

CERTIFICATE of EMC Compliance

Report No: EMC-FCC-1237

Type of equipment: NETWORK ENCODER

Model Name: SPE-1600RN & SPE-400BN

Applicant: Samsung Techwin Co., Ltd.

Address: #42 Seongju-Dong, Changwon-Shi,
Kyungsangnam-Do, Korea

Manufacturer#1 : Samsung Techwin Co., Ltd.

Address: #42 Seongju-Dong, Changwon-Shi,
Kyungsangnam-Do, Korea

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

Address: No.11 Weiliu Road. Micro-Electronic Industrial
Park Jingang Road Tianjin 300385, China

Test standards : FCC part 15 subpart B, Class A

Classification : Verification

The above equipment was tested by EMC compliance Testing Laboratory for with the requirements of FCC Rules and Regulations. The results of testing in this report apply to the product / system which was tested only.

These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.



Yeom, Han-Seok / Manager

Laboratory

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EMI TEST REPORT

Test report No.: EMC-FCC-1237
Type of Equipment: NETWORK ENCODER
Model Name: SPE-1600RN & SPE-400BN
Applicant: Samsung Techwin Co., Ltd.
#42 Seongju-Dong, Changwon-Shi,
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Manufacturer#1: Samsung Techwin Co., Ltd.
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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: FCC part 15 subpart B, Class A
Test Procedure and Items
- AC Power Line Conducted Emissions Measurement: ANSI C63.4-2009
- Radiated Emissions Measurement : ANSI C63.4-2009
Testing Laboratory: EMC Compliance Ltd.
Test result: Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC 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.

These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

Date of receipt: 2011. 02. 17

Date of testing: 2011. 02. 17

Issued date: 2011. 03. 10

Tested by: 

KIM, IN-HO

Approved by: 

YEOM, HAN-SEOK

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1. Applicant information

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Manufacturer#1: Samsung Techwin Co., Ltd.
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Contact name: **Kang Jei Soon**

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

Address

EMC compliance Ltd.

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

Telephone Number: 82 31 336 9919

Facsimile Number: 82 31 336 4767

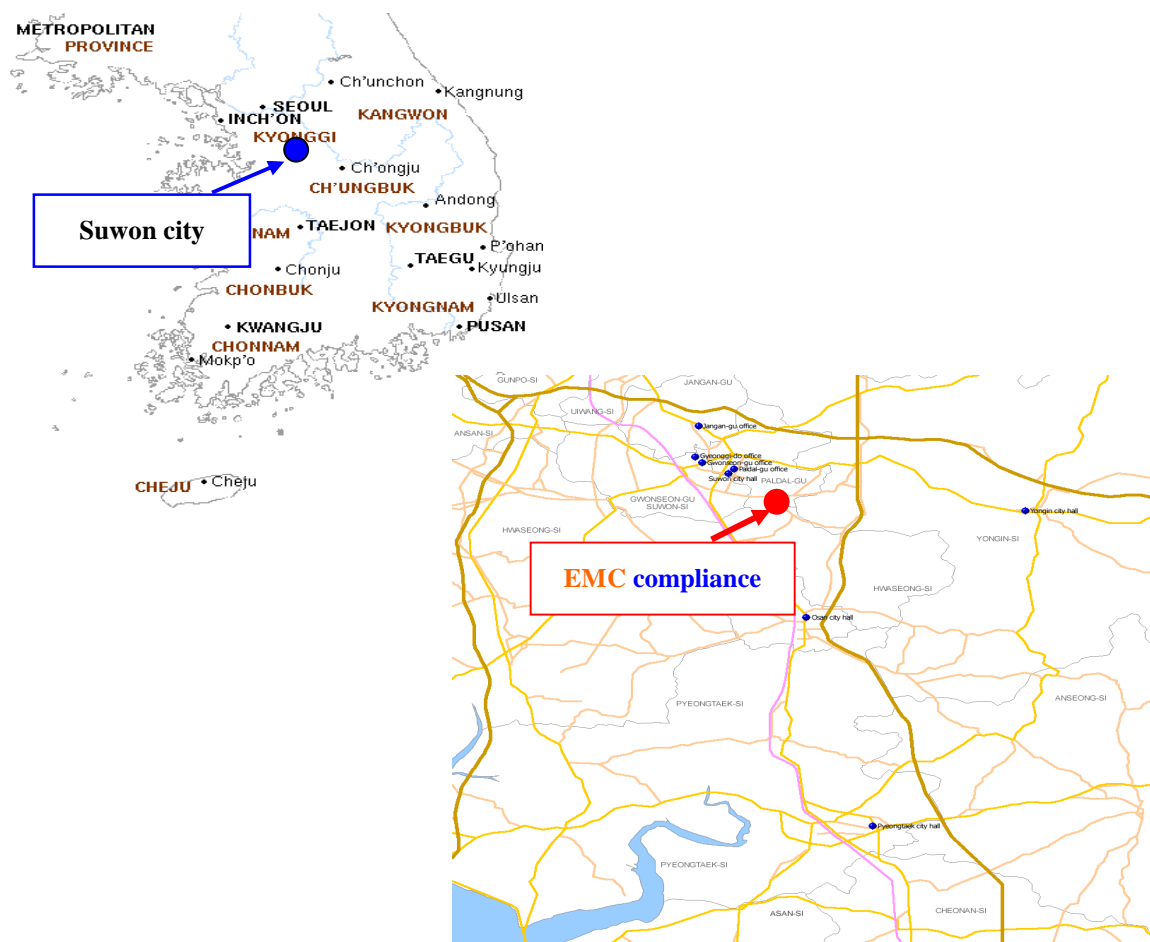
FCC CAB.: KR0040

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)	: 17 ~ 18 °C	29 ~ 30 % R.H.	-
Shielded room(CE)	: 19 °C	29 % R.H.	-

Test site

These testing items were performed following locations;

Shielded Room : Conducted Emission
Chamber (10 m) : Radiated Emission (Test distance: 10 m, 3 m)

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: ± 3.77 [dB]

150 kHz ~ 30 MHz: ± 3.35 [dB]

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

30 MHz ~ 300 MHz: 3 m: ± 4.3 [dB]

10 m: ± 4.3 [dB]

300 MHz ~ 1 000 MHz: 3 m: ± 4.4 [dB]

10 m: ± 4.3 [dB]

4. Description of E.U.T.

4.1 General information

	SPE-1600RN
Connectioion	
Expansion slots	4 slots for SPE-400B
Connector	RJ-45 (10/100/1000BASE-T)
Environmental	
Operating Temperature / Humidity	0°C ~ +40°C (+32°F ~ +104°F) / 20% ~ 80% RH
Electrical	
Input Voltage / Current	AC 100-240V~, 50/60Hz, 0.5A
Power Consumption	Max. 50W(With SPE-400B x 4)
Mechanical	
Color / Material	Black / Metal
Dimension (WxHxD)	W478 x H310.5 x D44mm (18.82" x 12.22" x 1.73")
Weight	3kg

	SPE-400BN	SPE-400BP
Operational		
Video In	4 CVBS : 1.0 Vp-p / 75Ω composite, NTSC/PAL Auto Detection	
Video Out	N/A	
De-interlacing Filter	Built-in	
Event Trigger	Motion Detection, Alarm Input, Video Loss	
Alarm I/O	Input 4ea / Output 4ea	
Remote Control Interface	4ea RS-485 (Half Duplex)	
RS-485 Protocol	SAMSUNG-T/E, PELCO-P/D	
Network		
Ethernet	1000BASE-T	
Video Compression Format	H.264, MPEG-4, MJPEG	
Resolution	704x480, 640x480, 352x240, 320x240	704x576, 640x480, 352x288, 320x240
Max. Framerate	30fps per channel	25fps per channel
Video Quality Adjustment	H.264/MPEG-4 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control	
Bitrate Control Method	H.264/MPEG-4 : CBR or VBR MJPEG : VBR	
Streaming Capability	Multiple Streaming (Up to 10 Profiles)	
Audio I/O	N/A	
Audio Compression Format	N/A	
Audio Communication	N/A	
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, ONVIF	

	SPE-400BN	SPE-400BP
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log	
Streaming Method	Unicast / Multicast	
Max. User Access	10 users at Unicast Mode	
Memory Slot	N/A	
ONVIF Conformance	Yes	
Web Viewer	Supported OS : Windows XP / VISTA / 7, MAC OS Supported Browser : Internet Explorer 6.0 or Higher, Firefox, Google Chrome, Apple Safari	
Central Management Software	NET-i viewer	
Environmental		
Operating Temperature / Humidity	0°C ~ +40°C (+32°F ~ +104°F) / 20% ~ 80% RH	
Ingress Protection	-	
Electrical		
Input Voltage / Current	DC 5V	
Power Consumption	Max. 11W	
Mechanical		
Color / Material	Black / Metal	
Dimension (WxHxD)	W210.2 x H82 x D35mm (8.27" x 3.23" x 1.38")	
Weight	165.9g	

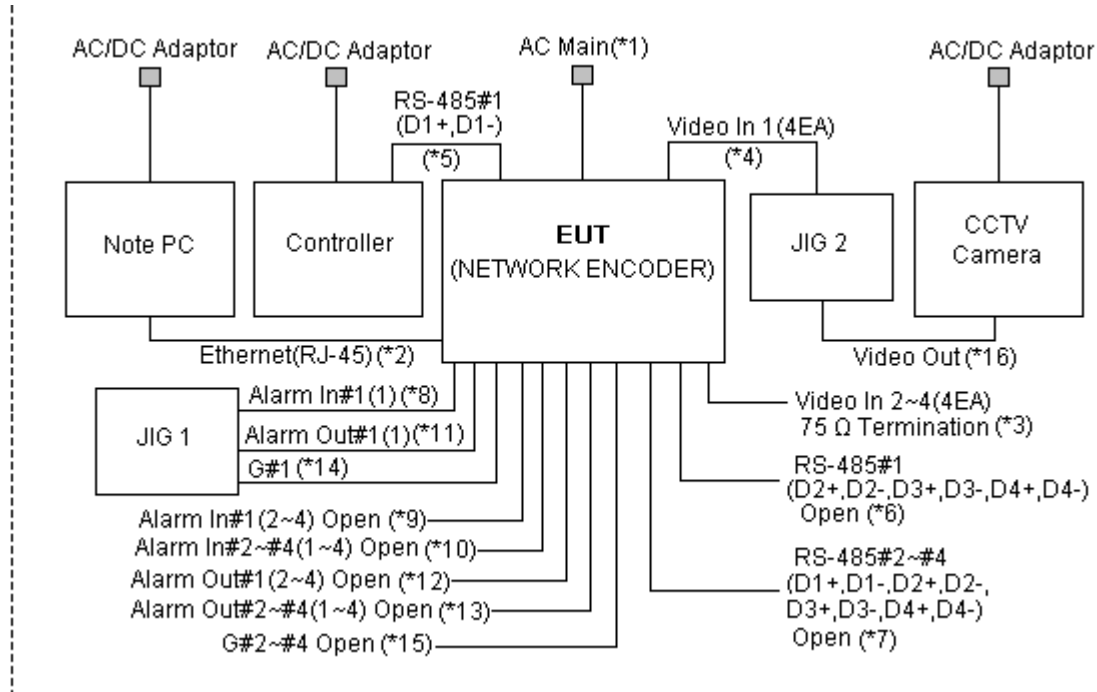
4.2 Product description

Type of product	NETWORK ENCODER
Model name (Basic)	SPE-1600RN & SPE-400BN
Model name (Variant)	N/A
Difference	-
Serial no	Engineering Sample
Testing voltage	120 V , 60 Hz
Product rating	AC 100 - 240 V , 50 / 60 Hz
Internal clock frequency	250 MHz
Note	-

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	C1410	473680121639	FUJITSU
CCTV Camera	SDC-435P	C08C6V3Z245129	SAMSUNGTECHWIN
Controller	SCC-1000	C28667WZ107714Y	SAMSUNG
JIG 1	-	-	-
JIG 2	-	-	-

4.4 Test configuration



Note *	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT (NETWORK ENCODER)	Power	AC Main	Power	1.5	Non-Shield
2		Ethernet(RJ-45)	Note PC	RJ-45	3.0	Non-Shield
3		Video In 2~4 (4EA)	75 Ω Termination	-	1.0	Shield
4		Video In 1(4EA)	JIG 2	Video Out(4EA)	3.0	Shield
5		RS-485#1 (D1+,D1-)	Controller	RS-485#1 (D1+, D1-)	3.0	Non-Shield
6		RS-485#1 (D2+,D2-,D3+,D3- ,D4+,D4-)	Open	-	3.0	Non-Shield
7		RS-485#2~#4 (D1+,D1-,D2+,D2- ,D3+,D3-,D4+,D4-)	Open	-	3.0	Non-Shield
8		Alarm In#1(1)	JIG 1	Alarm Out	3.0	Non-Shield
9		Alarm In#1(2~4)	Open	-	3.0	Non-Shield
10		Alarm In#2~#4(1~4)	Open	-	3.0	Non-Shield
11		Alarm Out#1(1)	JIG 1	Alarm In	3.0	Non-Shield
12		Alarm Out#1(2~4)	Open	-	3.0	Non-Shield
13		Alarm Out#2~#4 (1~4)	Open	-	3.0	Non-Shield
14		G#1	JIG 1	G#1	3.0	Non-Shield
15		G#2~#4	Open	-	3.0	Non-Shield
16	CCTV Camera	Video Out	JIG 2	Video In	3.0	Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

This test was done at worst case.

Test mode	Normal operating
1	Web view monitoring mode.
	RS-485, Alarm Port operating check mode.

5. Summary of test results

In the above configuration tested, The EUT complied with the requirement of the specification

5.1 Modification to the E.U.T.

None

5.2 Summary of EMI emission test results

FCC Part 15 Subpart B (Class A)

ANSI C63.4 – 2009

Application	Test method	Test result
Conducted emission - AC main port	ANSI C63.4 – 2009	Complied
Radiated emission	ANSI C63.4 – 2009	Complied

6. Test results

6.1 Conducted Emission

Test specification	FCC Part 15, Section 15.107(b), Class A		
Test mode	Operating mode.		
Date	2011. 02. 17		
Testing voltage	120 V, 60 Hz		
Test facility	Shielded room (CE#1)		
Temperature(°C)	19 °C	Humidity (% R.H.)	29 % R.H.
Remarks	Complied Minimum limit margin is 11.59 dB at 13.960 MHz. (Average)		

6.1.1 Limits of conducted emission measurement

Frequency [MHz]	Class A (dB(μV))		Class B (dB(μV))	
	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.

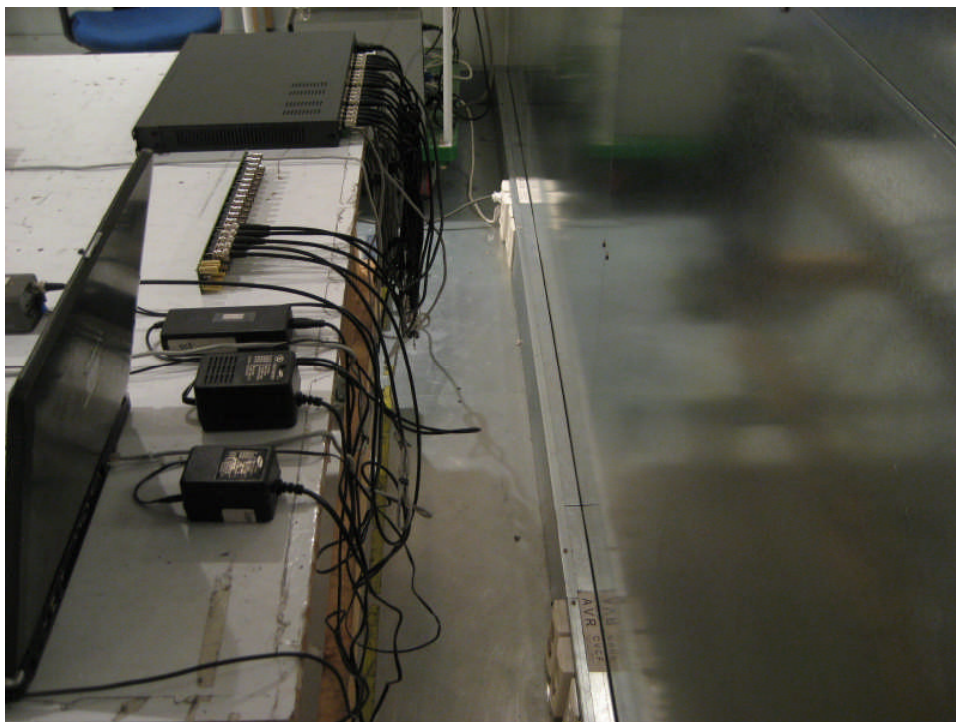
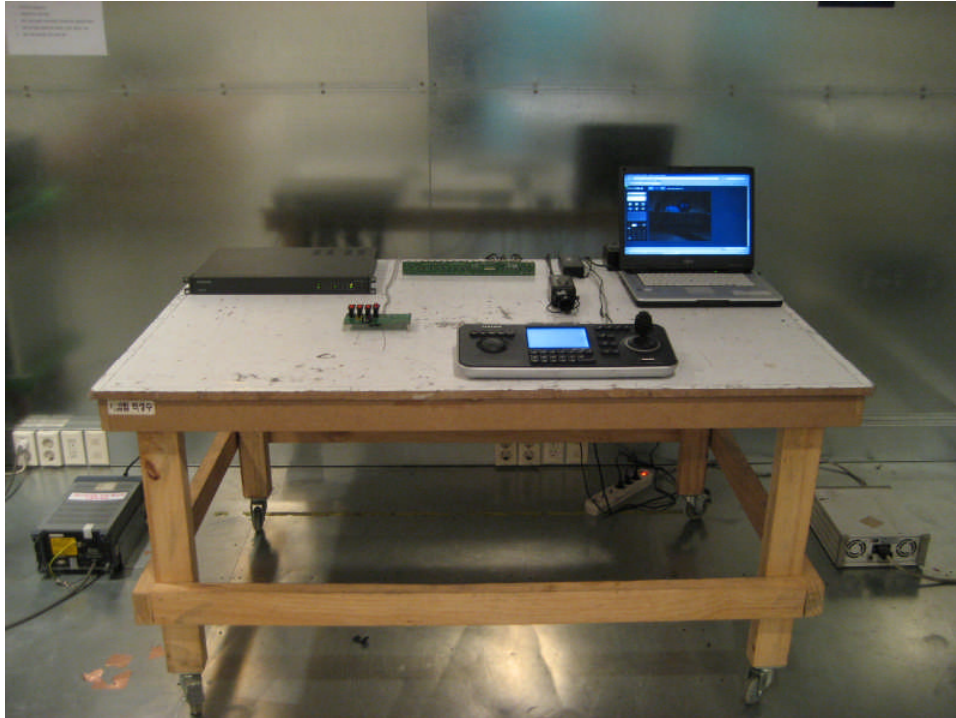
6.1.2 Measurement procedure

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	ESHS10	843276/003	R&S	11.06.11	<input checked="" type="checkbox"/>
LISN	ESH3-Z5	100267	R&S	11.07.05	<input checked="" type="checkbox"/>
LISN	L2-16A	0000J10705	PMM	-	<input checked="" type="checkbox"/>

6.1.4 Photographs of test setup



6.1.5 Conducted emission measurement result

Frequency [MHz]	Correction Factor		Line	Quasi-peak			Average		
	LISN	Cable		Limit	Reading	Result	Limit	Reading	Result
				[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]
0.153	0.07	0.03	H	79.00	60.45	60.55	66.00	53.00	53.10
0.195	0.07	0.02	N		38.86	38.95		34.61	34.70
0.198	0.08	0.02	H		43.25	43.35		38.41	38.51
0.261	0.08	0.02	H		46.90	47.00		40.76	40.86
0.315	0.08	0.03	H		47.09	47.20		38.02	38.13
0.321	0.07	0.03	N		44.63	44.73		36.82	36.92
1.011	0.09	0.05	H	73.00	51.11	51.25	60.00	40.75	40.89
3.210	0.10	0.07	H		48.86	49.03		40.92	41.09
6.090	0.20	0.09	H		47.92	48.21		41.72	42.01
6.160	0.15	0.09	N		48.38	48.62		42.24	42.48
13.390	0.42	0.12	H		53.80	54.34		47.65	48.19
13.960	0.36	0.12	N		54.01	54.49		47.93	48.41

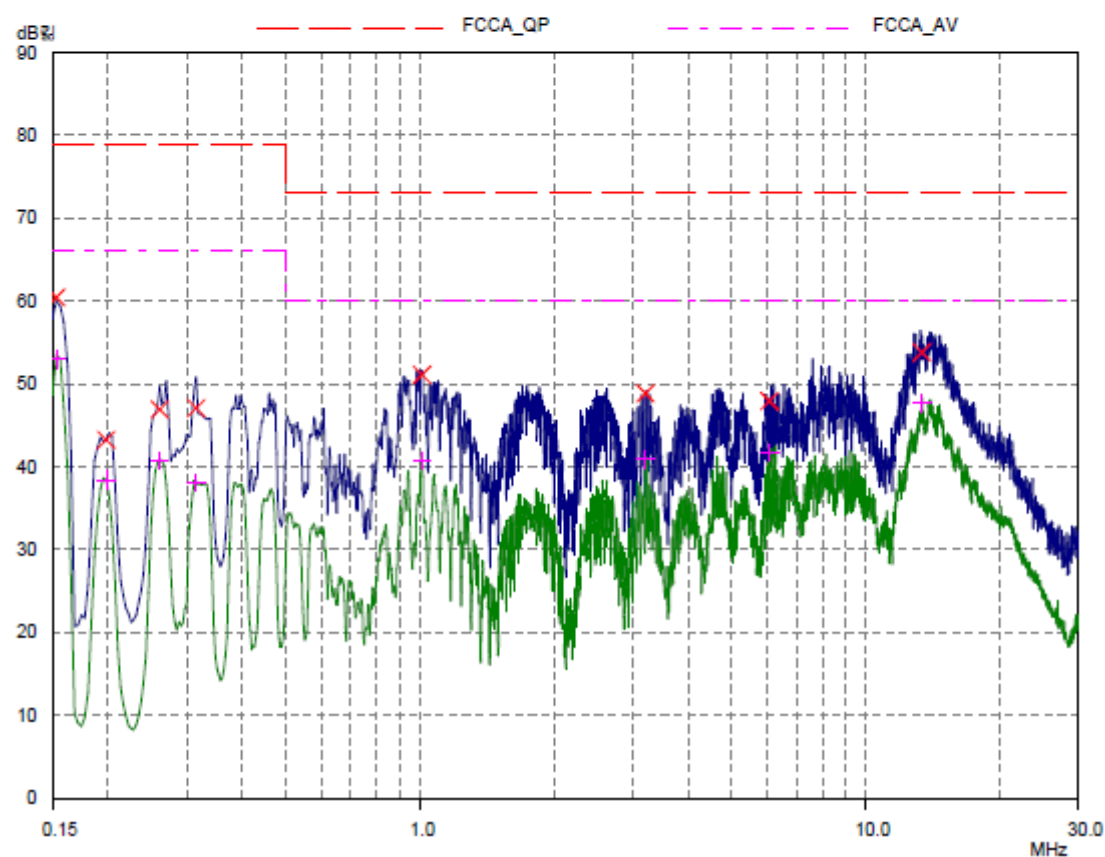
EUT: SPE-1600RN & SPE-400BN
Manuf:
Op Cond: H
Operator:
Test Spec: FCC Class A Conducted Emission
Comment:

Result File: h.dat :

Scan Settings (2 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB	
3MHz	30MHz	10kHz	10kHz	PK+AV	2msec	Auto	OFF	60dB	

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



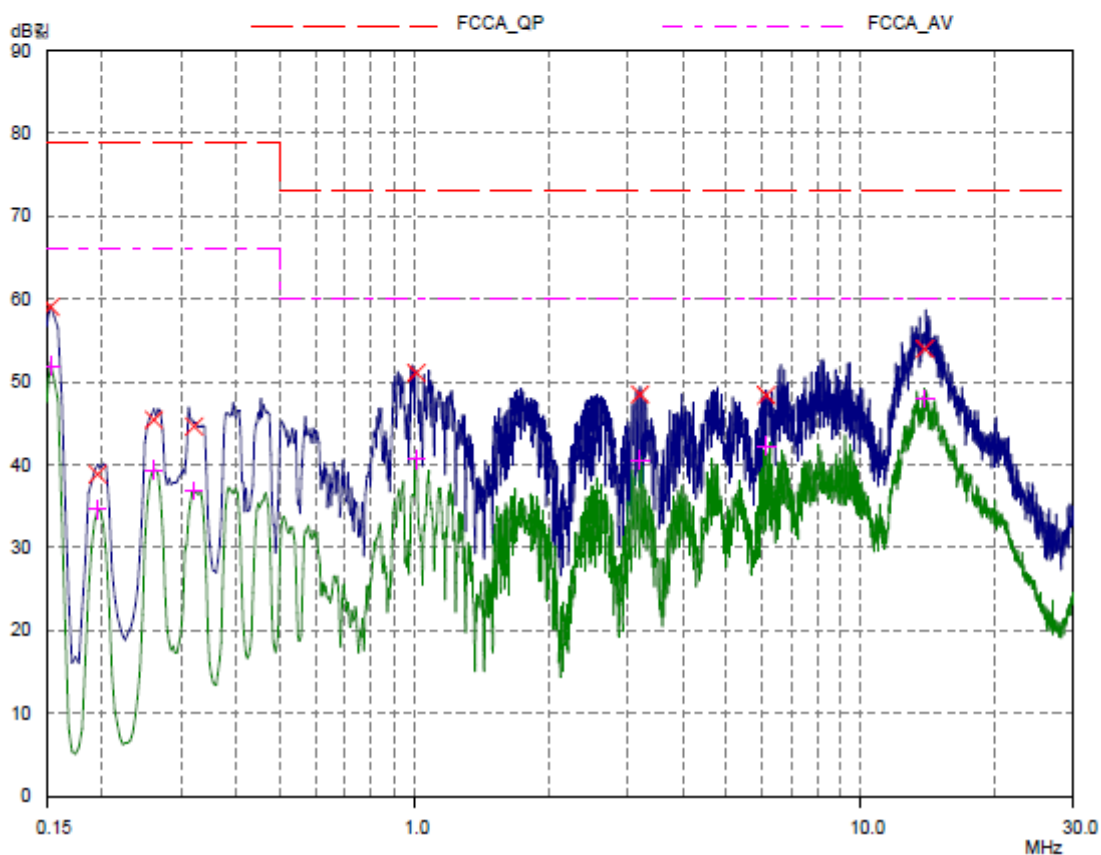
EUT: SPE-1600RN & SPE-400BN
Manuf:
Op Cond: N
Operator:
Test Spec: FCC Class A Conducted Emission
Comment:

Result File: n.dat :

Scan Settings (2 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB	
3MHz	30MHz	10kHz	10kHz	PK+AV	2msec	Auto	OFF	60dB	

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



6.2 Radiated Emission

Test specification	FCC Part 15, Section 15.109(g), Class A		
Test mode	Operating mode.		
Date	2011. 02. 17		
Testing voltage	120 V , 60 Hz		
Test facility	10 m Chamber (Test distance: 10 m, 3 m)		
Temperature (°C)	17 ~ 18 °C	Humidity (% R.H.)	29 ~ 30 % R.H.
Remarks	Complied Minimum limit margin is 4.7 dB at 324.021 MHz. (30 MHz ~ 1 GHz) Minimum limit margin is 18.4 dB at 1607.545 MHz. (1 GHz ~ 2 GHz_Average)		

6.2.1 Limits of radiated emission measurement

Frequency [MHz]	Class A (dB(μV/m)) @ 10 m	Class B (dB(μV/m)) @ 3 m
30-88	39	40
88-216	43.5	43.5
216-960	46.4	46
Above 960	49.5	54

* Note- Alternative standard: CISPR, Pub. 22 *

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

* 30 MHz ~ 1 GHz

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100001	R&S	11.08.17	<input checked="" type="checkbox"/>
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	11.11.30	<input checked="" type="checkbox"/>
Amplifier	310N	284608	SONOMA INSTRUMENT	11.07.08	<input checked="" type="checkbox"/>
3 dB Attenuator	8491A	16861	HP	12.01.13	<input checked="" type="checkbox"/>
Antenna Mast	AM4.0	079/3440509	MATURO	-	<input checked="" type="checkbox"/>
Turn Table	CO2000-SOFT	-	MATURO	-	<input checked="" type="checkbox"/>

* 1 GHz ~ 2 GHz

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Antenna Mast	AM4.0	079/3440509	MATURO	-	<input checked="" type="checkbox"/>
Turn Table	CO2000-SOFT	-	MATURO	-	<input checked="" type="checkbox"/>
Amplifier	8449B	3008A02343	AGILENT	11.12.01	<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

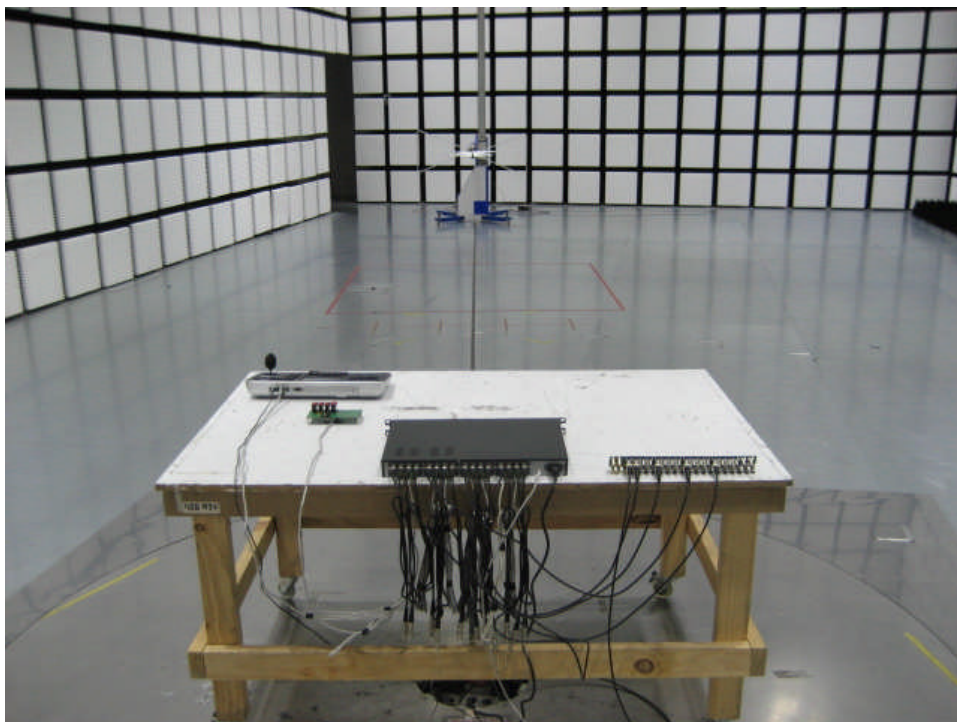
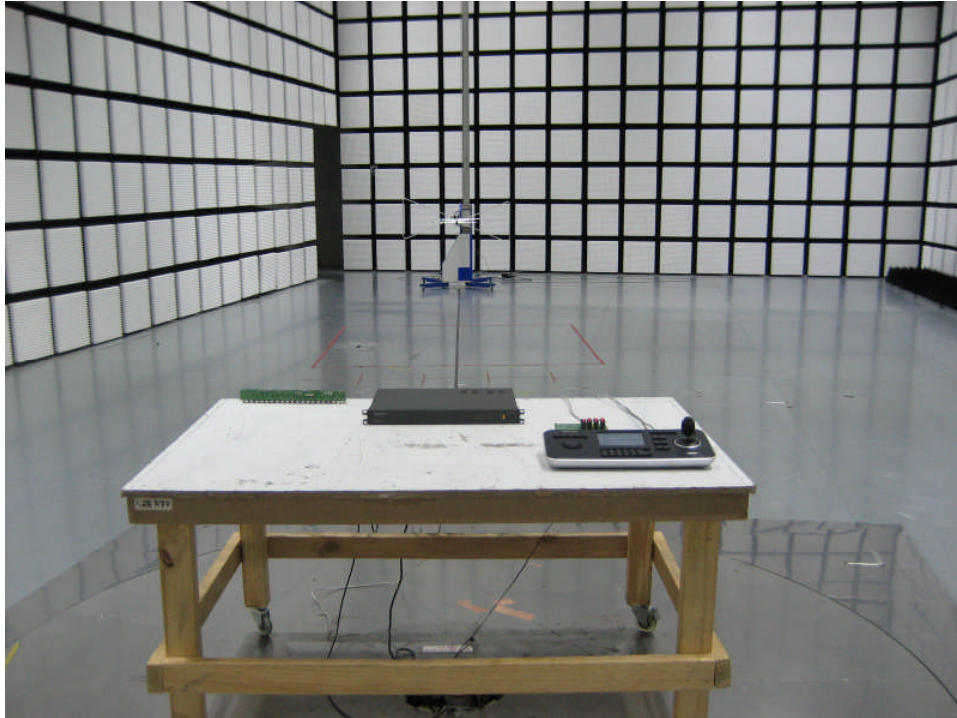
3 dB Att = 3 dB Attenuator

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

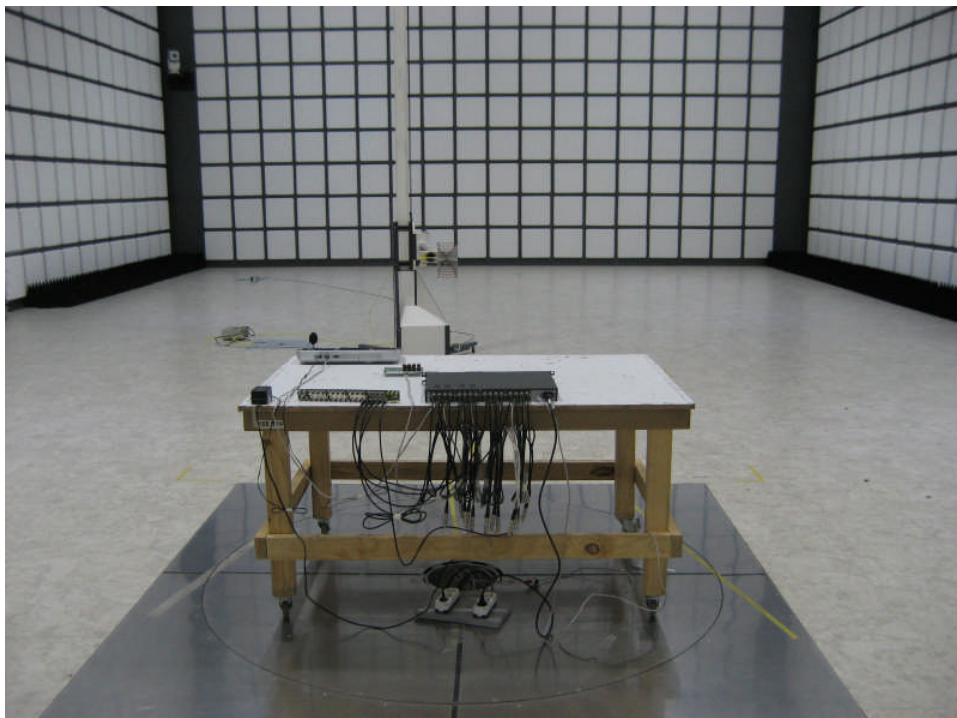
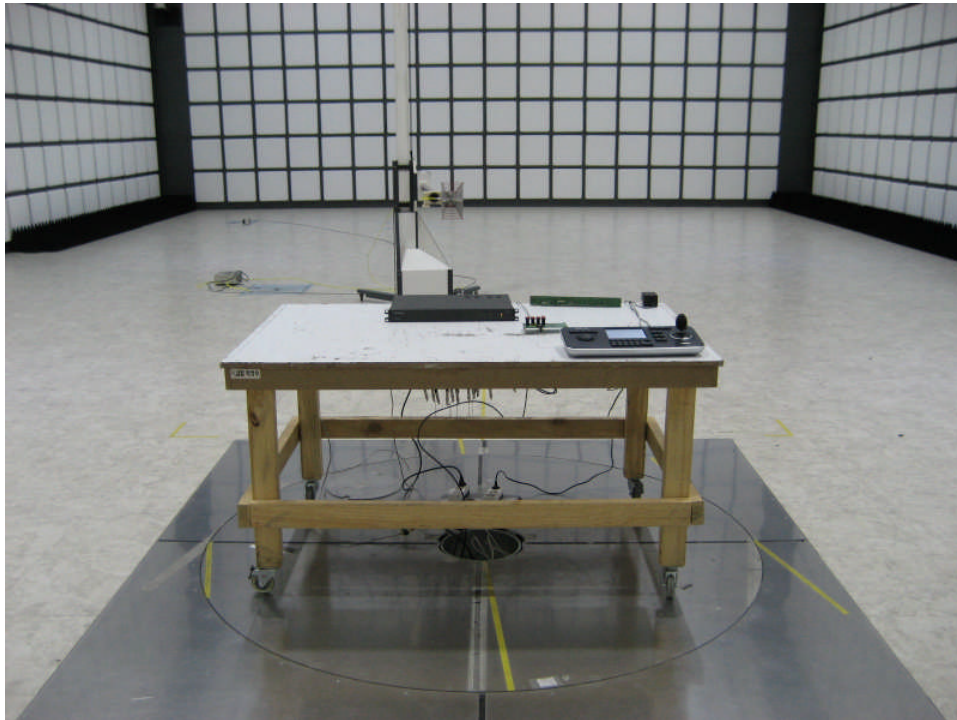
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.2.5 Photographs of test setup

* 30 MHz ~ 1 GHz



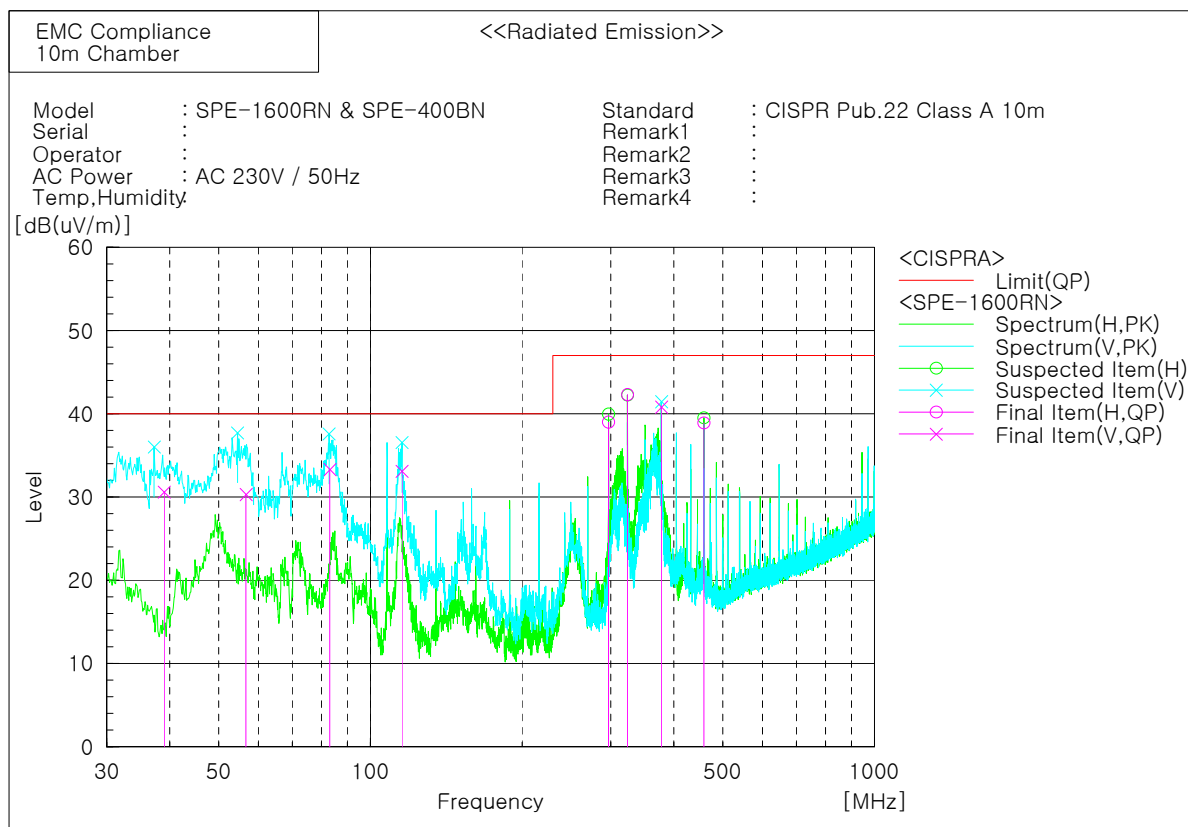
* 1 GHz ~ 2 GHz



6.2.6 Radiated emission measurement result

* Graph and Data

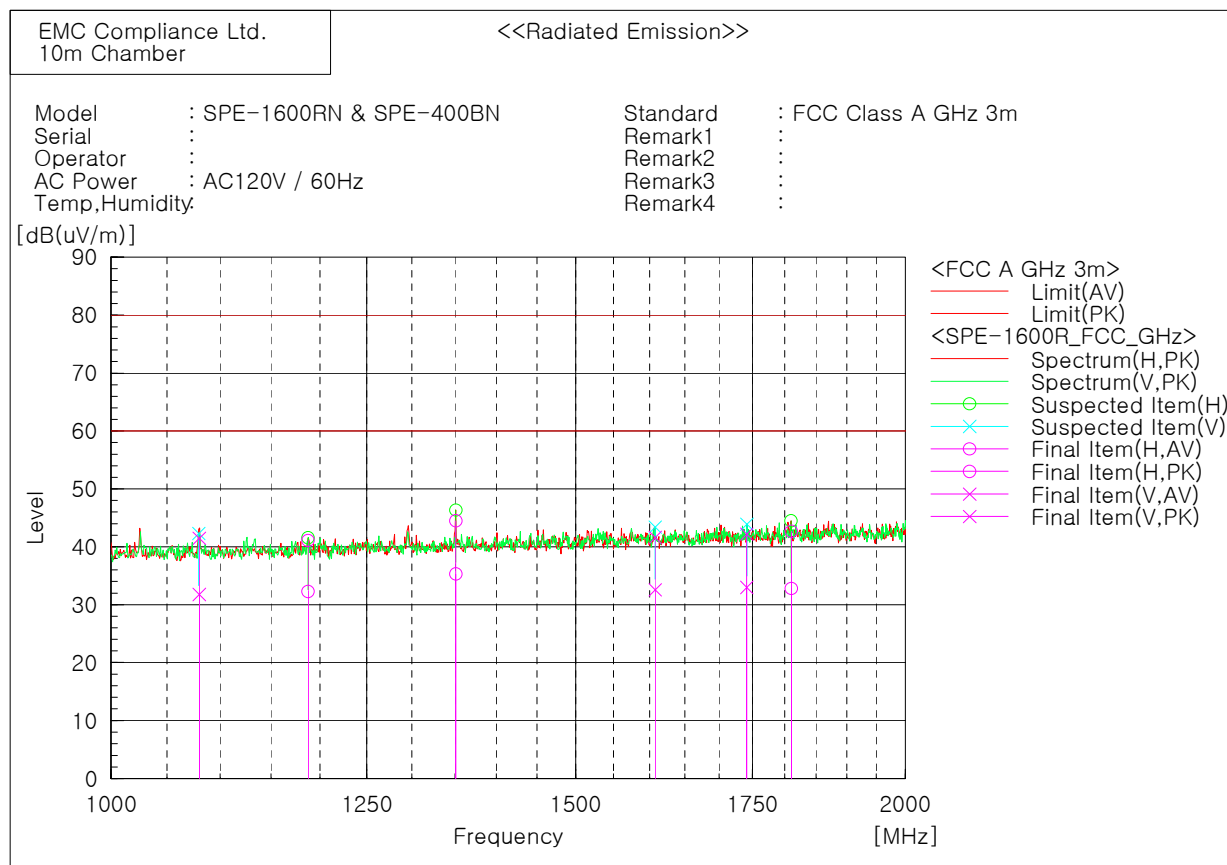
* 30 MHz ~ 1 GHz



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]	Remark
1	38.993	V	46.5	-15.9	30.6	40.0	9.4	100.0	268.9	
2	56.679	V	45.9	-15.6	30.3	40.0	9.7	100.0	136.5	
3	83.113	V	53.0	-19.7	33.3	40.0	6.7	199.0	165.5	
4	115.604	V	49.1	-16.0	33.1	40.0	6.9	100.0	197.5	
5	297.007	H	52.0	-13.0	39.0	47.0	8.0	400.0	350.8	
6	324.021	H	54.6	-12.3	42.3	47.0	4.7	301.0	112.8	
7	378.009	V	51.7	-10.9	40.8	47.0	6.2	100.0	295.7	
8	459.018	H	48.5	-9.6	38.9	47.0	8.1	200.0	66.0	

* 1 GHz ~ 2 GHz



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	1080.100	V	40.0	49.7	-8.2	31.8	41.5	60.0	80.0	28.2	38.5	100.0	335.9
2	1187.545	H	39.7	48.5	-7.4	32.3	41.1	60.0	80.0	27.7	38.9	100.0	99.9
3	1351.055	H	41.5	50.7	-6.2	35.3	44.5	60.0	80.0	24.7	35.5	100.0	311.3
4	1607.545	V	46.1	37.1	-4.5	41.6	32.6	60.0	80.0	18.4	47.4	100.0	59.5
5	1741.156	V	36.8	46.0	-3.8	33.0	42.2	60.0	80.0	27.0	37.8	200.0	136.9
6	1810.236	H	36.2	46.1	-3.4	32.8	42.7	60.0	80.0	27.2	37.3	200.0	4.5

7. E.U.T. photographs

Front View



Rear View



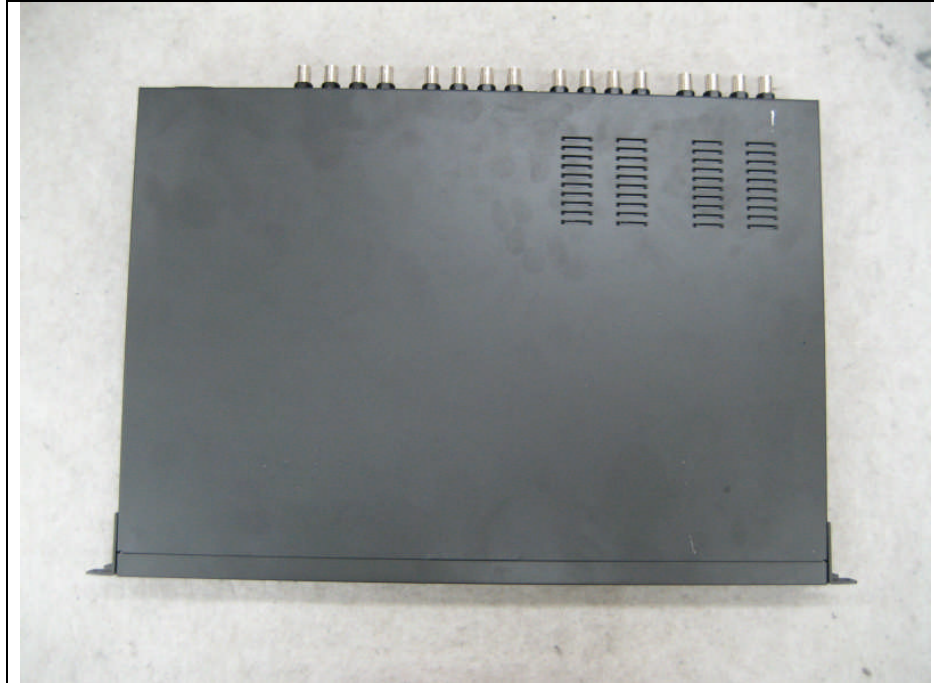
Left View



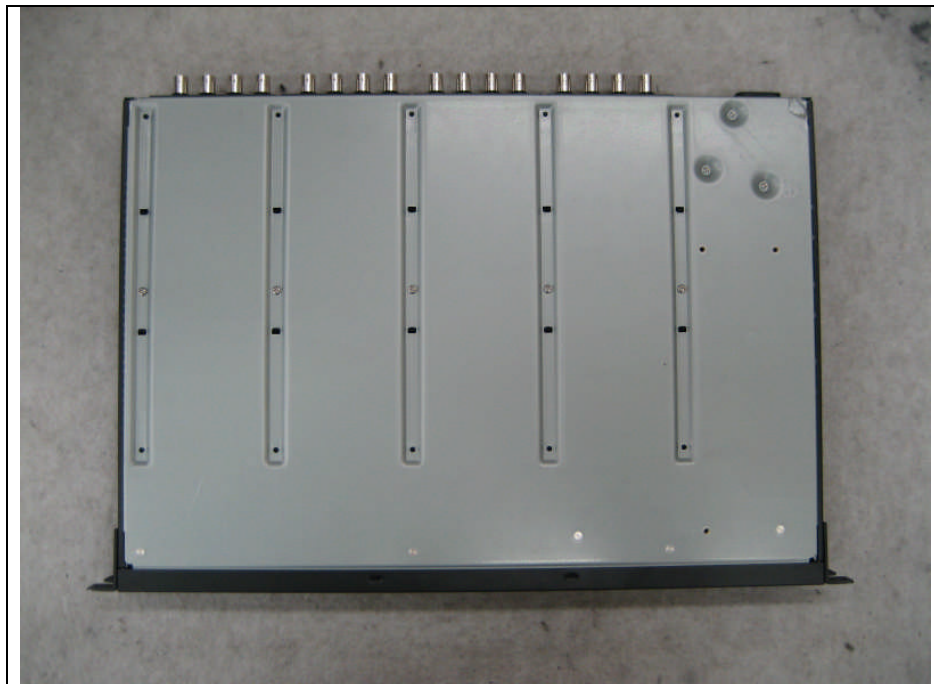
Right View



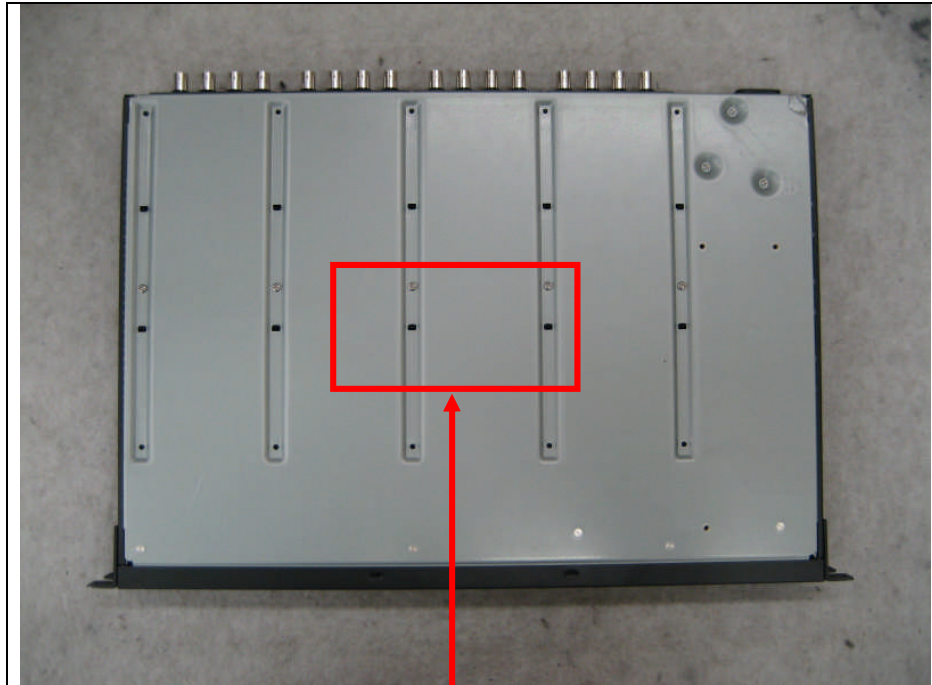
Top View



Bottom View



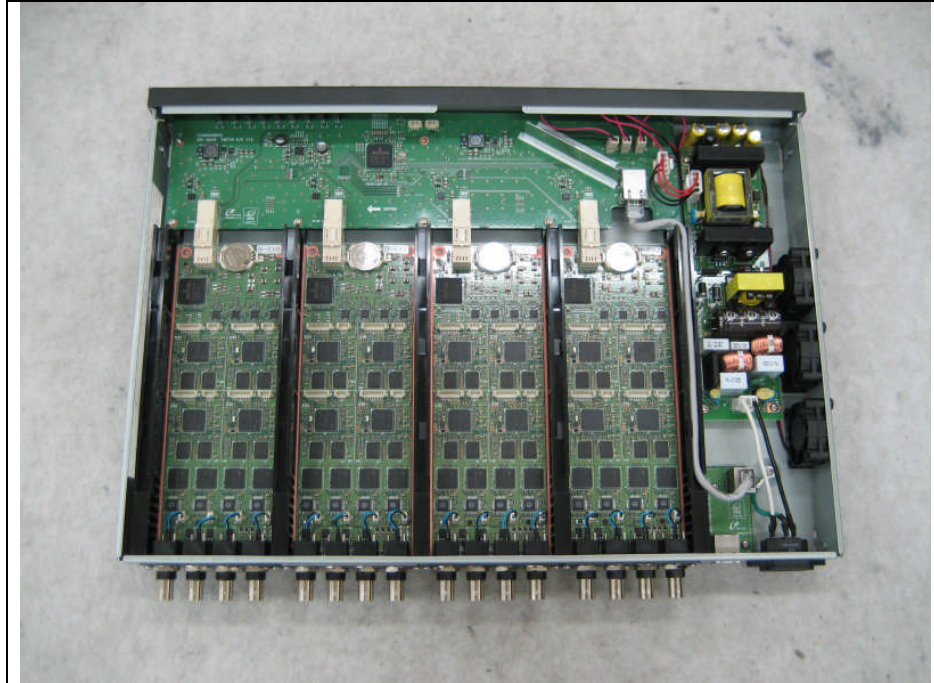
Label



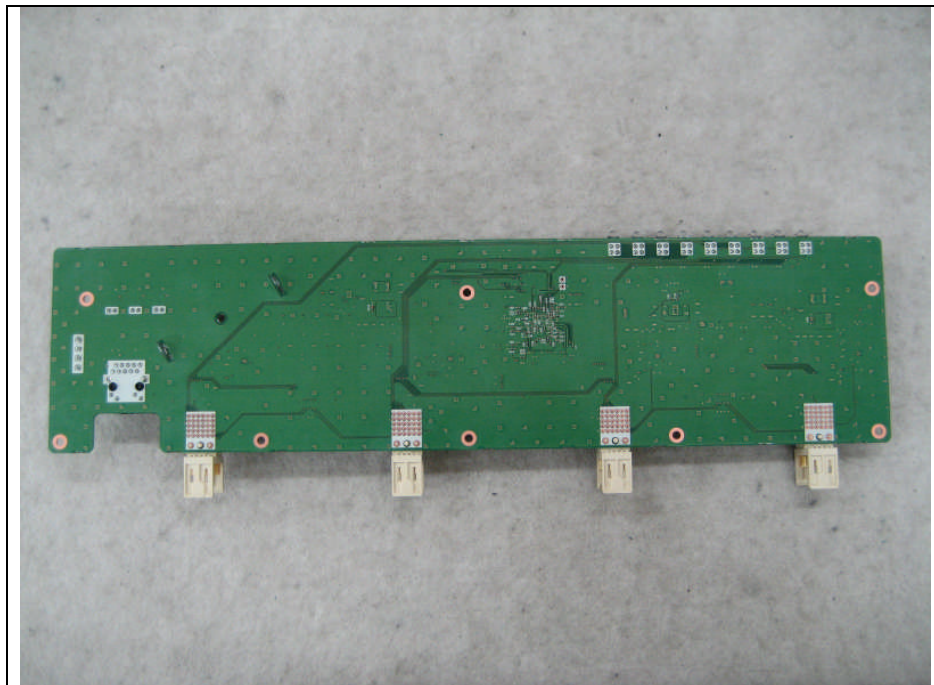
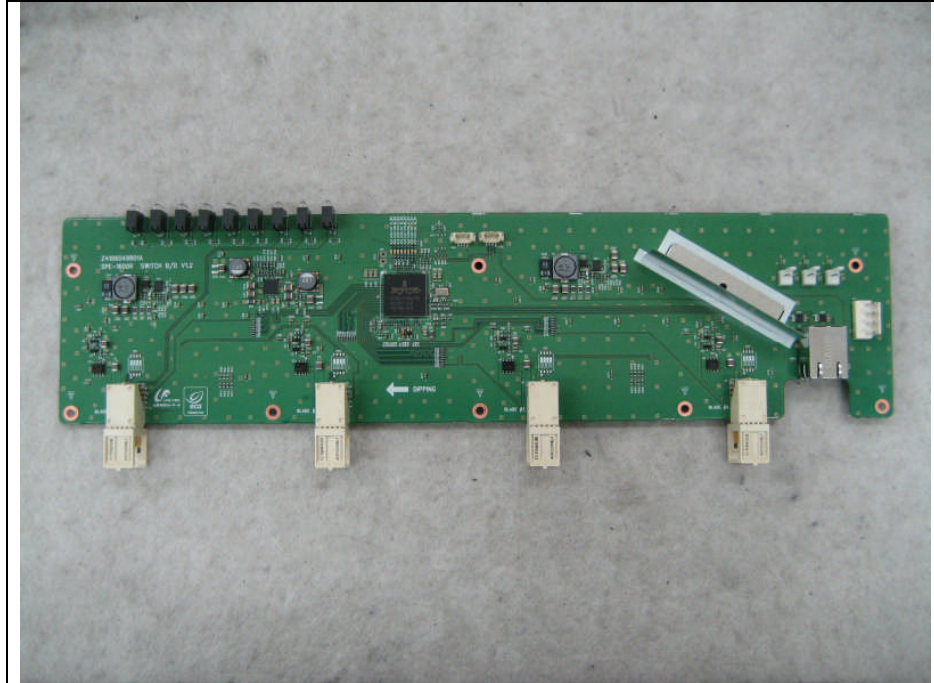
FCC Label Location

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

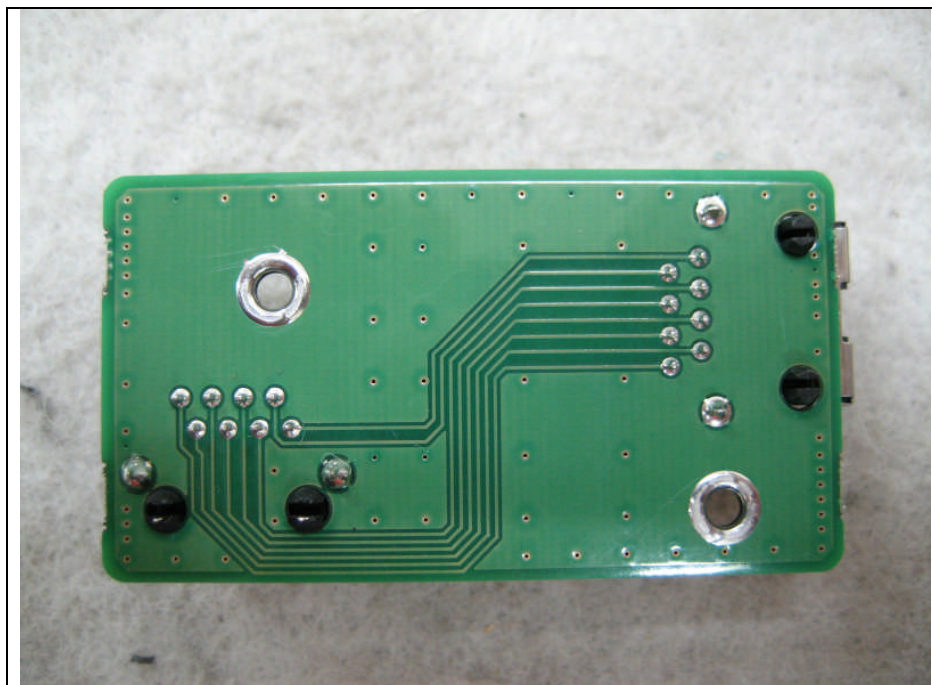
Inside



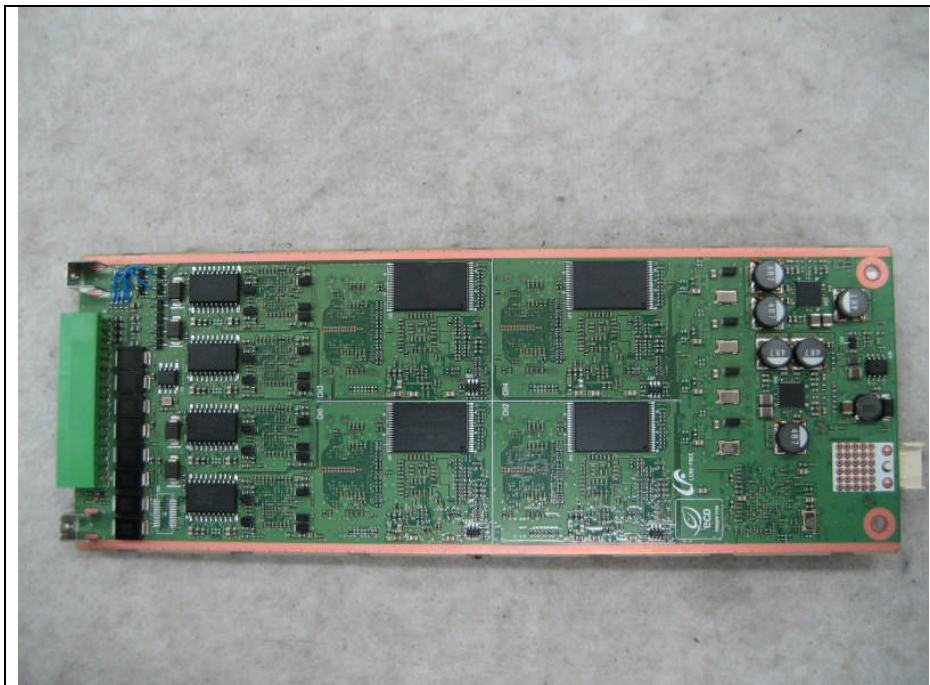
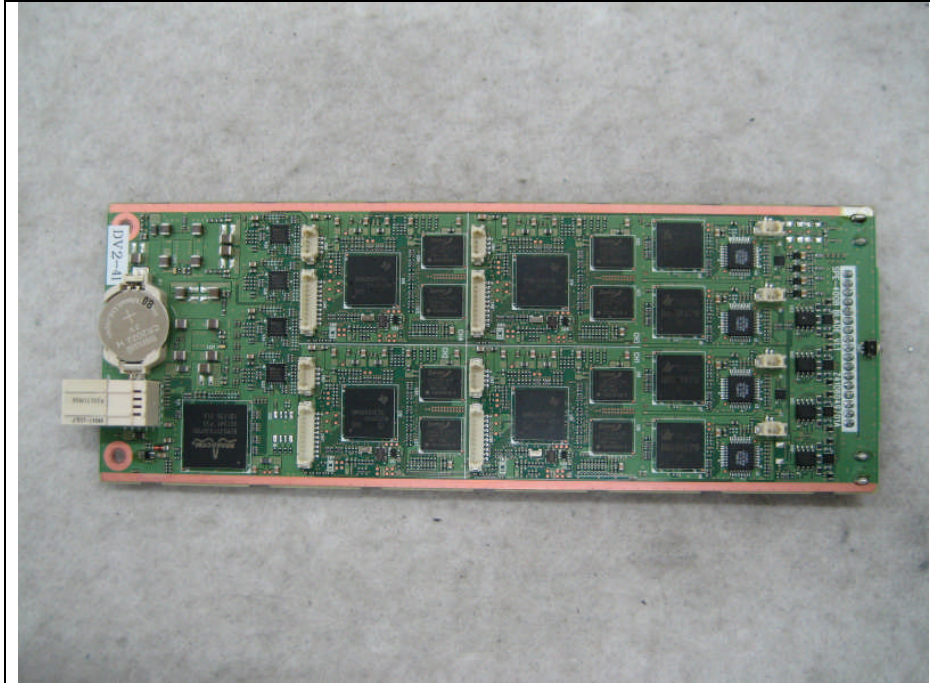
Switch Board



RJ-45 Board



BLADE Board(4EA)



Power Board

