

# Ultra-low ESR HC49/US (AT49)SMD MICROPROCESSOR 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

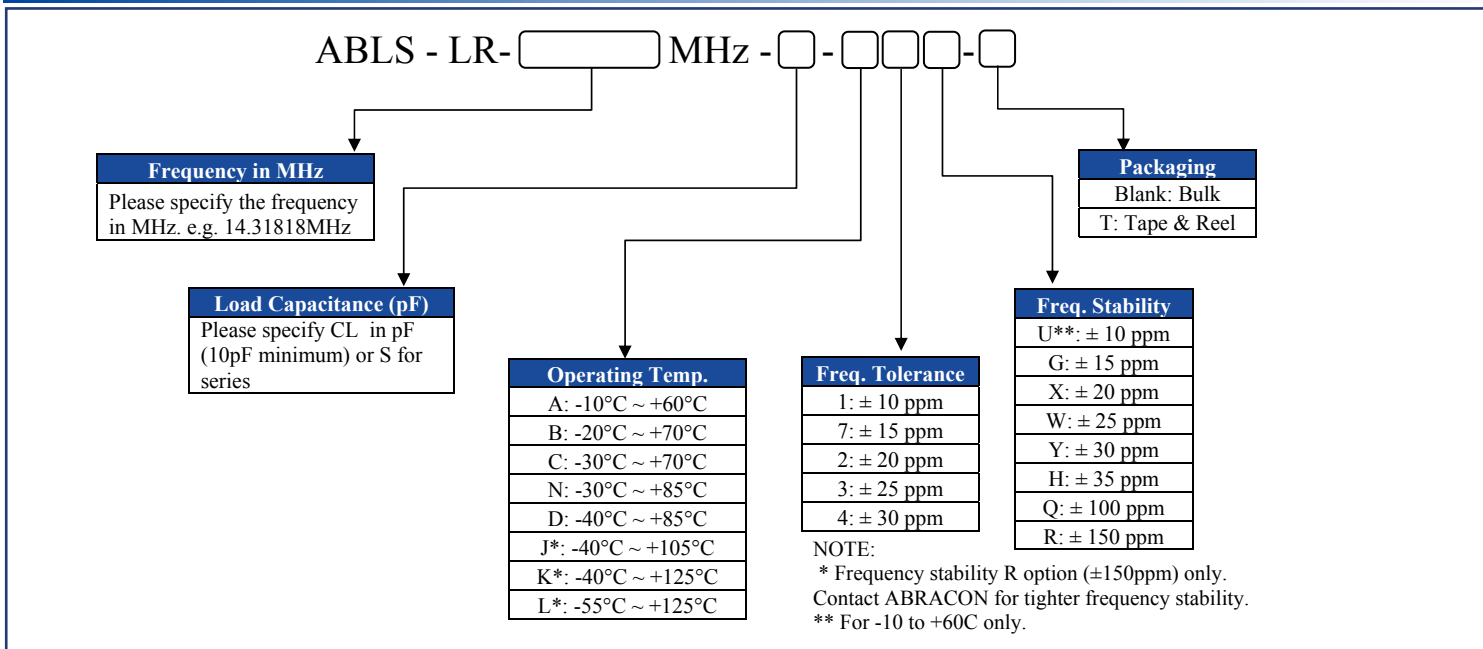
**STANDARD SPECIFICATIONS:**

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	3		36	MHz	
Operation Mode	Fundamental				
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)	3.0~3.579545MHz	-100	+100	ppm	Standard only
	3.579545~36MHz	-50	+50		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	-5		+5	ppm	@25°C±3°C First year
Insulation Resistance	500			MΩ	@ 100Vdc ± 15V
Spurious Response			-3	dB	
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.				

TABLE 1: ESR

FREQUENCY (MHz)	ESR (Ω) Max.
3.000000	100
3.072000	100
3.276800	75
3.500000 ~ 4.000000MHz	40
4.000001 ~ 4.500000MHz	30
4.500001 ~ 5.999999MHz	25
6.000000 ~ 7.499999MHz	20
7.500000 ~ 12.999999MHz	15
13.000000 ~ 36.000000MHz	10

**OPTIONS & PART IDENTIFICATION: (Left blank if standard)**



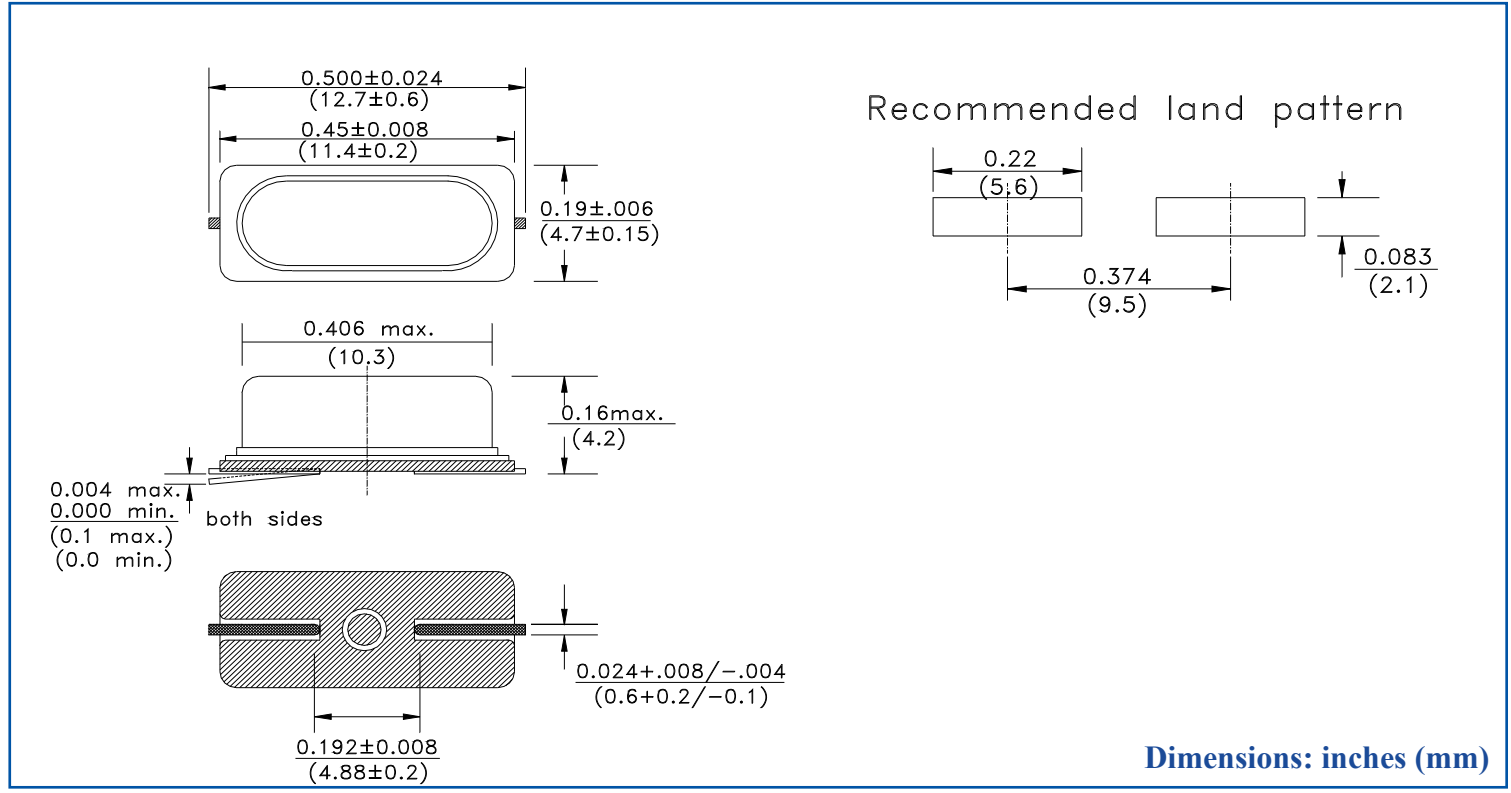


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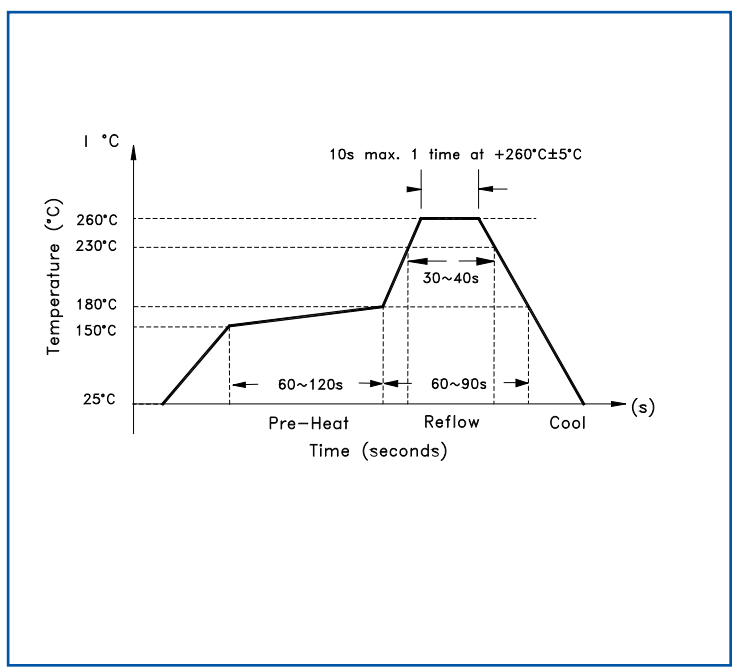
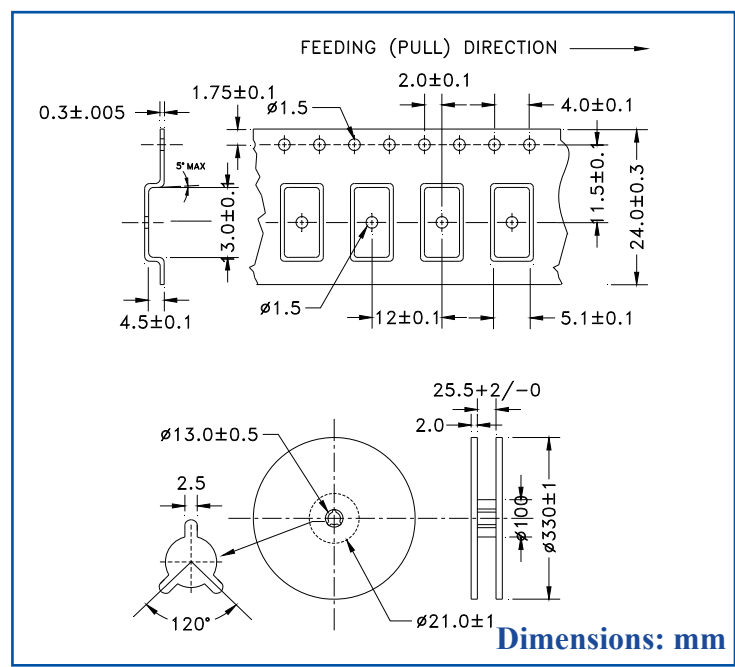
**Pb** **RoHS**  
Compliant

## OUTLINE DRAWING:



## TAPE & REEL: T = tape and reel (1000pcs/reel)

## REFLOW PROFILE:



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