

# SMD WATCH CRYSTAL 32.768 kHz

SERIES „M3215RR 32.768 KHZ ±20 PPM 9PF (-40/+85°C)“

## FEATURES

- + Cheapest available SMD-MINI-Watch-Crystal
- + Ultra low profile
- + Standard operating temperature range of -40/+85°C, others available on request
- + LRT-TECHNOLOGY Inside (LRT is Low ESR Resonator-Technology)
- + Excellent clock generator for CPU's, Wireless, Mobile Comm., RTC, IoT, etc.
- + Our top quality promise / depth of production:
  - Only use of crystal blanks from our in-house production
  - Excellent product features guaranteed by multiple 100% tests
  - 100% quality monitoring from crystal raw material to the end product



## GENERAL DATA

PARAMETERS	PRODUCT FEATURES AND CONDITIONS
SMD-CRYSTAL SERIES	M3215RR
NUMBER OF SOLDER PADS	2
FREQUENCY	32.768 kHz
FREQUENCY TOLERANCE AT 25°C	±20 ppm
LOAD CAPACITANCE (C <sub>L</sub> )	9 pF
WORKING TEMPERATURE RANGE	-40/+85°C
SERIES RESISTANCE	50 kΩ max.
SHUNT CAPACITANCE (C <sub>0</sub> )	1.5 pF max.
TURNOVER TEMPERATURE	+25°C ±5°C
TEMPERATURE COEFFICIENT	-0.03 ppm/°C <sup>2</sup> ±0.01 ppm/°C <sup>2</sup>
DRIVE LEVEL	0.1 μW typ. (0.5 μW max.)
AGING	±3 ppm max. after first year
INSULATION RESISTANCE	>500 MΩ DC/100V ±10%
STORAGE TEMPERATURE	-55°/+125°C
PRODUCT WEIGHT	0.012 g
MSL LEVEL	1
DELIVERY FORM	Tape and Reel (3.000 pcs)
RoHS	Lead free and RoHS compliant
MARKING	PxxxB (xxx = date code)
Ordering Code	M3215RR 32.768 kHz ±20 ppm 9pF (-40/+85°C)
Customer P/N	
PETERMANN-TECHNIK P/N	QEU10010060/2

### Notes

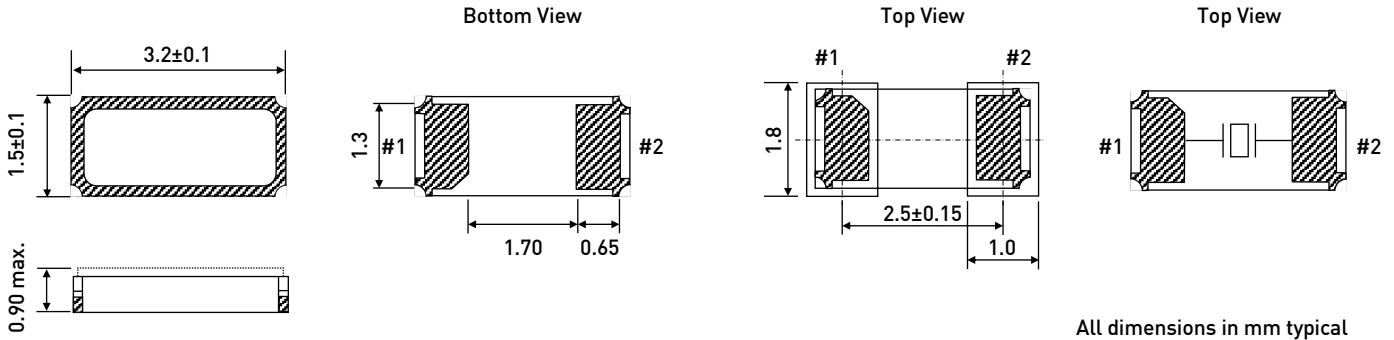
1. The reference temperature for all specified values and tests is +25°C.
2. No Ultrasonic Handling: Do not subject the M3215RR to an ultrasonic cleaning environment or to ultrasonic welding process. Permanent damage or long term reliability issues to the structure may occur.
3. Do not design any ground line under the M3215RR.

## DIMENSIONS AND PATTERNS

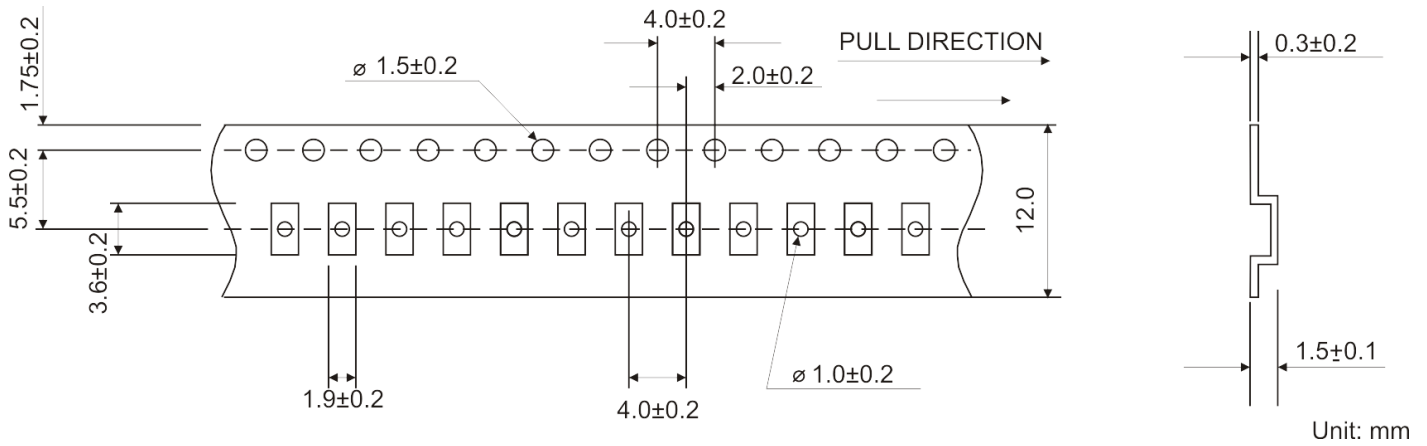
PACKAGE SIZE – DIMENSIONS (UNIT:MM)  
 3.2 X 1.5 X 0.9 MM

RECOMMENDED  
 LAND PATTERN

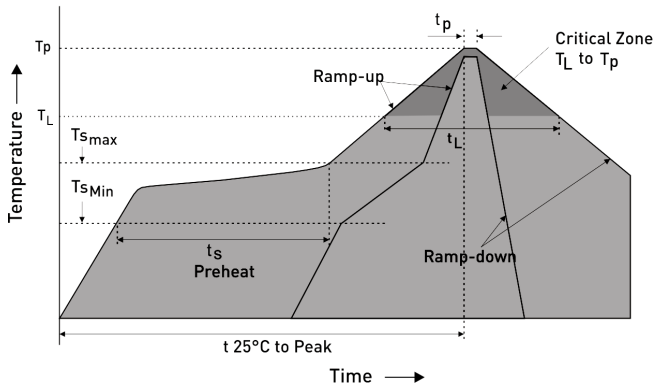
INTERNAL  
 CONNECTIONS



## REEL SPECIFICATION



## REFLOW SOLDER PROFILE



IPC/JEDEC Standard	IPC/JEDEC J-STD-020
Moisture Sensitivity Level	Level 1
TS MAX to TL (Ramp-up Rate)	3°C/second Maximum
Preheat	
- Temperature Minimum (TS MIN)	150°C
- Temperature Typical (TS TYP)	175°C
- Temperature Maximum (TS MAX)	200°C
- Time (tS)	60 - 180 Seconds
Ramp-up Rate (TL to TP)	3°C/second Maximum
Time Maintained Above:	
- Temperature (TL)	217°C
- Time (TL)	60 - 150 Seconds
Peak Temperature (TP)	260°C Maximum
Target Peak Temperature (TP Target)	255°C
Time within 5°C of actual peak (tP)	20 - 40 seconds
Max. Number of Reflow Cycles	2
Ramp-down Rate	6°C/second Maximum
Time 25°C to Peak Temperature (t)	8 minutes Maximum



## 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 QUALITY MANAGEMENT SYSTEM AND QUALITY CONTROL METHODS ALSO DOMINATE OUR QUALITY STANDARDS.