Reading Transistor Markings

Most transistor markings follow one of these codes: JEDEC, JIS or Pro-Electron. For ICs, look for known numbers (e.g. 741, 4001, 7400) between the prefix and the suffix. Don't confuse it with the date code. ICs typically have two numbers: The part number and the date code.

1. Joint Electron Device Engineering Council (JEDEC)
These part numbers take the form: digit, letter, sequential number, [suffix]

The letter is always 'N', and the first digit is 1 for diodes, 2 for transistors, 3 for four-leaded devices, and so forth. But 4N and 5N are reserved for opto-couplers. The sequential numbers run from 100 to 9999 and indicate the approximate time the device was first made.

If present, a suffix could indicate various things. For example, a 2N2222A is an enhanced version of a 2N2222. It has higher gain, frequency, and voltage ratings. Always check the data sheet.

Examples: 1N914 (diode), 2N2222, 2N2222A, 2N904 (transistors).

NOTE: When a metal-can version of a JEDEC transistor is remade in a plastic package, it is often given a number such as PN2222A which is a 2N2222A in a plastic case.

2. Japanese Industrial Standard (JIS)
These part numbers take the form: digit, two letters, sequential number, [optional suffix]

Digits are 1 for diodes, 2 for transistors, and so forth. The letters indicate the type and intended application of the device according to the following code:

SA:	**PNP HF transistor**	**SB:**	**PNP AF transistor**
SC:	**NPN HF transistor**	**SD:**	**NPN AF transistor**
SE:	**Diodes**	**SF:**	**Thyristors**
SG:	**Gunn devices**	**SH:**	**UJT**
SJ:	**P-channel FET**	**SK:**	**N-channel FET**
SM:	**Triac**	**SQ:**	**LED**
SR:	**Rectifier**	**SS:**	**Signal diodes**
ST:	**Avalanche diodes**	**SV:**	**Varicaps**
SZ:	**Zener diodes**		

The sequential numbers run from 10-9999. The optional suffix indicates that the type is approved for use by various Japanese organizations. Since the code for transistors always begins with 2S, it is sometimes omitted; for example, a 2SC733 could be marked C733.

Examples: 2SA1187, 2SB646, 2SC733.

3. Pro-Electron (European)
These part numbers take the form: two letters, [letter], sequential number, [suffix]

The first letter indicates the material:
_____A = Ge
_____B = Si
_____C = GaAs
_____R = compound materials.

The second letter indicates the device type and intended application:
_____A: diode, RF
_____B: diode,varactor
_____C: transistor, AF, small signal
_____D: transistor, AF, power
_____E: Tunnel diode
_____F: transistor, HF, small signal
_____K: Hall effect device
_____L: Transistor, HF, power
_____N: Opto-coupler
_____P: Radiation sensitive device
_____Q: Radiation producing device
_____R: Thyristor, Low power
_____T: Thyristor, Power
_____U: Transistor, power, switching
_____Y: Rectifier
_____Z: Zener, or voltage regulator diode
The third letter indicates if the device is intended for industrial or commercial applications. It's usually a W, X, Y, or Z. The sequential numbers run from 100-9999.

Examples: BC108A, BAW68, BF239, BFY51.

Instead of 2N and so forth, some manufacturers use their own system of designations. Some common prefixes are:

MJ: Motorola power, metal case
MJE: Motorola power, plastic case
MPS: Motorola low power, plastic case
MRF: Motorola HF, VHF and microwave transistor
RCA: RCA device
TIP: Texas Instruments (TI) power transistor, plastic case
TIPL: TI planar power transistor
TIS: TI small signal transistor (plastic case)
ZT: Ferranti
ZTX: Ferranti

Examples: ZTX302, TIP31A, MJE3055.

Many manufacturers also make custom parts, or custom-label standard parts, for large volume OEM customers. Typically, they have the OEM's mark or logo and part-number. When such parts hit the surplus market, they end up in hobbyist "bargain packs". Since data on these devices is not usually available, they are best used as LED-drivers and other such applications where the actual specifications are not critical.