

2.5V operation LVDS SAW Oscillator

EG-2121CA-L

◆ Features

- Generates high frequency clock from a high stability SAW (surface acoustic wave) resonator.
- 2.5V-LVDS output.
- Very low jitter/low phase noise.
- Small SMD in 7x5mm, Max1.4mm height, ceramic package.

◆ Applications

- Gigabit Ethernet, Fibre channel, Infini Band, PCI-express, Rapid IO, Hyper Transport, Memory clock, CPU clock

◆ Absolute Maximum Ratings

Item	Symbol	Unit	MIN.	TYP.	MAX.	Condition
Supply Voltage	V _{CC}	V	-0.5		+4.0	V _{CC} – GND
Storage temperature	T _{stg}	°C	-40		+100	Stored as bare product
Solder heat resistance	T _{sol}	Max. 240°C x Max. 10s x 2 times				

◆ Operating range

Item	Symbol	Unit	MIN.	TYP.	MAX.	Condition
Supply voltage	V _{CC}	V	2.375	2.5	2.625	
Operating temperature	T _{opr}	°C	0		+70	P version
			-5		+85	R version
Output load	RL	Ω	100			Differential resistor

◆ Frequency characteristics

(V_{CC}=2.375 to 2.625, GND=0.0V, Load=100Ω)

Item	Symbol	Unit	MIN.	TYP.	MAX.	Condition
Output frequency Range	f _{osc}	MHz	53.125		700	
Frequency Stability	df/f ₀	ppm	-100		+100	H version, *1
			-50		+50	G version, *1

*1 This includes initial frequency tolerance, temperature, supply voltage variation and loading variation. Please refer to Part Numbering Guide (page3).

◆ Electrical characteristics

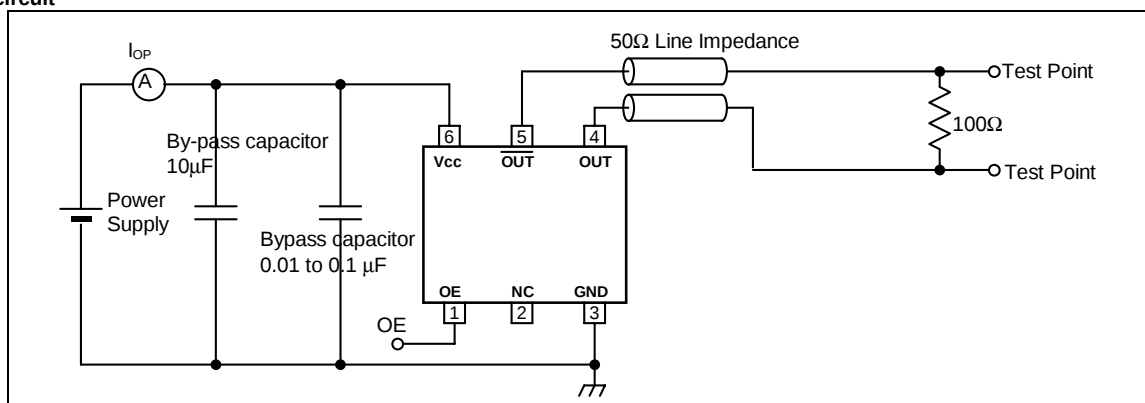
(V_{CC}=2.375 to 2.625, GND=0.0V, Load=100Ω)

Item	Symbol	Unit	MIN.	TYP.	MAX.	Condition
Start up time	T _{osc}	ms			10	t=0 at V _{CC} =2.375V
Current consumption	I _{OP}	mA		20	30	f _{osc} ≤500MHz
				25	35	f _{osc} >500MHz
OE High level input voltage	V _{IH}	V	0.7V _{CC}			
OE Low level input voltage	V _{IL}	V			0.3V _{CC}	
OE High level input current	I _{IH}	μA			1	OE= V _{CC}
OE Low level input current	I _{IL}	μA	-100		-10	OE=GND
Differential output voltage	V _{OD}	mV	247	350	454	V _{OD1} , V _{OD2}
Change to V _{OD}	dV _{OD}	mV			50	dV _{OD} = V _{OD1} -V _{OD2}
Offset Voltage	V _{OS}	V	1.125	1.25	1.375	V _{OS1} , V _{OS2}
Change to V _{OS}	dV _{OS}	mV			150	dV _{OS} = V _{OS1} -V _{OS2}
Duty at outputs crossing point	tw/t	%	48		52	V version: ≤175MHz
			45		55	53.125M to 350MHz
			40		60	>350M
Output Rise time	t _{TLH}	ps			400	20-80% of V _{OD}
Output Fall time	t _{THL}	ps			400	80-20% of V _{OD}
Phase Jitter *2 Offset =12KHz to 20MHz	T _{PJ}	UI		0.044x10 ⁻³		53.125 to 700MHz
		ps		0.29	1	@156.25MHz
Period Jitter *3 n=50000 samples	t _{RJ}	ps		3	4	σ of Random Jitter
	t _{P-P}	ps		25	40	Peak to Peak of jitter distribution
Accumulated Jitter *3 n=2 to 50000 cycles	t _{acc}	ps		4	5	σ of Total jitter distribution

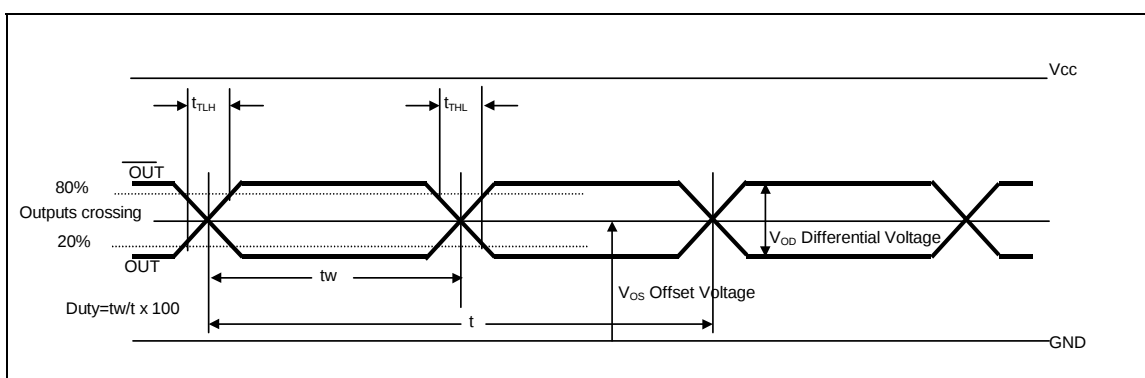
*2 Measured by SSB phase noise test equipment.

*3 Measured by Time interval analyzer or oscilloscope.

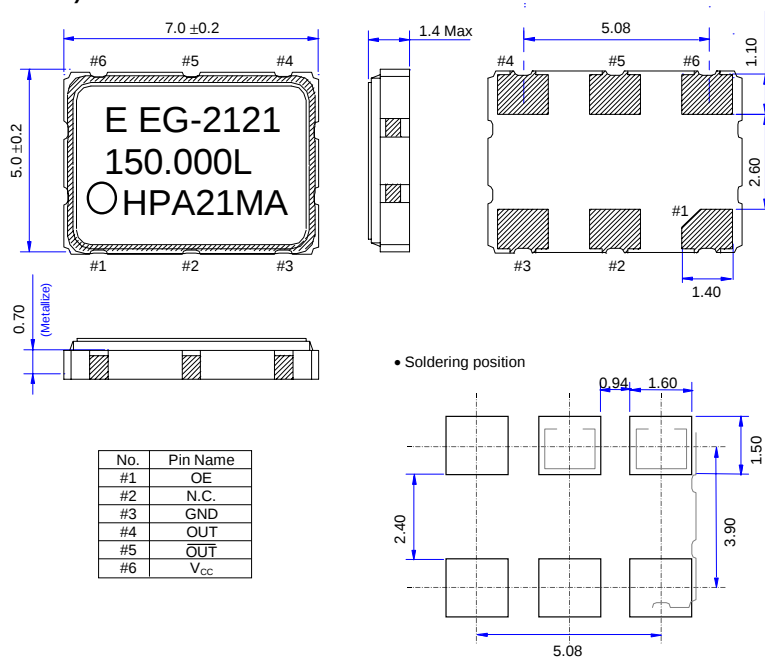
◆ Test circuit



◆ Timing chart



◆ External Dimensions (Unit : mm)



◆ Part Numbering Guide

EG-2121CA - 156.2500M - L H P A

Stability condition	A: Including 10yrs Aging	N: Excluding Aging
Temperature Range	P: 0 to +70C	R: - 5 to +85C
Frequency Stability	H: +/-100ppm	G: +/-50ppm
Output	L: LVDS	V: LVDS (Duty +/-2%)*2
Output Frequency	: see Standard frequency list	

*1 Available combination : xHPA, xHPN, xHRA, xHRN, xGPN

For xGPA and xGRN stability, please contact Epson.

xGRA is not available.

*2 V (Duty +/-2%) version is available under 175MHz.

◆ Standard Frequency List

53.1250 *3	62.5000 *3				
100.0000	106.2500	125.0000	133.0000	155.5200	156.2500
159.3750	161.1328 *4	200.0000	212.5000	250.0000	311.0400
312.5000	322.2656 *5	400.0000	425.0000	500.0000	
622.0800	625.0000	644.5313 *6			

Please round off 5th digit and specify 4-digit accuracy under decimal point.

*3 available only xHPA and xHPN.

Nominal frequency: *4=161.1328125MHz, *5=322.265625MHz, *6=644.53125MHz