



TEL :+86(0)769-38879888 Fax :+86(0)769-38879889 E-mail : yl@dgylec.com

PRODUCT SPECIFICATION SHEET

CUSTOMER	:	
PRODUCT TYPE	:	SMD TUNING FORK 3.2X1.5
NOMINAL FREQ.	:	32.768 KHz
FL P/N	:	3SQ3270003-Q
REVISION	:	S1
CUSTOMER P/N	:	

CUSTOMER'S APPROVAL&DATE

[illegible]

FL CORPORATION

APPROVED	CHECKED	DESIGNED
Jay Lee	Jin Qi	Chen XuanRu

MSL 1

RoHS Compliant



CONTENTS

PAGE

• SPECIFICATION REVISION RECORD SHEET	2
• ELECTRICAL SPECIFICATION	3
• ENVIRONMENT AND MECHANICAL CHARACTERISTICS	4
• PRECAUTIONS & OUTGOING INSPECTION STANDARD	5
• DIMENSIONS AND MARKING LAYOUT	6
• TAPING SPECIFICATION & CARRIER TAPE & TAPING REEL	7/10
• REFLOW PROFILE	11
• OUTSIDE BOX PACKING SPECIFICATION	12

ATTACHMENT (optional)

- | | | | |
|------------------------------------|---|------------------------------|--|
| • ELECTRICAL CHARACTERISTICS TEST | A | ☐ YES | ☒ NO |
| • TEMPERATURE CHARACTERISTICS TEST | B | ☐ YES | ☒ NO |



FL P/N:

3SQ3270003-Q

VER:

S1

PAGE:

2/12

[illegible]



PRODUCT DESCRIPTION

The maximum rating

	Item	Symbol	Rating	Note
1	Storage temperature range	T_stg	-55~+125℃	
2	Maximum drive level	DL max.	0.5 μW max.	

Recommended Operating Condition

	Item	Symbol	Rating	Note
1	Operating temperature range	T_use	-40~+85℃	
2	Drive level	DL	0.1 μW typ.	

Electrical-Characteristics

Measurement temperature :25±2℃

	Item	Symbol	Specifications	Conditions
1	Nominal frequency	f_nom	32.768 kHz	
2	Frequency tolerance	f_tol	$\pm 20 \times 10^{-6}$	
3	Load capacitance	C _L	7.0 pF	
4	Motional resistance	R ₁	70 kΩ max.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
5	Motional capacitance	C ₁	3 fF typ.	
6	Shunt capacitance	C ₀	1 pF typ.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
7	Turnover temperature	Ti	25 ± 5℃	Measure this coefficient at 3 points of 10℃、25℃、40℃ using C-MOS circuit
8	Parabolic coefficient	B	$(-3 \pm 1) \times 10^{-8} / ^\circ\text{C}^2$	
9	Frequency aging	f_age	$\pm 3 \times 10^{-6} / \text{year}$	25±3℃、First year
10	Insulation resistance	IR	500 MΩ min.	Measured with ATI 4329A Insulation Resistance Meter Apply DC100V



Environment and Mechanical characteristics

	Item	Specifications	Conditions	
1	High temperature storage	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	After storage under 125℃ for 1000 hours, measure at room temperature.	*1 *3
2	Low temperature storage	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	After storage under -55℃ for 1000 hours, measure at room temperature.	*1 *3
3	High temperature and high humidity storage	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	After storage under +85±2℃ , 85 % RH for 1000h, measure at room emperature.	*1 *3
4	Thermal shock resistance	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Measure at room temperature after 100 cycles. -55℃ ⇌ +125℃ for 30 minutes.P18	*1 *3
5	Mechanical shock resistance	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Measure after 100g-dummy(SII Standard) drop from 1500mm height on the concrete 3directions 10times	*2
6	Vibration resistance	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Amplitude 1.5mm and 10~60Hz with cycle time 2~3 minutes in 3 direction (X,Y,and Z axis) each for 2 h.	*2
7	IR Reflow	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Measure after 2 time reflow under reflow profile specified in page 10	*1
8	Shear strength	No peeling-off	Pressuring force 10N×10±1sec. according to IEC60068-2-21	*2
9	Peel strength	No peeling-off	Pressuring force 10N×10±1sec according to IEC60068-2-21	*2
10	Bending test	No peeling-off	Bending: 3mm×5±1sec. Thickness of the testing board: 1mm	*2

Note:

- Each test shall be done independently. (not in series tests)
- *1: Measure after 24 hours left at room temperature.
- *2: Measure after 2 hours left at room temperature.
- *3: Pre conditions
 - (1) IR Reflow : 2 times
 - (2) Initial values shall be measured after 24 hours at room temperature.
- Shift in series resistance after the above tests shall be less than ±20% or less than ±15kΩ.
In case of resistance to IR reflow and high temperature storage(±125℃ for 1000 hours) , shift in series resistance after the above tests shall be less than ±30% or ±20kΩ.



Precautions

(1) Recommended mounting conditions

Reflow profile As per reflow profile shown in page 10.

Manual soldering 350℃max. for 4 sec. Max.

(2) Cleaning

The crystal resonator may be destroyed by ultrasonic cleaning.

We don't guarantee the quality of the product with that cleaning method because such conditions as type of the washing machine, power, time, position in the bath, etc. can not be specified.

Please confirm ultrasonic cleaning is not giving any damage to the product before use when that cleaning method must be used.

Outgoing inspection standard

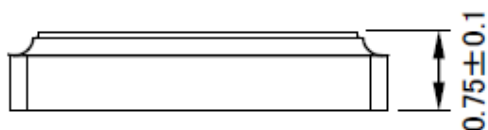
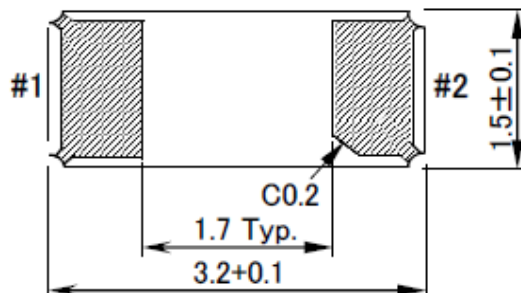
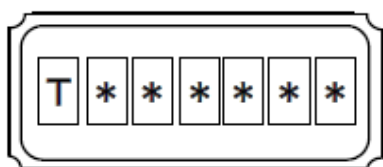
- The outgoing inspection shall be conducted as per the following standard.
- The sampling shall be performed according to the ANSI/ASQC Z1.4-1996.

NO	Item	Sampling level	AQL(%)
1	Frequency tolerance	I	1.0
2	Equivalent series resistance	I	1.0
3	Outer appearance	I	1.5
4	Others characteristics	Periodical quality inspection	

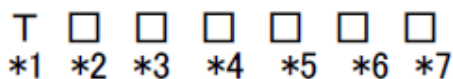


Dimensions and marking layout

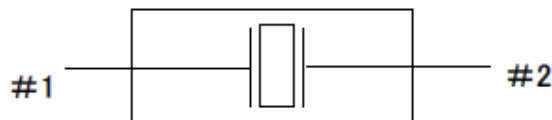
1、Out Line Drawing



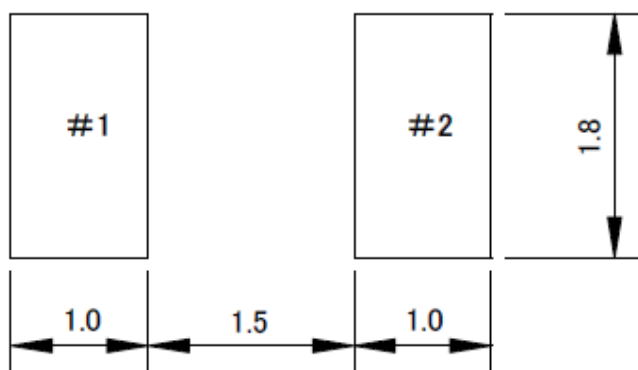
2、Marking



3、Lead Connection



- *1 Product name
- *2 Type of product
- *3 Specification
- *4 CL (7pF:B, 9pF:J, 12.5pF:F)
- *5 Year of production (Last digit of year)
- *6.7 Week of production (01~ 52)



Unit = mm

Materials:

Case: Alumina ceramics、Ni-plated、Au-plated

Lead: Kovar material、Ni-plated



Taping specification

1、Drawing of tape dimensions

- ① Carrier tape : Refer to page 8.
- ② Taping reel : Refer to page 9.

2、Material

- ① Carrier tape : PC black conductive
- ② Taping reel : PS conductive

3、Taping method

- (1) Taping shall be placed in tapes in such manner as to assure that marking of the components is visible as per Fig.1

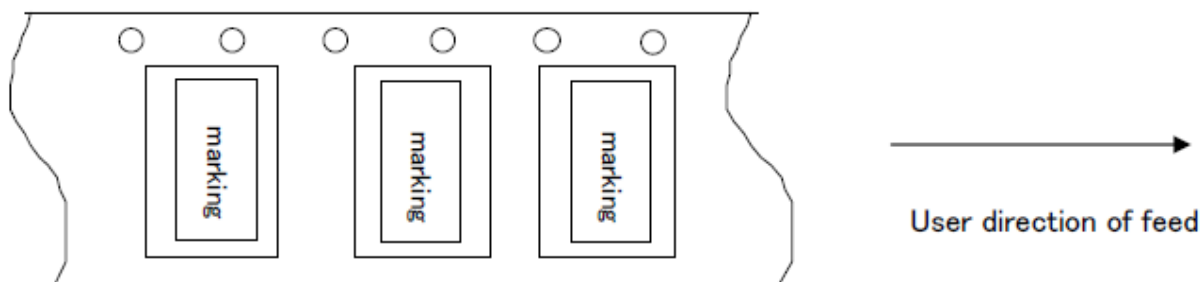


Fig. 1

(2) Reel

- ① On the side of reel there shall be more than 40 blocks of "No components".
- ② The beginning of Carrier Tape shall be bent vertically and hooked on groove of reel.

(3) Leader

- ① On the side of leader, there shall be more than 40 blocks of "No components"
- ② The length of Leader shall be over 400 mm.
- ③ The Length of Stick Tape for Cover Tape shall be about 100 mm and Stick Tape shall never be detached.

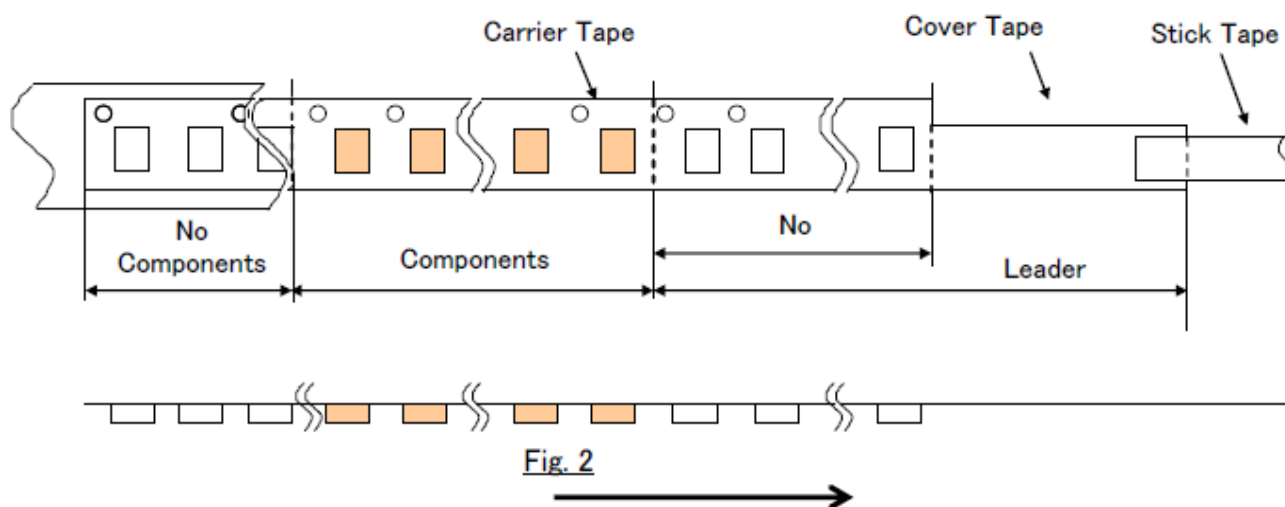


Fig. 2

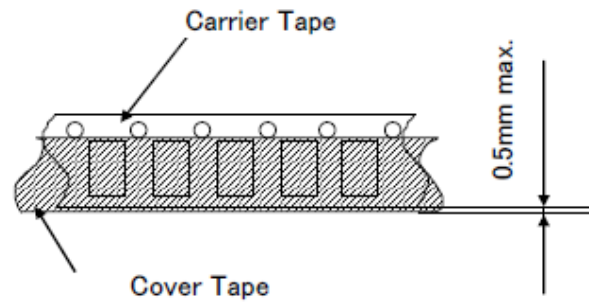
User direction of feed



(4) Gap between Carrier Tape and Cover Tape

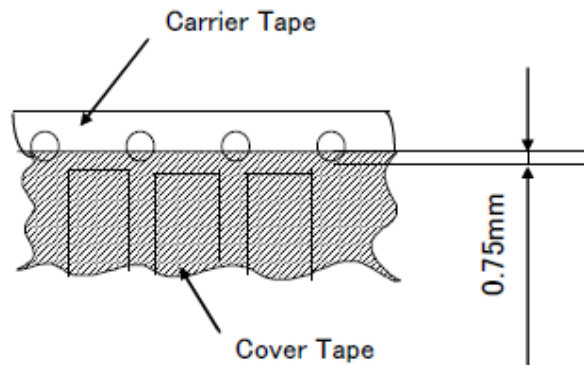
- ① Cover Tape protrudes from Carrier Tape by 0.5mm max.

Fig. 3



- ② Holes of Carrier Tape are covered with Cover Tape by 0.75mm max.

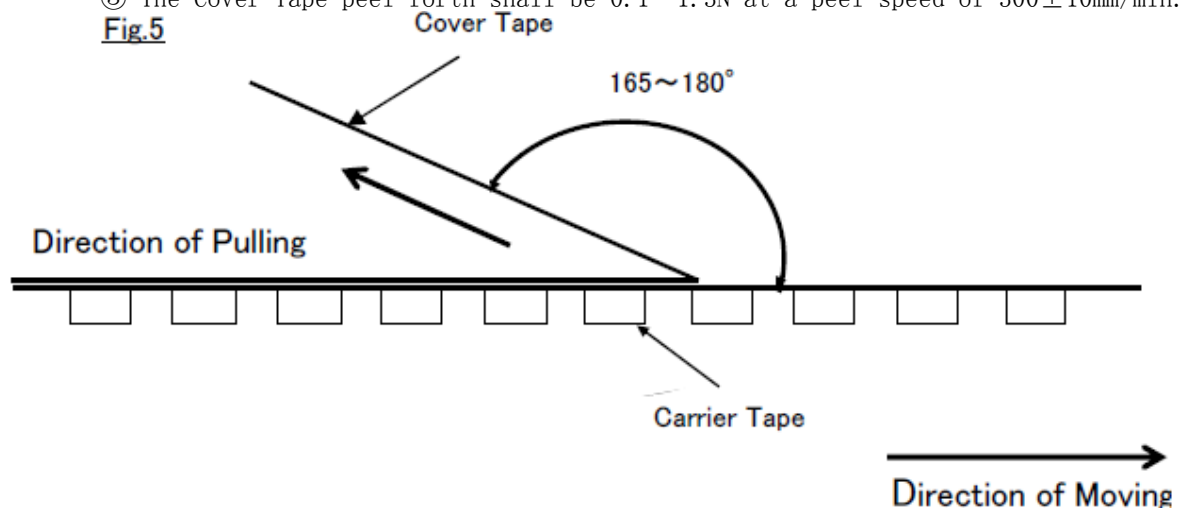
Fig. 4



(5) Peel strength

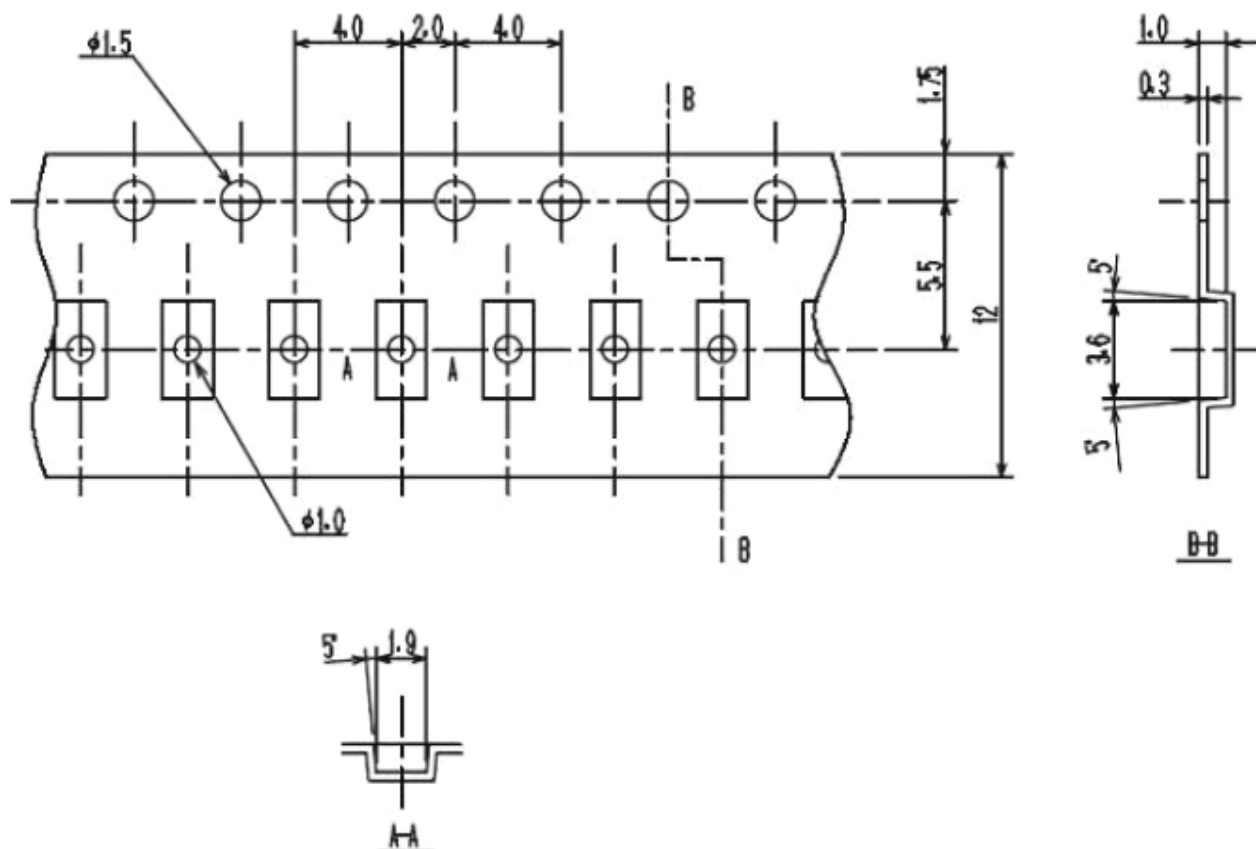
- ① The method of testing is done as shown below
② The value of force is at the beginning of desealing
③ The Cover Tape peel forth shall be 0.1~1.3N at a peel speed of 300 ± 10 mm/min.

Fig.5



Carrier tape

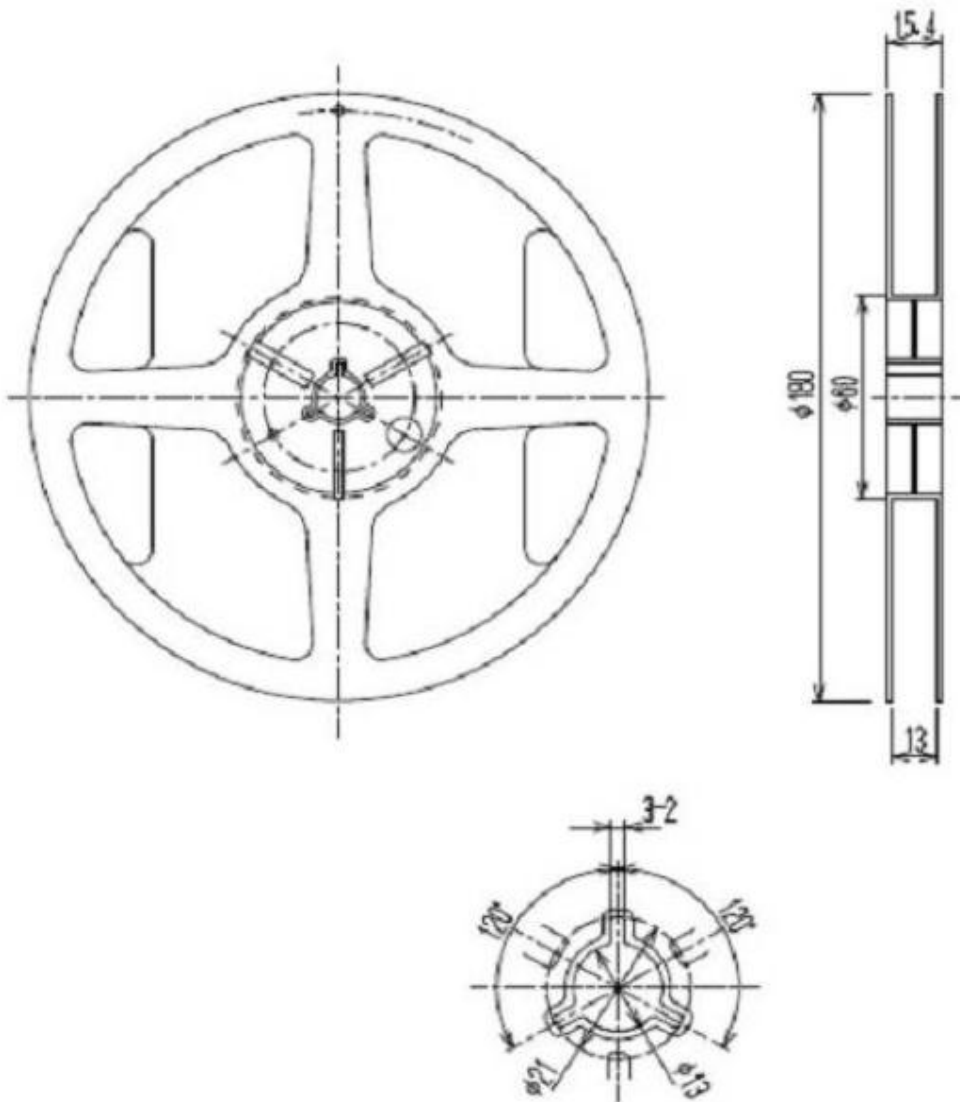
- (1) Conforms with EIA-481
- (2) Tolerance : ± 0.2





Taping reel

- (1) Conforms with EIAJ ET-7200B
- (2) Quantity per reel :3,000pcs./for a reel



Tolerance: $\pm 0.2\text{mm}$

Item	Specification	Unit
Materials	PS(anti statics)	-
inside reel wise W1	13.0+0.3/-0	mm
outside reel wise W2	15.4 $\pm$ 1.0	mm

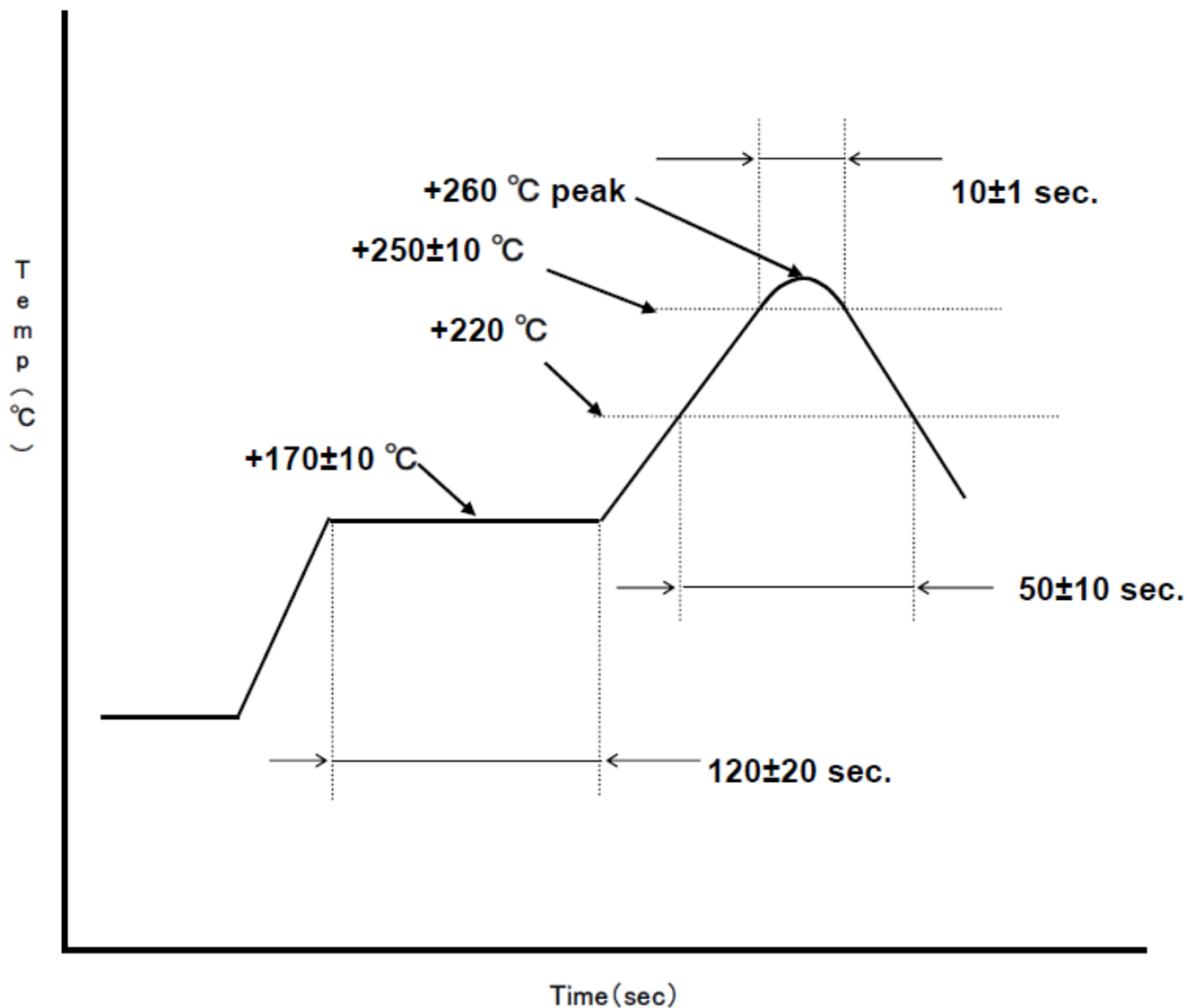
Unit = mm



Reflow Profile

Pre-Heating temperature: +170°C Pre-Heating time: 120sec

Heating temperature : +220°C Heating time : 50sec



Note:

- (1) The temperature used herein means the temperature on the circuit board.
- (2) Reflow is permitted 2 times.



广东惠伦晶体科技股份有限公司
GUANGDONG FAITH LONG CRYSTAL TECHNOLOGY Co.,Ltd.

TEL : +86(0)769-38879888
FAX : 86(0)769-38879889

FL P/N: 3SQ3270003-Q
VER: S1 PAGE: 12/12

SMD PRODUCT PACKING STANDARD

Out-going packing instruction

Reel Packing	Inner Packing	Carton
name: reel standard: diameter 18cm material: plastics	name: Bubble Wrap standard: 430×330+20mm material: HDPE(15 reels enter)	name: carton standard: 400×400×280mm material: AB corrugated paper(4 bags enter)
		 

The label instruction

Label Drawing	Mark	Name of Article	Spec.	Size	Printing
	L1	条码标签 Bar Code Label (Chintz Paper)	1.Part No. 2.Lot No. 3.Q'ty 4.Freq	70x50mm	White
	L2	条码标签 Bar Code Label (Chintz Paper)	1.Part No. 2.Date Code 3.Q'ty 4.Freq	70x50mm	White

Remark

Specifications on the label is for the use of templates with different product specifications may vary.
If customer specified requirements for labels packaging, please provide the operation procedure.

