

BUL216

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- VERY HIGH SWITCHING SPEED
- HIGH OPERATING JUNCTION TEMPERATURE
- HIGH RUGGEDNESS

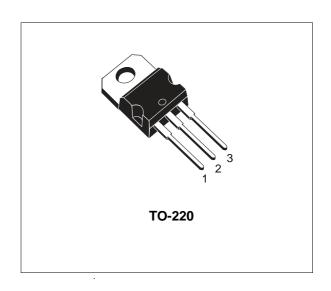
APPLICATIONS

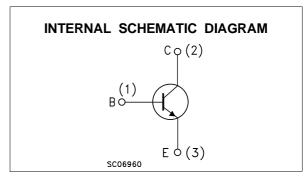
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

The BUL216 is manufactured using high voltage Multiepitaxial Mesa technology for cost-effective high performance. It uses a Hollow Emitter structure to enhance switching speeds.

The BUL series is designed for use in lighting applications and low cost switch-mode power supplies.





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 (Ic = 0)	9	V
Ic	Collector Current	4	Α
Ісм	Collector Peak Current (tp < 5 ms)	6	Α
I _B	Base Current	2	Α
I _{BM}	Base Peak Current (t _p < 5 ms)	4	Α
P _{tot}	Total Dissipation at T _c = 25 °C	90	W
T _{stg}	Storage Temperature	-65 to 150	°C
Tj	Max. Operating Junction Temperature	150	°C

June 2001 1/6

THERMAL DATA

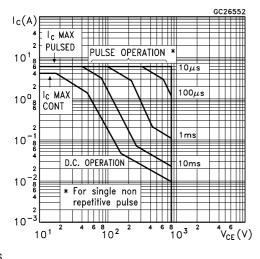
R _{thj-case}	Thermal Resistance Junction-Case	Max	1.39	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-Ambier	nt Max	62.5	°C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25$ $^{\circ}C$ unless otherwise specified)

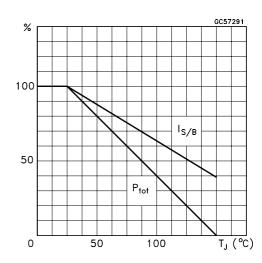
Symbol Parameter		Test Conditions	Min.	Тур.	Max.	Unit
Ices	Collector Cut-off Current (V _{BE} = 0)				100 500	μA μA
I _{CEO}	Collector Cut-off Current (I _B = 0)	V _{CE} = 800 V			250	μΑ
V _{CEO(sus)}	CEO(sus) Collector-Emitter I _C = 100 mA L = 25 mH Sustaining Voltage		800			V
V_{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 10 mA	9			V
V _{CE(sat)} *	Collector-Emitter Saturation Voltage	$I_C = 1 \text{ A}$ $I_B = 0.2 \text{ A}$ $I_C = 2 \text{ A}$ $I_B = 0.66 \text{ A}$			1 3	V V
V _{BE(sat)} *	Base-Emitter Saturation Voltage	I _C = 1 A I _B = 0.2 A I _C = 2 A I _B = 0.66 A			1.2 1.2	V V
h _{FE} *	DC Current Gain	$I_{C} = 0.4 \text{ A}$ $V_{CE} = 5 \text{ V}$ $I_{C} = 10 \text{ mA}$ $V_{CE} = 5 \text{ V}$	12 10		40	
t _s t _f	INDUCTIVE LOAD Storage Time Fall Time	$ \begin{aligned} I_{C} &= 1.5 \text{ A} & I_{B1} &= 0.5 \text{ A} \\ V_{BE(off)} &= -5 \text{ V} & R_{BB} &= 0 \Omega \\ V_{CL} &= 250 \text{ V} & L &= 200 \mu\text{H} \end{aligned} $		2.1 450	3.3 720	μs ns
t _s t _f	==()			3 600		μs ns

^{*} Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

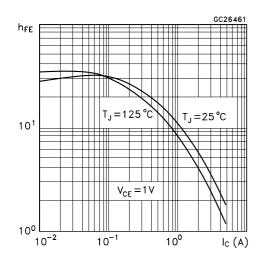
Safe Operating Areas



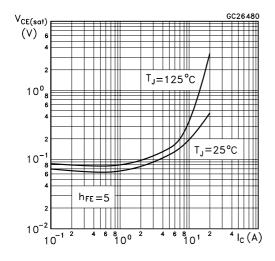
Derating Curve



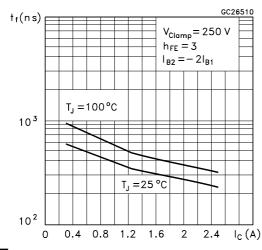
DC Current Gain



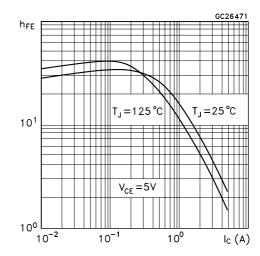
Collector Emitter Saturation Voltage



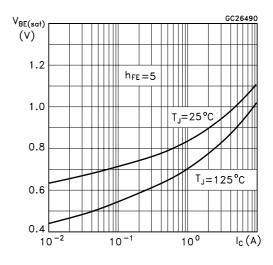
Inductive Fall Time



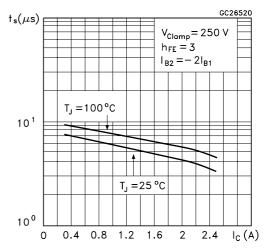
DC Current Gain



Base Emitter Saturation Voltage

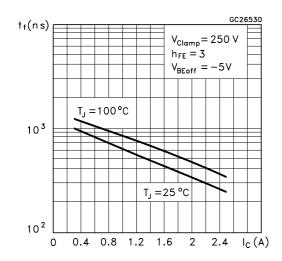


Inductive Storage Time

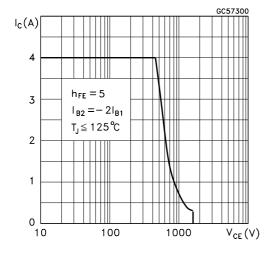


4

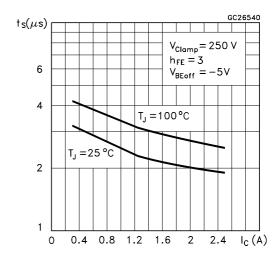
Inductive Fall Time



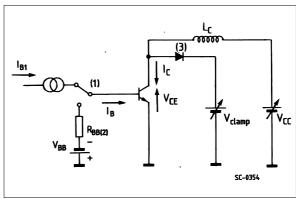
Reverse Biased SOA



Inductive Storage Time



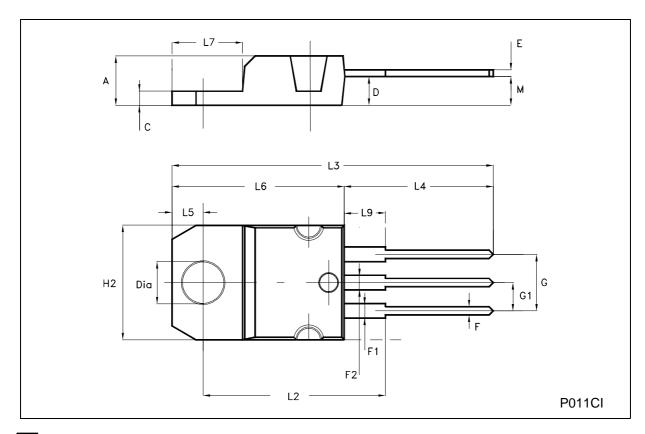
RBSOA and Inductive Load Switching Test Circuits



- (1) Fast electronic switch (2) Non-inductive Resistor
- (3) Fast recovery rectifier

TO-220 MECHANICAL DATA

DIM	mm		inch			
DIM.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
Α	4.40		4.60	0.173		0.181
С	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
М		2.60			0.102	
DIA.	3.75		3.85	0.147		0.151



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 2001 STMicroelectronics – Printed in Italy – All Rights Reserved STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

http://www.st.com