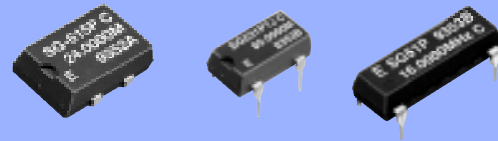




## CRYSTAL OSCILLATOR SPXO

# 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

SG-615



SG-531



SG-51



### 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 $\pm 0.5$ 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.	$I_{OH}=-400 \mu A(P,PTJ)/-4 mA(PH)$
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.	—	$L_{CMOS} \leq 15 pF$
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.	$I_{IH}=1 \mu A$ Max. (OE= $V_{CC}$ )
	$V_{IL}$	0.8 V Max.	1.5 V Max.	0.8 V Max.	$I_{IL}=-100 \mu A$ Min. (OE=GND), PTJ: $I_{IL}=-500 \mu A$ 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	$f_{aging}$	$\pm 5 \times 10^{-6}$ / 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			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			
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: $\pm 100 \times 10^{-6}$ 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
Output disable current	$I_{dis}$	10 mA Max.	—	10 mA Max.	OE=GND (PCG,PCN)
Stand-by current	$I_{std}$	—	50 $\mu A$ 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, $L_{CMOS} \leq$ Max.
Oscillation start up time	$t_{osc}$	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			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	$V_{CC}$	5.0 V $\pm$ 0.5 V		3.3 V $\pm$ 0.3 V	
Temperature range	Storage temperature	-55 °C to +125 °C			Store as bare product after unpacking
	Operating temperature	-20 °C to +70 °C		-40 °C to +85 °C	
Frequency tolerance	$f_{tol(osc)}$	B: $\pm 50 \times 10^{-6}$ , C: $\pm 100 \times 10^{-6}$		M: $\pm 100 \times 10^{-6}$	-20 °C to +70 °C *1 -40 °C to +85 °C
Current consumption	$I_{CC}$	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 $\mu$ A Max.			$\overline{ST}$ =GND (STW,SHW,SCW)
Symmetry	SYM	40 % to 60 %		40 % to 60 %	50 % $V_{CC}$ level, L_CMOS=Max.
		—		—	1.4 V level, L_CMOS=Max.
High output voltage	$V_{OH}$	—		$V_{CC}$ -0.4 V Min.	$I_{OH}$ =-16 mA(PTW,STW,PHW,SHW),-8 mA(PCW,SCW)
Low output voltage	$V_{OL}$	—		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.	—	—	$f_0 \leq 90$ MHz, Max.supply voltage
Output load condition (CMOS)	$L_{CMOS}$	15 pF Max.			Max.frequency, Max.supply voltage
Output enable / disable input voltage	$V_{IH}$	2.0 V Min.		70 % $V_{CC}$ Min.	OE Terminal, $\overline{ST}$ Terminal
	$V_{IL}$	0.8 V Max.		20 % $V_{CC}$ Max.	
Output rise and fall time	$t_r / t_f$	—		4 ns Max.	20 % $V_{CC}$ to 80 % $V_{CC}$ level, L_CMOS $\leq$ Max. 0.4 V to 2.4 V level
		4 ns Max.	—	—	
Oscillation start up time	$t_{osc}$	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 / 3.3 V, First year

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

## External dimensions

(Unit:mm)

## Footprint (Recommended)

(Unit:mm)

