

# HC/49US (AT49) ULTRA LOW ESR SMD LOW PROFILE CRYSTAL

ABLS-LR



RoHS  
Compliant



11.5 x 4.8 x 4.2 mm

**Moisture Sensitivity Level (MSL) – This product is Hermetically Sealed and not Moisture Sensitive - MSL = N/A: Not Applicable**

## FEATURES:

- Ultra low ESR as low as 20 ohms for 4MHz, 85% lower than typical SMD Low Profile HC49S Crystals
- Low negative resistance(-R) IC design can ensure high oscillation margin
- Tight stability and automotive grade temperature available
- Hermetically resistance weld sealed

## APPLICATIONS:

- Low negative resistance u-controller design for low frequency
- Wide range of automotive applications
- Industrial applications

## STANDARD SPECIFICATIONS:

### PARAMETERS

|                                                             |                                                                                                                                                           |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| ABRACON P/N                                                 | ABLS-LR Series                                                                                                                                            |
| Frequency                                                   | 3.0 MHz to 36 MHz                                                                                                                                         |
| Operation Mode                                              | AT cut (Fundamental)                                                                                                                                      |
| Operating Temperature                                       | 0°C to +70°C (see options)                                                                                                                                |
| Storage Temperature                                         | -55°C to +125°C                                                                                                                                           |
| Frequency Tolerance                                         | ± 50 ppm max. (see options)                                                                                                                               |
| Frequency Stability over the Operating Temp. (Ref to +25°C) | 3.0 ~ 3.579545MHz: ± 100 ppm max. (Standard only*)<br>*Please contact ABRACON for other stability specs.<br>3.579545 ~ 36MHz: ± 50 ppm max. (see options) |
| Equivalent Series Resistance (R1)                           | See Table 1                                                                                                                                               |
| Shunt Capacitance C <sub>0</sub>                            | 7pF max.                                                                                                                                                  |
| Load Capacitance C <sub>L</sub>                             | 18pF (see options)                                                                                                                                        |
| Drive Level                                                 | 1 mW max., 100µW typical                                                                                                                                  |
| Aging at 25°C Per Year                                      | ± 5ppm max.                                                                                                                                               |
| Insulation Resistance                                       | 500 MΩ min at 100Vdc ± 15V                                                                                                                                |
| Spurious Responses                                          | -3dB max.                                                                                                                                                 |
| Drive level dependency (DLD)                                | from 1µW to 500µW (minimum 7 points tested)                                                                                                               |

TABLE 1: ESR

| FREQUENCY (MHz)       | ESR ( ) Max. |
|-----------------------|--------------|
| 3.000000              | 100          |
| 3.072000              | 100          |
| 3.276800              | 75           |
| 3.500000 - 4.000000   | 40           |
| 4.000001 - 4.500000   | 25           |
| 4.500001 - 6.999999   | 20           |
| 7.000000 - 12.999999  | 15           |
| 13.000000 - 30.000000 | 10           |

## OPTIONS & PART IDENTIFICATION:

(Left blank if standard)

ABLS - LR -  MHz -  -  -  -

### Frequency in MHz

e.g. 3.579545MHz  
14.31818MHz  
24.000MHz

### Load Capacitance

Please specify CL in pF  
or S for Series (10pF  
minimum)

### Operating Temp.

A: -10°C ~ +60°C  
B: -20°C ~ +70°C  
C: -30°C ~ +70°C  
N: -30°C ~ +85°C  
D: -40°C ~ +85°C  
J(\*): -40°C to +105°C  
K(\*): -40°C to +125°C  
L(\*): -55°C to +125°C

### Freq. Tolerance

H5: ± 5 ppm  
1: ± 10 ppm  
7: ± 15 ppm  
2: ± 20 ppm  
3: ± 25 ppm  
4: ± 30 ppm

### Freq. Stability

U(\*\*): ± 10 ppm  
G: ± 15 ppm  
X: ± 20 ppm  
W: ± 25 ppm  
Y: ± 30 ppm  
H: ± 35 ppm  
Q: ± 100 ppm  
R: ± 150 ppm

### Packaging

Blank: Bulk  
T: Tape & Reel

\* Frequency stability R option (±150ppm) only.  
Contact ABRACON for tighter frequency stability.  
\*\* -10 to +60°C only.

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ABLS-LR

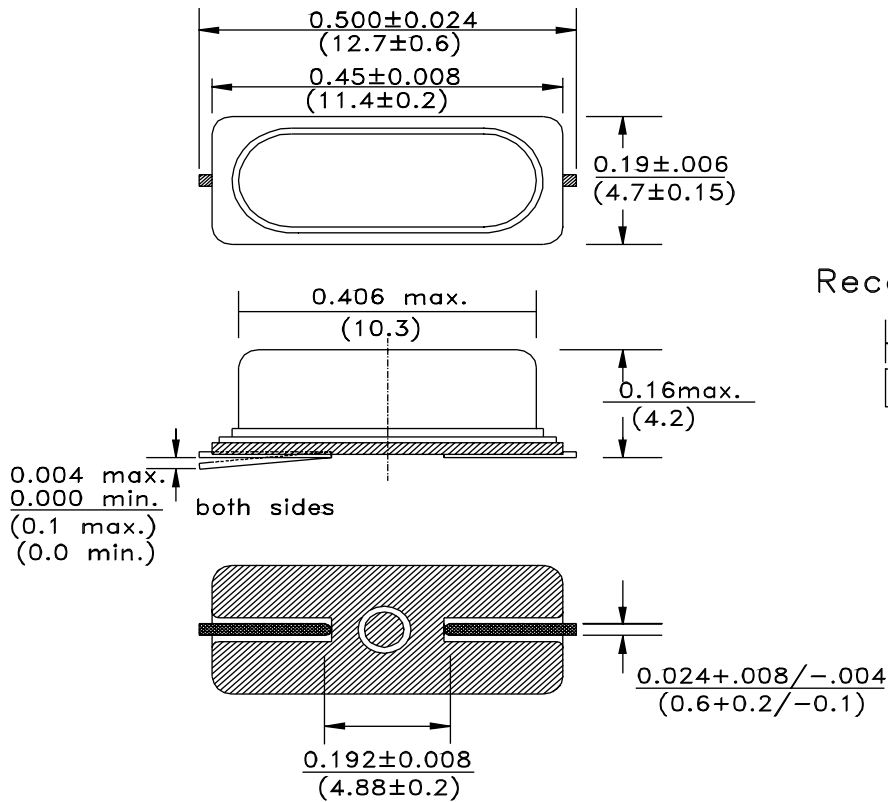


RoHS  
Compliant

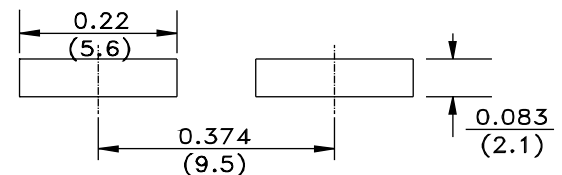


11.5 x 4.8 x 4.2 mm

## OUTLINE DRAWING:



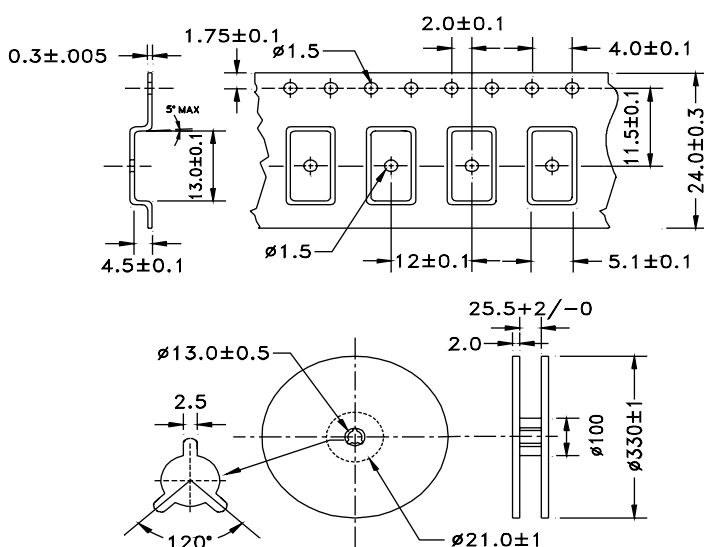
## Recommended land pattern



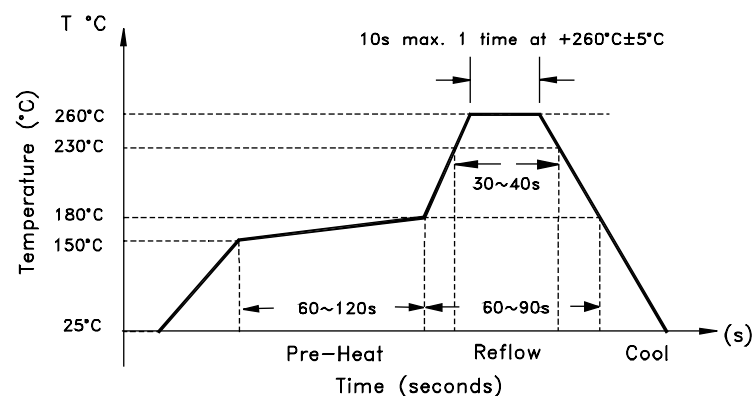
Dimensions: Inches (mm)

## TAPE & REEL: T= tape and reel (1,000pcs/reel)

## REFLOW PROFILE:



Dimensions: mm



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