

Silicon Diffused Power Transistor

BUJ101AU

GENERAL DESCRIPTION

High-voltage, high-speed planar-passivated npn power switching transistor in the I-PAK / SOT533 envelope intended for use in high frequency electronic lighting ballast applications, converters and inverters, etc.

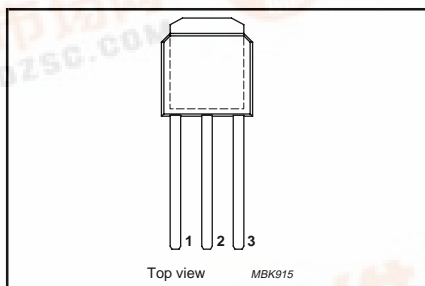
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	700	V
V_{CBO}	Collector-Base voltage (open emitter)		-	700	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	V
I_C	Collector current (DC)		-	1.5	A
I_{CM}	Collector current peak value		-	3	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ }^\circ\text{C}$	-	50	W
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 1.0\text{ A}; I_B = 200\text{ mA}$	0.32	1.0	V
h_{FE}		$I_C = 1.0\text{ A}; V_{CE} = 5\text{ V}$	11	14	
t_{fi}	Fall time (Inductive)	$I_C = 1.0\text{ A}, I_{BON} = 200\text{ mA}$	50	70	ns

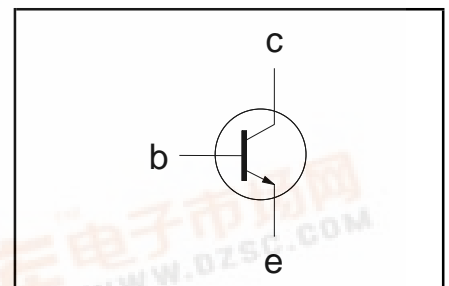
PINNING - SOT533

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 to emitter voltage	$V_{BE} = 0\text{ V}$	-	700	V
V_{CEO}	Collector to emitter voltage (open base)		-	400	V
V_{CBO}	Collector to base voltage (open emitter)		-	700	V
I_C	Collector current (DC)		-	1.5	A
I_{CM}	Collector current peak value		-	3	A
I_B	Base current (DC)		-	0.75	A
I_{BM}	Base current peak value		-	1.5	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ }^\circ\text{C}$	-	50	W
T_{stg}	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		-	2.5	K/W
$R_{th\ j-a}$	Junction to ambient	in free air	70	-	K/W



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STATIC CHARACTERISTICS $T_{mb} = 25\text{ °C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}, I_{CBO} I_{CES}	Collector cut-off current ¹	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $T_j = 125\text{ °C}$	-	0.9	100	μA
I_{CEO} I_{EBO} $V_{CEOsust}$	Collector cut-off current Emitter cut-off current Collector-emitter sustaining voltage	$V_{CE} = V_{CESMmax} (400\text{V})$ $V_{EB} = 9\text{ V}; I_C = 0\text{ A}$ $I_B = 0\text{ A}; I_C = 10\text{ mA};$ $L = 25\text{ mH}$	-	-	100	μA
V_{CEsat} V_{BEsat}	Collector-emitter saturation voltage Base-emitter saturation voltage	$I_C = 1.0\text{ A}; I_B = 200\text{mA}$ $I_C = 1.0\text{ A}; I_B = 200\text{mA}$	-	0.04	100	μA
h_{FE} h_{FE} h_{FE}	DC current gain	$I_C = 10\text{mA}; V_{CE} = 5\text{ V}$ $I_C = 100\text{mA}; V_{CE} = 5\text{ V}$ $I_C = 1.0\text{A}; V_{CE} = 5\text{ V}$	400	-	-	V
				0.32	1.0	V
				1.01	1.3	V
			11	20	27	
			12.5	21	31	
			7.5	11	14.5	

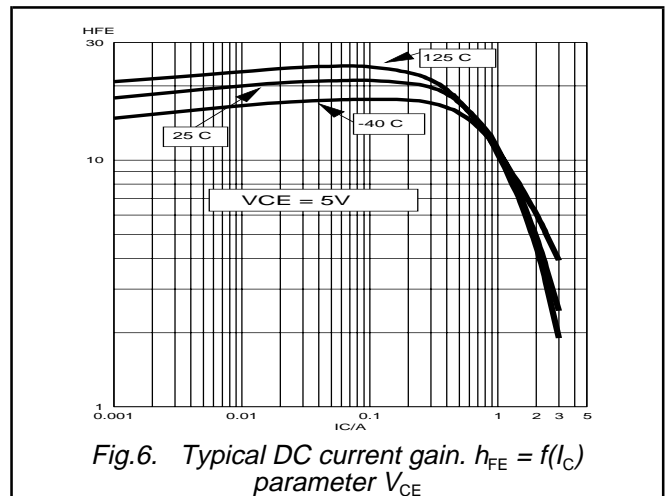
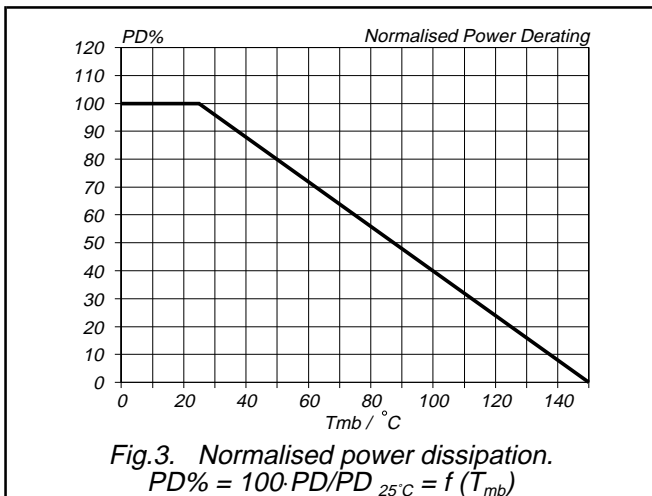
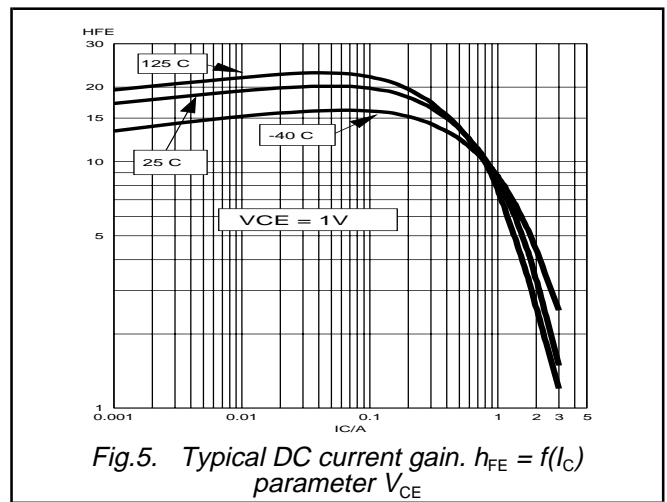
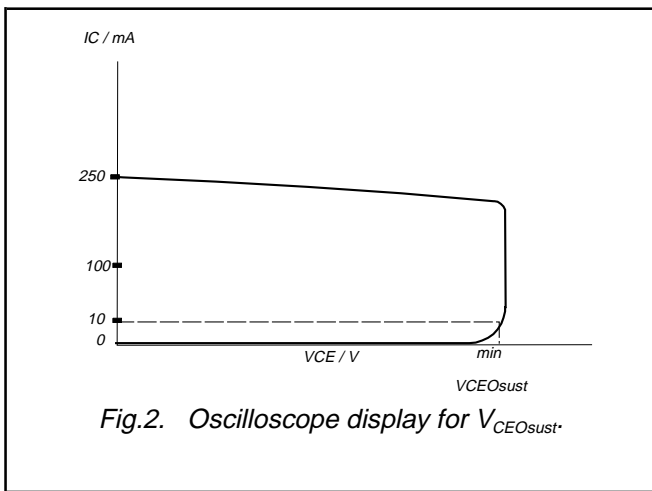
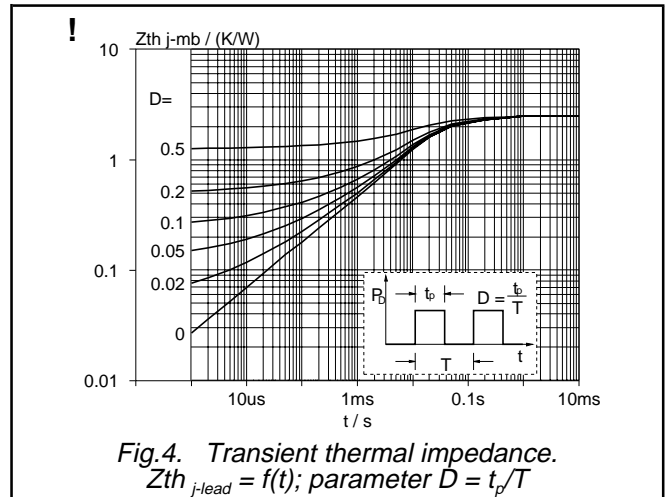
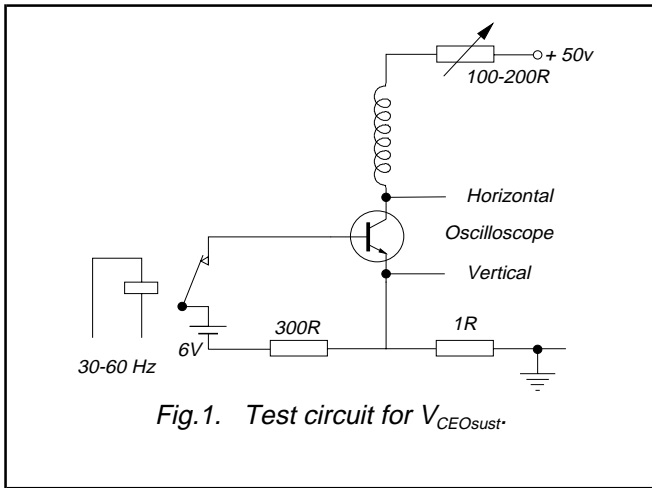
DYNAMIC CHARACTERISTICS $T_{mb} = 25\text{ °C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (resistive load)	$I_{Con} = 1.0\text{ A}; I_{Bon} = -I_{Boff} = 200\text{mA};$ $R_L = 75\text{ ohms}; V_{BB2} = 4\text{ V};$			
t_{on}	Turn-on time		0.65	0.88	μs
t_s	Turn-off storage time		0.88	1.2	μs
t_f	Turn-off fall time		250	338	ns
	Switching times (inductive load)	$I_{Con} = 1.0\text{ A}; I_{Bon} = 200\text{mA}; L_B = 1\text{ }\mu\text{H};$ $-V_{BB} = 5\text{ V}$			
t_s	Turn-off storage time		0.51	0.7	μs
t_f	Turn-off fall time		50	70	ns
	Switching times (inductive load)	$I_{Con} = 1.0\text{ A}; I_{Bon} = 200\text{mA}; L_B = 1\text{ }\mu\text{H};$ $-V_{BB} = 5\text{ V}; T_j = 100\text{ °C}$			
t_s	Turn-off storage time		-	1.4	μs
t_f	Turn-off fall time		-	130	ns

¹ Measured with half sine-wave voltage (curve tracer).

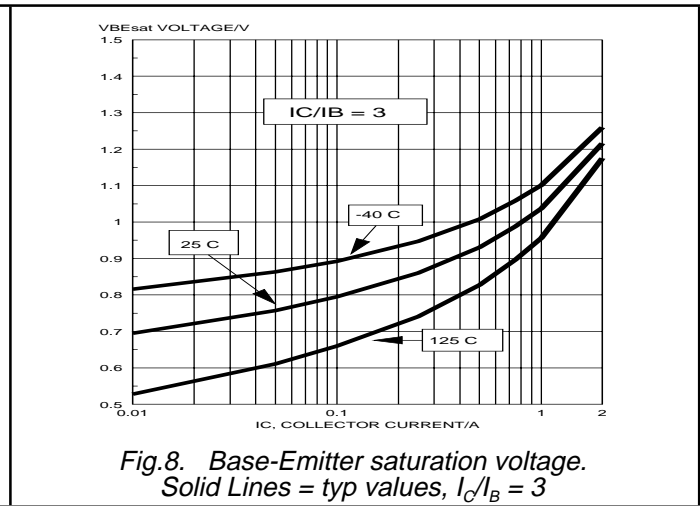
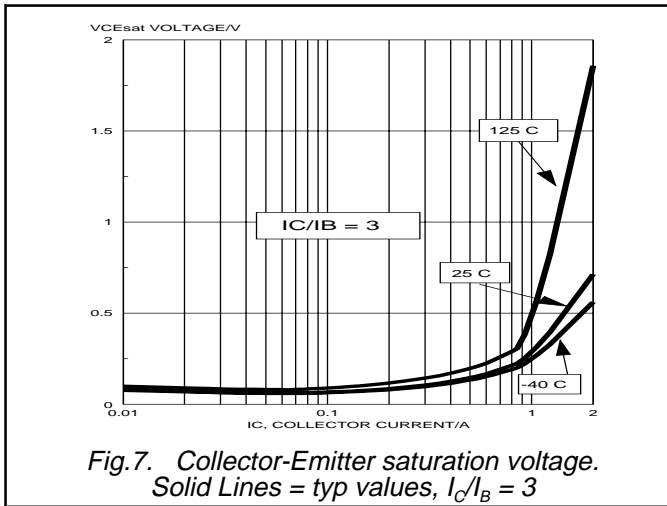
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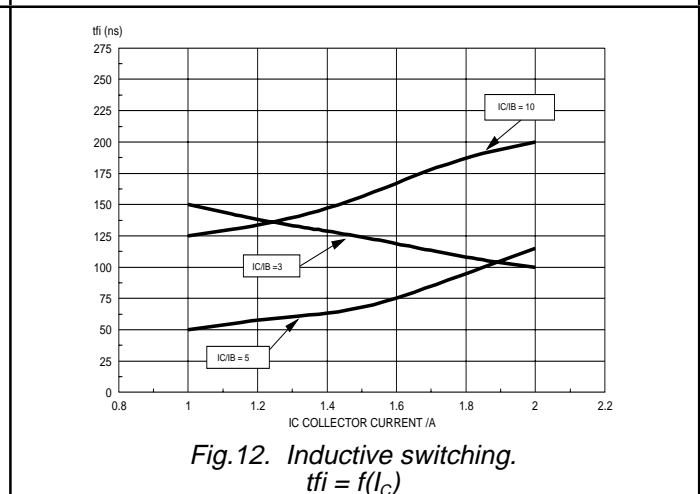
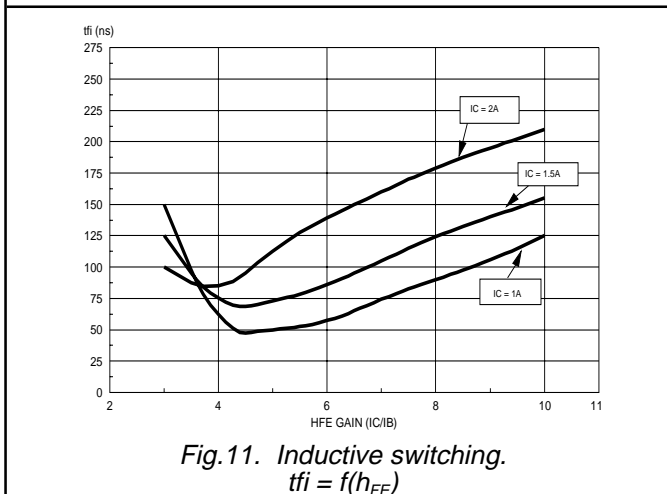
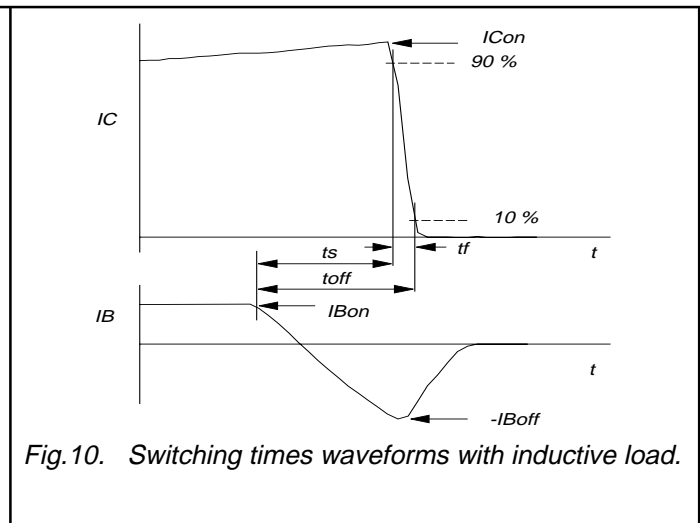
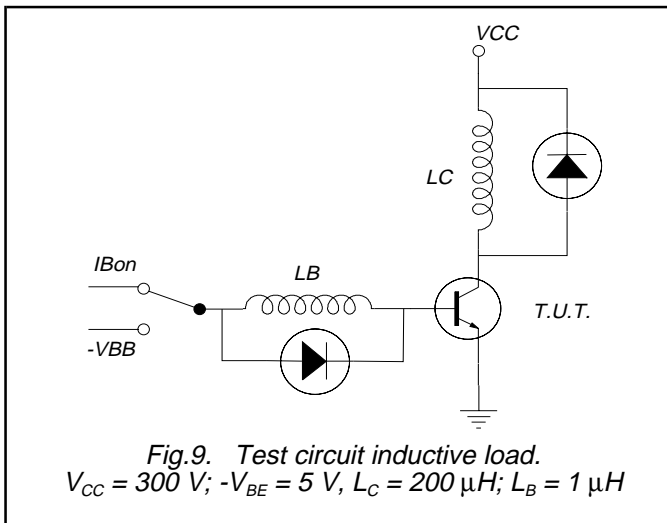


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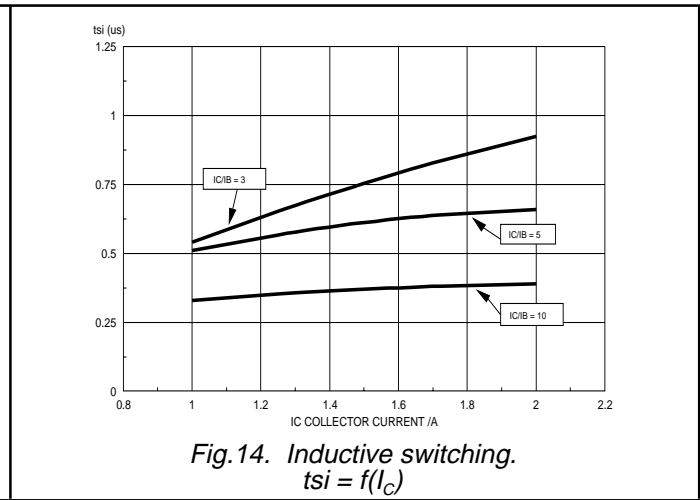
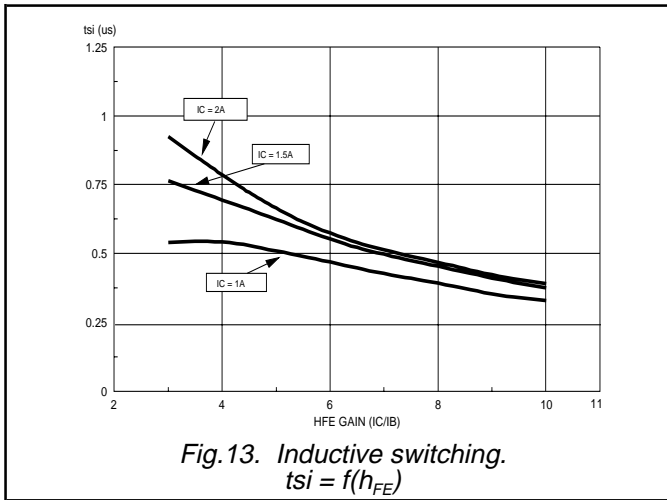


INDUCTIVE SWITCHING

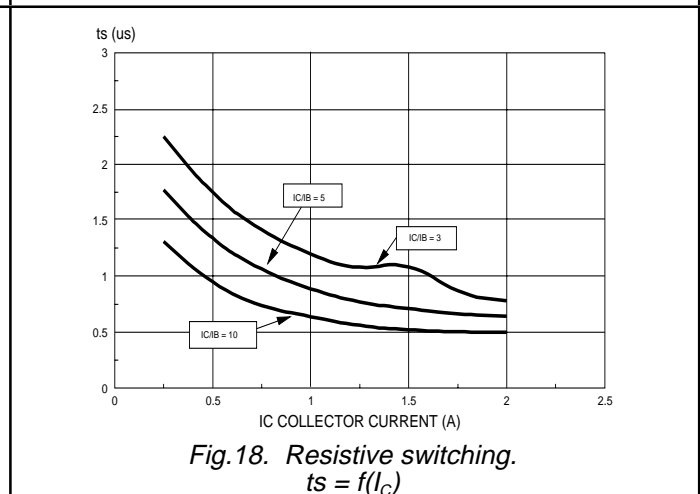
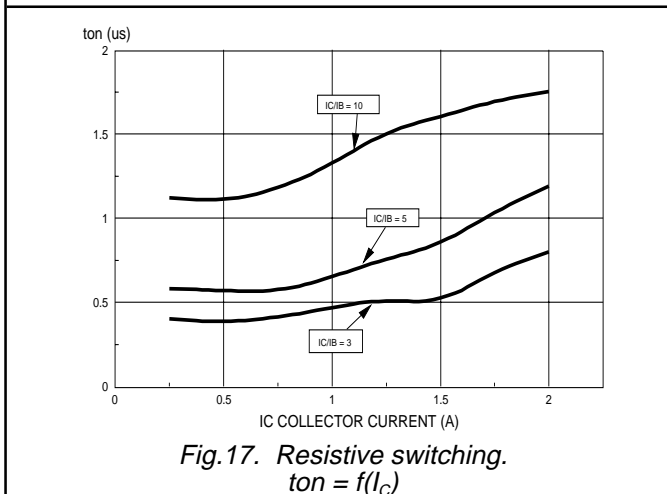
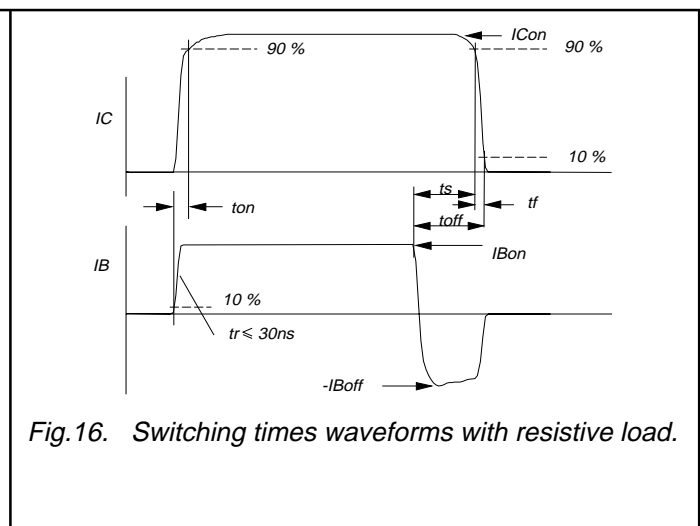
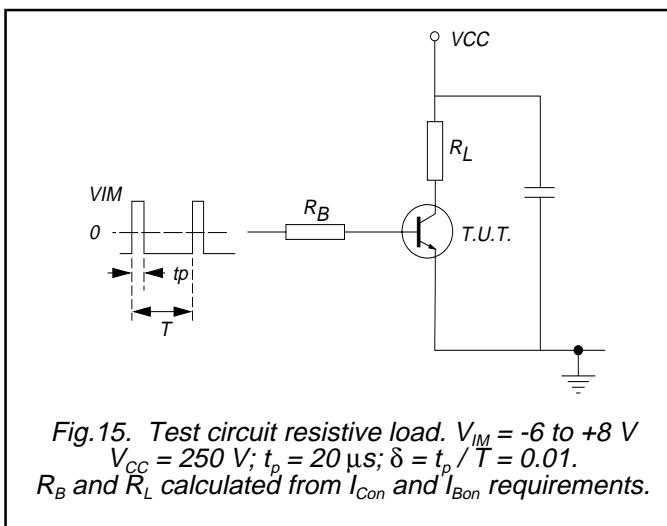


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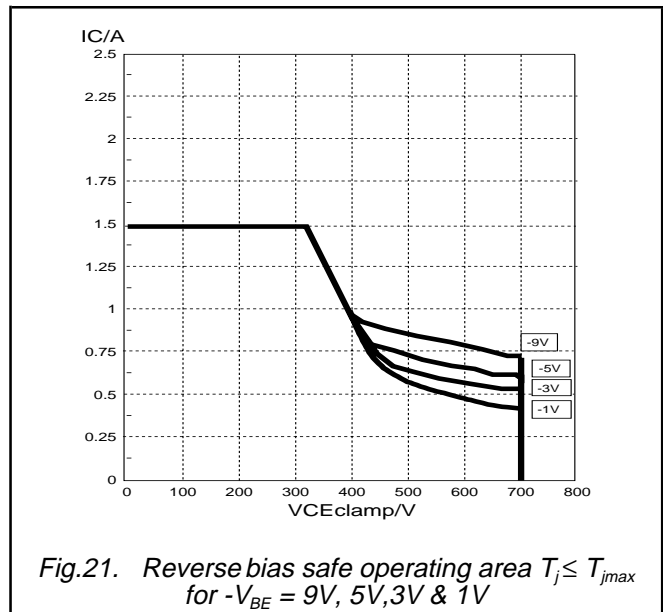
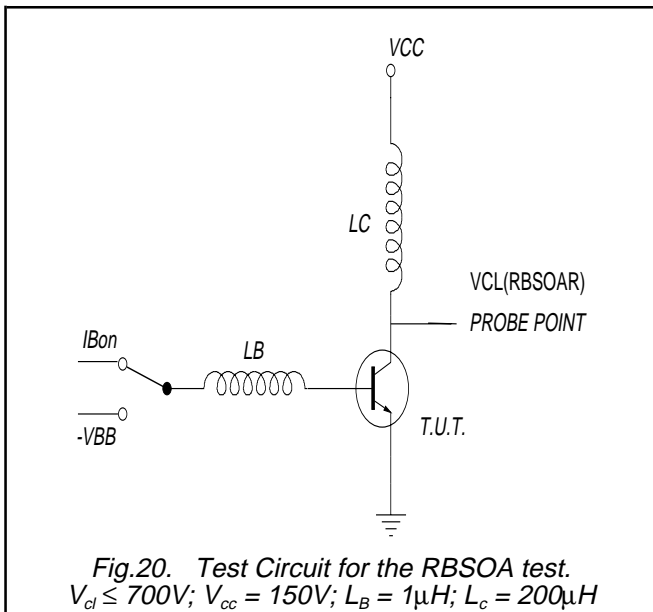
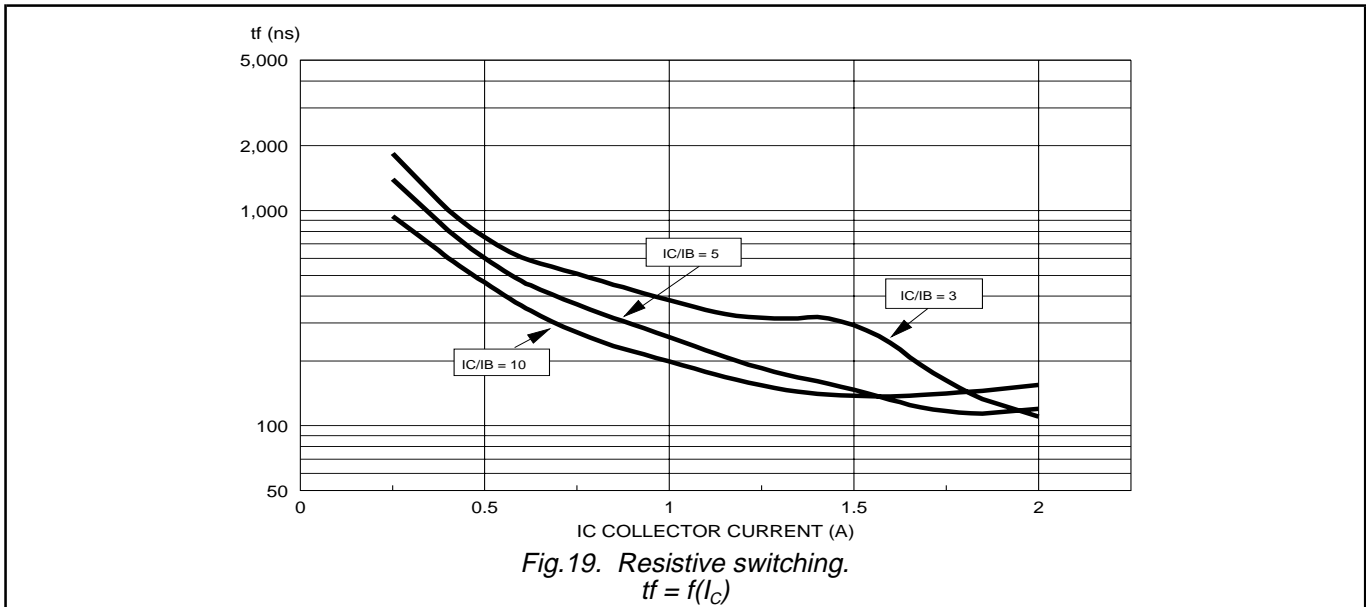


RESISTIVE SWITCHING



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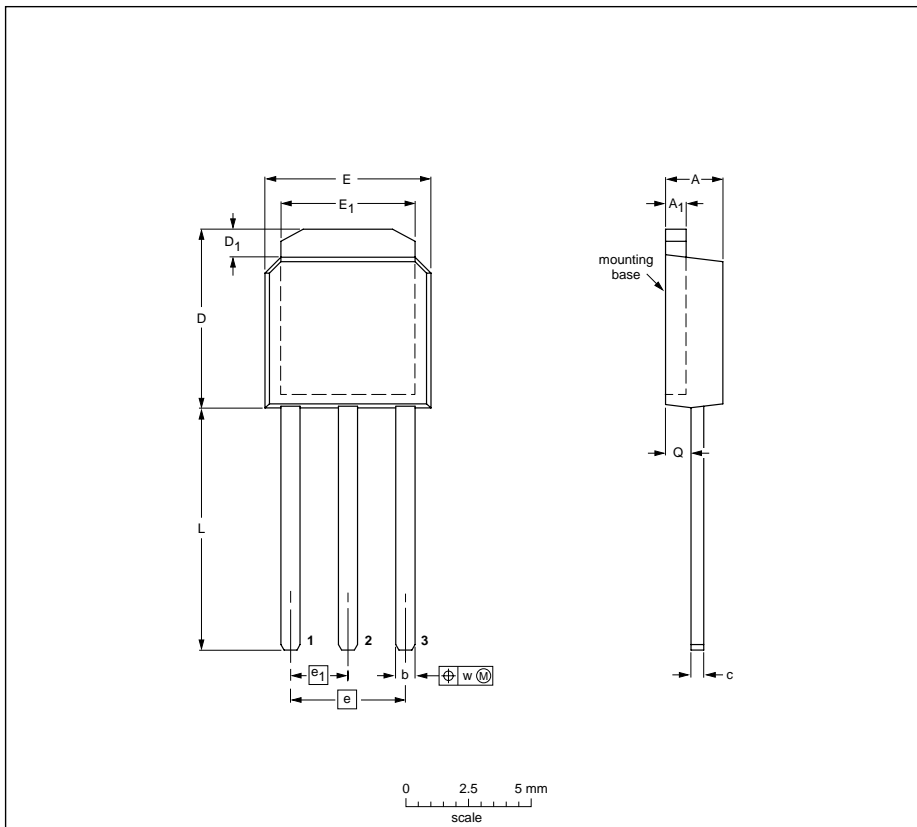
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MECHANICAL DATA

Plastic single-ended package (Philips version of I-PAK); 3 leads (in-line)

SOT533



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b	c	D	D ₁	E	E ₁	e	e ₁	L	Q
mm	2.38	0.89	0.89	0.56	7.28	1.06	6.73	5.36	4.57	2.285	9.8	1.00
	2.22	0.71	0.71	0.46	6.94	0.96	6.47	5.26			9.4	1.10

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT533		TO-251				99-02-18

Fig.22. SOT533 surface mounting package. Pin 2 connected to mounting base.

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DEFINITIONS

Data sheet status	
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.
Limiting values	
Limiting values are given 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 this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	
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