NAÇÃO FLUENTE

Inglês Técnico

Engenharia Elétrica

Sumário

Introdução

Neste material, exploraremos os termos e expressões essenciais necessários para uma comunicação eficaz no campo da engenharia elétrica.

Você desenvolverá habilidades para articular conceitos e técnicas elétricas de forma clara e precisa, enquanto adquire a capacidade de compreender e responder de maneira eficaz aos desafios e demandas desta área.

Estamos entusiasmados para iniciar esta jornada de aprendizado com você, contribuindo para o seu sucesso profissional como Engenheiro Elétrico!

Vamos começar!

Orientação

Siga estas orientações para otimizar o uso deste material e potencializar o seu aprendizado

1. Imprima este PDF;

2. Destaque com caneta marca-texto as palavras desconhecidas;

3. Leia a coluna *meaning* para descobrir o significado, sem usar tradutores;

4. Construa frases com aplicação das novas palavras que você está aprendendo.

   Se precisar de inspiração, use o **dictionary.cambridge.org**

   Faça isso por meio da escrita e não da digitação, pois isso potencializa o armazenamento do novo conhecimento na memória de longo prazo.

Expressões

Exemplos	
Active component Componente ativo	**An active component is required to change the amplitude of a signal between input and output.** É necessário um componente ativo para alterar a amplitude de um sinal entre entrada e saída.
Anode Ânodo	**A red wire is often attached to the anode.** Um fio vermelho é geralmente conectado ao ânodo.
Capacitance Capacitância	**We monitor any change in the voltage, resistance, or capacitance anywhere on the line.** Monitoramos qualquer alteração na tensão, resistência ou capacitância em qualquer lugar da linha.
Capacitor Capacitor	**Those capacitors were of a different design and a different manufacturer.** Esses capacitores tinham um design diferente e eram de fabricante diferente.
Circuit breaker Disjuntor	**Always use a circuit breaker for added safety.** Sempre use um disjuntor para aumentar a segurança.
Dielectric constant Constante Dielétrica	**Density fluctuations or changes in the dielectric constant do not influence the function.** Flutuações de densidade ou mudanças na constante dielétrica não influenciam a função.
Direct current Corrente contínua	**Only devices built for use with direct current can be operated in this system.** Somente dispositivos construídos para uso com corrente contínua podem ser operados neste sistema.
Electric charge Carga elétrica	**If you rub two materials together you may get an electric charge.** Se você esfregar dois materiais, você pode gerar uma carga elétrica.
Electric field Campo elétrico	**An electric field will exist even when there is no current flowing.** Um campo eléctrico existe mesmo quando não há corrente elétrica.
Electrostatic discharge Descarga eletrostática	**Improper grounding can cause electrostatic discharge.** O aterramento inadequado poderá causar descarga eletrostática.

Expressões

	Exemplos
Generator Gerador	**This is why the generator and battery need to be extremely effective.** É por isso que o gerador e a bateria têm que ser extremamente eficazes.
Impedance Impedância	**This basic network is able to act as an impedance transformer.** Essa rede básica é capaz de atuar como um transformador de impedância.
Load Impedance Impedância de carga	**Todos os elementos do sistema devem ter a mesma impedância de carga.** All elements of the system must have the same load impedance.
Negative charge Carga Negativa	**Oxygen, necessary for human life, carries a negative charge.** O oxigênio, necessário para a vida humana, carrega uma carga negativa.
Oscilloscope Osciloscópio	**They are a professional oscilloscope supplier based in China.** Eles são fornecedores profissionais de osciloscópios situados na China.
Passive component Componente Passivo	**If the surface is burned, it means this passive component is malfunctioning or in bad quality.** Se a superfície estiver queimada, significa que esse componente passivo está com defeito ou é de má qualidade.
Positive feedback Retorno positivo	**This positive feedback mechanism would act to maintain the direction of flow.** Esse mecanismo de retorno positivo atuaria para manter a direção do fluxo.
Potentiometer Potenciômetro	**For all the employees: don't blindly turn this potentiometer.** Aviso a todos os funcionários: não gire cegamente este potenciômetro.
Power supply Fonte de energia	**Uninterrupted power supply is a vital support for the modern way of life.** Uma fonte de energia ininterrupta é um suporte vital para o estilo de vida moderno.
Relay Relé	**Set a time period for the relay to wait after reaching the setpoint.** Estabeleça um período de tempo para que o relé espere após atingir o ponto de ajuste.

Expressões

	Exemplos
Resistor Resistor	**This circuit consists, usually, of only resistors and capacitors.** Este circuito consiste, geralmente, apenas de resistores e capacitores.
Semiconductor Semicondutor	**The material is a kind of semiconductor paint, filled by billions of nano cells able to capture solar energy.** O material é um tipo de tinta semicondutora, preenchida por bilhões de nano células capazes de captar energia solar.
Surge protector Filtro de linha	**I wonder if a surge protector would protect equipment within the facility.** Gostaria de saber se um filtro de linha protegeria o equipamento dentro da fábrica.
Switch Interruptor	**Now flip the switch and turn the machine off.** Agora acione o interruptor e desligue a máquina.
Transistor Transistor	**When the transistor blew, we were no longer able to regulate the current.** Quando o transistor queimou, não conseguimos mais regular a corrente.

Glossário

A

Acceptor atoms	Trivalent atoms that accept free electrons from another atom.
AC coupling	Circuit that passes an AC signal while blocking a DC voltage.
AC load line	A graph representing all possible combinations of AC output voltage and current for an amplifier.
Active component	A component that supplies energy to a circuit, or controls or modifies electrical signals.
Active filter	A type of electronic filter that uses an active component, such as an operational amplifier (op amp), to process analog signals.
Active region	The region of BJT operation between saturation and cutoff used for linear amplification.
ADC	Abbreviation for Analog to Digital Converter.
Aliased signals	A signal (normally electrical) sampled below the Nyquist Rate (twice the maximum frequency content of the signal) so that the frequency content of signal is erroneously rearranged.
Alpha	Ratio of collector current to emitter current in a bipolar junction transistor (BJT). Greek letter alpha “α” is the symbol used.
Amplifier	A circuit that increases the voltage, current, or power of a signal.
Amplitude	Magnitude or size of a signal voltage or current.
Analog	Information represented as continuously varying voltage or current rather than in discrete levels as opposed to digital data varying between two discrete levels.
Anode	The positive electrode or terminal of a device. The “P” material of a diode.
Astable	A circuit that cannot remain in one state. That is, it will periodically switch between states or oscillate.
Attenuate	To reduce the amplitude of an action or signal. The opposite of amplification.

Glossário

Average value	A value of voltage or current where the area of the wave above the value equals the area of the wave below the value.
AWG	Abbreviation for Arbitrary Waveform Generator. Abbreviation for American Wire Gauge.

B

Bandwidth	Width of the band of frequencies between the half power points.
Barrier potential	The potential difference that needs to be overcome to move electrons through the electric field in the depletion region.
Base	The region that lies between the emitter and collector of a bipolar junction transistor (BJT).
Base biasing	A method of biasing a BJT in which the bias voltage is supplied to the base by means of a resistor and the required resistor values are calculated.
Beta (β)	The ratio of collector current to base current in a bipolar junction transistor (BJT).
Bias	A DC voltage applied to a device to control its operation.
Bilateral amplifier	An amplifier with an external signal path from its output back to its input.
Bipolar junction transistor	A three terminal device in which emitter to collector current is controlled by base current.
Bode plot	A graph that shows how a system's magnitude and phase change as a function of frequency.
Branch current	The portion of total current flowing in one path of aparallel circuit.
Breakdown voltage	The voltage at which the breakdown of a dielectric or insulator occurs.
Bridge rectifier	A circuit using four diodes to provide full wave rectification. Converts an AC voltage to a pulsating DC voltage.

Glossário

Buffer	A circuit that connects a high-impedance source to a low-impedance load without significantly distorting the signal
Bulk resistance	The natural resistance of a “P” type or “N” type semiconductor material.
Bypass capacitor	A capacitor placed between a DC signal and ground to remove any AC component by shorting AC to ground.

C

CAD	Abbreviation for “computer aided design”
CAN	Controller Area Network, a robust serial communication bus standard popular in automotive and industrial applications.
Capacitance	The ability of a capacitor to store an electrical charge. The basic unit of capacitance is the Farad.
Capacitor	An electronic component having capacitive reactance.
Cascaded amplifier	An amplifier with two or more stages arranged in a series configuration.
Cascode amplifier	A high frequency amplifier made up of a common-source or common-emitter amplifier with a common-gate or common base amplifier in its drain/collector network.
Cathode	The cathode serves as the positive terminal in a battery and the negative terminal in an electrolytic cell.
Center-tapped full wave rectifier	Circuit that makes use of a center tapped transformer and two diodes to provide full wave rectification.
Center tapped transformer	A transformer with a connection at the electrical center of a winding.
Charge	The amount of electricity that is carried or held by an object.
Circuit	Interconnection of components to provide an electrical path between two or more components.
Clamper circuit	A diode circuit used to change the DC level of a waveform without distorting the waveform.

Glossário

Class A amplifier	A linear amplifier biased so the active device conducts through 360 degrees of the input waveform.
Class B amplifier	An amplifier with two active devices. The active components are biased so that each conducts for approximately 180 degrees of the input waveform cycle.
Class C amplifier	An amplifier in which the active device conducts for less than 180 degrees of the input waveform cycle.
Clipper	A diode circuit used to eliminate part of a waveform above or below a limit.
Closed circuit	A diode circuit used to eliminate part of a waveform above or below a limit.
Closed-loop gain	Gain of an amplifier when a feedback path is present.
Collector characteristic curve	A graph of collector voltage over collector current for a given base current.
Collector region	The semiconductor region in a bipolar junction transistor through which a flow of charge carriers leaves the base region.
Common base amplifier	A BJT circuit in which the base connection is common to both input and output.
Common collector amplifier	A BJT circuit in which the collector connection is common to both input and output.
Common drain amplifier	A FET circuit in which the drain connection is common to both input and output.
Common emitter amplifier	A BJT circuit in which the emitter connection is common to both input and output.
Common gate amplifier	A FET circuit in which the gate connection is common to both input and output.
Common source amplifier	A FET circuit in which the source connection is common to both input and output.

Glossário

Common-mode rejection ratio	(CMRR), The ratio of op-amp differential gain to common-mode gain. A measure of an op-amp's ability to reject common-mode signals such as noise.
Common-mode signals	Signals that appear simultaneously at two inputs of an operational amplifier (op-amp). Common mode signals are always equal in amplitude and phase.
Complimentary MOSFET logic	A semiconductor technology that uses MOSFET technology. CMOS devices are known for their low static power consumption and high noise immunity.
Comparator	An op-amp circuit that compares two inputs and provides a DC output indicating the polarity relationship between the inputs.
Complementary transistors	Two transistors, one NPN and one PNP, having nearly identical characteristics. N-channel and P-channel FETs can also be complementary.
Constant current circuit	A circuit that is used to maintain a constant current to a load, even when the load's resistance changes.
Conventional current flow	Concept of current produced by the movement of positive charges towards the negative terminal of a source.
Coulomb	Unit of electric charge. A quantity of 1 C is equal to the electrical charge of approximately 6.24 × 1018 electrons or protons.
Coupling	The transfer of electrical energy between circuits or parts of a circuit. It can be intentional, as part of the circuit's function, or it can be undesirable, such as when coupling occurs with stray fields.
Current	Measured in amperes, it is the flow of electrons through a conductor. Also known as electron flow.
Current amplifier	An electronic device used to increase signal current.
Current divider	Parallel network designed to divide the total current of a circuit.
Current feedback	A feedback system operates by taking a portion of the output signal, feeding it back to the input, and generating an error signal, which in turn controls the system.

Glossário

Current mirror	A circuit that copies a current flowing through one device to another, keeping the output current constant
Cutoff	Condition when an active device is biased such that output current is near zero or beyond zero.

D

DAC	Abbreviation for “digital to analog converter.”
Darlington pair	An amplifier consisting of two bipolar junction transistors with their collectors connected together and the emitter of one connected to the base of the other. Circuit has an extremely high current gain and input impedance.
DC	Abbreviation for “direct current”.
DC load line	A graph representing all possible combinations of voltage and current for a given load resistor in an amplifier.
DC offset	The presence of a direct current (DC) voltage or current in an AC power system.
DC power supply	Any source of DC power for electrical equipment.
Decade	A range of frequencies where the ratio between the highest and lowest frequency is 10. For example, 100 Hz to 1000 Hz is a decade.
Decibel	A logarithmic unit used to measure sound level.
Degenerative feedback	Also called negative feedback. A portion of the output of an amplifier is inverted and connected back to the input. This controls the gain of the amplifier and reduces distortion and noise.
Depletion layer or region	The area surrounding a PN junction that is depleted of carriers.
Depletion mode	In a FET, an operating mode where reverse gate-source voltage is used to deplete the channel of free carriers. This reduces the size of the channel and increases its resistance.
Depletion-mode MOSFET	A MOSFET designed to operate in either depletion mode or enhancement mode.

Glossário

Device	A component or part.
Dielectric	Insulating material between two plates where an electrostatic field exists.
Dielectric constant	Property of a material that determines how much electrostatic energy can be stored per unit volume when unit voltage is applied.
Dielectric strength	The maximum voltage an insulating material can withstand without breaking down.
Differential amplifier	An amplifier in which the output is in proportion to the differences between voltages applied to its two inputs.
Diffusion	The random thermal motion of electrons and holes in semiconductors
Digital	Relating to devices or circuits that have outputs of only two discrete levels. Examples: 0 or 1, high or low, on or off, true or false etc.
Digital oscilloscope	An oscilloscope that uses a high-speed analog-to-digital converter (ADC) to measure signals and then displays them on a screen (CRT or LCD) using standard computer graphics techniques.
Diode	A two terminal device that conducts in only one direction.
Direct coupling	Where the output of one amplifier stage is connected directly to the input of a second amplifier or to a load. Also known as DC coupling because DC signals are not blocked.
Direct current (DC)	Current that flows in only one direction.
Direct variation	Relationship between input and output in which the output varies in direct proportion to the input.
Donor atoms	Pentavalent atoms that give up electrons to the conduction band in an N type semiconductor material.
Doping	The process of adding impurity atoms to intrinsic (pure) silicon or germanium to improve the conductivity of the semiconductor material.

Glossário

E

Electric charge	Electric energy stored on the surface of a material. Also known as a static charge.
Electric field	A field or force that exists in the space between two different potentials or voltages. Also known as an electrostatic field.
Electromotive force	(emf), Force that causes the motion of electrons due to potential difference between two points. (voltage)
Electron	Smallest subatomic particle of negative charge that orbits the nucleus of an atom.
Electron flow	The movement of charged particles, like electrons or ions, through a conductor or space. This flow is also known as electric current, which is measured in amperes (A).
Electrostatic	Related to static electric charge.
Emitter	The semiconductor region from which charge carriers are injected into the base of a bipolar junction transistor.
Emitter feedback	A method for introducing negative feedback into a circuit. It works by adding a feedback resistor that decreases voltage in proportion to the transistor's emitter current.
Emitter follower	A buffer stage with high input impedance, low output impedance, and a gain of approximately unity.
Engineering notation	A floating point system in which numbers are expressed as products consisting of a number greater than one multiplied by an appropriate power of ten that is some multiple of three.
Enhancement-mode MOSFET	A field-effect transistor (FET) that acts like a normally-open switch and is used in integrated circuits.
Eequivalent resistance	The single resistance that can replace a combination of resistors in a circuit while maintaining the same current.

F

Fall time	Time it takes the falling edge of a pulse to go from 90% of peak voltage to 10% of peak voltage.

Glossário

Farad	The basic unit of capacitance.
Feedback	A portion of the output signal of an amplifier which is connected back to the input of the same amplifier.
Field effect transistor	(FET), A voltage-controlled transistor in which the source to drain conduction is controlled by gate to source voltage.
Filter circuit	Network consisting of capacitors, resistors and/or inductors used to pass certain frequencies and block others.
Flip Flop	A digital circuit that flips or toggles between two stable states (bistable). The Flip Flop inputs decide which of the two states its output will be.
Forward bias	A PN junction bias which allows current to flow through the junction. Forward bias decreases the resistance of the depletion layer.
Free electrons	Electrons that are not in any orbit around a nucleus.
Frequency-domain analysis	A method used in electrical engineering to analyze signals or data in terms of frequency, rather than time.
Frequency response	Indication of how well a circuit responds to different frequencies applied to it.
Frequency response curve	A graph of amplitude over frequency indicating a circuit response to different frequencies.
Full wave rectifier	Rectifier that makes use of the full AC wave in both the positive and negative half cycles.
Function generator	Signal generator that can produce sine, square, triangle and sawtooth output waveforms.
Fundamental frequency	Lowest frequency in a complex waveform.

G

Gain	Increase in voltage, current and/or power. Gain is expressed as a ratio of amplifier output value to the corresponding amplifier input value.

Glossário

Gain bandwidth product (GBWP)	A device parameter that indicates the maximum possible product of gain and bandwidth. The gain bandwidth product of a device is equal to the unity gain frequency (funity) of the device.
General Purpose Interface Bus (GPIB)	Also known as the IEEE-488 bus, it is widely used as an interface for connecting test instruments to computers and for providing programmable instrument control.
Ground	An intentional or accidental conducting path between an electrical system or circuit and the earth or some conducting body acting in place of the earth. A ground is often used as the common wiring point or reference in a circuit.

H

Half power point	A frequency at which the power is 50% of maximum. This corresponds to 70.7% of maximum current or voltage.
H-parameters	Transistor specifications that describe the component operating limits under specific circumstances.
Half-wave rectifier	A diode rectifier that converts AC to pulsating DC by eliminating either the negative or the positive alternation of each input AC cycle.
Harmonic	A frequency component of a signal that is an integral multiple of the fundamental of that signal.
Harmonics	Sine wave that is smaller in amplitude and some multiple of a fundamental frequency. Example: 880 Hz is the second harmonic of 440 Hz; 880 Hz is the third harmonic of 220 Hz.
Hole	A gap left in the covalent bond when a valence electron gains sufficient energy to jump to the conduction band.

I

Inter-Integrated Circuit (I2C)	A short-distance serial communication bus standard consisting of two signals (clock and data), popular for talking between several integrated circuits on the same printed circuit board.
IC	Abbreviation for “integrated circuit”

Glossário

IC voltage regulator	Three terminal device used to hold the output voltage of a power supply constant over a wide range of load variations.
IGFET	Insulated gate field effect transistor. Another name for a “MOSFET.”
Impedance (Z)	Measured in ohms, it is the total opposition to the flow of current offered by a circuit. Impedance consists of the vector sum of resistance and reactance.
Interleave	A technique used in digitizing oscilloscopes whereby ADCs of different analog channels are used together, normally resulting in higher sample rate or more memory depth when you are using fewer channels.
Internal resistance	Every source has some resistance in series with the output current. When current is drawn from the source some power is lost due to the voltage drop across the internal resistance. Usually called output impedance or output resistance.
Intrinsic material	A semiconductor material with electrical properties essentially characteristic of ideal pure crystal. Essentially silicon or germanium crystal with no measurable impurities.
Inverting amplifier	An amplifier that has a 180° phase shift from input to output.
Inverting amplifier	An amplifier that has a 180° phase shift from input to output.
Inverting input	In an operational amplifier (op amp) the input that is marked with a minus sign. A signal applied at the inverting input will be given 180° phase shift between input and output.
Ion	An atom with fewer electrons in orbit than the number of protons in the nucleus is a positive ion. An atom with a greater number of electrons in orbit than the number of protons in the nucleus is a negative ion.

K

Kilo	Metric prefix for 1000.
Kirchhoff's current law	The sum of the currents flowing into a point in a circuit is equal to the sum of the currents flowing out of that same point.

Glossário

Kirchhoff's voltage law	The algebraic sum of the voltage drops in a closed path circuit is equal to the algebraic sum of the source voltages applied.
Knee voltage	The voltage at which a curve joins two relatively straight portions of a characteristic curve. For a PN junction diode, the point in the forward operating region of the characteristic curve where conduction starts to increase rapidly. For a zener diode, the term is often used in reference to the zener voltage rating.

L

L-C tank circuit	A fundamental component of resonant circuits, composed of an inductor (L) and a capacitor (C) connected either in series or in parallel. This type of circuit is known for its ability to store electrical energy oscillating between the magnetic field of the inductor and the electric field of the capacitor.
Light-emitting diode (LED)	A semiconductor diode that converts electric energy into electromagnetic radiation at a visible and near infrared frequencies when its pn junction is forward biased.
Limiter	Circuit or device that prevents some portion of its input from reaching the output.
Local interconnect network (LIN)	A short-distance serial communication standard that is often found in systems also containing the CAN bus. LIN is slower and less complex than the CAN bus.
Line regulation	The ability of a voltage regulator to maintain a constant voltage when the regulator input voltage varies.
Load	A source drives a load. Whatever component or piece of equipment is connected to a source and draws current from a source is a load on that source.
Load current	Current drawn from a source by a load.
Load impedance	Vector sum of reactance and resistance in a load.
Loading effect	The degree to which a measurement instrument impacts the electrical properties of a circuit, such as its voltage, current, and resistance.

Glossário

Load regulation	The ability of a voltage regulator to maintain a constant output voltage under varying load currents.
Load resistance	Resistance of a load.

M

Majority carriers	The charge carriers that are present in greater quantity in a semiconductor material than the other type of carrier
Metal oxide field effect transistor (MOSFET)	A field effect transistor in which the insulating layer between the gate electrode and the channel is a metal oxide layer.
Mid-band gain	The gain value of a signal in the middle, or midband, region of a gain plot. This region is relatively flat, and the gain begins to decrease at either end.
Mid-point bias	An amplifier biased at the center of its DC load line.
Mil	One thousandth of an inch (0.001 in.)
Miller's theorem	A theorem that allows you to represent a feedback capacitor as equivalent input and output shunt capacitors.
Minority carriers	The conduction band holes in n-type material and valence band electrons in p-type material. Most minority carriers are produced by temperature rather than by doping with impurities.
Mixed-signal oscilloscopes	(MSOs), Digitizing oscilloscopes that have a larger number of channels than usual for looking at both analog and digital signals. MSOs typically have two or four analog channels and at least 8 bits of vertical resolution. There are usually 16 digital channels but they typically have only 1 bit of vertical resolution.
Monostable	A circuit that has one stable state. When perturbed, the circuit will return to the stable state after some fixed amount of time.
Multivibrator	A circuit used to implement a simple two-state system, which may be astable, monostable, or bistable.

Glossário

N

N-type semiconductor	A semiconductor compound formed by doping an intrinsic semiconductor with a pentavalent element. An n-type material contains an excess of conduction band electrons.
Negative	Terminal that has an excess of electrons.
Negative charge	A charge that has more electrons than protons.
Negative feedback	A feedback signal 180° out of phase with an amplifier input signal. Used to increase amplifier stability, bandwidth and input impedance. Also reduces distortion.
Negative ion	Also known as an anion. An atom having a greater number of electrons in orbit than there are protons in the nucleus.
Negative resistance	A property of some electrical circuits and devices where an increase in voltage across the device's terminals results in a decrease in electric current through it.
Negative temperature coefficient	A term used to describe a component whose resistance or capacitance decreases when temperature increases.
Node	Junction or branch point in a circuit.
Noise	Unwanted electromagnetic radiation within an electrical or mechanical system.
Non-inverting input	The terminal on an operational amplifier that is identified by a plus sign.
Non-linear scale	A scale in which the divisions are not equally spaced, logarithmic.
Norton's theorem	Any network of voltage sources and resistors can be replaced by a single current source in parallel with a single resistor.
NPN transistor	A bipolar junction transistor in which a p-type base element is sandwiched between an n-type emitter and an n-type collector.

Glossário

O

One Shot	Monostable circuit that produces one pulse when triggered.
Open-loop gain	The open-loop gain of an operational amplifier is the gain obtained when no feedback is used in the circuit. Open loop gain is usually exceedingly high; in fact, an ideal operational amplifier has infinite open-loop gain. Typically, an op-amp may have an open-loop gain of around 100,000. Normally, feedback is applied around the op-amp so that the gain of the overall circuit is defined and kept to a figure which is more usable. However, the very high gain of the op-amp enables considerable levels of feedback to be applied to achieve required performance. The open-loop gain of an operational amplifier falls very rapidly with increasing frequency. Along with slew rate, this is one of the reasons why operational amplifiers have limited bandwidth.

P

Passive component	Component that does not amplify a signal. Resistors, capacitors and inductors are examples.
Peak to peak	Difference between the maximum positive and maximum negative values of an AC waveform.
Pentavalent element	Element whose atoms have five valence electrons. Used in doping intrinsic silicon or germanium to produce n-type semiconductor material. Most commonly used pentavalent materials are arsenic and phosphorus.
Percentage of regulation	The change in output voltage that occurs between no-load and full-load in a DC voltage source. Dividing this change by the full-load value and multiplying the result by 100 gives percent regulation.
Percentage of ripple	The ratio of the effective rms value of ripple voltage to the average value of the total voltage. Expressed as a percentage.
Pinch-off region	A region on the characteristic curve of a FET in which the gate bias causes the depletion region to extend completely across the channel.

Glossário

PN Junction	Contact or connection between two or more wires or cables. The area where the p-type material and n-type material meet in a semiconductor.
P-N Junction diode	Diode. A semiconductor diode in which the rectifying characteristics occur at a junction between the n-type and p-type semiconductor materials.
PNP transistor	A bipolar junction transistor with an n-type base and p-type emitter and collector.
Positive feedback	A feedback signal that is in phase with an amplifier input signal. Positive feedback is necessary for oscillation to occur.
Potential difference	Voltage difference between two points which will cause current to flow in a closed circuit.
Potentiometer	A variable resistor with three terminals. Mechanical turning of a shaft can be used to produce variable resistance and potential. Example: A volume control is usually a potentiometer.
Power supply rejection ratio	(PSRR), A measure of an op-amps ability to maintain a constant output when the supply voltage varies.
Protoboard	Board with provision for attaching components without solder. Also called a breadboard. Primarily used for constructing experimental circuits.

Q

Quiescent point	(Q point), A point on the DC load line of a given amplifier that represents the quiescent (no signal) value of output voltage and current for the circuit.

R

RC differentiator	A circuit in which the output voltage is in proportion to the rate of change of the input voltage. A high pass RC circuit.
RC time constant	Product of resistance and capacitance in seconds.
Recombination	Process by which a conduction band electron gives up energy (in the form of heat or light) and falls into a valence band hole.

Glossário

Rectification	Process that converts alternating current to direct current.
Rectifier	Diode circuit that converts alternating current into pulsating direct current.
Regenerative feedback	Positive feedback. Feedback from the output of an amplifier to the input such that the feedback signal is in phase with the input signal. Used to produce oscillation.
Regulated power supply	Power supply that maintains a constant output voltage under changing load conditions.
Regulator	Device or circuit that maintains a desired output under changing conditions.
Resistance	Symbolized “R” and measured in ohms. Opposition to current flow and dissipation of energy in the form of heat.
Resistor	Component made of material that opposes flow of current and therefore has some value of resistance.
Reverse bias	Bias on a PN junction that allows only leakage current (minority carriers) to flow. Positive polarity on the n-type material and negative polarity to the p-type material.
Reverse breakdown voltage	Amount of reverse bias that will cause a PN junction to break down and conduct in the reverse direction.
Reverse current	Current through a diode when reverse biased. An extremely small current also referred to as leakage.
Reverse saturation current	Reverse current through a diode caused by thermal activity. This current is not affected by the amount of reverse bias on the component but does vary with temperature.
R-2R ladder	Network or circuit composed of a sequence of L networks connected in tandem. Circuit used in digital to analog converters.

S

Saturation current	The maximum current that can pass through an ionized gas or electron tube, where increasing the voltage will not increase the current.

Glossário

Schematic diagram	Illustration of an electrical or electronic circuit with the components represented by their symbols.
Scientific notation	Numbers entered as a number from one to ten multiplied by a power of ten. Example: 8765 = 8.765 × 103.
SDRAM	Synchronous dynamic random-access memory, the most popular form of digital memory today. It differs from previous-generation DRAM in that all signal timing is relative to one clock.
Self-biasing	A method of biasing that occurs when a voltage is developed on an electrode in a vacuum tube circuit.
Semiconductor	An element which is neither a good conductor or a good insulator, but rather lies somewhere between the two. Characterized by a valence shell containing four electrons. Silicon, germanium and carbon are the semiconductors most frequently used in electronics.
Series circuit	Circuit in which the components are connected end to end so that current has only one path to follow through the circuit.
Signal to noise ratio (SNR)	Ratio of the magnitude of the signal to the magnitude of noise usually expressed in decibels.
Silicon	(Si), Nonmetallic element (atomic number 14) used in pure form as a semiconductor.
Silicon dioxide	Glass like material used as the gate insulating material in a MOSFET.
Silicon transistor	A bipolar junction transistor using silicon as the semi conducting material.
Solid state	Pertaining to circuits where signals pass through solid semiconductor material such as transistors and diodes as opposed to vacuum tubes where signals pass through a vacuum.
Source follower	FET amplifier in which signal is applied between gate and drain with output taken between source and drain. Also called “common drain.”
Source impedance	Impedance through which output current is taken from a source.
Spectrum analyzer	Instrument used to display the frequency domain of a waveform plotting amplitude against frequency.

Glossário

SPI	Serial Peripheral Interface, a very simple short-distance serial communication bus standard consisting of either two (clock and data) or three (clock, data and strobe) signals, popular for reading data from microcontroller peripherals such as ADCs.
Summing amplifier	An op-amp circuit whose output is proportional to the sum of its instantaneous voltages.
Superposition theorem	Theorem designed to simplify networks containing two or more sources. It states that in a network containing more than one source, the current at any one point is equal to the algebraic sum of the currents produced by each source acting separately.

T

Thevenin's theorem	Theorem that replaces any complex network with a single voltage source in series with a single resistance.
Threshold voltage	For an enhancement MOSFET, the minimum gate source voltage required for conduction of source drain current.
Transconductance	Also called mutual conductance. Ratio of a change in output current to the change in input voltage that caused it.
Transistor	Term derived from "transfer resistor." Semiconductor device that can be used as an amplifier or as an electronic switch.
Trivalent element	One having three valence electrons. Used as an impurity in semiconductor material to produce p-type material. Most commonly used trivalent elements are: Aluminum, Gallium and Boron.

U

Unity gain frequency	Frequency of operation for a device where the gain of the component drops to unity.

V

Valence shell	The outermost electron shell for a given atom. The number of electrons in this shell determines the conductivity of the atom.

Glossário

Varactor diode	PN junction diode with a high junction capacitance when reverse biased. Most often used as a voltage-controlled capacitor. The varactor is also called: varicap, tuning diode and epicap.
Variable capacitor	Capacitor whose capacitance can be change by varying the effective area of the plates or the distance between the plates.
Variable resistor	Resistor whose resistance can be changed by turning a shaft. See also “potentiometer and rheostat.”
Vernier scale	A scale in which the divisions are uniformly spaced.
Virtual ground	Point in a circuit that is always at approximately ground potential. Often a ground for voltage, but not for current. The summing junction in an op-amp circuit.
Volt	Unit of potential difference or electromotive force. One volt is the potential difference needed to produce one ampere of current through a resistance of one ohm.
Voltage	(V), Term used to designate electrical pressure or force that causes current to flow.
Voltage amplifier	Amplifier designed to build up signal voltage. By design amplifiers can have a large voltage gain or a large current gain or a large power gain. Voltage amplifiers are designed to maximize voltage gain often at the expense of current gain or power gain.
Voltage divider	Fixed or variable series resistor network connected across a voltage to obtain a desired fraction of that voltage.
Voltage divider biasing	Biasing method used with amplifiers in which two series resistors connected across a source. The junction of the two biasing resistors provides correct bias voltage for the amplifier.
Voltage drop	The decrease in voltage that occurs when electricity passes through a circuit.
Voltage feedback	A closed-loop configuration in which the error signal is in the form of a voltage.
Voltage follower	Operational amplifier circuit characterized by a high input impedance, low output impedance and unity voltage gain. Used as a buffer between a source and a low impedance load.

Glossário

Voltage gain	Also called voltage amplification. Ratio of amplifier output voltage to input voltage usually expressed in decibels.
Voltage multiplier	Rectifier circuit using diodes and capacitors to produce a DC output voltage that is some multiple of the peak value of AC input voltage. Cost effective way of producing higher DC voltages. Voltage doublers and voltage triplers are examples.
Voltage regulator	Device or circuit that maintains constant output voltage (within certain limits) in spite of changing line voltage and/or load current.
Voltage source	A two-terminal device that provides a constant electrical potential difference to a circuit.

Z

Zener diode	Semiconductor diode in which reverse breakdown voltage current causes the diode to develop a constant voltage. Used as a clamp for voltage regulation.

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