

## 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 lineardis placement 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	$V_H$	$B=50\text{mT}, V_c=3\text{V}$	100		150	$\text{mV}$
Input Resistance	$R_{in}$	$B=0\text{mT}, I_c=0.1\text{mA}$	400		800	$\Omega$
Output Resistance	$R_{out}$	$B=0\text{mT}, I_c=0.1\text{mA}$	400		800	$\Omega$
Offset Voltage	$V_{os}$	$B=0\text{mT}, V_c=3\text{V}$	-6		+6	$\text{mV}$
Temp.Coefficient of $V_H$	$ \alpha_{VH} $	$B=50\text{mT}, V_c=3\text{V},$ $T_a=25\text{~}125^\circ\text{C}$		0.2		$\text{%/}^\circ\text{C}$
Temp.Coefficient of $R_{in}$	$ \alpha_{Rin} $	$B=0\text{mT}, I_c=0.1\text{mA},$ $T_a=25\text{~}125^\circ\text{C}$		0.2		$\text{%/}^\circ\text{C}$
Linearity of $V_H$	$\Delta K$	$B=10\text{~}100\text{mT}, V_c=3\text{V}$	-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.  $\alpha V_H = \frac{1}{V_H(T_{a1})} \times \frac{V_H(T_{a2}) - V_H(T_{a1})}{T_{a2} - T_{a1}} \times 100$

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

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

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

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

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

## Characteristic Curves

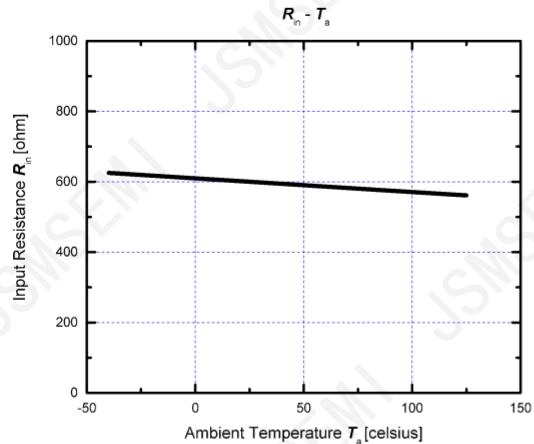


Figure 1. Input resistance  $R_{in}$  as a function of ambient temperature  $T_a$

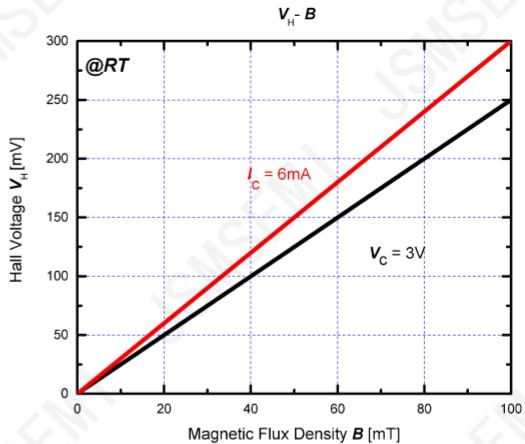


Figure 2. Hall voltage  $V_H$  as a function of magnetic flux density  $B$

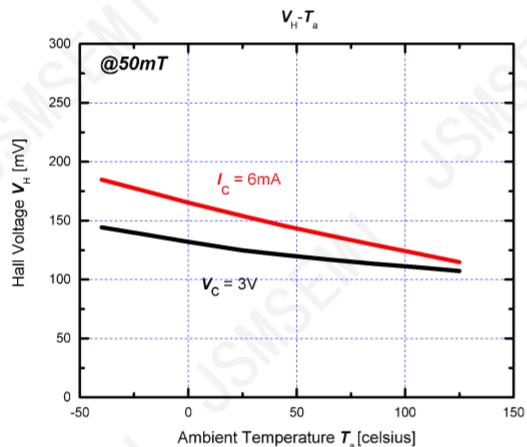


Figure 3. Hall voltage  $V_H$  as a function of ambient temperature  $T_a$

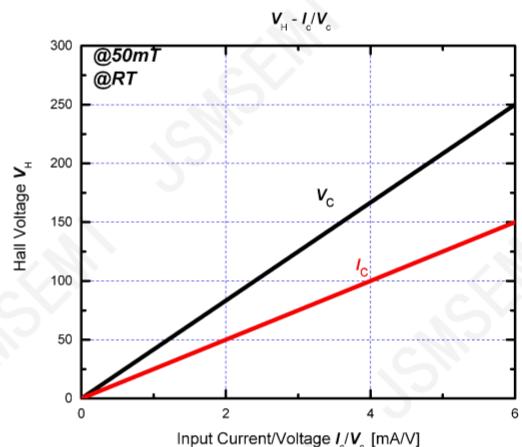


Figure 4. Hall voltage  $V_H$  as a function of magnetic flux density  $B$

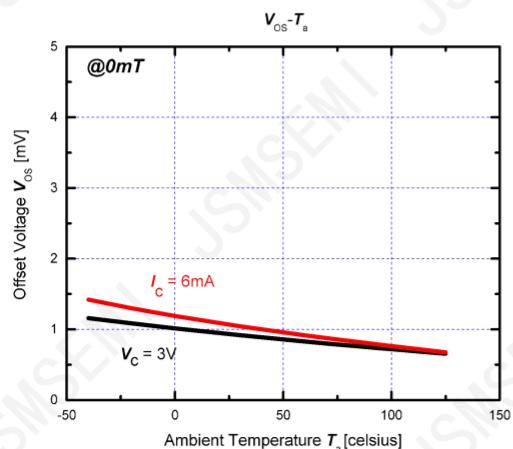


Figure 5. Offset voltage  $V_{os}$  as a function of ambient temperature  $T_a$

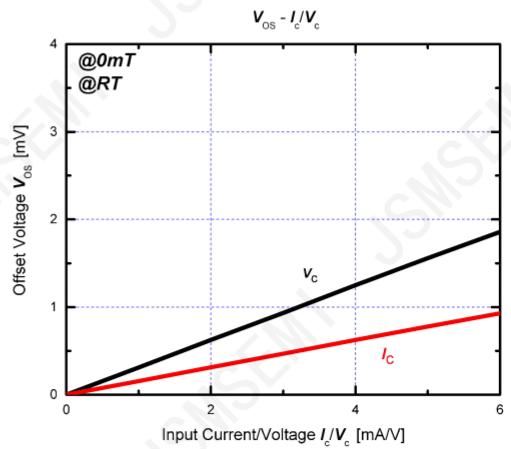
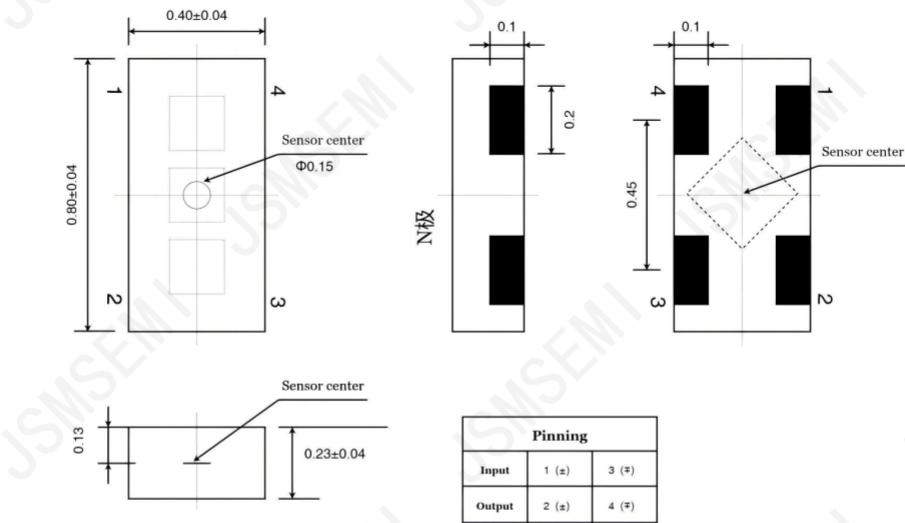
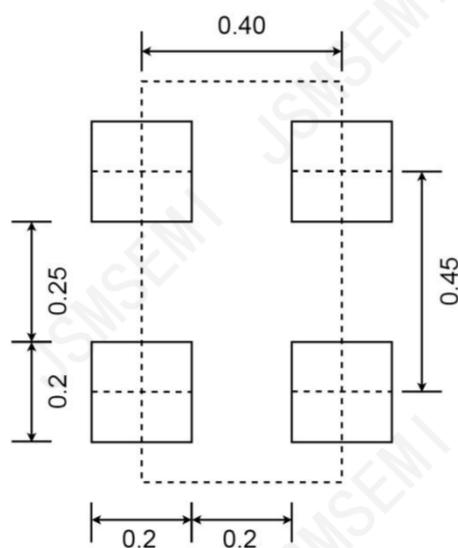


Figure 6. Offset voltage  $V_{os}$  as a function of electrical stimuli  $I_c/V_c$

Dimensional Drawing(Unit:mm)

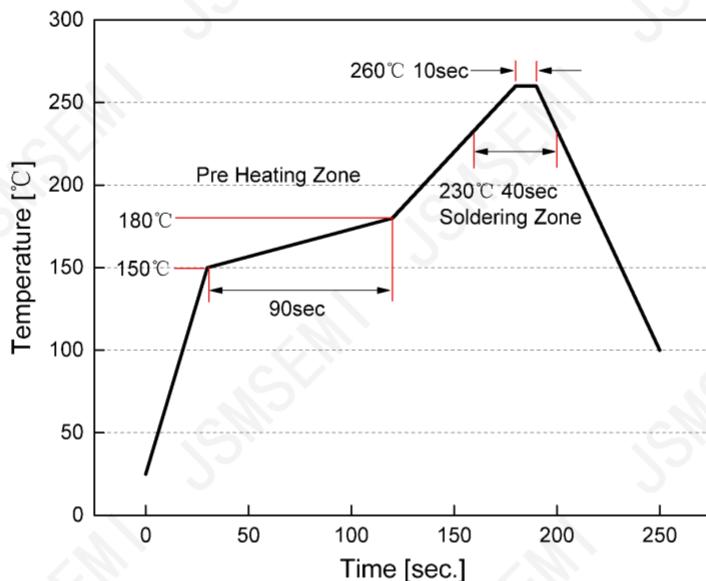


Land Pattern(Reference)



### Soldering Conditions(Reference)

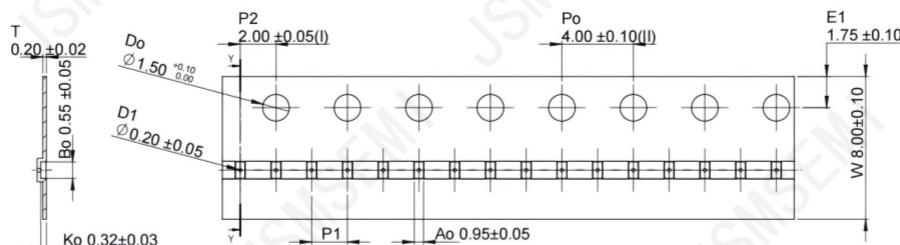
- No rapid heating and cooling is desired.
- Preheating is recommended for 90 seconds at 150~180°C.
- Peak Temperature should be 260°C or less.



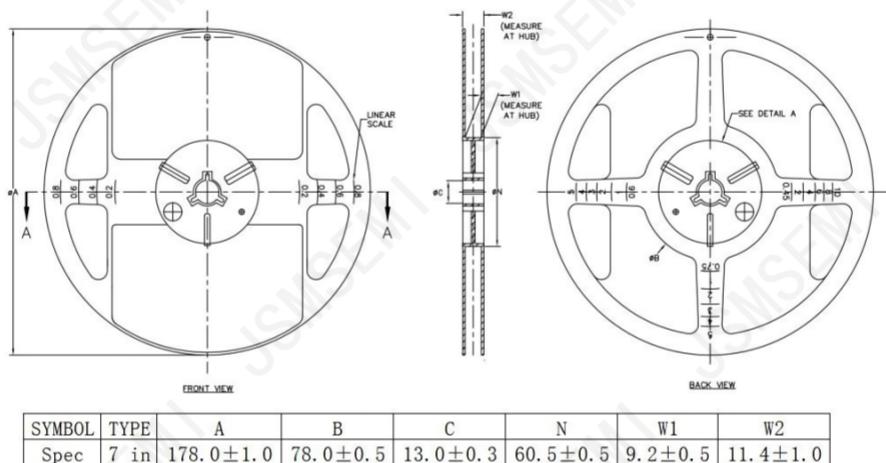
**Figure 7.** (Reference) Conditions of Reflow Profile

## Tape&Reel Specification

### Carrier tape dimension

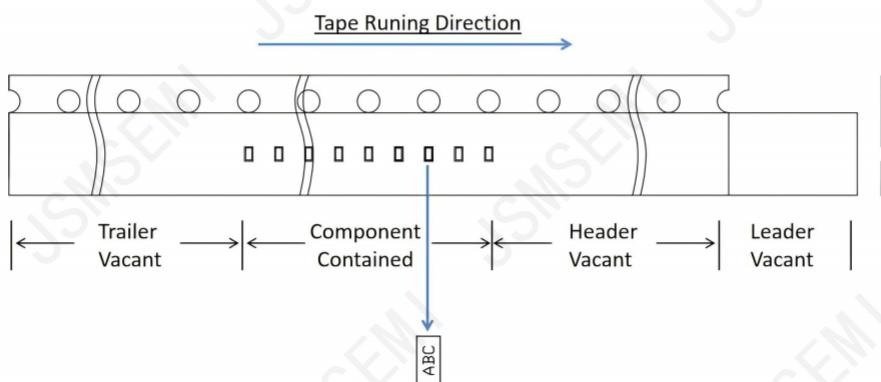


### Carrier reel dimension

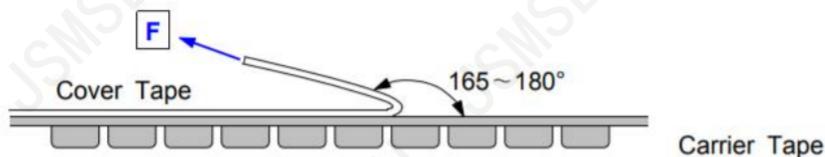


### Tape construction

- 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

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For additional information please contact [Kevin@jsmsemi.com](mailto:Kevin@jsmsemi.com) or visit [www.jsmsemi.com](http://www.jsmsemi.com)