

# LTI 40A

Hall Voltage 160mV Thin-Type Package GaAs Hall Device

## ■ Features

- Small temperature coefficient of the Hall voltage
- Good linearity of the Hall voltage
- Small imbalance 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

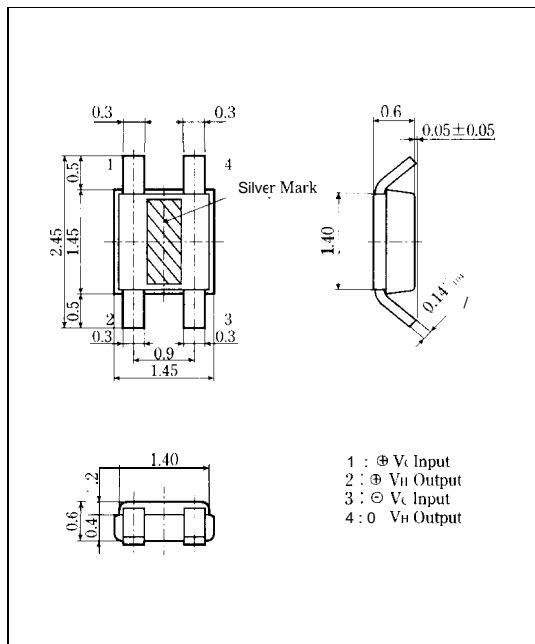
(T<sub>a</sub> = 25°C)

Parameter	Symbol	Rating	Unit
Control voltage	V <sub>C</sub>	12	v
Control current	I <sub>C</sub>	15	mA
Power dissipation	P <sub>D</sub>	150	mW
Operating temperature	T <sub>opr</sub>	-20 to +125	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C
Soldering temperature**	T <sub>sol</sub>	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<sub>a</sub> = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
No-load Hall voltage *1	V <sub>HI</sub>	V <sub>C</sub> = 6V, B = 100mT	145	160	175	mV
Imbalance ratio *2	Rank A	V <sub>HO</sub> /V <sub>HI</sub> V <sub>C</sub> = 6V, (B = 0)/(B = 100mT)	2	—	12	%
	Rank B		-5	—	5	
	Rank C		-2	—	-12	
Input resistance	R <sub>IN</sub>	I <sub>M</sub> = 1mA, B = 0mT	650	800	950	Ω
output resistance	R <sub>OUT</sub>	I <sub>M</sub> = 1mA, B = 0mT	1300	1600	1900	Ω
Drift of imbalanced voltage vs. temperature	ΔV <sub>HO</sub>	V <sub>C</sub> = 6V, B = 0mT, T <sub>a</sub> = -20°C to 25°C V <sub>C</sub> = 6V, B = 0mT, T <sub>a</sub> = 25°C to 125°C	—	5	—	mV
Temperature coefficient of Hall voltage	β	I <sub>C</sub> = 6mA, B = 100mT, T <sub>1</sub> = -20°C, T <sub>2</sub> = 125°C	—	-0.04	—	%/°C
Temperature coefficient of input resistance	α	I <sub>M</sub> = 1mA, B = 0mT, T <sub>1</sub> = -20°C, T <sub>2</sub> = 125°C	—	0.2	—	%/°C
Linearity of Hall voltage	γ	I <sub>C</sub> = 6mA, B <sub>1</sub> = 50mT, B <sub>2</sub> = 100mT	—	0.3	—	%

\*1 No-load Hall voltage is nearly proportional to V<sub>C</sub> (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<sub>C</sub> = 1 to 6V

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

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

V<sub>M</sub>: 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<sub>HO</sub>: Imbalance voltage

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

K<sub>H</sub>: Sensitivity
**SHARP**

Fig. 1 Hall Voltage vs. Ambient Temperature

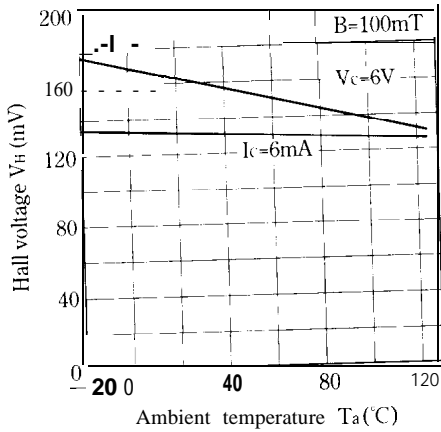


Fig. 2 Input Resistance vs. Ambient Temperature

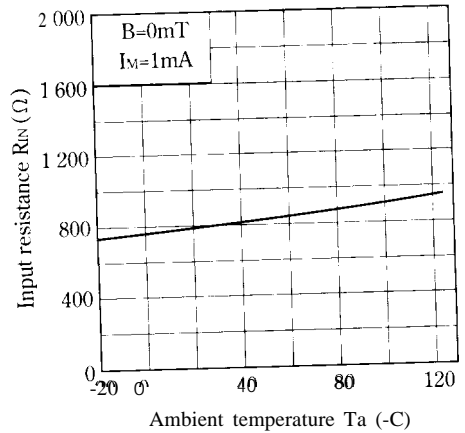


Fig. 3 Hall Voltage vs. Magnetic Flux Density

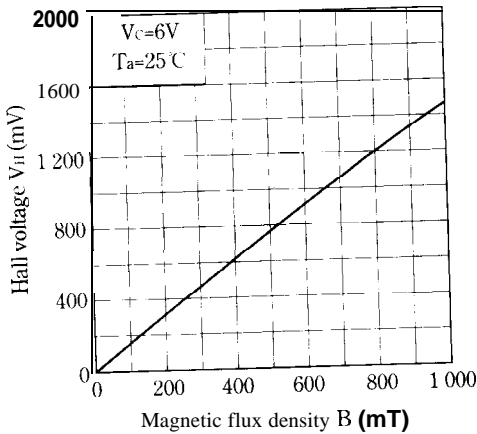


Fig. 4 Hall Voltage vs. Control Current

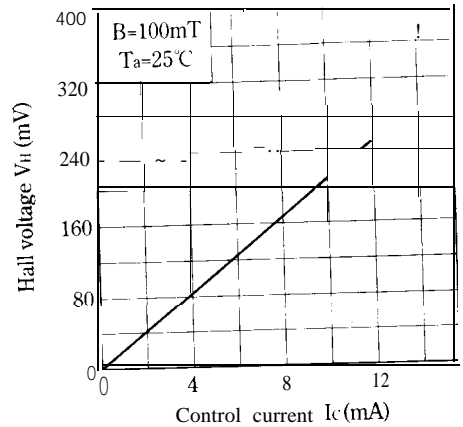


Fig. 5 Hall Voltage vs. Control Voltage

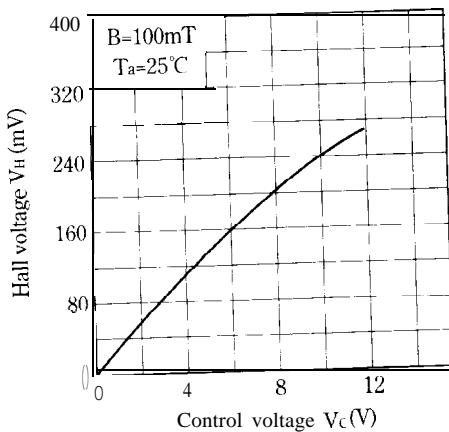


Fig. 6 Power Dissipation vs. Ambient Temperature

