



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 HCSSL
- 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 for inquiries regarding 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		Store as bare 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)	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 *2	f _{aging}	± 10 × 10 ⁻⁶ / year Max.		+25 °C, First year, V _{cc} =2.5 V,3.3 V	

*1 As per below table 1.

*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 for inquiries regarding 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		Store as bare 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)	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 *2	f _{aging}	± 10 × 10 ⁻⁶ / year Max.		+25 °C, First year, V _{cc} =2.5 V,3.3 V	

*1 As per below table 1.

*2 Except: ***A



► HCSL Output

Item	Symbol	EG-2121CA	EG-2102CA	Conditions / Remarks	
		HCSL			
Output frequency range	f _o	100 MHz to 350 MHz		Please contact us for inquiries regarding 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		Store as bare 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	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.		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.		fo < 100 MHz	Offset frequency: 12 kHz to 20 MHz
		0.5 ps Max.		100 MHz ≤ fo < 200 MHz	
		0.3 ps Max.		200 MHz ≤ fo	
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 below table 1.

*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		EG-2121CA: fo $\leq$ 175 MHz EG-2102CA: fo $\leq$ 350 MHz		All range		fo $\leq$ 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: $\pm 100 \times 10^{-6}$ (0°C to +70°C)	PHPA	PHPN	DHPA	DHPN	LHPA	LHPN	VHPA	VHPN	HHPA	HHPN
	HR: $\pm 100 \times 10^{-6}$ (-5°C to +85°C)	PHRA *5	PHRN *5	DHRA *5	DHRN *5	LHRA *5	LHRN *5	VHRA *5	VHRN *5	HHRA	HHRN
	GP: $\pm 50 \times 10^{-6}$ (0°C to +70°C)	PGPA *5	PGPN *5	DGPA *5	DGPN *5	LGPA *5	LGPN *5	VGPA *5	VGPN *5	HGPA	HGPN
	GR: $\pm 50 \times 10^{-6}$ (-5°C to +85°C)	—	PGRN *5	—	DGRN *5	—	LGRN *5	—	VGRN *5	—	HGRN
	HS: $\pm 100 \times 10^{-6}$ (-20°C to +70°C)	PHSA *5	PHSN *5	DHSA *5	DHSN *5	LHSA *5	LHSN *5	VHSA *5	VHSN *5	HHSA	HHSN
	GS: $\pm 50 \times 10^{-6}$ (-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 $\leq$ fo < 100 MHz : Unavailable.

Table 2 Jitter

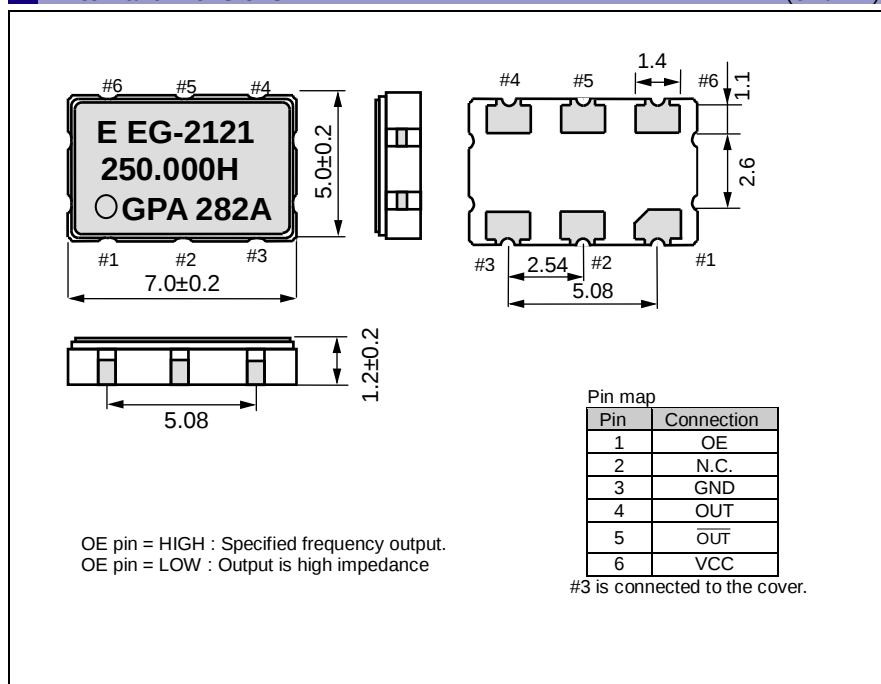
Item	Symbol	Specifications	Remarks
Jitter *	tDJ	0.2 ps Typ.	Deterministic Jitter
	tRJ	3 ps Typ.	Random Jitter
	tRMS	3 ps Typ.	σ (RMS of total distribution)
	tp-p	25 ps Typ.	Peak to Peak
	tacc	4 ps Typ.	Accumulated Jitter(σ) n=2 to 50000 cycles

* Based on DTS-2075 Digital timing system made from 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)



Footprint (Recommended)

(Unit:mm)

