SaRonix™
A PERICOM® COMPANY

SEL382 Series

2.5V PECL Low Jitter Crystal Clock Oscillator (XO)

Actual Size = 5 x 7mm

Product Features

- Less than 1 ps RMS jitter with advanced non-PLL, patent-pending design
- 2.5V 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

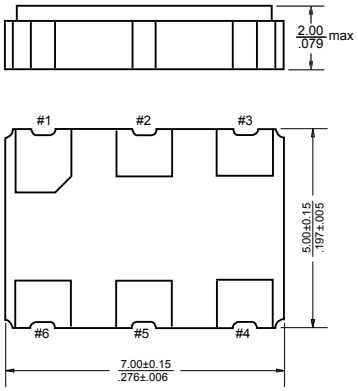
The SEL382 Series is a 2.5V crystal clock oscillator that achieves superb jitter and stability over a broad range of operating conditions and frequencies. The output clock signal, generated internally with a non-PLL oscillator design, is compatible with LVPECL logic levels. The device, available on tape and reel, is contained in a 5x7mm surface-mount ceramic package.

Applications

The SEL382 Series is an ideal reference clock for high-speed applications requiring low jitter, including:

- 1/10 Gigabit Ethernet
- 2/4/10G FibreChannel
- Serial Attached SCSI (SAS)
- Server & Storage platforms
- SONET/SDH linecards

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

50.0000 MHz	77.7600 MHz	150.0000 MHz
62.5000 MHz	100.0000 MHz	155.5200 MHz
66.0000 MHz	106.2500 MHz	156.2500 MHz
66.6667 MHz	125.0000 MHz	159.3750 MHz
75.0000 MHz	133.0000 MHz	160.0000 MHz

Ordering Information

S EL382 3 B - 156.2500 (T)

- **SaRonix**
- **Product Series**
- **Output Enable/Disable Function**
  - 0 = N/C pin 1, N/C pin 2
  - 3 = OE pin 1, N/C pin2
  - 4 = N/C pin 1, OE pin2
- **Frequency Stability**
  - A = ±25 ppm (0 to +70°C)
  - B = ±50 ppm (0 to +70°C)
  - E = ±50 ppm (-40 to +85°C)
- **Output Frequency** (MHz)
- **Packaging**
  - (T) = Tape & Reel full reel increments
  - Blank = Bulk packaged

Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Output frequency	50.00		160.00	MHz	As specified
Supply voltage	2.38	2.5	2.62	V	
Supply current		50	60	mA	(enabled)
Supply current			15	mA	(disabled)
Frequency stability	±25		±100	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		500	850	ps	measured 20/80% of waveform
Jitter, phase			1	ps RMS (1-σ)	12kHz to 40MHz frequency band
Jitter, accumulated			7	ps RMS (1-σ)	20,000 adjacent periods
Jitter, total			40	ps pk-pk	1,000 random periods

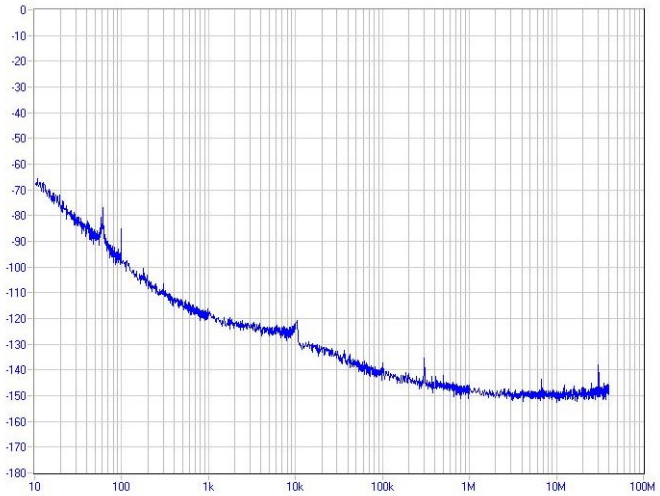
Notes:

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.

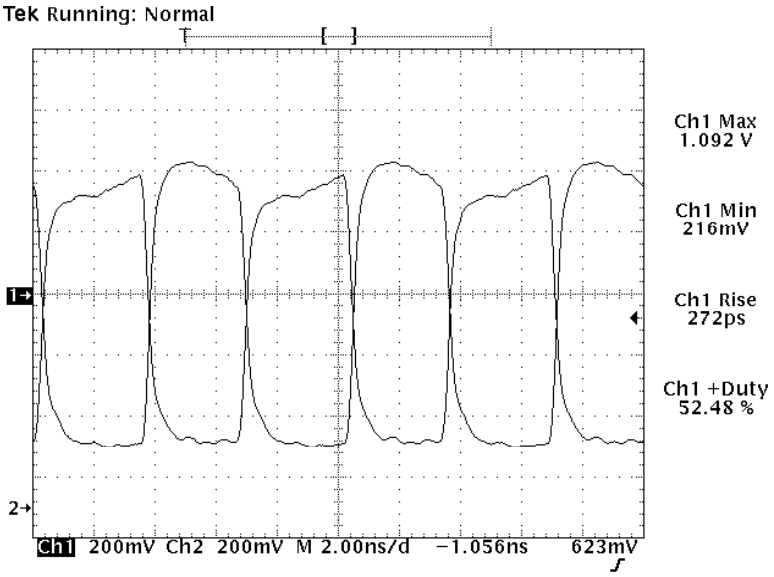
Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (OE pin), Output Enable	0.7V_{CC}			V	or open
Input voltage (OE pin), Output Disable			0.3V_{CC}	V	Outputs disabled to Hi-Z
Output disable delay			200	ns	
Output enable delay			10	ms	

Typical Phase Noise



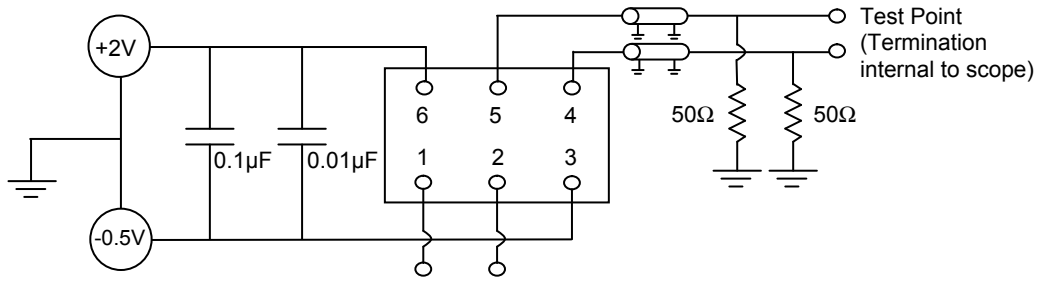
Typical Output Waveform



Absolute Maximum Ratings

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

Test Circuit



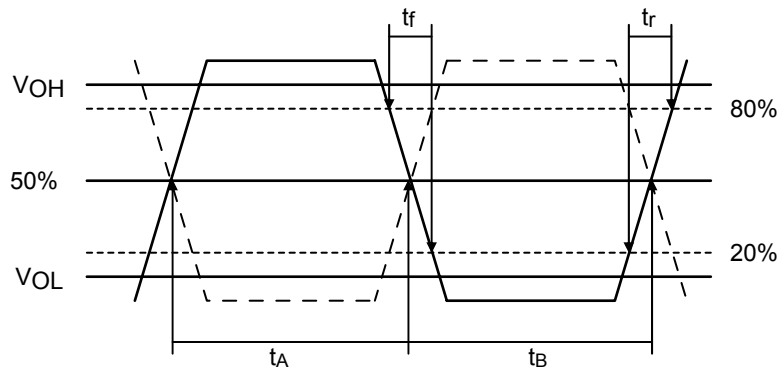
Output Enable/Disable Function
(OE function present on specified pin)

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	MIL-STD-883, Method 2003
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	MIL-STD-202, Method 210, Condition I or J

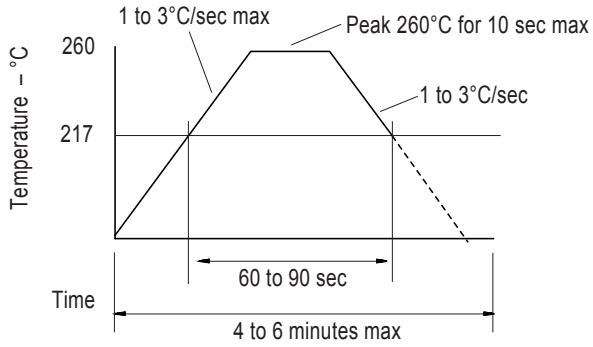
Output Waveform



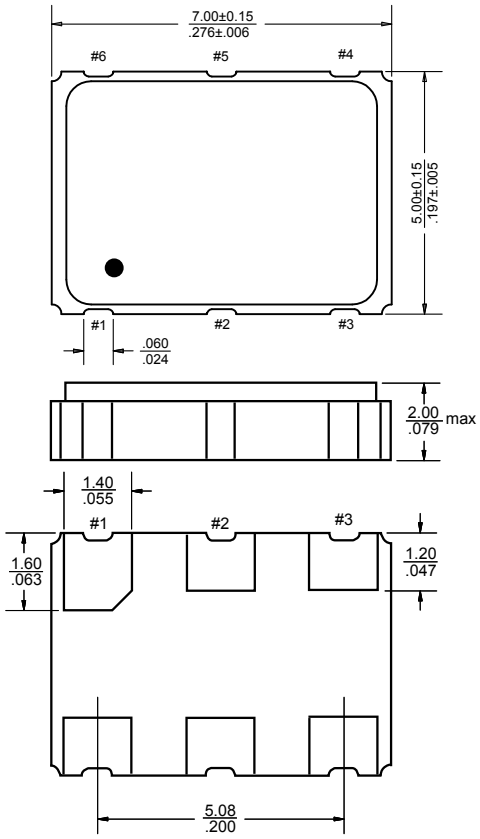
Duty cycle = 100% × (t_A) / (t_A + t_B)

Reflow Soldering Profile

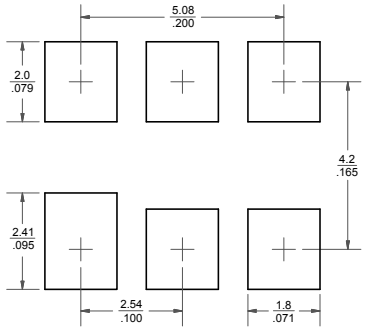
As per IPC/JEDEC J-STD-020C



Mechanical Drawings



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:	**SEL382 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**

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