

**CRYSTAL OSCILLATOR (SPXO)**

OUTPUT : LV-PECL, LVDS

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

- Achieved wide frequency range by PLL technology and 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



Product Number (please contact us)  
 SG3225EAN: X1G004251xxxx00  
 SG3225VAN: X1G004241xxxx00  
 SG5032EAN: X1G004271xxxx00  
 SG5032VAN: X1G004261xxxx00  
 SG7050EAN: X1G004291xxxx00  
 SG7050VAN: X1G004281xxxx00



SG3225EAN/VAN (3.2 x 2.5 x 1.05 mm) Actual size  
 SG5032EAN/VAN (5.0 x 3.2 x 1.0 mm)  
 SG7050EAN/VAN (7.0 x 5.0 x 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 <sub>o</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                | T <sub>use</sub>                | B: -20 °C to +70 °C, G: -40 °C to +85 °C   |   |   |
| Frequency tolerance                  | 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 <sub>ECL</sub> = 50 Ω or L <sub>LVDS</sub> = 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   |   | DC characteristics  |
|                                      | dV <sub>OD</sub>                | 50 mV Max.   |   |   |
|                                      | V <sub>OS</sub>                 | 1.15 V to 1.35 V   |   |   |
|                                      | dV <sub>OS</sub>                | 150 mV Max.  |   |   |
| Output load condition (ECL) / (LVDS) | L <sub>ECL</sub>                | 50 Ω   |   | Terminated to V <sub>cc</sub> - 2.0 V   |
|                                      | L <sub>LVDS</sub>               | 100 Ω  |   | Connected between OUT to 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 (V <sub>OH</sub> -V <sub>OL</sub> ).<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. <sup>*1</sup>  |   | Offset frequency: 12 kHz to 20 MHz  |
| Frequency aging                      | f <sub>aging</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<sub>o</sub> = 243 MHz ~ 250 MHz, 486 MHz ~ 500 MHz)

Product Name SG3225 E AN 156.250000MHz K J G A (ⓈⓈ: CG is not available)

(Standard form)

① Model ② Output (E: LV-PECL, V: LVDS) ③ Frequency ④ Supply voltage ⑤ Frequency tolerance

⑥ Operating temperature ⑦ Internal identification code ("A" is default)

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

| ⑤ Frequency tolerance |                        |
|-----------------------|------------------------|
| J                     | ±50 × 10 <sup>-6</sup> |
| E                     | ±30 × 10 <sup>-6</sup> |
| C                     | ±20 × 10 <sup>-6</sup> |

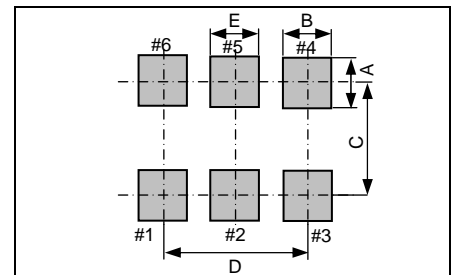
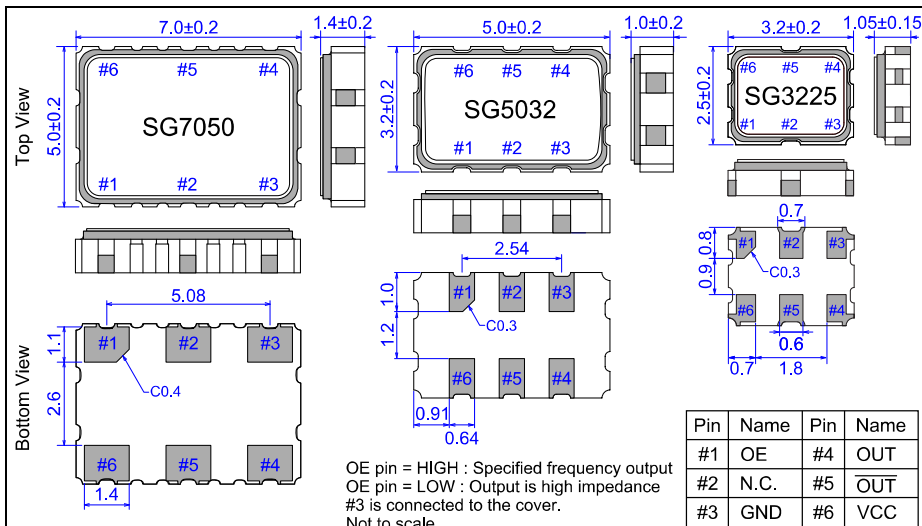
| ⑥ Operating temperature |                 |
|-------------------------|-----------------|
| B                       | -20 °C ~ +70 °C |
| G                       | -40 °C ~ +85 °C |

**External dimensions**

(Unit: mm)

**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 V<sub>cc</sub> - GND).

## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

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### ► 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 applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.  |
|  | ► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ).  |

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