

Surface Mount Assembly with a Toaster Oven

Mike Seguin, N1JEZ

Packrats June 19th, 2025

The Problem

- 1 New and interesting parts are getting smaller.**
- 2 Most no longer have leads that are easy to solder.**
- 3 They now have pads on the underside of the package.**
- 4 And can have a ground pad on the underside as well.**
- 5 Pad can be tied to the die for Thermal Management.**

Can we use a Toaster Oven?

as a Reflow Oven?



But how to make it work?

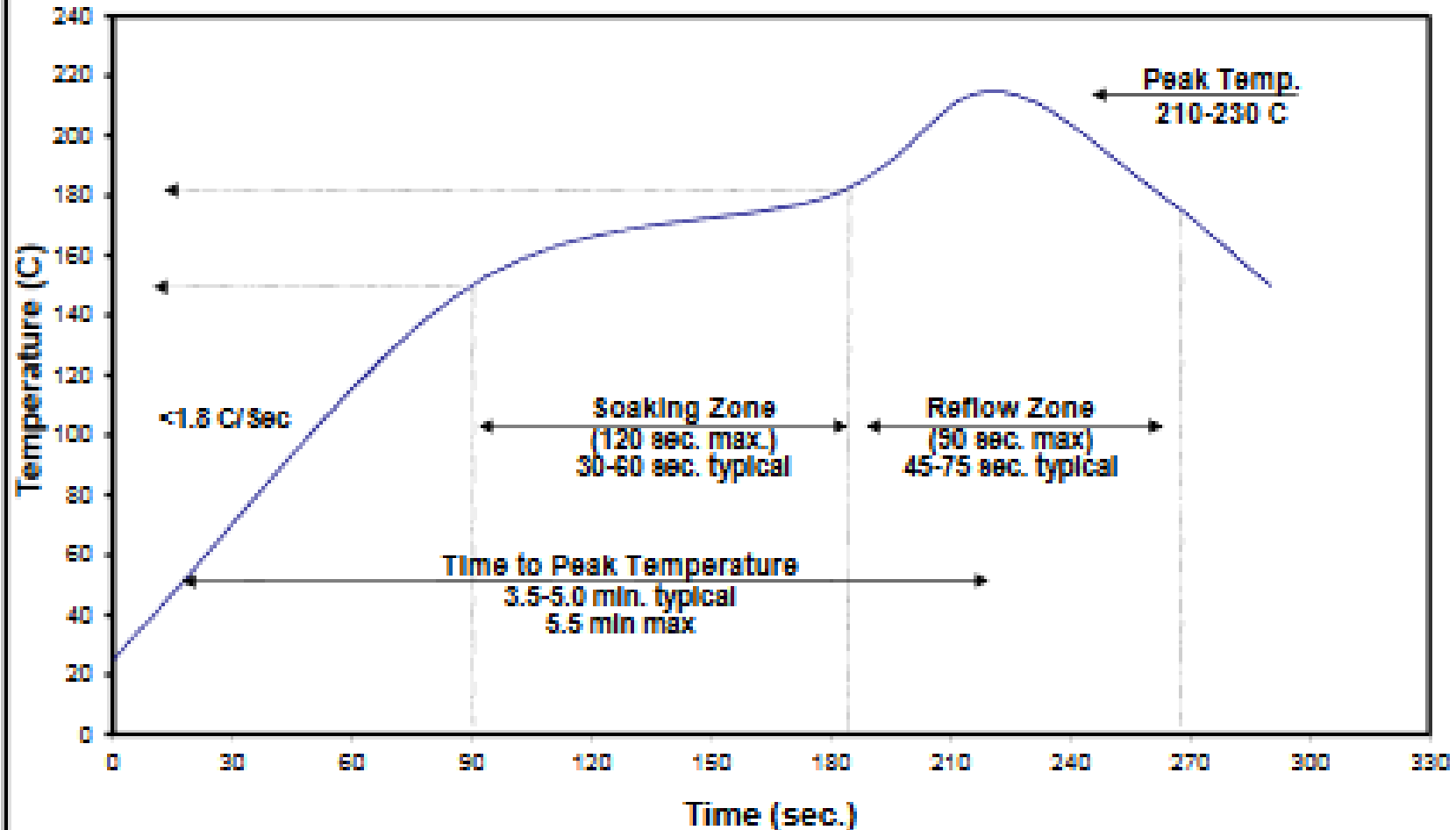
Kester EP256 Solder Paste 63/37 Syringe Dispenser



Refrigerate when not in use

Kester Reflow Profile

Alloy: Sn63Pb37 or Sn62Pb36Ag02



Ref10Leo!

RESET

S3

SC

MI

MO

FRONT

COUPLE

RELAY

AY

CONT
RAST

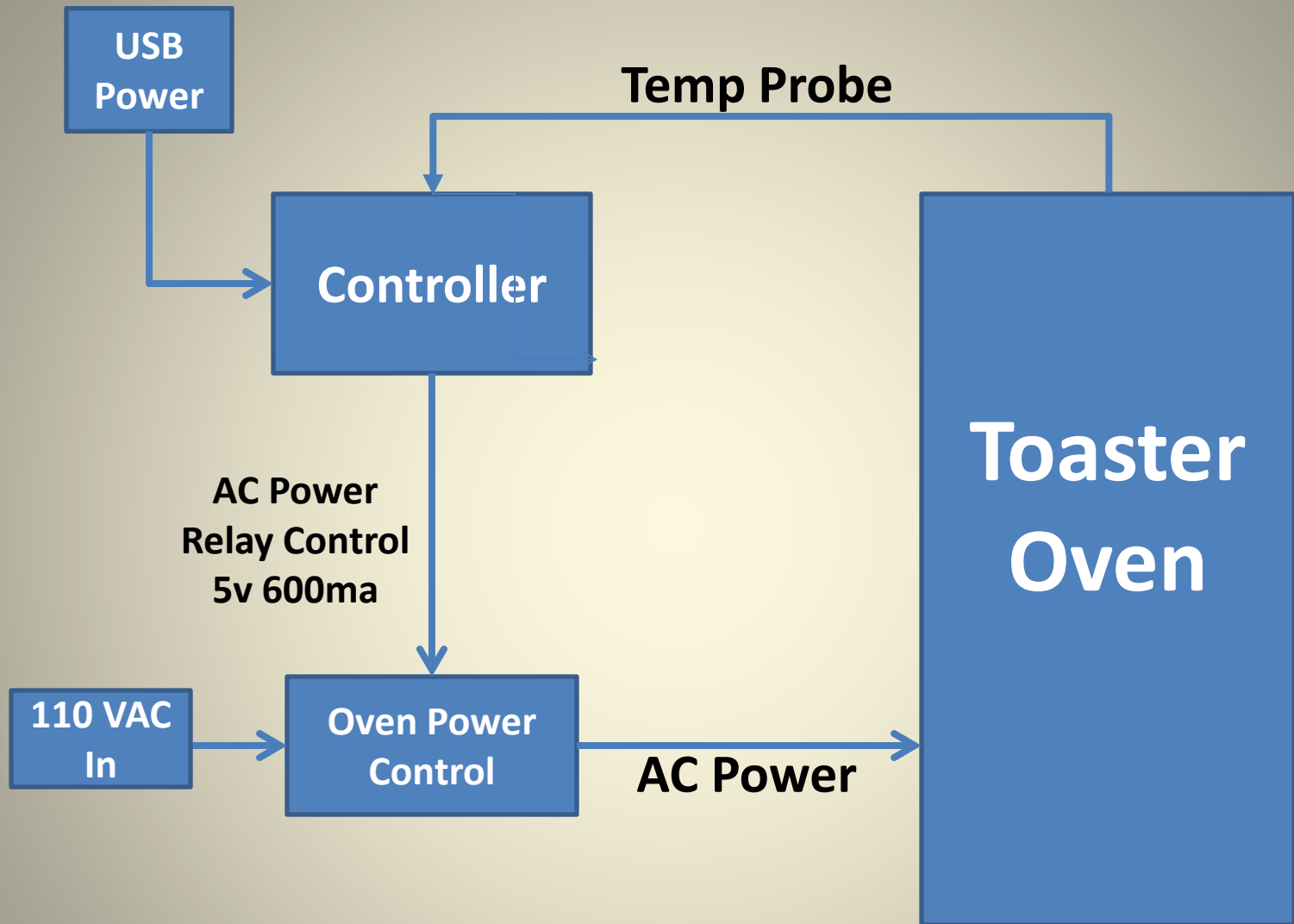
- ❖ **RefloLeo is a Kickstarter project**
- ❖ **Arduino Leonardo compatible**
- ❖ **K-type thermocouple**
- ❖ **USB powered**
- ❖ **I started using it in 2013**

❖ 5V, 600mA external relay control capability

❖ SD Card for Profile storage

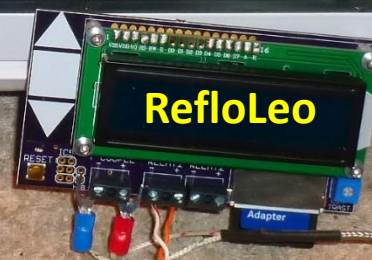
❖ Simple setup and operation

❖ Open hardware design





Thermocouple



RefloLeo



AC Power Switch

Thermocouple

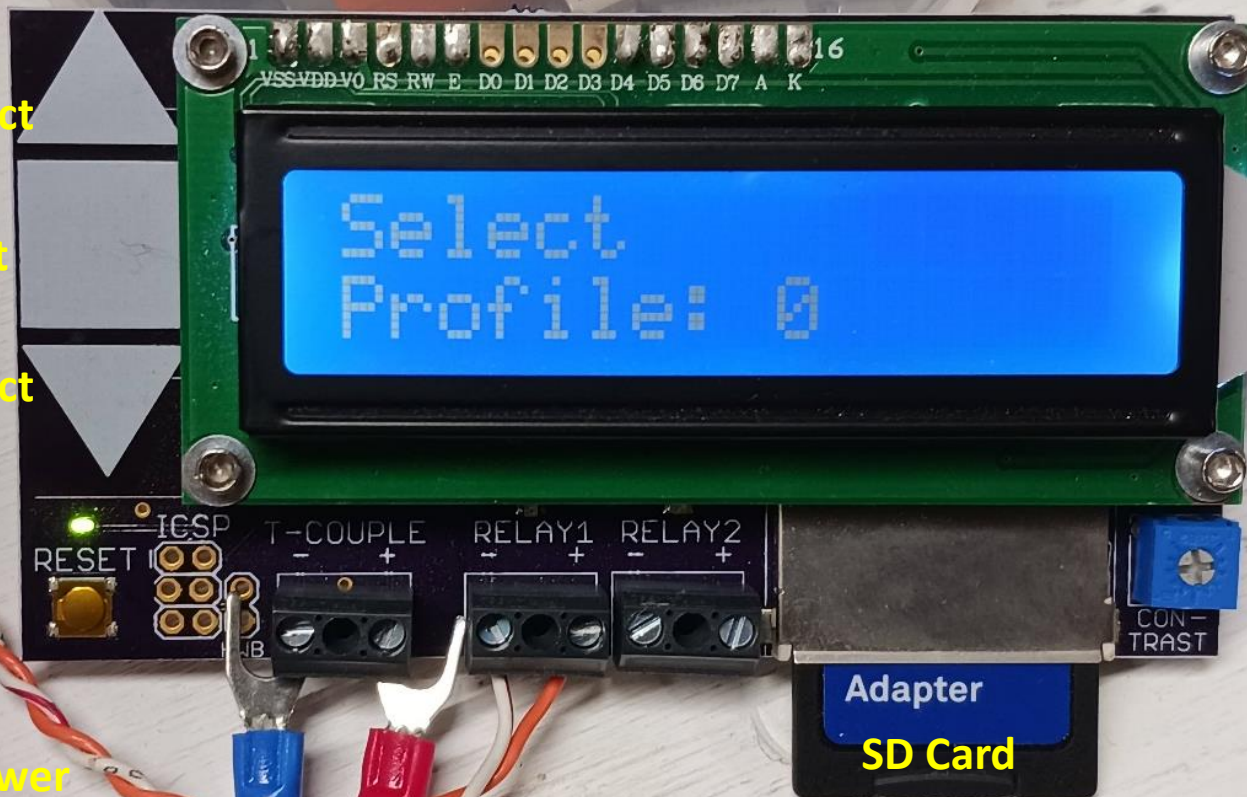
Profile Select

Start

Profile Select

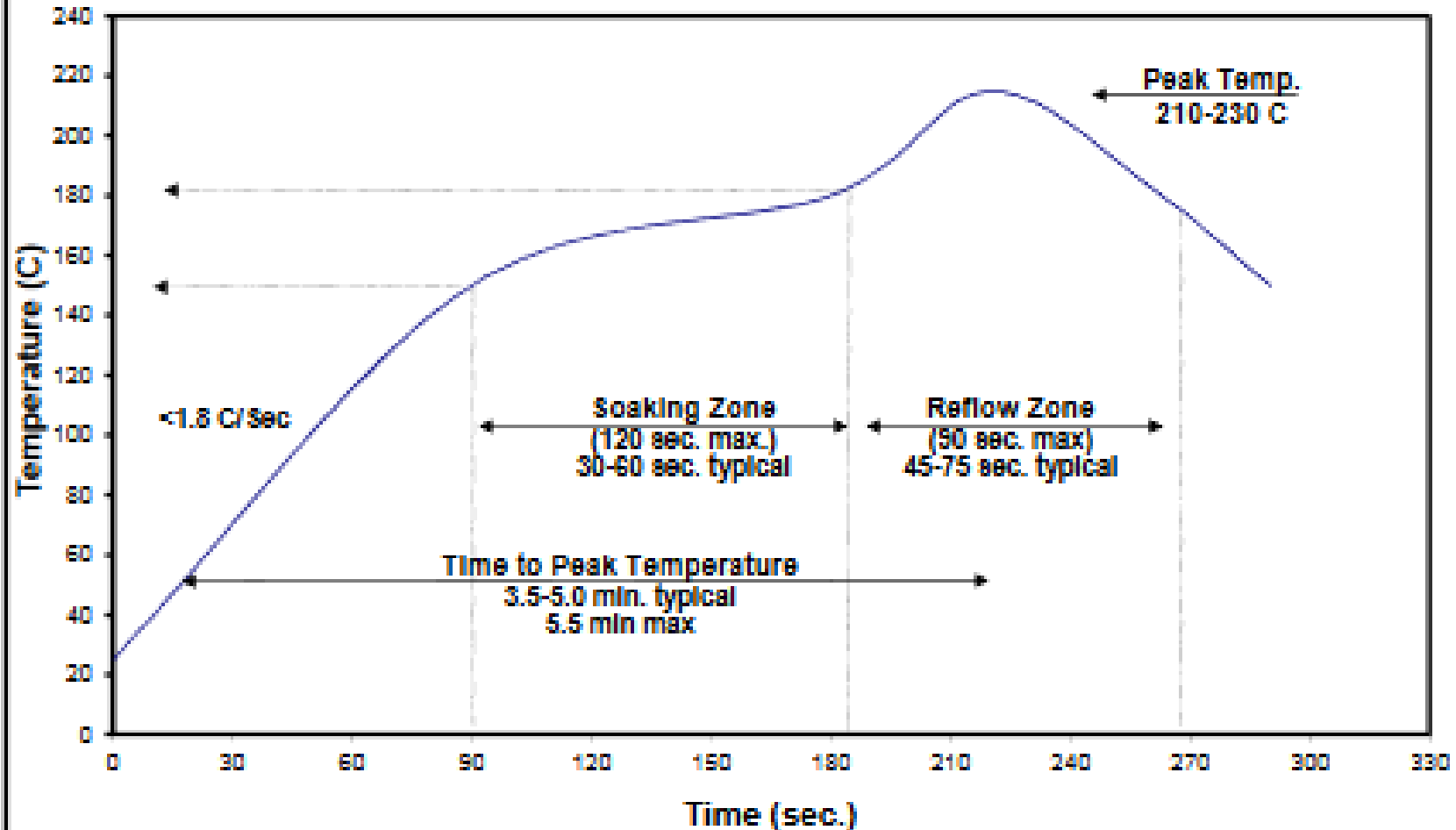
AC Power
Control

Thermocouple



Kester Reflow Profile

Alloy: Sn63Pb37 or Sn62Pb36Ag02



Reflow Profile Commands

T = Heat to specified temperature

H = Hold above specified temperature

W = Wait specified amount of time (in secs)

X = Exit program (close file, deactivate heat)

Reflow Profile Command Examples

T130,000 Goto 130 degrees

W000,015 Wait 15 seconds (and turn off heat)

H150,120 Hold at 150 degrees for 120 seconds

X000,000 Exit program and turn off relay

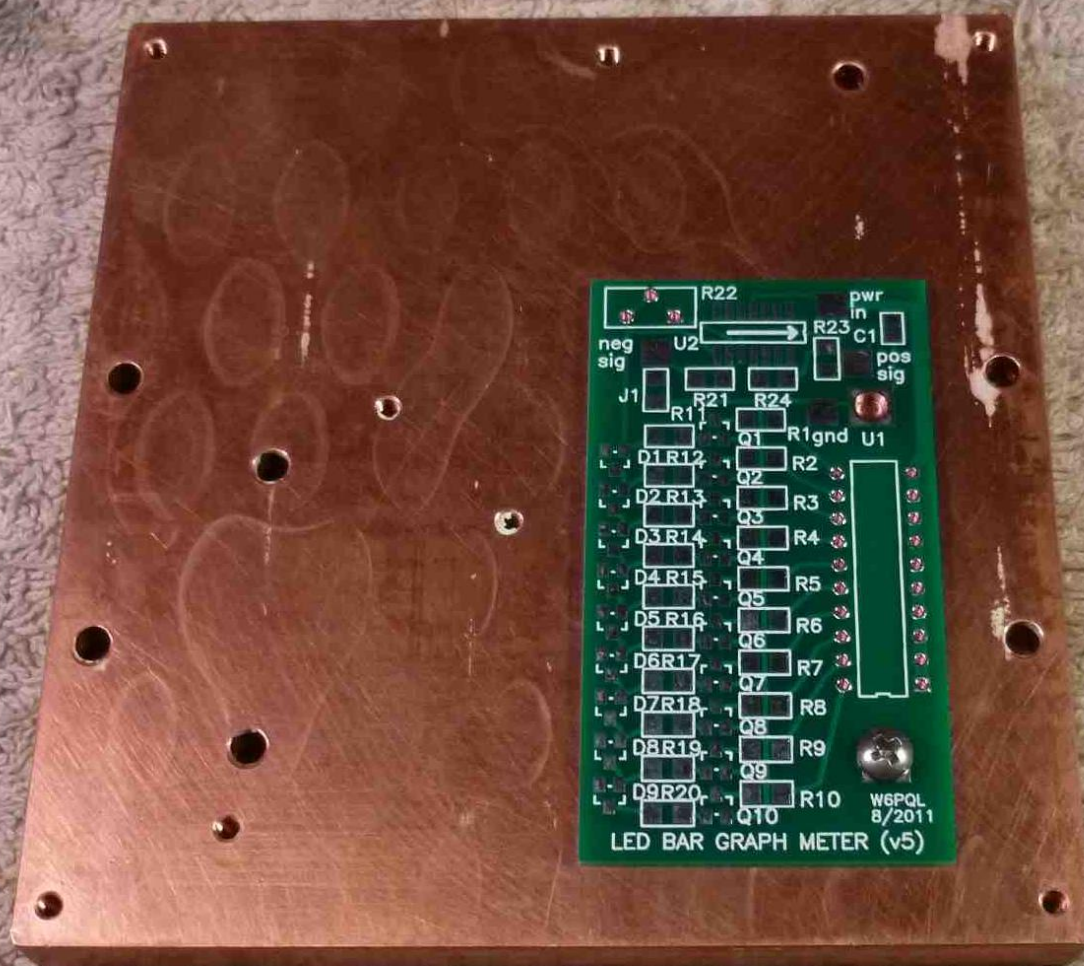
Multiple Profiles Stored on the SD Card

Profile 0 = Kester EP256 Solder Paste

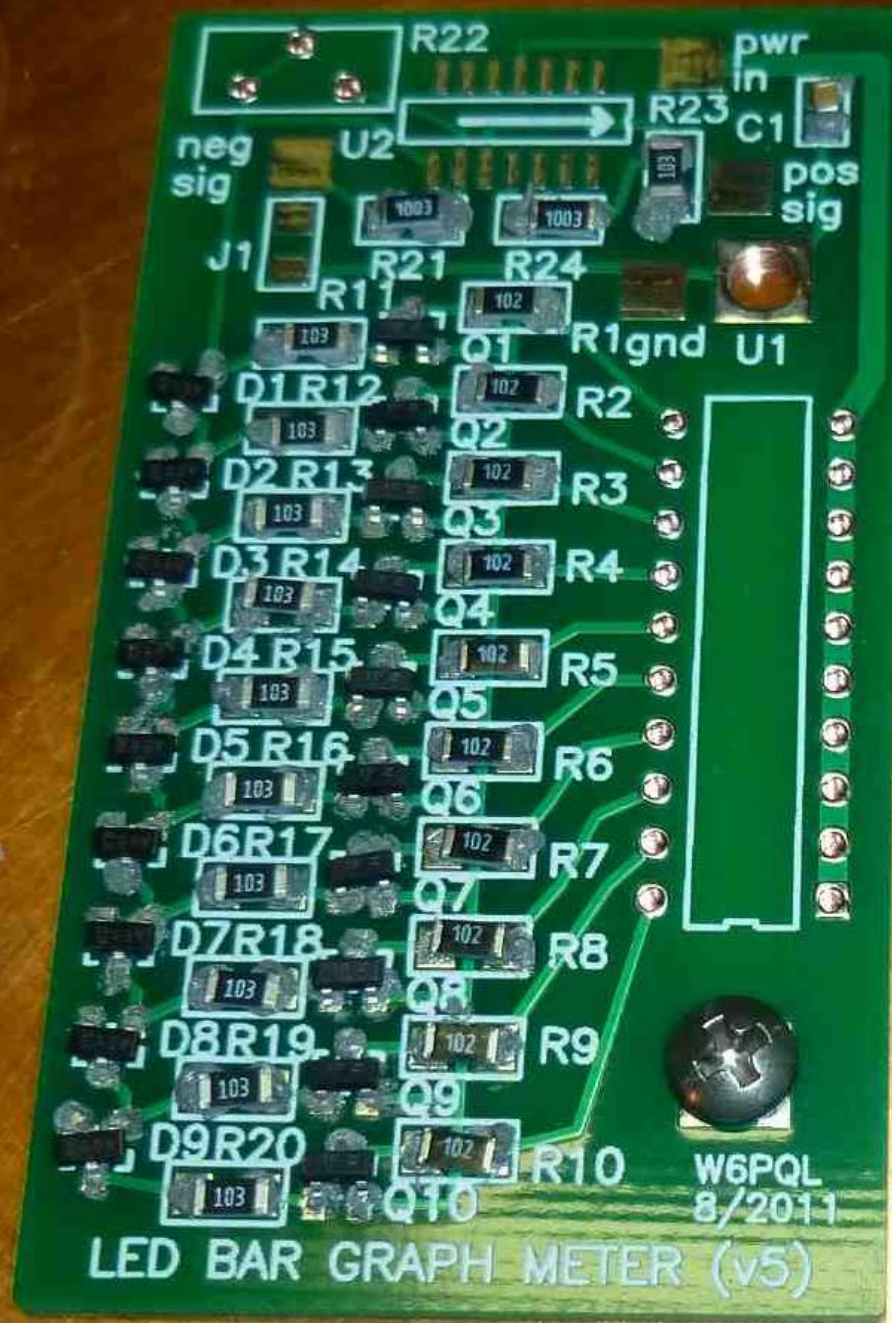
Profile 1 = Hot Pocket Reheat

Profile 2 = Tuna Melt Sandwich

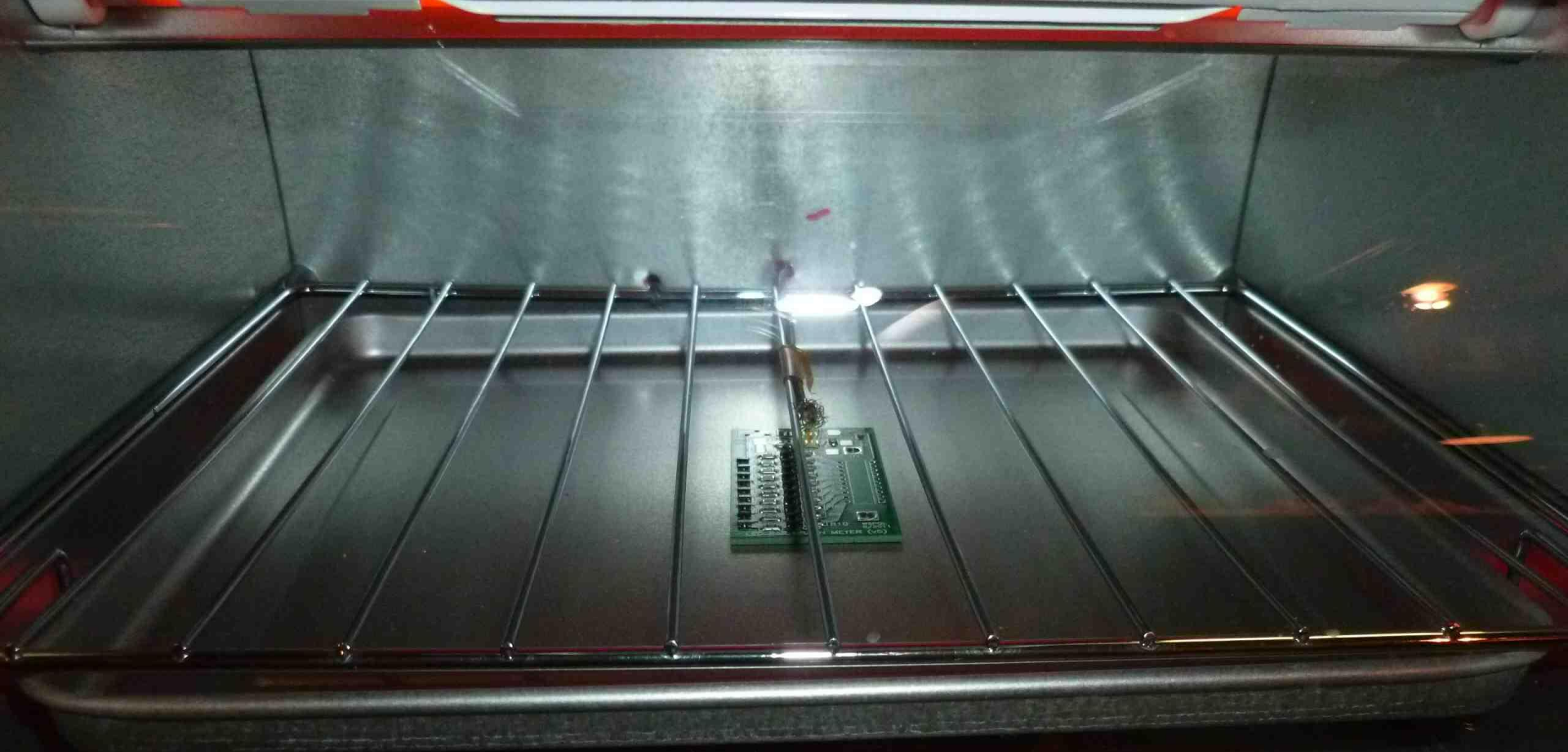
Profile 3 = Mini Pepperoni Pizza



W6PQL
LED Meter



**W6PQL
LED Meter
Set for oven**

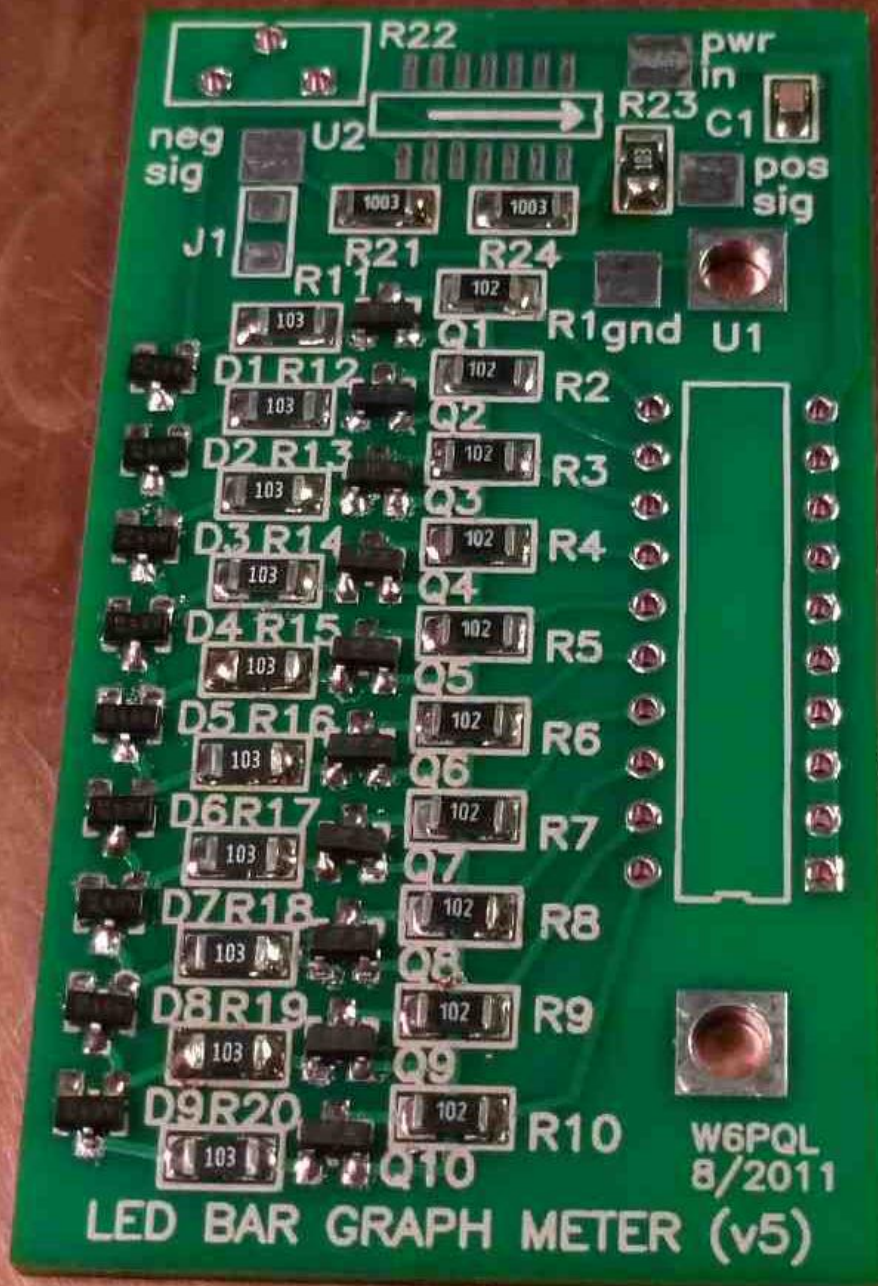


IN THE EVENT OF FOOD-FLARE-UP, KEEP DOOR CLOSED AND UNPLUG POWER CORD

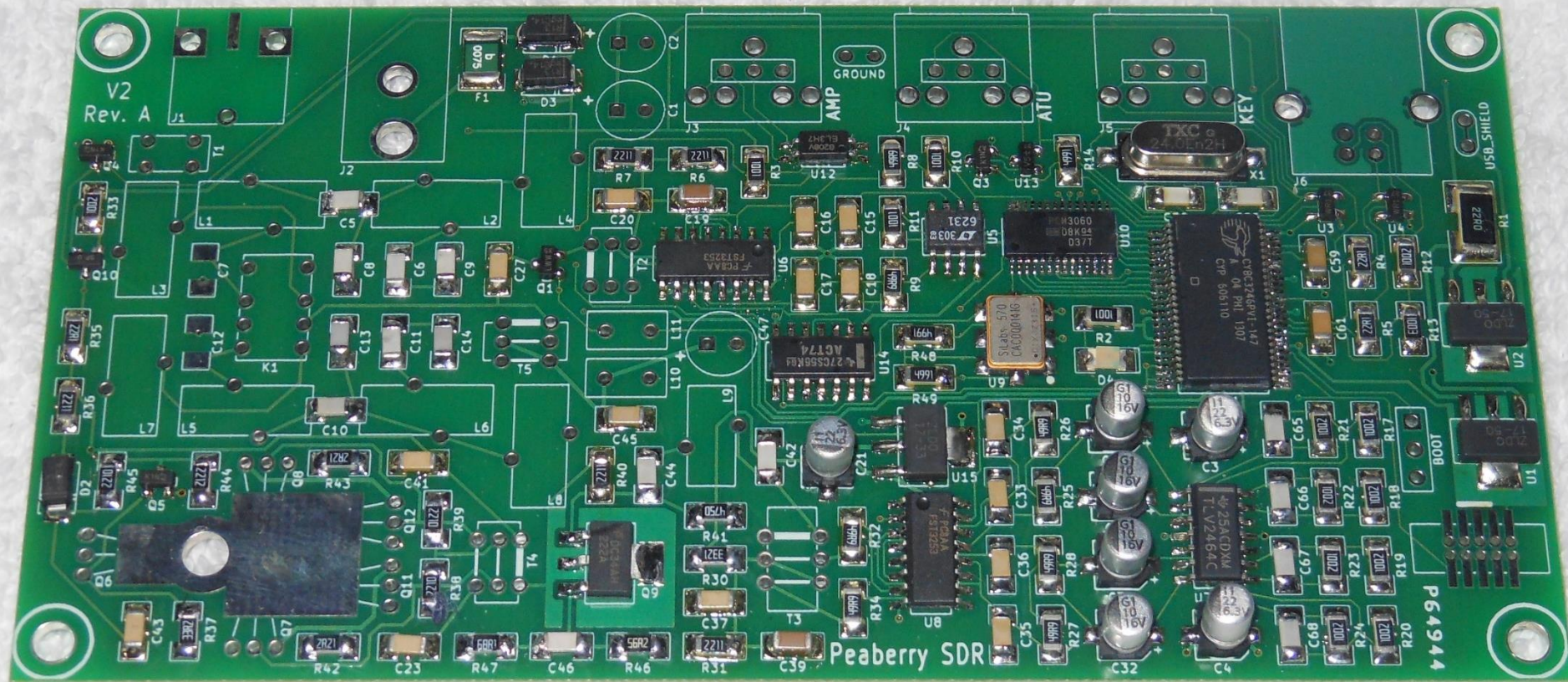
Toast-R-Oven™

NOTA: EN CASO DE LLAMARADA, DESCONECTE EL CABLE Y MANTENGA CERRADA LA PUERTA.

 **BLACK & DECKER®**



**W6PQL
LED Meter
Fresh out
of the oven**



CML Supply Item: 731-EP256-M

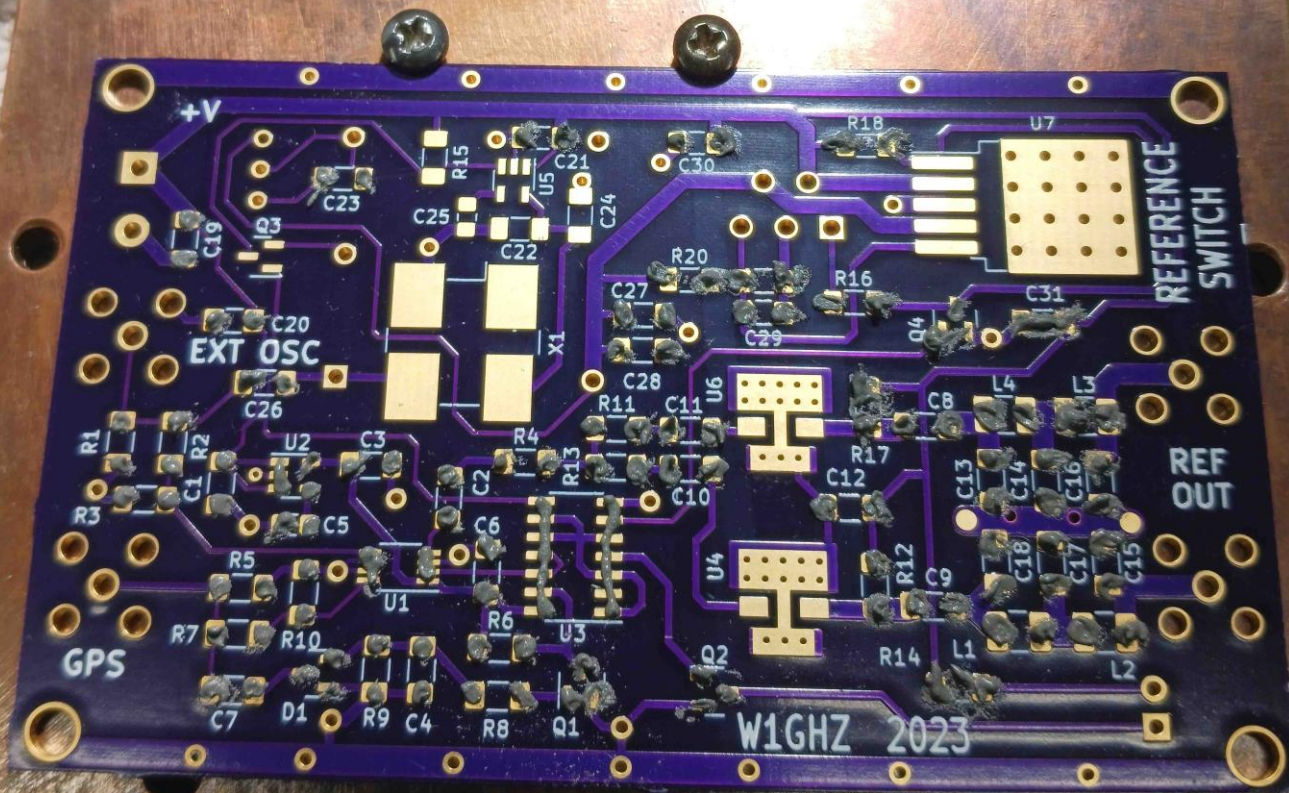
DOM:

10/2/23

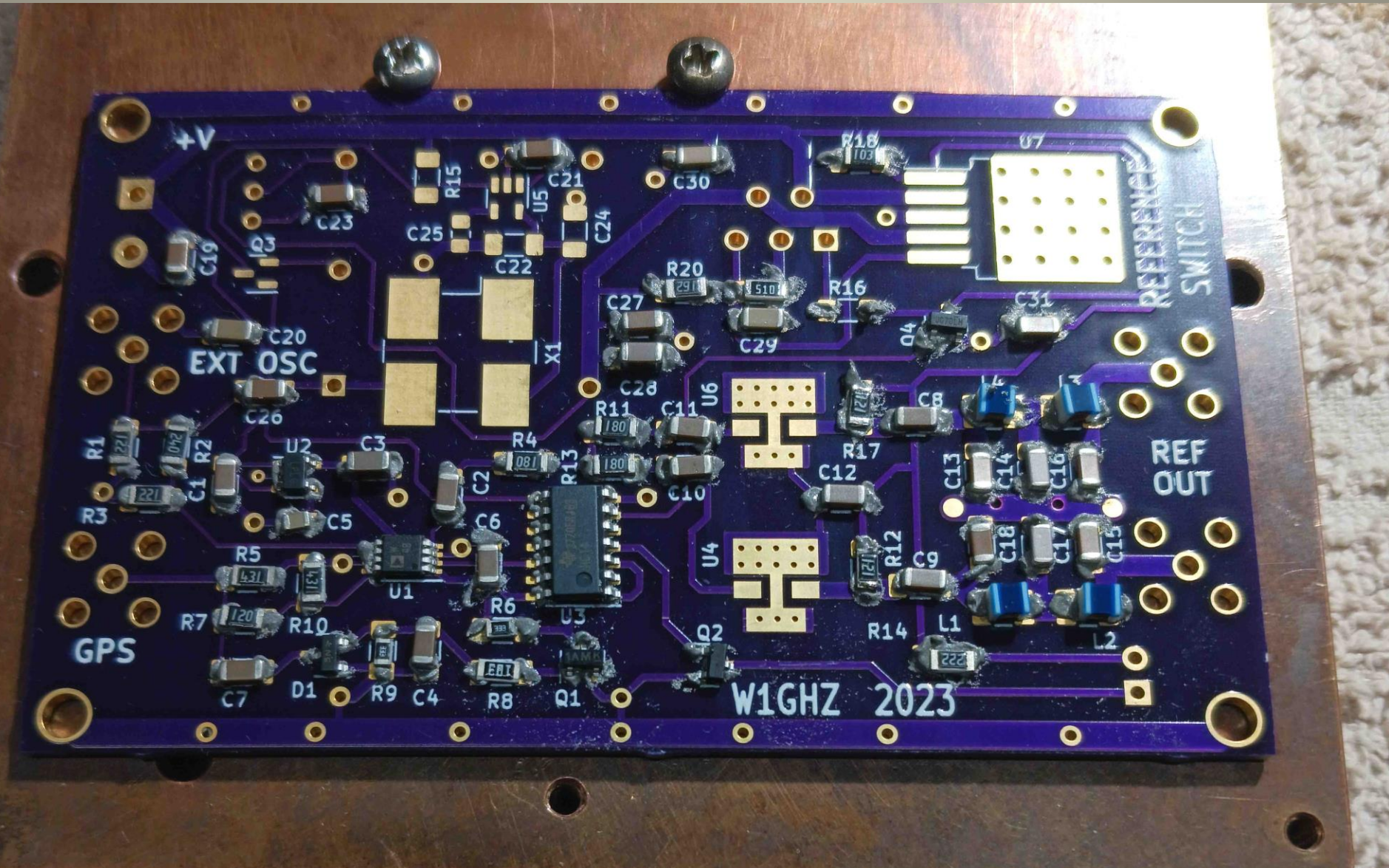
Kester® EP256 Solder Paste

Melt Point: 361°F/183°C Alloy: Sn63Pb37 Flux Type: No-Clean

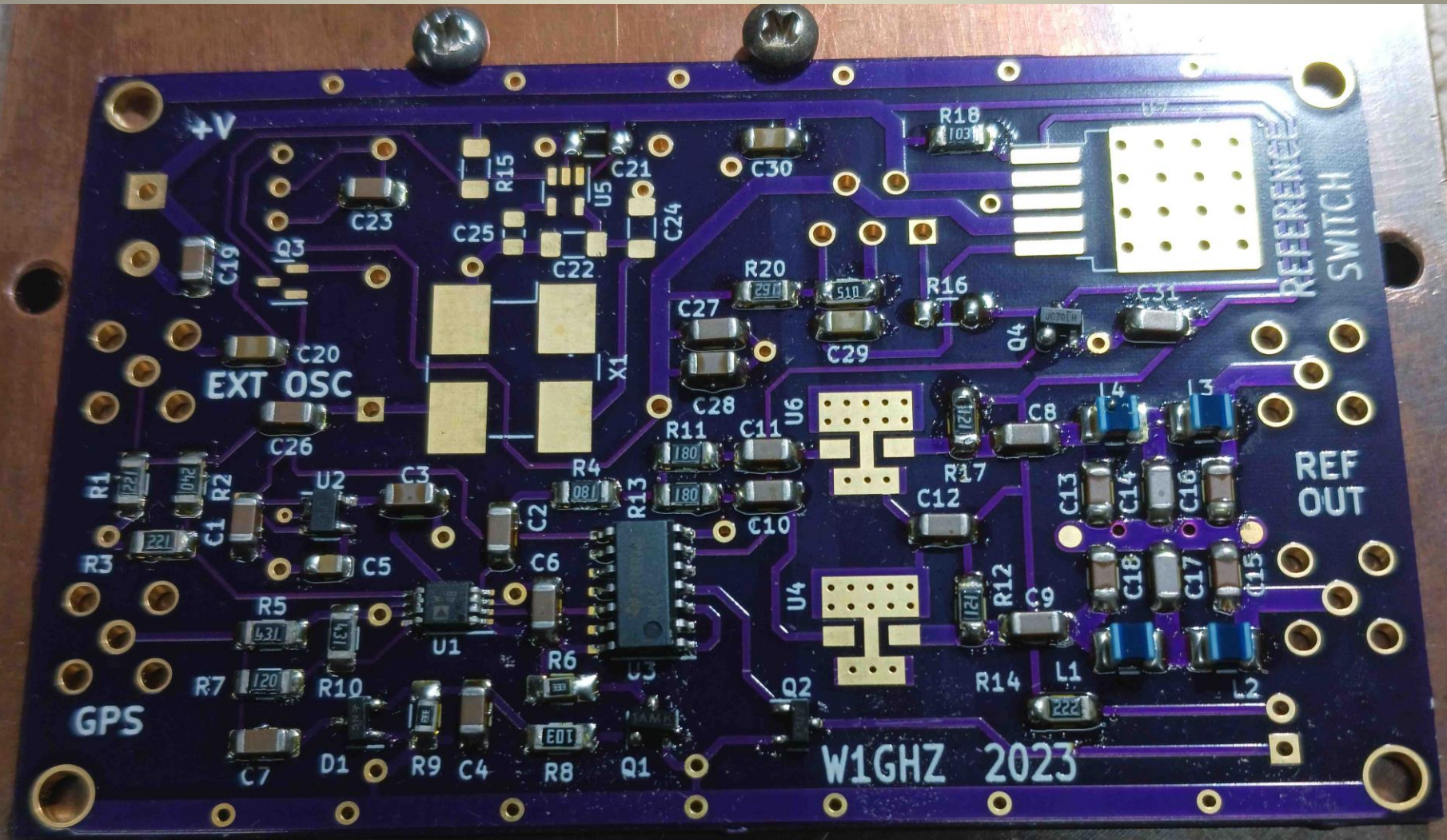
W1GHZ Reference Switch all pasted up



W1GHZ Reference Switch parts placed



W1GHZ Reference Switch completed





BGU8051

Low noise high linearity amplifier

Rev. 7 — 8 June 2017

Product data sheet
COMPANY PUBLIC

- Small 8-terminal leadless package 2 mm × 2 mm × 0.75 mm

7 Pinning information

7.1 Pinning

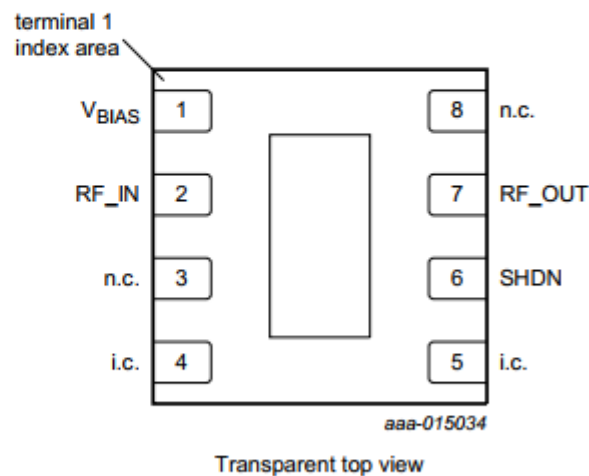
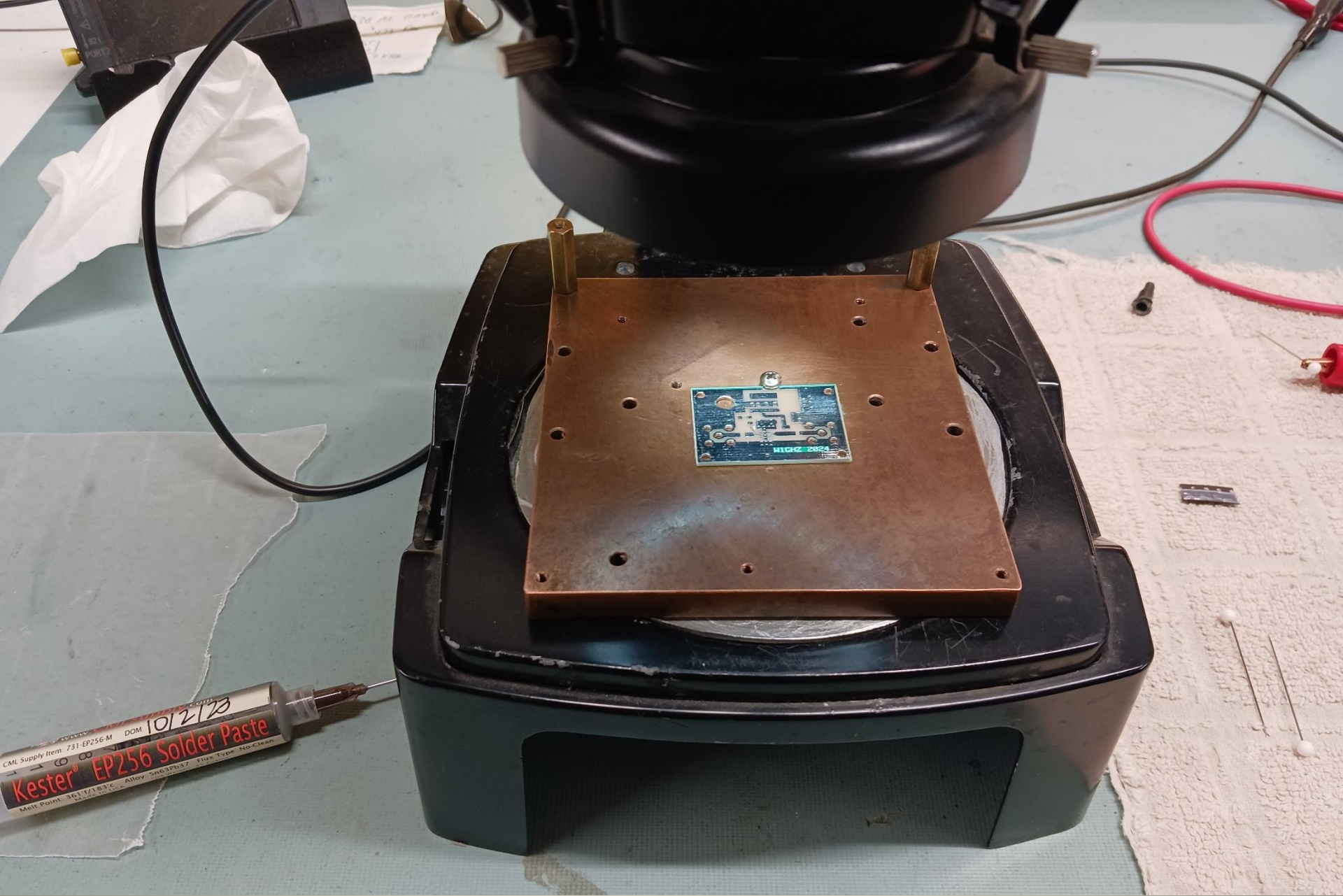


Figure 2. Pin configuration

The Shop





Board under the microscope ready for solder paste

7 Pinning information

7.1 Pinning

**Yellow lines are
where solder
paste was placed**

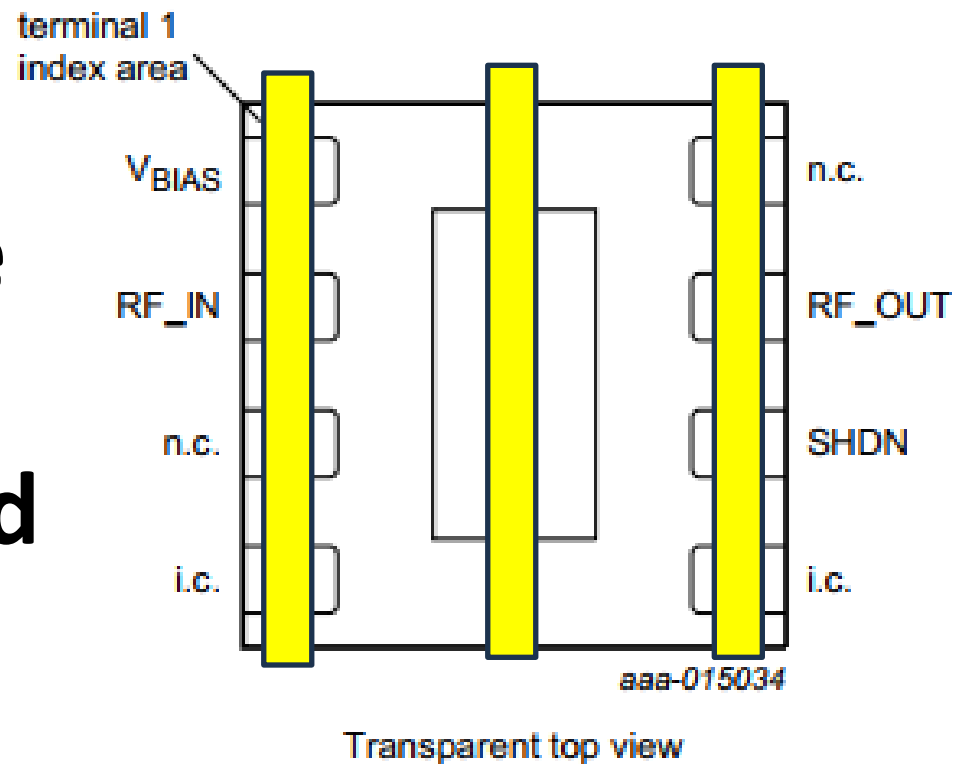
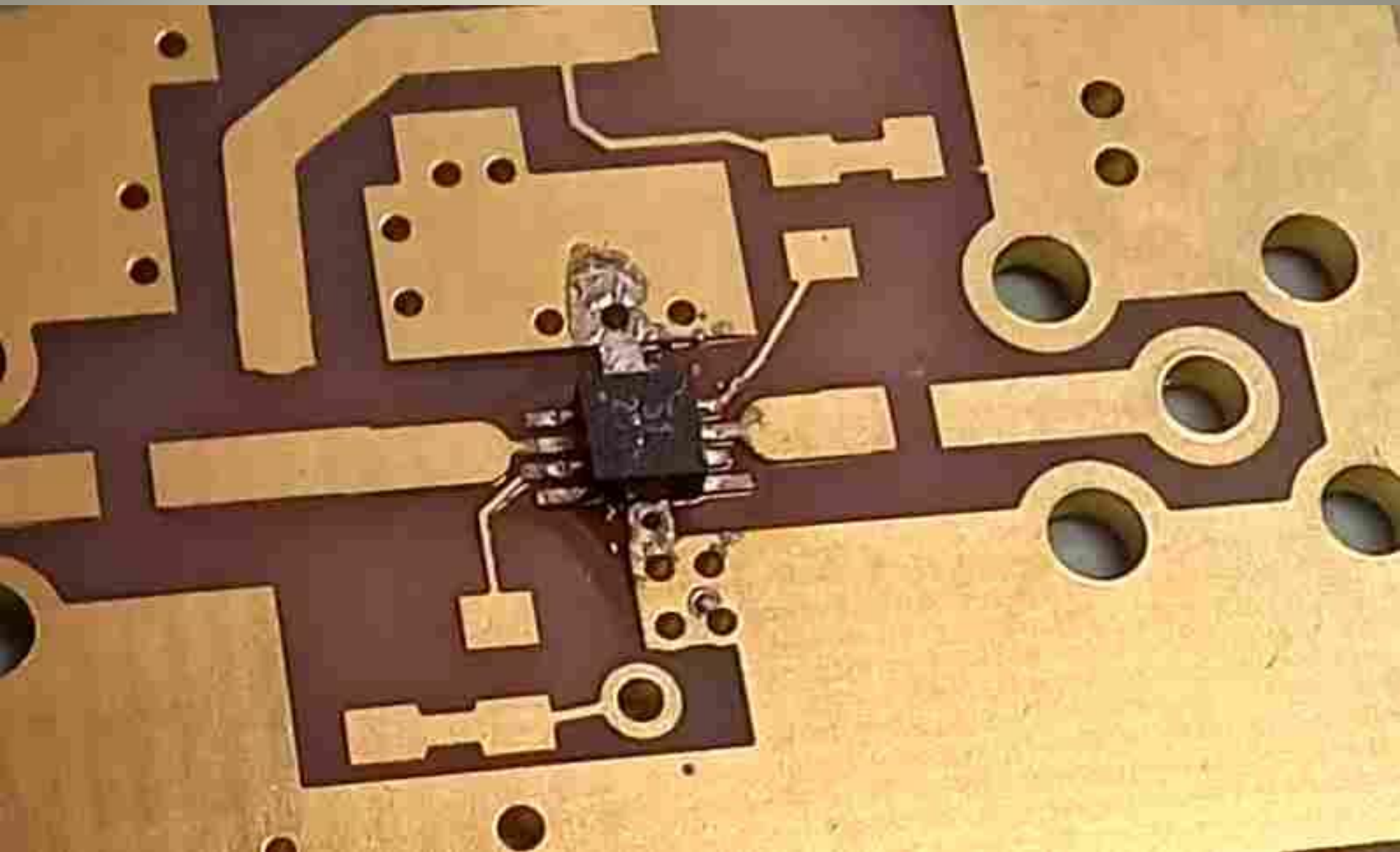
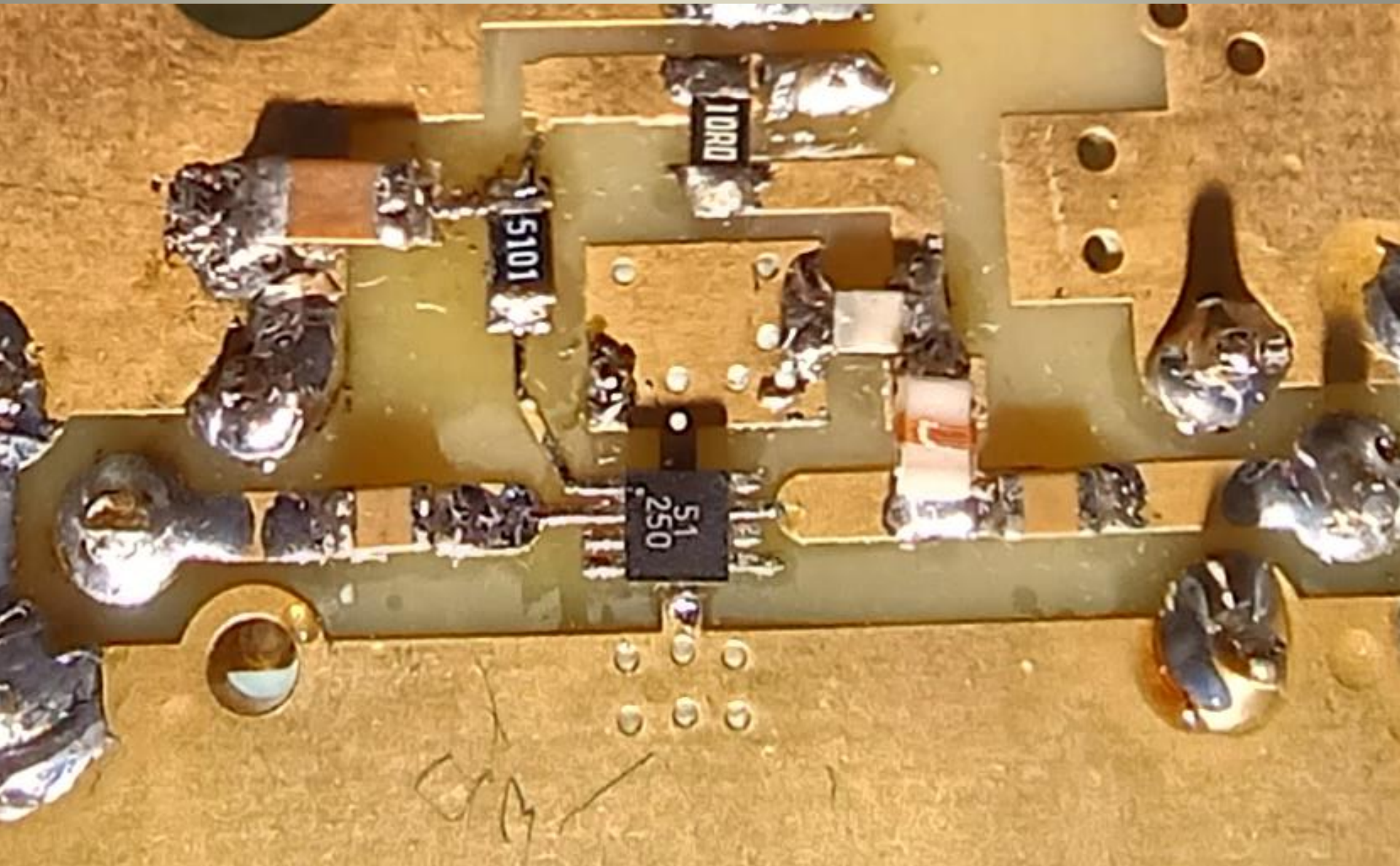


Figure 2. Pin configuration

First Attempt – Test Board



Working Board



Working Board Rear View



Wait for Solder Paste to come to room temp before use

**There is a finite time for solder paste to sit before Reflo
If you start a board, plan on finishing it in one sitting**

Preheat Oven at least once before use

For clean up and rework

TechSpray #2 size No Clean braid

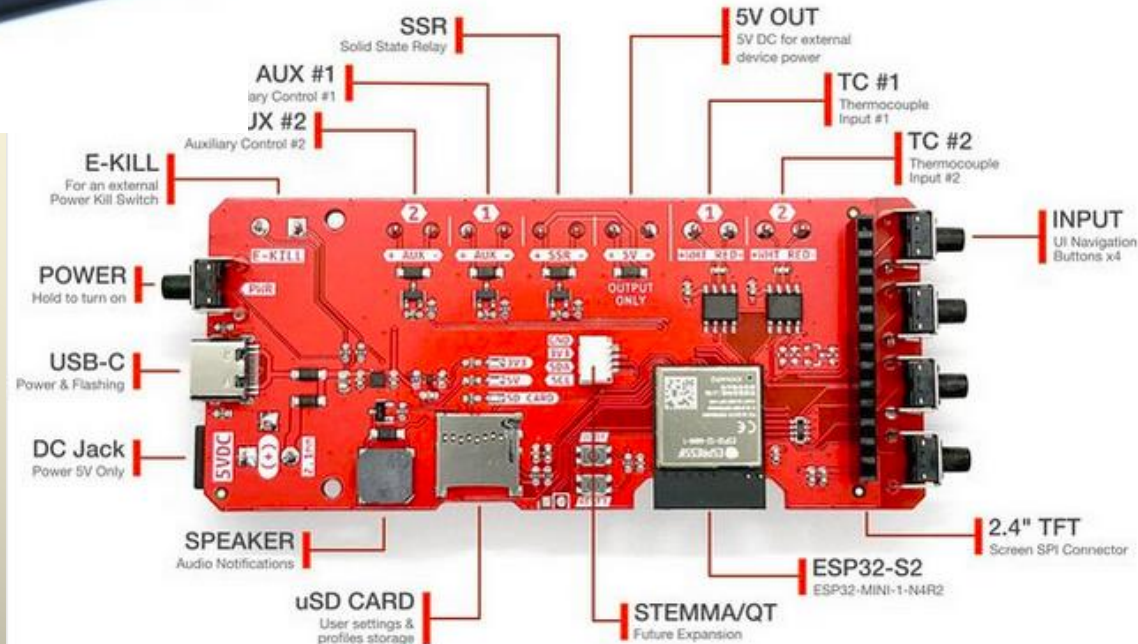
Kester .015 No Clean 23-6337-8806 SN63PB37

**For a toaster oven, get the smallest with the max heat
Mine is 1200 watt**

Reflow Master Pro on Tindie



\$89





Desktop Unit \$320.00

QUESTIONS?

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