

TEST REPORT

Applicant: AV Access Technology Ltd.

Address of Applicant: Unit 2801, 28th Floor, N0.88 Hing Fat Street, Causeway Bay, HongKong, China

Manufacturer/Factory: Shen Zhen Proitav Technology Co.,Ltd

Address of Manufacturer/Factory: Floor 3-4, Building 16, Hejing Industrial Zone, Fuyong Town, Baoan District, Shenzhen, China

Equipment Under Test (EUT)

Product Name: HDMI Switcher

Model No.: 4KSW41-KVM

Trade Mark: AV Access

Applicable standards: FCC CFR Title 47 Part 15 Subpart B

Date of sample receipt: November 19, 2018

Date of Test: November 20, 2018- January 18, 2019

Date of report issued: March 25, 2020

Test Result : Pass *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

A circular stamp for GTS Global Testing Services Co., Ltd. is overlaid with a handwritten signature in black ink. The signature appears to read 'Robinson Lo' and is dated '2020 mar'. The stamp contains the text 'GTS GLOBAL TESTING SERVICES CO., LTD.' around the perimeter.

Robinson Lo

Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Report No.	Version No.	Date	Description
GTS201812000152F01	00	January 21, 2019	Original
GTS202003000118F01	01	March 25, 2020	Change applicant, model number, trade mark, product external photos.

Prepared by:



Date:

March 25, 2020

Project Engineer

Reviewed by:



Date:

March 25, 2020

Reviewer

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4 Test Summary

Test Item	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission	FCC Part15.107	ANSI C63.4	Class B	PASS
Radiated Emissions #	FCC Part15.109	ANSI C63.4	Class B	PASS

Remark:

1. Pass: The EUT complies with the essential requirements in the standard.
2. # Refer to FCC Part 15.33 (b)(1) conditional testing procedure :

The highest frequency generated or used in the EUT	Test frequency range of Radiated emission
<108MHz	30MHz ~ 1GHz
108MHz ~ 500MHz	30MHz ~ 2GHz
500MHz ~ 1GHz	30MHz ~ 5GHz
>1GHz	30MHz ~ 5th harmonic of the highest frequency or 40 GHz, whichever is lower.

The highest frequency of the internal sources of the EUT is more than 108MHz.

5 General Information

5.1 General Description of EUT

Product Name:	HDMI Switcher
Model No.:	4KSW41-KVM
Power supply:	SWITCHING ADAPTOR Model: FJ-SW1202000N Input: AC100-240V, 50/60Hz, 0.6A Max Output: DC12V, 2000mA

5.2 Test mode and Test voltage

Test mode:	
Operation Mode	Keep the EUT in operation status.
Test voltage:	
AC 120/60Hz	

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
PHILIPS	LCD MONITOR	2588B6Q	UHBA1624052095H62
HUAWEI	Signal Source	Media Q M321	N/A

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● FCC —Registration No.: 381383 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383. ● IC —Registration No.: 9079A The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A. ● NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0.

5.7 Test Location

Tests were performed at:
<p>Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960</p>

6 Test Instruments list

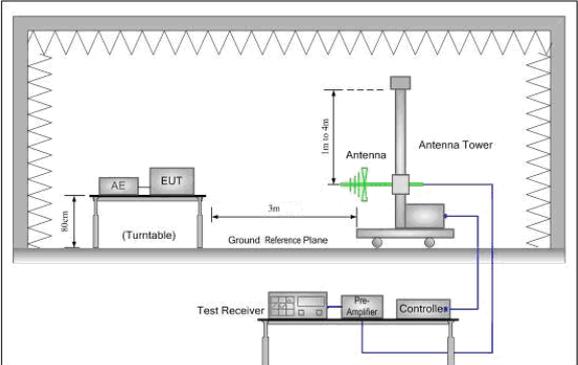
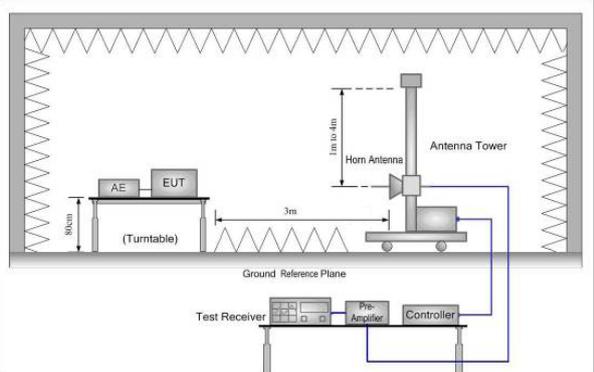
Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 27 2018	June. 26 2019
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 27 2018	June. 26 2019
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 27 2018	June. 26 2019
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 27 2018	June. 26 2019
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 27 2018	June. 26 2019
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 27 2018	June. 26 2019
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 27 2018	June. 26 2019
8	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	June. 27 2018	June. 26 2019

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

7 Test Results and Measurement Data

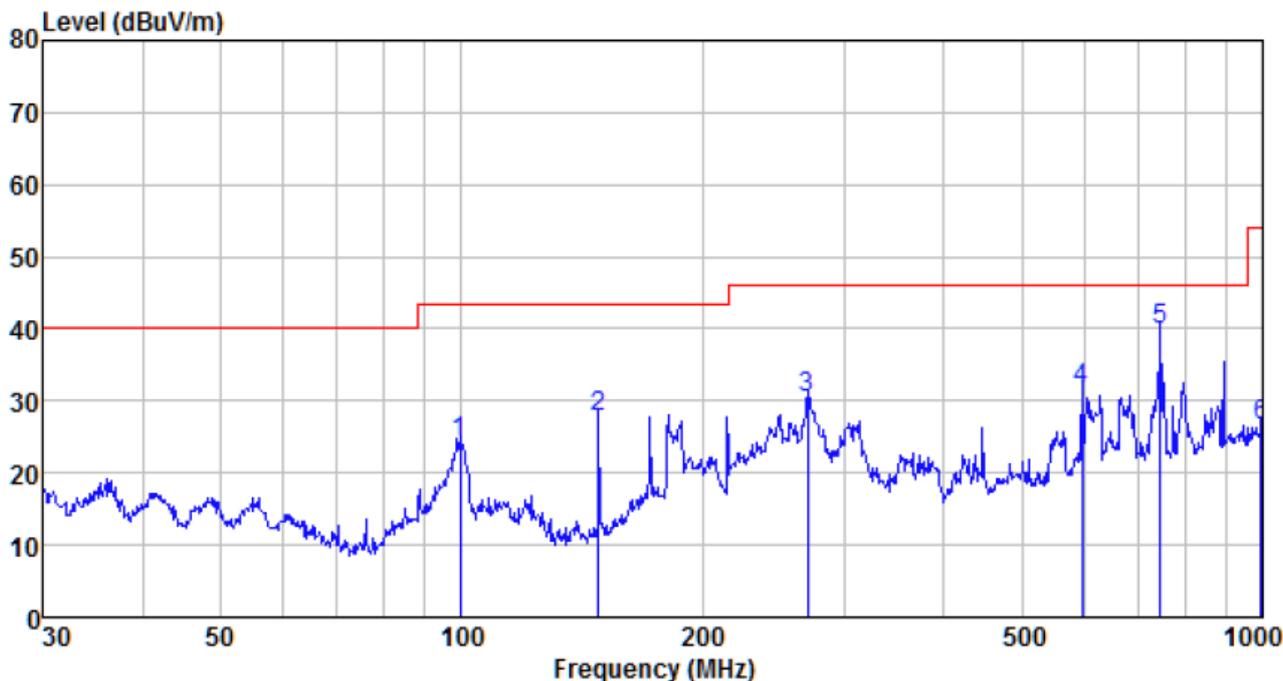
7.1 Radiated Emission

Test Requirement:	FCC Part15 B Section 15.109																				
Test Method:	ANSI C63.4:2014																				
Test Frequency Range:	30MHz to 6GHz																				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																				
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>120kHz</td> <td>300kHz</td> <td>Quasi-peak</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak</td> </tr> <tr> <td>Average</td> <td>1MHz</td> <td>3MHz</td> <td>Average</td> </tr> </tbody> </table>	Frequency	Detector	RBW	VBW	Value	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak	Above 1GHz	Peak	1MHz	3MHz	Peak	Average	1MHz	3MHz	Average	
Frequency	Detector	RBW	VBW	Value																	
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak																	
Above 1GHz	Peak	1MHz	3MHz	Peak																	
	Average	1MHz	3MHz	Average																	
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBμV/m @3m)</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td> <td>40.00</td> <td>Quasi-peak</td> </tr> <tr> <td>88MHz-216MHz</td> <td>43.50</td> <td>Quasi-peak</td> </tr> <tr> <td>216MHz-960MHz</td> <td>46.00</td> <td>Quasi-peak</td> </tr> <tr> <td>960MHz-1GHz</td> <td>54.00</td> <td>Quasi-peak</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>54.00</td> <td>Average</td> </tr> <tr> <td>74.00</td> <td>Peak</td> </tr> </tbody> </table>	Frequency	Limit (dB μ V/m @3m)	Value	30MHz-88MHz	40.00	Quasi-peak	88MHz-216MHz	43.50	Quasi-peak	216MHz-960MHz	46.00	Quasi-peak	960MHz-1GHz	54.00	Quasi-peak	Above 1GHz	54.00	Average	74.00	Peak
Frequency	Limit (dB μ V/m @3m)	Value																			
30MHz-88MHz	40.00	Quasi-peak																			
88MHz-216MHz	43.50	Quasi-peak																			
216MHz-960MHz	46.00	Quasi-peak																			
960MHz-1GHz	54.00	Quasi-peak																			
Above 1GHz	54.00	Average																			
	74.00	Peak																			
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p> 																				

<p>Test Procedure:</p>	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
<p>Test environment:</p>	<p>Temp.: 25 °C Humid.: 52% Press.: 1 012mbar</p>
<p>Measurement Record:</p>	<p>Uncertainty: ± 4.29dB</p>
<p>Test Instruments:</p>	<p>Refer to section 6 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.2 for details</p>
<p>Test results:</p>	<p>Pass</p>

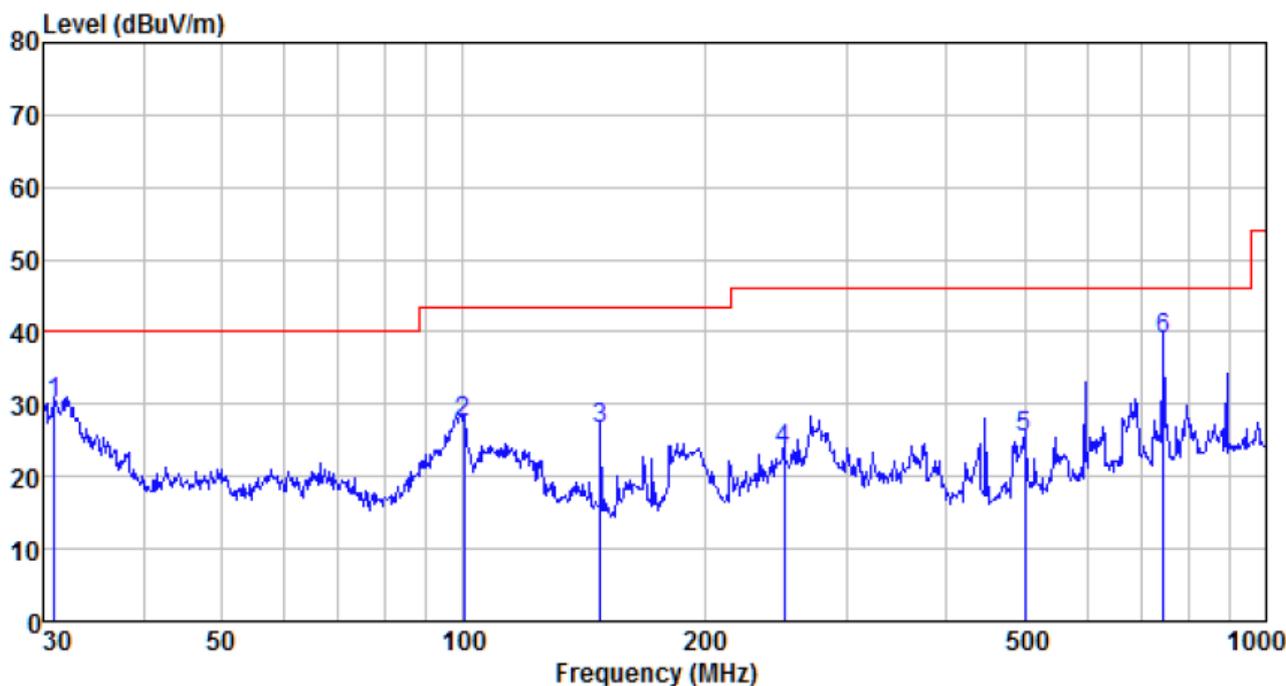
**Measurement Data
Below 1GHz:**

Test mode:	Operation Mode	Antenna Polarity:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
99.528	47.63	12.13	1.19	36.72	24.23	43.50	-19.27	QP
148.441	55.57	7.57	1.56	37.07	27.63	43.50	-15.87	QP
270.375	52.91	12.76	2.22	37.40	30.49	46.00	-15.51	QP
595.133	46.17	19.39	3.70	37.54	31.72	46.00	-14.28	QP
744.866	52.73	20.41	4.26	37.63	39.77	46.00	-6.23	QP
996.500	36.06	22.70	5.20	37.51	26.45	54.00	-27.55	QP

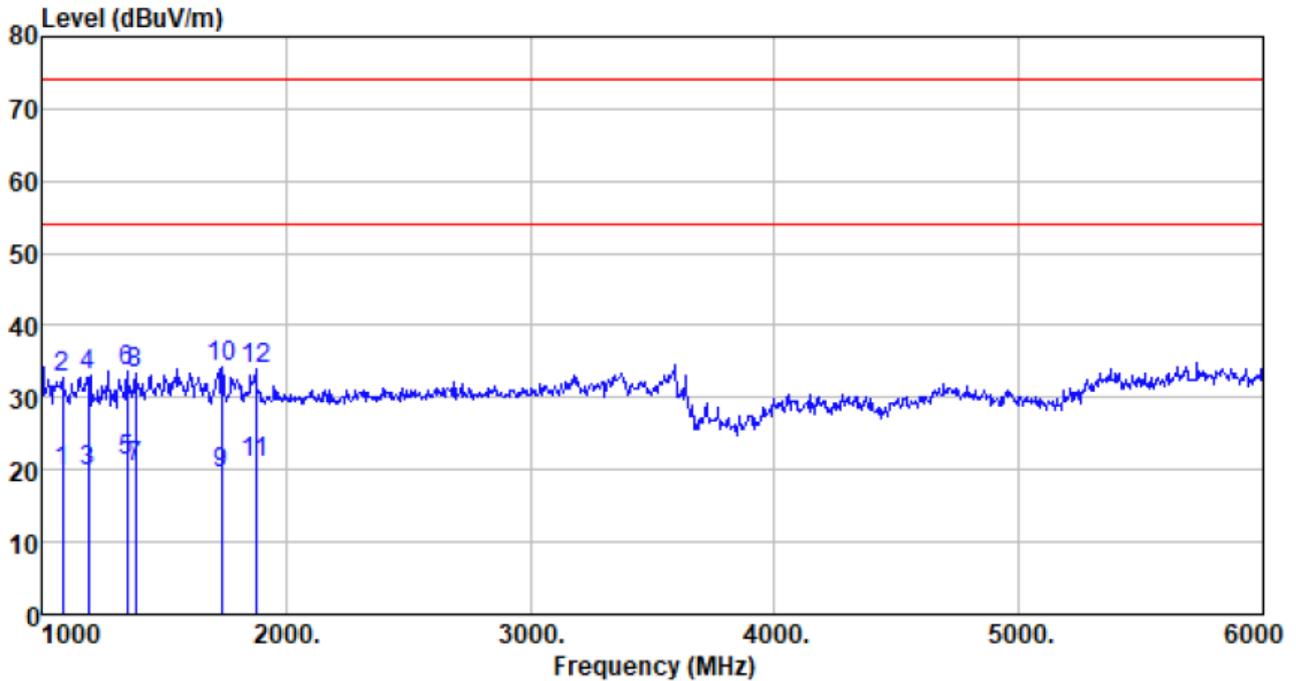
Test mode:	Operation Mode	Antenna Polarity:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
30.962	53.32	11.22	0.56	35.07	30.03	40.00	-9.97	QP
100.229	50.85	12.15	1.19	36.72	27.47	43.50	-16.03	QP
148.441	54.41	7.57	1.56	37.07	26.47	43.50	-17.03	QP
251.180	46.80	12.18	2.13	37.38	23.73	46.00	-22.27	QP
501.179	42.32	17.30	3.31	37.51	25.42	46.00	-20.58	QP
744.866	51.80	20.41	4.26	37.63	38.84	46.00	-7.16	QP

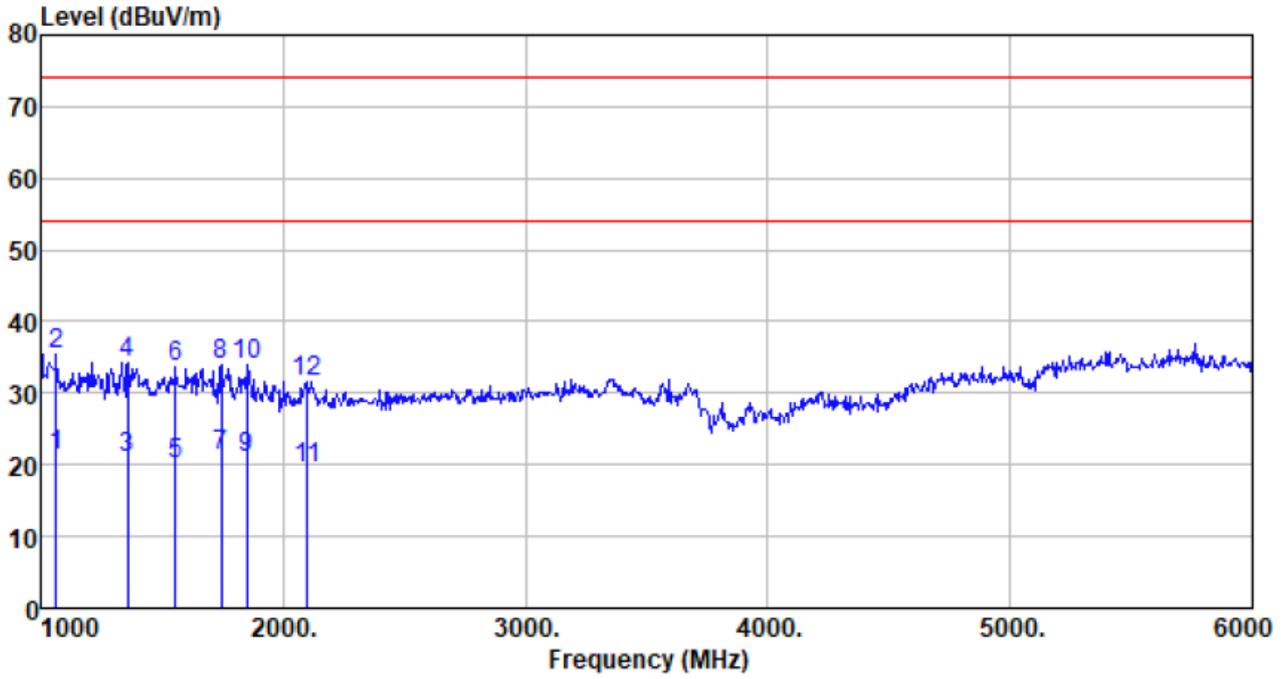
Above 1GHz:

Test mode:	Operation Mode	Antenna Polarity:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
1085.000	26.57	24.58	4.37	35.79	19.73	54.00	-34.27	Average
1085.000	39.52	24.58	4.37	35.79	32.68	74.00	-41.32	Peak
1190.000	26.55	24.79	4.46	35.90	19.90	54.00	-34.10	Average
1190.000	39.74	24.79	4.46	35.90	33.09	74.00	-40.91	Peak
1350.000	27.71	25.07	4.58	36.05	21.31	54.00	-32.69	Average
1350.000	40.12	25.07	4.58	36.05	33.72	74.00	-40.28	Peak
1385.000	26.64	25.13	4.61	36.08	20.30	54.00	-33.70	Average
1385.000	39.58	25.13	4.61	36.08	33.24	74.00	-40.76	Peak
1735.000	25.43	25.71	4.82	36.34	19.62	54.00	-34.38	Average
1735.000	40.11	25.71	4.82	36.34	34.30	74.00	-39.70	Peak
1875.000	26.42	25.92	4.90	36.42	20.82	54.00	-33.18	Average
1875.000	39.51	25.92	4.90	36.42	33.91	74.00	-40.09	Peak

Test mode:	Operation Mode	Antenna Polarity:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
1065.000	28.02	24.54	4.35	35.77	21.14	54.00	-32.86	Average
1065.000	42.23	24.54	4.35	35.77	35.35	74.00	-38.65	Peak
1360.000	27.48	25.08	4.59	36.05	21.10	54.00	-32.90	Average
1360.000	40.75	25.08	4.59	36.05	34.37	74.00	-39.63	Peak
1555.000	26.03	25.40	4.72	36.21	19.94	54.00	-34.06	Average
1555.000	39.88	25.40	4.72	36.21	33.79	74.00	-40.21	Peak
1745.000	26.90	25.72	4.83	36.34	21.11	54.00	-32.89	Average
1745.000	39.80	25.72	4.83	36.34	34.01	74.00	-39.99	Peak
1850.000	26.62	25.88	4.88	36.41	20.97	54.00	-33.03	Average
1850.000	39.55	25.88	4.88	36.41	33.90	74.00	-40.10	Peak
2100.000	24.56	26.45	5.08	36.60	19.49	54.00	-34.51	Average
2100.000	36.69	26.45	5.08	36.60	31.62	74.00	-42.38	Peak

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

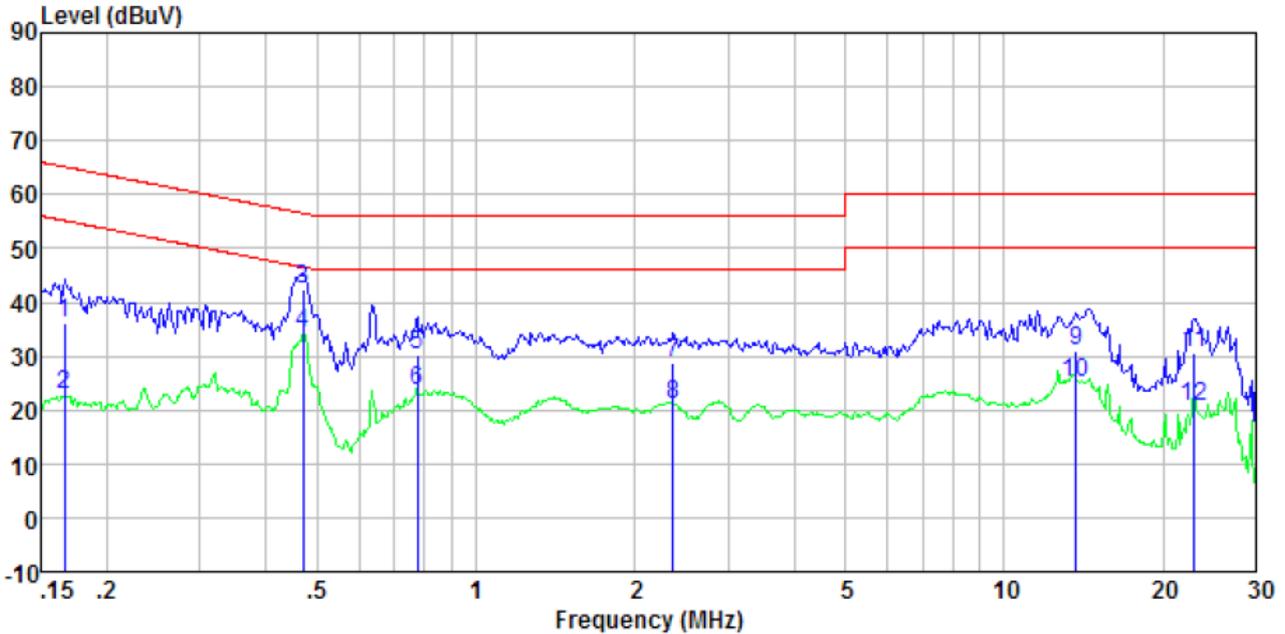
$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

7.2 Conducted Emissions

Test Requirement:	FCC Part15 B Section 15.107														
Test Method:	ANSI C63.4:2014														
Test Frequency Range:	150kHz to 30MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9kHz, VBW=30kHz														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>0.5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dBμV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	0.5-30	60	50
Frequency range (MHz)	Limit (dBμV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
0.5-30	60	50													
Test setup:	<p><i>Remark</i> <i>E.U.T.: Equipment Under Test</i> <i>LISN: Line Impedance Stabilization Network</i> <i>Test table height=0.8m</i></p>														
Test procedure	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement. 														
Test environment:	Temp.: 25 °C ; Humid.: 52% ; Press.: 1 012mbar														
Measurement Record:	Uncertainty: ± 3.44dB														
Test Instruments:	Refer to section 6 for details														
Test mode:	Refer to section 5.2 for details														
Test results:	Pass														

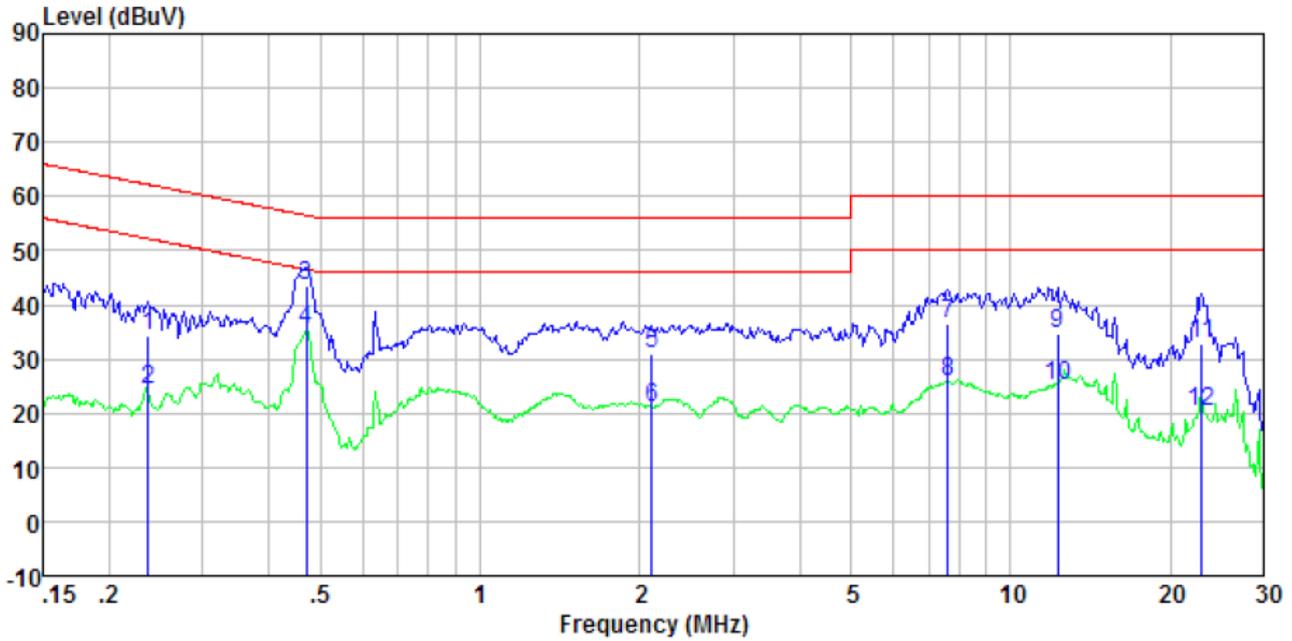
Measurement Data

Test mode:	Operation Mode	Phase Polarity:	Line
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Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	35.58	0.40	0.08	36.06	65.16	-29.10	QP
0.17	22.24	0.40	0.08	22.72	55.16	-32.44	Average
0.47	41.98	0.32	0.11	42.41	56.49	-14.08	QP
0.47	33.86	0.32	0.11	34.29	46.49	-12.20	Average
0.78	30.00	0.24	0.14	30.38	56.00	-25.62	QP
0.78	23.30	0.24	0.14	23.68	46.00	-22.32	Average
2.36	28.34	0.20	0.18	28.72	56.00	-27.28	QP
2.36	20.74	0.20	0.18	21.12	46.00	-24.88	Average
13.70	30.47	0.20	0.21	30.88	60.00	-29.12	QP
13.70	24.55	0.20	0.21	24.96	50.00	-25.04	Average
22.90	29.94	0.33	0.23	30.50	60.00	-29.50	QP
22.90	19.89	0.33	0.23	20.45	50.00	-29.55	Average

Test mode:	Operation Mode	Phase Polarity:	Neutral
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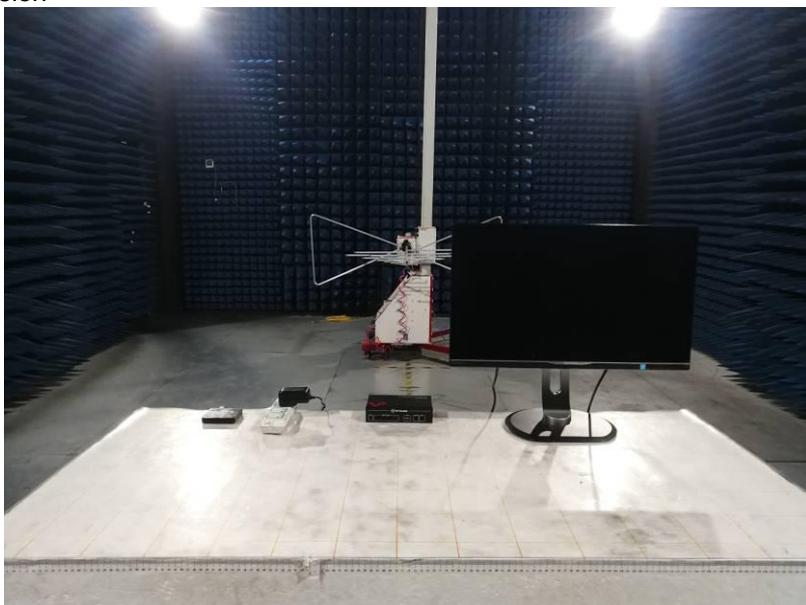
Freq MHz	Reading level dBuV	LISM/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.24	33.78	0.40	0.11	34.29	62.22	-27.93	QP
0.24	23.62	0.40	0.11	24.13	52.22	-28.09	Average
0.47	43.18	0.32	0.11	43.61	56.49	-12.88	QP
0.47	34.97	0.32	0.11	35.40	46.49	-11.09	Average
2.11	30.52	0.20	0.18	30.90	56.00	-25.10	QP
2.11	20.71	0.20	0.18	21.09	46.00	-24.91	Average
7.61	36.07	0.20	0.19	36.46	60.00	-23.54	QP
7.61	25.35	0.20	0.19	25.74	50.00	-24.26	Average
12.25	34.12	0.20	0.20	34.52	60.00	-25.48	QP
12.25	24.80	0.20	0.20	25.20	50.00	-24.80	Average
22.90	32.31	0.33	0.23	32.87	60.00	-27.13	QP
22.90	19.66	0.33	0.23	20.22	50.00	-29.78	Average

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

8 Test Setup Photo

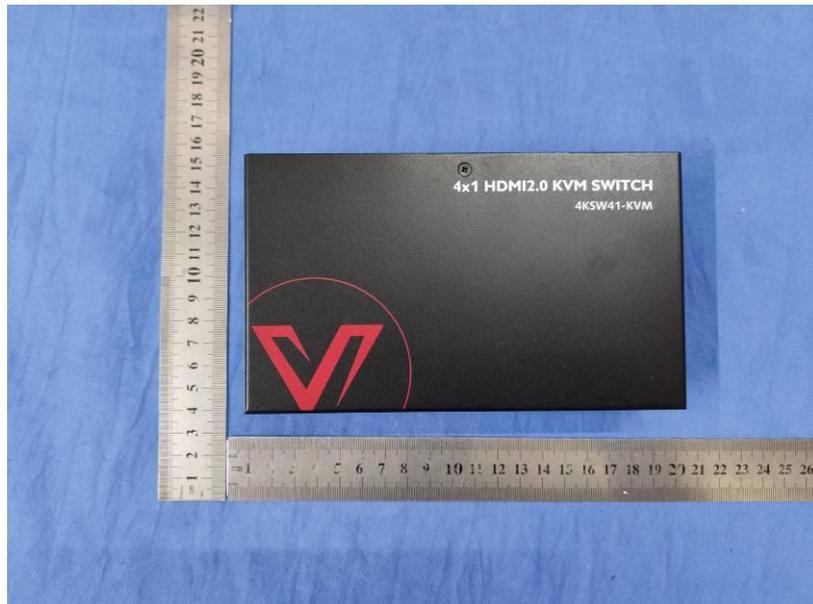
Radiated Emission

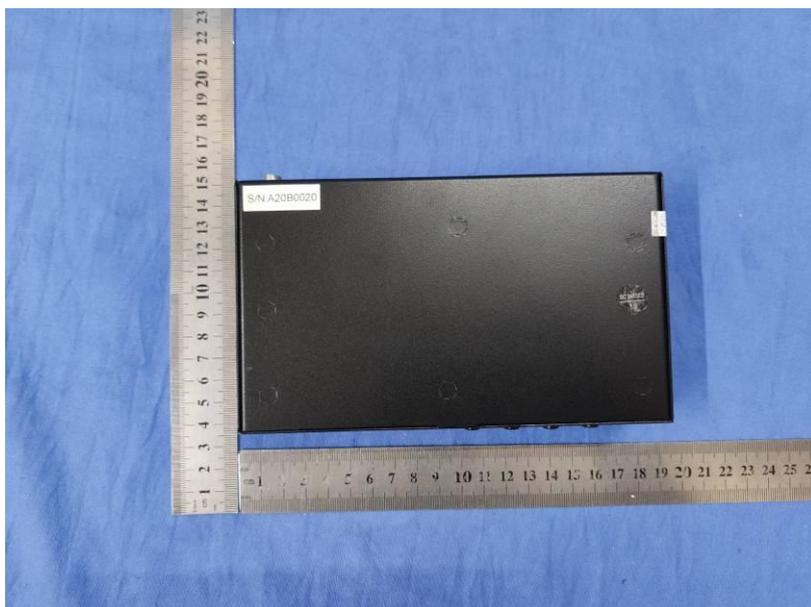


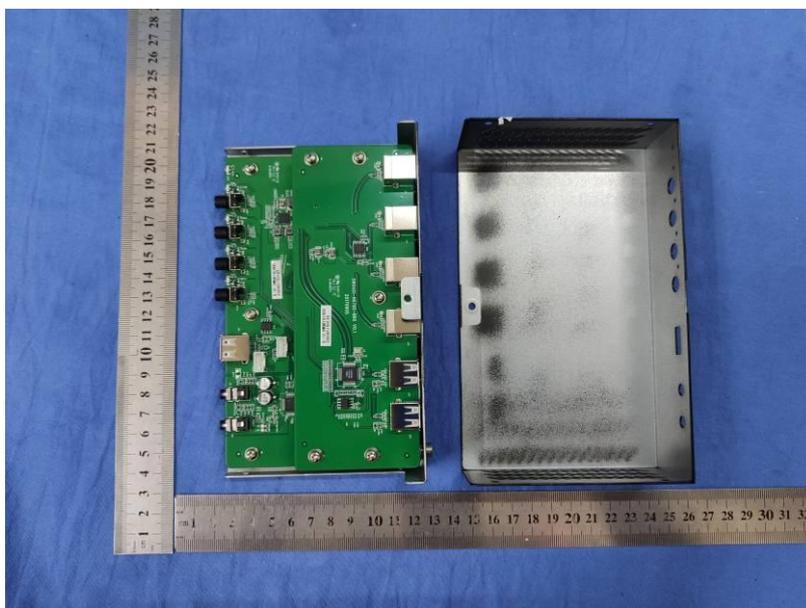
Conducted Emission

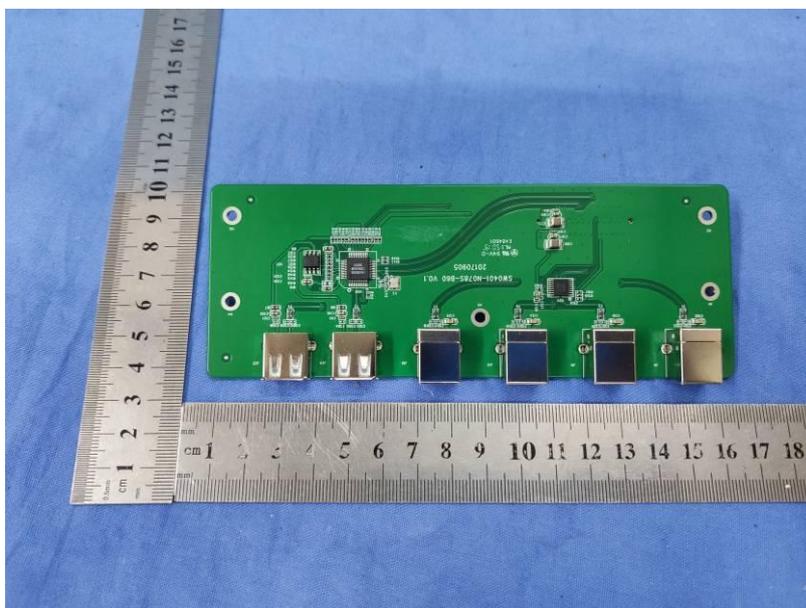
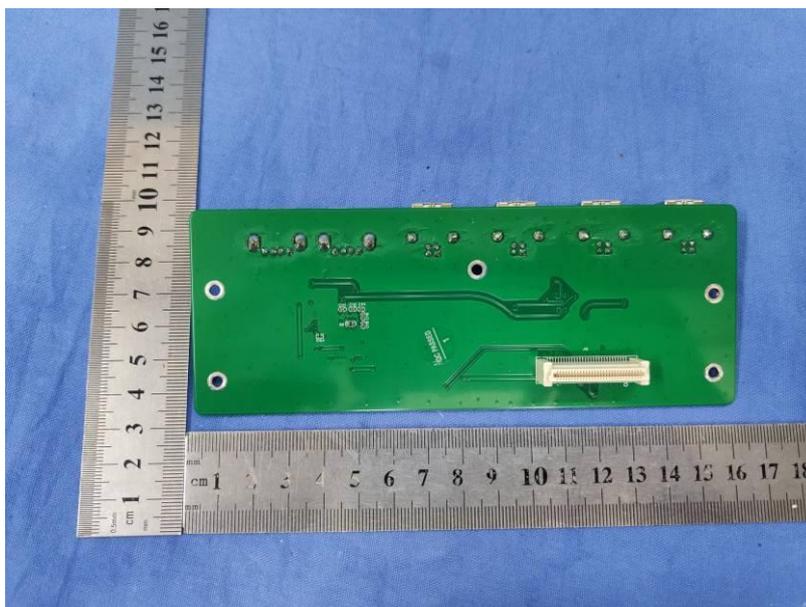


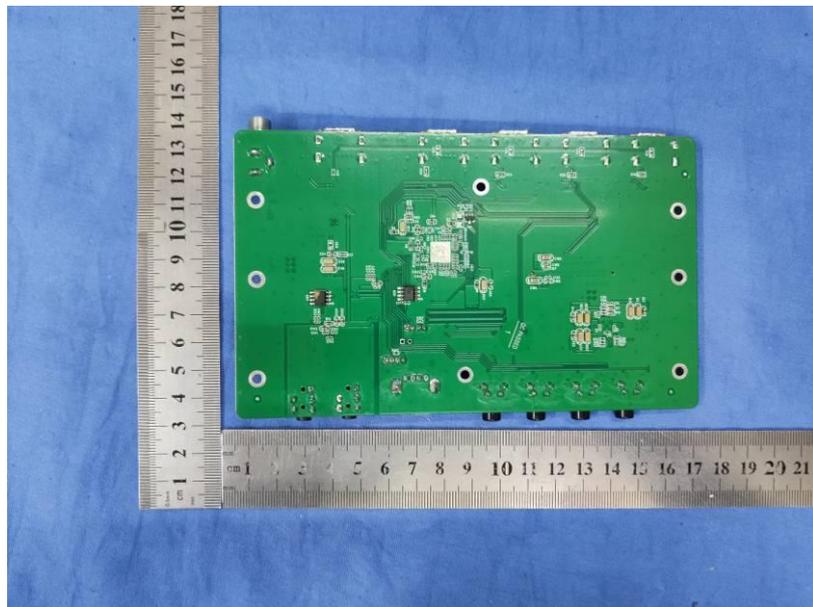
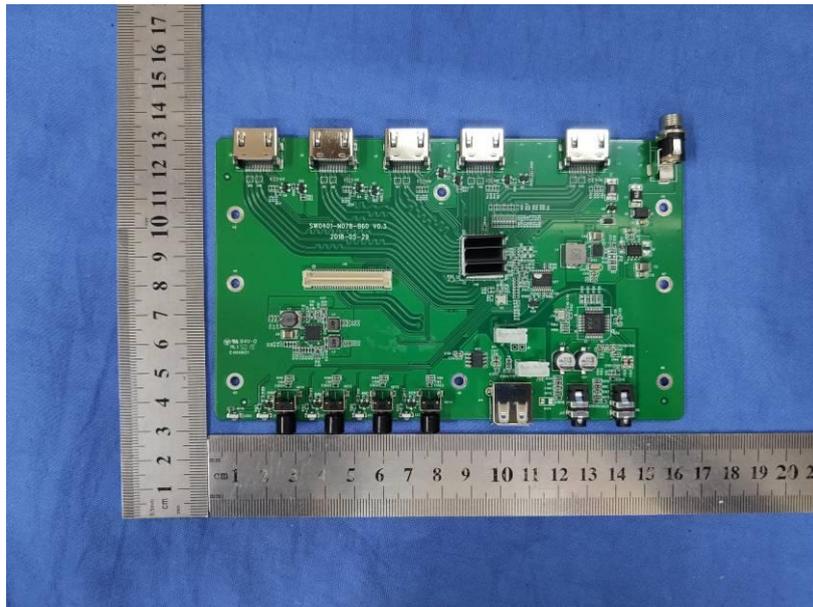
9 EUT Constructional Details













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