



## EMC TEST REPORT

Test Report No. : KES-E1-17T0750  
Date of Issue : Nov. 15, 2017  
Product name : THERMAL CAMERA  
Model/Type No. : TNO-4050TN  
Variant Mode : TNO-4040TN, TNO-4030TN  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,  
Gyeongsangnam-do, Korea  
Manufacturer : Hanwha Techwin (Tianjin) Co., Ltd.  
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA,  
Tianjin, 300385, People's Republic of China  
Equipment authorization : ☐ Declaration of Conformity  
☒ Verification  
☐ Certification  
Date of Receipt : Oct. 26, 2017  
Test date : Nov. 05, 2017 ~ Nov. 06, 2017  
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

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EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

This test report is not related to KOLAS.

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**REPORT REVISION HISTORY**

Date	Test Report No.	Revision History
Nov. 15, 2017	KES-E1-17T0750	Issued

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## 1.0 General Product Description

### Main Specifications of EUT are:

<b>Video</b>	
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
<b>Lens</b>	
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
<b>Operational</b>	
Camera Title	Off / On - WW : 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 Off / On(with Gyro)
Digital Image Stabilization	Off / On(8ea, 8point Polygonal zones), Handover
Motion Detection	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic
Privacy Masking	Off / Low / Middle / High
Gain Control	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Electronic Shutter Speed	Pelco D/P, Samsung T/E, Honeywell, Bosch, Panasonic, Sungin, AD, Vicon, GE
Pan/Tilt	Flip : On/Off Mirror : On/Off Hallway view : 90°/270°
Flip / Mirror	Tampering, Loitering, Directional Detection, Virtual Line, Fence detection, Enter/Exit, Appear / Disappear, Audio Detection, Motion Detection, Sound Classification, Shock detection, drastic temperature swings
Video & Audio Analytics	Input 2ea / Output 2ea
Alarm I/O	Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect
Alarm Triggers	File upload via FTP, E-Mail Notification via E-Mail local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers External output Selectable (Mic I/V/Line IN), Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm Line out, Max output level: 1 Vrms
Alarm events	support
Audio In	-
Audio out	-
Pixel count	-
Digital zoom	-
Remote control	-
<b>Network</b>	
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 : 5EA)
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) 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 Compression Format	Bi-directional (2-Way)
Audio Communication	IPv4, IPv6
IP	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
Protocol	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication (EAP-TLS, EAP-LEAP)
Security	Unicast / Multicast
Streaming Method	20 users at Unicast Mode 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
Max. User Access	ONVIF Profile S/G SUNAPI(HTTP API) Open Platform
Edge Storage	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Application Programming Interface	TBD
Webpage Language	SmartViewer, SSM
Web Viewer	
Central Management Software	
<b>Environmental</b>	
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
<b>Electrical</b>	
Input Voltage / Current	24VAC ± 10%, 12VDC ± 10%, PoE(IEEE802.3af)
Power Consumption	TBD
<b>Mechanical</b>	
Color / Material	TBD
Dimension (WxHxD)	TBD
Weight	TBD
기타	Palette 7mode

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## 1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage ☐ 230 Vac ☐ 120 Vac ☒ 24 Vac ☒ 12 Vdc ☒ PoE  
Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

Lens size difference

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
THERMAL CAMERA	TNO-4050TN	-	Hanwha Techwin (Tianjin) Co., Ltd.	E.U.T

## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	ANY4805C-LT1	10H300002	ANY ELECTRONICS CO., LTD	-
Notebook	ProBook4430s	-	HP	-
Notebook Adapter	SeriesPPP0009H	-	CHICONY POWER TECHNOLOGY (SUZHOU) CO., LTD,	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
Alarm Jig	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Phone	A1429	-	Apple	
Micro SD Card	-	-	Sandisk	

## 1.6 External I/O Cabling

### ■ AC 24 V, DC 12 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
THERMAL CAMERA (E.U.T)	RJ-45(LAN)	Notebook	RJ-45(LAN)	3.0	U
	Audio In (2 Pin)	Phone	3.5 mm	1.6	U
	Audio Out (2 Pin)	Speaker	3.5 mm	1.5	U
	Alarm (2 Pin)	Alarm Jig	Alarm	3.0	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-

\* Unshielded=U, Shielded=S

### ■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
THERMAL CAMERA (E.U.T)	RJ-45(PoE)	PoE Adapter	RJ-45(PoE)	3.0	U
PoE Adapter	RJ-45(LAN)	Notebook	RJ-45(LAN)	1.6	U
THERMAL CAMERA (E.U.T)	Audio In (2 Pin)	Phone	3.5 mm	1.6	U
	Audio Out (2 Pin)	Speaker	3.5 mm	1.5	U
	Alarm (2 Pin)	Alarm Jig	Alarm	3.0	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-

\* Unshielded=U, Shielded=S



## 1.7 EUT Operating Mode(s)

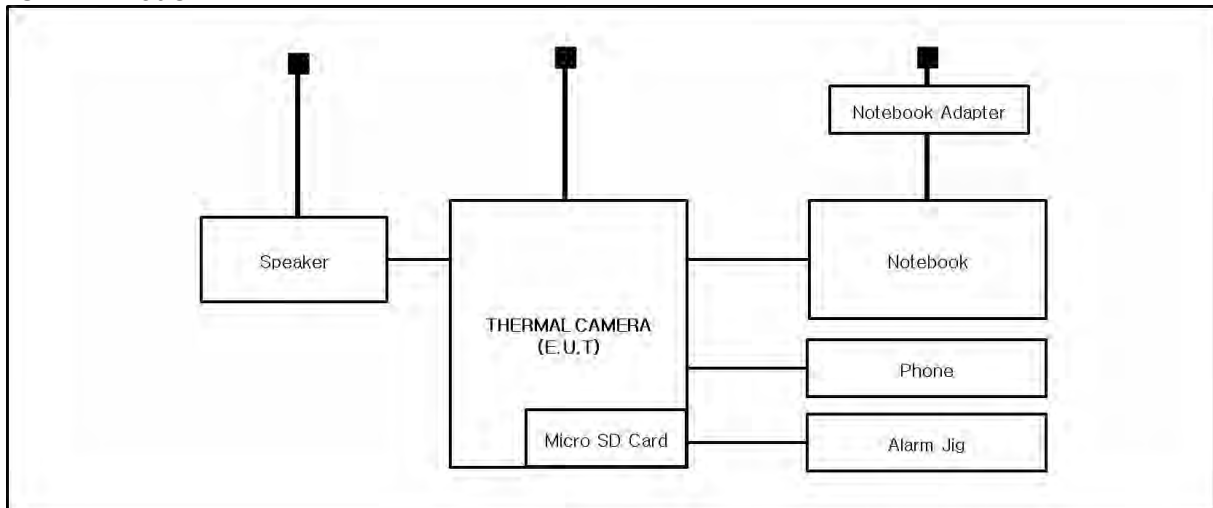
Test mode	operating
AC 24 V	E.U.T Monitoring, Ping Test
DC 12 V	
PoE	

E.U.T Test operating S/W		
Name	Version	Manufacture Company
WebViewer	-	Hanwha Techwin Co., Ltd.

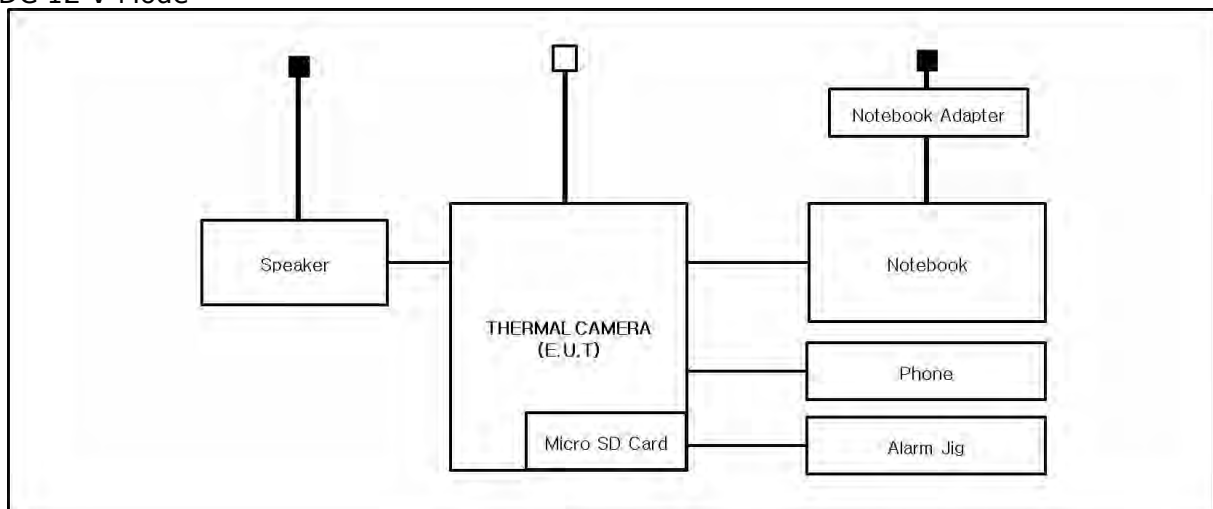
## 1.8 Configuration

■ AC Main  
□ DC Main

### ■ AC 24 V Mode

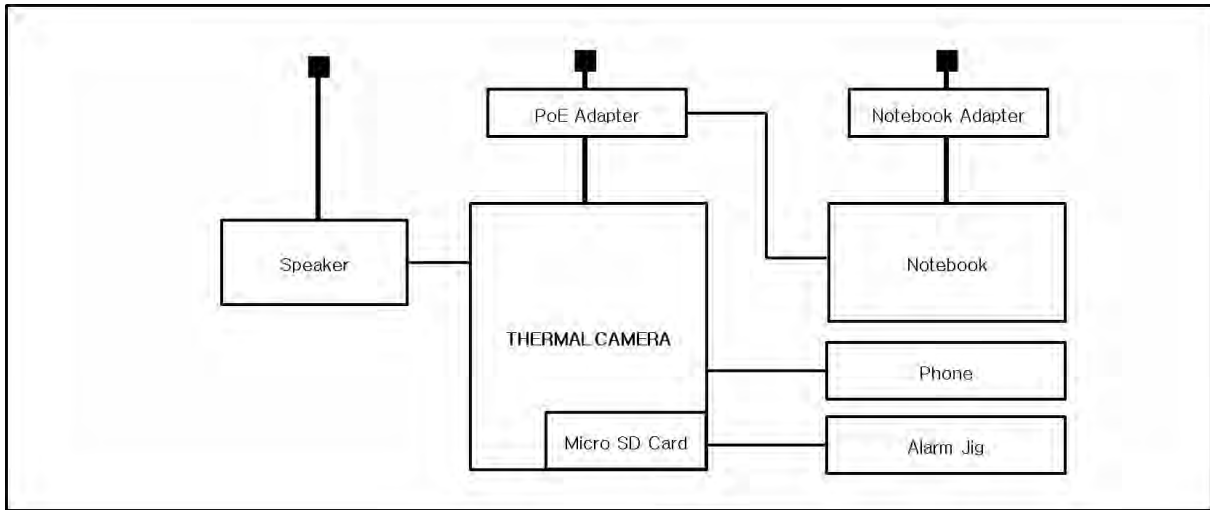


### ■ DC 12 V Mode





■ PoE Mode



## 1.9 Remarks when standards applied

N/A







## 1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

## 1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

## 1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-4308, C-4798, T-2311, G-914
KOREA	MSIP	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	CE	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	KOLAS	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	

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## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1  
☐ Class A

☐ Group 2  
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



☐ **VCCI V-3 / 2015.04**

☐ Class A

☐ Class B

☐ **AS/NZS:2013**

☐ Class A

☐ Class B

☒ **47 CFR Part 15, Subpart B**

☒ CISPR 22:2009 +A1:2010

☒ Class A

☐ Class B

☐ ANSI C63.4-2014

☐ Class A

☐ Class B

☒ **IC Regulation ICES-003 : 2016**

☒ CAN/CSA CISPR 22-10

☒ Class A

☐ Class B

☐ ANSI C63.4-2014

☐ **RE- Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

☐ Equipment for fixed use

☐ Equipment for vehicular use

☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

## 2.1 Conducted Emissions at Mains Power Ports

### Test Date

Nov. 06, 2017

### 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	101781	04, 27, 2018
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	01, 11, 2018
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	04, 27, 2018
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 13, 2017
<input type="checkbox"/>	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
<input type="checkbox"/>	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

### Test Conditions

Temperature: 20,2 °C  
Relative Humidity: 42,0 %

### 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**

Nov. 05, 2017

**Test Location**☐ OPEN AREA TEST SITE #2 ☒ SAC #4(10 m)**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	04, 18, 2018
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	12, 13, 2017
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

**Test Conditions**

Temperature: 20,2 °C

Relative Humidity: 41,3 %

**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**

Nov. 05, 2017

**Test Location**

SEMI ANECHOIC CHAMBER #4(10 m)

**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	04, 17, 2018
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2017
<input type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 24, 2018
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

**Test Conditions**

Temperature: 20,2 °C

Relative Humidity: 41,3 %

**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

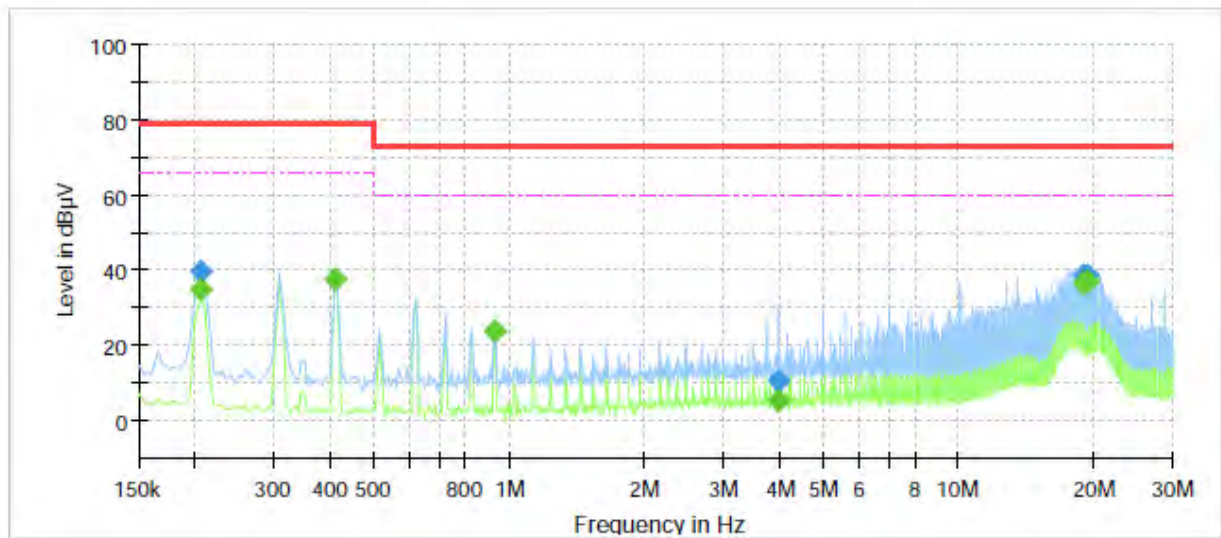
### Conducted Emissions at Mains Power Ports

#### ■ AC 24 V Mode

HOT LINE

#### Common Information

Test Description: Conducted Emission  
Model No.: TNO-4050TN  
Mode: AC 24 V  
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	---	34.72	66.00	31.28	1000.0	9.000	L1	19.5
0.205000	39.89	---	79.00	39.11	1000.0	9.000	L1	19.5
0.410000	---	37.77	66.00	28.23	1000.0	9.000	L1	19.7
0.410000	37.81	---	79.00	41.19	1000.0	9.000	L1	19.7
0.925000	---	23.70	60.00	36.30	1000.0	9.000	L1	20.1
0.925000	23.68	---	73.00	49.32	1000.0	9.000	L1	20.1
3.960000	---	5.55	60.00	54.45	1000.0	9.000	L1	20.0
3.960000	10.41	---	73.00	62.59	1000.0	9.000	L1	20.0
18.960000	---	36.64	60.00	23.36	1000.0	9.000	L1	20.3
18.960000	38.41	---	73.00	34.59	1000.0	9.000	L1	20.3
19.475000	---	36.98	60.00	23.02	1000.0	9.000	L1	20.3
19.475000	38.45	---	73.00	34.55	1000.0	9.000	L1	20.3

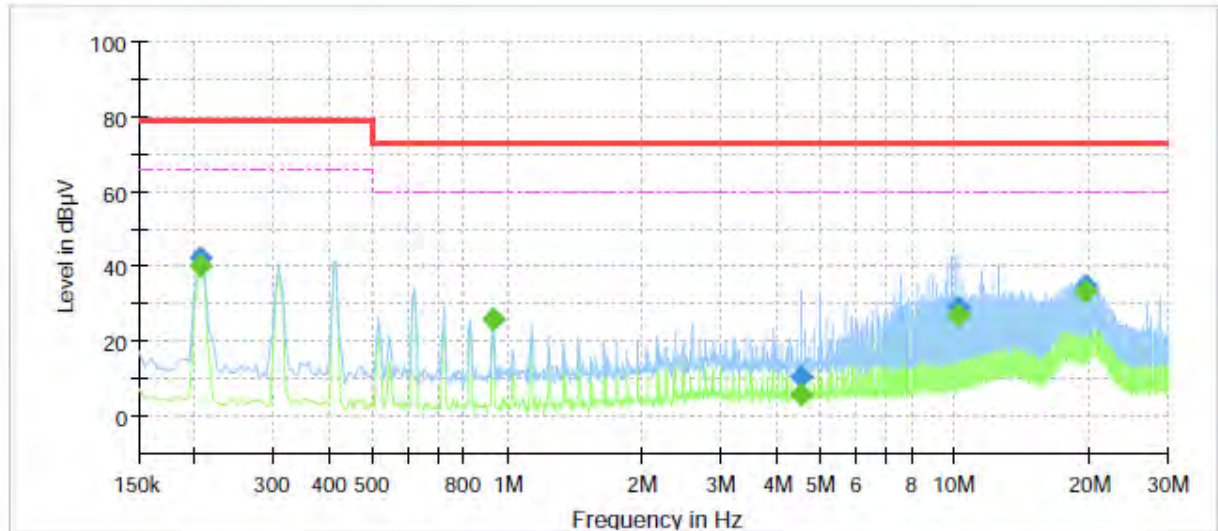
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## NEUTRAL LINE

### Common Information

Test Description: Conducted Emission  
Model No.: TNO-4050TN  
Mode: AC 24 V  
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	---	40.08	66.00	25.92	1000.0	9.000	N	19.5
0.205000	42.25	---	79.00	36.75	1000.0	9.000	N	19.5
0.925000	---	25.74	60.00	34.26	1000.0	9.000	N	20.0
0.925000	25.70	---	73.00	47.30	1000.0	9.000	N	20.0
4.545000	---	5.63	60.00	54.37	1000.0	9.000	N	19.9
4.545000	10.38	---	73.00	62.62	1000.0	9.000	N	19.9
10.205000	---	26.97	60.00	33.03	1000.0	9.000	N	20.1
10.205000	29.31	---	73.00	43.69	1000.0	9.000	N	20.1
19.580000	---	33.29	60.00	26.71	1000.0	9.000	N	20.4
19.580000	34.75	---	73.00	38.25	1000.0	9.000	N	20.4

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



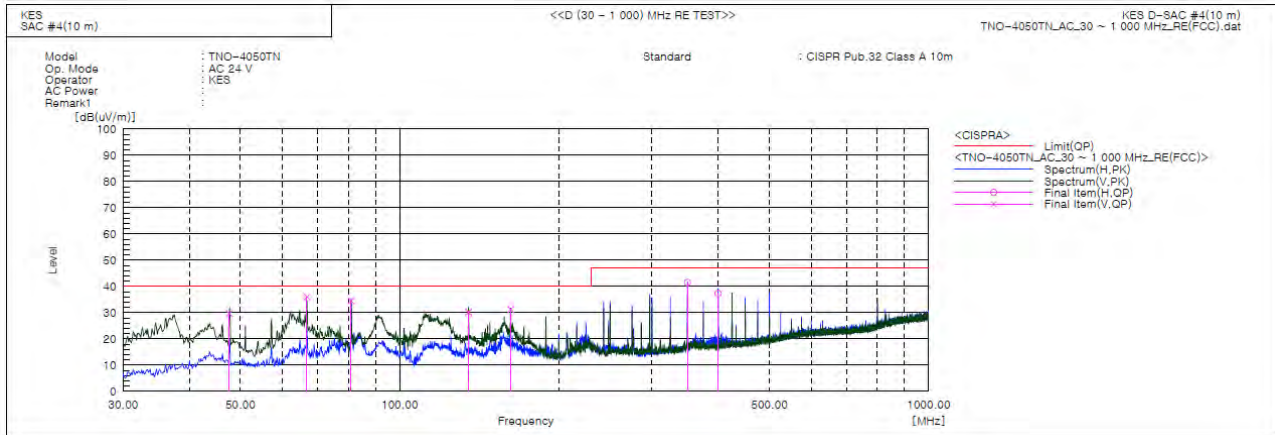
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### Radiated Electric Field Emissions(Below 1 GHz)

#### ■ AC 24 V 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	47.640	V	57.5	-27.8	29.7	40.0	10.3	115.0	108.0	
2	66.739	V	66.8	-30.8	36.0	40.0	4.0	318.0	122.0	
3	80.925	V	68.1	-33.6	34.5	40.0	5.5	228.0	158.0	
4	135.003	V	62.0	-31.8	30.2	40.0	9.8	138.0	237.0	
5	162.163	V	61.9	-30.7	31.2	40.0	8.8	197.0	353.0	
6	349.958	H	63.5	-22.0	41.5	47.0	5.5	200.0	255.0	
7	400.016	H	57.5	-20.2	37.3	47.0	9.7	200.0	129.0	

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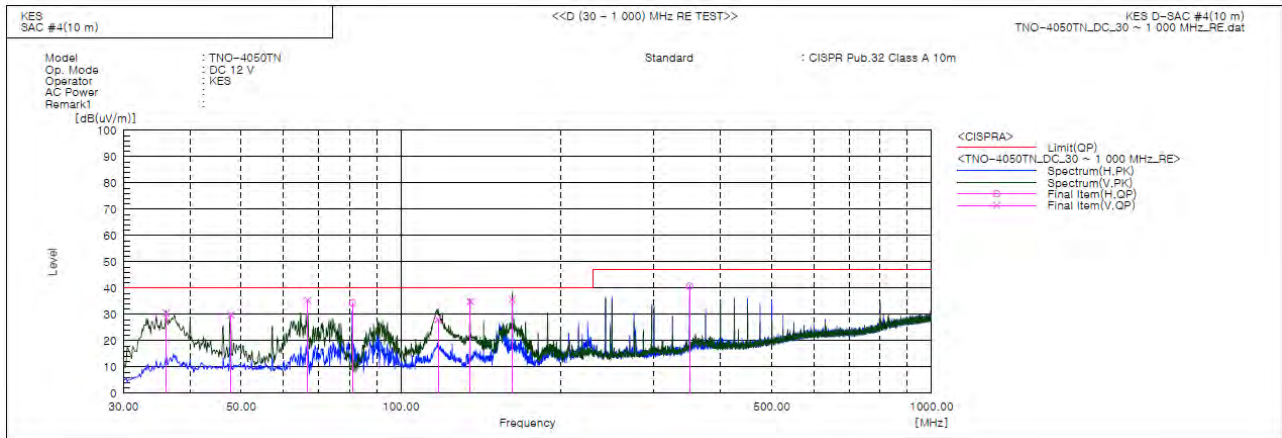


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## ■ DC 12 V Mode



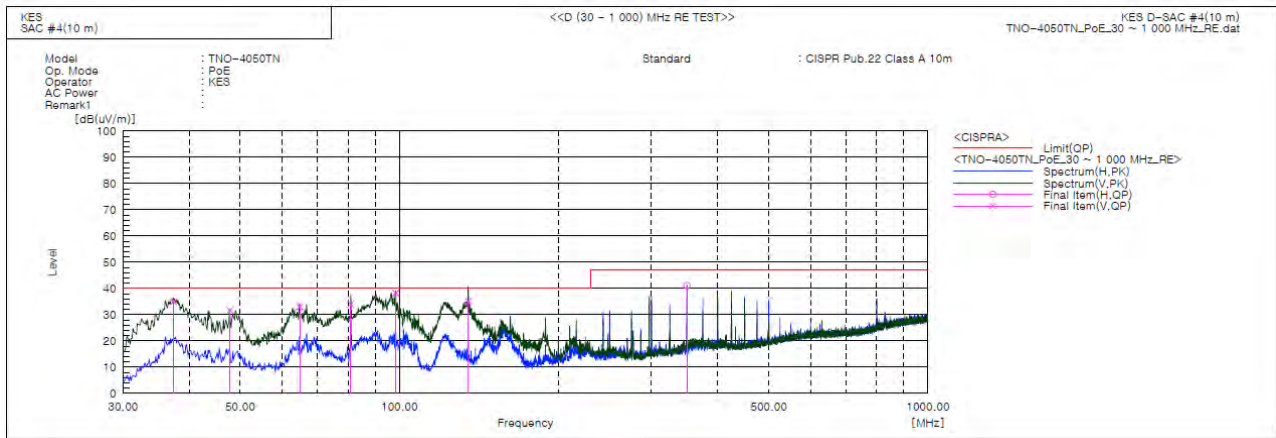
### Final Result

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	36.116	V	61.4	-30.9	30.5	40.0	9.5	129.0	11.0	
2	47.803	V	57.6	-27.8	29.8	40.0	10.2	150.0	20.0	
3	66.694	V	66.2	-30.8	35.4	40.0	4.6	246.0	84.0	
4	81.014	H	68.0	-33.6	34.4	40.0	5.6	375.0	225.0	
5	117.504	V	58.6	-30.5	28.1	40.0	11.9	131.0	169.0	
6	135.127	V	66.7	-31.8	34.9	40.0	5.1	138.0	323.0	
7	162.116	V	66.4	-30.7	35.7	40.0	4.3	259.0	336.0	
8	349.926	H	62.8	-22.0	40.8	47.0	6.2	283.0	233.0	

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■ PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	37.391	V	65.4	-30.4	35.0	40.0	5.0	125.0	256.0	
2	47.854	V	59.5	-27.8	31.7	40.0	8.3	165.0	235.0	
3	64.799	V	63.2	-30.2	33.0	40.0	7.0	130.0	93.0	
4	80.925	V	67.6	-33.6	34.0	40.0	6.0	228.0	134.0	
5	98.442	V	66.6	-28.4	38.2	40.0	1.8	206.0	157.0	
6	135.024	V	66.8	-31.8	35.0	40.0	5.0	126.0	299.0	
7	349.981	H	63.1	-22.0	41.1	47.0	5.9	162.0	272.0	

◆ Calculation – SAC #4(10 m)

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

Margin(QP)[dB] = Limit[dB( $\mu$ V/m)] - Result(QP) [dB( $\mu$ 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



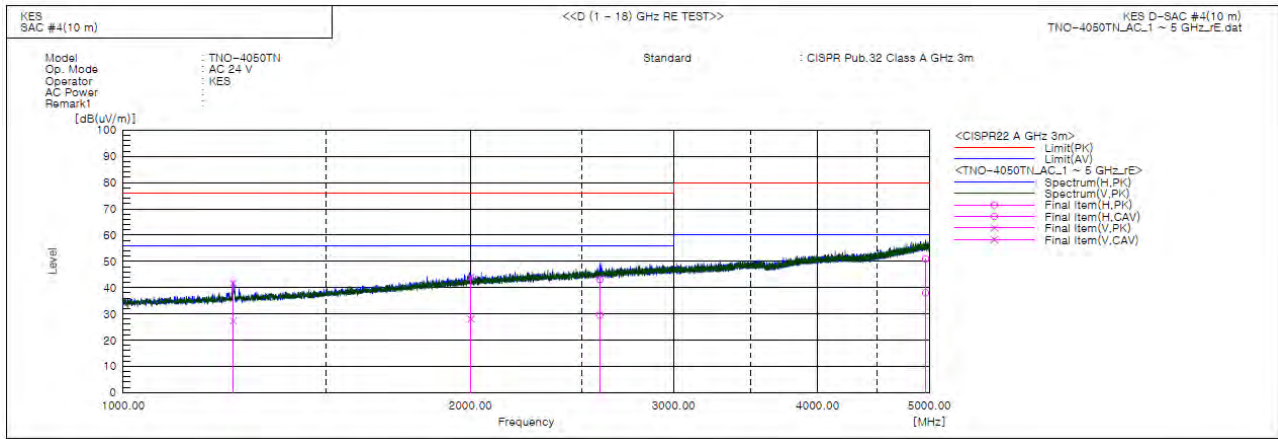
## KES Co., Ltd.

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www.kes.co.kr

Test report No.:  
KES-E1-17T0750  
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## Radiated Electric Field Emissions(Above 1 GHz)

### ■ AC 24 V 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	1246.370	V	46.4	32.0	-4.6	41.8	27.4	76.0	56.0	34.2	28.6	101.0	141.0	
2	2002.620	V	41.1	25.2	2.8	43.9	28.0	76.0	56.0	32.1	28.0	299.0	22.0	
3	2590.175	H	37.1	23.5	6.0	43.1	29.5	76.0	56.0	32.9	26.5	118.0	187.0	
4	4963.070	H	33.5	20.5	17.5	51.0	38.0	80.0	60.0	29.0	22.0	150.0	24.0	

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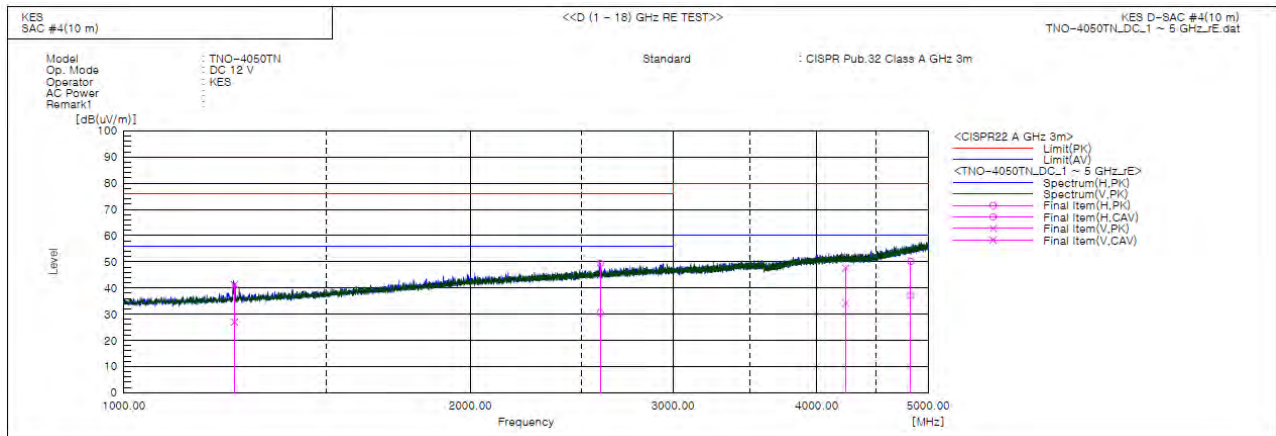


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### ■ DC 12 V Mode



#### 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	1247.910	V	45.9	31.6	-4.6	41.3	27.0	76.0	56.0	34.7	29.0	109.0	345.0	
2	2594.285	H	43.4	24.5	6.0	49.4	30.5	76.0	56.0	26.6	25.5	127.0	276.0	
3	4239.090	V	34.7	21.3	12.9	47.6	34.2	80.0	60.0	32.4	25.8	294.0	66.0	
4	4828.495	H	33.7	20.7	16.4	50.1	37.1	80.0	60.0	29.9	22.9	100.0	320.0	

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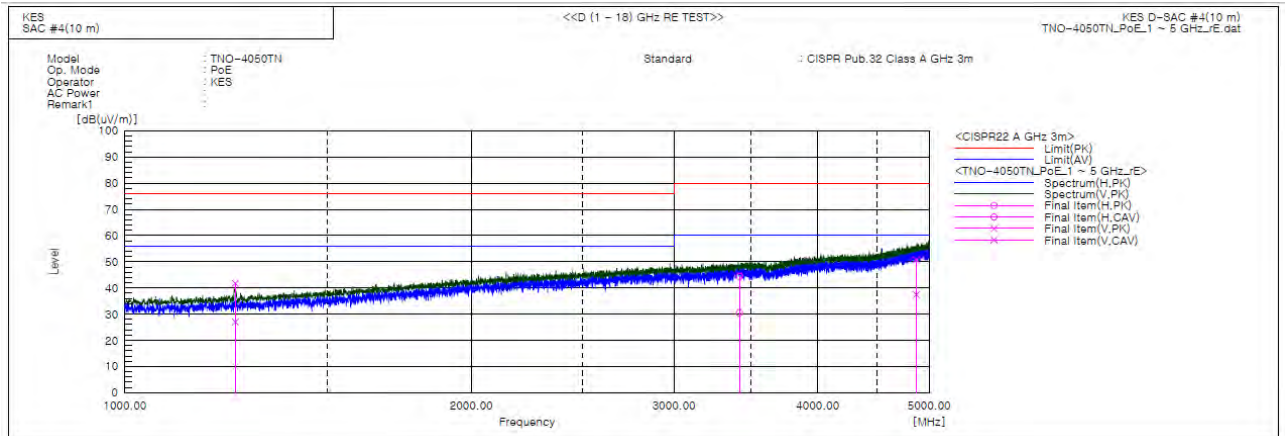


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### ■ PoE Mode



#### 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	1247.195	V	46.3	31.6	-4.6	41.7	27.0	76.0	56.0	34.3	29.0	106.0	341.0	
2	3420.675	H	35.4	21.5	9.0	44.4	30.5	80.0	60.0	35.6	29.5	208.0	356.0	
3	4874.320	V	34.0	20.6	16.8	50.8	37.4	80.0	60.0	29.2	22.6	100.0	17.0	

### ◆ Calculation

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

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

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## Test Setup Photos and Configuration

### Conducted Voltage Emissions



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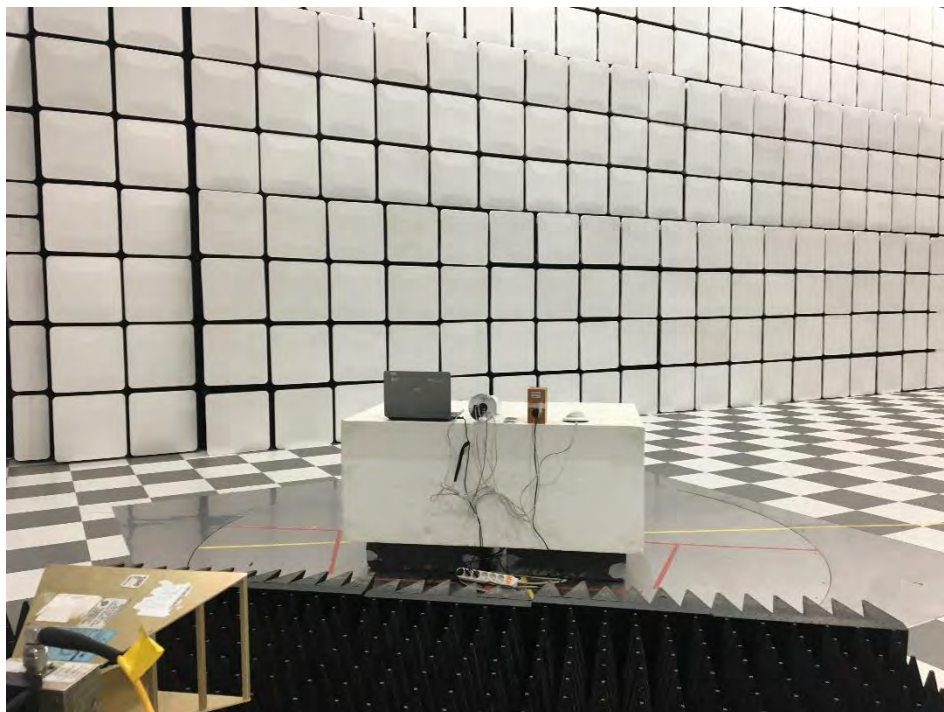


## Radiated Electric Field Emissions(Below 1 GHz)



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## Radiated Electric Field Emissions(Above 1 GHz)



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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

(Internal View)



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## EUT Internal View – Board 1

(Top)



(Bottom)

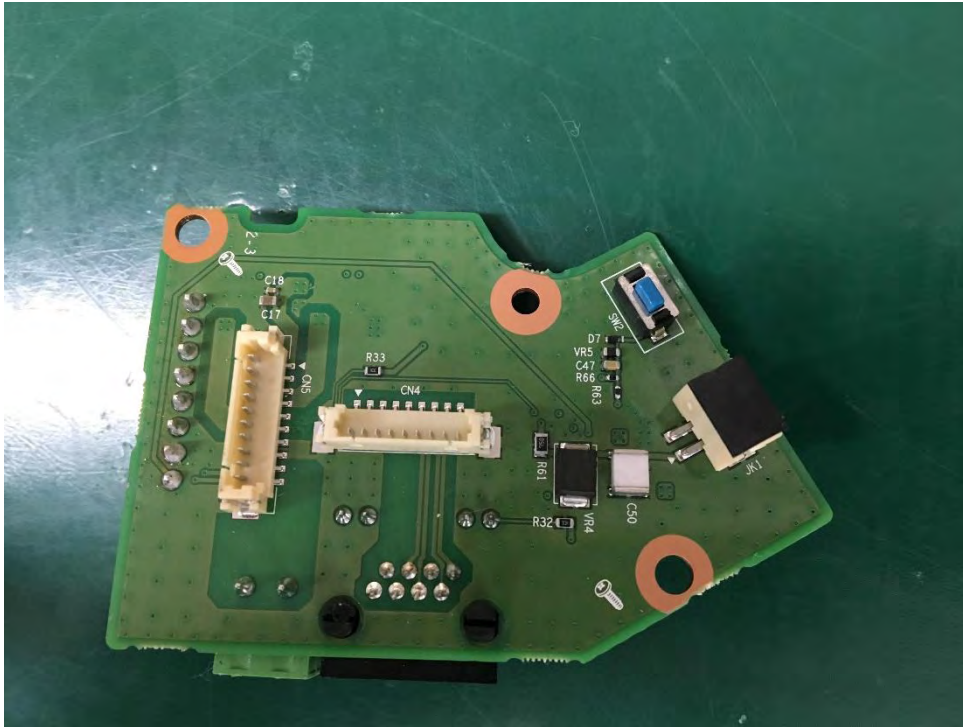


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## EUT Internal View – Board 2

(Top)



(Bottom)



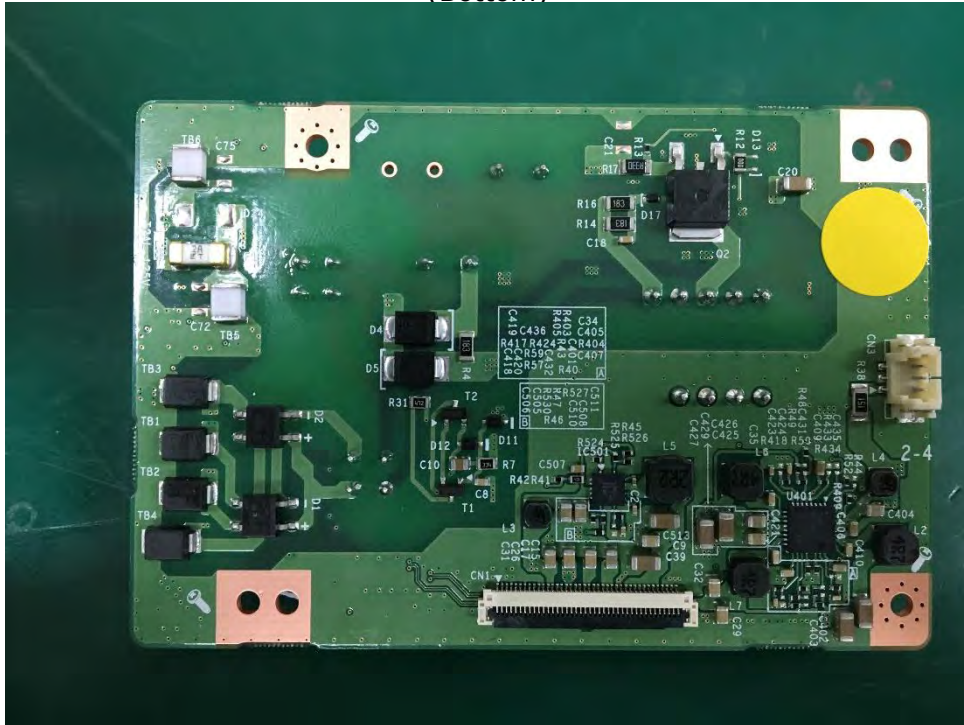
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## EUT Internal View – Board 3

(Top)



(Bottom)

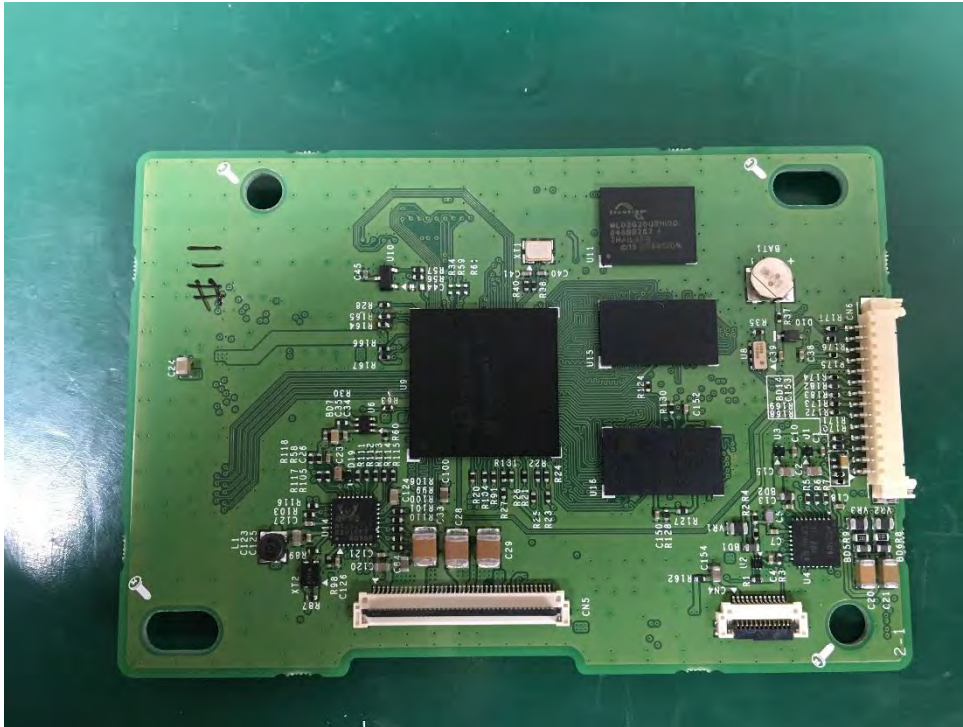


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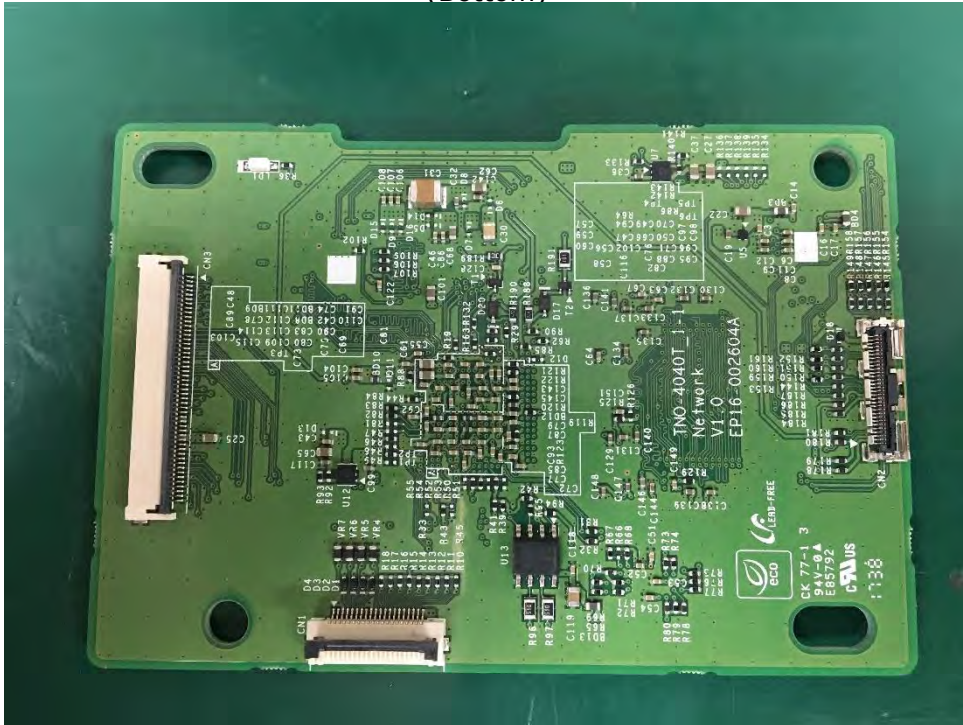


## EUT Internal View – Board 4

(Top)



(Bottom)

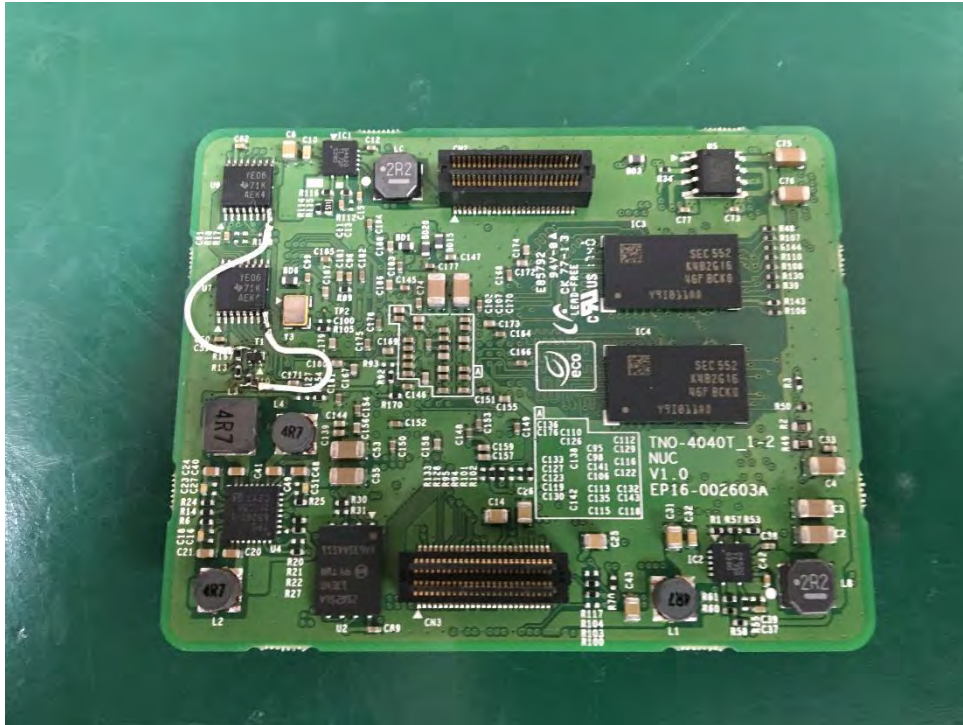


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## EUT Internal View – Board 5

(Top)



(Bottom)



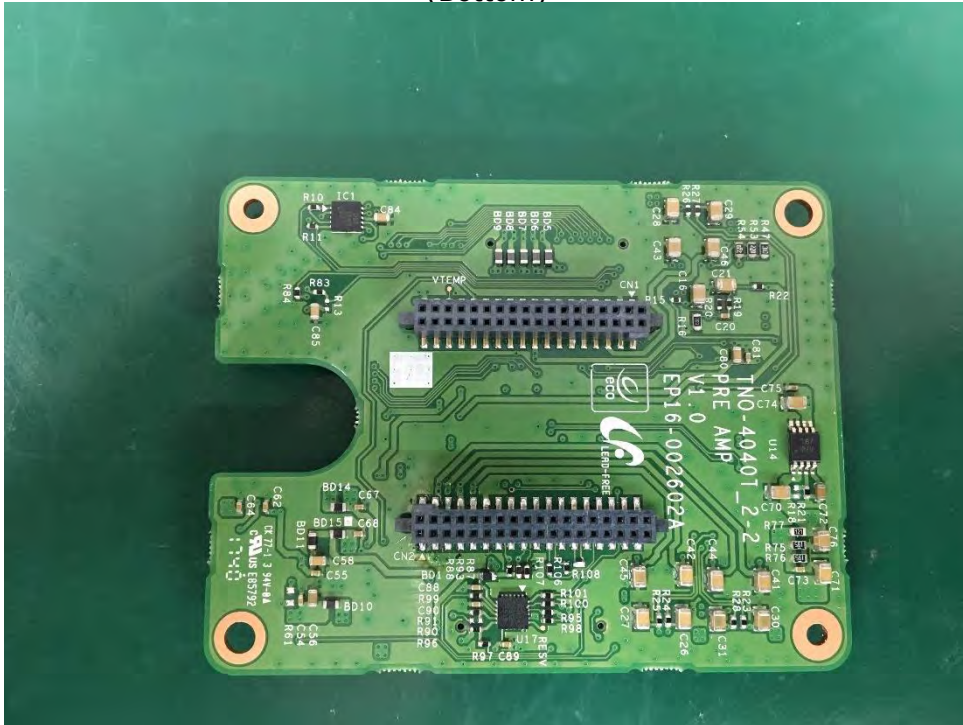
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## EUT Internal View – Board 6

(Top)



(Bottom)

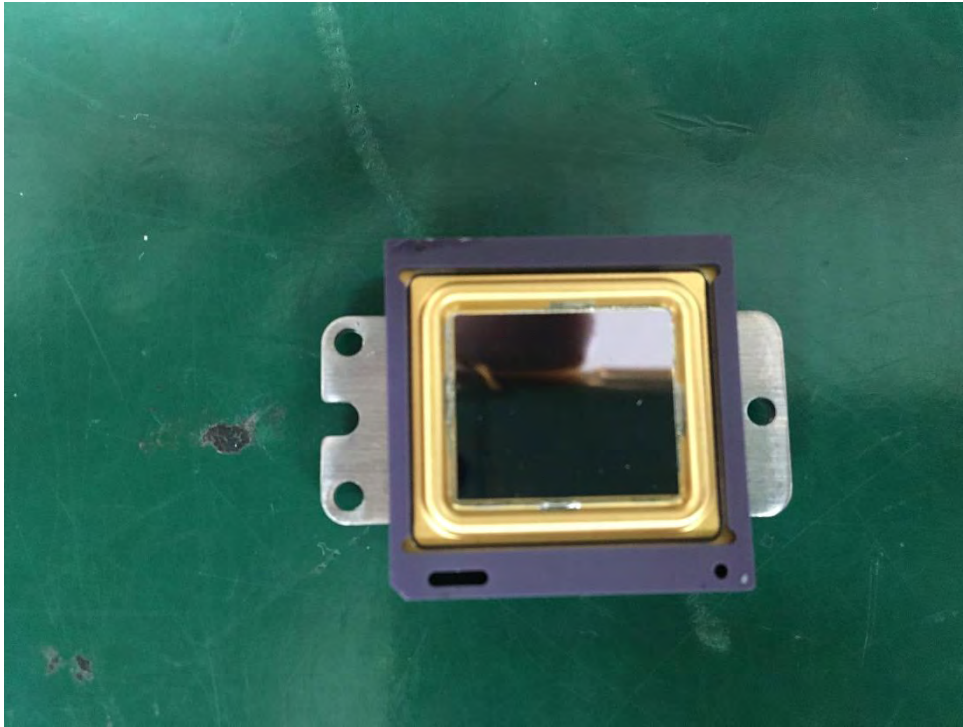


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## EUT Internal View – Lens 1

(Top)



(Bottom)



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## EUT Internal View – Lens 2

(Top)

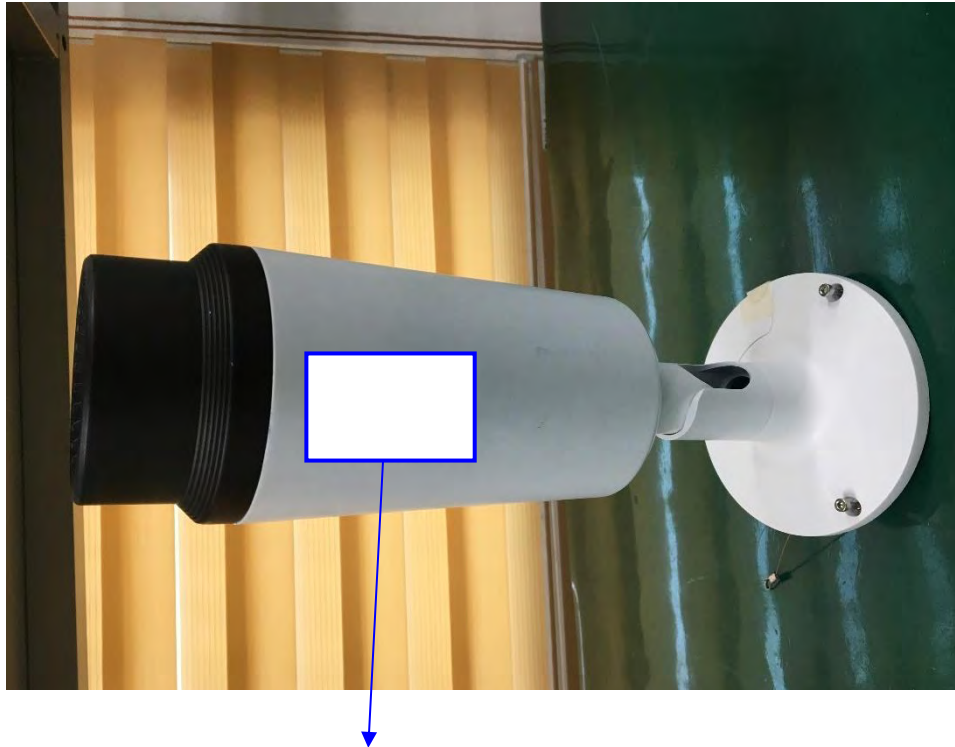


(Bottom)



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## Label Photographs



This device complies with part 15 of the FCC Rules. Operation in subject to the following two conditions: (1) This device Sep not cause harmful interference, and (2) this device must accept any interference received, including interference that Sep cause undesired operation.

CAN ICES-3(A) / NMB-3(A)