

### 3.3V PECL Ultra Low Jitter with True SMT pads Voltage Controlled Crystal Oscillator (VCXO)



Actual Size = 9 x 14mm



#### Product Features

- Frequencies available between 65 and 168 MHz
- High frequency fundamental-mode crystal
- No internal PLL or frequency multiplication
- Less than 0.5 ps RMS jitter
- LVPECL compatible output
- Commercial and industrial operation
- ±20 ppm stability (or as specified)
- ±50 ppm absolute (net) pull range
- 9x14mm true SMT design

#### Product Description

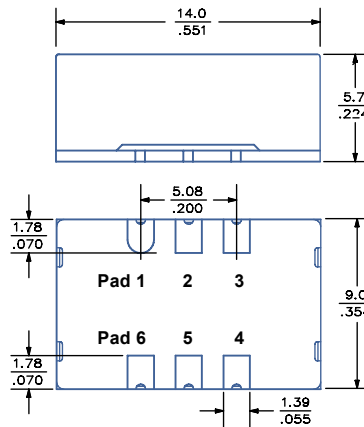
The S1569 is a voltage controlled crystal oscillator that achieves superb jitter and temperature stability over a broad range of operating conditions and frequencies. The device is constructed with a hermetically sealed, fundamental-mode quartz crystal resonator exhibiting a high-Q for exceptional phase noise performance. The device, available on tape and reel, is contained in a 9x14mm FR4 package.

#### Applications

The S1569 Series VCXO is an ideal component in phase locked loop circuits that perform clock smoothing, clock/data recovery, or frequency translation and card synchronization functions, supporting jitter-sensitive applications such as:

- SMPTE-compliant Video networking
- SONET/SDH/DWDM/E4 timing control & line cards
- 1 & 10 Gigabit Ethernet and FibreChannel
- Satellite, microwave and cellular base stations
- Server & Storage platforms

#### Package Outline



#### Pin Functions

Pad	Function
1	Control voltage
2	Output Enable/Disable
3	Ground
4	Q Output
5	$\bar{Q}$ Output
6	Supply voltage

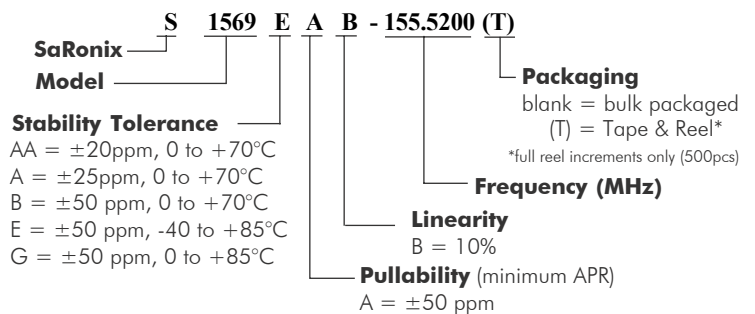
Full Mechanical Drawings page 7.  
Dimensions are in mm/inches.

#### Common Frequencies

65.0000	65.5360	70.6560
74.1758	74.2500	75.0000
77.7600	106.2500	108.0000
125.0000	139.2640	155.5200
156.2500	161.1328	167.3316

Contact SaRonix for additional frequencies

#### Ordering Information



**3.3V PECL Ultra Low Jitter with True SMT pads  
 Voltage Controlled Crystal Oscillator (VCXO)**
**Electrical Performance**

Parameter	Min.	Typ.	Max.	Units	Notes
Output frequency (F <sub>N</sub> )	65		168	MHz	As specified
Supply voltage	2.97	3.3	3.63	V	
Supply current			70	mA	
Frequency stability	±20		±50	ppM	See Note 1 below
Operating temperature	-40		+85	°C	As specified
Output logic 0, V <sub>OL</sub>			V <sub>CC</sub> - 1.645	V	0 to +70°C
Output logic 0, V <sub>OL</sub>			V <sub>CC</sub> - 1.590	V	-40 to +85°C
Output logic 1, V <sub>OH</sub>	V <sub>CC</sub> - 0.995			V	0 to +70°C
Output logic 1, V <sub>OH</sub>	V <sub>CC</sub> - 1.045			V	-40 to +85°C
Output load	50Ω to V <sub>CC</sub> - 2V				output requires termination
Duty cycle	45		55	%	measured 50% of waveform
Rise and fall time		0.18	0.55	ns	measured 20/80% of waveform
Jitter, phase			1	ps RMS (1-σ)	12kHz to 40MHz frequency band
Jitter, accumulated			3	ps RMS (1-σ)	20,000 adjacent periods
Jitter, total			20	ps pk-pk	100,000 random periods

**Notes:**

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

**Frequency Modulation Function**

Parameter	Min.	Typ.	Max.	Units	Notes
Absolute pull range (APR)	±50			ppM	See #1 below
Control voltage range	0.3		3.0	V <sub>DC</sub>	As rated
Center control voltage	1.32	1.65	1.98	V	For RMT center frequency
Monotonic linearity			10	%	Positive transfer slope
Input impedance	50			kΩ	Control voltage pin
Modulation bandwidth	10			kHz	-3dB

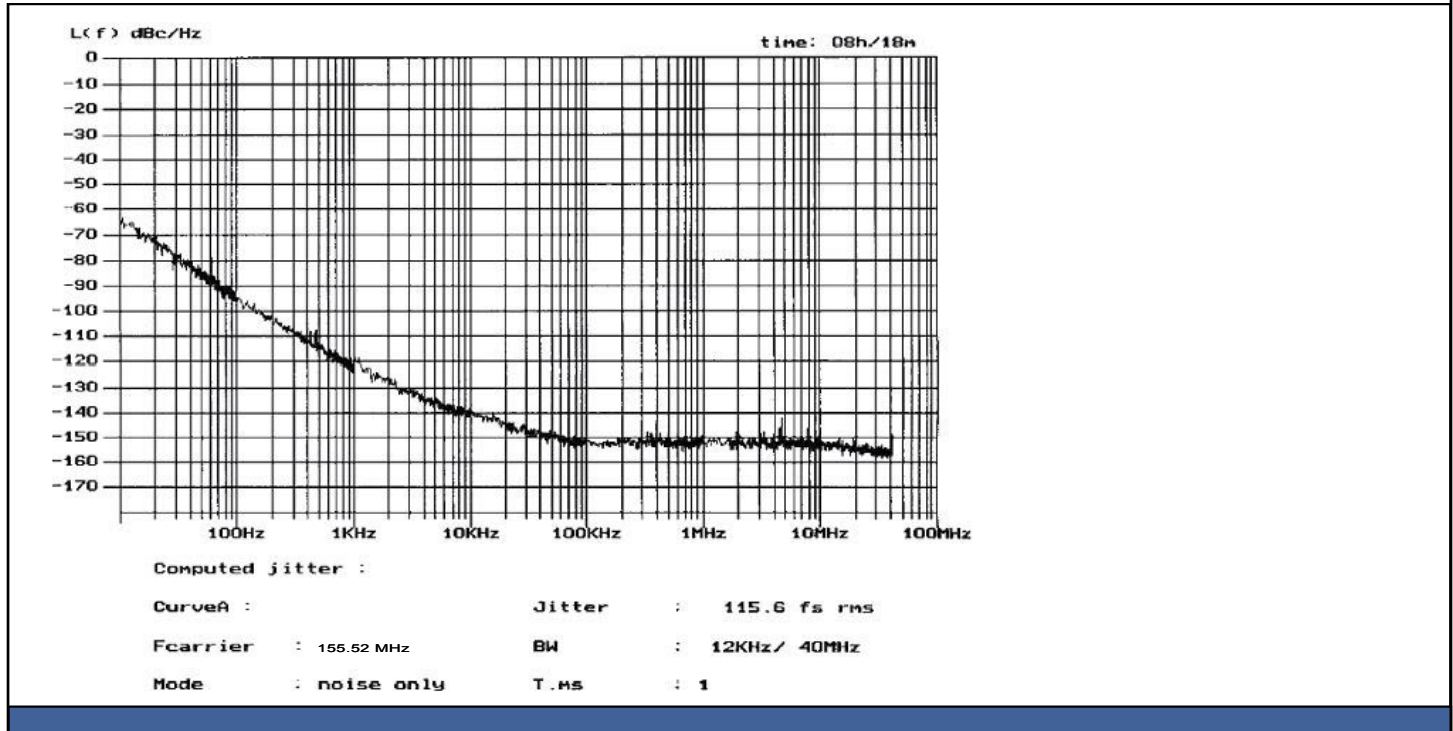
**Notes:**

- APR is relative to the nominal output frequency F<sub>N</sub> (as specified); APR is inclusive (net) of frequency deviation due to stability.

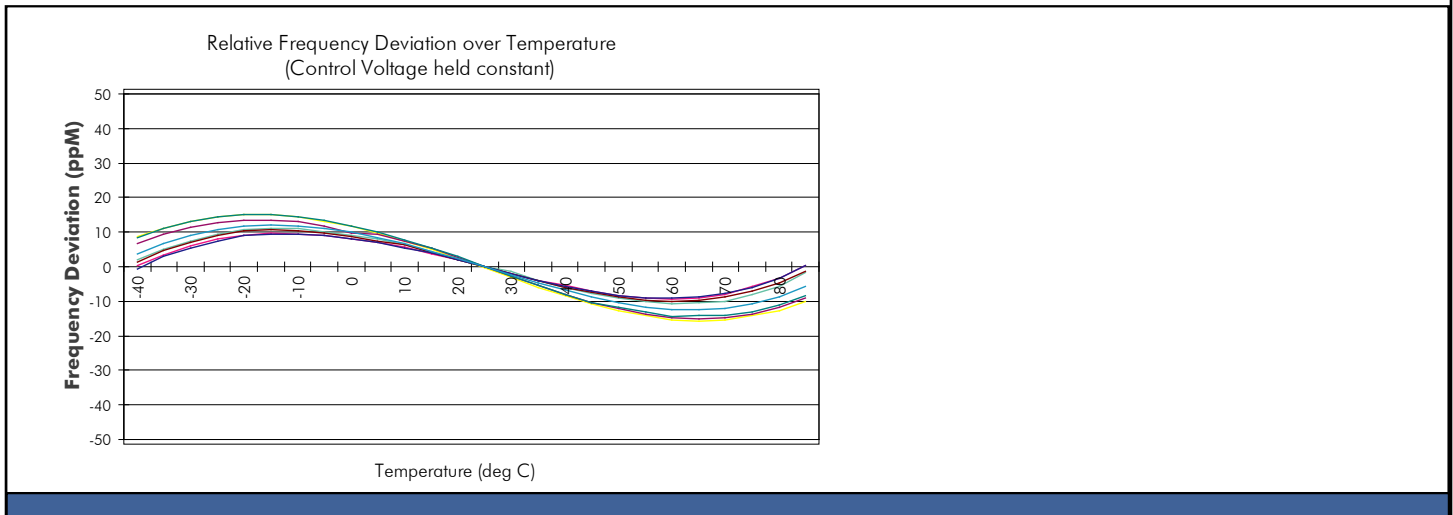
**Output Enable / Disable Function**

Parameter	Min.	Typ.	Max.	Units	Notes
Input voltage, Output Enable (pin 2)			V <sub>OL</sub>	V	or Open
Input voltage, Output Disable (pin2)	V <sub>CC</sub> - 1.165V			V	Q Output fixed to V <sub>OL</sub>

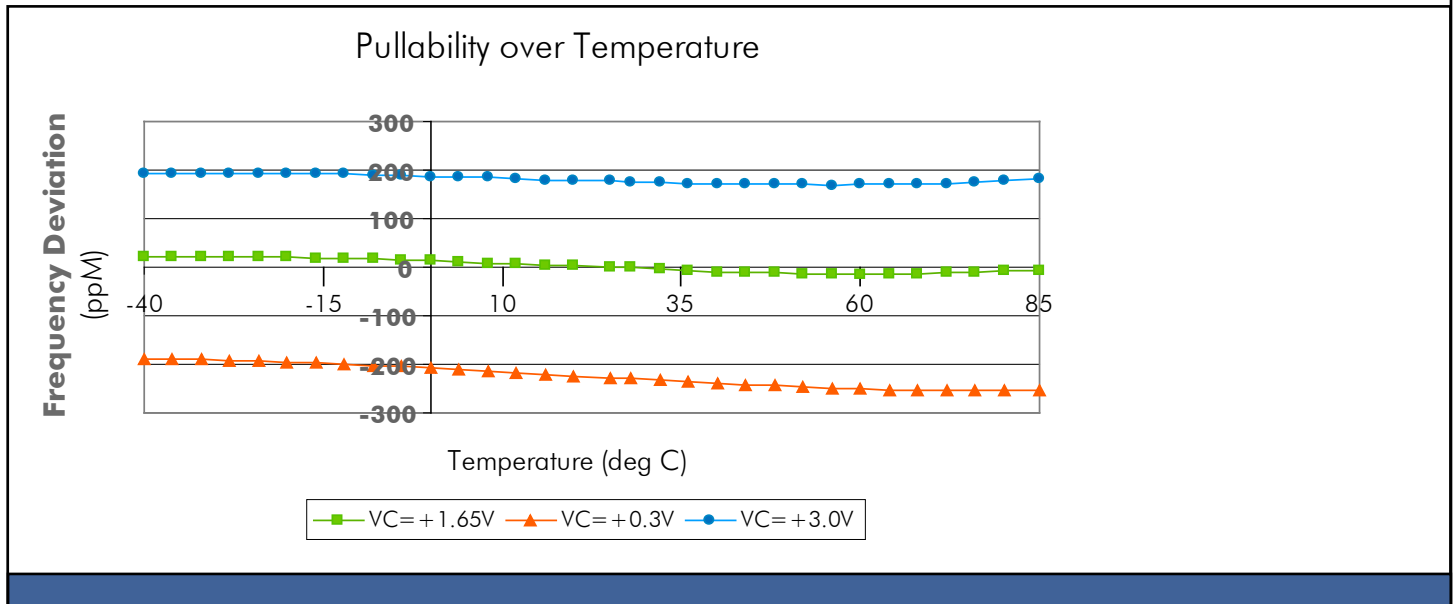
**Typical Phase Noise**



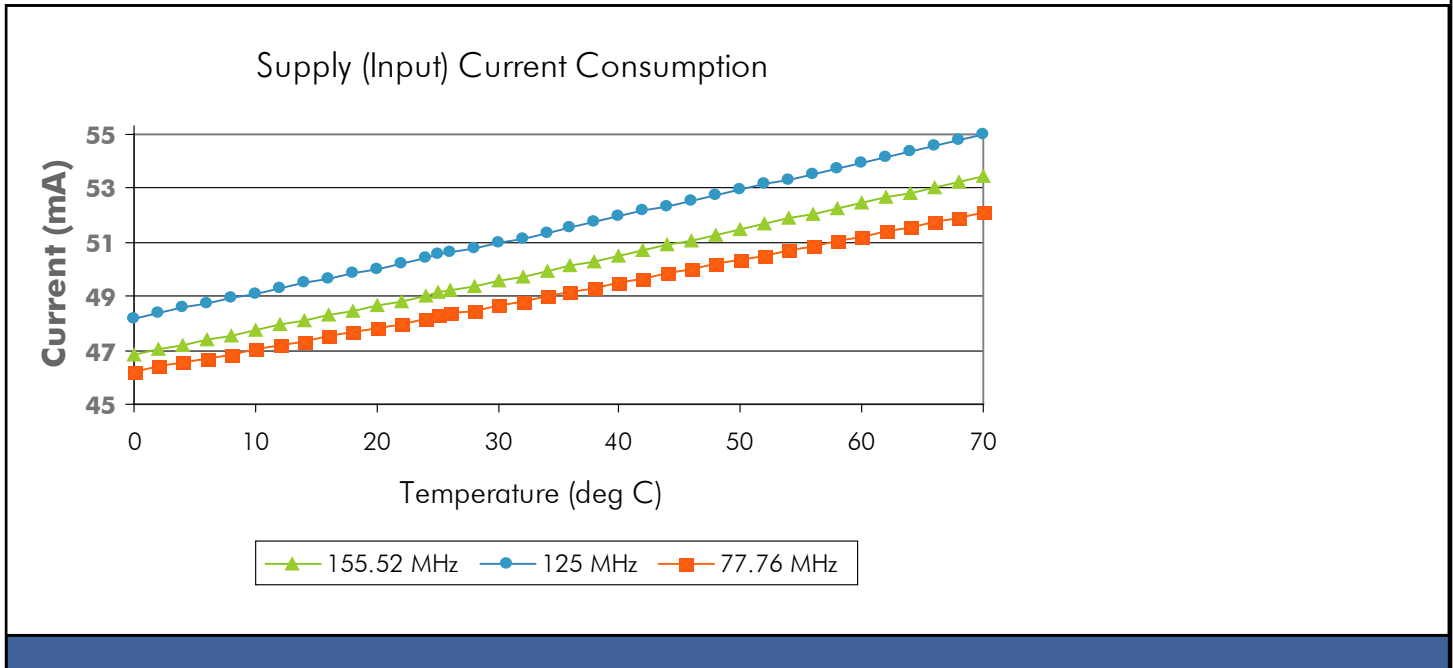
**Typical Stability Characteristics**



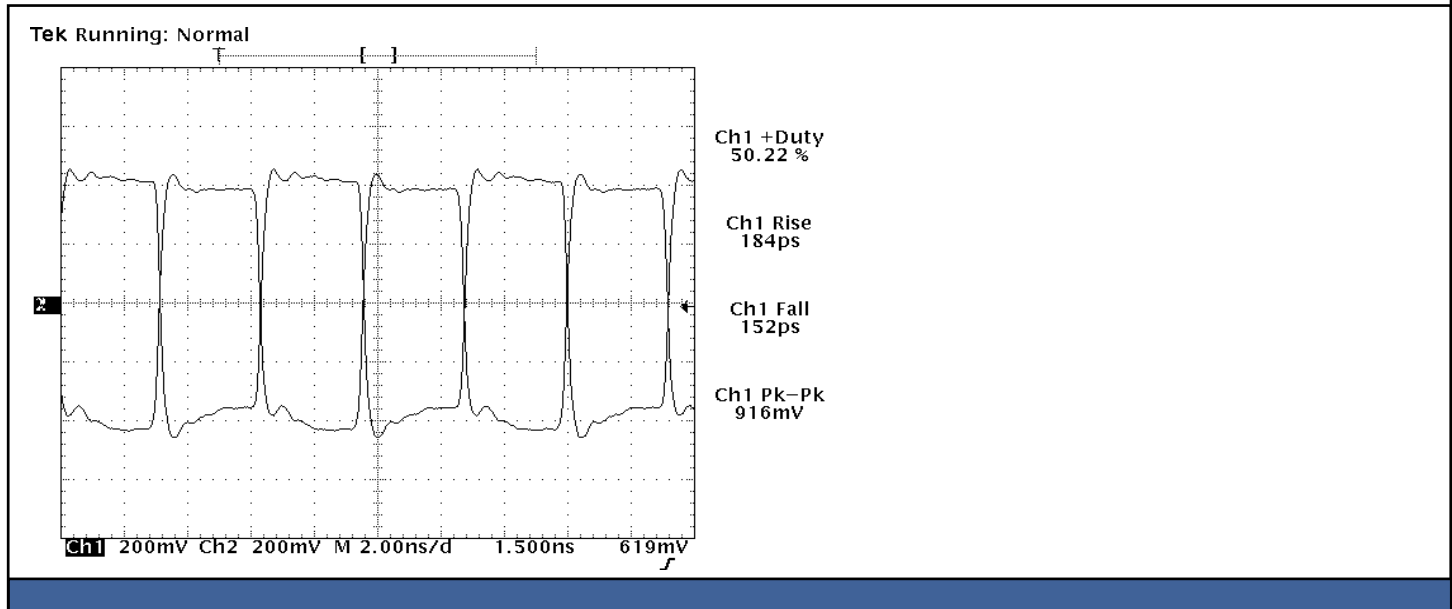
**Typical Pull Characteristics**



**Typical Supply Current**



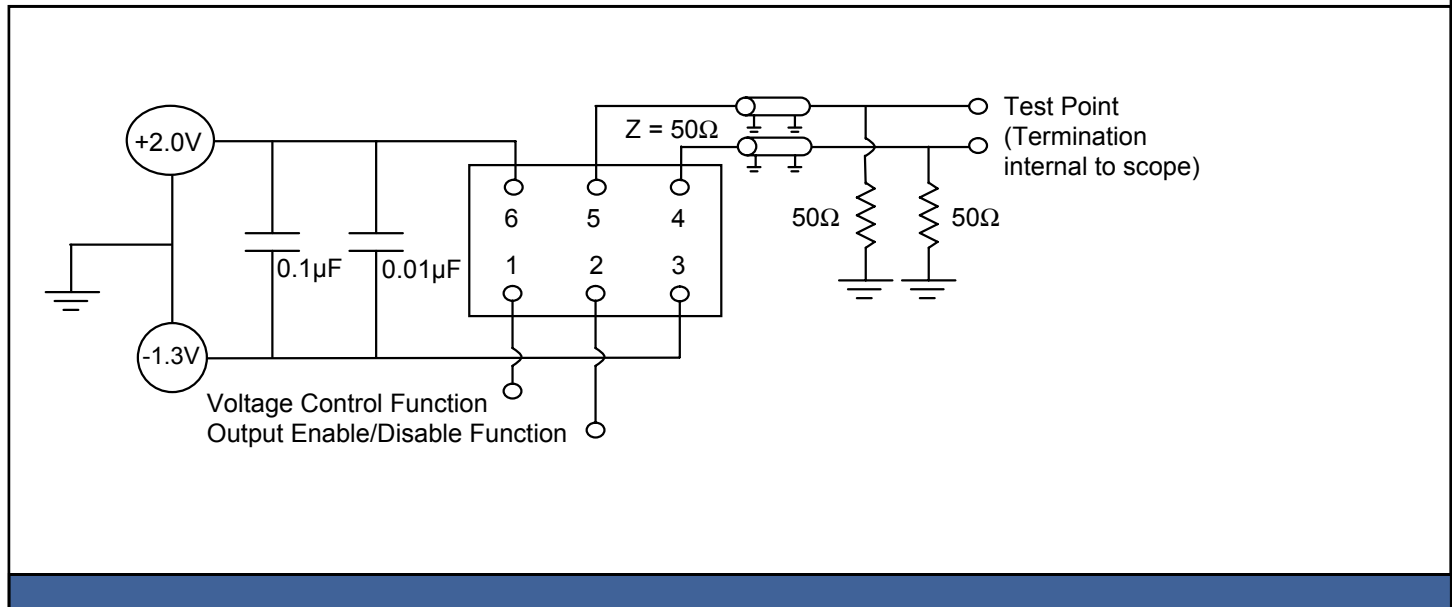
**Typical Output Waveform**



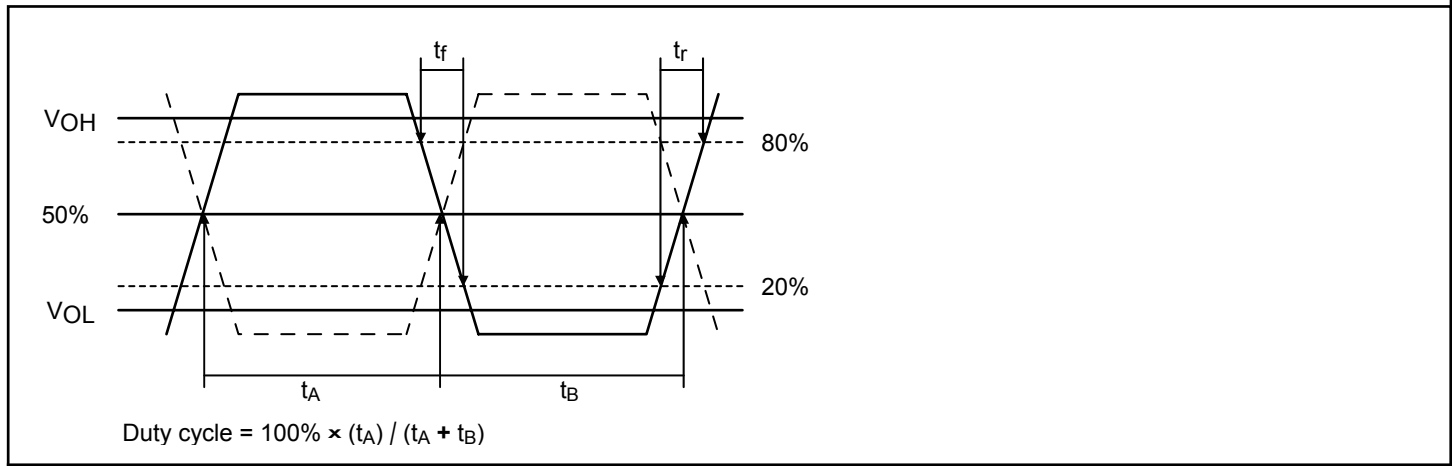
**Absolute Maximum Ratings**

Parameter	Min.	Typ.	Max.	Units	Notes
Storage temperature	-55		+125	°C	
Control voltage range	0		V <sub>CC</sub>	V	

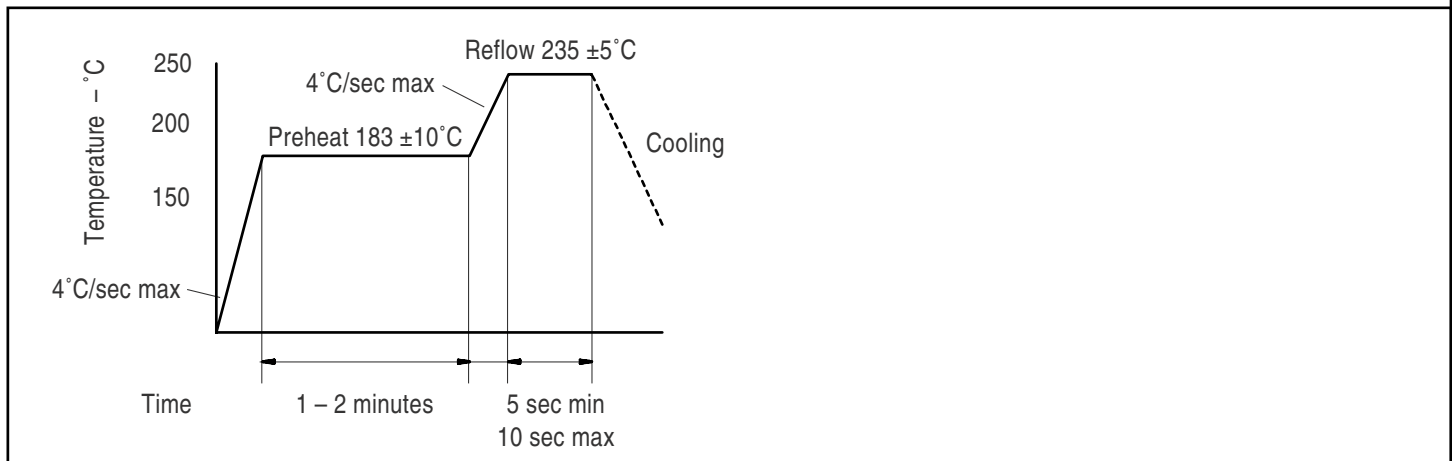
**Test Circuit**



**Output Waveform**



**Solder Reflow Guide**

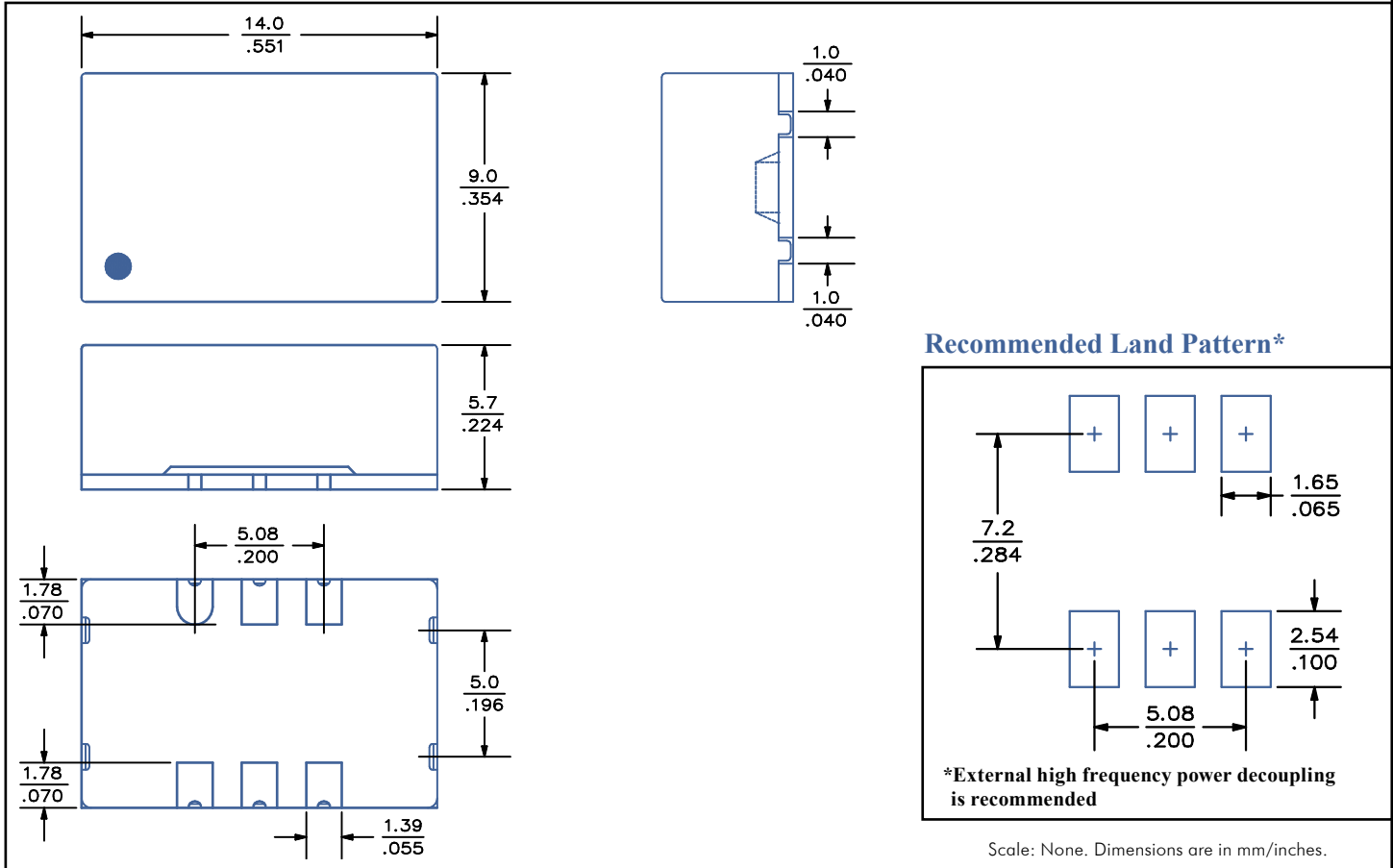


**Reliability Test Ratings**

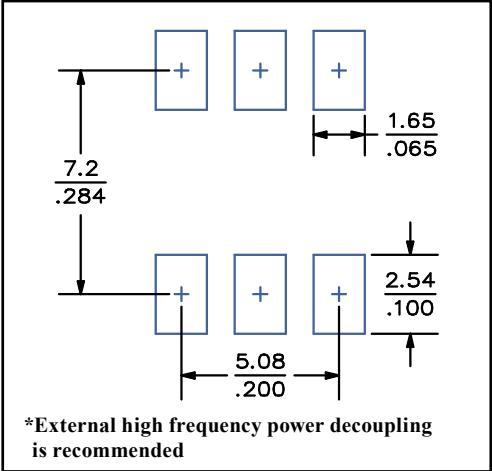
This product is rated under the following test conditions:

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	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

**Mechanical Drawings**



**Recommended Land Pattern\***



Scale: None. Dimensions are in mm/inches.

<b>Marking LINE 1:</b>	<b>SARONIX YY WW X</b>	<b>(Year, Week, Origin)</b>
<b>Marking LINE 2:</b>	<b>Frequency</b>	<b>(Frequency)</b>
<b>Marking LINE 3:</b>	<b>• S1569xxx</b>	<b>(Pin 1, Part Number)</b>

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

**Ordering Information**

