

### FN Series Crystal Clock Oscillator (XO) Legacy S1613 Series 7.0 x 5.0mm

# **3.3V CMOS Low Jitter XO**





7.0 x 5.0mm Ceramic SMD

### **Product Features**

- 1 to 166 MHz Frequency Range
- <1 ps RMS jitter
- 3.3V CMOS/TTL compatible logic levels
- Pin-compatible with standard 7.0 x 5.0mm packages
- Designed for standard reflow and washing techniques
- Low power standby mode
- Pb-free and RoHS/Green compliant

# **Product Description**

The FN Series 3.3V crystal clock oscillator 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 LVCMOS/LVTTL logic levels. The device, available on tape and reel, is contained in a 7.0 x 5.0mm surface-mount ceramic package.

# **Applications**

• Fibre Channel

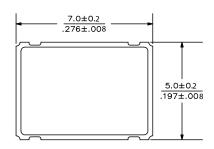
Ideal for low jitter or tight stability applications:

- Ethernet
- FPON

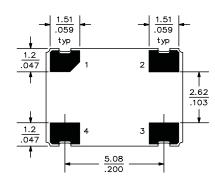
• 802.11a/b/g WiFi

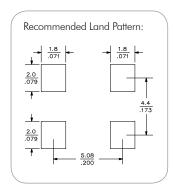
- SONET/SDH linecards
  DSLAM
- T1/E1, T3/E3 linecards
- Serial Attached SCSI (SAS)
- Server & Storage platforms

#### **Package:**







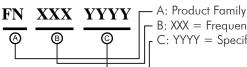


## **Pin Functions:**

Pin	Function
1	OE Function
2	Ground
3	Clock Output
4	V <sub>DD</sub>

1

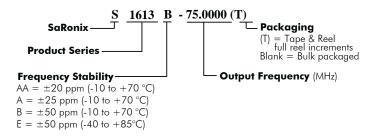
#### **Part Ordering Information:**



B: XXX = Frequency Code C: YYYY = Specification Code

Following the above format, Saronix-eCera part numbers will be assigned upon confirmation of exact customer requirements.

## **Legacy Ordering Information - For Reference Only:**



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# SaRonix-eCera

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#### **Electrical Performance**

	Parameter Min. Typ. Max. Units		Units	Notes		
Output Frequen	су	1 166 MHz		MHz	As specified	
Supply Voltage		+2.97	+3.3	+3.63	V	
Supply Current, Output Enabled				15		1 to 32 MHz
				25		32 to 50 MHz
				40	mA	50 to 80 MHz
				55		80 to 166 MHz
				10	μΑ	1 to 36 MHz, 100 to 166 MHz
Supply Current,	Supply Current, Standby Mode			100	μΑ	36 to 70 MHz
Frequency Stab	ility			±20 to ±50	ppm	See Note 1 below
		-20		+70	°C	Commercial (standard)
Operating Temp	Operating Temperature Range			+85		Industrial (standard)
Output Logic 0, V <sub>OL</sub>				10% V <sub>DD</sub>	V	
Output Logic 1,	Output Logic 1, V <sub>OH</sub>				V	
Output Load	Output Load			15	pF	
Duty Cycle		45		55	%	Measured 50% V <sub>DD</sub>
	up to 50 MHz			7		Measured 20/80% of waveform
Rise and Fall	50 to 80 MHz			5	ns	
Time	80 to 124 MHz			3		
	125 to 166 MHz			2.5		
Jitter, Phase	1 to 166 MHz			1	ps RMS (1-σ)	10kHz to 20 MHz frequency band
Jitter, Accumulated	up to 80 MHz			5	$\mathbf{D}\mathbf{M}\mathbf{C}(1)$	20.000 adjacent periods
	80 to 166 MHz			3	ps RMS (1-σ)	
Jitter,	up to 80 MHz 50	no nir nir	100.000			
Total	80 to 166 MHz			30	ps pk-pk	100.000 random periods

#### Notes:

1. 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.

2. For specifications othere than those listed, please contact sales.

#### **Output Enable / Disable Function**

Parameter	Min.	Тур.	Max.	Units	Notes
Input Voltage (pin 1), Output Enable	2.0			V	or open
Input Voltage (pin 1), Output Disable (low power standby)			0.5	V	Output is Hi-Z
Internal Pullup Resistance	50			kΩ	
Output Disable Delay			100	ns	
Output Enable Delay			10	ms	

#### **Absolute Maximum Ratings**

Parameter	Min.	Тур.	Max.	Units	Notes
Storage Temperature	-55		+125	°C	

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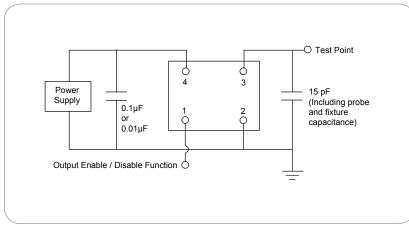


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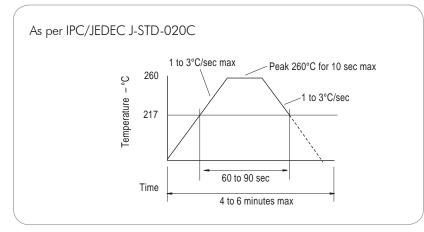
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#### **Test Circuit**



#### **Reflow Soldering Profile**



#### **Reliability Test Ratings**

This product is rated to meet the following test conditions:

Туре	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)

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