



# BUL742

## HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

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

### APPLICATIONS

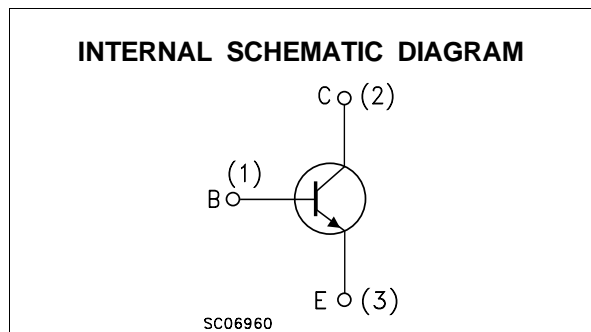
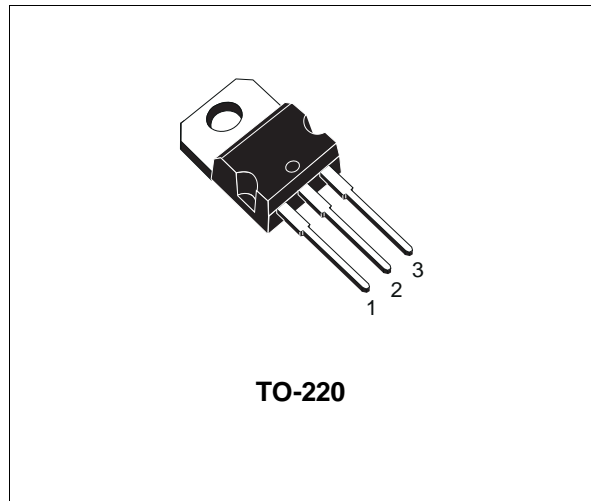
- ELECTRONIC BALLAST FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

### DESCRIPTION

The BUL742 is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability.

It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

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 ( $V_{BE} = 0$ )	900	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	400	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0, I_B = 0.75 \text{ A}, t_p < 10\mu\text{s}, T_J < 150^\circ\text{C}$ )	$BV_{EBO}$	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 $T_c = 25^\circ\text{C}$	70	W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_J$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

# BUL742

## THERMAL DATA

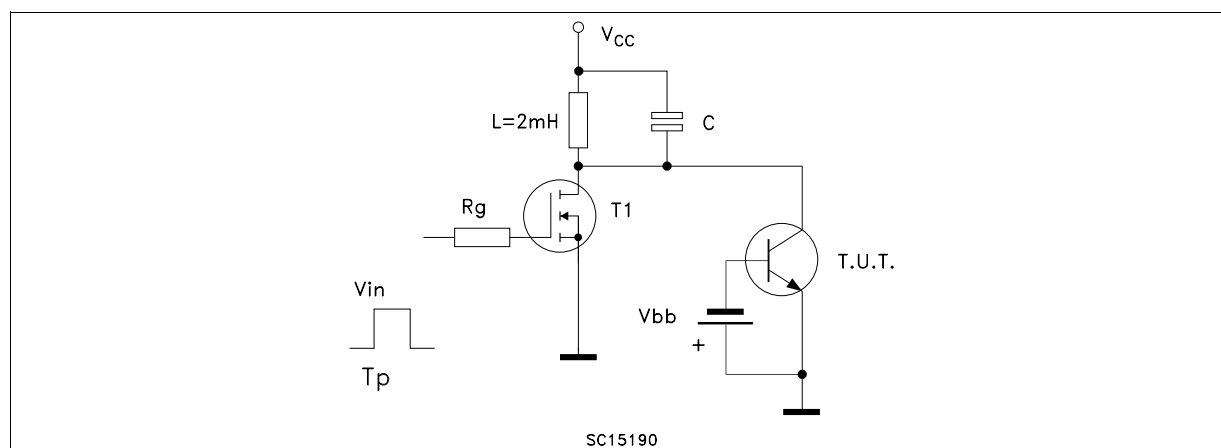
R <sub>thj-case</sub>	Thermal Resistance Junction-Case	Max	1.78	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

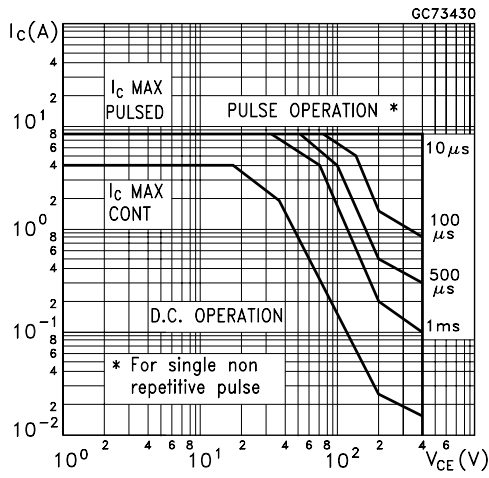
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = 900 V			100	μA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 100 mA      L = 25 mH	400			V
BV <sub>EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 1 mA	12			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 1 A      I <sub>B</sub> = 0.2 A I <sub>C</sub> = 2 A      I <sub>B</sub> = 0.4 A I <sub>C</sub> = 4 A      I <sub>B</sub> = 0.8 A			0.5 1.0 1.5	V V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 2 A      I <sub>B</sub> = 0.4 A			1.5	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 250 mA      V <sub>CE</sub> = 5 V I <sub>C</sub> = 2 A      V <sub>CE</sub> = 5 V	35 10		70 35	
t <sub>s</sub> t <sub>f</sub>	RESISTIVE LOAD Storage Time Fall Time	V <sub>CC</sub> = 125 V      I <sub>C</sub> = 0.5 A I <sub>B1</sub> = 45 mA      I <sub>B2</sub> = -45 mA t <sub>p</sub> = 300 μs		11 250		μs ns
E <sub>sb</sub>	Avalanche Energy	L = 2 mH	6			mJ

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

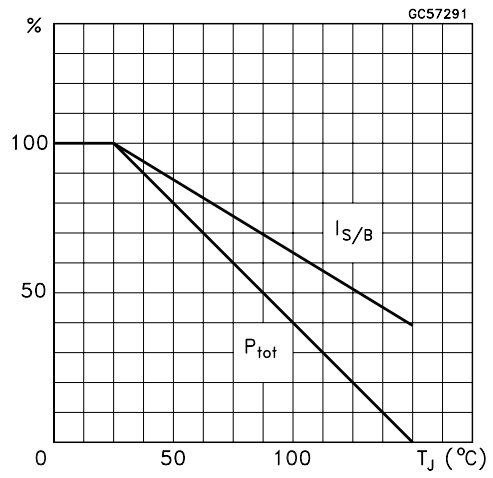
## Energy Rating Test Circuit



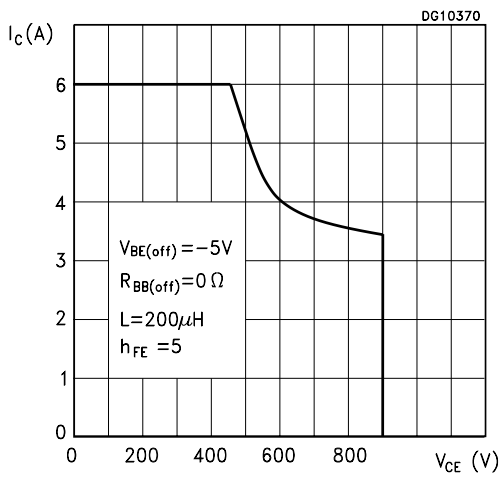
Safe Operating Areas



Derating Curve

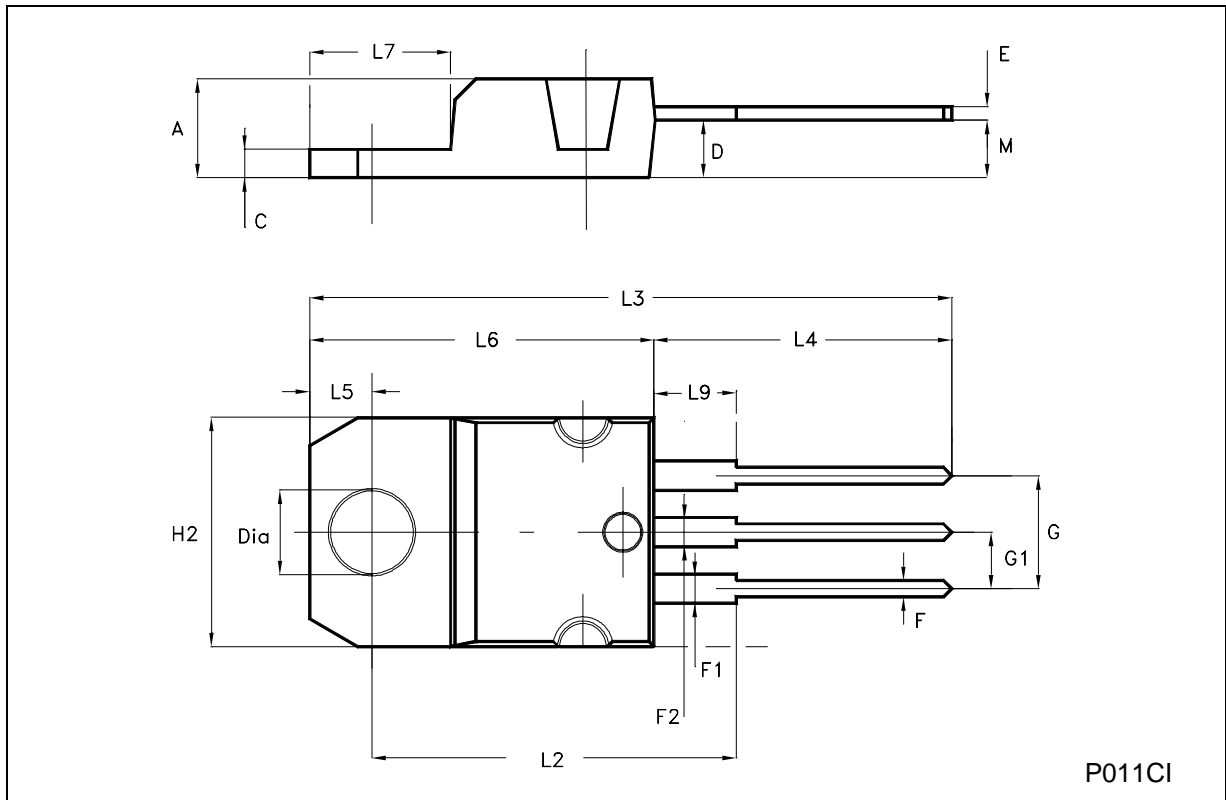


Reverse Biased SOA



**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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