

EMC TEST REPORT

Test report No : EMC-VCCI-0309
Type of Equipment : Digital Video Recorder
Model Name : SRD-1680DN
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 : VCCI V-3 / 2012.04, 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: 2013. 07. 03

Date of testing: 2013. 07. 22

Issued date: 2013. 07. 30

Tested by:



HWANG, SUN-BIN

Approved by:



YEOM, HAN-SEOK

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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.

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

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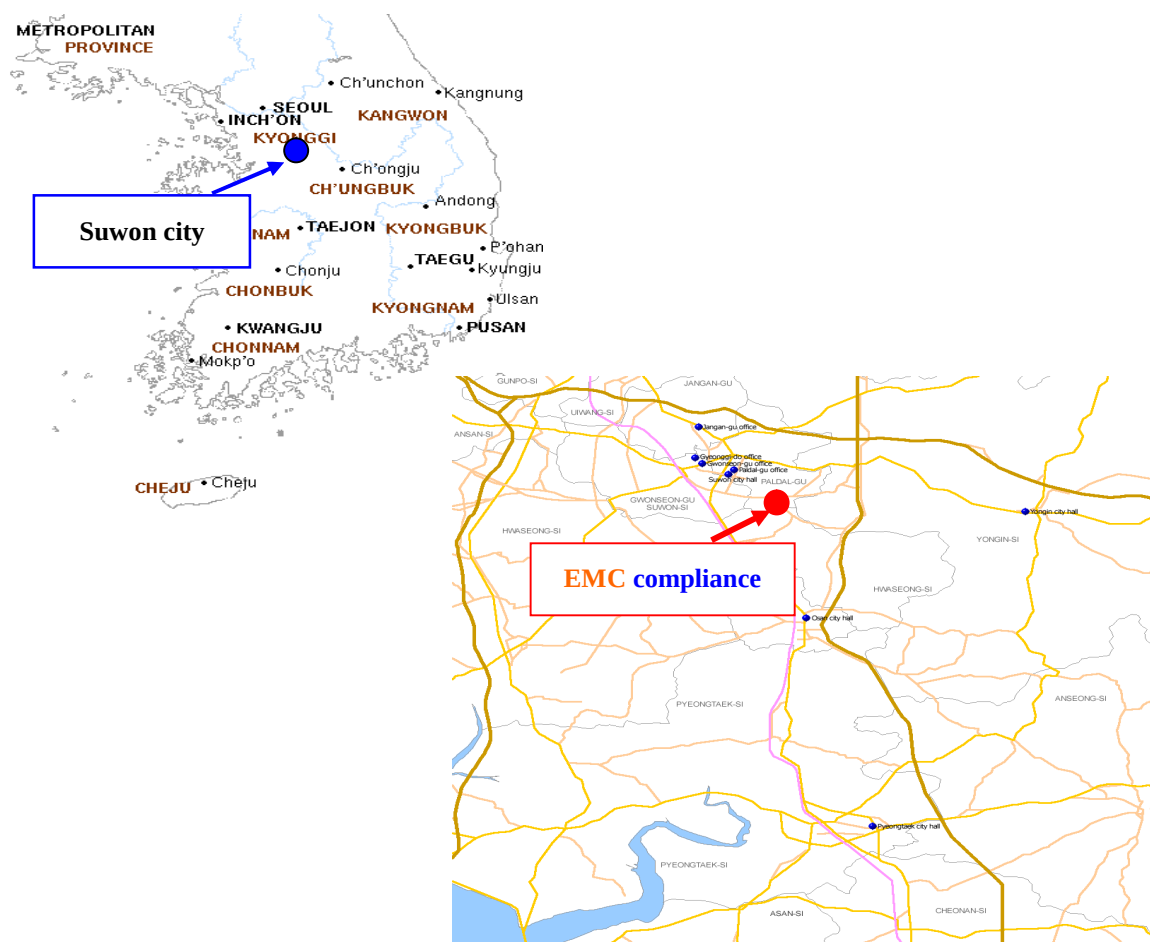
FCC CAB.: KR0040

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	56 % R.H.	-
Shielded room(CE)	: 26 °C	55 % 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: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#2)	9 kHz ~ 150 kHz: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#3)	9 kHz ~ 150 kHz: ± 4.00 dB 150 kHz ~ 30 MHz: ± 3.63 dB	
Radiated Emission measurement (C.L: Approx 95 %, k = 2)		
10 m Chamber (#F4)	30 MHz ~ 300 MHz	3 m: + 4.56 dB, - 4.58 dB 10 m: + 4.56 dB, - 4.56 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.84 dB, - 4.85 dB 10 m: + 4.71 dB, - 4.72 dB
	1 GHz ~ 6 GHz	3 m: + 6.19 dB, - 6.20 dB
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 dB
10 m Chamber (#F2)	30 MHz ~ 300 MHz	3 m: + 4.86 dB, - 4.88 dB 10 m: + 4.86 dB, - 4.86 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.98 dB, - 4.99 dB 10 m: + 4.85 dB, - 4.87 dB
	1 GHz ~ 6 GHz	3 m: + 6.19 dB, - 6.20 dB
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 dB

4. Description of E.U.T.

4.1 General information

Model		SRD-1680D
		16CH
Platform	CPU	Hisilicon(1EA Hi3531 + 2EA Hi3532)
	Codec	
Design		New
Operation System		Embedded LINUX
Video Format		HD 1080P/720P/4CIF
Operation Model		Live/REC/PB/NW
Video In	Channel	16CH(M CH HD + N CH SD) 0 ≤ M ≤ 8 N = 16 - M
	Connector Type	BNC 24 (SD&HD)
	Loop Through	X
Video Out	Composite	X
	S-Video	X
	VGA	MAX 1080P(60Hz)
	HDMI	MAX 1080P(60Hz)
Simultaneous Out		VGA and HDMI
Spot Out	Number	2
	Split Mode	SPOT1 : 1/4/9/16 SPOT2 : 1
	OSG	O
Audio In	Channel	16
	Connector Type	4CH RCA ,12CH D-sub
Audio Out	Channel	1
	Connector Type	RCA
Compression	Video	H.264
	Audio	G.711
	Codec Type	H/W
	Dual Codec	O
Multi Stream		O
Live	Resolution	1080P/720P/960H
	Frame Rate	240fps/240fps
	Split Mode	1/4/7/9/13/16/PIP
Recording	Resolution & Frame Rate	HD : 1080p (240fps) [720p (240fps)] SD : 960H (240fps)
	Quality Level	8Level(LV1~LV8)
	REC Mode	1.Normal REC 2.Schedule REC 3.Event REC - Motion/Alarm/Video Loss 4.Pre REC - Off/5/10/20/30sec 5.Post REC - 5/10/20/30sec - 1/2/3/5/60min 6.Time Laps REC - 1,2,3,..., 29,30 fps
		1.各Channel 可以分别设定
		- Resolution - Frame Rate

PLAY BACK	Resolution & Frame Rate	HD : 1080p (60fps) or SD : 960H (240fps)
	Search Mode	1.Time Search - Date/Time - Go to First/Go to Last - Calendar - Time Bar 2.Event Search - Motion/Alarm/Video Loss 3.Backup Search - USB Memory - USB External HDD
	Tric Mode	1.Play/Pause/Stop 2.Fast Forward/Backward - x2/x4/x8/x16/x32/x64 3.Slow Forward/Backward - x1/2, x1/4, x1/8 4.Step Play - Forward : I+P frame - Backward : I frame
Storage	Internal	1.Max Capacity : 2TB 2.Install HDD : 4EA (中國向8EA) 3.Packing : No HDD (中國向1EA 1T)
	External	1.USB 2.0 I/F 2.E-SATA : 2EA 3.Max Capacity : 2TB
Backup	USB	1.USB 2.0 2.Memory : Max 32G 3.External HDD : Max 1TB
	Format	1.SEC 2.DVR 3.AVI
Remote Viewer	Network	10/100/1000 Mbps Ethernet
	Transmit Speed	MAX 1080p 240fps and 4CIF 480fps and CIF 240fps
	Connection No	10 (Admin 1 + User 9)
	Connection Mode	1.Static IP 2.Dynamic IP 3.ADSL
	Protocol	TCP/IP, DHCP, PPPoE, SMTP, NTP, HTTP, DDNS, RTP, RTSP, UPnP
	Webviewer	IE, Safari, Chrome, Firefox
	Mobile	iPOLIS Mobile
	Smart TV	TBD
	Function	1.Quality 2.Bandwidth - Unlimited/2/1.5/1M - 800/600/500/400/300Kbps - 128Kbps 3.TCP/UDP Port 4.Unicast/Multicast 5.Webviewer Port 6.DDNS - Samsung iPOLIS DDNS - dyndns.com - no-ip.com - changeip.com 7.Mailing Service
PTZ Control	I/F	RS-485
	Protocol	Samsung/Vicon/Panasonic/AD/Philips/ Enna./Pelco D/Pelco P/Vcltp/Diamond/ Kalatel/Samsung Techwin

External Device	POS	O
	ATM	O
Intelligent Video		O
Control	Jog & Shuttle	X
	Mouse	USB I/F
	Remocon	Samsung Remocon
	System Keyboard	O
Camera 제어	I/F	I2C
	Protocol	Not Defiend
In/Out	USB	2
	RS-485	1
	RS-232C	1
	E-SATA	2
	Alarm In	16
	Alarm Out	4
The Other Function		1.Tool Bar 2.Pop Menu 3.S/W Upgrade - USB 4.Live & Network Monitoring without HDD
Electrical	Power Type	100 ~ 240VAC ATX inside
	Power	TBD
	Input Voltage	100 ~ 240VAC
	Operation Condition	Temperature 0~40℃ Humidity 20~85%RH
Mechanical	Dimensions (WxHxD)	TBD
	Net Weight	TBD
	Packing List	1.LAN Cable 2.Power Cord 3.Remocon 4.Mouse(Included Camera) 5.Quick Guide 6.CD(User Manual, Quick Guide, Router Guide) 7.Cushion 8.PE Back

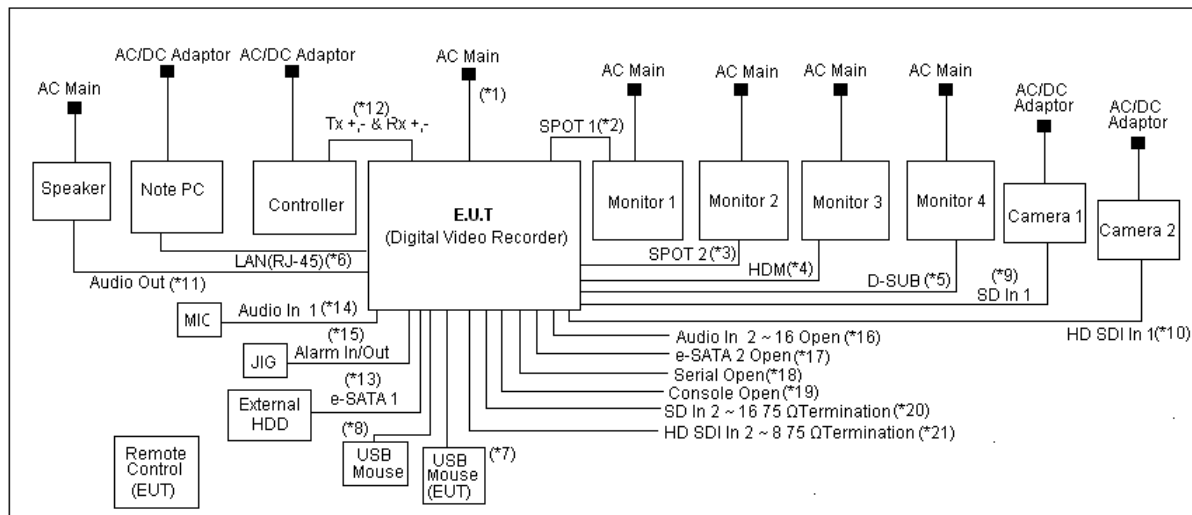
4.2 Product description

Type of product	Digital Video Recorder
Model name (Basic)	SRD-1680DN
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	100 V , 50 Hz
Product rating	AC 100 - 240 V , 50 / 60 Hz
Internal clock frequency	930 MHz
Note	-

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor 1	PM24KO	YER8HVDBA00052A	SAMSUNG
Monitor 2	PM24KO	YER8HVDBA00057E	SAMSUNG
Monitor 3	CF23MS	NC07H1KZ602039A	SAMSUNG
Monitor 4	B1940R	C95K67VD301612V	SAMSUNG
Note PC	PSLQ0K-02N005	3A045920Q	TOSHIBA
USB Mouse	1088	8165906050941	Microsoft
Camera 1	SCB-6000	C6PW6V3B80115Y	SAMSUNG
Camera 2	SCB-6000	C6PW6V3B801103K	SAMSUNG
Speaker	BR-5300 Digital	-	Britz
Controller	SCC-1000	EW089028913	SAMSUNG
External HDD	SP10XG	-	Valueplus
MIC	-	-	-
JIG	-	-	-

4.4 Test configuration



Note	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT (Digital Video Recorder)	Power	AC Main	Power	1.5	Non-Shield
2		SPOT 1	Monitor 1	SPOT 1	1.5	Shield
3		SPOT 2	Monitor 2	SPOT 2	1.5	Shield
4		HDMI	Monitor 3	HDMI	1.7	Shield
5		D-SUB	Monitor 4	D-SUB	1.5	Shield
6		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield
7		USB	USB Mouse (EUT)	USB	1.5	Shield
8		USB	USB Mouse	USB	1.5	Shield
9		SD In 1	Camera 1	SD Out	3.0	Shield
10		HD SDI In 1	Camera 2	HD SDI Out	3.0	Shield
11		Audio Out	Speaker	Audio In	1.5	Shield
12		Tx +,- & Rx +,-	Controller	Tx +,- & Rx +,-	3.0	Non-Shield
13		e-SATA 1	External HDD	e-SATA 1	2.0	Shield
14		Audio In 1	MIC	Audio Out	2.0	Shield
15		Alarm In/Out	JIG	Alarm In/Out	3.0	Non-Shield
16		Audio In 2 ~ 16	Open	-	2.0	Shield
17		e-SATA 2	Open	-	1.5	Shield
18		Serial	Open	-	1.5	Shield
19		Console	Open	-	1.5	Shield
20		SD In 2 ~ 16	75 Ω Termination	-	1.0	Shield
21		HD SDI In 2 ~ 8	75 Ω Termination	-	1.0	Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Web view camera monitoring test.
	Ping test.
	Controller test.
	Audio In/Out, Alarm test. (Used JIG)

5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
☒	Conducted Emission	VCCI V-3 / 2012.04, Class A	Complied
☒	Radiated Emission	VCCI V-3 / 2012.04, Class A	Complied

6. Test results

6.1 Conducted Emission

Test specification	VCCI V-3 / 2012.04, Class A		
Testing voltage	100 V, 50 Hz		
Test facility	Shielded room (CE#1)		
Date	2013. 07. 22		
Temperature (°C)	26 °C	Humidity (% R.H.)	55 % 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

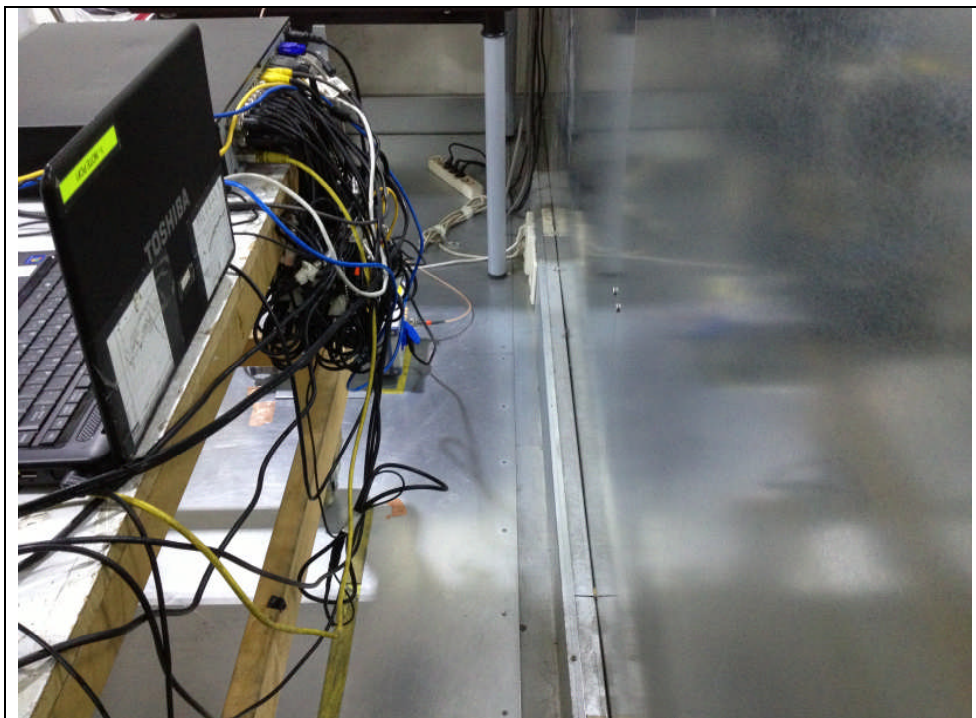
The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground 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

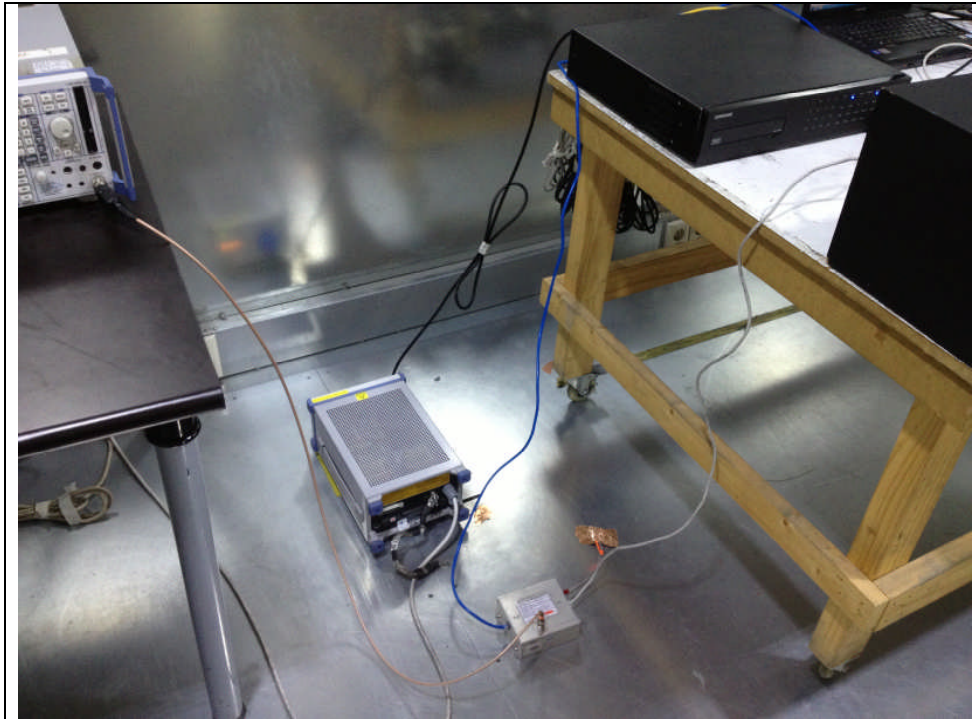
Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESHS30	828765/009	R&S	2013.10.22	☐
Test Receiver	ESCI7	100732	R&S	2014.02.18	☐
Test Receiver	ESCI	100001	R&S	2014.07.25	☒
Test Receiver	ESCI	100710	R&S	2013.11.06	☐
LISN	ENV216	101358	R&S	2013.10.22	☒
LISN	ESH3-Z5	100267	R&S	2014.07.08	☒
8-WIRE ISN	NTFM 8158 CAT5	CAT5-8158-0028	SCHWARZBECK	2014.04.13	☒
8-WIRE ISN	NTFM 8158 CAT3	CAT3-8158-0020	SCHWARZBECK	2014.04.13	☒
ISN	ST08	24342	TESEQ	2014.06.21	☐
ISN	ENY81	101545	R&S	2013.08.29	☒

6.1.4 Photographs of test setup

* AC Main

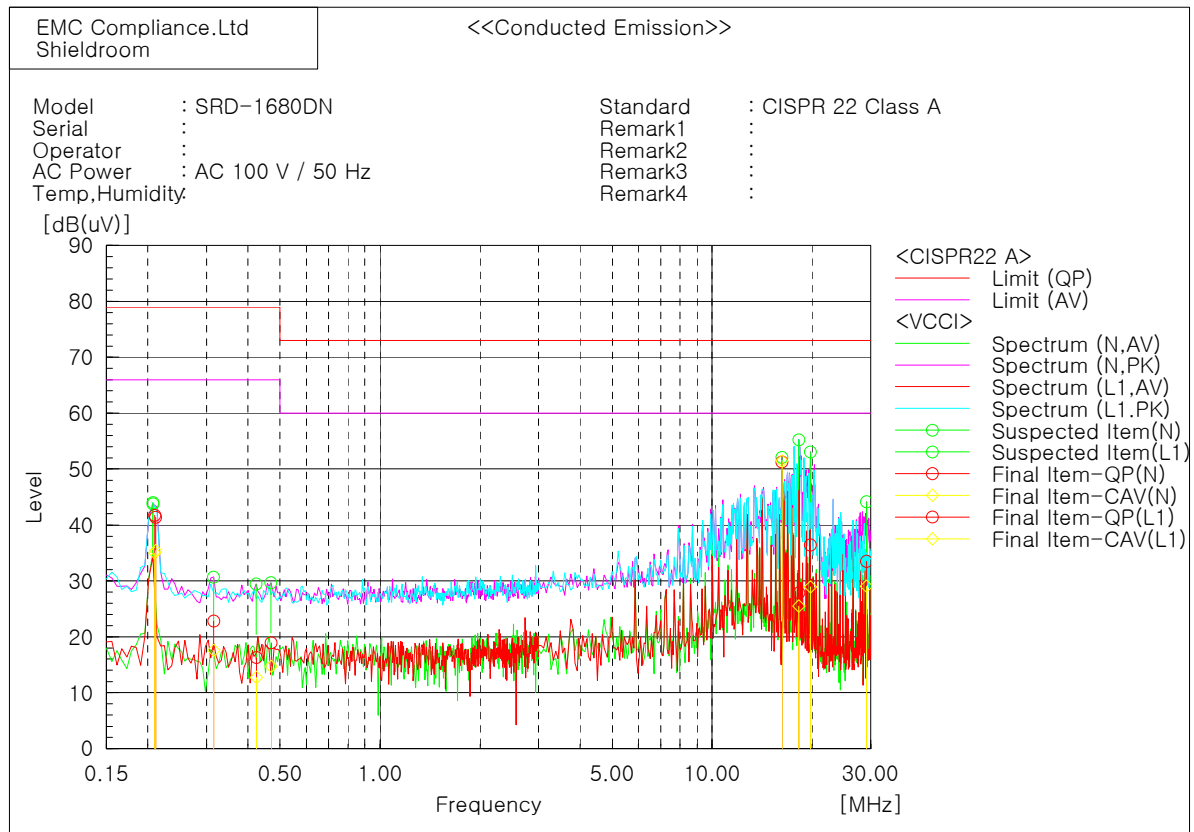


* Telecommunication



6.1.5 Conducted emission measurement result

* AC Main



Final Result

--- N Phase ---

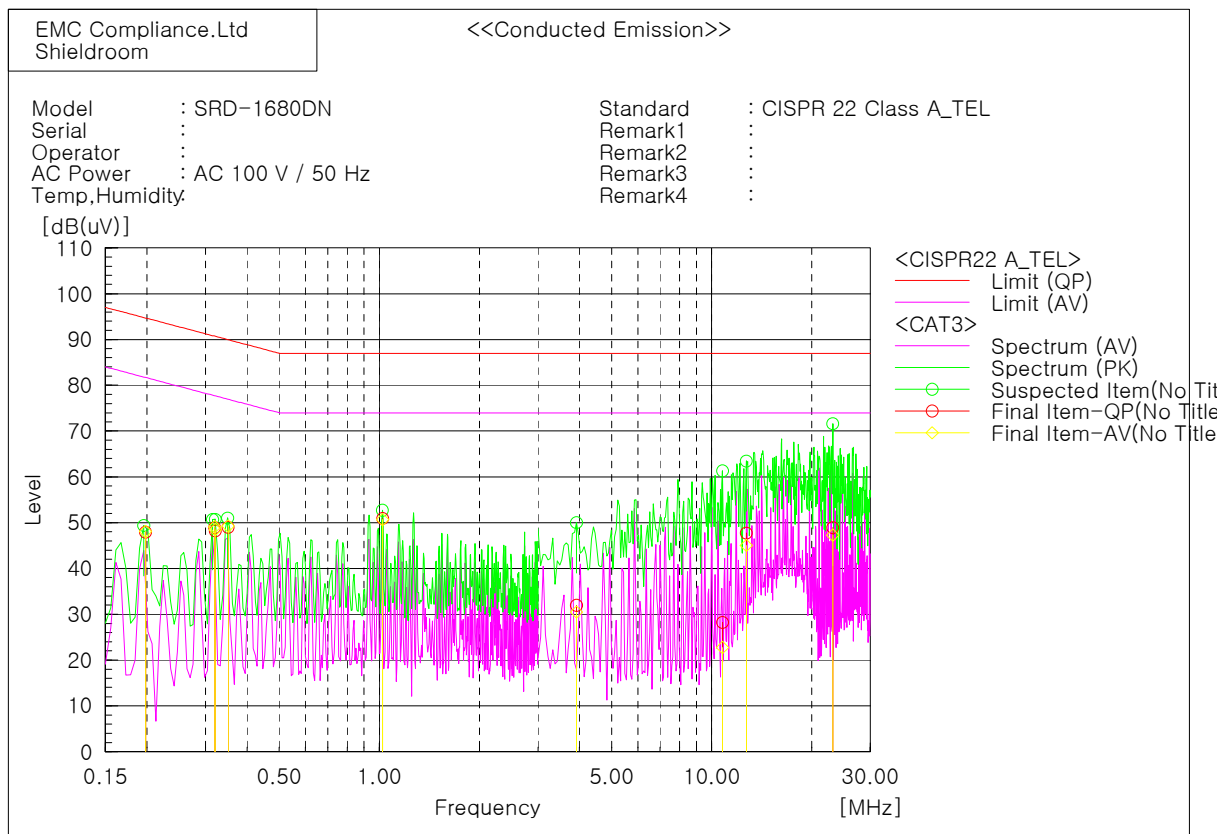
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	[dB]
1	0.20964	31.8	25.1	9.9	41.7	35.0	79.0	66.0	37.3	31.0
2	0.31584	12.8	7.6	10.0	22.8	17.6	79.0	66.0	56.2	48.4
3	0.42448	6.3	2.7	10.0	16.3	12.7	79.0	66.0	62.7	53.3
4	0.4698	8.9	4.7	10.0	18.9	14.7	79.0	66.0	60.1	51.3
5	16.22806	41.5	41.7	9.8	51.3	51.5	73.0	60.0	21.7	8.5
6	19.73988	26.6	19.1	9.8	36.4	28.9	73.0	60.0	36.6	31.1
7	29.1406	23.7	19.3	9.8	33.5	29.1	73.0	60.0	39.5	30.9

--- L1 Phase ---

No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	[dB]
1	0.2107	31.4	25.5	9.9	41.3	35.4	79.0	66.0	37.7	30.6
2	18.23294	18.0	15.7	9.8	27.8	25.5	73.0	60.0	45.2	34.5

* Telecommunication port

* LCL 55 dB (RJ-45 Port)_10Mbps

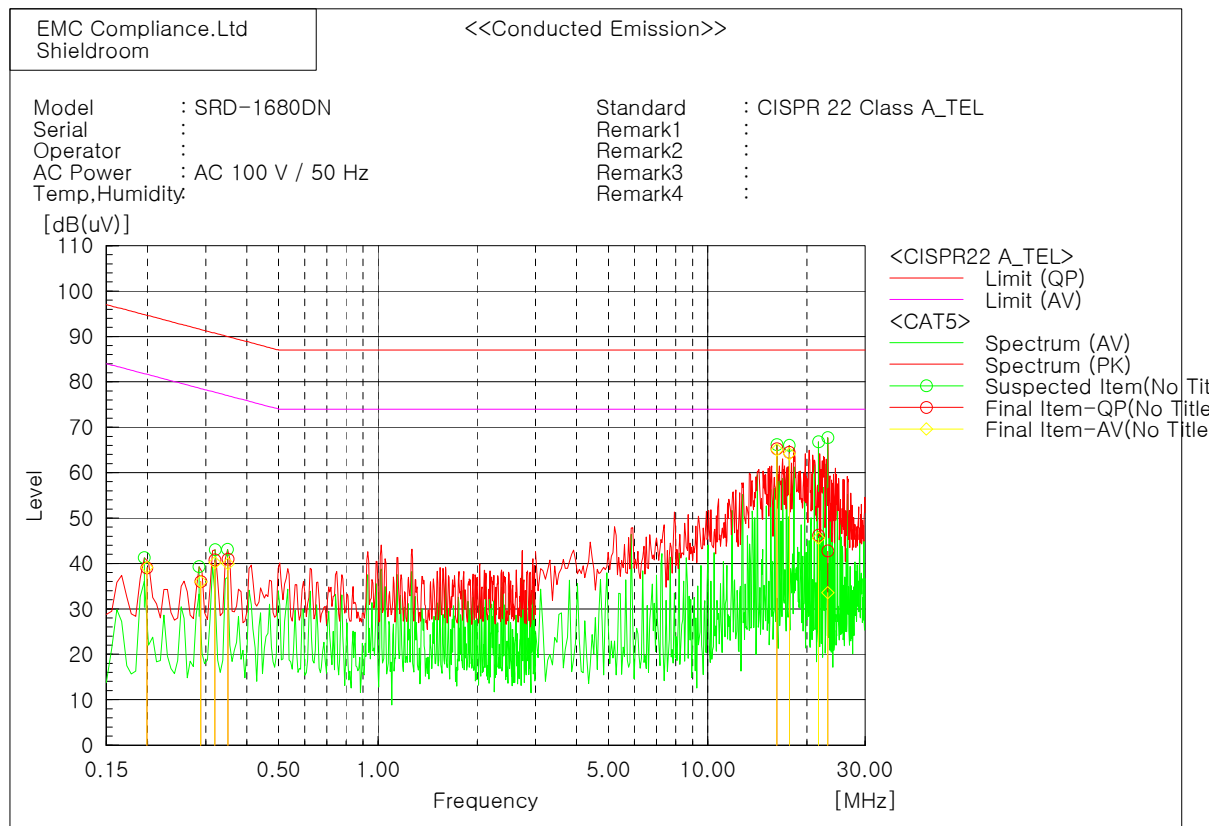


Final Result

--- No Title1 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	0.19796	37.5	37.7	10.4	47.9	48.1	94.7	81.7	46.8	33.6
2	0.31984	38.7	38.9	10.2	48.9	49.1	90.7	77.7	41.8	28.6
3	0.32106	38.0	38.3	10.2	48.2	48.5	90.7	77.7	42.5	29.2
4	0.35096	38.8	39.1	10.2	49.0	49.3	89.9	76.9	40.9	27.6
5	1.02276	41.0	40.8	9.9	50.9	50.7	87.0	74.0	36.1	23.3
6	3.92288	22.3	20.8	9.7	32.0	30.5	87.0	74.0	55.0	43.5
7	10.77858	18.5	13.1	9.7	28.2	22.8	87.0	74.0	58.8	51.2
8	12.71638	38.0	35.3	9.7	47.7	45.0	87.0	74.0	39.3	29.0
9	23.137	39.2	37.6	9.7	48.9	47.3	87.0	74.0	38.1	26.7

* LCL 65 dB (RJ-45 Port)_100Mbps

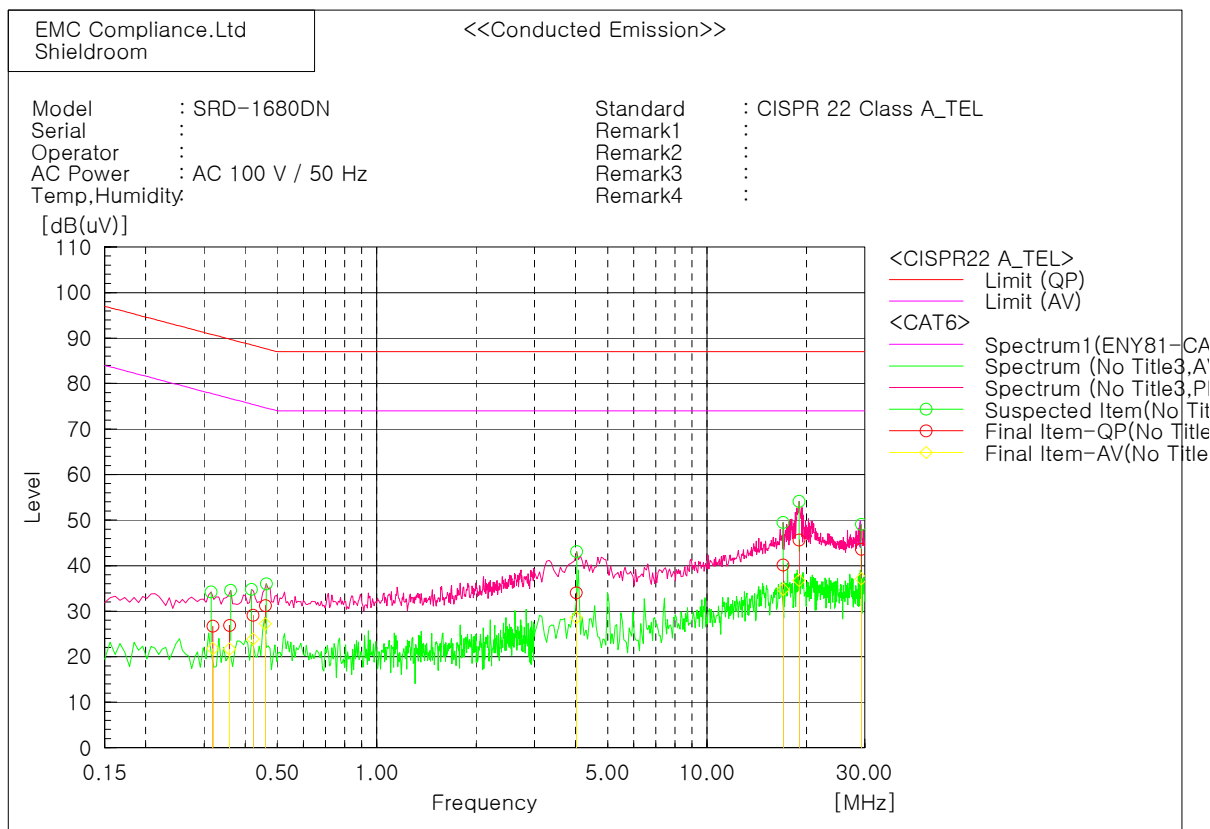


Final Result

--- 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	0.19918	28.8	28.9	10.2	39.0	39.1	94.6	81.6	55.6	42.5
2	0.29032	25.9	25.8	10.1	36.0	35.9	91.5	78.5	55.5	42.6
3	0.32002	30.7	30.1	10.1	40.8	40.2	90.7	77.7	49.9	37.5
4	0.35068	30.9	29.8	10.1	41.0	39.9	89.9	76.9	48.9	37.0
5	16.22782	55.6	55.4	9.7	65.3	65.1	87.0	74.0	21.7	8.9
6	17.69236	54.8	54.4	9.7	64.5	64.1	87.0	74.0	22.5	9.9
7	21.6886	36.5	35.9	9.7	46.2	45.6	87.0	74.0	40.8	28.4
8	23.13936	33.1	23.9	9.7	42.8	33.6	87.0	74.0	44.2	40.4

* LCL 75 dB (RJ-45 Port)_1000Mbps



Final Result

--- No Title3 Phase ---										
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
	[MHz]	QP	CAV		QP	CAV	QP	AV	QP	CAV
		[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.31928	16.8	11.9	9.9	26.7	21.8	90.7	77.7	64.0	55.9
2	0.35834	17.0	11.7	9.9	26.9	21.6	89.8	76.8	62.9	55.2
3	0.42208	19.2	14.1	9.8	29.0	23.9	88.4	75.4	59.4	51.5
4	0.46018	21.4	17.4	9.8	31.2	27.2	87.7	74.7	56.5	47.5
5	4.0231	24.8	19.3	9.3	34.1	28.6	87.0	74.0	52.9	45.4
6	16.98654	30.5	25.2	9.6	40.1	34.8	87.0	74.0	46.9	39.2
7	18.9876	35.9	27.1	9.7	45.6	36.8	87.0	74.0	41.4	37.2
8	29.29888	33.9	27.4	9.7	43.6	37.1	87.0	74.0	43.4	36.9

6.2 Radiated Emission

Test specification	VCCI V-3 / 2012.04, Class A		
Testing voltage	100 V, 50 Hz		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2013. 07. 22		
Temperature (°C)	26 °C	Humidity (% R.H.)	56 % 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	2014.02.18	☒
Test Receiver	ESCI	100001	R&S	2014.07.25	☐
Test Receiver	ESCI	100710	R&S	2013.11.06	☐
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2013.10.04	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2013.11.06	☒
3 dB Attenuator	8491B	22981	HP	2014.03.19	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A02343	AGILENT	2013.11.06	☒
Horn ANT	3115	00086706	ETS	2013.11.21	☒
Spectrum Analyzer	FSP7	100289	R&S	2013.12.14	☐

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

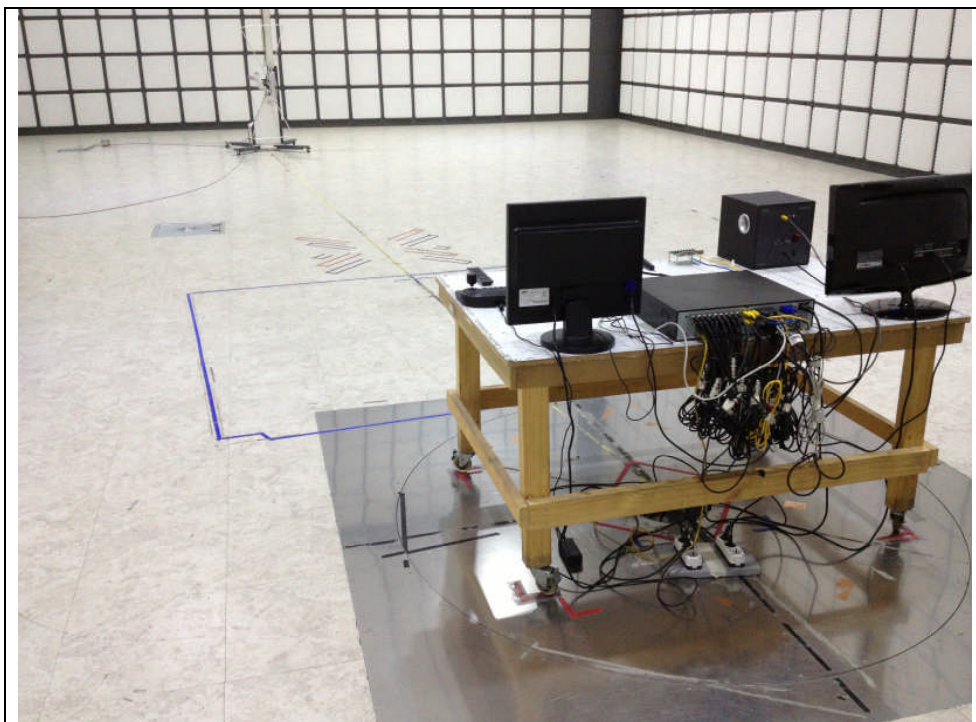
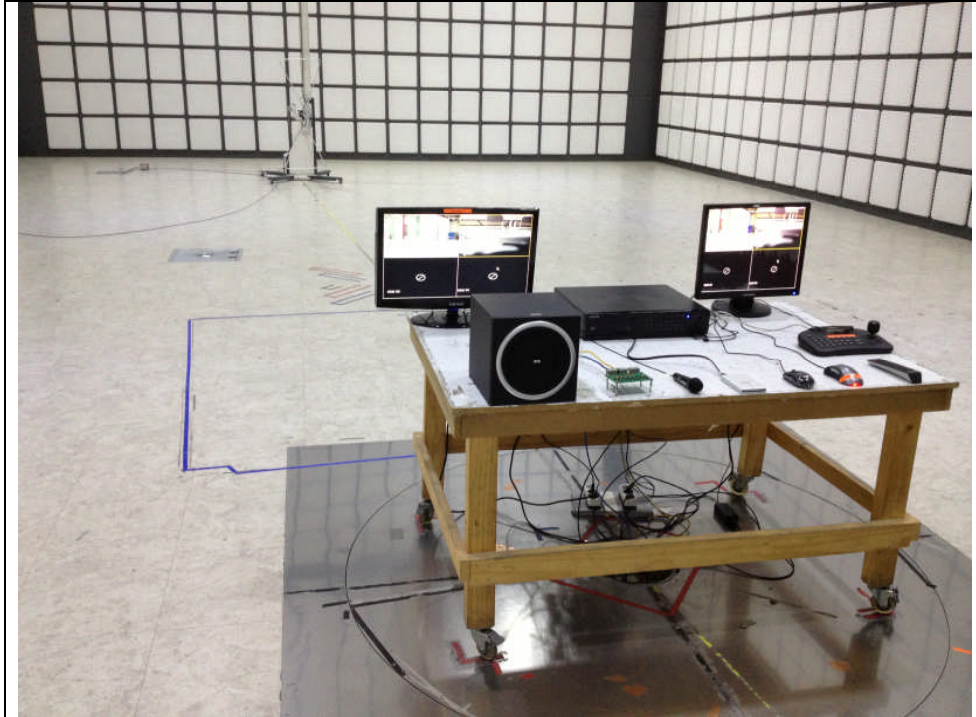
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

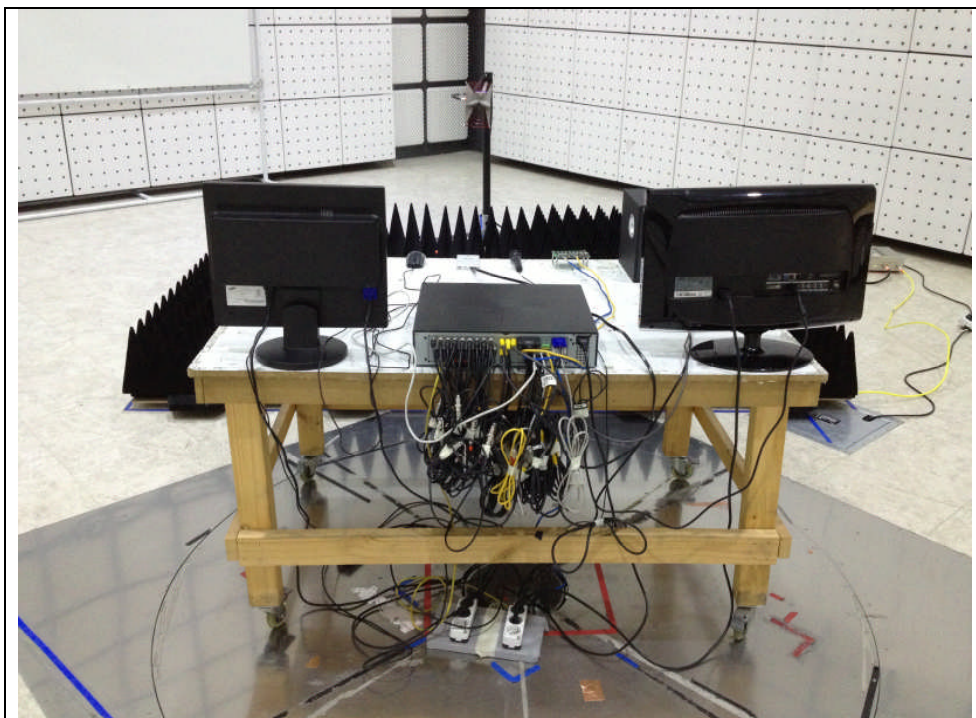
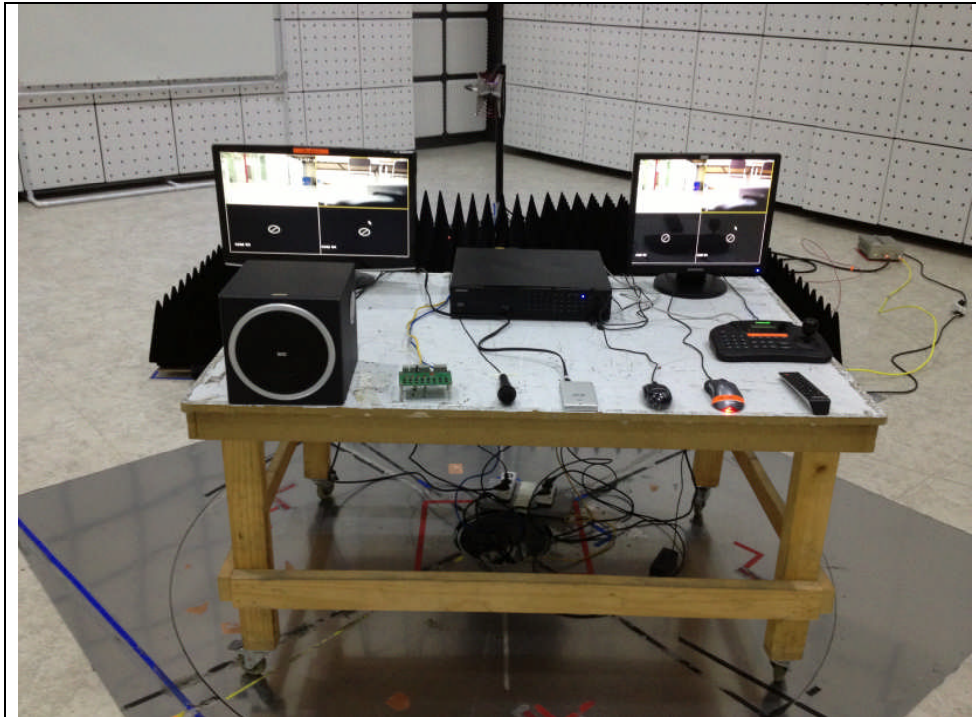
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$$

6.2.5 Photographs of test setup

* 30 MHz ~ 1 GHz



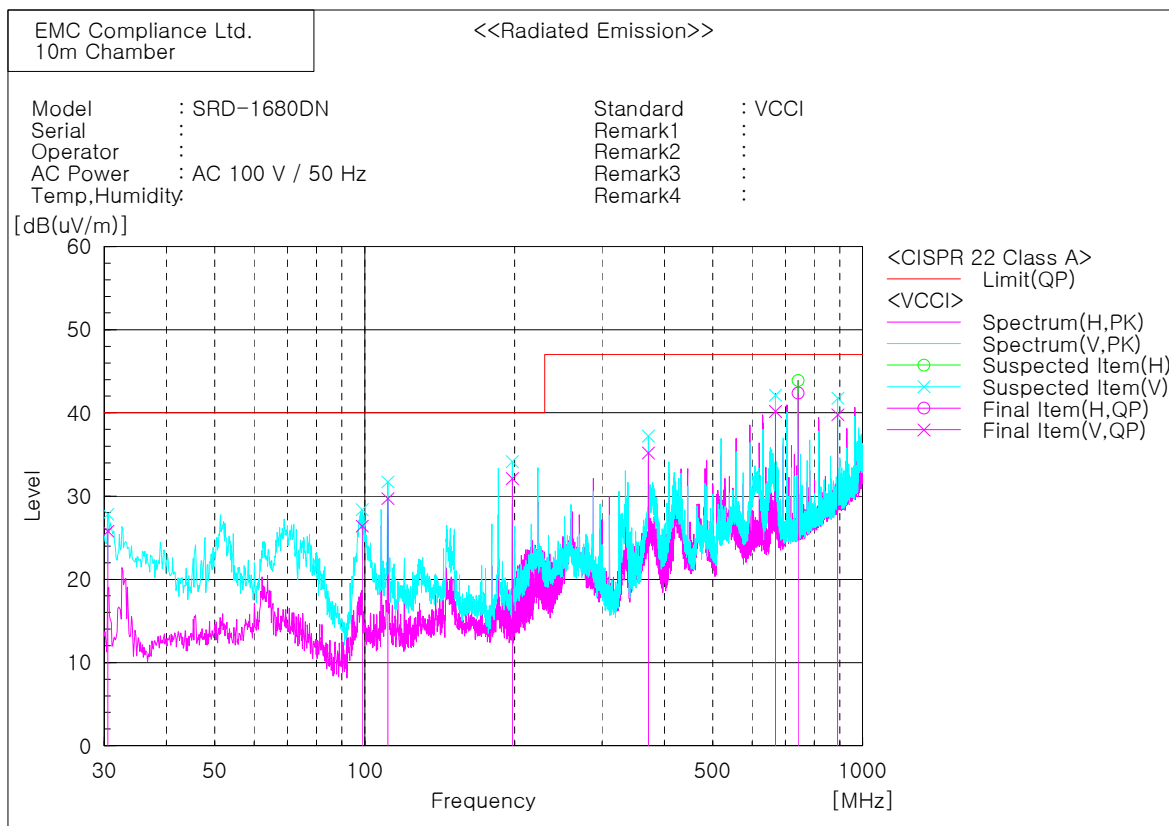
* 1 GHz ~ 6 GHz



6.2.6 Radiated emission measurement result

* Graph and Data

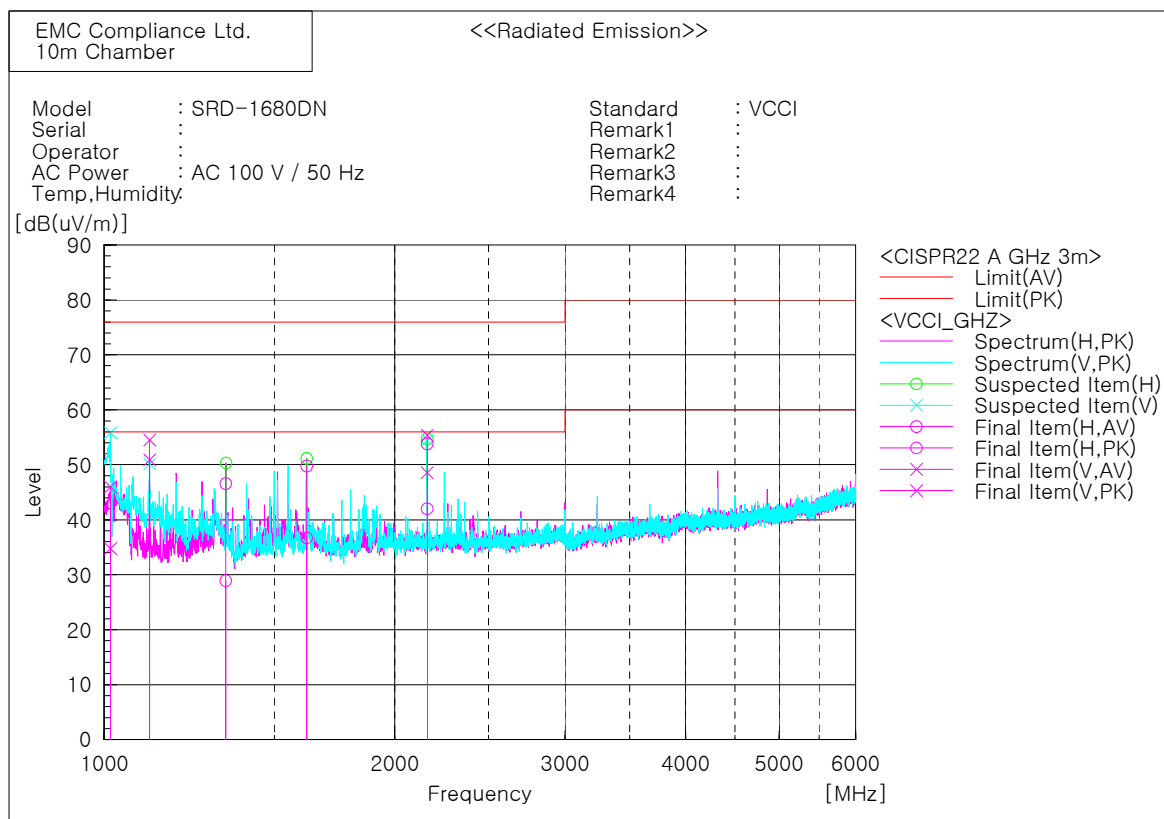
* 30 MHz ~ 1 GHz



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]	Remark
1	30.485	V	41.0	-15.2	25.8	40.0	14.2	100.0	10.7	
2	98.870	V	44.0	-17.6	26.4	40.0	13.6	100.0	275.5	
3	111.359	V	45.5	-15.8	29.7	40.0	10.3	100.0	156.6	
4	197.931	V	46.9	-14.8	32.1	40.0	7.9	199.0	6.2	
5	371.198	V	43.4	-8.2	35.2	47.0	11.8	100.0	328.3	
6	668.260	V	41.0	-0.8	40.2	47.0	6.8	100.0	353.6	
7	742.586	H	41.6	0.8	42.4	47.0	4.6	100.0	144.5	
8	891.117	V	35.8	4.0	39.8	47.0	7.2	199.0	358.0	

* 1 GHz ~ 6 GHz



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]	Remark
1	1014.402	V	41.9	53.1	-7.1	34.8	46.0	56.0	76.0	21.2	30.0	100.0	349.4	
2	1113.736	V	58.5	62.1	-7.6	50.9	54.5	56.0	76.0	5.1	21.5	100.0	187.7	
3	1336.421	H	34.6	52.3	-5.7	28.9	46.6	56.0	76.0	27.1	29.4	100.0	284.2	
4	1619.969	H	40.3	53.4	-3.6	36.7	49.8	56.0	76.0	19.3	28.2	100.0	38.8	
5	2160.000	V	49.5	56.3	-0.9	48.6	55.4	56.0	76.0	7.4	20.6	100.0	340.4	
6	2160.000	H	42.9	54.7	-0.9	42.0	53.8	56.0	76.0	14.0	22.2	100.0	357.4	

7. E.U.T. photographs

Front View



Rear View



Left View



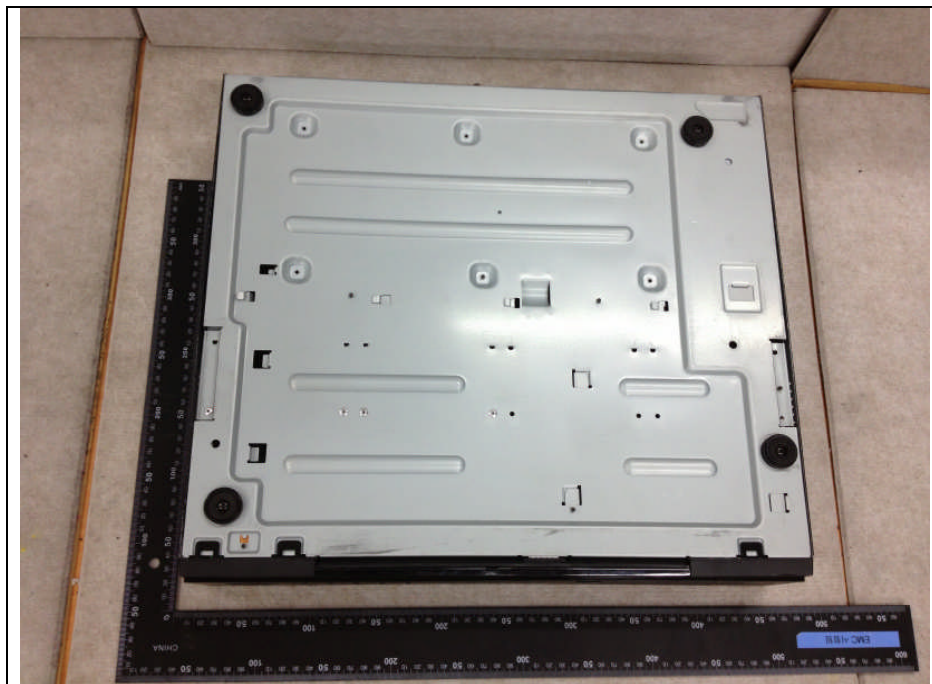
Right View



Top View



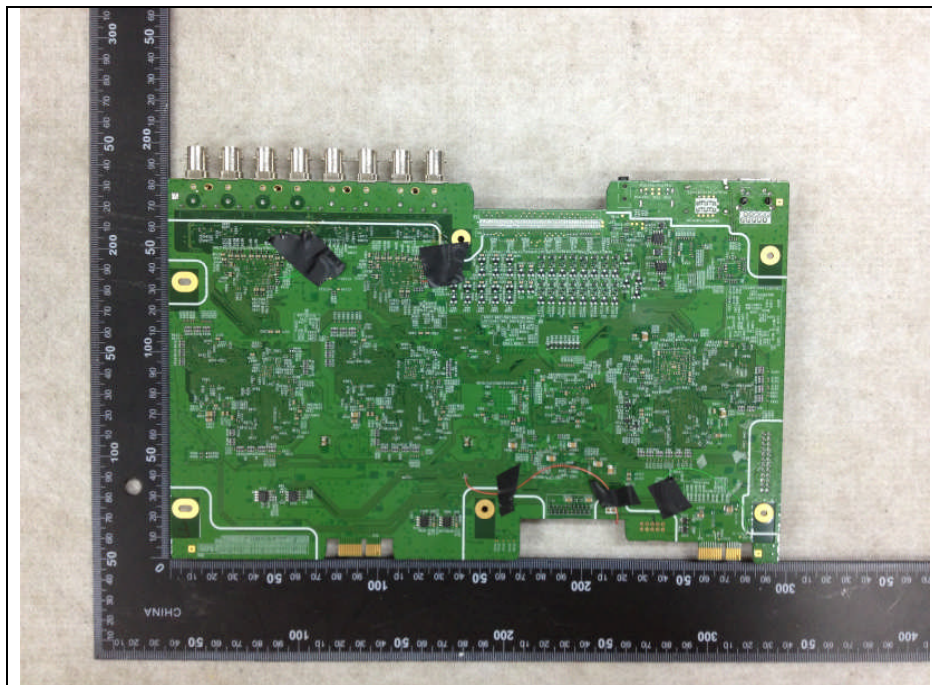
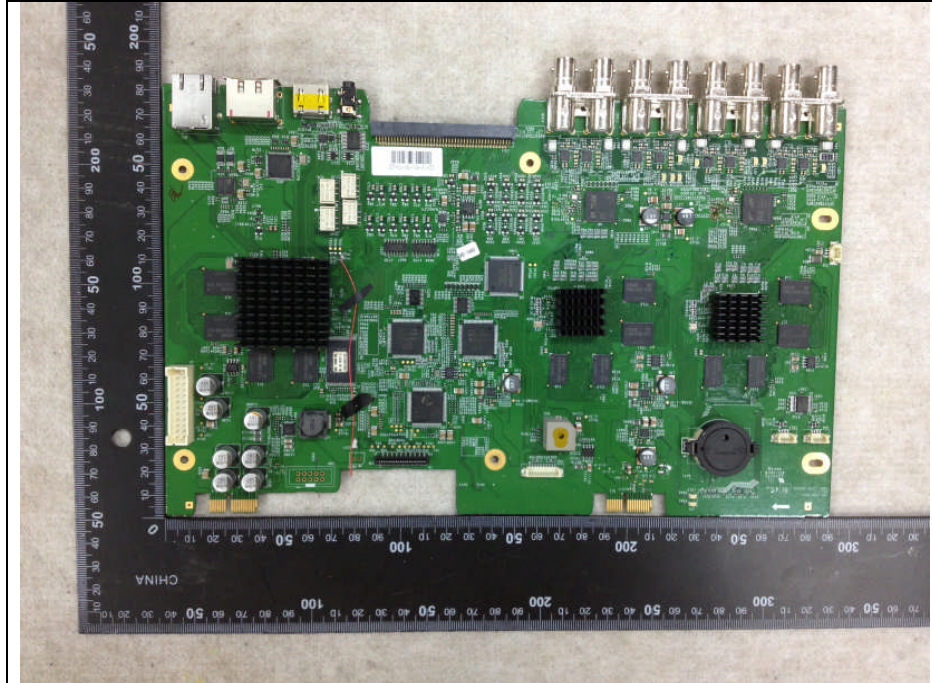
Bottom View



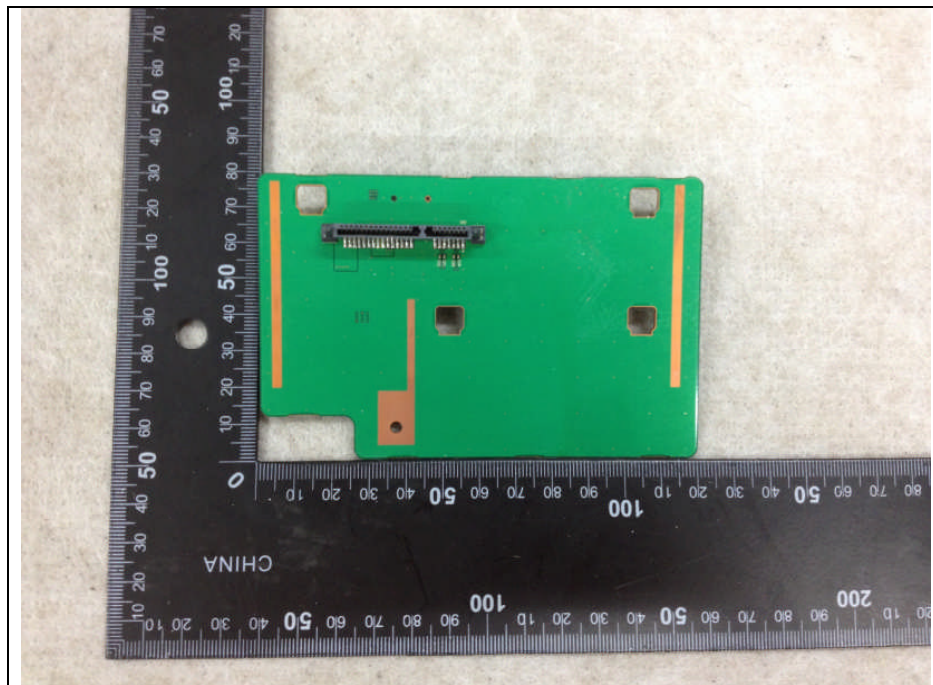
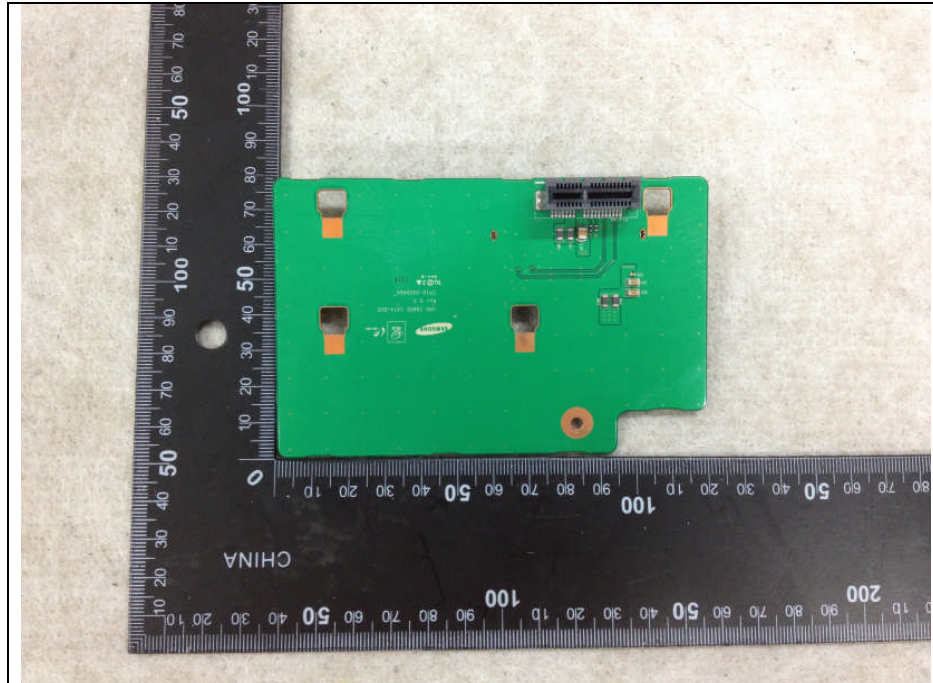
Inside



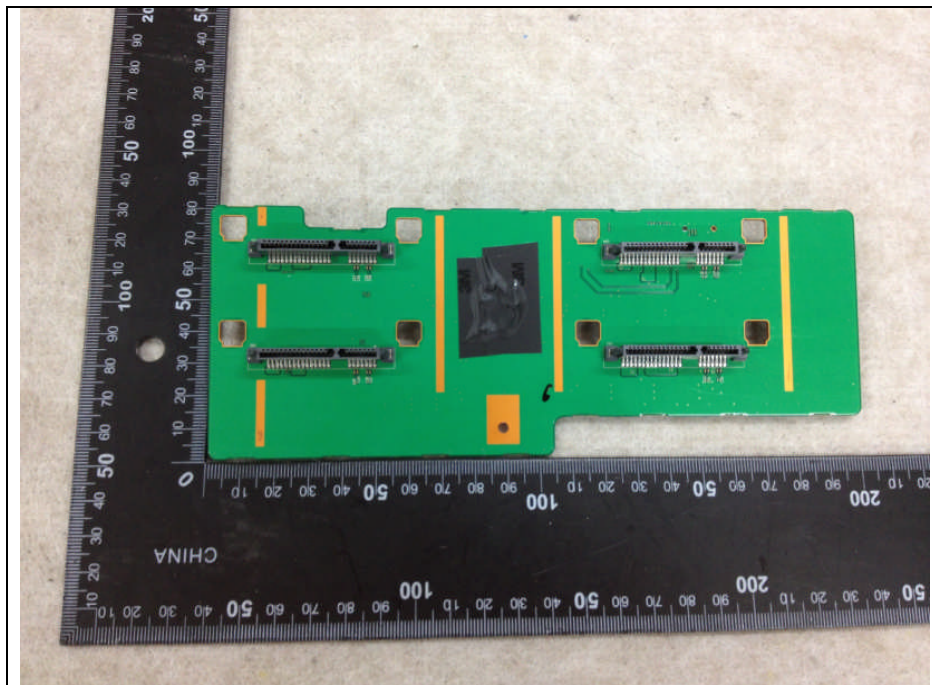
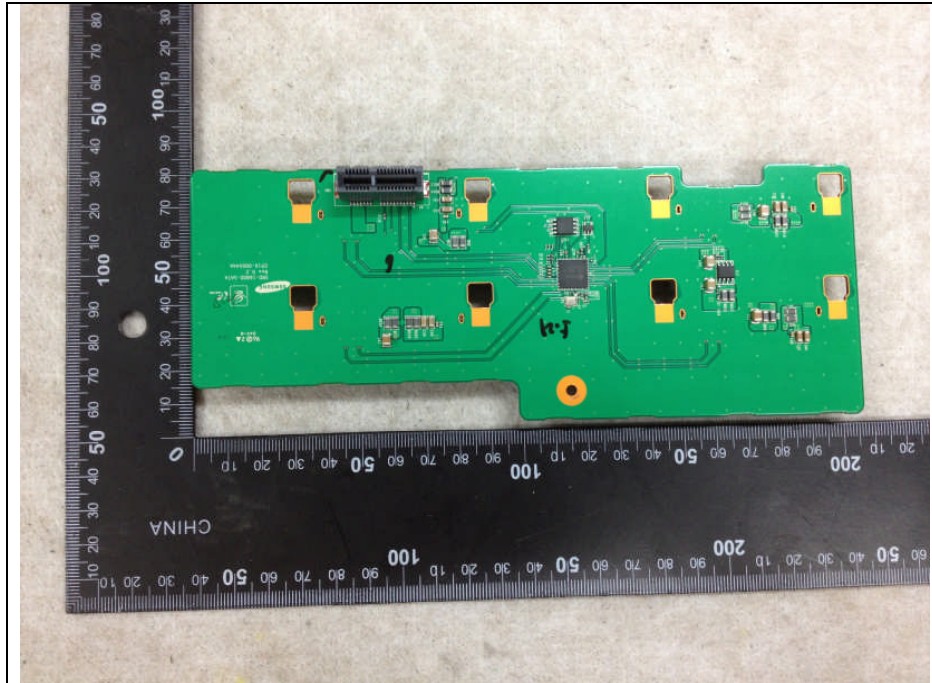
Main Board



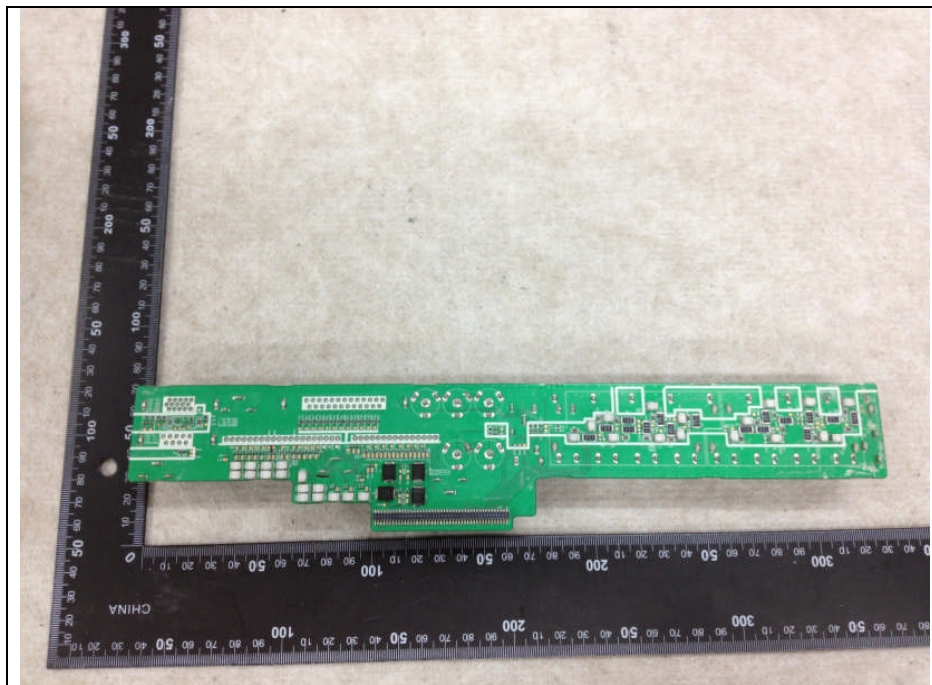
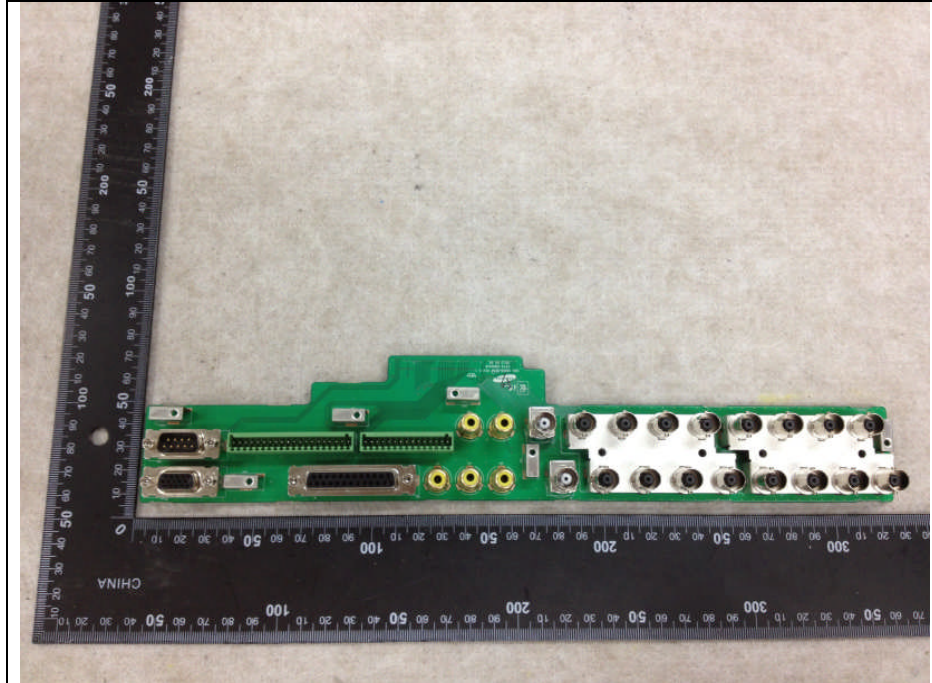
SUB Board 1



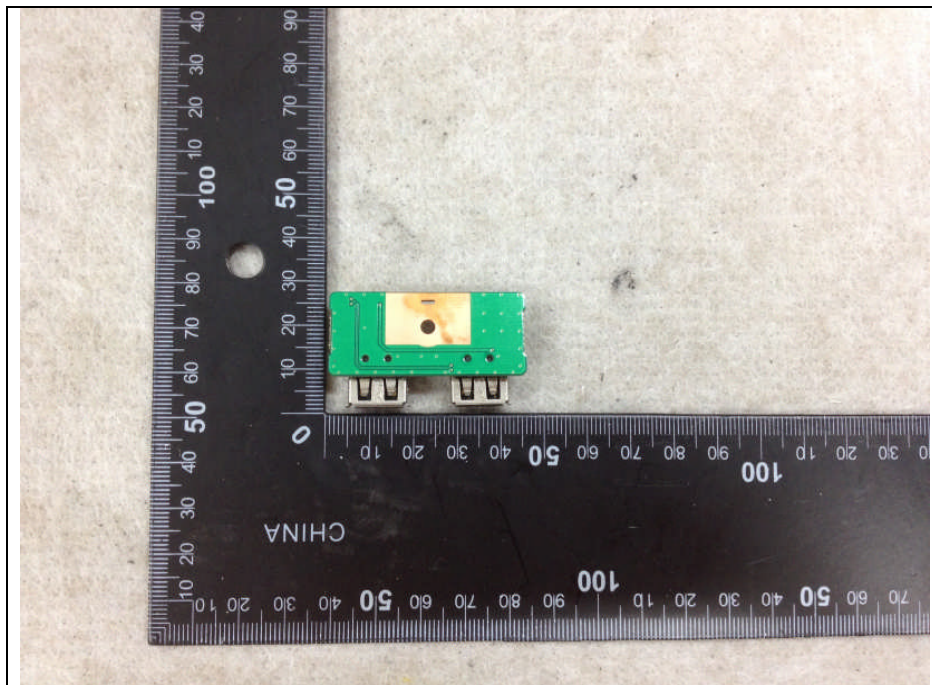
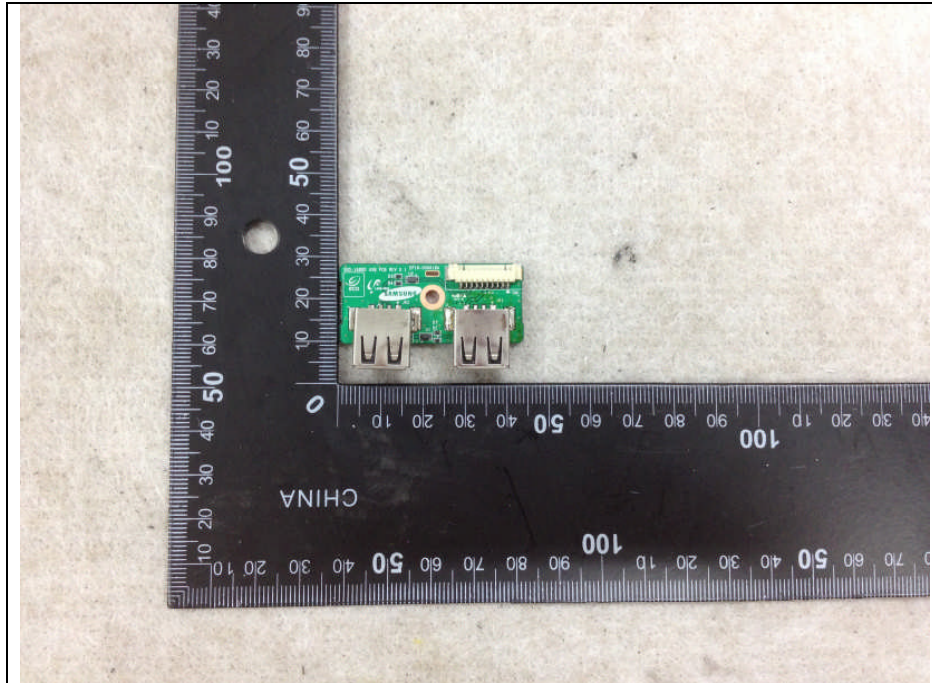
SUB Board 2



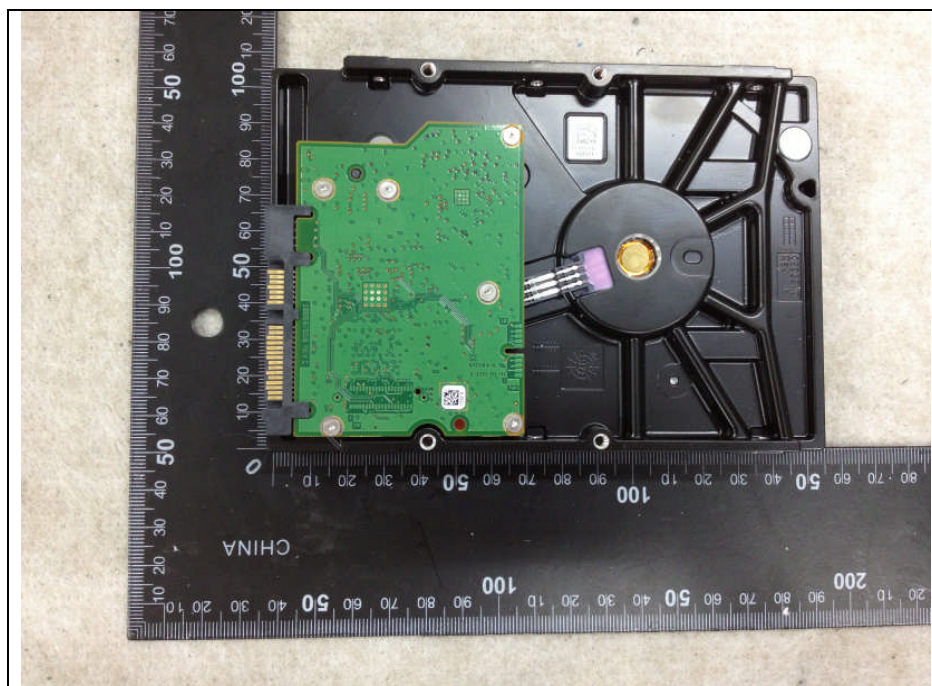
SUB Board 3



USB Board



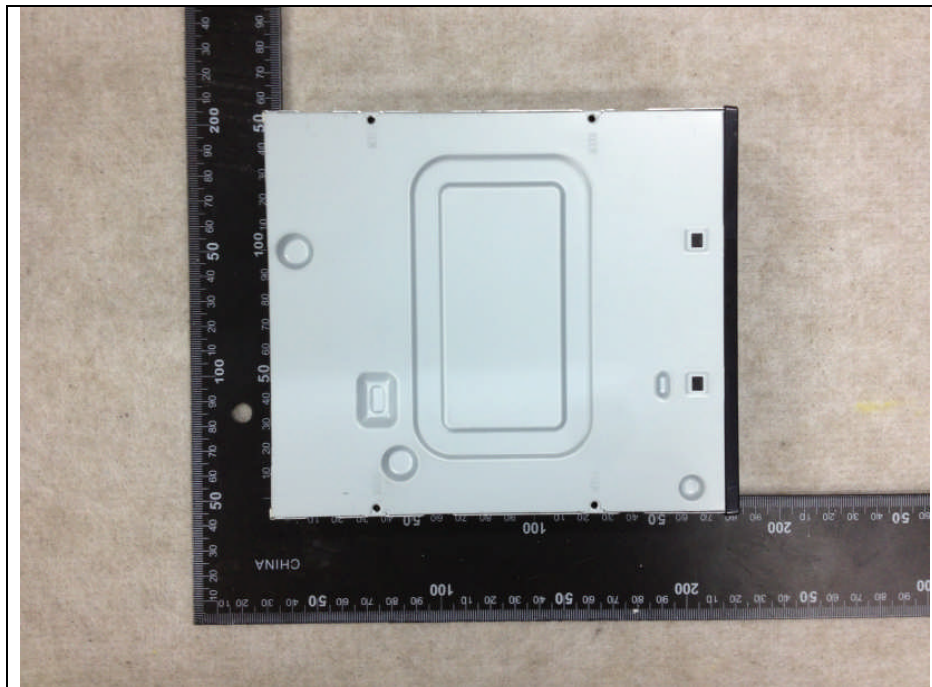
HDD (2000 GB)



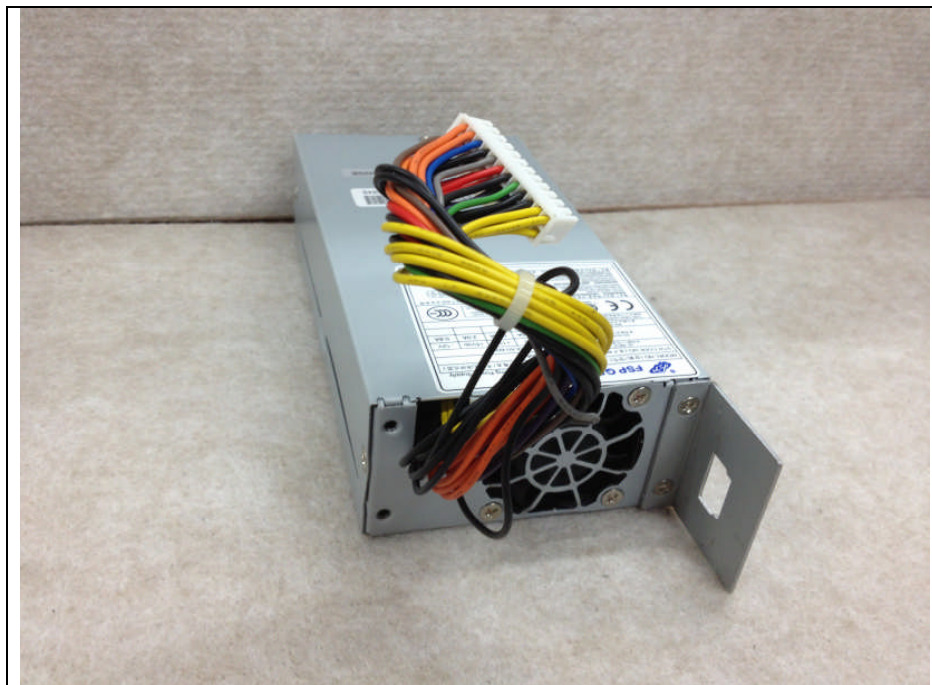


ODD





SMPS





USB Mouse





Remote Control

