PICO-APL3

Thermal Image Analysis Report

Summary	☐ **Pass** ☐ **Fail** ☑ **Pass with Deviation** **Comment:** 1. There are eight temperature points marginal passed. 2. There are four components that lack the Tc or Tj specifications, So we are unable to determine.

Test Result Summary

	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	12
Defect Unsolved	0	0	0	12

Issue date	QE Manager	Test Engineer
2017 / 09 / 29	**KJ Wang**	**Jerry Chen**

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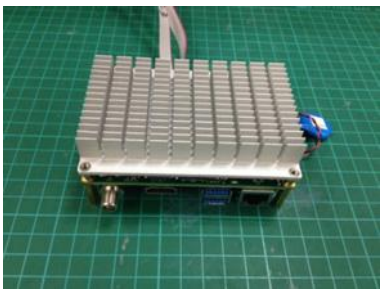
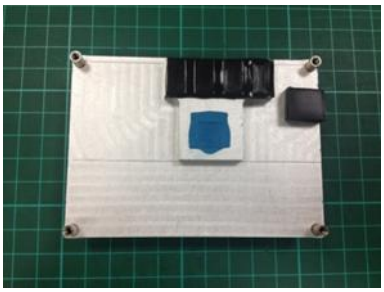
Sample Configuration & Quantity Under Test

- **Model name : PICO-APL3**
- **M/B Name : PICO-APL3 / Rev. A0.2**
- **CPU : Intel Pentium N4200 / 1.10 GHz**
- **BIOS : PICO-APL3 R0.4 (ZAP3AM04) (08/21/2017)**
- **Chipset: Intel Apollo Lake**
- **Memory：On board / DDR3L 4GB / SEC K4B8G1646D MYKO**
- **2.5” SATA HDD: TOSHIBA 160GB / MK1655GSX**
- **Test Software：Windows 10 / Run PassMark Burn In Test 8.1 Pro**
- **Adapter: FSP / FSP060-DIBAN2 / 12V 5A**
- **AT Power Supply: Zippy EMACS HG2-6400P (For 2.5” SATA HDD)**
- **Heat Sink:**





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Thermal Image Analysis

1. Test Date: 2017-09-28

2. Test Product: PICO-APL3

3. Test Site: AAEON QE Dept.

4. Temperature Measurement:

4.1. 40 Channel Thermal Recorder:

4.1.1 YOKOGAWA Inc,

4.2.2 Model: DA100-13-1D

Date of Calibration: 09/08/2017
Due date of Calibration: 09/07/2018
Serial Number: 12A323190

4.2. IR Scanner: Infrared Camera

4.2.1 NEC Avio Infrared Technologies Co., Ltd.

4.2.2 Model: Thermo GEAR G100W2-D

Date of Calibration: 11/29/2016
Due date of Calibration: 11/28/2017
Serial Number: 1051444

5. Test Condition:

Test by DA-100: 25.0℃ with Heat Sink

6. Take Picture Time:

After power on 2 hours

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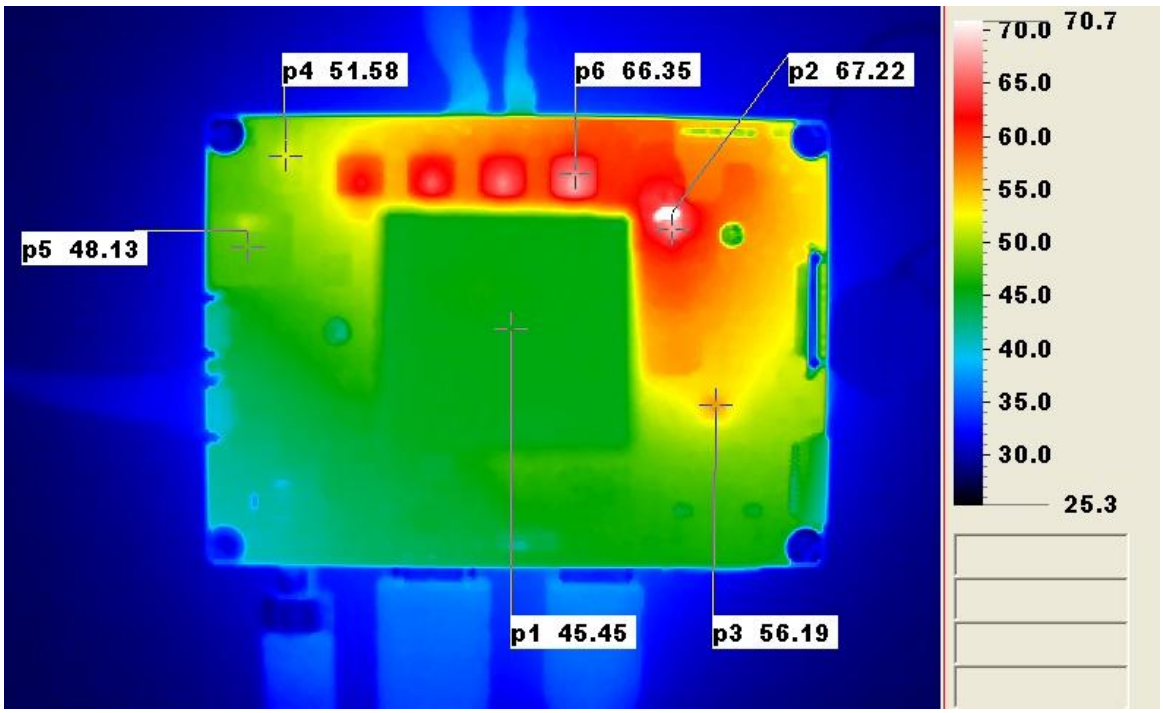
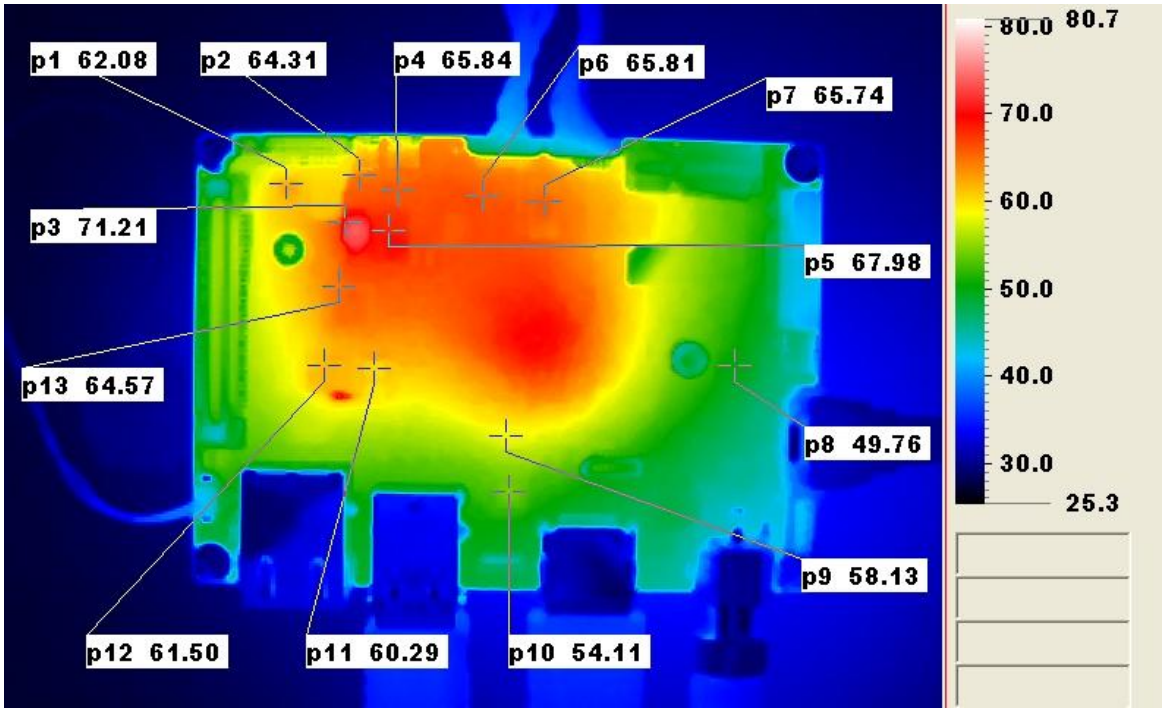
Temperature Profile Test:

Front Side:



Rear Side:



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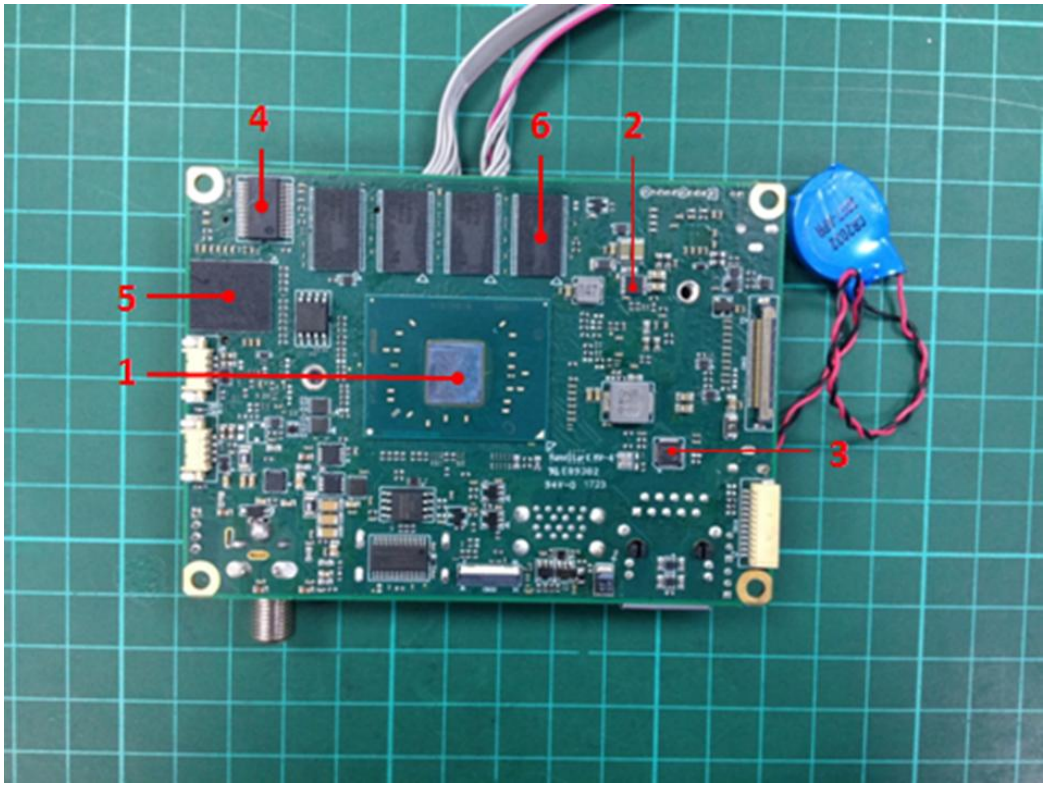
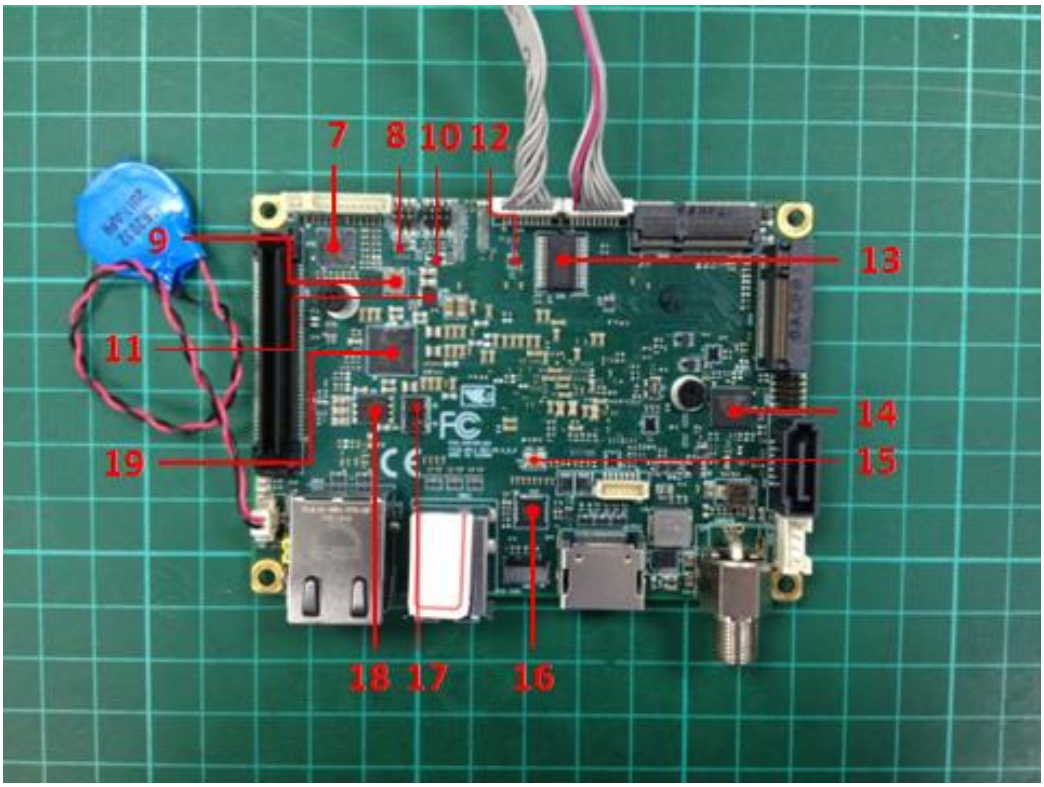
Terminal Recorder:

Measuring Thermal Couple Position：

Front Side:



Rear Side:



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Using YOKOGAWA Inc / DA100-13-1D test

Point	Position	Describe	Tc (*1) (℃)	TAT(*2)	TPT(*3)	Note
				25℃	60℃	
1	U25	Intel Pentium N4200 / 1.10 GHz	105	55.7	90.7	
2	Q17	PMPAK3X3 DUAL N-MOSFET..FAIRCHILD.FDMC7200S	125	71.7	106.7	
3	U80	Gigabit Ethernet Chip.QFN 32P.SMD.REALTEK.RTL8111G-CG	100	63.6	98.6	**Note 6**
4	U99	S232 Driver/Receiver.15KV ESD.SSOP TI.TRS213IDBR	125	54.8	89.8	
5	U38	eMMC Flash.32GB.3.3V..Kingston.EMMC32G-M525-A51	85	52.9	87.9	**Note 6**
6	U36	DDR3L.512M.Dual-Die.1600MHz. Samsung.K4B8G1646D-MYK0	95	56.8	91.8	**Note 6**
7	U78	HDA Audio Codec.w/Class-D AMP.REALTEK.ALC269Q-VC2-GR	100	63.7	98.7	**Note 6**
8	U89	ESDDiode.AIR 15KV.SLP2510P8.LITE-ON.L05ESDL5V0NA-4	100	62.8	97.8	**Note 6**
9	L1	Coil.0.47uH.DCR=14mΩ.Irms=7Amp.GOTREND.GSTD4020PE-R47	N/A	71.9	106.9	**Note 6**
10	D1	D Schottky.Vr=40V.Ifm=0.2A.Ir=0.2uA.WILLAS.BAS40W-06	100	60.6	95.6	**Note 6**
11	Q5	DUAL N-MOSFET.Vgs1/2=(+/-)20V.FAIRCHILD.FDMC7200S	125	65	100	
12	Q68	Dual N-Channel MOSFET.EMT6.SMD.ROHM.EM6K1GT2R	125	57.1	92.1	
13	U20	S232 Driver/Receiver.15KV ESD.SSOP TI.TRS213IDBR	125	57.7	92.7	
14	U5	Embedded Controller.SMD.ITE.IT8528VG/FX	85	51.6	86.6	**Note 6**
15	Y4	X'TAL.19.200MHz.20PF.ARGO.AGX-19.200M-20-S3225-E-Z-TR	N/A	54.9	89.9	**Note 6**
16	U32	HDMI/DVI Level Shifter.HVQFN.NXP.PTN3366BSMP	N/A	54.9	89.9	**Note 6**
17	TC3	KO-CAP.330uF.2.5V.20%.KEMET.T520B337M2R5ATE015	N/A	60.7	95.7	**Note 6**
18	Q3	DualN-MOSFET.FAIRCHILD.FDMS3660S	125	63.1	98.1	
19	U8	PMIC.Intel Apollo Lake.DDR=1.35V.TI.TPS650942A0RSKR	100	64.2	99.2	**Note 6**
20	Air	Air Temperature	N/A	25	60	

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Note(*):

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

2. "TAT" indicates the actual measured temperature under 25℃ working environmental.

3. "TPT" indicates the predicted temperature under product specification.

4. Judgment Criteria:

- **Fail** : Tm > Tc+5℃; The measured value is over specification plus margin.
- **Margin** : Tc+5℃ > Tm > Tc-10℃; 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℃; The measured value is with safety margin.

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

6. Defect NO. : E170401LABD03

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