

## OH10003

## GaAs Hall Device

## Magnetic sensor

## ■ Features

- Hall voltage: typ. 150 mV ( $V_C = 6\text{ V}$ ,  $B = 0.1\text{ T}$ )
- Input resistance: typ. 0.85 k $\Omega$
- Satisfactory linearity of GaAs hall voltage with respect to the magnetic field
- Small temperature coefficient of the hall voltage:  $\beta \leq -0.06\%/^{\circ}\text{C}$
- 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.)

■ Absolute Maximum Ratings  $T_a = 25^{\circ}\text{C}$ 

Parameter	Symbol	Rating	Unit
Control voltage	$V_C$	12	V
Power dissipation	$P_D$	150	mW
Operating ambient temperature	$T_{opr}$	-30 to +125	$^{\circ}\text{C}$
Storage temperature	$T_{stg}$	-55 to +125	$^{\circ}\text{C}$

■ Electrical Characteristics  $T_a = 25^{\circ}\text{C}$ 

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Hall voltage*1, 4	$V_H$	$V_C = 6\text{ V}$ , $B = 0.1\text{ T}$	130	150	170	mV
Unequilibrium ratio*2, 4	$V_{HO}/V_H$	$V_C = 6\text{ V}$ , $B = 0\text{ T}/B = 0.1\text{ T}$			$\pm 12$	%
Input resistance	$R_{IN}$	$I_C = 1\text{ mA}$ , $B = 0\text{ T}$	0.50	0.852		k $\Omega$
Output resistance	$R_{OUT}$	$I_C = 1\text{ mA}$ , $B = 0\text{ T}$			5	k $\Omega$
Temperature coefficient of hall voltage	$\beta$	$I_C = 6\text{ mA}$ , $B = 0.1\text{ T}$			-0.06	$\%/^{\circ}\text{C}$
Temperature coefficient of input resistance	$\alpha$	$I_C = 1\text{ mA}$ , $B = 0\text{ T}$			0.3	$\%/^{\circ}\text{C}$
Linearity of hall voltage*3	$\gamma$	$I_C = 6\text{ mA}$ , $B = 0.1\text{ T}/0.5\text{ T}$			2	%

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

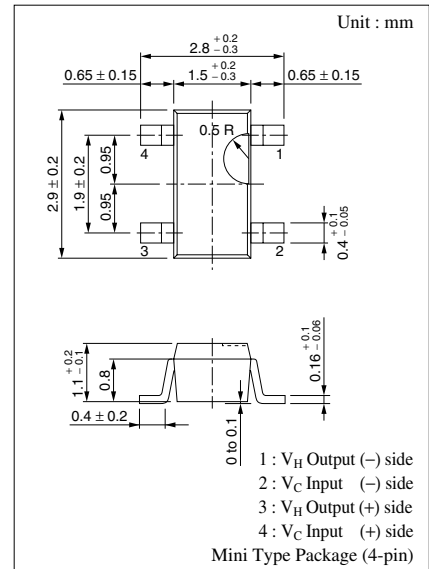
\*2: Unequilibrium ratio is a percentage of  $V_{HO}$  with respect to  $V_H$ .

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

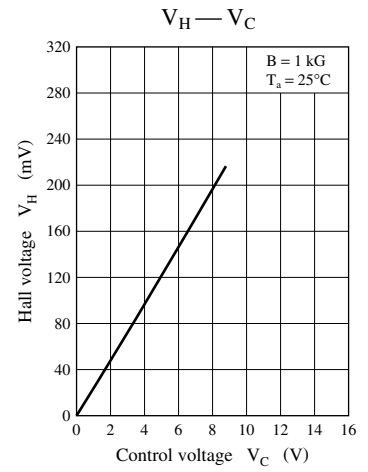
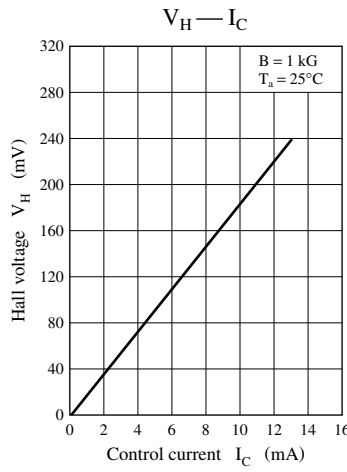
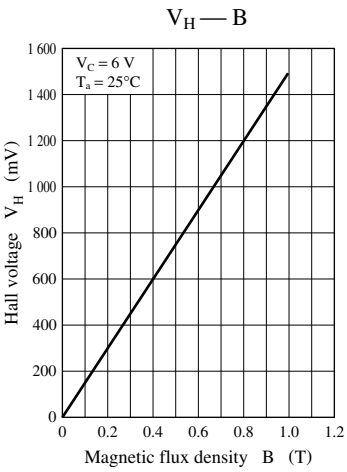
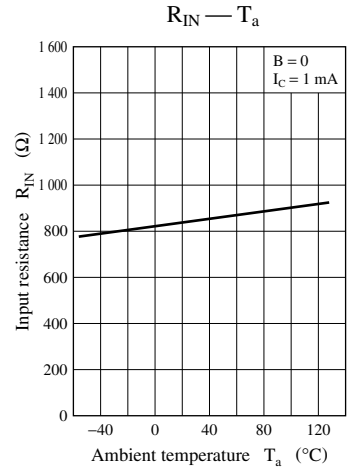
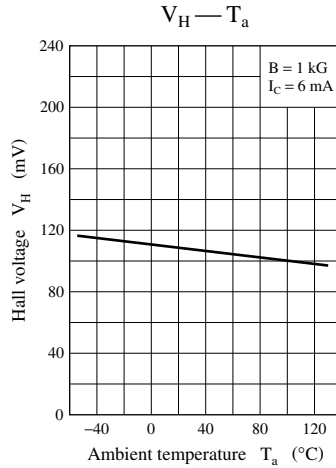
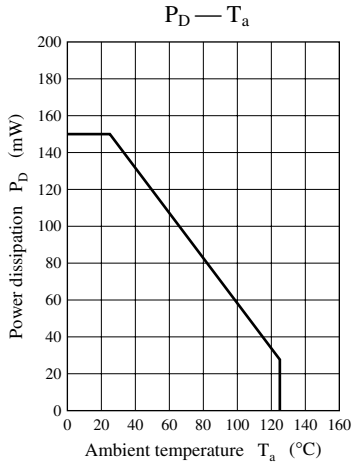
$$\gamma = \frac{K_{H5} - K_{HI}}{1/2(K_{HI} + K_{H5})} \quad \left( \text{the cumulative sensitivity } K_H = \frac{V_H}{I_C \cdot B} \right)$$

\*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



Marking Symbol: 3



■ Typical Drive Circuit

