

# MG911 GaAs Hall Element

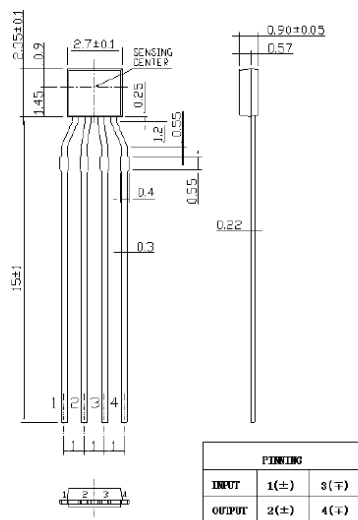
Linear GaAs Hall Element with high sensitivity

Excellent Thermal Characteristics

Thin-type SIP Package

Shipped in Bulk by Pack (500pcs devices per pack)

## Dimensional Drawing (Unit MM)



## Absolute Maximum Rating

Operating Temperature Range    -40°C ~ 125°C  
Storage Temperature Range    -45°C ~ 150°C  
Maximum Input Current  $I_{cmax}$  [mA]    10mA

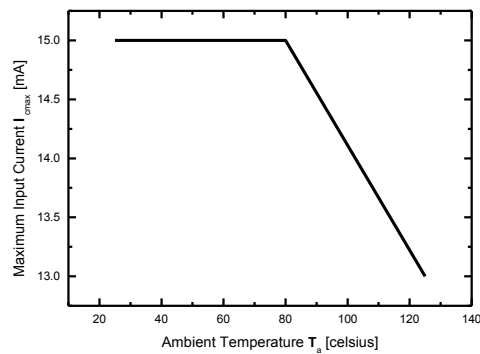


Figure 1. Maximum input current  $I_{cmax}$

## Electrical Characteristics ( RT=25°C )

Table 1. Electrical Characteristics of MG911.

Item	Symbol	Test Condi.	Min.	Typ.	Max.	Unit
Hall Voltage	$V_H$	$B = 50\text{mT}, I_c = 5\text{mA}$ $T_a = \text{RT}$	72	90	108	mV
Input/Output Resist.	$R_{\text{in/out}}$	$B = 0\text{mT}, I_c = 0.1\text{mA}$ $T_a = \text{RT}$	650	750	850	$\Omega$
Offset Voltage	$V_{\text{os}}$	$B = 0\text{mT}, I_c = 5\text{mA}$ $T_a = \text{RT}$	-5		+5	mV
Temp. Coeffi. of $V_H$	$ \alpha V_H $	$B = 50\text{mT}, I_c = 5\text{mA},$ $T_a = 25^\circ\text{C} \sim 125^\circ\text{C}$			0.06	%/ $^\circ\text{C}$
Temp. Coeffi. of $R_{\text{in}}$	$\alpha R_{\text{in}}$	$B = 0\text{mT}, I_c = 0.1\text{mA},$ $T_a = 25^\circ\text{C} \sim 125^\circ\text{C}$			0.3	%/ $^\circ\text{C}$
Linearity of $V_H$	$\Delta K$	$B = 0 - 50\text{mT}, I_c = 5\text{mA}$ $T_a = \text{RT}$	-1		+1	%

Note:

- $V_H = V_{H-M} - V_{\text{os}}$   
 in which  $V_{H-M}$  is the Output Hall Voltage,  $V_H$  is the Hall Voltage and  $V_{\text{os}}$  is the offset Voltage under the identical electrical stimuli.
- $$\alpha V_H = \frac{1}{V_H(T_{a1})} \times \frac{V_H(T_{a2}) - V_H(T_{a1})}{T_{a2} - T_{a1}} \times 100$$

$$T_{a1} = 25^\circ\text{C}, \quad T_{a2} = 125^\circ\text{C}$$
- $$\alpha R_{\text{in}} = \frac{1}{R_{\text{in}}(T_{a1})} \times \frac{R_{\text{in}}(T_{a2}) - R_{\text{in}}(T_{a1})}{T_{a2} - T_{a1}} \times 100$$

$$T_{a1} = 25^\circ\text{C}, \quad T_{a2} = 125^\circ\text{C}$$
- $$\Delta K = \frac{K(B_1) - K(B_2)}{\frac{K(B_1) + K(B_2)}{2}} \times 100 \quad K = \frac{V_H}{I_c \times B}$$

## Characteristic Curves

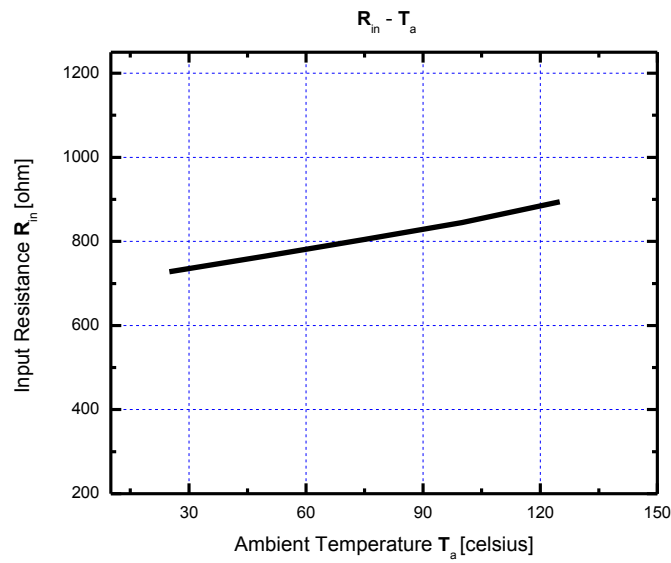


Figure 2. Input resistance  $R_{in}$  as a function of ambient temperature  $T_a$ .

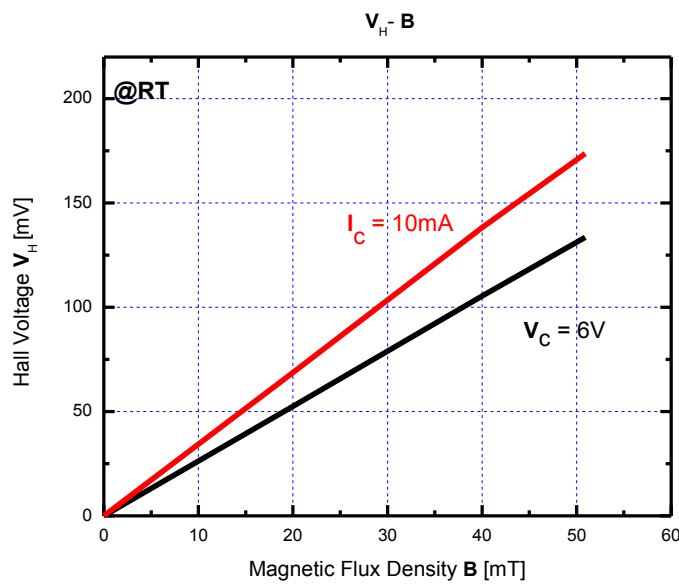


Figure 3. Hall voltage  $V_H$  as a function of magnetic flux density  $B$ .

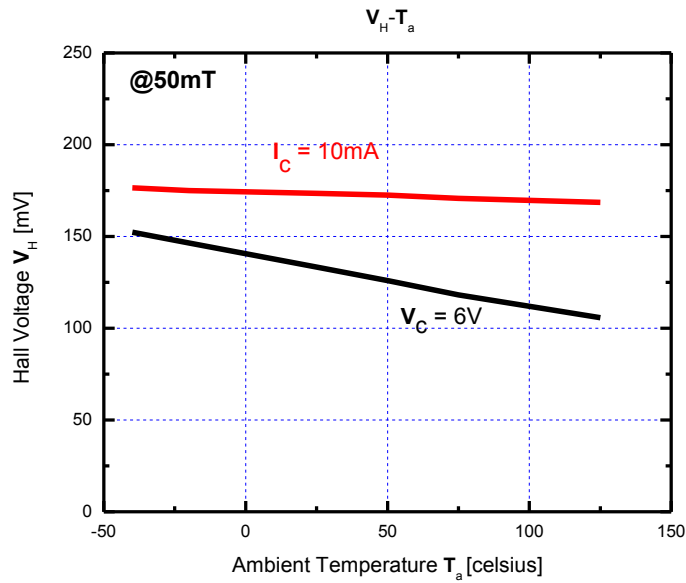


Figure 4. Hall voltage  $V_H$  as a function of ambient temperature  $T_a$ .

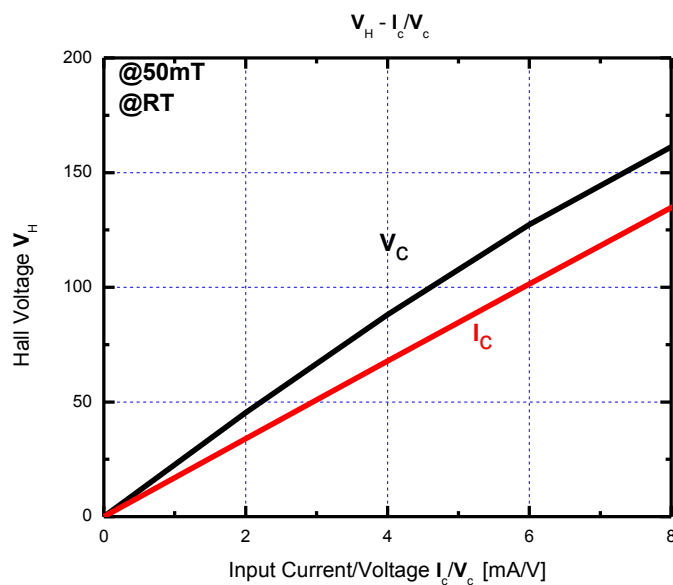


Figure 5. Hall voltage  $V_H$  as a function of electrical stimuli  $I_c/V_c$ .

## Reliability Test Terms

**Table 2.** Reliability Test Terms, Conditions and Durations.

No.	Terms	Conditions	Duration
1	High Temperature Storage (HTS)	<b>【JEITA EIAJ ED-4701】</b> $T_a = 150 ( 0 \sim +10 ) \text{ } ^\circ\text{C}$	1000 h
2	Heat Cycle (HC)	<b>【JEITA EIAJ ED-4701】</b> $T_a = -55^\circ\text{C} \sim 150^\circ\text{C}$ high temp. - normal temp. - low temp. 30 min - 5 min - 30 min	50 clcs
3	Temp. Humidity Storage (THS)	<b>【JEITA EIAJ ED-4701】</b> $T_a = 85 \pm 3 \text{ } ^\circ\text{C}$ , $R_H = 85 \pm 5 \%$	1000 h
4	Resist. to Hand Soldering Heat (RSHS)	<b>【JEITA EIAJ ED-4701】</b> Dipped in the $300 \pm 5 \text{ } ^\circ\text{C}$ solder up to the 1 mm part from the body	5sec
5	High Temp. Operating (HTO)	$T_a = 125 \text{ } ^\circ\text{C}$ , $V_c = 7.5\text{V}$	1000 h

Criteria:

- Variation of Hall Voltage  $V_H$  and input/output resistances  $R_{in/out}$  are less than 20%.
- Variation of offset voltage  $V_{os}$  is less than  $\pm 16 \text{ mV}$ .
- Other parameters in **Table 1.** are still within their ranges stated in **Table 1.**

## Soldering Conditions

The following conditions should be preserved. Solder ability should be checked by yourself, because it is depend on solder paste material and other parameters.

### Material of solder flux

- Use the resin based flux and refrain from using organic or inorganic acid based and water-soluble one.

### Cleansing of solder flux conditions

- Use Ethanol or Isopropyl alcohol as cleansing material.
- Process temperature should be 50 °C or less.
- Duration should be 5 min or less.

### Hand soldering conditions

- Apart from the mold resin more than 1mm.
- Solder at temperature 300 °C for less than 5s.

### Wave soldering conditions

- Temperature in Pre-heating zone should be lower than 150°C.
- Temperature in Soldering zone should be lower than 280°C.

## Precautions for ESD

This product is the device that is sensitive to ESD (Electrostatic Discharge). Handling Hall Elements with the ESD-Caution mark under the environment in which

- Static electrical charge is unlikely to arise. (Ex; Relative Humidity; over 40%RH).
- Wearing the antistatic suit and wristband when handling the devices.
- Implementing measures against ESD as for containers that directly touch the devices.

## Precautions for Storage

- Products should be stored at an appropriate temperature and humidity (5 to 35°C, 40 to 60%RH) after the unsealing of MBB. **Using self-sealer is highly recommended.** Keeping products away from chlorine and corrosive gas.

- **Long-term storage**

Products are sealed in MBB with a desiccant and partially a moisture indicator. The moisture indicator should be checked right after the unsealing of MBB. **If the moisture indicator reveals the internal moisture is above 50%RH, please contact the local distributor.**

- **For storage longer than 2 years**, it is recommended to store in nitrogen atmosphere with MBB sealed. Oxygen and H<sub>2</sub>O of atmosphere oxidizes leads of products and lead solder ability get worse.

## Precautions for Safety

- Do not alter the form of this product into a gas, powder or liquid through burning, crushing or chemical processing.
- Observe laws and company regulations when discarding this product.