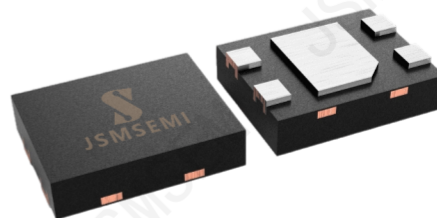


General description

- Linear InAs quantum well Hall element with excellent sensitivity and S/N ratio.
- Thin-type DFN package, shipped in packet-tape reel (10,000pcs per reel).
- Applications: linear current sensing linear displacement sensing and feed back control.



Absolute Maximum Ratings

| Item | Symbol | Conditions | Limit | Unit |
|-----------------------------|--------|------------|----------|------|
| Maximum Input Voltage | VC | Ta=25°C | 6 | V |
| Maximum Input Current | IC | | 10 | mA |
| Operating Temperature Range | Topr | | -40~+125 | °C |
| Storage Temperature Range | Tstg | | -40~+150 | °C |

Ordering Information

| Order number | Package | Operation Temperature Range | MSL Grade | Ship, Quantity | Green |
|--------------|---------|-----------------------------|-----------|----------------|-------|
| TLS113L-MCAA | DFN-4 | -40°C to +125°C | 3 | T&R, 10000 | RoHS |

Electrical Characteristics(Ta=25°C)

Table1.Electrical Characteristics of TLS113L-MCAA

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|------------------|---|------|------|------|------|
| Output Hall Voltage | V _H | B=50mT,V _C =3V | 100 | | 150 | mV |
| Input Resistance | R _{in} | B=0mT,I _C =0.1mA | 400 | | 800 | Ω |
| Output Resistance | R _{out} | B=0mT,I _C =0.1mA | 400 | | 800 | Ω |
| Offset Voltage | V _{os} | B=0mT,V _C =3V | -6 | | +6 | mV |
| Temp.Coefficient of V _H | αV _H | B=50mT,V _C =3V, Ta=25~125°C | | 0.2 | | %/°C |
| Temp.Coefficient of R _{in} | αR _{in} | B=0mT,I _C =0.1mA, Ta=25~125°C | | 0.2 | | %/°C |
| Linearity of V _H | ΔK | B=10~100mT,V _C =3V | -2 | | +2 | % |

Note:

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

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.

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

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

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

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

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

$$B_1 = 100\text{mT}, B_2 = 10\text{mT}$$

Characteristic Curves

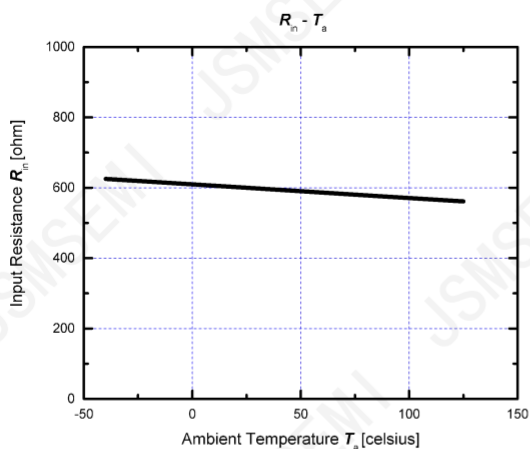


Figure 1. Input resistance R_{in} as a function of ambient temperature T_a

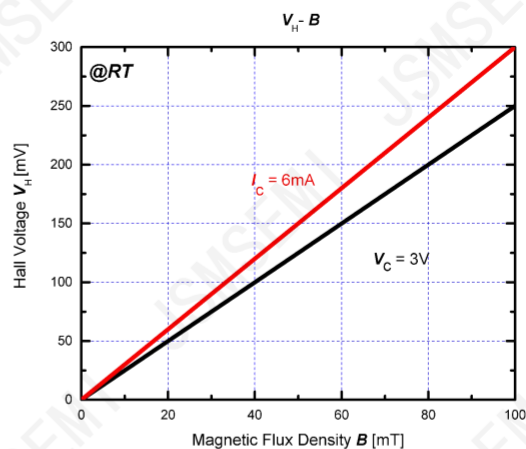


Figure 2. Hall voltage V_H as a function of magnetic flux density B

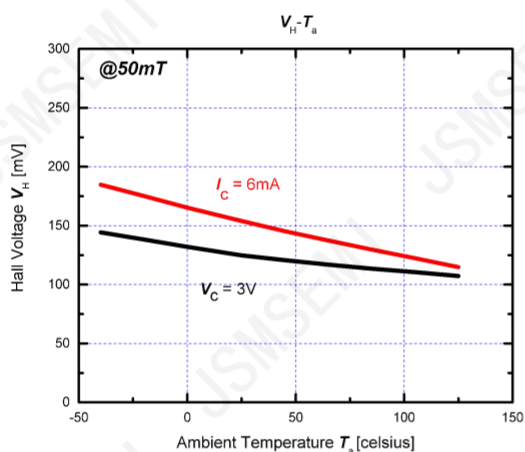


Figure 3. Hall voltage V_H as a function of ambient temperature T_a

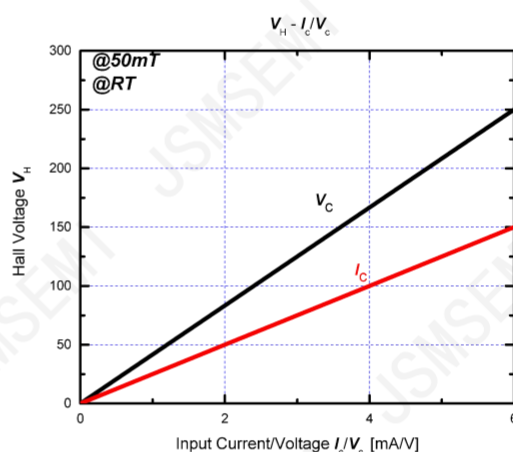


Figure 4. Hall voltage V_H as a function of magnetic flux density B

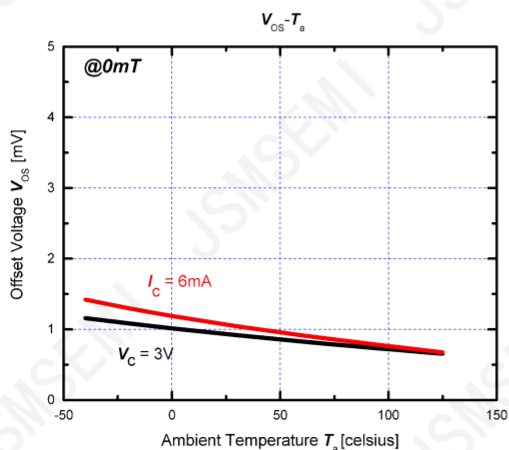


Figure 5. Offset voltage V_{OS} as a function of ambient temperature T_a

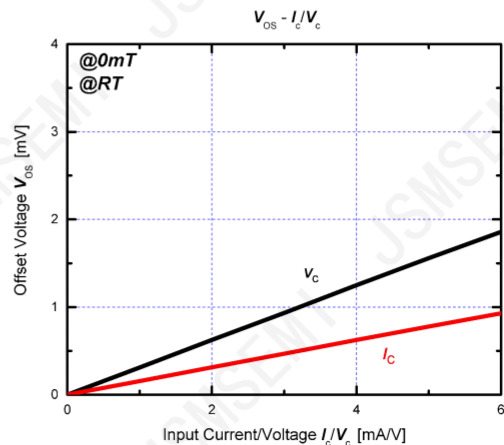
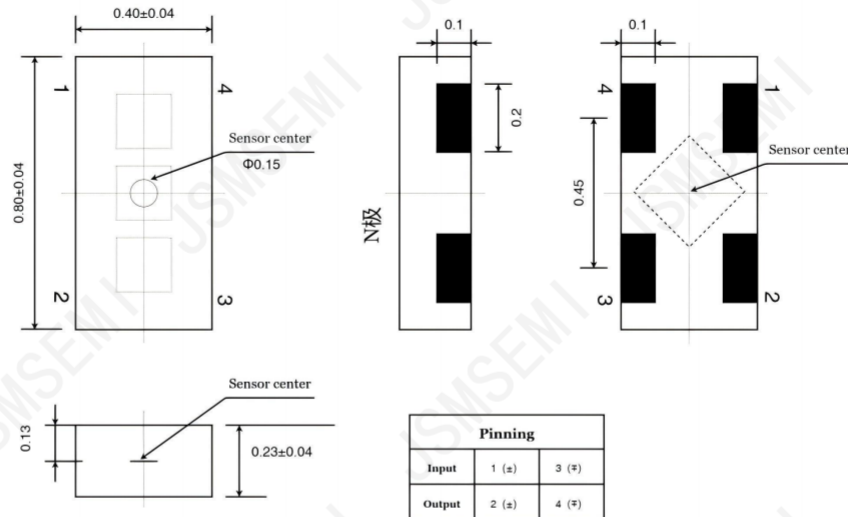
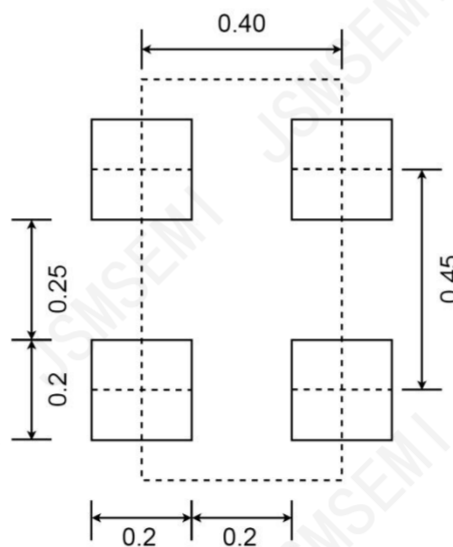


Figure 6. Offset voltage V_{OS} as a function of electrical stimuli I_c/V_c

Dimensional Drawing(Unit:mm)



Land Pattern(Reference)



Soldering Conditions(Reference)

- No rapid heating and cooling is desired.
- Preheating is recommended for 90 seconds at 150~180°C.
- Peak Temperature should be 260°C or less.

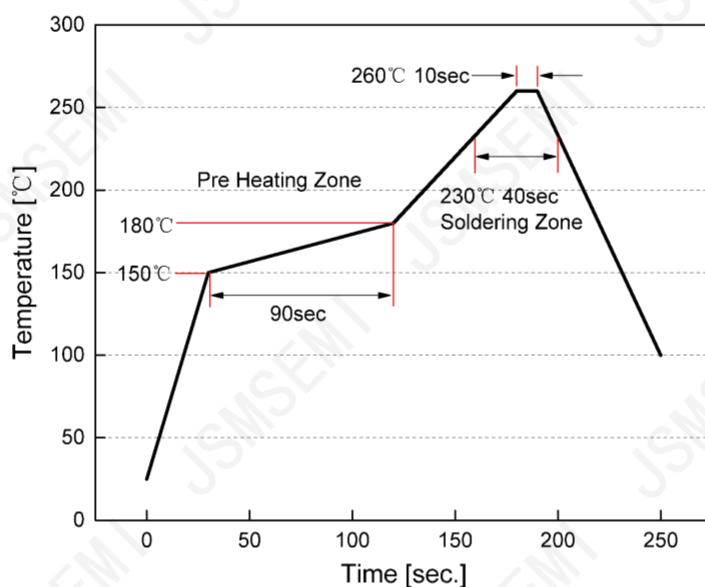
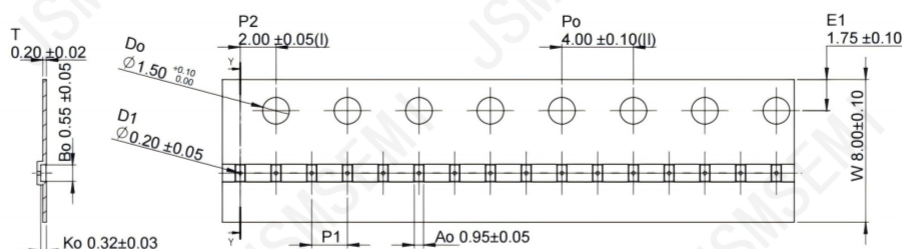


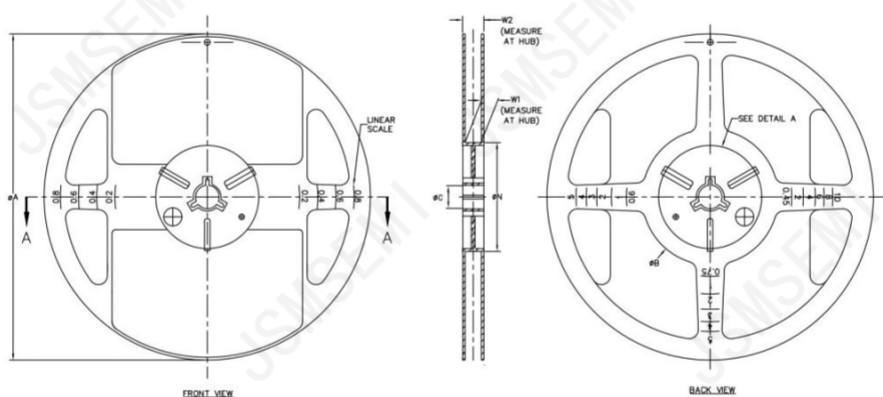
Figure 7. (Reference) Conditions of Reflow Profile

Tape&Reel Specification

Carrier tape dimension



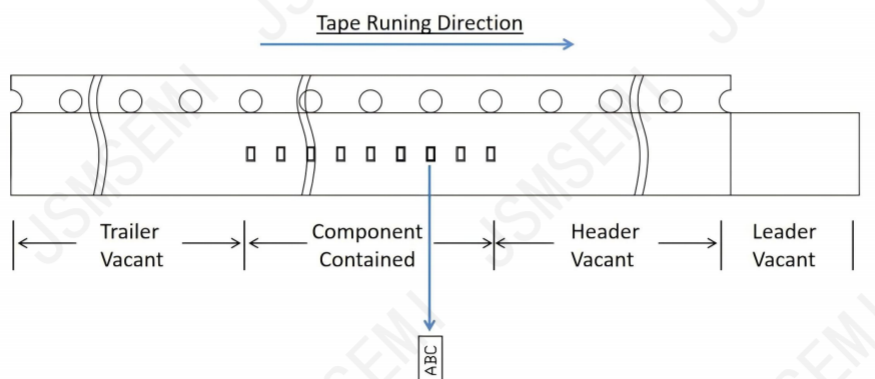
Carrier reel dimension



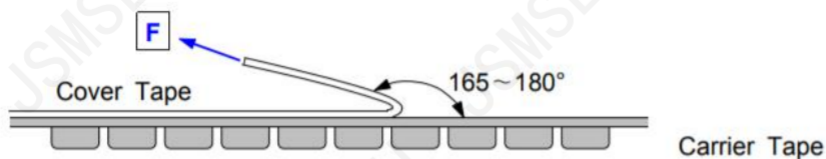
| SYMBOL | TYPE | A | B | C | N | W1 | W2 |
|--------|------|-----------|----------|----------|----------|---------|----------|
| Spec | 7 in | 178.0±1.0 | 78.0±0.5 | 13.0±0.3 | 60.5±0.5 | 9.2±0.5 | 11.4±1.0 |

Tape construction

- ① Laser marking side should face upwards, with the tape lead-out direction aligned with the long side of the carrier tape.
- ② The empty pockets of the carrier tape should be no less than 40cm.



Tape usage method



- ① The cover tape peel strength must be 20 to 80g.
- ② The product must not be attached to the cover tape.
- ③ The temperature must be below 40°C and the humidity below 80%RH. Avoid direct sunlight.
- ④ Do not pull the product out continuously.
- ⑤ The tape must not have any seams.

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 85% RH). Keep products away from chlorine and corrosive gas.
- Long-term storage may result in poor lead solder ability and degraded electrical performance even under proper conditions. For those parts, which stored long-term shall be check solder ability before it is used.
- For storage longer than 2 years, it is recommended to store in nitrogen atmosphere. Oxygen 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.

Other Precautions

Specifications may change without notice.

Revision History

| Rev. | Change | Date |
|------|-----------------|-----------|
| V1.0 | Initial version | 6/27/2021 |
| | | |

Important Notice

JSMSEMI Semiconductor (JSMSEMI) PRODUCTS ARE NEITHER DESIGNED NOR INTENDED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS UNLESS THE SPECIFIC JSMSEMI PRODUCTS ARE SPECIFICALLY DESIGNATED BY JSMSEMI FOR SUCH USE. BUYERS ACKNOWLEDGE AND AGREE THAT ANY SUCH USE OF JSMSEMI PRODUCTS WHICH JSMSEMI HAS NOT DESIGNATED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS IS SOLELY AT THE BUYER' S RISK.

JSMSEMI assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using JSMSEMI products.

Resale of JSMSEMI products or services with statements diferent from or beyond the parameters stated by JSMSEMI for that product or service voids all express and any implied warranties for the associated JSMSEMI product or s ervice. JSMSEMI is not responsible or liable for any such statements.

JSMSEMI All Rights Reserved. Information and data in this document are owned by JSMSEMI wholly and may not be edited, reproduced, or redistributed in any way without the express written consent from JSMSEMI.

Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the JSMSEMI product that you intend to use.

For additional information please contact Kevin@jsmsemi.com or visit www.jsmsemi.com