

Texas Instrument Electronics Online Challenge  
Gamechangers 4H Robotics Club  
Team 11549A  
15 December 2017

We took apart a modem because we always wondered how we got WiFi into our homes. When first taking apart the modem the case only had one screw, which was next to the Ethernet jack. This allowed us to take off the casing, which led us to the motherboard. Once inside we inspected the motherboard and found a TI transceiver. We found three integrated circuits that were also TI. A transceiver is a combination transmitter and receiver of network signals (analog, digital, etc.) We found six capacitors spread around across one side of the motherboard. The motherboard also contained five Plexiglas panels that covered five LED lights and helped to protect them while spreading their light evenly. We also found about two-dozen resistors, which surprised us.

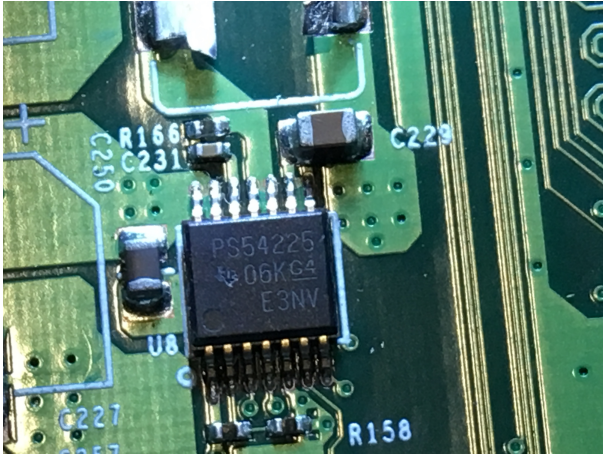
The only part of the motherboard we could not get access to was a silver box that was soldered on, so we had an adult open it for us. There were more circuits, and we found many resistors and two more integrated circuits. This box was where the modem was plugged into the power, internet line, and computer. We learned that a seemingly simple device that we often take for granted can be surprisingly complex, and were immersed in the inner workings of a circuit board. We also learned the function of our TI transceiver and how it can be used in radio and network contexts. Some of the parts included:

- Resistors, which change the amount of current flowing in the circuit
- Capacitors, which store charge
- LEDs, (5 of them), which showed the activity of the circuit (online, link/activity, power, input, output)
- Integrated circuits, which control voltage, PS54225, PS54231, PS54325

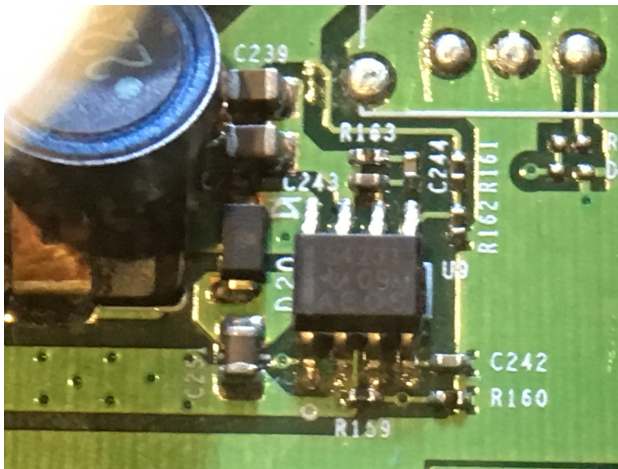
Finally, we also took apart many other pieces of technology, such as a variety of types of cell phones. This taught us that it can be very difficult to dismantle a phone, and that many security measures are taken by technology developers to prevent easy access to the inner components of their products.



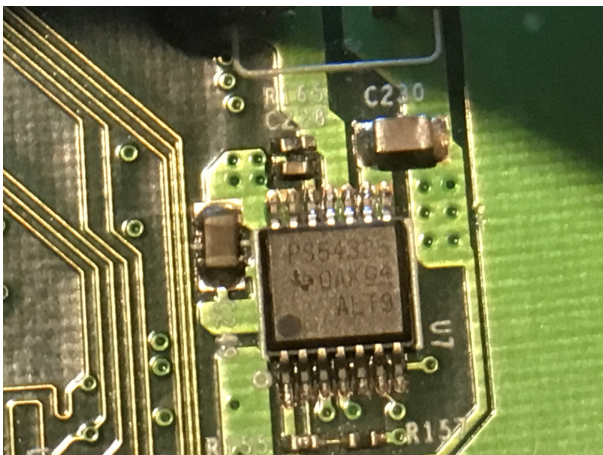
Final disassembly of SURFboard SB6121, a Motorola modem,  
with TI transceiver number TNETC4830ZDWG



TI Integrated circuit 54225



TI Integrated Circuit 54231



TI Integrated Circuit 54325