



CRYSTAL OSCILLATOR (SPXO)

OUTPUT : CMOS, TTL

SG-615 series

SG-531 / SG-51 series

- Frequency range : 1.025 MHz to 135 MHz
- Supply voltage : 3.3 V Typ. / 5.0 V Typ.
- Function : Output enable(OE) or Standby(\overline{ST})
- Pin compatible with full-size metal can. (SG-51 series)
- Pin compatible with half-size metal can. (SG-531 series)



Product Number (please contact us)

SG-615 : Q33615xx2xxxx00

SG-531 : Q32531xx2xxxx00

SG-51 : Q32510xx2xxxx00



Actual size

SG-615



SG-531



SG-51



Specifications (characteristics)

Item	Symbol	Specifications		Conditions / Remarks
		SG-615P SG-531P SG-51P	SG-615PTJ SG-531PTJ SG-51PTJ	
Output frequency range	f_o	1.025 MHz to 26 MHz	26.001 MHz to 66.667 MHz	Please contact us about available frequencies.
Supply voltage	V_{CC}	5.0 V ± 0.5 V		
Storage temperature	T_{stg}	-55 °C to +125 °C		Storage as single product.
Operating temperature	T_{use}	-20 °C to +70 °C		
Frequency tolerance	f_{tol}	B ¹ : $\pm 50 \times 10^{-6}$, C: $\pm 100 \times 10^{-6}$		-20 °C to +70 °C
Current consumption	I_{CC}	23 mA Max.	35 mA Max.	No load condition
Disable current	I_{dis}	12 mA Max.	28 mA Max.	OE=GND
Symmetry	SYM	40 % to 60 %	—	CMOS load: 50 % V_{CC} level
		40 % to 60 %	45 % to 55 %	TTL load: 1.4 V level
Output voltage	V_{OH}	$V_{CC}-0.4$ V Min.	2.4 V Min.	$I_{OH}=-400 \mu A$
	V_{OL}	0.4 V Max.		$I_{OL}=16$ mA(P)/ 8 mA(PTJ)
Output load condition (TTL)	L_{TTL}	10 TTL Max.	5 TTL Max.	$L_{CMOS} \leq 15$ pF
Output load condition (CMOS)	L_{CMOS}	50 pF Max.	—	
Input voltage	V_{IH}	2.0 V Min.	3.5 V Min.	$I_{IH}=1 \mu A$ Max. (OE= V_{CC})
	V_{IL}	0.8 V Max.	1.5 V Max.	$I_{IL}=-100 \mu A$ Min. (OE=GND), PTJ: $I_{IL}=-500 \mu A$ Min. (OE=GND)
Rise time / Fall time	t_r / t_f	8 ns Max.	—	CMOS load: 20 % V_{CC} to 80 % V_{CC} level
		8 ns Max.	5 ns Max.	TTL load: 0.4 V to 2.4 V level
Start-up time	t_{str}	4 ms Max.	10 ms Max.	Time at minimum supply voltage to be 0 s
Frequency aging	f_{aging}	$\pm 5 \times 10^{-6}$ / year Max.		+25 °C, $V_{CC}=5.0$ V, First year

*1 "B" tolerance will be available up to 55 MHz.

Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		SG-615PCG SG-531PCG	SG-615SCG SG-531SCG	SG-615PCN	
Output frequency range	f_o	1.500 MHz to 26.000 MHz		26.001 MHz to 66.667 MHz	Please contact us about available frequencies.
Supply voltage	V_{CC}	2.7 V to 3.6 V		3.0 V to 3.6 V	
Storage temperature	T_{stg}	-55 °C to +125 °C			Storage as single product.
Operating temperature	T_{use}	-40 °C to +85 °C			
Frequency tolerance	f_{tol}	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$ M: $\pm 100 \times 10^{-6}$			-20 °C to +70 °C -40 °C to +85 °C
Current consumption	I_{CC}	12 mA Max.		20 mA Max.	No load condition
Disable current	I_{dis}	10 mA Max.	—	10 mA Max.	OE=GND (PCG, PCN)
Stand-by current	I_{std}	—	50 μA Max.	—	\overline{ST} =GND (SCG)
Symmetry	SYM	45 % to 55 %			50 % V_{CC} level, L_{CMOS} =Max.
Output voltage	V_{OH}	$V_{CC}-0.4$ V Min.		$V_{CC}-0.4$ V Min.	$I_{OH}=8$ mA
	V_{OL}	0.4 V Max.		0.4 V Max.	$I_{OL}=8$ mA
Output load condition	L_{CMOS}	25 pF Max.		15 pF Max.	
Input voltage	V_{IH}	70 % V_{CC} Min.		70 % V_{CC} Min.	OE Terminal or \overline{ST} Terminal
	V_{IL}	20 % V_{CC} Max.		30 % V_{CC} Max.	
Rise time / Fall time	t_r / t_f	4 ns Max.			20 % V_{CC} to 80 % V_{CC} level, $L_{CMOS} \leq$ Max.
Start-up time	t_{str}	12 ms Max.		10 ms Max.	$t=0$ at 90% V_{CC}
Frequency aging	f_{aging}	$\pm 5 \times 10^{-6}$ / year Max.			+25 °C, $V_{CC}=3.3$ V, First year



Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		SG-615PTW / STW SG-531PTW / STW	SG-615PHW / SHW SG-531PHW / SHW	SG-615PCW / SCW SG-531PCW / SCW	
Output frequency range	f ₀	55.001 MHz to 135.000 MHz			Please contact us about available frequencies.
Supply voltage	V _{CC}	5.0 V ±0.5 V			
Storage temperature	T _{stg}	-55 °C to +125 °C			Storage as single product.
Operating temperature	T _{use}	-20 °C to +70 °C			
Frequency tolerance	f _{tol}	B: ±50 × 10 ⁻⁶ , C ¹ : ±100 × 10 ⁻⁶			-20 °C to +70 °C
		—			-40 °C to +85 °C
Current consumption	I _{CC}	45 mA Max.			No load condition(Max. frequency range)
Disable current	I _{dis}	30 mA Max.			
Stand-by current	I _{std}	50 μA Max.			ST =GND (STW,SHW,SCW)
Symmetry	SYM	40 % to 60 %			50 % V _{CC} level, L _{CMOS} =Max.
		—			1.4 V level, L _{CMOS} =Max.
Output voltage	V _{OH}	V _{CC} -0.4 V Min.			I _{OH} =-16 mA(PTW,STW,PHW,SHW), -8 mA(PCW,SCW) I _{OL} = 16 mA(PTW,STW,PHW,SHW), 8 mA(PCW,SCW)
	V _{OL}	0.4 V Max.			
Output load condition (TTL)	L _{TTL}	5 TTL Max.	—	—	f ₀ ≤ 90 MHz , Max.supply voltage
Output load condition (CMOS)	L _{CMOS}	15 pF Max.			Max.frequency , Max.supply voltage
Input voltage	V _{IH}	2.0 V Min.			OE Terminal or ST Terminal
	V _{IL}	0.8 V Max.			
Rise time / Fall time	tr / tf	4 ns Max.			20 % V _{CC} to 80 % V _{CC} level, L _{CMOS} ≤ Max.
		4 ns Max.	—	—	0.4 V to 2.4 V level
Start-up time	t _{str}	10 ms Max..			Time at minimum supply voltage to be 0 s
Frequency aging	f _{aging}	±5 × 10 ⁻⁶ /year Max.			+25 °C, V _{CC} =5.0 V / 3.3 V, First year

*2 "C" tolerance : $f_0 \geq 66.667$ MHz(PTW,STW,PHW,SHW)

Product Name SG-615 P C G 20.000000MHz C
(Standard form) ① ②③ ④ ⑤
①Model ②Function (P: Output enable, S:Standby)
③Supply voltage ④Frequency
⑤Frequency tolerance

③Supply voltage	
C	3.3 V Typ.
T,H	5.0 V Typ.
Blank	5.0 V Typ.

⑤Frequency tolerance	
B	$\pm 50 \times 10^{-6}$ / -20 to +70°C
C	$\pm 100 \times 10^{-6}$ / -20 to +70°C
M	$\pm 100 \times 10^{-6}$ / -40 to +85°C

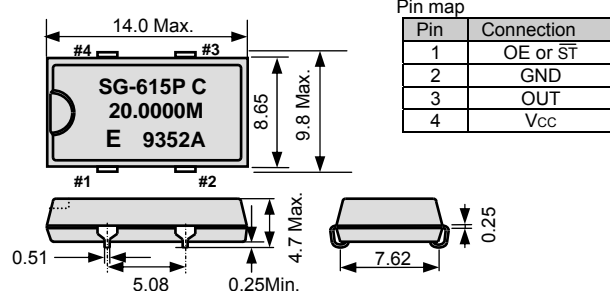
External dimensions

(Unit:mm)

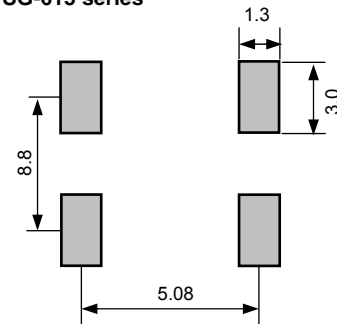
Footprint (Recommended)

(Unit:mm)

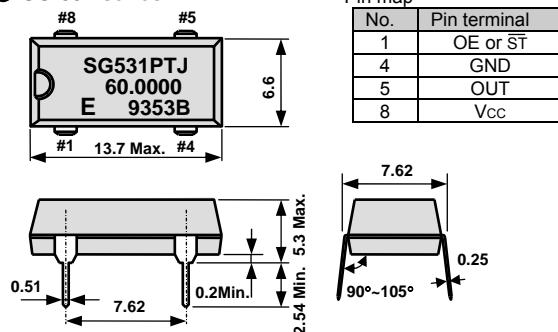
● SG-615 series



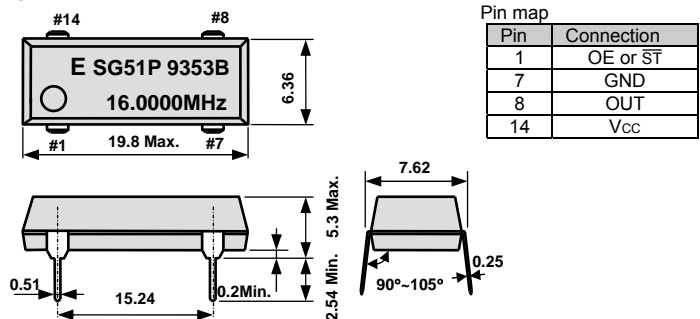
● SG-615 series



● SG-531 series



● SG-51 series



Note.
OE pin (P,PTJ,PTW,PHW,PCW,PCN,PCG)
OE pin = "H" or "open" : Specified frequency output.
OE pin = "L" : Output is high impedance.

\overline{ST} pin (STW, SHW, SCW,SCG)
 \overline{ST} pin = "H" or "open" : Specified frequency output.
 \overline{ST} pin = "L" : Output is low level
(weak pull - down), oscillation stops.

To maintain stable operation, provide a 0.01 μ F to 0.1 μ F by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between V_{CC} - GND).

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.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.





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ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

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	► 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 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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