

# **LOW-JITTER SAW OSCILLATOR (SPSO)** **OUTPUT : CMOS**

## **EG - 2021 / 2001CA**

- Frequency range : 62.5 MHz to 250 MHz
- Supply voltage : 2.5 V ... EG-2021CA  
3.3 V ... EG-2001CA
- Output : CMOS
- 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-2021CA: Q3807CA00xxxx00  
EG-2001CA: Q3801CA00xxxx00



Actual size

EG-2021CA

EG-2001CA

### **Specifications (characteristics)**

| Item                         | Symbol                          | Specifications                                            |                                                             | Conditions / Remarks                                                                |
|------------------------------|---------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |                                 | EG-2021CA                                                 | EG-2001CA                                                   |                                                                                     |
| Output frequency range       | f <sub>o</sub>                  | 62.500 MHz to 170.000MHz                                  | 106.250 MHz to 170.000 MHz                                  | Please contact us about 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                                         |                                                             | Storage as single product.                                                          |
| Operating temperature        | T <sub>use</sub>                | P: 0 °C to +70 °C<br>R: -5 °C to +85 °C                   |                                                             |                                                                                     |
| Frequency tolerance          | f <sub>tol</sub>                | G: ± 50 × 10 <sup>-6</sup><br>H: ± 100 × 10 <sup>-6</sup> | Z: ± 50 × 10 <sup>-6</sup><br>Y,H: ± 100 × 10 <sup>-6</sup> |                                                                                     |
| Current consumption          | I <sub>cc</sub>                 | 25 mA Max.                                                | 50 mA Max.                                                  | OE=V <sub>cc</sub> , No load condition                                              |
| Disable current              | I <sub>dis</sub>                | 600 µA Max.                                               | 10 µA Max.                                                  | OE=GND                                                                              |
| Symmetry                     | SYM                             | 45 % to 55 %                                              | 40 % to 60 %                                                | 50 % V <sub>cc</sub> level, L <sub>CMOS</sub> ≤ Max.                                |
| Output voltage               | V <sub>OH</sub>                 | V <sub>cc</sub> -0.35 V Min.                              | V <sub>cc</sub> -0.4 V Min.                                 | I <sub>OH</sub> = -8 mA                                                             |
|                              | V <sub>OL</sub>                 | 0.35 V Max.                                               | 0.4 V Max.                                                  | I <sub>OL</sub> = 8 mA                                                              |
| Output load condition (CMOS) | L <sub>CMOS</sub>               | 15 pF Max.                                                |                                                             |                                                                                     |
| 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> | 2 ns Max.                                                 |                                                             | Between 20% V <sub>cc</sub> and 80% V <sub>cc</sub> level, L <sub>CMOS</sub> ≤ Max. |
| Start-up time                | t <sub>str</sub>                | 10 ms Max.                                                |                                                             | Time at minimum supply voltage to be 0 s                                            |
| Jitter *1                    | 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                                           |
| Phase Jitter                 | t <sub>pj</sub>                 | 1 ps Max.                                                 |                                                             | Offset frequency: 12 kHz to 20 MHz                                                  |
| Frequency aging              | f <sub>aging</sub>              | ± 10 × 10 <sup>-6</sup> / year Max.                       | ± 5 × 10 <sup>-6</sup> / year Max.                          | +25 °C, First year, V <sub>cc</sub> =2.5 V, 3.3 V                                   |

\*1 Tested using a DTS-2075 Digital timing system made by WAVECREST with jitter analysis software VISI6.

Product Name **EG-2021 CA 125.000000MHz C H P A** (⑤⑥⑦: GPA, GRA are not available)

(Standard form)

- ① Model ② Package type ③ Frequency  
④ Output(C:CMOS)

⑤ Frequency tolerance ⑥ Operating temperature

⑦ Frequency aging (A\*2: Frequency tolerance include aging, N\*3: Frequency tolerance exclude aging)

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

Product Name **EG-2001 CA 125.000000MHz P C H**

(Standard form)

- ① Model ② Package type ③ Frequency  
④ Symmetry (P: 50±5%) ⑤ Supply voltage

⑥ Frequency tolerance / Operating temperature

| ⑤Supply voltage |            | ⑥Frequency tolerance / Operating temperature |                                      |
|-----------------|------------|----------------------------------------------|--------------------------------------|
| C               | 3.3 V Typ. | H*2                                          | ±100 × 10 <sup>-6</sup> / 0 to +70°C |
|                 |            | Y*3                                          | ±100 × 10 <sup>-6</sup> / 0 to +70°C |
|                 |            | Z*4                                          | ±50 × 10 <sup>-6</sup> / 0 to +70°C  |

\*2 This includes initial frequency tolerance, temperature variation, supply voltage variation, load variation, reflow drift, and aging(+25 °C,10 years).

\*3 This includes initial frequency tolerance, temperature variation, supply voltage variation, load variation, and reflow drift.(except aging)

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

### **External dimensions**

(Unit:mm)

**Footprint (Recommended) (Unit:mm)**

