

BULB128-1

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

Ordering Code	Marking	Shipment		
BULB128-1	BULB128	Tube		

- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- THROUGH HOLE I²PAK (TO-262) POWER PACKAGE IN TUBE (SUFFIX "-1")

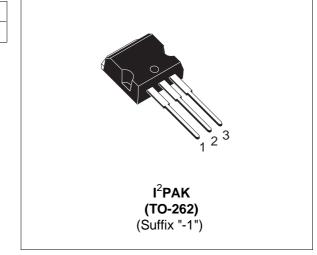
APPLICATIONS:

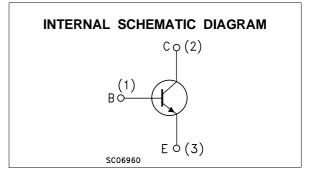
 ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

DESCRIPTION

The device is manufactured using high voltage Multi-Epitaxial Planar technology for high switching speeds and medium voltage capability. It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

The device 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)	700	V	
VCEO	Collector-Emitter Voltage $(I_B = 0)$	400	V	
V _{EBO}	Emitter-Base Voltage $(I_C = 0)$	9	V A A	
lc	Collector Current	4		
I _{CM}	Collector Peak Current (t _p < 5 ms)	8		
I _B Base Current		2	А	
I _{BM} Base Peak Current (t _p < 5 ms)		4	Α	
P _{tot}	Total Dissipation at $T_c = 25 \ ^{\circ}C$	70	W	
T _{stg}	Storage Temperature	-65 to 150	°C	
Tj	Max. Operating Junction Temperature	150	°C	

THERMAL DATA

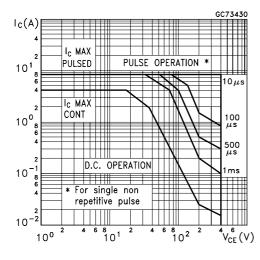
R _{thj-case}	Thermal Resistance Junction-Case	Max	1.78	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

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

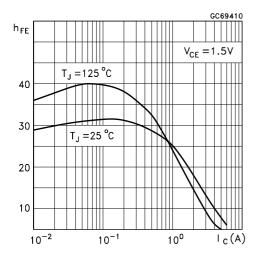
Symbol	Parameter	Test Co	Min.	Тур.	Max.	Unit	
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = 700 V V _{CE} = 700 V	T _C = 125 °C			100 500	μΑ μΑ
Vebo	Emitter-Base Voltage (I _C = 0)	I _E = 10 mA		9			V
$V_{CEO(sus)^*}$	Collector-Emitter Sustaining Voltage (I _B = 0)	I _C = 100 mA	L = 25 mH	400			V
ICEO	Collector Cut-Off Current (I _B = 0)	V _{CE} = 400 V				250	μA
V _{CE(sat)} *	Collector-Emitter Saturation Voltage	$I_{C} = 0.5 A$ $I_{C} = 1 A$ $I_{C} = 2.5 A$ $I_{C} = 4 A$	$I_B = 0.1 A$ $I_B = 0.2 A$ $I_B = 0.5 A$ $I_B = 1 A$		0.5	0.7 1 1.5	V V V V
V _{BE(sat)} *	Base-Emitter Saturation Voltage	$I_{C} = 0.5 A$ $I_{C} = 1 A$ $I_{C} = 2.5 A$	I _B = 0.1 A I _B = 0.2 A I _B = 0.5 A			1.1 1.2 1.3	V V V
h _{FE} *	DC Current Gain	$I_C = 10 \text{ mA}$ $I_C = 2 \text{ A}$	V _{CE} = 5 V V _{CE} = 5 V	10 14		28	
t _s t _f	RESISTIVE LOAD Storage Time Fall Time	$V_{CC} = 125 V$ $I_{B1} = 0.4 A$ $T_p = 30 \ \mu s$	$I_{C} = 2 A$ $I_{B2} = -0.4 A$ (see fig.2)	1.5	0.2	3 0.4	μs μs
t _s t _f	INDUCTIVE LOAD Storage Time Fall Time	$I_{C} = 2 A$ $V_{BE(off)} = -5 V$ $V_{clamp} = 200 V$	I _{B1} = 0.4 A R _{BB} = 0 Ω (see fig.1)		0.6 0.1	1 0.2	μs μs

* Pulsed: Pulse duration = 300 μ s, duty cycle 1.5 %

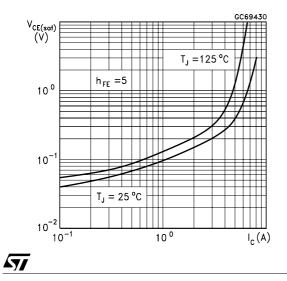
Safe Operating Areas



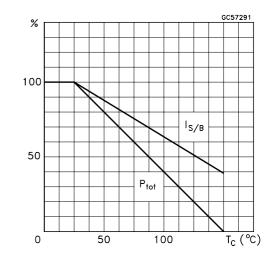
DC Current Gain



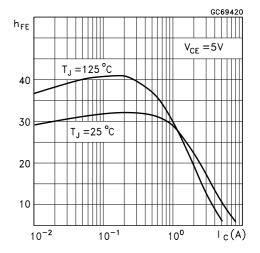
Collector Emitter Saturation Voltage



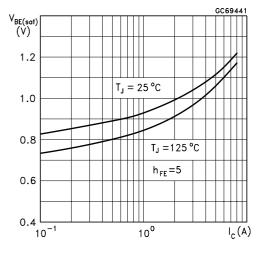
Derating Curve



DC Current Gain

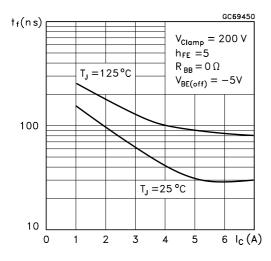




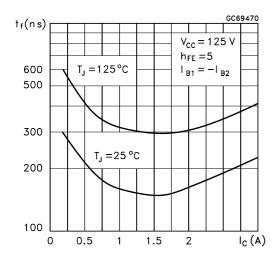


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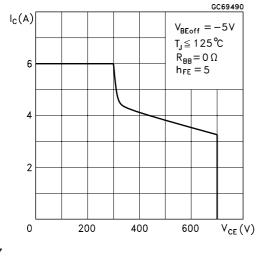
Inductive Fall Time



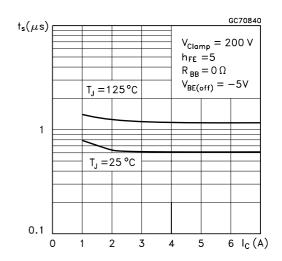
Resistive Fall Time

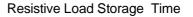


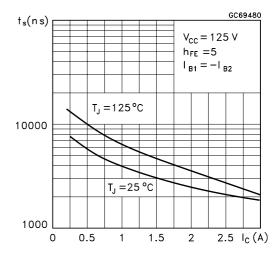
Reverse Biased SOA



Inductive Storage Time

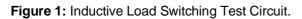






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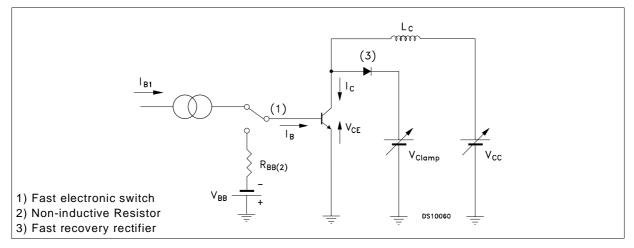
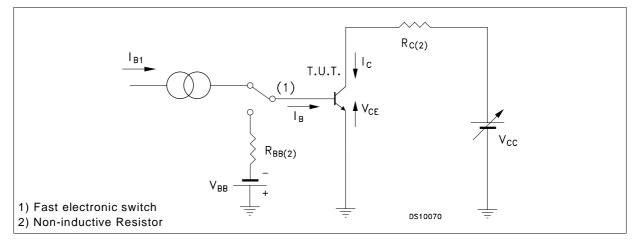
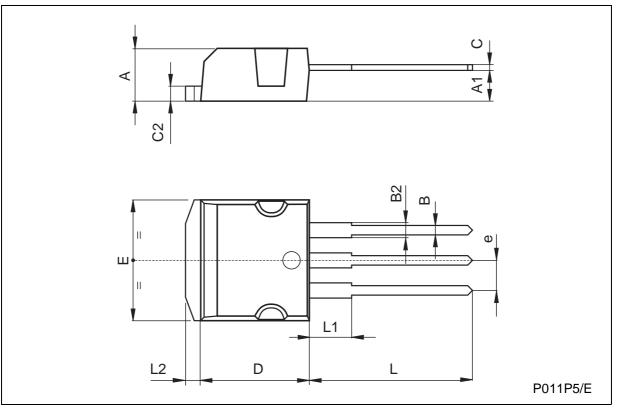


Figure 2: Resistive Load Switching Test Circuit.



		mm			inch		
MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
4.4		4.6	0.173		0.181		
2.49		2.69	0.098		0.106		
0.7		0.93	0.027		0.036		
1.14		1.7	0.044		0.067		
0.45		0.6	0.017		0.023		
1.23		1.36	0.048		0.053		
8.95		9.35	0.352		0.368		
2.4		2.7	0.094		0.106		
10		10.4	0.393		0.409		
13.1		13.6	0.515		0.531		
3.48		3.78	0.137		0.149		
	4.4 2.49 0.7 1.14 0.45 1.23 8.95 2.4 10 13.1	4.4 2.49 0.7 1.14 0.45 1.23 8.95 2.4 10 13.1 3.48	4.4 4.6 2.49 2.69 0.7 0.93 1.14 1.7 0.45 0.6 1.23 1.36 8.95 9.35 2.4 2.7 10 10.4 13.1 13.6 3.48 3.78	4.44.60.1732.492.690.0980.70.930.0271.141.70.0440.450.60.0171.231.360.0488.959.350.3522.42.70.0941010.40.39313.113.60.5153.483.780.137	4.4 4.6 0.173 2.49 2.69 0.098 0.7 0.93 0.027 1.14 1.7 0.044 0.45 0.6 0.017 1.23 1.36 0.048 8.95 9.35 0.352 2.4 2.7 0.094 10 10.4 0.393 13.1 13.6 0.515		

TO-262 (I²PAK) MECHANICAL DATA



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