

Reliability Data

1. Hall Devices

The Sharp Hall devices were required to satisfy the reliability tests detailed in Table 4.

Table 4: Hall device reliability tests

Test	Test conditions * 1	Defect judgement value
Solderability * 2	230 C, 5 s	$0.9 \times L < V_H < 1.1 \times U$ $0.8 \times L < R_N < 1.2 \times U$ $0.8 \times L < R_{CT} < 1.2 \times U$ U: Rated maximum value L: Rated minimum value
Solder heat resistance	260 C, 10 s	
Terminal Pull	Load 3 N, 5 s/terminal	
Shock test	15000m/s ² , 0.5ms for the X, Y and Z directions Three times for each direction	
Variable-frequency oscillation	200m/s ² , 100~2000~100Hz for 4min Four times each for the X, Y and Z directions	
Temperature cycle	-55°C to +150°C (30min.) (30min.) 50 cycles as above	
High-temperature/high-humidity storage	+60°C, 90%RH, 1 000 h	
High-temperature storage	+150°C, 1 000 h	
Low-temperature storage	-55°C, 1 000 h	
Operating life	P _a =150mW, T _a =25°C, 1 000 h	

* 1 Details are based on JIS C 7021.

* 2 Soldering is performed on 95% or more of total dip soldering area without protrusions or cavities being concentrated in one location.

(Notice) For LT120A, LT140A and LT140SA,

$$V_{HO} / V_H < 15\%$$

For LT135A

$$V_{HO} < 20mV$$

2. Hall ICs for noncontact switch

(LT230A/251A/253A/260A/261A/262A/280A)

were required to satisfy the reliability tests described in Table 5.

Table 5: Reliability tests of Hall IC for noncontact switch

Test	Test conditions * 1	Defect judgement value
Solderability * 2	230 C, 5 s	$B_{OH} - B_{OI} < 5mT$ $B_{RF} - B_{RI} < 5mT$ $0.8 \times L < I_{CC} < 1.2 \times U$ $V_{IH} < 1.5 \times U$ $I_{OH} < 1.5 \times U$ U: Rated maximum value L: Rated minimum value
Solder heat resistance	260 C, 10 s	
Terminal pull	Load 3 N, 5 s/terminal	
Shock test	15000m/s ² , 0.5ms for the X, Y and Z directions Three times for each direction	
Variable-frequency oscillation	200m/s ² , 100~2000~100Hz for 4min Four times each for the X, Y and Z directions	
Temperature cycle	-55°C to +150°C (30min.) (30min.) 50 cycles as above	
High-temperature/high-humidity storage	+60°C, 90%RH, 1 000 h	
High-temperature storage	+150°C, 1 000 h	
Low-temperature storage	-55°C, 1 000 h	
Operating life	V _{CC} =16V * 3, T _a =25°C, 1 000 h	

3. Hall ICs for fan motor (LT202A)

LT202A was required to satisfy the reliability tests detailed in Table 6.

Table 6: Reliability tests of Hall IC for fan motor

Test	Test conditions * 1	Defect judgement value
Solderability * 2	230 C, 5 s	$B_{II} - B_{Ii} < 5mT$ $B_{2i} - B_{2i} < 5mT$ $0.8 \times L < I_{CC} < 1.2 \times U$ $V_{IH} < 1.5 \times U$ $V_{OUT} < 1.5 \times U$ $I_{EAK} < 1.5 \times U$ $I_{OC} < 1.5 \times U$ U: Rated maximum value L: Rated minimum value
Solder heat resistance	260 C, 10 s	
Terminal pull	Load 3 N, 5 s/terminal	
Shock test	15000m/s ² , 0.5ms for the X, Y and Z directions Three times for each direction	
Variable-frequency oscillation	200m/s ² , 100~2000~100Hz for 4min Four times each for the X, Y and Z directions	
Temperature cycle	-55°C to +150°C (30min.) (30min.) 50 cycles as above	
High-temperature/high-humidity storage	+60°C, 90%RH, 1 000 h	
High-temperature storage	+150°C, 1 000 h	
Low-temperature storage	-55°C, 1 000 h	
Operating life	P _H =400mW, T _a =25°C, 1 000 h	

* 1 Details are based on JIS C 7021.

* 2 Soldering is performed on 95% or more of the total dip soldering area without protrusions or cavities being concentrated in one location.

B_{II}: B_I before test B_{Ii}: B_I after test

B_{2i}: B₂ before test B_{2i}: B₂ after test

* 1 Details are based on JIS C 7021.

* 2 Soldering is performed on 95% or more of the total dip soldering area without protrusions or cavities being concentrated in one location.

B_{OH}: B_{OH} before test B_{OI}: B_{OH} after test

B_{RF}: B_{RF} before test B_{RI}: B_{RF} after test

* 3 LT262A: V_{CC}=6.5V, LT280A: V_{CC}=6.0V