

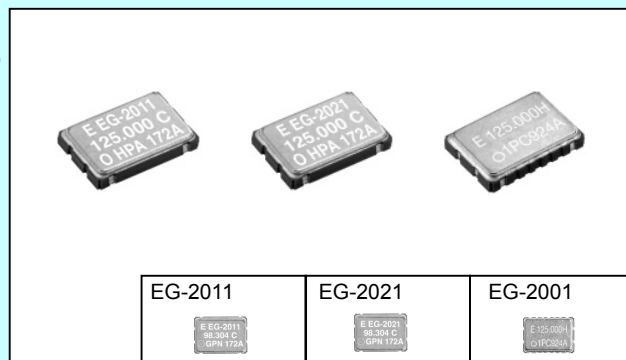
LOW-JITTER SAW OSCILLATOR

# EG-2011/2021/2001CA series

Product number (please contact us)

- EG-2011CA : Q3808CA00xxxx00
- EG-2021CA : Q3807CA00xxxx00
- EG-2001CA : Q3801CA00xxxx00

- Frequency range : 62.5 MHz to 170 MHz
- Operating voltage : 1.8V/ EG-2011CA  
2.5V/ EG-2021CA  
3.3V/ EG-2001CA
- Output : CMOS
- Function : Output enable(OE)
- Thickness : 1.2 mm Typ.
- Lead(Pb)-free : Complies with EU RoHS directive  
(Lead free completely)
- Very low jitter and low phase noise by SAW unit.



Actual Size

## Specifications (characteristics)

Item	Symbol	Specifications			Remarks	
		EG-2011CA	EG-2021CA	EG-2001CA		
Output frequency range	f <sub>o</sub>	62.500 MHz to 170.000 MHz		106.250 MHz to 170.000 MHz		
Power source voltage	Max. supply voltage	-0.5 V to +4.0 V				
	Operating voltage	V <sub>DD</sub>	1.8 V± 0.1 V	2.5 V± 0.125 V	3.3 V± 0.3 V	
Temperature range	Storage temperature	-40 °C to +100 °C			Stored as bare product after unpacking	
	Operating temperature	T <sub>OPR</sub>	P: 0 °C to +70 °C R: -5 °C to +85 °C			P: 0 °C to +70° C
Frequency stability	Δf/f <sub>o</sub>	G: ± 50 × 10 <sup>-6</sup> , H: ± 100 × 10 <sup>-6</sup>		Z: ± 50 × 10 <sup>-6</sup> Y,H: ± 100 × 10 <sup>-6</sup>	P: 0 °C to 70 °C, R: -5 °C to +85 °C *1	
Current consumption	I <sub>DD</sub>	20 mA Max.	25 mA Max.	50 mA Max.	No load condition, Max. frequency range	
Output disable current	I <sub>OE</sub>	600 μA Max.			10 μA Max.	OE=GND
Duty	tw/t	40 % to 60 % (45 % to 55 %)	45 % to 55 %		CMOS load: 50 % V <sub>DD</sub> , C <sub>L</sub> = Max. (EG-2011CA fo ≤ 125 MHz : 45 % to 55 %)	
High output voltage	V <sub>OH</sub>	V <sub>DD</sub> -0.35 V Min.		V <sub>DD</sub> -0.4 V Min.	I <sub>OH</sub> = -8 mA(EG-2001,2021), -6 mA(EG-2011)	
Low output voltage	V <sub>OL</sub>	0.35 V Max.		0.4 V Max.	I <sub>OL</sub> = 8 mA(EG-2001,2021), 6 mA(EG-2011)	
Output load condition	C <sub>L</sub>	15 pF Max.			Max. frequency and Max. operating voltage range	
High input voltage	V <sub>IH</sub>	70 % V <sub>DD</sub> Min.			OE terminal	
Low input voltage	V <sub>IL</sub>	30 % V <sub>DD</sub> Max.			OE terminal	
Output rise and fall time	t <sub>R</sub> / t <sub>F</sub>	2 ns Max.			CMOS load: 20 % to 80 % V <sub>DD</sub>	
Oscillation start up time	t <sub>OSC</sub>	10 ms Max.			Time at minimum operating voltage to be 0 s	
Jitter *2	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>	0.05 × 10 <sup>-3</sup> UI Typ.			offset frequency: 12 kHz to 20 MHz	
		1 ps Max.				
Aging *3	f <sub>a</sub>	± 10 × 10 <sup>-6</sup>		± 5 × 10 <sup>-6</sup>	T <sub>a</sub> =+25 °C, First year, V <sub>DD</sub> =1.8 V, 2.5 V, 3.3 V	

\*1 As per below table

\*2 Based on DTS-2075 Digital timing system made from WAVECREST with jitter analysis software VISI6.

\*3 Except: CHPA, CHRA, PCH

Model	EG-2011CA/EG-2021CA		
	Details of frequency stability		
Frequency stability	HP: ±100×10 <sup>-6</sup> (0°C to +70°C)	A *4	N *5
	HR: ±100×10 <sup>-6</sup> (-5°C to +85°C)	CHPA	CHPN
	GP: ±50×10 <sup>-6</sup> (0°C to +70°C)	CHRA	CHRN
	GR: ±50×10 <sup>-6</sup> (-5°C to +85°C)	CGPN	CGRN*7
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Model	EG-2001CA	
	Output mode	P: Duty 50 ± 5 %
Frequency stability	H: ±100×10 <sup>-6</sup> (0°C to +70°C) *4	PCH
	Y: ±100×10 <sup>-6</sup> (0°C to +70°C) *5	PCY
	Z: ±50×10 <sup>-6</sup> (0°C to +70°C) *6	PCZ

\*4 This includes initial frequency tolerance, temperature variation, supply voltage variation, load variation, reflow drift, and aging(T<sub>a</sub>=+25 °C, 10 years).

\*5 This includes initial frequency tolerance, temperature variation, supply voltage variation, load variation, and reflow drift.(except aging)

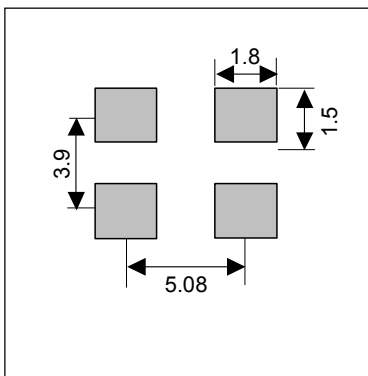
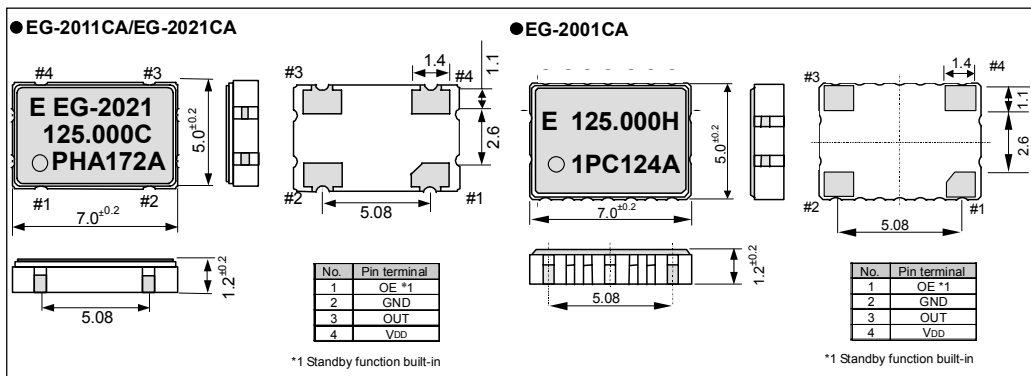
\*6 This includes initial frequency tolerance, and temperature variation.(except reflow drift, supply voltage variation, load variation and aging)

\*7 Please contact us for inquiries.

## External dimensions

(Unit:mm)

## Recommended soldering pattern (Unit:mm)



# ENERGY SAVING EPSON

EPSON offers effective savings to its customers through a wide range of electronic devices, such as semiconductors, liquid crystal display (LCD) modules, and crystal devices. These savings are achieved through a sophisticated melding of three different efficiency technologies.

Power saving technology provides low power consumption at low voltages.

Space saving technology provides further reductions in product size and weight through super-precise processing and high-density assembly technology.

Time saving technology shortens the time required for design and development on the customer side and shortens delivery times.

Our concept of Energy Saving technology conserves resources

by blending the essence of these three efficiency technologies. The essence of these technologies is represented in each of the products that we provide to our customers.

In the industrial sector, leading priorities include measures to counter greenhouse effect by reducing CO<sub>2</sub>, measures to preserve the global environment, and the development of energy-efficient products. Environmental problems are of global concern, and although the contribution of energy-saving products by our customers through the utilization of our electronic devices, EPSON is committed to the conservation of energy, both for the sake of people and of the planet on which we live.

## WORKING WITH ENVIRONMENTAL ISSUES

In 1988, Seiko Epson led in working to abolish CFCs, and perfect abolition of those ozone layer-destroying substances was achieved in 1992. In 1998, the 10<sup>th</sup> year of start of the CFC-free activity, Seiko Epson set this year as the "Second Environmental Benchmark Year" And established a new corporate General Environment Policy. Seiko Epson is tackling with environmental issues comprehensively.

At the end of Fiscal 1988, Seiko Epson succeeded in abolishing chloric solvents doubted to be harmful to human body. In fiscal 1999, Seiko Epson started the activity with a goal of abolishing lead solder. Pointed out possibility of environmental pollutant.



### Co-existence Mark

The environmental mark symbolizing Epson's basic stance of "Co-existence With Nature".

The design incorporates a fish, flower, and water, representing mutually supportive co-existence.

## PROMOTION OF ENVIRONMENT MANAGEMENT SYSTEM CONFORMING INTERNATIONAL STANDARD

At 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.

In May 2001, all of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

In the future, new Group companies will be expected to acquire the certification around the third year of operations.



ISO14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

## WORKING FOR HIGH QUALITY

Seiko-Epson quickly began working to acquire company-wide ISO9000 series certification, and has acquired ISO9001 or ISO 9002 certification with all targeted products manufactured in Japanese and overseas plants.

The Quartz Device Operations Division (Ina Japan, EPM and SZE) have acquired QS-9000 certification, which are of higher Level.



QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S. automobile manufacturers based on the international ISO 9000 series.

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