

Pro Electron

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Pro Electron/EECA is the European type designation and registration system for active components (such as semiconductors, liquid crystal displays, sensor devices, electronic tubes and cathode ray tubes).

Pro Electron was set up in 1966 in Brussels, Belgium. In 1983 it was merged with the **European Electronic Component Manufacturers Association** (EECA) and since then operates as an agency of the EECA.

The goal of Pro Electron is to allow unambiguous identification of electronic parts, even when made by several different manufacturers. To this end, manufacturers register new devices with the agency and receive new type designators for them.

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Designation system

Examples of Pro Electron type designators are:

- AD162 – Germanium power transistor for audio frequency use
- BY133 – Silicon rectifier
- BZY88C5V1 – Silicon 5.1 volt Zener diode
- CQY97 – light emitting diode
- ECC83 – 6.3 volt heater noval dual triode
- A63EAA00XX01 – Color TV picture tube
- SAA1300 – Digital integrated circuit

Pro Electron took the popular European coding system in use from around 1934 for valves (tubes), i.e. the Mullard–Philips tube designation, and essentially re-allocated several of the rarely used heater designations (first letter of the part number) for semiconductors. The second letter was used in a similar way to the valves naming convention: "A" for signal diode, "C" for low-power bipolar transistor or triode, "D" for high-power transistor (or triode), and "Y" for rectifier, but other letter designations did not follow the vacuum tube mode so closely.

The three digits (or letter followed by two digits) after the first two letters were essentially a sequence number, with (at first) a vestige of the valve-era convention that the first one or two digits would indicate the base (package) type in examples such as in this family of general-purpose transistors:

Package	NPN	PNP
TO-18	BC10x	BC17x
Lockfit	BC14x	BC15x
TO-92	BC54x	BC55x

... where x may be:

- 7 for high voltage
- 8 for general purpose
- 9 for low noise/high gain

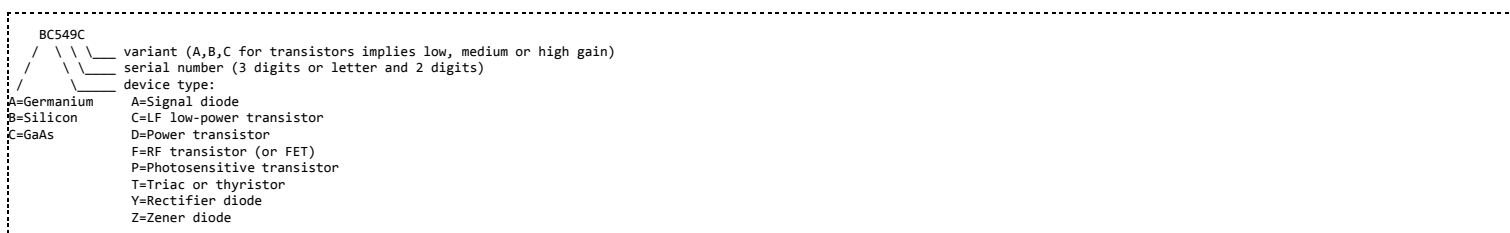
2nd letter	Usage	Example
A	Low-power/small-signal diode	AA119, BA121
B	Varicap diode	BB105G
C	Small signal transistor, $R_{th}G > 15K/W$	BC546C
D	High-power, low-frequency power transistor, $R_{th}G \leq 15K/W$	BD139
E	Tunnel (Esaki-)diode	AE100
F	Low-power, RF (high-frequency) bipolar or FET, $R_{th}G > 15K/W$	BF245
G	Hybrid device	BGY32, BGY585
H	Hall-effect sensor/diode	
L	High-frequency, high-power transistor (for transmitters), $R_{th}G \leq 15K/W$	BLW34
M	Ring modulator-type frequency mixer	
N	Opto-isolator	CNY17
P	Radiation detector (photodiode, phototransistor)	BPW34
Q	Radiation generator (LED)	CQY99
R	Low-power control or switching device: thyristors, diacs, triacs, UJT's, programmable unijunction transistors (PUT), silicon bidirectional switch (SBS), opto-triacs etc.	BR100
S	Low-power switching transistor, bipolar or MOSFET, $R_{th}G > 15K/W$	BS170
T	High-power control or switching device: thyristors, TRIACs, silicon bidirectional switch (SBS), etc.	BT138
U	High-power switching transistors, bipolar or MOSFET, $R_{th}G \leq 15K/W$	BU508, BUZ11
V	Antenna	
W	Surface-acoustic-wave device	
X	Frequency multiplier: varactor, step recovery diode	
Y	High-power rectifying diode	BY228
Z	Avalanche, TVS, Zener diode	BZY91

A 3-digit sequence number (or one letter then 2 digits, for industrial types) follows.^[1] Examples are:

Prefix class	Usage	Example
AC	Germanium small signal transistor	AC126
AF	Germanium RF transistor	AF117
BC	Silicon, small-signal transistor ("allround")	BC548B
BD	Silicon power transistor	BD139
BF	Silicon RF (high-frequency) BJT or FET	BF245
BS	Silicon switching transistor, bipolar or MOSFET)	BS170
BL	Silicon high-frequency, high-power (for transmitters)	BLW34
BU	Silicon high-voltage (for CRT horizontal deflection circuits)	BU508

With early devices, the number indicated the case type. Suffixes may be used, such as a letter (e.g. "C" often means high h_{FE} , such as in: BC549C^[2]). Other codes may follow to show gain (e.g. BC327-25) or voltage rating (e.g. BUK854-800A^[3]). A BC546 might only be marked "C546", thus possibly creating confusion with JIS abbreviated markings, because a transistor marked "C546" might also be a 2SC546.

▪ Short summary of semiconductor diode and transistor designations



Integrated circuits

- Linear ICs begin with the letter "T", e.g. TAA570 limiter–amplifier and FM detector.
- Logic ICs begin with the letter "F".
 - The FJ family is TTL (e.g. the FJH231 is a quadruple 2-input Open-collector NAND gate equivalent to the **SN7401**)
 - The FC family is DTL
 - The FD family is MOS.
- Mixed analog/digital ICs begin with the letter "U", e.g. UAA180 LED bargraph A/D and driver.

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FCH171
// \ \ serial number, gives the count and type of gates for example
// \ \ H=gate ("Combinatorial circuit") J=flip-flop K=monostable Q=RAM R=ROM etc.
FC=DTL
FD=MOS
FJ=TTL

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Unfortunately the serial number does not specify the same type of gate in each family, e.g. while an FJH131 is a quadruple 2-input NAND gate (like the 7400), an FCH131 is a dual 4-input NAND gate.^[1]

See also

- JEDEC
- JIS semiconductor designation
- Mullard–Philips tube designation
- RMA tube designation
- RETMA tube designation
- Russian tube designations

References

- ↑ "European Type Designation Code System for Electronic Components" (http://www.eeca.eu/images/downloads/PRO%20ELECTRON_D15%20final%20version%202007_12%20ESIA%20updated%2016%2007%2010.pdf) (16 ed.). Pro Electron, Brussels, Belgium. July 2010. Retrieved December 26, 2013.
- ↑ Datasheet for BC549, with A,B and C gain groupings (http://www.fairchildsemi.com/ds/BC/BC549.pdf)
- ↑ datasheet for BUK854-800A (800 volt IGBT) (http://www.datasheetcatalog.org/datasheet/philips/BUK854-800A.pdf)

External links

- Pro Electron (http://www.eeca.eu/)
- European Type Designation Code System for Electronic Components (15 ed) (http://material.htlwien10.at/wissensspeicher/Halbleiterkennzeichnungen/European_Type_Designation_Code-Sstem_for_Electronic_Components_PE-D15-2008_Pro-Electron.pdf), Pro-Electron, Brussels, Belgium, 6/2008; with tube designation systems

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