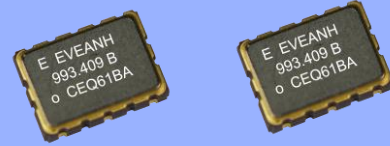


**VOLTAGE-CONTROLLED SAW OSCILLATOR (VCSO)**
**Output: LV-PECL**
**LOW PHASE JITTER**

# EV7050EAN

- Low phase jitter : 18 fs typ. \*3
- Frequency range : 600 MHz to 1100 MHz  
: 1200 MHz to 2200 MHz
- Function : OUTPUT disable(OE)/Standby(ST)
- Supply voltage : 3.3 V
- Absolute pull range :  $\pm 50 \times 10^{-6}$  Min./  $\pm 30 \times 10^{-6}$  Min.
- External dimensions: 7.0 x 5.0 x 1.6(t) mm
- Output : LV-PECL
- Application : OTN(40GbE,100GbE,400GbE),  
High Speed ADCs and DACs, Test Instrument


**Product Number (please contact us)**  
**X1M00052xxxxxx**


Actual size


**Specifications (characteristics)**
**Type OE**

Item	Symbol	EV7050EAN		Conditions / Remarks
Output frequency range	$f_o$	600 MHz to 1100 MHz / 1200 MHz to 2200 MHz		Please contact us about available frequencies
Supply voltage	$V_{cc}$	3.3 V $\pm 0.165$ V		
Storage temperature	$T_{stg}$	-55 °C to +125 °C		Storage as single product
Operating temperature	$T_{use}$	-10 °C to +85 °C	-40 °C to +85 °C	
Frequency tolerance *1	$f_{tol}$	$-100 \times 10^{-6}$ to $+100 \times 10^{-6}$	$-120 \times 10^{-6}$ to $+120 \times 10^{-6}$	
Absolute pull range *2	APR	$\pm 50 \times 10^{-6}$ Min	$\pm 30 \times 10^{-6}$ Min	
Current consumption	$I_{cc}$	$f_o=600$ to 1100 MHz : 115 mA Max $f_o=1200$ to 2200 MHz : 175 mA Max		
Output disable current	$I_{dis}$	$f_o=600$ to 1100 MHz : 80 mA Max $f_o=1200$ to 2200 MHz : 135 mA Max		
Input resistance	$R_{in}$	50 k $\Omega$ Min		DC level
Frequency change polarity	—	Positive slope		
Symmetry	SYM	45 % to 55 %		Reference is crossing point of OUT1 and OUT2
Output voltage	$V_{OH}$	$V_{cc} - 1.25$ V Min		Output termination is L_ECL
	$V_{OL}$	$V_{cc} - 1.55$ V Max		Output termination is L_ECL
Input voltage	$V_{IH}$	80% $V_{cc}$		OE terminal(#2)
	$V_{IL}$	20% $V_{cc}$		
Output load condition	$L_{ECL}$	50 $\Omega$		Terminated to $V_{cc}-2.0V$
Rise time / Fall time	$t_r / t_f$	0.125 ns Max		Between 20% and 80% of output single ended swing
Start-up time	$t_{str}$	10 ms Max		Time at 90 % $V_{cc}$ to be 0 s
Enable delay time	$t_{pzx}$	1.0 $\mu s$ Max		The time from release OE to Output signal
Phase Jitter	tPJ	18fs typ. *3 40fs Max		990 MHz $\leq f_o \leq 1100$ MHz
		60fs Max		1980 MHz $\leq f_o \leq 2200$ MHz Offset frequency: Except for the above 12 kHz to 20 MHz

**Type ST**

Item	Symbol	EV7050EAN		Conditions / Remarks
Output frequency range	$f_o$	600 MHz to 1100 MHz / 1200 MHz to 2200 MHz		Please contact us about available frequencies
Supply voltage	$V_{cc}$	3.3 V $\pm 0.165$ V		
Storage temperature	$T_{stg}$	-55 °C to +125 °C		Storage as single product
Operating temperature	$T_{use}$	-10 °C to +85 °C	-40 °C to +85 °C	
Frequency tolerance *1	$f_{tol}$	$-100 \times 10^{-6}$ to $+100 \times 10^{-6}$	$-120 \times 10^{-6}$ to $+120 \times 10^{-6}$	
Absolute pull range *2	APR	$\pm 50 \times 10^{-6}$ Min	$\pm 30 \times 10^{-6}$ Min	
Current consumption	$I_{cc}$	$f_o=600$ to 1100 MHz : 115 mA Max $f_o=1200$ to 2200 MHz : 175 mA Max		
Standby current	$I_{std}$	7 mA Max		
Input resistance	$R_{in}$	50 k $\Omega$ Min		DC level
Frequency change polarity	—	Positive slope		
Symmetry	SYM	45 % to 55 %		Reference is crossing point of OUT1 and OUT2
Output voltage	$V_{OH}$	$V_{cc} - 1.25$ V Min		Output termination is L_ECL
	$V_{OL}$	$V_{cc} - 1.55$ V Max		Output termination is L_ECL
Input voltage	$V_{IH}$	80% $V_{cc}$		ST terminal(#2)
	$V_{IL}$	20% $V_{cc}$		
Output load condition	$L_{ECL}$	50 $\Omega$		Terminated to $V_{cc}-2.0V$
Rise time / Fall time	$t_r / t_f$	0.125 ns Max		Between 20% and 80% of output single ended swing
Start-up time	$t_{str}$	10 ms Max		Time at ST terminal is $V_{IH}$ (Active Low is $V_{IL}$ ) to be 0 s
Resume time	$t_{res}$	10 ms Max		
Phase Jitter	tPJ	18fs typ. *3 40fs Max		990 MHz $\leq f_o \leq 1100$ MHz
		60fs Max		1980 MHz $\leq f_o \leq 2200$ MHz Offset frequency: Except for the above 12 kHz to 20 MHz

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

\*2 Absolute pull range (APR) = Frequency control range - Frequency tolerance

 \*3 Put bypass capacitor (0.1 $\mu F$  and 10 $\mu F$ ) near by  $V_{cc}$  terminal for jitter performance.



Product Name EV7050 EAN 1986.819000MHz C L E H B A  
(Standard form) ① ② ③ ④⑤⑥⑦⑧⑨

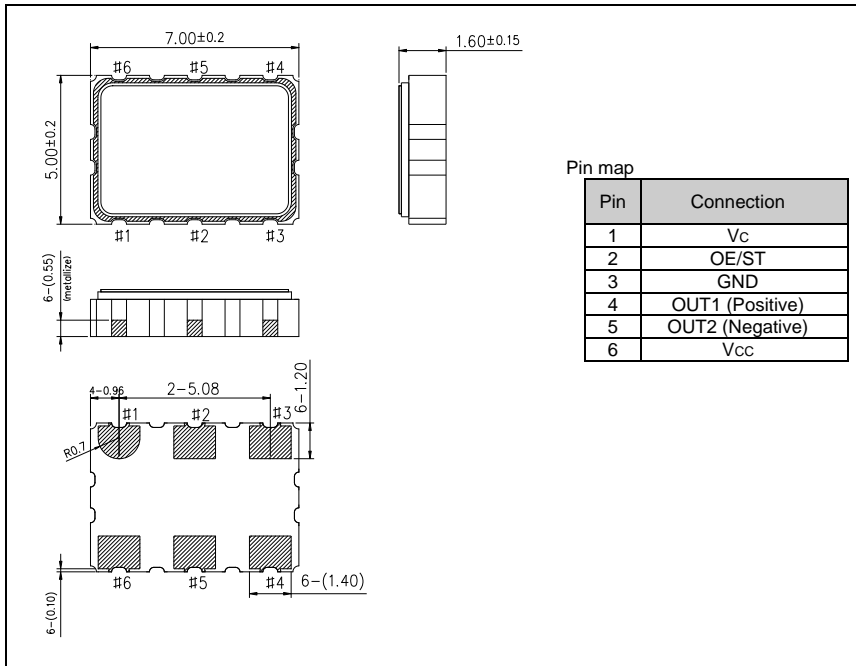
- ①Model ②Output(E: LV-PECL) ③Frequency
- ④Supply voltage (C: 3.3 V Typ.) ⑤Frequency tolerance
- ⑥Operating temperature ⑦OE function
- ⑧Absolute pull range(APR)
- ⑨Internal identification code ("A" is default)

④Supply voltage	⑤Frequency tolerance	⑥Operating temperature	⑦OE function	⑧APR	⑨identification code
C:3.3V Typ	L: -100~+100x 10 <sup>-6</sup>	E: -10 ~ +85°C	H:OE Active High L:OE Active Low S:ST Active High T:ST Active Low	B: ±50 x 10 <sup>-6</sup> Min.	A
	U: -120~+120x 10 <sup>-6</sup>	G: -40 ~ +85°C		A: ±30 x 10 <sup>-6</sup> Min.	

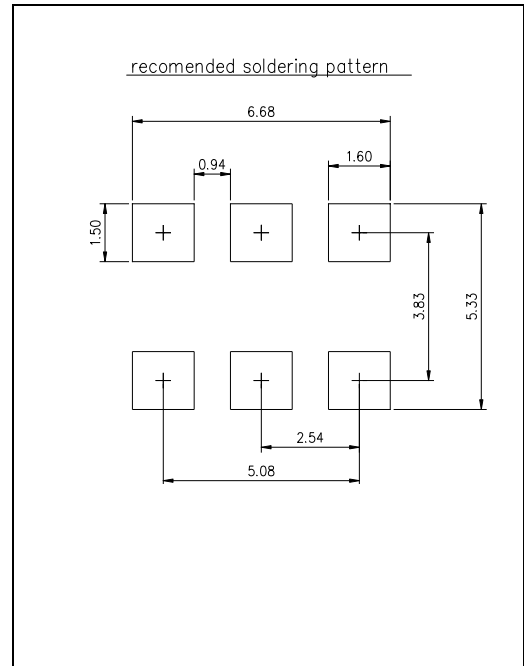
**OE Standby Type**

Product	Oscillation	Outputs
OE Active High	High: enable /Low: enable	High: enable(specified frequency) Low: disable(Hi-Z)
OE Active Low	High: enable /Low: enable	High: disable(Hi-Z) Low: enable(specified frequency)
ST Active High	High: enable /Low: disable	High: enable(specified frequency) Low: disable(Hi-Z)
ST Active Low	High: disable /Low: enable	High: disable(Hi-Z) Low: enable(specified frequency)

**External dimensions** (Unit :mm)



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



## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

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.

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.





## WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson 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.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

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

	► Pb free.
	► 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.)
	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ).

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