



HIGH TEMPERATURE PRODUCTS

Ruggedized Crystals and Oscillators

for Extreme Environments



www.STATEK.com

About Statek

In 1970, Statek Corporation was the first to use semiconductor technology such as photolithography, chemical etching and micromachining to manufacture quartz resonators in wafer form. Today, Statek remains at the forefront of innovation in the design, development and manufacturing of highly reliable, ultra-miniature quartz-based frequency control products.

Leveraging its proven technologies in the medical, military and avionics industries, Statek has harnessed the same highly reliable design and manufacturing techniques to offer robust high temperature products for extreme operating conditions. Its complete products portfolio includes ruggedized high temperature crystals and oscillators, both through hole and surface mount packaging technologies. Utilizing its expertise in the field of shock and vibration survivability, Statek components are designed to withstand both severe and cumulative shock events.

All Statek products are designed, manufactured and tested in the United States.

Technological Capability

Statek's core competence is its ability to design and manufacture ultra-miniature resonators in quartz wafers using its patented photolithographic and chemical milling processes.

With complete vertical integration, Statek has total in-house control over the manufacturing of its products. From cutting quartz bars into wafers, through lapping and polishing the wafers, making arrays of resonators by processing the wafers in the Wafer Fab lines, to assembling the resonators in ceramic packages and sealing them, Statek has the complete in-house capability to manufacture and test high-precision, extremely rugged and reliable ceramic-packaged quartz crystal resonators, oscillators and sensors.

Variable-size batch processing permits a balance between production efficiencies and a high mix of standard and custom devices.

Materials

Statek cultivates long-term relationships with its domestic suppliers to ensure stable sources of high-quality materials. Statek manufactures its resonators with high-grade cultured alpha-quartz and designs its own ceramic packages, which are then manufactured by its sister company, AdTech Ceramics.

Product Continuity

Statek provides the continuity of support required for downhole tools in the oil and gas industry. In addition to maintaining complete records and traceability, important in the aerospace industry, Statek is committed to supporting the life cycle of its customers' products.

Statek Key Attributes

- Proven supplier for high temperature and aerospace industries
- Products designed and manufactured in the USA
- Crystals manufactured from raw quartz bar in house
- Prompt specialized technical support

High Temperature Product Features

- Extended temperature range -55°C to over +275°C
- Severe and cumulative shock survivability up to 100,000g
- Through-hole and surface mount packaging
- Excellent long-term aging and operating life
- Low power consumption
- Full product traceability

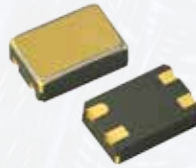


Applications

- Oil and gas downhole instrumentation
- MWD (Measurement While Drilling)
- LWD (Logging While Drilling)
- Underground boring tools
- Rotary shaft sensors
- Engine control
- Avionics

HT

SURFACE MOUNT OSCILLATORS



HTXO 275°C

5.0x7.5mm

Frequency Range	1.5 to 50 MHz	32.768 kHz
Supply Voltage	3.3 V and 5.0 V	3.3 V and 5.0 V
Typical Calibration Tolerances	±10 ppm to ±25 ppm	±10 ppm to ±25 ppm
Frequency Stability Over Temp. Range ¹	±250 ppm for +25°C to +225°C ±400 ppm for +25°C to +250°C ±650 ppm for +25°C to +275°C	±250 ppm for +25°C to +225°C ±400 ppm for +25°C to +250°C ±650 ppm for +25°C to +275°C
Total Frequency Tolerance	±350 ppm for +25°C to +225°C ±500 ppm for +25°C to +250°C ±750 ppm for +25°C to +275°C	±350 ppm for +25°C to +225°C ±500 ppm for +25°C to +250°C ±750 ppm for +25°C to +275°C
Typical Supply Current at +25°C	3.3 V 1.2 mA for 6 MHz 2.0 mA for 12 MHz	5.0 V 2.2 mA for 6 MHz 3.7 mA for 12 MHz
Output Load (CMOS) ²	15 pF	15 pF
Start-up Time	5 ms MAX	5 ms MAX
Rise/Fall Time	10 ns MAX	10 ns MAX
Duty Cycle	40% MIN, 60% MAX	40% MIN, 60% MAX
Aging	Aging is dependent on frequency and other design considerations. Please contact factory.	
Shock, survival	Up to 30,000 g, 0.5 ms, 1/2 sine	Up to 30,000 g, 0.5 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ³	20 g, 10-2000 Hz, swept sine	20 g, 10-2000 Hz, swept sine
Operating Temperature Range	-55°C to +275°C	-55°C to +275°C

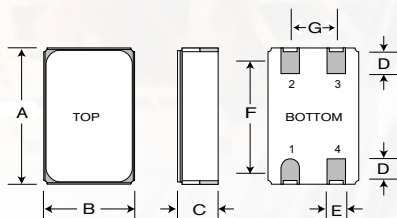
1. Does not include calibration tolerance. Other tolerances available.

2. TTL loads and higher CMOS loads available. Contact factory.

3. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Notes: Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice. All combinations may not be available.

HTXO



PIN CONNECTIONS

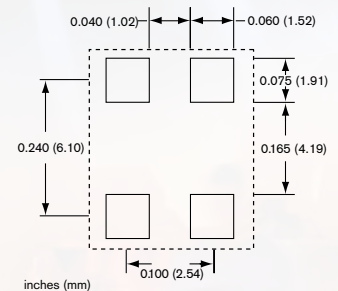
- 1 Enable/Disable (T) or not connected (N)
- 2 Ground
- 3 Output
- 4 V_{DD}

DIMENSIONS

DIM	TYP.		MAX.	
	inches	mm	inches	mm
A	0.295	7.50	0.302	7.68
B	0.197	5.00	0.204	5.18
C	0.059	1.50	0.065	1.65
D	0.055	1.40		
E	0.040	1.02		
F	0.240	6.10		
G	0.100	2.54		

Termination material is Au over Ni over W.
Solder dip (SM5) also available.

SUGGESTED LAND PATTERN



HT

SURFACE MOUNT OSCILLATORS



CXOXULPHT 200°C

3.2x2.5mm

Frequency Range	32.768 kHz
Supply Voltage	3.3 V
Standard Calibration Tolerance ¹	±10 ppm to ±25 ppm
Frequency Stability Over Temp. Range ²	±100 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C
Total Frequency Tolerance ¹	±200 ppm for +25°C to +200°C
Typical Supply Current at +25°C	55 µA
Output Load (CMOS) ³	15 pF
Start-up Time	20 ms TYP
Rise/Fall Time	4 ns / 5 ns TYP
Duty Cycle	45% MIN, 55% MAX
Aging, first year	Aging is dependent on frequency and other design considerations. Please contact factory.
Shock, survival	Up to 10,000 g, 0.3 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ⁴	20 g, 10-2000 Hz, swept sine
Operating Temperature Range	-55°C to +200°C

1. Other tolerances available.

2. Does not include calibration tolerance. Other tolerances available.

3. TTL loads and higher CMOS loads available. Contact factory.

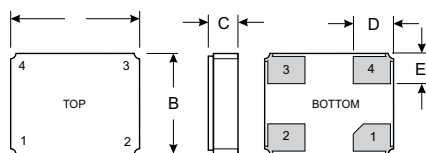
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Notes: Specifications are typical at 25°C unless otherwise noted.

Specifications are subject to change without notice.

All combinations may not be available.

CXOXULPHT



PIN CONNECTIONS

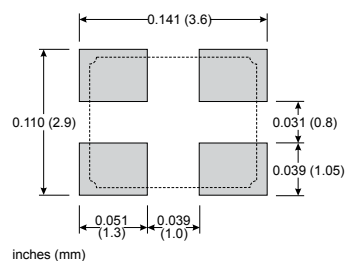
- 1 Enable/Disable (E) or not connected (N)
- 2 Ground
- 3 Output
- 4 V_{DD}

DIMENSIONS

DIM	TYP.		MAX.	
	inches	mm	inches	mm
A	0.126	3.20	0.136	3.40
B	0.099	2.50	0.107	2.70
C (SM1)	0.039	1.00	0.043	1.09
C (SM1/SM5)	0.044	1.12	0.048	1.21
D	0.040	1.00	0.041	1.10
E	0.030	0.75	0.031	0.85

Termination material is Au over Ni over W.
Solder dip (SM5) also available.

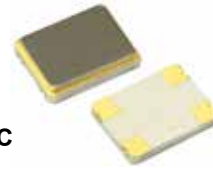
SUGGESTED LAND PATTERN



IN-HOUSE TEST CAPABILITIES FOR OSCILLATORS

Aging (Elevated Temperature)	MIL-PRF-55310, Para. 4.8.35	Salt Atmosphere	MIL-STD-883, Method 1009
Burn-in	MIL-PRF-55310, Table III	Solderability	MIL-STD-883, Method 2003
Die Shear Strength	MIL-STD-883, Method 2019	Temperature Cycling	MIL-STD-883, Method 1010
Fine/Gross Leak Testing	MIL-STD-883, Method 1014; MIL-STD-202, Method 112	Temperature Range	MIL-PRF-55310, Para. 1.2.1.3, Table III
Lead Integrity	MIL-STD-883, Method 2004	Thermal Shock	MIL-STD-202, Method 107
Moisture Resistance	MIL-STD-202, Method 106	Vibration	MIL-STD-202, Method 204
PIND (Particle Impact Noise Detection)	MIL-STD-883, Method 2020; MIL-STD-202, Method 217	Wirebond Pull Test	MIL-STD-883, Method 2023
MIL-PRF-55310 screening available			

HT SURFACE MOUNT OSCILLATORS



CXOMKHT 200°C

5.0x6.5mm

Frequency Range	200 kHz to 50 MHz	32.768 kHz
Supply Voltage	1.8 V, 2.5 V, 3.3 V and 5.0 V	3.3 V
Standard Calibration Tolerance ¹	±10 ppm to ±25 ppm	±10 ppm to ±25 ppm
Frequency Stability Over Temp. Range ²	±100 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C	±100 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C
Total Frequency Tolerance ¹	±200 ppm for +25°C to +200°C	±200 ppm for +25°C to +200°C
Typical Supply Current at +25°C	3.3 V 5.0 V	3.3 V
	2.6 mA for 24 MHz 8 mA for 24 MHz	500 µA
	3.3 mA for 32 MHz 10.5 mA for 32 MHz	
	4.7 mA for 50 MHz 15.5 mA for 50 MHz	
Output Load (CMOS) ³	15 pF	15 pF
Start-up Time	5 ms MAX	0.8 ms TYP
Rise/Fall Time	10 ns MAX	85 ns / 45 ns TYP
Duty Cycle	40% MIN, 60% MAX	40% MIN, 60% MAX
Aging, first year	Aging is dependent on frequency and other design considerations. Please contact factory.	
Shock, survival	Up to 100,000 g, 0.3 ms, 1/2 sine	Up to 10,000 g, 0.3 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ⁴	20 g, 10-2000 Hz, swept sine	20 g, 10-2000 Hz, swept sine
Operating Temperature Range	-55°C to +200°C	-55°C to +200°C

1. Other tolerances available.

2. Does not include calibration tolerance. Other tolerances available.

3. TTL loads and higher CMOS loads available. Contact factory.

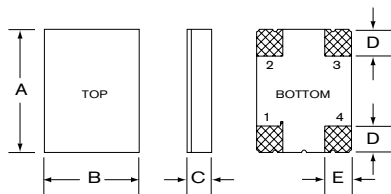
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Notes: Specifications are typical at 25°C unless otherwise noted.

Specifications are subject to change without notice.

All combinations may not be available.

CXOMKHT



PIN CONNECTIONS

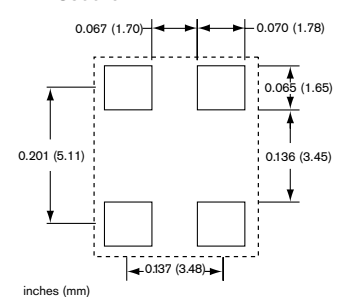
1	Enable/Disable (E or T)* or not connected (N)
2	Ground
3	Output
4	V _{DD}

* T version not available for 32.768 kHz

DIMENSIONS

DIM	inches	mm
A	0.263	6.68
B	0.204	5.18
C(SM1)	0.060	1.52
C(SM5)	0.065	1.65
D	0.065	1.65
E	0.070	1.78

SUGGESTED LAND PATTERN



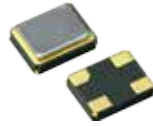
High-Shock • High-Temperature • High-Precision
Defense and Avionics | Industrial | Medical

ROBUST SOLUTIONS FOR EXTREME CONDITIONS

AS9100D • ISO 9001:2015

HT

SURFACE MOUNT OSCILLATORS



CXOXHT 200°C

3.2x2.5mm

Frequency Range	1 MHz to 50 MHz	32.768 kHz
Supply Voltage	1.8 V, 2.5 V, 3.3 V and 5.0 V	3.3 V
Standard Calibration Tolerance ¹	±10 ppm to ±25 ppm	±10 ppm to ±25 ppm
Frequency Stability Over Temp. Range ²	±100 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C	±100 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C
Total Frequency Tolerance ¹	±200 ppm for +25°C to +200°C	±200 ppm for +25°C to +200°C
Typical Supply Current at +25°C	3.3 V 5.0 V	3.3 V
	2.4 mA for 24 MHz 8 mA for 24 MHz 3.0 mA for 32 MHz 10.5 mA for 32 MHz 4.2 mA for 50 MHz 15.5 mA for 50 MHz	500 µA
Output Load (CMOS) ³	15 pF	15 pF
Start-up Time	5 ms MAX	0.8 ms TYP
Rise/Fall Time	10 ns MAX	85 ns / 45 ns TYP
Duty Cycle	40% MIN, 60% MAX	40% MIN, 60% MAX
Aging, first year	Aging is dependent on frequency and other design considerations. Please contact factory.	
Shock, survival	Up to 100,000 g, 0.5 ms, 1/2 sine	Up to 30,000 g, 0.3 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ⁴	20 g, 10-2000 Hz, swept sine	20 g, 10-2000 Hz, swept sine
Operating Temperature Range	-55°C to +200°C	-55°C to +200°C

1. Other tolerances available.

2. Does not include calibration tolerance. Other tolerances available.

3. TTL loads and higher CMOS loads available. Contact factory.

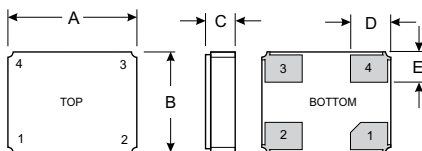
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Notes: Specifications are typical at 25°C unless otherwise noted.

Specifications are subject to change without notice.

All combinations may not be available.

CXOXHT



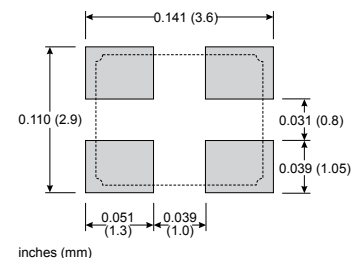
PIN CONNECTIONS

- 1 Enable/Disable (E) or not connected (N)
- 2 Ground
- 3 Output
- 4 VDD

DIMENSIONS

DIM	inches	mm
A	0.136	3.40
B	0.107	2.70
C (gold plated)	0.043	1.09
C (solder dipped)	0.048	1.21
D	0.041	1.10
E	0.031	0.85

SUGGESTED LAND PATTERN



HT

Surface Mount OSCILLATORS



HTO57 250°C

5x7mm

Frequency Range	1.5 MHz to 50 MHz	32.768 kHz
Supply Voltage	3.3 V and 5.0 V	3.3 V and 5.0 V
Typical Calibration Tolerance ¹	±10 ppm to ±25 ppm	±10 ppm to ±25 ppm
Frequency Stability Over Temp. Range ²	±250 ppm for +25°C to +225°C ±400 ppm for +25°C to +250°C	±250 ppm for +25°C to +225°C ±400 ppm for +25°C to +250°C
Total Frequency Tolerance	±350 ppm for +25°C to +225°C ±500 ppm for +25°C to +250°C	±350 ppm for +25°C to +225°C ±500 ppm for +25°C to +250°C
Typical Supply Current at +25°C	3.3 V 1.2 mA for 6 MHz 2.0 mA for 12 MHz	5.0 V 2.2 mA for 6 MHz 3.7 mA for 12 MHz
Output Load (CMOS) ³	15 pF	15 pF
Start-up Time	5 ms MAX	0.8 ms TYP
Rise/Fall Time	10 ns MAX	85 ns / 45 ns TYP
Duty Cycle	40% MIN, 60% MAX	40% MIN, 60% MAX
Aging, first year	Aging is dependent on frequency and other design considerations. Please contact factory.	
Shock, survival	Up to 30,000 g, 0.5 ms, 1/2 sine	Up to 30,000 g, 0.5 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ⁴	20 g, 10-2000 Hz, swept sine	20 g, 10-2000 Hz, swept sine
Operating Temperature Range	-55°C to +250°C	-55°C to +250°C

1. Other tolerances available.

2. Does not include calibration tolerance. Other tolerances available.

3. TTL loads and higher CMOS loads available. Contact factory.

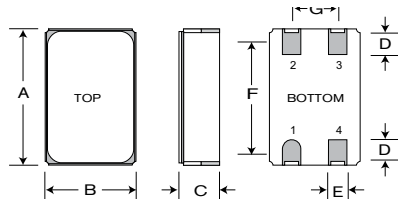
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Notes: Specifications are typical at 25°C unless otherwise noted.

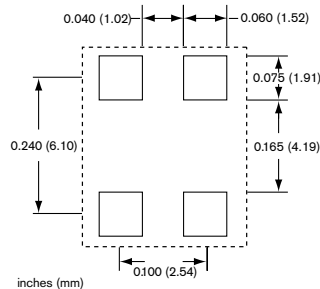
Specifications are subject to change without notice.

All combinations may not be available.

HTO57



PIN CONNECTIONS	
1	Enable/Disable (E) or not connected (N)
2	Ground
3	Output
4	VDD



DIMENSIONS

DIM	TYP.		MAX.	
	inches	mm	inches	mm
A	0.276	7.00	0.283	7.18
B	0.197	5.00	0.204	5.18
C	0.059	1.50	0.065	1.65
D	0.055	1.40		
E	0.040	1.00		
F	0.200	5.08		
G	0.117	2.97		

How to Order | Specify a High Temperature and High Shock Oscillator

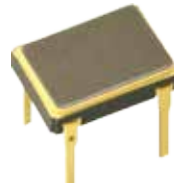
example									
CXOXHT		4	A		N	SM5	- 32.0M	, - / - / 200 /	H
Model Number	Supply Voltage Code	Shock Level Code	Special or Custom	Enable/Disable Option Code	Termination Code	Frequency and Code	Frequency Accuracy / Frequency Stability / or Total Stability Code /	Operating Temperature Range Code	
HTXO* CXOXLPHT* CXOMKHT CXOXHT HTO57	1 = 1.8V 2 = 2.5V 4 = 3.3V 5 = 5.0V	A = 5,000 g B = 10,000 g C = 20,000 g D = 30,000 g F = 50,000 g G = 75,000 g H = 100,000 g	S = Special or custom Blank = Standard	E, T, or N E and T are not available in all frequencies; contact factory with specific requirements.	Blank = Gold Plated (Lead Free) SM3 = Solder (60/40 Sn-Pb) SM5 = Solder (Lead Free)	K = kHz M = MHz	Accuracy at 25°C (in ppm) / Frequency Stability over Temperature (in ppm) / or Total Frequency Tolerance over Temperature (in ppm) /	H = +25°C to +200°C S = Customer specified HTXO / HTO57 only: Q = +25°C to +225°C W = +25°C to +250°C X = +25°C to +275°C	
HTXO/HTO57 available in 3.3V or 5.0V only CXOXLPHT available in 3.3V only									

*HTXO/HTO57 available in 3.3V or 5.0V only

*CXOXLPHT available in 3.3V only

- Through-hole features**
- Reduces mechanical and thermal mounting stresses
 - Robust lead attach-eutectic brazing process
 - Optional output enable/disable
 - Hermetically sealed package
 - Gold plated kovar leads

HT THRU-HOLE OSCILLATORS



LHTAT 275°C
5x7mm w/ Leads

Frequency Range	320 kHz to 50 MHz	32.768 kHz
Supply Voltage	3.3 V and 5.0 V	3.3 V and 5.0 V
Typical Calibration Tolerance ¹	±10 ppm to ±25 ppm	±10 ppm to ±25 ppm
Frequency Stability Over Temp. Range ²	±250 ppm for +25°C to +225°C ±400 ppm for +25°C to +250°C ±650 ppm for +25°C to +275°C	±250 ppm for +25°C to +225°C ±400 ppm for +25°C to +250°C ±650 ppm for +25°C to +275°C
Total Frequency Tolerance	±350 ppm for +25°C to +225°C ±500 ppm for +25°C to +250°C ±750 ppm for +25°C to +275°C	±350 ppm for +25°C to +225°C ±500 ppm for +25°C to +250°C ±750 ppm for +25°C to +275°C
Typical Supply Current at +25°C	3.3 V 1.2 mA for 6 MHz 2.0 mA for 12 MHz	5.0 V 2.2 mA for 6 MHz 3.7 mA for 12 MHz
Output Load (CMOS) ³	15 pF	15 pF
Start-up Time	5 ms MAX	0.8 ms TYP
Rise/Fall Time	10 ns MAX	85 ns / 45 ns TYP
Duty Cycle	40% MIN, 60% MAX	40% MIN, 60% MAX
Aging, first year	Aging is dependent on frequency and other design considerations. Please contact factory.	
Shock, survival	Up to 30,000 g, 0.5 ms, 1/2 sine	Up to 30,000 g, 0.5 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ⁴	20 g, 10-2000 Hz, swept sine	20 g, 10-2000 Hz, swept sine
Operating Temperature Range	-55°C to +200°C	-55°C to +200°C

1. Other tolerances available.

2. Does not include calibration tolerance. Other tolerances available.

3. TTL loads and higher CMOS loads available. Contact factory.

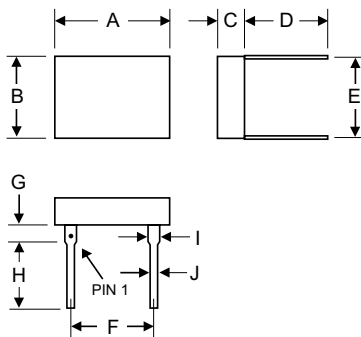
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Notes: Specifications are typical at 25°C unless otherwise noted.

Specifications are subject to change without notice.

All combinations may not be available.

LHTAT



PIN CONNECTIONS

1	Enable/Disable (E) or not connected (N)
2	Ground
3	Output
4	VDD

DIMENSIONS

DIM	TYP.		MAX.	
	inches	mm	inches	mm
A	0.276	7.00	0.281	7.14
B	0.197	5.00	0.202	5.13
C	0.065	1.65	0.070	1.78
D	0.200	5.08	0.205	5.20
E	0.195	4.90	0.205	5.20
F	0.200	5.08	0.205	5.20
G	0.040	1.02	—	—
H	0.160	4.06	—	—
I	0.028	0.71	—	—
J	0.018	0.46	0.021	0.53

How to Order | Specify a High Temperature Oscillator

example	LHTAT	5	S	HG	N	05	- 32.0M	- / - / 200 /	H
Model Number	LHTAT	Supply Voltage Code	Special or Custom	Shock Level Code	Enable/Disable Option Code	Termination Code	Frequency and Code	Frequency Accuracy / Frequency Stability / or Total Stability Code /	Operating Temperature Range Code
		4 = 3.3V 5 = 5.0V	S = Special or custom Blank = Standard	Blank = Standard HG = 30,000g	E, T, or N E and T are not available in all frequencies; contact factory with specific requirements.	Blank = Gold Plated (Lead Free) 05 = Solder (Lead Free)	K = kHz M = MHz	Accuracy at 25°C (in ppm) / Frequency Stability over Temperature (in ppm) / or Total Frequency Tolerance over Temperature (in ppm) /	H = +25°C to +200°C Q = +25°C to +225°C W = +25°C to +250°C X = +25°C to +275°C S = Customer Specified

HT

SURFACE MOUNT CRYSTALS



CX1VHT 200°C
8.0x3.6mm

CX1HT 225°C
8.0x3.6mm

Frequency Range	10 kHz to 600 kHz	6 MHz to 50 MHz
Fundamental Frequency	32.768 kHz	10 MHz 32 MHz
Motional Resistance R1 (Ω)	40k	30 25
Motional Capacitance C1 (fF)	2.3	5.5 6.2
Quality Factor Q (k)	53	100 30
Shunt Capacitance C0 (pF)	1.7	2.2 2.3
Typical Calibration Tolerance at +25°C ¹	±100 ppm	±100 ppm
Frequency Stability Over Temp. Range ²	Frequency f(T) at temperature T is related to frequency f(T0) at turning point temperature T0 by: $f(T) - f(T0) / f(T0) = k \times (T-T0)^2$ with the temperature coefficient $k = -0.035 \text{ ppm} / ^\circ\text{C}^2$	±125 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C ±250 ppm for +25°C to +225°C
Drive Level	0.5 μW max	500 μW max
Load Capacitance ³	9 pF	10 pF
Aging	Aging is dependent on frequency and other design considerations. Please contact factory.	
Shock, survival ⁴	Up to 1,000 g, 1 ms, 1/2 sine	Up to 1,000 g, 1 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ⁵	20 g, 10-2,000 Hz swept sine	20 g, 10-2,000 Hz swept sine
Operating Temperature Range	-55°C to +200°C	-55°C to +225°C
Max Process Temperature	+260°C for 20 sec.	+260°C for 20 sec.

1. Other tolerances available. Contact factory.

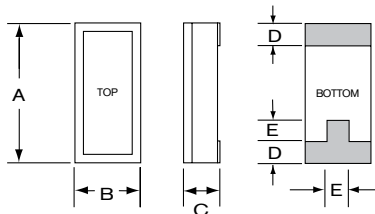
2. Does not include calibration tolerance. Other tolerances available.

3. Other load capacitance values available. Contact factory.

4. For higher levels, contact the factory.

5. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

CX1VHT / CX1HT

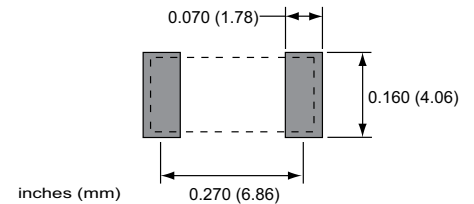


DIMENSIONS

MAX.

DIM	inches	mm
A	0.330	8.38
B	0.155	3.94
C (SM1)	0.070	1.78
C (SM5)	0.075	1.90
D	0.055	1.40
E	0.070	1.78
F	0.070	1.78

SUGGESTED LAND PATTERN



HT

SURFACE MOUNT CRYSTALS



CX4VHT 200°C
5.0x1.8mm

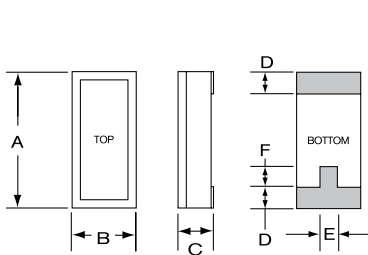
CX4HT 225°C
5.0x1.8mm

Frequency	30 kHz to 250 kHz	14 MHz to 50 MHz		
Fundamental Frequency	32.768 kHz	16 MHz	32 MHz	40 MHz
Motional Resistance R1 (Ω)	70k	75	30	30
Motional Capacitance C1 (fF)	2.3	1.5	2.5	1.5
Quality Factor Q (k)	31	90	70	90
Shunt Capacitance C0 (pF)	1.1	0.9	1.1	1.0
Typical Calibration Tolerance at +25°C¹	±100 ppm	±100 ppm		
Frequency Stability Over Temp. Range	Frequency f(T) at temperature T is related to frequency f(T0) at turning point temperature T0 by: f(T) - f(T0) / f(T0) = k x (T-T0)² with the temperature coefficient k = -0.035 ppm / °C²	±125 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C ±250 ppm for +25°C to +225°C		
Drive Level	0.5 μW max	200 μW max		
Load Capacitance²	9 pF	10 pF		
Aging	Aging is dependent on frequency and other design considerations. Please contact factory.			
Shock, survival³	5,000 g, 3 ms, 1/2 sine	5,000 g, 0.3 ms, 1/2 sine		
Vibration, survival per MIL-STD-202G⁴	20 g, 10-2,000 Hz swept sine	20 g, 10-2,000 Hz swept sine		
Operating Temperature Range	-55°C to +200°C	-55°C to +225°C		
Max Process Temperature	+260°C for 20 sec.	+260°C for 20 sec.		

1. Other tolerances available. Contact factory.
2. Other load capacitance values available. Contact factory.
3. For higher levels, contact factory.
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Notes: Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice. All combinations may not be available.

CX4VHT / CX4HT

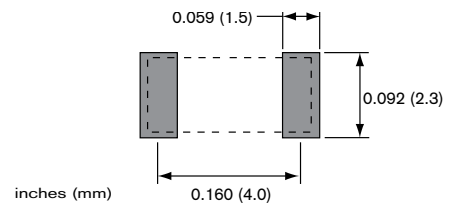


DIMENSIONS

MAX.

DIM	inches	mm
A	0.210	5.33
B	0.085	2.16
C (SM1)	0.050	1.27
C (SM5)	0.053	1.35
D	0.046	1.16
E	0.020	0.51
F	0.025	0.64

SUGGESTED LAND PATTERN



Notes: Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice. All combinations may not be available.

IN-HOUSE TEST CAPABILITIES FOR CRYSTALS

Electrical Testing	All crystal parameters	PIND (Particle Impact Noise Detection)	MIL-STD-883, Method 2020, Condition A
Temperature Testing	Crystal frequency and resistance over temperature	Radiographic Inspection	MIL-STD-202, Method 209
Thermal Shock	MIL-STD-202, Method 107, Condition B	Moisture Resistance	MIL-STD-202, Method 106
Fine & Gross Leak Testing	MIL-STD-202, Method 112	Salt Atmosphere	MIL-STD-883, Method 1009
Mechanical Shock	MIL-STD-202, Method 213, Conditions A-F	Solderability	MIL-STD-883, Method 2003
Vibration	MIL-STD-202, Method 204, Condition D	Aging	MIL-PRF-3098

HT SURFACE MOUNT CRYSTALS



CX9VHT 200°C

4.1x1.5mm

CX9HT 225°C

4.1x1.5mm

Frequency Range	32 kHz to 160 kHz	14 MHz to 250 MHz
Fundamental Frequency	32.768 kHz	25 MHz 49 MHz
Motional Resistance R1 (Ω)	100k	30 30
Motional Capacitance C1 (fF)	2.2	1.8 2.1
Quality Factor Q (k)	22	120 60
Shunt Capacitance C0 (pF)	1.0	1.0 1.0
Typical Calibration Tolerance at +25°C ¹	±100 ppm	±100 ppm
Frequency Stability Over Temp. Range ²	±125 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C ±250 ppm for +25°C to +225°C	±125 ppm for +25°C to +150°C ±150 ppm for +25°C to +175°C ±175 ppm for +25°C to +200°C ±250 ppm for +25°C to +225°C
Drive Level	500 µW max	100 µW max, 200 µW max
Load Capacitance ³	9 pF	10 pF
Aging	Aging is dependent on frequency and other design considerations. Please contact factory.	
Shock, survival ⁴	Up to 5,000 g, 0.3 ms, 1/2 sine	Up to 5,000 g, 0.3 ms, 1/2 sine
Vibration, survival per MIL-STD-202G ⁵	20 g RMS, 10-2,000 Hz swept sine	20 g, 10-2,000 Hz swept sine
Operating Temperature Range	-55°C to +225°C	-55°C to +225°C
Max Process Temperature	+260°C for 20 sec.	+260°C for 20 sec.

1. Other tolerances available. Contact factory.

2. Does not include calibration tolerance. Other tolerances available.

3. Other load capacitance values available. Contact factory.

4. For higher levels, contact the factory.

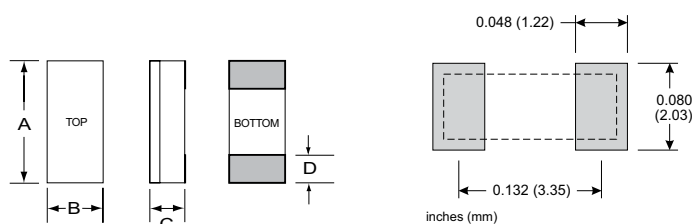
5. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

CX9VHT / CX9HT

Crystal Connections are between Pad 1 and Pads 2

DIMENSIONS

MAX.



DIM	inches	mm
A	0.170	4.32
B	0.068	1.73
C (SM1)	0.038	0.97
C (SM5)	0.040	1.02
D	0.038	0.97

How to Order | Specify a High Temperature Crystal

example CX1HT	S	C	SM1	32.0M	100 / 175 / - /	H	10
Model Number	Special or Custom Code	Lid Code	Termination Code	Frequency and Code	Stability For High Frequency	Operating Temperature Range Code	Load Capacitance (CL)
CX1VHT CX1HT CX4VHT CX4HT CX9VHT CX9HT	S = Special or custom Blank = Standard	C = Ceramic Lid	SM1 = Gold Plated (Lead Free) SM3 = Solder (60/40 Sn-Pb) SM5 = Solder (Lead Free)	K = kHz M = MHz	Accuracy at 25°C (in ppm) / Frequency Stability over Temperature Range (in ppm)	H = +25°C to +200°C Q = +25°C to +225°C S = Customer specified	Specify in pF
Note: Other package styles are available, please inquire.				Stability For Low Frequency	Specify only- Accuracy at 25°C (in ppm)		



Statek Corporation
512 N. Main Street
Orange, California

Statek Corporation maintains synergetic relationships with its sister companies Greenray Industries (high precision oscillators) and Advanced Technical Ceramics Company (HTCC, ceramic feedthroughs, multilayer ALN, chemical milling, injection molding) both leaders in their respective industries. Our alliance helps us to serve our customers with leading-edge innovation and world-class manufacturing, all from a single source.



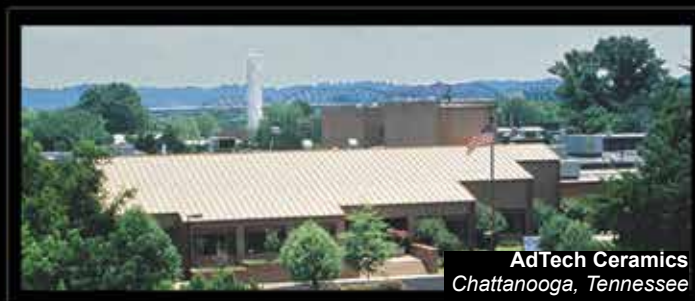
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Mechanicsburg, Pennsylvania



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AS9100D

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512 N. Main Street

Orange, California 92868

Tel. 714-639-7810

Fax 714-997-1256

www.statek.com