

RELIABILITY TEST RESULT

Product name : S-19933xA-S8TxU7

Package type : HTMSOP-8

| No. | Test item | Test Condition | Test Time | r/n | Criterion |
|-----|---------------------------------------------------------|-------------------------------------------------------------------------------|-------------|------|---------------------------------------------------------------------------------------------------------------------------|
| 1 | High-temperature operation | Ta=150 °C, V=Vopr max. | 2000 h | 0/22 | Satisfies the product standard |
| 2 | Temperature humidity bias #1 | Ta=85 °C, RH=85 %, V=Vopr max. | 2000 h | 0/22 | Satisfies the product standard |
| 3 | Pressure cooker bias #1 | Ta=130 °C, RH=85 %, P=2.3×10 ⁵ Pa V=Vopr max. | 96 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 | Temperature Cycle (Gas phase) #1 | Ta=150 °C ⇔ -65 °C 15 minutes for each | 1000 cycles | 0/22 | Satisfies the product standard |
| 7 | Resistance to soldering heat-1 (reflow soldering) #2 | T=260 °C , 10 s | 3 times | 0/22 | Satisfies the product standard No abnormality by appearances |
| 8 | Resistance to soldering heat-2 (Soldering Iron) #2 | T=380 °C , 5 s (Soldering iron tip temperature) Object : terminal parts | 2 times | 0/22 | Satisfies the product standard No abnormality by appearances |
| 9 | Resistance to soldering heat - 3 (Flow soldering) #2 | T=260 °C , 10 s | 1 time | 0/22 | Satisfies the product standard No abnormality by appearances |
| 10 | Solderability #3 | T=245 °C Solder material : Sn-3.0Ag-0.5Cu | 5 s | 0/11 | Zero cross time should be less than 3 seconds. Solder should be applied at 95% or more of solderability judgment area. |
| 11 | Whisker - 1 (Temperature / Humidity Storage) | Ta=30 °C, RH=60% | 4000 h | 0/6 | Whisker should be less than 40μm |
| 12 | Whisker - 2 (Temperature Cycling) | Ta=85 °C ⇔ -40 °C | 1500 cycles | 0/6 | Whisker should be less than 45μm |
| 13 | Whisker - 3 (High Temperature / Humidity Storage) | Ta=55 °C, RH=85 % | 4000 h | 0/6 | Whisker should be less than 40μm |
| 14 | Solder Joint Reliability (shear test) #3 | Ta=125 °C ⇔ -40 °C 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. |
| 15 | Terminal Strength (Pull test) | Pull force : 0.5 N | 30 s | 0/11 | Terminal is not taken off |
| 16 | Terminal Strength (Bending test) | Load : 0.25 N, 45 degree Bend a lead | Twice | 0/11 | Terminal is not taken off |
| 17 | ESD - 1 (Human Body Model) | V=±2000 V, C=100 pF, R=1.5 kΩ Ground : VIN / VSS | 5 pulses | 0/5 | Satisfies the product standard |
| 18 | ESD - 2 (Charged Device Model) | V=±500V charged, discharged | 1 pulse | 0/5 | Satisfies the product standard |
| 19 | Latch up 1 (Pulsed current injection test) | ±100 mA, V =Vopr max. | 1 pulse | 0/5 | No latch up |
| 20 | Latch up 2 (Vsupply overvoltage test) | The overvoltage specified when 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. Storage | Temperature Humidity Storage | Soldering Heat |
| Ta=125 °C t=24 h | Ta=85 °C RH=85 % t=168 h | Reflow 3 times T=260 °C t=10 s |

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

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