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PRODUCT SPECIFICATION SHEET

CUSTOMER : _____
PRODUCT TYPE : SMD X'TAL 2.0*1.6(4PAD)
NOMINAL FREQ. : 32.000000 MHz
FL P/N : 9S32000073
REVISION : A3
CUSTOMER P/N : _____

CUSTOMER'S APPROVAL&DATE

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

FL CORPORATION

| APPROVED | CHECKED | DESIGNED |
|----------|--------------|----------|
| Liu Feng | Liao Xiaohua | Li Xiang |

MSL1
RoHS Compliant



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| • SPECIFICATION OF THE ENVIRONMENT-RELATED SUBSTANCES | 9 |

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 |

Attention

- If you intend to use products on the controlling equipment that relate to medical, aeronautical, aerospace, military science, space and etc, please make sure to let us know your intentions in advance.
- Ultrasonic related process may cause damage to crystal blank by resonance itself. If ultrasonic related process is used, we strongly recommend to assess the damage risk under related ultrasonic conditions before use in production.

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

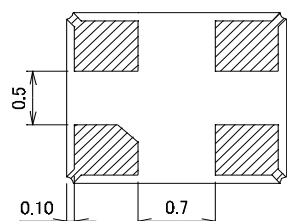
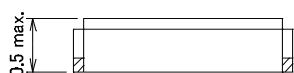
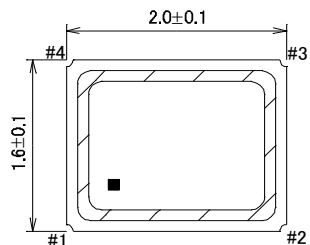
The crystal is using AT CUT (thickness shear mode)

ELECTRICAL SPECIFICATIONS

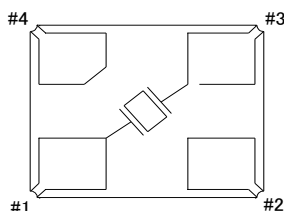
| No. | Items | Electrical Spec. | | | | Units | Remarks |
|-----|------------------------------|------------------|-------------|-----|-----|--------------------|---|
| | | Symbol | Min | Typ | Max | | |
| 1 | Nominal Frequency | FL | 32.000000 | | | MHz | - |
| 2 | Oscillation Mode | - | Fundamental | | | - | - |
| 3 | Load Capacitance | CL | 8.0 | | | 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 | - | - | 3 | 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 | | 85 | $^{\circ}\text{C}$ | - |
| 10 | Equivalent series resistance | ESR | - | | 80 | ohms | - |
| 11 | Insulation Resistance | IR | 500 | - | - | M-ohms | at DC 100V |
| 12 | ESD | - | HBM > 4000V | | | - | ANSI/ESDA/JEDEC JS-001 |
| 13 | MSL | - | Level 1 | | | - | J-STD-020 |
| 14 | Drive Level | DL | | | 100 | μW | - |



DIMENSIONS unit:mm

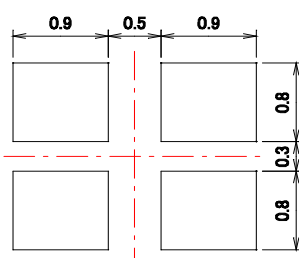


CONNECTION DIAGRAM (TOP VIEW)

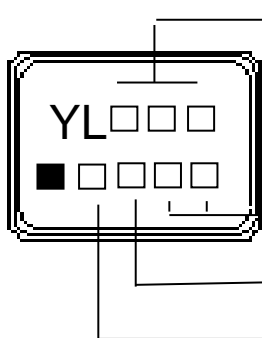


| Pin | Function |
|-----|------------------------|
| #1 | Xtal terminal (Input) |
| #2 | GND terminal |
| #3 | Xtal terminal (Output) |
| #4 | GND terminal |

LAND PATTERN unit:mm



MARKING



Frequency
EX: 32.000MHz = 320

lot (2 digits)

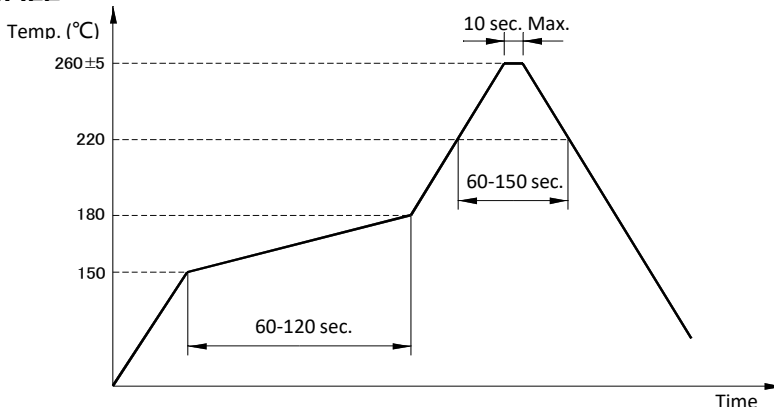
year month code

Administrative Symbol

| | | month | | | | | | | | | | | |
|------|------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| year | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2021 | 2025 | A | B | C | D | E | F | G | H | J | K | L | M |
| 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 |

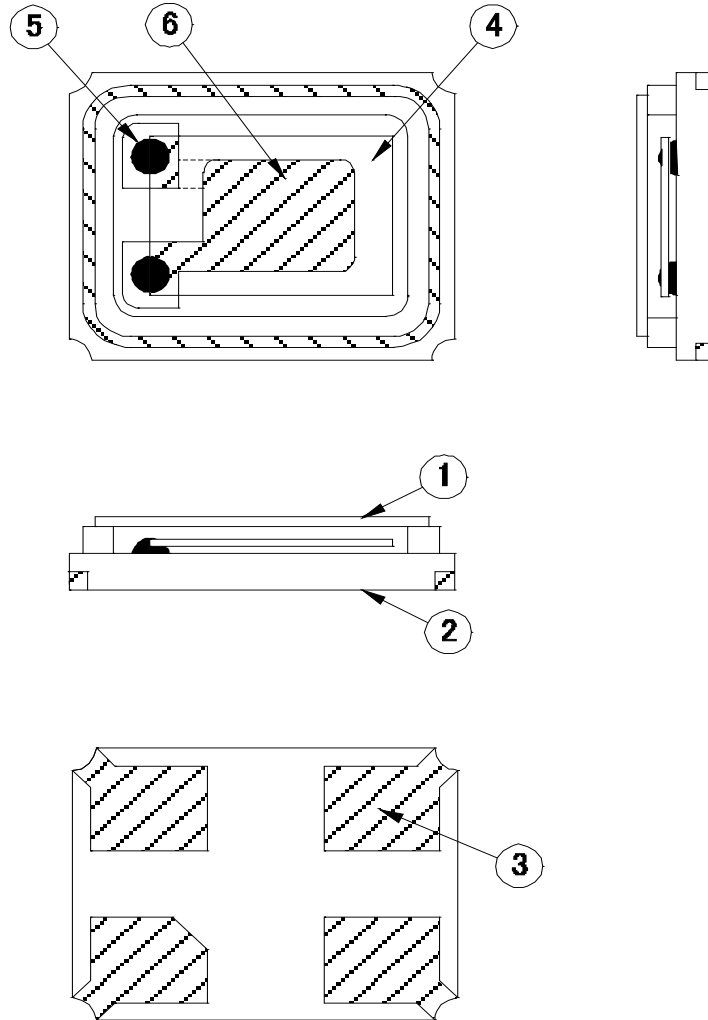
SUGGESTED REFLOW PROFILE

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

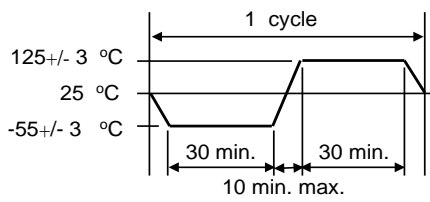
1.MECHANICAL ENDURANCE

| 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 mutually 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 time 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/cm2 | MIL-STD-883E |
| 6 | Fine Leak | Helium Bombing 4.5kgf/cm2 for 2 hr | MIL-STD-883E |
| 7 | Solderability | Temperature 245 °C +/- 5 °C Immersing depth 0.5 mm minimum Immersion time 10 +/- 0.5 seconds Flux Rosin resin methyl alcohol solvent (1 : 4) | MIL-STD-883E |
| 8 | Resistance To Soldering Heat | Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 +/- 5 °C Test time 5 +/- 1 sec. | MIL-STD-202F |

*Storage conditions : 18 months

*Constant humidity : 40~70%

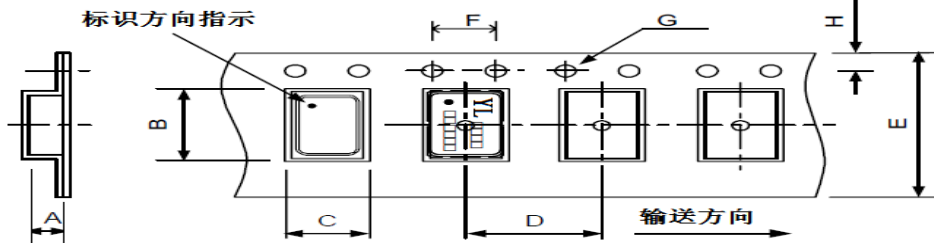
2.ENVIRONMENTAL ENDURANCE

| No. | Test Item | Test Methods | |
|-----|--------------------|---|--------------|
| 9 | High Temp. Storage | + 125 °C +/- 3 °C for 500 +/- 12 hours | MIL-STD-883E |
| 10 | Low Temp. Storage | - 40 °C +/- 3 °C for 500 +/- 12 hours | |
| 11 | Thermal Shock | Total 100 cycles of the following temperature cycle  | MIL-STD-883E |
| 12 | High Temp&Homidity | 85°C±3°C, RH 85%,500Hrs | JIS C5023 |

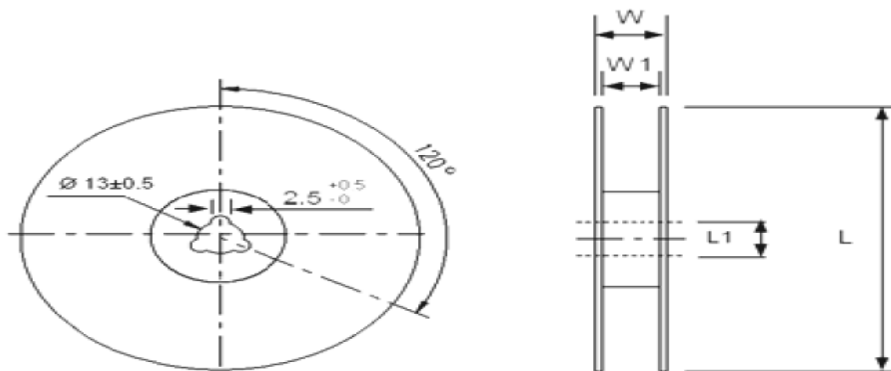
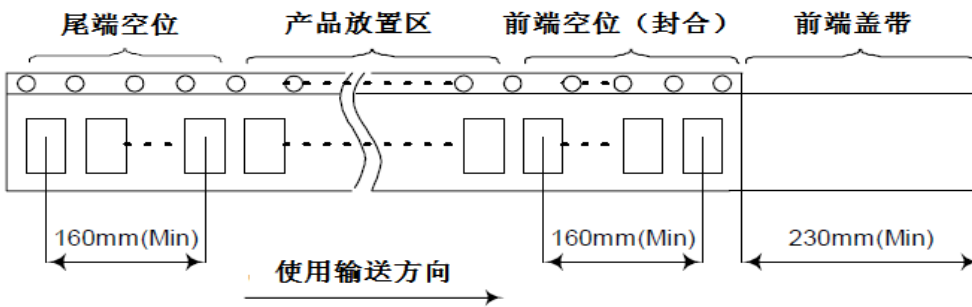


PACKING :

8mm-4mm, 3000pcs / reel, $\phi 178$;



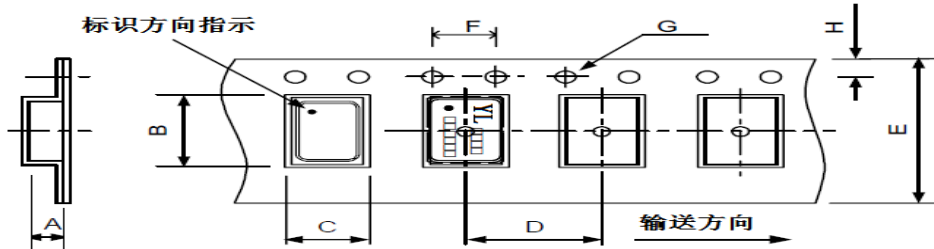
| Dimension | A | B | C | D | E | F | G | H | Unit: |
|-----------|-----------|-----------|-----------|------|------|------|------|------|-------|
| | 1.40 | 3.40 | 2.70 | 4.00 | 8.00 | 4.00 | 1.50 | 1.75 | mm |
| | ± 0.1 | ± 0.1 | ± 0.1 | | | | | | |



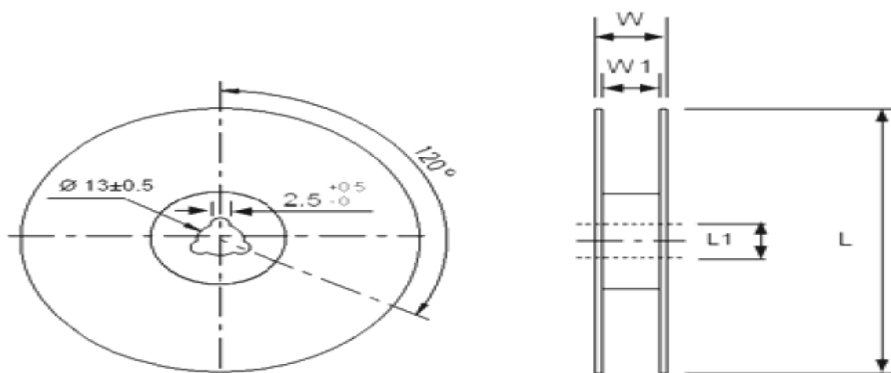
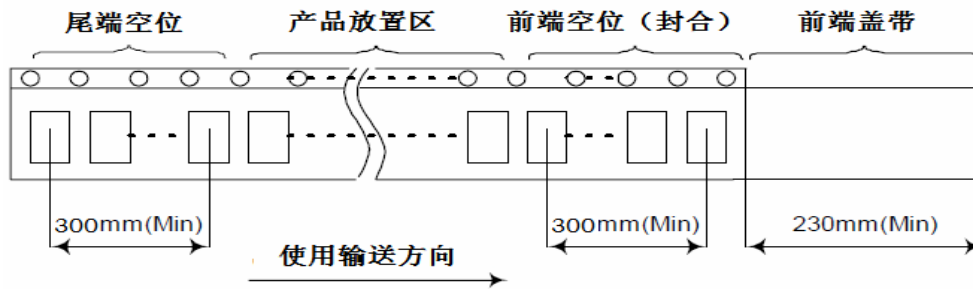


PACKING :

8mm-4mm, 3000pcs / reel, ϕ 178;



| Dimension | A | B | C | D | E | F | G | H | Unit: |
|-----------|-------------------|-------------------|-------------------|------|------|------|------|------|-------|
| | 0.65 ± 0.1 | 2.20 ± 0.1 | 1.90 ± 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 |




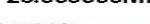










SMD PRODUCT PACKING STANDARD

Out-going packing instruction

| Reel Packing | Inner Packing | Carton |
|---|---|--|
| name: reel standard: diameter 18cm material: plastics | name: Bubble Wrap standard: 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 |
|---|------|--|---|---------|----------|
| PART NO : 3526000389  LOT NO : 20041400  Q'TY : 3000  FREQ : 26.000000MHz    惠伦晶体 FAITH LONG CRYSTAL MADE IN CHINA | L1 | 条码标签 Bar Code Label (Chintz Paper) | 1.Part No. 2.Lot No. 3.Q'ty 4.Freq | 70x50mm | White |
| PART NO : 3526000389  DATE CODE: 2015  Q'TY : 30000  FREQ : 26.000000MHz    惠伦晶体 FAITH LONG CRYSTAL MADE IN CHINA | 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、Iodine | 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 |

