# Damp Heat Test Report

## Issue by

**Engineering Department**

Report No: 0806DT0218

<table>
<thead>
<tr>
<th>Product Model</th>
<th>Rugged BOX PC : I330EAC-201</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Description</strong></td>
<td>I330EAC-201 Embedded Industrial Automation Controller</td>
</tr>
</tbody>
</table>

- New product
- Rugged BOX PC
- PCB : Winmate / I330-120

- Renew product
  - PCB :
  - BIOS:

- Revision change
  - PCB :
  - BIOS:
  - Component:

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2008/06/26  
**Issue date**

Lindon Lin  
**Approved**

Peter Chou  
**Test Engineer**
1. Document Introduction and Revision History

This document describes how we conduct the environment conditions and test procedure. It includes the test equipment we use, the test condition, and the test procedure we take. We also define our test criteria and the way to conclude the test result.

(According to client’s test specification, please see following sheets in detail.)

Table of Testing Summary Results

<table>
<thead>
<tr>
<th>NO</th>
<th>Test Item</th>
<th>Condition Description</th>
<th>Sect. / Page</th>
<th>Reference to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Damp Heat Test</td>
<td>- Test 3.8.3 / Class B</td>
<td>4 / 5</td>
<td>DNV-Standard for Certification No.2.4: April 2006</td>
</tr>
</tbody>
</table>
2. Product Configuration

1. M/B : Winmate / I330-120
2. CPU : Intel_Celeron_M_1.20GHz_533MHz
3. RAM : DSL / 1GB DDR2 / ELPIDA TWN E5108AJBG-6E-E / 667MHz
4. HDD : Seagate / ST940813AM / 40GB / IDE
5. DVD-ROM : No
6. Card+Reader with Floppy: No
7. LCD : No
8. MiniPCI to COM Port Module : PER-C40C-A10
9. Power Board : IRTDB-110
10. Adapter : LI SHIN / 0226B24160 / OUTPUT : 24V / 6.67A
11. Heat sink : Yes (On CPU) / Yes ( On Intel 945GME Chipset) / Yes ( On Intel ICH7M Chipset)
12. CPU FAN : No
13. System Fan : No
14. EUT of stage : Prototype Sample Version

SBC Specifications :

| Processor | Intel® Core 2 Duo ULV 1.06GHz, Core Duo ULV 1.2GHz, Celeron M ULV 1.2/1.06 GHz |
| BIOS      | Award 4Mbit Flash |
| System Chipset | Intel 945GME / ICH7M Chipset |
| Memory Slot | 1 x SODIMM, Max 2GB DDR2 667/533 (1GB Default) |
| IDE       | 1 x 44 pins IDE |
| KB / Mouse| 1 x PS/2 |
| Ethernet | Dual Realtek RTL8111B GigaLAN |
| VGA       | 1 x VGA |
| USB Ports | 4 x USB ports, USB 2.0 compliant |
| Serial Ports | 1 x RS-232, 1 x RS-232/422/485 |
3. Product Configuration of Photo

EUT of Photo

Top View

Bottom View

Front View

Back View

Side View

Side View
4. Damp Heat Test

A. Test Equipment:
   ─ Test Site: Winmate LAB
   ─ Programmable Temperature & Humidity Chamber
     ─ Kson/ THS-G4T-100 / S/N: 5887K
     ─ Display: ViewSonic / VX2235wm (SN:QA5070500972)
     ─ Display: CHIMEI_CMV946D / S/N:A190A2-HOE / REV. C1 01

B. LAB Environmental Conditions:
   ─ Ambient Temperature: 25 ± 3°C
   ─ Relative Humidity: 55 ± 20% RH

C. Test Method / Specification:
   ─ Reference to DNV-Standard for Certification No.2.4: April 2006
   ─ Test 3.8.3 / Class B
   ─ Operating
     ─ Test temperature: 25°C to 55°C ± 2°C
     ─ Relative Humidity: 96% ~ 98%RH ± 3%
     ─ For a period of 24 Hours / 2 Cycles
   ─ Testing Software:
     Running Windows XP with Stress software BCM Diagnostics Pro Version 2.30
   ─ Quantity: Total 1 Set
   ─ Testing Period: June 18, 2008 to June 20, 2008

Figure 1: Damp Heat Test Cycle
D. Check Condition and Requirements:

(1) After the preconditioning, humidity and temperature cycling is to be carried out in accordance with Fig. 1. The equipment under test is placed in the test chamber at room temperature and remains connected and switched on throughout the first test cycle. During the second test cycle, the equipment under test is switched off. Before the temperature rise interval, the relative humidity is to be raised to the upper test level. The temperature is then to be raised from normal ambient temperature to the upper test temperature within a period of 3 h ± 0.5 h. The rate of temperature change during the temperature rise interval is to be such that condensation takes place on the test specimen. For smaller test specimens, which have a low thermal time constant, the rate of temperature change is to be increased sufficiently to give condensation, even if this gives a rise time below 2h 30 min. The upper test temperature is to be maintained until the end of the high temperature period, which is 12 h ± 0.5 h from the start of the temperature cycle. The temperature is then to be lowered to normal ambient temperature within 3 to 6 h. The test specimen is to be in equilibrium with its surroundings during this period. The ambient temperature is then to be maintained until the end of the 24h temperature cycle. Two cycles are to be carried out.

After completion of the last temperature cycle, the relative humidity is lowered to normal ambient humidity. Where heaters or other devices to prevent condensation are an integral part of the test specimen, they may be used during the test.

(2) Performance Test as reference to "DNV-Standard for Certification No.2.4: April 2006 / Section 3.8.3.4". Performance test are be performance at upper test temperature within the first 2 hours (as illustrated in Figure 1 / A Mark ) of the first and the last 2 hours (as illustrated in Figure 1 / B Mark ) of the second test cycle. Within one hour (as illustrated in Figure 1 / C Mark ) at normal ambient humidity and temperature, the following tests are to be carried out:

-- Performance test in accordance with the relevant test programme. (By BCM Software)

(Which is to be carried out within one hour after the Damp Heat Test)
E. Test Result:

— Examine the appearance of specimen(s) by visual check and perform functional check, performance check after this test.
— Connect the specimen with rated power then examine whether the display function of specimen could be work normally or not.
— Functional Check & Mechanical Structure : Normal
— Appearance check (Visual check) : No visible damage
— The requirements of the performance test and check shall be met.

F. Test Judgment:

— Test Result

<table>
<thead>
<tr>
<th>Style Item No.</th>
<th>Check Item</th>
<th>Appearance check (Visual check)</th>
<th>Functional &amp; Performance check</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Appearance check</td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td></td>
<td>Functional check</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rugged BOX PC : I330EAC-201</td>
<td>No visible damage</td>
<td>No visible damage</td>
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