



# BUL742C

## HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

Ordering Code	Marking	Package / Shipment
BUL742C	BUL742C	TO-220 / Tube

- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED

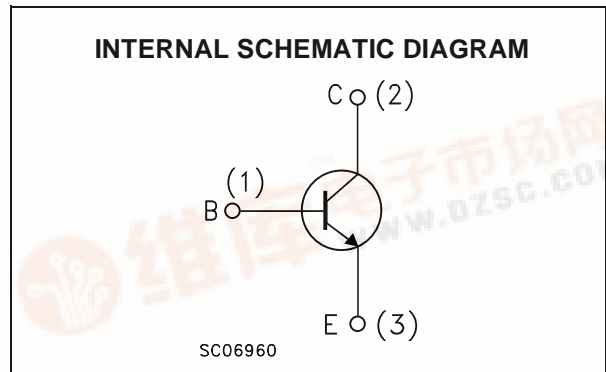
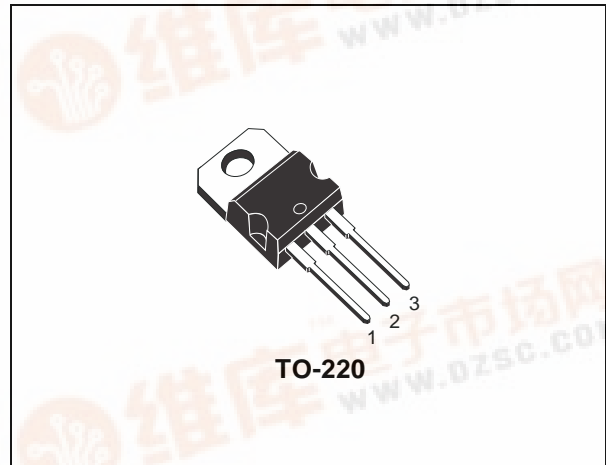
### APPLICATIONS:

- ELECTRONIC BALLAST FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

### DESCRIPTION

The device is manufactured using High Voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability.

Thanks to an increased intermediate layer, it has an intrinsic ruggedness which enables the transistor to withstand an high collector current level during breakdown condition, without using the transil protection usually necessary in typical converters for lamp ballast.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage ( $V_{BE} = 0$ )	1050	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	400	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0, I_B < 2 \text{ A}, t_p < 10 \text{ ms}$ )	$V_{(BR)EBO}$	V
$I_C$	Collector Current	4	A
$I_{CM}$	Collector Peak Current ( $t_p < 5 \text{ ms}$ )	8	A
$I_B$	Base Current	2	A
$I_{BM}$	Base Peak Current ( $t_p < 5 \text{ ms}$ )	4	A
$P_{tot}$	Total Dissipation at $T_c = 25 \text{ }^\circ\text{C}$	70	W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

## BUL742C

### THERMAL DATA

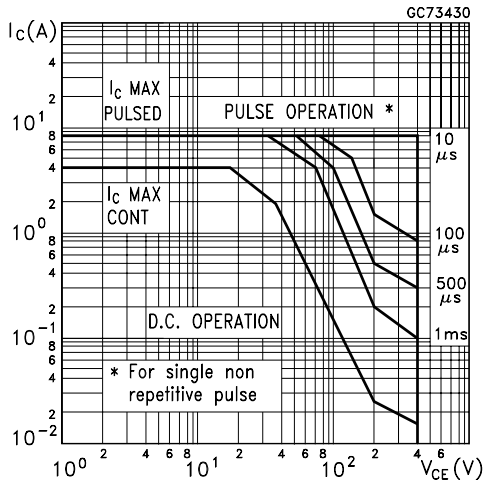
$R_{thj-case}$	Thermal Resistance Junction-case	Max	1.79	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W

### ELECTRICAL CHARACTERISTICS ( $T_j = 25\text{ °C}$ unless otherwise specified)

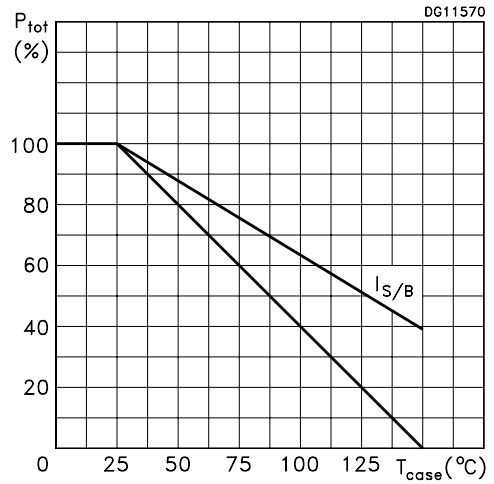
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 1050\text{ V}$				100	$\mu\text{A}$
$I_{CEO}$	Collector Cut-off Current ( $I_B = 0$ )	$V_{CE} = 400\text{ V}$				250	$\mu\text{A}$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = 1\text{ mA}$		12		24	V
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 10\text{ mA}$		400			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 1\text{ A}$ $I_C = 3.5\text{ A}$	$I_B = 0.2\text{ A}$ $I_B = 1\text{ A}$			0.5 1.5	V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 3.5\text{ A}$	$I_B = 1\text{ A}$			1.5	V
$h_{FE}^*$	DC Current Gain	$I_C = 0.1\text{ A}$ $I_C = 0.8\text{ A}$	$V_{CE} = 5\text{ V}$ $V_{CE} = 3\text{ V}$	48 25		100 50	
$t_s$ $t_f$	RESISTIVE LOAD Storage Time Fall Time	$I_C = 2\text{ A}$ $I_{B1} = -I_{B2} = 400\text{ mA}$ $V_{BB(off)} = -5\text{ V}$	$V_{CC} = 125\text{ V}$ $t_p = 300\text{ }\mu\text{s}$ (See Figure 1)		2.4 350		$\mu\text{s}$ ns
$E_{ar}$	Repetitive Avalanche Energy	$L = 2\text{ mH}$ $V_{BE} = -5\text{ V}$	$C = 1.8\text{ nF}$ (See Figure 2)	6			mJ

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

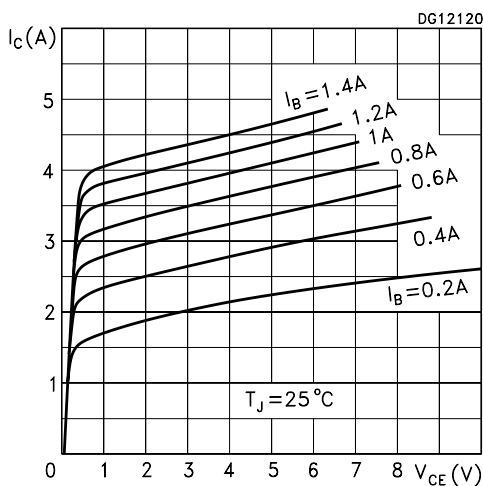
Safe Operating Area



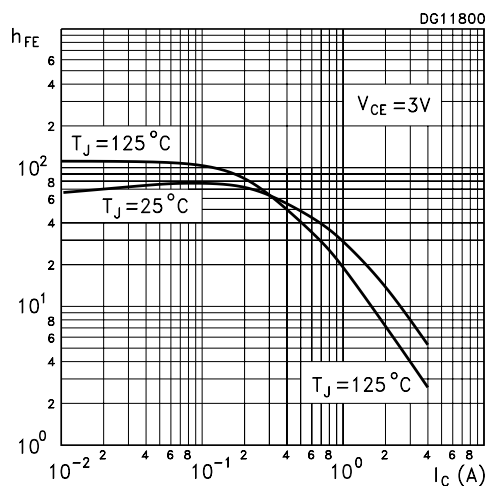
Derating Curve



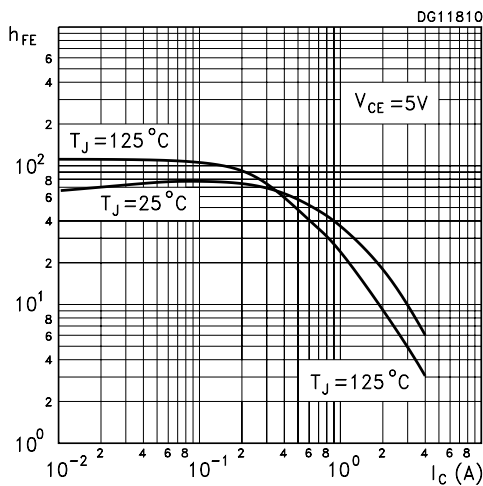
Output Characteristics



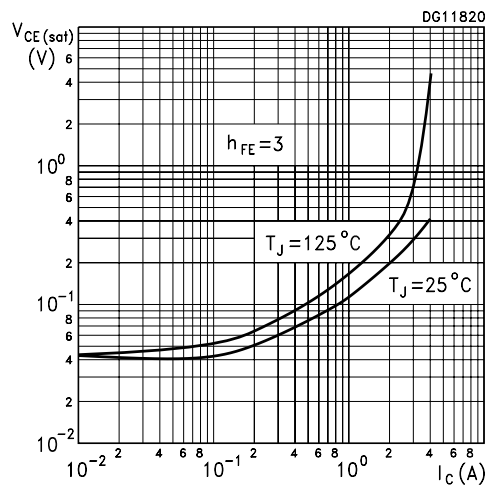
DC Current Gain



DC Current Gain

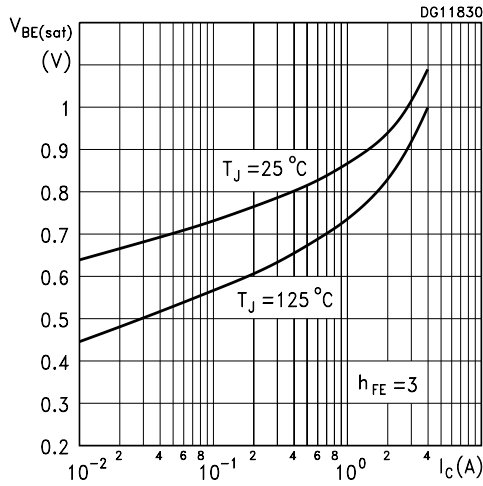


Collector-Emitter Saturation Voltage

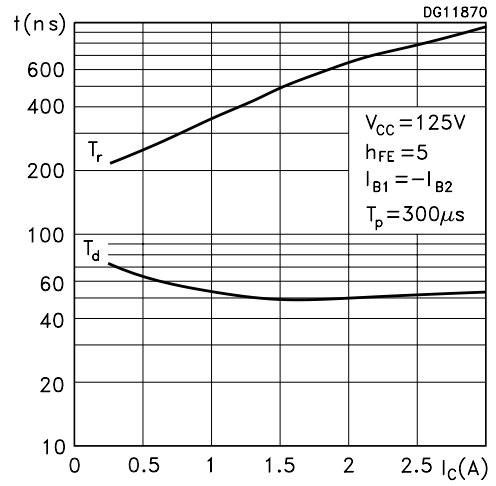


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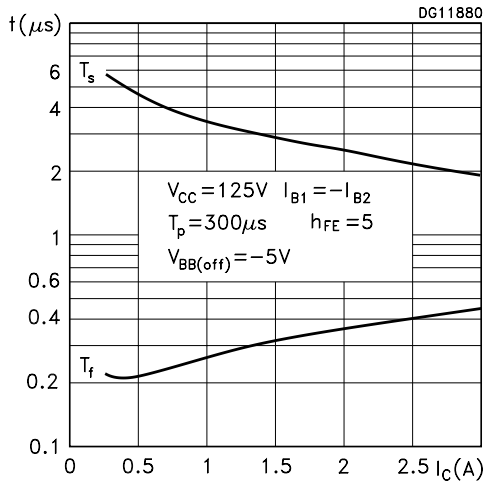
## Base-Emitter Saturation Voltage



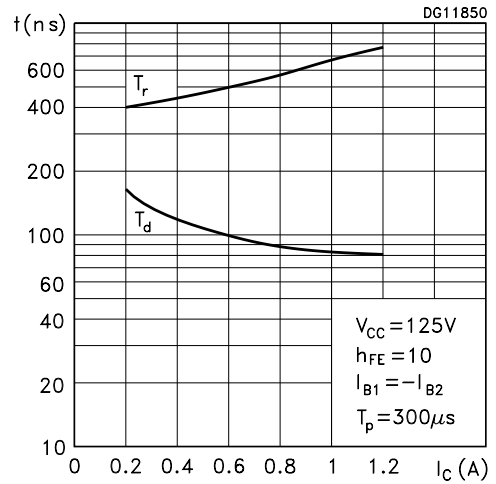
## Resistive Load Switching On Times



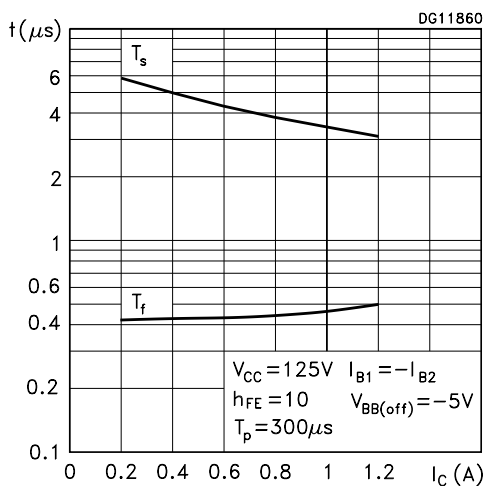
## Resistive Load Switching Off Times



## Resistive Load Switching On Times



## Resistive Load Switching Off Times



## Reverse Biased Safe Operating Area

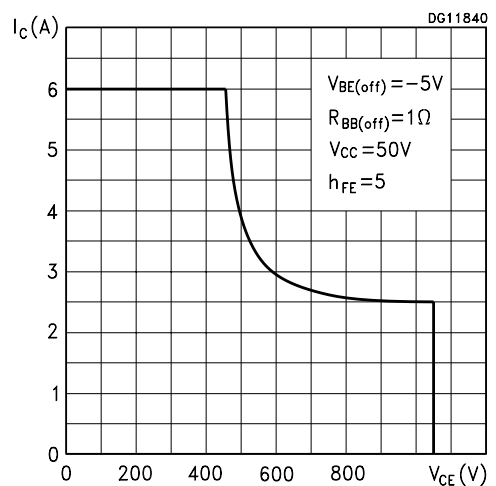


Figure 1: Resistive Load Switching Test Circuit

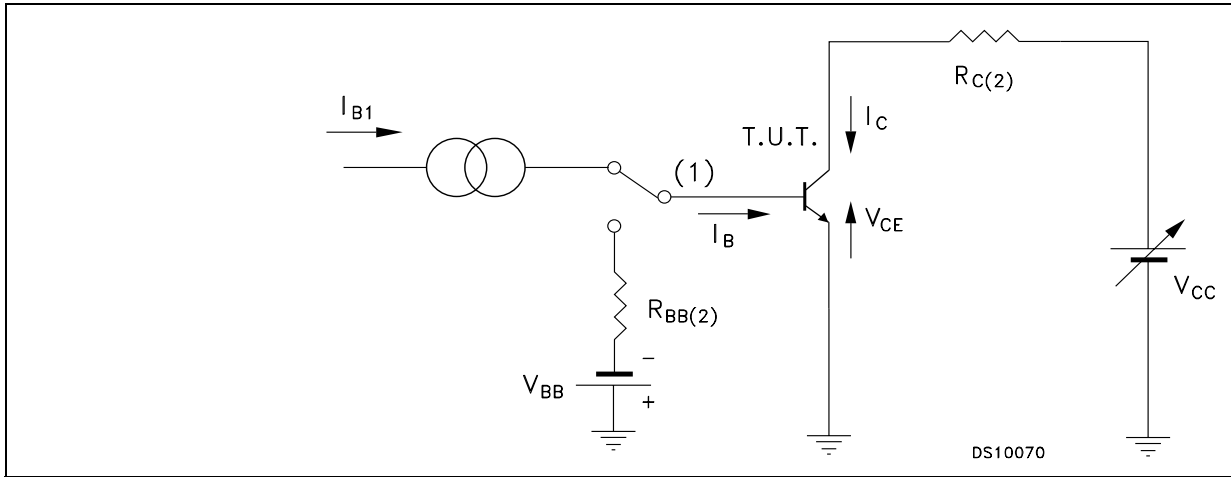
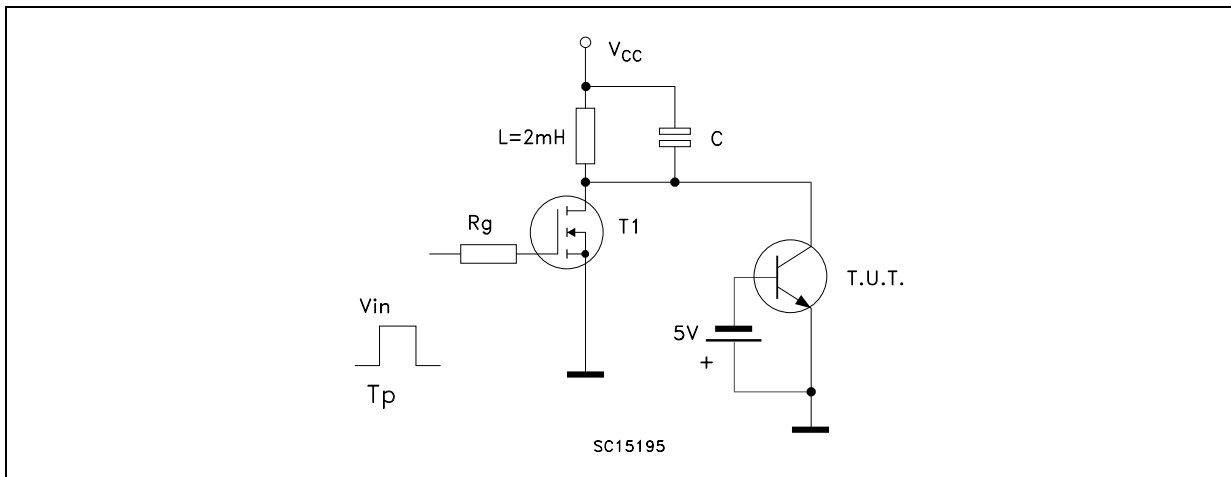
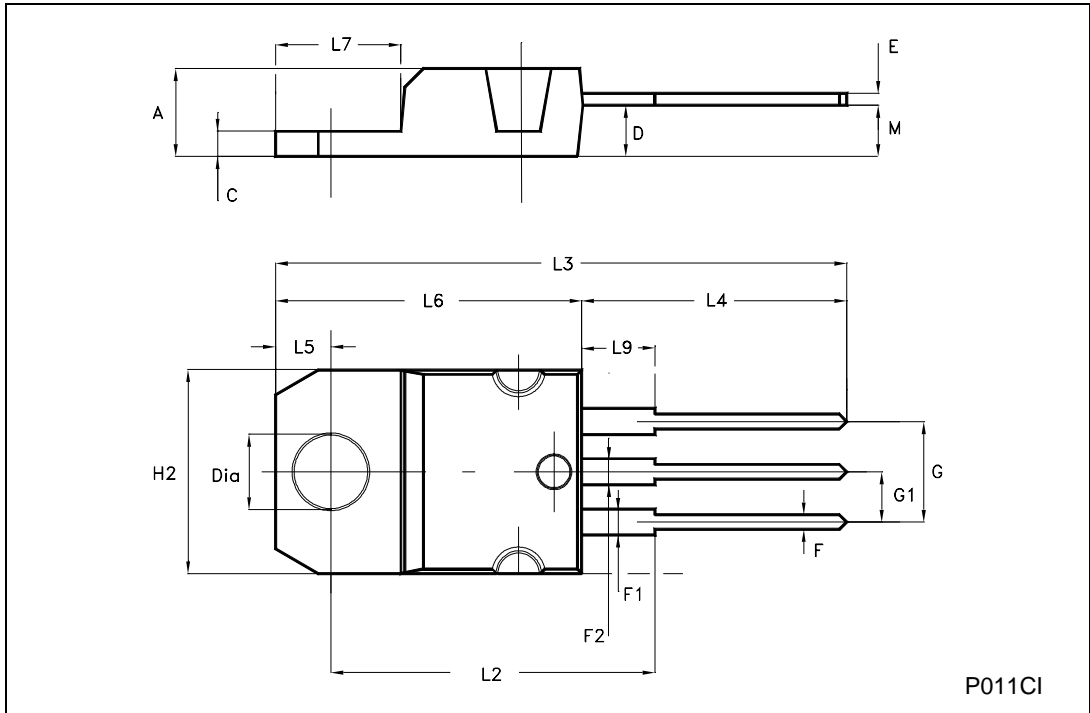


Figure 2: Energy Rating Test Circuit



**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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