

Attachment No. 4

TERMINOLOGY REPORT

I reviewed the past CE-2.0 minutes and the terminology history folder, and these are my findings:

In October 2000 it was reported that SAE cancelled its terminology document ARP914 in favor of EIA 622, and requested the following terms to be added:

- Fireproof
- Firewall
- Firezone (area)
- Vaporproof (area)
- Composite connector (**Already in EIA-622**)
- SWAMP(area) Severe Wind and Moisture Problem

I reviewed the history folder and found work in process on 23 definitions (see attachment 1).

April 2002 - Review was underway to comparing EIA-622 and the IEC terminology document. It was reported "that so far they were very similar". Mr. Carl Fritz stated that new terms were being generated by the Electronic Signal Methods group. Mr. Frank Ruffino stated a need to clarify the terms "process temperature", "storage temperature", and "operating temperature". It was motioned to request a revision to EIA-622.

November 2002 – Project number PN5037 was established to revise EIA-622.

Review of CE-2.0 minutes to date indicates no further activity on PN5037.

I e mailed Carl Fritz to determine status of PN5037. E mail from Carl Fritz on 9/25/05 states the project number is still good.

OTHER ITEMS

I received 32 definitions from Luanne Witt of the EIA High Speed Working Group (Attachment 2).

6 additional definitions (Attachment 3) along with the "reactance" definition on page 4 of attachment 2 were never finalized by the committee. These should be discussed by persons familiar with high speed testing. Otherwise they should be dropped.

I also have a request from Ron Gary of DSCC-VAI, RF connector group and Government liaison to CE-4.0, to add a definition for "Passive Intermodulation (PIM)" (Attachment 4).

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Regrind

Grinding of spurs and runners or any by-product of the molding process and combined with any percentage of virgin material.

Recombined

Process of recombining, spurs, runners and molding by-products with original (virgin) materials to produce a final product certified to the original manufacturers specifications including fiber length and content.

Captive hardware

hardware which is held in place by some mechanical means.

Herzian

Calculation of weight distributed over a cross sectional area (point of contact) in psi or Mpa

Mating hardware

A mechanical device that fastens connector halves together

Mounting hardware

A mechanical device that mounts connector assemblies to a piece of equipment or circuit board.

Precious metal alloy

metals that contain high composition weights of the stable metals Gold (Au), Platinum (Pt), Palladium (Pd) and Silver (Ag) Meeting discussion suggested the use of the term "NOBLE", in chemistry "noble" means non reactive and is used with a group of gasses from Helium through Radon

Point of electrical contact

The position of application of the force which provides electrical contact

Contact active area

See "contact Area"

Triaxial contact

Assembly of three contacts arranged coaxially as inner, intermediate, and outer contacts, enabling the termination of shielded triaxial or twisted pair cables. (Sometimes referred to as concentric twinax) (see triaxial construction)

Bifilar contact (twinax)

Assembly of three contacts consisting of two inner contacts arranged parallel to one another with the third contact peripheral to, and encircling the two inner contacts, enabling termination of screened twisted pair cables.

Male concentric

A concentric or triaxial contact where the outer contact is male; and the center contact(s) may be male or female. Also referred to as a triaxial contact.

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Female concentric

A concentric or triaxial contact where the outer contact is female: and the center contact(s) may be male or female.

Blind mate

Allows both connector halves to be joined in a normal engaging mode when either one or both connectors are concealed.

Low level circuit

Open circuit voltage less than 20 mv

Anti-bind roll off

Feature that prevents shell binding caused by side loads during mating/demating.

Zero insertion force socket (ZIF)

A socket in which contact surfaces normally do not mechanically touch until after mating thus requiring no component insertion force. After mating the contacts are actuated in some manner to make intimate electrical contact.

Low insertion force socket (LIF)

A socket in which the contact surfaces normally touch as they are mated and demate. Values are generally established as a force below one Newton (.225 pound) per contact, but greater than zero Newton's (0 pounds).

Normal insertion force socket (NIF)

A socket in which the contact surfaces touch as they are mated and demated. Values are generally established as a force above one Newton (.225 pound) per contact.

Maximum operating temperature

The maximum ambient temperature at which a connector will operate continuously within specified performance levels.

First make

The first conductive element to make physical electrical contact when two connector halves or a socket and an electrical component are physically mated together.

Last break

The last conductive to lose physical contact when two connector halves or a socket and an electrical component which have been previously mated, are physically separated from one another.

Conductance

The measure of a materials ability to conduct electric charge. The real part of the complex representation of admittance.

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ATTENUATION

The reduction of average power during the transmission of a signal from the input to the output of the device under test, usually measured in decibels (dB).

BIT PERIOD

The time interval between the successive like edges of the clock signal (rise to rise or fall to fall). This is the reciprocal of the clock frequency.

CROSSTALK (From EIA-622)

The phenomenon in which a signal transmitted on one wire of a cable of a transmission system is detectable in another adjacent wire: also known as bleed through.

CROSSTALK RATIO

The ratio of the signal coupled (induced) into the quiet signal conductor or conductor pair to the magnitude of the signal in the driven conductor or conductor pair. Both signals shall have the same units of either voltage or current, and the ratio may be expressed as percent or dB.

DIFFERENTIAL NOT BALANCED

DRIVE SIGNAL

For the time domain method, the drive signal is a step wave form. For the frequency domain method, the drive signal is sinusoidal.

EYE PATTERN

An oscilloscope display of synchronized pseudo-random digital data (signal amplitude versus time), showing the superposition of accumulated output waveforms.

FAR END CROSSTALK RATIO (FEXT)

The crosstalk ratio calculated on the quiet line at or in proximity to the receiving (destination) end of the driven line. Thus is the ratio of the far end quiet line signal amplitude of the driven line at the near end. This is the amp

IMPEDANCE

The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency. It is a combination of the resistance (R) and reactance (X) measured in ohms (Ω). The equation for impedance as a function of s-parameters is:

$$Z = Z_0 \frac{1 + s_{11}}{1 - s_{11}} = R + jX = Z_0 \left[\frac{(1 + \rho)}{(1 - \rho)} \right]$$

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INDUCTANCE (Official EIA definition)

The property of a circuit or circuit element that opposes a change in current flow. Inductance causes current changes to lag behind voltage changes. It is measured in henrys.

INDUCTIVE REACTANCE

The imaginary part of the impedance due to the inductance.

INSERTION LOSS

The power loss in a transmission cable assembly or system caused by the installation of a component such as a connector, splice or coupler; typically measured in decibels (dB). It includes losses incurred by the specimen and mismatch losses at the input and output of the specimen. When the impedance of the specimen matches that of the specimen environment impedance “insertion loss” = “attenuation”.

ISOLATION STANDARD

A reference fixture without a test sample and with identical crosstalk characteristics as the test fixture. This fixture may or may not be part of the test board.

JITTER

The difference between the earliest and latest times at which a signal crosses a specified reference voltage level.

Loop inductance (L_{Loop})

The inductance of two or more conductors in which the current flows into one conductor and returns through the other(s). The loop is defined as the current path inscribed by the ‘drive’ and ‘return’ path in the conductors.

$$L_{Loop} = L_1 + L_2 - (2 * L_m)$$

where: L_1 = self inductance of the driven conductor

L_2 = self inductance of the return path conductor(s)

L_m = mutual inductance between the drive and return path conductors.

MEASUREMENT SYSTEM RISE TIME

Rise time measured with the fixture in place, without the specimen, and with filtering (or normalization). Rise time is typically measured from the 10% to 90% level.

MUTUAL INDUCTANCE (L_m)

The common property of two electric conductors whereby a voltage (electromotive force) is induced across one conductor by a change of current in the other conductor.

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MUTUAL INDUCTANCE COUPLING COEFFICIENT (K_m)

The measure of degree of magnetic coupling between two conductors. It is a unitless parameter and is defined as follows:

$$K_m = \frac{L_m}{\sqrt{L_1 * L_2}}$$

NEAR END CROSSTALK RATIO (NEXT)

The crosstalk ratio calculated on the quiet line at or near the sending (signal source) end of the driven line.

PROPAGATION DELAY

(1)The time it takes for a signal to travel between two specified points of an interconnect system.

PROPAGATION DELAY (From EIA 622)

(2)Time delay between input and output of signal usually measured in nanoseconds per foot of cable.

RANDOM EYE PATTERN

The eye pattern measured through the fixture without the test specimen.

REACTANCE (1)From "The IEEE Standard Dictionary of Electrical and Electronics Terms" 6th Ed, IEEE Std 100-1996:

Reactance (1) The product of the sine of the angular phase difference between the current and potential difference times the ratio of the effective potential difference to the effective current, there being no source of power in the portion of the circuit under consideration. The reactance of a circuit is different for each component of an alternating current. Note: The reactance for the entire periodic current is not the sum of the reactances of the components. A definition of reactance for a nonsinusoidal periodic current has not yet been agreed upon.

(2) From Introduction to Electrical Engineering by Hayt,1968:

Reactance- The imaginary part of the impedance is called the reactance, symbolized by X and measured in ohms. Since the real part of the impedance is called the resistance R, $Z = R + jX$.

REFLECTION COEFFICIENT

The reflection coefficient is the ratio of the reflected to incident voltages at any given point. The reflection coefficient is given by:

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RELATED TERMS

$$\text{Gamma } (\Gamma) = \frac{V_{\text{reflected}}}{V_{\text{incident}}} = \frac{Z_L - Z_O}{Z_L + Z_O} = s_{11}$$

where Z_L is the fixture or specimen impedance and Z_O is the specimen environment impedance.

NOTE — In the time domain, the reflection coefficient symbol typically used is rho (ρ), while Gamma (Γ) is used for frequency domain measurements.

RETURN LOSS

The ratio in decibels (dB) of the power incident upon the impedance discontinuity to the power reflected from the discontinuity. The equation for return loss calculated from the reflection coefficient is:

$$\text{Return Loss} = 20 \log_{10} |\Gamma| = 20 \log_{10} |s_{11}|$$

RISE TIME

The time required for a voltage step to occur, measured between its initial value and final value, typically from 10% to 90% levels.

RISE TIME DEGRADATION

The increase in rise time to a theoretically perfect (zero rise time) voltage step when the specimen is inserted in the transmission path. The formula used to calculate the rise time degradation for gaussian signals from 10% to 90% is as follows:

Rise time degradation =

$$\sqrt{(\text{measurement rise time})^2 - (\text{measurement system rise time})^2}$$

SCATTERING PARAMETER (S-PARAMETER), s_{11}

s_{11} is the reflection coefficient at the input port of the device under test, defined as the ratio of the reflected voltage to incident voltage.

SELF INDUCTANCE

The inductance of a single conductor.

SKEW

The difference in propagation delay between two signal paths.

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SPECIMEN ENVIRONMENT IMPEDANCE

The impedance presented to the signal conductors by the fixture. This impedance is a result of transmission lines, termination resistors, attached receivers or signal sources, and fixture parasitics.

STEP AMPLITUDE

The voltage difference between the 0% and 100% levels, ignoring overshoot and undershoot.

TERMINATION [electronics usage]

An impedance connected to the end of a transmission line, typically to minimize reflected energy on the line.

VOLTAGE STANDING WAVE RATIO (VSWR)

The ratio of the maximum magnitude of the voltage on a line to the minimum magnitude at any given point. VSWR can be expressed by the following equations:

$$\text{VSWR} = \frac{|V_{\max}|}{|V_{\min}|} = \frac{|V_{\text{inc}} + V_{\text{refl}}|}{|V_{\text{inc}} - V_{\text{refl}}|}$$

or

$$\text{VSWR} = \frac{(1 + |\Gamma|)}{(1 - |\Gamma|)}$$

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These definitions were never ruled on by the committee:

Definitions from The IEEE Standard Dictionary of Electrical and Electronic Terms, Sixth Edition, IEEE Std 100-1996

differential signal

(1) The instantaneous, algebraic difference between two signals.

(2) A signal that is conveyed between two separate conductors, instead of one active conductor and signal ground. The magnitude of the differential signal is the difference between the two signals, rather than the voltages between the two individual signals and ground.

differential voltage signal The voltage difference between the true and complementary signals from a driver with two single-ended outputs whose signals always complement each other. Differential signals are also referred to as “balanced signals.”

differential-mode voltage (1) The instantaneous algebraic difference between the potential of two signals applied to the two sides of a balanced circuit. Also *called metallic voltage* in the telephone industry.

(2) The instantaneous algebraic difference of two signals applied to a balanced circuit, where both signals are referred to a common reference.
(first choice)

balanced line (waveguide) (two conductor) A transmission line consisting of two conductors in the presence of ground capable of being operated in such a way that the voltages on the two conductors at all transverse planes are equal in magnitude and opposite in direction. The ground may be a conducting sheath, forming a shielded transmission line.

balanced wire circuit (data transmission) One whose two sides are electrically alike and symmetrical with respect to ground and other conductors. The term is commonly used to indicate a circuit whose two sides differ only by chance.

balanced voltages (1) (waveguide) (on a balanced line) Voltages relative to ground on the two conductors of a balanced line which, at every point along the line, are equal in magnitude and opposite in polarity.

DSCC-VAI, RF Connector definition request

Passive Intermodulation (PIM)

PIM is an unwanted signal or signals generated by the non-linear mixing of 2 or more frequencies in a passive device such as a connector or cable.