EMC TEST REPORT For CE

Test Report No.	:	KES-E1-16T0562-R2
Date of Issue	:	May. 15, 2019
Product name	:	NETWORK VIDEO RECORDER
Model/Type No.	:	XRN-810S
Variant Model	:	XRN-810SP, XRN-810SP1T
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, KOREA
Manufacturer	:	1. Hanwha Techwin (Tianjin) Co.,Ltd. 2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. 3. D-TECH CO.,LTD.
Manufacturer Address	:	1. No.11 Weiliu Rd,Micro-Electronic Industrial Park, TEDA,Tianjin, 300385,People's Republic of China 2. Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam 3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex)
Date of Receipt	:	Nov. 01, 2016
Test date	:	Nov. 08, 2016 – Nov. 09, 2016
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Young Suk, Song
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Nov. 14, 2016	KES-E1-16T0562	Issued
Jun. 29, 2018	KES-E1-16T0562-R1	Re-issue due to manufacturer change
May. 15, 2019	KES-E1-16T0562-R2	Add a derived model

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1.0 General Product Description

Main Specifications of E.U.T 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 ☐ 220 Vac ☒ 230 Vac ☐ 240 Vac ☐ 24 Vac ☐ PoE

Frequency ☒ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

- Add derivative model for vendor management

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK VIDEO RECORDER	XRN-810S	-	Hanwha Techwin (Tianjin) 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 E.U.T Operating Mode(s)

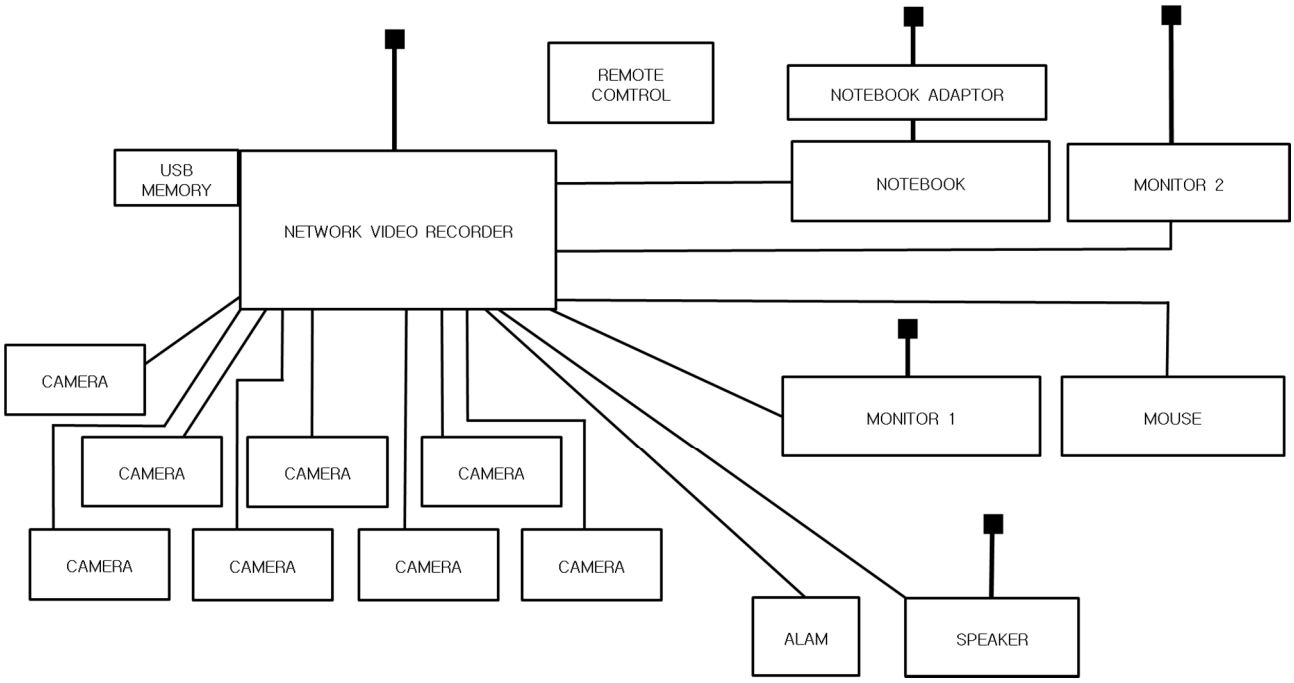
Equipment under test was operated during the measurement under the following conditions:

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 C63.4:2014 and CISPR 16-1-4:2012

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	**RRA**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100
International	**KOLAS**	EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KT489
USA	**FCC**	3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	KR0100
Canada	**ISED**	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	23298-1
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
Europe	**TÜV SÜD**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 17 07 01633 001

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 55032:2012/AC:2013	☒ Class A	☐ Class B
☐ EN 55024:2010 +A1:2015		
☒ EN 50130-4:2011		
☒ 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 C63.4-2009

☐ **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 at 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	-	AONE SHIELD	-	-
☒	EMI Test S/W	EMC32	R&S	9.12.00	-

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

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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
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-
☒	EMI Test S/W	-	-	-	-

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, 23, 2016
☒	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.

2.5 Harmonic Current Emissions

Test Date
Nov. 08, 2016

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	AC Source	ACS 500 N	EM TEST	V1024106760	08, 08, 2017
☒	Digital Power Analyzer	DPA 500 N	EM TEST	V1024106759	08, 08, 2017
☒	EMI Test S/W	dpa.control	EM TEST AG	5.4.8.0	-

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

Classification of Equipment for Harmonic Current Emissions
☒ Class A
☐ Class B
☐ Class C(Below 25 W)
☐ Class C(Above 25 W)
☐ Class D

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.6 Voltage Fluctuations and Flicker

Test Date
Nov. 08, 2016

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	AC Source	ACS 500 N	EM test	V1024106760	08, 08, 2017
☒	Digital Power Analyzer	DPA 500 N	EM test	V1024106759	08, 08, 2017
☒	EMI Test S/W	dpa.control	EM TEST AG	5.4.8.0	-

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

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:
EN 50130-4:2011 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change,

and no such flickering of indicators oeuvres at U = 130 $dB\mu V$.

For component of CCTV systems, where the status is monitored by observing the TV picture,

then deterioration of the picture is allowed at U = 140 $dB\mu V$, providing:

(a) there is no permanent damage or change to the EUT

(e.g. no corruption of memory or changes to programmable settings etc.)

(b) at U = 130 $dB\mu V$, any deterioration of the picture is so minor that the system could

still be used; and

(c) there in no observable deterioration of the picture at U = 120 $dB\mu V$.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

3.1 Electrostatic Discharge

Reference Standard
EN 61000-4-2:2009

Test Date
Nov. 09, 2016

Test Location
EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 24, 2017
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-
☒	EMS Test S/W	N/A	N/A	N/A	-

Test Conditions
Temperature: 16,4 ℃
Relative Humidity: 39,7 %
Atmospheric Pressure: 101,6 kPa

Test Specifications
Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

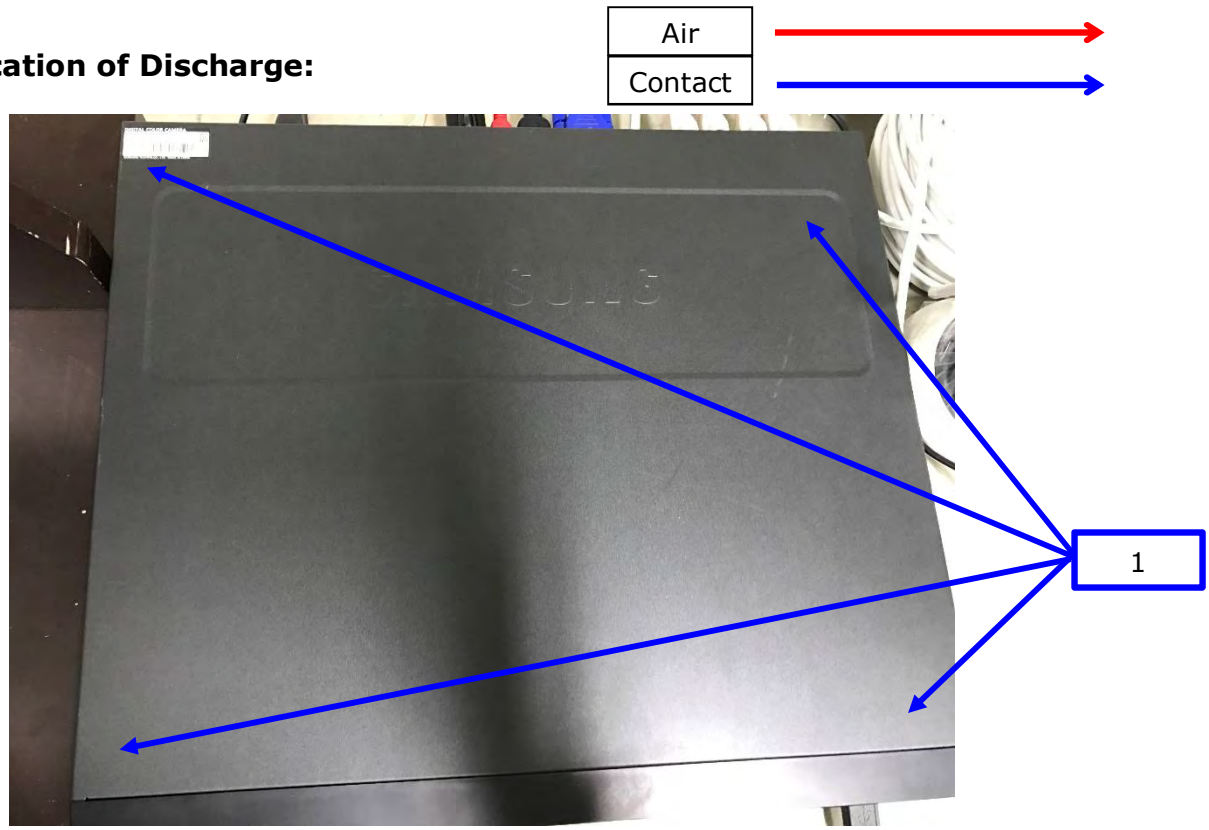
Discharge Voltage:

Contact	Air	HCP	VCP
☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

Location of Discharge:



Test Data

Indirect Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Surface	Contact Discharge	Complied	-
2	Ports	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.2 Radiated Electric Field Immunity

Reference Standard
EN 61000-4-3:2006 +A2:2010

Test Date
Nov. 09, 2016

Test Location
EMS-RS: ☐ Semi Anachoic Chamber #1 ☒ Semi Anechoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 08, 2017
☒	BROADBAND AMPLIFIER	BBA100	Rohde & Schwarz	101239	08, 08, 2017
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 08, 2017
☒	POWER METER	NRP2	Rohde & Schwarz	103475	08, 08, 2017
☒	AVG POWER SENSOR	NRP-Z91	Rohde & Schwarz	102526	08, 08, 2017
☒	AVG POWER SENSOR	NRP-Z91	Rohde & Schwarz	102527	08, 08, 2017
☒	Stacked Log.-Per.Antenna	STLP 9128 D	Schwarzbeck	9128D038	-
☒	DIRECTIONAL COUPLER	KYDC-D1070-DX40	Kytelecom Co., Ltd.	KY150001	08, 08, 2017
☒	Semi Anechoic Chamber #2	-	SEMITEC	-	-
☒	EMS Test S/W	EMC32	R&S	9.12.00	-

Test Conditions
Temperature: 16,4 ℃
Relative Humidity: 39,7 %
Atmospheric Pressure: 101,6 kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz
☒ 80 MHz to 2,7 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

Test Data

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.3 Electrical Fast Transients/Bursts

Reference Standard
EN 61000-4-4:2012

Test Date
Nov. 09, 2016

Test Location
EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	Capacitive Coupling Clamp	HFK	EM TEST	070925	06, 27, 2017
☒	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
☒	EMS Test S/W	iec.control	EM TEST AG	5.0.9.0	-

Test Conditions

Temperature:	16,4 ℃
Relative Humidity:	39,7 %
Atmospheric Pressure:	101,6 kPa

Test Specifications

Pulse Amplitude & Polarity: (AC Power Lines)	☐ ± 1.0 kV ☐ ± 4.0 kV	☒ ± 2.0 kV
Pulse Amplitude & Polarity: (Other supply / Signal Lines)	☐ ± 0.5 kV	☒ ± 1.0 kV ☐ ± 2.0 kV
Burst Period:	☒ 300 ms	☐ 2 s
Repetition Rate:	☐ 5 kHz	☒ 100 kHz
Duration of Test Voltage:	☒ ≥ 1 min	
Required Performance Criteria:	☒ Complied	

Test Data

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (㎸)	(-) Burst (㎸)
L – N - PE	Complied	Complied

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (㎸)	(-) Burst (㎸)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (㎸)	(-) Burst (㎸)
RJ-45	Complied	Complied
Alarm	Complied	Complied

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.4 Surge Transients

Reference Standard
EN 61000-4-5:2014

Test Date
Nov. 09, 2016

Test Location
EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
☐	CDN	CNV 508N1	EM TEST	P1551168979	04, 27, 2017
☐	CDN	CNV 504N	EM TEST	V0936105121	06, 27, 2017
☒	CDN	CNV 508T5	EM TEST	P1549168422	04, 27, 2017
☒	EMS Test S/W	iec.control	EM TEST AG	5.0.9.0	-

Test Conditions
Temperature: 16,4 ℃
Relative Humidity: 39,7 %
Atmospheric Pressure: 101,6 kPa

Test Specifications

AC Power Lines
Source Impedance: 12 ohm for common mode and 2 ohm for differential mode

Surge Amplitude : Common Mode
☐ (0,5 / 1,0 / 2,0) kV
Differential Mode
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 surges per angle

Angle: ☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity: ☒ Positive & Negative

Repetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance: 42 ohm for common mode

Surge Amplitude: Common Mode
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 Surges

Polarity: ☒ Positive & Negative

Repetition Rate: ☒ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

Test Data

☒ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L - N	Complied	Complied

☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L - PE	Complied	Complied
N - PE	Complied	Complied

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.5 Conducted Disturbance

Reference Standard
EN 61000-4-6:2014

Test Date
Nov. 09, 2016

Test Location
EMS-CS: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Continuous Wave Generator	CWS 500N1	EM TEST	V0936105119	08, 08, 2017
☒	6 dB Attenuator	ATT6	EM TEST	1208-34	08, 08, 2017
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 08, 2017
☐	CDN	CDN-T2-RJ11	EM TEST	0909-07	08, 08, 2017
☐	CDN	CDN-T4	EM TEST	0909-08	08, 08, 2017
☐	CDN	CDN-T8RJ45	EM TEST	0909-09	08, 08, 2017
☐	CDN	CDN-AF2	EM TEST	0909-10	08, 08, 2017
☐	CDN	CDN-AF4	EM TEST	0909-11	08, 08, 2017
☒	EM Injection Clamp	EM 101	Liithi	35943	02, 04, 2017
☒	EMS Test S/W	icd.control	EM TEST AG	5.3.7	-

Test Conditions
Temperature: 16,4 ℃
Relative Humidity: 39,7 %
Atmospheric Pressure: 101,6 kPa

Test Specifications

Frequency range: ☒ 150 ㎑ to 100 ㎒ ☐ 10 ㎑ to 30 ㎒
☐ 150 ㎑ to 230 ㎒ ☐ 10 ㎑ to 100 ㎒

Voltage Level: ☐ 1 Vrms ☐ 3 Vrms
☒ 10 Vrms

Modulation: ☒ AM, 80 %, 1 ㎑ sine wave
☒ PM, 1 ㎐ (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

Required Performance Criteria: ☒ Complied

Test Data

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N - PE	CDN (☐M2, ☒M3)	Complied

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN (☐M2, ☐M3)	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	EM Injection Clamp	Complied
Alarm	EM Injection Clamp	Complied

Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.

3.6 Voltage Dips and Short Interruptions

Reference Standard
EN 61000-4-11:2004

Test Date
Nov. 09, 2016

Test Location
EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
☒	EMS Test S/W	iec.control	EM TEST AG	5.0.9.0	-

Test Conditions

Temperature:	16,4 ℃
Relative Humidity:	39,7 %
Atmospheric Pressure:	101,6 kPa

Test Specifications & Observations/Remarks

(Test Voltage : AC 24 V, 50 ㎐)

Test Level	Duration [in period/ms (50 ㎐)]	Results
☒ 20 % dip	☒ 250 /5000	Complied
☒ 30 % dip	☒ 25 /500	Complied
☒ 60 % dip	☒ 10 /200	Complied
☒ 100 % dip	☒ 250 /5000	Complied

- Voltage cariations

☒ Unom + 10 %	☒ 26.4 V (ac)	Complied
☒ Unom - 15 %	☒ 20.4 V (ac)	Complied

Observations:
Complied – No degradation of function

Test Results
☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria
☐ NOT APPLICABLE

Remarks
PASS Required Performance Criteria.

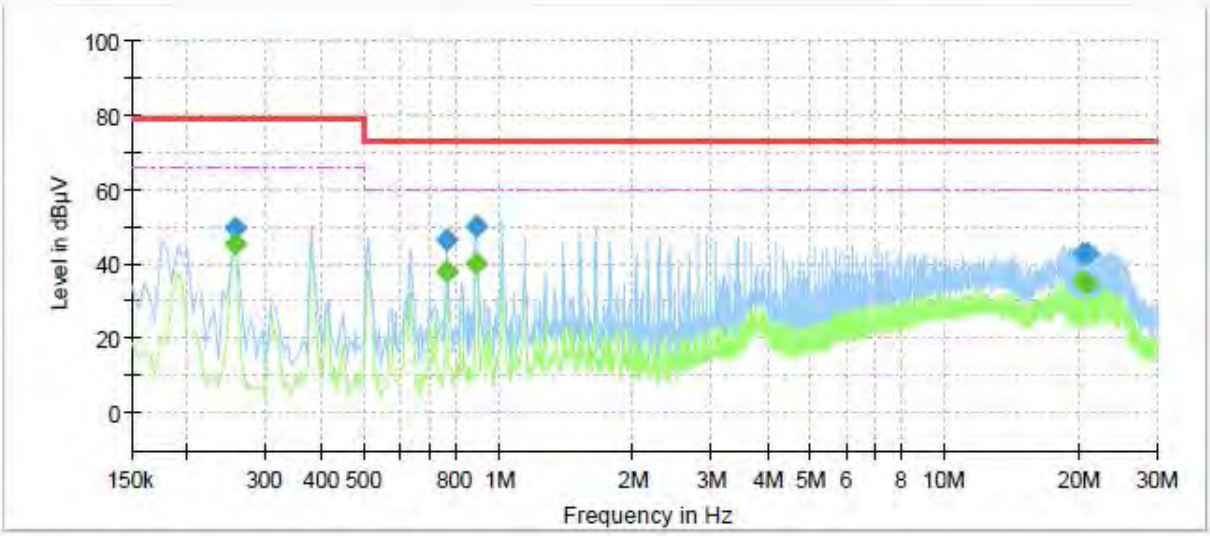
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

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



Final_Result

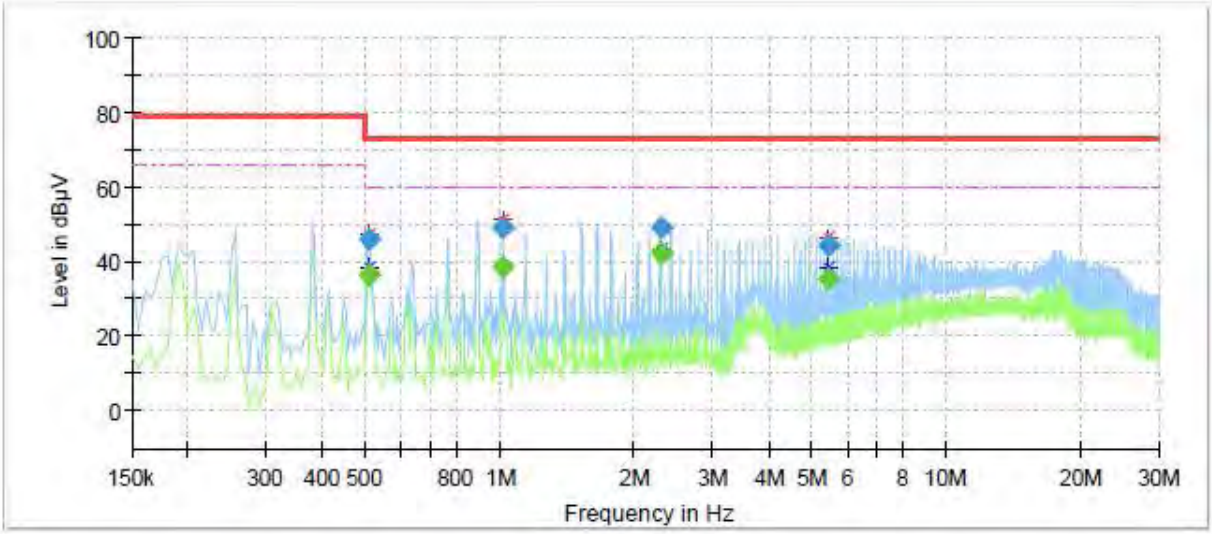
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.255000	---	45.43	66.00	20.57	1000.0	9.000	L1	9.7
0.255000	49.79	---	79.00	29.21	1000.0	9.000	L1	9.7
0.765000	---	37.96	60.00	22.04	1000.0	9.000	L1	9.9
0.765000	46.43	---	73.00	26.57	1000.0	9.000	L1	9.9
0.890000	---	40.43	60.00	19.57	1000.0	9.000	L1	9.9
0.890000	50.09	---	73.00	22.91	1000.0	9.000	L1	9.9
20.370000	---	35.66	60.00	24.34	1000.0	9.000	L1	10.2
20.370000	42.67	---	73.00	30.33	1000.0	9.000	L1	10.2
20.880000	---	34.95	60.00	25.05	1000.0	9.000	L1	10.2
20.880000	42.66	---	73.00	30.34	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-810SP
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	---	36.73	60.00	23.27	1000.0	9.000	N	9.8
0.510000	45.95	---	73.00	27.05	1000.0	9.000	N	9.8
1.015000	---	38.57	60.00	21.43	1000.0	9.000	N	9.9
1.015000	49.42	---	73.00	23.58	1000.0	9.000	N	9.9
2.290000	---	42.35	60.00	17.65	1000.0	9.000	N	10.0
2.290000	49.33	---	73.00	23.67	1000.0	9.000	N	10.0
5.470000	---	35.70	60.00	24.30	1000.0	9.000	N	10.0
5.470000	44.56	---	73.00	28.44	1000.0	9.000	N	10.0

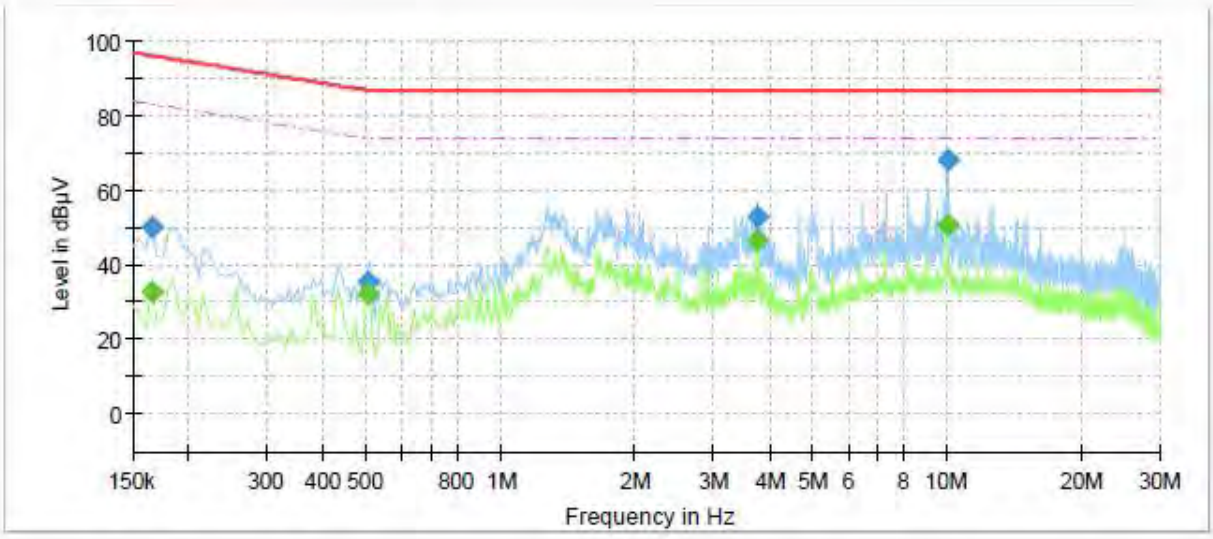
♦ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR+ Cable Loss)

Conducted Emissions at Telecommunication Ports

[10 Mbps]

Common Information

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



Final_Result

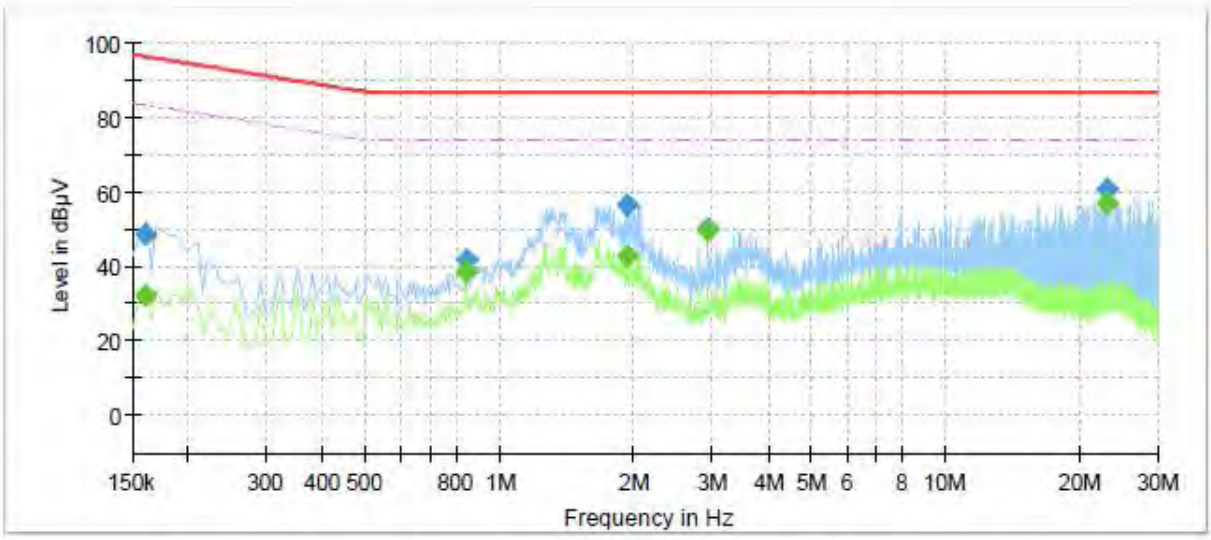
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	32.87	83.21	50.34	1000.0	9.000	Single Line	10.2
0.165000	50.05	---	96.21	46.16	1000.0	9.000	Single Line	10.2
0.505000	---	32.25	74.00	41.75	1000.0	9.000	Single Line	10.1
0.505000	35.41	---	87.00	51.59	1000.0	9.000	Single Line	10.1
3.750000	---	46.56	74.00	27.44	1000.0	9.000	Single Line	10.1
3.750000	52.69	---	87.00	34.31	1000.0	9.000	Single Line	10.1
10.015000	---	50.73	74.00	23.27	1000.0	9.000	Single Line	10.0
10.015000	68.21	---	87.00	18.79	1000.0	9.000	Single Line	10.0

♦ 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)

[100 Mbps]

Common Information

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



Final_Result

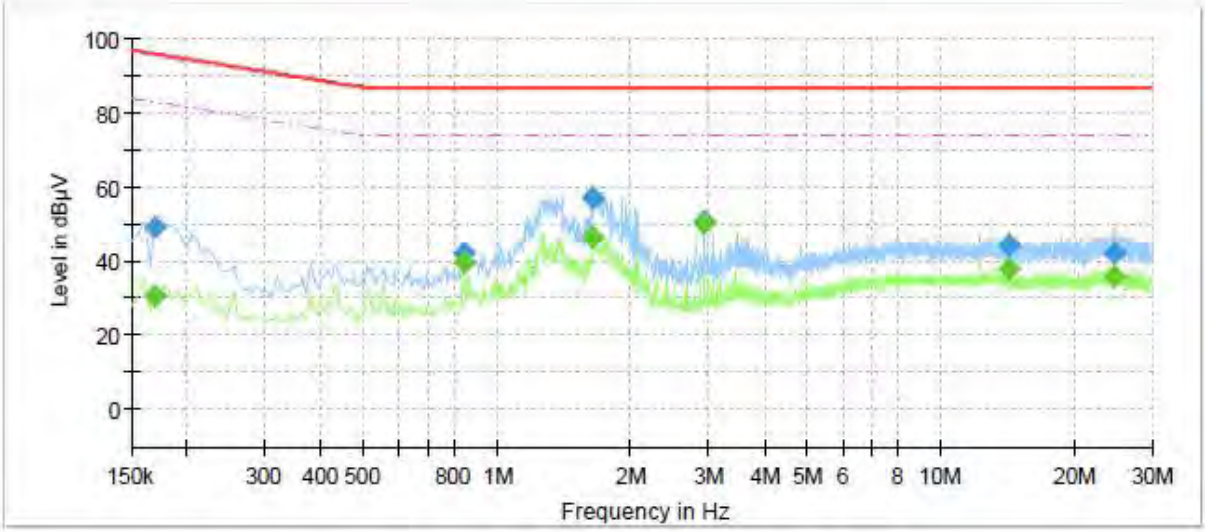
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	32.19	83.46	51.27	1000.0	9.000	Single Line	9.6
0.160000	48.75	---	96.46	47.71	1000.0	9.000	Single Line	9.6
0.840000	---	38.79	74.00	35.21	1000.0	9.000	Single Line	9.6
0.840000	41.61	---	87.00	45.39	1000.0	9.000	Single Line	9.6
1.940000	---	43.04	74.00	30.96	1000.0	9.000	Single Line	9.6
1.940000	56.47	---	87.00	30.53	1000.0	9.000	Single Line	9.6
2.925000	---	49.58	74.00	24.42	1000.0	9.000	Single Line	9.6
2.925000	50.17	---	87.00	36.83	1000.0	9.000	Single Line	9.6
23.130000	---	57.09	74.00	16.91	1000.0	9.000	Single Line	9.5
23.130000	60.68	---	87.00	26.32	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)

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XRN-810SP
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)
0.170000	---	30.61	82.96	52.35	1000.0	9.000	Single Line	9.6
0.170000	49.26	---	95.96	46.70	1000.0	9.000	Single Line	9.6
0.840000	---	39.48	74.00	34.52	1000.0	9.000	Single Line	9.5
0.840000	42.26	---	87.00	44.74	1000.0	9.000	Single Line	9.5
1.650000	---	46.38	74.00	27.62	1000.0	9.000	Single Line	9.5
1.650000	56.92	---	87.00	30.08	1000.0	9.000	Single Line	9.5
2.925000	---	50.10	74.00	23.90	1000.0	9.000	Single Line	9.5
2.925000	50.78	---	87.00	36.22	1000.0	9.000	Single Line	9.5
14.195000	---	38.24	74.00	35.76	1000.0	9.000	Single Line	9.4
14.195000	44.43	---	87.00	42.57	1000.0	9.000	Single Line	9.4
24.600000	---	36.08	74.00	37.92	1000.0	9.000	Single Line	9.5
24.600000	42.19	---	87.00	44.81	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)

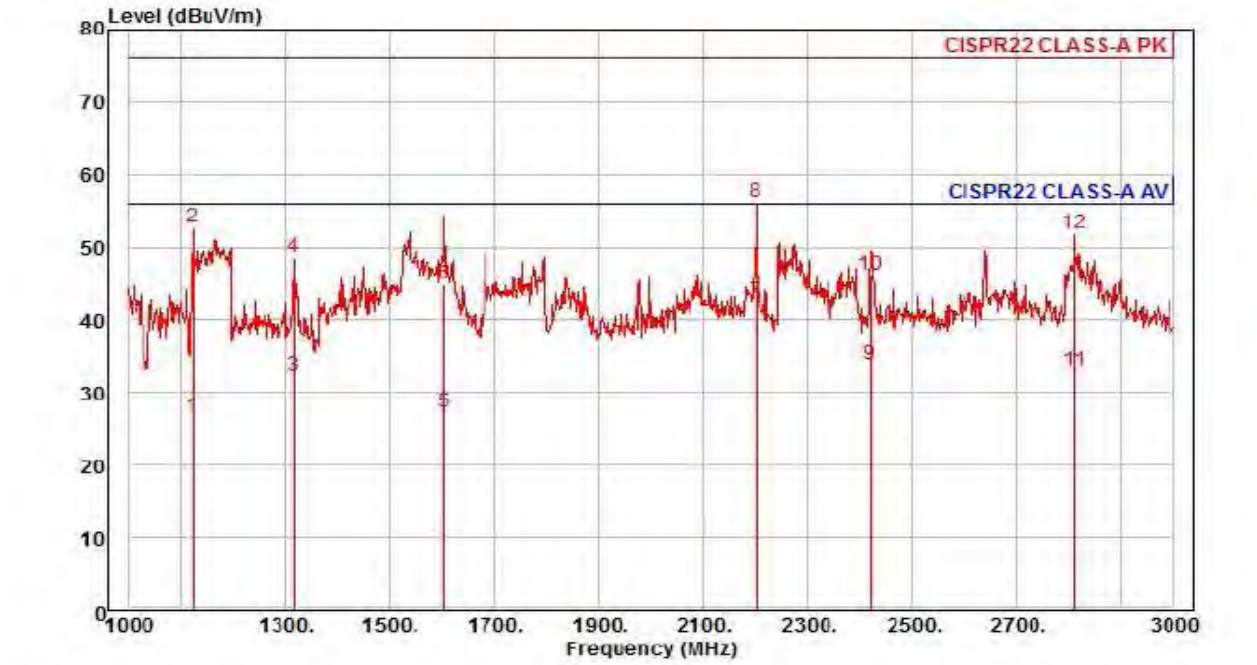
Radiated Electric Field Emissions(Below 1 ㎓)

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[㎒]	[dB㎶]		[m]	ANT. [dB/m]	Cable [dB]	[dB㎶/m]	[dB㎶/m]	[dB]
149.38	12.58	H	2.63	8.18	3.56	24.32	40.00	15.68
149.39	13.25	V	1.87	8.18	3.56	24.99	40.00	15.01
250.08	14.00	V	2.22	12.41	4.72	31.13	47.00	15.87
297.67	14.95	H	1.58	13.33	5.13	33.41	47.00	13.59
375.33	16.28	H	3.02	15.13	5.91	37.32	47.00	9.68
425.63	10.96	V	1.95	16.06	6.49	33.51	47.00	13.49
425.77	16.87	H	2.05	16.06	6.50	39.43	47.00	7.57
500.48	18.36	V	1.99	17.11	7.01	42.48	47.00	4.52

* 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

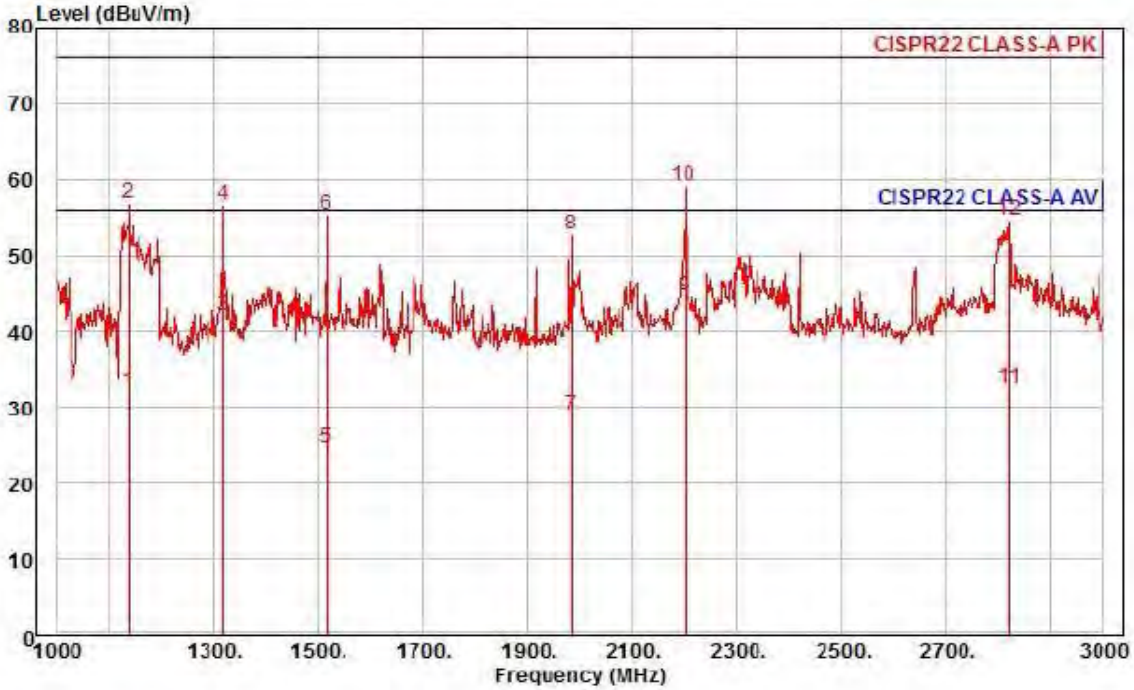
Radiated Electric Field Emissions(Above 1 ㎓)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XRN-810SP
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	35.08	24.39	6.88	39.80	318	56.00	-29.45	horizontal	Average
2		1122.00	61.31	24.39	6.88	39.80	318	76.00	-23.22	horizontal	Peak
3		1318.00	38.85	25.17	7.48	39.33	239	56.00	-23.83	horizontal	Average
4		1318.00	55.26	25.17	7.48	39.33	239	76.00	-27.42	horizontal	Peak
5		1604.00	31.88	26.31	8.32	39.23	236	56.00	-28.72	horizontal	Average
6		1604.00	49.47	26.31	8.32	39.23	236	76.00	-31.13	horizontal	Peak
7	pp	2200.00	43.81	28.37	9.80	39.42	19	56.00	-13.44	horizontal	Average
8	pk	2200.00	57.40	28.37	9.80	39.42	19	76.00	-19.85	horizontal	Peak
9		2420.00	34.06	28.91	10.36	39.44	155	56.00	-22.11	horizontal	Average
10		2420.00	46.36	28.91	10.36	39.44	155	76.00	-29.81	horizontal	Peak
11		2812.00	31.66	29.87	11.26	39.89	343	56.00	-23.10	horizontal	Average
12		2812.00	50.69	29.87	11.26	39.89	343	76.00	-24.07	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



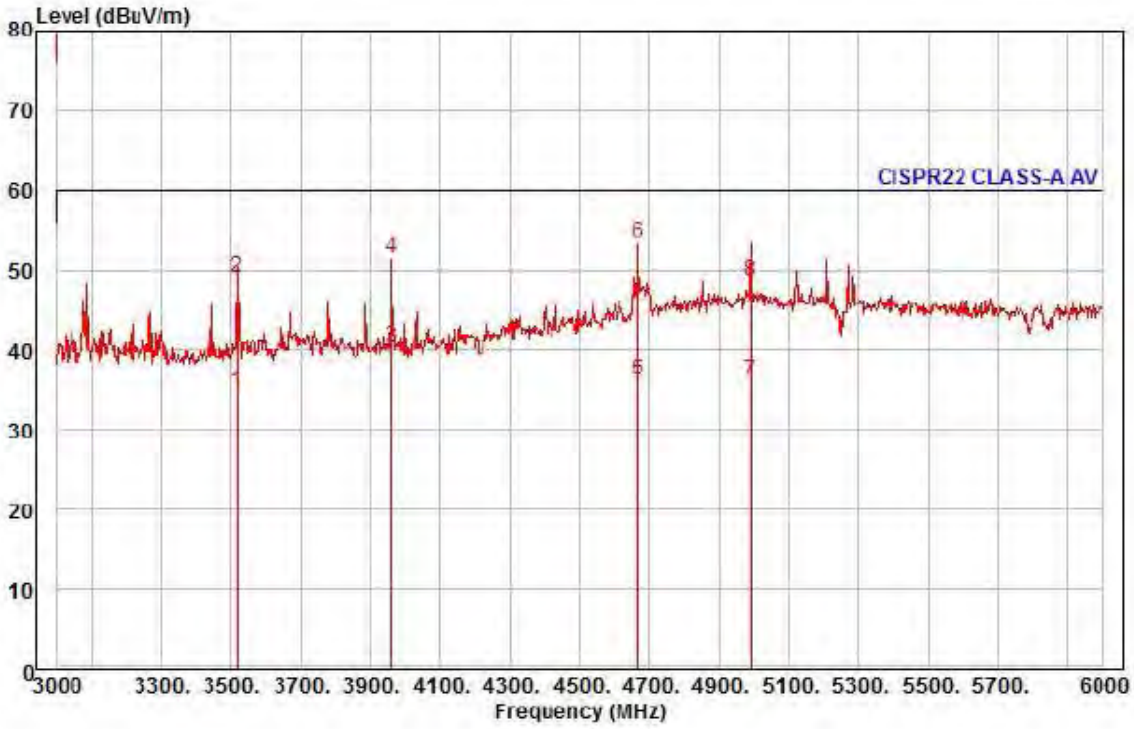
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XRN-810SP
Mode :
Memo : 1 ~ 3 GHz

	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	1136.00	40.35	24.45	6.93	39.76	352	56.00	-24.03	vertical	Average
2	1136.00	65.19	24.45	6.93	39.76	352	76.00	-19.19	vertical	Peak
3	1320.00	48.73	25.18	7.49	39.32	91	56.00	-13.92	vertical	Average
4	1320.00	63.34	25.18	7.49	39.32	91	76.00	-19.31	vertical	Peak
5	1516.00	29.79	25.96	8.06	39.18	214	56.00	-31.37	vertical	Average
6	1516.00	60.59	25.96	8.06	39.18	214	76.00	-20.57	vertical	Peak
7	1986.00	31.17	27.82	9.30	39.40	134	56.00	-27.11	vertical	Average
8	1986.00	55.09	27.82	9.30	39.40	134	76.00	-23.19	vertical	Peak
9 pp	2200.00	45.93	28.37	9.80	39.42	315	56.00	-11.32	vertical	Average
10 pk	2200.00	60.23	28.37	9.80	39.42	315	76.00	-17.02	vertical	Peak
11	2822.00	31.21	29.89	11.28	39.91	214	56.00	-23.53	vertical	Average
12	2822.00	53.52	29.89	11.28	39.91	214	76.00	-21.22	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

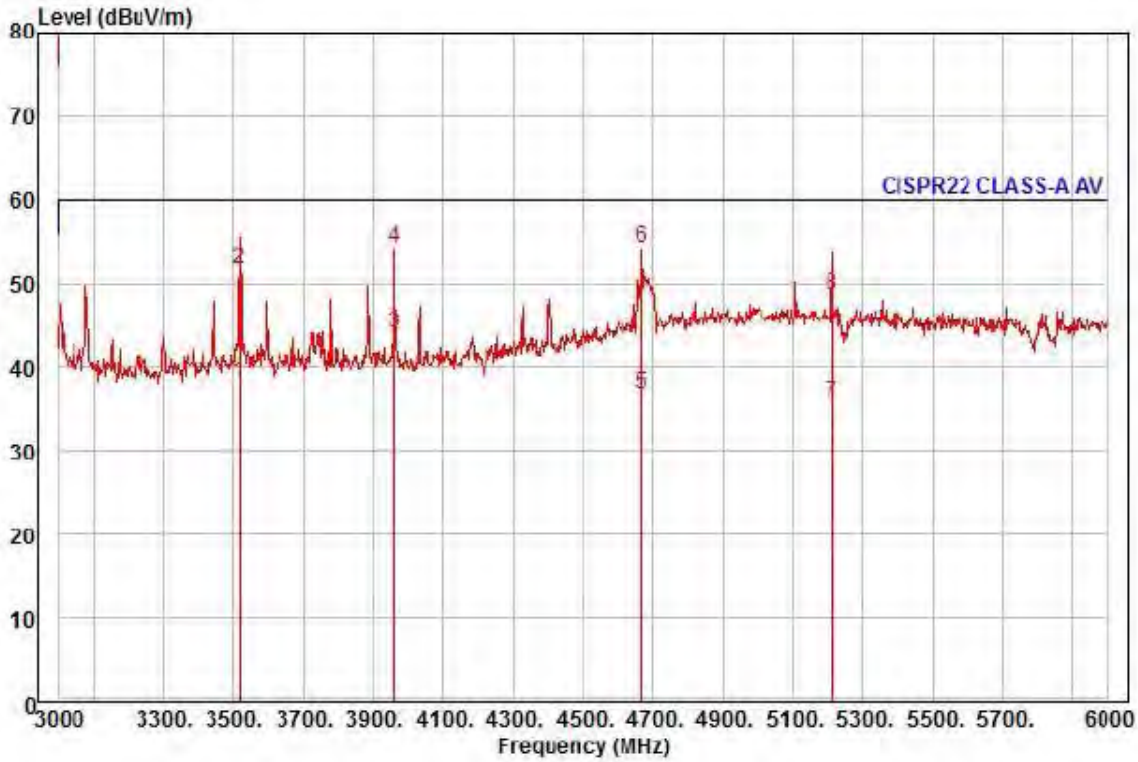


Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : XRN-810SP
Mode :
Memo : 3 ~ 6 GHz

	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	31.57	31.20	12.66	40.87	212	60.00	-25.44	horizontal	Average
2	3519.00	45.98	31.20	12.66	40.87	212	80.00	-31.03	horizontal	Peak
3 pp	3960.00	35.58	31.94	13.49	40.71	41	60.00	-19.70	horizontal	Average
4	3960.00	46.71	31.94	13.49	40.71	41	80.00	-28.57	horizontal	Peak
5	4668.00	26.26	35.82	14.81	40.60	317	60.00	-23.71	horizontal	Average
6 pk	4668.00	43.36	35.82	14.81	40.60	317	80.00	-26.61	horizontal	Peak
7	4989.00	23.47	37.66	15.30	40.28	215	60.00	-23.85	horizontal	Average
8	4989.00	36.02	37.66	15.30	40.28	215	80.00	-31.30	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-810SP
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	35.12	31.20	12.66	40.87	260	60.00	-21.89	vertical	Average
2	3519.00	48.77	31.20	12.66	40.87	260	80.00	-28.24	vertical	Peak
3 pp	3960.00	39.29	31.94	13.49	40.71	212	60.00	-15.99	vertical	Average
4 pk	3960.00	49.56	31.94	13.49	40.71	212	80.00	-25.72	vertical	Peak
5	4668.00	26.81	35.82	14.81	40.60	6	60.00	-23.16	vertical	Average
6	4668.00	44.15	35.82	14.81	40.60	6	80.00	-25.82	vertical	Peak
7	5214.00	23.34	37.29	15.73	40.63	93	60.00	-24.27	vertical	Average
8	5214.00	36.18	37.29	15.73	40.63	93	80.00	-31.43	vertical	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

Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
1	190.188E-3			
2	309.053E-6			PASS
3	22.354E-3	1.080	2.07	PASS
4	145.800E-6			PASS
5	9.190E-3	0.896	1.03	PASS
6	133.993E-6			PASS
7	7.667E-3	1.106	693.00E-3	PASS
8	163.171E-6			PASS
9	5.735E-3	1.593	360.00E-3	PASS
10	167.077E-6			PASS
11	4.837E-3			PASS
12	138.126E-6			PASS
13	2.919E-3			PASS
14	177.965E-6			PASS
15	2.308E-3			PASS
16	259.108E-6			PASS
17	3.039E-3			PASS
18	148.976E-6			PASS
19	2.142E-3			PASS
20	256.015E-6			PASS
21	1.874E-3			PASS
22	206.786E-6			PASS
23	2.664E-3			PASS
24	127.007E-6			PASS
25	780.398E-6			PASS
26	217.606E-6			PASS
27	1.321E-3			PASS
28	195.134E-6			PASS
29	1.869E-3			PASS
30	129.811E-6			PASS
31	1.641E-3			PASS
32	207.679E-6			PASS
33	1.874E-3			PASS
34	154.377E-6			PASS
35	1.086E-3			PASS
36	132.036E-6			PASS
37	400.009E-6			PASS
38	172.606E-6			PASS
39	343.354E-6			PASS
40	134.563E-6			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
1	191.987E-3			
2	523.881E-6			PASS
3	22.624E-3	0.492	4.60	PASS
4	212.144E-6			PASS
5	9.389E-3	0.412	2.28	PASS
6	295.931E-6			PASS
7	7.865E-3	0.511	1.54	PASS
8	241.261E-6			PASS
9	5.835E-3	0.729	800.00E-3	PASS
10	253.148E-6			PASS
11	4.938E-3			PASS
12	209.108E-6			PASS
13	3.049E-3			PASS
14	279.208E-6			PASS
15	2.470E-3			PASS
16	366.161E-6			PASS
17	3.181E-3			PASS
18	227.001E-6			PASS
19	2.276E-3			PASS
20	395.038E-6			PASS
21	2.061E-3			PASS
22	319.196E-6			PASS
23	2.807E-3			PASS
24	193.969E-6			PASS
25	1.022E-3			PASS
26	299.009E-6			PASS
27	1.426E-3			PASS
28	270.423E-6			PASS
29	2.031E-3			PASS
30	192.855E-6			PASS
31	1.793E-3			PASS
32	284.676E-6			PASS
33	2.077E-3			PASS
34	252.967E-6			PASS
35	1.232E-3			PASS
36	222.147E-6			PASS
37	491.494E-6			PASS
38	267.861E-6			PASS
39	499.525E-6			PASS
40	266.148E-6			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

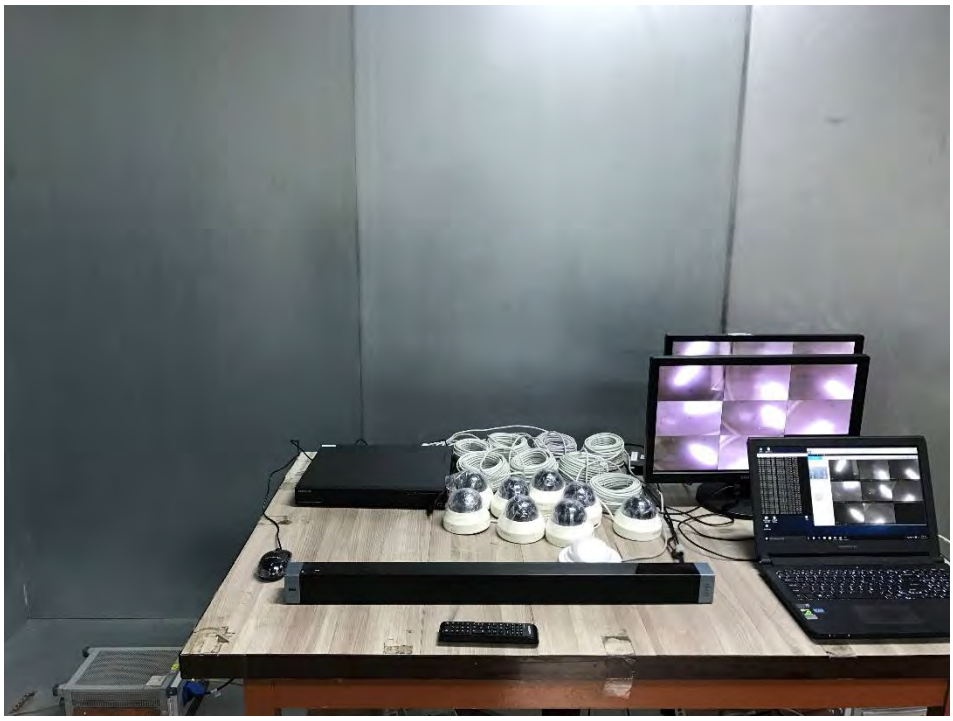
Test Data - Voltage Fluctuations

Maximum Flicker results

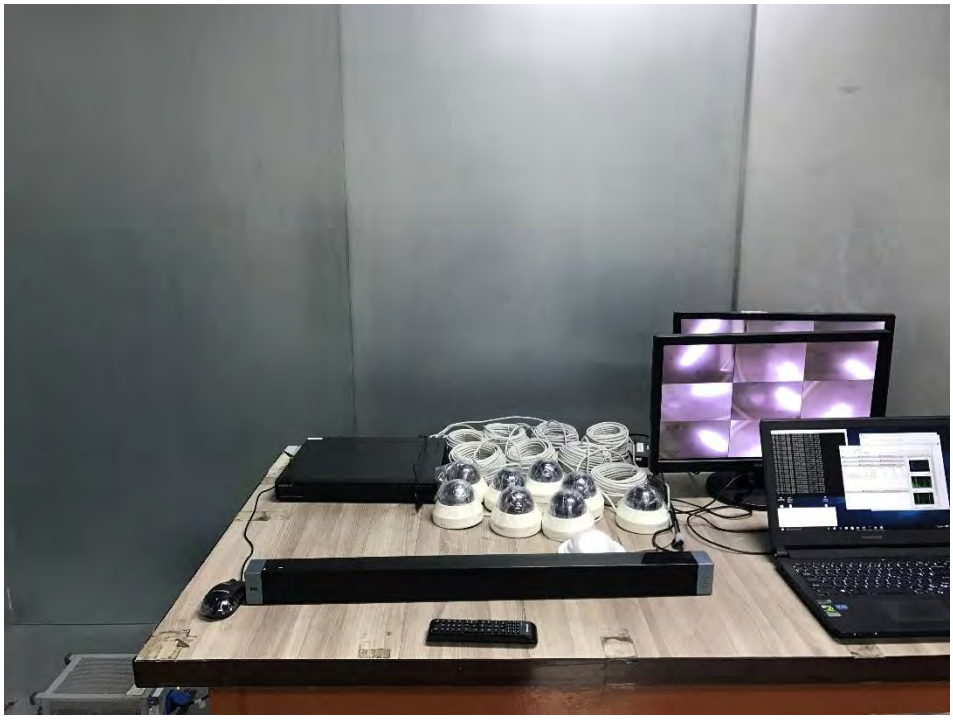
	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.113	4.00	PASS
Tmax [s]	0.000	0.50	PASS

Test Setup Photos and Configuration

Conducted Voltage Emissions

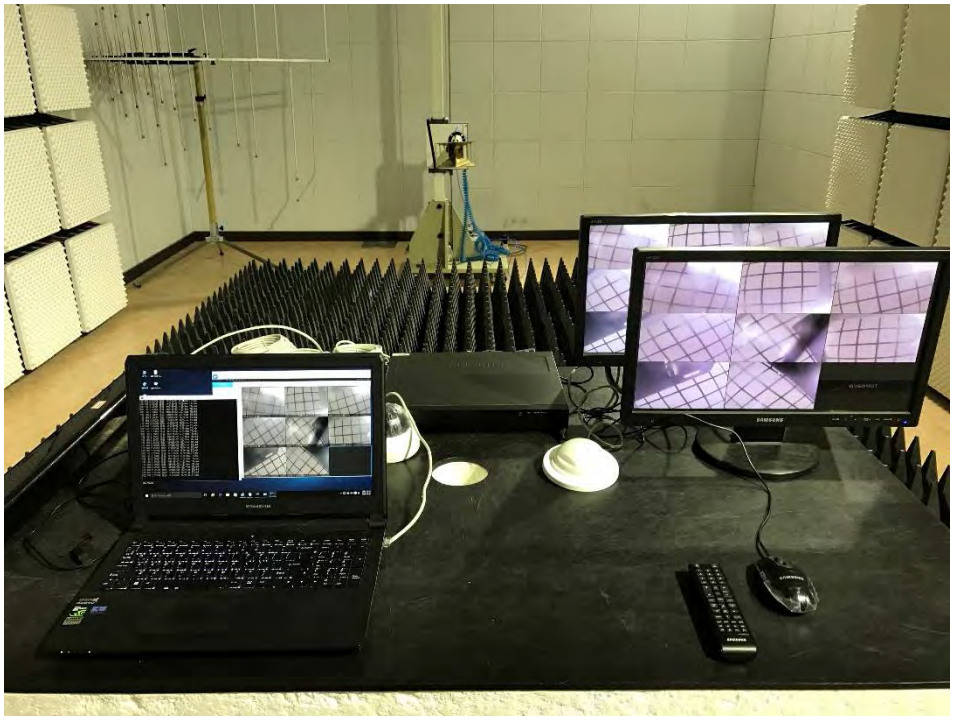


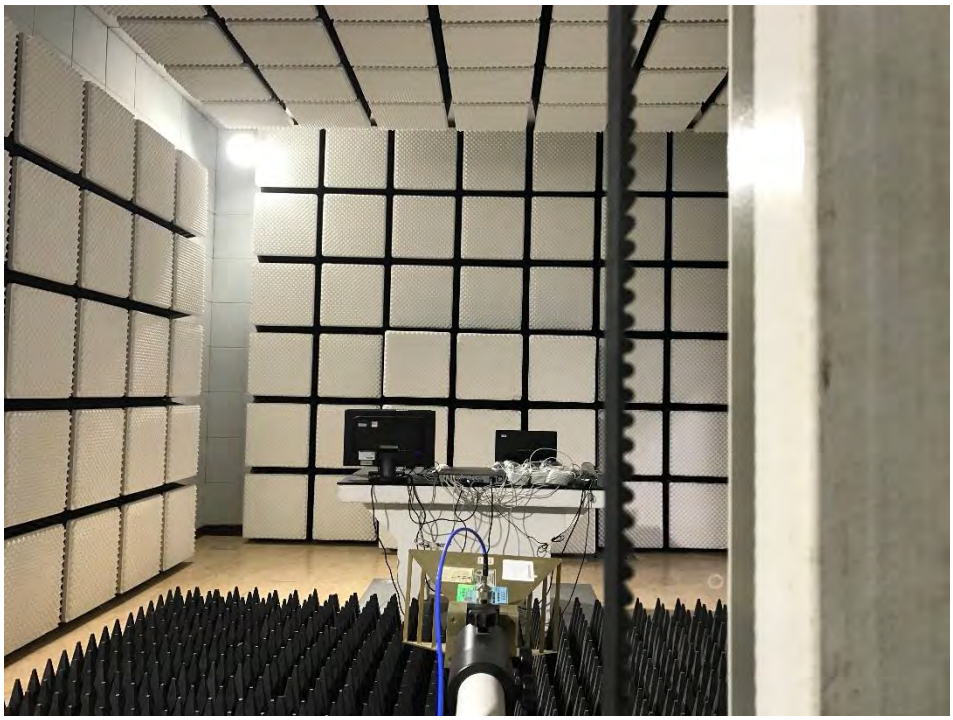
Conducted Telecommunication Emissions



Radiated Electric Field Emissions(Below 1 ㎓)

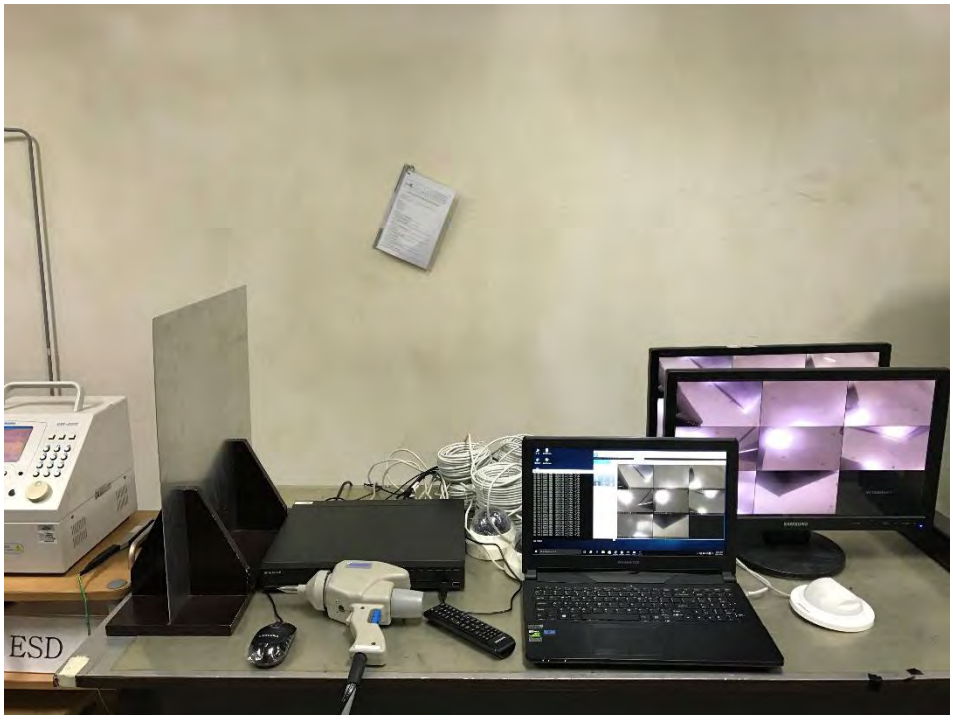
Radiated Electric Field Emissions(Above 1 ㎓)



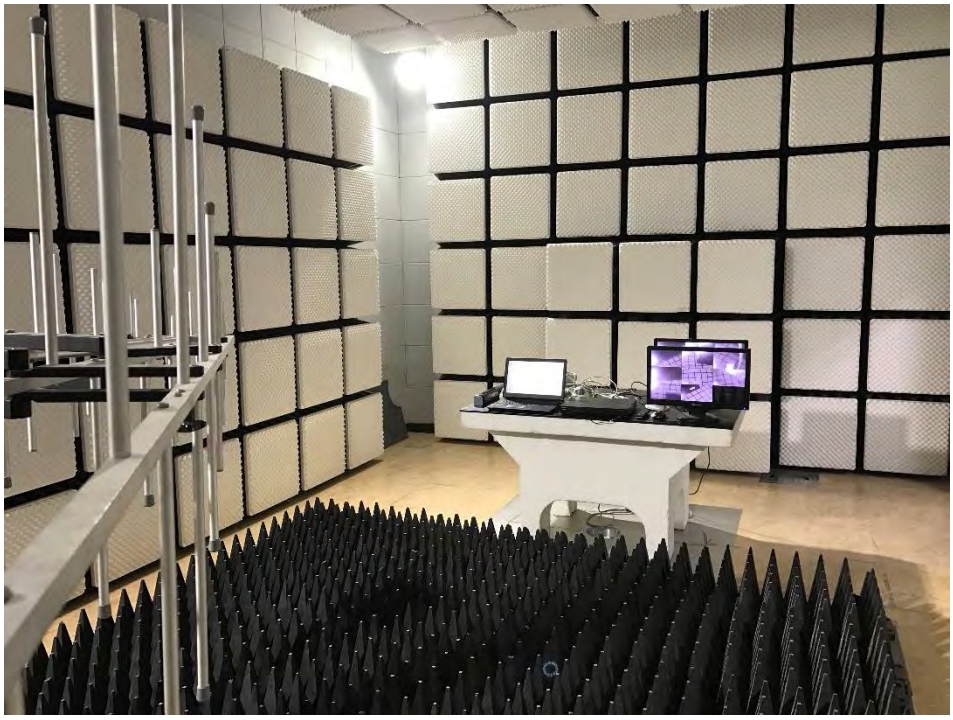


Harmonic Current Emissions and Voltage Fluctuations and Flicker

Electrostatic Discharge



Radiated Electric Field Immunity

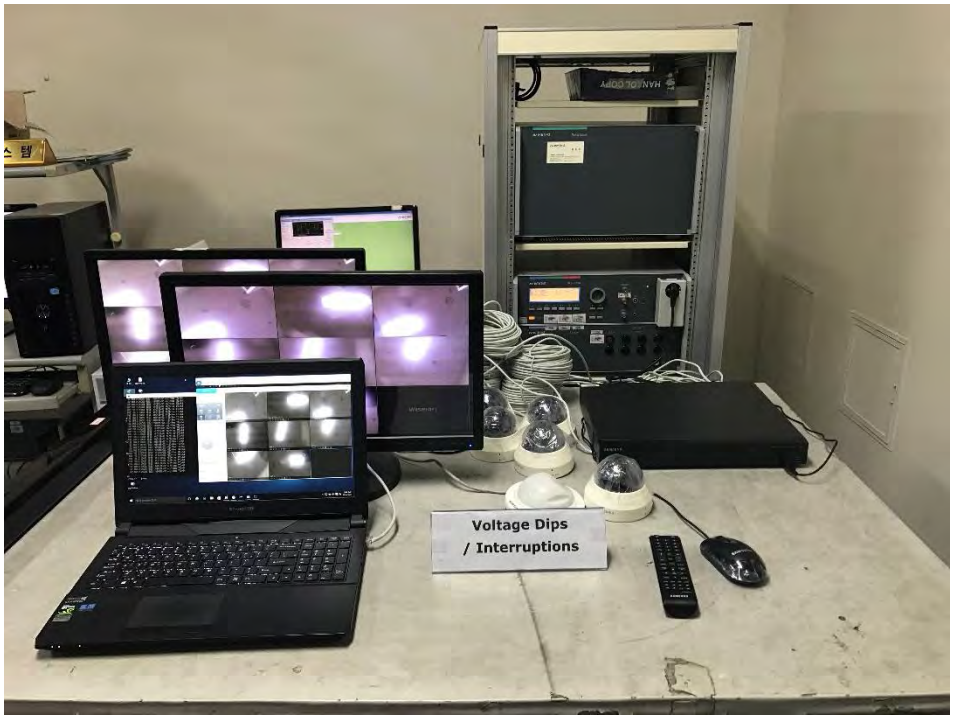


Electrical Fast Transients/Bursts

Surge Transients

Conducted Disturbance

Voltage Dips and Short Interruptions



EUT External Photographs

(Top)

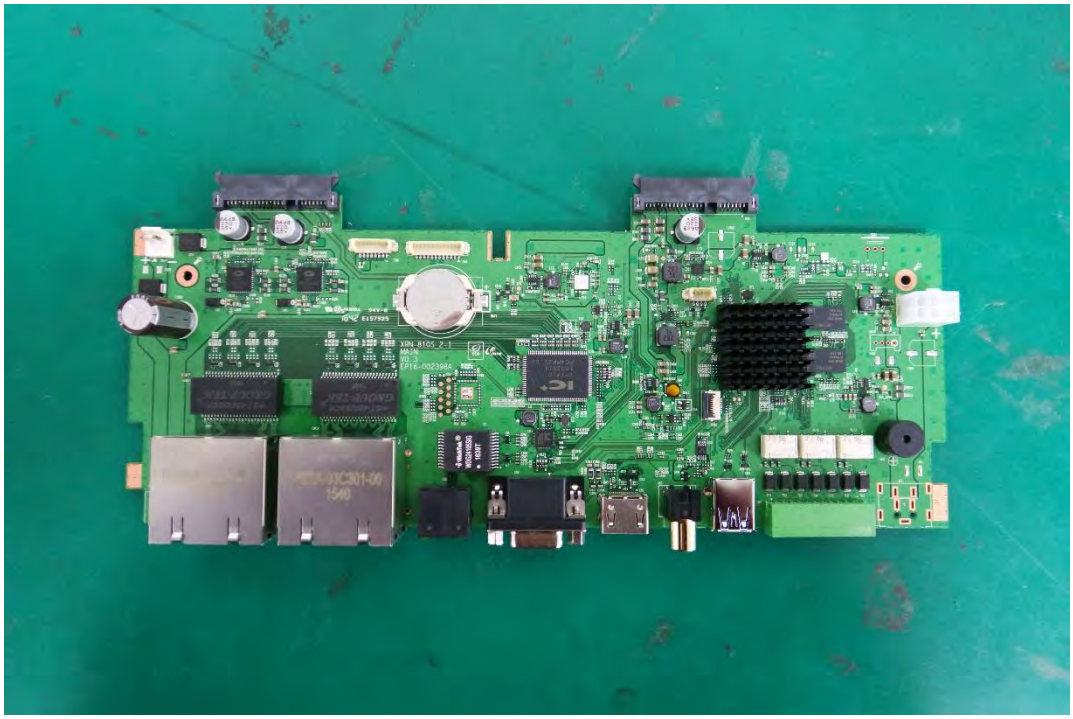
(Bottom)

EUT Internal Photographs

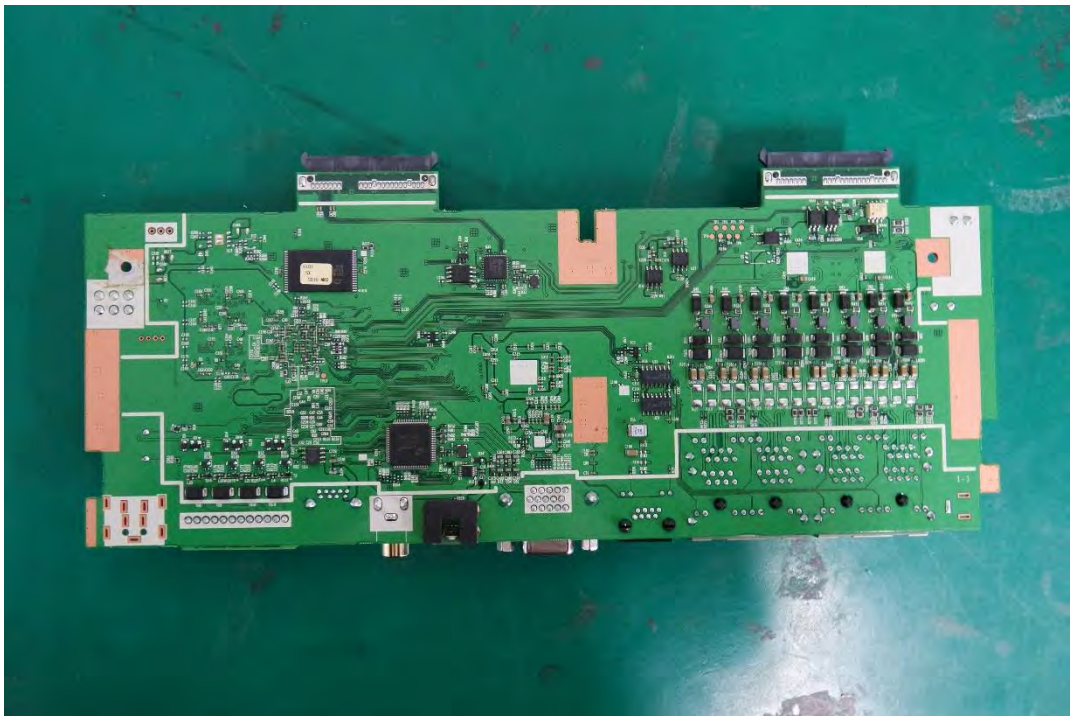
(Internal View)

EUT Internal View – Main Board

(Top)

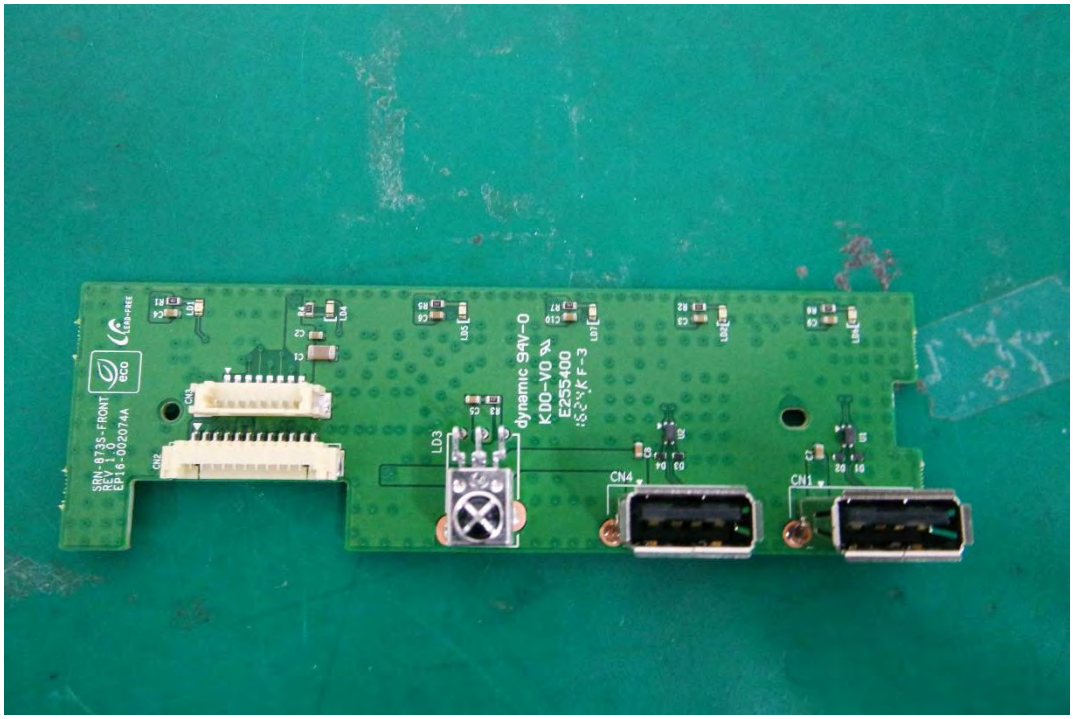


(Bottom)

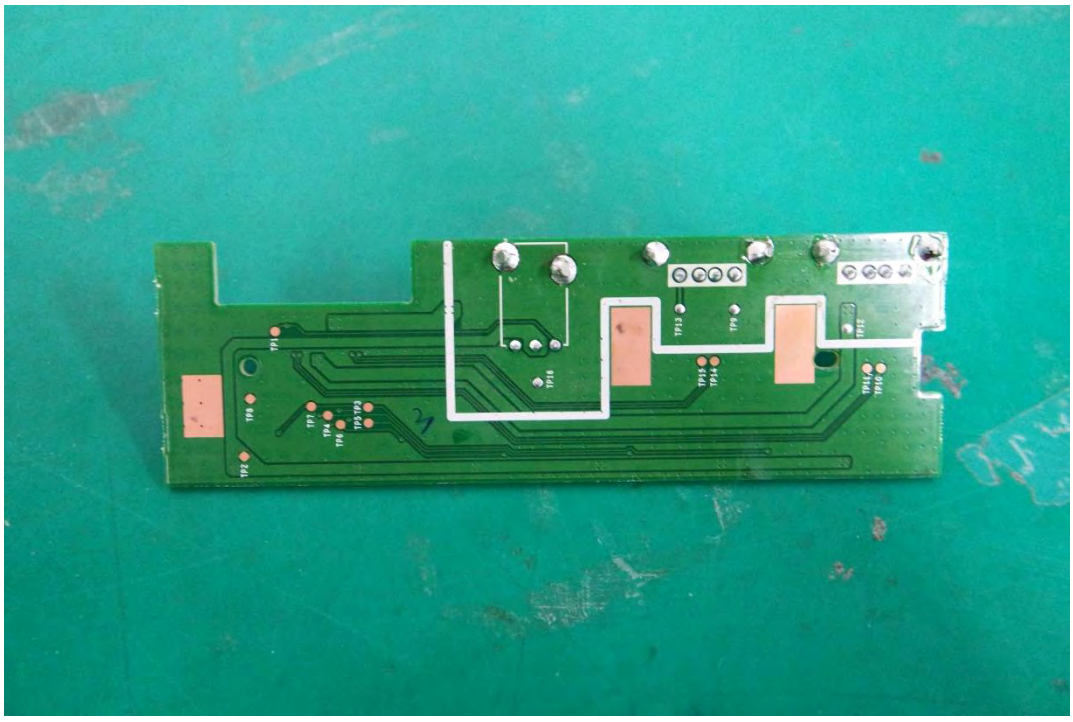


EUT Internal View –USB Board

(Top)



(Bottom)



EUT Internal View – Power

(Top)

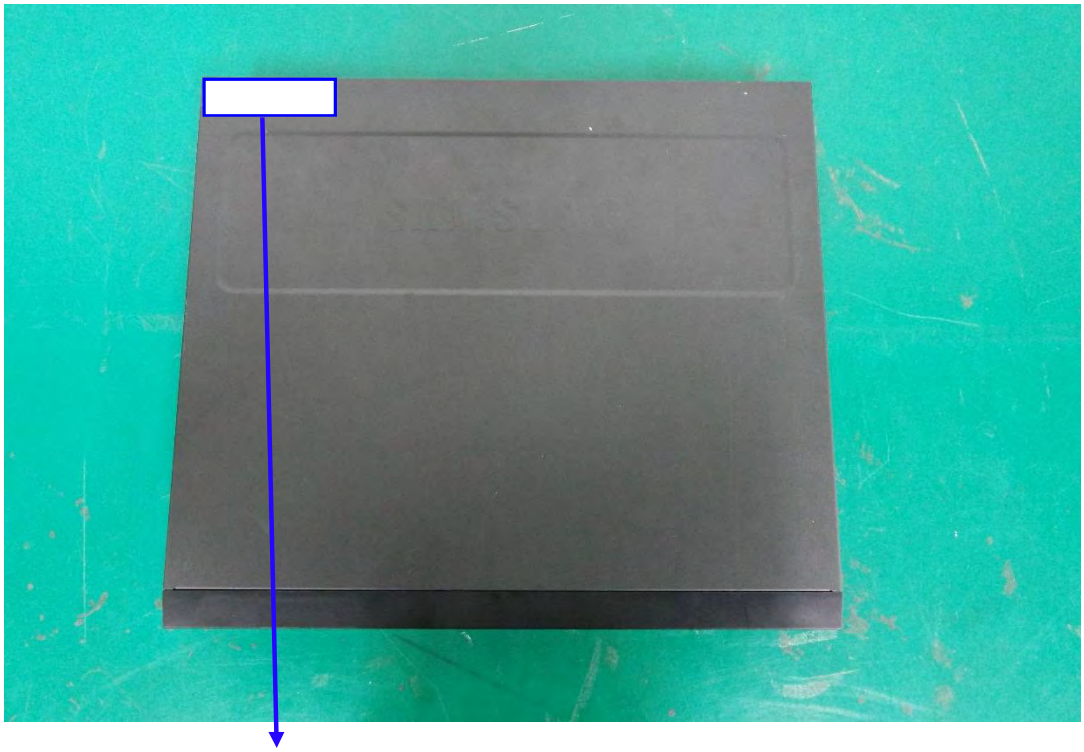
(Bottom)

EUT Internal View – HDD

(Top)

(Bottom)

Label and Location



NETWORK VIDEO RECORDE

Model No : XRN-810S

Manufacturer : HANWHA TECHWIN(TIANJIN)CO., LTD

Made in China

CE