

### SERIES R2016

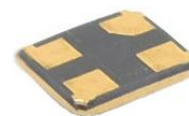
#### FEATURES

- ULTRA SMALL ULTRA THIN
- AUTOMATIC MOUNTING POSSIBLE
- EXCELLENT FOR HIGH DENSITY APPLICATIONS



#### SPECIFICATIONS

| PARAMETER                             | VALUE                                              |
|---------------------------------------|----------------------------------------------------|
| FREQUENCY RANGE*                      | 16.000 MHz to 72.000 MHz                           |
| MODE OF OSCILLATION                   | AT Cut, Fundamental                                |
| FREQUENCY TOLERANCE AT 25°C           | ±50 ppm max<br>±10 ppm, ±20 ppm, ±30 ppm available |
| FREQUENCY STABILITY OVER TEMPERATURE* | ±50 ppm max<br>±10 ppm, ±20 ppm, ±30 ppm available |
| OPERATING TEMPERATURE RANGE*          | -20°C to +70°C Standard<br>-40°C to +85°C Extended |
| STORAGE TEMPERATURE RANGE             | -40°C to +90°C                                     |
| AGING                                 | ±2 ppm 1st year max                                |
| LOAD CAPACITANCE                      | 8 pF to 32 pF or Series Resonance                  |
| EQUIVALENT SERIES RESISTANCE          | See Table 1                                        |
| SHUNT CAPACITANCE                     | 3.5 pF max                                         |
| DRIVE LEVEL                           | 100 µW max                                         |



\*Not any Combination Frequency-Operating Temperature Range- Stability is available. Please consult factory

| TABLE 1          |      |                 |
|------------------|------|-----------------|
| FREQUENCY (MHz)  | MODE | MAXIMUM ESR (Ω) |
| 16.000 to 20.999 | FUND | 200             |
| 21.000 to 25.999 | FUND | 120             |
| 26.000 to 37.999 | FUND | 100             |
| 38.000 to 72.000 | FUND | 60              |

#### PART NUMBERING SYSTEM

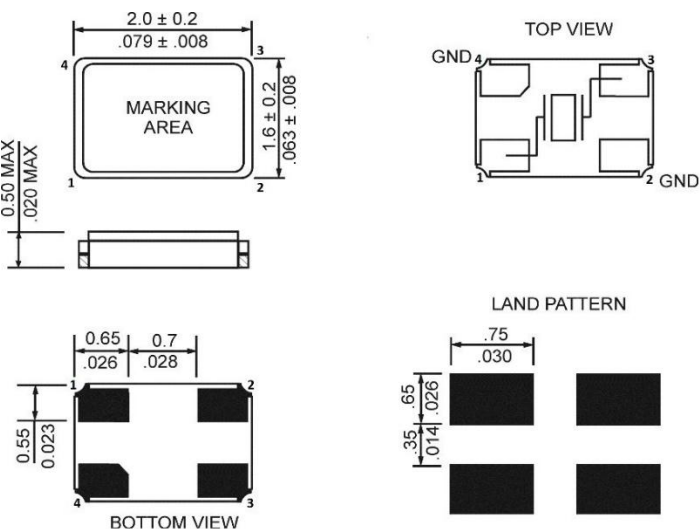
| TYPE  | - | FREQUENCY | - | LOAD CAPACITANCE                        | - | MODE                                         | TOLERANCE/STABILITY (ppm/ppm)                             |
|-------|---|-----------|---|-----------------------------------------|---|----------------------------------------------|-----------------------------------------------------------|
| R2016 | - | In MHz    | - | 8 to 32 pF for Parallel<br>S for Series | - | Blank for < 24.576 MHz<br>F for ≥ 24.576 MHz | Blank for Maximum<br>ppm for Other<br>Example: 1020, 2050 |

| - | TEMPERATURE RANGE                    | - | TAPE & REEL |
|---|--------------------------------------|---|-------------|
| - | Blank for Standard<br>X for Extended | - | TR          |

#### EXAMPLE: R2016-32.000-8-F-1030-X-TR

Surface Mount Crystal, 2.0 x 1.6 mm, 32.000 MHz, 8 pF Load, Fundamental Mode, ±10 ppm Tolerance, ±30 ppm Stability, from -40°C to +85°C, Tape and Reel Packaging

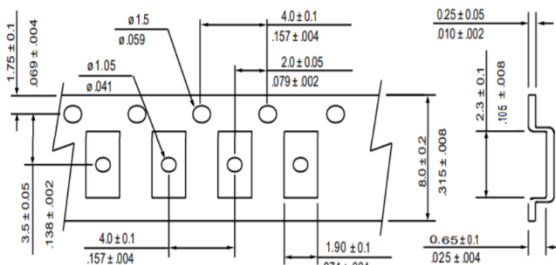
- **MECHANICAL SPECIFICATION**



Tolerance:  $\pm 0.1\text{mm}/0.004''$  if nothing else specified

**Note:** According to ceramic base availability the Chamfer location could be on a different pin. However, the Chamfer's location does not influence the electrical performance of the crystal.

- **CARRIER TAPE DIMENSIONS**

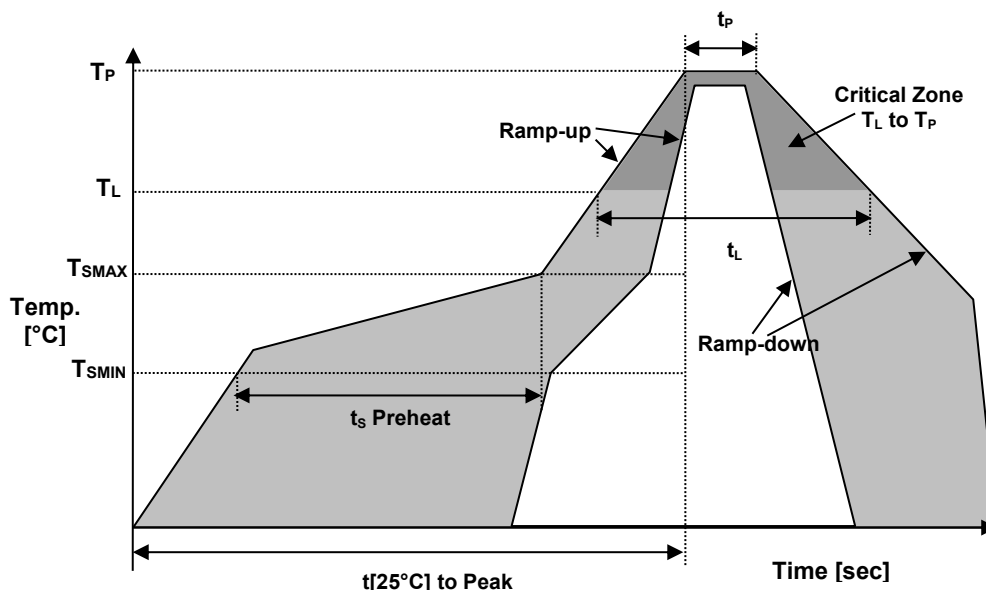


**NOTE: REFER TO EIA-481 FOR NON-SPECIFIED DIMENSIONS**

- **PACKAGING**

180 mm REEL DIAMETER  
8 mm TAPE WIDTH, 4 mm PITCH  
QUANTITY: 3000 PIECES PER REEL

## REFLOW PROFILE



| Reflow profile                                 |                               |              |
|------------------------------------------------|-------------------------------|--------------|
| Temperature Min Preheat                        | $T_{SMIN}$                    | 150°C        |
| Temperature Max Preheat                        | $T_{SMAX}$                    | 200°C        |
| Time ( $T_{SMIN}$ to $T_{SMAX}$ )              | $t_s$                         | 60-180 sec.  |
| Temperature                                    | $T_L$                         | 217°C        |
| Peak Temperature                               | $T_P$                         | 260°C        |
| Ramp-up rate                                   | $R_{UP}$                      | 3°C/sec max. |
| Ramp-down rate                                 | $R_{DOWN}$                    | 6°C/sec max. |
| Time within 5°C of Peak Temperature            | $t_p$                         | 10 sec.      |
| Time $t[25^\circ\text{C}]$ to Peak Temperature | $t[25^\circ\text{C}]$ to Peak | 480 sec.     |
| Time                                           | $t_L$                         | 60-150 sec.  |

## ENVIRONMENTAL

| PARAMETER                  | VALUE     |
|----------------------------|-----------|
| MOISTURE SENSITIVITY LEVEL | 1         |
| RoHS                       | COMPLIANT |
| REACH SVHC                 | COMPLIANT |
| HALOGEN-FREE               | COMPLIANT |
| ESD CLASSIFICATION LEVEL   | N/A       |
| TERMINATION FINISH         | Au        |

