# CRYSTAL OSCILLATOR (SPXO)

## OUTPUT : LV-PECL, LVDS

# SG3225EAN / VAN
# SG5032EAN / VAN
# SG7050EAN / VAN

Pb Free RoHS Compliant

**Product Number**
**SG3225EAN: X1G004251xxxx00**
**SG3225VAN: X1G004241xxxx00**
**SG5032EAN: X1G004271xxxx00**
**SG5032VAN: X1G004261xxxx00**
**SG7050EAN: X1G004291xxxx00**
**SG7050VAN: X1G004281xxxx00**

- •Achieved wide frequency range by PLL technology and Fundamental AT crystal units
- •Frequency range : 73.5 MHz to 700 MHz
- •Supply voltage : 2.5 V to 3.3 V
- •Function : Output enable (OE)
- • Output : LV-PECL or LVDS



SG3225EAN/VAN
(3.2 × 2.5 × 1.05 mm)



SG5032EAN/VAN
(5.0 × 3.2 × 1.0 mm)



SG7050EAN/VAN
(7.0 × 5.0 × 1.4 mm)

## Specifications (characteristics)

| Item | Symbol | Specifications | | Conditions / Remarks | |
|---|---|---|---|---|---|
| | | LV-PECL<br>SG3225EAN / SG5032EAN / SG7050EAN | LVDS<br>SG3225VAN / SG5032VAN / SG7050VAN | | |
| Output frequency range | $f_0$ | 73.5 MHz to 700 MHz | | Please contact us about available frequencies. | |
| Supply voltage | $V_{CC}$ | K: 2.5 V - 10 % to 3.3 V + 10 % | | | |
| Storage temperature | T_stg | -40 °C to +125 °C | | Storage as single product. | |
| Operating temperature range | T_use | B: -20 °C to +70 °C, G: -40 °C to +85 °C | | | |
| Frequency tolerance range | f_tol | J: ± 50 × $10^{-6}$, E: ± 30 × $10^{-6}$, C: ± 20 × $10^{-6}$ | | | |
| Current consumption | $I_{CC}$ | 65 mA Max. | 30 mA Max. | OE = Vcc, L_ECL = 50 Ω or L_LVDS = 100 Ω | |
| Disable current | I_dis | 20 mA Max. | | OE = GND | |
| Symmetry | SYM | 45 % to 55 % | | At outputs crossing point | |
| Output voltage (LV-PECL) | $V_{OH}$ | Vcc - 1.0 V to Vcc - 0.8 V | – | DC characteristics | |
| | $V_{OL}$ | Vcc - 1.78 V to Vcc - 1.62 V | – | | |
| Output voltage (LVDS) | $V_{OD}$ | – | 250 mV to 450 mV | $V_{OD1}$, $V_{OD2}$ | DC characteristics |
| | dVOD | – | 50 mV Max. | dVOD = \| $V_{OD1}$-$V_{OD2}$ \| | |
| | $V_{OS}$ | – | 1.15 V to 1.35 V | $V_{OS1}$, $V_{OS2}$ | |
| | dVOS | – | 150 mV Max. | dVOS = \| $V_{OS1}$-$V_{OS2}$ \| | |
| Output load condition (ECL) / (LVDS) | L_ECL | 50 Ω | – | Terminated to Vcc -2.0 V | |
| | L_LVDS | – | 100 Ω | Connected between OUT to $\overline{OUT}$ | |
| Input voltage | $V_{IH}$ | 70 % Vcc Min. | | OE terminal | |
| | $V_{IL}$ | 30 % Vcc Max. | | | |
| Rise time / Fall time | $t_r$ / $t_f$ | 350 ps Max. | 300 ps Max. | LV-PECL: Between 20 % and 80 % of (VOH-VOL).<br>LVDS: Between 20 % and 80 %of Differential Output peak to peak voltage | |
| Start-up time | t_str | 3 ms Max. | | Time at minimum supply voltage to be 0 s | |
| Phase Jitter | $t_{PJ}$ | 0.6 ps Max.*1 | | Offset frequency: 12 kHz to 20 MHz | |
| Frequency aging | f_age | ± 5 × $10^{-6}$ / year Max. | | +25 °C, First year, Vcc = 2.5 V, 3.3 V | |

*1 0.9 ps Max. ($f_0$ = 243 MHz ~ 250 MHz, 486 MHz ~ 500 MHz)

Product Name (Standard form)

SG3225 E AN 156.250000MHz K J G A (⑤⑥: CG is not available)
① ② ③ ④⑤⑥⑦

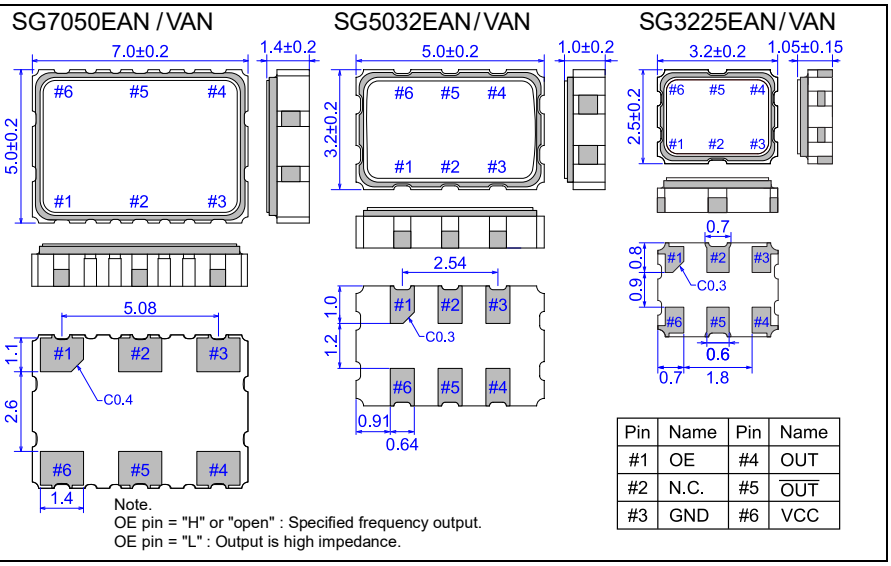
①Model ②Output (E: LV-PECL, V: LVDS) ③Frequency ④Supply voltage ⑤Frequency tolerance ⑥Operating temperature ⑦Internal identification code (“A” is default)

| ④Supply voltage | |
|---|---|
| K | 2.5 V ~ 3.3 V |

| ⑤Frequency tolerance | |
|---|---|
| J | ±50 × $10^{-6}$ |
| E | ±30 × $10^{-6}$ |
| C | ±20 × $10^{-6}$ |

| ⑥Operating temperature | |
|---|---|
| B | -20 °C ~ +70 °C |
| G | -40 °C ~ +85 °C |

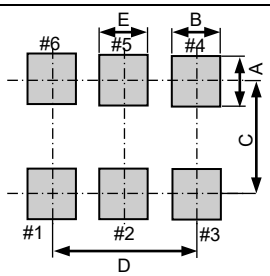
## External dimensions (Unit: mm)




Note.
OE pin = "H" or "open" : Specified frequency output.
OE pin = "L" : Output is high impedance.

| Pin | Name | Pin | Name |
|---|---|---|---|
| #1 | OE | #4 | OUT |
| #2 | N.C. | #5 | $\overline{OUT}$ |
| #3 | GND | #6 | VCC |

## Footprint (Recommended) (Unit: mm)




Size

| | SG3225 type | SG5032 type | SG7050 type |
|---|---|---|---|
| A | 1.05 | 1.60 | 2.00 |
| B | 0.86 | 0.89 | 1.80 |
| C | 1.85 | 2.60 | 4.20 |
| D | 2.58 | 2.54 | 5.08 |
| E | 0.82 | 0.89 | 1.80 |

To maintain stable operation, provide a 0.01 µF to 0.1 µF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

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

| | |
|---|---|
|  | ►Pb free. |
|  | ►Complies with EU RoHS directive.<br>*About the products without the Pb-free mark.<br>Contains Pb in products exempted by EU RoHS directive.<br>(Contains Pb in sealing glass, high melting temperature type solder or other.) |
|  | ►Designed for automotive general equipment. |
|  | ►Designed for automotive applications related to driving and safety. |

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