LED lamp repair

L. B., of Mittagong, NSW got fed up with modern globes which don't last anywhere near as long as they are supposed to. Having had two fail in quick succession, he decided to open them up and take matters into his own hands...

The life expectancy of mains-powered LED lamps can be far less than stated on the packaging. Some time ago I purchased four Mirabella lamps from the supermarket at half price and they worked just fine for a while. I used them 'base up' in lamps in my workshop, and after about five months the first one failed – it started flickering when switched on and then went dark.

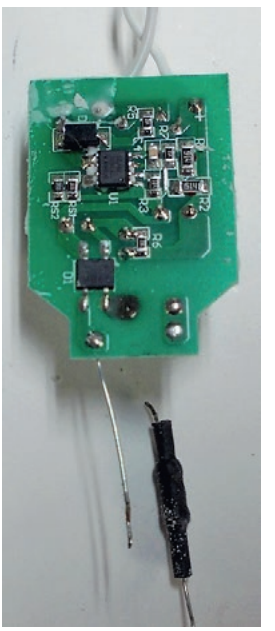
I swapped it for another and put the failed one aside until I had time to explore why it had failed so soon. Then a little while later, the second one failed in a different light fitting. I decided it was time to open them up and see what was going on. I was able to cut off the diffuser housing quite easily using a hobby knife, by slicing through the silicone attaching it to the base.

Under the diffuser I found one LED array, held to a heatsink using two screws. I marked the circuit board with which wire connected where and then unsoldered them.

Removing the two screws allowed the removal of the circuit board. The heatsink was a press fit into the internal metal body and when removed, it exposed the power supply board, encapsulated in more silicone.

Carefully removing the silicone with the hobby knife and pliers then desoldering the wires from the bayonet base allowed me to remove the power supply board.

Removing the remaining silicone from the base exposed two slots on the sides of the base for locating the circuit board. Both power supply boards had an off-board 10Ω resistor which had desoldered itself, hence the failure of the lamps. The area where it used to be soldered to the board was burnt in both cases, apparently due to a lot of heat being produced.



Right: the power supply board for the LED lamp, with an external 10Ω resistor shown in black below.

I assume that the heat from the resistor (encapsulated in the silicone) did its dastardly deed on the connection to the circuit board. Or maybe the original solder joint was not good, resulting in high resistance and therefore heating of the joint.

I reattached the resistor to the board after cleaning away some of the solder resist and applied a much larger amount of solder. Refitting the circuit board without the silicone encapsulation seems to have fixed the problem as neither of these LEDs has failed again, after being in service for longer than they were when they failed. Anyway, I guess time will tell.