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SOURCE CONTROL DRAWING
OFFICIAL SPECIFICATION

Item :	HC/49US (AT49) SMD Low Profile Crystal
EMBER CORP P/N	565-2400-001
ABRACON P/N :	ABLS-24.000MHZ-D-R60-1-W-T

Customer's Approval Please return this copy as a certification of your approval.
Approved by:
Date :


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Internal Use Only	
	500205
500041	500450
500210	500710

WARNING: ESD SENSITIVE PRODUCT

REVISION HISTORY				
REV.	ECO	DESCRIPTION	DATE	APP'D
-	-	Initial release	1/22/2007	LL

				TITLE ABLS-24.000MHZ-D-R60-1-W-T HC/49US (AT49) SMD Low Profile Crystal		
PREP. LL	DATE 1/22/2007	ENGR. HU	DATE 1/22/2007	SCALE None	DRAWING NO. 452489	REV. -
CKD CB	DATE 1/22/2007	APP'D JE	DATE 1/22/2007	PAGE OF 1 7		

1.0 SCOPE

This specification describes a 24.000MHz HC/49US SMD crystal.

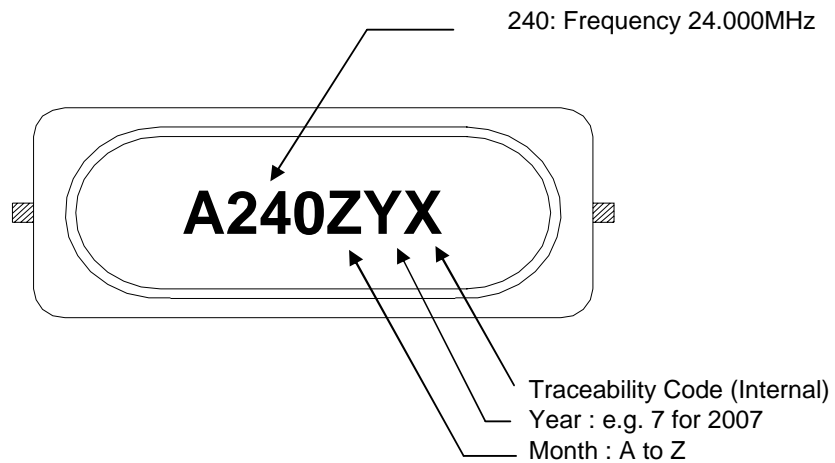
2.0 ELECTRICAL SPECIFICATIONS

Abrakon P/N:	ABLS-24.000MHZ-D-R60-1-W-T
Frequency:	24.000MHz
Operation mode:	Fundamental, AT-strip
Operating temperature:	- 40°C to + 85°C
Storage temperature:	- 55°C to + 125° C
Frequency tolerance:	± 10 ppm max.
Frequency stability over the operating temperature (Ref to +25° C):	± 25 ppm max.
Equivalent series resistance (max.):	60ohms max.
Shunt capacitance C0:	7.0pF max
Load capacitance CL:	18.0+/-1.0pF
Drive level:	1mW max., 100uW Typical
Aging @ 25° C per a year :	± 5 ppm max. / year
Insulation resistance:	500 Mohms min. at 100 Vdc ± 15 Vdc

3.0 SPECIAL REQUIREMENT

This product is **RoHS compliant** and **Pb-free**.

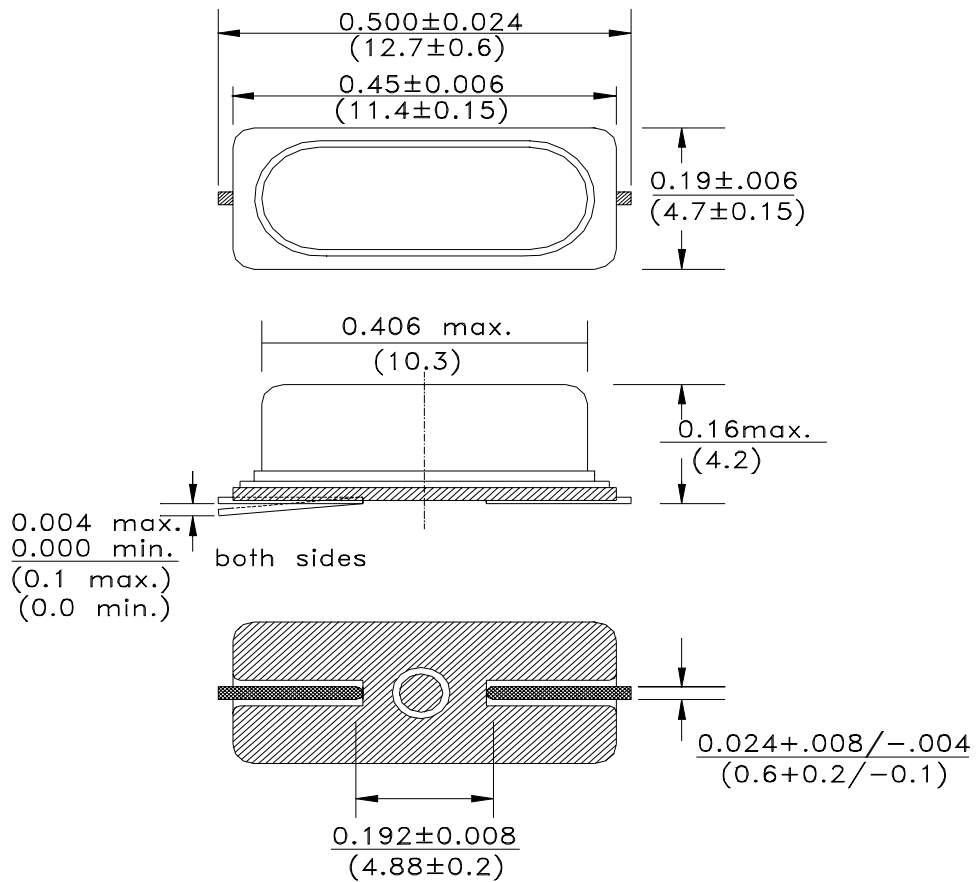
4.0 Marking



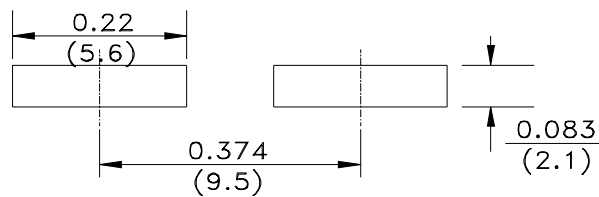
Month	Code
January	A
February	B
March	C
April	D
May	E
June	F
July	G
August	H
September	I
October	J
November	K
December	L

4.1 Marking Method : Laser Marking

5.0 Outline dimensions



Recommended land pattern



Dimension : Inches (mm)

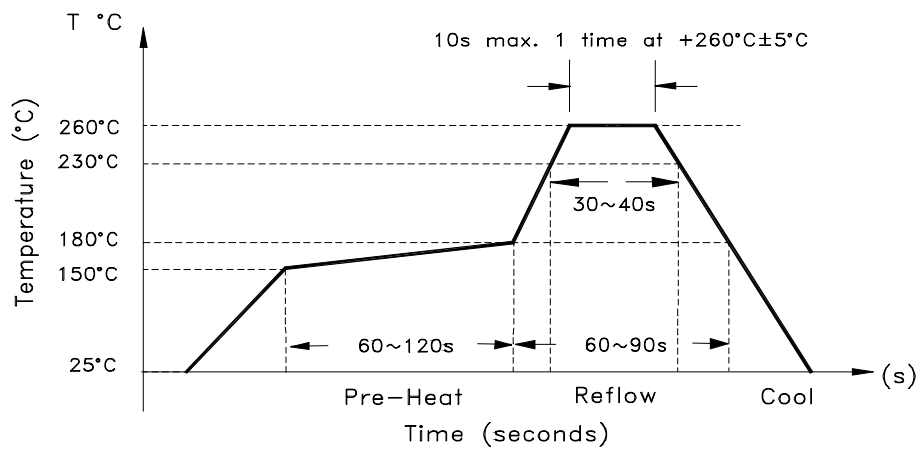
TOLERANCES:

UNLESS OTHERWISE SPECIFIED: .X: ± 0.1 (0.25) .XX: ± 0.01 (0.025) .XXX: ± 0.005 (0.013)

6.0 Reliability Test

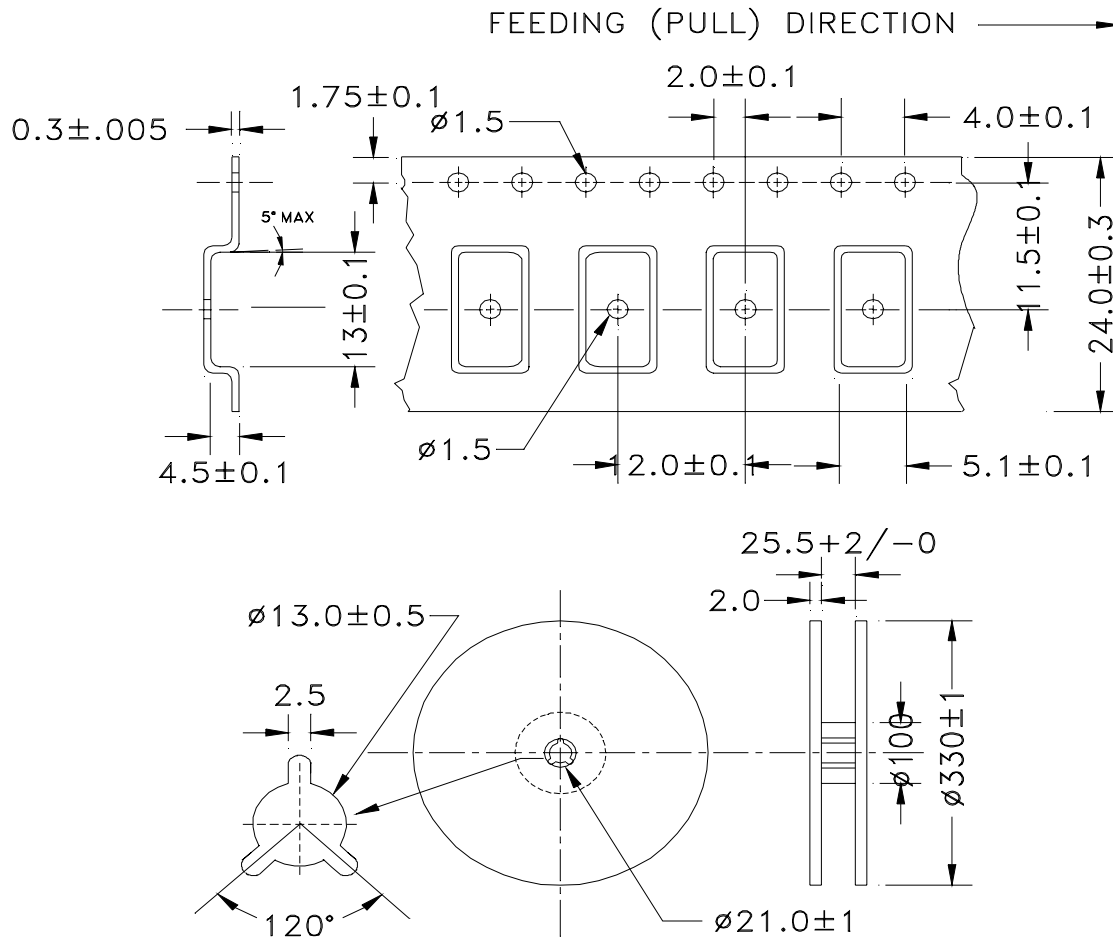
No.	Test Items	Test Conditions
1	Temperature Cycling:	The component shall remain within the electrical specification (± 5 ppm max) after 3 cycles of high and low temperature testing (-40°C to +85°C) for 2 hours max.
2	Thermal Shock:	The component shall remain within the electrical specification after exposure at extreme temperature -40°C to +85°C for 5 minutes for 3 cycles.
3	Vibration:	The component shall remain within the electrical specification after loaded vibration at 10Hz to 55Hz, amplitude 1.5mm, within 1 minute for 2 hours minimum on each axis (X,Y,Z).
4	Drop Test:	The component shall remain within the electrical specifications after a natural drop (3X) on a hard wooden board at 75 cm.
5	Humidity:	The component shall remain within the electrical specifications after being kept at a condition of ambient temperature +85°C, 85% RH for 96 hours minimum.
6	Fine Leak Test:	Expose samples to 60PSIG Helium gas for 2 hours. Max leak rate 2×10^{-8} atmcc/s.
7	Gross Leak Test:	Submerge samples in 100% De-ionized water or Perfluorocarbon at 85°C for at least 1 minute. Check for bubbles.
8	Solderability:	Solderability of terminals shall be kept at more than 95% after dipped in solder flux at $230^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 5 seconds.
9	Lead Bend	The component shall withstand maximum bend of 90° reference to base for 2 bends. Solder tinning must be 4 microns thick minimum.

6.1 Reflow Profile



7.0 PACKING

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



Dimension : Inches (mm)

TOLERANCES:

UNLESS OTHERWISE SPECIFIED: .X: ± 0.1 (0.25) .XX: ± 0.01 (0.025) .XXX: ± 0.005 (0.013)

8.0 Note

- (1) The parts are manufactured in accordance with this specification. If other conditions and specifications which are required for this specification, please contact ABRACON for more information.
- (2) ABRACON will supply the parts in accordance with this specification unless we receive a written request to modify prior to an order placement.
- (3) In no case shall ABRACON be liable for any product failure from in appropriate handling or operation of the item beyond the scope of this specification.
- (4) When changing your production process, please notify ABRACON immediately.
- (5) If you intend to use the product for listed application which may possibly cause to loss of life or assets, please notify ABRACON in advance.
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