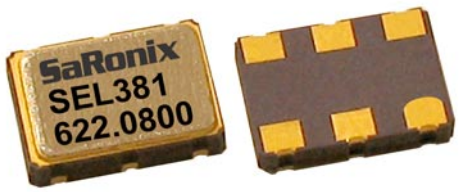
SaRonix™
A PERICOM® COMPANY

SEL381 Series

3.3V PECL High Frequency Crystal Clock Oscillator (XO)



Actual Size = 5 x 7mm

Product Features

- Very low noise at 25 MHz
  -110dBc/Hz @ 100Hz offset
  -130dBc/Hz @ 1Hz offset
  -145dBc/Hz @ 10Hz offset
- Less than 3ps RMS jitter
- Tight stability over a broad range of operating conditions
- 3.3V PECL (LVPECL) compatible logic levels
- Pin-compatible with standard 5x7mm packages
- Designed for standard reflow and washing techniques
- Pb-free and RoHS/Green compliant

Product Description

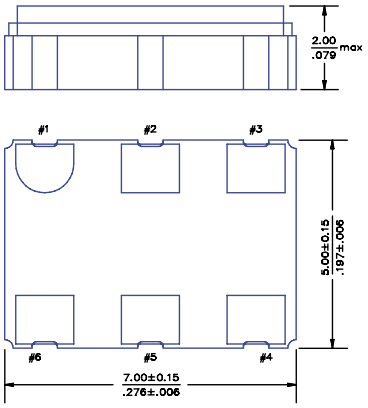
The SEL381 Series is a 3.3V crystal clock oscillator that achieves superb stability over a broad range of operating conditions and frequencies. The output clock signal is compatible with LVPECL logic levels. The device, available on tape and reel, is contained in a 5x7mm surface-mount ceramic package.

Applications

The SEL381 Series is an ideal reference clock for high-speed applications including:

- 10 Gigabit Ethernet
- Server & Storage platforms
- SONET/SDH linecards
- High-Speed Processors
- Infiniband
- 25 MHz LVPECL for Gigabit Ethernet

Packaging Outline



Pin Functions

Pin	Function
1	OE or NC
2	OE or NC
3	V_{EE}
4	Q Output
5	$\overline{Q}$ Output
6	V_{CC}

Common Frequencies

Contact SaRonix for additional frequencies (see SEL383 for 38 to 212 MHz)

25.0000 MHz
250.0000 MHz
311.0400 MHz
312.5000 MHz
350.0000 MHz
400.0000 MHz
425.0000 MHz
500.0000 MHz
622.0800 MHz
625.0000 MHz
644.5312 MHz
669.3266 MHz

Ordering Information

S EL381 3 B - 622.0800 (T)

SaRonix

Product Series

Output Enable/Disable Function
0 = N/C pin 1, N/C pin 2
1 = OE low true pin 1, N/C pin2
2 = N/C pin 1, OE low true pin2
3 = OE high true pin 1, N/C pin 2
4 = N/C pin 1, OE high true pin2

Frequency Stability
AA = ±20 ppm (0 to +70°C)
A = ±25 ppm (0 to +70°C)
B = ±50 ppm (0 to +70°C)
E = ±50 ppm (-40 to +85°C)
H = ±32 ppm (-40 to +85°C)

Output Frequency (MHz)
*see SEL383 Series for 38 to 212 MHz

Packaging
(T) = Tape & Reel
full reel increments
Blank = Bulk packaged

Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Output frequency	25		670	MHz	As specified
Supply voltage	2.97	3.3	3.63	V	
Supply current		85	110	mA	
Frequency stability			±20 to ±50	ppM	See Note 1 below
Operating temperature	-40		+85	°C	As specified
Output logic 0, V_{OL}			V_{CC} – 1.620	V	0 to +85°C
Output logic 0, V_{OL}			V_{CC} – 1.555	V	-40 to 0°C
Output logic 1, V_{OH}	V_{CC} – 1.025			V	0 to +85°C
Output logic 1, V_{OH}	V_{CC} – 1.085			V	-40 to 0°C
Output load	50Ω to V_{CC} – 2V				output requires termination
Duty cycle	45		55	%	measured 50% of waveform
Rise and fall time			850	ps	measured 20/80% of waveform
Jitter, phase			3	ps RMS (1-σ)	12kHz to 40MHz frequency band
Jitter, accumulated			10	ps RMS (1-σ)	20,000 adjacent periods
Jitter, total			40	ps pk-pk	100,000 random periods
Phase Noise		–110		dBc/Hz	100 Hz offset (25 MHz output)
Phase Noise		–130		dBc/Hz	1 kHz offset (25 MHz output)
Phase Noise		–145		dBc/Hz	10 kHz offset (25 MHz output)

Notes:

1. As specified. Stability includes all combinations of operating temperature, load changes, rated input (supply) voltage changes, initial calibration tolerance (25°C), aging (5 years at 40°C average effective ambient temperature), shock and vibration.

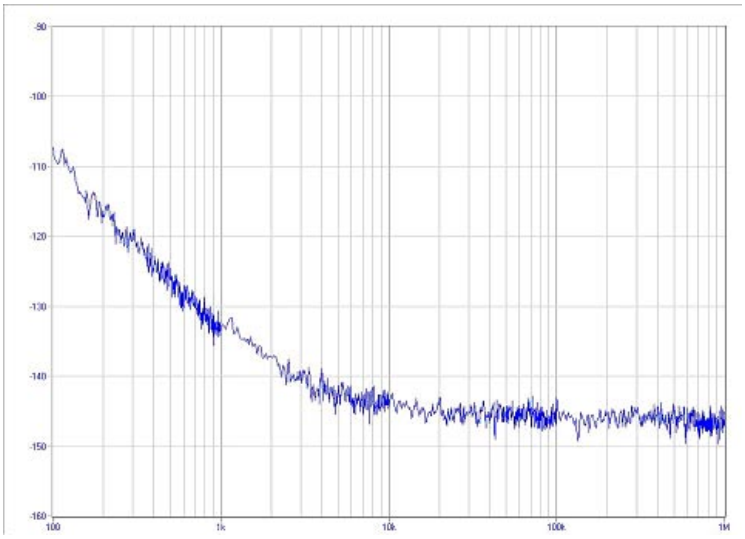
Output Enable / Disable Function (SEL3813 and SEL 3814)

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (OE pin), Output Enable	V_{OH}			V	or open
Input voltage (OE pin), Output Disable			V_{OL}	V	Outputs disabled to Hi-Z

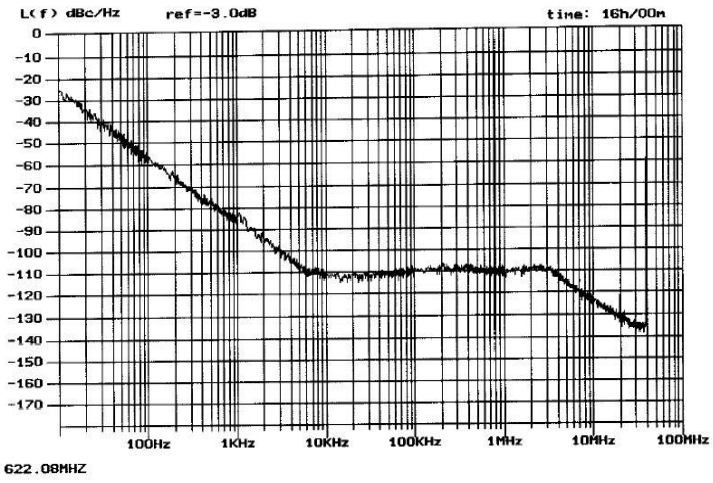
Output Enable / Disable Function (SEL3811 and SEL 3812)

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (OE pin), Output Enable			V_{OL}	V	or open
Input voltage (OE pin), Output Disable	V_{OH}			V	Outputs disabled to Hi-Z

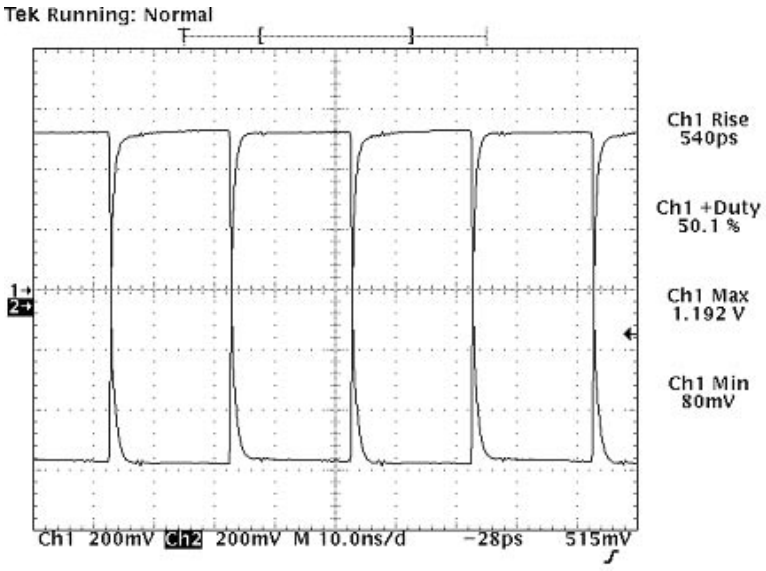
Typical Phase Noise (25 MHz Output)



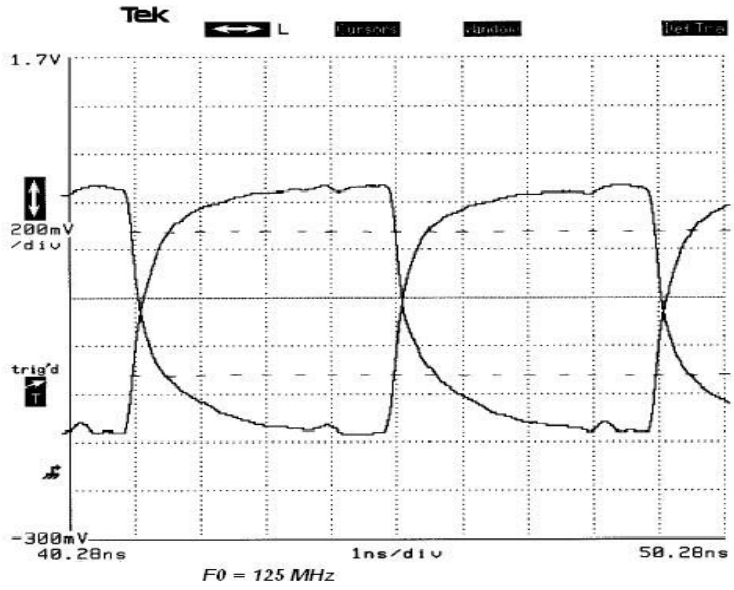
Typical Phase Noise (622.08 MHz Output)



Typical Output Waveform (25 MHz Output)



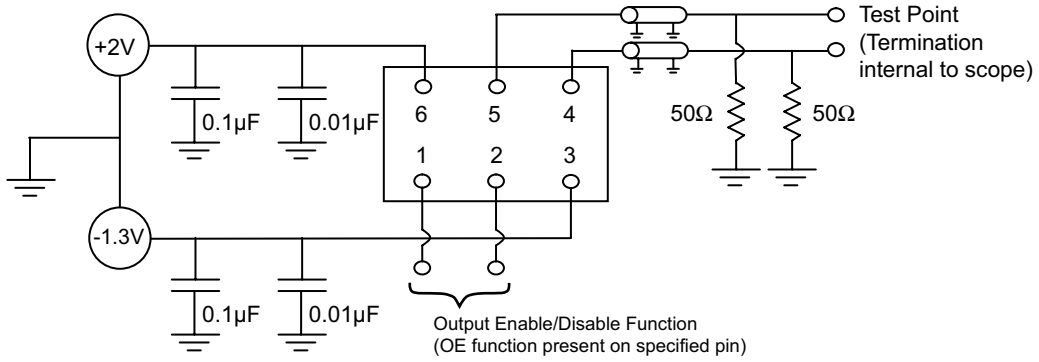
Typical Output Waveform (622.08 MHz Output)



Absolute Maximum Ratings

Parameter	Min.	Typ.	Max.	Units	Notes
Storage temperature	-55		+125	°C	

Test Circuit

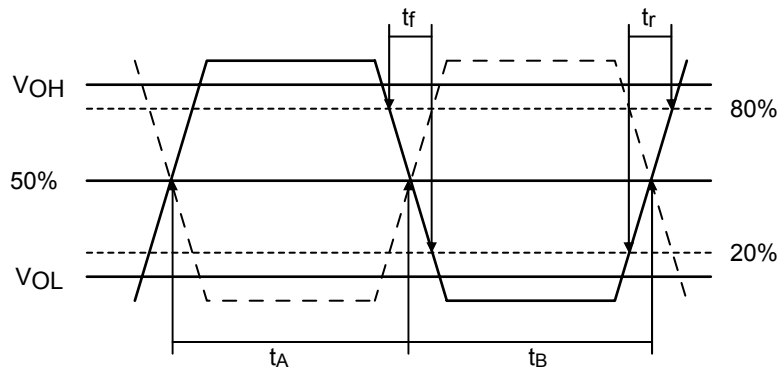


Reliability Test Ratings

This product is rated to meet the following test conditions:

Type	Parameter	Test Condition
Mechanical	Shock	MIL-STD-883, Method 2002, Condition B
Mechanical	Solderability	JESD22-B102-D Method 2 (Preconditioning E)
Mechanical	Terminal strength	MIL-STD-883, Method 2004, Condition D
Mechanical	Gross leak	MIL-STD-883, Method 1014, Condition C
Mechanical	Fine leak	MIL-STD-883, Method 1014, Condition A2 ($R_1 = 2x10^{-8}$ atm cc/s)
Mechanical	Solvent resistance	MIL-STD-202, Method 215
Environmental	Thermal shock	MIL-STD-883, Method 1011, Condition A
Environmental	Moisture resistance	MIL-STD-883, Method 1004
Environmental	Vibration	MIL-STD-883, Method 2007, Condition A
Environmental	Resistance to soldering heat	J-STD-020C Table 5-2 Pb-free devices (2 cycles max)

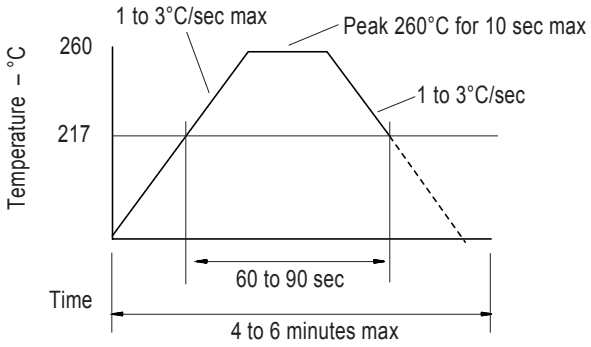
Output Waveform



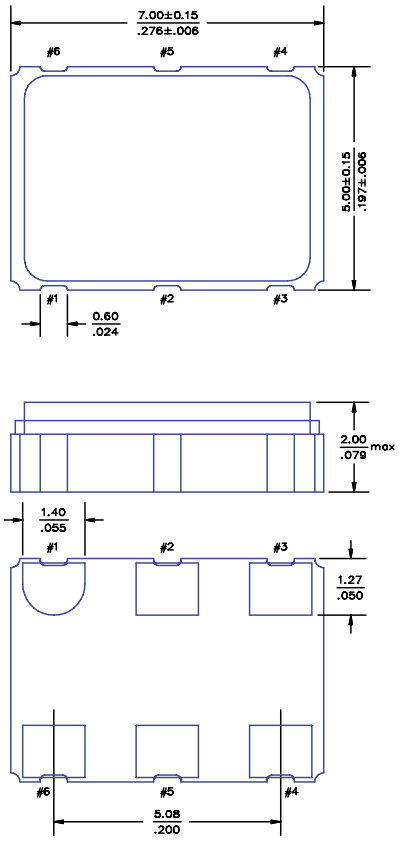
Duty cycle = 100% × (t_A) / (t_A + t_B)

Reflow Soldering Profile

As per IPC/JEDEC J-STD-020C

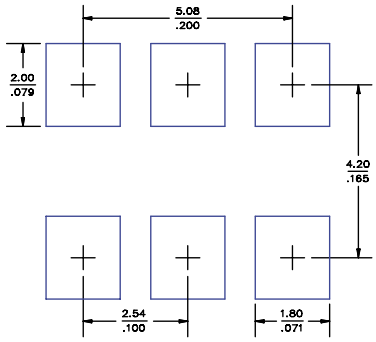


Mechanical Drawings



Please note: In 2005, ceramic package design changed to allow pin #1 size decrease as shown. Some older lot codes may be built with the prior package, in which case pin #1 is 1.4 x 1.6 mm max.

Recommended Land Pattern*



*External high-frequency power decoupling is recommended.(see test circuit for minimum recommendation). To ensure optimal performance, do not route traces beneath the package.

Scale: None. Dimensions are in mm/inches.

Marking LINE 1:	**SEL381 X**	**(SaRonix, Model, Stability code)**
Marking LINE 2:	**Frequency**	**(Frequency code)**
Marking LINE 3:	**● YY WW X**	**(Pin 1, Year, Week, Origin)**

**** Exact location of markings may vary**