

TESTING CERTIFICATE

EMC Compliance Ltd.

65, Sinwon-ro, Yeongtong-gu,
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Certificate No.: EMC-CE-4726

Page(1) / (42) Pages



1. Applicant

Name: Samsung Techwin Co., Ltd.
Address: 84, Jeongdong-ro, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, Korea
Date of Receipt: March 19, 2014

2. Manufacturer

Name#1: Samsung Techwin Co., Ltd.
Name#2: TIANJIN SAMSUNG TECHWIN
OPTO-ELECTRONIC CO., LTD

3. Use of Report:

Completed report

4. Test Sample:

Digital Video Recorder, SRD-445P

5. Date of Test:

March 21 ~ 23, 2014

6. Test method used:

AS/NZS CISPR 22:2009+A1:2010, Class A

7. Testing Environment:

Temperature: $(20.25 \pm 0.25) ^\circ\text{C}$,
Relative Humidity: $(26.2 \pm 1.5) \% \text{ R.H.}$

8. Test Results:

Refer to page 14 ~ page 26
(Measurement uncertainty: Refer to page 6)

This result shown in this report refer only to the sample(s) tested unless otherwise stated.

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EMC Compliance Laboratory.

Affirmation	Tested by  Name: PARK, GUN-SU	Technical Manager  Name: YEOM, HAN-SEOK
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The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2014. 03. 26

EMC Compliance Ltd.

Accredited by KOLAS, Republic of KOREA

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1. Applicant information

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2. Laboratory information

Address

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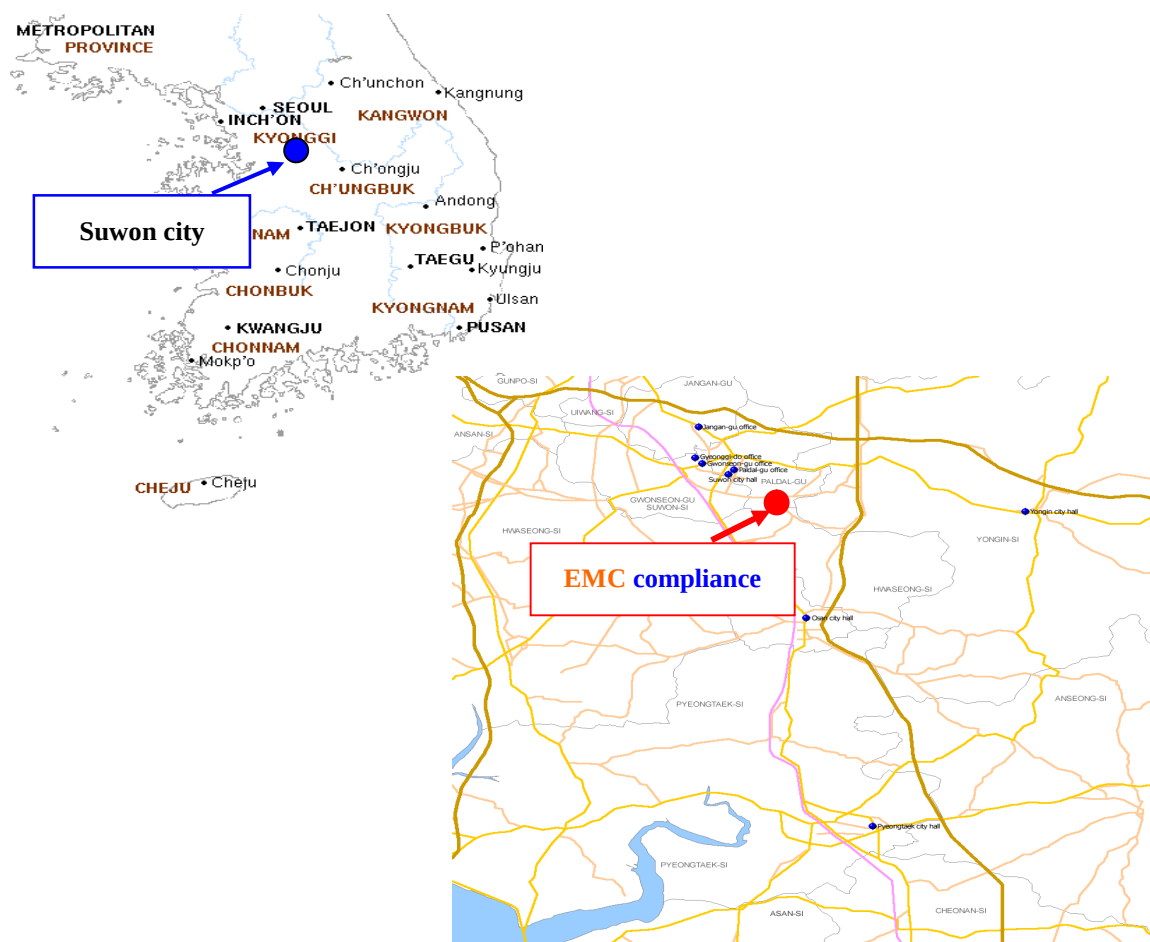
FCC CAB.: KR0040

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)	: 20.5 °C	24.7 % R.H.	-
Shielded room(CE)	: 20.0 °C	27.7 % 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
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

4. Description of E.U.T.

4.1 General information

Item		Details		
		SRD-445	SRD-842	SRD-1642
Video	Inputs	16(4,8) composite video 0.5–1 Vpp, 75 ohm		
	Resolution	960x480 NTSC, 960x576 PAL / 720x480 NTSC, 720x576 PAL		
Live	Frame rate	120fps NTSC, 100fps PAL	240fps NTSC, 200fps PAL	480fps NTSC, 400fps PAL
	Resolution	960x480 NTSC, 960x576 PAL (704x480 NTSC, 704x576 PAL)		
	Multi Screen display	1 / 4 / PIP / Sequence	1 / 4 / 7 / 9 / 13 / PIP / Sequence	1 / 4 / 7 / 9 / 13 / 16 / 16(A) / PIP / Sequence
Performance				
OS	Embedded	Linux		
Recording	Compression	H.264		
	Record Rate	• SRD-445 - NTSC: Up to 120fps @ 960x480 / PAL: Up to 100fps @ 960x576 - NTSC: Up to 120fps @ 704x480 / PAL: Up to 100fps @ 704x576 - NTSC: Up to 120fps @ 704x240 / PAL: Up to 100fps @ 704x288 - NTSC: Up to 120fps @ 352x240 / PAL: Up to 100fps @ 352x288 • SRD-842 - NTSC: Up to 60fps @ 960x480 / PAL: Up to 50fps @ 960x576 - NTSC: Up to 60fps @ 704x480 / PAL: Up to 50fps @ 704x576 - NTSC: Up to 120fps @ 704x240 / PAL: Up to 100fps @ 704x288 - NTSC: Up to 240fps @ 352x240 / PAL: Up to 200fps @ 352x288 • SRD-1642 - NTSC: Up to 120fps @ 960x480 / PAL: Up to 100fps @ 960x576 - NTSC: Up to 120fps @ 704x480 / PAL: Up to 100fps @ 704x576 - NTSC: Up to 240fps @ 704x240 / PAL: Up to 200fps @ 704x288 - NTSC: Up to 480fps @ 352x240 / PAL: Up to 400fps @ 352x288 ※ WD1 : 960X480 / 4CIF : 704X480 / 2CIF : 704X240 / CIF : 352X240 (NTSC) - WD1 : 960x576 / 4CIF : 704x576 / 2CIF : 704x288 / CIF : 352x288 (PAL)		
	Mode	NTSC : Manual, Schedule (Continuous / Event), Event(Pre / Post), Time lapse (1~30fps) PAL : Manual, Schedule (Continuous / Event), Event(Pre / Post), Time lapse (1~25fps)		
	Event	Video Loss, Motion(Level 1~10), Alarm, Tampering		
	Overwrite modes	Stop/Continuous		
	Pre Event	Up to 5 sec		
	POST Event	Up to 6 hour (Off, 5, 10, 20, 30 sec, 1, 3, 5, 10, 20 min, 1, 2, 3, 4, 5, 6 hour)		

Item		Details		
		SRD-445	SRD-842	SRD-1642
Search & Playback	Search mode	Time,Event,Backup,POS,Motion		
	Playback function	Fast Forward/Backward, Slow Forward/Backward ※ Backward Play with I-frame Only		
Network (IPv4)	Transmission speed	960H/4CIF/2CIF/ CIF(120fps NTSC, 100fps PAL)	960H/4CIF/2CIF/ CIF(240fps NTSC, 200fps PAL)	960H/4CIF/2CIF/ CIF(480fps NTSC, 400fps PAL)
	Bandwidth	Up to (8,32)Mbps, Unlimited(8M)/2/1.5/1 Mbps/800/600/500/400/300/200/100/ 50 kbps		
	Bandwidth control	Automatic		
	Stream	CIF (H.264)		
	Remote users Maximum	4 Persons (Search up to (2), Live Unicast/Live Multicast available)		
	Protocol support	TCP/IP,UDP,DHCP,PPPoE,SMTP,NTP,HTTP,DDNS,RTP,RTSP,SNMP		
	Monitoring	Smart viewer,Webviewer		
Smart phone	Smart Phone	Android, IOS		
	Protocol support	RTP, RTSP, HTTP, CGI		
	Remote users Maximum	Live(1)		
Storage	Internal HDD	Up to 1 SATA HDD	Up to 2 SATA HDD	
	External (e-SATA Interface)	1 EA	—	
	DVD Writer (Back-up)	—		
	USB (Back-up)	2 USB Ports		
	File Format (Back-up)	BU(DVR Player), EXE(Include Player), AVI		
Security	Password Protection	1 Admin, 10 Group , 10 User per 1 Group		
	Data Authentication	Watermark		
Interface				

Item		Details		
		SRD-445	SRD-842	SRD-1642
Monitors	VGA	1 VGA (1280x720, 1280x1024, 1920x1080)		
	HDMI	1 HDMI (1280x720, 1280x1024, 1920x1080)		
	Main Composite	–		
	Spot Composite	Analog Spot (1 BNC, 1 Vp-p, 75 ohm)		
	Loop Outputs	–		
Audio	Inputs / Output	Audio input : 4 channels / Output : 1 channel		
	Compression	G.711		
	Sampling rate	8KHz		
Alarm	Inputs / Output	Terminal 16(4,8) inputs (NO/NC) / Terminal 2 relay outputs (NO), Rating : 24VDC/1A, 125V AC/0.5A		
	Remote notification	Notification via e-mail		
Connections	Ethernet	1 RJ45 10/100 Base-T		
	Serial interface	RS-485(Half) for PTZ, System Keyboard, RS-232 Support for POS Interface (VSI-Pro)		
	USB	USB 2.0, 2 ports		
	e-SATA	1 EA	–	
	Application Suport	Mouse, Remote Controller		
	Protocol support	Samsung-E/ Samsung-T/ Pelco-D/ Pelco-p/Panasonic/ Phillips/ AD/ DIAMOND/ ERNA/ KALATEL/ VCL TP/MICON/ ELMO/GE PTZ Control via Coaxial Cable (Samsung CCVC, Pelco-C (Coaxitron))		
General				
Electrical	Input Voltage /Current	DC12V Adaptor 3A,100~240VAC 50~60Hz	DC12V Adaptor,4A,100~240VAC, 50~60Hz	
	Power consumption	Normal 19 W (with 1x HDD)		
Environmental	Operating Temperature / Humidity	+0°C to +40°C (+32°F to +104°F) / 20% to 85% RH		
Mechanical	Dimension (W x H x D) H (leg not included)	W315xH52xD224 mm (12.40" x 2.05" x8.82")	W375 x H52 x D255 mm (14.76" x 2.05" x10.04")	
	Weight (With hard disks)	1.7kg(3.75 lb)	3.62 kg (7.98 lb)	3.69 kg (8.14 lb)
	Rack mount kit	2 EA		
Lauguage		Korean, Japanese, Chinese (Simplified), English, French, German, Spanish, Italian, Russian, Polish, Czech, Turkish, Netherlands, Portuguese,Swedish, Danish, Thailandais, Rumania, Serbia, Croatia, Hungary, Greek, Chinese (Traditional), Finnish, Norwegian (25 Language)		

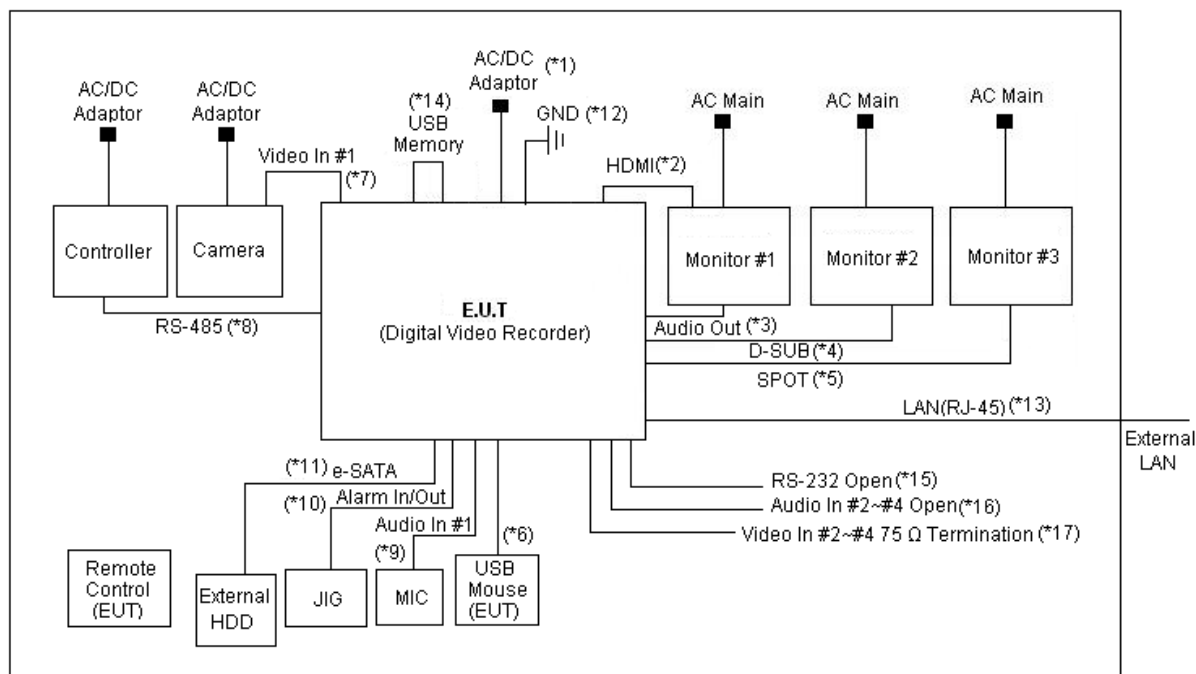
4.2 Product description

Type of product	Digital Video Recorder
Model name (Basic)	SRD-445P
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	240 V, 50 Hz
Product rating	*AC/DC Adaptor(ADS-65LSI-12-1 12036G) Input: 100-240 V~50/60 Hz, 1.5A Output: 12 V, 3.0 A
Internal clock frequency	Above 108 MHz
Note	*AC/DC adaptor was provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor #1	PM24KO	ZQ9XH1HBA01776V	SAMSUNG
Monitor #2	191G®N	N727HVZLC04632H	SAMSUNG
Monitor #3	SMT-2231P	YDQ03VDBB02500H	SAMSUNG
Controller	SCC-1000	EW089028913	SAMSUNG
Camera	SCB-6000	C6PW6V3B80115Y	SAMSUNG
External HDD	SP10	-	-
USB Memory(1GB)	-	-	-
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/DC Adaptor	Power	1.0	Non-Shield
2		HDMI	Monitor #1	HDMI	1.0	Shield
3		Audio Out	Monitor #1	Audio In	3.0	Shield
4		D-SUB	Monitor #2	D-SUB	1.5	Shield
5		SPOT	Monitor #3	SPOT	3.0	Shield
6		USB	USB Mouse (EUT)	USB	1.0	Shield
7		Video In #1	Camera	Video Out	3.0	Shield
8		RS-485	Controller	RS-485	3.0	Non-Shield
9		Audio In #1	MIC	Audio Out	3.0	Shield
10		Alarm In/Out	JIG	Alarm In/Out	3.0	Non-Shield
11		e-SATA	External HDD	e-SATA	1.0	Shield
12		GND	GND	GND	2.0	Non-Shield
13		LAN(RJ-45)	External LAN	LAN(RJ-45)	3.0	Non-Shield
14		USB	USB Memory	USB	Direct	-
15		RS-232	Open	-	1.0	Shield
16		Audio In #2~#4	Open	-	3.0	Shield
17		Video In #2~#4	75 Ω Termination	-	3.0	Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Monitoring test.
	Web view test.
	Alarm In/Out test.
	Audio In/Out test.
	RS-485 test.

5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
☒	Conducted Emission	AS/NZS CISPR 22:2009+A1:2010, Class A	14 Page ~ 20 Page
☒	Radiated Emission	AS/NZS CISPR 22:2009+A1:2010, Class A	21 Page ~ 26 Page

6. Test results

6.1 Conducted Emission

Test specification	AS/NZS CISPR 22:2009+A1:2010, Class A		
Testing voltage	240 V, 50 Hz		
Test facility	Shielded room (CE#1)		
Date	2014. 03. 21		
Temperature (°C)	20.0 °C	Humidity (% R.H.)	27.7 % R.H.
Remarks	Complied		

6.1.1 Limits of conducted emission measurement

☒ AC main

Frequency MHz	Class A $\text{dB}\mu\text{V}$		Class B $\text{dB}\mu\text{V}$	
	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 $\text{dB}\mu\text{V}$		Current Limits $\text{dB}\mu\text{A}$	
	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 $\text{dB}\mu\text{V}$		Current Limits $\text{dB}\mu\text{A}$	
	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 $20 \log_{10} 150/I = 44 \text{ dB}$).

6.1.2 Measurement procedure

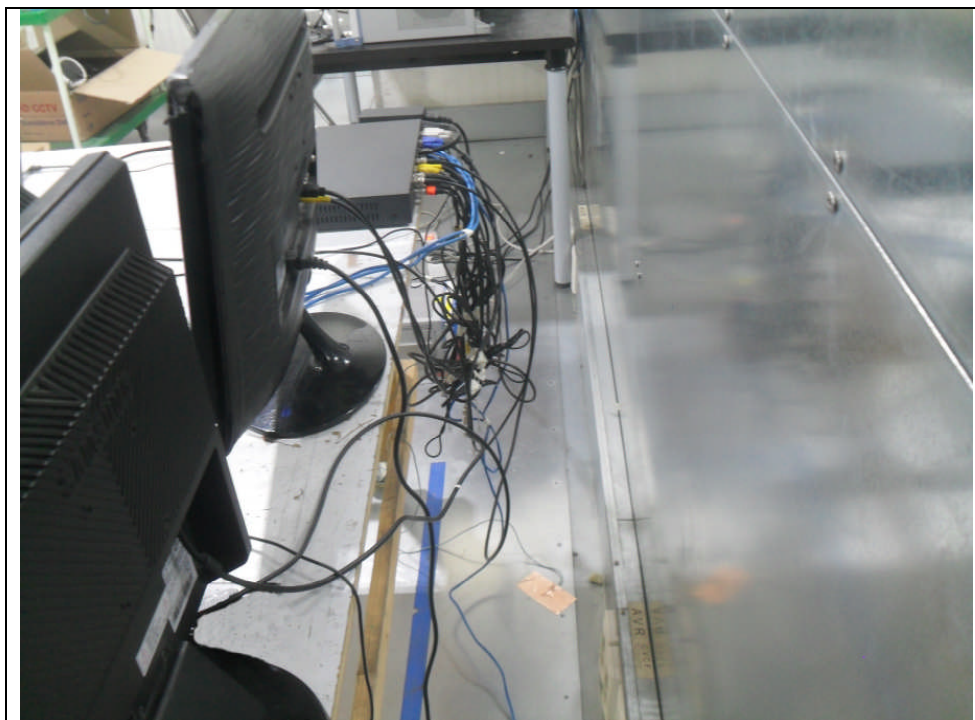
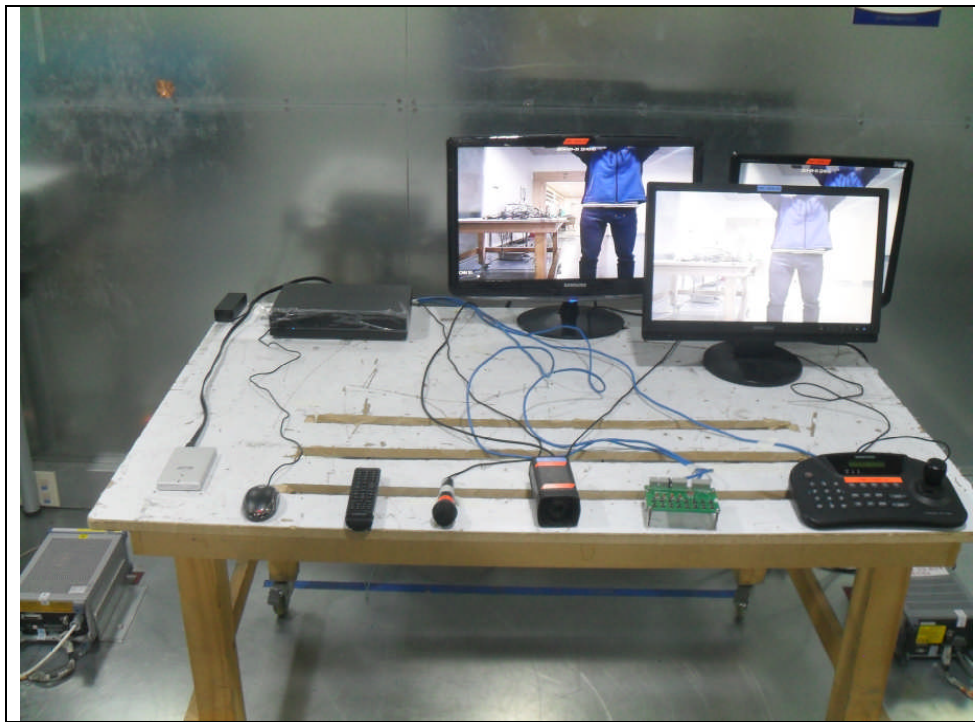
The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground plane. The LISN power was filtered. Each EUT power lead, except ground (safety) lead was individually connected through a LISN to input power source. EUT signal cables that hung closer than 0.4 m to the Horizontal metal ground 0.3 m ~ 0.4 m long. The power cord was bundles in the center. All peripheral equipment was powered from a sub LISN. The LISN and ISN were positioned 0.8 m from the EUT. Peak and Average detection were used in preliminary testing and Quasi-peak and Average detections were used at final measurement. Both lines of power cord, hot and neutral, were measured.

6.1.3 Used equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2015.01.27	☐
Test Receiver	ESCI	100001	R&S	2014.07.25	☒
Test Receiver	ESCI	100710	R&S	2014.10.28	☐
LISN	ENV216	101358	R&S	2014.10.04	☒
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	☐

6.1.4 Photographs of test setup

* AC Main

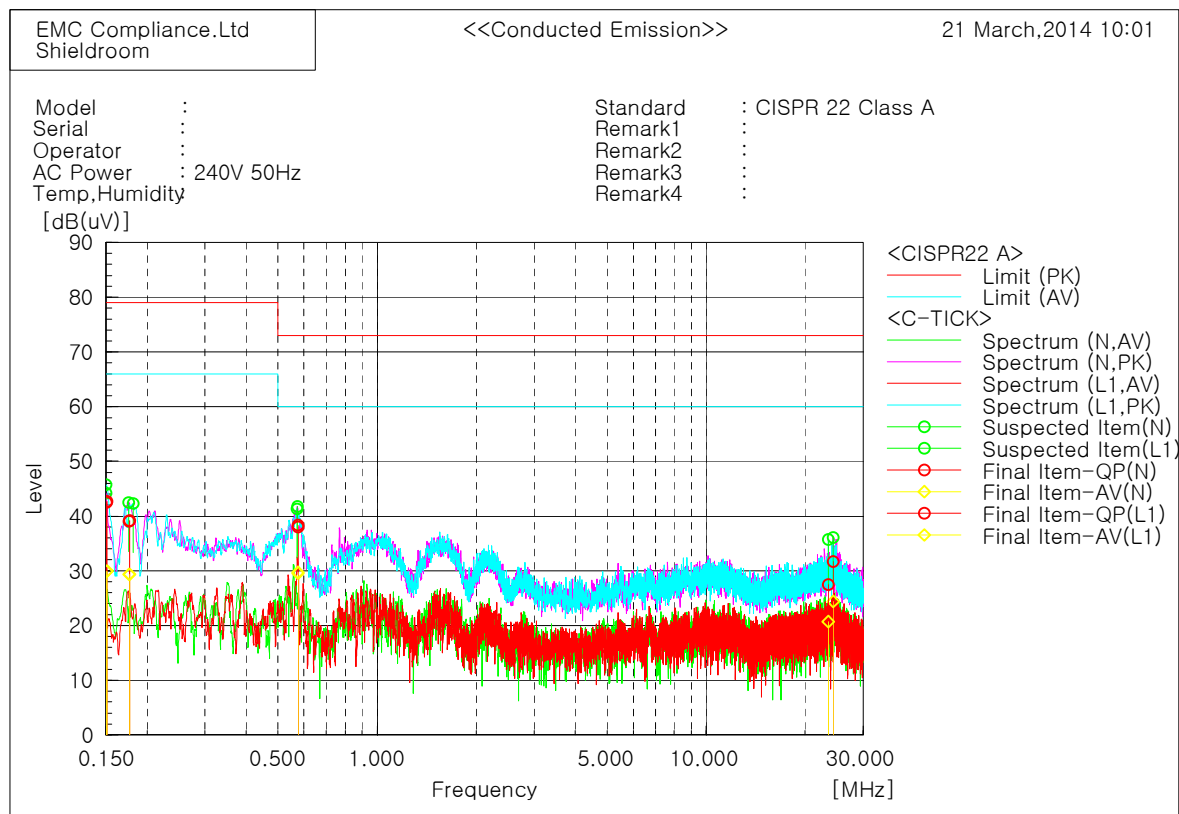


* Telecommunication



6.1.5 Conducted emission measurement result

* AC Main (SRD-445P)



Final Result

--- N Phase ---

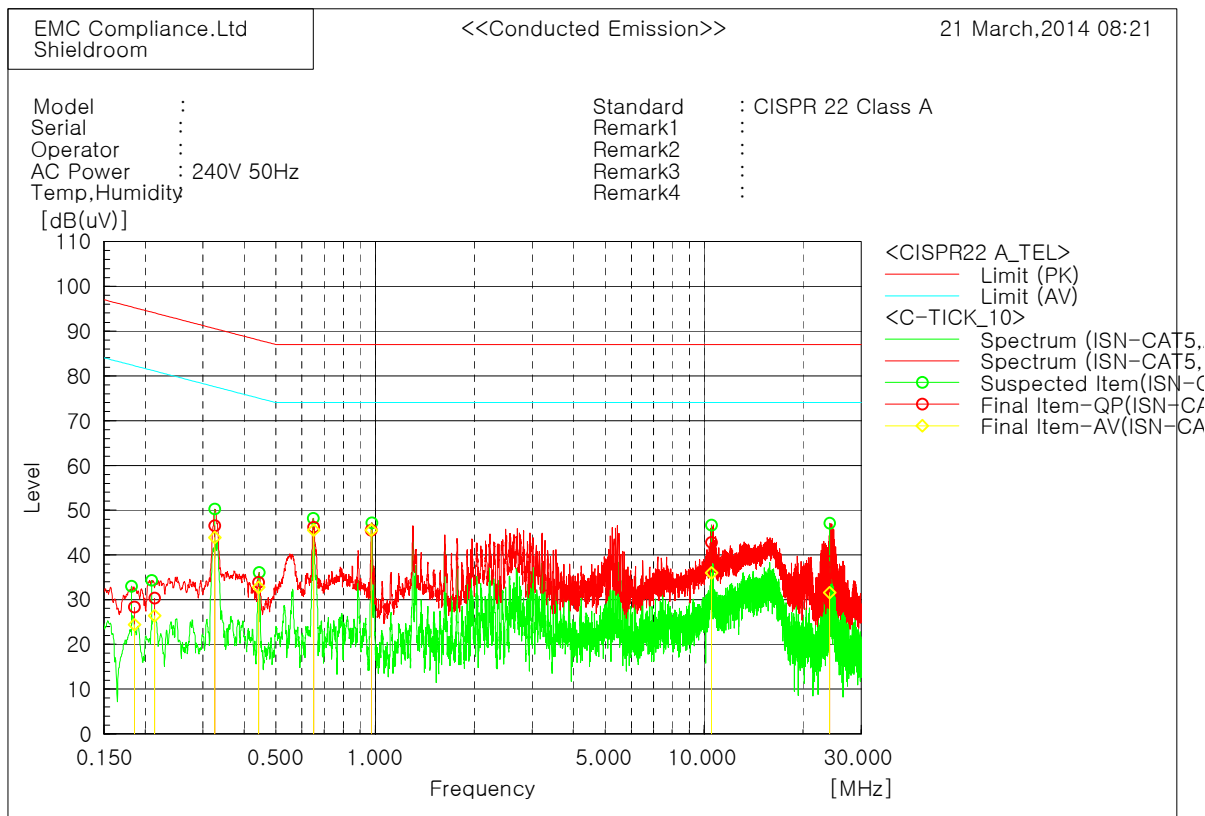
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.15082	32.6	20.0	10.0	42.6	30.0	79.0	66.0	36.4	36.0
2	0.17714	29.1	19.3	10.0	39.1	29.3	79.0	66.0	39.9	36.7
3	0.57523	28.0	19.5	10.0	38.0	29.5	73.0	60.0	35.0	30.5
4	24.29408	21.8	14.5	9.9	31.7	24.4	73.0	60.0	41.3	35.6

--- L1 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	0.15077	32.5	19.9	10.0	42.5	29.9	79.0	66.0	36.5	36.1
2	0.17661	29.1	19.3	10.0	39.1	29.3	79.0	66.0	39.9	36.7
3	0.57458	28.3	19.7	10.0	38.3	29.7	73.0	60.0	34.7	30.3
4	23.50726	17.6	10.8	9.9	27.5	20.7	73.0	60.0	45.5	39.3

* Telecommunication port

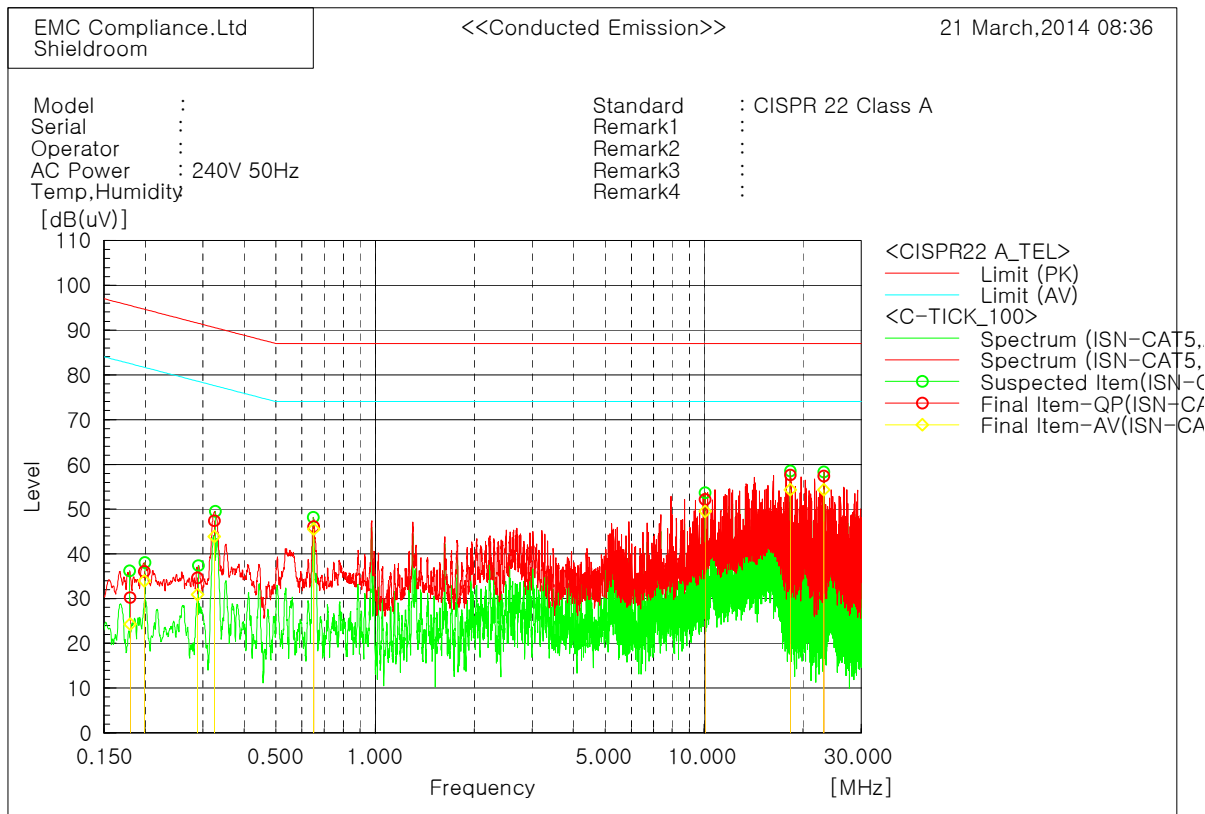
LAN Port (LCL 65 dB)_10 Mbps (SRD-445P)



Final Result

--- ISN-CAT5 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	0.1857	18.7	14.7	9.7	28.4	24.4	95.2	82.2	66.8	57.8
2	0.2139	20.6	16.7	9.7	30.3	26.4	94.1	81.1	63.8	54.7
3	0.32614	36.9	34.3	9.6	46.5	43.9	90.5	77.5	44.0	33.6
4	0.44313	24.4	23.2	9.5	33.9	32.7	88.0	75.0	54.1	42.3
5	0.64981	36.7	36.0	9.5	46.2	45.5	87.0	74.0	40.8	28.5
6	0.97524	36.1	36.2	9.4	45.5	45.6	87.0	74.0	41.5	28.4
7	10.53753	33.4	26.5	9.4	42.8	35.9	87.0	74.0	44.2	38.1
8	24.0287	28.9	21.9	9.6	38.5	31.5	87.0	74.0	48.5	42.5

LAN Port (LCL 65 dB)_100 Mbps (SRD-445P)



Final Result

--- ISN-CAT5 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	0.17979	20.4	14.5	9.8	30.2	24.3	95.5	82.5	65.3	58.2
2	0.19868	26.4	24.3	9.7	36.1	34.0	94.7	81.7	58.6	47.7
3	0.28905	25.1	21.3	9.6	34.7	30.9	91.6	78.6	56.9	47.7
4	0.32447	37.8	34.3	9.6	47.4	43.9	90.6	77.6	43.2	33.7
5	0.64977	36.6	36.0	9.5	46.1	45.5	87.0	74.0	40.9	28.5
6	10.06033	42.7	40.1	9.4	52.1	49.5	87.0	74.0	34.9	24.5
7	18.24335	48.1	44.9	9.5	57.6	54.4	87.0	74.0	29.4	19.6
8	23.12765	47.9	44.8	9.6	57.5	54.4	87.0	74.0	29.5	19.6

6.2 Radiated Emission

Test specification	AS/NZS CISPR 22:2009+A1:2010, Class A		
Testing voltage	240 V, 50 Hz		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2014. 03. 23		
Temperature (°C)	20.5 °C	Humidity (% R.H.)	24.7 % R.H.
Remarks	Complied		

6.2.1 Limits of radiated emission measurement

☒ Limits below 1 GHz

Frequency MHz	Class A dB μ V/m @ 10 m	Class B dB μ V/m @ 10 m
30 ~ 230	40	30
230 ~ 1 000	47	37

☒ Limits above 1 GHz

Frequency MHz	Class A @ 3 m		Class B @ 3 m	
	Average limit dB μ V/m	Peak limit dB μ V/m	Average limit dB μ V/m	Peak limit dB μ V/m
1 ~ 3	56	76	50	70
3 ~ 6	60	80	54	74

Note - The lower limit applies at the transition frequency.

6.2.2 Measurement procedure

The test was done at a 10 m chamber with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane. Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane.

Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.2.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2015.01.27	☒
Test Receiver	ESCI	100001	R&S	2014.07.25	☐
Test Receiver	ESCI	100710	R&S	2014.10.28	☐
Test Receiver	ESR	101078	R&S	2015.02.24	☐
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2015.10.16	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2014.10.31	☒
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	2014.10.31	☒
Horn ANT	3115	00155772	ETS	2015.02.26	☒
Spectrum Analyzer	FSP7	100289	R&S	2014.11.25	☐

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

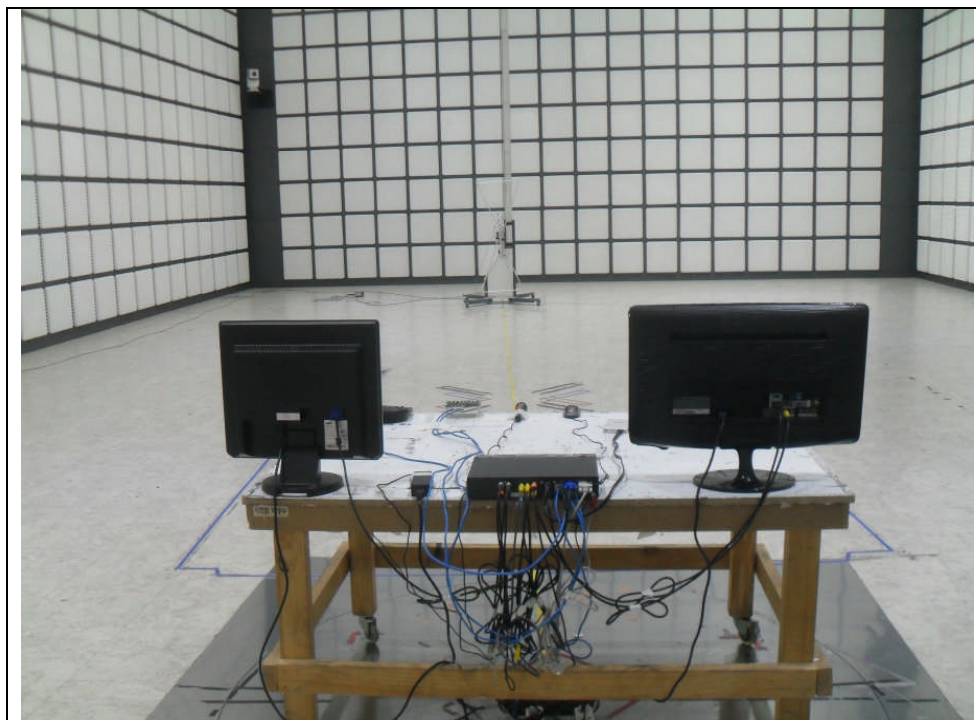
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

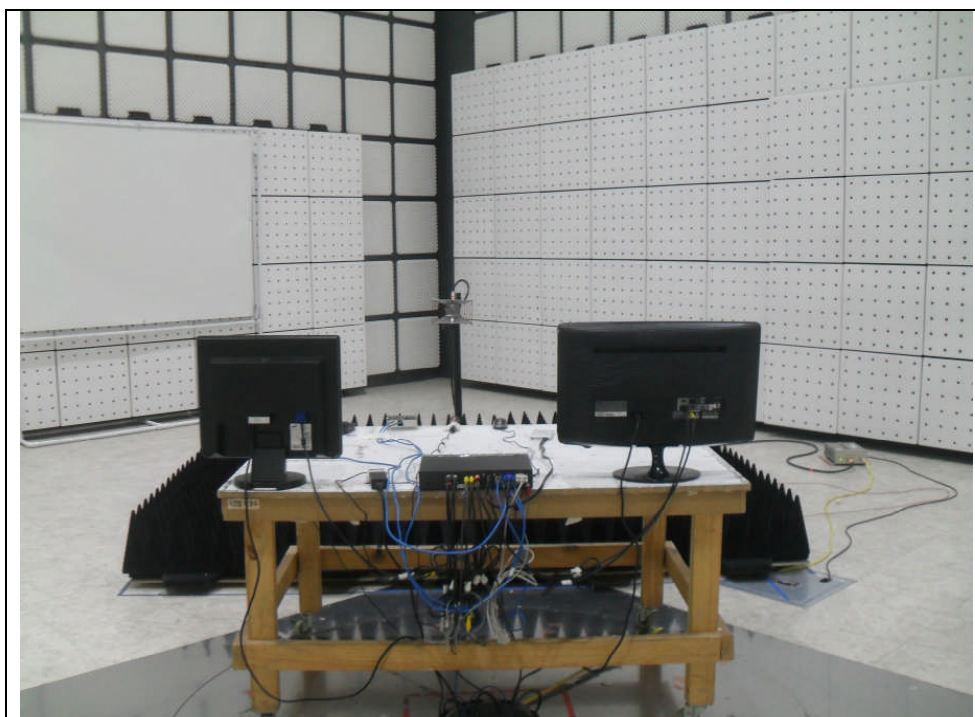
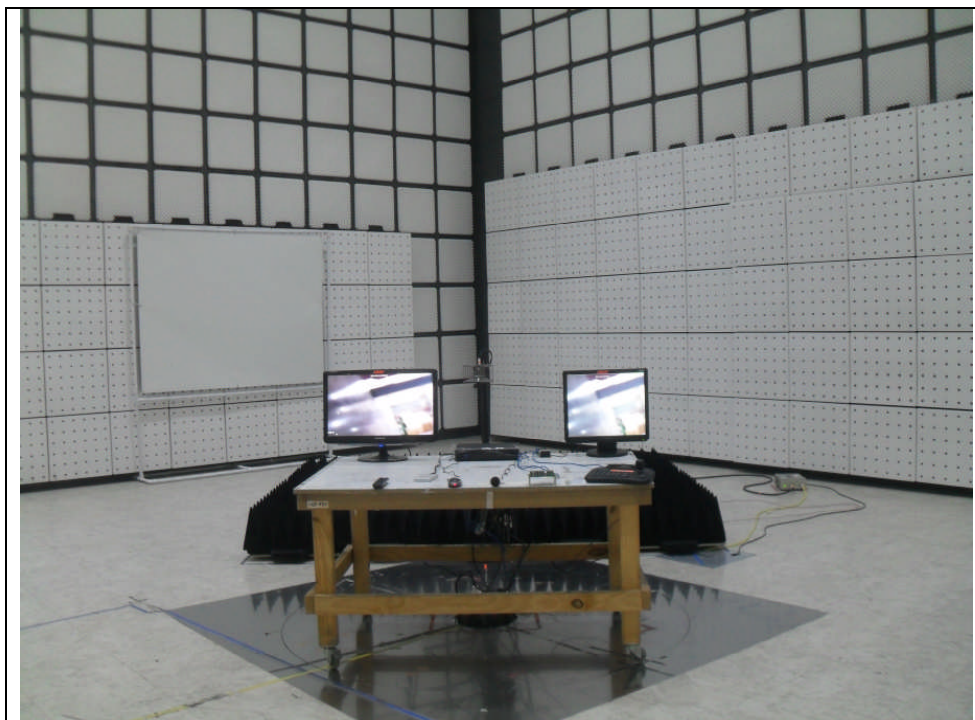
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}\mu\text{V/m}$$

6.2.5 Photographs of test setup

* 30 MHz ~ 1 GHz



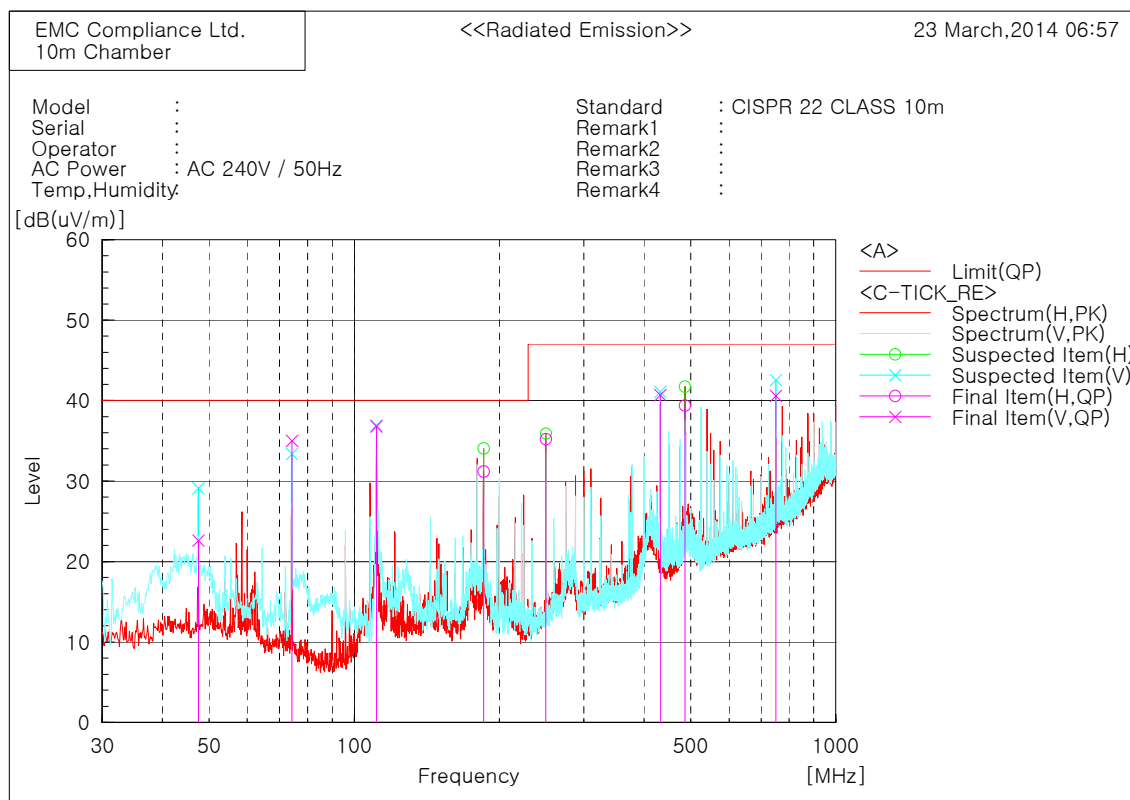
* 1 GHz ~ 6 GHz



6.2.6 Radiated emission measurement result

* Graph and Data

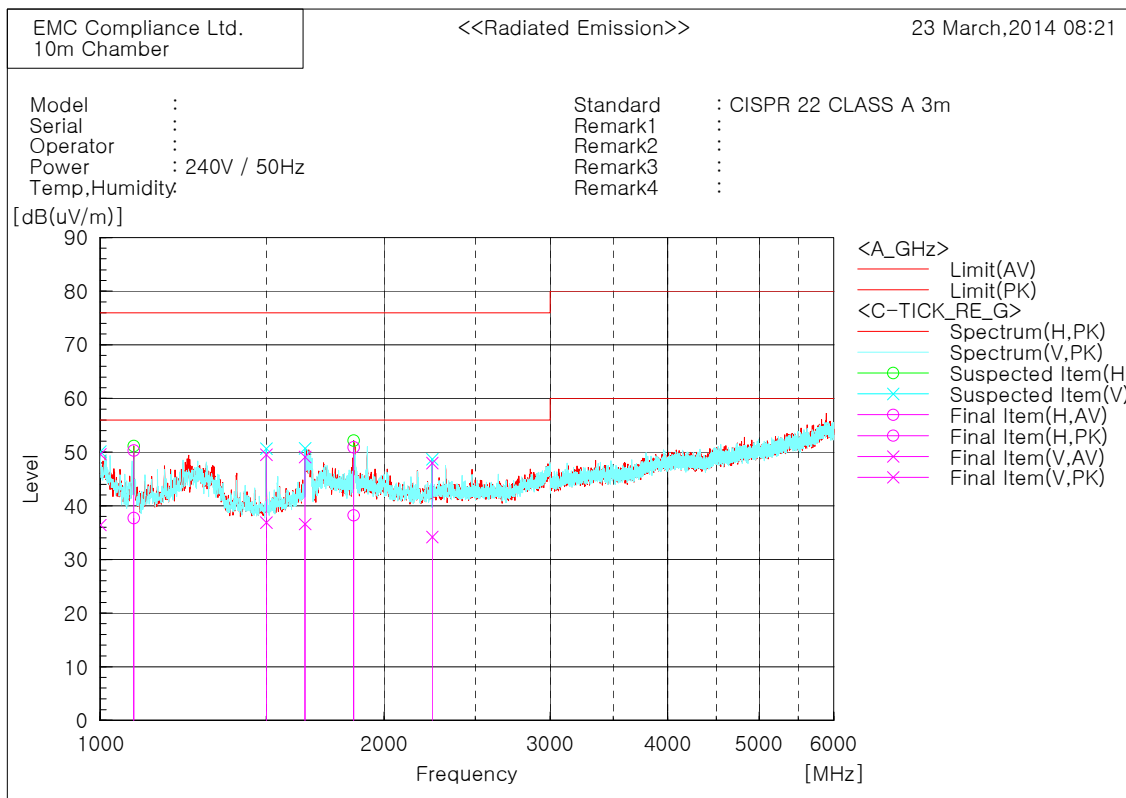
* 30 MHz ~ 1 GHz (SRD-445P)



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	47.460	V	35.8	-13.2	22.6	40.0	17.4	400.0	46.7
2	74.256	V	51.5	-16.5	35.0	40.0	5.0	100.0	358.1
3	111.238	V	53.0	-16.2	36.8	40.0	3.2	100.0	122.6
4	185.564	H	45.0	-13.8	31.2	40.0	8.8	400.0	184.8
5	249.947	H	47.3	-12.1	35.2	47.0	11.8	400.0	330.7
6	431.944	V	47.0	-6.3	40.7	47.0	6.3	100.0	233.5
7	486.021	H	44.3	-4.9	39.4	47.0	7.6	210.0	130.1
8	749.983	V	39.9	0.7	40.6	47.0	6.4	290.0	328.9

* 1 GHz ~ 6 GHz (SRD-445P)



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1000.000	V	42.4	55.6	-6.0	36.4	49.6	56.0	76.0	19.6	26.4	100.0	73.0
2	1085.000	H	43.1	55.7	-5.4	37.7	50.3	56.0	76.0	18.3	25.7	100.0	104.1
3	1500.000	V	39.2	51.8	-2.3	36.9	49.5	56.0	76.0	19.1	26.5	100.0	101.0
4	1648.750	V	37.6	50.1	-1.0	36.6	49.1	56.0	76.0	19.4	26.9	100.0	126.3
5	1857.500	H	38.0	50.7	0.2	38.2	50.9	56.0	76.0	17.8	25.1	100.0	154.5
6	2250.000	V	33.1	46.9	1.1	34.2	48.0	56.0	76.0	21.8	28.0	100.0	126.3

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



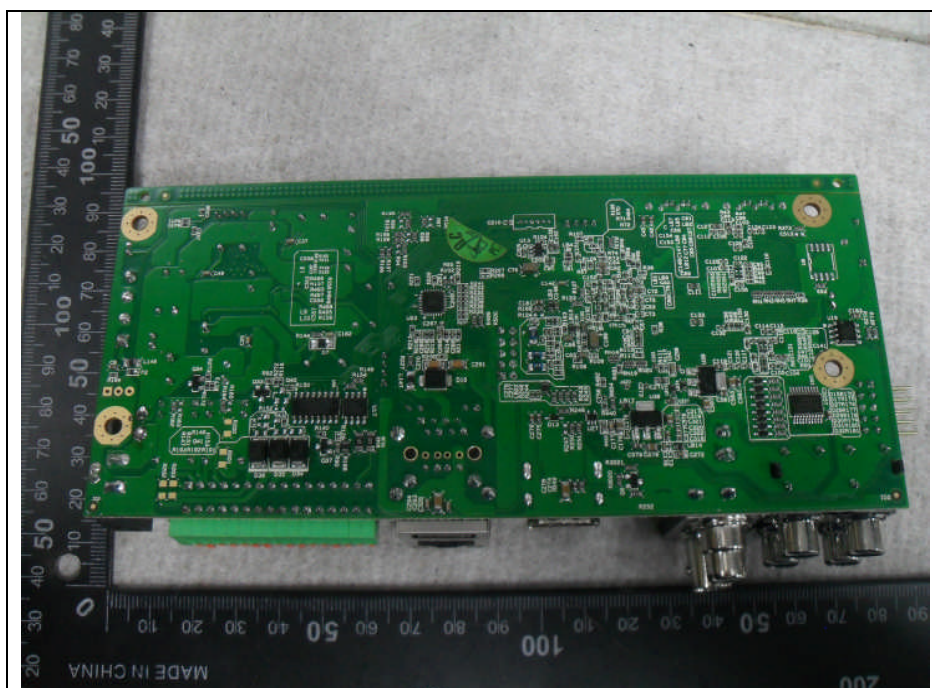
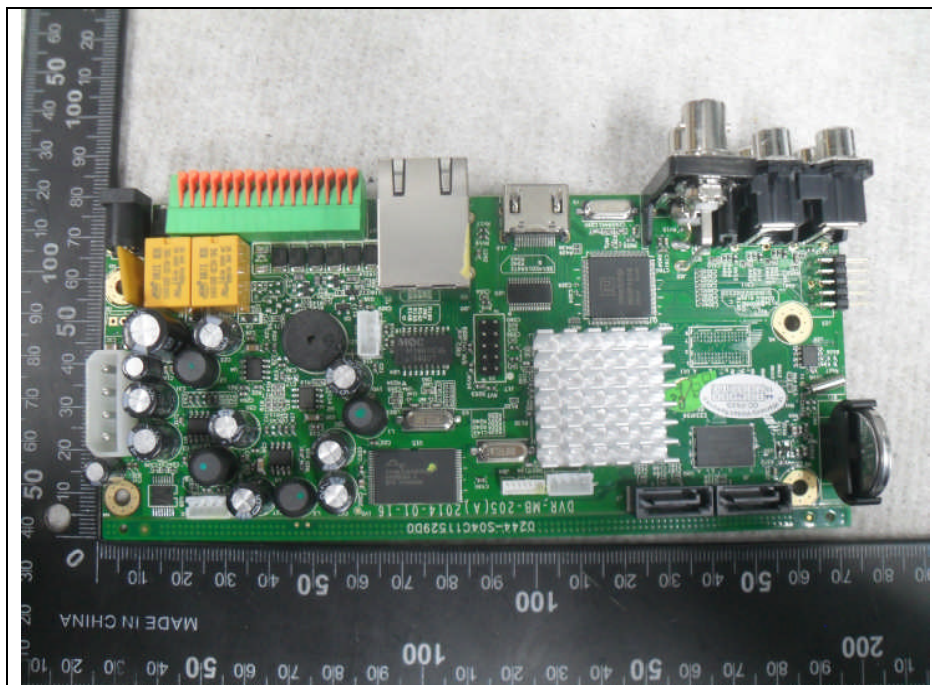
Bottom View



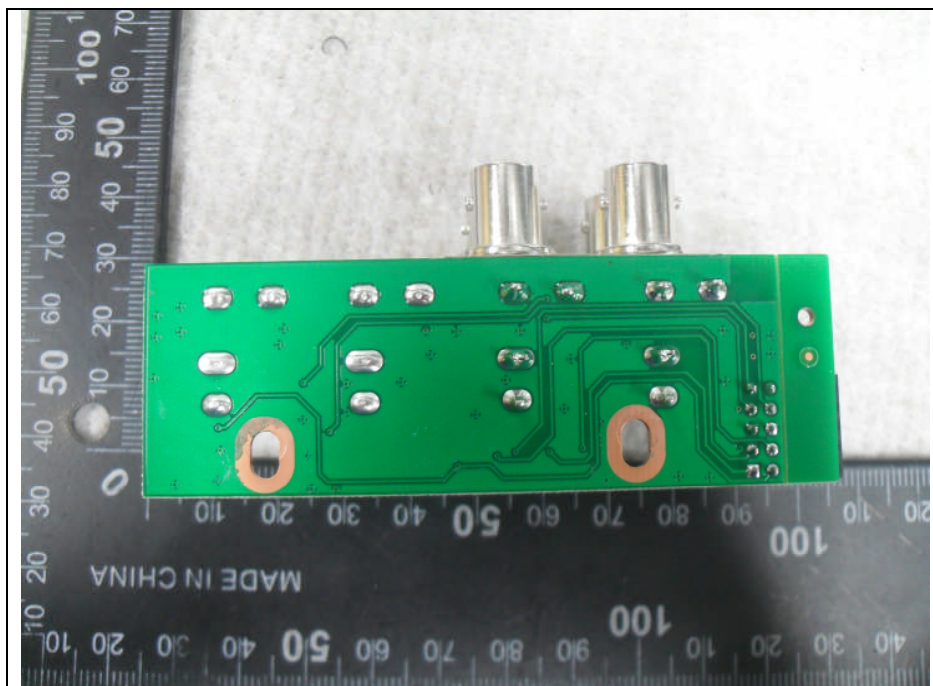
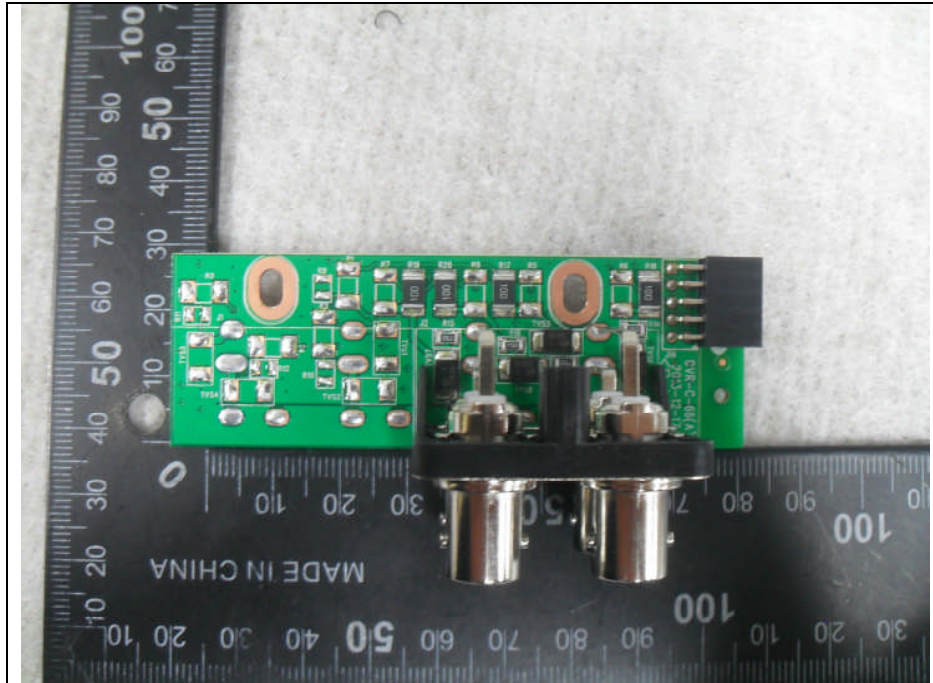
Inside



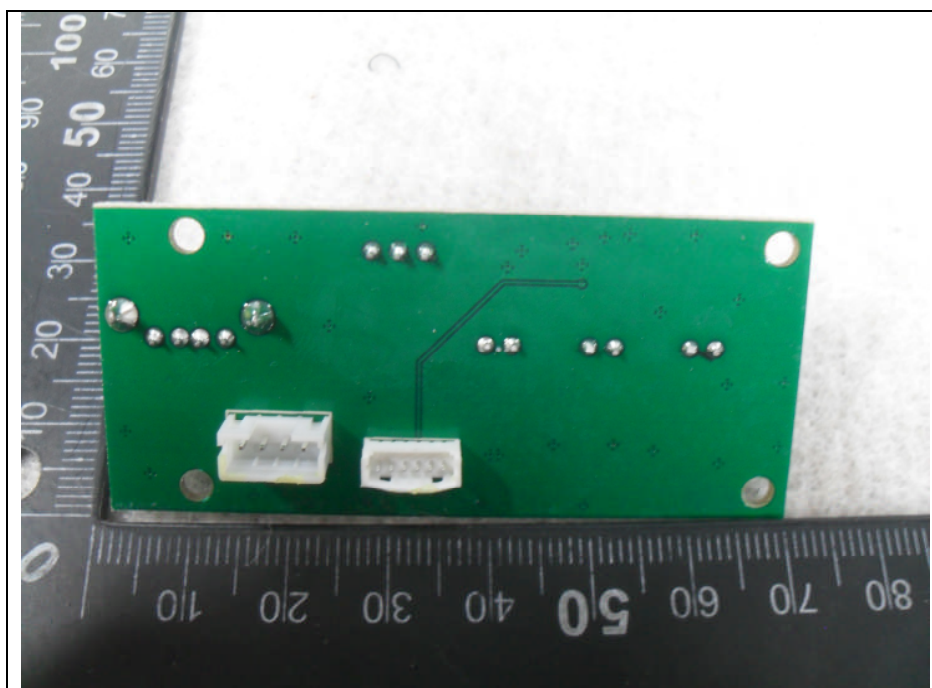
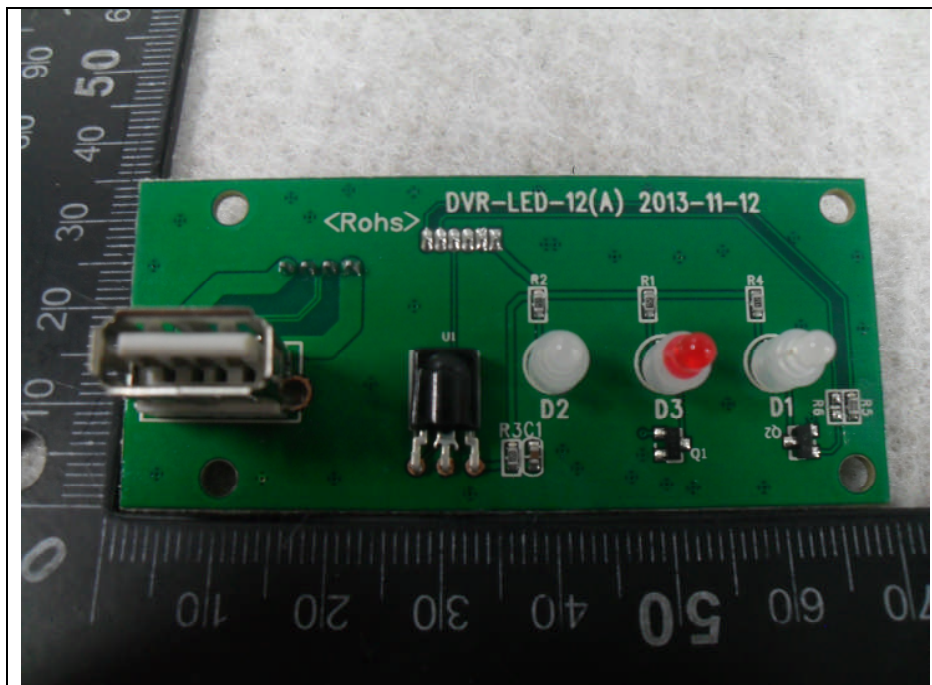
Main Board



SUB Board



LED Board



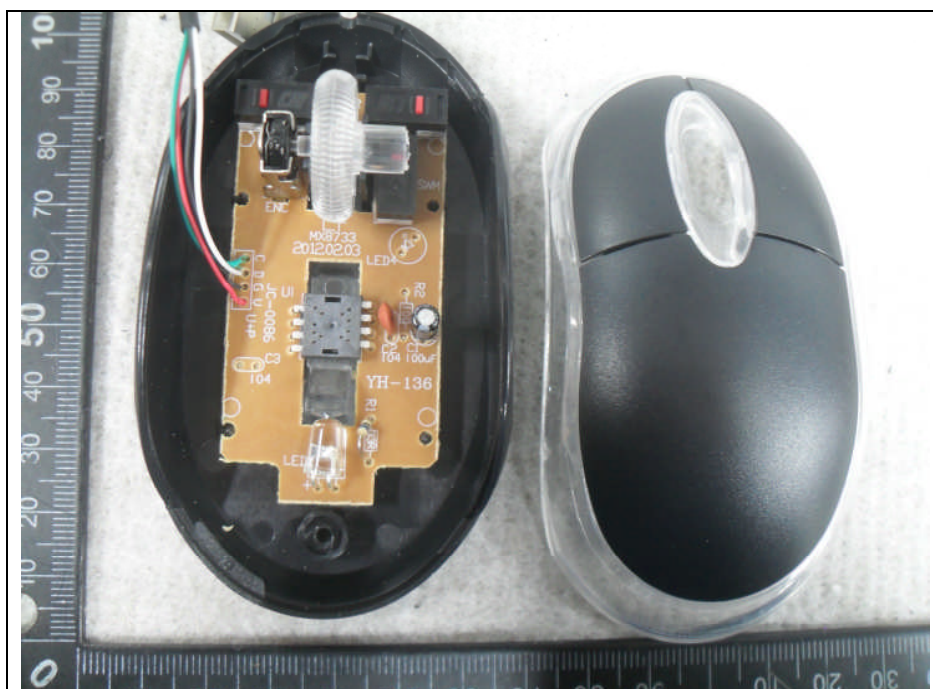
HDD (1TB)

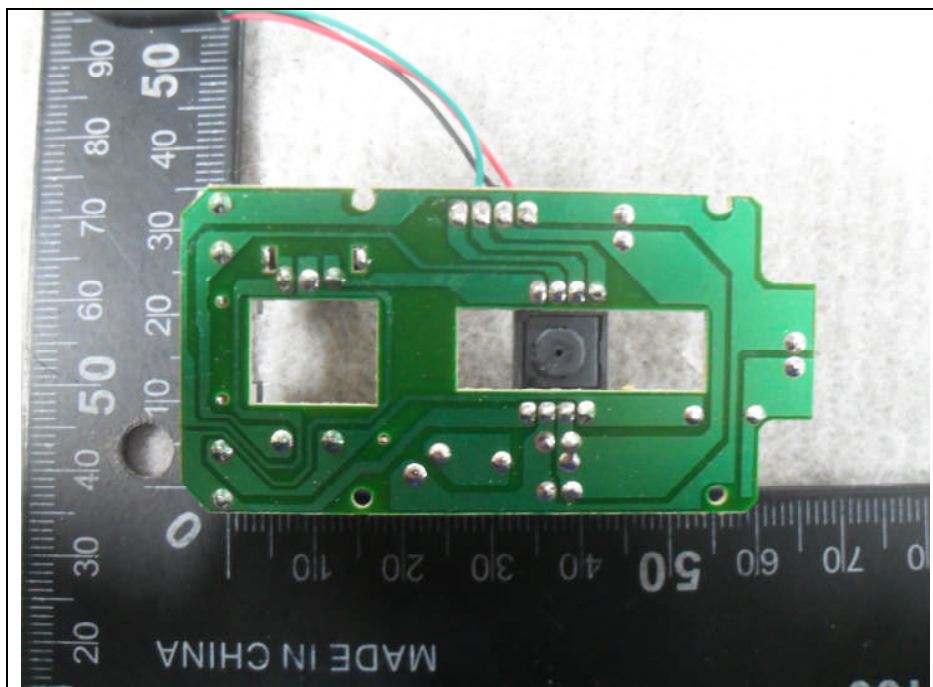
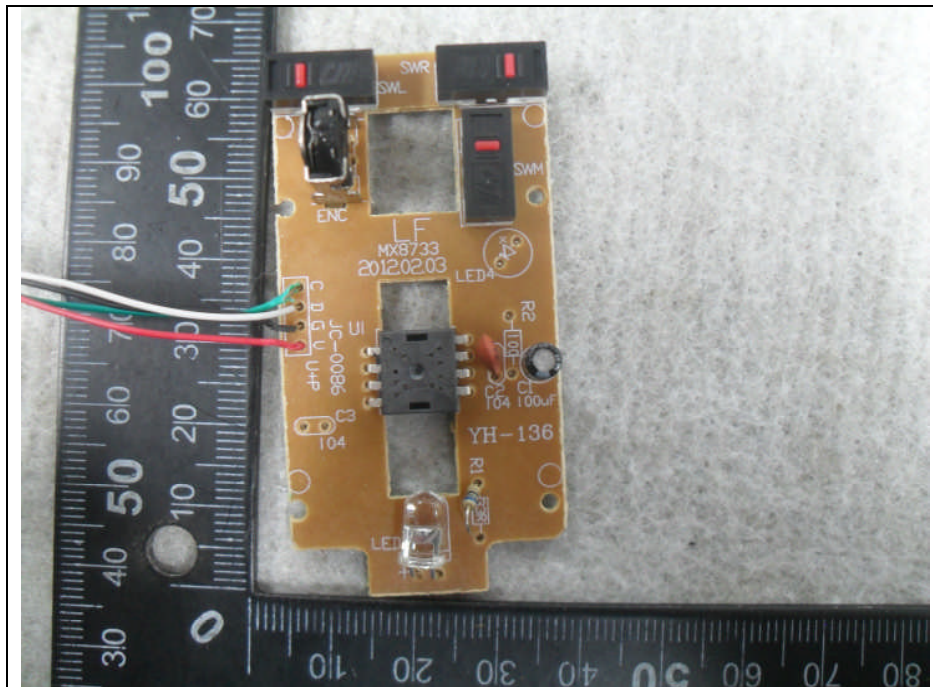




USB Mouse

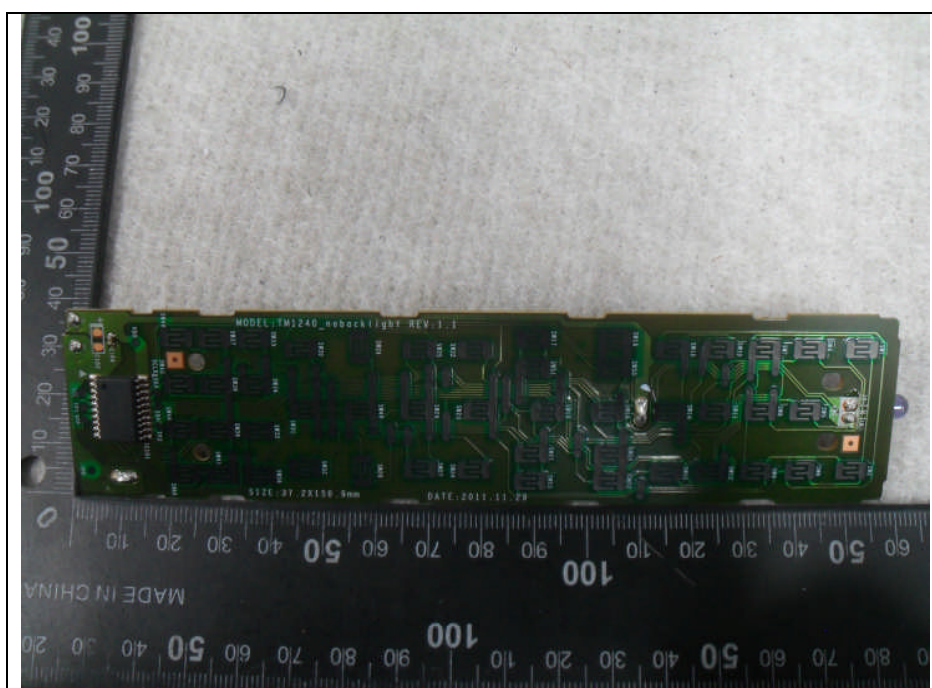
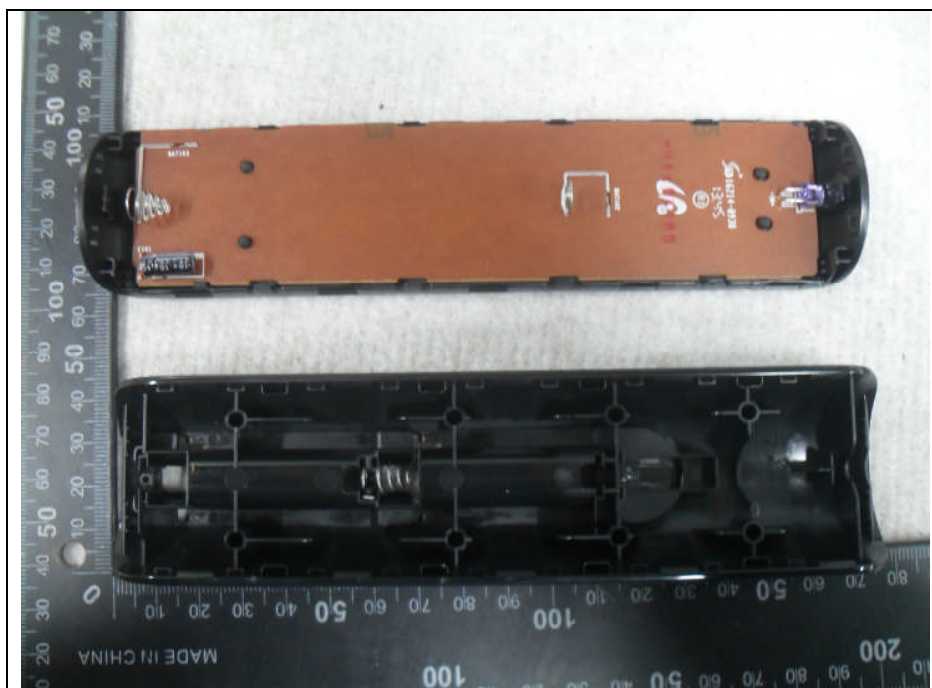


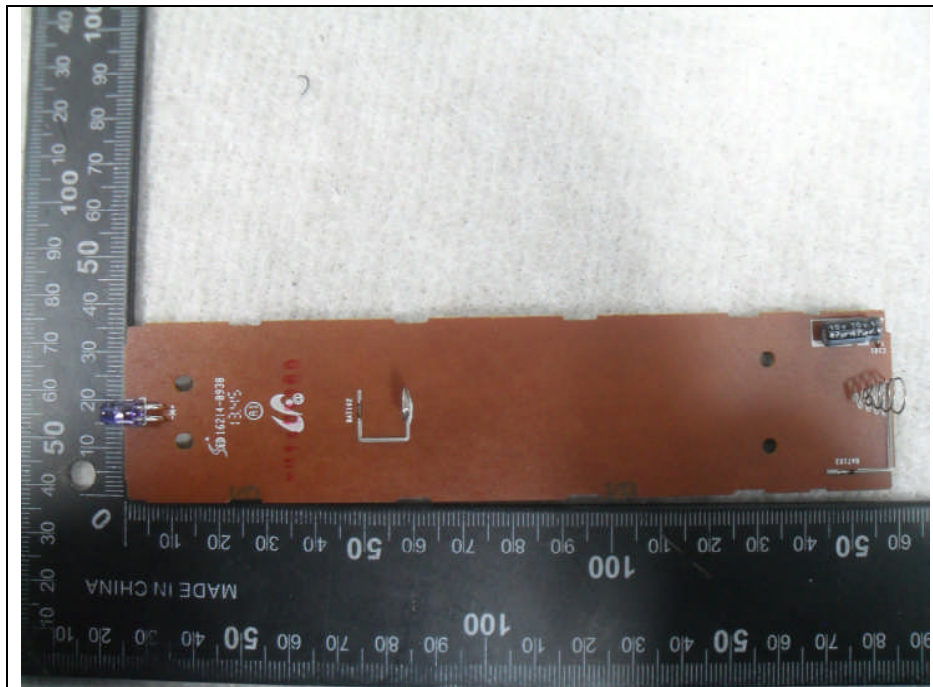




Remote Control







AC/DC Adaptor



