SLOVENSKI STANDARD
SIST EN 120001:2002

01-september-2002

Blank detail specification: Light emitting diodes, light emitting diode arrays, light emitting diode displays without internal logic and resistor

Blank Detail Specification: Light emitting diodes, light emitting diode arrays, light emitting diode displays without internal logic and resistor

Vordruck für Bauartspezifikation: Leuchtdioden, Leuchtdiodenzeilen und Leuchtdioden-Anzeigen (-Displays) ohne interne Logik und Widerstand

Spécification particulière cadre: Diodes électroluminescentes, réseaux de diodes électroluminescentes, afficheurs à diodes électroluminescentes sans résistance ni circuits logiques internes

Ta slovenski standard je istoveten z: **EN 120001:1992**

ICS:

31.260	Optoelektronika, laserska oprema	Optoelectronics. Laser equipment

SIST EN 120001:2002 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 120001

May 1992

UDC:

Supersedes CECC 20001 Issue 2:1991

Descriptors: Quality, electronic components, light emitting diodes, light emitting diode arrays, light emitting diode displays

English version

Blank Detail Specification: Light emitting diodes, light emitting diode arrays, light emitting diode displays without internal logic and resistor

Spécification Particulière Cadre: Diodes électroluminescentes, réseaux de diodes électroluminescentes, afficheurs à diodes électroluminescentes sans résistance ni circuits logiques internes

Vordruck für Bauartspezifikation: Leuchtdioden, Leuchtdiodenzeilen und Leuchtdioden-Anzeigen (-Displays) ohne interne Logik und Widerstand

This European Standard was approved by the CENELEC Electronic Components Committee (CECC) on 20 February 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

Ref. No. EN 120001:1992 E

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 20001 Issue 2:1991 was submitted to the formal vote for conversion to a European Standard; together with the voting report, circulated as document CECC(Secretariat)3025 it was approved by CECC as EN 120001 on 20 February 1992.

The following dates were fixed:

- latest date of announcement of the EN at national level (doa) 1993-02-16
- latest date of publication of an identical national standard (dop) 1993-08-16
- latest date of declaration of national standards obsolescence 1993-08-16
- latest date of withdrawal of conflicting national standards (dow) 2003-02-16

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 LIGHT EMITTING DIODES, LIGHT EMITTING DIODE ARRAYS, LIGHT EMITTING DIODE DISPLAYS without internal logic and resistor. 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 specification was prepared by CECC WG 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.

CECC 20001 (1983) has been amended to include LIGHT EMITTING DIODE DISPLAYS. The amendments have no influence on the detail specifications established in accordance with CECC 20001.

The text of this specification was circulated to the CECC for voting in the documents listed below and was ratified by the President of the CECC for printing as a CECC Specification.

Document	Date of Voting	Report on the Voting
CECC (Secretariat) 1038	June 1981	CECC (Secretariat) 1148
CECC (Secretariat) 1039	June 1981	CECC (Secretariat) 1147
CECC (Secretariat) 1455	Sept 1984	CECC (Secretariat) 1625

This issue 2 of CECC 20001 shall become effective for all new qualification approvals from 1st March 1991. Issue 1 shall remain valid for existing qualification approvals.

TEXTS BETWEEN SQUARE BRACKETS GIVE GUIDELINES ON HOW TO FILL IN THE BLANK DETAIL SPECIFICATION

LIGHT EMITTING DIODES, LIGHT EMITTING DIODE ARRAYS, LIGHT EMITTING DIODE DISPLAYS

[Name (address) of responsible ONH (and possibly of body from which specification is available)] ①	Page of	CECC 20001-XXX ② [CECC detail specification number plus issue number and/or date]
ELECTRONIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH: CECC 20000, issue ...[and national references if different] ③	[National number of detail specification ④ This box may not be used if National number includes CECC number]	

1 Mechanical description ⑦

Either outline references (code A) or base and case references (codes B + C) :

— from IEC 191-2 :
— national [if required]

OUTLINE DRAWING AND CONNECTIONS
(Terminal connected to case, if any)
[The outline drawing may correspond to the device itself and/or the device with its mounting clip]

[may be transferred to, or given with more details, in clause **9** of this specification]

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

Detail specification for : ⑤

[Type number (s) of relevant device (s) and, if appropriate structurally similar devices]

ORDERING INFORMATION: see clause **7** of this

2 Short description ⑥

LED/LED Array
Colour: Red/Yellow/Green/...
Semiconductor material: Ga As/Si...
Encapsulation: metal/glass/plastic/...
Application: LED for indicating purpose/Four diode array/...
Power: ambient-rated (T_{amb})
case-rated (T_{case})
5 × 7 dot matrix/seven segment display
[Some important quick reference data: diffusing device/narrow beam/... may be added]

3 Level (S) of quality assessment ⑧

[if relevant]

4 Limiting values (Absolute maximum rating system) ⑨

These apply per diode over the operating temperature range unless otherwise stated.

X denotes that a value shall be inserted in the detail specification

Clause CECC 20001	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 document.	Symbol	Value min.	Value max.	Unit
4.1	Operating ambient or case temperatures	$T_{amb/case}$	X	X	°C
4.2	Storage temperatures	T_{stg}	X	X	°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 **9.1** of this document]	T_{sld}		X	°C
4.4	Voltage				
4.4.1	For LED and arrays : Reverse voltage	V_R		X	V
4.4.2	For LED displays : Voltage between terminals	V		X	V

Information about manufactures who have components qualified to this detail specification is available in the current CECC 00200: Qualified products Lists.

Clause CECC 20001	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 document.	Symbol	Value		Unit
			min.	max.	
4.5	Forward current at operating temperature of 25 °C, with temperature derating curve if necessary (see **9.2**)				
4.5.1	For LED arrays and LED displays, where appropriate all diodes operating (continuous or average value)	$I_{F(tot)}$		(X)	A
4.5.2	Or per diode [mondatory for single diode] (continuous value)	I_F		(X)	A
4.6	Where appropriate: Peak forward current, at ambient temperature of 25 °C, under specified pulse conditions	$I_{(FRM)}$		(X)	A
4.7	Where appropriate: Total power dissipation at ambient temperature of 25 °C, with temperature derating curve if necessary (see **9.2**)	$P_{(tot)}$		(X)	W

5 Electrical and optical characteristics See clause 8 of this specification for inspection requirements (Groups A and C)

— Signs between brackets correspond to characteristics given as "where appropriate" or as alternatives:

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

— For equivalent characteristics given as alternatives, the choice 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 characteristics to be given at appropriate place but without clause number.

When several devices are defined in the same detail specification, the relevant values should be given on successive lines, where possible avoiding repetition of identical values.

The values of specified forward current shall be the same for all tests (except for "C_{tot}").

For bi-colour devices the characteristics shall be given for each colour.

For LED arrays and LED displays, this applies per diode (except for "m").

Clause CECC 20001	Measured	Characteristic and conditions, at T_{amb} or T_{case} = 25 °C unless otherwise stated	Symbol	Value		Unit
				min.	max.	
5.1		Luminous intensity and matching factor at specified forward Current (d.c. and/or under specified pulse conditions):				
5.1.1	A2b	Minimum value	$I_V(1)$	X		mcd
		Where the device is to be incorporated in a multi device display:				
5.1.2	A2b	Maximum value	$I_V(2)$		(X)	mcd
5.1.3	A2b	For arrays and displays Matching factor for diodes: $m = \frac{I_v \text{ (highest)}}{I_v \text{ (lowest)}}$	m		(X)	
5.2	C2b	Where appropriate: Luminous intensity (same conditions as for **5.1** at other specified temperatures (T_1, T_2) (may also be given as a curve (see **9.3**)	$I_V(T_1)$	(X)	(X)	mcd
			$I_V(T_2)$	(X)	(X)	mcd

Clause CECC 20001	Measured	Characteristic and conditions, at T_{amb} or T_{case} = 25 °C unless otherwise stated	Symbol	Value		Unit
				min.	max.	
5.3		Radiation diagram given as a curve (see **9.4**)				
5.4	C2a	Where appropriate: Half-intensity angle	$\theta_{1/2}$	(X)	(X)	d°
5.5	C2a	Where appropriate: Misalignment between optical axis and mechanical axis	$\Delta\theta$		(X)	d°
5.6	C2a	Peak emission wave length (same conditions as for **5.1**)*	λp	X	X	nm
5.7	C2a	Where appropriate: Spectral bandwidth*	Δλ		(X)	nm
5.8	C2b	Where appropriate: Temperature coefficient of peak emission wave length* (may also be given as a curve: see **9.5**)	αλp		(X)	nm/°C
5.9	A2b	Forward voltage (same conditions as for **5.1**)	V_F		X	V
5.10	A2b	Reverse continuous (d.c.) current at specified reverse voltage V_R	I_R		X	µA
5.11	C2a	Where appropriate: Capacitance under specified reverse voltage (V_R) and frequency (f) conditions	C_{tot}		(X)	pF
5.12	C2a	Where appropriate: Switching time at specified forward current (same as for **5.1**)	t_{on} t_{off}		(X) (X)	ns ns
		*measured on any emitting point or on the whole device				

6 Marking

[Any particular information other than given in box ⑦ on front page and/or **2.5** of CECC 20000 shall be specified here.]

7 Ordering information

The following minimum information is necessary to order a specific device, unless otherwise specified:

— precise type number
— CECC reference of detail specification with issue number and/or data when relevant
— any other particulars.

8 Test conditions and inspection requirements

These are given in the following tables, where the values and exact test conditions to be used should be specified as required for a given type, and as required by the relevant test in CECC 20000. X shows that a value is to be inserted in the detail specification.

[When several devices are included in the same detail specification, the relevant conditions and/or values should be given on successive lines, where possible avoiding repetition of identical conditions and/or values.

The choice between alternative tests should preferably be left open, unless very sound technical reasons forbid this. Although such tests are not strictly equivalent, they are meant to achieve the same results which are to assess the correct manufacture of a device. Alternatives are provided to take into account different equipments or methods of measurement used in various countries.]

In this section, references to clause numbers are made with respect to CECC 20000, unless otherwise stated.

Group A — Lot by lot

All tests are non destructive (**3.5.6**)

Examination or test (Ref. 4.3.4/...)	Conditions at T_{amb} or T_{case} = 25 °C unless otherwise stated	Inspection				
		Limits (see Note 1)			Assessment	
		min.	max.	Unit	IL	AQL
Sub-Group A1 Visual inspection	4.2.1				I	1,5 %
Sub-Group A2a Non-operative devices	[State relevant limits ⟶ See Note 2]				II	0,15 %
Sub-group A2b					II	0,65 %
I_V(1) (L-001)		X				
I_V(2) (where appropriate) (L-001)	I_F (d.c. or pulse) specified axis specified		(X)			
m (for arrays and displays) (L-001)			X			
V_F (L-006)	I_F (d.c. or pulse) specified		X			
I_R (L-007)	V_R specified		X			
Sub-Group A3 (where appropriate)					I	2,5 %
t_{on} (L-005)	I_F specified		(X)			
t_{off} (L-005)	I_F specified		(X)			
C_{tot} (L-008)	V_R and f specified		(X)			

NOTE 1 The relevant min and max limits of Group A are referred to later on, in Groups B and C, as LSL and USL (lower/upper specification limit).

NOTE 2 Non operatives are defined as follows:

— V_F any voltage higher than 5 times the maximum specified value.

— I_R any current higher than 100 times the maximum specified value.

— wrong polarity.

— I_V(1) any intensity lower than 10 µcd except if the specified value is lower than 100 µcd: In this case $I_V < \frac{I_V \text{ specified}}{100}$

— Obviously wrong emission wavelength.

The test conditions are the same as for A2b.

Group B — Lot by lot

Only tests marked (D) are destructive (**3.5.6**)

LSL = lower specification limit
USL = upper specification limit
} from Group A

Examination or test and reference	Conditions at T_{amb} or T_{case} = 25 °C unless otherwise stated	Inspection				
		Limits (see Note 1)			Assessment	
		min.	max.	Unit	IL	AQL
Sub-Group B1 Dimensions (**4.2.2**)	**4.2.2**/App. C	See front page, box ⑦			S2	2,5 %
Sub-Group B3 Lead bending (D) if applicable (**4.4.9**)	force = [see **4.4.9**]	No damage			S2	4 %
Sub-Group B4 Solderability (**4.4.7**) if applicable	as specified: solder bath method preferred	Good wetting			S4	2,5 %
Sub-Group B5 Rapid change of (**4.4.4**) temperature followed by either — accelerated damp heat (D)(**4.4.2**)	as specified as specified				S4	2,5 %
Final measurements: I_V(1) V_F I_R where appropriate: I_V(2) for arrays & displays: m	as for A2	LSL	USL USL USL USL			
or — sealing (**4.4.10**) (hermetic packages only)	as specified					
Sub-Group B8 Electrical endurance (**4.5**)	168 h Electrical operation (see Appendix of this document)				S4	1,5 %
Final measurements: I_V(1) V_F where appropriate: I_V(2) for arrays & displays: m	as for A2	0,8 LSL	 1,2USL 1,2USL 1,2USL			
Sub-Group CTR (**3.5.5**)	Attributes information for B3, B4, B5 and B8.					