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)

RoHS Compliant

Product Number (please contact us)

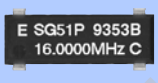
SG-615 : Q33615xx2xxxx00
SG -531 : Q32531xx2xxxx00
SG -51 : Q32510xx2xxxx00

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_0	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]: ±50 × 10^{-6}, C: ±100 × 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 µA
	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 ≤ 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 µA Max. (OE=V_{CC})
	V_{IL}	0.8 V Max.	1.5 V Max.	I_{IL}= -100 µA Min. (OE=GND), PTJ:I_{IL}= -500 µA 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	±5 × 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_0	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: ±50 × 10^{-6} C: ±100 × 10^{-6}			-20 °C to +70 °C
		M: ±100 × 10^{-6}			-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 ≤ Max.
Start-up time	t_str	12 ms Max.		10 ms Max.	t=0 at 90% V_{CC}
Frequency aging	f_aging	±5 × 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		26.001 MHz to 135.000 MHz	Please contact us about available frequencies.
Supply voltage	V_{CC}	5.0 V ±0.5 V		3.3 V ±0.3 V	
Storage temperature	T_stg	-55 °C to +125 °C			Storage as single product.
Operating temperature	T_use	-20 °C to +70 °C		-40 °C to +85 °C	
Frequency tolerance	f_tol	B: ±50 × 10^{-6} , C *2: ±100 × 10^{-6}			-20 °C to +70 °C
		—		M: ±100 × 10^{-6}	-40 °C to +85 °C
Current consumption	I_{CC}	45 mA Max.		28 mA Max.	No load condition(Max. frequency range)
Disable current	I_dis	30 mA Max.		16 mA Max.	OE=GND (PTW,PHW,PCW)
Stand-by current	I_std	50 µA Max.			$\overline{ST}$ =GND (STW,SHW,SCW)
Symmetry	SYM	—	40 % to 60 %		50 % V_{CC} level, L_CMOS=Max.
		40 % to 60 %	—		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)
	V_{OL}	0.4 V Max.			I_{OL}= 16 mA(PTW,STW,PHW,SHW), 8 mA(PCW,SCW)
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.		70 % V_{CC} Min.	OE Terminal or $\overline{ST}$ Terminal
	V_{IL}	0.8 V Max.		20 % V_{CC} Max.	
Rise time / Fall time	t_r / t_f	—	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 ≥66.667 MHz(PTW,STW,PHW,SHW)

Product Name (Standard form)

SG-615 P C G 20.000000MHz C
① ②③ ④ ⑤

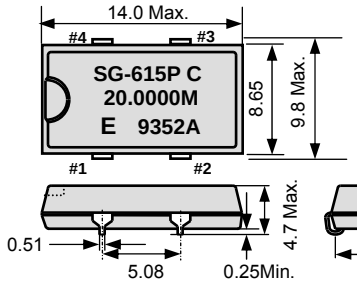
①Model ②Function (P: Output enable, S:Standby)
③Supply voltage ④Frequency
⑤Frequency tolerance

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

⑤Frequency tolerance	
B	±50 × 10^{-6} / -20 to +70°C
C	±100 × 10^{-6} / -20 to +70°C
M	±100 × 10^{-6} / -40 to +85°C

External dimensions (Unit:mm)

● SG-615 series

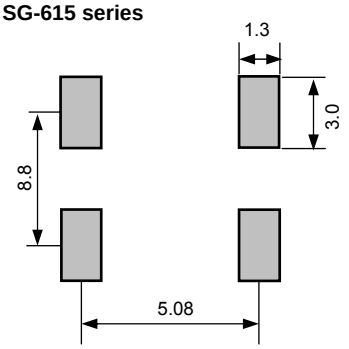


Pin map

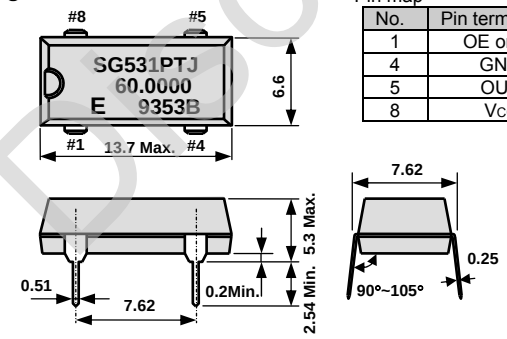
Pin	Connection
1	OE or $\overline{ST}$
2	GND
3	OUT
4	V_{CC}

Footprint (Recommended) (Unit:mm)

● SG-615 series



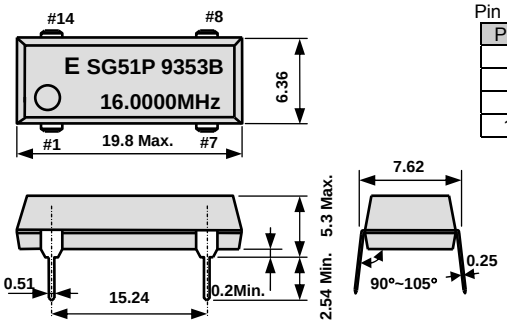
● SG-531 series



Pin map

No.	Pin terminal
1	OE or $\overline{ST}$
4	GND
5	OUT
8	V_{CC}

● SG-51 series



Pin map

Pin	Connection
1	OE or $\overline{ST}$
7	GND
8	OUT
14	V_{CC}

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 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - 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.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

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

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

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 applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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