

CRYSTAL OSCILLATOR (Programmable)

OUTPUT: CMOS

SG-8101 series**NEW**

- Frequency range : 0.67 MHz ~ 170 MHz (1 ppm Step)
- Supply voltage : 1.62 V ~ 3.63 V
- Function : Output enable (OE) or Standby (ST)
- Frequency tolerance, operating temperature:
 - ±15 ppm (-40 °C ~ +85 °C)
 - ±20 ppm, ±50 ppm (-40 °C ~ +105 °C)
- Package : 2.5 x 2.0, 3.2 x 2.5, 5.0 x 3.2, 7.0 x 5.0 (mm)
- PLL technology to enable short lead time
- Available field oscillator programmer "SG-Writer II"



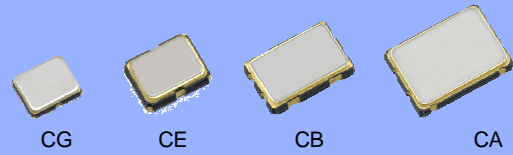
Product Number (please contact us)

SG-8101CA: X1G00519xxxxx00

SG-8101CB: X1G00520xxxxx00

SG-8101CE: X1G00521xxxxx00

SG-8101CG: X1G00518xxxxx00



Specifications (characteristics)

Item	Symbol	Specifications				Conditions/Remarks	
Supply voltage	V _{CC}	1.80 V Typ.		2.50 V Typ.	3.30 V Typ.		-
		1.62 V ~ 1.98 V	1.98 V ~ 2.20 V	2.20 V ~ 2.80 V	2.70 V ~ 3.63 V		
Output frequency range	f _o	0.67 MHz ~ 170 MHz					
Storage temperature	T _{stg}	-40 °C ~ +125 °C				Storage as single product.	
Operating temperature	T _{use}	-40 °C ~ +85 °C					
		-40 °C ~ +105 °C				2.5 x 2.0, 3.2 x 2.5 (mm) Package only	
Frequency tolerance ^{*1}	f _{tol}	B: ±15 × 10 ⁻⁶				T _{use} = -40 °C ~ +85 °C	
		C: ±20 × 10 ⁻⁶				T _{use} = -40 °C ~ +105 °C	
		J: ±50 × 10 ⁻⁶				T _{use} = -40 °C ~ +105 °C	
Current consumption	I _{CC}	3.1 mA Max.	3.2 mA Max.	3.3 mA Max.	3.4 mA Max.	T _{use} = +105 °C	No load, f _o = 20 MHz
		2.7 mA Typ.		2.8 mA Typ.	2.9 mA Typ.	T _{use} = +25 °C	
		5.2 mA Max.	5.5 mA Max.	6.3 mA Max.	7.6 mA Max.	T _{use} = +105 °C	No load, f _o = 170 MHz
Output disable current	I _{dis}	4.6 mA Typ.		5.5 mA Typ.	6.7 mA Typ.	T _{use} = +25 °C	
Standby current	I _{std}	3.2 mA Max.	3.2 mA Max.	3.3 mA Max.	3.5 mA Max.	OE = GND, f _o = 170 MHz	
		0.8 µA Max.	0.9 µA Max.	1.4 µA Max.	2.5 µA Max.	T _{use} = +105 °C	ST = GND
Symmetry	SYM	45 % ~ 55 %				50 % V _{CC} Level	
Output voltage (DC characteristics)	V _{OH}	90 % V _{CC} Min.				[mA]	
	V _{OL}	10 % V _{CC} Max.					
		Rise/Fall time	V _{CC}	*A	*B	*C	*D
		Default (f _o > 40 MHz)	I _{OH}	-2.5	-3.5	-4.0	-5.0
		Fast	I _{OL}	2.5	3.5	4.0	5.0
		Default (f _o ≤ 40 MHz)	I _{OH}	-1.5	-2.0	-2.5	-3.0
			I _{OL}	1.5	2.0	2.5	3.0
		Slow	I _{OH}	-1.0	-1.5	-2.0	-2.5
			I _{OL}	1.0	1.5	2.0	2.5
		*A: 1.62 V ~ 1.98 V, *B: 1.98 V ~ 2.20 V, *C: 2.20 V ~ 2.80 V, *D: 2.70 V ~ 3.63 V					
Output load condition	L _{CMOS}	15 pF Max.				-	
Input voltage	V _{IH}	70 % V _{CC} Min.				OE or ST	
	V _{IL}	30 % V _{CC} Max.					
Rise and Fall time	Default	tr/ff	3.0 ns Max.		f _o > 40 MHz		20 % - 80 % V _{CC} , L _{CMOS} = 15 pF
			6.0 ns Max.		f _o ≤ 40 MHz		
			3.0 ns Max.		f _o = 0.67 MHz ~ 170 MHz		
			10.0 ns Max.		f _o = 0.67 MHz ~ 20 MHz		
Enable/Disable Time	t _{oe}	1 µs Max.				Measured from the time OE pin crosses 70 % / 30 % V _{CC}	
Resume Time	t _{res}	3 ms Max.				Measured from the time ST pin crosses 70 % V _{CC}	
Start-up time	t _{str}	3 ms Max.				Measured from the time V _{CC} reaches its rated minimum value, 1.62 V	
Frequency aging	f _{aging}	This is included in frequency tolerance specification.				+25 °C, first year	

*1 Frequency tolerance includes initial frequency tolerance, temperature variation, supply voltage variation, reflow drift, load drift and aging (+25 °C, 1 year).

Pin description

Pin	Name	I/O type	Function	
1	OE	Input	Output enable	High or Open: Specified frequency output from OUT pin Low: Out pin is low (weak pull down), only output driver is disabled.
	ST	Input	Standby	High or Open: 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 _{std} .
2	GND	Power	Ground	
3	OUT	Output	Clock output	
4	V _{CC}	Power	Power supply	



Product Name

SG-8101CG 170.000000MHz T C H P A

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① Model, ② Package type,
- ③ Frequency, ④ Supply voltage,
- ⑤ Frequency tolerance, ⑥ Operating temperature,
- ⑦ Function, ⑧ Rise/Fall time

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

④ Supply voltage
T: 1.8 V ~ 3.3 V Typ.

⑥ Operating temperature
G: -40 °C ~ +85 °C
H: -40 °C ~ +105 °C

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

⑤ Frequency tolerance
B: 15×10^{-6}
C: 20×10^{-6}
J: 50×10^{-6}

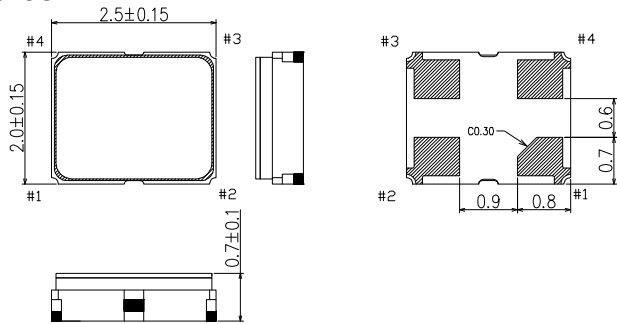
⑦ Function
P: Output Enable
S: Standby

Available combination	CA: 7.0 mm x 5.0 mm			CB: 5.0 mm x 3.2 mm			CE: 3.2 mm x 2.5 mm			CG: 2.5 mm x 2.0 mm		
Frequency tolerance	B: 15×10^{-6}	C: 20×10^{-6}	J: 50×10^{-6}	B: 15×10^{-6}	C: 20×10^{-6}	J: 50×10^{-6}	B: 15×10^{-6}	C: 20×10^{-6}	J: 50×10^{-6}	B: 15×10^{-6}	C: 20×10^{-6}	J: 50×10^{-6}
Operating temperature	G: -40 °C ~ +85 °C	✓		✓			✓			✓		
	H: -40 °C ~ +105 °C							✓	✓		✓	✓

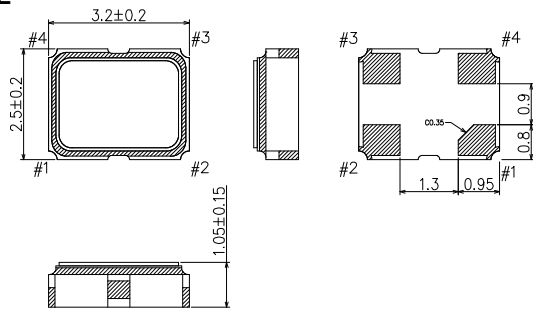
External dimensions

(Unit: mm)

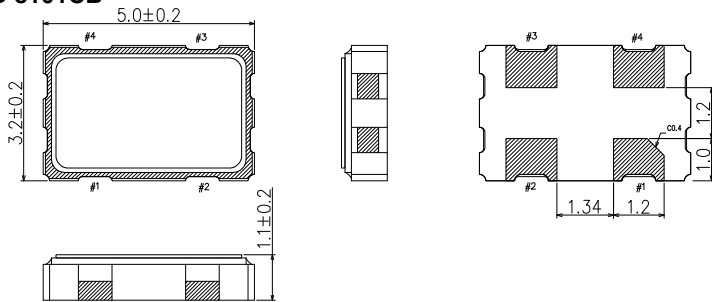
SG-8101CG



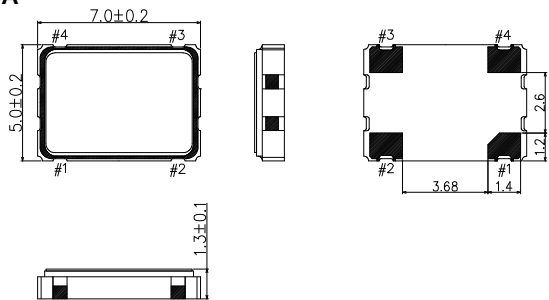
SG-8101CE



SG-8101CB



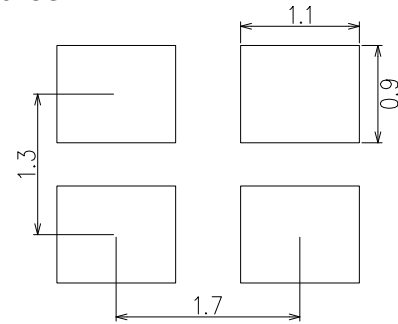
SG-8101CA



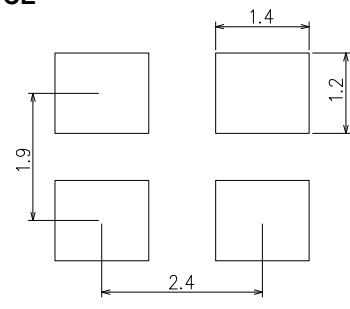
Footprint (Recommended)

(Unit: mm)

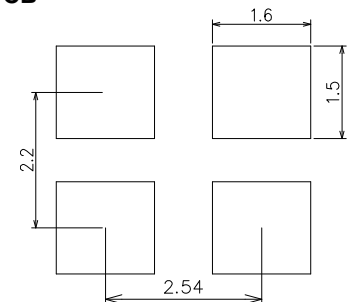
SG-8101CG



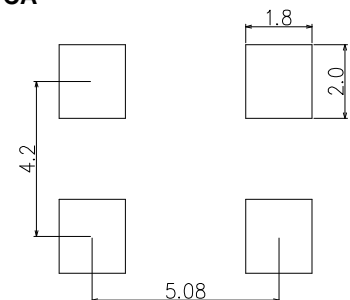
SG-8101CE



SG-8101CB



SG-8101CA



Notes:

In order to achieve optimum jitter performance, the 0.1 μF capacitor between V_{CC} 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.

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

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	► 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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