

# DATA SHEET

## **BST80**

**N-channel enhancement mode  
vertical D-MOS transistor**

Product specification  
Supersedes data of April 1995  
File under Discrete Semiconductors, SC13b

1997 Jun 20

# N-channel enhancement mode vertical D-MOS transistor

## BST80

### FEATURES

- Low drain-source on-state resistance
- Direct interface to C-MOS, TTL, etc.
- High-speed switching
- No secondary breakdown.

### APPLICATIONS

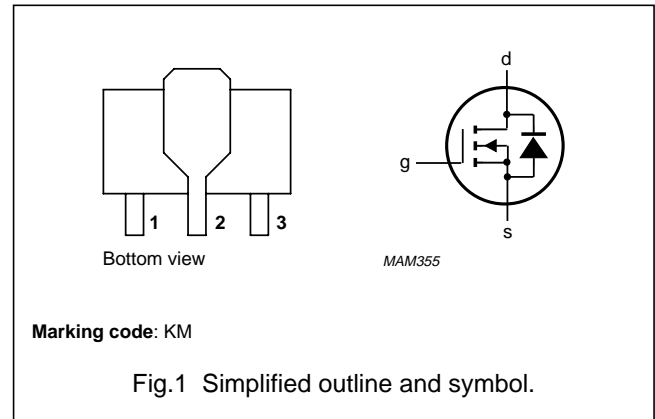
- Thin and thick film circuits
- Relay, high-speed and line transformer drivers.

### DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in a SOT89 package.

### PINNING - SOT89

PIN	SYMBOL	DESCRIPTION
1	s	source
2	d	drain
3	g	gate



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$V_{DS}$	drain-source voltage (DC)		–	80	V
$V_{GSO}$	gate-source voltage (DC)	open drain	–	$\pm 20$	V
$I_D$	drain current (DC)		–	500	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	–	1	W
$R_{DSon}$	drain-source on-state resistance	$I_D = 500\text{ mA}; V_{GS} = 10\text{ V}$	2	3	$\Omega$
$ y_{fs} $	forward transfer admittance	$I_D = 500\text{ mA}; V_{DS} = 15\text{ V}$	300	–	mS

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### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage (DC)		–	80	V
$V_{GSO}$	gate-source voltage (DC)	open drain	–	$\pm 20$	V
$I_D$	drain current (DC)		–	500	mA
$I_{DM}$	peak drain current		–	1	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 1	–	1	W
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	125	K/W

#### Note to the Limiting values and Thermal characteristics

1. Device mounted on a ceramic substrate; area 2.5 cm<sup>2</sup>; thickness 0.7 mm.

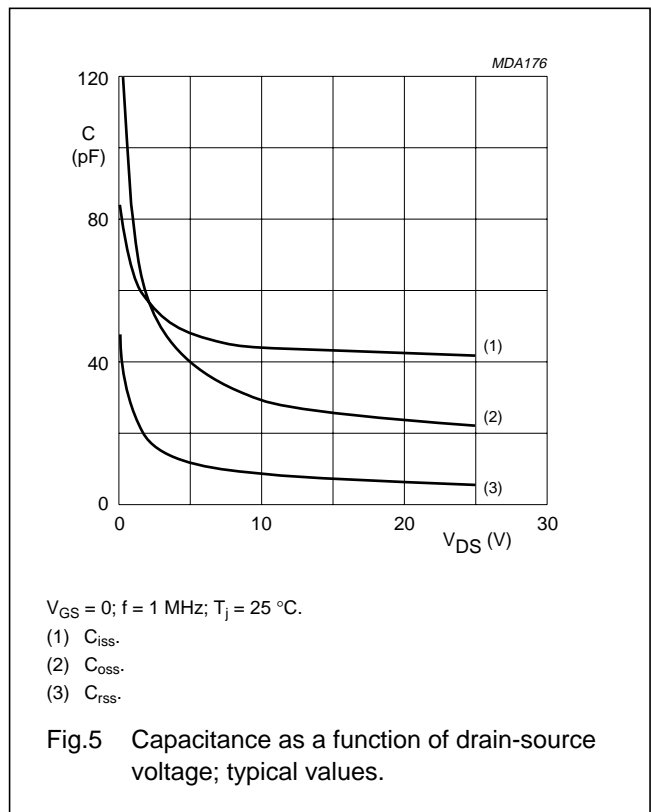
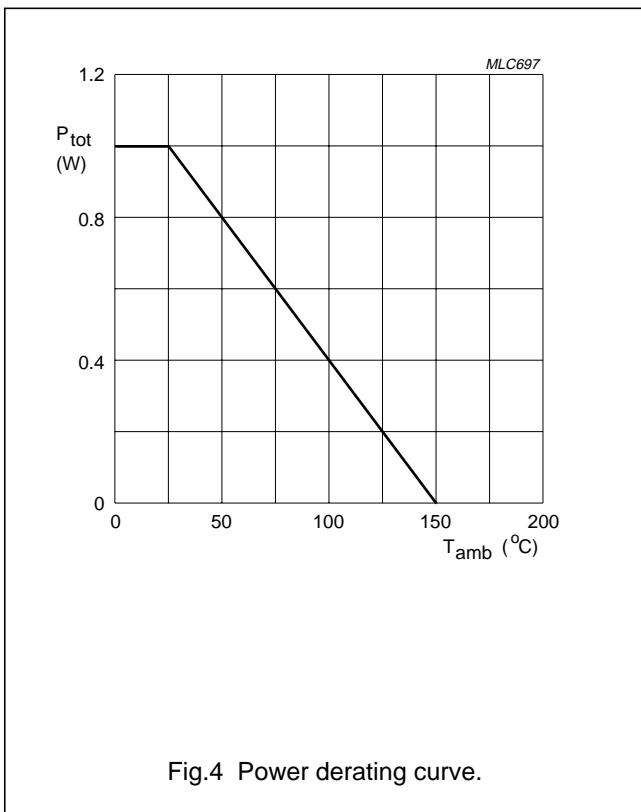
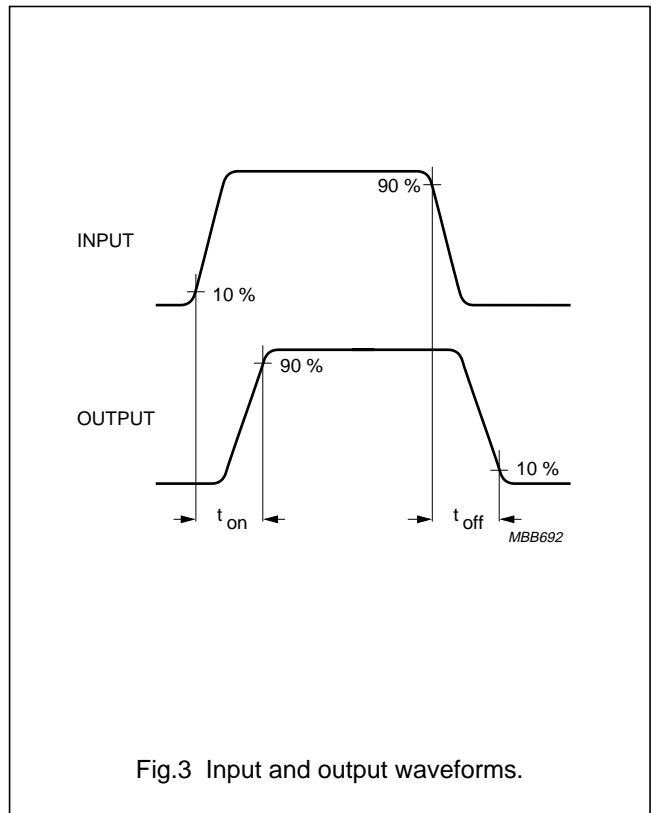
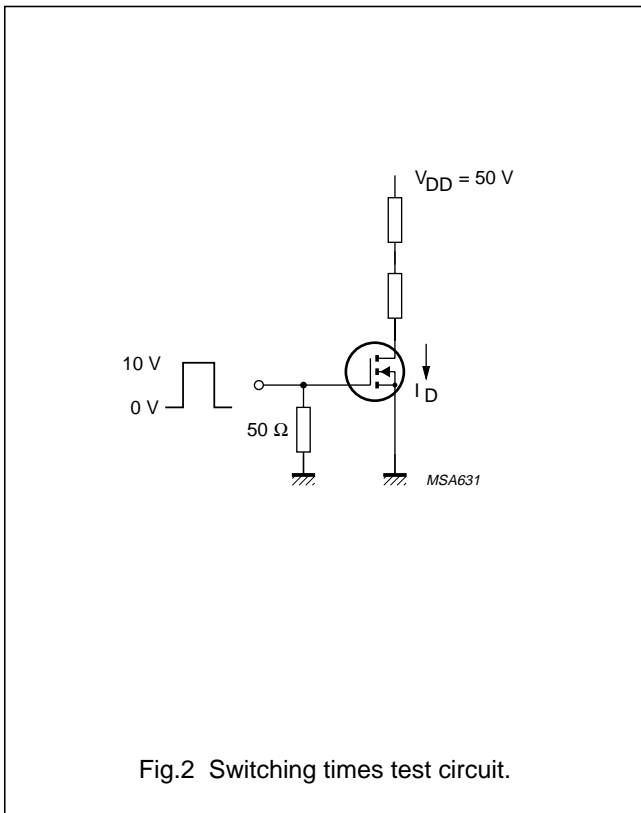
### CHARACTERISTICS

$T_j = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0$ ; $I_D = 10\ \mu\text{A}$	80	–	–	V
$V_{GSth}$	gate-source threshold voltage	$V_{DS} = V_{GS}$ ; $I_D = 1\ \text{mA}$	1.5	–	3.5	V
$I_{DSS}$	drain-source leakage current	$V_{DS} = 60\ \text{V}$ ; $V_{GS} = 0$	–	–	1	$\mu\text{A}$
$I_{GSS}$	gate leakage current	$V_{DS} = 0$ ; $V_{GS} = \pm 20\ \text{V}$	–	–	$\pm 100$	nA
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 10\ \text{V}$ ; $I_D = 500\ \text{mA}$	–	2	3	$\Omega$
$ y_{fs} $	forward transfer admittance	$I_D = 500\ \text{mA}$ ; $V_{DS} = 15\ \text{V}$	–	300	–	mS
$C_{iss}$	input capacitance	$V_{DS} = 10\ \text{V}$ ; $V_{GS} = 0$ ; $f = 1\ \text{MHz}$	–	45	60	pF
$C_{oss}$	output capacitance	$V_{DS} = 10\ \text{V}$ ; $V_{GS} = 0$ ; $f = 1\ \text{MHz}$	–	30	45	pF
$C_{rss}$	reverse transfer capacitance	$V_{DS} = 10\ \text{V}$ ; $V_{GS} = 0$ ; $f = 1\ \text{MHz}$	–	8	12	pF
<b>Switching times</b> (see Figs 2 and 3)						
$t_{on}$	turn-on time	$V_{GS} = 0\ \text{to}\ 10\ \text{V}$ ; $V_{DD} = 50\ \text{V}$ ; $I_D = 500\ \text{mA}$	–	–	10	ns
$t_{off}$	turn-off time	$V_{GS} = 10\ \text{to}\ 0\ \text{V}$ ; $V_{DD} = 50\ \text{V}$ ; $I_D = 500\ \text{mA}$	–	–	15	ns

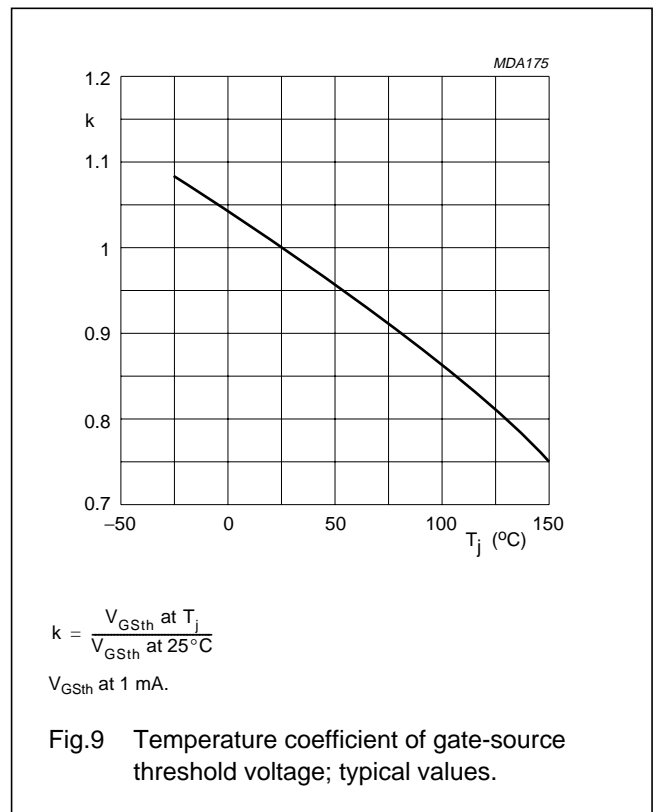
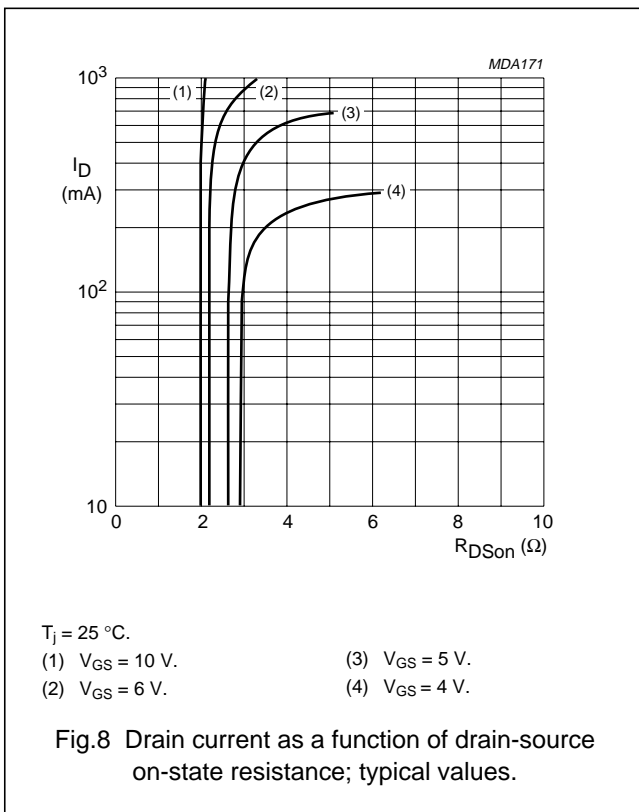
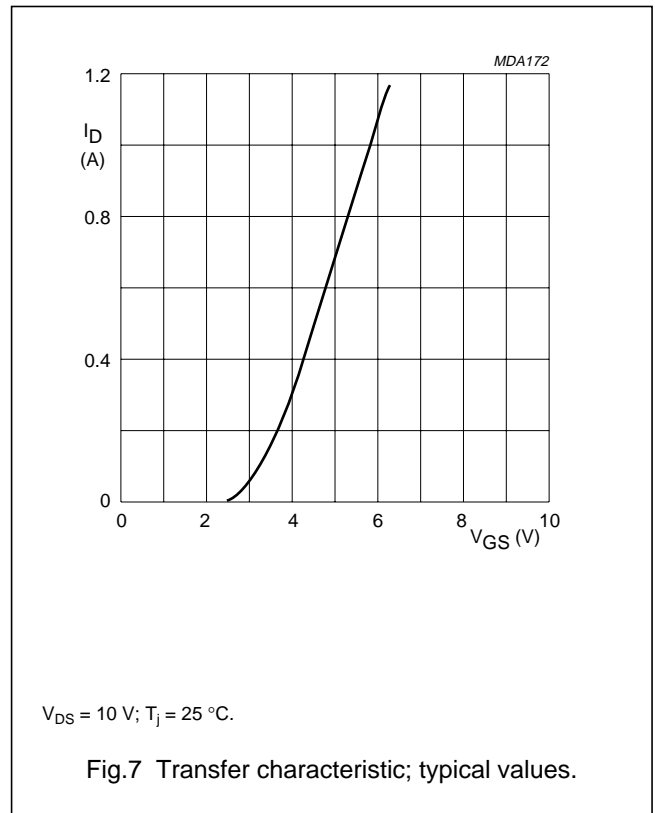
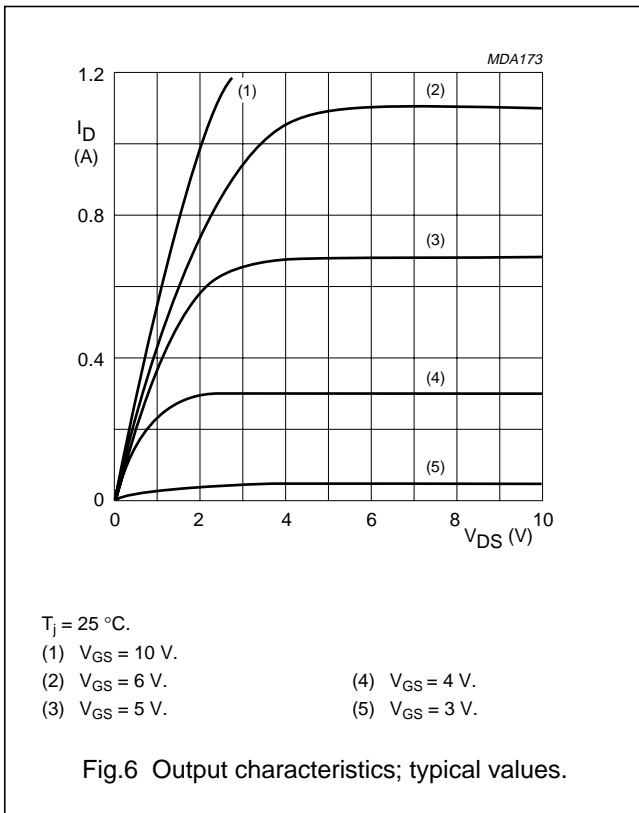
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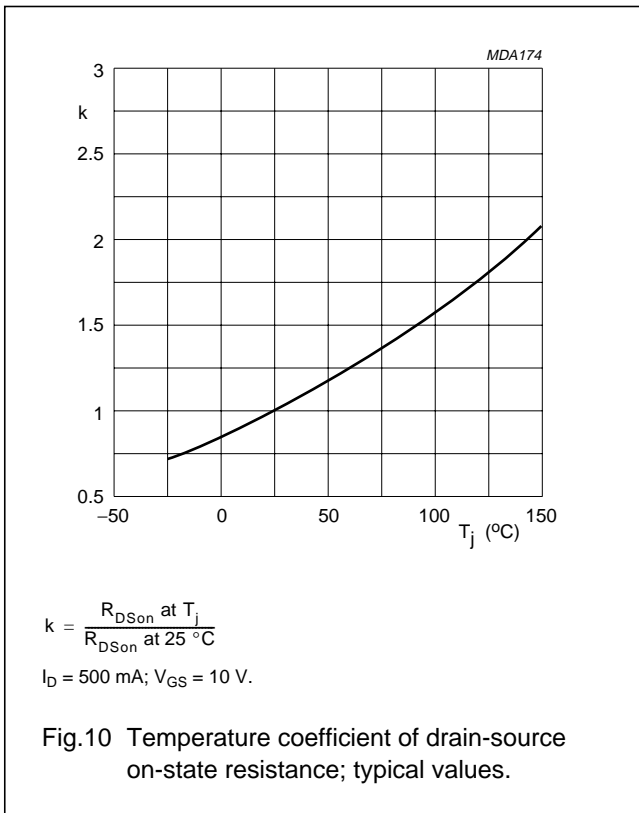
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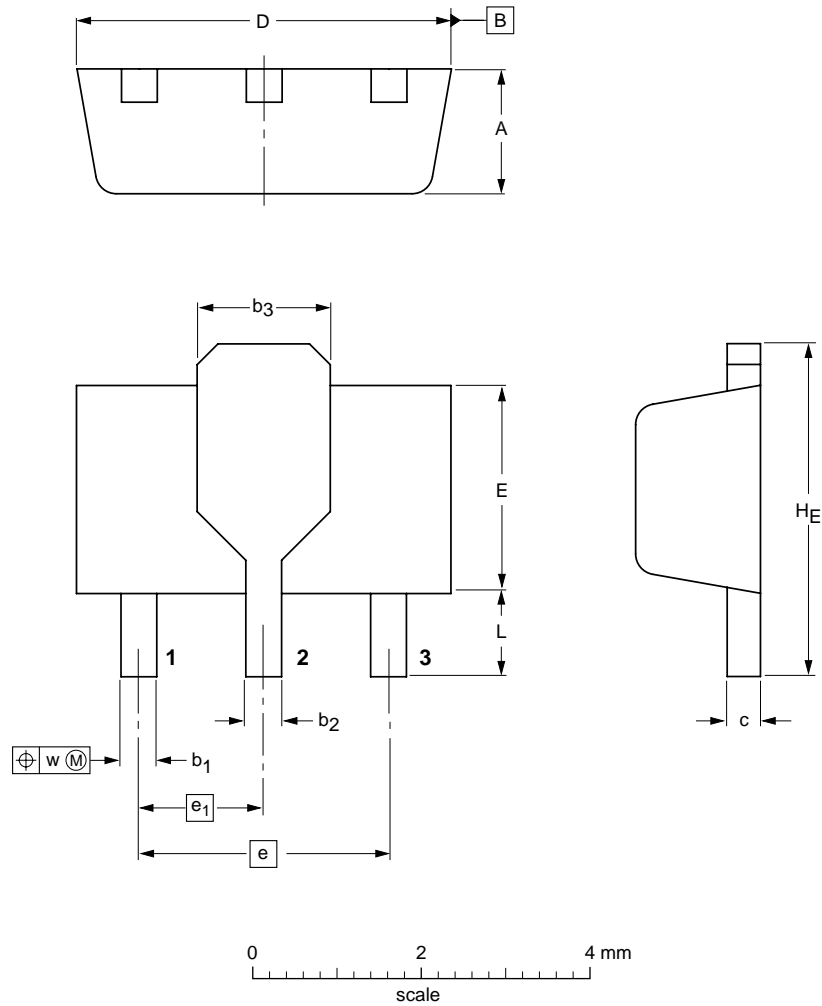
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PACKAGE OUTLINE

Plastic surface mounted package; drain pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L min.	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.37	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	0.8	0.13

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT89						97-02-28

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### DEFINITIONS

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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**NOTES**

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Printed in The Netherlands

137107/00/02/pp12

Date of release: 1997 Jun 20

Document order number: 9397 750 02337

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