GENE-QM87

Thermal Image Analysis Report

Summary	☑ **Pass** ☐ **Fail** ☐ **Pass with Deviation** **Comment: _____**

Test Result Summary				
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

Issue date	Approval	Issued by	Test Engineer
2013/06/13	TOM	Rex Chang	Glen Wen

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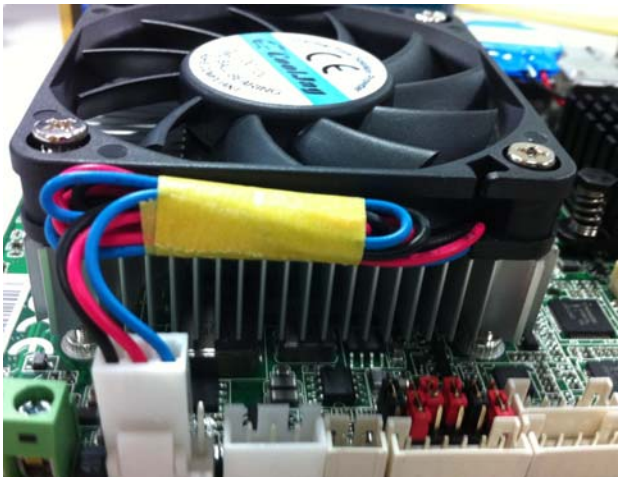
Sample Configuration & Quantity Under Test

- **Model name : GENE-QM87 A0.2**
- **CPU Board : GENE-QM87 A0.2**
- **CPU : Intel Core i5-4400E (2.70 GHz)**
- **Memory : Transcend DDR3L 1600 8GB**
- **HDD : WD WD5000AAKX 3.5” 500G**
- **BIOS : GENE-QM87 R0.4 (CQ87AM04)**
- **Test Software : Windows 7/ Run PassMark Burn In Test 7.0**
- **Power : AT Power**
- **CPU Fan**



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Thermal Image Analysis

1. Test Date: 2013-06-12

2. Test Product: GENE-QM87

3. Test Site: QE Dept.

4. Temperature Measurement:

4.1. 40 Channel Thermal Recorder:

4.1.1 OMRON Inc,

4.2.2 Model: ZR-RX40

Date of Calibration: 2012/12/11

Serial Number: H00452807

4.2. IR Scanner: Infrared Camera

4.2.1 NEC

4.2.2 Model: G100D

Date of Calibration: 2013-01-08

Serial Number: 1051444

5. Test Condition:

Component Side-1 (Test by ZR-RX40):25.0°C With CPU Fan

6. Take Picture Time:

After power on 2 hours

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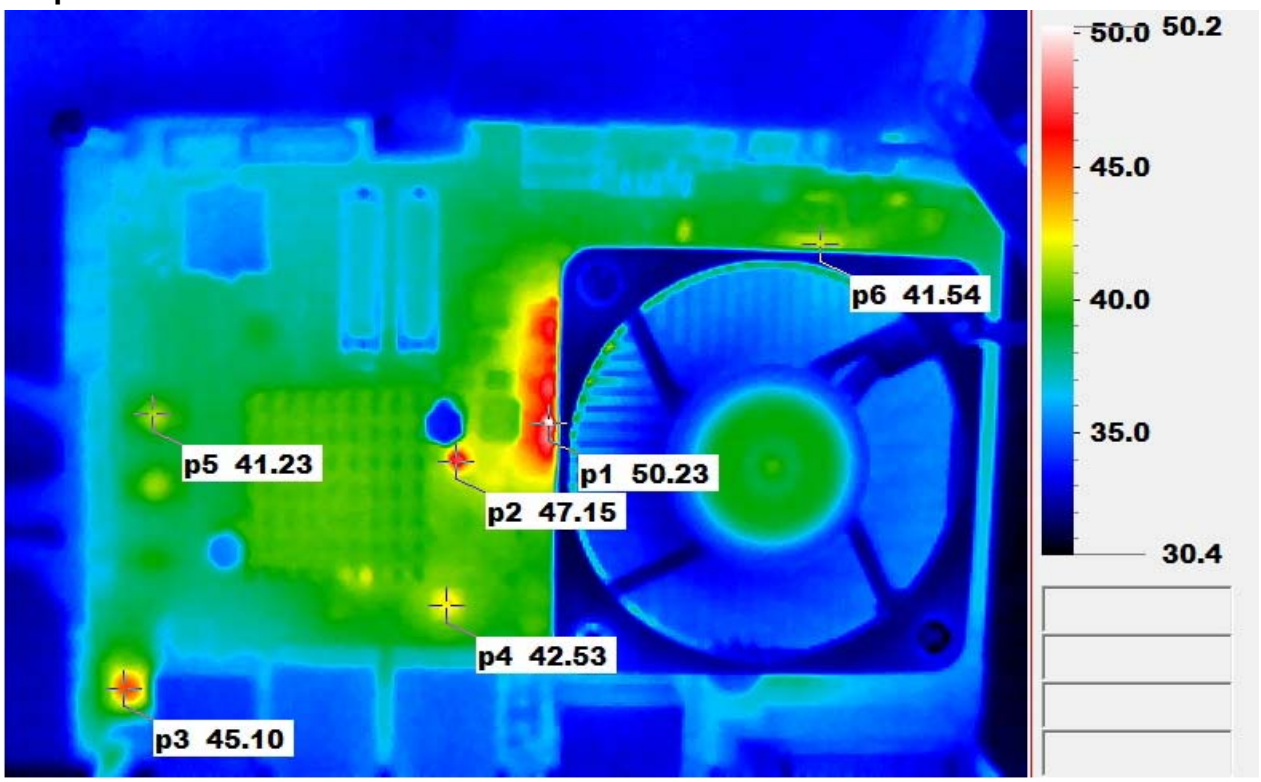
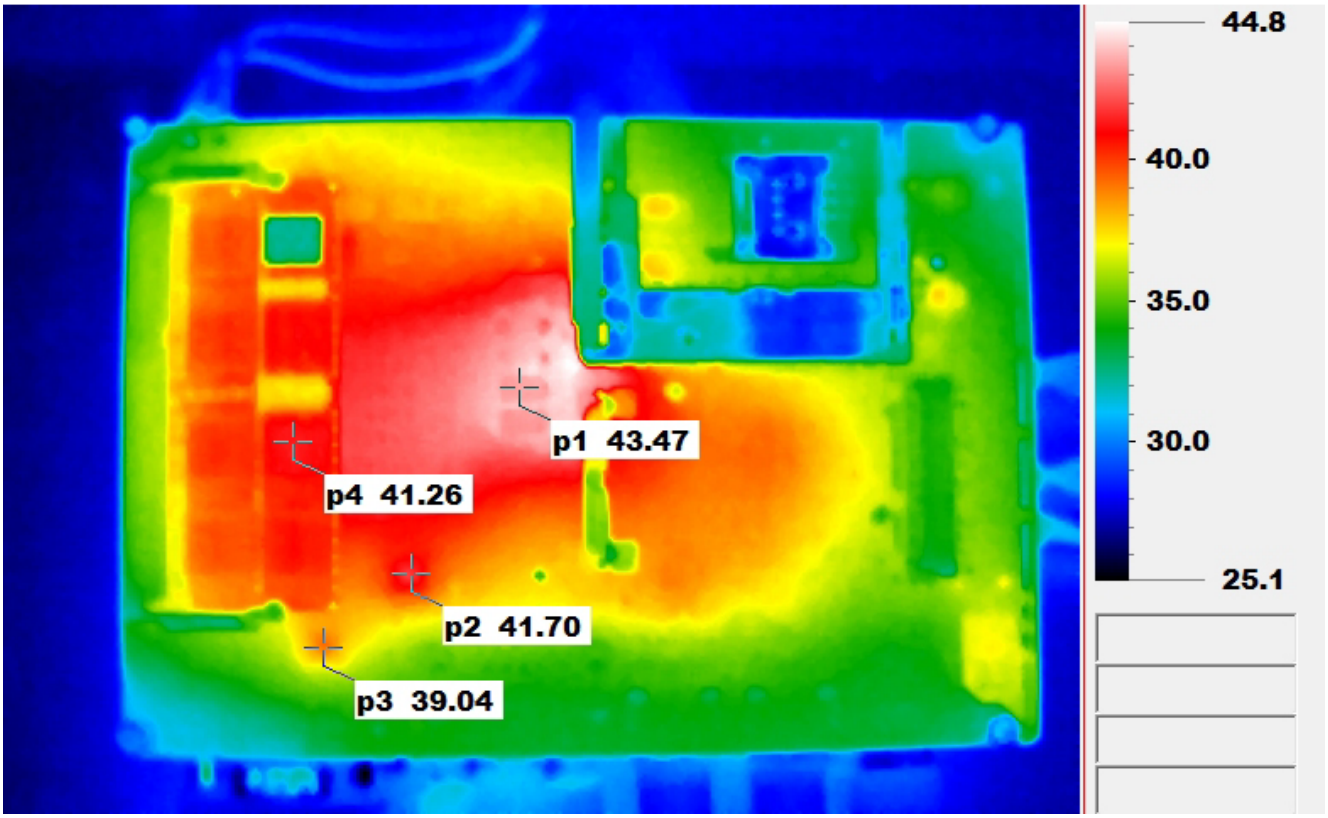
Temperature Profile Test:

Component Side:



Back Side:



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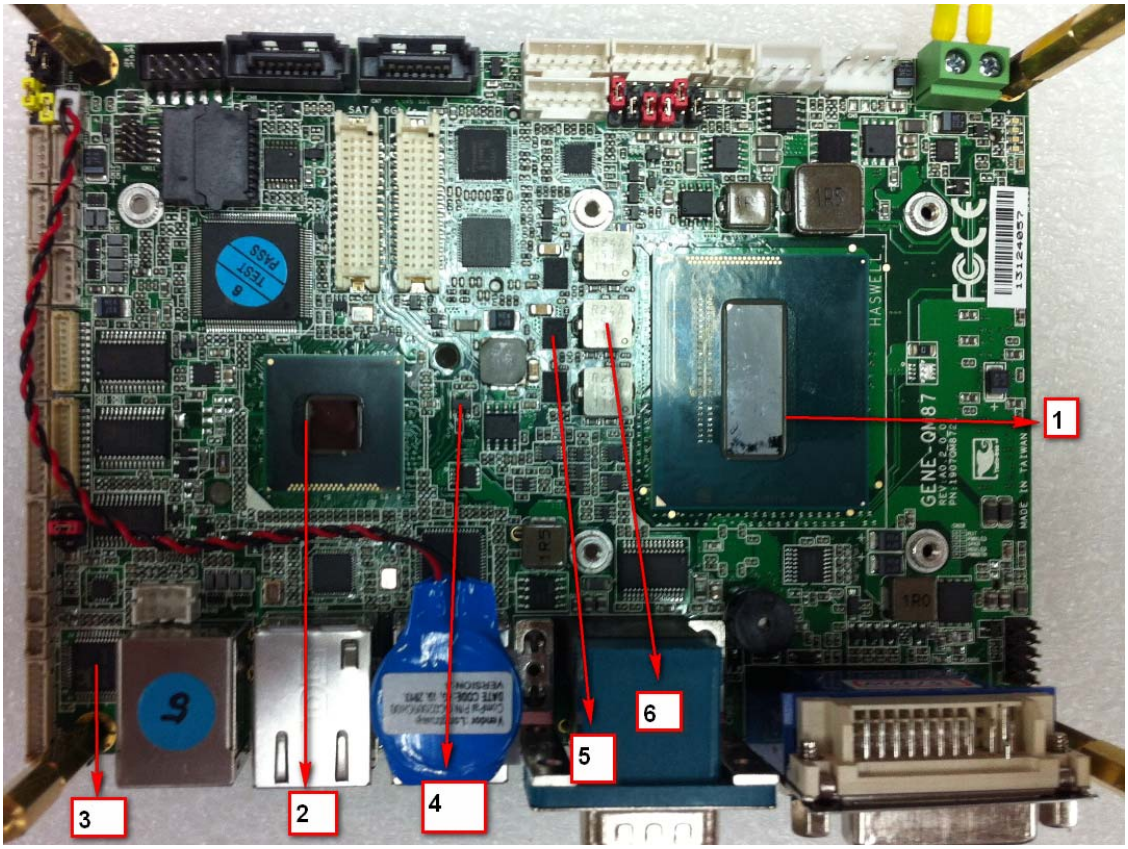
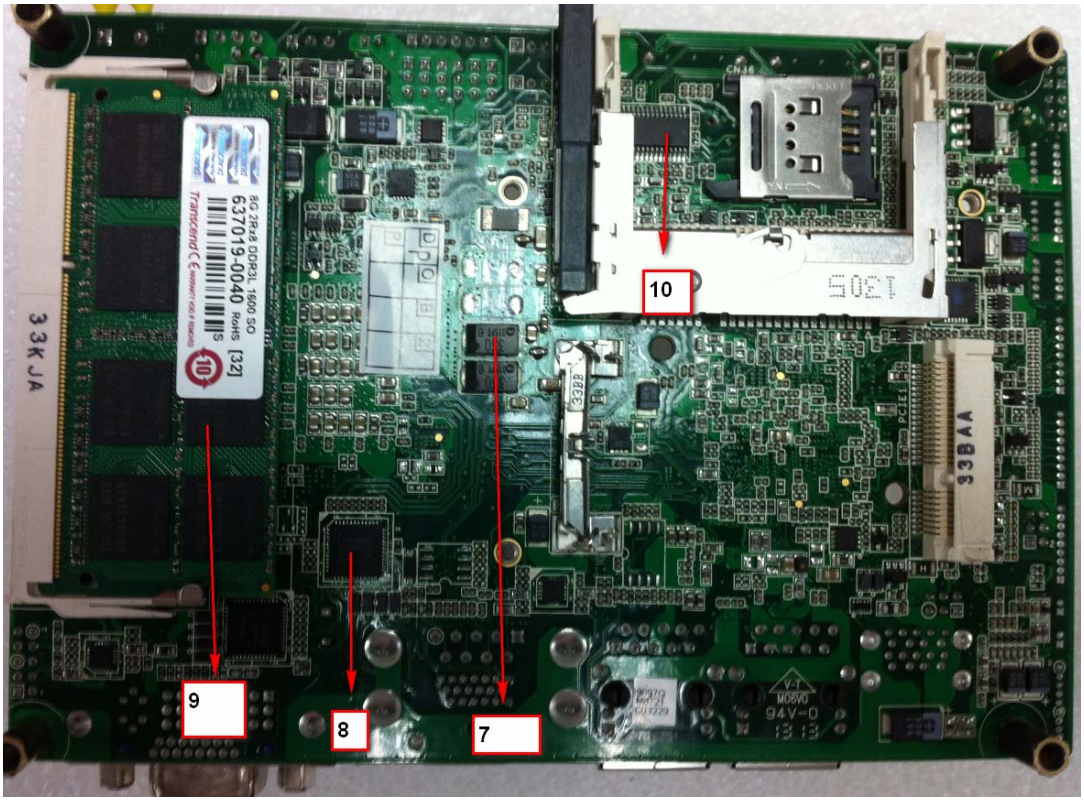
Terminal Recorder:

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℃	60℃	
1	CPU	Intel Core i5-4400E (2.70 GHz)	105	38.3	73.3	
2	U21	(TF)Chipset PCH.SMD.INTEL.BD82QM87	108	36.3	71.3	
3	U39	(TF)High Definition.Audio Codec.REALTEK.ALC892-GR	100.5	40.1	75.1	
4	U19	(TF)LDO Regulator.500mA.SOT23-5 5P.SMD.UPI.UP0107BMA5-00	100	40.9	75.9	
5	U15	(TF)Synchronous Buck NexFETTM.Power Stage.SMD.TI.CSD97374Q4M	150	36.3	71.3	
6	L4	(TF)COIL.0.24uH.DCR=1mohm.Irms=24Amp.20%.ETQP4LR24AFM	130	35.2	70.2	
7	TC17	(TF)SP CAP.330uF.2.5V.+10/-35%.D2(7.3*4.3*1.9). EEFSX0E331EY	105	38.4	73.4	
8	U57	(TF)for DP to HDMI/DVI.HVQFN 48P.SMD.NXP.PTN3360DBS	100	35.1	70.1	
9	Memory	Transcend DDR3L 1600 8GB	85	39.2	74.2	
10	U41	(TF)IC.Trusted Platform Module.TSSOP28.SMD.Infineon.SLB9635TT1.2	85	33.4	68.4	

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.

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