

High voltage fast-switching NPN power transistor

Features

- High voltage capability
- Low spread of dynamic parameters
- Very high switching speed

Applications

- Electronic ballast for fluorescent lighting
- Switch mode power supplies

Description

The BUL416T is an high voltage fast-switching NPN power transistor manufactured in planar technology with diffused collector. This device is designed for lighting and SMPS applications where high voltage capability is needed coupled with high switching speed.

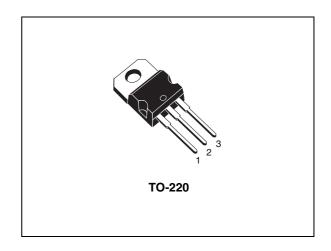


Figure 1. Internal schematic diagram

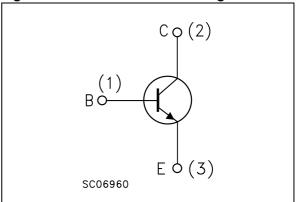


Table 1. Device summary

Order code	Marking	Package	Packaging
BUL416T	BUL416T	TO-220	Tube

Electrical ratings BUL416T

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CES}	Collector-emitter voltage (V _{BE} = 0)	1600	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	800	V
V _{EBO}	Emitter-base voltage ($I_C = 0$)	9	٧
I _C	Collector current	6	Α
I _{CM}	Collector peak current (t _P < 5 ms)	9	Α
I _B	Base current	5	Α
I _{BM}	Base peak current (t _P < 5 ms)	8	Α
P _{TOT}	Total dissipation at $T_c \le 25$ °C	110	W
T _{STG}	Storage temperature	- 65 to 150	°C
T _J	Max. operating junction temperature	150	°C

Table 3. Thermal data

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Symbol	Parameter	Value	Unit
R _{thJC}	Thermal resistance junction-case max	1.14	°C/W
R _{thJA}	Thermal resistance junction-ambient max	62.5	°C/W

2 Electrical characteristics

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

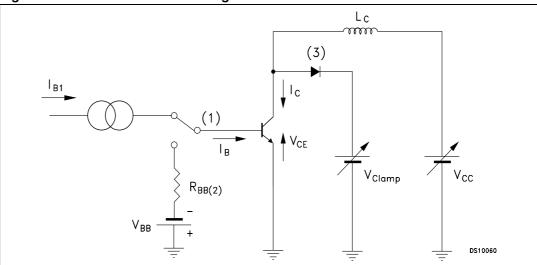
Table 4. Electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _{CES}	Collector cut-off current (V _{BE} = 0)	V _{CE} = 1600 V V _{CE} = 1600 V	T _c = 125 °C			100 500	μ Α μ Α
I _{CEO}	Collector cut-off current (I _B = 0)	V _{CE} = 800 V				250	μΑ
V _{CEO(sus)} (1)	Collector-emitter sustaining voltage (I _B = 0)	I _C =100 mA		800			V
V _{EBO}	Emitter-base voltage (I _C = 0)	I _E = 10 mA		9			V
V _{CE(sat)} (1)	Collector-emitter saturation voltage	$I_C = 2 A$ $I_C = 4 A$	$I_B = 0.4 A$ $I_B = 1.33 A$			1.2 1.5	V V
V _{BE(sat)} (1)	Base-emitter saturation voltage	$I_C = 2 A$ $I_C = 4 A$	$I_B = 0.4 A$ $I_B = 1.33 A$			1.2 1.5	V V
h _{FE} ⁽¹⁾	DC current gain	$I_C = 10 \text{ mA}$ $I_C = 0.7 \text{ A}$	~=	10 18		32	
t _s	Inductive load Storage time Fall time	$I_C = 3 A$ $V_{BE(off)} = -5 V I$ $V_{CL} = 200 V L$	R _{BB} = 0		1.8 800		μs ns

^{1.} Pulse test: pulse duration \leq 300 μ s, duty cycle \leq 2 %.

2.1 Test circuits

Figure 2. Inductive load switching test circuit



- 1. Fast electronic switch
- 2. Non-inductive resistor
- 3. Fast recovery rectifier

3 Package mechanical data

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Table 5. TO-220 type A mechanical data

Dim		mm.	
Dim.	Min.	Тур.	Max.
А	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
С	0.48		0.70
D	15.25		15.75
D1		1.27	
Е	10	10.40	
е	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	
ØP	3.75		3.85
Q	2.65		2.95

Figure 3. TO-220 type A drawing

Revision history BUL416T

4 Revision history

Table 6. Document revision history

Date	Revision	Changes	
06-Aug-2009	1	Initial release.	
25-Jan-2010	2	Document status promoted from preliminary data to datasheet.	

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