

EMC TEST REPORT

Test report No : EMC-VCCI-0373
Type of Equipment : Digital Video Recorder
Model Name : SRD-445N
Applicant : Samsung Techwin Co., Ltd.
84, Jeongdong-ro, Seongsan-gu,
Changwon-si, Gyeongsangnam-do, Korea
Manufacturer#1 : Samsung Techwin Co., Ltd.
84, Jeongdong-ro, Seongsan-gu,
Changwon-si, Gyeongsangnam-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 / 2013.04, 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: 2014. 03. 19

Date of testing: 2014. 03. 21 ~ 03. 23

Issued date: 2014. 03. 26

Tested by:


KIM, JIN-WON

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
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2. Laboratory information

Address

EMC compliance Ltd.

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-390, Korea

Telephone Number: 82 31 336 9919

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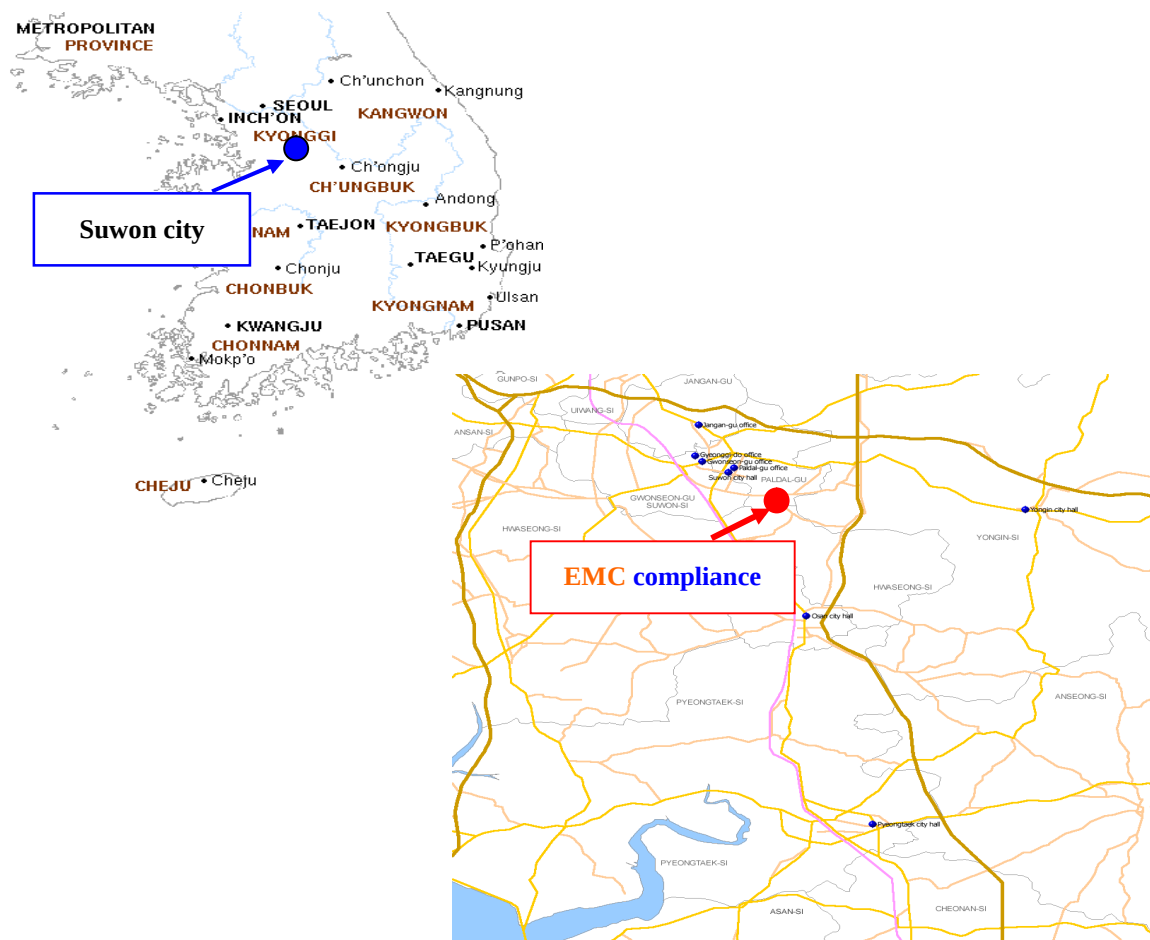
FCC CAB.: KR0040

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
	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

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, Thailanda's, Rumania, Serbia, Croatia, Hungary, Greek, Chinese (Traditional), Finnish, Norwegian (25 Language)		

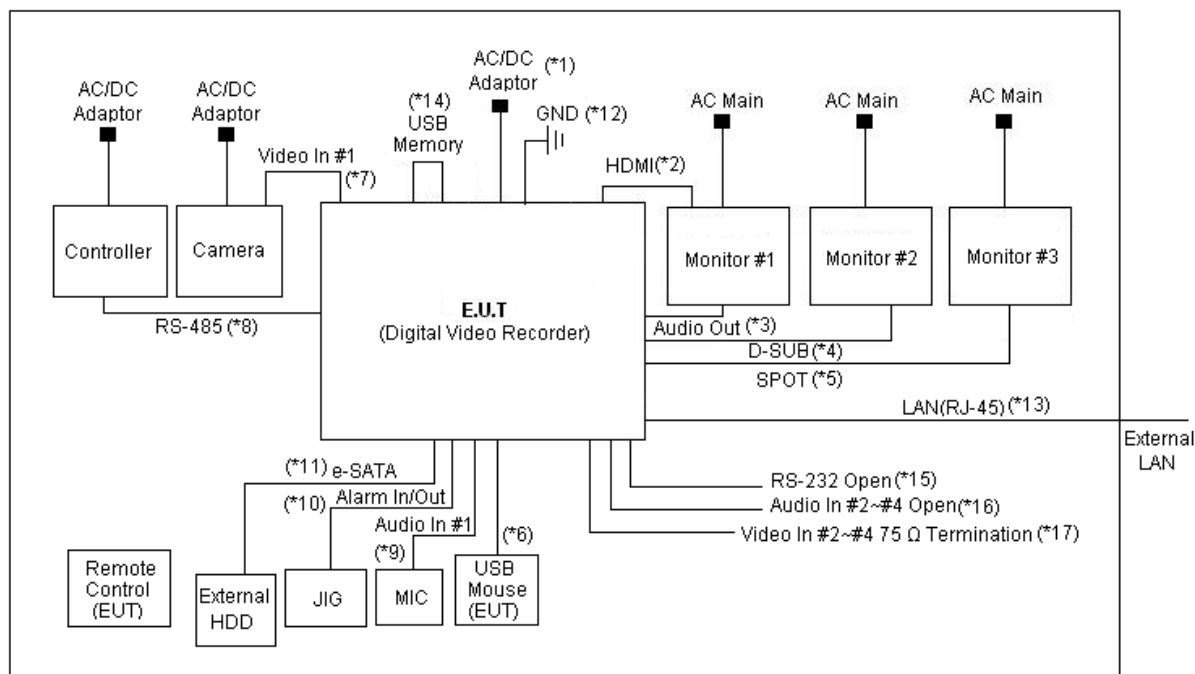
4.2 Product description

Type of product	Digital Video Recorder
Model name (Basic)	SRD-445N
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	100 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	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.
	Controller Test.

5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
☒	Conducted Emission	VCCI V-3 / 2013.04, Class A	Complied
☒	Radiated Emission	VCCI V-3 / 2013.04, Class A	Complied

6. Test results

6.1 Conducted Emission

Test specification	VCCI V-3 / 2013.04, Class A		
Testing voltage	100 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 (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

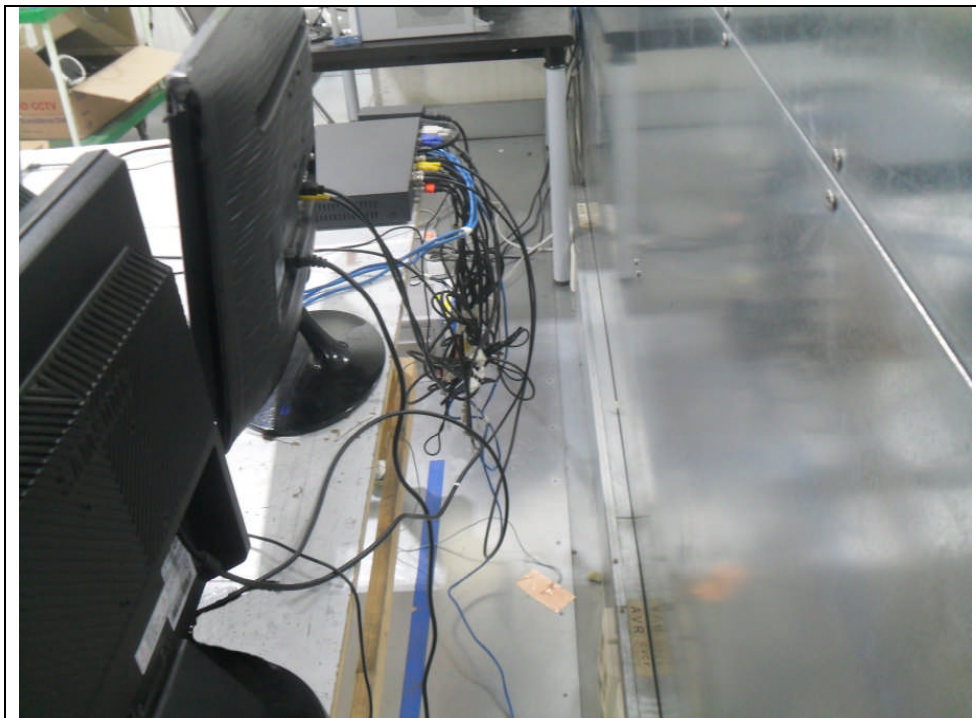
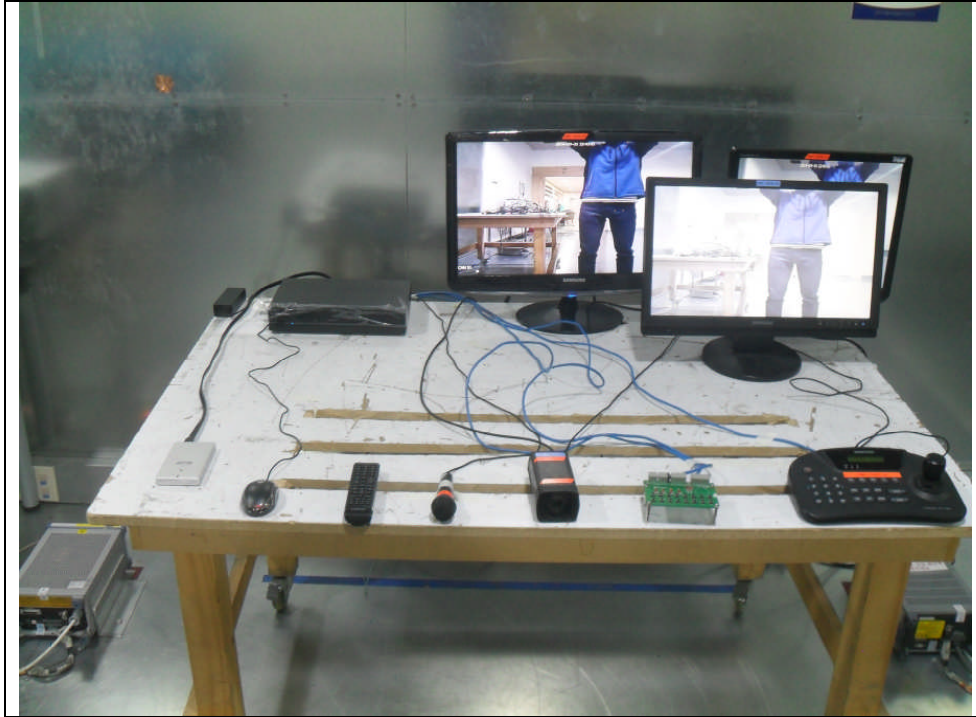
The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground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

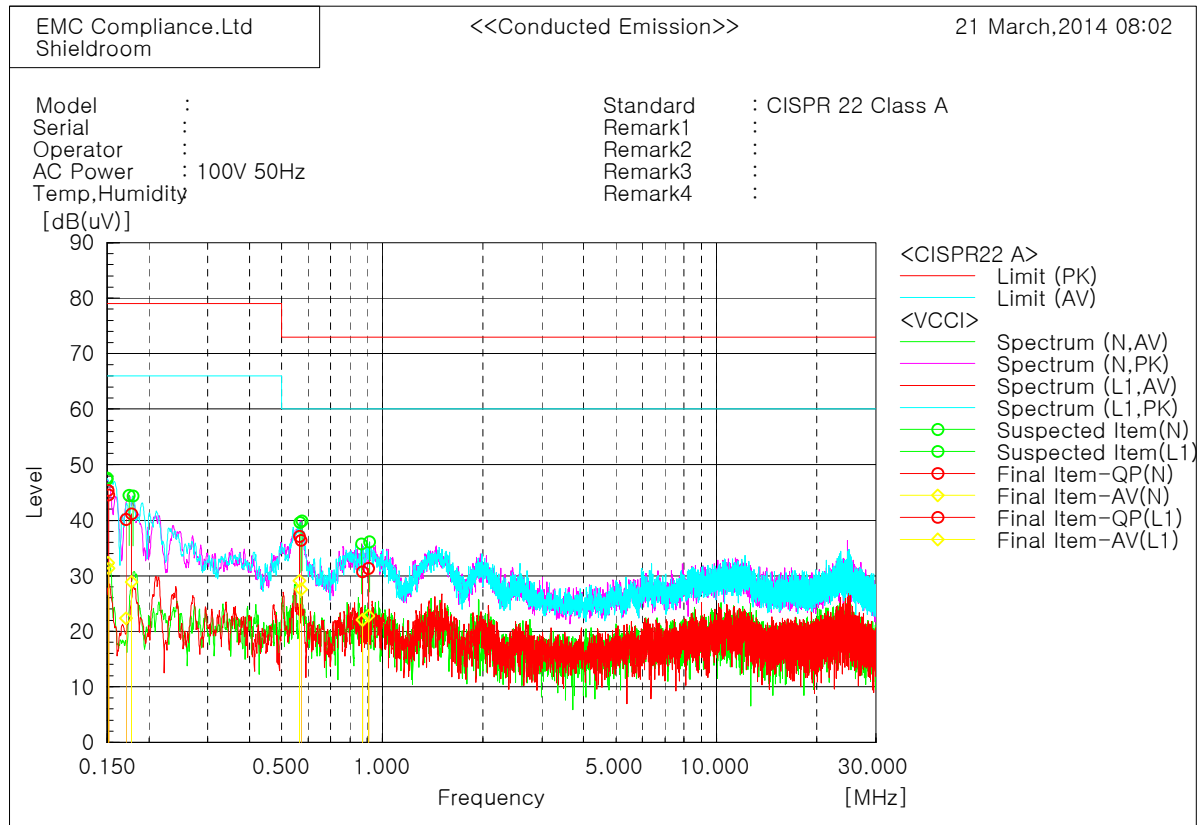


* Telecommunication



6.1.5 Conducted emission measurement result

* AC Main (SRD-445N)



Final Result

--- N Phase ---

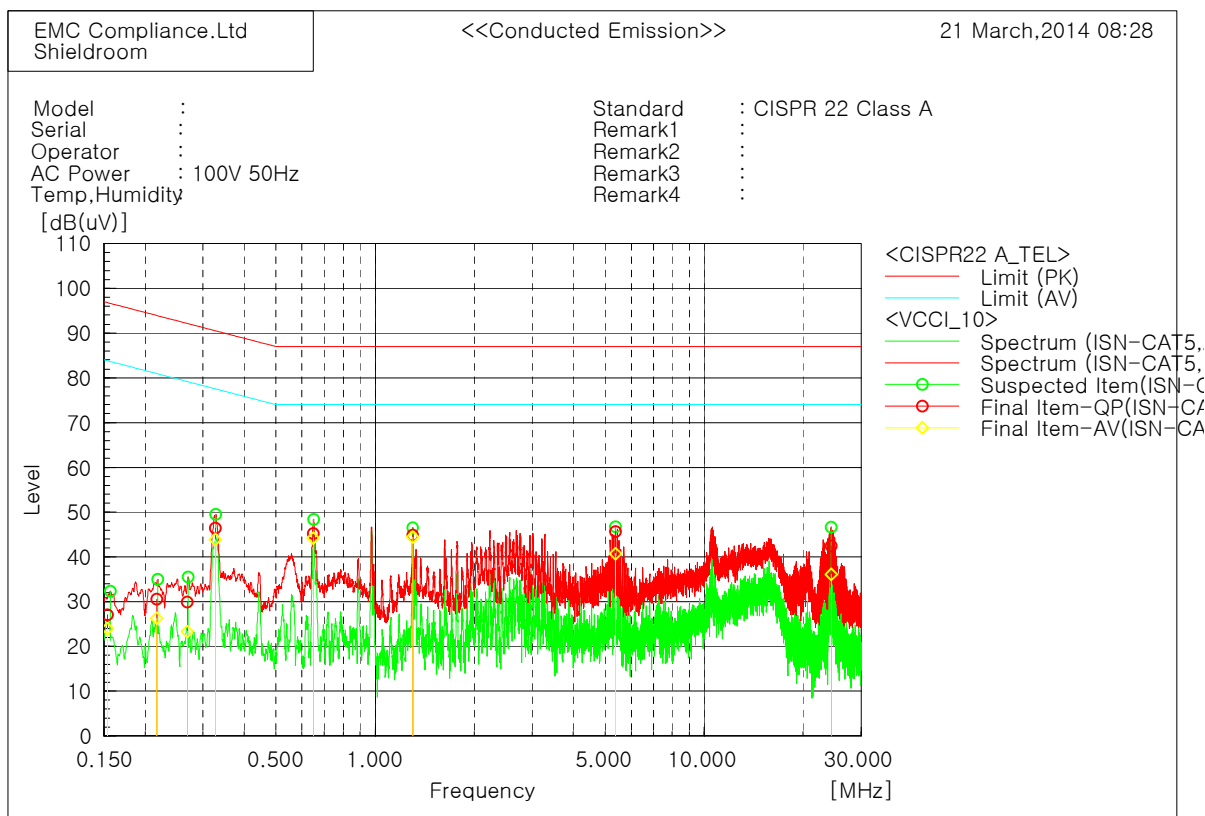
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	[dB]
1	0.15169	34.6	21.3	10.0	44.6	31.3	79.0	66.0	34.4	34.7
2	0.17122	30.2	12.3	10.0	40.2	22.3	79.0	66.0	38.8	43.7
3	0.57134	26.3	17.5	10.0	36.3	27.5	73.0	60.0	36.7	32.5
4	0.87234	20.8	12.1	9.9	30.7	22.0	73.0	60.0	42.3	38.0

--- 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	0.15095	35.4	22.3	10.0	45.4	32.3	79.0	66.0	33.6	33.7
2	0.17739	31.1	18.9	10.0	41.1	28.9	79.0	66.0	37.9	37.1
3	0.56518	27.1	19.1	10.0	37.1	29.1	73.0	60.0	35.9	30.9
4	0.90984	21.4	12.8	9.9	31.3	22.7	73.0	60.0	41.7	37.3

* Telecommunication port

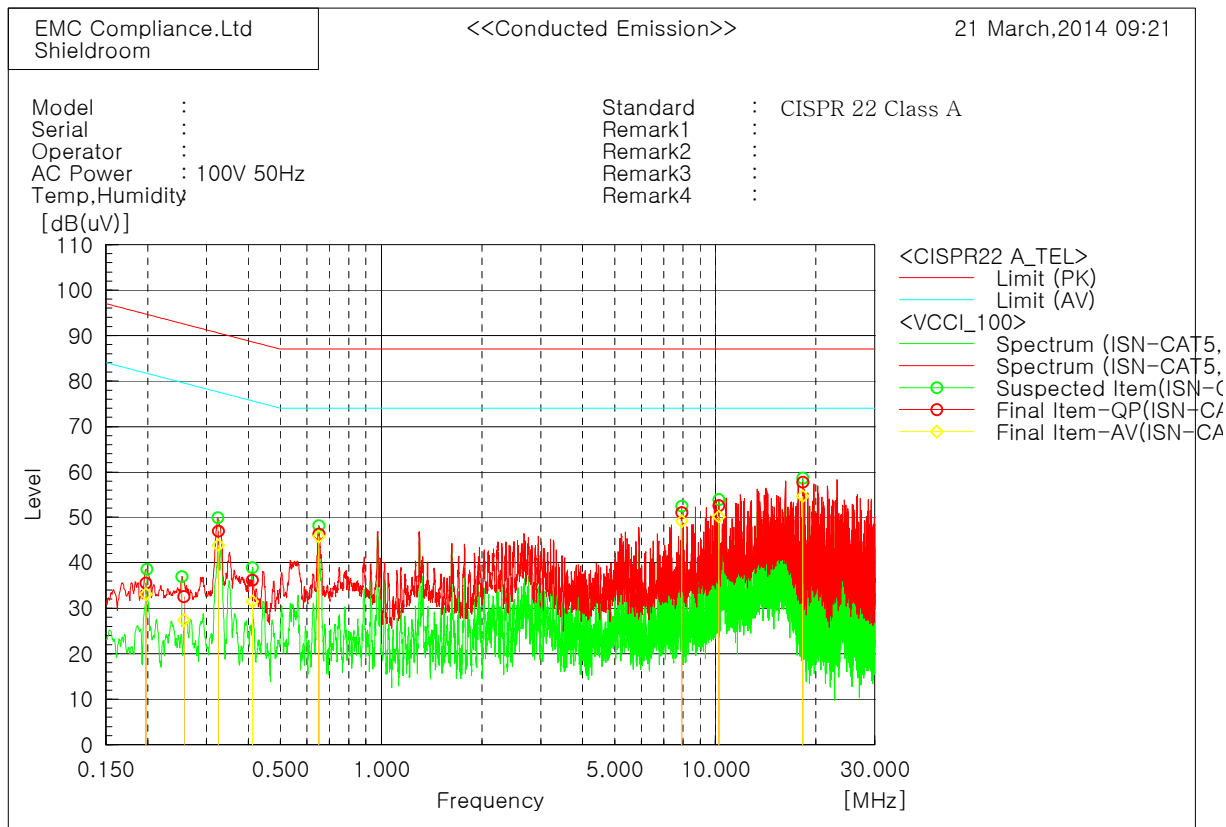
* LCL 65 dB (LAN Port)_10Mbps (SRD-445N)



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	0.26823	20.3	13.7	9.6	29.9	23.3	92.2	79.2	62.3	55.9
2	0.15366	17.2	14.2	9.8	27.0	24.0	96.8	83.8	69.8	59.8
3	0.21649	20.8	16.6	9.7	30.5	26.3	94.0	81.0	63.5	54.7
4	24.27562	32.9	26.5	9.6	42.5	36.1	87.0	74.0	44.5	37.9
5	5.37914	36.3	31.3	9.4	45.7	40.7	87.0	74.0	41.3	33.3
6	0.32623	36.8	34.3	9.6	46.4	43.9	90.5	77.5	44.1	33.6
7	0.64829	35.7	34.7	9.5	45.2	44.2	87.0	74.0	41.8	29.8
8	1.3003	35.4	35.0	9.4	44.8	44.4	87.0	74.0	42.2	29.6

* LCL 65 dB (LAN Port)_100Mbps (SRD-445N)



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(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	[dB]
1	0.19726	25.8	23.4	9.7	35.5	33.1	94.7	81.7	59.2	48.6
2	0.25715	22.8	17.7	9.7	32.5	27.4	92.5	79.5	60.0	52.1
3	0.32545	37.4	34.3	9.6	47.0	43.9	90.6	77.6	43.6	33.7
4	0.41188	26.7	22.0	9.5	36.2	31.5	88.6	75.6	52.4	44.1
5	0.65068	36.8	36.2	9.5	46.3	45.7	87.0	74.0	40.7	28.3
6	7.9235	41.6	39.7	9.4	51.0	49.1	87.0	74.0	36.0	24.9
7	10.24314	43.1	40.8	9.4	52.5	50.2	87.0	74.0	34.5	23.8
8	18.24349	48.3	45.2	9.5	57.8	54.7	87.0	74.0	29.2	19.3

6.2 Radiated Emission

Test specification	VCCI V-3 / 2013.04, Class A		
Testing voltage	100 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(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	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

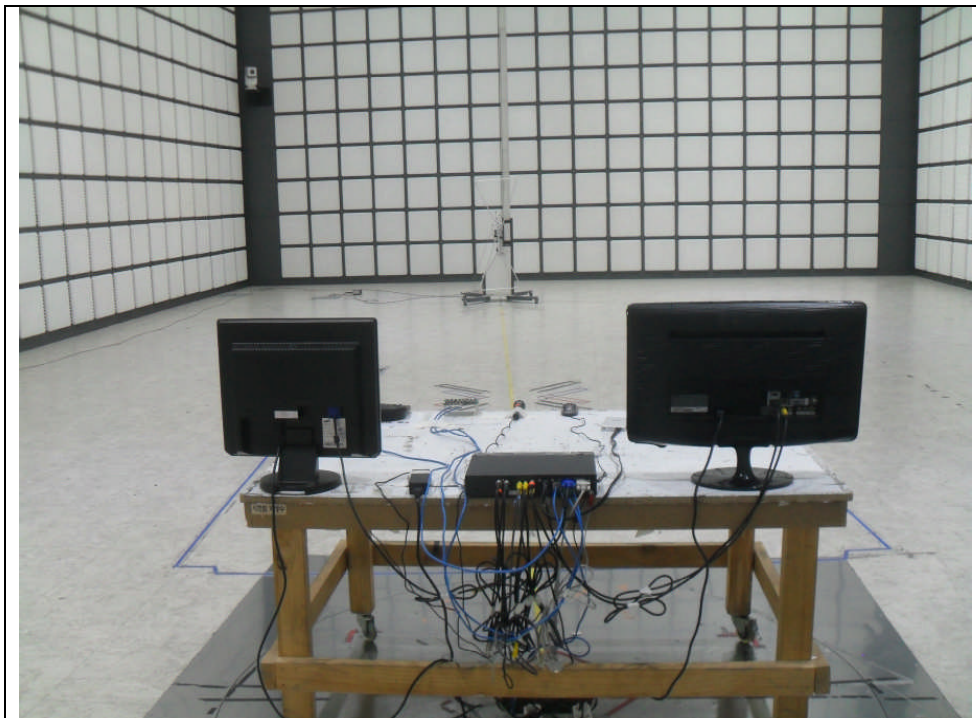
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

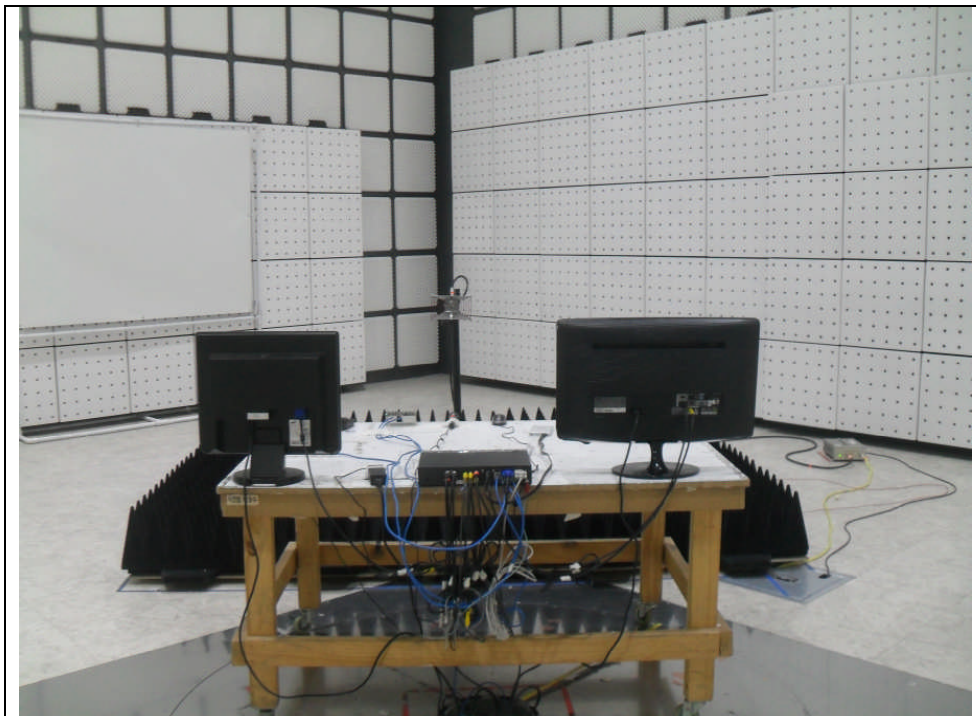
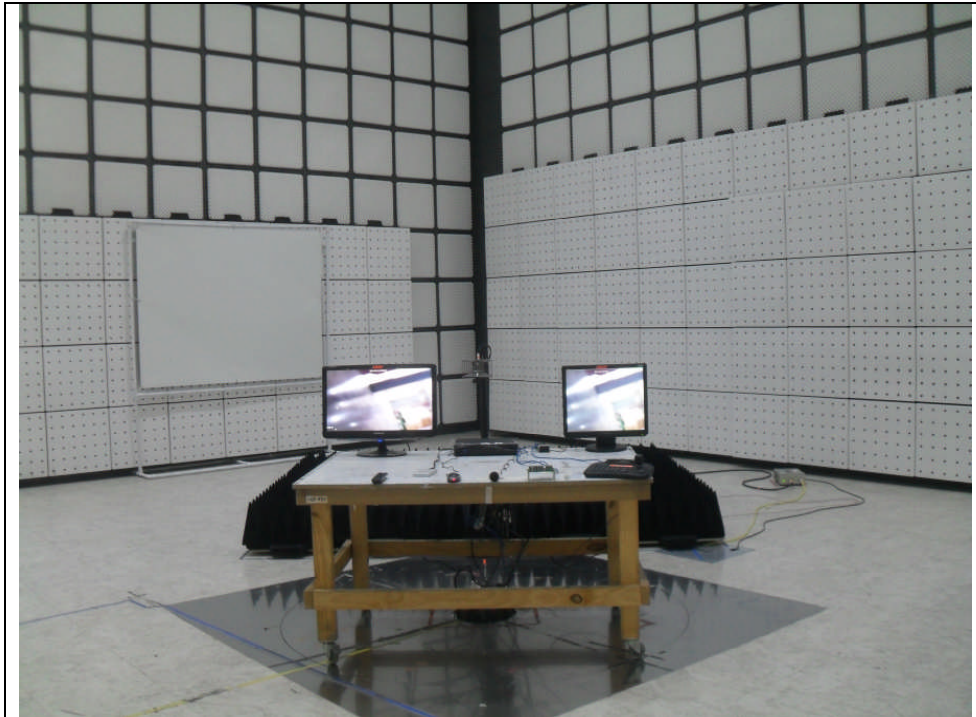
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$$

6.2.5 Photographs of test setup

* 30 MHz ~ 1 GHz



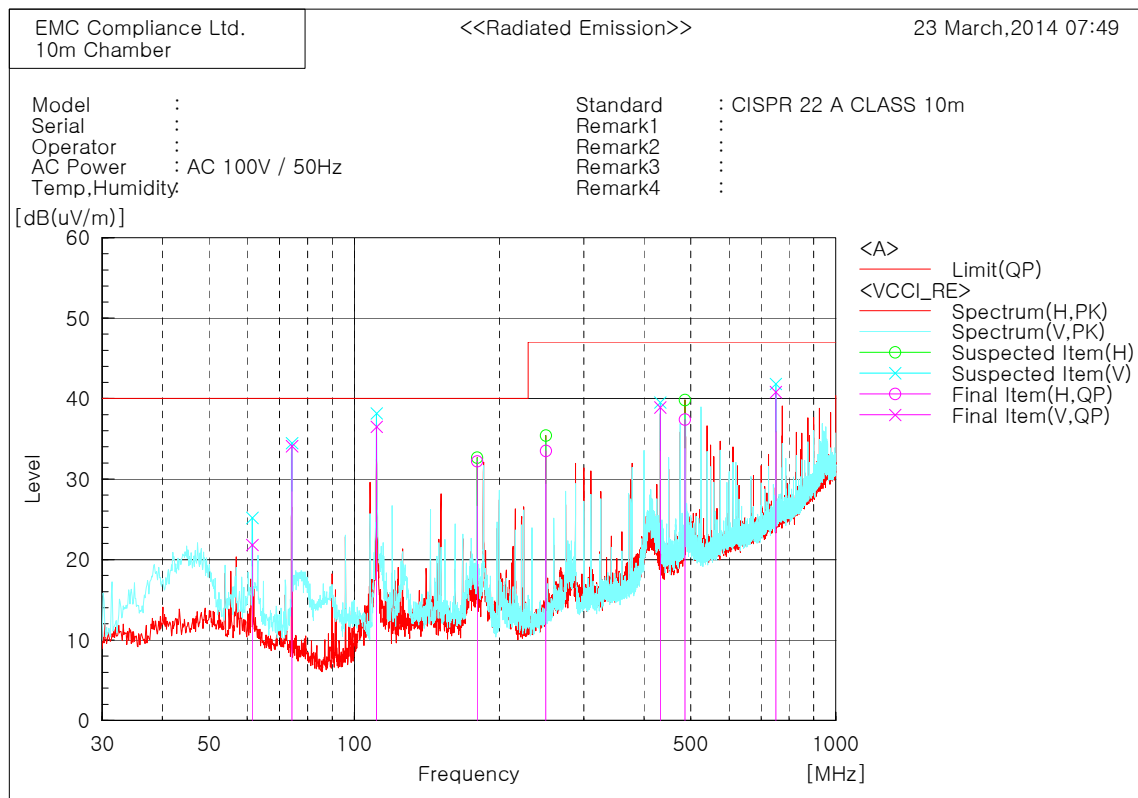
* 1 GHz ~ 6 GHz



6.2.6 Radiated emission measurement result

* Graph and Data

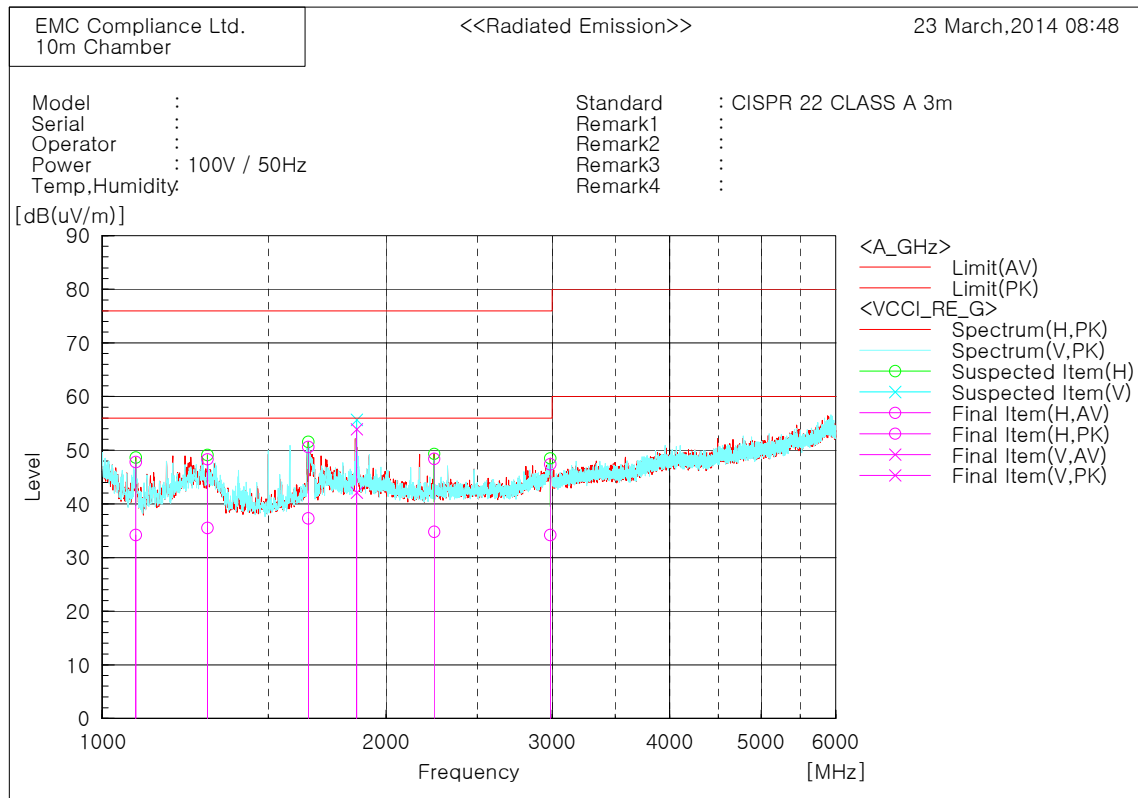
* 30 MHz ~ 1 GHz (SRD-445N)



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	61.404	V	36.2	-14.4	21.8	40.0	18.2	310.0	140.6
2	74.256	V	50.6	-16.5	34.1	40.0	5.9	310.0	251.5
3	111.359	V	52.7	-16.2	36.5	40.0	3.5	100.0	118.0
4	179.986	H	45.4	-13.2	32.2	40.0	7.8	400.0	46.2
5	249.947	H	45.6	-12.1	33.5	47.0	13.5	400.0	215.1
6	431.944	V	45.2	-6.3	38.9	47.0	8.1	400.0	313.6
7	486.021	H	42.3	-4.9	37.4	47.0	9.6	190.0	129.3
8	749.983	V	40.1	0.7	40.8	47.0	6.2	310.0	347.1

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



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	1085.000	H	39.6	53.2	-5.4	34.2	47.8	56.0	76.0	21.8	28.2	100.0	103.5
2	1293.125	H	39.4	52.2	-3.9	35.5	48.3	56.0	76.0	20.5	27.7	100.0	151.3
3	1653.750	H	38.3	51.6	-1.0	37.3	50.6	56.0	76.0	18.7	25.4	100.0	151.3
4	1861.250	V	41.9	53.7	0.2	42.1	53.9	56.0	76.0	13.9	22.1	100.0	123.0
5	2250.000	H	33.7	47.3	1.1	34.8	48.4	56.0	76.0	21.2	27.6	100.0	133.7
6	2987.500	H	30.8	44.0	3.4	34.2	47.4	56.0	76.0	21.8	28.6	100.0	168.9

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



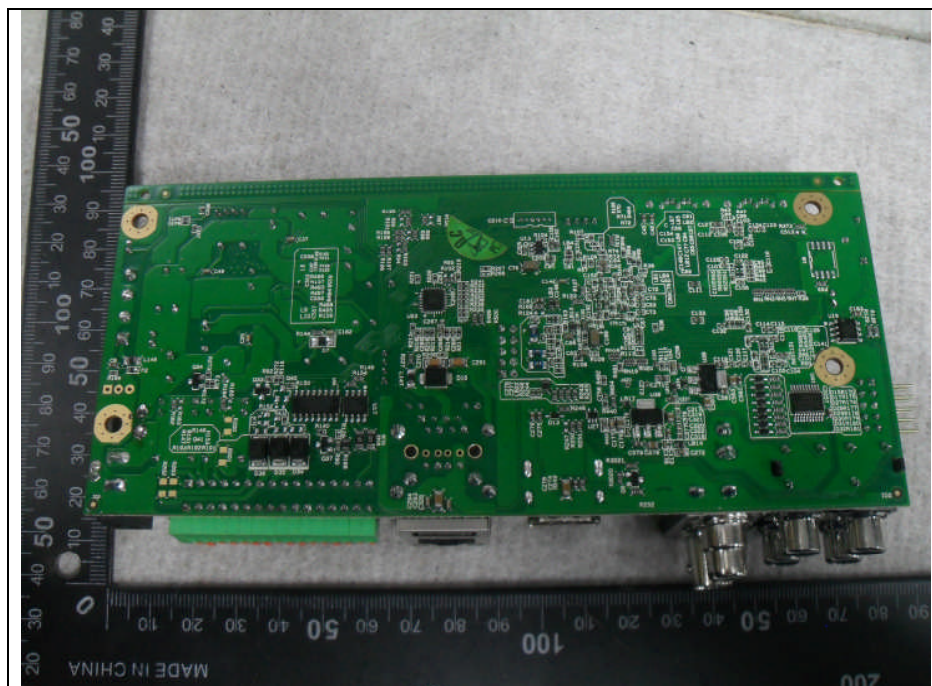
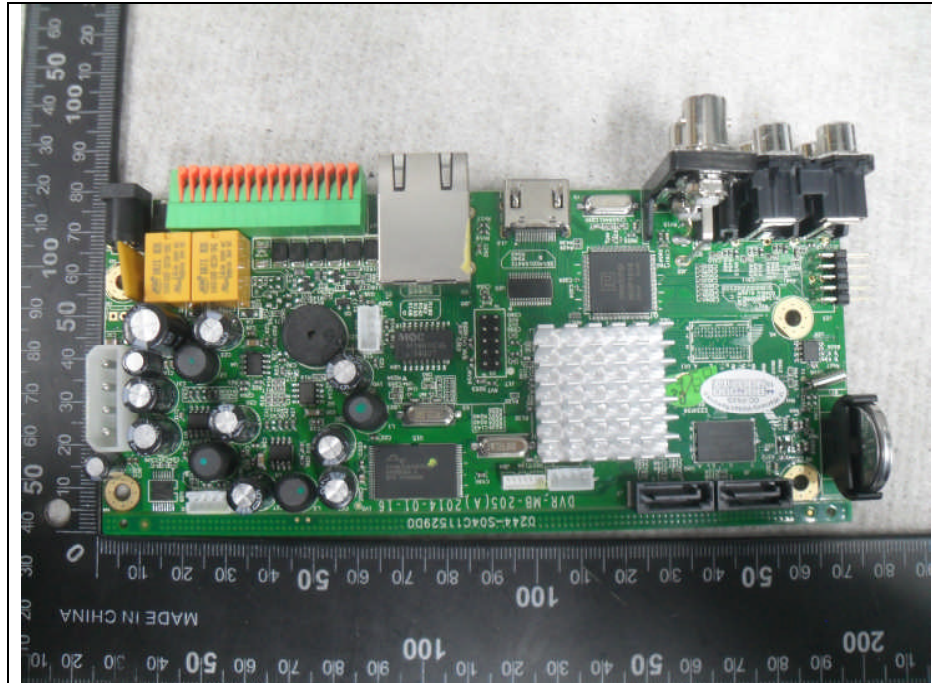
Bottom View



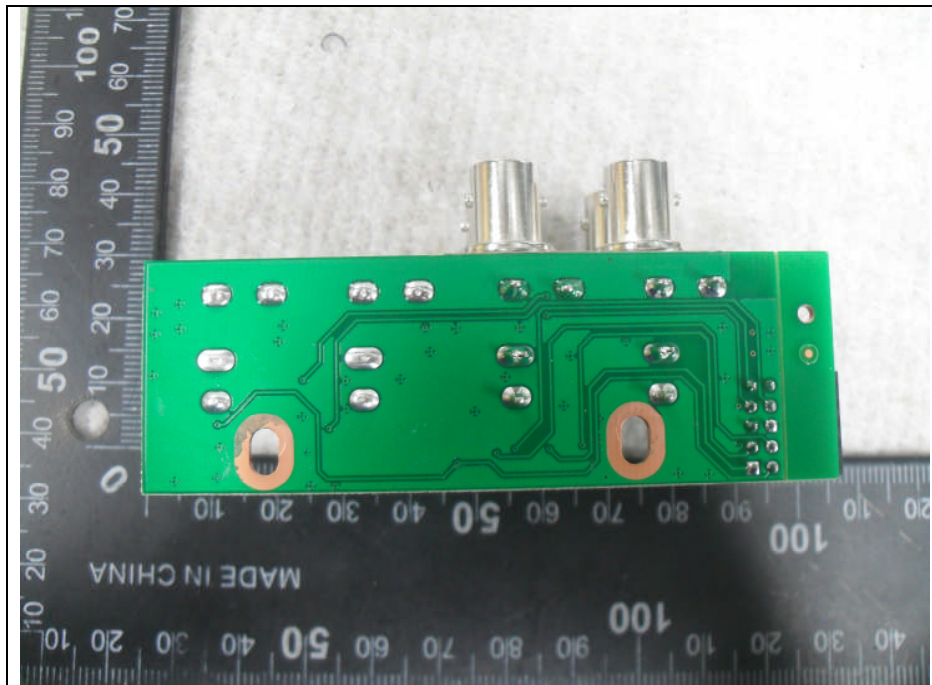
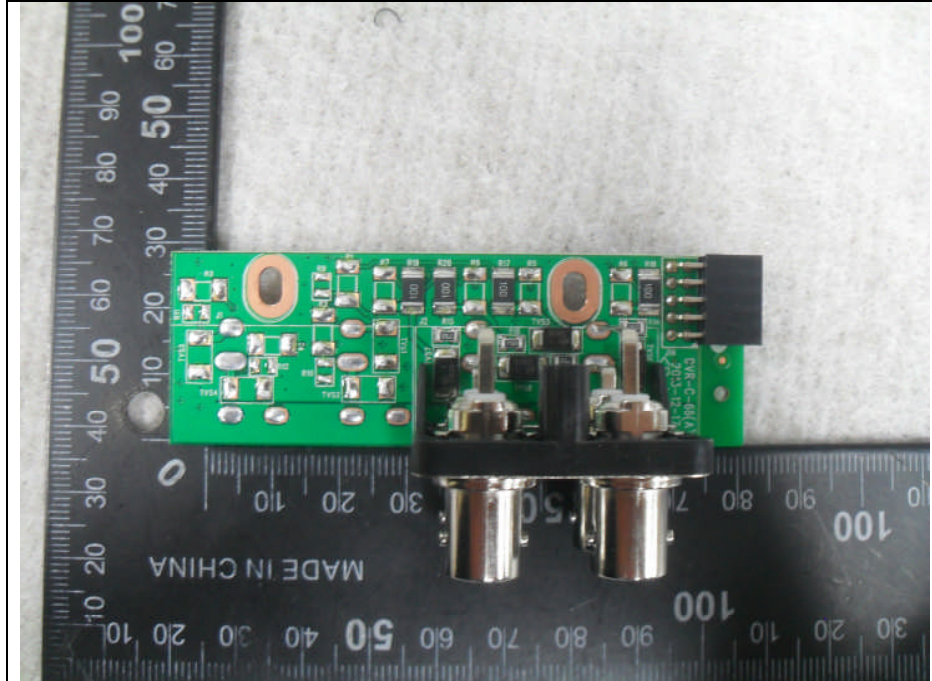
Inside



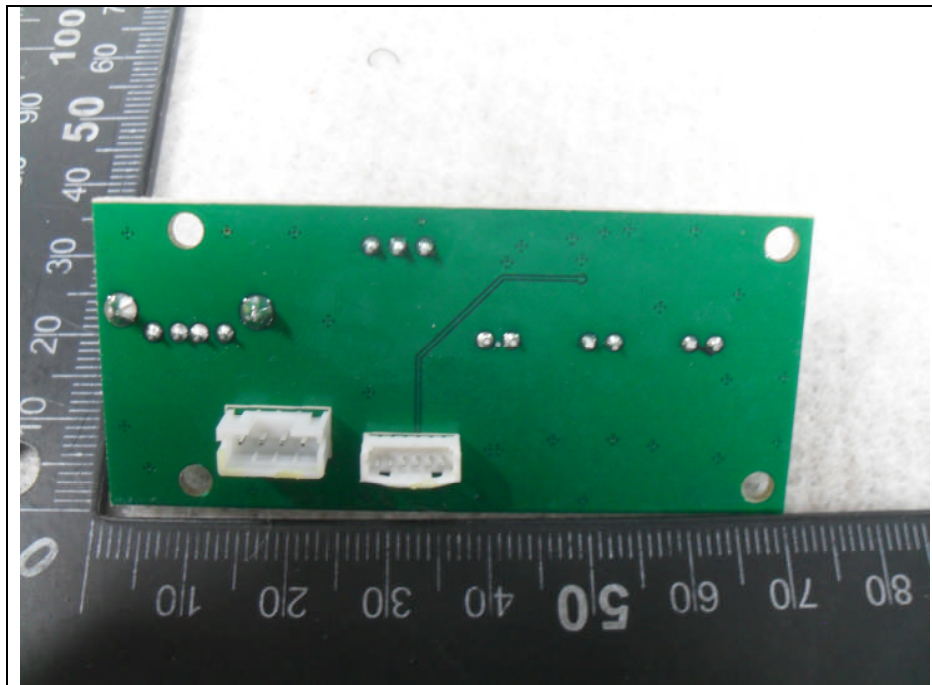
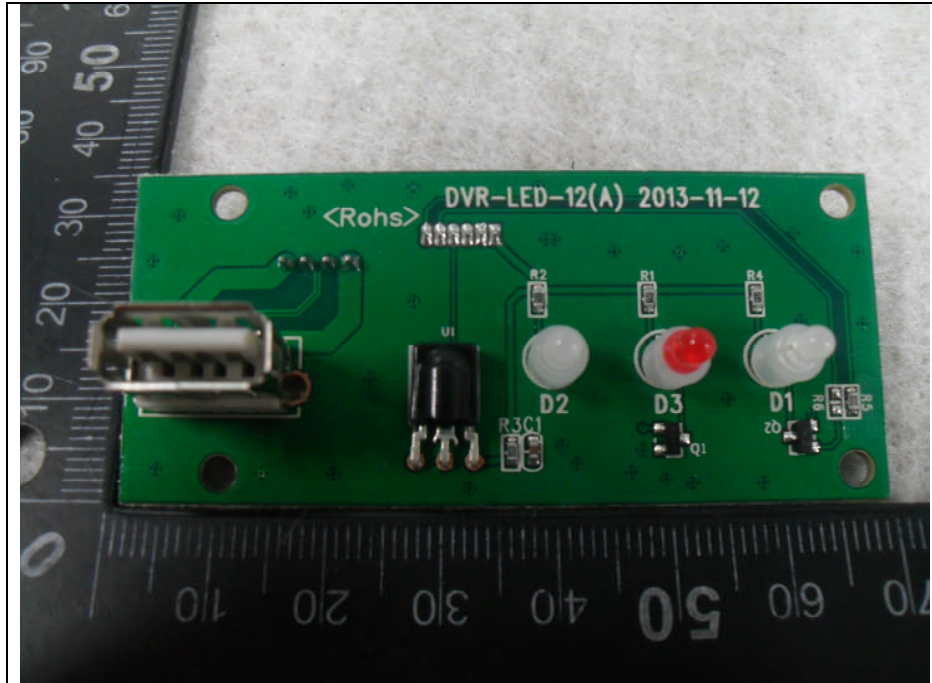
Main Board



SUB Board



LED Board



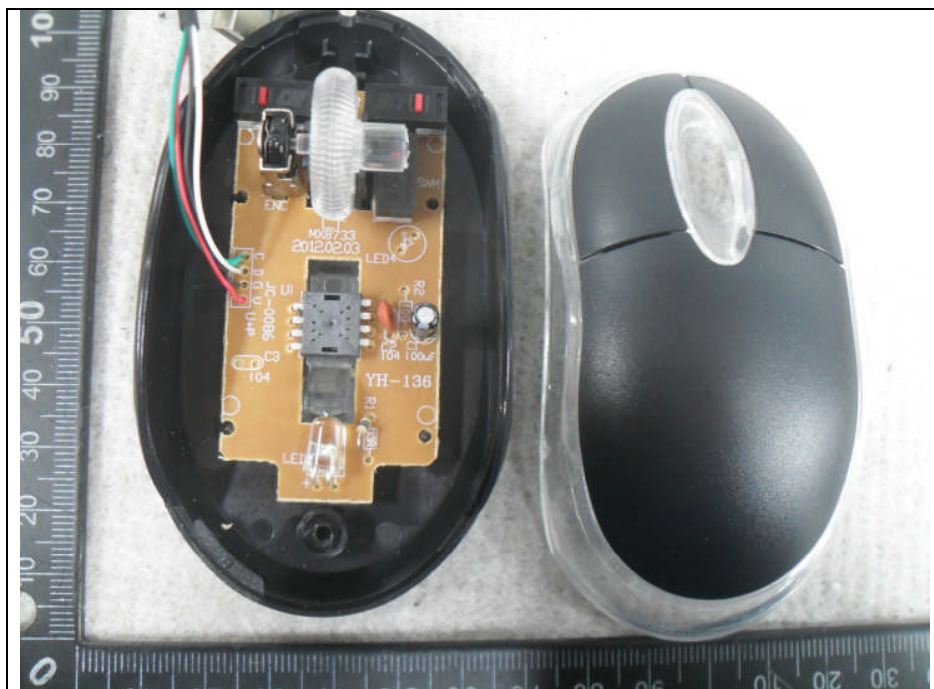
HDD (1TB)

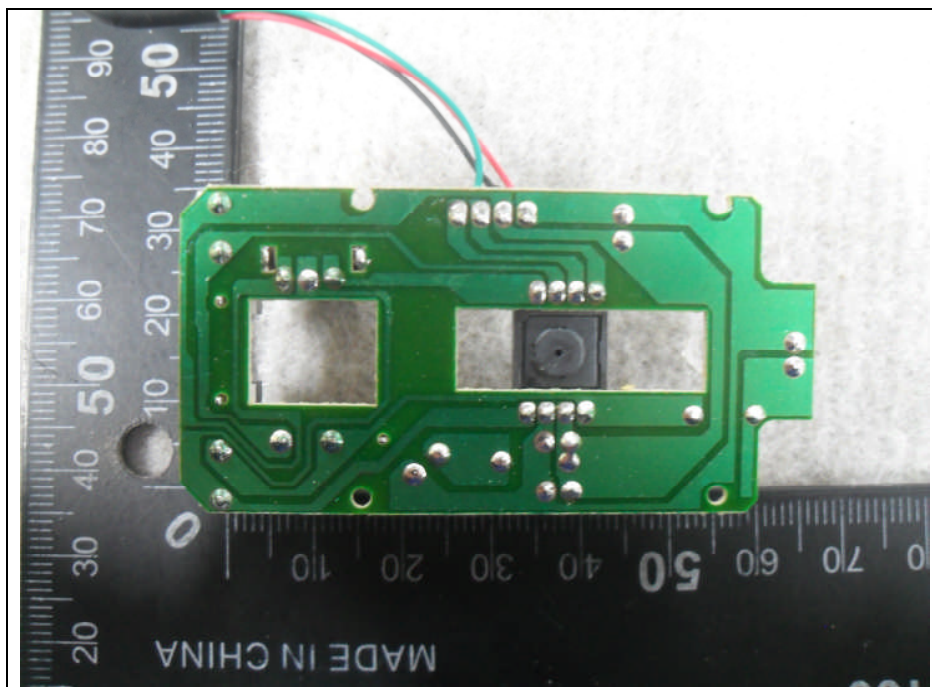
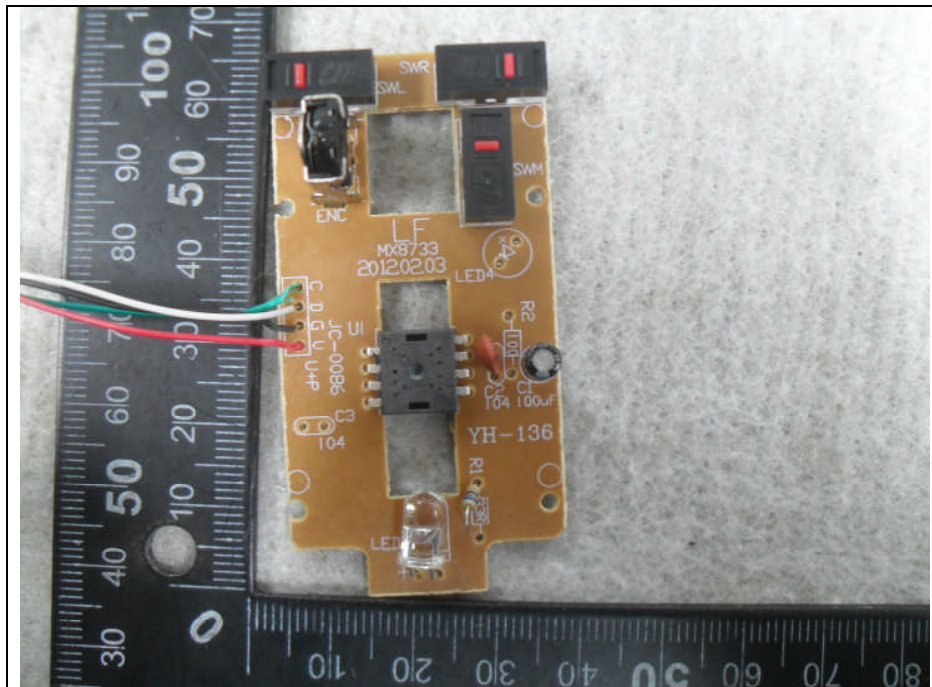




USB Mouse

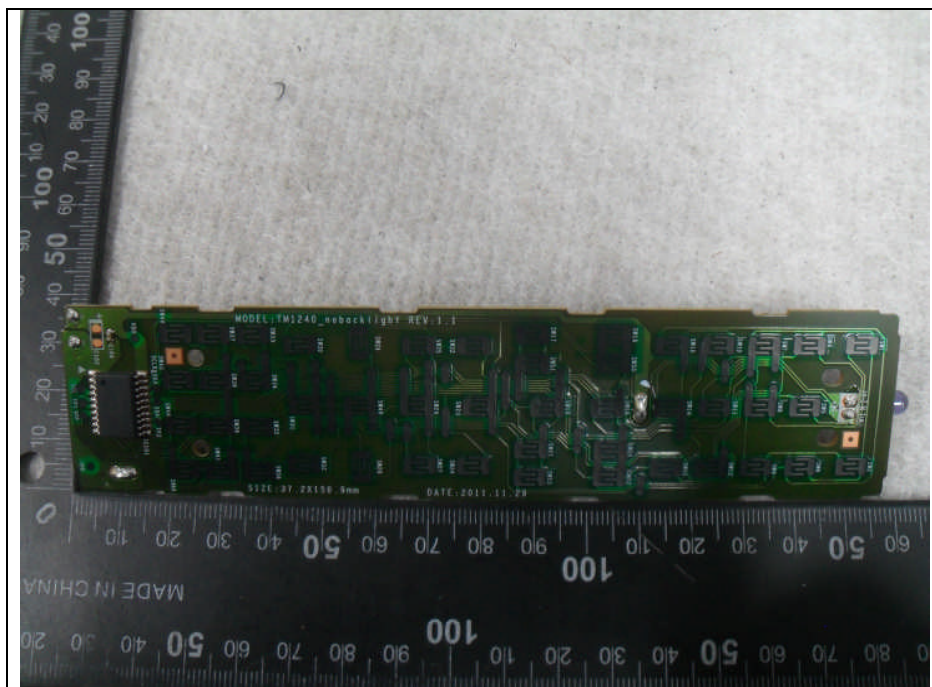
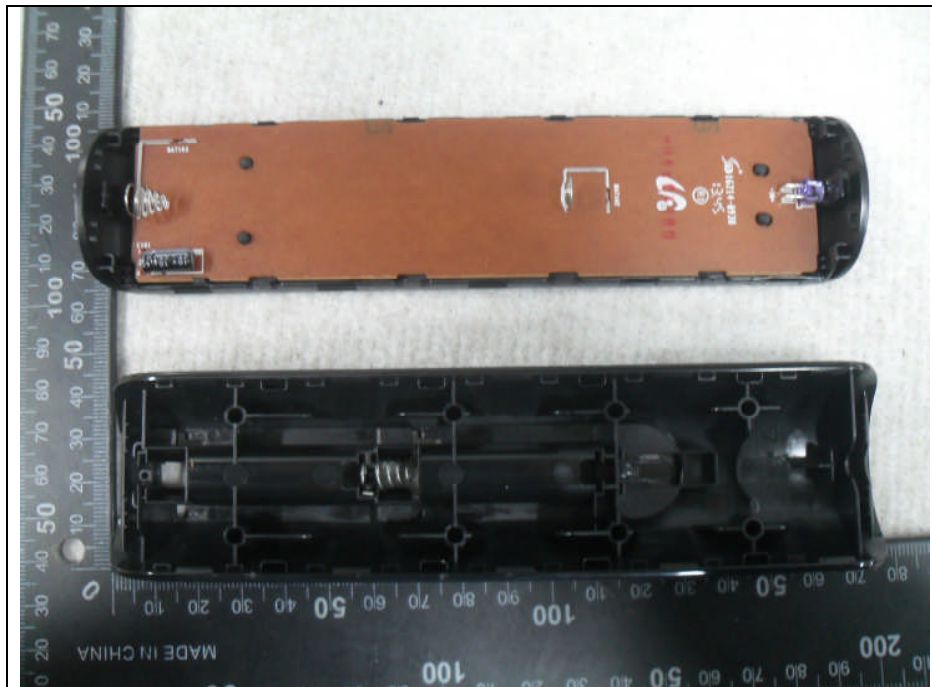


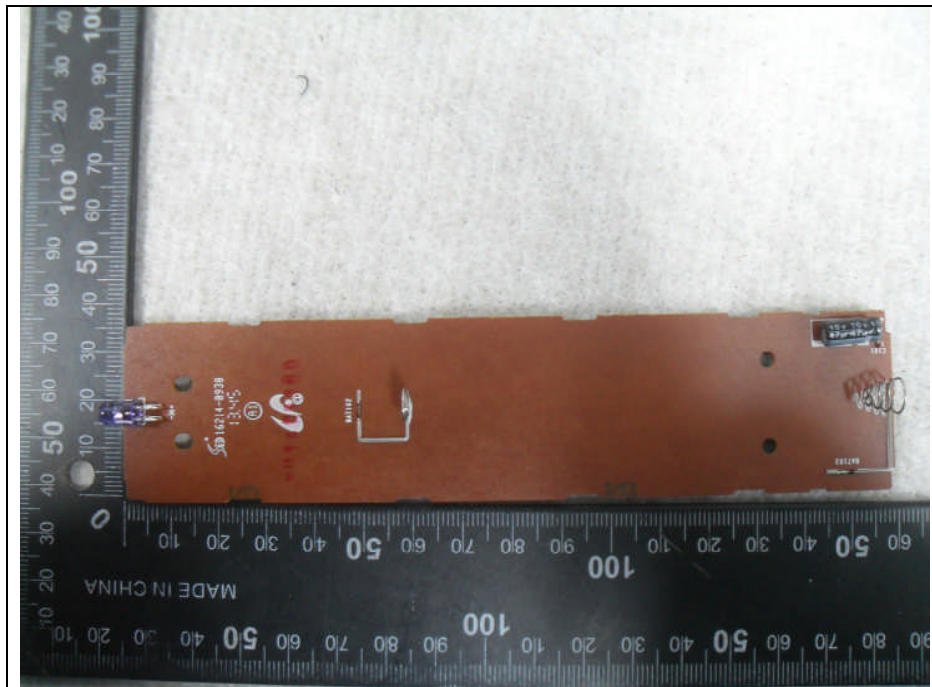




Remote Control







AC/DC Adaptor



