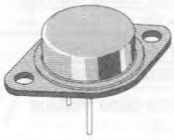
SGS-THOMSON MICROELECTRONICS

BUT100

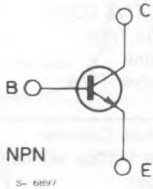
FAST SWITCHING POWER TRANSISTOR

- HIGH EFFICIENCY SWITCHING
- VERY LOW SATURATION VOLTAGE
- RECTANGULAR SAFE OPERATING AREA
- WIDE ACCIDENTAL OVERLOAD AREA



TO-3

INTERNAL SCHEMATIC DIAGRAM



DESCRIPTION

Suitable for motor drives, SMPS converters, uninterruptable power supply operating low voltage supply.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-emitter Voltage (V_{BE} = – 1.5V)	200	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	125	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	7	V
I_E	Emitter Current	50	A
I_{EM}	Emitter Peak Current	150	A
I_B	Base Current	10	A
I_{BM}	Base Peak Current	30	A
P_{tot}	Total Dissipation at T_c < 25°C	300	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Max. Operating Junction Temperature	200	°C

THERMAL DATA

$R_{th\,j\text{-}case}$	Thermal Resistance Junction-case	Max	0.58	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cutoff Current (R_{BE} = 5Ω)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV}$ T_c = 100°C			1 5	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°C			1 4	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	125			V
V_{EBO}	Emitter-base Voltage (I_C = 0)	I_E = 50mA	7			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 50A I_B = 2.5A I_C = 100A I_B = 10A I_C = 50A I_B = 2.5A T_j = 100°C I_C = 100A I_B = 10A T_j = 100°C			0.9 0.9 1.2 1.5	V V V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 50A I_B = 2.5A I_C = 100A I_B = 10A I_C = 50A I_B = 2.5A T_j = 100°C I_C = 100A I_B = 10A T_j = 100°C			1.4 2 1.4 2.1	V V V V
di_C/dt	Rate of Rise of on-state Collector Current	V_{CC} = 100V R_C = 0 I_{B1} = 5A t_p = 3µs T_j = 100°C See fig. 1	180			A/µs
t_s t_f t_c	INDUCTIVE LOAD Storage Time Fall Time Crossover Time	V_{CC} = 90V V_{clamp} = 125V I_C = 50A I_{B1} = 2.5A V_{BB} = – 5V L_C = 80µH R_{B2} = 1Ω T_j = 100°C See fig. 2			2 0.2 0.35	µs µs µs
V_{CEW}	Maximum Collector Emitter Voltage without Snubber	V_{CC} = 90V I_{CWoff} = 150A V_{BB} = – 5V I_{B1} = 10A L_C = 30µH R_{B2} = 1Ω T_j = 125°C See fig. 2	125			V

* Pulsed : Pulse duration = 3µs, duty cycle = 2 %.

Figure 1 : Turn-on Switching Characteristics of the Transistor.

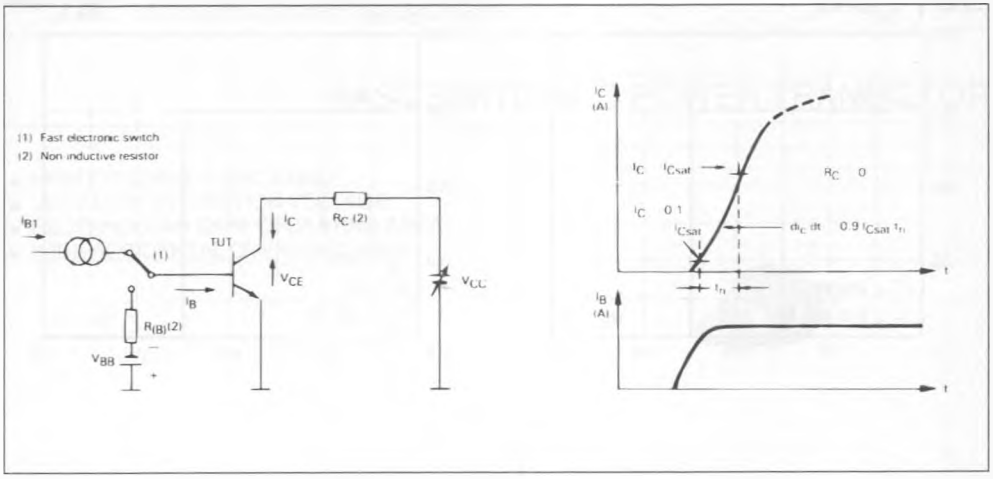
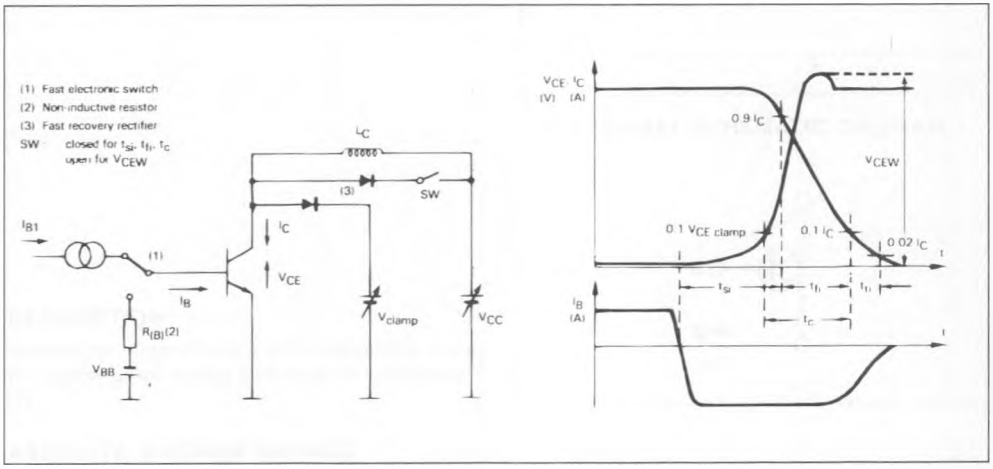
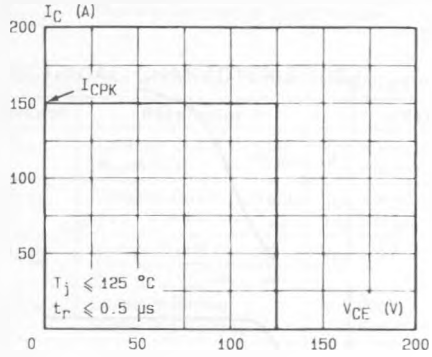


Figure 2 : Turn-off Switching Characteristics of the Transistor.



Forward biased Safe Operating Area (FBSOA).



Reverse biased Safe Operating Area (RBSOA).