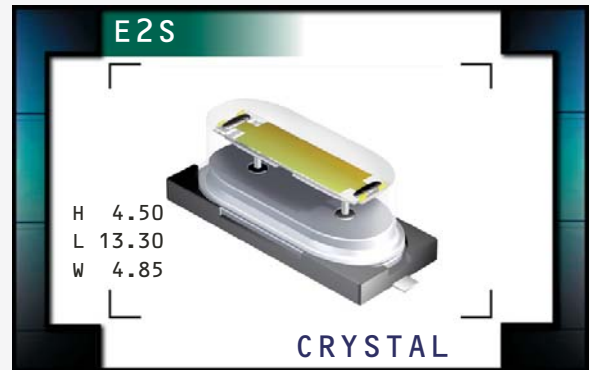


# E2S Series



**ECLIPTEK**<sup>®</sup>  
CORPORATION

- RoHS Compliant (Pb-Free)
- HC-49/UP package
- AT or BT cut available
- Resistance weld seal
- Tight tolerance/stability
- Tape and reel available



## NOTES

### ELECTRICAL SPECIFICATIONS

|   |  |
|---|--|
| <b>Frequency Range</b>                  | 3.579545MHz to 50.000MHz   |
| <b>Frequency Tolerance / Stability</b>  | ±50ppm / ±100ppm (Standard), ±30ppm / ±50ppm (AT cut only), ±15ppm / ±30ppm (AT cut only),           |
| <b>Over Operating Temperature Range</b> | ±15ppm / ±20ppm (AT cut only), or ±10ppm / ±15ppm (AT cut only)                                      |
| <b>Operating Temperature Range</b>      | 0°C to 70°C, -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 125°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 Parallel Resonant (Standard), Custom C <sub>L</sub> ≥10pF Parallel Resonant, 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 | 15.000MHz to 15.999MHz | 60 Max  | Fundamental / AT    |
| 5.000MHz to 5.999MHz    | 150 Max | Fundamental / AT | 16.000MHz to 23.999MHz | 50 Max  | Fundamental / AT    |
| 6.000MHz to 7.999MHz    | 120 Max | Fundamental / AT | 24.000MHz to 30.000MHz | 40 Max  | Fundamental / AT    |
| 8.000MHz to 8.999MHz    | 90 Max  | Fundamental / AT | 24.000MHz to 40.000MHz | 40 Max  | Fundamental / BT    |
| 9.000MHz to 9.999MHz    | 80 Max  | Fundamental / AT | 24.576MHz to 29.999MHz | 150 Max | Third Overtone / AT |
| 10.000MHz to 14.999MHz  | 70 Max  | Fundamental / AT | 30.000MHz to 50.000MHz | 100 Max | Third Overtone / AT |

MANUFACTURER  
ECLIPTEK CORP.

CATEGORY  
CRYSTAL

SERIES  
E2S

PACKAGE  
HC-49/UP

CLASS  
CR44

REV. DATE  
08/08

## PART NUMBERING GUIDE

### E2S A 18 - 20.000M TR

#### FREQUENCY TOLERANCE / STABILITY

A=±50ppm at 25°C, ±100ppm from 0°C to 70°C  
 B=±50ppm at 25°C, ±100ppm from -20°C to 70°C  
 C=±50ppm at 25°C, ±100ppm from -40°C to 85°C  
 D=±30ppm at 25°C, ±50ppm from 0°C to 70°C  
 E=±30ppm at 25°C, ±50ppm from -20°C to 70°C  
 F=±30ppm at 25°C, ±50ppm from -40°C to 85°C  
 G=±15ppm at 25°C, ±30ppm from 0°C to 70°C  
 H=±15ppm at 25°C, ±30ppm from -20°C to 70°C  
 J=±15ppm at 25°C, ±30ppm from -40°C to 85°C  
 K=±15ppm at 25°C, ±20ppm from 0°C to 70°C  
 L=±15ppm at 25°C, ±20ppm from -20°C to 70°C  
 M=±15ppm at 25°C, ±20ppm from -40°C to 85°C  
 N=±10ppm at 25°C, ±15ppm from 0°C to 70°C  
 P=±10ppm at 25°C, ±15ppm from -20°C to 70°C

#### PACKAGING OPTIONS

Blank=Bulk, TR=Tape and Reel

#### FREQUENCY

#### LOAD CAPACITANCE

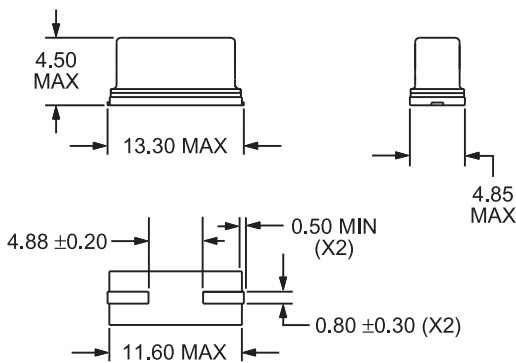
S=Series Resonant  
 XX=XXpF Parallel Resonant

#### MODE OF OPERATION / CRYSTAL CUT

A=Fundamental / AT,  
 B=Third Overtone / AT  
 D=Fundamental / BT

#### MECHANICAL DIMENSIONS

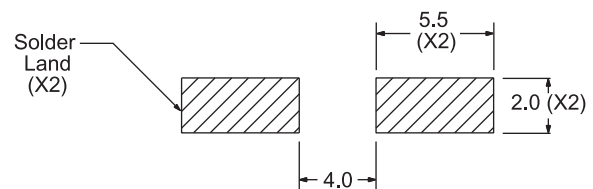
ALL DIMENSIONS IN MILLIMETERS



Coplanarity: 0.36mm Maximum

#### SUGGESTED SOLDER PAD LAYOUT

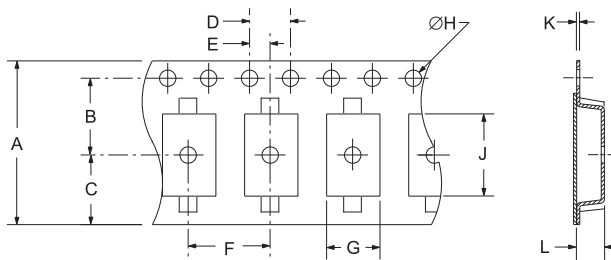
ALL DIMENSIONS IN MILLIMETERS



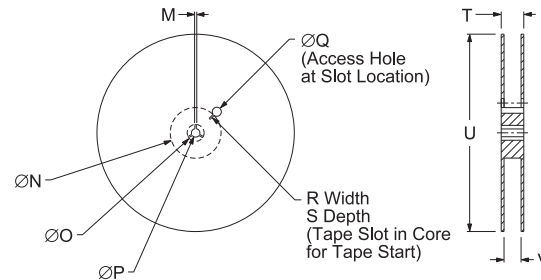
Tolerances = ±0.2

#### TAPE AND REEL DIMENSIONS

ALL DIMENSIONS IN MILLIMETERS



| TAPE | A     | B       | C        | D    | E     |
|------|-------|---------|----------|------|-------|
|      | 24±.3 | 11.5±.1 | 10.75±.1 | 4±.2 | 2±.1  |
| F    | G     | H       | J        | K    | L     |
|      | 12±.2 | B0*     | 1.5±.1   | A0*  | .4±.1 |
|      |       |         |          |      | K0*   |



| 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+2-0 |
|      |         |        |          |         | 1,000    |

\*Compliant to EIA-481A

#### ENVIRONMENTAL/MECHANICAL SPECIFICATIONS

| PARAMETER                    | SPECIFICATION                                 |
|------------------------------|---|
| ESD Susceptibility           | MIL-STD-883, Method 3015, Class 1, HBM: 1500V |
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A         |
| Flammability                 | UL94-V0                                       |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C         |
| Mechanical Shock             | MIL-STD-202, Method 213, Condition C          |
| Moisture Resistance          | MIL-STD-883, Method 1004                      |
| Moisture Sensitivity         | J-STD-020, MSL1                               |
| Resistance to Soldering Heat | MIL-STD-202, Method 210, Condition K          |
| Resistance to Solvents       | MIL-STD-202, Method 215                       |
| Solderability                | MIL-STD-883, Method 2003                      |
| Temperature Cycling          | MIL-STD-883, Method 1010, Condition B         |
| Vibration                    | MIL-STD-883, Method 2007, Condition A         |

#### MARKING SPECIFICATIONS

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

| MANUFACTURER   | CATEGORY | SERIES | PACKAGE  | CLASS | REV - DATE |
|----------------|----------|--------|----------|-------|------------|
| ECLIPTEK CORP. | CRYSTAL  | E2S    | HC-49/UP | CR44  | 08/08      |