# PRODUCT RELIABILITY REPORT

Product: JW1252A

| | Name | Position |
|---|---|---|
| Prepared By | Fen Shi | Quality Engineer |
| Checked By | Yanjun Xiang | Product Manager |
| Checked By | Houye Yang | QA Manager |
| Approved By | Frank Ren | VP of Quality |

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Quality Department

Joulwatt Technology (Hangzhou) CO.LTD.

杰华特微电子(杭州)有限公司 质量管理部

## 1. Device Information

| Product: | JW1252A |
|---|---|
| Lot# or DateCode: | AJ27RQ.1 |
| Package: | SOP8 |
| Report Date: | 2018/4/5 |

## 2. Summary of Test Results

| Test Items | Test condition | S.S. | Acc/Re | Fail/Pass | Test Result | Remark |
|---|---|---|---|---|---|---|
| High Temperature Operating Life | JESD22-A108, @+125°C for 1000 Hours or equivalent | 77 | 0/1 | 0/77 | PASS | |
| ESD: Human Body Model (HBM) | MIL-STD-883J Method 3015.9 | 18 | 0/1 | 0/18 | PASS | ＞2KV |
| Latch-up | EIA/JESD78 | 6 | 0/1 | 0/6 | PASS | >+/-200mA or >1.5Vccmax or ABS |
| Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing (Precondition L3) | Bake: 125℃,24h Soak: 30℃, 60%RH, 192h Reflow: 260℃, 3times | 330 | 0/1 | 0/330 | PASS | MSL=3 |
| Temperature Cycling (TCT) | JESD22-A104 -65℃-150℃, Dwell=15min,500/ 1000Cycles | 77 | 0/1 | 0/77 | PASS | |

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| Accelerated Moisture Resistance-Unbiased Autoclave (PCT) | JESD22-A102 121℃ 100%RH, 205 kPa,168h | 77 | 0/1 | 0/77 | PASS | |
|---|---|---|---|---|---|---|
| Accelerated Moisture Resistance-Unbiased HAST (uHAST) | 130℃, 85%RH, 96h | 77 | 0/1 | 0/77 | PASS | |
| High Temperature Storage Life (HTSL) | JESD22-A103 Ta=150℃,500/1000h | 77 | 0/1 | 0/77 | PASS | |

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## Appendix: Description of Reliability Test and Failure Rate Calculation

### High Temperature Operating Life Test

**Purpose:** This test is a worst-case life test that checks the integrity of the product. The high temperature testing is use for acceleration of any potential failures over time. The calculation for failure rate (FIT) using the operating ambient temperature is done using the arrhenius equation.

**Condition:** 125℃ @ Vccmax

**Pass Criteria**: All units must pass the min/max limits of the datasheet.

### ESD Test

**Purpose:** The purpose of the ESD test is to guarantee that the device can withstand electrostatic voltages during handling.

**Condition:** Human Body Model, Machine Model and Charged Device Model.

**Pass Criteria:** ESD Testing on every pin. The device must be fully functional after testing and pass the min/max limits in the datasheet.

### IC Latch-Up Test

**Purpose:** The purpose of this specification is to establish a method for determining IC latch-up characteristics and to define latch-up failure criteria. Latch-up characteristics are extremely important in determining product reliability and minimizing No Trouble Found (NTF) and Electrical Overstress (EOS) failures due to latch-up.

**Condition:** Voltage and current injection

**Pass criteria:** All pins with the exception of “no connect” pins and timing related pins, shall be latch-up tested. The device must be fully functional after testing and pass the min/max limits in the datasheet.

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Address: 9th Floor, Chuangye Building, East Software Park, Huaxing Road No. 99, Xihu District, Hangzhou, China
TEL：0571-89807321 FAX：0571-89807321-0

<u>**Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing**</u>

**Purpose:** The purpose of this standard is to identify the classification level of nonhermetic solid state surface mount devices (SMDs) that are sensitive to moisture-induced stress so that they can be properly packaged, stored, and handled to avoid damage during assembly solder reflow attachment and/or repair operations.

**Condition:** Bake + moisture sock + 3X reflow at 260℃

**Pass criteria:** All units must pass the min/max limits of the datasheet

<u>**Accelerated Moisture Resistance- Unbiased Autoclave**</u>

**Purpose:** To check the performance of the device in humid environments. This test checks the integrity of the passivation, poor metal to plastic seal and contamination level during assembly and material compatibility.

**Condition:** 121℃/15psig/100% RH (no bias)

**Pass Criteria:** All units must pass min/max limits of the datasheet.

<u>**Temperature Cycle Test**</u>

**Purpose:** This test is used to evaluate the die attach integrity and bond integrity. This is similar to the Thermal Shock test, but can generate different failure modes due to the longer dwell time and gradual temperature change.

**Condition:** -65℃ to 150℃

**Pass Criteria:** All units must pass min/max limits of the datasheet.

<u>**Accelerated Moisture Resistance-Unbiased HAST**</u>

**Purpose:** To evaluate the reliability of non-hermetic packaged solid-state devices in humid environment. This test is used to identify failure mechanisms internal to the package and is destructive.

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**Condition:** 130℃, 85%RH, 96h

**Pass Criteria:** All units must pass min/max limits of the datasheet.

**High Temperature Storage Life**

**Purpose:** This test is basically used to determine if the effects of diffusion, oxidation, intermetallic growth, and chemical degradation of packaging components will affect product life.

**Condition:** Ta=150℃+ Preconditioning if Required,T=1000h

**Pass Criteria:** All units must pass min/max limits of the datasheet.

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