

EIA STANDARD

TP-90A

Crosstalk Ratio Test Procedure for Electrical Connectors, Sockets, Cable Assemblies or Interconnection Systems

EIA-364-90A

(Revision of EIA-364-90)

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Electronic Components Industry Association

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(From Standards Proposal No. 5434.03, formulated under the cognizance of the EIA CE-2.0 Committee on National Connector and Socket Standards.)

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TEST PROCEDURE No. 90A

CROSSTALK RATIO TEST PROCEDURE
FOR
ELECTRICAL CONNECTORS, SOCKETS,
CABLE ASSEMBLIES OR INTERCONNECT SYSTEMS

(From EIA Standards Proposal No. 5434.03, formulated under the cognizance of the EIA CE-2.0 Committee on National Connector and Socket Standards, and previously published as EIA-364-90.)

1 Introduction

1.1 Scope

This procedure applies to interconnect assemblies, such as electrical connectors, sockets and cable assemblies.

1.2 Object

This standard describes test methods for measuring the magnitude of the electromagnetic coupling between driven and quiet lines of an interconnect assembly. Both time domain (method A) and frequency domain methods (method B), single-ended and differential transmission, and insertion and reference fixture techniques are described.

1.3 Definitions

1.3.1 Drive signal

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

1.3.2 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.

1.3.3 Near end crosstalk ratio (NEXT)

The crosstalk ratio calculated on the quiet line at or in proximity to the sending (signal source) end of the driven line. This is the ratio of the near end quiet line signal amplitude to the near end driven line signal amplitude.

1.3.4 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. This is the ratio of the far end quiet line signal amplitude to the near end driven line signal amplitude.

1.3.5 Measurement system rise time

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

1.3.6 Specimen environment impedance

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

1.3.7 Step amplitude

The voltage difference between the 0% and 100% levels, ignoring overshoot and undershoot, as indicated in figure 1.

1.3.8 Isolation standard

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

1.3.9 Termination (electronics usage)

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

2 Test resources

2.1 Equipment

2.1.1 Method A, time domain

2.1.1.1 A step generator is used on the driven line and an oscilloscope monitors the quiet line. In a differential application both shall be able to process differential signals. Typically, this means complementary outputs with provision for amplitude and skew adjustment, and dual inputs with a display of the difference and sum. Filtering or normalization shall be available for varying the rise time. A time domain reflectometer (TDR) is usually used.