



KES Co., Ltd.

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Report No.:
KES-EM-23T0256
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EMC TEST REPORT For VCCI

Test Report No. : KES-EM-23T0256
Date of Issue : Mar. 17, 2023
Product name : Network Camera
Model/Type No. : TNV-C7013RC
Variant Model : -
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Date of Receipt : Feb. 21, 2023
Test date : Mar. 03, 2023 ~ Mar. 09, 2023
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Dae Soo, Kim
EMC Test Engineer

Reviewed by

Seong Min, Choi
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 17, 2023	KES-EM-23T0256	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video		Radiometry	
Imaging Device	1/1.8" progressive CMOS	Temperature Detect Range	None
Resolution	2048x1536, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x480, 720x576, 720x480, 640x480, 640x360, 320x240	Temperature Accuracy	None
Max. Frame Rate	H.265/H.264: Max. 30fps/25fps(50Hz/50Hz) MJPEG: Max. 30fps/@3MP Max. 5fps	Temperature Detection	None
NETD	None	Additional	None
Pixel Size	None	Network	
Min. Illumination	Color: 0.04Lux(F2.0, 1/30sec, 30IRE) BW: 0.04Lux(F2.0, 1/30sec, 30IRE), 0Lux(IR LED on)	Ethernet	Metal shielded RJ-45(10/100BASE-T)
Video Out	None	Video Compression	H.265/H.264: Main/Baseline/High, MJPEG G.711 u-law /G.726 Selectable G.726(ADPCM) 8KHz, G.711 8KHz G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC: 48Kbps at 16KHz
Video Transmission Distance	None	Audio Compression	Smart Codec: Manual(Sea area), WiseStreamII, WiseStreamIII(Based on AI engine)
Lens		Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Focal Length (Zoom Ratio)	2.39mm fixed focal	Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Max. Aperture Ratio	F2.0	Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles, 3 virtual channel support)
Angular Field of View	H: 128°, V: 100°	Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTSP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, CoS, UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast), MQTT
Min. Object Distance	0.5m(1.64ft)	SIP support (VoIP, Peer-to-peer, SIP/P)	None
Focus Control	Fixed		TPM 2.0(FIPS 140-2 level 2)
Lens Type	None		HTTPS(SSL) Login Authentication
Mount Type	None		Digest Login Authentication
Optional Lens	None		IP Address Filtering
Pan / Tilt / Rotate			User access log
Pan / Tilt / Rotate Range	None		802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)
Pan Range	None		Device Certificate(Hanwha Techwin Root CA, pre-installed)
Pan Speed	None		Secure by default certificate
Tilt Range	None		Secure OS/Boot/Storage, Verify firmware forgery
Tilt Speed	None		ONVIF Profile S/G/I/M
Rotate Range	None		SUNAPI(HTTP API)
Sequence	None		Wisenet open platform
Preset Accuracy	None		
Operational		General	
Camera Title	Displayed up to 85 characters	Webpage Language	None
Direction Indicator	None	Web Viewer	None
Day & Night	Auto(ICR)	Edge Storage	Micro SD/SDHC/SDXC 1slot 1TB
Backlight Compensation	BLC, HLC, WDR, SSDR	Memory	4096MB RAM, 512MB Flash
Wide Dynamic Range	extremeWDR (120dB)	Environmental & Electrical	
Digital Noise Reduction	WiseNRII(Based on AI engine), SSNRV	Operating Temperature / Humidity	-10°C ~ +55°C (14°F ~ +131°F) 0~95% RH(non-condensing) Humidity control /w AIR vent
Digital Image Stabilization	Support	Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / 0~90% RH
Defog	Support	Certification	IP66, IP6K9K, IK10+
Motion Detection	Bea, Bpoint polygonal zones	Input Voltage	PoE(IEEE802.3af, Class3)
Privacy Masking	32ea, 4point Quadrangle zones - Color: Gray/Green/Red/Blue/Black/White - Mosaic	Power Consumption	PoE: Max 12.95W, typical 9.7W DC : Max 12.7W, typical 9.0W
Gain Control	Off / Max Gain / Manual	Mechanical	
White Balance	ATW / Narrow ATW / AWC / Manual / Indoor / Outdoor	Color / Material	White / Aluminum
LC	None	RAL Code	RAL9003
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2~1/12,000sec) Prefer shutter control(Based on AI engine)	Product Dimensions / Weight	198.3(W)x104.8(H)x198.6(D)(mm)(7.8"x4.13"x7.82"), 1.935g (4.27lb)
Digital PTZ	Support(Preset, Group)	Compatible Conduit hole / Gangbox	None
Video Rotation	Flip, Mirror, Halfway view(90°/270°)	Hanging Mount (Dome)	None
	Classified object type : Person/Face/Vehicle/license plate	Skin Cover	None
	Support DetectionShot	Skin Cover (Dome)	SPG-VANT13W
	Analytics events based on AI engine	Weather Cap (Dome)	None
	- Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit)	Power Module	None
	Analytics events	Backbox	None
	- Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Virtual area(Appear/Disappear), Clothes color detection(Orange/Black/Red, @400lux)	Certifications & Standards	
Business Intelligence	None	Network	None
Serial Interface	None		FCC 47 CFR 15 Subpart B Class A ICES-3(A)/NMB-3(A) CE/UKCA
Alarm I/O	2 configurable I/O ports * Support Alarm via optional SPM-4210 I/O box	EMC	- EN 55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3 VCCI C/SPR 32 Class A RCM AS/NZS CISPR 32 Class A KS C 9832 Class A, KS C 9835
Alarm Triggers	Analytics, Network disconnect, Alarm input, App event, Time schedule, MQTT	Safety	UL 62368-1, CAN/CSA C22.2 NO. 62368-1 IEC/EN 62471
	When alarm trigger occurred	Environment	IEC/EN 63000 IEC/EN 60529 IP66, ISO 20653 IP6K9K, IEC/EN 62262 IK10+
	- File upload(image): e-mail/FTP	Video	None
	- Notification: e-mail	DORI (EN62676-4 standard)	
	- Recording: SD/SDHC/SDXC or NAS recording at event triggers	Detect (25PPM/ 8PPF)	35.1m(115.16ft)
	- Alarm output	Observe (63PPM/ 19PPF)	14m(45.93ft)
	- Handover: PTZ preset, send message by HTTP/HTTPS/TCP	Recognize (125PPM/ 38PPF)	7.0m(22.97ft)
	- Audio clip playback	Identify (250PPM/ 76PPF)	3.5m(11.48ft)
	- MQTT: publication	LPR/ANPR/MMCR	
Audio Streaming	None	Speed Description	None
	Selectable(mic in/line in), Built-in MIC	Speed limit	None
Audio In	Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm * Support Audio via optional SPM-4210 I/O box	Min. Forward Distance	None
Audio Out	Line out, Max. output level: 1Vrms	Max. Forward Distance	None
IR Viewable Length	Wise IR 15m(49.21ft)	Max. Horizontal Angle	None
IR Illuminator (Optional)	None	Max. Vertical Angle	None
IR Radiation angle	None	Horizontal Offset	None
IR LED	None	Camera Height	None
IR Wavelength	None	Lane Coverage	None
IR Operation	None	Vehicle Recognition	None
Water Removal	None	Available Countries	None
Auto Tracking	None	Wisenet Road AI LPR/ANPR/MMCR	
Coaxial Protocol	None	Solution	None
Color Palettes	None	Speed Description	None
		Lane Coverage	None
		Speed limit	None
		Min. Forward Distance	None
		Max. Forward Distance	None
		Max. Horizontal Angle	None
		Max. Vertical Angle	None
		Horizontal Offset	None
		Camera Height	None
		Vehicle Recognition	None
		Available Countries	None

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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.

☒ AC 100 V, 60 Hz ☒ PoE

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 Camera	TNV-C7013RC	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC / DC ADAPTOR	KPL-048F-VI	-	I.T.E POWER SUPPLY	-
PoE SWITCH	POE29U-1AT(PL)	3115156G00001 3	Phihong Technology Co., Ltd.	-
LAPTOP	Latitude 5300	8C47BE45C060	DELL INC.	-
LAPTOP ADAPTOR	HA65NM130	-	Chicony Power Technology(Suzhou)Co., Ltd.	-
HEADSET	K550	-	Britz®	-
BUTTON ALARM	-	-	-	-
ALARM	-	-	-	-
SMART PHONE	SM-N920	-	SAMSUNG	-
Micro SD card	-	-	SanDisk	-

1.6 External I/O Cabling

■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (EUT)	DC JACK	AC / DC ADAPTOR	DC JACK	1.2	U
	RJ-45	LAPTOP	RJ-45	3.1	U
	MIC	HEADSET	MIC	1.8	U
	SPEAKER		SPEAKER	1.7	U
	ALARM IN	BUTTON ALARM	ALARM OUT	3.1	U
	ALARM OUT	ALARM	ALARM IN	3.1	U
	Micro SD Slot	Micro SD card	Micro SD Slot	-	-

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (EUT)	RJ-45 (PoE)	PoE SWITCH	RJ-45 (PoE)	3.1	U
	MIC	HEADSET	MIC	1.8	U
	SPEAKER		SPEAKER	3.0	U
	ALARM IN	BUTTON ALARM	ALARM OUT	3.1	U
	ALARM OUT	ALARM	ALARM IN	3.1	U
	Micro SD Slot	Micro SD card	Micro SD Slot	-	-

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

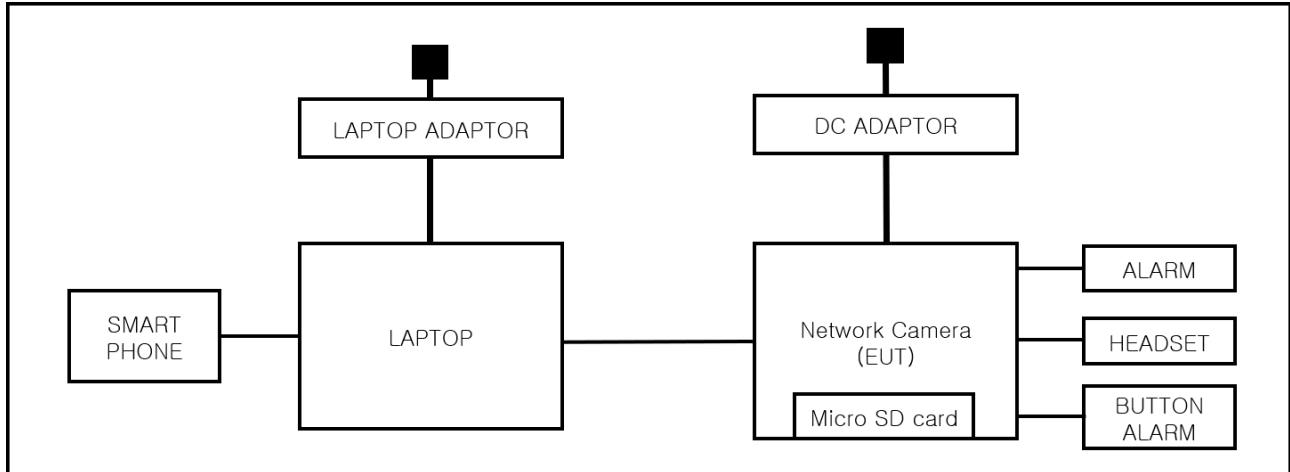
Test Mode	operating
Operation	1. Network ping test on the EUT and laptop. 2. Check if the image is output normally through the laptop's WEB VIEWER. 3. Run 1KHz Tone on the smartphone connected to the peripheral laptop to verify that it is output to the headset normally. 4. After the test, check if the micro SD card recorded properly.

EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

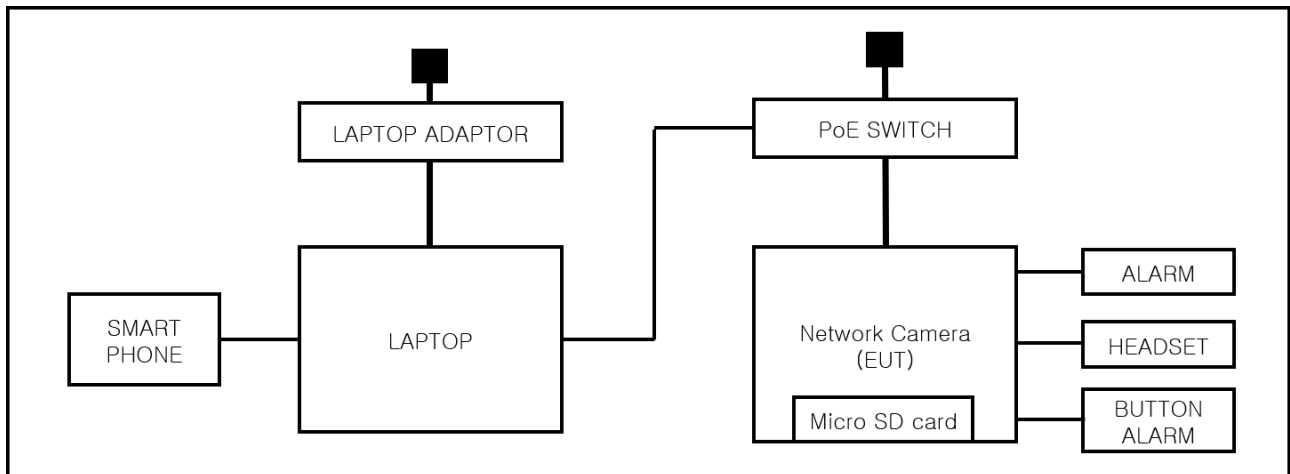
1.8 Configuration

■ AC Main
 □ DC Main

■ DC Mode



■ PoE Mode



1.9 Remarks when standards applied

N/A

1.10 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.

1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber 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 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
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ VCCI-CISPR 32:2016

☒ Class A

☐ Class B

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2.1 Conducted Emissions Mains Power Ports

Test Date
Mar. 06, 2023Test Location
Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
☒	LISN	ENV216	R & S	101787	11, 10, 2023
☒	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

Test Conditions

Temperature: (24,2 ± 0,0) °C
Relative Humidity: (43,2 ± 0,0) % R.H.Frequency Range of Measurement
150 kHz to 30 MHzInstrument Settings
IF Band Width: 9 kHzTest Results
The requirements are:☒ PASS
☐ NOT PASS
☐ NOT APPLICABLERemarks
See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date
Mar. 06, 2023Test Location
Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
☒	LISN	ENV216	R & S	101787	11, 10, 2023
☒	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 22, 2023
☐	CDN	CDNS502A	TESEQ	40431	11, 10, 2023

Test Conditions

Temperature: (24,2 ± 0,0) °C
Relative Humidity: (43,2 ± 0,0) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

- See Appendix A for test data.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date
Mar. 03, 2023Test Location
☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #4(10m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	03, 31, 2023
☒	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions

Temperature: (23,9 ± 0,1) °C
Relative Humidity: (43,1 ± 0,1) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

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 GHz)

Test Date
Mar. 05, 2023Test Location
SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 01, 2023
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	03, 06, 2024
☒	ATTENUATOR	8491A	HP	35496	03, 03, 2024
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024

Test Conditions

Temperature: (24,2 ± 0,0) °C
Relative Humidity: (43,0 ± 0,0) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

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

■ DC Mode

HOT LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

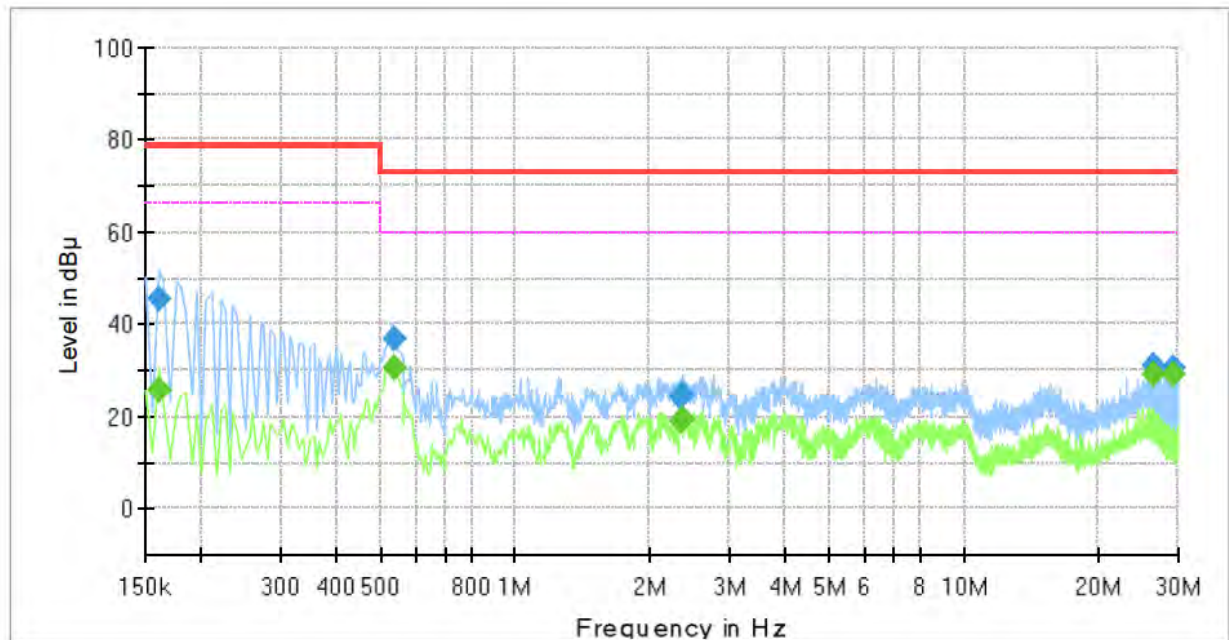
Conducted Emission

TNV-C7013RC

H

DC

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	25.86	66.00	40.14	1000.0	9.000	L1	19.5
0.160000	45.62	---	79.00	33.38	1000.0	9.000	L1	19.5
0.535000	---	30.39	60.00	29.61	1000.0	9.000	L1	19.8
0.535000	36.65	---	73.00	36.35	1000.0	9.000	L1	19.8
2.340000	---	19.00	60.00	41.00	1000.0	9.000	L1	20.3
2.340000	24.26	---	73.00	48.74	1000.0	9.000	L1	20.3
2.370000	---	19.48	60.00	40.52	1000.0	9.000	L1	20.3
2.370000	24.81	---	73.00	48.19	1000.0	9.000	L1	20.3
26.610000	---	29.12	60.00	30.88	1000.0	9.000	L1	20.4
26.610000	31.19	---	73.00	41.81	1000.0	9.000	L1	20.4
29.235000	---	29.31	60.00	30.69	1000.0	9.000	L1	20.4
29.235000	30.48	---	73.00	42.52	1000.0	9.000	L1	20.4

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NEUTRAL LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

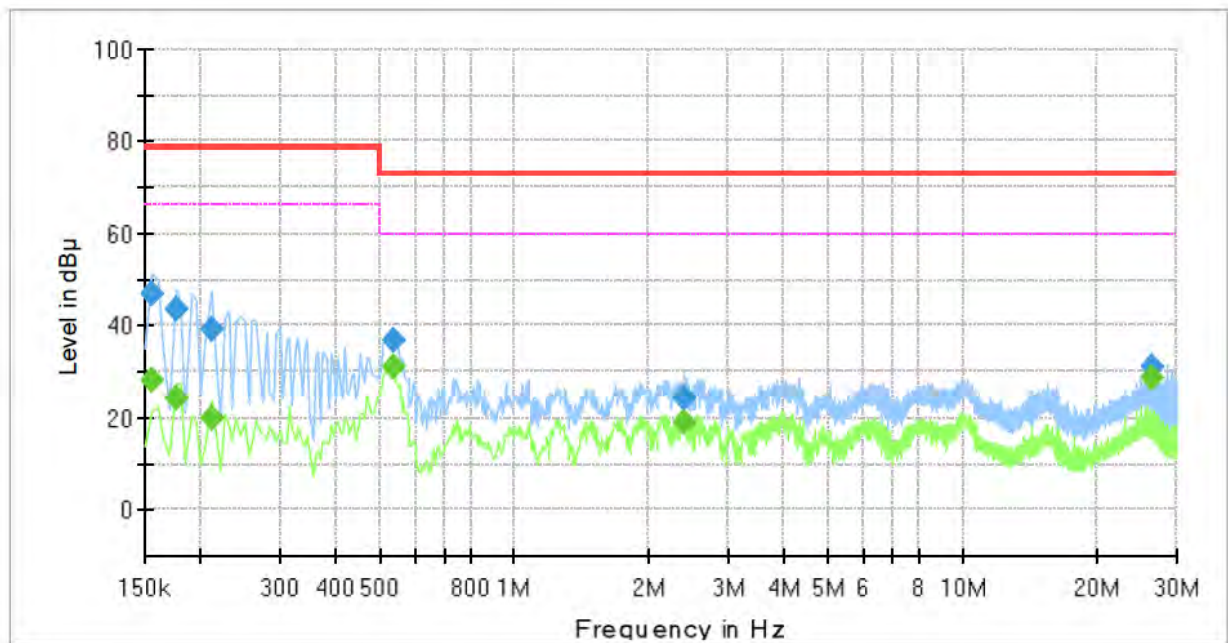
Conducted Emission

TNV-C7013RC

N

DC

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	46.69	---	79.00	32.31	1000.0	9.000	N	19.4
0.155000	---	28.15	66.00	37.85	1000.0	9.000	N	19.4
0.175000	---	24.18	66.00	41.82	1000.0	9.000	N	19.5
0.175000	43.73	---	79.00	35.27	1000.0	9.000	N	19.5
0.210000	39.12	---	79.00	39.88	1000.0	9.000	N	19.5
0.210000	---	20.09	66.00	45.91	1000.0	9.000	N	19.5
0.540000	---	31.06	60.00	28.94	1000.0	9.000	N	19.8
0.540000	36.75	---	73.00	36.25	1000.0	9.000	N	19.8
2.395000	24.26	---	73.00	48.74	1000.0	9.000	N	20.2
2.395000	---	18.95	60.00	41.05	1000.0	9.000	N	20.2
26.610000	31.08	---	73.00	41.92	1000.0	9.000	N	20.4
26.610000	---	28.73	60.00	31.27	1000.0	9.000	N	20.4

◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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Conducted Emissions at Telecommunication Ports

■ DC Mode

[100 Mbps]

Common Information

Test Description:

Model No.:

Mode :

Speed :

Operator Name:

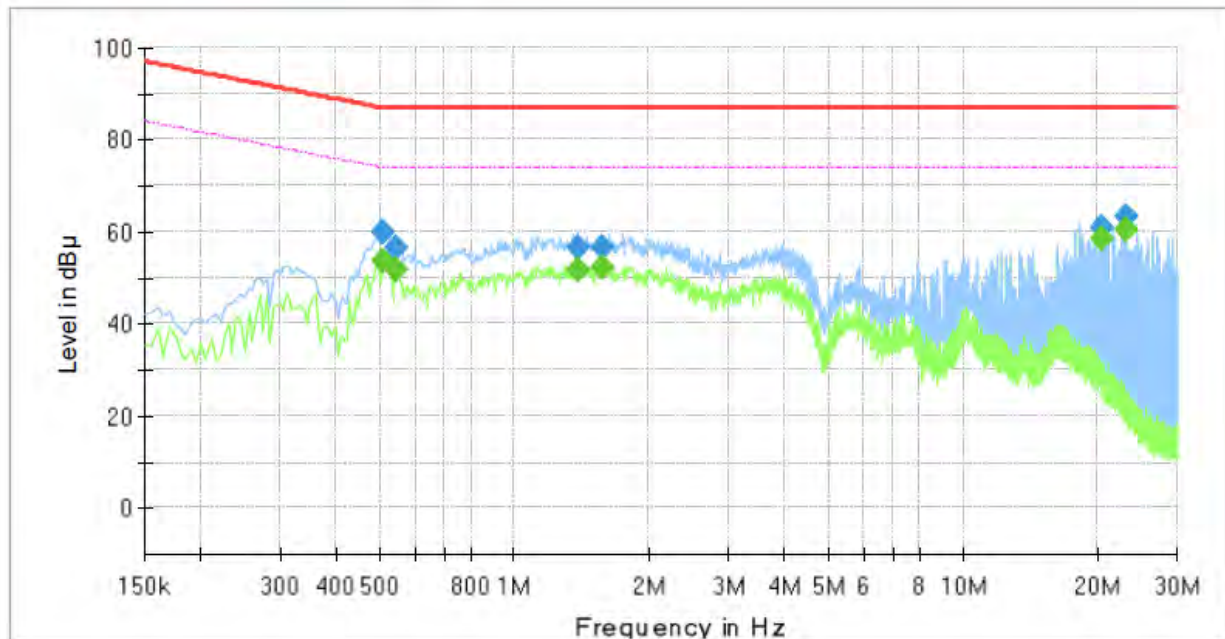
Telecommunication Emission

TNV-C7013RC

DC

100 Mbps

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.510000	---	53.63	74.00	20.37	1000.0	9.000	Single Line	19.8
0.510000	59.87	---	87.00	27.13	1000.0	9.000	Single Line	19.8
0.545000	---	51.57	74.00	22.43	1000.0	9.000	Single Line	19.8
0.545000	56.49	---	87.00	30.51	1000.0	9.000	Single Line	19.8
1.385000	---	51.93	74.00	22.07	1000.0	9.000	Single Line	20.1
1.385000	56.55	---	87.00	30.45	1000.0	9.000	Single Line	20.1
1.570000	---	52.02	74.00	21.98	1000.0	9.000	Single Line	20.1
1.570000	56.66	---	87.00	30.34	1000.0	9.000	Single Line	20.1
20.260000	---	58.64	74.00	15.36	1000.0	9.000	Single Line	20.0
20.260000	61.14	---	87.00	25.86	1000.0	9.000	Single Line	20.0
23.130000	---	60.22	74.00	13.78	1000.0	9.000	Single Line	20.1
23.130000	63.16	---	87.00	23.84	1000.0	9.000	Single Line	20.1

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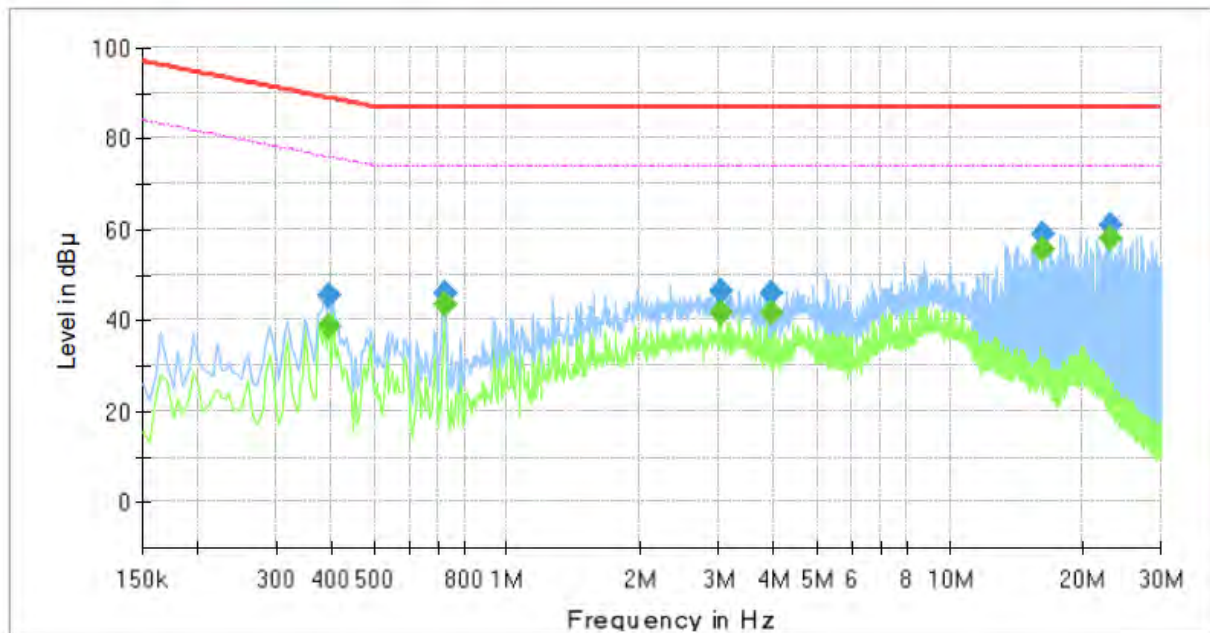
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PoE Mode

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	TNV-C7013RC
Mode :	PoE
Speed :	100 Mbps
Operator Name:	KES


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.395000	45.44	---	88.96	43.52	1000.0	9.000	Single Line	19.7
0.395000	---	38.92	75.96	37.04	1000.0	9.000	Single Line	19.7
0.720000	---	43.76	74.00	30.24	1000.0	9.000	Single Line	19.9
0.720000	45.80	---	87.00	41.20	1000.0	9.000	Single Line	19.9
3.040000	---	41.56	74.00	32.44	1000.0	9.000	Single Line	20.0
3.040000	46.21	---	87.00	40.79	1000.0	9.000	Single Line	20.0
3.955000	45.93	---	87.00	41.07	1000.0	9.000	Single Line	19.7
3.955000	---	41.77	74.00	32.23	1000.0	9.000	Single Line	19.7
16.230000	59.09	---	87.00	27.91	1000.0	9.000	Single Line	19.7
16.230000	---	55.58	74.00	18.42	1000.0	9.000	Single Line	19.7
23.130000	61.02	---	87.00	25.98	1000.0	9.000	Single Line	20.1
23.130000	---	57.85	74.00	16.15	1000.0	9.000	Single Line	20.1

◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

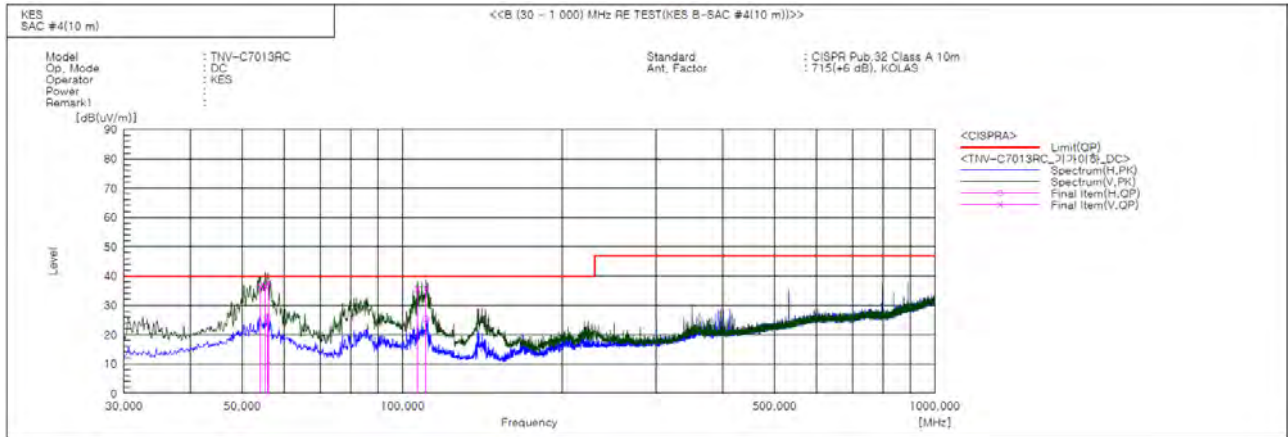
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Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode



Final Result

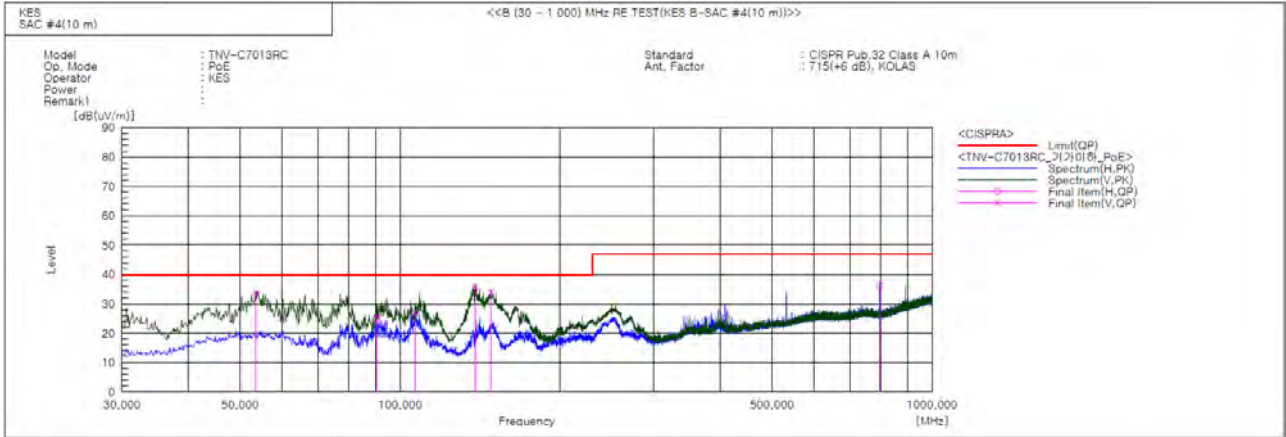
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	54.129	V	57.1	-20.8	36.3	40.0	3.7	161.0	87.0	
2	55.220	V	57.5	-21.0	36.5	40.0	3.5	107.0	112.0	
3	55.826	H	46.9	-21.0	25.9	40.0	14.1	382.0	68.0	
4	55.948	V	58.7	-21.1	37.6	40.0	2.4	113.0	135.0	
5	106.630	V	58.1	-22.6	35.5	40.0	4.5	124.0	274.0	
6	110.753	V	58.8	-23.0	35.8	40.0	4.2	115.0	247.0	
7	110.753	H	48.4	-23.0	25.4	40.0	14.6	366.0	233.0	

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■ PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	53.523	V	54.2	-20.8	33.4	40.0	6.6	147.0	290.0	
2	90.261	H	48.9	-24.1	24.8	40.0	15.2	392.0	11.0	
3	106.630	H	49.5	-22.6	26.9	40.0	13.1	349.0	94.0	
4	138.398	V	61.2	-25.4	35.8	40.0	4.2	115.0	148.0	
5	148.098	V	59.1	-25.3	33.8	40.0	6.2	123.0	122.0	
6	796.421	H	43.8	-7.4	36.4	47.0	10.6	376.0	327.0	

◆ Calculation

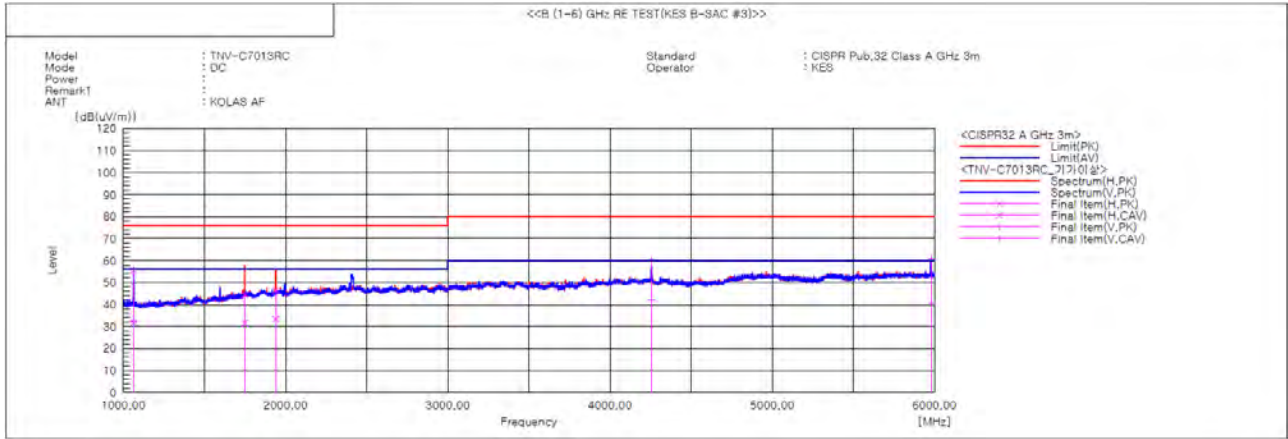
Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

Radiated Electric Field Emissions(Above 1 GHz)

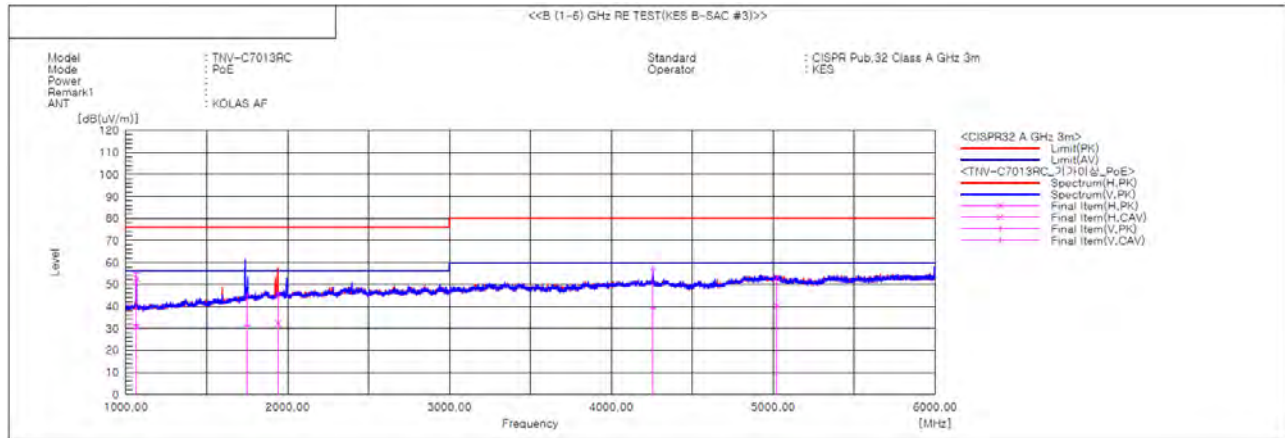
■ DC Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1064.090	H	59.1	35.4	-3.7	55.4	31.7	76.0	56.0	20.6	24.3	100.0	340.0	
2	1064.140	V	59.8	36.2	-3.7	56.1	32.5	76.0	56.0	19.9	23.5	100.0	166.7	
3	1748.250	H	42.1	29.2	2.4	44.5	31.6	76.0	56.0	31.5	24.4	100.0	314.6	
4	1939.637	H	42.4	29.3	4.1	46.5	33.4	76.0	56.0	29.5	22.6	100.0	355.4	
5	4254.810	V	48.6	30.4	11.7	60.3	42.1	80.0	60.0	19.7	17.9	100.0	71.1	
6	5983.029	V	44.7	24.3	16.2	60.9	40.5	80.0	60.0	19.1	19.5	100.0	291.2	

PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1064.160	H	56.6	34.3	-3.7	52.9	30.6	76.0	56.0	23.1	25.4	100.0	37.0	
2	1064.270	V	58.7	35.2	-3.7	55.0	31.5	76.0	56.0	21.0	24.5	100.0	164.7	
3	1747.238	V	42.2	28.9	2.4	44.6	31.3	76.0	56.0	31.4	24.7	100.0	19.1	
4	1939.662	H	41.6	28.2	4.1	45.7	32.3	76.0	56.0	30.3	23.7	100.0	283.0	
5	4258.030	V	45.5	27.3	11.7	57.2	39.0	80.0	60.0	22.8	21.0	100.0	288.6	
6	5023.648	H	38.8	25.6	14.5	53.3	40.1	80.0	60.0	26.7	19.9	100.0	2.7	

Calculation

Result(PK/CAV) [dB(μ V/m)] = (Reading(PK/CAV)[dB(μ V)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(μ V/m)] - Result(PK/CAV) [dB(μ V/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ DC Mode



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Conducted Emissions at Telecommunication Ports

■ DC Mode



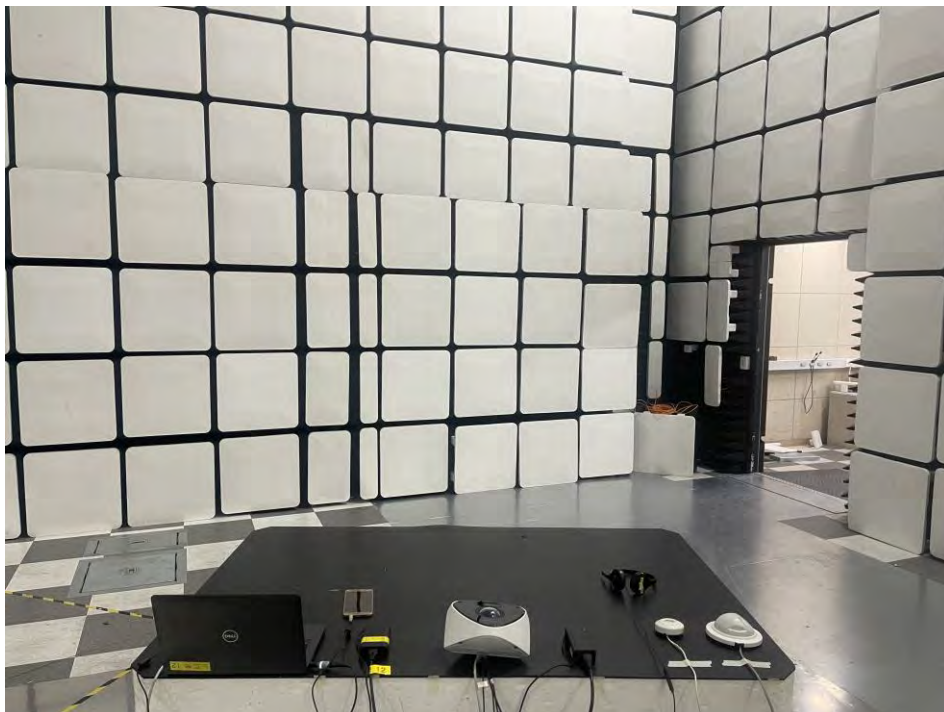
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■ PoE Mode



Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode



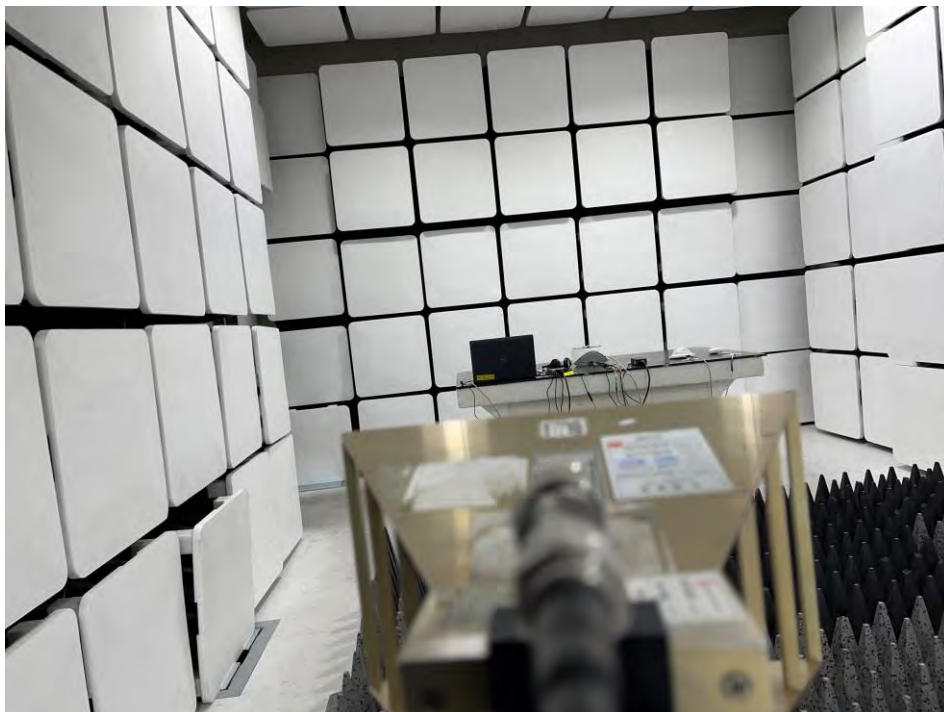
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■ PoE Mode



Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



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■ PoE Mode



EUT External Photographs

(Top)



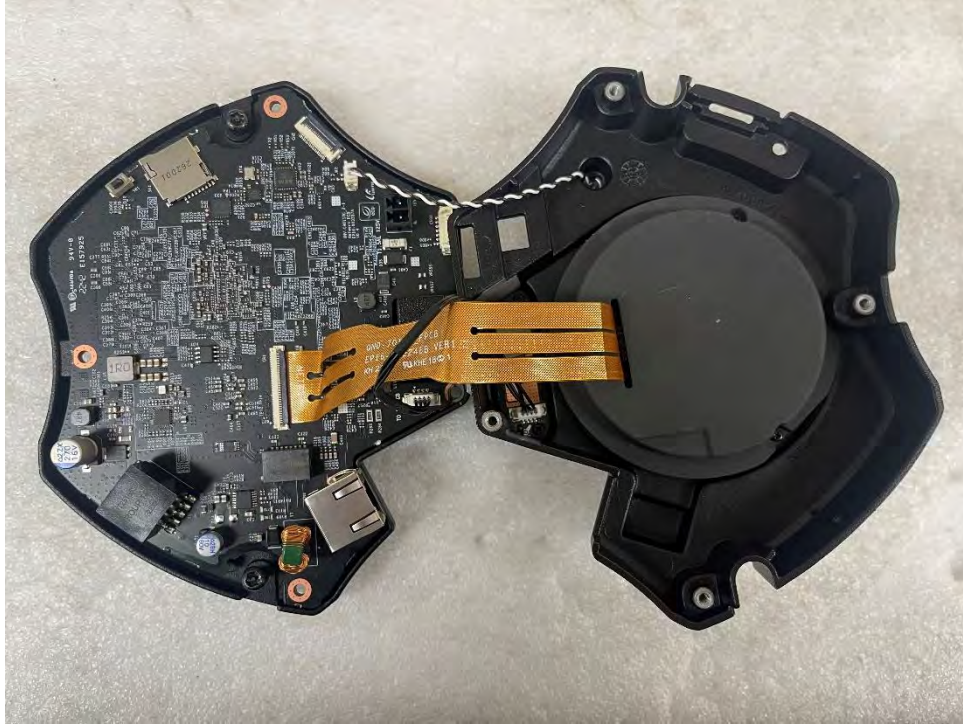
(Bottom)



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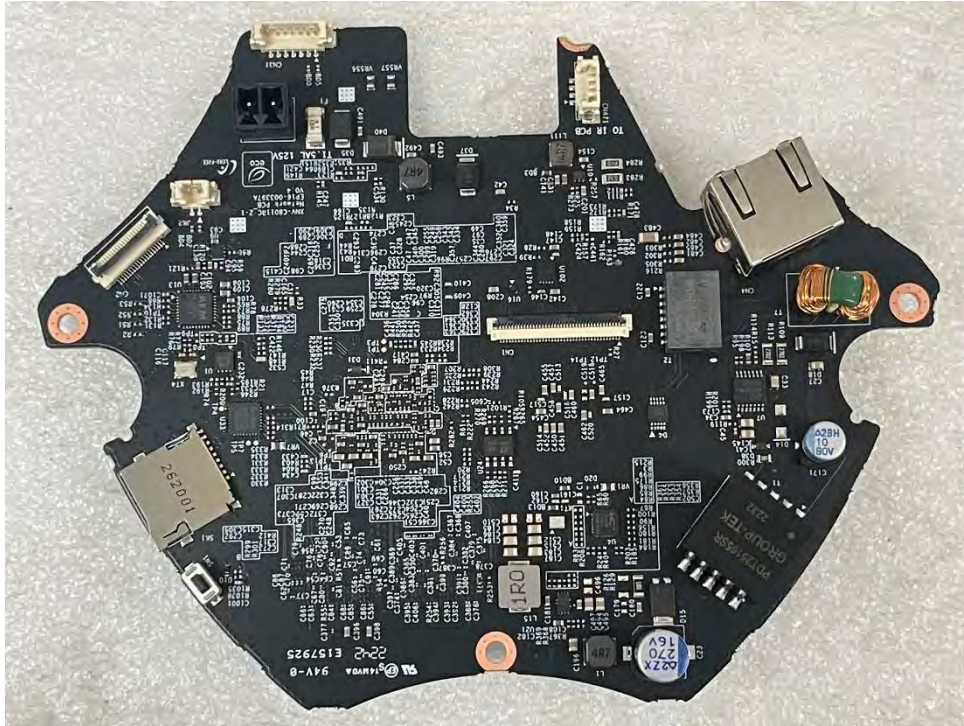
EUT Internal Photographs

(Internal View)

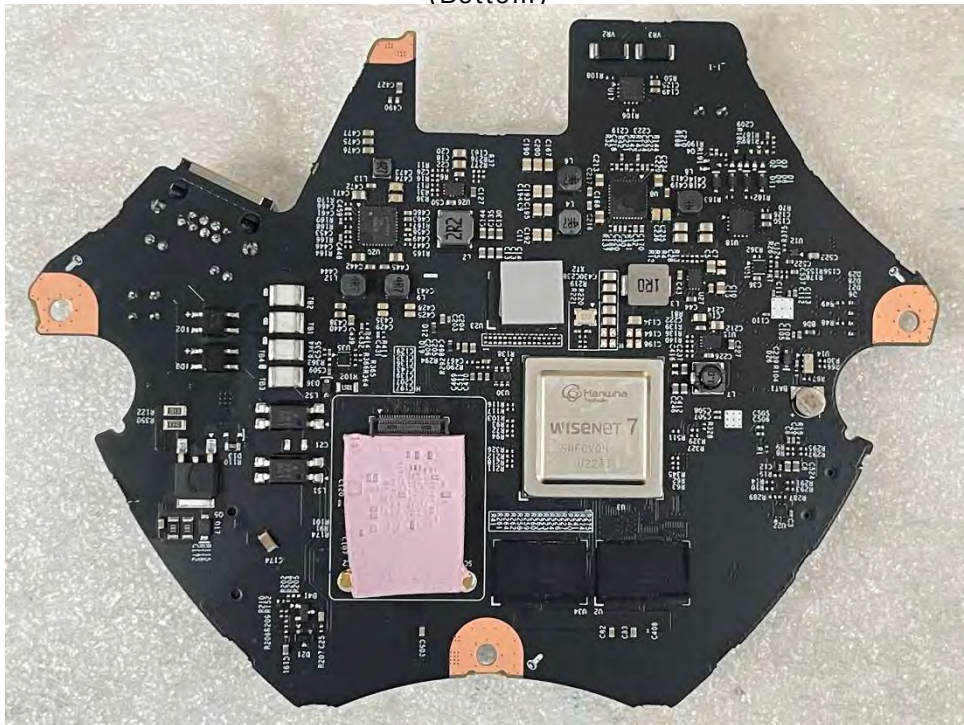


EUT Internal View – Board 1

(Top)



(Bottom)



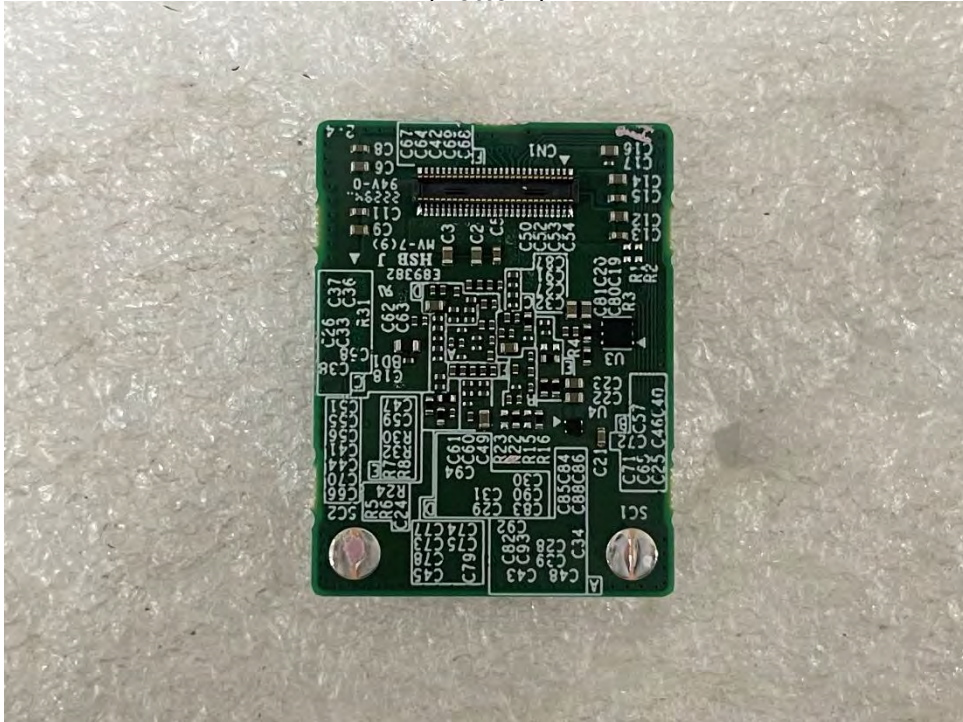
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EUT Internal View – Board 2

(Top)



(Bottom)



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EUT Internal View – Board 3

(Top)



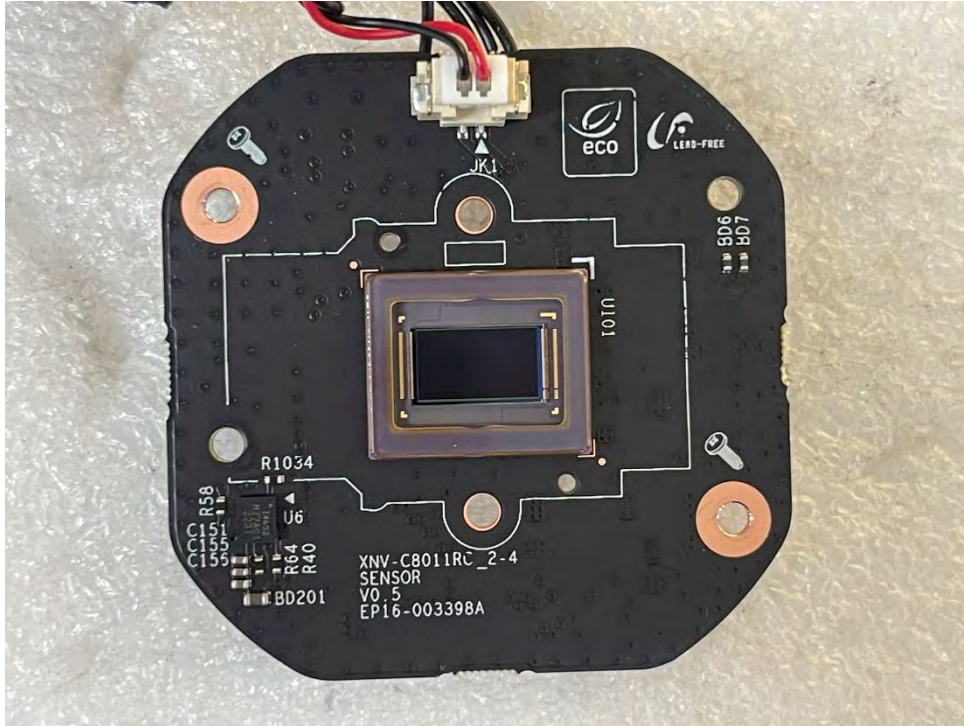
(Bottom)



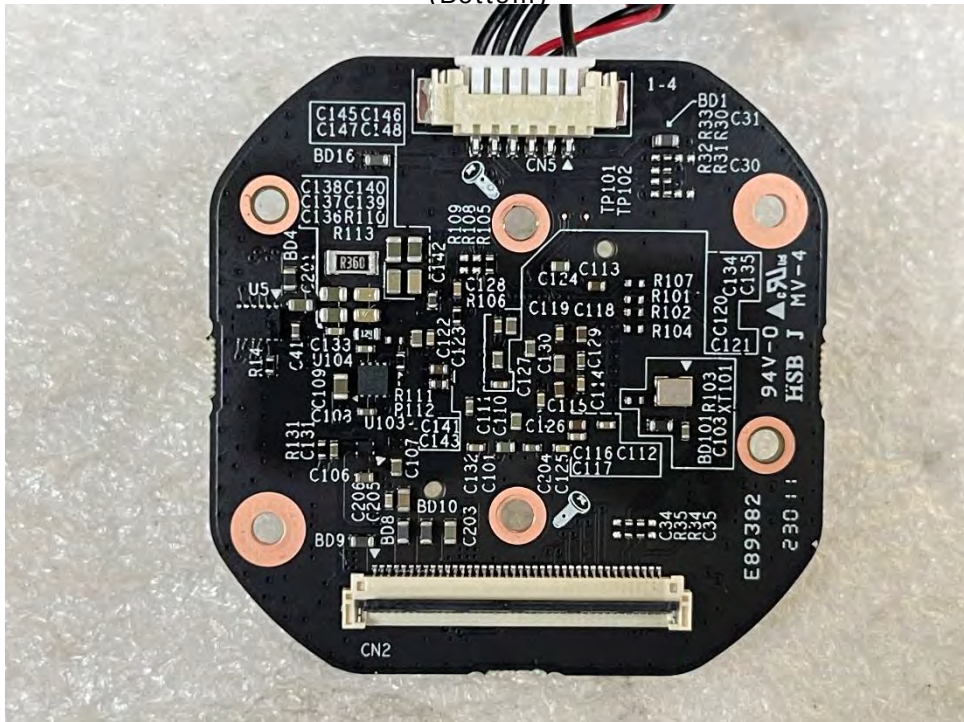
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EUT Internal View – Board 4

(Top)

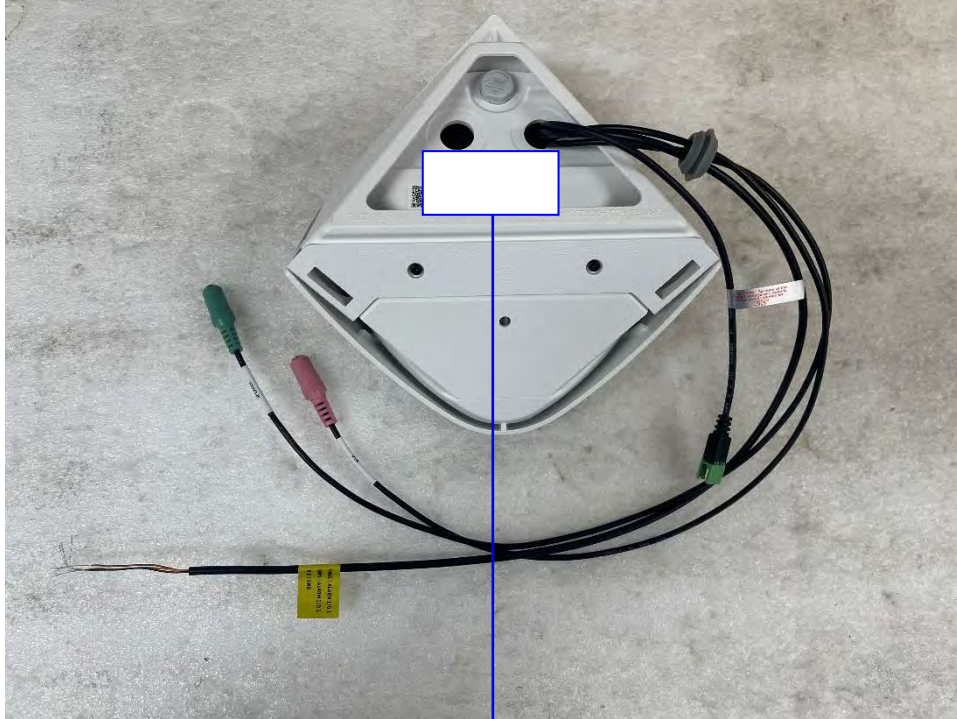


(Bottom)



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Label Photographs



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