

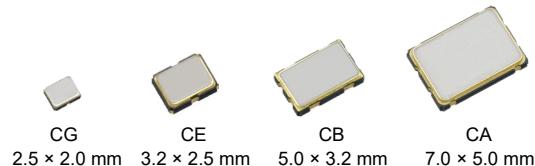
CRYSTAL OSCILLATOR (Programmable)  
OUTPUT: CMOS

**SG-8101** series

- Frequency range : 0.67 MHz to 170 MHz ( $1 \times 10^{-6}$  Step)
- Supply voltage : 1.62 V to 3.63 V
- Function : Output enable (OE) or Standby (ST)
- Frequency tolerance :  $\pm 15 \times 10^{-6}$  (-40 °C to +85 °C)  
 $\pm 20 \times 10^{-6}$ ,  $\pm 50 \times 10^{-6}$  (-40 °C to +105 °C)
- PLL technology to enable short lead time
- Available field oscillator programmer "SG-Writer II"



Product Number  
SG-8101CG: X1G005181xxxx00  
SG-8101CE: X1G005211xxxx00  
SG-8101CB: X1G005201xxxx00  
SG-8101CA: X1G005191xxxx00



Specifications (characteristics)

Item	Symbol	Specifications			Conditions/Remarks					
Supply voltage	V <sub>CC</sub>	1.80 V Typ.			-					
		1.62 V to 1.98 V	1.98 V to 2.20 V	2.20 V to 2.80 V	2.70 V to 3.63 V					
Output frequency range	f <sub>o</sub>	0.67 MHz to 170 MHz								
Storage temperature range	T <sub>stg</sub>	-40 °C to +125 °C			Storage as single product.					
Operating temperature range	T <sub>use</sub>	-40 °C to +85 °C			-					
		-40 °C to +105 °C								
Frequency tolerance <sup>1</sup>	f <sub>tol</sub>	B: $\pm 15 \times 10^{-6}$			T <sub>use</sub> = -40 °C to +85 °C					
		C: $\pm 20 \times 10^{-6}$			T <sub>use</sub> = -40 °C to +105 °C					
		J: $\pm 50 \times 10^{-6}$			T <sub>use</sub> = -40 °C to +105 °C					
Current consumption	I <sub>CC</sub>	3.2 mA Max.	3.3 mA Max.	3.4 mA Max.	3.5 mA Max.	T <sub>use</sub> = +105 °C	No load, f <sub>o</sub> = 20 MHz			
		2.7 mA Typ.			3.0 mA Typ.	T <sub>use</sub> = +25 °C				
		5.5 mA Max.	5.8 mA Max.	6.7 mA Max.	8.1 mA Max.	T <sub>use</sub> = +105 °C	No load, f <sub>o</sub> = 170 MHz			
		4.7 mA Typ.			5.7 mA Typ.	6.8 mA Typ.				
Output disable current	I <sub>dis</sub>	3.2 mA Max.	3.2 mA Max.	3.3 mA Max.	3.5 mA Max.	OE = GND, f <sub>o</sub> = 170 MHz				
Standby current	I <sub>std</sub>	0.9 $\mu$ A Max.	1.0 $\mu$ A Max.	1.5 $\mu$ A Max.	2.5 $\mu$ A Max.	T <sub>use</sub> = +105 °C	ST = GND			
		0.3 $\mu$ A Typ.	0.4 $\mu$ A Typ.	0.5 $\mu$ A Typ.	1.1 $\mu$ A Typ.	T <sub>use</sub> = +25 °C				
Symmetry	SYM	45 % to 55 %			50 % V <sub>CC</sub> Level					
Output voltage (DC characteristics)	V <sub>OH</sub>	90 % V <sub>CC</sub> Min.			[mA]					
					Rise/Fall time	V <sub>CC</sub>	*A	*B	*C	*D
	V <sub>OL</sub>	10 % V <sub>CC</sub> Max.			Default (f <sub>o</sub> > 40 MHz), Fast	I <sub>OH</sub>	-2.5	-3.5	-4.0	-5.0
					Default (f <sub>o</sub> ≤ 40 MHz)	I <sub>OL</sub>	2.5	3.5	4.0	5.0
Output load condition	L <sub>CMOS</sub>	15 pF Max.			Slow	I <sub>OH</sub>	-1.5	-2.0	-2.5	-3.0
		70 % V <sub>CC</sub> Min.				I <sub>OL</sub>	1.5	2.0	2.5	3.0
		30 % V <sub>CC</sub> Max.				I <sub>OH</sub>	-1.0	-1.5	-2.0	-2.5
						I <sub>OL</sub>	1.0	1.5	2.0	2.5
Input voltage	V <sub>IH</sub>	3.0 ns Max.			*A: 1.62 V to 1.98 V, *B: 1.98 V to 2.20 V, *C: 2.20 V to 2.80 V, *D: 2.70 V to 3.63 V					
	V <sub>IL</sub>	6.0 ns Max.								
		3.0 ns Max.								
		10.0 ns Max.								
Output disable time (OE)	t <sub>stp_OE</sub>	1 $\mu$ s Max.			Measured from the time OE or ST pin crosses 30 % V <sub>CC</sub>					
Output disable time (ST)	t <sub>stp_ST</sub>									
Output enable time (OE)	t <sub>sta_OE</sub>	1 $\mu$ s Max.			Measured from the time OE pin crosses 70 % V <sub>CC</sub>					
Output enable time (ST)	t <sub>sta_ST</sub>	3 ms Max.			Measured from the time ST pin crosses 70 % V <sub>CC</sub>					
Start-up time	t <sub>str</sub>	3 ms Max.			Measured from the time V <sub>CC</sub> reaches its rated minimum value, 1.62 V					
Frequency aging	f <sub>age</sub>	This is included in frequency tolerance specification.			+25 °C, first year					

<sup>1</sup> Frequency tolerance includes initial frequency tolerance, frequency / temperature characteristics, frequency / voltage coefficient, frequency / load coefficient and frequency aging (+25 °C, 1 year).

Pin description

Pin	Name	I/O type	Function			
1	OE	Input	Output enable	High <sup>2</sup> : Specified frequency output from OUT pin		
				Low: Out pin is low (weak pull down), only output driver is disabled.		
	ST	Input	Standby	High <sup>2</sup> : Specified frequency output from OUT pin		
				Low: Out pin is low (weak pull down), Device goes to standby mode. Supply current reduces to the least as I <sub>std</sub> .		
2	GND	Power	Ground			
3	OUT	Output	Clock output			
4	V <sub>CC</sub>	Power	Power supply			

<sup>2</sup> Please do not use the OE/ST terminal in the open state.



## Product Name

SG-8101CG 25.000000MHz T C H P A  
① ② ③ ④⑤⑥⑦⑧

①Model ②Package type  
③Frequency ④Supply voltage (T: 1.8 V to 3.3 V Typ.)  
⑤Frequency tolerance ⑥Operating temperature  
⑦Function ⑧Rise/Fall time

②Package type
CG 2.5 mm × 2.0 mm
CE 3.2 mm × 2.5 mm
CB 5.0 mm × 3.2 mm
CA 7.0 mm × 5.0 mm

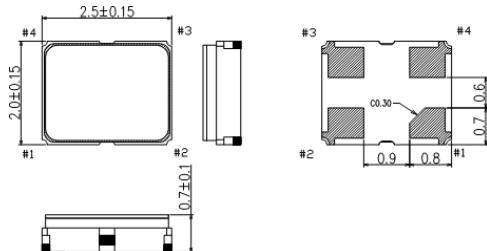
⑤Frequency tolerance / ⑥Operating temperature
BG $\pm 15 \times 10^{-6}$ / -40 °C to +85 °C
CH $\pm 20 \times 10^{-6}$ / -40 °C to +105 °C
JH $\pm 50 \times 10^{-6}$ / -40 °C to +105 °C

⑦Function
P Output enable
S Standby

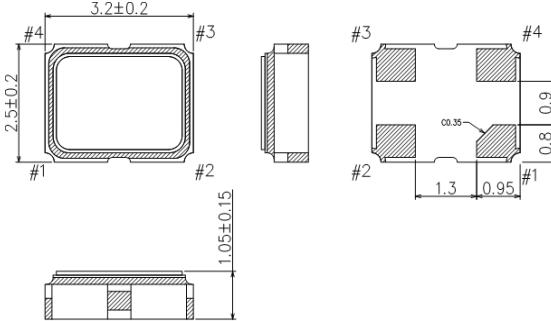
⑧Rise time/Fall time
A Default
B Fast
C Slow

## External dimensions (Unit: mm)

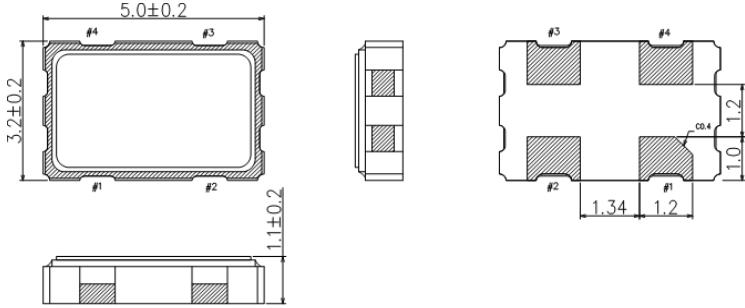
SG-8101CG



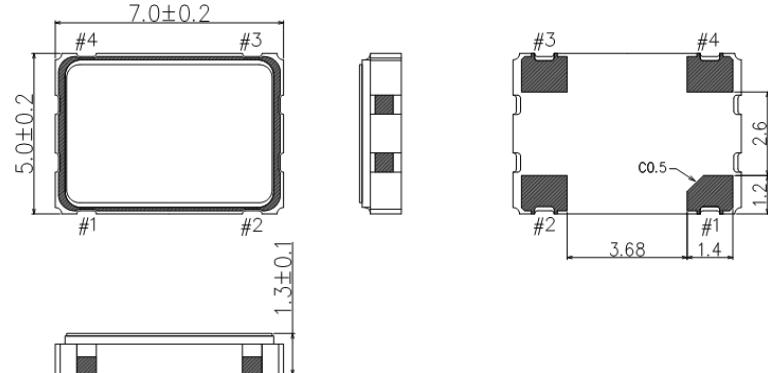
SG-8101CE



SG-8101CB

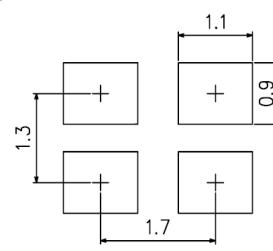


SG-8101CA

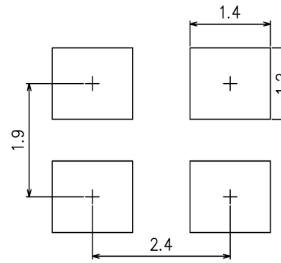


## Footprint (Recommended) (Unit: mm)

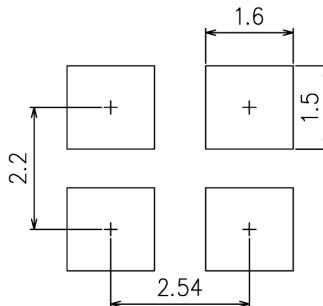
SG-8101CG



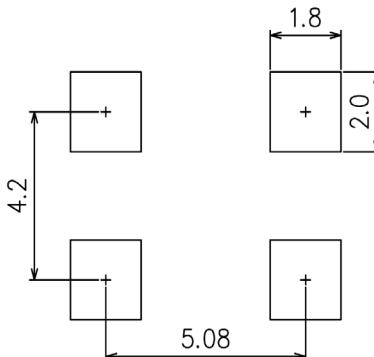
SG-8101CE



SG-8101CB



SG-8101CA



## Notes:

In order to achieve optimum jitter performance, the 0.1  $\mu$ F capacitor between Vcc and GND should be placed. It is also recommended that the capacitors are placed on the device side of the PCB, as close to the device as possible and connected together with short wiring pattern.

► **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 general equipment.
	► Designed for automotive applications related to driving and safety.

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