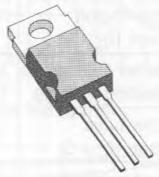
SGS-THOMSON MICROELECTRONICS

BUV26

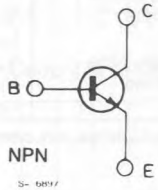
NPN FAST SWITCHING TRANSISTOR

- LOW SATURATION VOLTAGE
- FAST TURN-ON AND TURN-OFF
- BASE DRIVE SPECIFIED FOR DIFFERENT VALUES OF I_C
- WIDE SURGE AREA



TO-220

INTERNAL SCHEMATIC DIAGRAM



DESCRIPTION

High speed transistor suited for low voltage applications.

High frequency and efficiency converters switching regulators motor control.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	180	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	90	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	14	A
I_{CM}	Collector Peak Current ($t_p < 10$ms)	25	A
I_B	Base Current	4	A
I_{BM}	Base Peak Current ($t_p < 10$ms)	6	A
P_{tot}	Total Dissipation at $T_c < 25°C$	85	W
P_{tot}	Total Dissipation at $T_c < 60°C$	65	W
T_{stg}	Storage Temperature	– 65 to + 175	°C
T_j	Max. Operating Junction Temperature	175	°C

THERMAL DATA

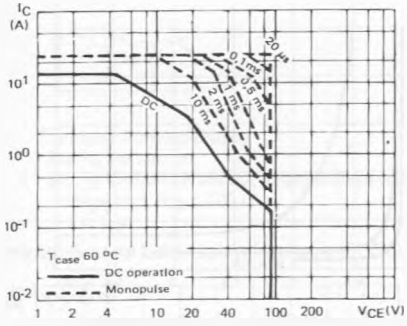
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	1.76	°C/W

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

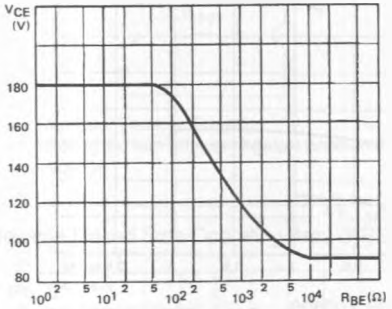
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cutoff Current (R_{BE} = 50Ω)	V_{CE} = 180V T_c = 125°C			3	mA
I_{CEX}	Collector Cutoff Current	V_{CE} = 180V V_{BE} = − 1.5V T_c = 125°C			1	mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5V			1	mA
$V_{CEO(sus)}$*	Collector Emitter Sustaining Voltage	I_C = 0.2A L = 25mH	90			V
V_{EBO}	Emitter-base Voltage (I_C = 0)	I_E = 50mA	7		30	V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 6A I_B = 0.6A I_C = 12A I_B = 1.2A			0.6 1.5	V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 12A I_B = 1.2A			2	V
	RESISTIVE LOAD					
t_{on}	Turn-on Time	V_{CC} = 50V I_C = 12A		0.4	0.6	µs
t_s	Storage Time	V_{BE} = − 6V I_{B1} = 1.2A		0.45	1	µs
t_f	Fall Time	R_{BB} = 2.5Ω		0.12	0.25	µs
	INDUCTIVE LOAD					
t_s	Storage Time	V_{CC} = 50V I_C = 12A		0.5		µs
t_f	Fall Time	V_{BE} = − 5V I_{B1} = 1.2A L_B = 0.5µH		0.04		µs
t_s	Storage Time	V_{CC} = 50V I_C = 12A			2	µs
t_f	Fall Time	V_{BE} = −5V I_{B1} = 1.2A L_B = 0.5µH T_j = 125°C			0.15	µs

* Pulsed : Pulse duration = 300µs, duty cycle = 1.5%

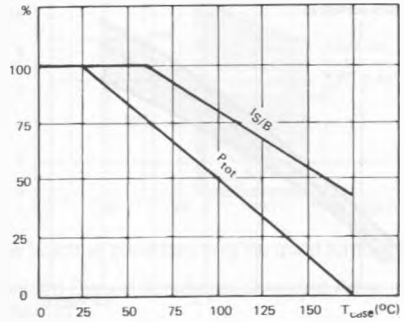
DC and Pulse Area.



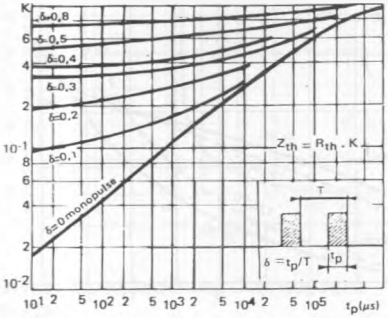
Collector-emitter Voltage vs Base-emitter Resistance.



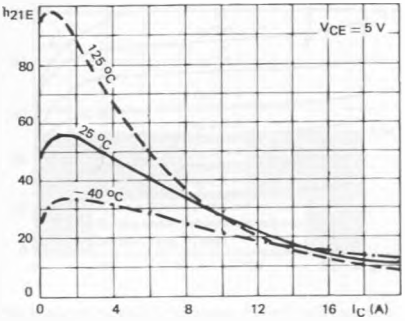
Power and $I_{S/B}$ Derating vs Case Temperature.



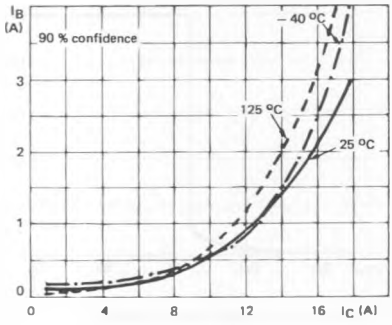
Transient Thermal Response.



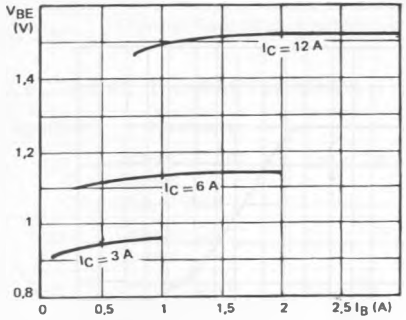
DC Current Gain.



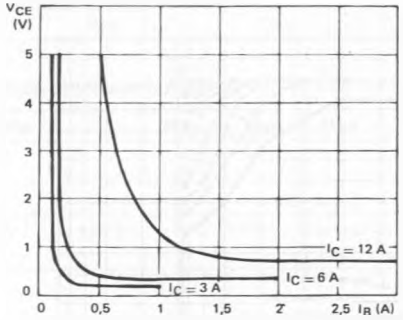
Minimum Base Current to saturate the transistor.



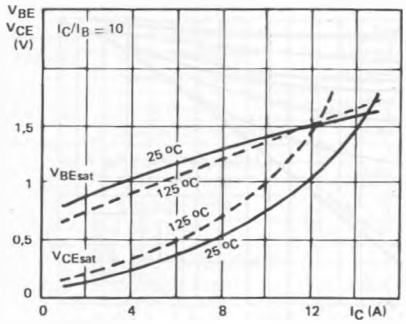
Base Characteristics.



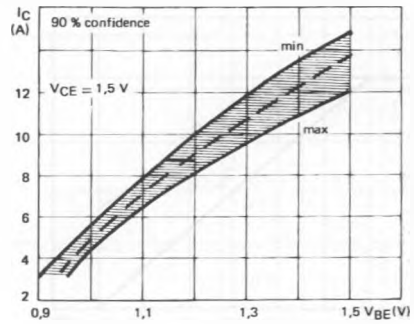
Collector Saturation Region.



Saturation Voltage.

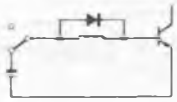


Collector Current Spread vs. Base-emitter Voltage.



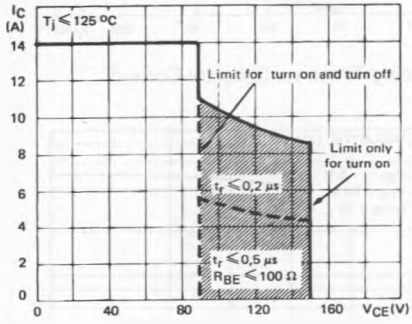
SWITCHING OPERATING AND OVERLOAD AREAS

Transistor Forward Biased
- During the turn on
- During the turn off without negative base-emitter voltage and $R_{BE} \leq 100\ \Omega$



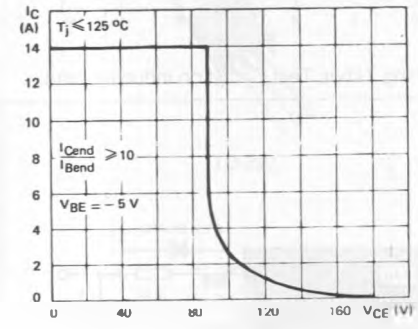
Transistor Reverse Biased
- During the turn off with negative base emitter voltage

Forward Biased Safe Operating Area (FBSOA).

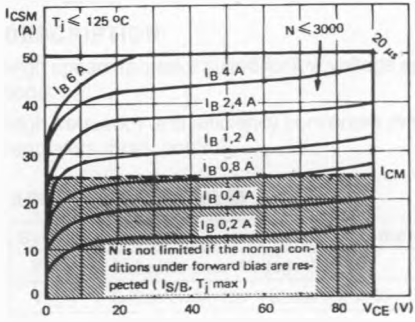


The hatched zone can only be used for turn on.

Reverse Biased Safe Operating Area (RBSOA).

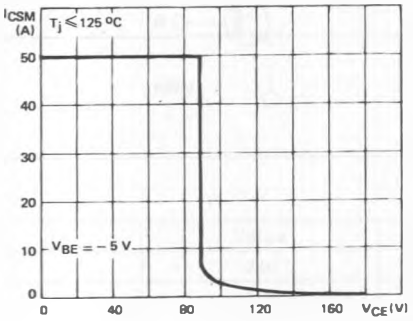


Forward Biased Accidental Overload Area (FBAOA).



The Kellog network (heavy point) allows the calculation of the maximum value of the short-circuit current for a given base current I_B (90 % confidence).

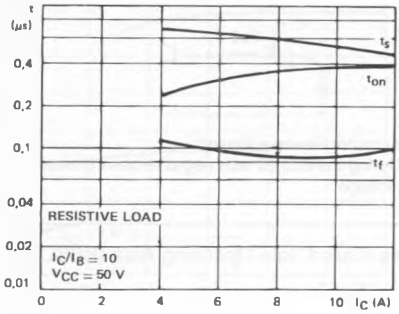
Reverse Biased Accidental Overload Area (RBAOA).



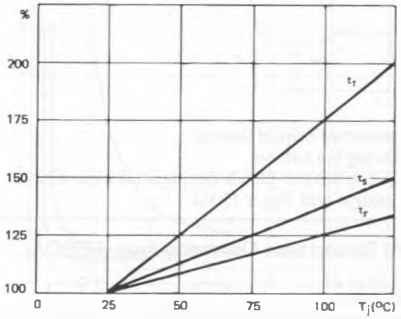
After the accidental overload current, the RBAOA has to be used for the turn off.

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

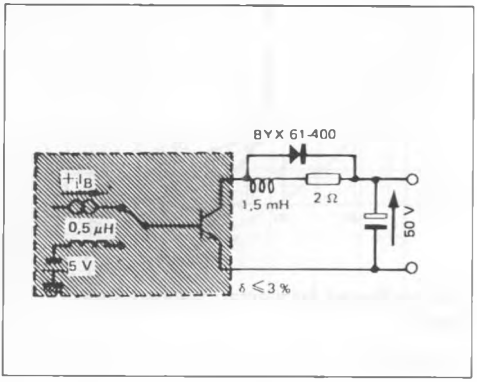
Switching Times vs. Collector Current (resistive load).



Switching Times vs. Junction Temperature.



Switching Times Test Circuit on inductive load.



Switching Times vs. Collector Current.