



EMC TEST REPORT For FCC

Test Report No. : KES-E1-17T0496-R1
Date of Issue : Aug. 05, 2020
Product name : CCTV CAMERA
Model/Type No. : HCB-6000N
Variant Model : SCB-6005
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 : Jul. 20, 2017
Test date : Jul. 27, 2017 ~ Jul. 28, 2017
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Young Suk, Song
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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

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3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 03, 2017	KES-E1-17T0496	Issued
Aug. 05, 2020	KES-E1-17T0496-R1	Reissuance due to the addition of a derivative

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/2.8" 2M CMOS
Total Pixels	1,945(H) x 1,109(V) 2.16M pixels
Effective Pixels	1,945(H) x 1,097(V) 2.13M pixels
Scanning System	Progressive Scan
Min. Illumination	Color : 0.15Lux (F1.2, 50IRE); 0.09Lux (F1.2, 30IRE) B/W : 0.015Lux (F1.2, 50IRE); 0.009Lux (F1.2, 30IRE)
S / N Ratio	52dB (AGC off, Weight on)
Video Output	BNC(AHD / TVI / CVI / CVBS Selectable)
Resolution	1920 x 1080
Max. Framerate	30fps @1080p 25fps @1080p
Lens Type	
Focal Length (Zoom Ratio)	-
Max. Aperture Ratio	-
Angular Field of View	-
Min. Object Distance	-
Focus Control	-
Lens Type	-
Mount Type	C/CS
Operational	
IR LED	-
Viewable length	-
On Screen Display	Multi-language Support(16) English, Japanese, Spanish, French, Portuguese, Korean, German, Italian, Russian, Polish, Czech, Romanian, Serbian, Swedish, Danish, Turkish
Camera Title	Off / On (Displayed 15 characters)

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Day & Night	Auto (ICR) / External / Color / B/W
Backlight Compensation	Off / User BLC / HLC
Wide Dynamic Range	120dB
Contrast Enhancement	-
Digital Noise Reduction	SSNR4 (Off / On)
Defog	AUTO / MANUAL / OFF
Digital Image Stabilization	Not support
Motion Detection	Off / On(4 zones)
Privacy Masking	Off / On (4zones rectangle)
Gain Control	Off / Low / Middle / High / Very High
White Balance	ATW / Outdoor / Indoor / Manual / AWC (1,800K° ~ 10,500K°)
LDC (Lens Distortion Correction)	Not support
Electronic Shutter Speed	1sec~ 1/12,000sec
Digital Zoom	Not support
Reverse	Off / H-Rev / V-Rev / HV-Rev
Profile	Basic, Day & Night, Backlight, ITS, Indoor, User
Intelligent Video Analytics	Not support
Alarm	(MD) output 1, External D/N 1
Remote control interface	Coaxial, RS-485
Protocol	Coax : Pelco-C(coaxitron), ACP(AHD Coax Protocol) RS-485 : Samsung T/E, Pelco D/P, Panasonic Bosch, Honeywell, Vicon, GE, AD
Video Transmission Distance	500m(5C2V Coaxial Cable)
Environmental	
Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / Less than 90% RH
Ingress Protection	-
Vandal Resistance	-
Electrical	
Input Voltage/Current	Dual (24VAC±10% & 12VDC±10%)
Power Consumption	Max. 3.5W
Mechanical	
Color / Material	Ivory / Plastic
Dimension (WxHxD)	92.7*59.6*68.4
Weight	231g

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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

Addition of derivative model for distribution route classification

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
CCTV CAMERA	HCB-6000N	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
MONITOR	M1962DL	010NDTC5Z497	LG Electronics Nanjing Display Co., Ltd.	-
Controller	SPC-1010	C50E67WG10100F	SamSung Techwin Co.,Ltd.	-
Controller Adaptor	RS-AB1000	-	Dongguan Jinhua Sheng Power Technology Co.,Ltd.	-
LENS	AG3Z3112FCS-MPIR	-	computar	-



1.6 External I/O Cabling

- AC 24 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
CCTV CAMERA (E.U.T)	BNC	MONITOR	Component	3.0	S
	IRIS	LENS	IRIS	0.1	U
	2 Pin	Controller	2 Pin	3.0	U

- DC 12 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
CCTV CAMERA (E.U.T)	BNC	MONITOR	Component	3.0	S
	IRIS	LENS	IRIS	0.1	U
	2 Pin	Controller	2 Pin	3.0	U

* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

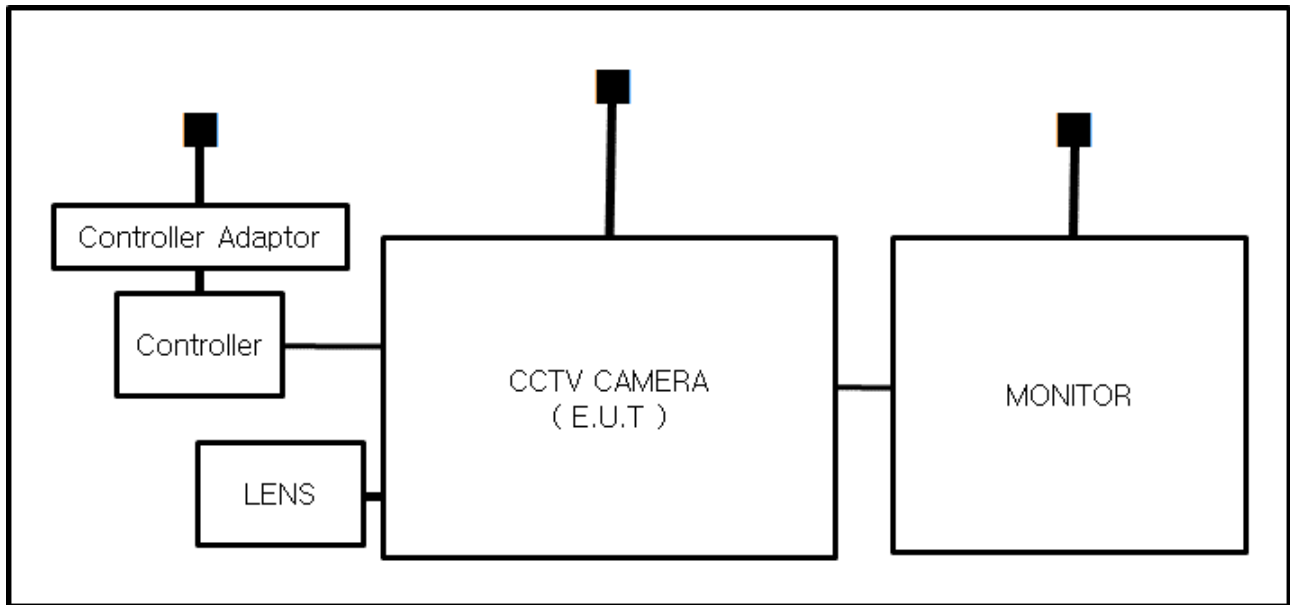
Test mode	operating
AC 24 V	E.U.T Monitoring
DC 12 V	E.U.T Monitoring

E.U.T Test operating S/W		
Name	Version	Manufacture Company
-	-	-

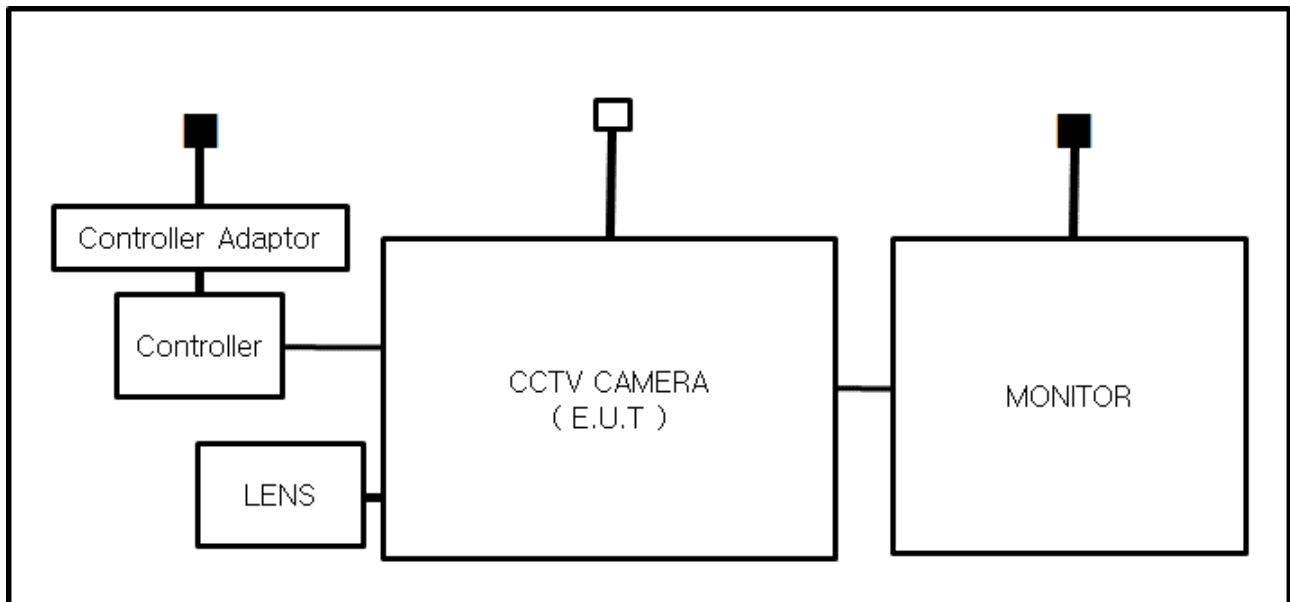
1.8 Configuration

■ AC Main
 □ DC Main

- AC 24 V Mode



- DC 12 V Mode



1.9 Remarks when standards applied

- N/A

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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
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298-1
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-20056, C-20036, T-20040, G-20057
Europe	TÜ V SÜ D	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0003



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



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- | | | |
|---|---|----------------------------------|
| ☐ VCCI V-3 / 2015.04 | ☐ Class A | ☐ Class B |
| ☐ AS/NZS CISPR22:2009 +A1:2010 | ☐ 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 | | |

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2.1 Conducted Emissions at Mains Power Ports

Test Date
Jul. 27, 2017

Test Location
Electro wave Shieldroom

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	04, 27, 2018
☒	LISN	ENV216	R & S	101137	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017

Test Conditions
Temperature: 24,0 °C
Relative Humidity: 53,4 %

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.

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2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jul. 27, 2017

Test Location☐ OPEN AREA TEST SITE #2 ☒ SAC #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, 18, 2018
☒	AMPLIFIER	SCU 01	R & S	100603	12, 13, 2017
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

Test Conditions

Temperature: 25,1 °C

Relative Humidity: 52,1 %

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.

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2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date
Jul. 28, 2017

Test Location
SAC #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	Rohde & Schwarz	100551	04, 17, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	05, 02, 2019

Test Conditions

Temperature: 24,5 °C
Relative Humidity: 48,2 %

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.



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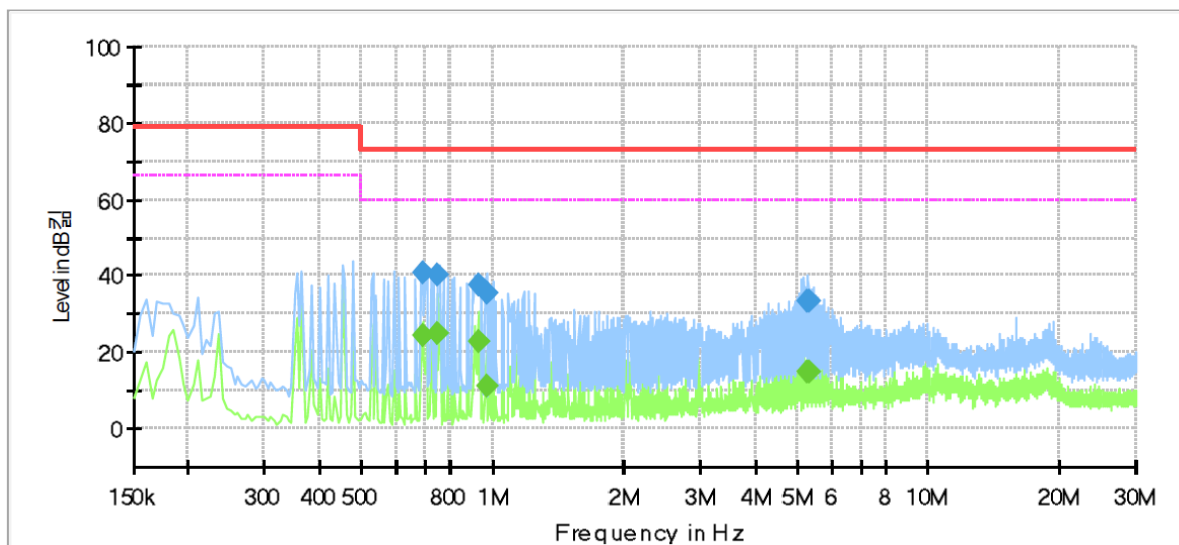
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

- AC 24 V Mode

Common Information

Test Description: Conducted Emission
Model No.: HCB-6000N
Mode: AC 24 V_H
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.690000	---	24.16	60.00	35.84	1000.0	9.000	L1	19.7
0.690000	40.57	---	73.00	32.43	1000.0	9.000	L1	19.7
0.745000	---	24.87	60.00	35.13	1000.0	9.000	L1	19.7
0.745000	40.09	---	73.00	32.91	1000.0	9.000	L1	19.7
0.925000	---	22.98	60.00	37.02	1000.0	9.000	L1	19.8
0.925000	37.38	---	73.00	35.62	1000.0	9.000	L1	19.8
0.970000	---	11.18	60.00	48.82	1000.0	9.000	L1	19.8
0.970000	35.62	---	73.00	37.38	1000.0	9.000	L1	19.8
5.295000	---	14.81	60.00	45.19	1000.0	9.000	L1	19.9
5.295000	33.53	---	73.00	39.47	1000.0	9.000	L1	19.9
5.350000	---	14.88	60.00	45.12	1000.0	9.000	L1	19.9
5.350000	33.55	---	73.00	39.45	1000.0	9.000	L1	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))

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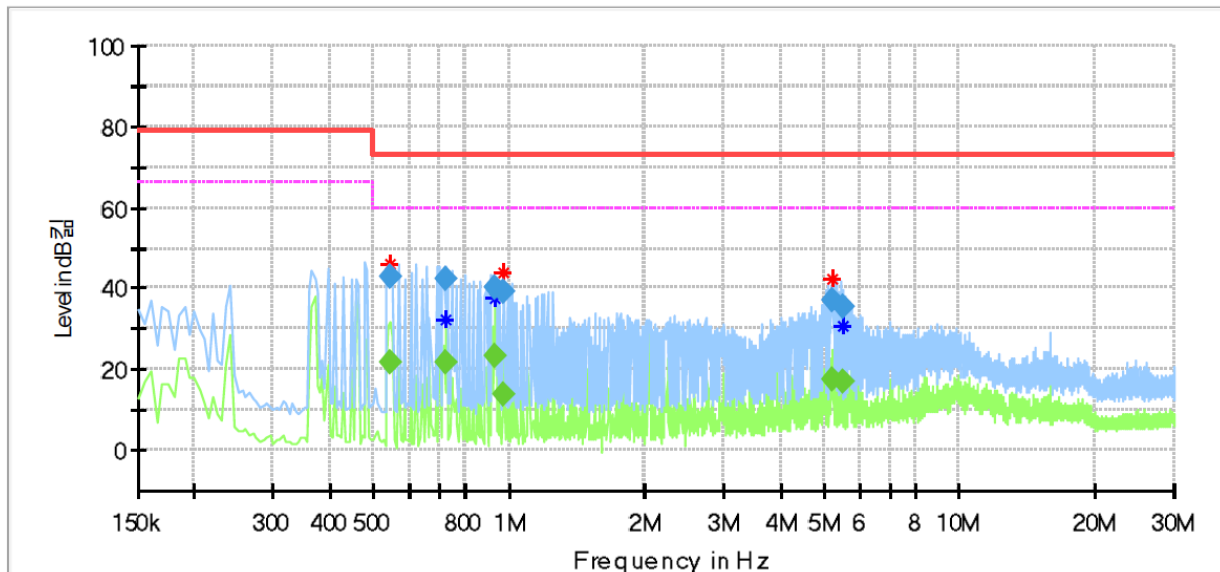
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[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: HCB-6000N
Mode: AC 24 V_N
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.545000	---	21.77	60.00	38.23	1000.0	9.000	N	19.6
0.545000	42.66	---	73.00	30.34	1000.0	9.000	N	19.6
0.725000	---	21.78	60.00	38.22	1000.0	9.000	N	19.7
0.725000	42.43	---	73.00	30.57	1000.0	9.000	N	19.7
0.930000	---	23.18	60.00	36.82	1000.0	9.000	N	19.8
0.930000	40.25	---	73.00	32.75	1000.0	9.000	N	19.8
0.975000	---	13.83	60.00	46.17	1000.0	9.000	N	19.8
0.975000	39.12	---	73.00	33.88	1000.0	9.000	N	19.8
5.200000	---	17.57	60.00	42.43	1000.0	9.000	N	19.9
5.200000	36.83	---	73.00	36.17	1000.0	9.000	N	19.9
5.530000	---	17.15	60.00	42.85	1000.0	9.000	N	19.8
5.530000	35.40	---	73.00	37.60	1000.0	9.000	N	19.8

◆ 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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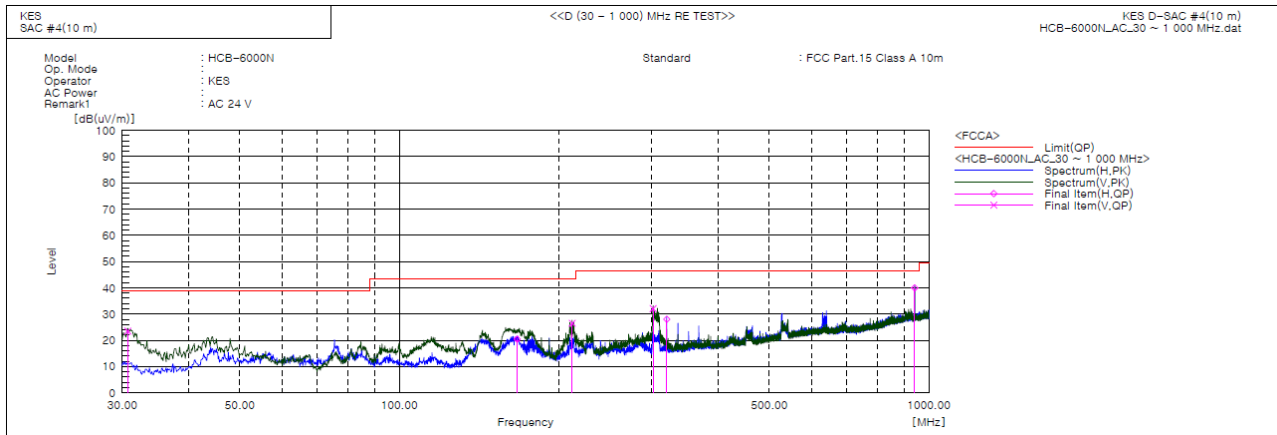
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Radiated Electric Field Emissions(Below 1 GHz)

- AC 24 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	30.728	V 55.7	-32.2	23.5	39.0	15.5	154.0	102.0	
2	167.013	H 50.9	-30.5	20.4	43.5	23.1	393.0	59.0	
3	212.118	V 53.0	-26.5	26.5	43.5	17.0	110.0	175.0	
4	301.721	V 55.8	-23.7	32.1	46.5	14.4	103.0	9.0	
5	320.030	H 51.1	-23.1	28.0	46.5	18.5	216.0	163.0	
6	940.624	H 49.0	-9.1	39.9	46.5	6.6	101.0	4.0	

◆ 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

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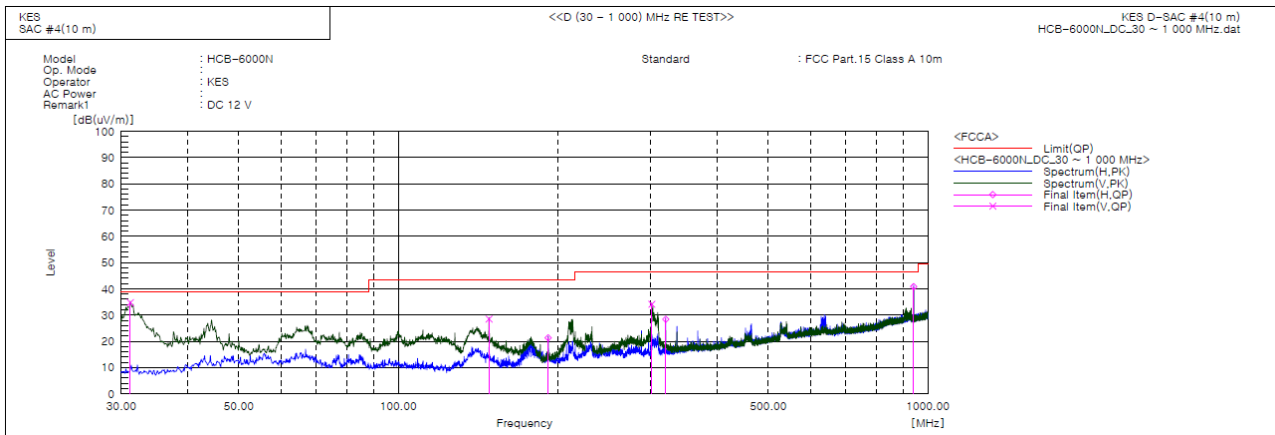
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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- DC 12 V Mode



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	31.213	V	66.8	-32.1	34.7	39.0	4.3	100.0	147.0	
2	148.461	V	59.9	-31.4	28.5	43.5	15.0	105.0	167.0	
3	191.990	H	48.8	-27.5	21.3	43.5	22.2	398.0	172.0	
4	301.236	V	57.9	-23.8	34.1	46.5	12.4	113.0	1.0	
5	320.030	H	51.5	-23.1	28.4	46.5	18.1	232.0	167.0	
6	940.579	H	49.9	-9.1	40.8	46.5	5.7	101.0	4.0	

◆ Calculation – SAC #4(10 m)

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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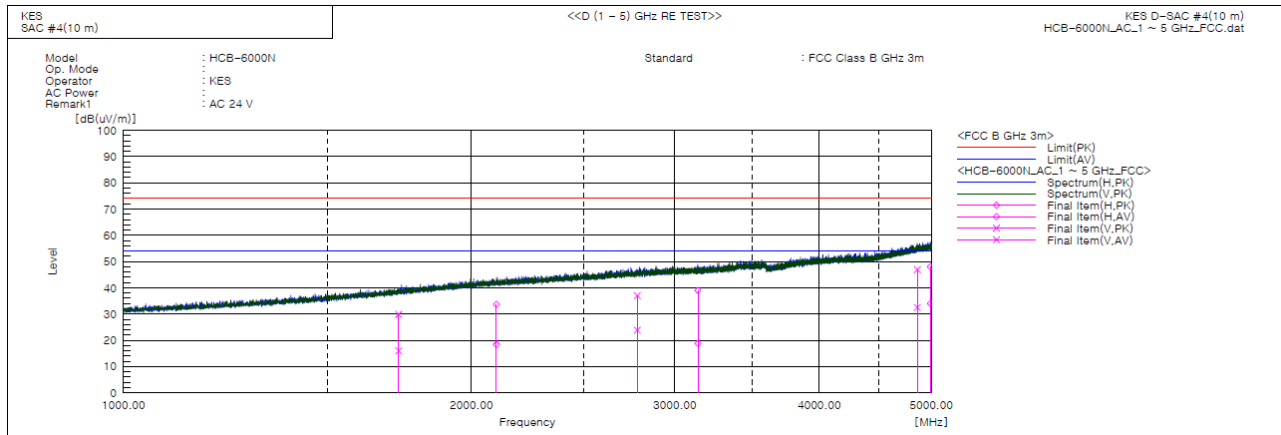
Test report No.:

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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 AV [dB(uV)]	c.f	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1730.538	V	29.7	15.8	0.2	29.9	16.0	74.0	54.0	44.1	38.0	398.0	282.0	
2	2102.631	H	30.2	14.9	3.5	33.7	18.4	74.0	54.0	40.3	35.6	387.0	292.0	
3	2783.499	V	30.0	16.9	7.0	37.0	23.9	74.0	54.0	37.0	30.1	368.0	5.0	
4	3141.245	H	31.0	10.8	8.0	39.0	18.8	74.0	54.0	35.0	35.2	386.0	295.0	
5	4863.530	V	30.2	15.8	16.7	46.9	32.5	74.0	54.0	27.1	21.5	392.0	63.0	
6	4992.820	H	30.4	16.4	17.6	48.0	34.0	74.0	54.0	26.0	20.0	397.0	51.0	

◆ 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

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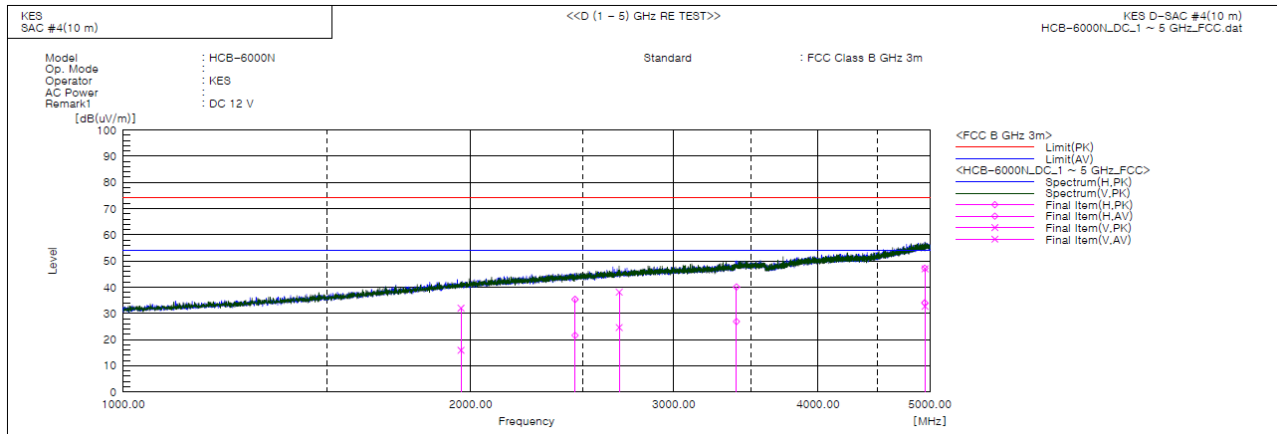
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- DC 12 V Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1962.136	V	29.6	13.5	2.4	32.0	15.9	74.0	54.0	42.0	38.1	397.0	178.0	
2	2463.548	H	30.0	16.3	5.3	35.3	21.6	74.0	54.0	38.7	32.4	113.0	128.0	
3	2690.241	V	31.6	18.1	6.5	38.1	24.6	74.0	54.0	35.9	29.4	388.0	57.0	
4	3399.686	H	31.2	18.0	8.9	40.1	26.9	74.0	54.0	33.9	27.1	395.0	275.0	
5	4950.742	H	29.8	16.6	17.4	47.2	34.0	74.0	54.0	26.8	20.0	391.0	153.0	
6	4953.056	V	29.6	15.3	17.4	47.0	32.7	74.0	54.0	27.0	21.3	399.0	126.0	

◆ 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

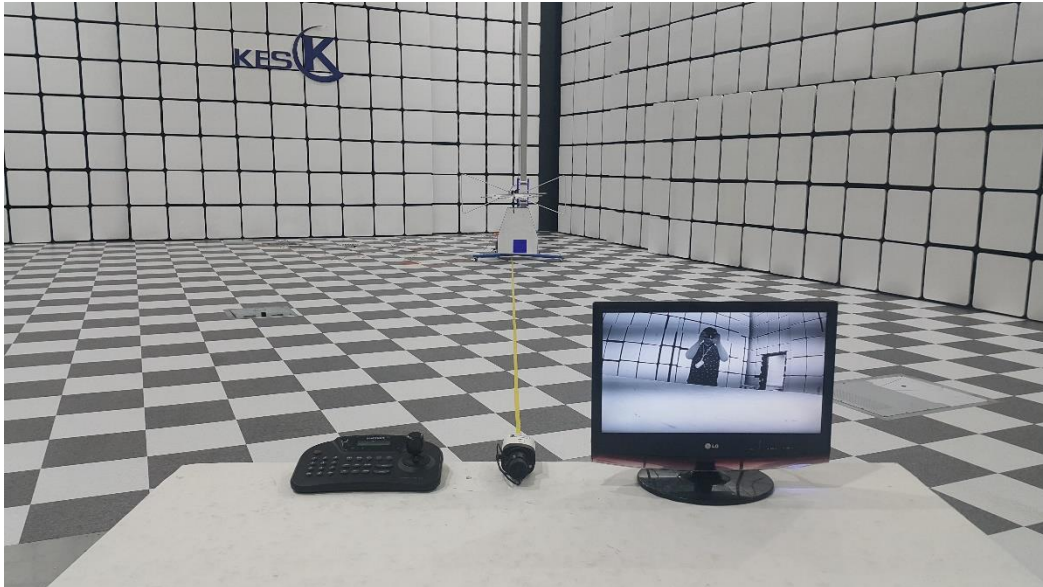
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Test Setup Photos and Configuration

Conducted Voltage Emissions

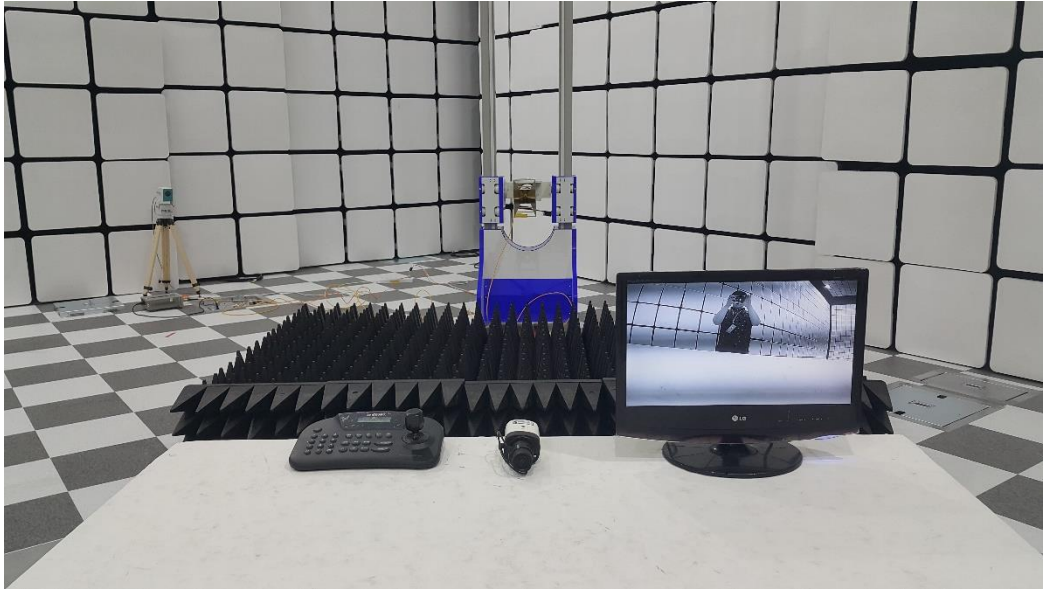


Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs



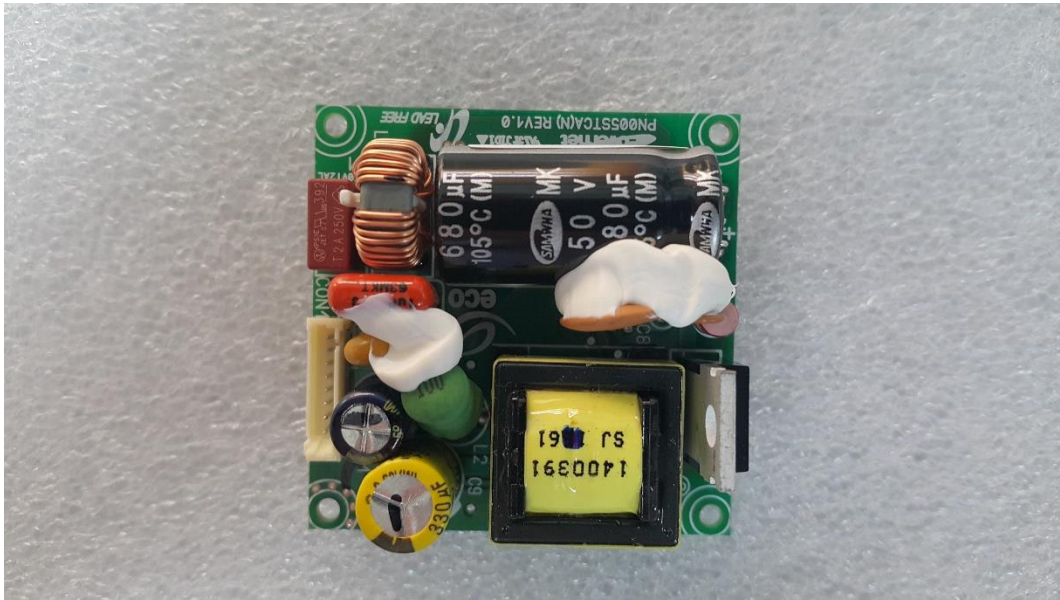
EUT Internal Photographs

(Internal View)

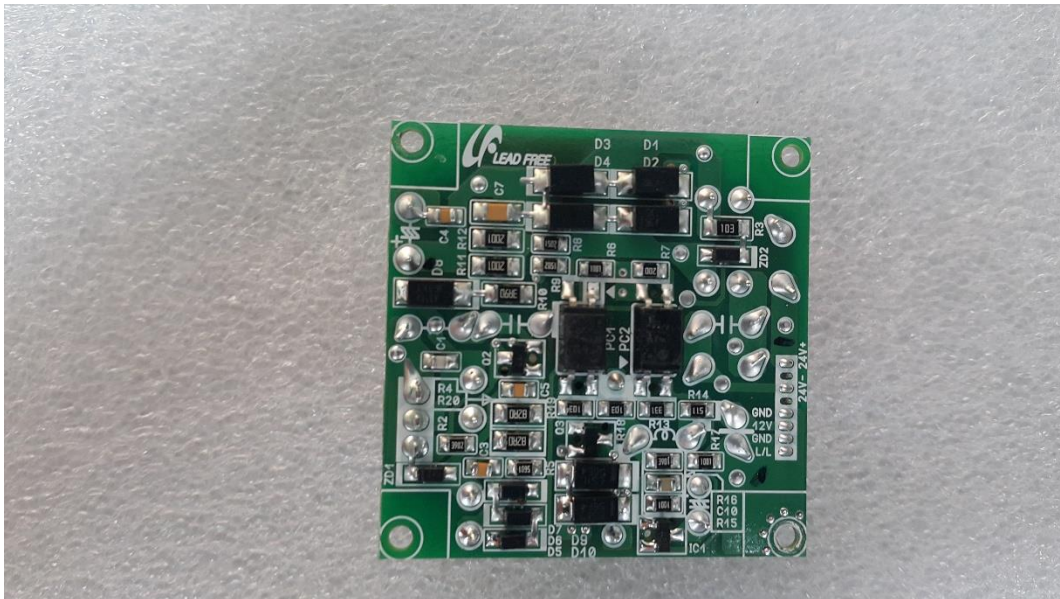


EUT Internal View – board

(Top)



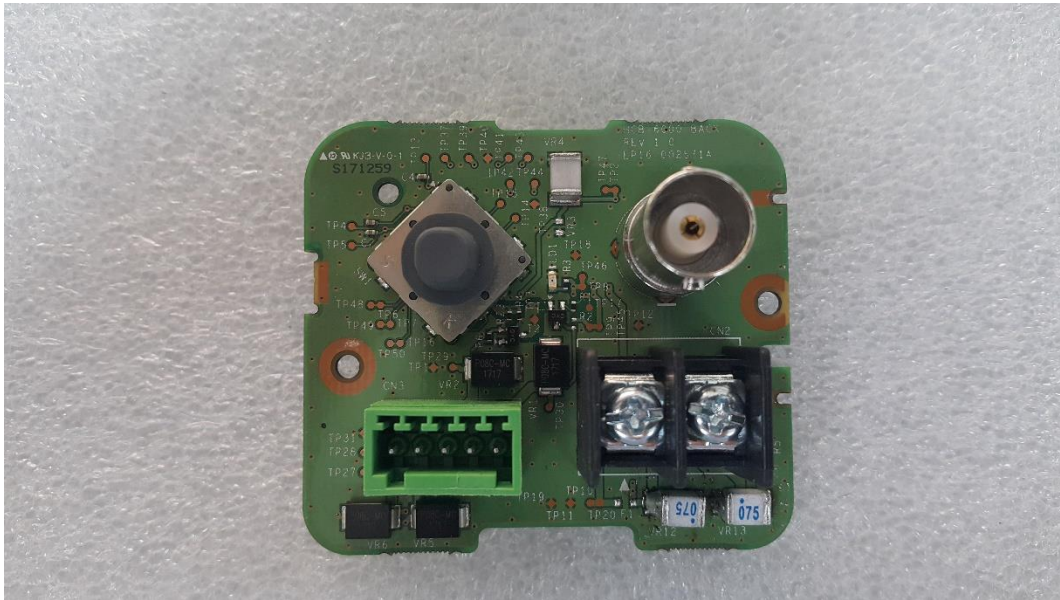
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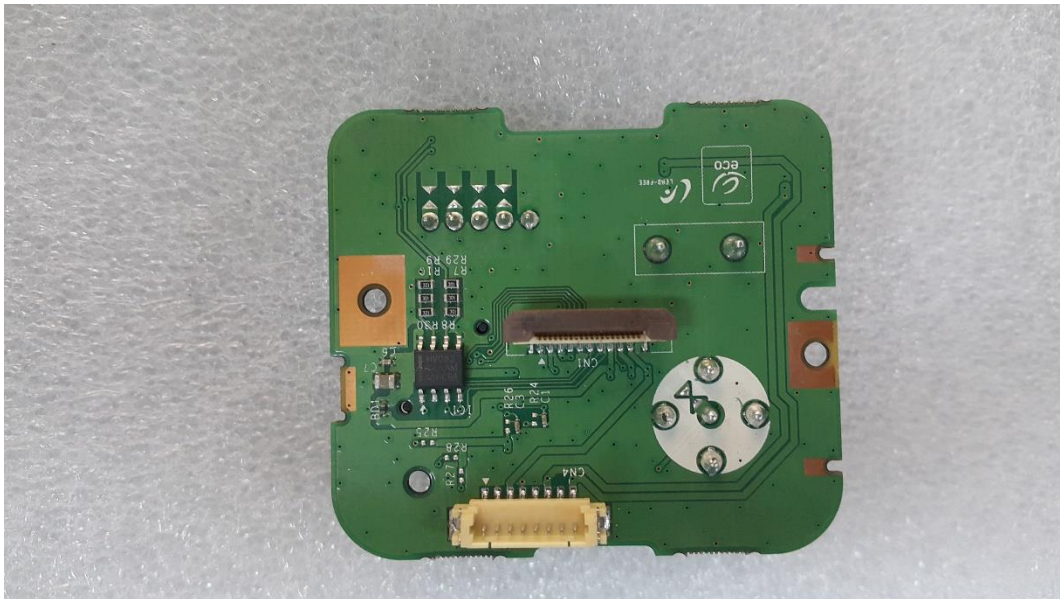
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EUT Internal View – Port board

(Top)



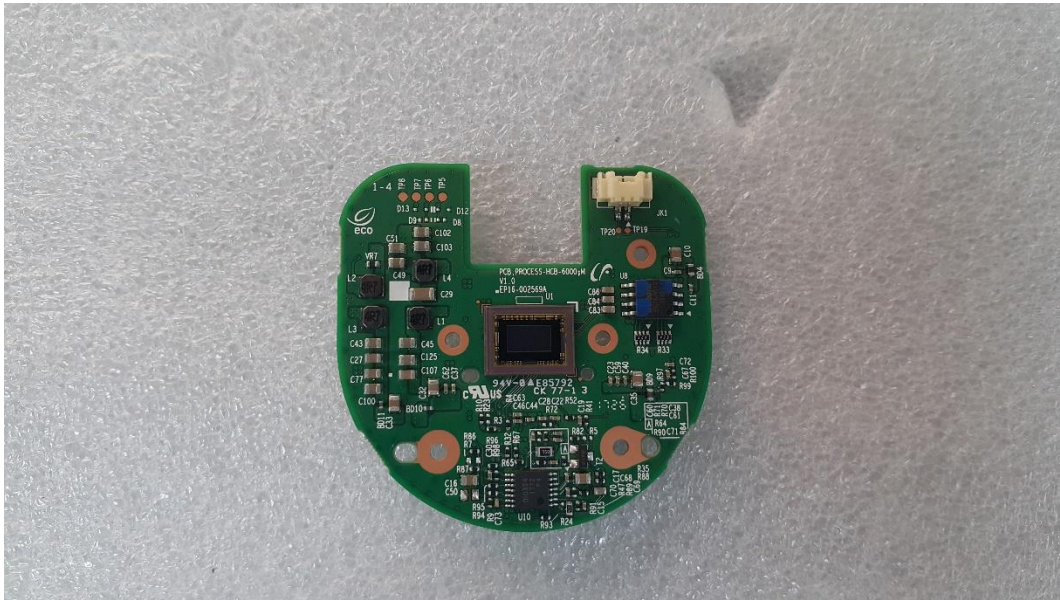
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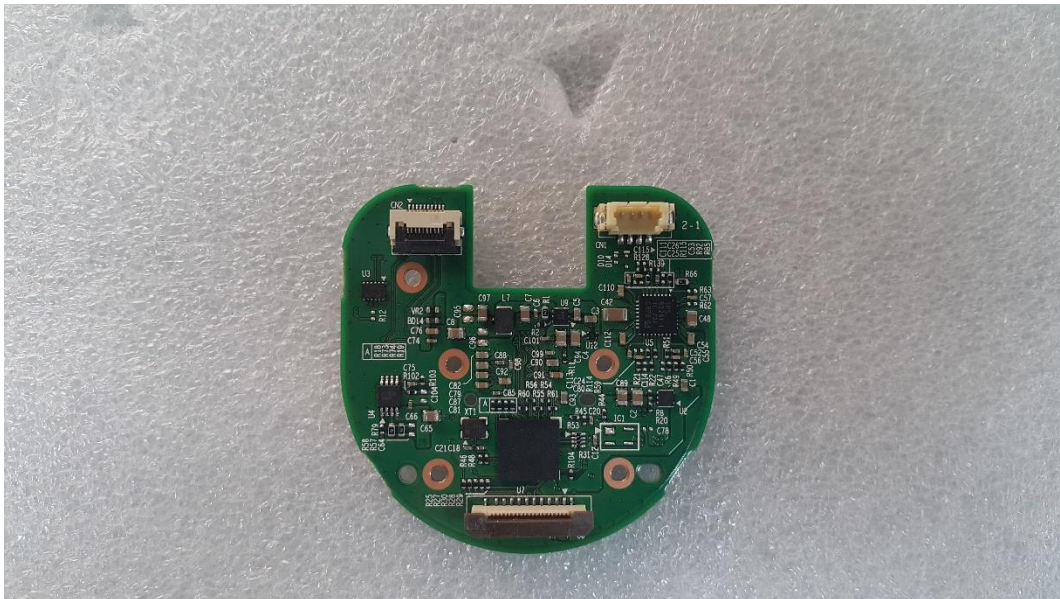
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EUT Internal View – Lens board

(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.