CRYSTAL OSCILLATOR (Programmable)
OUTPUT: CMOS

SG-8018 series

Pb Free　**RoHS Compliant**

Product Number
SG-8018CG: X1G005601xxxx00
SG-8018CE: X1G005591xxxx00
SG-8018CB: X1G005581xxxx00
SG-8018CA: X1G005571xxxx00

- 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 ºC to +105 ºC)
  　　　　　　　　　　　Including frequency aging(+25 ºC, 10 years)
- PLL technology to enable short lead time
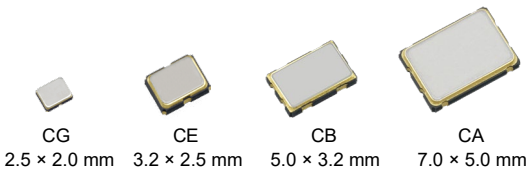- Available field oscillator programmer "SG-Writer II"

CG
2.5 × 2.0 mm

CE
3.2 × 2.5 mm

CB
5.0 × 3.2 mm

CA
7.0 × 5.0 mm

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: ±50 × 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 µA Max.	1.0 µA Max.	1.5 µA Max.	2.5 µA Max.	T_use = +105 °C	$\overline{ST}$ = GND				
		0.3 µA Typ.	0.4 µA Typ.	0.5 µA Typ.	1.1 µA Typ.	T_use = +25 °C					
Symmetry	SYM	45 % to 55 %				50 % V_{CC} Level					

I_{OH}/I_{OL} Conditions　　　　　　　　　　　　　　　[mA]

Rise/Fall time		V_{CC}	*A	*B	*C	*D
Default (f_O > 40 MHz), Fast	I_{OH}		-2.5	-3.5	-4.0	-5.0
	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 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

Item	Symbol	Specifications	Conditions/Remarks
Output voltage (DC characteristics)	V_{OH}	90 % V_{CC} Min.	(see table above)
	V_{OL}	10 % V_{CC} Max.	
Output load condition	L_CMOS	15 pF Max.	-
Input voltage	V_{IH}	70 % V_{CC} Min.	OE or $\overline{ST}$
	V_{IL}	30 % V_{CC} Max.	
Rise time /Fall time — Default	tr/tf	3.0 ns Max.	f_O > 40 MHz
		6.0 ns Max.	f_O ≤ 40 MHz
Rise time /Fall time — Fast		3.0 ns Max.	f_O = 0.67 MHz to 170 MHz
Rise time /Fall time — Slow		10.0 ns Max.	f_O = 0.67 MHz to 20 MHz
Output disable time (OE) / Output disable time (ST)	tstp_oe / tstp_st	1 µs Max.	Measured from the time OE or $\overline{ST}$ pin crosses 30 % V_{CC}
Output enable time (OE)	tsta_oe	1 µs Max.	Measured from the time OE pin crosses 70 % V_{CC}
Output enable time (ST)	tsta_st	3 ms Max.	Measured from the time $\overline{ST}$ 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

Note for Rise/Fall time: 20 % - 80 % V_{CC}, L_CMOS = 15 pF

*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.
	$\overline{ST}$	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/$\overline{ST}$ terminal in the open state.

Product Name

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

①Model ②Package type ③Frequency
④Supply voltage (T: 1.8 V to 3.3 V Typ.)
⑤Frequency tolerance (J: ±50 × 10^{-6})
⑥Operating temperature (H: -40 °C to +105 °C)
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

⑦Function	
P	Output enable
S	Standby

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

External dimensions (Unit: mm)

SG-8018CG

SG-8018CE
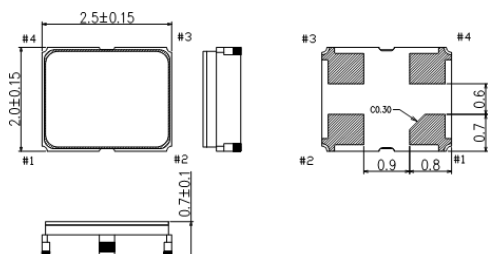
SG-8018CB

SG-8018CA

Footprint (Recommended) (Unit: mm)

SG-8018CG
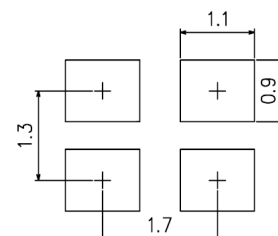
SG-8018CE
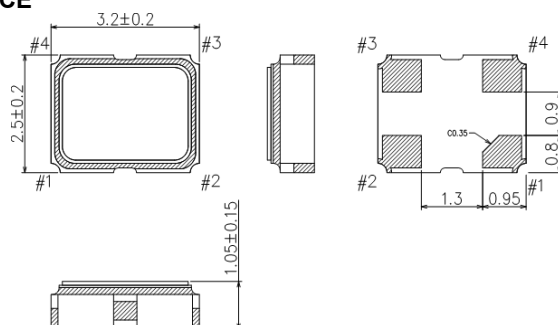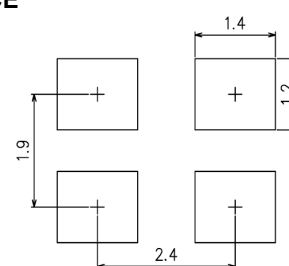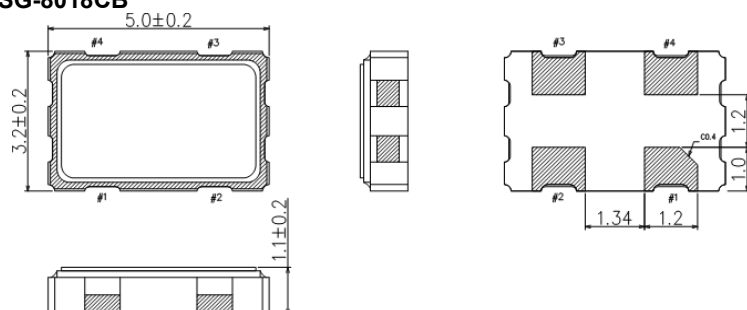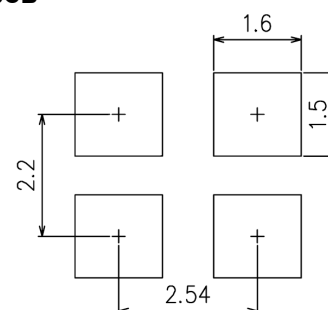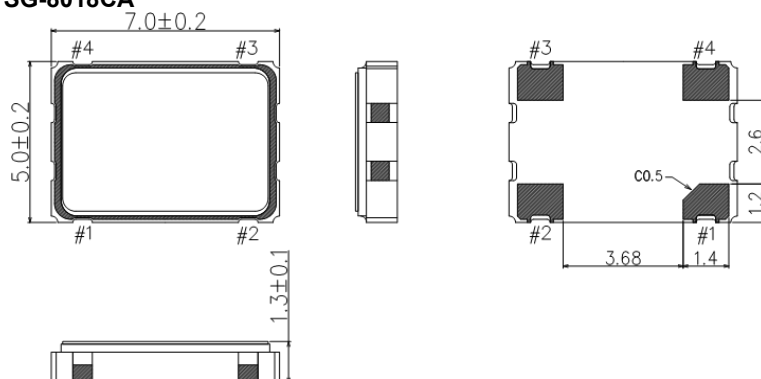
SG-8018CB

SG-8018CA
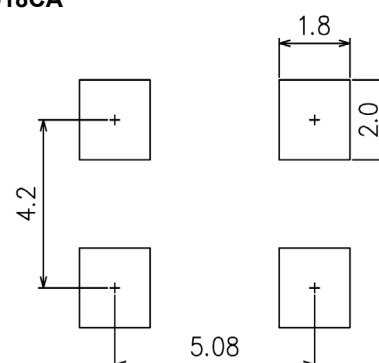
■Notes:

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.

Pb Free	►Pb free.

RoHS Compliant	►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.)

For Automotive	►Designed for automotive general equipment.
Automotive Safety	►Designed for automotive applications related to driving and safety.

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