CRYSTAL OSCILLATOR

LOW-JITTER SAW OSCILLATOR

EG - 2021 / 2001CA series

- 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 t (mm) Typ.
- Very low jitter and low phase noise by SAW unit.

Pb Free
RoHS Compliant

Product Number (please contact us)
EG-2021CA: Q3807CA00xxxx00
EG-2001CA: Q3801CA00xxxx00

Actual size

EG-2021CA	EG-2001CA
	

Specifications (characteristics)

Item		Symbol	Specifications EG-2021CA		Specifications EG-2001CA	Remarks
Output frequency range		f_0	62.500 MHz to 170.000MHz	170.001MHz to 250.000MHz	106.250 MHz to 170.000 MHz	
Supply voltage		Vcc	2.5 V± 0.125 V		3.3 V± 0.3 V	
Temperature range	Storage temperature	T_stg	-40 °C to +100 °C			Store as bare product after unpacking
	Operating temperature	T_use	P: 0 °C to +70 °C R: -5 °C to +85 °C		0 °C to +70° C	
Frequency tolerance		f_tol	G: ± 50 × 10^{-6} H: ± 100 × 10^{-6}		Z: ± 50 × 10^{-6} Y,H:±100 × 10^{-6}	P:0 °C to 70 °C,R:-5 °C to +85 °C *1
Current consumption		Icc	25 mA Max.	30 mA Max.	50 mA Max.	No load condition, Max. frequency range
Disable current		I_dis	600 µA Max.		10 µA Max.	OE=GND
Symmetry		SYM	45 % to 55 %	40 % to 60 %	45 % to 55 %	CMOS load:50 % Vcc level, L_CMOS= Max.
High output voltage		VOH	Vcc-0.35 V Min.		Vcc-0.4 V Min.	IOH = -8 mA
Low output voltage		VOL	0.35 V Max.		0.4 V Max.	IOL = 8 mA
Output load condition		L_CMOS	15 pF Max.			Max. frequency and Max. supply voltage range
High input voltage		VIH	70 % Vcc Min.			OE terminal
Low input voltage		VIL	30 % Vcc Max.			OE terminal
Rise time / Fall time		t_r / t_f	2 ns Max.			CMOS load :between 20% Vcc and80%of Vcc leve
Start-up time		t_str	10 ms Max.			Time at minimum supply voltage to be 0 s
Jitter *2		t_{DJ}	0.2 ps Typ.			Deterministic Jitter
		t_{RJ}	3 ps Typ.			Random Jitter
		t_{RMS}	3 ps Typ.			σ (RMS of total distribution)
		t_{p-p}	25 ps Typ.			Peak to Peak
		t_{acc}	4 ps Typ.			Accumulated Jitter(σ) n=2 to 50000 cycles
Phase Jitter		t_{PJ}	0.05 × 10^{-3} UI Typ. 1 ps Max.			Offset frequency: 12 kHz to 20 MHz
Frequency aging*3		f_aging	± 10 × 10^{-6}/ year Max.		± 5 × 10^{-6}/ year Max.	+25 °C, First year, Vcc=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

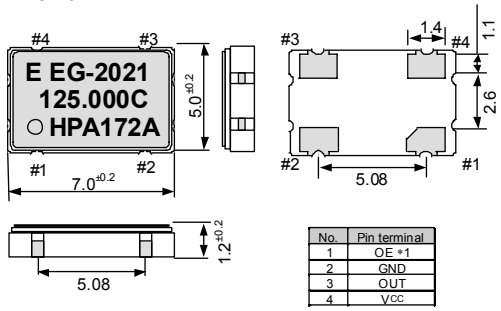
Model	EG-2021CA Details of frequency tolerance	A *4	N *5
Frequency tolerance	HP: ±100×10^{-6} (0°C to +70°C)	CHPA	CHPN
	HR: ±100×10^{-6} (-5°C to +85°C)	CHRA	CHRN
	GP: ±50×10^{-6} (0°C to +70°C)	—	CGPN
	GR: ±50×10^{-6} (-5°C to +85°C)	—	CGRN*7

EG-2001CA Output mode		P:Symmetry 50 ±5 %
Frequency tolerance	H: ±100×10^{-6} (0°C to +70°C) *4	PCH
	Y: ±100×10^{-6} (0°C to +70°C) *5	PCY
	Z: ±50×10^{-6} (0°C to +70°C) *6	PCZ

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

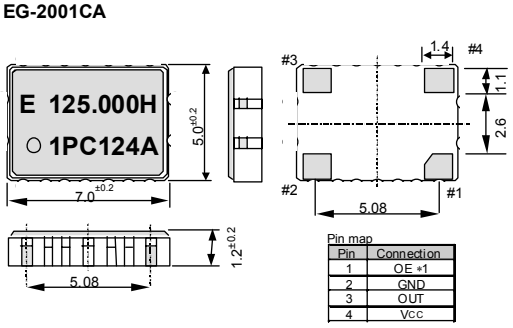
● EG-2021CA



No.	Pin terminal
1	OE *1
2	GND
3	OUT
4	Vcc

*1 Standby function built-in
#2 is connected to the cover.

● EG-2001CA

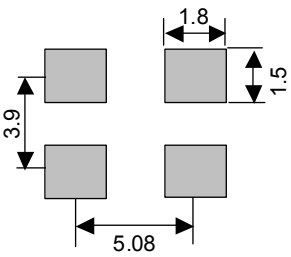


Pin map

Pin	Connection
1	OE *1
2	GND
3	OUT
4	Vcc

*1 Standby function built-in
#2 is connected to the cover.

Footprint (Recommended) (Unit:mm)



To maintain stable operation, provide by-pass capacitor with more than 0.1 µF at a location as near as possible to the power source terminal of the crystal products (between Vcc - GND).

“QMEMS” EPSON TOYOCOM

In order to meet customer needs in a rapidly advancing digital, broadband and ubiquitous society, we are committed to offering products that are one step ahead of the market and a rank above the rest in quality. To achieve our goals, we follow a “3D (three device) strategy” designed to drive both horizontal and vertical growth. We will to grow our three device categories of “Timing Devices”, ”Sensing Devices” and “Optical Devices”, and expand vertical growth through a combination of products from these categories.

A Quartz MEMS is any high added value quartz device that exploits the characteristics of quartz crystal material but that is produced using MEMS (micro-electro-mechanical system) processing technology.

Market needs are advancing faster than previously imagined toward smaller, more stable crystal products, but we will stay ahead of the curve by rolling out products that exceed market speed and quality requirements. We want to further accelerate the 3D strategy by QMEMS.

Quartz devices have become crucial in the network environment where products are increasingly intended for broadband, ubiquitous applications and where various types of terminals can transfer information almost immediately via LAN and WAN on a global scale. Epson Toyocom Corporation addresses every single aspect within a network environment. The new corporation offers “Digital Convergence” solutions to problems arising with products for consumer use, such as, core network systems and automotive systems.

QMEMS

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Epson Toyocom, 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.

ISO 14000 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.

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

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs, Epson Toyocom made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

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

ISO/TS 16949 is a global standard based on QS-9000, a severe standard corresponding to the requirements from the automobile industry.

►Explanation of the mark that are using it for the catalog

Pb Free	►**Pb free.**
RoHS Compliant	►**Complies with EU RoHS directive.** ***About the products without the Pb-free mark.** **Contains Pb in products exempted by EU RoHS directive.** **(Contains Pb in sealing glass, high melting temperature type solder or other.)**
For Automotive	►**The products have been designed for high reliability applications such as Automotive.**

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  / Medical instruments to sustain life / Submarine transmitters / Power stations and related / Fire work equipment and security equipment
  / traffic control equipment / and others requiring equivalent reliability.
- In this new crystal master for Epson Toyocom, product codes and markings will remain as previously identified prior to the merger.
  Due to the on-going strategy of gradual unification of part numbers, please review product codes and markings, as they will change during the course of the coming months.

  We apologize for the inconvenience, but we will eventually have a unified part numbering system for Epson Toyocom that will be user friendly.