

Innovation of the Flash Drive

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Introduction

Since the dawn of the technology era, there have been many inventions/creations that have been made to benefit us in the coming future. These include inventions such as the mobile phone, microwaves, laptops, etc. Each of these creations has undoubtedly left their mark on the world and will be remembered for ages to come. But today, I want to highlight a very special invention that can be called the founding father for the way that information is now shared from device to device, this invention is called the flash drive. The origins of the flash drive start with the famously known electronics store, Toshiba. At the beginning, the idea of the “flash drive” was not yet materialized, but there was a creation called the “flash memory” (which is essentially a place where you can store the data meant for computers) that was created by a Toshiba employee, Fujio Masouka. The true origins of the who created the first model of the flash drive is being heavily debated till this day. Right now, there are two companies who are fighting in order to hold the title of being the first ones to come up with the patent of these companies, M-Systems and Netac Technologies. Even though being created in what seems like ages ago, there have still been many updates to the original patent for a flash drive. An example of this being the most recent update to the flash drive which was made in 2017 seen the flash drive being able to hold almost 2 Terabytes of information, this is a juristic leap from what the original flash drive was able to hold in storage (this being only 8MB).

External Parts

Outer Cover

For a flash drive, we have both the external and the internal parts of it. When we first look at the external parts of the flash drive, we are introduced to the outer cover. The outer cover of a flash drive is usually the first thing that the human mind sees on a flash drive and looks as such:

Figure 1



Note. Common model of what a regular outer cover looks like,

Here, the outer cover would be the red and orange part. The main purpose of having the outer cover on the flash drive is to protect the contents of the internal parts of the flash drive. Without the outer cover protecting your flash drive you can be sure that problems would arise with it (these problems being when the data that you have inside of the drive will become corrupted or the interior becomes damaged)

Connector Plug

The next external piece that comes on a flash drive is the connector plug. The connector plug is the most noticeable piece on a flash drive, this is because it is usually the only metal part that is visible on a flash drive.

Figure 2

Wikipedia



Note. The connector plug of a flash drive is metal shown on the far left.

The purpose for having a connector plug is simple. The main function of a connector plug is to create a pathway between your input and output, in most cases this will be from your flash drive to your computer/laptop. This is how all connector plugs are supposed to work, but there are also some variations to connector plugs. A few types to name are Type A connectors, Type B connectors, Mini USB connectors, and even Super Speed connectors.

Internal Parts

NAND Flash Memory Chip.

The first part of the interior design of a flash drive is the NAND Flash Memory Chip. The meaning of NAND stands for “Not And”. The NAND Chip is a very important piece of the whole flash drive (probably the most important part of the entire flash drive) this is because the NAND Flash Memory Chip allows for the flash drive to store information, anything that is uploaded to a flash drive is saved to the chip.

Figure 3



Note. This photo highlights where the Memory Chip can be found.

Because of the NAND Memory Chip and how important that it is, that is why it is so major that the flash drive has a strong outer cover.

Mass Storage Controller Chip.

The easiest way that the Mass Storage Controller Chip can be explained is by using a comparison. This comparison is the files app that you have on your laptop. In your files app, you are able to see all of the files, downloads, documents, and music that you have. And in the files app you are able to move these files around, sort them out, and even delete them, this is essentially what this chip does. The Mass Storage Controller Chip acts as the control center for

the flash drive and allows information to be imported and exported between the flash drive and the host that it's connected to.

Figure 4

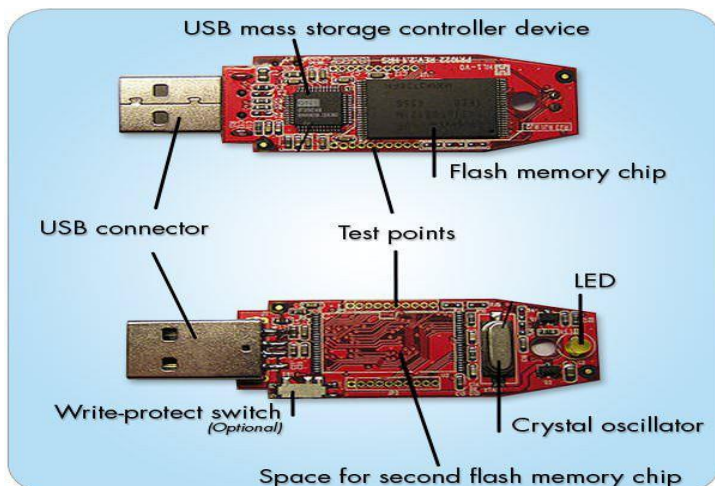


Note. The Controller Chip takes up a fair amount of the flash drive.

Crystal Oscillator

Finally, the structure of a flash drive is the Crystal Oscillator. The Crystal Oscillator functions as a small clock that gives the circuits within the flash drive certain instructions, “is a digital timing device that creates an extremely precise frequency-based electrical signal by leveraging the mechanical resonance of a piezoelectric element vibrating crystal” (ChipSun Tech, 2023)

Figure 5



Note. The Crystal Oscillator can be found right next to the Flash Memory Chip

Obsolete?

Since the advancement of the flash drive, there have also been many other inventions that have been added to the tech world. I mention this because of the emergence of something called “Cloud Storage”. Cloud Storage is a highly reliable tool that allows users to store anything from pictures, documents, and files onto your phone, laptop, or anything that can connect to the internet. Essentially it is a flash drive without the physical components needed to work it and is 100 percent virtual. This is where this issue comes in for the flash drive, because many people have found the cloud to be more secure than a flash drive, this is because to access the cloud you need to input your own special password and enable a two-step authentication system, flash drives on the other hand can be accessed right away by connecting it to a usb port which makes it very easy for information to be compromised and stolen. Another reason why people may prefer cloud storage is because there is no limit to how much storage you can have on the cloud storage, though this could not be said about flash drives. Most flash drives offer storage ranging from 8GB to 2TB. As time goes on, many people may come to the conclusion that it is inconvenient to carry a physical object around with you that carries very important information everywhere that you go and may choose to make the switch to something safer and more reliable. Until then, the flash drive is here to stay.

Conclusion

From its introduction in 1999, to the most recent update of it in 2017, the flash drive is a piece of technology that has lasted the test of time and is still found very useful by many people

of all professions. It is very easy to overlook how much time and technology that went and goes into the production of this product because it is so in use today. But even though there are still many usb in use today, it does not take away from the fact newer technology has appeared on the scene such as the emergence of cloud storage which gets rid of the need of having an actual. Hopefully this description can highlight the key pieces that are needed to create a flash drive and can also let readers know how this invention was so revolutionary to the world that we are currently moving forward to.

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