

CRYSTAL OSCILLATOR (Programmable)

OUTPUT: CMOS

SG-8018 series

- Frequency range : 0.67 MHz to 170 MHz (1 ppm Step)
- Supply voltage : 1.62 V to 3.63 V
- Function : Output enable (OE) or Standby (\overline{ST})
- Frequency tolerance : ± 50 ppm (-40 °C to $+105$ °C)
Including frequency aging ($+25$ °C, 10 years)
- PLL technology to enable short lead time
- Available field oscillator programmer "SG-Writer II"



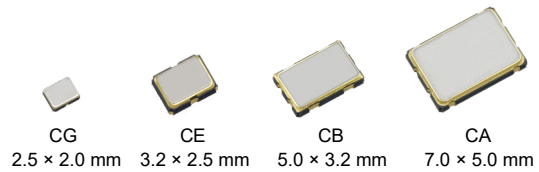
Product Number

SG-8018CG: X1G005601xxxx00

SG-8018CE: X1G005591xxxx00

SG-8018CB: X1G005581xxxx00

SG-8018CA: X1G005571xxxx00



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 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_o	0.67 MHz to 170 MHz					
Storage temperature range	T_{stg}	-40 °C to $+125$ °C				Storage as single product.	
Operating temperature range	T_{use}	-40 °C to $+105$ °C				-	
Frequency tolerance ^{*1}	f_{tol}	J: $\pm 50 \times 10^{-6}$				$T_{use} = -40$ °C to $+105$ °C	
Current consumption	I_{CC}	3.2 mA Max.	3.3 mA Max.	3.4 mA Max.	3.5 mA Max.	$T_{use} = +105$ °C	No load, $f_o = 20$ MHz
		2.7 mA Typ.		2.9 mA Typ.	3.0 mA Typ.	$T_{use} = +25$ °C	
		5.5 mA Max.	5.8 mA Max.	6.7 mA Max.	8.1 mA Max.	$T_{use} = +105$ °C	No load, $f_o = 170$ MHz
		4.7 mA Typ.		5.7 mA Typ.	6.8 mA Typ.	$T_{use} = +25$ °C	
Output disable current	I_{dis}	3.2 mA Max.	3.2 mA Max.	3.3 mA Max.	3.5 mA Max.	OE = GND, $f_o = 170$ MHz	
Standby current	I_{std}	0.9 μ A Max.	1.0 μ A Max.	1.5 μ A Max.	2.5 μ A Max.	$T_{use} = +105$ °C	ST = GND
		0.3 μ A Typ.	0.4 μ A Typ.	0.5 μ A Typ.	1.1 μ A Typ.	$T_{use} = +25$ °C	
Symmetry	SYM	45 % to 55 %				50 % V_{CC} Level	
Output voltage (DC characteristics)	V_{OH}	90 % V_{CC} Min.				[mA]	
						Rise/Fall time	V_{CC} *A *B *C *D
	V_{OL}	10 % V_{CC} Max.				Default ($f_o > 40$ MHz), Fast	I_{OH} -2.5 -3.5 -4.0 -5.0
						Default ($f_o \leq 40$ MHz)	I_{OL} 2.5 3.5 4.0 5.0
				Slow	I_{OH} -1.5 -2.0 -2.5 -3.0		
					I_{OL} 1.5 2.0 2.5 3.0		
					I_{OH} -1.0 -1.5 -2.0 -2.5		
					I_{OL} 1.0 1.5 2.0 2.5		
				*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			
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 time /Fall time	Default /Fast /Slow	t_r/t_f	3.0 ns Max.			$f_o > 40$ MHz	
			6.0 ns Max.			$f_o \leq 40$ MHz	
			3.0 ns Max.			$f_o = 0.67$ MHz to 170 MHz	
			10.0 ns Max.			$f_o = 0.67$ MHz to 20 MHz	
Output disable time (OE)	t_{stp_oe}	1 μ s Max.				Measured from the time OE or ST pin crosses 30 % V_{CC}	
Output disable time (ST)	t_{stp_st}	1 μ s Max.				Measured from the time OE pin crosses 70 % V_{CC}	
Output enable time (OE)	t_{sta_oe}	1 μ s Max.				Measured from the time OE pin crosses 70 % V_{CC}	
Output enable time (ST)	t_{sta_st}	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_{age}	This is included in frequency tolerance specification.				$+25$ °C, 10 years	

*1 Frequency tolerance includes initial frequency tolerance, frequency / temperature characteristics, frequency / voltage coefficient, frequency / load coefficient and frequency aging ($+25$ °C, 10 years).

Pin description

Pin	Name	I/O type	Function	
1	OE	Input	Output enable	High ^{*2} : Specified frequency output from OUT pin Low: Out pin is low (weak pull down), only output driver is disabled.
	ST	Input	Standby	High ^{*2} : 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	

*2 Please do not use the OE/ST terminal in the open state.



Product Name

SG-8018CG 25.000000MHz T J H P A
① ② ③ ④⑤⑥⑦⑧

- ① Model
- ② Package type
- ③ Frequency
- ④ Supply voltage (T: 1.8 V to 3.3 V Typ.)
- ⑤ Frequency tolerance (J: $\pm 50 \times 10^{-6}$)
- ⑥ Operating temperature (H: -40 °C to +105 °C)
- ⑦ Function
- ⑧ Rise/Fall time

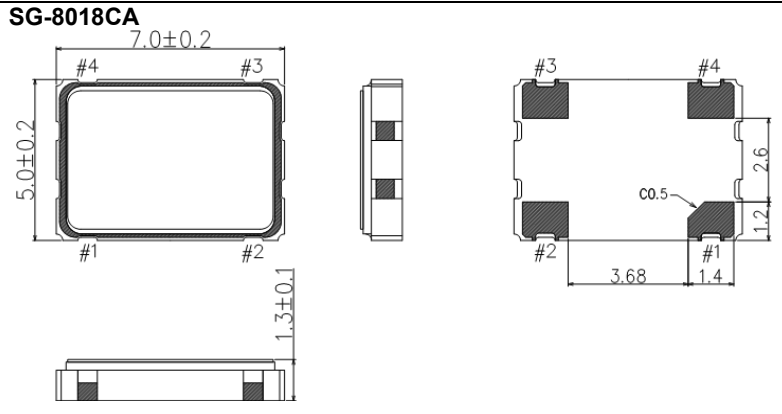
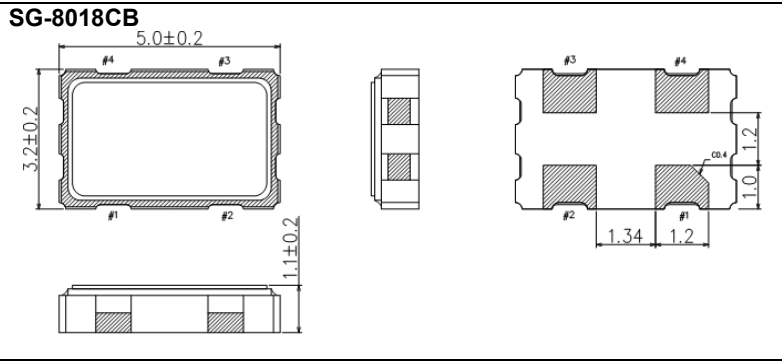
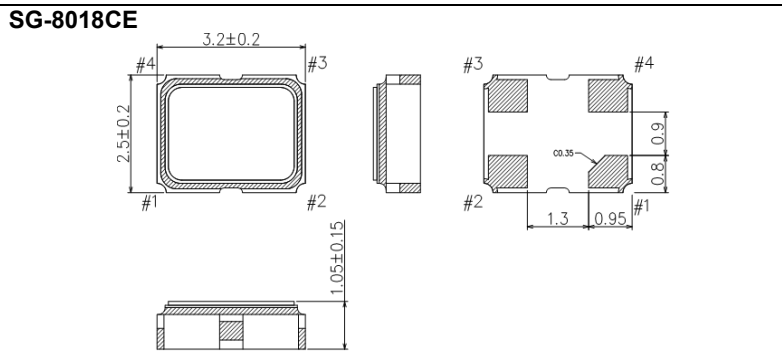
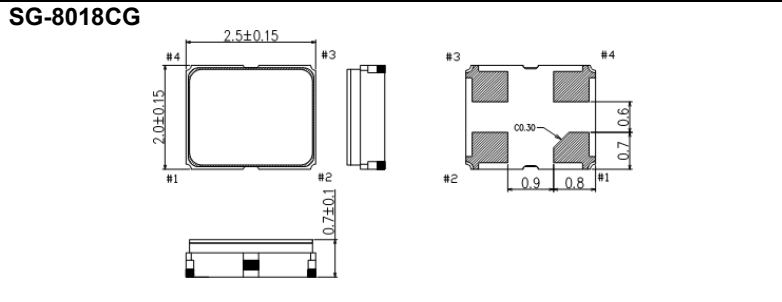
② Package type	
CG	2.5 mm × 2.0 mm
CE	3.2 mm × 2.5 mm
CB	5.0 mm × 3.2 mm
CA	7.0 mm × 5.0 mm

⑦ Function	
P	Output enable
S	Standby

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

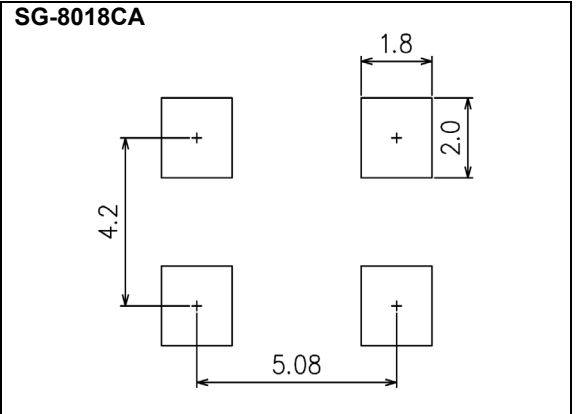
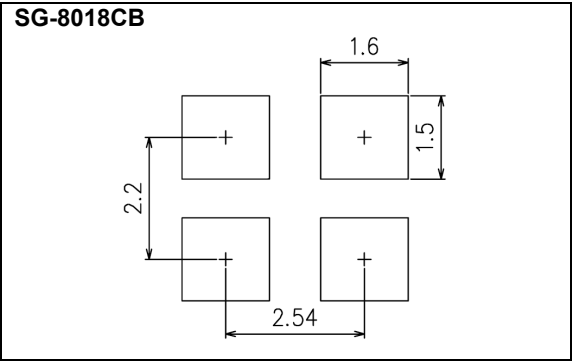
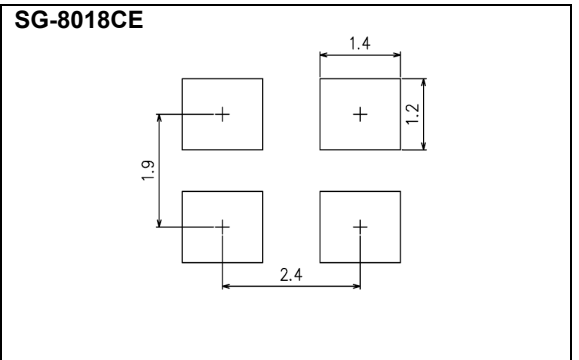
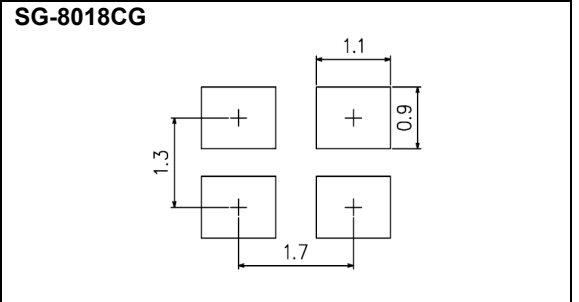
External dimensions

(Unit: mm)



Footprint (Recommended)





(Unit: mm)



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.

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

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	<p>► 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.)</p>
	<p>► Designed for automotive general equipment.</p>
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