

Once every week, I take out the trash and bring it to the town dump. At the dump, there exists the Swap Shop, which is a place for people to drop off their old and unused possessions, like skis, chairs, and electronics. Sometimes I won't find anything, maybe some old hair dryers or broken radios, but sometimes I find amazing parts, like a graphics card from 2009. This is why I selected the BFG GeForce GTX 275, because a member of my community had dropped it off at the Swap Shop and I thought it could be used as more than garbage; I could use it as a way to learn about electrical components and their use in computing.

After taking it home and removing the heatsink, I found almost nothing that was made by Texas Instruments. There were GDDR3 memory chips by Samsung for a whopping total of 896 MB, which is nothing compared to the 4 GB of GDDR5 on the newest GPU's, and capacitors of unknown origin. The graphics processor was designed and built by NVIDIA along with the green chip beside it, which handles the graphics output of the GPU. I also found power MOSFETs developed by ON Semiconductor, along with power connectors, SLI connectors, and PCI connectors. The only thing found on the GPU made by Texas Instruments was the R56W 4C 9423J, which, unlike nearly everything else listed prior, had just one of itself on the PCB.

The R56W part happens to be one of the most important parts on the PCB, besides the graphics processor itself, as it acts as the voltage supplier for the on-board memory. It takes in 12 V and outputs a steady 1.5 V at up to 20 amps. Since the technology for individual components wasn't as developed when the 275 was produced as it is today, the R56W was used to scale down voltage to be more workable with the memory chips on PCB. Furthermore, these smaller components couldn't draw too much power due to the sheer amount of power necessary for the graphics processor to run, thus the low voltage MOSFETs and the voltage scale-down for the memory chips.

After looking up the roles of each of these components, I was awestruck; not because of how complicated they all looked, but how they all worked together to accomplish a common goal. Each MOSFET was used in tandem with the memory chips to boost clock speeds on the GPU. Each capacitor worked to help the processor as well, along with everything else that wasn't listed. Every little part of the PCB worked to help the GPU make fast calculations and output video to a display. This is somewhat like what working on a team, whether robotics, sports, or other activity, is like, since each individual makes the team work more efficiently and quickly.



