

Microelectronic Circuits 5th Edition

Bipolar junction transistor

Retrieved August 10, 2016. A.S. Sedra; K.C. Smith (2004). Microelectronic Circuits (5th ed.). New York: Oxford. p. 509. ISBN 978-0-19-514251-8. "VBIC

A bipolar junction transistor (BJT) is a type of transistor that uses both electrons and electron holes as charge carriers. In contrast, a unipolar transistor, such as a field-effect transistor (FET), uses only one kind of charge carrier. A bipolar transistor allows a small current injected at one of its terminals to control a much larger current between the remaining two terminals, making the device capable of amplification or switching.

BJTs use two p–n junctions between two semiconductor types, n-type and p-type, which are regions in a single crystal of material. The junctions can be made in several different ways, such as changing the doping of the semiconductor material as it is grown, by depositing metal pellets to form alloy junctions, or by such methods as diffusion of n-type and p...

List of MOSFET applications

enable high-density integrated circuits (ICs) such as memory chips and microprocessors. MOSFETs in integrated circuits are the primary elements of computer

The MOSFET (metal-oxide-semiconductor field-effect transistor) is a type of insulated-gate field-effect transistor (IGFET) that is fabricated by the controlled oxidation of a semiconductor, typically silicon. The voltage of the covered gate determines the electrical conductivity of the device; this ability to change conductivity with the amount of applied voltage can be used for amplifying or switching electronic signals.

The MOSFET is the basic building block of most modern electronics, and the most frequently manufactured device in history, with an estimated total of 13 sextillion (1.3 × 10²²) MOSFETs manufactured between 1960 and 2018. It is the most common semiconductor device in digital and analog circuits, and the most common power device. It was the first truly compact transistor that...

Bipolar transistor biasing

Second Edition, Cambridge University Press, 1989, ISBN 0-521-37095-7, pp. 73-75 A.S. Sedra & K.C. Smith (2004). Microelectronic Circuits (5th ed.). New

Biasing is the setting of the DC operating point of an electronic component. For bipolar junction transistors (BJTs), the operating point is defined as the steady-state DC collector-emitter voltage (

V

c

e

V

ce

{\displaystyle V_{\mathrm {ce} }}

) and the collector current (

I

c

$$I_{\mathrm {c} }$$

) with no input signal applied. Bias circuits for BJTs are discussed in this article.

Electricity

dealing with electrical circuits involving active components such as vacuum tubes, transistors, diodes and integrated circuits, and associated passive

Electricity is the set of physical phenomena associated with the presence and motion of matter possessing an electric charge. Electricity is related to magnetism, both being part of the phenomenon of electromagnetism, as described by Maxwell's equations. Common phenomena are related to electricity, including lightning, static electricity, electric heating, electric discharges and many others.

The presence of either a positive or negative electric charge produces an electric field. The motion of electric charges is an electric current and produces a magnetic field. In most applications, Coulomb's law determines the force acting on an electric charge. Electric potential is the work done to move an electric charge from one point to another within an electric field, typically measured in volts...

IBM System/360

more transistors onto a circuit card, allowing more powerful but smaller computers, but did not include integrated circuits, which IBM considered too

The IBM System/360 (S/360) is a family of computer systems announced by IBM on April 7, 1964, and delivered between 1965 and 1978. System/360 was the first family of computers designed to cover both commercial and scientific applications and a complete range of sizes from small, entry-level machines to large mainframes. The design distinguished between architecture and implementation, allowing IBM to release a suite of compatible designs at different prices. All but the only partially compatible Model 44 and the most expensive systems use microcode to implement the instruction set, which used 8-bit byte addressing with fixed-point binary, fixed-point decimal and hexadecimal floating-point calculations. The System/360 family introduced IBM's Solid Logic Technology (SLT), which packed more transistors...

Metalloid

resilient at higher operating temperatures, and easier to work during the microelectronic fabrication process. Germanium is still a constituent of semiconducting

A metalloid is a chemical element which has a preponderance of properties in between, or that are a mixture of, those of metals and nonmetals. The word metalloid comes from the Latin metallum ("metal") and the Greek oeides ("resembling in form or appearance"). There is no standard definition of a metalloid and no complete agreement on which elements are metalloids. Despite the lack of specificity, the term remains in use in the literature.

The six commonly recognised metalloids are boron, silicon, germanium, arsenic, antimony and tellurium. Five elements are less frequently so classified: carbon, aluminium, selenium, polonium and astatine. On a standard periodic table, all eleven elements are in a diagonal region of the p-block extending from boron at the upper left to astatine at lower right...

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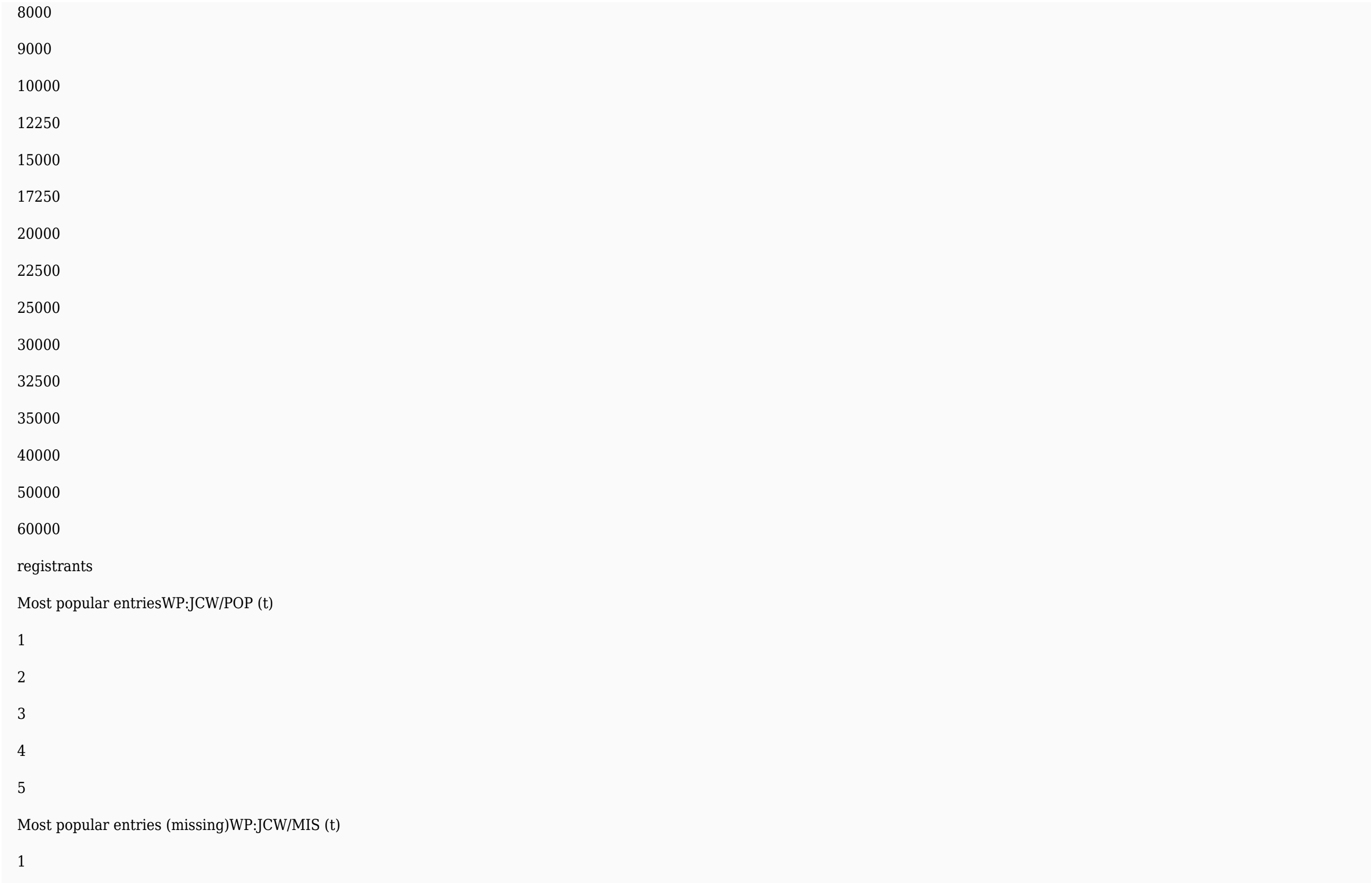
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