



Declaration of Conformity



Type of equipment: NETWORK VIDEO ENCODER
Brand Name /Trade Mark: SAMSUNG
Type designation /model: SPE-101P
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
/ August 24, 2011

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

Chang Suk Oh
SAMSUNG TECHWIN CO., LTD

EMC TEST REPORT

Test report No: EMC-CE-2700
Type of Equipment: NETWORK VIDEO ENCODER
Model Name: SPE-101P
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. 08. 03

Date of testing: 2011. 08. 15 ~ 08. 17

Issued date: 2011. 08. 24

Tested by:

CHO, MOON-SUP

Approved by:

YEOM, HAN-SEOK

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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

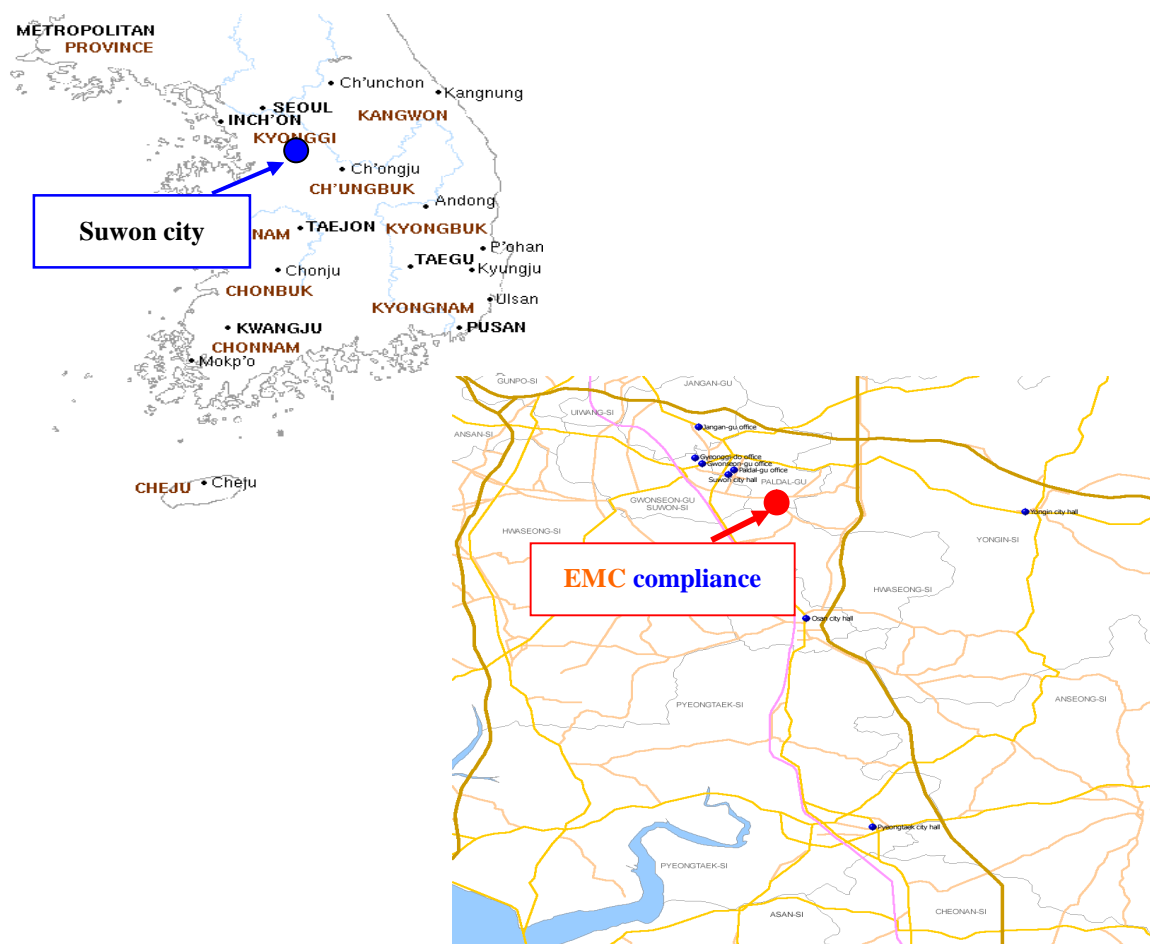
FCC CAB.: KR0040

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)	: 26 °C	48 % R.H.	-
Shielded room(CE)	: 26 °C	50 % R.H.	-
Shielded room(ESD)	: 27 °C	49 % R.H.	100.1 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, 3m)

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]

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]

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

± 1.82 [dB]

4. Description of E.U.T.

4.1 General information

	SPE-101N	SPE-101P
Operational		
Video In	CVBS : 1.0 Vp-p / 75Ω composite, NTSC/PAL Auto Detection	
De-interlacing Filter	Built-in	
Event Trigger	Motion Detection, Video Loss	
Remote Control Interface	1ea RS-422/485	
RS-485 Protocol	SAMSUNG-T/E, PELCO-P/D, Panasonic, VICON, Honeywell, AD, GE, BOSCH, SUNGJIN	
Network		
Ethernet	RJ-45 (10/100BASE-T)	
Video Compression Format	H.264, MPEG-4, Motion JPEG	
Resolution	704x480, 640x480, 352x240, 320x240	704x576, 640x480, 352x288, 320x240
Max. Framerate	30fps	25fps
Video Quality Adjustment	H.264, MPEG-4 : Compression Level, Target Bitrate Level Control Motion JPEG : Quality Level Control	
Bitrate Control Method	H.264, MPEG-4 : CBR or VBR Motion JPEG : VBR	
Streaming Capability	Multiple Streaming (Up to 10 Profiles)	
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	
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x	
Streaming Method	Unicast / Multicast	
Max. User Access	10 users at Unicast Mode	
ONVIF Conformance	Yes	
Web Viewer	Supported OS : Window XP(service pack 2 이상), Vista, 7, Mac OS X(10.4.8 이상) Supported Browser : MS IE 7.x, 8.x, FireFox 2.x, 3.x, Safari 3, 4, Google Chrome	
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	PoE(IEEE802.3af), DC12V	
Power Consumption	Max. 3.2W or 200mA	
Mechanical		
Color / Material	White/Mold, Silver/Press	
Dimension (WxHxD)	W43 x H29 x D95.5mm (1.69" x 1.41" x 3.76"), Connector included	
Weight	115g	

4.2 Product description

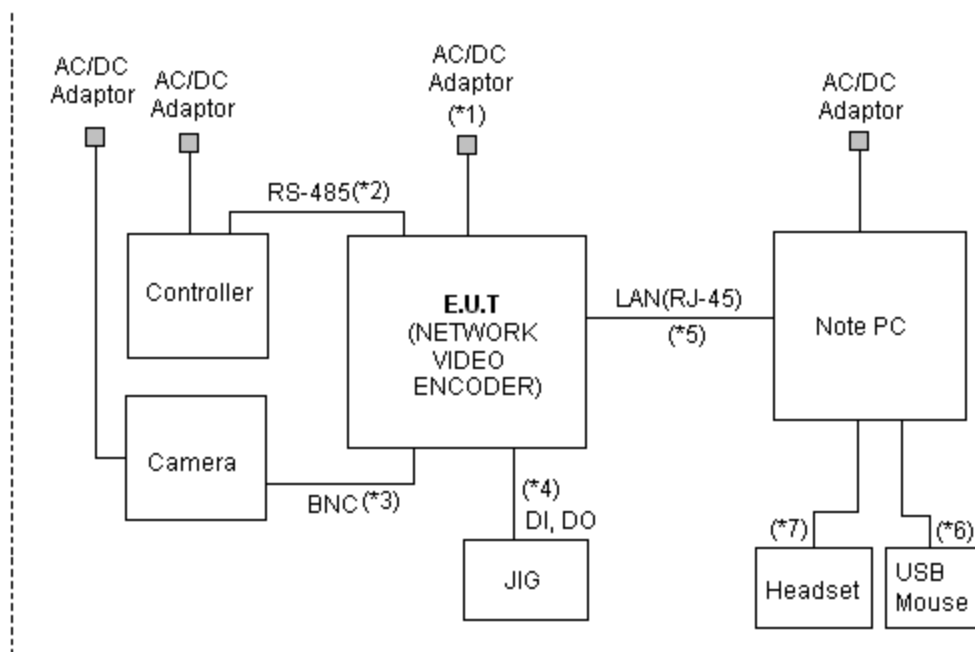
Type of product	NETWORK VIDEO ENCODER
Model name (Basic)	SPE-101P
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 V / PoE
Product rating	DC 12 V / PoE
Internal clock ferquence	108 MHz
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	C1321	472680432036	FUJITSU
USB Mouse	1088	8165900106545	Microsoft
JIG	-	-	-
Headset	SHS-250V	-	SAMSUNG
Controller	SC-3000	-	CNB
Camera	SDC-435P	C08C6V3Z245129	SAMSUNGTECHWIN
AC/DC adaptor	DAD12050DKA	-	Dream Electronics

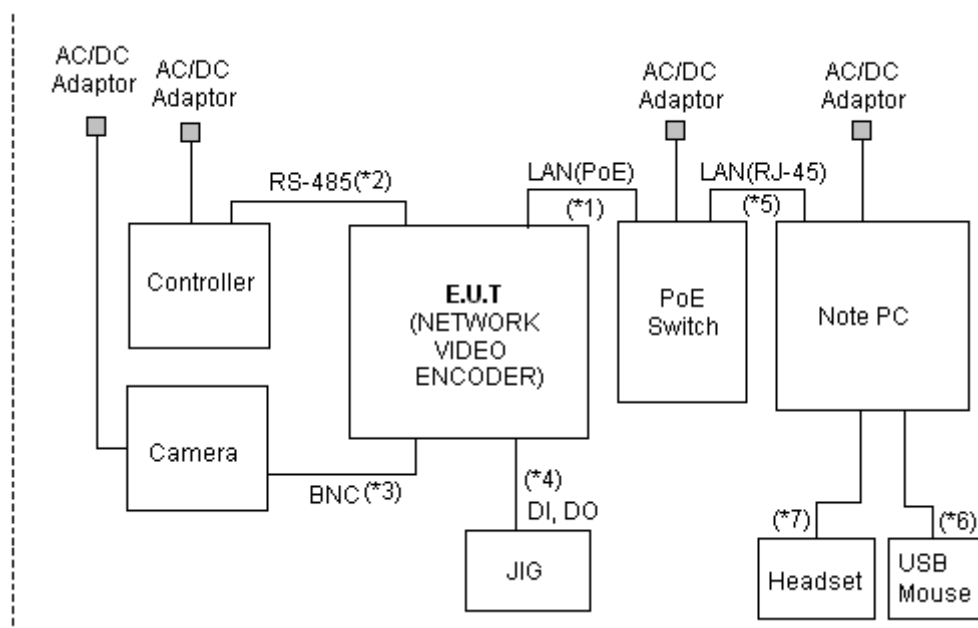
4.4 Test configuration

* AC/DC adaptor (DC 12V)



Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (NETWORK VIDEO ENCODER)	Power	AC/DC Adaptor	Power	1.6	Non-Shield	-
2		RS-485	Controller	RS-485	3.0	Non-Shield	Out-door
3		BNC	Camera	BNC	3.0	Shield	Out-door
4		DI, DO	JIG	DI, DO	3.0	Non-Shield	Out-door
5		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield	-
6	Note PC	USB	USB Mouse	USB	1.7	Shield	-
7		Headset	Headset	Headset	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 (NETWORK VIDEO ENCODER)	LAN(PoE)	PoE Switch	LAN(PoE)	3.0	Non-Shield	-
2		RS-485	Controller	RS-485	3.0	Non-Shield	Out-door
3		BNC	Camera	BNC	3.0	Shield	Out-door
4		DI, DO	JIG	DI, DO	3.0	Non-Shield	Out-door
5	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	3.0	Non-Shield	-
6		USB	USB Mouse	USB	1.7	Shield	-
7		Headset	Headset	Headset	2.0	Non-Shield	-

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operation
1	Web viewer test 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 oeuvres at $U = 130 \text{ dB}\mu\text{V}$.

For component of CCTV systems, where the status is monitored by observing the TV picture, then

deterioration of the picture is allowed at $U = 140 \text{ dB}\mu\text{V}$, providing:

- (a) there is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings etc.):
- (b) at $U = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at $U = 120 \text{ dB}\mu\text{V}$.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

6. Test results

6.1 Conducted Emission

Test specification	EN 55022:2006+A1:2007, Class A		
Test mode	Web viewer test mode.		
Date	2011. 08. 15		
Testing voltage	DC 12V / PoE		
Test facility	Shielded room (CE#2)		
Temperature (°C)	26 °C	Humidity (% R.H.)	50 % R.H.
Remarks	Complied Telecommunication Minimum limit margin is 6.25 dB at 25.000 MHz. (PoE_ Average)		

6.1.1 Limits of conducted emission measurement

- Telecommunication

Frequency [MHz]	Class A Voltage Limits (dB(μV))		Current Limits (dB(μA))	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	97 to 87	84 to 74	0.15 ~ 0.5	84 to 74
0.5 ~ 30	87	74	0.5 ~ 30	74

* 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.

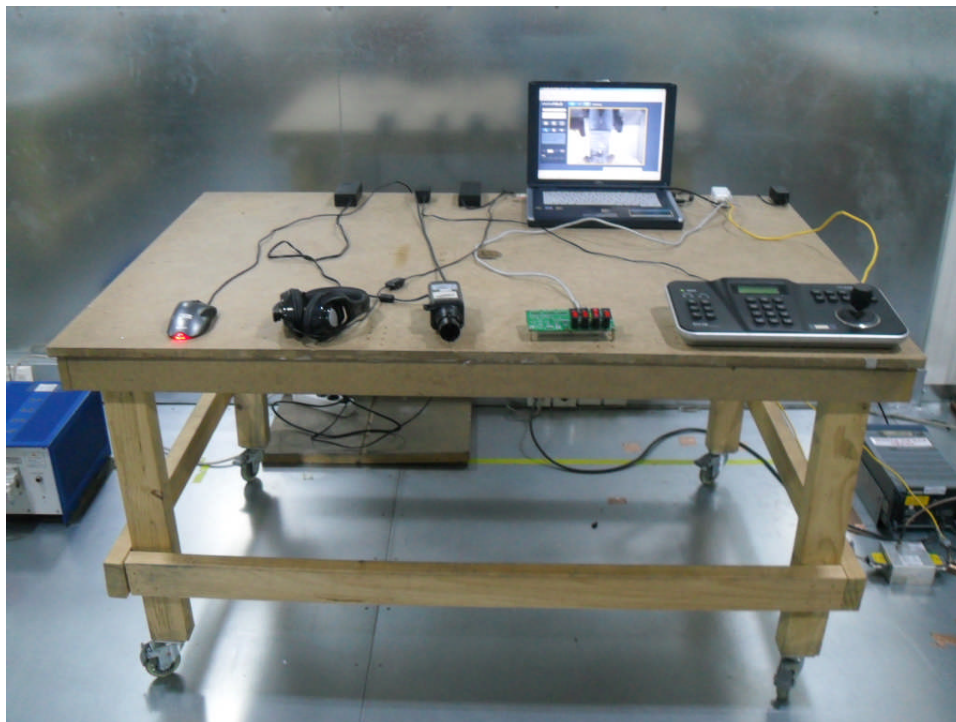
6.1.3 Used equipments

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

6.1.4 Photographs of test setup

* Telecommunication

-AC/DC adaptor(DC 12 V)-



- PoE -



6.1.5 Conducted emission measurement result

* Telecommunication port

*** AC/DC adaptor(DC 12 V)_LCL 65 dB (LAN(RJ-45) Port)**

Frequency [MHz]	Correction	Quasi-peak			Average		
	Factor	Limit	Reading	Result	Limit	Reading	Result
	Cable	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]
0.192	0.01	94.95	74.27	74.28	81.95	72.80	72.81
0.282	0.01	91.76	73.25	73.26	78.76	62.07	62.08
0.423	0.01	88.39	68.07	68.08	75.39	57.60	57.61
0.453	0.01	87.82	65.25	65.26	74.82	57.53	57.54
0.849	0.02	87.00	72.93	72.95	74.00	60.42	60.44
1.293	0.03		73.12	73.15		58.97	59.00
2.454	0.07		76.34	76.41		60.49	60.56
2.559	0.07		75.18	75.25		60.39	60.46

EUT: SPE-101P
Manuf:
Op Cond: T
Operator:
Test Spec: EN55022 CLASS A Conducted Emission
Comment:

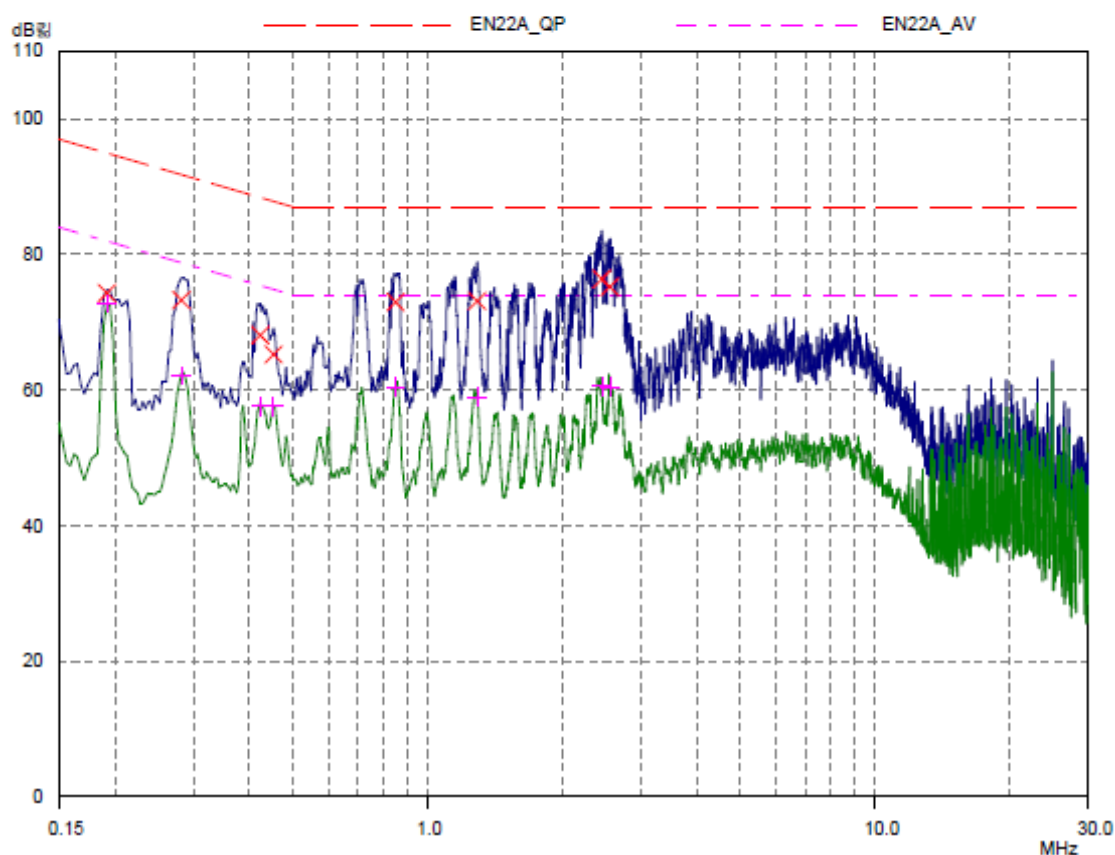
Result File: spe-10~1.dat : T

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
	22	150kHz	30MHz	T8

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



*** PoE_LCL 65 dB (LAN(RJ-45) Port)**

Frequency [MHz]	Correction	Quasi-peak			Average		
	Factor	Limit	Reading	Result	Limit	Reading	Result
	Cable	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]
0.192	0.01	94.95	74.67	74.68	81.95	73.38	73.39
0.210	0.01	94.21	70.96	70.97	81.21	53.43	53.44
0.285	0.01	91.67	57.06	57.07	78.67	48.23	48.24
0.387	0.01	89.13	59.93	59.94	76.13	58.34	58.35
1.146	0.03	87.00	57.55	57.58	74.00	46.64	46.67
2.406	0.07		60.39	60.46		45.19	45.26
16.230	0.20		59.56	59.76		56.90	57.10
25.000	0.25		68.12	68.37		67.50	67.75

EUT: SPE-101P
Manuf:
Op Cond: T
Operator:
Test Spec: EN55022 CLASS A Conducted Emission
Comment: POE

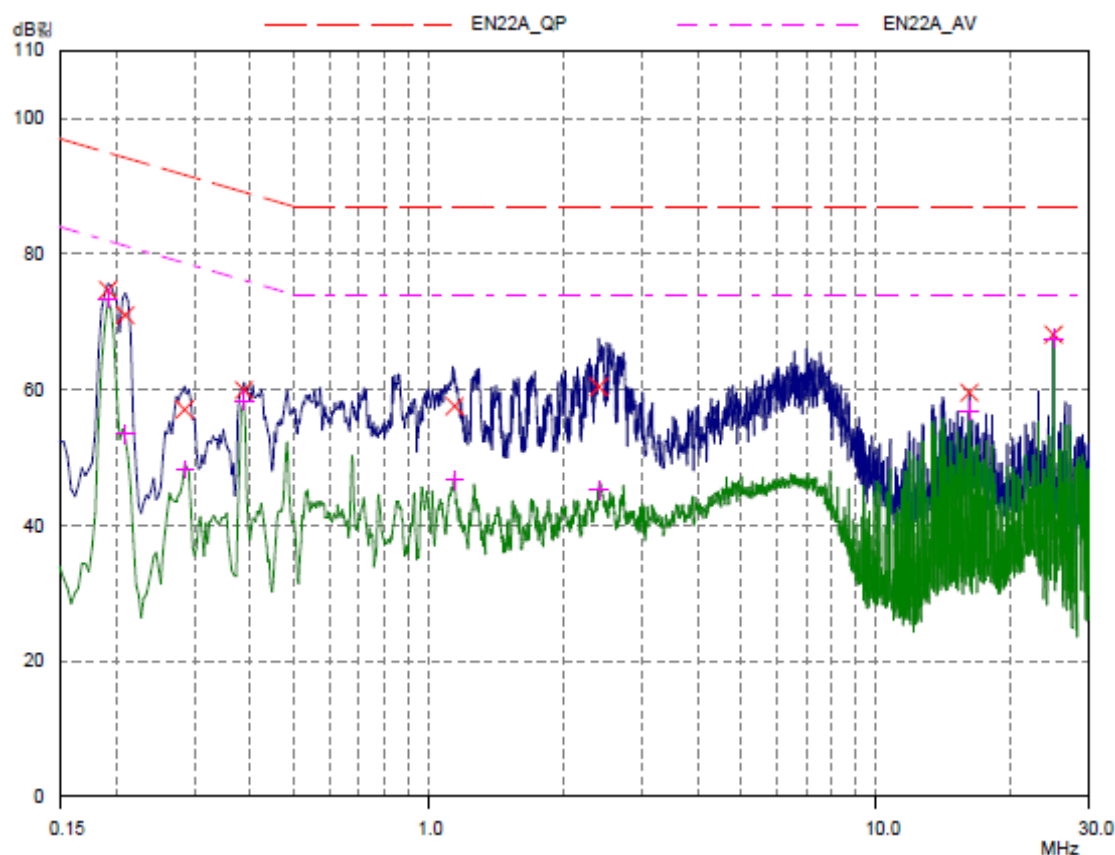
Result File: spe-10~2.dat : T

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
	22	150kHz	30MHz	T8

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



6.2 Radiated Emission

Test specification	EN 55022:2006+A1:2007, Class A		
Test mode	Web viewer test mode.		
Date	2011. 08. 15		
Testing voltage	DC 12 V / PoE		
Test facility	10 m Chamber (Test distance: 10m, 3m)		
Temperature (°C)	26 °C	Humidity (% R.H.)	48 % R.H.
Remarks	<p>Complied</p> <p>30 MHz ~ 1 GHz</p> <p>Minimum limit margin is 6.8 dB at 64.173 MHz. (AC/DC adaptor(DC 12 V))</p> <p>1 GHz ~ 6 GHz</p> <p>Minimum limit margin is 25.4 dB at 1134.250 MHz. (PoE_Average)</p>		

6.2.1 Limits of radiated emission measurement

* Limits below 1 GHz

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

* Limits above 1 GHz

Frequency [GHz]	Average limit (dB(μV/m))	Peak limit (dB(μV/m))
1 ~ 3	50	70
3 ~ 6	54	74
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	<input checked="" type="checkbox"/>
Bi-Log Antenna	VULB 9160	3228	SCHWARZBECK	12.09.13	<input checked="" type="checkbox"/>
Amplifier	310N	293004	SONOMA INSTRUMENT	11.12.01	<input checked="" type="checkbox"/>
3 dB Attenuator	8491A	27444	HP	11.11.30	<input checked="" type="checkbox"/>
Antenna Mast	MA4000-EP	303	Innco Systems	-	<input checked="" type="checkbox"/>
Turn Table	DT2000S-1t	079	Innco Systems	-	<input checked="" type="checkbox"/>
Amplifier	8449B	3008A01802	AGILENT	12.05.11	<input checked="" type="checkbox"/>
Horn ANT	3115	00086706	ETS	11.12.22	<input checked="" type="checkbox"/>
Spectrum Analyzer	FSP7	100289	R&S	11.12.17	<input checked="" type="checkbox"/>

6.2.4 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follow:

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

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G= Amplifier Gain

3 dB Att = 3 dB Attenuator

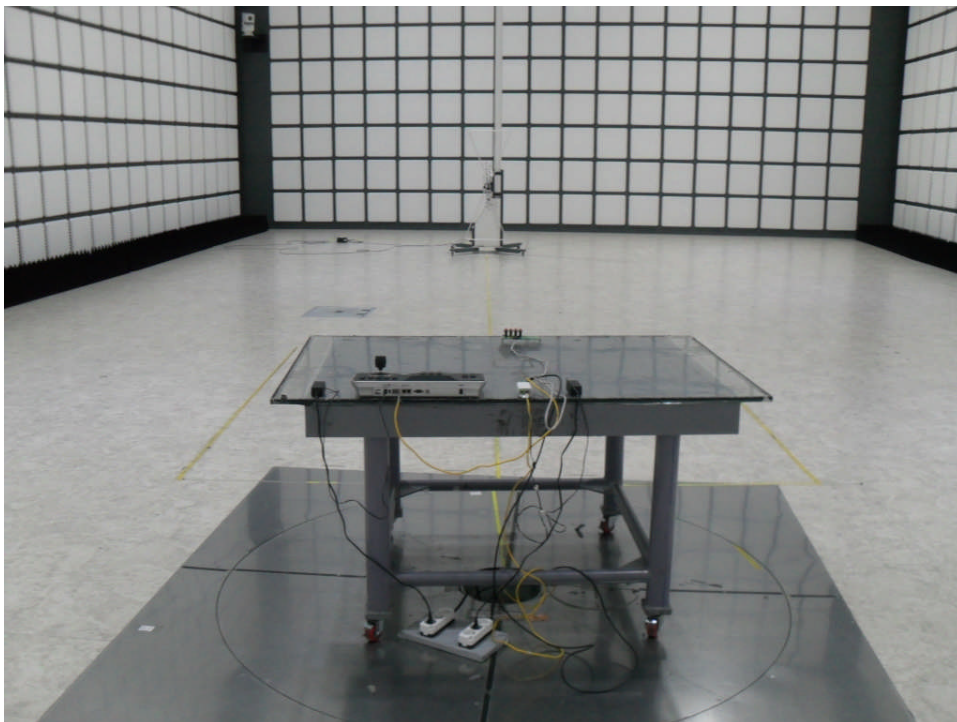
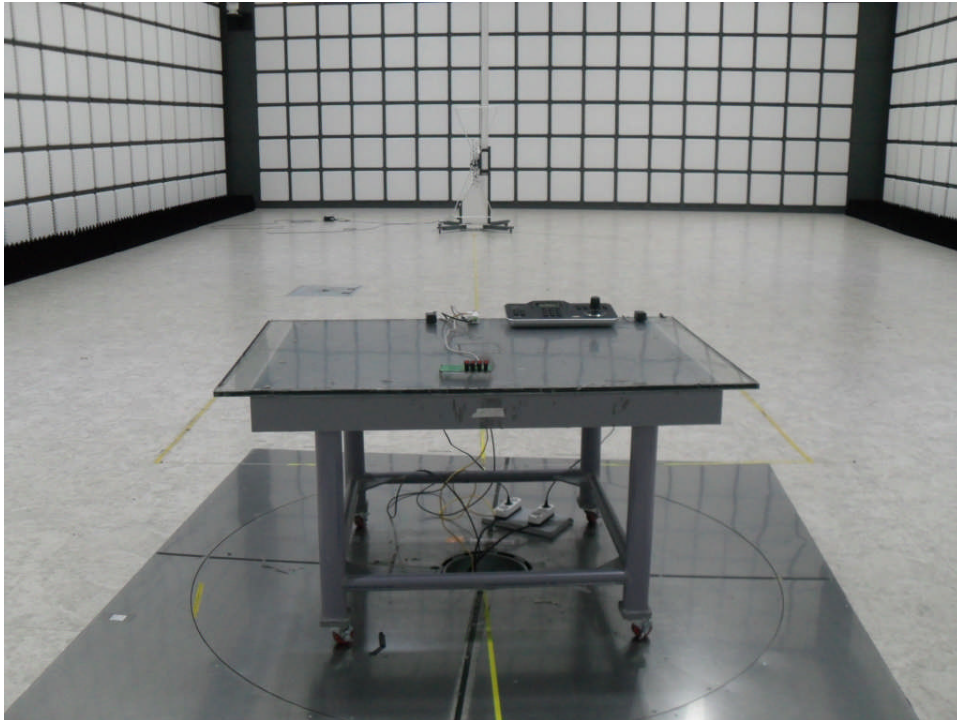
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

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

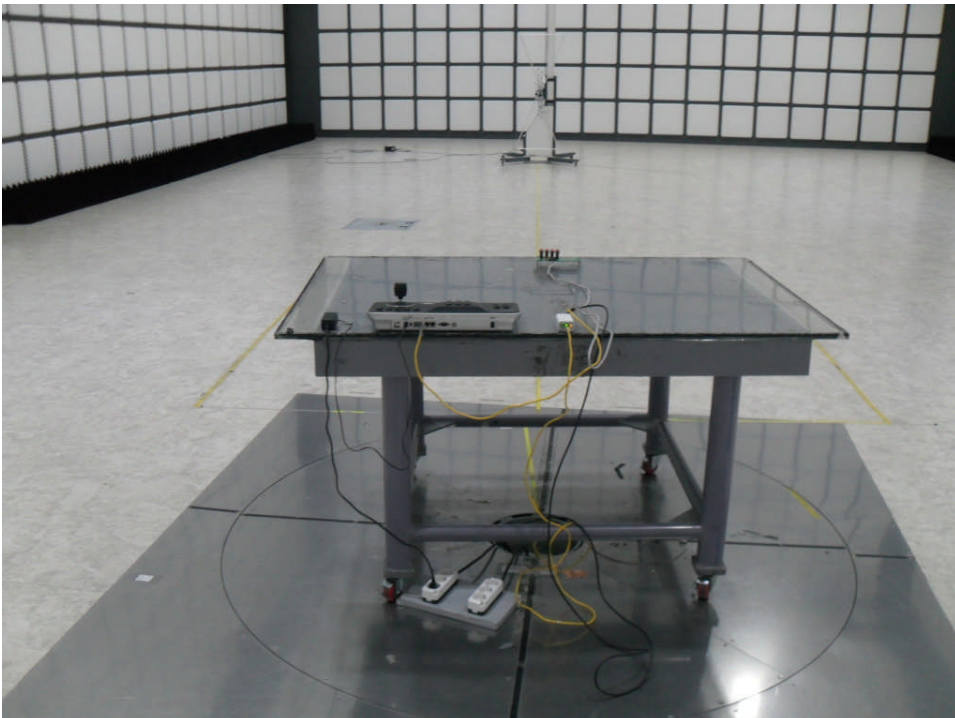
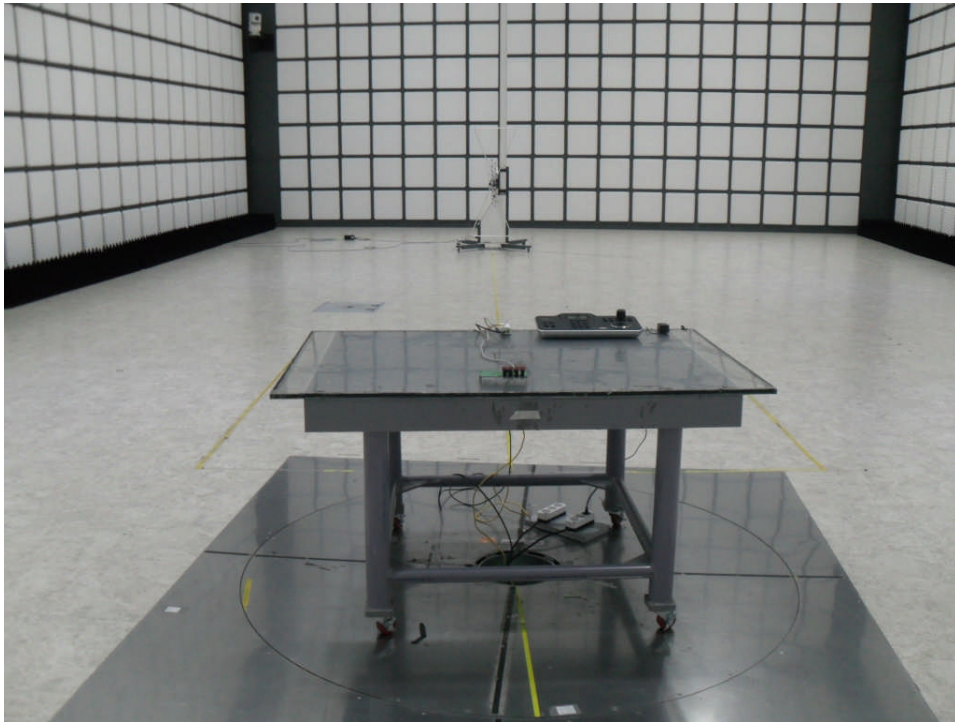
6.2.5 Photographs of test setup

* 30 MHz ~ 1 GHz

* AC/DC adaptor(DC 12 V)

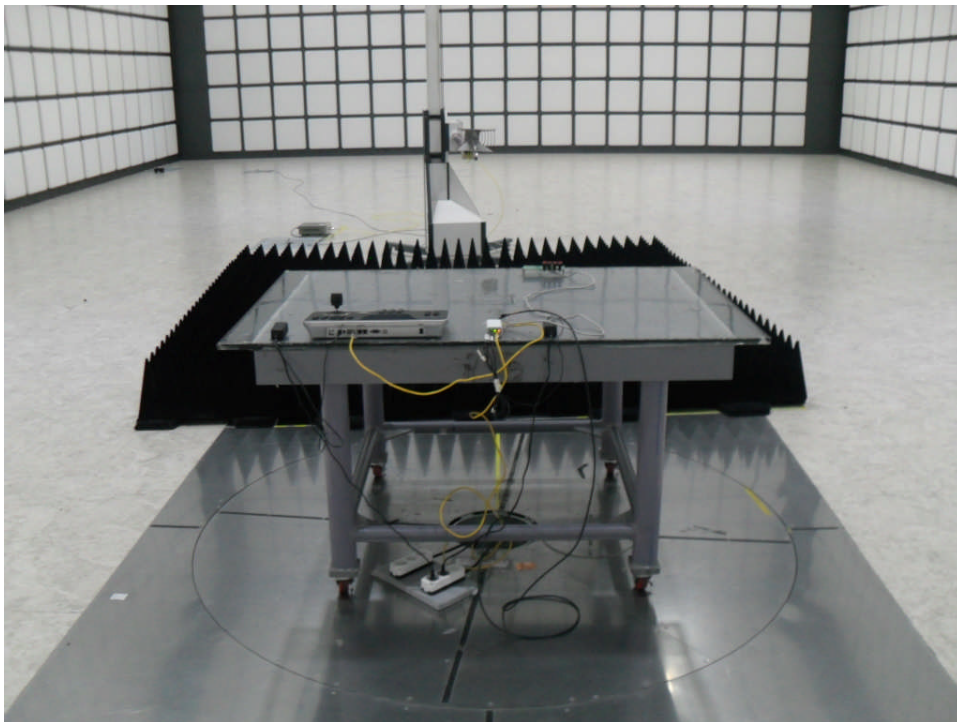
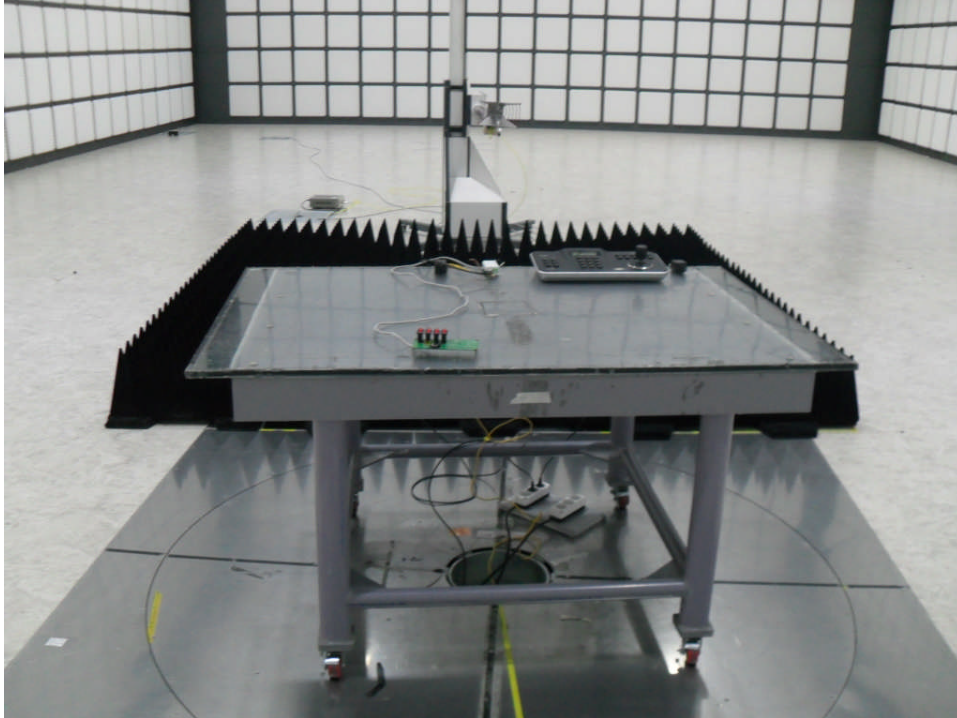


* PoE

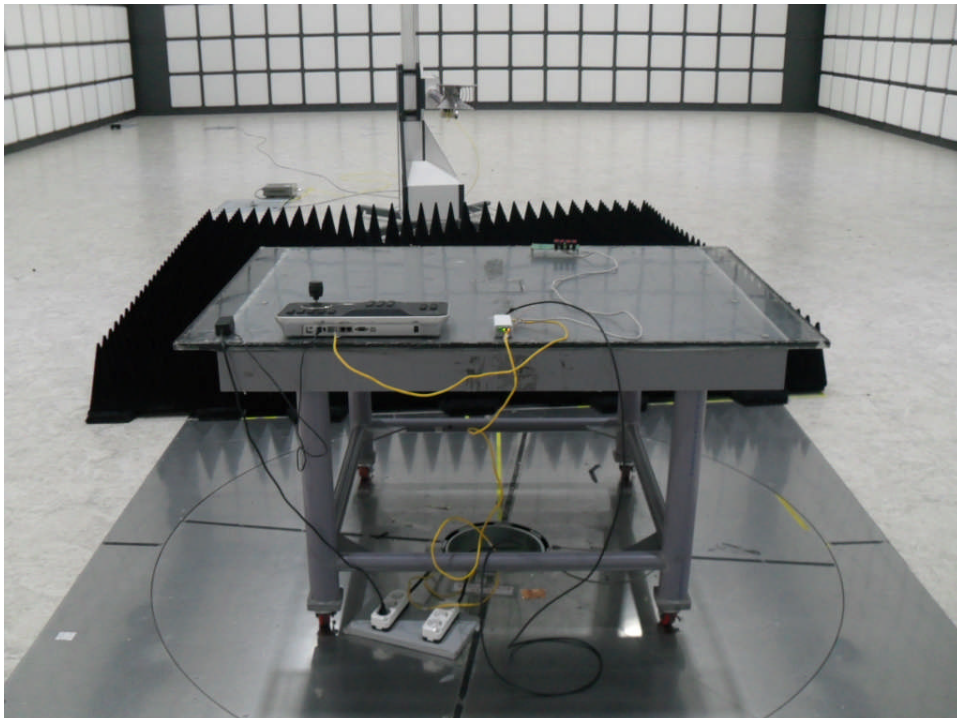
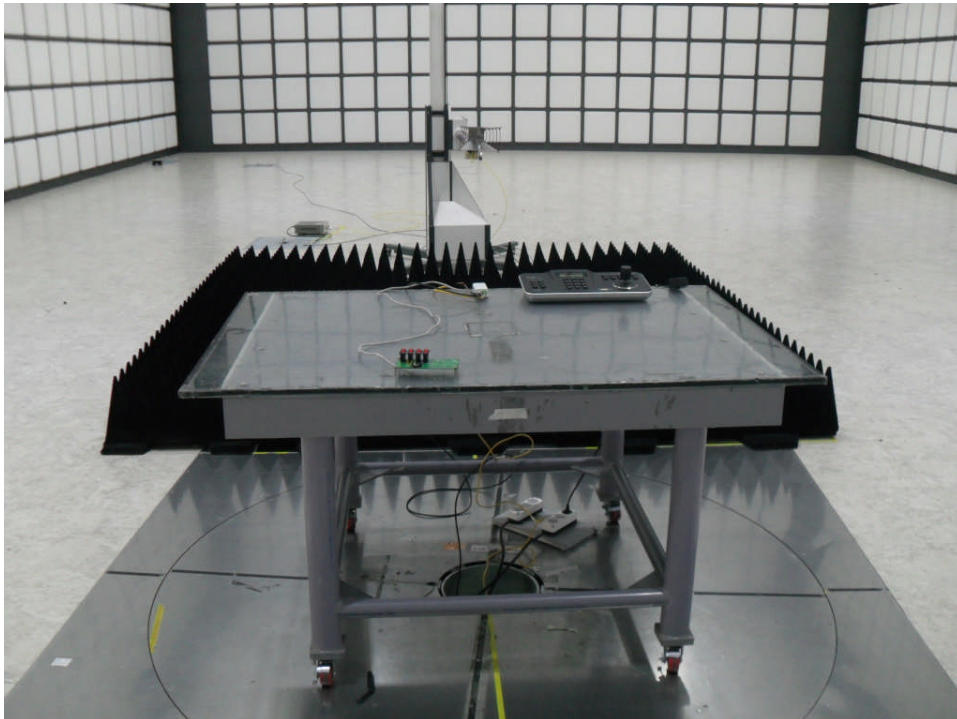


* 1 GHz ~ 6 GHz

* AC/DC adaptor(DC 12 V)



* PoE

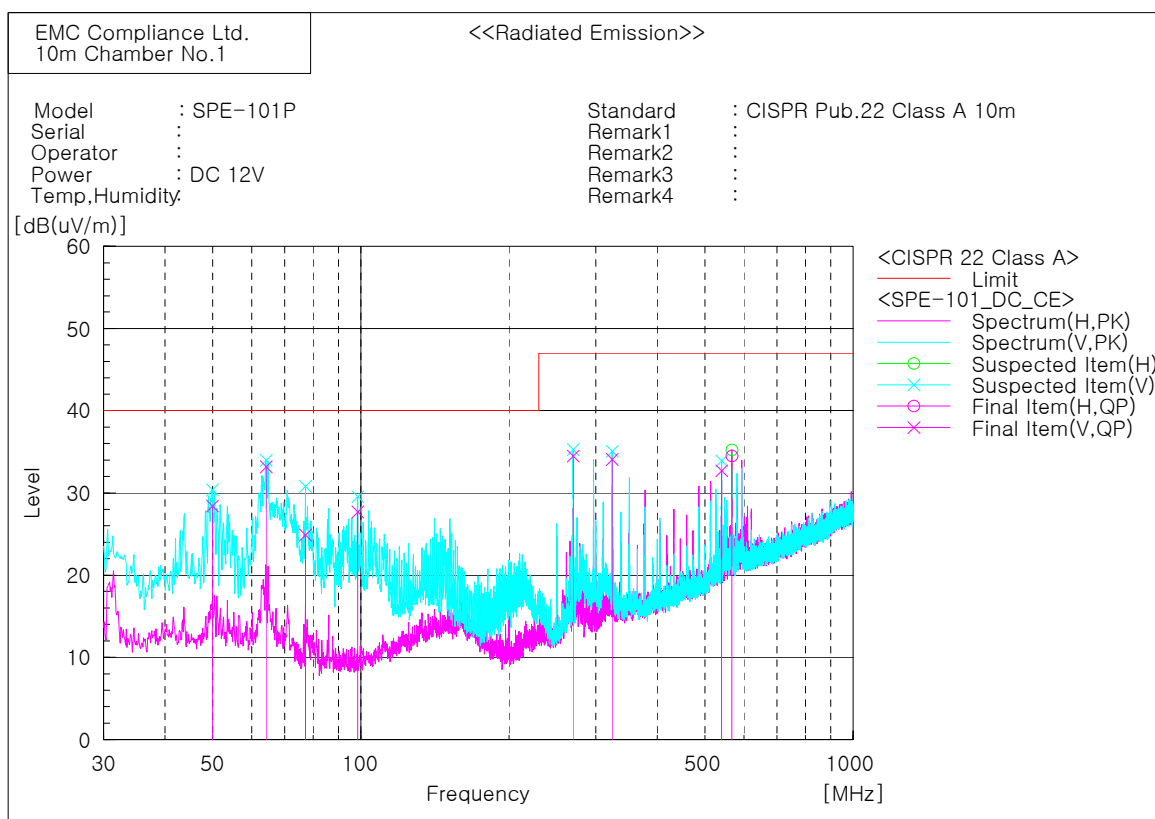


6.2.6 Radiated emission measurement result

* Graph and Data

* 30 MHz ~ 1 GHz

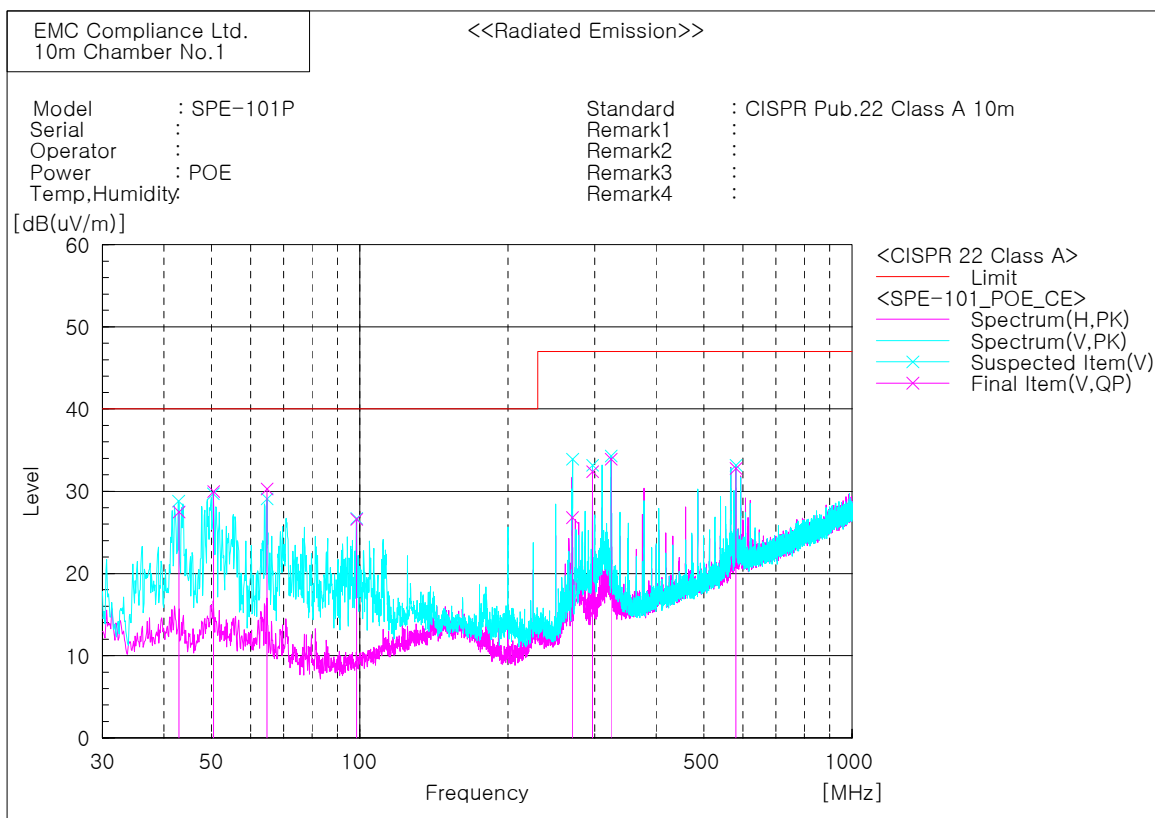
* AC/DC adaptor(DC 12 V)



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	49.885	V	42.9	-14.5	28.4	40.0	11.6	202.0	215.5
2	64.173	V	48.9	-15.7	33.2	40.0	6.8	202.0	103.9
3	77.193	V	42.9	-18.0	24.9	40.0	15.1	100.0	87.4
4	98.506	V	44.9	-17.2	27.7	40.0	12.3	202.0	89.5
5	269.954	V	47.4	-12.9	34.5	47.0	12.5	302.0	9.2
6	324.031	V	45.1	-11.0	34.1	47.0	12.9	100.0	344.6
7	540.099	V	38.2	-5.5	32.7	47.0	14.3	100.0	193.7
8	567.138	H	39.4	-4.9	34.5	47.0	12.5	298.0	24.5

* PoE

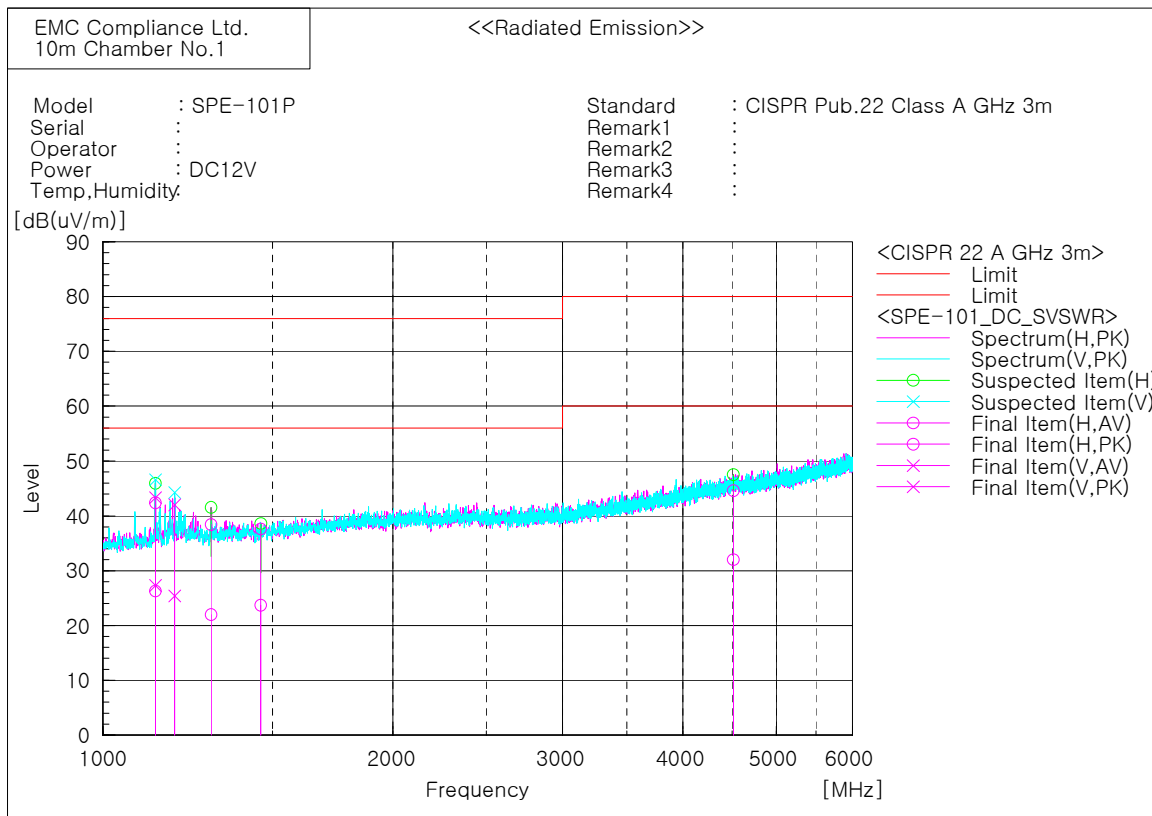


Final Result

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	50.447	V	44.5	-14.5	30.0	40.0	10.0	100.0	118.1
2	42.943	V	41.8	-14.3	27.5	40.0	12.5	100.0	223.1
3	64.789	V	46.1	-15.8	30.3	40.0	9.7	100.0	75.0
4	98.506	V	43.8	-17.2	26.6	40.0	13.4	201.0	54.5
5	269.982	V	39.7	-12.9	26.8	47.0	20.2	302.0	139.6
6	296.993	V	44.4	-12.0	32.4	47.0	14.6	100.0	320.0
7	324.031	V	44.9	-11.0	33.9	47.0	13.1	100.0	326.8
8	580.475	V	37.3	-4.5	32.8	47.0	14.2	100.0	132.4

* 1 GHz ~ 6 GHz

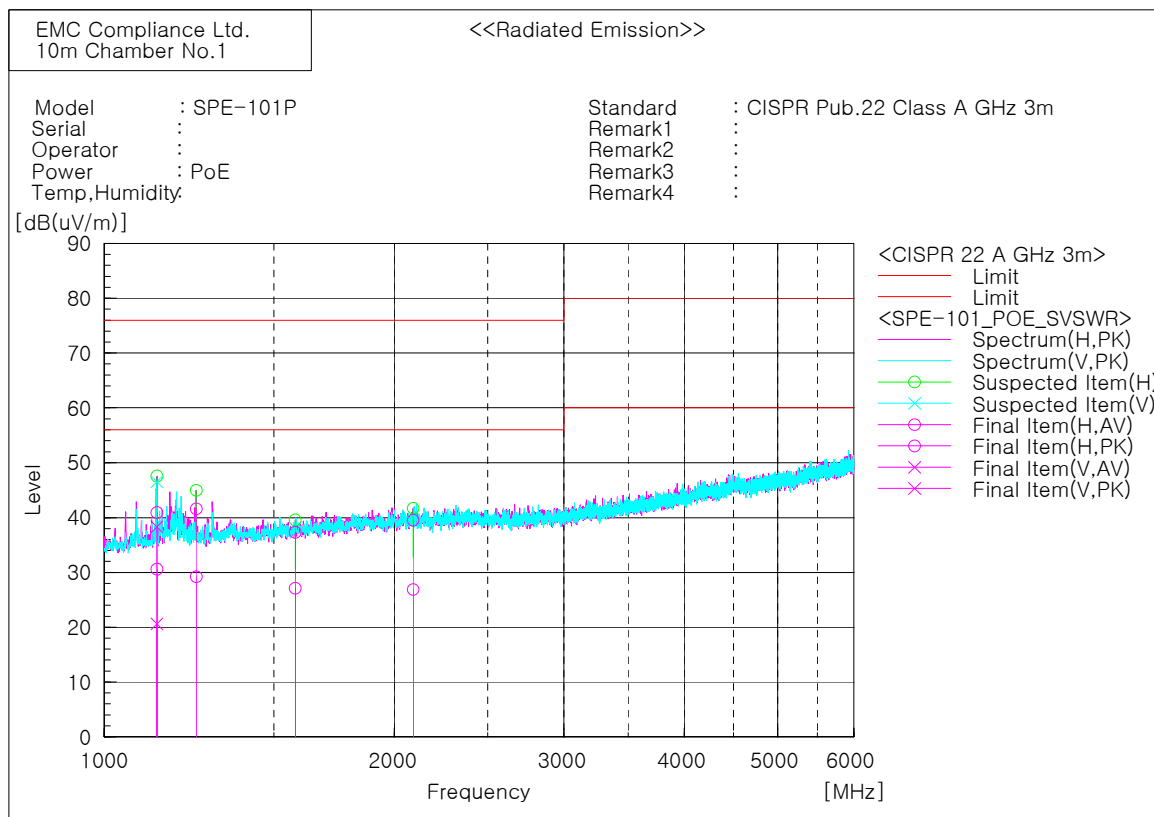
* AC/DC adaptor(DC 12 V)



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	1133.658	V	39.2	55.2	-11.9	27.3	43.3	56.0	76.0	28.7	32.7	100.0	230.1
2	1133.750	H	38.2	54.3	-11.9	26.3	42.4	56.0	76.0	29.7	33.6	100.0	327.4
3	1187.350	V	36.9	53.5	-11.5	25.4	42.0	56.0	76.0	30.6	34.0	100.0	2.8
4	1295.568	H	32.5	48.9	-10.5	22.0	38.4	56.0	76.0	34.0	37.6	100.0	347.5
5	1458.253	H	32.9	46.8	-9.2	23.7	37.6	56.0	76.0	32.3	38.4	100.0	277.1
6	4513.125	H	29.6	42.2	2.4	32.0	44.6	60.0	80.0	28.0	35.4	100.0	189.2

* 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	1133.590	V	32.5	50.2	-11.9	20.6	38.3	56.0	76.0	35.4	37.7	100.0	235.8
2	1134.250	H	42.5	52.8	-11.9	30.6	40.9	56.0	76.0	25.4	35.1	100.0	189.5
3	1246.250	H	40.2	52.6	-11.0	29.2	41.6	56.0	76.0	26.8	34.4	199.0	254.3
4	1578.560	H	35.4	45.6	-8.3	27.1	37.3	56.0	76.0	28.9	38.7	100.0	84.0
5	2092.500	H	32.6	45.2	-5.7	26.9	39.5	56.0	76.0	29.1	36.5	100.0	274.8

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 HCP / VCP: ± 2 kV, ± 4 kV, ± 6 kV				
Discharge impedance	330 Ω / 150 pF				
Testing voltage	DC 12V / PoE				
Date	2011. 08. 16				
Number of discharge (Each polarity)	10				
Interval between discharges	1 s				
Temperature(°C)	27 °C	Humidity (% R.H.)	49 % R.H.	Pressure (kPa)	100.1 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	<input checked="" type="checkbox"/>
HCP	-	-	-	-	<input checked="" type="checkbox"/>
VCP	-	-	-	-	<input checked="" type="checkbox"/>

6.3.3 Photographs of test setup

* AC/DC adaptor(DC 12 V)



* PoE



6.3.4 Measurement result

Electrostatic Discharge (Test Point)

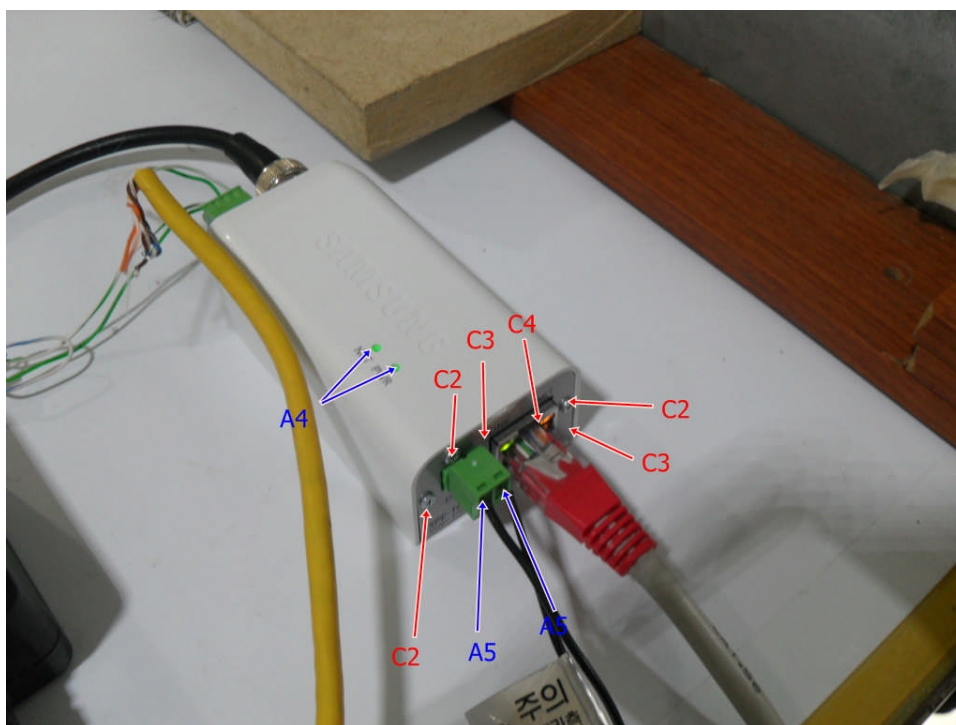
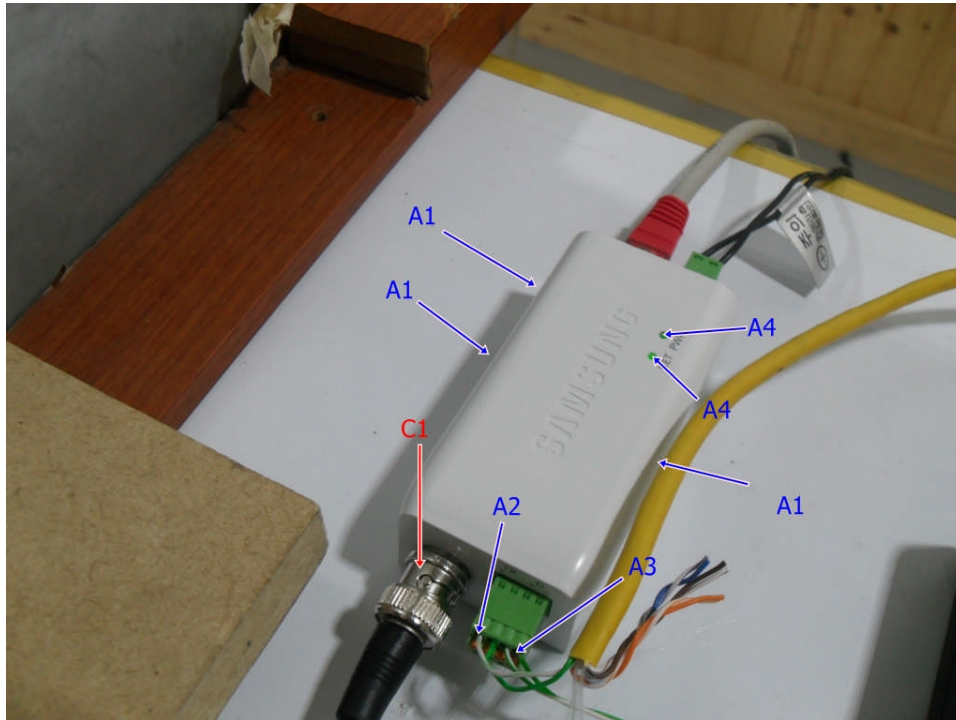
Air discharge



Contact discharge



* AC/DC adaptor(DC 12 V)



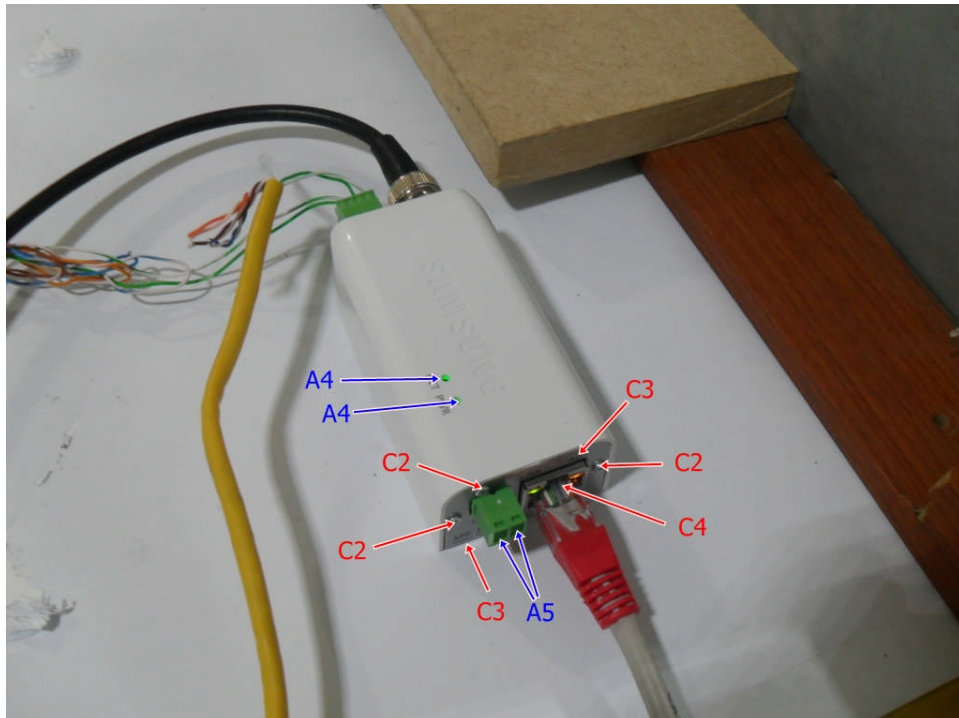
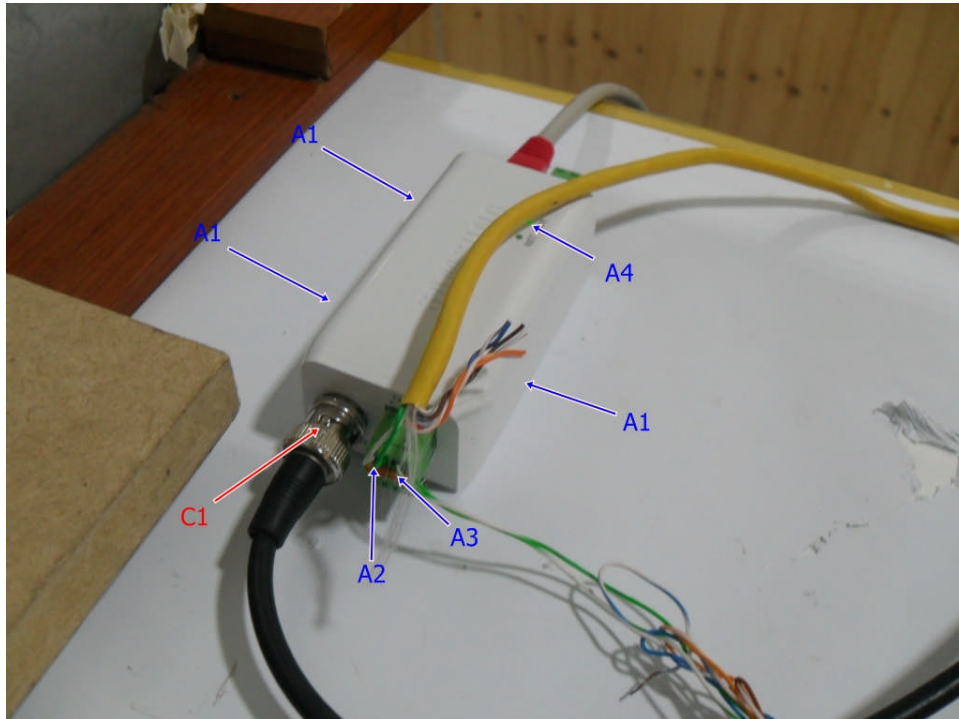
Contact discharge

Location(EUT)		Applied level (\pm)	Result
C1	BNC Port	± 2 kV, ± 4 kV, ± 6 kV	Complied
C2	Screw	± 2 kV, ± 4 kV, ± 6 kV	Complied
C3	Case	± 2 kV, ± 4 kV, ± 6 kV	Complied
C4	LAN Port	± 2 kV, ± 4 kV, ± 6 kV	Complied
	HCP (All 4 sides)	± 2 kV, ± 4 kV, ± 6 kV	Complied
	VCP (All 4 sides)	± 2 kV, ± 4 kV, ± 6 kV	Complied

Air discharge

Location(EUT)		Applied level (\pm)	Result
A1	Case	± 2 kV, ± 4 kV, ± 8 kV	Complied
A2	RS-485 Port	± 2 kV, ± 4 kV, ± 8 kV	Complied
A3	DI, DO Port	± 2 kV, ± 4 kV, ± 8 kV	Complied
A4	LED	± 2 kV, ± 4 kV, ± 8 kV	Complied
A5	Power Port	± 2 kV, ± 4 kV, ± 8 kV	Complied

* PoE



Contact discharge

Location(EUT)		Applied level (\pm)	Result
C1	BNC Port	± 2 kV, ± 4 kV, ± 6 kV	Complied
C2	Screw	± 2 kV, ± 4 kV, ± 6 kV	Complied
C3	Case	± 2 kV, ± 4 kV, ± 6 kV	Complied
C4	LAN Port	± 2 kV, ± 4 kV, ± 6 kV	Complied
	HCP (All 4 sides)	± 2 kV, ± 4 kV, ± 6 kV	Complied
	VCP (All 4 sides)	± 2 kV, ± 4 kV, ± 6 kV	Complied

Air discharge

Location(EUT)		Applied level (\pm)	Result
A1	Case	± 2 kV, ± 4 kV, ± 8 kV	Complied
A2	RS-485 Port	± 2 kV, ± 4 kV, ± 8 kV	Complied
A3	DI, DO Port	± 2 kV, ± 4 kV, ± 8 kV	Complied
A4	LED	± 2 kV, ± 4 kV, ± 8 kV	Complied
A5	Power 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. 08. 16				
Temperature(°C)	26 °C	Humidity (% R.H.)	52 % R.H.	Pressure (kPa)	100.1 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.

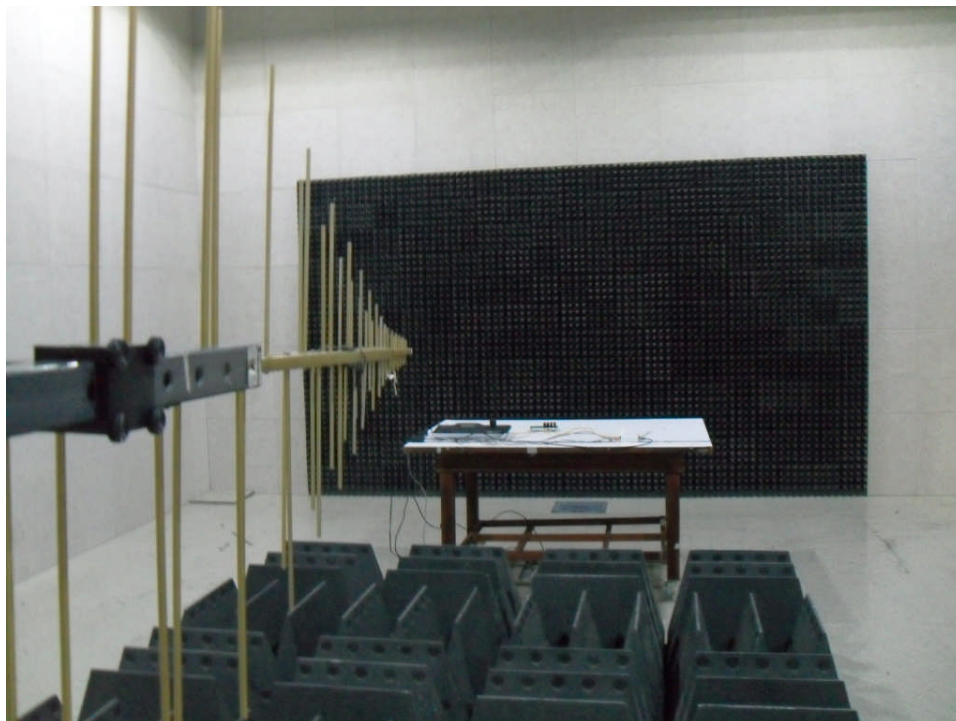
The EUT was tested all sides, horizontal and vertical polarization.

6.4.2 Used equipments

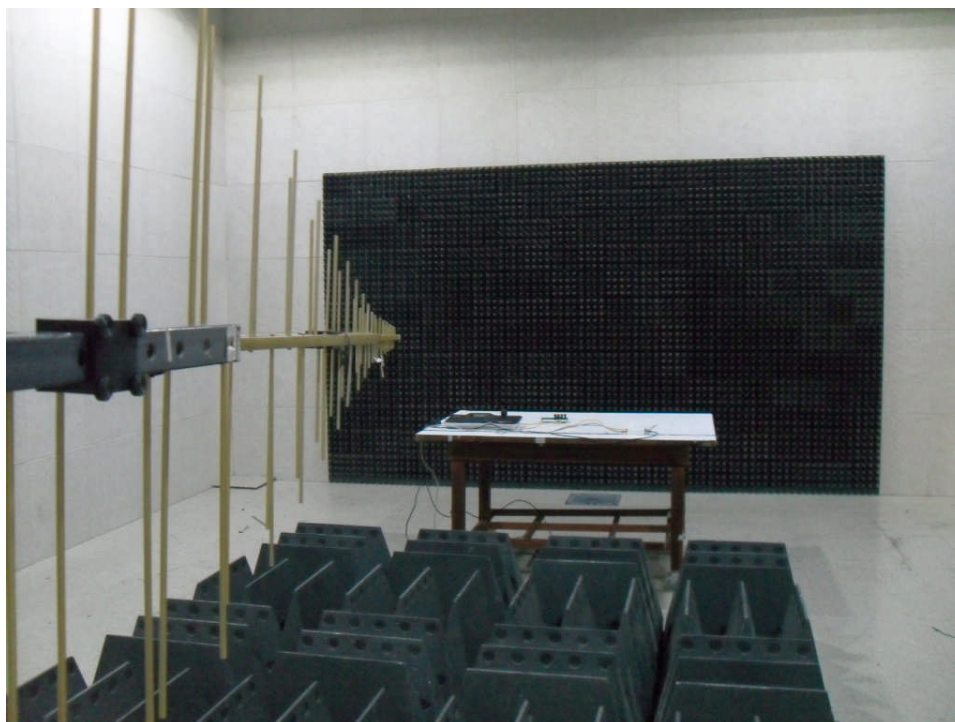
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	12.04.11	<input checked="" type="checkbox"/>
Power sensor	PH2000	303224	AR	12.04.11	<input checked="" type="checkbox"/>
Power sensor	PH2000	303222	AR	12.04.11	<input checked="" type="checkbox"/>
Directional coupler	DC6180	303976	AR	12.04.11	<input checked="" type="checkbox"/>
Directional coupler	DC7144M1	320279	AR	12.02.23	<input checked="" type="checkbox"/>
Signal generator	E4421B	GB40052295	AGILENT	11.10.25	<input checked="" type="checkbox"/>
Amplifier	150W1000M2	303843	AR	12.04.11	<input checked="" type="checkbox"/>
Amplifier	60S1G3M2	320444	AR	12.04.11	<input checked="" type="checkbox"/>
Broadband Ant.	LPDA-0803	130269	ETS	-	<input checked="" type="checkbox"/>
Field monitor	SI-300	-	TDK	-	<input checked="" type="checkbox"/>
Antenna master	-	-	ETS	-	<input checked="" type="checkbox"/>

6.4.3 Photographs of test setup

* AC/DC adaptor(DC 12 V)



* PoE



6.4.4 Measurement result

* AC/DC adaptor(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. 08. 17				
Temperature(°C)	27 °C	Humidity (% R.H.)	52 % R.H.	Pressure (kPa)	100.0 kPa
Remarks	Complied - 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	<input checked="" type="checkbox"/>
Capacitive Coupling Clamp	-	-	EM TEST	-	<input checked="" type="checkbox"/>

6.5.3 Photographs of test setup

* AC/DC adaptor(DC 12V)



- Clamp -



* PoE



6.5.4 Measurement result

* AC/DC adaptor(DC 12V)

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

* Signal (AC/DC adaptor(DC 12V), PoE)

EFT coupling point	(+)	(-)	Result
BNC	+ 1 kV	- 1 kV	Complied
DI, DO	+ 1 kV	- 1 kV	Complied
RS-485	+ 1 kV	- 1 kV	Complied

* Telecommunication (PoE)

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

6.6 Surge

Test specification	EN 61000-4-5:2006				
Coupling	DC 12 V, Signal(DI, DO, RS-485): CDN Signal(BNC): Direct				
Test level	DC 12 V: ± 0.5 kV, ± 1 kV Signal: ± 0.5 kV, ± 1 kV				
Surge pulse shape	Tr/Th = 1.2 / 50 μ s				
Coupling Impedance	DC 12 V, Signal(DI, DO, RS-485): 40 Ω Signal(BNC): Direct				
Number of surge & Coupling time	5 / 1 min				
Angles	0°, 90°, 180°, 270°				
Testing voltage	DC 12 V / PoE				
Date	2011. 08. 17				
Temperature(°C)	27 °C	Humidity (% R.H.)	52 % R.H.	Pressure (kPa)	100.0 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	<input checked="" type="checkbox"/>
CDN	CNV 508	1001-10	EM TEST	-	<input checked="" type="checkbox"/>

6.6.3 Photographs of test setup

* AC/DC adaptor(DC 12 V)



-Clamp-



* PoE



6.6.4 Measurement result

* AC/DC adaptor(DC 12 V)

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

* Signal (AC/DC adaptor(DC 12 V), PoE)

Coupling point	(+)	(-)	Result
BNC	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
DI, DO	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
RS-485	+ 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(BNC) : CDN(S1/75) Signal(DI, DO, RS-485): Clamp Telecommunication: Clamp				
Testing voltage	DC 12 V / PoE				
Date	2011. 08. 16				
Temperature(°C)	27 °C	Humidity (% R.H.)	51 % R.H.	Pressure (kPa)	100.1 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.

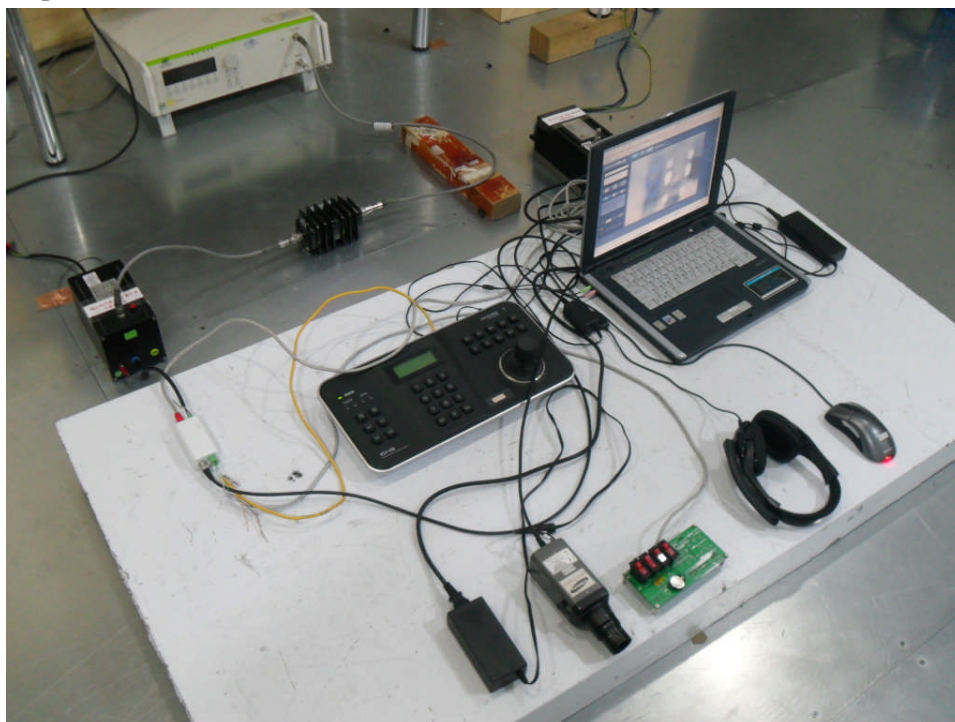
The power and all network cable, I/O cables longer than 3 m length were tested.

6.7.2 Used equipments

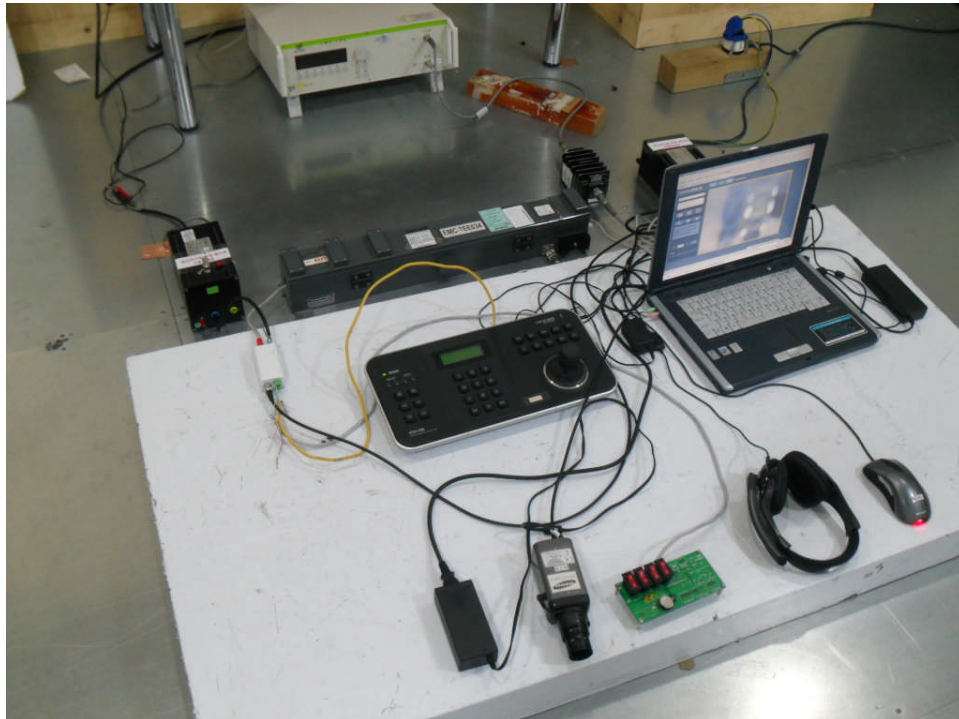
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	CWS 500 C S1	V0635101750	EM TEST	11.10.13	<input checked="" type="checkbox"/>
CDN	CDN M2/M3	0906-12	EM TEST	11.10.13	<input checked="" type="checkbox"/>
CDN	CDN M3-32A	0506-29	EM TEST	12.02.11	<input checked="" type="checkbox"/>
CDN	CDN S1/75	0410-28	EM TEST	12.05.17	<input checked="" type="checkbox"/>
Attenuator	73-6-34	MU918	MCE/WEINSCHEL	11.10.13	<input checked="" type="checkbox"/>
EM Clamp	KEMZ 801	17643	Schaffner	12.04.25	<input checked="" type="checkbox"/>
Current probe	MD720	W1345167/M6/0068	Schaffner	-	<input type="checkbox"/>

6.7.3 Photographs of test setup

* AC/DC adaptor(DC 12 V)



- Clamp -



* PoE



6.7.4 Measurement result

* AC/DC adaptor(DC 12 V)

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

* Signal (AC/DC adaptor(DC 12 V), PoE)

Coupling point	Coupling method	Result
BNC	CDN(S1/75)	Complied
DI, DO	Clamp	Complied
RS-485	Clamp	Complied

* Telecommunication (PoE)

Coupling point	Coupling method	Result
LAN(RJ-45)	Clamp	Complied
LAN(PoE)	Clamp	Complied

7. E.U.T. photographs

Front View



Rear View



Left View



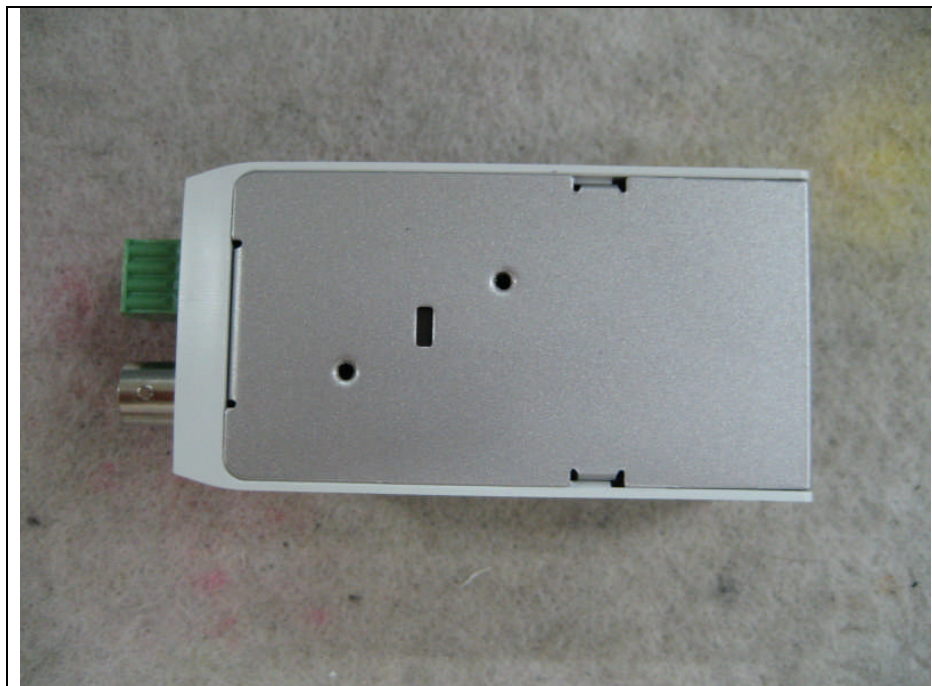
Right View



Top View



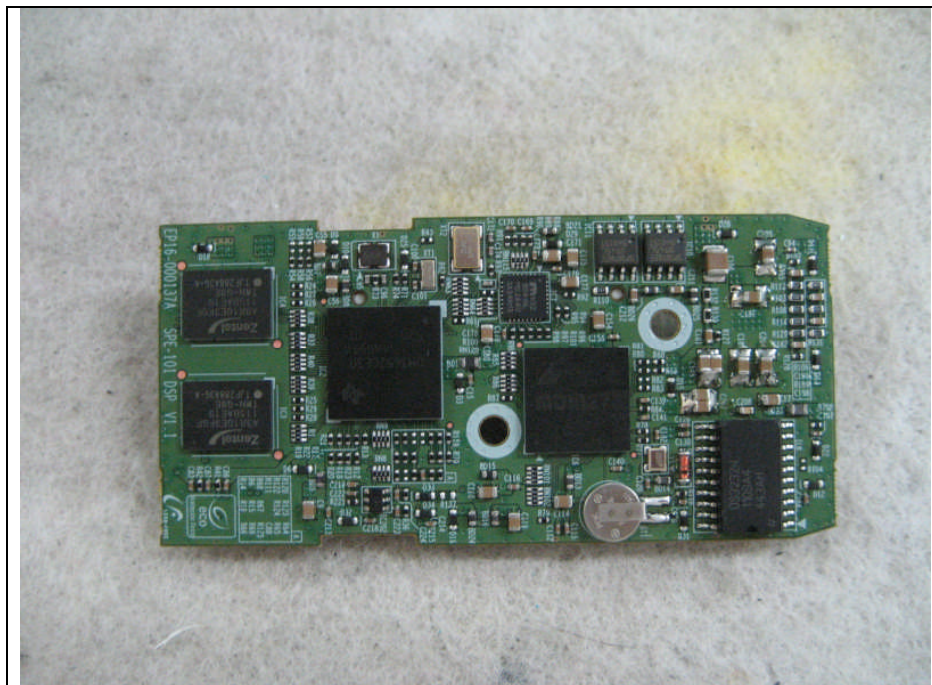
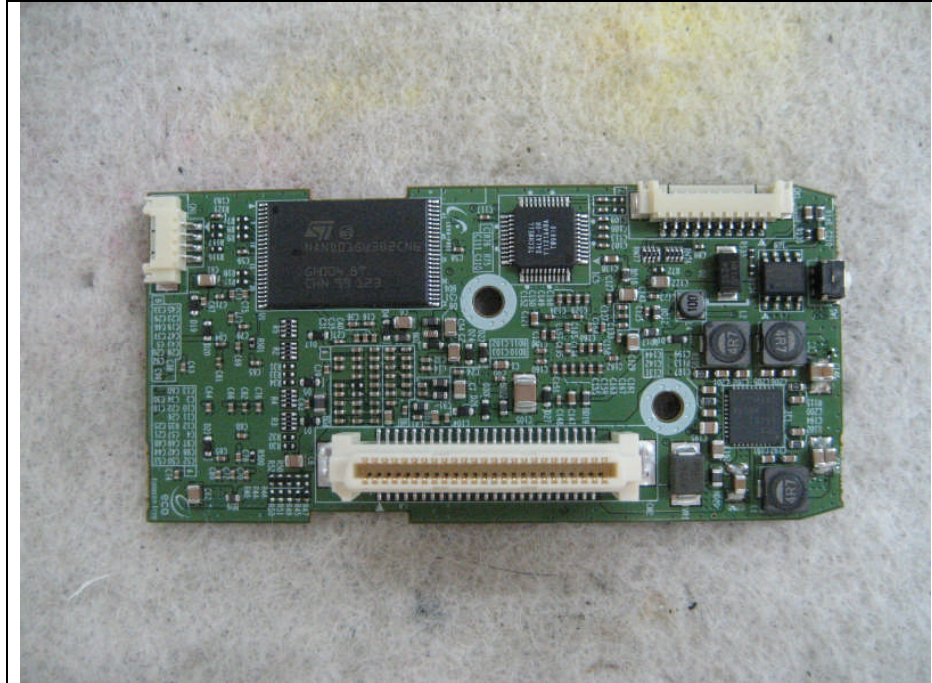
Bottom View



Inside



Main Board



Power Board

