

# SMD QUARTZ CRYSTAL SPECIFICATION

## SERIES „SMD02016/4 48.000 MHZ 10/10/-20+70/8PF“

### FEATURES

- + Low cost ceramic packaged low ESR MHz quartz crystal
- + Excellent clock generator for CPU's, Wireless, Mobile Comm., IoT, IoT, WIFI, Industrial, etc.
- + LRT-TECHNOLOGY Inside (LRT is our unique [Low ESR Resonator-Technology](#))
- + Our top quality promise / depth of production:
  - Only use of crystal blanks from our in-house production, based on our unique LRT-Technology
  - Excellent product features guaranteed by multiple 100% tests and 100% end-test
  - 100% quality monitoring from crystal raw material to the end product
  - Excellent quality, performance and reliability is guaranteed.



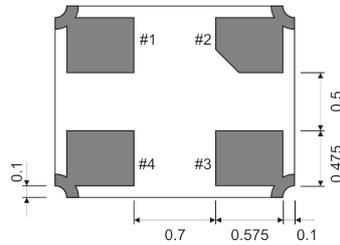
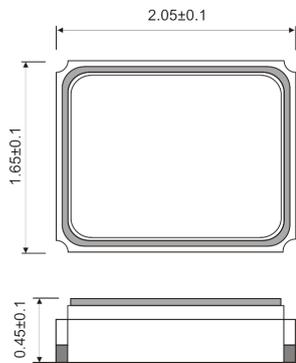
### GENERAL DATA

PARAMETERS	PRODUCT FEATURES AND CONDITIONS
SMD-CRYSTAL SERIES	SMD02016/4
PACKAGE HEIGHT	0.55 mm max.
FREQUENCY	48.000 MHz
MODE OF VIBRATION	AT-FUNDAMENTAL
EQUIVALENT SERIES RESISTANCE	30 Ω max.
FREQUENCY TOLERANCE AT 25°C	±10 ppm
LOAD CAPACITANCE (CL)	8 pF
WORKING TEMPERATURE RANGE	-20/+70°C
TEMPERATURE STABILITY	±10 ppm over -20/+70°C (referred to +25°C)
SHUNT CAPACITANCE (C0)	1.0 pF max.
AGING	±2 ppm max. after first year, ±10 ppm max. after 10 years
DRIVE LEVEL	100 µW typ. / 200 µW max.
INSULATION RESISTANCE	>500 MΩ DC/100V ±15V
STORAGE TEMPERATURE	-55/+125°C
PRODUCT WEIGHT	0.006 g
MSL LEVEL	1
DELIVERY FORM	Tape & Reel (3.000 pcs)
RoHS	Lead free and RoHS compliant
POP (EU)2019/1021)	No POP substances
PFAS	No PFAS present
PROP 65	Compliant to PROP 65
TSCA	Compliant to TSCA
DELIVERY FORM	Tape & Reel (3.000 pcs)
SOLDERING CONDITION	See reflow solder profile
MARKING	Line 1 = P48M8 Line 2 = xxxx (xxxx = date code)
ORDERING CODE	SMD02016/4 48.000 MHz 10/10/-20+70/8pF
CUSTOMER P/N	
PETERMANN-TECHNIK P/N	QEU9310125

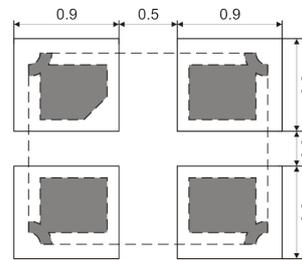
Note:

1. LRT is optimized low ESR resonator design for fast and secure oscillation start-up.
2. The reference temperature for all specified values and tests is +25°C.
3. Do not use cleaning baths operating at ultrasonic frequencies or ultrasonic welding processes.
4. Do not solder with hot air gun.

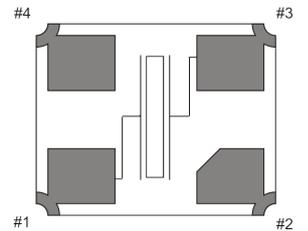
## DIMENSIONS



Reference soldering pattern



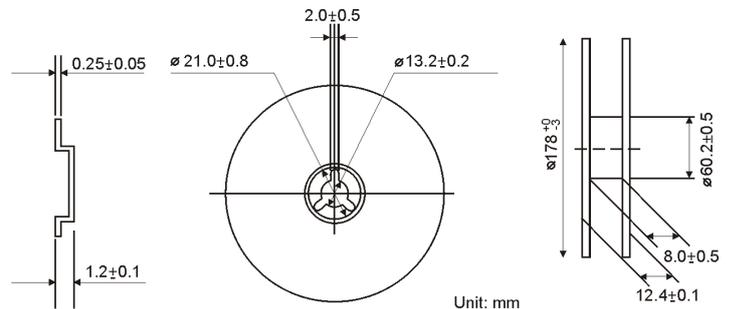
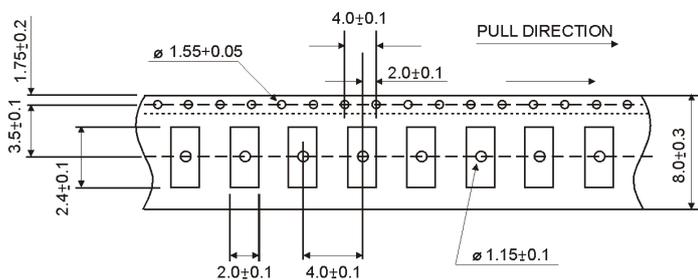
Internal connections (Top View)



PIN CONNECTION:  
#1 & #3 connected to the quartz  
#2 & #4 connected to the cover  
#2 & #4 can be connected to ground

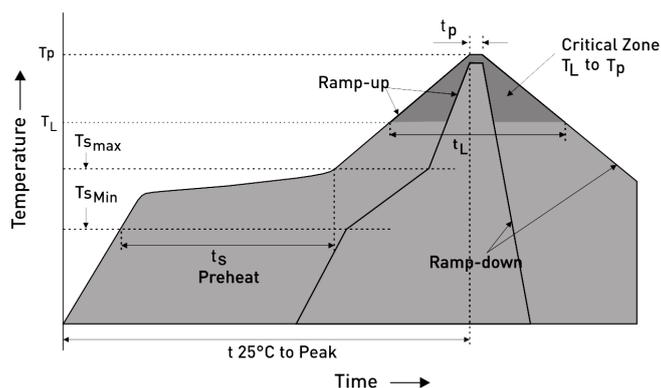
Unit: mm

## REEL SPECIFICATION



Unit: mm

## 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)	265°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 QM-SYSTEM AND QUALITY CONTROL METHODS .

THE HEARTBEAT OF YOUR INNOVATION  
RELIABLE · COST-EFFECTIVE · COMPETENT  
DESIGN SMARTER – EMPOWERING YOUR PRODUCTS

FOR ALMOST 30 YEARS, WE HAVE BEEN YOUR SPECIALIST FOR CRYSTALS AND OSCILLATORS – FROM PROVEN STANDARDS TO CUSTOM-TAILORED SOLUTIONS.

YOU DEVELOP WITH THE HIGHEST STANDARDS – WE DELIVER THE COMPONENTS TO MATCH: INNOVATIVE, RELIABLE, AND COST-EFFICIENT.

CHOOSE OUR PRODUCTS AND BENEFIT FROM TOP-TIER QUALITY, INNOVATION, STABLE AND INDEPENDENT SUPPLY CHAINS AND PARTNERSHIP ON HIGHEST LEVEL.

SUSTAINABLE SUCCESS FOR YOU AND YOUR PRODUCTS!