OH10003

GaAs Hall Device

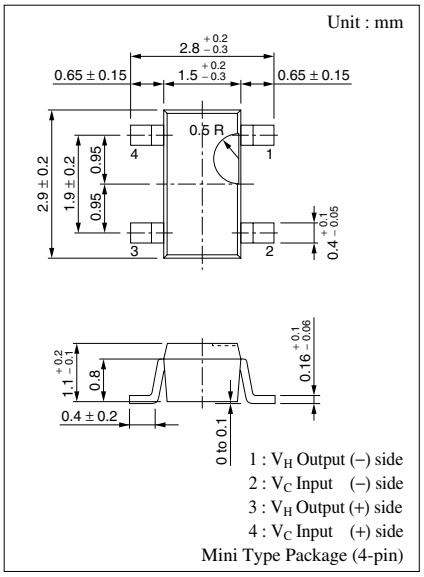
Magnetic sensor

■ Features

- Hall voltage: typ. 150 mV (V_C = 6 V, B = 0.1 T)
- Input resistance: typ. 0.85 kΩ
- Satisfactory linearity of GaAs hall voltage with respect to the magnetic field
- Small temperature coefficient of the hall voltage: $\beta \leq -0.06\%/°C$
- Sealed in the Mini type (4-pin) package. Allowing automatic insertion through the taping and 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.)



Marking Symbol: 3

■ 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, 4	V_H	V_C = 6 V, B = 0.1 T	130	150	170	mV
Unequilibrium ratio*2, 4	V_{HO}/V_H	V_C = 6 V, B = 0 T/B = 0.1 T			±12	%
Input resistance	R_{IN}	I_C = 1 mA, B = 0 T	0.50	0.852		kΩ
Output resistance	R_{OUT}	I_C = 1 mA, B = 0 T			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 : Unequilibrium ratio is a percentage of V_{HO} with respect to V_H.

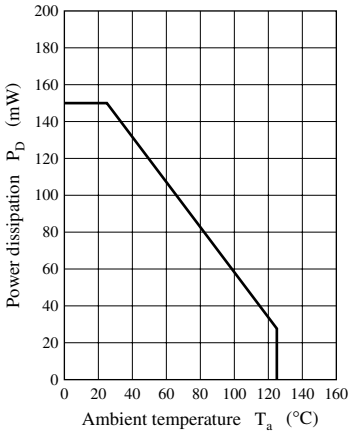
*3 : The linearity γ of V_H is a percentage of a difference between cumulative sensitivity of K_{H1} and K_{H5} which are measured respectively at B = 0.1 T and 0.5 T to their average. That is,

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

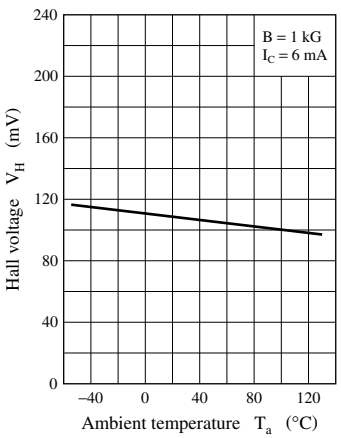
*4 : V_H, V_{HO}/V_H rank classification

Class	HQ	HR	IQ	IR	KQ	KR
V_H (mV)	130 to 158	142 to 170	130 to 158	142 to 170	130 to 158	142 to 170
V_{HO}/V_H (%)	−5 to +5		+2 to +12		−2 to −12	
Marking Symbol	3HQ	3HR	3IQ	3IR	3KQ	3KR

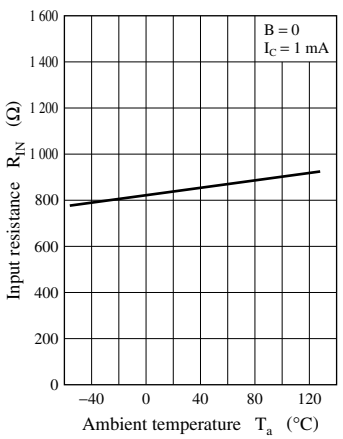
P_D — T_a



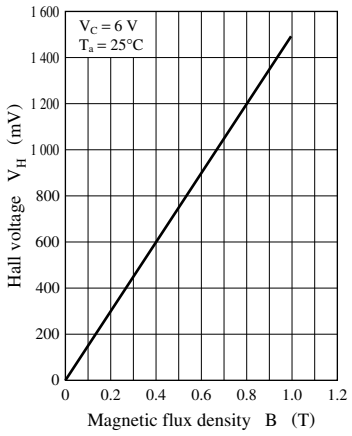
V_H — T_a



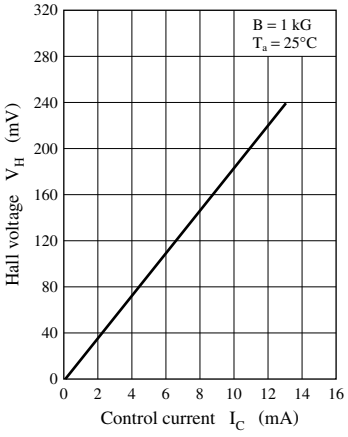
R_{IN} — T_a



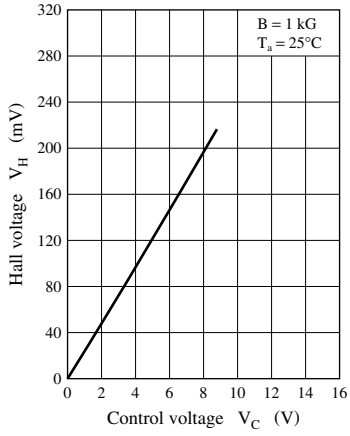
V_H — B



V_H — I_C



V_H — V_C



■ Typical Drive Circuit