# MG910 GaAs Hall Element

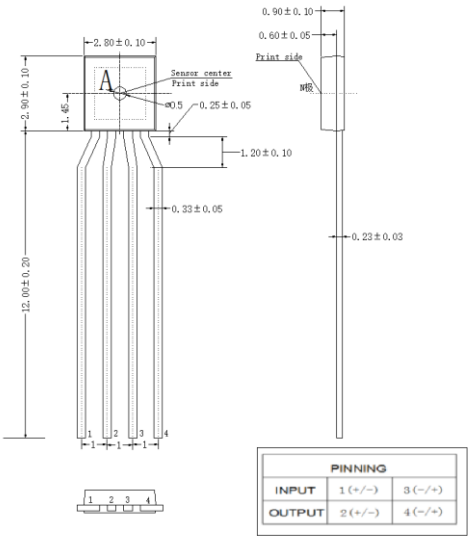
Linear GaAs Hall Element

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℃ ~ 125℃ |
| Storage Temperature Range | -45℃ ~ 150℃ |
| Maximum Input Current $I_{cmax}$ [mA] | 13mA |

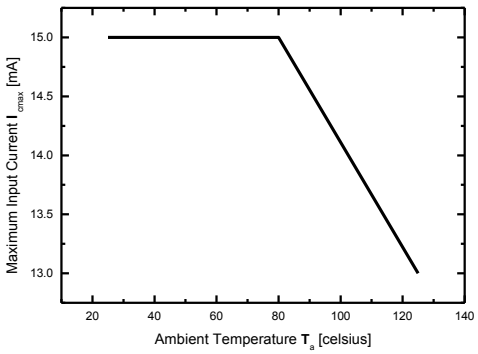



**Figure 1.** Maximum input current $I_{cmax}$

# Electrical Characteristics （RT=25℃）

**Table 1.** Electrical Characteristics of MG910.

| Item | Symbol | Test Condi. | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Hall Voltage | $V_H$ | $B$ = 50mT, $I_C$=5mA<br>$T_a$ = RT | 36 | 45 | 54 | mV |
| Input/Output Resist. | $R_{in/out}$ | $B$ = 0mT, $I_C$ = 0.1mA<br>$T_a$ = RT | 650 | 750 | 850 | Ω |
| Offset Voltage | $V_{os}$ | $B$ = 0mT, $I_C$ = 5mA<br>$T_a$ = RT | -5 | | +5 | mV |
| Temp. Coeffi. of $V_H$ | $\|\alpha V_H\|$ | $B$ = 50mT, $I_C$ =5mA,<br>$T_a$ = 25℃ ~ 125℃ | | | 0.06 | %/℃ |
| Temp. Coeffi. of $R_{in}$ | $\alpha R_{in}$ | $B$ = 0mT, $I_C$ =0.1mA,<br>$T_a$ = 25℃ ~ 125℃ | | | 0.3 | %/℃ |
| Linearity of $V_H$ | $\Delta K$ | $B$ = 0.1 - 0.4T, $I_C$ =5mA<br>$T_a$ = RT | -1 | | +1 | % |

Note:

1. $\boldsymbol{V_H = V_{H-M} - V_{os}}$
   in which$\boldsymbol{V_{H-M}}$ is the Output Hall Voltage, $\boldsymbol{V_H}$ is the Hall Voltage and $\boldsymbol{V_{os}}$ is the offset Voltage under the identical electrical stimuli.

2. $\alpha \boldsymbol{V_H} = \frac{1}{\boldsymbol{V_H}(\boldsymbol{T_{a1}})} \times \frac{\boldsymbol{V_H}(\boldsymbol{T_{a2}}) - \boldsymbol{V_H}(\boldsymbol{T_{a1}})}{\boldsymbol{T_{a2}} - \boldsymbol{T_{a1}}} \times 100$

   $\boldsymbol{T_{a1}} = 25℃, \quad \boldsymbol{T_{a2}} = 125℃$

3. $\alpha \boldsymbol{R_{in}} = \frac{1}{\boldsymbol{R_{in}}(\boldsymbol{T_{a1}})} \times \frac{\boldsymbol{R_{in}}(\boldsymbol{T_{a2}}) - \boldsymbol{R_{in}}(\boldsymbol{T_{a1}})}{\boldsymbol{T_{a2}} - \boldsymbol{T_{a1}}} \times 100$

   $\boldsymbol{T_{a1}} = 25℃, \quad \boldsymbol{T_{a2}} = 125℃$

4. $\Delta \boldsymbol{K} = \frac{\boldsymbol{K(B_1)} - \boldsymbol{K(B_2)}}{\frac{\boldsymbol{K(B_1)} + \boldsymbol{K(B_2)}}{2}} \times 100 \qquad \boldsymbol{K} = \frac{\boldsymbol{V_H}}{\boldsymbol{I_c} \times \boldsymbol{B}}$

# Characteristic Curves

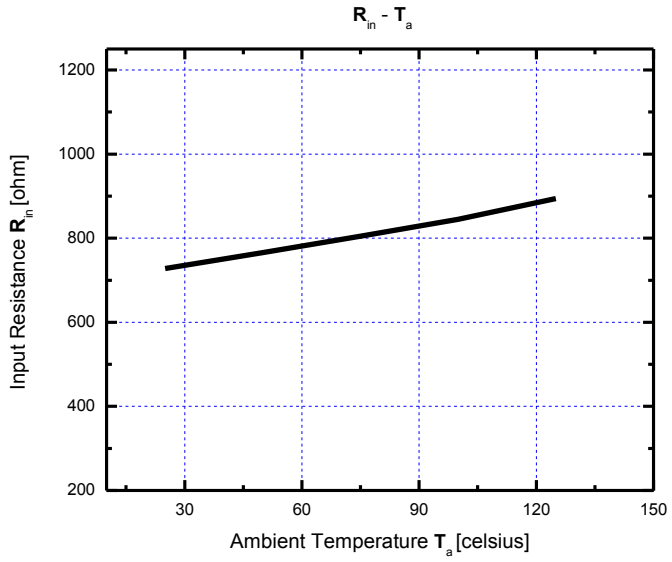



Figure 2.Input resistance $R_{in}$ as a function of ambient temperature $T_a$.

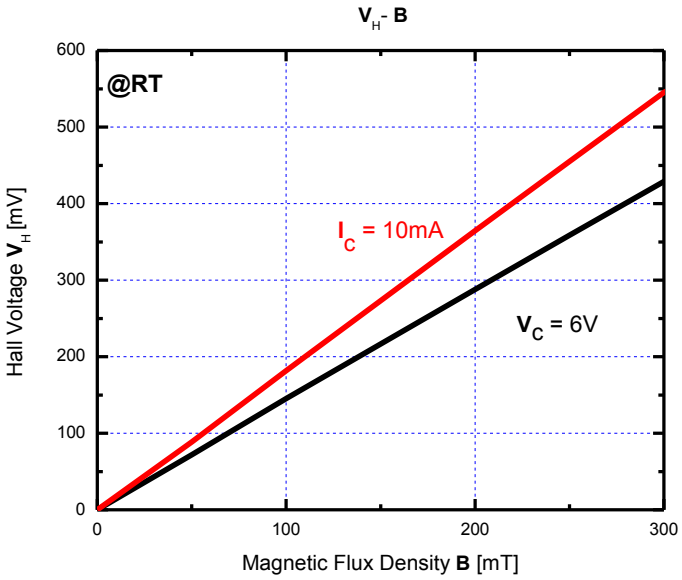



Figure 3. Hall voltage $V_H$ as a function ofmagnetic flux density $B$.

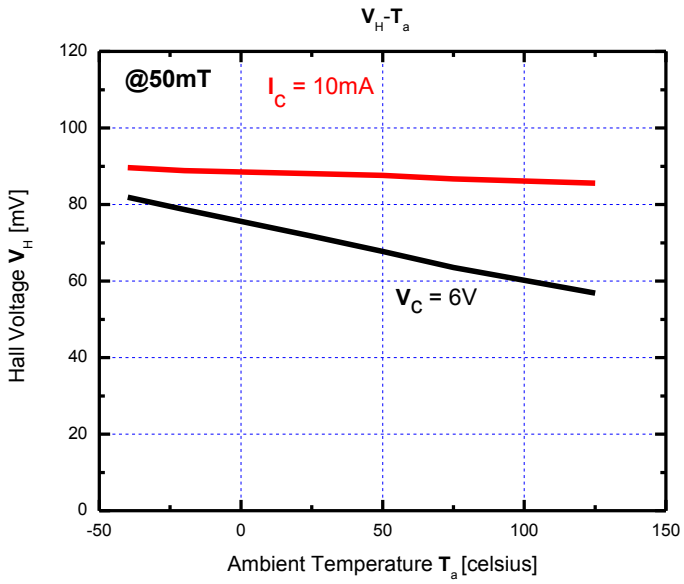



Figure 4. Hall voltage$\boldsymbol{V}_{\mathrm{H}}$ as a function of ambient temperature$\boldsymbol{T}_{\mathrm{a}}$.

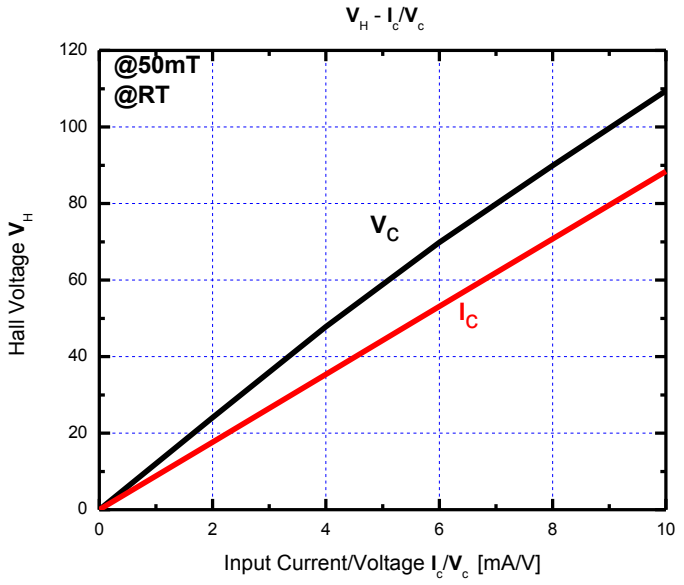



Figure 5. Hall voltage $\boldsymbol{V}_{\mathrm{H}}$ as a function of electrical stimuli $\boldsymbol{I}_{\mathrm{c}}$/ $\boldsymbol{V}_{\mathrm{c}}$.

## Reliability Test Terms

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

| No. | Terms | Conditions | Duration |
|---|---|---|---|
| 1 | High Temperature Storage (HTS) | 【JEITA EIAJ ED-4701】 $T_a$ =150 ( 0 ~ +10 ) ℃ | 1000 h |
| 2 | Heat Cycle (HC) | 【JEITA EIAJ ED-4701】 $T_a$=-55℃~150 ℃ high temp. - normal temp. - low temp. 30 min - 5 min - 30 min | 50 clcs |
| 3 | Temp. Humidity Storage (THS) | 【JEITA EIAJ ED-4701】 $T_a$ =85±3 ℃ , $R_H$ =85±5 % | 1000 h |
| 4 | Resist. to Hand Soldering Heat (RHSH) | 【JEITA EIAJ ED-4701】 Dipped in the 300±5 ℃ solder up to the 1 mm part from the body | 5sec |
| 5 | High Temp. Operating (HTO) | $T_a$ =125 ℃ , $V_c$ =7.5V | 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 ±16 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 ℃ or less.
- Duration should be 5 min or less.

### Hand soldering conditions

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

### Wave soldering conditions

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

## 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%HR, please contact the local distributor.**

- **For storage longer than 2 years**, it is recommended to store in nitrogen atmosphere with MBB sealed. Oxygen and $H_2O$ 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.