

BUL381 BUL382

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- STM PREFERRED SALESTYPES
- HIGH VOLTAGE CAPABILITY
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERISED AT 125°C

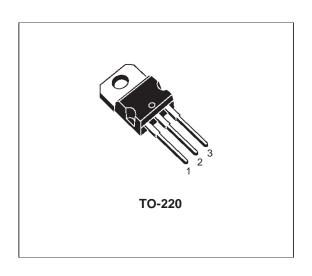
APPLICATIONS

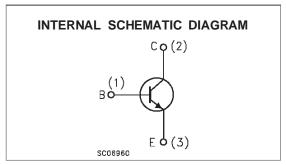
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

The BUL381 and BUL382 manufactured using high voltage Multiepitaxial Mesa technology for cost-effective high performance. They use 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)	800	V
V _{CEO}	Collector-Emitter Voltage (I _B = 0)	400	V
V _{EBO}	Emitter-Base Voltage (I _C = 0)	9	V
Ic	Collector Current	5	Α
Ісм	Collector Peak Current (tp < 5 ms)	8	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	70	W
T _{stg}	Storage Temperature	-65 to 150	°C
Tj	Max. Operating Junction Temperature	150	°C

June 1998

THERMAL DATA

R _{thj-case}	Thermal	Resistance	Junction-Case	Max	1.78	°C/W
$R_{thj-amb}$	Thermal	Resistance	Junction-Ambient	Max	62.5	°C/W

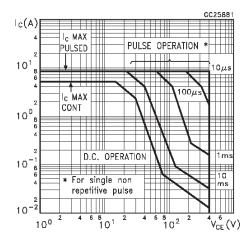
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol Parameter		Test Conditions	Min.	Тур.	Max.	Unit	
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	$V_{CE} = 800 \text{ V}$ $V_{CE} = 800 \text{ V}$ $T_j = 125 \text{ °C}$			100 500	μA μA	
I _{CEO}	Collector Cut-off Current (I _B = 0)	V _{CE} = 400 V			250	μΑ	
V _{CEO(sus)}	Collector-Emitter Sustaining Voltage	I _C = 100 mA L = 25 mH	400			V	
V_{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 10 mA	9			V	
VCE(sat)*	Collector-Emitter Saturation Voltage				0.5 0.7 1.1	V V V	
V _{BE(sat)*}	Base-Emitter Saturation Voltage	I _C = 1 A I _B = 0.2 A I _C = 2 A I _B = 0.4 A			1.1 1.2	V V	
h _{FE} *	DC Current Gain	$I_C = 2 A$ $V_{CE} = 5 V$ $I_C = 10 \text{ mA}$ $V_{CE} = 5 V$	8 10				
t _{ON} t _s t _f	RESISTIVE LOAD Turn-on Time Storage Time Fall Time	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.4		1 2.2 800	μs μs ns	
t _{ON} t _s t _f	RESISTIVE LOAD Turn-on Time Storage Time Fall Time	$V_{CC} = 250 \ V \ I_{C} = 2 \ A$ $I_{B1} = 0.4 \ A \ I_{B2} = -0.4 \ A$ (for BUL382 only) $t_p = 30 \ \mu s$	1.7		1 2.5 800	μs μs ns	
t _s	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 2 \text{ A} V_{CL} = 250 \text{ V}$ $I_{B1} = 0.4 \text{ A} I_{B2} = -0.8 \text{ A}$ $L = 200 \mu H$		1.7 75	2.6 120	μs ns	
t _s	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 2 \text{ A} V_{CL} = 250 \text{ V}$ $I_{B1} = 0.4 \text{ A} I_{B2} = -0.8 \text{ A}$ $L = 200 \mu\text{H} T_j = 125 ^{\circ}\text{C}$		2.6 150		μs ns	

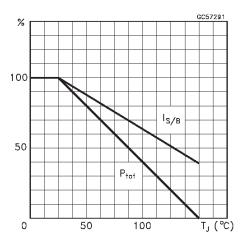
^{*} Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

577

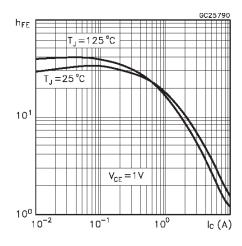
Safe Operating Areas



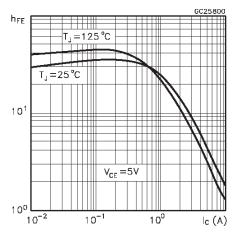
Derating Curves



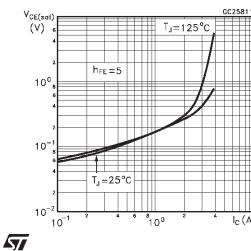
DC Current Gain



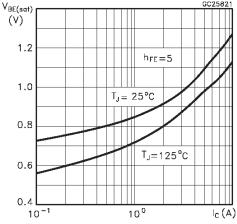
DC Current Gain



Collector Emitter Saturation Voltage

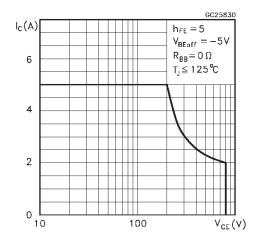


Base Emitter Saturation Voltage

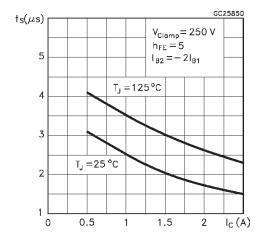


3/7

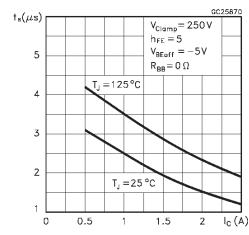
Reverse Biased SOA



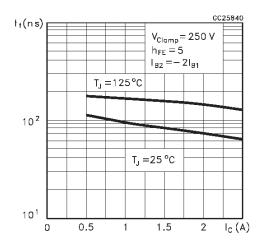
Inductive Storage Time



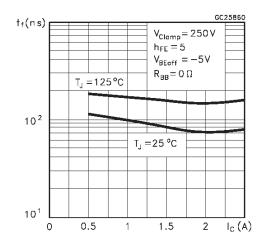
Inductive Storage Time



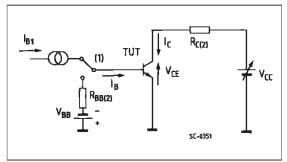
Inductive Fall Time



Inductive Fall Time



Resistive Load Switching Test Ciurcuit

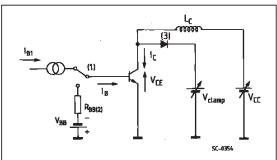


- 1) Fast electronic switch
- 2) Non-inductive Resistor

57

4/7

Reverse BSOA and Inductive Load Switching Test Ciurcuit

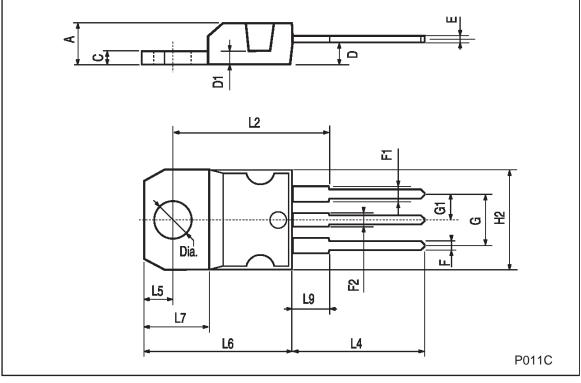


- 1) Fast electronic switch
- 2) Non-inductive Resistor3) Fast recovery Rectifier



TO-220 MECHANICAL DATA

DIM.	mm			inch			
DIN.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
А	4.40		4.60	0.173		0.181	
С	1.23		1.32	0.048		0.051	
D	2.40		2.72	0.094		0.107	
D1		1.27			0.050		
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		0.203	
G1	2.4		2.7	0.094		0.106	
H2	10.0		10.40	0.393		0.409	
L2		16.4			0.645		
L4	13.0		14.0	0.511		0.551	
L5	2.65		2.95	0.104		0.116	
L6	15.25		15.75	0.600		0.620	
L7	6.2		6.6	0.244		0.260	
L9	3.5		3.93	0.137		0.154	
DIA.	3.75		3.85	0.147		0.151	



6/7

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