

# Miniature Quartz Crystal Ceramic SMD

**US/USQ**



1.6 x 1.2mm Ceramic SMD

## Product Description

The DIODES™ 4-pad US/USQ Series seam seal devices incorporate a ultra-miniature AT-cut crystal resonator housed in a standard 1.6 x 1.2mm ceramic package. These compact crystals are ideal for surface mounting in densely populated or small form-factor PCB applications.

## Product Features

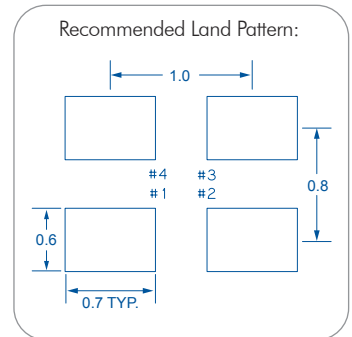
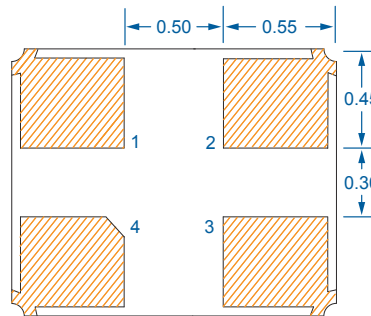
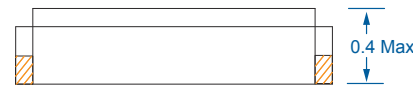
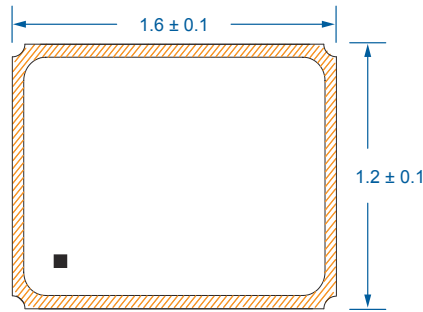
- Rugged AT-cut Crystal Construction
- Miniature 1.6 x 1.2mm Ceramic Package
- Available on Tape & Reel; 8mm Tape, 3000 Units Per Reel
- AEC-Q 200 Compliant – Grade 1
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. “Green” Device (Note 3)
- The USQ Series are suitable for automotive applications requiring specific change control; these parts is AEC-Q200 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

<https://www.diodes.com/quality/product-definitions/>

## Typical Application(s)

- Portable / Hand-held PCs
- PCMCIA Cards
- Bluetooth
- Wireless LAN
- RF-SIM
- Pin Drive
- SD Module
- Automotive

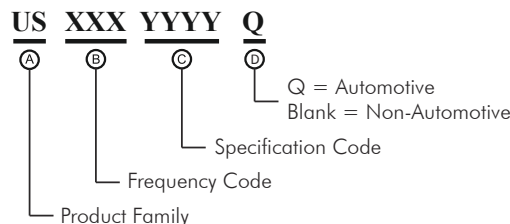
**Package:** (Scale: none; Dimensions are in mm)



## Pin Functions:

Pin	Function
1	Xtal
2	GND
3	Xtal
4	GND

## Part Ordering Information:



Following the above format, Saronix-eCera part numbers will be assigned upon confirmation of exact customer requirements.

## Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

## Frequency Range:

- 24.000000 MHz to 60.000000 MHz (Fundamental)

## Characteristics at 25°C ±2°C:

- Frequency Calibration Tolerance: ±10ppm, to ±50ppm
- Load Capacitance: 6 to 20pF or Series Resonance
- Equivalent Series Resistance (ESR):
  - 120Ω Max. (24.000000 to 29.999999 MHz)
  - 100Ω Max. (30.000000 to 39.999999 MHz)
  - 80Ω Max. (40.000000 to 49.999999 MHz)
  - 60Ω Max. (50.000000 to 60.000000 MHz)
- Drive Level: 10μW typ. (100μW max)
- Shunt Capacitance:
  - 1pF Max. (24.000000 to 39.999999 MHz)
  - 1.5pF Max. (40.000000 to 60.000000 MHz)

## Temperature Range:

- Operating: -20°C to +70°C or -40°C to +85°C or -40°C to +105°C or -40°C to +125°C
- Storage: -55°C to +125°C

## Frequency Stability (Reference to the Frequency at 25°C):

- -20°C to +70°C: ±10ppm, to ±100ppm
- -40°C to +85°C: ±15ppm, to ±100ppm
- -40°C to +105°C: ±20ppm, to ±100ppm
- -40°C to +125°C: ±50ppm, to ±100ppm

## Aging at 25°C, First Year:

- ±2ppm Max. (24.000000 to 50.000000 MHz)
- ±3ppm Max. (50.000001 to 60.000000 MHz)

## Reflow Temperature:

- 260°C Max, 10 seconds Max

## Mechanical

- Shock: JESD22-B104 Condition B
- Solderability: J-STD-002
- Vibration: JESD22-B103
- Solvent Resistance: JESD22-B107
- Resistance to Soldering Heat: J-STD-020C Table 5-2 Pb-free devices (3 cycles max)

## Environmental

- Gross Test Leak: JESD22-A109, Condition C
- Fine Test Leak: JESD22-A109, Condition A1
- Moisture Resistance: JESD22-A113
- Insulation Resistance: 500 MΩ min (100 VDC)

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