



TEST REPORT



Report No. : KES-EM-22T0675-R2
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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. : TNO-4050T

Variant Model : TNO-4030T, TNO-4040T, TNO-L4030T, TNO-L4040T, TNO-L4050T

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)

3. Equipment authorization : Supplier's Declaration of Conformity

4. Date of Receipt : Mar. 26, 2024

5. Test date : Jul. 21, 2022

6. Date of Issue : Mar. 26, 2024

7. Test Results : In Compliance

Tested by

Reviewed by

Seon Ho, Choi
EMC Test Engineer

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
Aug. 08, 2022	KES-EM-22T0675	Issued
Feb. 24, 2023	KES-EM-22T0675-R1	Change the Applicant and manufacturer at the request of the customer.
Mar. 26, 2024	KES-EM-22T0675-R2	Product name change and reissue due to addition of derivative model

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	Uncooled Micro volometer
Pixel size	17µm
Effective Pixels	640x480(Scale up 800x600)
Sensitivity	NETD < 50mK
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation USB : Micro USB type B, 1280x720, for installation
Lens	
Focal Length (Zoom Ratio)	35mm fixed
Max. Aperture Ratio	1.0
Angular Field of View	H: 17°
Min. Object Distance	TBD
Focus Control	Fixed
Lens Type	TBD
Mount Type	Board-in type
Operational	
Camera Title	Off / On - W/W : English/Numeric/Special Characters - China : English/Numeric/Special/Chinese Characters - Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto Scale by Resolution
Digital Image Stabilization	Off / On(with Gyro)
Motion Detection	Off/ On(8ea, 8point Polygonal zones), Handover
Privacy Masking	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic
Gain Control	Off / Low / Middle / High
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Pan/Tilt	Pelco D/P, Samsung T/E, Honeywell, Bosch, Panasonic, Sungin, AD, Vicon, GE
Flip / Mirror	Flip : On/Off Mirror : On/Off Halfway view : 90°/270°
Video & Audio Analytics	Tampering, Loitering, Directional Detection, Virtual Line, Fence detection, Enter/Exit, Appear / Disappear, Audio Detection, Motion Detection, Sound Classification, Shock detection, drastic temperature swings
Alarm I/O	Input 2ea / Output 2ea
Alarm Triggers	Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect
Alarm events	File upload via FTP, E-Mail Notification via E-Mail local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers External output
Audio In	Selectable (Mic IN/Line IN), Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out, Max output level: 1 Vrms
Pixel count	support
Digital zoom	-
Remote control	-
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG
Resolution	800x600, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264 : Max. 30fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : SEA)
WiseStream II	Support
Video Quality Adjustment	H.264/H.265 : Target Bitrate Level Control MJPEG : Target Bitrate Level Control
Bitrate Control Method	H.264/H.265 : CBR or VBR MJPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio Compression Format	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 8/16/32/48KHz
Audio Communication	Bi-directional (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication (EAP-TLS, EAP-LEAP)
Streaming Method	Unicast / Multicast
Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC (up to 256 GB) - Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. NAS(Network Attached Storage) Local PC for Instant Recording
Application Programming Interface	ONVIF Profile S/G SUNAPI(HTTP API) Open Platform
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	TBD
Central Management Software	SmartViewer, SSM
Environmental	
Operating Temperature / Humidity	-40°C ~ +60°C (-40°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66, NEMA 4X
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	24VAC ± 10%, 12VDC ± 10%, PoE(IEEE802.3af)
Power Consumption	TBD
Mechanical	
Color / Material	TBD
Dimension (WxHxD)	TBD
Weight	TBD
2 E	Palette 7mode



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 120 V, 60 Hz (AC Adapter Input Power)
- ☒ AC 120 V, 60 Hz (DC Adapter Input Power)
- ☒ AC 120 V, 60 Hz (PoE Adapter Input Power)

1.2 Variant Model Differences

- TNO-4030T, TNO-4040T, TNO-L4030T : Added derivative model due to HW same FW difference.
- TNO-L4040T, TNO-L4050T : Add derivative model due to SW difference
(Number of video frames: 30 → 8)

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK THERMAL CAMERA	TNO-4050T	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-
PoE Adapter	PSE156G	-	-	-
AC Adapter	DRL-246000AC	-	Dream Electronics Co., Ltd.	-
Notebook	LG15N54	410NZGK015231	LG Electronics Inc.	-
Notebook Adapter	ADP-90WH B	84ZW19F1663	DELTA ELECTRONICS (JIANGSU) LTD.	-
Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-
Headset	K550	-	Britz®	-
SmartPhone	SM-N920S	-	Samsung	-
Micro SD Card	-	-	SanDisk	-



1.6 External I/O Cabling

■ AC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK THERMAL CAMERA (EUT)	2 Pin	AC Adapter	2 Pin	2.0	U
	RJ-45(LAN)	Notebook	RJ-45(LAN)	3.0	U
	Alarm OUT	Alarm	Alarm IN	4.0	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	3.5 mm	Headset	3.5 mm	1.8	U
	3.5 mm		3.5 mm	1.8	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	3.5 mm	SmartPhone	3.5 mm	1.1	U
	DC Jack	Notebook Adapter	DC Jack	1.9	U

* Unshielded=U, Shielded=S

■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK THERMAL CAMERA (EUT)	2 Pin	AC/DC Adapter	2 Pin	1.6	U
	RJ-45(LAN)	Notebook	RJ-45(LAN)	3.0	U
	Alarm OUT	Alarm	Alarm IN	4.0	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	3.5 mm	Headset	3.5 mm	1.8	U
	3.5 mm		3.5 mm	1.8	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	3.5 mm	SmartPhone	3.5 mm	1.1	U
	DC Jack	Notebook Adapter	DC Jack	1.9	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(PoE)	3.0	U
	Alarm OUT	Alarm	Alarm IN	4.0	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	3.5 mm	Headset	3.5 mm	1.8	U
	3.5 mm		3.5 mm	1.8	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
PoE Adapter	RJ-45(LAN)	Notebook	RJ-45(LAN)	2.0	U
Notebook	3.5 mm	SmartPhone	3.5 mm	1.1	U
	DC Jack	Notebook Adapter	DC Jack	1.9	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

Test Mode	operating
AC Mode	Check the Normal Operation status. after testing, check if the recording is normally done on the Micro SD Card
DC Mode	
PoE Mode	

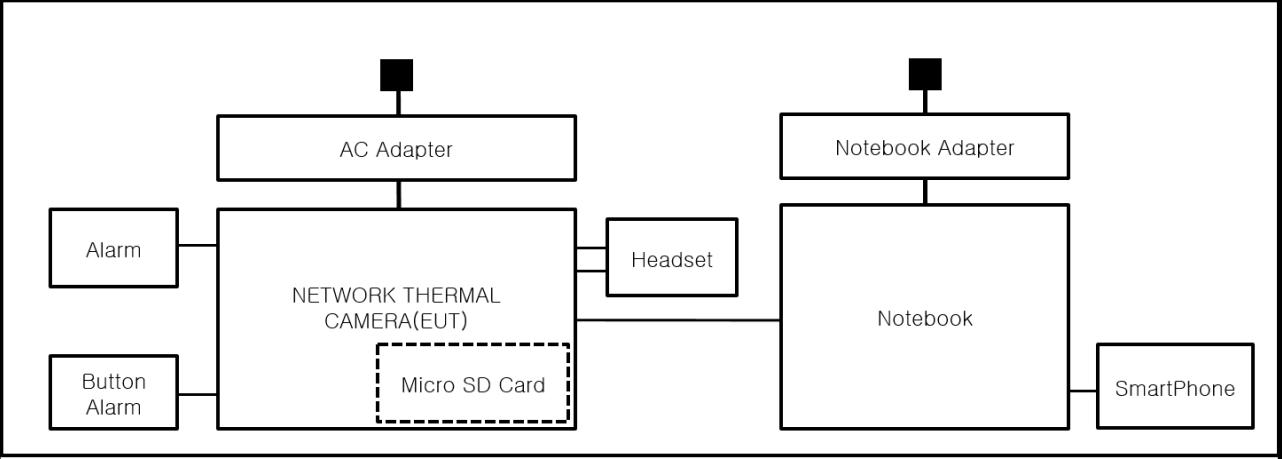
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd



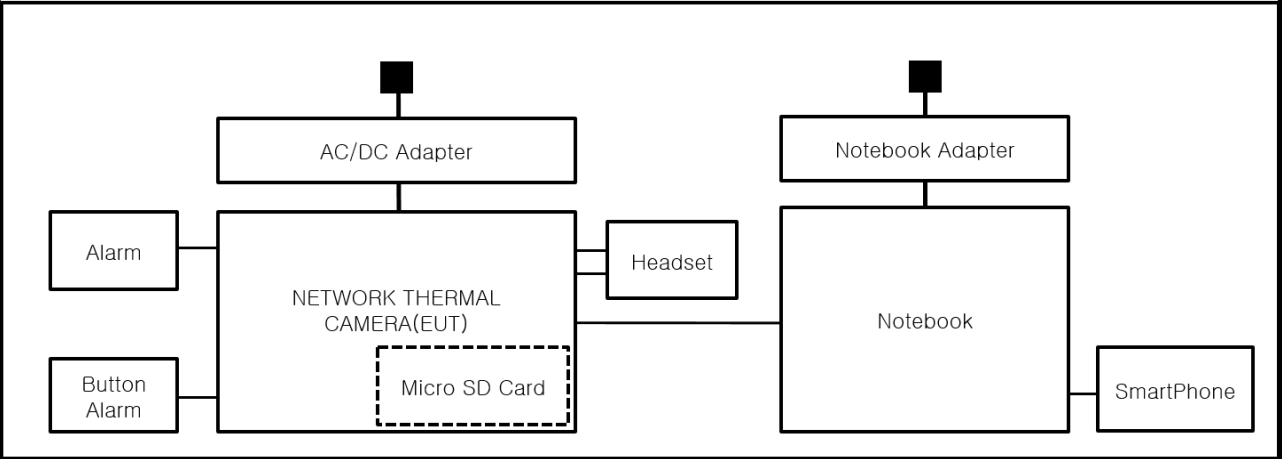
1.8 Configuration

■ AC Main
□ DC Main

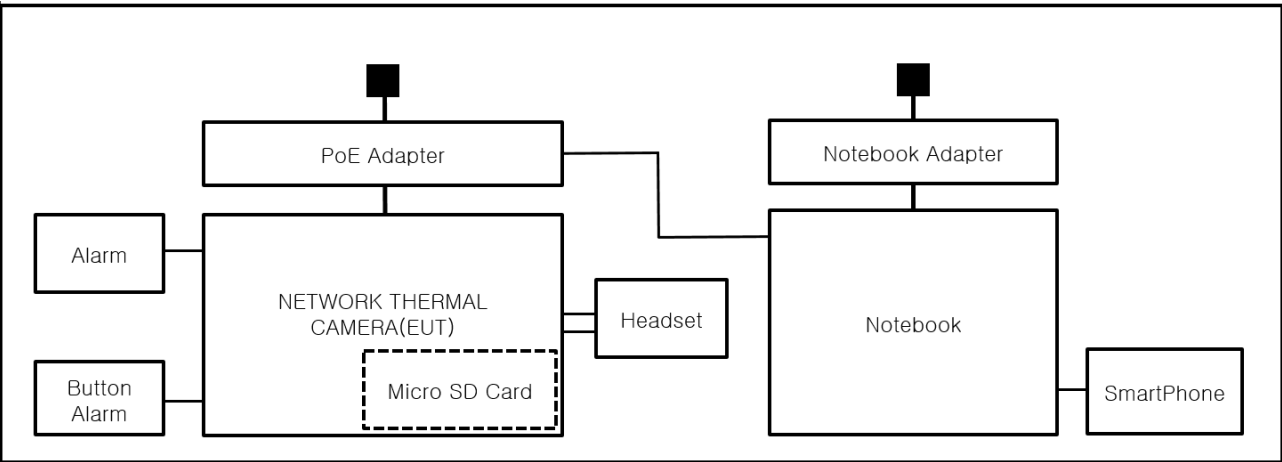
■ AC Mode



■ DC Mode



■ PoE Mode





1.9 Remarks when standards applied

The USB, VIDEO ports were excluded from the test as administrator ports.

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:

☒ **47 CFR Part 15, Subpart B**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B

☒ **IC Regulation ICES-003 Issue 7**

☐ CAN/CSA-CISPR 32:17

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B





2.1 Conducted Emissions at Mains Power Ports

Test Date

Jul. 21, 2022

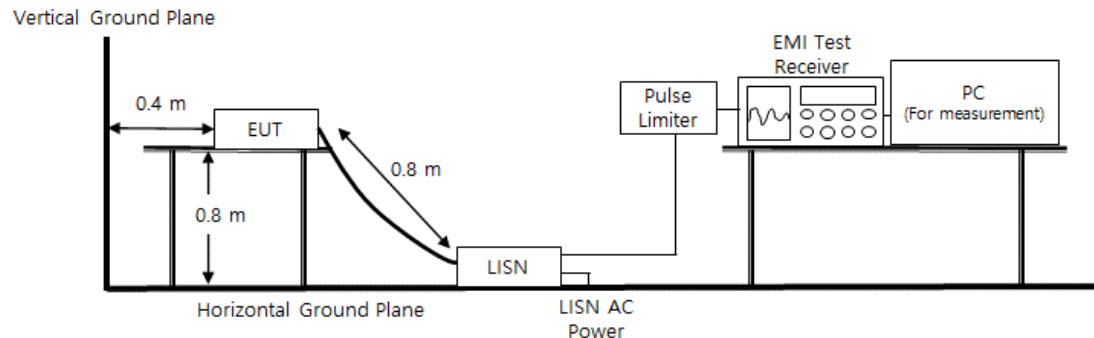
Test Location

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

Diagram of test setup





Test Conditions

Temperature: (24,7 ± 0,2) °C
Relative Humidity: (45,4 ± 0,3) % 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.



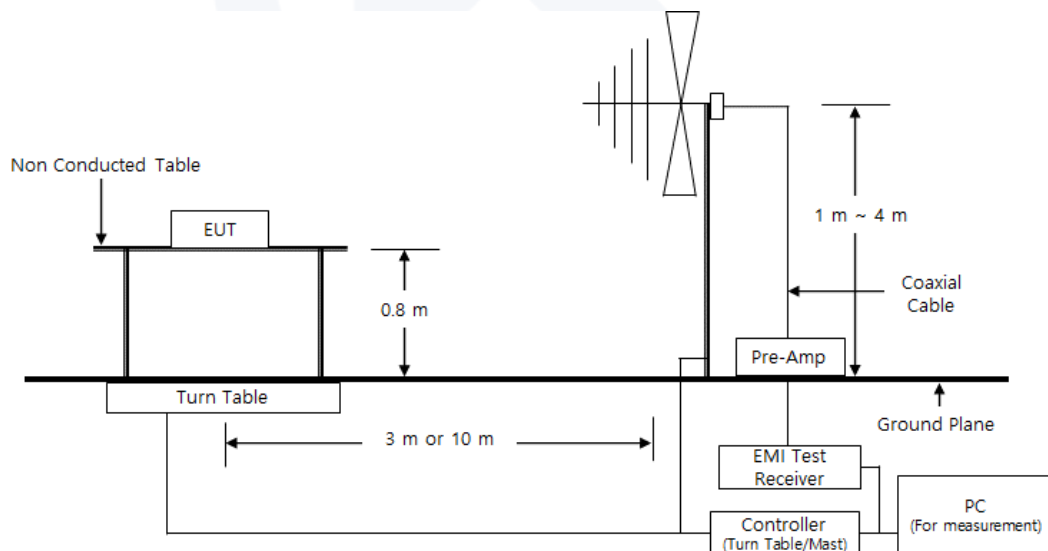
2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jul. 21, 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	03, 31, 2023
☒	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

Diagram of test setup



Test Conditions

Temperature: (24,5 ± 0,3) °C
Relative Humidity: (44,9 ± 0,4) % 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.



2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jul. 21, 2022

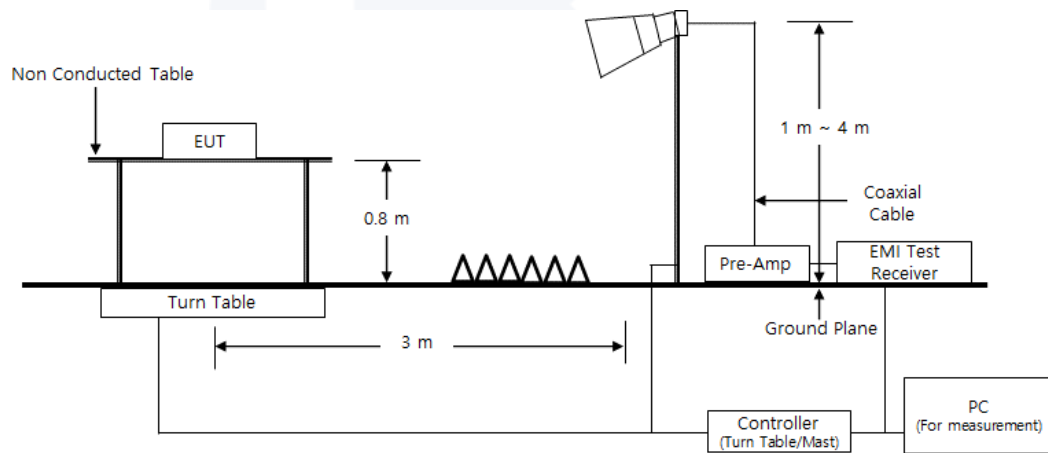
Test Location

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	04, 01, 2023
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Diagram of test setup





Test Conditions

Temperature: (24,5 ± 0,3) °C
Relative Humidity: (44,9 ± 0,3) % R.H.

Frequency Range of Measurement

1 GHz to 5 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

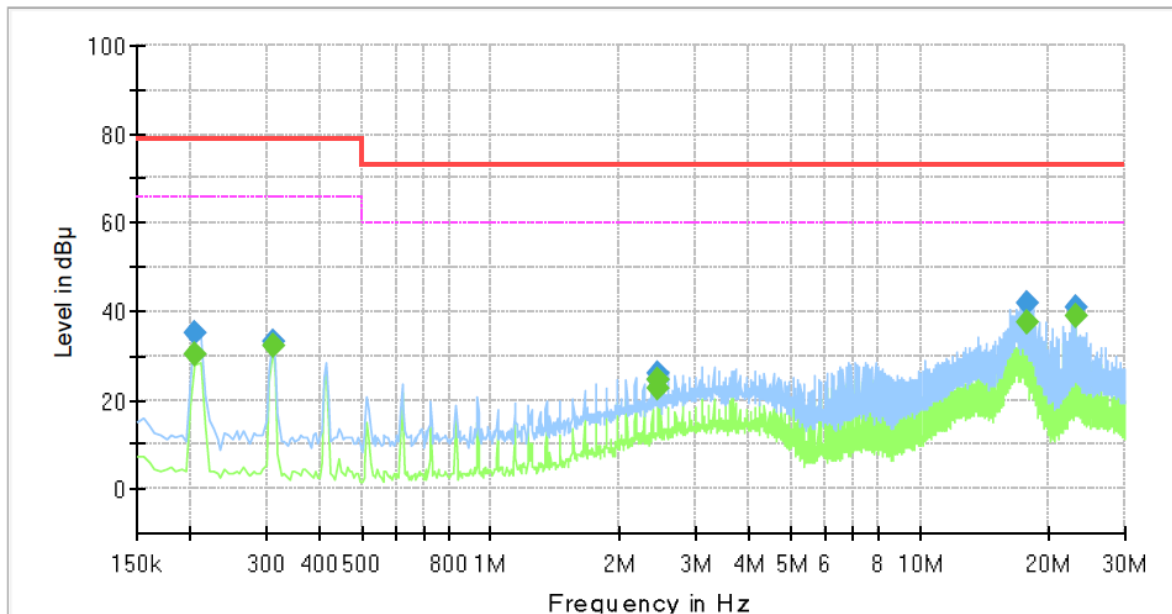
Conducted Emissions at Mains Power Ports

■ AC Mode

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: TNO-4050T
Phase: H
Mode: AC
Operator Name: KES



Final_Result

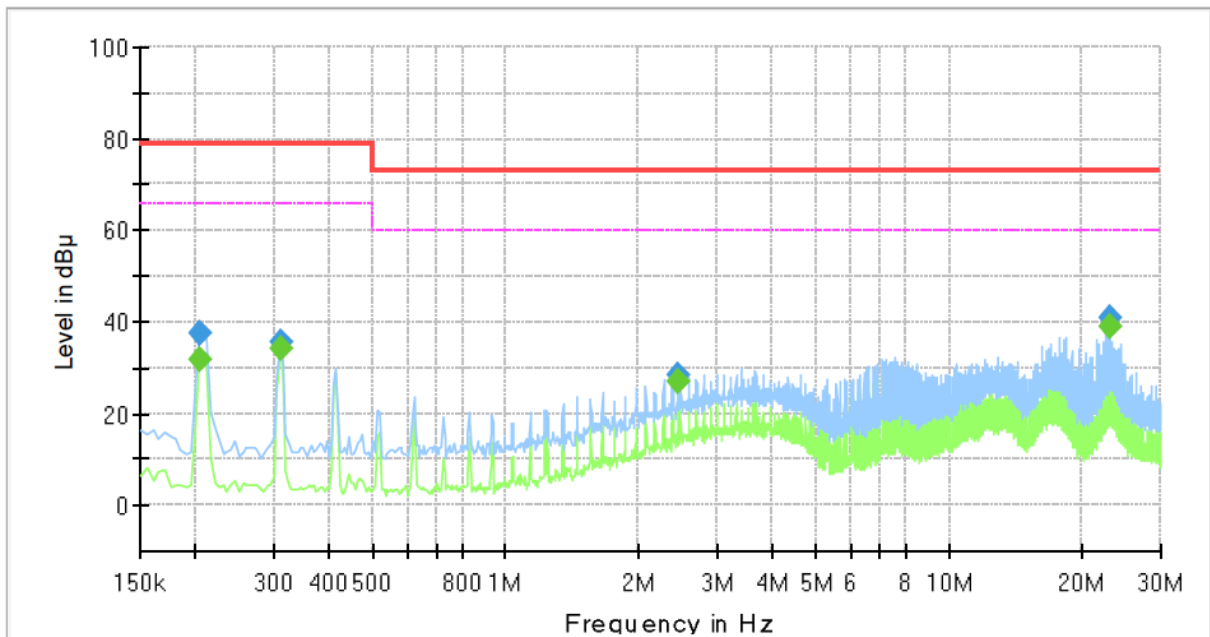
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.205000	---	30.46	66.00	35.54	1000.0	9.000	L1	19.4
0.205000	35.08	---	79.00	43.92	1000.0	9.000	L1	19.4
0.310000	---	32.12	66.00	33.88	1000.0	9.000	L1	19.5
0.310000	33.43	---	79.00	45.57	1000.0	9.000	L1	19.5
2.440000	---	22.65	60.00	37.35	1000.0	9.000	L1	20.3
2.440000	24.63	---	73.00	48.37	1000.0	9.000	L1	20.3
2.445000	---	24.56	60.00	35.44	1000.0	9.000	L1	20.3
2.445000	25.92	---	73.00	47.08	1000.0	9.000	L1	20.3
17.695000	---	37.43	60.00	22.57	1000.0	9.000	L1	20.0
17.695000	41.94	---	73.00	31.06	1000.0	9.000	L1	20.0
23.130000	---	38.86	60.00	21.14	1000.0	9.000	L1	20.1
23.130000	40.71	---	73.00	32.29	1000.0	9.000	L1	20.1



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: TNO-4050T
Phase: N
Mode: AC
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.205000	---	31.67	66.00	34.33	1000.0	9.000	N	19.4
0.205000	37.43	---	79.00	41.57	1000.0	9.000	N	19.4
0.310000	---	34.29	66.00	31.71	1000.0	9.000	N	19.5
0.310000	35.66	---	79.00	43.34	1000.0	9.000	N	19.5
2.445000	---	27.14	60.00	32.86	1000.0	9.000	N	20.3
2.445000	28.56	---	73.00	44.44	1000.0	9.000	N	20.3
23.130000	---	39.22	60.00	20.78	1000.0	9.000	N	20.1
23.130000	41.14	---	73.00	31.86	1000.0	9.000	N	20.1

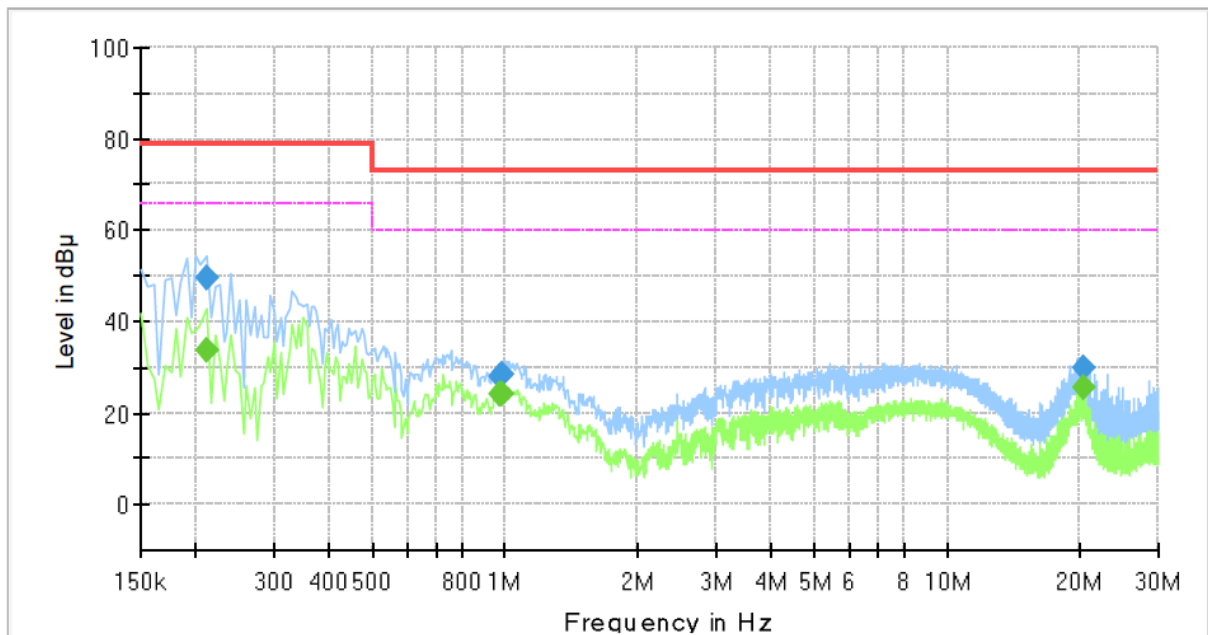


■ DC Mode

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: TNO-4050T
Phase: H
Mode: DC
Operator Name: KES



Final Result

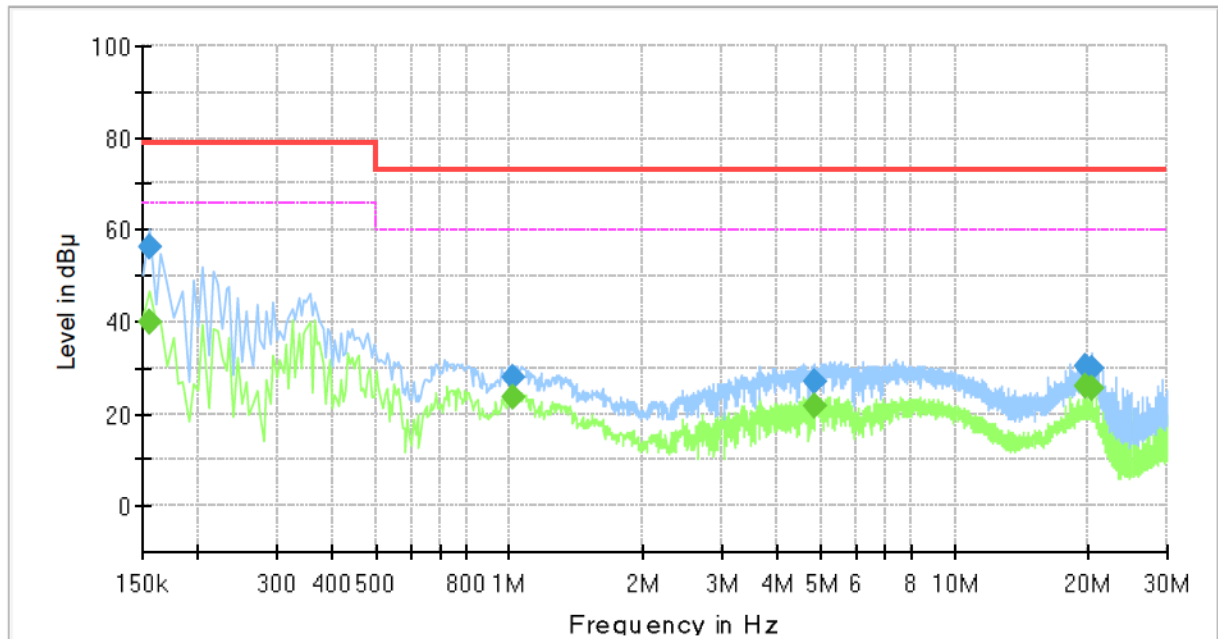
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	33.92	66.00	32.08	1000.0	9.000	L1	19.4
0.210000	49.54	---	79.00	29.46	1000.0	9.000	L1	19.4
0.975000	---	24.15	60.00	35.85	1000.0	9.000	L1	20.0
0.975000	28.09	---	73.00	44.91	1000.0	9.000	L1	20.0
0.985000	---	24.02	60.00	35.98	1000.0	9.000	L1	20.0
0.985000	28.65	---	73.00	44.35	1000.0	9.000	L1	20.0
20.260000	---	25.61	60.00	34.39	1000.0	9.000	L1	20.1
20.260000	29.90	---	73.00	43.10	1000.0	9.000	L1	20.1



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: TNO-4050T
Phase: N
Mode: DC
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	40.03	66.00	25.97	1000.0	9.000	N	19.4
0.155000	56.52	---	79.00	22.48	1000.0	9.000	N	19.4
1.020000	---	23.86	60.00	36.14	1000.0	9.000	N	20.0
1.020000	27.90	---	73.00	45.10	1000.0	9.000	N	20.0
4.840000	---	21.58	60.00	38.42	1000.0	9.000	N	19.7
4.840000	27.11	---	73.00	45.89	1000.0	9.000	N	19.7
19.710000	---	25.94	60.00	34.06	1000.0	9.000	N	20.1
19.710000	30.31	---	73.00	42.69	1000.0	9.000	N	20.1
20.260000	---	25.76	60.00	34.24	1000.0	9.000	N	20.2
20.260000	29.99	---	73.00	43.01	1000.0	9.000	N	20.2

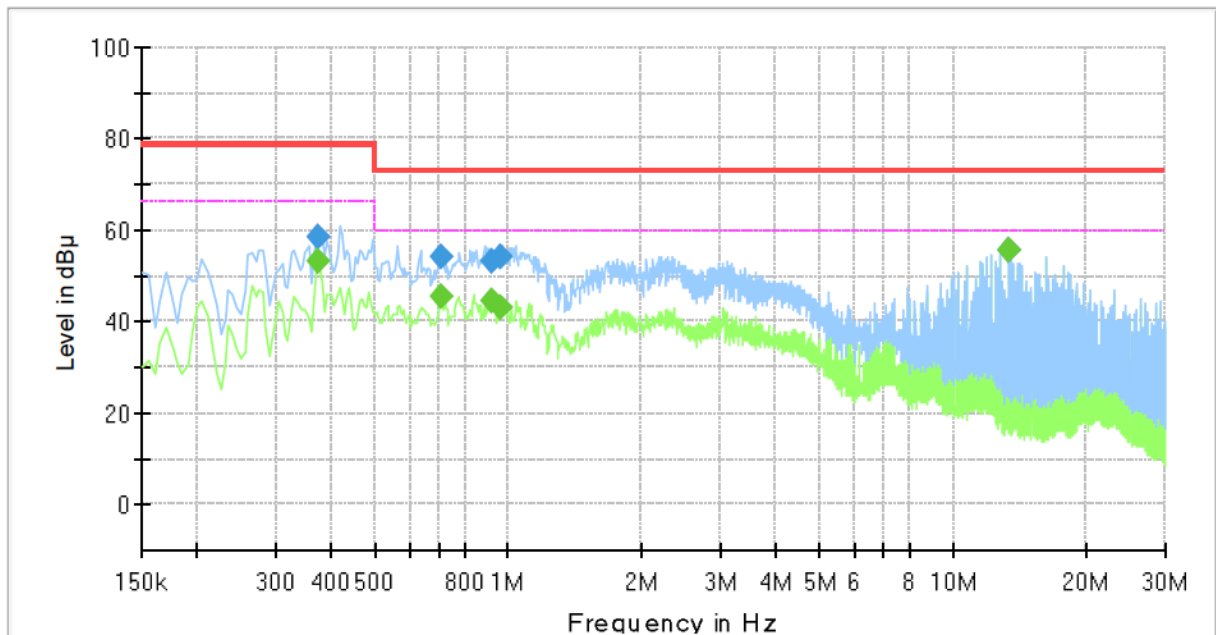


■ PoE Mode

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: TNO-4050T
Phase: H
Mode: PoE
Operator Name: KES



Final Result

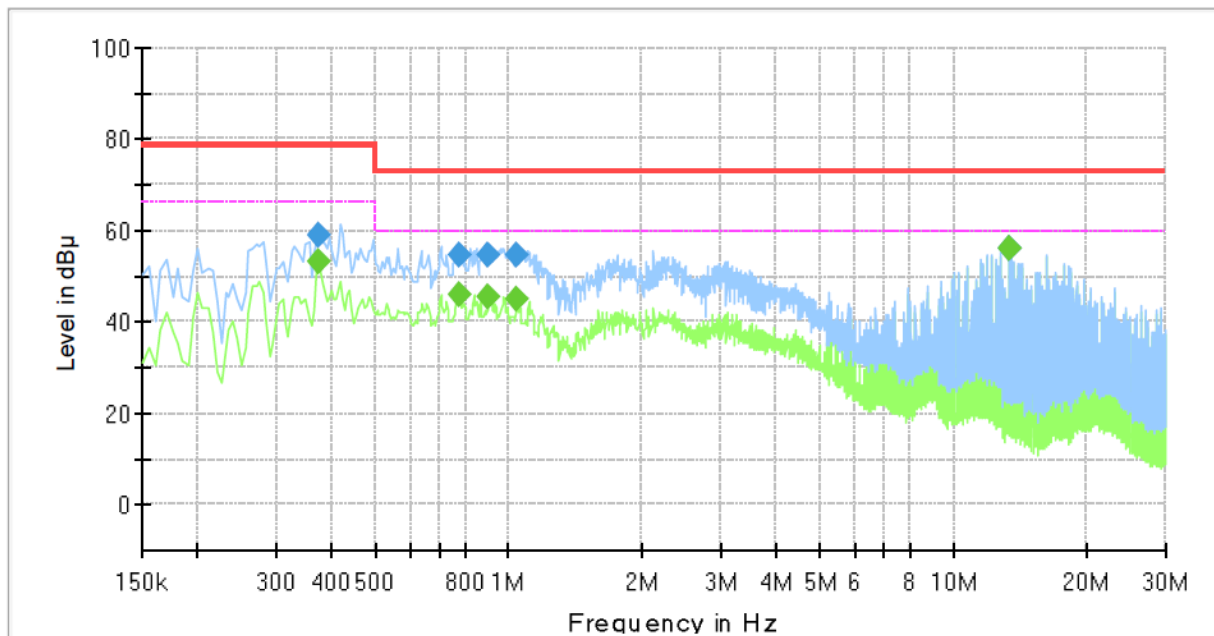
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.375000	---	53.40	66.00	12.60	1000.0	9.000	L1	19.6
0.375000	58.69	---	79.00	20.31	1000.0	9.000	L1	19.6
0.705000	---	45.66	60.00	14.34	1000.0	9.000	L1	19.9
0.705000	54.21	---	73.00	18.79	1000.0	9.000	L1	19.9
0.915000	---	44.37	60.00	15.63	1000.0	9.000	L1	20.1
0.915000	53.36	---	73.00	19.64	1000.0	9.000	L1	20.1
0.965000	---	43.19	60.00	16.81	1000.0	9.000	L1	20.0
0.965000	54.09	---	73.00	18.91	1000.0	9.000	L1	20.0
13.420000	---	55.65	60.00	4.35	1000.0	9.000	L1	19.9
13.420000	55.82	---	73.00	17.18	1000.0	9.000	L1	19.9



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: TNO-4050T
Phase: N
Mode: PoE
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.375000	---	53.23	66.00	12.77	1000.0	9.000	N	19.6
0.375000	59.20	---	79.00	19.80	1000.0	9.000	N	19.6
0.775000	---	46.04	60.00	13.96	1000.0	9.000	N	20.0
0.775000	54.85	---	73.00	18.15	1000.0	9.000	N	20.0
0.900000	---	45.66	60.00	14.34	1000.0	9.000	N	20.1
0.900000	54.42	---	73.00	18.58	1000.0	9.000	N	20.1
1.040000	---	44.98	60.00	15.02	1000.0	9.000	N	20.1
1.040000	54.54	---	73.00	18.46	1000.0	9.000	N	20.1
13.420000	---	55.94	60.00	4.06	1000.0	9.000	N	19.9
13.420000	56.12	---	73.00	16.88	1000.0	9.000	N	19.9

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

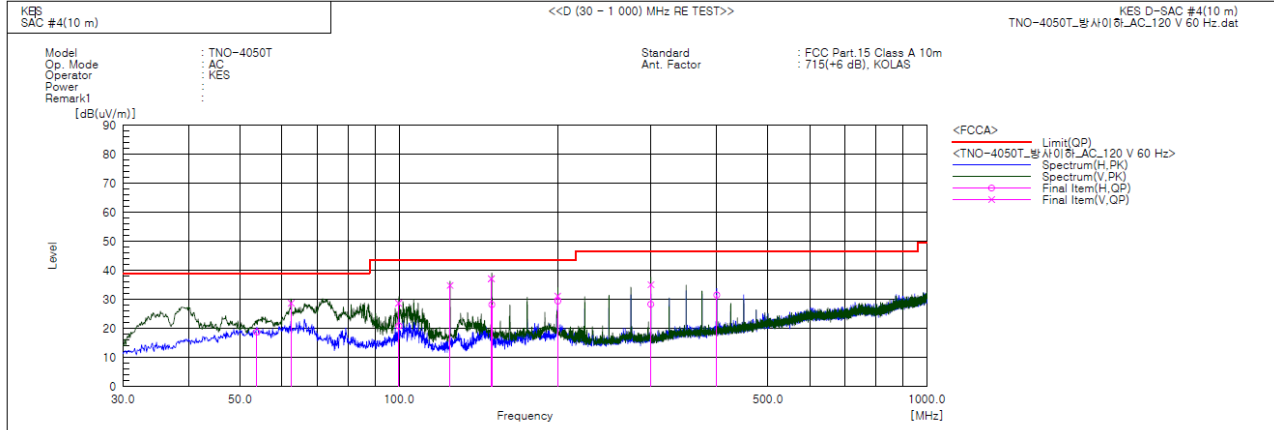
Reading Value : Not shown in the table.

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

**Radiated Electric Field Emissions(Below 1 GHz)**

- 47 CFR Part 15, Subpart B

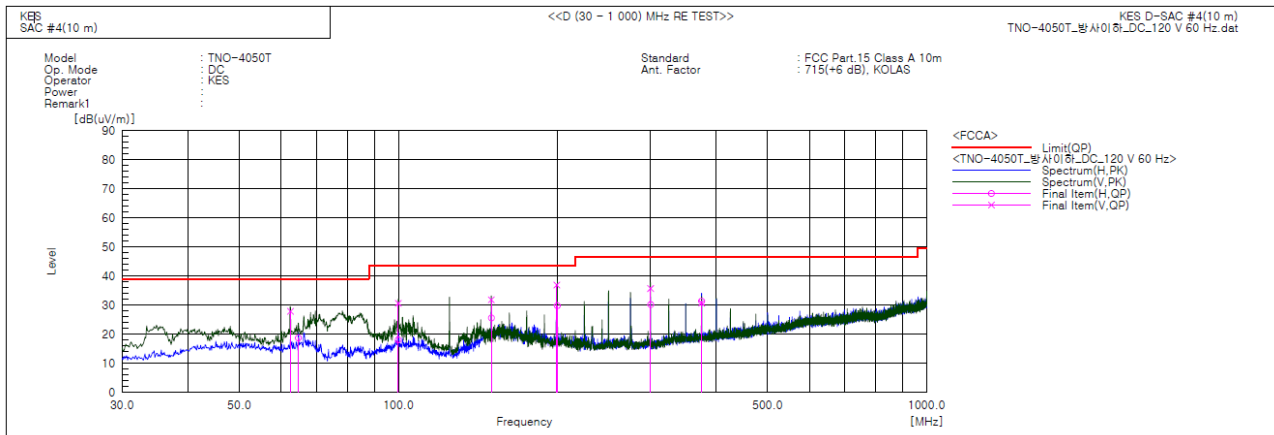
■ AC Mode

**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	53.765	H	40.1	-21.3	18.8	39.0	20.2	391.0	89.0	
2	62.495	V	51.2	-22.5	28.7	39.0	10.3	109.0	289.0	
3	99.778	V	51.2	-22.5	28.7	43.5	14.8	106.0	216.0	
4	99.961	H	43.4	-22.5	20.9	43.5	22.6	385.0	35.0	
5	124.939	V	59.7	-24.9	34.8	43.5	8.7	198.0	253.0	
6	149.541	V	62.4	-25.3	37.1	43.5	6.4	106.0	197.0	
7	149.916	H	53.5	-25.3	28.2	43.5	15.3	391.0	35.0	
8	199.694	V	52.2	-21.0	31.2	43.5	12.3	100.0	143.0	
9	199.993	H	50.4	-21.0	29.4	43.5	14.1	400.0	72.0	
10	300.012	H	46.3	-18.0	28.3	46.5	18.2	354.0	237.0	
11	300.024	V	53.1	-18.0	35.1	46.5	11.4	100.0	216.0	
12	400.055	H	45.7	-14.2	31.5	46.5	15.0	311.0	132.0	



■ DC Mode

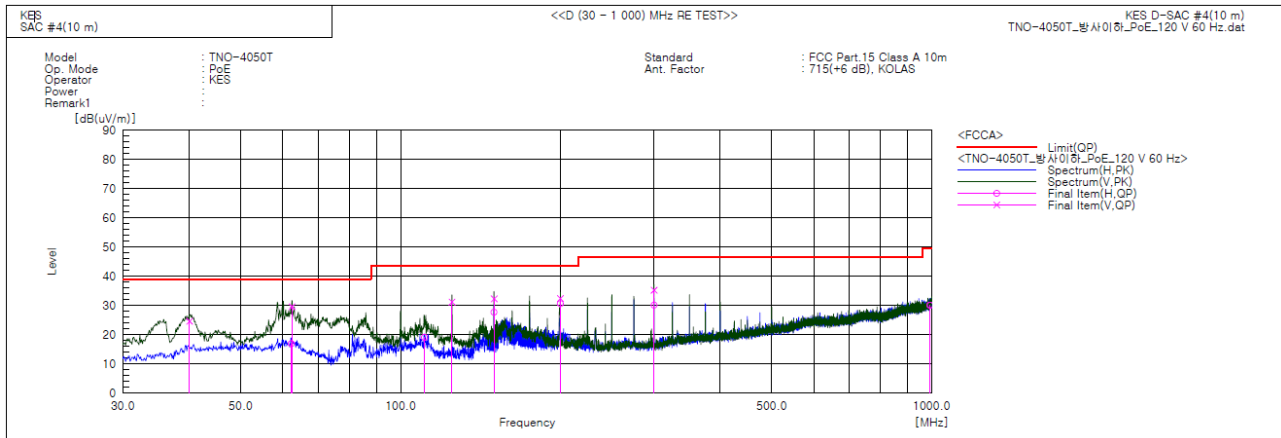


Final Result

No.	Frequency (P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]	QP [dB(uV)]	[dB(1/m)]	QP [dB(uV/m)]	QP [dB(uV/m)]	QP [dB]	[cm]	[deg]	
1	62.495	V 50.4	-22.5	27.9	39.0	11.1	199.0	3.0	
2	64.678	H 41.9	-23.2	18.7	39.0	20.3	315.0	353.0	
3	99.961	V 53.1	-22.5	30.6	43.5	12.9	100.0	217.0	
4	99.961	H 40.6	-22.5	18.1	43.5	25.4	384.0	54.0	
5	149.916	V 57.1	-25.3	31.8	43.5	11.7	109.0	162.0	
6	149.995	H 50.9	-25.3	25.6	43.5	17.9	351.0	107.0	
7	199.515	V 57.9	-21.0	36.9	43.5	6.6	106.0	17.0	
8	199.993	H 50.8	-21.0	29.8	43.5	13.7	309.0	125.0	
9	300.024	V 53.7	-18.0	35.7	46.5	10.8	114.0	217.0	
10	300.412	H 48.2	-18.0	30.2	46.5	16.3	400.0	269.0	
11	374.956	H 46.1	-14.8	31.3	46.5	15.2	301.0	124.0	
12	374.984	V 45.5	-14.8	30.7	46.5	15.8	183.0	152.0	



■ PoE Mode



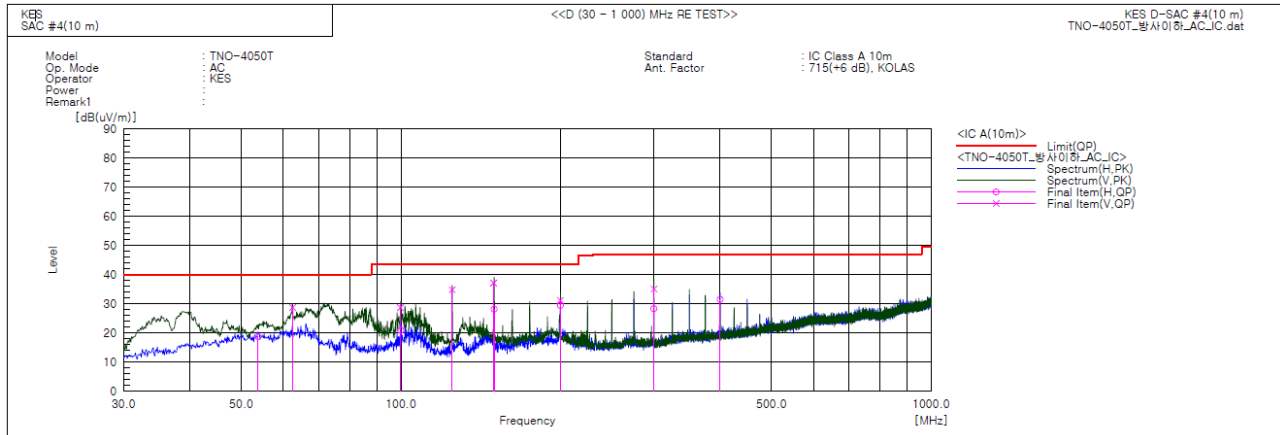
Final Result

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	40.064	V	47.1	-22.5	24.6	39.0	14.4	100.0	290.0	
2	62.253	H	39.4	-22.5	16.9	39.0	22.1	308.0	324.0	
3	62.495	V	52.1	-22.5	29.6	39.0	9.4	109.0	261.0	
4	110.874	H	41.5	-22.4	19.1	43.5	24.4	314.0	269.0	
5	124.939	V	56.1	-24.9	31.2	43.5	12.3	107.0	73.0	
6	149.916	H	53.0	-25.3	27.7	43.5	15.8	400.0	215.0	
7	149.995	V	57.6	-25.3	32.3	43.5	11.2	197.0	163.0	
8	199.993	V	53.4	-21.0	32.4	43.5	11.1	199.0	199.0	
9	199.993	H	51.6	-21.0	30.6	43.5	12.9	359.0	179.0	
10	300.024	V	53.2	-18.0	35.2	46.5	11.3	100.0	128.0	
11	300.024	H	48.1	-18.0	30.1	46.5	16.4	400.0	179.0	
12	992.604	H	32.8	-2.7	30.1	49.5	19.4	305.0	53.0	



- IC Regulation ICES-003 Issue 7

■ AC Mode

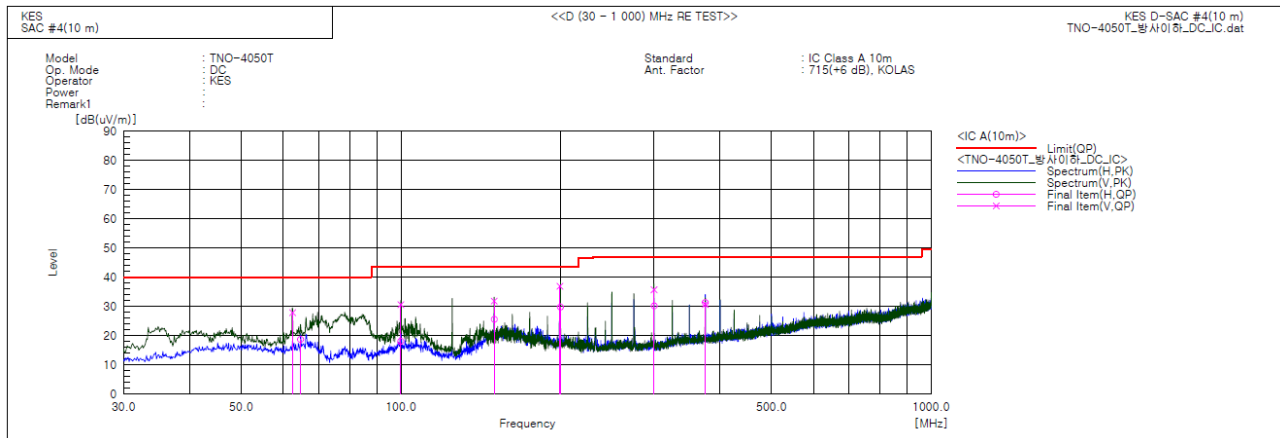


Final Result

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	53.765	H	40.1	-21.3	18.8	40.0	21.2	391.0	89.0	
2	62.495	V	51.2	-22.5	28.7	40.0	11.3	109.0	289.0	
3	99.778	V	51.2	-22.5	28.7	43.5	14.8	106.0	216.0	
4	99.961	H	43.4	-22.5	20.9	43.5	22.6	385.0	35.0	
5	124.939	V	59.7	-24.9	34.8	43.5	8.7	198.0	253.0	
6	149.541	V	62.4	-25.3	37.1	43.5	6.4	106.0	197.0	
7	149.916	H	53.5	-25.3	28.2	43.5	15.3	391.0	35.0	
8	199.694	V	52.2	-21.0	31.2	43.5	12.3	100.0	143.0	
9	199.993	H	50.4	-21.0	29.4	43.5	14.1	400.0	72.0	
10	300.012	H	46.3	-18.0	28.3	47.0	18.7	354.0	237.0	
11	300.024	V	53.1	-18.0	35.1	47.0	11.9	100.0	216.0	
12	400.055	H	45.7	-14.2	31.5	47.0	15.5	311.0	132.0	



■ DC Mode

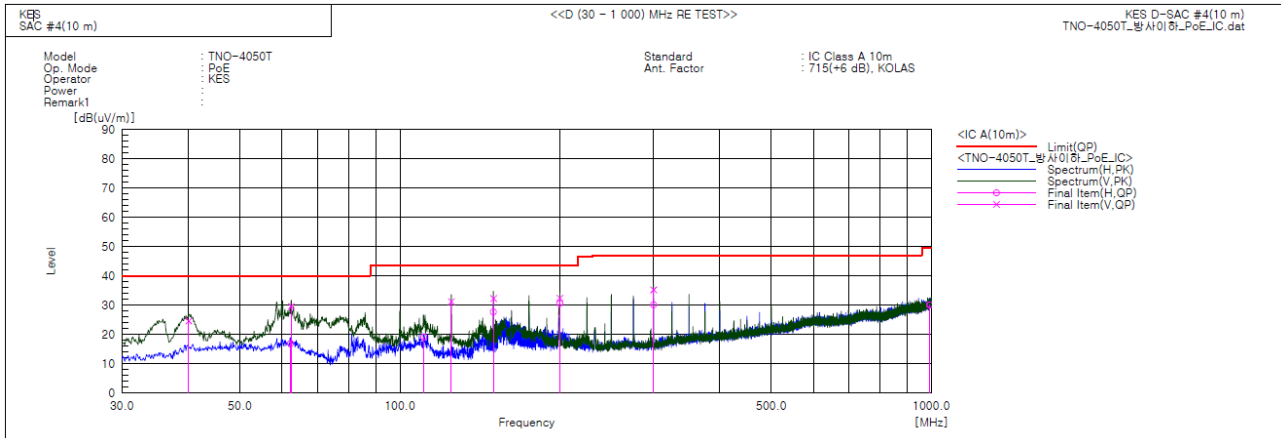


Final Result

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	62.495	V	50.4	-22.5	27.9	40.0	12.1	199.0	3.0	
2	64.678	H	41.9	-23.2	18.7	40.0	21.3	315.0	353.0	
3	99.961	V	53.1	-22.5	30.6	43.5	12.9	100.0	217.0	
4	99.961	H	40.6	-22.5	18.1	43.5	25.4	384.0	54.0	
5	149.916	V	57.1	-25.3	31.8	43.5	11.7	109.0	162.0	
6	149.995	H	50.9	-25.3	25.6	43.5	17.9	351.0	107.0	
7	199.515	V	57.9	-21.0	36.9	43.5	6.6	106.0	17.0	
8	199.993	H	50.8	-21.0	29.8	43.5	13.7	309.0	125.0	
9	300.024	V	53.7	-18.0	35.7	47.0	11.3	114.0	217.0	
10	300.412	H	48.2	-18.0	30.2	47.0	16.8	400.0	269.0	
11	374.956	H	46.1	-14.8	31.3	47.0	15.7	301.0	124.0	
12	374.984	V	45.5	-14.8	30.7	47.0	16.3	183.0	152.0	



■ 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	40.064	V	47.1	-22.5	24.6	40.0	15.4	100.0	290.0	
2	62.253	H	39.4	-22.5	16.9	40.0	23.1	308.0	324.0	
3	62.495	V	52.1	-22.5	29.6	40.0	10.4	109.0	261.0	
4	110.874	H	41.5	-22.4	19.1	43.5	24.4	314.0	269.0	
5	124.939	V	56.1	-24.9	31.2	43.5	12.3	107.0	73.0	
6	149.916	H	53.0	-25.3	27.7	43.5	15.8	400.0	215.0	
7	149.995	V	57.6	-25.3	32.3	43.5	11.2	197.0	163.0	
8	199.993	V	53.4	-21.0	32.4	43.5	11.1	199.0	199.0	
9	199.993	H	51.6	-21.0	30.6	43.5	12.9	359.0	179.0	
10	300.024	V	53.2	-18.0	35.2	47.0	11.8	100.0	128.0	
11	300.024	H	48.1	-18.0	30.1	47.0	16.9	400.0	179.0	
12	992.604	H	32.8	-2.7	30.1	49.5	19.4	305.0	53.0	

◆ Calculation – SAC #4(10 m)

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

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

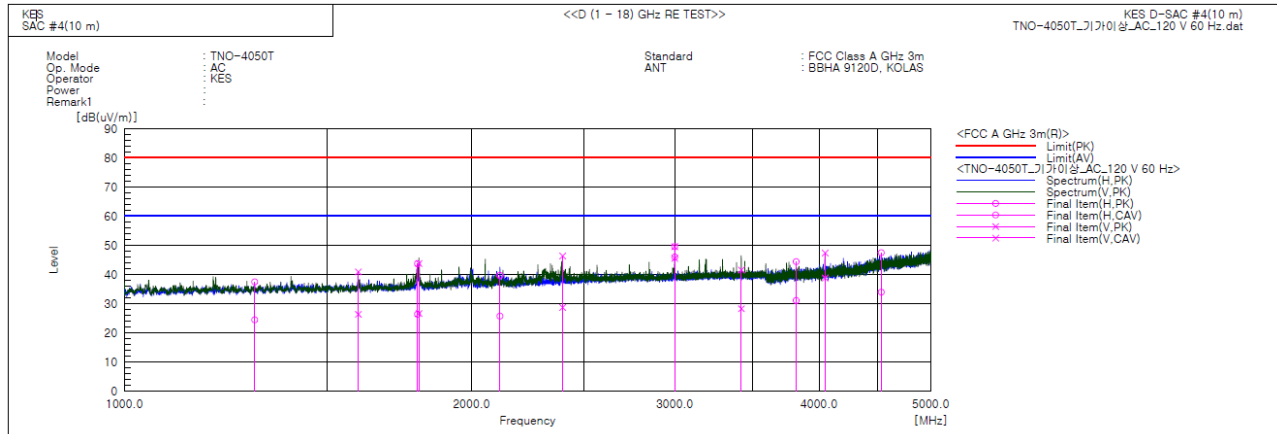
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

■ AC Mode

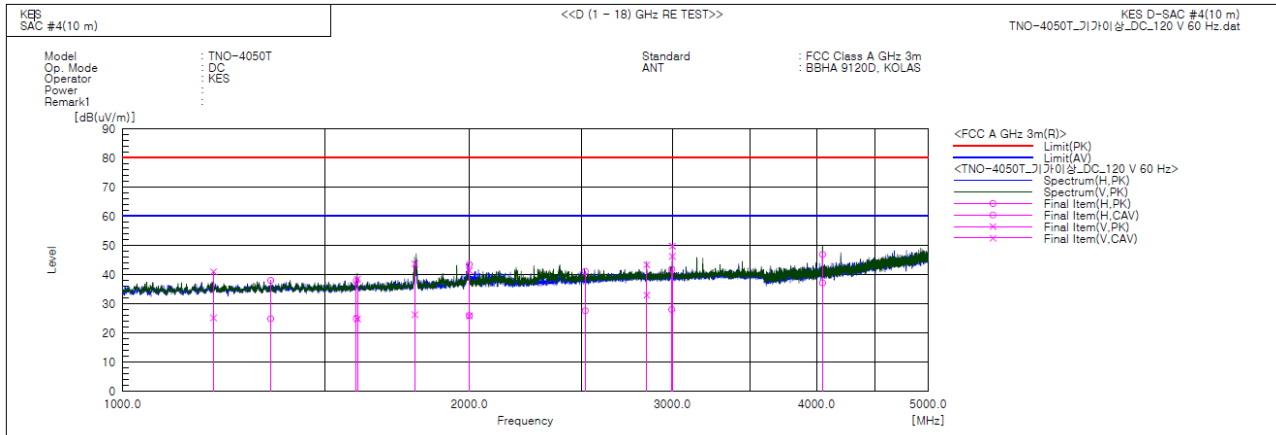


Final Result

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	1297.135	H	41.9	28.9	-4.4	37.5	24.5	80.0	60.0	42.5	35.5	352.0	262.0	
2	1594.955	V	43.8	29.3	-2.9	40.9	26.4	80.0	60.0	39.1	33.6	192.0	174.0	
3	1794.850	H	45.9	28.6	-2.2	43.7	26.4	80.0	60.0	36.3	33.6	400.0	189.0	
4	1800.435	V	45.9	28.8	-2.1	43.8	26.7	80.0	60.0	36.2	33.3	118.0	174.0	
5	2116.360	H	40.4	26.5	-0.7	39.7	25.8	80.0	60.0	40.3	34.2	306.0	207.0	
6	2397.725	V	45.6	28.0	0.8	46.4	28.8	80.0	60.0	33.6	31.2	109.0	192.0	
7	3000.010	H	46.3	42.7	3.3	49.6	46.0	80.0	60.0	30.4	14.0	358.0	262.0	
8	3000.145	V	46.3	42.3	3.3	49.6	45.6	80.0	60.0	30.4	14.4	102.0	137.0	
9	3425.650	V	37.3	24.0	4.3	41.6	28.3	80.0	60.0	38.4	31.7	100.0	210.0	
10	3822.785	H	38.2	24.9	6.2	44.4	31.1	80.0	60.0	35.6	28.9	399.0	154.0	
11	4050.050	V	40.1	31.5	7.3	47.4	38.8	80.0	60.0	32.6	21.2	100.0	174.0	
12	4528.875	H	37.0	23.5	10.5	47.5	34.0	80.0	60.0	32.5	26.0	400.0	154.0	



■ DC Mode

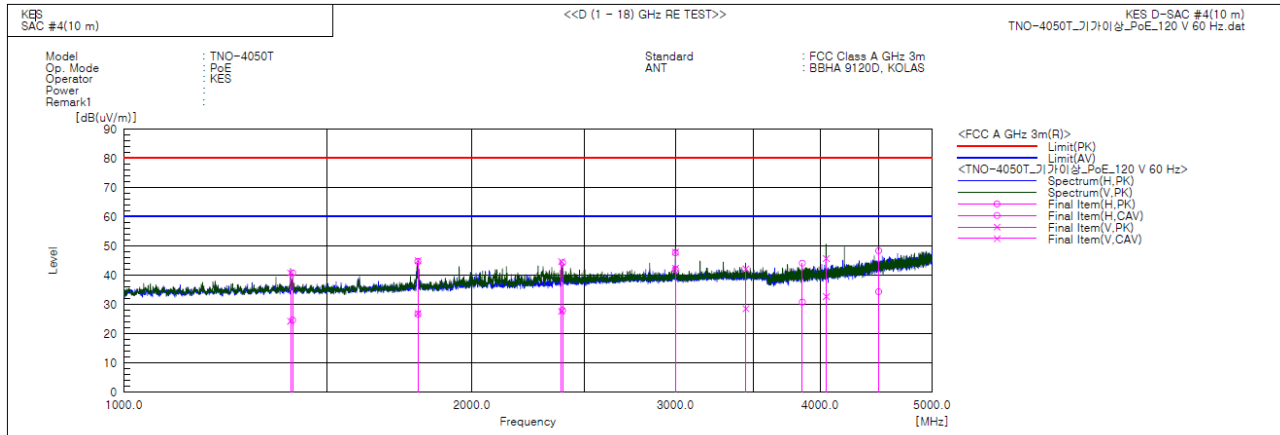


Final Result

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	1199.480	V	45.9	30.1	-4.9	41.0	25.2	80.0	60.0	39.0	34.8	114.0	5.0	
2	1345.090	H	42.1	29.0	-4.1	38.0	24.9	80.0	60.0	42.0	35.1	398.0	3.0	
3	1595.800	H	40.8	27.9	-2.9	37.9	25.0	80.0	60.0	42.1	35.0	357.0	115.0	
4	1599.835	V	41.4	27.7	-2.9	38.5	24.8	80.0	60.0	41.5	35.2	199.0	7.0	
5	1793.495	V	45.9	28.5	-2.2	43.7	26.3	80.0	60.0	36.3	33.7	186.0	77.0	
6	1999.375	V	42.7	27.2	-1.3	41.4	25.9	80.0	60.0	38.6	34.1	178.0	56.0	
7	1999.490	H	44.8	27.3	-1.3	43.5	26.0	80.0	60.0	36.5	34.0	311.0	315.0	
8	2520.950	H	39.7	26.2	1.4	41.1	27.6	80.0	60.0	38.9	32.4	305.0	394.0	
9	2850.100	V	40.6	30.2	2.8	43.4	33.0	80.0	60.0	36.6	27.0	109.0	55.0	
10	2996.650	H	38.7	24.9	3.2	41.9	28.1	80.0	60.0	38.1	31.9	379.0	108.0	
11	3000.105	V	46.5	43.0	3.3	49.8	46.3	80.0	60.0	30.2	13.7	100.0	298.0	
12	4049.890	H	39.6	29.9	7.3	46.9	37.2	80.0	60.0	33.1	22.8	319.0	356.0	



■ 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	1394.270	V	44.6	28.1	-3.8	40.8	24.3	80.0	60.0	39.2	35.7	100.0	261.0	
2	1399.670	H	44.6	28.5	-3.8	40.8	24.7	80.0	60.0	39.2	35.3	394.0	154.0	
3	1796.350	H	46.8	28.8	-2.1	44.7	26.7	80.0	60.0	35.3	33.3	400.0	210.0	
4	1796.530	V	47.1	29.1	-2.1	45.0	27.0	80.0	60.0	35.0	33.0	196.0	208.0	
5	2390.960	V	43.9	26.9	0.8	44.7	27.7	80.0	60.0	35.3	32.3	115.0	243.0	
6	2395.895	H	43.5	27.2	0.8	44.3	28.0	80.0	60.0	35.7	32.0	400.0	191.0	
7	3000.030	V	44.6	39.1	3.3	47.9	42.4	80.0	60.0	32.1	17.6	127.0	278.0	
8	3000.040	H	44.4	38.7	3.3	47.7	42.0	80.0	60.0	32.3	18.0	356.0	228.0	
9	3450.635	V	37.9	24.3	4.3	42.2	28.6	80.0	60.0	37.8	31.4	184.0	261.0	
10	3861.415	H	37.7	24.4	6.4	44.1	30.8	80.0	60.0	35.9	29.2	308.0	265.0	
11	4050.490	V	38.4	25.4	7.3	45.7	32.7	80.0	60.0	34.3	27.3	100.0	225.0	
12	4496.040	H	38.2	24.2	10.2	48.4	34.4	80.0	60.0	31.6	25.6	319.0	210.0	

◆ 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

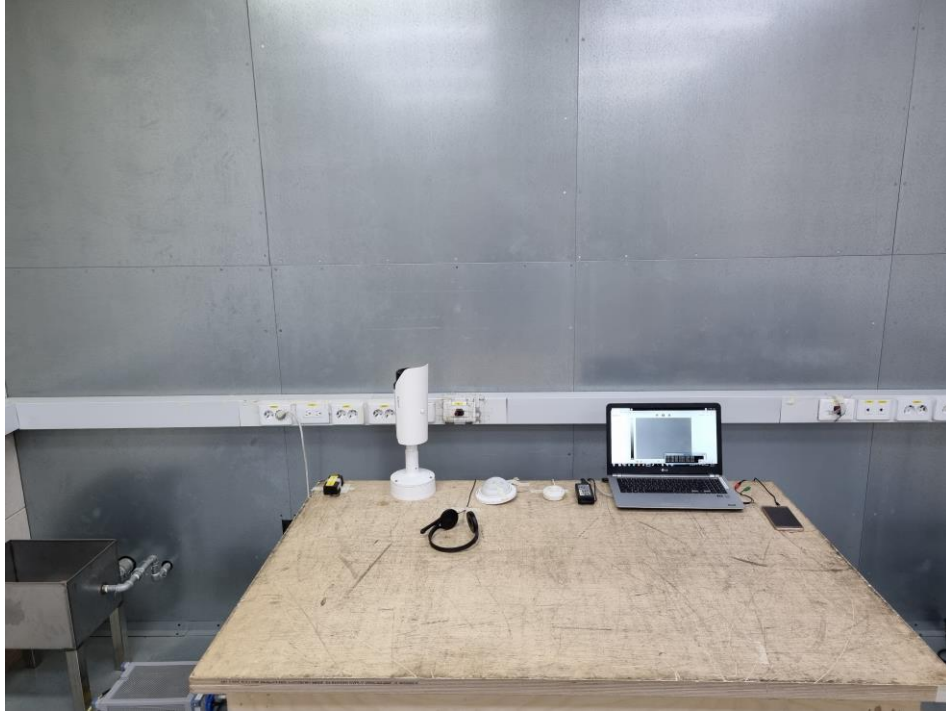
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value



Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ AC, DC Mode





■ PoE Mode





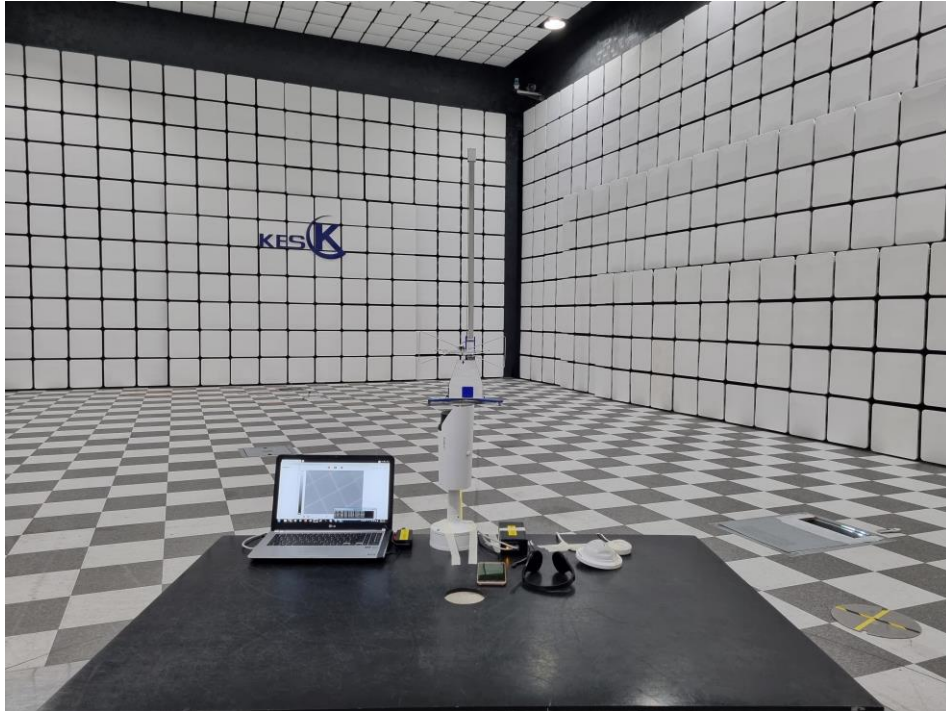
Radiated Electric Field Emissions(Below 1 GHz)

■ AC, DC Mode





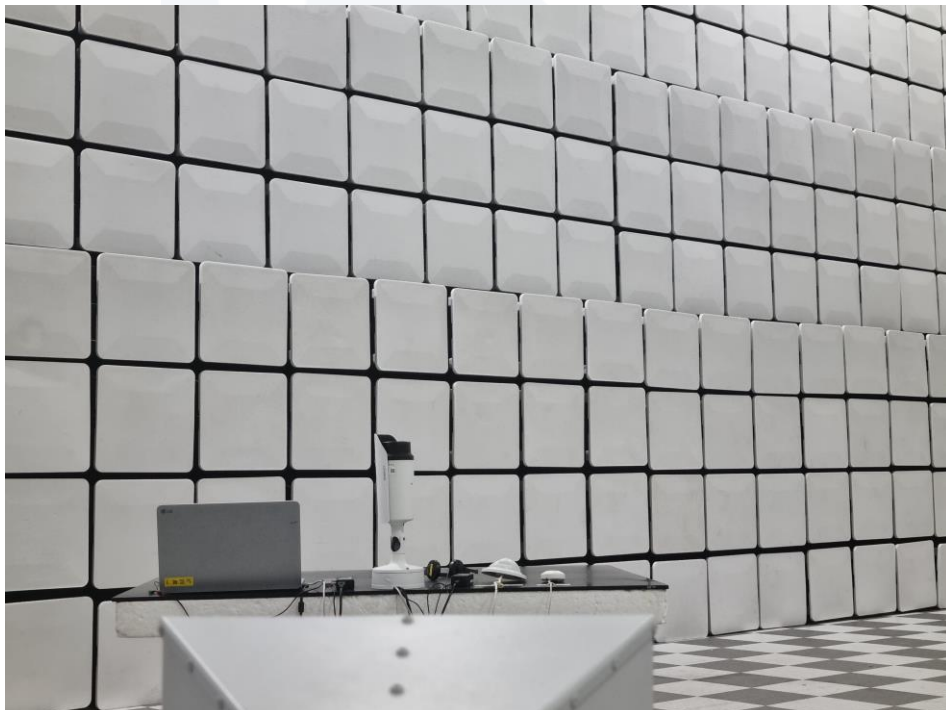
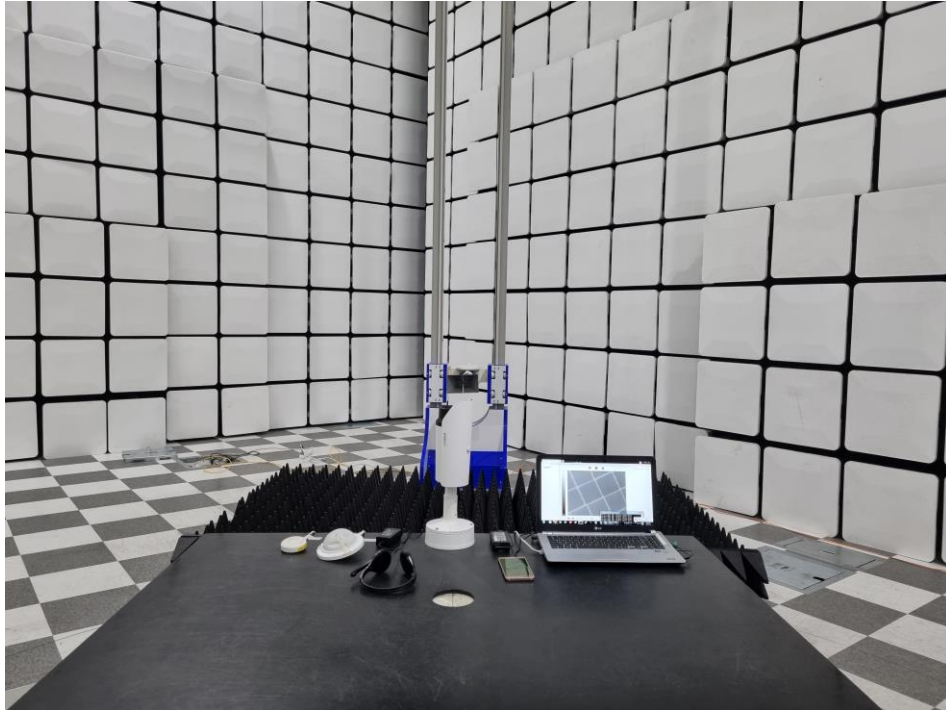
■ PoE Mode





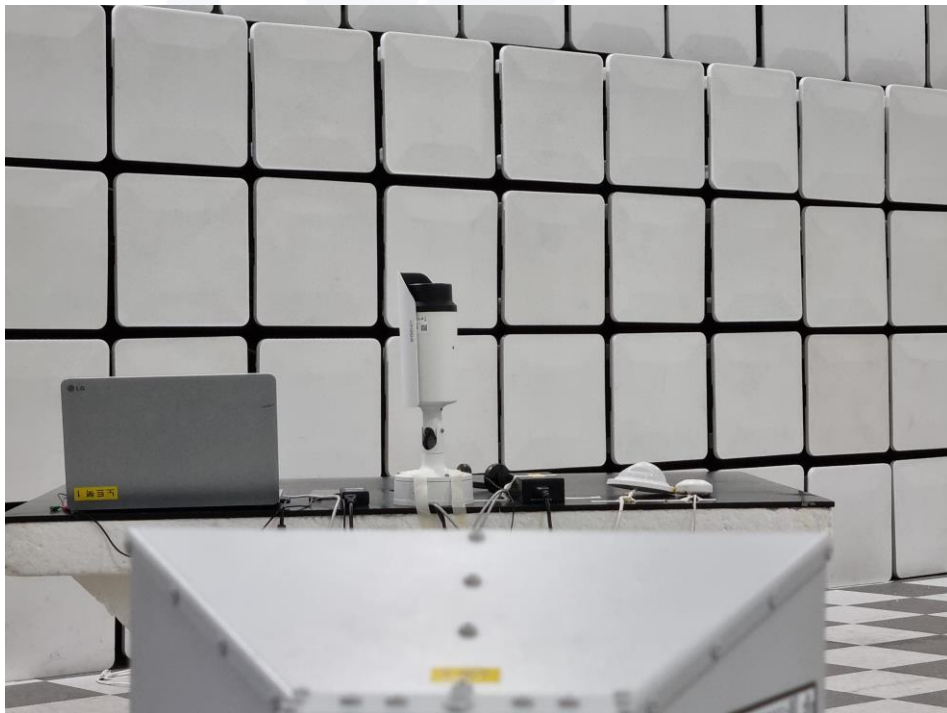
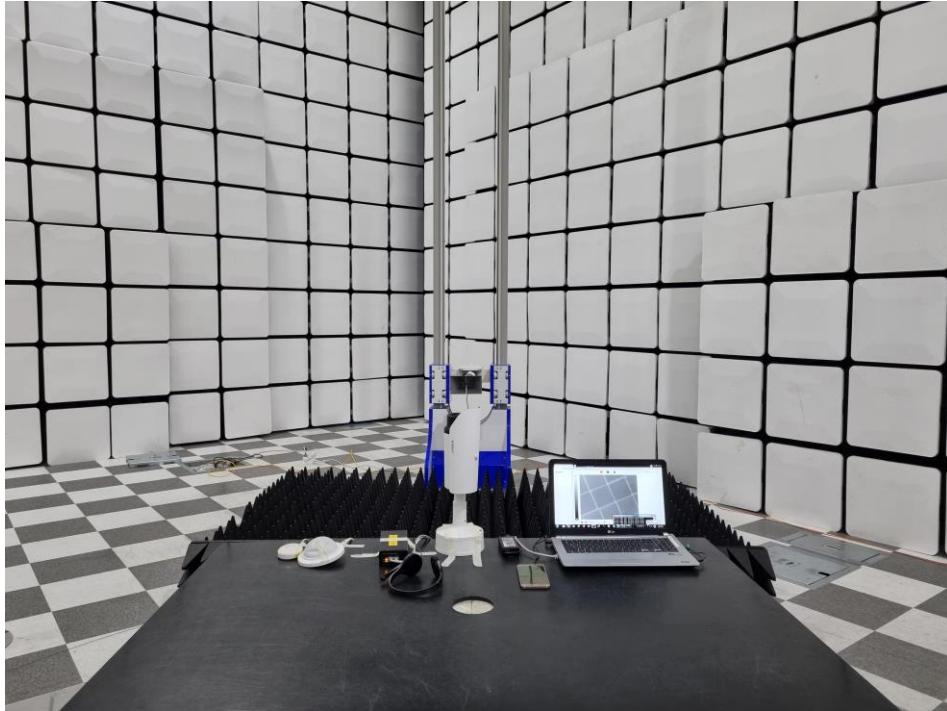
Radiated Electric Field Emissions(Above 1 GHz)

■ AC, DC Mode





■ PoE Mode





EUT External Photographs

(Top)



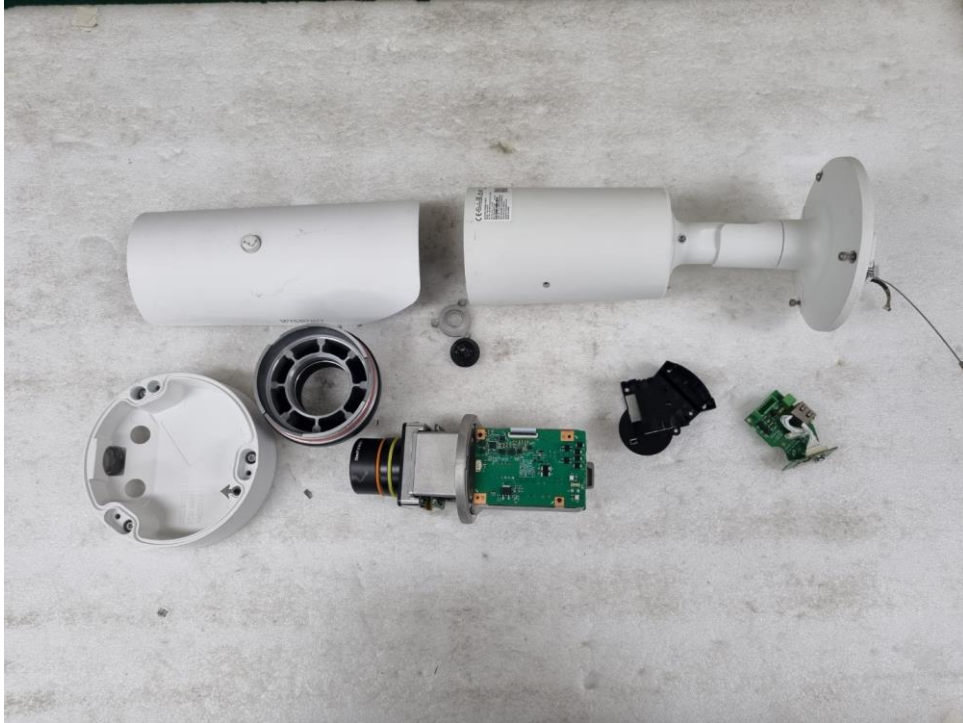
(Bottom)





EUT Internal Photographs

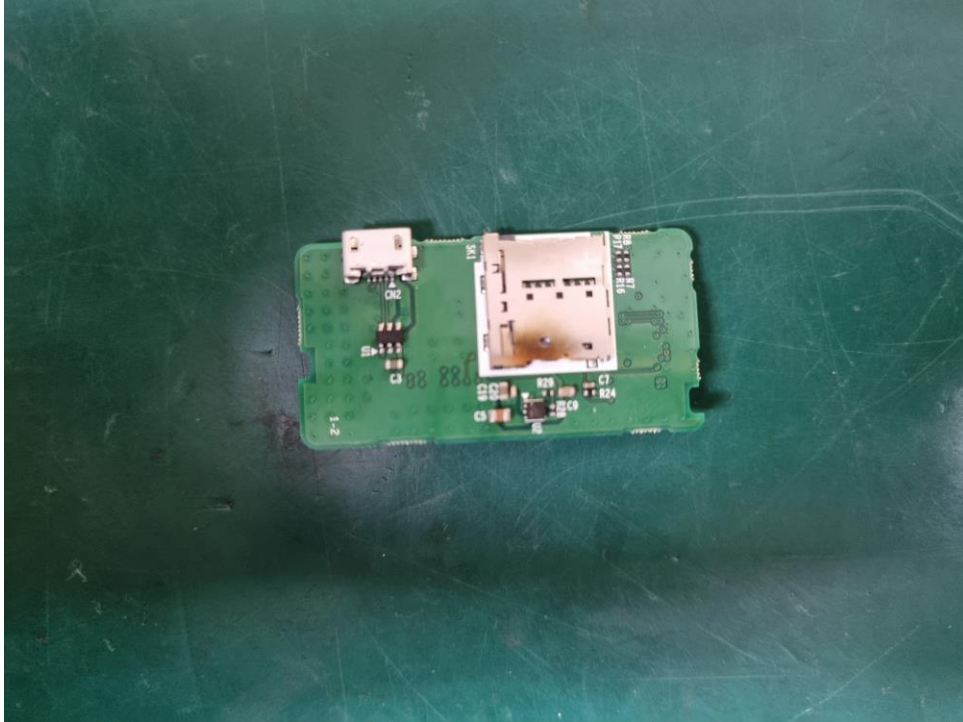
(Internal View)





EUT Internal View – Board 1

(Top)



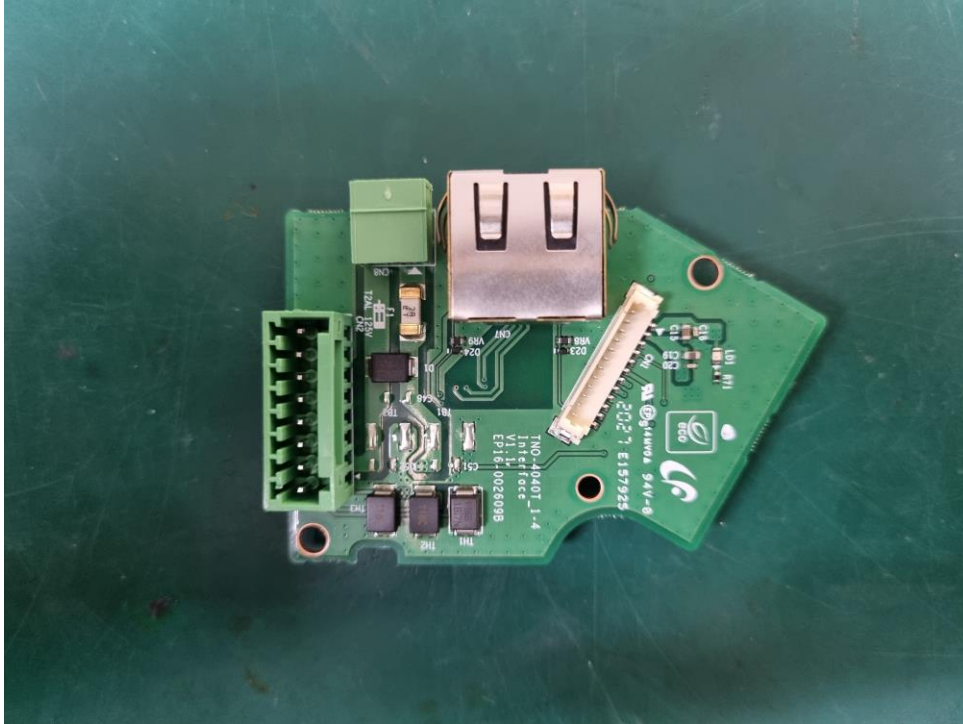
(Bottom)





EUT Internal View – Board 2

(Top)



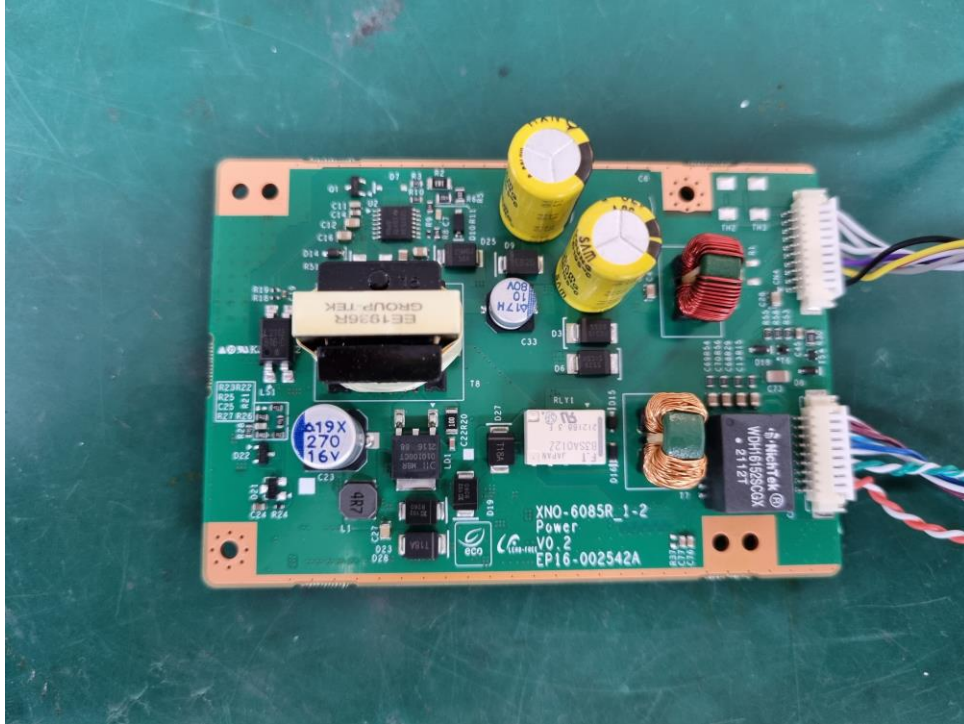
(Bottom)



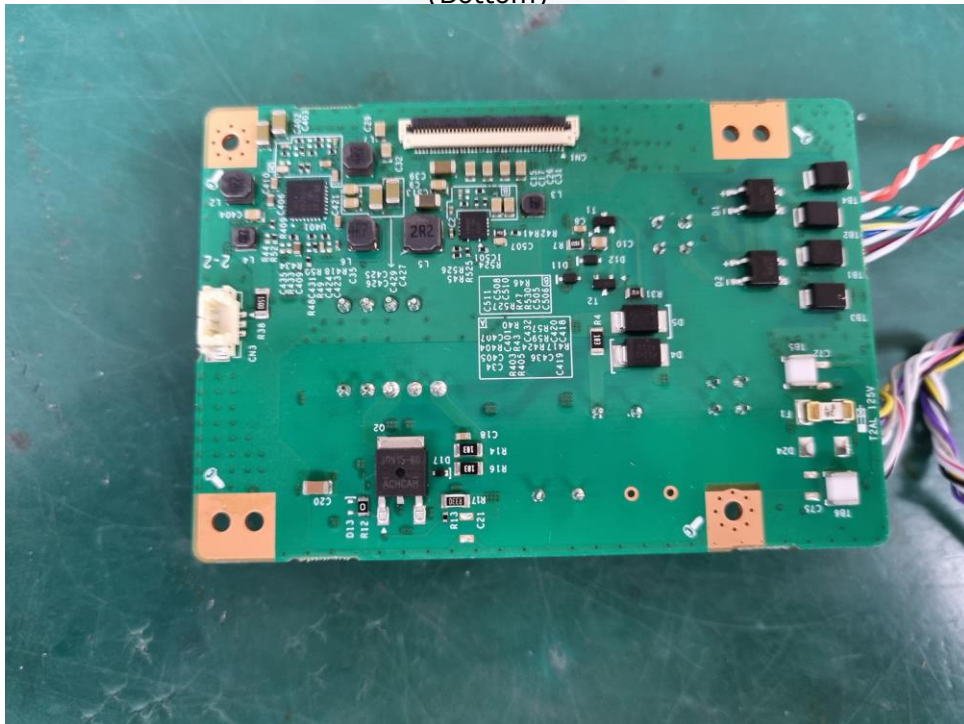


EUT Internal View – Board 3

(Top)



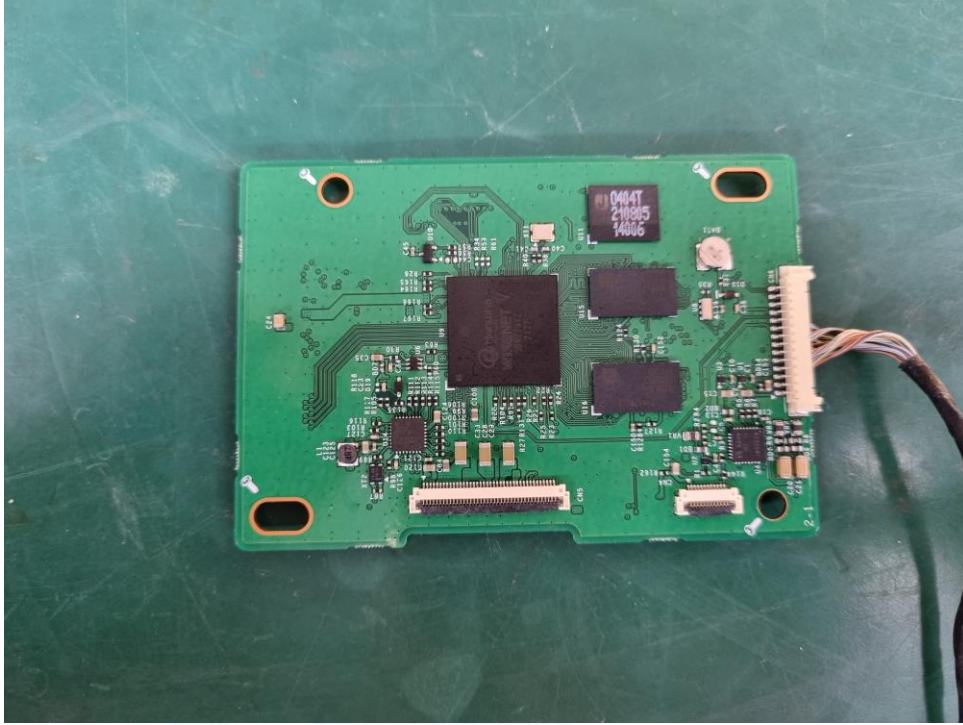
(Bottom)



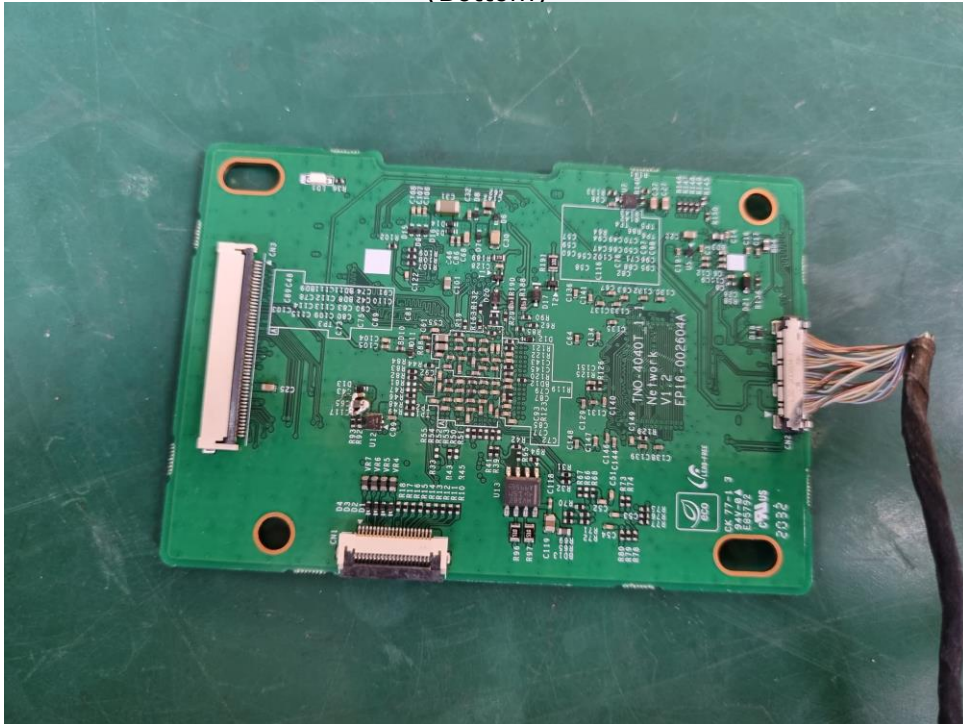


EUT Internal View – Board 4

(Top)



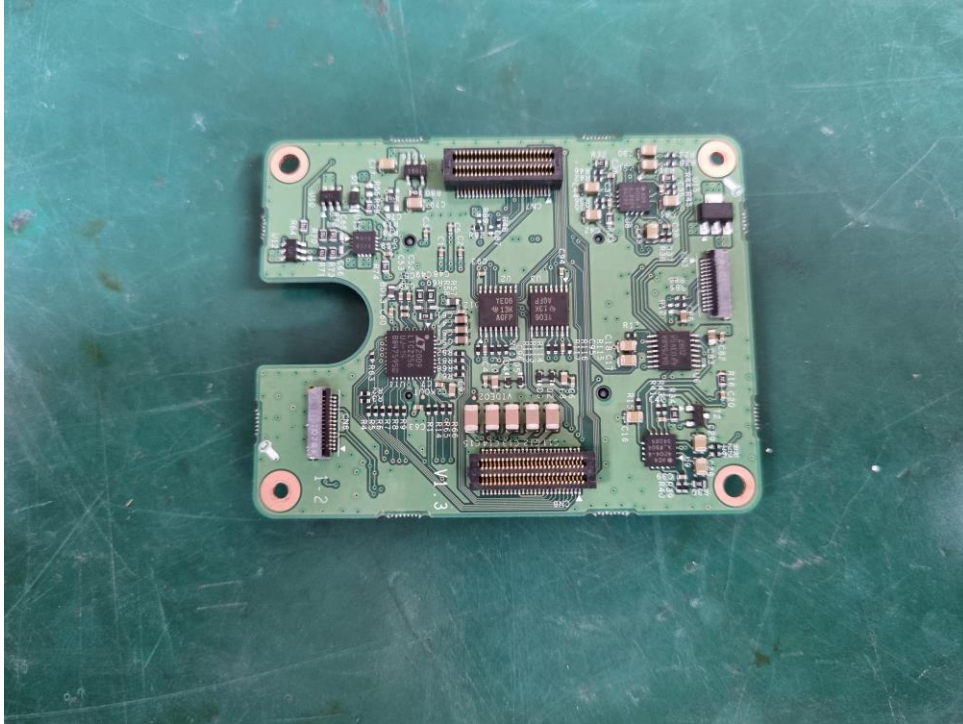
(Bottom)





EUT Internal View – Board 5

(Top)



(Bottom)





EUT Internal View – Board 6

(Top)



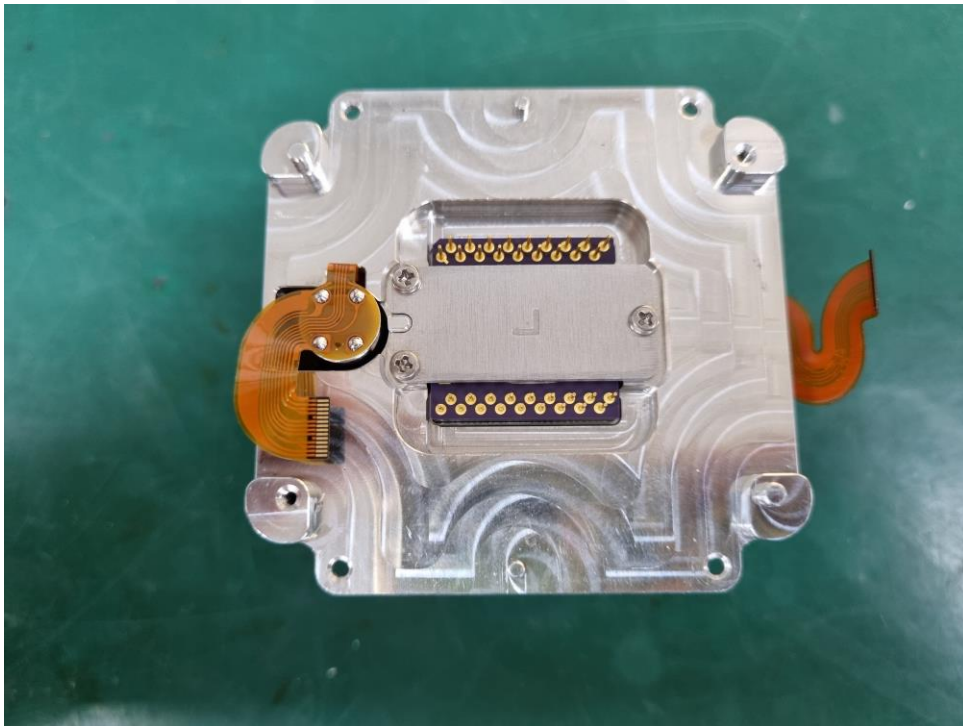
(Bottom)





EUT Internal View – Lens

(Top)





Label Photographs

FCC Label



Hanwha Vision Co., Ltd

TNO-4050T

IC Label

CAN ICES-003(A) / NMB-003(A)

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.