

EMC TEST REPORT

Test report No : EMC-VCCI-0311
Type of Equipment : Network Camera
Model Name : SNP-6201HN
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 : VCCI V-3 / 2012.04, Class A
Testing Laboratory : EMC Compliance Ltd.
Test result : Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of VCCI Rules and Regulations.

The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of receipt: 2013. 07. 03

Date of testing: 2013. 07. 23

Issued date: 2013. 07. 29

Tested by:

JUNG, YOUNG-JUN

Approved by:

YEOM, HAN-SEOK

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1. Applicant information

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Manufacturer#2: TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
Address: No.11 Weiliu Road, Micro-Electronic Industrial Park
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2. Laboratory information

Address

EMC compliance Ltd.

480-5 Sin-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, 443-390, Korea

Telephone Number: 82 31 336 9919

Facsimile Number: 82 505 299 8311

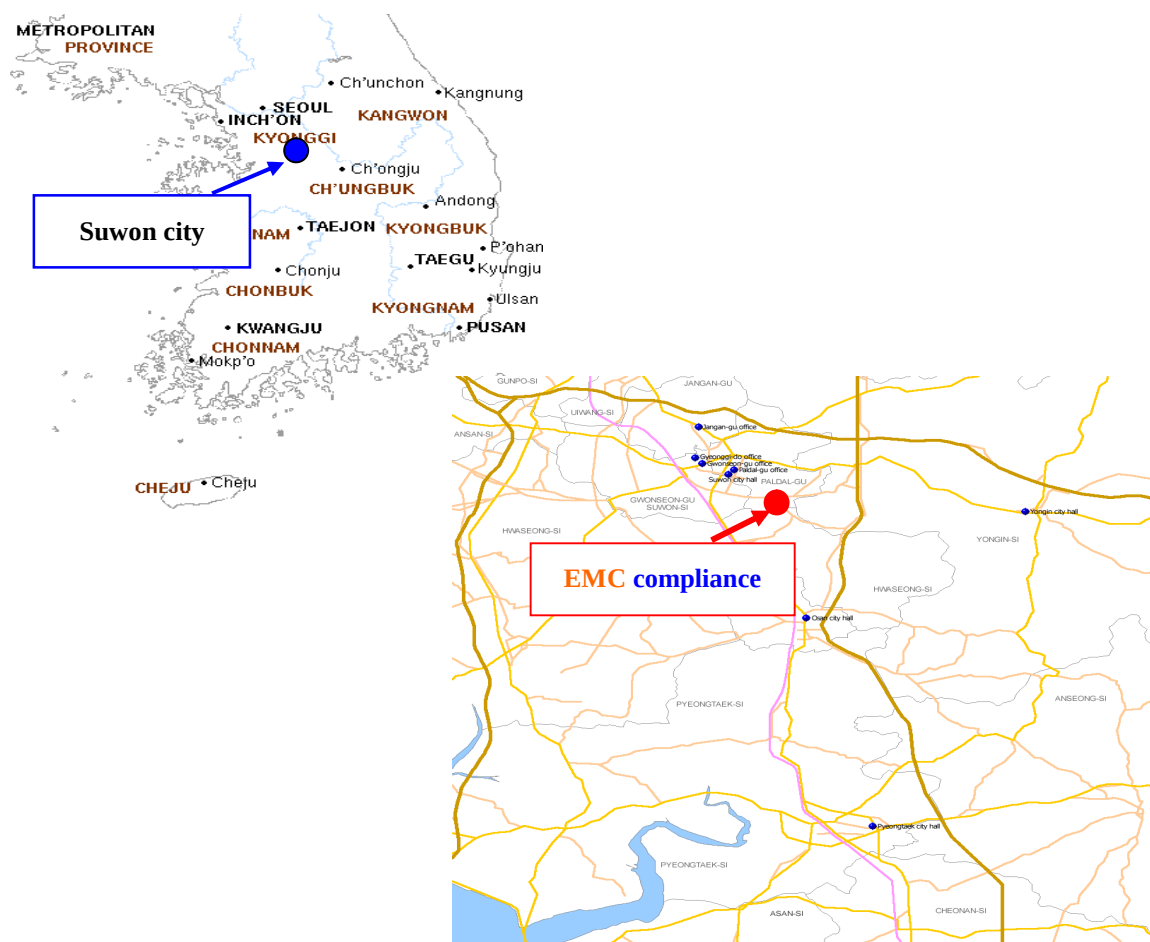
FCC CAB.: KR0040

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

Industry Canada Registration No.: 8035A

KOLAS NO.: 231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
Chamber(10 m)	: 24 °C	43 % R.H.	-
Shielded room(CE)	: 22 °C	46 % R.H.	-

Test site

These testing items were performed following locations;

Test item	Test site
Conducted Emission	Shielded Room
Radiated Emission	10 m Chamber

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
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 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
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 dB

4. Description of E.U.T.

4.1 General information

	SNP-6201N/HN	SNP-6201P/HP
Video		
Imaging Device	1/3-type PS CMOS (Panasonic MN34041)	
Total Pixels	2,010(H) x 1,108(V), 2.2M Pixels	
Effective Pixels	1,944(H) x 1,092(V), 2.1M Pixels	
Scanning System	Progressive Scan	
Min. Illumination	SNP-6201 : Color 1.5 Lux @ F1.6 (50IRE) B/W 0.1 Lux @ F1.6 (50IRE) SNP-6201H :Color 1.5 Lux @ F1.6 (50IRE) B/W 0.1 Lux @ F1.6 (50IRE)	
S / N Ratio	50dB	
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 704x480(N), 704x576(P), for installation	
Lens		
Focal Length (Zoom Ratio)	4.45 ~ 89mm (20X)	
Max. Aperture Ratio	F1.6(Wide) / F2.9(Tele)	
Angular Field of View	H : 63°(Wide) ~ 3.49°(Tele) / V : 37°(Wide) ~ 1.99°(Tele)	
Min. Object Distance	INDOOR	OUTDOOR
	1m (3.28ft)	1m (3.28ft)
Focus Control	AF / One-Shot AF / Manual	
Lens Type	DC Auto Iris	
Mount Type	Board-in type	
Pan / Tilt / Rotate		
Pan Range	360° Endless	
Pan Speed	Preset : 500°/sec, Manual : 0.024°/sec ~ 120°/sec	
Tilt Range	210°(-15° ~ 195°)	
Tilt Speed	Preset : 500°/sec, Manual : 0.024°/sec ~ 120°/sec	
Rotate Range	-	
Preset	255ea	
Preset Accuracy	±0.2°	
Auto Tracking	N/A	

Operational		
Camera Title	Off / On (Displayed up to 15 characters)	
Day & Night	Auto (ICR) / Color / B/W	
Backlight Compensation	Off / BLC / WDR / HLC	
Wide Dynamic Range	128X (60dB)	
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)	
Digital Noise Reduction	SSNRIII (2D+3D Noise Filter) (Off / On)	
Digital Image Stabilization	Off / On	
Motion Detection	Yes (4EA)	
Privacy Masking	Off / On (12 Rectangle zones)	
Sens-up (Frame Integration)	Off / Auto (2X ~ 60X)	
Gain Control	Off / Low / Medium / High / Manual	
White Balance	AWC, Manual, Indoor, Outdoor, ATW (2,400°K ~ 10,500°K)	
Electronic Shutter Speed	ESC / FLK / Manual (1/30 ~ 1/33,000)	ESC / FLK / Manual (1/30 ~ 1/33,000)
Digital Zoom	8X	
Flip / Mirror	Off / On	
Intelligent Video Analytics	Tampering(Scene Change), Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection(5ea)	
Tracking Module	-	
Schedule	-	
Alarm I/O	Input 4ea / Output 2ea	
Remote Control Interface	RS-485/422	
RS-485 Protocol	Samsung-T/E, Pelco-D/P, Panasonic, Honeywell, AD, Vicon, GE, BOSCH	
Alarm Triggers	Alarm Input, Motion Detection, Intelligent Video Analytics, Network Disconnect	
Alarm events	• File upload via FTP, E-Mail • Notification via E-Mail, TCP and • local storage(SD/SDHC) recording at Network disconnected • External output • PTZ preset	

Network		
Ethernet	RJ-45 (10/100BASE-T)	
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG	
Resolution	1920x1080P(Full HD), SXGA (1280 x 1024), 1280 x 960, HD (16 : 9, 1280 x 720p), 1024 x 768, SVGA (800 x 600), VGA (640 x 480), QVGA (320 x 240)	
Max. Framerate	Max 30fps at all resolutions * When WDR ON, Max. framerate is Max 15fps.	
Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control	
Bitrate Control Method	H.264 : CBR or VBR, Motion JPEG : VBR	
Streaming Capability	Multiple Streaming (Up to 10 Profiles)	
Audio I/O	Mic(Line)-in Selectable via UI, Line-out (Mono, 1Vrms)	
Audio Compression Format	G.711 u-law, G.726	
Audio Communication	Bi-directional (2-Way)	
IP	IPv4, 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, PIM-SM, UPnP	
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	SD/SDHC Memory Slot	
ONVIF Conformance	Yes(v.2.1)	

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 *Apple Safari, Windows Internet Explorer 9.0(32bit)/8.0(32bit)/7.0(32bit) *For Mac OS X, only the Safari browser is supported.
Central Management Software	Smart Viewer
Environmental	
Operating Temperature / Humidity	SNP-6201 : -10°C ~ +55°C (+14°F ~ +131°F) / 20% ~ 80% RH SNP-6201H : AC24V Mode : -50°C ~ +55°C (-58°F ~ +131°F) / ~ 90% RH PoE+ Mode : -30°C ~ +55°C (-22°F ~ +131°F) / ~ 90% RH
Ingress Protection	IP66 (SNP-6201H only)
Vandal Resistance	SNP-6201 only (When SNP-6201 + SHP-3701H : IK10 Accessory Housing)
Electrical	
Input Voltage / Current	24V AC, PoE+ (IEEE802.3at)
Power Consumption	SNP-6201 : 15W(AC24V), 13W(PoE+) SNP-6201H : 15W(AC24/PoE+, Heater Off), 53W(AC24V Heater On), 25W(PoE+ Heater On)
Mechanical	
Color / Material	SNP-6201 : Ivory / Plastic SNP-6201H : Ivory / Aluminum / Plastic Sun-Shield
Dimension (WxHxD)	SNP-6201 : H218 x Ø152 mm SNP-6201H : H293.6 x Ø220 mm
Weight	SNP-6201 : 1.8kg SNP-6201H : 3.2kg

4.2 Product description

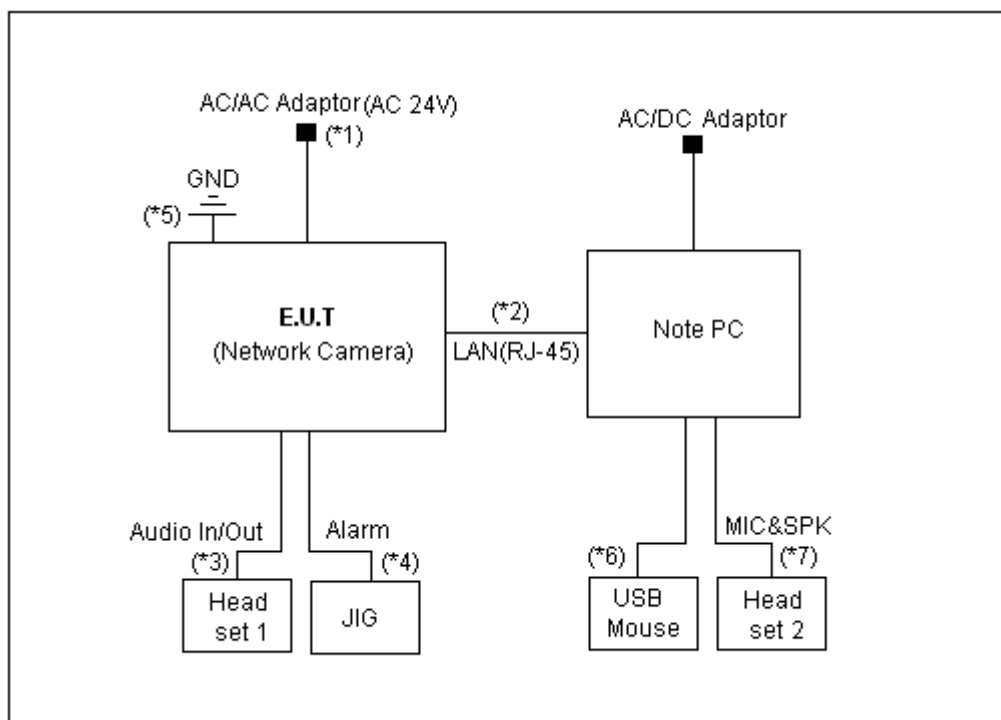
Type of product	Network Camera
Model name (Basic)	SNP-6201HN
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	AC 24 V , PoE
Product rating	AC 24 V , PoE
Internal clock frequency	Above 108 Mhz
Note	* AC/AC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	PSLQ0K-02N005	2A078516Q	TOSHIBA
USB Mouse	1088	8165900106545	Microsoft
Headset#1	SHS-250V	-	SAMSUNG
Headset#2	SHS-250V	-	SAMSUNG
JIG	-	-	-
AC/AC Adaptor (AC 24V)	STA-220	-	Dream Electronics
PoE Switch	MHPSE-01	-	-

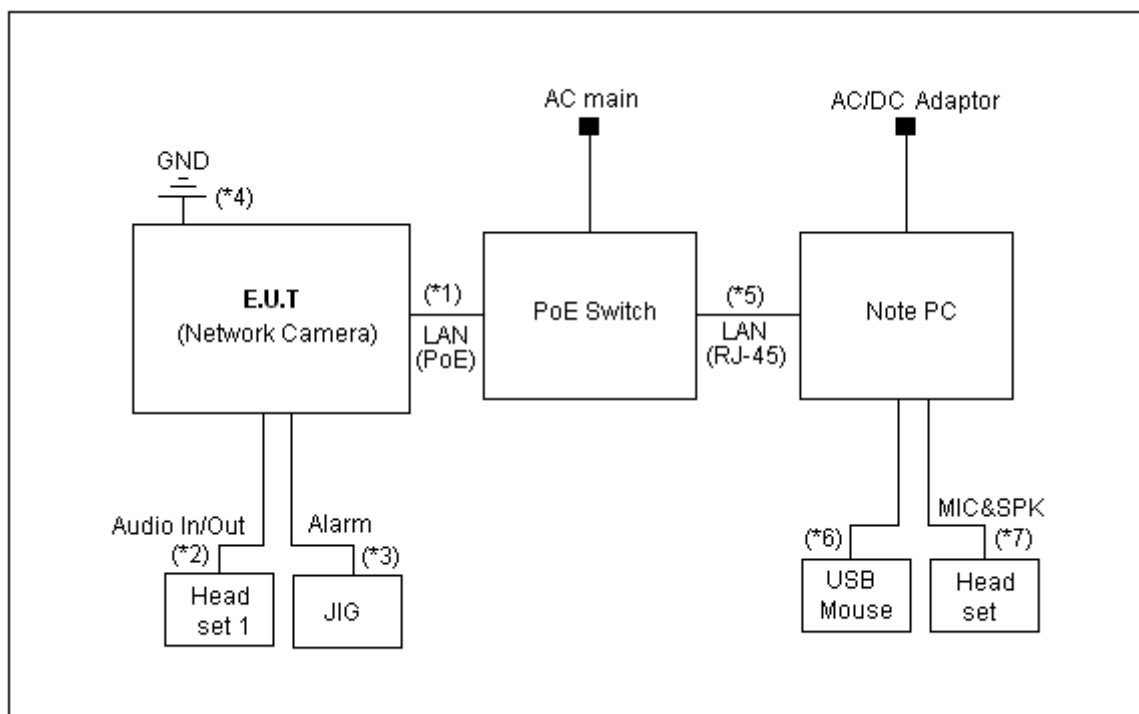
4.4 Test configuration

#1- AC 24V



Note *	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT (Network Camera)	Power	AC/AC 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
4		Alarm	JIG	Alarm	3.0	Non-Shield
5		GND	GND	GND	1.2	-
6	Note PC	USB	USB Mouse	USB	1.8	Shield
7		MIC&SPK	Headset 2	MIC&SPK	2.0	Non-Shield

#2- PoE



* Power supplied from PoE Switch

Note *	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
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
3		Alarm	JIG	Alarm	3.0	Non-Shield
4		GND	GND	GND	1.2	-
5	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	3.0	Non-Shield
6		USB	USB Mouse	USB	1.8	Shield
7		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 test
	Audio In/Out test.

* Note: 2 types of powers are available for the product, that are AC 24 V, PoE.

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

5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
☒	Conducted Emission	VCCI V-3 / 2012.04, Class A	Complied
☒	Radiated Emission	VCCI V-3 / 2012.04, Class A	Complied

6. Test results

6.1 Conducted Emission

Test specification	VCCI V-3 / 2012.04, Class A		
Testing voltage	AC 24 V, PoE		
Test facility	Shielded room (CE#1)		
Date	2013. 07. 23		
Temperature (°C)	22 °C	Humidity (% R.H.)	46 % R.H.
Remarks	Complied		

6.1.1 Limits of conducted emission measurement

☐ AC main

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

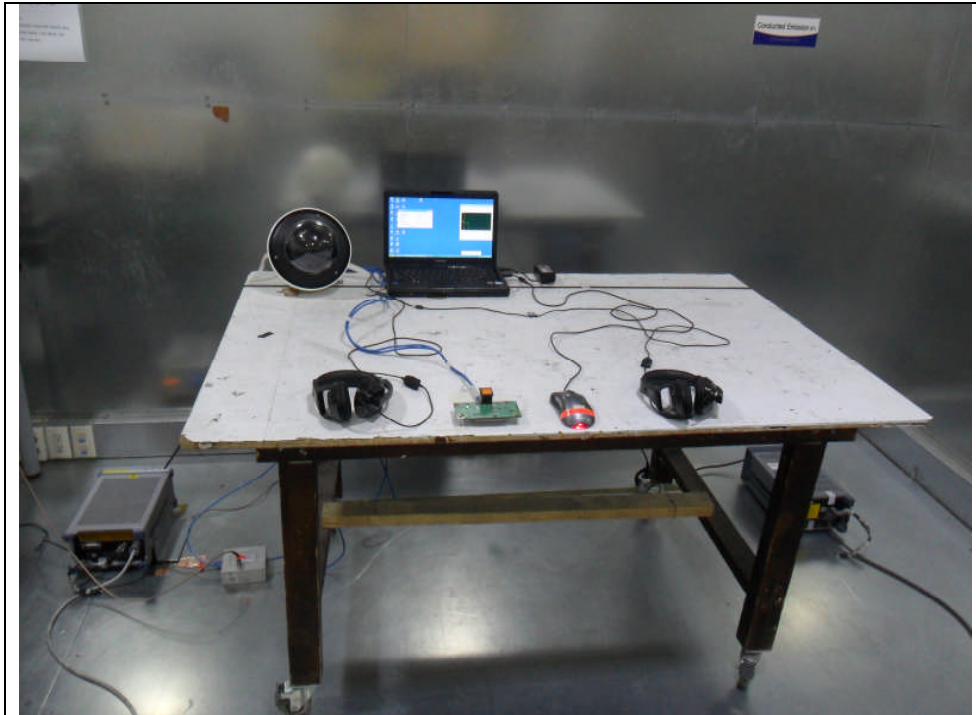
6.1.3 Used equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESHS30	828765/009	R&S	2013.10.22	☐
Test Receiver	ESCI7	100732	R&S	2014.02.18	☐
Test Receiver	ESCI	100001	R&S	2014.07.25	☐
Test Receiver	ESCI	100710	R&S	2013.11.06	☒
LISN	ENV216	101358	R&S	2013.10.22	☒
LISN	ESH3-Z5	100267	R&S	2014.07.08	☒
8-WIRE ISN	NTFM 8158 CAT5	CAT5-8158-0048	SCHWARZBECK	2013.10.30	☒
8-WIRE ISN	NTFM 8158 CAT3	CAT3-8158-0033	SCHWARZBECK	2013.10.30	☒
ISN	ST08	24342	TESEQ	2014.06.21	☐
ISN	ENY81	101545	R&S	2013.08.29	☐

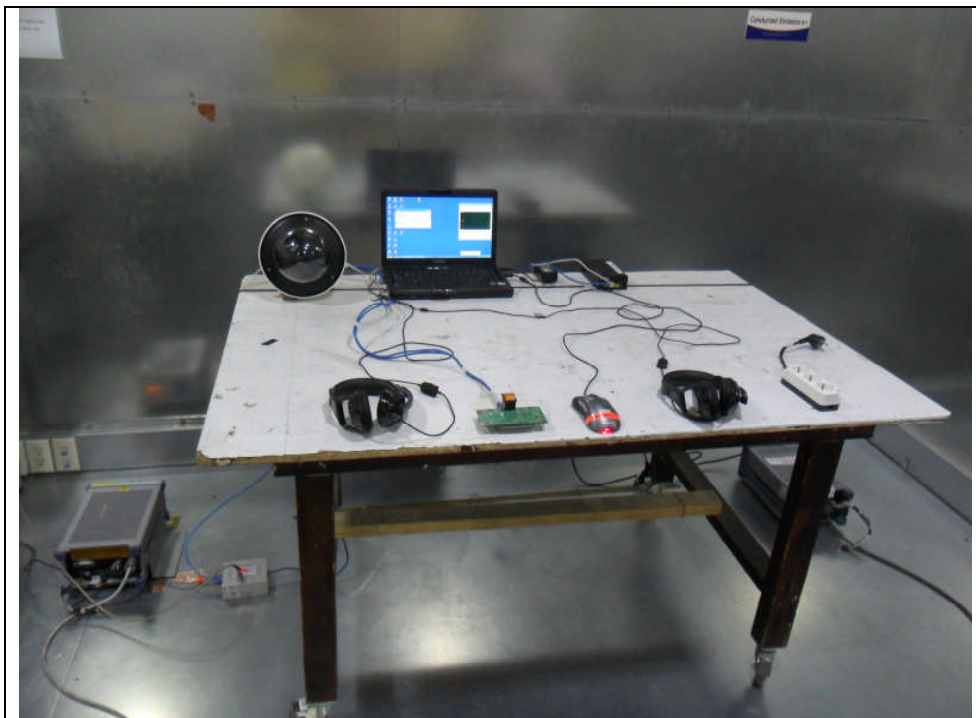
6.1.4 Photographs of test setup

* Telecommunication

#1- AC 24V



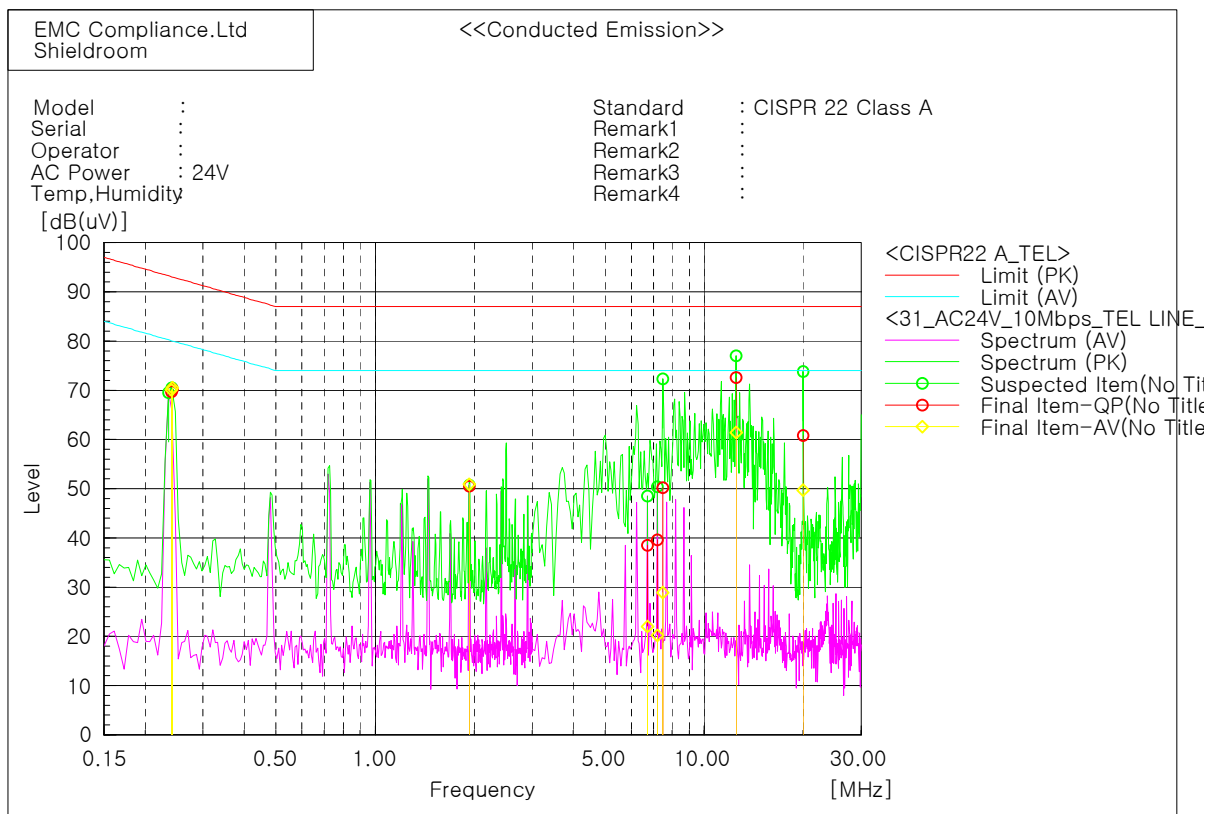
#2-PoE



6.1.5 Conducted emission measurement result

* Telecommunication port

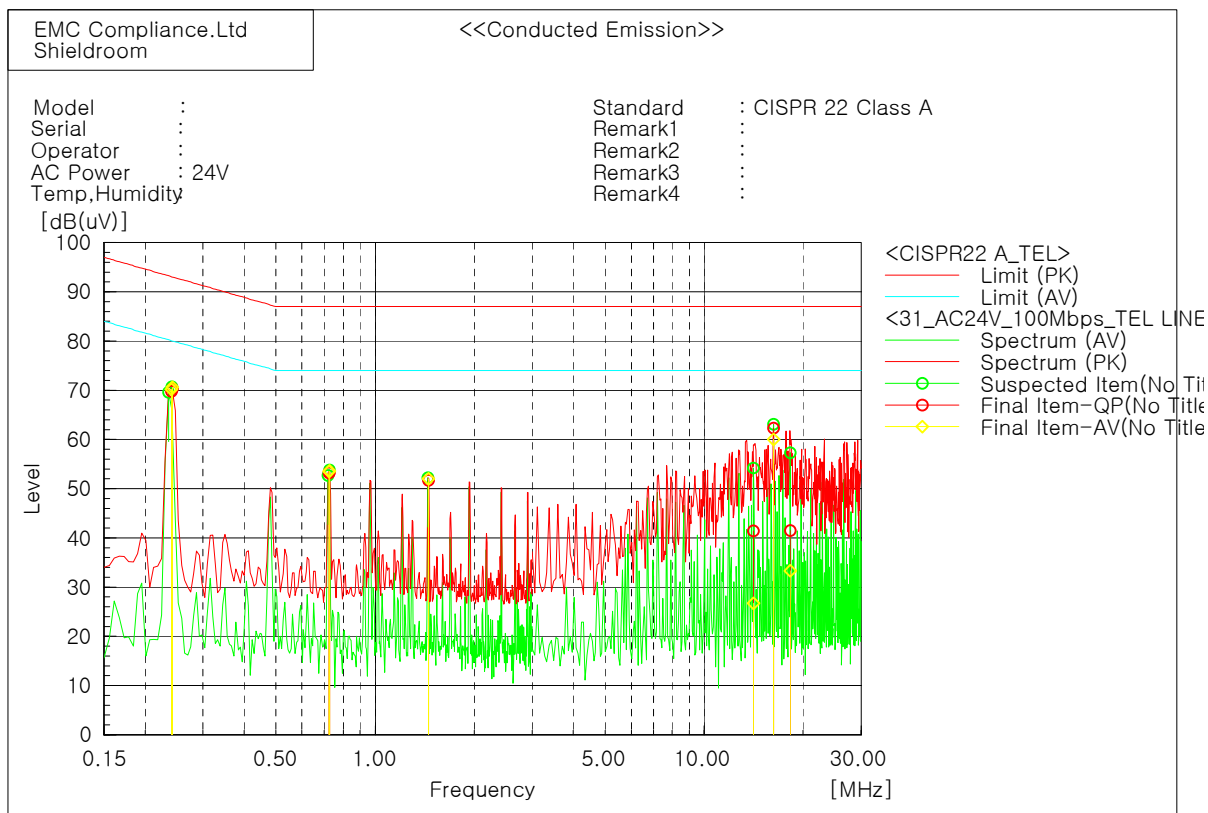
#1- AC 24V _ LAN Port (LCL 55 dB)_10 Mbps(SNP-6201HN)



Final Result

ISN-CAT3 Phase										
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.2405	59.4	59.8	10.3	69.7	70.1	93.1	80.1	23.4	10.0
2	0.24188	59.9	60.2	10.3	70.2	70.5	93.0	80.0	22.8	9.5
3	1.93542	40.6	41.0	9.9	50.5	50.9	87.0	74.0	36.5	23.1
4	6.73026	28.8	12.3	9.7	38.5	22.0	87.0	74.0	48.5	52.0
5	7.20954	29.9	10.5	9.7	39.6	20.2	87.0	74.0	47.4	53.8
6	7.48662	40.5	19.2	9.7	50.2	28.9	87.0	74.0	36.8	45.1
7	12.49912	62.9	51.7	9.7	72.6	61.4	87.0	74.0	14.4	12.6
8	20.005	51.1	40.0	9.7	60.8	49.7	87.0	74.0	26.2	24.3

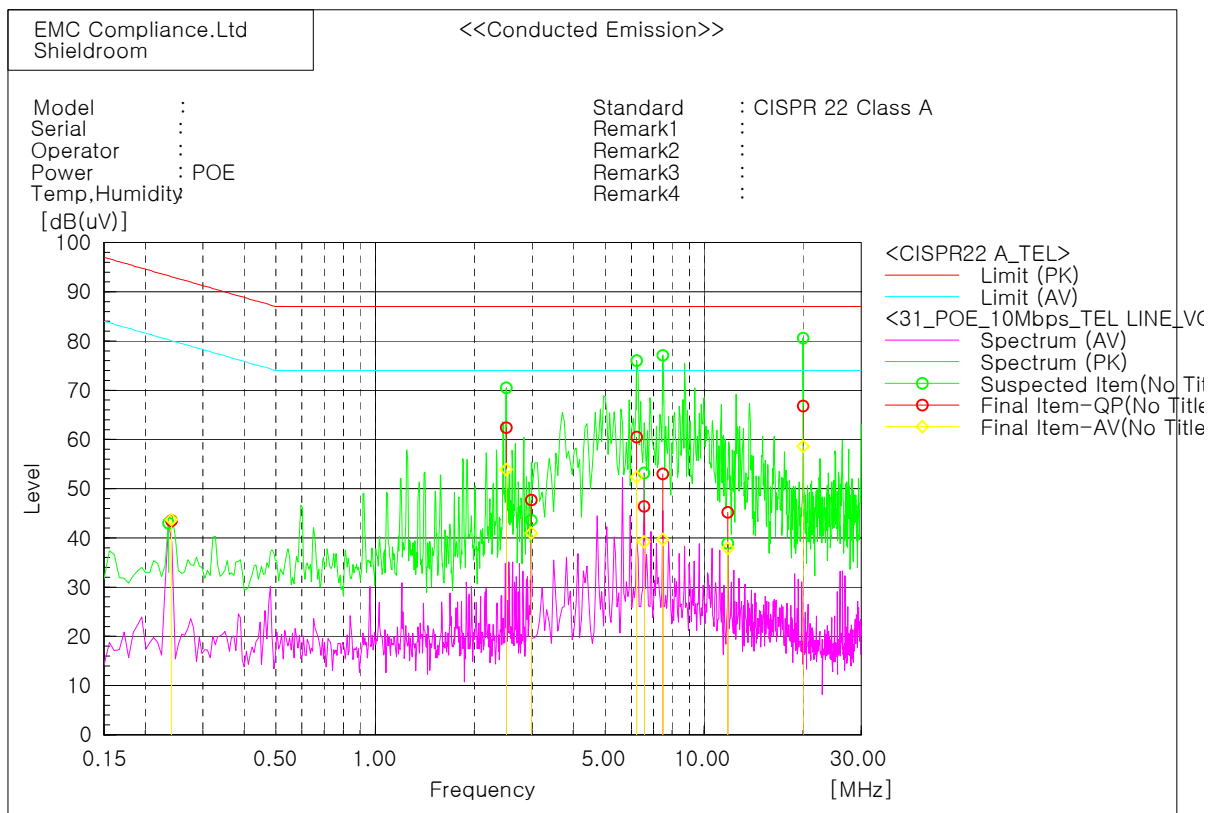
#1- AC 24V _ LAN Port (LCL 65 dB)_100 Mbps(SNP-6201HN)



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	0.2405	59.6	60.0	10.2	69.8	70.2	93.1	80.1	23.3	9.9
2	0.24172	60.1	60.4	10.2	70.3	70.6	93.0	80.0	22.7	9.4
3	0.72484	43.3	43.6	9.9	53.2	53.5	87.0	74.0	33.8	20.5
4	0.72548	43.4	43.7	9.9	53.3	53.6	87.0	74.0	33.7	20.4
5	1.45098	41.9	42.2	9.8	51.7	52.0	87.0	74.0	35.3	22.0
6	14.12534	31.7	17.0	9.7	41.4	26.7	87.0	74.0	45.6	47.3
7	16.2281	52.6	50.3	9.7	62.3	60.0	87.0	74.0	24.7	14.0
8	18.2781	31.8	23.6	9.7	41.5	33.3	87.0	74.0	45.5	40.7

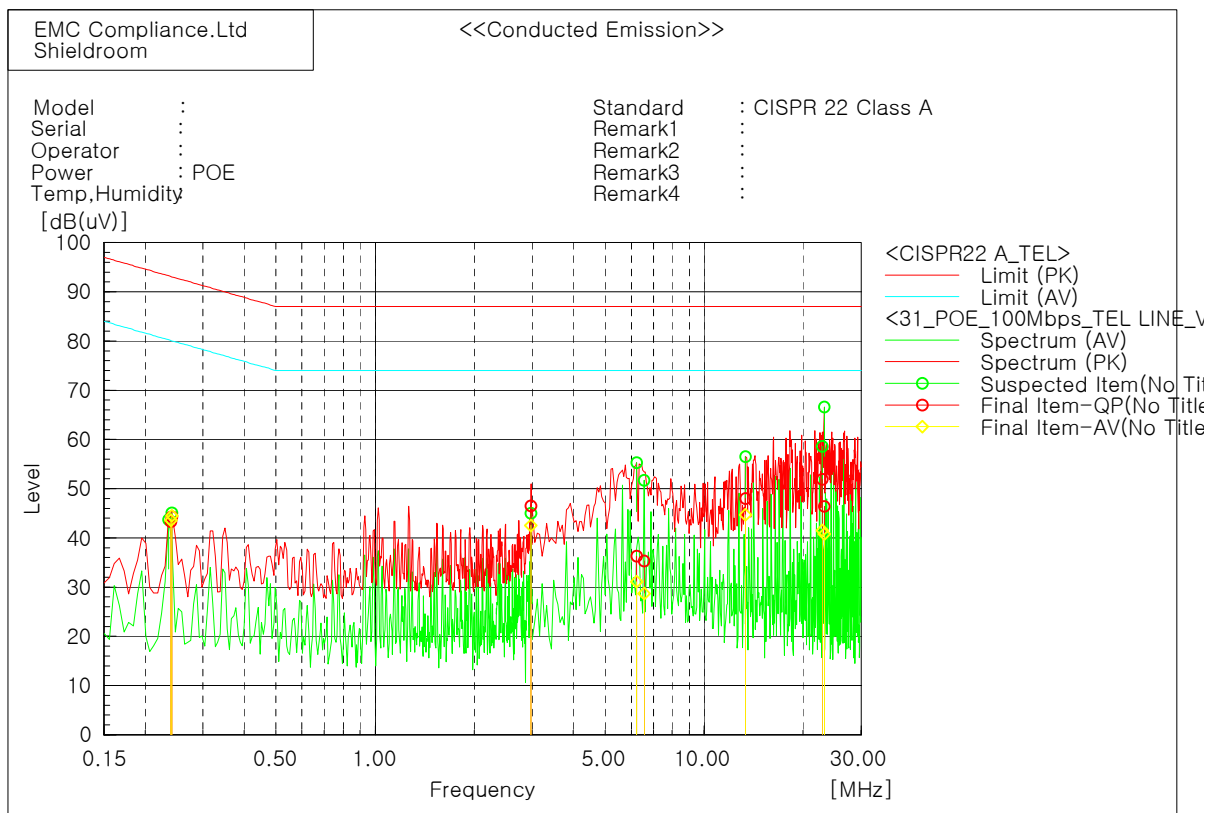
#2- PoE _ LAN Port (LCL 55 dB)_10 Mbps(SNP-6201HN)



Final Result

--- ISN-CAT3 Phase ---										
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.24048	33.2	33.4	10.3	43.5	43.7	93.1	80.1	49.6	36.4
2	2.49958	52.6	44.1	9.8	62.4	53.9	87.0	74.0	24.6	20.1
3	2.9878	37.9	31.2	9.8	47.7	41.0	87.0	74.0	39.3	33.0
4	6.245	50.8	42.7	9.7	60.5	52.4	87.0	74.0	26.5	21.6
5	6.569	36.7	29.5	9.7	46.4	39.2	87.0	74.0	40.6	34.8
6	7.48682	43.3	30.0	9.7	53.0	39.7	87.0	74.0	34.0	34.3
7	11.79722	35.5	28.2	9.7	45.2	37.9	87.0	74.0	41.8	36.1
8	20.005	57.1	48.9	9.7	66.8	58.6	87.0	74.0	20.2	15.4

#2- PoE _ LAN Port (LCL 65 dB)_100 Mbps(SNP-6201HN)



Final Result

--- ISN-CAT5 Phase ---										
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.23978	33.1	33.4	10.2	43.3	43.6	93.1	80.1	49.8	36.5
2	0.2416	34.1	34.3	10.2	44.3	44.5	93.0	80.0	48.7	35.5
3	2.97448	36.7	32.7	9.8	46.5	42.5	87.0	74.0	40.5	31.5
4	6.24344	26.6	21.4	9.7	36.3	31.1	87.0	74.0	50.7	42.9
5	6.56634	25.6	19.0	9.7	35.3	28.7	87.0	74.0	51.7	45.3
6	13.36304	38.3	35.0	9.7	48.0	44.7	87.0	74.0	39.0	29.3
7	22.87572	42.2	31.8	9.7	51.9	41.5	87.0	74.0	35.1	32.5
8	23.1372	36.7	31.1	9.7	46.4	40.8	87.0	74.0	40.6	33.2

6.2 Radiated Emission

Test specification	VCCI V-3 / 2012.04, Class A		
Testing voltage	AC 24 V, PoE		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2013. 07. 23		
Temperature (°C)	24 °C	Humidity (% R.H.)	43 % 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 ~ 1000	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	☒
Test Receiver	ESCI	100001	R&S	2014.07.25	☐
Test Receiver	ESCI	100710	R&S	2013.11.06	☐
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2013.10.04	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2013.11.06	☒
3 dB Attenuator	8491B	22981	HP	2014.03.19	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A02343	AGILENT	2013.11.06	☒
Horn ANT	3115	00086706	ETS	2013.11.21	☒
Spectrum Analyzer	FSP7	100289	R&S	2013.12.14	☐

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

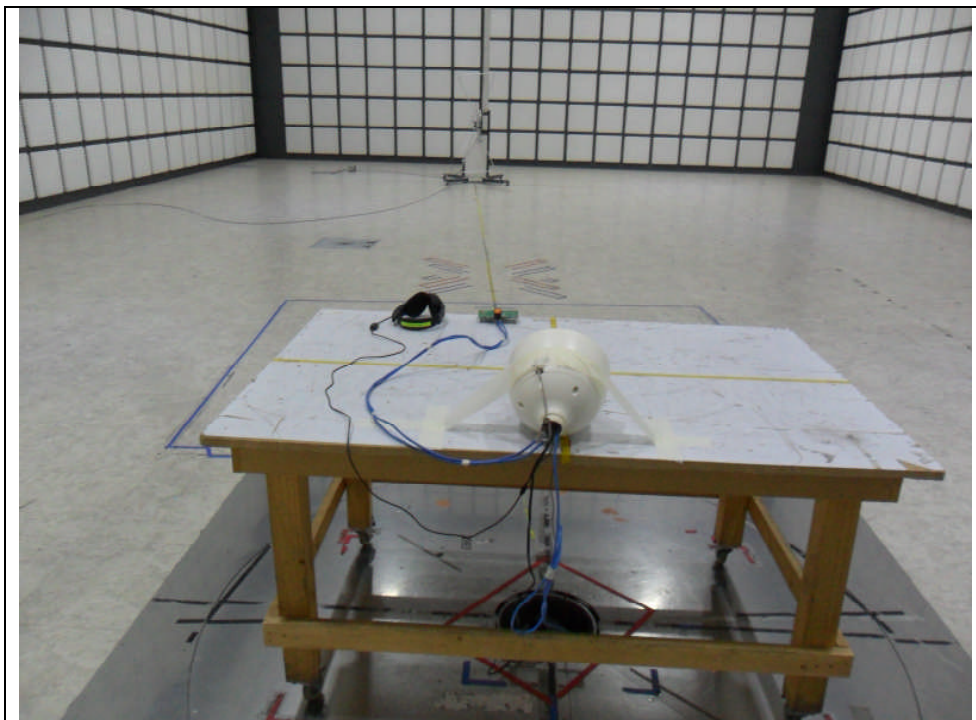
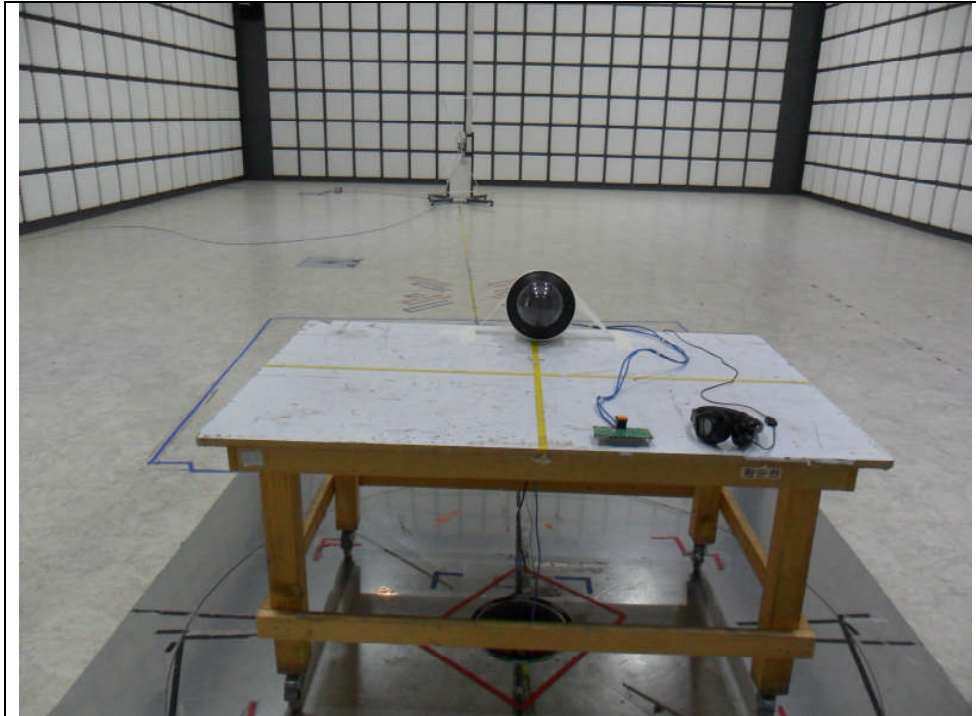
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

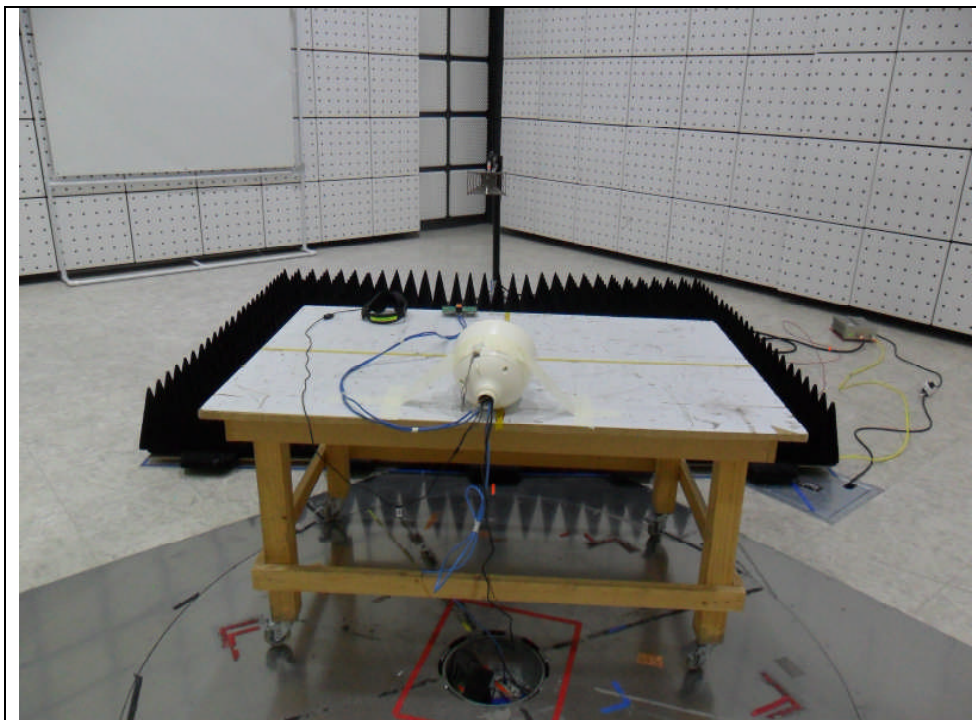
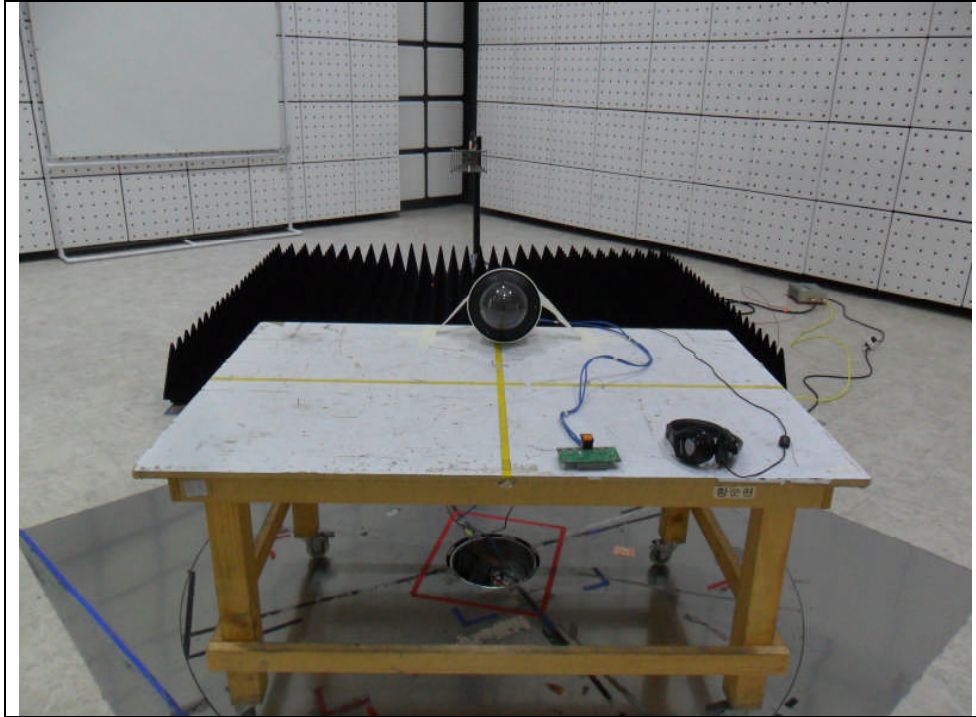
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$$

6.2.5 Photographs of test setup

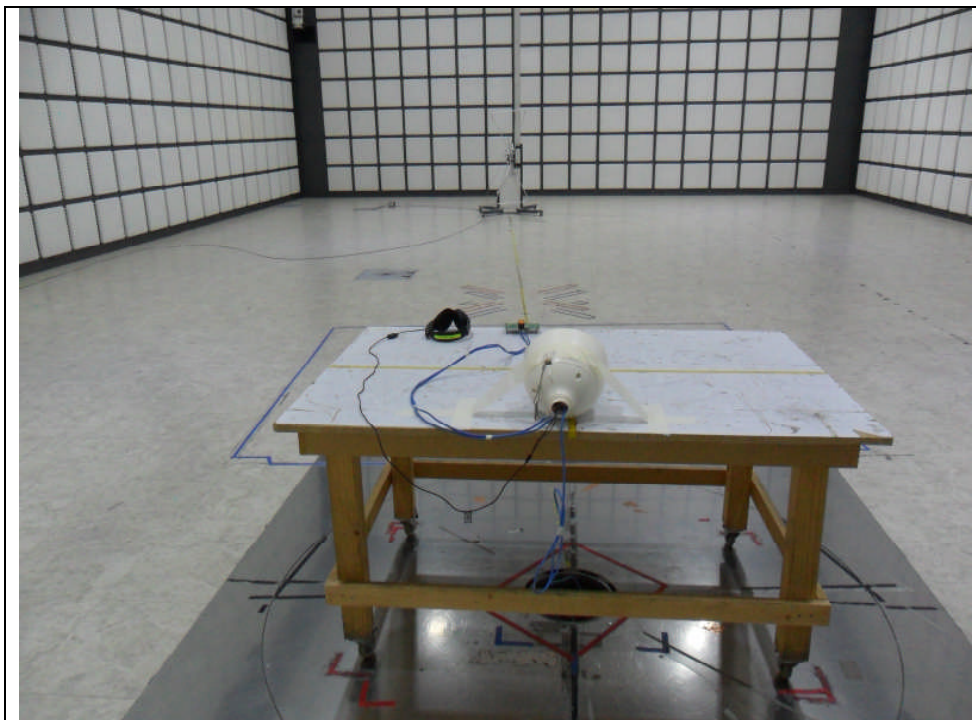
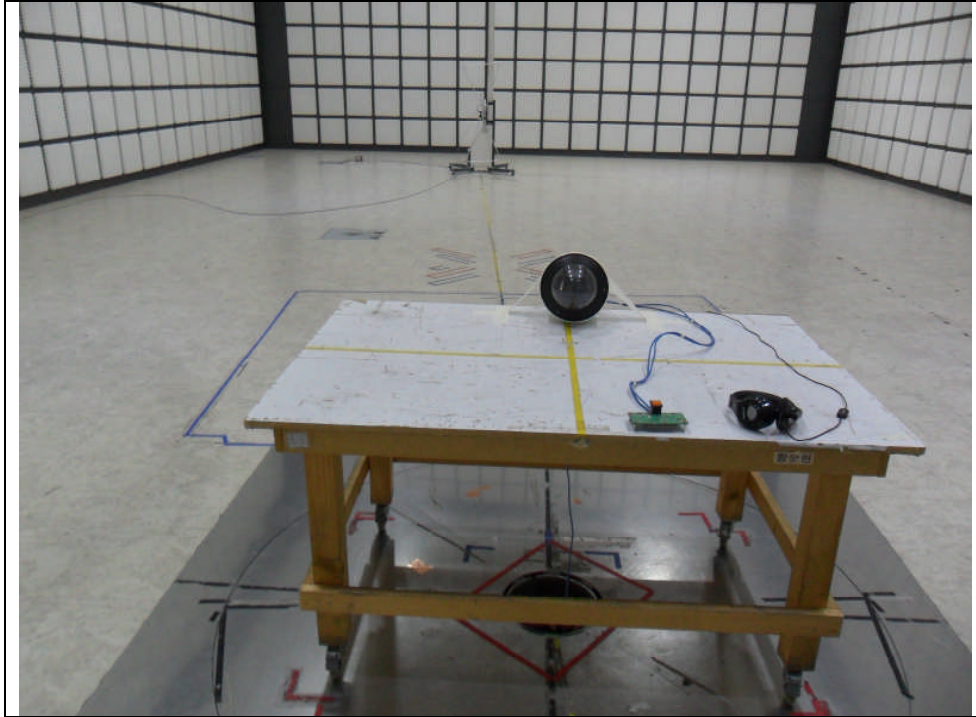
* 30 MHz ~ 1 GHz (#1- AC 24V)



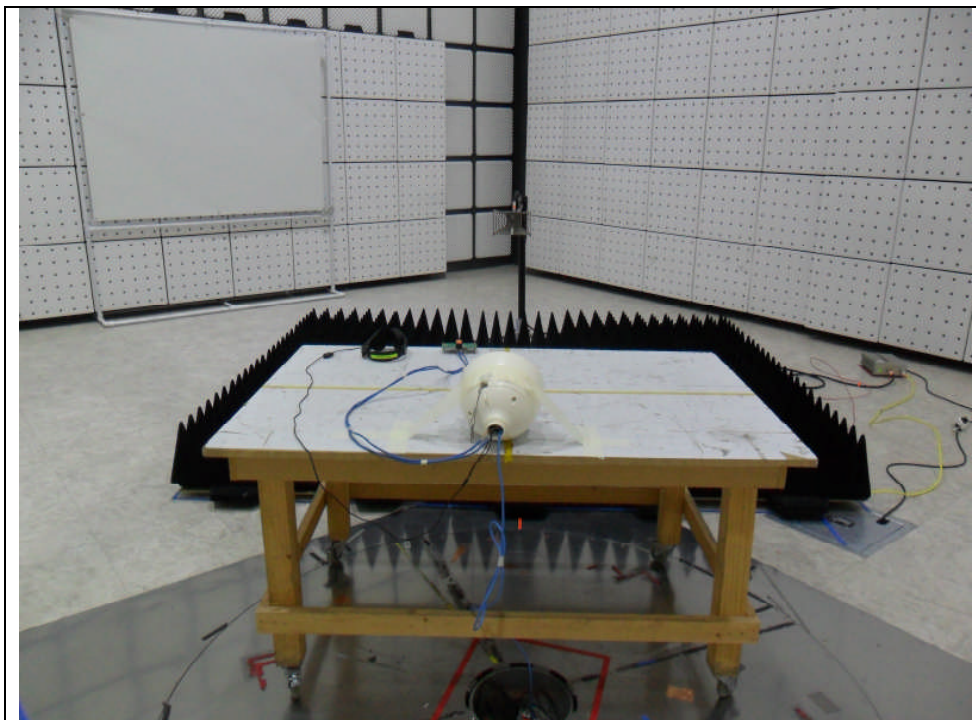
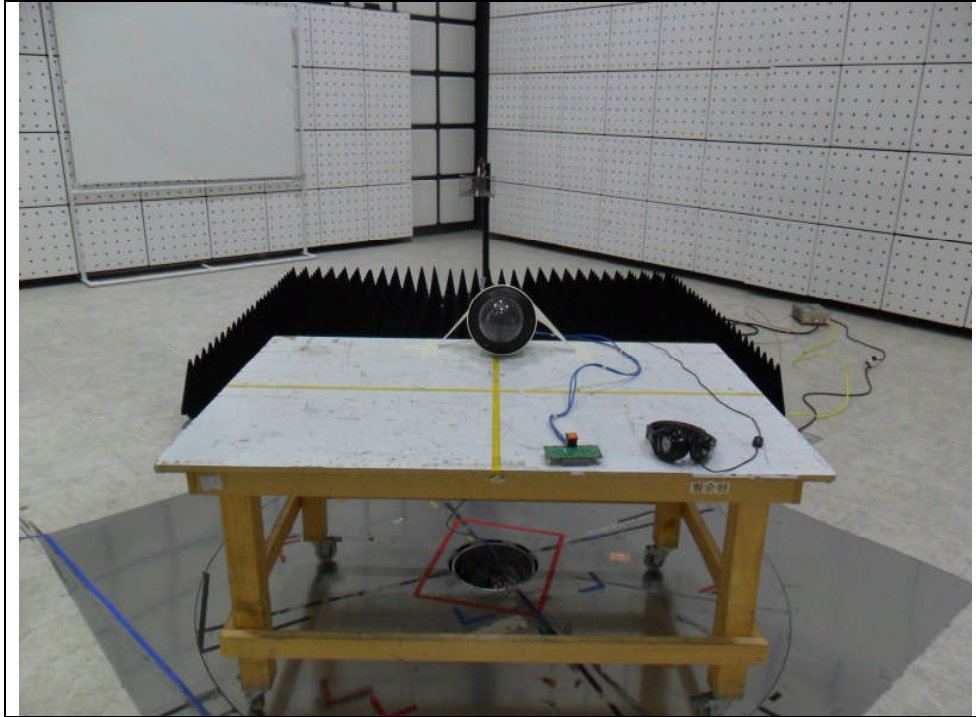
* 1 GHz ~ 6 GHz (#1- AC 24V)



* 30 MHz ~ 1 GHz (#2-PoE)



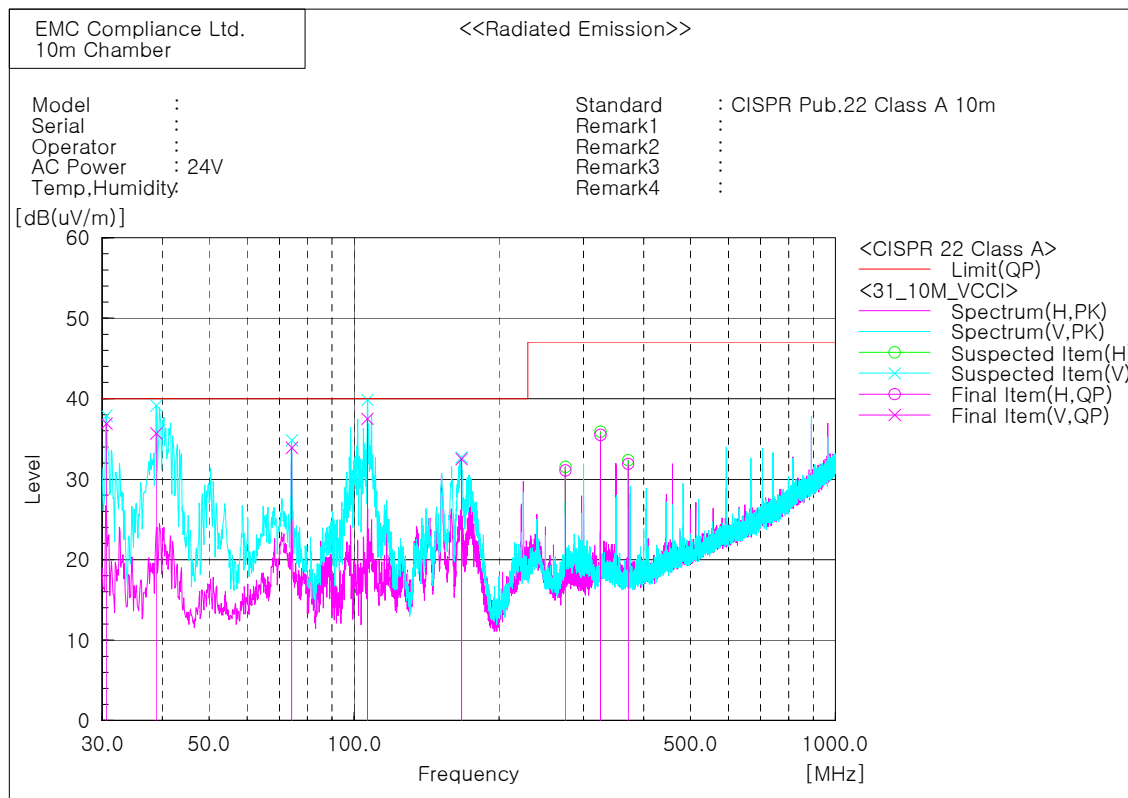
* 1 GHz ~ 6 GHz (#2-PoE)



6.2.6 Radiated emission measurement result

* Graph and Data

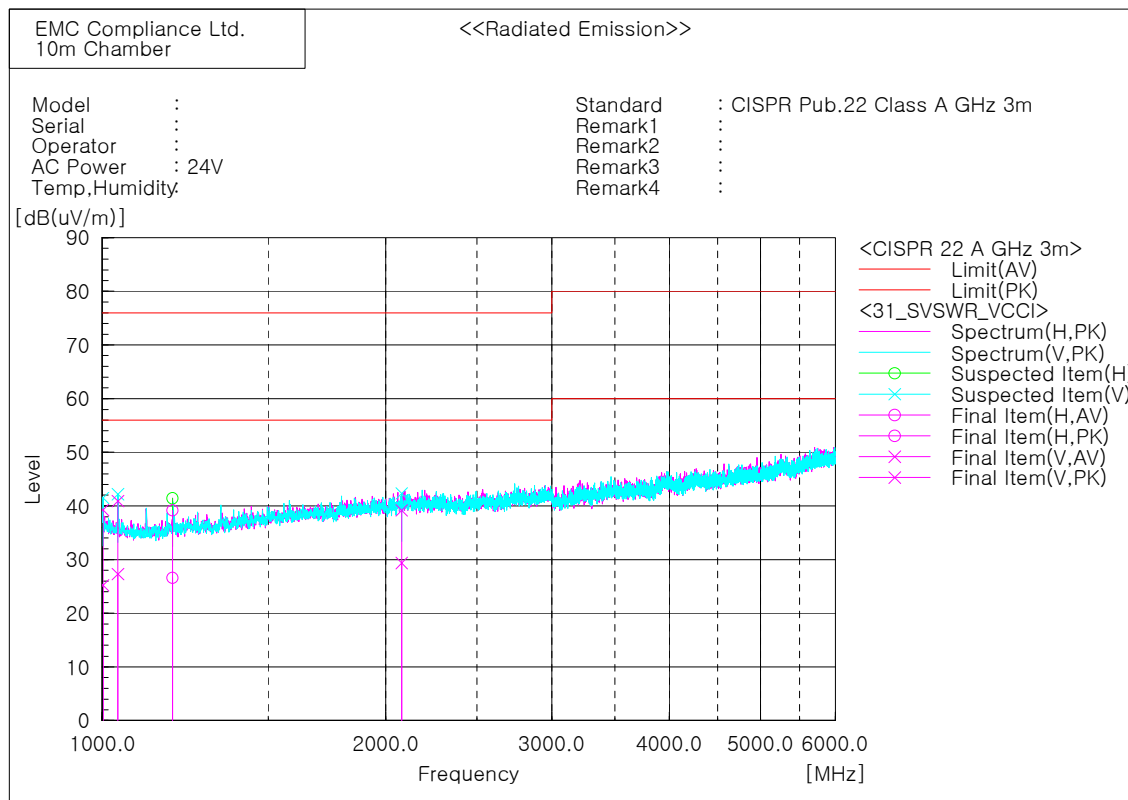
* 30 MHz ~ 1 GHz (#1- AC 24V) _ SNP-6201HN



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	30.606	V	52.1	-15.2	36.9	40.0	3.1	100.0	8.9
2	38.851	V	50.0	-14.3	35.7	40.0	4.3	298.0	143.2
3	74.256	V	49.5	-15.6	33.9	40.0	6.1	100.0	218.4
4	106.630	V	54.0	-16.5	37.5	40.0	2.5	100.0	168.8
5	167.255	V	44.8	-12.3	32.5	40.0	7.5	100.0	48.5
6	275.046	H	42.4	-11.3	31.1	47.0	15.9	400.0	244.7
7	325.001	H	44.9	-9.4	35.5	47.0	11.5	301.0	353.5
8	371.198	H	40.1	-8.2	31.9	47.0	15.1	201.0	262.1

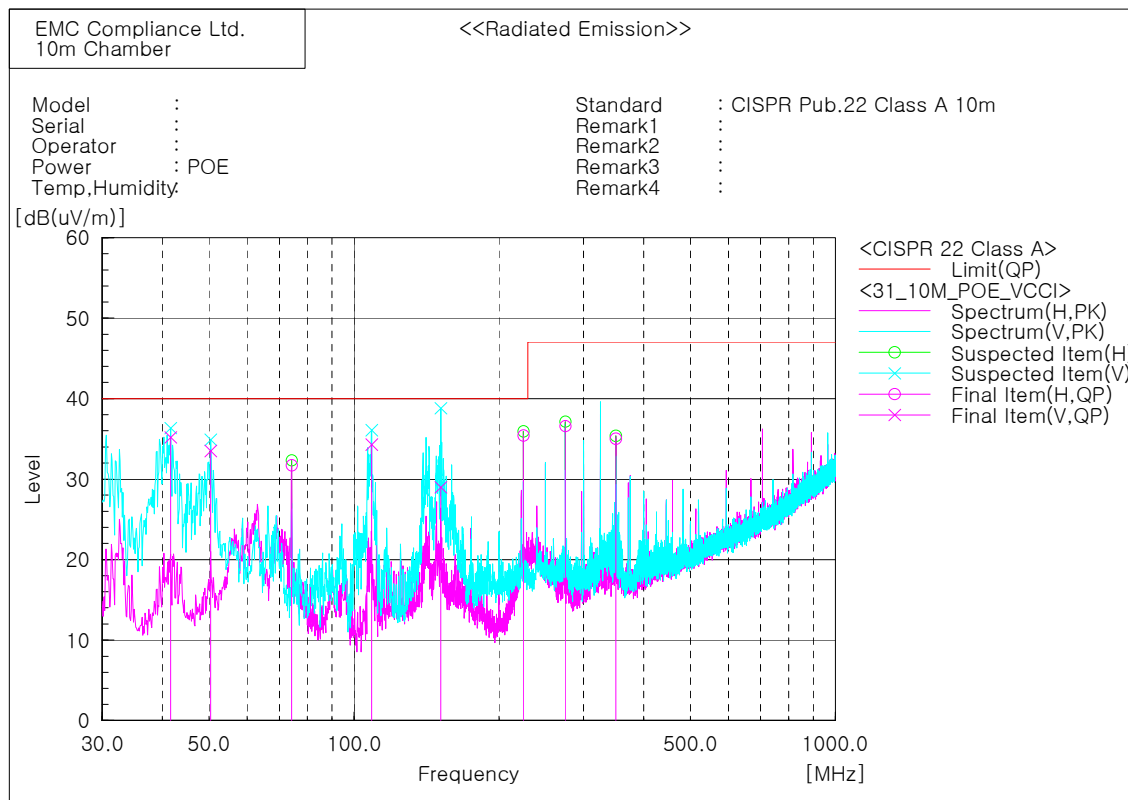
* 1 GHz ~ 6 GHz (#1- AC 24V) _ SNP-6201HN



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	1001.875	V	32.5	46.6	-7.3	25.2	39.3	56.0	76.0	30.8	36.7	100.0	135.3
2	1038.750	V	35.1	48.7	-7.8	27.3	40.9	56.0	76.0	28.7	35.1	100.0	85.6
3	1187.500	H	33.7	46.3	-7.1	26.6	39.2	56.0	76.0	29.4	36.8	100.0	317.6
4	2079.375	V	30.4	40.2	-1.0	29.4	39.2	56.0	76.0	26.6	36.8	100.0	267.7

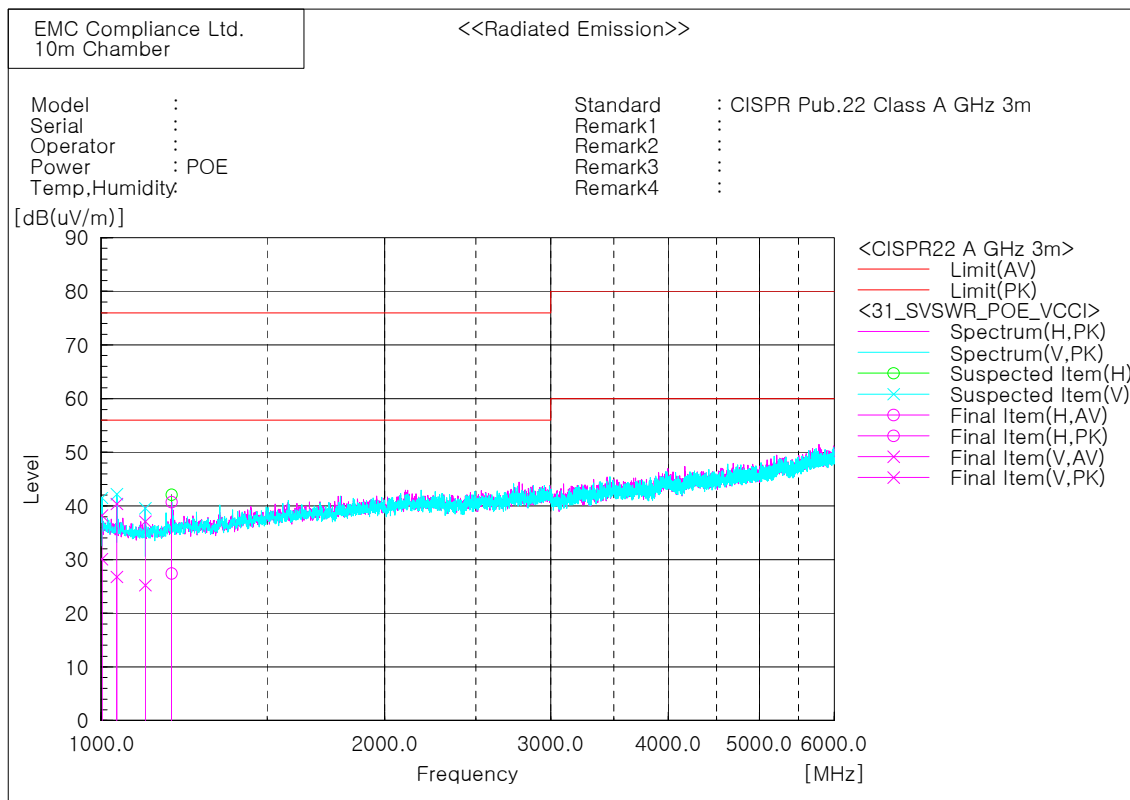
* 30 MHz ~ 1 GHz (#2- PoE) _ SNP-6201HN



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	41.640	V	49.0	-13.8	35.2	40.0	4.8	100.0	106.4
2	50.370	V	46.8	-13.3	33.5	40.0	6.5	100.0	119.9
3	74.256	H	47.3	-15.6	31.7	40.0	8.3	400.0	231.1
4	108.813	V	50.5	-16.2	34.3	40.0	5.7	100.0	192.0
5	151.614	V	41.4	-12.4	29.0	40.0	11.0	100.0	283.7
6	224.970	H	49.2	-13.8	35.4	40.0	4.6	400.0	285.1
7	275.046	H	47.9	-11.3	36.6	47.0	10.4	400.0	40.5
8	349.979	H	43.8	-8.8	35.0	47.0	12.0	400.0	27.0

* 1 GHz ~ 6 GHz (#2- PoE) _ SNP-6201HN



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	1001.875	V	37.4	45.5	-7.3	30.1	38.2	56.0	76.0	25.9	37.8	100.0	135.3
2	1038.750	V	34.6	48.2	-7.8	26.8	40.4	56.0	76.0	29.2	35.6	100.0	85.6
3	1113.750	V	33.2	45.1	-8.0	25.2	37.1	56.0	76.0	30.8	38.9	100.0	117.2
4	1188.125	H	34.5	47.8	-7.1	27.4	40.7	56.0	76.0	28.6	35.3	100.0	197.5

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



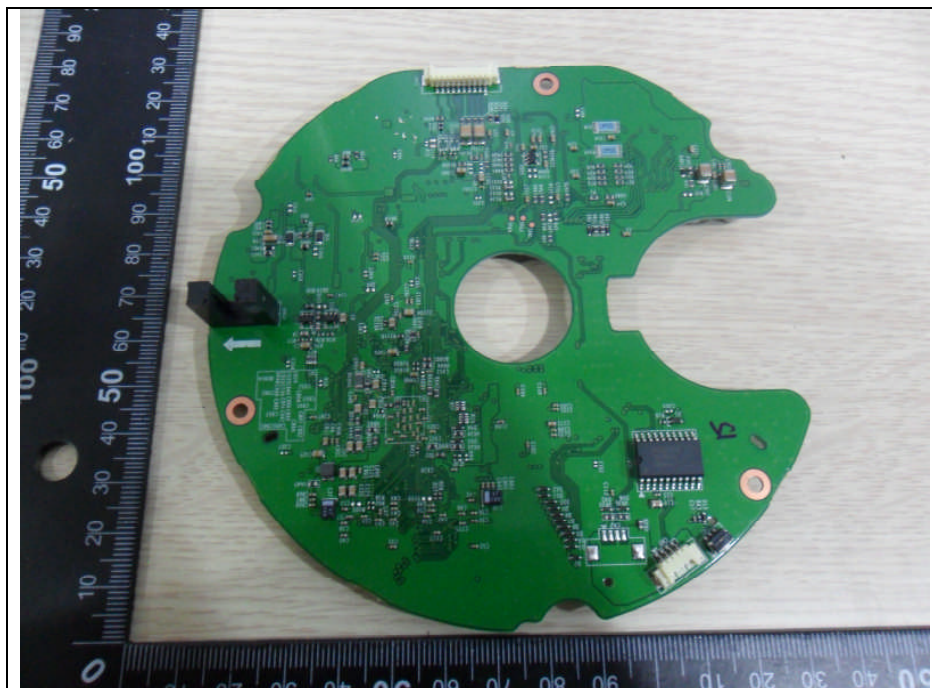
Bottom View



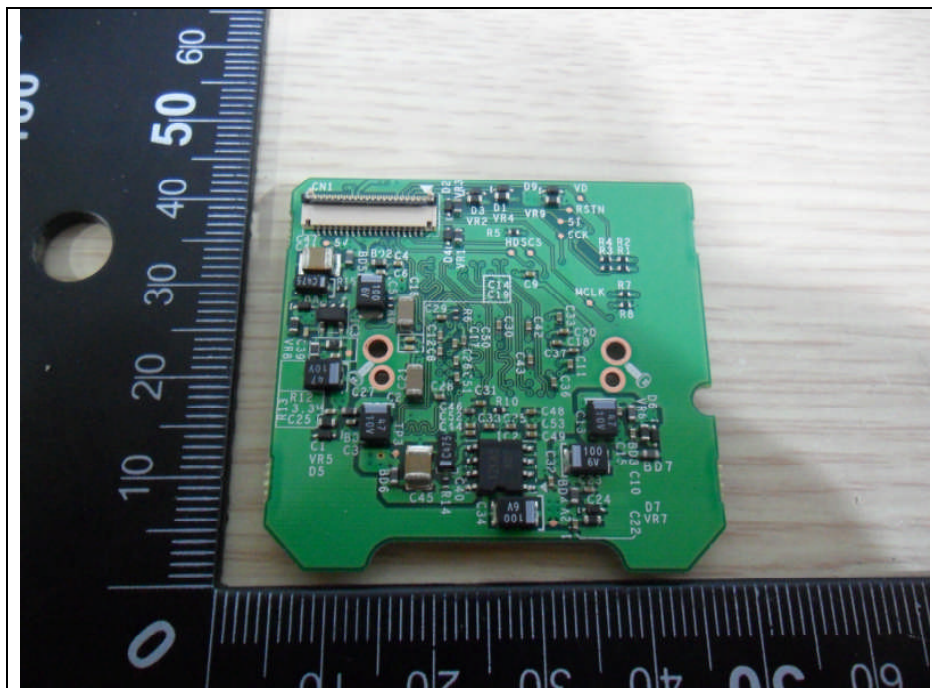
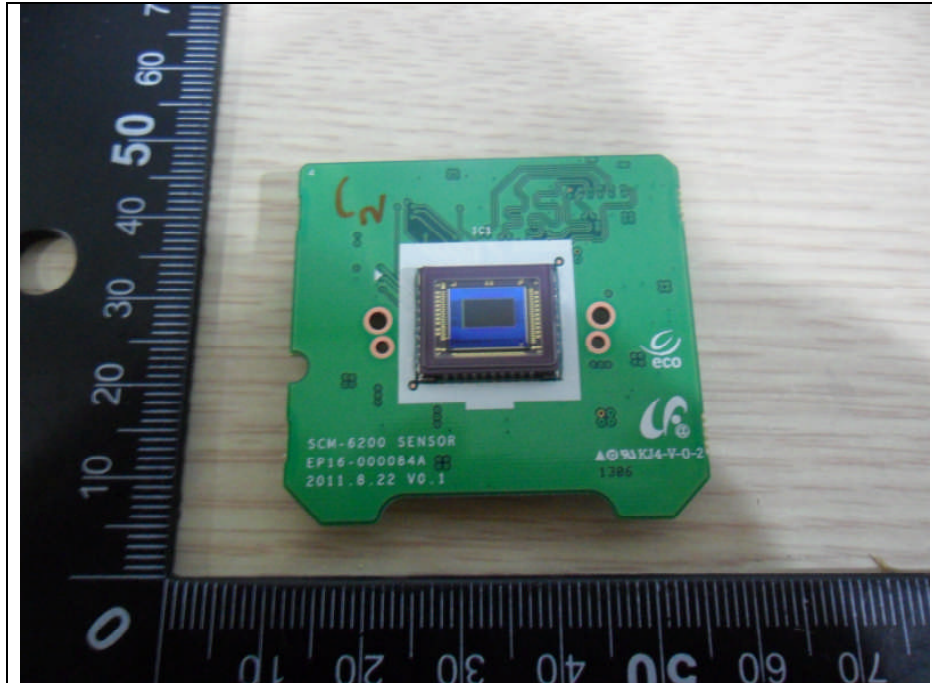
Inside



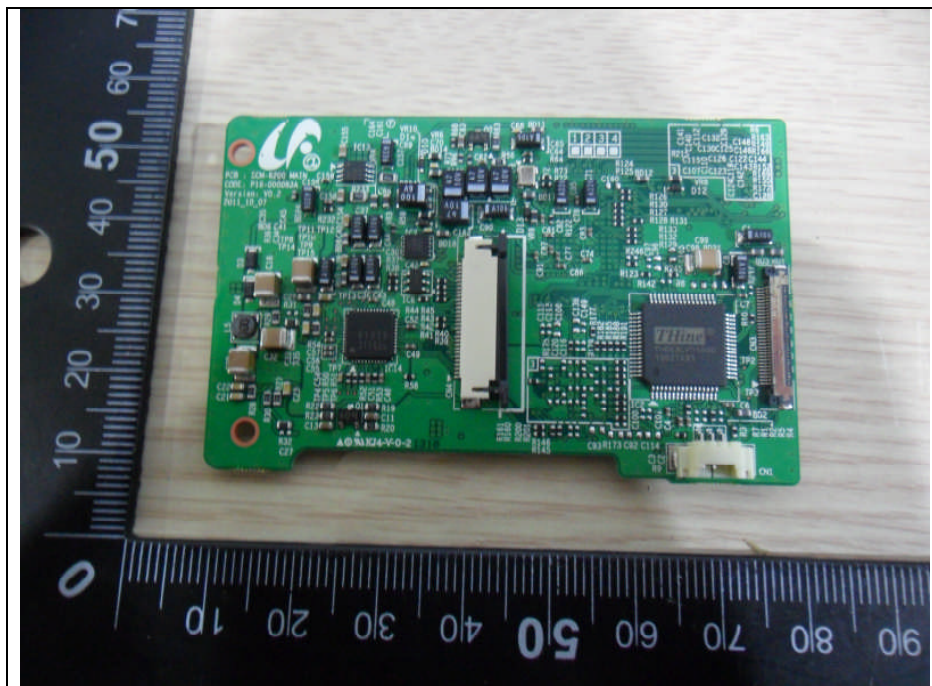
Main Board



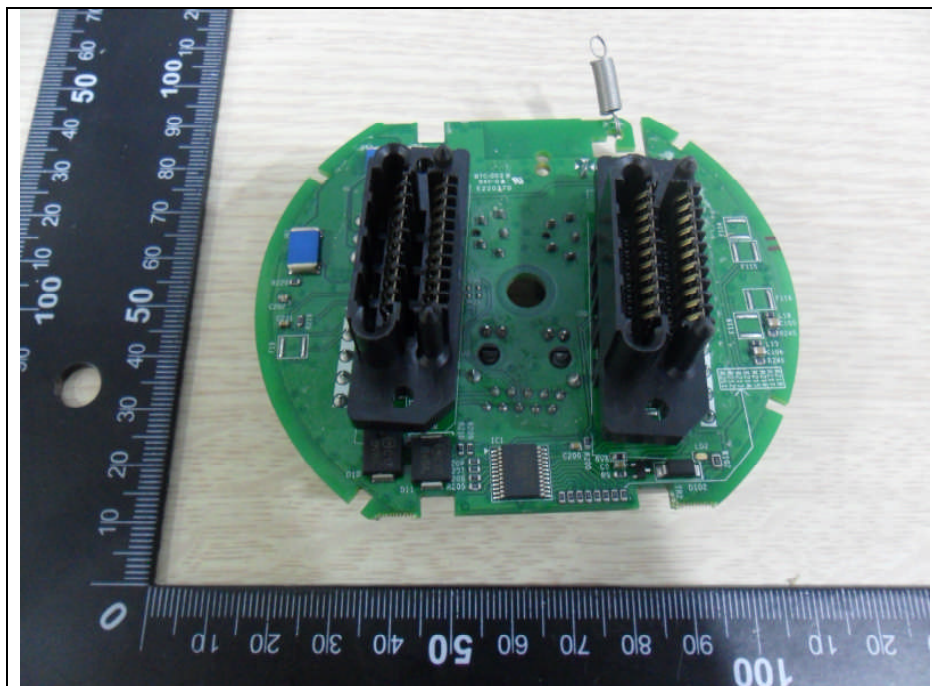
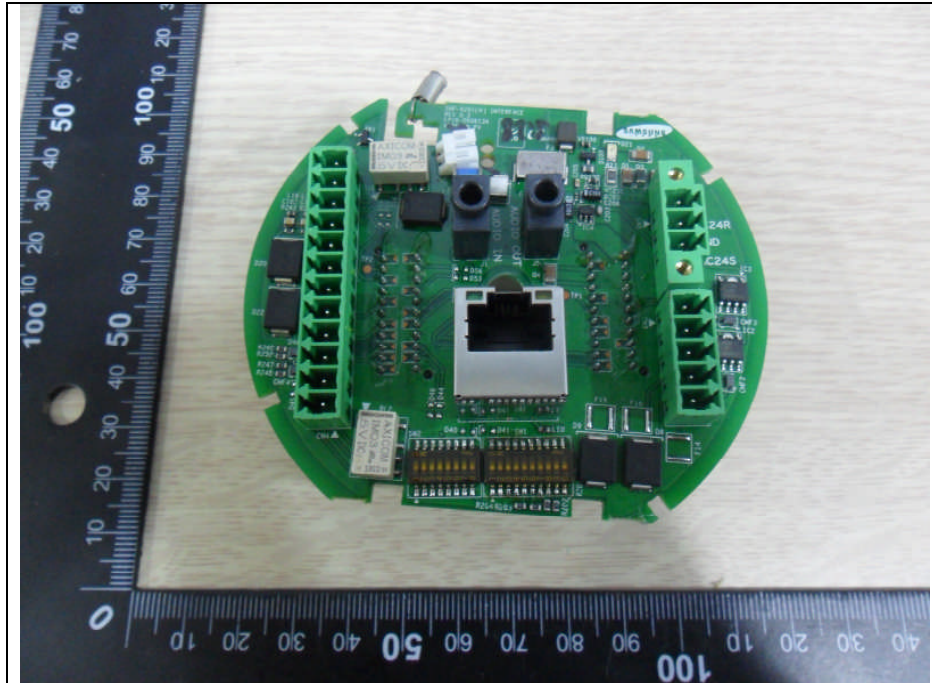
CCD Board



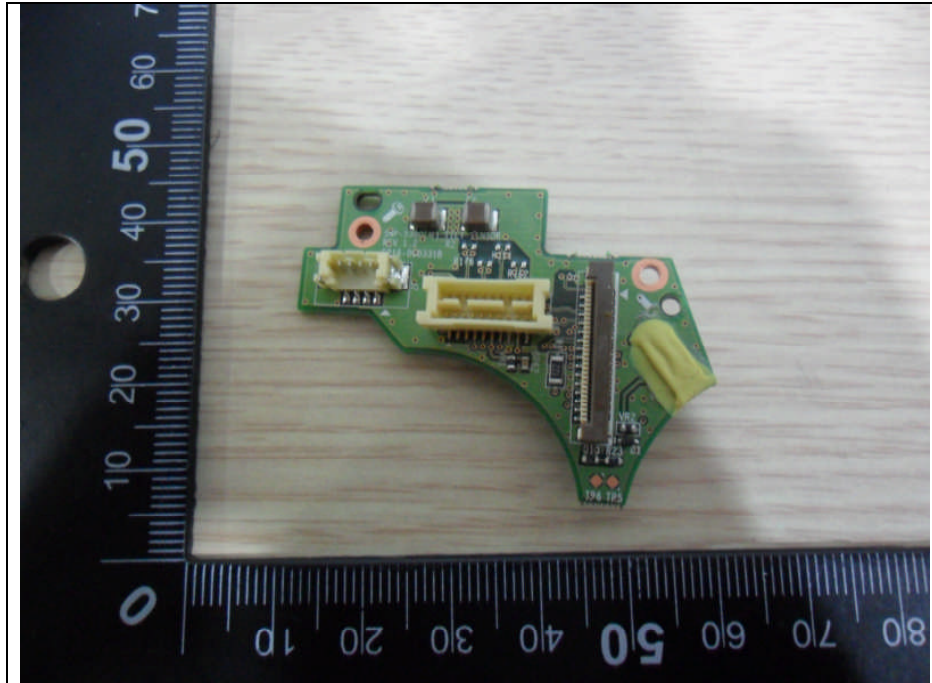
CCD SUB Board



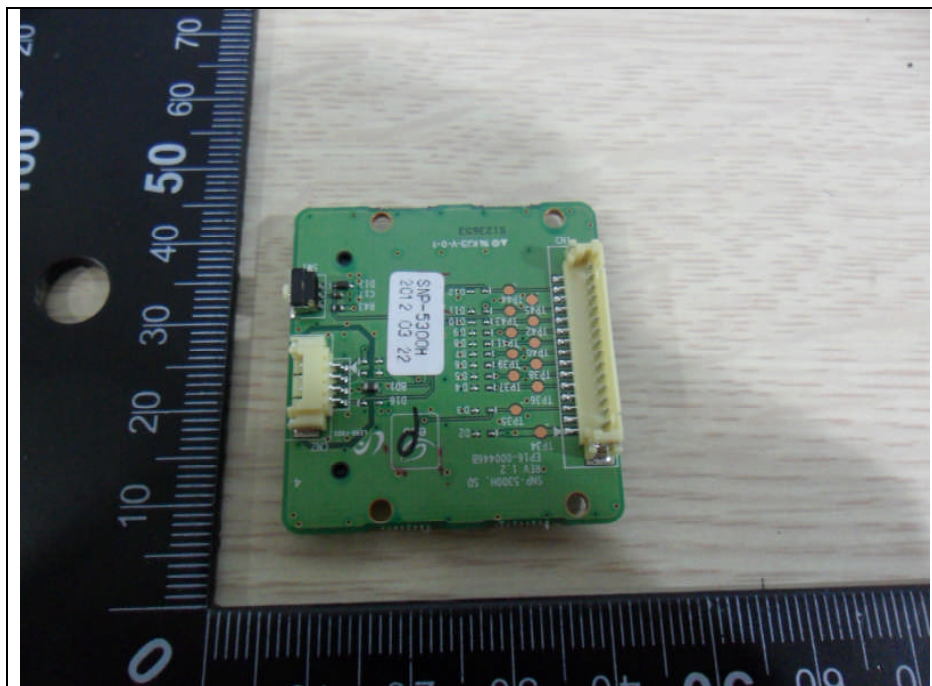
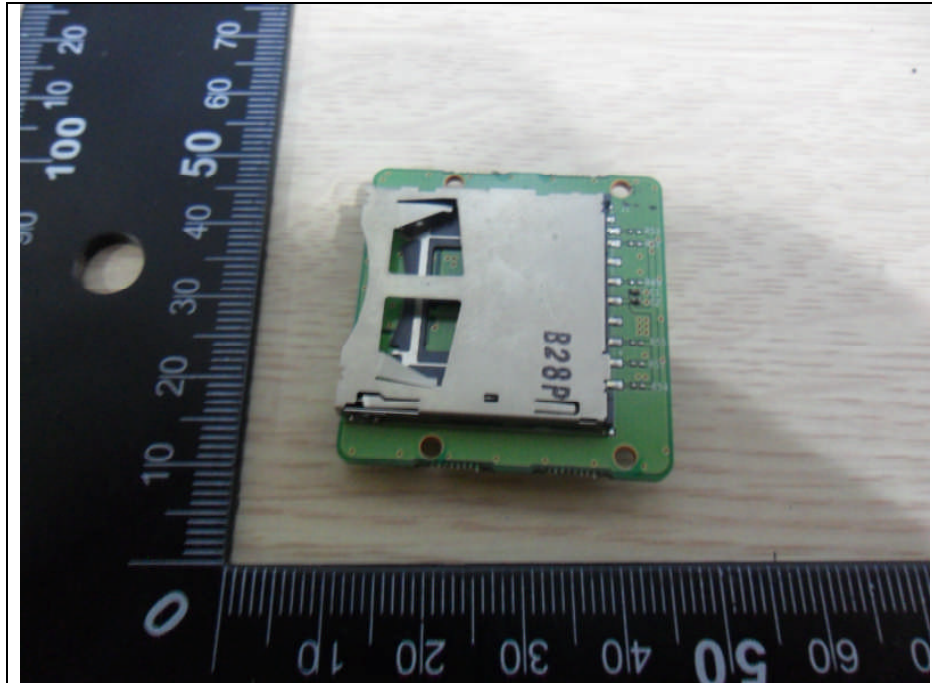
Interface Board



SUB Board



Power Board



Power Board

