

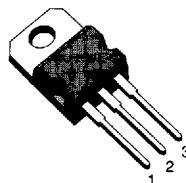
HIGH VOLTAGE NPN MULTIEPITAXIAL FASTSWITCHING TRANSISTOR

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

DESCRIPTION:

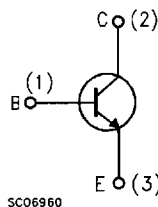
The BUL48 is a high voltage NPN FASTSWITCHING transistor designed to be used in lighting applications, like electronic ballasts for fluorescent lamps.

Its characteristics make it also ideal for power supplies



TO-220

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 ($t_p < 5\text{ ms}$)	11	A
I_B	Base Current	3.5	A
I_{BM}	Base Peak Current ($t_p < 5\text{ ms}$)	7	A
P_{tot}	Total Dissipation at $T_c = 25^\circ\text{C}$	75	W
T_{stg}	Storage Temperature Range	-65 to 150	$^\circ\text{C}$
T_j	Max. Operating Junction Temperature	150	$^\circ\text{C}$

THERMAL DATA

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

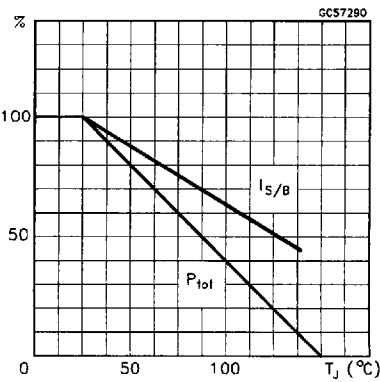
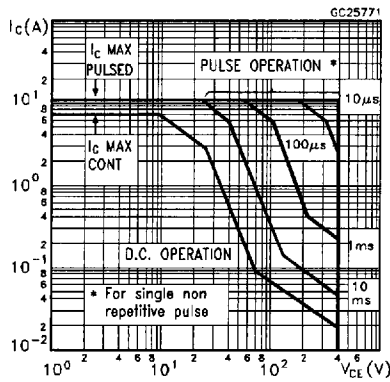
ELECTRICAL CHARACTERISTICS
($T_{case} = 25\ ^{\circ}\text{C}$ unless otherwise specified)

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

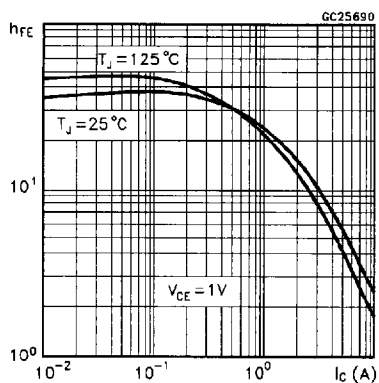
* Pulsed: Pulse duration = 300 μs , duty cycle 1 5 %

Safe Operating Area

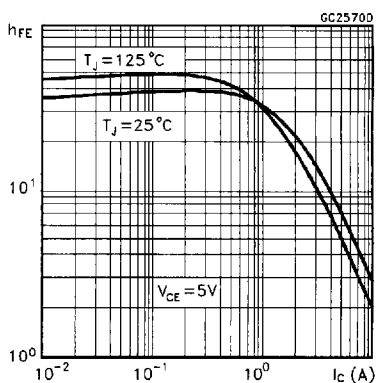
Derating Curve



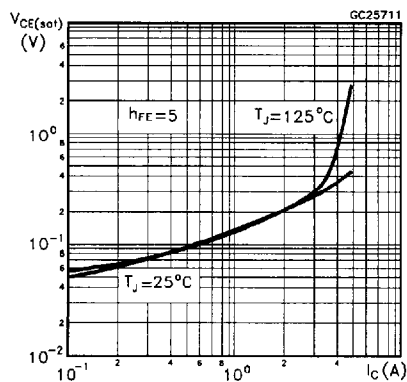
DC Current Gain



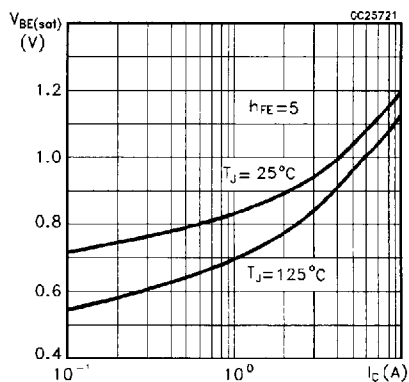
DC Current Gain



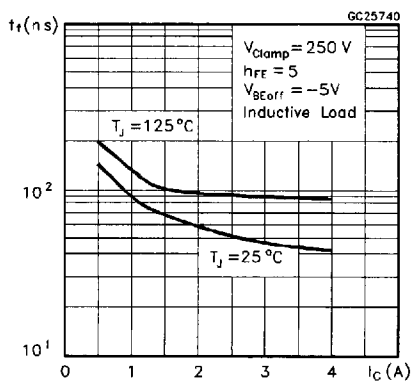
Collector Emitter Saturation Voltage



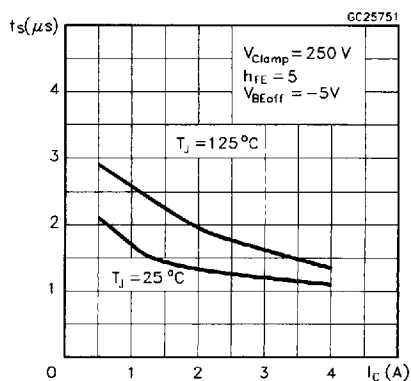
Base Emitter Saturation Voltage



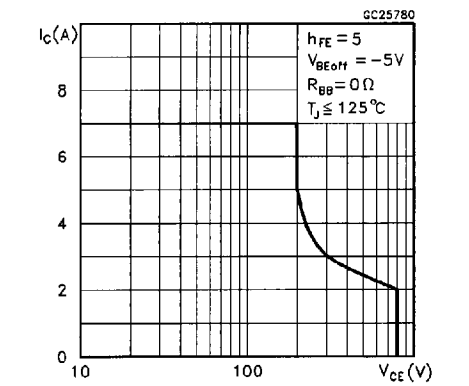
Inductive Fall Time



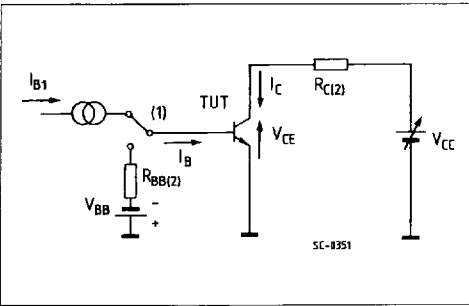
Inductive Storage Time



Reverse Biased SOA

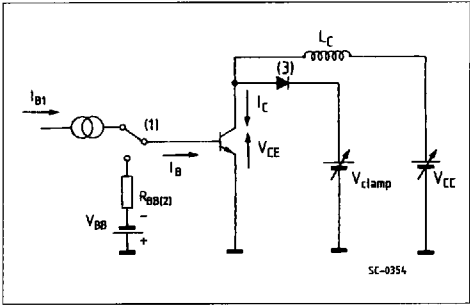


Resistive Load Switching Test Circuit



- (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