

# CRYSTAL OSCILLATOR

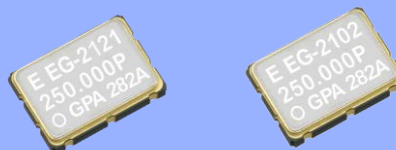
## LOW-JITTER SAW OSCILLATOR

# EG-2121 / 2102CA

- Frequency range : 53.125 MHz to 700 MHz
  - Supply voltage : 2.5 V ... EG-2121CA  
3.3 V ... EG-2102CA
  - Output : Differential LV-PECL or LVDS or HCSSL
  - Function : Output enable (OE)
  - External dimensions : 7.0 × 5.0 × 1.2 mm
- Very low jitter and low phase noise by SAW unit.



**Product Number (please contact us)**  
**EG-2121CA: Q3805CAx0xxx00**  
**: X1M000101xxx00**  
**EG-2102CA: Q3806CA00xxx00**  
**: X1M000091xxx00**



Actual size



### Specifications (characteristics)

#### ► Differential LV-PECL Output

| Item                        | Symbol  | EG-2121CA   | EG-2102CA          | Conditions / Remarks   |
|-----------------------------|---|---|--------------------|--|
|                             |   | Differential LV-PECL                                    |                    |  |
| Output frequency range      | f <sub>o</sub>                                      | 53.125 MHz to 500 MHz                                   | 100 MHz to 700 MHz | Please contact us for inquiries regarding available frequencies. |
| Supply voltage              | V <sub>cc</sub>                                     | 2.5 V ±0.125 V  | 3.3 V ±0.3 V       |  |
| Storage temperature         | T <sub>stg</sub>                                    | -40 °C to +100 °C                                       |                    | Store as bare product .  |
| Operating temperature *1    | T <sub>use</sub>                                    | P:0 °C to +70 °C ,R:-5 °C to +85 °C ,S:-20 °C to +70 °C |                    |  |
| Frequency tolerance *1      | f <sub>tol</sub>                                    | G: ± 50 × 10 <sup>-6</sup> ,H: ±100 × 10 <sup>-6</sup>  |                    |  |
| Current consumption         | I <sub>cc</sub>                                     | 80 mA Max.  | 100 mA Max.        | OE=V <sub>cc</sub> , L_ECL=50 Ω                                  |
| Disable current             | I <sub>dis</sub>                                    | 20 mA Max.  | 32 mA Max          | OE=GND   |
| Symmetry                    | SYM   | P:40 % to 60 %<br>(fo > 350 MHz)                        | P:45 % to 55 %     | at outputs crossing point  |
|                             |   | P:45 % to 55 %<br>(fo ≤ 350 MHz)                        |                    |  |
|                             |   | D:48 % to 52 %<br>(fo ≤ 175 MHz)                        |                    |  |
| Output voltage              | V <sub>OH</sub>                                     | 1.55 V Typ.   | 2.35 V Typ.        | DC characteristics   |
|                             | V <sub>cc</sub> -1.025 V to V <sub>cc</sub> -0.88 V |   |                    |  |
|                             | V <sub>OL</sub>                                     | 0.8 V Typ.  | 1.6 V Typ.         |  |
| Output load condition (ECL) | L_ECL   | V <sub>cc</sub> -1.81 V to V <sub>cc</sub> -1.62 V      |                    | Terminated to V <sub>cc</sub> -2.0 V                             |
| Input voltage               | V <sub>IH</sub>                                     | 50 Ω  |                    | OE terminal  |
|                             | V <sub>IL</sub>                                     | 70 % V <sub>cc</sub> Min.<br>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> )       |
| 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>                                     | 0.8 ps Max.   |                    | fo < 100 MHz   |
|                             |   | 0.5 ps Max.   |                    | 100 MHz ≤ fo < 200 MHz   |
|                             |   | 0.3 ps Max.   |                    | 200 MHz ≤ fo   |
| Frequency aging *2          | f <sub>aging</sub>                                  | ± 10 × 10 <sup>-6</sup> / year Max.                     |                    | +25 °C, First year, V <sub>cc</sub> =2.5 V,3.3 V                 |

\*1 As per below table 1.

\*2 Except: \*\*\*A

#### ► LVDS Output

| Item                         | Symbol                          | EG-2121CA   | EG-2102CA                        | Conditions / Remarks  |
|------------------------------|---------------------------------|---|----------------------------------|---|
|                              |                                 | LVDS  |                                  |   |
| Output frequency range       | f <sub>o</sub>                  | 53.125 MHz to 700 MHz                                   |                                  | Please contact us for inquiries regarding available frequencies.  |
| Supply voltage               | V <sub>cc</sub>                 | 2.5 V ±0.125 V  | 3.3 V ±0.3 V                     |   |
| Storage temperature          | T <sub>stg</sub>                | -40 °C to +100 °C                                       |                                  | Store as bare product.  |
| Operating temperature *1     | T <sub>use</sub>                | P:0 °C to +70 °C ,R:-5 °C to +85 °C ,S:-20 °C to +70 °C |                                  |   |
| Frequency tolerance *1       | f <sub>tol</sub>                | G: ± 50 × 10 <sup>-6</sup> ,H: ±100 × 10 <sup>-6</sup>  |                                  |   |
| Current consumption          | I <sub>cc</sub>                 | 30 mA Max   | 45 mA Max.                       | OE=V <sub>cc</sub> , L_LVDS= 100 Ω                                |
| Disable current              | I <sub>dis</sub>                | 20 mA Max   | 30 mA Max.                       | OE=GND  |
| Symmetry                     | SYM                             | L:40 % to 60 %<br>(fo > 350 MHz)                        | L:40 % to 60 %<br>(fo > 350 MHz) | at outputs crossing point   |
|                              |                                 | L:45 % to 55 %<br>(fo ≤ 350 MHz)                        |                                  |   |
|                              |                                 | V:48 % to 52 %<br>(fo ≤ 175 MHz)                        |                                  |   |
| Output voltage               | V <sub>OD</sub>                 | 350 mV Typ. 247 mV to 454 mV                            |                                  | DC characteristics  |
|                              | dV <sub>OD</sub>                | 50 mV Max.  |                                  |   |
|                              | V <sub>OS</sub>                 | 1.25 V Typ. 1.125 V to 1.375 V                          |                                  |   |
|                              | dV <sub>OS</sub>                | 150 mV Max.   |                                  |   |
| Output load condition (LVDS) | 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 Differential Output peek to peek 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>                 | 0.8 ps Max.   |                                  | fo < 100 MHz  |
|                              |                                 | 0.5 ps Max.   |                                  | 100 MHz ≤ fo < 200 MHz  |
|                              |                                 | 0.3 ps Max.   |                                  | 200 MHz ≤ fo  |
| Frequency aging *2           | f <sub>aging</sub>              | ± 10 × 10 <sup>-6</sup> / year Max.                     |                                  | +25 °C, First year, V <sub>cc</sub> =2.5 V,3.3 V                  |

\*1 As per below table 1.

\*2 Except: \*\*\*A

### ► HCSL Output

| Item                         | Symbol                          | EG-2121CA  |  | EG-2102CA    |  | Conditions / Remarks   |                                    |
|------------------------------|---------------------------------|--|--|--------------|--|--|------------------------------------|
|                              |                                 | HCSL   |  |              |  |  |                                    |
| Output frequency range       | fo                              | 100 MHz to 350 MHz   |  |              |  | Please contact us for inquiries regarding available frequencies. |                                    |
| Supply voltage               | Vcc                             | 2.5 V ±0.125 V   |  | 3.3 V ±0.3 V |  |  |                                    |
| Storage temperature          | T_stg                           | -40 °C to +125 °C  |  |              |  | Store as bare product.   |                                    |
| Operating temperature        | T_use                           | P: 0 °C to +70 °C, R: -5 °C to +85 °C, S: -20 °C to +70 °C |  |              |  |  |                                    |
| Frequency tolerance *1       | f_tol                           | G: ±50 × 10 <sup>-6</sup> , H: ±100 × 10 <sup>-6</sup>     |  |              |  |  |                                    |
| Current consumption          | Icc                             | 80 mA Max.   |  | 85 mA Max.   |  | OE=Vcc, L_HCSL=50 Ω  |                                    |
| Disable current              | I_dis                           | 20 mA Max.   |  | 35 mA Max.   |  | OE=GND   |                                    |
| Symmetry                     | SYM                             | 45 % to 55 %   |  |              |  | at outputs crossing point  |                                    |
| Output Voltage               | VoH                             | 0.75 V Typ.  |  |              |  | DC characteristics   |                                    |
|                              | VoL                             | -0.3 V Typ.  |  |              |  |  |                                    |
| Output load condition (HCSL) | L_HCSL                          | 50 Ω   |  |              |  | Terminated to GND  |                                    |
| Input voltage                | V <sub>IH</sub>                 | 70 % Vcc Min.  |  |              |  | OE terminal  |                                    |
|                              | V <sub>IL</sub>                 | 30 % Vcc Max.  |  |              |  |  |                                    |
| Rise time / Fall time        | t <sub>r</sub> / t <sub>f</sub> | 500 ps Max.  |  |              |  | Between 0.175 V and 0.525 V of output                            |                                    |
| Start-up time                | t_str                           | 10 ms Max.   |  |              |  | Time at minimum supply voltage to be 0 s                         |                                    |
| Phase Jitter                 | t <sub>pj</sub>                 | 0.8 ps Max.  |  |              |  | fo < 100 MHz   | Offset frequency: 12 kHz to 20 MHz |
|                              |                                 | 0.5 ps Max.  |  |              |  | 100 MHz ≤ fo < 200 MHz   |                                    |
|                              |                                 | 0.3 ps Max.  |  |              |  | 200 MHz ≤ fo   |                                    |
| Frequency aging *2           | f_aging                         | ±10 × 10 <sup>-6</sup> / year Max.                         |  |              |  | +25 °C, First year, Vcc=2.5 V, 3.3 V                             |                                    |

\*1 As per below table 1.

\*2 Except: \*\*\*A

**Table 1 Frequency tolerance and aging**

| Output and Symmetry                           |  | P: Differential LV-PECL |         | D: Differential LV-PECL |         | L: LVDS   |         | V: LVDS      |         | H: HCSL   |      |
|---|--|-------------------------|---------|-------------------------|---------|-----------|---------|--------------|---------|-----------|------|
| Frequency range                               |  | All range               |         |                         |         | All range |         | fo ≤ 175 MHz |         | All range |      |
| Aging   |  | A *3                    | N *4    | A *3                    | N *4    | A *3      | N *4    | A *3         | N *4    | A *3      | N *4 |
| Frequency tolerance and operating temperature | HP: ±100 × 10 <sup>-6</sup> (0°C to +70°C)   | PHPA                    | PHPN    | DHPA                    | DHPN    | LHPA      | LHPN    | VHPA         | VHPN    | HHPA      | HHPN |
|   | HR: ±100 × 10 <sup>-6</sup> (-5°C to +85°C)  | PHRA *5                 | PHRN *5 | DHRA *5                 | DHRN *5 | LHRA *5   | LHRN *5 | VHRA *5      | VHRN *5 | HHRA      | HHRN |
|   | GP: ±50 × 10 <sup>-6</sup> (0°C to +70°C)    | PGPA *5                 | PGPN *5 | DGPA *5                 | DGPN *5 | LGPA *5   | LGPN *5 | VGPA *5      | VGPN *5 | HGPA      | HGPN |
|   | GR: ±50 × 10 <sup>-6</sup> (-5°C to +85°C)   | —                       | PGRN *5 | —                       | DGRN *5 | —         | LGRN *5 | —            | VGRN *5 | —         | HGRN |
|   | HS: ±100 × 10 <sup>-6</sup> (-20°C to +70°C) | PHSA *5                 | PHSN *5 | DHSA *5                 | DHSN *5 | LHSA *5   | LHSN *5 | VHSA *5      | VHSN *5 | HHSA      | HHSN |
|   | GS: ±50 × 10 <sup>-6</sup> (-20°C to +70°C)  | —                       | PGSN *5 | —                       | DGSN *5 | —         | LGSN *5 | —            | VGSN *5 | —         | HGSN |

\*3 This includes initial frequency tolerance, temperature variation, supply voltage variation, reflow drift, and aging (+25 °C, 10 years).

\*4 This includes initial frequency tolerance, temperature variation, supply voltage variation, and reflow drift (except aging).

\*5 53.125 MHz ≤ fo < 100 MHz : Unavailable.

**Table 2 Jitter**

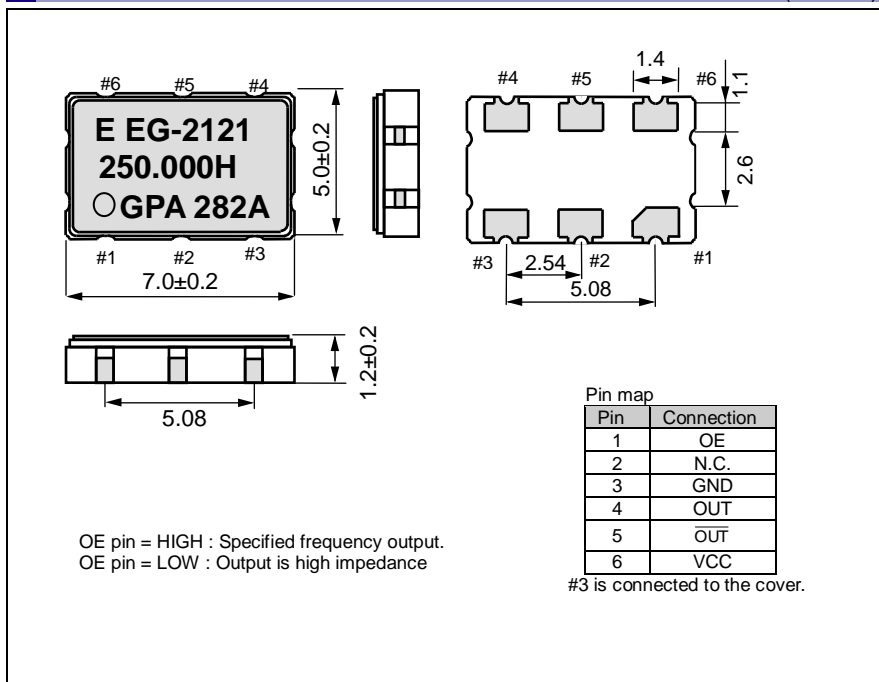
| Item     | Symbol           | Specifications | Remarks                                   |
|----------|------------------|----------------|---|
| Jitter * | t <sub>DJ</sub>  | 0.2 ps Typ.    | Deterministic Jitter                      |
|          | t <sub>RJ</sub>  | 3 ps Typ.      | Random Jitter                             |
|          | t <sub>RMS</sub> | 3 ps Typ.      | σ (RMS of total distribution)             |
|          | t <sub>p-p</sub> | 25 ps Typ.     | Peak to Peak                              |
|          | t <sub>acc</sub> | 4 ps Typ.      | Accumulated Jitter(σ) n=2 to 50000 cycles |

\* Based on DTS-2075 Digital timing system made from WAVECREST with jitter analysis software VISI6. : Differential LV-PECL, LVDS output

\* Based on SIA-3100C signal integrity analyzer made from WAVECREST. : HCSL output

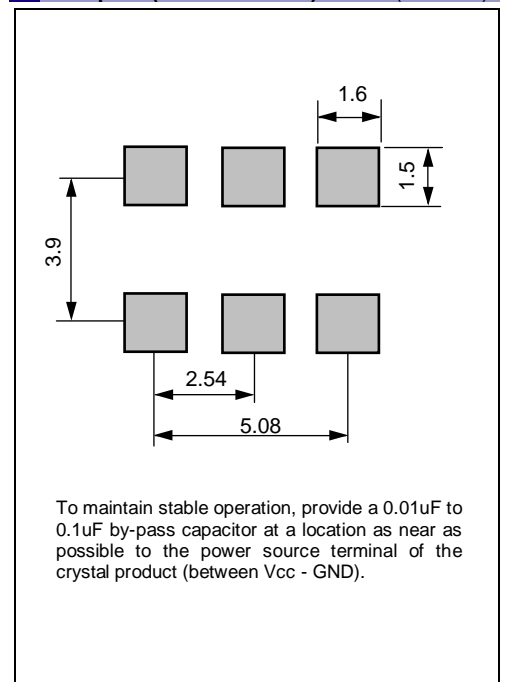
### External dimensions

(Unit:mm)



### Footprint (Recommended)

(Unit:mm)





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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