

Ultra-Miniature SMD Crystal

32.768kHz, 100kHz to 180kHz

FEATURES

- Frequency Range 32.768kHz and 100kHz to 180kHz
- High shock resistance
- Ultra-small ceramic package
- Low ageing
- Designed for low power applications
- Full MIL testing available

DESCRIPTION

CX11SM crystals are leadless devices designed for surface mounting on PCBs or hybrid substrates. The crystals have very small outline and low-profile and are suited for all low frequency applications. Designed and manufactured by Statek Inc.

SPECIFICATION

Specifications stated are typical at 25°C unless otherwise indicated. Specifications may change without notice.

| Parameters | Fundamental | |
|--|-------------|---------|
| Frequency (kHz): | 32.768 | 100.0 |
| Motional Resistance R1 (kΩ): | 50 | 20 |
| Motional Capacitance C1 (ff): | 3.5 | 1.0 |
| Quality Factor Q (k): | 25 | 70 |
| Shunt Capacitance C0 (pF): | 1.0 | 0.8 |
| Load Capacitance (pF) ¹ : | 9 | 9 |
| Mass (Ceramic lid, SM1) | 12mg | 12mg |
| Turnover Temperature (°C) ^{2,3} : | 25 | 18 |
| Calibration Tolerance ⁴ : | ±20ppm | ±100ppm |

| | |
|---------------------------------|-------------------------------|
| Drive Level: | 0.5μW max. |
| Freq./Temperature Constant (k): | -0.035ppm/°C ² |
| Ageing, first year: | 3ppm maximum |
| Shock, Survival: | 5,000g, 0.3ms, 1/2 sine |
| Vibration, survival: | 20g rms, 10~2000Hz swept sine |
| Operating Temperature Range | |
| Commercial: | -10° to +70°C |
| Industrial: | -40° to +85°C |
| Military: | -55 to +125°C |
| Storage Temperature Range: | -55° to +125°C |
| Maximum Process Temperature: | +260°C for 20 seconds |

1. Other load capacitance values are 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 temperature available.
4. Tighter tolerances available.

PACKAGING OPTIONS

CX11SM crystals are available either tray packed (<250pcs) or tape and reel (>250 pieces).
12mm tape, 178mm or 330mm reels (EIA 418).

HOW TO ORDER CX11SM CRYSTALS

CX11 - S - C - SM1 - 32.768K, 100 / I

'S' if special, custom design. Otherwise leave blank

Blank = glass lid
C = ceramic lid

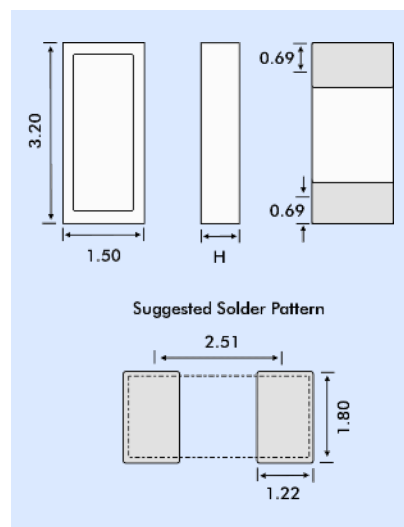
Terminations
 SM1 = Gold plated *
 SM2 = Solder plated
 SM3 = Solder dipped
 SM4 = Solder plated *
 SM5 = Solder dipped *
 * = Lead free

Frequency
K = kHz

Calibration Tolerance*
 A
 B
 C

Temp. Range
 C = -10° ~ +70°C
 I = -40° ~ +85°C
 M = -55° ~ +125°C
 S = Customer specified

OUTLINE & DIMENSIONS

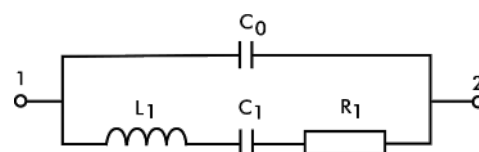


| Dim. H | Glass Lid | Ceramic Lid | Thin Glass Lid |
|--------|-----------|-------------|----------------|
| SM1 | 0.74 | 0.77 | 0.77 |
| SM2 | 0.77 | 0.79 | 0.79 |
| SM3 | 0.81 | 0.84 | 0.71 |
| SM4 | 0.77 | 0.79 | 0.79 |
| SM5 | 0.81 | 0.84 | 0.71 |

TERMINATIONS - PLATING

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

CRYSTAL EQUIVALENT CIRCUIT



R1 Motional Resistance L1 Motional Inductance
 C1 Motional Capacitance C0 Shunt Capacitance