

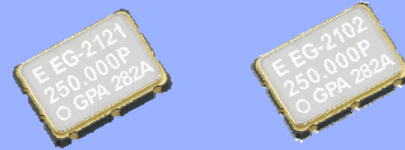
**CRYSTAL OSCILLATOR
LOW-JITTER SAW OSCILLATOR**

EG-2121 / 2102CA

- Frequency range : 53.125 MHz to 700 MHz
- Supply voltage : 2.5 V ... EG-2121CA
3.3 V ... EG-2102CA
- Output : Differential 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
: X1M000101xxx00
EG-2102CA: Q3806CA00xxx00
: X1M000091xxx00



Actual size

EG-2121CA

EG-2102CA


Specifications (characteristics)
► Differential LV-PECL Output

Item	Symbol	EG-2121CA	EG-2102CA	Conditions / Remarks
		Differential 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 *1	T _{use}	P:0 °C to +70 °C ,R:-5 °C to +85 °C ,S:-20 °C to +70 °C		
Frequency tolerance *1	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			
	V _{OL}	0.8 V Typ.	1.6 V Typ.	
Output load condition (ECL)	L _{ECL}	50 Ω		Terminated to V _{cc} -2.0 V
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	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

*1 As per table 1 below.

*2 Except: ***A

► 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 *1	T _{use}	P:0 °C to +70 °C ,R:-5 °C to +85 °C ,S:-20 °C to +70 °C		
Frequency tolerance *1	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)		
		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 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	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

*1 As per table 1 below.

*2 Except: ***A

► HCSL Output

Item	Symbol	EG-2121CA		EG-2102CA		Conditions / Remarks
		HCSL				
Output frequency range	fo	100 MHz to 350 MHz				Please contact us about available frequencies.
Supply voltage	Vcc	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 *1	f_tol	G: ±50 × 10 ⁻⁶ ,H: ±100 × 10 ⁻⁶				
Current consumption	Icc	80 mA Max.		85 mA Max.		OE=Vcc,L_HCSL=50 Ω
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 % Vcc Min.				OE terminal
	V _{IL}	30 % Vcc 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
		0.8 ps Max.				
Phase Jitter	t _{pj}	0.5 ps Max.				Offset frequency: 12 kHz to 20 MHz
		0.3 ps Max.				
		±10 × 10 ⁻⁶ / year Max.				
Frequency aging *2	f_aging	±10 × 10 ⁻⁶ / year Max.				+25 °C, First year, Vcc=2.5 V,3.3 V

*1 As per table 1 below.

*2 Except: ***A

Table 1 Frequency tolerance and aging

Output and Symmetry		P: Differential LV-PECL		D: Differential LV-PECL		L: LVDS		V: LVDS		H: HCSL	
Frequency range		All range				All range		fo ≤ 175 MHz		All range	
Aging		A *3	N *4	A *3	N *4	A *3	N *4	A *3	N *4	A *3	N *4
Frequency tolerance and operating temperature	HP: ±100 × 10 ⁻⁶ (0°C to +70°C)	PHPA	PHPN	DHPA	DHPN	LHPA	LHPN	VHPA	VHPN	HHPA	HHPN
	HR: ±100 × 10 ⁻⁶ (-5°C to +85°C)	PHRA *5	PHRN *5	DHRA *5	DHRN *5	LHRA *5	LHRN *5	VHRA *5	VHRN *5	HHRA	HHRN
	GP: ±50 × 10 ⁻⁶ (0°C to +70°C)	PGPA *5	PGPN *5	DGPA *5	DGPN *5	LGPA *5	LGPN *5	VGPA *5	VGPN *5	HGPA	HGPN
	GR: ±50 × 10 ⁻⁶ (-5°C to +85°C)	—	PGRN *5	—	DGRN *5	—	LGRN *5	—	VGRN *5	—	HGRN
	HS: ±100 × 10 ⁻⁶ (-20°C to +70°C)	PHSA *5	PHSN *5	DHSA *5	DHSN *5	LHSA *5	LHSN *5	VHSA *5	VHSN *5	HHSA	HHSN
	GS: ±50 × 10 ⁻⁶ (-20°C to +70°C)	—	PGSN *5	—	DGSN *5	—	LGSN *5	—	VGSN *5	—	HGSN

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

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

*5 53.125 MHz ≤ fo < 100 MHz : Unavailable.

Table 2 Jitter

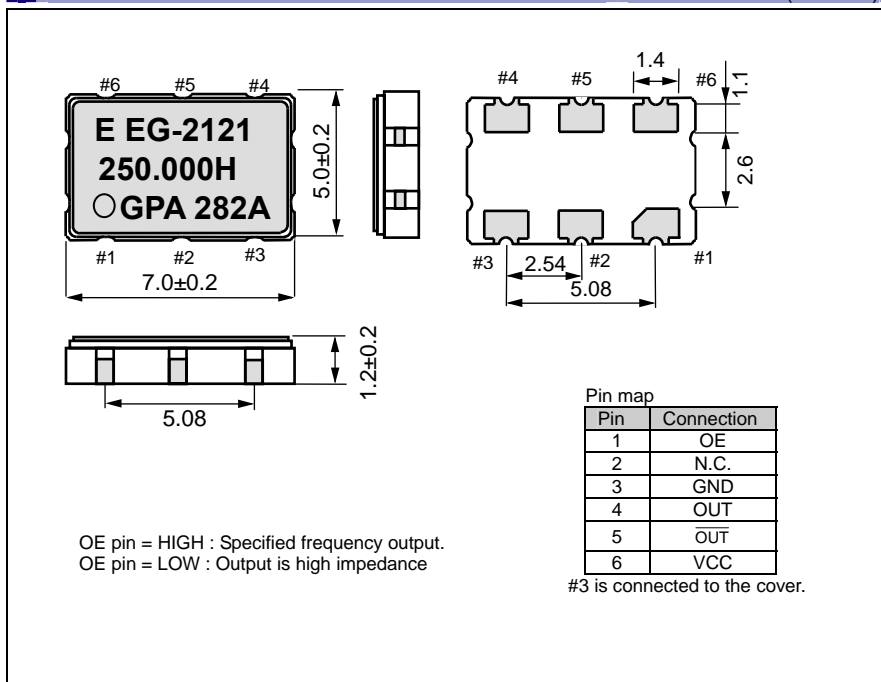
Item	Symbol	Specifications	Remarks
Jitter *	t _{DJ}	0.2 ps Typ.	Deterministic Jitter
	t _{RJ}	3 ps Typ.	Random Jitter
	t _{RMS}	3 ps Typ.	σ (RMS of total distribution)
	t _{p-p}	25 ps Typ.	Peak to Peak
	t _{acc}	4 ps Typ.	Accumulated Jitter(σ) n=2 to 50000 cycles

* Tested using a DTS-2075 Digital timing system made by WAVECREST with jitter analysis software VISI6. : Differential LV-PECL, LVDS output

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

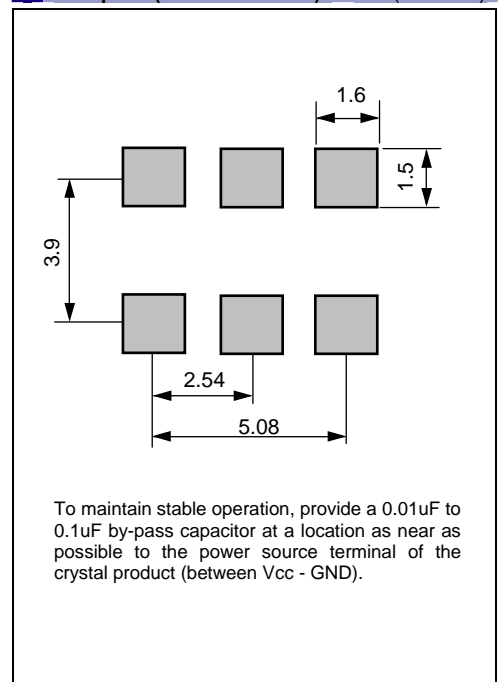
External dimensions

(Unit:mm)


 OE pin = HIGH : Specified frequency output.
 OE pin = LOW : Output is high impedance

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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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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	<p>► 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.)</p>
	<p>► The products have been designed for high reliability applications such as Automotive.</p>

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