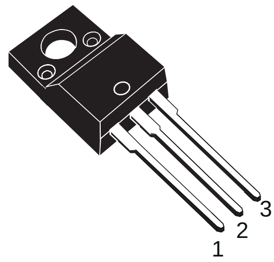
BUL1203EFP

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING



TO-220FP

APPLICATIONS

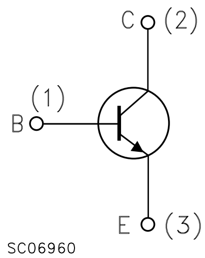
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING (277 V HALF BRIDGE AND 120 V PUSH-PULL TOPOLOGIES)

DESCRIPTION

The BUL1203EFP is a new device manufactured using Diffused Collector technology to enhance switching speeds and tight h_{FE} range while maintaining a wide RBSOA.

Thanks to his structure it has an intrinsic ruggedness which enables the transistor to withstand a high collector current level during Breakdown condition, without using the transil protection usually necessary in typical converters for lamp ballast.

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-BaseVoltage (I_E = 0)	1200	V
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	1200	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	550	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	9	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 ^oC	36	W
V_{isol}	Insulation Withstand Voltage (RMS) from All Three Leads to Exernal Heatsink	1500	V
T_{stg}	Storage Temperature	-65 to 150	^oC
T_j	Max. Operating Junction Temperature	150	^oC

THERMAL DATA

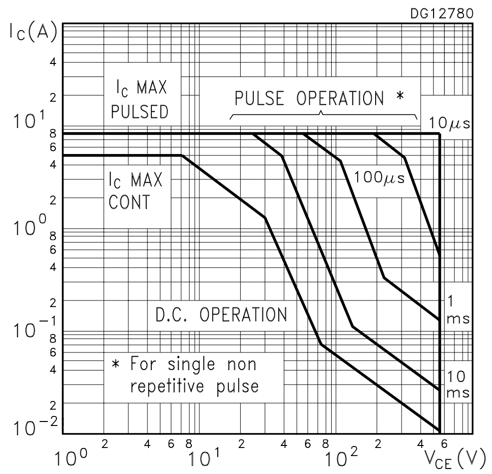
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	3.47	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

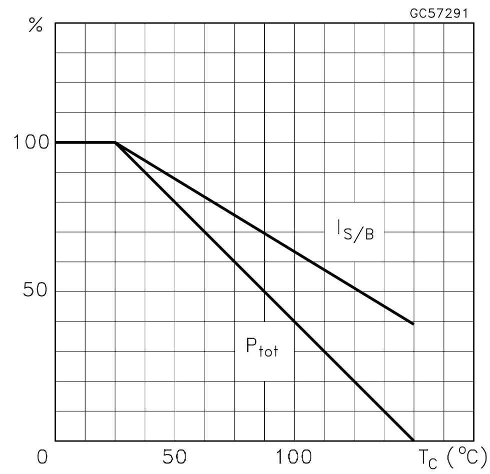
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 1200 V			100	µA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 550 V			100	µA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA L = 25 mH	550			V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	I_E = 10 mA	9			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 1 A I_B = 0.2 A I_C = 2 A I_B = 0.4 A I_C = 3 A I_B = 1 A			0.5 0.7 1.5	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 2 A I_B = 0.4 A I_C = 3 A I_B = 1 A			1.5 1.5	V V
h_{FE}*	DC Current Gain	I_C = 1 mA V_{CE} = 5 V I_C = 10 mA V_{CE} = 5 V I_C = 0.8 A V_{CE} = 3 V I_C = 2 A V_{CE} = 5 V	10 10 14 9		 32 28	
 t_{on} t_s t_f	RESISTIVE LOAD Turn-on Time Storage Time Fall Time	I_C = 2 A I_{B1} = 0.4 A I_{B2} = -0.8 A tp = 30 µs V_{CC} = 150 V (see figure 2)		 2.5 0.2	 0.5 3.0 0.3	 µs µs µs
E_{ar}	Repetitive Avalanche Energy	L = 2 mH C = 1.8 nF V_{CC} = 50 V V_{BE} = -5 V (see figure 3)	6			mJ

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

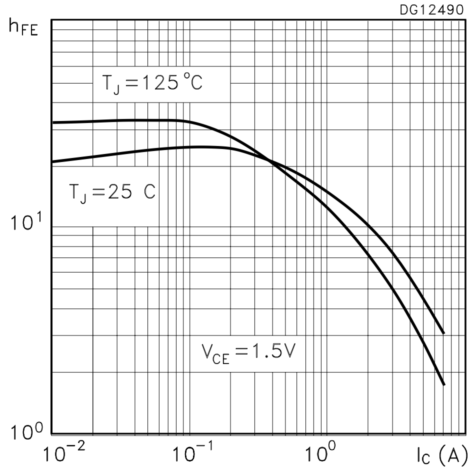
Safe Operating Area



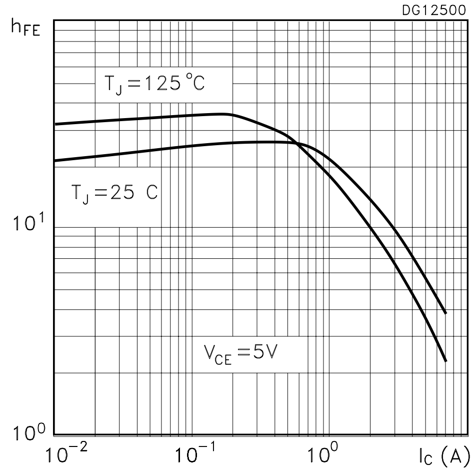
Derating Curve



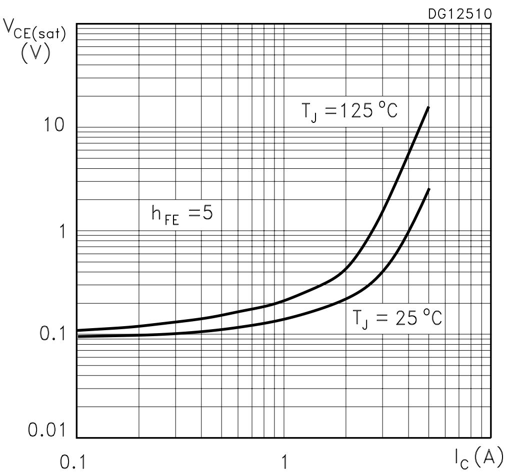
DC Current Gain



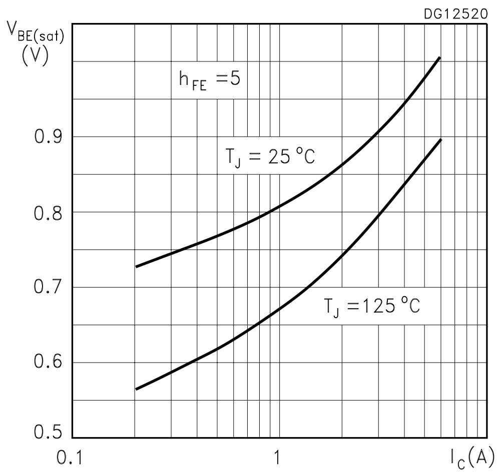
DC Current Gain



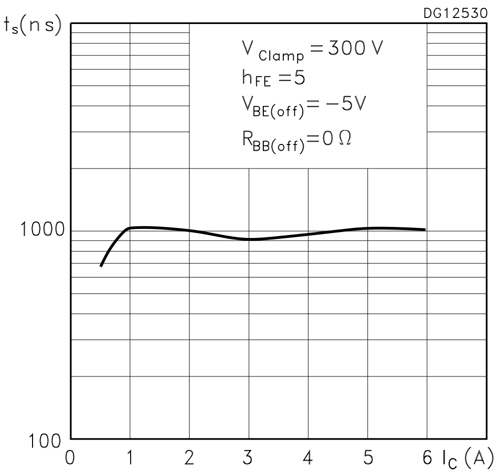
Collector-Emitter Saturation Voltage



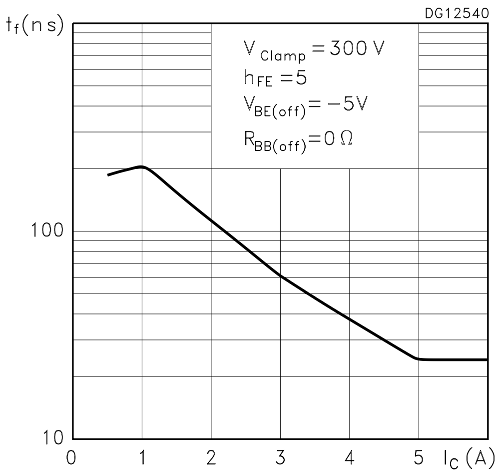
Base-Emitter Saturation Voltage



Inductive Load Storage Time



Inductive Load Fall Time



Reverse Biased Safe Operating Area

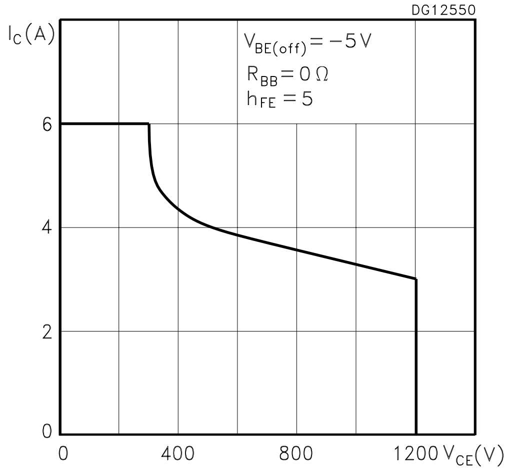


Figure 1: Inductive Load Switching Test Circuit

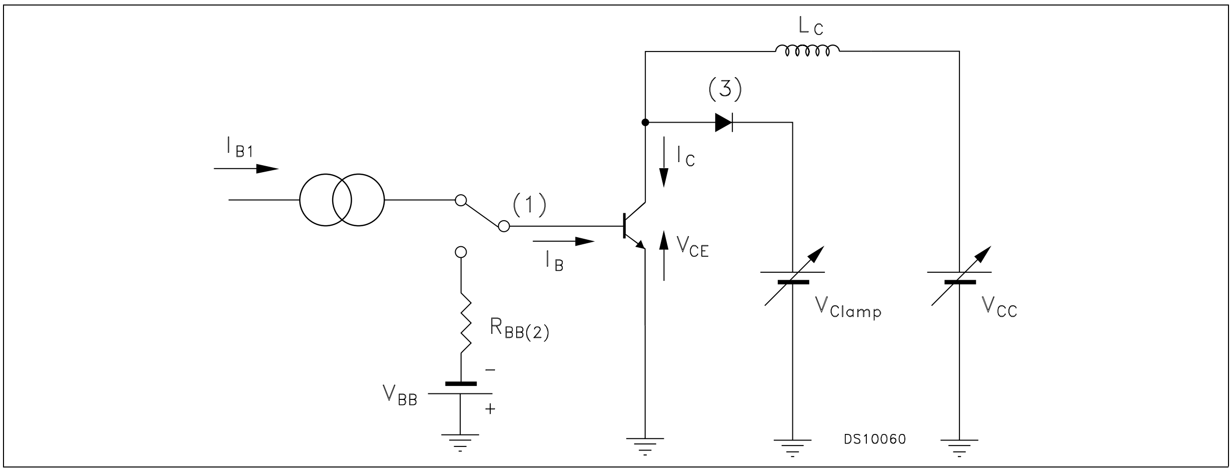


Figure 2: Resistive Load Switching Test Circuit

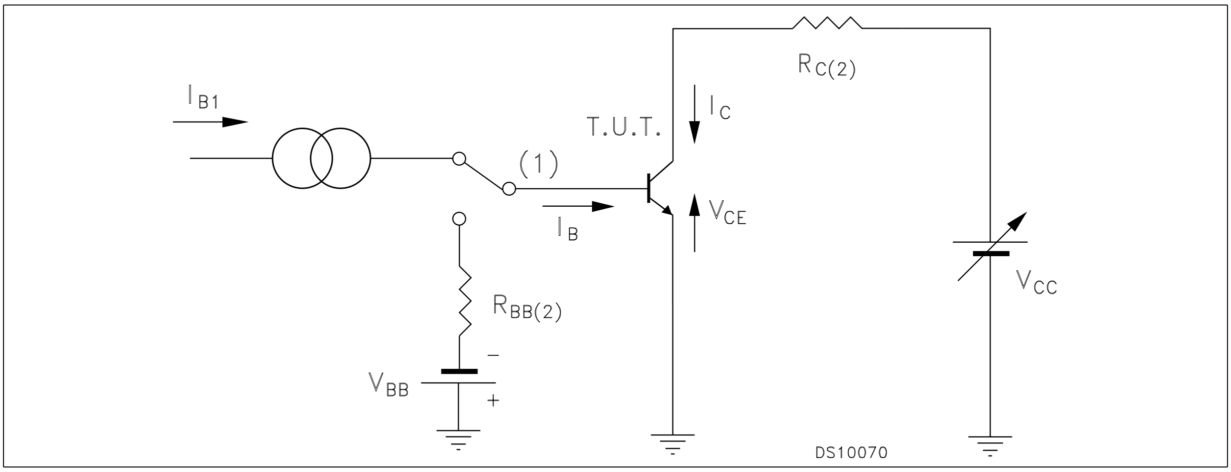
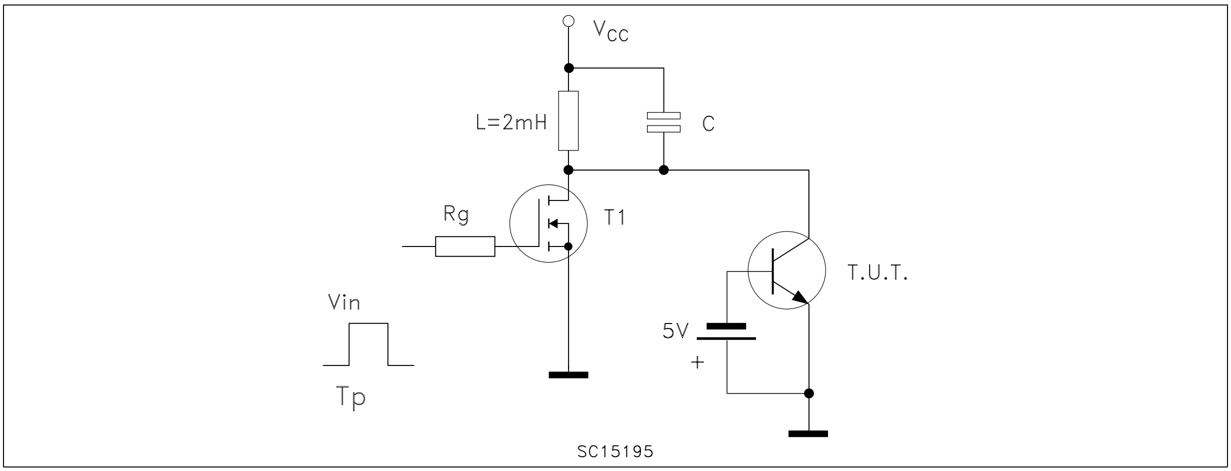


Figure 3: Energy Rating Test Circuit



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