

GLOSSARY OF TERMS AND ACCRONYMS

AMI (Alternate Mark Inversion): A bipolar coding scheme in which successive ones (marks) must alternate in polarity.

Analog: A continuous wave or signal (such as human voice).

Analog Transmission: The transmission of a continuously variable signal, as opposed to a discrete (digital) one.

ANSI: American National Standards Institute.

Asynchronous Transmission: A transmission method that sends units of data one character at a time. Characters are preceded by start bits and followed by stop bits, which provide synchronization at the receive terminal. Also called start-stop transmission.

ATM: Asynchronous Transfer Mode. A standard (ITU) implementation of cell relay, which is a packet switching technique using packets (cells) of a fixed length. It is asynchronous in the sense that the recurrence of cells containing information from an individual user is not periodic.

Attenuation: Signal power loss through equipment, lines or other transmission devices. Measured in decibels.

AWG: The American Wire Gauge System, which specifies wire diameter.

BACKSWING: (*Pulse Transformers*) The negative overshoot after the trailing edge reaches zero volts. Specified as a percentage of the pulse amplitude.

Balanced: A transmission line in which voltages on the two conductors are equal in magnitude, but opposite in polarity, with respect to ground.

Bandwidth: The range of frequencies passing through a given circuit. The greater the bandwidth, the more information can be sent through the circuit in a given amount of time.

Baud: Unit of signaling speed equivalent to the number of discrete conditions or events per second. If each signal event represents only one bit condition, baud rate equals bps (bits per second).

Bit: The smallest unit of information in a binary system. Represents either a one or zero ("1" or "0").

Bps (Bits Per Second): A measure of data transmission rate in serial transmission.

Broadband: Wideband technology capable of supporting voice, video and data, possibly using multiple channels.

Byte: A group of bits (normally 8 bits in length).

C_D: *see* Distributed Capacitance.

CSU (Channel Service Unit): Equipment installed on customer premises at the interface to phone company lines to terminate a DDS or T1 circuit. CSUs provide network protection and diagnostic capabilities.

CCITT: Consultative Committee for International Telephone and Telegraph.

CCITT I.430: Specifications for layer 1 of ISDN user-network interface.

CHOKER: Another word for Inductor.

CMRR: *see* COMMON MODE REJECTION RATIO

COMMON-MODE NOISE: Electrical interference that is common to both lines in relation to earth ground

COMMON MODE REJECTION RATIO: A measure of the isolation between a transformer's windings. For a specific input voltage and frequency with the primary terminals shorted, CMRR is the ratio of input voltage to output voltage measured at the loaded secondary output terminals.

CROSSTALK: The unwanted transfer (or pick up) of a signal from one transformer to another.

C_{WW}: *see* Interwinding Capacitance.

dB (Decibel) - Unit for measuring relative strength (ratio) of two signals.

dBm - A measure of power in communications: the decibel in reference to one milliwatt (0 dBm = 1 milliwatt and -30 dBm = .001 milliwatt)

DCR: Direct Current Resistance.

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DDS (Digital Data Service): A trademark of AT&T, identifying a private line service for digital data communications in the data rate range between 2400 and 56,000 bps. Commonly used in countries other than the U.S.A. at 64 or 128 kbps or higher.

DISTRIBUTED CAPACITANCE: The shunt capacitance of the winding being measured.

Dielectric Strength: The dielectric strength is a measurement of isolation between each winding and/or windings and the core. The voltage applied is typically a 60Hz root-mean-squared (rms) voltage.

DIFFERENTIAL-MODE NOISE: Electrical interference that is not common to both lines but is present between both lines. (Normal Mode noise)

DIL: Dual-In-Line. A thru-hole device with leads emerging from bottom of package.

DIP: Dual in Line Package. A molded product suitable for auto-insertable technology. Rhombus' DIP parts are also available in Gullwing or J-Bend lead styles for surface mount applications.

Distortion: The unwanted change in a signal's waveform occurring between two points in a transmission system.

DROOP: The drop in amplitude of the pulse from. Measured from the amplitude of the pulse to the top of the trailing edge of the pulse. Droop is specified as a percentage of the amplitude.

Dry: Refers to a transformer which is designed to carry no Direct Current in its windings.

DS-3: Digital Signal level 3. Term used to refer to the 45 Mbps digital signal carried on a T3 facility.

DSU (Digital Service Unit): A user device interfacing to a digital circuit (such as DDS or T1 when combined with a CSU). The DSU converts the user's data stream to bipolar format for transmission.

DTE: Data Terminal Equipment

E1: The 2.048 Mbps digital carrier system common

in Europe.

E3: The European standard for high-speed digital transmission, operating at 34 Mbps

ECMA: European Computer Manufacturers Association

Echo Cancellation: A technique used in high speed modems and voice circuits to isolate and filter out unwanted signal energy caused by echoes from the main transmitted signal.

Echo-Signal: Distortion occurring when a transmitted signal is echoed back (reflected) to the originating station.

EIA (Electronic Industries Association) - A standards organization in the U.S. specializing in the electrical and functional characteristics of interface equipment.

EMI (Electromagnetic Interference) - Radiation leakage outside a transmission medium resulting mainly from the use of high frequency wave energy and signal modulation. EMI can be reduced by appropriate shielding.

ENERGY STORAGE: The amount of energy stored in an inductor. Values of Rhombus Inductors are generally given in mJoules. Formula for energy storage is $LI^2/2$.

ET-CONSTANT: A measurement of the flux density level of a transformer. The maximum obtainable time and voltage product across a winding.

ETHERNET: A standard for Local Area Networks. Ethernet utilizes coaxial cables and CSMA/CD

FCC (Federal Communications Commission) - The regulatory agency established in the United States for all interstate radio and electronic communications.

FDDI (Fiber Distributed Data Interface): An ANSI standard for fiber optic links with data rates up to 100 Mbps.

Fiber Optics: Thin filaments of glass or plastic carrying a transmitted light beam (generated by an LED or laser).

Full Duplex: A circuit or device permitting transmission in two directions at the same time.

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G.703: An ITU standard for the physical and electrical characteristics of various digital interfaces, including those at 64 kbps and 2.048 Mbps.

HDSL (High Bit-Rate Digital Subscriber Line): A high-performance twisted pair transmission technology, best known as an enhanced transport mechanism for T1 or E1 service. It is designed for the local loop between a customer's premises and an area exchange central office.

Half Duplex: A circuit or device capable of transmitting in two directions, but not at the same time.

HIGH POTENTIAL (HI-POT) TEST: Typically this refers to Insulation Resistance (IR) test. Consult appropriate data sheet for information.

IEEE (Institute of Electrical and Electronic Engineers) - An international professional society issuing its own standards. The IEEE is a member of ANSI and ISO.

IEEE 802.3: The industry standard for a bus local area network using CSMA/CD.

IEEE 802.4: The industry standard for a token bus local area network.

IEEE 802.5: The industry standard for a token ring local area network.

INSERTION LOSS: The difference between the power received at the load before, and after, the insertion of the transformer.

INSULATION RESISTANCE (IR): The IR test, sometimes referred to as DC Insulation Resistance, is a test to determine the insulating properties of the transformer. The direct-current insulation resistance is measured between each winding and all other windings and the core or case. Specified as a minimum value, it is measured in Megohms at a particular DC voltage, typically 50 to 500 V, applied for a minimum of 10 seconds.

INTERWINDING CAPACITANCE: The capacitance between primary and secondary windings.

ISDN: Integrated Services Digital Network.

ISO (International Standards Organization) -

An international organization involved in writing communications standards.

ITU (International Telecommunication Union) - A European-based, international advisory committee recommending worldwide standards for transmission.

Jitter: The deviation of a transmission signal in time or phase. It can introduce errors and loss of synchronization in high speed synchronous communications.

LAN: (Local Area Network)

Leakage Inductance: The part of the inductance of one winding which does not link to another.

Modem (Modulator-Demodulator) - A device used to convert serial digital data from a transmitting DTE to a signal suitable for transmission over extended distances. It also reconverts the transmitted signal to serial digital data for acceptance by a receiving DTE.

Modulation: The alteration of a carrier wave in relation to the value or samples of the data being transferred.

OCL: see Open Circuit Inductance

OPEN CIRCUIT INDUCTANCE: The inductance of one winding (usually the primary) with other windings open. OCL effects the top of the pulse.

OVERSHOOT: The difference between the amplitude of the output pulse and the peak amplitude. Overshoot is measured as a percentage of the amplitude.

PBX (Private Branch Exchange) - A private telephone exchange.

PCM (Pulse Code Modulation): A procedure for adapting an analog signal (such as voice) into a 64 kbps digital bit stream for transmission. PBX trunks and data equipment.

PERCENT RIPPLE: The percentage of ripple or AC flux to total flux, or in an inductor, the percentage of alternating current to average current.

PULSE AMPLITUDE: The maximum amplitude of the flat top portion of the pulse. Measured in Volts.

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Repeater: A device which automatically amplifies, restores, or reshapes signals to compensate for distortion and/or attenuation prior to retransmission.

RETURN LOSS: At a discontinuity in a transmission system, the difference between the power incident upon, and the power reflected from, the discontinuity. Typically measured in dB.

RISE TIME: The time required for the leading edge of a pulse to increase from 10% to 90% of the pulse amplitude.

Shielding : The protective enclosure surrounding a transmission medium, designed to minimize electromagnetic interference (EMI/RFI).

SINGLE LAYER WINDING: A winding for a toroid core which will result in the full utilization of the inside circumference of the core without the overlapping of turns. The thickness of insulation and tightness off winding will affect results.

STARLAN: Local Area Network utilizing star topology.

STP (Shielded Twisted Pairs): General term for cabling systems that are designed specifically for data transmission, and where the cables are shielded.

SWING: (*Power Inductors*) A term used to describe how inductance responds to changes in current. Usually specified as a ratio of inductance change to current change.

Synchronous Transmission: Transmission in which data bits are sent at a fixed rate, with the transmitter and receiver synchronized.

T1: Digital transmission system operating at 1.544 Mbps. (DS1-formatted digital signal)

TEMPERATURE RISE: The increase in surface temperature of a component in free-standing air due to the total power dissipation resulting from losses generated in the wire and core material.

TOKEN RING: A ring topology in LAN networks that uses a token for explicit access. IEEE 802.5

TURNS RATIO: The ratio of the number of turns in the primary winding to the number of turns in the secondary winding of a transformer. The turns ratio is often derived from the measurement of

input-to-output voltage ratio. Using a suitable oscilloscope with high impedance probes, the ratio may be determined by applying a unipolar or bipolar current or voltage pulse to one of the windings and measuring the ratio of the corresponding voltage-pulse amplitudes appearing on the windings. The input signal level applied should be kept sufficiently low so that the wave shape distortion caused by core saturation is minimized. When this is done, the difference between the turns ratio and the voltage ratio will be negligible.

UTP (Unshielded Twisted Pair): General term for all cabling systems used for transmission of data which are not shielded.

V.17: 14.4 Kbps Fax transmission over dial lines

V.21: 300 bps Dial line modulation

V.22: 1.2 Kbps Dial line modulation

V22bis: 2.4 Kbps Dial line modulation

V27bis: 4.8 Kbps 4-wire leased line modulation

V29: 9.6 Kbps 4-wire leased line modulation (Data & Fax)

V32: 9.6 Kbps Dial and 2 wire leased line modulation

V32bis: 14.4 Kbps Dial and 2 wire leased line modulation

V33: 14.4 Kbps 4-wire leased line modulation

V34: 28.8 Kbps Dial and 2 wire leased line modulation

V34+: 33.6 Kbps Dial and 2 wire leased line modulation

Wet: Refers to a transformer which is designed to carry a certain amount of Direct Current in it's windings.

Z_{oc}: The open circuit impedance of a transformer.