

DATA SHEET

BUJ100 Silicon Diffused Power Transistor

Product specification

September 2018

Silicon Diffused Power Transistor

BUJ100

GENERAL DESCRIPTION

High-voltage, high-speed planar-passivated npn power switching transistor in the TO92 envelope intended for use in compact fluorescent lamps and low power electronic lighting ballasts, converters and inverters, etc.

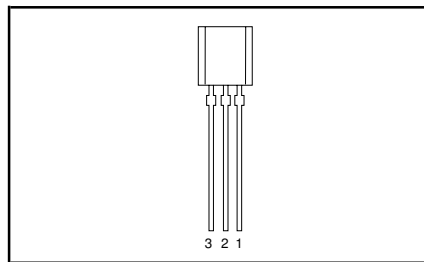
QUICK REFERENCE DATA

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)		-	1.0	A
I_{CM}	Collector current peak value		-	2.0	A
P_{tot}	Total power dissipation	$T_{lead} \leq 25\text{ }^\circ\text{C}$	-	2	W
V_{CESat}	Collector-emitter saturation voltage	$I_C = 0.75\text{ A}; I_B = 150\text{ mA}$	0.24	1.0	V
h_{FE}		$I_C = 0.75\text{ A}; V_{CE} = 5\text{ V}$	14	20	
t_{fi}	Fall time (Inductive)	$I_C = 1.0\text{ A}; I_{BON} = 200\text{ mA}$	50	70	ns

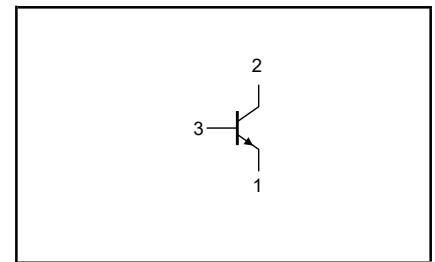
PINNING - TO92

PIN	DESCRIPTION
1	Emitter
2	Collector
3	Base

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)		-	1.0	A
I_{CM}	Collector current peak value		-	2.0	A
I_B	Base current (DC)		-	0.5	A
I_{BM}	Base current peak value		-	1.0	A
P_{tot}	Total power dissipation	$T_{lead} \leq 25\text{ }^\circ\text{C}$	-	2	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
$R_{th\ j-lead}$	Thermal resistance junction to lead		-	60	K/W
$R_{th\ j-a}$	Thermal resistance Junction to ambient	pcb mounted; lead length = 4mm	150	-	K/W

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}, I_{CBO} I_{CES}	Collector cut-off current ¹	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $T_j = 125\text{ °C}$	-	0.8 2.0	100 500	μA μA
I_{CEO}	Collector cut-off current	$V_{CEO} = V_{CEOMmax} (400\text{V})$	-	-	100	μA
I_{EBO}	Emitter cut-off current	$V_{EB} = 9\text{ V}; I_C = 0\text{ A}$	-	0.05	100	μA
$V_{CEOsust}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}; I_C = 10\text{mA};$ $L = 25\text{ mH}$	400	-	-	V
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 0.75\text{ A}; I_B = 0.15\text{ A}$	-	0.24	1.0	V
V_{BEsat}	Base-emitter saturation voltage	$I_C = 0.75\text{ A}; I_B = 0.15\text{ A}$	-	0.93	1.3	V
h_{FE}	DC current gain	$I_C = 10\text{mA}; V_{CE} = 5\text{ V}$	11	20	27	
h_{FE}		$I_C = 100\text{mA}; V_{CE} = 5\text{ V}$	12.5	21	31	
h_{FE}		$I_C = 0.75\text{ A}; V_{CE} = 5\text{ V}$	9	14	20	

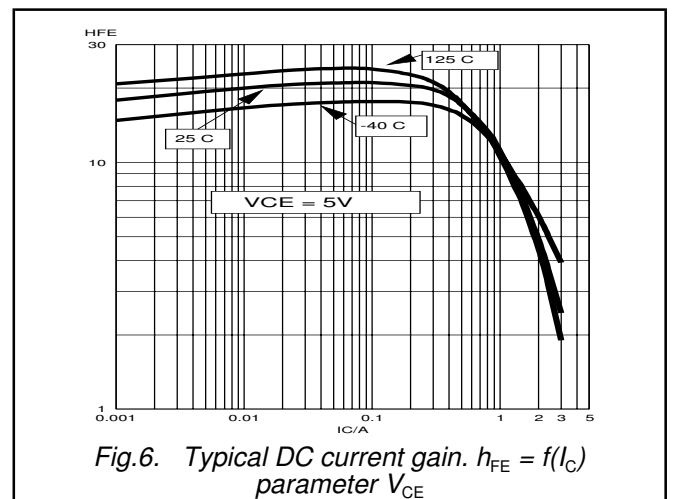
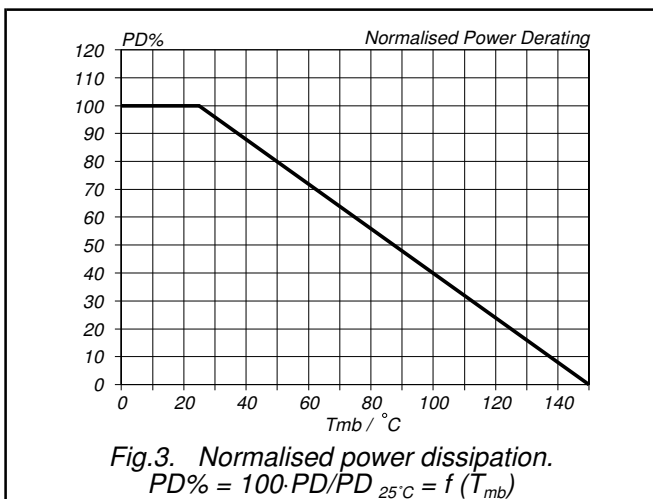
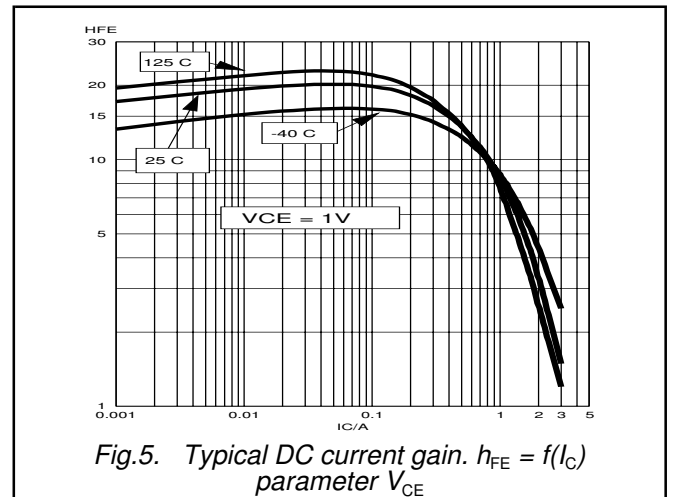
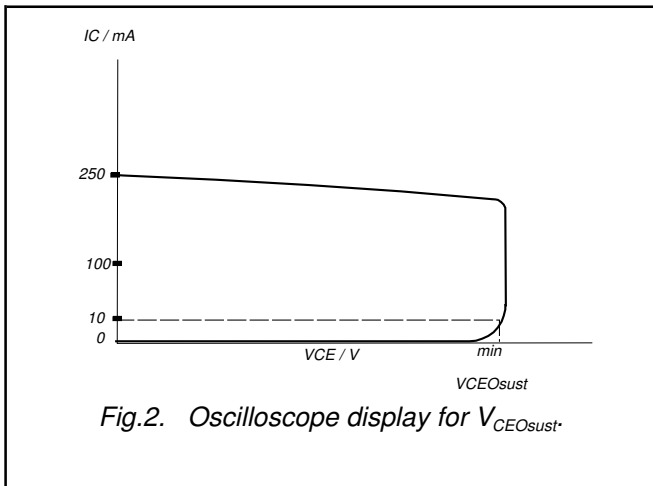
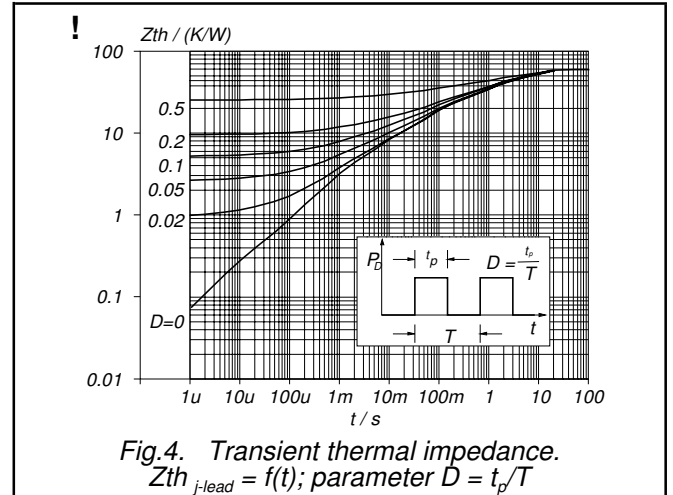
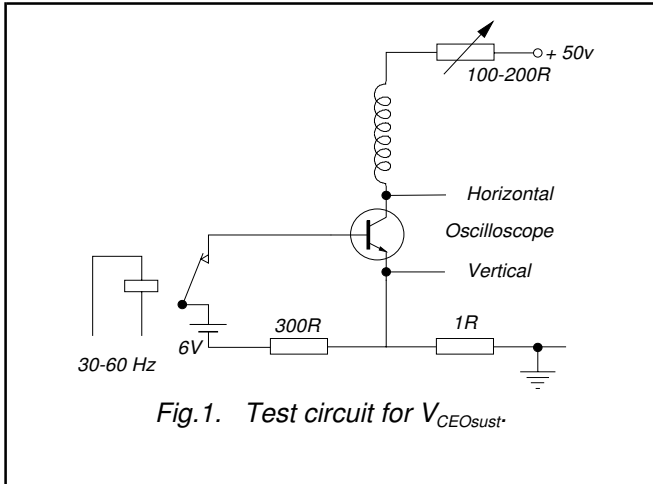
DYNAMIC CHARACTERISTICS $T_{lead} = 25\text{ °C}$ unless otherwise specified

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).

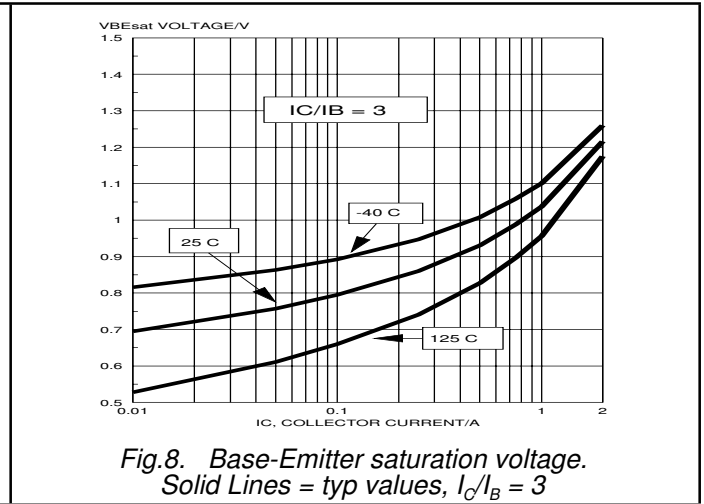
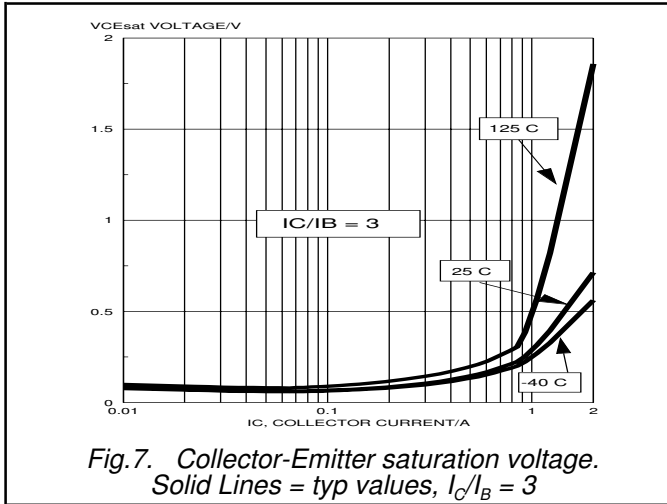
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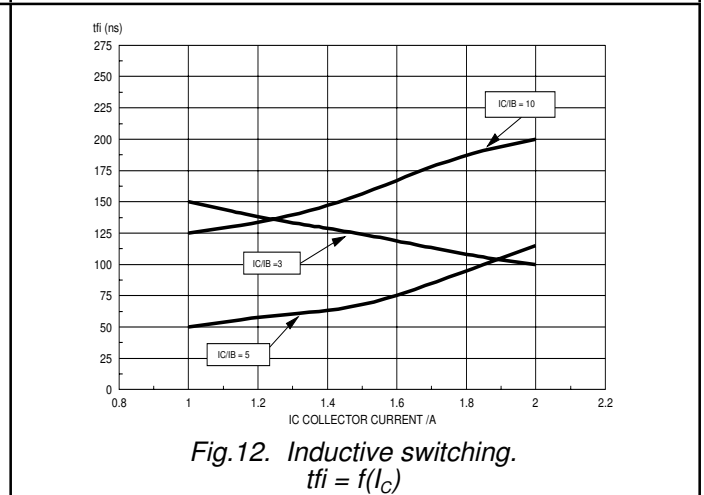
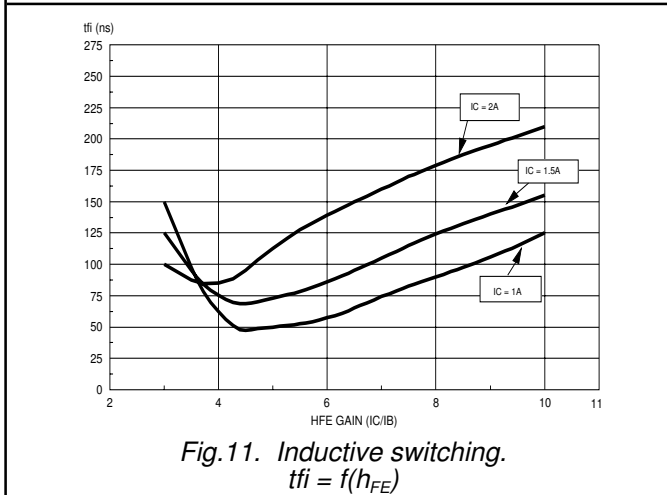
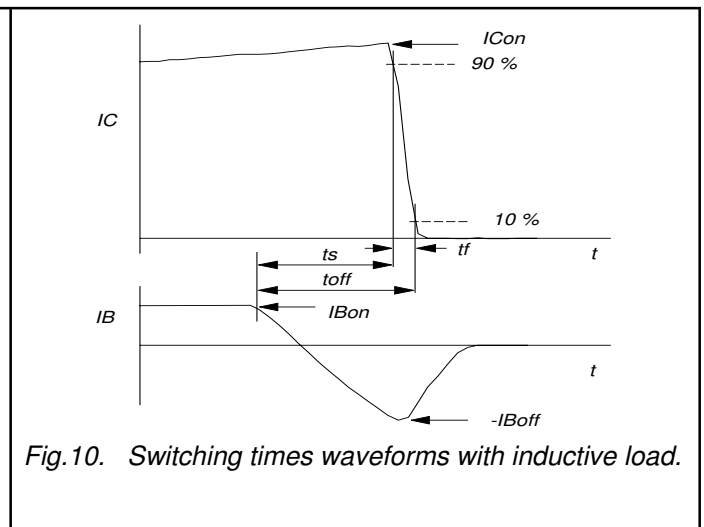
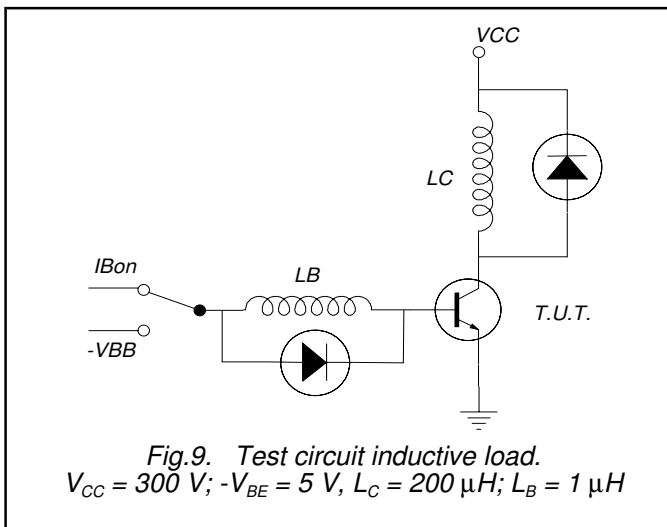


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INDUCTIVE SWITCHING



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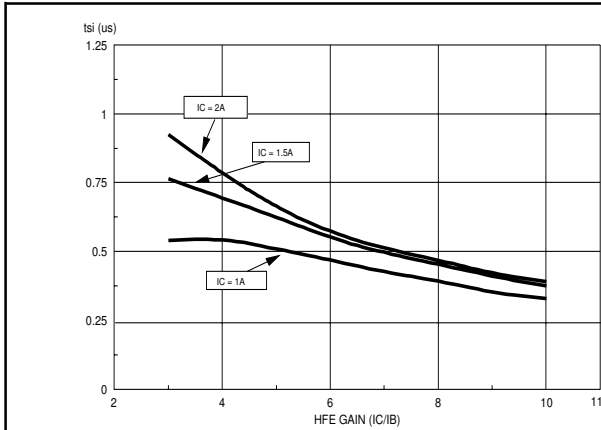


Fig.13. Inductive switching.
 $t_{si} = f(h_{FE})$

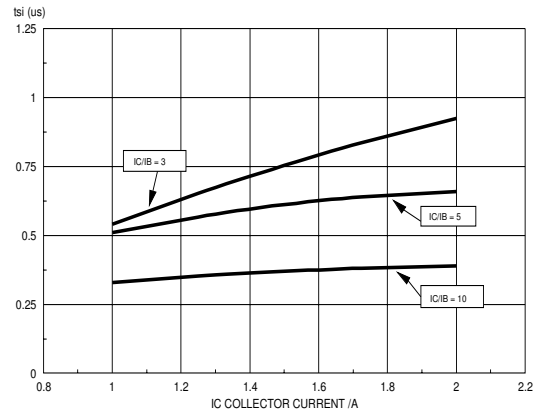


Fig.14. Inductive switching.
 $t_{si} = f(I_C)$

RESISTIVE SWITCHING

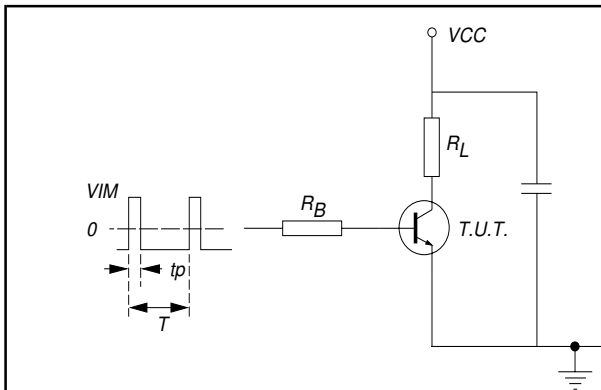


Fig.15. Test circuit resistive load. $V_{IM} = -6$ to $+8$ V
 $V_{CC} = 250$ V; $t_p = 20$ μs ; $\delta = t_p / T = 0.01$.
 R_B and R_L calculated from I_{Con} and I_{Bon} requirements.

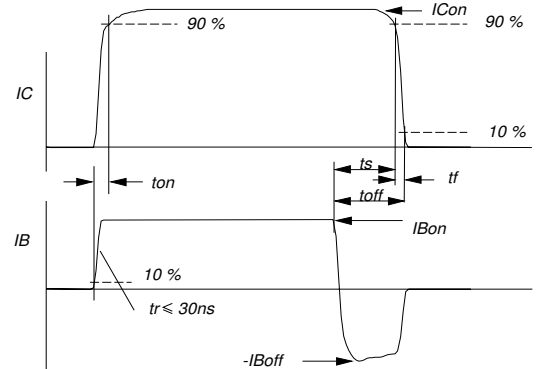


Fig.16. Switching times waveforms with resistive load.

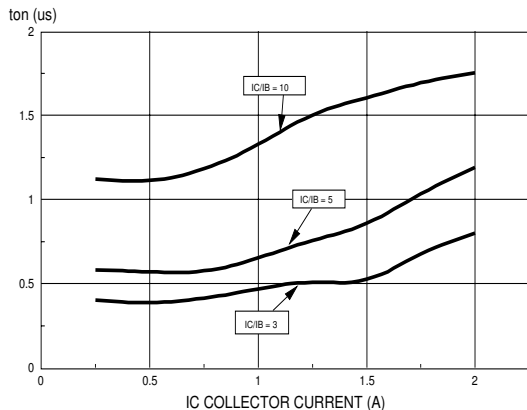


Fig.17. Resistive switching.
 $t_{on} = f(I_C)$

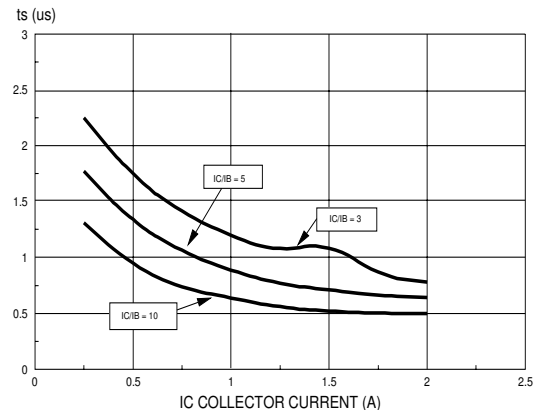
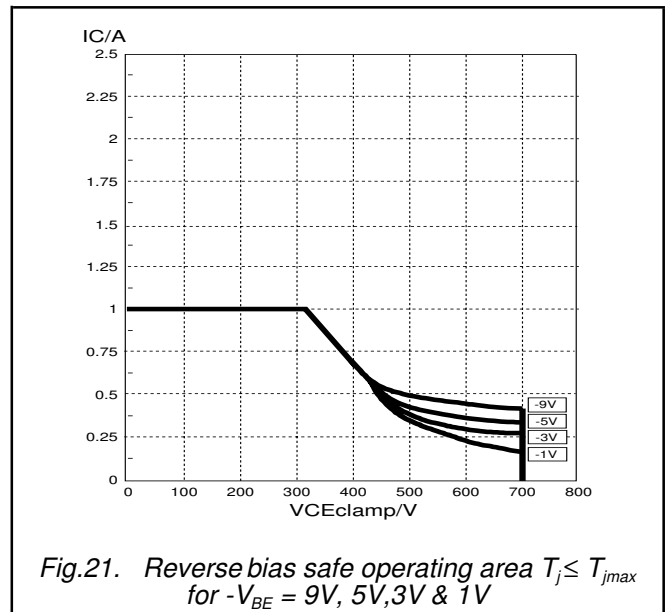
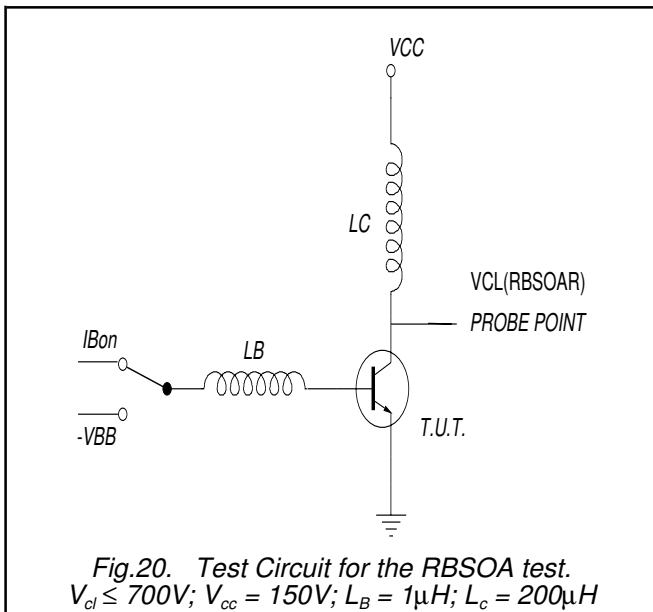
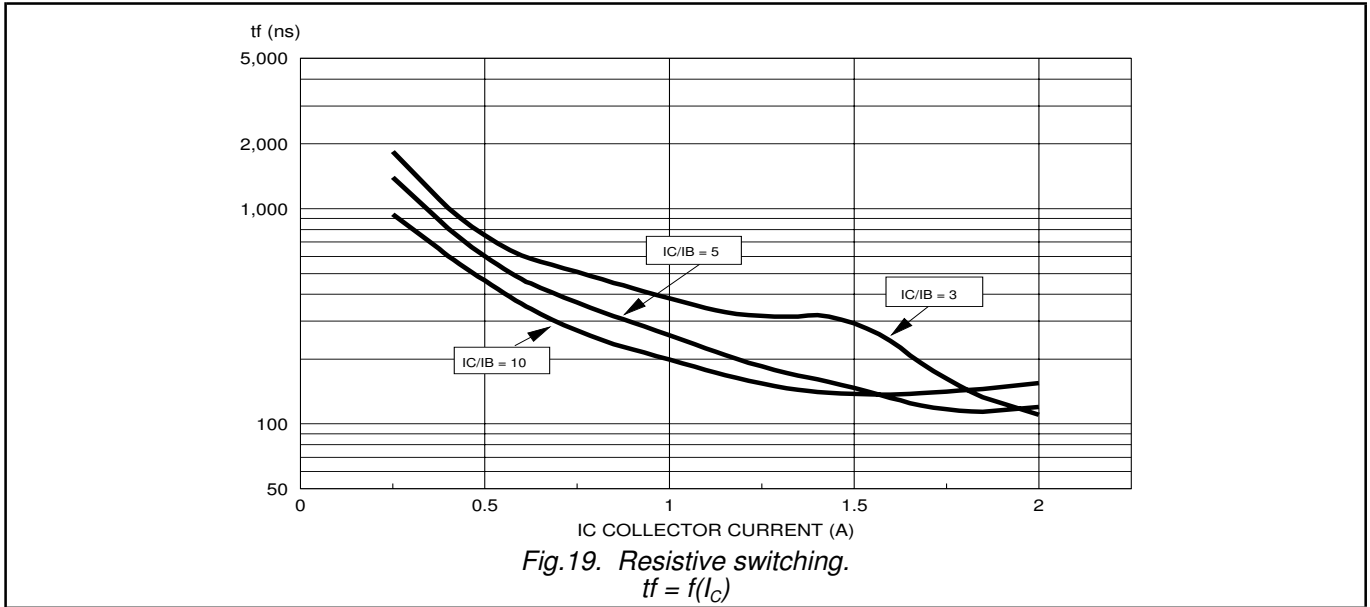


Fig.18. Resistive switching.
 $t_s = f(I_C)$

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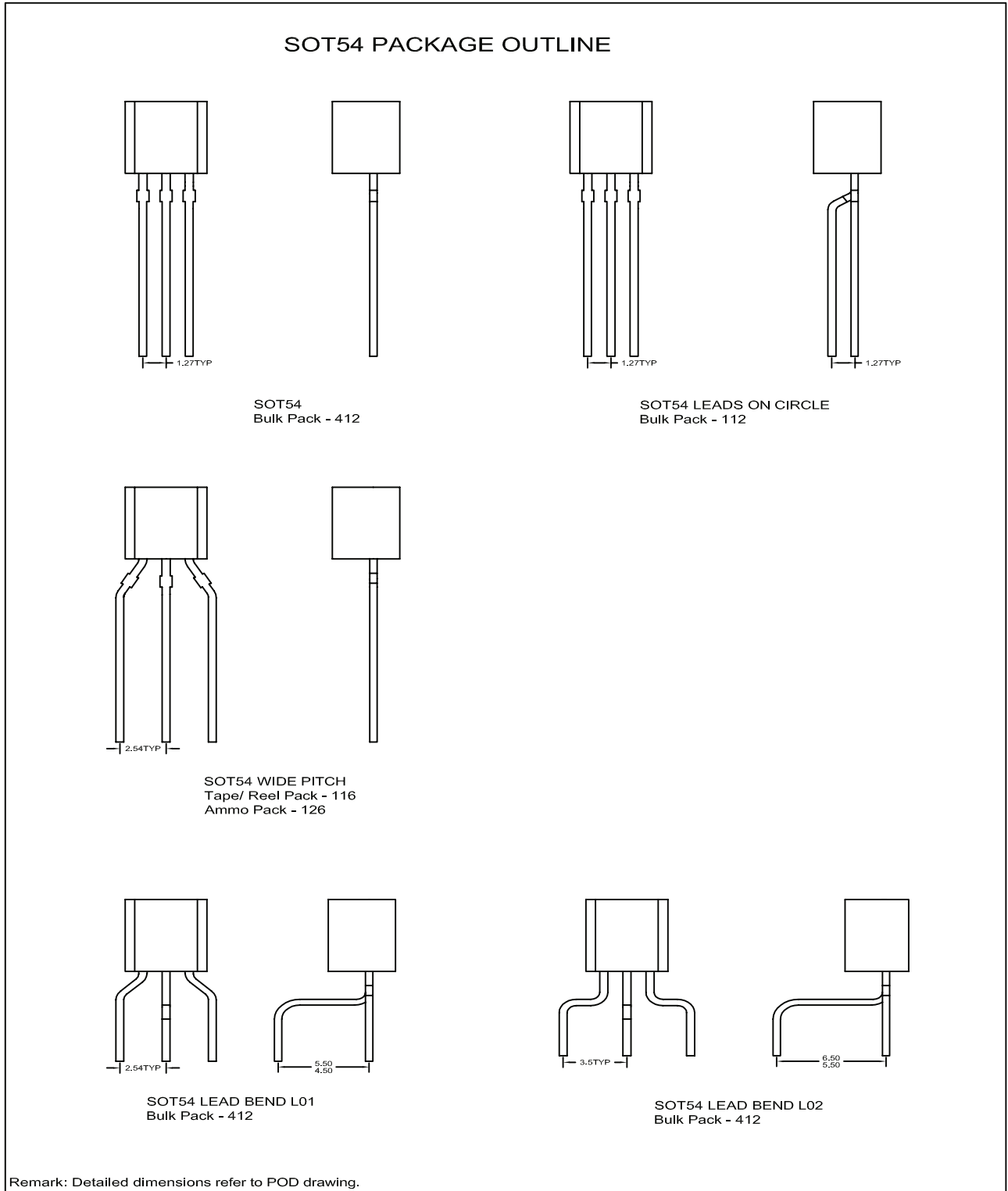
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MECHANICAL DATA



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