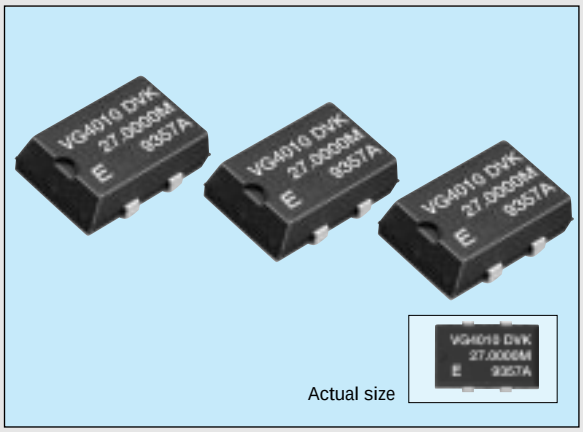
VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR

# VG-4000 series

- High accuracy and high reliability due to trimmerless design.
- Built-in heat resistive AT-cut crystal provides heat resistance equivalent to that of general-purpose ICs.
- Use of C-MOS IC assures low current consumption.
- Excellent shock resistance and environmental capability.
- Supply voltage: 5V(VG-4010JA)
- Supply voltage: 3.3V(VG-4030JA)



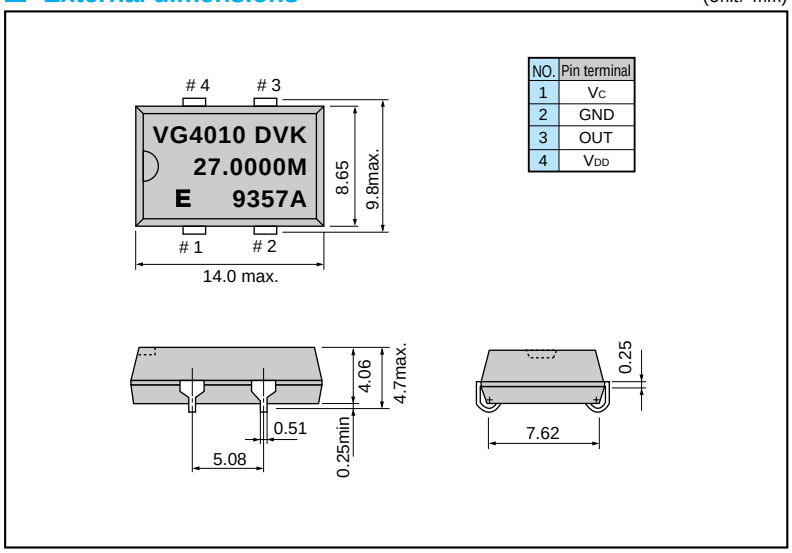

## Specifications (characteristics)

| Item | | Symbol | VG-4010JA DVK | VG-4030JA DVK | Remarks |
|---|---|---|---|---|---|
| | | | Specifications | | |
| Output frequency range | | $f_0$ | 2.0000 MHz to 28.63636 MHz | | * |
| Power source voltage | Max. supply voltage | $V_{DD}$-GND | -0.5V to +7.0V | | |
| | Operating voltage | $V_{DD}$ | 5.0V ±0.25V | 3.3V ±0.17V | |
| Temperature range | Storage temperature | $T_{STG}$ | -55˚C to +125˚C | | |
| | Operating temperature | $T_{OPR}$ | -20˚C to + 70˚C(-40˚C to + 85˚C) | | |
| Soldering condition | | $T_{SOL}$ | Twice at under 260˚C within 10 sec. | | |
| Frequency stability | | $\Delta f/f_0$ | ±35ppm max. | ±37ppm max. | VC=0.5 to 4.5V(4010JA) / VC=0.0 to 3.0V(4030JA) |
| Current consumption | | Iop | 35mA max. | 18mA max. | No load condition |
| Pull range | | $\Delta f_C$ | ±75ppm | As per below table | VC=0.5 to 4.5V(4010JA) / VC=0.0 to 3.0V(4030JA) |
| Input resistance | | $Z_{IN}$ | 10MΩ min. | | DC Level |
| Frequency change polarity | | | Positive polarity | | VC=0.5 to 4.5V(4010JA) / VC=0.0 to 3.0V(4030JA) |
| Duty | | tw/t | 45% to 55%(40% to 60%) | 40% to 60% | 1/2VDD level(1.4V level) |
| Output voltage | | $V_{OH}$ | $V_{DD}$ -0.4V min. | | $I_{OH}$= -0.8mA |
| | | $V_{OL}$ | 0.4V max. | | $I_{OL}$=3.2mA |
| Output load condition (fan out) | | N/$C_L$ | 2TTL or 30pF max. | 30pF max. | TTL load/C-MOS load |
| Output rise time | | $t_{TLH}$ | 5ns. max. | 6ns. max. | C-MOS load: 20%→80% $V_{DD}$ level |
| | | | 8ns. max. | — | TTL load: 0.4V→2.4V level |
| Output fall time | | $t_{THL}$ | 5ns. max. | 6ns. max. | C-MOS load: 20%→80% $V_{DD}$ level |
| | | | 8ns. max. | — | TTL load: 0.4V→2.4V level |
| Oscillation start up time | | $t_{OSC}$ | 10ms. max. | | Time at minimum operating voltage to be 0 sec. |
| Aging | | fa | ±5ppm max. | | Ta=25˚C, first year |
| Shock resistance | | S.R. | ±10ppm max. | | Three drops on a hard board from 75 cm or excitation test with 3000G x 0.3ms x 1/2sine wave in 3 directions |

Vc should be "GND" or "OPEN" when power is on.
* Please contact us for inquiries about the available frequency.

## External dimensions

(Unit: mm)



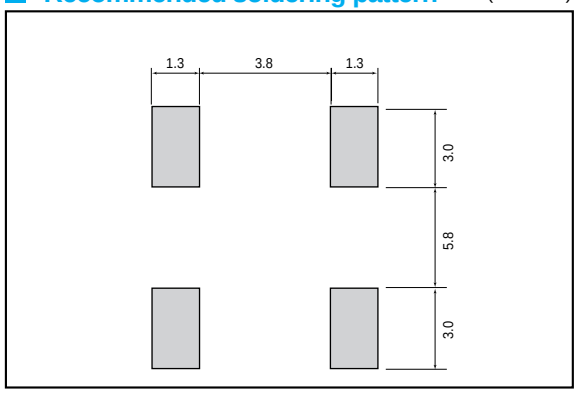

## Pull range

| Pull range | Remarks |
|---|---|
| 180ppm | Crystal unit's frequency < 20MHz, Vc=0.0 to 3.0V |
| 150ppm | Crystal unit's frequency ≥ 20MHz, Vc=0.0 to 3.0V |

Please consult us for pull range.

## Recommended soldering pattern

(Unit: mm)



# THE CRYSTALMASTER

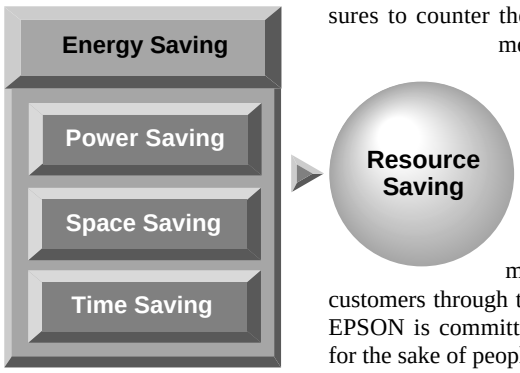
# ENERGY SAVING EPSON

EPSON offers effective savings to its customers through a wide range of electronic devices, such as semiconductors, liquid crystal display (LCD) modules, and crystal devices. These savings are achieved through a sophisticated melding of three different efficiency technologies.

Power saving technology provides low power consumption at low voltages.

Space saving technology provides further reductions in product size and weight through super-precise processing and high-density assembly technology.

Time saving technology shortens the time required for design and development on the customer side and shortens delivery times.




Our concept of Energy Saving technology conserves resources by blending the essence of these three efficiency technologies. The essence of these technologies is represented in each of the products that we provide to our customers.

In the industrial sector, leading priorities include measures to counter the greenhouse effect by reducing CO2, measures to preserve the global environment, and the development of energy-efficient products. Environmental problems are of global concern, and although the contribution of energy-saving technology developed by EPSON may appear insignificant, we seek to contribute to the development of energy-saving products by our customers through the utilization of our electronic devices. EPSON is committed to the conservation of energy, both for the sake of people and of the planet on which we live.

**SEIKO EPSON CORP. QUARTZ DEVICE DIVISION acquired ISO9001 and ISO14001 certification by B.V.Q.I. (Bureau Veritas Quality International) .**

**ISO9001 in October, 1992.**

**ISO14001 in November,1997.**