

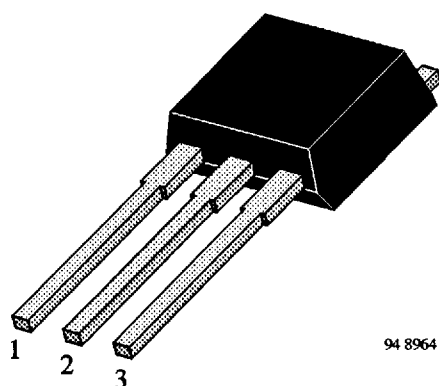
Silicon NPN High Voltage Switching Transistor

Features

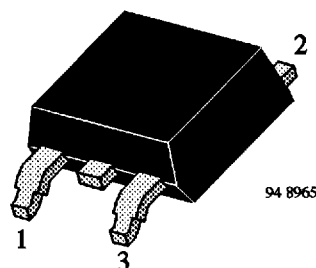
- Multi diffusion technology
- Glass passivation
- High reverse voltage
- Short switching times

Applications

Electronic lamp ballast circuits
Switch-mode power supplies



BUD86
BUD87
1 Emitter 2 Collector 3 Base



BUD86 -SMD
BUD87 -SMD
1 Emitter 2 Collector 3 Base

Absolute Maximum Ratings

$T_{case} = 25^{\circ}C$, unless otherwise specified

Parameter	Test Conditions	Type	Symbol	Value	Unit
Collector-emitter voltage		BUD86	V_{CEO}	400	V
		BUD87	V_{CEO}	450	V
		BUD86	V_{CES}	800	V
		BUD87	V_{CES}	1000	V
Emitter-base voltage			V_{EBO}	5	V
Collector current			I_C	0.5	A
Collector peak current			I_{CM}	1	A
Base current			I_B	0.3	A
			$-I_B$	0.3	A
Total power dissipation	$T_{case} \leq 60^{\circ}C$		P_{tot}	20	W
Junction temperature			T_j	150	$^{\circ}C$
Storage temperature range			T_{stg}	-65 to +150	$^{\circ}C$

Maximum Thermal Resistance

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

Parameter	Test Conditions	Symbol	Value	Unit
Junction case		R_{thJC}	4.5	K/W

Electrical Characteristics

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

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Collector cut-off current	$V_{\text{CE}} = 800 \text{ V}$	BUD86	I_{CES}			100	μA
	$V_{\text{CE}} = 1000 \text{ V}$	BUD87	I_{CES}			100	μA
	$V_{\text{CE}} = 800 \text{ V}; T_{\text{case}} = 125^{\circ}\text{C}$	BUD86	I_{CES}			1	mA
	$V_{\text{CE}} = 1000 \text{ V}; T_{\text{case}} = 125^{\circ}\text{C}$	BUD87	I_{CES}			1	mA
Collector-emitter breakdown voltage (figure 1)	$I_{\text{C}} = 100 \text{ mA}; L = 125 \text{ mH}; I_{\text{measure}} = 50 \text{ mA}$	BUD86	$V_{(\text{BR})\text{CEO}}$	400			V
		BUD87	$V_{(\text{BR})\text{CEO}}$	450			V
Emitter-base breakdown voltage	$I_{\text{E}} = 1 \text{ mA}$		$V_{(\text{BR})\text{EBO}}$	5			V
Collector-emitter saturation voltage	$I_{\text{C}} = 100 \text{ mA}; I_{\text{B}} = 10 \text{ mA}$		V_{CEsat}			0.8	V
	$I_{\text{C}} = 200 \text{ mA}; I_{\text{B}} = 20 \text{ mA}$		V_{CEsat}			1	V
Base-emitter saturation voltage	$I_{\text{C}} = 200 \text{ mA}; I_{\text{B}} = 20 \text{ mA}$		V_{BEsat}			1	V
DC forward current transfer ratio	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 50 \text{ mA}$		h_{FE}		50		
Gain bandwidth product	$I_{\text{C}} = 50 \text{ mA}; V_{\text{CE}} = 10 \text{ V}; f = 1 \text{ MHz}$		f_{T}		20		MHz

Switching Characteristics

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

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Resistive load (figure 2)							
Storage time	$I_{\text{C}} = 400 \text{ mA}; I_{\text{B1}} = 20 \text{ mA}; -I_{\text{B2}} = 40 \text{ mA}; V_{\text{S}} = 125 \text{ V}$		t_{s}			3.5	μs
Fall time			t_{f}		0.4		μs

94 8863

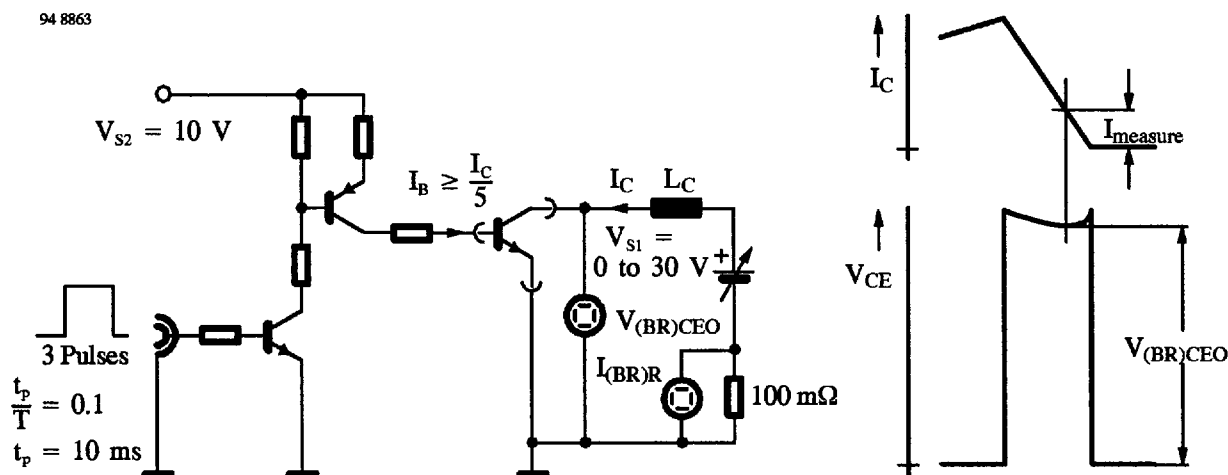
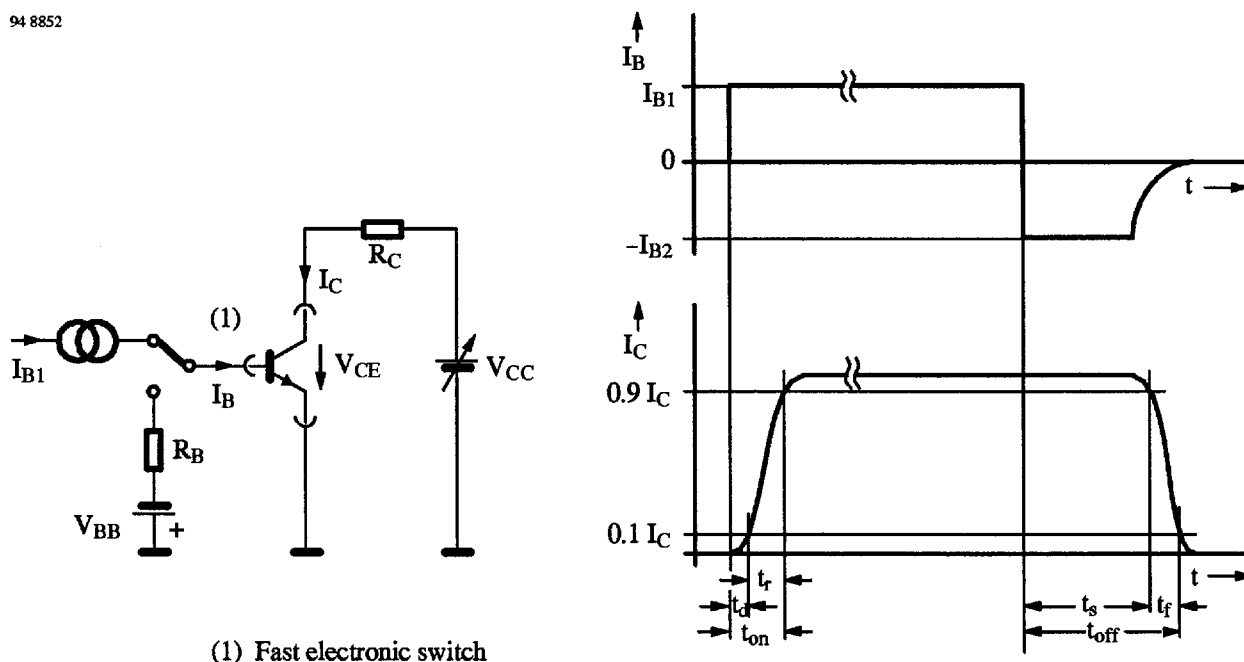


Figure 1. Test circuit for $V_{(BR)CEO}$

94 8852



(1) Fast electronic switch

Figure 2. Test circuit for switching characteristics - resistive load

Typical Characteristics ($T_{\text{case}} = 25^\circ\text{C}$ unless otherwise specified)

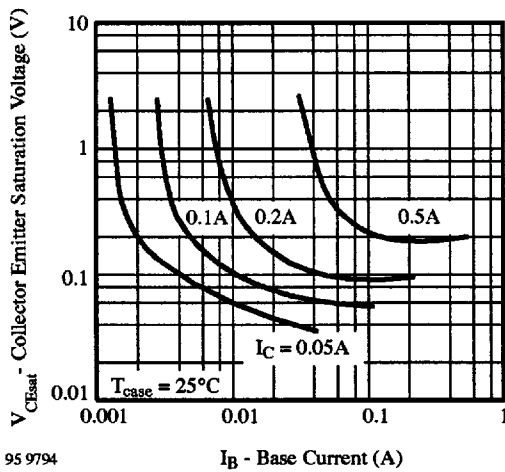


Figure 3. V_{CEsat} vs. I_{B}

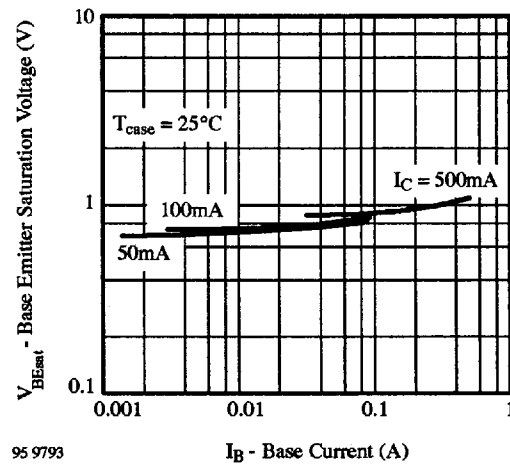


Figure 5. V_{BEsat} vs. I_{B}

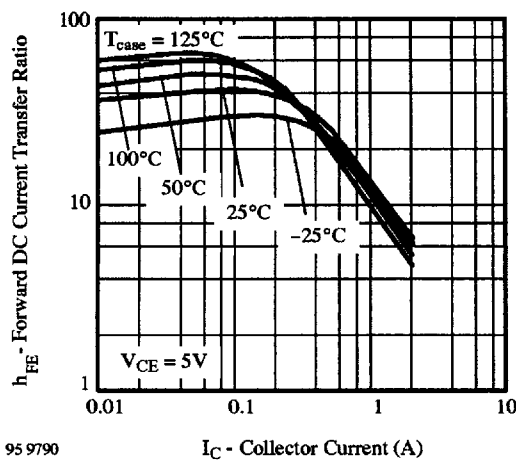


Figure 4. h_{FE} vs. I_{C}

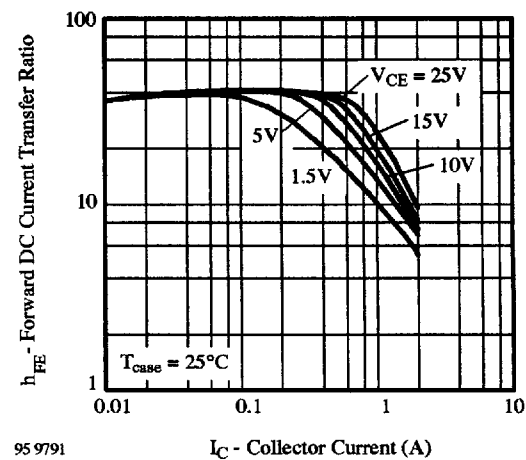
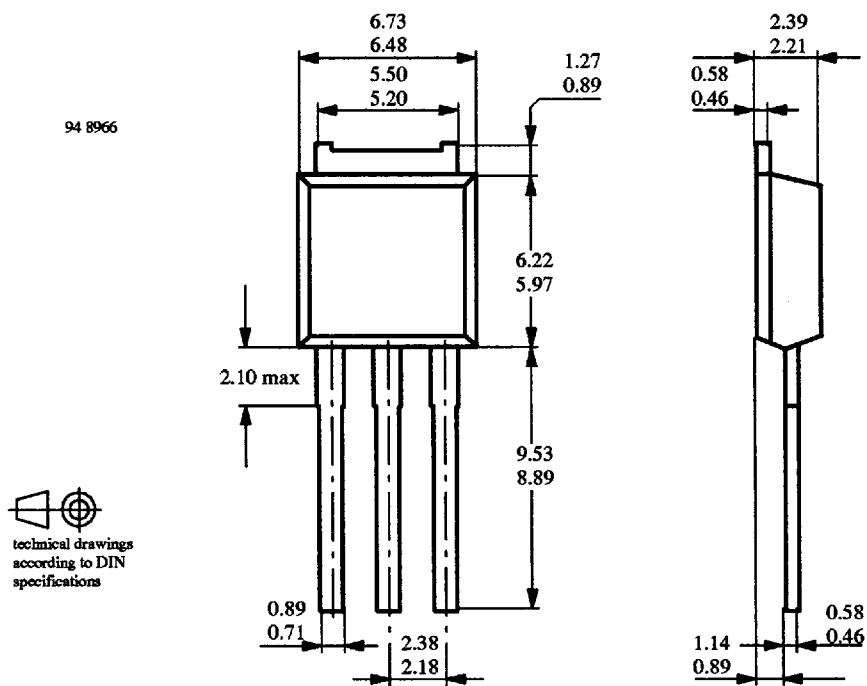


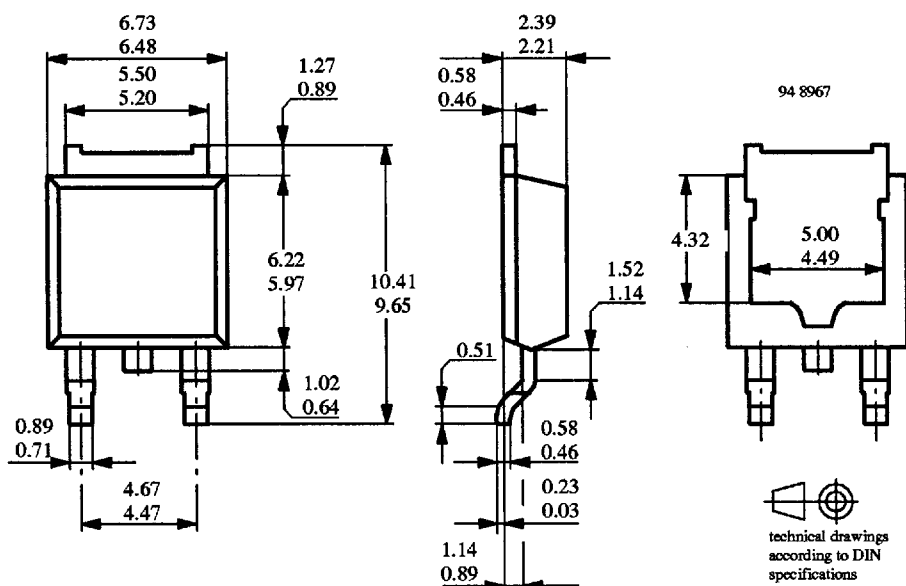
Figure 6. h_{FE} vs. I_{C}

Dimensions in mm

TO251



TO252



For ordering TO 252 add SMD to the type number (i.e. BUD86-SMD)