Ubiquiti UniFi AP AC Lite TVS Diode Replacement

This guide outlines steps needed to repair an...

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INTRODUCTION

This guide outlines steps needed to repair an Ubiquiti Unifi AP AC Lite (model UAP-AC-LITE) access point which **does not power on**, and is identified by the PoE injector having a power fault (blinking white on the PoE injector).

In some cases, affected units' center LEDs may flash dimly when the reset button is held pressed in with the POE power in place. This may only be visible if the board is out of it's chassis.

The UAP-AC-LITE contains an over-voltage protection circuit driven by a unidirectional TVS diode. While this diode is not a fuse, it's expected failure mode is to short, and divert power away from the rest of the board. This short is also detected by the PoE injector, which causes it to not deliver power.

In this guide will show how to:

1. Disassemble the UAP-AC-LITE
2. Test if the over voltage protection TVS diode has failed
3. Remove and replace the broken diode

TOOLS:

iFixit Opening Tool (1)
Jimmy (1)
Standard plastic prying tools may not be sufficient. A Jimmy or comparable tool is highly recommended.
Multimeter (1)
Digital multimeter with diode tester is ideal, but any ohmmeter should be sufficient.
Tweezers (1)
Curved tweezers is most ergonomic, but regular tweezers should get the job done.
Soldering Iron (1)
A small enough tip to work with surface mounted component is required.

PARTS:

Soldering Flux (1)
Lead-Free Solder (1)
SMBJ24A TVS-Diode (1)

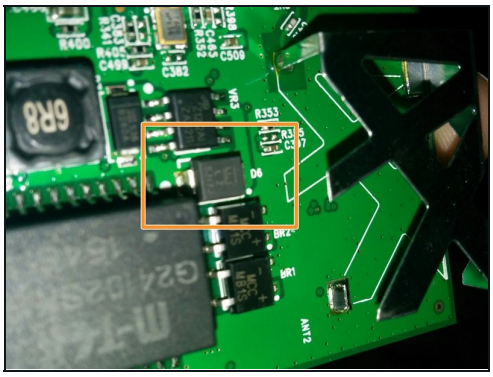
Step 1 — Pry the device open



- The front cover is secured by five tabs.
  - Use the Jimmy to create a gap near a clip and insert a plastic prying tool. Apply moderate pressure to force the clips open.

ⓘ Watch out for alignment tabs that may obstruct your progress. Aim to guide the Jimmy toward the center of the front cover.

Step 2 — Test the TVS diode

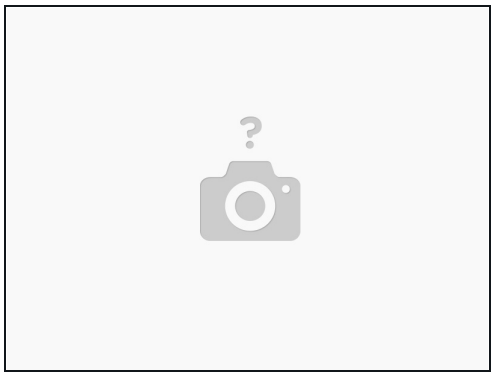

- The TVS diode, marked D6 on the PCB, is located between the antenna and a large IC on the RJ45 port side of the board.

ⓘ It is a 24V uni-directional TVS diode with J leads (SMBJ24A) made by Littlefuse. Note the location of the white bar on the diode, as it indicates its orientation.

- Use a multimeter or ohmmeter to test whether the diode has shorted. A shorted diode will read less than 1 Ohm in both directions. A working diode will have significantly higher resistance in one direction than the other.

ⓘ If the diode is not shorted, then there may be another issue, and proceeding further may not help resolve the problem with your access point.

Step 3 — Remove the broken diode

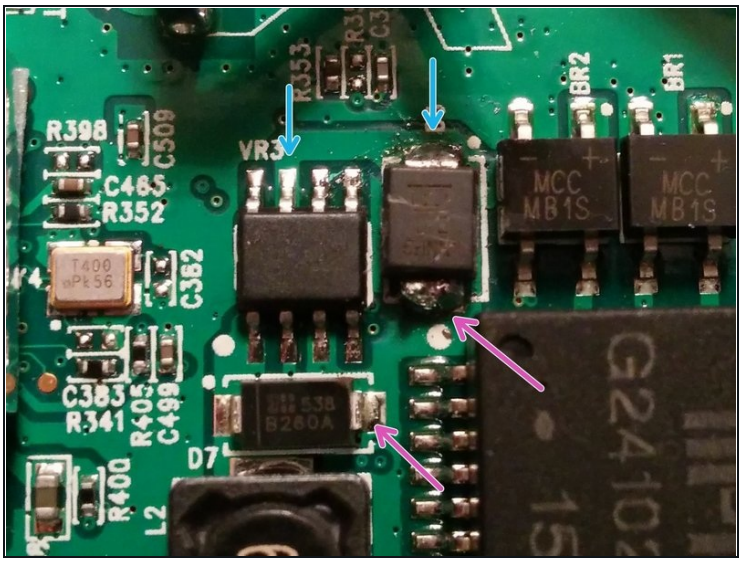


- To desolder the broken diode, apply heat to one side while lifting the diode with tweezers. Repeat on the other side until the diode comes loose.

  If the solder seems to not want to melt, try using a larger soldering tip to transfer more heat and melt the solder faster.

After removing the shorted diode, the access point should power up and function normally. However, omitting this step could result in further damage if an overvoltage event occurs.

Step 4 — Install a new diode



Before installing the new diode, use a multimeter or ohmmeter to verify that it is functioning correctly. A working TVS diode will exhibit significantly higher resistance in one direction than the other.

- To install the new diode:

  ⚠ Check the orientation marking on the diode to ensure it is positioned correctly, with **the bar pointing toward the antenna**.

  - Apply flux to the pads and add a thin layer of solder. If solder does not adhere to the pads, you can add it to the underside of the diode pins instead.

  - Hold the new diode in place using tweezers. While applying downward force, apply heat to one pin near the solder until the solder melts and makes a connection. Repeat with the other lead.

- Verify that the connections are good. There should be continuity between one pin of D6 and a pin in VR3, and between the other pin of D6 and D7.

To reassemble your device, reattach front cover.