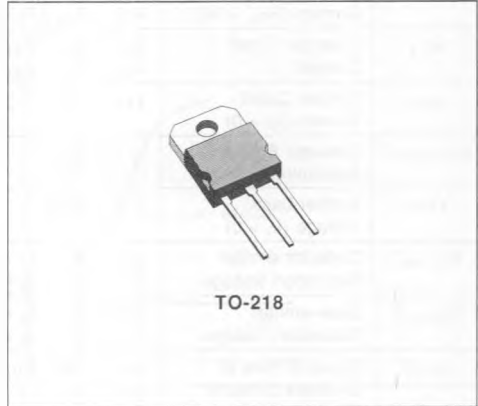


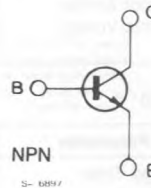


FAST SWITCHING POWER TRANSISTOR

- HIGH VOLTAGE HIGH SPEED TRANSISTOR SUITED FOR USE ON THE 220 AND 380V MAINS
- SUITABLE FOR SWITCH MODE POWER SUPPLY UPS, DC AND AC MOTOR CONTROL



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-emitter Voltage ($V_{BE} = -1.5V$)	850	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	450	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	7	V
I_E	Emitter Current	30	A
I_{EM}	Emitter Peak Current	45	A
I_B	Base Current	6	A
I_{BM}	Base Peak Current	10	A
P_{Tot}	Total Dissipation at $T_c < 25^\circ C$	200	W
T_{sig}	Storage Temperature	- 65 to 150	$^\circ C$
T_j	Max. Operating Junction Temperature	150	$^\circ C$

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.63	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
I_{CER}	Collector Cutoff Current ($R_{BE} = 5\Omega$)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV}$ $T_E = 100^{\circ}C$			0.2 1	mA mA	
I_{CEV}	Collector Cutoff Current	$V_{CE} = V_{CEV}$ $V_{BE} = -1.5V$ $V_{CE} = V_{CEV}$ $V_{BE} = -1.5V$ $T_C = 100^{\circ}C$			0.2 1	mA mA	
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5V$			1	mA	
$V_{CEO(sus)^*}$	Collector Emitter Sustaining Voltage	$I_C = 0.2A$ $L = 25mH$	450			V	
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	$I_E = 100mA$		7		V	
$V_{CE(sat)^*}$	Collector-emitter Saturation Voltage	$I_C = 20A$ $I_B = 4A$ $I_C = 20A$ $I_B = 4A$ $T_J = 100^{\circ}C$		0.35 0.7	0.9 2	V V	
$V_{BE(sat)^*}$	Base-emitter Saturation Voltage	$I_C = 20A$ $I_B = 4A$ $I_C = 20A$ $I_B = 4A$ $T_J = 100^{\circ}C$		1.05 1	1.5 1.5	V V	
di_C/dt	Rated of Rise of On-state Collector Current	$V_{CC} = 300V$ $R_C = 0$ $t_p = 3\mu s$ See fig. 1	120	160		A/ μs	
$V_{CE(3\mu s)}$	Collector Emitter Dynamic Voltage	$V_{CC} = 300V$ $R_C = 15\Omega$ See fig. 1			4.5	8	V
$V_{CE(5\mu s)}$	Collector Emitter Dynamic Voltage	$V_{CC} = 300V$ $R_C = 15\Omega$ See fig. 1			2.5	4	V

INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_s	Storage Time	$V_{CC} = 50V$ $V_{clamp} = 450V$			3	μs
t_f	Fall Time	$I_C = 20A$ $I_B = 4A$		0.25	0.4	μs
t_c	Crossover Time	$V_{BB} = -5V$ $R_{BB} = 0.62\Omega$ $L_C = 0.12mH$ $T_J = 100^{\circ}C$ See fig. 1		0.5	0.7	μs
V_{CEW}	Maximum Collector Emitter Voltage without Snubber	$V_{CC} = 50V$ $I_{Cwoff} = 30A$ $V_{BB} = -5V$ $I_{B1} = 4A$ $L_C = 0.08mH$ $R_{BB} = 0.62\Omega$ $T_J = 125^{\circ}C$ See fig. 2	450			V

Figure 1 : Switching Times Test Circuit (resistive load).

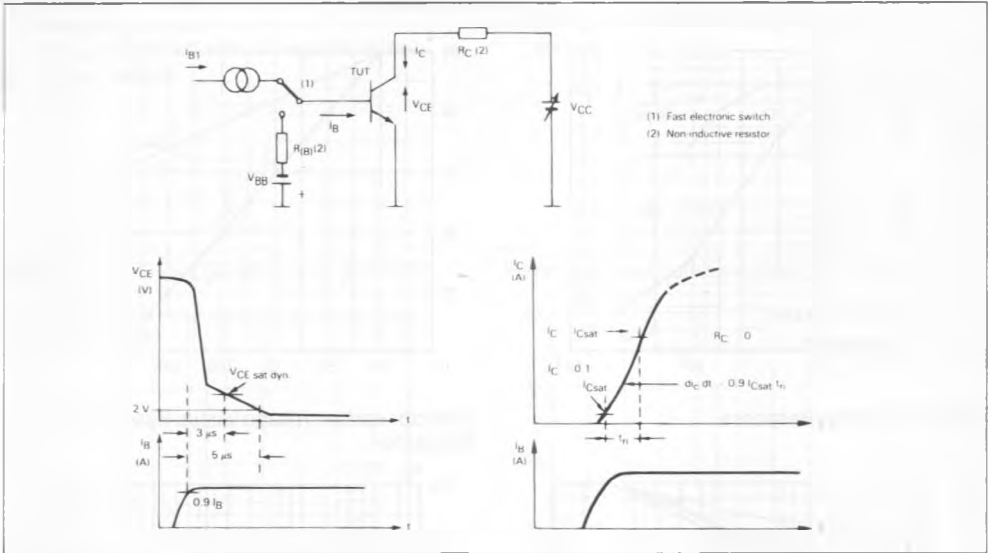


Figure 2a : Turn-off Switching Test Circuit.

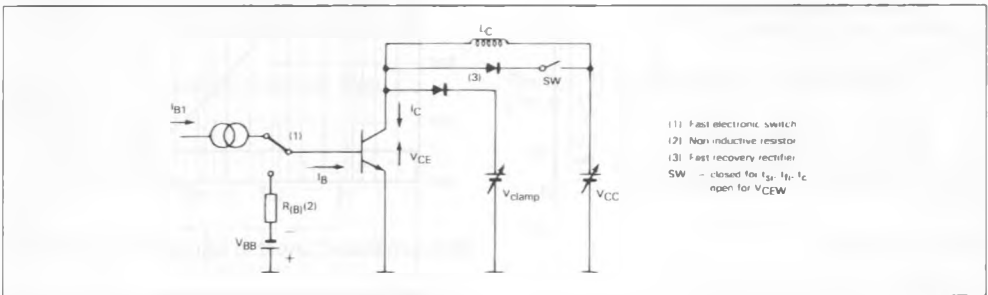
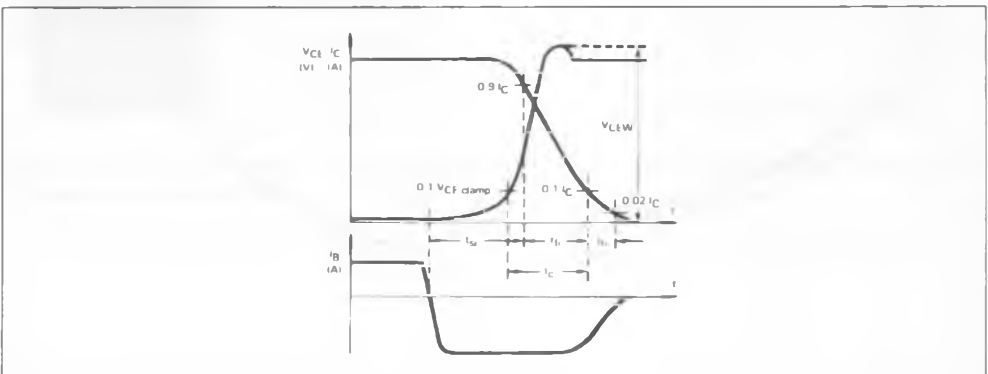
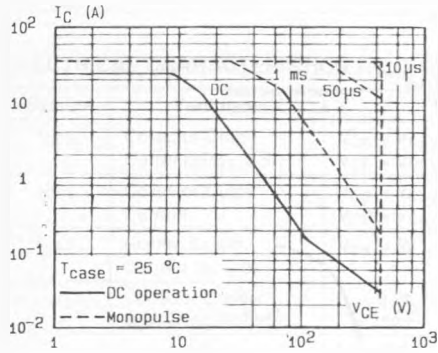


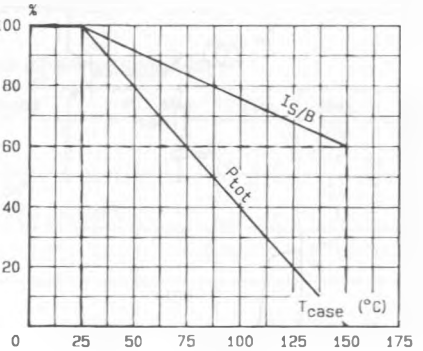
Figure 2b : Turn-off Switching Waveforms (inductive load).



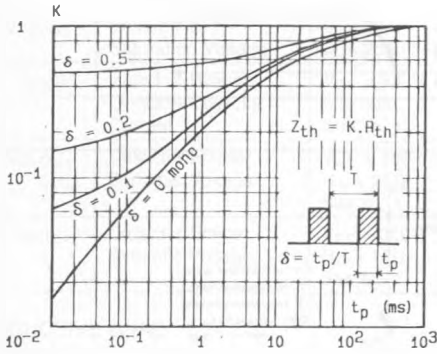
DC and AC Pulse Area.



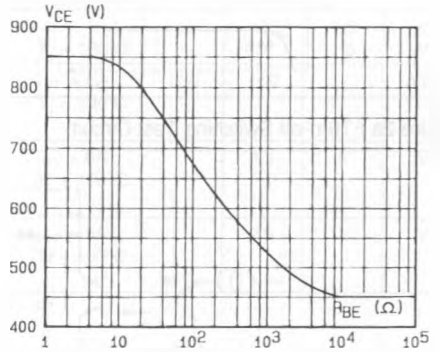
Power and $I_{S/B}$ Derating versus Case Temperature.



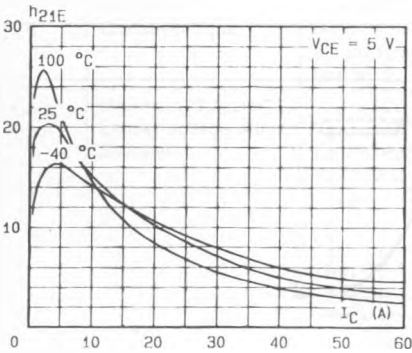
Transient Thermal Response.



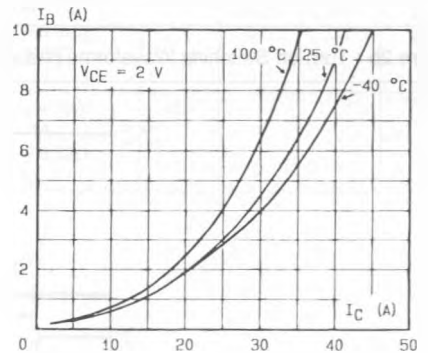
Collector-emitter Voltage versus Base-emitter Resistance.



DC Current Gain.



Minimum Base Current to saturate the Transistor.



SWITCHING OPERATING AND OVERLOAD AREAS

TRANSISTOR FORWARD BIASED

- During the turn-on
- During the turn-off without negative base-emitter voltage.

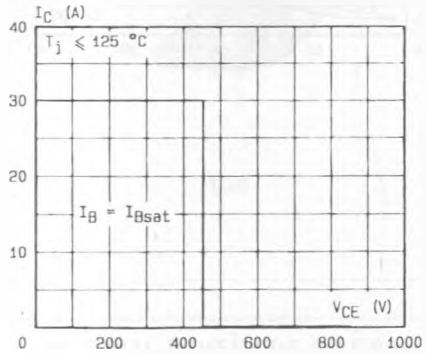
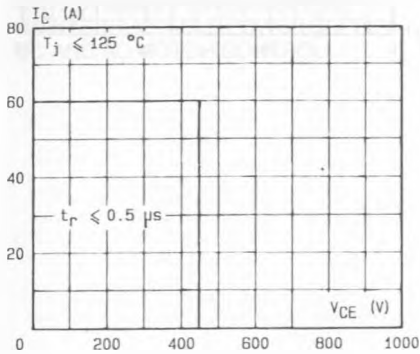
TRANSISTOR REVERSE BIASED

- During the turn-off with negative base-emitter voltage.



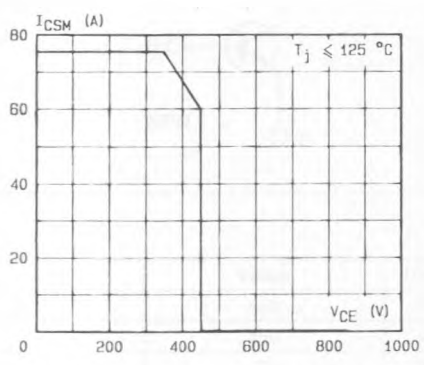
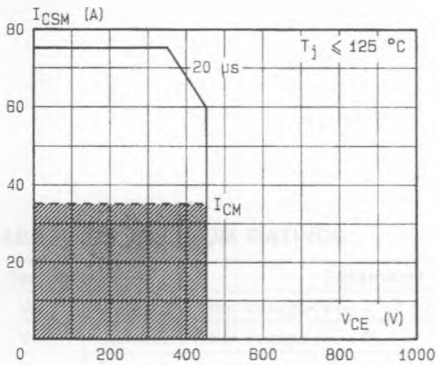
Forward Biased Safe Operating Area (FBSOA).

Reverse Biased Safe Operating Area (RBSOA).



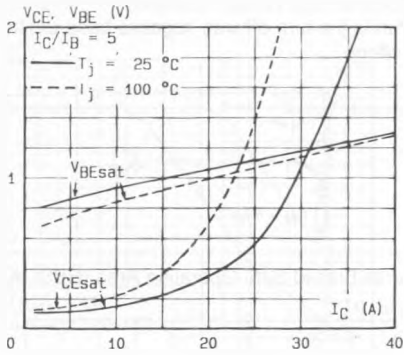
Forward Biased Accidental Overload Area (FBAOA).

Reverse Biased Accidental Overload Area (RBAOA).



High accidental surge currents ($I > I_{CM}$) are allowed if they are non repetitive and applied less than 3000 times during the component life.

Saturation Voltage.



Switching Times versus Collector Current.

