VOLTAGE-CONTROLLED SAW OSCILLATOR (VCSO)

Output: LV-PECL, Sine wave

LOW PHASE JITTER

NEW

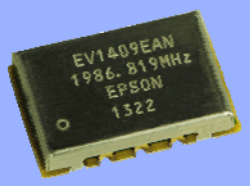
RoHS Compliant

Product Number (please contact us)
EV1409EAN: X1M000391xxxxxx
EV1409SAN: X1M000401xxxxxx

EV1409EAN / SAN

- Low phase jitter : 22fs typ. (EV1409EAN) *3
  : 10fs typ. (EV1409SAN) *3
- Frequency range : 1000 MHz to 3000 MHz(EV1409EAN)
  : 1000 MHz to 2500 MHz(EV1409SAN)
- Supply voltage : 3.3 V
- Absolute pull range : $\pm 50 \times 10^{-6}$ Min.
- External dimensions: 14.0 × 9.0 × 2.6(t) mm (Low Profile)
- Output : LV-PECL or Sine wave

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



Actual size

Specifications (characteristics)

Item	Symbol	EV1409EAN (LV-PECL)	EV1409SAN (Sine wave)	Conditions / Remarks	
Output frequency range	f_0	1000 MHz to 3000 MHz	1000 MHz to 2500 MHz	Please contact us about available frequencies.	
Supply voltage	V_{CC}	3.3 V ±0.165 V			
Storage temperature	T_stg	-45 °C to +90 °C		Storage as single product.	
Operating temperature	T_use	-10 °C to +85 °C			
Frequency tolerance *1	f_tol	P: -70×10^{-6} to $+120 \times 10^{-6}$			
Current consumption	I_{CC}	90 mA Max.			
Absolute pull range *2	APR	$\pm 50 \times 10^{-6}$ Min.		V_C=1.65±1.65 V	
Pull range	—	-170×10^{-6} Max.(V_C=0V),$+120 \times 10^{-6}$ Min.(V_C=3.3V)		V_C=1.65±1.65 V	
Input resistance	Rin	100 kΩ Min.		DC level	
Frequency change polarity	—	Positive slope			
Symmetry	SYM	40 % to 60 %	—	V_{CC}-1.45 V, V_C = 1/2 V_{CC}	
Output voltage	V_{OH}	V_{CC} -1.3 V Min.	—	1000MHz<f_0 ≤ 2000 MHz	
		V_{CC} -1.4 V Min.	—	2000MHz<f_0 ≤ 3000 MHz	
	V_{OL}	V_{CC} -1.65 V Max.	—	1000MHz<f_0 ≤ 2000 MHz	
		V_{CC} -1.6 V Max.	—	2000MHz<f_0 ≤ 2500 MHz	
		V_{CC}-1.5 V Max.	—	2500MHz<f_0 ≤ 3000 MHz	
Output level	—	—	0 dBm Min.		
Output load condition	L_ECL	50 Ω	—	Terminated to Vcc-2.0V	
	Load_R	—	50 Ω	Terminated to GND	
Rise time / Fall time	t_r / t_f	0.5 ns Max.	—	1000 MHz ≤ f_0 ≤ 1700 MHz	Between 20 % and
		0.3 ns Max.	—	1700 MHz < f_0 ≤ 3000 MHz	80 % of (V_{OH}-V_{OL})
Start-up time	t_str	10 ms Max.		Time at 90 %V_{CC} to be 0 s	
Phase Jitter	tPJ	100 fs Max.	50fs Max.	1000 MHz ≤ f_0 ≤ 1700 MHz	Offset frequency:
		22fs typ. *3 50 fs Max.	10fs typ. *3 30fs Max.	1700 MHz < f_0 ≤ 3000 MHz	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 Output frequency is at 1986.819MHz(LV-PECL), 1968.75MHz(Sine wave)

Product Name (Standard form): EV1409 EAN 1986.819000MHz C P E N B A
① ② ③ ④⑤⑥⑦⑧⑨

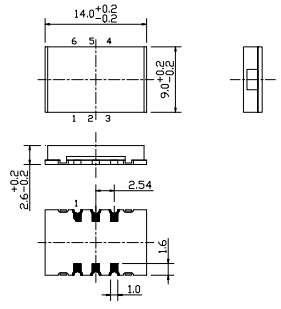
①Model ②Output(E: LV-PECL, S: Sine wave) ③Frequency
④Supply voltage (C: 3.3 V Typ.) ⑤Frequency tolerance
⑥Operating temperature ⑦OE function (N: Non)
⑧Absolute pull range
⑨Internal identification code (“A” is default)

⑤Frequency tolerance	
P	-70 to +120× 10^{-6}

⑥Operating temp.	
E	-10 to +85°C

⑧Absolute pull range	
B	±50 × 10^{-6} Min.

External dimensions (Unit :mm)

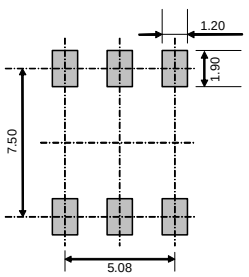


Pin map

Pin	Connection	
	LV-PECL	Sine wave
1	Vc	
2	GND	
3	GND	
4	OUT1 (Positive)	OUT
5	OUT2 (Negative)	N.C.
6	Vcc	

#2 and #3 are connected to the cover.

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.

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

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

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

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