

**MEDIUM VOLTAGE FAST-SWITCHING  
NPN POWER TRANSISTOR**

PRELIMINARY DATA

- SGS-THOMSON PREFERRED SALESTYPES
- MEDIUM VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERISED AT 125°C
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

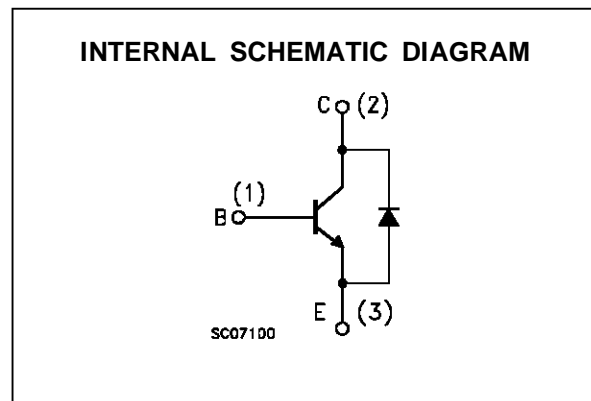
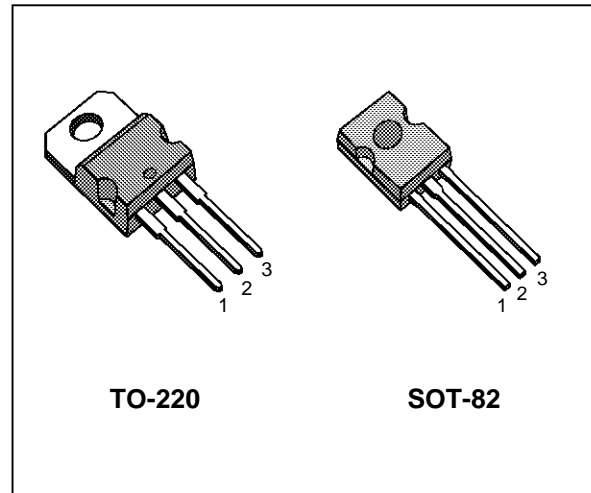
**APPLICATIONS**

- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS

**DESCRIPTION**

The BUL26D and BULK26D are manufactured using medium voltage Multi Epitaxial Planar technology for high switching speeds and medium voltage capability. They use a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining a wide RBSOA.

The BUL series is designed for use in lighting applications and low cost switch-mode power supplies.



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value		Unit
		BUL26D	BULK26D	
V <sub>CES</sub>	Collector-Emitter Voltage (V <sub>BE</sub> = 0)	600		V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)	300		V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)	12		V
I <sub>C</sub>	Collector Current	4		A
I <sub>CM</sub>	Collector Peak Current (t <sub>p</sub> < 5 ms)	8		A
I <sub>B</sub>	Base Current	2		A
I <sub>BM</sub>	Base Peak Current (t <sub>p</sub> < 5 ms)	4		A
P <sub>tot</sub>	Total Dissipation at T <sub>c</sub> = 25 °C	60	50	W
T <sub>stg</sub>	Storage Temperature Range	-65 to 150		°C
T <sub>j</sub>	Max. Operating Junction Temperature	150		°C

# BUL26D

## THERMAL DATA

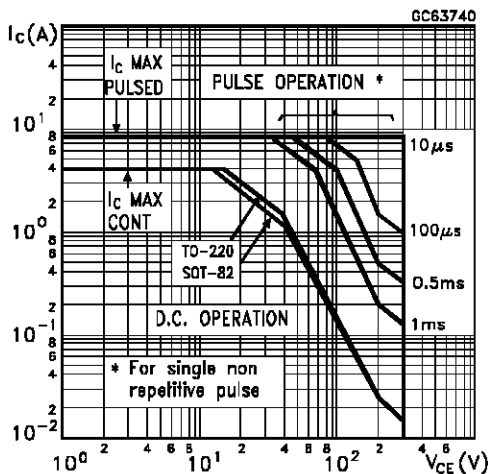
			TO220	SOT-82	
$R_{thj-case}$	Thermal Resistance Junction-Case	Max	2.08	2.5	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	62.5	62.5	$^{\circ}C/W$

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

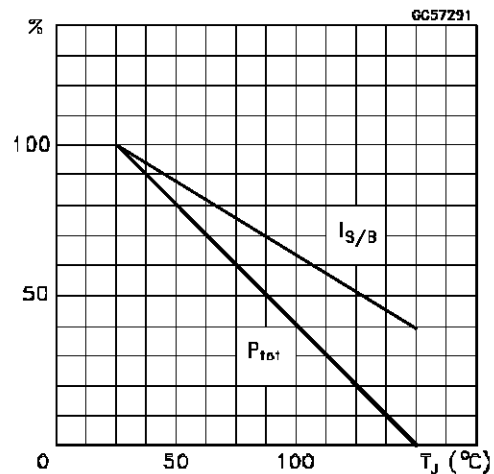
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 600 V$			200	$\mu A$
$I_{CEO}$	Collector Cut-off Current ( $I_B = 0$ )	$V_{CE} = 300 V$			250	$\mu A$
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 100 mA$	300			V
$V_{EBO}$	Emitter-Base Voltage	$I_E = 10 mA$	12			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 1 A \quad I_B = 0.2 A$			0.5	V
		$I_C = 2 A \quad I_B = 0.4 A$			0.7	V
		$I_C = 3 A \quad I_B = 0.6 A$			1	V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 1 A \quad I_B = 0.2 A$			1.1	V
		$I_C = 2 A \quad I_B = 0.4 A$			1.2	V
		$I_C = 3 A \quad I_B = 0.6 A$			1.3	V
$h_{FE*}$	DC Current Gain	$I_C = 10 mA \quad V_{CE} = 5 V$	10			
		$I_C = 1 A \quad V_{CE} = 3 V$	15		45	
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 3 A \quad I_{B1} = 0.6 A$ $V_{BE(off)} = -5 V \quad R_{BB} = 0 \Omega$ $V_{CL} = 250 V \quad L = 200 \mu H$		0.8 70	1.3 130	$\mu s$ ns
		$I_C = 3 A \quad I_{B1} = 0.6 A$ $V_{BE(off)} = -5 V \quad R_{BB} = 0 \Omega$ $V_{CL} = 250 V \quad L = 200 \mu H$ $T_j = 125^{\circ}C$		1.2 100		$\mu s$ ns
$V_f$	Diode Forward Voltage	$I_C = 2.5 A$			3	V

\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle 1.5 %

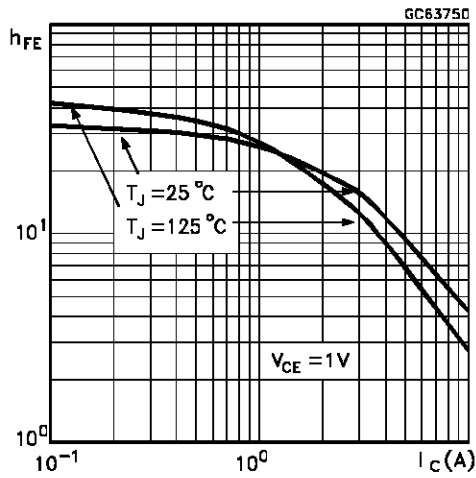
## Safe Operating Areas



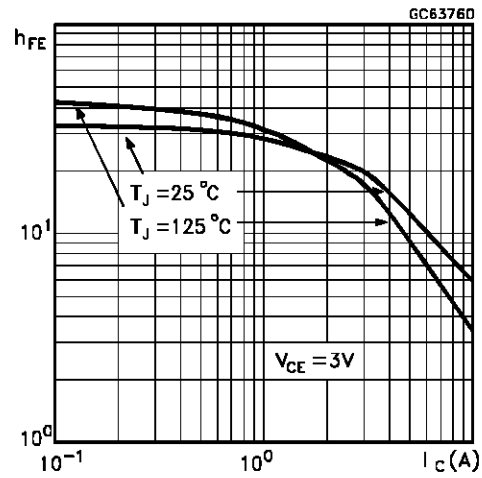
## Derating Curves



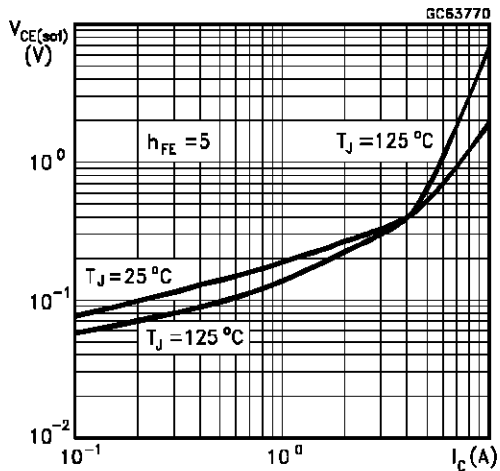
DC Current Gain



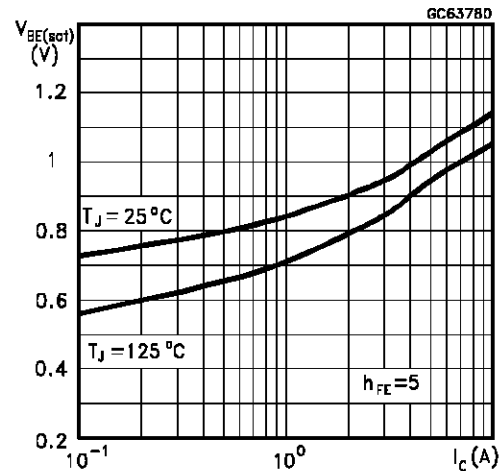
DC Current Gain



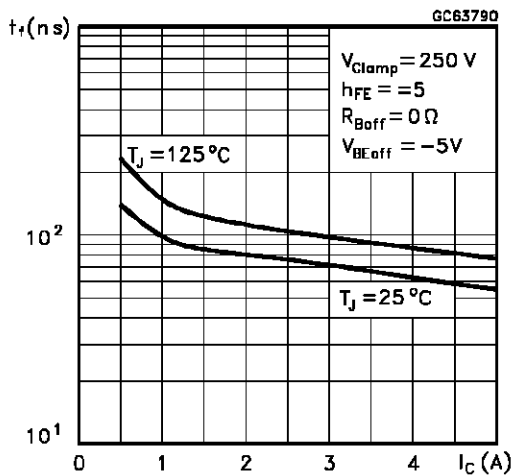
Collector-Emitter Saturation Voltage



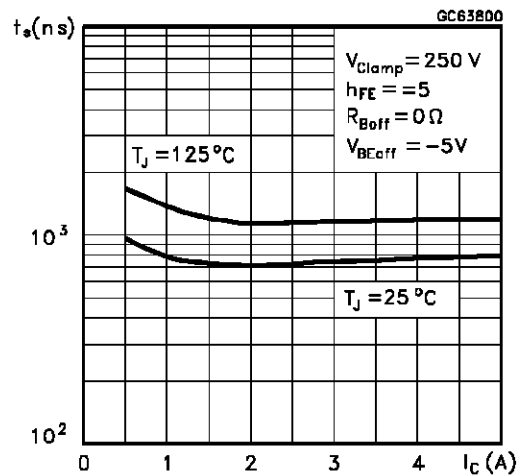
Base-Emitter Saturation Voltage



Inductive Fall Time

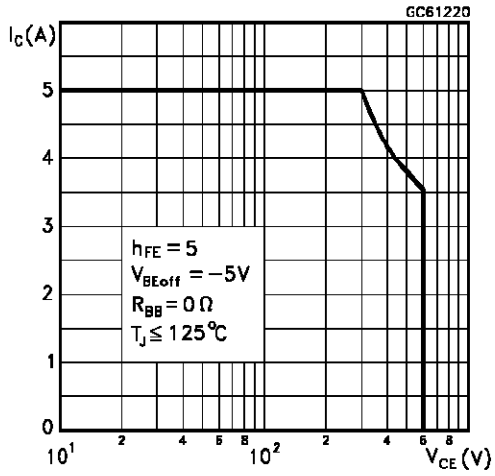


Inductive Storage Time

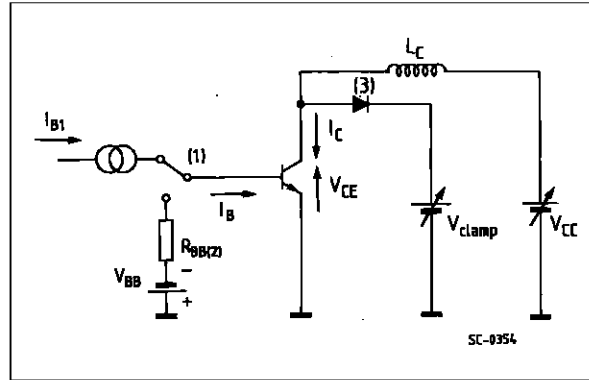


# BUL26D

## Reverse Biased SOA



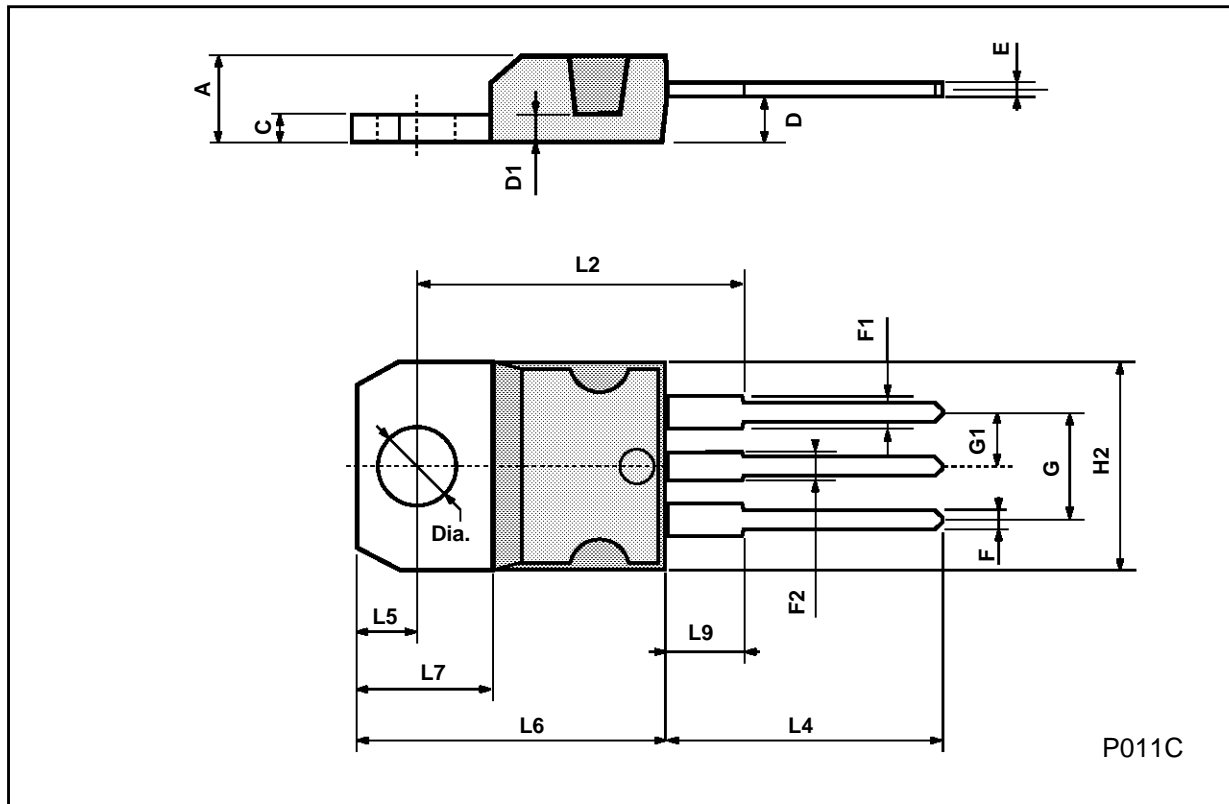
## RBSOA and Inductive Load Switching Test Circuit



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

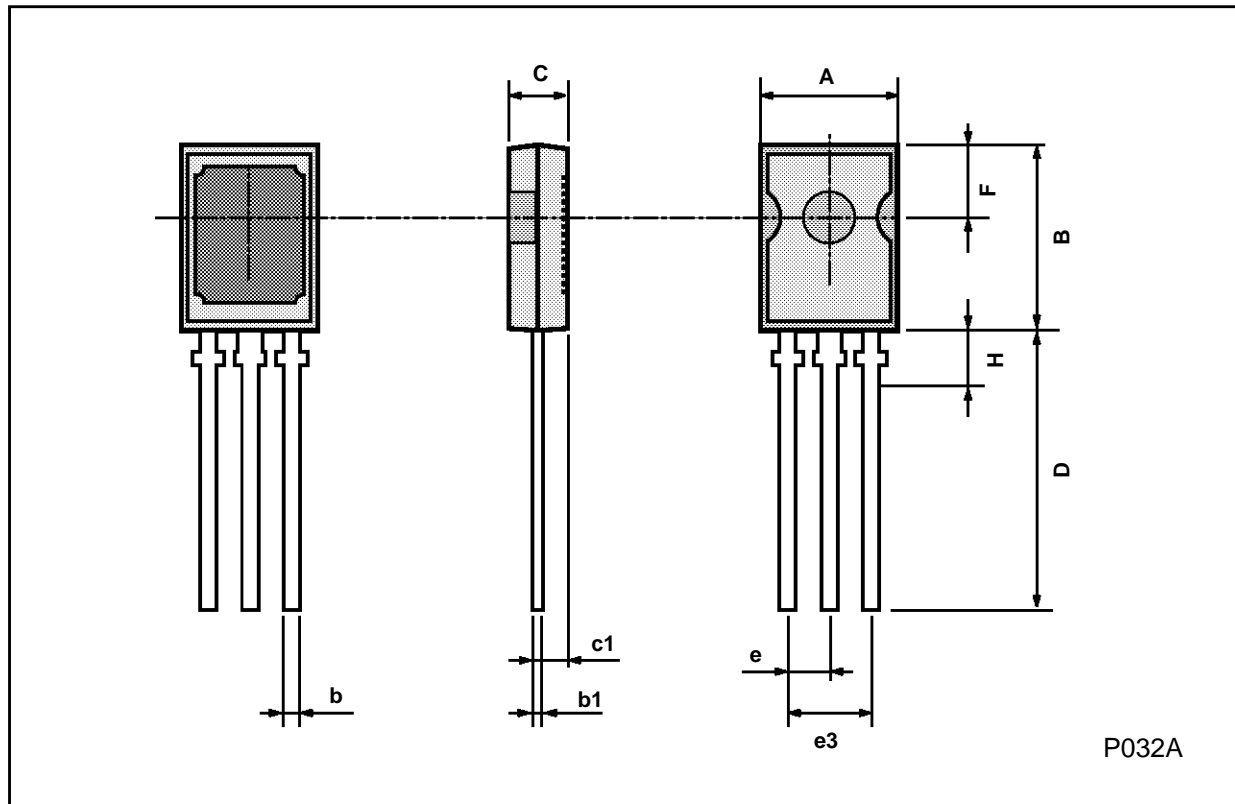
**TO-220 MECHANICAL DATA**

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		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
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		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



**SOT-82 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		11.3	0.413		0.445
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.04		0.106
c1		1.2			0.047	
D		15.7			0.618	
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
H			2.54		0.100	



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