

# GLOSSARY OF RF TERMS

**MIL:** Abbreviation for "Military" (as in Military Standards.)

**Mixer:** Provides frequency translation from the input signal to the output signal. It is a nonlinear electrical circuit that creates new frequencies from two signals applied to it.

**Noise:** Random electrical signals, generated by circuit components or by environmental disturbances.

**Passive Intermodulation (PIM):** Simply put, Passive Intermodulation (PIM) is interference of a signal. PIM is a nonlinear response that occurs when two or more signals are present in a passive device such as a cable, connector, coupler. PIM is typically caused by dissimilar metals or dirty/loose interconnects.

**Phase Shift:** The change in time experience by voltage or current after passing through a circuit or cable. Phase shift is a delay in time that is commonly expressed in degrees or picoseconds when it relates to connectors or cable assemblies.

**Polarization:** Describes how a material responds to an applied electric field as well as the way the material changes the electric field.

**Propagation:** Moving or Transmitting energy along a path.

**Pulse:** A rapid change in signal level over a relatively short period of time.

**Receiver:** A device that detects a signal and converts it into an electrical form that is usable by other electronic devices.

**Return Loss:** Expressed in dB, it is a measure of the amount of reflected power on a transmission line when it is terminated or connected to any passive or active device.

**RF Leakage:** The amount of signal frequency which radiates (leaks) from the RF connector or cable.

**RG/U:** Symbol for cables that are made to Government Specification. The "R" stands for Radio Frequency, the "G" means Government, the corresponding number specifies the government approval, and the "U" means it is a universal specification.

**Rubber Duck Antenna:** An electrically short, omnidirectional antenna used on wireless devices such as GPS receivers. These antennas typically have a flexible plastic shield.

**Semi-Rigid:** A cable with rigid outer conductor that contains a flexible inner conductor and dielectric that form a coaxial transmission line.

**Shielding:** The metal sleeve surrounding the conductors in a wire circuit or cable to prevent interference or leakage.

**Surface Mount Device:** Abbreviated as SMD, it is an active or passive device designed to be soldered to the surface of a printed circuit board.

**Temperature:** Refers to the minimum and maximum temperatures that a given component can operate at while still meeting all specifications unless otherwise noted.

**Termination:** Also known as a Load, terminations are used at the end of a transmission line and are designed to absorb RF power with very little reflection, effectively terminating the line.

**Torque:** Recommended mating torque for industry standard connectors: SMA = 7 to 10 in-lbs; Type-N = 12 to 15 in-lbs; TNC = 12 to 15 in-lbs; 7/16 DIN = 220 to 300 in-lbs.

**Twinax Cable:** Similar to coax cable, but has two inner conductors instead of one. Typically used for very-short-range applications.

**Twinax Connector:** Two-Pole symmetrical connectors that maintain a balanced transmission line. Twinax connectors are ideal for applications using shielded twin-wire cables with different impedances in the range of 75 to 95 Ohms.

**VSWR:** Abbreviation for Voltage Standing Wave Ratio. VSWR is an efficiency measurement of how radio frequency is transmitted from a power source through a transmission line, into a termination (or load).

**Waveguide:** Used at microwave frequencies, waveguides are metallic transmission lines typically used to interconnect transmitters and receivers with antennas.

**Yagi:** A directional, shortwave radio antenna consisting of a horizontal conductor with several insulated dipoles parallel to and in the plane of the conductor.

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**Absorption:** The loss of power resulting from conversion of power into heat.

**Albaloy:** A "tri-metal" plating finish comprised primarily of copper, tin and zinc which provides good electrical performance. It also provides excellent passive intermodulation (PIM) performance comparable to silver.

**Attenuation:** Attenuation, measured in decibels (dB), is the reduction in signal power that occurs when a signal travels over long distances.

**Bandwidth:** The difference between the upper and lower frequencies in a continuous set of frequencies.

**Circulator:** A passive, three-port device used to control the direction of signal flow in an RF circuit.

**Coaxial Cable:** A cable with an inner conductor surrounded by a flexible and tubular insulating layer, then surrounded by a tubular conducting shield.

**Coaxial Connector:** Typically used with coaxial cables, these connectors are designed to maintain shielding and minimize the change in transmission line impedance at the connection. A RF connector is an electrical connector designed to work at radio frequencies.

**Contact:** The part of an interconnect that interfaces between the connector and the lead or coaxial center conductor on the device being connected.

**DC block:** A capacitor that allows you to separate Direct Current (DC) voltages along a transmission line.

**Decibel (dB):** A decibel is a logarithmic unit expressing the ratio of two powers. It is ten times the logarithm to base 10 of the ratio of two powers.

**Dielectric:** In a coaxial cable, the dielectric is the insulation between the inner and outer conductor. Dielectric influences the electrical properties such as impedance and velocity.

**Diode:** An electronic device with low resistance that allows current to flow in only one direction.

**DWV:** Acronym for Dielectric Withstanding Voltage. DWV is the minimum voltage requirement of a connector's insulating material to ensure high voltage surges will not cause dielectric failure.

**Ferrule (Coaxial):** A short tube used to make solderless connections to a coaxial cable (as in crimping)

**Ferrule (FO):** A component of a fiber optic connection that aligns and holds a fiber in place.

**Fiber Optics:** The transmission of radiant energy (or light) through an optical wave guide, generally made of glass or plastic.

**Flange:** A projection with holes extending a connector or waveguide that permits mounting the connector or waveguide to a panel, or to another mating half.

**Frequency:** Is a signal of alternating current (AC) that swings from a high peak to a negative point. Each swing from crest to trough of the wave is called a cycle. Frequency is the number of cycles per second that is measured in Hz (Hertz), where 1 Hz = 1 CPS (Cycles per second)

**Gain:** The ratio of power output to the power input of the amplifier in dB.

**GHz:** Frequency measurement that equals a billion cycles per second. For example, 7 GHz = 7 billion cycles per second.

**Impedance:** A measurement of resistance calibrated in "Ohms" which varies with frequency.

**Insertion Loss:** In a transmission system, it is the change in load power due to the insertion of a particular device.

**Jacket:** On a coaxial cable, it is a non-metallic, outer protective cover applied over an insulated wire or cable.

**Land Mobile Radio:** Also referred to as LMR, is a wireless communications system intended for terrestrial use, typically by users in vehicles or on foot.

**MHz:** Frequency measurement that equals a million cycles per second. For example, 3 MHz = 3 million cycles per second.

**Microwave:** A wavelength on the electromagnetic spectrum lying between the infrared and the radio frequency range. Microwaves extend from 1 GHz to 300 GHz.