

Connectors for electronic equipment — Tests and measurements —

Part 25-1: Test 25a — Crosstalk ratio

The European Standard EN 60512-25-1:2001 has the status of a British Standard

ICS 31.220.10

National foreword

This British Standard is the official English language version of EN 60512-25-1:2001. It is identical with IEC 60512-25-1:2001.

The UK participation in its preparation was entrusted by Technical Committee EPL/48, Electromechanical components for electronic equipment, to Subcommittee EPL/48/2, Connectors for electronic equipment, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Tests and measurements
Part 25-1: Test 25a - Crosstalk ratio
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CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 48B/1059/FDIS, future edition 1 of IEC 60512-25-1, prepared by SC 48B, Connectors, of IEC TC 48, Electromechanical components and mechanical structures for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60512-25-1 on 2001-10-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
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- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2004-10-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex A is normative and annex B is informative.

Endorsement notice

The text of the International Standard IEC 60512-25-1:2001 was approved by CENELEC as a European Standard without any modification.

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CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS–

Part 25-1: Test 25a – Crosstalk ratio

1 General

1.1 Scope and object

This part of IEC 60512 applies to interconnect assemblies, such as electrical connectors, sockets and cable assemblies.

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

1.2 Definitions

For the purpose of this part of IEC 60512, the following definitions apply.

1.2.1

drive signal

a step waveform (in the time domain) or a sinusoidal waveform (in the frequency domain)

1.2.2

crosstalk ratio

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 have the same units of either voltage or current, and the ratio may be expressed in per cent or decibels (dB)

1.2.3

near end crosstalk ratio (NEXT)

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

1.2.4

far end crosstalk ratio (FEXT)

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

1.2.5

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

1.2.6

specimen environment impedance

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

1.2.7

step amplitude

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

1.2.8

isolation standard

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

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.

NOTE The test professional should be aware of limitations of any mathematical operation(s) performed by an instrument, (e.g. normalization or software filtering).

2.1.1.2 Probes

Probes, when used, shall have suitable rise time performance and circuit loading characteristics (resistance and capacitance).

2.1.2 Method B, frequency domain

A network analyzer is preferred. When greater dynamic range is desired, a signal generator and spectrum analyzer or a vector network analyzer (for measurement with full 2-port calibration) may alternatively be used. If necessary, additional equipment to increase the measurement sensitivity (e.g. broadband output amplifiers or low-noise preamplifiers) may be used. A multi-port network analyzer with appropriate software or baluns may be used for differential measurements.

2.2 Fixture

Unless otherwise specified in the referencing document, the specimen environment impedance shall match the impedance of the test equipment. Typically, this will be 50 Ω for single-ended measurements and 100 Ω for differential.