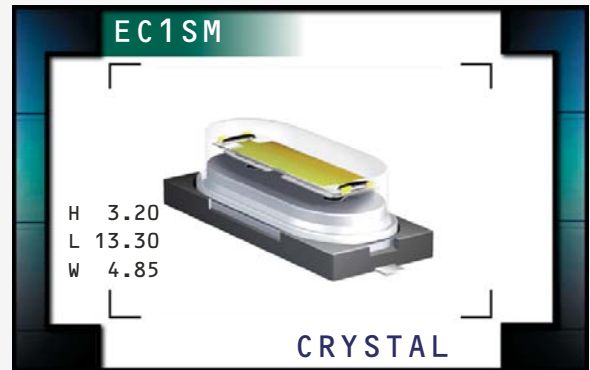


# EC1SM Series

- HC-49/UP short 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 60.000MHz
<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 (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	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 48.000MHz	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 60.000MHz	100 Max	Third Overtone / AT

## PART NUMBERING GUIDE

### EC1SM A - T - 20 - 30.00M 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  
 H=±15ppm at 25°C, ±30ppm from -40°C to 85°C  
 J=±15ppm at 25°C, ±20ppm from 0°C to 70°C  
 K=±15ppm at 25°C, ±20ppm from -20°C to 70°C  
 L=±15ppm at 25°C, ±20ppm from -40°C to 85°C  
 M=±10ppm at 25°C, ±15ppm from 0°C to 70°C  
 N=±10ppm at 25°C, ±15ppm from -20°C to 70°C

#### PACKAGING OPTIONS

Blank=Bulk, TR=Tape and Reel

#### FREQUENCY

#### LOAD CAPACITANCE

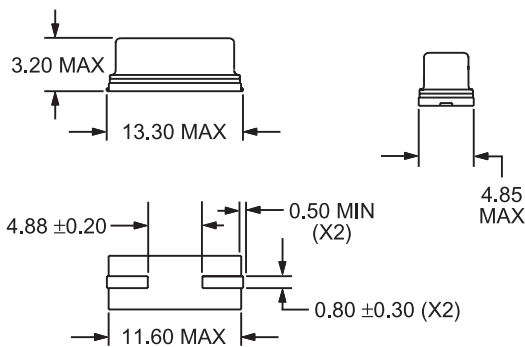
Blank=18pF (Standard), S=Series  
 XX=XXpF (Custom)

#### MODE OF OPERATION / CRYSTAL CUT

Blank=Fundamental / AT,  
 B=Fundamental / BT  
 T=Third Overtone / AT

#### MECHANICAL DIMENSIONS

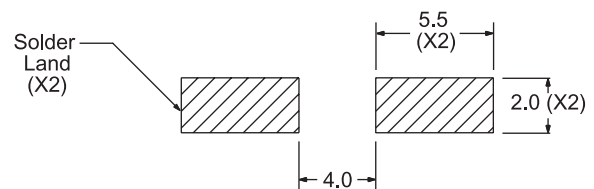
ALL DIMENSIONS IN MILLIMETERS



Coplanarity: 0.36mm Maximum

#### SUGGESTED SOLDER PAD LAYOUT

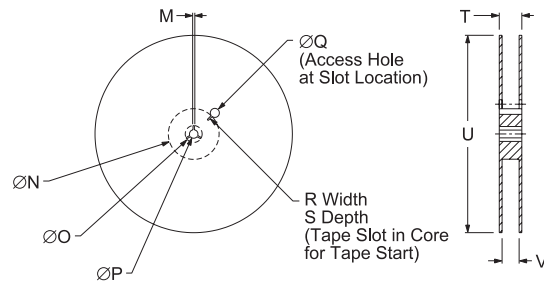
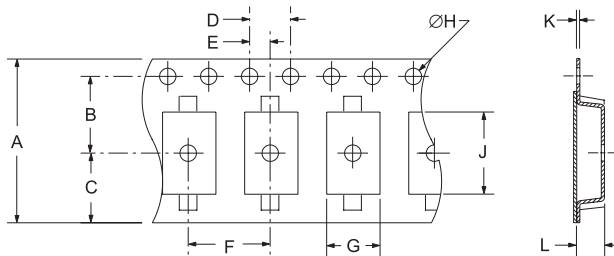
ALL DIMENSIONS IN MILLIMETERS



Tolerances = ±0.2

#### TAPE AND REEL DIMENSIONS

ALL DIMENSIONS IN MILLIMETERS



TAPE	A	B	C	D	E
	24±.3	11.5±.1	0.75±.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
	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

#### ENVIRONMENTAL/MECHANICAL SPECIFICATIONS

##### PARAMETER

Fine Leak Test  
 Gross Leak Test  
 Mechanical Shock  
 Vibration  
 Solderability  
 Temperature Cycling  
 Resistance to Soldering Heat  
 Resistance to Solvents

##### SPECIFICATION

MIL-STD-883, Method 1014, Condition A  
 MIL-STD-883, Method 1014, Condition C  
 MIL-STD-202, Method 213, Condition C  
 MIL-STD-883, Method 2007, Condition A  
 MIL-STD-883, Method 2002  
 MIL-STD-883, Method 1010  
 MIL-STD-883, Method 210  
 MIL-STD-883, Method 215

#### MARKING SPECIFICATIONS

\*Compliant to EIA-481A

Line 1: E XX.XXX

Frequency in MHz  
 (5 Digits Maximum + Decimal)

MANUFACTURER  
 ECLIPTEK CORP.

CATEGORY  
 CRYSTAL

SERIES  
 EC1SM

PACKAGE  
 HC-49/UP Short

CLASS  
 CR21

REV. DATE  
 09/03