

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



11.5 x 4.8 x 4.2 mm

ABLS-LR



RoHS  
Compliant

**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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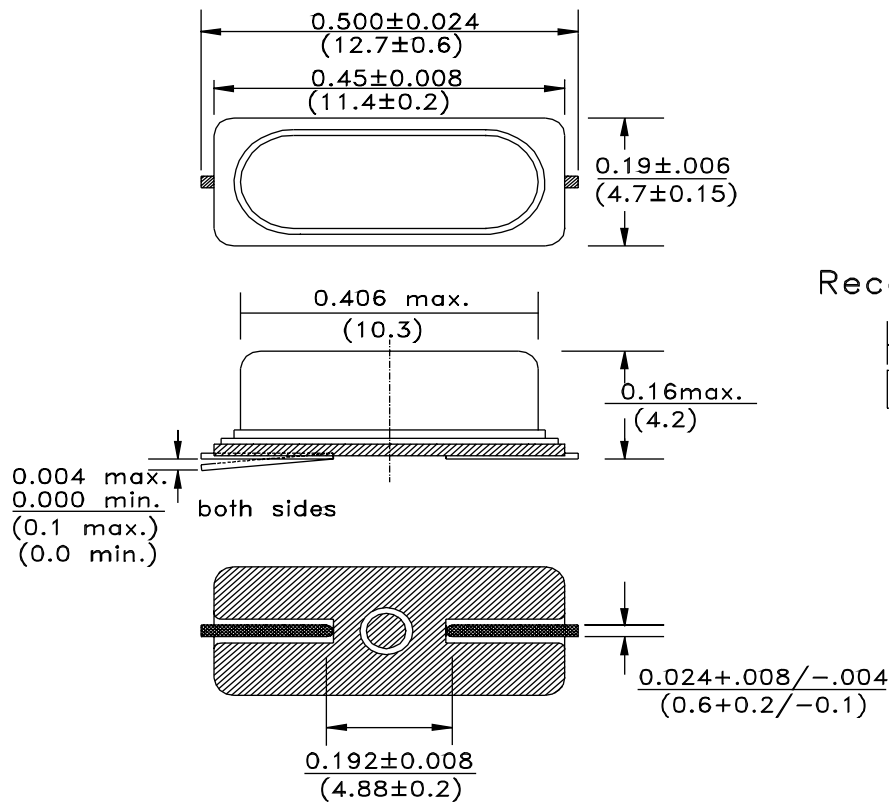


RoHS  
Compliant

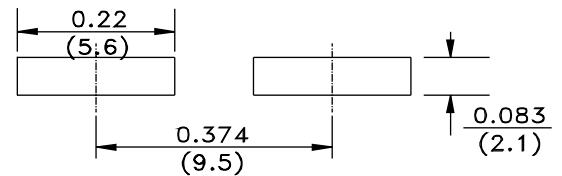


11.5 x 4.8 x 4.2 mm

## OUTLINE DRAWING:



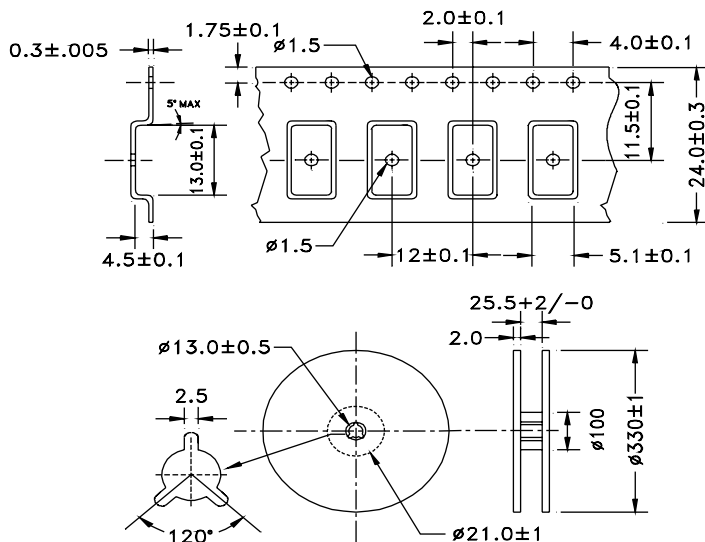
## Recommended land pattern



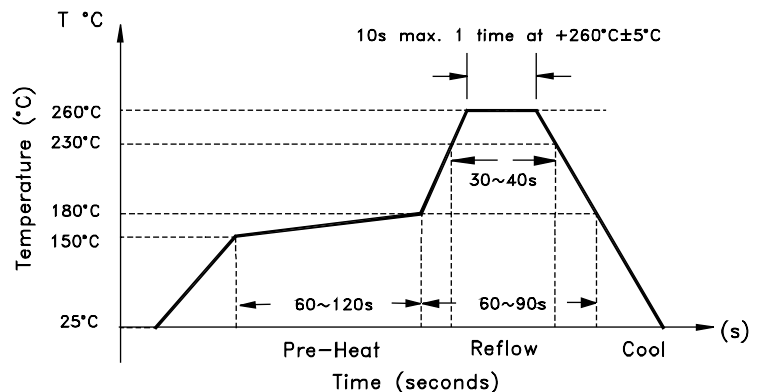
Dimensions: Inches (mm)

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

## REFLOW PROFILE:



Dimensions: mm



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