

Technical Data

SEL2400 / SEL3400 Series



Description

A crystal controlled, high frequency, highly stable oscillator, compatible with Motorola 10KH, 10KE or 100LVE logic families. SaRonix proprietary high frequency sealed crystals running on the fundamental or 3rd overtone available for exceptional stability and reliability. The output can be disabled and wired-OR for testing or combining multiple clocks. Open emitter output allows the user to select the load termination to optimize performance. Complementary outputs are available.*

Applications & Features

- Ideal for high resolution graphics & imaging applications
- Superior stability with AT-cut crystal performance compared to SAW technology
- Provides 10KH and 10KE (Motorola ECLinPS) compatible outputs
- 3.3V PECL version with 10LVE outputs
- Frequencies up to 250 MHz including SONET 155.52 MHz
- Disable/wired-OR output feature available
- Standard 0.200" high package
- Fundamental or overtone crystal operation results in superior jitter characteristics over PLL implementations
- AT crystal technology allows for economic and quick turn-around of custom frequencies
- Surface mountable gull wing version available

Frequency Range:	7 MHz to 250 MHz
Frequency Stability:	±20, ±25, ±50 or ±100 ppm over all conditions: calibration tolerance, operating temperature, input voltage change, load change, aging, shock and vibration.
Temperature Range:	
Operating:	0 to +70°C or -40 to +85°C
Storage:	-55 to +125°C
Supply Voltage:	5.0V or -5.2V, 3.3V PECL
Supply Current:	
SEL3400:	70mA typ, 100mA max, 56mA typ @ 3.3V
SEL2400:	48mA typ complementary, 45mA typ E/D (40mA disabled) 48mA typ single output, 80mA max
Output Drive:	
Symmetry:	45/55% max @ V _{BB} or Complementary Outputs Crossing
Rise & Fall Times:	1ns typ, 3ns max 20% to 80% for 10KH Logic 350ps typ, 550ps max 20% to 80% for 10KE Logic (SEL3400)
Logic 0:	V _{CC} -1.595 max, 0 to +70°C V _{CC} -1.595 max, -40 to +85°C
Logic 1:	V _{CC} -1.02 min, 0 to +70°C V _{CC} -1.08 min, -40 to +85°C
Load:	50Ω to V _{CC} -2V
Jitter:	3.5ps max RMS period jitter, 1ps max 1σ cycle-to-cycle jitter
Mechanical:	
Shock:	MIL-STD-883, Method 2002, Condition B
Solderability:	MIL-STD-883, Method 2003
Terminal Strength:	MIL-STD-202, Method 211, Conditions A & C
Vibration:	MIL-STD-883, Method 2007, Condition A
Solvent Resistance:	MIL-STD-202, Method 215
Resistance to Soldering Heat:	MIL-STD-202, Method 210, Condition A, B or C (I or J for Gull Wing on SEL3400)
Environmental:	
Gross Leak Test:	MIL-STD-883, Method 1014, Condition C
Fine Leak Test:	MIL-STD-883, Method 1014, Condition A2
Thermal Shock:	MIL-STD-883, Method 1011, Condition A
Moisture Resistance:	MIL-STD-883, Method 1004

Part Numbering Guide

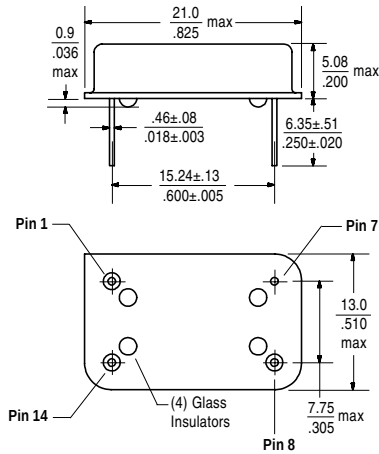
Series	SEL	3	4	0	0	B	-	250.0000	Frequency (MHz)
ECL									
Construction									K = Gull Wing Package SEL3400 only
2 = Blank Crystal, 7 to 133 MHz									
3 = Tubular Crystal, 70+ to 250 MHz									
Supply Type									Stability Tolerance
4 = Pos. Supply Pin 14 = V _{CC} , Pin 7 = V _{EE}									AA = ±20 ppm, 0 to +70°C
5 = Neg. Supply Pin 14 = V _{EE} , Pin 7 = V _{CC}									A = ±25 ppm, 0 to +70°C
									B = ±50 ppm, 0 to +70°C
									C = ±100 ppm, 0 to +70°C
									E = ±50 ppm, -40 to +85°C
									F = ±100 ppm, -40 to +85°C
Logic Type									Device Type (See Table I)
0 = 10KE, 5V, SEL3400 only									0 = Pin 1 - Control
1 = 10KH									1 = Pin 1 - $\bar{Q}$ Complementary
3 = 10KE, 3.3V, SEL3400 only, 70 to 155.52 MHz									2 = Pin 1 - No Connect

*For internal termination contact factory.

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Package Details



Pin Functions:

Pin 1: Q 3XX1
E/D 3XX0

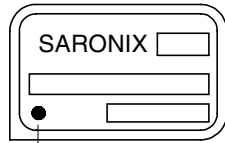
Pin 7: Case
VEE 34XX
VCC 35XX

Pin 14: VCC 34XX
VEE 35XX

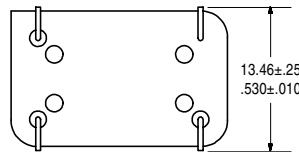
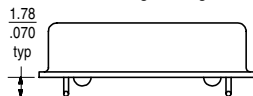
Pin 8: Q Wired-or

Marking Format**

Includes Date Code, Frequency, Model



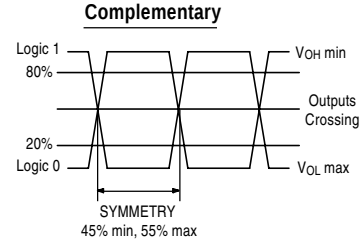
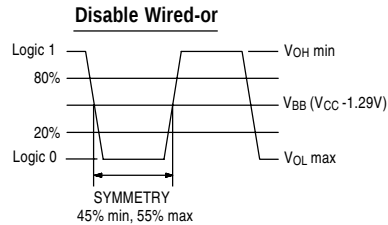
Gull Wing Package



Scale: None (Dimensions in mm inches)

**Exact location of items may vary

Output Waveforms



Enable Function and Supply Options

Truth Table I - Positive Supply	
Pin 1 EN	Pin 8
Logic 0	Clock Output
Logic 1	Logic 0

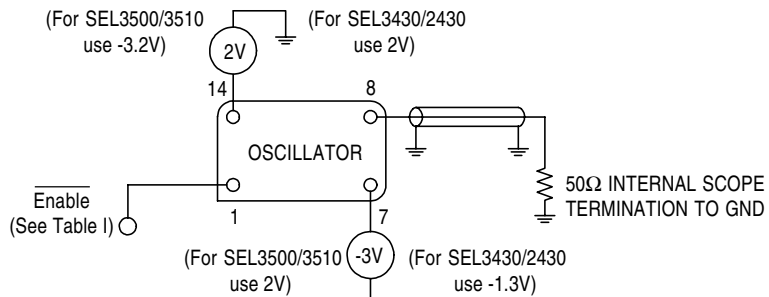
Enable/Disable Propagation Delay:
10K: ((1/f)/2) + 250ps max
10KH: ((1/f)/2) + 2ns max

Table II		
Device Type	Pin 7 (Case)*	Pin 14
SEL34XX	VEE 0V (or VEE -5V [-3.3V 10KE])	VCC +5V (+3.3V 10KE) (or VCC 0V)
SEL35XX	VCC 0V (or VCC +5V [+3.3V 10KE])	VEE -5V (-3.3V 10KE) (or VEE 0V)

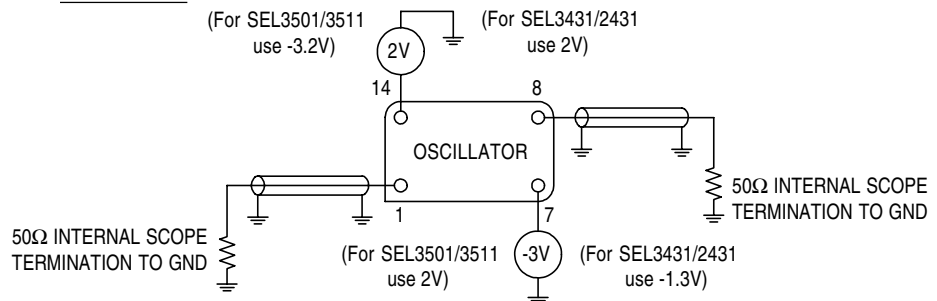
*Pin 14 connected to case available.
Contact Factory.

Test Circuits

SEL3400 / 3410



SEL3401 / 3411



All specifications are subject to change without notice.