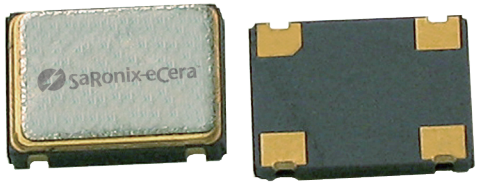
3.3V CMOS Low Jitter, Hig Frequency XO

SX



Actual Size = 5 x 7mm

Product Features

- Thicker crystal than conventional overtone for improved reliability
- Less than 1 ps RMS jitter with advanced non-PLL, patented clock circuit (U.S. Patent# 7002423)
- ±50ppM accuracy (all rated conditions including aging) standard for commercial or industrial operating conditions
- 3.3V CMOS/TTL compatible logic levels
- Pin-compatible with standard 7x5mm packages
- Designed for standard reflow and washing techniques
- IBIS model available
- RoHS compliant**

  (**per #7, Annex of Directive 2002/05/EC)

Product Description

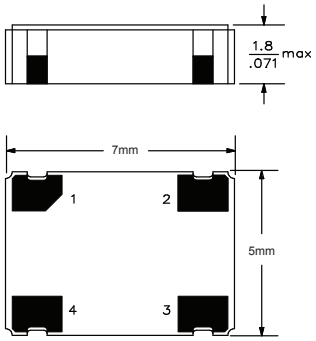
The SX Series includes an enhanced high-frequency version of the popular FN series, a 3.3V crystal clock oscillator that achieves superb jitter and stability over a broad range of operating conditions and frequencies. The output clock signal, generated internally with a patented oscillator design, is compatible with LVCMOS/LVTTL logic levels. The device, available on tape and reel, is contained in a 7x5mm surface-mount ceramic package.

Applications

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

- 1/10 Gigabit Ethernet
- FibreChannel
- Serial Attached SCSI (SAS)
- Server & Storage platforms
- SONET/SDH linecards
- Passive Optical Network (PON) devices

Packaging Outline



Pin Functions

Pin	Function
1	OE Function
2	Ground
3	Clock Output
4	V_{DD}

Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Supply voltage	+2.97	+3.3	+3.63	V	
Supply current, output enabled			30	mA	
Supply current, output disabled			10	mA	Output Hi-Z
Frequency stability			±50	ppM	See Note 1 below
Operating temperature	-40		+85	°C	As specified
Output logic 0, VOL			10% V_{DD}	V	
Output logic 1, VOH	90% V_{DD}			V	
Output load	15 pF (max) or 10 LSTTL				
Duty cycle	45		55	%	-40 to +85°C measured 50%VDD
Rise and fall time			2	ns	measured 20/80% of waveform
Jitter, phase		0.25	1	ps RMS (1-σ)	12kHz to 40MHz frequency band
Jitter, total			50	ps pk-pk	100,000 random periods
Subharmonic Level			-40	dBc	

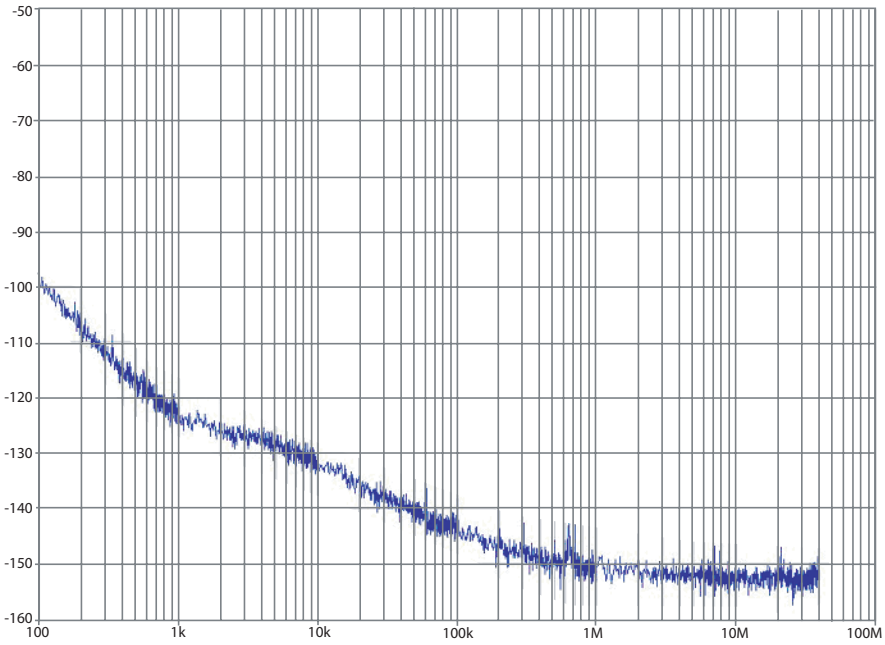
Notes:

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

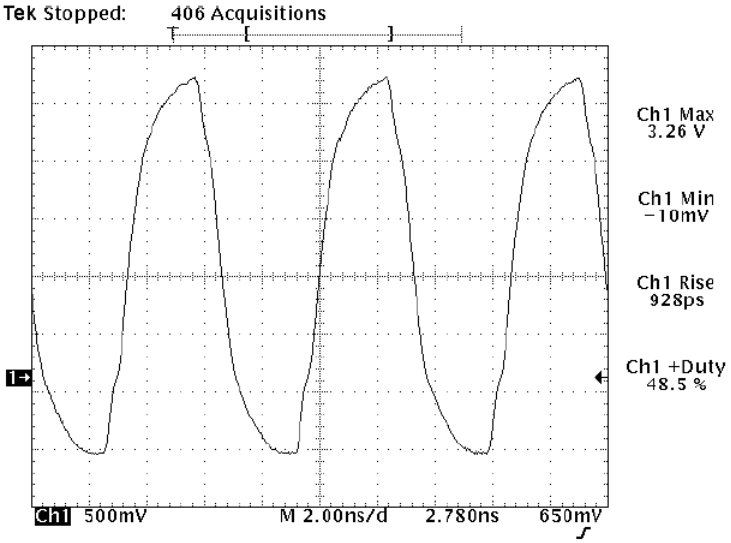
Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (pin 1), Output Enable	2.2			V	or open
Input voltage (pin 1), Output Disable (low power standby)			0.8	V	Output is Hi-Z
Internal pullup resistance	50			kΩ	
Output disable delay			100	ns	
Output enable delay			1	ms	

Typical Accumulated Jitter



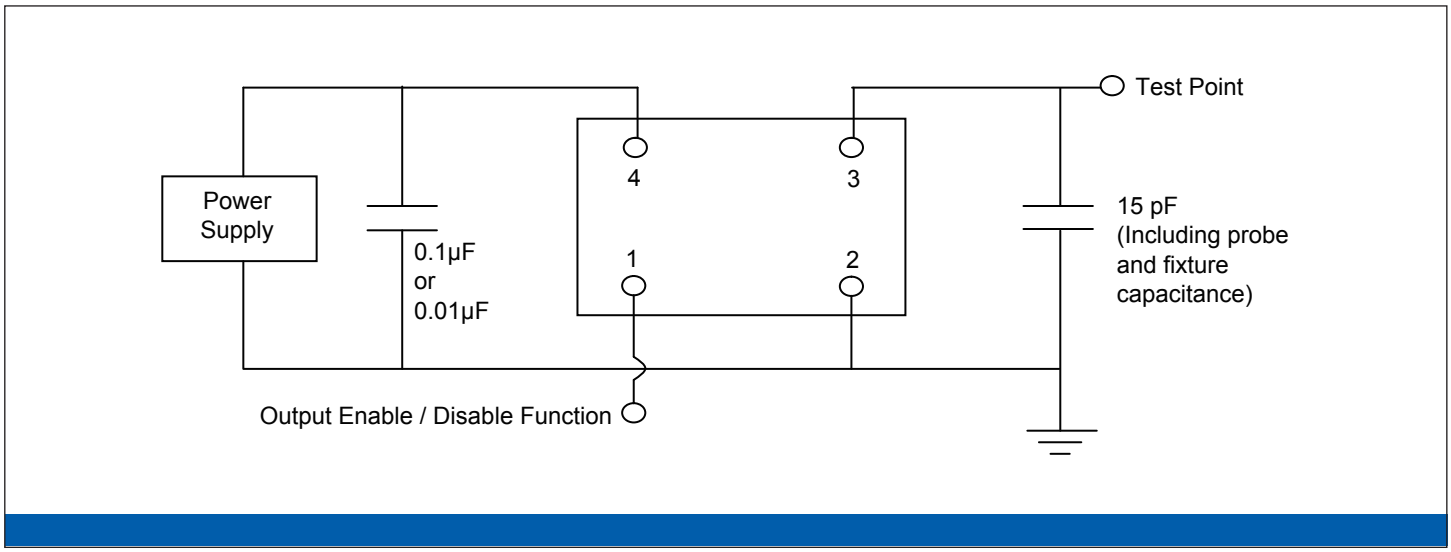
Typical Output Waveform (75 MHz output)



Absolute Maximum Ratings

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

Test Circuit

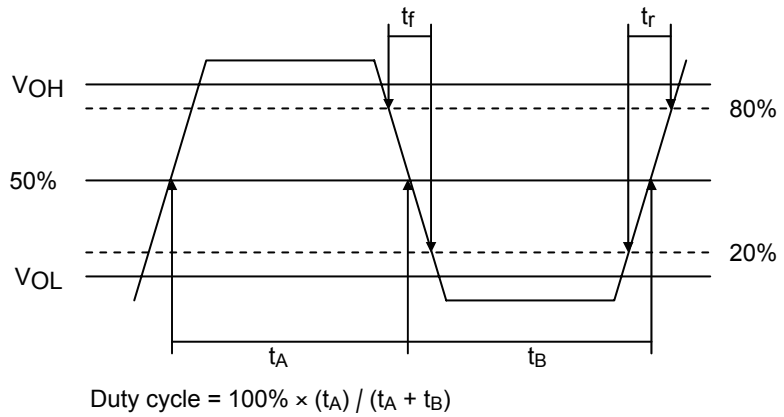


Reliability Test Ratings

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)

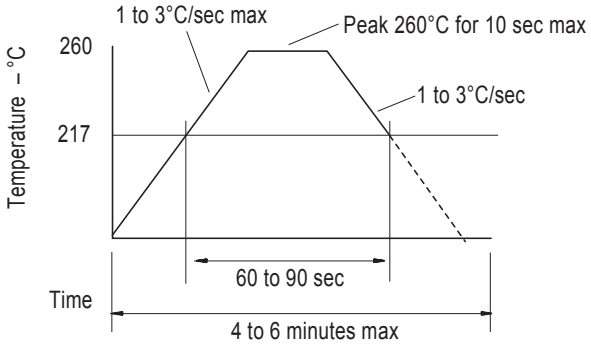
Output Waveform



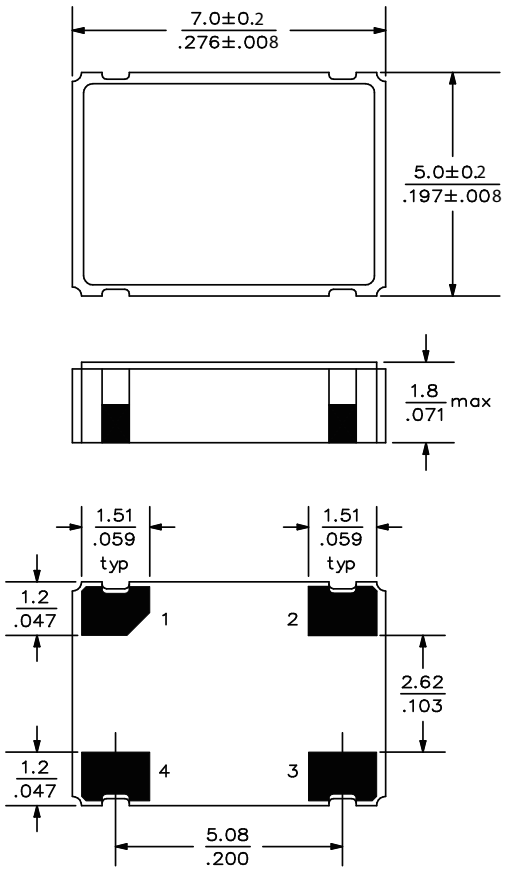
Duty cycle = 100% × (t_A) / (t_A + t_B)

Reflow Soldering Profile

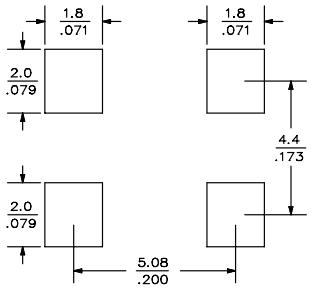
As per IPC/JEDEC J-STD-020C



Mechanical Drawings



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: