

EMC TEST REPORT

Test report No : EMC-VCCI-E0411
Type of Equipment : Network Camera
Model Name : SNB-8000N
Applicant : Samsung Techwin Co., Ltd.
84, Jeongdong-ro, Seongsan-gu,
Changwon-si, Gyeongsangnam-do, Korea
Manufacturer#1 : Samsung Techwin Co., Ltd.
84, Jeongdong-ro, Seongsan-gu,
Changwon-si, Gyeongsangnam-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 / 2013.04, 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: 2014. 10. 21

Date of testing: 2014. 11. 09 ~ 11.10

Issued date: 2014. 11. 12

Tested by: 
JUNG, YONG-JUN

Approved by: 
BEAK, JEONG-SOO

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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.

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

Telephone Number: 82 70 5008 1021

Facsimile Number: 82 505 299 8311

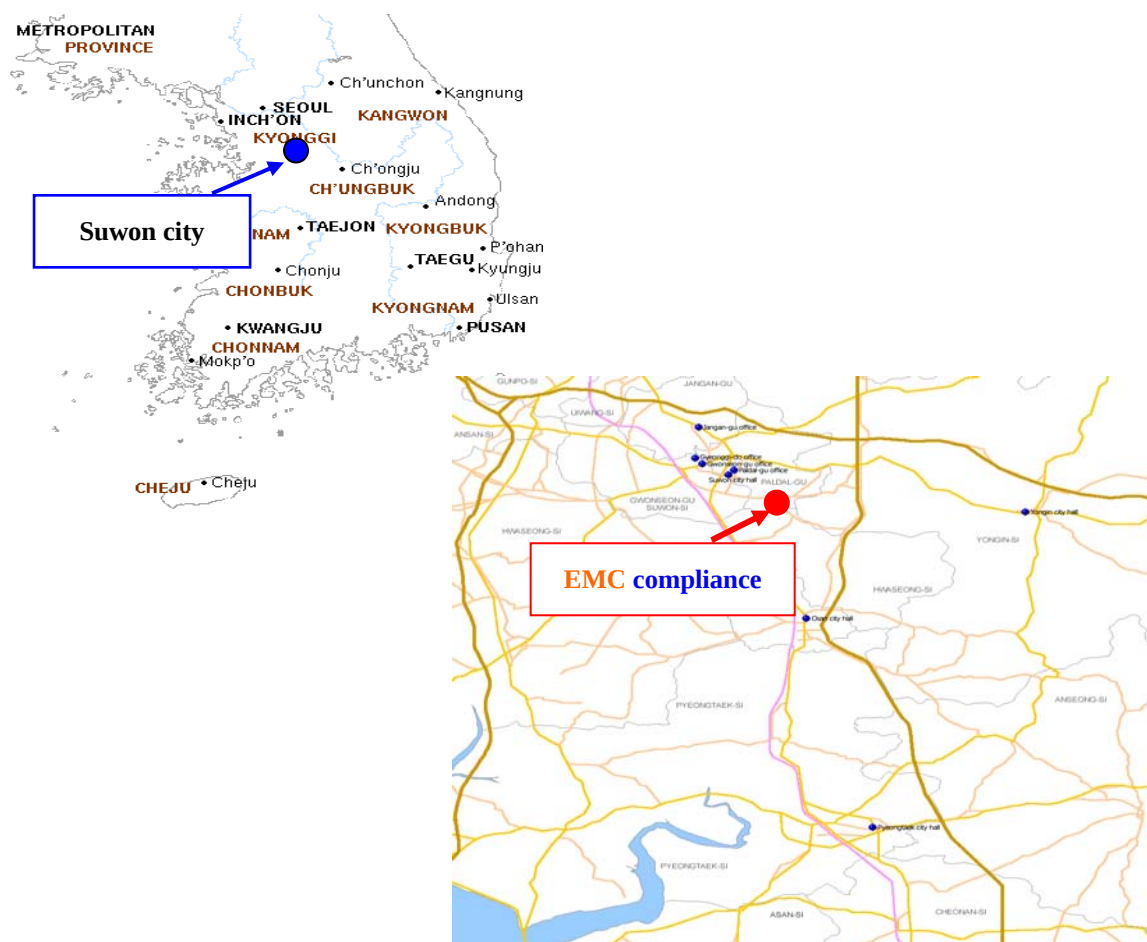
FCC CAB.: KR0040

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)	: 28.4 °C	27.2 % R.H.	-
Shielded room(CE)	: 22.4 °C	25.9 % 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

	SNB-8000
Video	
Imaging Device	1/1.8" 6M CMOS
Total Pixels	6M -> 3096 x 2094
Effective Pixels	2616(H) x 1976(V) (QXGA)
Scanning System	Progressive
Min. Illumination	Color : 0.2 Lux (1/20, F1.2, 50IRE), 0.005 Lux (2sec, F1.2, 50IRE) Color : 0.1 Lux (1/20, F1.2, 30IRE), 0.0025 Lux (2sec, F1.2, 30IRE) B/W : 0.02 Lux (1/20, F1.2, 50IRE), 0.0005 Lux (2sec, F1.2, 50IRE) B/W : 0.01 Lux (1/20, F1.2, 30IRE), 0.00025 Lux (2sec, F1.2, 30IRE)
S / N Ratio	50dB ↑
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - DIP connector type
Lens	
Focus Control	Simple Focus / Manual - Remote control via network ,Button control (Manual, Simple Focus)
Lens Type	Manual / DC Auto Iris, P-Iris
Mount Type	C/CS Mount
Operational	
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC
Wide Dynamic Range (contrast Enhancement)	60dB
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNRIII(2D+3D Noise Filter)
Digital Image Stabilization	-
Defog	-
Motion Detection	Off / On (4ea, Rectangular zones)
Privacy Masking	Off / On (32ea, Rectangular zones)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor (Include Mercury)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital PTZ	16x, Digital PTZ(Preset,Group)
Flip / Mirror	Off / On
Intelligent Video Analytics	Tampering, Audio Detection, People Counting (coming '15.MAR)
Alarm I/O	Input 1ea / Output 1ea
Audio In	Selectable (Mic IN/Line IN) (Built- IN Mic) Supply voltage:2.5V DC(4mA), Input Impedance : approx 2K ohm
Audio out	Line out (3.5mm stereo mini jack) Max output Level : 1Vrms
Serial Interface	RS-485 - Samsung-T/E, Pelco-D/P, Sungjin, Panasonic, vicon, Honewell, AD, GE, Bosch
Alarm Triggers	Motion detection, Tampering, Audio Detection, 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	5M Mode 2592x1944 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 720x576 / 720x480 / 640x480 / 320x240 2M Mode 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 720x576 / 720x480 / 640x480 / 320x240
Max. Framerate	5M Mode H.264: 20 fps for all resolution MJPEG: 2592x1944 : 10 fps 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : 15 fps 800x600 / 720x576 / 720x480 / 640x480 / 320x240 : 20 fps 2M Mode H.264: 30 fps for all resolution MJPEG: 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : 15 fps 800x600 / 720x576 / 720x480 / 640x480 / 320x240 : 20 fps
Smart Codec	-
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 6 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	10 users at Unicast Mode
Edge Storage	micro SD/SDHC/SDXC (64GB) - motion Images recorded in the SDX/SDHC/SD memory card can be downloaded. NAS(Network Attached Storage)
Application Programming Interface	ONVIF Profile S SUNAPI(HTTP API) SVNP 2.0 Samsung Camera Application Platform
Webpage 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. 8~11) 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, SSM

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	AC24V±10%, DC12V±10%,PoE(IEEE802.3af,Class3)
Power Consumption	Max. 12.65W (AC 24V, 50~60Hz)
	Max. 10.68W (DC 12V)
	Max. 12.14W (PoE, Class3)
Mechanical	
Color / Material	FRONT (BLACK) , BODY (IVORY) / FRONT(Aluminium), BODY(Aluminium)
Dimension (WxHxD)	W73.1 x H66.6 x D147.0
Weight	566g

4.2 Product description

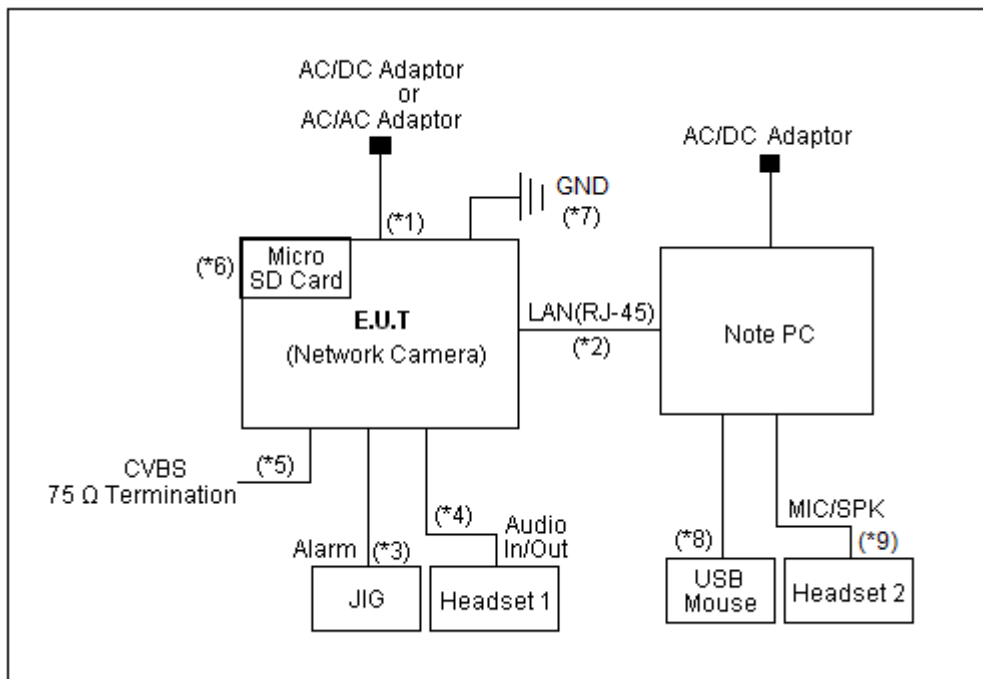
Type of product	Network Camera
Model name (Basic)	SNB-8000N
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	-
Testing voltage	100 V , 50 Hz, PoE
Product rating	*AC/DC Adaptor#1 (DSA-60W-12 1 12048) Input: AC 100 - 240 V , 50 / 60 Hz, 1.5 A Output: DC 12 V , 4 A *AC/AC Adaptor#2 (DRL-241500AC) Input: AC 100 - 240 V , 50 / 60 Hz, 0.2 A Output: AC 24 V , 1.5A *PoE
Internal clock frequency	Above 108 Mhz
Note	* AC/DC adaptor was provided by the manufacturer. * AC/AC adaptor was 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	8165900112700	Microsoft
Headset 1	ES-303	-	inkel
Headset 2	SHS-250V	-	SAMSUNG
JIG	-	-	-
Micro SD Card (4GB)	-	-	-

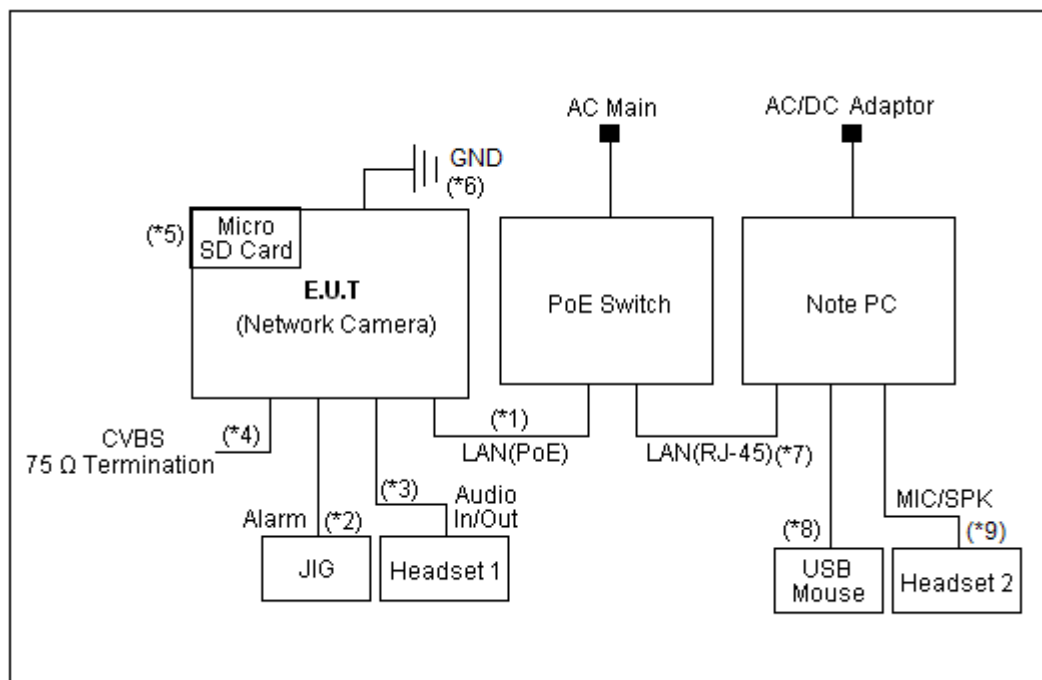
4.4 Test configuration

#1- AC/DC Adaptor, #2-AC/AC Adaptor



Note *	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT (Network Camera)	Power	AC/DC Adaptor or AC/AC Adaptor	Power	1.6	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		CVBS	75 Ω Termination	-	0.5	Non-Shield
6		Micro SD Card	Micro SD Card	Micro SD Card	Direct	-
7		GND	GND	GND	1.6	Non-Shield
8	Note PC	USB	USB Mouse	USB	1.8	Shield
9		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.
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		CVBS	75 Ω Termination	-	0.5	Non-Shield
5		Micro SD Card	Micro SD Card	Micro SD Card	Direct	-
6		GND	GND	GND	1.6	Non-Shield
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.
	Recording Test.

* Note: 3 types of powers are available for the product, that are AC/DC Adaptor(DC 12 V),

AC/AC Adaptor(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
☒	Conducted Emission	VCCI V-3 / 2013.04, Class A	Complied
☒	Radiated Emission	VCCI V-3 / 2013.04, Class A	Complied

6. Test results

6.1 Conducted Emission

Test specification	VCCI V-3 / 2013.04, Class A		
Testing voltage	100 V, 50 Hz, PoE		
Test facility	Shielded room (CE#1)		
Date	2014. 11. 09		
Temperature (°C)	22.4 °C	Humidity (% R.H.)	25.9 % 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

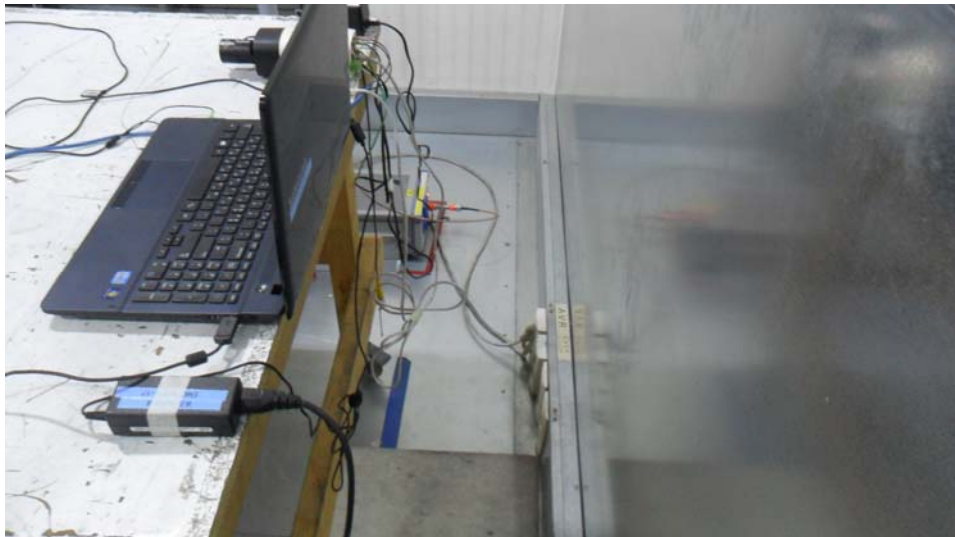
The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground 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	CAT5-8158-0071	SCHWARZBECK	2015.03.21	☒
8-WIRE ISN	NTFM 8158 CAT3	CAT3-8158-0020	SCHWARZBECK	2015.03.07	☐
ISN	ST08	24342	TESEQ	2015.05.30	☐

6.1.4 Photographs of test setup

* AC Main(#1- AC/DC Adaptor, #2- AC/AC Adaptor)



* Telecommunication

#1- AC/DC Adaptor, #2- AC/AC Adaptor

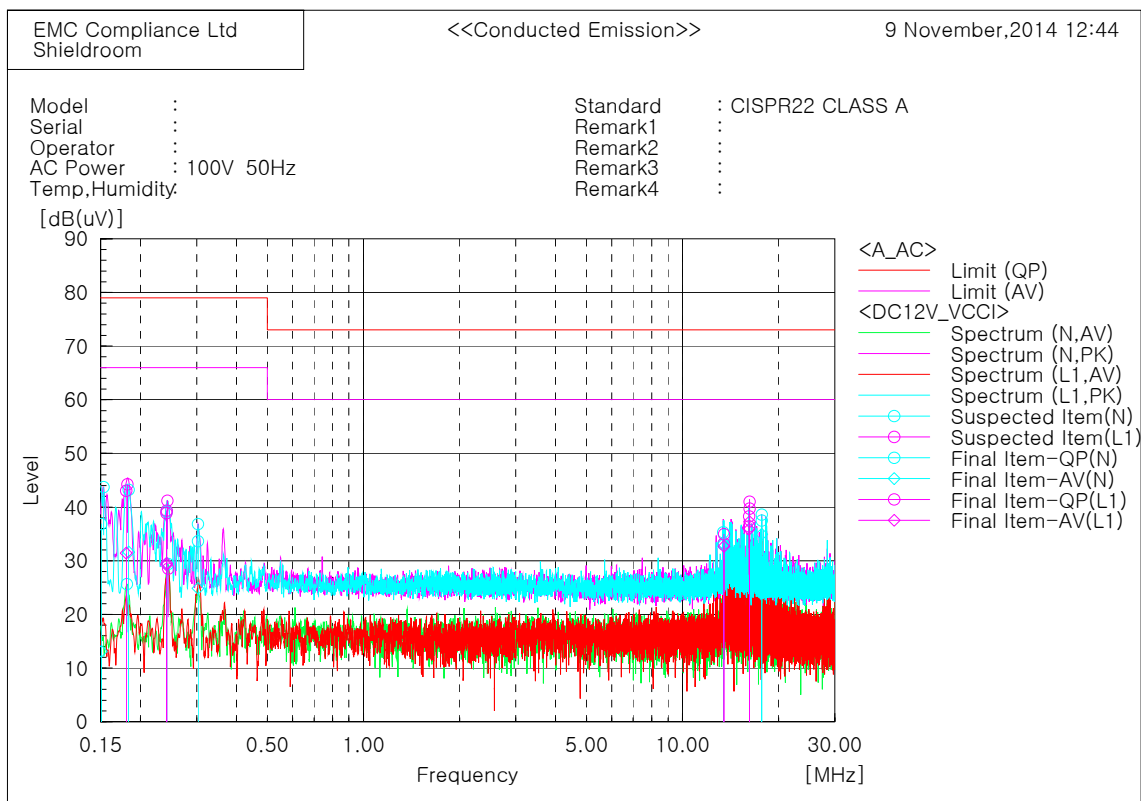


#3- PoE



6.1.5 Conducted emission measurement result

* AC Main (SNB-8000N) _#1- AC/DC Adaptor

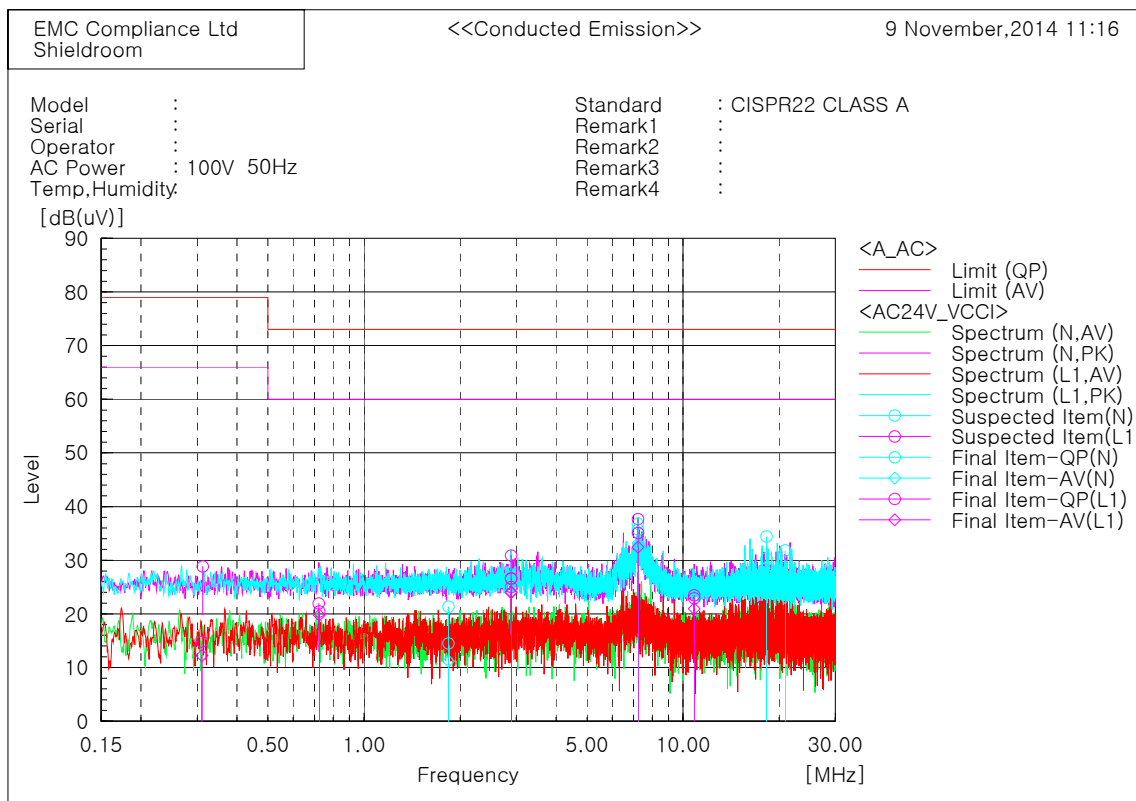


Final Result

--- 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	0.15084	27.1	3.3	9.8	36.9	13.1	79.0	66.0	42.1	52.9
2	0.18356	33.3	21.7	9.9	43.2	31.6	79.0	66.0	35.8	34.4
3	0.24184	29.5	19.9	9.6	39.1	29.5	79.0	66.0	39.9	36.5
4	0.30271	23.9	15.2	9.7	33.6	24.9	79.0	66.0	45.4	41.1
5	13.42013	25.5	23.3	9.8	35.3	33.1	73.0	60.0	37.7	26.9
6	17.69378	27.6	25.0	9.9	37.5	34.9	73.0	60.0	35.5	25.1

--- 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	0.18038	33.2	21.6	9.8	43.0	31.4	79.0	66.0	36.0	34.6
2	0.24121	29.3	19.6	9.6	38.9	29.2	79.0	66.0	40.1	36.8
3	0.24186	29.7	19.9	9.6	39.3	29.5	79.0	66.0	39.7	36.5
4	13.48082	25.1	22.9	9.8	34.9	32.7	73.0	60.0	38.1	27.3
5	16.16706	28.5	26.1	9.8	38.3	35.9	73.0	60.0	34.7	24.1
6	16.22803	29.9	27.4	9.8	39.7	37.2	73.0	60.0	33.3	22.8

* AC Main (SNB-8000N) _#2- AC/AC Adaptor



Final Result

--- N Phase ---

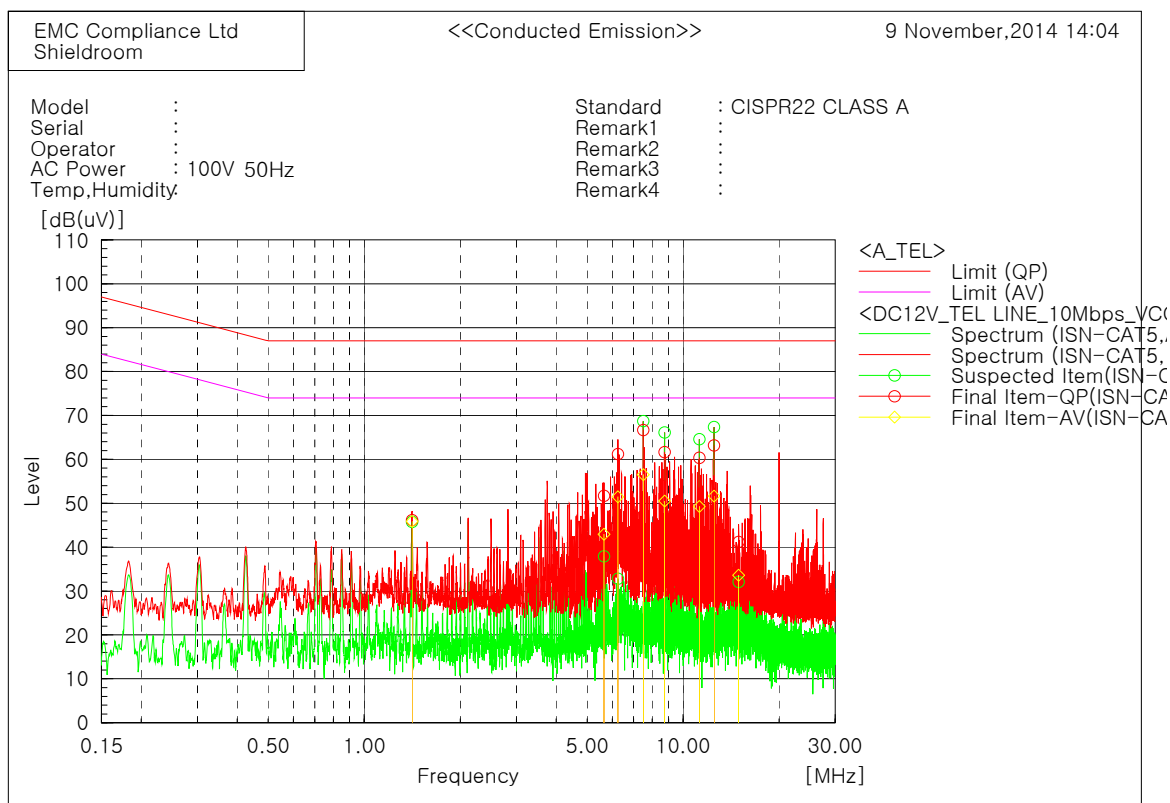
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	1.83797	4.8	1.5	9.7	14.5	11.2	73.0	60.0	58.5	48.8
2	2.88765	16.9	14.2	9.8	26.7	24.0	73.0	60.0	46.3	36.0
3	7.22031	26.0	23.5	9.7	35.7	33.2	73.0	60.0	37.3	26.8
4	7.22338	25.5	22.8	9.7	35.2	32.5	73.0	60.0	37.8	27.5
5	18.24472	20.4	19.0	9.9	30.3	28.9	73.0	60.0	42.7	31.1
6	20.86998	15.8	13.2	9.9	25.7	23.1	73.0	60.0	47.3	36.9

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.31087	5.0	2.4	9.8	14.8	12.2	79.0	66.0	64.2	53.8
2	0.72369	10.6	10.4	9.8	20.4	19.8	73.0	60.0	52.6	40.2
3	2.88908	16.9	14.0	9.7	26.6	24.1	73.0	60.0	46.4	35.9
4	2.88929	16.9	14.3	9.7	26.6	24.0	73.0	60.0	46.4	36.0
5	7.22208	25.3	22.6	9.8	35.1	32.4	73.0	60.0	37.9	27.6
6	10.82713	13.1	11.2	9.8	22.9	21.0	73.0	60.0	50.1	39.0

* Telecommunication port

LAN Port (LCL 65 dB)_10 Mbps (SNB-8000N)_#1- AC/DC Adaptor

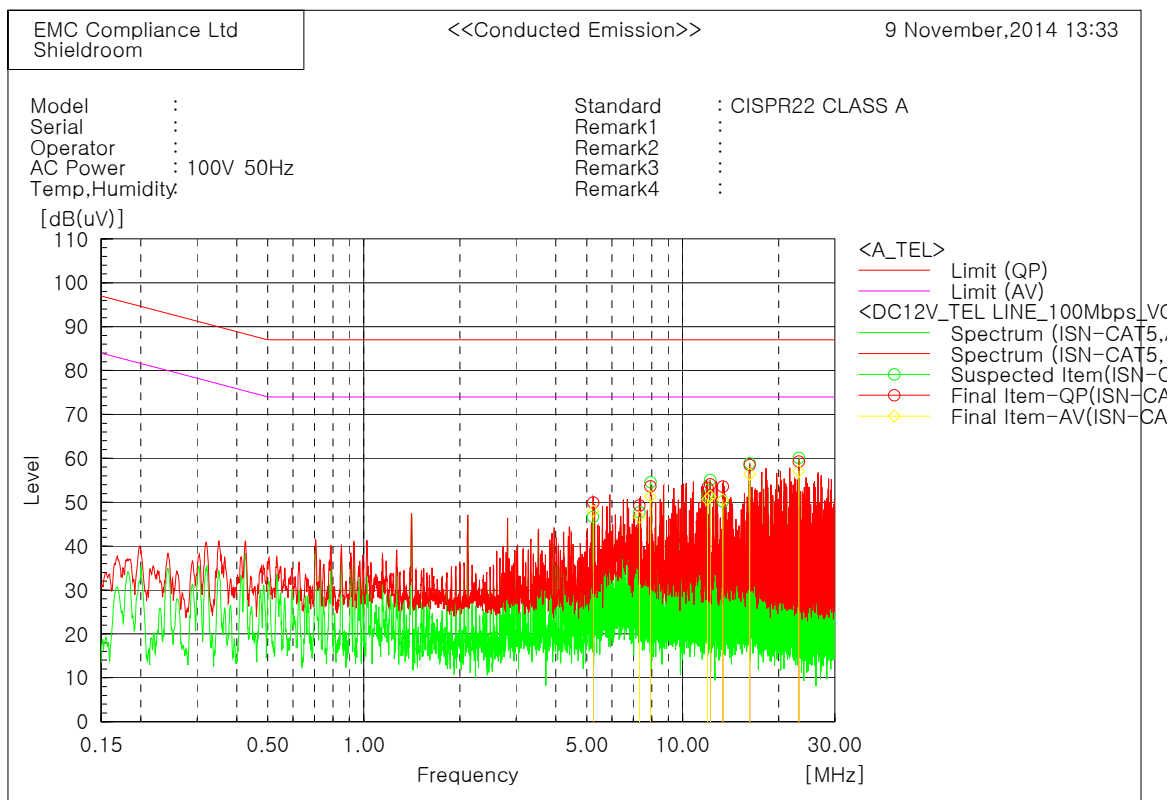


Final Result

--- No Title2 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	1.41227	36.5	36.2	9.7	46.2	45.9	87.0	74.0	40.8	28.1
2	5.6517	42.1	33.3	9.6	51.7	42.9	87.0	74.0	35.3	31.1
3	6.25068	51.6	41.8	9.6	61.2	51.4	87.0	74.0	25.8	22.6
4	7.50029	57.1	46.9	9.6	66.7	56.5	87.0	74.0	20.3	17.5
5	8.74998	52.0	40.9	9.6	61.6	50.5	87.0	74.0	25.4	23.5
6	11.25017	50.8	39.6	9.6	60.4	49.2	87.0	74.0	26.6	24.8
7	12.50032	53.6	42.0	9.6	63.2	51.6	87.0	74.0	23.8	22.4
8	14.94426	31.4	23.9	9.7	41.1	33.6	87.0	74.0	45.9	40.4

LAN Port (LCL 65 dB)_100 Mbps (SNB-8000N)_#1- AC/DC Adaptor

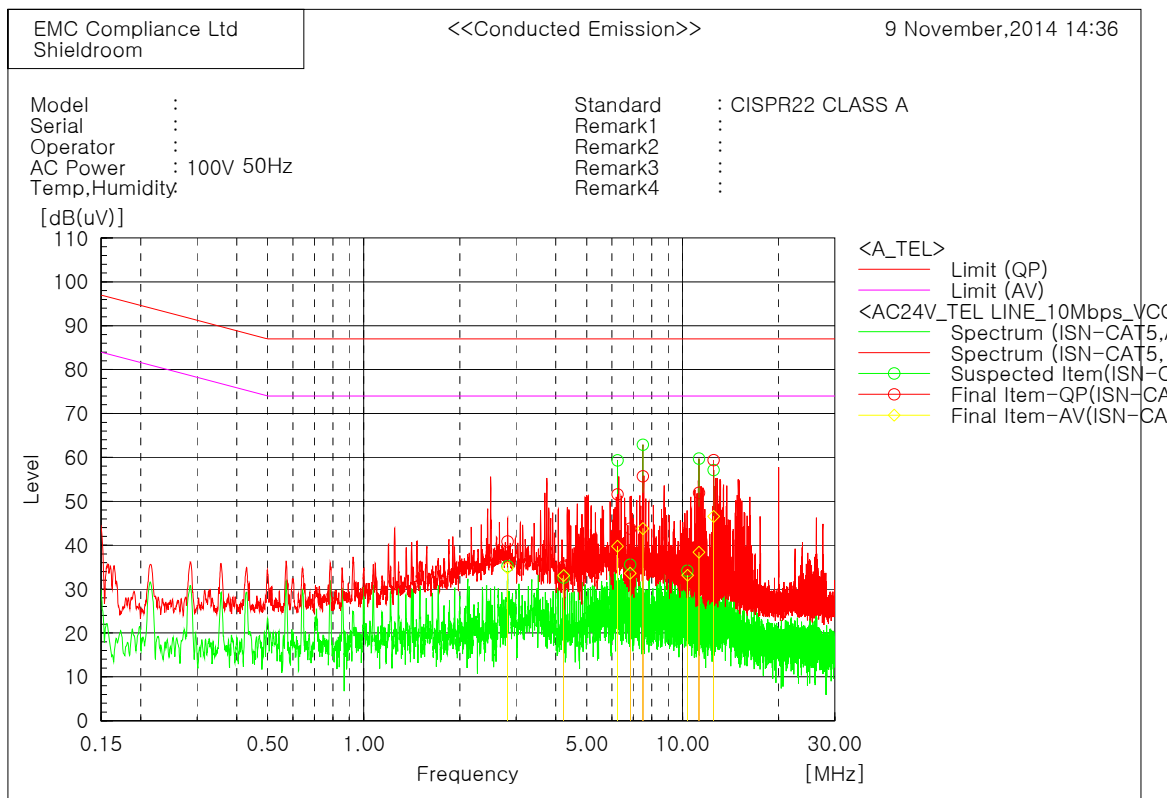


Final Result

--- No Title2 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	5.23738	40.4	38.4	9.6	50.0	48.0	87.0	74.0	37.0	26.0
2	7.31186	39.6	37.0	9.6	49.2	46.6	87.0	74.0	37.8	27.4
3	7.92289	44.0	41.7	9.6	53.6	51.3	87.0	74.0	33.4	22.7
4	11.95383	43.7	41.0	9.6	53.3	50.6	87.0	74.0	33.7	23.4
5	12.19773	44.5	41.7	9.6	54.1	51.3	87.0	74.0	32.9	22.7
6	13.35826	44.0	41.0	9.6	53.6	50.6	87.0	74.0	33.4	23.4
7	16.22851	48.8	46.7	9.7	58.5	56.4	87.0	74.0	28.5	17.6
8	23.129	49.4	47.3	9.8	59.2	57.1	87.0	74.0	27.8	16.9

LAN Port (LCL 65 dB)_10 Mbps (SNB-8000N)_#2- AC/AC Adaptor

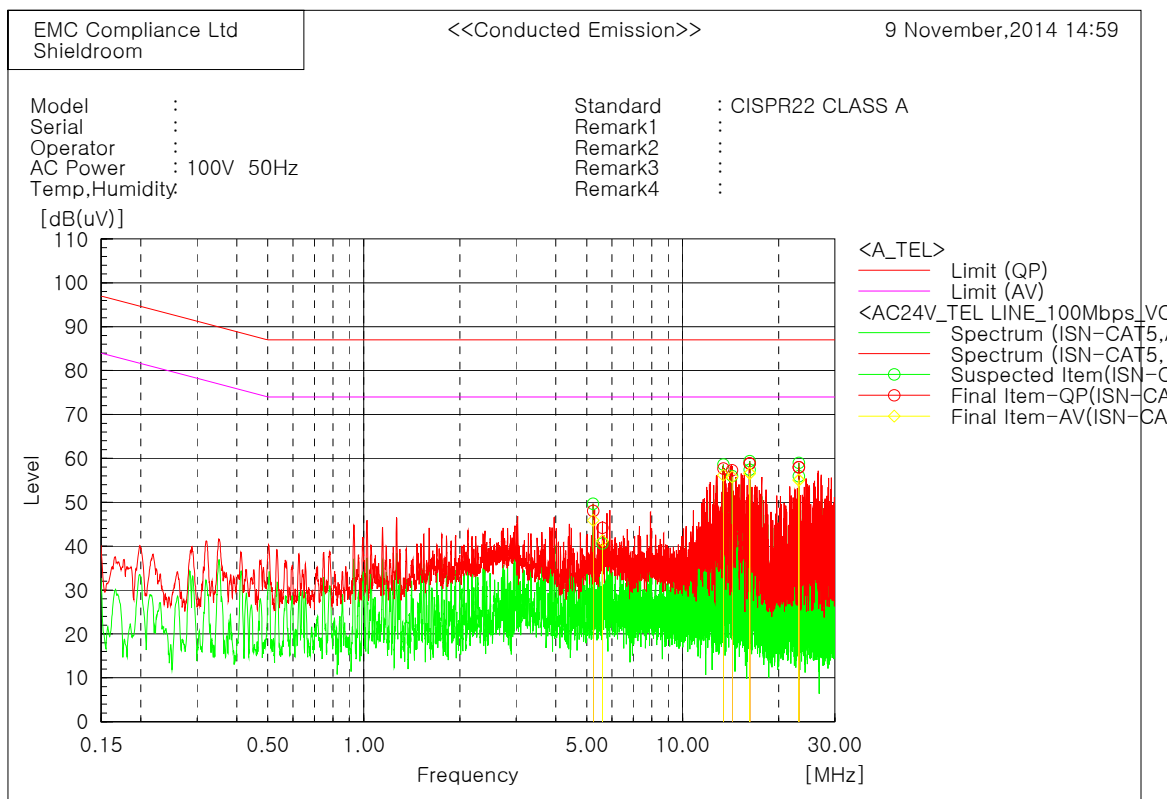


Final Result

--- No Title2 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	2.82604	31.2	25.2	9.6	40.8	34.8	87.0	74.0	46.2	39.2
2	4.23515	25.5	23.5	9.6	35.1	33.1	87.0	74.0	51.9	40.9
3	6.25116	42.0	30.2	9.6	51.6	39.8	87.0	74.0	35.4	34.2
4	6.84774	34.2	24.0	9.6	43.8	33.6	87.0	74.0	43.2	40.4
5	7.50015	46.1	34.2	9.6	55.7	43.8	87.0	74.0	31.3	30.2
6	10.35078	28.3	23.6	9.6	37.9	33.2	87.0	74.0	49.1	40.8
7	11.25039	42.3	28.8	9.6	51.9	38.4	87.0	74.0	35.1	35.6
8	12.50046	49.8	36.9	9.6	59.4	46.5	87.0	74.0	27.6	27.5

LAN Port (LCL 65 dB)_100 Mbps (SNB-8000N)_#2- AC/AC Adaptor

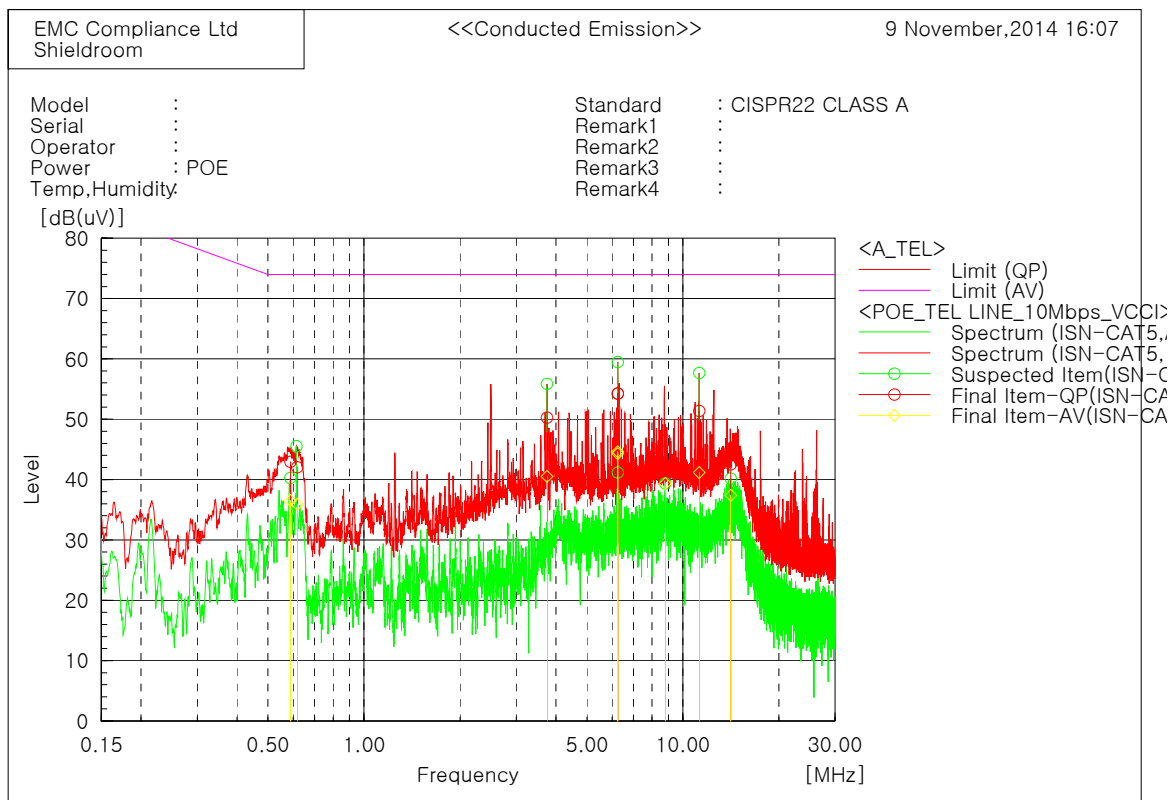


Final Result

--- No Title2 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	5.2372	38.4	36.3	9.6	48.0	45.9	87.0	74.0	39.0	28.1
2	5.60281	34.6	31.6	9.6	44.2	41.2	87.0	74.0	42.8	32.8
3	13.41904	48.1	46.5	9.6	57.7	56.1	87.0	74.0	29.3	17.9
4	14.27455	47.6	46.1	9.7	57.3	55.8	87.0	74.0	29.7	18.2
5	16.22849	49.2	46.9	9.7	58.9	56.6	87.0	74.0	28.1	17.4
6	16.22889	49.1	46.8	9.7	58.8	56.5	87.0	74.0	28.2	17.5
7	23.12889	48.2	45.2	9.8	58.0	55.0	87.0	74.0	29.0	19.0
8	23.12909	48.2	45.3	9.8	58.0	55.1	87.0	74.0	29.0	18.9

LAN Port (LCL 65 dB)_10 Mbps (SNB-8000N)_#3- PoE

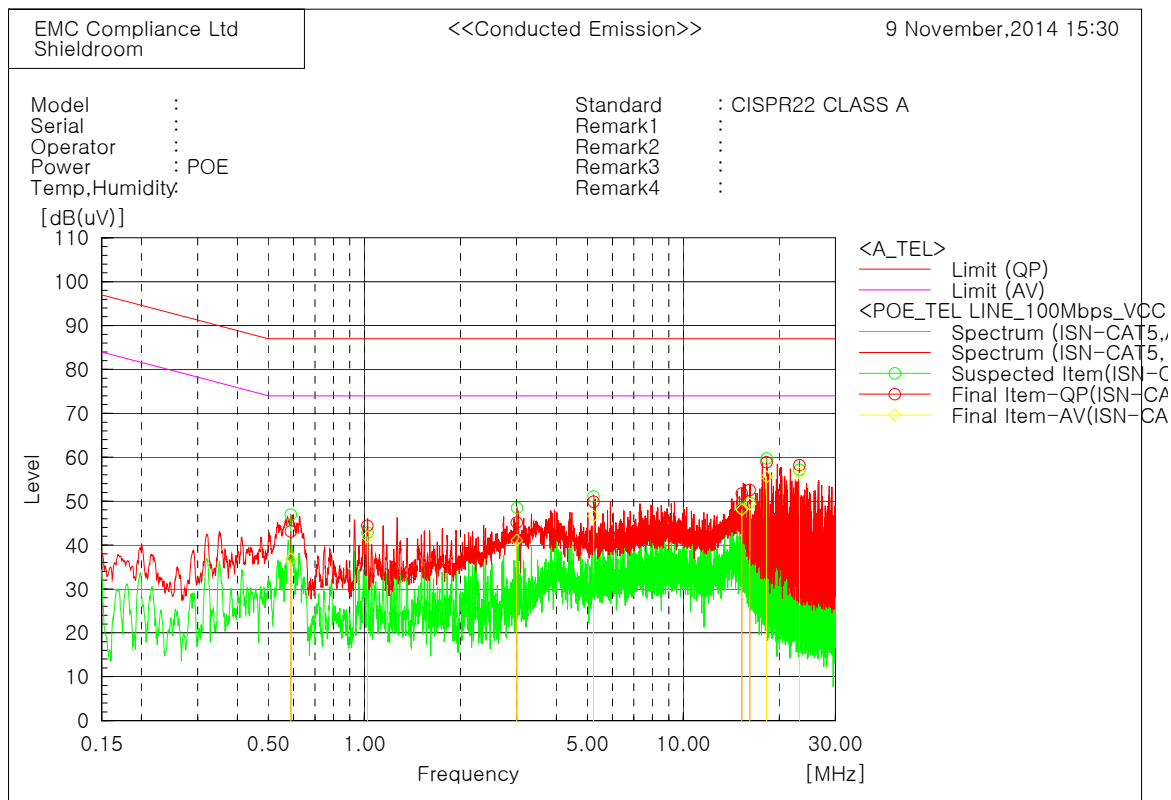


Final Result

--- No Title2 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	0.58836	33.2	26.8	9.7	42.9	36.5	87.0	74.0	44.1	37.5
2	0.61686	32.4	26.2	9.7	42.1	35.9	87.0	74.0	44.9	38.1
3	3.74997	40.6	30.8	9.7	50.3	40.5	87.0	74.0	36.7	33.5
4	6.2499	44.7	35.0	9.6	54.3	44.6	87.0	74.0	32.7	29.4
5	6.25025	44.7	34.7	9.6	54.3	44.3	87.0	74.0	32.7	29.7
6	8.80444	36.8	29.8	9.6	46.4	39.4	87.0	74.0	40.6	34.6
7	11.24977	41.8	31.6	9.6	51.4	41.2	87.0	74.0	35.6	32.8
8	14.13137	32.8	27.7	9.7	42.5	37.4	87.0	74.0	44.5	36.6

LAN Port (LCL 65 dB)_100 Mbps (SNB-8000N)_#3- PoE



Final Result

--- No Title2 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	0.58813	33.4	27.1	9.7	43.1	36.8	87.0	74.0	43.9	37.2
2	1.02238	34.7	32.2	9.7	44.4	41.9	87.0	74.0	42.6	32.1
3	3.0081	35.5	31.4	9.7	45.2	41.1	87.0	74.0	41.8	32.9
4	5.23539	40.3	37.0	9.6	49.9	46.6	87.0	74.0	37.1	27.4
5	15.25125	42.1	38.4	9.7	51.8	48.1	87.0	74.0	35.2	25.9
6	16.16673	42.8	39.6	9.7	52.5	49.3	87.0	74.0	34.5	24.7
7	18.2429	49.2	45.9	9.7	58.9	55.6	87.0	74.0	28.1	18.4
8	23.12878	48.4	46.6	9.8	58.2	56.4	87.0	74.0	28.8	17.6

6.2 Radiated Emission

Test specification	VCCI V-3 / 2013.04, Class A		
Testing voltage	100 V, 50 Hz		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2014. 11. 10		
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(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	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

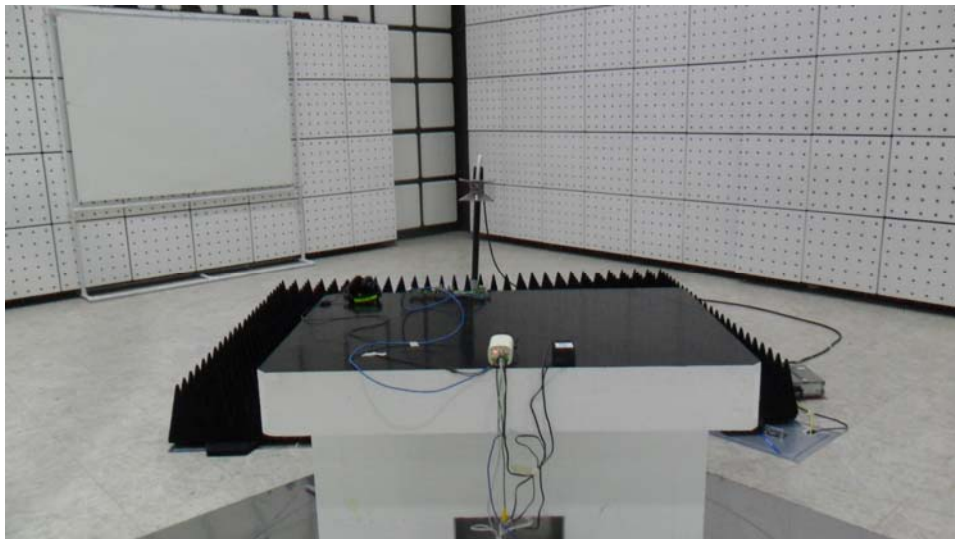
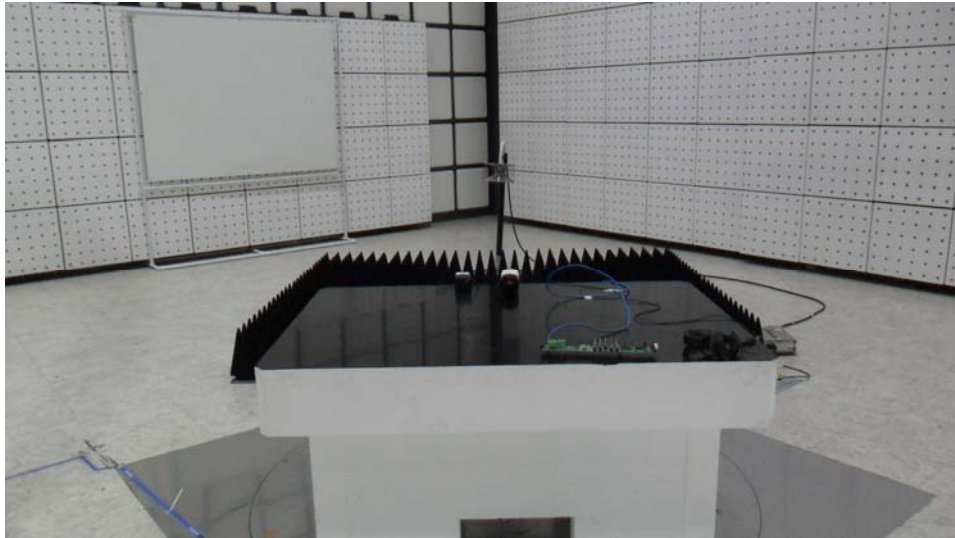
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$$

6.2.5 Photographs of test setup

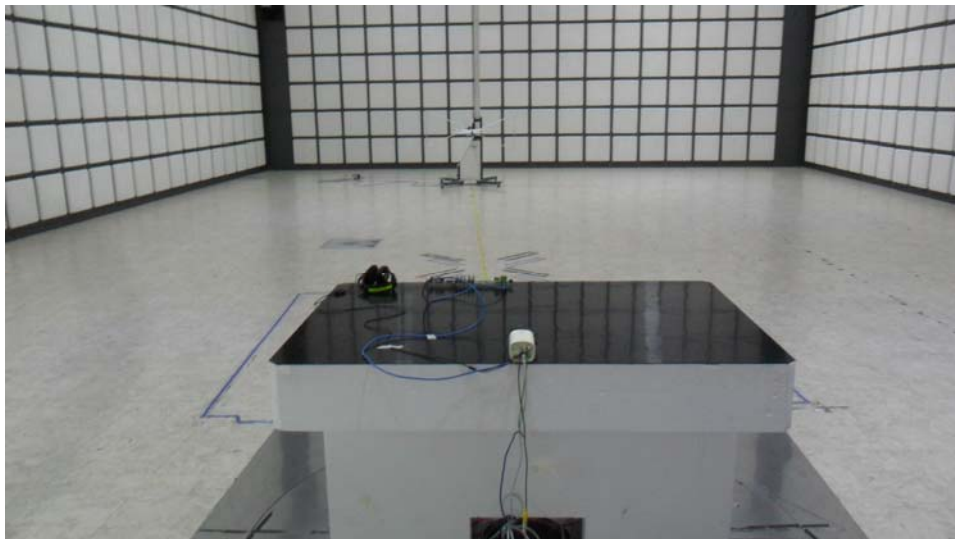
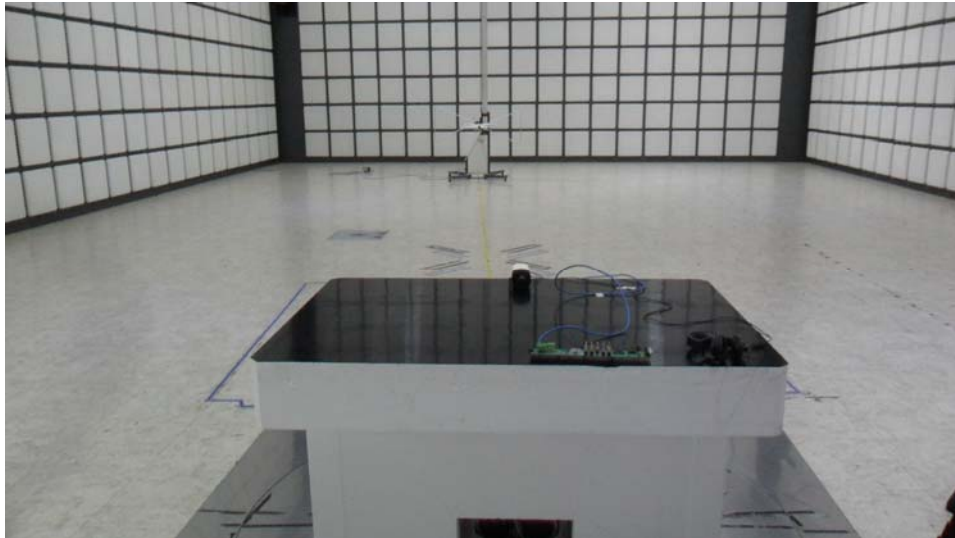
* 30 MHz ~ 1 GHz (#1-AC/DC Adaptor, #2-AC/AC Adaptor)



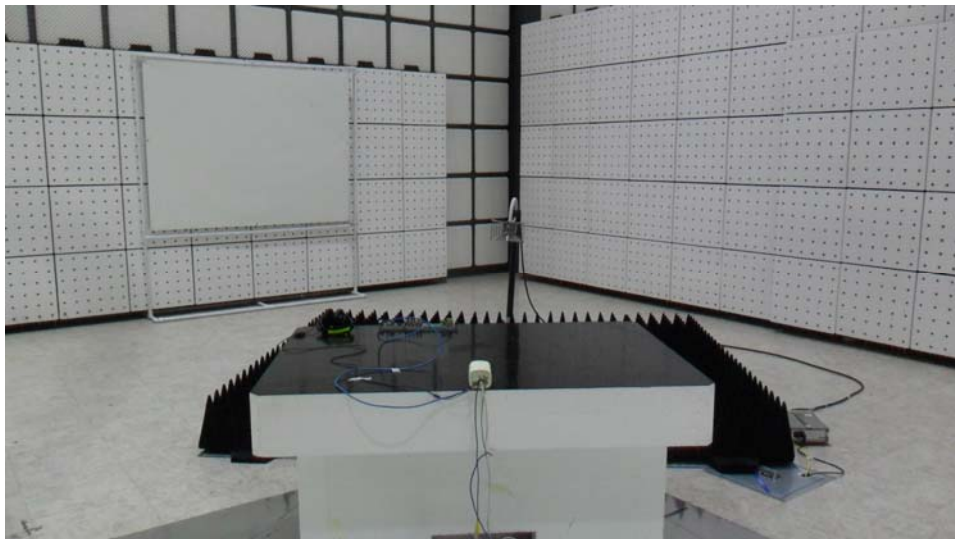
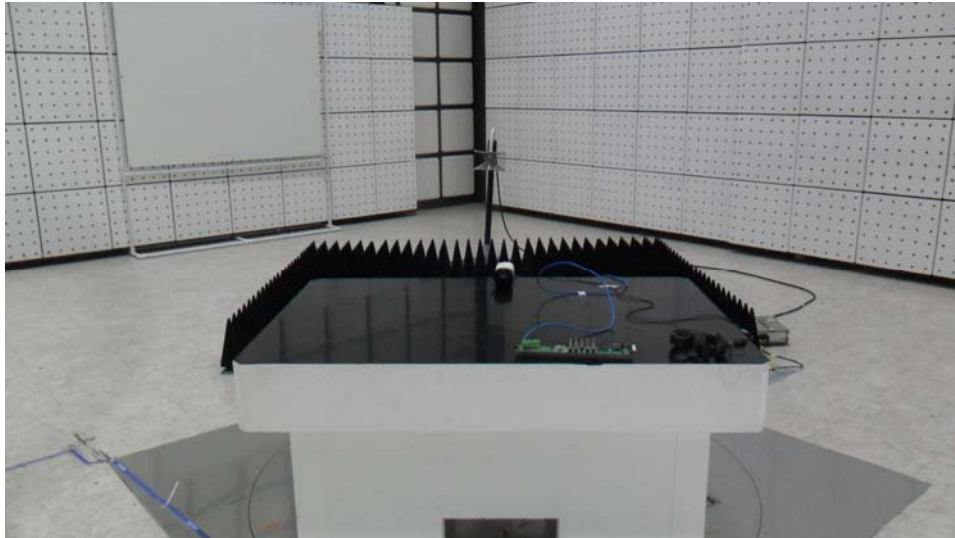
* 1 GHz ~ 6 GHz(#1-AC/DC Adaptor, #2-AC/AC Adaptor)



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



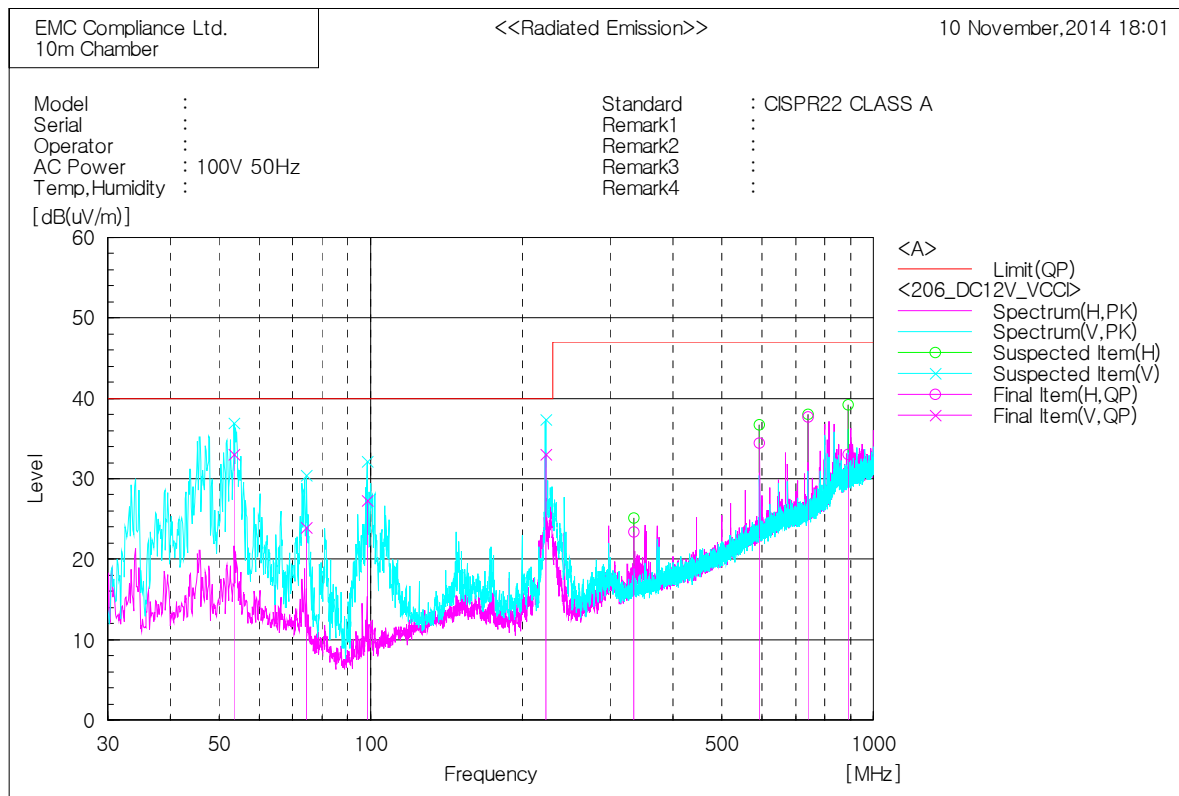
* 1 GHz ~ 6 GHz(#3-PoE)



6.2.6 Radiated emission measurement result

* Graph and Data

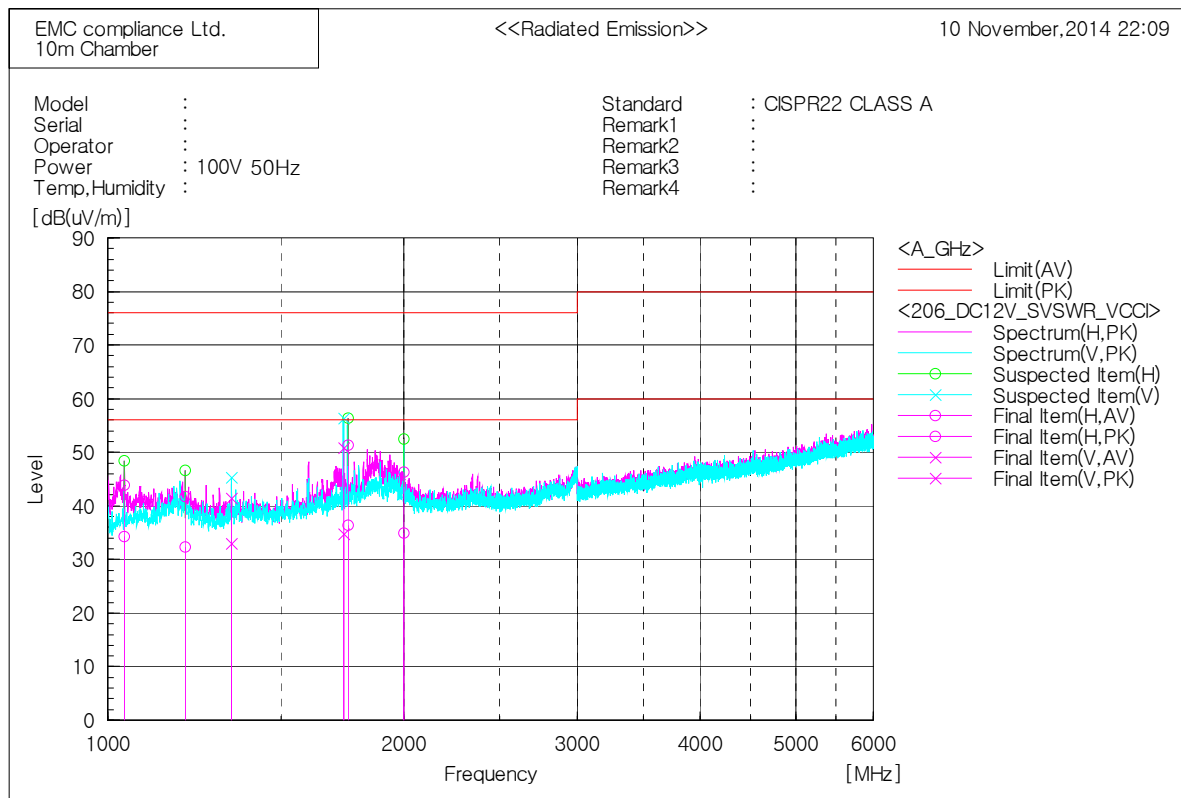
* 30 MHz ~ 1 GHz (SNB-8000N)_#1-AC/DC Adaptor



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	53.523	V	45.9	-12.9	33.0	40.0	7.0	100.0	254.2
2	74.499	V	39.4	-15.5	23.9	40.0	16.1	199.0	103.5
3	98.385	V	44.4	-17.1	27.3	40.0	12.7	199.0	138.2
4	222.788	V	46.6	-13.6	33.0	40.0	7.0	100.0	264.8
5	334.095	H	32.3	-8.9	23.4	47.0	23.6	301.0	107.8
6	593.934	H	35.6	-1.2	34.4	47.0	12.6	100.0	151.8
7	742.465	H	36.5	1.2	37.7	47.0	9.3	100.0	276.7
8	890.996	H	28.6	4.4	33.0	47.0	14.0	100.0	324.9

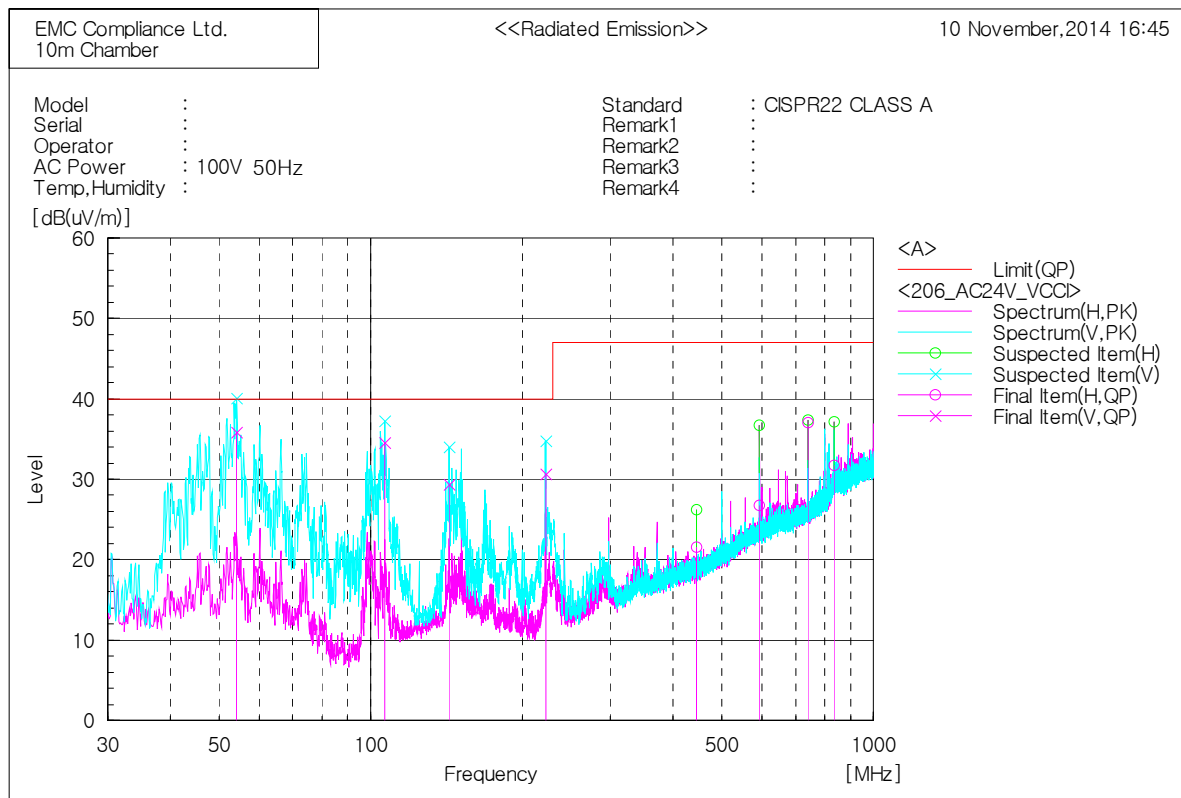
* 1 GHz ~ 6 GHz (SNB-8000N)_#1-AC/DC Adaptor



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	1040.000	H	40.2	49.8	-5.9	34.3	43.9	56.0	76.0	21.7	32.1	100.0	224.1
2	1199.375	H	37.1	46.5	-4.8	32.3	41.7	56.0	76.0	23.7	34.3	100.0	11.4
3	1336.250	V	36.6	45.2	-3.7	32.9	41.5	56.0	76.0	23.1	34.5	100.0	318.9
4	1736.250	V	34.3	50.4	0.4	34.7	50.8	56.0	76.0	21.3	25.2	100.0	249.5
5	1754.375	H	35.8	50.7	0.6	36.4	51.3	56.0	76.0	19.6	24.7	100.0	356.2
6	2000.000	H	33.0	44.3	2.0	35.0	46.3	56.0	76.0	21.0	29.7	100.0	200.0

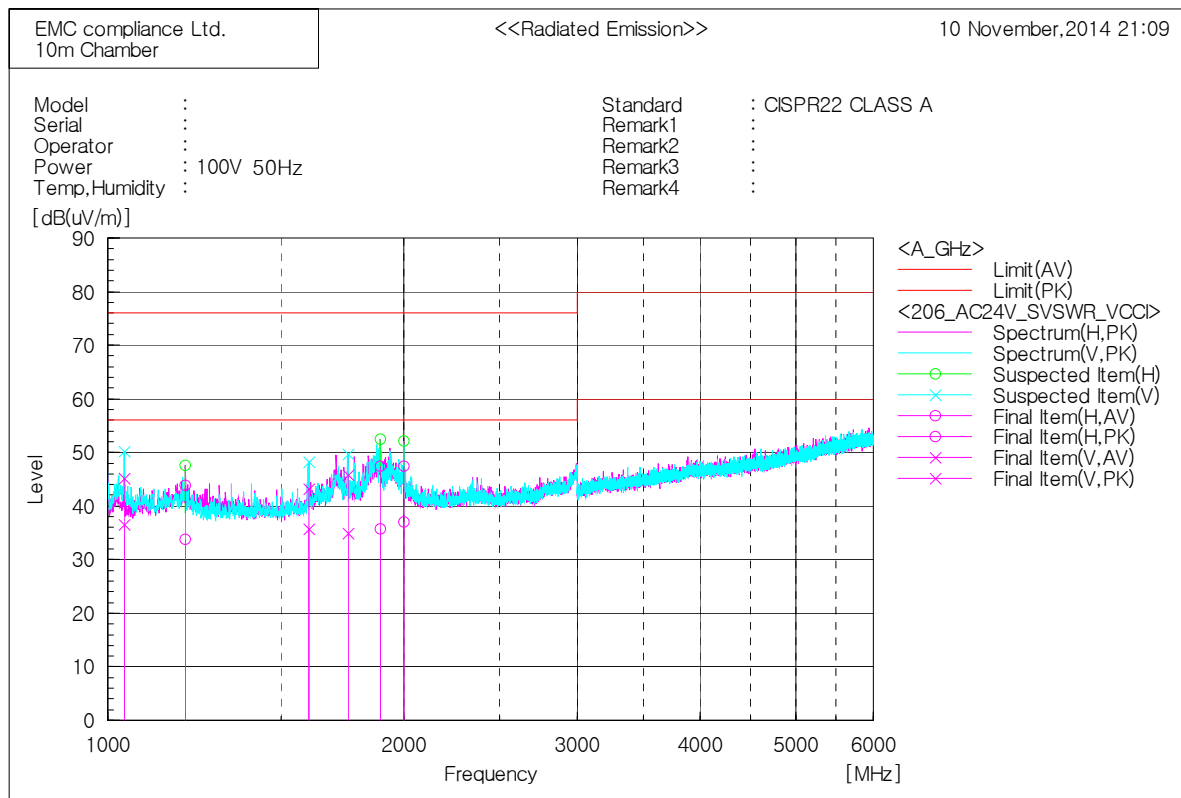
* 30 MHz ~ 1 GHz (SNB-8000N)_#2-AC/AC Adaptor



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	54.129	V	48.9	-13.0	35.9	40.0	4.1	100.0	113.2
2	106.630	V	50.3	-15.8	34.5	40.0	5.5	198.0	83.3
3	143.248	V	41.5	-12.2	29.3	40.0	10.7	100.0	322.2
4	222.788	V	44.2	-13.6	30.6	40.0	9.4	100.0	95.1
5	445.524	H	27.0	-5.5	21.5	47.0	25.5	201.0	196.9
6	594.055	H	27.9	-1.2	26.7	47.0	20.3	201.0	231.6
7	742.465	H	35.8	1.2	37.0	47.0	10.0	100.0	257.6
8	837.040	H	28.4	3.3	31.7	47.0	15.3	301.0	266.6

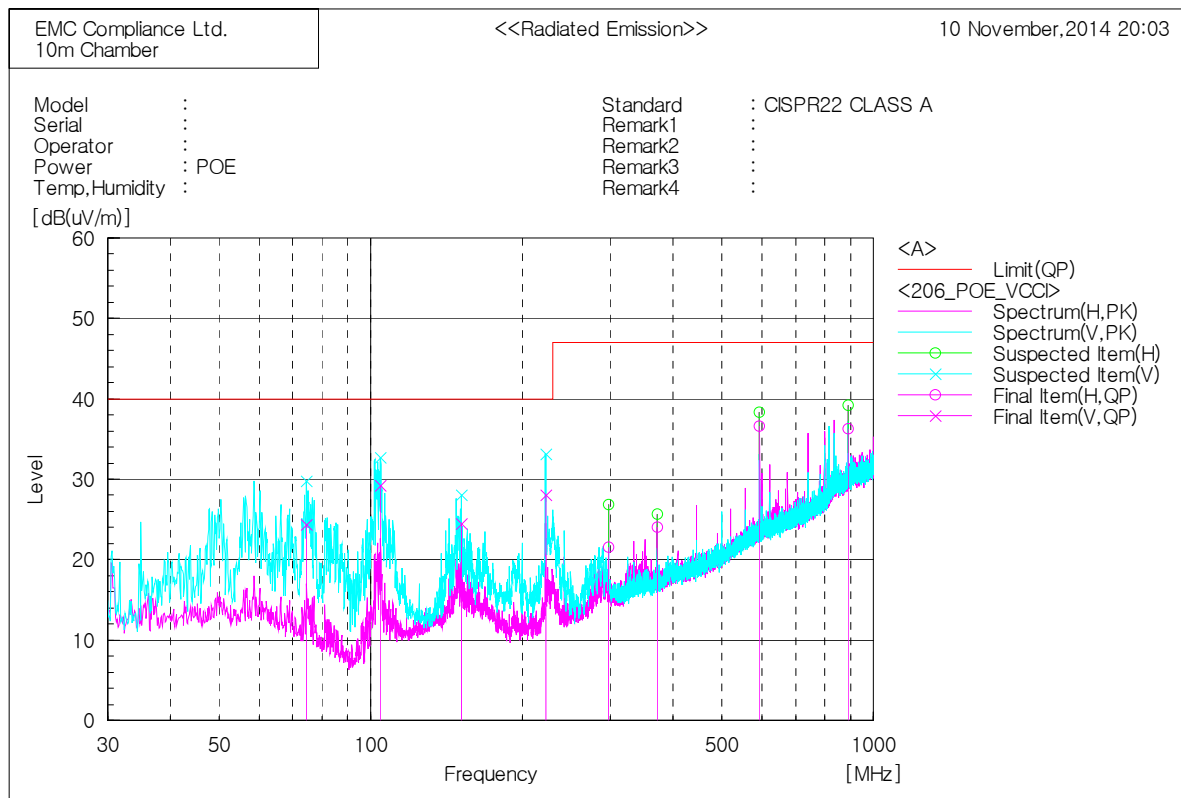
* 1 GHz ~ 6 GHz (SNB-8000N)_#2-AC/AC Adaptor



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	1039.375	V	42.5	51.1	-5.9	36.6	45.2	56.0	76.0	19.4	30.8	100.0	225.0
2	1200.000	H	38.6	48.7	-4.8	33.8	43.9	56.0	76.0	22.2	32.1	100.0	144.7
3	1600.000	V	36.9	44.3	-1.1	35.8	43.2	56.0	76.0	20.2	32.8	100.0	198.0
4	1754.375	V	34.3	45.2	0.6	34.9	45.8	56.0	76.0	21.1	30.2	100.0	155.9
5	1893.750	H	34.1	45.8	1.7	35.8	47.5	56.0	76.0	20.2	28.5	100.0	204.7
6	2000.000	H	35.1	45.5	2.0	37.1	47.5	56.0	76.0	18.9	28.5	100.0	4.7

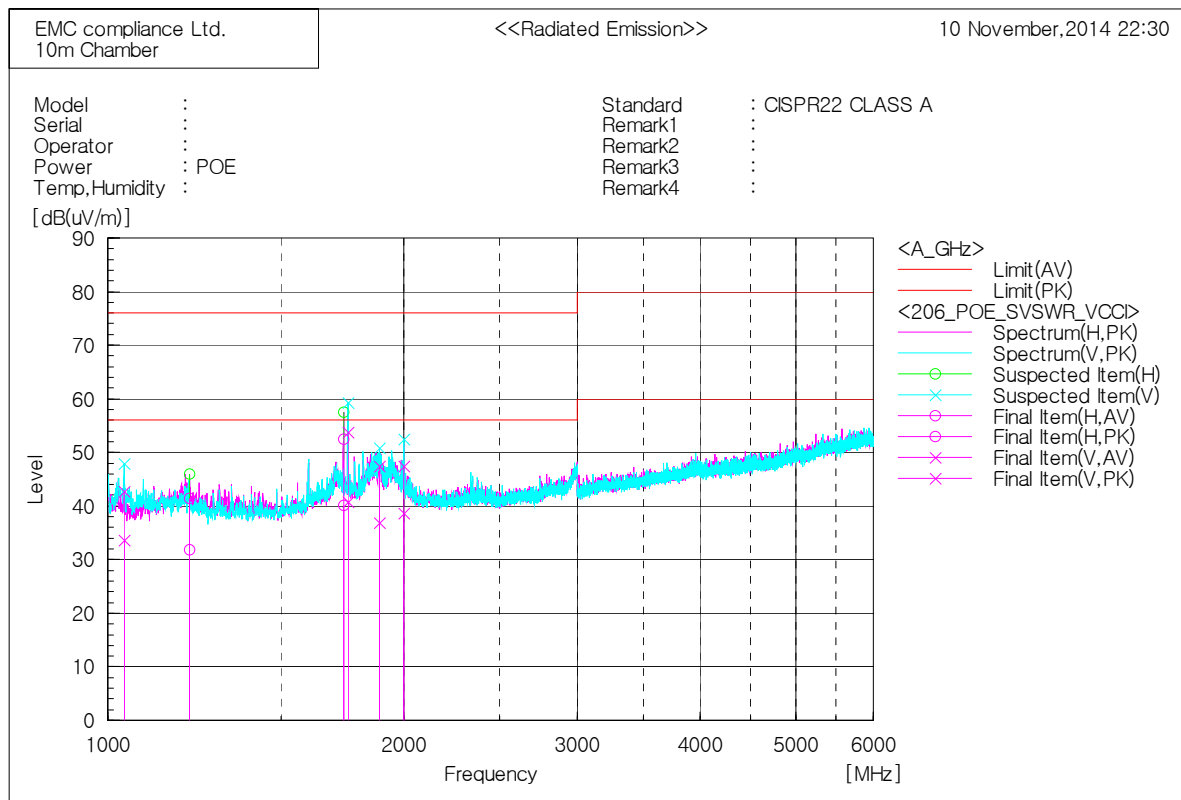
* 30 MHz ~ 1 GHz (SNB-8000N)_# 3-PoE



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	74.499	V	39.9	-15.5	24.4	40.0	15.6	199.0	145.0
2	104.690	V	45.3	-16.1	29.2	40.0	10.8	199.0	125.4
3	151.493	V	36.4	-11.9	24.5	40.0	15.5	100.0	325.0
4	222.788	V	41.6	-13.6	28.0	40.0	12.0	100.0	64.5
5	296.993	H	31.6	-10.1	21.5	47.0	25.5	201.0	79.6
6	371.198	H	31.6	-7.6	24.0	47.0	23.0	201.0	270.8
7	593.934	H	37.8	-1.2	36.6	47.0	10.4	201.0	257.3
8	890.996	H	31.9	4.4	36.3	47.0	10.7	100.0	224.4

* 1 GHz ~ 6 GHz (SNB-8000N)_#3-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	1039.375	V	39.5	48.7	-5.9	33.6	42.8	56.0	76.0	22.4	33.2	100.0	212.2
2	1211.875	H	36.6	46.2	-4.7	31.9	41.5	56.0	76.0	24.1	34.5	100.0	167.4
3	1736.875	H	39.7	52.0	0.4	40.1	52.4	56.0	76.0	15.9	23.6	100.0	272.6
4	1753.750	V	40.2	53.1	0.6	40.8	53.7	56.0	76.0	15.2	22.3	100.0	105.1
5	1888.750	V	35.1	45.8	1.7	36.8	47.5	56.0	76.0	19.2	28.5	100.0	215.2
6	1999.375	V	36.7	45.4	2.0	38.7	47.4	56.0	76.0	17.3	28.6	100.0	201.7

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



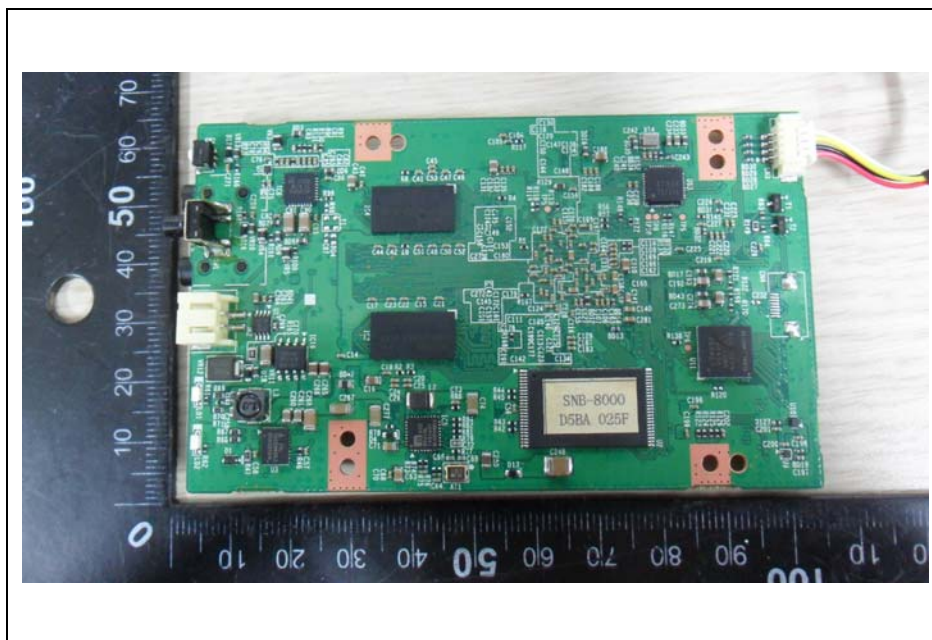
Bottom View



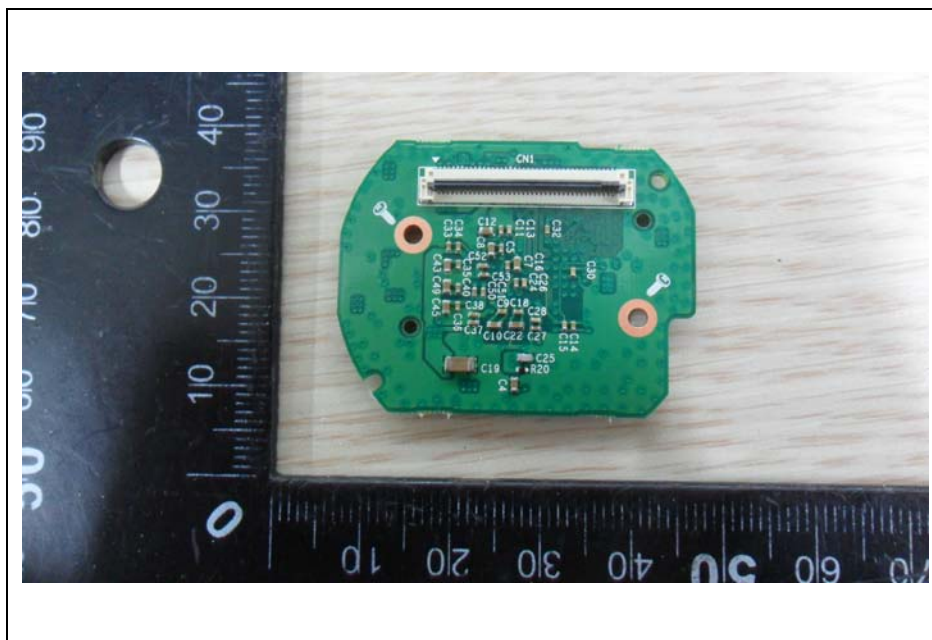
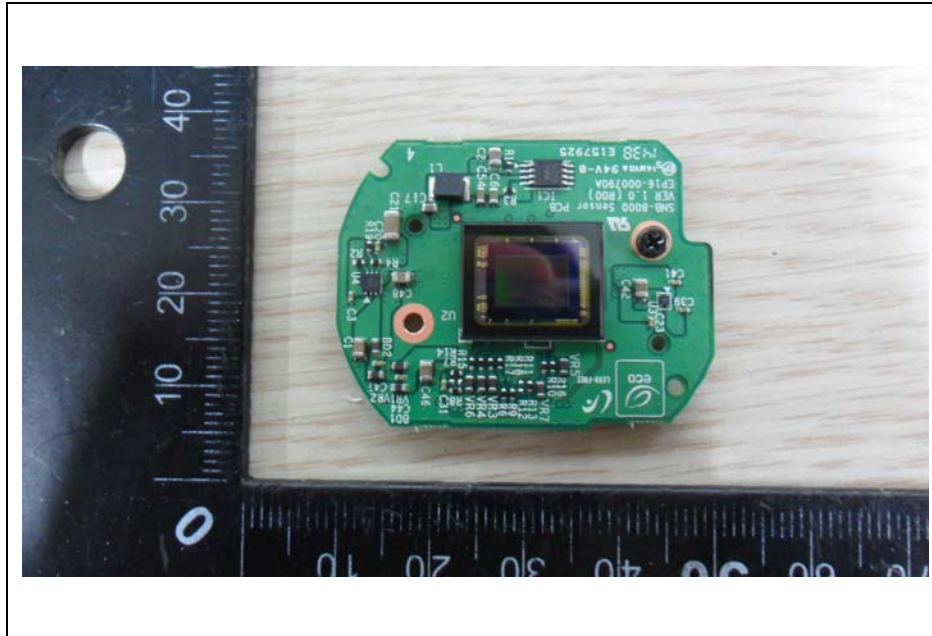
Inside



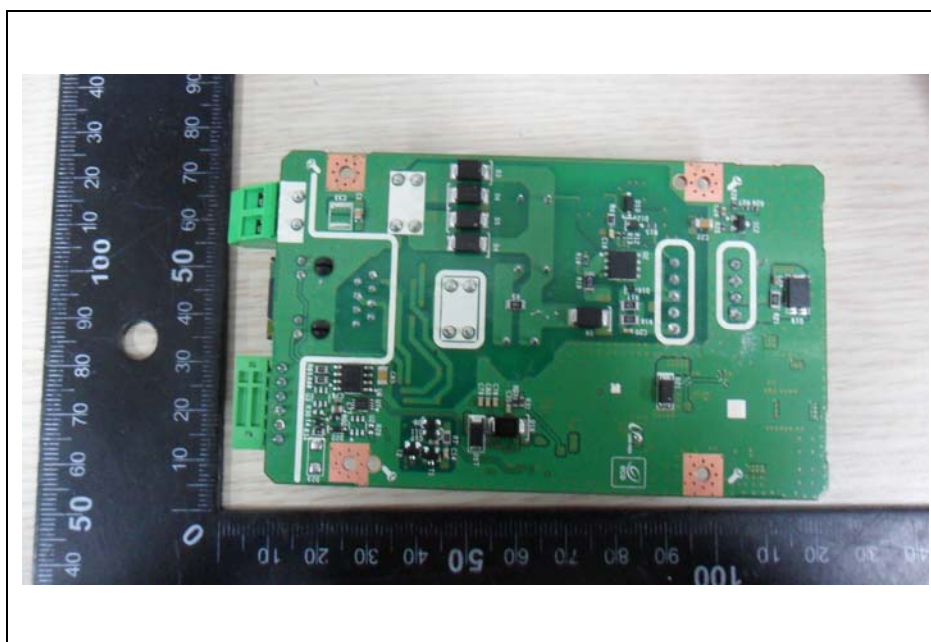
Main Board



CCD Board



Power Board



AC/DC Adaptor



AC/AC Adaptor

