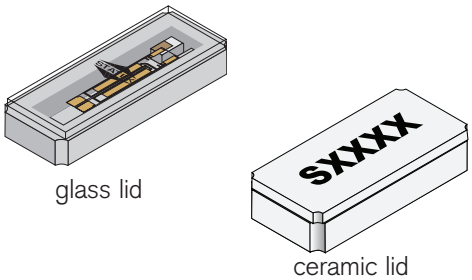
CX11VSM CRYSTAL

32 kHz to 180 kHz

Surface Mount Quartz Crystal

DESCRIPTION

Designed and manufactured in the USA, Statek's CX11VSM tuning-fork quartz crystal has an extremely small footprint (3.2 mm x 1.5 mm) and a very low profile (under 1 mm). For applications where space or mass are a premium, the small size and low mass of the CX11VSM make it the ideal choice.



glass lid

ceramic lid

FEATURES

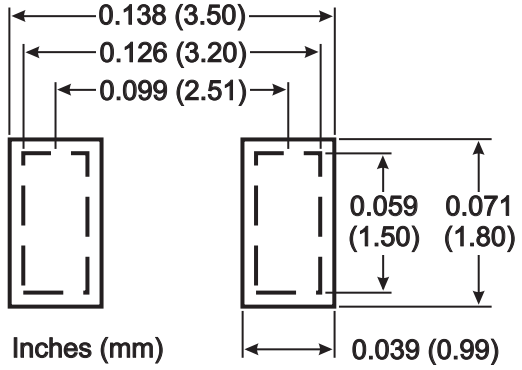
- Ultra-miniature
- Low profile (less than 1 mm)
- Low mass (12 mg for SM1 with ceramic lid)
- Surface mount
- Available with ceramic or glass lid
- High shock and vibration survival
- Excellent aging characteristics
- Ideal for low power applications
- Full military testing available
- Designed and manufactured in the USA

APPLICATIONS

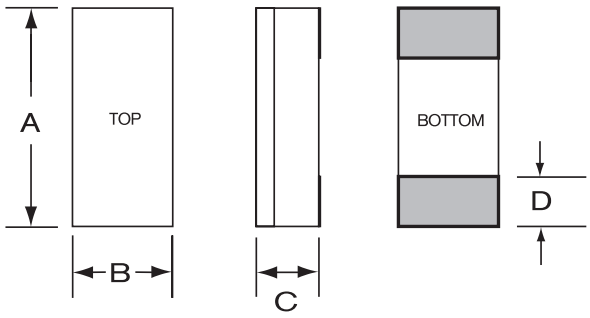
Medical

- CRM
- Infusion pumps
- Diabetes Control

SUGGESTED LAND PATTERN



PACKAGE DIMENSIONS



	TYPICAL		MAXIMUM	
DIM	inches	mm	inches	mm
A	0.127	3.20	0.135	3.43
B	0.060	1.50	0.068	1.73
C	-	-	see below	
D	0.027	0.69	0.037	0.94

THICKNESS (DIM C)

Lid	Termination	Typical		Maximum	
		inches	mm	inches	mm
Ceramic	SM1	0.030	0.77	0.035	0.90
	SM2/SM4	0.031	0.79	0.036	0.92
	SM3/SM5	0.033	0.84	0.038	0.97
Glass	SM1	0.029	0.74	0.034	0.87
	SM2/SM4	0.030	0.77	0.035	0.89
	SM3/SM5	0.032	0.81	0.037	0.94
Thin Glass	SM1	0.025	0.64	0.030	0.77
	SM2/SM4	0.026	0.66	0.031	0.79
	SM3/SM5	0.028	0.71	0.033	0.84

TERMINATIONS

Designation	Termination
SM1	Gold Plated
SM2	Solder Plated
SM3	Solder Dipped
SM4	Solder Plated (Lead Free)
SM5	Solder Dipped (Lead Free)

STATEK CORPORATION 512 N. MAIN ST., ORANGE, CA 92868 714-639-7810 FAX: 714-997-1256 **www.statek.com**

SPECIFICATIONS

Specifications are typical at 25°C unless otherwise noted.
Specifications are subject to change without notice.

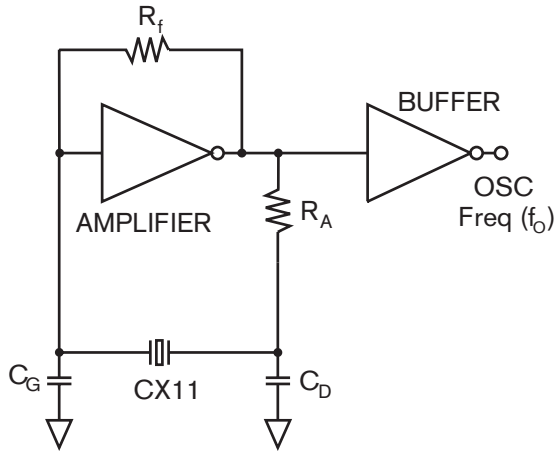
Fundamental Frequency	32.768 kHz	50 kHz	100 kHz
Motional Resistance R_1	50 kΩ	40 kΩ	20 kΩ
Motional Capacitance C_1	3.5 fF	1.4 fF	1.0 fF
Quality Factor Q	25,000	55,000	70,000
Shunt Capacitance C_0	1.0 pF	0.8 pF	0.8 pF
Load Capacitance[1]	9 pF	9 pF	9 pF
Mass (SM1, ceramic lid)	12 mg	12 mg	12 mg
Temperature Characterization[2]			
Turnover Temperature[3] T_0	25 °C	17 °C	18 °C
Frequency - Temperature Constant k	-0.035 ppm/°C²		
Standard Calibration Tolerance[4]	± 20 ppm	±100 ppm	
Drive Level	0.5 µW MAX		
Aging, first year	3 ppm MAX		
Shock, survival	5,000 g, 0.3 ms, 1/2 sine		
Vibration, survival	20 g, 10-2,000 Hz swept sine		
Operating Temp. Range	-10°C to +70°C (Commercial) -40°C to +85°C (Industrial) -55°C to +125°C (Military)		
Storage Temp. Range	-55°C to +125°C		
Max Process Temperature	260°C for 20 sec.		

1. Other load capacitances available.
2. The crystal frequency f as a function of temperature T follows the parabolic relationship

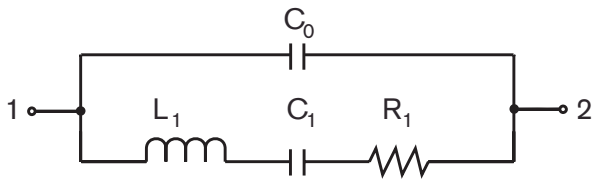
$$f(T) = f(T_0)\,[1 + k\,(T - T_0)^2],$$

where T_0 is the turnover temperature and k is the frequency-temperature constant.
3. Other turnover temperatures available.
4. Tighter tolerances available.

CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT



EQUIVALENT CIRCUIT



R_1 Motional Resistance L_1 Motional Inductance
C_1 Motional Capacitance C_0 Shunt Capacitance

PACKAGING OPTIONS

- Tray Pack
- 12 mm tape, 7"or 13" reels
  Per EIA 481 (see Tape and Reel data sheet 10109)

HOW TO ORDER CX11VSM CRYSTALS

CX11V **S** **C** **SM1** – **32.768K** , **100** / **I** , **9pF**

- **S**: "S" if special or custom design. Blank if Std.
- **C**: Blank = Glass Lid; T = Thin Glass Lid; C = Ceramic Lid
- **SM1**: SM1 = Gold Plated (Lead Free); SM2 = Solder Plated; SM3 = Solder Dipped; SM4 = Solder Plated (Lead Free); SM5 = Solder Dipped (Lead Free)
- **32.768K**: Frequency K = kHz
- **100**: Calibration Tolerance @ 25°C (in ppm)
- **I**: Temp. Range: C = -10°C to +70°C; I = -40°C to +85°C; M = -55°C to +125°C; S = Customer Specified
- **9pF**: Load Capacitance (Customer Specified)

Note: Crystals with SM1, SM4 or SM5 terminations are Pb-free.
Crystals with SM2 or SM3 terminations contain Pb.

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