

### FEATURES

- **Miniature size: 5.0mm x 3.2mm x 1.0mm height**
- **Gold-plated ceramic base with metal seam-welded lid**
- **To minimize EMI the whole crystal may be grounded**
- **High shock and vibration resistance**
- **Ideal for PDAs, GPS, PCMCIA, Wirless LAN etc.**

### DESCRIPTION

MJ crystals are miniature surface-mount crystals produced with a ceramic substrate and seam-welded metal lid. Their compact size and low mass make them an ideal crystal for high-density applications.

### SPECIFICATION

|                                |  |
|--------------------------------|--|
| Frequency Range:               | 10.0MHz to 48.0MHz                                     |
| Mode:                          | AT-Cut Fundamental                                     |
| Calibration Tolerance at 25°C: | from ±5ppm<br>(±10, ±20 or ±30ppm standard)            |
| Frequency stability            |  |
| -10° to +60°C                  | from ±5ppm   |
| -20° to +70°C                  | from ±10ppm  |
| -40° to +90°C                  | from ±15ppm  |
| Storage Temperature:           | -40°~+105°C  |
| Effective Series Resistance:   | See table  |
| Shunt Capacitance (C0):        | 2pF to 4pF typical, 5pF maximum                        |
| Load Capacitance (CL):         | Series or from 10pF to 32pF<br>(Customer specified CL) |
| Ageing:                        | <±3ppm per year at +25°C                               |
| Drive level:                   | 100 µW maximum   |
| Reflow Soldering:              | 10s maximum at 260°C twice<br>or 180s at 230°C, once.  |
| Package:                       | Ceramic base, metal (Kovar) lid,<br>Hermetic seal      |
| Packaging:                     | 12mm EIA tape and reel<br>1000 pieces per reel         |

### EQUIVALENT SERIES RESISTANCE (ESR)

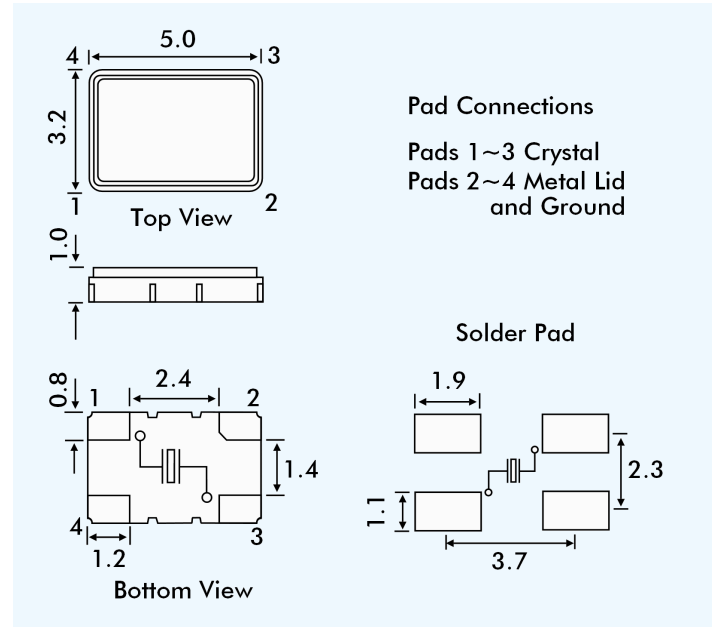
| Frequency Range MHz | Crystal Cut/ Mode | ESR Ohms Max. |
|---------------------|-------------------|---------------|
| 10.0 ~ 12.0         | AT Fund.          | 80            |
| 12.0 ~ 16.0         | AT Fund.          | 60            |
| 16.01~48.0          | AT Fund.          | 50            |

### ENVIRONMENTAL SPECIFICATION

|                |   |
|----------------|---|
| RoHS Status:   | Compliant   |
| Gross Leak:    | 1kg pressurized water immersion test as per Euroquartz procedures.  |
| Fine Leak:     | <5x10 <sup>-8</sup> atm cc/s -helium leak test  |
| Shock:         | ±5ppm max. Free drop 3 times from 75cm height onto a hard wooden board or half sine wave acceleration of 100g peak amplitude for 11 ms duration, 3 cycles each plane. |
| Vibration:     | ±5ppm max., frequency 10 to 55Hz, amplitude 1.5mm or 10g rms. Duration 6 hours.   |
| Solderability: | MIL-STD-883, Method 2003  |
| Humidity:      | 48 hours at 85°C, relative humidity, non-condensing   |
| Thermal Shock: | Temperature cycling: Exposed to -40°C for 30 minutes then to +85°C for 30 minutes, - duration 5 days.   |



### OUTLINE & DIMENSIONS



### PART NUMBER GENERATION

Part numbers for MJ crystals are generated as follows:

Example: 12.000MHz MJ/20/30/-10+60/18pF/60R

