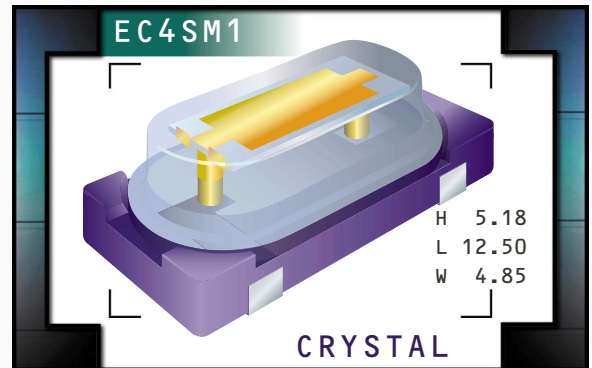


EC4SM1 Series

- Four pad surface mount 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

Frequency Range	3.579545MHz to 60.000MHz
Frequency Tolerance / Stability	$\pm 50\text{ppm} / \pm 100\text{ppm}$ (Standard),
Over Operating Temperature Range	$\pm 30\text{ppm} / \pm 50\text{ppm}$ (AT cut only), or $\pm 15\text{ppm} / \pm 30\text{ppm}$ (AT cut only)
Operating Temperature Range	0°C to 70°C (Standard), -20°C to 70°C (AT cut only), or -40°C to 85°C (AT cut only)
Aging (at 25°C)	$\pm 5\text{ppm} / \text{year}$ Maximum
Storage Temperature Range	-40°C to 85°C
Shunt Capacitance	7pF Maximum
Insulation Resistance	500 Megaohms Minimum at $100V_{\text{DC}}$
Drive Level	1 mWatt Maximum
Load Capacitance (C_L)	18pF (Standard), Custom $C_L \geq 10\text{pF}$, 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

EC4SM1 A - T - 20 - 30.000M 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

PACKAGING OPTIONS

Blank=Bulk, TR=Tape and Reel

FREQUENCY

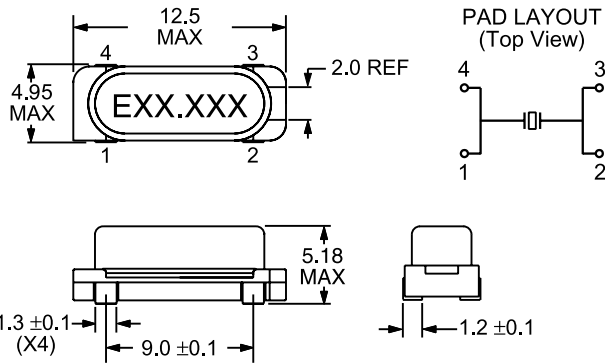
LOAD CAPACITANCE

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

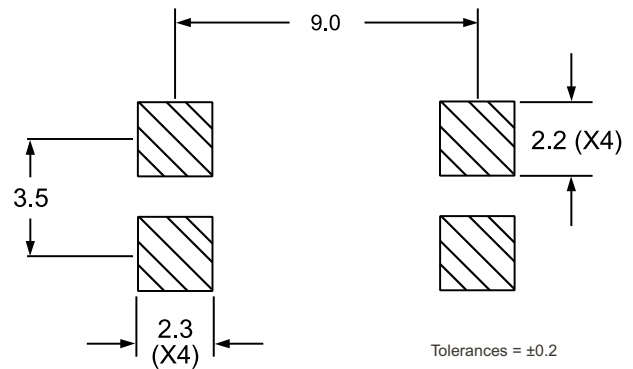
MODE OF OPERATION / CRYSTAL CUT

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

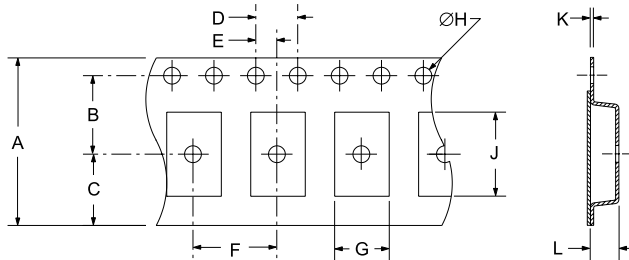
MECHANICAL DIMENSIONS ALL DIMENSIONS IN MILLIMETERS



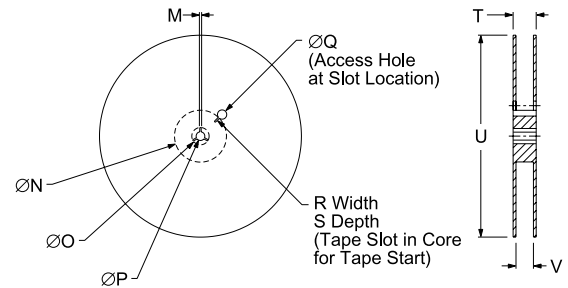
SUGGESTED SOLDER PAD LAYOUT ALL DIMENSIONS IN MILLIMETERS



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
					5.35±0.2



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
Seal Integrity	Bubble test in Perfluorocarbon at +125°C ±5°C for 60 seconds minimum.
Solderability	Sn63 Solder dip at +230°C ±5°C for 5 seconds/95% coverage.
Marking Permanency	10 Strokes with brush after 1 minute soak in solvent, 3 times.
Shock	Random drop on hard wooden plate 3 times from a height of 50cm.
Vibration	Frequency with an amplitude of 1.5mm sweeping between 10Hz to 55Hz within 1 minute (approximately) for 2 hours minimum on each axis (X,Y and Z) for a total of 6 hours.

MARKING SPECIFICATIONS

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

MANUFACTURER
ECLIPTEK CORP.

CATEGORY
CRYSTAL

SERIES
EC4SM1

PACKAGE
EPOXY BASE

CLASS
CR35

REV. DATE
01/02