1．SCOPE

This product specification is applied to the magnetic switch AS-M15NA-R.

2．MURATA PART NUMBER

2-1　Part Description

Magnetic Switch

2-2　Murata Part Number

AS-M15NA-R

3．DIMENSIONS AND SCHEMATICS

3-1　Dimensions

SON-4 Pin Package

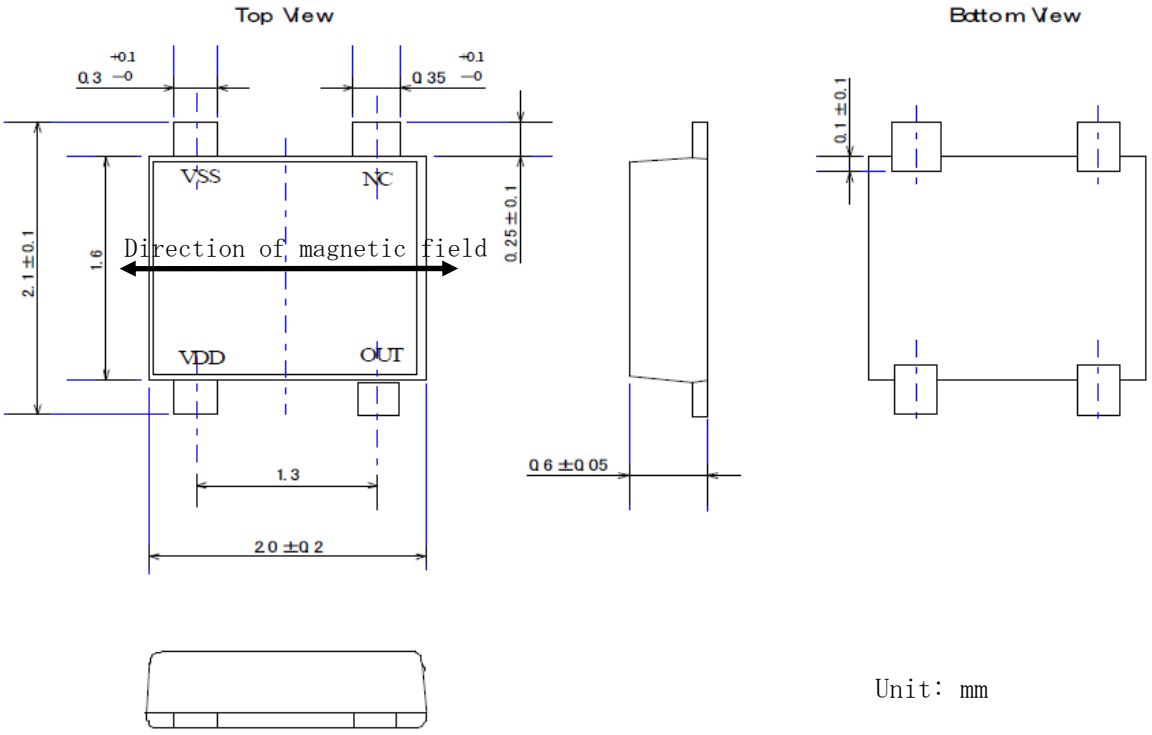


Fig.1　Dimension

3-2 Block wiring diagram

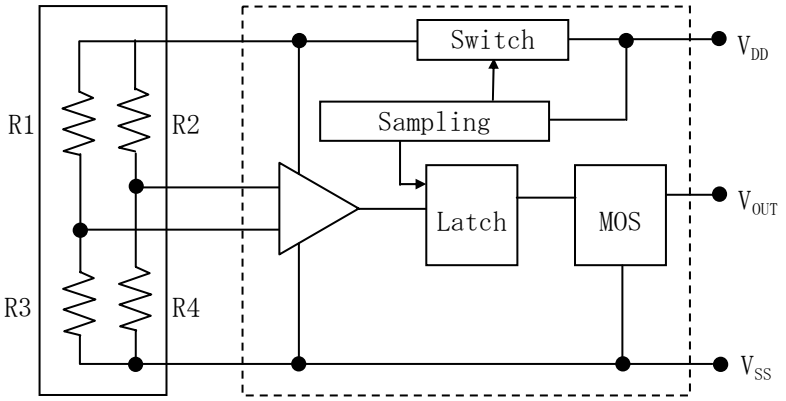


Fig.2　Block wiring diagram

3-3 Magnetic electric conversion characteristic

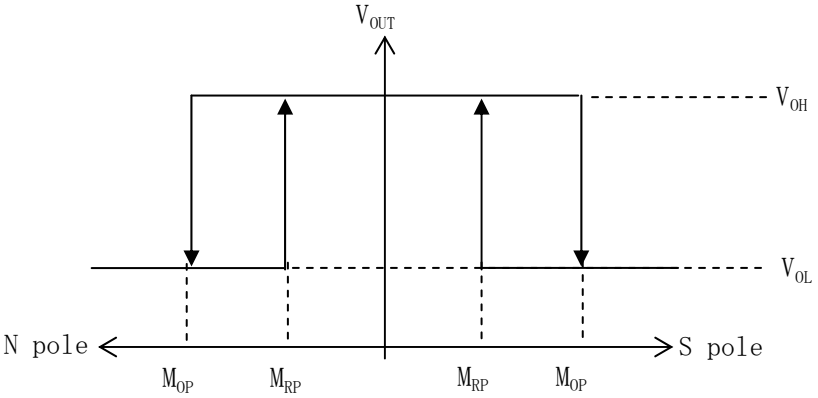


Fig.3　Magnetic electric conversion characteristic

3-4 Timing Diagram

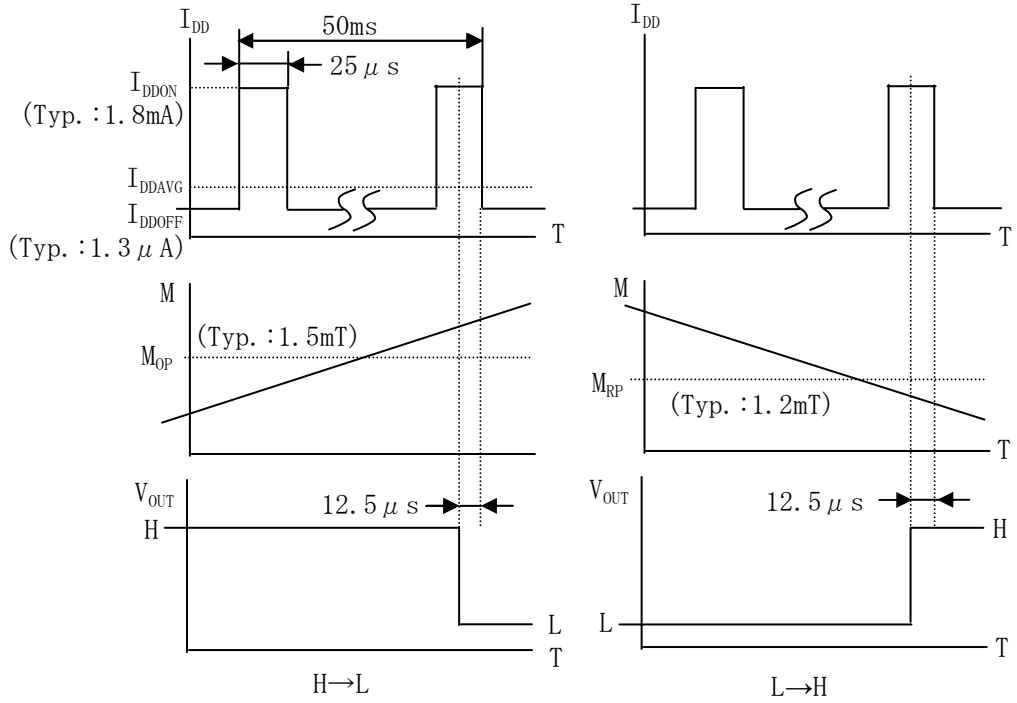


Fig.4　Timing Diagram

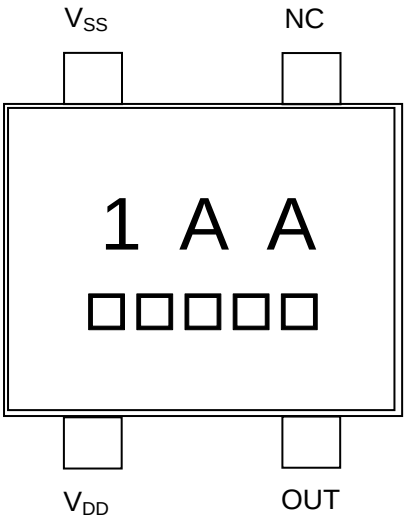
3-5 Electric Characteristics / Absolute Maximum Rating (Ta＝25℃,VDD＝1.8V)

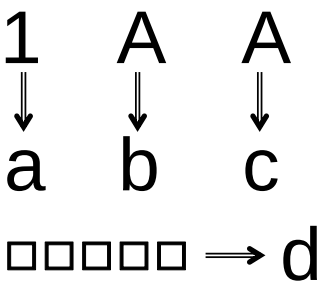
	Sign	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}	－	1.6	1.8	3.5	V
Absolute max. supply voltage	－	－	VSS-0.3	－	VSS＋6.0	V
Current consumption	I_{AVE}	V_{DD}=1.8V	－	1.6	3.0	μA
Operating magnetic field	Mop	H→L	－	1.5	2.2	mT
	M_{RP}	L→H	0.8	1.2	－	mT
High level output	V_{OH}	I_{OUT}=+1.0mA	0.9×VDD	－	－	V
Low level output	V_{OL}	I_{OUT} =-1.0mA	－	－	0.1×VDD	V
Operating temp.	－	－	-40	－	+85	℃
Storage temp.	－	－	-50	－	+125	℃
Temperature condition	－	－	－	255	260	℃

＊Each item are specifications derived from individual testing.

Table1　Electric Characteristics / Absolute Maximum Rating

3-6 Marking





a	Series Name:1/Magnetic Switch
b	Specification: A/Standard Specification
c	Products Version :A/Initial
d	Products Lot Number

Fig.5　Marking

3-7 Taping Method

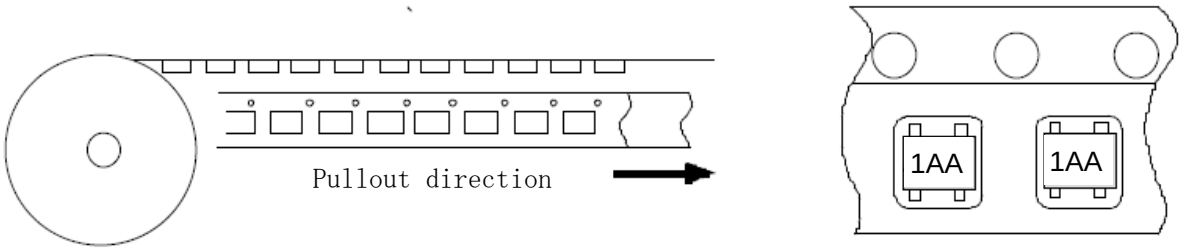
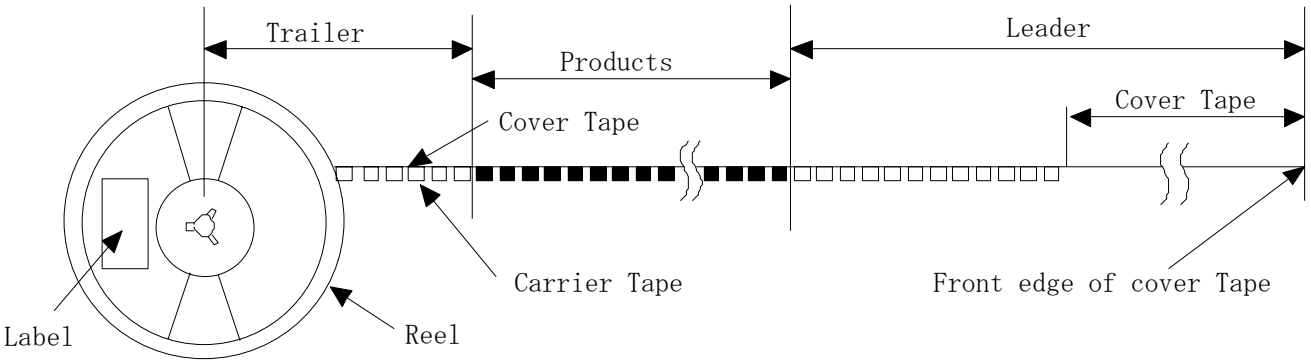
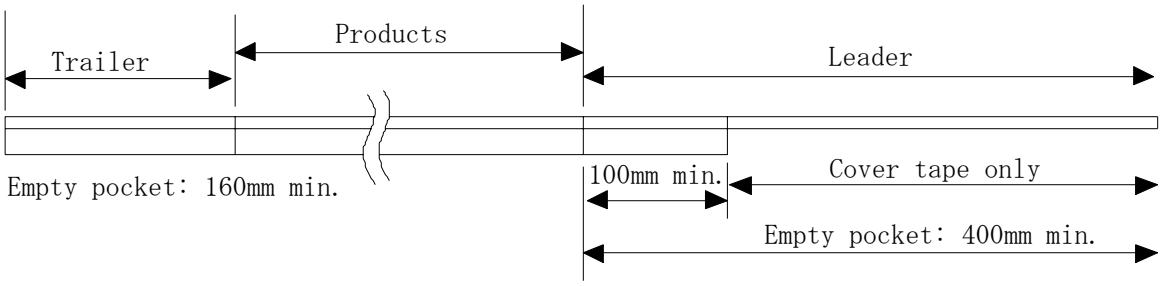


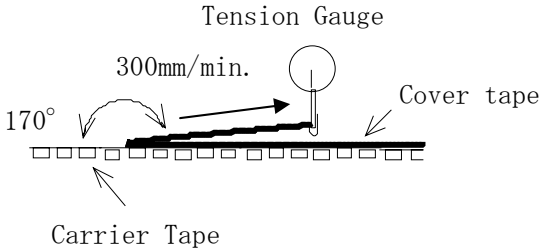
Fig.6 Direction of Taping





＊3000pcs/reel

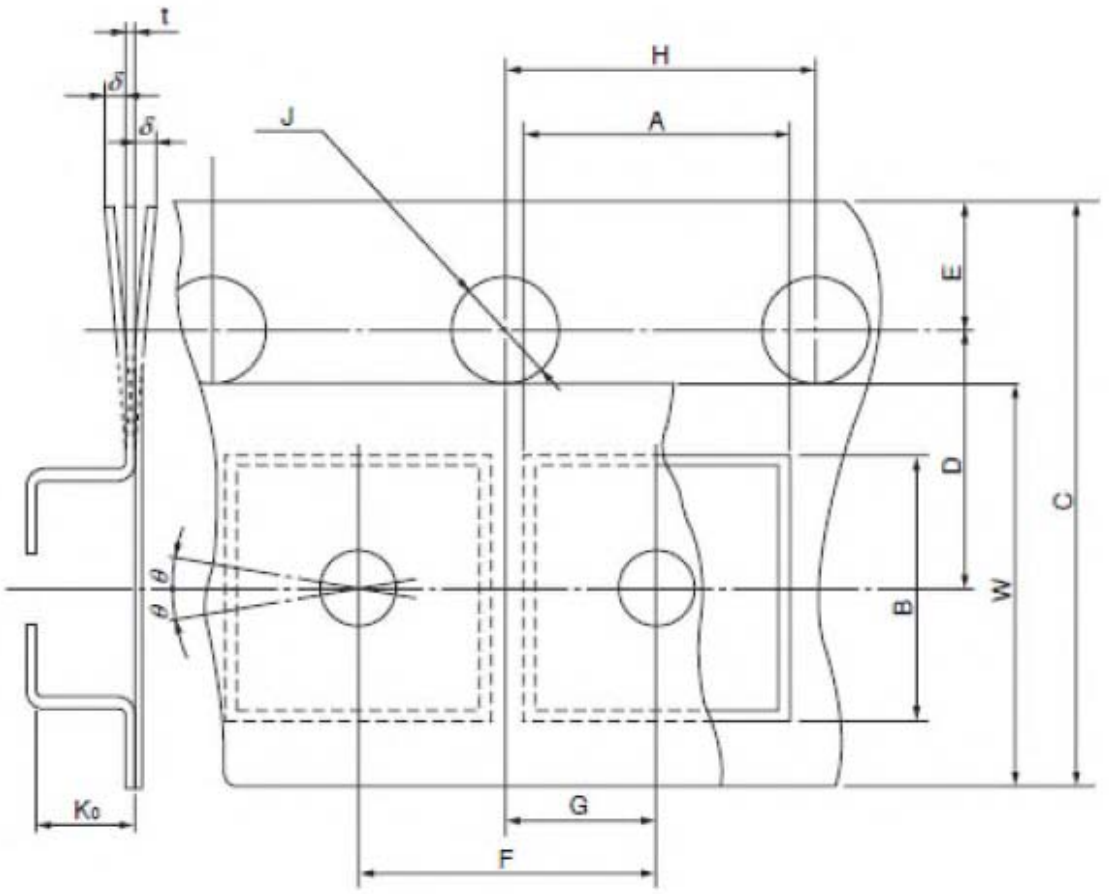
Fig.7 Taping



Standard of tape peeling strength 20～70g

Fig.8 Peeling Strength Test

3-8　Carrier Tape

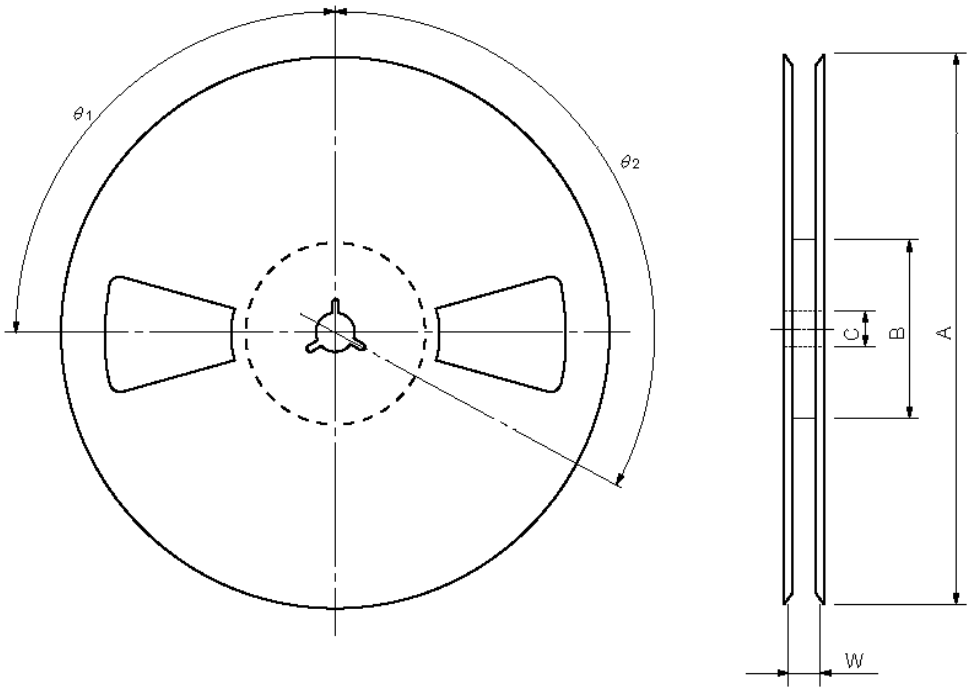


Symbol	Size・Angle
A	2.4±0.1
B	2.4±0.1
K_0	0.75±0.1
F	4.0±0.1
J	φ1.5+0.1/−0
H	4.0±0.1
E	1.75±0.1
G	2.0±0.05
D	3.5±0.05
W	5.5±0.1
C	8.0±0.2
t	0.25±0.05
θ	30° MAX

Unit：mm

Fig.9　Carrier Tape

3-9 Taping Reel Size



UNIT : mm

ITEM		SYMBOL	SIZE	REMARKS
Flange	Diameter	A	φ178±2	
	Space Between Flanges	W	9±0.5	
Hub	Outer Diameter	B	φ60±1	
	Slit Location	θ1	90°	
	Spindle Hole Diameter	C	φ13±0.5	
	Key Slit Location	θ2	120°	
Marking				Type no., quantity and lot code are marked or labeled.

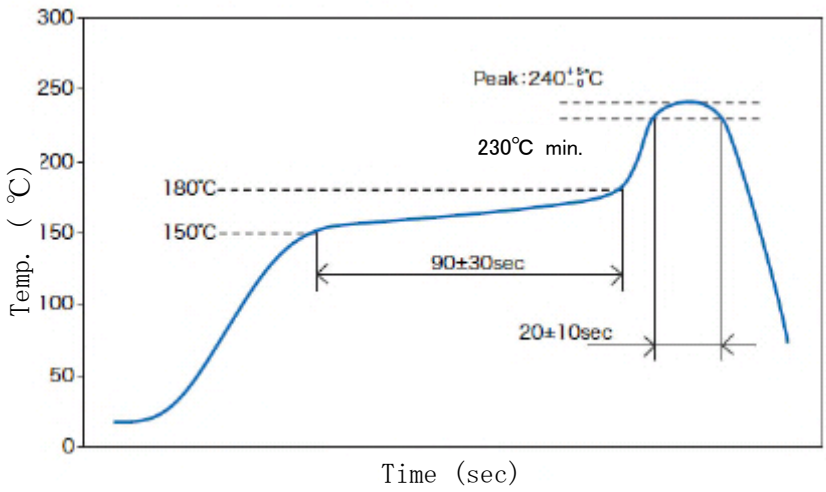
Fig.10 Taping Reel Size

4. Standard Reflow Soldring Condition

Reflow soldering	
240℃	Within 5sec.max
230℃ min.	20±10sec
Pre-heating	
150 to 180℃	90±30sec
Measurement point	Parts surface
Product storage conditions	10 to 40℃,30 to 60%RH

Solder substance : Ｓｎ－３．０Ａｇ－Ｃｕ (Lead free solder)

Table2　Standard Reflow Soldring Condition



Standard Temperature Profile

＊Reflow soldering : Twice, under the above standard temperature profile.

Fig.11　Standard Temperature Profile

5. Reliabilty test

No.	Item	Test conditions	Criteria
1	High Temperature	85℃×1000Hr	When satisfying the electrical condition of 3-5
2	High Temperature bias	85℃×1000Hr, V_{DD}=3.5V	
3	High Temperature and Humidity	85℃ 85%RH×1000Hr	
4	Pressure cooker	121℃ 100%RH P=2atm×100Hr	
5	Temperature cycling	-40℃/30min⇔+85℃/30min 200Cycle (Gaseous)	
6	Resistance to Reflow Soldering	EIAJ ED-4701 standard solder heating process Method 1 (2cycles process)	
7	ESD	EIAJ ED-4701C-111 200pF,0Ω,2times,200V min	
8	Solder ability	Solder temperature : 245℃ Time : 3sec Dipping	Above 95%
9	Latch-Up	200pF,0Ω,1time,100V min	Does not latch up
10	Detachability	At height of 75cm, naturally detach from P-tile	When satisfying the electrical condition of 3-5

＊Prior the high temperature and humidity and the temperature cycling, samples are stored at 125℃×1hour×dry condition, 85℃×85RH×168±1hour, then reflowed 2times (preparation of heating at 150℃×90sec, Heating at 230℃×20sec)

＊Each item are specifications derived from individual testing.

Table2 Reliabilty test

6．⚠CAUTION

6-1 Limitation of Applications

Please avoid using this product for the applications listed below which require especially high reliability for the prevention of defects that might directly cause damage to the third party's life, body or property.

When this product is used for the applications listed below, we shall not be liable for any claims on the product.

① Aircraft equipment
② Aerospace equipment
③ Undersea equipment
④ Generating plant equipment
⑤ Medical equipment
⑥ Transportation equipment (vehicles, trains, ships, etc.)
⑦ Traffic signal equipment
⑧ Disaster prevention / crime prevention equipment
⑨ Data-processing equipment
⑩ Application of similar complexity and/or reliability requirements to the applications listed in the above.

6-2 FAIL-SAFE

Be sure to provide as appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.

7．CAUTION FOR USE

7-1 HANDLING

・This product may be degraded by electrostatic discharge. It is necessary to take anti-static precautions when handling.

7-2 Design

・Please thoroughly evaluate this product for the magneto-variation of the magnet used along with this product, otherwise this product may result in the miss-operation or the non-operation.

・Please be careful about a magnetic body (Iron, Nickel, etc.) and a magnetic noise immunity that may affect the magnetism of a magnet.

・Please don't supply inverse voltage or excess voltage to this product. If applied, this product may be damaged and electrically destroyed.

・Please design your product not to be affected by stress of the resin due to heat shrink.

7-3 Storage condition

・We would suggest to store this product under the condition.

Temperature: 10 to 40℃

Humidity: 30 to 60%RH

※Stored this product in desiccator or in N_2 atmosphere is recommended.

・Storage period is within 6 month under above mentioned the condition. Please mount it as soon as possible once unpacked because solder ability may be degraded.

・Please avoid the water, chemical solvent or oil.

・Please avoid the corrosive gas (Cl_2, H_2S, NH_3, NO_2, NO_3 etc.).

・Please avoid the strong vibration or shock.

7-4 Mounting

・Please mount this product under our standard reflow condition. Otherwise this product may be damaged.

・Terminal should be avoided to apply excessive force or to bend.

・Please don't apply excessive bending stress to this product in the board otherwise this product may be damaged.

8. ⚠NOTE

・Make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.

・Not to use our product deviating from the agreed specifications.

・We consider it not to appropriate to include any terms and conditions with regard to the business transaction in the product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions such as warranty clause, product liability clause, or intellectual property infringement liability clause, they will be deemed to be invalid.