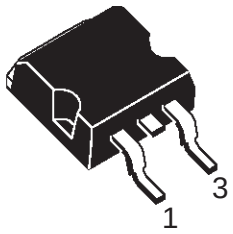
BULB39D

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- HIGH RUGGEDNESS
- SURFACE-MOUNTING D^2PAK (TO-263) POWER PACKAGE IN TAPE & REEL (Suffix "T4")



D^2PAK
(TO-263)
(Suffix "T4")

APPLICATIONS

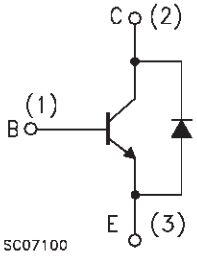
- ELECTRONIC TRANSFORMERS FOR HALOGEN LAMPS
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

The BULB39D is manufactured using high voltage Multi Epitaxial Planar technology to enhance switching speeds while maintaining wide RBSOA.

The BUL series is designed for use in electronics transformers for halogen lamps.

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	850	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	450	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	9	V
I_C	Collector Current	4	A
I_{CM}	Collector Peak Current (t_p <5 ms)	8	A
I_B	Base Current	2	A
I_{BM}	Base Peak Current (t_p <5 ms)	4	A
P_{tot}	Total Dissipation at T_c = 25 °C	70	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

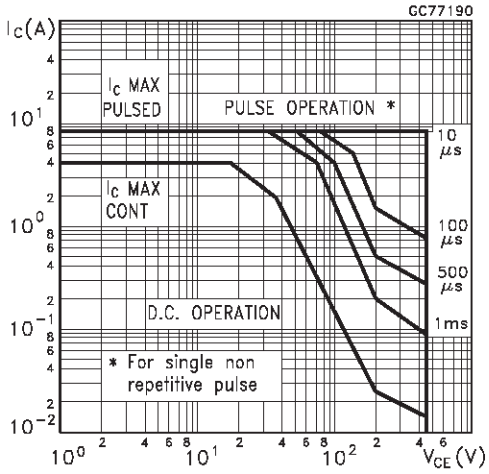
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case Max	1.78	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	70	$^oC/W$

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

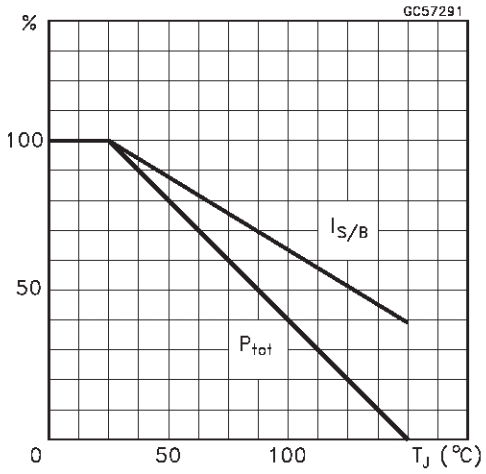
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 850 V V_{CE} = 850 V T_j = 125 ^oC			100 500	µA µA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 9 V			100	µA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA L = 25 mH	450			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 1 A I_B = 0.2 A I_C = 2.5 A I_B = 0.5 A		0.13	0.5 1.1	V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 1 A I_B = 0.2 A I_C = 2.5 A I_B = 0.5 A			1.1 1.3	V V
h_{FE}*	DC Current Gain	I_C = 5 A V_{CE} = 10 V I_C = 10 mA V_{CE} = 5 V	4 10			
V_{CEW}	Maximum Collector Emitter Voltage Without Snubber	I_C = 6 A R_{BB} = 0 Ω V_{BB} = -2.5 V L = 50µH t_p = 10 µs	450			V
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 2.5 A $I_{B(on)}$ = 0.5 A $V_{BE(off)}$ = -5 V R_{BB} = 0 Ω V_{CL} = 300 V L = 1 mH		 0.7 50	 1.5 100	 µs ns
V_f	Diode Forward Voltage	I_C = 2 A			1.5	V

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

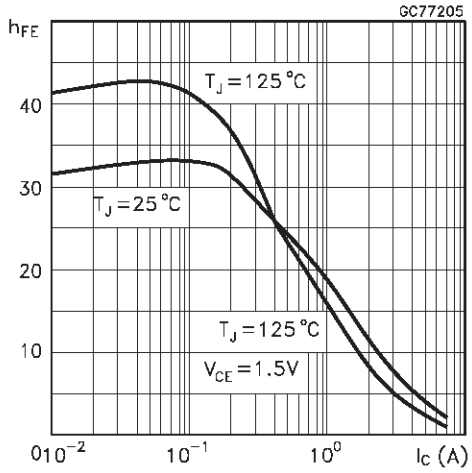
Safe Operating Areas



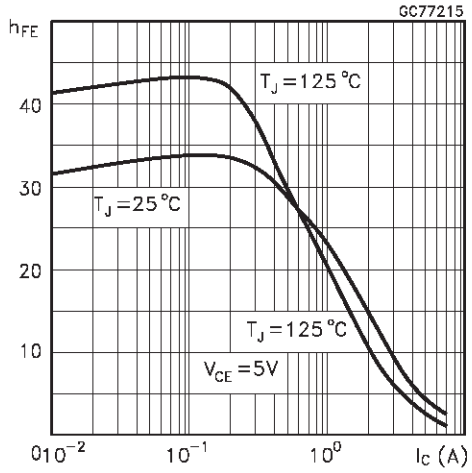
Derating Curve



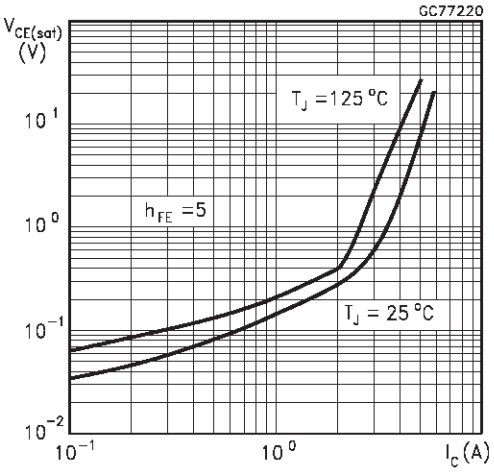
DC Current Gain



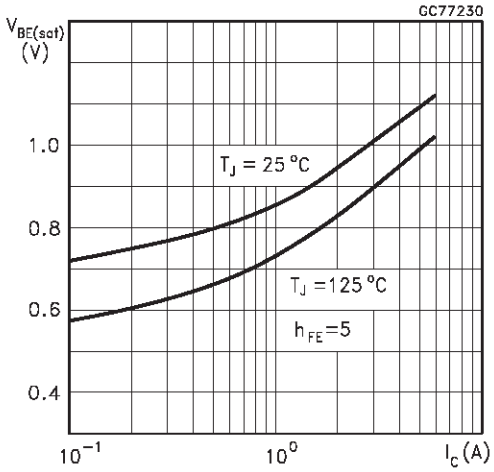
DC Current Gain



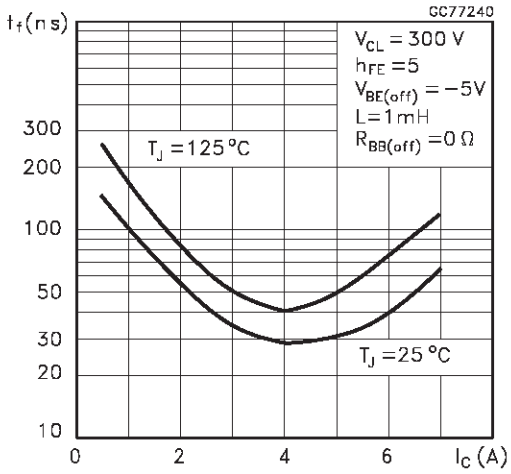
Collector Emitter Saturation Voltage



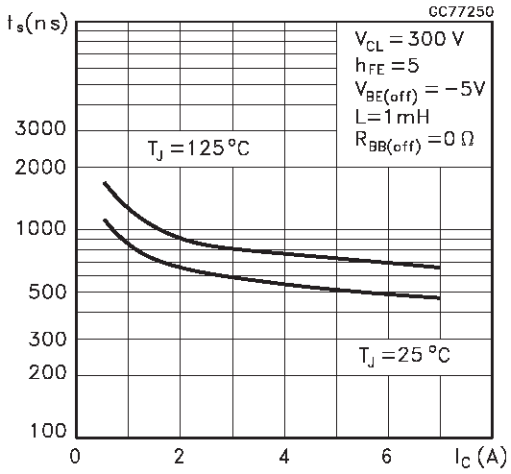
Base Emitter Saturation Voltage



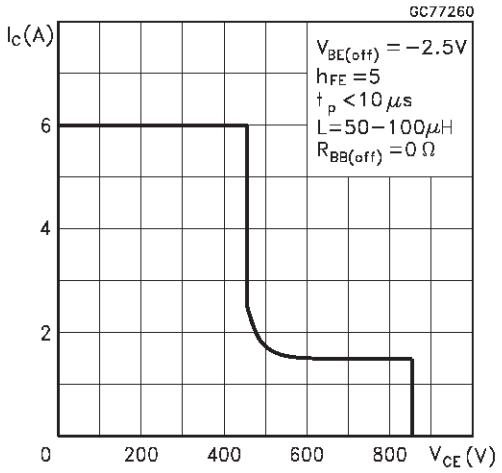
Inductive Fall Time



Inductive Storage Time

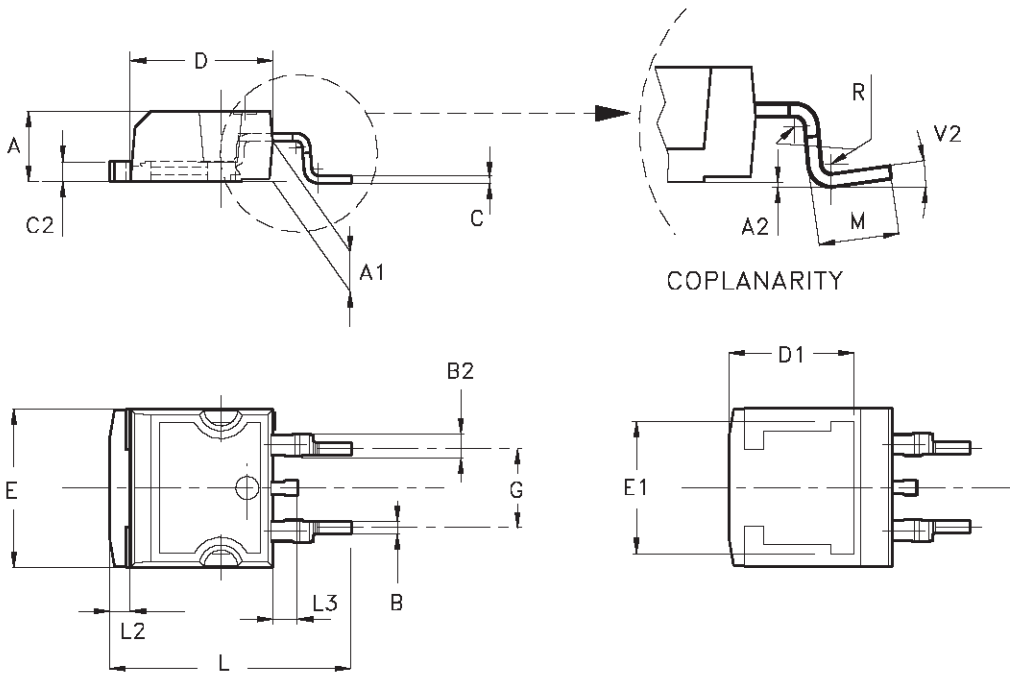


Reverse Biased SOA



TO-263 (D^2PAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.036
B2	1.14		1.70	0.044		0.067
C	0.45		0.60	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8.00			0.315	
E	10.00		10.40	0.393		0.409
E1		8.50			0.334	
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.4	0.050		0.055
L3	1.40		1.75	0.055		0.068
M	2.40		3.2	0.094		0.126
R		0.40			0.016	
V2	0^o		8^o	0^o		8^o



- Weight : 1.38 g (typ.)
- The planaty of the slug must be within 30 µm

P011P6/G