

TEST REPORT



Report No. : KES-EM-23T0906

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KES Co., Ltd.

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1. Client

Applicant : Hanwha Vision Co., Ltd

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do,
Republic of Korea

2. Sample Description

Product name : NETWORK THERMAL CAMERA

Model/Type No. : TNM-C4940TD

Variant Model : TNM-C4940TDR, TNM-C4942TDR

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

3. Date of Receipt : Sep. 19, 2023

4. Test date : Oct. 04, 2023 ~ Oct. 11, 2023

5. Date of Issue : Oct. 25, 2023

6. Test Results : In Compliance

Tested by

Dong Hyun, Won
EMC Test Engineer

Reviewed by

Dong Il, Lee
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
Oct. 25, 2023	KES-EM-23T0906	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Spec Display Name	Thermal	Visible
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	12μm	None
Min. Illumination	None	Color: 0.06Lux(F1.3, 1/30sec) BW: 0.004Lux(F1.3, 1/30sec), 0Lux(IR LED on)
Video Out	USB : Micro USB Type B	
Lens		
Focal Length (Zoom Ratio)	9.1mm fixed focal	4.4~9.3mm(2.2x) motorized varifocal
Max. Aperture Ratio	F1.0	F1.3(Wide)~F2.15(Tele)
Angular Field of View	H: 50.0°, V: 37.0°, D: 63.8°	H:112.1°(Wide)~47.5°(Tele) / V:58.0°(Wide)~26.6°(Tele) / D:137.5°(Wide)~54.6°(Tele)
Min. Object Distance	3.5m(11.48ft)	Wide: 1.75m(5.74ft) / Tele: 5.21m(17.09ft)
Focus Control	Fixed	Simple focus
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, SDR
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	8ea, polygonal zones	
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 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	30m
Color Palettes	Whitehot, Blackhot, Rainbow, Rainbow2, Sepia, Red, Iron, Custom	None

KES-QP16-F01(00-23-01-01)

KES Co., Ltd.

The authenticity of the test report, contact kes@kes.co.kr

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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(Sea 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)	
Application Programming Interface	Secure boot, Secure firmware	
	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 25.5W	
	12V _{DC} : Max 21.5W	
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 240 V, 50 Hz

☒ PoE

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 THERMAL CAMERA	TNM-C4940TD	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
PoE Adapter	POE29U-1AT(PL)	-	Phihong Technology Co., Ltd.	-
Notebook	P95G001	9JM8HT2	DELL INC.	-
Notebook Adapter	HA65NM130	-	Chicony Power Technology (Suzhou)Co.,Ltd.	-
Headset	K550	-	Britz®	-
Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-
Smartphone	SM-N950N	R39J80FHA8	Samsung Electronics Co., Ltd.	-
Micro SD Card 1	-	-	Transcend	8 GB
Micro SD Card 2	-	-	Transcend	8 GB

1.6 External I/O Cabling

■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK THERMAL CAMERA (EUT)	DC In (2 Pin)	Adapter	Line	2.0	U
	RJ-45 (LAN)	Notebook	RJ-45	4.2	S
	3.5 mm (Audio In)	Headset	3.5 mm	1.8	U
	3.5 mm (Audio Out)		3.5 mm	1.8	U
	2 Pin (Alarm Out)	Alarm	2 Pin	3.1	U
	2 Pin (Alarm In)	Button Alarm	2 Pin	3.3	U
	Micro SD Card Slot	Micro SD Card 1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card 2	Micro SD Card Slot	-	-
Notebook	3.5 mm	Smartphone	3.5 mm	1.4	U
	DC Jack	Notebook Adapter	DC Jack	2.0	U

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK THERMAL CAMERA (EUT)	RJ-45 (PoE)	PoE Adapter	RJ-45	4.2	S
	3.5 mm (Audio In)	Headset	3.5 mm	1.8	U
	3.5 mm (Audio Out)		3.5 mm	1.8	U
	2 Pin (Alarm Out)	Alarm	2 Pin	3.1	U
	2 Pin (Alarm In)	Button Alarm	2 Pin	3.3	U
	Micro SD Card Slot	Micro SD Card 1	Micro SD Card Slot	-	-
	Micro SD Card Slot	Micro SD Card 2	Micro SD Card Slot	-	-
Notebook	3.5 mm	Smartphone	3.5 mm	1.4	U
	RJ-45 (LAN)	PoE Adapter	RJ-45	1.9	S
	DC Jack	Notebook Adapter	DC Jack	2.0	U

* Unshielded=U, Shielded=S

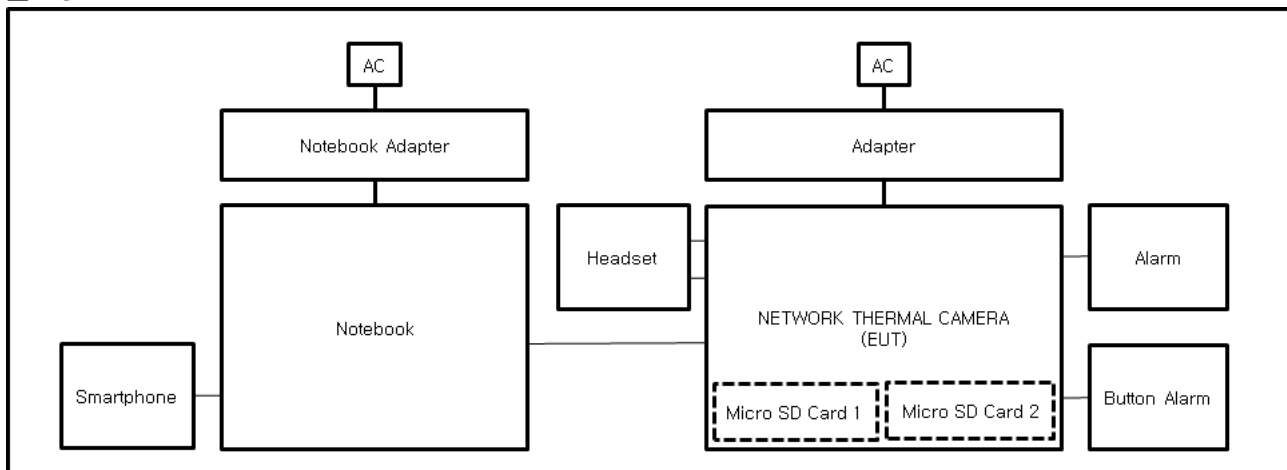
1.7 EUT Operating Mode(s)

Test mode	operating
DC	1. Run the Web Viewer on your laptop and check the camera video output 2. PingTest from your laptop to check the network status 3. After the test, the Micro SD Card storage file was checked.
PoE	

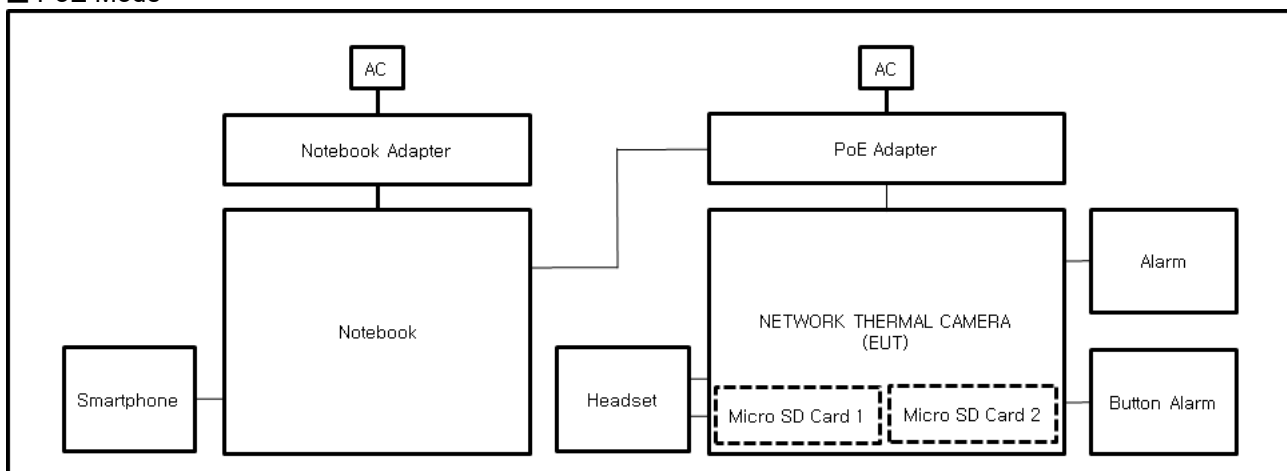
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

1.8 Configuration

■ DC Mode



■ PoE Mode



1.9 Remarks when standards applied

Micro 5 Pin USB Port is not tested because it is for unused port.




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

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **AS/NZS CISPR 32:2015 AMD 1:2020**

☒ Class A

☐ Class B

2.1 Conducted Emissions at Mains Power Ports

Test Date

Oct. 04, 2023

Test Location

Electro wave Shieldroom #6

Test Equipment

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

Test Conditions

Temperature: (23,7 ± 0,1) °C

Relative Humidity: (47,2 ± 0,1) % 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

RemarksSee Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Oct. 04, 2023

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	11, 10, 2023
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
<input checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 06, 2024
<input type="checkbox"/>	CDN	CDNS502A	TESEQ	40431	11, 10, 2023

Test Conditions

Temperature: (23,7 ± 0,1) °C

Relative Humidity: (47,2 ± 0,1) % 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

Oct. 11, 2023

Test Location☐ OPEN AREA TEST SITE #2☒ SEMI ANECHOIC CHAMBER #4(10m)**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100551	03, 21, 2024
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions

Temperature: (23,5 ± 0,1) °C

Relative Humidity: (45,0 ± 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

RemarksSee Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Oct. 04, 2023

Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	ES10/RE	TOYO Corporation	2022.01.000	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	03, 21, 2024
<input checked="" type="checkbox"/>	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 08, 2023
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	HP	3008A00538	05, 31, 2024
<input checked="" type="checkbox"/>	ATTENUATOR	8491B	HP	23094	03, 21, 2024

Test Conditions

Temperature: (23,1 ± 0,1) °C

Relative Humidity: (47,9 ± 0,1) % 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.
- The Average of the test data is the cispr average result.

APPENDIX A – TEST DATA

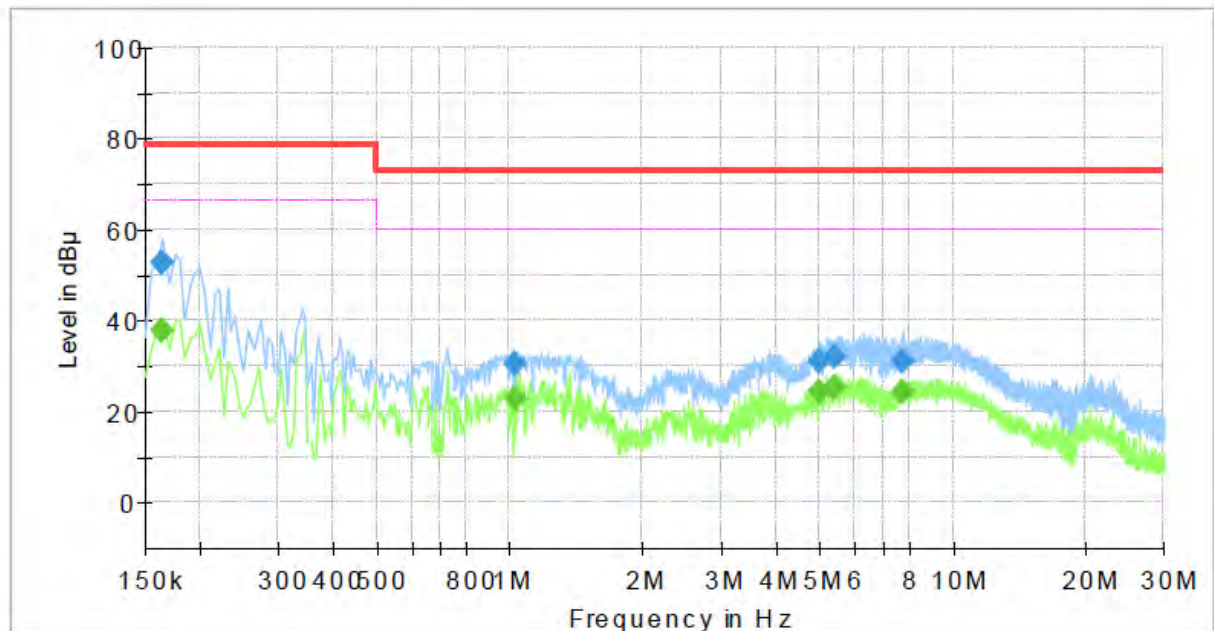
Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	TNM-C4940TD
Phase:	H
Mode:	DC
Operator Name:	KES



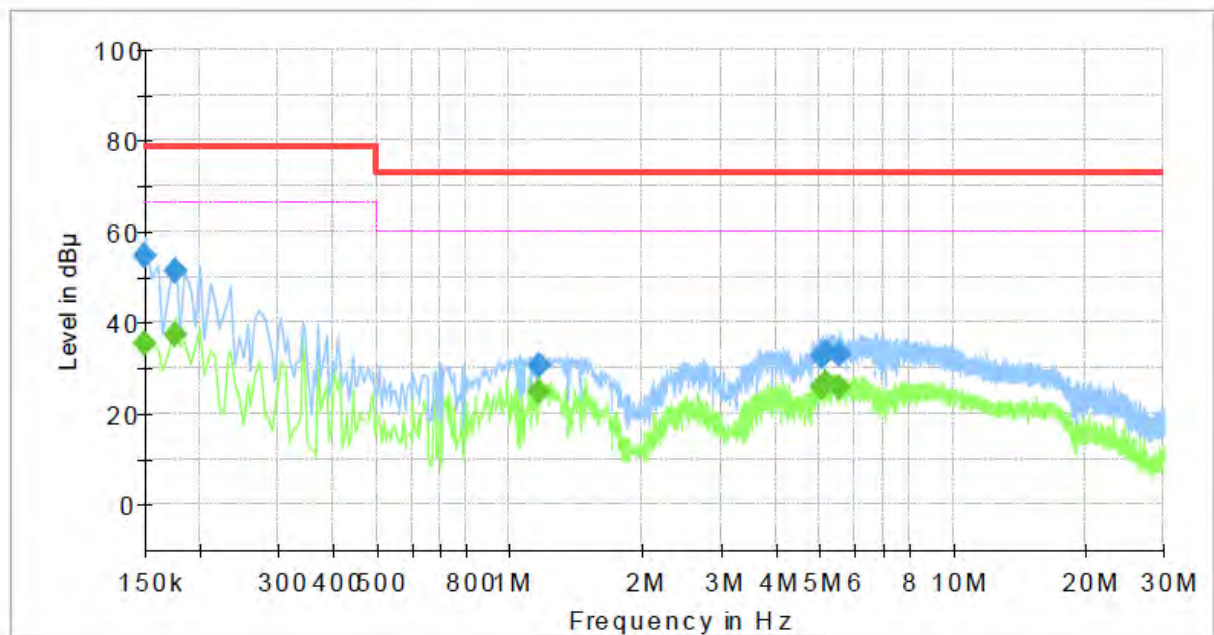
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	37.77	66.00	28.23	1000.0	9.000	L1	19.4
0.165000	52.68	---	79.00	26.32	1000.0	9.000	L1	19.4
1.030000	---	22.63	60.00	37.37	1000.0	9.000	L1	19.5
1.030000	30.59	---	73.00	42.41	1000.0	9.000	L1	19.5
5.025000	---	24.25	60.00	35.75	1000.0	9.000	L1	19.7
5.025000	31.00	---	73.00	42.00	1000.0	9.000	L1	19.7
5.405000	---	25.22	60.00	34.78	1000.0	9.000	L1	19.8
5.405000	32.05	---	73.00	40.95	1000.0	9.000	L1	19.8
7.715000	---	24.33	60.00	35.67	1000.0	9.000	L1	19.9
7.715000	30.98	---	73.00	42.02	1000.0	9.000	L1	19.9

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	TNM-C4940TD
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)
0.150000	---	35.44	66.00	30.56	1000.0	9.000	N	19.4
0.150000	54.76	---	79.00	24.24	1000.0	9.000	N	19.4
0.175000	---	37.18	66.00	28.82	1000.0	9.000	N	19.4
0.175000	51.36	---	79.00	27.64	1000.0	9.000	N	19.4
1.170000	---	24.75	60.00	35.25	1000.0	9.000	N	19.5
1.170000	30.51	---	73.00	42.49	1000.0	9.000	N	19.5
5.090000	---	25.73	60.00	34.27	1000.0	9.000	N	19.7
5.090000	32.47	---	73.00	40.53	1000.0	9.000	N	19.7
5.215000	---	26.74	60.00	33.26	1000.0	9.000	N	19.7
5.215000	33.25	---	73.00	39.75	1000.0	9.000	N	19.7
5.535000	---	25.94	60.00	34.06	1000.0	9.000	N	19.8
5.535000	32.82	---	73.00	40.18	1000.0	9.000	N	19.8

◆ 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))

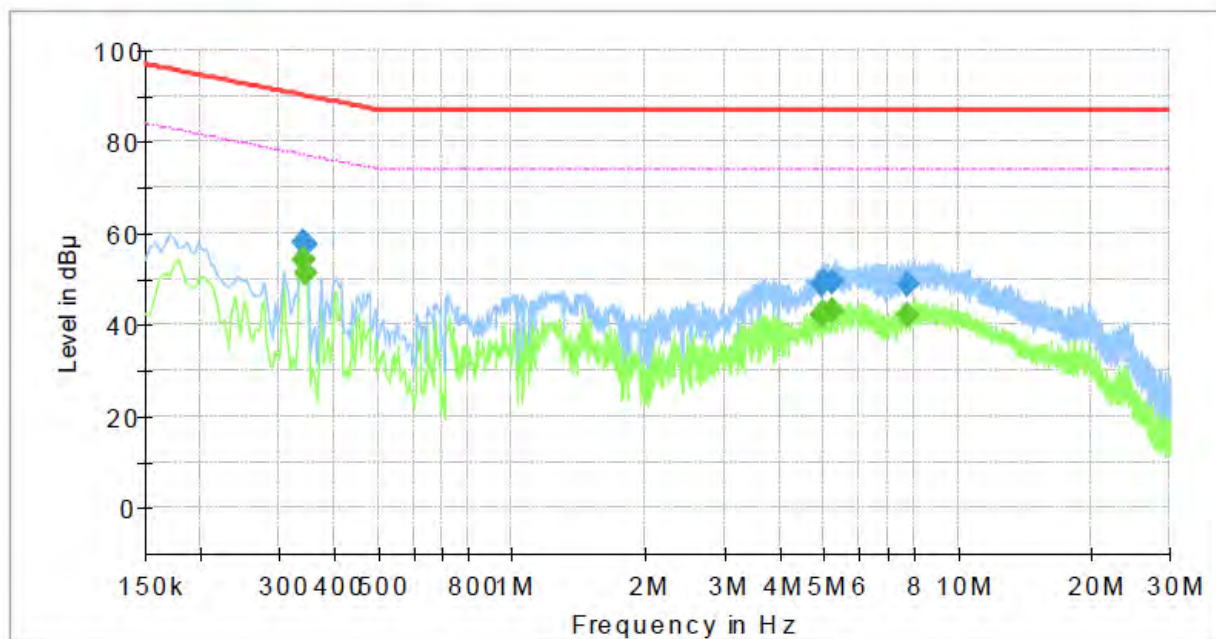
Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	TNM-C4940TD
Mode :	DC
Speed :	1 000 Mbps
Operator Name:	KES

**Final Result**

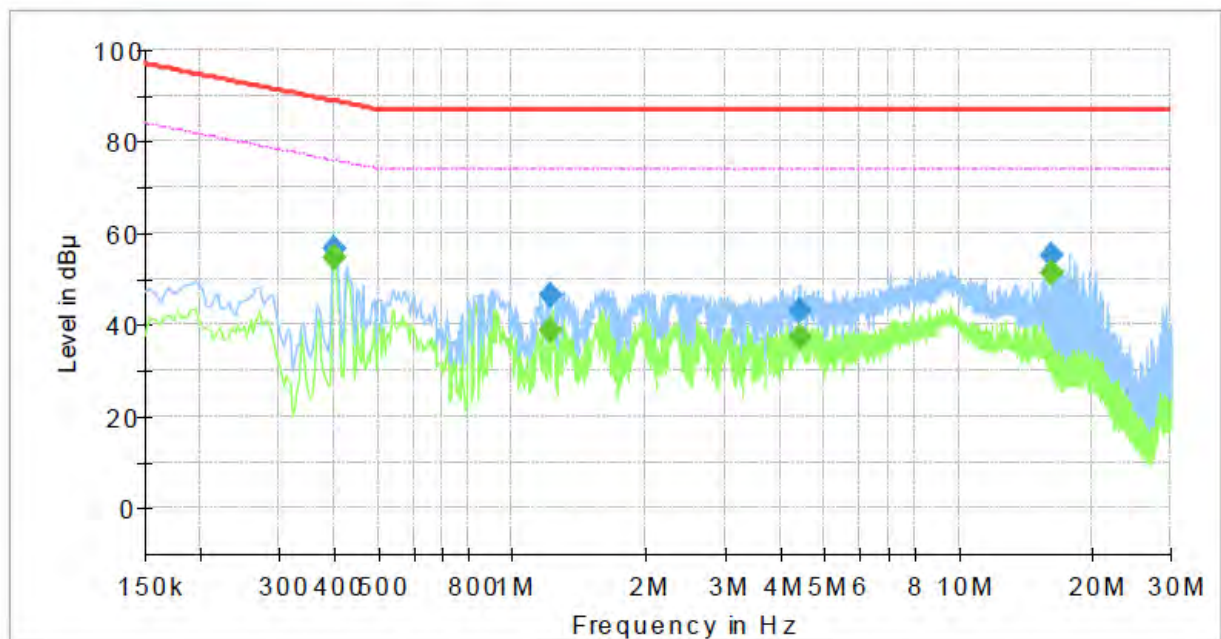
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.342000	---	54.22	77.15	22.93	1000.0	9.000	Single Line	19.1
0.342000	57.84	---	90.15	32.31	1000.0	9.000	Single Line	19.1
0.346000	---	51.47	77.06	25.59	1000.0	9.000	Single Line	19.1
0.346000	57.40	---	90.06	32.66	1000.0	9.000	Single Line	19.1
4.966000	---	41.99	74.00	32.01	1000.0	9.000	Single Line	19.5
4.966000	48.67	---	87.00	38.33	1000.0	9.000	Single Line	19.5
5.006000	---	42.49	74.00	31.51	1000.0	9.000	Single Line	19.5
5.006000	49.16	---	87.00	37.84	1000.0	9.000	Single Line	19.5
5.278000	---	42.88	74.00	31.12	1000.0	9.000	Single Line	19.5
5.278000	49.28	---	87.00	37.72	1000.0	9.000	Single Line	19.5
7.730000	---	42.19	74.00	31.81	1000.0	9.000	Single Line	19.6
7.730000	48.89	---	87.00	38.11	1000.0	9.000	Single Line	19.6

■ PoE Mode

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	TNM-C4940TD
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)
0.398000	---	54.61	75.90	21.29	1000.0	9.000	Single Line	19.1
0.398000	56.44	---	88.90	32.46	1000.0	9.000	Single Line	19.1
1.222000	---	38.60	74.00	35.40	1000.0	9.000	Single Line	19.3
1.222000	46.40	---	87.00	40.60	1000.0	9.000	Single Line	19.3
4.414000	---	37.05	74.00	36.95	1000.0	9.000	Single Line	19.4
4.414000	43.25	---	87.00	43.75	1000.0	9.000	Single Line	19.4
16.230000	---	51.21	74.00	22.79	1000.0	9.000	Single Line	20.0
16.230000	55.04	---	87.00	31.96	1000.0	9.000	Single Line	20.0

◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

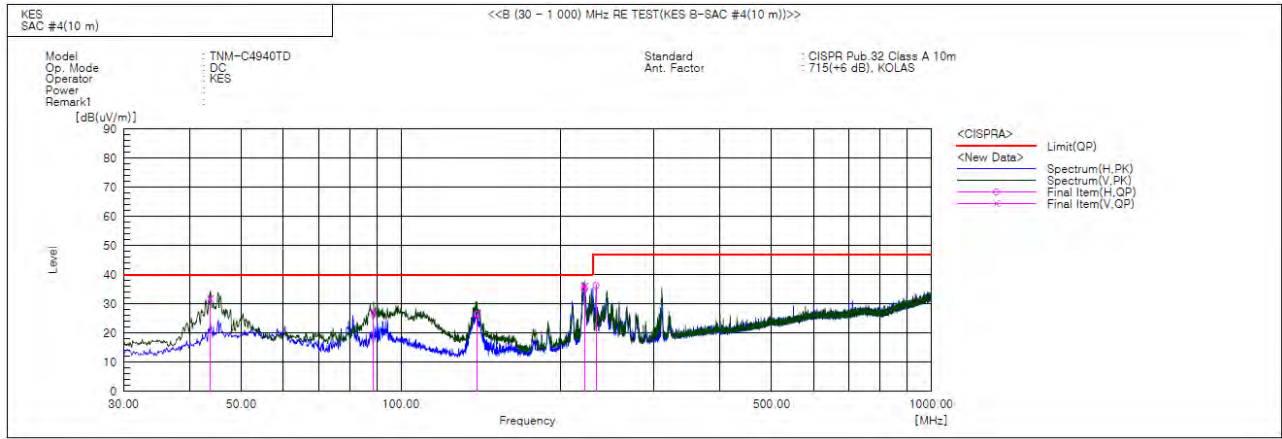
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

Radiated Electric Field Emissions(Below 1 GHz)

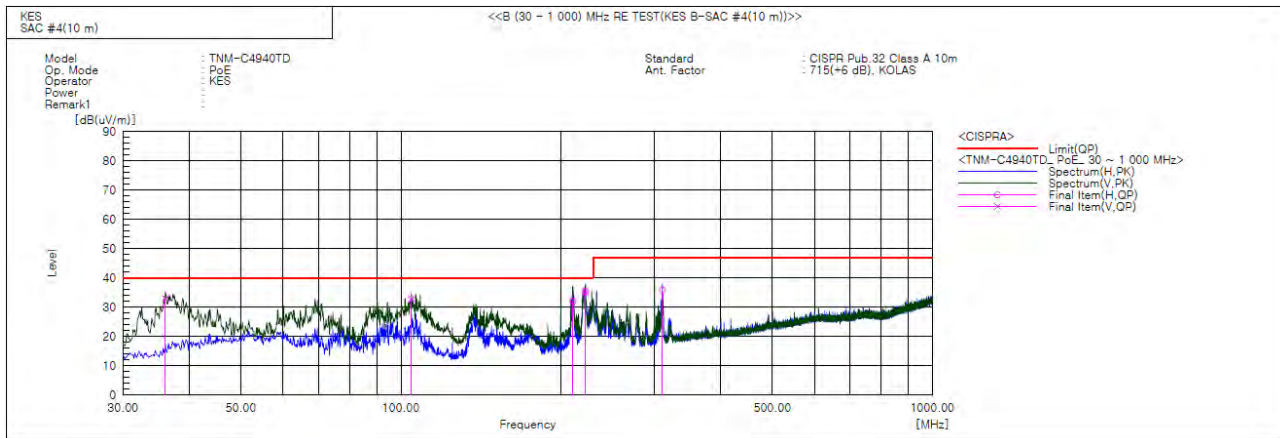
DC Mode



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	43.701	V	52.9	-21.1	31.8	40.0	8.2	108.0	330.0	
2	88.806	V	51.3	-24.3	27.0	40.0	13.0	150.0	78.0	
3	139.246	H	51.5	-25.1	26.4	40.0	13.6	365.0	36.0	
4	221.939	H	54.6	-19.5	35.1	40.0	4.9	298.0	251.0	
5	222.060	V	55.5	-19.5	36.0	40.0	4.0	112.0	196.0	
6	233.458	H	55.4	-19.1	36.3	47.0	10.7	400.0	273.0	

PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	36.063	V	56.7	-23.8	32.9	40.0	7.1	150.0	34.0	
2	104.690	V	55.0	-22.2	32.8	40.0	7.2	148.0	328.0	
3	210.663	H	52.1	-20.1	32.0	40.0	8.0	384.0	260.0	
4	222.407	H	54.8	-19.5	35.3	40.0	4.7	400.0	260.0	
5	222.424	V	54.5	-19.5	35.0	40.0	5.0	110.0	140.0	
6	310.451	H	52.7	-16.9	35.8	47.0	11.2	299.0	296.0	

◆ Calculation

Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

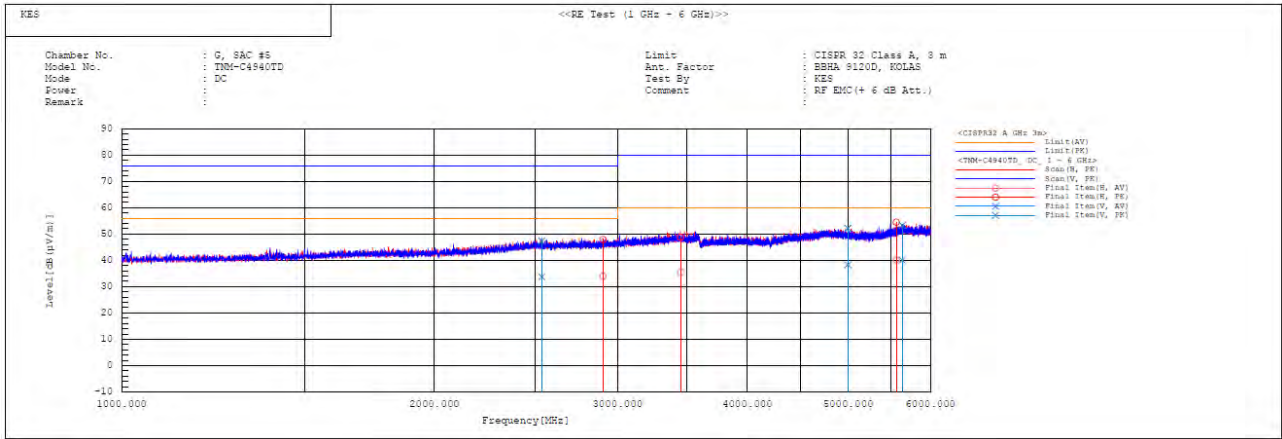
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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

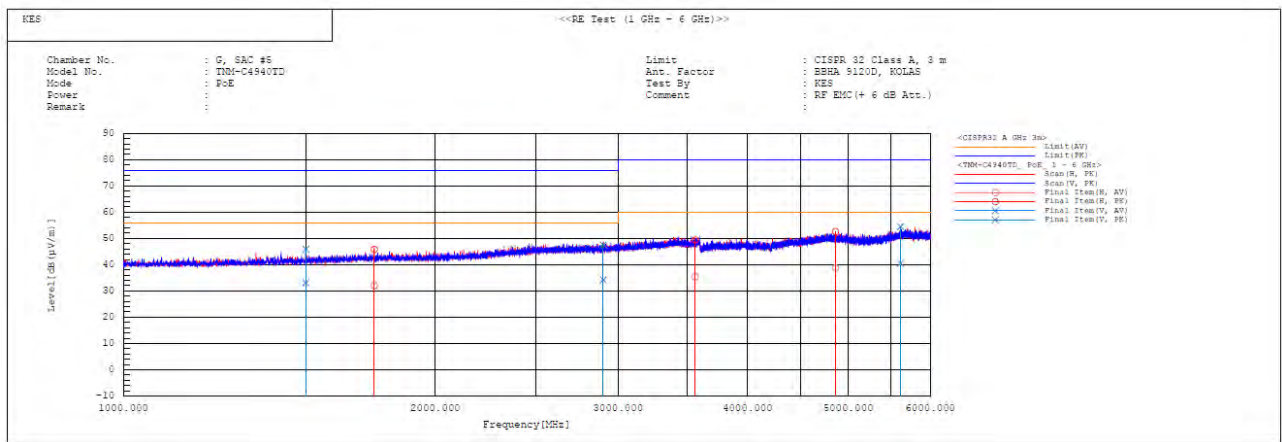
Radiated Electric Field Emissions(Above 1 GHz)

DC Mode



Final Result														
No.	Frequency	Pol	Reading AV	Reading PK	c.f	Result AV	Result PK	Limit AV	Limit PK	Margin AV	Margin PK	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB (1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[deg]	
1	2536.306	V	28.9	42.5	4.8	33.7	47.3	56.0	76.0	22.3	28.7	100.0	85.6	
2	2903.848	H	28.0	41.9	6.0	34.0	47.9	56.0	76.0	22.0	28.1	100.0	148.7	
3	3450.094	H	28.6	42.0	6.8	35.4	48.8	60.0	80.0	24.6	31.2	100.0	328.8	
4	4998.689	V	25.9	39.8	12.4	38.3	52.2	60.0	80.0	21.7	27.8	100.0	44.0	
5	5562.957	H	27.1	41.4	13.1	40.2	54.5	60.0	80.0	19.8	25.5	100.0	217.8	
6	5635.952	V	26.9	40.1	13.2	40.1	53.3	60.0	80.0	19.9	26.7	100.0	131.6	

PoE Mode



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1499.993	V	32.4	45.2	0.7	33.1	45.9	56.0	76.0	22.9	30.1	100.0	147.0	
2	1745.987	H	30.3	44.1	1.7	32.0	45.8	56.0	76.0	24.0	30.2	100.0	171.6	
3	2902.614	V	28.2	41.5	6.0	34.2	47.5	56.0	76.0	21.8	28.5	100.0	359.9	
4	3560.499	H	28.4	42.5	6.9	35.3	49.4	60.0	80.0	24.7	30.6	100.0	78.4	
5	4862.648	H	27.1	40.9	11.7	38.8	52.6	60.0	80.0	21.2	27.4	100.0	316.4	
6	5619.633	V	27.3	41.3	13.2	40.5	54.5	60.0	80.0	19.5	25.5	100.0	227.7	

◆ Calculation

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

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

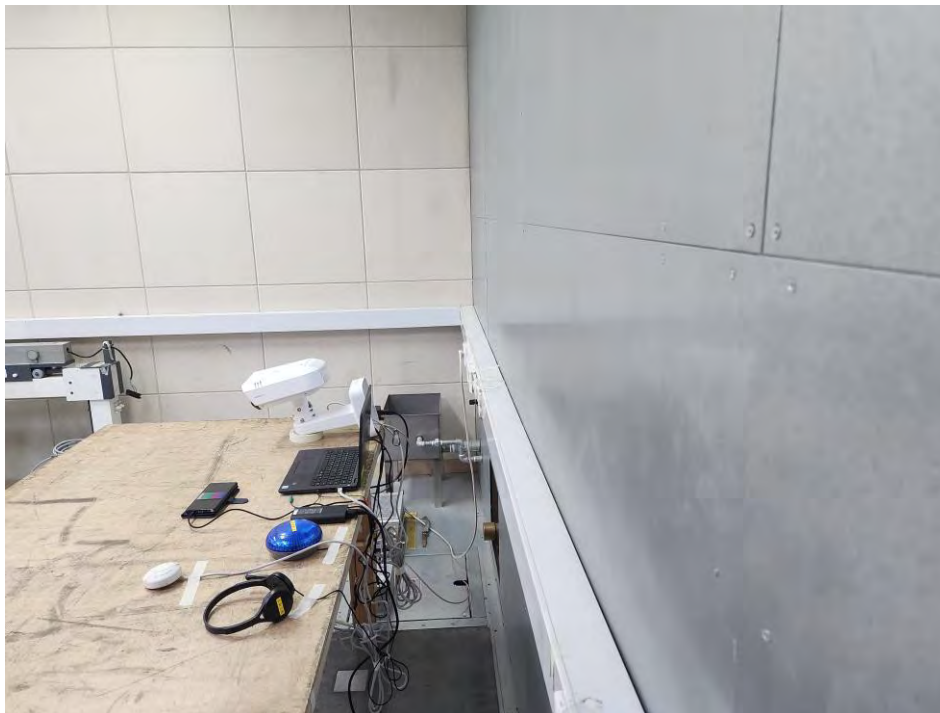


Conducted Emissions at Telecommunication Ports

■ DC Mode

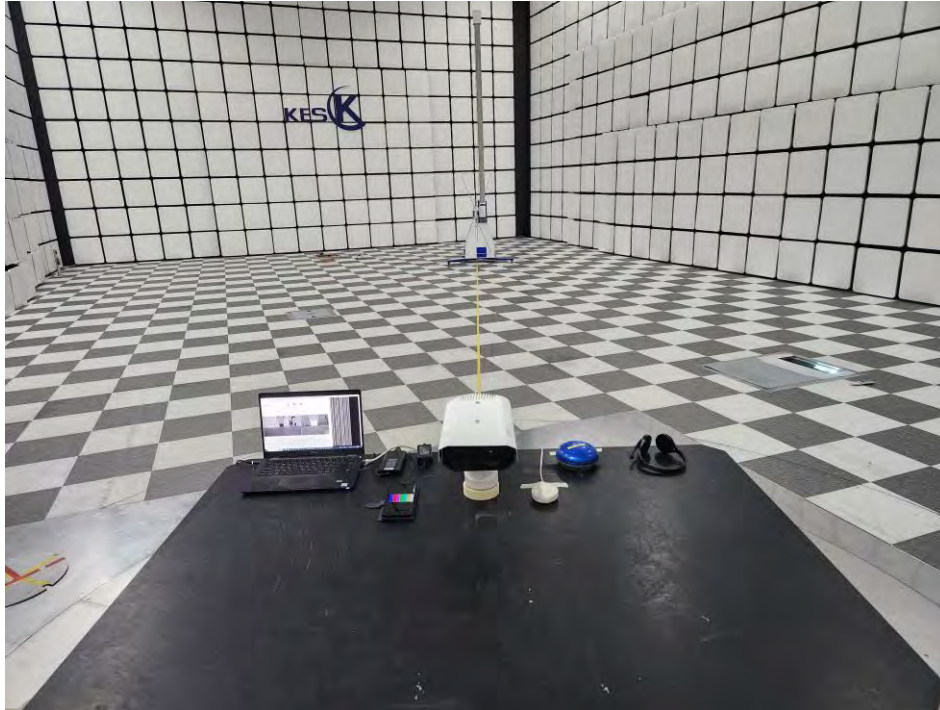


■ PoE Mode

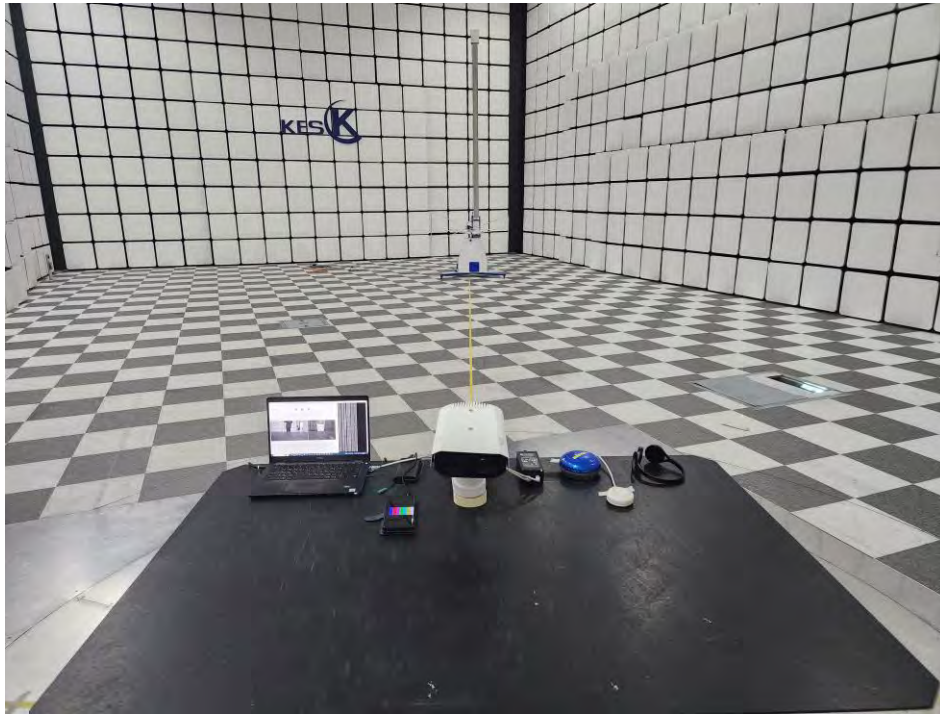


Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode

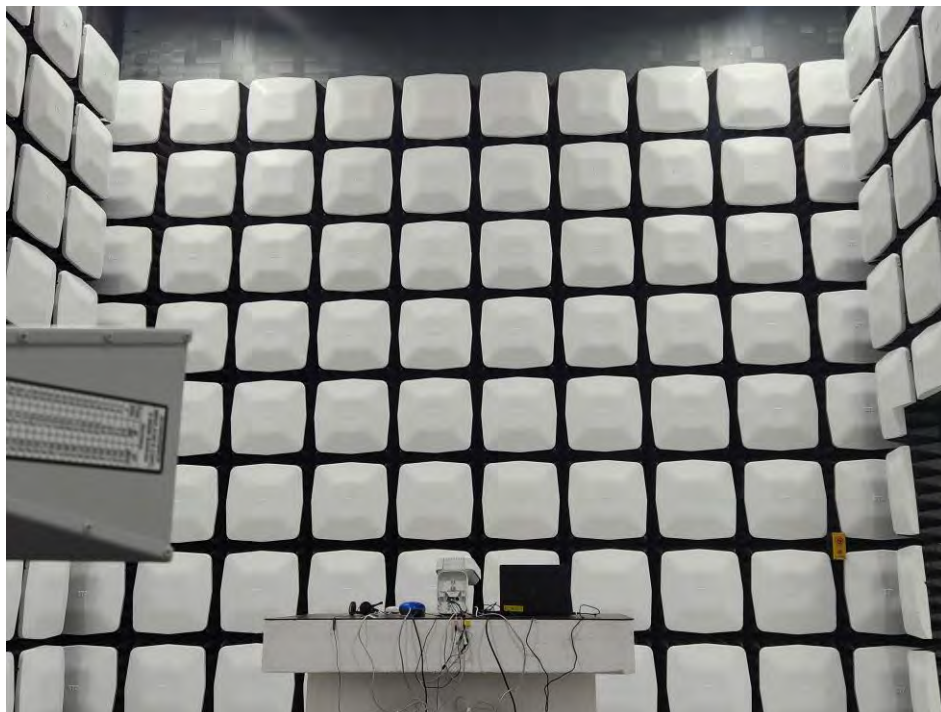
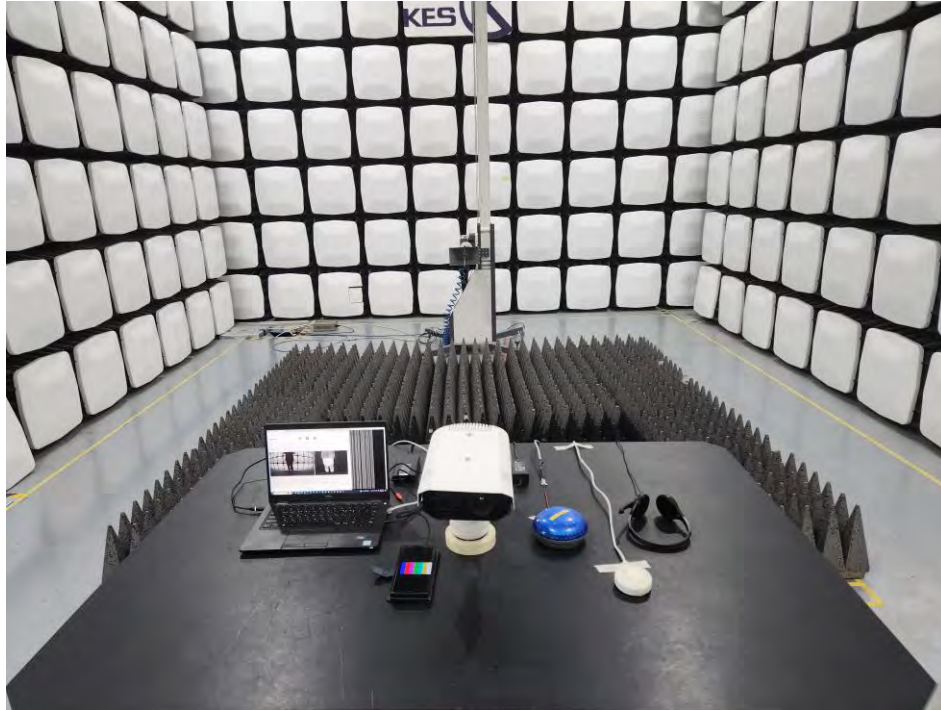


■ PoE Mode

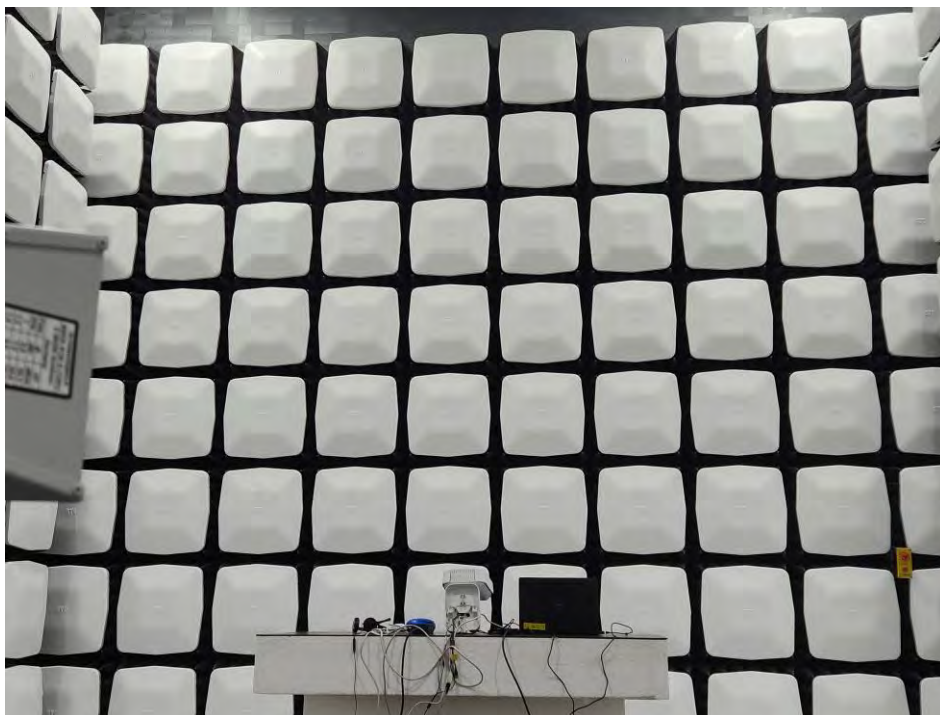
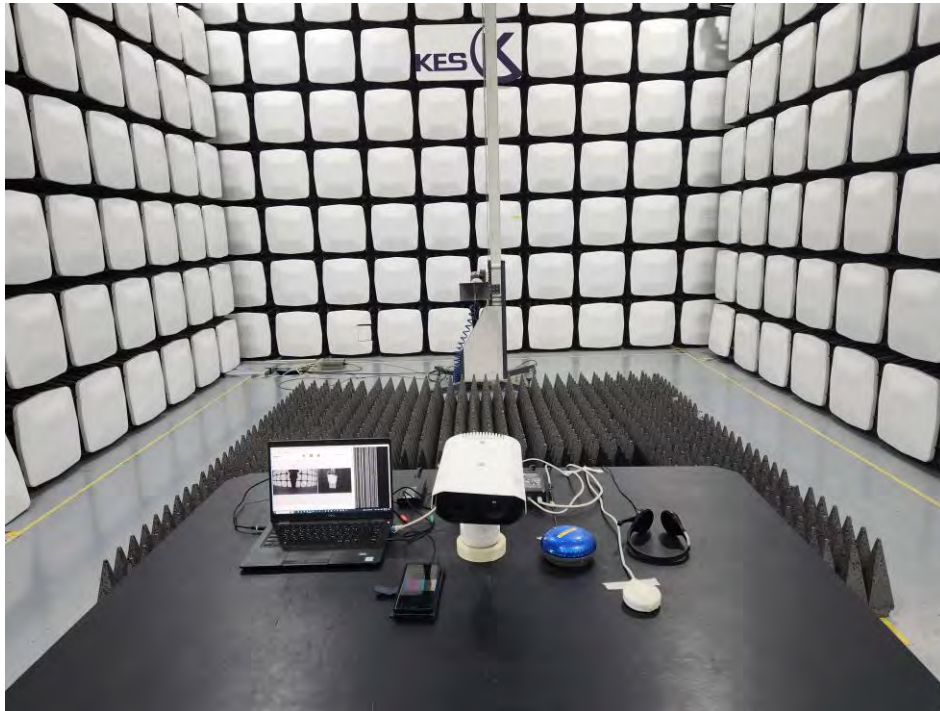


Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



■ PoE Mode



EUT External Photographs

(Top)

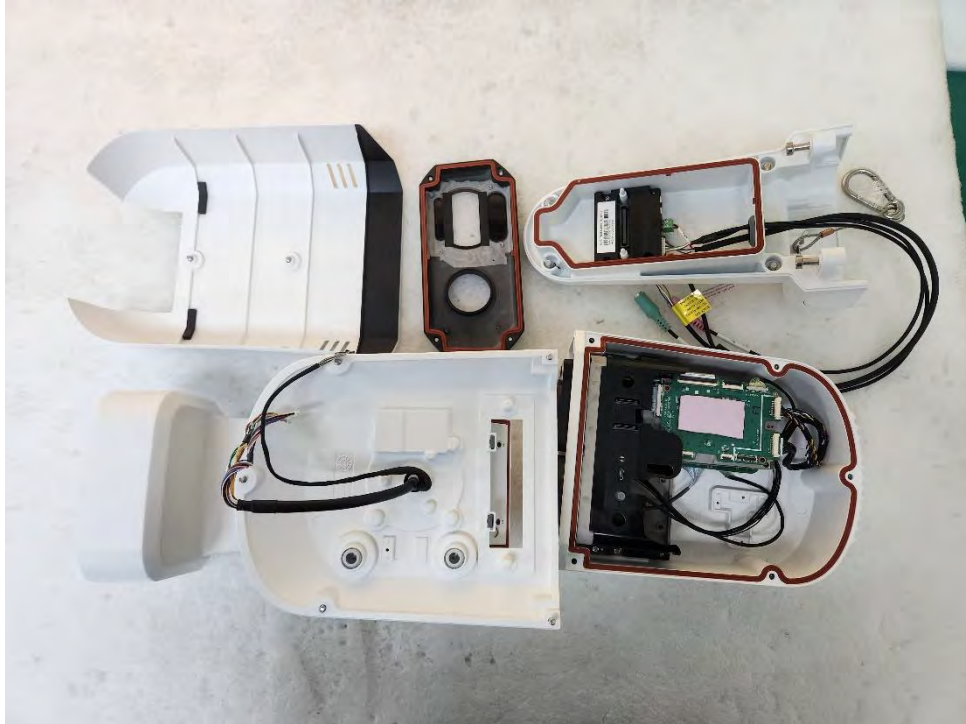


(Bottom)



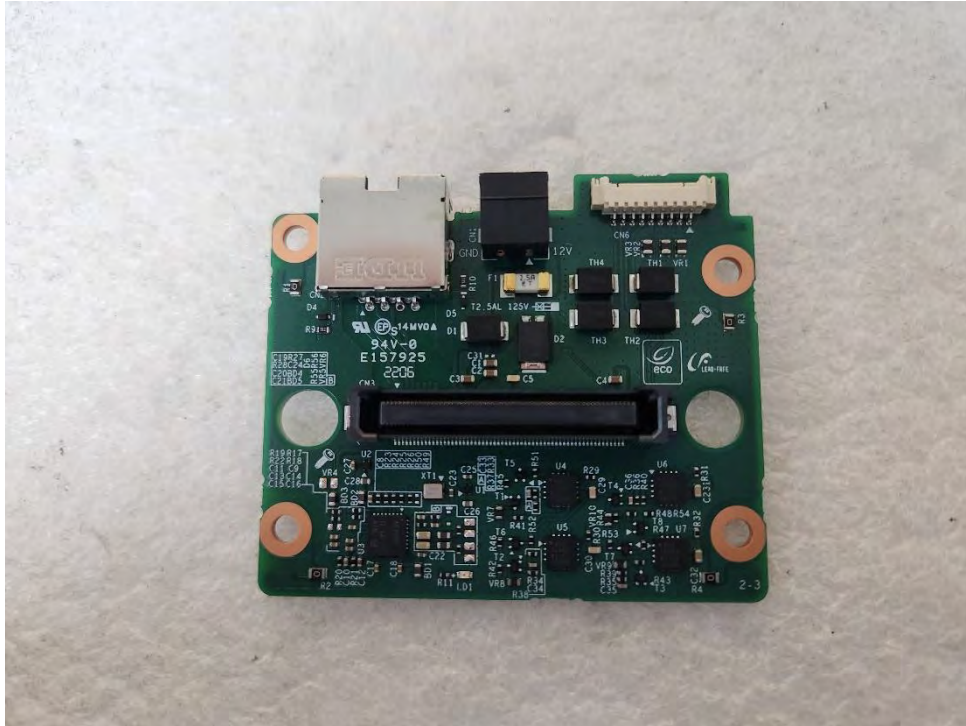
EUT Internal Photographs

(Internal View)



EUT Internal View – Board 1

(Top)

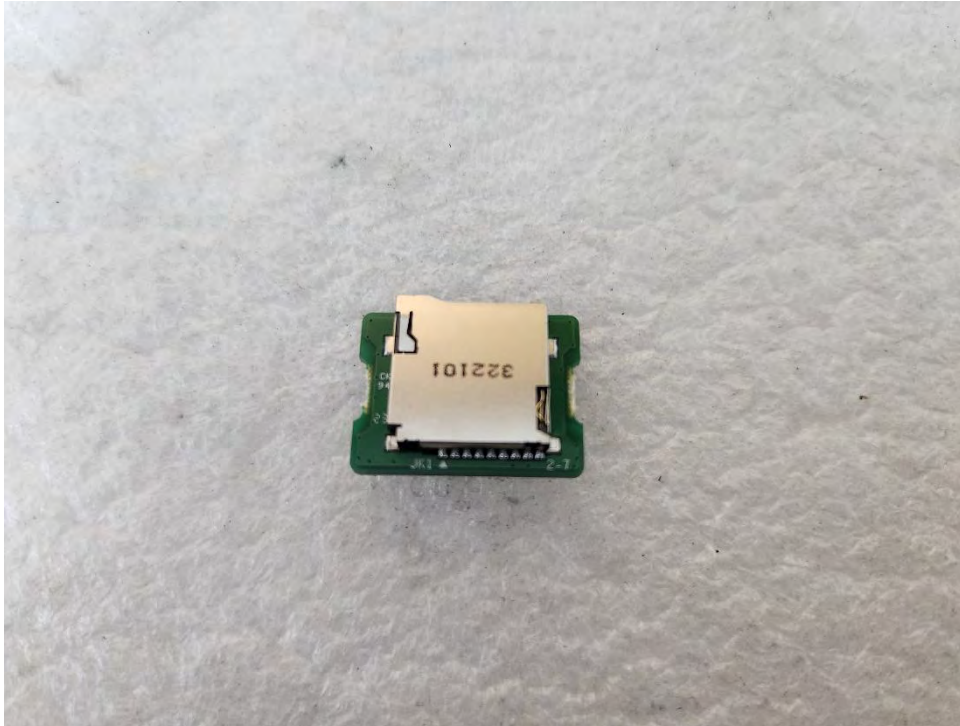


(Bottom)

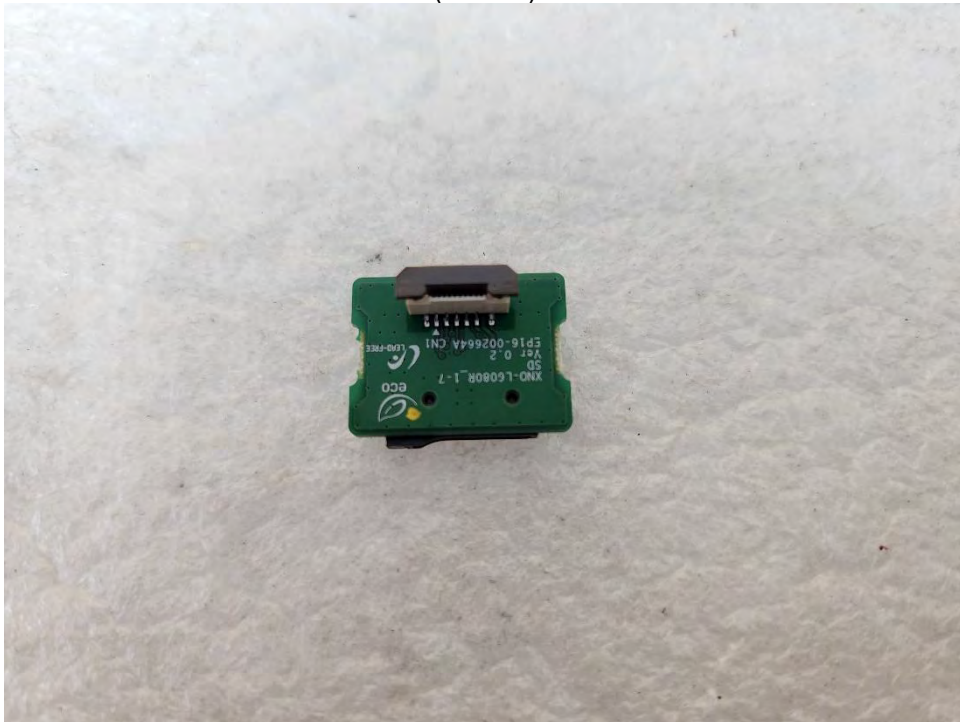


EUT Internal View – Board 2

(Top)



(Bottom)

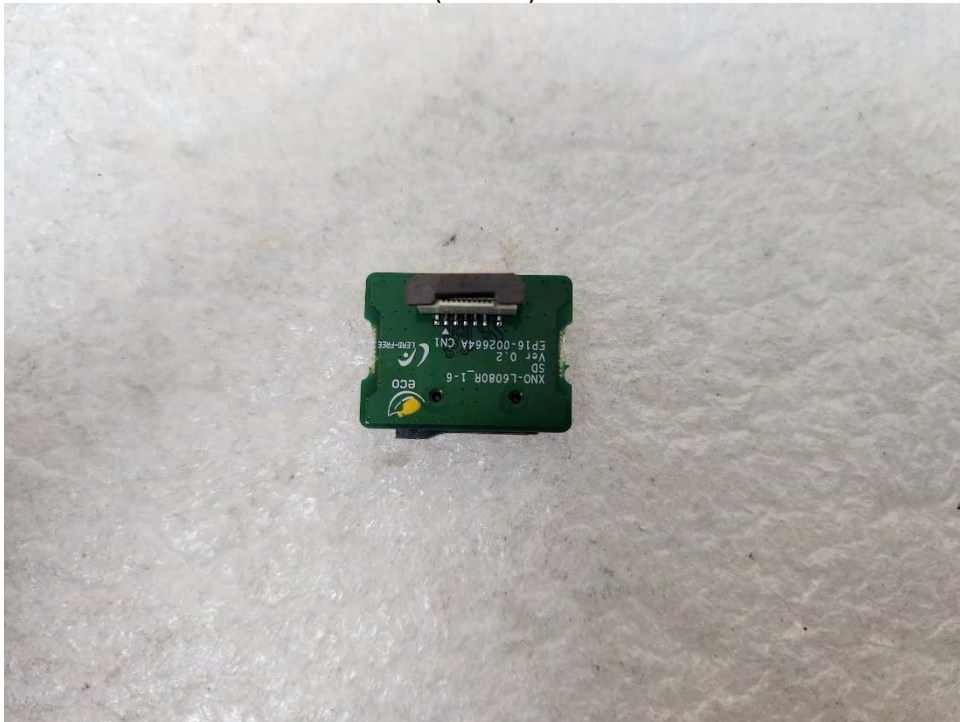


EUT Internal View – Board 3

(Top)



(Bottom)



EUT Internal View – Board 4

(Top)



(Bottom)



EUT Internal View – Board 5

(Top)



(Bottom)

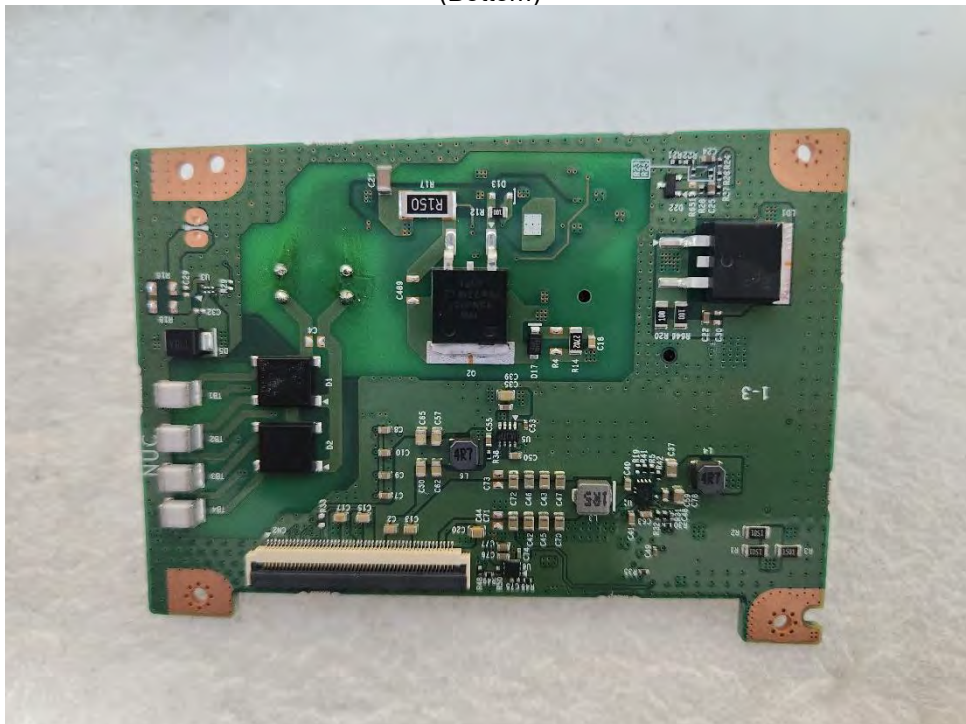


EUT Internal View – Board 6

(Top)



(Bottom)



EUT Internal View – Board 7

(Top)



(Bottom)



EUT Internal View – Board 8

(Top)



(Bottom)



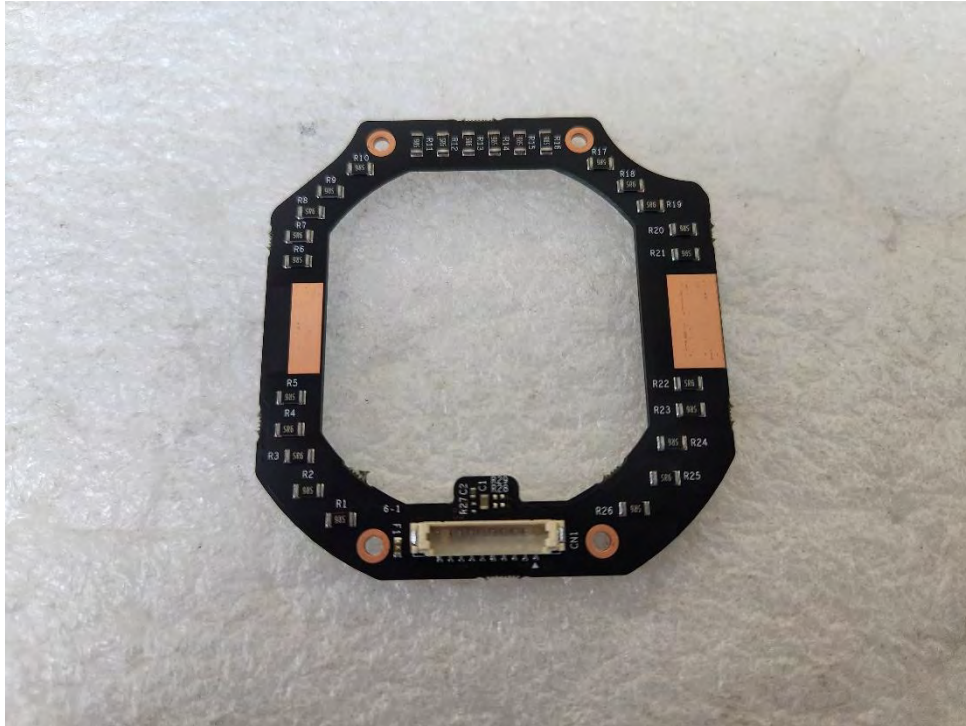
EUT Internal View – Board 9

(Top)

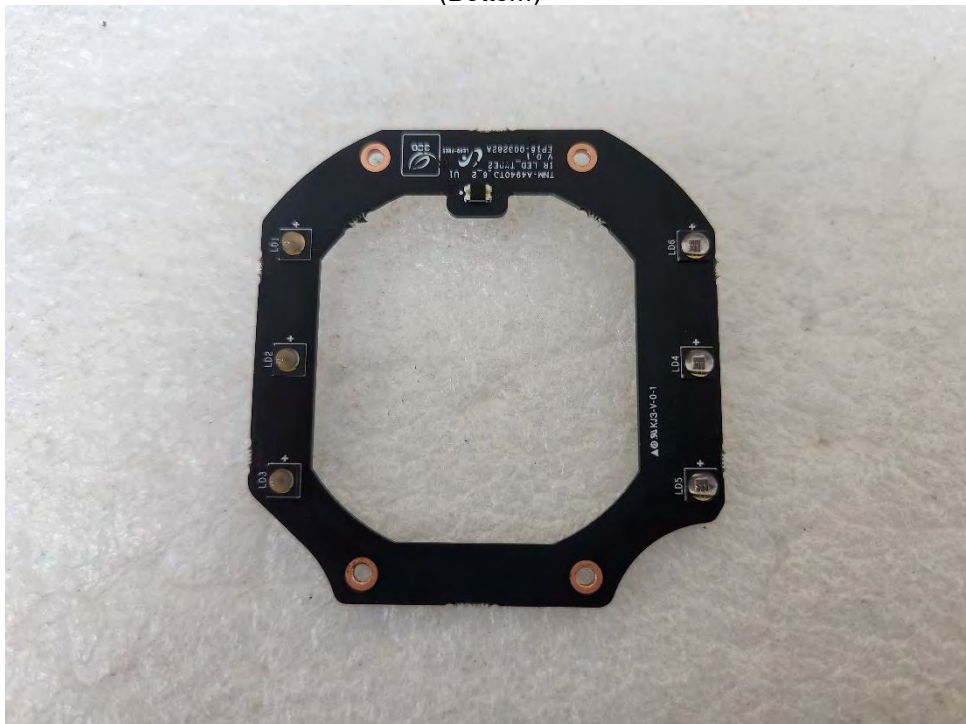


EUT Internal View – Board 10

(Top)

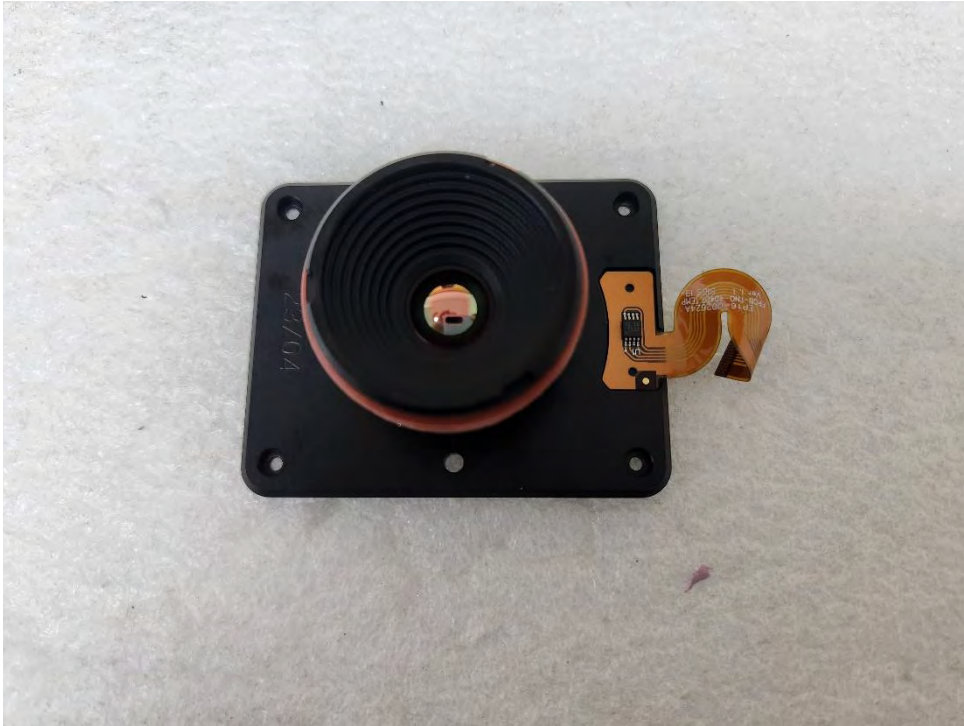


(Bottom)



EUT Internal View – Lens 1

(Top)



(Bottom)



EUT Internal View – Lens 2

(Top)



(Bottom)

