
**Družinska specifikacija: digitalna integrirana zelo hitra vezja CMOS (HC MOS)
– Serije HC/HCT/HCU**

Family Specification: Digital integrated HC MOS circuits – Series HC/HCT/HCU

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Descriptors: Quality, electronic components, digital integrated HC MOS circuits

English version

**Family Specification:
Digital Integrated HC MOS Circuits
Series HC/HCT/HCU**

**Spécification de famille:
Circuits intégrés logiques
HC MOS
Séries HC/HCT/HCU**

**Familienpezifikation:
Digitale integrierte HC MOS-
Schaltungen
Serien HC/HCT/HCU**

This European Standard was approved by the CENELEC Electronic Components Committee (CECC) on 30 April 1994. 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.

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CECC

**CENELEC Electronic Components Committee
Comité des Composants Electroniques du CENELEC
CENELEC- Komitee für Bauelemente der Elektronik
General Secretariat: Gartenstr. 179, D-60596 Frankfurt am Main**

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 9, 'Integrated Circuits'.

The text of the draft based on document CECC 90 109 Issue 2 : 1989 (with A1) was submitted to the formal vote for conversion to a European Standard; together with the voting report, circulated as document CECC(Secretariat)3538 it was approved by CECC as EN 190 109 on 30 April 1994.

The following dates were fixed:

- | | | |
|---|-------|-------------------|
| - latest date of announcement of the EN at national level | (doa) | 1994-09-01 |
| - latest date of publication of an identical national standard* | (dop) | 1995-03-01 |
| - latest date of withdrawal of conflicting national standards* | (dow) | 1996-03-01 |

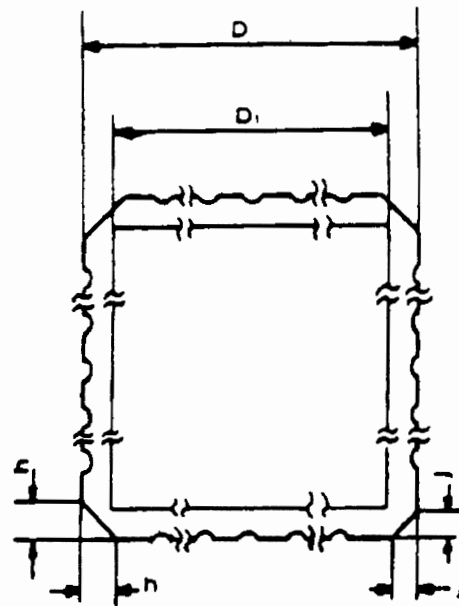
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- * National Standard (excluding National implementation of IECQ Specifications)

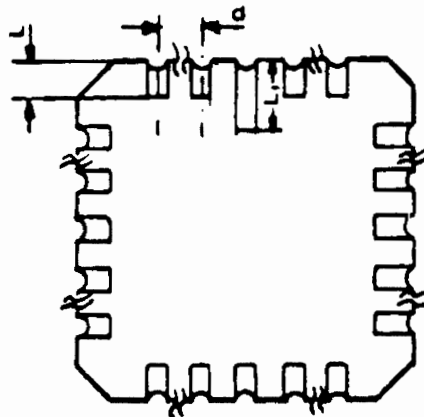
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3.8.2 Dimensions of chip carriers



LEAD-LESS CERAMIC
CHIP CARRIER



REF.	DIMENSIONS (inches)					
	20 PINS			28 PINS		
	min	nom.	max	min	nom.	max
A	0,045	-	0,088	0,045	-	0,088
A ₁	0,064	-	0,100	0,064	-	0,100
D	0,342	-	0,358	0,440	-	0,460
D ₁ (1)	-	-	0,358	-	-	0,460
L	0,042	-	0,058	0,042	-	0,058
L ₁	0,075	-	0,107	0,075	-	0,107
b	0,022	-	0,028	0,022	-	0,028
d	-	0,05(2)	-	-	0,05(2)	-
h	0,03	-	0,05	0,03	-	0,05
j	0,005	-	0,025	0,010	-	0,030

- (1) The lids shall not extend beyond the edges of the body including corners.
- (2) Means true geometrical position.

Dieses blaue Blatt ist nach dem Titelblatt der CECC 90 109 Ausgabe 2 (1989) einzufügen

This blue page shall be inserted after the title page of CECC 90 109 Issue 2 (1989)

Cette page bleue doit être insérée après la page de garde de la CECC 90 109 Edition 2 (1989)

ÄNDERUNG 1 ZU CECC 90 109 (Ausgabe 2)
FAMILIEN-SPEZIFIKATION
DIGITALE INTEGRIERTE HC MOS-SCHALTUNGEN - Serien HC/HCT/HCU

AMENDMENT 1 TO CECC 90 109 (Issue 2)
FAMILY SPECIFICATION
DIGITAL INTEGRATED HC MOS CIRCUITS - Series HC/HCT/HCU

AMENDEMENT 1 A LA CECC 90 109 (Edition 2)
SPECIFICATION DE FAMILLE
CIRCUITS INTEGRES LOGIQUES HC MOS - Séries HC/HCT/HCU

EIN DEUTSCHER TEXT LIEGT NICHT VOR

The following amendment shall be made :
Replace pages 25/26 and 27 to 36 by new pages 25/26 and 27/28, 29/30, 31/32.
Enter this amendment on the yellow "Record of amendments" sheet.
This amendment was circulated to the CECC for voting in the documents listed below and was ratified by the president of the CECC for publication.

La modification suivante doit être effectuée :
Remplacer les pages 25/26 et 27 à 36 par les nouvelles pages 25/26 et 27/28, 29/30, 31/32 ci-jointes.
Enregistrer cette modification sur la feuille jaune "Enregistrement des amendements".
Le texte de cet amendement a été soumis au vote du CECC dans les documents indiqués ci-dessous et a été ratifié par le Président du CECC pour être publié.

Document Date of voting Report on the voting
CECC(Secretariat)2984 February 1992 CECC(Secretariat)3043

Document Date de vote Rapport de vote
CECC(Secretariat)2984 Février 1992 CECC(Secretariat)3043



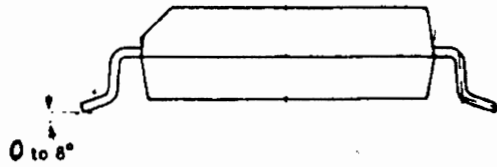
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EXAMINATION OR TEST	D ND	CONDITIONS OF TEST	LIMITS TO BE SPECIFIED
GROUP A INSPECTION			
Sub-Group A3			
Static characteristics at 25 °C SS/4.1.2	ND	The values selected shall be for the worst possible condition for the terminal being considered. The sequence and combination of input signals which give the appropriate output levels shall be prescribed.	
1) Input leakage current I_I SS/4.1.8 and FS/2.6		$V_{CC} = V_{CCA}$ For I_{I+} : $V_I = V_{CC}$ to input under test $V_I = 0$ to other inputs For I_{I-} : $V_I = 0$ V to input under test $V_I = V_{CC}$ to other inputs All inputs measured in turn, outputs not connected.	$ I_{IA} $
2) Output leakage current I_{OZ} (for three-state only) FS/2.8		$V_{CC} = V_{CCA}$ $V_I = V_{ILA}$ or V_{IHB} combined to obtain a high impedance state at output $V_O = 0$ or V_{CC} in turn All outputs are measured in turn .	$ I_{OZA} $
3) Quiescent supply current I_{CC} SS/4.1.6 and FS/2.1		$V_{CC} = V_{CCA}$ $V_O = 0$ or V_{CC} in turn Outputs are not connected	I_{CCA}
4) Low level output voltage $V_{OL(1)}$ SS/4.1.2(1) or SS/4.1.2(5) and FS/2.5 (Not applicable for HCT)		$V_{CC} = 2$ V $V_I = V_{IHB}$ or V_{ILA} necessary to obtain an output at low level in accordance with the function table . $I_O = + 20 \mu A$ All outputs are measured in turn .	$V_{OLA(1)}$

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3.8.3 Dimensions of SO packages

See Families A75 and A76 in IEC 191-2M with complementary requirement related to angle of leads as shown after :



4 INSPECTION REQUIREMENTS

See 3.6 of CECC 90 000 with the following special requirements :

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EXAMINATION OR TEST	D ND	CONDITIONS OF TEST	LIMITS TO BE SPECIFIED
Sub-Group A3 (contd)			
5) Low level output voltage $V_{OL(2)}$ SS/4.1.2(1) or SS/4.1.2(5) and FS/2.5 (For HC, HCT, HCU)		$V_{CC} = 4,5 \text{ V}$ $V_I = V_{IHB}$ or V_{ILA} necessary to obtain an output at low level in accordance with the function table. $I_O =$ specified values in FS/2.5 All outputs are measured in turn .	$V_{OLA(2)}$
6) Low level output voltage $V_{OL(3)}$ SS/4.1.2(1) or SS/4.1.2(5) and FS/2.5 (Not applicable for HCT)		$V_{CC} = 6 \text{ V}$ $V_I = V_{IHB}$ or V_{ILA} necessary to obtain an output at low level in accordance with the function table. $I_O =$ specified values in FS/2.5 All outputs are measured in turn .	$V_{OLA(3)}$
7) High level output voltage $V_{OH(1)}$ SS/4.1.2(2) or SS/4.1.2(5) and FS/2.4 (Not applicable for HCT)		$V_{CC} = 2 \text{ V}$ $V_I = V_{IHB}$ or V_{ILA} necessary to obtain an output at high level in accordance with the function table. $I_O = 20 \mu\text{A}$ All outputs are measured in turn .	$V_{OH(1)}$
8) High level output voltage $V_{OH(2)}$ SS/4.1.2(2) or SS/4.1.2(5) and FS/2.4 (For HC, HCT, HCU)		$V_{CC} = 4,5 \text{ V}$ $V_I = V_{IHB}$ or V_{ILA} necessary to obtain an output at high level in accordance with the function table. $I_O =$ specified values in FS/2.4 All outputs are measured in turn .	$V_{OH(2)}$

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EXAMINATION OR TEST	D ND	CONDITIONS OF TEST	LIMITS TO BE SPECIFIED
<p>Sub-Group A3 (contd)</p> <p>9) High level output voltage $V_{OH(3)}$ SS/4.1.2(2) or SS/4.1.2(5) and FS/2.4 (Not applicable for HCT)</p>		$V_{CC} = 6\text{ V}$ $V_I = V_{IHB}$ or V_{ILA} necessary to obtain an output at high level in accordance with the function table , $I_O =$ specified values in FS/2.4 All outputs are measured in turn .	$V_{OH(3)}$
<p>10) Analogue switch off-state current per channel I_{SA} (where appropriate) FS/2.7 and FS/2.14.3 (Not applicable for HCU)</p>		$V_{CC} = 6\text{ V (HC)}$ or $5,5\text{V (HCT)}$ $V_I = V_{IHB}$ or V_{ILA} $ V_S = V_{CC}$ or $V_{CC} - V_{EE}$	$ I_{SA} $
<p>Sub-Group A5</p> <p>Dynamic characteristics at 25 °C SS/4.1.3</p> <p>Transition times t_{THL}, t_{TLH} Propagation times t_{PHL}, t_{PLH}, t_{PHZ}, t_{PZH}, t_{PLZ}, t_{PZL} (if applicable) t_{su}, t_h, t_{rem}, t_w (if applicable)</p>	ND	$V_{CC} =$ FS/2.13 Pulse generator and driving circuits : FS/2.13.1 Switching waveforms and loading circuits : FS/2.13.3 Fixed inputs = 0 or V_{CC}	Maximum, and if applicable minimum, see relevant DS

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EXAMINATION OR TEST	D ND	CONDITIONS OF TEST	LIMITS TO BE SPECIFIED
GROUP B INSPECTION			
<u>Sub-Group B5</u> Electrical endurance 168 h. GS/note 11 SS/4.2 End point tests : GS/note 10 Electrical tests : Sub-Groups A2 and A3	ND	$T_{amb} = 125\text{ °C}$ SS/4.2.2 and FS/3.4 As for Sub-Groups A2 and A3	As for Sub-Groups A2 and A3
GROUP C INSPECTION			
<u>Sub-Group C8</u> Electrical endurance 2 000 h. SS/4.2 End point tests : GS/note 10 Electrical tests : Sub-Groups A2 and A3	ND	$T_{amb} = 125\text{ °C}$ SS/4.2.2 and FS/3.4 As for Sub-Groups A2 and A3	As for Sub-Groups A2 and A3

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EXAMINATION OR TEST	D ND	CONDITIONS OF TEST	LIMITS TO BE SPECIFIED	INSPECTION REQUIREMENTS			
GROUP D INSPECTION				ASSESSMENT LEVELS			
				P		Y	
				n	c	n	c
<u>Sub-Group D1</u> Electrical endurance 8 000 h. SS/4.2 End point tests : Electrical tests : Sub-Groups A2, A3 and A5	D	$T_{amb} = T_{amb\ max.}$ SS/4.2.2 and FS/3.4 As for Sub-Groups A2, A3 and A5	As for Sub-Groups A2, A3 and A5	GS/3.6		GS/3.6	
<u>Sub-Group D2</u> Transient energy test GS/4.5.9 End point tests : Sub-Groups A2, A3 and A5	D	GS/4.5.9 and FS/3.3 As for Sub-Groups A2, A3 and A5	As for Sub-Groups A2, A3 and A5	GS/3.6		GS/3.6	
<u>Sub-Group D4a</u> Input latch-up FS/3.7	D	FS/3.7	FS/3.7	8	1	na	na
<u>Sub-Group D4b</u> Output latch-up FS/3.7	D	FS/3.7	FS/3.7	8	1	na	na
<u>Sub-Group D4c</u> V _{CC} latch-up FS/3.7	D	FS/3.7 SIST EN 190109:2006	FS/3.7	8	1	na	na
<u>Sub-Group D5</u> Input capacitance C _{in} SS/4.1.7 and FS/2.9	ND	SS/4.1.7 and FS/2.9 and FS/3.6	FS/2.9	GS/3.6		GS/3.6	

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EXAMINATION OR TEST	D ND	CONDITIONS OF TEST	LIMITS TO BE SPECIFIED	INSPECTION REQUIREMENTS			
				ASSESSMENT LEVELS			
				P		Y	
				n	c	n	c
<u>Sub-Group D6</u> Output capacitance 3 state output C _{OZ} SS/4.1.7 and FS/2.9	ND	SS/4.1.7 and FS/2.9 and FS/3.6	FS/2.9	GS/3.6		GS/3.6	
<u>Sub-Group D7</u> Maximum saturation current FS/2.1.4	D	FS/2.14	FS/2.14	18	1	na	na

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FOREWORD

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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 HC MOS DIGITAL INTEGRATED CIRCUITS. 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, and copies of it can be obtained from the addresses shown on the blue fly sheet.

PREFACE

This Family Specification was prepared by CECC WG 9 "INTEGRATED CIRCUITS".

It is based, wherever possible, on the Publications of the International Electrotechnical Commission and in particular on IEC 748 : Semiconductor devices : Integrated circuits and IEC 749 : Semiconductor devices : Mechanical and climatic test methods.

It contains general information on HC MOS digital integrated circuits and defines the common characteristics for this family of integrated circuits.

Together with the device type detail specification (DS) of a component usually prepared nationally, this family detail specification forms a complete detail specification.

The text of this second issue consists of the text of CECC90 109 Issue 1 (1986) amended in accordance with the ratified new material introduced in the following documents :

<u>Document</u>	<u>Date of Voting</u>	<u>Report on the Voting</u>
CECC(Secretariat)2093	May 1987	CECC(Secretariat)2225

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In accordance with the decision of the CECC Management Committee 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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EFFECTIVE DATE <https://standards.iteh.ai/catalog/standards/sist/e3e5e136-79c2-429f-8eb0-f82d28f0cc8d/sist-en-190109-2006>

This second Issue of CECC 90 109 shall become effective for all new qualification approvals on 1st of august 1989. Issue 1 will continue to remain effective to cover all past approvals.