OH10010

GaAs Hall Device

Magnetic sensor

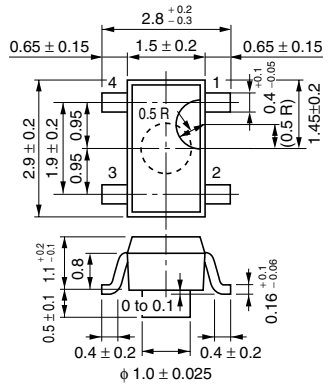
■ Features

- Hall voltage: typ. 105 mV (V_C = 6 V, B = 0.1 T)
- Input resistance: typ. 0.75 kΩ
- Satisfactory linearity of GaAs hall voltage with respect to the magnetic field
- Small temperature coefficient of the hall voltage: β ≤ – 0.06%/°C
- Mini type (4-pin) package with positioning projection. Allowing automatic insertion through the magazine package.

■ Applications

- Various hall motor (VCR, phonograph, VD, CD, and FDD)
- Automotive equipment
- Industrial equipment
- Applicable to wide-varying field (OA equipment, etc.)

Unit : mm



1 : V_H Output (–) side
2 : V_C Input (–) side
3 : V_H Output (+) side
4 : V_C Input (+) side

Mini Type Package (4-pin) with positioning projection

Marking Symbol: ON

■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Control voltage	V_C	12	V
Power dissipation	P_D	150	mW
Operating ambient temperature	T_{opr}	–30 to +125	°C
Storage temperature	T_{stg}	–55 to +125	°C

■ Electrical Characteristics T_a = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Hall voltage*1	V_H	V_C = 6 V, B = 0.1 T	80	105	130	mV
Unequilibrium ratio*2, 4	V_{HO}	V_C = 6 V, B = 0 T			±19	mV
Input resistance	R_{IN}	I_C = 1 mA, B = 0 T	0.5	0.75		kΩ
Output resistance	R_{OUT}	I_C = 1 mA, B = 0 T		1.5	5	kΩ
Temperature coefficient of hall voltage	β	I_C = 6 mA, B = 0.1 T			–0.06	%/°C
Temperature coefficient of input resistance	α	I_C = 1 mA, B = 0 T			0.3	%/°C
Linearity of hall voltage*3	γ	I_C = 6 mA, B = 0.1 T/0.5 T			2	%

Note) *1 : $V_H = \dfrac{|V_H^+| + |V_H^-|}{2}$

*2 : Output pin voltage under no-load (B = 0) condition

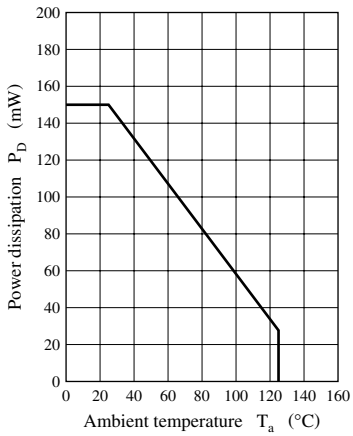
*3 : The linearity γ of V_H is a percentage of a difference between cumulative sensitivity of K_{H1} and K_{H5} which are measured respectively at B = 0.1 T and 0.5 T to their average. That is,

$$\gamma = \frac{K_{H5} - K_{H1}}{1/2(K_{H1} + K_{H5})}$$ (the cumulative sensitivity $K_H = \dfrac{V_H}{I_C \cdot B}$)

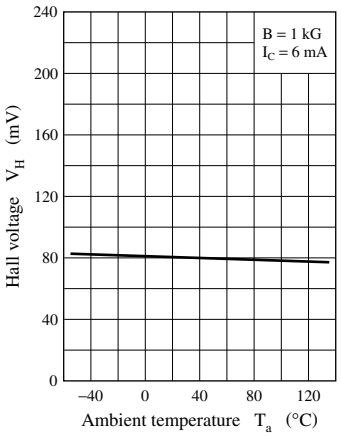
*4 : V_{HO} rank classification

Class	A	B	C	D	E
V_{HO} (mV)	+19 to +9	+12 to +2	+5 to –5	–2 to –12	–9 to –19

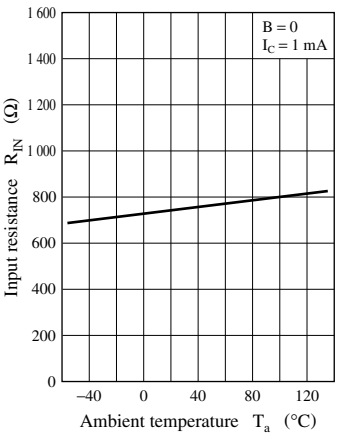
P_D — T_a



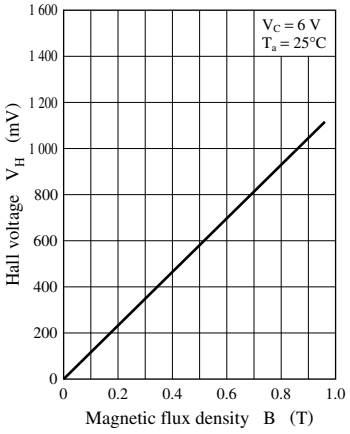
V_H — T_a



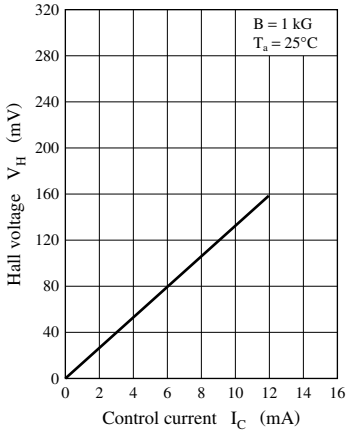
R_{IN} — T_a



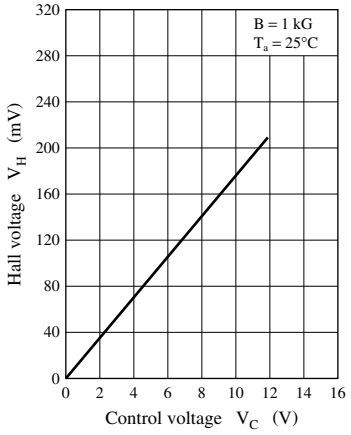
V_H — B



V_H — I_C



V_H — V_C



■ Typical Drive Circuit