



VCXO

16.384 MHz to 130 MHz
Miniature Surface Mount
Voltage-Controlled Crystal Oscillator

DESCRIPTION

Statek's 5 mm x 7 mm surface mount Voltage-Controlled Crystal Oscillator is designed for applications requiring a highly-pullable 3.3 V CMOS-output VCXO with a small footprint.

Offered at frequencies from 16.384 MHz to 130 MHz with operation over wide temperature ranges (up to -40°C to +105°C), these VCXOs offer exceptional performance in a small package.

FEATURES

- High Absolute Pull Range (APR)
- Low phase noise - Low phase jitter
- Wide frequency range
- Non-standard frequencies supported
- Extended Industrial temperature range
- -55°C option available

APPLICATIONS

Military & Aerospace

- Avionics
- Communications
- Projectiles

TERMINATIONS

Designation	Termination
SM1	Gold Plated (Pb Free)
SM3	Solder Dipped
SM5	Solder Dipped (Pb Free)

ENABLE/DISABLE OPTIONS (T/N)

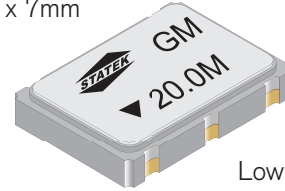
Statek offers two enable/disable options: T and N. The T-version has a Tri-State output and continues to oscillate internally when the output is put into the high Z state. As a result, when re-enabled, the oscillator does not have to restart and an output with a stable frequency resumes almost immediately. The N-version does not have PIN 2 connected internally and so has no enable/disable capability. The following table describes the Enable/Disable option T.

ENABLE/DISABLE OPTION T FUNCTION TABLE

	Enable (PIN 2 High*)	Disable (PIN 2 Low)
Output	Frequency Output	High Z State
Oscillator	Oscillates	Oscillates
Current	Normal	Lower than normal

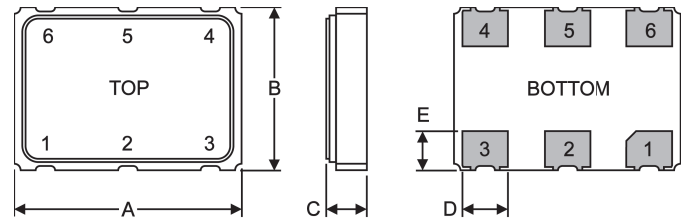
*When PIN 2 is allowed to float, it is held high by an internal pull-up resistor.

5mm x 7mm



Low Profile

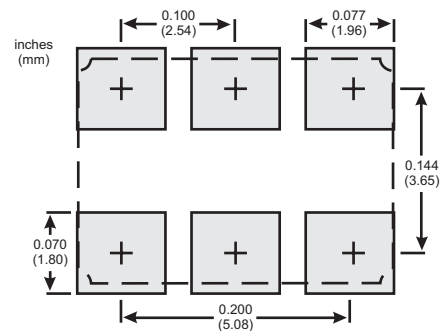
DIMENSIONS



PACKAGE DIMENSIONS

Dimension	Minimum mm	Typical mm	Maximum mm
A	6.86	7.00	7.16
B	4.85	5.00	5.16
C (SM1)	1.55	1.75	1.95
C (SM3/SM5)	1.65	1.85	2.05
D	1.19	1.40	1.41
E	1.07	1.27	1.47

SUGGESTED LAND PATTERN



PIN CONNECTIONS

1. Control Voltage (V_C)
2. Enable/Disable (T) or not connected (N)
3. Ground
4. Output
5. Not connected (N)
6. Supply Voltage (V_{DD})

ABSOLUTE MAXIMUM RATINGS

Supply Voltage V_{DD}	-0.5 V to 4.6 V
Storage Temperature	-55°C to +125°C
Maximum Process Temperature	260°C for 10 seconds

PACKAGING OPTIONS

VCXO - Tray Pack
 - Tape and reel
 Per EIA 481 (see Tape and Reel data sheet 10109)

SPECIFICATIONS TABLE Parameters listed are at 25°C unless otherwise noted.

Parameter	Symbol	Units	Minimum	Typical	Maximum	Conditions / Comments
Nominal Frequency	F	MHz	16.384		130	
Operating Temperature ¹	T	°C	-40		+85	
			-40		+105	
Supply Voltage	V_{DD}	V	3.0	3.3	3.6	
Current	I_{DD}	mA			5	$F \leq 20$ MHz
					8	$20 \text{ MHz} < F \leq 50$ MHz
					14	$50 \text{ MHz} < F \leq 130$ MHz
Output Loading ²	C_L	pF		15		$F \leq 100$ MHz.
				10		$F > 100$ MHz.
Control Voltage	V_C	V	0.3		3.0	
Absolute Pull Range (APR) ³		ppm	-75		+75	$-40^\circ\text{C} \leq T \leq +85^\circ\text{C}$
		ppm	-50		+50	$-40^\circ\text{C} \leq T \leq +105^\circ\text{C}$
Linearity		%		5	10	
Start Up Time		ms			5	
Duty Cycle		%	40		60	45/55 available
Rise Time	t_r	ns			5	
Fall Time	t_f	ns			5	
Logic Low	V_{OL}	V			$0.1 V_{DD}$	
Logic High	V_{OH}	V	$0.9 V_{DD}$			
Period Jitter (rms)	J	ps		2.5	3.5	
Phase Jitter (rms)	J_Φ	ps		0.5		50 MHz (BW = 12 kHz - 20 MHz)
Phase Noise	\mathcal{L}	dBc/Hz				See graph below.
Aging ⁴		ppm	-5		+5	First year, $F \leq 50$ MHz

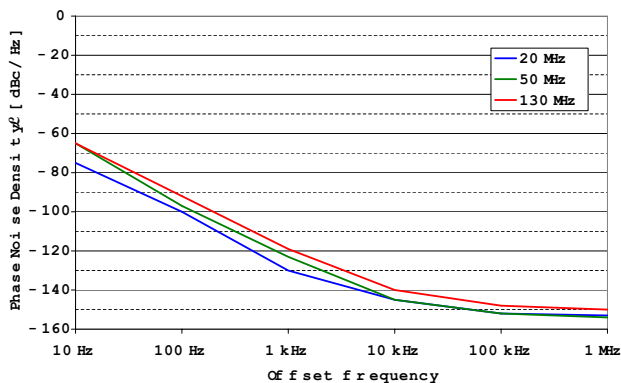
1. Contact Factory for -55°C operation.

2. Higher C_L available. Contact factory.

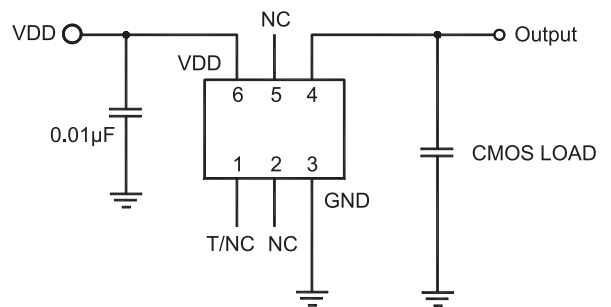
3. The Absolute Pull Range (APR) is the range of frequencies to which the VCXO can be tuned over the operational temperature range. Expressed in parts-per-million (ppm), the reference is the nominal (absolute) frequency F .

4. Tighter aging available. Contact factory.

Typical Phase Noise Density



Test Circuit



Note: a 0.1µF bypass capacitor between VDD and GND pins as close as possible is recommended to minimize power supply line noise.

HOW TO ORDER VCXO SURFACE MOUNT CRYSTAL OSCILLATORS

VCXO	A	4	T	SM3	—	130.0M	,	75	/	I
Package Size A = 5 mm x 7 mm	Supply Voltage 3 = 3.0 V 4 = 3.3 V	Enable/Disable Option T or N	Terminations Blank = SM1 = Gold Plated (Pb Free) SM3 = Solder Dipped SM5 = Solder Dipped (Pb Free)		Frequency M = MHz	APR		Temp. Range: C = -10°C to +70°C I = -40°C to +85°C E = -40°C to +105°C S = Customer Specified		

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