# CRYSTAL OSCILLATOR (SPXO)

**OUTPUT : LV-PECL, LVDS**

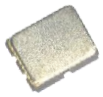
Pb Free | RoHS Compliant

**Product Number**
**SG2016EGN: X1G006131xxxx15**
**SG2016VGN: X1G006111xxxx15**
**SG2520EGN: X1G005881xxxx15**
**SG2520VGN: X1G005901xxxx15**

# SG2016EGN/VGN (high frequency range)
# SG2520EGN/VGN (high frequency range)

- •Frequency : 500 MHz to 625 MHz
- •Supply voltage : 2.5 V Typ. / 3.3 V Typ.
- •Frequency tolerance : ±50 × $10^{-6}$
- •Operating temperature : -40 °C to +85 °C, -40 °C to +105 °C
- •Function : Output enable (OE)
- •Phase jitter : 40 fs Max. (fo = 625 MHz)

SG2016EGN
SG2016VGN
(2.0 × 1.6 × 0.63 mm)



SG2520EGN
SG2520VGN
(2.5 × 2.0 × 0.74 mm)

## Specifications (characteristics)

| Item | Symbol | Specifications | | Conditions / Remarks | |
|---|---|---|---|---|---|
| | | LV-PECL | LVDS | | |
| | | SG2016EGN / SG2520EGN | SG2016VGN / SG2520VGN | | |
| Output frequency | fo | 500 MHz to 625 MHz | | Please contact us for available frequencies. | |
| Supply voltage | $V_{CC}$ | C: 3.3 V ± 5 %, D: 2.5 V ± 5 % | | | |
| Storage temperature | T_stg | -55 °C to +125 °C | | | |
| Operating temperature | T_use | G: -40 °C to +85 °C, H: -40 °C to +105 °C | | | |
| Frequency tolerance | f_tol | ±50 × $10^{-6}$ Max. | | Includes initial frequency tolerance, frequency / temperature characteristics, frequency / voltage coefficient and 10 years aging (+25 °C) | |
| Current consumption | $I_{CC}$ | 60 mA Max. | – | OE = $V_{CC}$, L_ECL = 50 Ω | |
| | | – | 40 mA Max. | OE = $V_{CC}$, L_LVDS = 100 Ω | |
| Disable current | I_dis | 35 mA Max. | 30 mA Max. | OE = GND | |
| Symmetry | SYM | 45 % to 55 % | | At output crossing point | |
| Output voltage (LV-PECL) | $V_{OH}$ | $V_{CC}$ - 1.1 V Min. | – | Output option: A, DC characteristic | |
| | $V_{OL}$ | $V_{CC}$ - 1.6 V Max. | | | |
| Differential swing | $V_{SW}$ | 0.8 V to 1.6 V | 500 mV to 900 mV | Output option: A | |
| | | – | 800 mV to 1 400 mV | Output option: B | |
| | | – | 700 mV to 1 100 mV | Output option: C | |
| Output voltage (LVDS) | $V_{OD}$ | – | 250 mV to 450 mV | Output option: A | Differential output voltage, $V_{OD1}$, $V_{OD2}$ |
| | | | 400 mV to 700 mV | Output option: B | |
| | | | 350 mV to 550 mV | Output option: C | |
| | $dV_{OD}$ | – | 50 mV Max. | $dV_{OD}$ = \| $V_{OD1}$ - $V_{OD2}$ \| | |
| | $V_{OS}$ | – | 1.15 V to 1.35 V | Offset voltage, $V_{OS1}$, $V_{OS2}$ | |
| | $dV_{OS}$ | – | 50 mV Max. | $dV_{OS}$ = \| $V_{OS1}$ - $V_{OS2}$ \| | |
| Output load condition | L_ECL | 50 Ω | – | Terminated to $V_{CC}$ - 2.0 V | |
| | L_LVDS | – | 100 Ω | Connected between OUT and $\overline{OUT}$ | |
| Input voltage | $V_{IH}$ | 70 % $V_{CC}$ Min. | | OE terminal | |
| | $V_{IL}$ | 30 % $V_{CC}$ Max. | | | |
| Rise/Fall times | tr/tf | 0.2 ns Max. | | 20 % - 80 % of $V_{SW}$ | |
| Start-up time | t_str | 10 ms Max. | | t = 0 at 90 % $V_{CC}$ | |
| Phase jitter | $t_{PJ}$ | 40 fs Max. | | fo = 625 MHz, Offset frequency: 12 kHz to 20 MHz | |

## Product name

Product Name (Standard form)

SG2016 EGN 625.000000MHz C J H P X A
a b c d e f g h i

a: Model b: Output (E: LV-PECL, V: LVDS) c: Frequency d: Supply voltage e: Frequency tolerance
f: Operating temperature g: Function h: Internal identification code ("X" is default) i: Output option

| d: Supply voltage | |
|---|---|
| C | 3.3 V Typ. |
| D | 2.5 V Typ. |

| e: Freq. tolerance | |
|---|---|
| J | ±50 × $10^{-6}$ |

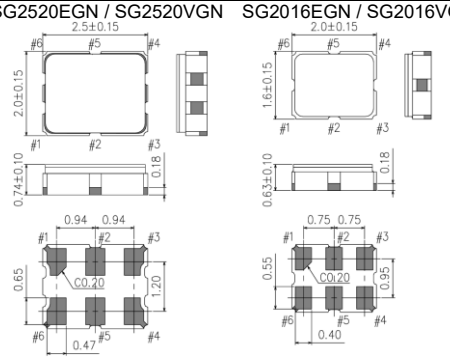
| f: Operating temperature | |
|---|---|
| G | -40 °C to +85 °C |
| H | -40 °C to +105 °C |

| g: Function | |
|---|---|
| P | OE |

| i: Output option | | |
|---|---|---|
| | SG2016EGN / SG2520EGN | SG2016VGN / SG2520VGN |
| A | Default | $V_{OD}$ = 250 mV to 450 mV |
| B | – | $V_{OD}$ = 400 mV to 700 mV |
| C | – | $V_{OD}$ = 350 mV to 550 mV |

## External dimensions (Unit:mm)

SG2520EGN / SG2520VGN SG2016EGN / SG2016VGN

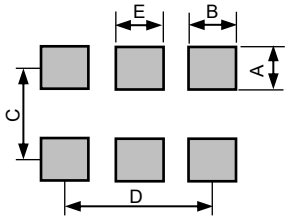



Pin map

| Pin | Connection |
|---|---|
| 1 | OE or $\overline{ST}$ |
| 2 | N.C. (Open or $V_{CC}$) |
| 3 | GND |
| 4 | OUT |
| 5 | $\overline{OUT}$ |
| 6 | $V_{CC}$ |

Note:
OE or $\overline{ST}$ pin = HIGH or "Open": Specified frequency output.
OE or $\overline{ST}$ pin = LOW: Output is high impedance

## Footprint (Recommended) (Unit:mm)




| | SG2520EGN SG2520VGN | SG2016EGN SG2016VGN |
|---|---|---|
| A | 0.88 | 0.85 |
| B | 0.76 | 0.574 |
| C | 1.38 | 1.15 |
| D | 1.99 | 1.564 |
| E | 0.63 | 0.574 |

In order to achieve optimum jitter performance, it is recommended that 0.1 µF and 10 µF bypass capacitors should be connected between $V_{CC}$ and GND and placed as close to the $V_{CC}$ pin as possible.

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

| | |
|---|---|
| Pb Free | ►PLead-free product.<br>*No lead is intentionally added. |
| RoHS Compliant | ►EU RoHS Compliant Product.<br>*Compliant with the EU RoHS Directive. The product is either exempt or below applicable limits for restricted substances. |
| For Automotive | ►Designed for automotive general equipment. |
| Automotive Safety | ►Designed for automotive applications related to driving and safety. |

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