

# HC49/US (AT49) LOW PROFILE SMD MICROPROCESSOR CRYSTAL

**ABLS3 Series**

Request Samples



Check Inventory



11.4 x 4.7 x 2.7 mm

**RoHS/RoHS II Compliant**

MSL Level = N/A



## Key Electrical Specifications

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	3.579545	-----	24.000000	MHz	Fundamental AT (Standard)
	24.000001	-----	50.000000		Fundamental AT or BT (See options)
	24.000001	-----	70.000000		3 <sup>rd</sup> Overtone (Standard)
Operation Mode	Fundamental or 3rd Overtone				
Operating Temperature	0	-----	+70	°C	See options
Storage Temperature	-55	-----	+125	°C	
Frequency Tolerance @+25°C	-50	-----	+50	ppm	See options
Frequency Stability over the Operating Temperature ( ref. to +25°C)	-50	-----	+50	ppm	See options (For BT cut, ±100ppm max.at -10° C to +60° C only)
Equivalent series resistance (R1)	See table 1 below			Ω	
Shunt capacitance (C0)	-----	-----	7	pF	
Load capacitance (CL)	-----	18	-----	pF	Standard (See options if other than STD)
Drive Level	-----	100	1000	μW	
Aging	-5	-----	+5	ppm	@25°C±3°C First year
Insulation Resistance	500	-----	-----	MΩ	@ 100Vdc ± 15V
Drive level dependency (DLD)	Minimum 7 points tested: from 1μW to 500μW. Change in frequency (Maximum - Minimum) over DLD range < ±10ppm Change in ESR (Maximum - Minimum) over DLD range < 25% of Max ESR value. Maximum ESR over DLD range < Max ESR value.				

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**TABLE 1: ESR**

FREQUENCY (MHz)	ESR ( $\Omega$ )
3.579545 - 4.999 (Fund.)	180
5.000 - 5.999 (Fund.)	120
6.000 - 7.999 (Fund.)	100
8.000 - 8.999 (Fund.)	80
9.000 - 9.999 (Fund.)	60
10.000 - 15.999 (Fund.)	50
16.000 - 50.000 (Fund.)	40
24.01 - 31.999 (3rd O/T)	100
32.000 - 70.00 (3rd O/T)	80

## Options and Part Identification (left blank if standard)

ABLS3 - [ ] MHz - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

### Frequency in MHz

Please specify the frequency in MHz. e.g. 14.31818MHz

### Load Capacitance (pF)

Please specify CL  
(Minimum 10pF) in pF or S for series

### Custom ESR if other than standard

R□  
 Specify a value in  $\Omega$  (e.g.: R40)

### 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 ~ +105°C
- K\*: -40°C ~ +125°C
- L\*: -55°C ~ +125°C

### Freq. Tolerance

- H5:  $\pm 5$  ppm
- 1:  $\pm 10$  ppm
- 7:  $\pm 15$  ppm
- 2:  $\pm 20$  ppm
- 3:  $\pm 25$  ppm
- 4:  $\pm 30$  ppm

### Freq. Stability

- U\*\*:  $\pm 10$  ppm
- G:  $\pm 15$  ppm
- X:  $\pm 20$  ppm
- W:  $\pm 25$  ppm
- Y:  $\pm 30$  ppm
- H:  $\pm 35$  ppm
- Q:  $\pm 100$  ppm
- R:  $\pm 150$  ppm

NOTE: Fundamental BT frequency stability  $\pm 100$ ppm max. at -10° C to +60° C only.

\* Frequency stability  $\pm 50$ ppm,  $\pm 100$ ppm,  $\pm 150$ ppm only.

\*\* -10 to +60C only.

Contact ABRACON for tighter frequency stability.



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Phone: 512-371-6159 | Fax: 512-351-8858  
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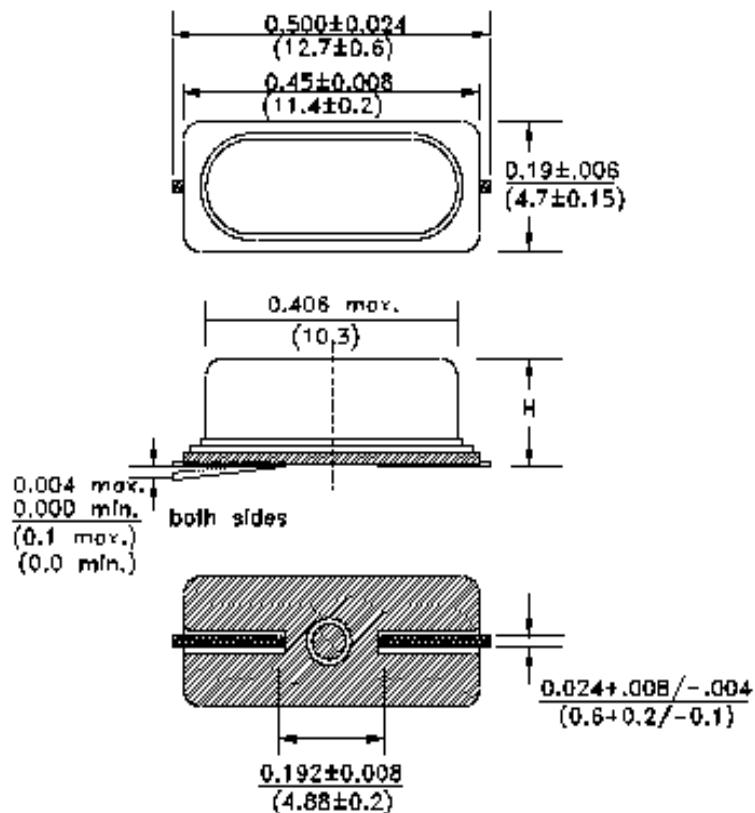
11.4 x 4.7 x 2.7 mm

RoHS/RoHS II Compliant

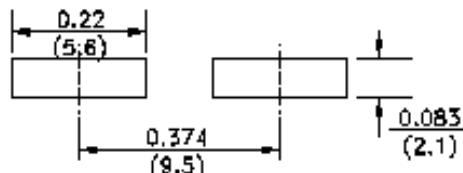
MSL Level = N/A



## Mechanical Dimensions



## Recommended land pattern



H: 2.7mm MAX

Dimensions: inches (mm)

Sealing Method = Resistance Weld Sealing



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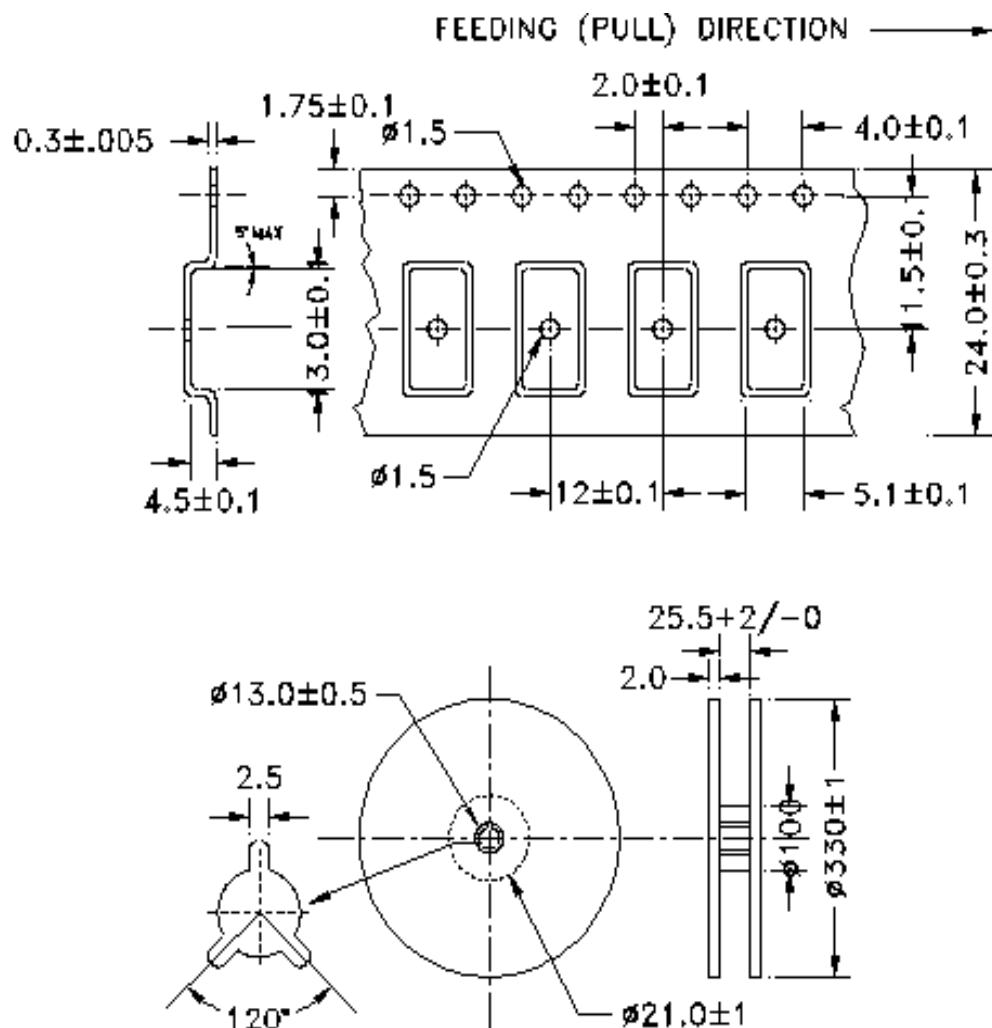
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## Packing

T = tape and reel (1000pcs/reel)



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## Reflow Profile [JEDEC J-STD-020]

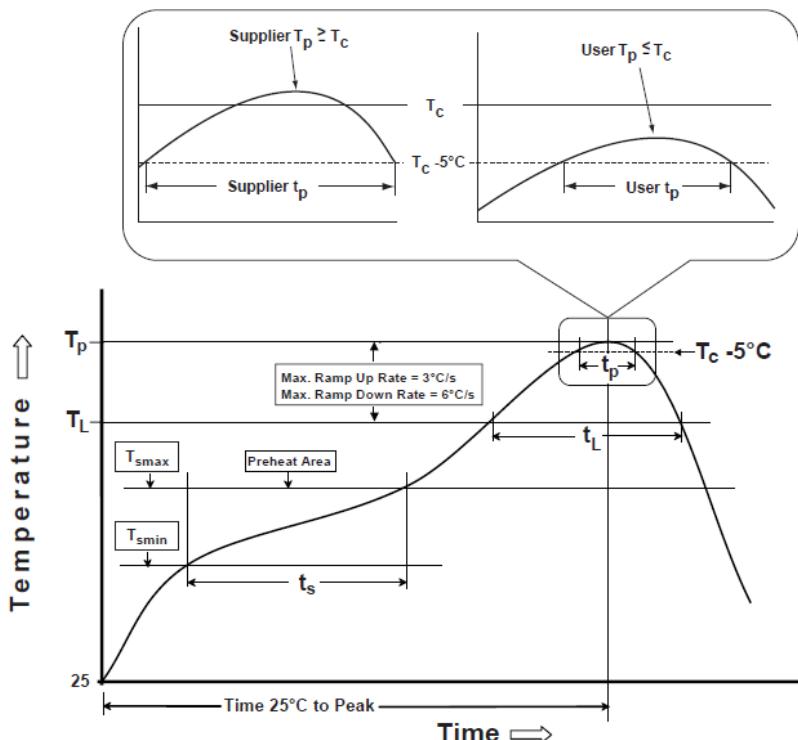


Table 1

### SnPb Eutectic Process Classification Temperatures (T<sub>c</sub>)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

### Pb-Free Process Classification Temperatures (T<sub>c</sub>)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T <sub>smin</sub> )	100°C	150°C
Temperature maximum (T <sub>smax</sub> )	150°C	200°C
Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/sec. max	3°C/sec. max
Liquidous temperature (T <sub>L</sub> )	183°C	217°C
Time at liquidous (t <sub>L</sub> )	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T <sub>p</sub> )*	see Table 1	see Table 2
Time (t <sub>p</sub> )** within 5°C of the specified classification temperature (T <sub>c</sub> )	20 sec.	30 sec.
Ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

\*Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as supplier minimum and a user maximum.

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