

LT120A

Hall Voltage 160mV GaAs Hall Device

■ Features

- Small temperature coefficient of the Hall voltage
- Good linearity of the Hall voltage
- Small imbalanced voltage
- Directly DC voltage applicable

■ Applications

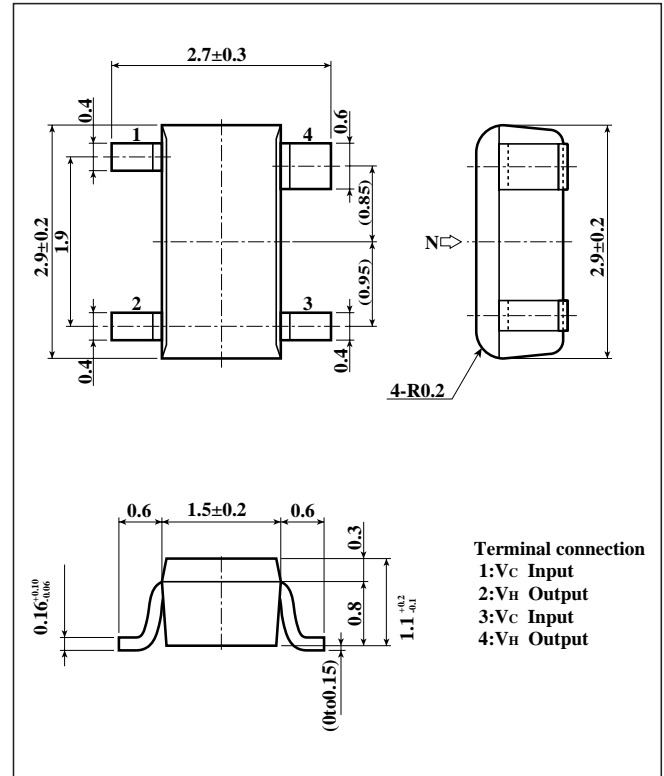
- Brushless motors
VCR, CD, CD-ROM, FDD
- Measuring equipment
Gauss meters, magnetic substance detectors
- Noncontact sensors
Microswitches, tape-end detection
- Other magnetic detection

■ Absolute Maximum Ratings (T_a=25°C)

Parameter	Symbol	Rating	Unit
Control voltage	V _C	12	V
Control current	I _C	15	mA
Power dissipation	P _D	150	mW
Operating temperature	T _{opr}	-20 to +125	°C
Storage temperature	T _{stg}	-55 to +150	°C
Soldering temperature*1	T _{sol}	260	°C

*1 Soldering time : 10 seconds

■ Outline Dimensions (Unit : mm)



As for dimensions of tape-packaged products, refer to page 44 .

■ Electrical Characteristics (T_a=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
No-load Hall voltage*1	V _H	V _C =6V, B=100mT	145	160	175	mV
Imbalanced ratio*2	Rank A	V _{HO} /V _H V _C =6V, (B=0)/(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	1 300	1 600	1 900	Ω
Drift of imbalanced voltage vs. temperature	ΔV _{HO}	V _C =6V, B=0mT, T _a =-20°C to 25°C	-	5	-	mV
		V _C =6V, B=0mT, T _a =25°C to 125°C	-	-	-	
Temperature coefficient of Hall voltage	β	I _C =6mA, B=100mT, T ₁ =-20°C, T ₂ =125°C	-	-0.04	-	%/°C
Temperature coefficient of input resistance	α	I _M =1mA, B=0mT, T ₁ =-20°C, T ₂ =125°C	-	0.2	-	%/°C
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 V_C (within the range of 1 to 6V) at temperatures of -20°C to +125°C.
Keep the voltage within the allowable power dissipation range.

*2 Imbalanced ratio is in +/-12% within the range of V_C=1 to 6V.

$$V_H = V_M - V_{HO}$$

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

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

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

V_M: Observed Hall voltageV_{HO}: Imbalanced voltageK_H: Sensitivity

SHARP

In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

Fig. 1 Hall Voltage vs. Ambient Temperature

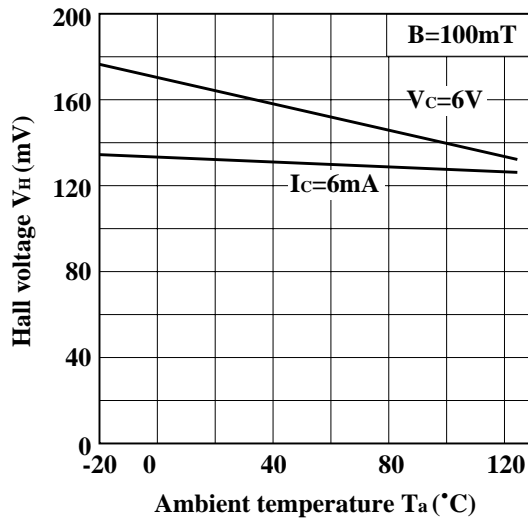


Fig. 2 Input Resistance vs. Ambient Temperature

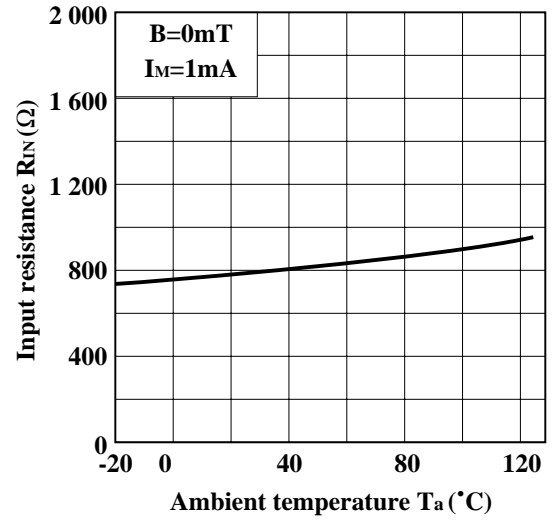


Fig. 3 Hall Voltage vs. Magnetic Flux Density

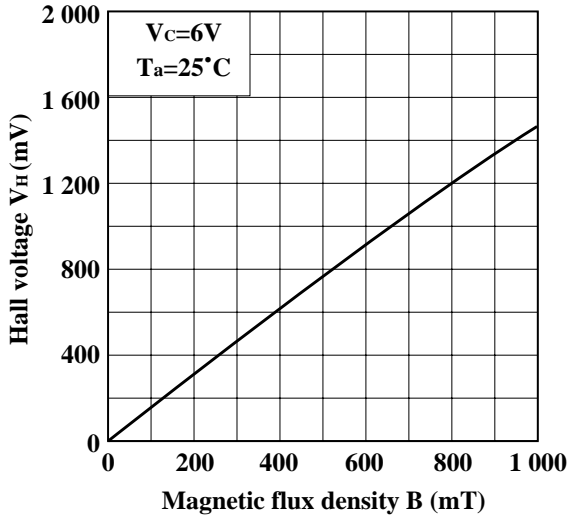


Fig. 4 Hall Voltage vs. Control Current

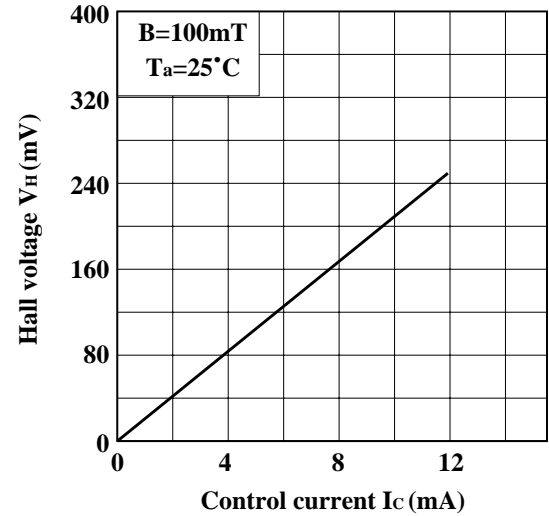


Fig. 5 Hall Voltage vs. Control Voltage

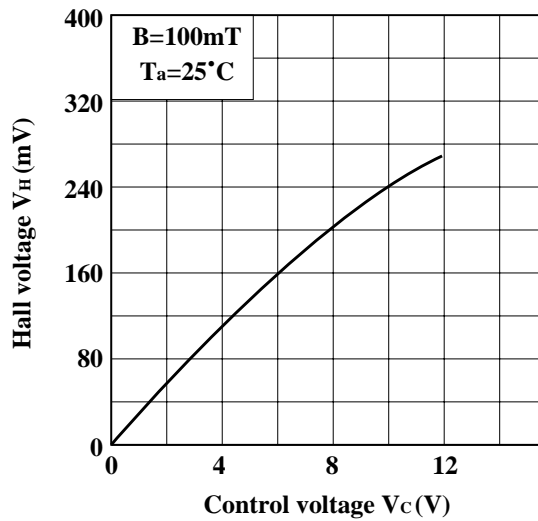


Fig. 6 Power Dissipation vs. Ambient Temperature

