

# DATA SHEET

## **BS208**

P-channel enhancement mode  
vertical D-MOS transistor

Product specification  
File under Discrete Semiconductors, SC13b

April 1995

# P-channel enhancement mode vertical D-MOS transistor

**BS208**

**FEATURES**

- Direct interface to C-MOS
- High-speed switching
- No secondary breakdown.

**DESCRIPTION**

P-channel enhancement mode vertical D-MOS transistor in a TO-92 envelope. Intended for use in relay, high-speed and line transformer drivers.

**PINNING - TO-92**

PIN	DESCRIPTION
1	source
2	gate
3	drain

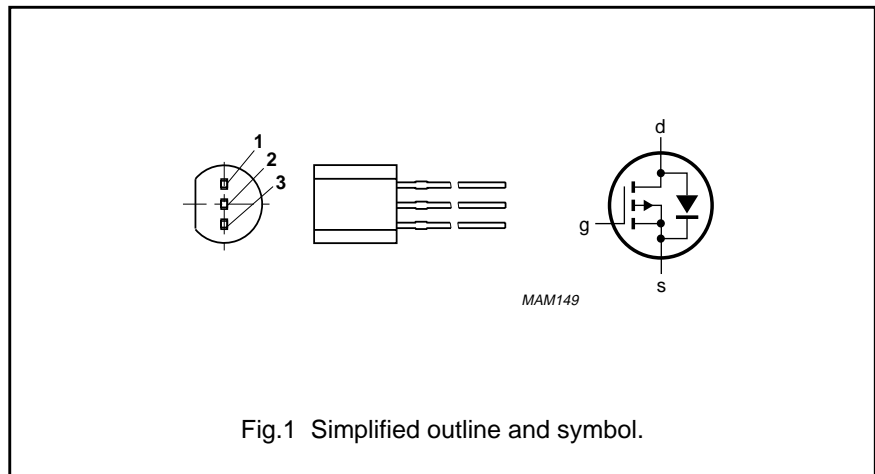


Fig.1 Simplified outline and symbol.

**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{DS}$	drain-source voltage (DC)		–	–	–200	V
$V_{GSO}$	gate-source voltage (DC)	open drain	–	–	$\pm 20$	V
$ Y_{fs} $	forward transfer admittance	$I_D = -200 \text{ mA}; V_{DS} = -25 \text{ V}$	100	200	–	mS
$I_D$	drain current (DC)		–	–	–0.2	A
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = -10 \text{ V}; I_D = -200 \text{ mA}$	–	10	14	$\Omega$
$P_{tot}$	total power dissipation	$T_{amb} = 25 \text{ }^\circ\text{C}$	–	–	0.83	W

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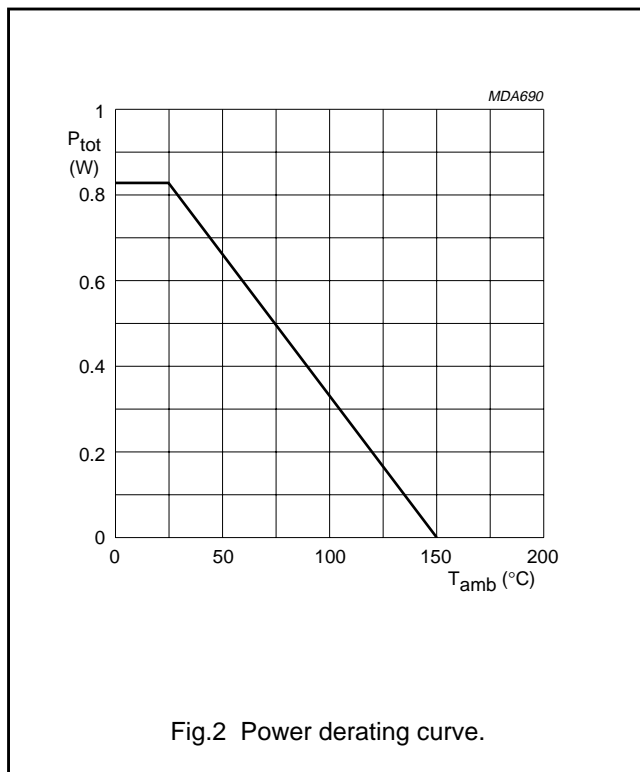
**LIMITING VALUES**

In accordance with the Absolute Maximum System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$-V_{DS}$	drain-source voltage		-	200	V
$\pm V_{GSO}$	gate-source voltage	open drain	-	20	V
$-I_D$	drain current	DC	-	0.2	A
$-I_{DM}$	drain current	peak value	-	0.6	A
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ }^\circ\text{C}$	-	0.83	W
$T_{stg}$	storage temperature range		-65	+150	$^\circ\text{C}$
$T_j$	junction temperature		-	150	$^\circ\text{C}$

**THERMAL RESISTANCE**

SYMBOL	PARAMETER	MAX.	UNIT
$R_{thj-a}$	from junction to ambient	150	K/W



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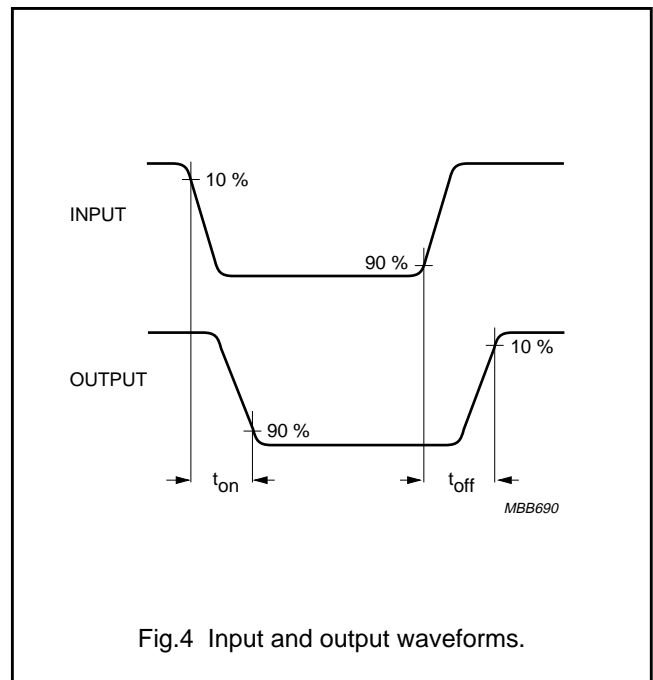
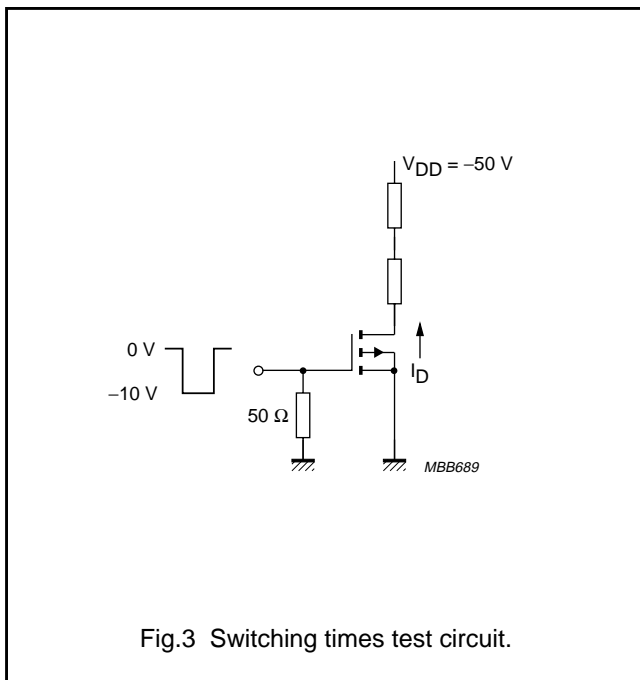
**CHARACTERISTICS**

T<sub>j</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
-V <sub>(BR)DSS</sub>	drain-source breakdown voltage	-V <sub>GS</sub> = 0 -I <sub>D</sub> = 10 μA	200	-	-	V
-I <sub>DSS</sub>	drain-source leakage current	-V <sub>DS</sub> = 130 V V <sub>GS</sub> = 0	-	-	1	μA
-I <sub>DSS</sub>	drain-source leakage current	-V <sub>DS</sub> = 70 V -V <sub>GS</sub> = 0.2 V	-	-	25	μA
-I <sub>GSS</sub>	gate-source leakage current	-V <sub>GS</sub> = 20 V V <sub>DS</sub> = 0	-	-	100	nA
-V <sub>GS(th)</sub>	gate-source threshold voltage	V <sub>GS</sub> = V <sub>DS</sub> -I <sub>D</sub> = 1 mA	0.8	-	2.8	V
R <sub>DS(on)</sub>	drain-source on-resistance	-V <sub>GS</sub> = 10 V -I <sub>D</sub> = 200 mA	-	-	14	Ω
Y <sub>fs</sub>	transfer admittance	-V <sub>DS</sub> = 25 V -I <sub>D</sub> = 200 mA	100	200	-	mS
C <sub>iss</sub>	input capacitances	note 1	-	55	90	pF
C <sub>oss</sub>	output capacitance	note 1	-	20	30	pF
C <sub>rss</sub>	feedback capacitance	note 1	-	5	15	pF
t <sub>on</sub>	turn-on time	note 2	-	5	10	ns
t <sub>off</sub>	turn-off time	note 2	-	20	30	ns

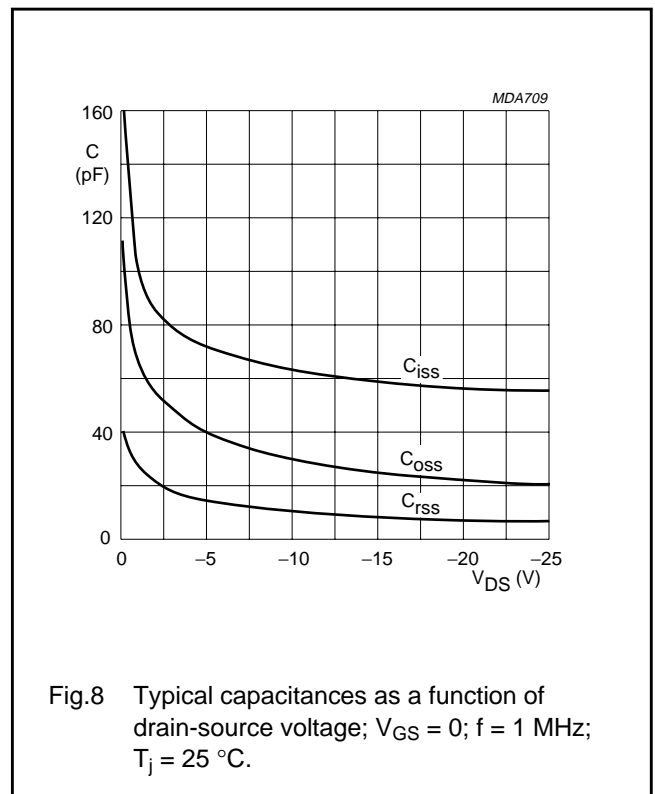
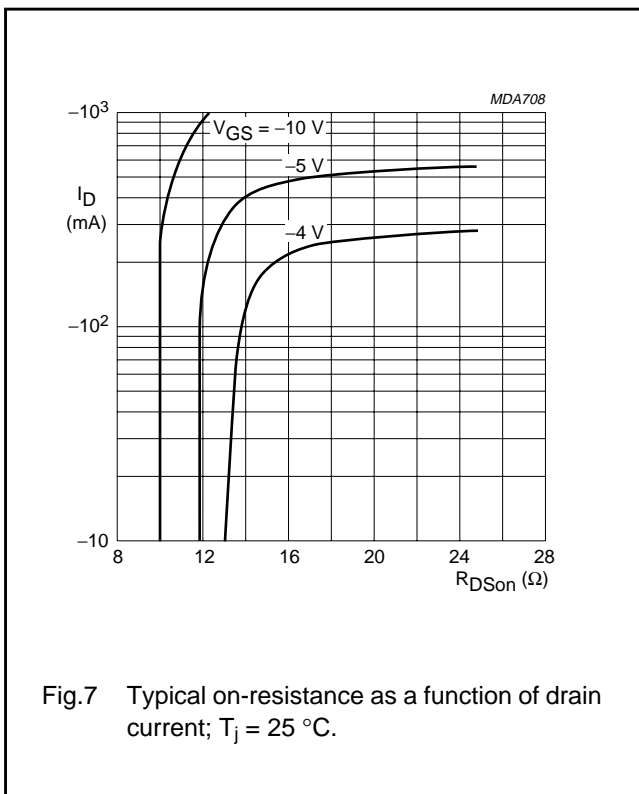
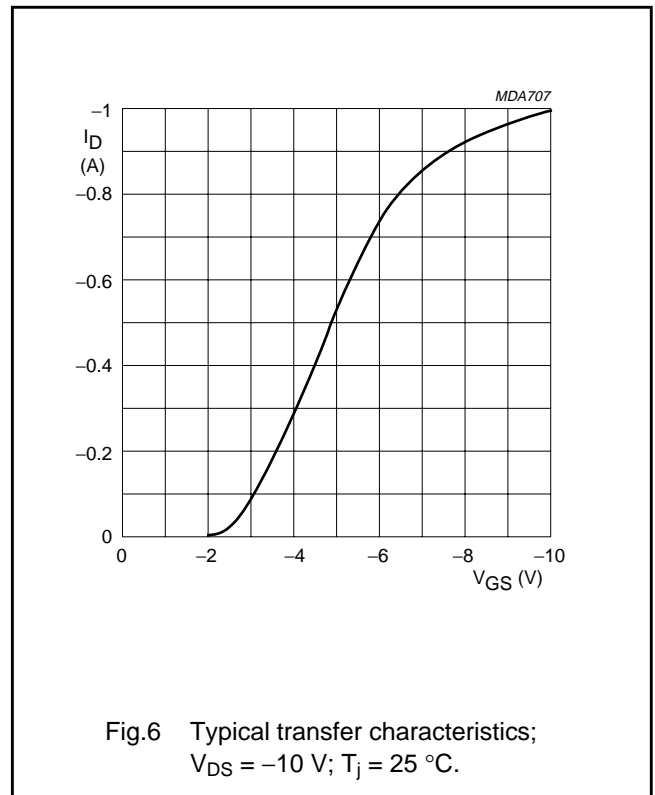
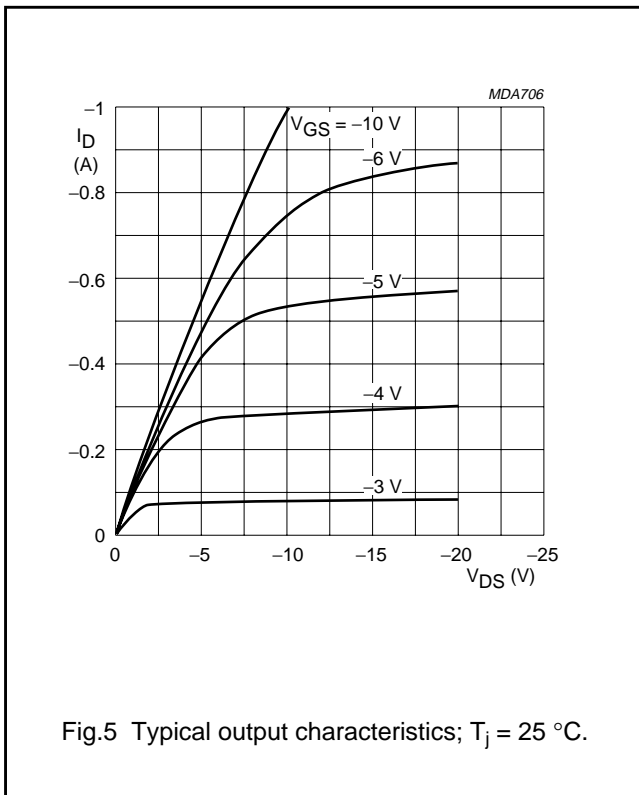
**Notes**

1. Measured at f = 1 MHz; -V<sub>DS</sub> = 25 V; V<sub>GS</sub> = 0.
2. -V<sub>GS</sub> = 0 to 10 V; -I<sub>D</sub> = 250 mA; -V<sub>DD</sub> = 50 V.



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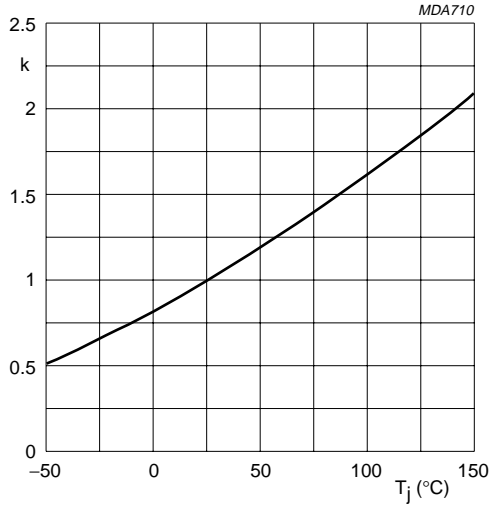


Fig.9 Temperature coefficient of drain-source on-resistance;

$$k = \frac{R_{DS(on)} \text{ at } T_j}{R_{DS(on)} \text{ at } 25^\circ\text{C}};$$

typical R<sub>DS(on)</sub> at 200 mA/10 V.

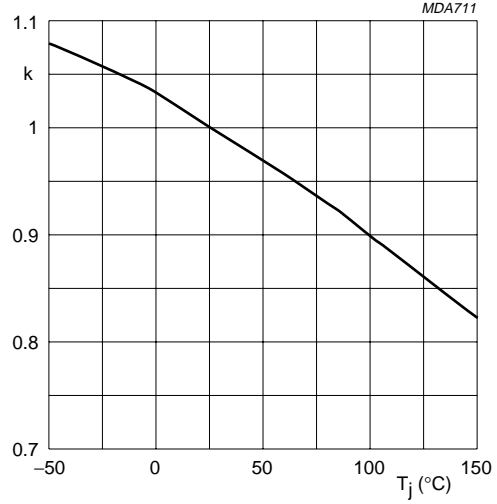


Fig.10 Temperature coefficient of gate-source threshold voltage;

$$k = \frac{V_{GS(th)} \text{ at } T_j}{V_{GS(th)} \text{ at } 25^\circ\text{C}};$$

typical V<sub>GS(th)</sub> at 1 mA.

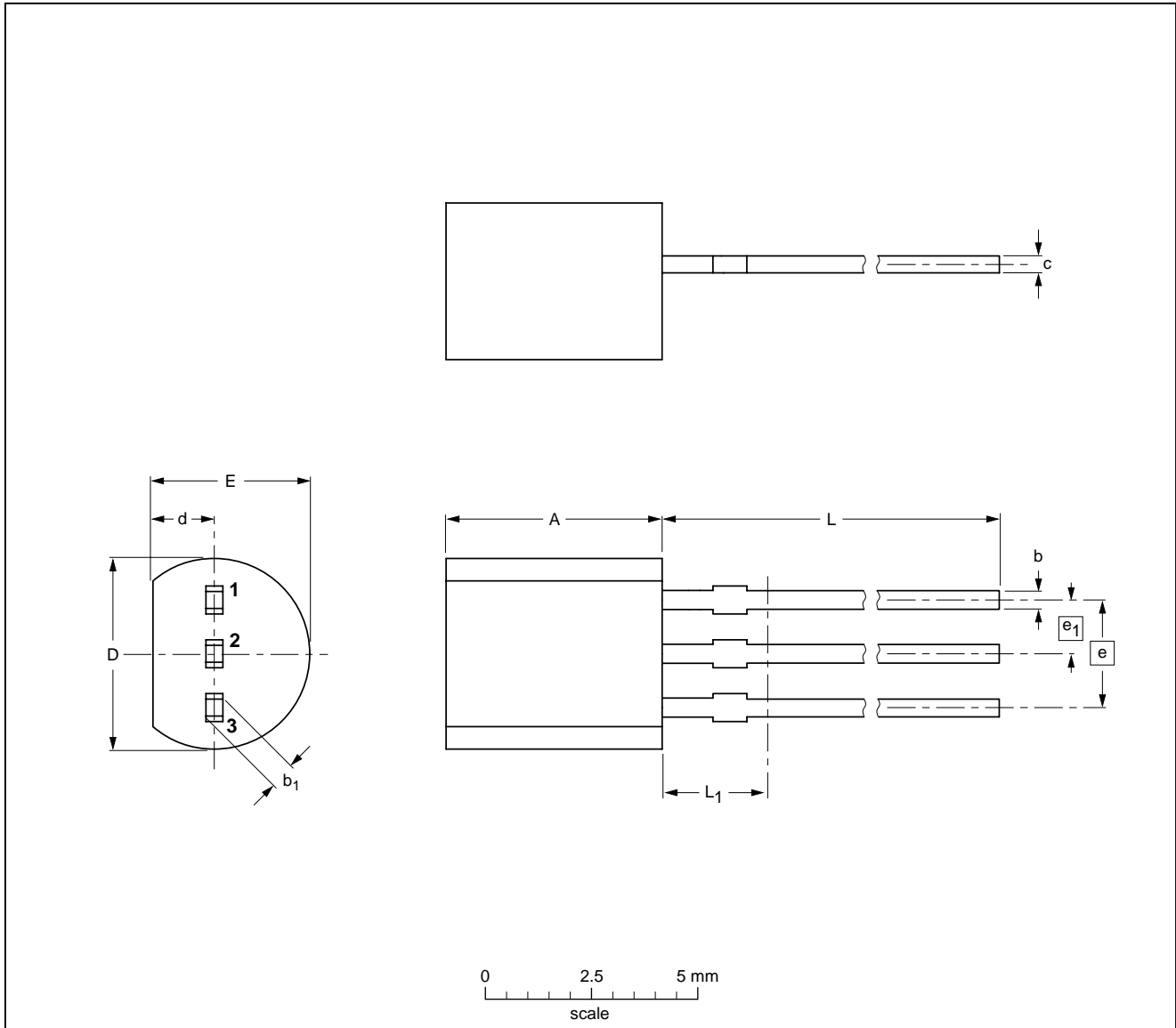
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PACKAGE OUTLINES

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup>
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT54		TO-92	SC-43		97-02-28

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**BS208****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>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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