What Is Optical Disk?

OPTICAL DISK

Optical disk is an electronic data storage medium from which data is read and written to by using a low-powered laser beam. It is flat, circular, plastic or glass disk on which data is stored in the form of light and dark pits. The laser beam reads the pits and the data can be accessed. There are three basic types of optical disks:• Read-only optical disks: The optical disks, which are recorded at the time of manufacture and cannot be erased. CD, CD-ROM, DVD-ROM, and DVD-Video are the read-only disks.• WORM: WORM stands for write-once, read many. The optical disks that can be recorded by the user only once but cannot be erased. After they have been recorded once, they behave like a read-only optical disk CD-R, DVD-R, and WORM disks are write-once.• Rewritable/Magneto-optic disks: The optical disks that can be erased and written to with the new information. CR-RW, DVD-RAM, DVD-RW, and magneto-optic disks and Data play are rewritable. Rewritable disks use magneto-optic or phase change technology.An optical disk offers many advantages over magnetic storage media.• Highest storage capacity

• Low cost per Megabyte of storage

• Environmental condition tolerance

• High data stability

• Long media lifeAn optical disk has much more storage capacity on the order of gigabytes, than a magnetic disk. It can hold up to 6GB of data in comparison to 1.44 MB of a diskette. Optical disks are inexpensive to manufacture. Data stored on optical disks is resistant to power surges or magnetic disturbances, such as head crashes or corruption form stray magnetic fields. Hence, they provide high data stability. Optical disks are less vulnerable to extremes of hot and cold as compared to the magnetic disks. Optical disks have long media life than magnetic disks.OPTICAL STORAGE DEVICESCD-ROMCD-ROM: is an abbreviation of Compact Disc Read-Only Memory. A CD-ROM is a CD that contains computer data, which cannot be read or rewritten. In computers, CDROM is the most commonly used optical storage technology. CD-ROM is a compact disc that contains information, which is accessible by a computer. It is composed of polycarbonate plastic, thin reflective metal layers, made of aluminium and a lacquer coating. Data is stored on the disc as a series of light and dark pits; the light portion refers to the spaces between the pits. A laser beam reads the pits and the data can be accessed.CD-ROM is an adaptation/EXTENSION of the compact disc that is designed for music storage and playback. The format of CD-ROM is very similar to an audio CD; the only difference being the standards used to store data. A standard 120 mm CD-ROM holds up to 700 MB of data, or about 70 minutes of audio. This may mean that One CD can contain over one thousand novels; an average novel being composed of 60, 000 words. Once the data is written to a standard CD-ROM disc, it cannot be altered or rewritten.A CD-ROM can be read using a CD-ROM drive, which is almost common on the personal computers. A CD-ROM drive may be connected to the computer in several different ways depending on the type of interface, such as:• IDE (ATA)

• SCSI

• SATA

• Firewire

• USBAlmost all modern CD-ROM drives can play audio as well as video CDs.CD-ROM STANDARDSCD-ROM format provides an outstanding solution to the problem of storing large digital files. Several formats are used for data stored on CD-ROMs. These include Red book standards for audio-CD, White Book and Yellow Book for CD-ROM. An ISO 9960, which defines the standard file system of a CD-ROM is due to be replaced by ISO 13490.CD-ROM FORMATOne CD-ROM sector contains 2352 bytes, which is further divided into 98 24-byte frames. A CD-ROM contains a third layer of Reed-Solomon error correction in order to achieve improved error correction and detection.Mode-1 CD-ROM: It has full three layers of error correction data, which contains 2048 bytes of the available 2352 per sector. Mode-2 CD-ROM: It is mostly used for video files, which contains 2336 user-available bytes per sector.CD-ROM SPEEDS AND USES+ Early CD-ROM drives were known as single-speed and could read the data at the speed of 150 KBps.+ CD-ROM drives can transfer data up to the speed of 7800 KBps+ CD-ROM can store audio, video, text and program instructions. It is used to store software programs.DVD-ROMDVD-ROM: is an abbreviation of Digital Versatile Disc- read only memory. DVD-ROM is an optical disc storage media format that can be used for data storage, which includes movies with high video and sound quality. DVD-ROM is a non-volatile optical storage medium similar to CD-ROM, which contains computer data that cannot be erased or rewritten. These DVDs are read-only disks that have storage capacity for 133 minutes of high quality video, in format, and audio full- length feature film. The discs are pressed in a similar fashion as the CDs. The reflective surface is gold or silver colored.DVD-ROM can be accessed using a DVD-ROM drive attached to the personal computer. DVD-ROM drives are backward compatible, i.e. they are also capable of reading CD-ROMs and audio CDs as well. The DVD-ROM supports disks with capacities of 4.7 GB to 17 GB and access rates of 600 KBps to 1.3 MBps. A standard DVD disc store up to 9.4 GB of data. DVD-ROMs are of same size as a compact disc, but holds data about 7 times more. DVD can store that much of data because both the sides of a disc are used, with sophisticated data compression technologies.DVD-ROM is a variation of CD-ROM that is being used in place of CD-ROMs in many personal computers. All DVD-ROMs contain a file system, UDF, which is an extension of the ISO 9660 Standard used for data CDs.CD-RWCD-RW is an abbreviation of compact disc-rewritable. It is a recordable CD format that can be erased and rerecorded multiple times, just like a floppy disk or a hard disk. It is a rewritable version of CD-ROM. CD-RW disc is round plastic, about 5 inches in diameter. CD-RW disks can be played or recorded in the CD-RW drive only. These disks behave unusable when put in a regular CD-drive or a CD-R drive cannot be played. A CD-RW drive can read everything except a DVD.A CD-RW can hold 650 Megabytes of data (unlimited number of times) written by a CD-RW drive. CD-RW cannot be selectively overwritten but can be extended. CD-RWs must be closed before they can be read in a normal CD-ROM drive. CD-RW disks cannot be

read using a CD-ROM drive built before 1997. CD-RWs can be randomly read and written because of the variation of UDF format. CD-RW disks and drives are more expensive than a regular CD-ROM drive or media. A CD-RW disc can be read optically by laser light.DVD-RWDVD-RW: stands for Digital Versatile Disk-Rewritable. It is a re-recordable optical disc, which can record up to 4.7 GB per side in a similar fashion to a CD-RW. DVD-RW supports sequential read/write access i.e. the device may need to wait for the correct location in a constantly revolving medium. The information stored on DVD-RW can be erased and rerecorded over multiple times without damaging the medium.DVD-RW is a phase-change erasable format based on DVD-R, using similar mark length, track pitch and rotation control. The format is supported by the DVD Forum. DVD-RW is also called “DVD Dash RW" and "DVD Minus RW”.DVD-RW can be played in many DVD drives and players. Depending on quality, recording time varies from 1 hour to 6 hours.

About the Author

Optical Pumping is a widely used and powerful technique for exploring atomic energy states, atomic transitions, and atomic collisions using electromagnetism.