



# CRYSTAL OSCILLATOR

## PROGRAMMABLE

### OUTPUT : CMOS

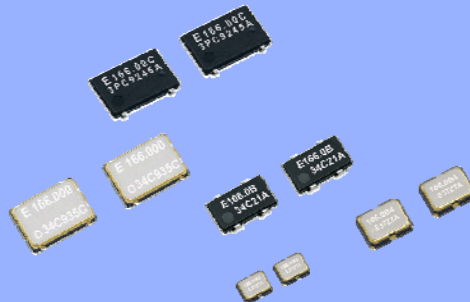
## SG-8003 series

- Frequency range : 1 MHz to 166 MHz
- Supply voltage : 1.8 V / 2.5 V / 3.0 V / 3.3 V
- Function : Output enable(OE) or Standby( $\overline{ST}$ )

- Short mass production lead time by PLL technology.
  - SG-Writer available to purchase.
- Please contact Epson or local sales representative.



Product Number (please contact us)  
X1G003xx2xxxx00



### Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		PE / SE	PD / SD	PC / SC	
Output frequency range	$f_0$	1 MHz to 166 MHz			
Supply voltage	$V_{CC}$	1.8 V Typ. 1.6 V to 2.2 V	2.5 V Typ. 2.2 V to 2.8 V	3.3 V Typ. 2.7 V to 3.6 V	
Storage temperature	$T_{stg}$	-40 °C to +85 °C			Storage as single product.
Operating temperature	$T_{use}$	-20 °C to +70 °C / -40 °C to +85 °C			
Frequency tolerance	$f_{tol}$	B: $\pm 50 \times 10^{-6}$ , C: $\pm 100 \times 10^{-6}$			-20 °C to +70 °C
		L: $\pm 50 \times 10^{-6}$ , M: $\pm 100 \times 10^{-6}$			-40 °C to +85 °C
Current consumption	$I_{CC}$	3.5 mA Max.	4.0 mA Max.		No load condition, 1 MHz $\leq f_0 \leq$ 25 MHz
		5.0 mA Max.	6.5 mA Max.		No load condition, 25 MHz $< f_0 \leq$ 50 MHz
		6.0 mA Max.	8.5 mA Max.		No load condition, 50 MHz $< f_0 \leq$ 75 MHz
		7.0 mA Max.	10.5 mA Max.		No load condition, 75 MHz $< f_0 \leq$ 100 MHz
		8.5 mA Max.	12.5 mA Max.		No load condition, 100 MHz $< f_0 \leq$ 125 MHz
		10.0 mA Max.	15.0 mA Max.		No load condition, 125 MHz $< f_0 \leq$ 166 MHz
Output disable current	$I_{dis}$	8 mA Max.			OE=GND (PE,PD,PC)
Stand-by current	$I_{std}$	50 $\mu$ A Max.			$\overline{ST}$ =GND (SE,SD,SC)
Symmetry	SYM	45 % to 55 %			50 % $V_{CC}$ level, $L_{CMOS} \leq 15$ pF
Output voltage	$V_{OH}$	90 % $V_{CC}$ Min.		$V_{CC} - 0.4$ V Min.	$I_{OH} = -4$ mA (PD,SD,PE,SE), $-8.0$ mA (PC,SC)
	$V_{OL}$	10 % $V_{CC}$ Max.		0.4 V Max.	$I_{OL} = 4$ mA (PD,SD,PE,SE), 8.0 mA (PC,SC)
Output load condition (CMOS)	$L_{CMOS}$	15 pF Max.			
Input voltage	$V_{IH}$	80 % $V_{CC}$ Min.			OE terminal or $\overline{ST}$ terminal
	$V_{IL}$	20 % $V_{CC}$ Max.			
Rise and Fall time	$t_r / t_f$	5.0 ns Max.			1 MHz $\leq f_0 < 80$ MHz   20 % $V_{CC}$ to 80 % $V_{CC}$
		2.5 ns Max.			80 MHz $\leq f_0 \leq 166$ MHz   level, $L_{CMOS} = 15$ pF
Start-up time	$t_{str}$	5 ms Max.			$t=0$ at 90 % $V_{CC}$
Frequency aging	$f_{aging}$	$\pm 3 \times 10^{-6}$ / year Max.			+25 °C, First year, $V_{CC} = 1.8$ V, 2.5 V, 3.3 V

Product Name  
(Standard form)

SG-8003 CG 166.000000MHz P E B

- ① Model    ② Package type    ③ Frequency  
④ Function (P: Output enable, S: Standby)  
⑤ Supply voltage    ⑥ Frequency tolerance

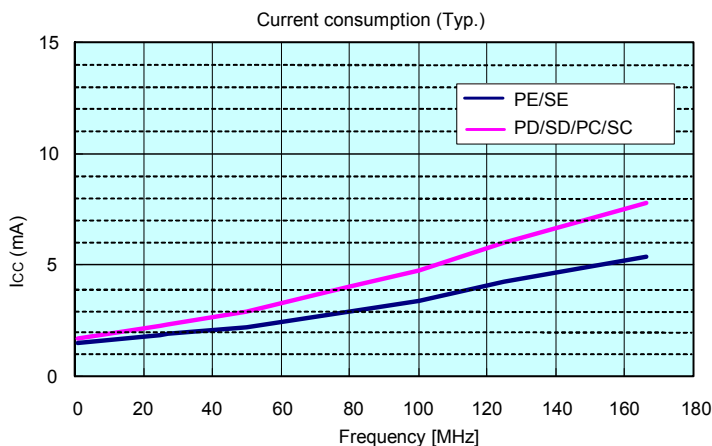
⑤ Supply voltage

C	3.3 V Typ.
D	2.5 V Typ.
E	1.8 V Typ.

⑥ Frequency tolerance

B	$\pm 50 \times 10^{-6}$ / -20 to +70 °C
C	$\pm 100 \times 10^{-6}$ / -20 to +70 °C
L	$\pm 50 \times 10^{-6}$ / -40 to +85 °C
M	$\pm 100 \times 10^{-6}$ / -40 to +85 °C

### Current consumption

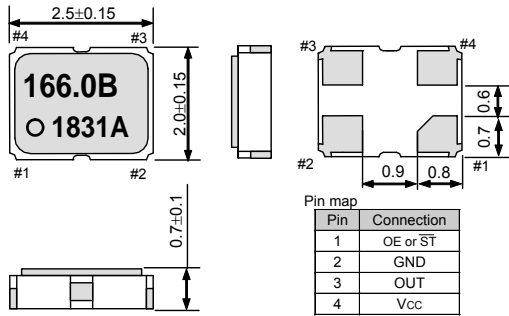


External dimensions

(Unit:mm)

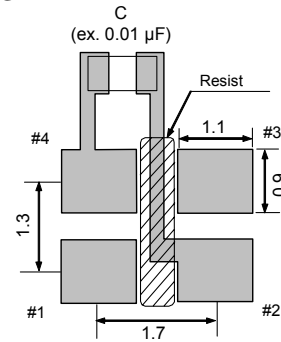
SG-8003CG

Actual size



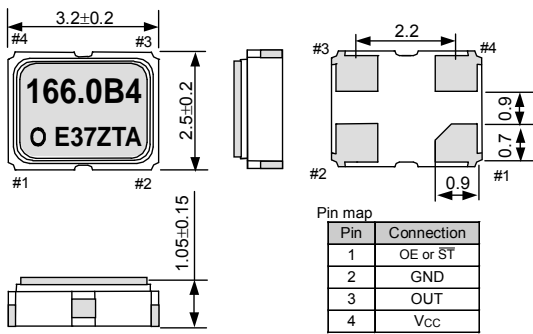
SG-8003CG

(Unit:mm)

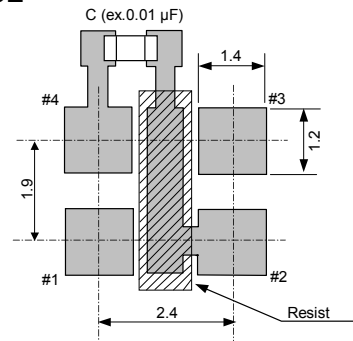


SG-8003CE

Actual size

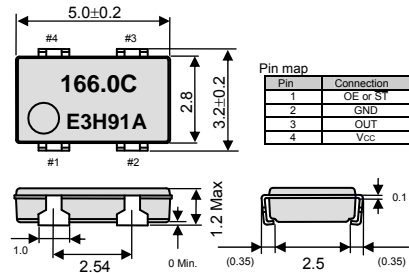


SG-8003CE



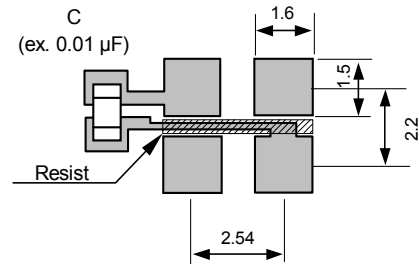
SG-8003LB

Actual size



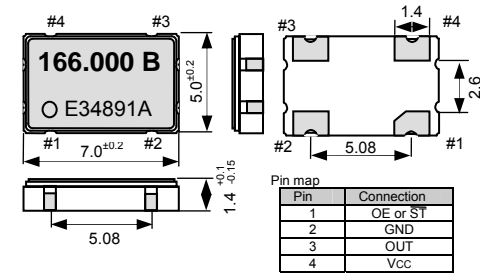
Metal may be exposed on the top or bottom of this product. This will not affect any quality, reliability or electrical spec.

SG-8003LB

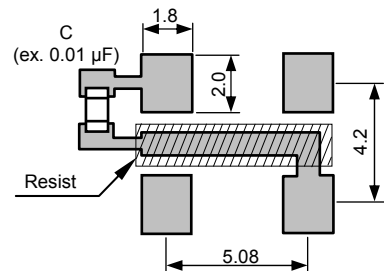


SG-8003CA

Actual size

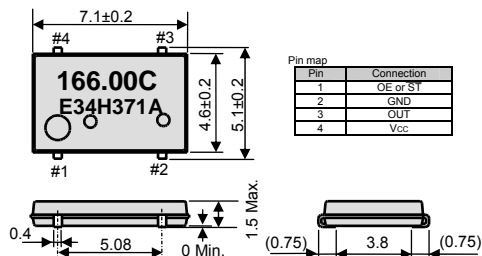


SG-8003CA

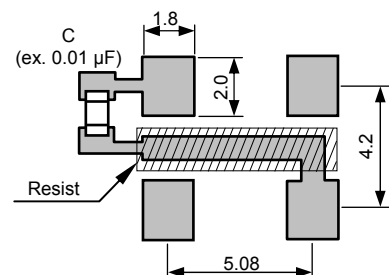


SG-8003JF

Actual size



SG-8003JF



Note.

OE Pin (PE, PD, PC)  
 OE Pin = "H" or "open" : Specified frequency output.  
 OE Pin = "L" : Output is low level (weak pull - down)

ST Pin (SE, SD, SC)  
 ST Pin = "H" or "open" : Specified frequency output.  
 ST Pin = "L" : Output is low level (weak pull - down), oscillation stops.

To maintain stable operation, provide a 0.01µF to 0.1µF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.





## WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

### ► Explanation of the mark that are using it for the catalog

	► Pb free.
	► Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc.)

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