LT135A

Hall Voltage 240mV GaAs Hall Device

Features

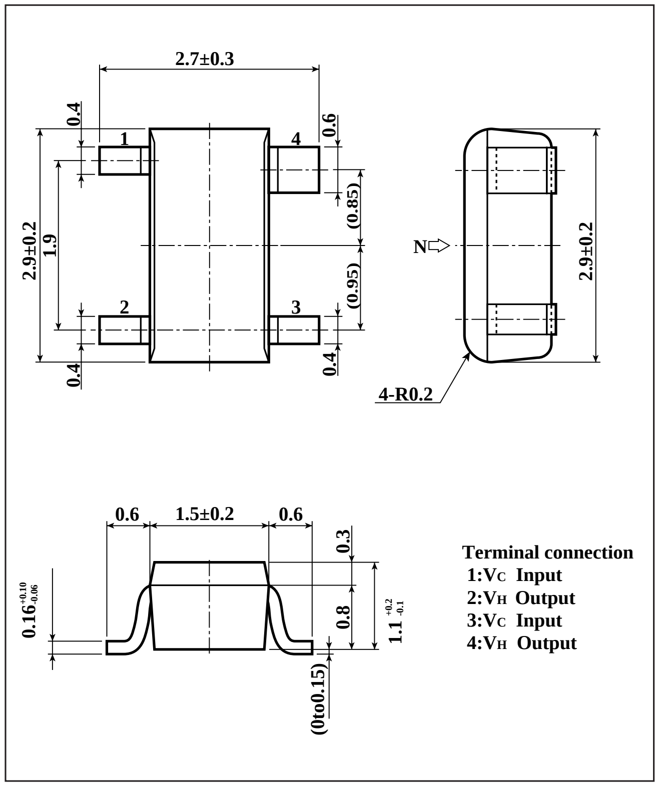
- Small temperature coefficient of the Hall voltage
- Good linearity of the Hall voltage
- Small imbalanced voltage
- Directly DC voltage applicable

Applications

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

Outline Dimensions

(Unit : mm)



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

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

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	200	240	280	mV
Imbalanced voltage[*2]	V_{HO}	V_C=6V, B=0mT	-15	-	15	mV
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	$\|\Delta V_{HO}\|$	V_C=6V, B=0mT, T_a=-20˚C to 25˚C V_C=6V, B=0mT, T_a=25˚C to 125˚C	-	5	-	mV
Temperature coefficient of Hall voltage	β	I_C=6mA, B=100mT, T_1=-20˚C, T_2=125˚C	-	-0.03	-	%/˚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	-	2	-	%

*1 No-load Hall voltage is nearly proportional to Vc (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 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}:Imbalanced voltage

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

K_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 spcification sheets before using any SHARP device.

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Fig. 1 Hall Voltage vs. Ambient Temperature

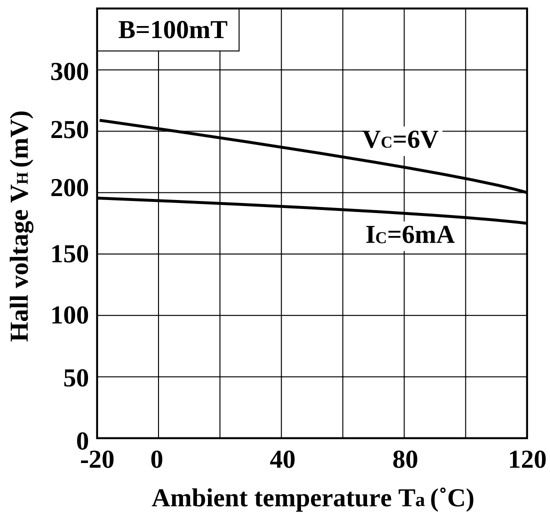


Fig. 2 Input Resistance vs. Ambient Temperature

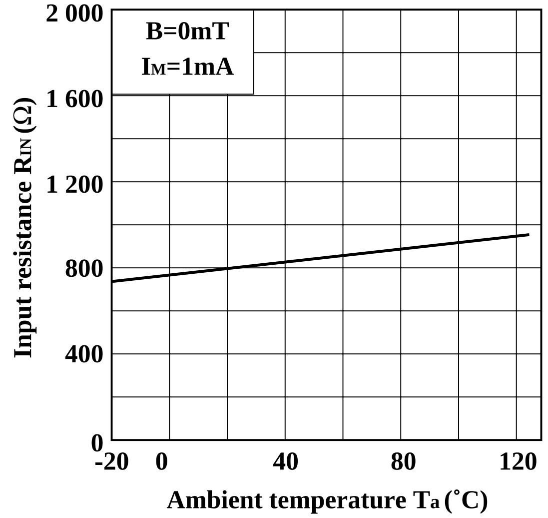


Fig. 3 Hall Voltage vs. Magnetic Flux Density

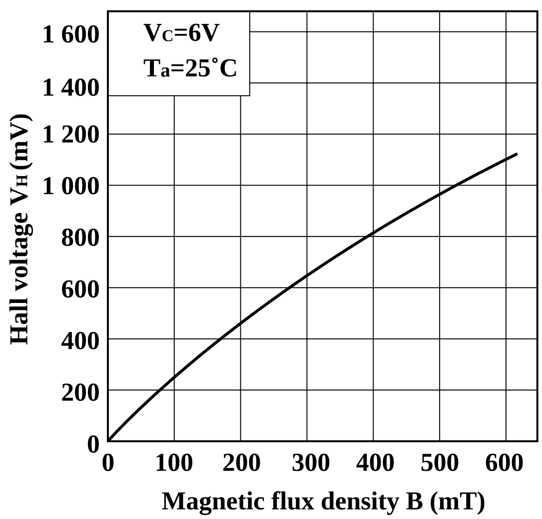


Fig. 4 Hall Voltage vs. Control Current

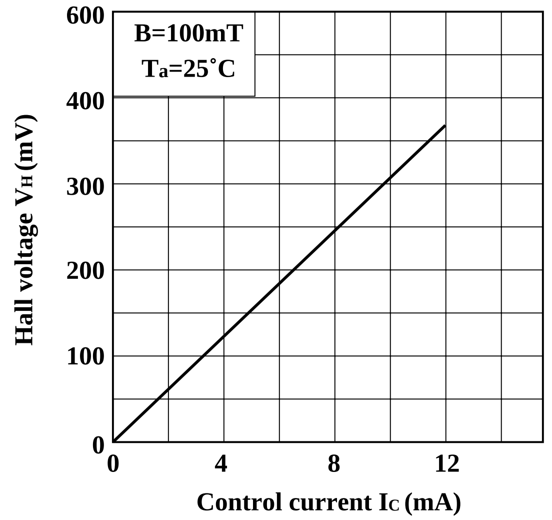


Fig. 5 Hall Voltage vs. Control Voltage

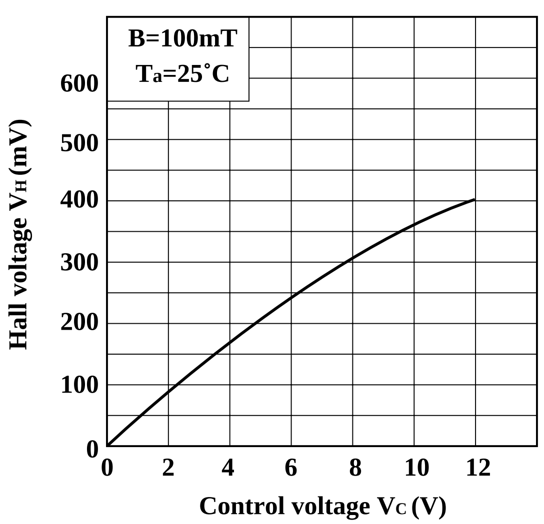
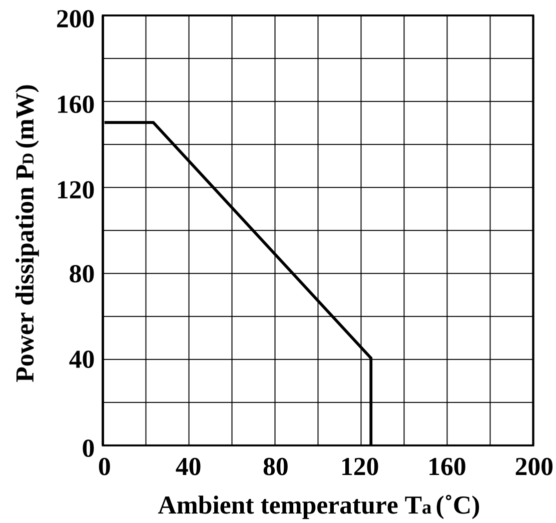


Fig. 6 Power Dissipation vs. Ambient Temperature



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