EMC TEST REPORT For VCCI

Test Report No.	:	KES-EM-22T0304
Date of Issue	:	Apr. 01, 2022
Product name	:	THERMAL CAMERA
Model/Type No.	:	TNM-C4960TD
Variant Model	:	TNM-C4950TD
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Manufacturer	:	1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. 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	:	Mar. 11, 2022
Test date	:	Mar. 17, 2022
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Min Seong, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Apr. 01, 2022	KES-EM-22T0304	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video		
Imaging Device	Uncooled micro bolometer	1/1.8" CMOS
Resolution	1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360	3840x2160, 3072x1728, 2592x1944, 2688x1520, 2560x1440, 2048x1536, 1920x1080, 1600x1200, 1280x1024,1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360
Max. Framerate	H.265/H.264: Max. 30fps MJPEG: Max. 3fps	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 1fps/1fps(60Hz/50Hz)
NETD	< 60mK	None
Pixel Size	12㎛	None
Min. Illumination	None	Color: 0.06Lux(F1.7, 1/30sec) BW: 0.005Lux(F1.7, 1/30sec)
Video Out	USB : Micro USB Type B	
Lens		
Focal Length (Zoom Ratio)	25mm fixed focal	10.9~29mm(2.6x) motorized varifocal
Max. Aperture Ratio	F1.0	F1.7(Wide)~F1.73(Tele)
Angular Field of View	H: 17.4˚, V: 13.1˚, D: 21.6˚	H:42.0°(Wide)~15.0°(Tele) / V:22.8°(Wide)~8.4°(Tele) / D:48.7°(Wide)~17.1°(Tele)
Min. Object Distance	26m(85.30ft)	Wide: 2.5m(8.20ft) / Tele: 6m(19.68ft)
Focus Control	Fixed	Simple foucs
Lens Type	None	
Mount Type	None	
Optional Lens	None	
Pan / Tilt / Rotate		
Pan / Tilt / Rotate Range	None	
Pan Range	None	
Pan Speed	None	
Tilt Range	None	
Tilt Speed	None	
Rotate Range	None	
Sequence	None	
Preset Accuracy	None	
Operational		
Camera Title	Displayed up to 85 characters	
Direction Indicator	None	None
Day & Night	None	Auto(ICR)
Backlight Compensation	None	BLC, WDR, SSDR
Wide Dynamic Range	None	WDR(120dB)
Digital Noise Reduction	None	SSNR V, WiseNR II
Digital Image Stabilization	None	Support(built-in gyro sensor)
Motion Detection		
Privacy Masking	6ea, rectangle zones - Color: Gray/Black/White	
Gain Control	None	Low / Middle / High
White Balance	None	ATW / AWC / Manual / Indoor / Outdoor
LDC	None	Support
Electronic Shutter Speed	None	Minimum / Maximum / Anti flicker(1/5~1/12,000sec) Auto prefer shutter control(Based on AI engine)

Analytics	- Analytics events : Directional detection, Motion detection, Enter/Exit, Virtual line, Temperature Change detection	- Analytics events based on AI engine(NPU) : Object detection (Person/Face/Vehicle(car/truck/bus/bicycle/motorcycle)/License plate), Bestshot, IVA (Virtual line/Area, Enter/Exit, Loitering, direction, intrusion), Stopped vehicle, Traffic jam - Analytics events : Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Shock detection, Appear/Disappear
Business Intelligence	None	None
Alarm I/O	4 configurable I/O ports	
Alarm Triggers	Analytics, Network disconnect, Alarm input	
Alarm Events	When alarm trigger occurred - File upload(image) : e-mail/FTP - Notification : e-mail - Recording : SD/SDHC/SDXC or NAS recording at event triggers - Alarm output - Handover(PTZ preset, Send message by HTTP/HTTPS/TCP) - Audio clip playback	
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm	
Audio Out	Line out, Max.output level: 1Vrms	
IR Viewable Length	None	None
Color Palettes	Whitehot, Blackhot, Rainbow, Rainbow2, Sepia, Red, Iron, Custom	None
Network		
Ethernet	Metal shielded RJ-45(10/100/1000BASE-T)	
Video Compression	H.265/H.264: Main/High, MJPEG	
Audio Compression	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	
Smart Codec	WiseStreamⅡ	Manual(5ea area), WiseStreamⅢ
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control	
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR	
Streaming	Unicast(6 users) / Multicast Multiple streaming(Up to 3 profiles)	
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast)	
Security	TPM 2.0 (FIPS 140-2 level 2) HTTPS(SSL) login authentication Digest login authentication IP address filtering User access log 802.1X authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2) Device certificate(Hanwha Techwin Root CA, pre-installed) Secure boot, Secure firmware	
Application Programming Interface	ONVIF Profile S/T SUNAPI(HTTP API) Wisenet open platform (visible channel only)	

General		
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Swedish, Japanese, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek	
Edge Storage	Micro SD/SDHC/SDXC 2slots 512GB	
Memory	4GB RAM, 512MB FLASH	
Environmental & Electrical		
Operating Temperature / Humidity	-40°C to +60°C(-58°F to +140°F) * Start up should be done at above -30°C less than 95% RH(non-condensing)	
Storage Temperature / Humidity	-50°C to +60°C(-58°F to +140°F) / Less than 95% RH(Non-condensing)	
Certification	IP66/IP67, IK10, NEMA4X, NEMA TS 2(2.2.8, 2.2.9)	
Input Voltage	PoE+(IEEE802.3at, Class4), $12V_{DC}$	
Power Consumption	PoE+ : Max 23.5W $12V_{DC}$: Max 19.5W	
Mechanical		
Color / Material	White / Aluminum	
RAL Code	RAL9003	
Product Dimensions / Weight	353.4 * 287.5 * 191.2mm (13.92 * 11.32 * 7.53in) / 4.533kg	
DORI (EN62676-4 standard)		
Detect (25PPM/ 8PPF)	None	Wide: 51.7m(169.94ft) / Tele: 174.5m(572.64ft)
Observe (63PPM/ 19PPF)	None	Wide: 20.7m(67.85ft) / Tele: 69.8m(229.06ft)
Recognize (125PPM/ 38PPF)	None	Wide: 10.3m(33.93ft) / Tele: 34.9m(114.53ft)
Identify (250PPM/ 76PPF)	None	Wide: 5.2m(16.96ft) / Tele: 17.5m(57.26ft)

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

Addition of derivative models for place of sale management

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
THERMAL CAMERA	TNM-C4960TD	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Notebook	LG15N54	507NZET040180	LG	-
Notebook Adapter	PA-1900-14	OF4A263348701J247	LITE-ON TECHNOLOGY COPORATION	-
Micro SD Card 1	-	-	SanDisk	32 GB
Micro SD Card 2	-	-	SanDisk	16 GB
MIC	MP1000	-	-	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-
Smart Phone	SM-N950N	R39JB0C3FB	SAMSUNG	-

1.6 External I/O Cabling

■ DC Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
THERMAL CAMERA (EUT)	2 Pin	AC/DC Adapter	Line-Out (2 Pin)	1.0	U
	RJ-45	Notebook	RJ-45	3.0	S
	SLOT	Micro SD Card 1	SLOT	-	-
	SLOT	Micro SD Card 2	SLOT	-	-
	MIC (3.5 ㎜)	MIC	XLR	2.0	U
	Speaker (3.5 ㎜)	Speaker	Line-Out (3.5 ㎜)	1.6	U
	3 Pin	Alarm	Line-Out (3 Pin)	3.0	U
	3 Pin	Button Alarm	Line-Out (3 Pin)	3.0	U
Notebook	DC Jack	Notebook Adapter	Line-Out (DC Jack)	1.0	U
	3.5 ㎜	Smart Phone	3.5 ㎜	1.0	U

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
THERMAL CAMERA (EUT)	RJ-45 (PoE)	PoE Adapter	RJ-45 (PoE)	3.0	S
	SLOT	Micro SD Card 1	SLOT	-	-
	SLOT	Micro SD Card 2	SLOT	-	-
	MIC (3.5 ㎜)	MIC	XLR	2.0	U
	Speaker (3.5 ㎜)	Speaker	Line-Out (3.5 ㎜)	1.6	U
	3 Pin	Alarm	Line-Out (3 Pin)	3.0	U
	3 Pin	Button Alarm	Line-Out (3 Pin)	3.0	U
Notebook	RJ-45	PoE Adapter	RJ-45 (DATA)	1.0	S
	DC Jack	Notebook Adapter	Line-Out (DC Jack)	1.0	U
	3.5 ㎜	Smart Phone	3.5 ㎜	1.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

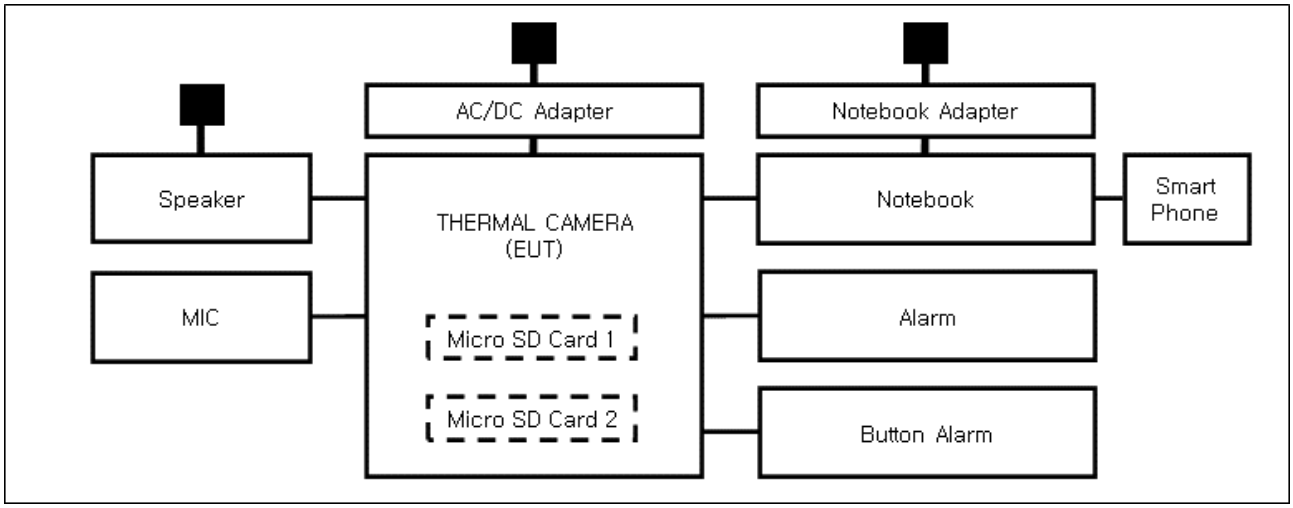
Test Mode	operating
Operation	- By connecting to the Web Viewer, checking the video output of EUT and performing a ping test, it was confirmed that the network function is operating normally. - After the test, the Micro SD Card was checked to see if it was recorded normally.

EUT Test operating S/W		
Name	**Version**	**Manufacture Company**
Web Viewer	-	-

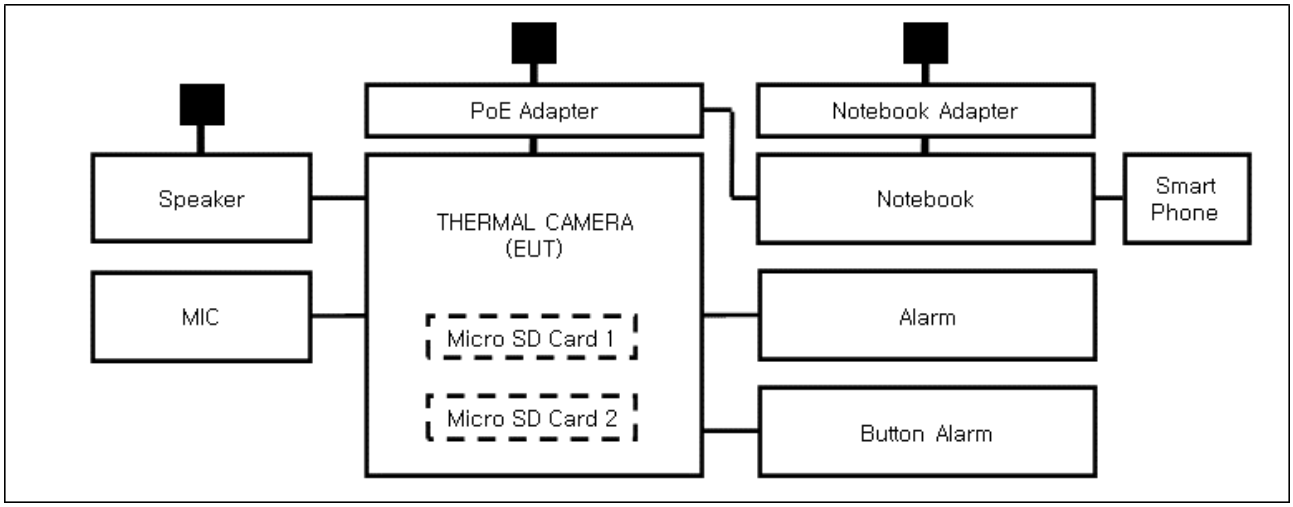
1.8 Configuration

■ AC Main
□ DC Main

■ DC Mode



■ PoE Mode



1.9 Remarks when standards applied

- USB Port was excluded from testing because it is the management port.
- PoE port is considered to be wired network port, so power-related test items are excluded.

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, Yeoju-si, Gyeonggi-do, 12658, Korea. 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 , 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-20056, C-20036, T-20040, G-20057
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 001633 0004

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **VCCI-CISPR 32:2016** ☒ Class A ☐ Class B

2.1 Conducted Emissions Mains Power Ports

Test Date
Mar. 17, 2022

Test 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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022

Test Conditions
Temperature: (24,6 ± 0,1) ℃
Relative Humidity: (44,1 ± 0,1) % R.H.

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
Mar. 17, 2022

Test 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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022
☒	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 07, 2023
☐	CDN	CDNS502A	TESEQ	40431	12, 27, 2022

Test Conditions
Temperature: (24,6 ± 0,1) ℃
Relative Humidity: (44,1 ± 0,1) % R.H.

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.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

2.3 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Mar. 17, 2022

Test 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	04, 01, 2022
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions
Temperature: (23,7 ± 0,2) ℃
Relative Humidity: (44,3 ± 0,3) % R.H.

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
Mar. 17, 2022

Test Location
SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.120	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	04, 01, 2022
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022
☒	PREAMPLIFIER	8449B	HP	3008A00538	06, 21, 2022

Test Conditions
Temperature: (25,3 ± 0,3) ℃
Relative Humidity: (47,2 ± 0,5) % R.H.

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

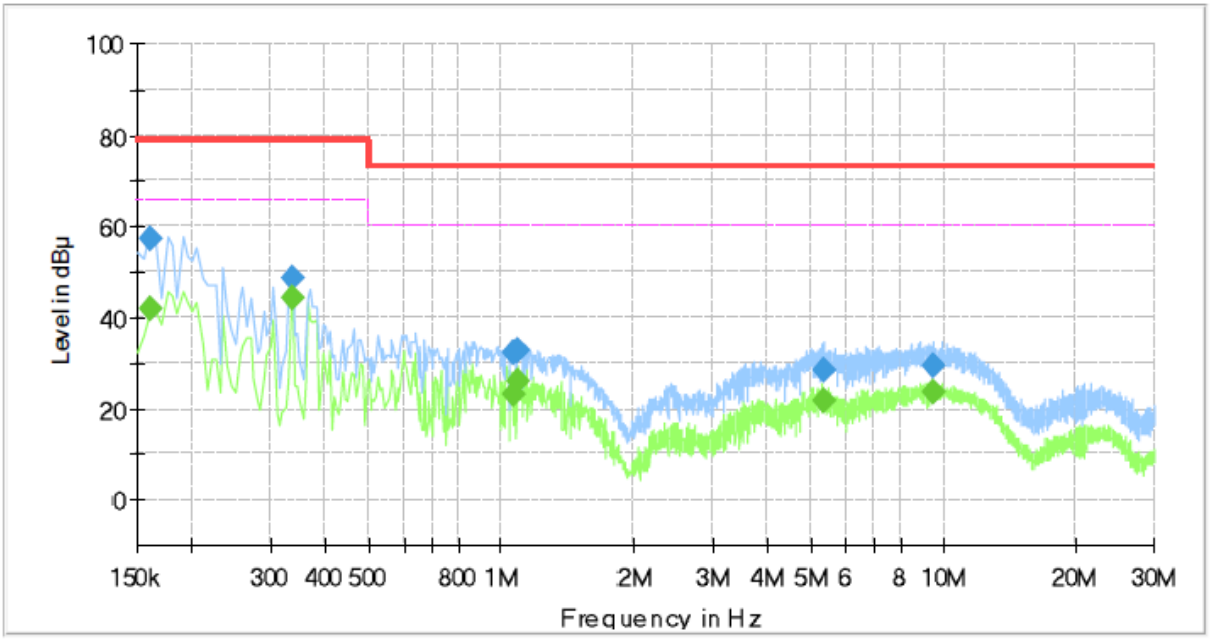
Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	TNM-C4960TD
Phase:	H
Mode:	DC
Operator Name:	KES



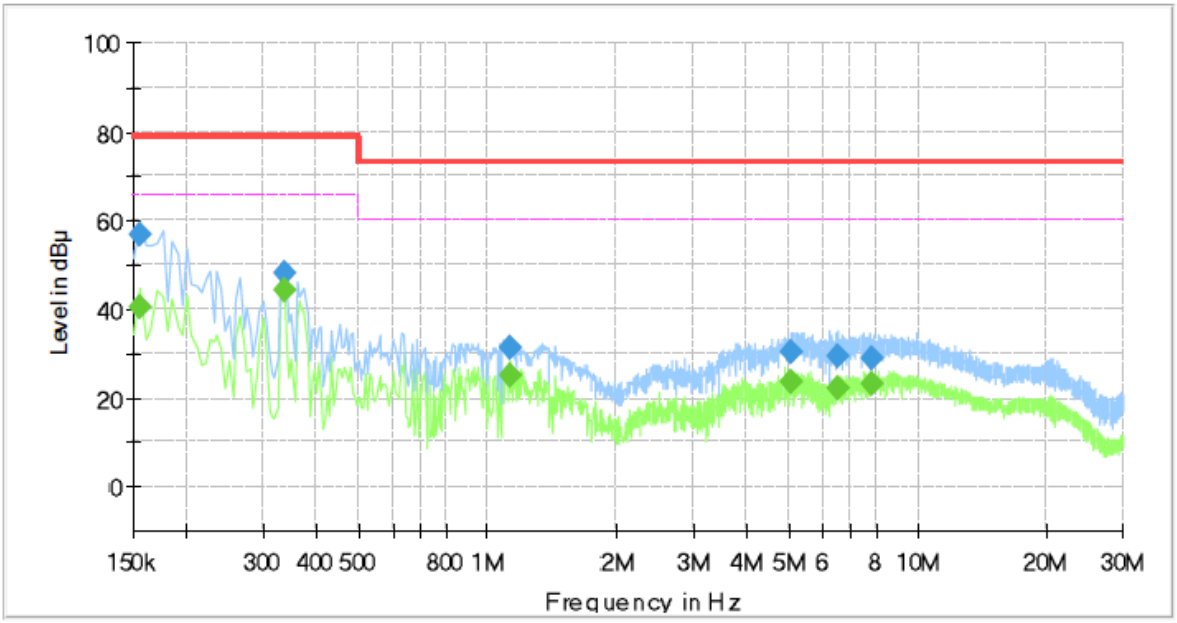
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	41.99	66.00	24.01	1000.0	9.000	L1	19.4
0.160000	57.01	---	79.00	21.99	1000.0	9.000	L1	19.4
0.335000	---	44.37	66.00	21.63	1000.0	9.000	L1	19.5
0.335000	48.44	---	79.00	30.56	1000.0	9.000	L1	19.5
1.070000	---	23.01	60.00	36.99	1000.0	9.000	L1	20.1
1.070000	32.42	---	73.00	40.58	1000.0	9.000	L1	20.1
1.090000	---	26.03	60.00	33.97	1000.0	9.000	L1	20.1
1.090000	32.60	---	73.00	40.40	1000.0	9.000	L1	20.1
5.345000	---	21.66	60.00	38.34	1000.0	9.000	L1	19.6
5.345000	28.64	---	73.00	44.36	1000.0	9.000	L1	19.6
9.455000	---	23.72	60.00	36.28	1000.0	9.000	L1	19.8
9.455000	29.57	---	73.00	43.43	1000.0	9.000	L1	19.8

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	TNM-C4960TD
Phase:	N
Mode:	DC
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	40.29	66.00	25.71	1000.0	9.000	N	19.4
0.155000	56.70	---	79.00	22.30	1000.0	9.000	N	19.4
0.335000	---	44.04	66.00	21.96	1000.0	9.000	N	19.5
0.335000	48.12	---	79.00	30.88	1000.0	9.000	N	19.5
1.125000	---	24.98	60.00	35.02	1000.0	9.000	N	20.1
1.125000	31.18	---	73.00	41.82	1000.0	9.000	N	20.1
5.090000	---	23.56	60.00	36.44	1000.0	9.000	N	19.6
5.090000	30.42	---	73.00	42.58	1000.0	9.000	N	19.6
6.515000	---	22.15	60.00	37.85	1000.0	9.000	N	19.5
6.515000	29.28	---	73.00	43.72	1000.0	9.000	N	19.5
7.850000	---	23.17	60.00	36.83	1000.0	9.000	N	19.6
7.850000	29.14	---	73.00	43.86	1000.0	9.000	N	19.6

♦ 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 + Pulse Limiter FACTOR))

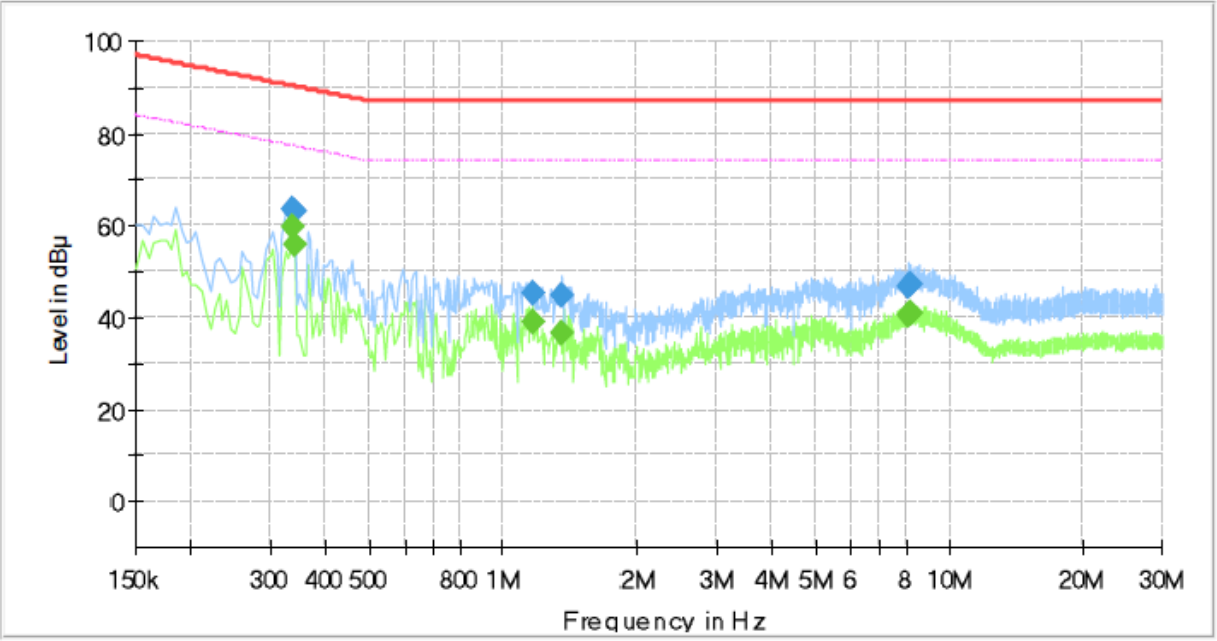
Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	TNM-C4960TD
Mode :	DC
Speed :	1 000 Mbps
Operator Name:	KES



Final_Result

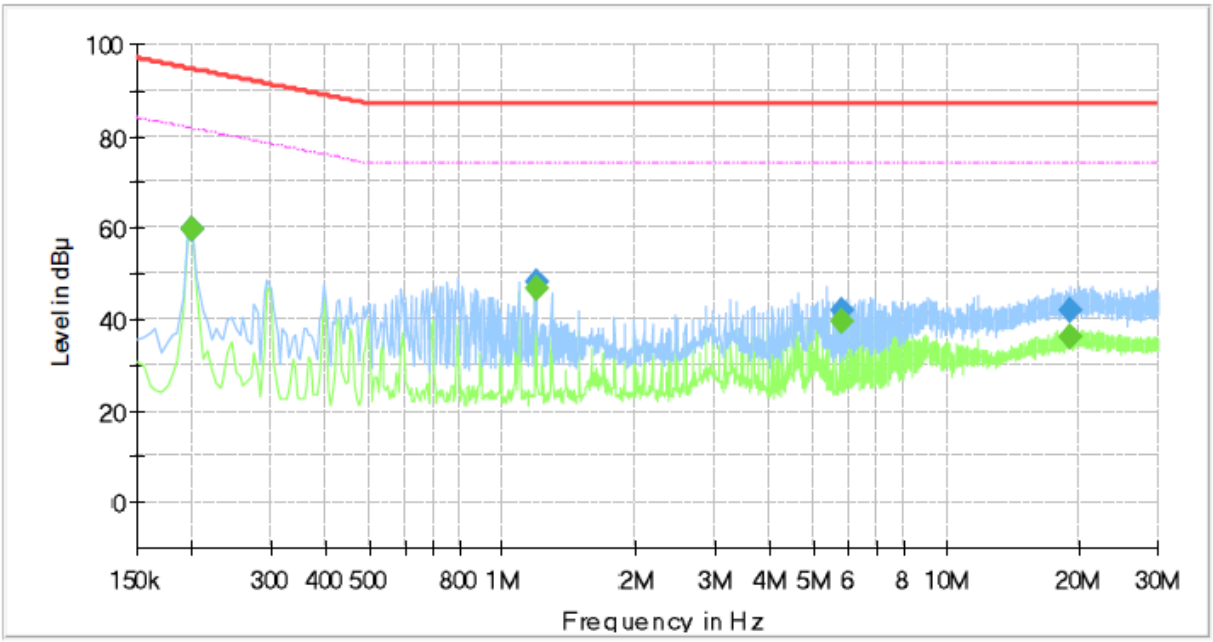
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.335000	---	59.89	77.33	17.44	1000.0	9.000	Single Line	19.6
0.335000	63.66	---	90.33	26.67	1000.0	9.000	Single Line	19.6
0.340000	---	55.70	77.20	21.50	1000.0	9.000	Single Line	19.6
0.340000	63.21	---	90.20	26.99	1000.0	9.000	Single Line	19.6
1.165000	---	38.92	74.00	35.08	1000.0	9.000	Single Line	20.0
1.165000	45.13	---	87.00	41.87	1000.0	9.000	Single Line	20.0
1.360000	---	36.78	74.00	37.22	1000.0	9.000	Single Line	20.0
1.360000	44.63	---	87.00	42.37	1000.0	9.000	Single Line	20.0
8.065000	---	40.38	74.00	33.62	1000.0	9.000	Single Line	19.3
8.065000	46.59	---	87.00	40.41	1000.0	9.000	Single Line	19.3
8.200000	---	40.87	74.00	33.13	1000.0	9.000	Single Line	19.3
8.200000	46.95	---	87.00	40.05	1000.0	9.000	Single Line	19.3

■ PoE Mode

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	TNM-C4960TD
Mode :	PoE
Speed :	1 000 Mbps
Operator Name:	KES



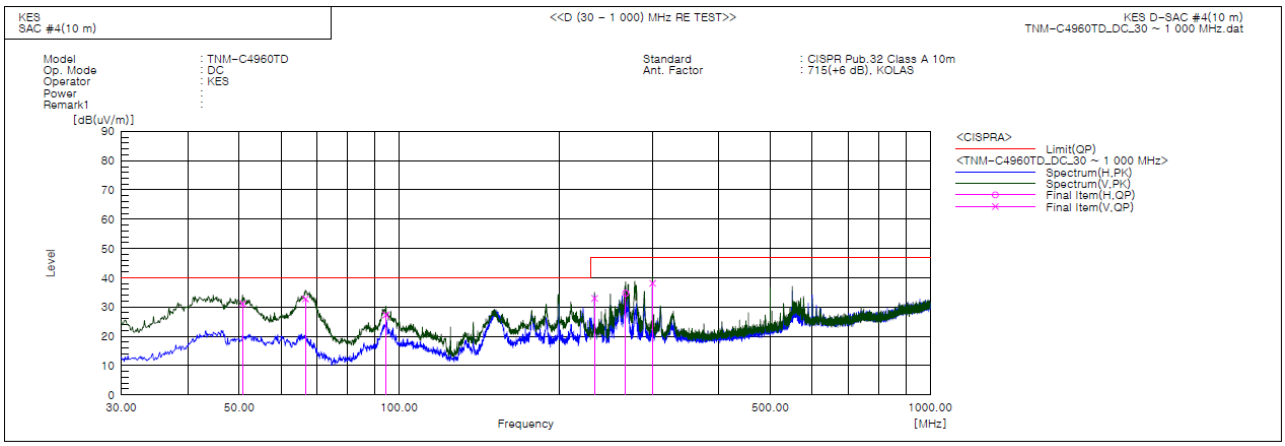
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.200000	---	59.55	81.61	22.06	1000.0	9.000	Single Line	19.7
0.200000	59.62	---	94.61	34.99	1000.0	9.000	Single Line	19.7
1.190000	---	46.80	74.00	27.20	1000.0	9.000	Single Line	20.0
1.190000	48.16	---	87.00	38.84	1000.0	9.000	Single Line	20.0
5.840000	---	39.40	74.00	34.60	1000.0	9.000	Single Line	19.3
5.840000	41.98	---	87.00	45.02	1000.0	9.000	Single Line	19.3
19.110000	---	36.25	74.00	37.75	1000.0	9.000	Single Line	19.8
19.110000	41.89	---	87.00	45.11	1000.0	9.000	Single Line	19.8

♦ 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 + Pulse Limiter FACTOR))

Radiated Electric Field Emissions(Below 1 ㎓)

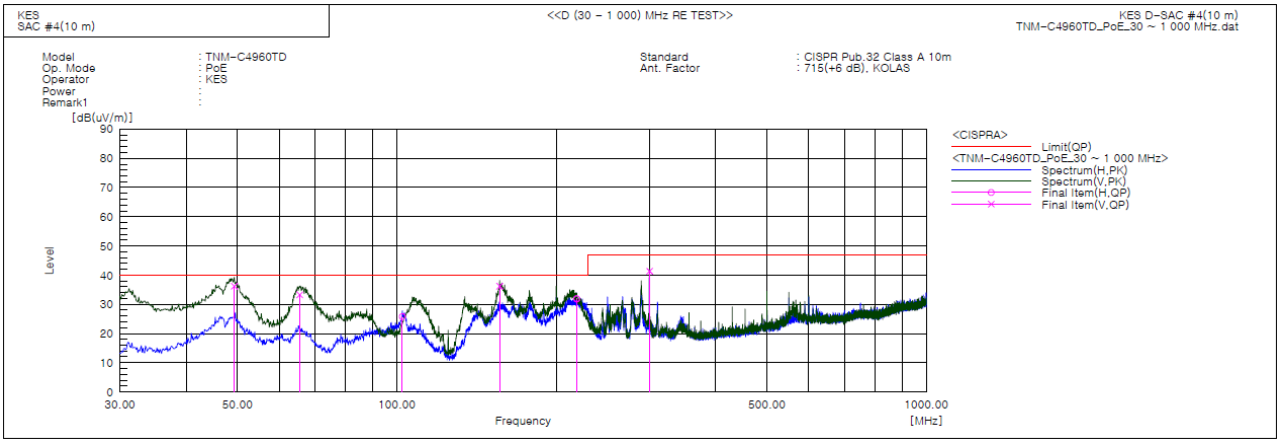
■ DC Mode



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	50.734	V	52.1	-21.0	31.1	40.0	8.9	100.0	128.0	
2	66.618	V	56.5	-23.7	32.8	40.0	7.2	157.0	102.0	
3	94.505	V	50.9	-23.6	27.3	40.0	12.7	100.0	113.0	
4	233.458	V	52.9	-19.9	33.0	47.0	14.0	116.0	207.0	
5	266.923	H	53.6	-18.9	34.7	47.0	12.3	400.0	171.0	
6	300.024	V	56.1	-18.0	38.1	47.0	8.9	124.0	256.0	

■ PoE Mode



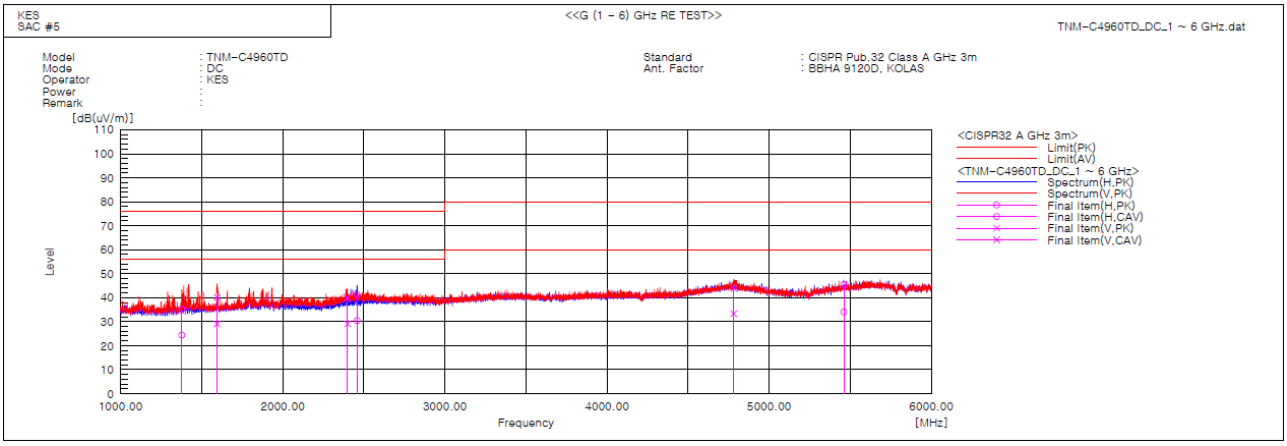
Final Result

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	49.279	V	57.3	-21.1	36.2	40.0	3.8	114.0	247.0	
2	65.526	V	56.7	-23.4	33.3	40.0	6.7	100.0	110.0	
3	102.386	H	48.3	-22.5	25.8	40.0	14.2	364.0	173.0	
4	156.343	V	61.1	-24.9	36.2	40.0	3.8	132.0	145.0	
5	218.665	H	52.4	-20.5	31.9	40.0	8.1	400.0	246.0	
6	300.024	V	59.4	-18.0	41.4	47.0	5.6	162.0	186.0	

♦ 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 ㎓)

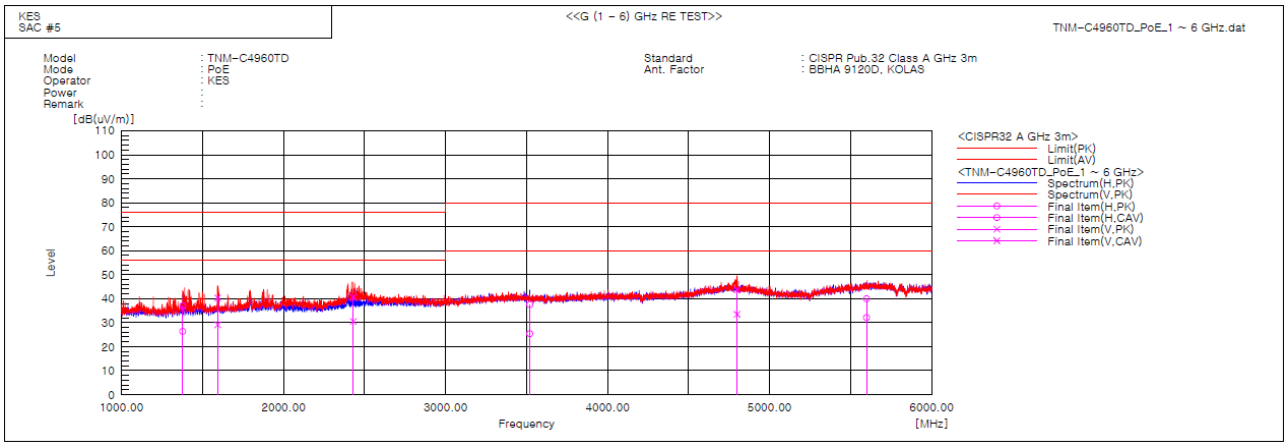
■ DC Mode



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	1377.544	H	40.5	29.8	-5.4	35.1	24.4	76.0	56.0	40.9	31.6	100.0	79.7	
2	1593.717	V	44.8	33.7	-4.6	40.2	29.1	76.0	56.0	35.8	26.9	100.0	196.7	
3	2398.771	V	41.5	30.7	-1.5	40.0	29.2	76.0	56.0	36.0	26.8	100.0	165.3	
4	2458.613	H	42.5	31.8	-1.3	41.2	30.5	76.0	56.0	34.8	25.5	100.0	239.7	
5	4780.701	V	37.4	26.9	6.5	43.9	33.4	80.0	60.0	36.1	26.6	100.0	200.9	
6	5459.338	H	37.2	25.8	8.3	45.5	34.1	80.0	60.0	34.5	25.9	100.0	295.3	

■ 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	1377.260	H	42.4	31.8	-5.4	37.0	26.4	76.0	56.0	39.0	29.6	100.0	132.4	
2	1593.129	V	45.0	33.8	-4.6	40.4	29.2	76.0	56.0	35.6	26.8	100.0	188.4	
3	2430.064	V	42.1	32.0	-1.4	40.7	30.6	76.0	56.0	35.3	25.4	100.0	337.7	
4	3519.375	H	35.8	23.6	1.8	37.6	25.4	80.0	60.0	42.4	34.6	100.0	345.0	
5	4799.357	V	37.1	26.9	6.6	43.7	33.5	80.0	60.0	36.3	26.5	100.0	222.2	
6	5598.272	H	31.9	24.0	8.1	40.0	32.1	80.0	60.0	40.0	27.9	100.0	195.9	

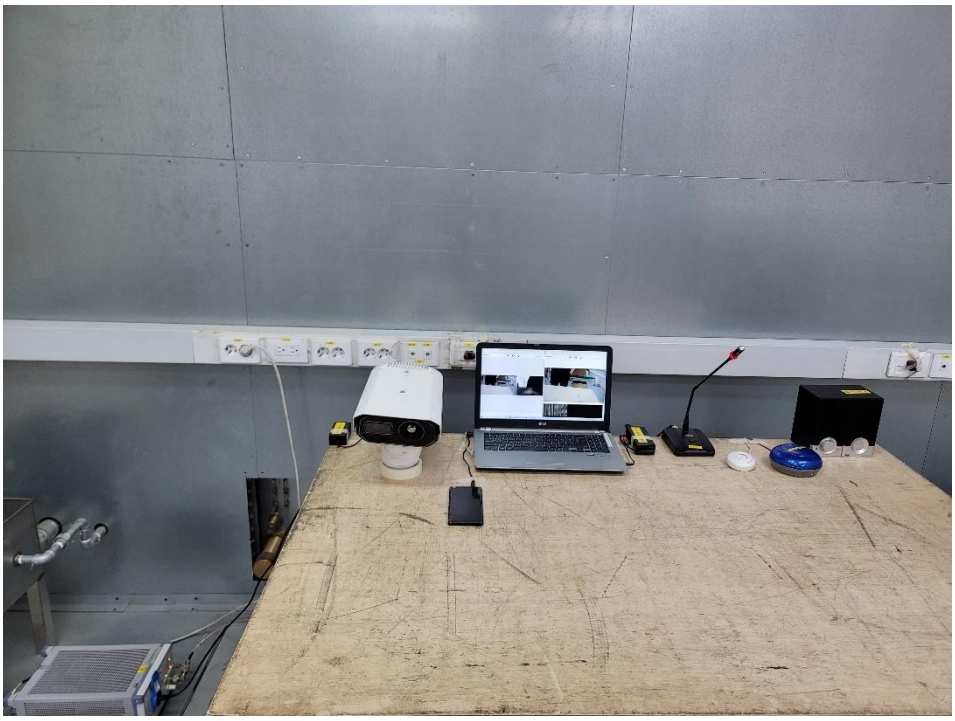
♦ Calculation

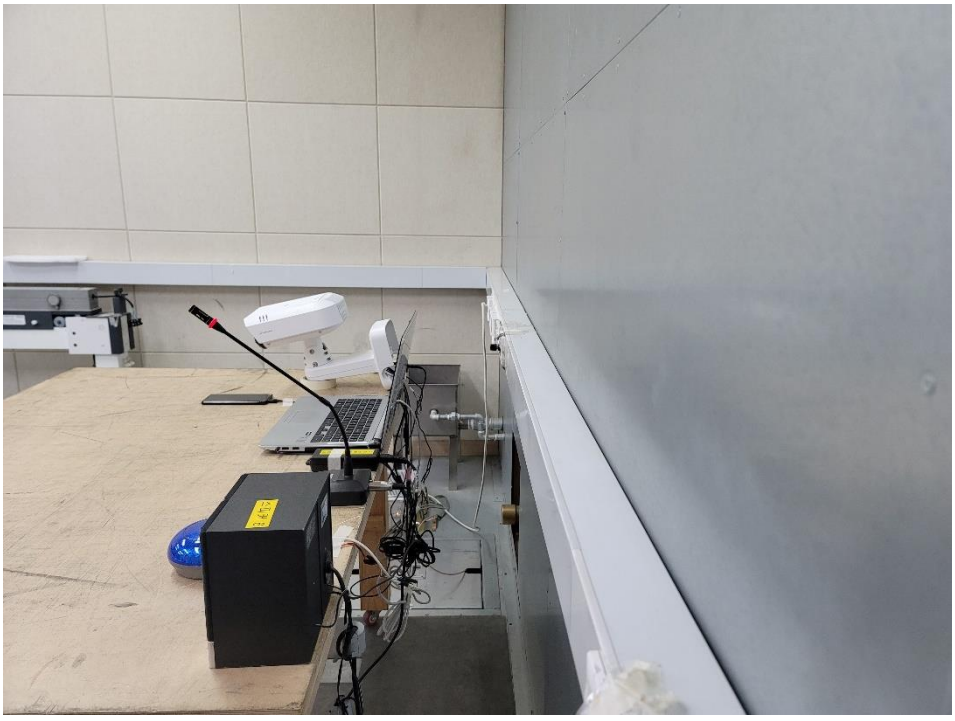
Result(PK/CAV) [dB(㎶/m)] = (Reading(PK/CAV)[dB(㎶)] + c.f[dB(1/m)]
Margin(PK/CAV)[dB] = Limit[dB(㎶/m)] - Result(PK/CAV) [dB(㎶/m)]
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ DC Mode

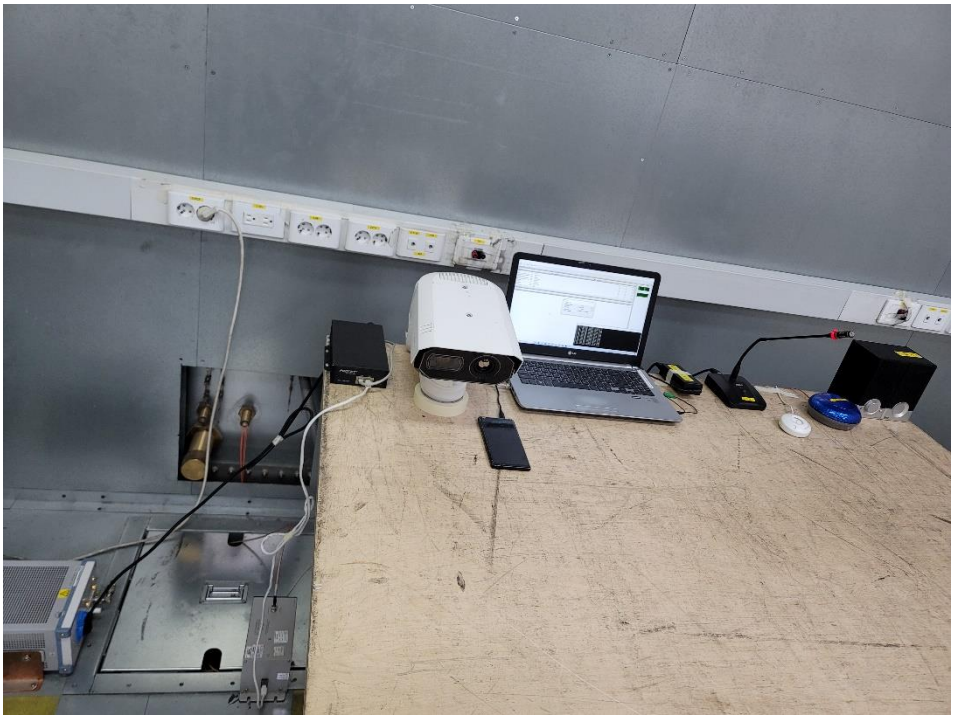




Conducted Emissions at Telecommunication Ports

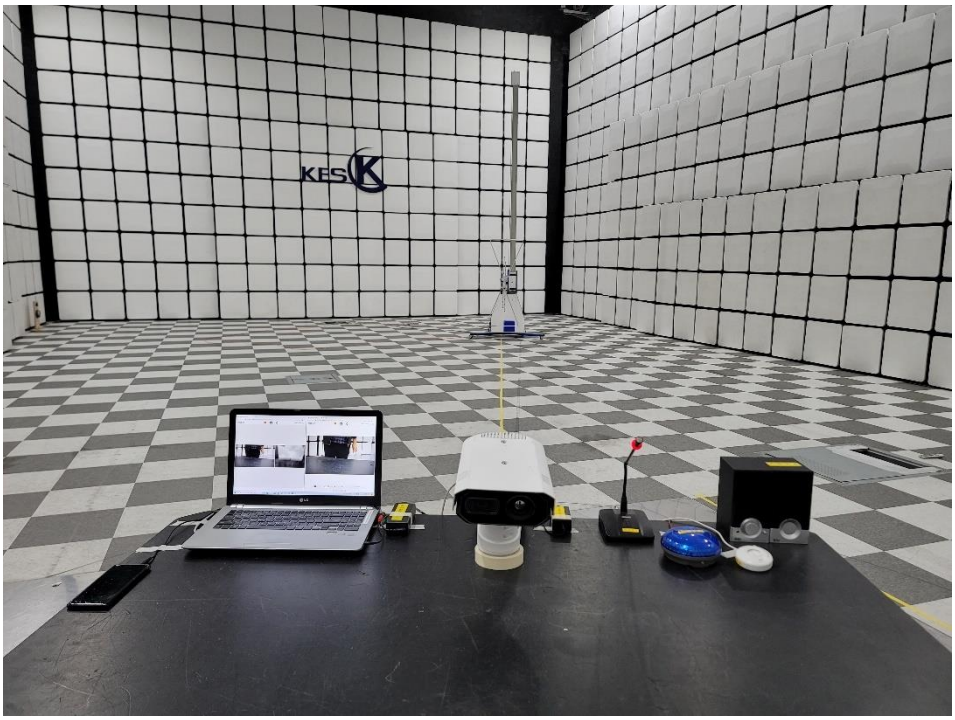
■ DC Mode

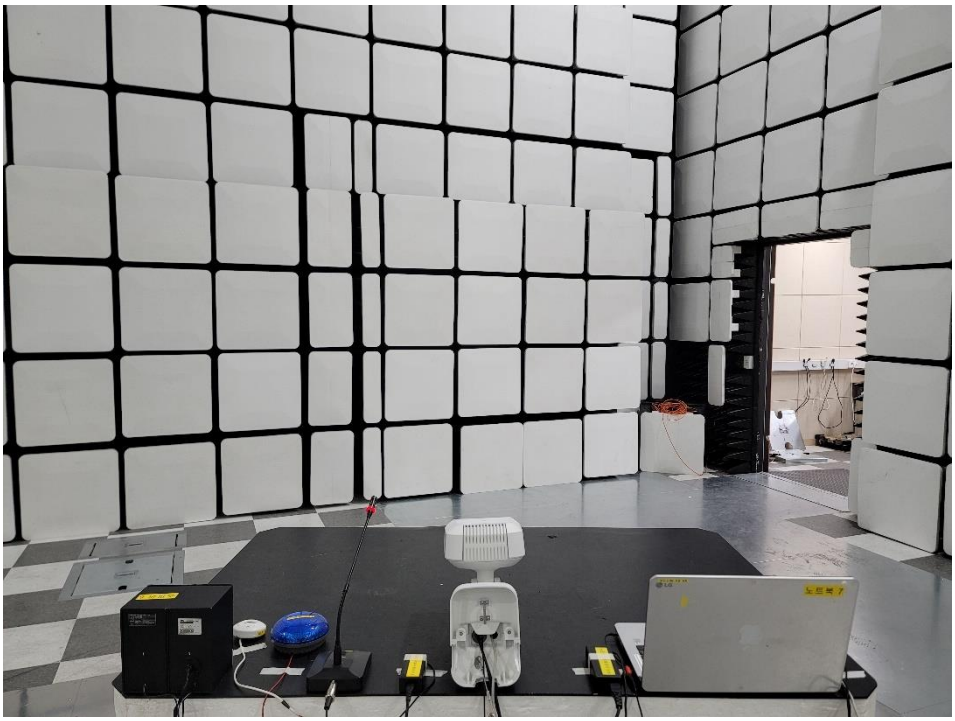
■ PoE Mode



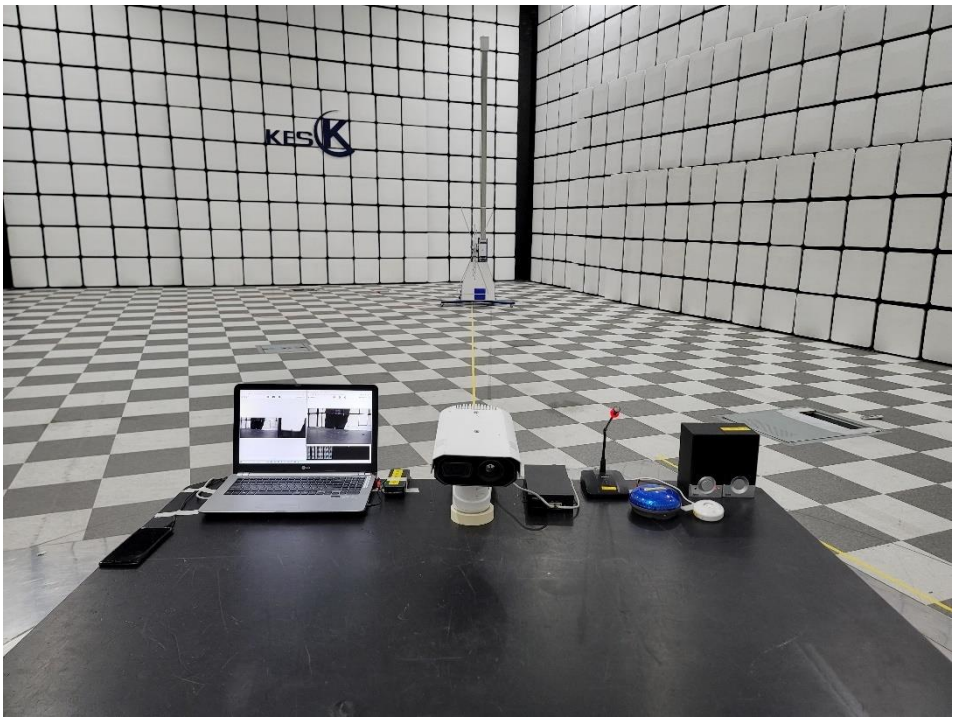
Radiated Electric Field Emissions(Below 1 ㎓)

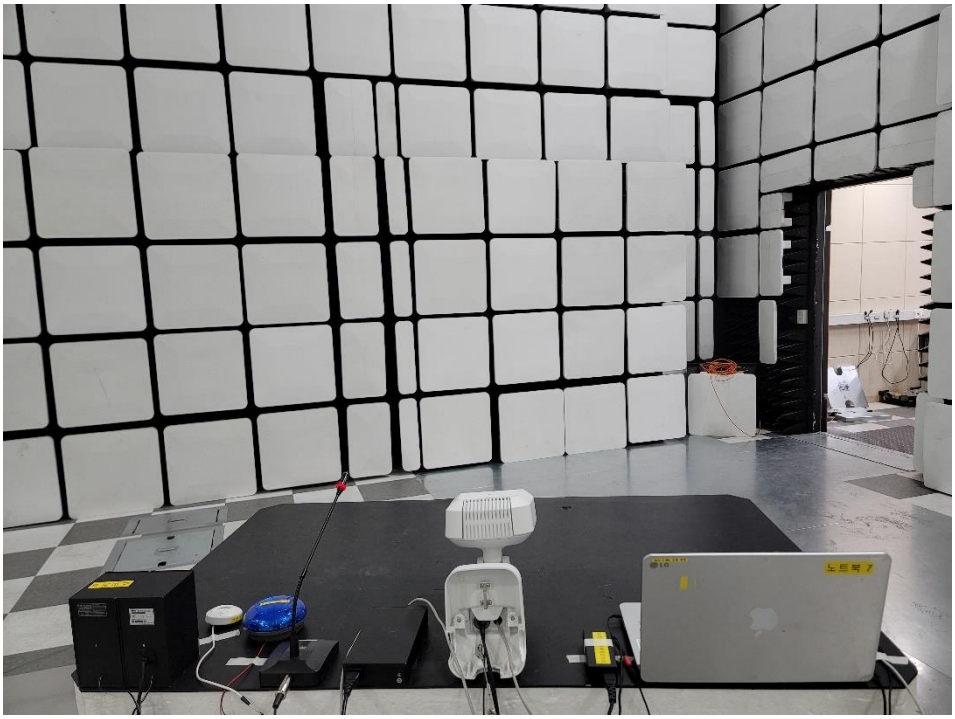
■ DC Mode





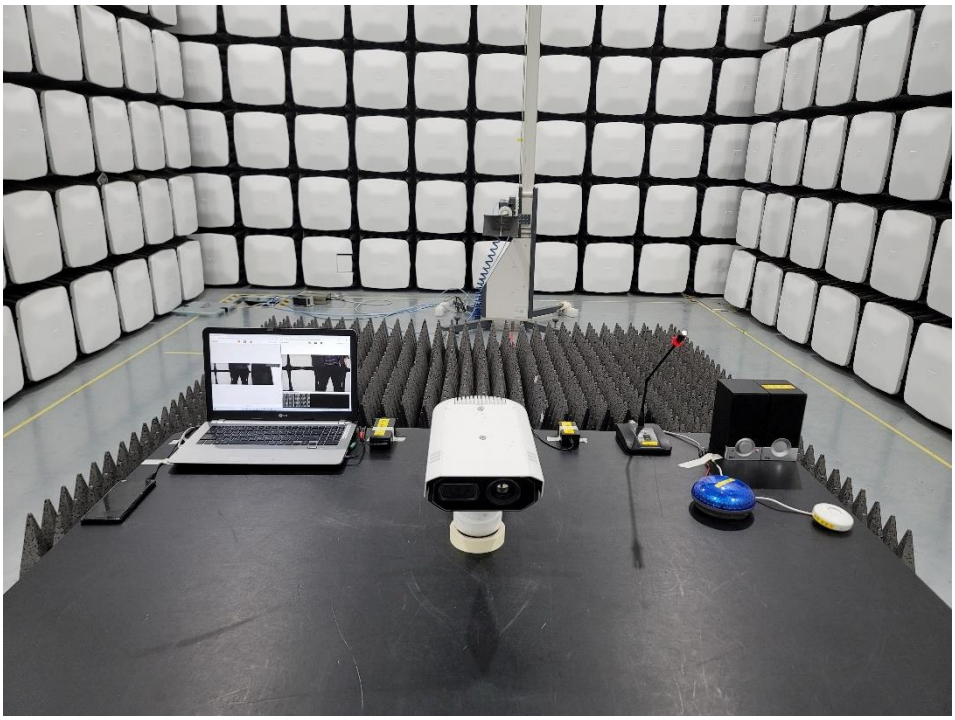
■ PoE Mode

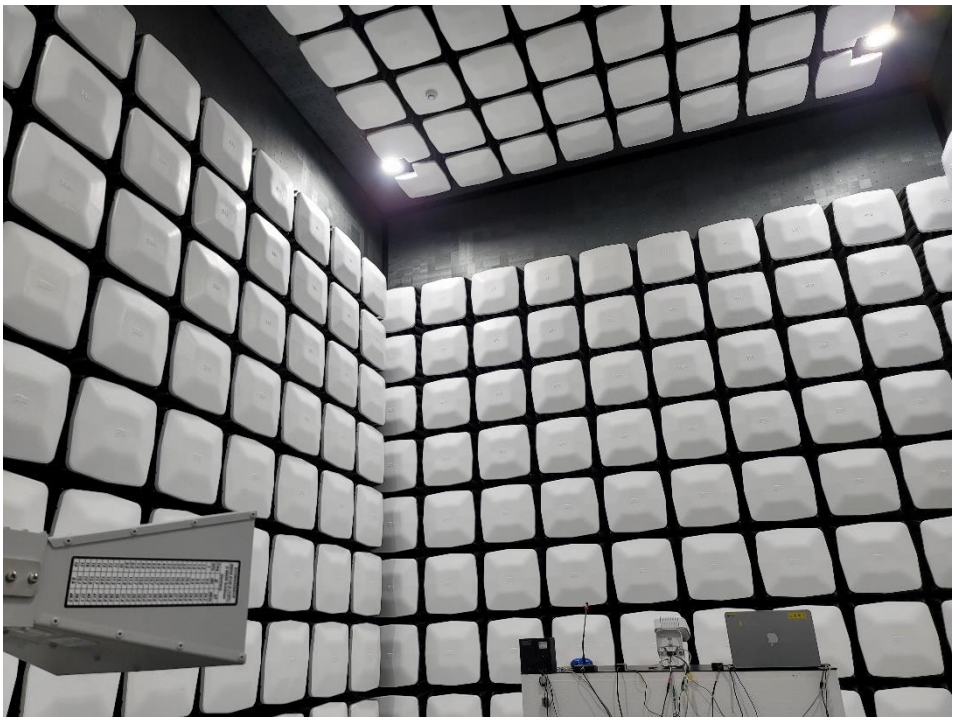




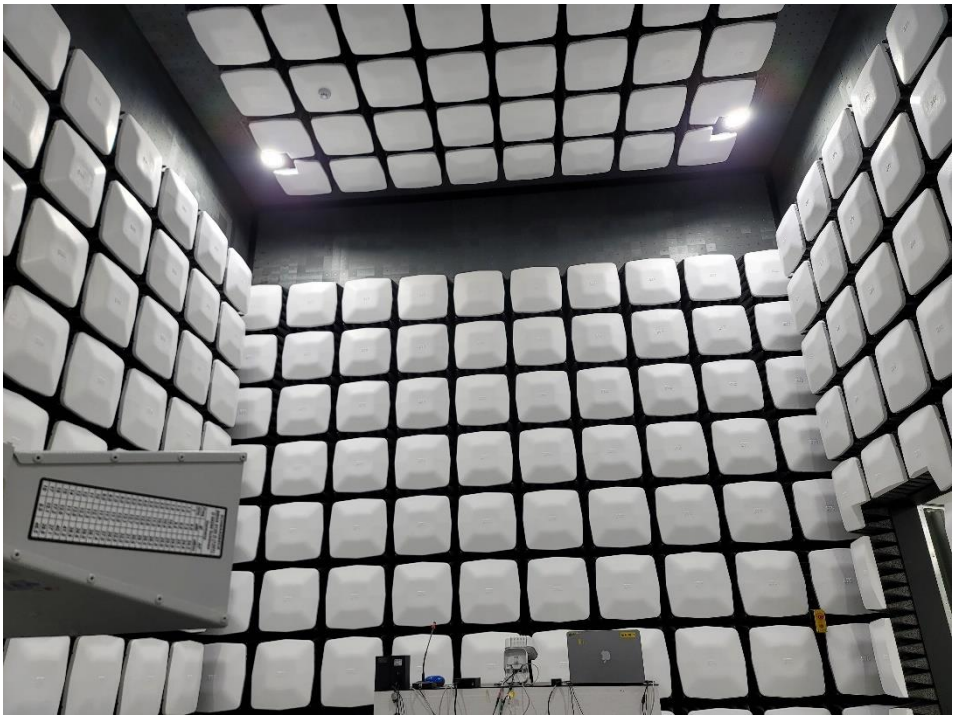
Radiated Electric Field Emissions(Above 1 ㎓)

■ DC Mode



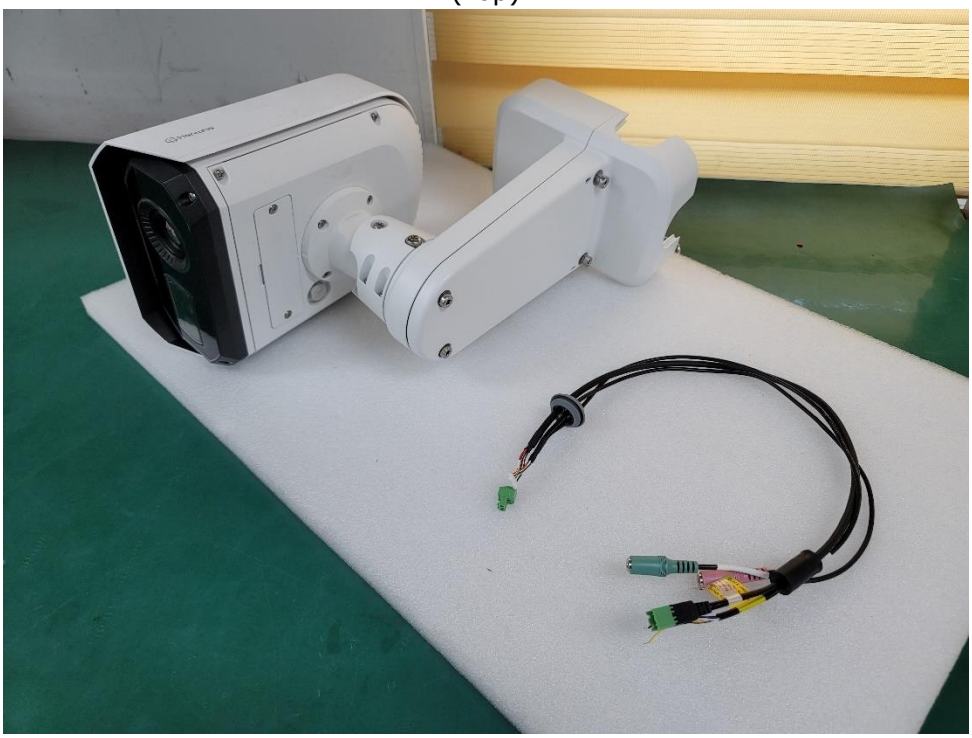


■ PoE Mode

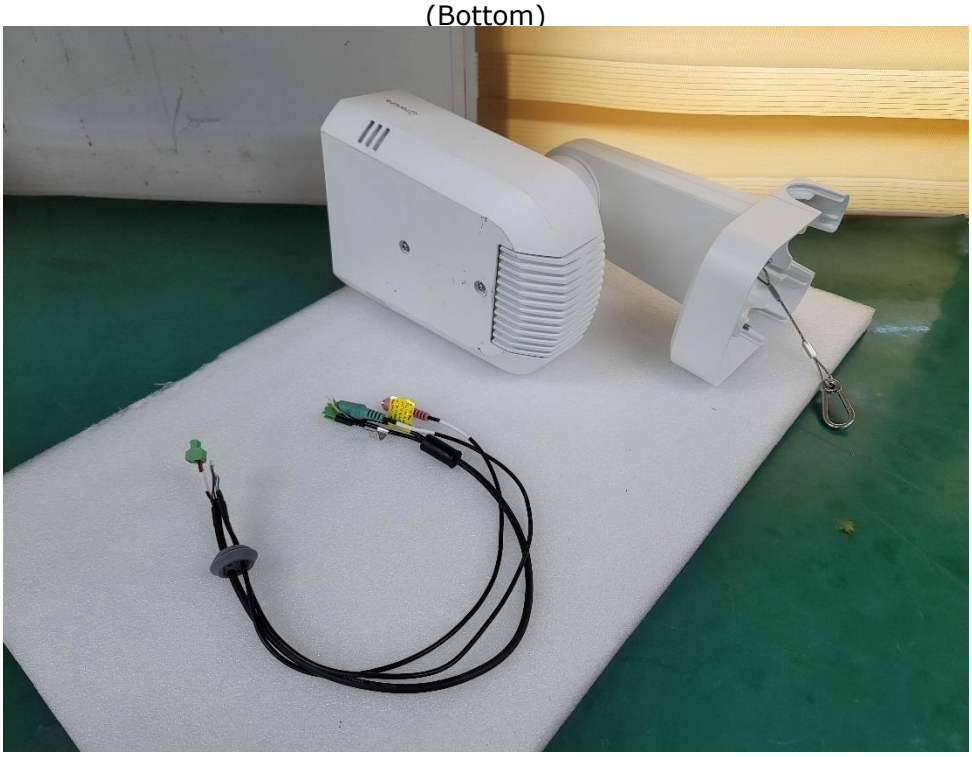


EUT External Photographs

(Top)

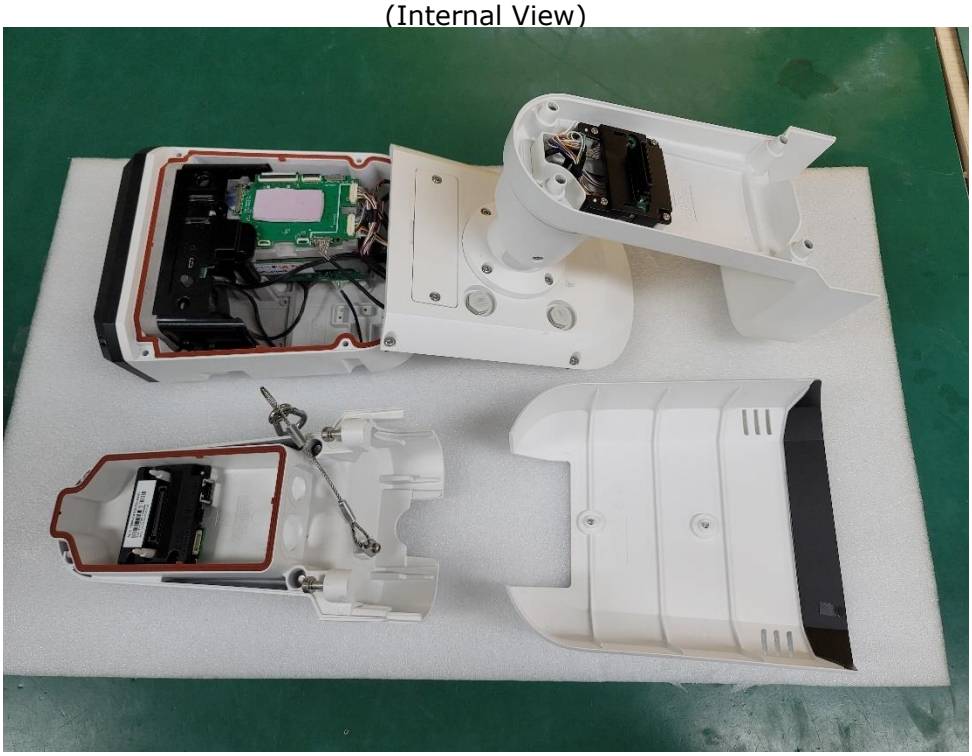


(Bottom)



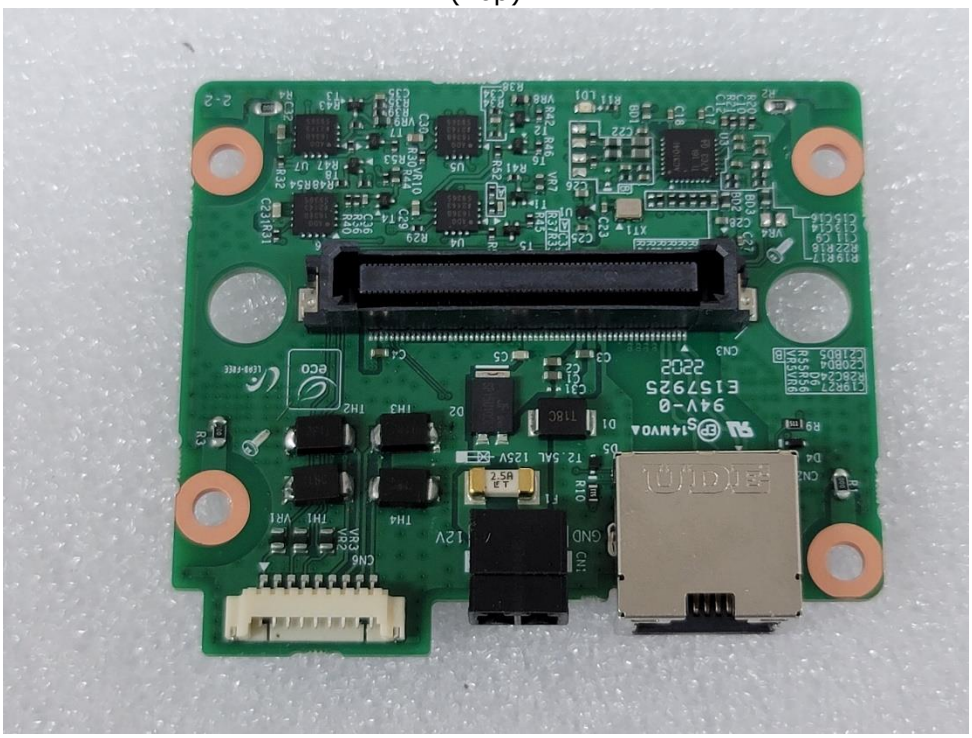
EUT Internal Photographs

(Internal View)



EUT Internal View – Back Box Board

(Top)



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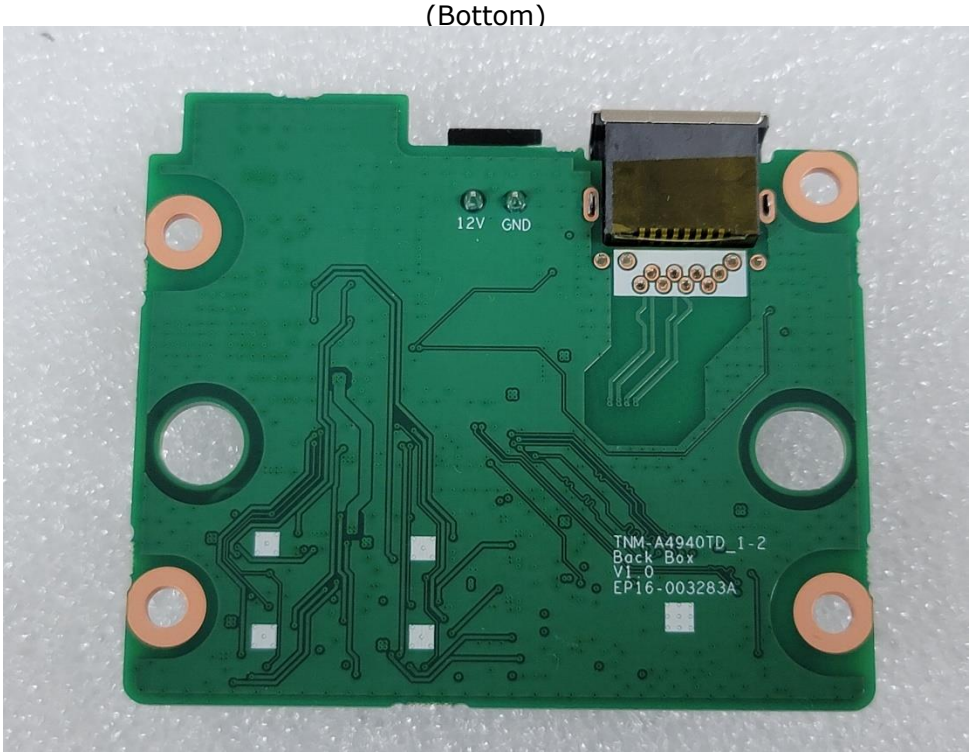
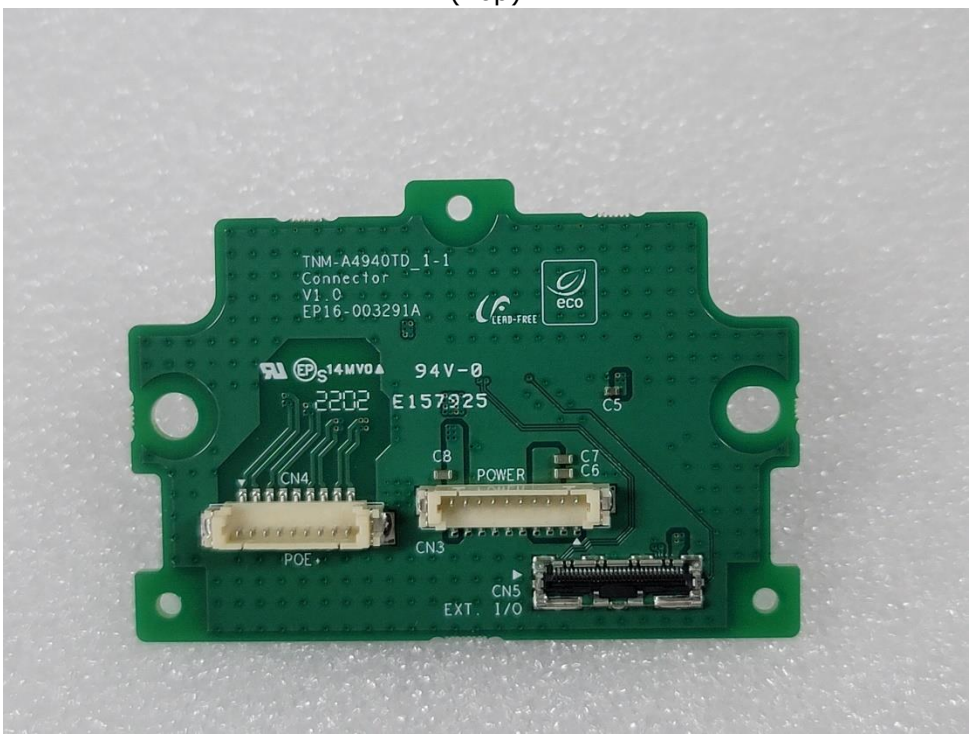


EUT Internal View – Connector Board

(Top)



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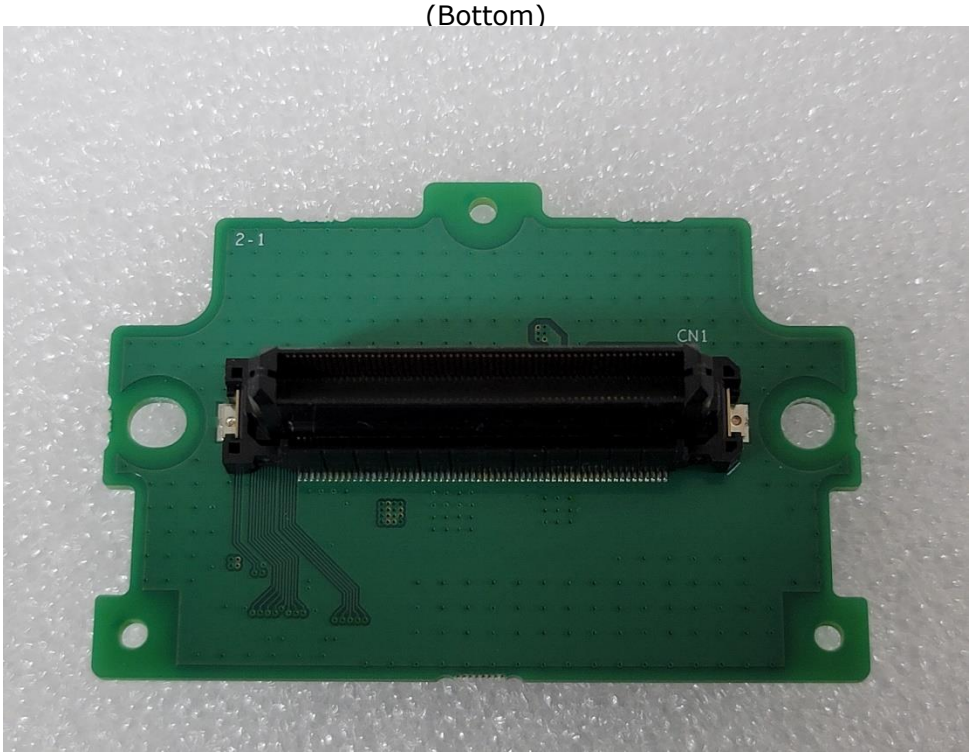
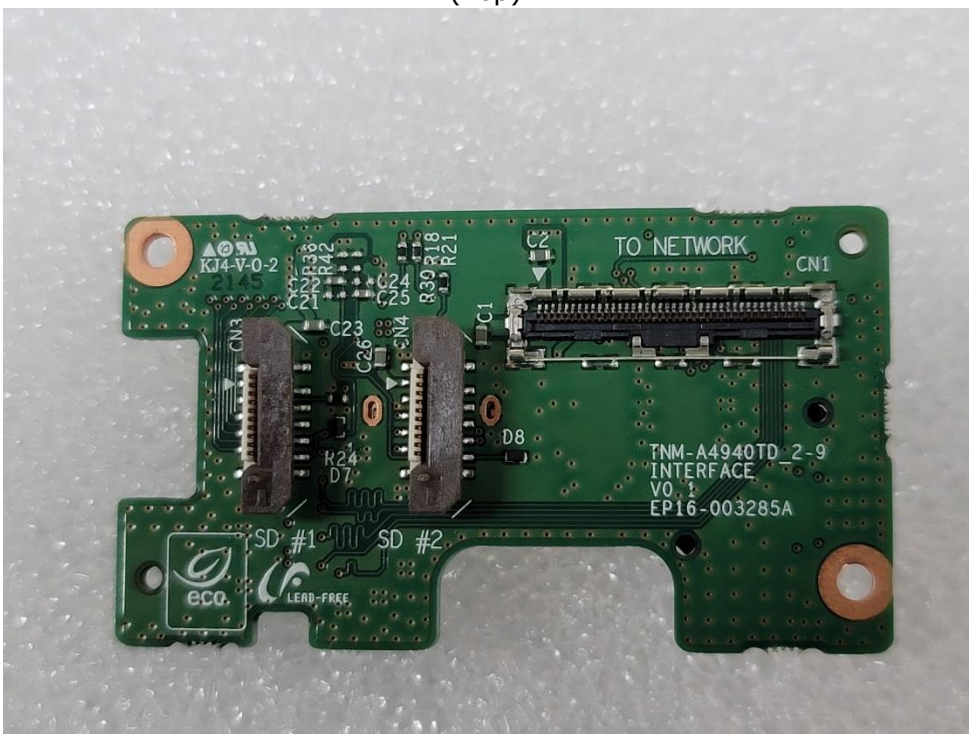


EUT Internal View – Interface Board

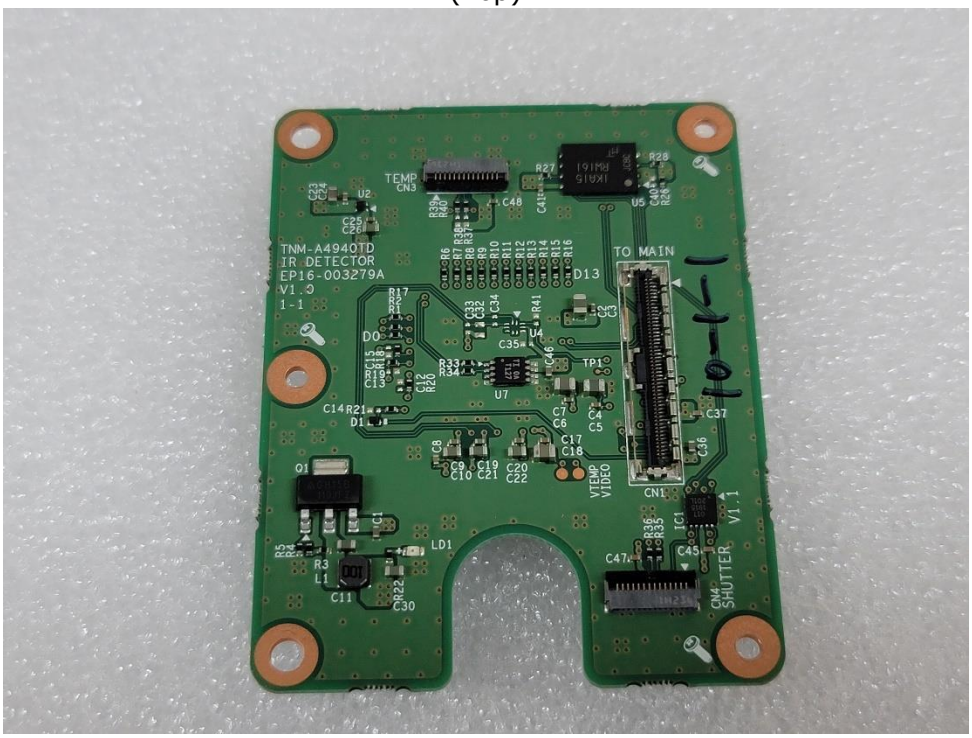
(Top)



(Bottom)

EUT Internal View – IR Detector Board

(Top)



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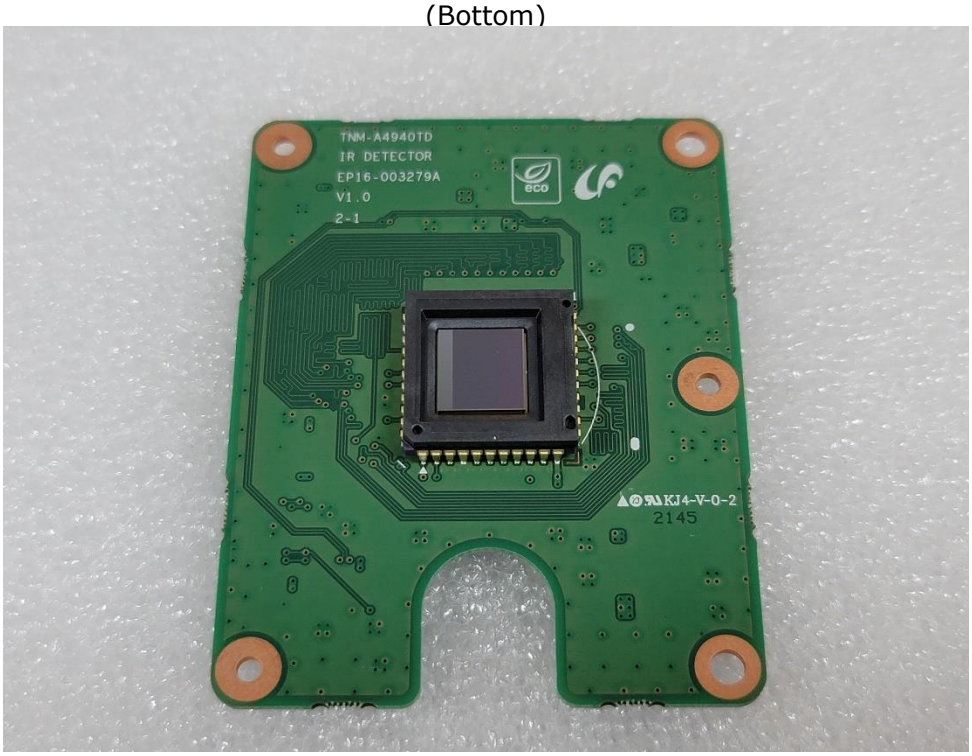
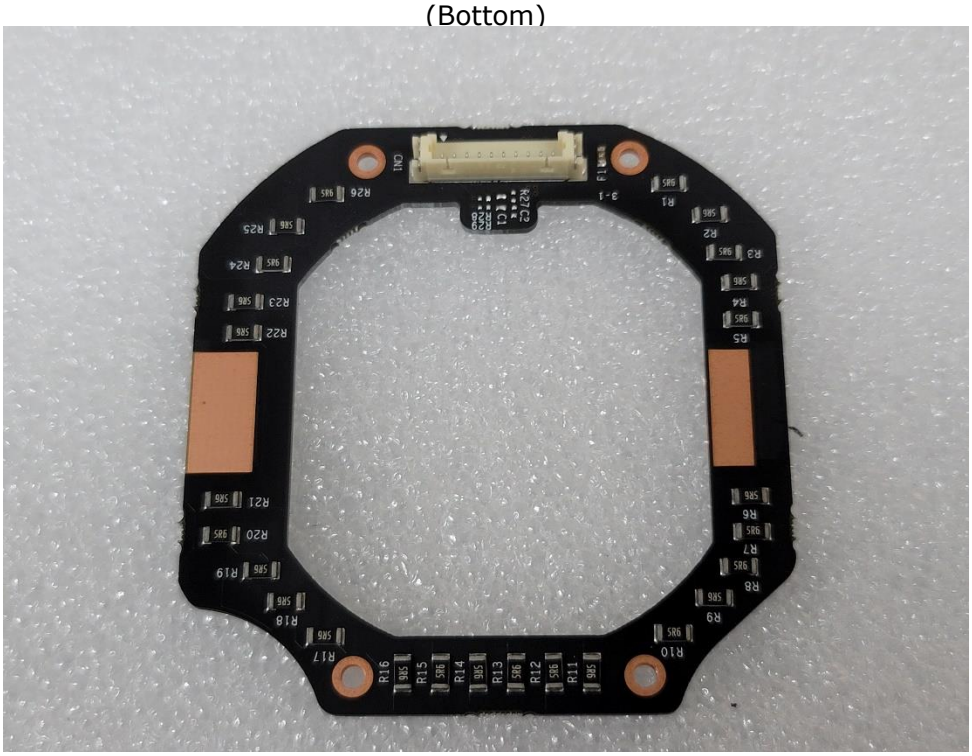


EUT Internal View – IR Board

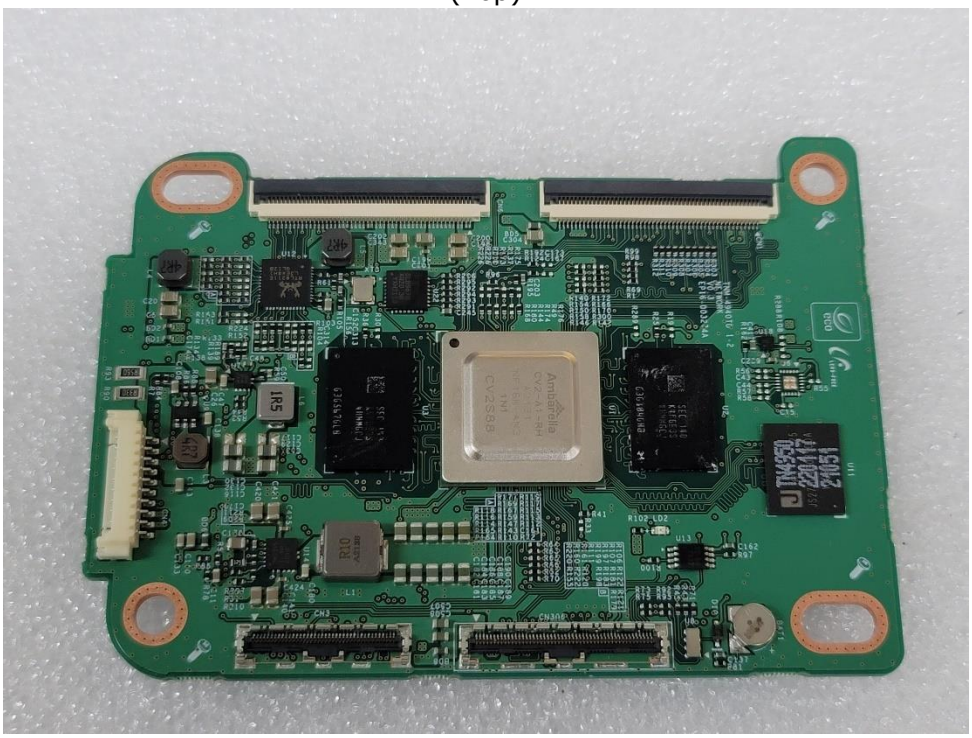
(Top)

(Bottom)



EUT Internal View – Network Board

(Top)



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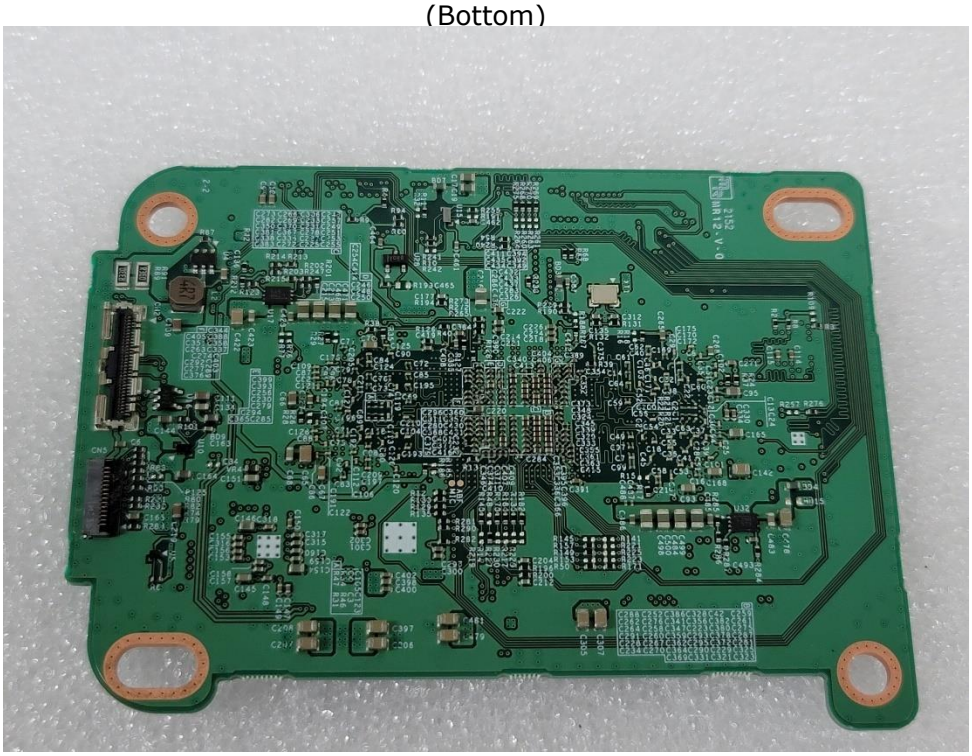
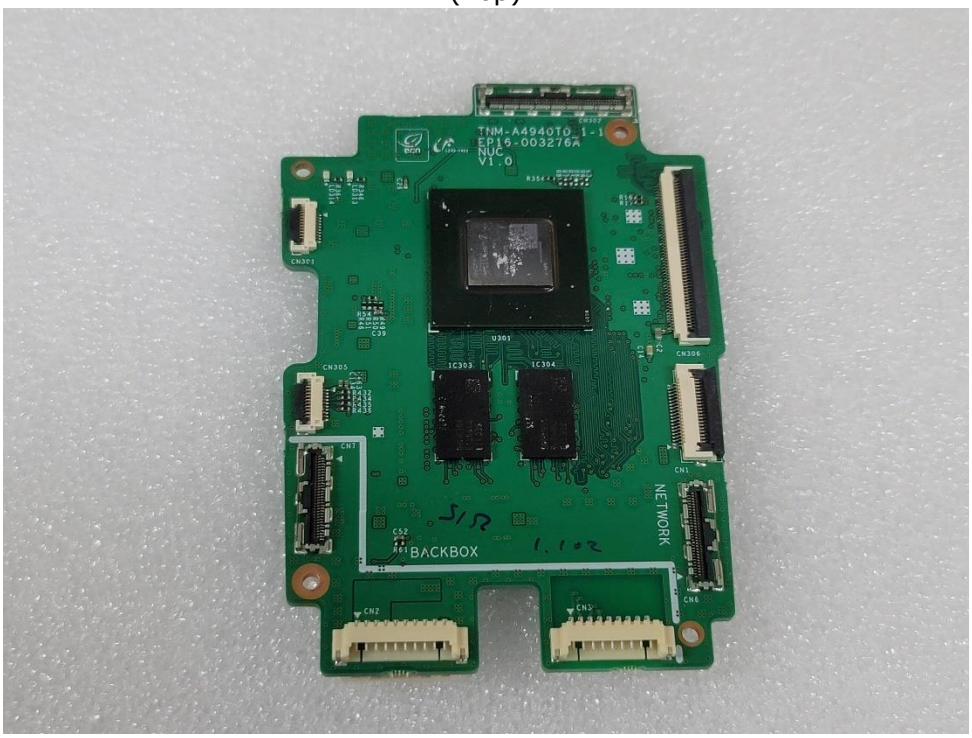


EUT Internal View – NUC Board

(Top)



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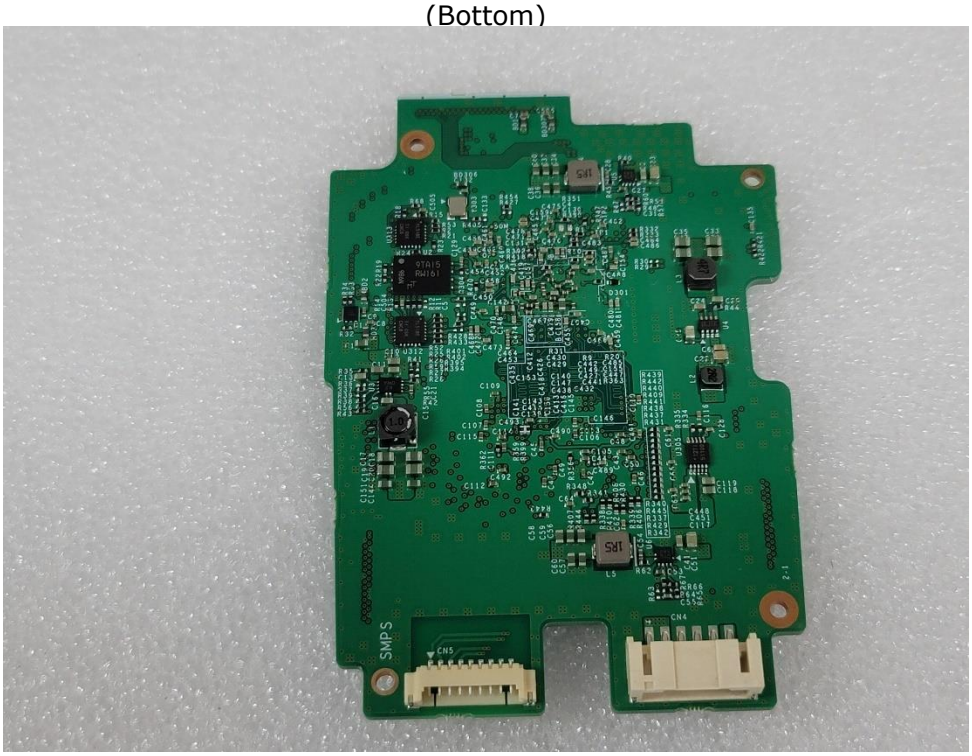
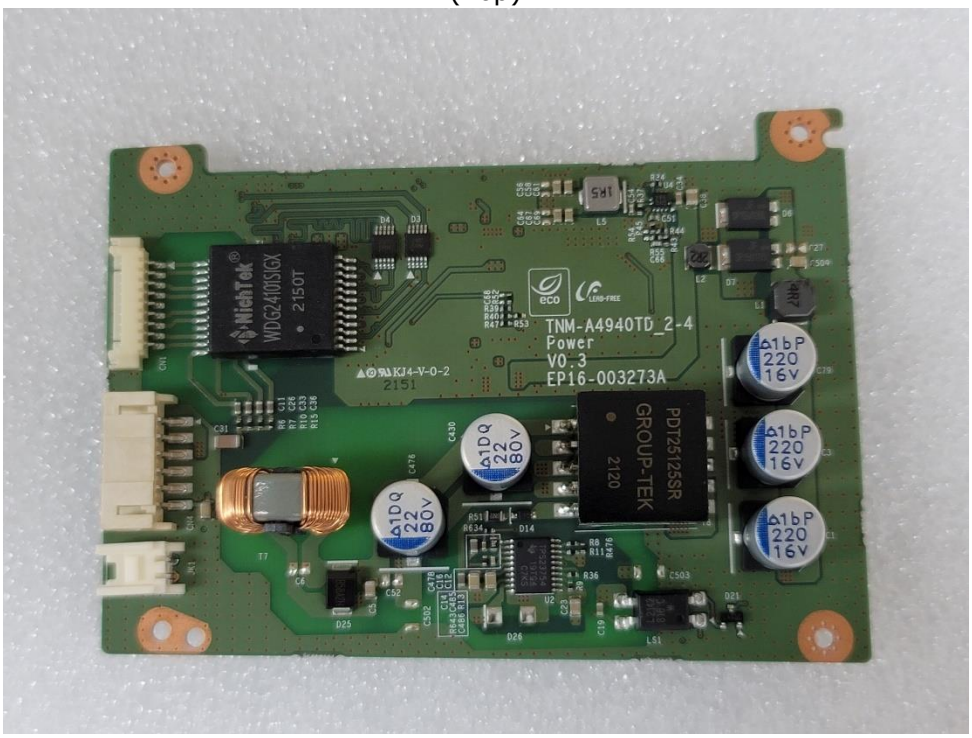


EUT Internal View – Power Board

(Top)



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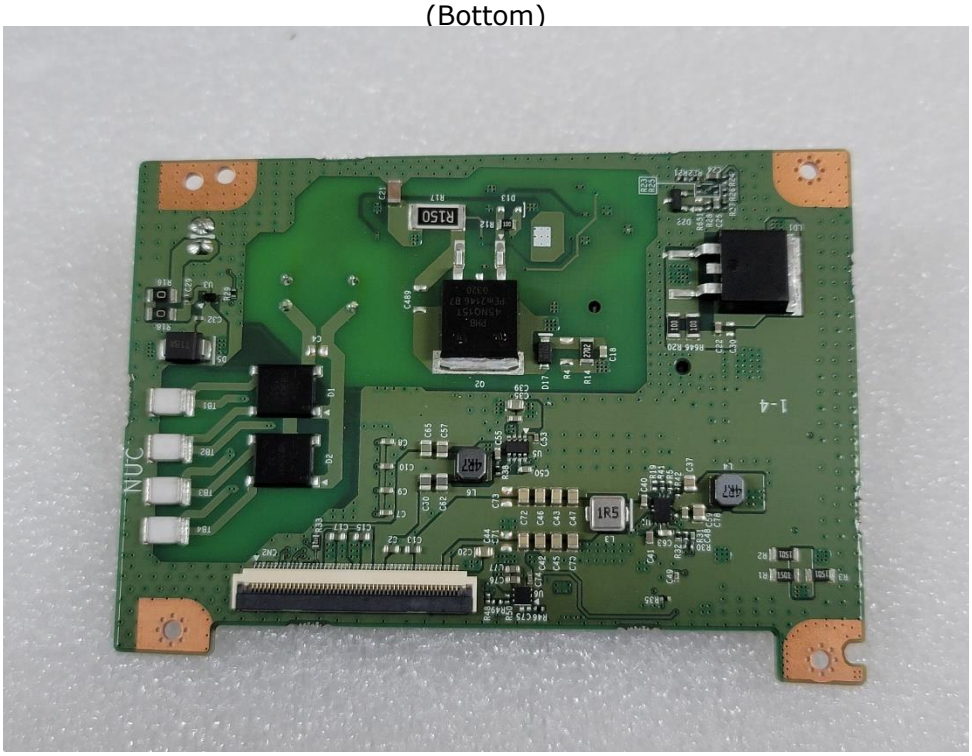
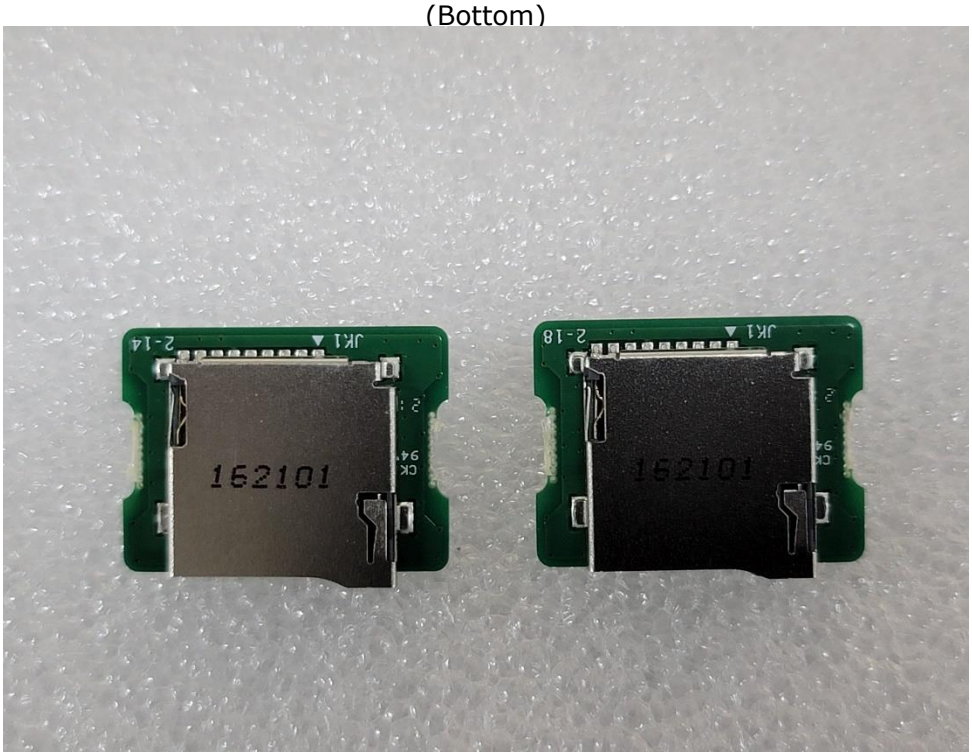


EUT Internal View – SD Board

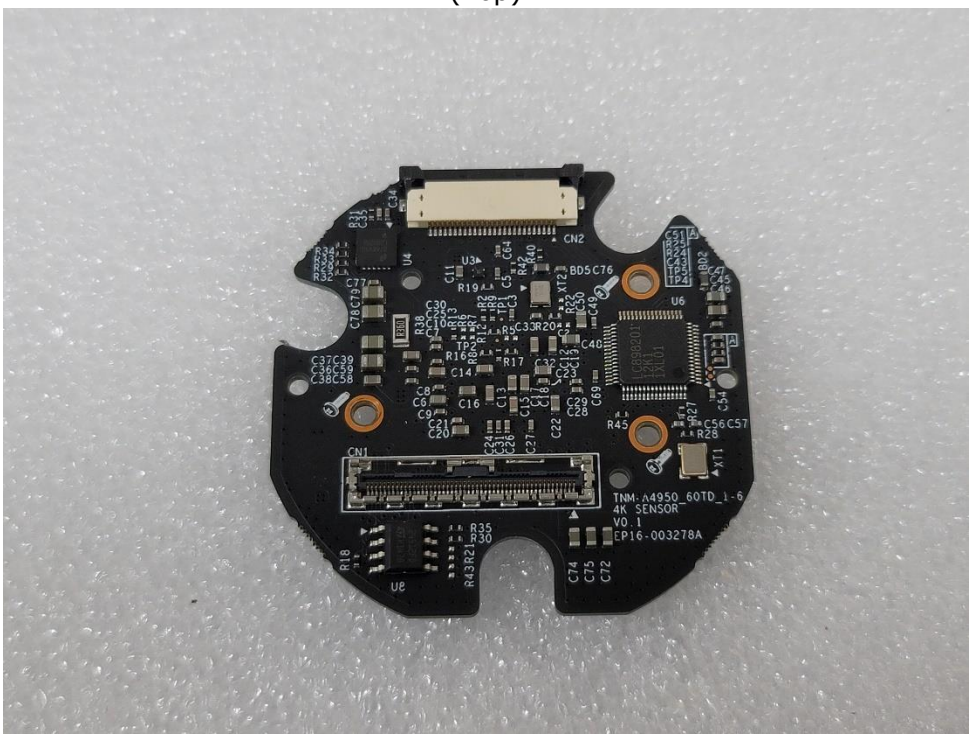
(Top)

(Bottom)



EUT Internal View – Sensor Board

(Top)



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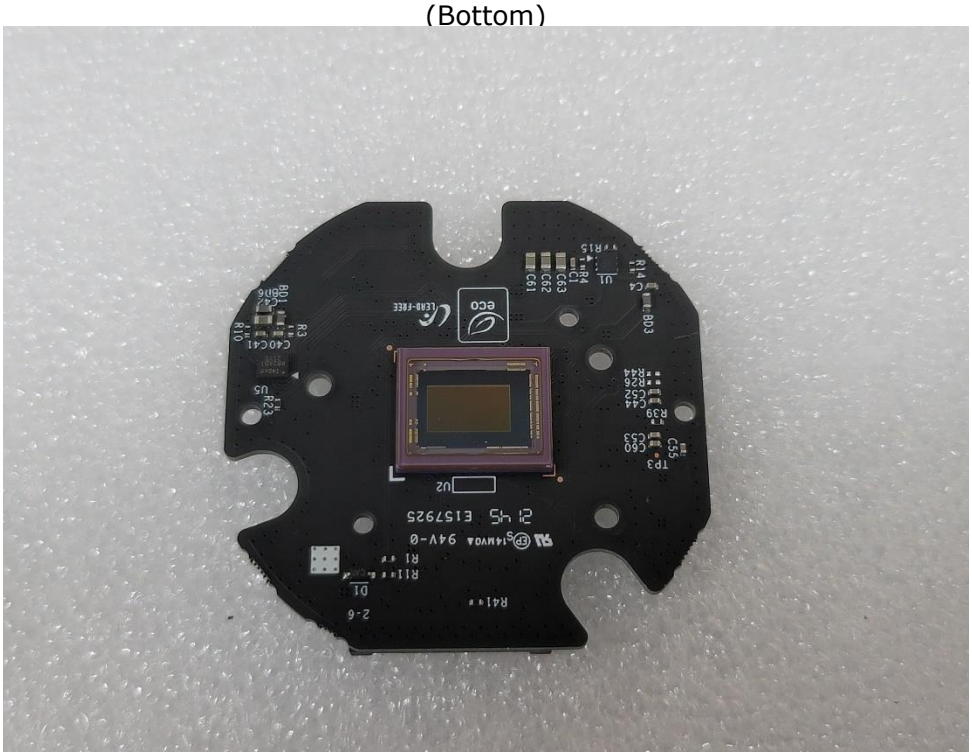
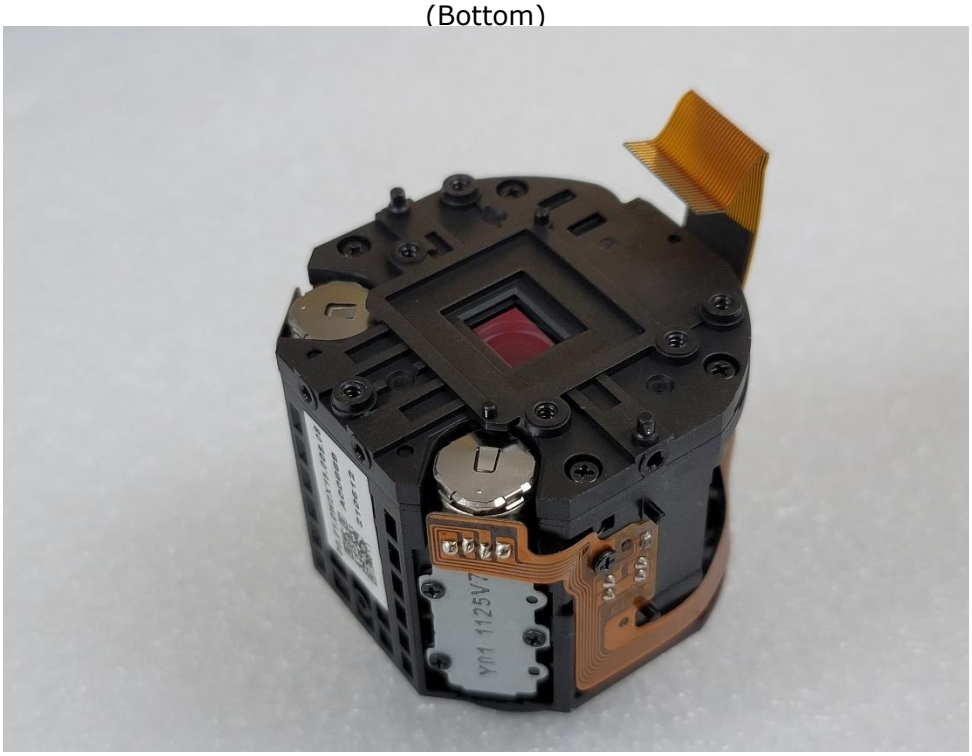


EUT Internal View – Lens 1

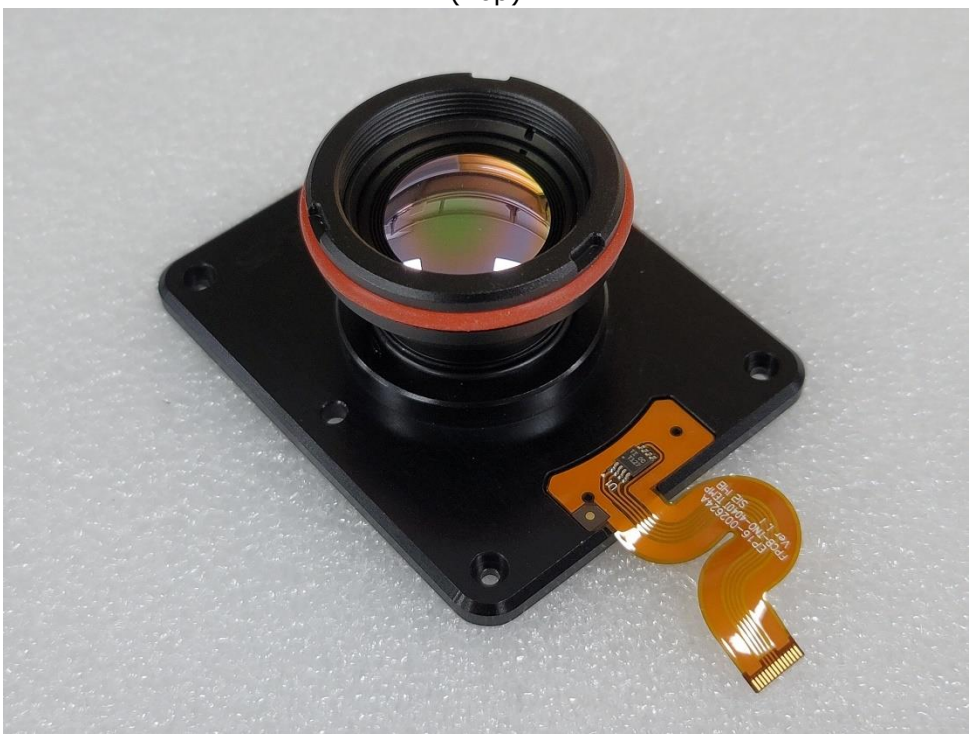
(Top)

(Bottom)



EUT Internal View – Lens 2

(Top)



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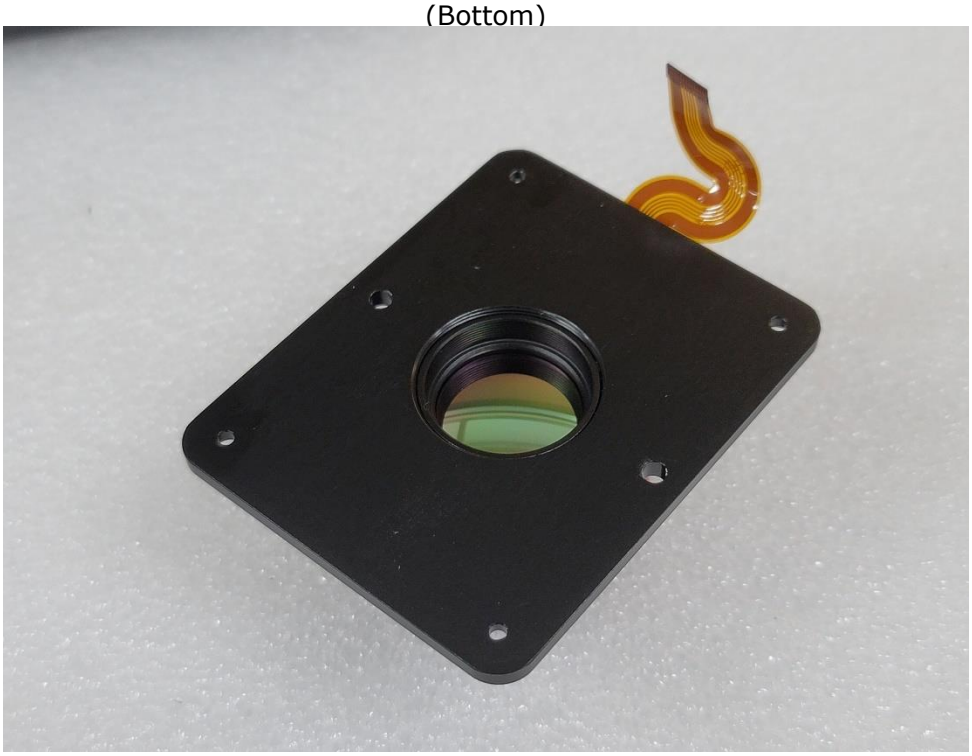
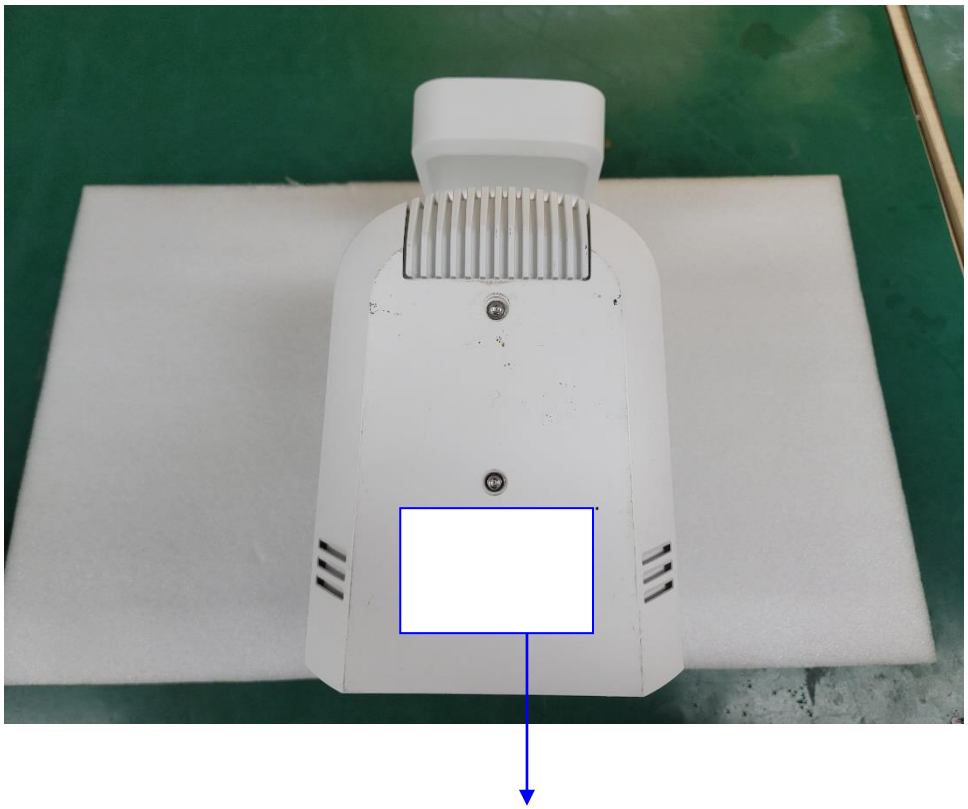


Label Photographs



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