

# ABL SERIES HC49/US (AT49) MICROPROCESSOR CRYSTAL

ABL Series

Request Samples



Check Inventory



11.5 x 5.0 x 3.5 mm

RoHS/RoHS II Compliant

MSL Level = N/A



## Features

- High reliability & Low Cost
- Tight stability & extended temperature
- Proven resistance welded metal package

## Applications

- Home electronics
- Computers, modems, and communications
- High-precision TCXO and clock applications
- Microprocessors

## Key Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	3.579545		70.00		
Operation mode	3.579545		24.00	MHz	Fundamental AT- cut (Standard)
	24.01		70.00		3rd OT AT-cut (Standard)
	24.01		50.00		Fundamental AT- cut or BT-cut (See options)
Operating Temperature	0		+70	°C	See options
Storage Temperature	-55		+125	°C	
Frequency Tolerance	-50		+50	ppm	See options
Frequency Stability over the Operating Temperature ( ref. to +25°C)	-50		+50	ppm	See options
Equivalent series resistance (R1)	See Table 1 below			Ω	
Shunt capacitance (C0)			7	pF	
Load capacitance (CL)		18		pF	See options
Drive Level		100	1000	μW	
Aging @ 25°C per year			±5	ppm	
Insulation Resistance	500			MΩ	@ 100Vdc ± 15V
Drive Level Dependency (DLD, Minimum 7 points tested: from 1μW to 500μW)			±10	ppm	Δfrequency (Max – Min)
			25% of Max ESR	Ω	ΔESR (Max – Min)
			Max ESR in Table 1	Ω	Max ESR over DLD range

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TABLE 1

Frequency (MHz)	ESR( $\Omega$ ) max.
3.579 - 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

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

ABL -  MHz -  -  -    -  -  -

**Frequency in MHz**  
Please specify the frequency in xx.xxxxMHz.  
e.g. 14.3181MHz

**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:	± 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
TRAY:	Tray

Value Added	
I	Insulator Tab
L2	Middle 3rd lead
QXX	Trimmed leads
Q15	for 0.15" length

Oscillation Mode	
F:	Fund. AT>24MHz
FB***:	Fund. BT>24MHz

### NOTES:

\* Frequency stability ±50ppm, ±100ppm, ±150ppm only. Contact ABRACON for tighter frequency stability.

\*\* Contact ABRACON for availability of ± 10 ppm with other Operating Temp. options.

\*\*\* Fundamental BT frequency stability ± 100ppm max at -10°C ~ +60°C only.



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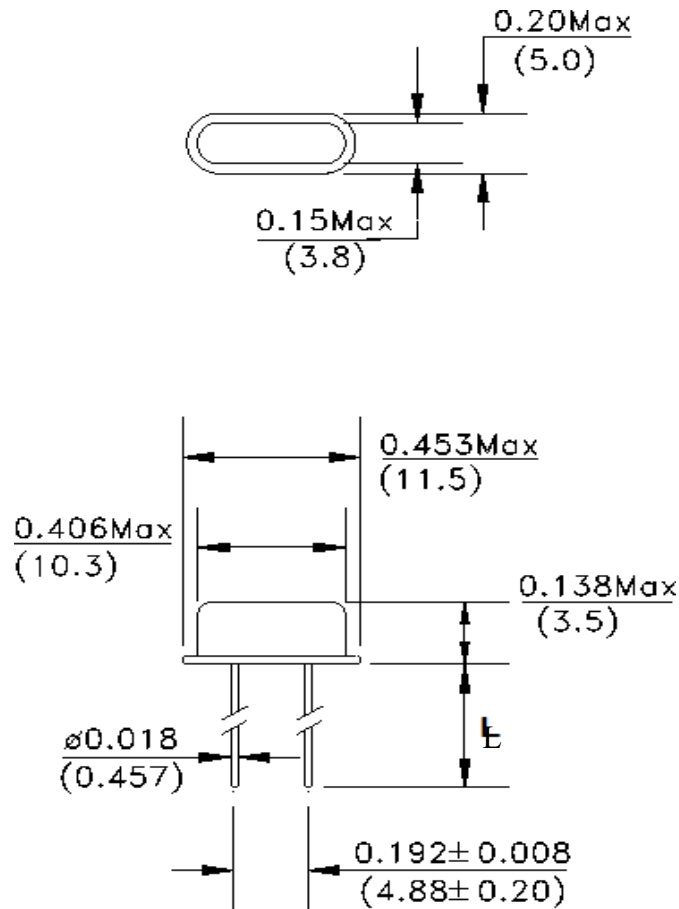
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## Mechanical Dimensions



L	Packaging
5.5mm Min	Bulk
20.0 $\pm$ 0.5mm	Tape & Reel

Dimensions: inch (mm)



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

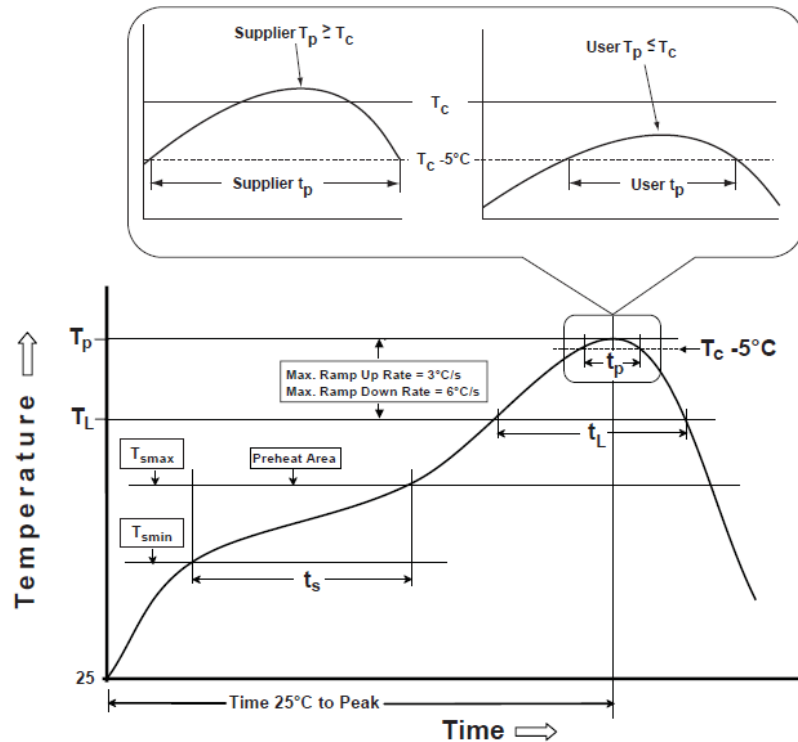


Table 1

SnPb Eutectic Process  
Classification Temperatures ( $T_c$ )

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 ( $T_c$ )

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 ( $T_{smin}$ )	100°C	150°C
Temperature maximum ( $T_{smax}$ )	150°C	200°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3°C/sec. max	3°C/sec. max
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60 - 150 sec.	60 - 150 sec.
Peak package body temperature ( $T_p$ )*	see Table 1	see Table 2
Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_c$ )	20 sec.	30 sec.
Ramp-down rate ( $T_p$ to $T_{smax}$ )	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 ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as supplier minimum and a user maximum.

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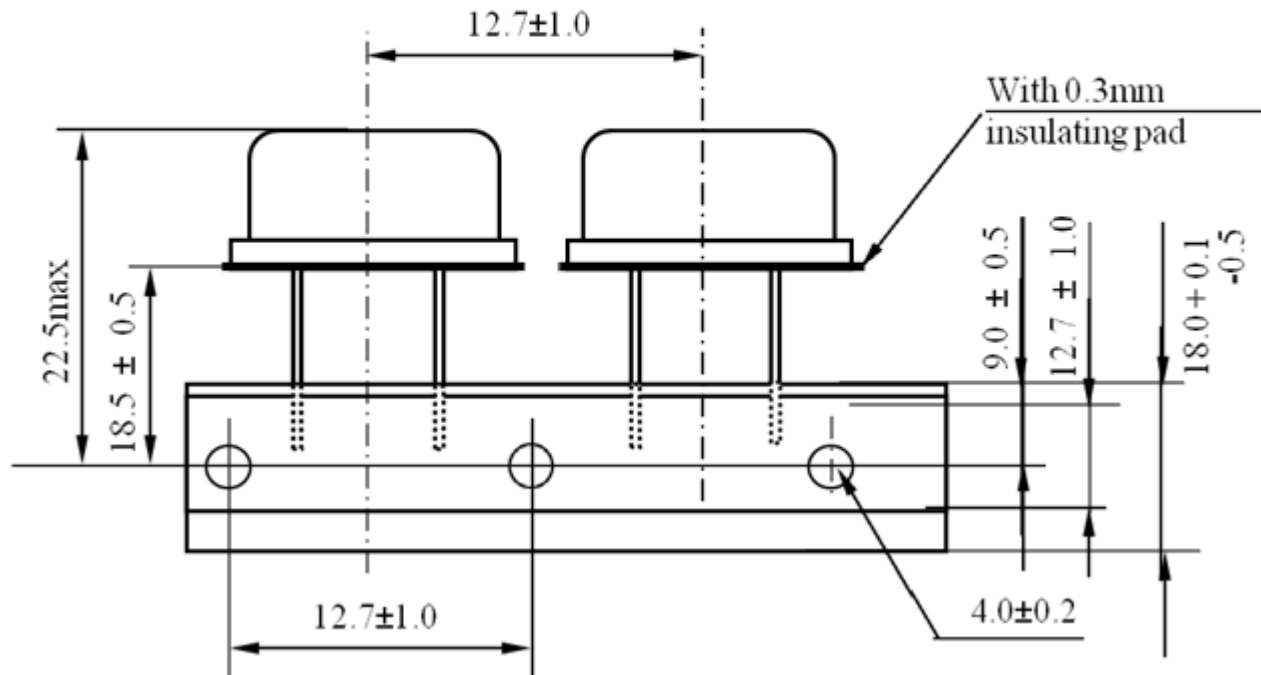
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## Packaging

T= Tape and reel (1,000pcs/reel)



Dimensions: inch (mm)

**ATTENTION:** Abracon LLC's products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon's products are not specifically designed for Military, Aviation, Aerospace, Life-dependent Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon LLC is required. Please contact Abracon LLC for more information.



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