

Silicon diffused power transistor

BU2508A

GENERAL DESCRIPTION

Enhanced performance, new generation, high-voltage, high-speed switching npn transistor in a plastic envelope intended for use in horizontal deflection circuits of colour television receivers. Features exceptional tolerance to base drive and collector current load variations resulting in a very low worst case dissipation.

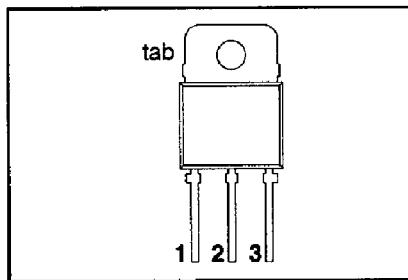
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	700	V
I_C	Collector current (DC)		-	8	A
I_{CM}	Collector current peak value		-	15	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ }^\circ\text{C}$	-	125	W
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 4.5\text{ A}; I_B = 1.29\text{ A}$	-	1.0	V
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 4.5\text{ A}; I_B = 1.1\text{ A}$	-	5.0	V
I_{Csat}	Collector saturation current		4.5	-	A
t_f	Fall time	$I_{CM} = 4.5\text{ A}; I_{B(on)} = 1.1\text{ A}$	0.4	-	μs

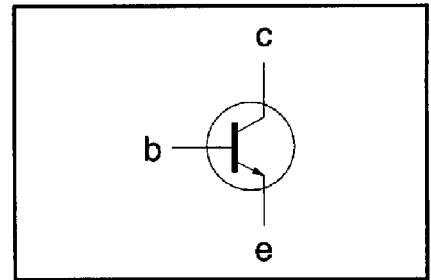
PINNING - SOT93

PIN	DESCRIPTION
1	base
2	collector
3	emitter
tab	collector

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum Rating System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	700	V
I_C	Collector current (DC)		-	8	A
I_{CM}	Collector current peak value		-	15	A
I_B	Base current (DC)		-	4	A
I_{BM}	Base current peak value		-	6	A
$-I_{B(AV)}$	Reverse base current	average over any 20 ms period	-	100	mA
$-I_{BM}$	Reverse base current peak value ¹		-	5	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ }^\circ\text{C}$	-	125	W
T_{sg}	Storage temperature		-65	150	$^\circ\text{C}$
T_j	Junction temperature		-	150	$^\circ\text{C}$

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Junction to mounting base	-	-	1.0	K/W
$R_{th\ j-a}$	Junction to ambient	in free air	45	-	K/W

¹ Turn-off current.

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STATIC CHARACTERISTICS

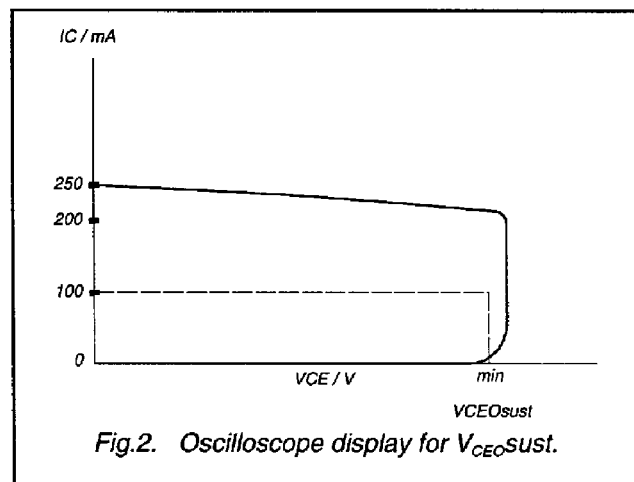
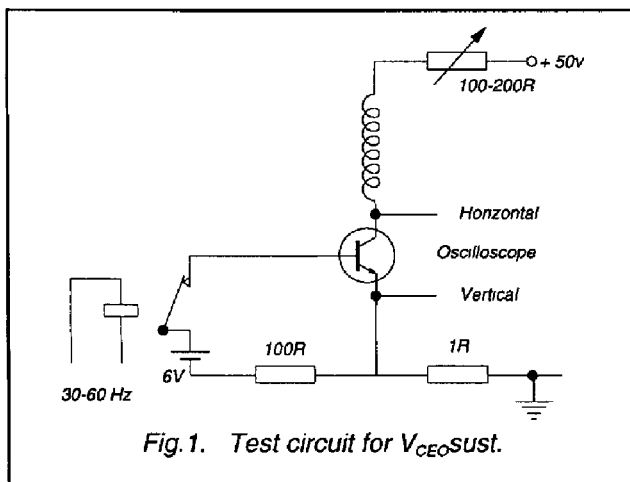
$T_{mb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}	Collector cut-off current ²	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$	-	-	1.0	mA
		$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}; T_j = 125\text{ }^{\circ}\text{C}$	-	-	2.0	mA
I_{EBO}	Emitter cut-off current	$V_{EB} = 7.5\text{ V}; I_C = 0\text{ A}$	-	-	1.0	mA
$V_{CEOsust}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}; I_C = 100\text{ mA}; L = 25\text{ mH}$	700	-	-	V
V_{CEsat}	Collector-emitter saturation voltages	$I_C = 4.5\text{ A}; I_B = 1.1\text{ A}$	-	-	5.0	V
V_{CEsat}		$I_C = 4.5\text{ A}; I_B = 1.29\text{ A}$	-	-	1.0	V
V_{BEsat}	Base-emitter saturation voltage	$I_C = 4.5\text{ A}; I_B = 1.7\text{ A}$	-	-	1.3	V
h_{FE}		DC current gain	$I_C = 100\text{ mA}; V_{CE} = 5\text{ V}$	6	13	26
h_{FE}	Second breakdown current	$I_C = 4.5\text{ A}; V_{CE} = 1\text{ V}$	4	5.5	7.5	A
I_{SB}			$V_{CE} = 120\text{ V}; t = 200\text{ }\mu\text{s}$	11	-	-

DYNAMIC CHARACTERISTICS

$T_{mb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
C_c	Collector capacitance	$I_E = 0\text{ A}; V_{CE} = 10\text{ V}; f = 1\text{ MHz}$	90	-	pF
t_s	Switching times (line deflection circuit)	$I_{CM} = 4.5\text{ A}; I_{B(end)} = 1.1\text{ A}; L_B = 6\text{ }\mu\text{H}; -V_{BB} = 4\text{ V}; (-di_B/dt = 0.6\text{ A}/\mu\text{s})$	5.0	6.0	μs
t_f	Turn-off fall time		0.4	0.6	μs



² Measured with half sine-wave voltage (curve tracer).

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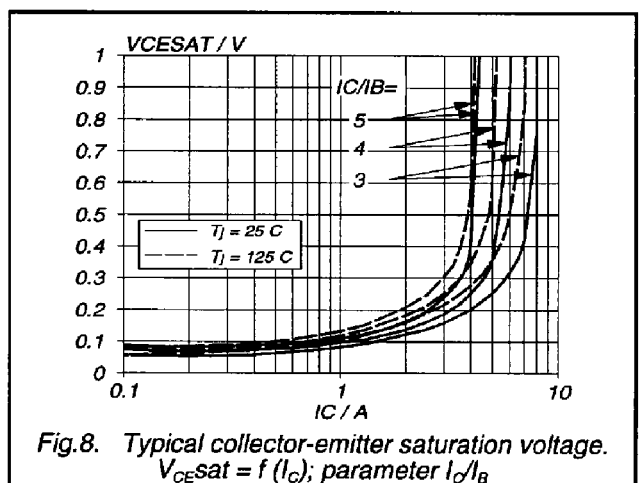
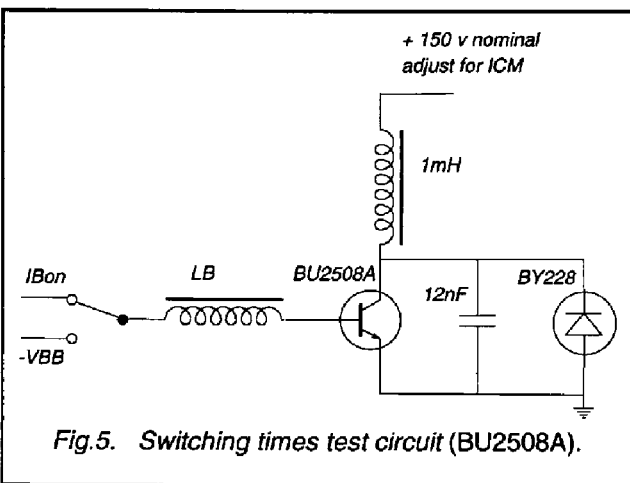
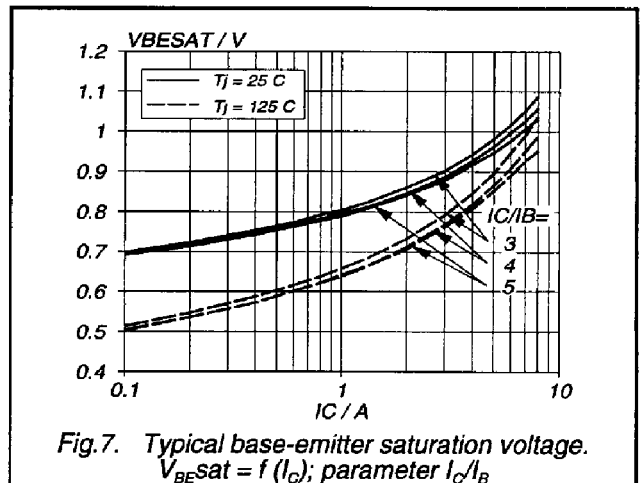
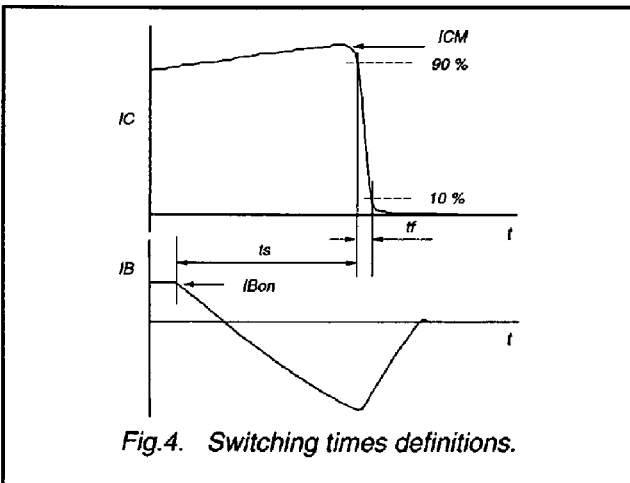
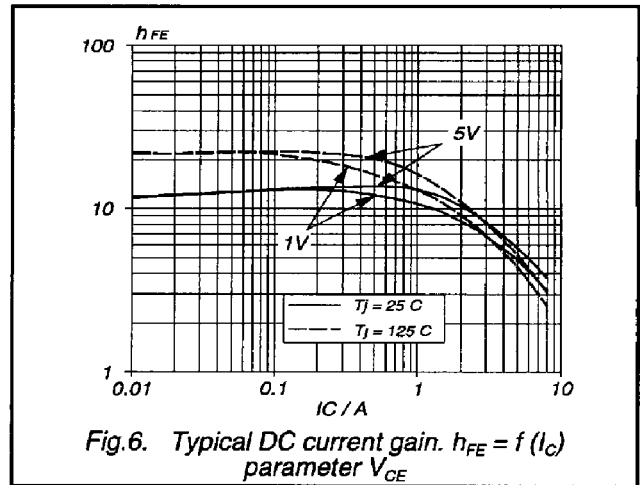
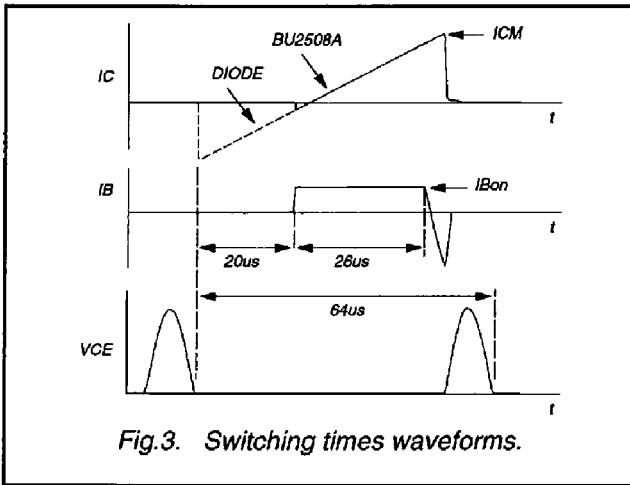
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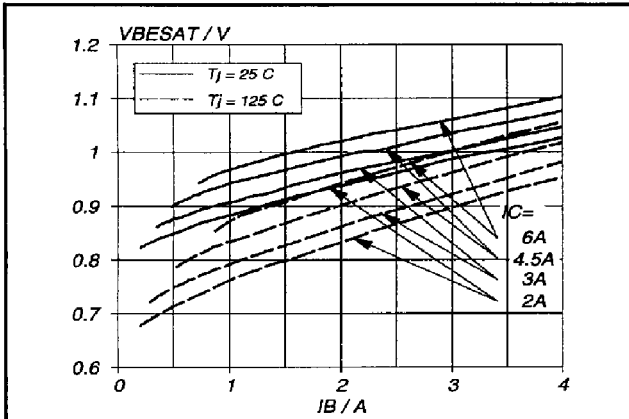


Fig.9. Typical base-emitter saturation voltage.
 $V_{BEsat} = f(I_B)$; parameter I_C

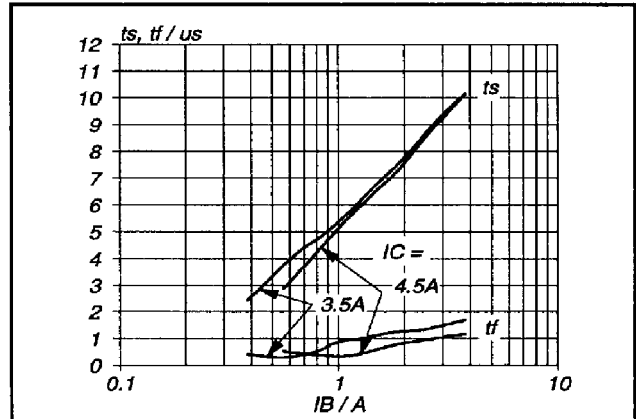


Fig.12. Typical collector storage and fall time.
 $t_s = f(I_B)$; $t_f = f(I_B)$; parameter I_C ; $T_J = 85^\circ\text{C}$

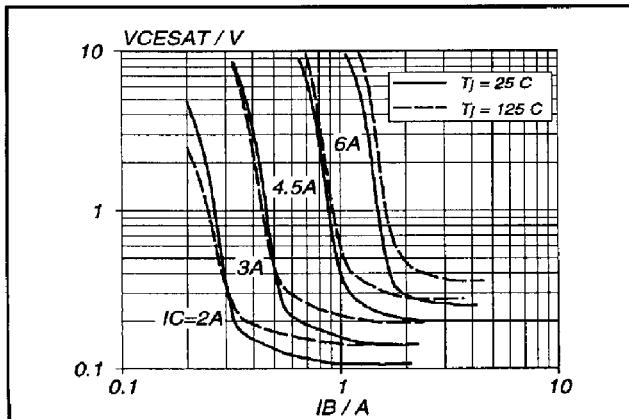


Fig.10. Typical collector-emitter saturation voltage.
 $V_{CEsat} = f(I_B)$; parameter I_C

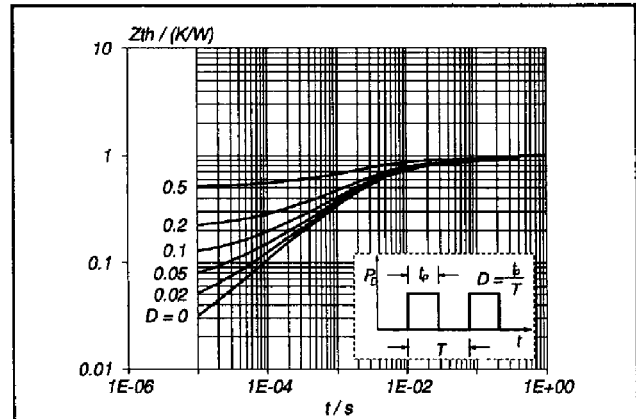


Fig.13. Transient thermal impedance.
 $Z_{th1-mb} = f(t)$; parameter $D = t_p/T$

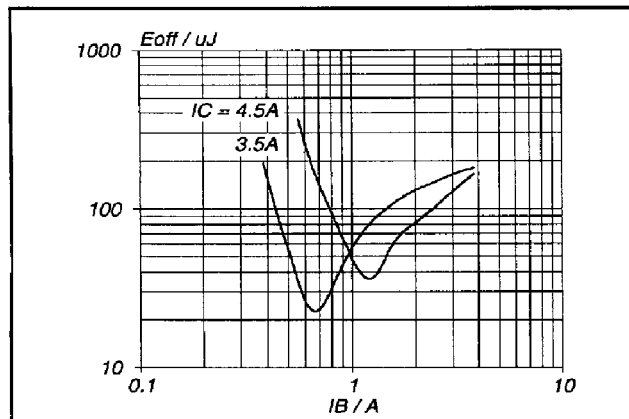


Fig.11. Typical turn-off losses. $T_J = 85^\circ\text{C}$
 $E_{off} = f(I_B)$; parameter I_C

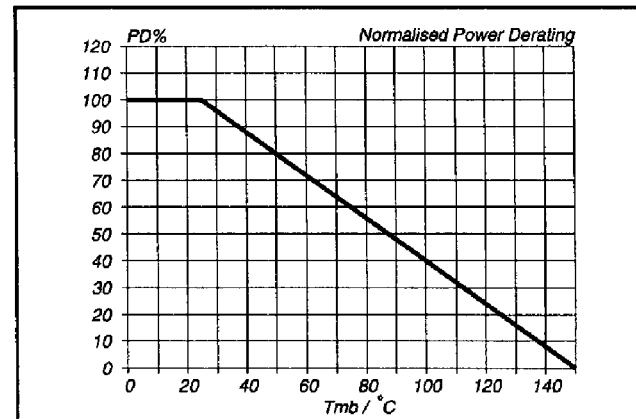


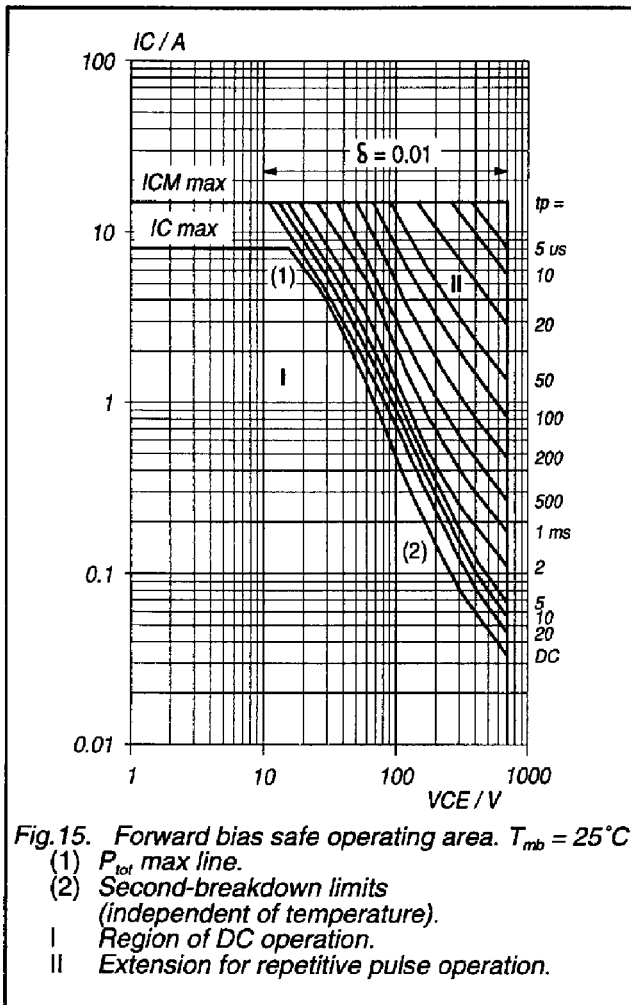
Fig.14. Normalised power dissipation.
 $PD\% = 100 \cdot P_D / P_{D25^\circ\text{C}} = f(T_{mb})$

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MECHANICAL DATA

Dimensions in mm

Net Mass: 5 g

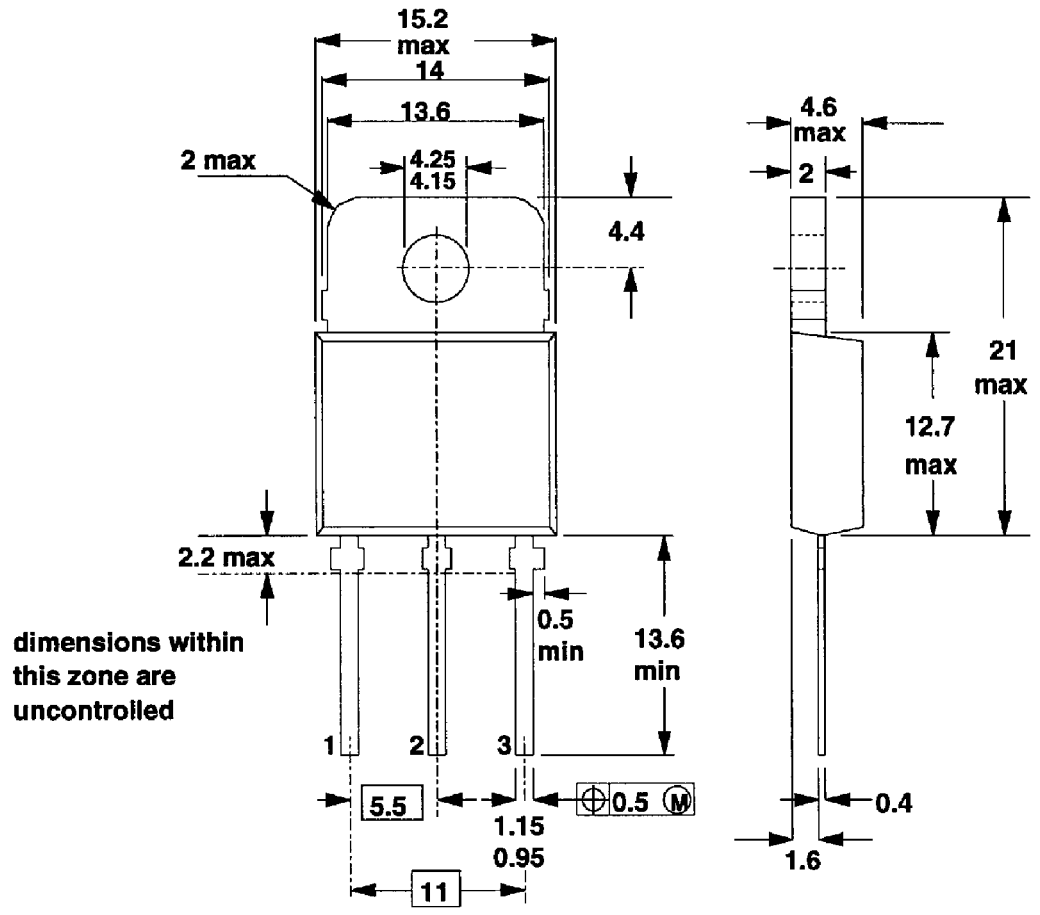


Fig. 16. SOT93; pin 2 connected to mounting base.

Notes

1. Accessories supplied on request: refer to mounting instructions for SOT93 envelope.

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