

UP Squared AI Edge Compute

With eMMC

Thermal Analysis Test Report

Report NO: 19D090011

Test Cause
For ATRF No. QE190508 Request

Summary	<p><input type="checkbox"/> Pass</p> <p><input type="checkbox"/> Fail</p> <p>Note: There is/are ___ defect(s) not list in the report, please check it in the DTS Website.</p> <p><input checked="" type="checkbox"/> Pass with Deviation</p> <p>Comment: <u>1. There is 1 temperature points (No.11) lack the Tc specifications, so we are unable to determine.</u></p> <p><u>2. There is 1 temperature point marginal passed but function is stable.</u></p>
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Issue date

2019-06-04

Supervisor

Louie Lee

Test Engineer

Juno Cheng

Test item list

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3. *High Temperature Operation*----- 4

Testing Result

Num	Test item list	Result	Remark
1	High Temperature Operation test	Pass	

Configuration of EUT

Num	Item	Spec
1	Model Name	UP Squared AI Edge Compute (UPS-EDAI series)
2	Main Board	UP-APL01 Rev. A1.0
4	BIOS Ver.	NA
5	CPU Type	INTEL CPU.Apollo Lake.Atom x7-E3950 /1.60 GHz.(Up to 2.0GHz.)
6	On board memory	DDR3L-1600 SDRAM 4GB
7	On board eMMC	Kingston M52564 64GB
8	Test Software	Linux / Ubuntu16.04
9	Power supply:	Powertron / PA1024-050IB400 / 5V, 4.0A 20W Max

Heat Sink



Inside System



High Temperature Operation test

Test Date: 06-04~06-03-2019

Test Product: UPS-EDAI-X7series

Test Site: AAEON QE Dept.

Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bd: Dry Heat Test (Operation)

Test Equipment:

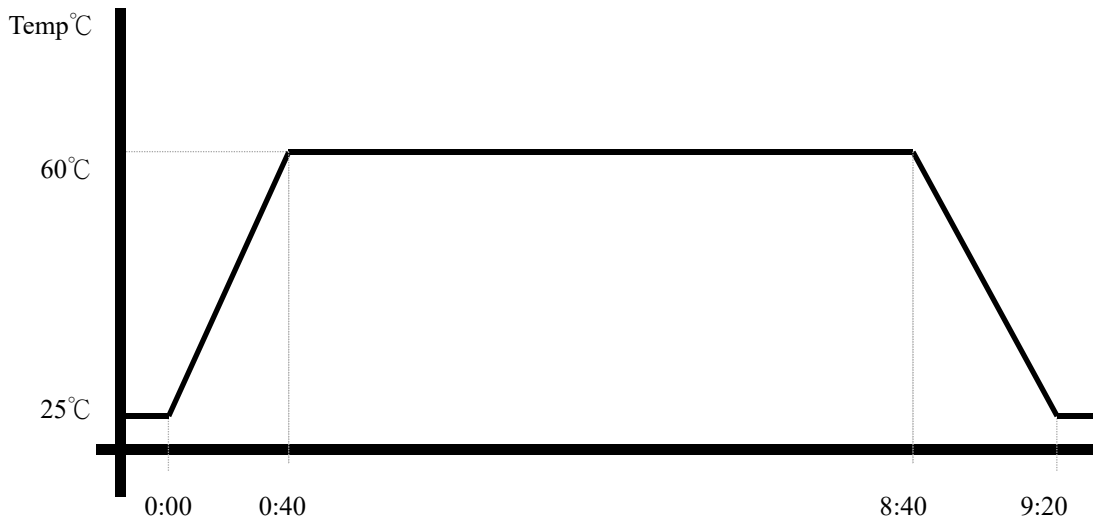
Programmable Temperature & Humidity Chamber
K.SON. INS. TECH. CORP.
Model: THS-D7TS-100+LN2
Date of Calibration: 04/19/2019
Due date of Calibration: 04/18/2020
Serial Number: A0445

Temperature Measurement:

20 Channel Thermal Recorder
OMRON ZR-RX45
Date of Calibration: 12/19/18
Due date of Calibration: 12/18/2019
Serial Number: 12A323190

Testing Item:

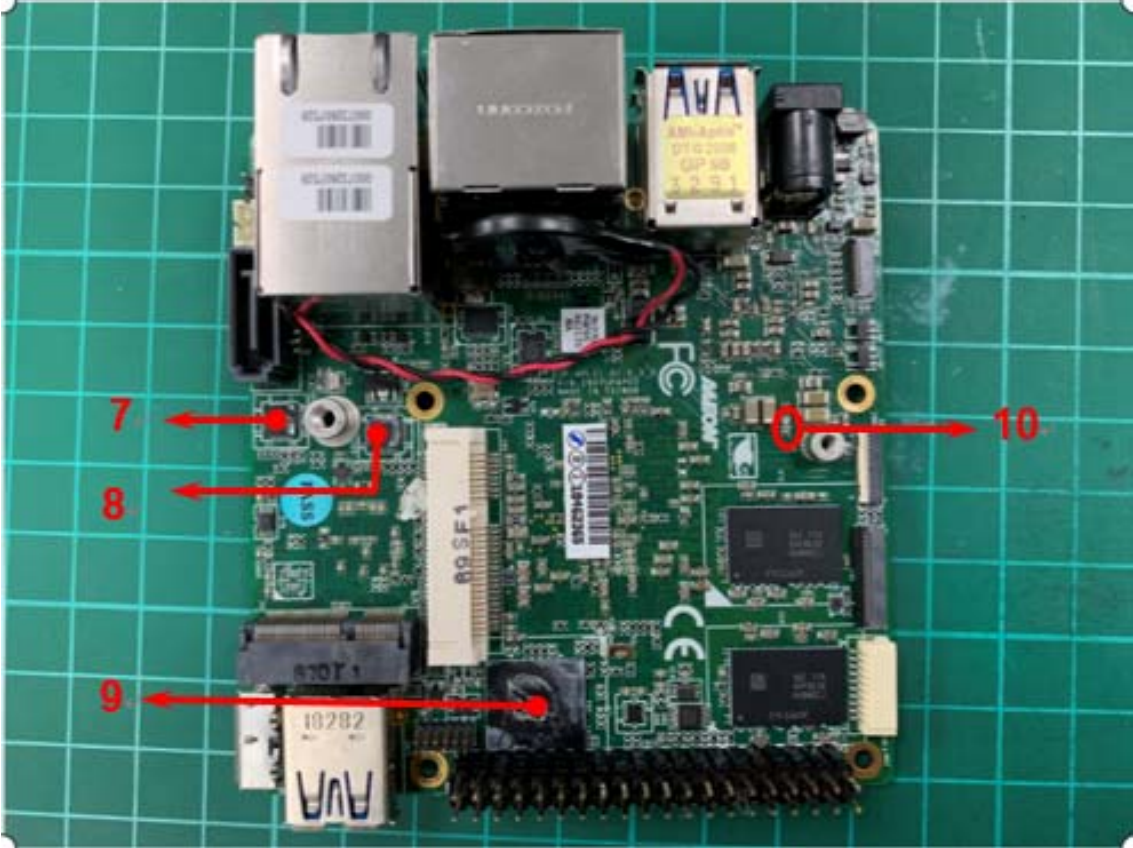
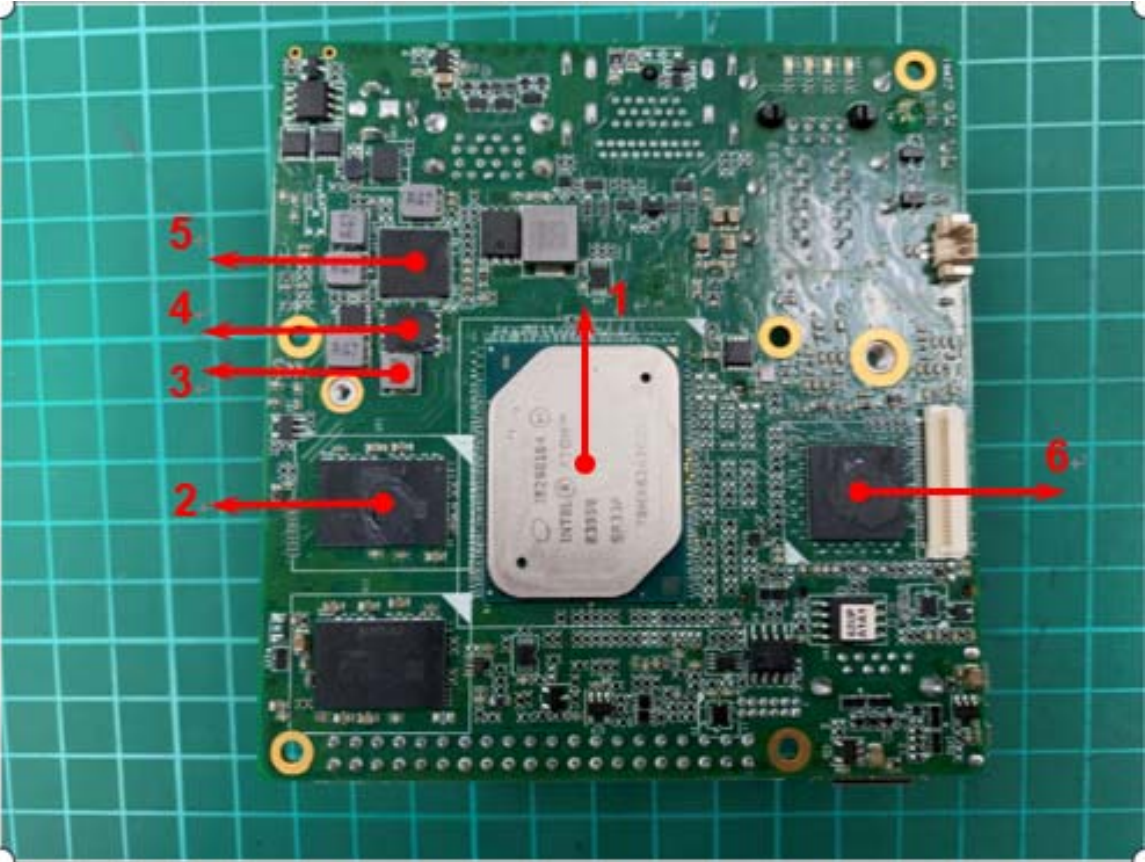
1. Test Temperature: 60°C
2. Test Times: 8Hrs
3. Test Software: Linux / Ubuntu16.04
4. Test Environment Curve:



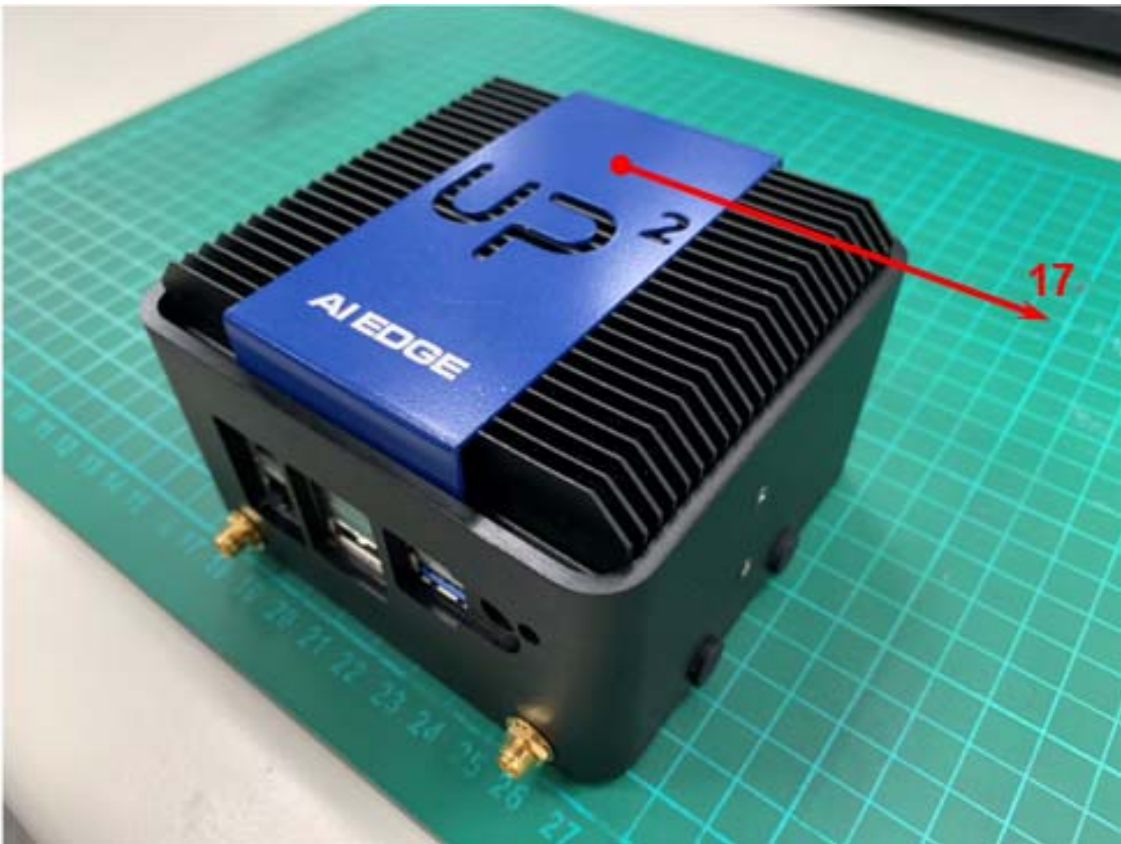
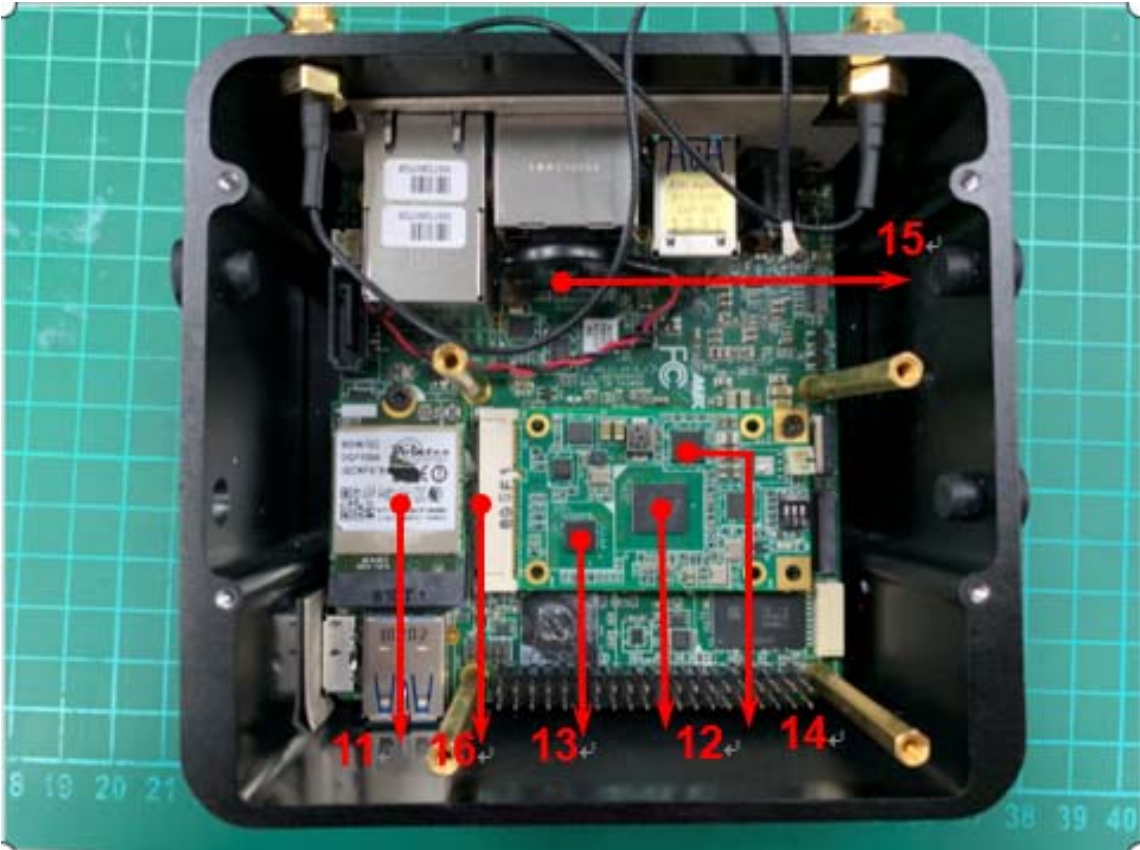
High Temperature Operation test

Terminal Recorder:

Measuring Thermal Couple Position :



High Temperature Operation test



High Temperature Operation test

Thermal profile data:

AEU UPS System (UPS-GWS01 X7) (With 0.5m/sec airflow)

Point	Position	Describe	Spec Tc(*1)	TAT(*2) TPT(*3)		Note
				60	25	
1.	U1	Intel Atom® x7-E3950 Processor 2M Cache, up to 2.00 GHz	98	79.5	44.5	
2	U71	IC.16Gb LPDDR4.SDRAM MT53B512M32D2NP-062WT:C	95	84.9	49.9	
3	L22	Coil.SMD.GOTREND.GSTD4020PE-R47M	100	85.0	50.0	
4	Q24	PWR.PMPAK5X6 DUAL N-MOSFET FAIRCHILD.FDMS7620S	125	84.6	49.6	
5	U56	IC.PMIC. Intel Apollo Lake.SMD.TI.TPS650940A0RSKR	100	81.2	46.2	
6	U52	IC.CPLD FOR MAX SMD.Altera.10M02SCU169C8G	100	87.6	52.6	
7	U34	IC.PCI.Gigabit Ethernet Chip.REALTEK.RTL8111G-CG	100	96.5	61.5	
8	U33	IC.PCI. Gigabit Ethernet Chip.SMD.REALTEK.RTL8111G-CG	100	96.5	61.5	
9	U41	IC.eMMC Flash.64GB.SMD.Kingston.EMMC64G-M525-A51	85	82.1	47.1	Note 4
10	R552	(TF)CR.2.2.1/10W.1%.0603.SMD	125	92.1	57.1	
11	WIFI	Bointec,DGF109A	NA	87.0	52.0	
12	U5	(TF)IC.CHIP MyriadX.MA2485(C0)/MM#999A6H/SLMYP	150	88.9	53.9	
13	U3	(TF)IC.Triple Synchronous Converter.VQFN32.	125	86.2	51.2	
14	U1	(TF)IC.PCIE Controller FRESCO.FL1100-1A0-LX	150	90.5	55.5	
15		Battery	85	78.7	43.7	
16		Chassis inside Surface Temp.-1	NA	76.0	41.0	
17		Chassis Surface Temp.	NA	76.5	41.5	

Note(*):

1. "Tc" indicates the component's case maximum temperature value specified in its datasheet.

2. "TAT" indicates the actual measured temperature in chamber.

3. "TPT" indicates the predicted temperature by offset from TAT

4. Judgment Criteria:

- **Fail** : $T_m > T_c$; The measured value is over specification.

- **Margin Pass** : $T_c > T_m > T_c - 5^\circ\text{C}$; The measured value is within specification with margin.

It is strongly recommended to add thermal dissipation design for better reliability.

- **Pass** : $T_m < T_c - 5^\circ\text{C}$; The measured value is with safety margin.

4. Defect NO. NA

Sample Configuration & Quantity Under Test:

Quantity: 1 (AEU UPS System)

Test Result:

No issues were found during the temperature rise operation test.