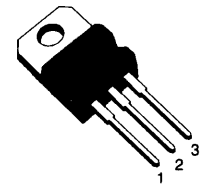
SGS-THOMSON MICROELECTRONICS

BUL48

HIGH VOLTAGE NPN MULTIEPITAXIAL FASTSWITCHING TRANSISTOR

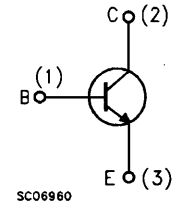
- HIGH VOLTAGE CAPABILITY
- TIGHT CONTROL OF DYNAMIC CHARACTERISTICS
- MINIMUM LOT TO LOT SPREAD FOR RELIABLE OPERATION
- LOW BASE DRIVE REQUIREMENTS
- VERY HIGH SWITCHING SPEED: t_f = 55ns (typ.) AND t_s = 1.3µs (typ.) AT I_C = 2.5A, I_{B1} = 0.5A, V_{BEoff} = -5V R_{BB} = 0Ω
- COMPLETE CHARACTERIZATION AT 125°C



TO-220

DESCRIPTION:
The BUL48 is a high voltage NPN FASTSWITCHING transistor designed to be used in lighting applications, like electronic ballasts for fluorescent lamps.
Its characteristics make it also ideal for power supplies

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	800	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	400	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	9	V
I_C	Collector Current	7	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	11	A
I_B	Base Current	3.5	A
I_{BM}	Base Peak Current (t_p < 5 ms)	7	A
P_{tot}	Total Dissipation at T_c = 25 °C	75	W
T_{stg}	Storage Temperature Range	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

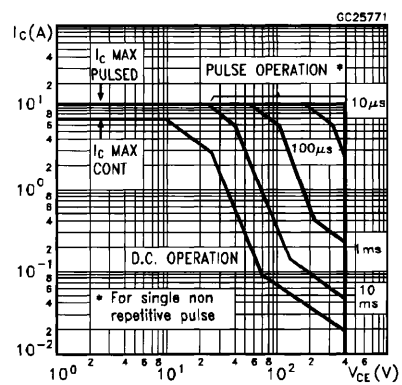
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	1.65	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

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

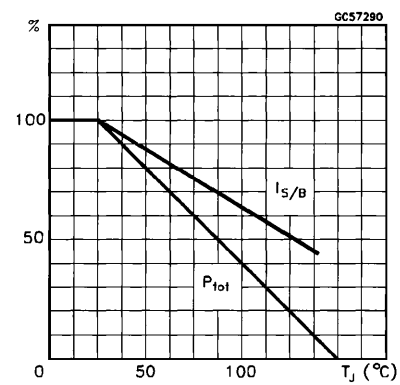
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 800 V V_{CE} = 800 V T_j = 125 °C			100 500	µA µA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{EC} = 400 V			250	µA
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	I_C = 100 mA L = 25 mH	400			V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	I_E = 10 mA	9			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 2 A I_B = 0.5 A I_C = 3 A I_B = 0.6 A I_C = 4 A I_B = 1 A			1 1.5 1.5	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 2 A I_B = 0.5 A I_C = 3 A I_B = 0.6 A I_C = 4 A I_B = 1 A			1.2 1.5 1.5	V V V
h_{FE}*	DC Current Gain	I_C = 0.5 A V_{CE} = 3 V I_C = 1 A V_{CE} = 5 V I_C = 10 mA V_{CE} = 5 V	18 10	 30 	50 	
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 2.5 A I_{B1} = 0.5 A $V_{BE(off)}$ = -5 V R_{BB} = 0 Ω V_{CL} = 250 V L = 200 µH		 1.3 55	 2 100	 µs ns
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 2.5 A I_{B1} = 0.5 A $V_{BE(off)}$ = -5 V R_{BB} = 0 Ω V_{CL} = 250 V L = 200 µH T_j = 125 °C		 1.8 95	 	 µs ns

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

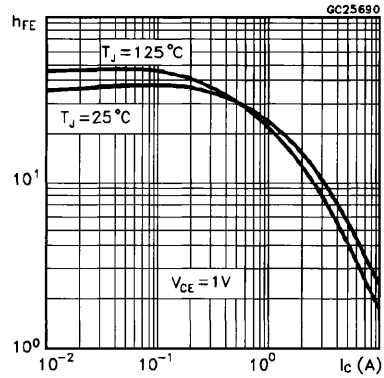
Safe Operating Area



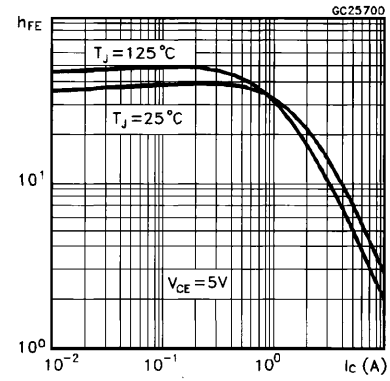
Derating Curve



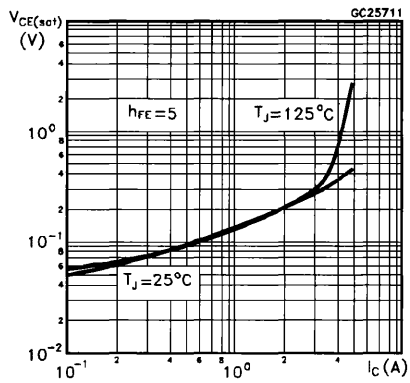
DC Current Gain



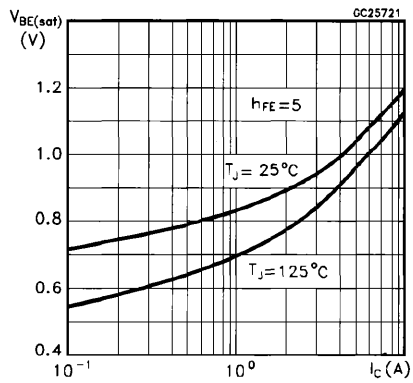
DC Current Gain



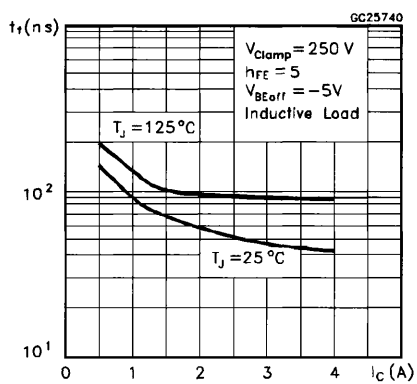
Collector Emitter Saturation Voltage



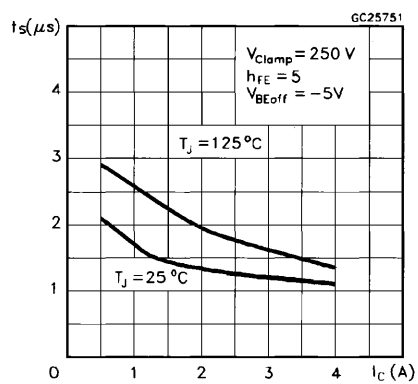
Base Emitter Saturation Voltage



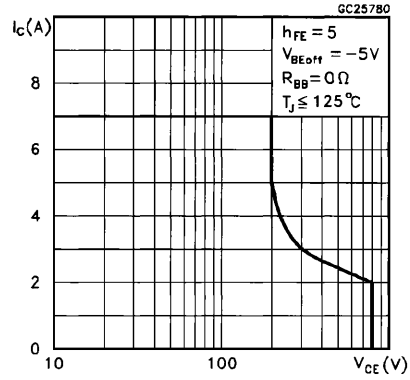
Inductive Fall Time



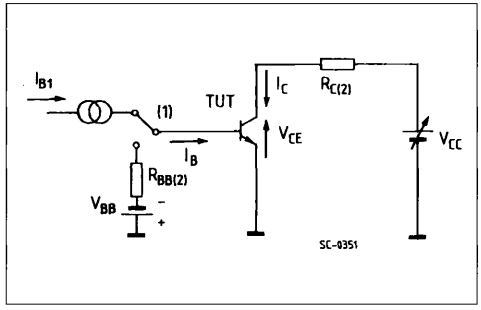
Inductive Storage Time



Reverse Biased SOA

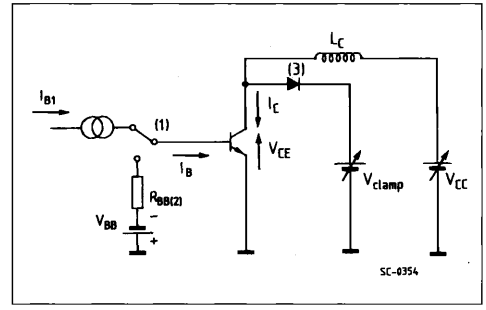


Resistive Load Switching Test Circuit



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

RBSOA and Inductive Load Switching Test Circuit



(1) Fast electronic switch
(2) Non-inductive Resistor
(3) Fast recovery rectifier