

ECN/PCN No.: 3145

For Manufacturer			
<b>Product Description:</b> 32.768kHz SMD Low Profile Crystal	<b>Abracon Part Number / Part Series:</b> ABS07-120-32.768kHz-T		<input type="checkbox"/> Series
			<input checked="" type="checkbox"/> Part Number
<b>Affected Revision:</b> Rev. B	<b>New Revision:</b> Rev. C	<b>Application:</b>	<input type="checkbox"/> Safety
			<input checked="" type="checkbox"/> Non-Safety

**Prior to Change**

**ELECTRICAL SPECIFICATIONS**

Shunt capacitance (C0):

- Typical → 1.20 pF

Parameters	Minimum	Typical	Maximum	Units
Shunt capacitance (C0)		1.20		pF

Motional capacitance (Cm):

- Minimum → 3.0 fF
- Typical → 3.7 fF
- Maximum → 4.4 fF

Parameters	Minimum	Typical	Maximum	Units
Motional capacitance (Cm)	3.0	3.7	4.4	fF

**After Change**

**ELECTRICAL SPECIFICATIONS**

Shunt capacitance (C0):

- Typical → 1.10 pF

Parameters	Minimum	Typical	Maximum	Units
Shunt capacitance (C0)		1.10		pF

Motional capacitance (Cm):

- Minimum → not specified
- Typical → 4.7 fF
- Maximum → not specified

Parameters	Minimum	Typical	Maximum	Units
Motional capacitance (Cm)		4.7		fF

**Cause/Reason for Change:**

Revision of the electrical specifications to align with the product design.

**Change Plan**

<b>Effective Date:</b> 07/02/20	<b>Additional Remarks:</b> N/A
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**Change Declaration:**

Revision of the typical electrical specifications to align with a new production line processes, needed to address production capacity and flexibility of delivery.

<b>Issued Date:</b> 07/02/20	<b>Issued By:</b> Brooke Cushman	<b>Issued Department:</b> Engineering
<b>Approval:</b> Syed Raza Engineering VP	<b>Approval:</b> Reuben Quintanilla Quality Director	<b>Approval:</b> Ying Huang Purchasing Director

For Abracon EOL only		
Last Time Buy (if applicable): N/A	Alternate Part Number / Part Series: N/A	
Additional Approval: N/A	Additional Approval: N/A	Additional Approval: N/A
Customer Approval (If Applicable)		
Qualification Status: <input type="checkbox"/> Approved <input type="checkbox"/> Not accepted <i>Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.</i>		
Customer Part Number:	Customer Project:	
Company Name:	Company Representative:	Representative Signature:
Customer Remarks:		

# ABS07-120-32.768kHz-T; TUNING FORK CRYSTAL



3.2 x 1.5 x 0.9 mm

32.768kHz SMD; ESR OPTIMIZED CRYSTAL



**Moisture Sensitivity Level (MSL) – This product is Hermetically Sealed and not Moisture Sensitive - MSL = N/A: Not Applicable**

## FEATURES:

- Guaranteed ESR of 60kΩ Maximum for Low Power Designs
- 0.9mm height ideal for high density circuit boards
- Seam sealed ceramic package offers excellent environmental & heat resistance
- Extended Operating temperature of -40°C to +85°C for industrial applications

## APPLICATIONS:

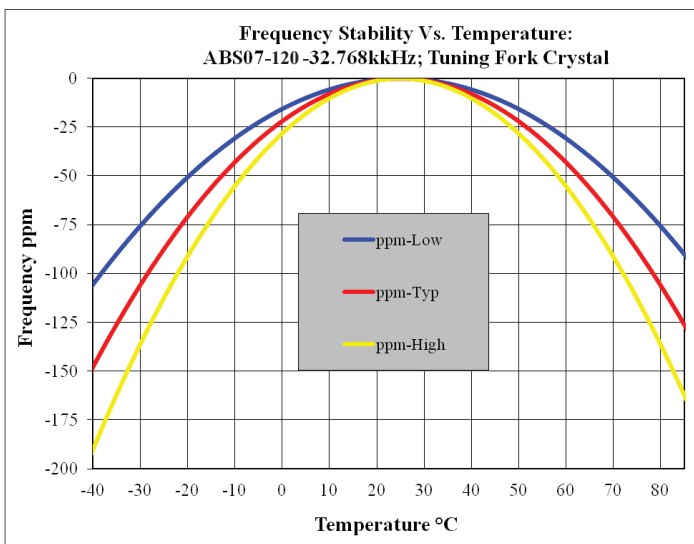
- Power sensitive designs requiring Low ESR Crystal, such as ST-Micro MCU STM32L based solutions
- Communication & measurement equipment
- Commercial, Consumer & Industrial applications
- Wireless communications
- PDA and Smartphone

## STANDARD SPECIFICATIONS

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency		32.768		kHz	
Operation Mode	Tuning Fork – AT Cut				
Operating Temperature	-40		+85	°C	
Storage Temperature	-55		+125	°C	
Frequency Tolerance @+25°C	-20		+20	ppm	Tested at 0.1uW
Temperature Coefficient:	-0.045	-0.035	-0.025	ppm/T <sup>2</sup>	
Turn-over temperature:	+20	+25	+30	°C	
Equivalent series resistance (R1)		55	60	kΩ	
Shunt capacitance (C0)		1.10		pF	
Motional capacitance (Cm)		4.7		fF	
Load capacitance (CL)		6.0		pF	
Drive Level		0.1	0.5	μW	
Q value	13000				
Aging@25°C±3°C	-3		3	ppm	First year
Insulation Resistance	500			MΩ	@ 100Vdc ± 15V

## PART IDENTIFICATION: ABS07-120-32.768 kHz-T

## FREQUENCY VARIATION OVER OPERATING TEMPERATURE; RELATIVE TO MEASURED FREQUENCY AT 25°C



Temp °C	(ppm) Low	(ppm) Typ	(ppm) High
-40	-105.63	-147.88	-190.13
-35	-90.00	-126.00	-162.00
-30	-75.63	-105.88	-136.13
-25	-62.50	-87.50	-112.50
-20	-50.63	-70.88	-91.13
-15	-40.00	-56.00	-72.00
-10	-30.63	-42.88	-55.13
-5	-22.50	-31.50	-40.50
0	-15.63	-21.88	-28.13
5	-10.00	-14.00	-18.00
10	-5.63	-7.88	-10.13
15	-2.50	-3.50	-4.50
20	-0.63	-0.88	-1.13
25	0.00	0.00	0.00
30	-0.63	-0.88	-1.13
35	-2.50	-3.50	-4.50
40	-5.63	-7.88	-10.13
45	-10.00	-14.00	-18.00
50	-15.63	-21.88	-28.13
55	-22.50	-31.50	-40.50
60	-30.63	-42.88	-55.13
65	-40.00	-56.00	-72.00
70	-50.63	-70.88	-91.13
75	-62.50	-87.50	-112.50
80	-75.63	-105.88	-136.13
85	-90.00	-126.00	-162.00

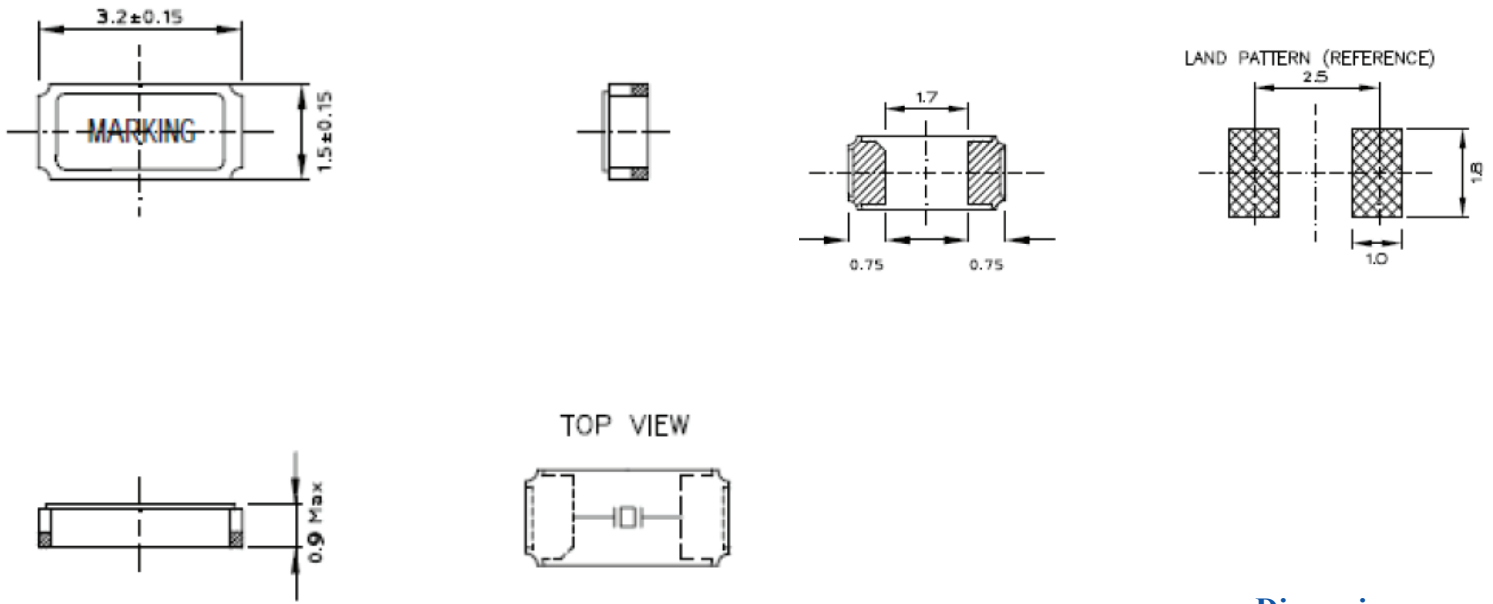
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32.768kHz SMD; ESR OPTIMIZED CRYSTAL



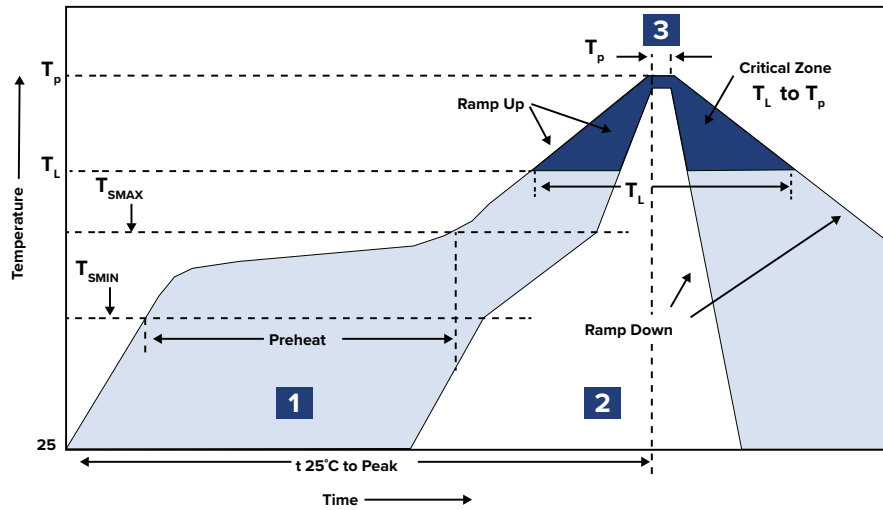
3.2 x 1.5 x 0.9 mm

## OUTLINE DRAWING:



Dimensions: mm

## REFLOW PROFILE:



Zone	Description	Temperature	Time
1	Preheat	$T_{SMIN} \sim T_{SMAX}$ 150°C ~ 200°C	90 sec. Max
2	Reflow	$T_L$ 255°C Min	60 sec. Max
3	Peak heat	$T_P$ 260°C $\pm$ 5°C	10 sec. Max

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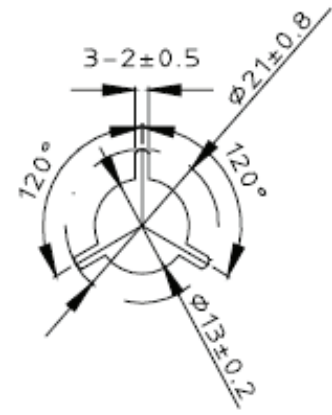
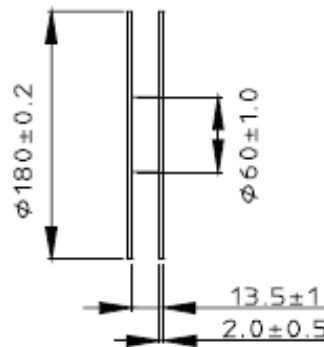
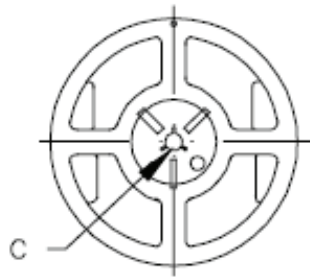


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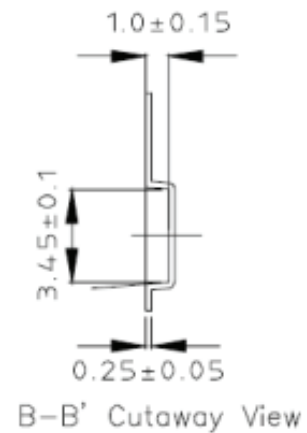
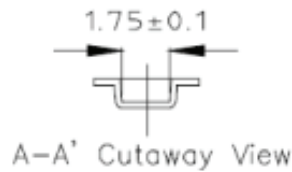
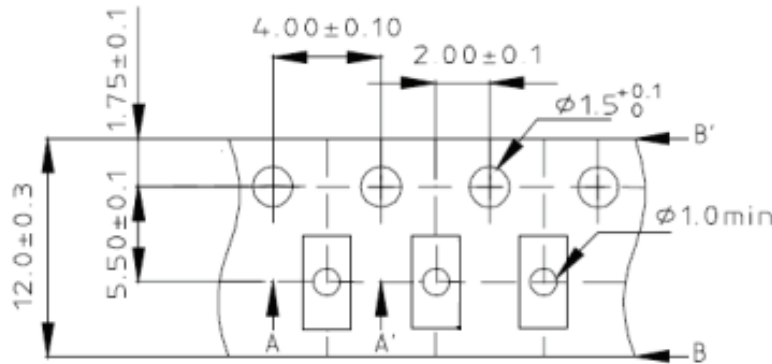
## TAPE & REEL:

T=Tape and reel (3,000pcs/reel)

REEL : 3000PCS



C.ENLARGE



Dimensions: 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.