

ABRACON ABS25-32.768KHZ-6-T

ABRACON ABS25 Series Crystal User Manual

Model: ABS25-32.768KHZ-6-T

[Introduction](#) [Setup](#) [Operating](#)
[Principles](#) [Maintenance](#) [Troubleshooting](#) [Specifications](#) [Support](#)

1. INTRODUCTION

This manual provides essential information for the proper use, installation, and maintenance of the ABRACON ABS25-32.768KHZ-6-T Low Frequency Crystal. This component is designed for precise timing applications in various electronic circuits.

The ABS25 series crystal is a surface-mount device (SMD) operating at a frequency of 32.768 kHz, commonly used in real-time clock (RTC) applications, microcontrollers, and other timing-critical systems. It features a compact 8mm x 3.8mm package with a 6 pF load capacitance and a frequency tolerance of 20 ppm.



Figure 1: ABRACON ABS25-32.768KHZ-6-T Low Frequency Crystal. This image shows a small, black, rectangular surface-mount electronic component with four metallic contacts on its sides, designed for precise timing applications.

2. SETUP AND INSTALLATION

Proper installation is crucial for optimal performance and longevity of the crystal. This component is a surface-mount device (SMD) and requires appropriate soldering techniques.

2.1. Recommended Soldering Profile

- **Reflow Soldering:** Follow industry-standard reflow soldering profiles for lead-free components. Ensure peak temperature does not exceed 260°C for more than 10 seconds.
- **Hand Soldering:** If hand soldering, use a fine-tip soldering iron. Limit contact time to 3 seconds per pad at a maximum temperature of 350°C. Avoid excessive mechanical stress on the crystal during soldering.

2.2. Circuit Board Layout Considerations

- **Placement:** Position the crystal as close as possible to the oscillator IC to minimize trace length and parasitic capacitance.
- **Grounding:** Ensure a solid ground plane beneath the crystal and oscillator circuit to reduce noise and improve stability.
- **Capacitors:** Use recommended load capacitors (typically 6 pF for this model) connected between the crystal pins and ground. These capacitors are critical for proper oscillation.
- **Shielding:** In noisy environments, consider adding a ground trace or shield around the crystal and its associated components.

3. OPERATING PRINCIPLES

The ABS25-32.768KHZ-6-T crystal operates as the resonant element in an oscillator circuit, typically a Pierce oscillator configuration. Its primary function is to provide a stable and precise clock signal at 32.768 kHz.

3.1. Frequency Stability

The crystal's frequency stability is influenced by temperature, load capacitance, and drive level. This model has a frequency tolerance of ± 20 ppm at 25°C.

- **Temperature:** The frequency-temperature characteristic of 32.768 kHz crystals typically follows a parabolic curve. The nominal frequency is achieved at 25°C.
- **Load Capacitance:** The specified load capacitance of 6 pF is critical for achieving the nominal frequency. Deviations will cause frequency shifts.
- **Drive Level:** Operate the crystal within the recommended drive level to prevent damage or frequency instability. Consult the oscillator IC datasheet for appropriate drive level settings.

3.2. Power Consumption

Crystals themselves are passive components and do not consume significant power. Power consumption is primarily determined by the associated oscillator circuit. Low-power oscillator designs are recommended for battery-operated devices.

4. MAINTENANCE

The ABRACON ABS25 series crystals are passive electronic components and generally require no routine maintenance once properly installed. However, certain environmental factors and handling practices should be observed.

4.1. Storage

- Store crystals in their original packaging in a dry, temperature-controlled environment (e.g., 0°C to 40°C, 30% to 70% relative humidity).
- Avoid exposure to direct sunlight, corrosive gases, or extreme temperatures.

4.2. Handling Precautions

- Handle components with care to prevent mechanical shock or damage to the package and leads.

- Use anti-static precautions (ESD-safe workstations, wrist straps) when handling to prevent electrostatic discharge damage to sensitive integrated circuits in the vicinity.
- Do not apply excessive force or bend the leads.

4.3. Cleaning

If cleaning of the PCB is necessary after assembly, use standard electronic cleaning agents. Ensure the cleaning process does not introduce mechanical stress or residues that could affect performance.

5. TROUBLESHOOTING

If the crystal oscillator circuit is not functioning as expected, consider the following common issues:

Problem	Possible Cause	Solution
No oscillation or unstable oscillation	◦ Incorrect load capacitance ◦ Poor PCB layout (long traces, insufficient grounding) ◦ Damaged crystal ◦ Incorrect oscillator IC configuration ◦ Excessive drive level	◦ Verify load capacitors match 6 pF specification. ◦ Review PCB layout for optimal crystal placement and grounding. ◦ Inspect crystal for physical damage; replace if necessary. ◦ Check oscillator IC datasheet for correct external component values and pin connections. ◦ Reduce drive level if possible, or ensure it's within limits.
Frequency deviation from nominal	◦ Incorrect load capacitance ◦ Temperature variations ◦ Aging of the crystal	◦ Adjust load capacitors to fine-tune frequency. ◦ Consider temperature compensation if operating over a wide temperature range. ◦ For critical applications, allow for initial aging or use a crystal with tighter aging specifications.

6. SPECIFICATIONS

Key technical specifications for the ABRACON ABS25-32.768KHZ-6-T crystal:

Parameter	Value
Model Number	ABS25-32.768KHZ-6-T
Nominal Frequency	32.768 kHz
Frequency Tolerance	±20 ppm at 25°C
Load Capacitance	6 pF
Operating Temperature Range	-40°C to +85°C (typical for ABS25 series)
Storage Temperature Range	-55°C to +125°C (typical for ABS25 series)
Package Type	SMD (Surface Mount Device)
Dimensions	8mm x 3.8mm (typical for ABS25 series)
Manufacturer	ABRACON

Parameter	Value
ASIN	B00LWN90LO
Date First Available	September 3, 2014

Note: For detailed electrical characteristics and environmental ratings, refer to the official ABRACON ABS25 series datasheet.

7. SUPPORT AND WARRANTY

7.1. Technical Support

For technical inquiries, detailed datasheets, or application assistance regarding the ABRACON ABS25 series crystals, please visit the official ABRACON website or contact their technical support department.

- **Manufacturer:** ABRACON
- **Website:** www.abracon.com

7.2. Warranty Information

ABRACON products are typically covered by a standard manufacturer's warranty against defects in materials and workmanship. The specific terms and duration of the warranty may vary. Please refer to the official ABRACON warranty policy available on their website or contact your distributor for details.

This product is sold by KHC Shop. For return or replacement inquiries related to your purchase, please refer to the seller's return policy or contact KHC Shop directly via the Amazon platform.

© 2023 ABRACON. All rights reserved.

This document is for informational purposes only and is subject to change without notice.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question