VOLTAGE-CONTROLLED SAW OSCILLATOR (VCSO)

Output: LV-PECL

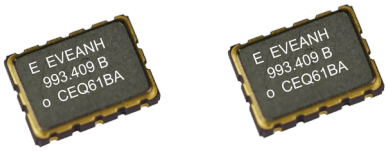
LOW PHASE JITTER

EV7050EAN

Product Number
X1M00052xxxxxxx

- Low phase jitter : 18 fs typ. *3
- Frequency range : 750 MHz to 1100 MHz
  : 1500 MHz to 2200 MHz
- Function : OUTPUT disable(OE)/Standby(ST)
- Supply voltage : 3.3 V
- Absolute pull range : ±50 × 10^{-6} Min./ ±30 × 10^{-6} Min.
- External dimensions: 7.0 × 5.0 × 1.6(t) mm
- Output : LV-PECL

Application : OTN(40GbE,100GbE,400GbE),
High Speed ADCs and DACs, Test Instrument



Specifications (characteristics)

Type OE

Item	Symbol	EV7050EAN		Conditions / Remarks	
Output frequency range	fo	750 MHz to 1100 MHz / 1500 MHz to 2200 MHz		Please contact us about available frequencies	
Supply voltage	Vcc	3.3 V ±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 × 10^{-6} to +100 × 10^{-6}	-120 × 10^{-6} to +120 × 10^{-6}		
Absolute pull range *2	APR	±50 × 10^{-6} Min	±30 × 10^{-6} Min		
Current consumption	Icc	f0=750 to 1100 MHz : 115 mA Max f0=1500 to 2200 MHz : 175 mA Max			
Output disable current	I_dis	f0=750 to 1100 MHz : 80 mA Max f0=1500 to 2200 MHz : 135 mA Max			
Input resistance	Rin	50 kΩ Min		DC level	
Frequency change polarity	—	Positive slope			
Symmetry	SYM	45 % to 55 %		Reference is crossing point of OUT1 and OUT2	
Output voltage	VOH	Vcc -1.25 V Min		Output termination is L_ECL	
	VOL	Vcc -1.55 V Max		Output termination is L_ECL	
Input voltage	VIH	80% Vcc		OE terminal(#2)	
	VIL	20% Vcc			
Output load condition	L_ECL	50 Ω		Terminated to Vcc-2.0V	
Rise time / Fall time	tr / tf	0.125 ns Max		Between 20% and 80% of output single ended swing	
Start-up time	t_str	10 ms Max		Time at 90 %Vcc to be 0 s	
Enable delay time	tpzx	1.0 us Max		The time from release OE to Output signal	
Phase Jitter	tPJ	18fs typ. *3 40fs Max		990 MHz ≤ f0 ≤ 1100 MHz 1980 MHz ≤ f0 ≤ 2200 MHz	Offset frequency: 12 kHz to 20 MHz
		60fs Max		Except for the above	

Type ST

Item	Symbol	EV7050EAN		Conditions / Remarks	
Output frequency range	fo	750 MHz to 1100 MHz / 1500 MHz to 2200 MHz		Please contact us about available frequencies	
Supply voltage	Vcc	3.3 V ±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 × 10^{-6} to +100 × 10^{-6}	-120 × 10^{-6} to +120 × 10^{-6}		
Absolute pull range *2	APR	±50 × 10^{-6} Min	±30 × 10^{-6} Min		
Current consumption	Icc	f0=750 to 1100 MHz : 115 mA Max f0=1500 to 2200 MHz : 175 mA Max			
Standby current	I_std	7 mA Max			
Input resistance	Rin	50 kΩ Min		DC level	
Frequency change polarity	—	Positive slope			
Symmetry	SYM	45 % to 55 %		Reference is crossing point of OUT1 and OUT2	
Output voltage	VOH	Vcc -1.25 V Min		Output termination is L_ECL	
	VOL	Vcc -1.55 V Max		Output termination is L_ECL	
Input voltage	VIH	80% Vcc		ST terminal(#2)	
	VIL	20% Vcc			
Output load condition	L_ECL	50 Ω		Terminated to Vcc-2.0V	
Rise time / Fall time	tr / tf	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 VIH(Active Low is VIL) to be 0 s	
Resume time	t_res	10 ms Max			
Phase Jitter	tPJ	18fs typ. *3 40fs Max		990 MHz ≤ f0 ≤ 1100 MHz 1980 MHz ≤ f0 ≤ 2200 MHz	Offset frequency: 12 kHz to 20 MHz
		60fs Max		Except for the above	

*1 Frequency tolerance includes initial frequency tolerance, temperature variation, supply voltage change, reflow drift, and aging (+25°C, 10 years).
*2 Absolute pull range (APR) = Frequency control range - Frequency tolerance
*3 Put bypass capacitor (0.1uF and 10uF) near by Vcc terminal for jitter performance.

Product Name (Standard form)

EV7050 EAN 1986.819000MHz C L E H B A
① ② ③ ④⑤⑥⑦⑧⑨

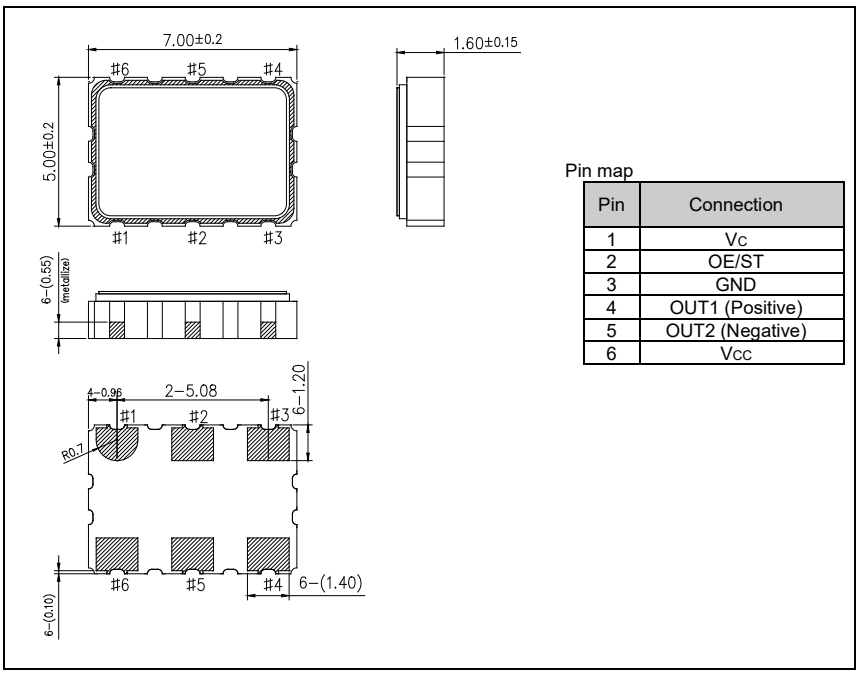
①Model ②Output(E: LV-PECL) ③Frequency
④Supply voltage (C: 3.3 V Typ.) ⑤Frequency tolerance
⑥Operating temperature ⑦OE function
⑧Absolute pull range(APR)
⑨Internal identification code (“A” is default)

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

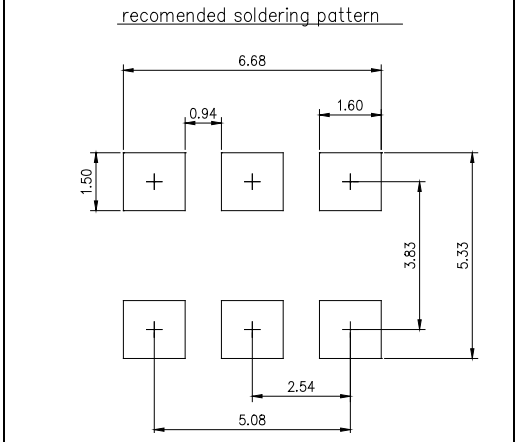
External dimensions (Unit :mm)



Pin map

Pin	Connection
1	Vc
2	OE/ST
3	GND
4	OUT1 (Positive)
5	OUT2 (Negative)
6	Vcc

Footprint(Recommended (Unit :mm)



►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 general equipment.
	►Designed for automotive applications related to driving and safety.

NOTICE：PLEASE READ CAREFULLY BELOW BEFORE THE USE OF THIS DOCUMENT

1. The content of this document is subject to change without notice. Before purchasing or using Epson products, please contact with sales representative of Seiko Epson Corporation (“Epson”) for the latest information and be always sure to check the latest information published on Epson’s official web sites and resources.
2. This document may not be copied, reproduced, or used for any other purposes, in whole or in part, without Epson’s prior consent.
3. Information provided in this document including, but not limited to application circuits, programs and usage, is for reference purpose only. Epson makes no guarantees against any infringements or damages to any third parties’ intellectual property rights or any other rights resulting from the information. This document does not grant you any licenses, any intellectual property rights or any other rights with respect to Epson products owned by Epson or any third parties.
4. Epson has prepared this document carefully to be accurate and dependable, but Epson does not guarantee that the information is always accurate and complete. Epson assumes no responsibility for any damages you incurred due to any misinformation in this document.
5. Epson products listed in this document and our associated technologies shall not be used in any equipment or systems that laws and regulations in Japan or any other countries prohibit to manufacture, use or sell. Furthermore, Epson products and our associated technologies shall not be used for the purposes of military weapons development (e.g. mass destruction weapons), military use, or any other military applications. If exporting Epson products or our associated technologies, please be sure to comply with the Foreign Exchange and Foreign Trade Control Act in Japan, Export Administration Regulations in the U.S.A (EAR) and other export-related laws and regulations in Japan and any other countries and to follow their required procedures.
6. Epson assumes no responsibility for any damages (whether direct or indirect) caused by or in relation with your non-compliance with the terms and conditions in this document or for any damages (whether direct or indirect) incurred by any third party that you give, transfer or assign Epson products.
7. For more details or other concerns about this document, please contact our sales representative.
8. Company names and product names listed in this document are trademarks or registered trademarks of their respective companies.

●Disclaimer

1. Epson products are designed for use in general electronic equipment applications that do not require extremely high reliability or safety.

2. Epson does not represent or warrant that its products will not cause a failure for any particular application, except for cases where the failure is a direct result caused by defects in materials and workmanship of this product.
If a product fails due to defects in materials and workmanship, to the maximum extent permitted by law, we will, at our sole discretion, refund or replace the affected product.

3. When products for used directly or indirectly in certain devices or applications (ex. Nuclear power, aerospace, infrastructure facilities, medical equipment, etc.) which are connected to or affect safety of human life or property, Customer is solely responsible for determining if the products and respective specifications are suitable for the intended use in particular customer applications.
Customer shall implement necessary and proper safety design and measures (including redundant design, malfunction prevention design, etc.) to ensure reliability and safety before using the products in/with customer’s Equipment.

4.For the products designed for automotive applications, the products comply with AEC-Q100 or AEC-Q200.
Products do not comply with ISO 26262 (Products are not categorized to ASIL A, B, C and D).

5. No dismantling, analysis, reverse engineering, modification, alteration, adaptation, reproduction, etc., of Epson products is allowed.
Furthermore, any defects caused by this are not covered by the warranty.

©Seiko Epson Corporation 2025