



## BUL1203E

# 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

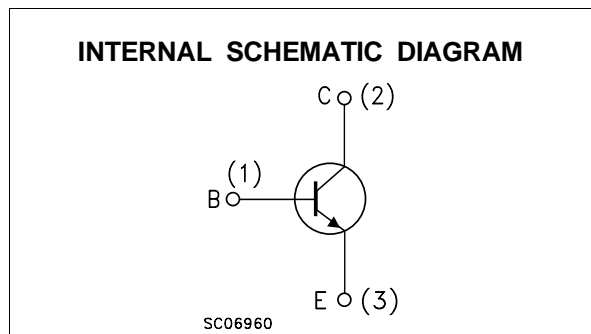
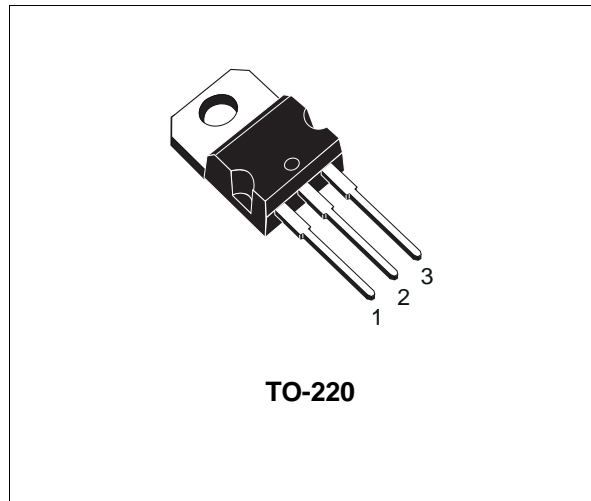
### APPLICATIONS

- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING (277 V HALF BRIDGE AND 120 V PUSH-PULL TOPOLOGIES)

### DESCRIPTION

The BUL1203E is a new device manufactured using Diffused Collector technology to enhance switching speeds and tight  $h_{FE}$  range while maintaining a wide RBSOA.

Thanks to his structure it has an intrinsic ruggedness which enables the transistor to withstand a 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 ( $V_{BE} = 0$ )	1200	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	550	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	9	V
$I_C$	Collector Current	5	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	100	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

# BUL1203E

## THERMAL DATA

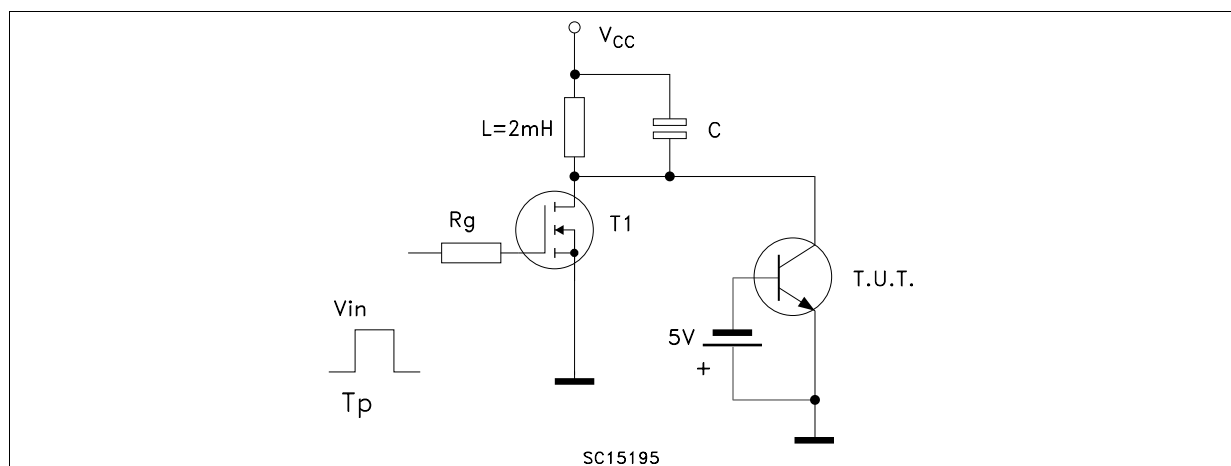
R <sub>thj-case</sub>	Thermal Resistance Junction-case	1.25	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

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> = 1200 V			100	μA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = 550 V			100	μA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 100 mA	550			V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 10 mA	9			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> = 3 A      I <sub>B</sub> = 1 A			0.5 0.7 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 I <sub>C</sub> = 3 A      I <sub>B</sub> = 1 A			1.5 1.5	V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 1 mA      V <sub>CE</sub> = 5 V I <sub>C</sub> = 10 mA     V <sub>CE</sub> = 5 V I <sub>C</sub> = 0.8 A      V <sub>CE</sub> = 3 V I <sub>C</sub> = 2 A        V <sub>CE</sub> = 5 V	10 10 14 9		32 28	
t <sub>on</sub> t <sub>s</sub> t <sub>f</sub>	RESISTIVE LOAD Turn-on Time Storage Time Fall Time	I <sub>C</sub> = 2 A      I <sub>B1</sub> = 0.4 A I <sub>B2</sub> = -0.8 A    t <sub>p</sub> = 30 μs V <sub>CC</sub> = 150 V		2.5 0.2	0.5 3.0 0.3	μs μs μs
E <sub>sb</sub>	Avalanche Energy	L = 2 mH	6			mJ

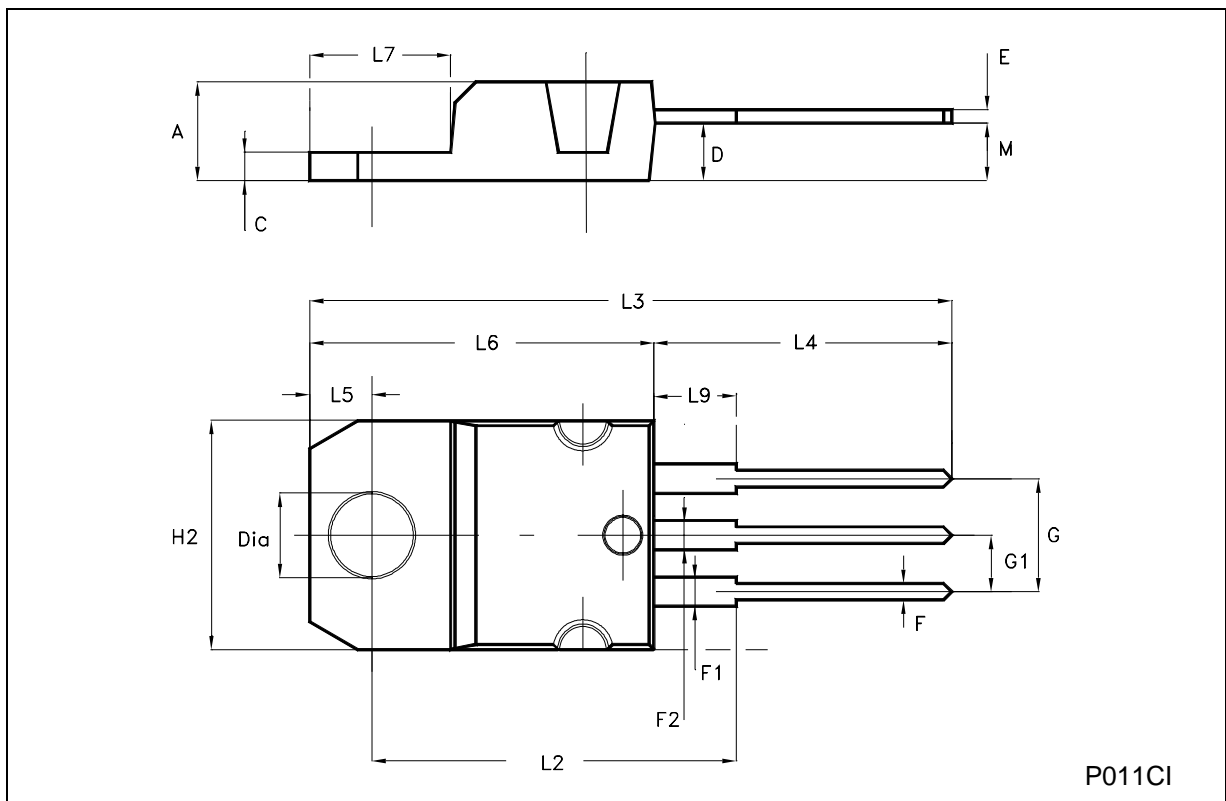
\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

## 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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