



浙江汇隆晶片技术有限公司

*Zhejiang Huilong Crystals Technology Co.,Ltd*

## ***SPECIFICATION FOR APPROVAL***

CUSTOMER

NOMINAL FREQUENCY

24.000000 MHz

HOLDER TYPE

3225

SPEC. NO. ( P/N )

HL24000092-A

CUSTOMER P/N

ISSUE DATE

Nov.27,2025

| APPROVED                                                                            | PREPARED                                                                            | QA                                                                                    |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| APPROVED BY CUSTOMER:                                                               |                                                                                     | AVL Status                                                                            |
| Please return one copy with approval to HLC                                         |                                                                                     |                                                                                       |

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ISO9001  
ISO14001



RoHS Compliant ( Pb- Free )



# TYPE HL SEAM SEALED X'TAL

## ELECTRICAL SPECIFICATIONS

HLC Parts Number : HL24000092-A

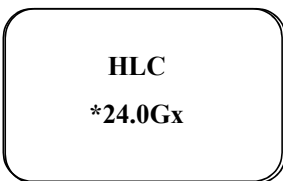
| Item                          | Symbol | Specifications |      |     |               | Notes                                                   |
|-------------------------------|--------|----------------|------|-----|---------------|---------------------------------------------------------|
|                               |        | Min            | Type | Max | Units         |                                                         |
| Nominal frequency             | FO     | 24.000000      |      |     | MHz           |                                                         |
| Mode of Oscillation           | OT     | Fundamental    |      |     |               |                                                         |
| Load Capacitance              | CL     | 9              |      |     | pF            |                                                         |
| Frequency Tolerance           | FT     | $\pm 10$       |      |     | ppm           | at 25°C $\pm 3^\circ\text{C}$                           |
| Frequency Stability           |        | $\pm 20$       |      |     | ppm           | with working temperature<br>Reference to 25°C frequency |
| Working temperature range     | TR     | -40~85         |      |     | °C            |                                                         |
| Drive Level                   | DL     | 100            |      |     | $\mu\text{W}$ |                                                         |
| Series Resonant Resistance RR | CI/RR  | 40             |      |     | $\Omega$      | Max.                                                    |
| Insulation Resistance         | IR     | >500           |      |     | M $\Omega$    |                                                         |
| Shunt Capacitance C0          | C0     | 3              |      |     | pF            | Max.                                                    |
| Aging                         |        | $\pm 3$        |      |     | ppm/yr.       |                                                         |
| Storage temperature range     |        | -55 ~ 125      |      |     | °C            |                                                         |
|                               |        |                |      |     |               |                                                         |

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# TYPE HL SEAM SEALED X'TAL

## MARKING



HLC: HLC Use Code      x:      CL Code      x:      Date Code

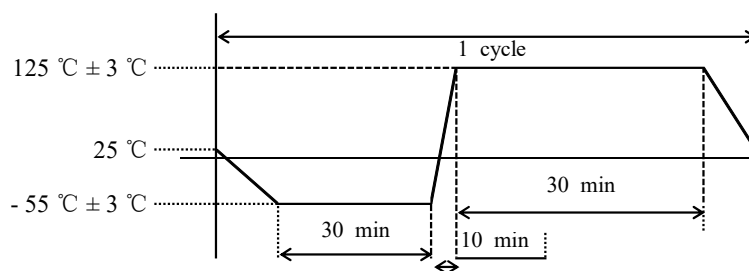
| CL    | Code | CL     | Code | CL     | Code |
|-------|------|--------|------|--------|------|
| 0pf   | 0    | 7.5pf  | H    | 11.2pf | a    |
| 6pf   | 1    | 11pf   | I    | 11.4pf | b    |
| 8pf   | 2    | 8.5pf  | J    | 13.5pf | d    |
| 10pf  | 3    | 7.1pf  | K    | 20.5pf | e    |
| 12pf  | 5    | 19pf   | L    | 8.8pf  | f    |
| 15pf  | 6    | 12.5pf | M    | 17pf   | g    |
| 16pf  | 7    | 27pf   | N    | 4.3pf  | h    |
| 18pf  | 8    | 7.3pf  | O    | 9.9pf  | i    |
| 20pf  | 9    | 13pf   | P    | 24pf   | j    |
| 22pf  | A    | 11.5pf | Q    | 9.4pf  | m    |
| 25pf  | B    | 7pf    | R    | 8.2pf  | n    |
| 28pf  | C    | 14pf   | S    | 6.8pf  | q    |
| 30pf  | D    | 23pf   | T    | 90pf   | r    |
| 32pf  | E    | 11.1pf | U    | 5.6pf  | t    |
| 9.5pf | F    | 33pf   | V    | 5pf    | u    |
| 9pf   | G    | 10.5pf | W    | 10.7pf | v    |
|       |      | 9.2pf  | Y    | 7.2pf  | y    |
|       |      | 50pf   | Z    |        |      |

|        |   |        |   |
|--------|---|--------|---|
| Jan-25 | N | Jan-26 | A |
| Feb-25 | P | Feb-26 | B |
| Mar-25 | Q | Mar-26 | C |
| Apr-25 | R | Apr-26 | D |
| May-25 | S | May-26 | E |
| Jun-25 | T | Jun-26 | F |
| Jul-25 | U | Jul-26 | G |
| Aug-25 | V | Aug-26 | H |
| Sep-25 | W | Sep-26 | J |
| Oct-25 | X | Oct-26 | K |
| Nov-25 | Y | Nov-26 | L |
| Dec-25 | Z | Dec-26 | M |
|        |   |        |   |
|        |   |        |   |
|        |   |        |   |
|        |   |        |   |
|        |   |        |   |
|        |   |        |   |
|        |   |        |   |

备注：年份印字代码原则按奇偶年两年一个循环

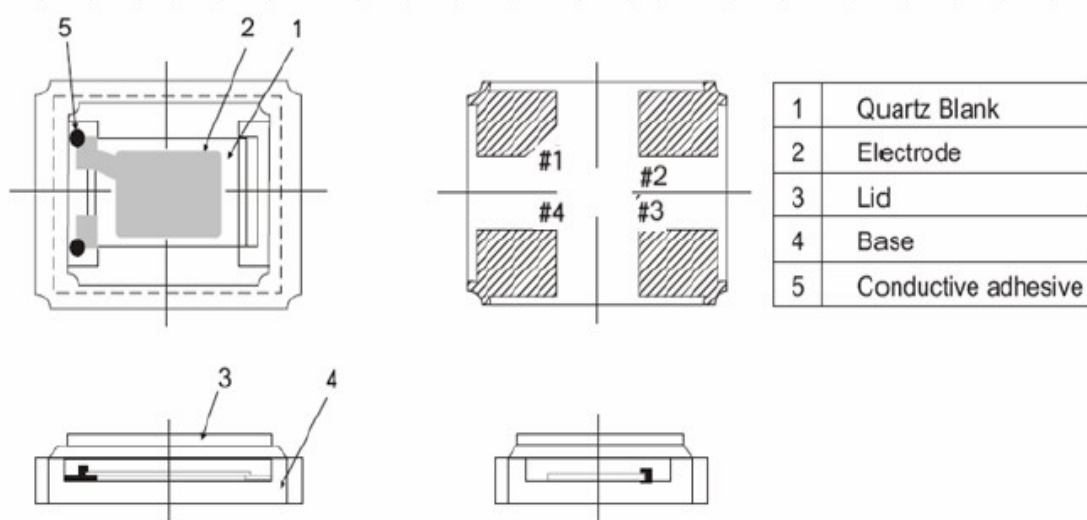
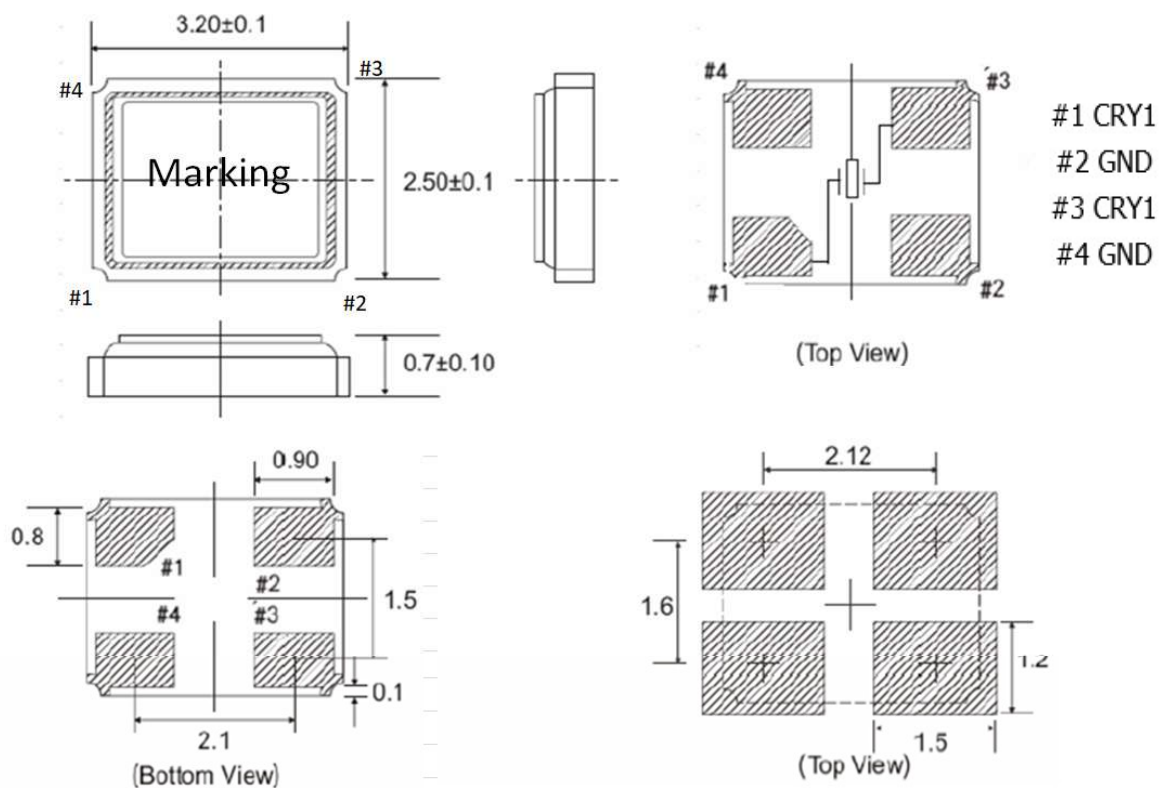
## RELIABILITY SPECIFICATIONS

| NO. | TEST ITEM                    | TEST METHODS                                                                                                                                                                                                                                                |
|-----|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | DROP TEST                    | Device are dropped from a height of 150 cm onto 2 mm thickness stainless plate executing 3 times of random drops.                                                                                                                                           |
| 2   | MECHANICAL SHOCK             | Device are shocked to half sine wave (1000 G) three mutually perpendicular axes each 3 times.                                                                                                                                                               |
| 3   | VIBRATION                    | <div>Frequency range10 ~ 2000 Hz</div> <div>Amplitude1.5 mm</div> <div>Sweep Time20 minute</div> <div>Test Time2 hours</div>                                                                                                                                |
| 4   | SOLDERABILITY                | <div>MIL - STD - 20E Method 208C</div> <div>Temperature245℃±5℃</div> <div>MaterialH63A (Silver 2 ~ 3 %)</div> <div>Immersion depth0.5 mm minimum</div> <div>Immersion time3 ± 0.5 seconds</div> <div>FluxRosin resin methyl alcohol solvent ( 1 : 4 )</div> |
| 5   | RESISTANCE TO SOLDERING HEAT | MIL - SLD -202, Method 210, Condition I or J<br>10 sec immersion into 260 ± 5℃ solder pot, above 180℃ is 90 ~ 120 sec.                                                                                                                                      |
| 6   | LOW TEMP. STORAGE            | Leave at - 40 °C ± 2℃ for 16 hours                                                                                                                                                                                                                          |
| 7   | HIGH TEMP. STORAGE           | Leave at 125 °C ± 3℃ for 72 hours                                                                                                                                                                                                                           |
| 8   | THERMAL SHOCK                | Total 100 cycles of the following temperature cycle                                                                                                                                                                                                         |

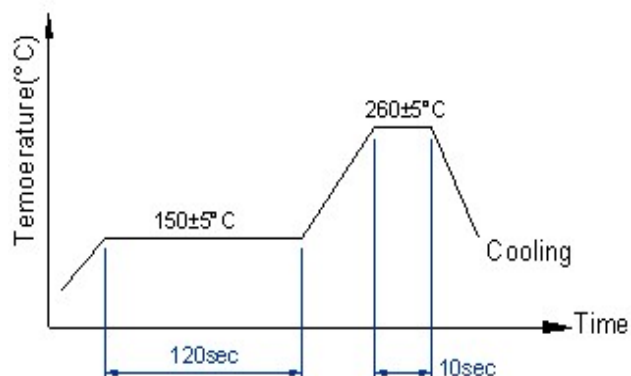


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## DIMENSIONS



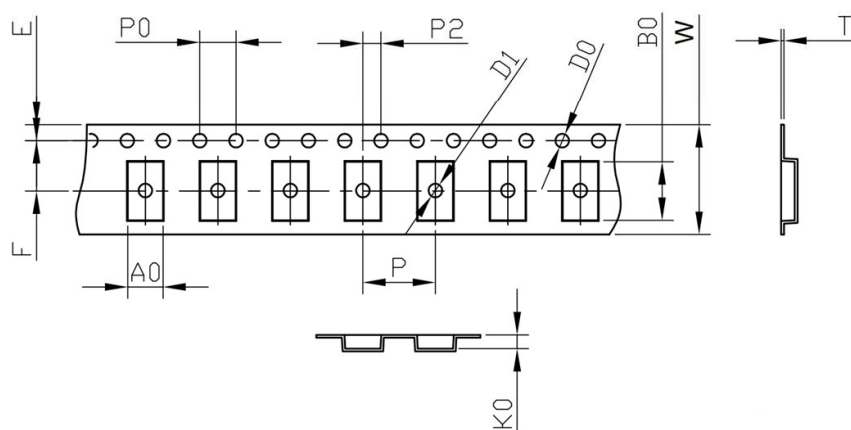
## SUGGESTED IR REFLOW PROFILE



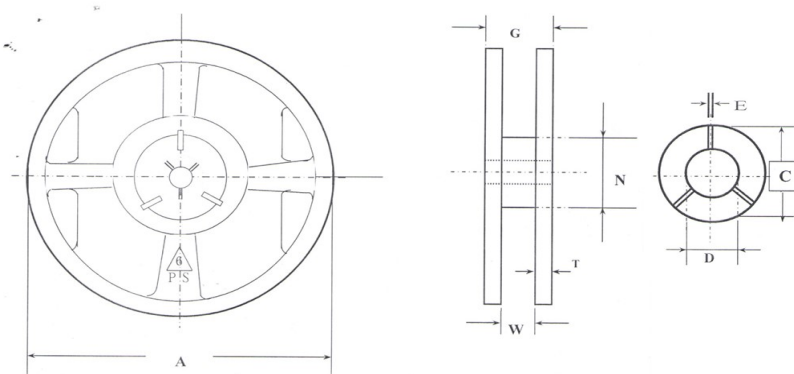
Total Time: 200 Sec.Max

Solder melting point : 185°C

## PACKING



|      | W       | A <sub>0</sub> | B <sub>0</sub> | K <sub>0</sub> | E        | F       | P       | P <sub>0</sub> | P <sub>2</sub> | D <sub>0</sub> | D <sub>1</sub> | T         |
|------|---------|----------------|----------------|----------------|----------|---------|---------|----------------|----------------|----------------|----------------|-----------|
| 3225 | 8.0±0.3 | 2.70±0.1       | 3.40±0.1       | 0.80±0.1       | 1.75±0.1 | 3.5±0.1 | 4.0±0.1 | 4.0±0.1        | 2.0±0.1        | 1.55±0.05      | 1.0±0.1        | 0.25±0.05 |



|      | A       | W       | T       | N        | C        | D        | E       | G      |
|------|---------|---------|---------|----------|----------|----------|---------|--------|
| 3225 | 178±2.0 | 9.5±0.5 | 1.4±0.2 | 60.2±0.5 | 20.2±1.0 | 13.2±0.5 | 2.5±0.5 | 12±1.4 |

- 230mm minimum leader which consist of carrier and/or tape followed by a minimum of 160mm of empty carrier tape sealed with cover tape.
- 160mm minimum trailer of empty carrier tape sealed with cover tape.

## PACKING

