



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) 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

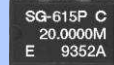
SG-531 : Q32531xx2xxxx00

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 | . |
| Supply voltage | V_{cc} | 5.0 V ± 0.5 V | | |
| Storage temperature | T_{stg} | -55 °C to +125 °C | | Store as bare product. |
| Operating temperature | T_{use} | -20 °C to +70 °C | | |
| Frequency tolerance | f_{tol} | 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 |
| 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 | |
| Supply voltage | V_{cc} | 2.7 V to 3.6 V | | | |
| Storage temperature | T_{stg} | -55 °C to +125 °C | | | Store as bare 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, $L_{CMOS}=\text{Max.}$ |
| | | $V_{cc}-0.4$ V Min. | | $V_{cc}-0.4$ V Min. | $I_{OH}=-8$ mA |
| Output voltage | V_{OH} | $V_{cc}-0.4$ V Min. | | $V_{cc}-0.4$ V Min. | $I_{OL}=8$ mA |
| | V_{OL} | 0.4 V Max. | | 0.4 V Max. | |
| 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, $L_{CMOS} \leq \text{Max.}$ |
| 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 / SHW | 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 | |
| Storage temperature | T_{stg} | -55 °C to +125 °C | | | Store as bare product. |
| Operating temperature | T_{use} | -20 °C to +70 °C | | -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 *1 -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 μ A 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. | — | — | $f_0 \leq 90$ 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, $L_{CMOS} \leq$ Max. 0.4 V to 2.4 V level |
| | | 4 ns Max. | — | — | |
| Start-up time | t_{str} | 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 |

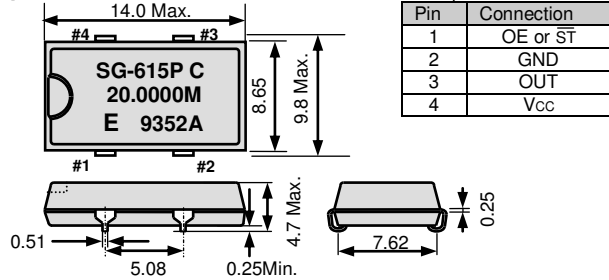
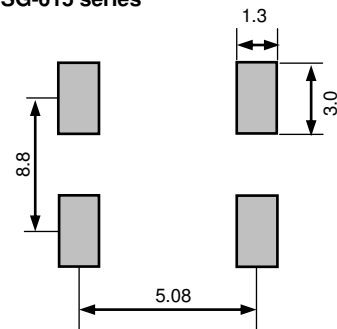
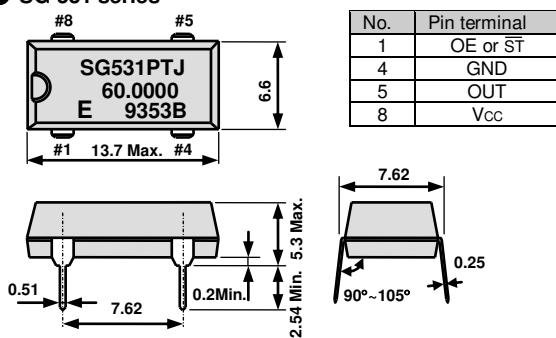
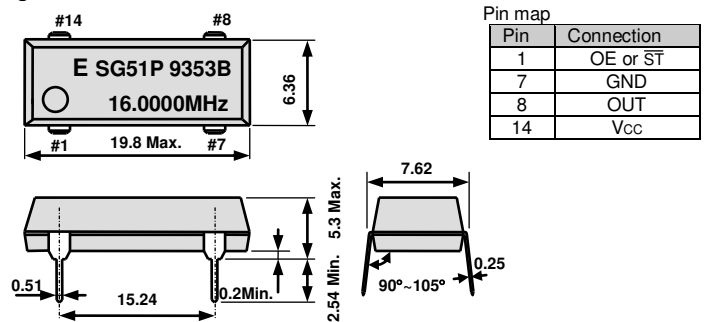
*1 "C" tolerance : $f_0 \geq 66.667$ MHz(PTW,STW,PHW,SHW)

External dimensions

(Unit:mm)

Footprint (Recommended)

(Unit:mm)

● 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).