

FXO2.048M3.3SM7-50DEW

1. UARTZ CRYSTAL OSCILLATOR SPECIFICATION

No	Parameter	Symb	Electrical Specification				Remark
			Min.	Type	Max.	Unit	
1.1	Holder type		FXO751				-
1.2	Nominal Frequency	F0	2.048				MHz
1.3	Supply Voltage	V _{DD}	2.97	3.3	3.63	V	-
1.4	Frequency Stability	f _{STAB}	-50		+50	ppm	See Note 1
1.5	Current consumption	I _{DD}			16	mA	-
1.6	Operating Temperature	T _{OPR}	-40		+85	°C	-
1.7	Storage Temperature	T _{STG}	-55		+125	°C	-
1.8	Symmetry	SYM	45		55	%	-
1.9	Rise& Fall Time	Tr / Tf			5	ns	-
1.10	Output Load	CL		15		pF	CMOS
1.11	Output Wave form	-	Square				-
1.12	Output Low Level	V _{OL}			10%	V _{DD}	-
1.13	Output High level	V _{OH}	90%			V _{DD}	
1.14	Start-up Time	t _{str}			10	ms	
1.15	Pin 1 Connection	-	E/D Control				-
1.16	Standby Current	I _{STD}			10	μA	
1.17	RMS Phase Jitter	φ _J			1.0	ps	Integrated from 12KHz to 20MHz
1.18	Aging	Fa	-3		+3	ppm	+25°C 1 st Year
1.19	Insulation Resistance	IR	500			MΩ	at DC 100V
1.20	Moisture Sensitivity Level	MSL	Level 1				-

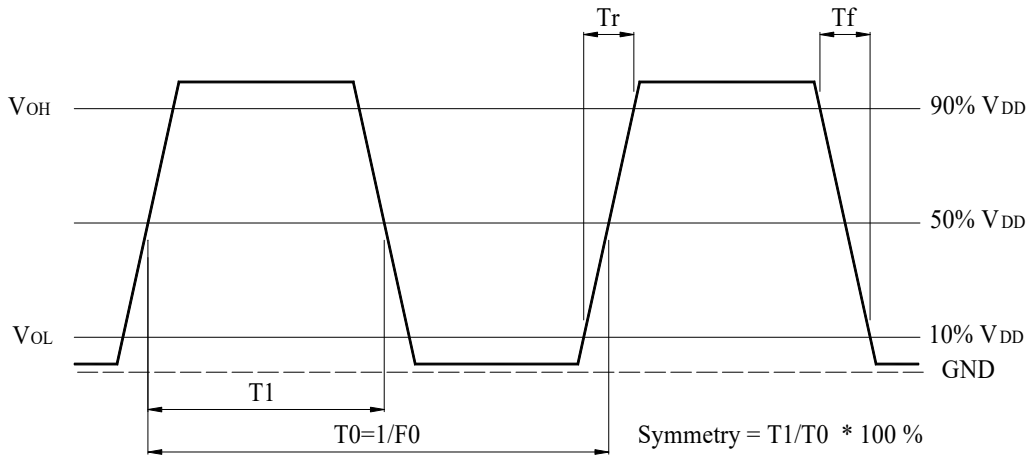
Note1 : Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration.

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow: Ambient temperature : 25±5°C ,Relative humidity : 40%~70%

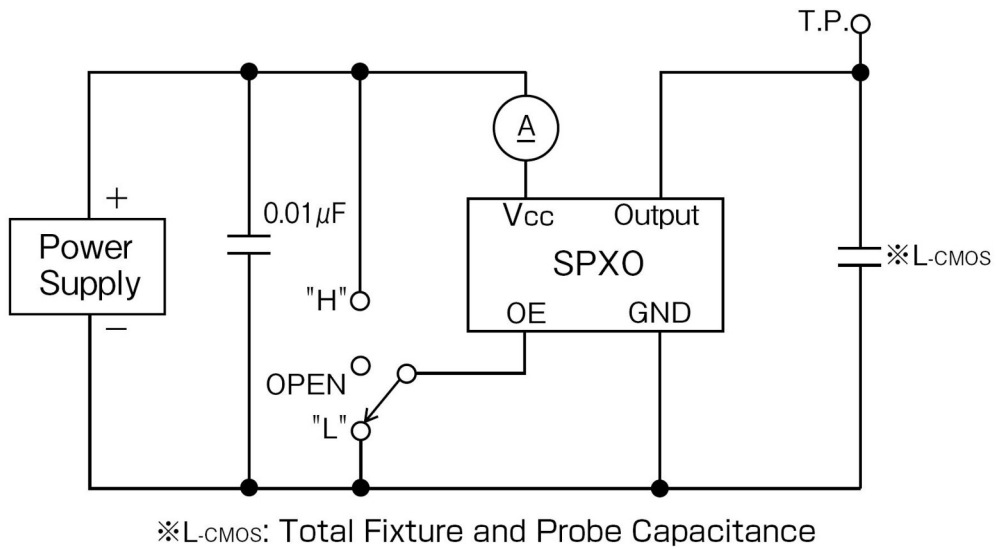
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2. Output Waveform



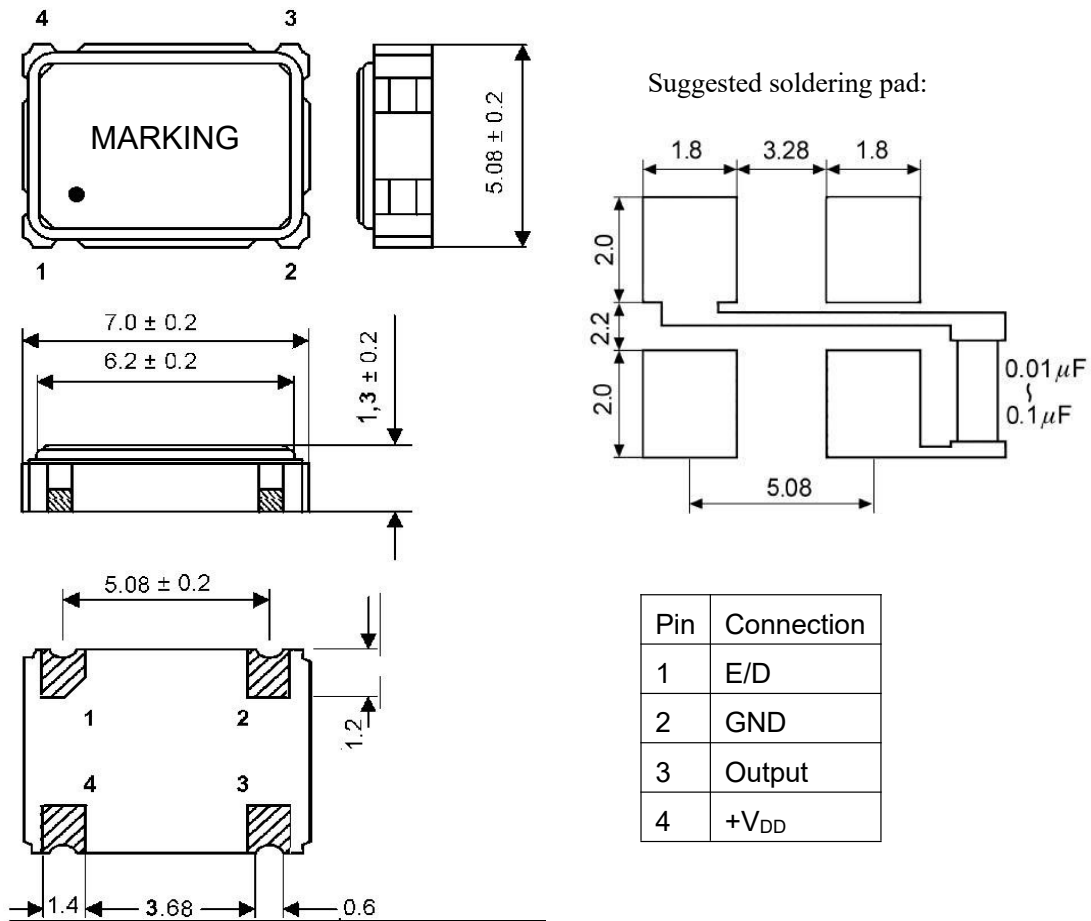
3. Test circuit



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4. Marking & Dimensions (UNIT: mm)



Pin	Connection
1	E/D
2	GND
3	Output
4	+V _{DD}

Reference drawing

(1) Base: Alumina Ceramic (Al ₂ O ₃) Metallized Pad: W Ni Plating Au Plating
(2) Cap: Fe-Ni
(3) Crystal Enclosure Seal: Seal Seam
(4) Crystal Blank Rectangular At-Cut Quartz Crystal Blank
(5) Adhesive Silver Conductive Polyimide Resin
(6) Electrode Ag
(7) Pad Alumina Ceramic (W. Ni. Au)

E/D: Enable/Disable Function

Pin 1# (E/D control)	Pin 3# (output)
Open (NC)	Active
High"1" (V _{IH} ≥ 70%V _{DD})	Active
Low"0" (V _{IH} ≤ 30%V _{DD})	High impedance

Disabled conditions:

- internal oscillator active
- output disabled, high impedance

Enable condition:

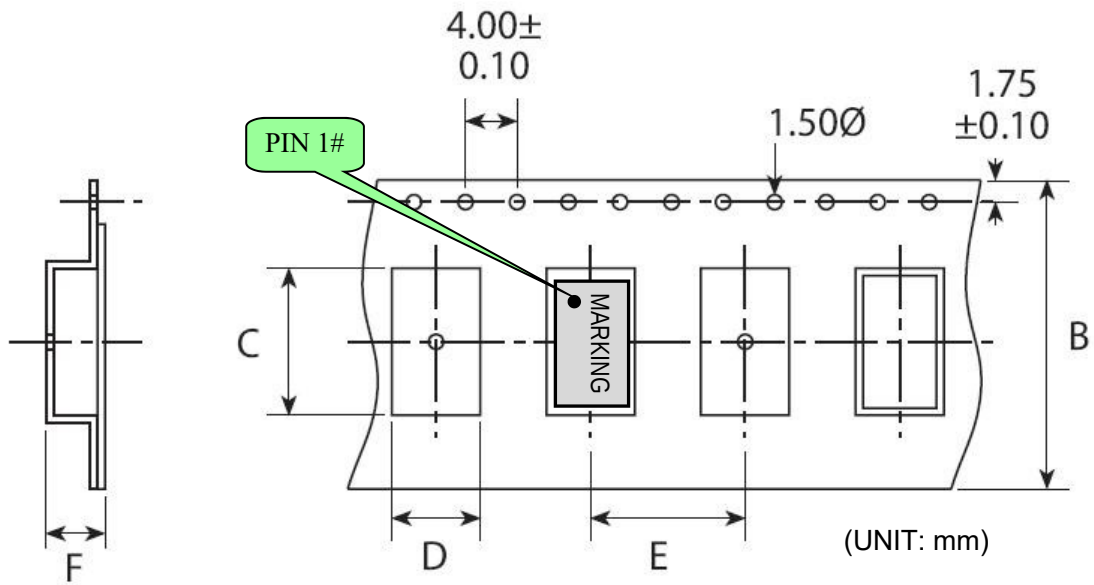
- pull the E/D pin to 'H' if the oscillator should always be enabled

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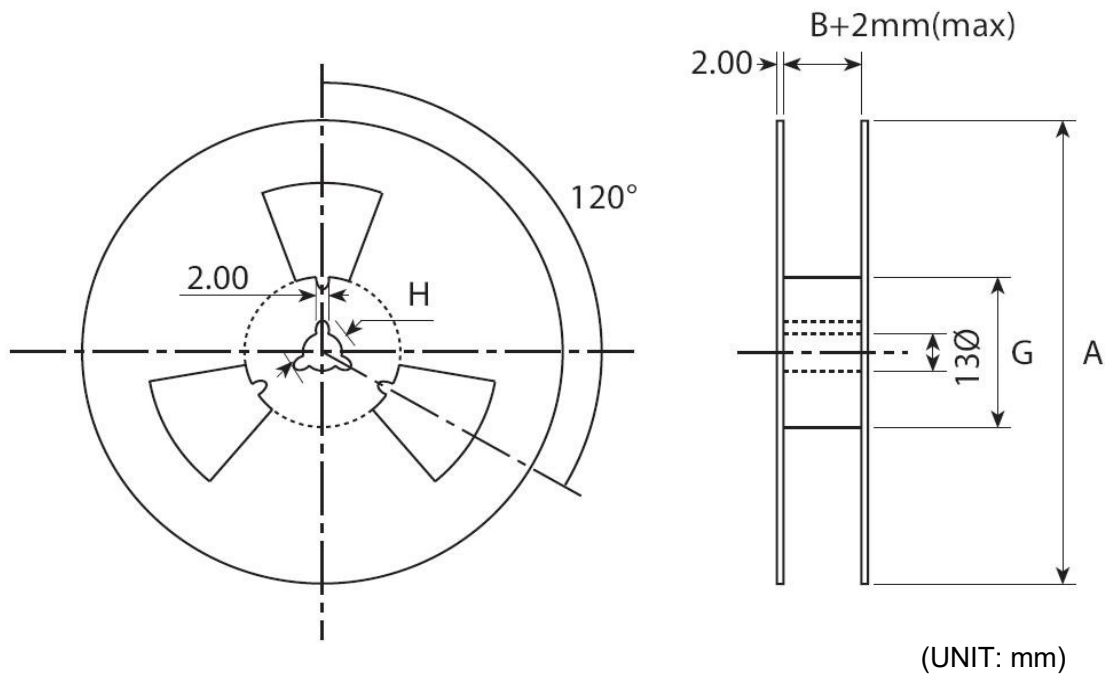
5. Emboss Carrier Tape & Reel

a.) Dimensions of Carrier Tape



	A	B	C	D	E	F	G
OSC-SMD7050	178±2.0	16.0±0.3	7.40±0.10	5.40±0.10	8.0±0.1	2.2±0.2	60.5±1.0

b.) Dimensions of Reel



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c.) Storage condition

Temperature: +40deg.C Max.

Relative Humidity: 80% Max.

d.) Standard packing quantity

1,000PCS / REEL

e.) Material of the tape

Material(Carrier tape) : Black conductive PS

Material (Cover tape) : Clear PE

Material (Reel) : PS

f.) Label contents

.The type of product

.Our specification No.

.Your Part No.

.Lot No.

.Nominal Frequency

.Quantity

.Our Company Name

Sticks label for every reel.

INSPECTION RECORDS

PO NO.:

CUSTOMER P/N:

FT P/N:

LOT NO.:

PACKAGE:

FREQUENCY:

REMARKS:

QUANTITY:

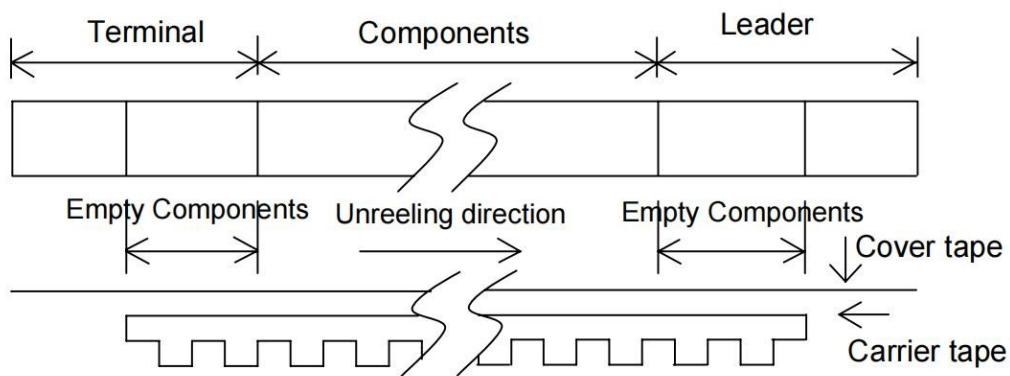
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g.) Taping dimension

Leader	Cover-tape	The length of cover-tape in the leader is more than 400 mm including empty embossed area.
	Carrier-tape	After all products were packaged, must remain more than twenty pieces or 400 mm empty area, which should be sealed by cover-tape.
Terminal	Cover-tape	The tip of cover-tape shall be fixed temporary by paper tape and roll around the core of reel one round.
	Carrier-tape	The empty embossed area which are sealed by top cover-tape must remain more the 40 mm.



h.) Joint of tape

The carrier-tape and top cover-tape should not be jointed.

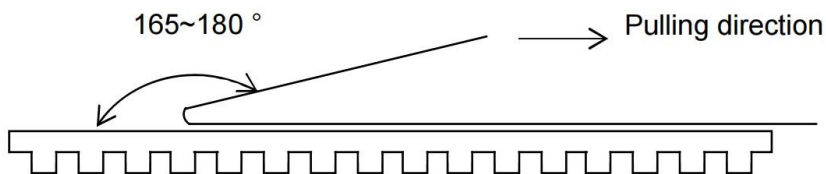
i.) Release strength of cover tape

It has to between 0.1N to 0.7N under following condition.

Pulling direction 165° to 180°

Speed 300mm/min.

Otherwise unless specified.



Other standards shall be based on JIS C 0806-1990.

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6.Mechanical Reliability

*Measurement shall be carried out after letting it alone in the room temperature for 1 hour.

	Item	Conditions	Specifications
6.1	Drop	Fall freely from 100 cm of height 3 times on a firm wood	MIL-STD-202H Method 203
6.2	Mechanical Shock	Half-sine shock pulse peak acceleration of 1500g, pulse duration 0.5ms, 3 shocks in each direction of three mutually perpendicular axes	MIL-STD-202H Method 213
6.3	Vibration	(1)Vibration Frequency: 10~55Hz (2)Cycle: 1 to 2 Min. (3)Full Cycle: 1.5mm P-P. (4)Direction: X.Y.Z (5)Time: 2 Hours / Each Direction	MIL-STD-202H Method 204
6.4	Substrate Bending	Mount the specimen on substrate. Apply the following pressure Direction: see Fig -1 Speed: 0.5 mm/sec Hours: 5 ± 1 sec Amount of substrate: 3 mm Max.	Without mechanical damage such as breaks. Without electrode peeling. Electrical characteristics shall be satisfied.
6.5	Adhesion	Mount the specimen on substrate. Apply the following pressure Direction: see Fig -2 Weight: 10N Hours: 10 ± 1 sec	
6.6	Body strength	Mount the specimen on substrate. Apply the following pressure Direction: see Fig -3 Weight: 10N Hours: 10 ± 1 sec	
6.7	Seal	Fine Leak: 4.5kgf/cm ² 2hours 1×10 ⁻⁹ Pa.m ³ /sec Gross Leak: 4.5kgf/cm ² 2hours 1.5×10 ⁻⁵ Pa.m ³ /sec	MIL-STD-202H Method 112

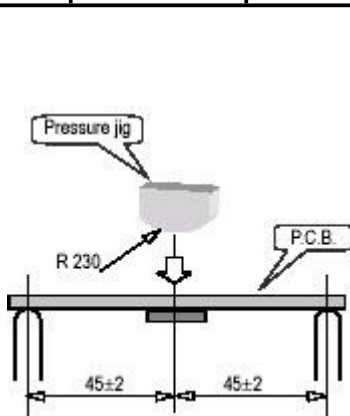


Fig-1

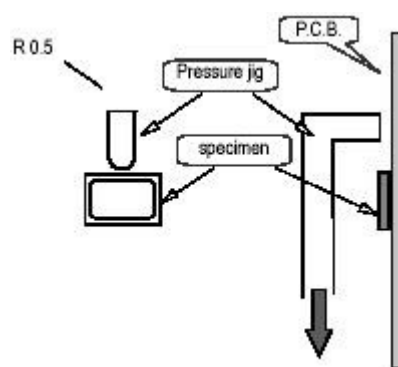


Fig-2

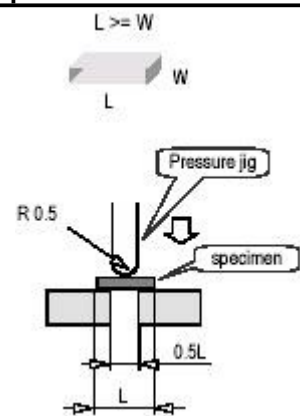
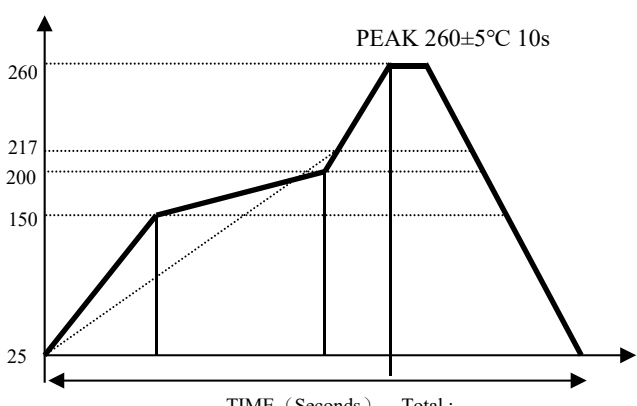


Fig-3

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6.8	Solder ability	Pre-heat temperature : $+150\pm 10^{\circ}\text{C}$ Pre-heat time : 60~120s When the temperature of the specimen is reached at $+215\pm 3^{\circ}\text{C}$, it shall be left for $30\pm 1\text{sec}$. Peak temperature $240\pm 5^{\circ}\text{C}$ Material: Pb-free (Sn96.5/Ag3.0/Cu0.5) Flux : Rosin resin methyl alcohol solvent (1:4) The electrodes should be covered by a new solder at least 90% of immersed area.	MIL-STD-202H Method 208
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6.9	Resistance to Soldering Heat	<p>Run in Reflow Reflow soldering shall be allowed Only two(2) time.</p> <p style="text-align: center;">Available for Lead Free Soldering</p>  <p style="text-align: center;">TIME (Seconds) Total :</p> <table border="1" data-bbox="446 1332 1037 1467"> <tr> <td>(1)</td> <td>Preheat</td> <td>160~180 deg.C</td> <td>120sec.</td> </tr> <tr> <td>(2)</td> <td>Primary heat</td> <td>220 deg.C</td> <td>60sec.</td> </tr> <tr> <td>(3)</td> <td>Peak</td> <td>260 deg.C</td> <td>10sec. Max.</td> </tr> </table>	(1)	Preheat	160~180 deg.C	120sec.	(2)	Primary heat	220 deg.C	60sec.	(3)	Peak	260 deg.C	10sec. Max.	MIL-STD-202H Method 210
(1)	Preheat	160~180 deg.C	120sec.												
(2)	Primary heat	220 deg.C	60sec.												
(3)	Peak	260 deg.C	10sec. Max.												

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7. Environmental Reliability

*Measurement shall be carried out after letting it alone in the room temperature for 1 hour.

	Item	Conditions	Specifications
7.1	Humidity	+85°C±2°C, RH 80~85%, Duration of 500 hours. The units are then allowed to stand for approx 2 hours in room temperature before checking	MIL-STD-202H Method 106
7.2	Storage in Low Temperature	Temperature: -40±2°C , Duration of 500 hours. The units are then allowed to stand at room temperature for approx 2 hours before checking.	MIL-STD-202H Method 108
7.3	Storage in High Temperature	Temperature: +85°C±2°C, Duration of 500 hours. The units are then allowed to stand at room temperature for approx 2 hours before checking.	MIL-STD-202H Method 108
7.4	Thermal Shock	Temperature 1: -55°C±5°C Temperature 2: 125°C±5°C Temperature change between T1 and T2 at soonest Run 100 cycles, maintain T1 and T2 30minutes each in one cycle (Refer to Fig-4)	MIL-STD-202H Method 107

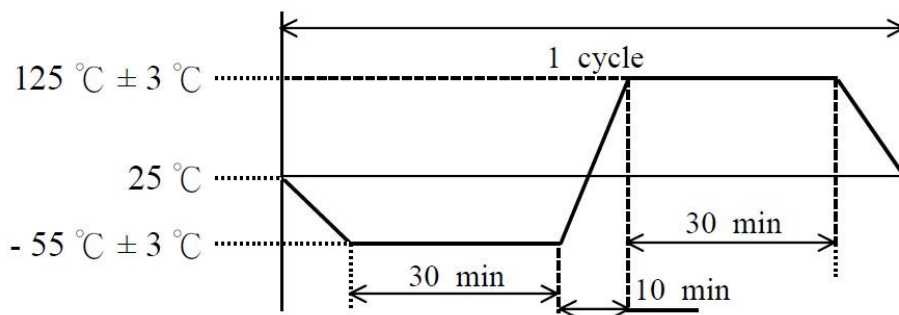
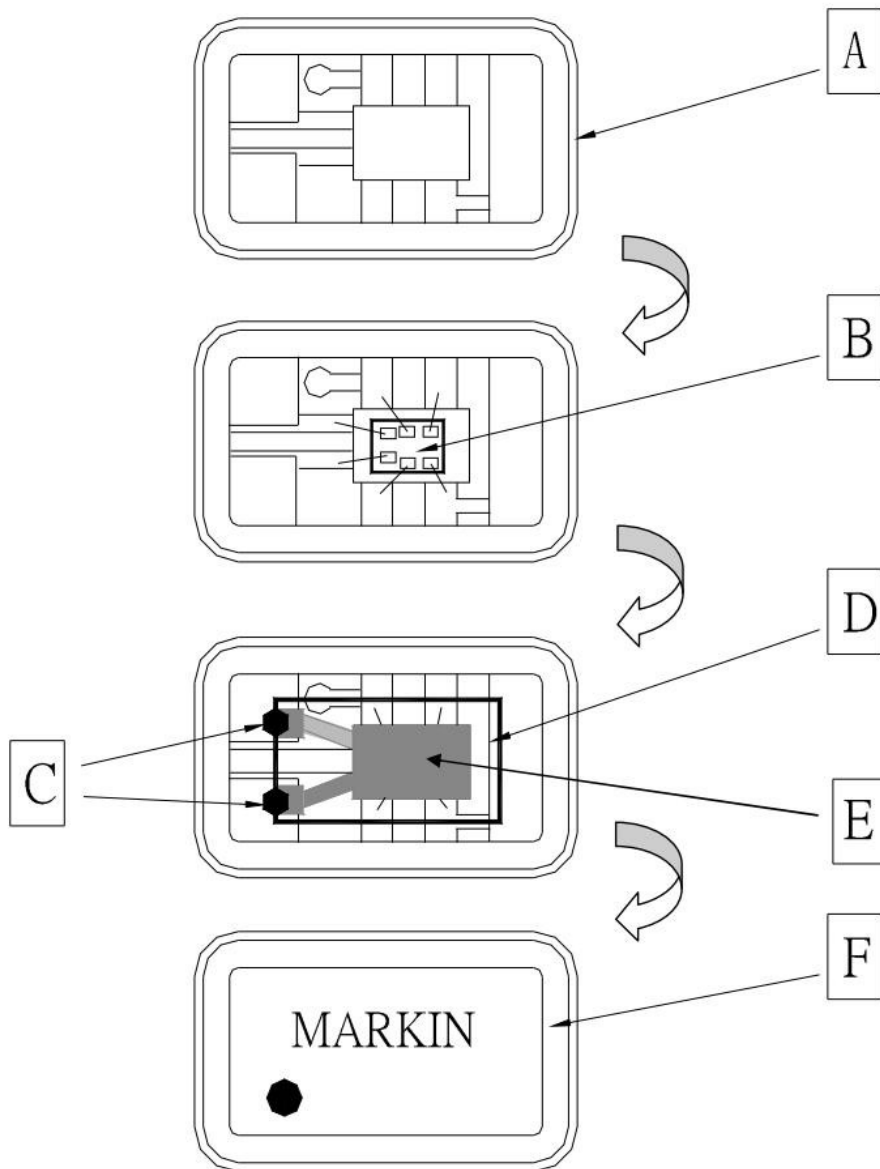


Fig-4

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8. Structure illustration:

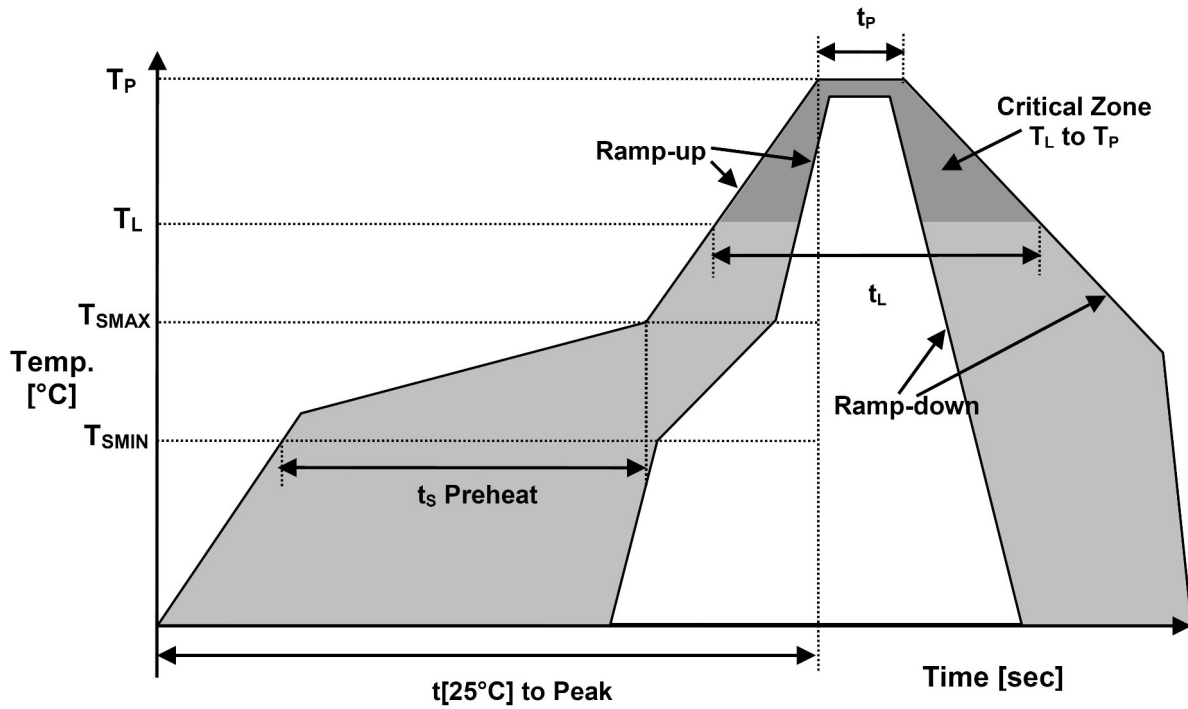


COMPONENTS		METERIALS	COMPONENTS		METERIALS
A	Base (Package)	Ceramic(Al_2O_3) + Kovar(Fe+Co+Ni)	D	Crystal blank	SiO_2
B	IC Chip	Si	E	Electrode	Cr+Ag
C	Conductive adhesive	Ag+Silicon resin	F	Lid	Kovar(Fe+Co+Ni)

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9. Recommended Solder Reflow Profile



Temperature Min Preheat	T_{SMIN}	150°C
Temperature Max Preheat	T_{SMAX}	175°C
Time (T_{SMIN} to T_{SMAX})	t_s	60-120 sec
Temperature	T_L	217°C
Peak Temperature	T_P	260°C
Ramp-up rate	R_{UP}	3°C/sec max.
Ramp-down rate	R_{DOWN}	6°C/sec max.
Time within 5°C of Peak Temperature	t_P	10 sec max.
Time t[25°C] to Peak Temperature	t[25°C] to Peak	360 sec max.
Time	t_L	60 sec max.

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