

CERTIFICATE of EMC Compliance

Report No: EMC-FCC-1314
Type of equipment: NETWORK VIDEO DECODER
Model Name: SPD-400N
Applicant: SAMSUNG TECHWIN CO., LTD.
Address: #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 : 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-1314
Type of Equipment: NETWORK VIDEO DECODER
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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.

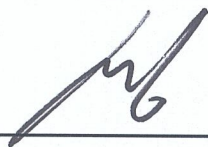
These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

Date of receipt: 2011. 06. 08

Date of testing: 2011. 06. 15 ~ 06. 15

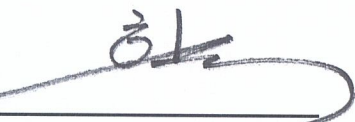
Issued date: 2011. 06. 23

Tested by:



KIM, IN-HO

Approved by:



YEOM, HAN-SEOK

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1. Applicant information

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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 Park
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2. Laboratory information

Address

EMC compliance Ltd.

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

Telephone Number: 82 31 336 9919

Facsimile Number: 82 31 336 4767

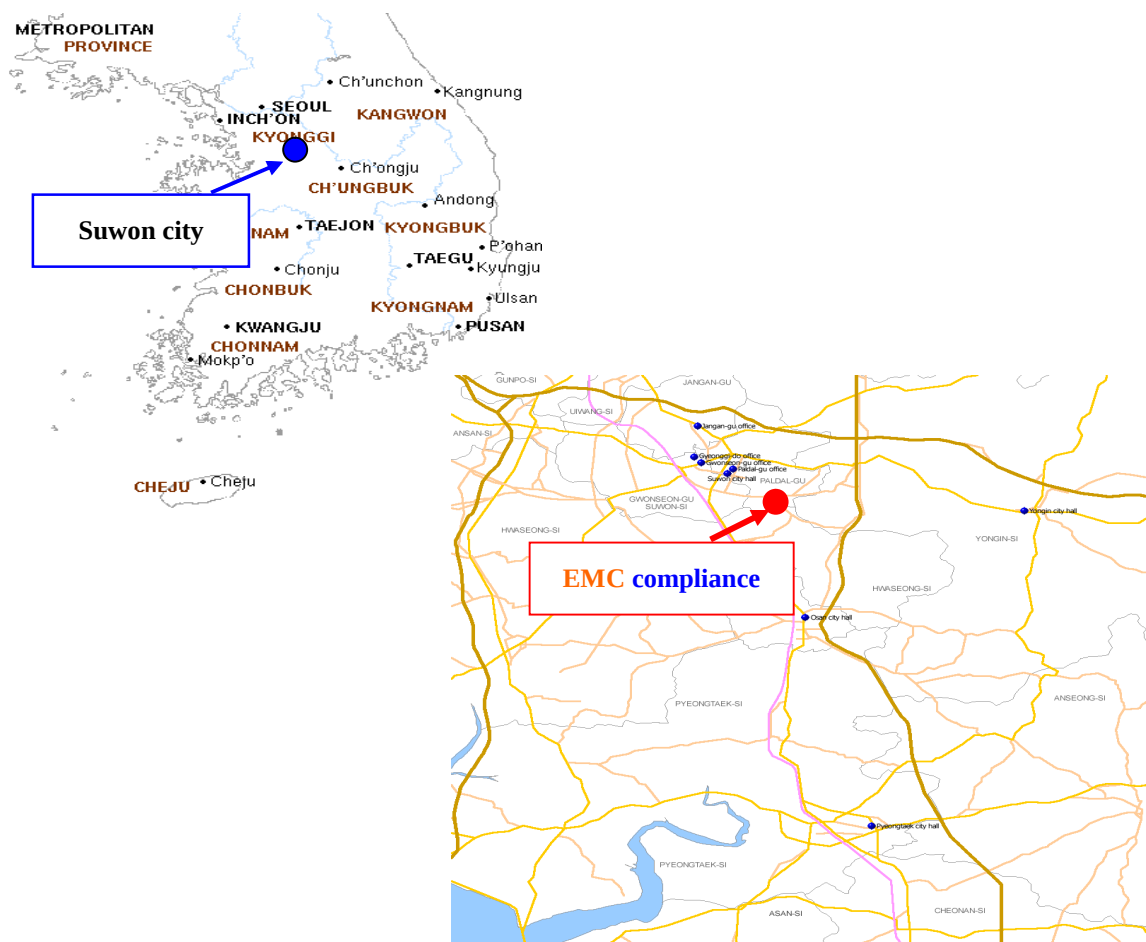
FCC CAB.: KR0040

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	40 % R.H.	-
Shielded room(CE)	: 25 °C	38 % 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

	SPD-400N	SPD-400P
Operational		
Video Out	1) HDMI / VGA : Max 1920x1080p (HDMI, VGA 동일 해상도 출력) 1920x1080p, 1680x1050, 1600x900, 1440x900, 1280x1024, 1280x720p, 1024 x 768	
	2) CVBS : 1.0 Vp-p / 75Ω composite 704x480	2) CVBS : 1.0 Vp-p / 75Ω composite 704x576
	3) HDMI/VGA, CVBS selectable	
Event Trigger	Alarm Input, IP Camera event Input	
Alarm I/O	Input 1ea / Output 2ea (Relay)	
Remote Control Interface	-	
Network		
Ethernet	RJ-45 (10/100/1000 BASE-T)	
Video Compression Format	H.264, MPEG-4, MJPEG	
Resolution	1) H.264 - Single View : 1920x1080(2M pixel) ~ 320x240 - Quad View : 720p ~ 320x240 (800x600 제1회) 2) MPEG-4 : - Single View : 4CIF ~ 320x240 - Quad View : 4CIF ~ 320x240 3) MJPEG : - Single View : 720p ~ 320x240 (800x600 제1회) - Quad View : 720p ~ 320x240 (800x600 제1회) 1920x1080p, 1280x1024, 1280x720p, 704x576, 704x480, 640x480, 352x288, 352x240, 320x240	
Max. Framerate	Max 30fps at single view, Max 120fps at 4x(640x480), Max 100fps at 4X4CIF, Max 60fps at 4x720p (Audio Disable 조건)	
Display	Single View, Quad View	
Audio I/O	Line out 1ea	
Audio Compression Format	G.711	
IP	IPv4, IPv6	
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), NTP, HTTP, DHCP, ICMP, IGMP, ARP, SSL, DNS	
Security	HTTPS(SSL) Login Authentication User access Log	
Camera Registration	32 camera, 8 layout, 10 sequence	
USB	-	
ONVIF Conformance	No	

Support Device	Samsung : SNB-1000, SND-1010, SNV-3120, SNP-3430H, SNP-3120, 3120V, 3120VH, SNB-5000, SNB-7000(2M 이하 profile만 지원), SND-5080/F, SNV-5080, SNV-5010, SPE-100, 400, SPE-1600R/400B	
	Axis : P3301, P3343, P3344, P1311, P1343, P1344, P1346 PTZ215, Q6032, Q7401, Q7404 (F/W ver : 5.x)	
	1) Stream(Live Video/Audio) : SVNP1.2 , (RTP/RTSP : AXIS) 2) Control/Network alarm : CGI	
Web Viewer	Supported OS : Windows XP, Vista, 7 Supported Browser : MS IE 7.x, 8.x, FireFox 2.x, 3.x, Google Chrome, Safari	
Central Management Software	-	
Environmental		
Operating Temperature / Humidity	+0°C ~ +40°C (+32°F ~ +104°F) / 0% ~ 90% RH	
Ingress Protection	-	
Electrical		
Input Voltage / Current	12V DC	
Power Consumption	TBD	
Mechanical		
Color / Material	Silver / Metal	
Dimension (WxHxD)	W178 x H34 x D128mm (7.00" x 1.34" x 5.04")	
Weight	TBD	

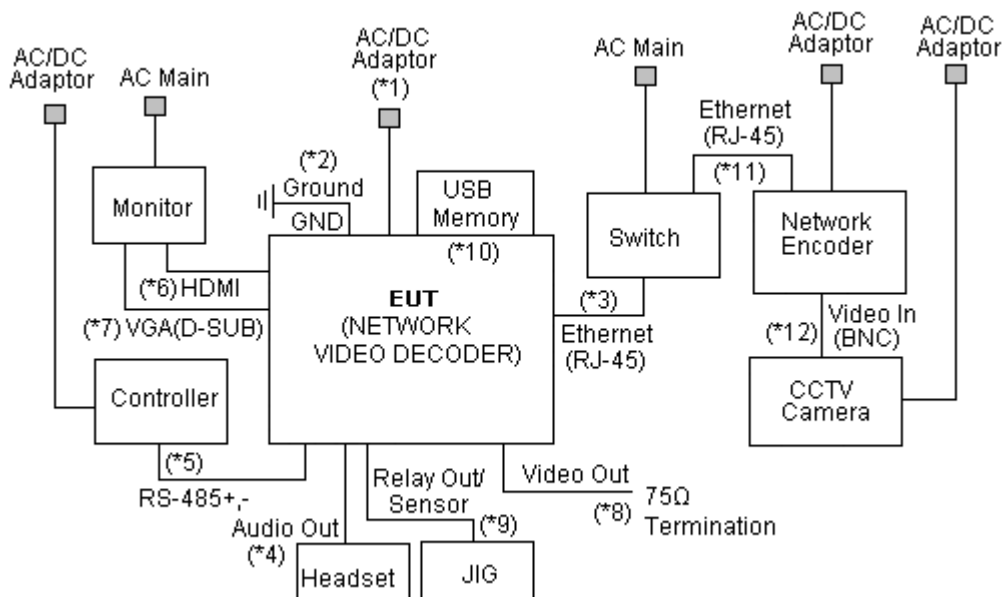
4.2 Product description

Type of product	NETWORK VIDEO DECODER
Model name (Basic)	SPD-400N
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, 1.5 A
Internal clock frequency	729 MHz
Note	* AC/DC adaptor was provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Network Encoder	SPE-100	-	Samsung Techwin
CCTV Camera	CNB-D1705P	-	CNB
Switch	3CGSU05A	-	3COM
Controller	SCC-1000	C28667WZ107714Y	SAMSUNG
JIG	-	-	-
Monitor	PU24WS	NE21HMCZ402094D	LG
Headset	ES-304	-	inkel
USB Memory(8GB)	-	-	Transcend

4.4 Test configuration



Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (NETWORK VIDEO DECODER)	Power	AC/DC Adaptor	Power	1.5	Non-Shield	-
2		GND	Ground	GND	1.3	Non-Shield	-
3		Ethernet(RJ-45)	Switch	RJ-45	3.0	Non-Shield	-
4		Audio Out	Headset	Audio In	2.0	Non-Shield	-
5		RS-485+,-	Controller	RS-485+,-	3.0	Non-Shield	-
6		HDMI	Monitor	HDMI	1.6	Shield	-
7		VGA(D-SUB)	Monitor	VGA(D-SUB)	1.8	Shield	Out-door
8		Video Out	75Ω Termination	Video In	1.0	Shield	Out-door
9		Relay Out/Sensor	JIG	Relay In/Sensor	3.0	Non-Shield	-
10		USB	USB Memory	USB	Direct	-	Out-door
11	Network Encoder	Ethernet(RJ-45)	Switch	RJ-45	3.0	Non-Shield	
12		Video In(BNC)	CCTV Camera	Video Out(BNC)	1.0	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	Monitoring mode.
	RS-485 operating mode.
	Relay/Sensor operating 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. 06. 15		
Testing voltage	120 V, 60 Hz		
Test facility	Shielded room (CE#1)		
Temperature(°C)	25 °C	Humidity (% R.H.)	38 % R.H.
Remarks	Complied Minimum limit margin is 30.88 dB at 0.246 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	12.06.14	☒
LISN	ESH3-Z5	100267	R&S	11.07.05	☒
LISN	L2-16A	0000J10705	PMM	-	☒

6.1.4 Photographs of test setup



6.1.5 Conducted emission measurement result

Frequency [MHz]	Correction Factor		Line	Quasi-peak			Average		
				Limit	Reading	Result	Limit	Reading	Result
	LISN	Cable		[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]
0.183	0.07	0.01	N	79.00	43.82	43.90	66.00	31.45	31.53
0.246	0.07	0.01	N		40.90	40.98		35.04	35.12
0.306	0.07	0.01	N		36.50	36.58		28.23	28.31
0.366	0.07	0.01	N		32.33	32.41		27.30	27.38
0.369	0.08	0.01	H		29.82	29.91		25.04	25.13
13.970	0.36	0.18	N	73.00	18.96	19.50	60.00	13.38	13.92
16.770	0.55	0.21	H		17.95	18.71		10.39	11.15
17.710	0.52	0.21	N		17.35	18.08		11.08	11.81
21.790	0.93	0.24	H		22.43	23.60		16.49	17.66
21.920	0.76	0.24	N		23.19	24.19		16.31	17.31
26.610	1.29	0.27	H		23.29	24.85		17.90	19.46

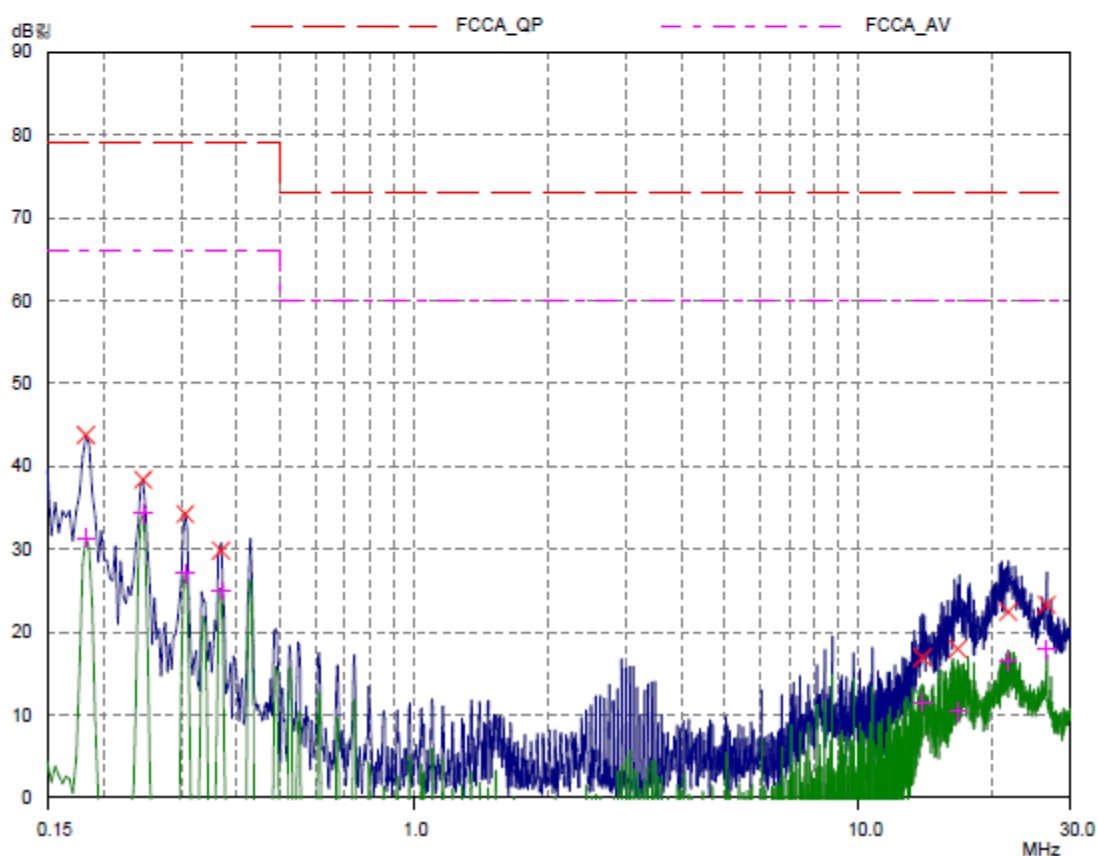
EUT: SPD-400N
Manuf:
Op Cond: H
Operator:
Test Spec: FCC Class A Conducted Emission
Comment:

Result File: h_fcc.dat : New Measurement

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

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



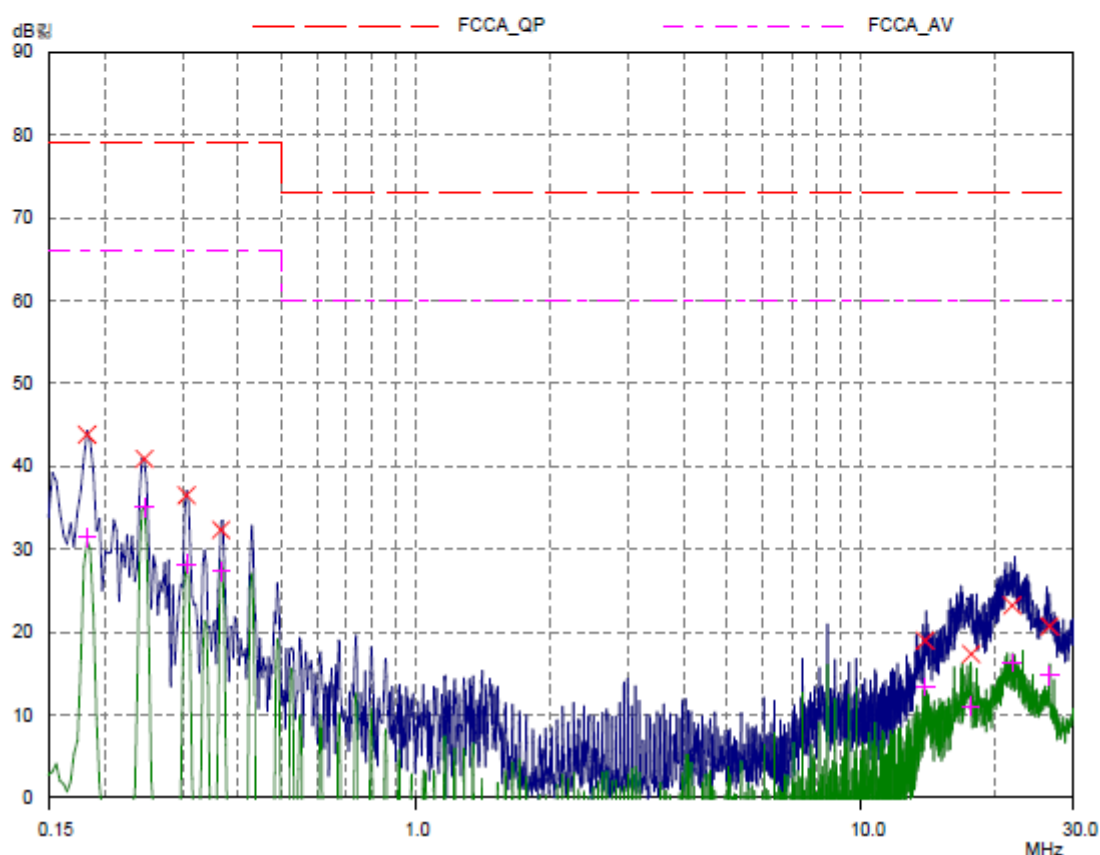
EUT: SPD-400N
Manuf:
Op Cond: N
Operator:
Test Spec: FCC Class A Conducted Emission
Comment:

Result File: n_fcc.dat : New Measurement

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

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. 06. 15		
Testing voltage	120 V, 60 Hz		
Test facility	10 m Chamber (Test distance: 10 m, 3 m)		
Temperature (°C)	26 °C	Humidity (% R.H.)	40 % R.H.
Remarks	Complied Minimum limit margin is 7.4 dB at 875.480 MHz. (30 MHz ~ 1 GHz) Minimum limit margin is 20.7 dB at 1707.154 MHz. (1 GHz ~ 5 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

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100710	R&S	11.12.01	☒
Bi-Log Antenna	VULB 9160	3228	SCHWARZBECK	12.09.13	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	11.12.01	☒
3 dB Attenuator	8491A	27444	HP	11.11.30	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A01802	AGILENT	12.05.11	☒
Horn ANT	3115	00086706	ETS	11.12.22	☒
Spectrum Analyzer	FSP7	100289	R&S	11.12.17	☒

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

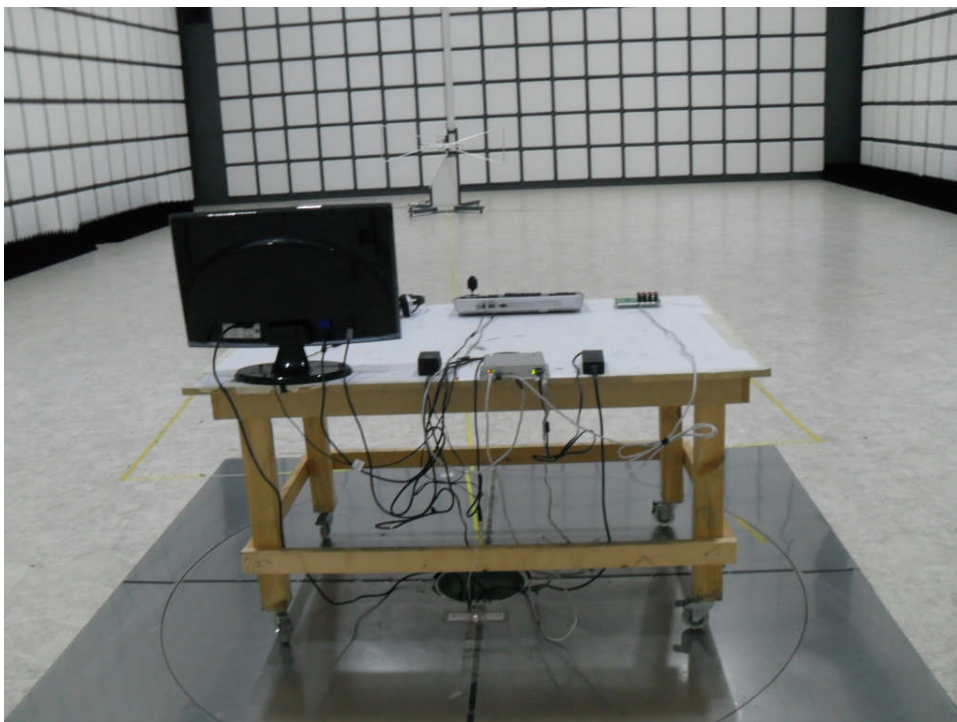
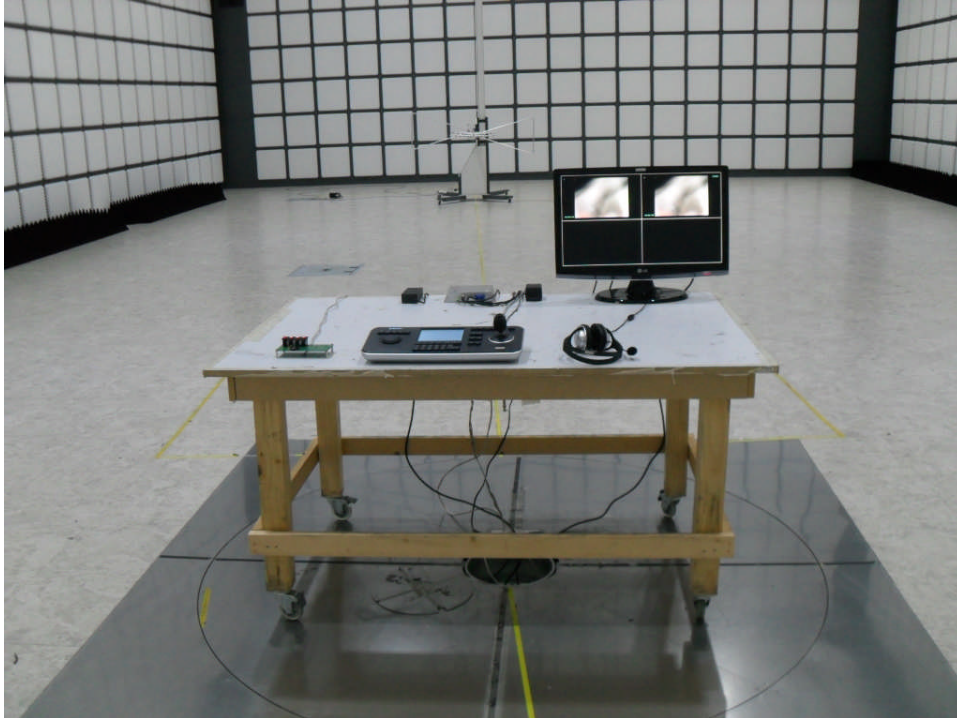
3 dB Att = 3 dB Attenuator

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

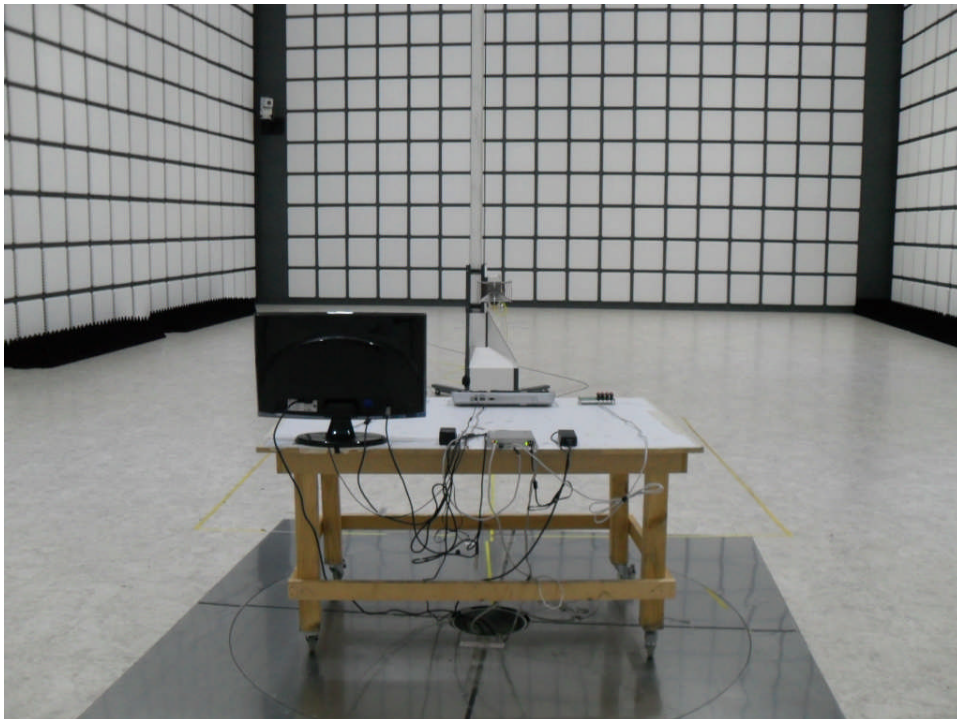
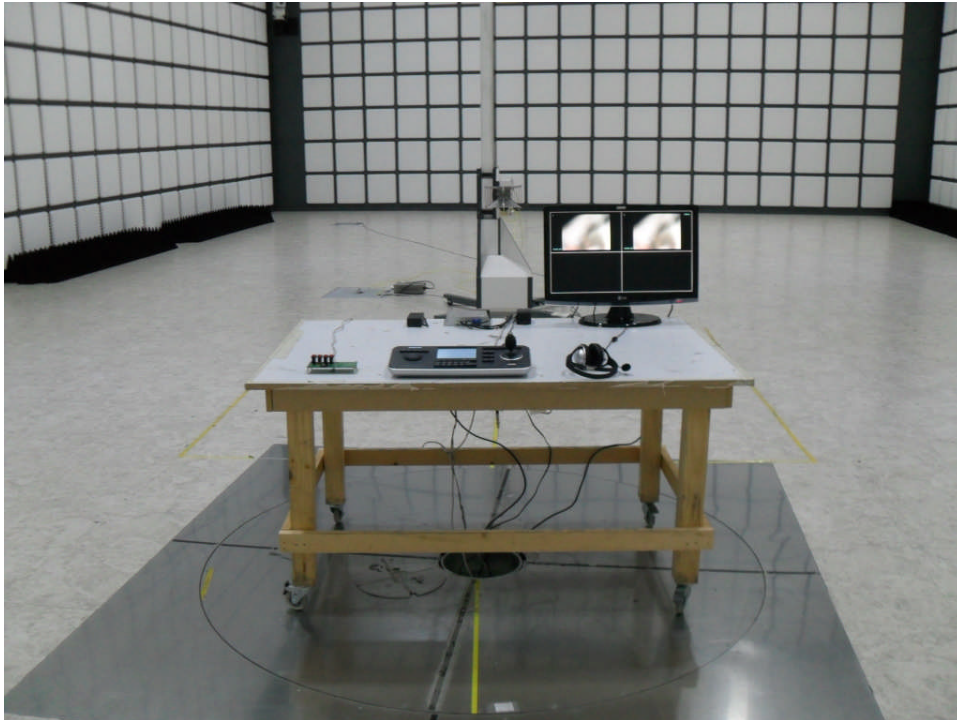
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.2.5 Photographs of test setup

* 30 MHz ~ 1 GHz



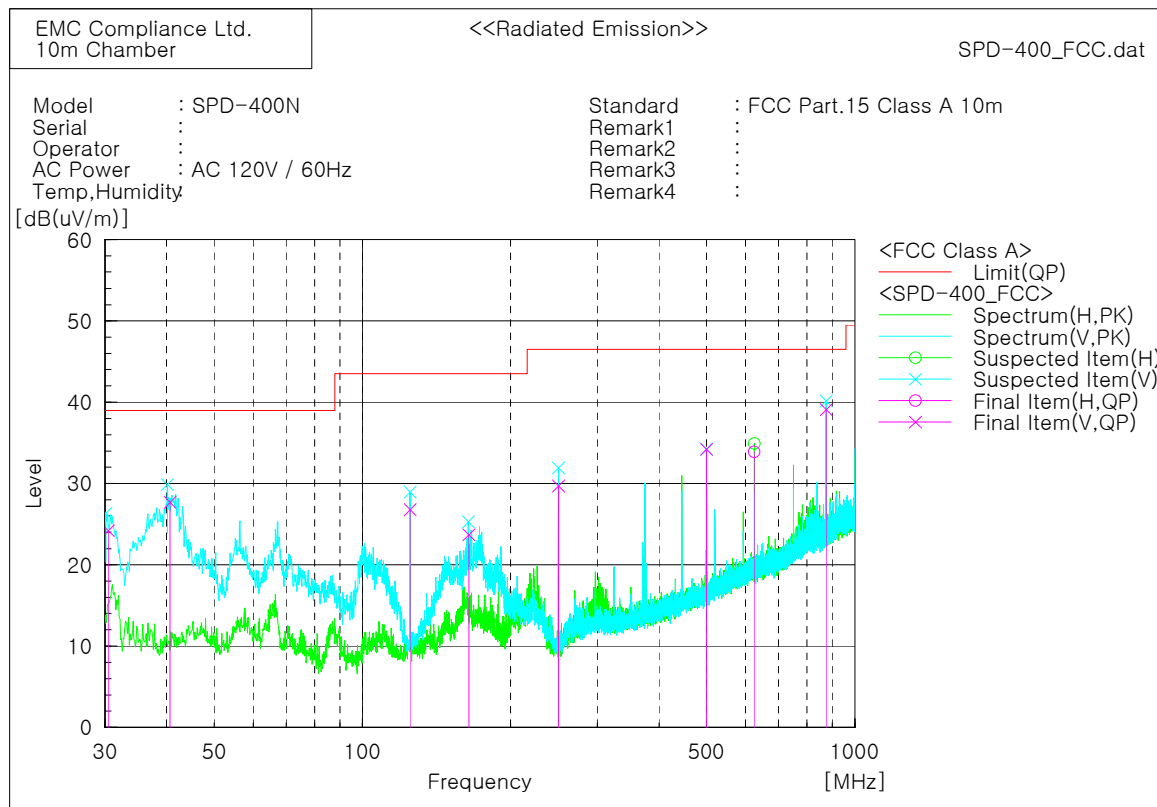
* 1 GHz ~ 5 GHz



6.2.6 Radiated emission measurement result

* Graph and Data

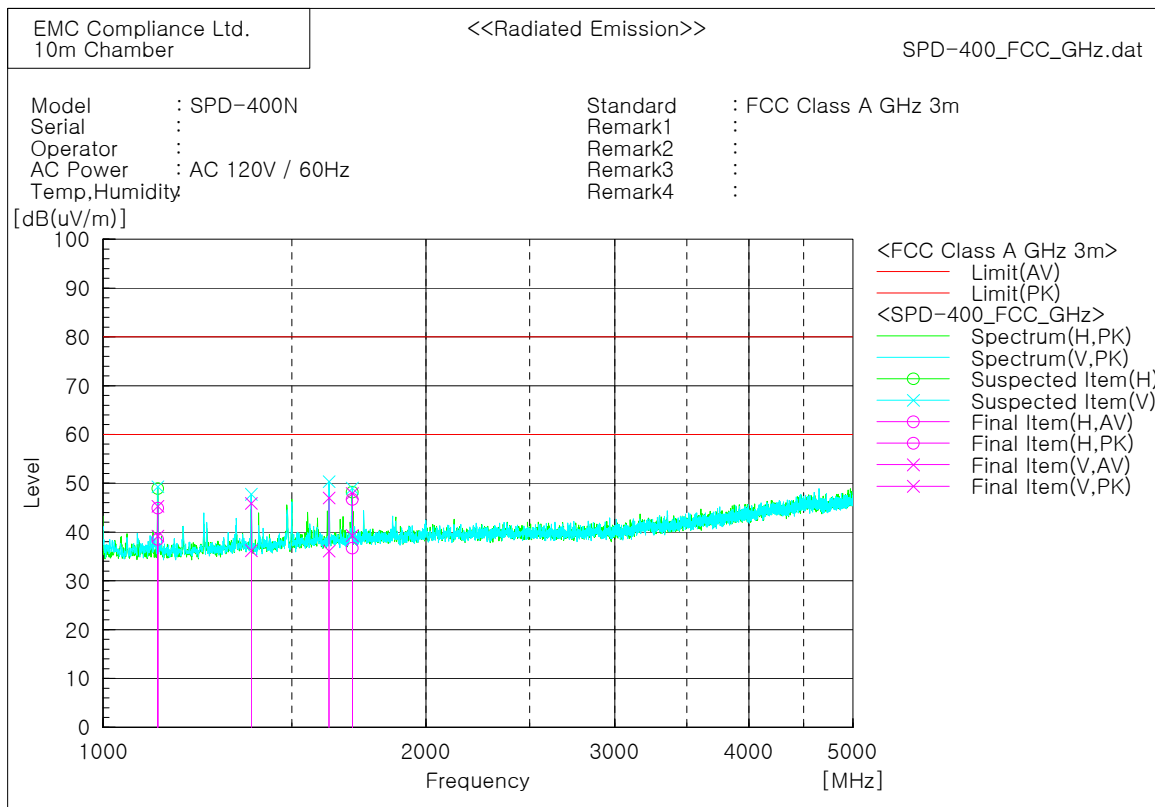
* 30 MHz ~ 1 GHz



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	30.485	V	42.1	-17.9	24.2	39.0	14.8	100.0	142.1
2	40.690	V	44.6	-16.9	27.7	39.0	11.3	400.0	280.3
3	125.010	V	43.2	-16.4	26.8	43.5	16.7	190.0	67.8
4	164.472	V	38.5	-14.8	23.7	43.5	19.8	190.0	155.7
5	250.000	V	45.6	-15.9	29.7	46.5	16.8	100.0	56.8
6	500.045	V	43.2	-9.0	34.2	46.5	12.3	100.0	134.6
7	624.548	H	40.2	-6.3	33.9	46.5	12.6	208.0	202.8
8	875.480	V	41.0	-1.9	39.1	46.5	7.4	291.0	0.1

* 1 GHz ~ 5 GHz



Final Result

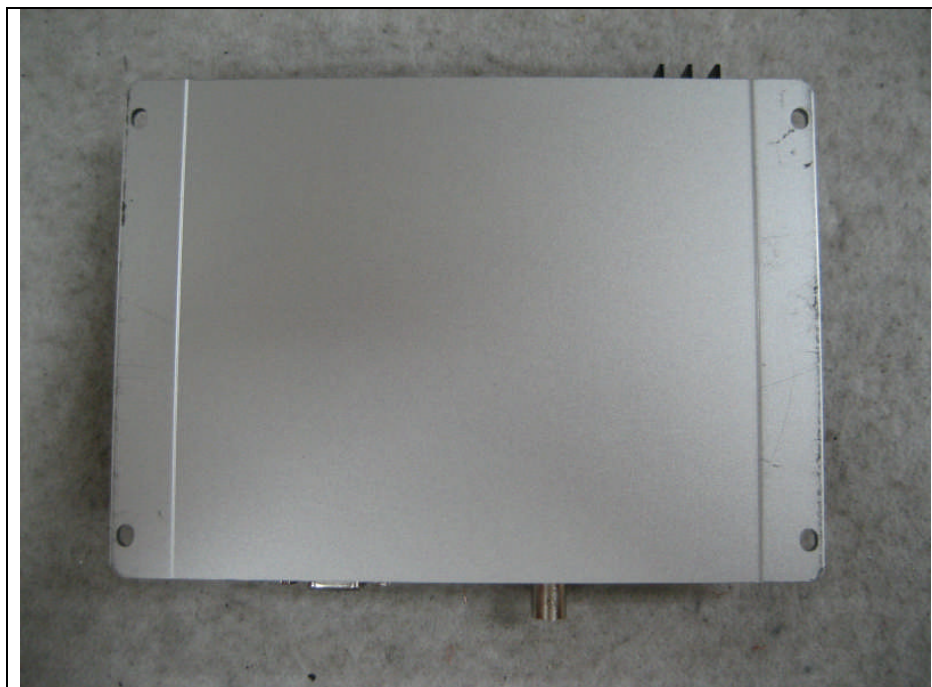
No.	Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	c.f [dB(1/m)]	Result AV [dB(uV/m)]	Result PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1124.944	V	51.2	57.3	-12.0	39.2	45.3	60.0	80.0	20.8	34.7	199.0	50.9
2	1124.944	H	50.5	56.9	-12.0	38.5	44.9	60.0	80.0	21.5	35.1	100.0	311.8
3	1374.898	V	46.1	55.8	-9.9	36.2	45.9	60.0	80.0	23.8	34.1	100.0	317.4
4	1624.756	V	44.1	55.0	-8.0	36.1	47.0	60.0	80.0	23.9	33.0	100.0	142.1
5	1707.154	V	46.8	55.4	-7.5	39.3	47.9	60.0	80.0	20.7	32.1	100.0	124.5
6	1707.154	H	44.2	54.2	-7.5	36.7	46.7	60.0	80.0	23.3	33.3	100.0	223.9

7. E.U.T. photographs

Front View



Rear View



Left View



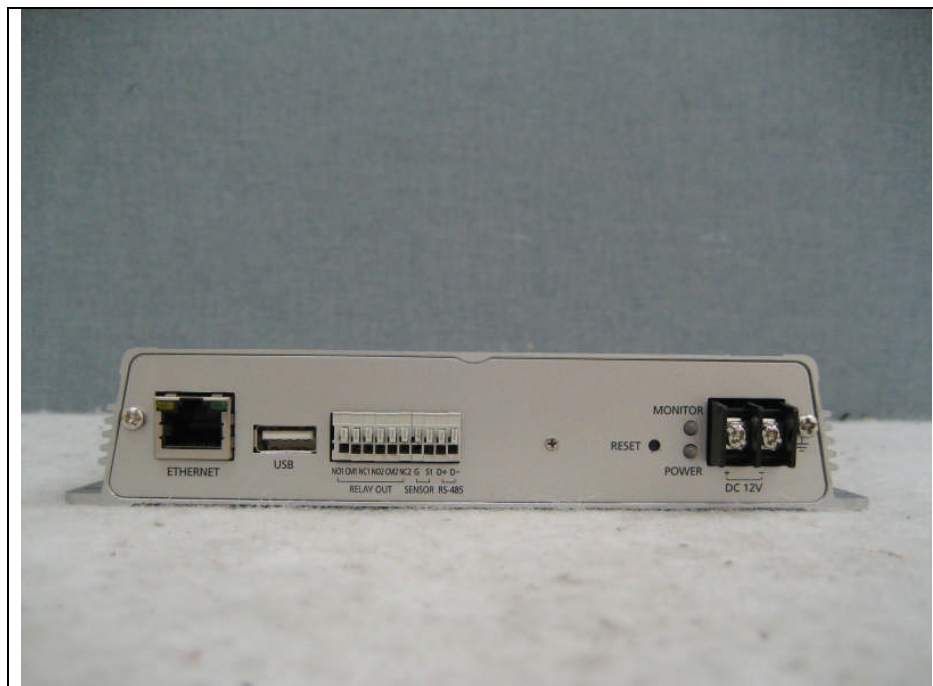
Right View



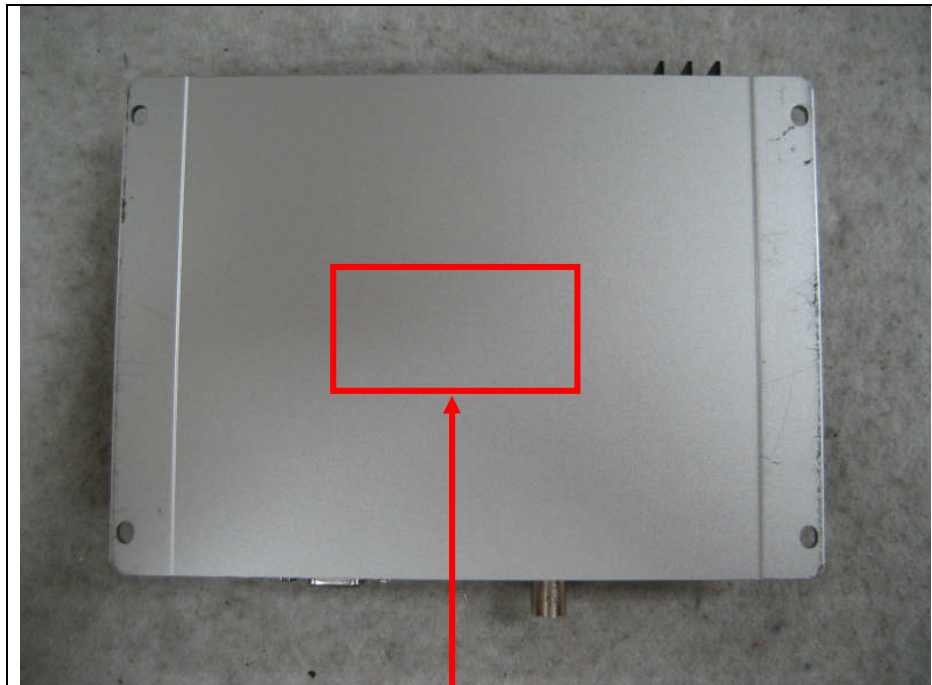
Top View



Bottom View



Label



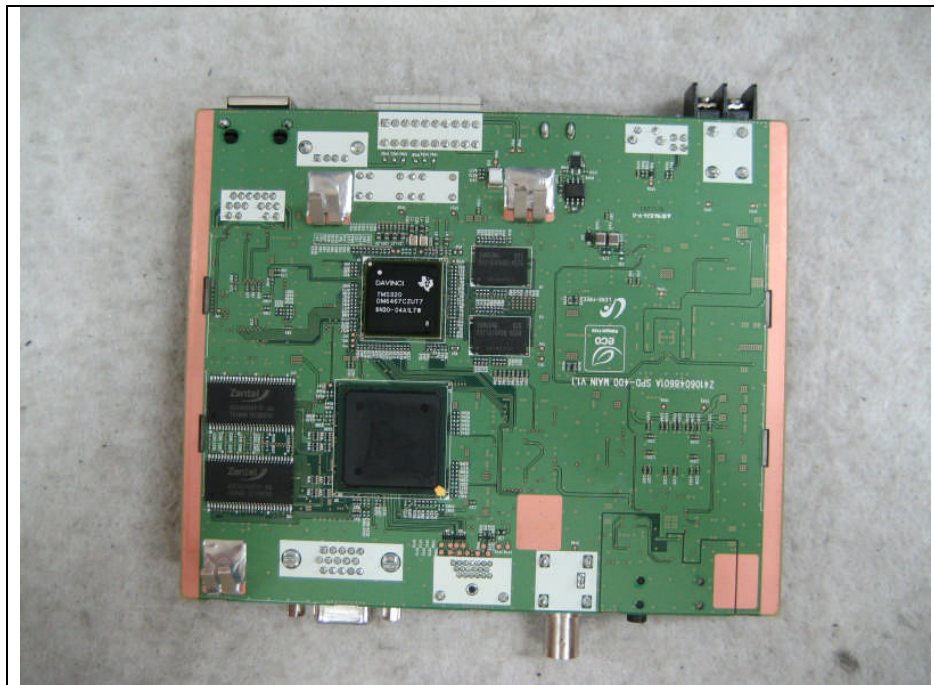
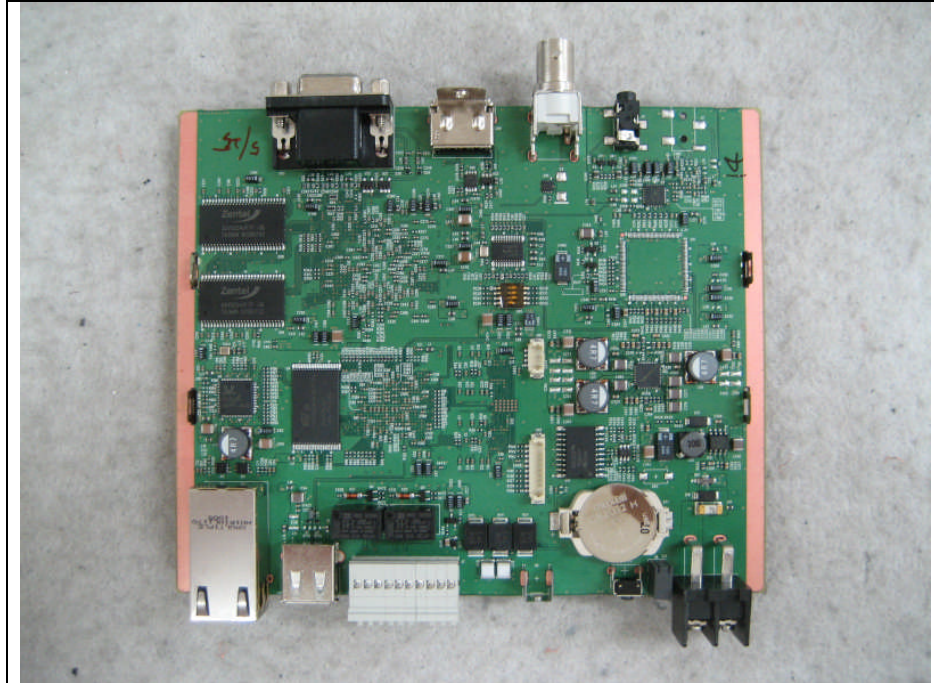
FCC Label Location

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



Main Board



Adaptor

