BUL85D

MEDIUM VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- HIGH RUGGEDNESS

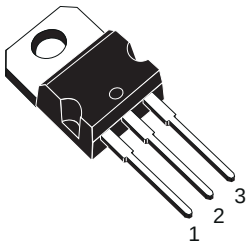
APPLICATIONS

- 110V AC ELECTRONIC TRANSFORMERS FOR HALOGEN LAMPS UP TO 100 W
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

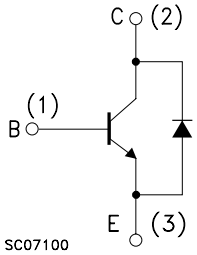
The BUL85D is manufactured using Multi Epitaxial Planar technology for high switching speeds and medium voltage capability.

The BUL85D is designed for use in 110V AC electronic transformers for halogen lamps.



TO-220

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	500	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	250	V
V_{EBO}	Emitter-Base Voltage (I_C = 0, I_B < 2.5 A, t_p < 10µs, T_J < 150 °C)	$V_{(BR)EBO}$	V
I_C	Collector Current	8	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	15	A
I_B	Base Current	4	A
I_{BM}	Base Peak Current (t_p < 5 ms)	8	A
P_{tot}	Total Dissipation at Tc = 25 °C	80	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

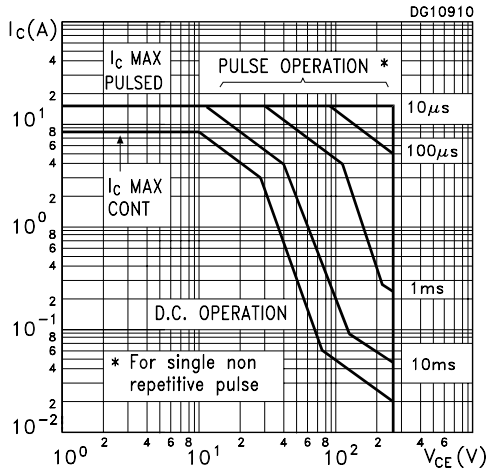
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	1.56	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	62.5	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

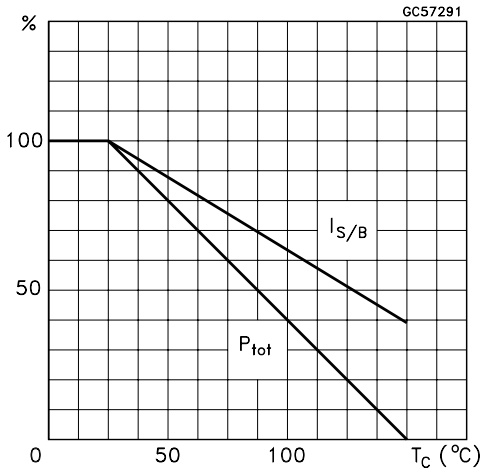
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 500 V V_{CE} = 500 V T_j = 125 ^oC			100 500	µA µA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 9 V			100	µA
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 10mA	10		18	V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10 mA L = 25 mH	250			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 2 A I_B = 0.4 A I_C = 4 A I_B = 0.8 A I_C = 8 A I_B = 1.6 A		0.1	0.3 0.6 1.2	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 2 A I_B = 0.4 A I_C = 8 A I_B = 1.6 A			1.1 1.5	V V
h_{FE}*	DC Current Gain	I_C = 10 mA V_{CE} = 5 V I_C = 0.5 A V_{CE} = 5 V I_C = 14 A V_{CE} = 10 V	10 4		 60 10	
t_s t_f	RESISTIVE LOAD Storage Time Fall Time	I_C = 4 A V_{CC} = 150 V $I_{B(on)}$ = -$I_{B(off)}$ = 0.8 A t_p ≥ 30 µs (see figure 2)	1.2	1.8	2.4 250	µs ns
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 4 A V_{CL} = 200 V I_B = 0.8 A $V_{BE(off)}$ = -3 V R_{BB} = 0 Ω t_p ≥ 30µs (see figure 1)		0.7 50		µs ns
V_f	Diode Forward Voltage	I_C = 5 A			1.5	V

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

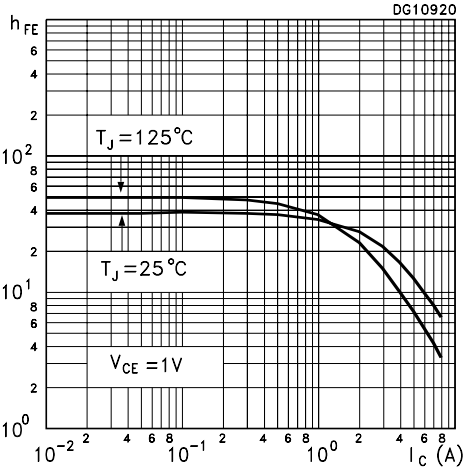
Safe Operating Area



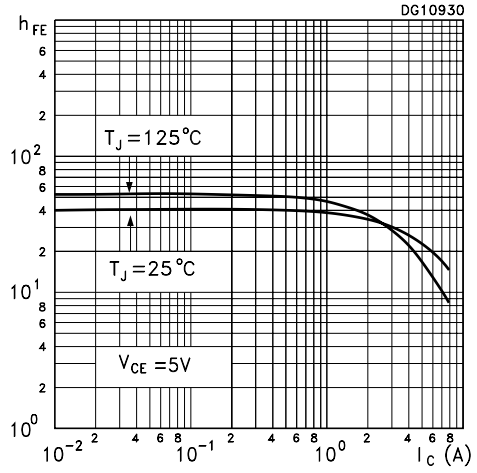
Derating Curve



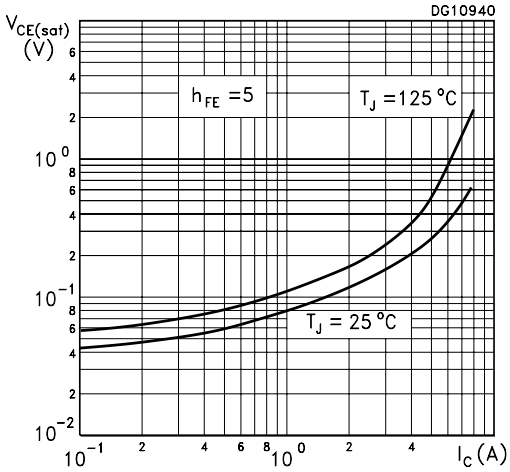
DC Current Gain



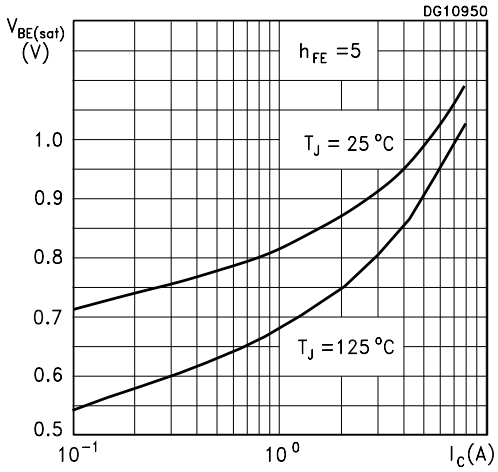
DC Current Gain



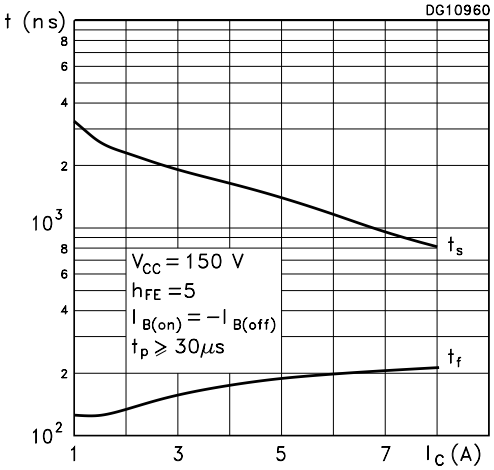
Collector Emitter Saturation Voltage



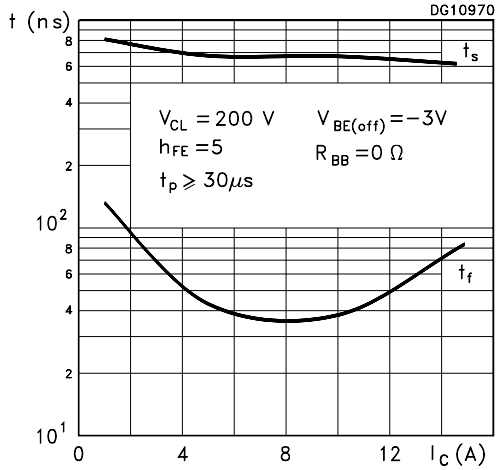
Base Emitter Saturation Voltage



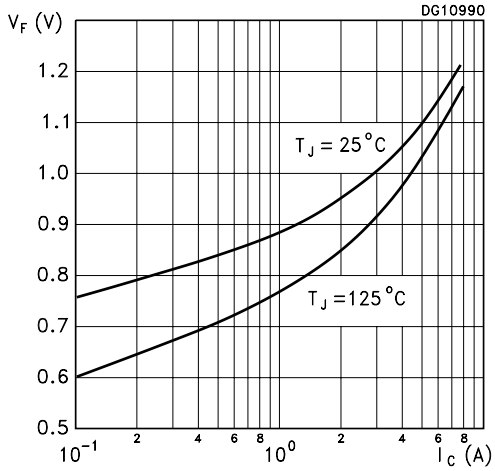
Switching Time Resistive Load



Switching Time Inductive Load



Diode Forward Voltage



Reverse Biased SOA

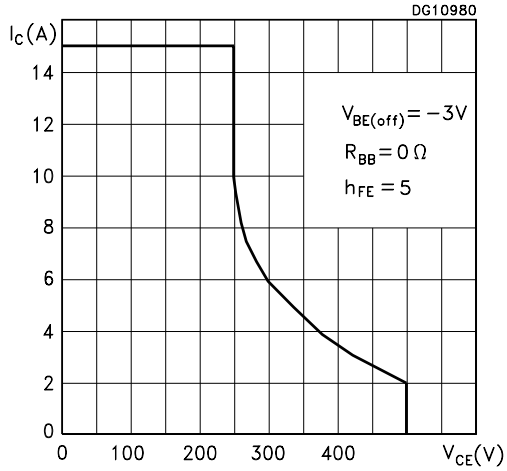


Figure 1: Inductive Load Switching Test Circuit.

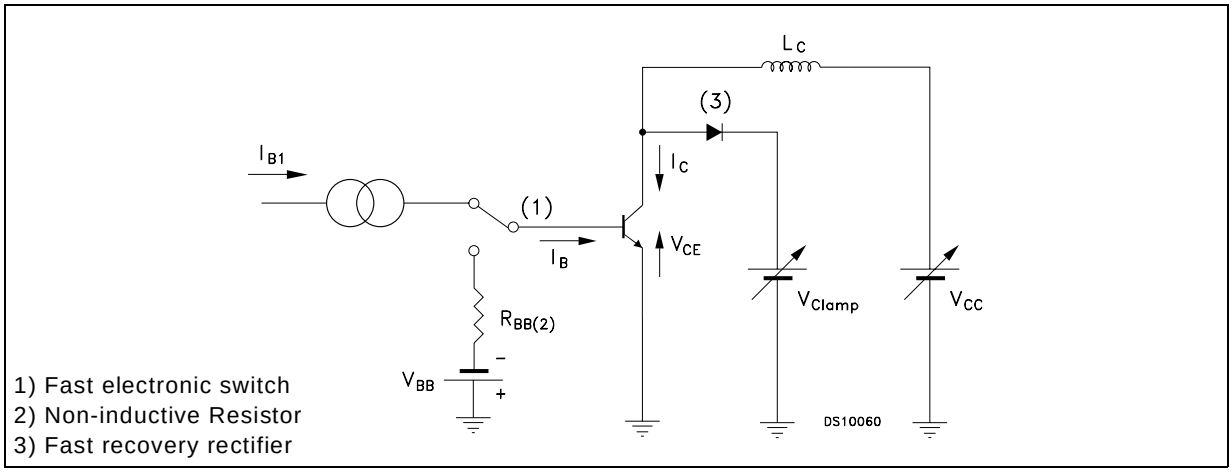
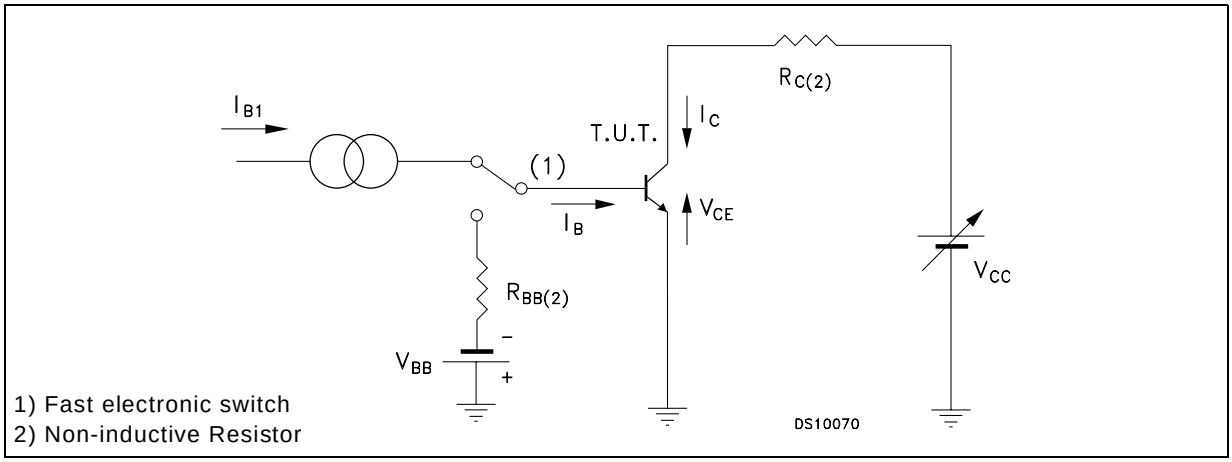
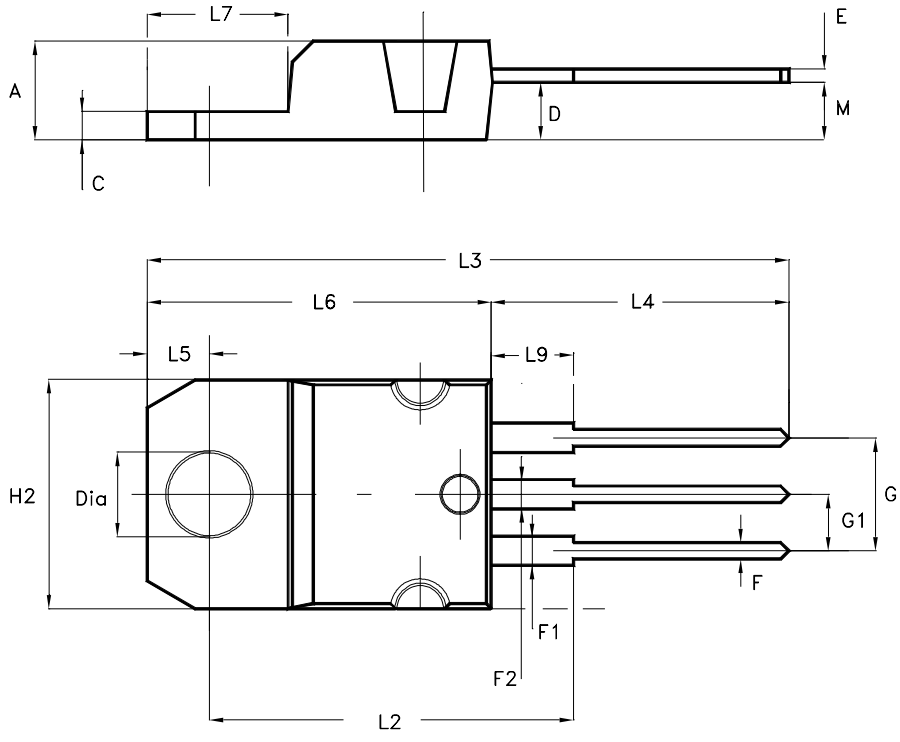


Figure 2: Resistive Load Switching Test Circuit.



TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.052
D	2.40		2.72	0.094		0.107
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.202
G1	2.40		2.70	0.094		0.106
H2	10.00		10.40	0.394		0.409
L2		16.40			0.645	
L4	13.00		14.00	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.20		6.60	0.244		0.260
L9	3.50		3.93	0.137		0.154
M		2.60			0.102	
DIA.	3.75		3.85	0.147		0.151



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