



EMC TEST REPORT For VCCI

Test Report No. : KES-E1-16T0106

Date of Issue : Mar. 18, 2016

Product name : NETWORK CAMERA

Model/Type No. : SNV-L6013RN

Variant Model : -

Applicant : Hanwha Techwin Company Limited

Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, korea

Manufacturer : Tianjin Samsung Techwin Opto-Electronic Co., Ltd.

Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,
300385, People's Republic of China

Date of Receipt : Jan. 06, 2016

Test date : Mar. 15, 2016 – Mar. 16, 2016

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Hyo Jin, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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Test report No.:
KES-E1-16T0106
Page (2) of (33)

REPORT REVISION HISTORY

Date	Revision	Page No
Mar. 18, 2016	KES-E1-16T0106	Issued

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TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	6
1.2	Variant Model Differences.....	6
1.3	Device Modifications	6
1.4	Equipment Under Test.....	6
1.5	Support Equipments	6
1.6	External I/O Cabling	7
1.7	EUT Operating Mode(s)	7
1.8	Configuration.....	8
1.9	Calibration Details of Equipment Used for Measurement	9
1.10	Test Facility	9
1.11	Laboratory Accreditations and Listings	9
2.0	Test Regulations.....	10
2.1	Conducted Emissionsat Mains Power Ports.....	12
2.2	Conducted Emissions at Telecommunication Ports.....	13
2.3	Radiated Electric Field Emissions(Below 1 GHz)	14
2.4	Radiated Electric Field Emissions(Above 1 GHz)	15
APPENDIX A – TEST DATA.....		16
Conducted Emissions at Mains Power Ports.....		16
Conducted Emissions at Telecommunication Ports		18
Radiated Electric Field Emissions(Below 1 GHz)		20
Radiated Electric Field Emissions(Above 1 GHz).....		21
EUT External Photographs		29
EUT Internal Photographs		30
Main Board EUT Internal View – IR Board.....		31
Main Board EUT Internal View – Camera Board.....		32
Main Board EUT Internal View – Main Board		33



1.0 General Product Description

Main Specifications of EUT are:

	SNV-L6013R
Video	
Imaging Device	1/2.9" 2.19M CMOS
Total Pixels	2,000(H) x 1,121(V)
Effective Pixels	1,984(H) x 1,105(V)
Scanning System	Progressive
Min. Illumination	Color : 0.15Lux (1/30sec, F1.8), 0.003Lux(2sec, F1.8) B/W : 0Lux (IR LED on)
Lens	
Focal Length (Zoom Ratio)	3.6mm
Max. Aperture Ratio	F1.8
Angular Field of View	H: 86.5°, V: 47.8°, D: 101.2°
Min. Object Distance	0.5m
Lens Type	Fixed
Mount Type	Board type
Pan / Tilt / Rotate	
Pan Range	-5°~+5°
Tilt Range	0~67°
Rotate Range	90°
Operational	
IR Viewable Length	15m
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	True Day & Night
Backlight Compensation	Off / BLC
Contrast Enhancement(DWDR)	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNR(Off / On)
Motion Detection	Off / On (4ea rectangler zones)
Privacy Masking	Off / On (6ea rectangler zones)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC(Lens distortion control)	On/Off (5 levels with Min/Max)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker
Flip / Mirror	Flip / Mirror / Hallway view
Intelligent Video Analytics	Motion Detection with metadata, Tampering
Alarm Triggers	Motion detection, Tampering Detection, SD card error, NAS error
Alarm Events	File upload via FTP and E-Mail Local storage recording at Event Notification via E-Mail
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264, MJPEG
Resolution	1920x1280 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 720x576 / 640x480 / 320x240
Max. Framerate	H.264 : Max 30fps at all resolutions MJPEG : Max 1fps at 1920x1080/1280x960/1280x720/1024x768, Max. 15fps at other resolution
Video Quality Ajustment	H.264 : Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate control method	H.264 : CBR or VBR MJPEG : VBR



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Test report No.:

KES-E1-16T0106

Page (5) of (33)

Audio I/O	Line-in
Audio Compression Format	G.711 u-law /G.726 Selectable G.726(ADPCM) : 8KHz, G.711 : 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps
Audio Communication	Uni-directional
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, 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
Streaming Method	Unicast / Multicast
Max. User Access	6 users at Unicast Mode
Edge storage	Micro SD/SDHC Max 32G, NAS - Motion images recorded in the SD memory card can be downloaded - Manual recording at Local PC
Application Programming Inter	ONVIF Profile S, G SUNAPI(HTTP API)
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Finnish, Norwegian
Web Viewer	Supported OS: Windows 7, 8, 10, Mac OS X 10.8, 10.9, 10.10, 10.11 Supported Browser: Explore 11, Mozilla Firefox 43, Apple Safari 9 * Mac OS X only
Central Management Software	SmartViewer
Environmental	
Operating Temperature / Humi	-30°C ~ +55°C / Less than 90% RH * Start up should be done at above -20°C
Storage Temperature / Humidit	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10 EN50155 class T3 (Vibration, Shock, bump, temperature) EN50121, ISO 16750-3(Vibration) NEMA 250 type 4x
Electrical	
Input Voltage / Current	PoE(IEEE802.3af, Class2)
Power Consumption	Max. 5.8W
Mechanical	
Color / Material	Ivory / Metal
Dimension (WxHxD)	99x100x52mm
Weight	300g

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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 ☐ 100 Vac ☐ 110 Vac ☐ 120 Vac ☐ 24 Vac ☐ 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	SNV-L6013RN	-	Tianjin Samsung Techwin Opto-Electronic Co., Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adapter	KST-PSE-G808SR	-	-	-
Notebook	NT-R410Y	Z9YJ93CS300631H	Samsung Electronics Co., Ltd.	-
AC/DC Adapter	AD-6019	-	LI SHIN INTERNATIONAL ENTERPRISE CORP.	-
MIC	CMK-303	-	CAMAC	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	POE Adapter	Notebook	3.0	U
	MIC	MIC	Line Out	1.5	U
POE Adapter	RJ-45	Notebook	RJ-45	1.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

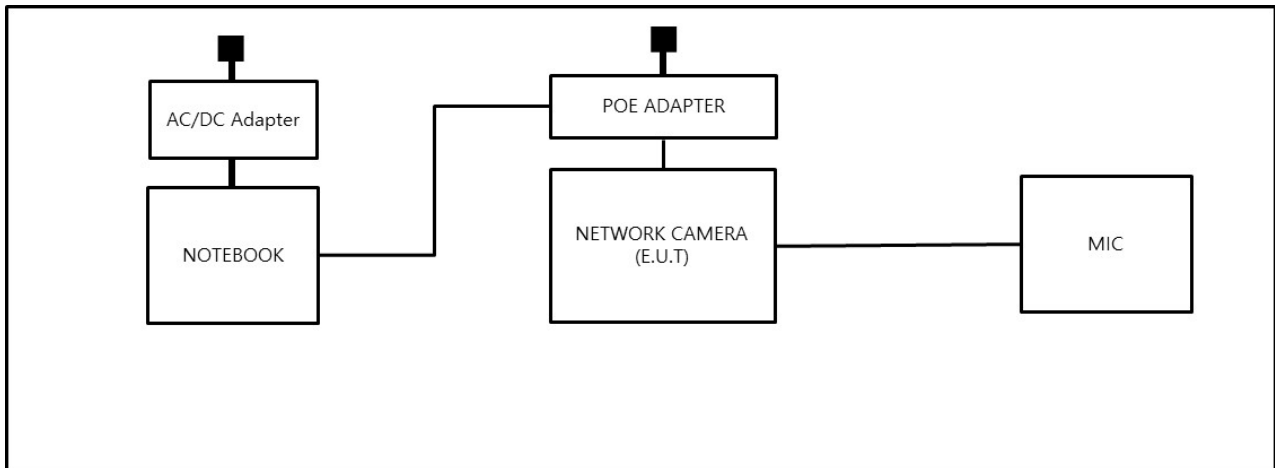
Equipment under test was operated during the measurement under the following conditions:

Test mode	Normal operating
OP	MONITORING Network ping test

- Input power condition during the measurements was POE

1.8 Configuration

■ AC Main
□ DC Main



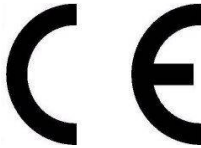
1.9 Calibration Details of Equipment Used for Measurement

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.

1.10 Test Facility

The measurement facility is located at 473-29 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.

1.11 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)	

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2004/108/EC**

☐ 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 55022:2010

☐ 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-3/2013.04

☒ Class A

☐ Class B

☐ AS/NZS CISPR22:2009 +A1:2010

☐ Class A

☐ Class B

☐ 47 CFR Part 15, Subpart B / ANSI C63.4-2009

☐ Class A

☐ Class B

☐ IC Regulation ICES-003 : 2012
/ ANSI C63.4-2014

☐ Class A

☐ Class B

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B



☐ **R&TTE- Directive 1999/5/EC**

☐ 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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test Receiver	ESR7	R&S	101190	08, 13, 2016
☐	LISN	ENV216	R&S	101787	01, 14, 2017
☐	LISN	ESH2-Z5	R&S	100450	05, 06, 2016
☐	Electro wave Shieldroom	-	AONE SHIELD	-	-

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

Because the E.U.T power is PoE, limits are not specified.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Mar. 15, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R&S	101783	05, 06, 2016
☒	LISN	ENV216	R&S	101137	02, 04, 2017
☒	LISN	ENV216	R&S	101786	05, 06, 2016
☒	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	04, 02, 2016
☐	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	04, 02, 2016
☒	8-Wire ISN CAT6	NTFM 8158	Schwarzbeck Mess	8158-0029	08, 14, 2016
☒	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: 25,1 °C
Relative Humidity: 41,8 %

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

Mar. 16, 2016

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 Receiver	ESR3	R&S	101781	05. 06. 2016
☒	Trilog-Broadband Antenna	VULB 9163	SCHWARZBECK	9168-713	05. 15. 2017
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	-	EMCO	-	-
☒	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 16,7 °C

Relative Humidity: 38,0 %

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

Mar. 16, 2016

Test Location

Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESU26	R&S	100552	05. 06. 2016
☒	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10. 23. 2016
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05. 07. 2017
☒	Semi Anchoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-

Test Conditions

Temperature: 24,9 °C
Relative Humidity: 43,27 %

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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Test report No.:
KES-E1-16T0106
Page (16) of (33)

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

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Test report No.:
KES-E1-16T0106
Page (17) of (33)

[NEUTRAL]

N/A

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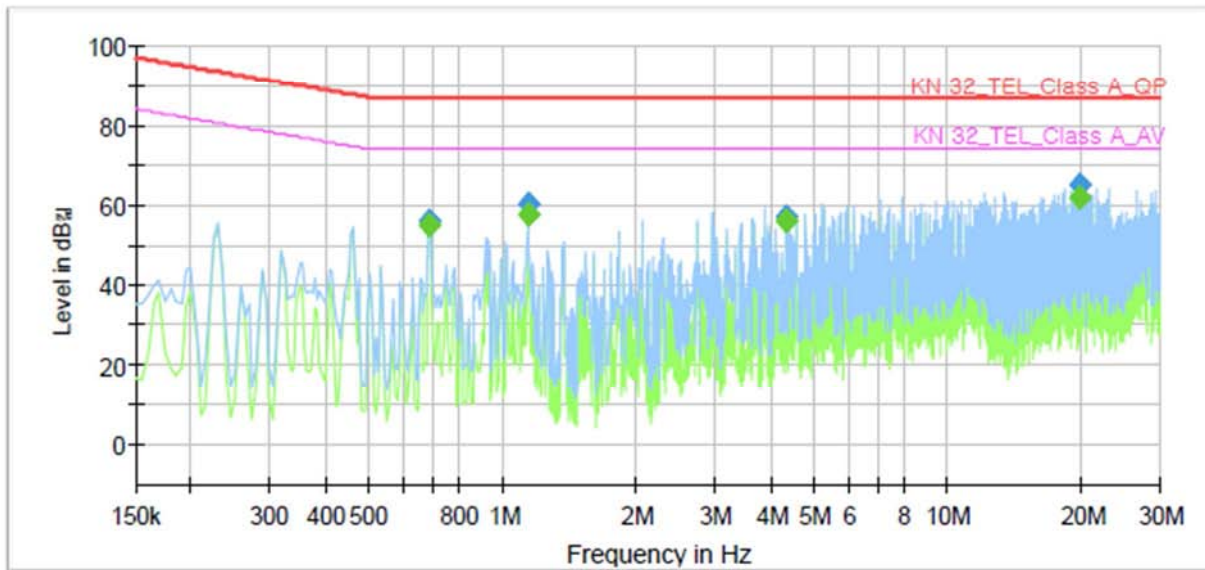


Conducted Emissions at Telecommunication Ports

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNV-L6013RN
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)
0.685000	---	54.91	74.00	19.09	1000.0	9.000	Single Line	10.0
0.685000	55.97	---	87.00	31.03	1000.0	9.000	Single Line	10.0
1.145000	---	57.80	74.00	16.20	1000.0	9.000	Single Line	10.0
1.145000	60.58	---	87.00	26.42	1000.0	9.000	Single Line	10.0
4.350000	---	55.85	74.00	18.15	1000.0	9.000	Single Line	9.9
4.350000	57.42	---	87.00	29.58	1000.0	9.000	Single Line	9.9
19.710000	---	61.91	74.00	12.09	1000.0	9.000	Single Line	10.1
19.710000	65.14	---	87.00	21.86	1000.0	9.000	Single Line	10.1



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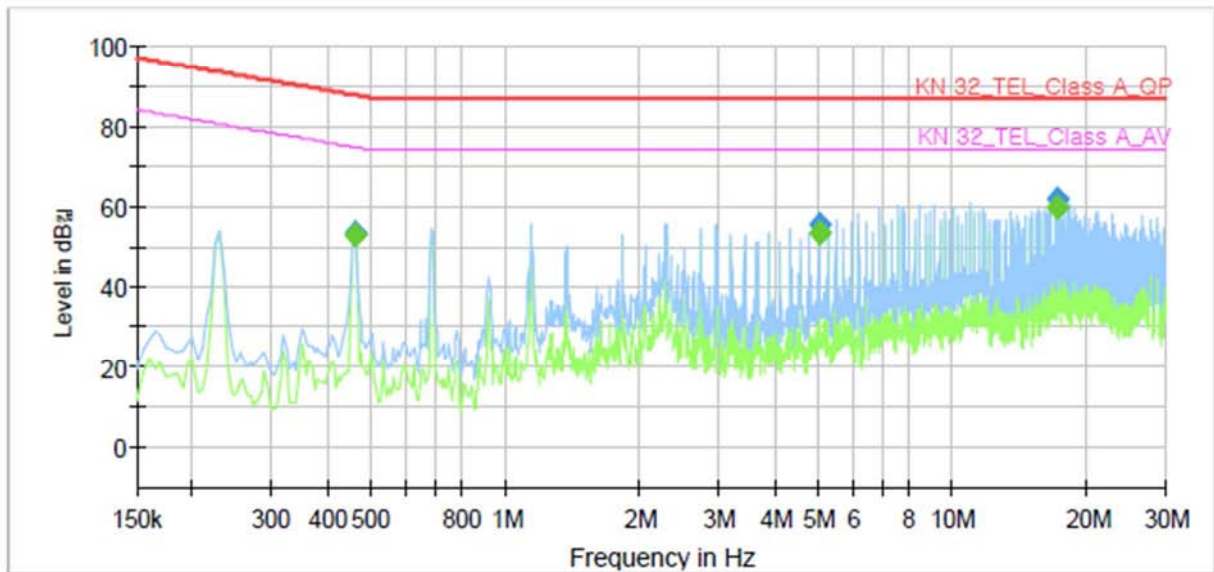
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Test report No.:
KES-E1-16T0106
Page (19) of (33)

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-L6013RN
Mode: 1 000 Gbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.460000	---	52.87	74.69	21.82	1000.0	9.000	Single Line	9.4
0.460000	53.58	---	87.69	34.11	1000.0	9.000	Single Line	9.4
5.035000	---	53.20	74.00	20.80	1000.0	9.000	Single Line	9.3
5.035000	55.35	---	87.00	31.65	1000.0	9.000	Single Line	9.3
17.165000	---	59.92	74.00	14.08	1000.0	9.000	Single Line	9.5
17.165000	61.95	---	87.00	25.05	1000.0	9.000	Single Line	9.5

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Test report No.:
KES-E1-16T0106
Page (20) of (33)

Radiated Electric Field Emissions(Below 1 GHz)

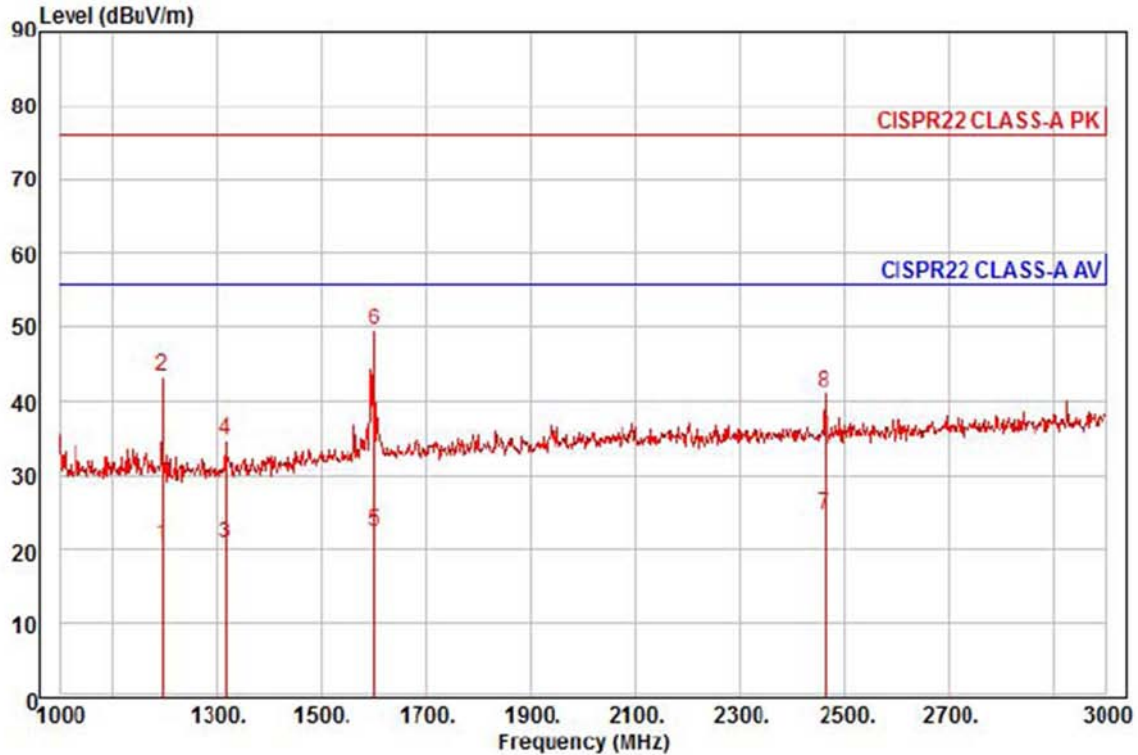
Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
77.53	15.71	H	4.00	7.71	1.73	25.15	40.00	14.85
137.67	16.35	H	4.00	8.05	2.35	26.75	40.00	13.25
156.10	15.03	H	4.00	8.42	2.58	26.03	40.00	13.97
163.86	15.21	V	1.00	8.72	2.66	26.59	40.00	13.41
205.57	12.37	H	4.00	11.42	2.92	26.71	40.00	13.29
445.50	21.10	H	4.00	16.34	4.55	41.99	47.00	5.01

* H : Horizontal, V : Vertical

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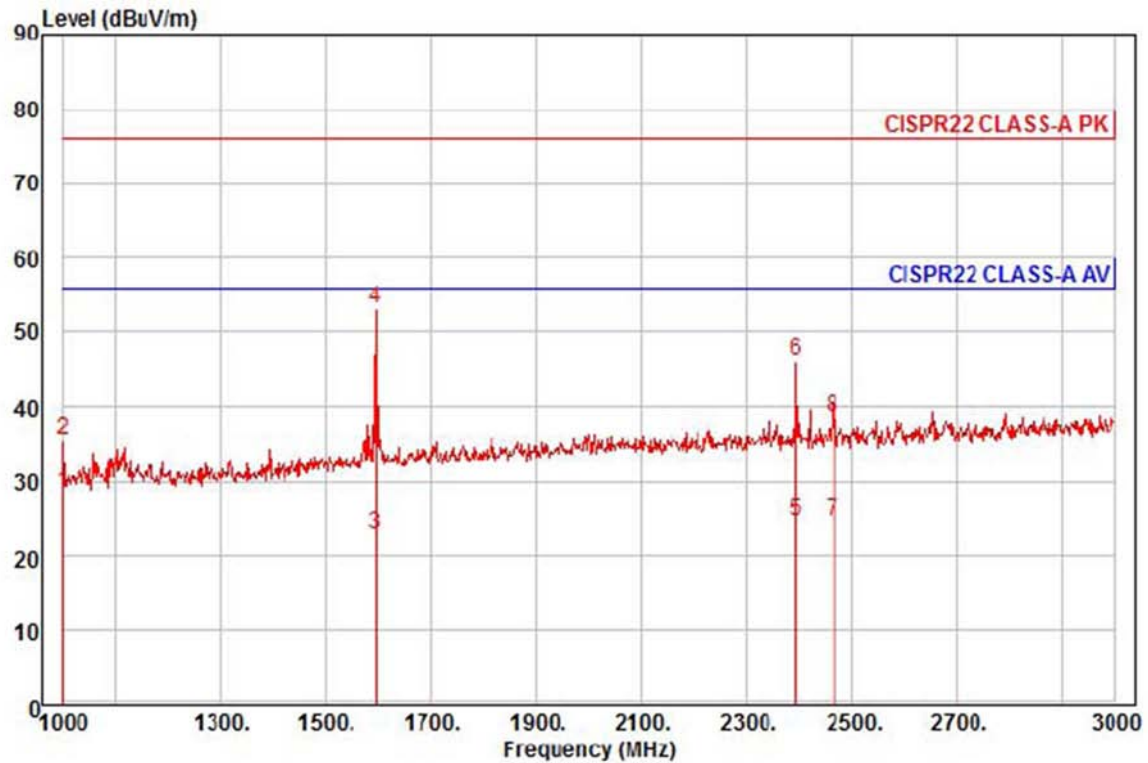


Radiated Electric Field Emissions(Above 1 GHz)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RN
Mode :
Memo : (1 - 3) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1196.00	28.77	24.69	7.08	40.02	164	56.00	-35.48	horizontal	Average
2	1196.00	51.73	24.69	7.08	40.02	164	76.00	-32.52	horizontal	Peak
3	1318.00	28.09	25.17	7.43	39.96	282	56.00	-35.27	horizontal	Average
4	1318.00	42.31	25.17	7.43	39.96	282	76.00	-41.05	horizontal	Peak
5	1600.00	27.94	26.29	8.25	39.83	126	56.00	-33.35	horizontal	Average
6 pp	1600.00	54.75	26.29	8.25	39.83	126	76.00	-26.54	horizontal	Peak
7 av	2462.00	25.69	29.01	10.06	39.90	310	56.00	-31.14	horizontal	Average
8	2462.00	41.94	29.01	10.06	39.90	310	76.00	-34.89	horizontal	Peak



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RN
Mode :
Memo : (1 - 3) GHz

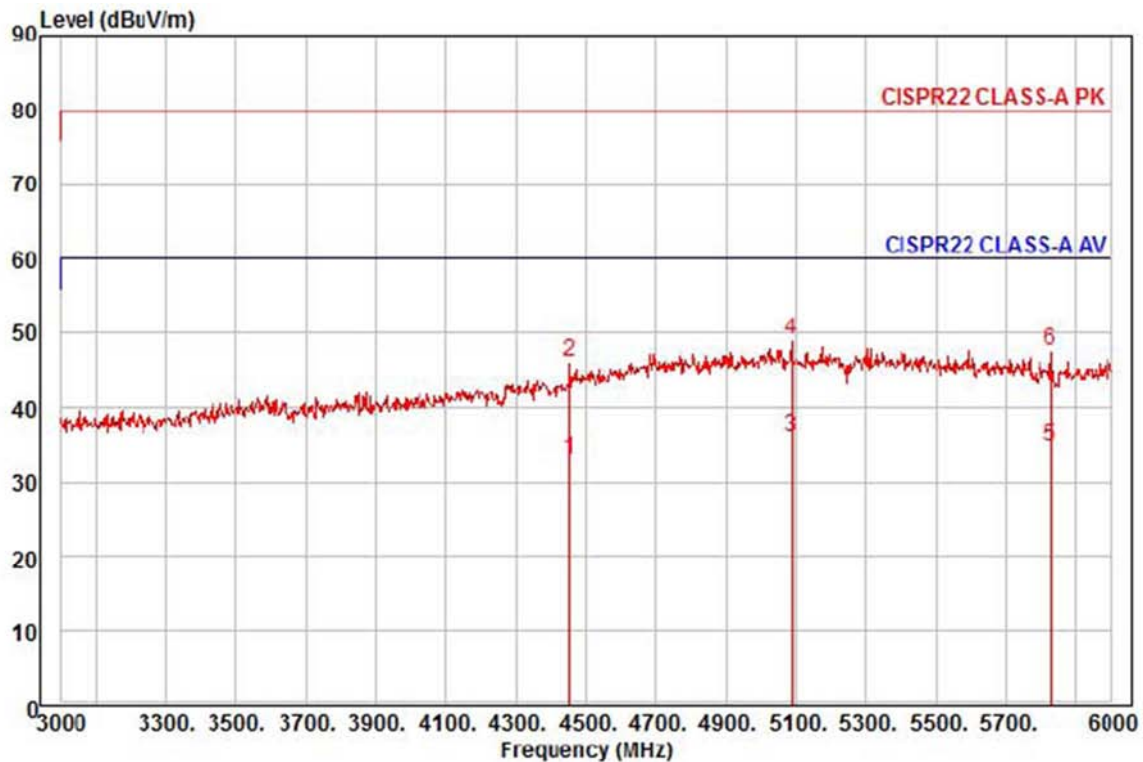
		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1 av	1000.00	38.10	23.91	6.51	40.12	17	56.00	-27.60	vertical	Average
2	1000.00	45.37	23.91	6.51	40.12	17	76.00	-40.33	vertical	Peak
3	1596.00	28.45	26.28	8.24	39.83	224	56.00	-32.86	vertical	Average
4 pp	1596.00	58.56	26.28	8.24	39.83	224	76.00	-22.75	vertical	Peak
5	2394.00	25.79	28.85	9.95	39.86	170	56.00	-31.27	vertical	Average
6	2394.00	47.16	28.85	9.95	39.86	170	76.00	-29.90	vertical	Peak
7	2466.00	25.57	29.02	10.06	39.90	227	56.00	-31.25	vertical	Average
8	2466.00	39.42	29.02	10.06	39.90	227	76.00	-37.40	vertical	Peak



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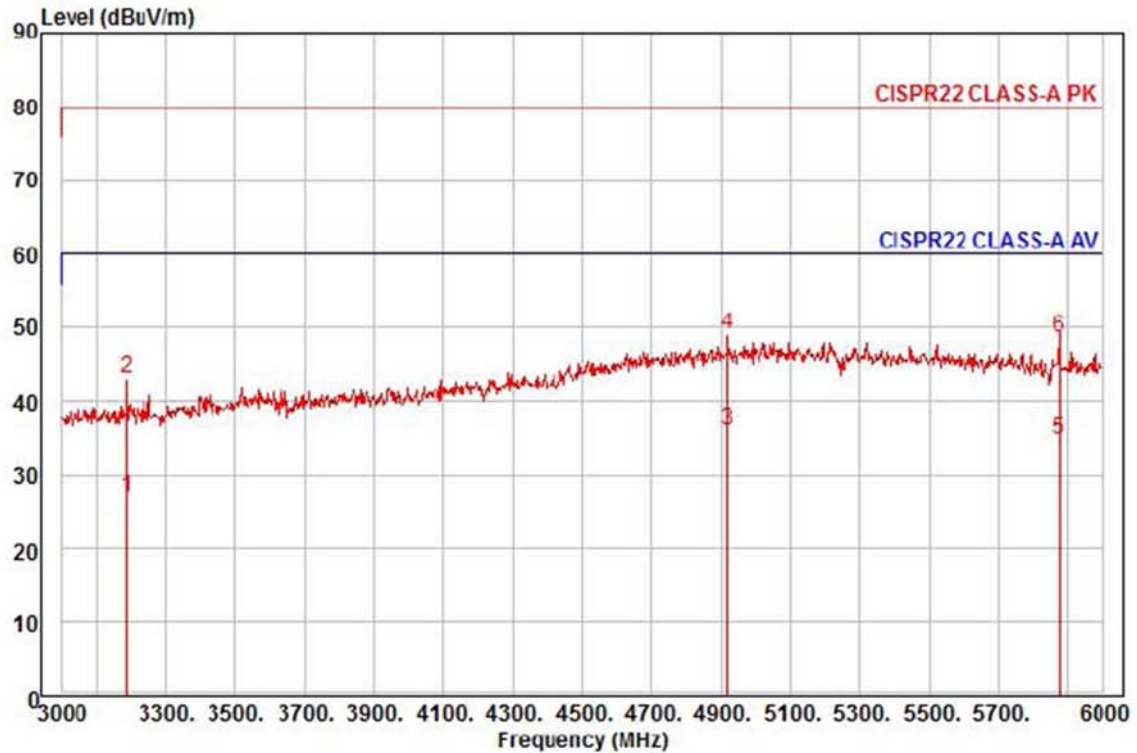
Test report No.:
KES-E1-16T0106
Page (23) of (33)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RN
Mode :
Memo : (3 - 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4455.00	24.50	34.61	14.35	40.41	133	60.00	-26.95	horizontal	Average
2	4455.00	37.56	34.61	14.35	40.41	133	80.00	-33.89	horizontal	Peak
3 pp	5088.00	23.40	37.54	15.43	40.40	137	60.00	-24.03	horizontal	Average
4 pk	5088.00	36.45	37.54	15.43	40.40	137	80.00	-30.98	horizontal	Peak
5	5829.00	22.46	36.05	16.54	40.29	59	60.00	-25.24	horizontal	Average
6	5829.00	35.18	36.05	16.54	40.29	59	80.00	-32.52	horizontal	Peak

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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RN
Mode :
Memo : (3 - 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3186.00	24.87	30.64	11.70	40.25	216	60.00	-33.04	vertical	Average
2	3186.00	41.17	30.64	11.70	40.25	216	80.00	-36.74	vertical	Peak
3 pp	4920.00	23.96	37.26	15.19	40.41	301	60.00	-24.00	vertical	Average
4 pk	4920.00	36.96	37.26	15.19	40.41	301	80.00	-31.00	vertical	Peak
5	5877.00	22.60	35.95	16.63	40.29	229	60.00	-25.11	vertical	Average
6	5877.00	36.28	35.95	16.63	40.29	229	80.00	-31.43	vertical	Peak



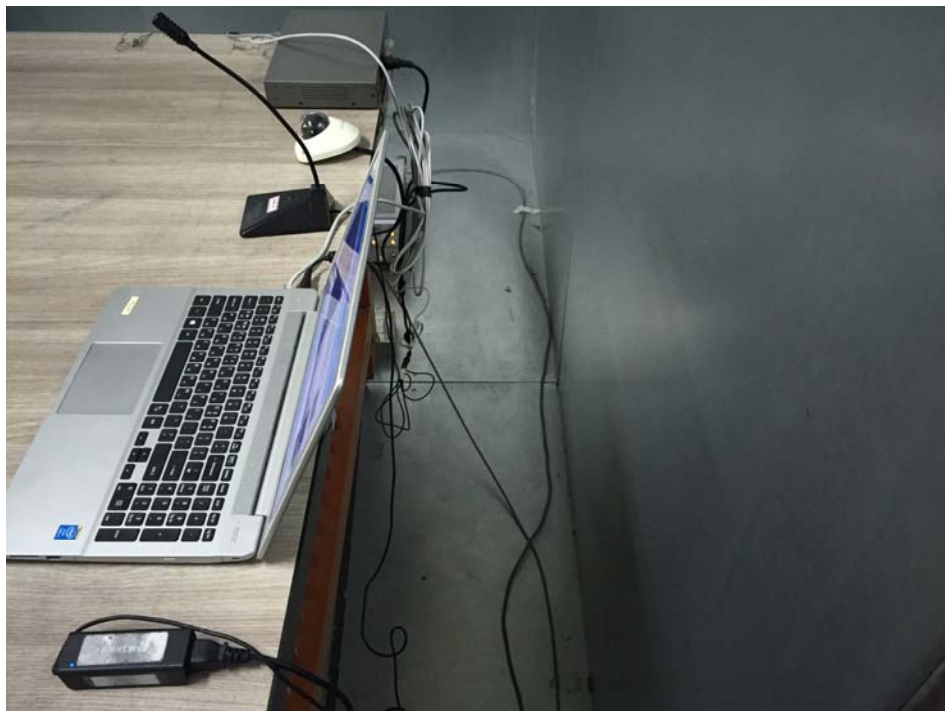
Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

N/A

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

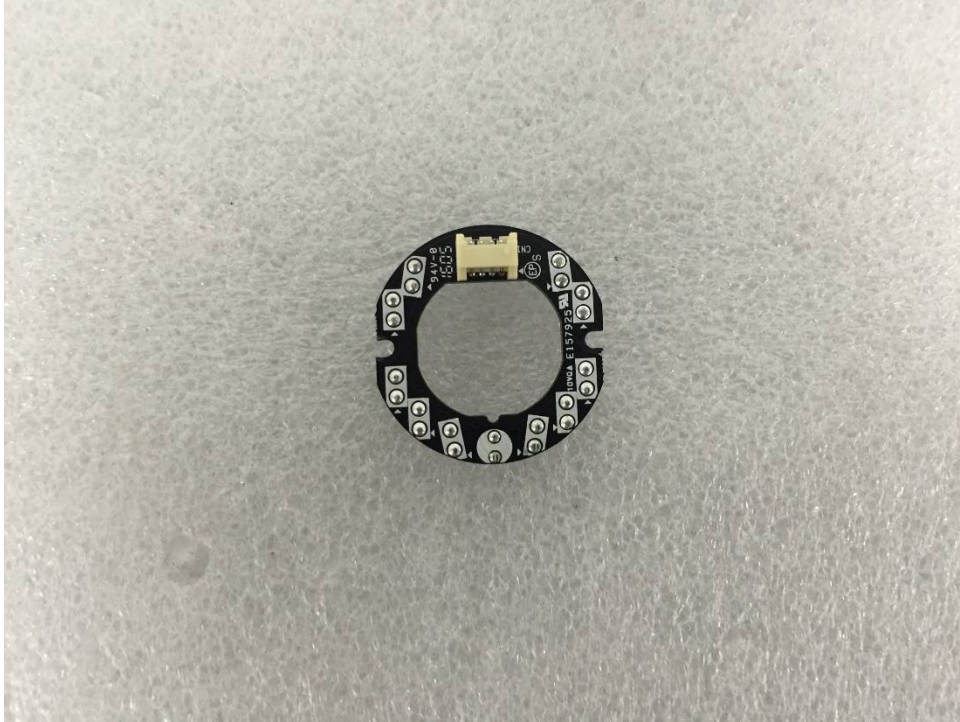
(Internal View)



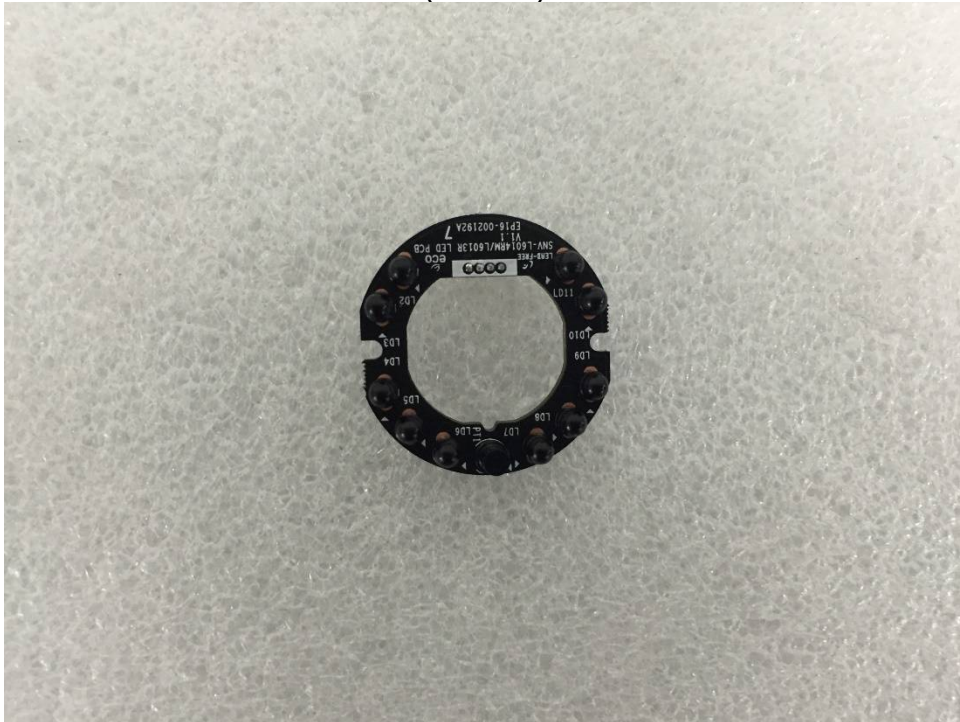
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Main Board EUT Internal View – IR Board

(Top)



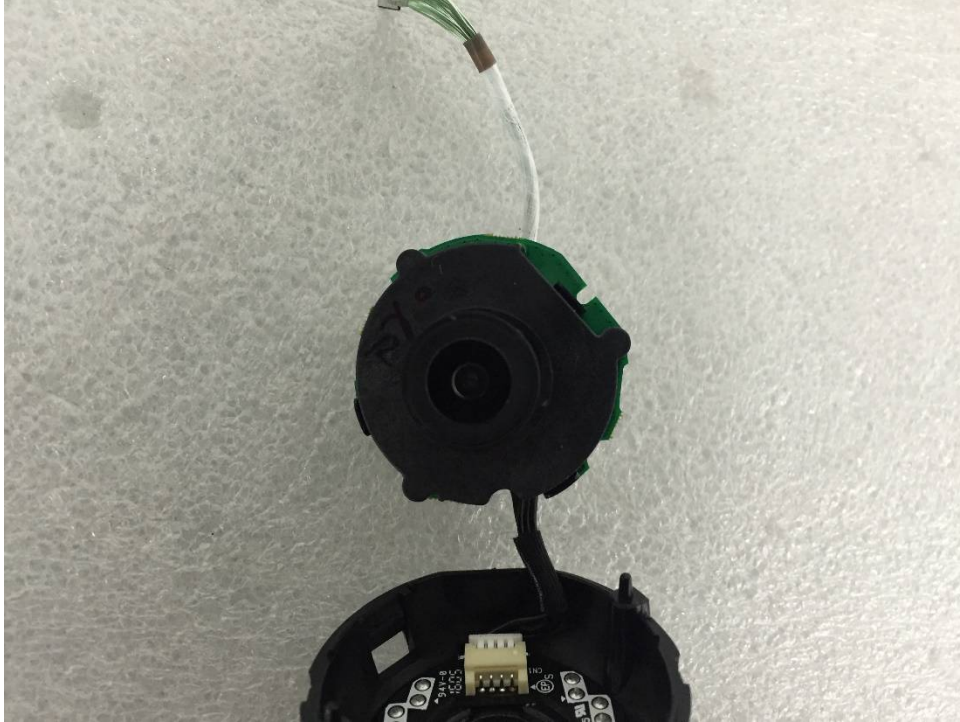
(Bottom)



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Main Board EUT Internal View – Camera Board

(Top)



(Bottom)



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Main Board EUT Internal View – Main Board

(Top)



(Bottom)



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