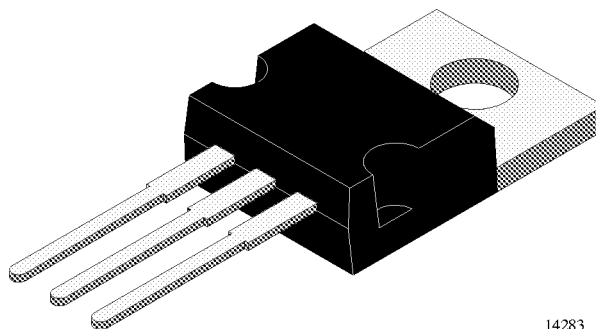


Silicon NPN High Voltage Switching Transistor

Features

- Monolithic integrated C-E-free-wheel diode
- 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

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

Parameter	Test Conditions	Symbol	Value	Unit
Collector-emitter voltage		V_{CEO}	400	V
		V_{CEW}	500	V
		V_{CES}	700	V
Emitter-base voltage		V_{EBO}	11	V
Collector current		I_C	5	A
Collector peak current		I_{CM}	7.5	A
Base current		I_B	2.5	A
Base peak current		I_{BM}	3.5	A
Total power dissipation	$T_{case} \leq 25^{\circ}\text{C}$	P_{tot}	40	W
Junction temperature		T_j	150	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-65 to +150	$^{\circ}\text{C}$

Maximum Thermal Resistance

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

Parameter	Test Conditions	Symbol	Value	Unit
Junction case		R_{thJC}	3.12	K/W

Electrical Characteristics

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Transistor						
Collector cut-off current	$V_{CES} = 700\text{ V}$	I_{CES}			50	μA
	$V_{CES} = 700\text{ V}; T_{case} = 150^{\circ}\text{C}$	I_{CES}			0.5	mA
Collector-emitter breakdown voltage (figure 1)	$I_C = 300\text{ mA}; L = 125\text{ mH}; I_{measure} = 100\text{ mA}$	$V_{(BR)CEO}$	400			V
Emitter-base breakdown voltage	$I_E = 1\text{ mA}$	$V_{(BR)EBO}$	11			V
Collector-emitter saturation voltage	$I_C = 850\text{ mA}; I_B = 210\text{ mA}$	V_{CEsat}			0.2	V
Base-emitter saturation voltage	$I_C = 850\text{ mA}; I_B = 210\text{ mA}$	V_{BEsat}			1	V
DC forward current transfer ratio	$V_{CE} = 2\text{ V}; I_C = 10\text{ mA}$	h_{FE}	10			
	$V_{CE} = 2\text{ V}; I_C = 850\text{ mA}$	h_{FE}	10			
	$V_{CE} = 5\text{ V}; I_C = 5\text{ A}$	h_{FE}	4			
Collector-emitter working voltage	$V_S = 50\text{ V}; L = 1\text{ mH}; I_C = 5\text{ A}; I_{B1} = 1.7\text{ A}; -I_{B2} = 0.5\text{ A}; -V_{BB} = 5\text{ V}$	V_{CEW}	500			V
Dynamic saturation voltage	$I_C = 2.5\text{ A}; I_B = 0.5\text{ A}; t = 1\text{ }\mu\text{s}$	$V_{CEsatdyn}$			12	V
	$I_C = 2.5\text{ A}; I_B = 0.5\text{ A}; t = 3\text{ }\mu\text{s}$	$V_{CEsatdyn}$			3	V
Gain bandwidth product	$I_C = 500\text{ mA}; V_{CE} = 10\text{ V}; f = 1\text{ MHz}$	f_T	4			MHz
Free-wheel diode						
Forward voltage	$I_F = 1.67\text{ A}$	V_F			1.2	V

Switching Characteristics

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Resistive load (figure 2)						
Turn on time	$I_C = 0.85\text{ A}; I_{B1} = 0.2\text{ A}; -I_{B2} = 0.4\text{ A}; V_S = 250\text{ V}$	t_{on}			0.2	μs
Storage time		t_s			3	μs
Fall time		t_f			0.4	μs

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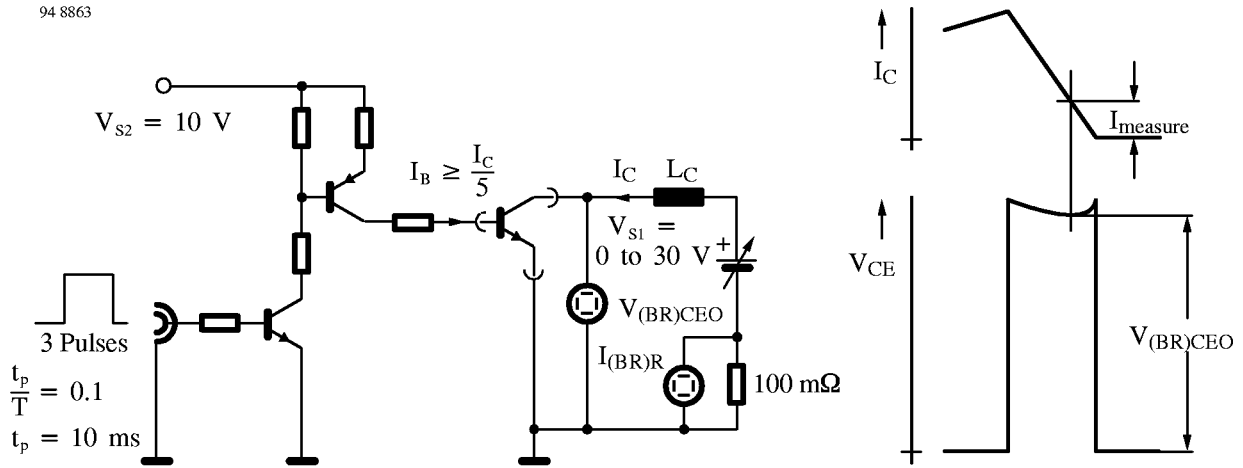
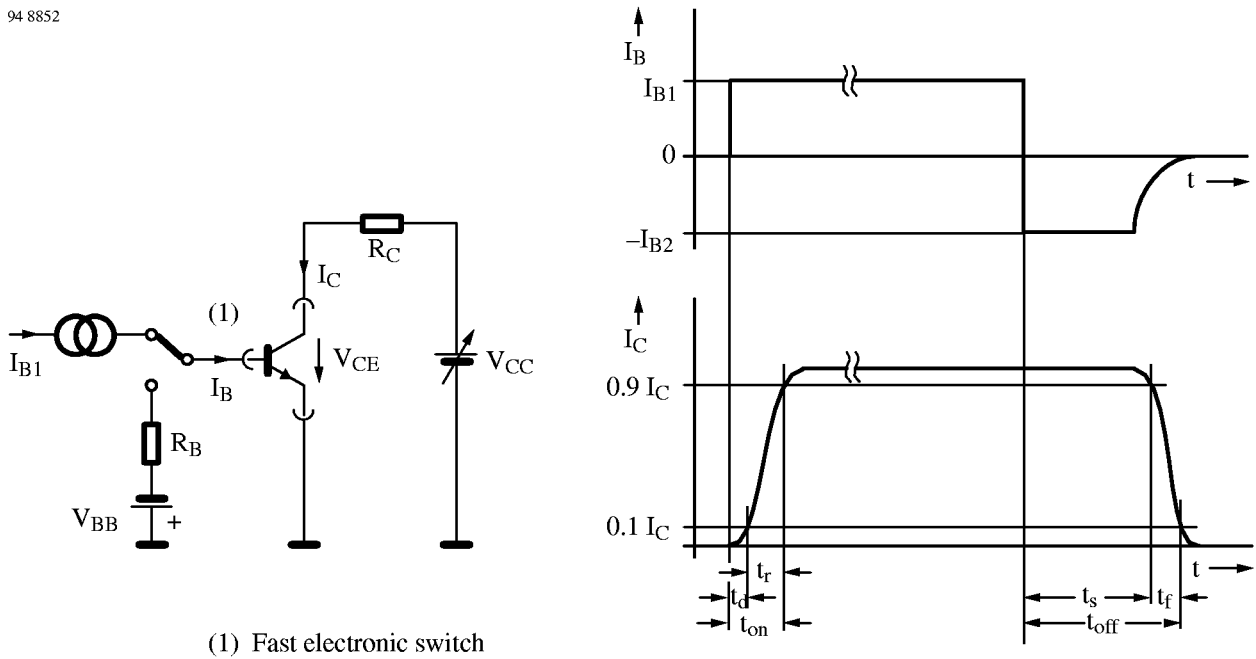


Figure 1. Test circuit for $V_{(BR)CEO}$

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(1) Fast electronic switch

Figure 2. Test circuit for switching characteristics – resistive load



Typical Characteristics ($T_{case} = 25_C$ unless otherwise specified)

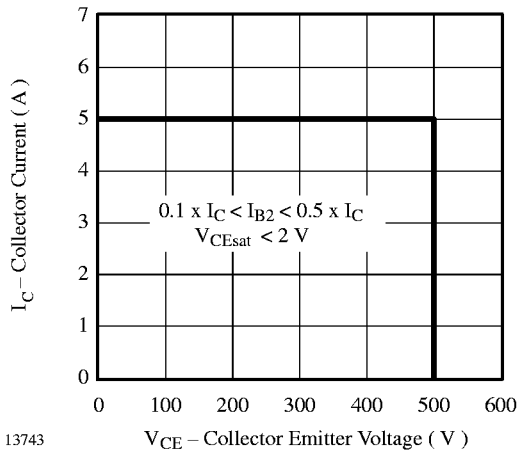


Figure 3. V_{CEW} - Diagram

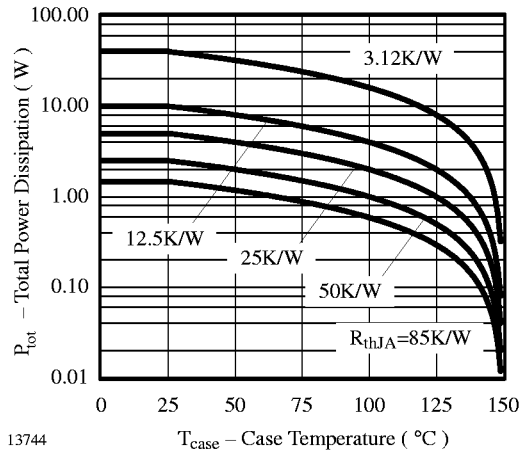


Figure 6. P_{tot} vs. T_{case}

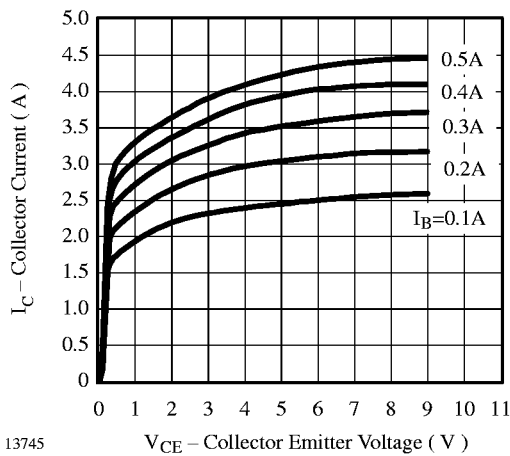


Figure 4. I_C vs. V_{CE}

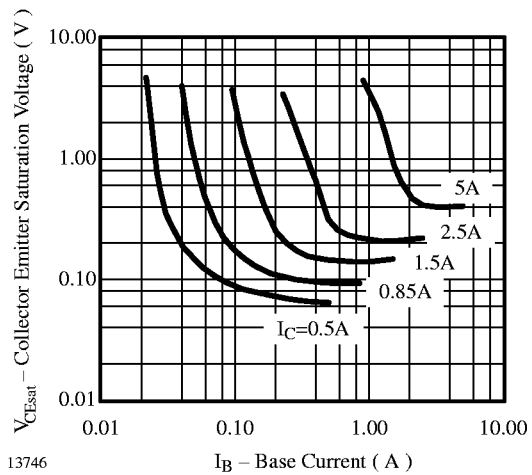


Figure 7. V_{CEsat} vs. I_B

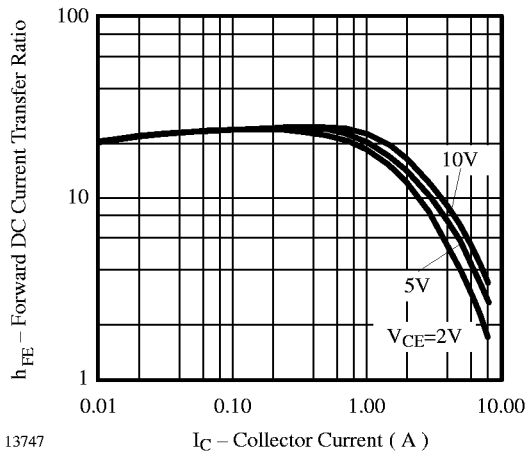


Figure 5. h_{FE} vs. I_C

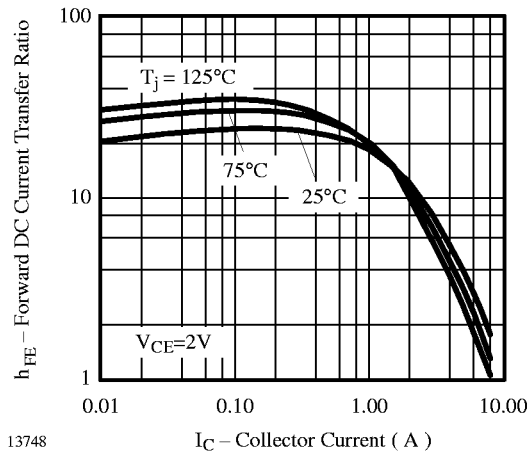


Figure 8. h_{FE} vs. I_C

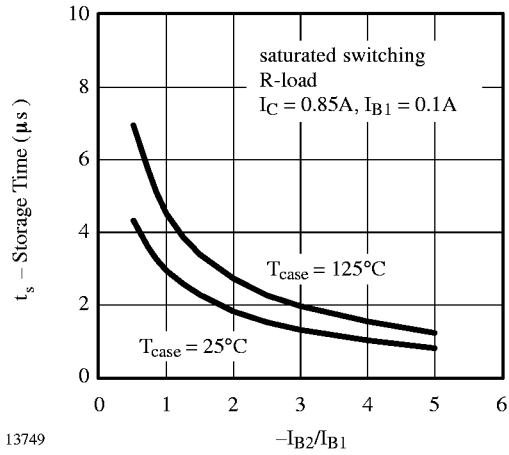


Figure 9. t_s vs. $-I_{B2}/I_{B1}$

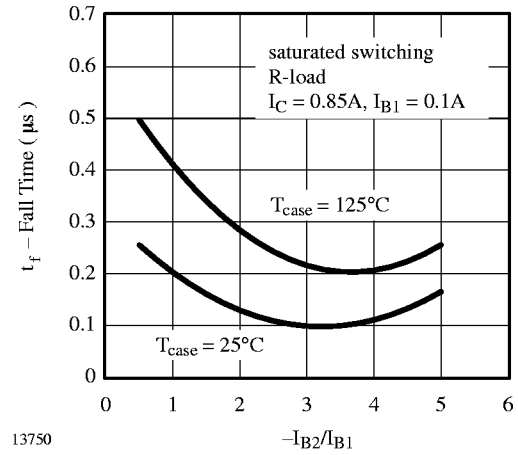


Figure 12. t_f vs. $-I_{B2}/I_{B1}$

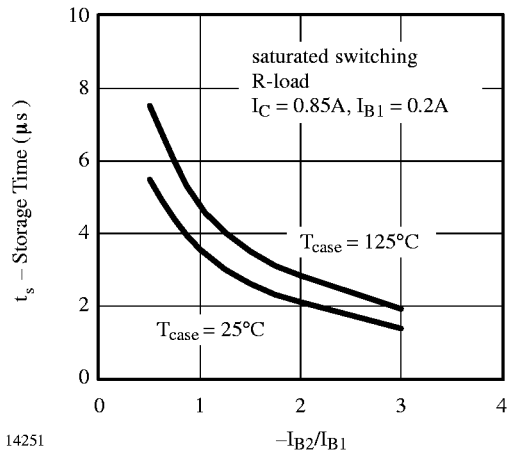


Figure 10. t_s vs. $-I_{B2}/I_{B1}$

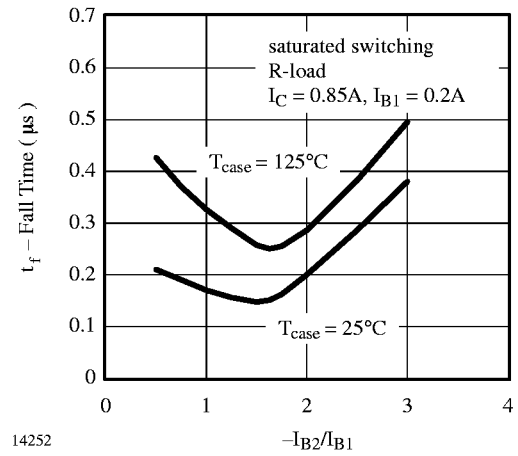


Figure 13. t_f vs. $-I_{B2}/I_{B1}$

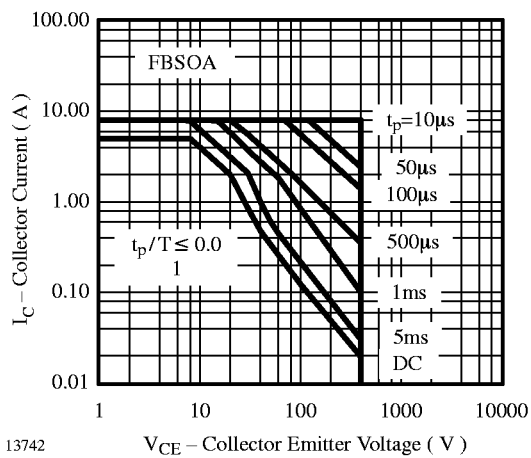


Figure 11. I_C vs. V_{CE}

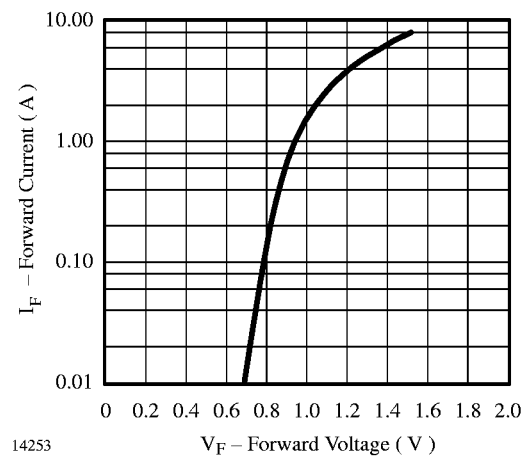


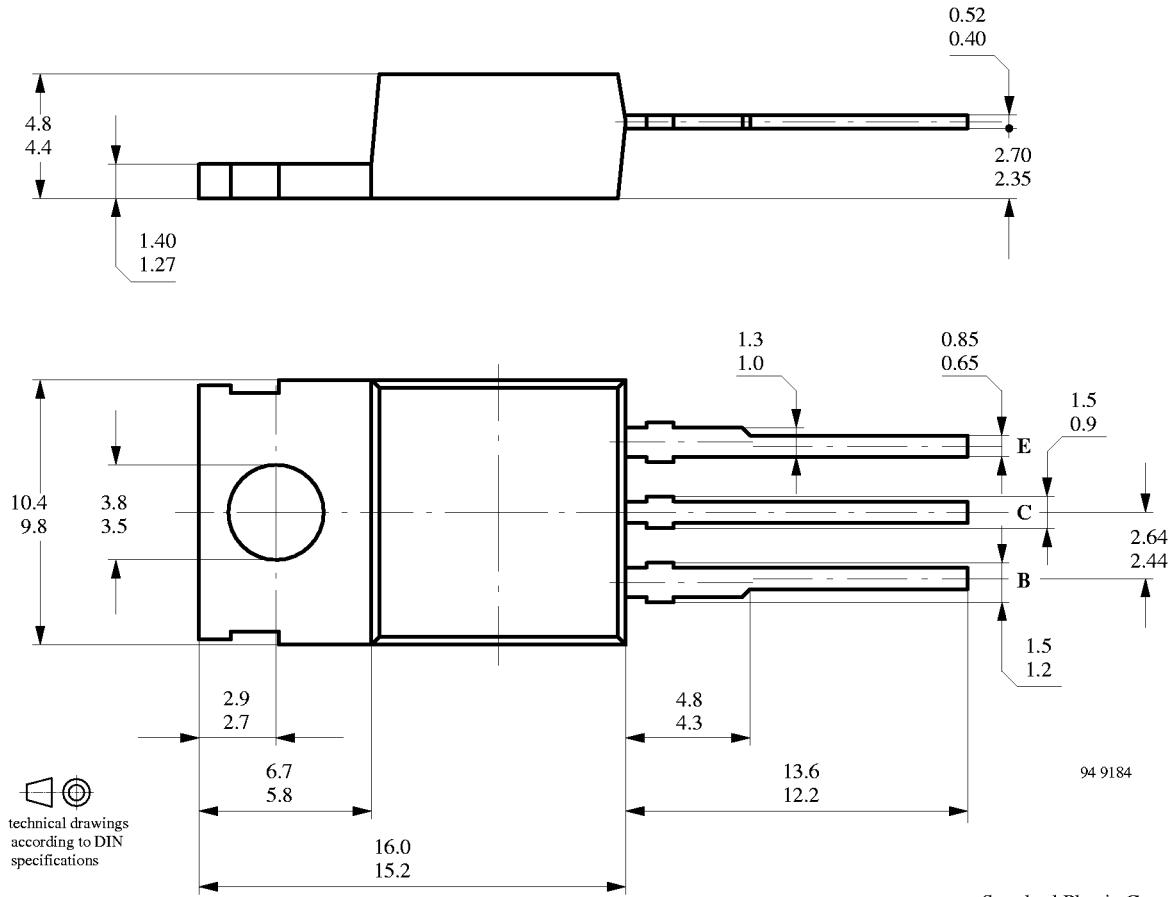
Figure 14. I_F vs. V_F

BUF725D

Vishay Telefunken



Dimensions in mm



Collector connected with metallic surface

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