



SLOVENSKI STANDARD
SIST EN 120004:2002

01-september-2002

Blank detail specification: Ambient rated photocouplers with phototransistor output

Blank Detail Specification: Ambient rated photocouplers with phototransistor output

VFB: Umgebungsbezogene Optokoppler mit Phototransistor-Ausgang

SPC: Photocoupleurs à température ambiante spécifiée, avec phototransistor en sortie

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Ta slovenski standard je istoveten z: EN 120004:1992

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ICS:

31.080.30 Tranzistorji Transistors

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en

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EUROPEAN STANDARD
 NORME EUROPÉENNE
 EUROPÄISCHE NORM

EN 120004

July 1992

UDC:

Supersedes CECC 20004 Issue 2:1987

Descriptors: Quality, electronic components, photocouplers

English version

Blank Detail Specification: Ambient rated photocouplers with phototransistor output

Spécification Particulière Cadre:
 Photocoupleurs à température
 ambiante spécifiée, avec
 phototransistor en sortie

Vordruck für Bauartspezifikation:
 Umgebungsbezogene
 Optokoppler mit
 Fototransistor-Ausgang

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This European Standard was approved by the CENELEC Electronic Components Committee (CECC) on 27 January 1992. CENELEC members are bound to comply with 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 General Secretariat of the CECC 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 CECC General Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom. The membership of the CECC is identical, with the exception of the national electrotechnical committees of Greece, Iceland and Luxembourg.

CECC

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

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

Foreword

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized System for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby acceptable in all member countries without further testing.

This European Standard was prepared by CECC WG 20, "Opto-Electronic Components and Liquid Crystal Devices".

The text of the draft based on document CECC 20004 Issue 2:1987 was submitted to the formal vote for conversion to a European Standard; together with the voting report, circulated as document CECC(Secretariat)3006 the following documents were approved by CECC as EN 120004 on 27 January 1992:

CECC 20004 Issue 1:1987 with Amendment 1 [SIST EN 120004:2002](#)

The following dates were fixed: <https://standards.iteh.ai/catalog/standards/sist/83f2b5c4-bbfa-44c5-a6fe-e92c9d666c0a/sist-en-120004-2002>

- latest date of announcement of the EN at national level (doa) 1992-12-22
- latest date of publication of an identical national standard (dop) 1993-06-22
- latest date of declaration of national standards obsolescence 1993-06-22
- latest date of withdrawal of conflicting national standards (dow) 2002-12-22

Förderverein für Elektrotechnische Normung (FEN) e. V.
Cenelec Electronic Components Committee

CECC

English version

Harmonized System of Quality Assessment for
Electronic Components

BLANK DETAIL SPECIFICATION:
AMBIENT RATED
PHOTOCOUPPLERS WITH
PHOTOTRANSISTOR OUTPUT

STANDARD PREVIEW
(standards.iteh.ai)

Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION PARTICULIERE CADRE:

PHOTOCOUPLEURS
A TEMPERATURE AMBIANTE
SPECIFIEE, AVEC
PHOTOTRANSTISOR EN SORTIE

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

VORDRUCK
FÜR BAUARTSPEZIFIKATION:
UMGEBUNGSBEZOGENE
OPTOKOPPLER MIT
PHOTOTRANSISTOR-AUSGANG



2 Edition
Issue
Ausgabe

CECC 20 004

1987

Contents

| | Page |
|---|------|
| Foreword | iii |
| 1 Mechanical description | 1 |
| 2 Short description | 1 |
| 3 Levels(5) of quality assessment | 1 |
| 4 Limiting values | 1 |
| 5 Electrical characteristics | 3 |
| 6 Marking | 4 |
| 7 Ordering information | 4 |
| 8 Test conditions and inspection requirements | 4 |
| 9 Additional information | 9 |
| Appendix A Endurance test conditions and limits | 10 |

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The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or certificate, of Conformity. The components produced under the system are thereby accepted by all member countries without further testing.

This specification has been formally approved by the CECC, and has been prepared for those countries taking part in the system who wish to issue national harmonized specifications for AMBIENT RATED PHOTOCOUPLEDERS WITH PHOTOTRANSISTOR OUTPUT. It should be read in conjunction with the current Regulations for the CECC System

At the date of printing of this specification, the member countries of the CECC are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Preface

This new edition of this blank detail specification was prepared by CECC Working group 20: "SEMICONDUCTOR OPTOELECTRONIC AND LIQUID CRYSTAL DEVICES". It is one of a series of blank detail specifications for semiconductor devices based on the generic specification CECC 20000.

With respect to issue 1 the most important changes are the additional requirement for photocouplers specified to bridge basic or supplementary insulation or to bridge double or reinforced insulation.

Voting [SIST EN 120004:2002](https://standards.iteh.ai/catalog/standards/sist/83f2b5c4-bbfa-44c5-a6fe-09203061c093/en-120004-1992)

<https://standards.iteh.ai/catalog/standards/sist/83f2b5c4-bbfa-44c5-a6fe-09203061c093/en-120004-1992>

The amendments inserted in this Issue 2 were circulated to the CECC for voting in documents listed below and were ratified by the president of the CECC for printing as a CECC Specification.


| Documents | Voting dates | Reports on voting |
|-----------------------|--------------|-----------------------|
| CECC(Secretariat)1831 | January 1986 | CECC(Secretariat)1900 |
| CECC(Secretariat)1855 | March 1986 | CECC(Secretariat)1920 |

NOTE This specification is published initially in English and French. The German text will follow as soon as it has been prepared.

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| AMBIENT RATED PHOTOCOUPLER WITH PHOTOTRANSISTOR OUTPUT | | | | | |
|--|--|-----------|--|------|---|
| [Name (address) of responsible ONH (and possibly of body from which specification is available)] | ① | Page of | CECC 20004-XXX | ② |  |
| ELECTRONIC COMPONENT OF ASSESSED QUANTITY IN ACCORDANCE WITH: CECC 20000, issue 1 [and national references if different] | ③ | | [National number of detail specification This box may not be used if national number includes CECC number] | ④ | |
| 1 Mechanical description Either outline references (code A) or base and case references (codes B + C): — from IEC 191-2: — national [if applicable] OUTLINE DRAWING AND CONNECTIONS (Terminal connected to case, if any) [may be transferred to, or given with more details in, clause 9 of this specification] | ⑦ | | DETAIL SPECIFICATION FOR: [Type number (s) of relevant device (s) and, if appropriate structurally similar devices] ORDERING INFORMATION: see clause 7 of this specification | ⑤ | |
| MARKING: letters and figures/colour code [see 2.5 of CECC 20000 and/or clause 6 of this specification] Polarity indication if special method is used | | | 2 Short description Semiconductor material: Ga As/Si ... Encapsulation: metal/glass/plastic/ ... Application: Isolated signal transmission Power: ambient-rated (T_{amb}) [It should be stated here if the device is suitable to bridge basic or supplementary insulation or to bridge double or reinforced insulation.] | ⑥ | |
| | | | [Some important quick reference data may be added] | | |
| | | | 3 Level(s) of quality assessment Class S, T or V (according to endurance test) | ⑧ | |
| 4 Limiting values (Absolute maximum rating system) These apply over the operating temperature range, unless otherwise stated. [X denotes that d value shall be inserted in the detail specification] | | | | ⑨ | |
| Clause | [Repeat only clause numbers used, with text. Additional values, if any shall be given at the appropriate place without clause number (s). Curves should preferably be given in clause 9 of this specification] | Symbol | Value | | Unit |
| | | | min. | max. | |
| 4.1 | Operating ambient temperature | T_{amb} | X | X | $^{\circ}\text{C}$ |
| 4.2 | Storage temperatures | T_{stg} | X | X | $^{\circ}\text{C}$ |
| 4.3 | Soldering temperature Soldering time and minimum distance to case shall be given Recommended mounting conditions (temperature, duration ...) may be given in clause 9 of this specification | T_{sld} | | X | $^{\circ}\text{C}$ |
| 4.4 | Input reverse voltage | V_R | | X | V |
| 4.5 | Collector emitter voltage $I_B = 0$ | V_{CEO} | | X | V |
| 4.6 | Where there is a base connection, collector base voltage with $I_E = 0$ | V_{CBO} | | X | V |
| 4.7.1 | Where there is a base connection emitter base voltage with $I_C = 0$ (Continued on next page) | V_{EBO} | | X | V |
| Information about manufacturers who have components qualified to this detail specification is available in the current CECC 00200: Qualified Products List. | | | | | |

| Clause | [Repeat only clause numbers used, with text. Additional values, if any shall be given at the appropriate place without clause number (s). Curves should preferably be given in clause 9 of this specification] | Symbol | Value | | Unit |
|---|--|----------------|-------|------|------------------|
| | | | min. | max. | |
| and/or | | | | | |
| 4.7.2 | Emitter collector voltage (where there is no base connection) | V_{ECO} | | X | V |
| 4.8 | Input-to-output working voltage (device operating) | V_{IOWM} | | X | V |
| 4.9 | Continuous input forward current at $T_{amb} = 25^\circ\text{C}$ see derating curve or derating factor | I_F | | X | mA |
| 4.10 | Peak input forward current at $T_{amb} = 25^\circ\text{C}$ under specified pulse condition. See derating curve or derating factor. | I_{FRM} | | X | A |
| 4.11 | Output transistor Power dissipation at $T_{amb} = 25^\circ\text{C}$ | $P_{(output)}$ | | X | W |
| 4.12 | Total package power dissipation at $T_{amb} = 25^\circ\text{C}$ See derating curve and/or derating factor | P_{tot} | | X | W |
| <u>ISOLATION RELATED VALUES</u> | | | | | |
| 4.13 | Continuous or repetitive peak isolation voltage (45 Hz to 65 Hz) (see NOTE) | V_{IORM} | X | | V |
| 4.14 | Where appropriate, surge isolation voltage 1,2 $\mu\text{s}/50 \mu\text{s}$ pulses of each polarity (see NOTE) | V_{IOSM} | (X) | | V |
| 4.15 | Where appropriate, external air gap (clearance) Input terminals to output terminals | V_{IO1} | (X) | | |
| 4.16 | Where appropriate, external tracking path (creepage distance) Input terminals to output terminals | V_{IO2} | (X) | | |
| 4.17 | Where appropriate, tracking resistance ("KB-value") according to IEC 112 | V_{TR} | (X) | | |
| <u>ADDITIONAL REQUIREMENTS FOR PHOTOCOUPPLERS INTENDED TO BRIDGE BASIC OR SUPPLEMENTARY INSULATION OR TO BRIDGE DOUBLE OR REINFORCED INSULATION</u> | | | | | |
| Operation of the device at the following limiting values may lead to permanent damage and satisfactory operation may no longer be assumed. However, the isolation resistance (see sub-clause 5.12) shall not be impaired and shall stay within the specified limits. The case shall not burst nor shall parts break away and the case shall not melt or burst into flame. | | | | | |
| 4.18 | Ambient temperature | | | X | $^\circ\text{C}$ |
| 4.19 | Maximum input voltage (d.c. and/or r.m.s.) | | | X | V |
| 4.20 | Maximum input current (d.c. and/or r.m.s.) | | | X | A |
| 4.21 | Maximum output voltage (d.c. and/or r.m.s.) | | | X | V |
| 4.22 | Maximum output current (d.c. and/or r.m.s.) | | | X | A |

NOTE All input terminals shall be short-circuited and all output terminals shall be short-circuited.

5 Electronic characteristic See clause 8 of this specification for inspection requirements (Groups A and C)

[Signs between brackets correspond to characteristic given as "Where appropriate" or as alternatives:

— Those characteristic marked "where appropriate" in this clause and in the inspection section shall either be committed or if specified, shall then be measured.

— For equivalent characteristics given as alternatives, the choose should preferably be left open to allow the use of the same detail specification by different manufacturers or countries.

Repeat only clause numbers used, with text. Any additional characteristic if any, shall be given at the appropriate place without clause number.

When several devices are included in the same detail specification, the relevant values should be given on successive lines where possible avoiding repeating identical values.]

| Clause | Measured | Characteristics and conditions, at $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise stated $I_B = 0$, except for h_{FE} and I_{CBO} | Symbol | Value | | Unit |
|--------|----------|--|----------------|-------|------|---------------|
| | | | | min. | max. | |
| 5.1 | A2b | Forward input voltage at specified I_F (d.c. and/or under specified pulse conditions at specified pulse width and duty cycle) | V_F | | X | V |
| 5.2 | A3 | Collector-emitter saturation voltage at specified I_C and specified I_F | $V_{CE(sat)}$ | | X | V |
| 5.3 | A2b | Reverse input current at specified V_R | I_R | | X | nA |
| 5.4 | A2b | Collector-emitter cut-off current at specified V_{CE} and $I_F = 0$ | I_{CEO} | | X | nA |
| 5.5 | A4 | Collector-base cut-off current at specified V_{CB} and $I_F = 0$ | I_{CBO} | | X | nA |
| 5.6 | A4 | Static value of the foreword current transfer ratio (where the base connection is present) at specified V_{CE} and specified I_C and $I_F = 0$ | h_{FE} | X | (X) | |
| 5.7 | A2b | DC current transfer ratio at specified V_{CE} and preferably at typical operating I_F | $I_C/I_{F(1)}$ | X | (X) | |
| 5.8 | A3 | DC current transfer ratio at specified V_{CE} and at a lower I_F (preferably 2 mA) | $I_C/I_{F(1)}$ | X | | |
| 5.9 | C2a | Turn-on time at specified I_F or specified I_C and specified R_2 and V_{CC} | t_{on} | | X | μs |
| 5.10 | C2a | Turn-off time at specified I_F or specified I_C and specified R_2 and V_{CC} | t_{off} | | X | μs |
| 5.11 | | Small signal modulation cut-off frequency (3 dB point) under specified test conditions, if applicable. | f_c | (X) | | kHz |
| 5.12 | A2b | Isolation resistance between input and output at specified voltage, (preferably 1 000 V) (see Note) | R_{IO} | X | | Ω |
| 5.13 | C2a | Input to output capacitance at specified frequency (preferably 1 MHz), $I_F = 0$, $I_C = 0$ (see Note) | C_{IO} | | X | pF |

NOTE All input terminals shall be short-circuited and all output terminals shall be short-circuited.