

## CRYSTAL OSCILLATOR (SPXO)

**OUTPUT : LV-PECL, LVDS**



Product Number

**SG3225EAN: X1G004251xxx00**

SG3225VAN: X1G004241xxxx00

SG5032EAN: X1G004271xxxx00

SG5032VAN: X1G004261xxxx00

SG7050EAN: Y1G004291xxxx00

SG7050VAN: X1G004281xxxx00

**SG3225EAN / VAN**  
**SG5032EAN / VAN**  
**SG7050EAN / VAN**

- 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                                                                              | LVDS                              |                                                                                                                         |                    |
|                                      |                                 | SG3225EAN / SG5032EAN / SG7050EAN                                                    | SG3225VAN / SG5032VAN / SG7050VAN |                                                                                                                         |                    |
| Output frequency range               | f <sub>0</sub>                  | 73.5 MHz to 700 MHz                                                                  |                                   | Please contact us about available frequencies.                                                                          |                    |
| Supply voltage                       | V <sub>CC</sub>                 | K: 2.5 V - 10 % to 3.3 V + 10 %                                                      |                                   |                                                                                                                         |                    |
| Storage temperature                  | T <sub>stg</sub>                | -40 °C to +125 °C                                                                    |                                   | Storage as single product.                                                                                              |                    |
| Operating temperature range          | T <sub>use</sub>                | B: -20 °C to +70 °C, G: -40 °C to +85 °C                                             |                                   |                                                                                                                         |                    |
| Frequency tolerance range            | f <sub>tol</sub>                | J: ± 50 × 10 <sup>-6</sup> , E: ± 30 × 10 <sup>-6</sup> , C: ± 20 × 10 <sup>-6</sup> |                                   |                                                                                                                         |                    |
| Current consumption                  | I <sub>CC</sub>                 | 65 mA Max.                                                                           | 30 mA Max.                        | OE = V <sub>CC</sub> , L ECL = 50 Ω or L LVDS = 100 Ω                                                                   |                    |
| Disable current                      | I <sub>dis</sub>                | 20 mA Max.                                                                           |                                   | OE = GND                                                                                                                |                    |
| Symmetry                             | SYM                             | 45 % to 55 %                                                                         |                                   | At outputs crossing point                                                                                               |                    |
| Output voltage (LV-PECL)             | V <sub>OH</sub>                 | V <sub>CC</sub> - 1.0 V to V <sub>CC</sub> - 0.8 V                                   | —                                 | DC characteristics                                                                                                      |                    |
|                                      | V <sub>OL</sub>                 | V <sub>CC</sub> - 1.78 V to V <sub>CC</sub> - 1.62 V                                 | —                                 |                                                                                                                         |                    |
| Output voltage (LVDS)                | V <sub>OD</sub>                 | —                                                                                    | 250 mV to 450 mV                  | V <sub>OD1</sub> , V <sub>OD2</sub>                                                                                     | DC characteristics |
|                                      | dV <sub>OD</sub>                | —                                                                                    | 50 mV Max.                        | dV <sub>OD</sub> =   V <sub>OD1</sub> -V <sub>OD2</sub>                                                                 |                    |
|                                      | V <sub>OS</sub>                 | —                                                                                    | 1.15 V to 1.35 V                  | V <sub>OS1</sub> , V <sub>OS2</sub>                                                                                     |                    |
|                                      | dV <sub>OS</sub>                | —                                                                                    | 150 mV Max.                       | dV <sub>OS</sub> =   V <sub>OS1</sub> -V <sub>OS2</sub>                                                                 |                    |
|                                      |                                 |                                                                                      |                                   |                                                                                                                         |                    |
| Output load condition (ECL) / (LVDS) | L ECL                           | 50 Ω                                                                                 | —                                 | Terminated to V <sub>CC</sub> -2.0 V                                                                                    |                    |
|                                      | L LVDS                          | —                                                                                    | 100 Ω                             | Connected between OUT to $\overline{\text{OUT}}$                                                                        |                    |
| Input voltage                        | V <sub>IH</sub>                 | 70 % V <sub>CC</sub> Min.                                                            |                                   | OE terminal                                                                                                             |                    |
|                                      | V <sub>IL</sub>                 | 30 % V <sub>CC</sub> Max.                                                            |                                   |                                                                                                                         |                    |
| Rise time / Fall time                | t <sub>r</sub> / t <sub>f</sub> | 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 <sub>str</sub>                | 3 ms Max.                                                                            |                                   | Time at minimum supply voltage to be 0 s                                                                                |                    |
| Phase Jitter                         | t <sub>pj</sub>                 | 0.6 ps Max.*1                                                                        |                                   | Offset frequency: 12 kHz to 20 MHz                                                                                      |                    |
| Frequency aging                      | f <sub>age</sub>                | ± 5 × 10 <sup>-6</sup> / year Max.                                                   |                                   | +25 °C, First year, V <sub>CC</sub> = 2.5 V, 3.3 V                                                                      |                    |

\*1 0.9 ps Max. ( $f_0 = 243 \text{ MHz} \sim 250 \text{ MHz}$ ,  $486 \text{ MHz} \sim 500 \text{ MHz}$ )

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

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

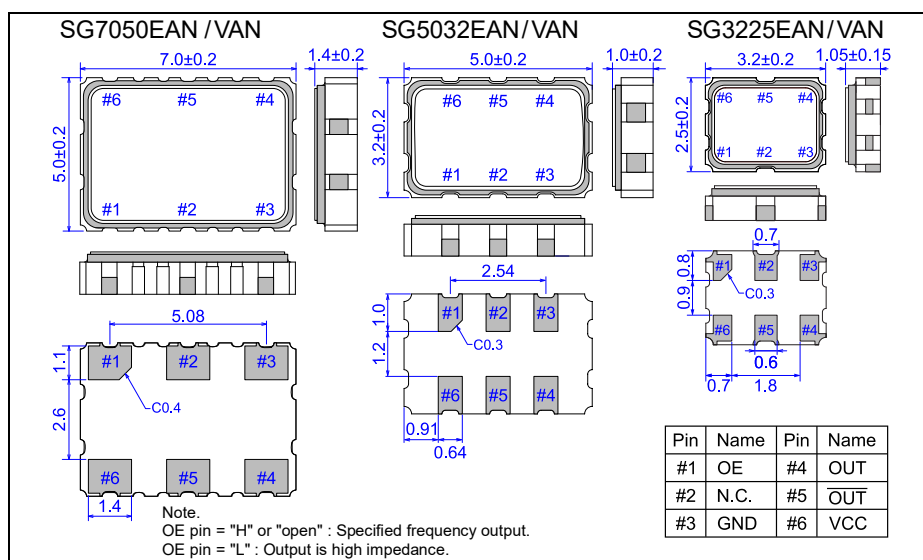
|                 |               |
|-----------------|---------------|
| ④Supply voltage |               |
| K               | 2.5 V ~ 3.3 V |

| ⑤Frequency tolerance |                         |
|----------------------|-------------------------|
| J                    | $\pm 50 \times 10^{-6}$ |
| E                    | $\pm 30 \times 10^{-6}$ |
| C                    | $\pm 20 \times 10^{-6}$ |

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

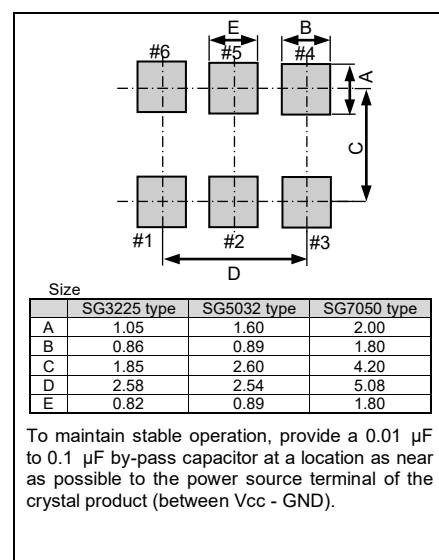
## External dimensions

(Unit: mm)



## Footprint (Recommended)

(Unit: mm)



► 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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