EMB-Q87A

Thermal Image Analysis Report

Summary	☐ **Pass** ☐ **Fail** ☑ **Pass with Deviation** **Comment: Temperature at 2 components were estimated to be in marginal temperature points in comparion with component datasheets.**

Test Result Summary

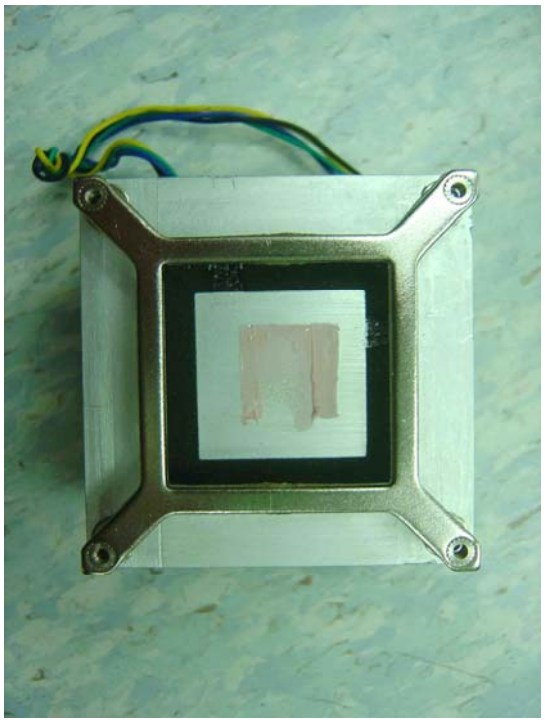
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	1
Defect Unsolved	0	0	0	1

Issue date	Approval	Test Engineer
2013 / 07 / 26	Tom Lin	Rex Chang

AAEON Technology Inc.
5F, No.135, Lane 235, Pao Chiao Rd.,
Hsin-Tien City, Taipei, Taiwan, R.O.C.
TEL: +886-2-8919-1234
FAX: +886-2-8919-1053

Sample Configuration & Quantity Under Test

- **Model name : EM-Q87A A0.2**
- **CPU Board : EMB-Q87A A0.2**
- **CPU : Intel Core i7-4700EQ / 2.40GHz**
- **Memory : Transcend 8GB * 2 / DDR3 1600 / SECK4B4G0846B**
- **3.5” SATA HDD : Seagate ST500DM002 / 500GB**
- **BIOS : EMB-QM87A R1.0 (EM87AT10) (05/23/2013)**
- **Test Software : Windows 7 / Run PassMark Burn In Test 7.0 Pro**
- **Power : AT Power (AT to ATX Mode)**
- **CPU Cooler :**



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Thermal Image Analysis

1. Test Date: 2013-07-26

2. Test Product: EMB-QM87A

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: 2012/10/08

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: 2013/01/08

Serial Number: 1051444

5. Test Condition:

Test by DA-100: 25.0℃ with Heat Sink + FAN (Full speed)

6. Take Picture Time:

After power on 2 hours

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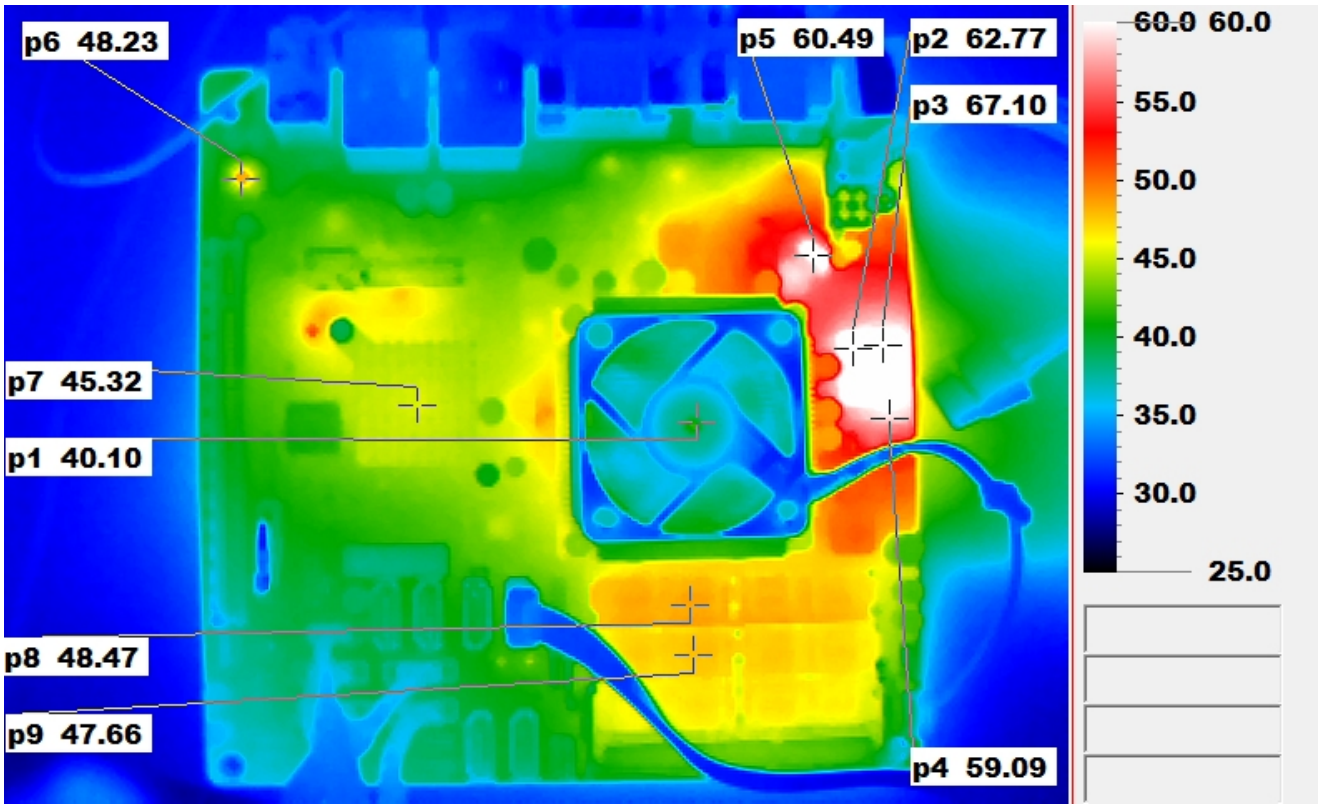
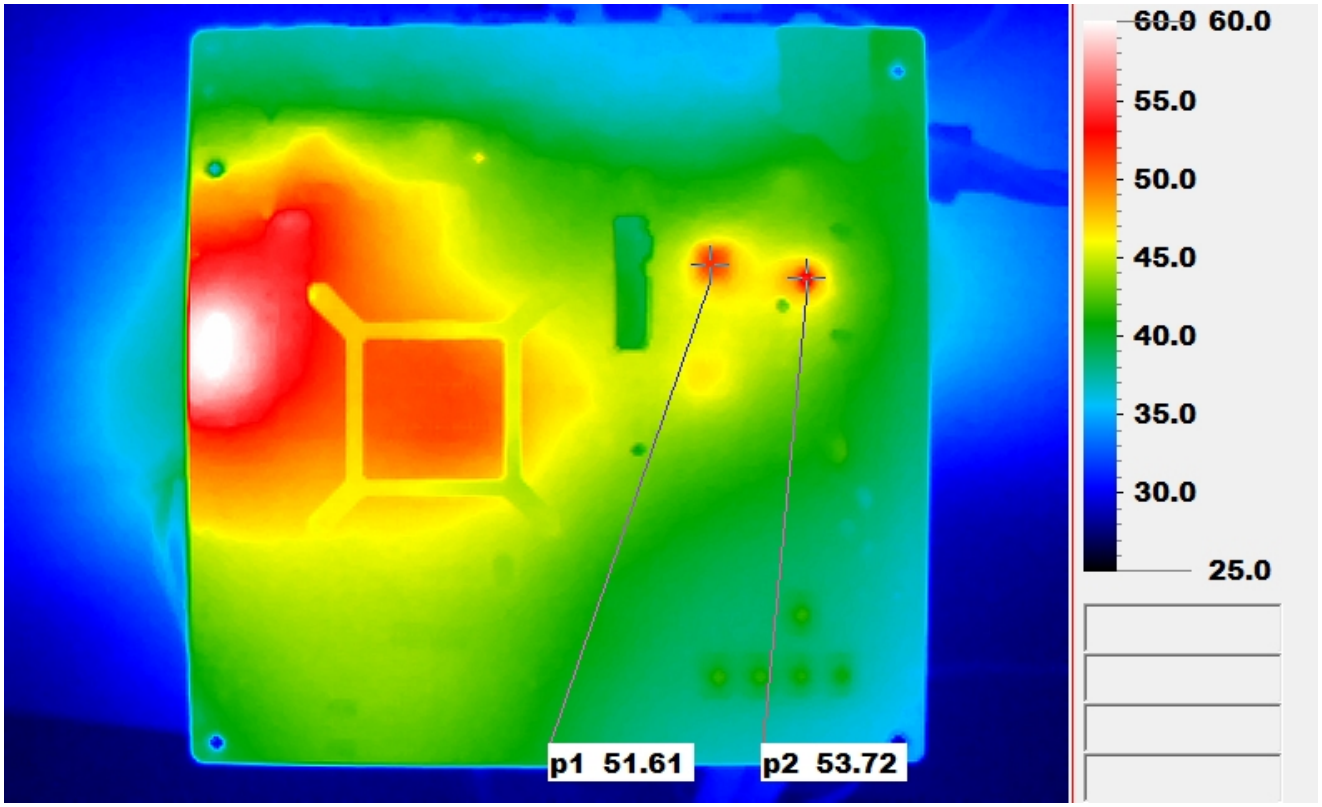
Temperature Profile Test:

Component Side:



Back Side:



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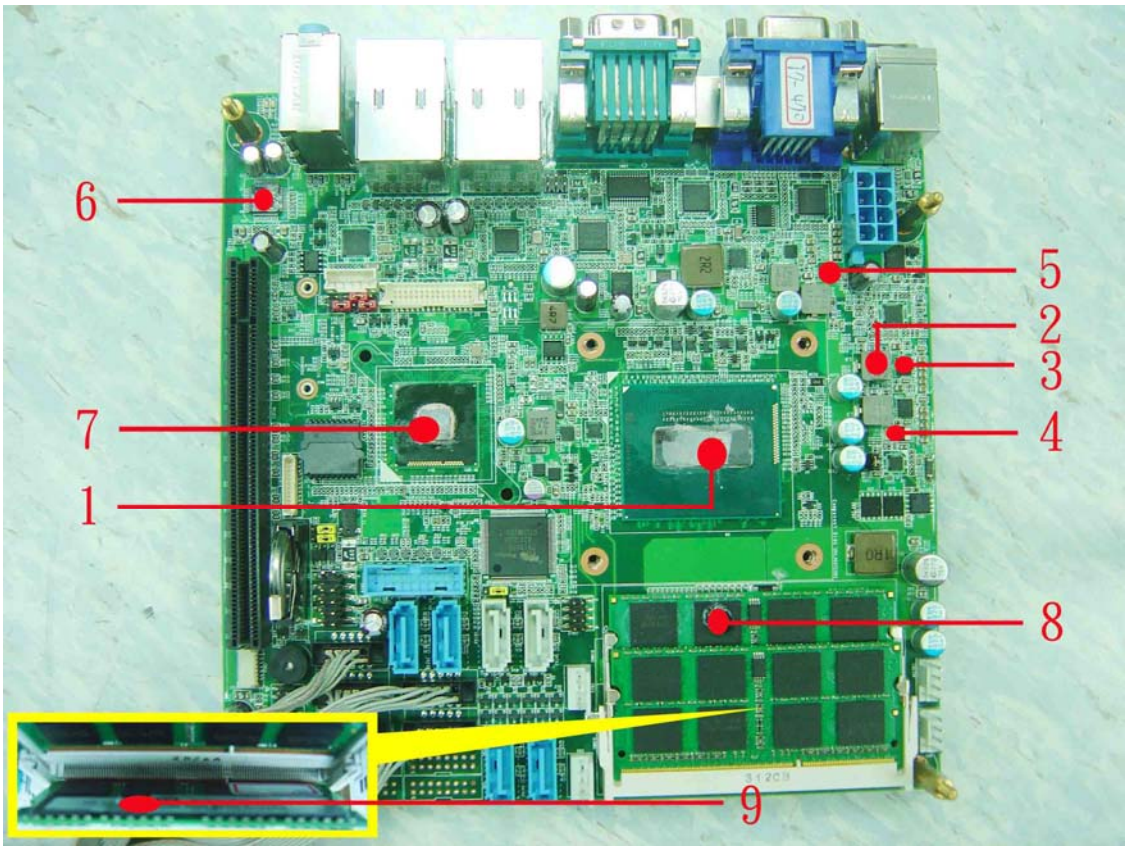
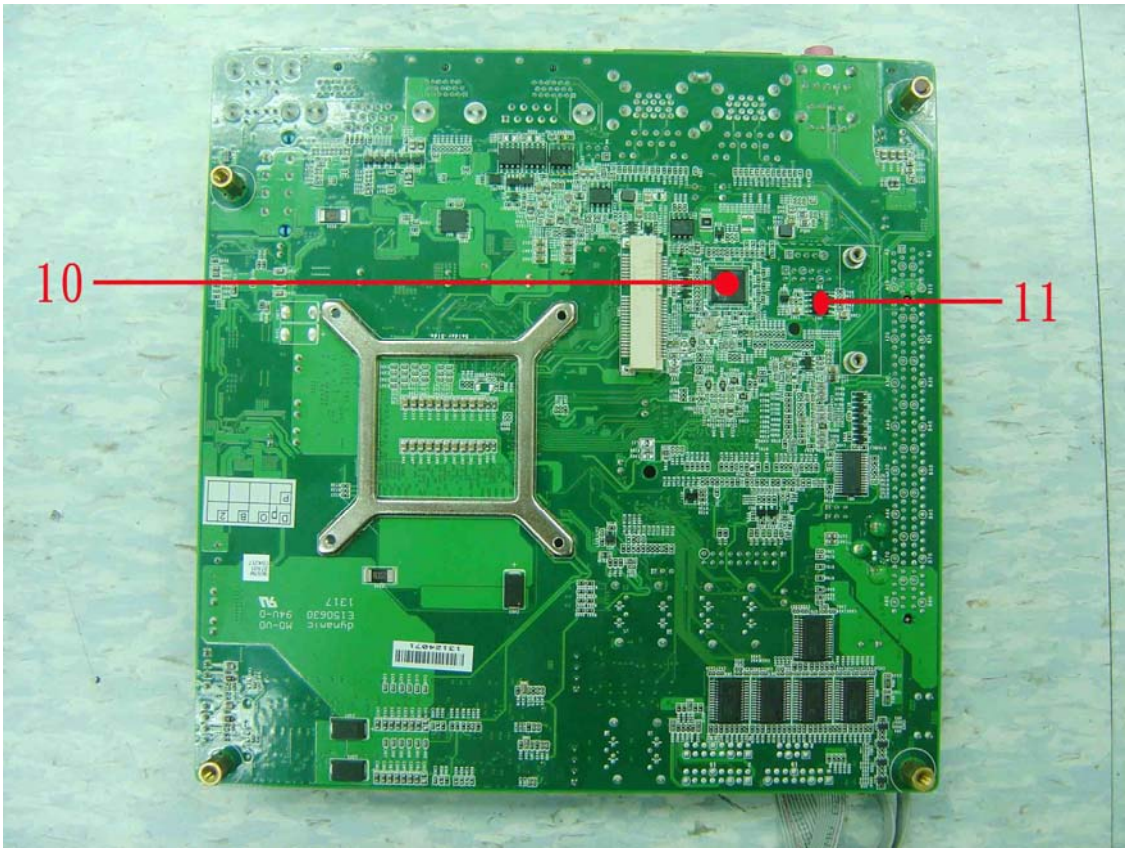
Terminal Recorder:

Measuring Thermal Couple Position：





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Using YOKOGAWA / DARWIN DA100-100-13-1D test

Point	Position	Describe	Tc (*1) (℃)	Tm (*2) Measured Under		Note
				25.0℃	60℃	
1	U9	(TF) INTEL Core i7-4700EQ / 2.40GHz CPU	100	39.2	74.2	
2	L6	(TF) COIL.Panasonic.ETQP4LR24AFM	130	44.7	79.7	
3	U16	(TF) Synchronous Buck NexFETTM. TI.CSD97374Q4M	125	44.7	79.7	
4	R171	(TF)CR.0.002.2W.5%.2512. Walsin.WR Series	125	46.7	81.7	
5	U31	(TF) Synchronous Buck NexFETTM. TI.CSD97374Q4M	125	58.6	93.6	
6	U41	(TF) HIGH DEFINITIOND.AUDIO CODEC.REALTEK.ALC662-GR	130	39.5	74.5	
7	U12	(TF)Chipset PCH.SMD.INTEL.BD82QM87	108	34.8	69.8	
8	-	Memory chipset - 1	95	41.5	76.5	
9	-	Memory chipset - 2	95	41.5	76.5	
10	U85	(TF) DisplayPort to LVDS Converter.Chrontel.CH7511B-BF	85	44.3	79.3	Note4
11	U83	(TF) Low dropout Linear Regulator.GMT.G9731F11U	85	43.6	78.6	Note4

Note(*):

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

2. "Tm" indicates the measured Tc value under working environmental temperature within product specification.

3. 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.

4. Defect NO. I121120QED07

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