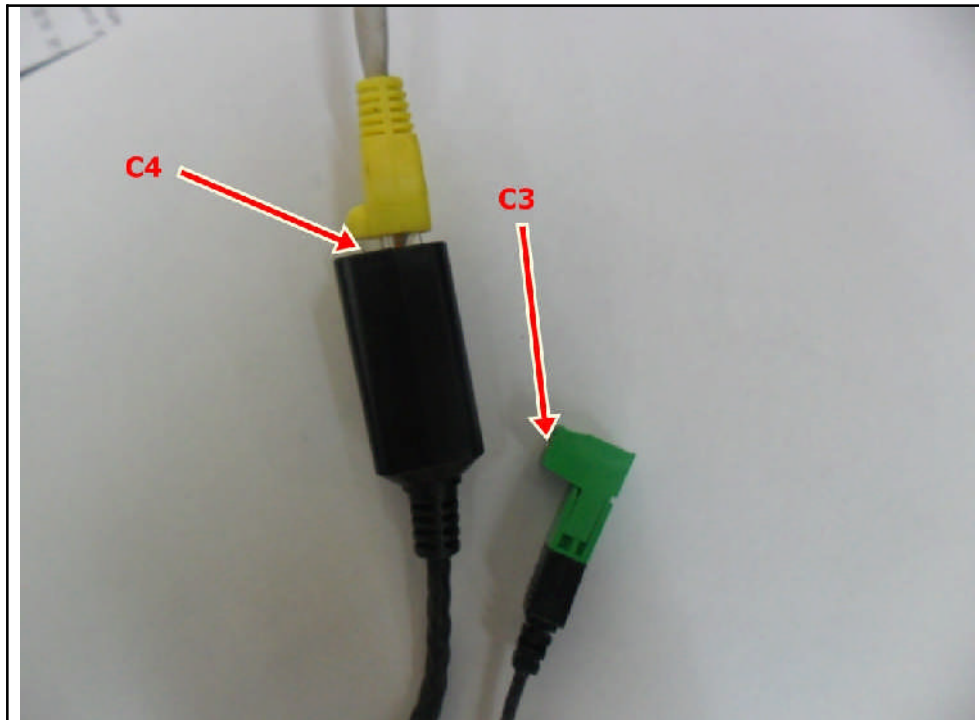
* DC 12 V





* PoE





* DC 12 V, PoE

Contact discharge

Location(EUT)		Applied level (±)	Result
C1	Case	± 2 kV, ± 4 kV, ± 6 kV	Complied
C2	Screw	± 2 kV, ± 4 kV, ± 6 kV	Complied
C3	Power Port	± 2 kV, ± 4 kV, ± 6 kV	Complied
C4	RJ-45 Port	± 2 kV, ± 4 kV, ± 6 kV	Complied
	VCP (All 4 sides)	± 2 kV, ± 4 kV, ± 6 kV	Complied

Air discharge

Location(EUT)		Applied level (±)	Result
A1	Lens	± 2 kV, ± 4 kV, ± 8 kV	Complied
A2	Alarm In/Out Port	± 2 kV, ± 4 kV, ± 8 kV	Complied

6.4 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006				
Tested frequency	80 MHz ~ 1 GHz, 1 GHz ~ 2 GHz log 1 % step				
Test level & Modulation	1, 3, 10 V/m, 80 % Amplitude Modulation (1 kHz) 1, 3, 10 V/m, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Distance	3 m from EUT to tip of antenna				
Dwell time	3 s				
Step size	log 1 % step				
Testing voltage	DC 12 V / PoE				
Date	2011. 11. 23				
Temperature(°C)	22 °C	Humidity (% R.H.)	27 % R.H.	Pressure (kPa)	101.3 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.4.1 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.

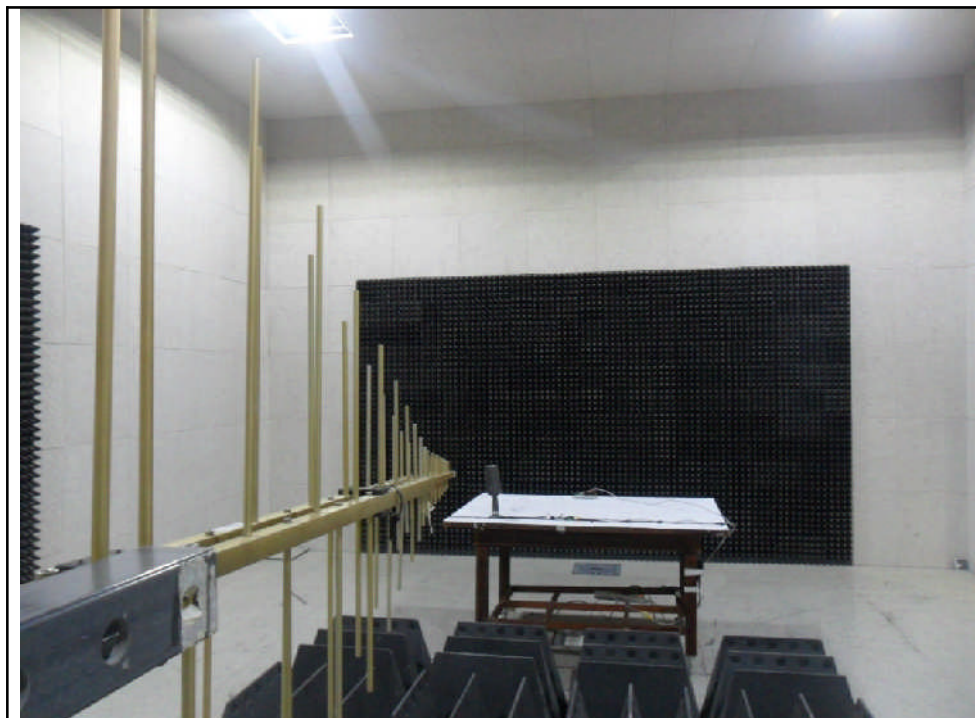
The EUT was tested all sides, horizontal and vertical polarization.

6.4.2 Used equipments

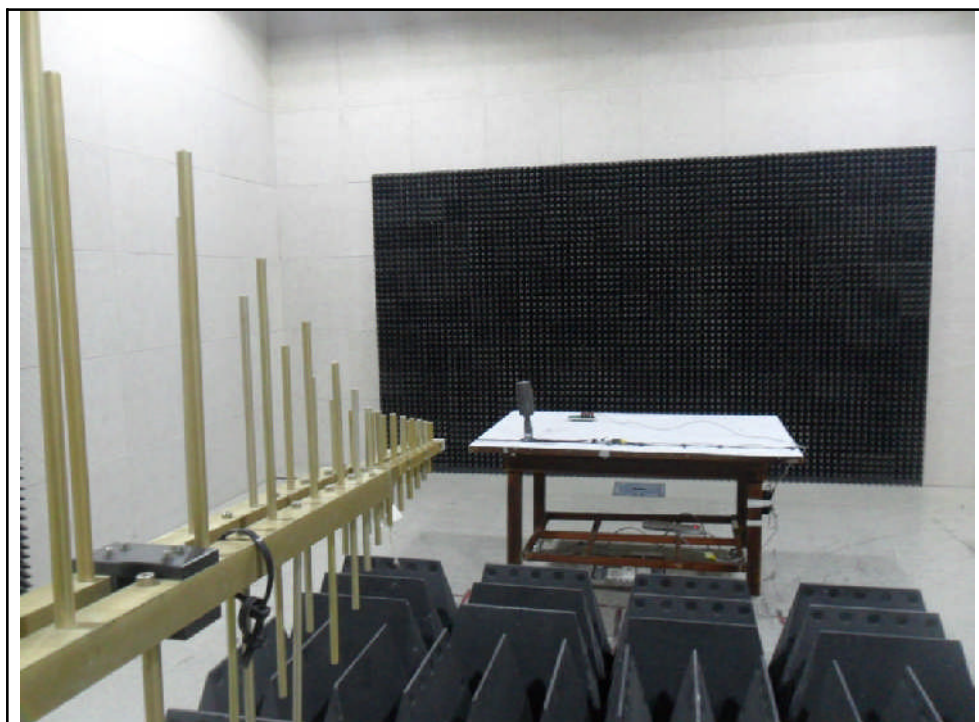
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	12.04.11	☒
Power sensor	PH2000	303224	AR	12.04.11	☒
Power sensor	PH2000	303222	AR	12.04.11	☒
Directional coupler	DC6180	303976	AR	12.04.11	☒
Directional coupler	DC7144M1	320279	AR	12.02.23	☒
Signal generator	E4421B	GB40052295	AGILENT	12.10.12	☒
Amplifier	150W1000M2	303843	AR	12.04.11	☒
Amplifier	60S1G3M2	320444	AR	12.04.11	☒
Broadband Ant.	LPDA-0803	130269	ETS	-	☒
Field monitor	SI-300	-	TDK	-	☒
Antenna master	-	-	ETS	-	☒

6.4.3 Photographs of test setup

* DC 12 V



* PoE



6.4.4 Measurement result

* DC 12 V, 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

6.5 Electric Fast Transient/BURST

Test specification	EN 61000-4-4:2004				
Coupling	DC 12 V Signal: Clamp Telecommunication: Clamp				
Test level	DC 12 V : ± 1 kV Peak Signal: ± 1 kV Peak Telecommunication: ± 1 kV Peak				
Repetition frequency	5 kHz, Tr/Th = 5 / 50 ns				
Coupling time	60 s				
Testing voltage	DC 12 V / PoE				
Date	2011. 11. 23				
Temperature(°C)	24 °C	Humidity (% R.H.)	28 % R.H.	Pressure (kPa)	101.3 kPa
Remarks	Complied DC Line, Telecommunication - During the test, flickering phenomenon happened, after this test, EUT was operated normally. Signal - There was no change of operation status during above testing.				

6.5.1 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.

6.5.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	0701-03	EM TEST	12.06.14	☒
Capacitive Coupling Clamp	-	-	EM TEST	-	☒

* DC 12 V (DC Line)



* DC 12 V (Signal, Telecommunication)



* PoE(Signal, Telecommunication)



6.5.4 Measurement result

*DC Line

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

* Signal (DC 12 V, PoE)

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

* Telecommunication (DC 12 V, PoE)

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

6.6 Surge

Test specification	EN 61000-4-5:2006				
Coupling	DC 12 V, Signal : CDN				
Test level	DC 12 V, Signal : ± 0.5 kV, ± 1 kV				
Surge pulse shape	Tr/Th = 1.2 / 50 μ s				
Coupling Impedance	DC 12 V, Signal: 40 Ω				
Number of surge & Coupling time	5 / 1 min				
Testing voltage	DC 12 V / PoE				
Date	2011. 11. 23				
Temperature(°C)	24 °C	Humidity (% R.H.)	28 % R.H.	Pressure (kPa)	101.3 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. 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.

6.6.2 Used equipments

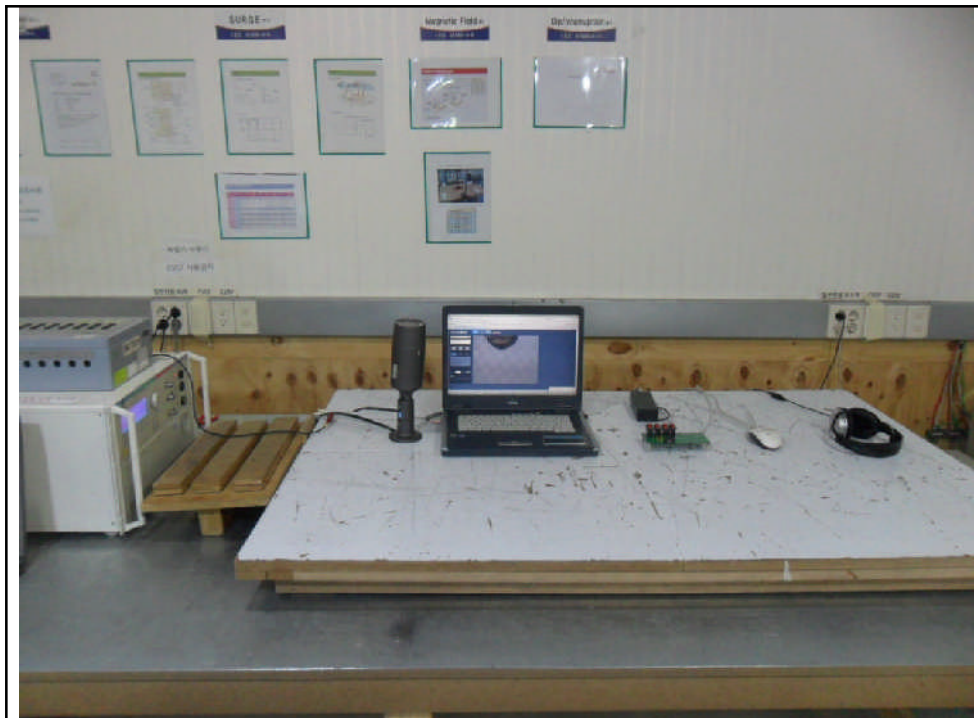
Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	0701-03	EM TEST	12.06.14	☒
CDN	CNV 508	1001-10	EM TEST	-	☒

6.6.3 Photographs of test setup

* DC 12 V (DC Line)



* DC 12 V (Signal)



* PoE(Signal)



6.6.4 Measurement result

* DC Line

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

* Signal (DC 12 V, PoE)

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

6.7 Conducted Immunity

Test specification	EN 61000-4-6:2007				
Tested frequency	0.15 MHz ~ 100 MHz log 1 % step				
Test level & Modulation	1, 3, 10 V, 80 % Amplitude Modulation (1 kHz) 1, 3, 10 V, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Coupling method	DC 12 V : CDN(M2) Signal: Clamp Telecommunication: Clamp				
Testing voltage	DC 12 V / PoE				
Date	2011. 11. 22				
Temperature(°C)	21 °C	Humidity (% R.H.)	24 % R.H.	Pressure (kPa)	102.0 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.

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.

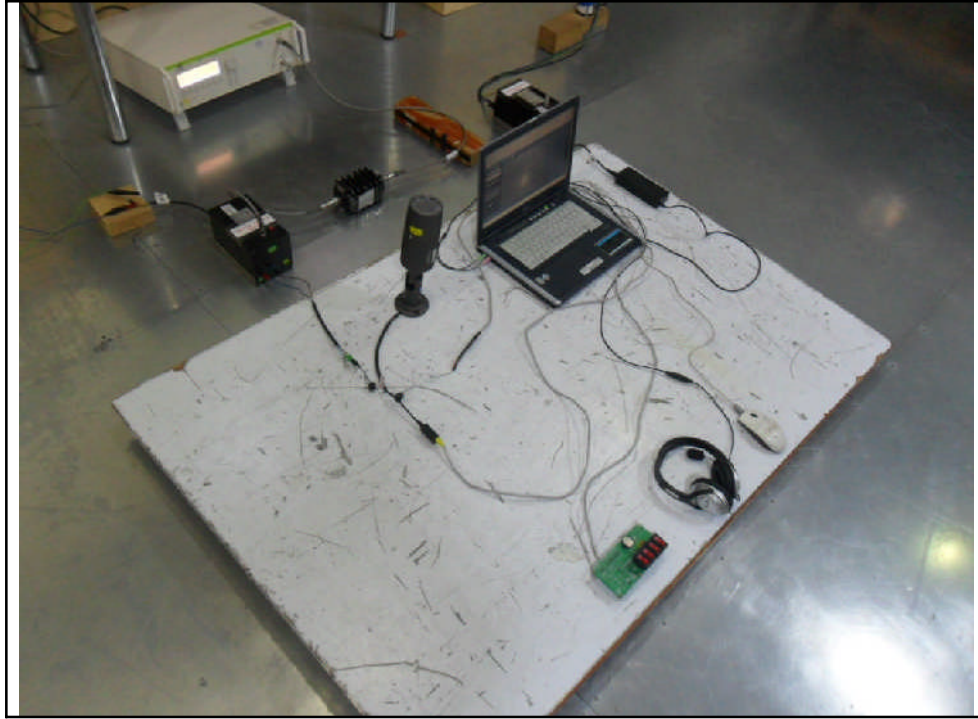
The power and all network cable, I/O cables longer than 3 m length were tested.

6.7.2 Used equipments

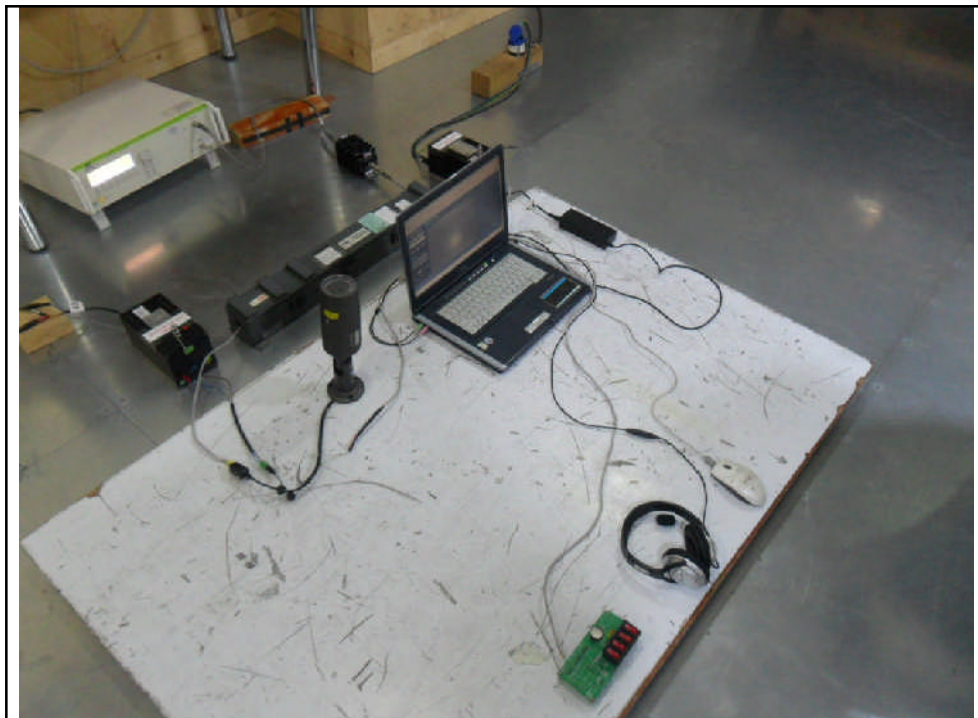
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	CWS 500 C S1	V0635101750	EM TEST	12.10.13	☒
CDN	CDN M2/M3	0906-12	EM TEST	12.10.12	☒
CDN	CDN M3-32A	0506-29	EM TEST	12.02.11	☒
Attenuator	73-6-34	MU918	MCE/WEINSCHTEL	12.10.13	☒
EM Clamp	KEMZ 801	17643	Schaffner	12.04.25	☒
Current probe	MD720	W1345167/M6/0068	Schaffner	-	☐

6.7.3 Photographs of test setup

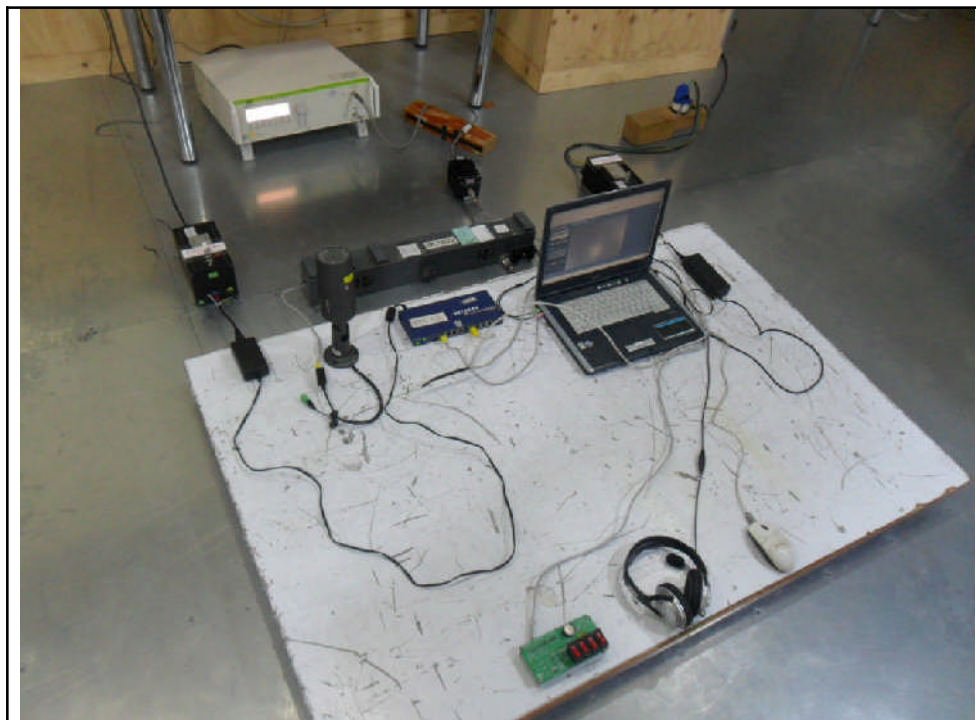
* DC 12 V (DC Line)



* DC 12 V (Signal, Telecommunication)



* PoE (Signal, Telecommunication)



6.7.4 Measurement result

* DC Line

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

* Signal (DC 12 V, PoE)

Coupling point	Coupling method	Result
Alarm In/Out	Clamp	Complied

* Telecommunication (DC 12 V, PoE)

Coupling point	Coupling method	Result
RJ-45	Clamp	Complied

7. E.U.T. photographs

Front View



Rear View



Left View



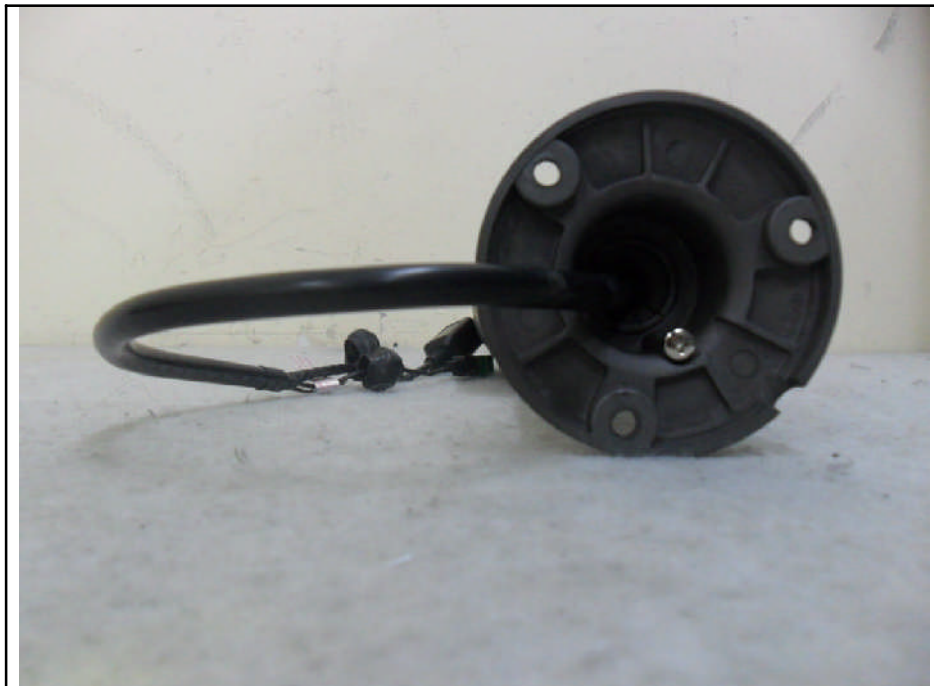
Right View



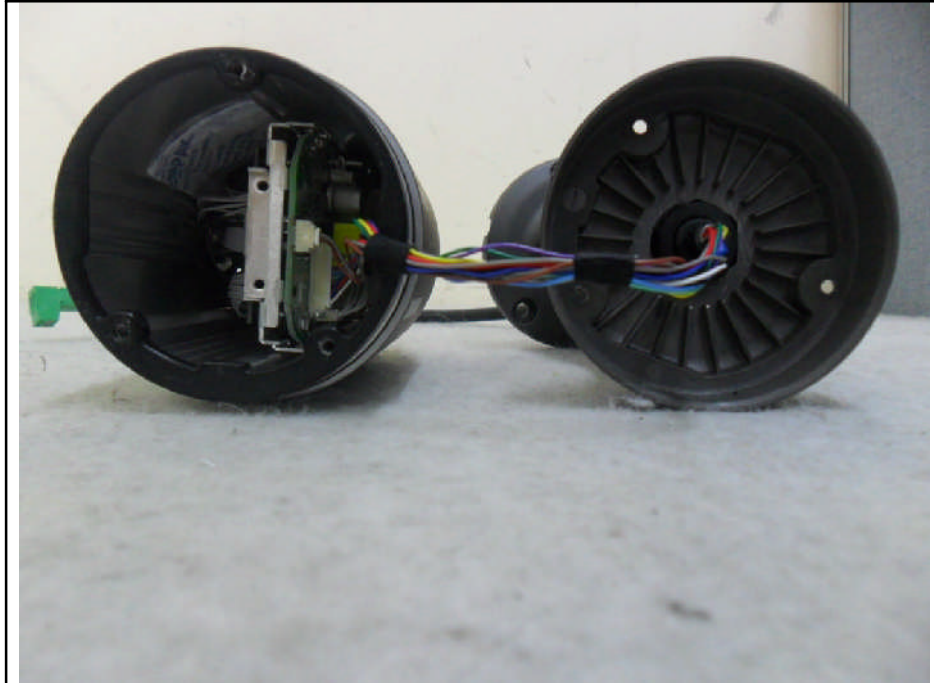
Top View



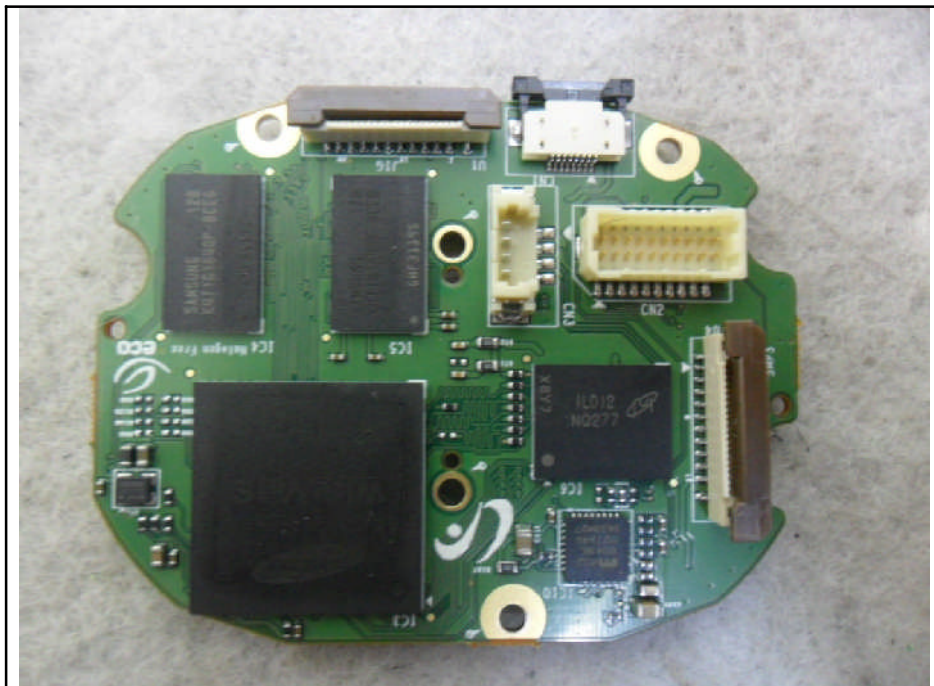
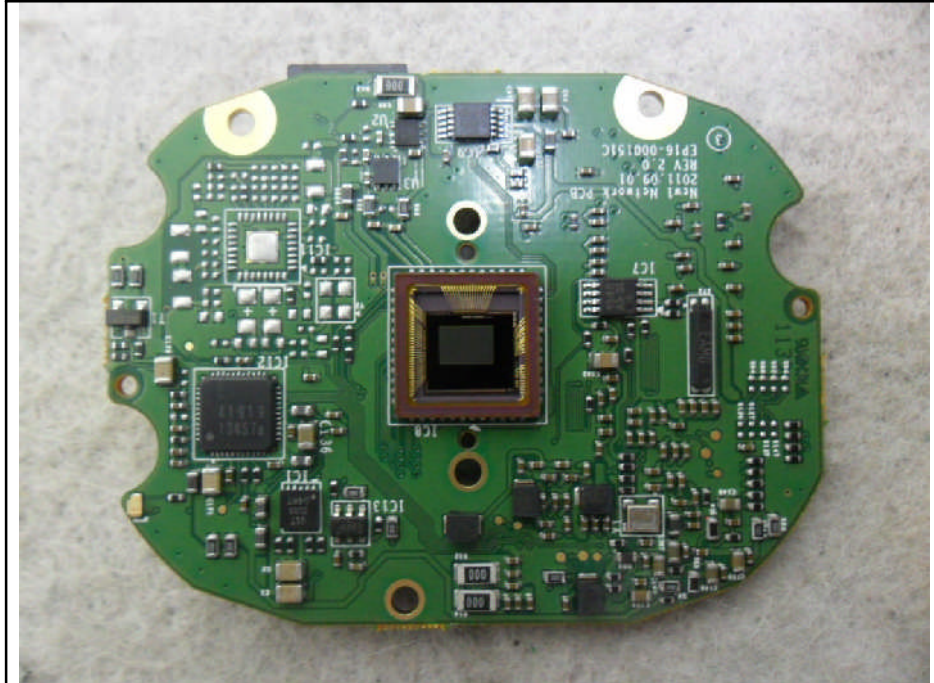
Bottom View



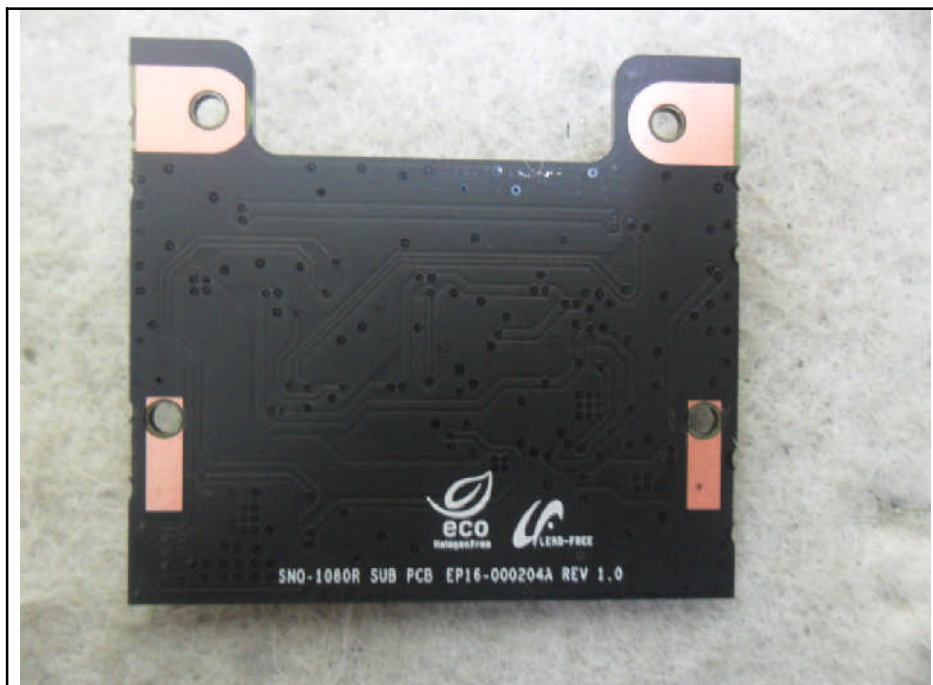
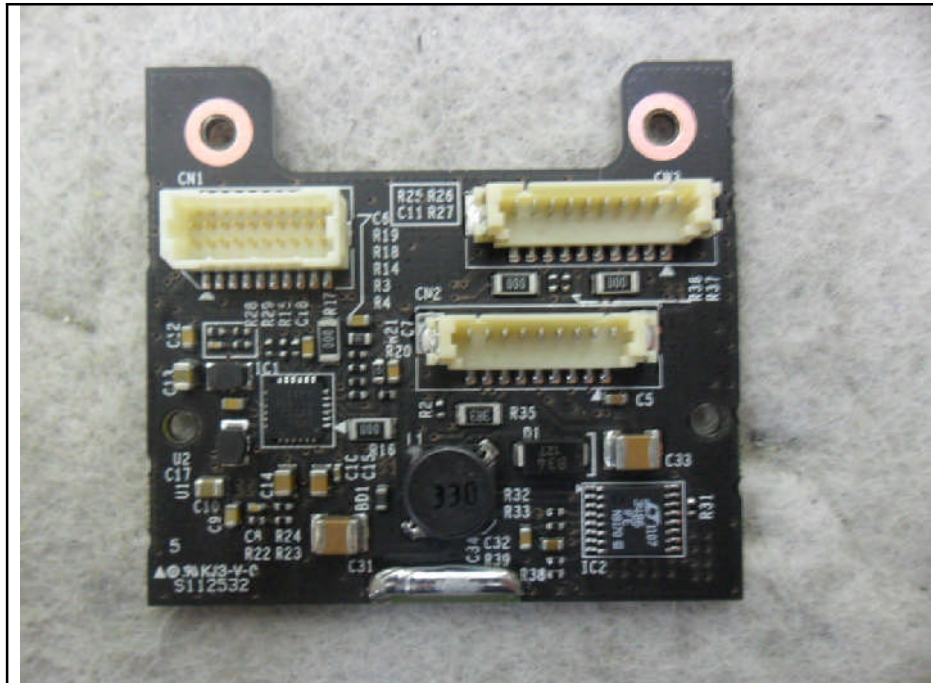
Inside



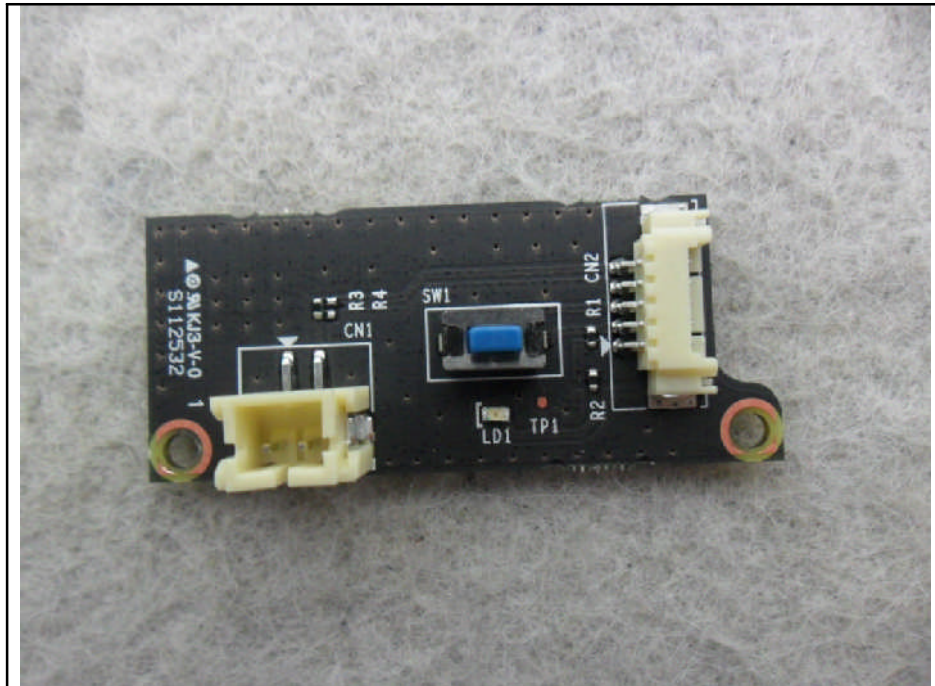
CCD Board



Camera SUB Board



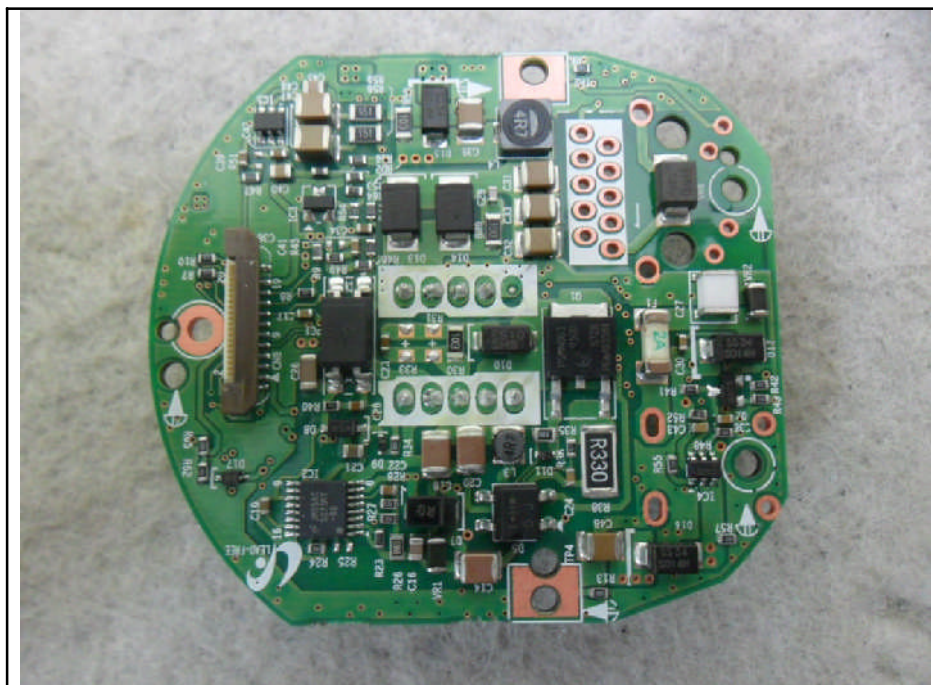
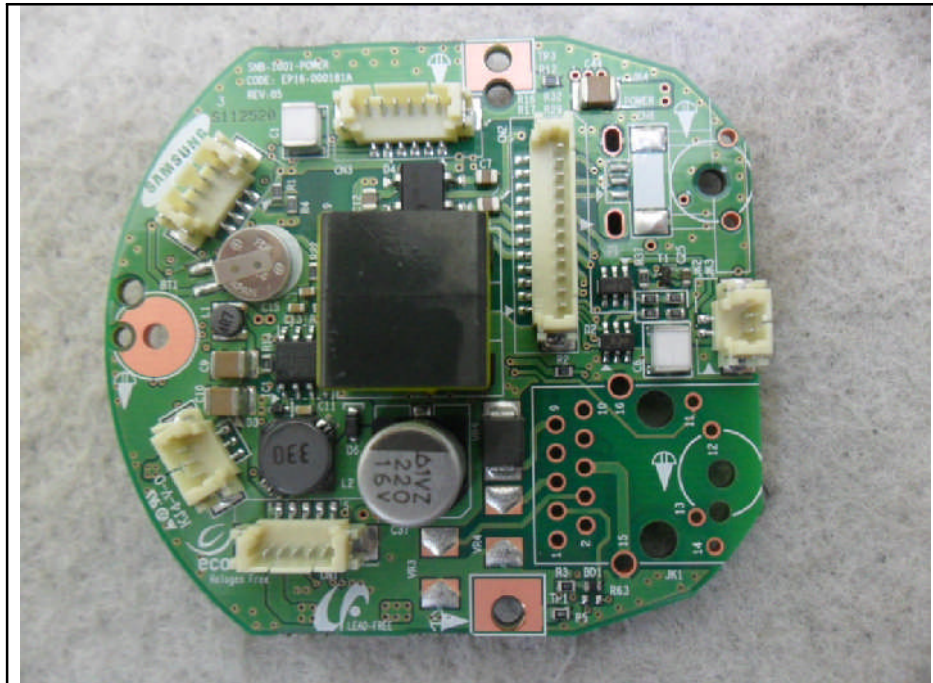
Interface Board



LED Board



Power Board



Adaptor

