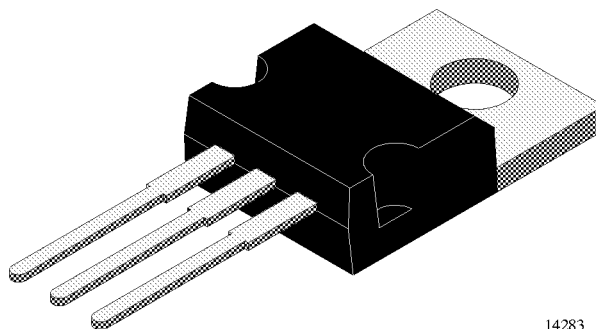




Silicon NPN High Voltage Switching Transistor

Features

- Simple-sWitch-Off Transistor (SWOT)
- HIGH SPEED technology
- Planar passivation
- 100 kHz switching rate
- Very low switching losses
- Very low dynamic saturation
- Very low operating temperature
- Optimized RBSOA
- High reverse voltage



14283

Applications

Electronic lamp ballast circuits
Switch-mode power supplies

Absolute Maximum Ratings

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

Parameter	Test Conditions	Symbol	Value	Unit
Collector-emitter voltage		V_{CEO}	500	V
		V_{CEW}	650	V
		V_{CES}	1000	V
Emitter-base voltage		V_{EBO}	11	V
Collector current		I_{C}	8	A
Collector peak current		I_{CM}	12	A
Base current		I_{B}	4	A
Base peak current		I_{BM}	6	A
Total power dissipation	$T_{\text{case}} = 25^{\circ}\text{C}$	P_{tot}	75	W
Junction temperature		T_{j}	150	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-65 to +150	$^{\circ}\text{C}$

Maximum Thermal Resistance

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

Parameter	Test Conditions	Symbol	Value	Unit
Junction case		R_{thJC}	1.67	K/W

Electrical Characteristics

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector cut-off current	$V_{\text{CE}} = 1000 \text{ V}$	I_{CES}			10	μA
	$V_{\text{CE}} = 1000 \text{ V}; T_{\text{case}} = 150^{\circ}\text{C}$	I_{CES}			1.0	mA
Collector-emitter breakdown voltage (figure 1)	$I_{\text{C}} = 300 \text{ mA}; L = 125 \text{ mH}; I_{\text{measure}} = 100 \text{ mA}$	$V_{(\text{BR})\text{CEO}}$	500			V
Emitter-base breakdown voltage	$I_{\text{E}} = 1 \text{ mA}$	$V_{(\text{BR})\text{EBO}}$	11			V
Collector-emitter saturation voltage	$I_{\text{C}} = 1.3 \text{ A}; I_{\text{B}} = 0.33 \text{ A}$	V_{CEsat}			0.2	V
	$I_{\text{C}} = 4 \text{ A}; I_{\text{B}} = 1.3 \text{ A}$	V_{CEsat}			0.4	V
Base-emitter saturation voltage	$I_{\text{C}} = 1.3 \text{ A}; I_{\text{B}} = 0.33 \text{ A}$	V_{BEsat}			1.0	V
	$I_{\text{C}} = 4 \text{ A}; I_{\text{B}} = 1.3 \text{ A}$	V_{BEsat}			1.2	V
DC forward current transfer ratio	$V_{\text{CE}} = 2 \text{ V}; I_{\text{C}} = 10 \text{ mA}$	h_{FE}	10			
	$V_{\text{CE}} = 2 \text{ V}; I_{\text{C}} = 1.3 \text{ A}$	h_{FE}	10			
	$V_{\text{CE}} = 2 \text{ V}; I_{\text{C}} = 4 \text{ A}$	h_{FE}	6			
	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 8 \text{ A}$	h_{FE}	4			
Collector-emitter working voltage	$V_{\text{S}} = 50 \text{ V}; L = 1 \text{ mH}; I_{\text{C}} = 8 \text{ A}; I_{\text{B1}} = 2.7 \text{ A}; -I_{\text{B2}} = 0.8 \text{ A}; -V_{\text{BB}} = 5 \text{ V}$	V_{CEW}	650			V
Gain bandwidth product	$I_{\text{C}} = 500 \text{ mA}; V_{\text{CE}} = 10 \text{ V}; f = 1 \text{ MHz}$	f_{T}	4			MHz
Free-wheel diode						
Forward voltage	$I_{\text{F}} = 1.3 \text{ A}$	V_{F}			1.5	V

Switching Characteristics

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Resistive load (figure 2)						
Turn on time	$I_C = 1.3 \text{ A}; I_{B1} = 0.35 \text{ A};$ $-I_{B2} = 0.7 \text{ A}; V_S = 250 \text{ V}$	t_{on}			0.25	μs
Storage time		t_s			4.0	μs
Fall time		t_f			0.5	μs
Turn on time	$I_C = 4 \text{ A}; I_{B1} = 0.8 \text{ A};$ $-I_{B2} = 2 \text{ A}; V_S = 250 \text{ V}$	t_{on}			1.0	μs
Storage time		t_s			2.5	μs
Fall time		t_f			0.5	μs
Inductive load (figure 3)						
Storage time	$I_C = 1.3 \text{ A}; I_{B1} = 0.35 \text{ A}; -I_{B2} = 0.7 \text{ A};$ $L = 200 \mu\text{H}; V_{\text{clamp}} = 300 \text{ V}; -V_{BE} = 5 \text{ V}$	t_s			4.5	μs
Fall time		t_f			0.25	μs
Storage time	$I_C = 4 \text{ A}; I_{B1} = 0.8 \text{ A}; -I_{B2} = 2 \text{ A};$ $L = 200 \mu\text{H}; V_{\text{clamp}} = 300 \text{ V}; -V_{BE} = 5 \text{ V}$	t_s			2.5	μs
Fall time		t_f			0.15	μs

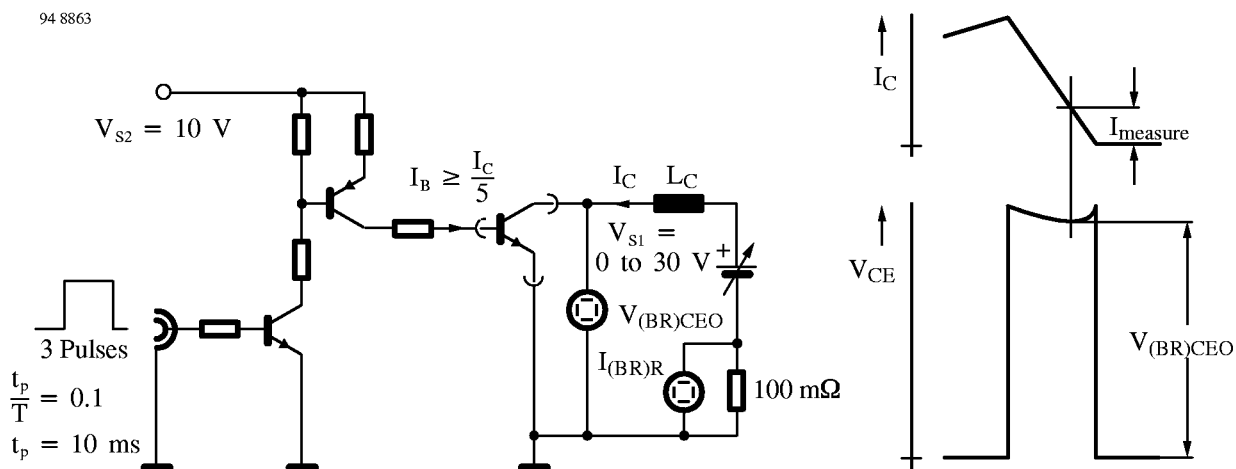


Figure 1. Test circuit for $V_{(\text{BR})\text{CEO}}$

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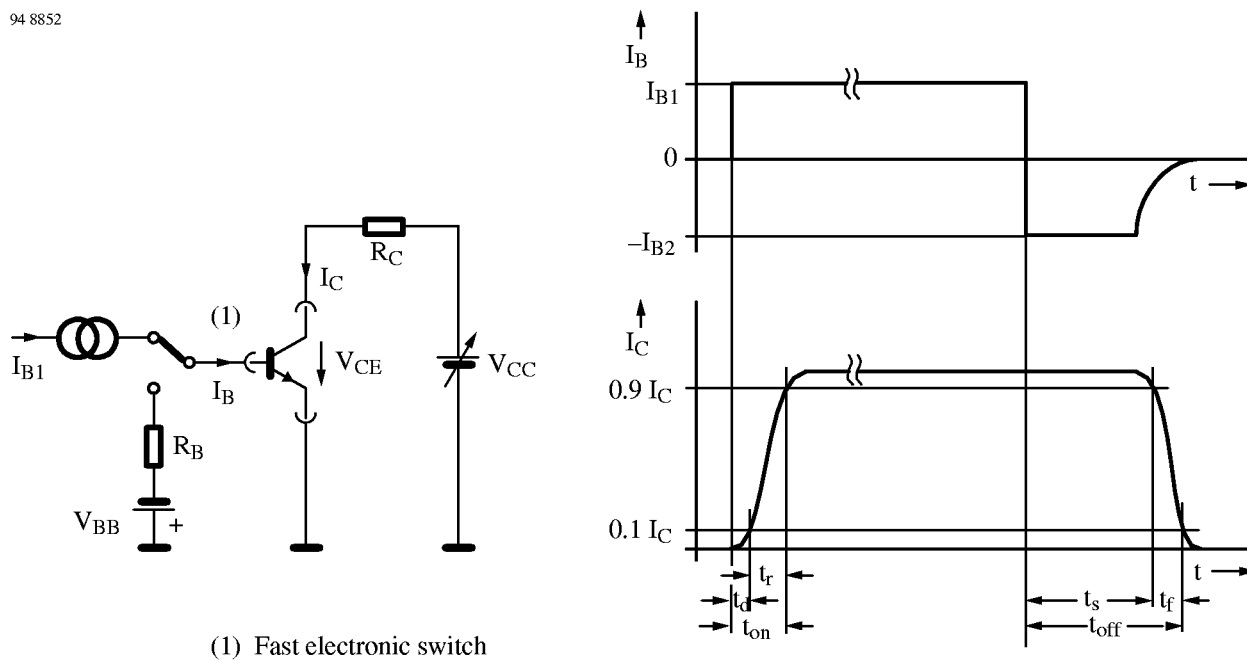


Figure 2. Test circuit for switching characteristics – resistive load

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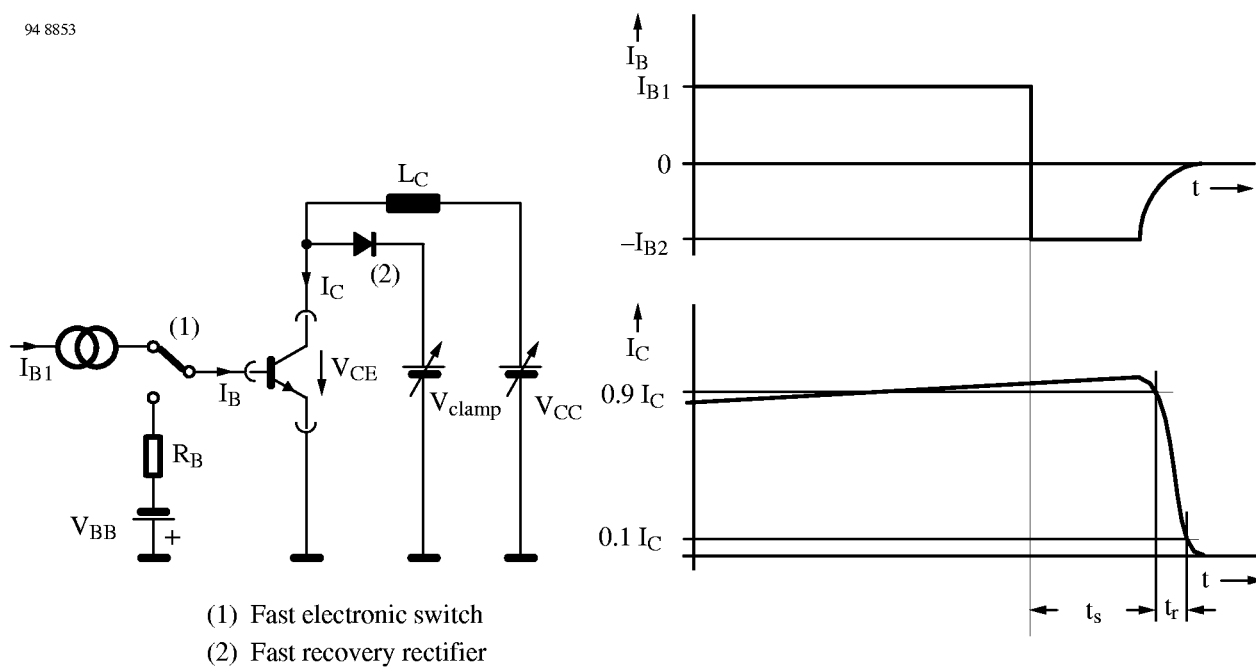
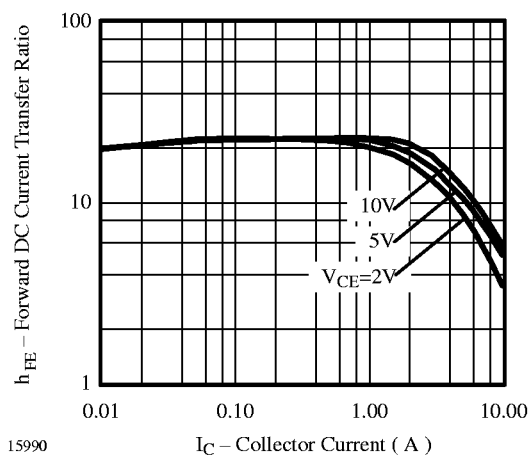
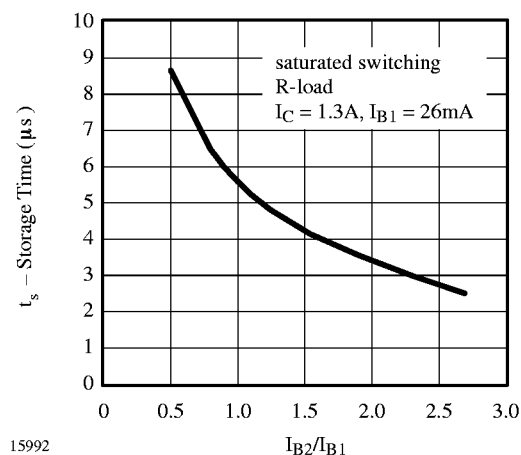
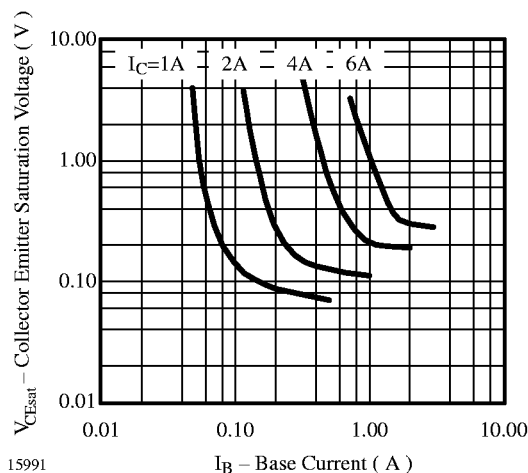
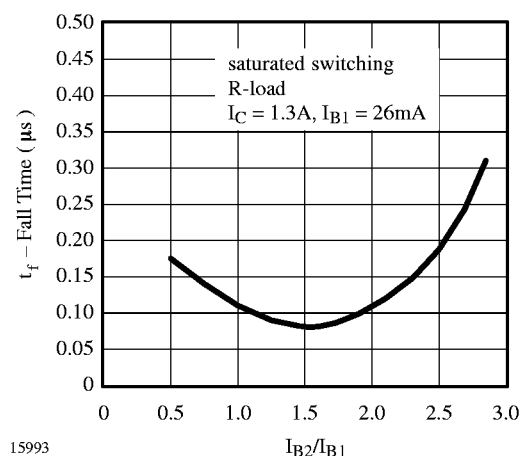
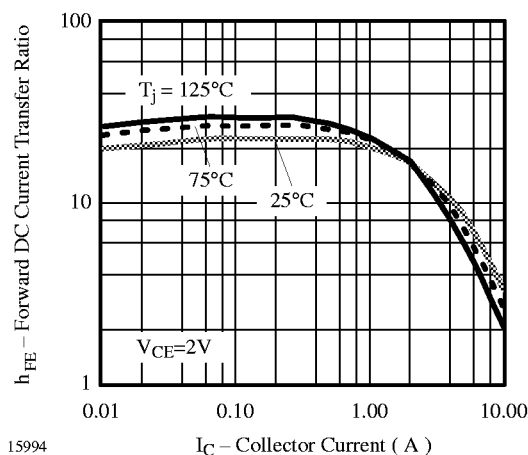
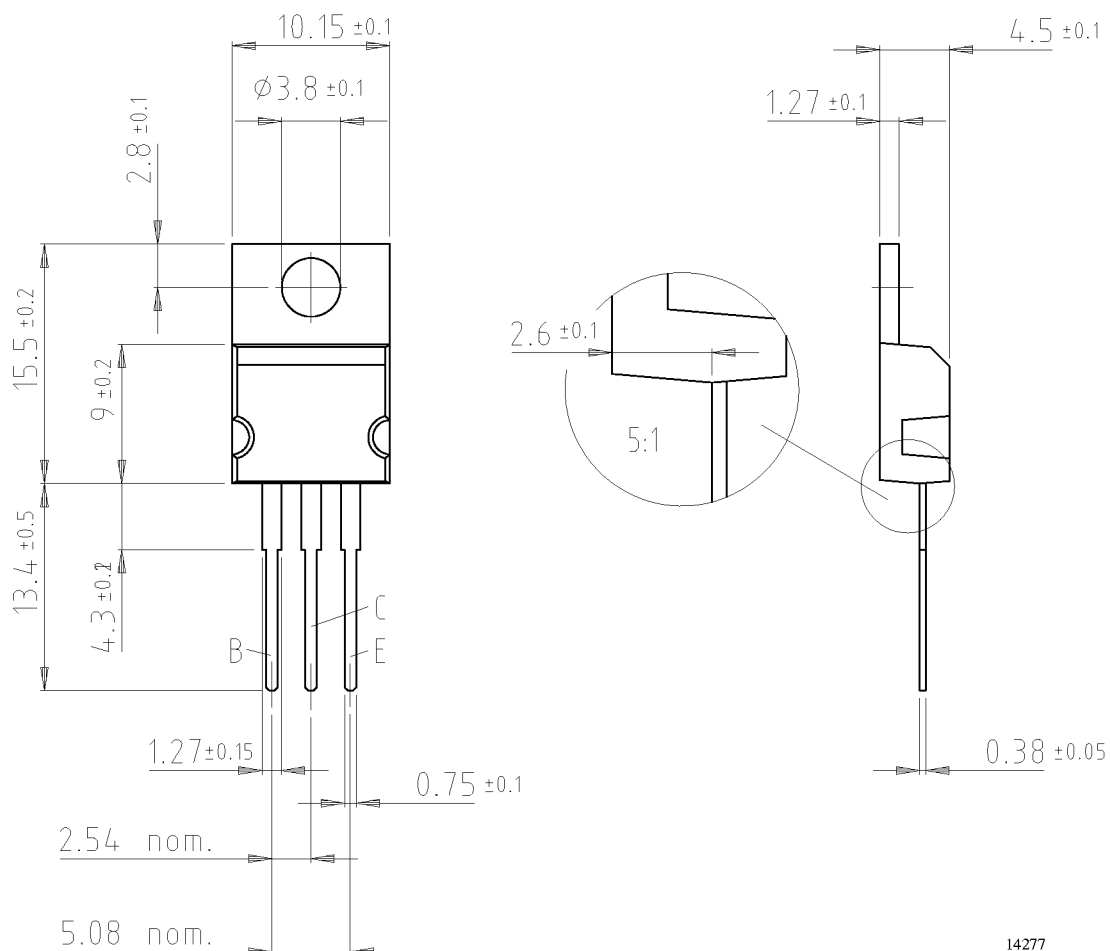


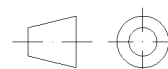
Figure 3. Test circuit for switching characteristics – inductive load

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

 Figure 4. h_{FE} vs. I_C

 Figure 7. t_s vs. $-I_{B2}/I_{B1}$

 Figure 5. V_{CEsat} vs. I_B

 Figure 8. t_f vs. $-I_{B2}/I_{B1}$

 Figure 6. h_{FE} vs. I_C

Dimensions in mm



14277



technical drawings
according to DIN
specifications

Plastic case JEDEC TO 220
Collector connected with metallic surface