E1S Series Crystal

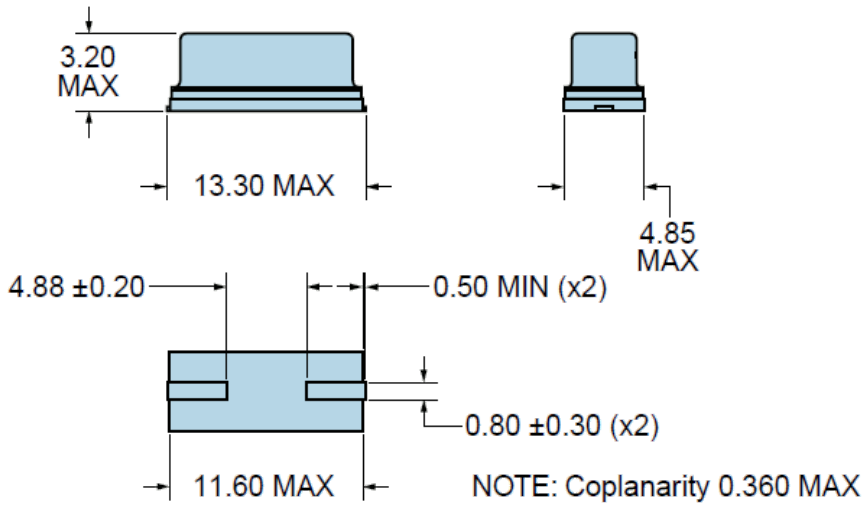
Quartz Crystal Resonator HC49/UP Short 2 Pad Surface Mount (SMD) 3.2mm Height Metal Resistance Weld Seal

Revision H 11/09/2015

Electrical Specifications

Nominal Frequency	3.579545MHz to 50.000MHz *Some frequencies within this range may not be available.*
Frequency Tolerance (at 25°C)	±50ppm Maximum ±30ppm Maximum ±15ppm Maximum ±10ppm Maximum
Frequency Stability (over Operating Temperature Range)	±100ppm Maximum ±50ppm Maximum ±30ppm Maximum ±20ppm Maximum ±15ppm Maximum
Operating Temperature Range	0°C to +70°C -20°C to +70°C -40°C to +85°C -40°C to +105°C -40°C to +125°C -55°C to +125°C
Aging at 25°C	±5ppm/year Maximum
Load Capacitance	10pF to 50pF Parallel Resonant Series Resonant
Shunt Capacitance	7pF Maximum
Equivalent Series Resistance	Click to Open ESR Table
Mode of Operation	Fundamental or Third Overtone
Crystal Cut	AT or BT
Drive Level	1mWatt Maximum
Storage Temperature Range	-55°C to +125°C
Insulation Resistance	Measured at $100V_{DC}$ 500 Megaohms Minimum

Mechanical Dimensions



All Dimensions in Millimeters

Marking Specifications

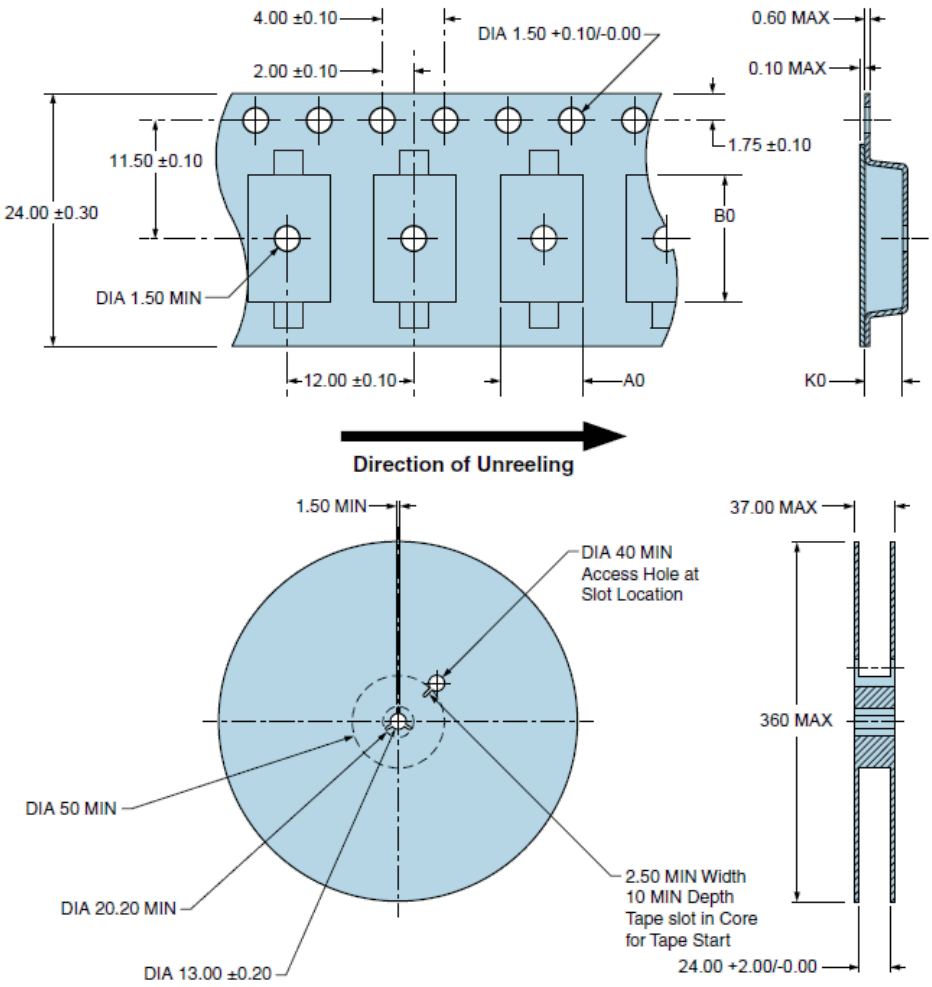
Line 1: **EXXXXXXM**

- E = Ecliptek Designator
- XXXXXX = Nominal Frequency (5 Digits + Decimal)
- M = Frequency Unit of Measure (MHz)

Environmental and Mechanical Specifications

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

Tape & Reel Dimensions



1000 pieces per reel
Compliant to EIA-481
All Dimensions in Millimeters

Fundamental Mode AT Cut

Nominal Frequency Range in MHz	*Maximum ESR in Ohms*
3.579545 to 4.999999	200
5.000000 to 5.999999	150
6.000000 to 7.999999	120
8.000000 to 8.999999	90
9.000000 to 9.999999	80
10.000000 to 14.999999	70
15.000000 to 15.999999	60
16.000000 to 23.999999	50
24.000000 to 30.000000	40

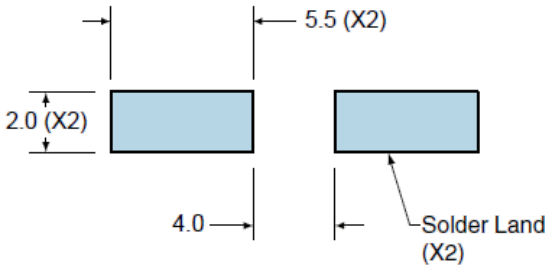
Fundamental Mode BT Cut

Nominal Frequency Range in MHz	*Maximum ESR in Ohms*
24.000000 to 40.000000	40

Third Overtone Mode AT Cut

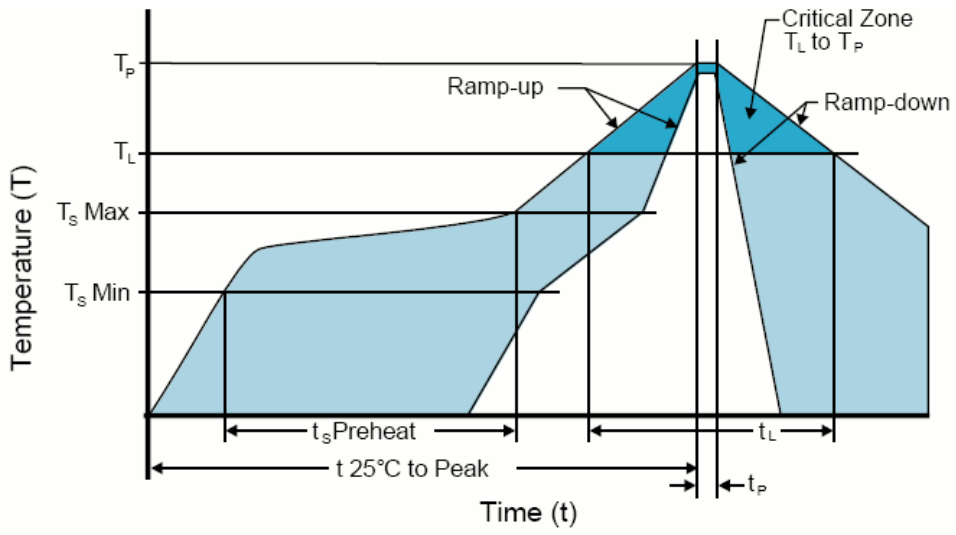
Nominal Frequency Range in MHz	*Maximum ESR in Ohms*
24.576000 to 29.999999	150
30.000000 to 50.000000	100

Recommended Solder Pad Dimensions



Tolerances = ±0.1
All Dimensions in Millimeters

Solder Reflow Profile



High Temperature Infrared/Convection

Note: Temperatures shown are applied to body of device.

T_S MAX to T_L (Ramp-up Rate)	3°C/second Maximum
Preheat	
- Temperature Minimum (T_S MIN)	150°C
- Temperature Typical (T_S TYP)	175°C
- Temperature Maximum (T_S MAX)	200°C
- Time (t_S)	60 - 180 Seconds
Ramp-up Rate (T_L to T_P)	3°C/second Maximum
Time Maintained Above:	
- Temperature (T_L)	217°C
- Time (t_L)	60 - 150 Seconds
Peak Temperature (T_P)	260°C Maximum for 10 Seconds Maximum
Target Peak Temperature (T_P Target)	250°C +0/-5°C
Time within 5°C of actual peak (t_P)	20 - 40 seconds
Ramp-down Rate	6°C/second Maximum
Time 25°C to Peak Temperature (t)	8 minutes Maximum
Moisture Sensitivity Level	Level 1

Low Temperature Infrared/Convection

Note: Temperatures shown are applied to body of device.

T_S MAX to T_L (Ramp-up Rate)	5°C/second Maximum
Preheat	
- Temperature Minimum (T_S MIN)	N/A
- Temperature Typical (T_S TYP)	150°C
- Temperature Maximum (T_S MAX)	N/A
- Time (t_S)	60 - 120 Seconds
Ramp-up Rate (T_L to T_P)	5°C/second Maximum
Time Maintained Above:	
- Temperature (T_L)	150°C
- Time (t_L)	200 Seconds Maximum
Peak Temperature (T_P)	240°C Maximum
Target Peak Temperature (T_P Target)	240°C Maximum 2 Times / 230°C Maximum 1 Time
Time within 5°C of actual peak (t_P)	10 seconds Maximum 2 Times / 80 seconds Maximum 1 Time
Ramp-down Rate	5°C/second Maximum
Time 25°C to Peak Temperature (t)	N/A
Moisture Sensitivity Level	Level 1

High Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
260°C Maximum for 5 seconds Maximum, 2 times Maximum.

Low Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
185°C Maximum for 10 seconds Maximum, 2 times Maximum.

Part Number Constructor

Build a Part Number

Select the parameters that meet your requirements and then click the Next button below

On the next page

Part Number specific documents, resources, and tools

Frequency (MHz)

3.579545 to 50.000

Some frequencies within this range may not be available

Frequency Tolerance/Stability

±50ppm at 25°C, ±100ppm over 0°C to +70°C

Mode of Operation

AT-Cut Fundamental

Load Capacitance (pF)

18 (10 to 50 or leave blank for Series Resonant)

Packaging Options

Tape & Reel

- Part Number Specific Data Sheet
- Compliance Docs (REACH, RoHS, CMRT)
- Automated Quick Quote
- IPC-1752
- Check Stock
- My Parts List
- Plus more

Part Numbering Guide

E1S A A 18 -20.000M TR

Series
Quartz Crystal Resonator HC49/UP Short 2 Pad Surface Mount (SMD) 3.2mm Height Metal Resistance Weld Seal

Frequency Tolerance/Stability
A = ±50ppm at 25°C, ±100ppm over 0°C to +70°C
B = ±50ppm at 25°C, ±100ppm over -20°C to +70°C
C = ±50ppm at 25°C, ±100ppm over -40°C to +85°C
D = ±30ppm at 25°C, ±50ppm over 0°C to +70°C
E = ±30ppm at 25°C, ±50ppm over -20°C to +70°C
F = ±30ppm at 25°C, ±50ppm over -40°C to +85°C
G = ±15ppm at 25°C, ±30ppm over 0°C to +70°C
H = ±15ppm at 25°C, ±30ppm over -20°C to +70°C
J = ±15ppm at 25°C, ±30ppm over -40°C to +85°C
K = ±15ppm at 25°C, ±20ppm over 0°C to +70°C
L = ±15ppm at 25°C, ±20ppm over -20°C to +70°C
M = ±15ppm at 25°C, ±20ppm over -40°C to +85°C
N = ±10ppm at 25°C, ±15ppm over 0°C to +70°C
P = ±10ppm at 25°C, ±15ppm over -20°C to +70°C
Q = ±10ppm at 25°C, ±15ppm over -40°C to +85°C
R = ±15ppm at 25°C, ±30ppm over -40°C to +105°C
S = ±30ppm at 25°C, ±50ppm over -40°C to +105°C
T = ±50ppm at 25°C, ±100ppm over -40°C to +105°C
V = ±30ppm at 25°C, ±50ppm over -40°C to +125°C
W = ±50ppm at 25°C, ±100ppm over -40°C to +125°C
Y = ±30ppm at 25°C, ±50ppm over -55°C to +125°C
Z = ±50ppm at 25°C, ±100ppm over -55°C to +125°C

Load Capacitance
S = Series Resonant
XX = 10pF Parallel Resonant to 50pF Parallel Resonant

Mode of Operation
A = AT-Cut Fundamental
B = AT-Cut Third Overtone
D = BT-Cut Fundamental

Nominal Frequency

Packaging Options
Blank = Bulk
TR = Tape & Reel

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