

■ Precautions for Use

Please read the following precautions carefully in order to use NDK's crystal oscillators correctly and to ensure optimum performance of the unit.

1. Electric Handling

1.1 Power Source

Connect the power source to a specified terminal with the correct polarity as shown in this catalogue. If the power source is connected with positive and negative electrodes reversed or if it is connected to a terminal other than the specified one, parts inside the crystal oscillator will be damaged, and the oscillator will not work.

In addition, if a voltage higher than the rated value is applied, it may cause similar damage to that mentioned above. Make sure to use the oscillator at the correct rated voltage, but if a voltage lower than the rated value is applied, parts inside the oscillator will not be damaged, and the unit may not give optimum performance.

1.2 Load Impedance

Set a prescribed value for load impedance. When a value other than the prescribed one is set for load impedance, the output frequency and the output level will not meet the specified values, which may cause problems, such as distortion of output waveforms. Particularly, set the reactance of the load impedance according to the specifications.

1.3 Output Frequency and Output Level

When measuring the output frequency or output level of a crystal oscillator, adjust the input impedance of the measuring instrument to the load impedance of the crystal oscillator.

When the input impedance of the measuring instrument is different from the load impedance of the crystal oscillator, measure the output frequency or output level with high impedance so that the impedance on the measurement side can be ignored.

2. Mechanical Handling

2.1 Shock

Do not administer any strong shocks to the crystal oscillator. When carrying the oscillator or mounting it on another device, protect the unit from any shocks, be careful not to drop it or hit it with a hard object. Strong shocks may cause damage to the parts inside the crystal oscillator, which may cause the oscillator not to work.

If a strong shock has been given to the oscillator, make sure to check its characteristics before using it.

2.2 Mounting of a Lead-mount Crystal Oscillator

Do not apply any excessive force to the terminals and mounting screws of a crystal oscillator.

When mounting the crystal oscillator on a printed board, align the distance between the mounting holes with that between the terminals. If the oscillator is mounted forcibly and these distances are different from each other, the terminals may be damaged.

Do not bend hermetic terminals with a diameter of 0.6 mm or more.

Even when it is necessary to bend terminals with a diameter of 0.6 mm or less, do not bend them directly from their hermetic base so that the hermetic glass can be protected. If the glass cracks, the airtight seal and insulation may be affected and the unit may be unable to deliver the prescribed characteristics.

When a non-hermetic crystal oscillator (with its product case having a hole for frequency correction) is mounted, be careful to prevent flux from entering the hole because movable components, such as a variable capacitor and a variable resistor, are positioned on the inner side of the hole. Solder the terminals at 260 °C (which is the temperature of the terminals) for a maximum of five seconds. Do not solder the terminals directly to the cover or the base.

2.3 Mounting of a Surface-mount Crystal Oscillator

(1) Rapid temperature change after an oscillator has been mounted on a board

When the material of the mounting board, for a surface-mount crystal oscillator package with ceramics, has an expansion coefficient that is different from that of the ceramic, the soldered fillet section may crack in an environment where repeated and extreme temperature changes occur over a long period of time.

Under such conditions, it is recommended that the situation is checked beforehand.

(2) Shock from automatic mounting

When a crystal oscillator is adsorbed or chucked by automatic mounting or a shock that exceeds the specified values is given when it is being mounted on the board, this causes its characteristics to change or deteriorate.

(3) Stress by board bending

If the PC board is bent after a crystal unit is soldered to the PC board, the mechanical stress may cause the soldered part to peel off or the crystal unit package to crack.

2.4 Cleaning

Do not use immersion cleaning with the following crystal oscillators:

| | | |
|-----------|-----------|-----------|
| NV13M08YK | NV13M08YM | NV13M08YN |
| NV13M09WK | NV13M09WN | NV11M09YA |
| NV13M09WS | NV13M09WT | NY13M09WA |

All oven-controlled crystal oscillators (OCXO)

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3. Storage

The ambient temperature and humidity for crystal oscillators in storage should be based on normal temperature and normal humidity (+5 to 45 °C and 10 to 75 %). The temperature and humidity shown above are the ambient-environment criteria to ensure the characteristics of a crystal oscillator do not deteriorate when in use or after it has been left for a long period of time with no power supply voltage applied. However, the electrical and mechanical characteristics, such as the oscillation frequency aging characteristic and the soldering properties, may change over time. Therefore, it is recommended that crystal oscillators should not be kept in storage for a long period of time (three months or more), although depending on their specifications and configuration, the storage period will differ.

In addition, do not store crystal oscillators in an environment of high temperature and high humidity (relative humidity: 75 % or more) and in places where corrosive gas is generated. If you need to use crystal oscillators in an environment exposed to sea breezes or in places where humidity is high and dew condensation easily occurs, consider using hermetically sealed ones.

4. Reflow soldering

Figure 2 shows the standard temperature profile in IR reflow soldering.

The peak temperature for High Precision Oscillator (OCXO) and the VCXO of following type are +245 °C.

For queries concerning a more detailed reflow profile, please contact us.

For the following oscillators, please do not reflow the board upside down after mounting them. (The products themselves or their covers may fall off.)

| | | |
|-----------|-----------|-----------|
| NV11M09YA | NV13M08YM | NV13M08YK |
| NV13M08YN | NV13M09WK | NV13M09WN |
| NV13M09WS | NV13M09WT | NY13M09WA |

5. Application

This product is manufactured on the assumption that it is to be used in general electronic devices (communication, control, and measuring devices).

In the case of space equipment, nuclear power controls, human life-related medical equipment, etc. that require high reliability and transport machines that require high safety, please contact us.

In addition, this product basically consists of crystal oscillators. Therefore, when it is used in vibrating, wind-cooling, or noisy environments, the characteristics of the product may not be maintained, in such cases please carefully assess such conditions or contact us.

