



BUL903EDFP

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- INTEGRATED ANTISATURATION AND PROTECTION NETWORK
- 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
- ARCING TEST SELF PROTECTED
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING

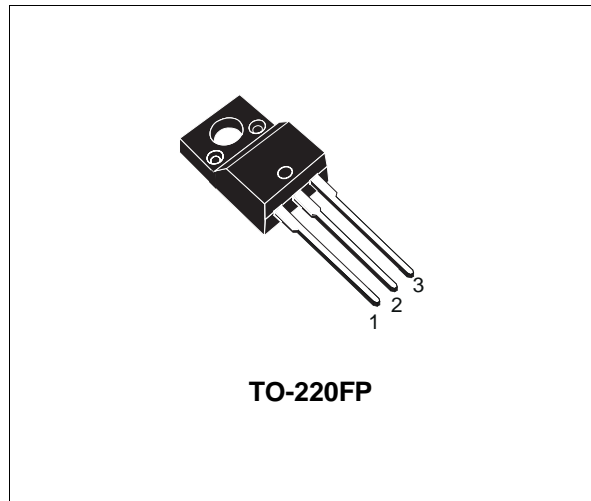
APPLICATIONS

- FOUR LAMP ELECTRONIC BALLAST FOR 120 V MAINS IN PUSH-PULL CONFIGURATION

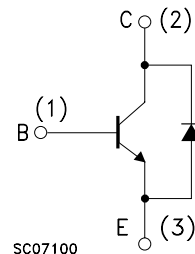
DESCRIPTION

The BUL903EDFP is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability.

The device has been designed to operate without baker clamp and transil protection. This enables saving from 2 up to 10 components in the application.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage ($V_{BE} = 0$)	900	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	400	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	5	A
I_{CM}	Collector Peak Current ($t_p < 5$ ms)	8	A
I_B	Base Current	2	A
I_{BM}	Base Peak Current ($t_p < 5$ ms)	4	A
P_{tot}	Total Dissipation at $T_c = 25$ °C	35	W
V_{isol}	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	1500	V
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

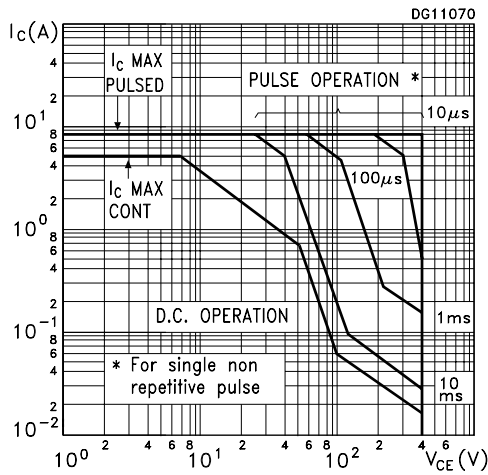
R _{thj-case}	Thermal Resistance Junction-Case	Max	3.57	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

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

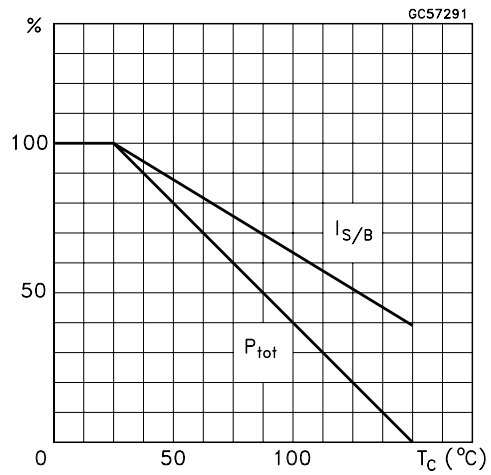
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = 900 V			100	μA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{EB} = 7 V			100	μA
V _{(BR)CES}	Collector-Emitter Breakdown Voltage (V _{BE} = 0)	I _C = 100 μA	900			V
V _{CEO(sus)*}	Collector-Emitter Sustaining Voltage (I _B = 0)	I _C = 10 mA L = 25 mH	400			V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 0.5 A I _B = 50 mA I _C = 1 A I _B = 0.15 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 = 50 mA I _C = 1 A I _B = 0.15 A I _C = 2 A I _B = 0.4 A			1 1.1 1.2	V V V
h _{FE*}	DC Current Gain	I _C = 10 mA V _{CE} = 5 V I _C = 0.25 A V _{CE} = 5 V I _C = 0.5 A V _{CE} = 5 V I _C = 2.5 A V _{CE} = 5 V	20 40 28 8		70 60 16	
t _d t _r t _s t _f	RESISTIVE LOAD Delay Time Rise Time Storage Time Fall Time	V _{CC} = 125 V I _C = 0.7 A I _{B1} = 50 mA I _{B2} = 0.4 A t _p = 300 μs (see figure 1)			0.2 1 0.8 0.25	μs μs μs μs
E _{ar}	Repetitive Avalanche Energy	V _{CC} = 50V C = 1.8 nF V _{BE} = -5 V L = 2 mH (see figure 2)	6			mJ
V _F	Parallel Diode Forward Voltage	I _F = 2 A			1.2	V

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

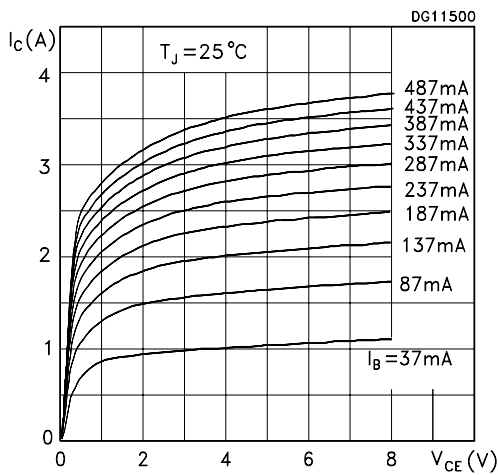
Safe Operating Area



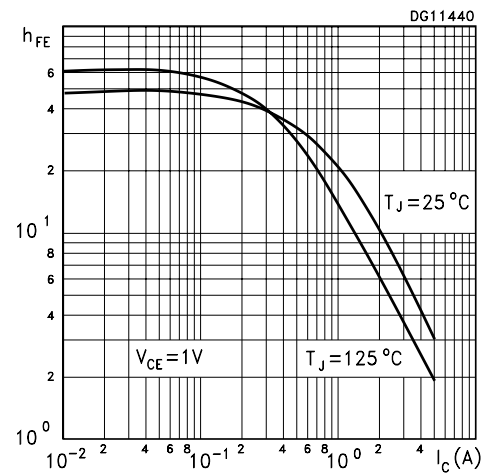
Derating Curve



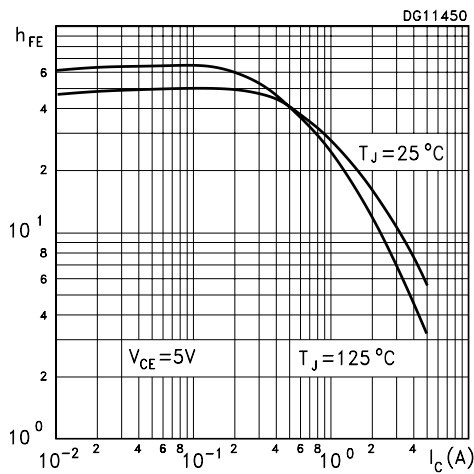
Output Characteristics



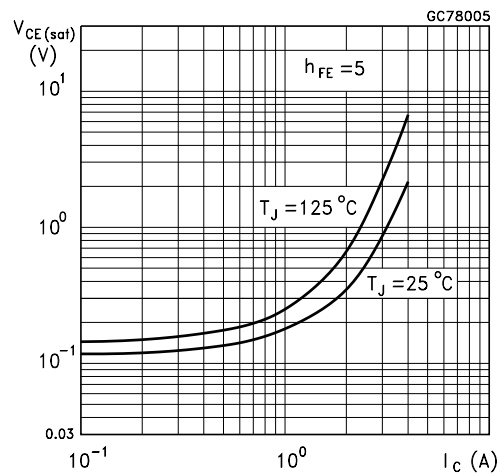
DC Current Gain



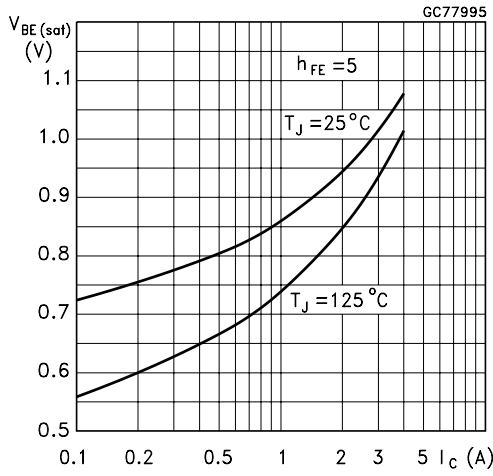
DC Current Gain



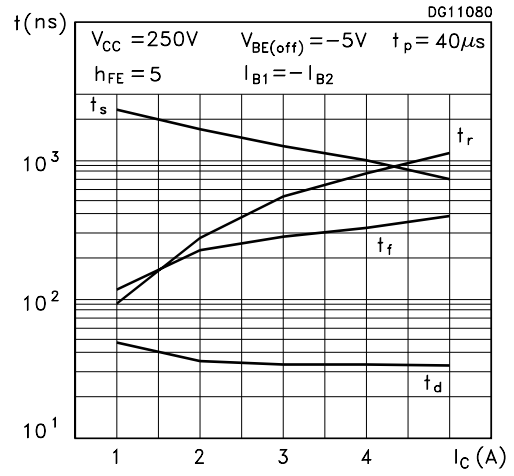
Collector Emitter Saturation Voltage



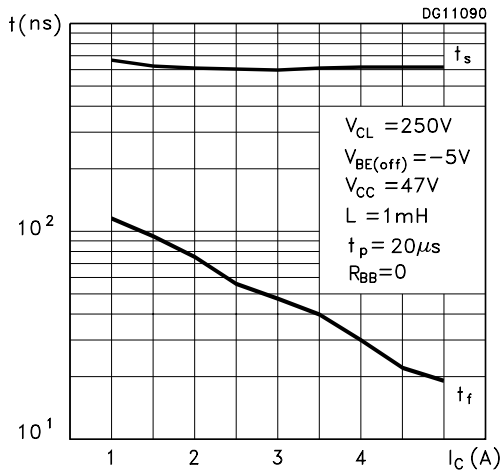
Base Emitter Saturation Voltage



Switching Times Resistive Load



Switching Times Inductive Load



Reverse Biased SOA

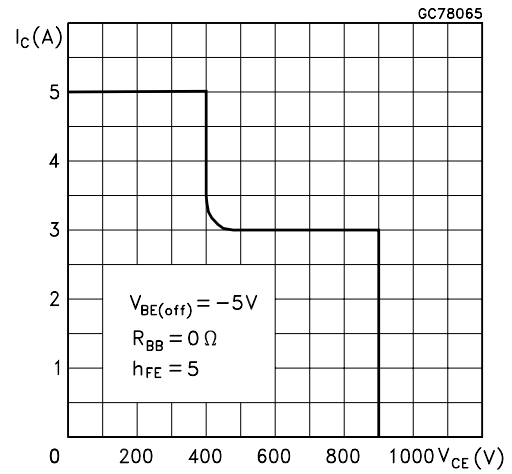


Figure 1: Resistive Load Switching Test Circuit

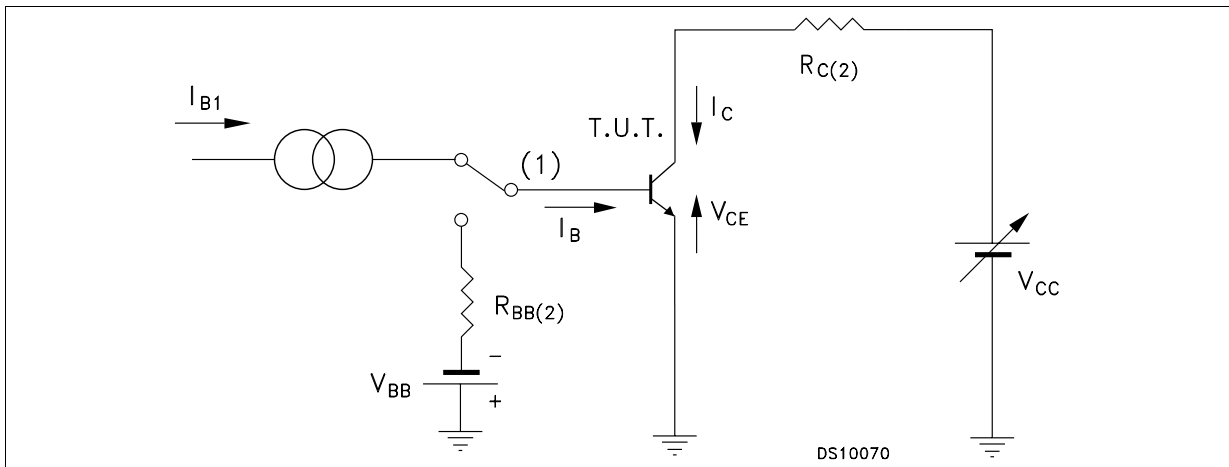


Figure 2 : Energy Rating Test Circuit

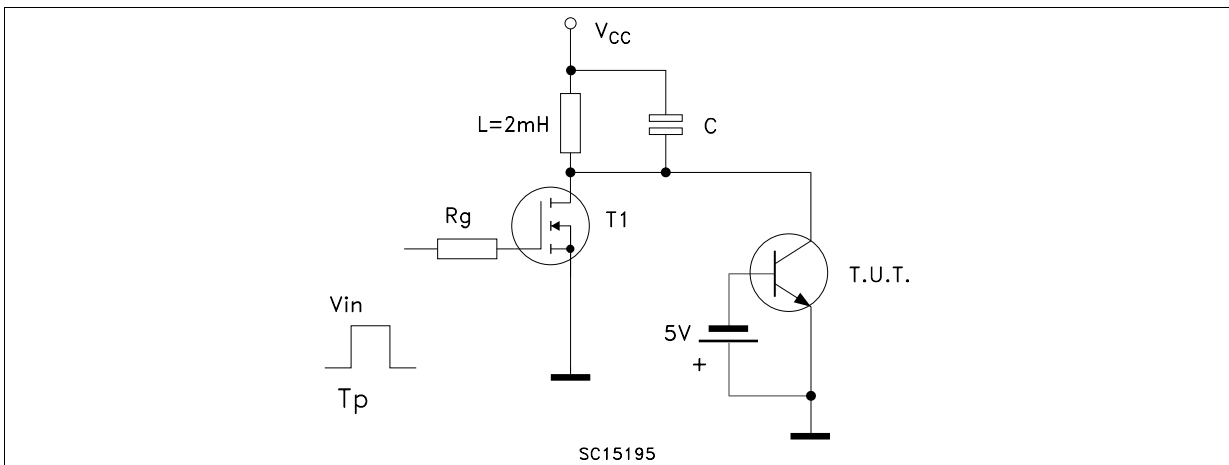
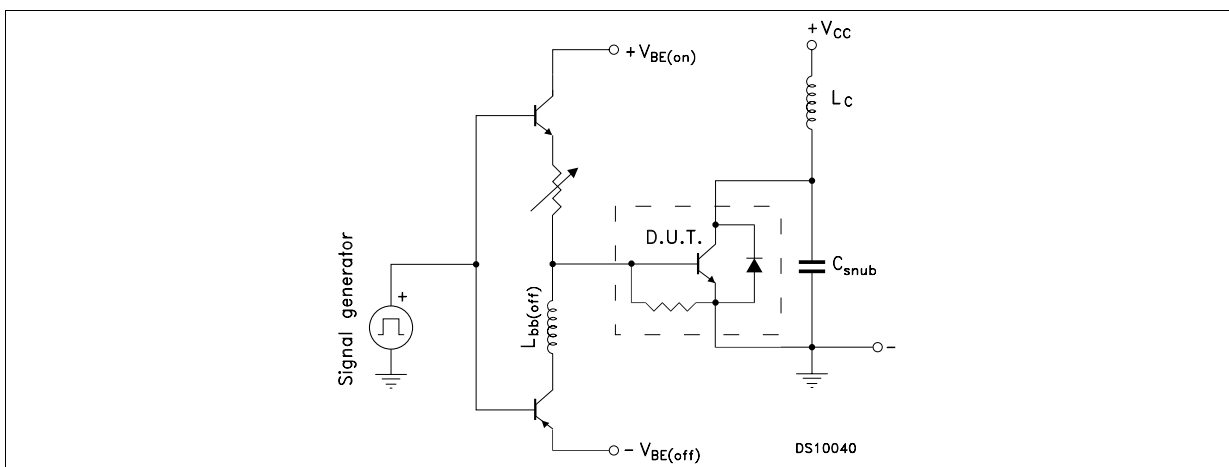
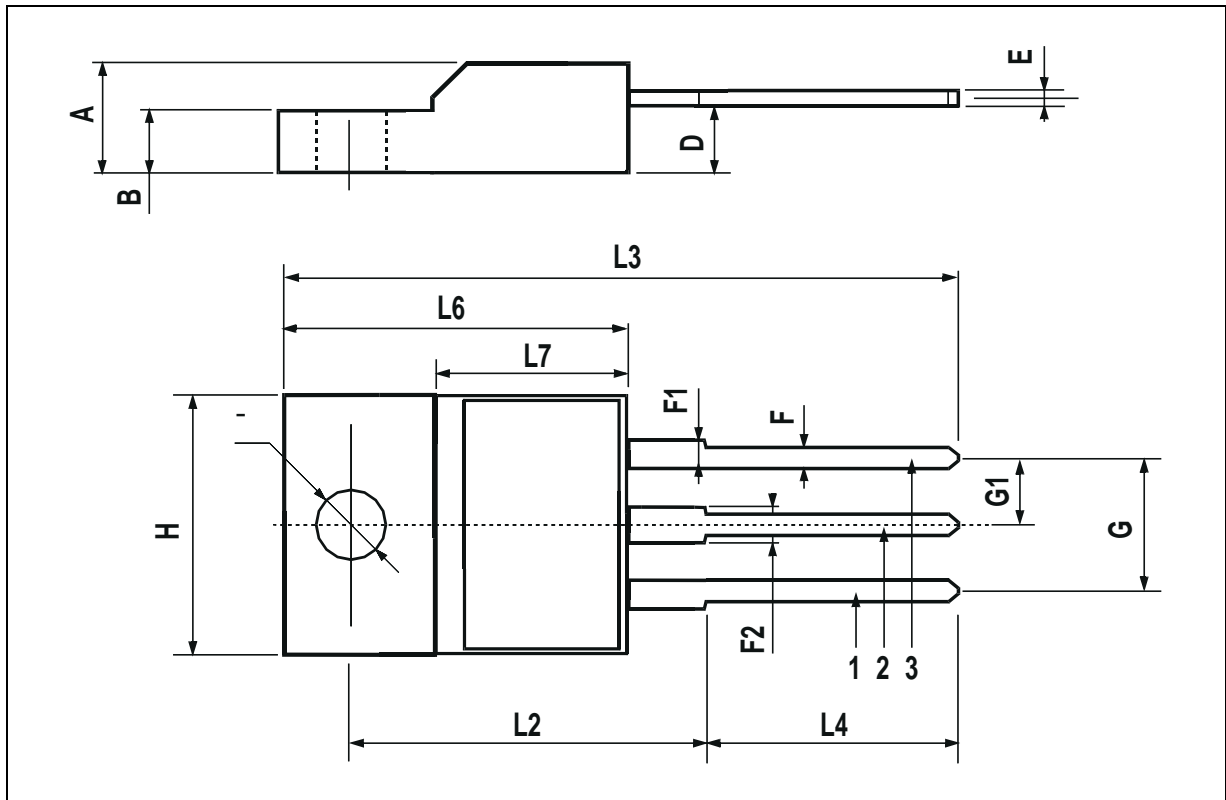


Figure 3: Inductive Load Switching Test Circuit



TO-220FP MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.45		0.7	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.7	0.045		0.067
F2	1.15		1.7	0.045		0.067
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
H	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
Ø	3		3.2	0.118		0.126



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