

LOW-JITTER SAW OSCILLATOR (SPSO)

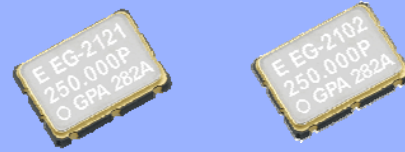
OUTPUT : LV-PECL, LVDS, HCSL

EG-2121 / 2102CA

- Frequency range : 53.125 MHz to 700 MHz
- Supply voltage : 2.5 V ... EG-2121CA
3.3 V ... EG-2102CA
- Output : LV-PECL or LVDS or HCSL
- Function : Output enable (OE)
- External dimensions : 7.0 × 5.0 × 1.2 mm
- Very low jitter and low phase noise by SAW unit.



Product Number (please contact us)
 EG-2121CA: Q3805CAx0xxx00
 : X1M000101xxxx00
 EG-2102CA: Q3806CA00xxx00
 : X1M000091xxxx00



Actual size

EG-2121CA

EG-2102CA



Specifications (characteristics)

► Differential LV-PECL Output

Item	Symbol	EG-2121CA	EG-2102CA	Conditions / Remarks
		LV-PECL		
Output frequency range	f _o	53.125 MHz to 500 MHz	100 MHz to 700 MHz	Please contact us about available frequencies.
Supply voltage	V _{cc}	2.5 V ±0.125 V	3.3 V ±0.3 V	
Storage temperature	T _{stg}	-40 °C to +100 °C		Storage as single product.
Operating temperature	T _{use}	P:0 °C to +70 °C ,R:-5 °C to +85 °C ,S:-20 °C to +70 °C		
Frequency tolerance	f _{tol}	G: ±50 × 10 ⁻⁶ ,H: ±100 × 10 ⁻⁶		
Current consumption	I _{cc}	80 mA Max.	100 mA Max.	OE=V _{cc} , L_ECL=50 Ω
Disable current	I _{dis}	20 mA Max.	32 mA Max.	OE=GND
Symmetry	SYM	P:40 % to 60 % (f _o > 350 MHz)	P:45 % to 55 %	at outputs crossing point
		P:45 % to 55 % (f _o ≤ 350 MHz)		
		D:48 % to 52 % (f _o ≤ 175 MHz)		
Output voltage	V _{OH}	1.55 V Typ.	2.35 V Typ.	DC characteristics
		V _{cc} -1.025 V to V _{cc} -0.88 V		
		0.8 V Typ.	1.6 V Typ.	
Output load condition (ECL)	L _{ECL}	V _{cc} -1.81 V to V _{cc} -1.62 V		Terminated to V _{cc} -2.0 V
		50 Ω		
Input voltage	V _{IH}	70 % V _{cc} Min.		OE terminal
	V _{IL}	30 % V _{cc} Max.		
Rise time / Fall time	t _r / t _f	400 ps Max.		Between 20% and 80% of (V _{OH} -V _{OL})
Start-up time	t _{str}	10 ms Max.		Time at minimum supply voltage to be 0 s
Phase Jitter	tp _J	0.8 ps Max.		f _o < 100 MHz
		0.5 ps Max.		100 MHz ≤ f _o < 200 MHz
		0.3 ps Max.		200 MHz ≤ f _o
Frequency aging	f _{aging}	± 10 × 10 ⁻⁶ / year Max.		+25 °C, First year, V _{cc} =2.5 V,3.3 V

► LVDS Output

Item	Symbol	EG-2121CA	EG-2102CA	Conditions / Remarks
		LVDS		
Output frequency range	f _o	53.125 MHz to 700 MHz		Please contact us about available frequencies.
Supply voltage	V _{cc}	2.5 V ±0.125 V	3.3 V ±0.3 V	
Storage temperature	T _{stg}	-40 °C to +100 °C		Storage as single product.
Operating temperature	T _{use}	P:0 °C to +70 °C ,R:-5 °C to +85 °C ,S:-20 °C to +70 °C		
Frequency tolerance	f _{tol}	G: ±50 × 10 ⁻⁶ ,H: ±100 × 10 ⁻⁶		
Current consumption	I _{cc}	30 mA Max.	45 mA Max.	OE=V _{cc} , L_LVDS= 100 Ω
Disable current	I _{dis}	20 mA Max.	30 mA Max.	OE=GND
Symmetry	SYM	L:40 % to 60 % (f _o > 350 MHz)	L:40 % to 60 % (f _o > 350 MHz)	at outputs crossing point
		L:45 % to 55 % (f _o ≤ 350 MHz)	L:45 % to 55 % (f _o ≤ 350 MHz)	
		V:48 % to 52 % (f _o ≤ 175 MHz)	V:48 % to 52 % (f _o ≤ 175 MHz)	
Output voltage	V _{OD}	350 mV Typ. 247 mV to 454 mV		DC characteristics
	dV _{OD}	50 mV Max.		
	V _{OS}	1.25 V Typ. 1.125 V to 1.375 V		
	dV _{OS}	150 mV Max.		
Output load condition (LVDS)	L _{LVDS}	100 Ω		Connected between OUT to $\overline{\text{OUT}}$
Input voltage	V _{IH}	70 % V _{cc} Min.		OE terminal
	V _{IL}	30 % V _{cc} Max.		
Rise time / Fall time	t _r / t _f	400 ps Max.		Between 20 % and 80 % of Differential Output Peak to Peak voltage
Start-up time	t _{str}	10 ms Max.		Time at minimum supply voltage to be 0 s
Phase Jitter	tp _J	0.8 ps Max.		f _o < 100 MHz
		0.5 ps Max.		100 MHz ≤ f _o < 200 MHz
		0.3 ps Max.		200 MHz ≤ f _o
Frequency aging	f _{aging}	± 10 × 10 ⁻⁶ / year Max.		+25 °C, First year, V _{cc} =2.5 V,3.3 V

► HCSL Output

Item	Symbol	EG-2121CA		EG-2102CA		Conditions / Remarks
		HCSL				
Output frequency range	f _o	100 MHz to 350 MHz				Please contact us about available frequencies.
Supply voltage	V _{cc}	2.5 V ±0.125 V		3.3 V ±0.3 V		
Storage temperature	T _{stg}	-40 °C to +125 °C				Storage as single product.
Operating temperature	T _{use}	P: 0 °C to +70 °C ,R: -5 °C to +85 °C ,S: -20 °C to +70 °C				
Frequency tolerance	f _{tol}	G: ±50 × 10 ⁻⁶ ,H: ±100 × 10 ⁻⁶				OE=V _{cc} ,L _{HCSL} =50 Ω
Current consumption	I _{cc}	80 mA Max.		85 mA Max.		
Disable current	I _{dis}	20 mA Max.		35 mA Max.		OE=GND
Symmetry	SYM	45 % to 55 %				at outputs crossing point
Output Voltage	V _{OH}	0.75 V Typ.				DC characteristics
	V _{OL}	-0.3 V Typ.				
Output load condition (HCSL)	L _{HCSL}	50 Ω				Terminated to GND
Input voltage	V _{IH}	70 % V _{cc} Min.				OE terminal
	V _{IL}	30 % V _{cc} Max.				
Rise time / Fall time	t _r / t _f	500 ps Max.				Between 0.175 V and 0.525 V of output
Start-up time	t _{str}	10 ms Max.				Time at minimum supply voltage to be 0 s
Phase Jitter	t _{pj}	0.8 ps Max.				f _o < 100 MHz
		0.5 ps Max.				100 MHz ≤ f _o < 200 MHz
		0.3 ps Max.				200 MHz ≤ f _o
Frequency aging *2	f _{aging}	± 10 × 10 ⁻⁶ / year Max.				+25 °C, First year, V _{cc} =2.5 V,3.3 V

Product Name **EG-2121 CA 250.000000MHz P G P A**

(Standard form) ① ② ③ ④⑤⑥⑦

①Model ②Package type ③Frequency

④Output/Symmetry ⑤Frequency tolerance ⑥Operating temperature

⑦Frequency aging (A*1: Frequency tolerance include aging, N*2: Frequency tolerance exclude aging)

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

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

(⑤⑥⑦: GRA, GSA are not available)

(⑤⑥: As for LV-PECL and LVDS output, for 53.125 MHz ≤ f_o < 100 MHz only HP is available)

④	Output	Symmetry	
		EG-2121CA	EG-2102CA
P	LV-PECL	40 % to 60 % (f _o > 350 MHz) 45 % to 55 % (f _o ≤ 350 MHz)	45 % to 55 %
D	LV-PECL	48 % to 52 % (f _o ≤ 175 MHz)	48 % to 52 % (f _o ≤ 350 MHz)
L	LVDS	40 % to 60 % (f _o > 350 MHz) 45 % to 55 % (f _o ≤ 350 MHz)	
V	LVDS	48 % to 52 % (f _o ≤ 175 MHz)	
H	HCSL	45 % to 55 %	

⑤Frequency tolerance	
G	±50 × 10 ⁻⁶
H	±100 × 10 ⁻⁶

⑥Operating temperature	
P	0 to +70°C
R	-5 to +85°C
S	-20 to +70°C

Table 2 Jitter

Item	Symbol	Specifications	Remarks
Jitter *	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

* Tested using a DTS-2075 Digital timing system made by WAVECREST with jitter analysis software VISI6.

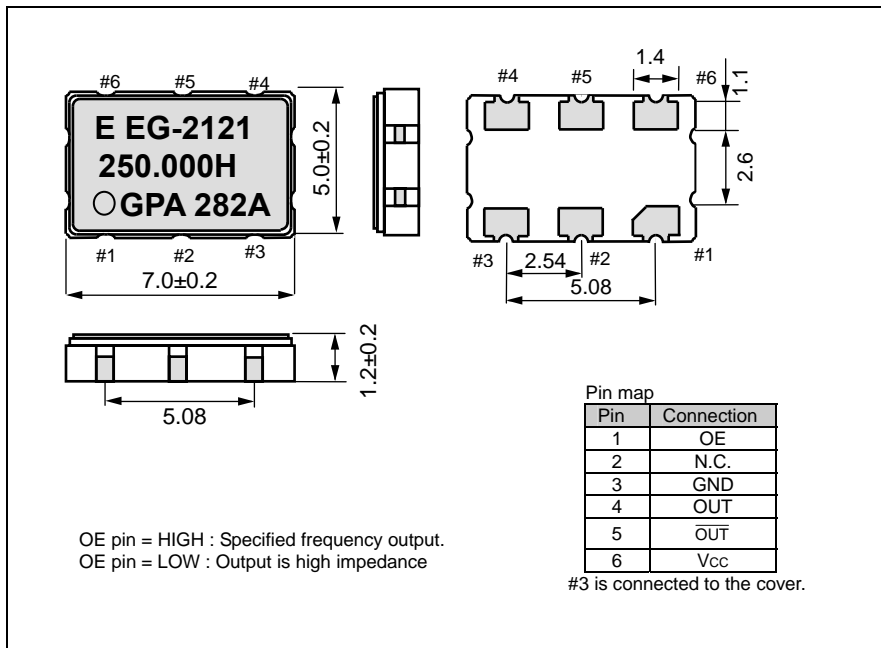
* Based on SIA-3100C signal integrity analyzer made from WAVECREST.

: Differential LV-PECL, LVDS output

: HCSL output

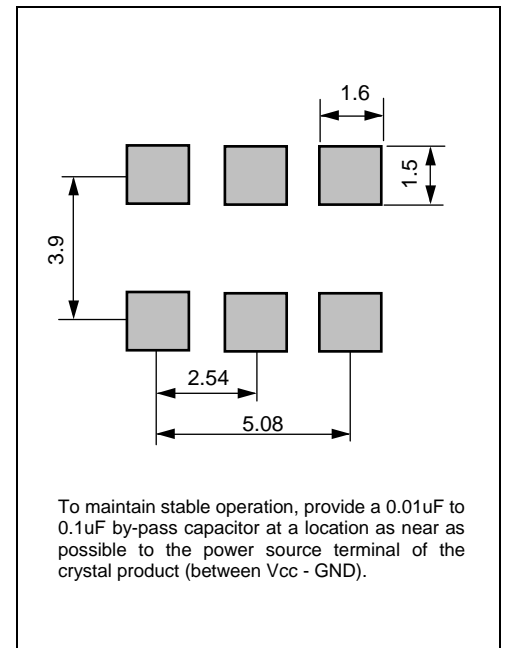
External dimensions

(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.

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	► 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.
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