# CRYSTAL CLOCK OSCILLATORS

## High Frequency Type

### 2560NK


RoHS Compliant
Directive 2002/95/EC

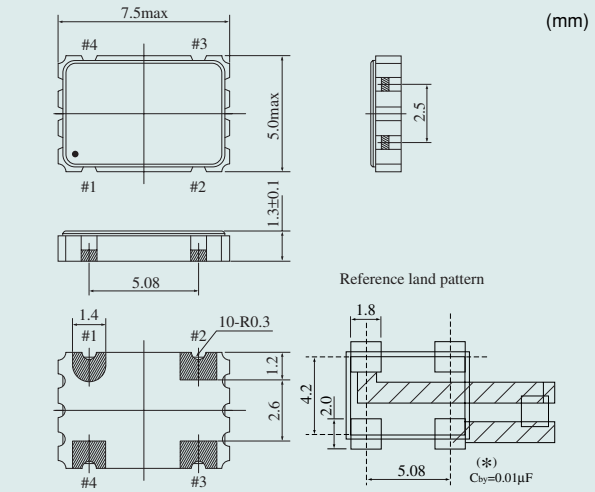
### ■ Features

- Leadless type clock oscillator which fits highly dense mounting, with light & small demand, surface mounting.
- IR reflow, automatic mounting are applicable.
- Frequency range : 1.8MHz~80MHz.
- Stand-by function for output : Tri-state output.
- Static electricity proof package with tape & reel available.

**■ Absolute Maximum Rating**
**Supply Voltage ($V_{DD}$) –0.5~+7.0V DC**
**Storage Temperature Range –55~+125°C**

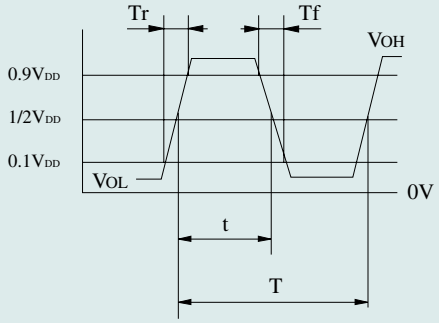
| Item \ Model | | 2560NK | | | |
|---|---|---|---|---|---|
| Output Level | | C-MOS | | | |
| Frequency Range | (MHz) | 1.8≦F≦25 | 25<F≦50 | 50<F≦67 | 67<F≦80 |
| Frequency Stability | (×10⁻⁶) | ±100 | | | |
| Operating Temp. Range | (°C) | –10~+70 | | | |
| Supply Voltage ($V_{DD}$) | (V) | 5.0±0.5 | | | |
| Current Consumption | (mA) +5V DC, 25°C | 25 (max) | 40 (max) | 60 (max) | 73 (max) |
| $V_{OL}$ max/$V_{OH}$ min | (V) | 0.1$V_{DD}$/0.9$V_{DD}$ $I_{OL}$=16mA $I_{OH}$=–16mA | | | |
| Tr max/Tf max | (ns) | 5/5 (0.1$V_{DD}$~0.9$V_{DD}$) | | | |
| Duty Cycle | (%) | 45~55 (at +1/2$V_{DD}$) | | | |
| Fanout (gate) | $C_L$ (pF) | 50 | | | |
| Stand-by Function | Tri-state | Yes | | | |

### ■ 2560NK Outline




| PAD No. | Connection |
|---|---|
| # 1 | STAND-BY |
| # 2 | GND |
| # 3 | OUTPUT |
| # 4 | $V_{DD}$ |

### ■ Output Wave <C-MOS>




Duty Cycle = t/T×100 [%]

### ■ Stand-by Function <Tri-state>

| # 1 input | # 3 output |
|---|---|
| H level (+2.2 $V_{DD}$ min) or open | Operating |
| L level (+0.8 $V_{DD}$ max) | High impedance |

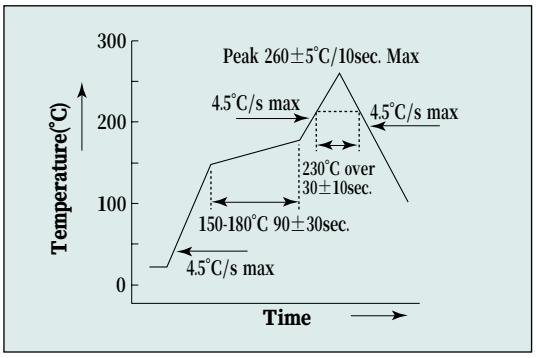


Please access NDK web site (http://www.ndk.com/) for the latest information.

# Handling Cautions (2500 series)

## ■ Examples for soldering conditions

(Infra-red ray reflow soldering)




- **Soldering**

  To avoid product damage during soldering, please follow either below reflow conditions (a) or (b).

  (a) Temperature : 260°C (max)
  Duration : 10 seconds (max)

  (b) Temperature : 230°C (max)
  Duration : 80 seconds (max)

- **Cleaning**

  Basically, the 2500 series can be cleaned by ultrasonic wave. However, in some cases, during ultrasonic wave cleanings, internal design may be damaged. Please check conditions carefully beforehand.

- **Marking resistance to solvents**

  The markings withstand 30 minutes soaking in Alcohol.
  If conditions are more severe than above mentioned, please check carefully beforehand.

- **Others**

  The 2500 series are C-MOS products. Careful handling (same as with C-MOS IC) is needed to avoid electrostatic problems.

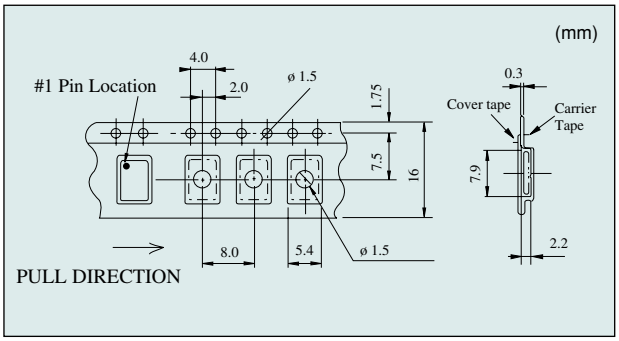
  Incorrect pin connection can cause problems.
  Please make sure to connect correctly as below.
  #2 terminal → GND
  #4 terminal → $V_{DD}$

# Taping Dimensions (2500 series)

## ■ Taping method

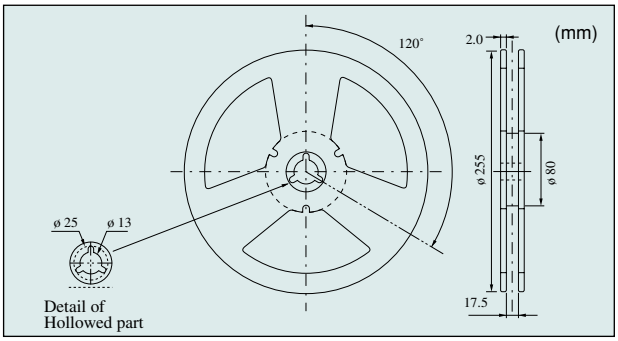
| Quantity | Taping method |
|---|---|
| 1~499 | Vinyl bag packaging |
| 500~1999 | Taping |
| 2000 ~ | Taping & Reel |

## ■ Tape




2000 pieces/reel are boxed and shipped with the taping method as shown above

## ■ Reel




*Note The Packaging method shown above is only for large orders. For small orders, or for samples, the packaging form is different according to the requested quantity .

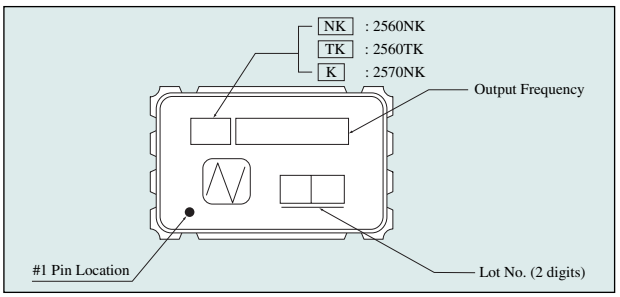
## 2500 SERIES WARRANTY CLAUSE

| No. | Item | Condition | Specification |
|---|---|---|---|
| 1 | Thermal Shock Test | 1 Cycle: –55˚C (15minutes)~+125˚C (15minutes)<br>Number of Cycle : 5 cycles in gas phase | (1) |
| 2 | Vibration Test | 10~55Hz, 1.5mm (Peak to Peak)<br>55~2000Hz, 196m/s$^2$<br>Sweep time 6 Hours (3 directions, 2H each) | (1) |
| 3 | Drop Test | Drop Height: 75 cm, 3 drops onto hard wooden board | (1) |
| 4 | Soldering. Resistance | Test Condition Soaking in the soldering bath at +260˚C±5˚C for 20 seconds 2 times each or Soaking in the soldering bath at +230˚C±5˚C for 180 seconds 2times each | (1) |
| 5 | Soldering Test | Test Condition: Soaking in the soldering bath at +235°C±5˚C for 2±0.5 seconds | (2) |
| 6 | Air Tightness | 5minutes immersion in Fluorinert at 125˚C±5˚C | (3) |
| 7 | Solvent Resistance | Soaking in alcohol for 30 minutes | (4) |

(1) After the tests mentioned above, the electrical specifications are satisfied.
The electrical specifications are Tr/Tf, $V_{OL}/V_{OH}$, Duty Cycle.
(2) More than 90% of Lead or Pad should be covered by solder.
(3) No bubbles should be observed.
(4) The markings are not faded out.

## 2500 SERIES MARKING

Marking frequency digits differs according to marking space available.
Please refer to below.




**2500 Series:**

- Including decimal point, 6 digits are marked.
  [EX] 14.31818MHz → 14.318