NEON-ATS200

Thermal Testing Report for ES2 System

Thermal Report Rev: 1.0

Revision Date: 16, 05, 2022

Preface

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Revision History

Revision	Description	Date	By
1.0	First release.	2022-05-16	Allen Zhuang

Table of Contents

1. Introduction

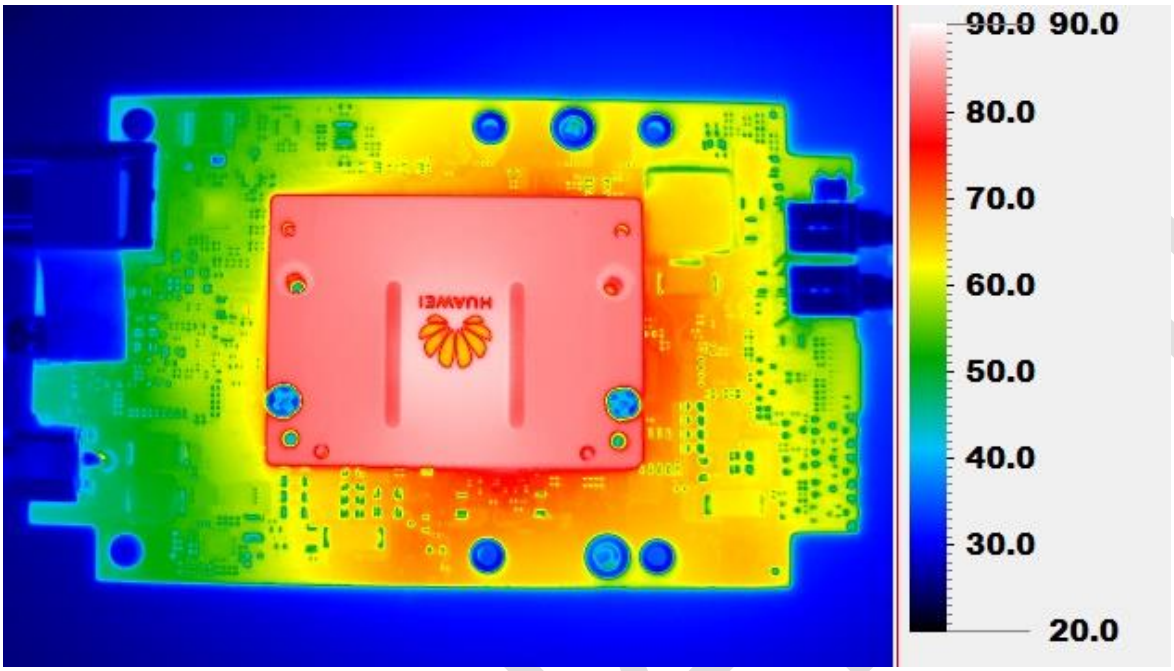
In this report, NEON-ATS200 is verified in air circulation chamber at 45 degC ambient temperature.

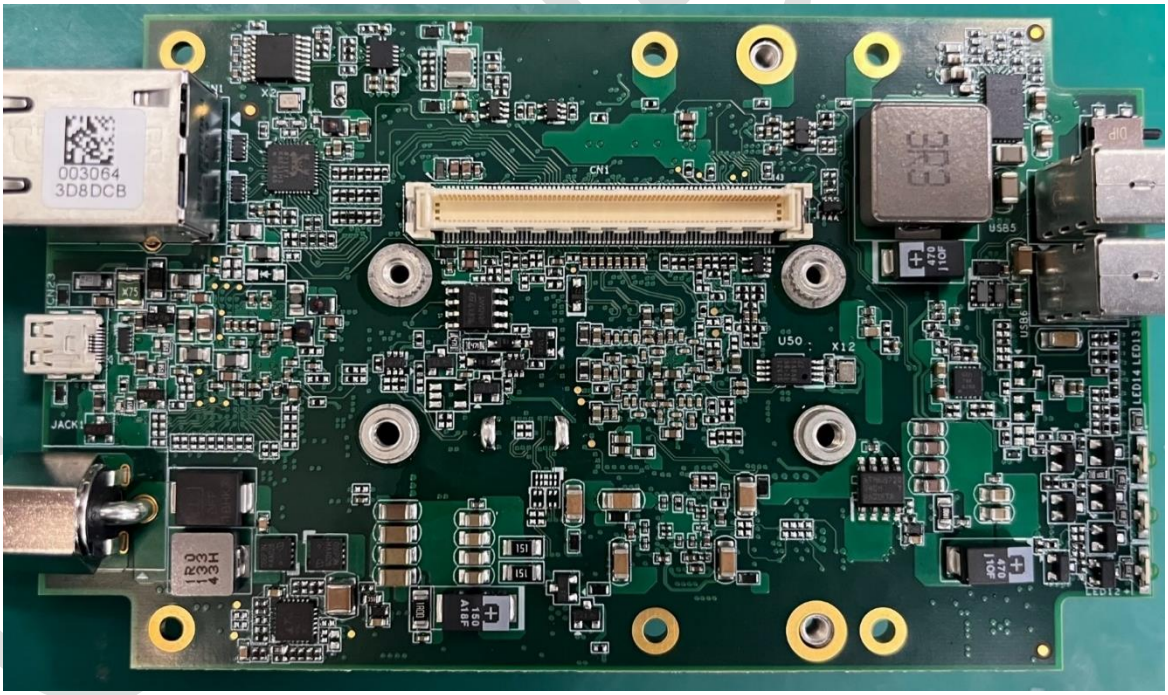
2. Test Condition and Equipments

- Module: HUAWEI Atlas200
- Processor: 2 DaVinci AI Core with 8cores A55,max 1.6GHz
- NEON-ATS200 carrier : 51-64508-0A20
- Power adapter: FSP060-DHAN3, 12V, 5A, 60W
- Camera sensor: BASLER daA1280-54uc, CS-Mount
- OS: Ubuntu 18.04 LTS 64-bit
- Stress Tool：Dongsheng application with Pylon viewer continuous shot
- Chamber Model： KSON/THS-S6T-150 (0.6m/s air flow)
- Chamber Temperature：45℃
- Thermal Couple Type: Omaga T type

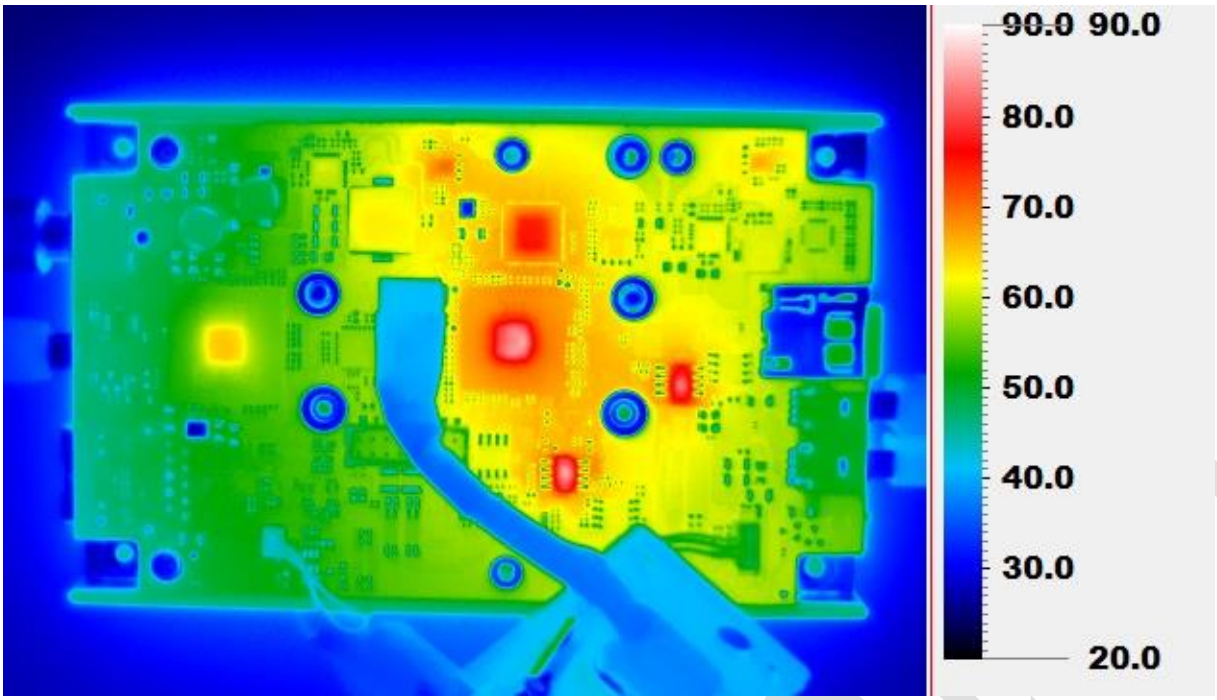
3. IR Temperature Distribution (Ta=25℃)

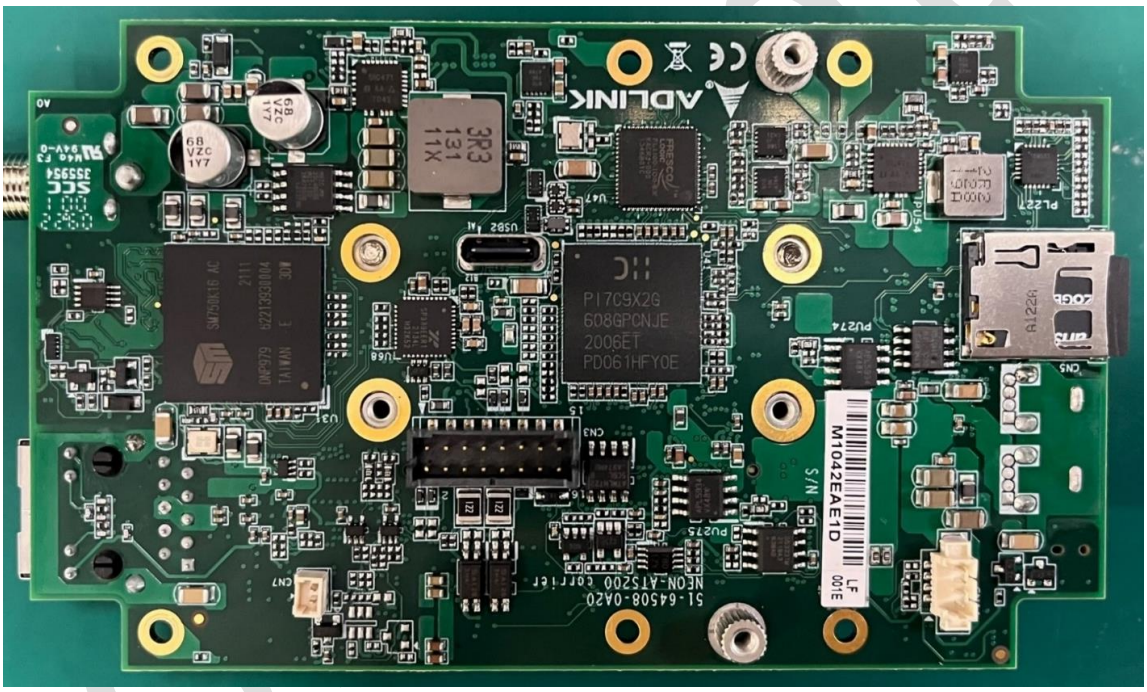
According to the stress tool setting, run the stress software 1 hr at ambient temperature 25℃ before taking IR pictures.





M/B at top side

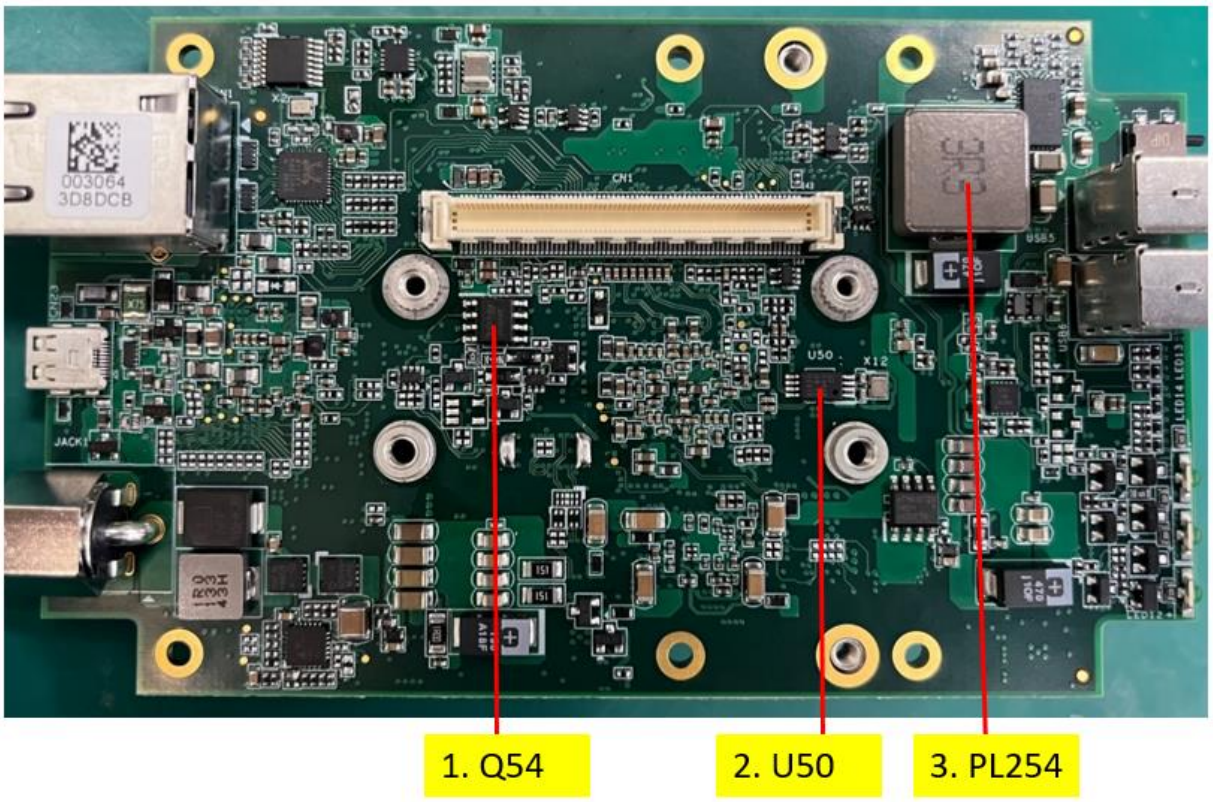




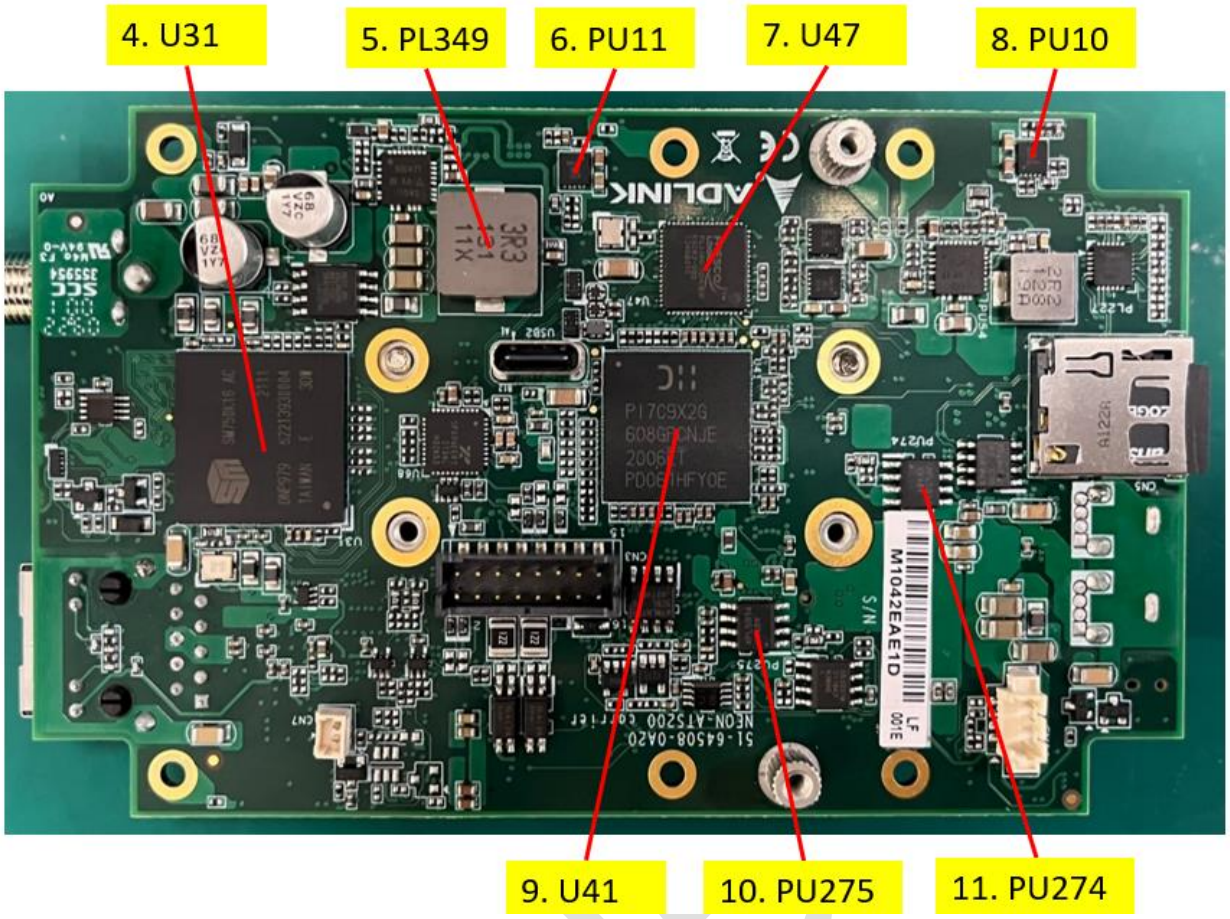
M/B at bottom side

4. Measured Temperature Position

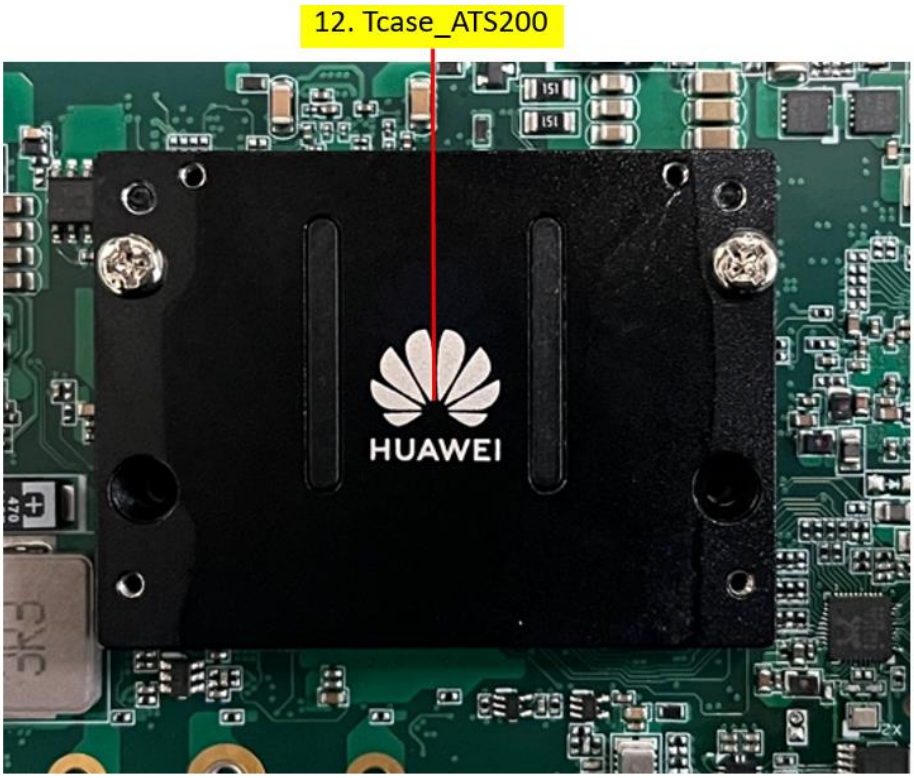
According to the IR pictures, OMEGA T-type thermocouples are attached on the components which have more heat consumiption when extrapolate their temperature at 25~45°C ambient.



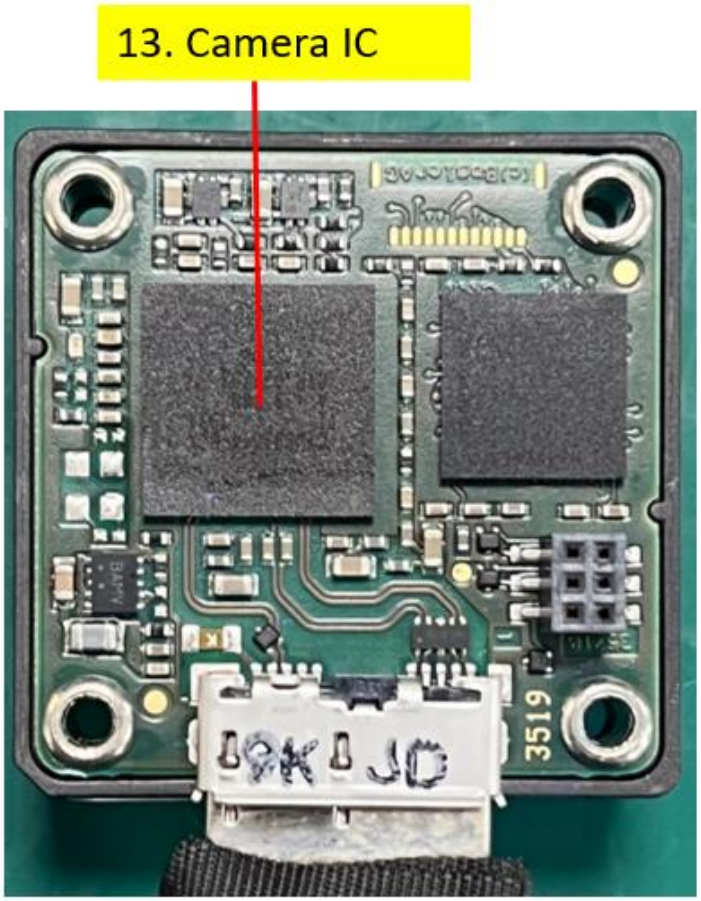
M/B at top side



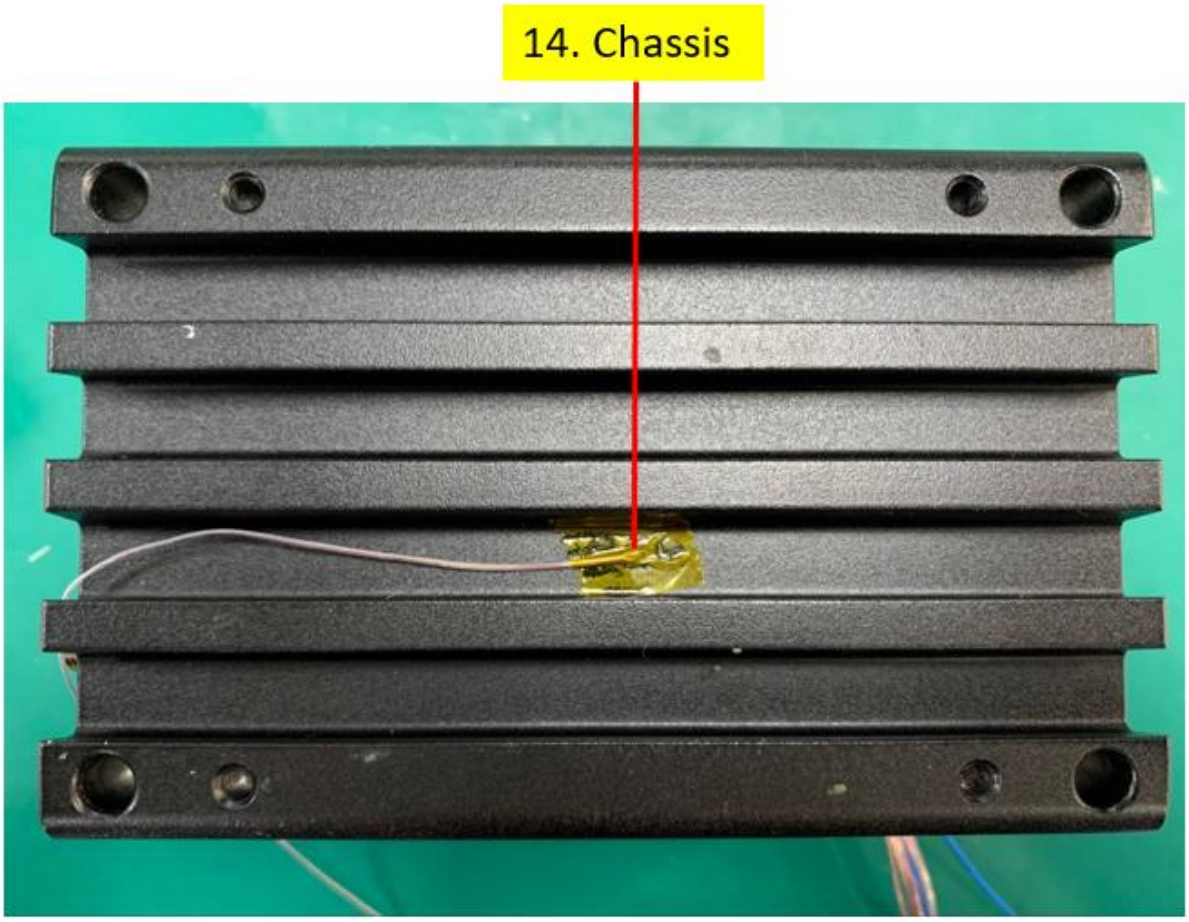
M/B at bottom side



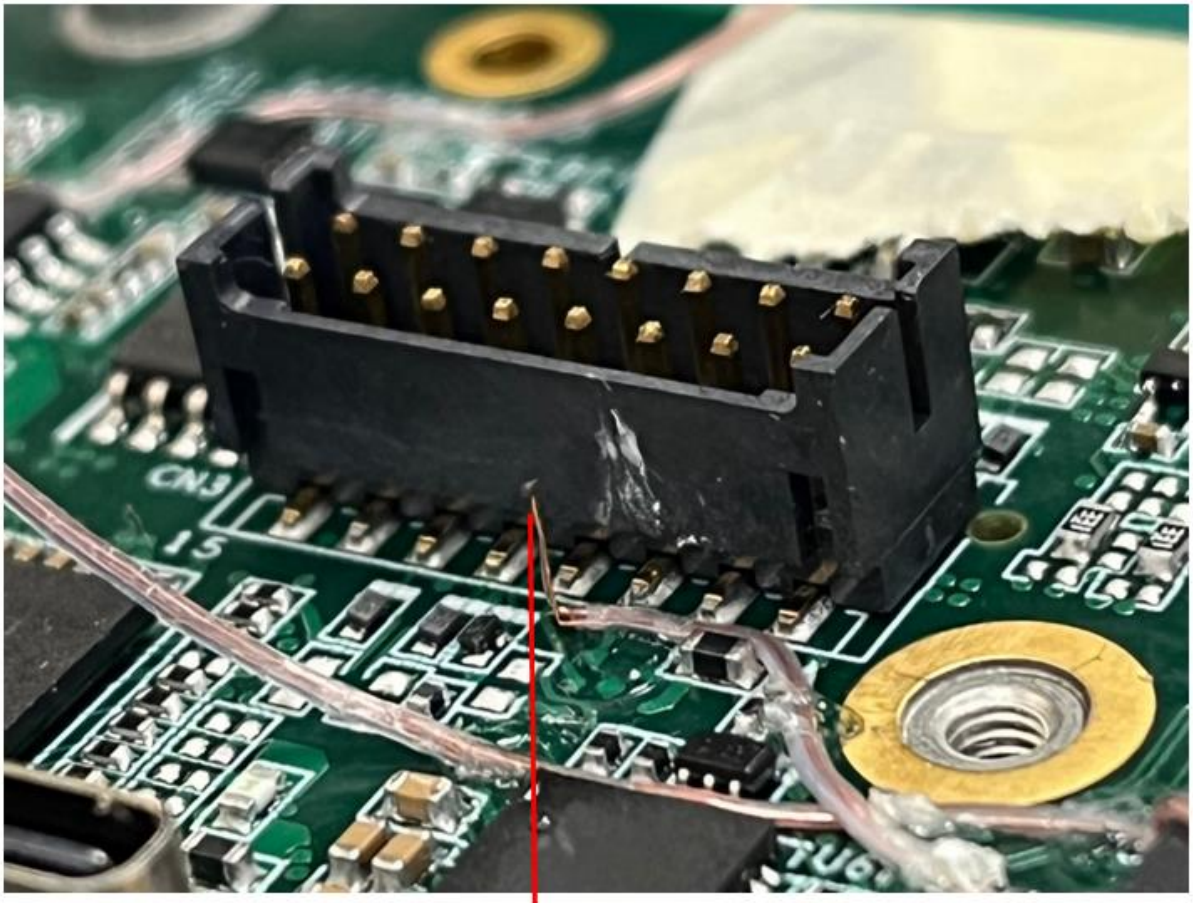
ATS200 Module



Camera sensor



Chassis



15. Ta_in

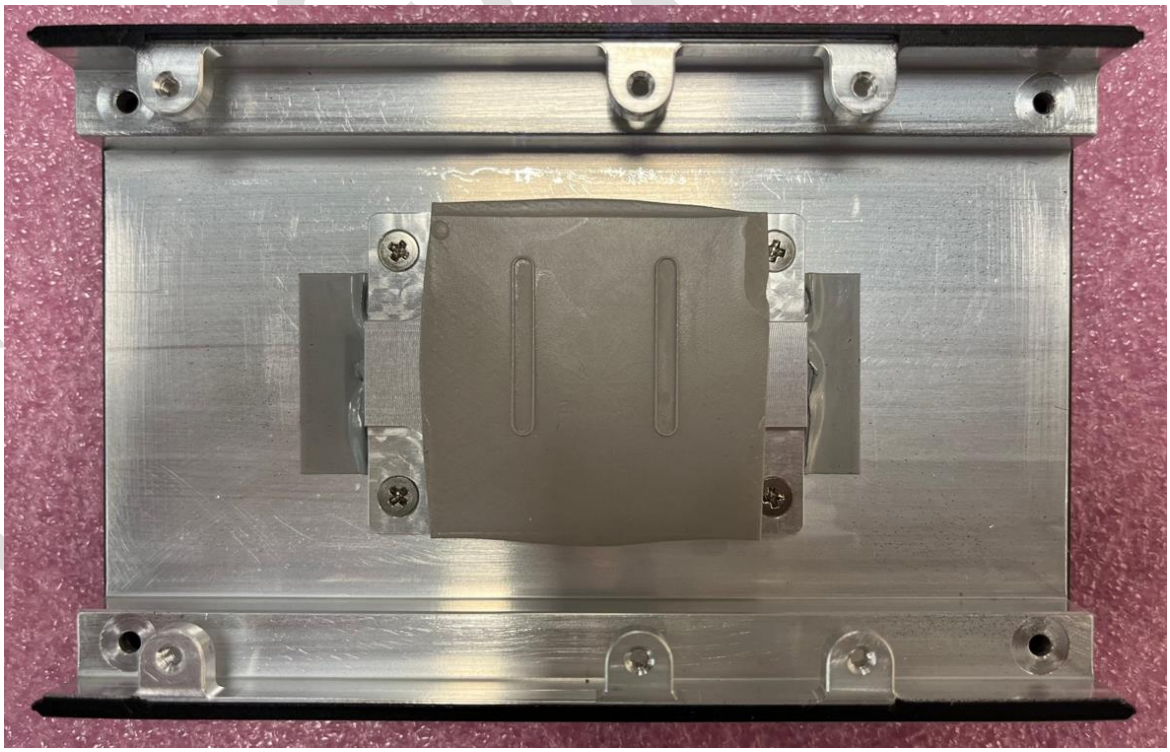
System inside

5. Thermal Solution

5.1 Chassis heat Sink, P/N: 32-60022-0100-A0

Chassis thermal pad: 32-90296-1000-A0, PK95, 39x39x1.5mm

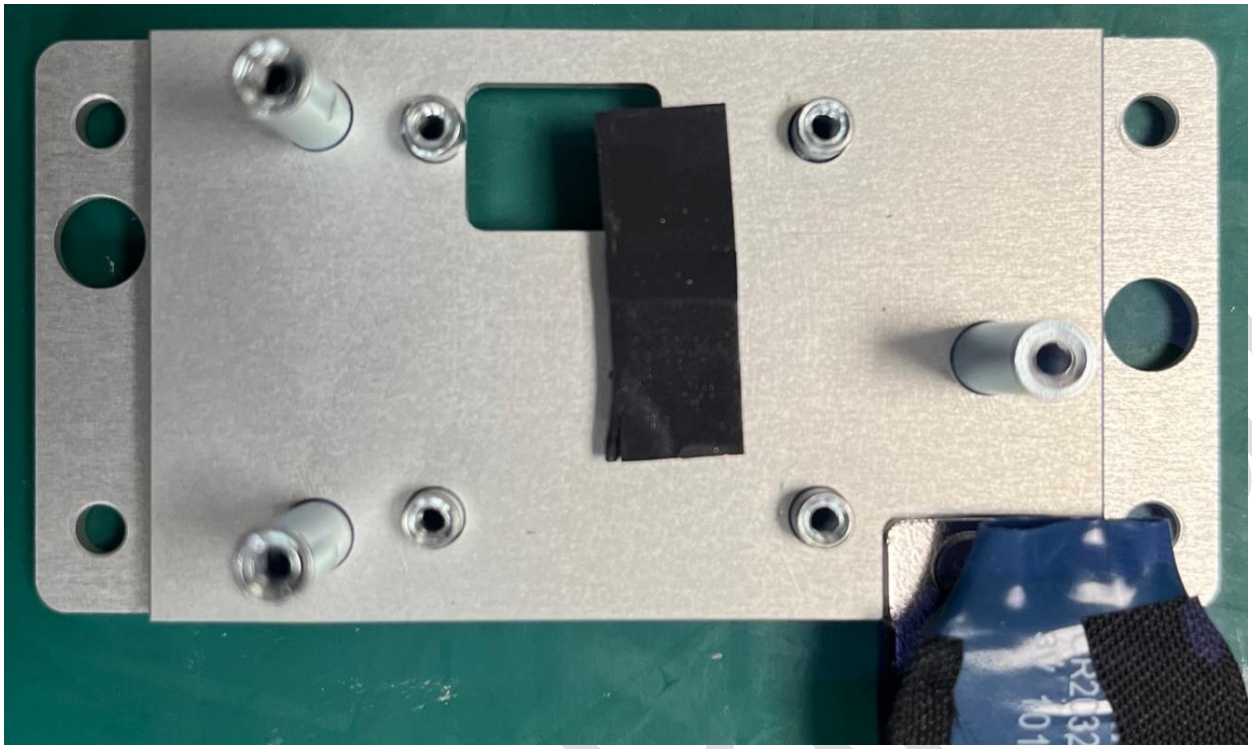
Heat sink top side



Heat sink bottom side

5.2 Camera sensor holder (Basler): 34-90240-0100-A0

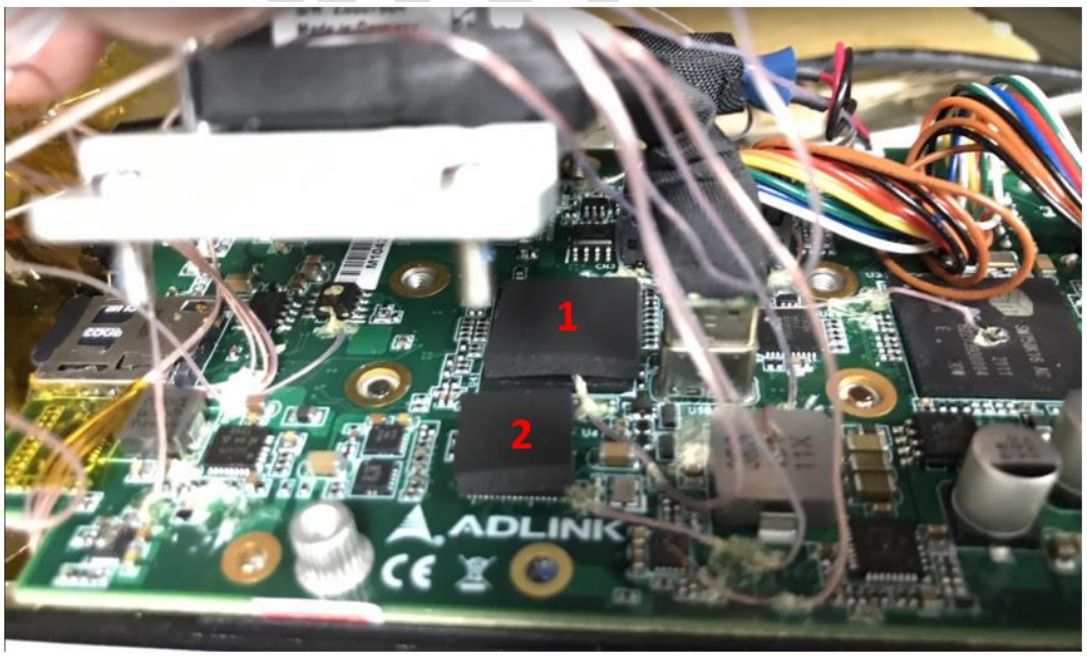
Thermal pad P/N on hoder for Basler camera: 32-90258-0000, XR-HL, 20x7x3mm



5.3 Thermal pad for carrier board

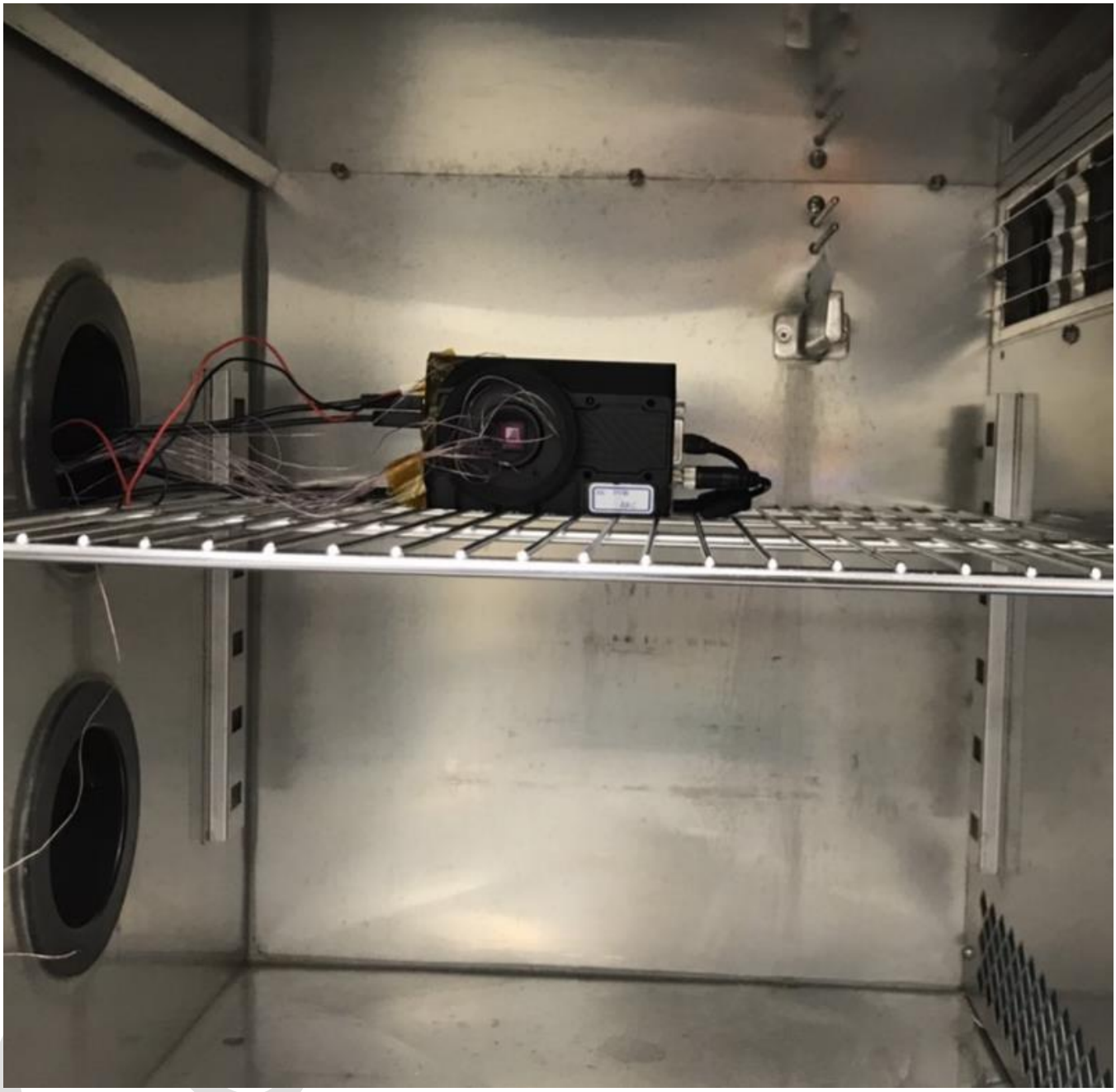
Thermal pad1 (for PCIE Gen2 Switch): 32-90115-2000, XR-HL, 12x12x2.5mm

Thermal pad2 (for PCIe to USB Bridge): 32-90135-4000, XR-HL, 10x10x3mm

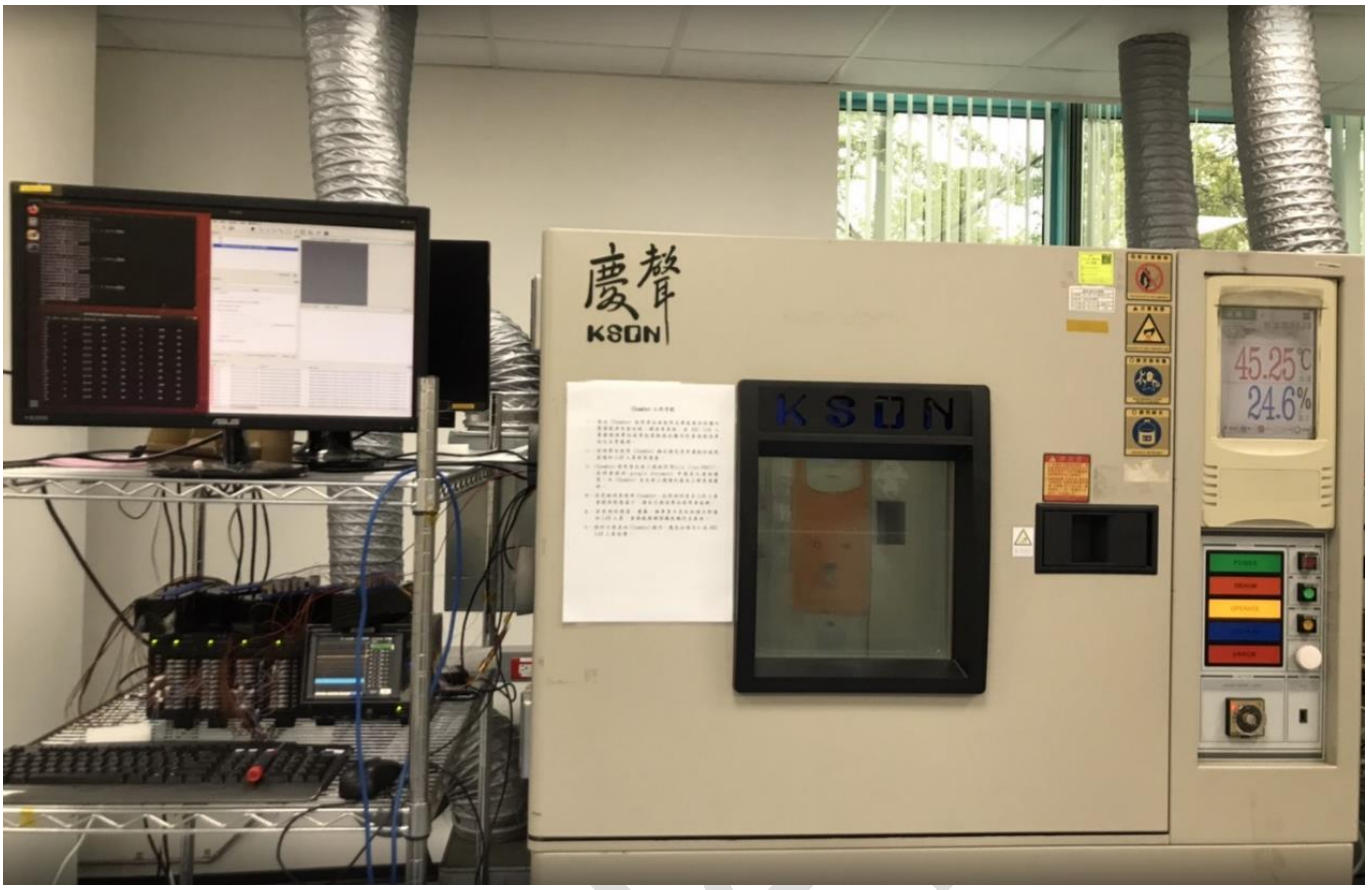


6. Illustration For Testing Equipment

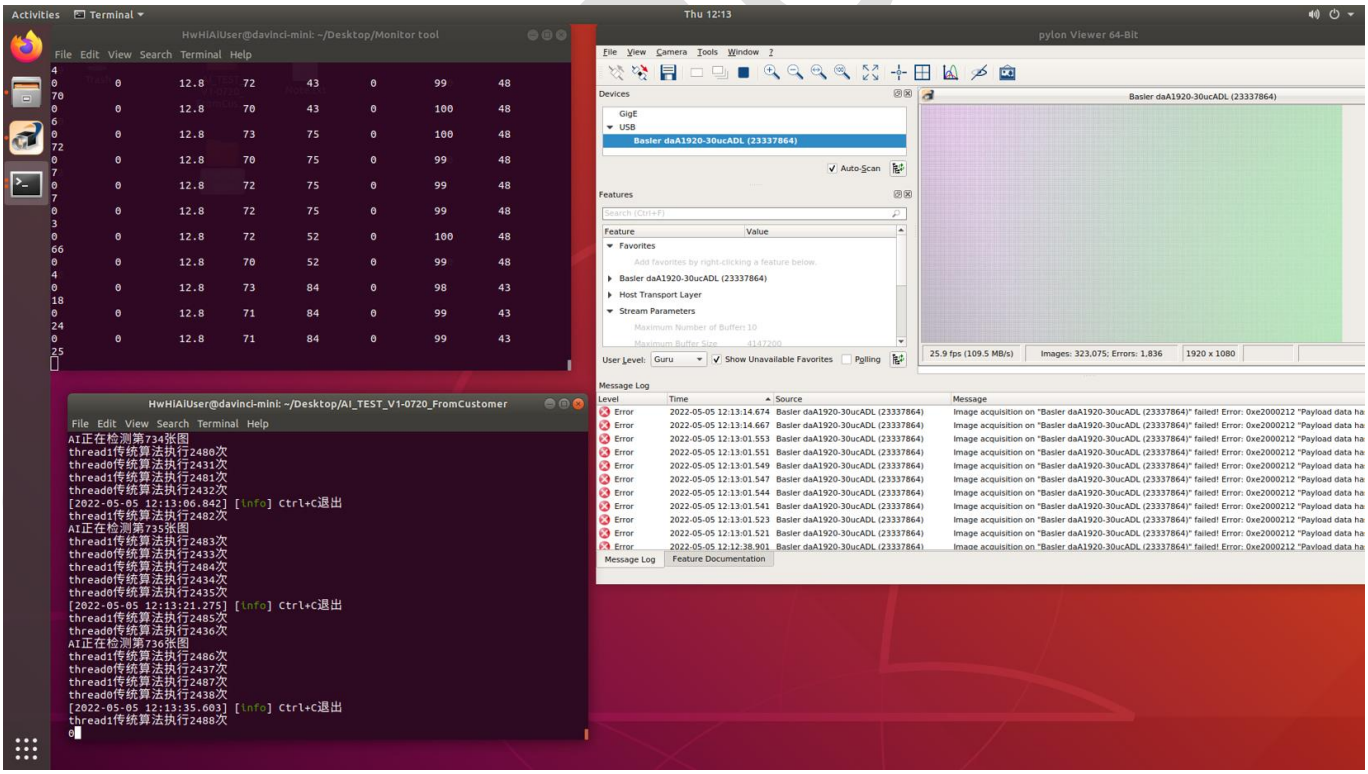
6.1. Thermal Test in Chamber



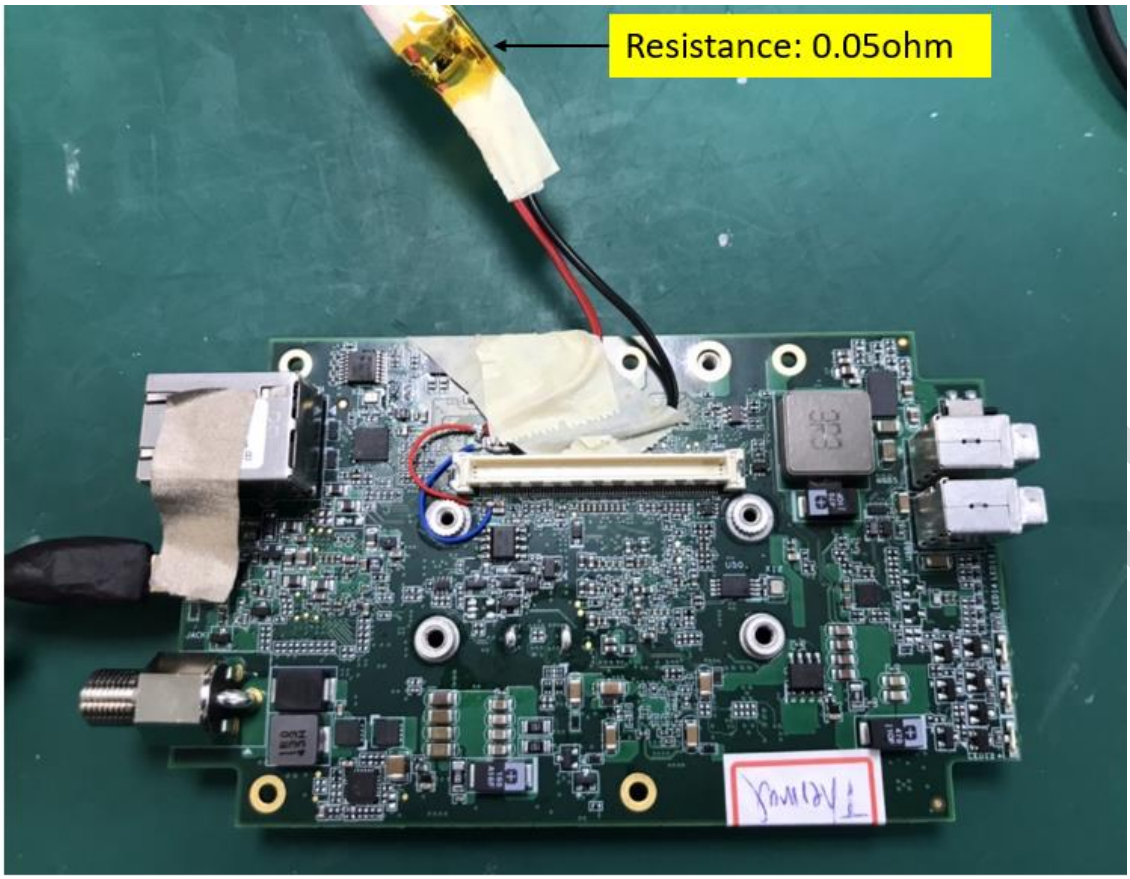
NEON-ATS200 thermal test in chamber



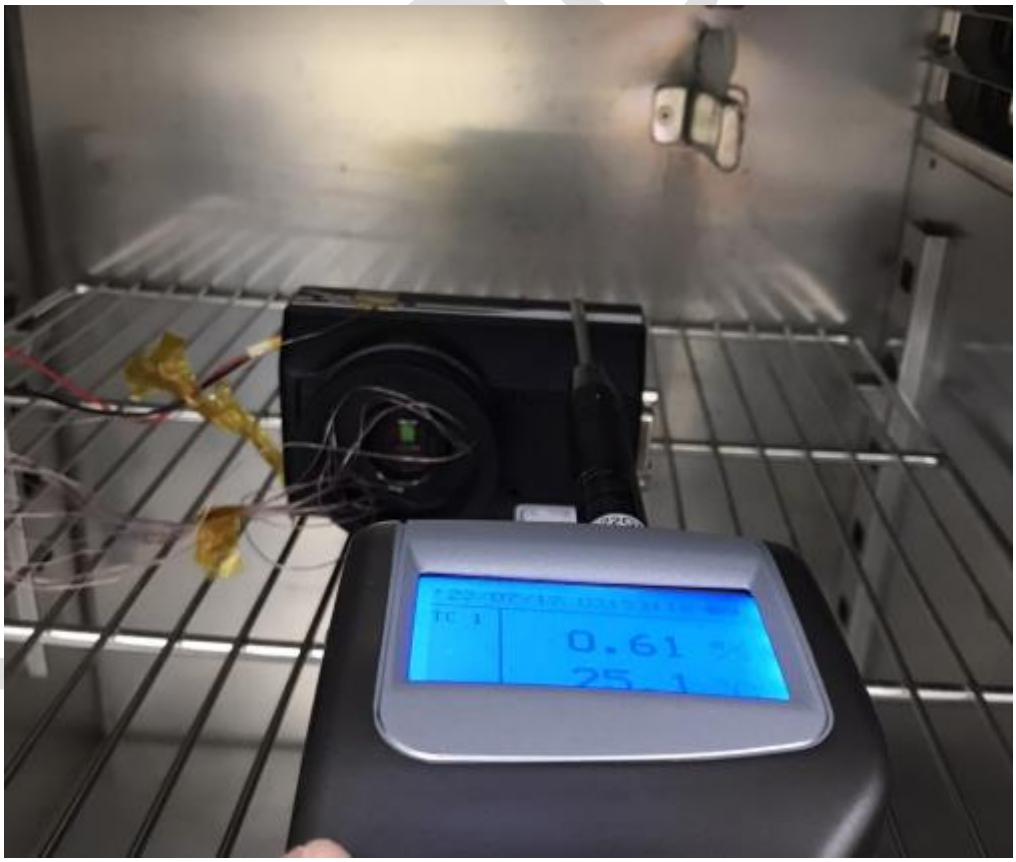
Testing equipment setup



Running Dongsheng application with Pylon viewer continuous shot.



Welding the power wires on carrier board for measured ATS200 Power consumption



Air speed measured in chamber

7. Test Results

7.1 Temperature result

item	Components	Specification			Measured data	Note
		Tj	Tc	Ta		
0	CPU	100	-	-	76.0	Tj
1	Q54_Digital Output MOS	125	-	-	76.1	Tc
2	U50_Clock Gen.	150	-	85	84.2	Tc
3	PL254_3.8V choke	-	125	-	80.1	Tc
4	U31_SM750	-	-	85	84.7	Tc
5	PL349_5V Choke	-	125	-	82.4	Tc
6	PU11_DC/DC P_+1V05_LDO	125	-	-	84.1	Tc
7	U47_PCIe to USB Bridge	-	105	70	84.2	Tc
8	PU10_DC/DC P_+1V2_LDO	125	-	-	83.0	Tc
9	U41_PCIE Gen2 Switch	125	125	85	95.2	Tc
10	PU275_DC/DC VDDC	150	-	-	87.5	Tc
11	PU274_DC/DC VDDA	150	-	-	88.2	Tc
12	ATLAS_Tcase	-	80	-	64.3	Tc
13	Camera_IC	-	75	-	74.5	Tc
14	Chassis	-	-	-	61.6	Tc
15	Ta-in	-	-	-	69.5	Tc
16	Ta	-	-	-	45.1	Ta
17	Measured Module Power (Average)				8.5	Watts
18	System Power				18.2~22	Watts
19	AI Core (NPU) Utility				40~80%	Percentage
20	CPU Utility				100%	Percentage
21	System Status				Normal	-
22	Chamber Air Flow				0.6	m/s

Note:

T_j: Junction Temperature

T_c: Case Temperature

T_a: Ambient Temperature

Red: can't meet temperature specification

8. Conclusion

- According to the thermal test result 7-1, all components can meet its thermal spec under operating 45℃ ambient.