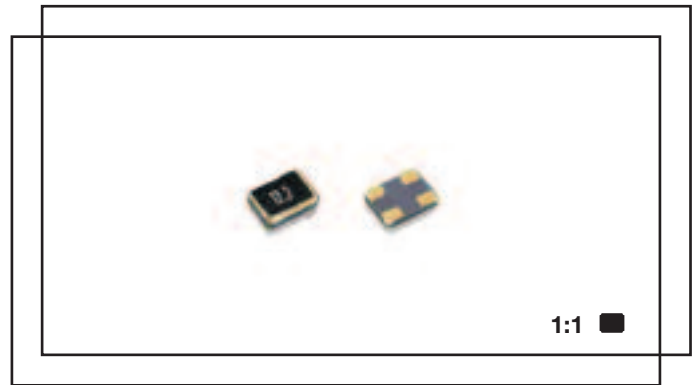


XX sub miniature crystal (13.0 ~ 48.0)MHz

- # (3.2 x 2.5)mm ceramic package
- # 12mm tape and reel
- # Au-Sn vacuum seal
- # ± 5 ppm tolerance available
- # RoHS compliant



Electrical specification

Case style	XX: height 0.6mm
Frequency range	(13.0 ~ 48)MHz, fundamental
Standard frequencies	13.0MHz, 16.0MHz, 20.00MHz, 25.00MHz, 26.0MHz, 32.0MHz
Adjustment tolerance	from ± 5 ppm at +25°C, frequency dependent
Temperature tolerance	from ± 5 ppm, frequency and temperature range dependent
Operating temperature	(-10 +60)°C ~ (-40 +85)°C
Storage temperature	(-55 +125)°C
Load	customer specified
Shunt capacitance C_0	7.0pF max.
Drive level	10 μ W typical, 100 μ W max.
Q factor	80,000 typical
Ageing	± 1 ppm max. per year
Insulation resistance	500Meg. ohm min. at 100Vd.c.

Ordering information

The XX smd crystals may be specified within their available frequency range together with load capacitance, adjustment tolerance, temperature tolerance and temperature range with each parameter coded as follows

Example XX crystal, 16.00MHz, load 20pF, ± 10 ppm at +25°C, ± 10 ppm(-10 +60)°C

TFC PART NUMBER XX 16.00M H B B I

'XX' crystal series: XX

'16.00M' frequency: 16.00M = 16.00MHz, frequency range from (13.0 ~ 48.0)MHz

'H' load capacitance: H = 20pF

'B' adjustment tolerance at +25°C: B = ± 10 ppm

'B' temperature tolerance: B = ± 10 ppm

'I' temperature range: I = (-10 +60)°C

Load capacitance A: 8pF, B: 9pF, C: 10pF, D: 12pF, F: 16pF,
G: 18pF, H: 20pF, J: 32pF, S: series

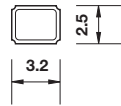
Adjustment tolerance A: ± 5 ppm, B: ± 10 ppm, P: ± 15 ppm, C: ± 20 ppm, D: ± 25 ppm,
E: ± 30 ppm, G: ± 50 ppm, H: ± 100 ppm

Temperature tolerance A: ± 5 ppm, B: ± 10 ppm, P: ± 15 ppm, C: ± 20 ppm, D: ± 25 ppm,
E: ± 30 ppm, G: ± 50 ppm, H: ± 100 ppm

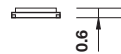
Temperature range I: (-10 +60)°C, C: (-20 +70)°C, L: (-40 +85)°C

XX sub miniature crystal

XX dimensions(mm) shown twice full size

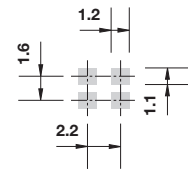
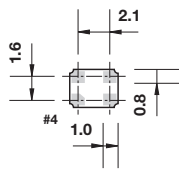


Suggested land pattern



Crystal pads are palladium gold, 0.5µ, suitable for vapour phase or reflow soldering, preheat to +150°C for 2 minutes, peak temperature 250°C for 30 seconds max.

Pad size (1.1 x 1.2)mm



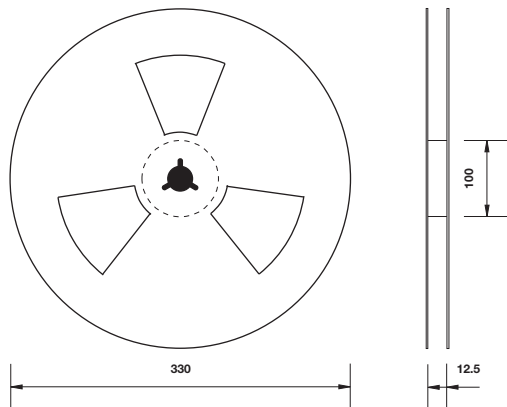
Bottom view

Pads #2 and #4 connected to metal top

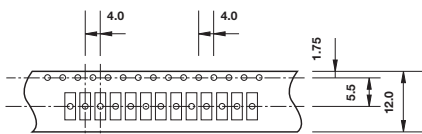
ESR - equivalent series resistance

frequency range(MHz)	cut/mode	esr()
(13.0)	AT1	<150
(13.0 ~ 19.5)	AT1	<100
(19.5 ~ 27.0)	AT1	<80
(27.0 ~ 48.0)	AT1	<60

Tape and reel dimensions(mm)



Centre hole diameter 13.5mm, slot width 2mm spaced at 120°
Reel quantity 1K, 2K, 3K, 5K, pieces, leader tape 400mm minimum
Trailer tape: 10 empty compartments minimum



Tape transport hole diameter 1.5mm
Compartment size 3.4mm x 2.7mm, depth 1.4mm
Component spacing 4.0mm

Product marking

Marking includes frequency and date code:

XX.XXX Frequency in MHz
YWW Y = last digit of year
 WW = week number