



SPECIFICATION

(Approval sheet of GaAs Hall Sensor)

Part Name	GaAs Hall Sensor	Image
Product No.	HE71DY2U23	
User Code		
Revision	Rev.1	
Manufacturer	NANOS Co., Ltd.	

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GaAs Hall Sensor Specification	DATE : 2017.03.18
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1. Revision History

Date	Rev. No	Contents revised	Design	Approval
0	2015.3.30	Establishment	K.I.Jun	J.H.Lee
1	2017.3.18	Marking Change : Page 11	C.S.Kim	K.C.Cho

Model : HE71DY2U23 (SH-71D)	Revision	1
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2. Electrical Characteristic

2.1 Absolute maximum ratings

[Ta=25℃]

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

2.2 General electrical specifications

[Ta=25℃]

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℃]

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

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

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

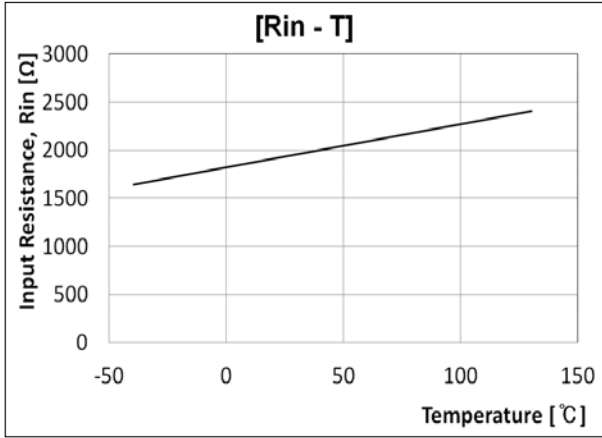
$$T1 = 25^\circ\text{C}, T2 = 125^\circ\text{C}$$

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

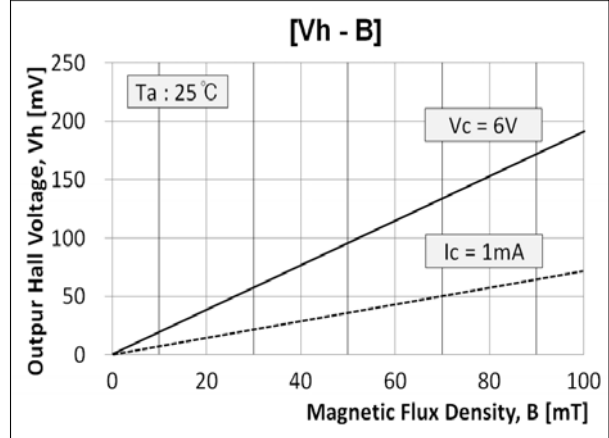
$$B1 = 0.5T, B2 = 0.1T$$

2.4 Characteristic graphs

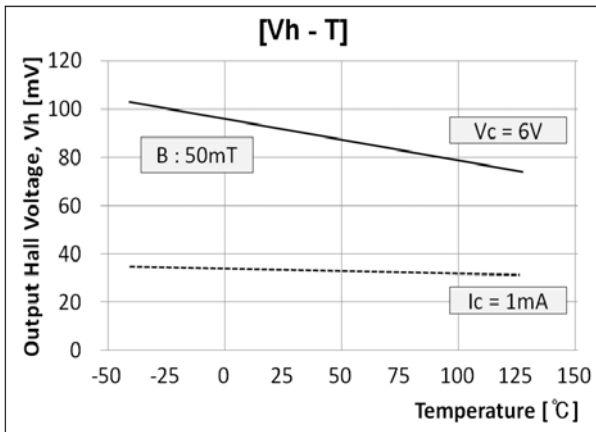
■ Rin-T



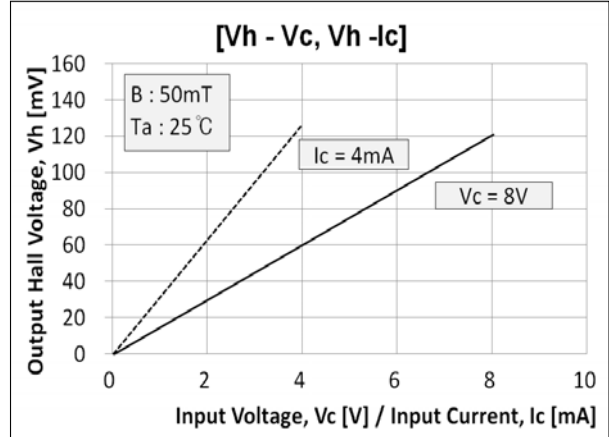
■ Vh-B



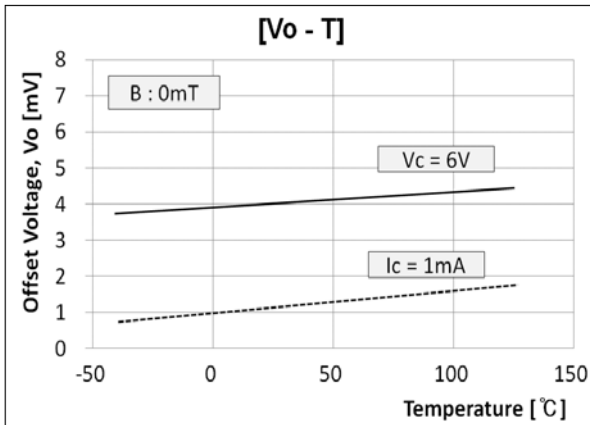
■ Vh-T



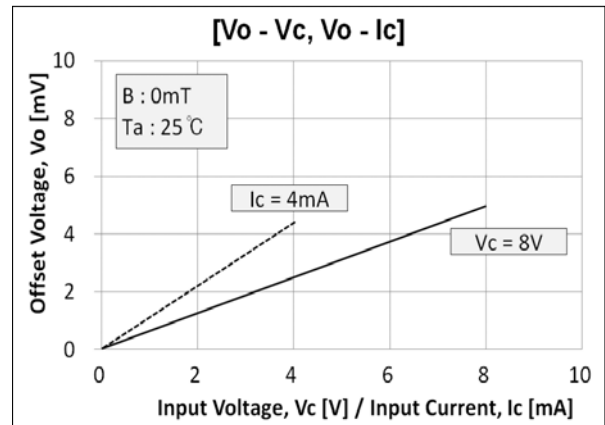
■ Vh-Vc, Vh-Ic



■ Vo-T [For reference only]



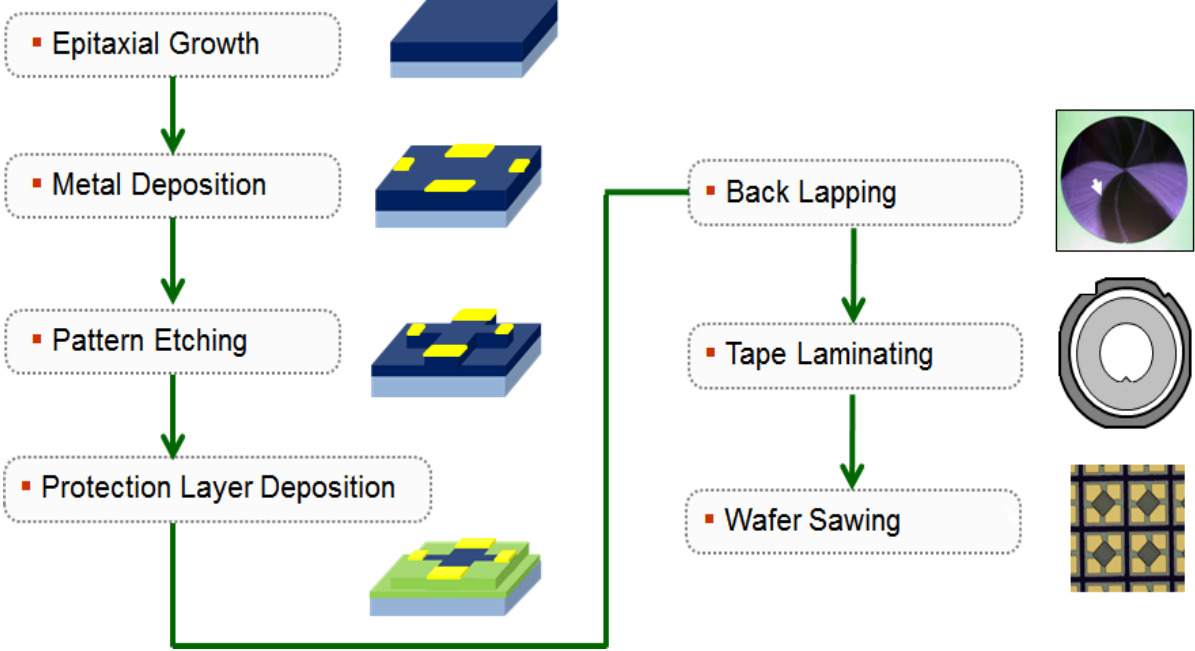
■ Vo-Vc [For reference only]



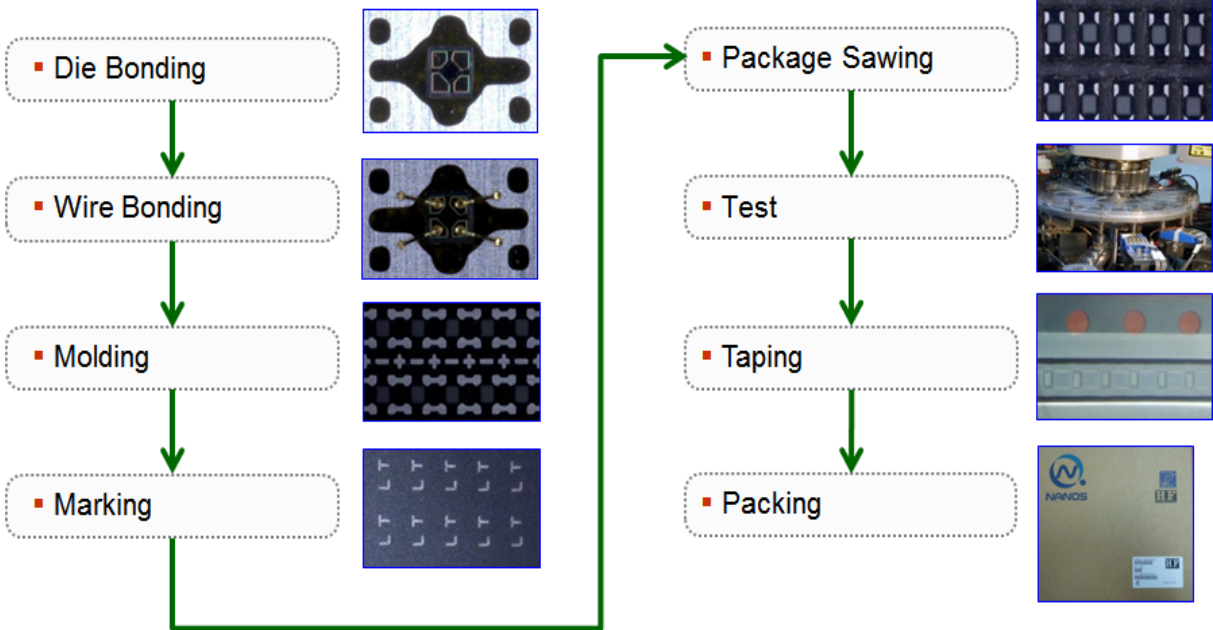
※ Magnetic Flux Density 1[mT] = 10 [G]

3. Manufacturing Process

FAB

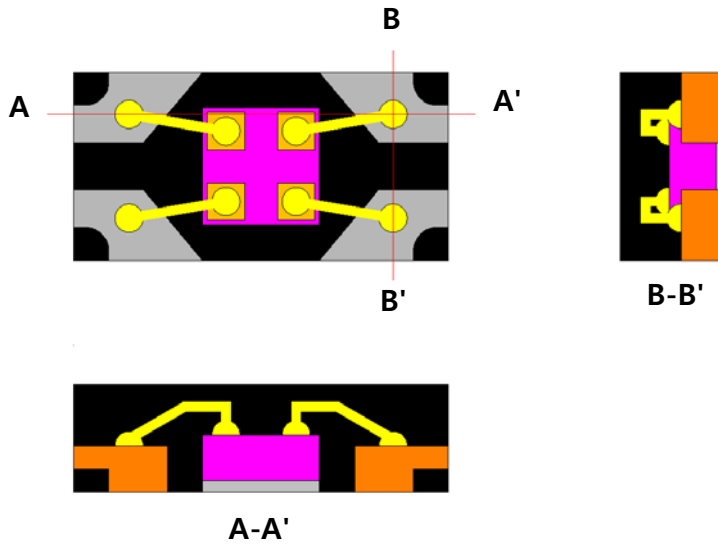


Package

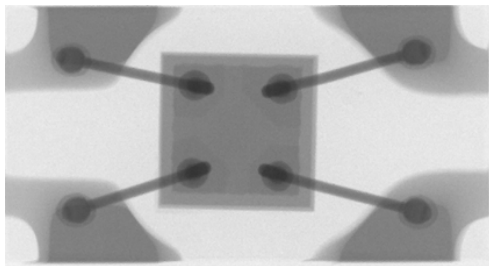


4. Internal Structure and X-Ray Image

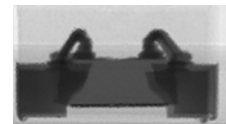
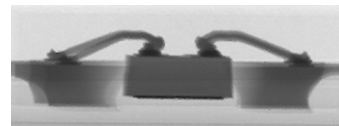
4.1 Internal Structure



4.2 X-Ray Image



[Top View]



[Side View]

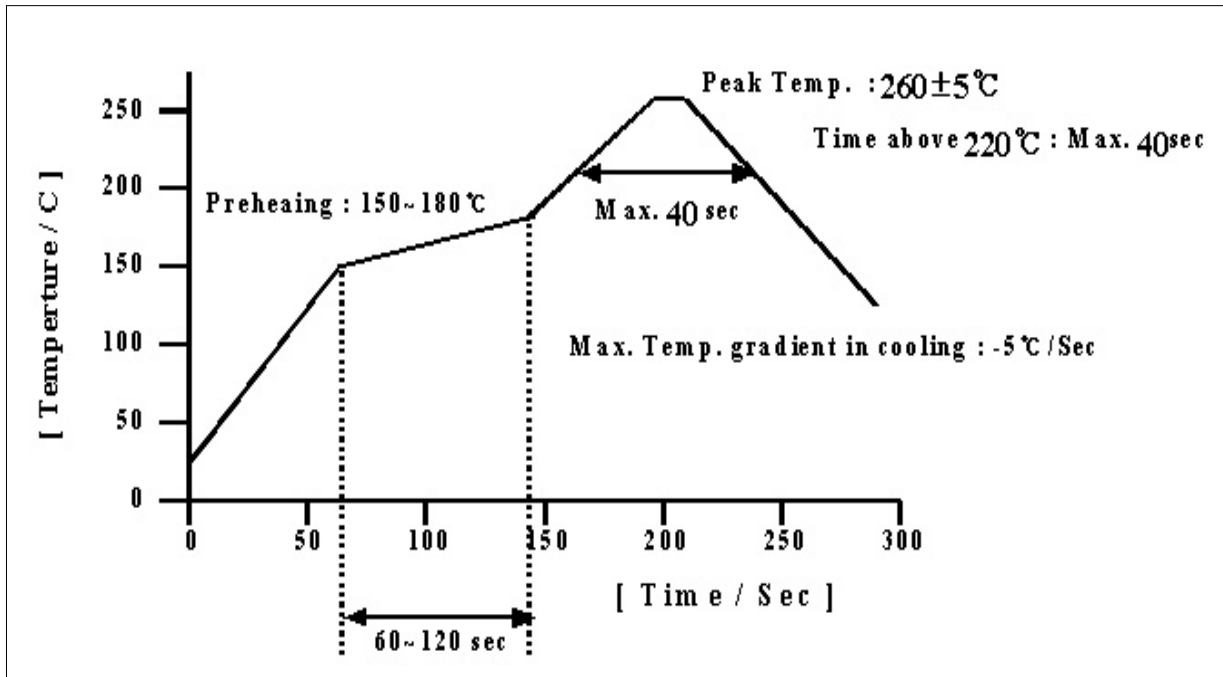
5. Part List

Part	Material
Chip	GaAs
Au Wire	4N-Au
Epoxy Molding Compound	Silica, Epoxy etc.
Lead Frame	Cu Alloy
DAF	Epoxy Resin, Silica

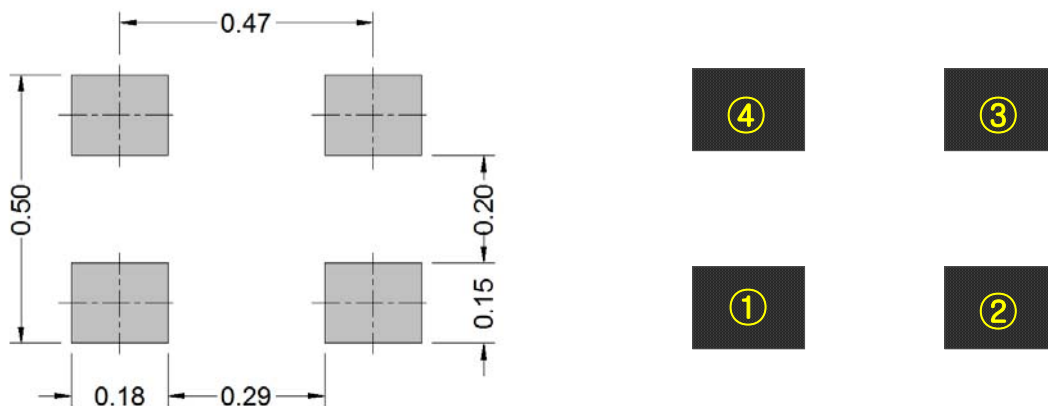
6. Reflow Profile

6.1 Reflow Condition

- 1) No rapid heating and cooling is desired.
- 2) Preheating is recommended for 1~2minutes at 150~180°C.
- 3) Reflowing is recommended for 10~20seconds at 220~260°C.



6.2 PCB Land Pattern [unit : mm]

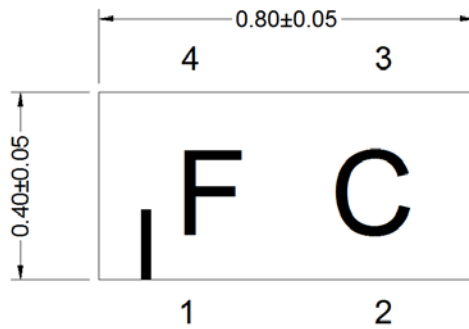


7. Package Specification

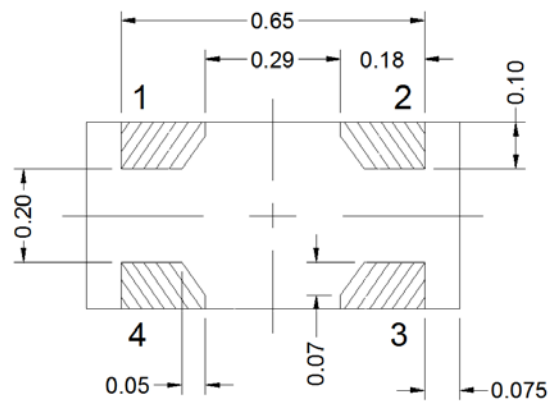
7.1 Package Dimensions [unit : mm]

W x L x H = 0.80 ± 0.05 [mm] x 0.40 ± 0.05 [mm] x 0.23 ± 0.04 [mm]

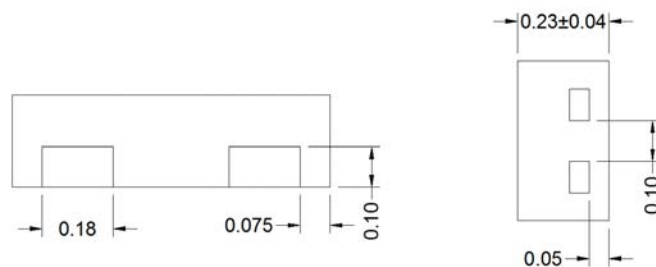
1) Top View



2) Bottom View



3) Side View

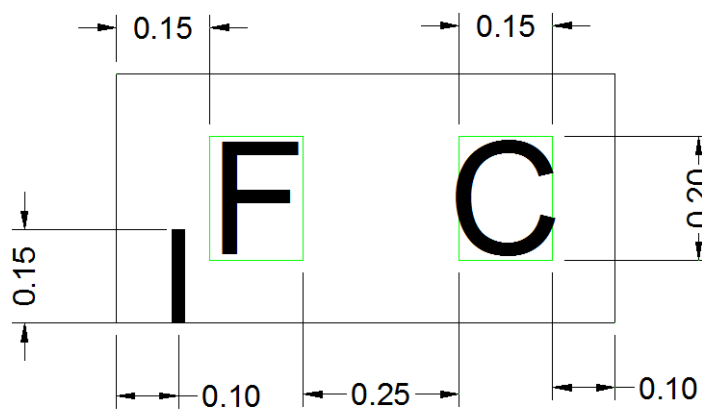


7.2 Pin Description

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

7.3 Marking (Date Code) Specifications

1) Marking Position & Size [unit : mm]



2) Marking (#1 Pin and Production Code)

- Ⓐ Bar : #1 Pin
- Ⓑ 1'st Character : Production Year/Month
- Ⓒ 2'nd Character : Production Date

7.4 Marking Method : Laser Marking

7.5 Marking Table

1) Bar & 1'st Character : #1 Pin & Production Year/Month

Y/M	17/1	17/2	17/3	17/4	17/5	17/6	17/7	17/8
Mark	┐D	┐E	┐F	┐H	┐I	┐J	┐L	┐N
Y/M	17/9	17/10	17/11	17/12	18/1	18/2	18/3	18/4
Mark	┐T	┐U	┐V	┐X	┐Y	┐Z	┐1	┐2
Y/M	18/5	18/6	18/7	18/8	18/9	18/10	18/11	18/12
Mark	┐5	┐7	┐C	┐E	┐F	┐H	┐I	┐J
Y/M	19/1	19/2	19/3	19/4	19/5	19/6	19/7	19/8
Mark	┐L	┐N	┐T	┐U	┐V	┐X	┐Y	┐Z
Y/M	19/9	19/10	19/11	19/12	20/1	20/2	20/3	20/4
Mark	┐1	┐2	┐5	┐7	┐C	┐E	┐F	┐H
Y/M	20/5	20/6	20/7	20/8	20/9	20/10	20/11	20/12
Mark	┐I	┐J	┐L	┐N	┐T	┐U	┐V	┐X

2) 2'nd Character: Production Date

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

8. Packing Specification

8.1 Packing Method

1) Reel + Humidity Card + Absorbent



- Reel Taping Q'ty : 10kpcs/reel
- Humidity Card : 1ea/reel
- Absorbent : 1ea/reel
- Barcode Label : Print the HF Mark

+



2) 1Reel +1Humidity Card +1Absorbent → 1Al Bag



- Al Bag : 1reel/bag
- Contents : 1Reel +1Humidity Card +1Absorbent
- Barcode Label : Print the HF Mark

3) 1Al Bag → 1Reel Box



- 1Reel Box : 1Al Bag / 1Reel Box
- Contents : 1Al Bag (1Reel +1Humidity Card + 1Absorbent)
- Q'ty : 10kpcs
- Barcode Label : Print the HF Mark

4) 1Reel Box x 5EA → 1Inner Box



- 1Inner Box : (1Reel Box x 5EA) / 1Inner Box
- Contents : 1Reel Box x 5EA
- Q'ty : 50kpcs
- Barcode Label : Print the HF Mark

5) 1Inner Box x 4EA → Outer Box



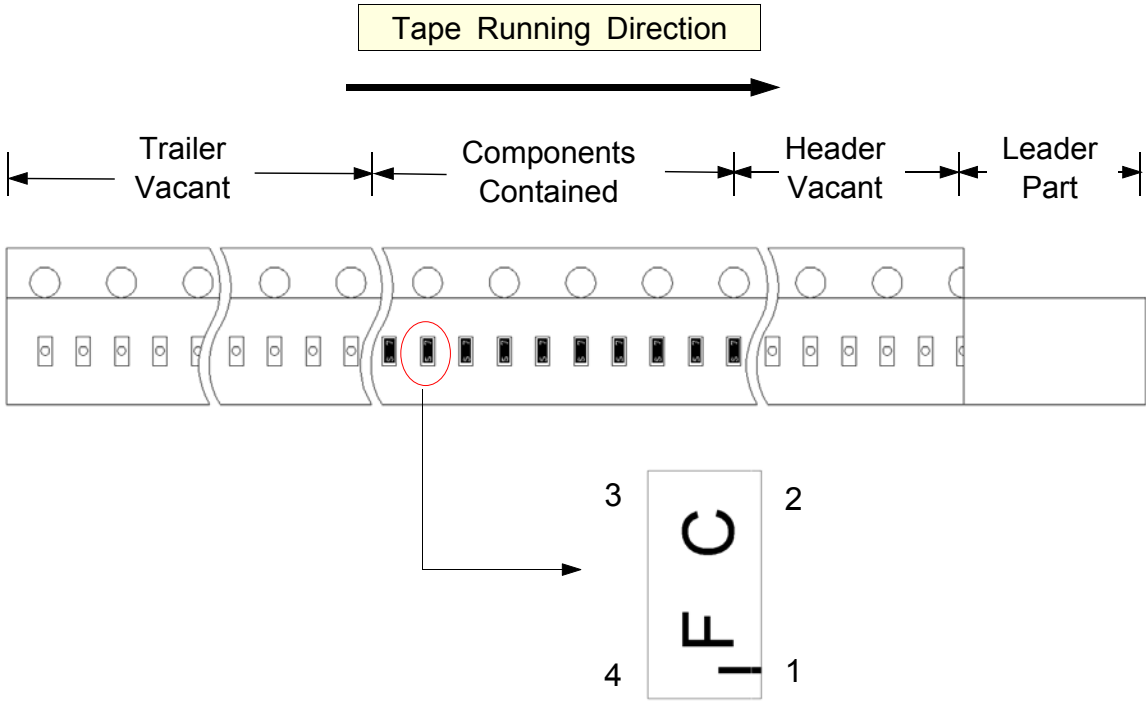
- Outer Box : 1Inner Box x 4EA / Outer Box
- Contents : 1Inner Box x 4EA
- Q'ty : 200kpcs
- Barcode Label : Print the HF Mark

8.2 Packing Unit

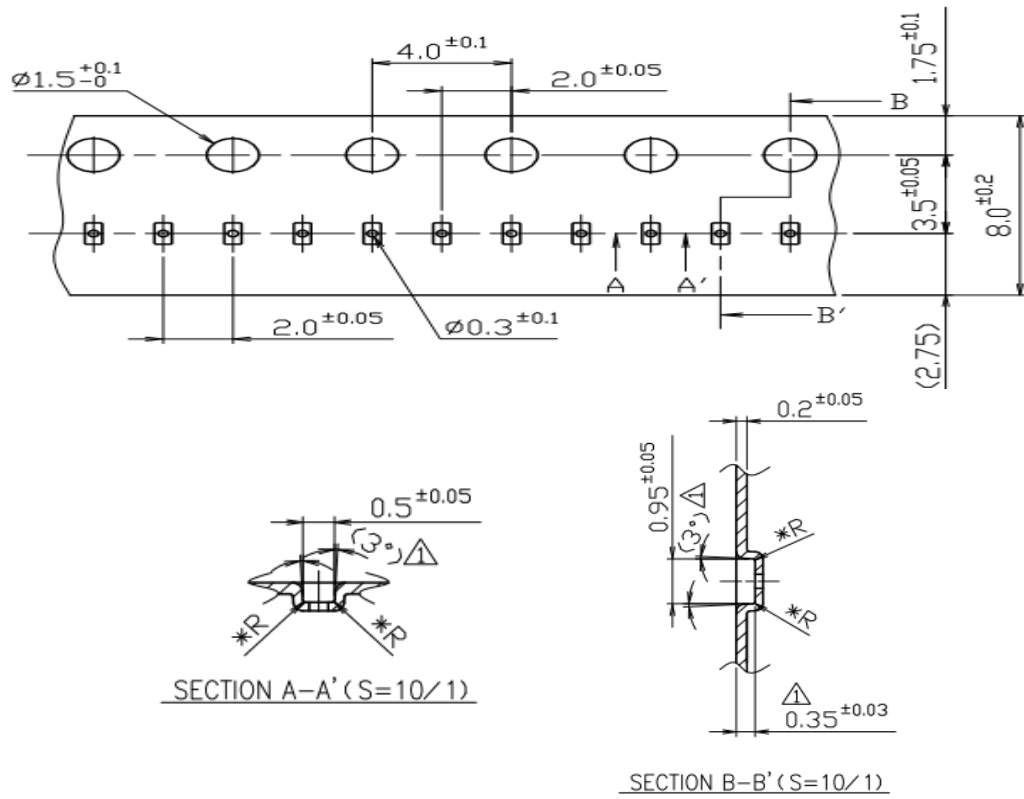
- 1) 10,000pcs of devices are packed in one reel.
- 2) 1reel is packed in one Al bag and 1reel box.
- 3) Five 1reel boxes are packed in one inner box.
- 4) Four inner boxes, 200,000pcs of devices, are packed in one outer box.
- 5) Dummy could be packed for safe dealing.

8.3 Taping

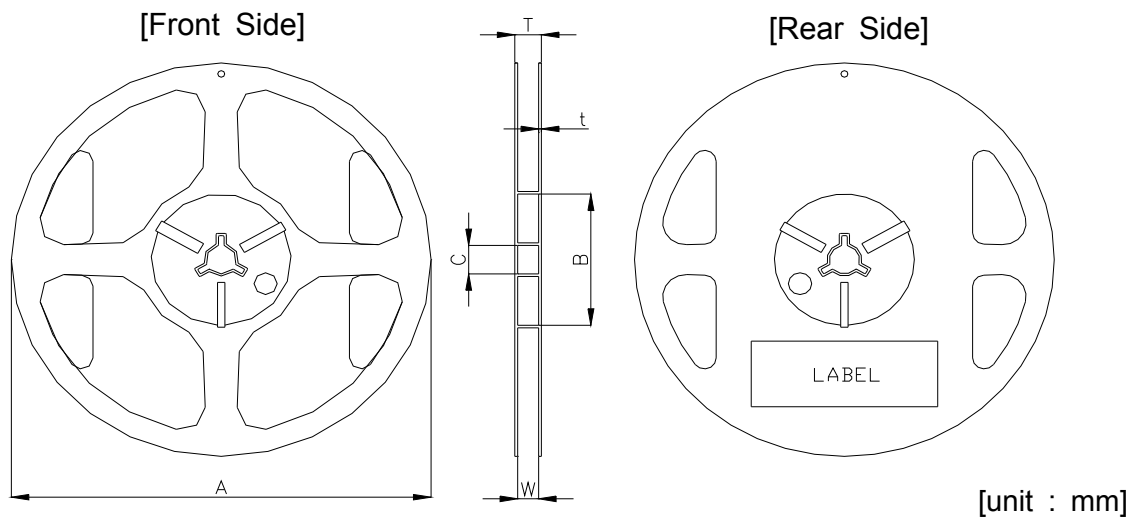
- 1) SH-71D should be packed and marking is possible to see through cover tape.
- 2) At least, 100mm vacant parts are made both front and rear side of tape.



8.3 Carrier Tape Drawing [unit : mm]



8.4 Reel Drawing [unit : mm]



SYMBOL	A	B	C	W	T	t
Spec.	$\phi 180^{+0}_{-3}$	$\phi 60^{+1}_{-0}$	$\phi 13 \pm 0.3$	9 ± 0.3	11.4 ± 1.0	2.0 max.

9. Reliability Test Specification

9.1 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

9.2 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