Color Sensor Experiment ch2

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Color Sensor Experiment #2

This document is a supplement to com.zenmcu.0031-0_(zenai-community-of-robots).pdf.

I designed a special test board, brd0059b, to mount a VEML6040 color sensor, a KTD2026 RGB LED driver and an RGB LED onto a brd0058a, which is is an I2C master.

I anticipated having difficulty hand soldering these tiny parts, and in fact, I did have difficulty. I used solder paste, flux, and my hot air reflow system. After first soldering all of the components and probing the I2C bus I discovered that only the VEML6040 was alive. The KTD2026 did not respond. So I went ahead and tested the color sensor.

The results are that it does in fact work, but it seems (at least initially) to be less sensitive than the obsolete TCS34725. But it is probably good enough for locating robots with RGB LEDs on them.

So after that limited success, I tried to remove and re-solder the RGB driver IC. But I fumbled it as I removed it and I was unable to identify the pin 1 marking. (I was not even entirely sure that I identified it correctly to begin with.) So I stored it away and solder on another one. I managed to solder it on, and again I didn't find any shorts, but it still did not respond on I2C.
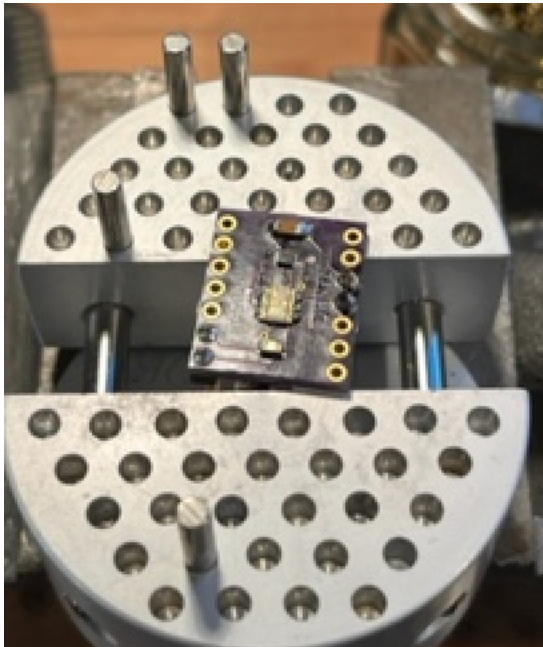
Initial soldering with hot air reflow.
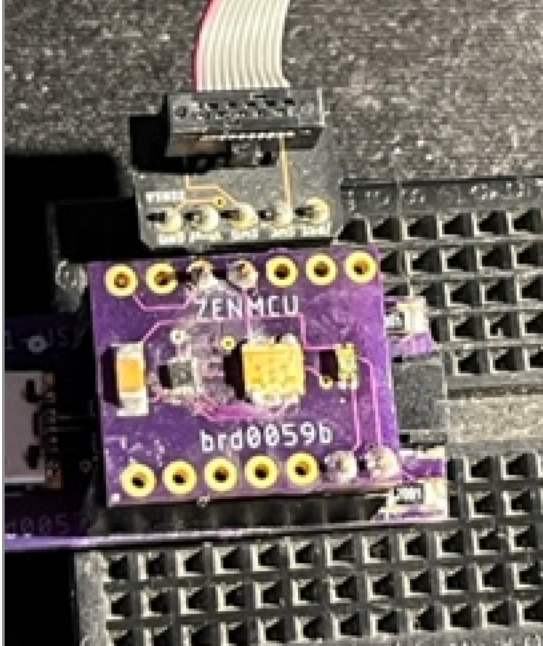
After the second soldering attempt, mounted on brd0058a.

I have two more of the brd0059b PCBs to experiment with, so I cay try again. It is entirely possible that I misinterpreted the pin 1 mark. Or that I just flubbed the soldering. I did use my 6x magnifiers etc so I'm pretty sure the soldering was ok, but its impossible to say.

Update - I couldn't leave it alone so I tried to re-solder the KTD2026 again. Not only did I fail, but I borked the I2C bus. So I ended up just removing it altogether from that board and leaving the VEML6040.

Then I decided to try just the KTD2026 on another board. And I was able to use hot air to solder on on in only two tries. And miraculously, it worked. So I added the VEML and the the RGB LED. But the VRML didn't work. In the process of trying to reflow it properly I managed to yank off one of its pads and ruined it. So I tried yet another, and after several tries succeeded.

All in all I think I ruined 1 VEML and possibly 4 KTDs, because I'm not sure I can identify pin1 anymore on them. Maybe the top writing will help.
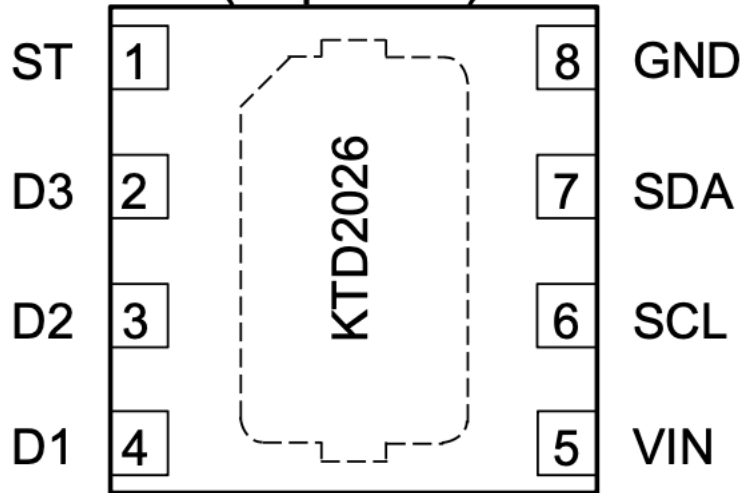
In any case I now have one complete test board, though I have not run the KTD test code yet, I've only probed I2C and seen it respond.

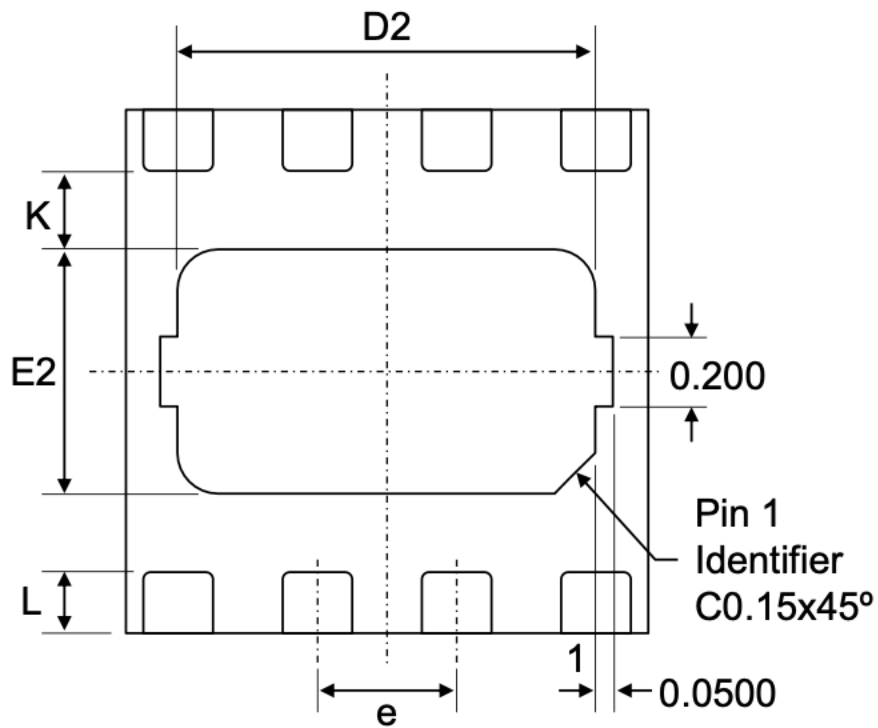Honestly I need a different RGB driver IC with a larger footprint, and/or a reflow hot-plate.

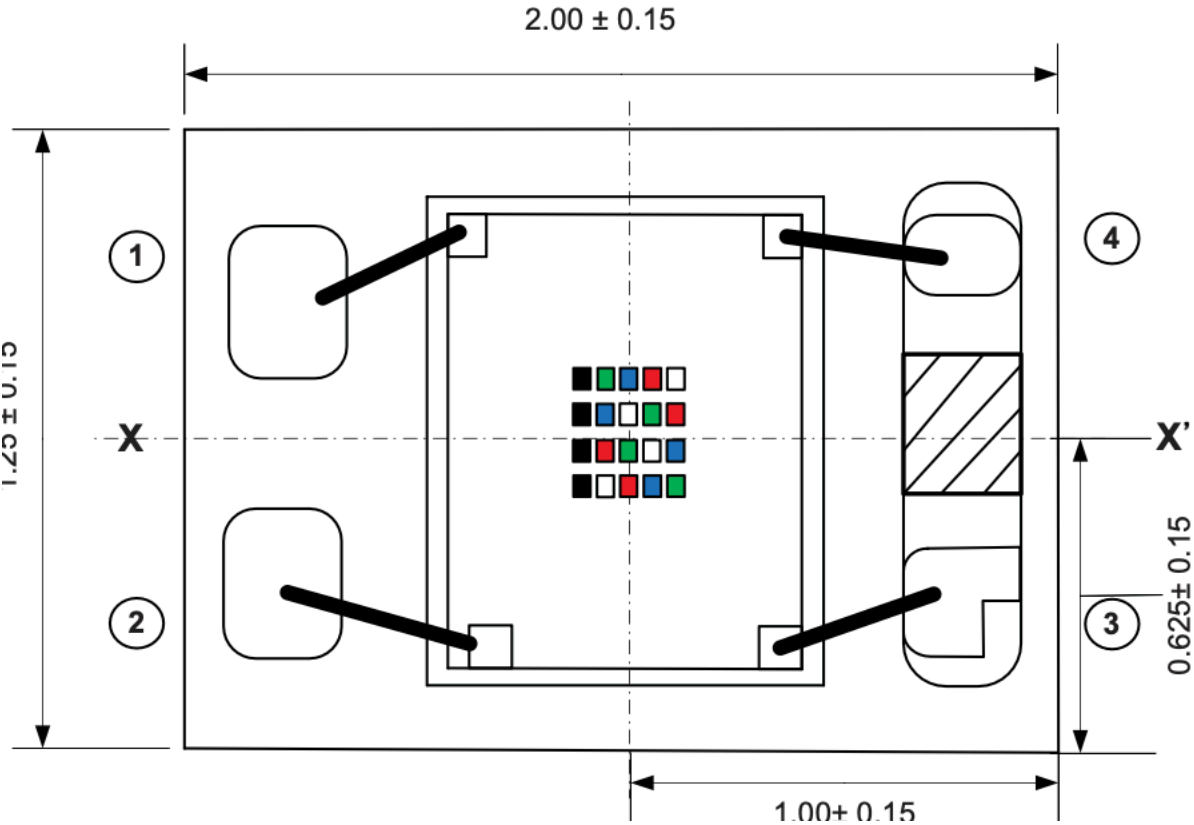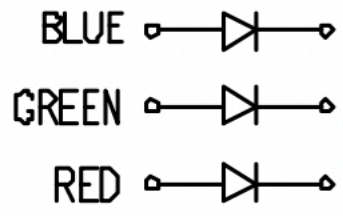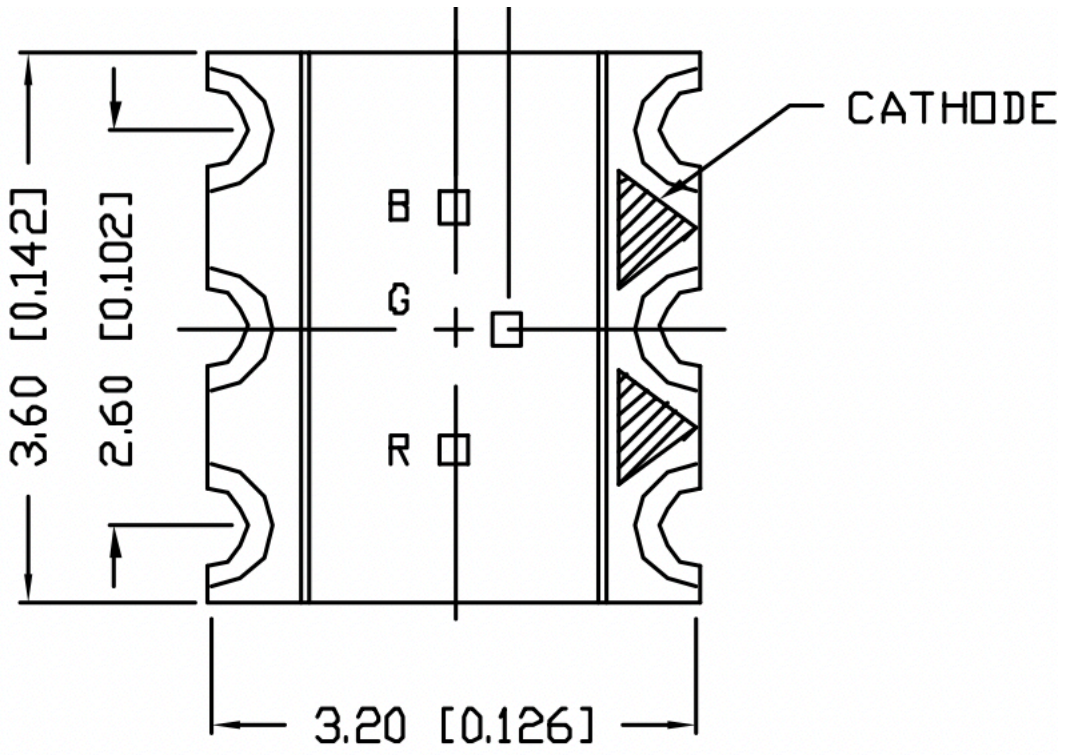For reference, here are the marking details.

KTD2026
(Top View)

ST	1	
D3	2	
D2	3	
D1	4	

KTD2026

8	GND	
7	SDA	
6	SCL	
5	VIN	

Bottom View

D2

K

E2 — 0.200

L

Pin 1
Identifier
C0.15x45º

e

1

0.0500

And the markings for the other parts as well, for reference.

TOP VIEW

2.00 ± 0.15

1.25 ± 0.15

0.625± 0.15

1.00+ 0.15

CATHODE

3.60 [0.142]

2.60 [0.102]

B

G

R

3.20 [0.126]

BLUE

GREEN

RED

End