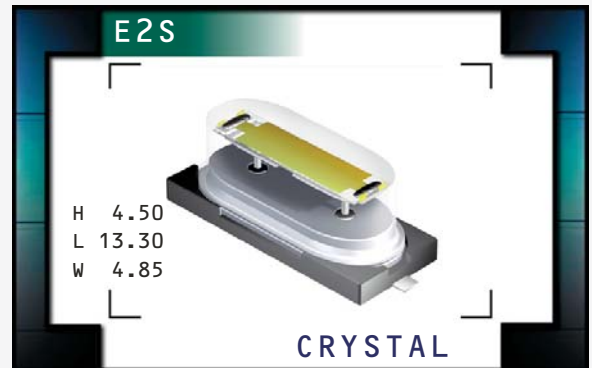


E2S Series



- 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

Frequency Range	3.579545MHz to 50.000MHz
Frequency Tolerance / Stability	±50ppm / ±100ppm (Standard), ±30ppm / ±50ppm (AT cut only), ±15ppm / ±30ppm (AT cut only),
Over Operating Temperature Range	±15ppm / ±20ppm (AT cut only), or ±10ppm / ±15ppm (AT cut only)
Operating Temperature Range	0°C to 70°C, -20°C to 70°C (AT cut only), -40°C to 85°C (AT cut only), or -40°C to 125°C (AT cut only)
Aging (at 25°C)	±5ppm / year Maximum
Storage Temperature Range	-40°C to 125°C
Shunt Capacitance	7pF Maximum
Insulation Resistance	500 Megaohms Minimum at 100V _{dc}
Drive Level	1 mWatt Maximum
Load Capacitance (C_L)	18pF (Standard), Custom C _L ≥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 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
08/05

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
 T=±30ppm at 25°C, ±50ppm from -40°C to 125°C

PACKAGING OPTIONS

Blank=Bulk, TR=Tape and Reel

FREQUENCY

LOAD CAPACITANCE

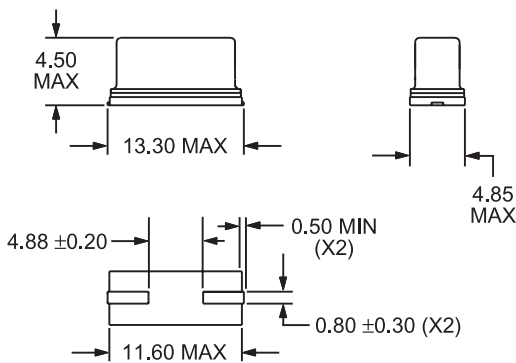
S=Series
 XX=XXpF

MODE OF OPERATION / CRYSTAL CUT

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

MECHANICAL DIMENSIONS

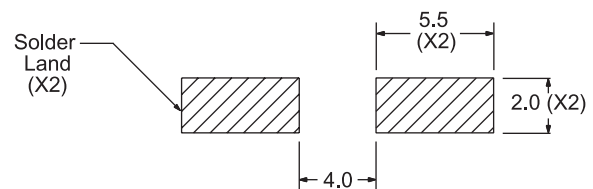
ALL DIMENSIONS IN MILLIMETERS



Coplanarity: 0.36mm Maximum

SUGGESTED SOLDER PAD LAYOUT

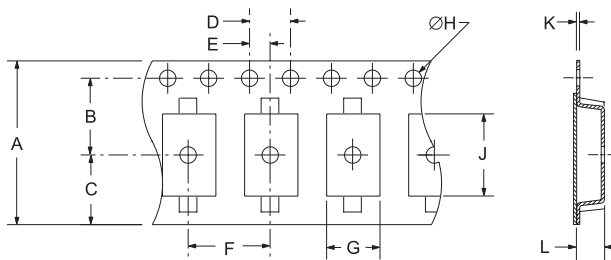
ALL DIMENSIONS IN MILLIMETERS



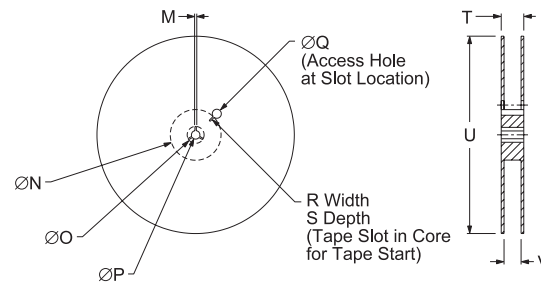
Tolerances = ±0.2

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

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

SPECIFICATION

MIL-STD-883, Method 1014, Condition A
 MIL-STD-883, Method 1014, Condition C
 Sn 2µm - 6µm
 MIL-STD-202, Method 213, Condition C
 MIL-STD-202, Method 210
 MIL-STD-202, Method 215
 MIL-STD-883, Method 2002
 MIL-STD-883, Method 1010
 MIL-STD-883, Method 2007, Condition A

MARKING SPECIFICATIONS

Line 1: E XX.XXX M

Frequency in MHz
 (5 Digits Maximum + Decimal)

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