

RELIABILITY TEST DATA

Product name : S-89220ACNC-xxxTxS

Package type : SC-88A

| No. | Test item | Test Condition | Test Time | r/n |
|-----|--|---|----------------|------|
| 1 | High Temperature Operation | Ta=125 °C V _{DD} =Vopr max. | 1000 h | 0/22 |
| 2 | High Temperature Bias | Ta=125 °C V _{DD} =Vabs max.×0.9 | 1000 h | 0/22 |
| 3 | #1 Temperature Humidity Bias | Ta=85 °C RH=85 % V _{DD} =Vabs max.×0.9 | 1000 h | 0/22 |
| 4 | #1 Un-saturated Pressure Cooker Bias | Ta=125 °C RH=85 % P=2×10 ⁵ Pa V _{DD} =Vabs max.×0.9 | 100 h | 0/22 |
| 5 | High Temperature Storage | Tstg max.=150 °C | 1000 h | 0/22 |
| 6 | Low Temperature Storage | Tstg min.=−65 °C | 1000 h | 0/22 |
| 7 | #1 Temperature Cycle (Gas phase) | Tstg max.=150 °C , Tstg min.=−65 °C (30 min each) | 200 cycles | 0/22 |
| 8 | #1 Thermal Shock (Liquid phase) | Tstg max.=150 °C , Tstg min.=−65 °C (5 min each) | 100 cycles | 0/22 |
| 9 | #1 Resistance to soldering heat - 1 (reflow) | T=260 °C , 10 s | 3 times | 0/22 |
| 10 | #1 Resistance to soldering heat - 2 (Solder iron) | T=380 °C , 5 s | Twice | 0/22 |
| 11 | #2 Solderability | T=230 °C Solder material ; Sn-3.0Ag-0.5Cu | 3 s | 0/11 |
| 12 | Whisker - 1 (Room Temperature Storage) | Ta=25±3 °C RH=40~70% criteria ; Whisker should be less than 50μm | 3 months | 0/10 |
| 13 | Whisker - 2 (Temperature Cycle) | Tstg max.=85 °C , Tstg min.=−40 °C (30 min each) criteria ; Whisker should be less than 50μm | 1000 cycles | 0/10 |
| 14 | Whisker - 3 (Temperature Humidity Storage) | Ta=60 °C RH=93 % criteria ; Whisker should be less than 50μm | 2000 h | 0/10 |
| 15 | Solder Joint Reliability (Temperature Cycle + shear test) | Tstg max.=125 °C , Tstg min.=−40 °C (30 min each) Solder material ; Sn-3.0Ag-0.5Cu criteria ;After temperature cycle test, keep strength for shear stress more than the 50 % of initial mean value. | 2000 cycles | 0/5 |
| 16 | Lead Strength (Pull test) | Pull force ; 1.0N | 30 s | 0/11 |
| 17 | Lead Strength (Bending test) | Load ; 0.5 N 45 degree Bend a lead | Twice | 0/11 |
| 18 | ESD - 1 (Human Body Model) | V=±2000 V C=100 pF R=1.5 kΩ Ref. To V _{DD} / V _{SS} (5units for each direction) | 5 pulses | 0/20 |

| | | | | |
|----|-------------------------|---|----------|------|
| 19 | ESD - 2 (Machine Model) | $V=\pm 200\text{ V}$ $C=200\text{ pF}$ $R=0\ \Omega$ Ref. To V_{DD}/V_{SS} (5units for each direction) | 3 pulses | 0/20 |
| 20 | Latch Up | $\pm 100\text{ mA}$ ($V_{CLAMP} = V_{opr\ max.}$) 10 ms pulse $V_{DD} = V_{opr\ max.}$ | 1 pulse | 0/5 |

Remark : $V_{abs\ max.}$ = Absolute maximum voltage , $V_{opr\ max.}$ =Maximum operation voltage

: 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. Storage | Temperature Humidity Storage | Soldering Heat |
| $T_a=125\text{ }^\circ\text{C}$ $t=24\text{ h}$ | $T_a=85\text{ }^\circ\text{C}$ $RH=85\ \%$ $t=168\text{ h}$ | Infrared Reflow 3 times $T=260\text{ }^\circ\text{C}$ $t=10\text{ s}$ |

| Pre Treatment (#2) | | |
|--|---|----------------|
| High Temp. Storage | Temperature Humidity Storage | Soldering Heat |
| $T_a=125\text{ }^\circ\text{C}$ $t=24\text{ h}$ | $T_a=105\text{ }^\circ\text{C}$ $RH=100\ \%$ $t=8\text{ h}$ | — |