



## SMD WATCH CRYSTAL SERIES M1610

### FEATURES

Pb free  
 RoHS-2 2011/65/EU  
 compliant

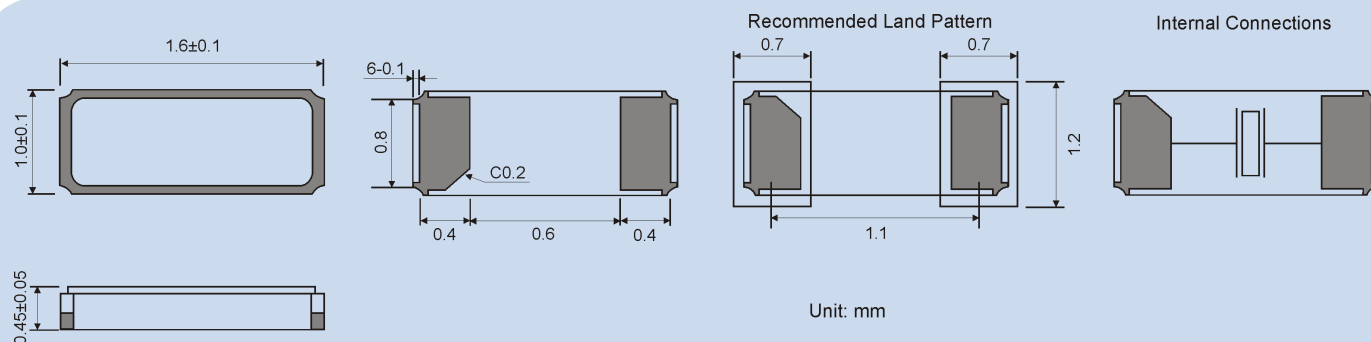
- ❑ Smallest available low cost watch crystal
- ❑ Ultra low profile
- ❑ Standard operating temperature range of -40/+85°C
- ❑ Excellent clock generator for CPU's, Wireless, Mobile Comm., etc.

### GENERAL DATA

SMD-CRYSTAL SERIES	M1610	(1.6x1.0x0.45mm)
NUMBER OF SOLDER PADS	2	
FREQUENCY	32.768 kHz	
FREQUENCY TOLERANCES AT 25°C	±20 ppm (standard) / other parameters available on request	
LOAD CAPACITANCE (C <sub>L</sub> )	12.5 pF (standard)	6,7,8, 9 and 10pF available on request
WORKING TEMPERATURE RANGES	-40/+85°C	
RESONANCE RESISTANCE	90 kΩ max.	
SHUNT CAPACITANCE C <sub>0</sub>	1.2 pF typ.	
TURNOVER TEMPERATURE	+25°C ±5°C	
PARABOLIC COEFFICIENT	-0.04 ppm/°C <sup>2</sup>	
DRIVE LEVEL	0.2 μW typical (0.5 μW max.)	
AGING	±3 ppm max. per year	
INSULATION RESISTANCE	>500 MΩ DC/100V ±10%	
STORAGE TEMPERATURE	-55°/+125°C	
DELIVERY FORM	Tape and Reel (3.000 pcs per reel)	

OTHER PARAMETERS ARE AVAILABLE ON REQUEST / CREATE HERE YOUR SPECIFICATION

### DIMENSIONS



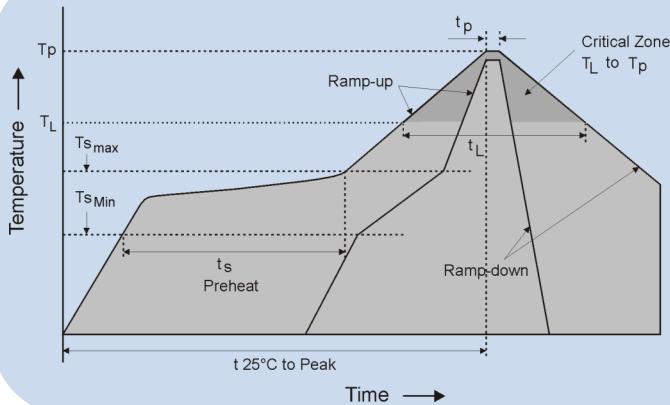
**CRYSTALS**  
**OSCILLATORS**  
**CERAMIC RESONATORS**

**PT**  
 Premium Quality by  
**PETERMANN-TECHNIK**

**CERAMIC FILTERS**  
**SAW COMPONENTS**

Spec.01 • REV.00 • Dec. 2013

## REFLOW SOLDER PROFILE



Profile Feature	Pb-Free Assembly
Average ramp-up rate (TL to TP)	3°C/second max.
Preheat:	
Temperature Min (Tsmin)	150°C
Temperature Max (Tsmax)	200°C
Time (min to max) (ts)	60-180 seconds
Time maintained above:	
Temperature (TL)	217°C
Time (tL)	60-150 seconds
Peak/Classification Temperature (Tp)	240°C
Time within 5°C of actual Peak Temperature (tp)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

## ORDERING INFORMATION

Series

M1610

Frequency

32.768 kHz

Frequency  
Stability at  
25°C

±20

Temperature  
Range

-40+85°C

Load  
Capacitance

12.5 pF

Example: M1610 32.768 kHz ±20ppm 12.5pF (-40+85°C)  
 PLEASE INDICATE YOUR REQUIRED PARAMETERS

**CRYSTALS**  
**OSCILLATORS**  
**CERAMIC RESONATORS**



Premium Quality by  
**PETERMANN-TECHNIK**

**CERAMIC FILTERS**  
**SAW COMPONENTS**

Spec.01 • REV.00 • Dec. 2013