



# Terminology Pocket Guide

AVX Corporation is a leading manufacturer of passive electronic components and connector products. Our global capability generates over \$1 billion in sales and encompasses products from 37 facilities in 17 countries.

We operate in a market and at a time when acronyms and “buzzwords” are increasingly used. This terminology guide is our attempt at helping you understand the “technospeak” which surrounds us.

If you have any additions or questions, please contact me or e-mail at: [hunterc@avxcorp.com](mailto:hunterc@avxcorp.com).

# **AVX** products include

## **Connectors**

Automotive Connectors  
Board to Board Connectors - SMT and Through-Hole  
Card Edge  
Compact Flash Connectors  
Compact PCI  
Custom Designed Connectors  
Customized Backpanel, Racking and Harnessing Services  
DIN 41612 Connectors  
FFC/FPC Connectors  
Insulation Displacement Connectors  
I/O Connectors  
Memory Card Headers and Sockets  
MOBO™, I/O, Board to Board and Battery Connectors  
PCMCIA Frameless Kit  
Press-fit Connectors  
Torson, 1.27mm (.050") Board to Board Connectors  
Varicon  
Wire to Board, Crimp or IDC

## **Passives**

MLC Capacitors	Thin Film Inductors
Tantalum Capacitors	Thin Film Fuses
Microwave Capacitors	Voltage Suppressors
Thin Film Capacitors	Acoustical Piezos
Glass Capacitors	Ferrites
Chip Resistors	Thermistors (NTC, PTC)
Chip Resistor Arrays	Film Capacitors
EMI Filters	Suppression Capacitors
Bulk Filters	Power Capacitors
SAW Filters	Integrated Passive Components
Dielectric Filters	Varistors (MOV)
Resonators	Disc Capacitors
Oscillators	

**4 Cap Array:** IPC with four capacitors in an 0612 package

**A/D:** Analog to digital signal conversion

**AC:** Alternating current

**Accu L:** AVX name for tight tolerance, high frequency thin film inductors

**Accu F:** AVX name for tight tolerance, high frequency thin film capacitors

**Accu P:** AVX name for tight tolerance, high frequency thin film capacitors

**AccuGuard:** AVX name for the thin film fuse products

**Active Components:** Semiconductor devices e.g. Integrated circuits; components made with semiconductor materials

**Alternating Current:** Electrical current that periodically alters the direction (+/-) of current flow

**Aluminum Electrolytic:** Capacitor using aluminum oxide as the dielectric and a liquid electrolytic as one electrode and the aluminum foil as the other

**Ambient Noise:** Average level of noise at a specific location

**Ambient Temperature:** Average temperature surrounding a component

**Ammo-Pack:** Panasonic trademark for products where devices are taped together and then folded in a box

**Ampere:** Unit of measure for electrical current

**Analog Circuit:** A circuit that provides information from a varying electrical signal

**Anode:** The positive electrode of a component

**Automatic Insertion:** Machines used to place parts onto printed circuit boards

**Axial Leads:** Wire attachment to a component which extend along the axis of a unit, i.e. out of each end of the device

**B Tolerance:** Capacitor tolerance of  $\pm 0.1\text{pF}$

**Backpanel:** Customer specific PCB assembly normally including Pressfit connectors manufactured by ELCO

**Balun:** Balanced and unbalanced transmission lines=unbalanced system to balanced system converter

**Bandpass Filter:** Filter which allows frequencies within a specific band to pass while rejecting others

**Bandwidth:** Range of specified frequencies over which the output response of a circuit remain above a defined value

**Battery:** Power (voltage) obtained from a chemical reaction in a cell. Cells that convert chemical energy to electric energy producing a direct current. Cells connected in series for higher voltage, or parallel for higher current

**Baud Rate:** Unit of signal speed which indicates the number of discrete signal events transmitted per second

**Baud:** Time needed for an individual signal event in a digital transmission. Unit of speed in data transmission - 1 bit per second

**BitGuard:** AVX name for thin capacitor (0.030") designed to be used under an IC

**Blocking Capacitor:** Coupling capacitor between electronic circuits used to block direct current and limit the flow of low-frequency alternating current signals without affecting high frequency alternating current signals

**Board to Board:** Connector system for interfacing two PCB boards

**Bond:** An electrical interconnection, e.g. wire bond

**Boost Capacitor:** Damper circuit capacitor for TV receivers which boost the DC power supply voltage already present

**Boxed Film (BF):** Film capacitor contained in molded plastic package

**BPS:** Bits per second

**Breadboard:** A circuit design in the initial stage of a system, i.e. prototype

**Breakdown Voltage:** Voltage applied to a capacitor which causes shorting

**Bulk Cassette:** Devices packaged loose in a plastic case used for automatic placement

**Bulk Packaging:** Devices packaged loose in a bag

**Bulkhead Filter:** Encased EMI filters mounted on walls, chassis or bulkheads

**Burn-in:** Subjecting parts to heavy electrical bias/load at elevated temperature for a specific time period in order to induce failure of marginal devices

**Bypass Capacitor:** Capacitor providing a low-impedance path to ground to filter unwanted noise

**C Tolerance:** Capacitor tolerance of  $\pm 0.25\text{pF}$

**C:** Capacitance symbol

**COG/NP0:** Stable capacitor dielectric for ceramic capacitors ( $0 \pm 30\text{ppm}/^\circ\text{C}$ )

**Capacitance:** Ability to store energy in an electric field. Normally, expressed as the stored charge in farads

**Capacitive Coupling:** Capacitor which couples a signal between two electronic circuits

**Capacitor:** Energy storage device made from two conducting plates separated by a dielectric/insulating material

**CapGuard:** AVX name for a leaded component which has a ceramic capacitor and a TransGuard in series

**Cathode:** Negative electrode of a component

**CDR:** Military designation for chips

**Celsius:** Temperature scale where the freezing point of water is  $0^\circ$  and the boiling point of water is  $100^\circ$

**Centerline:** Distance between the center point of two adjacent connector contacts

**Ceramic Package:** Package enclosure made from inorganic, non-metallic material

**Chip:** A leadless form of an electronic component

**CK:** Military designation for ceramic capacitors in MIL-C-11015

**CKR:** Military designation for military approved capacitors to MIL-C-39014 - established reliability

**Clean-Room:** A manufacturing area where air is filtered to minimize dust particles.nb Class 10 = 10 microns of dust per cubic meter. Class 100 = 100 microns of dust per cubic meter, etc.

**Clock Oscillator:** Electronic circuit generating precisely controlled, accurate timing signals at regular intervals

**Clock Rate:** Oscillation frequency of the clock in a system

**Coaxial Cable:** Concentric transmission line made up of an inner conductor, outer ground conductor and insulation layer for separation

**Cofired Ceramic:** The firing together of two different ceramic formulations

**Coil:** Component made from wire, wound around a core

**Conductor:** A substance/material through which electrons flow easily

**Conformal Coating:** A thin non-conductive protective coating that conforms to size of part

**Contact:** The metal part of a connector which connects two parts of a connector together or the connector to another component

**CPU:** Central processing unit

**Crystal:** Component made from quartz that vibrates very precisely at its natural frequency when excited with a voltage

**Current:** Flow of electrons, measured in amperes. One ampere will flow when one volt is provided to a circuit which has a resistance of one ohm

**CV:** Product of capacitance and voltage of a capacitor

**Cycle:** A single complete execution of a waveform that periodically occurs in time

**D Tolerance:** Capacitor tolerance of  $\pm 0.5\text{pF}$

**D/A:** Digital to analog signal conversion

**Damping:** Energy loss which slows response

**Date Code:** Code, normally four digits, which identifies when a part was manufactured. Usually the first two digits are the week, e.g. 08 is week 8 and the remaining two digits are the year, e.g. 98 is 1998

**DC:** Direct current

**Decibel (db):** Standard unit that represents the relative intensity or power of a signal

**Decoupling:** Shunting of unwanted noise to ground

**Die:** Uncased component yielded from a wafer

**Dielectric Constant:** Ratio of the relative storage capacity of a material to that of a vacuum

**Dielectric Strength:** Capability of the dielectric to withstand voltage without damage

**Dielectric:** Non-conducting material separating the plates of a capacitor

**Digital Circuit:** A circuit which represents data with on and off signals

**DIN41612:** German industry standard connector

**Diode:** Device with two terminals which has a high resistance to current flow in one direction and a low resistance

**DipGuard:** AVX name for two pin dual-in-line ceramic capacitor

**Dipped:** Term used for leaded components, e.g. tantalum capacitors, usually epoxy coated

**Direct Current (DC):** Current flowing in one direction

**Disk/Disc:** Single layer ceramic capacitor

**Dissipation:** Loss of energy, usually in the form of heat

**Dual-in-Line:** Standard packaging arrangement which has connecting pins along each long side of a package

**E12:** The name of twelve standard values for capacitance/resistance between 1 and 99 and any multiple to the power of ten. E12 values are 10, 12, 15, 1, 22, 27, 33, 39, 47, 56, 68, 82

**E24:** The name of twenty-four standard values for capacitance/resistance between 1 and 99 and any multiple to the power of ten. E24 values are 10, 11, 12, 13, 15, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 43, 47, 51, 56, 62, 68, 75, 82, 91

**E6:** The name of six standard values for capacitance/resistance between 1 and 99 and any multiple to the power of ten. E6 values are 10, 15, 22, 33, 47, 68

**ECOAX:** TPC name for axial leaded ceramic capacitor  
(AVX: SpinGuard)

**ECOCAP:** TPC name for radial leaded ceramic capacitor (AVX: SkyCap)

**ECOMP 1,2,3,4:** AVX name for the Kyocera product groups

**EIA:** Electronics Industry Association

**Electrode:** Contacts which emit or collect the movement of electrons

**Electrolyte:** Substance which enters into a chemical reaction and produces a conductive liquid

**Electrolytic Capacitor:** Capacitor whose one or more electrodes are impregnated or immersed in a wet electrolyte

**Electrostatic:** Electricity produced by the impact of two surfaces

**Encapsulate:** Covering for an element which provides environmental protection

**Energy Density:** Amount of energy stored in a given unit of volume

**ESL:** Equivalent series inductance. Inductance characteristic of the component in the circuit

**ESR:** Equivalent series resistance. Resistance characteristic of the component in the circuit

**Extended Range:** New higher capacitance versions of current capacitor families

**F Tolerance:** Capacitor/Resistor tolerance of  $\pm 1\%$

**Fahrenheit:** Temperature scale where the freezing point of water is 32° and the boiling point of water is 212°

**Failure Analysis:** Analysis of a circuit or component to determine the reason for failure

**Farad:** Capacitance unit where one farad unit is one coulomb of charge with one volt across it

**Feedthrough:** Three terminal capacitor where two terminals are common conductors

**Ferrite:** A material that provides a magnetic field for filtering and power applications. Hard: Magnetic material; Soft: Non-magnetic material

**FFC/FPC:** Fine pitch connectors manufactured by ELCO

**Film Capacitor:** Capacitor made from plastic films usually polyester or polypropylene

**Film:** Coating or layer of material used to form various elements, inter-connections, or insulation

**Filter (LPF/BPF):** Device or circuit which allows signals of specific frequencies to pass while blocking those of other frequencies;  
LPF = Low Pass Filter, BPF = Band Pass Filter

**Fire:** Heating of a ceramic material to change its crystalline structure

**Flip-chip:** Method of mounting devices with solder bumps (balls)

**Flyback Transformer (FPT):** Autotransformer generating high voltage in the horizontal output state of a TV receiver

**FM:** Frequency modulation

**Frequency:** The number of periodic waveform cycles completed in one second; KHz = 1000 cycles, MHz = 1,000,000 cycles, GHz = 1,000,000,000 cycles

**G Tolerance:** Capacitor/Resistor tolerance of  $\pm 2\%$

**GHz:** Gigahertz

**Gigahertz (GHz):**  $10^9$  cycles per second (see Frequency)

**Glass Capacitor:** Capacitor made with a glass dielectric

**Glass K:** AVX name for a special glass formulation capacitor with properties similar in some cases to glass but higher dielectric constant

**Ground:** Common return path for electrical currents

**Harmonic:** Frequency multiple of a fundamental sine wave signal frequency

**Henry ( $\mu\text{H}$ ):** Unit of inductance which indicates the induced force of one volt when the current is varied at 1 ampere per second

**Hermetic-sealing:** Sealing which is gas-tight

**Hertz:** One complete cycle per second

**High Frequency:** Signal frequency 3-30 MHz

**High Q:** Capacitor which has very low losses: Low ESR

**Hybrid:** A circuit on an insulating substrate that consists of an assembly of components

**Hz:** Hertz

**IDCapacitor:** Interdigitated capacitor designed for low inductance

**IDConnector:** Insulation displacement connector

**IEEE:** Institute of Electrical and Electronic Engineers

**Impedance:** Total resistance of a capacitor including capacitance reactance, ESL and ESR

**Inductance:** Property of an element by which an electromotive force is induced by a change in current

**Ink:** Paste or thick film material which is screen printable

**Insulator:** Material which is a poor conductor to the extent that current does not flow through it when voltage is applied

**Integrated Circuit:** Multiple components fabricated and interconnected on a semiconductor substrate

**Interdigitated Capacitor (IDC):** Low inductance capacitor

**Intermediate Frequency (IF):** The frequency at which the received signal is converted before final data abstraction

**IPC:** (Integrated passive components) Multiple components fabricated and interconnected on a ceramic substrate

**J Tolerance:** Capacitor/Resistor tolerance of  $\pm 5\%$

**Jitter:** Signal misalignment which results in data misinterpretation

**Joule:** Measured unit of energy

**K Band:** Microwave frequency 11 GHz to 36 GHz

**K Tolerance:** Capacitor tolerance of  $\pm 10\%$

**Kilohertz:** One thousand complete cycles per second

**L:** Inductor symbol

**Laser Trim:** Removal of material to adjust the value of a parameter on a device

**Layout:** A drawing showing components and interconnection used to generate artwork or masks for substrate metallization

**LC Circuit:** Circuit containing a capacitor and an inductor

**Leaching:** The migration of a material (usually metals) into another material under the influence of electrical gradient and usually moisture

**Leadframes:** Metal attachment used to electronically connect an element to the next level of assembly

**Leadspacing:** Measure of the distance between the two wires on a radial leaded product

**Leakage:** Unwanted electricity flow through or around a component or circuit

**Life-test:** Applying an electrical bias or load over a special time period normally at an elevated temperature for a sample lot to prove quality

**Low Frequency:** Signal frequency 30 Hz - 300 KHz

**Low Pass Filter:** Filter which allows frequencies below a given cut-off frequency to pass and rejects any above that frequency. Used primarily for EMI

**Low Profile:** Components which when mounted on a board offer a low height dimension

**M Tolerance:** Capacitor tolerance of  $\pm 20\%$

**MCM:** (Multi chip module) Combination of devices in a single mountable package

**Mean Time Between Failures (MTBF):** Statistic showing average time between component failures

**Medium Frequency:** Signal frequency between 300 KHz - 3 MHz

**Megahertz:** One million complete cycles per second

**Metallization:** A conductive film pattern deposited on a substrate

**Mic (Mike):** Jargon for microfarad

**Mica:** Mineral with good insulating and heat resistance properties, often used as an insulator or dielectric

**Micro:** 1/1,000,000, e.g. microfarad ( $\mu\text{F}$ ), microhenry ( $\mu\text{H}$ ), micron  $10^{-6}$

**Microcircuit:** A circuit with high component density which performs a function

**Microleaf:** Two piece connector manufactured by ELCO

**Microwaves:** Signals with frequencies above 1 GHz with wavelengths  $< 1\text{mm}$

**Mil:** One thousandth of a unit, often referring to 1/1000 of an inch

**Miniceramic:** AVX name for miniature ceramic capacitors

**Miniresistor:** AVX name for miniature resistors

**Minitan:** AVX trademark and name for miniature solid tantalum capacitors

**MLC:** Multilayer ceramic or multilayer capacitor

**MOBO:** Custom connectors for mobile communications applications manufactured by ELCO

**Nano:** 1/1,000,000,000, e.g. nanofarad, nanohenry  $10^{-9}$

**Nanofarad (nF):** Unit of capacitance  $10^{-9}$  Farads

**Nanohenry (nH):** Unit of inductance  $10^{-9}$  Henrys

**NEDA:** National Electronic Distribution Association

**Nickel Barrier:** A standard plated termination style for SMD components. A surface solderable termination is plated over it

**NP0/C0G:** Stable capacitor dielectric for ceramic capacitors that has little capacitance change over temperature as bias

**NTC:** Negative temperature coefficient

**Ohm:** Unit of resistance

**Ohms Law:**  $I=E/R$  Current equals voltage divided by resistance

**Open Circuit:** Incomplete path for current to flow, infinite resistance

**Oscillator:** Device or circuit which produces a constant signal at a given frequency when a given bias is applied

**P Tolerance:** Capacitance tolerance -0 +100%

**Package:** The container for an electronic component with terminals for access

**Paper Capacitor:** Fixed capacitor made from wound metal foil separated by a paper dielectric

**Passivation:** An insulation layer which protects from contaminants such as moisture or loose particles

**Passive Components:** Devices like resistors, capacitors and inductors which do not amplify signal

**Passive Network:** Multiple passive components connected together which provide no circuit gain

**Permeability:** A measure comparing the ability of electrons to move through a material versus air

**Pico:** 1/1,000,000,000,000, e.g. picosecond, picohenry, picofarad  $10^{-12}$

**Picofarad (pF):** Unit of capacitance  $10^{-12}$  Farads

**Picohenry (pH):** Unit of inductance  $10^{-12}$  Henrys

**Piezoelectric:** Material property that emits a voltage when pressure is applied

**Polar Devices:** Devices which when assembled onto a PCB must be placed with the + and - connection correctly located. (Tantalum capacitors are polar)

**Polycarbonate:** Material used as a dielectric in a film capacitor

**Polyester:** Material used as a dielectric in a film capacitor

**Polypropylene:** Material used as a dielectric in a film capacitor

**Polystyrene:** Material used as a dielectric in a film capacitor

**Porcelain:** High Q ceramic capacitor dielectric

**Potentiometer:** Adjustable resistor with a mechanical mechanism for changing its value, e.g. a moving contact

**Power Dissipation:** Power expelled in the form of heat from within a device

**Power Factor Correction:** Energy saving application capacitor which helps to improve loss angle

**Power Factor:** The ratio of actual power to perceived power in an AC signal, at less than 10% equals dissipation factor

**Pressfit:** Varipin style connector product manufactured by ELCO

**PTC:** Positive temperature coefficient

**Puff:** Jargon for picofarad (pF)

**Q Quality Factor:** Q: measure of loss of an element

**Quartz Crystal:** Accurately cut quartz crystal which vibrates at a specific frequency, normally encased in a metal can

**QV2000:** AVX quality system, Quality Vision 2000

**R:** Resistor symbol

**Radial:** Connection leads which extend from the same end of a device

**Resistance:** Material characteristic resulting in energy loss by opposing the flow of electrons

**Resistor:** Device which provides resistance to current flow

**Resonant Frequency:** In an AC circuit the point at which capacitance and inductive reactance cancel each other out

**RF:** Communication signal frequencies between 10 KHz and 10,000 GHz

**SAW Filter:** Surface Acoustic Wave filter

**Schematic:** Diagram of an electronic circuit showing all components and interconnects

**Self-healing:** Ability of some film capacitors to isolate potential short circuits

**Semiconductor:** The material used as a substrate for devices like transistors, diodes, and integrated circuits

**Shelf Life:** Time period where components retain specified characteristics while unused, e.g. warehoused (stored inventory)

**Silver Migration:** Movement of silver metal ion under the influence of an electrical field and usually moisture

**Single Layer (SLC):** Ceramic dielectric which is one layer

**SkyCap:** AVX name for radial leaded ceramic capacitor (TPC: ECOCAP)

**SLC:** Single layer capacitor

**SMD:** Surface mount device

**SMO:** Switch-mode output capacitor

**SMPS:** Switch-mode power supply

**SMT:** Surface mount technology

**SpinGuard:** AVX name for axial leaded ceramic capacitor (TPC: ECOAX)

**Stacked Foil:** Construction technique for low inductance film capacitors

**StaticGuard:** AVX name for low energy rated transient voltage suppressors

**Stray Capacitance:** Capacitance present in a circuit between components

**Substrate:** Material upon which the components are placed

**TACmicrochip:** 0603 tantalum capacitor

**Tape and Reel:** Packaging method where components can be auto-inserted

**Temperature Coefficient:** The degree to which components exhibit change of any parameters with respect to temperature change over time

**Temperature Cycling:** An environmental test where parts are subjected to a series of cycles alternating between low and high temperature extremes

**Termination:** Method or material used to connect components to a circuit

**Thermal Shock:** An environmental test or circumstance where parts are subjected to rapid change in temperature to induce mechanical failure

**Thermistor:** Component where resistance changes due to a change in temperature

**Thick Film:** A film deposited by screen printing process which is fired at high temperature

**Thin Film:** Material deposited in a vacuum by sputtering used in the AVX Israel plant for manufacturing tight tolerance products

**Tip and Ring Capacitor:** Standard telecom filter to block -48v DC telephone line voltage and pass subscriber's AC signal pulse

**Tolerance:** Specification of allowable variance from a given value, e.g.  $100 \pm 20$  in 20% tolerance

**TPS:** AVX designation for low ESR tantalum capacitor

**TransGuard:** AVX name for transient voltage suppressors

**Trimmer Capacitor:** Adjustable capacitor with a mechanical mechanism for changing capacitance value, normally a moving contact

**Trimmer:** Adjustable device with a mechanical mechanism for changing parametric values, normally a moving contact

**Trimming:** Ability to adjust or fine tune a parameter, normally by way of a mechanical tuner or a laser which removes material

**UL:** Underwriters laboratory, test registration body

**UPS:** Uninterruptable power supply

**Varicon:** Special contact system used in connectors manufactured by ELCO

**Varistor:** Device where resistance varies as voltage varies; as voltage increases resistance decreases

**VDE:** German equivalent of UL (Underwriters Laboratories) approved body

**Voltage Rating:** Maximum recommended voltage for a component

**Voltage:** Measure of force which causes current to flow. One volt enables one ampere to flow through one ohm of resistance

**Weibull Failure Rate:** A system of rating the predicted reliability used for military Ta capacitors

**X Capacitor:** Safety capacitor used across AC line for differential mode filtering

**X7R:** EIA designation for a temperature change causing capacitance to vary  $\pm 15\%$  between  $-55$  and  $+125^{\circ}\text{C}$  Class II material - temperature stable

**XY Capacitor:** AC power line filtering capacitors. Fail safe mode is a requirement

**Y Capacitor:** Safety capacitor connected to ground for common mode filtering

**Y5V:** EIA designation for a temperature change causing capacitance to vary  $+22/-82\%$  between  $-30$  and  $85^{\circ}\text{C}$  Class II material - general application

**Yield:** The ratio of useable units at the end of a manufacturing process to the number of units started

**Z5U:** EIA designation for a temperature change causing capacitance to vary  $+22/-56\%$  between  $+10$  and  $85^{\circ}\text{C}$  Class II material - general application



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