

OH10004

GaAs Hall Device

Magnetic sensor

■ Features

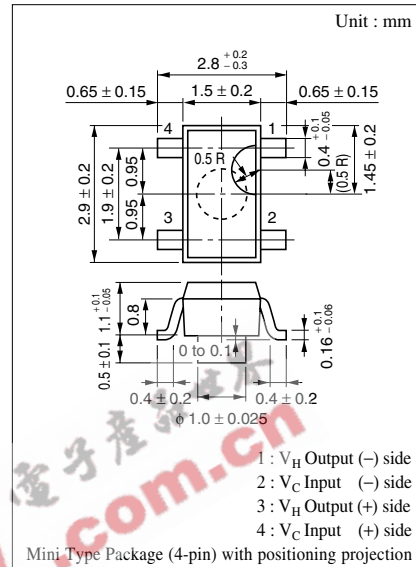
- Hall voltage: typ. 150 mV ($V_C = 6\text{ V}$, $B = 0.1\text{ T}$)
- Input resistance: typ. 0.85 k Ω
- Satisfactory linearity of GaAs hall voltage with respect to the magnetic field
- Small temperature coefficient of the hall voltage: $\beta \leq -0.06\%/^{\circ}\text{C}$
- Mini type (4-pin) package with positioning projection. Allowing automatic insertion through the magazine package.

■ Applications

- Various hall motor (VCR, phonograph, VD, CD, and FDD)
- Automotive equipment
- Industrial equipment

■ 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	$^{\circ}\text{C}$



Marking Symbol: 4

■ 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	$V_C = 6\text{ V}$, $B = 0\text{ T}/B = 0.1\text{ T}$			± 12	%
Input resistance	R_{IN}	$I_C = 1\text{ mA}$, $B = 0\text{ T}$	0.50	0.85		k Ω
Output resistance	R_{OUT}	$I_C = 1\text{ mA}$, $B = 0\text{ T}$			5	k Ω
Temperature coefficient of hall voltage	β	$I_C = 6\text{ mA}$, $B = 0.1\text{ T}$			-0.06	$\%/^{\circ}\text{C}$
Temperature coefficient of input resistance	α	$I_C = 1\text{ mA}$, $B = 0\text{ T}$			0.3	$\%/^{\circ}\text{C}$
Linearity of hall voltage*3	γ	$I_C = 6\text{ mA}$, $B = 0.1\text{ T}/0.5\text{ T}$			2	%

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

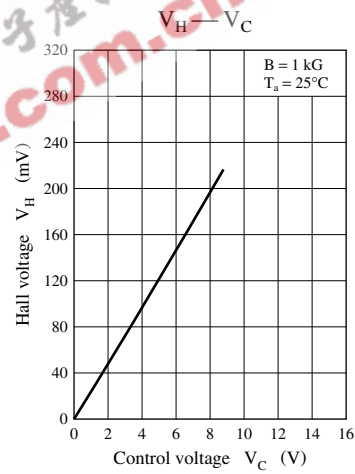
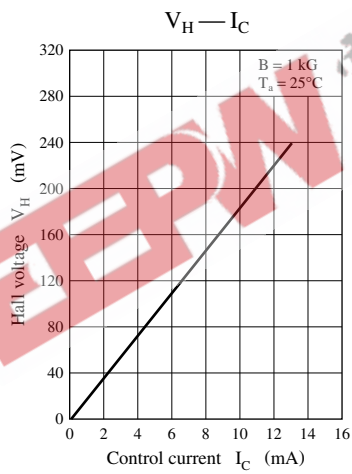
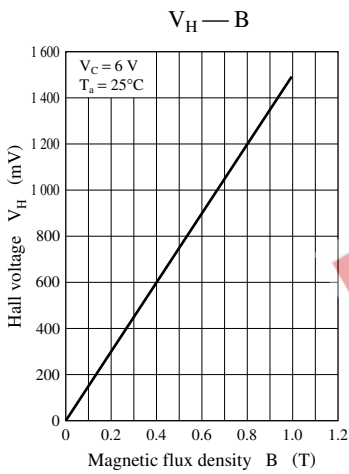
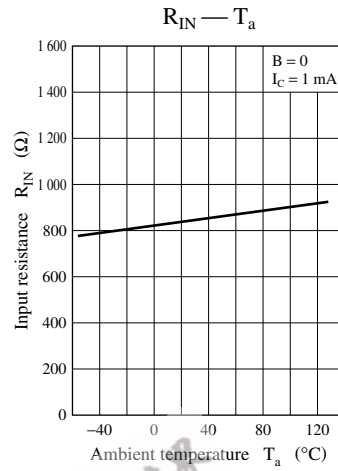
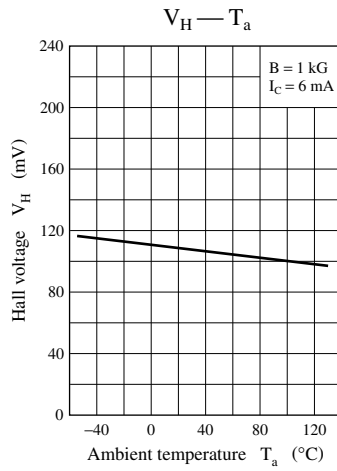
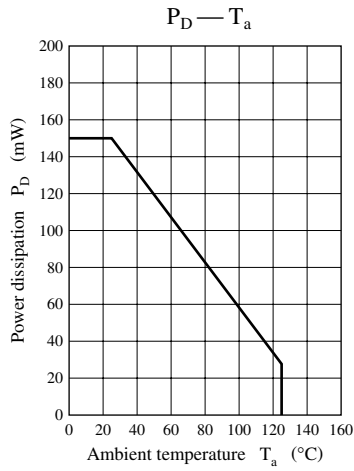
*2 : Unequilibrium ratio is a percentage of V_{HO} with respect to V_H .

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

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

*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	4HQ	4HR	4IQ	4IR	4KQ	4KR



■ Typical Drive Circuit

