Basic concepts of semiconductor
ROMs

What is ROM: A ROM (Read-only memory) is a sort of semiconductor memory technology applied where the data is written once and then not changed. This type of memory is used where data requires to be stored permanently, even when the power is switched, as many memory technologies lose the data once the power is switched. ROM can be understood as a semiconductor memory designed to hold data permanently or do not change frequently. During normal operation, no new data can be written into ROM but data can be read from ROM. It is a non-volatile memory that can retain information even after the power supply is turned off.

As against volatile memory in the non-volatile type of memory, the data is maintained in the memory even if the power supply is removed. Thus we can assume that in non-volatile memory the data is stored permanently. Several home appliances such as rice cookers and washing machines use ROM devices to store pre-set programs. ROM is designed specifically for reading data. It may be possible to erase or write data on ROM, but it takes an inordinately long time to do so. To correct this deficiency, new kinds of devices have developed in recent years that serve as a cross between ROM and RAM, including flash memory and EPROM.

Types of ROM :

PROM (programmable read-only memory)

EPROM (erasable programmble read-only memory)

EEPROM (electrically erasable programmable ROM)

Mask ROM.

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<u>Masked ROM (MROM):</u> The early ROMs were hard-wired instruments that consisted of a pre programmed set of data or instructions. These types of ROMS are called masked ROMS, which are comparatively inexpensive.

<u>Programmable Read-only memory (PROM)</u>

PROM is a type of read-only memory that can be amended only once by a user. The user buys an empty PROM and inputs the required data using a PROM program. It consists of the small fuses inside which are memory only once and is not erasable.

<u>Erasable & programmable Read-only memory (ERROM)</u>: It is possible to erase EPROM by exposing it to ultra-violet light for a period of up to 40 min. normally an EPROM eraser performs this operation. An electrical charge is stored in an insulated gate region while programming

The charge is held for more than 10 years as there is no leakage path.

Electrically Erasable & programmable Read-only-memory (EEPROM):

EEPROM can be programmed and erased using electricity. It is possible to erase and reprogram it about ten thousand times. Erasing or programming, both take about 4 to 10 ms time. In EEPROM any desired location can be separately erased and programmed.

Advantages OF ROM:

- It is a non-volatile type of memory.
- This type of memory cannot be randomly modified.
- more affordable the RAMS.
- simple to examine.
- More reliable than RAMs.
- Static and do not require refreshment.