

SPECIFICATION

MODEL : SH-61D

P/N : HE61DY2U22

Halogen Free

GaAs Hall Sensor

NANOS Co., Ltd

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Gyeonggido, 445-861, Republic of Korea

1. Description

This data sheet is applied to GaAs Hall sensor that NANOS co. Ltd., supplies.

2. Electrical specifications

2.1 Absolute maximum ratings

[Ta=25°C]

Parameter	Symbol	Rating	Unit
Maximum Input Voltage	Vc	8	V
Maximum Power Dissipation	Pmax	150	mW
Operating Temperature Range	Top	-40 ~ +125	°C
Storage Temperature Range	Tst	-40 ~ +150	°C

2.2 General electrical specifications

[Ta=25°C]

Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	Vh	Vin=6V, B=50mT	78	102	mV
Input Resistance	Rin	Ic = 0.1mA	1,600	2,400	Ω
Output Resistance	Rout	Ic = 0.1mA	3,200	4,800	Ω
Offset Voltage	Vo	Vin = 6V, B = 0mT	- 8	+ 8	mV

※ Vh=Vhm-Vo (Vhm : The output voltage measured at 50mT)

2.3 Other electrical specifications (For reference only)

[Ta=25°C]

Parameter	Symbol	Conditions	Min	Max	Unit
Temp. Coeff. of VH	αVh	Average value between Ta = 25~125°C, B=50mT, Ic=5mA	-	- 0.07	%/°C
Temp. Coeff. of Rin	αRin	Average value between Ta = 25~125°C, B=0mT, Ic=0.1mA	-	0.3	%/°C
Linearity	ΔK	B=0.1TG/0.5T Ic=5mA	-	2	%

$$\begin{aligned}
 \text{※ } \alpha_{Rin} &: \frac{1}{Rin[T1]} \times \frac{Rin[T2] - Rin[T1]}{[T2 - T1]} \times 100 & \text{※ } \Delta K &: \frac{K[B1] - K[B2]1}{[K(B1) + K(B2)]/2} \times 100
 \end{aligned}$$

$$\text{※ } \alpha_{Vh} : \frac{1}{Vh[T1]} \times \frac{Vh[T2] - Vh[T1]}{[T2 - T1]} \times 100$$

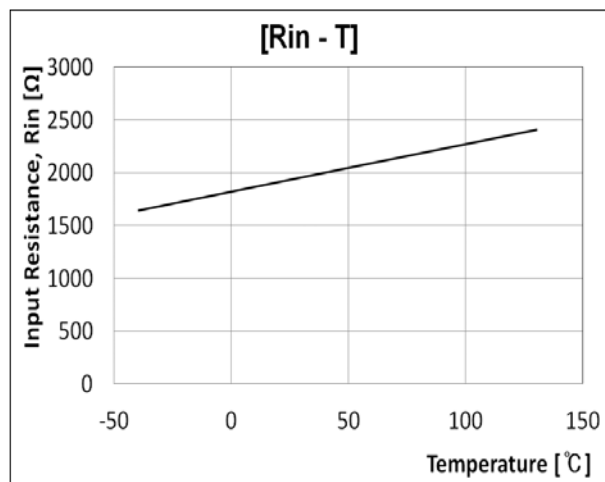
$$T1 = 25^\circ\text{C}, T2 = 125^\circ\text{C}$$

$$K = Vh / (Ic \cdot B)$$

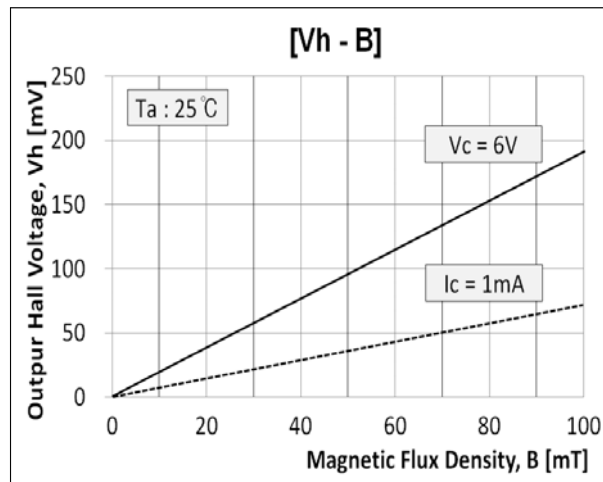
$$B1 = 0.5T, B2 = 0.1T$$

2.4 Characteristics graphs

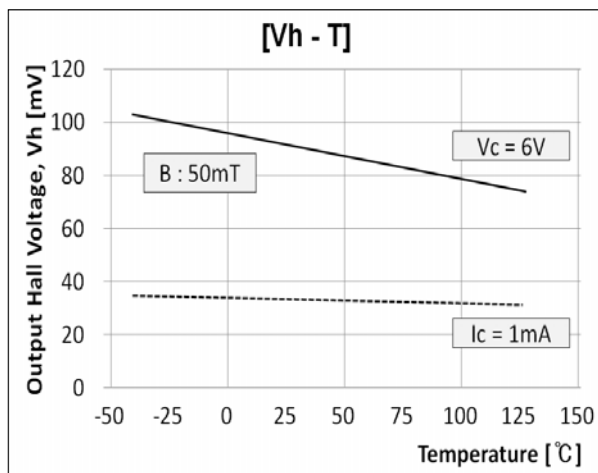
■ Rin-T



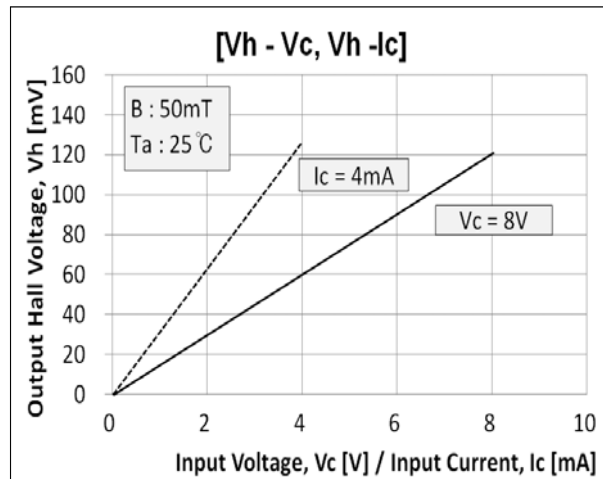
■ Vh-B



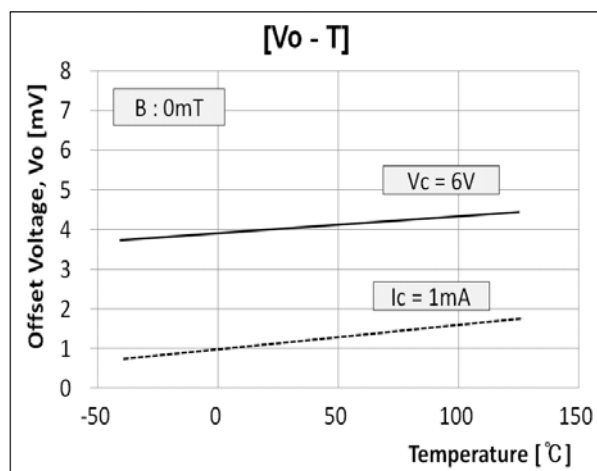
■ Vh-T



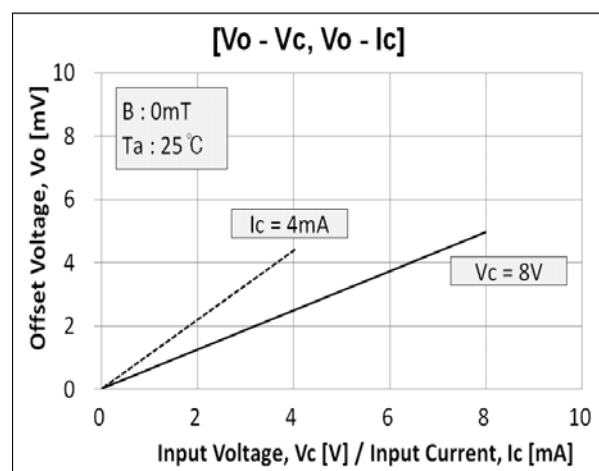
■ Vh-Vc, Vh-Ic



■ Vo-T [For reference only]



■ Vo-Vc [For reference only]



※ Voltage constant operation

※ Vo-T and Vo-Vc sample : Rin = 2036[Ω], Vo = 4.19[mV]

3. Method for mounting

3.1 Lead frame

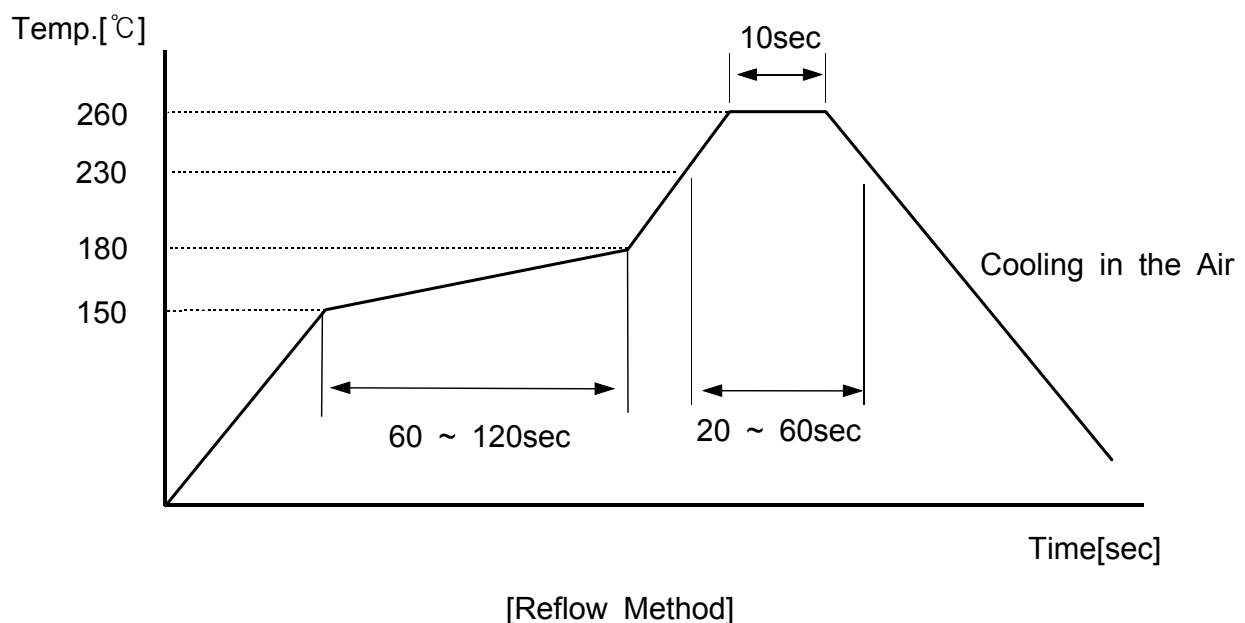
- 1) The material of lead frame is phosphor bronze alloy and the wire bonded surface is plated by silver. The minimum thickness of silver plating is $2.0\mu\text{m}$.
- 2) Lead frame is plated by pure Sn and the thickness is controlled by $4\sim 12\mu\text{m}$.

3.2 Soldering conditions on PCB

- 1) No rapid heating and cooling is desired.
- 2) Preheating is recommended for 60 ~ 120secs at $150\sim 180^\circ\text{C}$.
- 3) Reflowing is recommended for 10seconds at 260°C .

3.3 Soldering method and temperature

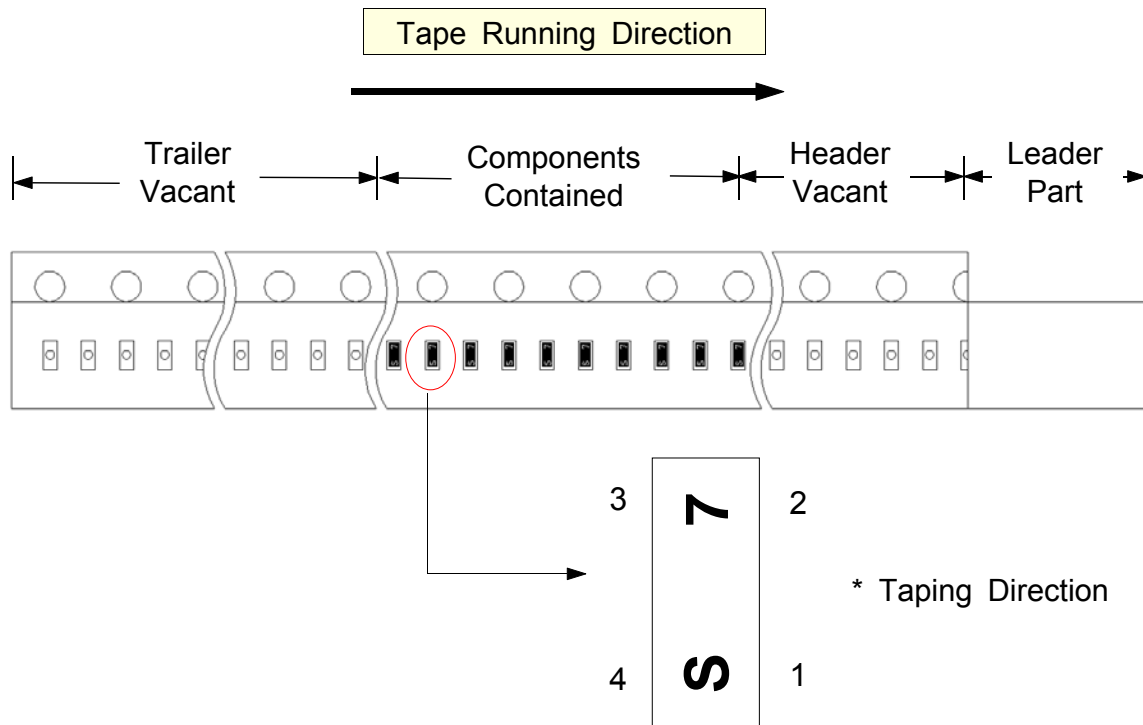
Items	Method	Temperature
Reflow	Soldering by passing the heated zone	Max 260°C in 10sec
Solder Iron	Soldering by solder-iron	Max 350°C in 3sec



4. Packaging

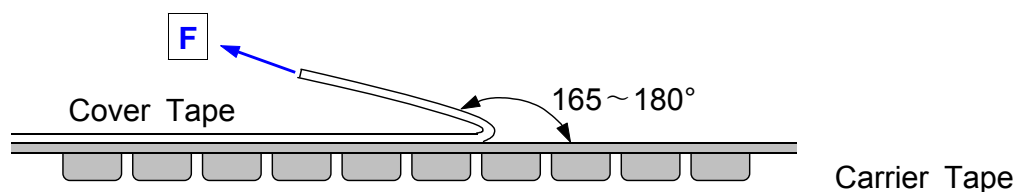
4.1 Taping

- 1) SH-61D should be packed and marking is possible to see through cover tape.
- 2) At least, 100mm vacant parts are made both front and rear side of tape.



4.2 Taping specifications

- 1) Pull Strength(F) = 20~70g



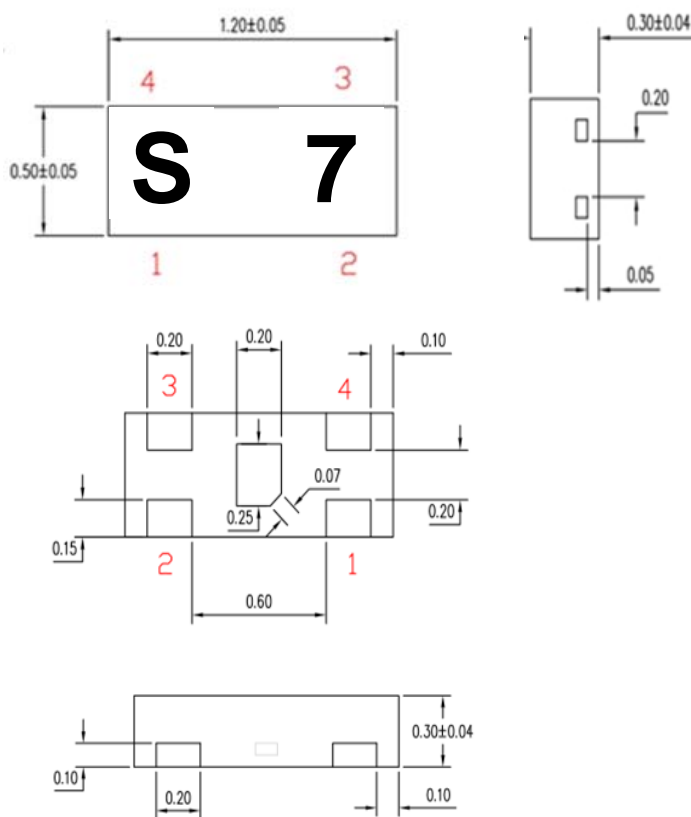
- 2) Devices should not run out of a pocket when tape is bent down 15mm curvature.
- 3) Devices should not stick to cover tape.
- 4) Devices should be kept below 40°C and below RH80% in the shade.
- 5) Tape has no joint.

4.3 Packing unit

- 1) 10,000pcs of devices are packed in one reel.
- 2) Five reels are packed in one inner box.
- 3) Four inner boxes, 200,000pcs of devices, are packed in one outer box.
- 4) Dummy could be packed for safe dealing.

5. External dimensions and appearance

5.1 External dimensions [Unit :mm]



Pin No.	Description
1	Input +
2	Output +
3	Input -
4	Output -

※ No.3 and center pad are electrically connected.

5.2 Marking method

Devices should be marked by LASER beam in the form of 「Y/M + Date」.



5.2.1 Year and Month marking table

Y/M	14/1	14/2	14/3	14/4	14/5	14/6	14/7	14/8
Mark	1	2	3	4	5	6	7	8
Y/M	14/9	14/10	14/11	14/12	15/1	15/2	15/3	15/4
Mark	9	A	B	C	D	E	F	G
Y/M	15/5	15/6	15/7	15/8	15/9	15/10	15/11	15/12
Mark	J	K	L	M	N	P	R	S
Y/M	16/1	16/2	16/3	16/4	16/5	16/6	16/7	16/8
Mark	1▪	2▪	3▪	4▪	5▪	6▪	7▪	8▪
Y/M	16/9	16/10	16/11	16/12	17/1	17/2	17/3	17/4
Mark	9▪	A▪	B▪	C▪	D▪	E▪	F▪	G▪
Y/M	17/5	17/6	17/7	17/8	17/9	17/10	17/11	17/12
Mark	J▪	K▪	L▪	M▪	N▪	P▪	R▪	S▪

5.2.2 Date marking table

Date	1	2	3	4	5	6	7	8
Mark	1	2	3	4	5	6	7	8
Date	9	10	11	12	13	14	15	16
Mark	9	A	B	C	D	E	F	G
Date	17	18	19	20	21	22	23	24
Mark	J	K	L	M	N	P	R	S
Date	25	26	27	28	29	30	31	
Mark	T	U	V	W	X	Y	Z	

6. Reliability test specifications

6.1 Test item and condition

No	Test item	Test condition	Quantity	Time
1	High Temp. High Humidity	Ta=85±5℃, Relative Humidity=85±5%RH	22pcs	1,000HR
2	High Temp. Operating	Ta=125±5℃, Vc=6.0V±10%	22pcs	1,000HR
3	Preconditioning	Preconditioning : Ta=150±5℃, 24HR Moisture Absorption : Ta=85±5℃, 85±5%RH, 168HR Reflow : Ta=260±5℃, 10sec	22pcs	2Cycle
4	High Temp. Storage	Ta=150±5℃	22pcs	1,000HR
5	Temp. Cycle	-55±5℃, 30min ↔ 25℃, 5min ↔ 150±5℃, 30min	22pcs	50Cycle

6.2 Criterion for judging

After each reliability test, samples should be store at least 24hrs in room temp. & humidity, and then measure.

Item	Specification
Rin	Change rate[%] : ±20%↓
Rout	
VH	
Vo	Max. ±16mV