



PRODUCT SPECIFICATION SHEET

CUSTOMER : _____
PRODUCT TYPE : SMD X'TAL 2.5*2.0(4PAD)
NOMINAL FREQ. : 32.000000 MHz
FL P/N : 2S32000079
REVISION : S0
CUSTOMER P/N : _____

CUSTOMER'S APPROVAL&DATE

| |
|--|
| |
|--|

FL CORPORATION

| APPROVED | CHECKED | DESIGNED |
|----------|---------|----------|
| Xing Yue | Jin Qi | Li Xiang |

MSL1
RoHS Compliant



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ATTACHMENT (optional)

- | | | | | | |
|------------------------------------|---|--------------------------|-----|-------------------------------------|----|
| • ELECTRICAL CHARACTERISTICS TEST | A | <input type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO |
| • TEMPERATURE CHARACTERISTICS TEST | B | <input type="checkbox"/> | YES | <input checked="" type="checkbox"/> | NO |



PRODUCT DESCRIPTION

Standard atmospheric conditions

Unless otherwise specified. The standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature $25\pm 2^{\circ}\text{C}$
Relative humidity 40%~70%

If there is no doubt the results, measurement shall be made within the following limits:

Ambient temperature $25\pm 2^{\circ}\text{C}$
Relative humidity : 40%~70%

Measure equipment

Electrical characteristics measured by S&A250B or equivalent.

Crystal cutting type

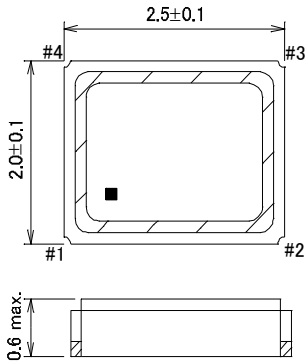
The crystal is using AT CUT (thickness shear mode)

ELECTRICAL SPECIFICATIONS

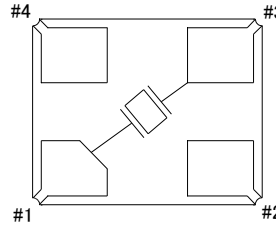
| No. | Items | Electrical Spec. | | | | | Remarks |
|-----|------------------------------|------------------|-------------|-----|-----|--------------------|-----------------------------------------------------------------------|
| | | Symbol | Min | Typ | Max | Units | |
| 1 | Nominal Frequency | FL | 32.000000 | | | MHz | |
| 2 | Oscillation Mode | - | Fundamental | | | - | |
| 3 | Load Capacitance | CL | 10.0 | | | pF | |
| 4 | Frequency Tolerance | - | ± 10 | | | ppm | at $25\pm 2^{\circ}\text{C}$ |
| 5 | Frequency Stability | - | ± 15 | | | ppm | at $-40\sim +85^{\circ}\text{C}$ (reference 25°C) |
| 6 | Shunt Capacitance | C0 | - | - | 5 | pF | |
| 7 | Aging (/1 year) | - | ± 3 | | | ppm/year | at $25\pm 2^{\circ}\text{C}$ |
| 8 | Operating Temperature | - | -40 | - | 85 | $^{\circ}\text{C}$ | |
| 9 | Storage Temperature | - | -40 | - | 105 | $^{\circ}\text{C}$ | |
| 10 | Equivalent series resistance | ESR | - | - | 50 | ohms | |
| 11 | Insulation Resistance | IR | 500 | - | - | M-ohms | at DC 100V |
| 12 | ESD | - | HBM > 4000V | | | - | JESD22-A114-B |
| 13 | MSL | - | Level 1 | | | - | IPC/JEDEC J-STD-033C |
| 14 | Drive Level | DL | - | - | 100 | μW | |



DIMENSIONS unit:mm

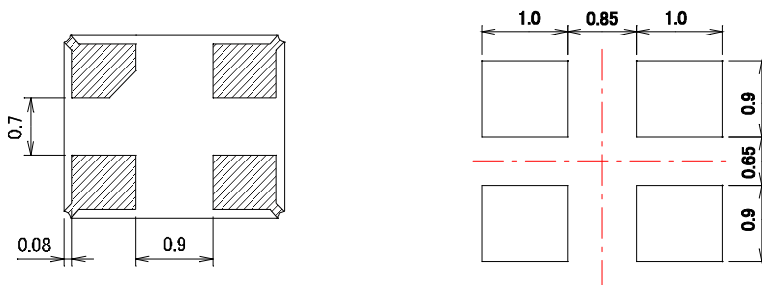


CONNECTION DIAGRAM (TOP VIEW)

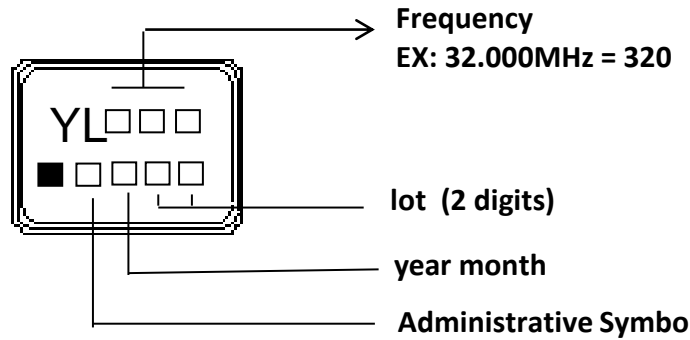


| Pin | Function |
|-----|------------------------|
| #1 | Xtal terminal (Input) |
| #2 | GND terminal |
| #3 | Xtal terminal (Output) |
| #4 | GND terminal |

LAND PATTERN unit:mm



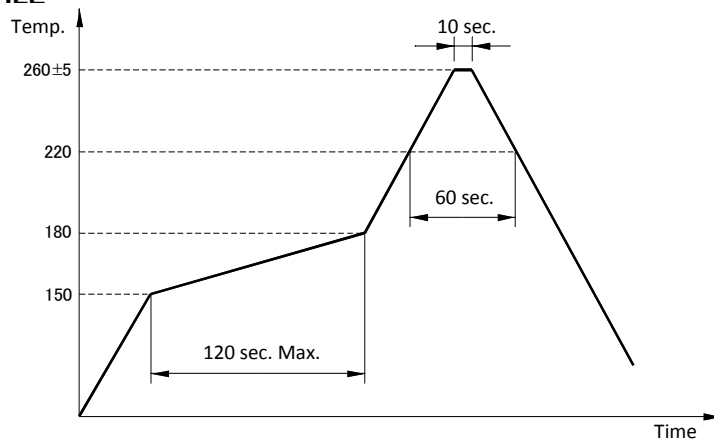
MARKING



| year | month | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|------|-------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 2021 | 2025 | A | B | C | D | E | F | G | H | J | K |
| 2022 | 2026 | N | P | Q | R | S | T | U | V | W | X | Y | Z |
| 2023 | 2027 | a | b | c | d | e | f | g | h | j | k | l | m |
| 2024 | 2028 | n | p | q | r | s | t | u | v | w | x | y | z |

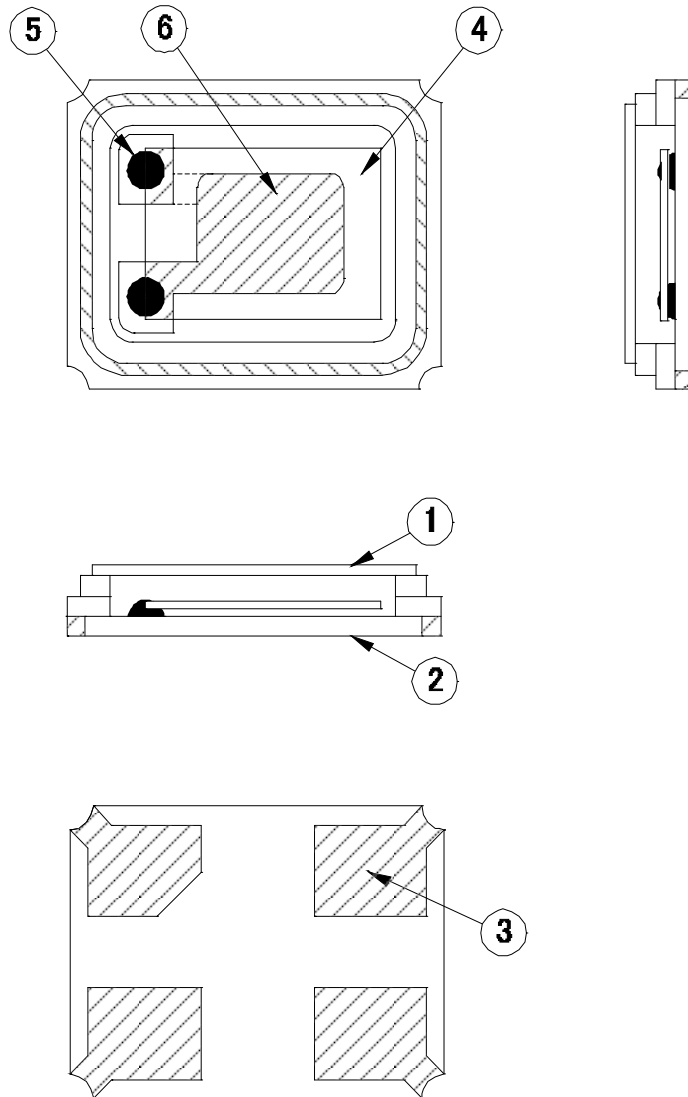
SUGGESTED REFLOW PROFILE

Total time : 360 sec. Max.
Solder melting point :225 °C





STRUCTURE ILLUSTRATION



| NO | COMPONENTS | MATERIALS | QTY | FINISH/SPECIFICATIONS |
|----|---------------------|---------------------------------------------------|-----|-----------------------|
| 1 | Cap(Lid) | Kovar(Fe+Co+Ni) | 1 | Ni plating |
| 2 | Base(Package) | Almina Ceramics (Al ₂ O ₃) | 1 | |
| 3 | Pad(Package) | Ni + Au | 4 | Ni+Au plating |
| 4 | Crystal blank | SiO ₂ | 1 | - |
| 5 | Conductive adhesive | Ag | 2 | Silicone resin |
| 6 | Electrode | Noble metal | 2 | - |



RELIABILITY SPECIFICATIONS

1.MECHANICAL ENDURANCE

| No. | Test Item | Test Methods | |
|-----|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| 1 | Drop Test | 150 cm height, fall freely onto stainless plate 3 times. | JIS C6701 |
| 2 | Shock Test | 150g/150cm Height,3times in the direction of $\pm x$, $\pm y$, $\pm z$ on concrete floor | IEC-68-02-27 |
| 3 | Mechanical Shock | Device are shocked to half sine wave (1000 G) three mutua pendicular axes each 3 times. 1.0m sec. duration time | MIL-STD-202F |
| 4 | Vibration | Frequency range 10 ~ 55 Hz Amplitude 1.52 mm Pendicular axes each test tim ϵ 2 hours (x,y,z Axis) Total test time 6 hours | MIL-STD-883E |
| 5 | Gross Leak | Standard Sample For Automatic Gross Leak Detector Test Pressure 2kg/cm 2 | MIL-STD-883E |
| 6 | Fine Leak | Helium Bombing 4.5kgf/cm 2 for 2 hr | MIL-STD-883E |
| 7 | Solderability | Temperature 260 $^{\circ}$ C \pm 5 $^{\circ}$ C Immersing depth 0.5 mm minimum Immersion time 5 \pm 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4) | GB/T 2424.17-2008 / IEC 60068-2-44:1995; GB/T 2423.28-2005 / IEC 60068-2-20:1979 |
| 8 | Resistance To Soldering Heat | Pre-heat temperature 125 $^{\circ}$ C Pre-heat time 60 ~ 120 sec. Test temperature 260 \pm 5 $^{\circ}$ C Test time 5 \pm 1 sec. | MIL-STD-202F |

*Storage conditions : 18 months

*Constant humidity : 40~70%

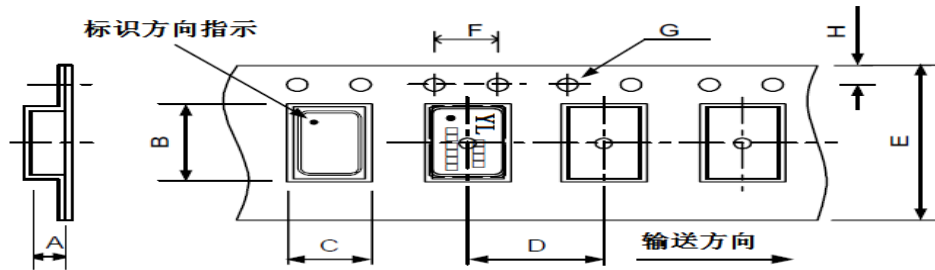
2.ENVIRONMENTAL ENDURANCE

| No. | Test Item | Test Methods | |
|-----|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 9 | High Temp. Storage | + 125 $^{\circ}$ C \pm 3 $^{\circ}$ C for 500 \pm 12 hours | MIL-STD-883E |
| 10 | Low Temp. Storage | - 40 $^{\circ}$ C \pm 3 $^{\circ}$ C for 500 \pm 12 hours | |
| 11 | Thermal Shock | Total 100 cycles of the following temperature cycle 1 cycle 125 \pm 3 $^{\circ}$ C 25 $^{\circ}$ C -55 \pm 3 $^{\circ}$ C 30 min. 30 min. 10 min. max. | MIL-STD-883E |
| 12 | High Temp&Homidity | 85 $^{\circ}$ C \pm 3 $^{\circ}$ C, RH 85%,500Hrs | JIS C5023 |

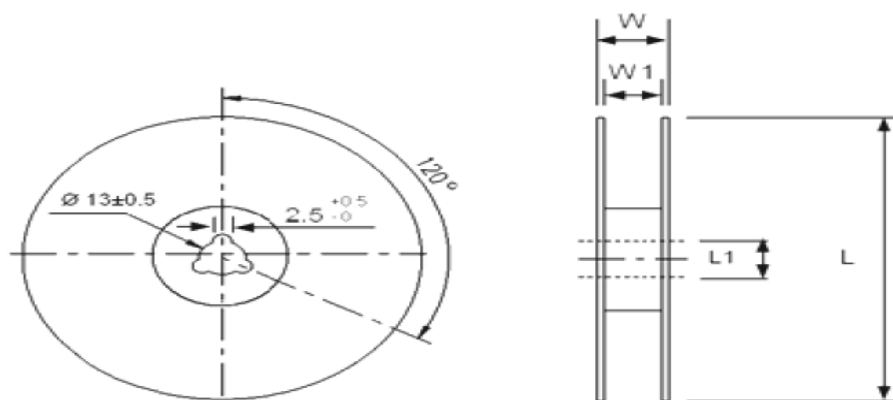
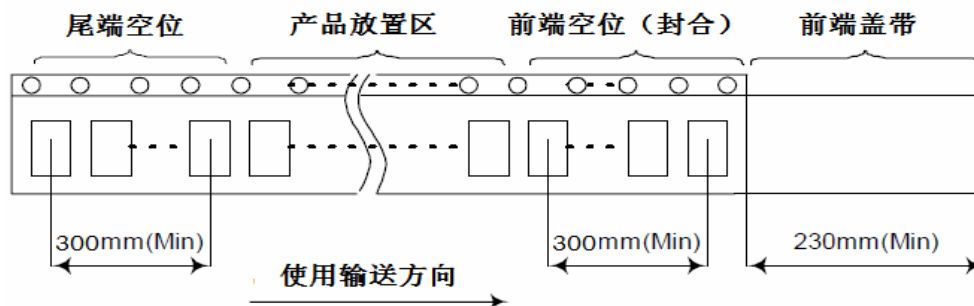


PACKING :

8mm-4mm, 3000pcs / reel, ϕ 178;



| Dimension | A | B | C | D | E | F | G | H | Unit: |
|-----------|-------------------|-------------------|-------------------|------|------|------|------|------|-------|
| | 1.55 ± 0.1 | 2.70 ± 0.1 | 2.25 ± 0.1 | 4.00 | 8.00 | 4.00 | 1.50 | 1.75 | mm |







| Dimension | L | L1 | W | W1 | Unit: mm |
|-----------|-----|----|------|----|----------------|
| | 178 | 13 | 11.5 | 8 | 3000pcs / reel |







SMD PRODUCT PACKING STANDARD

Out-going packing instruction

| Reel Packing | Inner Packing | Carton |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| name: reel standard: diameter 18cm material: plastics | name: Bubble Wrap standard: 430x330+20mm material: HDPE(15 reels enter) | name: carton standard: 400x400x280mm material: AB corrugated paper(4 bags enter) |
|  |  |  |
| | |  |

The label instruction

| Label Drawing | Mark | Name of Article | Spec. | Size | Printing |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------|-----------------------------------------------|---------|----------|
| <p>PART NO : 3526000389</p> <p>LOT NO : 20041400</p> <p>Q'TY : 3000</p> <p>FREQ : 26.000000MHz</p>  <p>MSL 1</p>  | L1 | 条码标签 Bar Code Label (Chintz Paper) | 1.Part No. 2.Lot No. 3.Q'ty 4.Freq | 70x50mm | White |
| <p>PART NO : 3526000389</p> <p>DATE CODE: 2015</p> <p>Q'TY : 30000</p> <p>FREQ : 26.000000MHz</p>  <p>MSL 1</p>  | 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.



| Range | Products | Packing Material |
|---------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------|
| Banned Substances | Maximum concentration ppm(mg/kg) | Maximum concentration ppm(mg/kg) |
| 1.镉及镉化合物 Cadmium and cadmium compounds | 100 | 100 |
| 2.铅及铅化合物 Lead and lead compounds | 1000 | 100 |
| 3.汞及汞化合物 Mercury and mercury compounds | 1000 | 100 |
| 4.六价铬化合物 Hexavalent-Chromium VI (Cr+6) | 1000 | 100 |
| 5.聚溴联苯 PBB Polybrominated biphenyls | 1000 | N/A |
| 6.聚溴二苯醚 PBDE Polybrominated diphenyl ethers | 1000 | N/A |
| 7.邻苯二甲酸二(2-乙基己基)酯 DEHP Di (2-ethylhexyl) phthalate | 1000 | N/A |
| 8.邻苯二甲酸丁苄酯 BBP Butyl Benzyl Phthalate | 1000 | N/A |
| 9.邻苯二甲酸二丁酯 DBP Dibutyl Phthalate | 1000 | N/A |
| 10 邻苯二甲酸二异丁酯 DIBP Diisobutyl Phthalate | 1000 | N/A |
| 11. 氟 (F)、氯 (Cl)、溴 (Br)、碘 (I) Fluorine、Chlorine、Bromine、 | 900、900、900、900 注: Br+Cl<1000 | N/A |
| 12.包装材料中重金属(汞、镉、六价铬、铅、PBB、PBDE)之总量 Heavy metals (mercury, cadmium, lead, Cr+6,PBB and PBDE) in packing materials | N/A | 100 铅(Pb) + 镉(Cd) + 汞(Hg) + 六价铬(Cr+6) <100ppm |
| 13.高度关注物质 SVHC-Substances of Very High Concern | 1000 | N/A |

