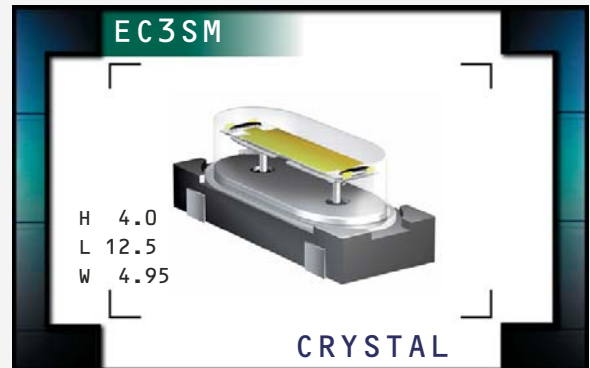


# EC3SM Series

- Four pad surface mount short package
- AT or BT cut available
- Resistance weld seal
- Tight tolerance/stability
- Interchangeable with plastic surface mount crystals
- Tape and reel available



## NOTES

### ELECTRICAL SPECIFICATIONS

|   |  |
|---|--|
| <b>Frequency Range</b>                  | 3.579545MHz to 40.000MHz   |
| <b>Frequency Tolerance / Stability</b>  | ±50ppm / ±100ppm (Standard), ±30ppm / ±50ppm (AT cut only), ±15ppm / ±30ppm (AT cut only), |
| <b>Over Operating Temperature Range</b> | or ±15ppm / ±20ppm (AT cut only)   |
| <b>Operating Temperature Range</b>      | 0°C to 70°C (Standard), -20°C to 70°C (AT cut only), or -40°C to 85°C (AT cut only)        |
| <b>Aging (at 25°C)</b>                  | ±5ppm / year Maximum   |
| <b>Storage Temperature Range</b>        | -40°C to 85°C  |
| <b>Shunt Capacitance</b>                | 7pF Maximum  |
| <b>Insulation Resistance</b>            | 500 Megaohms Minimum at 100V <sub>dc</sub>   |
| <b>Drive Level</b>                      | 1 mWatt Maximum  |
| <b>Load Capacitance (C<sub>L</sub>)</b> | 18pF (Standard), Custom C <sub>L</sub> ≥10pF, or Series Resonant                           |

### EQUIVALENT SERIES RESISTANCE (ESR), MODE OF OPERATION (MODE), AND CUT

| Frequency Range         | ESR (Ω) | Mode / Cut       | Frequency Range        | ESR (Ω) | Mode / Cut       |
|-------------------------|---------|------------------|------------------------|---------|------------------|
| 3.579545MHz to 4.999MHz | 200 Max | Fundamental / AT | 10.000MHz to 14.999MHz | 70 Max  | Fundamental / AT |
| 5.000MHz to 5.999MHz    | 150 Max | Fundamental / AT | 15.000MHz to 15.999MHz | 60 Max  | Fundamental / AT |
| 6.000MHz to 7.999MHz    | 120 Max | Fundamental / AT | 16.000MHz to 23.999MHz | 50 Max  | Fundamental / AT |
| 8.000MHz to 8.999MHz    | 90 Max  | Fundamental / AT | 24.000MHz to 30.000MHz | 40 Max  | Fundamental / AT |
| 9.000MHz to 9.999MHz    | 80 Max  | Fundamental / AT | 24.000MHz to 40.000MHz | 40 Max  | Fundamental / BT |

## PART NUMBERING GUIDE

### EC3SM - B - 20 - 28.375M TR

#### FREQUENCY TOLERANCE / STABILITY

Blank=±50ppm at 25°C, ±100ppm from 0°C to 70°C  
 A=±50ppm at 25°C, ±100ppm from -20°C to 70°C  
 B=±50ppm at 25°C, ±100ppm from -40°C to 85°C  
 C=±30ppm at 25°C, ±50ppm from 0°C to 70°C  
 D=±30ppm at 25°C, ±50ppm from -20°C to 70°C  
 E=±30ppm at 25°C, ±50ppm from -40°C to 85°C  
 F=±15ppm at 25°C, ±30ppm from 0°C to 70°C  
 G=±15ppm at 25°C, ±30ppm from -20°C to 70°C  
 J=±15ppm at 25°C, ±20ppm from 0°C to 70°C

#### PACKAGING OPTIONS

Blank=Bulk, TR=Tape and Reel

#### FREQUENCY

#### LOAD CAPACITANCE

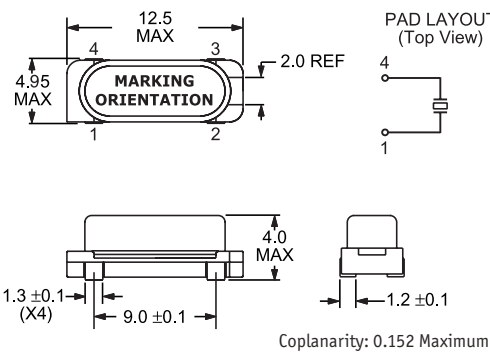
Blank=18pF (Standard), S=Series  
 XX=XXpF (Custom)

#### MODE OF OPERATION / CRYSTAL CUT

Blank=Fundamental / AT  
 B=Fundamental / BT

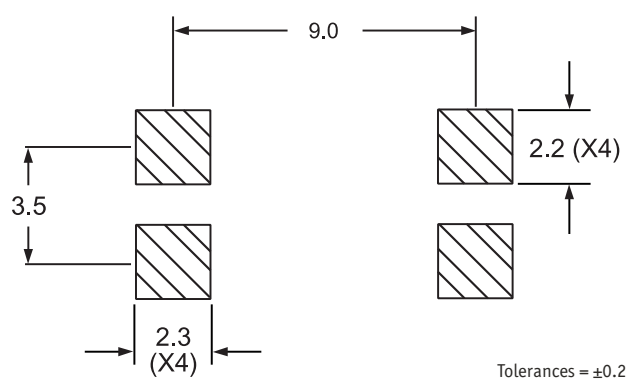
#### MECHANICAL DIMENSIONS

ALL DIMENSIONS IN MILLIMETERS



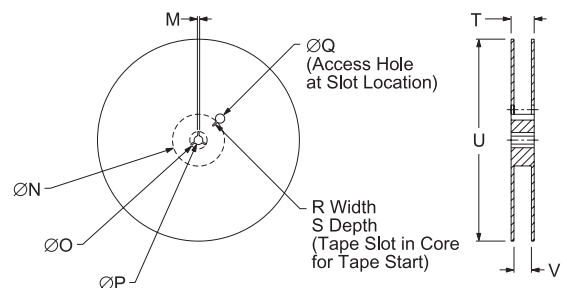
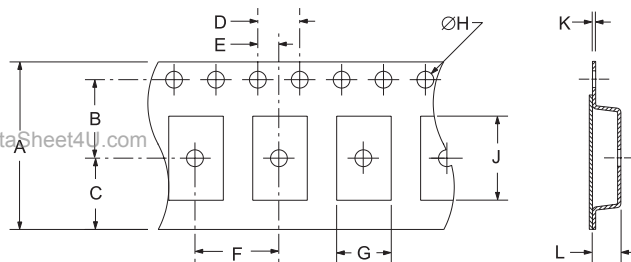
#### SUGGESTED SOLDER PAD LAYOUT

ALL DIMENSIONS IN MILLIMETERS



#### TAPE AND REEL DIMENSIONS

ALL DIMENSIONS IN MILLIMETERS



| TAPE | A     | B       | C        | D       | E      |        |
|------|-------|---------|----------|---------|--------|--------|
|      | 24±.3 | 11.5±.1 | 10.75±.1 | 4±.1    | 2±.1   |        |
| F    | G     | H       | J        | K       | L      |        |
|      | 12±.1 | 5.4±.1  | 1.5 ±.1  | 12.5±.1 | .4±.05 | 4.2±.1 |

| REEL | M       | N      | O        | P       | Q        |       |
|------|---------|--------|----------|---------|----------|-------|
|      | 1.5 MIN | 50 MIN | 20.2 MIN | 13±.2   | 40 MIN   |       |
| R    | S       | T      | U        | V       | QTY/REEL |       |
|      | 2.5 MIN | 10 MIN | 30.4 MAX | 360 MAX | 24.4+2-2 | 1,000 |

#### ENVIRONMENTAL/MECHANICAL SPECIFICATIONS

| PARAMETER                    | SPECIFICATION                         |
|------------------------------|---------------------------------------|
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C |
| Mechanical Shock             | MIL-STD-202, Method 213, Condition C  |
| Vibration                    | MIL-STD-883, Method 2007, Condition A |
| Solderability                | MIL-STD-883, Method 2002              |
| Temperature Cycling          | MIL-STD-883, Method 1010              |
| Resistance to Soldering Heat | MIL-STD-883, Method 210               |
| Resistance to Solvents       | MIL-STD-883, Method 215               |

#### MARKING SPECIFICATIONS

\*Compliant to EIA-481A

Line 1: E XX.XXX  
 Frequency in MHz  
 (5 Digits Maximum + Decimal)

| MANUFACTURER   | CATEGORY | SERIES | PACKAGE          | CLASS | REV. DATE |
|----------------|----------|--------|------------------|-------|-----------|
| ECLIPTEK CORP. | CRYSTAL  | EC3SM  | EPOXY BASE SHORT | CR32  | 08/06     |