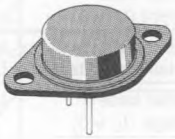
SGS-THOMSON MICROELECTRONICS

BUV42A

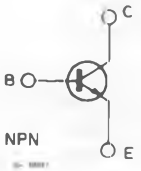
FAST SWITCHING POWER TRANSISTOR

- FAST SWITCHING TIMES
- LOW SWITCHING LOSSES
- VERY LOW SATURATION VOLTAGE AND HIGH GAIN FOR REDUCED LOAD OPERATION



TO-3

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-emitter Voltage (V_{BE} = – 1.5V)	400	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	300	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	7	V
I_C	Collector Current	12	A
I_{CM}	Collector Peak Current	18	A
I_B	Base Current	2.5	A
I_{BM}	Base Peak Current	4	A
P_{tot}	Total Dissipation at T_c < 25°C	120	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Max. Operating Junction Temperature	200	°C

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	1.46	°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} = 10Ω)	V_{CE} = V_{CEV} V_{CE} = V_{CEV} T_c = 100°C			0.5 2.5	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			0.5 2	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	300			V
V_{EBO}	Emitter-base Voltage (I_C = 0)	I_E = 50mA	7			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 4A I_B = 0.4A I_C = 4A I_B = 0.4A T_j = 100°C			0.9 1.9	V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 4A I_B = 0.4A I_C = 4A I_B = 0.4A T_j = 100°C			1.3 1.5	V V
di_c/dt	Rate of Rise of on-state Collector Current	V_{CC} = 250V R_C = 0 I_{B1} = 0.6A t_p = 3μs T_j = 100°C See fig. 1	25			A/μs

INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_s t_f t_c	Storage Time Fall Time Crossover Time	V_{CC} = 250V V_{clamp} = 300V I_C = 4A I_B = 0.4A V_{BB} = − 5V R_{B2} = 6.25Ω L_C = 3.1mH T_j = 100°C see fig. 2			3 0.4 0.7	μs μs μs
V_{CEW}	Maximum Collector Emitter Voltage without Snubber	V_{CC} = 50V I_{CWoff} = 6A V_{BB} = − 5V I_{B1} = 0.4A L_C = 0.42mH R_{BB} = 6.25Ω T_j = 125°C See fig. 2	300			V

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

(1) Fast electronic switch
(2) Non-inductive resistor

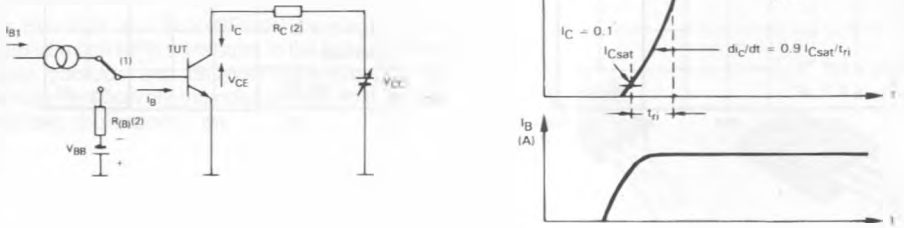
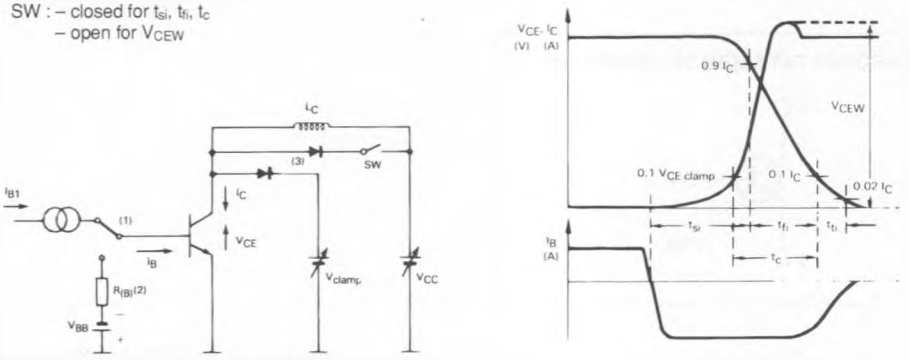
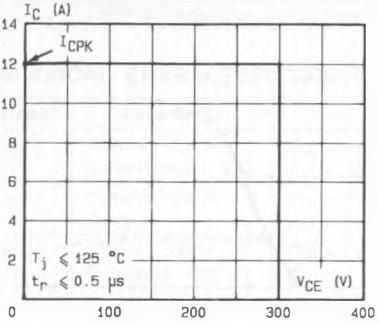


Figure 2 : Turn-off Switching Characteristics of the Transistor.

(1) Fast electronic switch
(2) Non-inductive resistor
(3) Fast recovery rectifier
SW : – closed for t_{si}, t_{fi}, t_c
– open for V_{CEW}



Forward Biased Safe Operating Area (FBSOA).



Reverse Biased Safe Operating Area (RBSOA).