

EMC TEST REPORT For VCCI

Test Report No. : KES-E1-17T0581

Date of Issue : Aug. 29, 2017

Product name : CCTV CAMERA

Model/Type No. : HCZ-6320N

Variant Model : -

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. 31, 2017

Test date : Aug. 14, 2017 ~ Aug. 17, 2017

Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by



Jun Soo, Jung
EMC Test Engineer

Reviewed by



Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.



KES Co., Ltd.

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Test report No.:
KES-E1-17T0581
Page (2) of (32)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 29, 2017	KES-E1-17T0581	Issued

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TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	5
1.2	Variant Model Differences.....	5
1.3	Device Modifications	5
1.4	Equipment Under Test.....	5
1.5	Support Equipments	5
1.6	External I/O Cabling	6
1.7	EUT Operating Mode(s)	6
1.8	Configuration.....	7
1.9	Remarks when standards applied	8
1.10	Calibration Details of Equipment Used for Measurement	8
1.11	Test Facility	8
1.12	Laboratory Accreditations and Listings	8
2.0	Test Regulations.....	9
2.1	Conducted Emissions Mains Power Ports.....	11
2.2	Conducted Emissions at Telecommunication Ports.....	12
2.3	Radiated Electric Field Emissions(Below 1 GHz)	13
2.4	Radiated Electric Field Emissions(Above 1 GHz)	14
APPENDIX A – TEST DATA.....		15
Conducted Emissions at Mains Power Ports.....		15
Conducted Emissions at Telecommunication Ports		17
Radiated Electric Field Emissions(Below 1 GHz)		19
Radiated Electric Field Emissions(Above 1 GHz).....		20
Test Setup Photos and Configuration		24
Conducted Voltage Emissions		24
Conducted Telecommunication Emissions		25
Radiated Electric Field Emissions(Below 1 GHz)		26
Radiated Electric Field Emissions(Above 1 GHz).....		27
EUT External Photographs.....		28
EUT Internal Photographs		29



1.0 General Product Description

Main Specifications of EUT are:

HCZ-6320	
Video	
Imaging Device	1/2.8" 2.38M CMOS
Total Pixels	1952(H) x 1116(V), 2.18M
Effective Pixels	1044(H) x 1104(V), 2.14M
Scanning System	Progressive
Min. Illumination	Color : 0.2 Lux (1/30sec, F1.6, 30IRE), 0.003 Lux(2sec, F1.6, 30IRE) B/W : 0.01 Lux (1/30sec, F1.6, 30IRE), 0.0001 Lux(2sec, F1.6, 30IRE)
S / N Ratio	50dB
Video Out	AHD : 1080p, BNC CVBS : SD, DIP connector type
Lens	
Focal Length (Zoom Ratio)	4.44 ~ 142.6mm(Optical 32X)
Max. Aperture Ratio	F1.6 (Wide) / F4.4 (Tele)
Angular Field of View	H : 62.8°(Wide) ~ 2.23°(Tele) / V : 36.80°(Wide) ~ 1.26°(Tele)
Min. Object Distance	Wide 1.5m, Tele 2m
Focus Control	Auto / Manual / One Push
Lens Type	DC Auto Iris
Mount Type	Board-in type
Preset	
Preset	255ea
Operational	
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	Auto (ICR) / Color / B/W / External
Backlight Compensation	Off / BLC / HLC / WDR
Wide Dynamic Range	120dB
Contrast Enhancement	SSDR(Off / On)
Digital Noise Reduction	SSNR(2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On
Defog	Off/Auto/Manual
Motion Detection	Off / On (4ea Rectangle zone)
Privacy Masking	Off / On (12 Zones of Rectangle zone)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor / Mercury / Sodium
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/33,000sec)
Digital Zoom	16x
Flip / Mirror	Off / On
Intelligent Video Analytics	Detection / Tracking / Fixed Moved / Tampering
Remote Control I/F	RS-485, Coaxial
Protocol	RS-485: Samsung-T/E, Pelco-D/P, Panasonic, Bosch, AD, Vicon, Honeywell Coaxial: ACP (AHD Coax Protocol)
Video Transmission Distance	500m(5C2V Coaxial Cable)
Environmental	
Operating Temperature / Humidity	-10°C ~ +55°C(+14°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-10°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	-
Vandal Resistance	-
Electrical	
Input Voltage / Current	DC12V
Power Consumption	Max. 6W
Mechanical	
Color / Material	Dark Gray / Metal
Dimension (WxHxD)	72.0x60.0x137.0mm
Weight	476g

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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 ☐ 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
CCTV CAMERA	HCZ-6320N	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
MONITOR	SMT-2232	C95V67VF900025B	Weihai Daewoo Electronics Co., Ltd.	-
Controller	SPC-1010	C50E67WD601003	SamSung Techwin Co.,Ltd	-
Controller adapter	RS-AB1000	-	Dongguan Jinhua Sheng Power Technology Co.,Ltd	-
DVR	SDH-C74041	-	Hanwha Techwin (Tianjin) Co.,Ltd	-
DVR adapter	FJ-SW1202000U	-	-	-
Mouse	-	-	Hanwha Techwin (Tianjin) Co.,Ltd	-
Remote control	-	-	Hanwha Techwin (Tianjin) Co.,Ltd	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
CCTV CAMERA (E.U.T)	BNC	DVR	BNC	4.0	S
	RJ-45	Controller	2 pin	3.0	U
DVR	USB	Mouse	USB	1.4	U
	HDMI	MONITOR	HDMI	1.7	S
	-	Remote controller	-	-	-

* Unshielded=U, Shielded=S

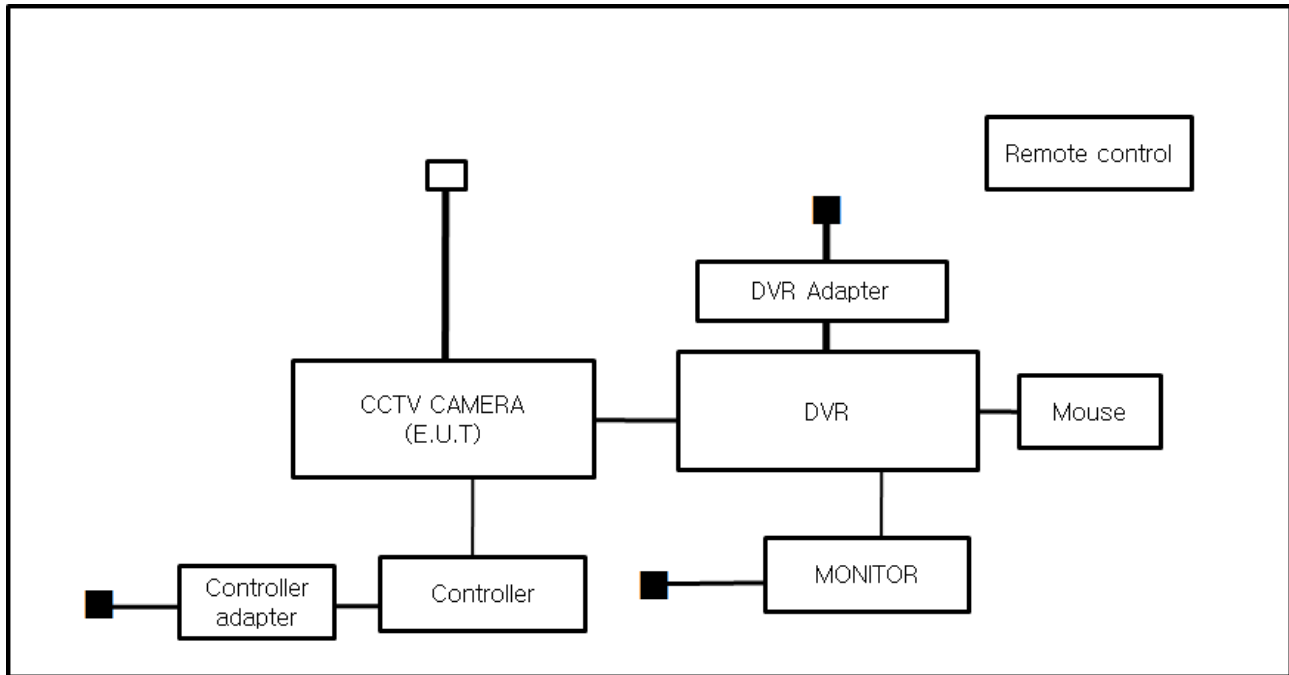
1.7 EUT Operating Mode(s)

Test mode	operating
OP	E.U.T Monitoring

E.U.T 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, Yeoju-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 61547 :2009

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☐ 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 CISPR22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2009 | | |
| ☐ 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 Mains Power Ports

Test Date

N/A

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	101781	04, 27, 2018
☐	LISN	ENV216	R & S	101787	01, 11, 2018
☐	LISN	ESH2-Z5	R & S	100450	04, 27, 2018
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 13, 2017

Test Conditions

Temperature: °C

Relative Humidity: %

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

N/A



2.2 Conducted Emissions at Telecommunication Ports

Test Date

N/A

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	101781	04, 27, 2018
☐	LISN	ENV216	R & S	101787	01, 11, 2018
☐	LISN	ESH2-Z5	R & S	100450	04, 27, 2018
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 13, 2017
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 11, 2018
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	01, 11, 2018

Test Conditions

Temperature: °C

Relative Humidity: %

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

N/A



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Aug. 14, 2017

Test Location

☒ OPEN AREA TEST SITE #1

☐ OPEN AREA TEST SITE #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	-	-	-	-
☒	EMI TEST RECEIVER	ESVS10	Rohde & Schwarz	826008/014	04, 18, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	04, 14, 2018

Test Conditions

Temperature: 24,8 °C

Relative Humidity: 74,0 %

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

Aug. 17, 2017

Test Location

SEMI ANECHOIC CHAMBER #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	e3	AUDIX	8.083b	-
☒	EMI TEST RECEIVER	ESU26	R & S	100552	04, 19, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01729	05, 31, 2018
☐	ATTENUATOR	8491A	HP	35496	03, 24, 2018
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	05, 17, 2018

Test Conditions

Temperature: 23,1 °C

Relative Humidity: 49,6 %

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

RemarksSee Appendix A for test data.



KES Co., Ltd.

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Test report No.:
KES-E1-17T0581
Page (15) of (32)

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

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Test report No.:
KES-E1-17T0581
Page (16) of (32)

[NEUTRAL]

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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Test report No.:
KES-E1-17T0581
Page (17) of (32)

Conducted Emissions at Telecommunication Ports

[10 Mbps]

N/A

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Test report No.:
KES-E1-17T0581
Page (18) of (32)

[100 Mbps]

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 (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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Radiated Electric Field Emissions(Below 1 GHz)

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
32.59	19.90	V	1.10	10.65	1.25	31.80	40.00	8.20
90.18	18.10	V	1.00	9.70	2.12	29.92	40.00	10.08
216.87	16.20	V	1.39	11.83	3.27	31.30	40.00	8.70
222.59	12.10	H	4.00	11.96	3.32	27.38	40.00	12.62
432.60	12.90	H	3.55	16.13	4.95	33.98	47.00	13.02
539.81	15.30	H	4.00	18.08	5.44	38.82	47.00	8.18

* H : Horizontal, V : Vertical

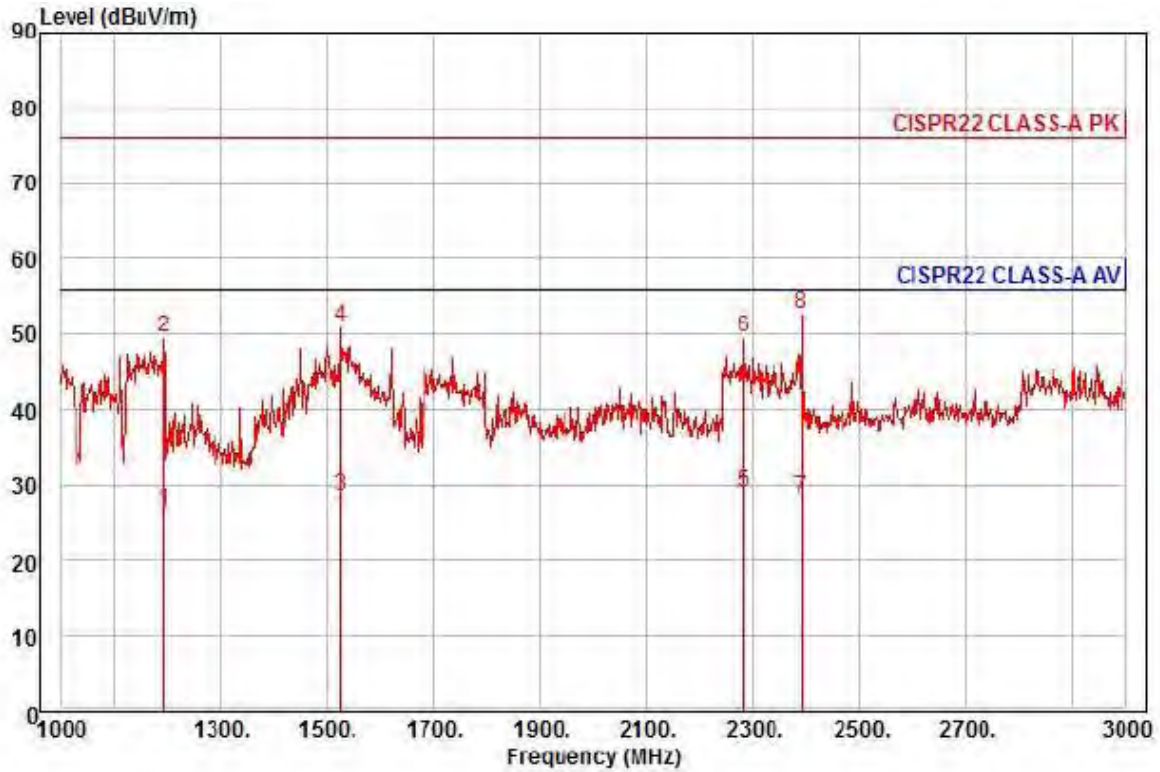
◆ Calculation

Corrected Amplitude [dB μ V] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

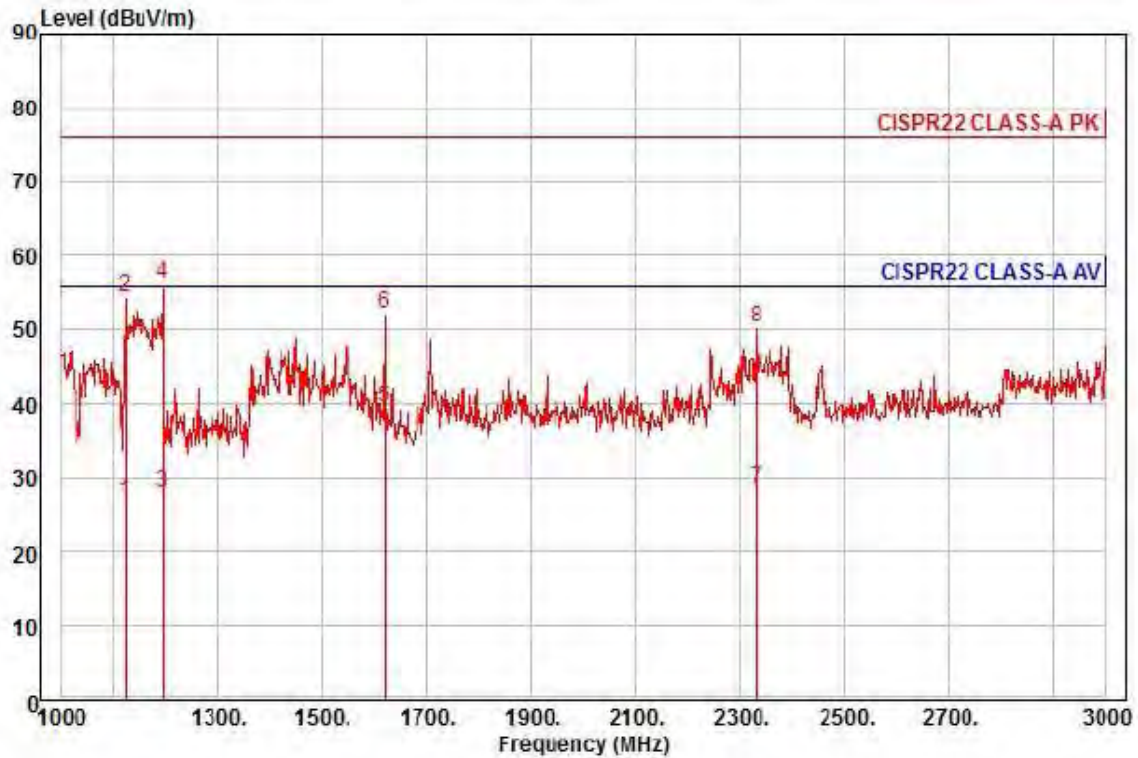
Correction Factor : ANT FACTOR + Cable loss

Radiated Electric Field Emissions(Above 1 GHz)



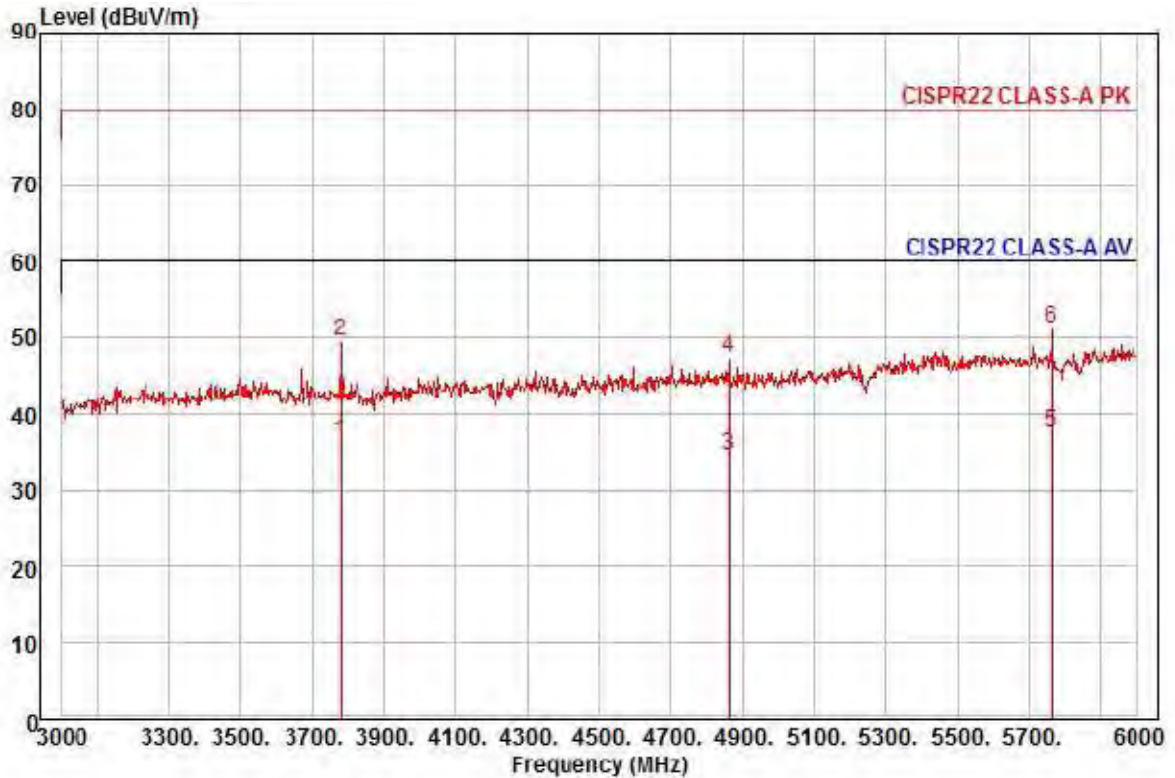
Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : HCZ-6320N
Mode :
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1194.00	32.13	23.09	7.26	35.89	313	56.00	-29.41	horizontal	Average
2	1194.00	55.10	23.09	7.26	35.89	313	76.00	-26.44	horizontal	Peak
3	1524.00	31.51	24.12	8.29	35.59	6	56.00	-27.67	horizontal	Average
4	1524.00	54.28	24.12	8.29	35.59	6	76.00	-24.90	horizontal	Peak
5 av	2282.00	26.93	26.87	10.32	35.28	53	56.00	-27.16	horizontal	Average
6	2282.00	47.63	26.87	10.32	35.28	53	76.00	-26.46	horizontal	Peak
7	2392.00	25.84	27.20	10.58	35.32	39	56.00	-27.70	horizontal	Average
8 pp	2392.00	50.15	27.20	10.58	35.32	39	76.00	-23.39	horizontal	Peak



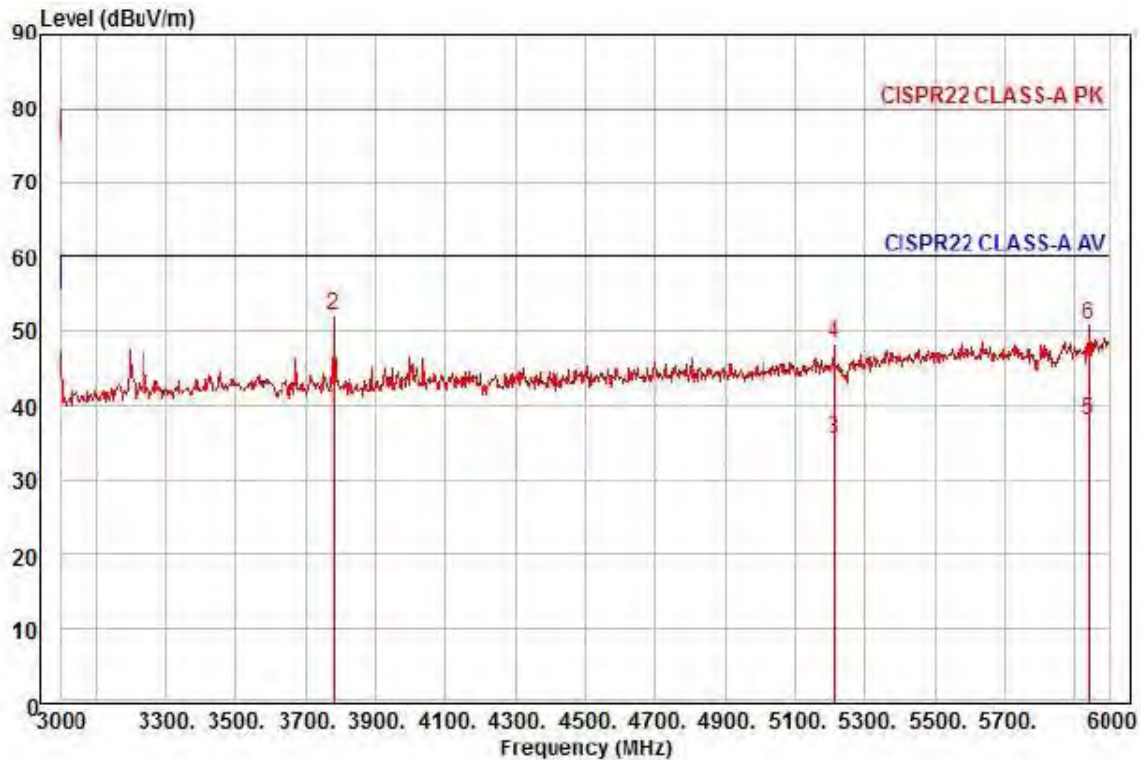
Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : HCZ-6320N
Mode :
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1122.00	32.85	22.87	7.03	35.95	359	56.00	-29.20	vertical	Average
2	1122.00	60.45	22.87	7.03	35.95	359	76.00	-21.60	vertical	Peak
3	1196.00	33.36	23.10	7.27	35.89	15	56.00	-28.16	vertical	Average
4 pk	1196.00	61.70	23.10	7.27	35.89	15	76.00	-19.82	vertical	Peak
5 pp	1620.00	41.83	24.50	8.56	35.51	21	56.00	-16.62	vertical	Average
6	1620.00	54.62	24.50	8.56	35.51	21	76.00	-23.83	vertical	Peak
7	2332.00	26.32	27.02	10.43	35.30	35	56.00	-27.53	vertical	Average
8	2332.00	48.08	27.02	10.43	35.30	35	76.00	-25.77	vertical	Peak



Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : HCZ-6320N
Mode :
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3780.00	26.08	31.91	13.60	35.34	294	60.00	-23.75	horizontal	Average
2	3780.00	39.33	31.91	13.60	35.34	294	80.00	-30.50	horizontal	Peak
3	4863.00	21.34	33.12	15.59	35.58	173	60.00	-25.53	horizontal	Average
4	4863.00	34.29	33.12	15.59	35.58	173	80.00	-32.58	horizontal	Peak
5 pp	5760.00	20.44	35.76	16.99	35.68	325	60.00	-22.49	horizontal	Average
6 pk	5760.00	34.25	35.76	16.99	35.68	325	80.00	-28.68	horizontal	Peak



Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : HCZ-6320N
Mode :
Memo :

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	pp	3780.00	29.23	31.91	13.60	35.34	51	60.00	-20.60	vertical Average
2	pk	3780.00	42.00	31.91	13.60	35.34	51	80.00	-27.83	vertical Peak
3		5214.00	20.85	34.25	16.09	35.64	340	60.00	-24.45	vertical Average
4		5214.00	33.63	34.25	16.09	35.64	340	80.00	-31.67	vertical Peak
5		5940.00	20.21	36.03	17.46	35.69	156	60.00	-21.99	vertical Average
6		5940.00	33.16	36.03	17.46	35.69	156	80.00	-29.04	vertical Peak

◆ Calculation

Over Limit [dB] = (Read Level[dB μ V] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB])
- Limit Line[dB μ V]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,

Cable Loss : Cable loss, Preamp Factor : Preamp Factor



KES Co., Ltd.

C-3701, Simin-daero 365-40,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Test report No.:
KES-E1-17T0581
Page (24) of (32)

Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

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Test report No.:
KES-E1-17T0581
Page (25) of (32)

Conducted Telecommunication Emissions

N/A

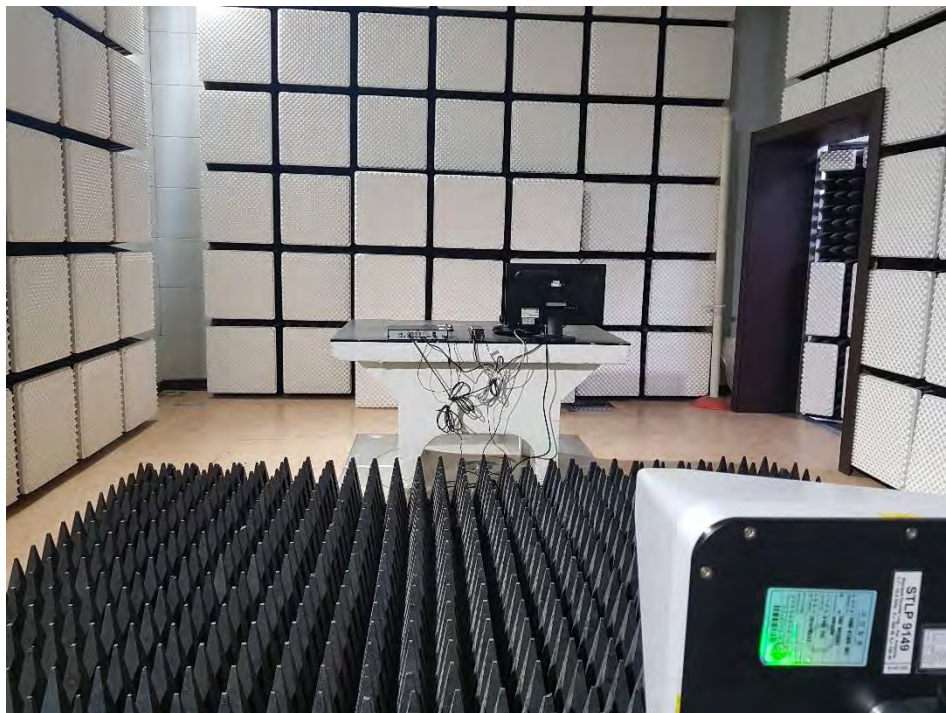
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Radiated Electric Field Emissions(Below 1 GHz)



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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

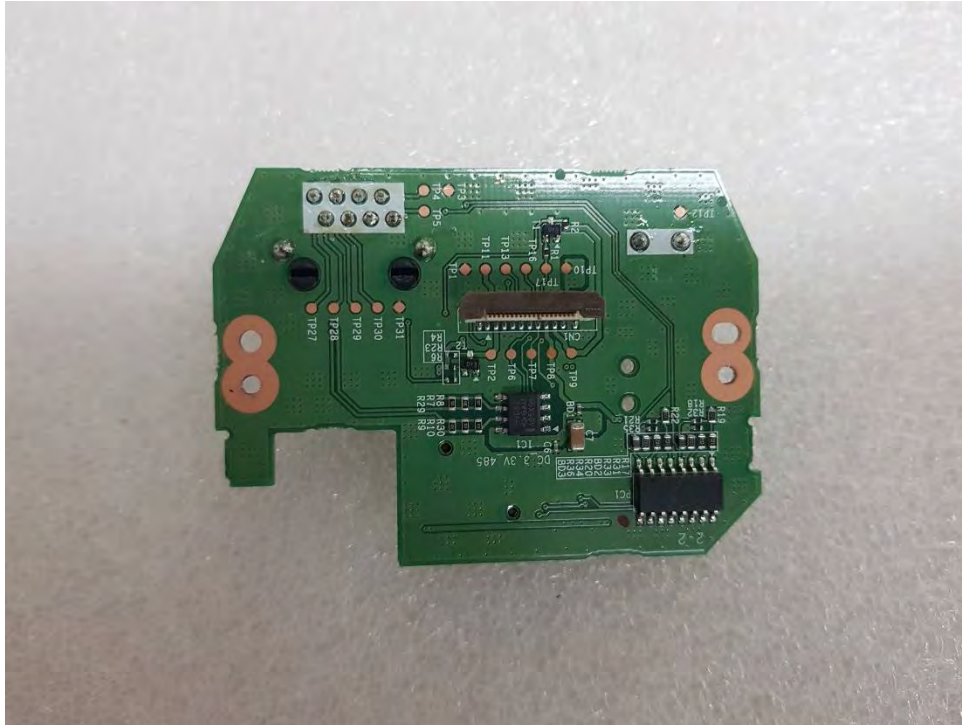
(Internal View)



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EUT Internal View – board 1

(Top)



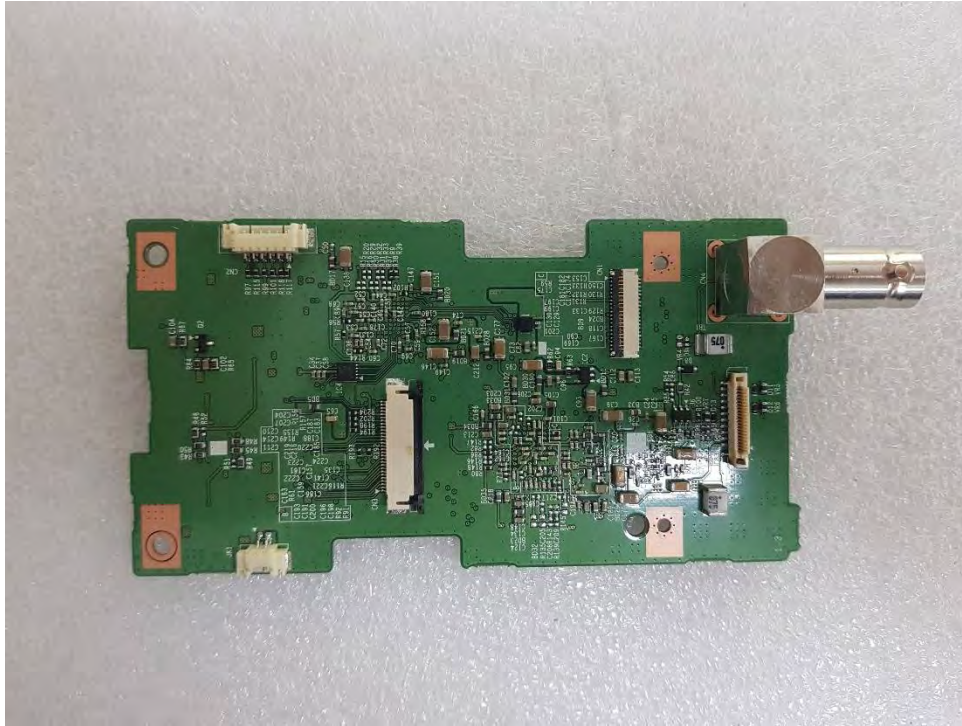
(Bottom)



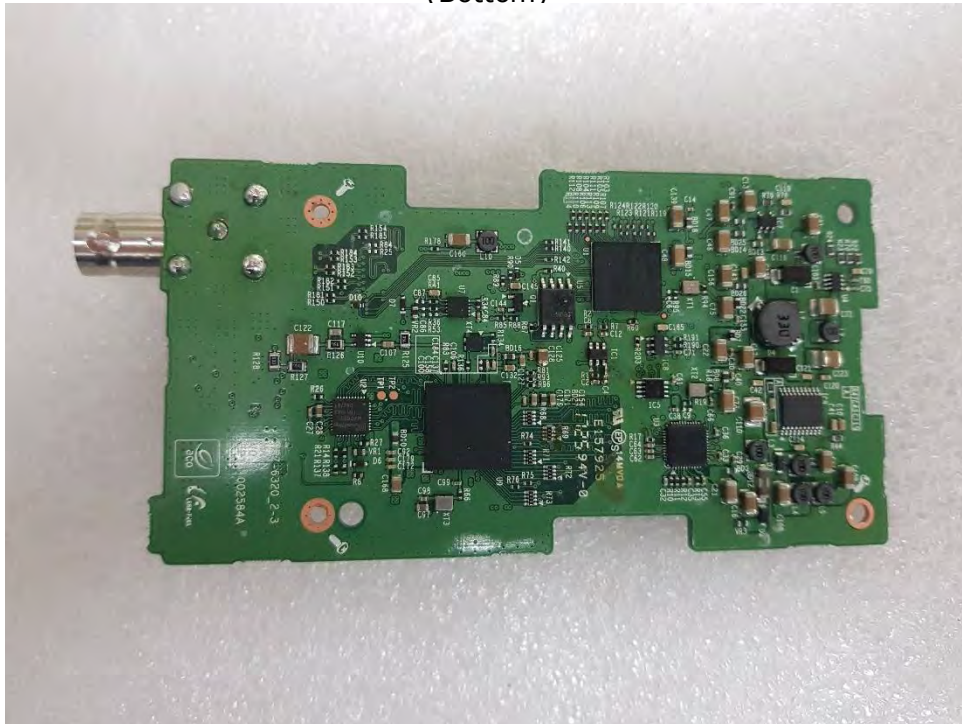
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EUT Internal View – board 2

(Top)



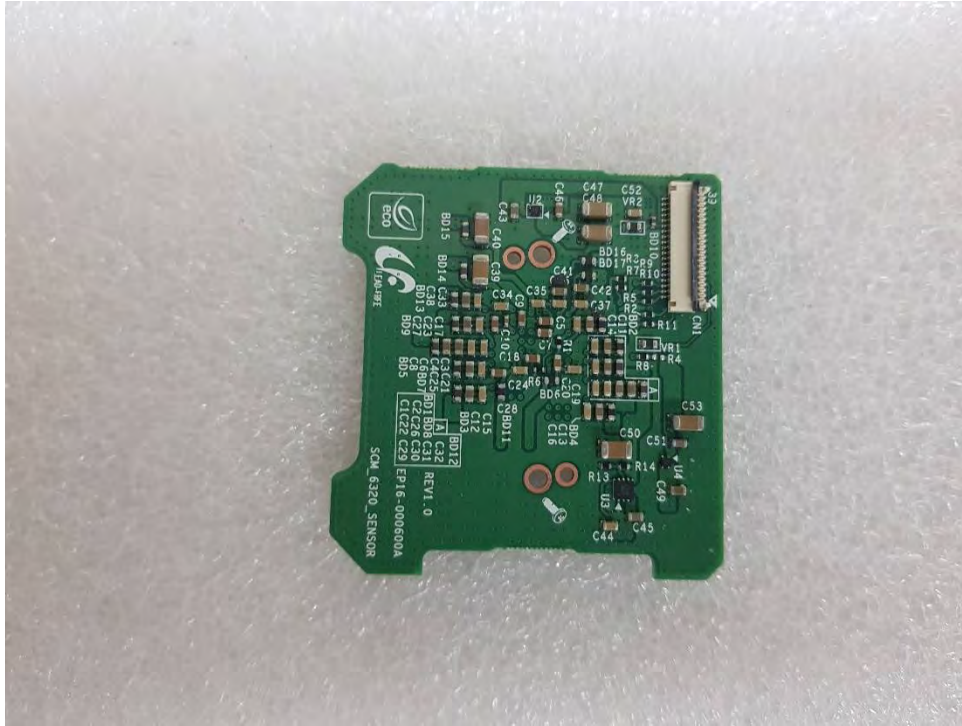
(Bottom)



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EUT Internal View – board 3

(Top)



(Bottom)

