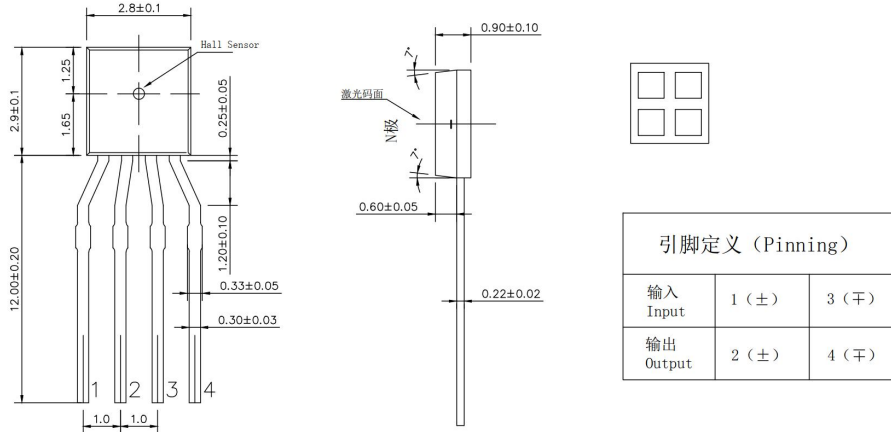


## ATHS119 GaAs Hall Element

- 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°C ~ 125°C
Storage Temperature Range	-40°C ~ 150°C
Maximum Input Current $I_{cmax}$	13mA

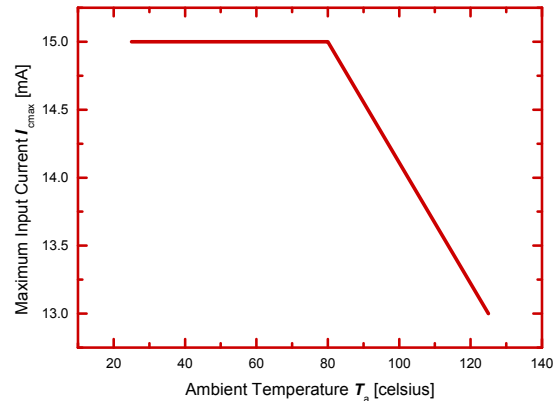


Figure 1. Maximum input current  $I_{cmax}$

### Electrical Characteristics (RT=25°C)

Table 1. Electrical Characteristics of ATHS119.

Item	Symbol	Test Condi.	Min.	Typ.	Max.	Unit
Hall Voltage	$V_H$	$B = 50mT, I_c = 5mA$ $T_a = RT$	36	45	54	mV
Input/Output Resist.	$R_{in/out}$	$B = 0mT, I_c = 0.1mA$ $T_a = RT$	650	750	850	$\Omega$
Offset Voltage	$V_{os}$	$B = 0mT, I_c = 5mA$ $T_a = RT$	-5		+5	mV
Temp. Coeff. of $V_H$	$ \alpha V_H $	$B = 50mT, I_c = 5mA,$ $T_a = 25^\circ C \sim 125^\circ C$			0.06	%/°C
Temp. Coeff. of $R_n$	$\alpha R_n$	$B = 0mT, I_c = 0.1mA,$ $T_a = 25^\circ C \sim 125^\circ C$			0.3	%/°C
Linearity of $V_H$	$\Delta K$	$B = 0.1 - 0.5T, I_c = 5mA$ $T_a = RT$	-2		+2	%

Note:

$$1. V_H = V_{H-M} - V_{os}$$

In which  $V_{H-M}$  is the Output Hall Voltage,  $V_H$  is the Hall Voltage and  $V_{os}$  is the offset Voltage under the identical electrical stimuli.

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

$$T_{a1} = 25^\circ C, T_{a2} = 125^\circ C$$

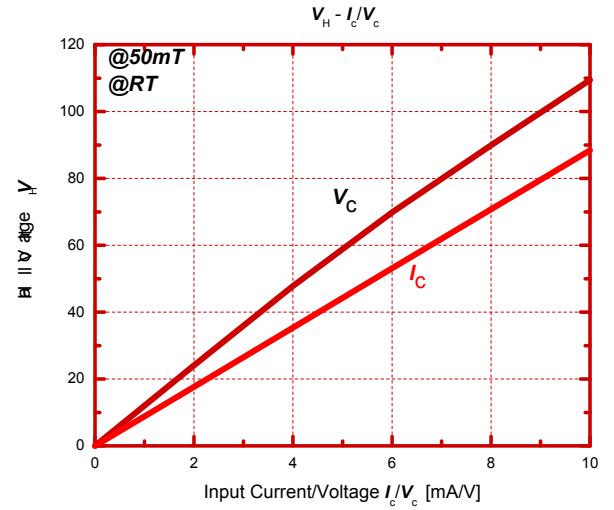
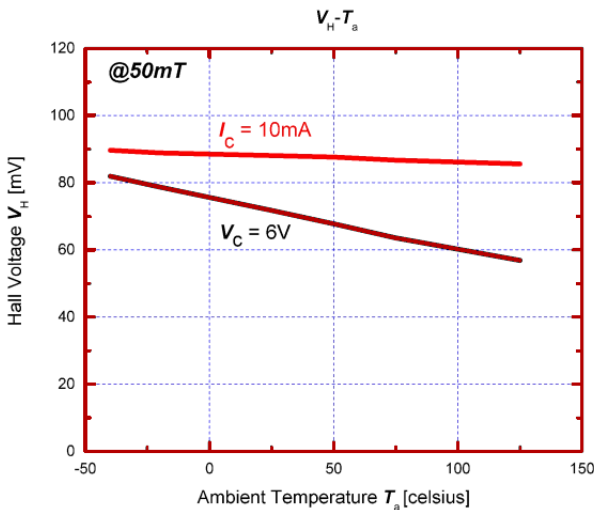
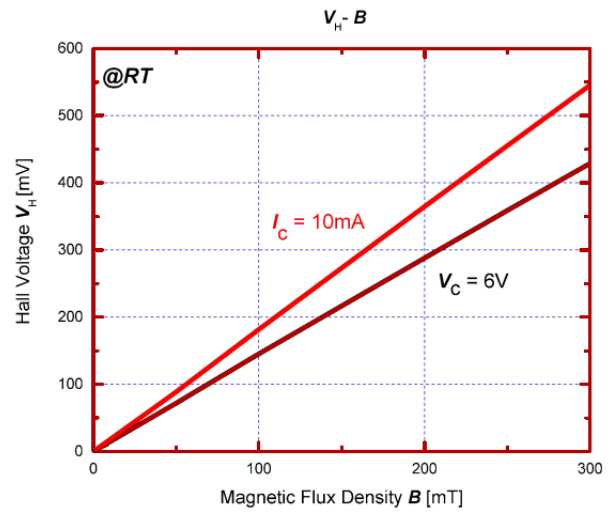
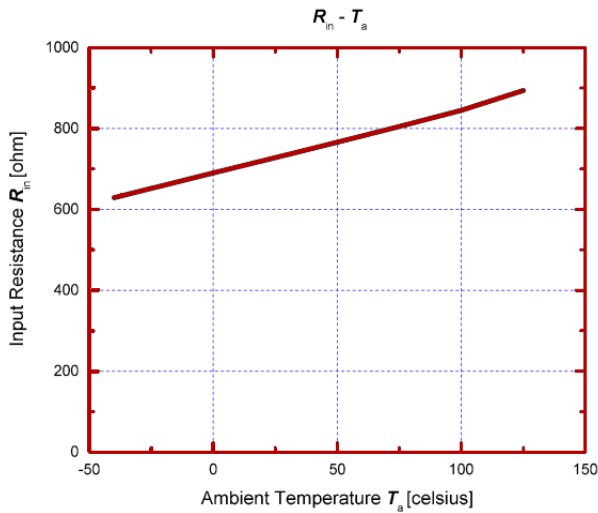
$$3. \alpha R_{in} = \frac{1}{R_{in}(T_{a1})} \times \frac{R_{in}(T_{a2}) - R_{in}(T_{a1})}{T_{a2} - T_{a1}} \times 100$$

$$T_{a1} = 25^\circ C, T_{a2} = 125^\circ C$$

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

$$B_1 = 0.5T, B_2 = 0.1T$$

## Characteristic Curves



## Reliability Test Terms

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

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

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

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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

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

### Cleansing of solder flux conditions

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

### Hand soldering conditions

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

### Wave soldering conditions

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

## Precautions for ESD

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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 anti-static suit and wristband when handling the devices.
- Implementing measures against ESD as for containers that directly touch the devices.

## Precautions for Storage

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

- **For storage longer than 2 years**

Products are sealed in MBB with a desiccant. 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

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- 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.