BUL59

High voltage fast-switching NPN power transistor

Features

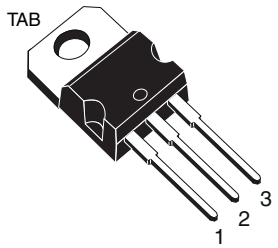
- High voltage capability
- Very high switching speed
- High ruggedness

Applications

- Electronic transformers for halogen lamps
- Switch mode power supplies

Description

The BUL59 is manufactured using planar technology with epitaxial collector adopting new and enhanced high voltage structure.



TO-220

Figure 1. Internal schematic diagram

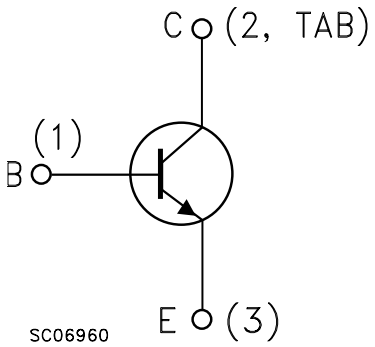


Table 1. Device summary

Order code	Marking	Package	Packaging
BUL59	BUL59	TO-220	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage (V_{BE} = 0)	850	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	400	V
V_{EBO}	Emitter-base voltage (I_C = 0)	9	V
I_C	Collector current	8	A
I_{CM}	Collector peak current (t_P < 5 ms)	16	A
I_B	Base current	4	A
I_{BM}	Base peak current (t_P < 5 ms)	8	A
P_{TOT}	Total dissipation at T_c = 25 °C	90	W
T_{STG}	Storage temperature	- 65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter		Value	Unit
R_{thJC}	Thermal resistance junction-case	max	1.39	°C/W
R_{thJA}	Thermal resistance junction-ambient	max	62.5	°C/W

2 Electrical characteristics

T_{case} = 25 °C unless otherwise specified.

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current (V_{BE} = 0)	V_{CE} = 850 V V_{CE} = 850 V T_C = 125 °C			200 500	µA µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 9 V			100	µA
$V_{CEO(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 10 mA	400			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 2 A I_B = 0.4 A I_C = 5 A I_B = 1 A			0.5 1.5	V V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = 2 A I_B = 0.4 A I_C = 5 A I_B = 1 A			1.2 1.6	V V
V_{CEW}	Maximum collector emitter voltage at turn off without snubber	I_C = 11 A $I_{B(on)}$= 1.83 A $V_{BE(off)}$ = - 5 V	450			V
h_{FE}	DC current gain	I_C = 2 A V_{CE} = 5 V I_C = 5 A V_{CE} = 5 V I_C = 8 A V_{CE} = 10 V	8 6 4		40 30	
t_s t_f	Inductive load Storage time Fall time	I_C = 2 A $I_{B(on)}$ = 0.4 A $V_{BE(off)}$ = - 5 V R_{BB} = 0 V_{CC} = 250 V L = 200 µH		1.1 0.4		µs µs

1. Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2 %.

3 Package mechanical data

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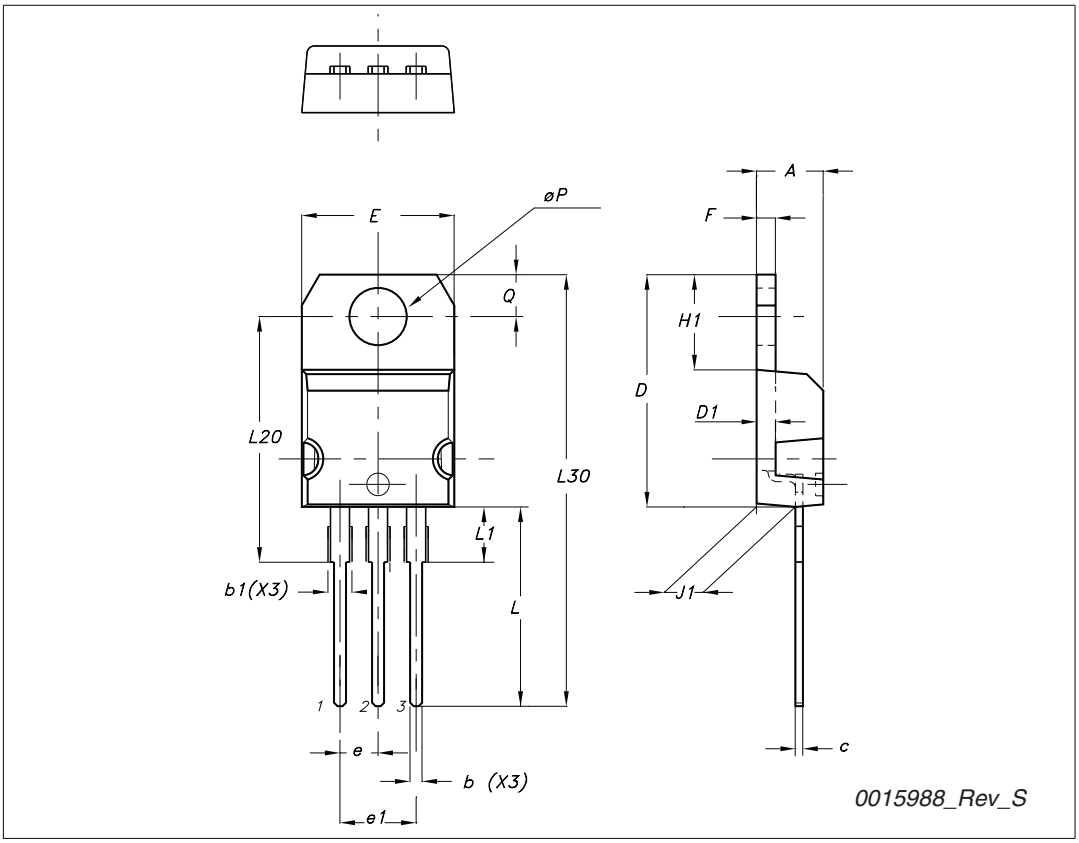
TO-220 type A mechanical data

Dim	mm		
	Min	Typ	Max
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
c	0.48		0.70
D	15.25		15.75
D1		1.27	
E	10		10.40
e	2.40		2.70
e1	4.95		5.15
F	1.23		1.32
H1	6.20		6.60
J1	2.40		2.72
L	13		14
L1	3.50		3.93
L20		16.40	
L30		28.90	
∅P	3.75		3.85
Q	2.65		2.95



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
21-Jun-2004	6	Document migration, no content change.
24-Feb-2010	7	Modified: *Description on page 1*, updated TO-220 package mechanical data.

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