

Features

- ± 20 ppm (Tolerance) Available
- Ultra-Miniature Package
- Tape and Reel

Applications

- Real Time Clock
- Measurement instruments
- Wireless Applications



Part Numbering Guide

SWS 21 2 12 D 48 - 32.768K

SUNTSU WATCH SMT
CRYSTAL

2.0mm x 1.2mm

2 PAD

LOAD CAPACITANCE

12 : 12.5pF

9 : 9.0pF

7 : 7.0pF

6 : 6.0pF

FREQUENCY TOLERANCE

D : ± 20 ppm

F : ± 10 ppm

OPERATING TEMPERATURE RANGE

16 : $-10^{\circ}\text{C} - +60^{\circ}\text{C}$

27 : $-20^{\circ}\text{C} - +70^{\circ}\text{C}$

48 : $-40^{\circ}\text{C} - +85^{\circ}\text{C}$

FREQUENCY
kHz



Cage Code: 4GUT4

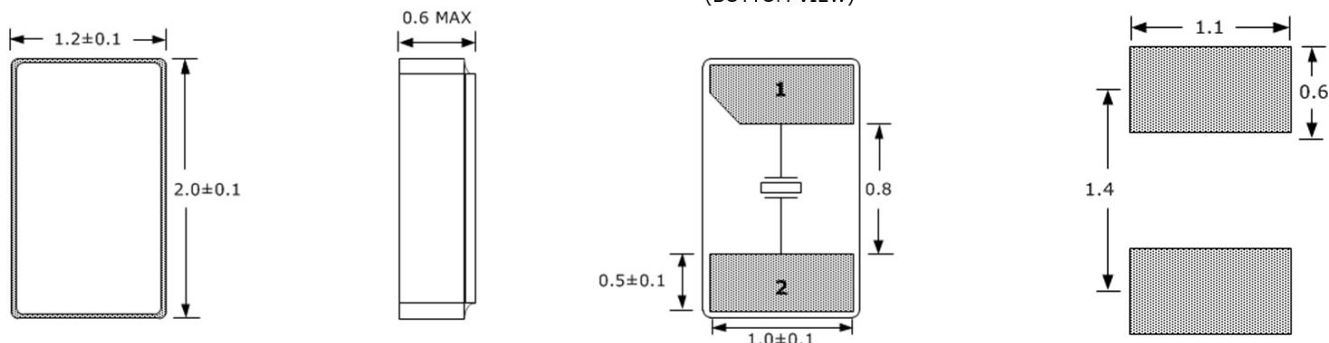
To customize your parameters contact a Suntsu representative.

Electrical Parameters	Units	Minimum	Typical	Maximum	Remarks
Frequency Range	kHz		32.768		
Frequency Tolerance at $+25^{\circ}\text{C}$	ppm	-20		+20	See part numbering guide for options.
Frequency Stability vs. Aging	ppm	-3		+3	First year @ $+25^{\circ}\text{C}$.
Frequency Coefficient (β)	ppm/ T^2	-0.040	-0.030	-0.020	
Operating Temperature	$^{\circ}\text{C}$	-40		+85	See part numbering guide for options.
Turnover Temperature	$^{\circ}\text{C}$	+20	+25	+30	
Storage Temperature	$^{\circ}\text{C}$	-55		+125	
Load Capacitance	pF			12.5	See part numbering guide for options.
Shunt Capacitance	pF		1.3		
Drive Level	μW			0.5	
Insulation Resistance	M Ω	500			@ 100VDC $\pm 15\text{V}$.
Equivalent Series Resistance	k Ω			90	

Outline Drawing & Recommended Land Pattern

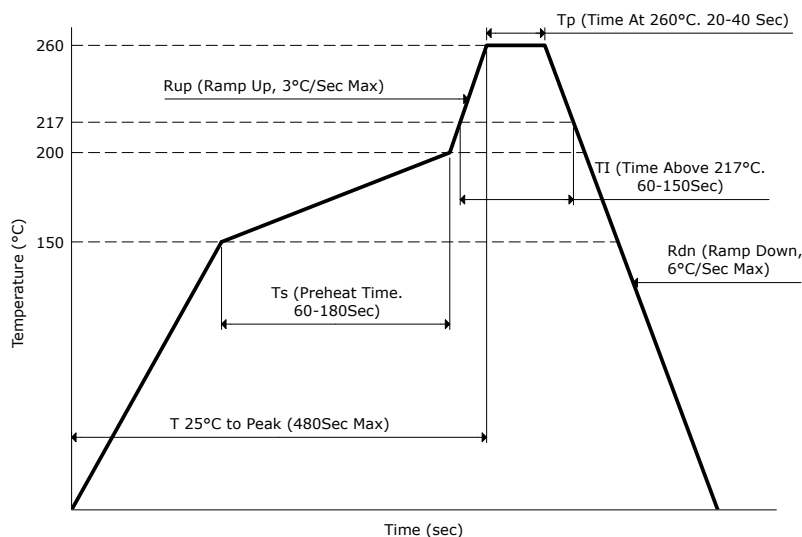
All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

ELECTRODE ARRANGEMENT (BOTTOM VIEW)



Environmental Specifications		Mechanical Specifications	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	Mechanical Shock	MIL-STD-202, Method 213, Condition B
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	Vibration	MIL-STD-883, Method 2007, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Moisture Resistance	MIL-STD-883, Method 1004	Resistance to Solvents	MIL-STD-202, Method 215
Moisture Sensitivity	J-STD-020, MSL 1	Solderability	MIL-STD-883, Method 2003

Reflow Profile & Part Marking



Line 1: XXXXX
 ↑
 Lot Code

Tape And Reel Dimensions

All dimensions are in millimeters (mm) unless otherwise noted. Drawings are not to scale.

3,000pcs / Reel

