

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- NPN TRANSISTOR
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED

APPLICATIONS:

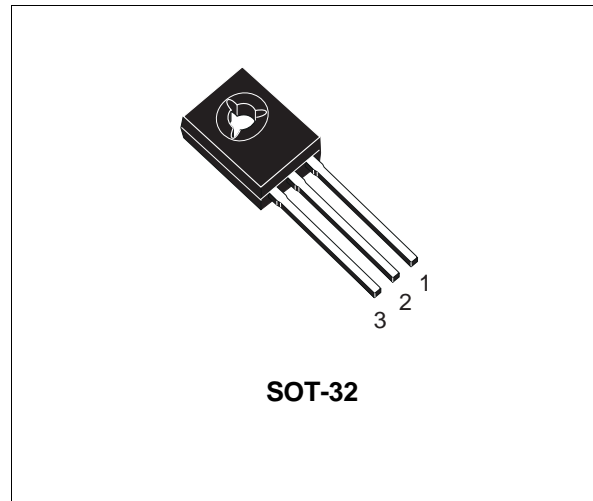
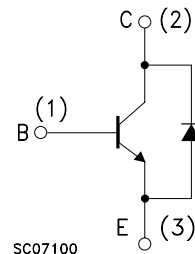
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS

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.


INTERNAL SCHEMATIC DIAGRAM

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage ($V_{BE} = 0$)	700	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	2	A
I_{CM}	Collector Peak Current ($t_p < 5$ ms)	4	A
I_B	Base Current	1	A
I_{BM}	Base Peak Current ($t_p < 5$ ms)	2	A
P_{tot}	Total Dissipation at $T_c = 25$ °C	45	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

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THERMAL DATA

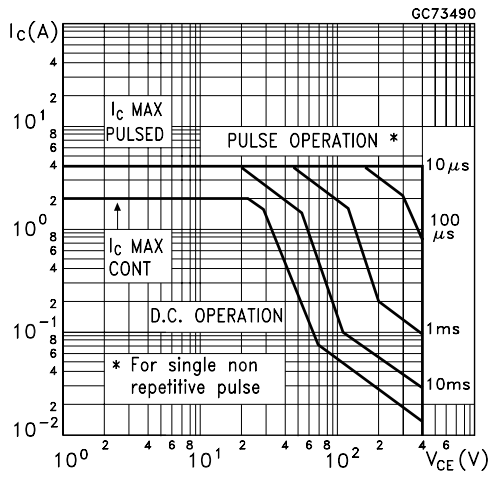
R _{thj-case}	Thermal Resistance Junction-Case	Max	2.77	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	80	°C/W

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

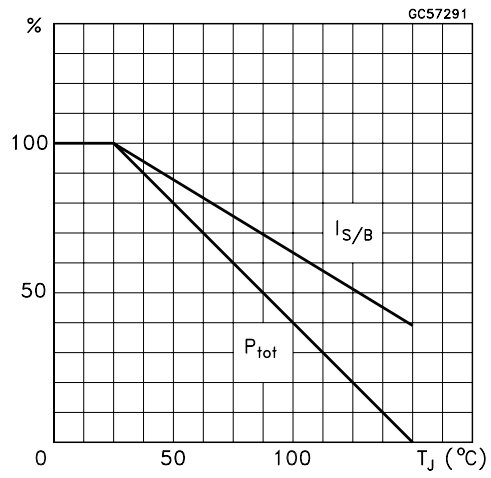
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = 700 V V _{CE} = 700 V T _j = 125 °C			100 500	μA μA
V _{EBO}	Emitter-Base Voltage	I _E = 10 mA	9			V
V _{CEO(sus)}	Collector-Emitter Sustaining Voltage	I _C = 100 mA L = 25 mH	400			V
I _{CEO}	Collector-Emitter Leakage Current	V _{CE} = 400 V			250	μA
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 0.5 A I _B = 0.1 A I _C = 1 A I _B = 0.2 A I _C = 2 A I _B = 0.4 A			0.5 1 1.5	V V V
V _{BE(sat)*}	Base-Emitter Saturation Voltage	I _C = 0.5 A I _B = 0.1 A I _C = 1 A I _B = 0.2 A I _C = 2 A I _B = 0.4 A			1.0 1.2 1.3	V V V
h _{FE*}	DC Current Gain	I _C = 10 mA V _{CE} = 5 V I _C = 0.5 A V _{CE} = 5 V I _C = 2 A V _{CE} = 5 V	10 10 8		50	
t _r t _s t _f	RESISTIVE LOAD Rise Time Storage Time Fall Time	V _{CC} = 125 V I _C = 1 A I _{B1} = 0.2 A I _{B2} = -0.2 A		0.4 3.2 0.25	0.7 4.5 0.4	μs μs μs
t _s t _f	INDUCTIVE LOAD Storage Time Fall Time	I _C = 1 A I _{B1} = 0.2 A V _{BE} = -5 V L = 50 mH V _{clamp} = 300 V		0.8 0.16		μs μs

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

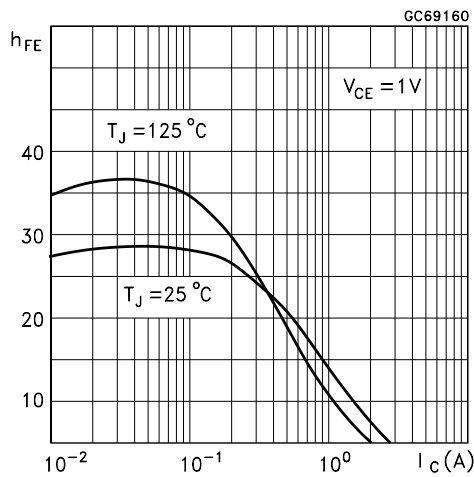
Safe Operating Areas



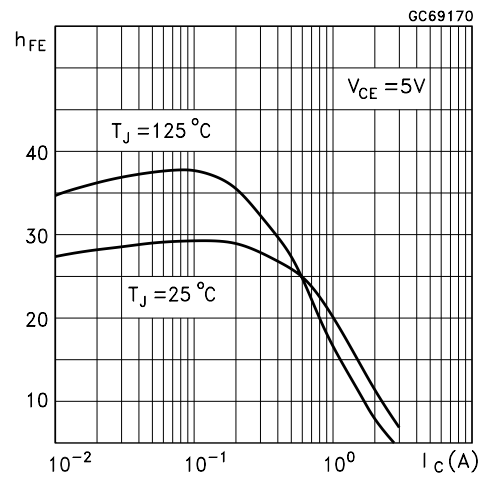
Derating Curve



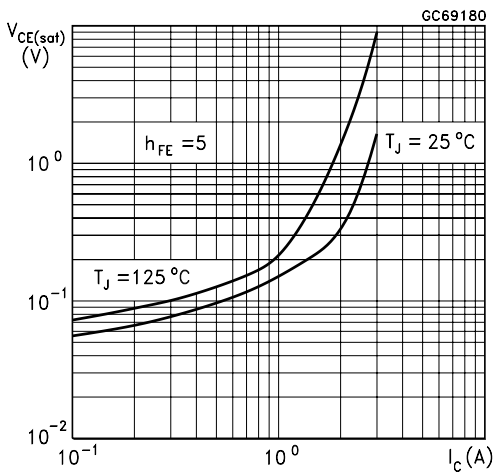
DC Current Gain



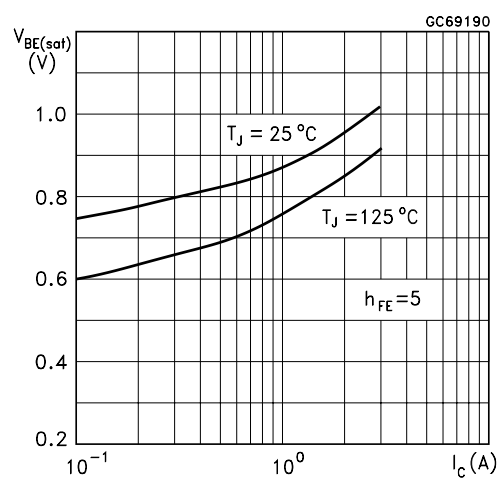
DC Current Gain



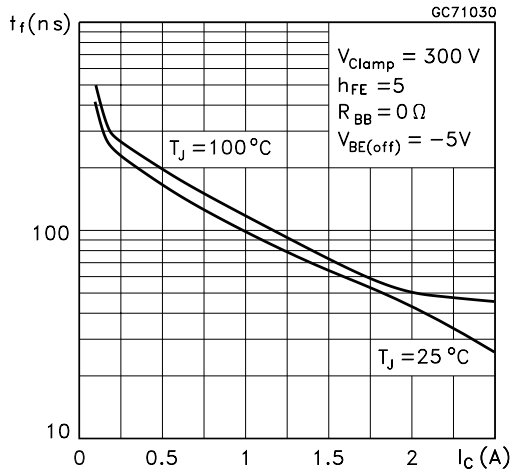
Collector Emitter Saturation Voltage



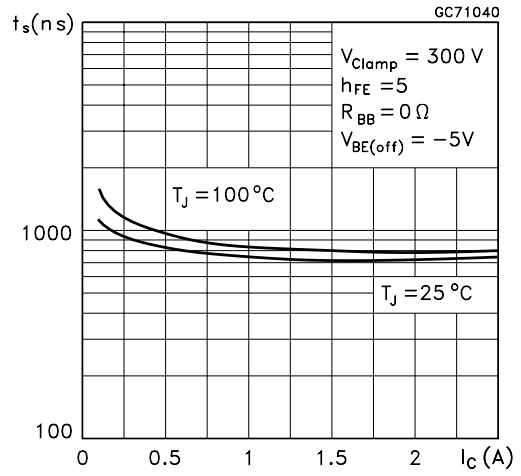
Base Emitter Saturation Voltage



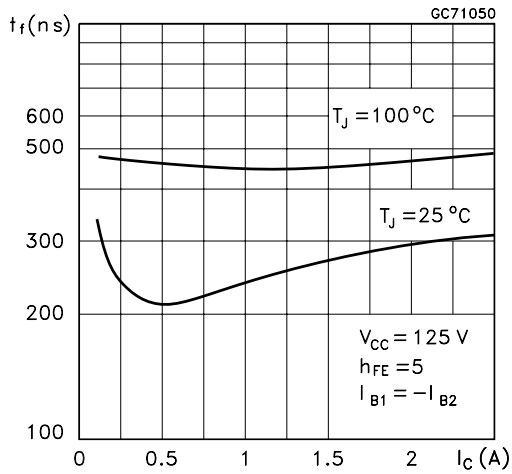
Inductive Fall Time



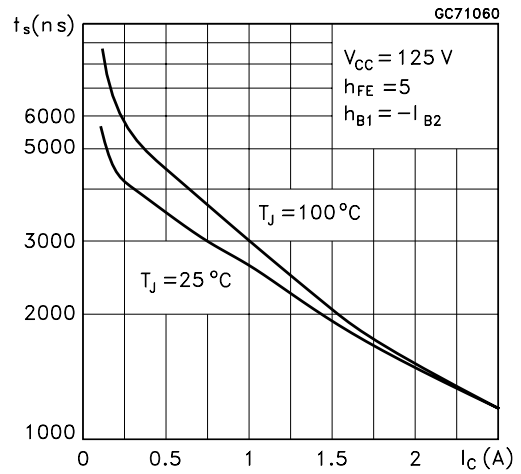
Inductive Storage Time



Resistive Fall Time



Resistive Load Storage Time



Reverse Biased SOA

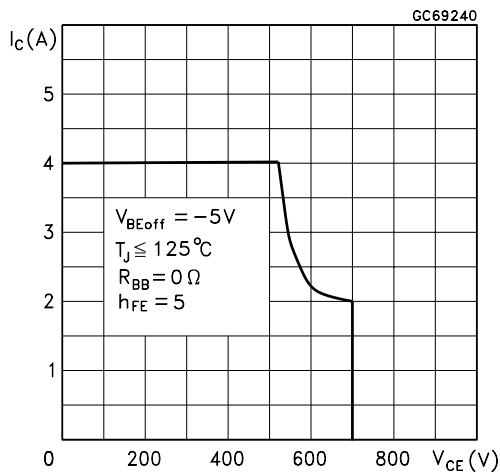


Figure 1: Inductive Load Switching Test Circuits.

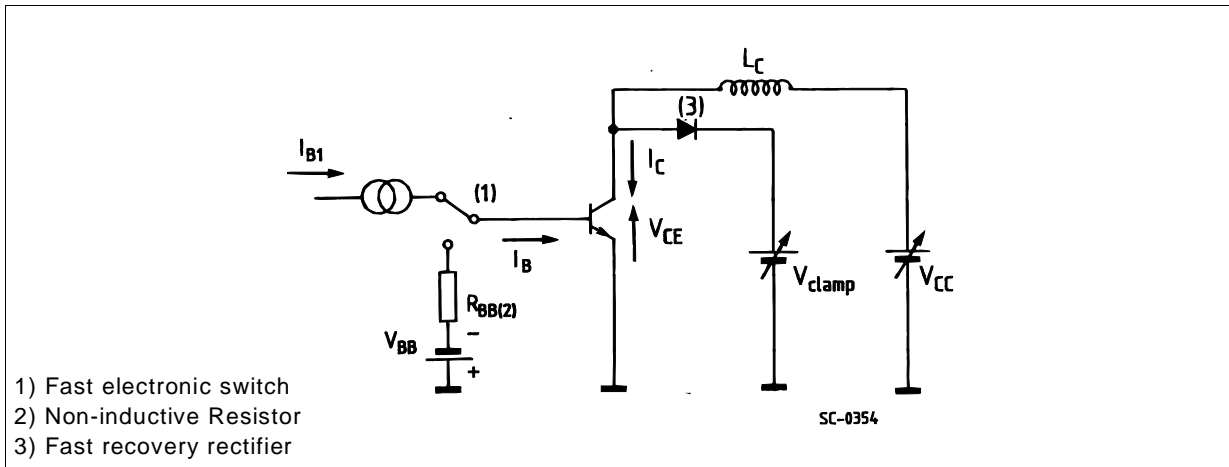
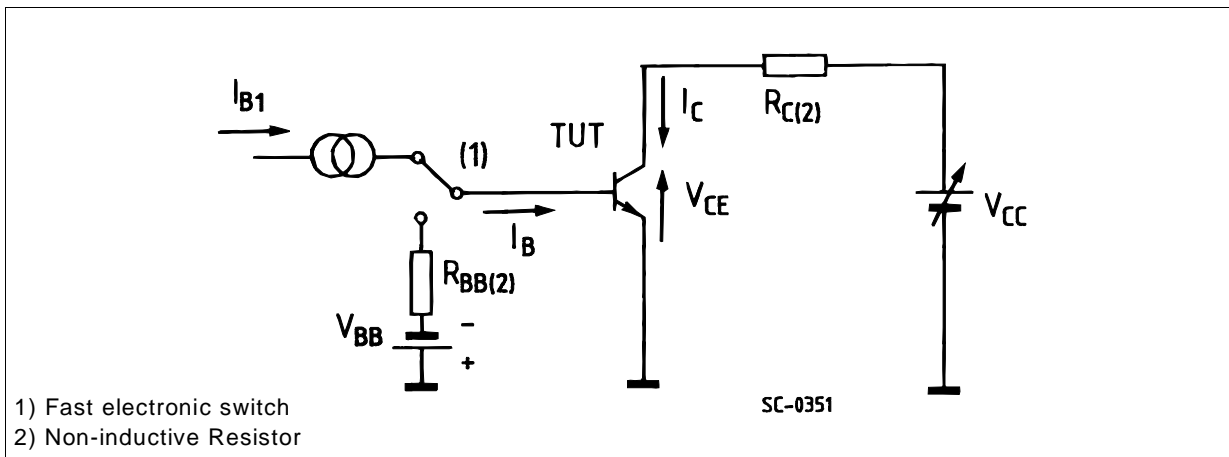
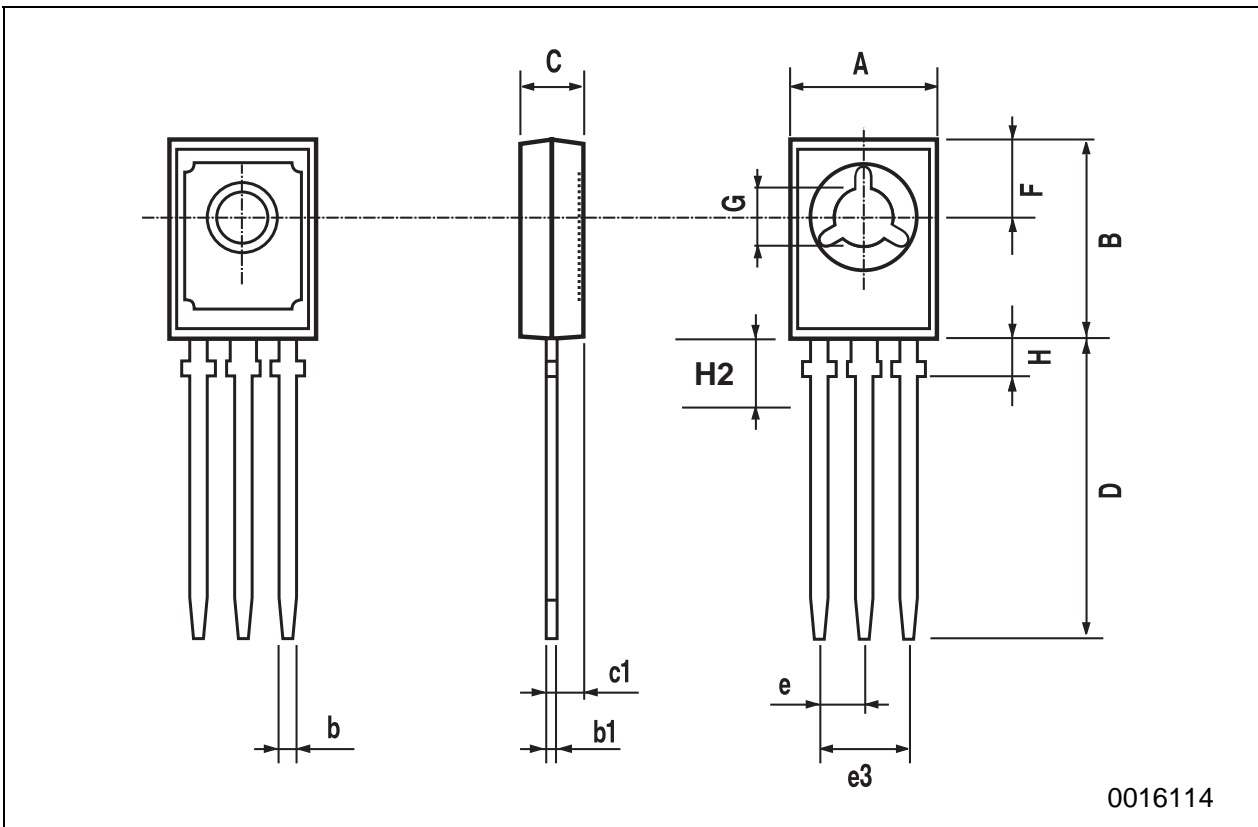


Figure 2: Resistive Load Switching Test Circuits.



SOT-32 (TO-126) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.445
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.040		0.106
c1	1.0		1.3	0.039		0.050
D	15.4		16.0	0.606		0.629
e		2.2			0.087	
e3	4.15		4.65	0.163		0.183
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100
H2		2.15			0.084	



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