



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: Q3805CA0xxxx00

: X1M000101xxxx00

EG-2102CA: Q3806CA00xxxx00

: 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)	D:48 % to 52 % (f _o ≤ 350 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.		
		V _{cc} -1.81 V to V _{cc} -1.62 V			
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	Offset frequency: 12 kHz to 20 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		V _{OD1} , V _{OD2}	DC characteristics
	dV _{OD}	50 mV Max.		dV _{OD} = V _{OD1} -V _{OD2}	
	V _{OS}	1.25 V Typ. 1.125 V to 1.375 V		V _{OS1} , V _{OS2}	
	dV _{OS}	150 mV Max.		dV _{OS} = V _{OS1} -V _{OS2}	
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	Offset frequency: 12 kHz to 20 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			
Current consumption	I _{cc}	80 mA Max.	85 mA Max.	OE=V _{cc} ,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.			
	V _{OL}	-0.3 V Typ.		DC characteristics	
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	Offset frequency: 12 kHz to 20 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 $\leq f_o < 100$ 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 % ($f_o \leq 350$ MHz)	45 % to 55 %
D	LV-PECL	48 % to 52 % ($f_o \leq 175$ MHz)	48 % to 52 % ($f_o \leq 350$ MHz)
L	LVDS	40 % to 60 % ($f_o > 350$ MHz) 45 % to 55 % ($f_o \leq 350$ MHz)	
V	LVDS	48 % to 52 % ($f_o \leq 175$ MHz)	
H	HCSL	45 % to 55 %	

⑤Frequency tolerance	
G	$\pm 50 \times 10^{-6}$
H	$\pm 100 \times 10^{-6}$

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 *	tdj	0.2 ps Typ.	Deterministic Jitter
	trj	3 ps Typ.	Random Jitter
	$trms$	3 ps Typ.	σ (RMS of total distribution)
	$tp-p$	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.

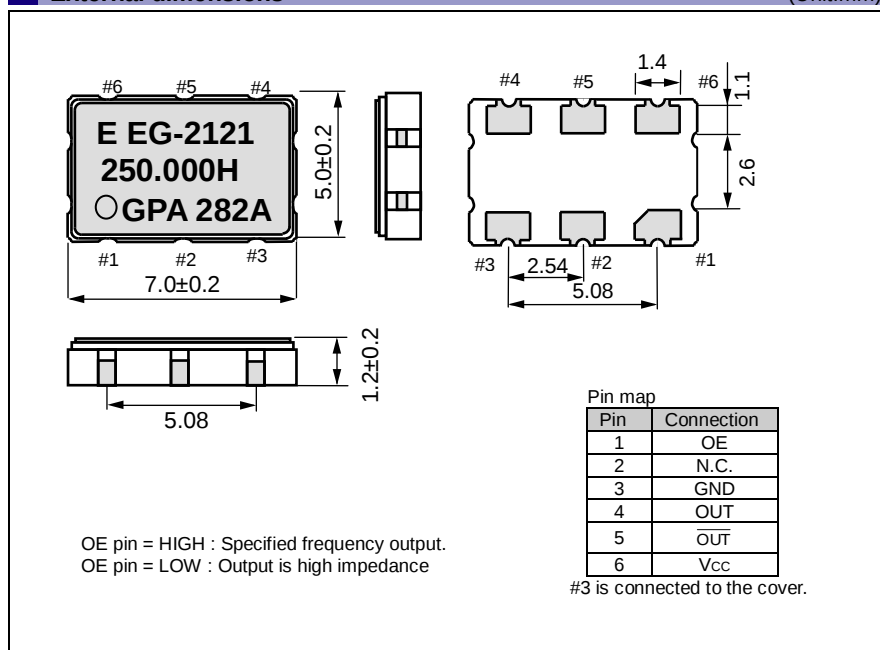
* Based on SIA-3100C signal integrity analyzer made from WAVECREST.

: Differential LV-PECL, LVDS output

: HCSL output

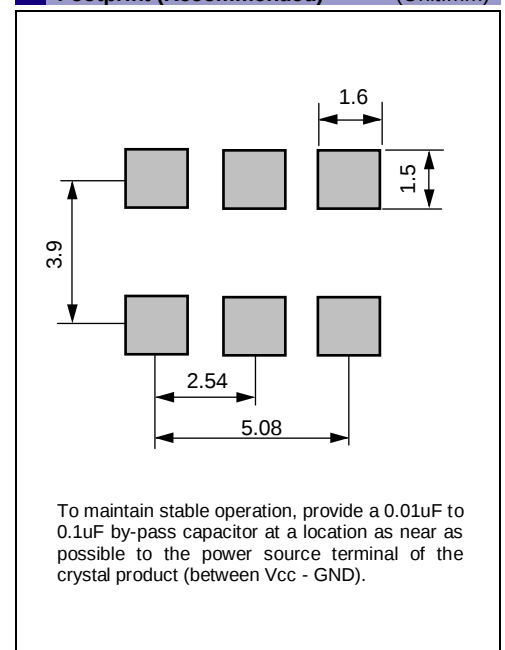
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



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