

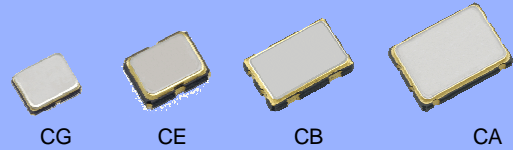
CRYSTAL OSCILLATOR (Programmable) SPREAD SPECTRUM OUTPUT: CMOS SG-9101 series

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)
- Down or Center spread modulation
- Configurable spreading
 - 3 modulation profile (Hershey-kiss, Sine-wave, Triangle),
 - 4 modulation frequency, 6 spread percentage
- 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-9101CA: X1G00530xxxxx00
 SG-9101CB: X1G00531xxxxx00
 SG-9101CE: X1G00532xxxxx00
 SG-9101CG: X1G00529xxxxx00



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				5.0 x 3.2, 7.0 x 5.0 (mm) Package only																																								
		-40 °C ~ +105 °C				2.5 x 2.0, 3.2 x 2.5 (mm) Package only																																								
Current consumption	I _{CC}	3.3 mA Max.	3.4 mA Max.	3.5 mA Max.	3.6 mA Max.	T _{use} = +105 °C	No load, f _o = 20 MHz																																							
		2.9 mA Typ.		3.0 mA Typ.	3.1 mA Typ.	T _{use} = +25 °C																																								
		5.4 mA Max.	5.7 mA Max.	6.5 mA Max.	7.8 mA Max.	T _{use} = +105 °C	No load, f _o = 170 MHz																																							
		4.8 mA Typ.		5.7 mA Typ.	7.0 mA Typ.	T _{use} = +25 °C																																								
Output disable current	I _{dis}	3.4 mA Max.	3.4 mA Max.	3.5 mA Max.	3.7 mA Max.	OE = GND, f _o = 170 MHz																																								
Standby current	I _{std}	0.8 μA Max.	0.9 μA Max.	1.4 μA Max.	2.5 μA Max.	T _{use} = +105 °C	ST = GND																																							
		0.3 μA Typ.	0.4 μA Typ.	0.5 μA Typ.	1.0 μA Typ.	T _{use} = +25 °C																																								
Symmetry	SYM	45 % ~ 55 %				50 % V _{CC} Level																																								
Output voltage (DC characteristics)	V _{OH}	90 % V _{CC} Min.				<table border="1"> <thead> <tr> <th></th> <th>V_{CC}</th> <th>*A</th> <th>*B</th> <th>*C</th> <th>*D</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Rise/Fall time</td> <td>I_{OH}</td> <td>-2.5</td> <td>-3.5</td> <td>-4.0</td> <td>-5.0</td> </tr> <tr> <td>I_{OL}</td> <td>2.5</td> <td>3.5</td> <td>4.0</td> <td>5.0</td> </tr> <tr> <td rowspan="2">Default (f_o ≤ 40 MHz)</td> <td>I_{OH}</td> <td>-1.5</td> <td>-2.0</td> <td>-2.5</td> <td>-3.0</td> </tr> <tr> <td>I_{OL}</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> </tr> <tr> <td rowspan="2">Slow</td> <td>I_{OH}</td> <td>-1.0</td> <td>-1.5</td> <td>-2.0</td> <td>-2.5</td> </tr> <tr> <td>I_{OL}</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> </tr> </tbody> </table> <p>*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</p>			V _{CC}	*A	*B	*C	*D	Rise/Fall time	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
		V _{CC}	*A	*B	*C			*D																																						
Rise/Fall time	I _{OH}	-2.5	-3.5	-4.0	-5.0																																									
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Default (f _o ≤ 40 MHz)	I _{OH}	-1.5	-2.0	-2.5	-3.0																																									
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Slow	I _{OH}	-1.0	-1.5	-2.0	-2.5																																									
	I _{OL}	1.0	1.5	2.0	2.5																																									
V _{OL}	10 % V _{CC} Max.																																													
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																																								

Spread spectrum configuration

④	C: Center spread modulation	ⓐCode	02	05	07	10	15	20
		Spread percentage	±0.25 %	±0.5 %	±0.75 %	±1.0 %	±1.5 %	±2.0 %
④	D: Down spread modulation	ⓐCode	05	10	15	20	30	40
		Spread percentage	-0.5 %	-1.0 %	-1.5 %	-2.0 %	-3.0 %	-4.0 %

Modulation frequency: 25.4 kHz (default), 6.3 kHz, 8.5 kHz, 12.7 kHz

Modulation profile: Hershey-kiss (default), Sine-wave, Triangle

Product Name

SG-9101CG 170.000000MHz C 20 P H A A A

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① Model, ② Package type, ③ Frequency,

④ Spread type, ⑤ Spread percentage code,

⑥ Function, ⑦ Operating temperature,

⑧ Modulation frequency, ⑨ Modulation profile, ⑩ 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 Spread type
 C: Center spread
 D: Down spread

⑥ Function
 P: Output enable
 S: Standby

⑦ Operating temperature
 G: -40 °C ~ +85 °C
 H: -40 °C ~ +105 °C

⑧ Modulation frequency
 A: 25.4 kHz (default)
 B: 12.7 kHz
 C: 8.5 kHz
 D: 6.3 kHz

⑨ Modulation profile
 A: Hershey-kiss (default)
 B: Sine-wave
 C: Triangle

⑩ Rise/Fall time
 A: Default
 B: Fast
 C: Slow

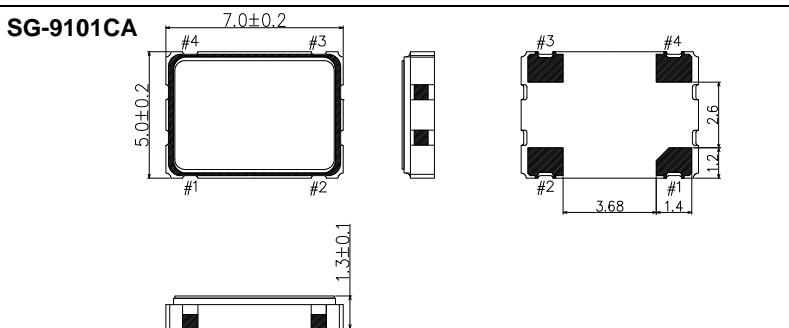
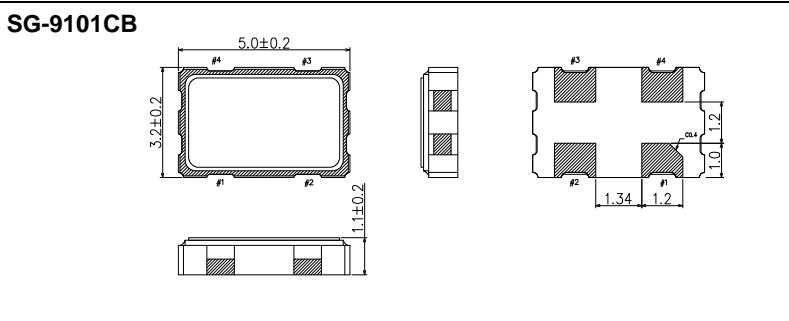
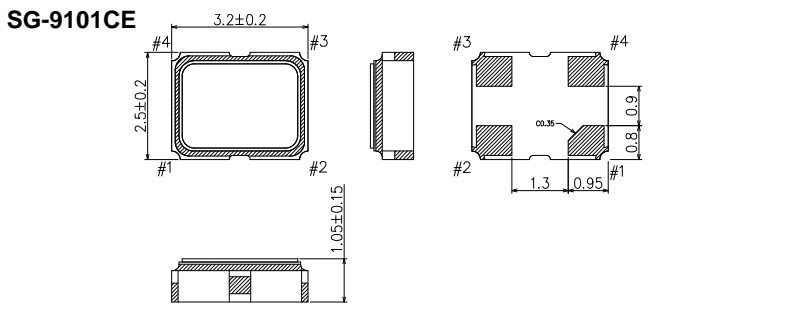
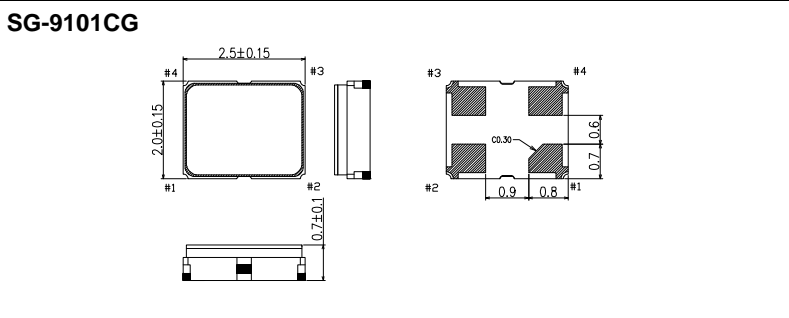


Pin description

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	

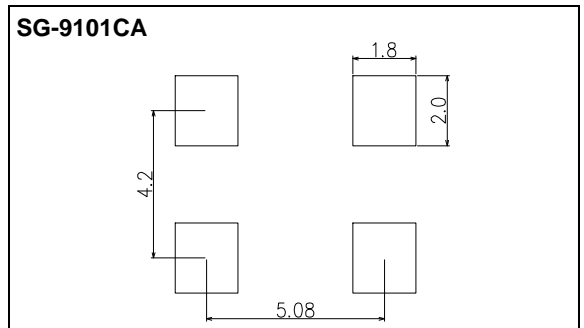
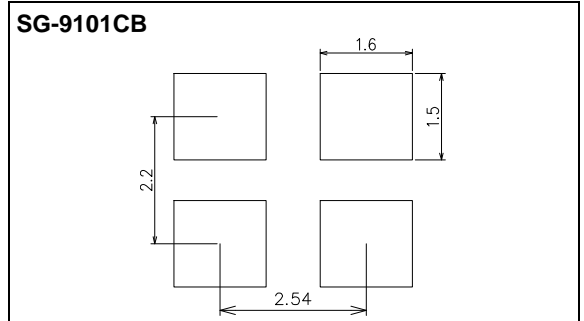
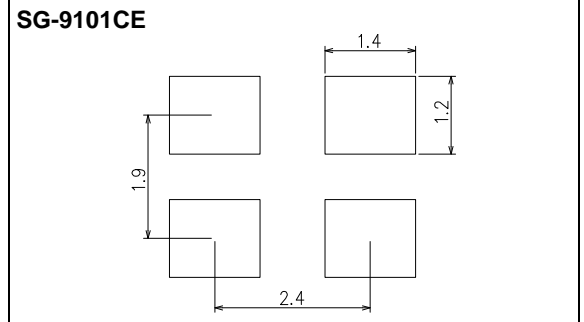
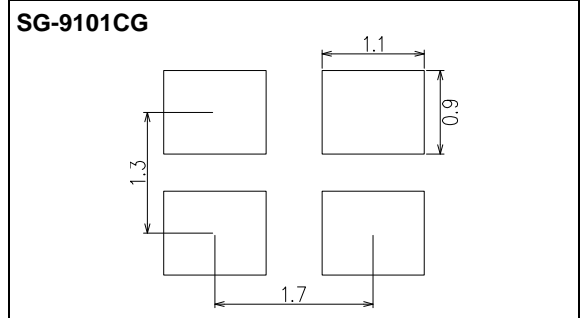
External dimensions

(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.

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.

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The Netherlands



Elektrostraat 17
NL-7483 PG Haaksbergen

T: +31 (0)53 573 33 33
F: +31 (0)53 573 33 30
E: nl@texim-europe.com

Belgium



Zuiderlaan 14 bus 10
B-1731 Zellik

T: +32 (0)2 462 01 00
F: +32 (0)2 462 01 25
E: belgium@texim-europe.com

UK & Ireland



St. Mary's House, Church Lane
Carlton Le Moorland
Lincoln LN5 9HS

T: +44 (0)1522 789 555
F: +44 (0)845 299 22 26
E: uk@texim-europe.com

Germany North



Bahnhofstrasse 92
D-25451 Quickborn

T: +49 (0)4106 627 07-0
F: +49 (0)4106 627 07-20
E: germany@texim-europe.com

Germany South



Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
F: +49 (0)89 436 086-19
E: germany@texim-europe.com

Austria



Warwitzstrasse 9
A-5020 Salzburg

T: +43 (0)662 216 026
F: +43 (0)662 216 026-66
E: austria@texim-europe.com

Nordic region



Sdr. Jagtvej 12
DK-2970 Hørsholm

T: +45 88 20 26 30
F: +45 88 20 26 39
E: nordic@texim-europe.com

General information



info@texim-europe.com
www.texim-europe.com