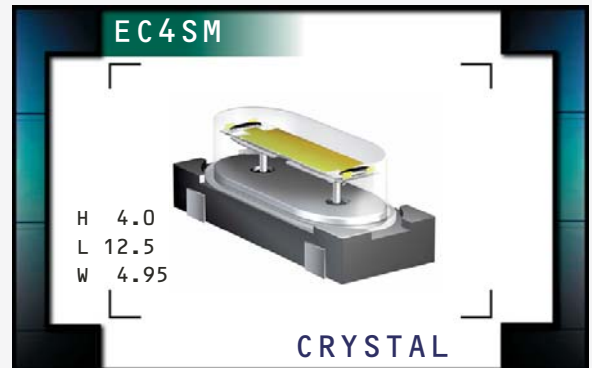


# EC4SM Series

- 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 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	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

### EC4SM - B - 20 - 25.000 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

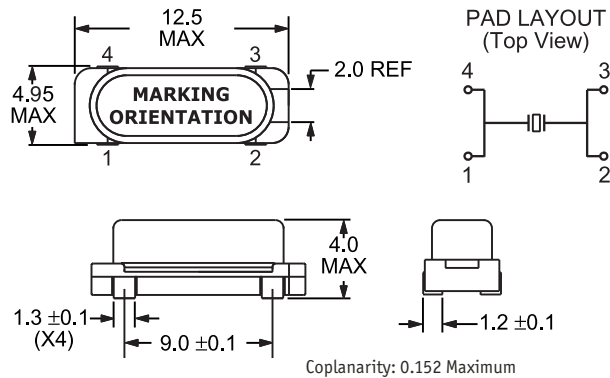
Blank=18pF Parallel Resonant (Standard)  
 XX=XXpF Parallel Resonant (Custom)  
 S=Series Resonant

#### MODE OF OPERATION / CRYSTAL CUT

Blank=Fundamental / AT  
 B=Fundamental / BT

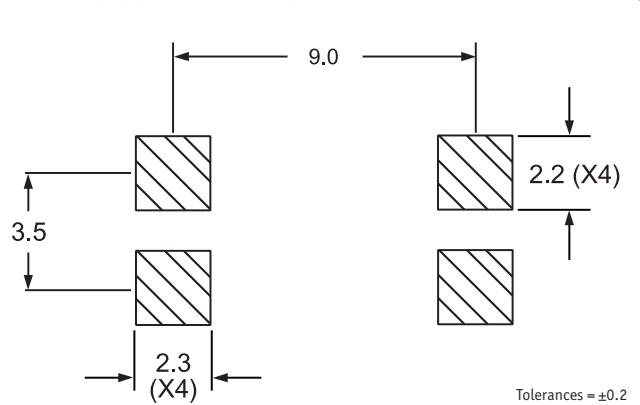
#### MECHANICAL DIMENSIONS

ALL DIMENSIONS IN MILLIMETERS



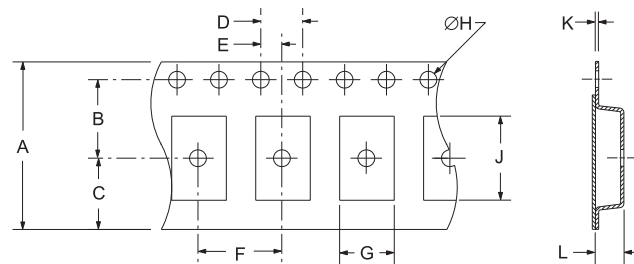
#### SUGGESTED SOLDER PAD LAYOUT

ALL DIMENSIONS IN MILLIMETERS

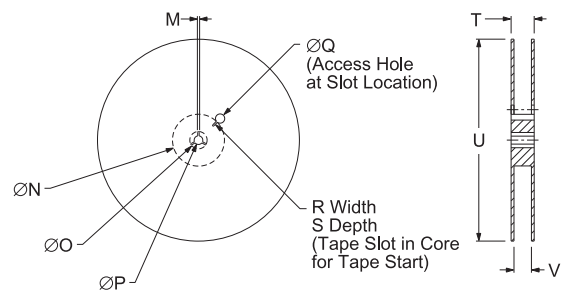


#### TAPE AND REEL DIMENSIONS

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	2.5±.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+2-0	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 ECLIPTEK CORP.	CATEGORY CRYSTAL	SERIES EC4SM	PACKAGE EPOXY BASE SHORT	CLASS CR33	REV. DATE 08/06
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