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# SMD WATCH CRYSTAL 32.768 kHz

SERIES "M1610 32.768 KHZ ±20 PPM 6PF (-40/+85°C)"

### **FEATURES**

- + Excellent shock-resistance, robust ceramic package with metal lid
- + Ultra low profile
- + Standard operating temperature range of -40/+85°C
- + Excellent clock generator for CPU's, Wireless, Mobile Comm., etc.



### **GENERAL DATA**

NUMBER OF SOLDER PADS         2           FREQUENCY         32.768 kHz           FREQUENCY TOLERANCE AT 25°C         ±20 ppm           LOAD CAPACITANCE (CL)         6 pF           WORKING TEMPERATURE RANGE         -40/+85°C           SERIES RESISTANCE         90 kΩ max.           SHUNT CAPACITANCE (C₀)         1.3 pF typ.           TURNOVER TEMPERATURE         +25°C ±5°C           TEMPERATURE COEFFICIENT         -0.03±0.01 ppm/°C²           DRIVE LEVEL         0.1 μW±0.01 μW (0.5 μW max.)           AGING         ±3 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.           INSULATION RESISTANCE         >500 MΩ DC/100V ±10%           STORAGE TEMPERATURE         -40°/+85°C           DELIVERY FORM         Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)           ROHS         Lead free and ROHS compliant           MARKING         Axxxx (A = model code, xxxx = date code)           Ordering Code         M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)	PARAMETERS	PRODUCT FEATURES AND CONDITIONS
FREQUENCY FREQUENCY TOLERANCE AT 25°C  ±20 ppm  LOAD CAPACITANCE (C.)  6 pF  WORKING TEMPERATURE RANGE  -40/+85°C  SERIES RESISTANCE  90 kΩ max.  SHUNT CAPACITANCE (Co)  1.3 pF typ.  TURNOVER TEMPERATURE  +25°C ±5°C  TEMPERATURE COEFFICIENT  -0.03±0.01 ppm/°C²  DRIVE LEVEL  0.1 μW±0.01 μW (0.5 μW max.)  AGING  ±3 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.  INSULATION RESISTANCE  STORAGE TEMPERATURE  -40°/+85°C  DELIVERY FORM  Tape and Reet (5.000 pcs per reet, other quantities on request as cut off tape or bulks)  ROHS  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  Customer P/N	SMD-CRYSTAL SERIES	M1610
### ### ### ### ### ### ### ### ### ##	NUMBER OF SOLDER PADS	2
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WORKING TEMPERATURE RANGE -40/+85°C  SERIES RESISTANCE 90 kΩ max.  SHUNT CAPACITANCE [C₀] 1.3 pF typ.  TURNOVER TEMPERATURE +25°C ±5°C  TEMPERATURE COEFFICIENT -0.03±0.01 ppm/°C²  DRIVE LEVEL 0.1 µW±0.01 µW [0.5 µW max.]  AGING ±3 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.  INSULATION RESISTANCE >500 MΩ DC/100V ±10%  STORAGE TEMPERATURE -40°/+85°C  DELIVERY FORM Tape and Reel [5.000 pcs per reel, other quantities on request as cut off tape or bulks)  ROHS Lead free and ROHS compliant  MARKING Axxxx [A = model code, xxxx = date code]  Ordering Code  Customer P/N	FREQUENCY TOLERANCE AT 25°C	±20 ppm
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SHUNT CAPACITANCE (Co)  1.3 pF typ.  TURNOVER TEMPERATURE  +25°C ±5°C  TEMPERATURE COEFFICIENT  -0.03±0.01 ppm/°C²  DRIVE LEVEL  0.1 μW±0.01 μW (0.5 μW max.)  AGING  ±3 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.  INSULATION RESISTANCE  >500 MΩ DC/100V ±10%  STORAGE TEMPERATURE  -40°/+85°C  DELIVERY FORM  Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  ROHS  Lead free and ROHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)	WORKING TEMPERATURE RANGE	-40/+85°C
TURNOVER TEMPERATURE  +25°C ±5°C  TEMPERATURE COEFFICIENT  -0.03±0.01 ppm/°C²  DRIVE LEVEL  0.1 µW±0.01 µW (0.5 µW max.)  43 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.  INSULATION RESISTANCE  >500 MΩ DC/100V ±10%  STORAGE TEMPERATURE  -40°/+85°C  DELIVERY FORM  Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  RoHS  Lead free and RoHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)	SERIES RESISTANCE	90 kΩ max.
TEMPERATURE COEFFICIENT  -0.03±0.01 ppm/°C²  DRIVE LEVEL  0.1 µW±0.01 µW (0.5 µW max.)  ±3 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.  INSULATION RESISTANCE  >500 M\(D\) DC/100V ±10%  STORAGE TEMPERATURE  -40°/+85°C  DELIVERY FORM  Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  ROHS  Lead free and ROHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)	SHUNT CAPACITANCE (Co)	1.3 pF typ.
DRIVE LEVEL  0.1 μW±0.01 μW (0.5 μW max.)  43 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.  INSULATION RESISTANCE  >500 MΩ DC/100V ±10%  STORAGE TEMPERATURE  -40°/+85°C  DELIVERY FORM  Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  RoHS  Lead free and RoHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)  Customer P/N	TURNOVER TEMPERATURE	+25°C ±5°C
#3 ppm first year, ±5 ppm / 5 years and ±10 ppm / 10 years max.  INSULATION RESISTANCE  \$500 M\(0\) DC/100V ±10%  STORAGE TEMPERATURE  \$-40\(^{\text{PS}\circ}\)  Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  ROHS  Lead free and ROHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85\(^{\text{C}}\))  Customer P/N	TEMPERATURE COEFFICIENT	-0.03±0.01 ppm/°C <sup>2</sup>
INSULATION RESISTANCE  >500 M\(\Omega\) DC/100V \(\pm\) 10\%  STORAGE TEMPERATURE  -40\(\circ\) +85\(\circ\)  DELIVERY FORM  Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  ROHS  Lead free and RoHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz \(\pm\)20 ppm 6pF (-40/+85\(\circ\)C)  Customer P/N	DRIVE LEVEL	0.1 μW±0.01 μW (0.5 μW max.)
STORAGE TEMPERATURE  -40°/+85°C  Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  RoHS  Lead free and RoHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)  Customer P/N	AGING	$\pm 3$ ppm first year, $\pm 5$ ppm / 5 years and $\pm 10$ ppm / 10 years max.
Tape and Reel (5.000 pcs per reel, other quantities on request as cut off tape or bulks)  RoHS  Lead free and RoHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)  Customer P/N	INSULATION RESISTANCE	>500 MΩ DC/100V ±10%
tape or bulks)  RoHS  Lead free and RoHS compliant  MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)  Customer P/N	STORAGE TEMPERATURE	-40°/+85°C
MARKING  Axxxx (A = model code, xxxx = date code)  Ordering Code  M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)  Customer P/N	DELIVERY FORM	
Ordering Code M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)  Customer P/N	RoHS	Lead free and RoHS compliant
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	Ordering Code	M1610 32.768 kHz ±20 ppm 6pF (-40/+85°C)
PETERMANN-TECHNIK P/N QEU10010074	Customer P/N	
	PETERMANN-TECHNIK P/N	QEU10010074

#### Notes

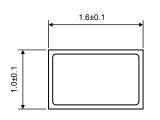
- 1. The reference temperature for all specified values and tests is +25°C.
- 2. No Ultrasonic Cleaning: Do not subject the M1610 to an ultrasonic cleaning environment. Permanent damage or long term reliability issues to the structure may occur.
- 3. Do not design any ground line under the M1610.
- 4. Do not solder with hot air gun.

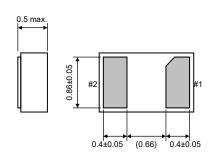
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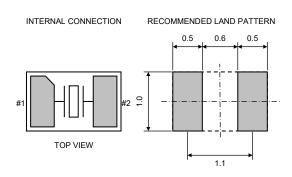


### **DIMENSIONS AND PATTERNS**

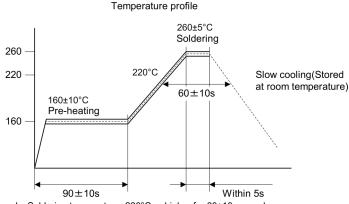
#### PACKAGE SIZE – DIMENSIONS (UNIT:MM) 1.6 X 1.0 X 0.5 MM







## REFLOW SOLDER PROFILE



Peak temperature: 260±5°C for within 5 seconds. Soldering temperature: 220°C or higher for 60±10 seconds.

Pre-heating temperature:160±10°C for 90±10 seconds. Quartz crystal units which is put on PCB shall be through reflow soldering furnace twice with the condition shown above.



# PREMIUM QUALITY BY PETERMANN-TECHNIK



OUR COMPANY IS CERTIFIED ACCORDING TO ISO 9001:2015 AND 14001:2015

THIS IS FOR YOU TO ENSURE THAT THE PRINCIPLES OF QUALITY MANAGEMENT ARE FULLY IMPLEMENTED IN OUR QM-SYSTEM AND QUALITY CONTROL METHODS.