



EMC TEST REPORT For VCCI

Test Report No. : KES-E1-17T0512
Date of Issue : Aug. 14, 2017
Product name : CCTV CAMERA
Model/Type No. : HCO-6080RN
Variant Model : HCO-6070RN
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
Date of Receipt : Aug. 01, 2017
Test date : Aug. 08, 2017 ~ Aug. 09, 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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KES-E1-17T0512
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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 14, 2017	KES-E1-17T0512	Issued

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1.0 General Product Description

Main Specifications of EUT are:

HCO-6080RN		HCO-6080RP
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 : 0.2Lux (F1.4, 50IRE); 0.11Lux (F1.4, 30IRE) B/W : 0Lux(IR LED on)	
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)	2.8 ~ 12mm (4.3x) motorized varifocal	
Max. Aperture Ratio	F1.4	
Angular Field of View	H : 103.8°(Wide) ~ 32.4°(Tele) / V : 53.7°(Wide) ~ 18.4°(Tele)D : 121.9°(Wide) ~ 37.1°(Tele)	
Min. Object Distance	0.5m (1.64ft)	
Focus Control	Simple focus(Motorized V/F) / Manual	
Lens Type	DC Auto Iris	
Mount Type	Board-in type	
Auto Back Focus(ABF)	-	
Operational		
IR LED		
Viewable length	30m (98.43ft)	
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)	
Day & Night	Auto (ICR) / 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	
Remote control interface	Coaxial	
Protocol	NTSC/PAL : Pelco-C (Coaxitron) AHD : ACP(AHD Coax Protocol)	
Video Transmission Distance	500m(5C2V Coaxial Cable)	
Environmental		
Operating Temperature / Humidity	-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH * Start up should be done at above -10°C	
Ingress Protection	IP66	
Vandal Resistance	IK10	
Electrical		
Input Voltage/Current	Dual (24VAC±10% & 12VDC±10%)	
Power Consumption	Max. 6W	
Mechanical		
Color / Material	Dark Gray / Aluminum	
Dimension (WxHxD)	260* Ø 78 mm	
Weight	922g	

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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

The Variant model is management model of each different sellers.

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
CCTV CAMERA	HCO-6080RP	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
MONITOR	23MA53D	303KKMH9Z019	LG Electronics Co., Ltd.	-
MONITOR Adapter	PSAB-L205A	EAY62850201	LG Innotek Yantai Co. Ltd.	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-



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	3.5	S
	2 Pin	Alarm	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	3.5	S
	2 Pin	Alarm	2 Pin	3.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

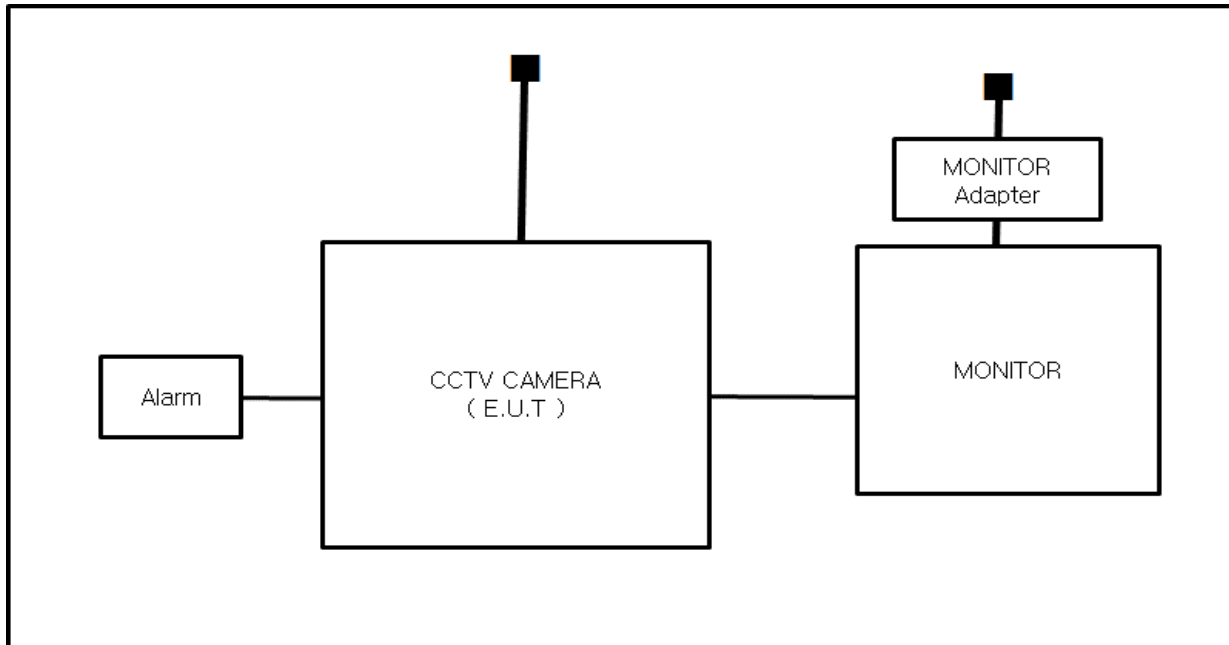
Test mode	operating
AC 24 V	E.U.T Monitoring
DC 12 V	E.U.T Monitoring

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

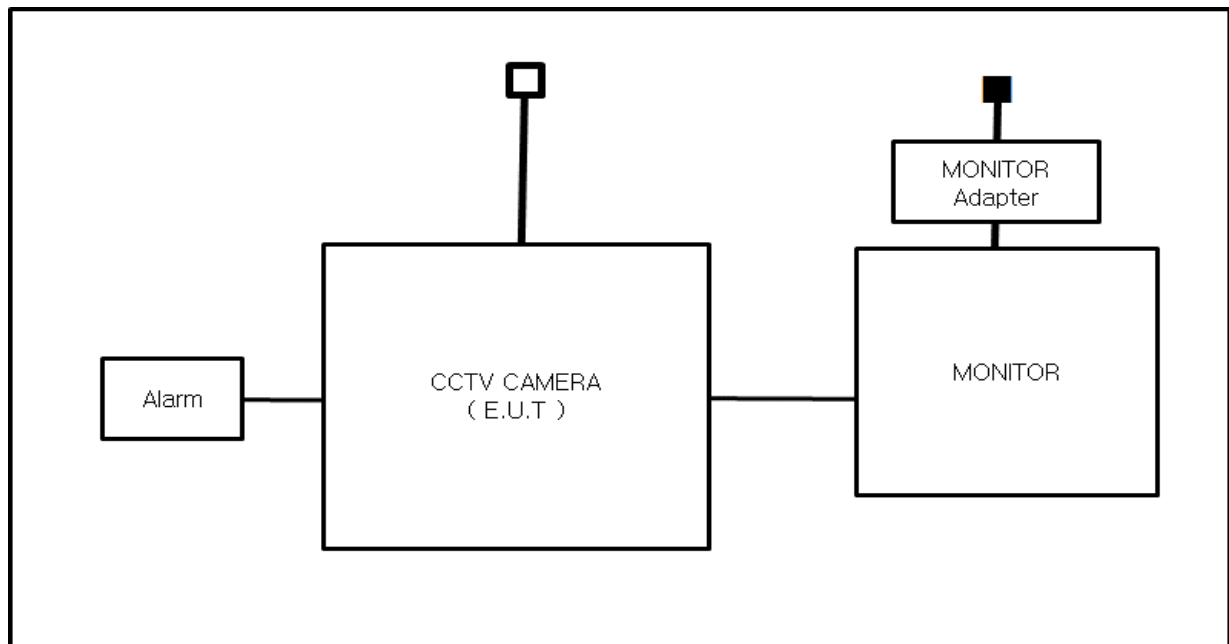
1.8 Configuration

■ AC Main
□ DC Main

- AC 24 V Mode



- DC 12 V Mode



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1.9 Remarks when standards applied

- N/A

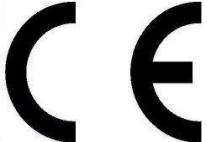
1.10 Calibration Details of Equipment Used for Measurement

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 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

Aug. 08, 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 ConditionsTemperature: 23,3 °C
Relative Humidity: 40,8 %**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

RemarksSee Appendix A for test data.



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	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
☐	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 29, 2018
☐	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 29, 2018
☐	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	08, 11, 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



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Aug. 09, 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	R & S	826008/014	04, 18, 2018
☐	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	04, 14, 2018

Test Conditions

Temperature: 22,8℃
Relative Humidity: 42,3 %

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.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Aug. 09, 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 ConditionsTemperature: 22,8℃
Relative Humidity: 42,3 %**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.

APPENDIX A – TEST DATA

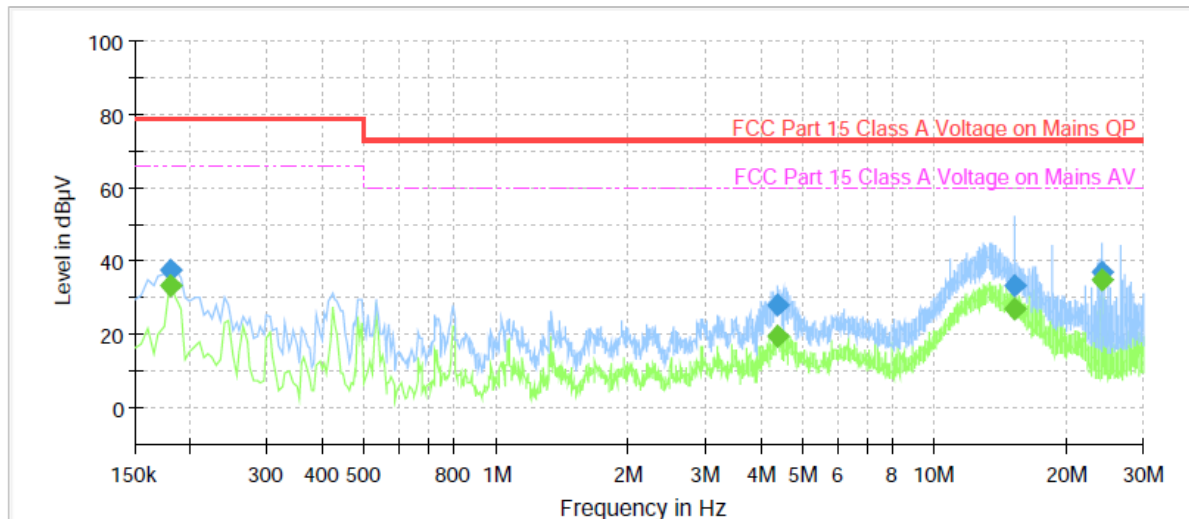
Conducted Emissions at Mains Power Ports

- AC 24 V Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	HCO-6080RN
Mode	AC
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.180000	---	33.59	66.00	32.41	1000.0	9.000	L1	19.4
0.180000	37.59	---	79.00	41.41	1000.0	9.000	L1	19.4
4.390000	---	19.57	60.00	40.43	1000.0	9.000	L1	19.9
4.390000	27.83	---	73.00	45.17	1000.0	9.000	L1	19.9
15.215000	---	26.94	60.00	33.06	1000.0	9.000	L1	20.0
15.215000	33.45	---	73.00	39.55	1000.0	9.000	L1	20.0
24.050000	---	34.80	60.00	25.20	1000.0	9.000	L1	20.1
24.050000	37.25	---	73.00	35.75	1000.0	9.000	L1	20.1

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

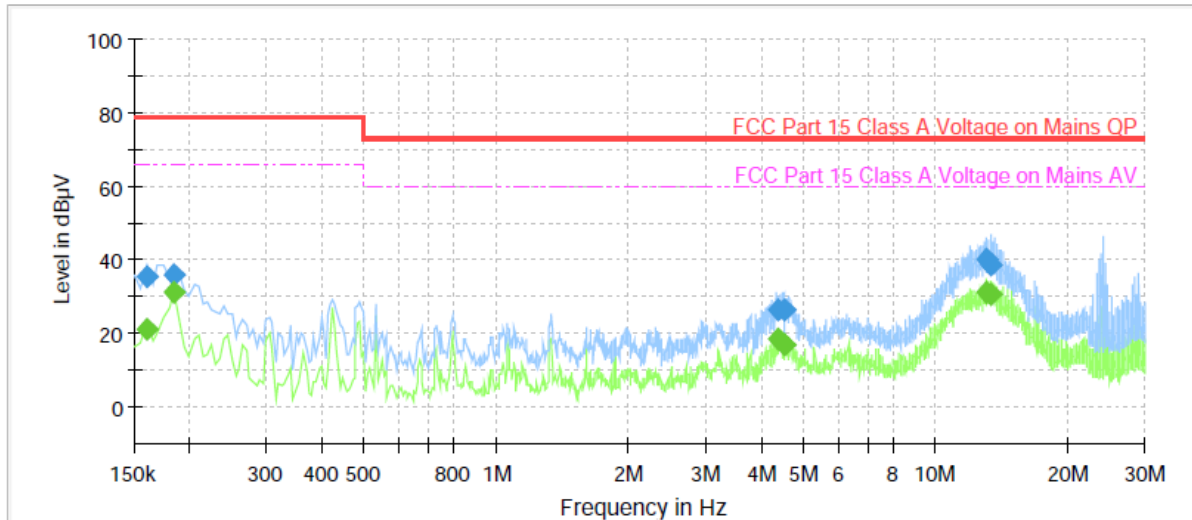
Reading Value : Not shown in the table.

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

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	HCO-6080RN
Mode	AC
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	21.11	66.00	44.89	1000.0	9.000	N	19.4
0.160000	35.41	---	79.00	43.59	1000.0	9.000	N	19.4
0.185000	---	31.39	66.00	34.61	1000.0	9.000	N	19.4
0.185000	36.09	---	79.00	42.91	1000.0	9.000	N	19.4
4.390000	---	18.30	60.00	41.70	1000.0	9.000	N	19.9
4.390000	26.56	---	73.00	46.44	1000.0	9.000	N	19.9
4.520000	---	17.02	60.00	42.98	1000.0	9.000	N	19.9
4.520000	26.57	---	73.00	46.43	1000.0	9.000	N	19.9
13.105000	---	31.07	60.00	28.93	1000.0	9.000	N	19.8
13.105000	40.16	---	73.00	32.84	1000.0	9.000	N	19.8
13.300000	---	30.85	60.00	29.15	1000.0	9.000	N	19.8
13.300000	38.54	---	73.00	34.46	1000.0	9.000	N	19.8

◆ 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))



Conducted Emissions at Telecommunication Ports

[10 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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[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)

- AC 24 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	
142.46	23.50	V	1.00	8.00	2.67	34.17	40.00	5.83
173.15	19.40	V	1.00	9.12	2.98	31.50	40.00	8.50
186.39	18.90	V	1.00	10.10	3.07	32.07	40.00	7.93
197.58	14.80	V	1.00	11.23	3.11	29.14	40.00	10.86
228.75	15.40	V	1.00	12.09	3.37	30.86	40.00	9.14
367.85	15.50	V	1.00	14.87	4.35	34.72	47.00	12.28

* H : Horizontal, V : Vertical

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

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- DC 12 V Mode

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]
123.14	20.70	V	1.00	9.39	2.45	32.54	40.00	7.46
133.19	21.40	V	1.00	8.52	2.57	32.49	40.00	7.51
145.43	18.90	V	1.00	8.08	2.70	29.68	40.00	10.32
147.78	20.50	V	1.00	8.15	2.72	31.37	40.00	8.63
222.80	20.20	V	1.00	11.96	3.32	35.48	40.00	4.52
367.89	18.30	V	1.00	14.87	4.35	37.52	47.00	9.48

* H : Horizontal, V : Vertical

◆ Calculation

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

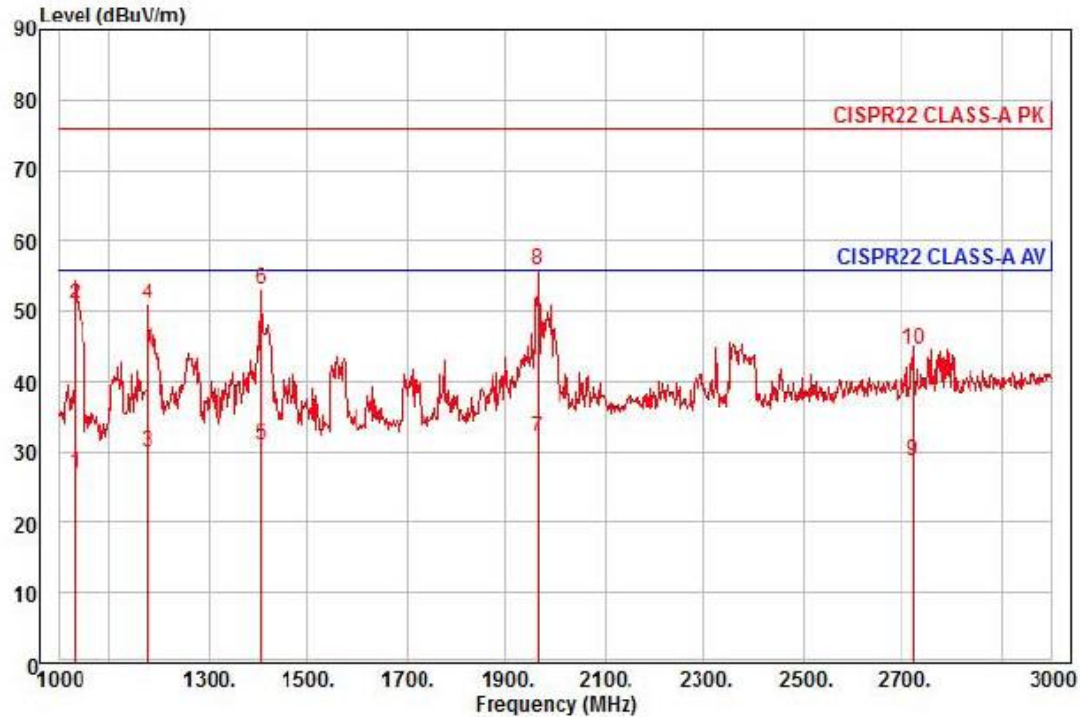
Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

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Radiated Electric Field Emissions(Above 1 GHz)

- AC 24 V Mode



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 : HCO-6080RN
Mode : AC
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preampl Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1030.00	33.68	22.59	6.73	36.03	359	56.00	-29.03	horizontal	Average
2	1030.00	57.79	22.59	6.73	36.03	359	76.00	-24.92	horizontal	Peak
3	1176.00	35.54	23.04	7.20	35.90	27	56.00	-26.12	horizontal	Average
4	1176.00	56.57	23.04	7.20	35.90	27	76.00	-25.09	horizontal	Peak
5	1406.00	34.89	23.73	7.95	35.70	55	56.00	-25.13	horizontal	Average
6	1406.00	57.27	23.73	7.95	35.70	55	76.00	-22.75	horizontal	Peak
7 av	1964.00	31.93	25.87	9.55	35.20	44	56.00	-23.85	horizontal	Average
8 pp	1964.00	55.58	25.87	9.55	35.20	44	76.00	-20.20	horizontal	Peak
9	2722.00	24.31	28.51	11.39	35.45	310	56.00	-27.24	horizontal	Average
10	2722.00	40.18	28.51	11.39	35.45	310	76.00	-31.37	horizontal	Peak

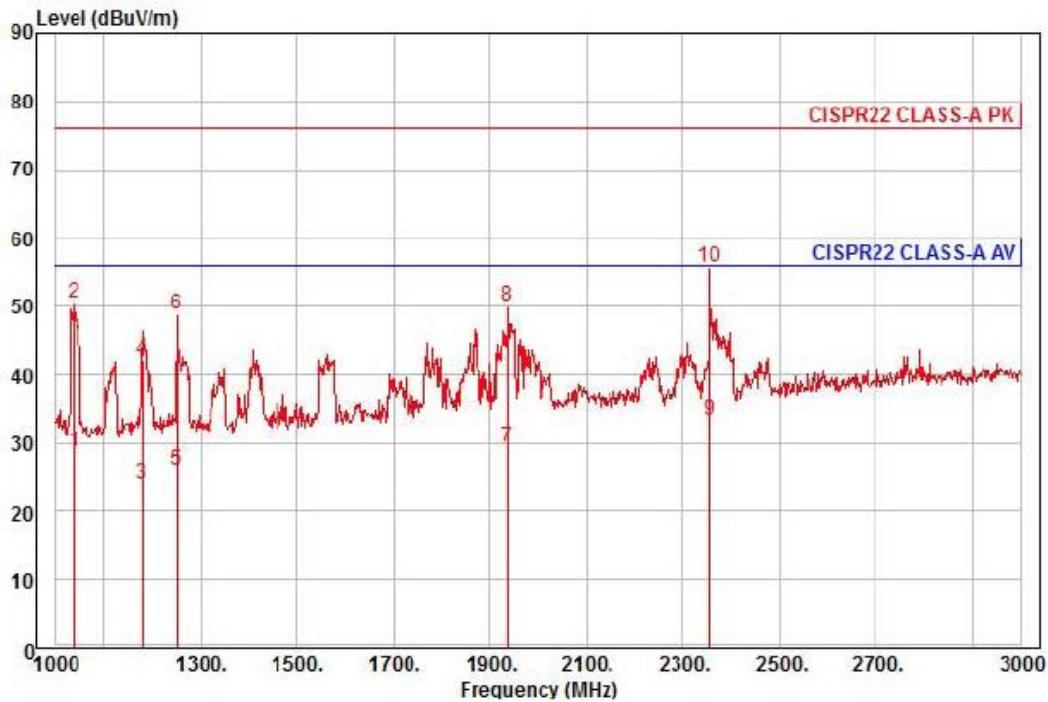
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Test report No.:
KES-E1-17T0512
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : HCO-6080RN
Mode : AC
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	1038.00	35.28	22.62	6.76	36.03	6	56.00	-27.37	vertical	Average
2	1038.00	57.17	22.62	6.76	36.03	6	76.00	-25.48	vertical	Peak
3	1178.00	29.64	23.04	7.21	35.90	6	56.00	-32.01	vertical	Average
4	1178.00	47.72	23.04	7.21	35.90	6	76.00	-33.93	vertical	Peak
5	1252.00	31.12	23.27	7.45	35.84	42	56.00	-30.00	vertical	Average
6	1252.00	54.02	23.27	7.45	35.84	42	76.00	-27.10	vertical	Peak
7	1936.00	29.33	25.76	9.47	35.23	356	56.00	-26.67	vertical	Average
8	1936.00	49.98	25.76	9.47	35.23	356	76.00	-26.02	vertical	Peak
9 av	2356.00	30.99	27.09	10.49	35.31	23	56.00	-22.74	vertical	Average
10 pp	2356.00	53.30	27.09	10.49	35.31	23	76.00	-20.43	vertical	Peak

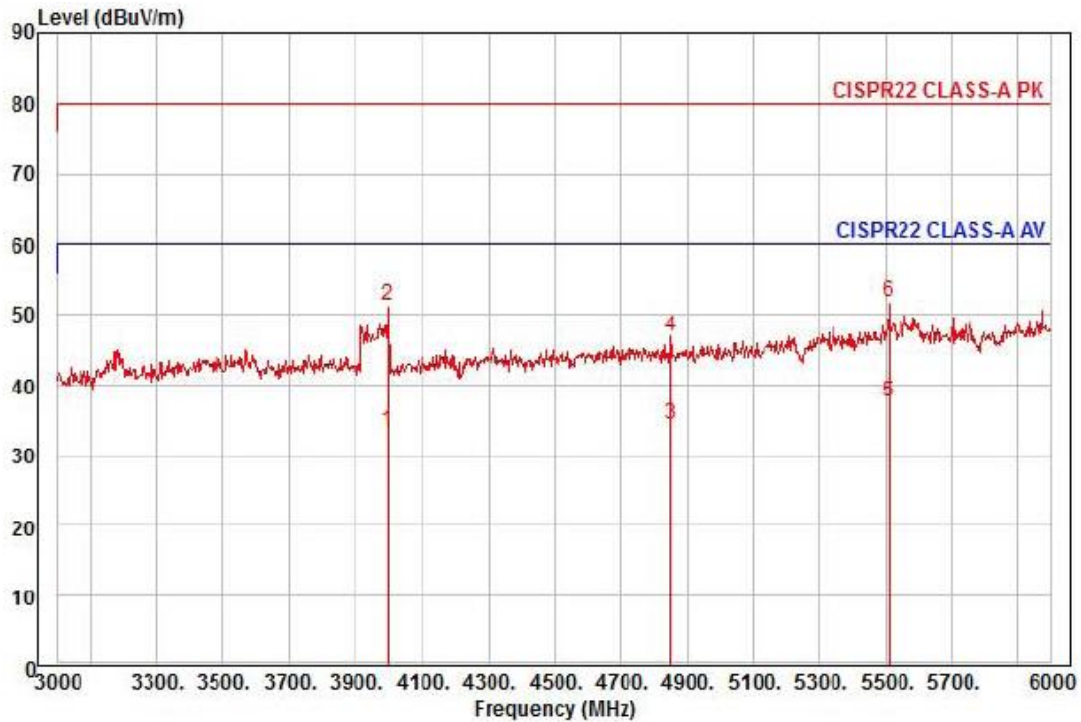
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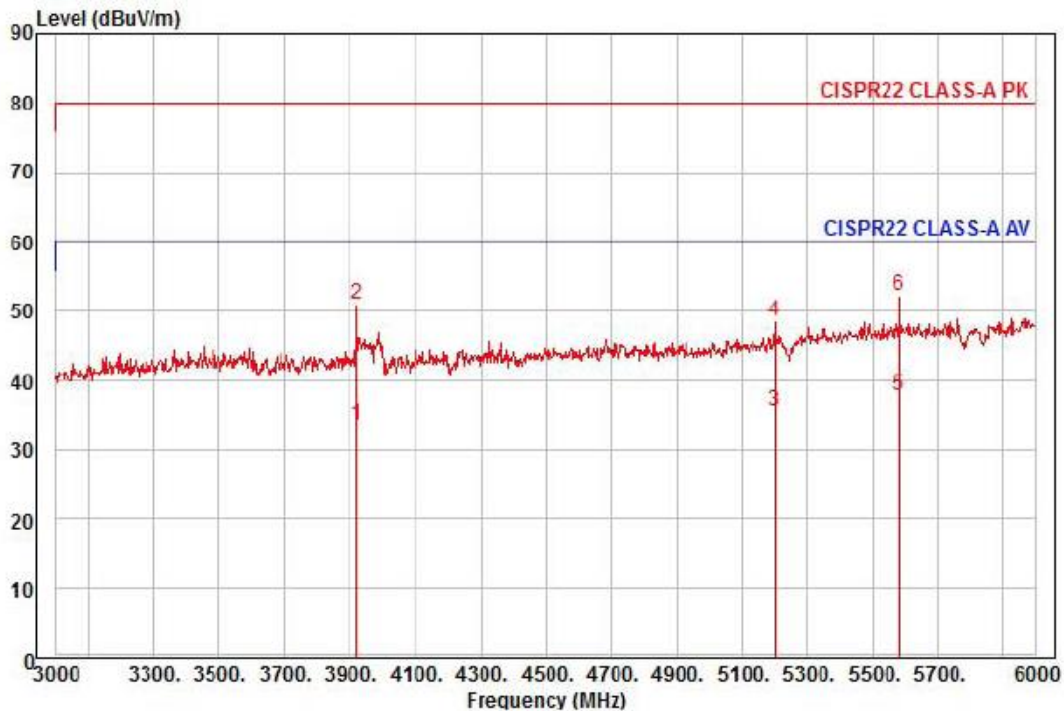
Test report No.:
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : HCO-6080RN
Mode : AC
Memo : 3 ~ 6 GHz

		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	3999.00	22.17	32.50	14.07	35.28	53	60.00	-26.54	horizontal	Average
2	3999.00	40.05	32.50	14.07	35.28	53	80.00	-28.66	horizontal	Peak
3	4851.00	21.31	33.10	15.58	35.58	218	60.00	-25.59	horizontal	Average
4	4851.00	33.84	33.10	15.58	35.58	218	80.00	-33.06	horizontal	Peak
5 pp	5511.00	21.14	35.39	16.63	35.66	72	60.00	-22.50	horizontal	Average
6 pk	5511.00	35.49	35.39	16.63	35.66	72	80.00	-28.15	horizontal	Peak

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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 : HCO-6080RN
Mode : AC
Memo : 3 ~ 6 GHz

	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	3921.00	22.59	32.29	13.90	35.30	56	60.00	-26.52	vertical	Average
2	3921.00	40.00	32.29	13.90	35.30	56	80.00	-29.11	vertical	Peak
3	5202.00	20.91	34.20	16.07	35.64	313	60.00	-24.46	vertical	Average
4	5202.00	33.81	34.20	16.07	35.64	313	80.00	-31.56	vertical	Peak
5 pp	5583.00	21.12	35.49	16.74	35.66	15	60.00	-22.31	vertical	Average
6 pk	5583.00	35.72	35.49	16.74	35.66	15	80.00	-27.71	vertical	Peak

◆ Calculation

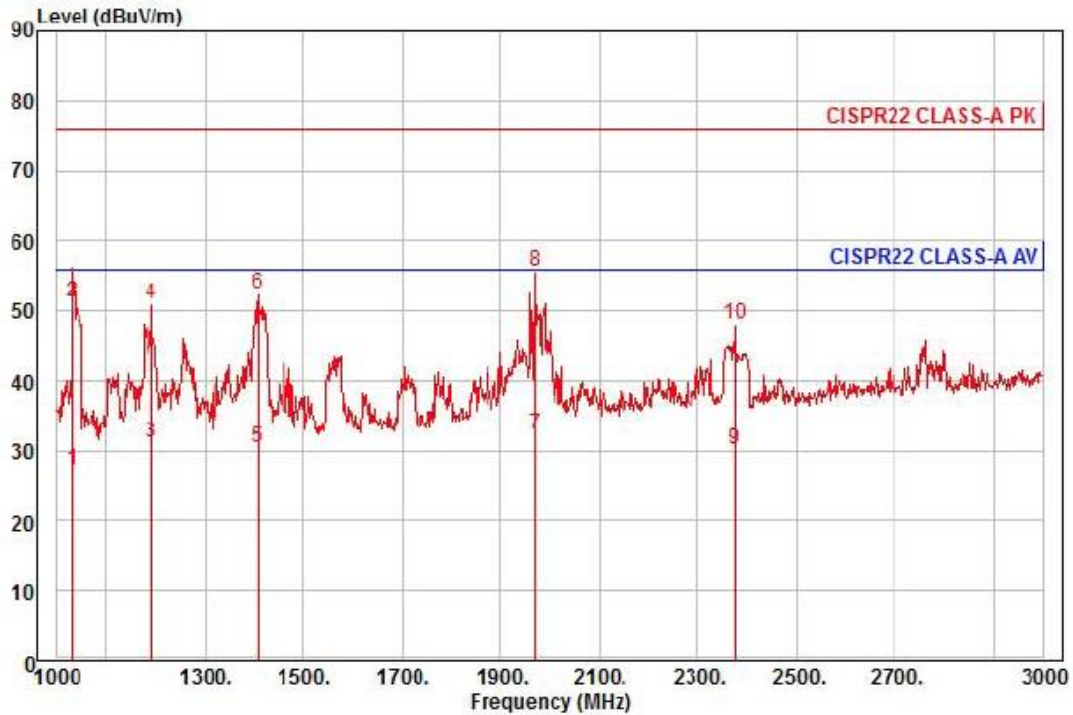
Result(PK/CAV) [dB(μ V/m)] = (Reading(PK/CAV)[dB(μ V)] + c.f[dB(1/m)])

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

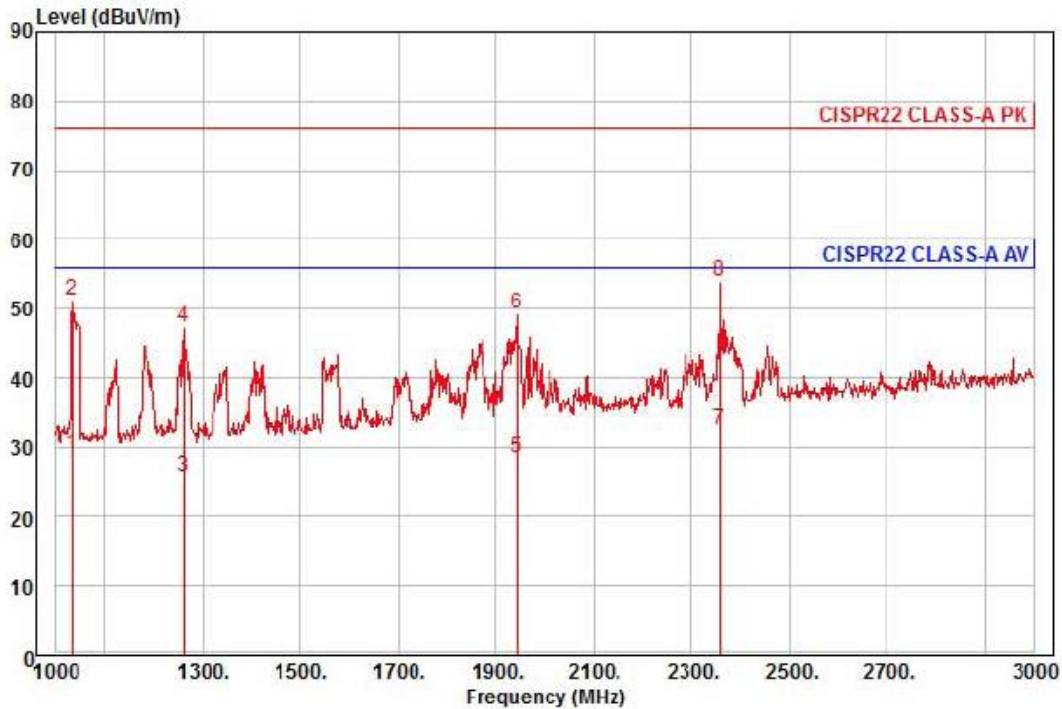
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

- DC 12 V Mode



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 : HCO-6080RN
Mode : DC
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preampl Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1030.00	33.96	22.59	6.73	36.03	1	56.00	-28.75	horizontal	Average
2	1030.00	57.92	22.59	6.73	36.03	1	76.00	-24.79	horizontal	Peak
3	1192.00	36.62	23.08	7.26	35.89	34	56.00	-24.93	horizontal	Average
4	1192.00	56.61	23.08	7.26	35.89	34	76.00	-24.94	horizontal	Peak
5	1408.00	34.49	23.74	7.95	35.70	56	56.00	-25.52	horizontal	Average
6	1408.00	56.55	23.74	7.95	35.70	56	76.00	-23.46	horizontal	Peak
7 av	1970.00	32.24	25.89	9.56	35.20	51	56.00	-23.51	horizontal	Average
8 pp	1970.00	55.38	25.89	9.56	35.20	51	76.00	-20.37	horizontal	Peak
9	2374.00	27.76	27.15	10.53	35.32	51	56.00	-25.88	horizontal	Average
10	2374.00	45.65	27.15	10.53	35.32	51	76.00	-27.99	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

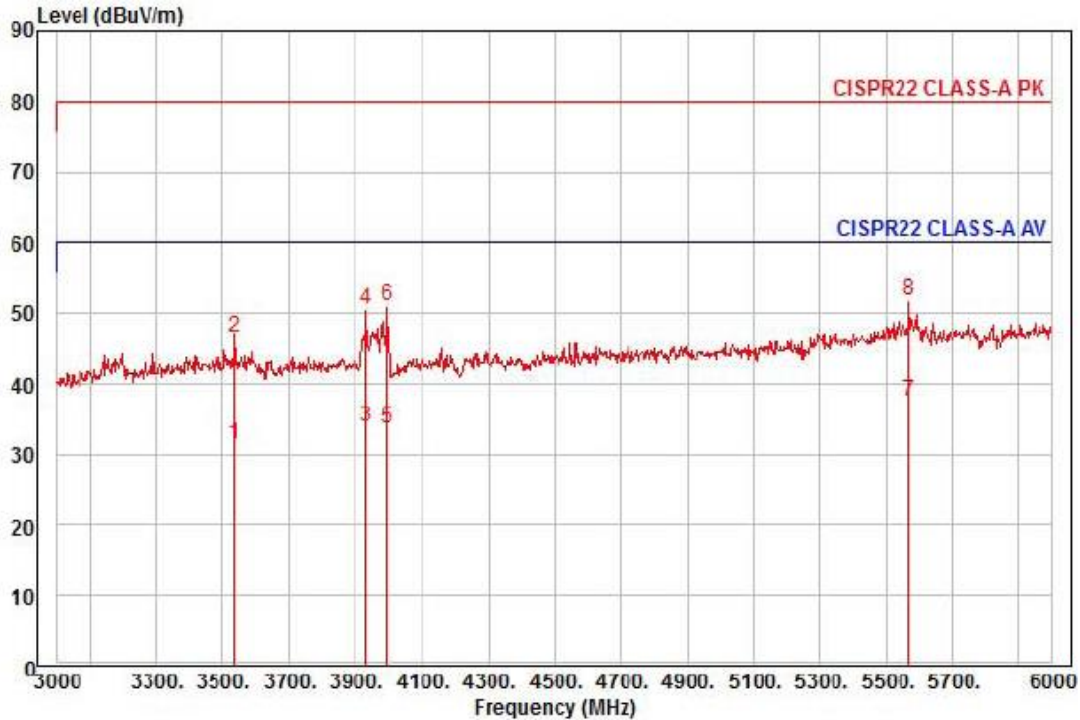
Project :

Model : HCO-6080RN

Mode : DC

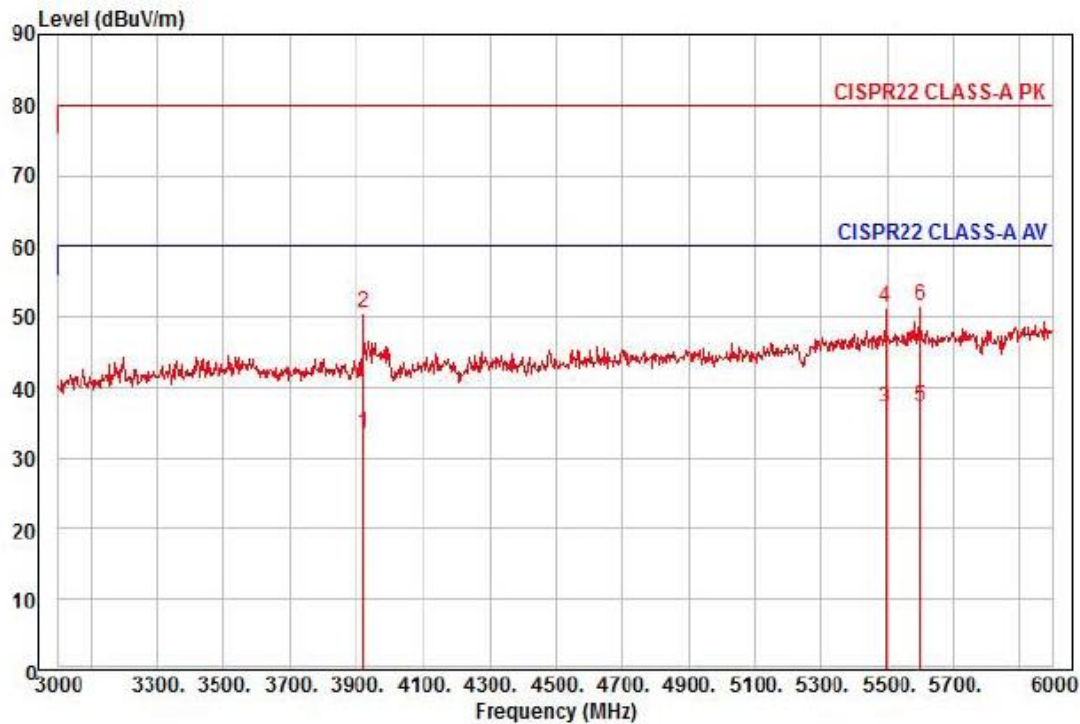
Memo : 1 ~ 3 GHz

	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	1032.00	35.61	22.60	6.74	36.03	6	56.00	-27.08	vertical	Average
2	1032.00	57.85	22.60	6.74	36.03	6	76.00	-24.84	vertical	Peak
3	1262.00	30.79	23.30	7.48	35.83	56	56.00	-30.26	vertical	Average
4	1262.00	52.48	23.30	7.48	35.83	56	76.00	-28.57	vertical	Peak
5	1944.00	28.48	25.79	9.49	35.22	356	56.00	-27.46	vertical	Average
6	1944.00	49.32	25.79	9.49	35.22	356	76.00	-26.62	vertical	Peak
7 av	2358.00	30.22	27.10	10.50	35.31	25	56.00	-23.49	vertical	Average
8 pp	2358.00	51.73	27.10	10.50	35.31	25	76.00	-21.98	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 : HC0-6080RN
Mode : DC
Memo : 3 ~ 6 GHz

	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	3537.00	22.45	31.25	13.19	35.41	28	60.00	-28.52	horizontal	Average
2	3537.00	37.67	31.25	13.19	35.41	28	80.00	-33.30	horizontal	Peak
3	3933.00	22.99	32.32	13.92	35.30	56	60.00	-26.07	horizontal	Average
4	3933.00	39.54	32.32	13.92	35.30	56	80.00	-29.52	horizontal	Peak
5	3996.00	22.25	32.49	14.06	35.28	59	60.00	-26.48	horizontal	Average
6	3996.00	39.68	32.49	14.06	35.28	59	80.00	-29.05	horizontal	Peak
7 pp	5571.00	21.00	35.48	16.72	35.66	28	60.00	-22.46	horizontal	Average
8 pk	5571.00	35.15	35.48	16.72	35.66	28	80.00	-28.31	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 : HC0-6080RN
Mode : DC
Memo : 3 ~ 6 GHz

	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	3921.00	22.46	32.29	13.90	35.30	56	60.00	-26.65	vertical	Average
2	3921.00	39.61	32.29	13.90	35.30	56	80.00	-29.50	vertical	Peak
3	5496.00	20.74	35.35	16.60	35.66	14	60.00	-22.97	vertical	Average
4	5496.00	34.97	35.35	16.60	35.66	14	80.00	-28.74	vertical	Peak
5 pp	5601.00	20.57	35.52	16.77	35.67	6	60.00	-22.81	vertical	Average
6 pk	5601.00	34.80	35.52	16.77	35.67	6	80.00	-28.58	vertical	Peak

◆ 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

Test Setup Photos and Configuration

Conducted Voltage Emissions



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Test report No.:
KES-E1-17T0512
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Conducted Telecommunication Emissions

N/A

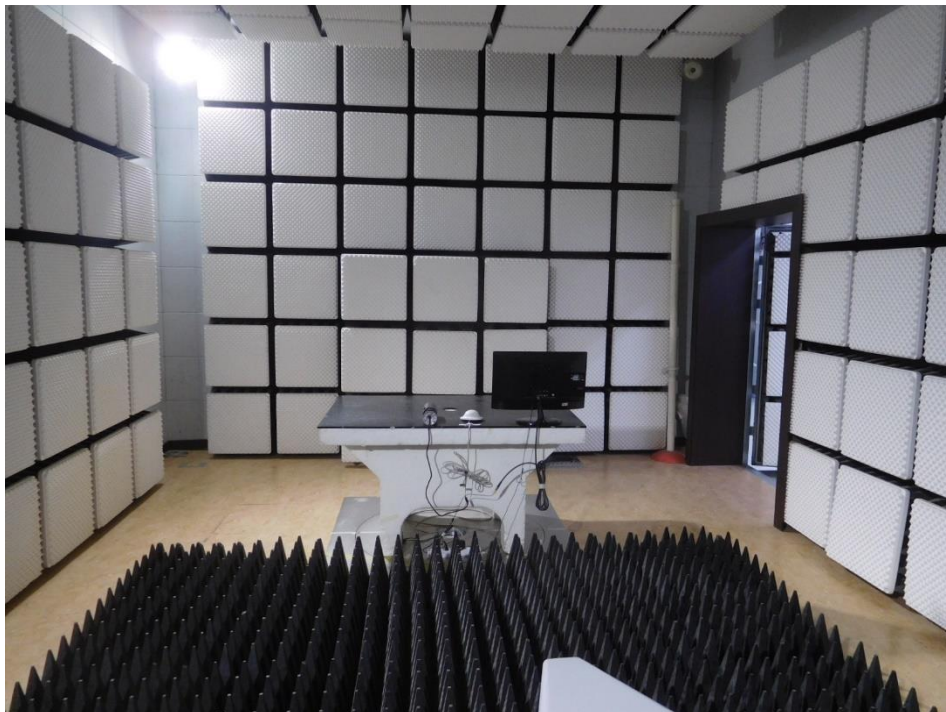
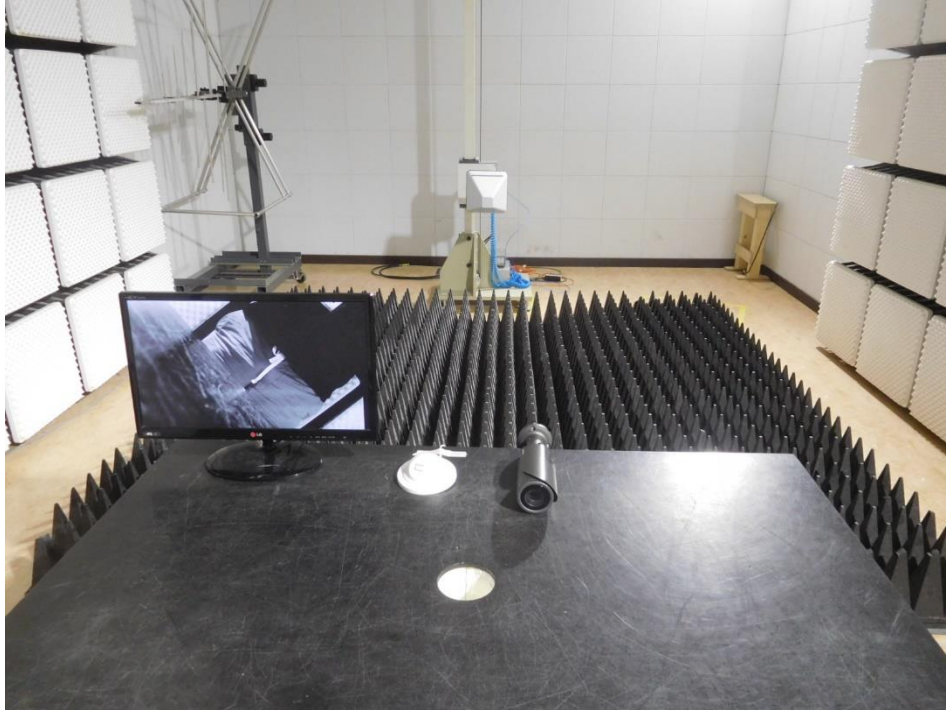
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Radiated Electric Field Emissions(Below 1 GHz)



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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

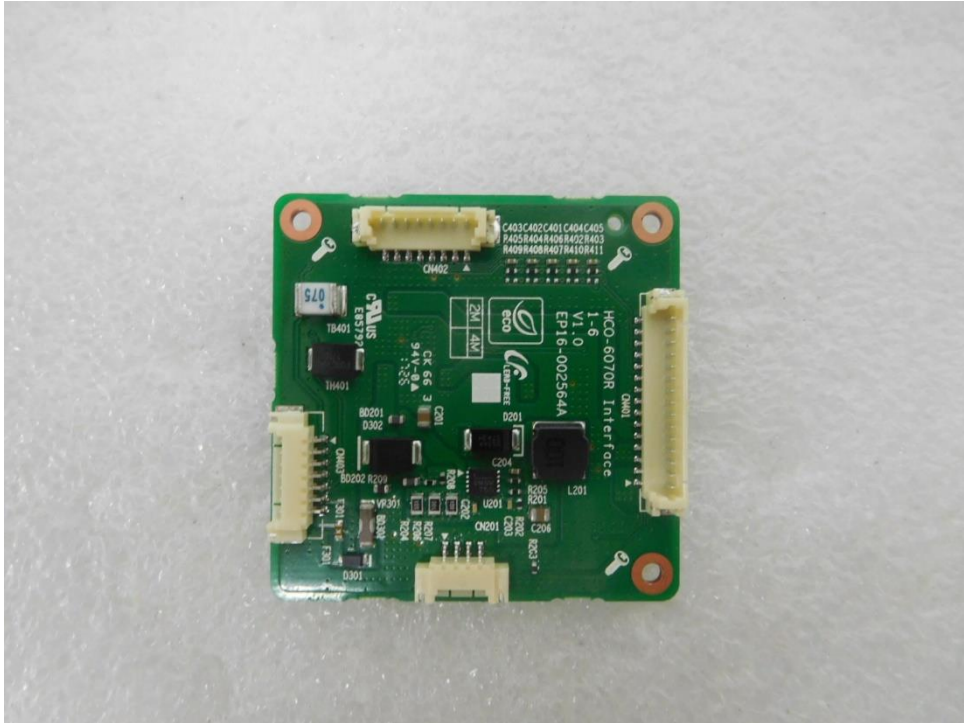
(Internal View)



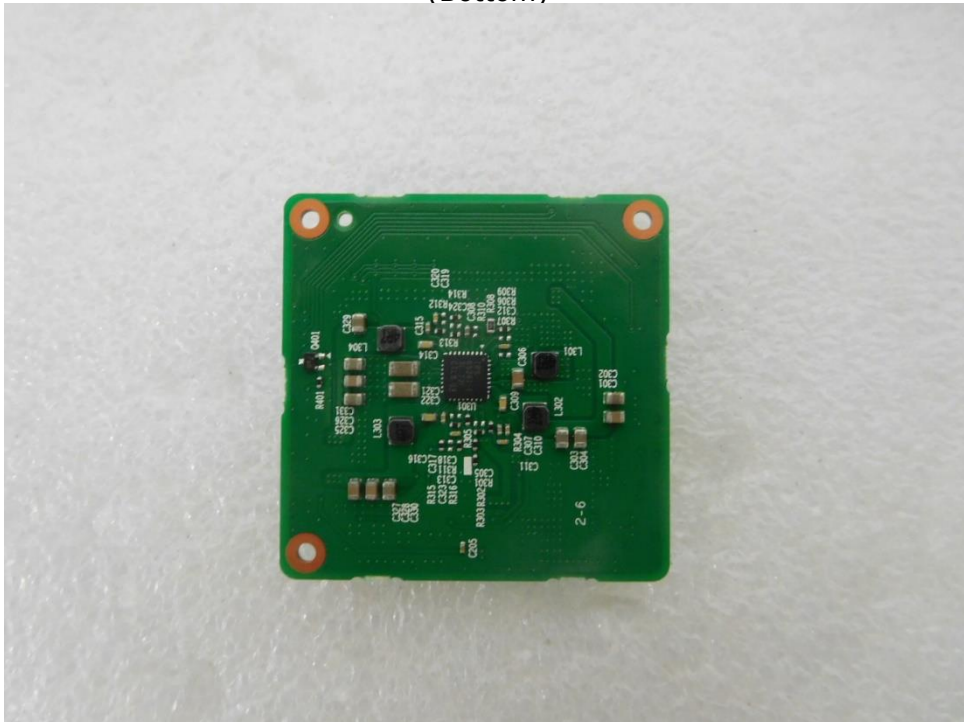
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EUT Internal View – Main board

(Top)



(Bottom)



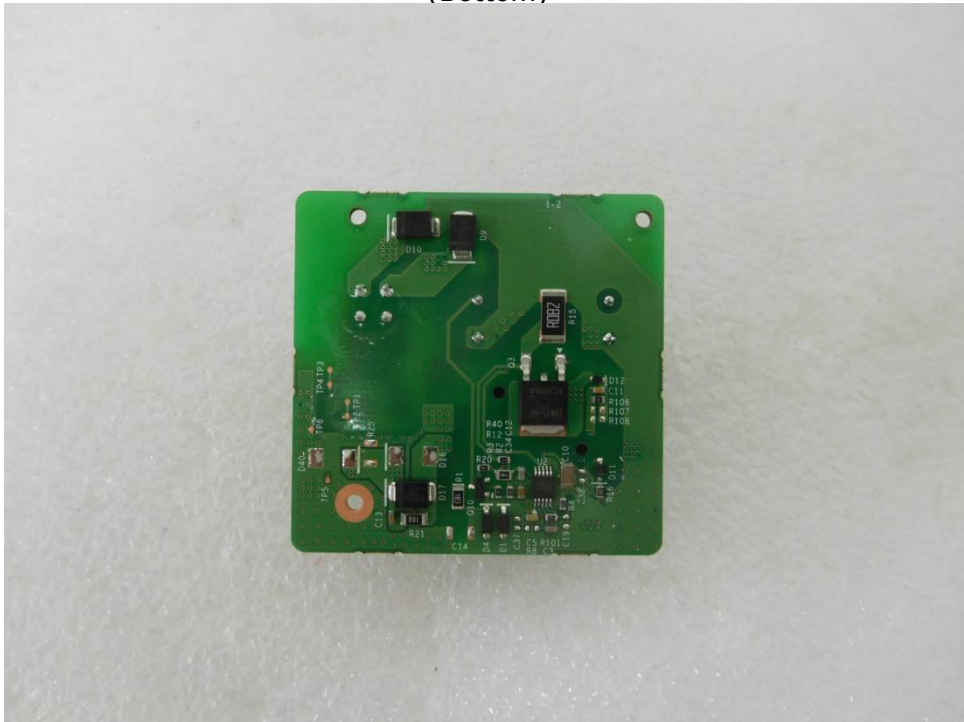
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EUT Internal View – Power board

(Top)



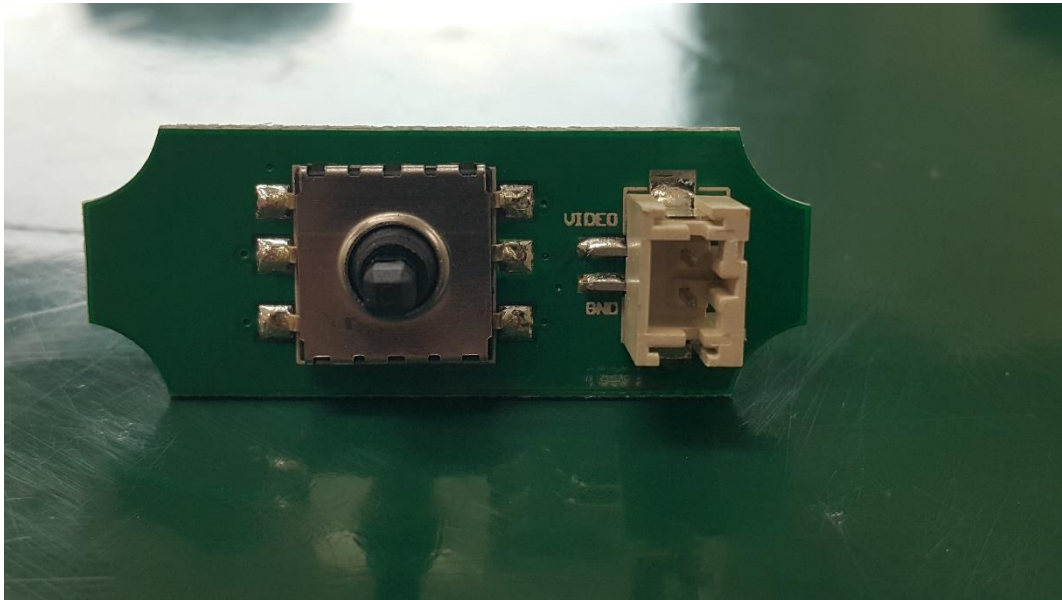
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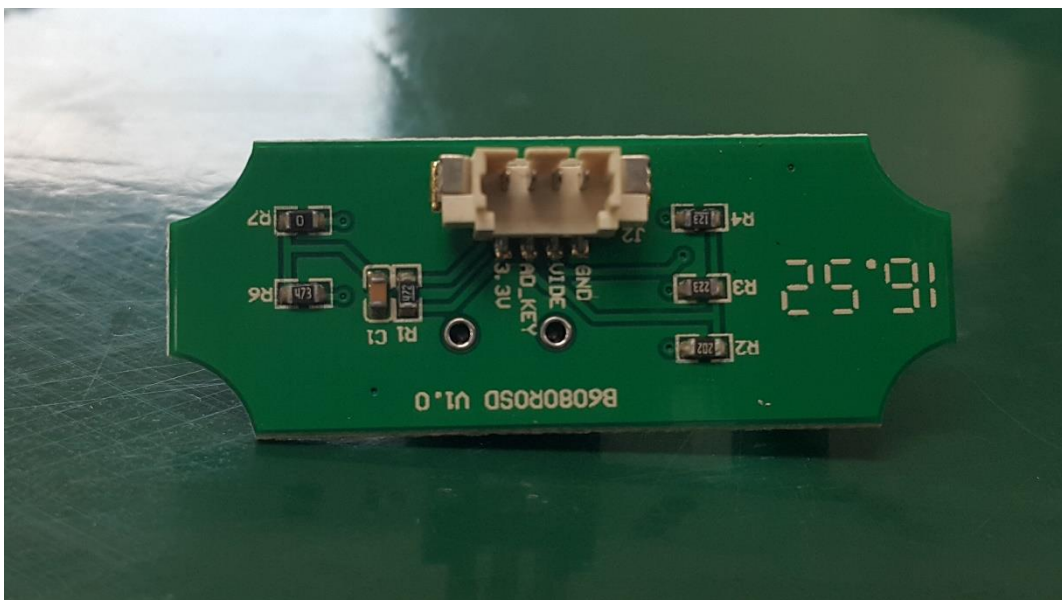
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EUT Internal View – Serve board

(Top)



(Bottom)



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EUT Internal View – IR board

(Top)



(Bottom)



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