



## BUL129D

### High Voltage Fast-Switching NPN Power Transistor

#### Features

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

#### Applications

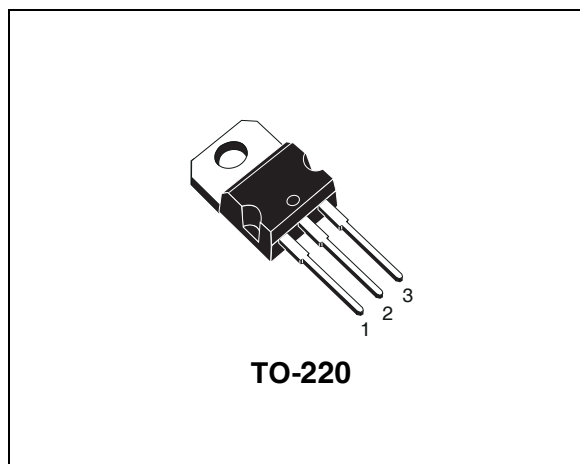
- ELECTRONIC TRANSFORMERS FOR HALOGEN LAMPS

#### Description

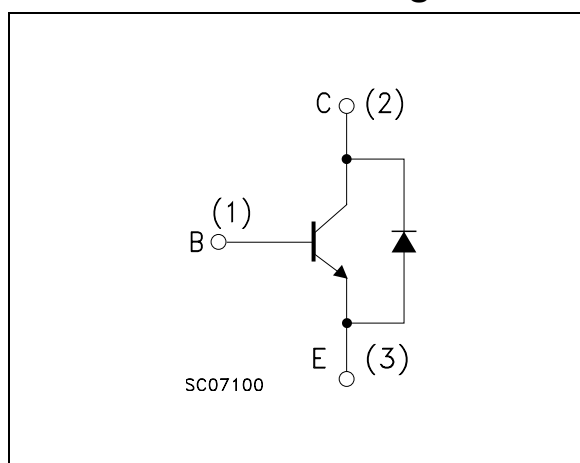
The device is manufactured using High Voltage Multi-Epitaxial Planar technology for high switching speeds while maintaining the wide RBSOA.

The device is designed to be used in electronics transformers for halogen lamps.

PRELIMINARY DATA



#### Internal Schematic Diagram



#### Order Codes

Part Number	Marking	Package	Packing
BUL129D	BUL129D	TO-220	TUBE

# 1 Absolute Maximum Ratings

**Table 1. Absolute Maximum Rating**

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage ( $V_{BE} = 0$ )	800	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 ( $t_P < 5\text{ms}$ )	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 $T_C = 25^\circ\text{C}$	65	W
$T_{STG}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_J^*$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

**Table 2. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal Resistance Junction-Case Max	1.92	$^\circ\text{C}/\text{W}$
$R_{thj-amb}$	Thermal Resistance Junction-ambient Max	62.5	$^\circ\text{C}/\text{W}$

## 2 Electrical Characteristics

**Table 3. Electrical Characteristics** ( $T_{\text{case}} = 25^{\circ}\text{C}$ ; unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{\text{CES}}$	Collector Cut-off Current ( $V_{\text{BE}} = 0$ )	$V_{\text{CE}} = 800 \text{ V}$ $V_{\text{CE}} = 800 \text{ V}$ $T_{\text{j}} = 125^{\circ}\text{C}$			100 500	$\mu\text{A}$ $\mu\text{A}$
$V_{\text{EBO}}$	Emitter-Base Voltage ( $I_{\text{C}} = 0$ )	$I_{\text{E}} = 10 \text{ mA}$	9			V
$V_{\text{CEO(sus)}}$ <i>Note: 1</i>	Collector-Emitter Sustaining Voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 100 \text{ mA}$ $L = 25 \text{ mH}$	450			V
$V_{\text{CE(sat)}}$ <i>Note: 1</i>	Collector-Emitter Saturation Voltage	$I_{\text{C}} = 0.5 \text{ A}$ $I_{\text{B}} = 0.1 \text{ A}$ $I_{\text{C}} = 1 \text{ A}$ $I_{\text{B}} = 0.2 \text{ A}$ $I_{\text{C}} = 2.5 \text{ A}$ $I_{\text{B}} = 0.5 \text{ A}$ $I_{\text{C}} = 4 \text{ A}$ $I_{\text{B}} = 1 \text{ A}$		0.7	0.7 1 1.5 V	V V V V
$V_{\text{BE(sat)}}$ <i>Note: 1</i>	Base-Emitter Saturation Voltage	$I_{\text{C}} = 0.5 \text{ A}$ $I_{\text{B}} = 0.1 \text{ A}$ $I_{\text{C}} = 1 \text{ A}$ $I_{\text{B}} = 0.2 \text{ A}$ $I_{\text{C}} = 2 \text{ A}$ $I_{\text{B}} = 0.5 \text{ A}$			1.1 1.2 1.3	V V V
$h_{\text{FE}}$ <i>Note: 1</i>	DC Current Gain	$I_{\text{C}} = 10 \text{ mA}$ $V_{\text{CE}} = 5 \text{ V}$ $I_{\text{C}} = 4.5 \text{ A}$ $V_{\text{CE}} = 10 \text{ V}$	10 4			
$t_{\text{s}}$ $t_{\text{f}}$	INDUCTIVE LOAD Storage Time Fall Time	$I_{\text{C}} = 2 \text{ A}$ $V_{\text{clamp}} = 300 \text{ V}$ $I_{\text{B1}} = 0.4 \text{ A}$ $V_{\text{BE(off)}} = -5 \text{ V}$ $R_{\text{BB}} = 0 \Omega$ (see figure 2)		0.75 0.1	1.6 0.2	$\mu\text{s}$ $\mu\text{s}$
$V_{\text{f}}$	Diode Forward Voltage	$I_{\text{C}} = 2 \text{ A}$			1.5	V

*Note: 1 Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$ .*

### 3 Typical Characteristics and Test Circuits

Figure 1. Reverse Biased SOA

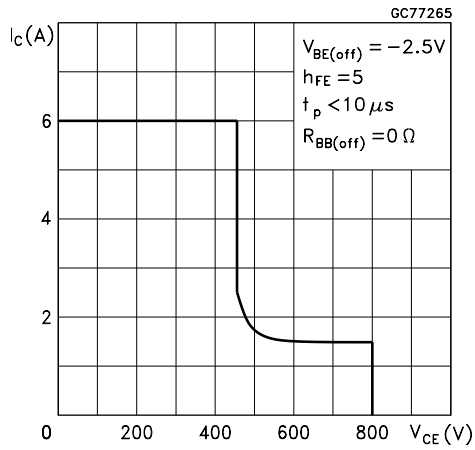
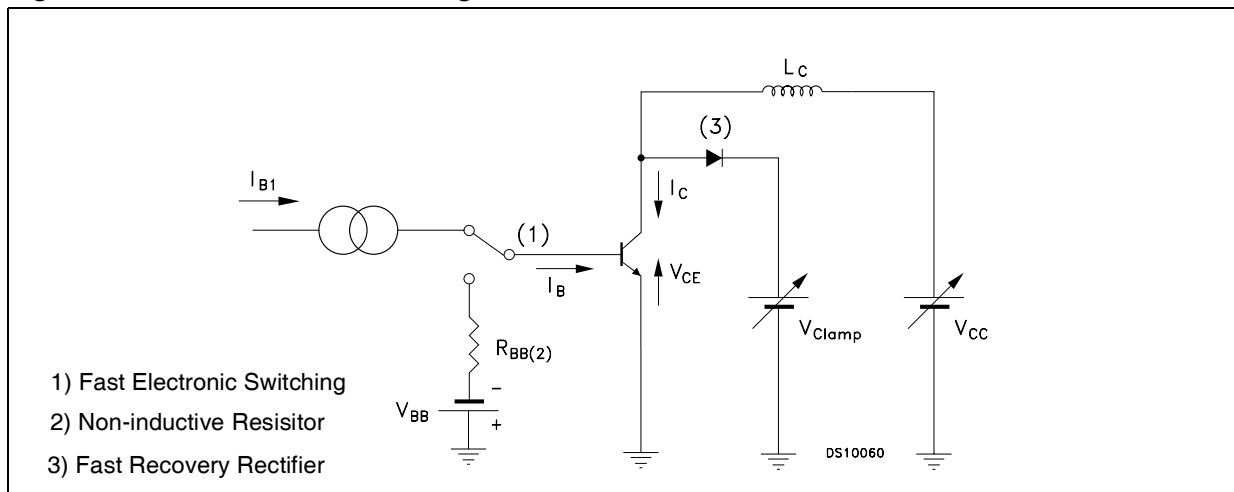
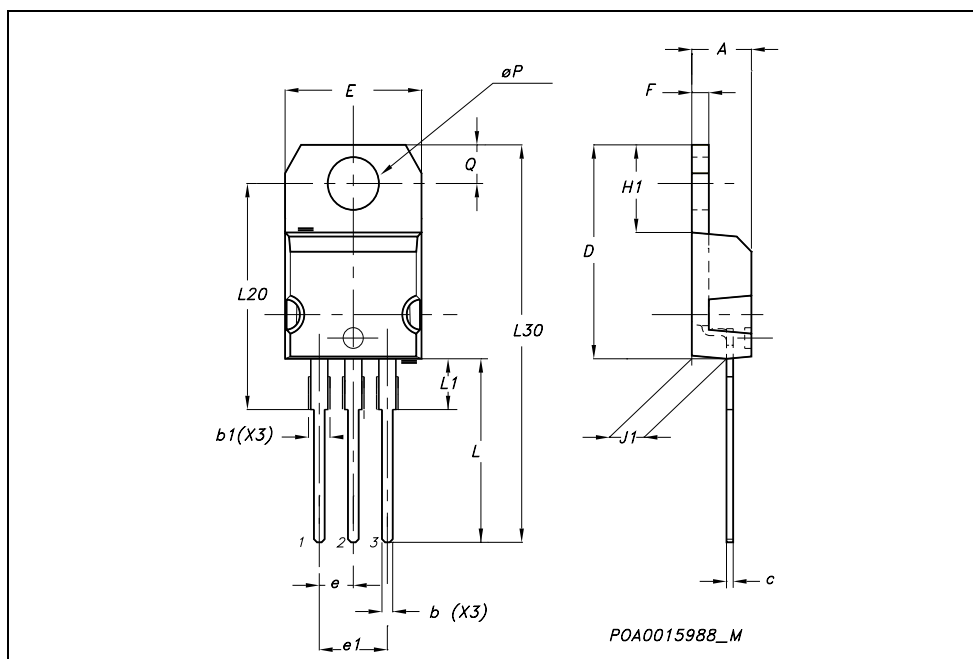


Figure 2. Inductive Load Switching Test Circuit



## 4 Package Mechanical Data

TO-220 MECHANICAL DATA						
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
b	0.61		0.88	0.024		0.034
b1	1.15		1.70	0.045		0.066
c	0.49		0.70	0.019		0.027
D	15.25		15.75	0.60		0.620
E	10		10.40	0.393		0.409
e	2.40		2.70	0.094		0.106
e1	4.95		5.15	0.194		0.202
F	1.23		1.32	0.048		0.052
H1	6.20		6.60	0.244		0.256
J1	2.40		2.72	0.094		0.107
L	13		14	0.511		0.551
L1	3.50		3.93	0.137		0.154
L20		16.40			0.645	
L30		28.90			1.137	
øP	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



## 5 Revision History

Date	Revision	Changes
06-Dec-2005	1	Initial release.

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