


|                                  |     |           |      |      |
|----------------------------------|-----|-----------|------|------|
| RoHS Compliant<br>Pb - Lead Free | Ltr | Revisions | Date | Appr |
|                                  |     |           |      |      |
|                                  |     |           |      |      |
|                                  |     |           |      |      |

**Electrical Specifications:**

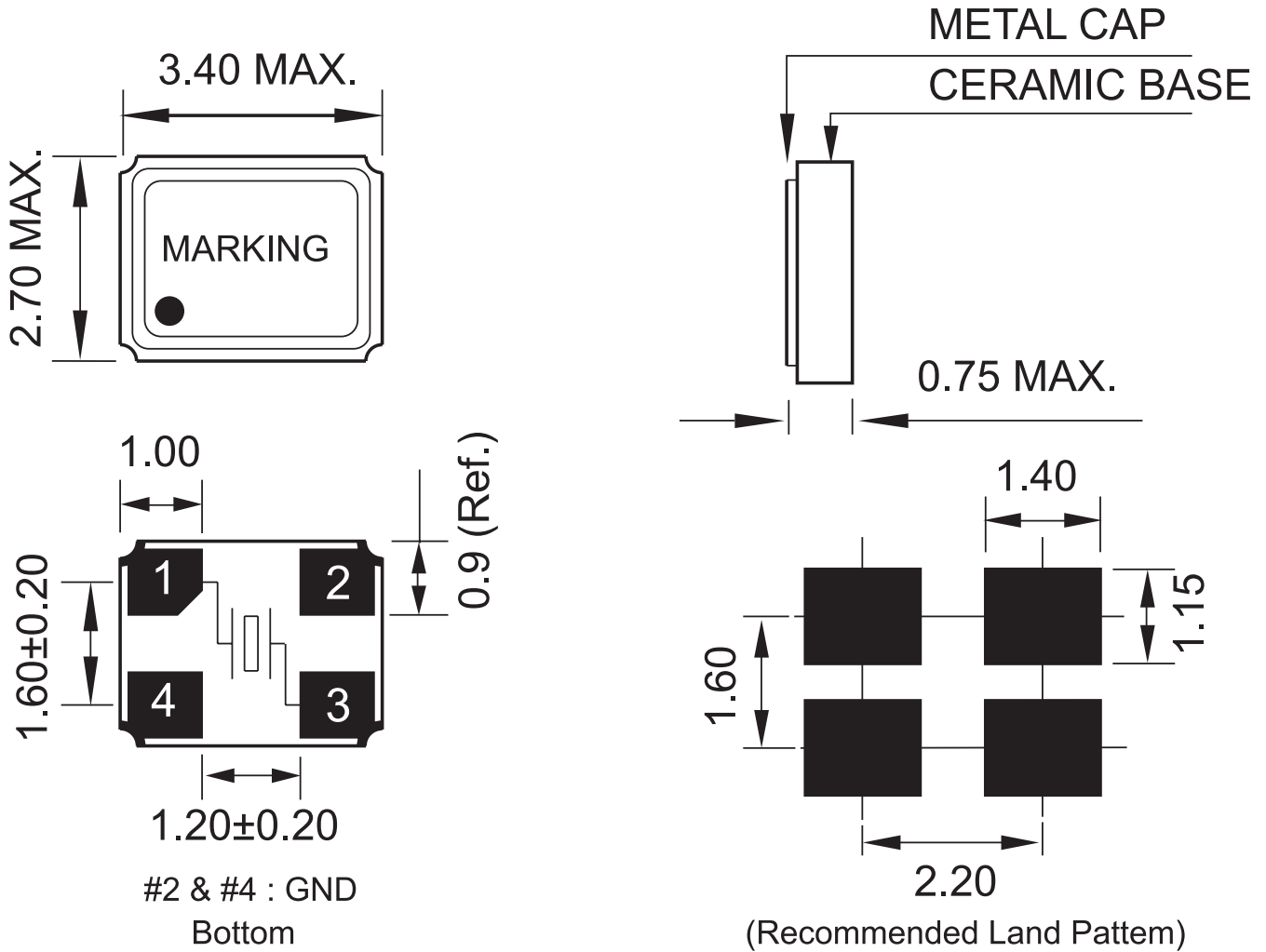
|  |             |                              |                     |
|--|-------------|------------------------------|---------------------|
| Frequency Range                            |             | 10.000 to 54.000             | MHz                 |
| Mode of Oscillation                        | Fundamental | 10.000 to 54.000             | MHZ                 |
| Frequency Tolerance at 25°C                | Standard    | ±30                          | PPM Max<br>(Note 1) |
|  | Optional    | ±25                          |                     |
|  |             | ±20                          |                     |
|  |             | ±15                          |                     |
|  |             | ±10                          |                     |
| Frequency Stability over Temperature Range | Standard    | ±50                          | PPM Max<br>(Note 1) |
|  | Optional    | ±30                          |                     |
|  |             | ±25                          |                     |
|  |             | ±20                          |                     |
|  |             | ±15                          |                     |
| Operating Temperature Range                | Standard    | -10 to +70                   | ° C                 |
|  | Extended    | -40 to +85                   |                     |
| Storage Temperature Range                  |             | -55 to +125                  |                     |
| Aging                                      |             | ±3                           | PPM Max/Year        |
| Load Capacitance                           |             | 7 to 32 and Series Resonance | pF                  |
| Shunt Capacitance                          |             | 5.0                          |                     |
| Equivalent Series Resistance (ESR)         |             | See ESR Table                | Ohm                 |
| Drive Level                                |             | 100                          | uW Max              |
| Insulation Resistance                      |             | 500 at 100 Vdc ± 15 Vdc      | M Ohm               |

**Frequency Range and ESR Values:**

| Frequency Range in MHz | ESR Ohm Max | Mode of Operation |
|------------------------|-------------|-------------------|
| 10.000 to 11.999       | 200         | Fundamental       |
| 12.000 to 29.999       | 100         | Fundamental       |
| 30.000 to 54.000       | 50          | Fundamental       |

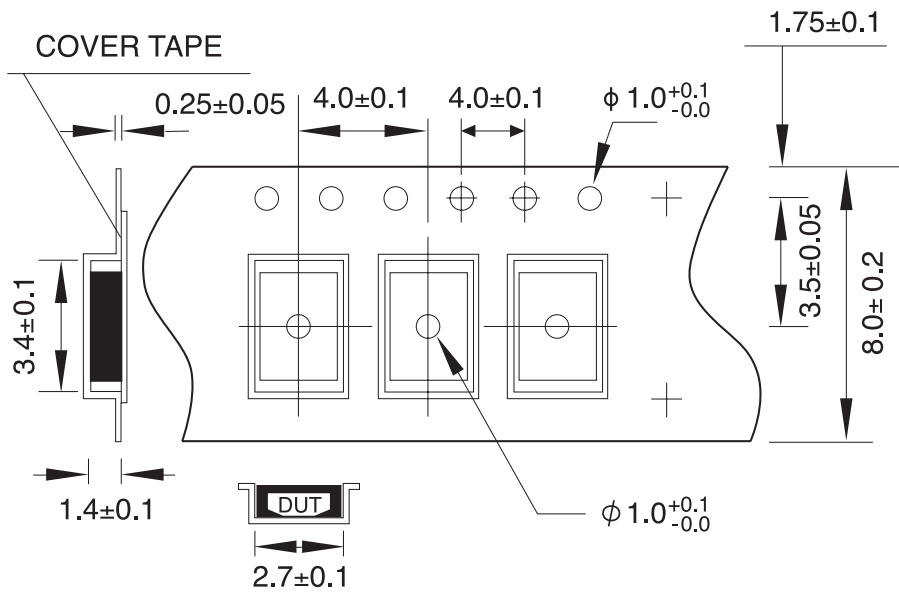
|   |  |                   |
|---|--|-------------------|
|  <p>11-3 Chien-Kuo Rd T.E.P.Z. 4027 Taiwan, ROC</p> <p>All dimensions are millimeters.</p> <p>CAD: TCR</p> <p>Review: EG</p> <p>Appr: JL</p> <p>Page: 1/4   Date: Dec. 9, 2013</p> | Specification Title:   |                   |
|   | <p><b>Microprocessor Crystal Unit</b></p> <p><b>Low Profile</b></p> <p><b>2.5 x 3.2 millimeter Surface Mount</b></p> <p><b>General Product Specification</b></p> |                   |
|   | Part Number:   | <b>C3E Series</b> |

**Mechanical Outline:**



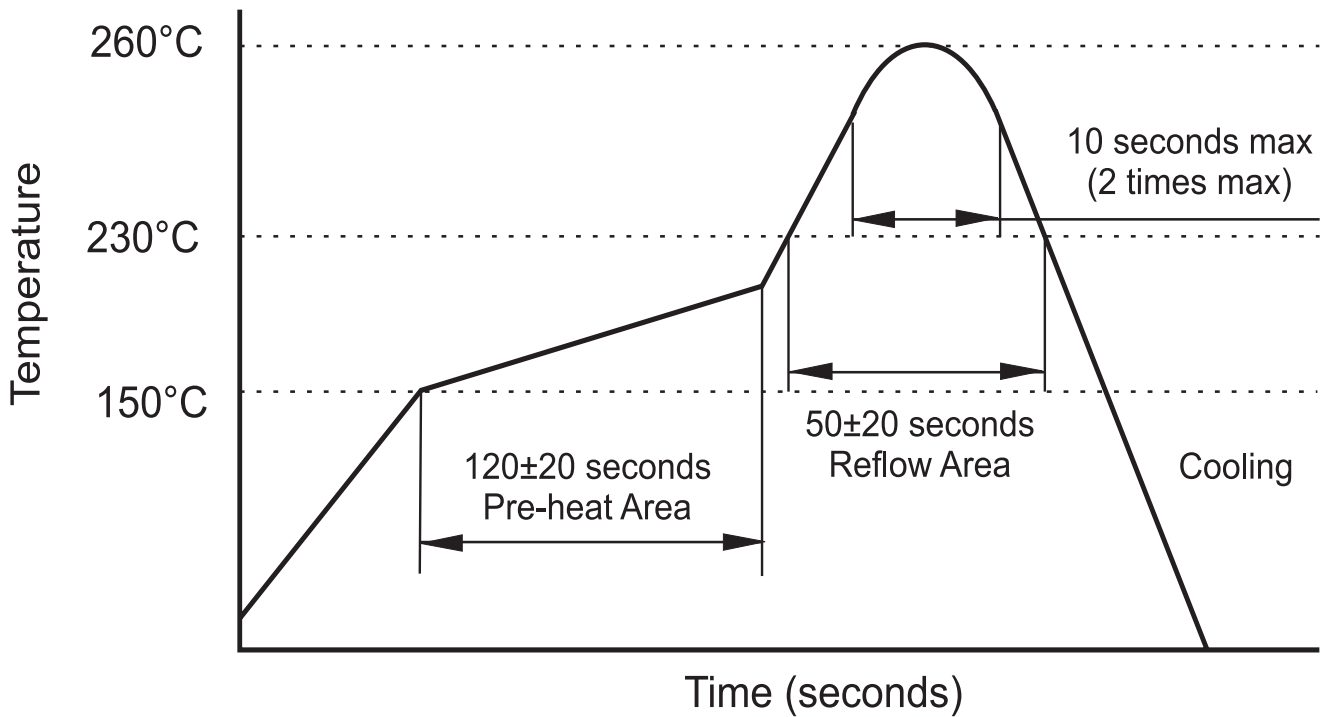
**Package is Seam Sealed Ceramic-Metal.  
Dimensions are millimeters.**

**Carrier Tape Dimensions:**



**Dimensions are millimeters.**

**Solder Reflow Characteristics:**



**How to build a Part Number:**

|   |                 |                         |                      |
|---|-----------------|-------------------------|----------------------|
| <b>Series</b>                           |                 | <b>C</b>                | <b>Parameter</b>     |
| <b>Package</b>                          |                 | <b>3E</b>               | <b>3.2 x 2.5 mm</b>  |
|   |                 | -                       |                      |
| <b>Frequency</b>                        |                 | <b>10.000 to 54.000</b> | <b>MHz</b>           |
|   |                 | -                       |                      |
| <b>Load Capacitance</b>                 |                 | <b>7</b>                | <b>7 pF</b>          |
|   |                 | <b>10</b>               | <b>10 pF</b>         |
|   |                 | <b>12</b>               | <b>12 pF</b>         |
|   |                 | <b>16</b>               | <b>16 pF</b>         |
|   |                 | <b>18</b>               | <b>18 pF</b>         |
|   |                 | <b>20</b>               | <b>20 pF</b>         |
|   |                 | <b>32</b>               | <b>32 pF</b>         |
|   |                 | <b>S</b>                | <b>Series</b>        |
|   |                 | -                       |                      |
| <b>Frequency Tolerance<br/>(Note 1)</b> | <b>Standard</b> | <b>30</b>               | <b>±30 PPM</b>       |
|   | <b>Option</b>   | <b>25</b>               | <b>±25 PPM</b>       |
|   |                 | <b>20</b>               | <b>±20 PPM</b>       |
|   |                 | <b>15</b>               | <b>± 15 PPM</b>      |
|   |                 | <b>10</b>               | <b>±10 PPM</b>       |
| <b>Frequency Stability<br/>(Note 1)</b> | <b>Standard</b> | <b>50</b>               | <b>±50 PPM</b>       |
|   | <b>Option</b>   | <b>30</b>               | <b>±30 PPM</b>       |
|   |                 | <b>25</b>               | <b>±25 PPM</b>       |
|   |                 | <b>20</b>               | <b>±20 PPM</b>       |
|   |                 | <b>15</b>               | <b>±15 PPM</b>       |
|   |                 | <b>10</b>               | <b>±10 PPM*</b>      |
|   |                 | -                       |                      |
| <b>Temperature Range</b>                | <b>Standard</b> | <b>See Notes</b>        | <b>-10 to +70 °C</b> |
|   | <b>Extended</b> | <b>X</b>                | <b>-40 to +85 °C</b> |
|   |                 | -                       |                      |
| <b>Packaging</b>                        |                 | <b>R</b>                | <b>Tape and Reel</b> |

**Part Number Example:**

**C3E-32.768-18-3050-X-R**

**C3E- 2.5 x 3.2 mm SMD Seam Seal Crystal Unit**

**32.768 MHz Nominal Frequency**

**18 pF Load Capacitance**

**3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability**

**Fundamental Mode**

**X: -40 to +85° C Temperature Range**

**R: Tape and Reel Packaging**

**Notes:**

- 1- Frequency Tolerance and Stability options are limited due to physical size.  
\* ±10 PPM Temperature Stability is only available from -30 to +85° C.
- 2- Standard Temperature Range does not need to be included in Part Number description.
- 3- Product is shipped in Tape and Reel configuration. Each reel contains 3000 pieces.
- 4- Quantities less than 3000 are shipped bulk in ESD pouches.
- 5- Specification subject to change without notice.