

**LOW-JITTER SAW OSCILLATOR (SPSO)**

**OUTPUT : LV-PECL, LVDS**



**Product Number**  
 XG-2121CA P: X1M000311xxxx00  
 XG-2121CA L: X1M000351xxxx00  
 XG-2102CA P: X1M000301xxxx00  
 XG-2102CA L: X1M000341xxxx00

**XG-2121CA**  
**XG-2102CA**

- Frequency range : 100 MHz to 700 MHz
  - Supply voltage : 2.5 V ... XG-2121CA  
3.3 V ... XG-2102CA
  - Output : LV-PECL or LVDS
  - Function : Output enable (OE)
  - External dimensions : 7.0 × 5.0 × 1.2 mm
- Low jitter and low phase noise by SAW unit.



**Specifications (characteristics)**

| Item                                 | Symbol                          | LV-PECL  |                | LVDS                               |                                       | Conditions / Remarks   |
|--------------------------------------|---------------------------------|--|----------------|------------------------------------|---------------------------------------|--|
|                                      |                                 | XG-2121CA P  | XG-2102CA P    | XG-2121CA L                        | XG-2102CA L                           |  |
| Output frequency range               | f <sub>o</sub>                  | 100 MHz to 700 MHz   |                |                                    |                                       | Please contact us about available frequencies.   |
| Supply voltage                       | V <sub>cc</sub>                 | 2.5 V ± 0.125 V  | 3.3 V ± 0.33 V | 2.5 V ± 0.125 V                    | 3.3 V ± 0.33 V                        |  |
| Storage temperature                  | T <sub>stg</sub>                | -55 °C to +125 °C  |                |                                    |                                       | Storage as single product.   |
| Operating temperature                | T <sub>use</sub>                | P: 0 °C to +70 °C, R: -5 °C to +85 °C, S: -20 °C to +70 °C |                |                                    |                                       |  |
| Frequency tolerance                  | f <sub>tol</sub>                | G: ± 50 × 10 <sup>-6</sup> , H: ± 100 × 10 <sup>-6</sup>   |                |                                    |                                       |  |
| Current consumption                  | I <sub>cc</sub>                 | 60 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>                | 2 mA Max.  |                | 15 mA Max.                         |                                       | OE=GND   |
| Symmetry                             | SYM                             | 45 % to 55 %   |                |                                    |                                       | At outputs crossing point  |
| Output voltage (LV-PECL)             | V <sub>OH</sub>                 | 1.55 V Typ.  | 2.35 V Typ.    | -                                  |                                       | DC characteristics   |
|                                      | V <sub>OL</sub>                 | V <sub>cc</sub> -1.025 V to V <sub>cc</sub> -0.88 V        |                | -                                  |                                       |  |
| Output voltage (LVDS)                | V <sub>OD</sub>                 | -  |                | 350 mV Typ., 247 mV to 454 mV      |                                       | DC characteristics   |
|                                      | dV <sub>OD</sub>                | -  |                | 50 mV Max.                         |                                       |  |
| 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 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> | 400 ps Max.  |                |                                    |                                       | Between 20 % and 80 % of (V <sub>OH</sub> -V <sub>OL</sub> ).<br>Between 20 % and 80 % of Differential Output Peak to Peak voltage |
| Start-up time                        | t <sub>str</sub>                | 10 ms Max.   |                |                                    |                                       | Time at minimum supply voltage to be 0 s   |
| Phase Jitter                         | t <sub>pj</sub>                 | 0.23 ps Max.   |                | 0.27 ps Max.                       |                                       | 100 MHz ≤ f <sub>o</sub> < 150 MHz   |
|                                      |                                 | 0.22 ps Max.   |                | 0.24 ps Max.                       |                                       | 150 MHz ≤ f <sub>o</sub> < 200 MHz   |
|                                      |                                 | 0.21 ps Max.   |                | 0.23 ps Max.                       |                                       | 200 MHz ≤ f <sub>o</sub> < 300 MHz   |
|                                      |                                 | 0.18 ps Max.   |                | 0.19 ps Max.                       |                                       | 300 MHz ≤ f <sub>o</sub> < 400 MHz   |
|                                      |                                 | 0.16 ps Max.   |                | 0.16 ps Max.                       |                                       | 400 MHz ≤ f <sub>o</sub> < 500 MHz   |
|                                      |                                 | 0.14 ps Max.   |                | 0.14 ps Max.                       |                                       | 500 MHz ≤ f <sub>o</sub> < 600 MHz   |
| 0.10 ps Max.                         |                                 | 0.10 ps Max.   |                | 600 MHz ≤ f <sub>o</sub> ≤ 700 MHz | Offset frequency:<br>12 kHz to 20 MHz |  |
| Frequency aging                      | f <sub>age</sub>                | ± 10 × 10 <sup>-6</sup> / year Max.                        |                |                                    |                                       | +25 °C, First year, V <sub>cc</sub> =2.5 V, 3.3 V  |

Product Name **XG-2121CA 212.500000MHz P H P A** (⑤⑥⑦: GRA, GSA are not available)  
 (Standard form) ① ② ③ ④⑤⑥⑦

- ① Model ② Package type ③ Frequency
- ④ Output (P:LV-PECL, L:LVDS)

⑤ Frequency tolerance ⑥ Operating temperature

⑦ Frequency aging (A\*1: Frequency tolerance include aging, N\*2: Frequency tolerance exclude aging)

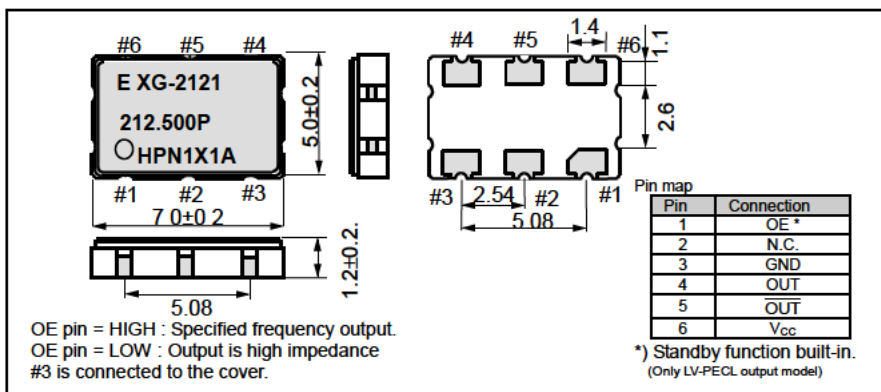
|                       |                          |                   |                  |
|-----------------------|--------------------------|-------------------|------------------|
| ⑤ Frequency tolerance |                          | ⑥ Operating temp. |                  |
| G                     | ± 50 × 10 <sup>-6</sup>  | P                 | 0 °C to +70 °C   |
| H                     | ± 100 × 10 <sup>-6</sup> | R                 | -5 °C to +85 °C  |
|                       |                          | S                 | -20 °C to +70 °C |

\*1 This includes initial frequency tolerance, temperature variation, supply voltage change, reflow drift, and aging(+25 °C, 10 years).

\*2 This includes initial frequency tolerance, temperature variation, supply voltage change, and reflow drift (except aging).

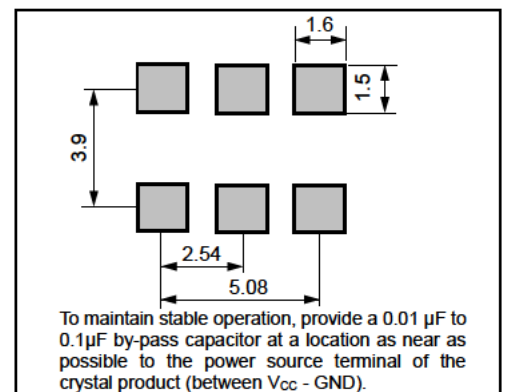
**External dimensions**

(Unit:mm)



**Footprint (Recommended)**

(Unit:mm)



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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.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

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|   |   |
|---|---|
|  | ► 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.  |
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