

# RELIABILITY TEST RESULT

Product name : S-93A46AD0A-T8TxUD

Package type : 8-Pin TSSOP

| No. | Test item                                                          | Test Condition                                                                | Test Time                | r/n  | Criterion                                                                                                                 |
|-----|--------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------|------|---------------------------------------------------------------------------------------------------------------------------|
| 1   | High-temperature operation                                         | Ta=125 °C, V=Vopr max.                                                        | 2000 h                   | 0/22 | Satisfies the product standard                                                                                            |
| 2   | Temperature humidity bias <sup>#1</sup>                            | Ta=85 °C, RH=85 %, V=Vopr max.                                                | 2000 h                   | 0/22 | Satisfies the product standard                                                                                            |
| 3   | Pressure cooker bias <sup>#1</sup>                                 | Ta=125 °C, RH=85 %, P=2×10 <sup>5</sup> Pa<br>V = Vopr max.                   | 100 h                    | 0/22 | Satisfies the product standard                                                                                            |
| 4   | Storage in high temperature                                        | Ta=150 °C                                                                     | 2000 h                   | 0/22 | Satisfies the product standard                                                                                            |
| 5   | Storage in low temperature                                         | Ta=-65 °C                                                                     | 2000 h                   | 0/22 | Satisfies the product standard                                                                                            |
| 6   | Write/Erase Cycle-1                                                | Ta=85 °C, V=Vopr max.                                                         | 1×10 <sup>6</sup> cycles | 0/22 | Satisfies the product standard                                                                                            |
| 7   | Write/Erase Cycle-2                                                | Ta=105 °C, V=Vopr max.                                                        | 8×10 <sup>5</sup> cycles | 0/22 | Satisfies the product standard                                                                                            |
| 8   | Write/Erase Cycle-3                                                | Ta=125 °C, V=Vopr max.                                                        | 5×10 <sup>5</sup> cycles | 0/22 | Satisfies the product standard                                                                                            |
| 9   | Temperature Cycle (Gas phase) <sup>#1</sup>                        | Ta=150 °C ⇔ -65 °C<br>15 minutes for each                                     | 1000 cycles              | 0/22 | Satisfies the product standard                                                                                            |
| 10  | Resistance to soldering heat-1<br>(reflow soldering) <sup>#2</sup> | T=260 °C , 10 s                                                               | 3 times                  | 0/22 | Satisfies the product standard<br>No abnormality by appearances                                                           |
| 11  | Resistance to soldering heat-2<br>(Soldering Iron) <sup>#2</sup>   | T=380 °C , 5 s<br>(Soldering iron tip temperature)<br>Object : terminal parts | 2 times                  | 0/22 | Satisfies the product standard<br>No abnormality by appearances                                                           |
| 12  | Resistance to soldering heat - 3<br>(Flow soldering) <sup>#2</sup> | T=260 °C , 10 s                                                               | 1 time                   | 0/22 | Satisfies the product standard<br>No abnormality by appearances                                                           |
| 13  | Solderability <sup>#3</sup>                                        | T=245 °C<br>Solder material : Sn-3.0Ag-0.5Cu                                  | 5 s                      | 0/11 | Zero cross time should be less than 3 seconds.<br>Solder should be applied at 95% or more of solderability judgment area. |
| 14  | Whisker - 1<br>(Temperature / Humidity Storage)                    | Ta=30 °C, RH=60%                                                              | 4000 h                   | 0/6  | Whisker should be less than 40μm                                                                                          |
| 15  | Whisker - 2<br>(Temperature Cycling)                               | Ta=85 °C ⇔ -40 °C                                                             | 1500 cycles              | 0/6  | Whisker should be less than 45μm                                                                                          |
| 16  | Whisker - 3<br>(High Temperature / Humidity Storage)               | Ta=55 °C, RH=85 %                                                             | 4000 h                   | 0/6  | Whisker should be less than 40μm                                                                                          |
| 17  | Solder Joint Reliability<br>(shear test) <sup>#3</sup>             | Ta=125 °C ⇔ -40 °C<br>Solder material : Sn-3.0Ag-0.5Cu                        | 2000 cycles              | 0/22 | After temperature cycle test, keep strength for shear stress more than the 50 % of initial mean value.                    |
| 18  | Terminal Strength (Pull test)                                      | Pull force : 1.0 N                                                            | 30 s                     | 0/11 | Terminal is not taken off                                                                                                 |
| 19  | Terminal Strength (Bending test)                                   | Load : 0.5 N, 45 degree Bend a lead                                           | 2 times                  | 0/11 | Terminal is not taken off                                                                                                 |
| 20  | ESD - 1 (Human Body Model)                                         | V=±2000 V, C=100 pF, R=1.5 kΩ<br>Ground : V <sub>CC</sub> / GND               | 5 pulses                 | 0/5  | Satisfies the product standard                                                                                            |
| 21  | ESD - 2 (Charged Device Model)                                     | V=±500V charged, discharged                                                   | 1 pulse                  | 0/5  | Satisfies the product standard                                                                                            |
| 22  | Latch up<br>(Pulsed current injection test)                        | ±100 mA, V =Vopr max.                                                         | 1 pulse                  | 0/5  | No latch up                                                                                                               |

Remark : Vopr max. =Maximum operation voltage

#1,2,3 : Each test designated # is performed after Pre-Treatment finished.

Pre-Treatment consists of High Temperature Storage , Temperature Humidity Storage and Soldering Heat. (See the table below.)

| Pre Treatment (#1)    |                                 |                                      |
|-----------------------|---------------------------------|--------------------------------------|
| High Temp.<br>Storage | Temperature<br>Humidity Storage | Soldering Heat                       |
| Ta=125 °C<br>t=24 h   | Ta=85 °C<br>RH=85 %<br>t=168 h  | Reflow 3 times<br>T=260 °C<br>t=10 s |

| Pre Treatment (#2)    |                                 |                |
|-----------------------|---------------------------------|----------------|
| High Temp.<br>Storage | Temperature<br>Humidity Storage | Soldering Heat |
| Ta=125 °C<br>t=24 h   | Ta=85 °C<br>RH=85 %<br>t=168 h  | —              |

| Pre Treatment (#3)    |                                 |                |
|-----------------------|---------------------------------|----------------|
| High Temp.<br>Storage | Temperature<br>Humidity Storage | Soldering Heat |
| —                     | Ta=105 °C<br>RH=100 %<br>t=8 h  | —              |