



EMC TEST REPORT For RCM

Test Report No. : KES-E1-19T0244

Date of Issue : Apr. 18, 2019

Product name : NETWORK CAMERA

Model/Type No. : QND-8030R

Variant Model : -

Applicant : Hanwha Techwin Co., Ltd.

Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488, KOREA

Manufacturer : 1. Hanwha Techwin (Tianjin) Co.,Ltd.
2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
3. D-TECH CO.,LTD.

Manufacturer Address : 1. No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,
300385, People's Republic of China
2. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do,
Korea (Suwon Industrial Complex)

Date of Receipt : Apr. 09, 2019

Test date : Apr. 13, 2019

Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Dong In, Kim
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
Apr. 18, 2019	KES-E1-19T0244	Issued

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1.0 General Product Description

Main Specifications of EUT are:

1/2.8" 5MP CMOS
2592(H)x1944(V)
None
None
Color: 0.15Lux(F1.6, 1/30sec) (TBD)
BW: 0Lux(IR LED on)
CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P) for installation
3.2~10mm(3.1x) motorized varifocal
F1.6(Wide)~F2.9(Tele)
H: 100.3°(Wide)~31.2°(Tele) / V: 72.3°(Wide)~23.5°(Tele) / H: 133.1°(Wide)~38.8°(Tele)
None
Simple focus
None
None
None
0°~350° / 0°~67° / 0°~355°
None
None
None
None
None
None
None
None
20m(65.62ft)
Displayed up to 85 characters
Auto(ICR)
BLC, WDR, SDR
120dB
SSNR
None
None
4ea, polygonal zones
6ea, rectangular zones
Low / Middle / High
ATW / AWC / Manual / Indoor / Outdoor
Support
Minimum / Maximum / Anti flicker (1/5~1/12,000sec)
None
Flip, Mirror, Hallway view(90°/270°)
Defocus detection, Directional detection, Motion detection, Enter/Exit, Tampering, Virtual line
None
None

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Input 1ea / Output 1ea
Analytics, Network disconnect, Alarm input
File upload via FTP and e-mail
Notification via e-mail
SD/SDHC/SDXC or NAS recording at event triggers
Alarm output
None
None
None
None
None
None
None
None
None
None
None
None
None
RJ-45(10/100BASE-T)
H.265/H.264: Main/High, MJPEG
2592x1944, 2592x1464, 2560x1920, 2560x1440, 1920 x 1080, 1280 x 960, 1280 x 720, 800 x 600, 800 x 448, 720 x 576, 720 x 480, 640 x 480, 640 x 360
H.265/H.264: Max. 30fps/25fps(60Hz/50Hz)
MJPEG: Max. 15fps/12fps(60Hz/50Hz)
WiseStreamII
H.264/H.265: Target bitrate level control
MJPEG: Quality level control
H.264/H.265: CBR or VBR
MJPEG: VBR
Unicast(6 users) / Multicast
Multiple streaming (Up to 3 profiles)
None
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
HTTPS(SSL) Login Authentication
Digest Login Authentication
IP Address Filtering
User access log
802.1X Authentication(EAP-TLS, EAP-LEAP)
Device Certificate(Hanwha Techwin Root CA)
Micro SD/SDHC/SDXC 1slot 256GB (TBD)
ONVIF Profile S/G/T
SUNAPI(HTTP API)
Wisenet open platform
English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch
Supported OS: Windows 7, 8.1, 10, Mac OS X 10.10, 10.11, 10.12
Recommended Browser: Google Chrome
Supported Browser: MS Explore11, MS Edge, Mozilla Firefox(Window 64bit only), Apple Safari(Mac OS X only)
512MB RAM, 256MB Flash
-10°C ~ +40°C (+14°F ~ +104°F) / Less than 90% RH (TBD)
-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH (TBD)
IP42 (TBD) , IK08
PoE(IEEE802.3af, Class3)
TBD
White / Plastic
RAL9003
Ø119.8x98.8mm(Ø4.72x3.89"), TBD

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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 ☐ 240 Vac ☐ 100 Vac ☐ 24 Vac ☐ 12 Vdc ☒ PoE

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	QND-8080R	-	Hanwha Techwin (Tianjin) Co.,Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adaptor	POE 36U-1AT-R	P90215791A1	PHIHONG	-
Notebook	ProBook4430s	-	HP	-
Notebook Adaptor	SeriesPPP0009H	-	CHICONY POWER TECHNOLOGY (SUZHOU) CO.,LTD,	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Button Alarm	-	-	-	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	POE Adaptor	RJ-45	3.0	U
	2 Pin	Alarm	2 Pin	3.0	U
	2 Pin	Button Alarm	2 Pin	3.0	U
POE Adaptor	RJ-45	Notebook	RJ-45	2.0	U

* Unshielded=U, Shielded=S

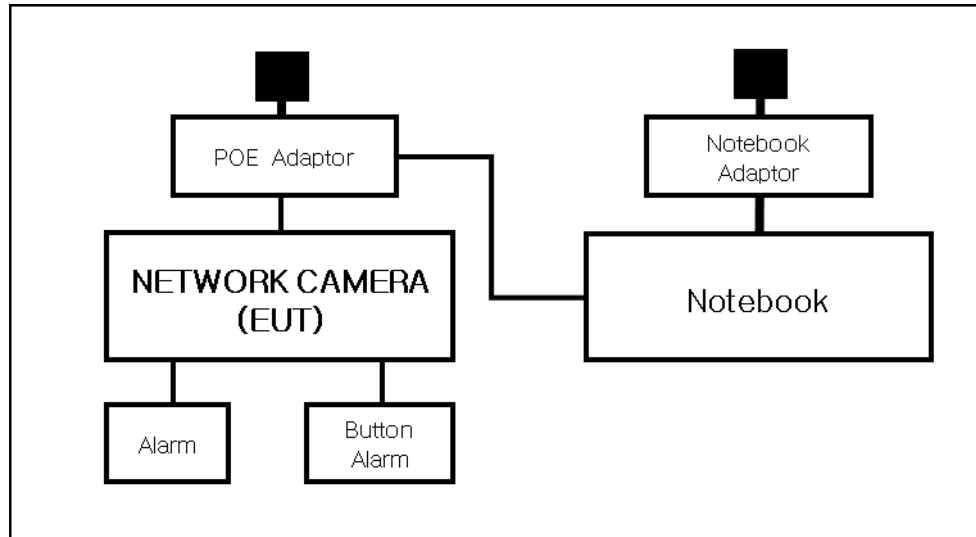
1.7 EUT Operating Mode(s)

Test mode	operating
OPERATION	EUT Monitoring, Ping Test

EUT Test operating S/W		
Name	Version	Manufacture Company
-	-	-

1.8 Configuration

■ AC Main
□ DC Main



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 C63.4:2014 and CISPR 16-1-4:2012

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-4308, C-4798, T-2311, G-914
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 17 07 01633 001

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-CISPR 32:2016 | ☐ Class A | ☐ Class B |
| ☒ AS/NZS CISPR32:2015 | ☒ Class A | ☐ Class B |
|
 | | |
| ☐ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2009 | | |
| ☐ 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

N/A

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	101781	04, 25, 2019
☐	LISN	ENV216	R & S	101787	01, 04, 2020
☐	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 26, 2019

Test Conditions

Temperature:

°C

Relative Humidity:

% 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

It is not tested apply because it is powered by PoE



2.2 Conducted Emissions at Telecommunication Ports

Test Date
Apr. 13, 2019

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	101781	04, 25, 2019
☒	LISN	ENV216	R & S	101787	01, 04, 2020
☒	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 26, 2019
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 07, 2020

Test Conditions
Temperature: 22,0 °C
Relative Humidity: 43,9 % 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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date
Apr. 13, 2019

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

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, 09, 2020
☒	AMPLIFIER	SCU 01	R & S	100603	11, 26, 2019
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020
☒	ATTENUATOR	8491A	HP	32173	03, 11, 2020

Test Conditions
Temperature: 23,1 °C
Relative Humidity: 42,9 % R.H.

Frequency Range of Measurement
30 MHz to 1 GHz

Instrument Settings
IF Band Width: 120 kHz

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date
Apr. 13, 2019

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, 06, 2019
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2019
☐	ATTENUATOR	8491A	HP	35496	03, 11, 2020
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	03, 12, 2021

Test Conditions
Temperature: 23,1 °C
Relative Humidity: 43,1 % 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.



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APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

N/A

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NEUTRAL LINE

N/A

◆ 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))

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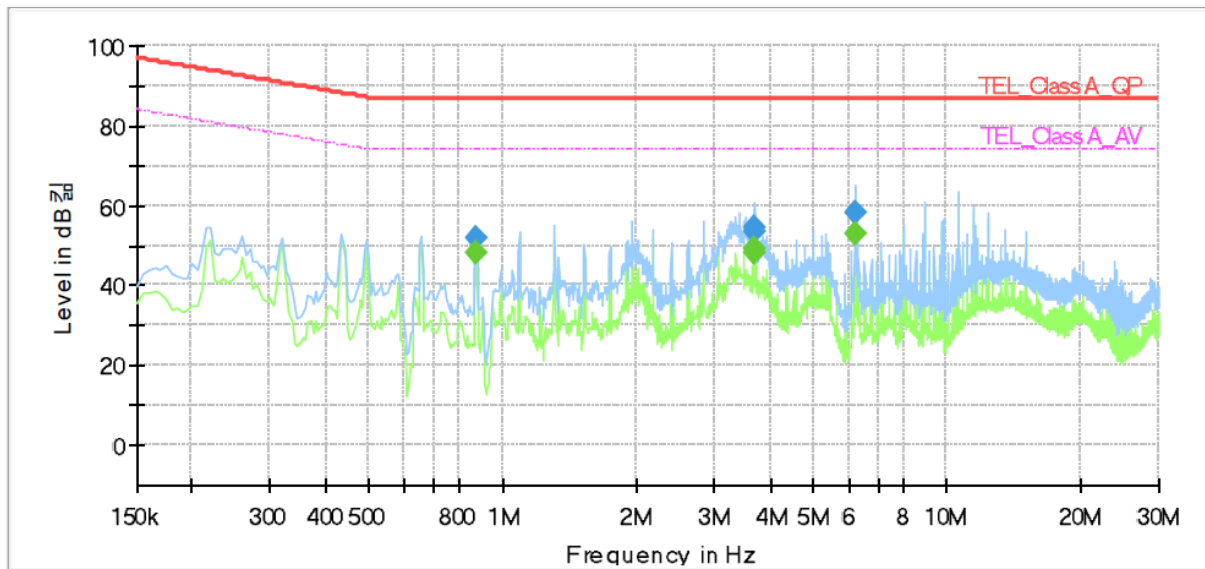


Conducted Emissions at Telecommunication Ports

[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: QND-8080R
Mode: 10 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.870000	---	48.14	74.00	25.86	1000.0	9.000	Single Line	19.8
0.870000	51.74	---	87.00	35.26	1000.0	9.000	Single Line	19.8
3.695000	---	48.21	74.00	25.79	1000.0	9.000	Single Line	19.7
3.695000	54.47	---	87.00	32.53	1000.0	9.000	Single Line	19.7
3.700000	---	49.14	74.00	24.86	1000.0	9.000	Single Line	19.7
3.700000	53.56	---	87.00	33.44	1000.0	9.000	Single Line	19.7
6.250000	---	52.67	74.00	21.33	1000.0	9.000	Single Line	19.8
6.250000	58.40	---	87.00	28.60	1000.0	9.000	Single Line	19.8

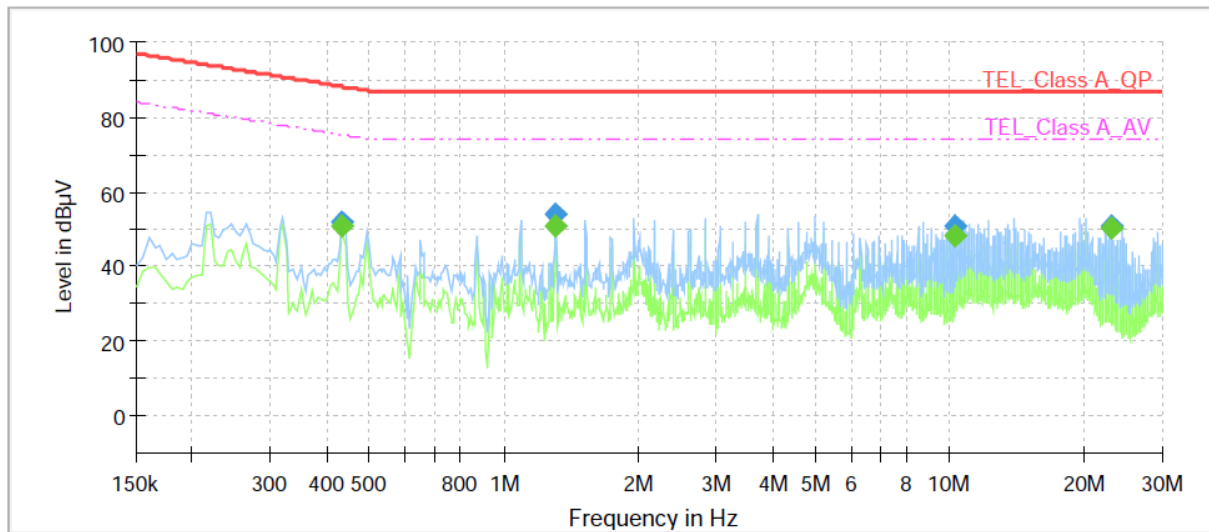
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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: QND-8080R
Mode: 100 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.435000	---	50.62	75.16	24.54	1000.0	9.000	Single Line	19.7
0.435000	51.97	---	88.16	36.19	1000.0	9.000	Single Line	19.7
1.305000	---	50.85	74.00	23.15	1000.0	9.000	Single Line	19.6
1.305000	54.13	---	87.00	32.87	1000.0	9.000	Single Line	19.6
10.245000	---	48.17	74.00	25.83	1000.0	9.000	Single Line	19.8
10.245000	50.70	---	87.00	36.30	1000.0	9.000	Single Line	19.8
23.130000	---	50.20	74.00	23.80	1000.0	9.000	Single Line	20.3
23.130000	50.97	---	87.00	36.03	1000.0	9.000	Single Line	20.3

◆ 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))

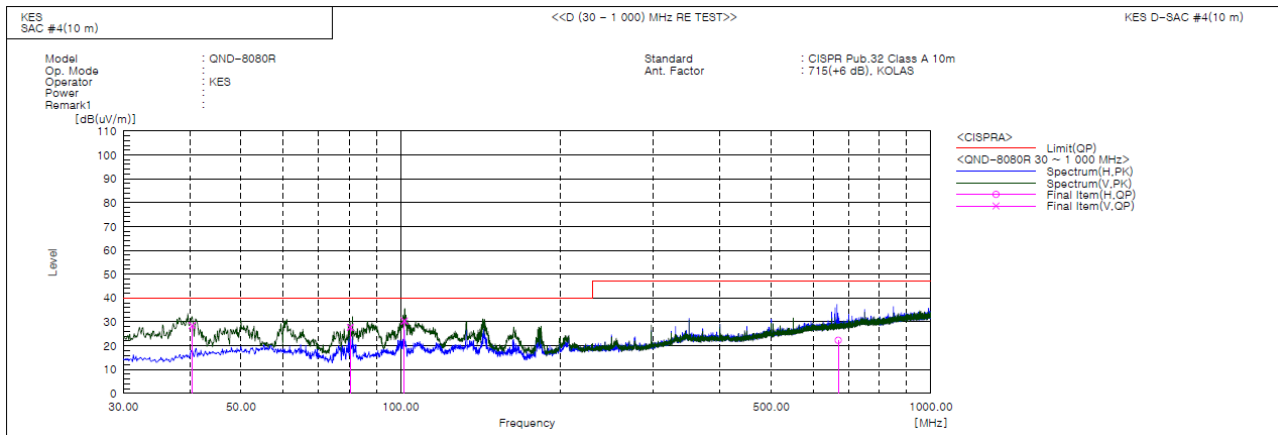


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Radiated Electric Field Emissions(Below 1 GHz)



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	40.427	V	51.4	-22.9	28.5	40.0	11.5	103.0	322.0	
2	80.341	V	55.4	-27.7	27.7	40.0	12.3	111.0	232.0	
3	101.663	V	53.0	-22.6	30.4	40.0	9.6	105.0	32.0	
4	668.651	H	31.4	-9.1	22.3	47.0	24.7	371.0	55.0	

◆ 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)]

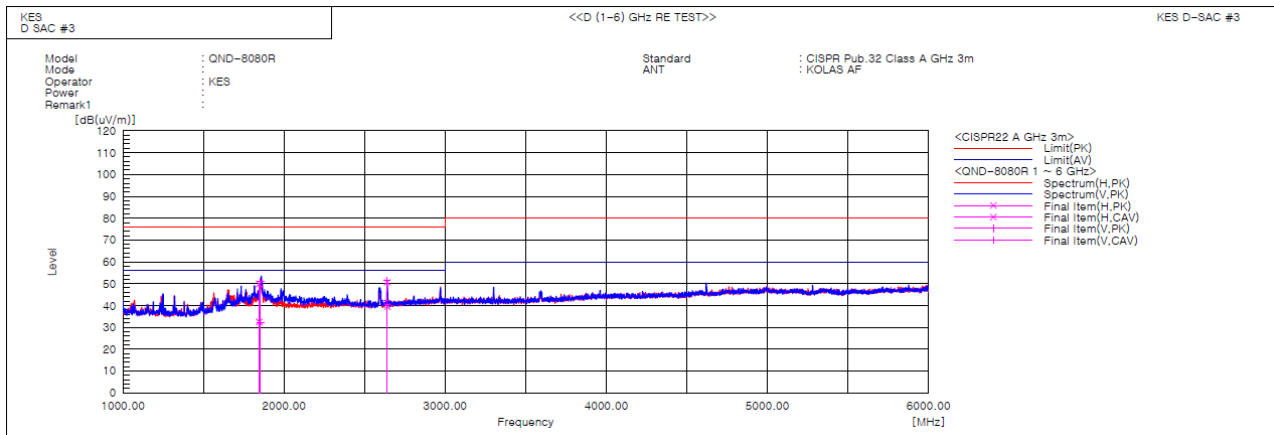
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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

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Radiated Electric Field Emissions(Above 1 GHz)



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)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1846.522	H	52.7	35.3	-2.8	49.9	32.5	76.0	26.1	23.5	100.0	358.1	
2	1854.121	V	53.6	34.8	-2.8	50.8	32.0	76.0	25.2	24.0	100.0	357.1	
3	2640.490	V	51.2	42.0	0.3	51.5	42.3	76.0	24.5	13.7	100.0	193.0	
4	2640.590	H	50.3	39.2	0.3	50.6	39.5	76.0	25.4	16.5	100.0	210.6	

◆ Calculation

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

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

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

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



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Report No.:
KES-E1-19T0244
Page (22) of (31)

Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

N/A

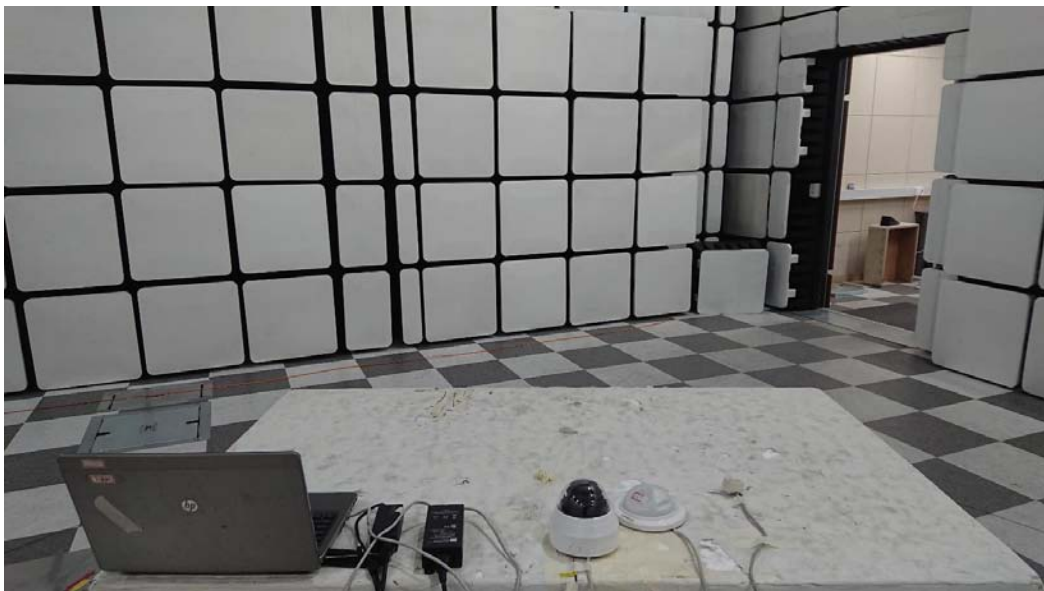
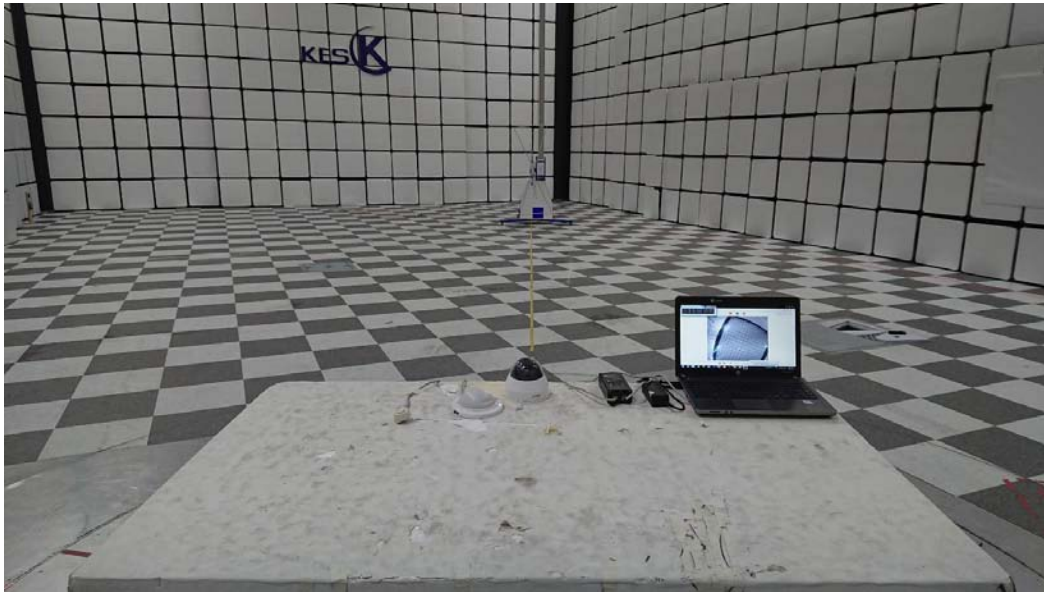
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Conducted Telecommunication Emissions



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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)



EUT Internal View – Main Board

(Top)



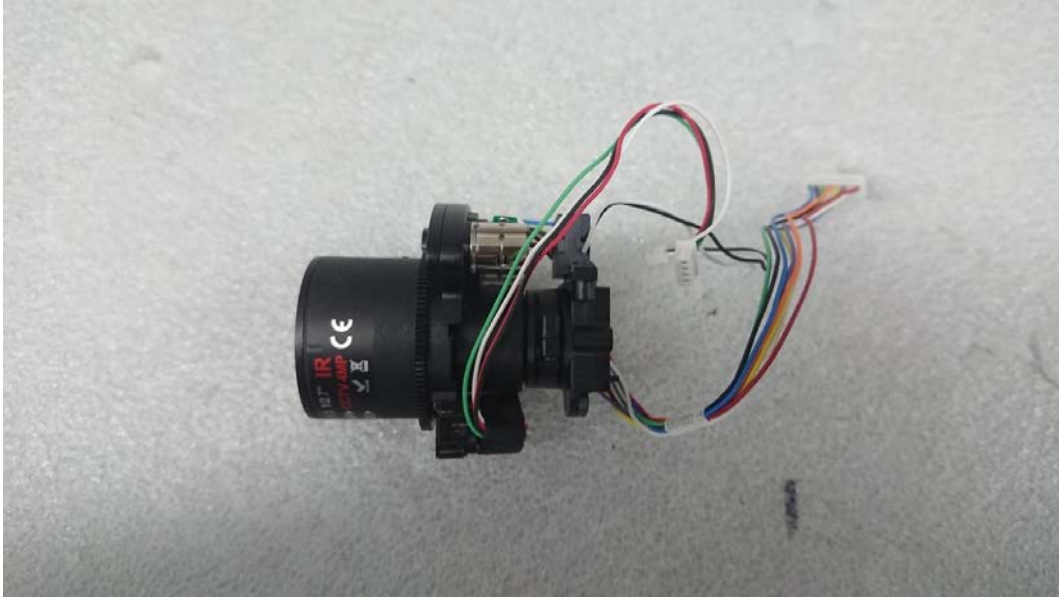
(Bottom)



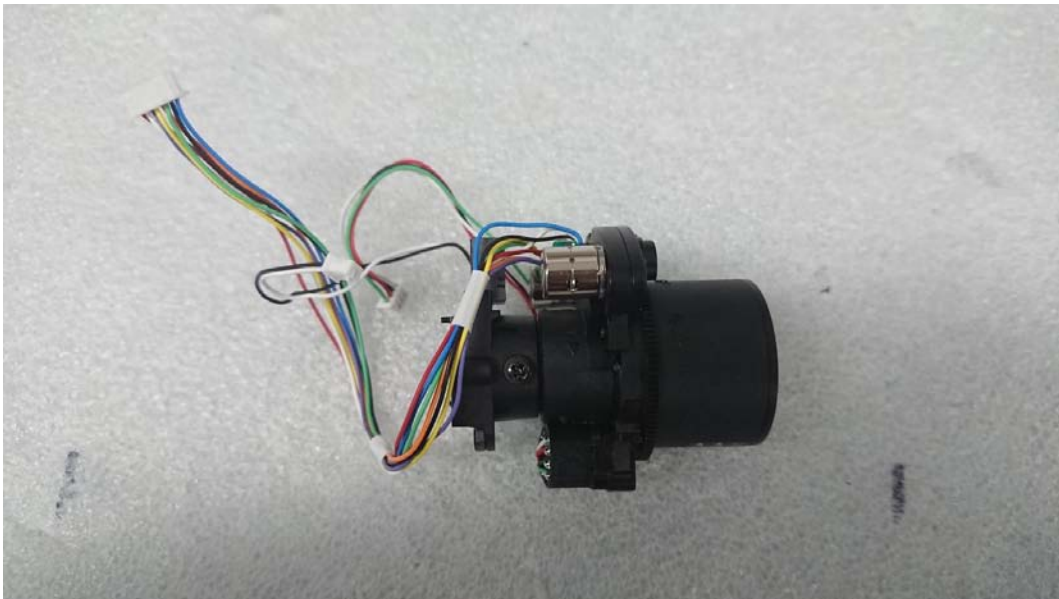
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EUT Internal View – Lens

(Top)



(Bottom)



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EUT Internal View – Lesn Board

(Top)



(Bottom)



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EUT Internal View - IR Board

(Top)



(Bottom)



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