

Easy-PCB Solder Reflow Oven

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Features

- Insulated aluminum frame with XxYxZ interior chamber
- XXX Watt heating element with solid state relay control
- Forced convection fan driven by bipolar stepper motor with speed control
- Type X thermocouple for temperature feedback loop
- XXXXX based feedback control
- Integrated 120 VAC power supply with surge and short protection
- Combined temperature/run time 7-segment display
- Convenient pushbutton/menu interface for temperature profile programming

Introduction

Easy-PCB is a small, desktop convection oven for DIY reflow soldering at home.

As integrated circuits continue to become smaller and faster, many μ -controllers, FPGAs, and other ICs are no longer available in DIP form for breadboard prototyping or solder iron soldering. Similar to the shift away from PC parallel ports in the early 2000s, the shift away from DIPs means modern electronics hobbyists need more complicated equipment than their predecessors.

Currently, commercial solder reflow stations are available for soldering fine pitch, SMD, and BGA componenets. More recently, several hackers have created open source designs for inexpensive reflow ovens, using converted kitchen toaster ovens.

Easy-PCB is better because it is a convection oven; controlled air flow prevents parts from being blown out of position and convection heating obviates the uneven heat absorbtion seen in infrared radiation based systems. Furthermore, *Easy-PCB* was designed from the ground up for soldering, so the heating elements and oven frame were optimized alongside the temperature controller for a typical solder reflow profile.

Figures/control-system.pdf

The *Easy-PCB* Control System: not just a controller bolted onto a disjoint oven.

Easy-PCB allows hobbyists to produce solder reflow temperature profiles with a high degree of accuracy and repeatability. Alongside freely available PCB design programs like Eagle and low-quantity fabrication services like OSH Park, *Easy-PCB* makes modern integrated components, such as digital CMOS cameras, within the range of capabilities of independent hobbyists.

Figures/control-results.pdf

Faithful Temperature Profile Control

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