SLOVENSKI STANDARD

SIST EN 60512-25-6:2005

marec 2005

Konektorji za elektronsko opremo – Preskusi in meritve – 25-6. del: Preskus 25f: očesni diagram in trepetanje (IEC 60512-25-6:2004)

Connectors for electronic equipment - Tests and measurements - Part 25-6: Test 25f: Eye pattern and jitter (IEC 60512-25-6:2004)

ICS 31.220.10

Referenčna številka
SIST EN 60512-25-6:2005(en)

EUROPEAN STANDARD **EN 60512-25-6**

NORME EUROPÉENNE

EUROPÄISCHE NORM July 2004

ICS 31.220.10

English version

Connectors for electronic equipment - Tests and measurements Part 25-6: Test 25f: Eye pattern and jitter

(IEC 60512-25-6:2004)

Connecteurs pour équipements électroniques - Essais et mesures Partie 25-6: Essai 25f: Diagramme de l'oeil et gigue (CEI 60512-25-6:2004)

Steckverbinder für elektronische Einrichtungen - Mess- und Prüfverfahren Teil 25-6: Prüfung 25f - Augendiagramm und Jitter (IEC 60512-25-6:2004)

This European Standard was approved by CENELEC on 2004-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

Ref. No. EN 60512-25-6:2004 E

Foreword

The text of document 48B/1429/FDIS, future edition 1 of IEC 60512-25-6, 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 60512-25-6 on 2004-07-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2005-04-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2007-07-01

Endorsement notice

The text of the International Standard IEC 60512-25-6:2004 was approved by CENELEC as a European Standard without any modification.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60512-25-6

Première édition
First edition
2004-05

Connecteurs pour équipements électroniques – Essais et mesures –

Partie 25-6:
Essai 25f: Diagramme de l'oeil et gigue

Connectors for electronic equipment – Tests and measurements –

Part 25-6:
Test 25f: Eye pattern and jitter

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE Q

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 25-6: Test 25f: Eye pattern and jitter

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60512-25-6 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

The text of this standard is based on the following documents:

FDIS	Report on voting
48B/1429/FDIS	48B/1444/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended

CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 25-6: Test 25f: Eye pattern and jitter

1 Introduction

1.1 Scope and object

This part of IEC 60512 is applicable to electrical connectors, cable assemblies, or interconnection systems within the scope of IEC TC 48.

This standard describes methods for measuring an eye pattern response and jitter in the time domain.

1.2 Terms and definitions

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

1.2.1
eye pattern
oscilloscope display of synchronized pseudo-random digital data (signal amplitude versus time), showing the superposition of accumulated output waveforms

1.2.2
jitter
difference between the earliest and latest times at which a signal crosses a specified reference voltage level

1.2.3
bit period
time interval between the successive like edges (rise to rise or fall to fall) of the clock signal. This is the reciprocal of the clock frequency

1.2.4
skew
difference in propagation delay between two signal paths

1.2.5
measurement system rise time
rise time measured with fixture in place, without the specimen, and with filtering (or normalization). The rise time is typically measured from 10 % to 90 % levels

2 Test resources

2.1 Equipment

2.1.1 High speed pattern generator with clock output capable of producing a signal with specified rise and fall times and data pattern.

2.1.2 Signal analyzer with external clock input capable of infinite persistence display. This is typically a digital sampling oscilloscope (DSO) with sampling head. It is preferred that the DSO have a masking capability.

NOTE Make sure not to exceed the maximum allowable input ratings of the oscilloscope input ports. This will prevent costly damage and provide reliable measurements. Even signal excursions that are within the maximum allowable signal levels of the oscilloscope can result in unstable eye pattern responses.

2.2 Fixture

2.2.1 The test fixtures shall provide for proper signal(s) and ground pattern(s) and, if required, proper termination of adjacent signal lines.

2.2.2 When measuring a differential response, make sure that the test fixtures and test cables are delay matched to minimize the skew. It is recommended that the skew of the test cables and fixtures be less than 5 % of the bit period.

3 Test specimen

3.1 Description

For this test procedure, the test specimen shall be as follows.

3.1.1 Separable connectors

A mated connector pair.

3.1.2 Cable assembly

Assembled connectors and cables, and mated connectors.

3.1.3 Sockets

A socket and test device or a socket and pluggable header adapter.

4 Test procedure

4.1 General

4.1.1 Allow sufficient time for the equipment to warm-up and stabilize (according to the equipment manufacturer's instructions).

4.1.2 If the specimen does not have a single-ended characteristic impedance of 50 Ω or a differential impedance of 100 Ω, impedance matching pads should be used. The required values are calculated using the equations in Figures A.1 or A.2. Use standard resistors having values nearest the values calculated from these equations.

4.1.3 Adjust the data generator for proper signal characteristics. These include rise time, amplitude, data rate, and encoding scheme.

NOTE Rise time adjustments should be made using hardware filters at the signal source and not using software filtering on the analyzer.

4.1.4 Trigger the oscilloscope on the data generator clock signal, making sure the clock signal does not exceed the normal operating range of the clock input port.

4.1.5 Where possible, measure the eye pattern and/or jitter of the fixture and test cables without the specimen. Adjust the oscilloscope controls to display an eye pattern. The time base setting should be selected so that one unit interval (bit period) occupies at least 50 % of the horizontal display. The vertical sensitivity should be selected so that the signal amplitude occupies 50 % to 100 % of the vertical display. See Annex B for examples.

4.2 Eye pattern

4.2.1 Method A, mask test

4.2.1.1 Set the oscilloscope to infinite persistence display mode and set data acquisition to stop after the required number of waveforms.

4.2.1.2 Insert the specimen and initiate data acquisition to generate a preliminary eye pattern.

4.2.1.3 After the preliminary eye pattern data has been acquired, display or create the desired mask. Make sure the eye pattern and mask are positioned with respect to each other and centered on the horizontal axis of the display). The mask should be placed (left to right) so that it best fits into the eye pattern. See Figures B.3 and B.4 for examples.

4.2.1.4 If available, enable the function on the DSO that counts the number of data points that fall within the mask (referred to as "mask hits").

4.2.1.5 Initiate data acquisition to generate a new eye pattern.

4.2.1.6 After the data acquisition is completed, record the number of mask hits. If the automatic counting function ("hit counter") is not available on the DSO, count and record the number of mask hits.

4.2.1.7 If required by the referencing document, make a hard copy of the oscilloscope display.

4.2.2 Method B, eye opening test

4.2.2.1 Set the oscilloscope to infinite persistence display mode and set data acquisition to stop after the required number of waveforms.

4.2.2.2 Insert the specimen and initiate data acquisition to generate the eye pattern.

4.2.2.3 After the eye pattern has been acquired, measure and record the eye height at a time corresponding to 50 % of the bit period (V at 50 % t). Measure and record the eye width at a voltage level corresponding to 50 % of the signal amplitude (t at 50 % V).

4.2.2.4 If required by the referencing document, make a hard copy of the oscilloscope display.