LT1 70A (under development)

Vertical Type GaAs Hall IC for Radial Type Motor

Features

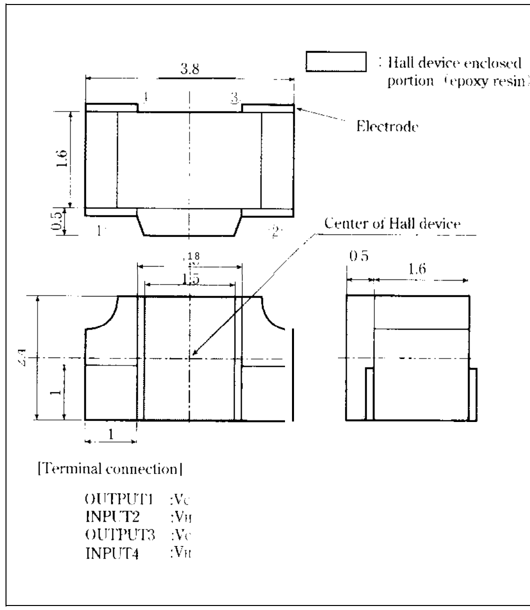
- Suitable for radial type motor due to vertical type package
  max. 3 times no-load Hall voltage compared with Sharp's LT120A
- Leadless package for surface mounting (Taping: 3,0OO pcs/reel)
- Small temperature coefficient of the Hall voltage
- Good linearity of the Hall voltage
- Small imbalance voltage
- Directly DC voltage applicable

Applications

(1) Spindle motors (radial type) for CD-ROM, DVD
(2) Fan motors
(3) Capstan motors

Outline Dimensions

(Unit : mm)



As fur dimensions of tape-packaged products. refer tu page 44

Absolute Maximum Ratings

(T_a=25℃)

Parameter	Symbol	Rating	Unit
Control voltage	V_C	12	v
Control current	I_C	15	mA
Power dissipation	P	150	mW
operating temperature	T_{opr}	−20 to +85	℃
Storage temperature	T_{stg}	−40 to +105	℃
Soldering temperature*	T_{sol}	260	℃

※ Soldering time:within 10 seconds

Electrical Characteristics

(T_a=25℃)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
No-load Hall voltage ※1		V_H	V_C=6V, B=100mT	145	160	175	mV
Imbalance ratio ※2	Rank A	V_{HO}/V_H	V_C=6V, (B=0)/(B=100mT)	2		12	%
	Rank B			−5	—	5	
	Rank C			−2	—	−12	
Input resistance		R_{IN}	I_M=1mA, B=0mT	650	800	950	Ω
output resistance		R_{OUT}	I_M=1mA, B=0mT	1300	1600	1900	Ω
Drift of imbalance voltage vs. temperature		ΔV_{HO}	V_C=6V, B=0mT, T_a=−20℃ to 25℃ V_C=6V, B=0mT, T_a=25℃ to 125℃	-	5	—	mV
Temperature coefficient of Hall voltage		β	I_C=6mA, B=100mT, T_1=−20℃, T_2=125℃	—	−0.04	–	%/℃
Temperature coefficient of input resistance		α	I_M=1mA, B=0mT, T_1=−20℃, T_2=125℃	–	0.2		%/℃
Linearity of Hall voltage		γ	I_C=6mA, B_1=50mT, B_2=100mT		0.3	—	%

※1 No-load Hall voltage is nearly proportional to Vc (within the range of 1 to 6V) at temperatures of -20℃ to + 125℃
Keep the voltage within the allowable power dissipation range.
※2 Imbalanced ratio is in +/-12% within the range of Vc=1 to 6V.

$V_H = V_M - V_{HO}$

$$\beta = \frac{1}{V_H(T_1)} \times \frac{|V_H(T_2) - V_H(T_1)|}{(T_2 - T_1)} \times 100$$

V_M: observed Hall voltage

$$\alpha = \frac{1}{R_{IN}(T_1)} \times \frac{|R_{IN}(T_2) - R_{IN}(T_1)|}{(T_2 - T_1)} \times 100$$

V_{HO}: Imbalance voltage

$$\gamma = \frac{|K_H(B_2) - K_H(B_1)|}{|K_H(B_1) + K_H(B_2)|} \times 2 \times 100, \quad K_H = \frac{V_H}{(k \times B)}$$

K_H: Sensitivity

SHARP

Fig. 1 Hall Voltage vs. Ambient Temperature

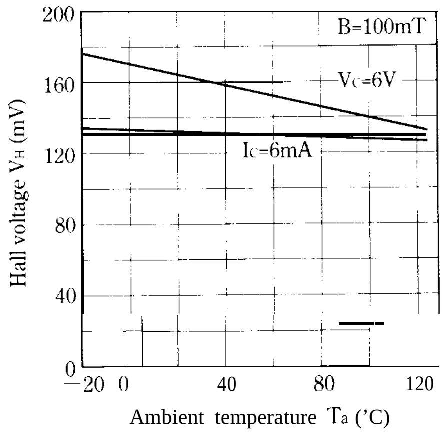


Fig. 2 Input Resistance vs. Ambient Temperature

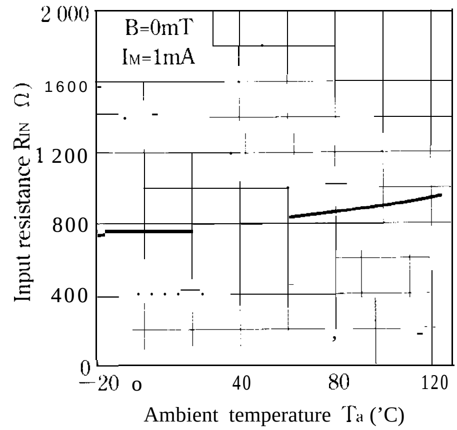


Fig. 3 Hall Voltage vs. Magnetic Flux Density

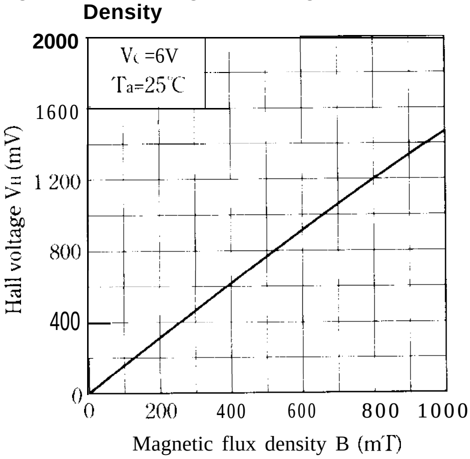


Fig. 4 Hall Voltage vs. Control Current

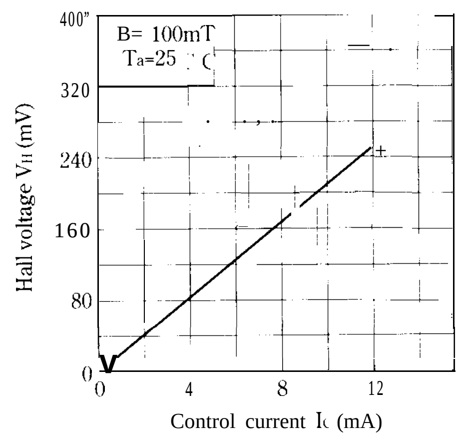
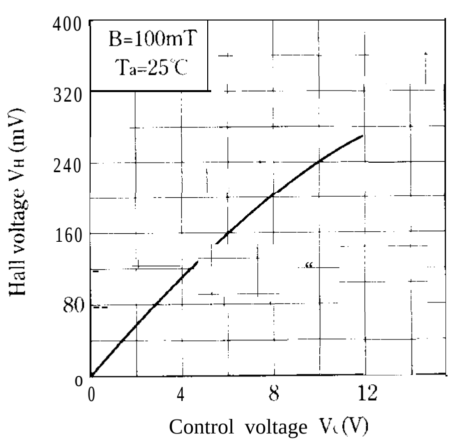


Fig. 5 Hall Voltage vs. Control Voltage



Fia. 6 Power Dissipation vs. Ambient Temperature