

CYSJ166A GaAs HALL-EFFECT ELEMENTS

CYSJ166A series Hall-effect element is a ion-implanted magnetic field sensor made of mono-crystal gallium arsenide (GaAs) semiconductor material group III-V using ion-implanted technology. It can convert a magnetic flux density signal linearly into voltage output.

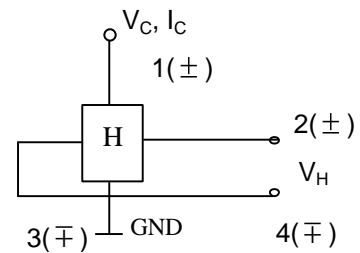
FEATURES

- High Linearity
- Superior Temperature Stability
- Miniature Package
- Wide measuring range 0-3T

TYPICAL APPLICATION

- Magnetic Field Measurement
- DC Brushless Motor
- Current Sensor
- Non-contact Switch
- Position Control
- Detection Of Revolution

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Value	Unit
Max. Input Current/Voltage	V_C	12	V
Max. Input Power	P_D	150	mW
Operating temperature range	T_A	-40~125	°C
Storage temperature range	T_S	-55~150	°C

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$)

Parameter	Symbol	Test conditions	Value	Unit
Hall output voltage	V_H	$B=100\text{mT}$, $V_C=6\text{V}$	156~204	mV
Offset voltage	$V_{os}(V_u)$	$V_C=6\text{V}$, $B=0\text{mT}$	± 8	mV
Input resistance	R_{in}	$B=0\text{mT}$, $I_C=0.1\text{mA}$	1000~1500	Ω
Output resistance	R_{out}	$B=0\text{mT}$, $I_C=0.1\text{mA}$	1800~3000	Ω
Temperature coefficient of Hall output voltage	αV_H	$I_C=5\text{mA}$, $B=100\text{mT}$ ($T_a=25^\circ\text{C} \sim 125^\circ\text{C}$)	-0.06	%/°C
Temperature coefficient of input and output resistance	αR_{in} αR_{out}	$I_C=0.1\text{mA}$, $B=0\text{mT}$ ($T_a=25^\circ\text{C} \sim 125^\circ\text{C}$)	0.3	%/°C
Linearity	ΔK_H	$I_C=5\text{mA}$ $B=0.1/0.5\text{T}$	2	%

Notes:

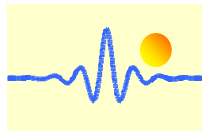
$$\alpha V_H = \frac{1}{V_H(T_1)} \times \frac{V_H(T_2) - V_H(T_1)}{T_2 - T_1} \times 100,$$

$$\Delta K_H = \frac{K(B_1) - K(B_2)}{[K(B_1) + K(B_2)]} \times 200$$

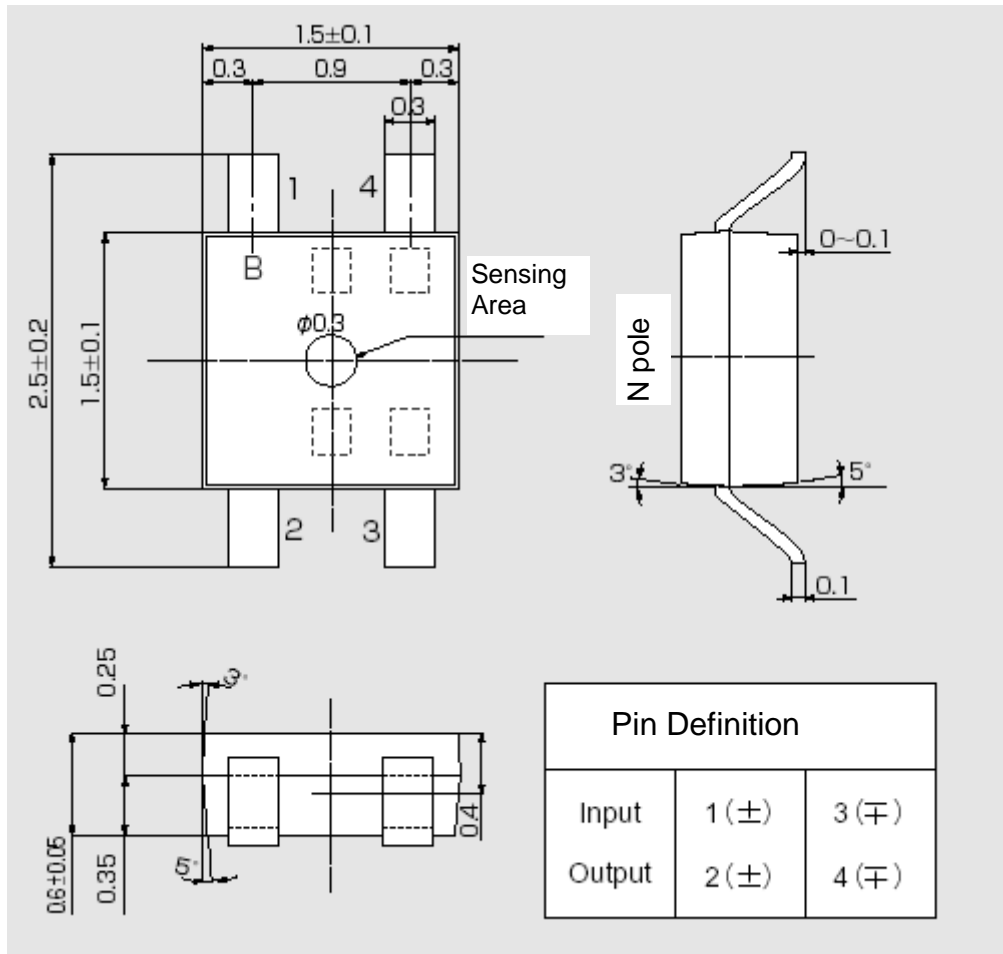
$$T_1=25^\circ\text{C}, T_2=125^\circ\text{C}, \quad B_1=0.5\text{T}, B_2=0.1\text{T}$$

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

$$K_H = \frac{V_H}{I_C B}$$



Package Outline Drawing (Unit: mm)



Characteristic Curves

Allowable Package Power Dissipation

