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Reading Transistor Markings

Source: Electronix Express

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. ■