

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
 : 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
		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)		
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}	V _{cc} -1.81 V to V _{cc} -1.62 V		Terminated to V _{cc} -2.0 V
Input voltage	V _{IH}	50 Ω		OE terminal
	V _{IL}	70 % V _{cc} Min. 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}	1 ps Max.		Offset frequency: 12 kHz to 20 MHz
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		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 $\bar{O}U\bar{T}$
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}	1 ps Max.		Offset frequency: 12 kHz to 20 MHz
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	fo	100 MHz to 350 MHz				Please contact us for inquiries regarding 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				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	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	VoH	0.75 V Typ.				DC characteristics
	VoL	-0.3 V Typ.				
Output load condition (HCSL)	L_HCSL	50 Ω				Terminated to GND
Input voltage	ViH	70 % Vcc Min.				OE terminal
	ViL	30 % Vcc Max.				
Rise time / Fall time	tr / tf	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	tpj	1 ps Max.				Offset frequency: 12 kHz to 20 MHz
Frequency aging *2	f_aging	± 10 × 10 ⁻⁶ / year Max.				+25 °C, First year, Vcc=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 ≤ 175 MHz EG-2102CA: fo ≤ 350 MHz		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

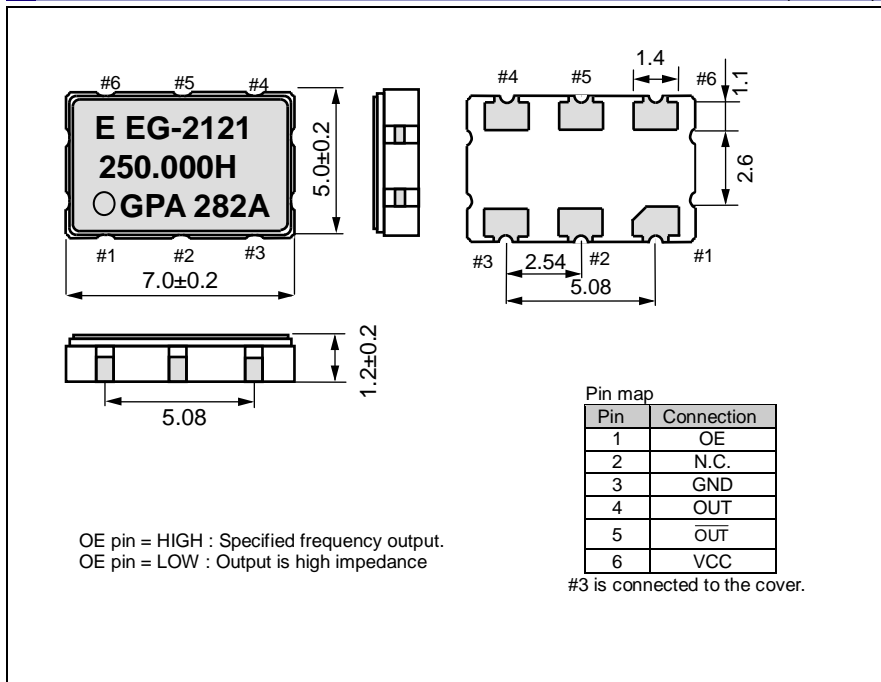
Item	Symbol	Specifications	Remarks
Jitter *	tDJ	0.2 ps Typ.	Deterministic Jitter
	trj	3 ps Typ.	Random Jitter
	trms	3 ps Typ.	σ (RMS of total distribution)
	tp-p	25 ps Typ.	Peak to Peak
	tacc	4 ps Typ.	Accumulated Jitter(σ) n=2 to 50000 cycles

* 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

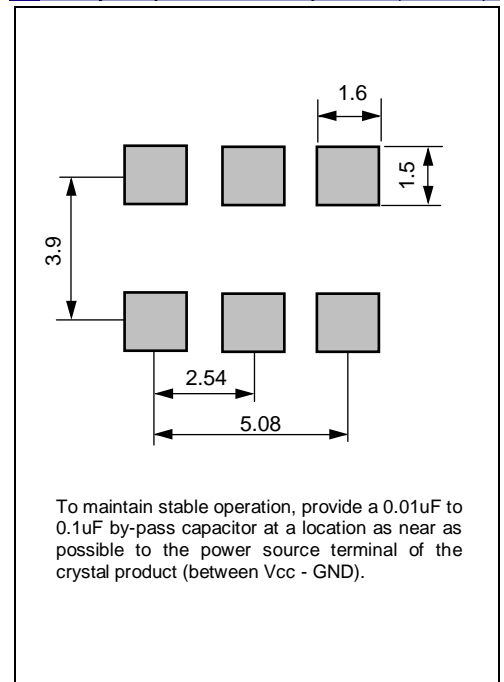
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



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