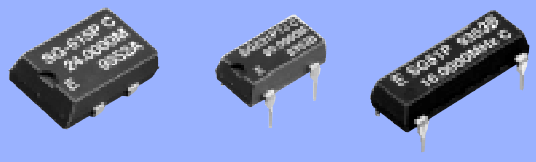
CRYSTAL OSCILLATOR
SPXO

SG-615 series
SG-531/SG-51 series

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



Actual size

Specifications (characteristics)

Item		Symbol	Specifications			Remarks
			SG-615P SG-531P SG-51P	SG-615PTJ SG-531PTJ SG-51PTJ	SG-615PH SG-531PH SG-51PH	
Output frequency range		f_0	1.025 MHz to 26 MHz	26.001 MHz to 66.667 MHz		.
Supply voltage		V_{CC}	5.0 V ±0.5 V			
Temperature range	Storage temperature	T_stg	-55 °C to +125 °C			Store as bare product after unpacking
	Operating temperature	T_use	-20 °C to +70 °C			
Frequency tolerance		f_tol(osc)	B: $\pm 50 \times 10^{-6}$, C: $\pm 100 \times 10^{-6}$			-20 °C to +70 °C *1
Current consumption		I_{CC}	23 mA Max.	35 mA Max.		No load condition
Output disable current		I_dis	12 mA Max.	28 mA Max.	20 mA Max.	OE=GND
Symmetry		SYM	40 % to 60 %	—	40 % to 60 %	CMOS load:50 % V_{CC} level
			40 % to 60 %	45 % to 55 %	—	TTL load: 1.4 V level
High output voltage		V_{OH}	V_{CC}-0.4 V Min.	2.4 V Min.	V_{CC}-0.4 V Min.	I_{OH}=-400 µA(P,PTJ)/-4 mA(PH)
Low output voltage		V_{OL}	0.4 V Max.			I_{OL}=16 mA(P)/ 8 mA(PTJ)/ 4 mA(PH)
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.	—	50 pF Max.	
Output enable / disable input voltage		V_{IH}	2.0 V Min.	3.5 V Min.	2.0 V Min.	I_{IH}= 1 µA Max. (OE=V_{CC})
		V_{IL}	0.8 V Max.	1.5 V Max.	0.8 V Max.	I_{IL}= -100 µA Min. (OE=GND), PTJ:I_{IL}= -500 µA Min.(OE=GND)
Output rise and fall time		t_r / t_f	8 ns Max.	—	7 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
Oscillation start up time		t_{OSC}	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			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	
Supply voltage		V_{CC}	2.7 V to 3.6 V		3.0 V to 3.6 V	
Temperature range	Storage temperature	T_stg	-55 °C to +125 °C			Store as bare product after unpacking
	Operating temperature	T_use	-40 °C to +85 °C			
Frequency tolerance		f_tol(osc)	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$			-20 °C to +70 °C
			M: $\pm 100 \times 10^{-6}$			-40 °C to +85 °C
Current consumption		I_{CC}	12 mA Max.		20 mA Max.	No load condition
Output 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.
High output voltage		V_{OH}	V_{CC}-0.4 V Min.		V_{CC}-0.4 V Min.	I_{OH}=-8 mA
Low output voltage		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.	
Output enable / disable input voltage		V_{IH}	70 % V_{CC} Min.		70 % V_{CC} Min.	OE Terminal , $\overline{ST}$ Terminal
		V_{IL}	20 % V_{CC} Max.		30 % V_{CC} Max.	
Output rise and fall time		t_r / t_f	4 ns Max.			20 % V_{CC} to 80 % V_{CC} level, L_CMOS ≤ Max.
Oscillation start up time		t_{OSC}	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

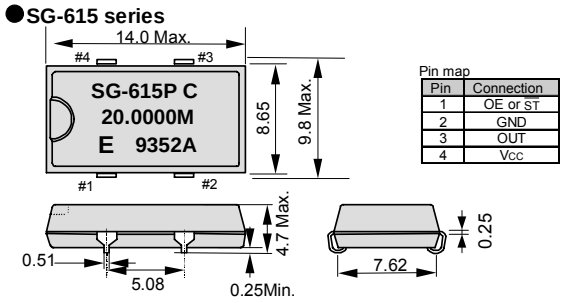
Specifications (characteristics)

Item		Symbol	Specifications			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	
Supply voltage		Vcc	5.0 V ±0.5 V		3.3 V ±0.3 V	
Temperature range	Storage temperature	T_stg	-55 °C to +125 °C			Store as bare product after unpacking
	Operating temperature	T_use	-20 °C to +70 °C		-40 °C to +85 °C	
Frequency tolerance		f_tol(osc)	B: ±50 × 10^{-6} , C: ±100 × 10^{-6}			-20 °C to +70 °C *1
			—		M: ±100 × 10^{-6}	-40 °C to +85 °C
Current consumption		Icc	45 mA Max.		28 mA Max.	No load condition(Max. frequency range)
Output disable current		I_dis	30 mA Max.		16 mA Max.	OE=GND (PTW,PHW,PCW)
Stand-by current		I_std	50 µA Max.			ST =GND (STW,SHW,SCW)
Symmetry		SYM	—	40 % to 60 %		50 % Vcc level, L_CMOS=Max.
			40 % to 60 %	—		1.4 V level ,L_CMOS=Max.
High output voltage		VOH	Vcc-0.4 V Min.			IOH=-16 mA(PTW,STW,PHW,SHW),-8 mA(PCW,SCW)
Low output voltage		VOL	0.4 V Max.			IOL= 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
Output enable / disable input voltage		VIH	2.0 V Min.		70 % Vcc Min.	OE Terminal , ST Terminal
		VIL	0.8 V Max.		20 % Vcc Max.	
Output rise and fall time		t_r / t_f	—	4 ns Max.		20 % Vcc to 80 % Vcc level, L_CMOS ≤ Max.
			4 ns Max.	—	—	0.4 V to 2.4 V level
Oscillation start up time		tOSC	10 ms Max..			Time at minimum supply voltage to be 0 s
Frequency aging		f_aging	±5 × 10^{-6} / year Max.			+25 °C, Vcc=5.0 V / 3.3 V, First year

*1 "C" tolerance :f_0 ≥66.667 MHz(PTW,STW,PHW,SHW)

External dimensions (Unit:mm)

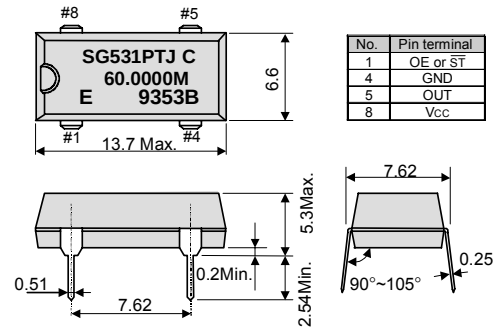
● SG-615 series



Pin map

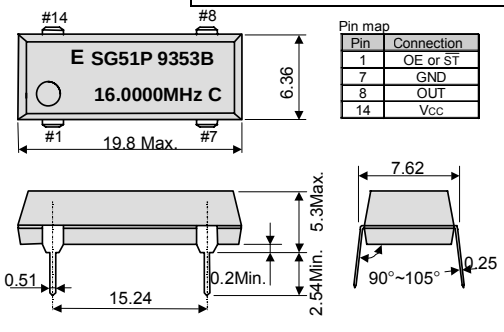
Pin	Connection
1	OE or ST
2	GND
3	OUT
4	Vcc

● SG-531 series



No.	Pin terminal
1	OE or ST
4	GND
5	OUT
8	Vcc

● SG-51 series



Pin map

Pin	Connection
1	OE or ST
7	GND
8	OUT
14	Vcc

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

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

Footprint (Recommended) (Unit:mm)

● SG-615 series