



actual size

Quartz Crystal SMQ32SL

- SMD Tuning Fork Crystal • 8.0 x 3.8 mm
- 32.768 kHz standard
- package height 2.5 mm max.



RoHS compliant



Pb free pads



REACH compliant



Conflict mineral free

GENERAL DATA	
TYPE	SMQ32SL
frequency	32.768 kHz (30.0 ~ 100.0 kHz on request)
frequency tolerance at 25 °C ± 5 °C	± 20 ppm / ± 30 ppm ± 10 ppm (ask if available)
load capacitance C_L	12.5 pF std. (6 pF ~ 16 pF on request)
temperature constant (T_C)	$T_C = -0.04 \text{ ppm} / ^\circ\text{C}^2 \text{ max.}$ $T_C = -0.034 \text{ ppm} / ^\circ\text{C}^2 \text{ typical}$
frequency temperature characteristic	$\Delta f = T_C \cdot (T_A - T_{TP})^2$ in [ppm] T_A = actual ambient temperature $T_{TP} = 25 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ T_{TP} = turning point temperature
operating temperature range	-20 °C ~ +70 °C / -40 °C ~ +85 °C
shunt capacitance C_0	1.3 pF typical
series resistance max. (ESR)	50 kΩ (35 kΩ ask if available)
storage temperature	-40 °C ~ +90 °C
drive level max.	1 μW
aging first year	< ± 3 ppm

TABLE 1: FREQUENCY STABILITY VS. TEMPERATURE

frequency stability		-80 ppm	-160 ppm
-20 °C ~ +70 °C	STD.	●	
-40 °C ~ +85 °C	T1		●

● standard

MARKING

frequency (optional)
internal code / date code

DIMENSIONS

top view: #1, #2, #3, #4, 4.0 max.
 side view: 5.5^{+0.1}, 2.4^{+0.1}
 bottom view: 0.5^{+0.1}, 1.0 max., 8.0^{+0.2}
 crystal connection: #1, #2, #3, #4, #2 - #3: not connected
 pad layout: 1.9^{+0.1}, 1.3^{+0.1}, 4.2^{+0.1}, 1.3^{+0.1}

Terminals
1 - # 4 X-tal
2 - # 3 NC

in mm

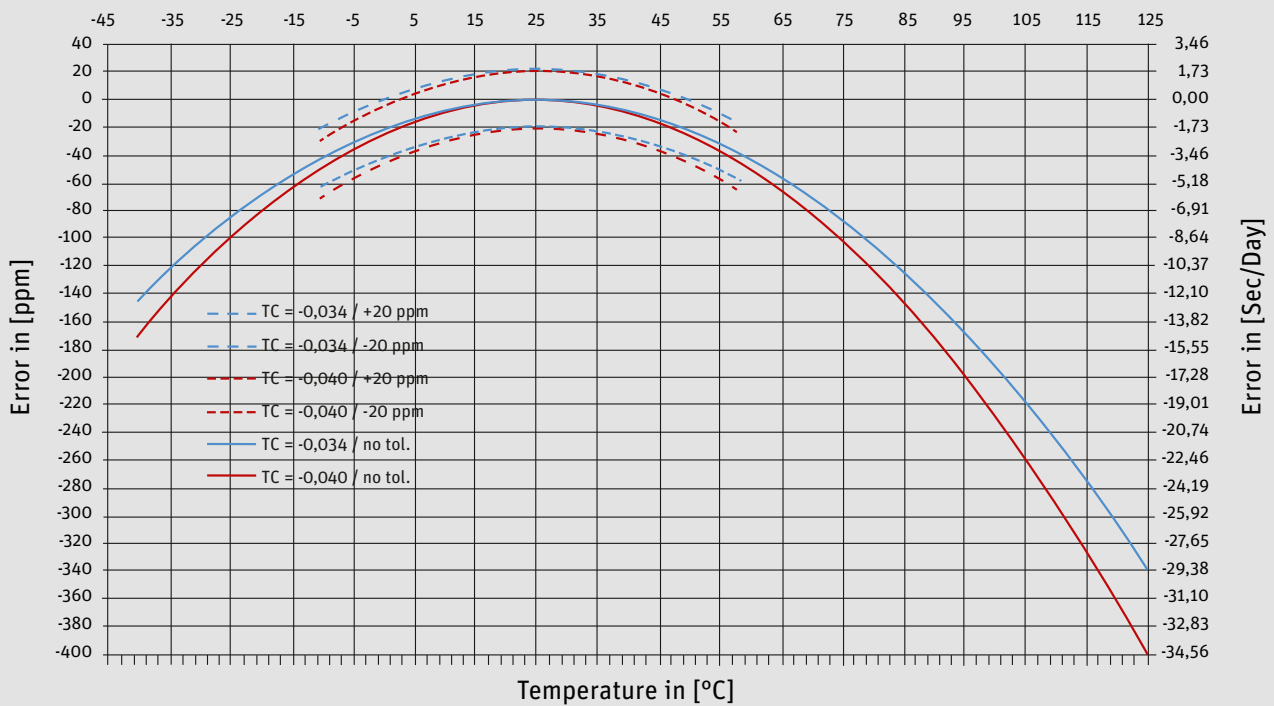
ORDER INFORMATION

Q	frequency	type	load capacitance	tolerance at 25 °C	option
Quartz	0.032768 MHz	SMQ32SL	12.5 pF Std. 6 pF ~ 16 pF (on request)	10 = ±10 ppm 20 = ±20 ppm 30 = ±30 ppm	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C

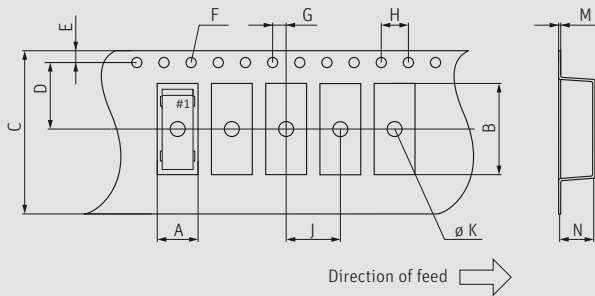
Example: Q 0.032768-SMQ32SL-12.5-20-T1-LF (Suffix LF = RoHS compliant / Pb free pads)

Quartz Crystal SMQ32SL

FREQUENCY ERROR VS. TEMPERATURE IN PPM OR SECONDS PER DAY



TAPING SPECIFICATION

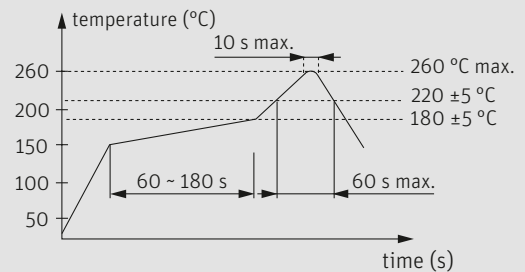


1000 pcs per reel

in mm

A	B	C	D	E	G
4.1 ^{±0.2}	8.4 ^{±0.2}	16.0 ^{±0.3}	7.5 ^{±0.1}	1.75 ^{±0.1}	ø1.5 ^{±0.1}
G	H	J	K	L	M
2.0 ^{±0.1}	4.0 ^{±0.1}	8.0 ^{±0.1}	ø2.5 max.	0.3 ^{±0.05}	2.7 ^{±0.1}

REFLOW SOLDERING PROFILE



note: parts are also suitable for soldering systems with lead (Pb) content