

# Transistor and diode numbering

## - the numbering or code systems used for transistors, diodes and FETs.

There are many thousands of different types of diode and transistor. These have different characteristics according to the way they are designed and made. Some may be intended for high power applications, like those used in power amplifiers or power supplies, whereas others may be intended for small signal applications where low current consumption is an issue. Other types of transistor may be required for radio frequency applications.

As there is a vast number of different types of transistor, each type is given a unique code so that it can be identified and identical ones bought. In this way it is possible to specify a specific type of transistor by using its type number or code.

---

## Semiconductor numbering schemes

There are many different ways of organising a numbering scheme. In the early days of thermionic valve (vacuum tube) manufacture, each manufacturer gave a number to the types they manufactured. In this way there were vast numbers of different numbers for devices many of which were virtually identical. It soon became obvious that a more structured approach was required, so that the same device could be bought regardless of the manufacturer.

The same is true for semiconductor devices, and manufacturer independent numbering schemes are used for both diodes and transistors. In fact there are two main semiconductor numbering schemes in use:

1. **Pro-electron scheme** This diode and transistor numbering scheme was originated in Europe and is widely used for transistors developed and manufactured here.
2. **JEDEC scheme** This diode and transistor numbering scheme was originated in the USA and it is widely used for diodes and transistors that originate from North America.

Using these diode and transistor numbering schemes it is possible to look at the part number and identify certain properties it will possess and what applications it may be used for. In particular, the Pro-electron diode and transistor numbering scheme makes it possible to broadly identify the capabilities of the transistor. For example parameters such as the transistor being intended for low frequency power, RF, etc can be determined.

The JEDEC semiconductor numbering system details far less, being intended to be purely a numbering system. From the number it can be determined how many PN junctions are in the device.

## Pro-Electron Numbering or Coding System

First Letter Specifies semiconductor material	Second Letter Specifies type of device	Subsequent Characters
A Germanium B Silicon C Gallium Arsenide R Compound materials	A Diode - low power or signal B Diode - variable capacitance C Transistor - audio frequency, low power D Transistor - audio frequency, power E Tunnel diode F Transistor - high frequency, low power G Miscellaneous devices H Diode - sensitive to magnetism L Transistor - high frequency, power N Photocoupler P Light detector Q Light emitter R Switching device, low power, e.g. thyristor, diac, unijunction S Transistor - switching low power T Switching device, low power, e.g. thyristor, triac U Transistor - switching, power W Surface acoustic wave device X Diode multiplier Y Diode rectifying Z Diode - voltage reference	The characters following the first two letters form the serial number of the device. Those intended for domestic use have three numbers, but those intended for commercial or industrial use have letter followed by two numbers, i.e. A10 - Z99.

This a BC107 is a low power audio transistor and a BBY10 is variable capacitance diode for industrial or commercial use.

---

## JEDEC Numbering or Coding System

First Number	Second Letter	Subsequent numbers
1 = Diode 2 = Bipolar transistor 3 = FET	N	Serial number of device

Thus a 1N4148 is a diode and a 2N706 is a transistor.

---

## Summary

The Pro-electron transistor and diode numbering or coding system provides more information about the device, than the JEDEC system. However both of these diode and transistor numbering schemes are widely used and enable the same device types to be made by a number of manufacturers. This enables equipment manufacturers to buy their semiconductors from a number of different manufactures and know that they are buying devices with the same characteristics.