

## Introduction to Filter Connectors EMI/EMP Glossary



**Absorption Loss:** That part of shielding effectiveness dealing with energy absorption through a metal barrier.

**Attenuation:** Reduction in the quality or magnitude of an electrical signal. Suppression of EMI noise in the interconnect transmission path.

**Aperture Leakage:** Compromise in shielding effectiveness from holes, slits, and slots from braid, windows, cooling openings, and joints of metal boxes where EMI can get in or out.

**Bandwidth:** The frequency interval between the upper and lower 3 dB down response of a receiver.

**Broadband EMI:** Electrical disturbances whose frequency spectrum cover several octaves or decades in the frequency spectrum or exceed the receiver bandwidth.

**Capacitance:** The measure or ability of a multilayer ceramic planar array to capture and store electrical energy.

**Common Mode (CM):** As applied to two or more wires, all currents flowing therein with the same polarity.

**Conducted Interference:** EMI transmitted along an unshielded conductor or cable.

**Coupling Path:** The conducted or radiated path by which interfering energy gets from a source to a victim.

**Cross Modulation:** Energy from one transmitter that causes the modulation to change on a received signal from another transmitter.

**Crosstalk:** Electromagnetic energy bleed across dielectric materials, for example, in twisted pair cable sets or across adjacent connector contacts, disrupting the electrical signals in each respective circuit.

**Differential Mode (DM):** Voltages or currents on a wire pair that are of opposite polarity.

**Dielectric Withstanding Voltage (DWV):** Rating, expressed in volts at a given frequency at ambient temperature defining the maximum voltage a dielectric material can withstand before failing.

**Drain:** path by which charges absorbed by a conductor move to ground in a properly grounded system.

**Electric Field:** A radiated wave's potential gradient in volts per meter (V/m).

**Electrical Gasket:** A compressible bond used between two mating metal members to secure a low-impedance path between them.

**EMC:** Electromagnetic compatibility, the conditions under which all components of a system do not interfere with each other or with their environment.

**EMI:** Electromagnetic interference (opposite of EMC). Electromagnetic disturbance that degrades performance of electronic equipment.

**EMP:** Electromagnetic pulse. A broadband, high-intensity, short-duration burst of electromagnetic energy such as might occur as a result of a nuclear explosion.

**ESD:** Electrostatic discharge. A momentary (and unwanted) discharge of built-up electrical energy, usually from an electrically insulated object to an object with a different electrical potential.

**Emission:** Unwanted electromagnetic signal emanating from a piece of equipment.

**Ferrite:** Powdered magnetic material in form of beads, rods, and rings used to absorb EMI on wires and cables.

**Field Strength:** Radiated voltage or current per meter corresponding to electric or magnetic fields.

**Filter:** A device to block the flow of EMI while passing the desired signal frequencies.

**Grounding:** A conductive path to earth designed to eliminate electrical shock by shunting away dangerous currents.

**Impulse Noise:** A transient electrical disturbance, usually repetitive.

**Inductors:** Used with capacitors to form tuned circuits to filter out specific signal frequencies.

**Magnetic Field:** A radiated wave's current gradient, expressed in amperes per meter (A/m).

**Multilayer Planar Array:** Multi-layer ceramic EMI filter device housed in a connector. The most widely applied type of EMI filter.

**Narrowband:** EMI Interference whose emission bandwidth is less than the bandwidth of the EMI measuring receiver or spectrum analyzer.

**Power Conditioning:** Reduction of EMI pollution on power mains by inserting filters, isolators, regulators, or an uninterruptible power supply (UPS).

**Radiated Interference:** EMI or noise transmitted from any electrical system, from power-lines to mobile telephones.

**Radio Frequency Interference (RFI):** A special class of electromagnetic interference in which radio frequency transmissions cause unintentional problems in equipment operation.

**Reflection Loss:** Shielding effectiveness due to energy reflection from impedance mismatch between incident field and metal barrier.

**Roll-Off:** The frequency in an attenuation curve at which a filter begins to reduce the quality or magnitude of an electrical signal.

**Shielding Effectiveness (SE):** The ratio of field strengths (absorption and reflection losses) before and after installing a shield.

Dimensions in inches (millimeters) and are subject to change without notice.



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**Shot Noise:** The noise caused by random fluctuations in the motion of charge carriers such as electrons in a conductor.

**Skin Depth:** The calculated metal layer thickness through which some 63 percent of the surface current flows.

**Surge:** A sudden voltage increase on the power mains.

**TEMPEST:** Transient Electromagnetic Pulse Surveillance Technology.

**Transfer Impedance ( $Z_t$ ):** The quality of cable shield performance calculated by the ratio of the coupled voltage to the surface current, in ohms per meter ( $\Omega/m$ ).





**Transient:** A short-duration voltage surge due to a lightning strike or other dynamic event.

**UPS:** Uninterruptible power supply.

**Waveform:** For lightning events, measure of electrical transient exposure level and surge severity.

### Glenair Statement on RoHS Compliance

European Union Directive 2002/95/EC on Restriction of the use of certain Hazardous Substances ("RoHS") states that certain types of OEM equipment (primarily consumer electronic products such as personal computers) shall not contain lead, mercury, cadmium, hexavalent chromium, PBB's or PBDE's. For the record, Glenair does not produce any OEM products of this type. Furthermore, our interconnect components are either free of the substances RoHS controls, or specifically intended for use in military-aerospace applications that are exempt. Accordingly, Glenair will continue to offer cadmium and chromate finishes in accordance with DoD and aerospace specifications and as required by these customers. Makers of consumer products should refer to RoHS guidelines to ensure interconnect components are correctly specified when used in in RoHS regulated electronic equipment. Consumer product manufacturers may also refer to the following table to ensure any products they may specify from this catalog are equipped with RoHS compliant materials and finishes. Going forward, Glenair will gladly employ substitutes to current military-aerospace materials and finishes as they are proven reliable and as military standards permit.

Connector and Backshell Plating: RoHS Compliance		
Plating Type	RoHS Compliance	Notes
Cadmium with yellow or olive drab chromate conversion coating over electroless nickel	No	Electroless nickel is the preferred alternate.
Electroless nickel		First choice for RoHS compliance. Good corrosion resistance, excellent conductivity, M83513 approved, always in stock.
Stainless steel shell, passivated		Higher cost but unsurpassed corrosion resistance, not conductive enough for typical EMI needs. Build-to-order.
Gold over aluminum		Low volume, higher cost, excellent conductivity. Build-to-order.
Ni-PTFE 1000 Hour Grey™ Nickel Fluorocarbon Polymer		Conductive, CAD-Free, 1000 hr. salt spray plating offers outstanding corrosion protection. MIL-DTL-38999 Rev. L
Chem film	No	Electroless nickel is the preferred alternate.

### Preference for Domestic Specialty Metals Statement

For parts we make and sell, we comply with the Preference for Domestic Specialty Metals requirements (as modified by Alternate 1, Deviation 20008-00002) that, additionally, are required to meet US Military Specifications, Federal Specifications, or ASTM (or other industry) Specifications. Vendors certify (and are audited) to adherence with these requirements with each purchase order fulfilled. Glenair parts are in compliance with DFARS 252.225-7014, Alternate 1, Deviation 20008-00002, "Preference for Domestic Specialty Metals."

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