

UPS-EHL01

Thermal Image Analysis Report

Summary	☒ Pass Comment: <u>There are 2 temperature points marginal passed but function is stable.</u>			
	☐ Fail			
Test Result Summary				
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	2
Defect Unsolved	0	0	0	2

Issue date

2022 / 05 / 17

Deputy Manager

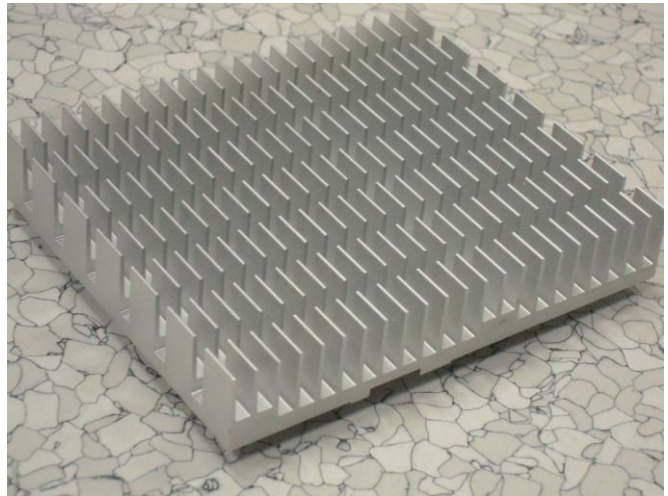
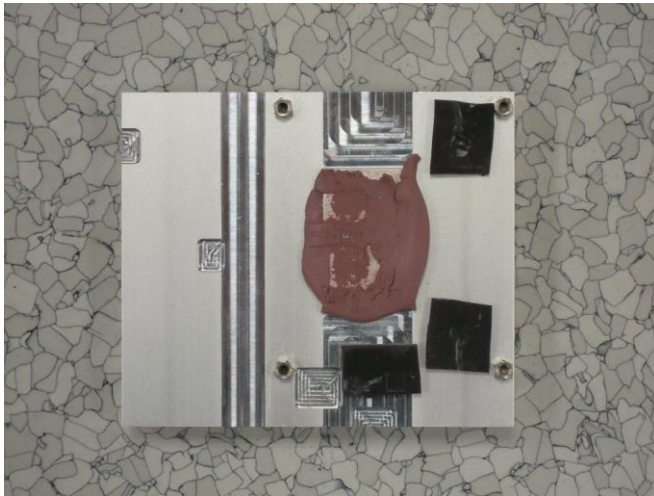
Louie Lee

Test Engineer

Clement Chien

Sample Configuration & Quantity Under Test

- **Model name : UPS-EHL01 / A0.1**
- **BIOS : USEHAM04**
- **CPU : Intel Pentium J6426 @2.0GHz / 10W**
- **Memory : On board 16GB**
- **Storage: eMMC 128GB**
- **Test Software : Windows 10 / Run PassMark Burn In Test 9.0 Pro(1014)**
- **Power: AT Power Supply**
- **CPU Sink :**



Thermal Image Analysis

1. Test Date: 2022-05-16

2. Test Product: UPS-EHL01 / A0.1

3. Test Site: AAEON QE Dept.

4. Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON.)

Model: THS-D7S-100+L N2

Date of Calibration: 10/01/21

Due date of Calibration: 09/30/22

Serial Number: 3898

5. Temperature Measurement:

5.1 40 Channel Thermal Recorder:

YOKOGAWA Inc,

Model: DA100-13-1D

Date of Calibration: 09/04/21

Dute Date of Calibration: 09/03/22

Serial Number: 12A323190

5.2 IR Scanner: Infrared Camera

NEC Avio Infrared Technologies Co., Ltd.

Model: Thermo GEAR G100W2-D

Date of Calibration: 11/04/21

Dute Date of Calibration: 11/03/22

Serial Number: 1051444

6. Test Condition:

6.1 Test by IR Scanner: 25.0°C Room Temperature

6.2 EUT with Heat Sink

6.3 Test by PTU Tool: 25.0°C with 0.5m/s Air Flow

6.4 Test by PTU Tool and Thermal Recorder: 60°C with 0.5m/s Air Flow

6.5 PTU run Workload + Burn in Test v9.0(DISK + LAN + Sound) & USB
Dammy Load

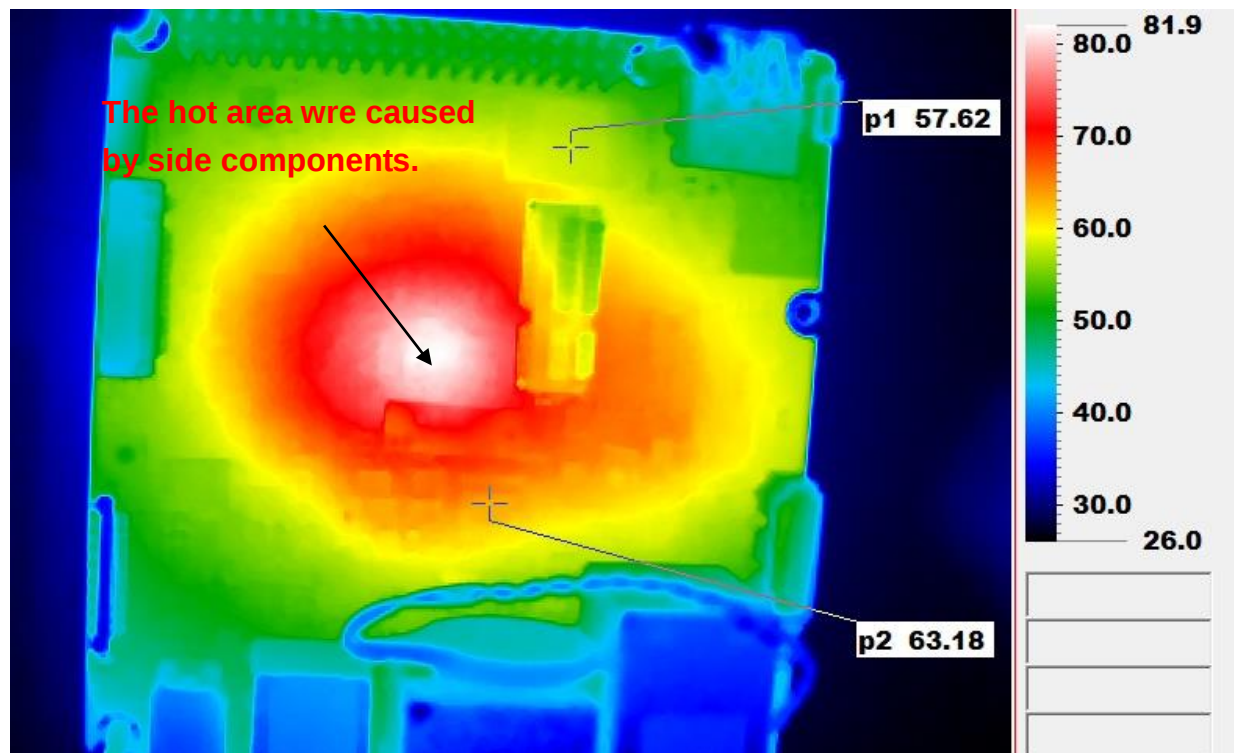
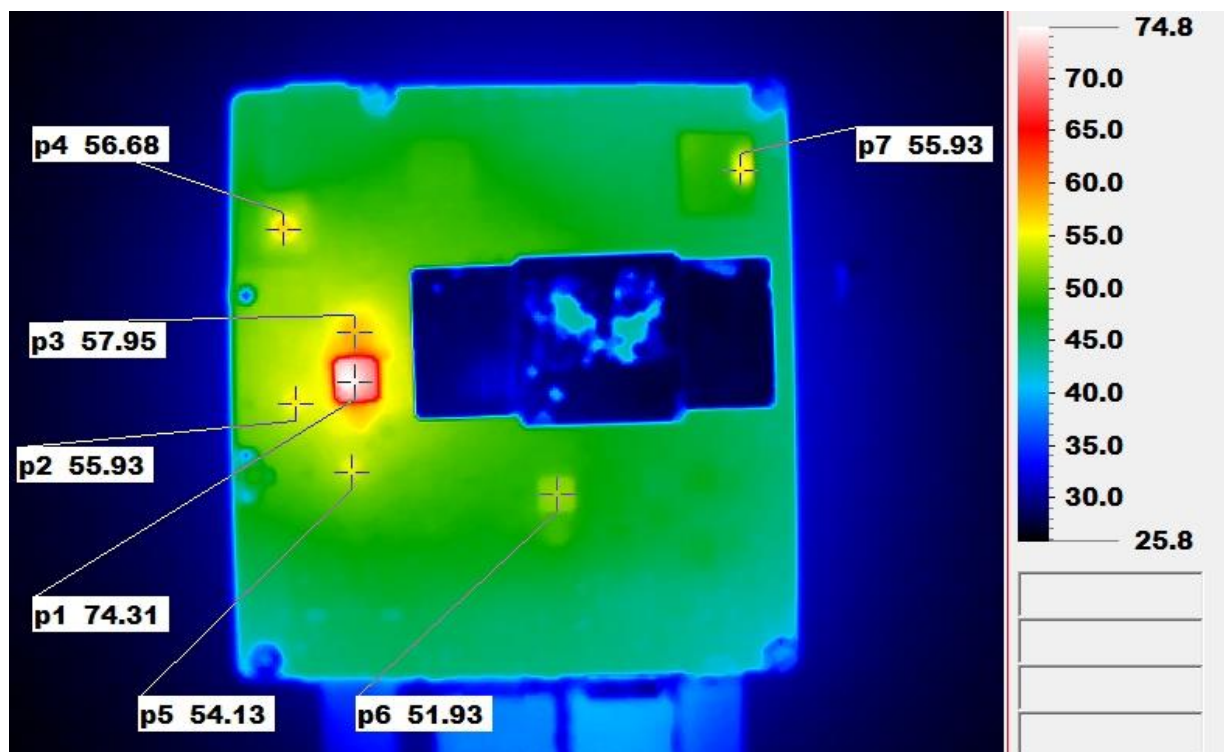
7. Take Picture Time:

After Power on 2 hours

8. Tempeture Points Record Time:

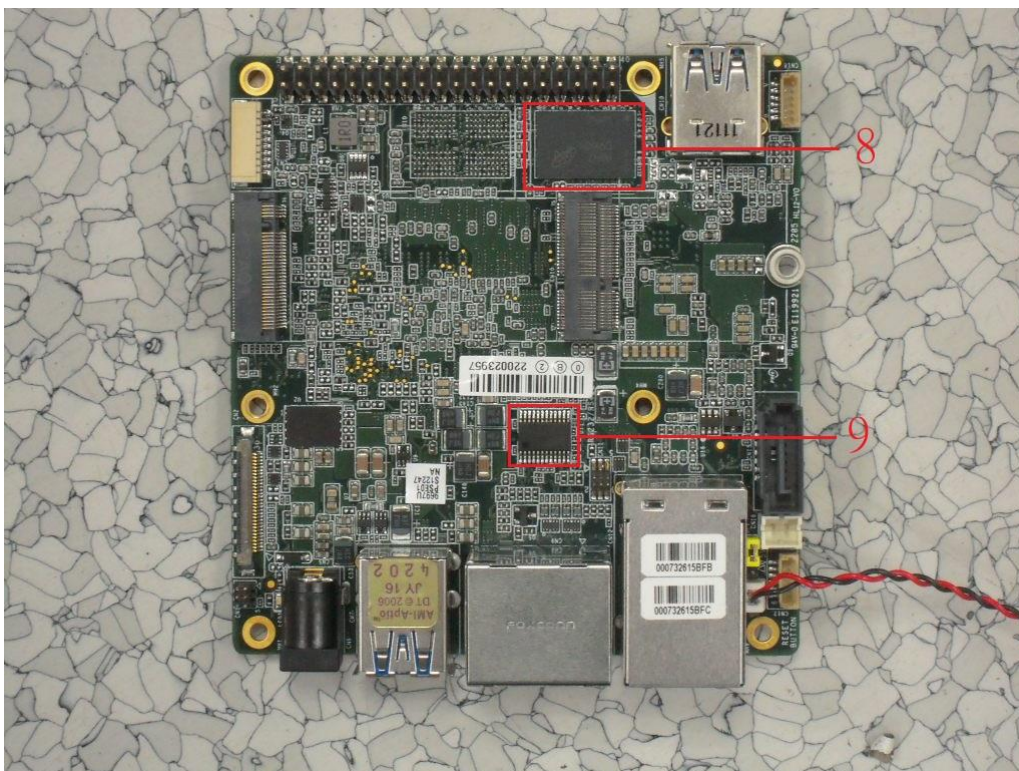
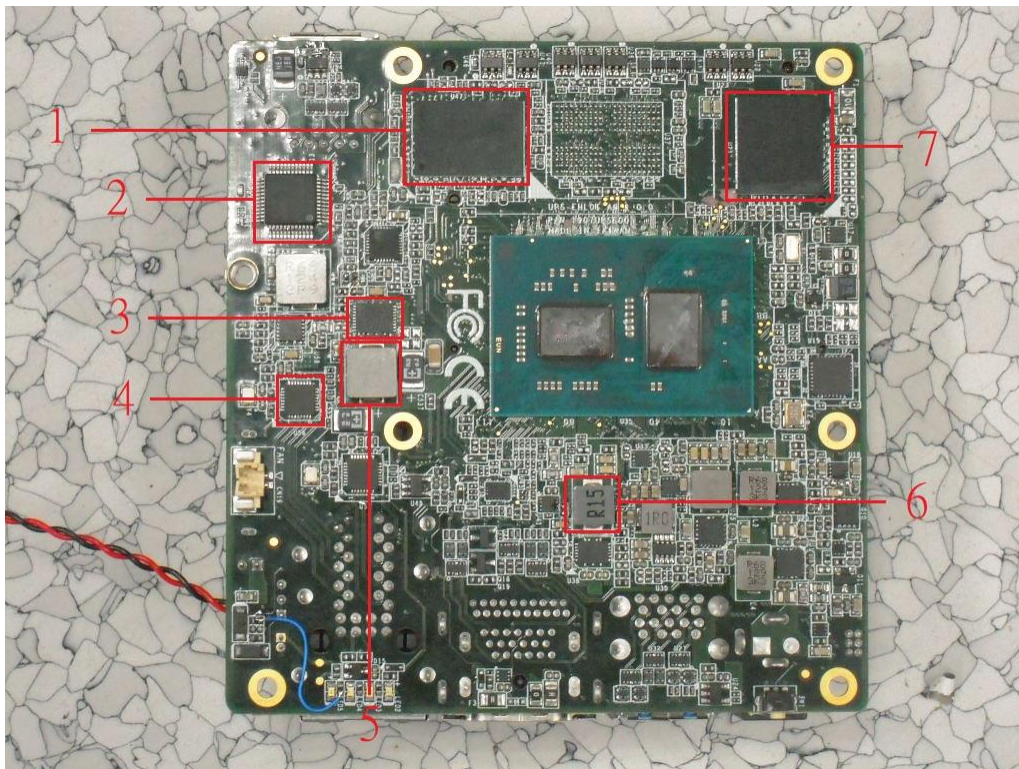
After Burn in 4 hours

Temperature Profile Test: Component Side:



Terminal Recorder:

Measuring Thermal Couple Position :



CPU Frequency Record

Point	CPU Freq.		Note
	Temp. Stage(°C)	Intel Pentium J6426 @2.0GHz TDP: 10W	
CPU	Normal Tn(*1) = 25	Fn(*3) = 2.0GHz	DTS average=52°C TDP average=9.9W
	SPEC. Ts(*2) = 60	Fs(*4) = 1.8GHz	DTS average=89°C TDP average=9.9W

Note(*):

- "Tn" indicates the room temperature value in testing chamber.
- "Ts" indicates the maximum operating temperature value specified in its datasheet.
- "Fn" indicates under normal temperature environment, the operating freq. of the CPU.
- "Fs" indicates under high temperature environment, the operating freq. of the CPU.
- Judgment Criteria:**
 - Fail:**
Fs < Fn * 70%; The CPU average freq. value is lower than Fn * 70%.
 - Pass:**
Fs > Fn * 70%; The CPU average freq. value is higher than Fn * 70%.
- Intel PTU for EHL v0.5 : Use Workload Test, set CPU stress 90% + GPU stress set High.

Using YOKOGAWA / DA100-13-1D test

Point	Position	Describe	Tc (*1) (°C)	Tm(*3)	Note
				60°C	
1	U47	(TF)SDRAM.SMD.LPDDR4.2GB.(512Mx32).1866Hz.1.1V.FBGA.200P.X32.Micron.MT53D512M32D2DS-053 WT:D	85	74.4	
2	U57	(TF)IC.7.1+2 Channel High Definition.Audio Codec.LQFP 48P.SMD.REALTEK.ALC888S-VD2-GR	100.5	72.5	
3	U51	(TF)IC.CMOS.SMD.INTELLI-PHASE with Integrated High & Low-Side FETs Driver.TQFN.25P.MONOLITHIC POWER SYSTEMS (MPS).MP86945-AGVT-Z	Ta=150	77.8	
4	U56	(TF)IC.PCI-express.Gigabit Ethernet Chip.QFN 32P.SMD.REALTEK.RTL8111H-CG	Ta=70	74.4	Note 4
5	L8	(TF)COIL.SMD.0.15uH.20%.DCR=0.64mohm.Idc=40.0A.7.1*6.6*4.0mm.ZenithTek.ZPWM-6040ML-R15M	Ta=125	60.3	
6	L7	(TF)COIL.ZenithTek.ZBWM050530C2R15MB	Ta=125	76.0	
7	U21	(TF)IC.eMMC 5.1 Flash.64GB.Sandisk.SDINBDA4-64G-V	Ta=85	75.4	Note 4
8	U14	(TF)IC.16Gb(512Mx32).LPDDR4/LPDDR4X.SDRAM.2133MHz.1.8V/1.1V.FBGA.200P.SMD.Micron.MT53D512M32D2DS-053 WT:D	85	71.0	
9	U11	(TF)IC.RS-232.422.485.Transceiver.24P.TSSOP.SMD.MaxLinear.SP330EEY-L	85	72.3	

Note(*):

1. "Tc" indicates the component's case maximum temperature value specified in its datasheet.
2. "TA" indicates the component's ambient temperature value specified in its datasheet
3. "Tm" indicates the actual measured temperature under 60°C product specification working environmental.

4. Judgment Criteria:

- Fail

- Tm > Tc+5°C; The measured value is over specification plus margin.
- Tm > TA+5°C; The measured value is over specification plus margin.

- Margin

- Tc+5°C > Tm > Tc-10°C; The measured value is within specification with margin.
- TA+5°C > Tm > TA-10°C; The measured value is within specification with margin.
- For FANLESS system application, it is strongly recommended to add thermal dissipation design for better reliability.

- Pass

- Tm < Tc-10°C; The measured value is with safety margin.
- Tm < TA-10°C; The measured value is with safety margin.

. RTC battery avoid to put on heat position. Please do not exceed battery temperature specification.