EMC TEST REPORT For VCCI

Test Report No.	:	KES-E1-16T0560
Date of Issue	:	Nov, 14, 2016
Product name	:	NETWORK VIDEO RECORDER
7		
Model/Type No.	:	XRN-810SN
Variant Model	:	-
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	1204, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangna-do, Korea
Manufacturer	:	Tianjin Samsung Techwin Opto-Electronic Co., Ltd.
Manufacturer Address	:	No.11 Weiliu Rd,Micro-Electronic Industrial Park, TEDA, Tianjin, 300385, People's Republic of China
Date of Receipt	:	Nov, 01, 2016
Test date	:	Nov, 08, 2016
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Young Suk, Song
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Nov. 14, 2016	KES-E1-16T0560	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Model		XRN-810S
Display		
Network Camera	Inputs	Max. 8CH
	Resolution	CIF ~ 8MP
	Protocols	Samsung, ONVIF
Live	Local Display	1x HDMI / 1x VGA
	Multi-Channel Display	[Local Monitor] 1 / 2V / 3V / 4 / 6 / 8 / Auto Sequence [Web] 1 / 4 / 8 / Auto Sequence
	Performance	[Local Monitor] 8MP(60fps,only One Ch) 5MP(90fps), 3MP(120fps), 2MP(240fps), 720p(240fps), D1(240fps) [Web] 5MP(30fps), 3MP(60fps), 2MP(120fps), 720p(240fps), D1(240fps)
Performance		
Operating System	Embedded	Linux
Record	Compression	H.265, H.264, MJPEG
	Recording Bandwidth	Max. 100Mbps
	Resolution	CIF ~ 8MP
	Type	Manual, Schedule(Continuous/Event), Event (Pre/Post)
	Event Action	e-Mail, PTZ Preset, Alarm Out, Buzzer, Monitor Out
Search & Play	Playback Bandwidth	32Mbps (8CH simultaneously)
	Performance	Max. 3 Users (Remote 3)
	Mode	Date & Time(Calendar) Event Log list Text Search(POS, ANPR)
	Simultaneous playback	Max. 8CH (Local, Network)
	Resolution	CIF ~ 8MP
	Playback Control	Fast/Slow Forward / Backward, Move one step Up / Down
Storage	Default Built-In	0TB ~ 8TB (dependent on region)
	Internal	2SATA
	Max.Capacity	8TB
Backup	File backup	BU/Exe(USB), JPG/AVI(Web, CMS)
	Function	Multi channel(Upto 8CH) Play, Date-Time/Title display
Sensor	I/O	4/3 (NO 2EA, NO/NC 1EA)
Audio	Input	8 CH (network)
	Compression	G.711, G.726, AAC(16/48KHz)
	Audio Communication	2-Way
Network		
Protocol		TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)
DDNS		Hanwha Security DDNS
Transmission Bandwidth		128Mbps
Max Remote Users		Search (3), Live Unicast (10), Multicast (20)
IP Version		IPv4/v6
Security		User access Log, IP Filtering, 802.1x, Encryption
OS		Supported OS : Windows 7, 8, 10, Mac OS X 10.8. 10.9. 10.10. 10.11

Web Browser		Non-plugin Webviewer Supported Browser: Google Chrome 47, MS Edge 20 Plug-in Webviewer Supported MS Explore 11 , Mozilla Firefox 43 , Apple Safari 9 * Mac OS X only
Viewer Software	Type	SSM, Webviewer, Smart Viewer, wisenet Mobile
	CMS Support	Support SDK/CGI(SUNAPI)
Functions		
Camera Setup	Register	PnP, Manual
	Setup Items	IP address, Add profile edit, Bitrate, Compression, GOP, Quality, Camera MD setup Camera video setup (Simple focus, Brightness/Contrast, Flip/Mirror, IRIS, WDR, D&N, SSNR, Shutter, SSDR, DIS), Fisheye Dewarping(web), Hallway View Setup, Camera Webpage
Camera Control	PoE	1) Monitor PoE Power consumption 2) On/Off Control for each PoE camera 3) Remote Reset for each PoE camera
Easy Configuration		Setup Wizard (Date/Time, Network, Auto Camera Configuration) P2P (TUTK)
Redundancy	ARB	Yes
PTZ	Control	Via GUI, Webviewer, SPC-2000
	Preset	300 Presets (Camera)
Smart phone	Support Model	I-Phone, Android
	Protocol Support	RTP, RTSP, HTTP, CGI(SUNAPI)
	Control	Live(8ch) : Multi-Profile Support Playback(1ch) Event push
	Max. Remote Users	Search (3), Live Unicast (10), Multicast (20)
System Control	Control Applications	Mouse, Web, SPC-2000 (Controller), IR Remocon
Indicator/Interface		
Front	Indicator	Power Status LED 1EA HDD Action LED 1EA Alarm Status LED 1EA Record Status LED 1EA Network Action LED 1EA Backup LED 1EA
Connectors	HDMI	1 EA - Support upto 4K (3840 x 2160)
	Audio	Out(1EA, RCA, Line)
	Ethernet	■ 8EA (PoE/PoE+, 100Mbps) ■ 1EA (WAN, 1Gbps) - WAN : Uplink to CMS
	Alarm	In(4EA, Terminal Block) Out(3EA, Terminal Block)
	USB	Front 2EA(USB2.0), Rear 1(USB3.0)
	Reset	Switch(1EA)
	Power Cord	Included
System		
Log	Log List	Max. 20000 (System Log, Event Log each)
Environmental		
Operating Temperature / Humidity		+0°C to +40°C(+32°F to +104°F)
Humidity		20% ~ 85% RH

1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage ☐ 100 Vac ☐ 110 Vac ☒ 120 Vac ☐ 24 Vac ☐ PoE

Frequency ☐ 50 Hz ☒ 60 Hz ☐ Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK VIDEO RECORDER	XRN-810SN	-	Tianjin Samsung Techwin Opto-Electronic Co.,Ltd.	E.U.T
MOUSE	MOEIUOA,AA-SM2PCPB	-	Dongguan Primax Electronic & Telecommunication Products Ltd.	
REMOTE CONTROL	EP10-000331A	-	SAMSUNG	
HDD	WD10PURX	-	West digital	

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
MONITOR 1	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-
MONITOR 2	SMT-2232	C95V67VF900038B	Weihai Daewoo Electronics Co., Ltd.	-
SPEAKER	BZ-T3400 AV Soundbar	-	AVIM AUDIO	-
NETWORK CAMERA	SND-L6013RN	-	SAMSUNG TECHWIN CO., LTD.	8 ea
USB MEMORY	-	-	SanDisk	16 GB
NOTEBOOK	X56K	HN11N5151FJ0045W	HANSUNG	-
NOTEBOOK ADAPTOR	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Alarm	-	-	-	-

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK VIDEO RECORDER (E.U.T)	HDMI	MONITOR 1	HDMI	1.4	S
	VGA OUT	MONITOR 2	D-SUB	1.6	S
	AUDIO OUT	SPEAKER	AUX	1.4	U
	USB 3.0	USB MEMORY	USB 3.0	-	U
	VIEWER	NOTEBOOK	RJ-45	3.0	U
	USB 2.0	MOUSE	USB 2.0	1.8	U
	2 PIN	Alarm	2 PIN	3.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U
	POE CAMERA	NETWORK CAMERA	RJ-45	5.0	U

* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

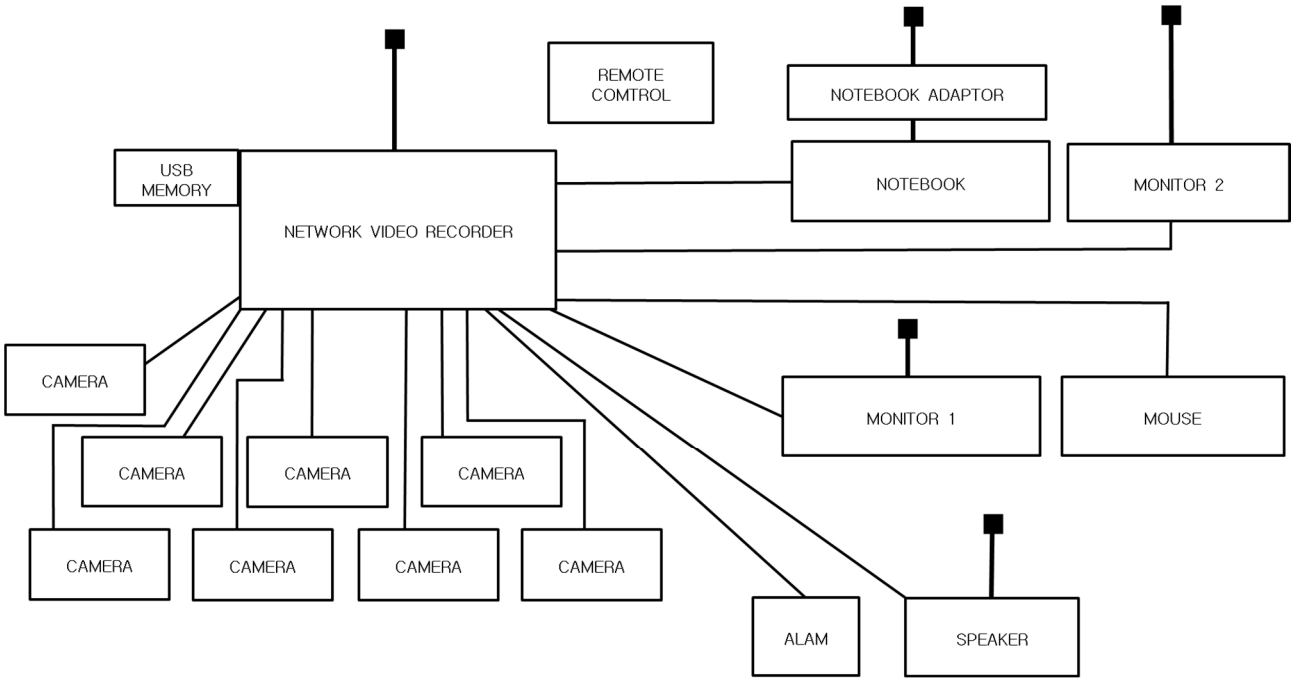
Equipment under test was operated during the measurement under the following conditions:

Test mode	operating
	E.U.T Monitoring , Ping test, 1 ㎑

E.U.T Test operating S/W		
Name	Version	Manufacture Company
WebViewer	-	Hanwha Techwin Co., Ltd.

1.8 Configuration

■ AC Main
□ DC Main



1.9 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.10 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	**FCC**	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
JAPAN	**VCCI**	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	R-4308, C-4798, T-2311, G-914
KOREA	**MSIP**	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100
Canada	**IC**	3 & 10 meter Open Area Test Sites and one conducted site	4769B-1
Europe	**CE**	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	**KOLAS**	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KOREA LABORATORY ACCREDITATION SCHEME KOLAS TESTING NO. 489

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010 ☐ Group 1 ☐ Class A ☐ Group 2 ☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547 :2009

☐ EN 55022:2010 ☐ Class A ☐ Class B

☐ EN 55024:2010 +A1:2015

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013

☒ **VCCI V-3 / 2015.04** ☒ Class A ☐ Class B

☐ **AS/NZS CISPR22:2009 +A1:2010** ☐ Class A ☐ Class B

☐ **47 CFR Part 15, Subpart B**

- ☐ CISPR 22:2009 +A1:2010 ☒ Class A ☐ Class B
- ☐ ANSI C63.4-2014

☐ **IC Regulation ICES-003 : 2016**

- ☐ CAN/CSA CISPR 22-10 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2014

☐ **RE– Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

- ☐ Equipment for fixed use
- ☐ Equipment for vehicular use
- ☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

2.1 Conducted Emissions Mains Power Ports

Test Date
Nov, 08, 2016

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R & S	101783	05, 03, 2017
☒	LISN	ENV216	R & S	101137	02, 04, 2017
☒	LISN	ENV216	R & S	101786	05, 02, 2017
☒	Electro wave Shieldroom	-	SEMITEC	-	-
☒	EMI Test S/W	EMC32	R & S	9.12.00	-

Test Conditions
Temperature: 18,2 ℃
Relative Humidity: 41,5 %

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date
Nov, 08, 2016

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R & S	101783	05, 03, 2017
☒	LISN	ENV216	R & S	101137	02, 04, 2017
☒	LISN	ENV216	R & S	101786	05, 02, 2017
☒	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	04, 01, 2017
☒	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	04, 01, 2017
☒	8-Wire ISN CAT6	NTFM 8158	Schwarzbeck Mess	8158-0029	08, 11, 2017
☒	Electro wave Shieldroom	-	SEMITEC	-	-
☒	EMI Test S/W	EMC32	R & S	9.12.00	-

Test Conditions
Temperature: 18,2 ℃
Relative Humidity: 41,5 %

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.3 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Nov, 08, 2016

Test Location
☐ Open Area Test Site #1 ☒ Open Area Test Site #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI TEST Receiver	ESR3	R&S	101781	05, 03, 2017
☒	Trilog-Broadband ANT	VULB 9163	Schwarzbeck	9163-713	05, 15, 2017
☒	OATS	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-
☒	EMI Test S/W	N/A	N/A	N/A	N/A

Test Conditions
Temperature: 10,1 ℃
Relative Humidity: 50,0 %

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Nov, 08, 2016

Test Location
Semi Anechoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESU26	R&S	100552	04, 24, 2017
☒	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10, 14, 2017
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 07, 2017
☒	Semi Anechoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-
☒	EMI Test S/W	e3	AUDIX	8.083b	-

Test Conditions
Temperature: 18,2 ℃
Relative Humidity: 41,5 %

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

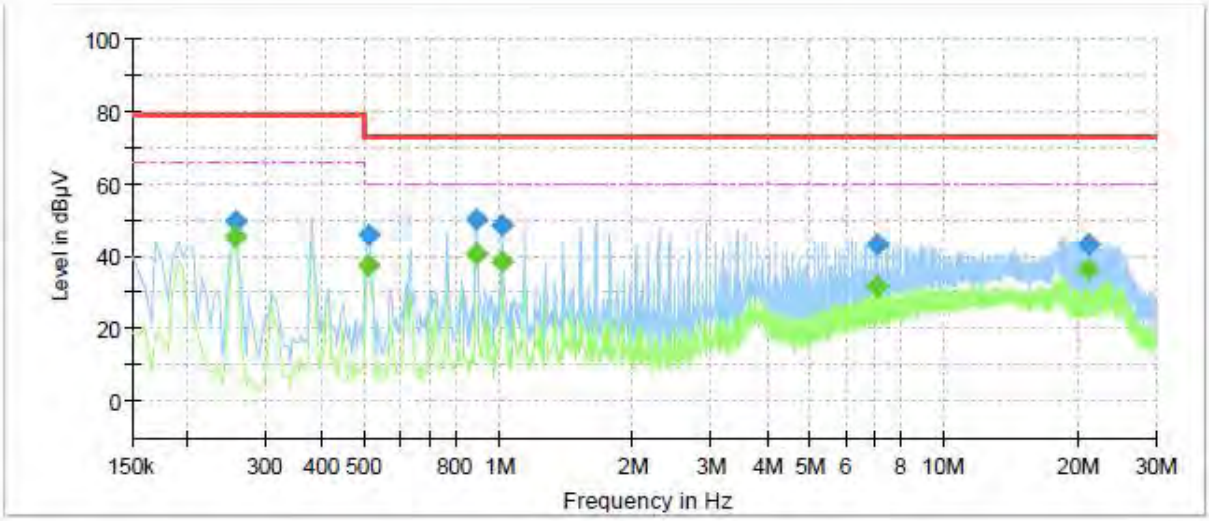
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	XRN-810SN
Mode	
Operator Name:	KES



Final_Result

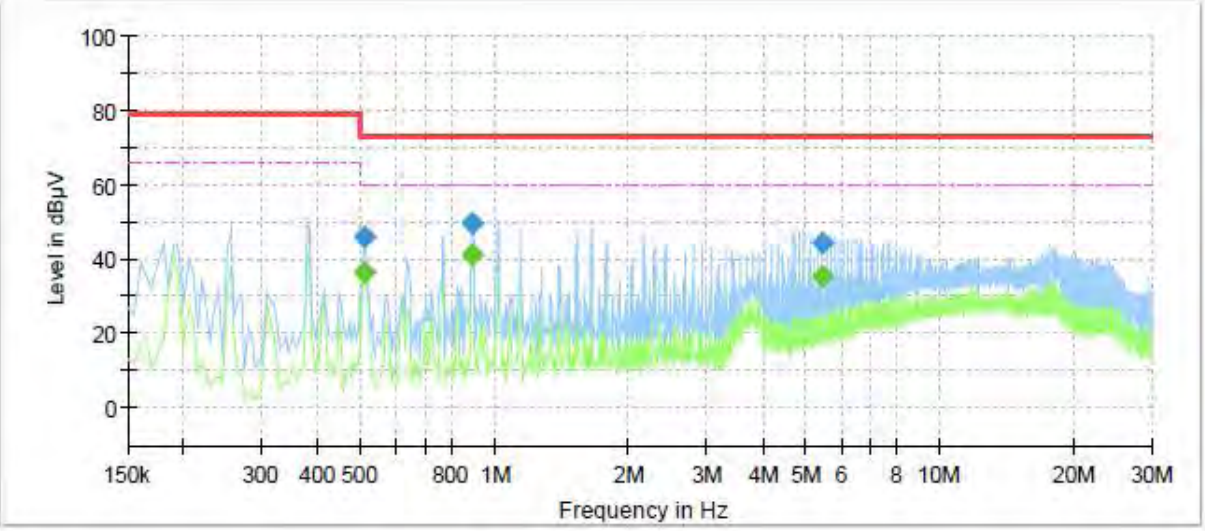
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.255000	---	45.49	66.00	20.51	1000.0	9.000	L1	9.7
0.255000	49.87	---	79.00	29.13	1000.0	9.000	L1	9.7
0.510000	---	37.65	60.00	22.35	1000.0	9.000	L1	9.8
0.510000	46.09	---	73.00	26.91	1000.0	9.000	L1	9.8
0.890000	---	40.66	60.00	19.34	1000.0	9.000	L1	9.9
0.890000	50.31	---	73.00	22.69	1000.0	9.000	L1	9.9
1.015000	---	38.71	60.00	21.29	1000.0	9.000	L1	9.9
1.015000	48.66	---	73.00	24.34	1000.0	9.000	L1	9.9
7.125000	---	31.87	60.00	28.13	1000.0	9.000	L1	10.0
7.125000	43.60	---	73.00	29.40	1000.0	9.000	L1	10.0
21.130000	---	36.50	60.00	23.50	1000.0	9.000	L1	10.2
21.130000	43.29	---	73.00	29.71	1000.0	9.000	L1	10.2

♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR+ Cable Loss)

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	XRN-810SN
Mode	
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.510000	---	36.64	60.00	23.36	1000.0	9.000	N	9.8
0.510000	46.19	---	73.00	26.81	1000.0	9.000	N	9.8
0.890000	---	41.06	60.00	18.94	1000.0	9.000	N	9.9
0.890000	49.96	---	73.00	23.04	1000.0	9.000	N	9.9
5.470000	---	35.56	60.00	24.44	1000.0	9.000	N	10.0
5.470000	44.57	---	73.00	28.43	1000.0	9.000	N	10.0

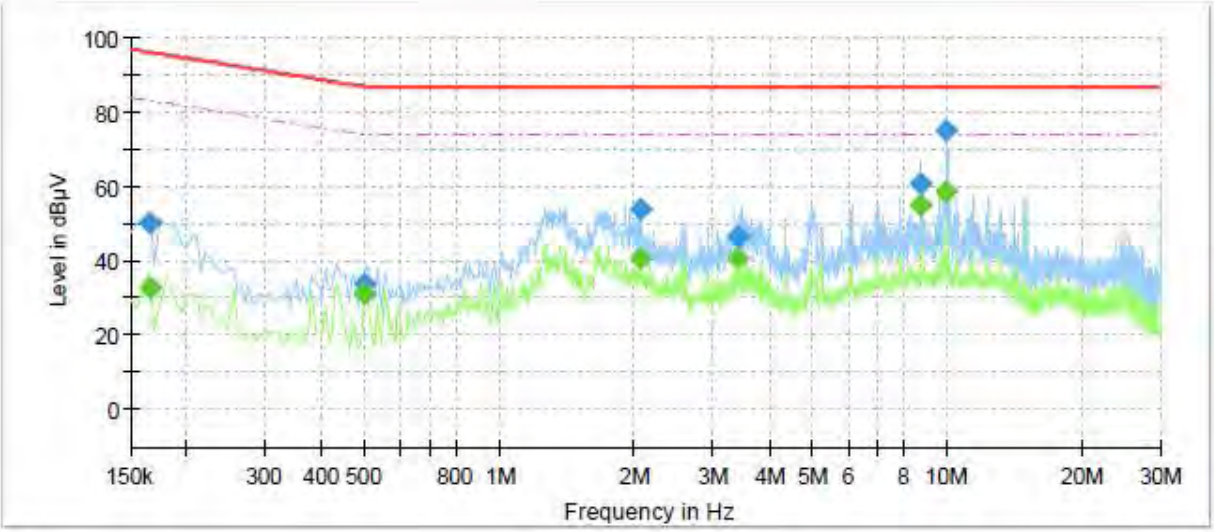
♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR+ Cable Loss)

Conducted Emissions at Telecommunication Ports

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XRN-810SN
Mode	10M
Operator Name:	KES



Final_Result

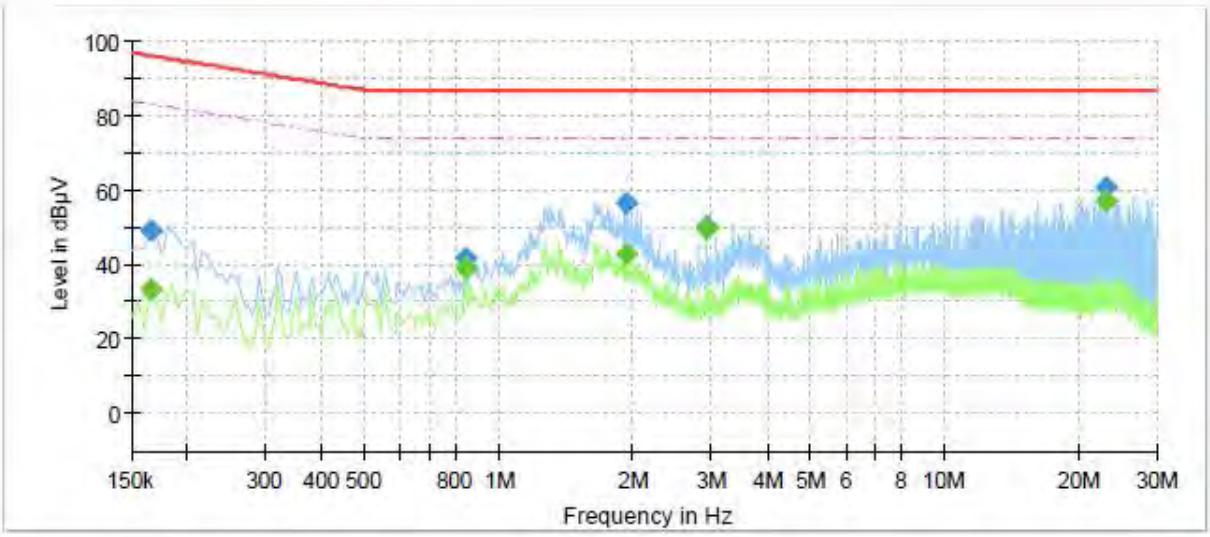
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	32.93	83.21	50.28	1000.0	9.000	Single Line	10.2
0.165000	50.21	---	96.21	46.00	1000.0	9.000	Single Line	10.2
0.500000	---	31.37	74.00	42.63	1000.0	9.000	Single Line	10.1
0.500000	33.78	---	87.00	53.22	1000.0	9.000	Single Line	10.1
2.075000	---	40.86	74.00	33.14	1000.0	9.000	Single Line	10.1
2.075000	54.14	---	87.00	32.86	1000.0	9.000	Single Line	10.1
3.425000	---	40.54	74.00	33.46	1000.0	9.000	Single Line	10.1
3.425000	46.81	---	87.00	40.19	1000.0	9.000	Single Line	10.1
8.750000	---	55.07	74.00	18.93	1000.0	9.000	Single Line	10.0
8.750000	61.04	---	87.00	25.96	1000.0	9.000	Single Line	10.0
10.000000	---	58.53	74.00	15.47	1000.0	9.000	Single Line	10.0
10.000000	75.09	---	87.00	11.91	1000.0	9.000	Single Line	10.0

♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (ISN FACTOR+ Cable Loss)

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XRN-810SN
Mode	100M
Operator Name:	KES



Final_Result

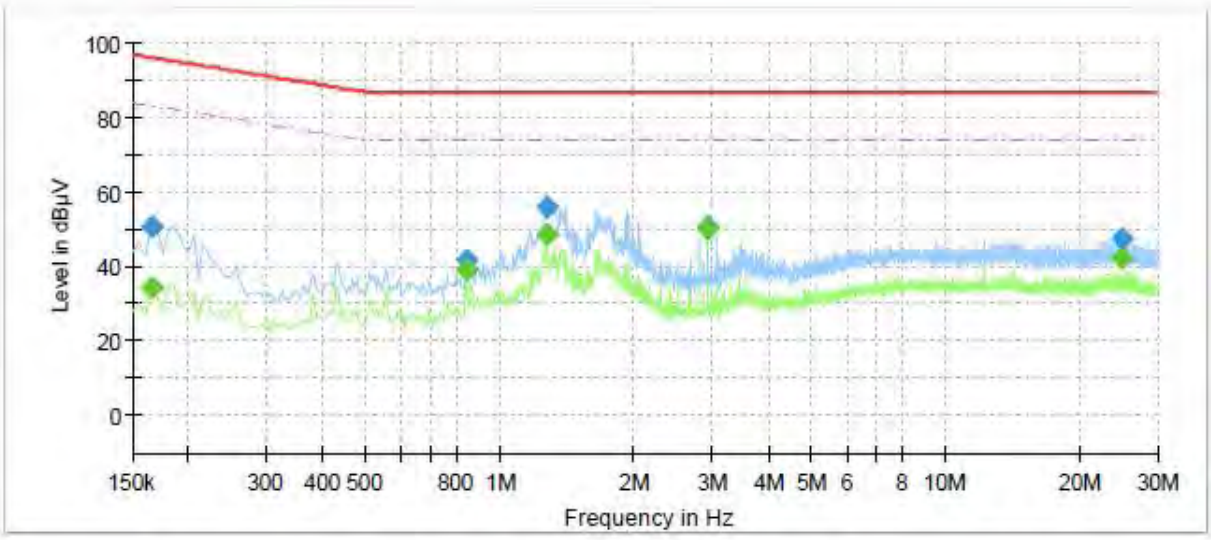
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	33.43	83.21	49.78	1000.0	9.000	Single Line	9.6
0.165000	49.35	---	96.21	46.86	1000.0	9.000	Single Line	9.6
0.840000	---	39.25	74.00	34.75	1000.0	9.000	Single Line	9.6
0.840000	41.86	---	87.00	45.14	1000.0	9.000	Single Line	9.6
1.940000	---	43.07	74.00	30.93	1000.0	9.000	Single Line	9.6
1.940000	56.57	---	87.00	30.43	1000.0	9.000	Single Line	9.6
2.925000	---	49.61	74.00	24.39	1000.0	9.000	Single Line	9.6
2.925000	50.19	---	87.00	36.81	1000.0	9.000	Single Line	9.6
23.130000	---	57.18	74.00	16.82	1000.0	9.000	Single Line	9.5
23.130000	60.71	---	87.00	26.29	1000.0	9.000	Single Line	9.5

♦ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (ISN FACTOR+ Cable Loss)

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XRN-810SN
Mode	1000M
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	34.17	83.21	49.04	1000.0	9.000	Single Line	9.6
0.165000	50.65	---	96.21	45.56	1000.0	9.000	Single Line	9.6
0.840000	---	39.29	74.00	34.71	1000.0	9.000	Single Line	9.5
0.840000	41.88	---	87.00	45.12	1000.0	9.000	Single Line	9.5
1.270000	---	48.47	74.00	25.53	1000.0	9.000	Single Line	9.5
1.270000	55.90	---	87.00	31.10	1000.0	9.000	Single Line	9.5
2.925000	---	50.19	74.00	23.81	1000.0	9.000	Single Line	9.5
2.925000	50.86	---	87.00	36.14	1000.0	9.000	Single Line	9.5
25.000000	---	42.25	74.00	31.75	1000.0	9.000	Single Line	9.5
25.000000	47.88	---	87.00	39.12	1000.0	9.000	Single Line	9.5

♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (ISN FACTOR+ Cable Loss)

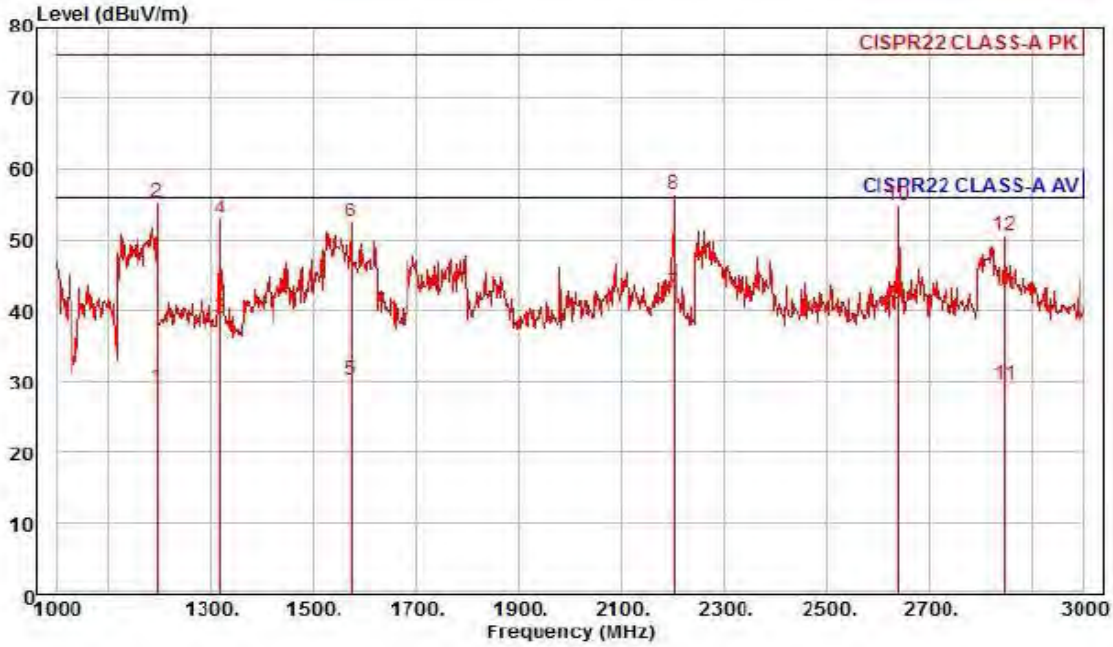
Radiated Electric Field Emissions(Below 1 ㎓)

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[㎒]	[dBμV]		[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	
149.31	12.52	V	2.94	8.18	3.56	24.26	40.00	15.74
222.98	10.25	H	2.01	11.81	4.39	26.45	40.00	13.55
250.17	14.69	V	2.36	12.41	4.72	31.82	47.00	15.18
297.67	11.68	H	1.29	13.33	5.13	30.14	47.00	16.86
375.26	10.99	H	2.14	15.13	5.91	32.03	47.00	14.97
425.71	14.58	H	1.36	16.06	6.49	37.13	47.00	9.87
475.32	13.58	V	3.02	16.75	6.90	37.23	47.00	9.77
519.77	17.87	V	1.08	17.53	7.16	42.56	47.00	4.44

* H : Horizontal, V : Vertical

♦ Calculation
Corrected Amplitude [㏈uV] = Amplitude[㏈uV] + Correction Factor [㏈]
Corrected Amplitude : The Final Value, Amplitude : Reading Value,
Correction Factor : ANT FACTOR + Cable loss

Radiated Electric Field Emissions(Above 1 ㎓)



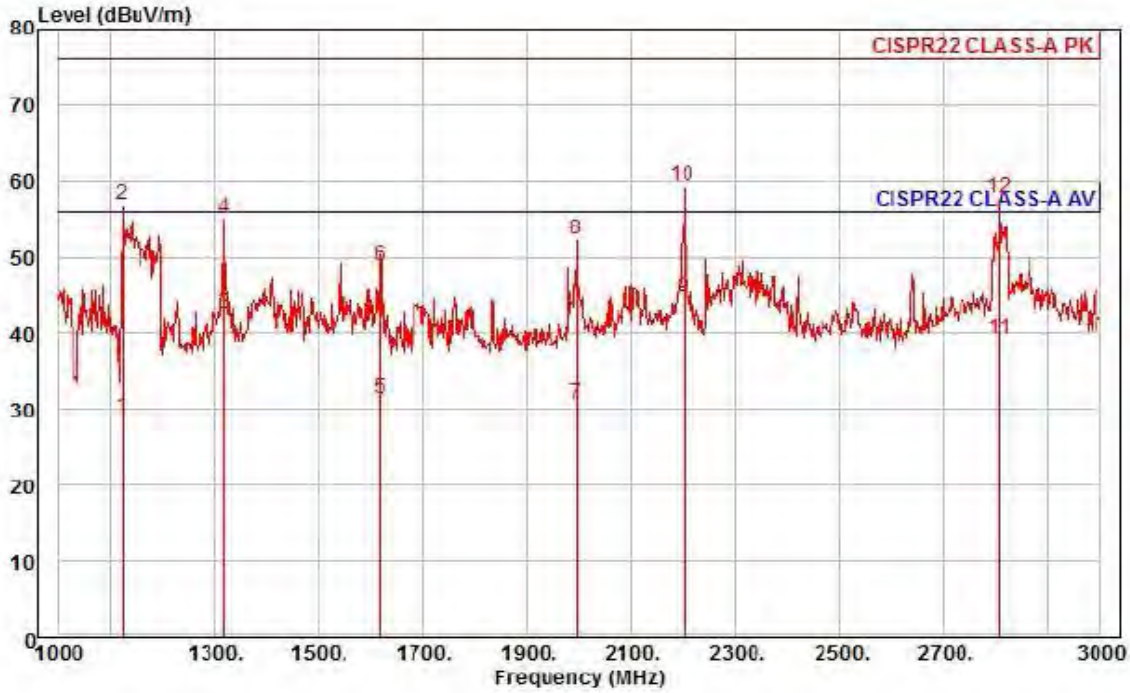
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XRN-810SN
Mode :
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1196.00	37.00	24.69	7.13	39.62	309	56.00	-26.80	horizontal	Average
2	1196.00	63.18	24.69	7.13	39.62	309	76.00	-20.62	horizontal	Peak
3	1320.00	45.58	25.18	7.49	39.32	271	56.00	-17.07	horizontal	Average
4	1320.00	59.72	25.18	7.49	39.32	271	76.00	-22.93	horizontal	Peak
5	1574.00	35.15	26.19	8.23	39.21	37	56.00	-25.64	horizontal	Average
6	1574.00	57.40	26.19	8.23	39.21	37	76.00	-23.39	horizontal	Peak
7 pp	2200.00	43.82	28.37	9.80	39.42	21	56.00	-13.43	horizontal	Average
8 pk	2200.00	57.68	28.37	9.80	39.42	21	76.00	-19.57	horizontal	Peak
9	2640.00	40.28	29.45	10.84	39.70	209	56.00	-15.13	horizontal	Average
10	2640.00	54.41	29.45	10.84	39.70	209	76.00	-21.00	horizontal	Peak
11	2846.00	28.34	29.95	11.34	39.93	287	56.00	-26.30	horizontal	Average
12	2846.00	49.16	29.95	11.34	39.93	287	76.00	-25.48	horizontal	Peak

♦ Calculation

Over Limit [㏈] = (Read Level[㏈uV] + Ant Factor[㏈/m] + Cable Loss [㏈] − Preamp Factor [㏈]) − Limit Line[㏈uV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor



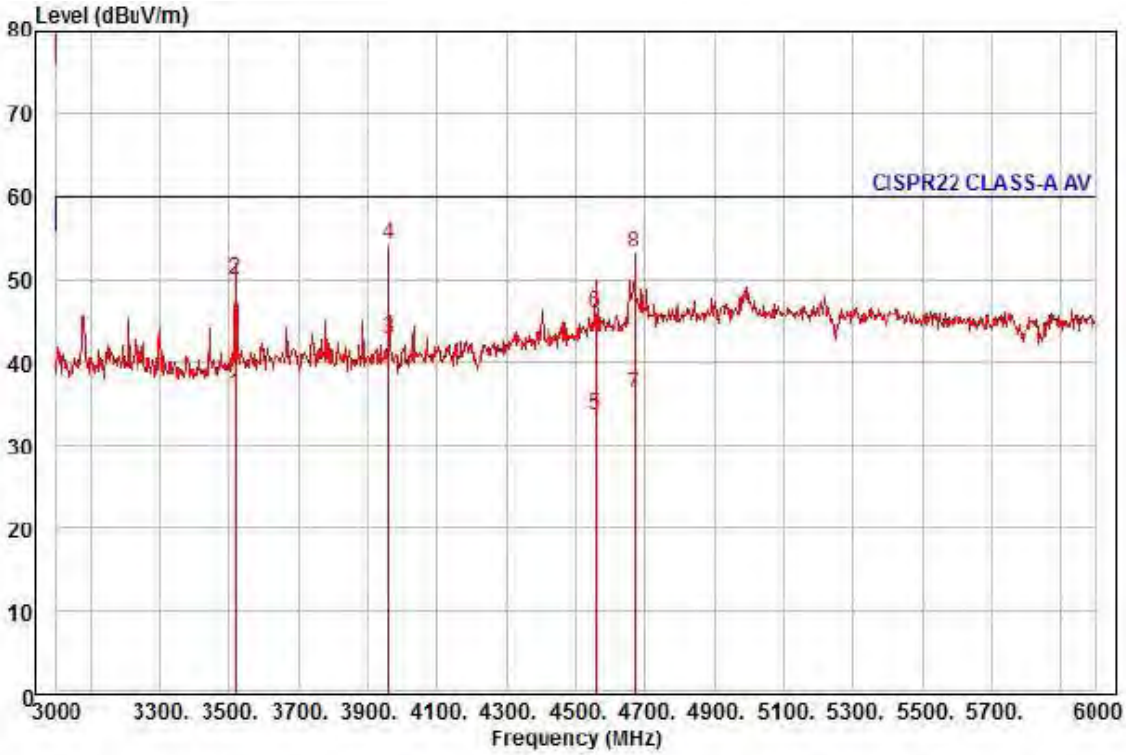
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XRN-810SN
Mode :
Memo : 1 ~ 3 GHz

		Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
		MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1		1122.00	37.53	24.39	6.88	39.80	353	56.00	-27.00	vertical	Average
2		1122.00	65.33	24.39	6.88	39.80	353	76.00	-19.20	vertical	Peak
3		1320.00	49.14	25.18	7.49	39.32	238	56.00	-13.51	vertical	Average
4		1320.00	61.75	25.18	7.49	39.32	238	76.00	-20.90	vertical	Peak
5		1618.00	35.95	26.36	8.36	39.23	27	56.00	-24.56	vertical	Average
6		1618.00	53.35	26.36	8.36	39.23	27	76.00	-27.16	vertical	Peak
7		1996.00	33.03	27.86	9.33	39.41	182	56.00	-25.19	vertical	Average
8		1996.00	54.63	27.86	9.33	39.41	182	76.00	-23.59	vertical	Peak
9	pp	2200.00	45.94	28.37	9.80	39.42	140	56.00	-11.31	vertical	Average
10	pk	2200.00	60.46	28.37	9.80	39.42	140	76.00	-16.79	vertical	Peak
11		2808.00	38.00	29.86	11.25	39.89	7	56.00	-16.78	vertical	Average
12		2808.00	56.61	29.86	11.25	39.89	7	76.00	-18.17	vertical	Peak

♦ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB]) – Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor



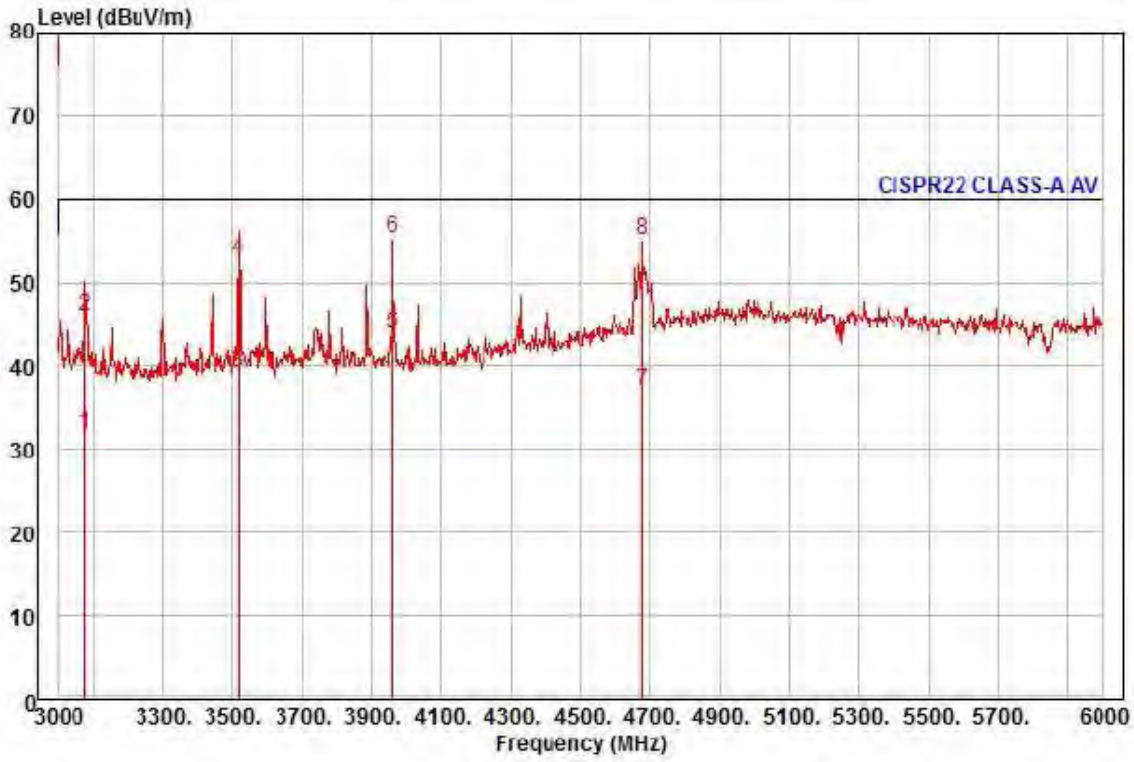
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XRN-810SN
Mode :
Memo : 3 ~ 6 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3519.00	33.25	31.20	12.66	40.87	222	60.00	-23.76	horizontal	Average
2	3519.00	46.97	31.20	12.66	40.87	222	80.00	-30.04	horizontal	Peak
3 pp	3960.00	37.98	31.94	13.49	40.71	88	60.00	-17.30	horizontal	Average
4 pk	3960.00	49.55	31.94	13.49	40.71	88	80.00	-25.73	horizontal	Peak
5	4557.00	24.45	35.19	14.57	40.71	185	60.00	-26.50	horizontal	Average
6	4557.00	37.00	35.19	14.57	40.71	185	80.00	-33.95	horizontal	Peak
7	4671.00	26.03	35.84	14.81	40.60	318	60.00	-23.92	horizontal	Average
8	4671.00	43.16	35.84	14.81	40.60	318	80.00	-26.79	horizontal	Peak

♦ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB]) – Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XRN-810SN
Mode :
Memo : 3 ~ 6 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3078.00	29.78	30.46	11.84	40.23	195	60.00	-28.15	vertical	Average
2	3078.00	43.88	30.46	11.84	40.23	195	80.00	-34.05	vertical	Peak
3	3519.00	36.26	31.20	12.66	40.87	206	60.00	-20.75	vertical	Average
4	3519.00	49.74	31.20	12.66	40.87	206	80.00	-27.27	vertical	Peak
5 pp	3960.00	39.15	31.94	13.49	40.71	256	60.00	-16.13	vertical	Average
6 pk	3960.00	50.58	31.94	13.49	40.71	256	80.00	-24.70	vertical	Peak
7	4680.00	26.87	35.89	14.83	40.59	7	60.00	-23.00	vertical	Average
8	4680.00	44.97	35.89	14.83	40.59	7	80.00	-24.90	vertical	Peak

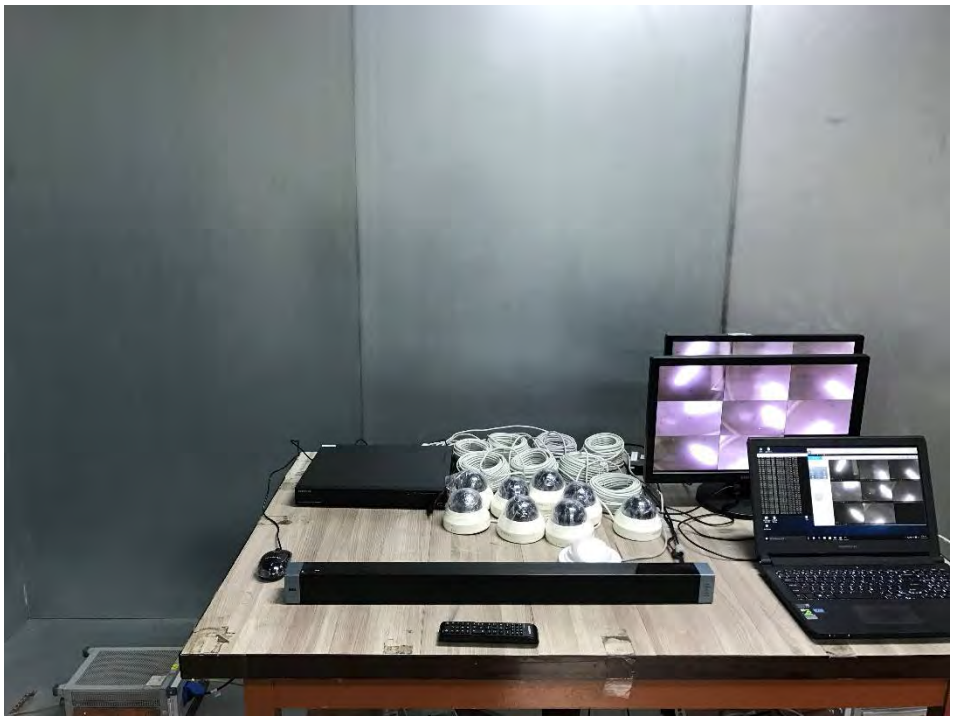
♦ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB]) – Limit Line[dBuV]

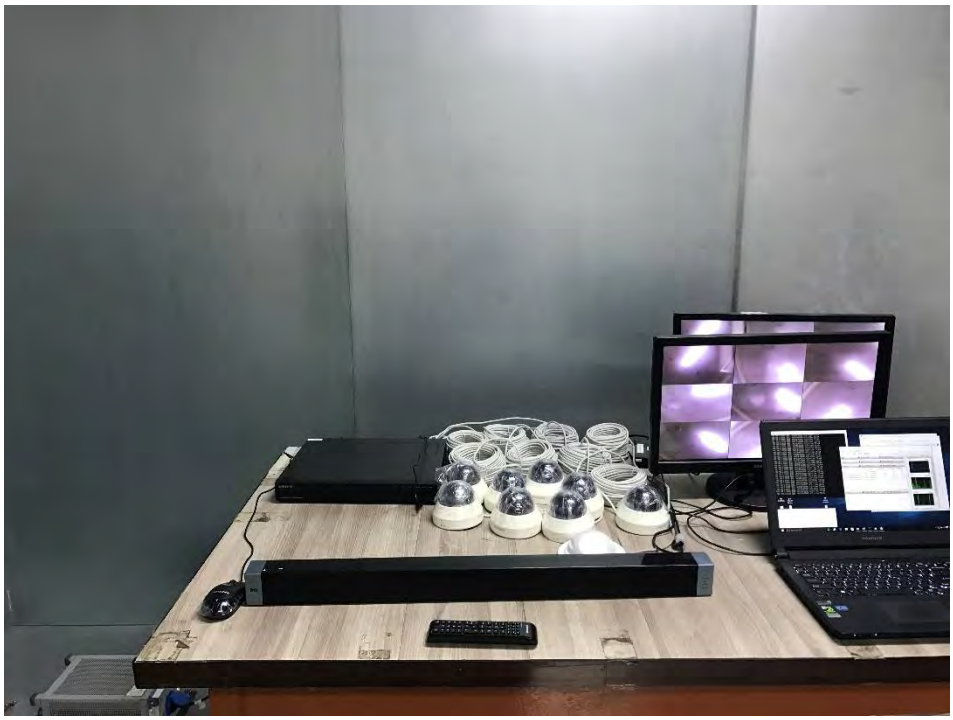
Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor

Test Setup Photos and Configuration

Conducted Voltage Emissions

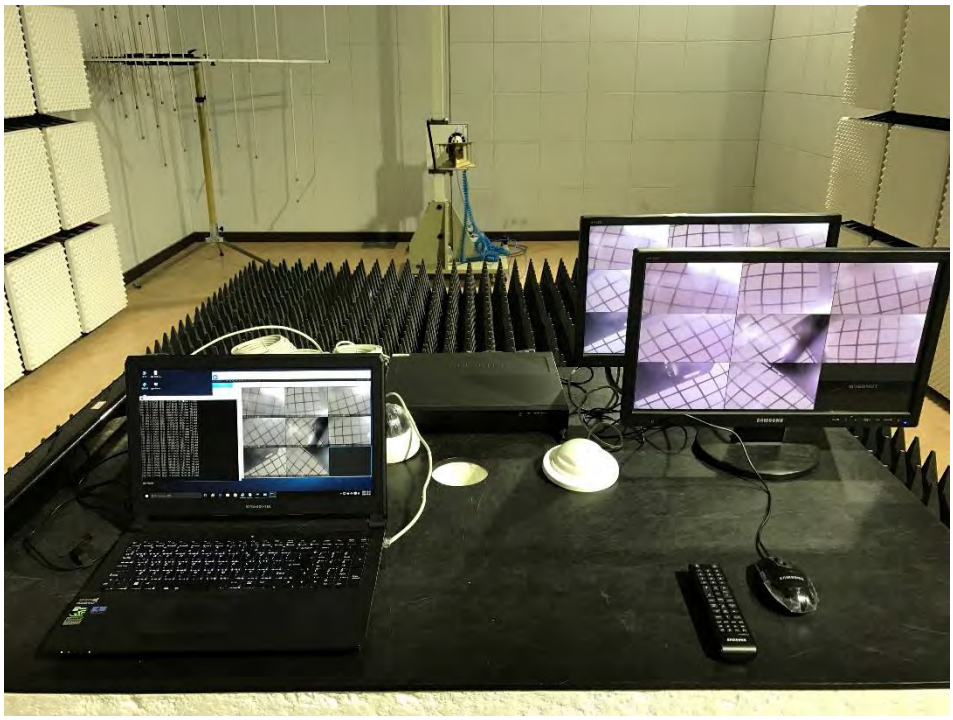


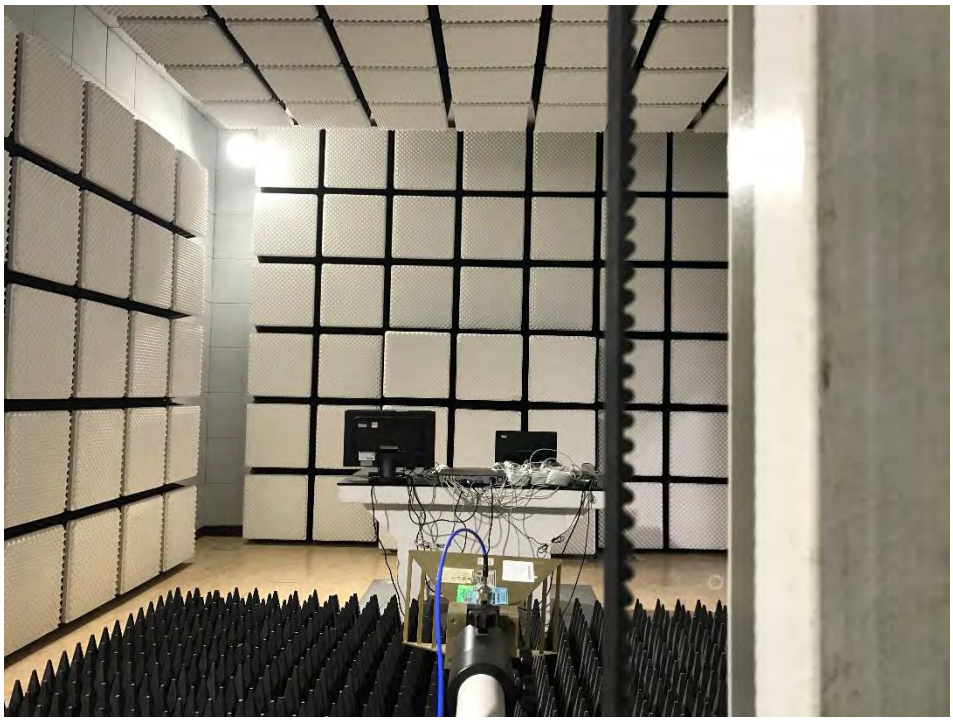
Conducted Telecommunication Emissions



Radiated Electric Field Emissions(Below 1 ㎓)

Radiated Electric Field Emissions(Above 1 ㎓)





EUT External Photographs

(Top)

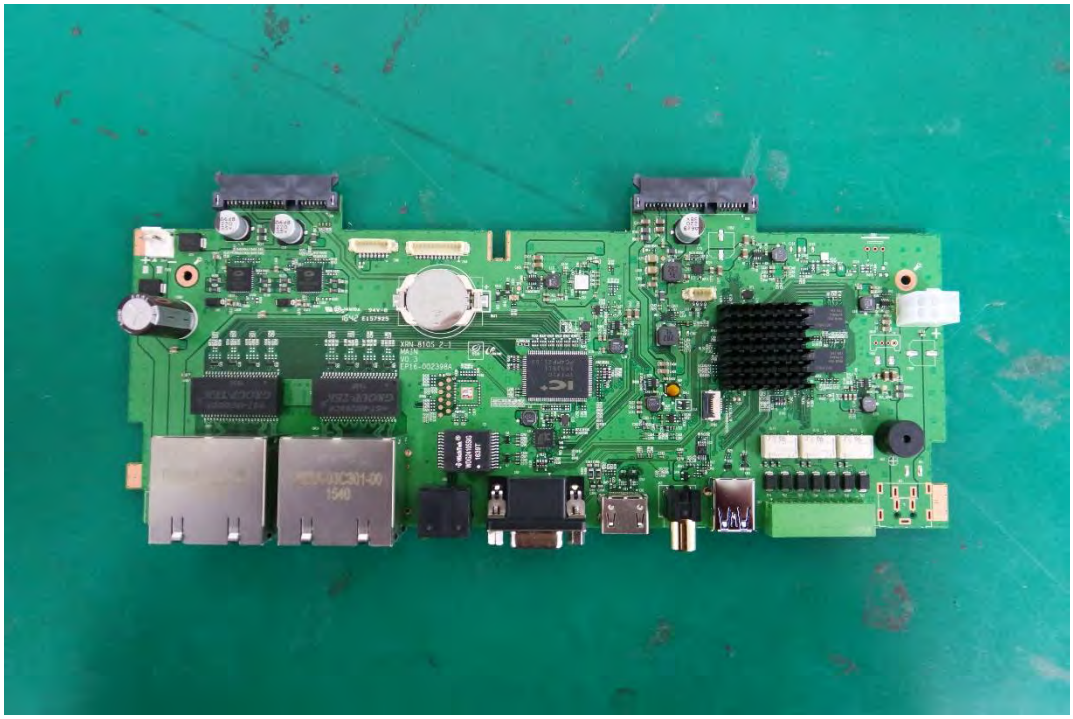
(Bottom)

EUT Internal Photographs

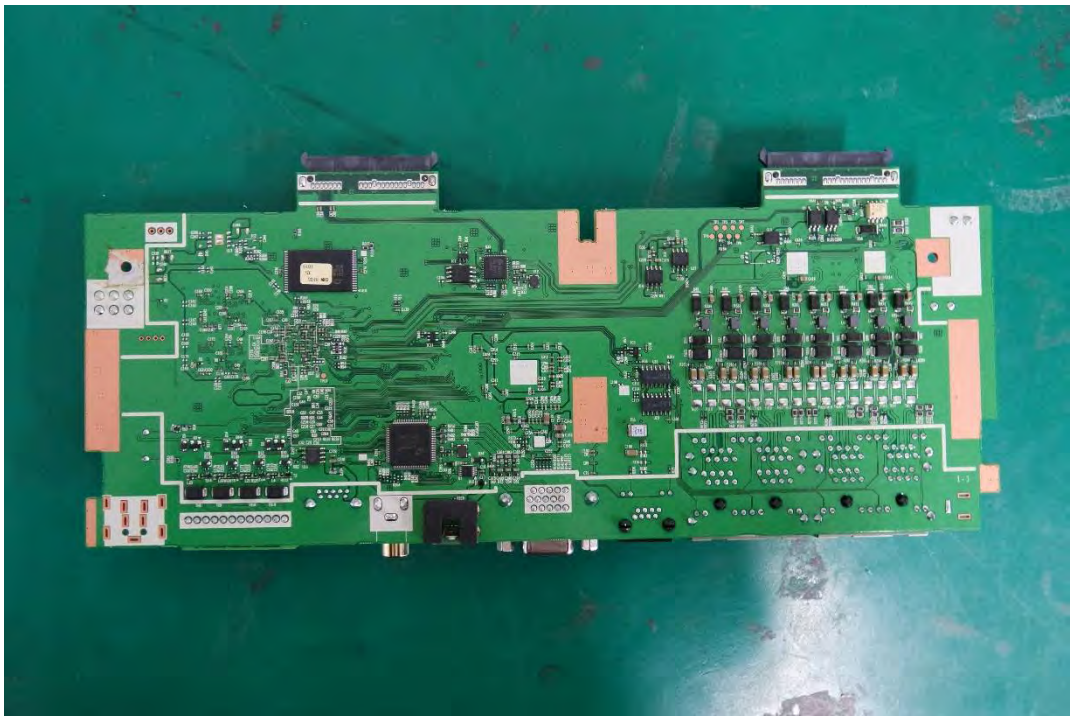
(Internal View)

EUT Internal View – Main Board

(Top)

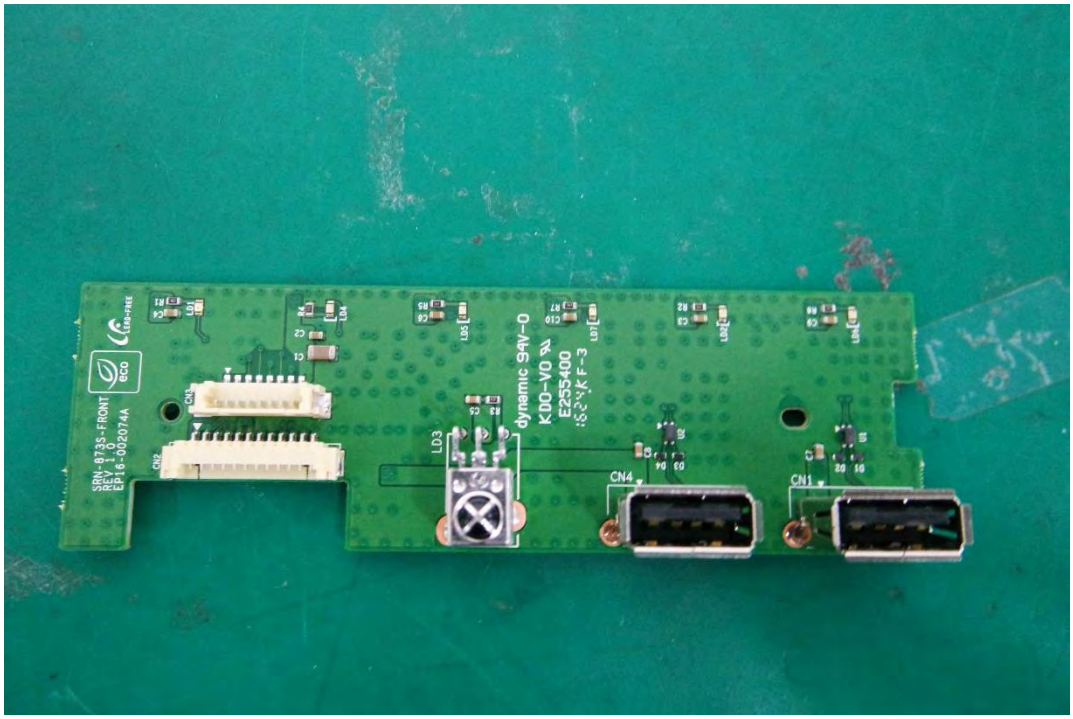


(Bottom)



EUT Internal View –USB Board

(Top)



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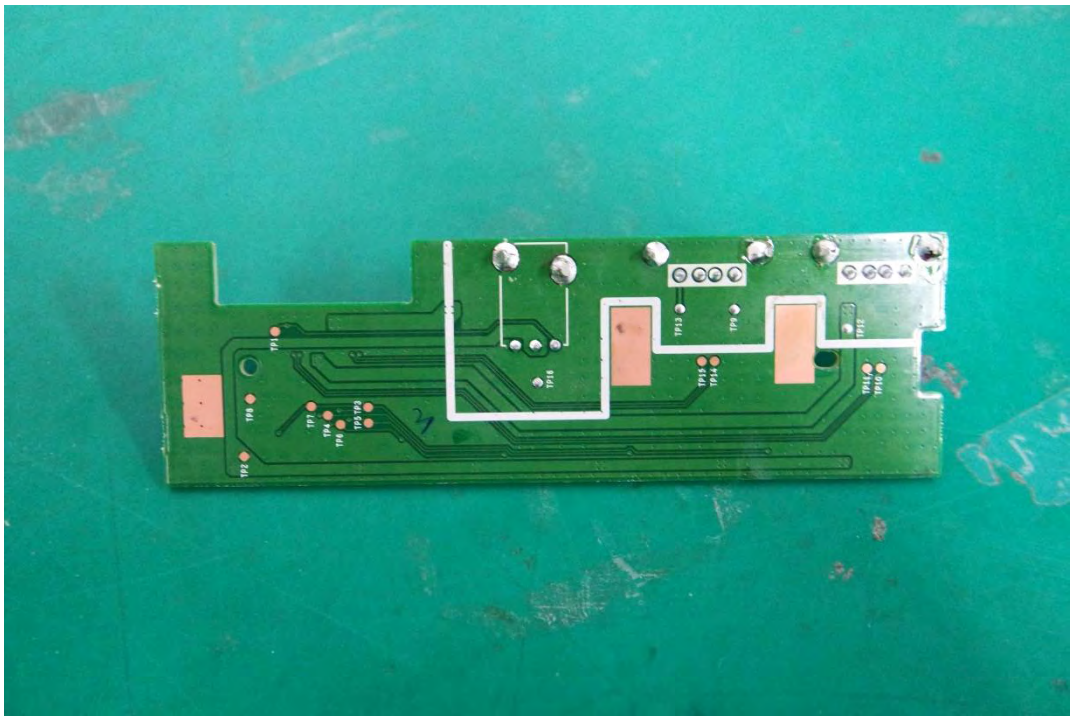

EUT Internal View – Power

(Top)

(Bottom)

EUT Internal View – HDD

(Top)

(Bottom)