LT1 20A

Hall Voltage 160mV 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

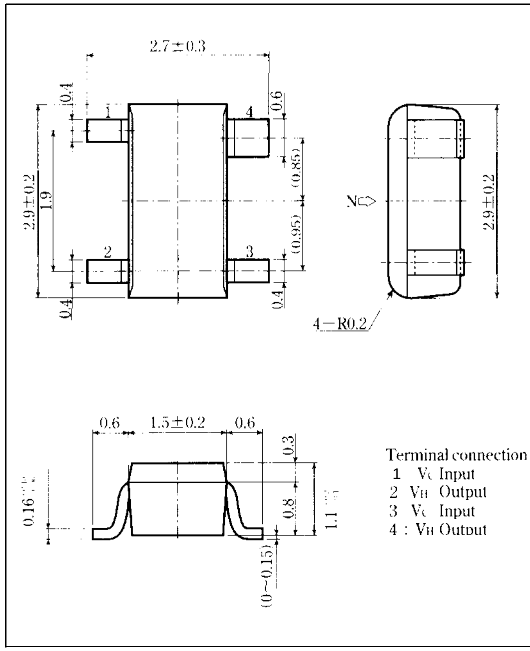
(T_a=25°C)

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 "*"		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) / (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		$\lvert \Delta V_{HO} \rvert$	V_C=6V, B=0mT, T_a=−20°C to 25°C V_C =6V, B=OmT, 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	–	**-0.04**	**-**	%/°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-1oad Hall voltage is nearly proportional to Vc (within the range of 1 to 6V) at temperatures of -20°C 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

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

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

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

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

V_M: Observed Hall voltage

V_{HO}: Imbalanced voltage

K_H: Sensitivity

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Fig. 1 Hall Voltage vs. Ambient Temperature

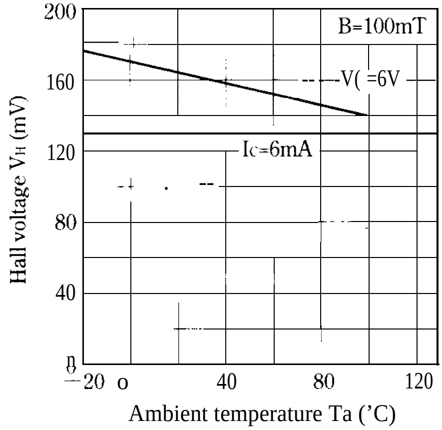


Fig. 2 Input Resistance vs. Ambient Temperature

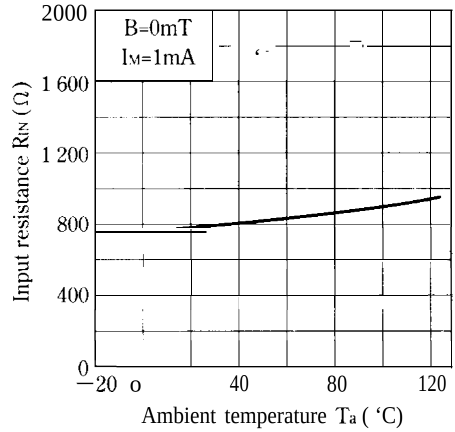


Fig. 3 Hall Voltage vs. Magnetic Flux Density

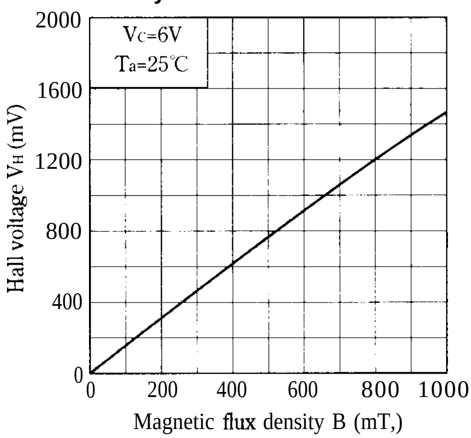


Fig. 4 Hall Voltage vs. Control Current

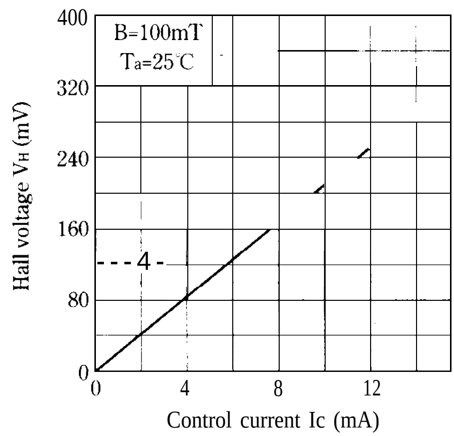


Fig. 5 Hall Voltage vs. Control Voltage

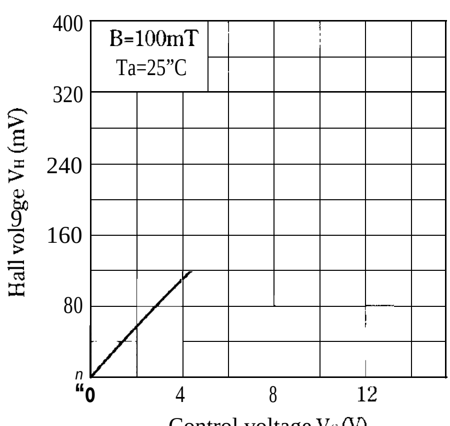
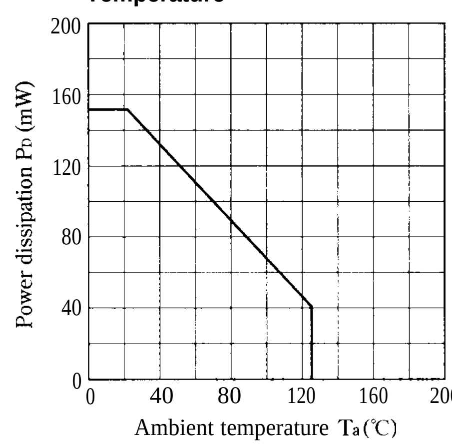


Fig. 6 Power Dissipation vs. Ambient Temperature



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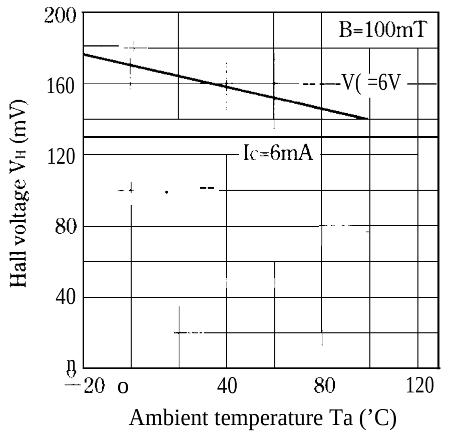

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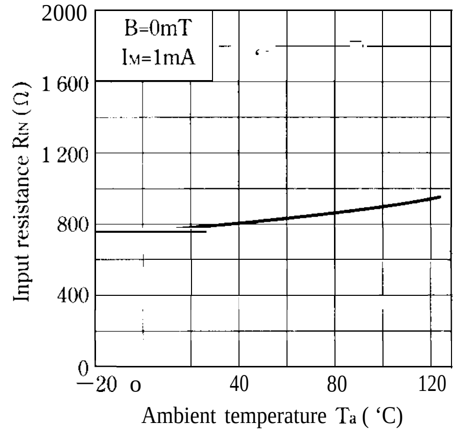

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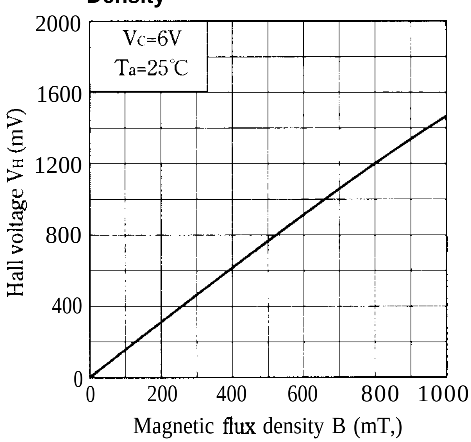
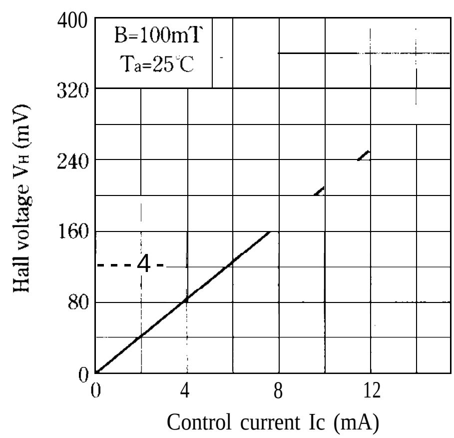


Fig. 4 Hall Voltage vs. Control Current



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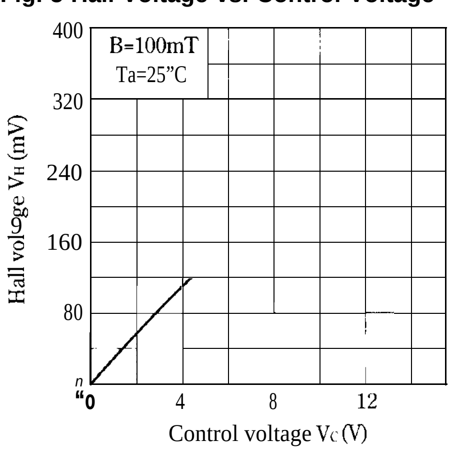

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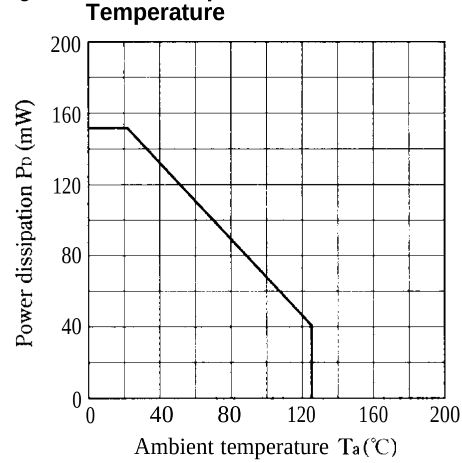

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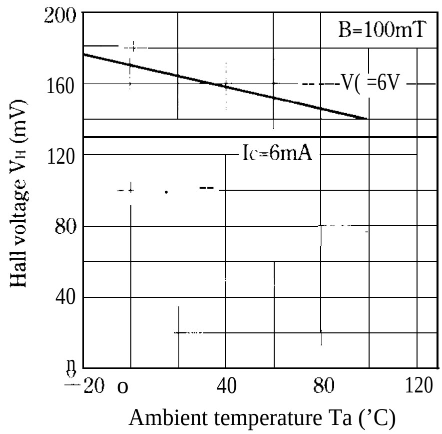

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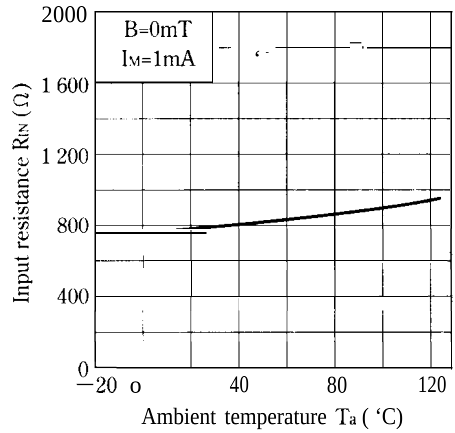

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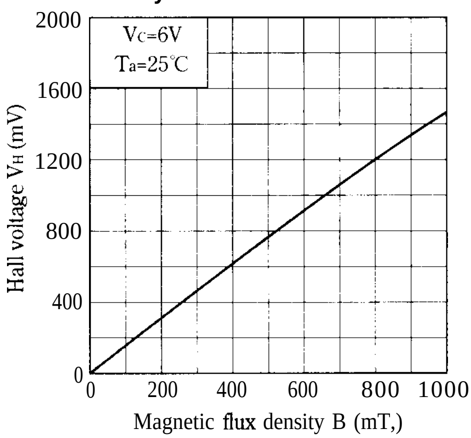

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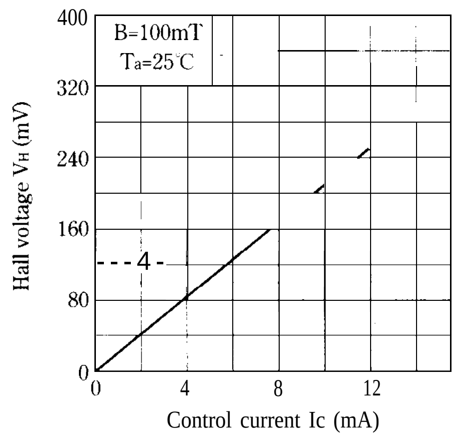

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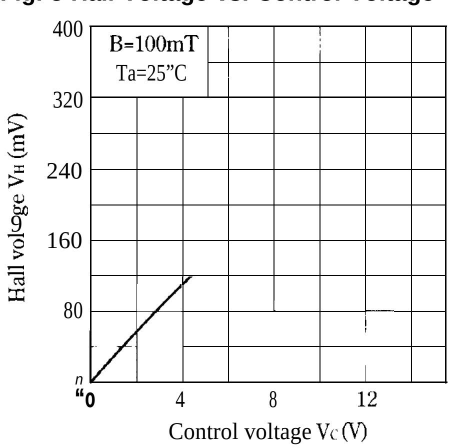

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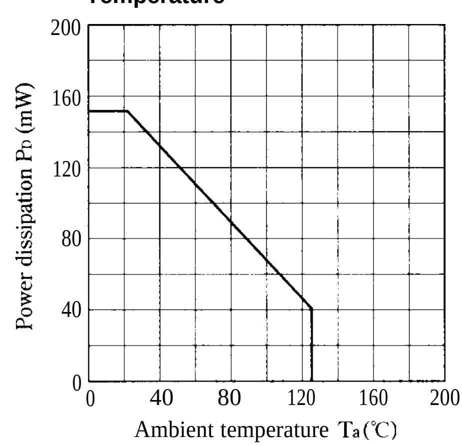

LTI 40A

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
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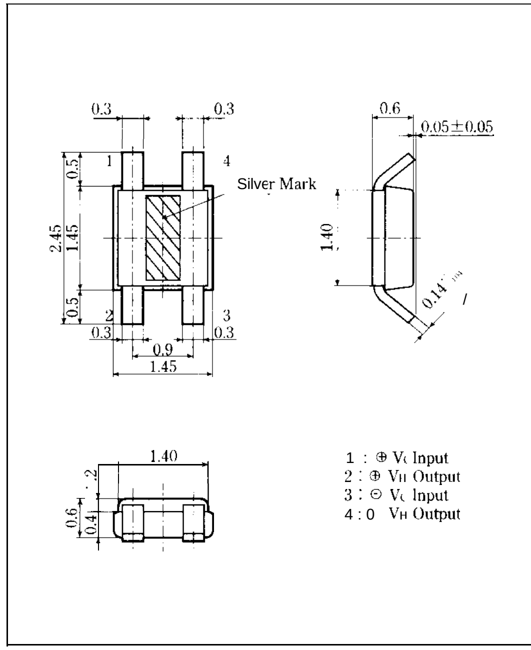
- Other magnetic detection

■ Outline Dimensions

(Unit : mm)



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Power dissipation	P_D	150	mW
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※1 Soldering time 10 seconds

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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 imbalanced voltage vs. temperature		$\|\Delta V_{HO}\|$	V_C=6V, B=OmT, T_a=−20°C to 25°C V_C=6V, B=OmT, 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	–	**–0.04**	–	%/°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, B2= 100mT	–	0.3	–	%

※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}: Imbalance voltage

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

K_H: Sensitivity

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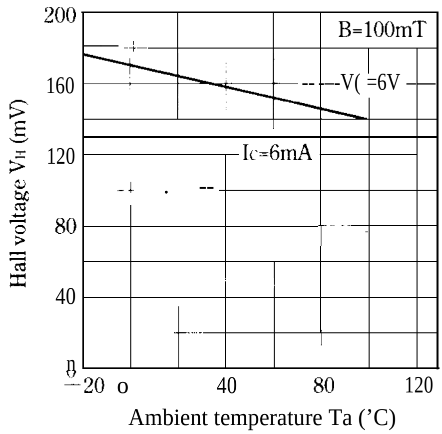

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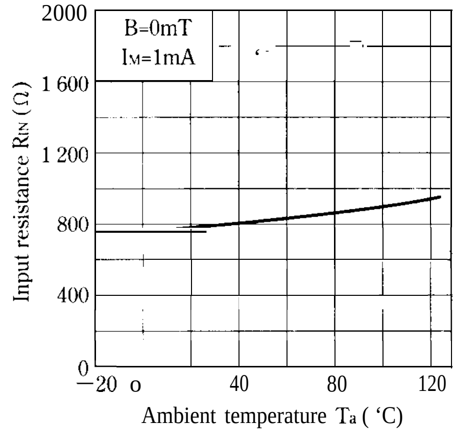

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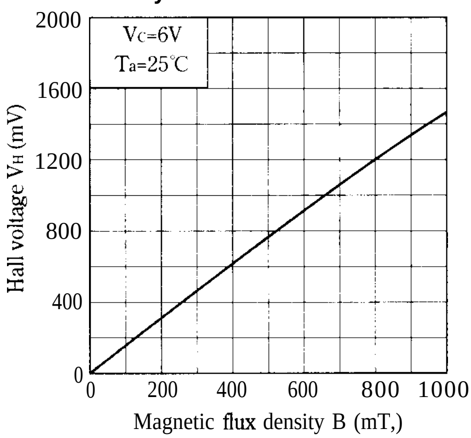

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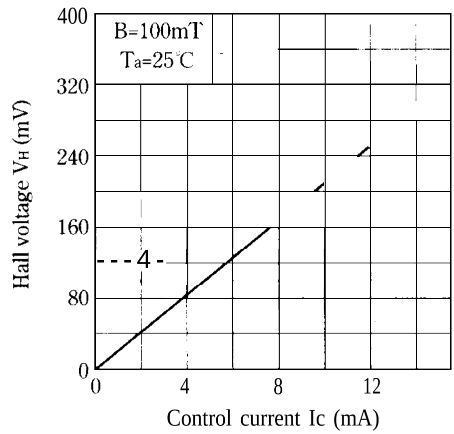

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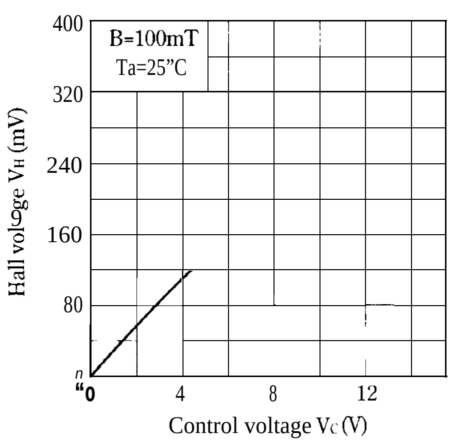

Fig. 6 Power Dissipation vs. Ambient Temperature