

TESTING CERTIFICATE

EMC Compliance Ltd.

65, Sinwon-ro, Yeongtong-gu,
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443-390, Korea
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Certificate No.: EMC-K-E0171

Page(1) / (39) Pages



1. Applicant

Name: Samsung Techwin Co., Ltd.
Address: 84, Jeongdong-ro, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, Korea
Date of Receipt: November 25, 2014

2. Manufacturer

Name#1: Samsung Techwin Co., Ltd.
Name#2: TIANJIN SAMSUNG TECHWIN
OPTO-ELECTRONIC CO., LTD

3. Use of Report:

Completed report

4. Test Sample:

Network Camera, SNZ-6320P

5. Date of Test:

November 30 ~ December 01, 2014

6. Test method used:

AS/NZS CISPR 22:2009+A1:2010, Class A

7. Testing Environment:

Temperature: $(24.9 \pm 3.5) ^\circ\text{C}$,
Relative Humidity: $(25.65 \pm 1.55) \% \text{ R.H.}$

8. Test Results:

Refer to page 15 ~ page 31
(Measurement uncertainty: Refer to page 6)

This result shown in this report refer only to the sample(s) tested unless otherwise stated.

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EMC Compliance Laboratory.

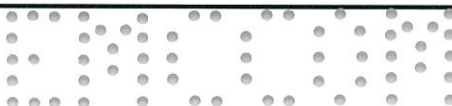
Affirmation	Tested by  Name: JUNG, YONG-JUN	Technical Manager  Name: YEOM, HAN-SEOK
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The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2014.12.04

EMC Compliance Ltd.

Accredited by KOLAS, Republic of KOREA



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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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Manufacturer#2: TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
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2. Laboratory information

Address

EMC compliance Ltd.

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-390, Korea

Telephone Number: 82 70 5008 1021

Facsimile Number: 82 505 299 8311

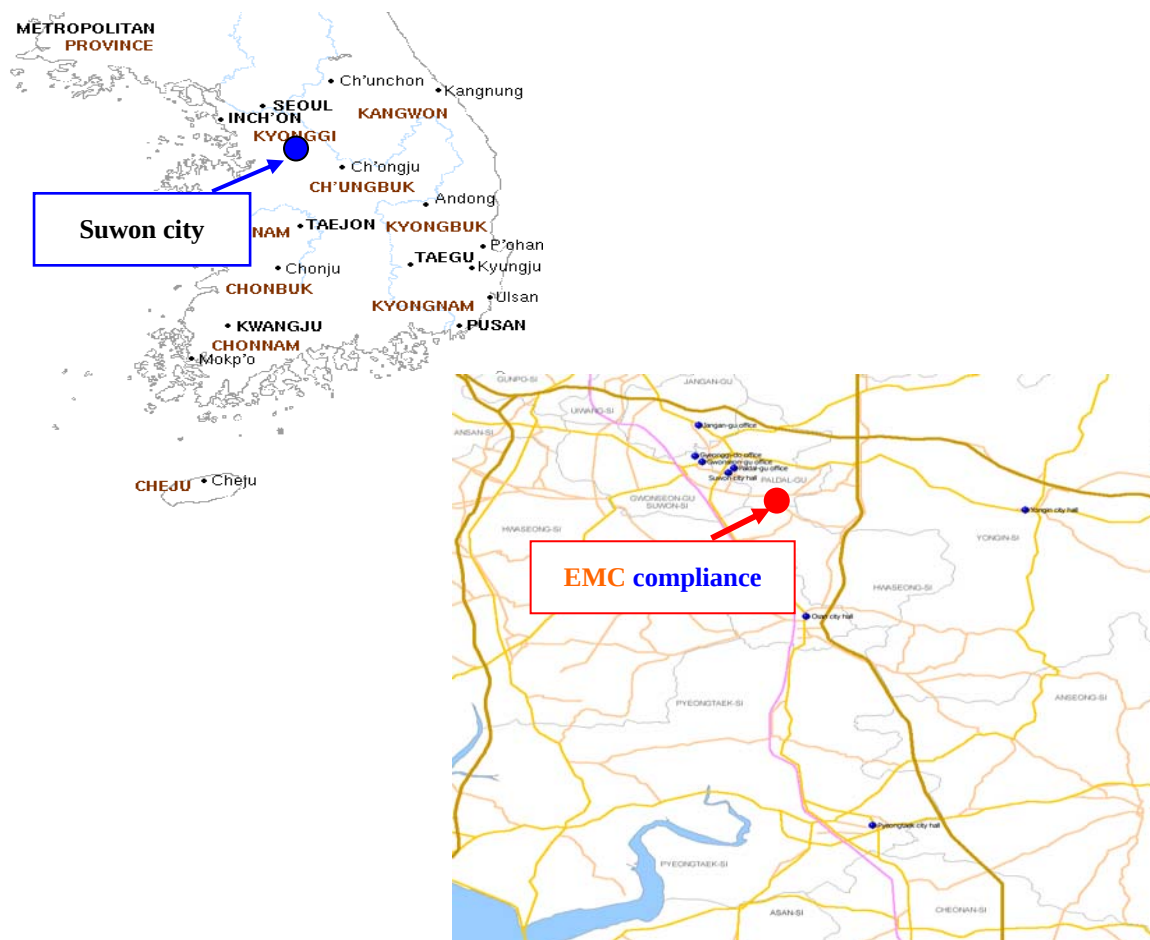
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

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)	: 28.4 °C	27.2 % R.H.	-
Shielded room(CE)	: 21.4 °C	24.1 % 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	± 3.75 dB
	150 kHz ~ 30 MHz	± 3.36 dB
Shielded Room (CE#2)	9 kHz ~ 150 kHz	± 3.79 dB
	150 kHz ~ 30 MHz	± 3.42 dB
Radiated Emission measurement (C.L: Approx 95 %, k = 2)		
10 m Chamber (#F4)	30 MHz ~ 300 MHz	3 m: + 4.87 dB, - 4.99 dB 10 m: + 4.86 dB, - 4.98 dB
	300 MHz ~ 1 000 MHz	3 m: + 5.04 dB, - 5.14 dB 10 m: + 4.91 dB, - 5.02 dB
	1 GHz ~ 6 GHz	3 m: + 6.03 dB, - 6.06 dB
10 m Chamber (#F2)	30 MHz ~ 300 MHz	3 m: + 4.94 dB, - 5.06 dB 10 m: + 4.93 dB, - 5.05 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.97 dB, - 5.08 dB 10 m: + 4.84 dB, - 4.96 dB
	1 GHz ~ 6 GHz	3 m: + 6.03 dB, - 6.05 dB
Radio Frequency Electromagnetic Fields (C.L: Approx 95 %, k = 2)		
± 1.82 dB		
Disturbance power Electromagnetic Fields (C.L: Approx 95 %, k = 2)		
± 3.30 dB		

4. Description of E.U.T.

4.1 General information

	SNZ-6320
Video	
Imaging Device	1/2.8" PS Exmor 2.38M CMOS
Total Pixels	1952(H) x 1116(V)
Effective Pixels	1944(H) x 1104(V)
Scanning System	Progressive
Min. Illumination	Color : 0.3 Lux (1/30sec, F1.6, 50IRE) B/W : 0.03 Lux (1/30sec, F1.6, 50IRE) 30IRE
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)	4.42~142.6mm(Optical 32X)
Max. Aperture Ratio	F1.6 (Wide) / F4.4(Tele)
Angular Field of View	H : 62.8°(Wide) ~ 2.23°(Tele) / V : 36.80°(Wide) ~ 1.26°(Tele)
Min. Object Distance	Wide 10mm ,Tele 1.5m
Focus Control	Auto / Manual / One Push
Lens Type	DC Auto Iris
Mount Type	Board-in type
Operational	
Camera Title	Off / On (Displayed up to 45 characters)
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC
Wide Dynamic Range	120dB
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNRIII (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 / Mercury
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital Zoom	16x
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 (Relay)
Audio In	Selectable (Mic IN/Line IN) Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out (3.5mm stereo mini jack) , Max output level: 1 Vrms
Serial Interface	RS-485 - Samsung-T/E, Pelco-D/P, Sungjin, Panasonic, Bosch, AD, GE, Vicon, Honeywell
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) or NAS recording at Network disconnected & Event (Alarm Triggers) External output

Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 720x576 / 640x480 / 640x360 / 320x240 / 320x180
Max. Framerate	H.264 : Max 60fps at all resolutions Motion JPEG : 1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : Max. 15 fps 800x600 / 800x450 / 720x576 / 640x480 / 640x360 / 320x240 / 320x180 : Max. 30fps
Smart Codec	Manual Mode (area-based : SEA) Face detection Mode
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 Compression Format	G.711 u-law / G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC LC 8/16 KHz
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
Edge Storage	SD/SDHC/SDXC - motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. NAS (network attached storage) / Instant Recording to the local PC
Application Programming Interface	ONVIF Profile S SUNAPI 2.0 SVNP 1.2 Samsung Camera Application Platform
Webpage Language	English, French, German, Spanish, Italian, Chinese, 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 / 8.1, MAC OS X 10.7 / 10.8 Supported Browser : Microsoft Internet Explorer (Ver. 8~11), Mozilla Firefox (Ver. 9~19) , Google Chrome (Ver. 15~32) 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, SSM, Mobile viewer

Environmental	
Operating Temperature / Humidity	-10°C ~ +55°C(+14°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Electrical	
Input Voltage / Current	DC12V, PoE(IEEE802.3af,Class3)
Power Consumption	TBD
Mechanical	
Color / Material	Dark Gray / Metal TBD
Dimension (WxHxD)	W72 x H60 x D136 mm TBD
Weight	540g TBD

4.2 Product description

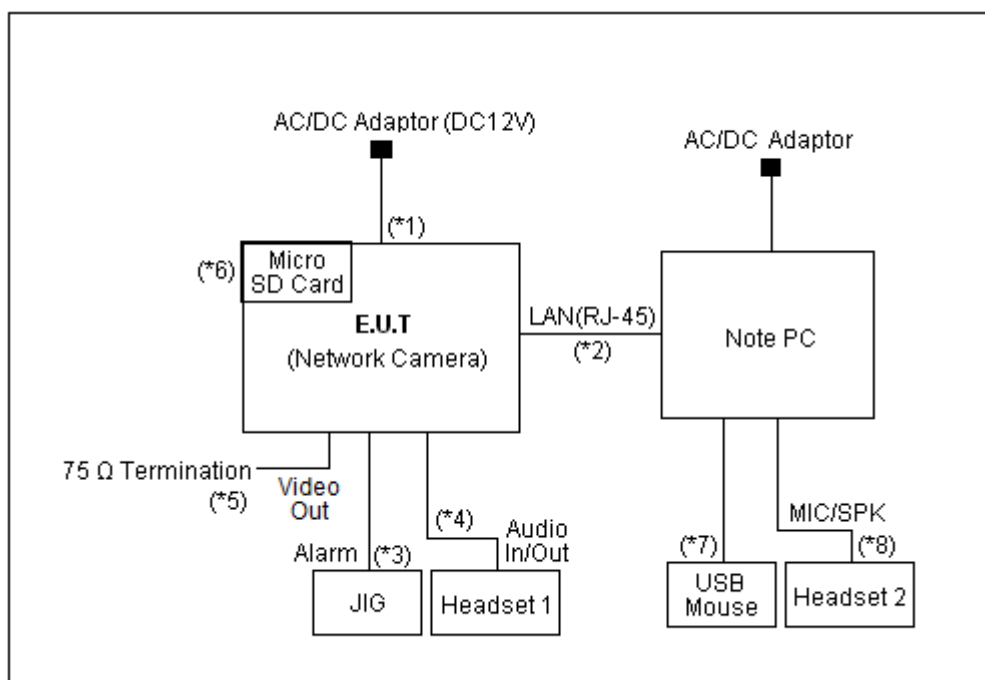
Type of product	Network Camera
Model name (Basic)	SNZ-6320P
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	-
Testing voltage	DC 12 V, PoE
Product rating	DC 12 V, PoE
Internal clock frequency	Above 108 MHz
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	NT271B5E	JGFE91DF600046D	SAMSUNG
USB Mouse	1088	8165906051134	Microsoft
Headset 1	SHS-250V	-	SAMSUNG
Headset 2	SHS-250V	-	SAMSUNG
JIG	-	-	-
Micro SD Card (4GB)	-	-	-
PoE Switch	-	-	-
AC/DC Adaptor (DC 12 V)	DAD12050DKA	-	Dream Electronics

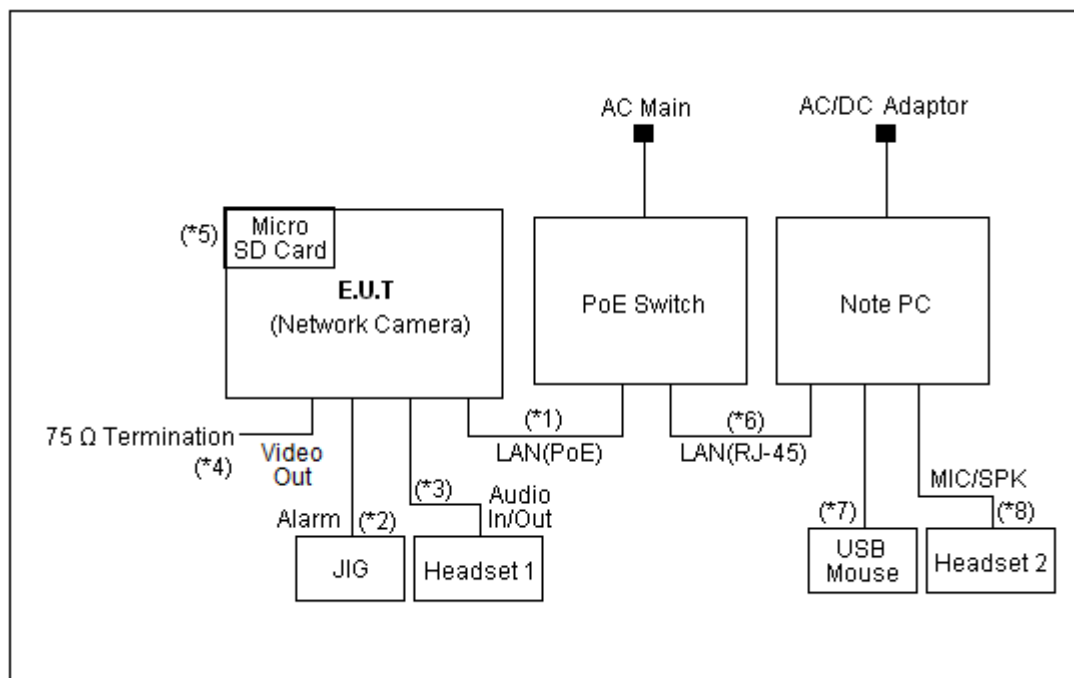
4.4 Test configuration

#1- DC 12V



Note	Start		End		Cable	
*	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT (Network Camera)	Power	AC/DC Adaptor	Power	1.4	Non-Shield
2		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield
3		Alarm	JIG	Alarm	3.0	Non-Shield
4		Audio In/Out	Headset 1	Audio In/Out	3.0	Non-Shield
5		Video Out	75 Ω Termination	-	0.3	Non-Shield
6		Micro SD Card	Micro SD Card	Micro SD Card	Direct	-
8	Note PC	USB	USB Mouse	USB	1.8	Shield
9		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		Alarm	JIG	Alarm	3.0	Non-Shield
3		Audio In/Out	Headset 1	Audio In/Out	3.0	Non-Shield
4		Video Out	75 Ω Termination	-	0.3	Non-Shield
5		Micro SD Card	Micro SD Card	Micro SD Card	Direct	-
7	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	3.0	Non-Shield
8		USB	USB Mouse	USB	1.8	Shield
9		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	Web Viewer Monitoring Test.
	Audio In/Out Test.
	Alarm Test.
	Ping Test.
	Micro SD Card Recording Test.

* Note: 2 types of powers are available for the product, that are DC 12 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	AS/NZS CISPR 22:2009+A1:2010, Class A	15 Page ~ 213 Page
☒	Radiated Emission	AS/NZS CISPR 22:2009+A1:2010, Class A	22 Page ~ 31 Page

6. Test results

6.1 Conducted Emission

Test specification	AS/NZS CISPR 22:2009+A1:2010, Class A		
Testing voltage	DC 12 V, PoE		
Test facility	Shielded room (CE#1)		
Date	2014. 12. 01		
Temperature (°C)	21.4 °C	Humidity (% R.H.)	24.1 % 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.

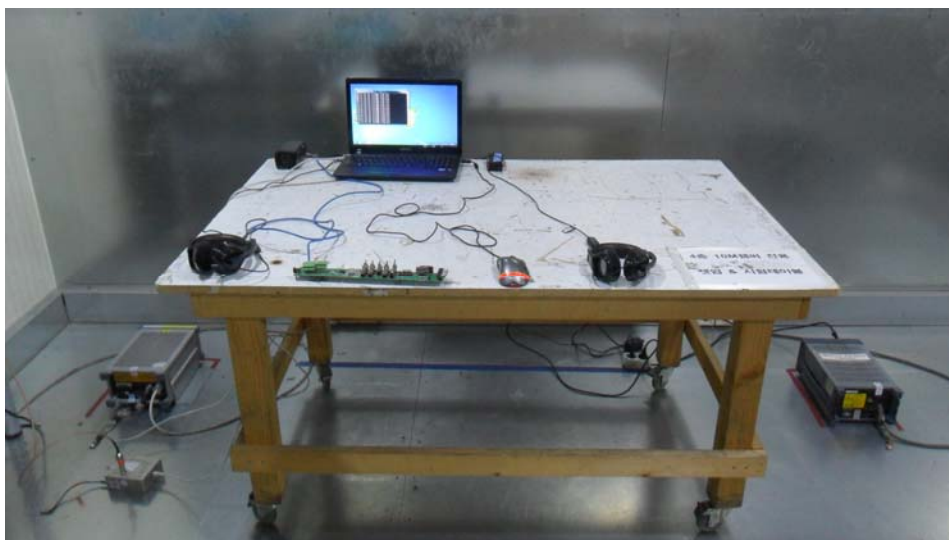
6.1.3 Used equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2015.01.27	☐
Test Receiver	ESCI	100001	R&S	2015.07.14	☒
Test Receiver	ESCI	100710	R&S	2015.10.13	☐
TWO-LINE V-NETWORK	ENV216	101358	R&S	2015.10.02	☐
TWO-LINE V-NETWORK	ESH3-Z5	100267	R&S	2015.06.24	☒
8-WIRE ISN	NTFM 8158 CAT5	CAT5-8158-0028	SCHWARZBECK	2015.03.07	☒
8-WIRE ISN	NTFM 8158 CAT3	CAT3-8158-0020	SCHWARZBECK	2015.03.07	☐

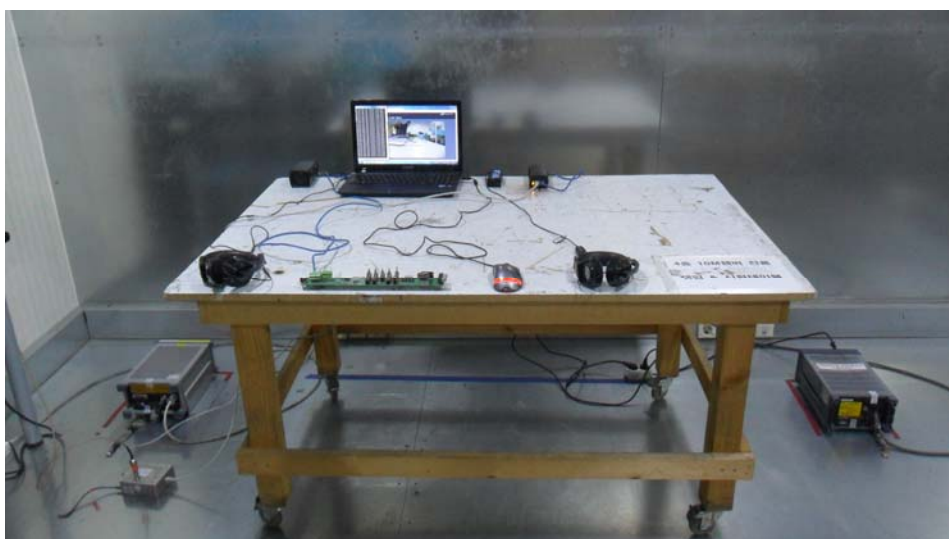
6.1.4 Photographs of test setup

* Telecommunication

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



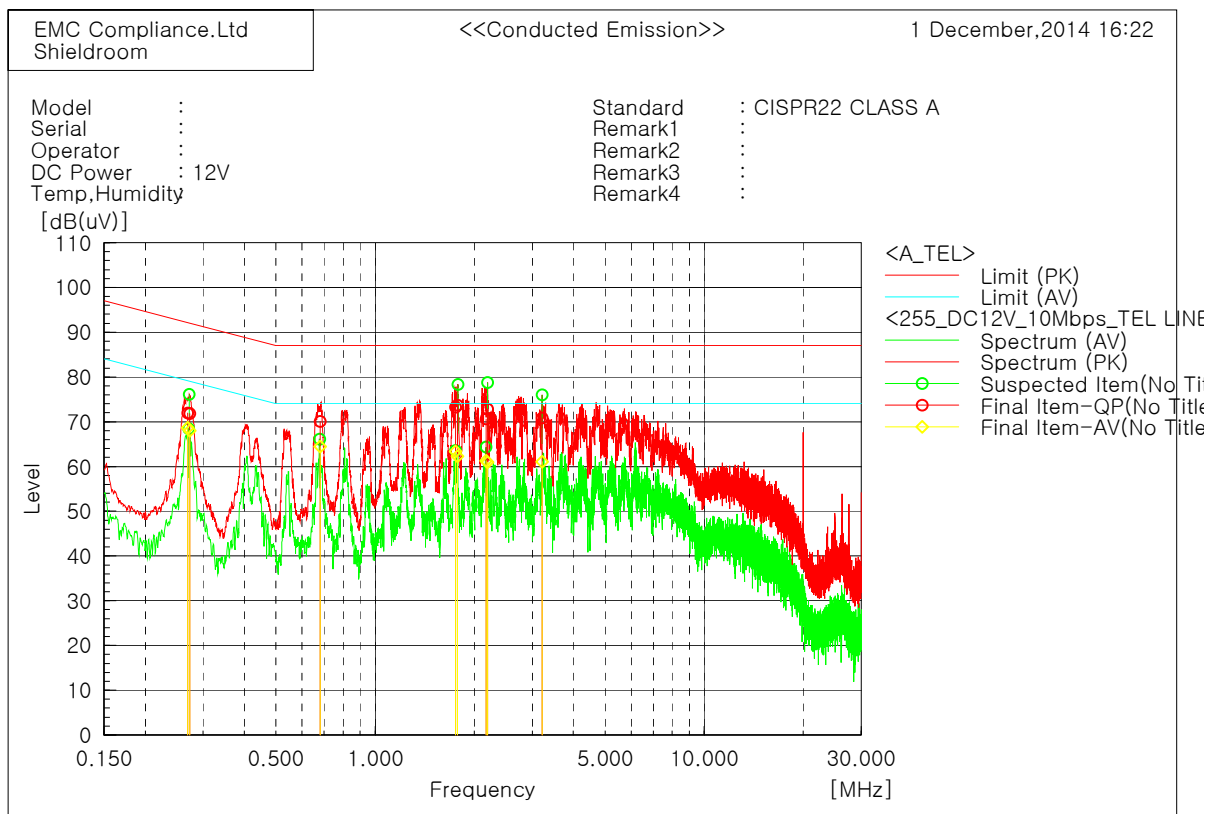
#2- PoE



6.1.5 Conducted emission measurement result

* Telecommunication port

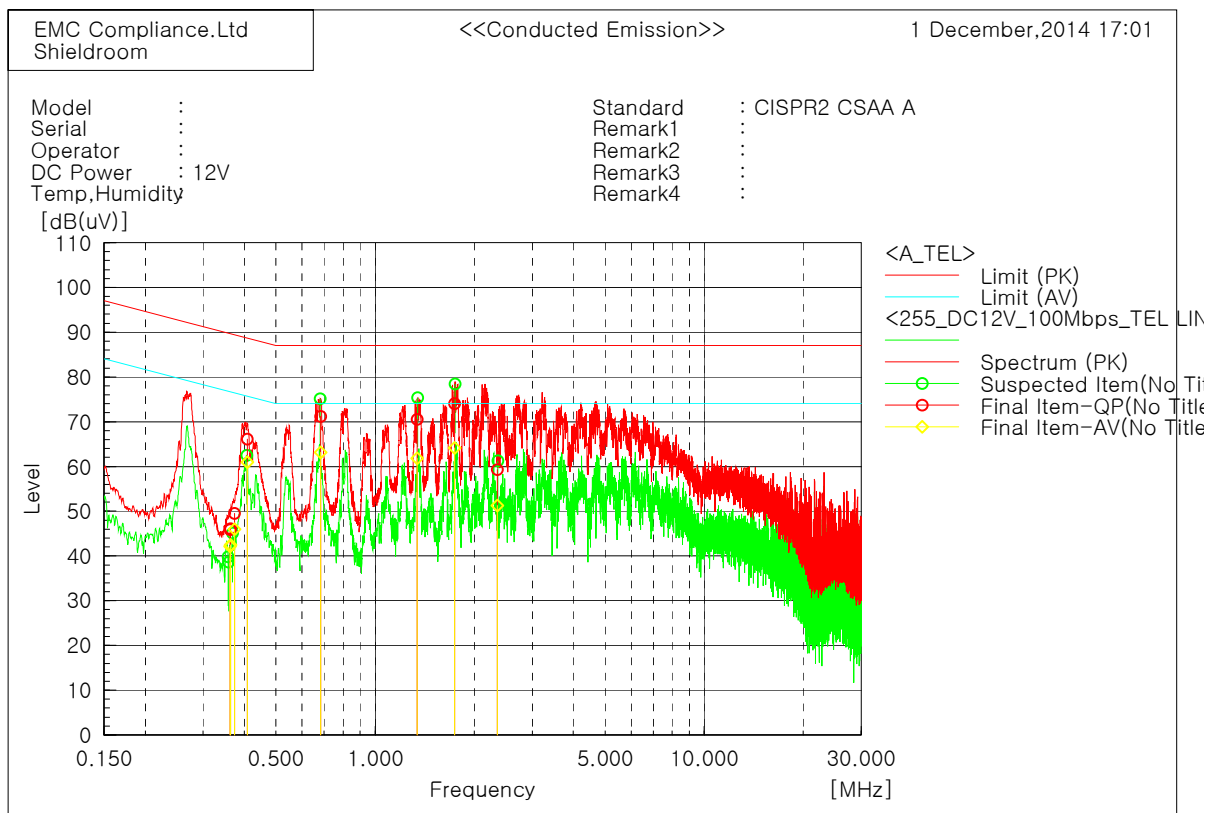
LCL 65 dB (LAN Port)_10 Mbps (SNZ-6320P)_#1- DC 12V



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	0.2694	62.0	58.8	9.9	71.9	68.7	92.1	79.1	20.2	10.4
2	0.27307	61.9	58.1	9.9	71.8	68.0	92.0	79.0	20.2	11.0
3	0.68055	60.4	54.8	9.7	70.1	64.5	87.0	74.0	16.9	9.5
4	1.75659	63.6	53.6	9.7	73.3	63.3	87.0	74.0	13.7	10.7
5	1.78204	64.1	52.6	9.6	73.7	62.2	87.0	74.0	13.3	11.8
6	2.17511	61.0	51.7	9.6	70.6	61.3	87.0	74.0	16.4	12.7
7	2.19413	63.2	51.3	9.6	72.8	60.9	87.0	74.0	14.2	13.1
8	3.2195	61.1	51.3	9.7	70.8	61.0	87.0	74.0	16.2	13.0

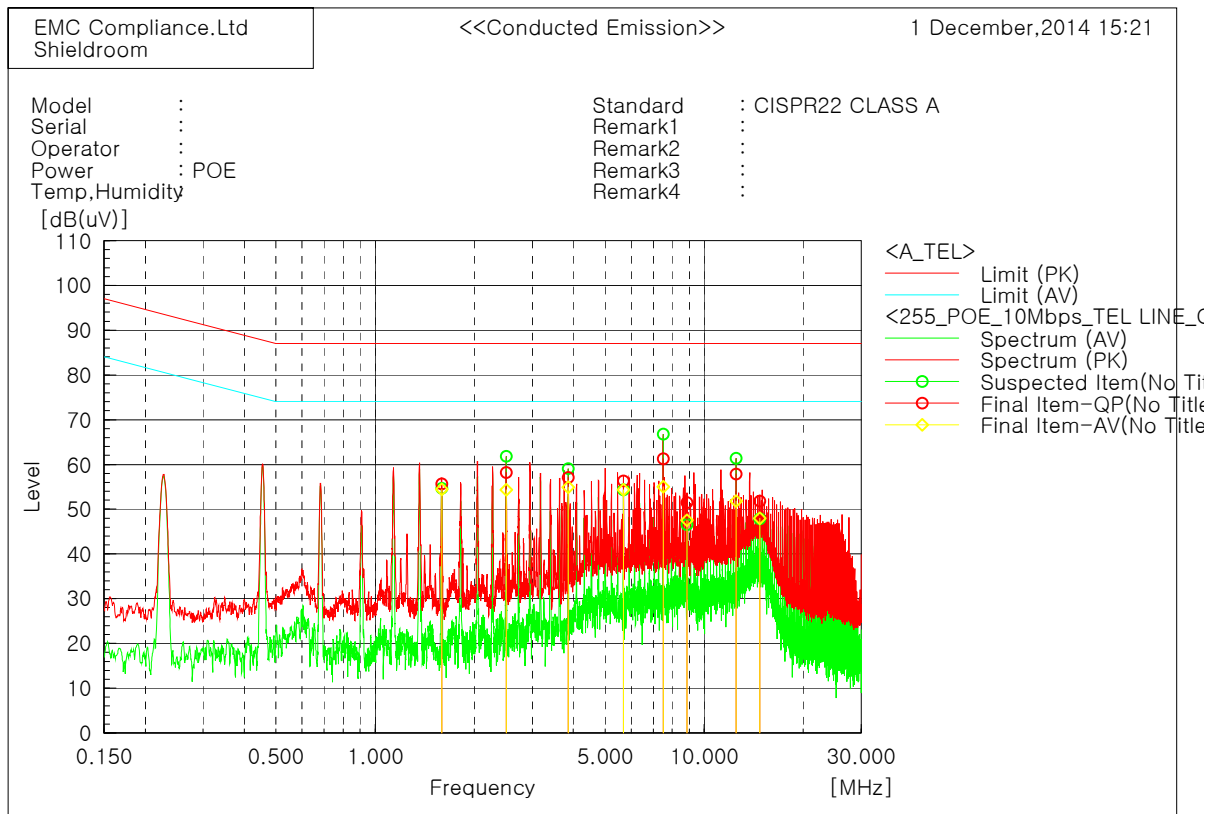
LCL 65 dB (LAN Port)_100 Mbps (SNZ-6320P)_#1- DC 12V



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	0.36185	36.0	32.3	9.9	45.9	42.2	89.7	76.7	43.8	34.5
2	0.36381	36.3	32.6	9.8	46.1	42.4	89.6	76.6	43.5	34.2
3	0.37393	39.7	36.2	9.8	49.5	46.0	89.4	76.4	39.9	30.4
4	0.40909	56.3	51.2	9.8	66.1	61.0	88.7	75.7	22.6	14.7
5	0.68379	61.5	53.4	9.7	71.2	63.1	87.0	74.0	15.8	10.9
6	1.34246	60.8	52.1	9.7	70.5	61.8	87.0	74.0	16.5	12.2
7	1.74575	64.3	54.4	9.7	74.0	64.1	87.0	74.0	13.0	9.9
8	2.35304	49.7	41.7	9.6	59.3	51.3	87.0	74.0	27.7	22.7

LCL 65 dB (LAN Port)_10 Mbps (SNZ-6320P)_# 2- PoE

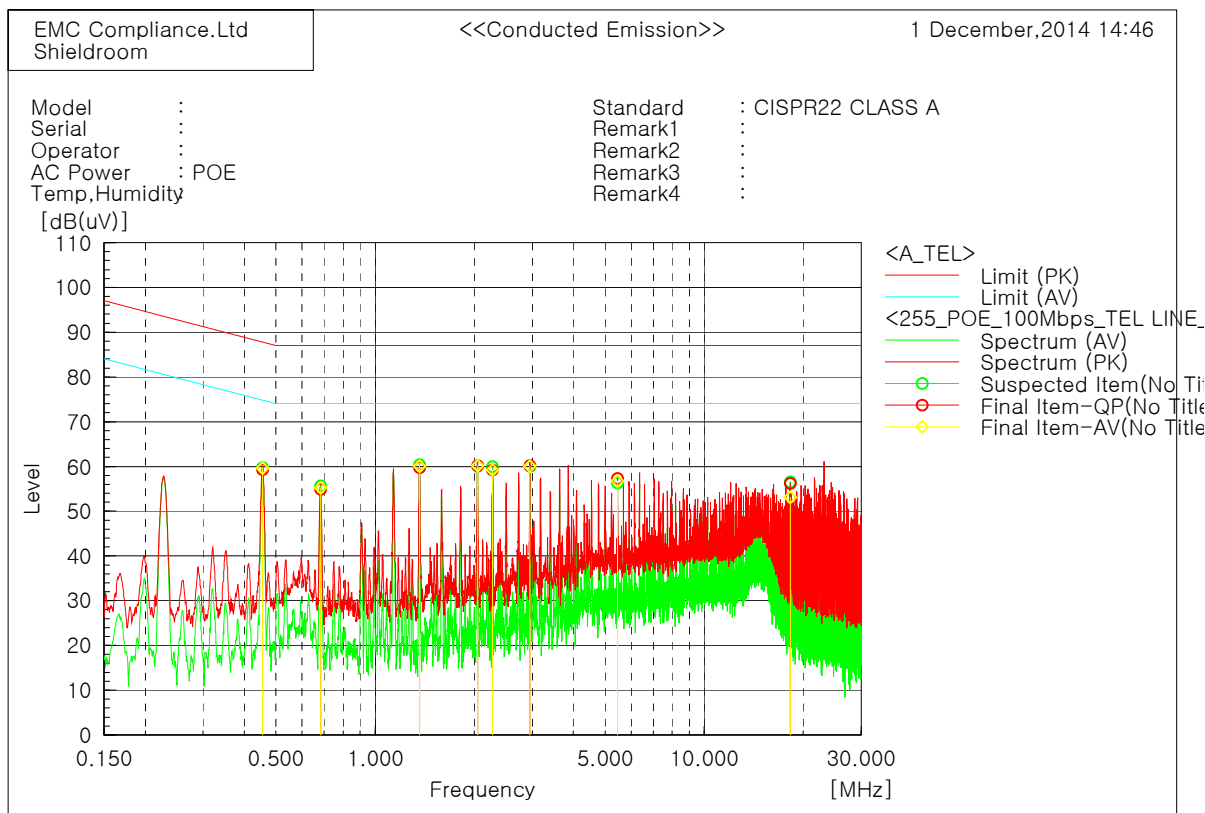


Final Result

--- 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	1.59148	46.0	44.7	9.7	55.7	54.4	87.0	74.0	31.3	19.6
2	2.4999	48.6	44.8	9.6	58.2	54.4	87.0	74.0	28.8	19.6
3	3.86355	47.4	45.2	9.7	57.1	54.9	87.0	74.0	29.9	19.1
4	5.68267	46.8	44.8	9.6	56.4	54.4	87.0	74.0	30.6	19.6
5	7.5003	51.7	45.5	9.6	61.3	55.1	87.0	74.0	25.7	18.9
6	8.86563	41.8	37.9	9.6	51.4	47.5	87.0	74.0	35.6	26.5
7	12.50083	48.2	42.2	9.6	57.8	51.8	87.0	74.0	29.2	22.2
8	14.77542	42.1	38.3	9.7	51.8	48.0	87.0	74.0	35.2	26.0

LCL 65 dB (LAN Port)_100 Mbps (SNZ-6320P)_#2- PoE



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	0.45472	49.5	49.9	9.8	59.3	59.7	87.8	74.8	28.5	15.1
2	0.68234	45.2	45.6	9.7	54.9	55.3	87.0	74.0	32.1	18.7
3	1.36382	50.0	50.3	9.7	59.7	60.0	87.0	74.0	27.3	14.0
4	2.04605	50.6	50.6	9.6	60.2	60.2	87.0	74.0	26.8	13.8
5	2.27344	49.6	49.6	9.6	59.2	59.2	87.0	74.0	27.8	14.8
6	2.95506	50.5	50.4	9.7	60.2	60.1	87.0	74.0	26.8	13.9
7	5.45492	47.7	47.1	9.6	57.3	56.7	87.0	74.0	29.7	17.3
8	18.24344	46.5	43.4	9.7	56.2	53.1	87.0	74.0	30.8	20.9

6.2 Radiated Emission

Test specification	AS/NZS CISPR 22:2009+A1:2010, Class A		
Testing voltage	DC 12 V, PoE		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2014. 11. 30		
Temperature (°C)	28.4 °C	Humidity (% R.H.)	27.2 % 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 MHz	Class A @ 3 m		Class B @ 3 m	
	Average limit dB μ V/m	Peak limit dB μ V/m	Average limit dB μ V/m	Peak limit dB μ V/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	2015.01.27	☒
Test Receiver	ESCI	100001	R&S	2015.07.14	☐
Test Receiver	ESCI	100710	R&S	2015.10.13	☐
Test Receiver	ESR	101078	R&S	2015.02.24	☐
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2016.08.28	☒
Amplifier	310N	284608	SONOMA INSTRUMENT	2015.04.16	☒
3 dB Attenuator	8491B	22981	HP	2015.03.04	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Preamplifier	8449B	3008A02343	AGILENT	2015.10.13	☒
Horn ANT	3115	00155772	ETS	2015.02.26	☒
Spectrum Analyzer	E4407B	US39010142	AGILENT	2015.10.13	☐

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

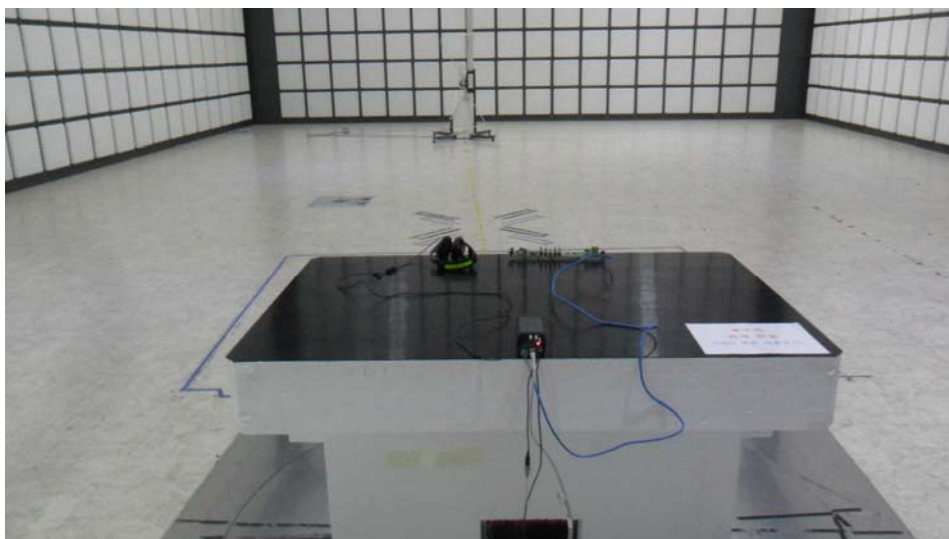
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

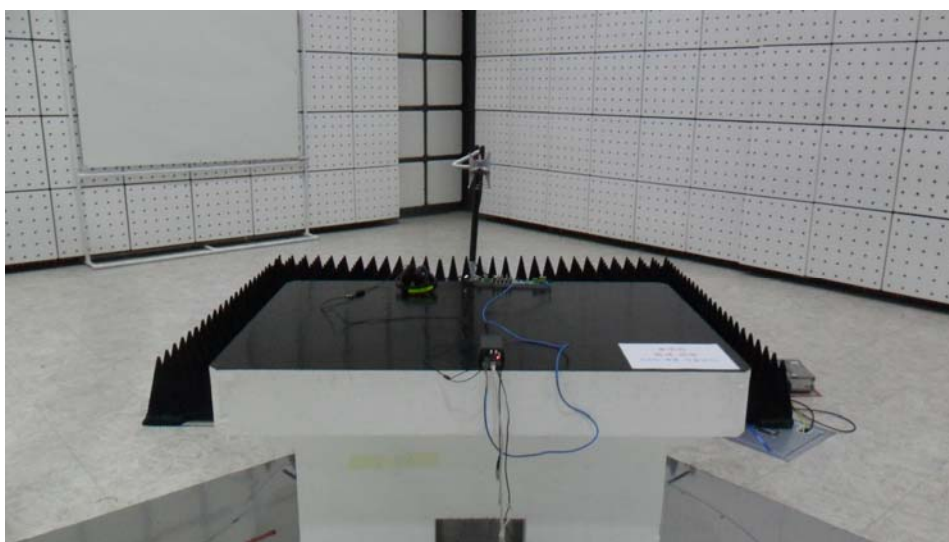
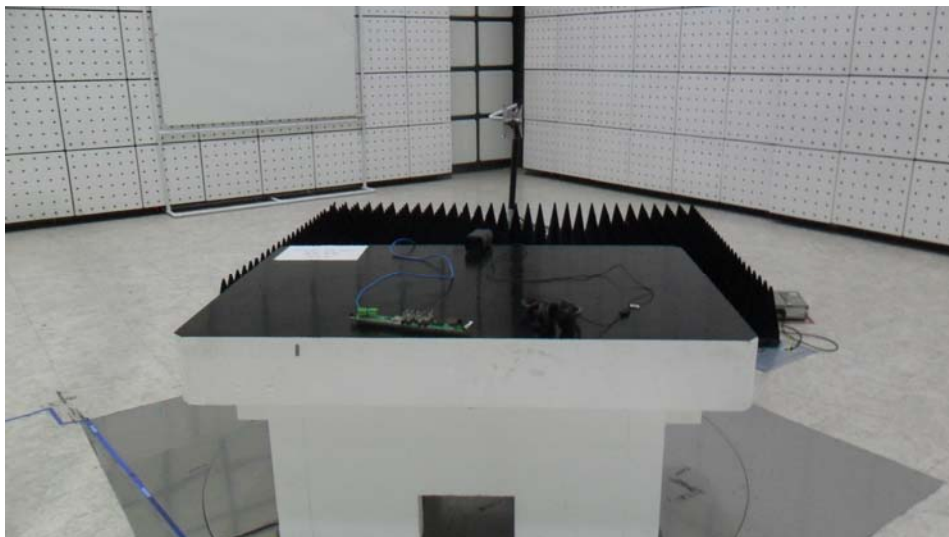
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}\mu\text{V/m}$$

6.2.5 Photographs of test setup

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



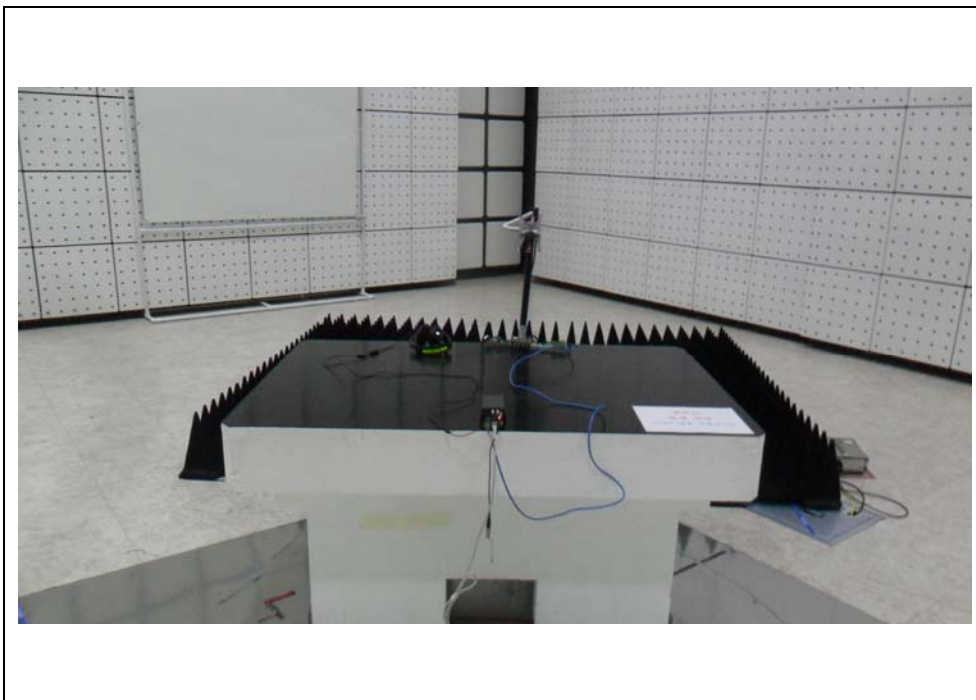
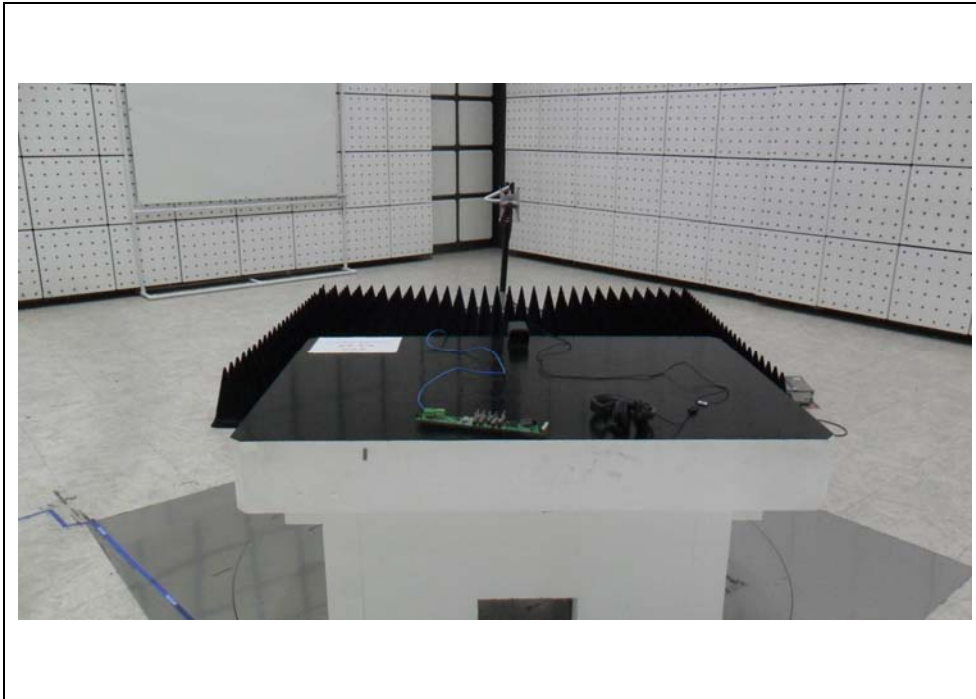
* 1 GHz ~ 6 GHz (#1- DC 12V)



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



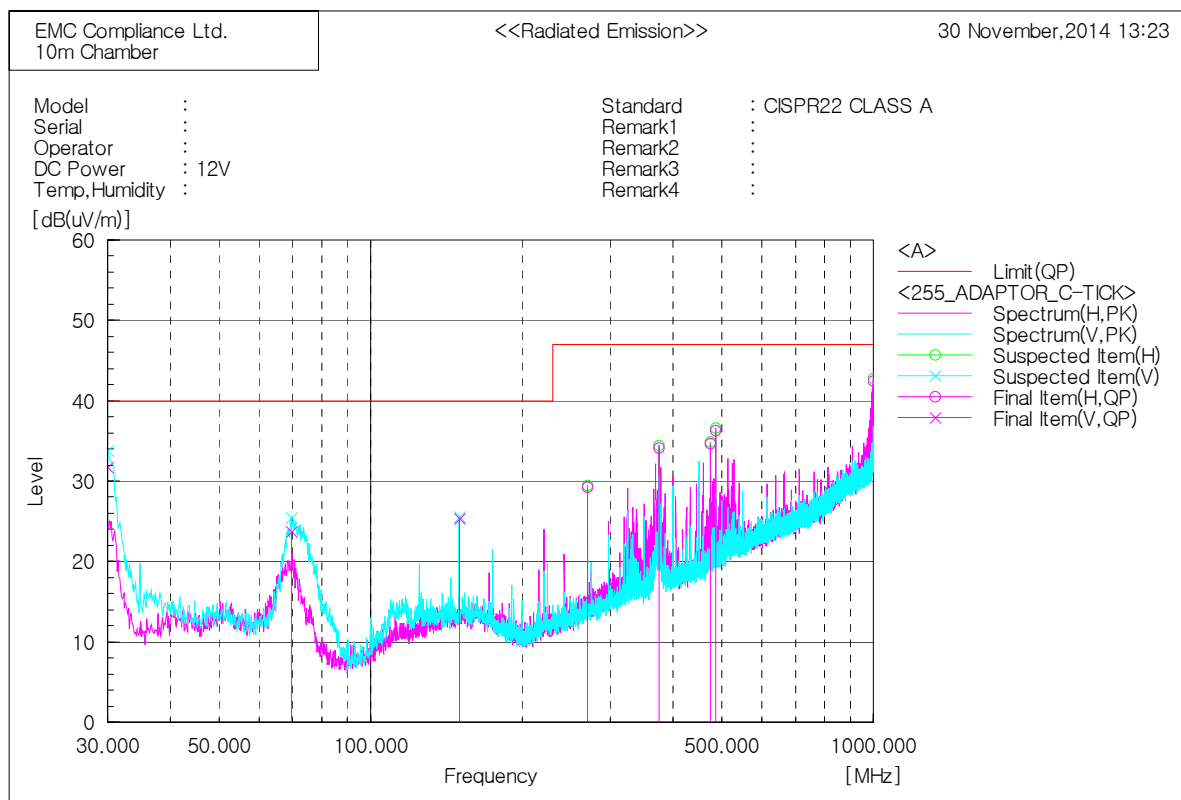
* 1 GHz ~ 6 GHz (#2- PoE)



6.2.6 Radiated emission measurement result

* Graph and Data

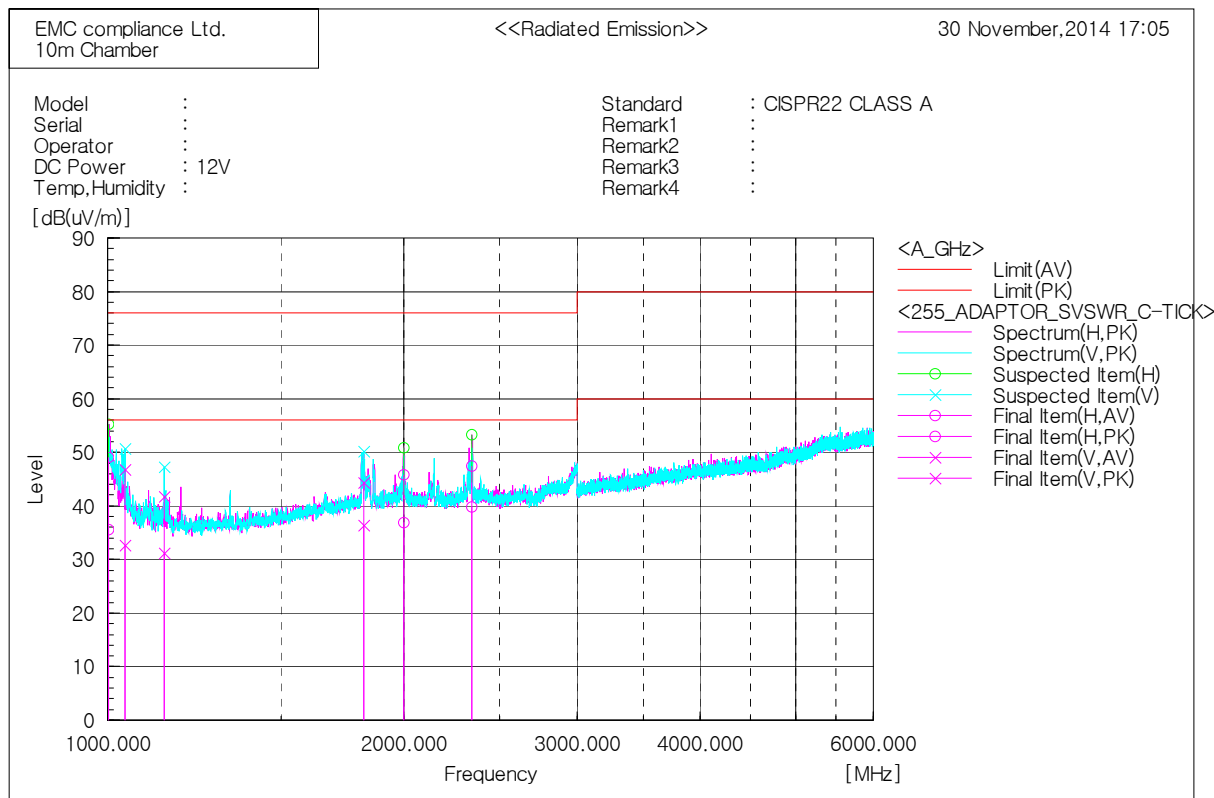
* 30 MHz ~ 1 GHz (SNZ-6320P) _#1- DC 12V



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	30.000	V	46.2	-14.5	31.7	40.0	8.3	400.0	136.9
2	69.528	V	38.0	-14.3	23.7	40.0	16.3	100.0	164.3
3	150.038	V	37.2	-11.9	25.3	40.0	14.7	100.0	235.3
4	269.954	H	40.3	-11.1	29.2	47.0	17.8	400.0	158.7
5	374.956	H	41.6	-7.5	34.1	47.0	12.9	100.0	278.9
6	474.987	H	39.5	-4.8	34.7	47.0	12.3	100.0	31.9
7	486.021	H	40.8	-4.5	36.3	47.0	10.7	100.0	31.9
8	998.060	H	35.9	6.6	42.5	47.0	4.5	100.0	53.0

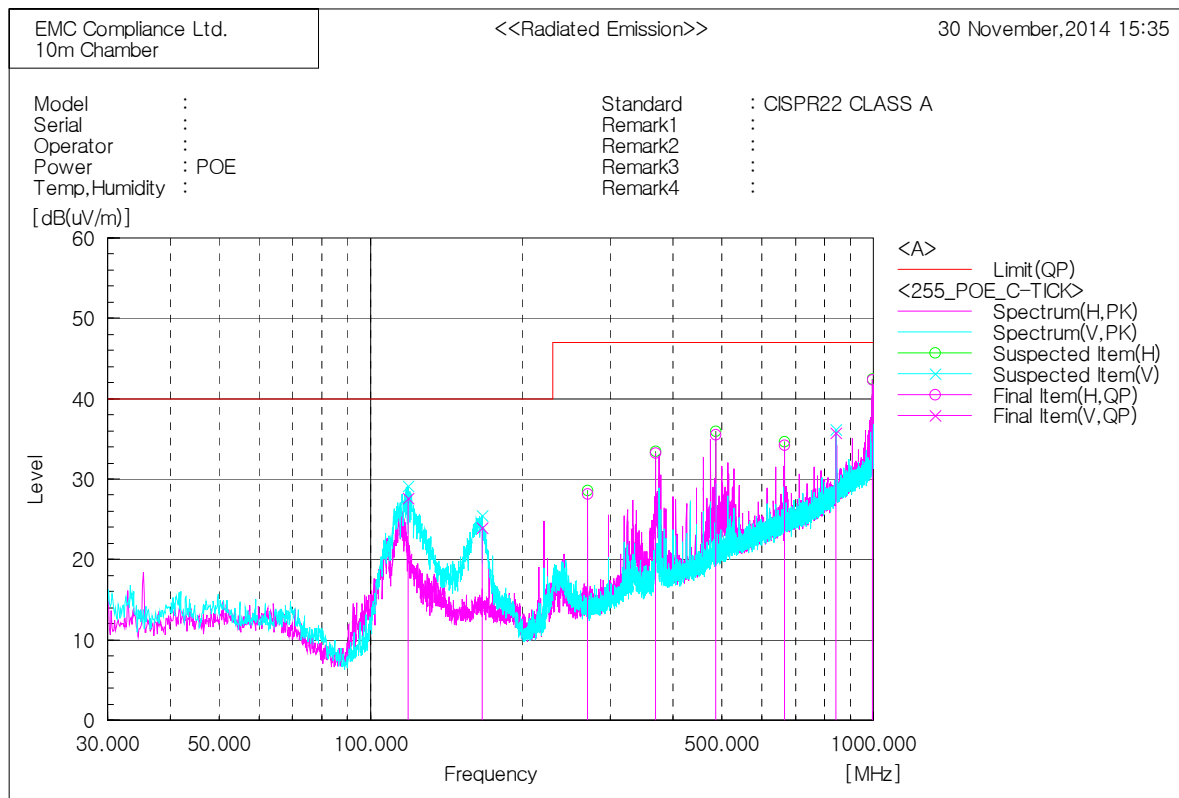
* 1 GHz ~ 6 GHz (SNZ-6320P) _#1- DC 12V



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	1002.500	H	41.6	55.2	-6.1	35.5	49.1	56.0	76.0	20.5	26.9	100.0	73.3
2	1041.250	V	38.5	52.7	-5.9	32.6	46.8	56.0	76.0	23.4	29.2	100.0	54.8
3	1141.875	V	36.4	46.9	-5.2	31.2	41.7	56.0	76.0	24.8	34.3	100.0	54.8
4	1819.375	V	35.2	43.1	1.2	36.4	44.3	56.0	76.0	19.6	31.7	100.0	348.6
5	1998.125	H	34.8	43.8	2.0	36.8	45.8	56.0	76.0	19.2	30.2	100.0	59.7
6	2345.625	H	37.9	45.6	1.9	39.8	47.5	56.0	76.0	16.2	28.5	100.0	86.9

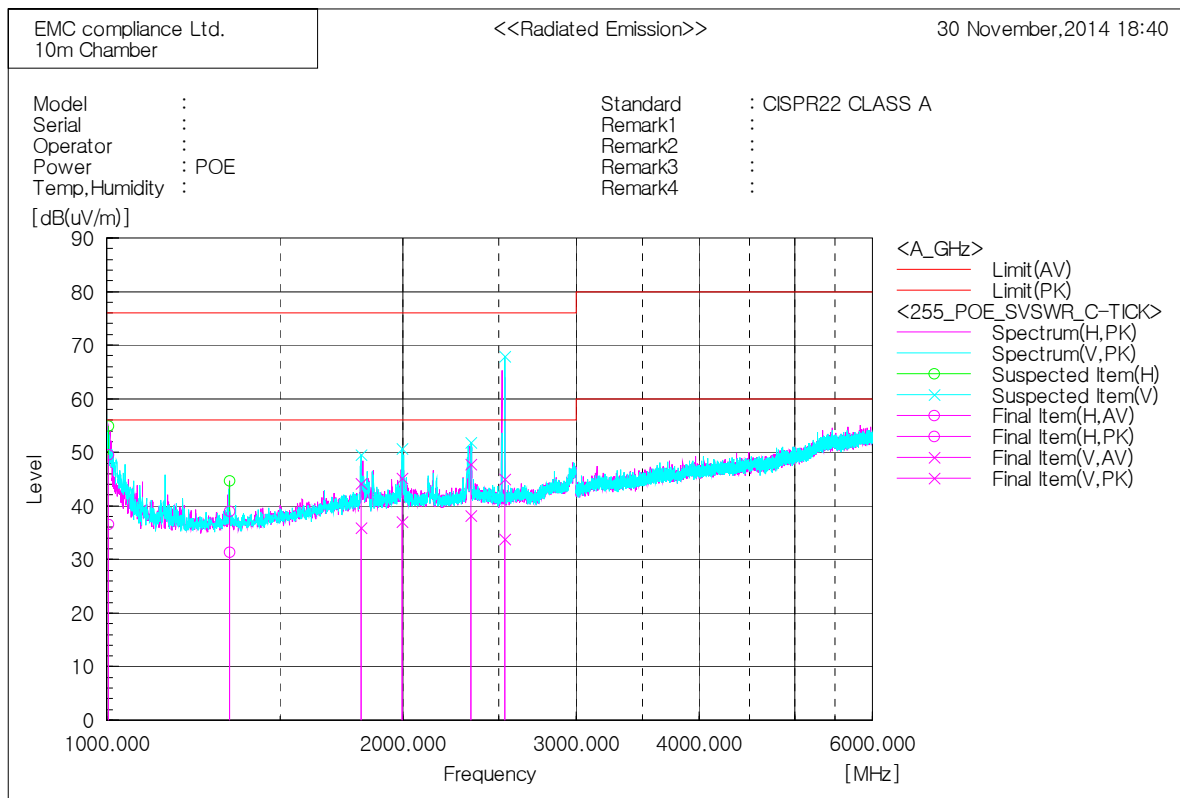
* 30 MHz ~ 1 GHz (SNZ-6320P)_#2- PoE



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]
1	118.634	V	41.9	-14.3	27.6	40.0	12.4	100.0	185.7
2	166.891	V	35.7	-11.8	23.9	40.0	16.1	100.0	315.6
3	269.954	H	39.3	-11.1	28.2	47.0	18.8	400.0	334.8
4	368.651	H	41.0	-7.7	33.3	47.0	13.7	400.0	81.1
5	486.021	H	40.0	-4.5	35.5	47.0	11.5	100.0	206.7
6	666.078	H	34.3	-0.1	34.2	47.0	12.8	100.0	31.5
7	843.588	V	32.2	3.5	35.7	47.0	11.3	400.0	354.2
8	996.847	H	35.8	6.5	42.3	47.0	4.7	100.0	238.5

* 1 GHz ~ 6 GHz (SNZ-6320P)_#2- PoE



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	1003.125	H	42.7	55.6	-6.1	36.6	49.5	56.0	76.0	19.4	28.5	100.0	351.0
2	1331.875	H	35.1	42.8	-3.8	31.3	39.0	56.0	76.0	24.7	37.0	100.0	32.0
3	1812.500	V	34.8	43.1	1.1	35.9	44.2	56.0	76.0	20.1	31.8	100.0	328.9
4	1996.250	V	35.0	43.2	2.0	37.0	45.2	56.0	76.0	19.0	30.8	100.0	79.7
5	2346.250	V	36.2	45.8	1.9	38.1	47.7	56.0	76.0	17.9	28.3	100.0	270.0
6	2538.750	V	31.8	43.0	2.0	33.8	45.0	56.0	76.0	22.2	31.0	100.0	20.8

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



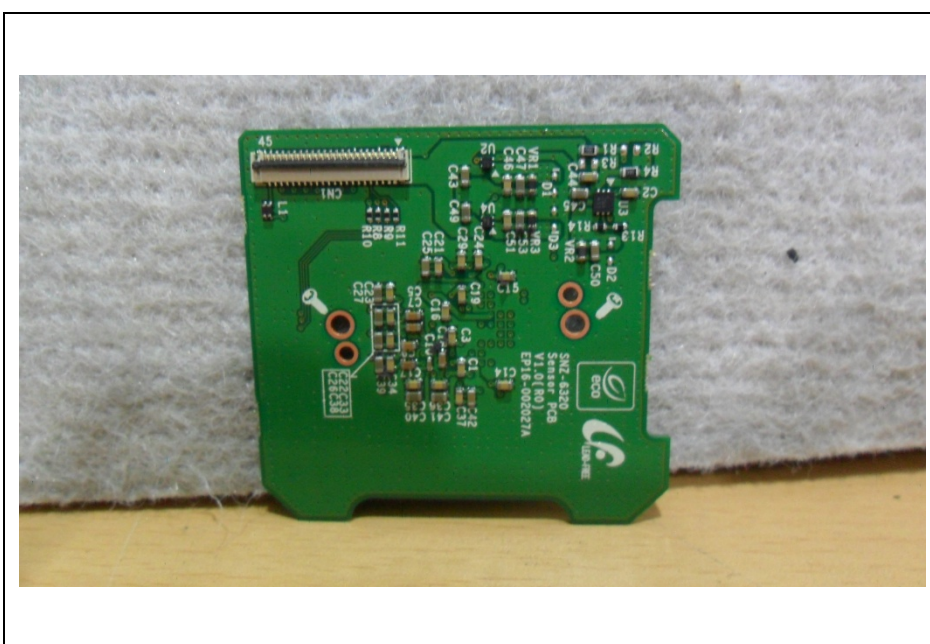
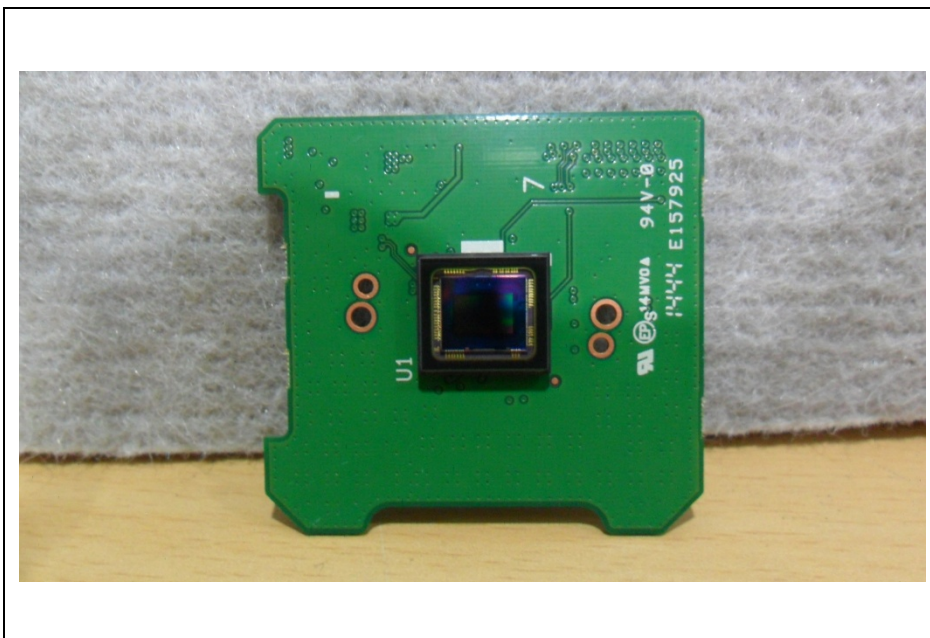
Bottom View



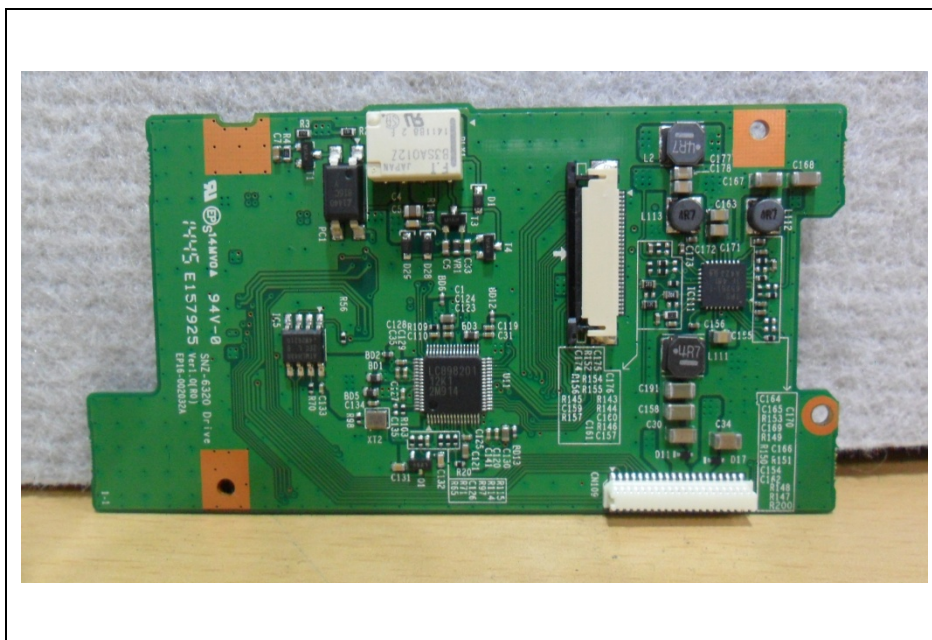
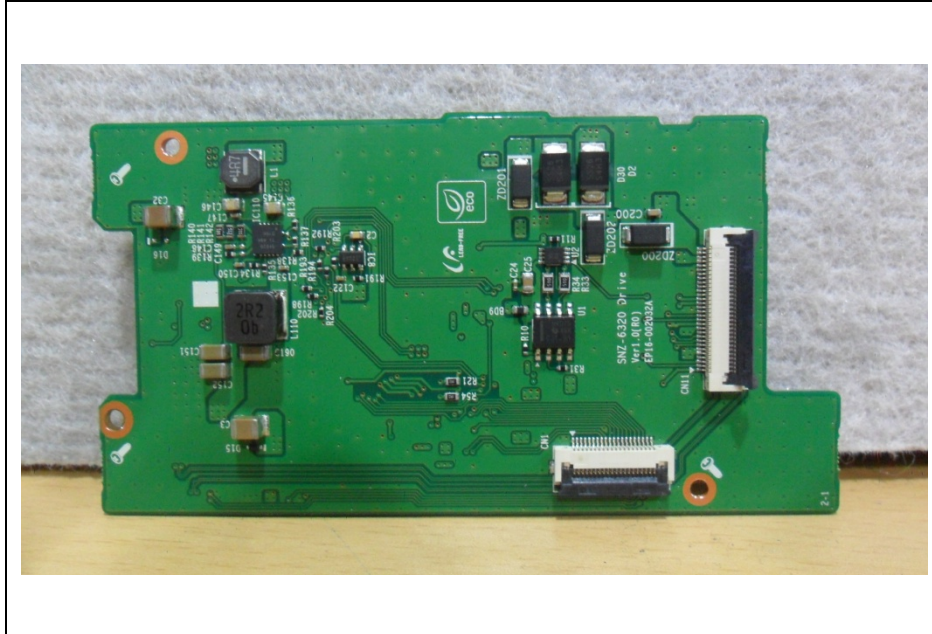
Inside



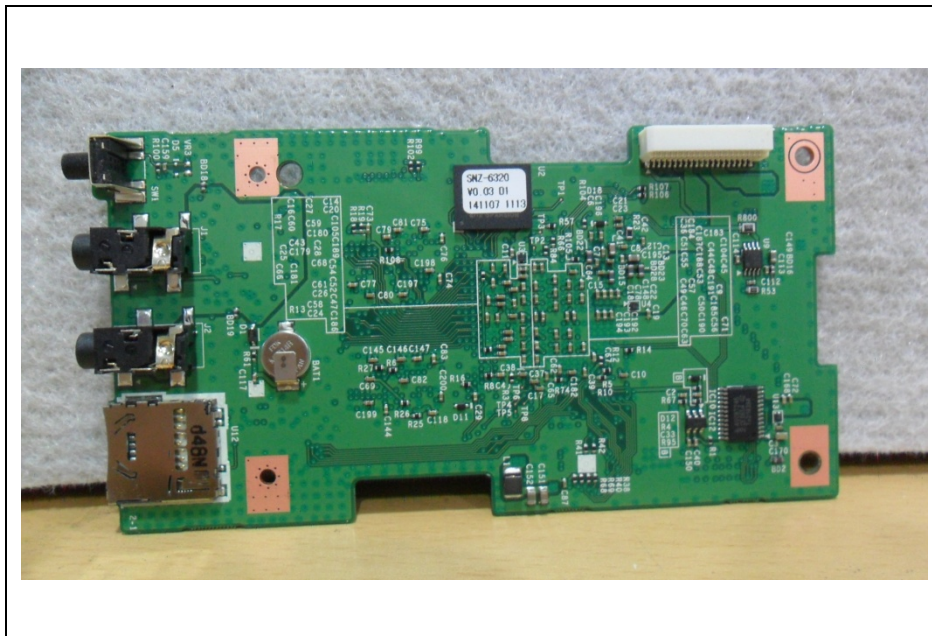
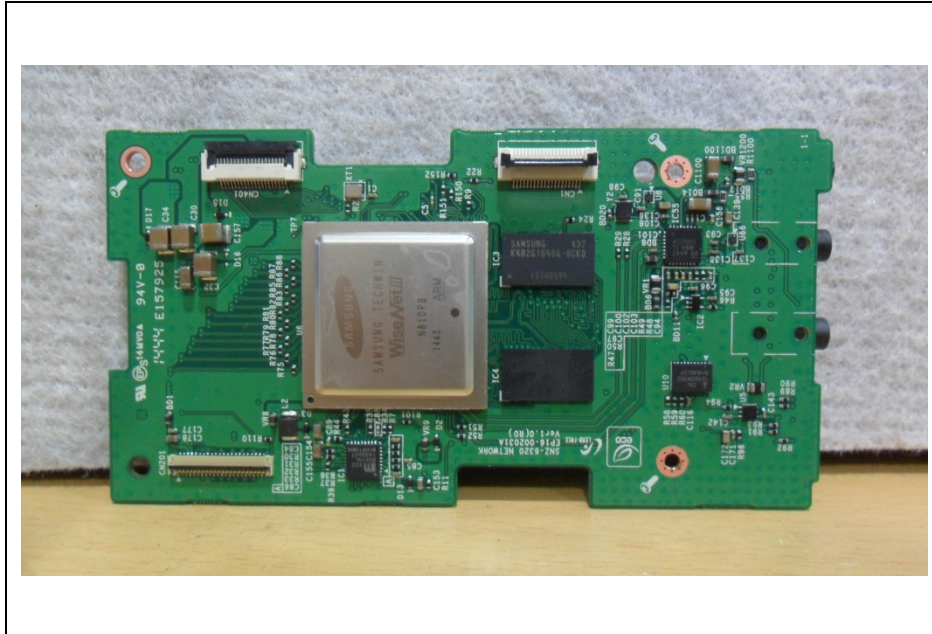
CCD Board



Drive Board



Network Board



Power Board

