BUL1203E

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

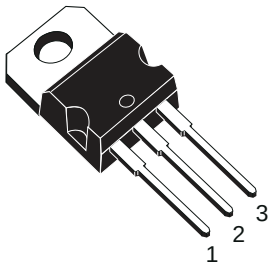
APPLICATIONS

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

DESCRIPTION

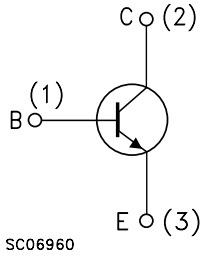
The BUL1203E is a new device manufactured using Diffused Collector technology to enhance switching speeds and tight h_{FE} range while maintaining a wide RBSOA.

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.



TO-220

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 °C	100	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

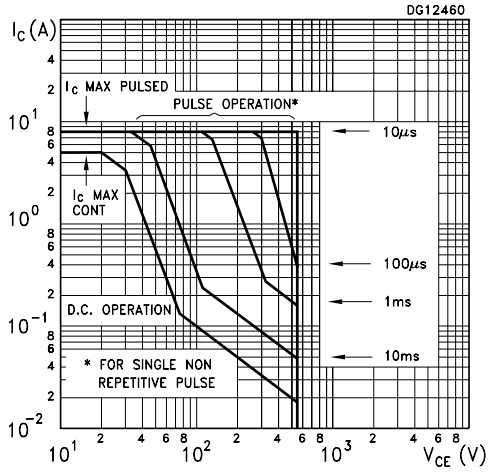
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	1.25	°C/W

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

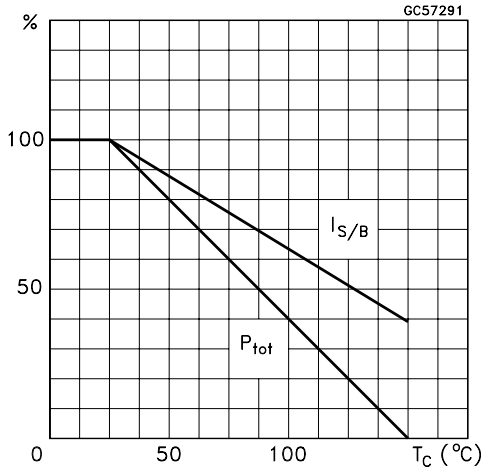
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 1200 V			100	µA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 550 V			100	µA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA L = 25 mH	550			V
V_{EBO}	Emitter-Base 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 %

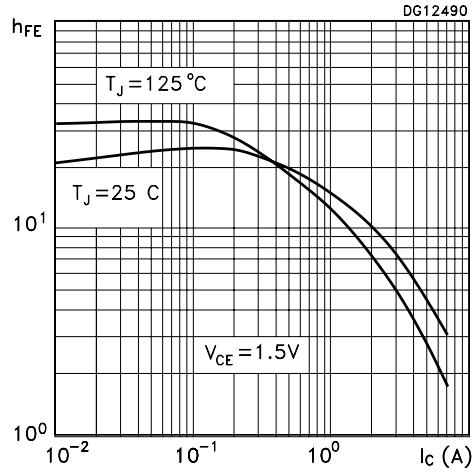
Safe Operating Area



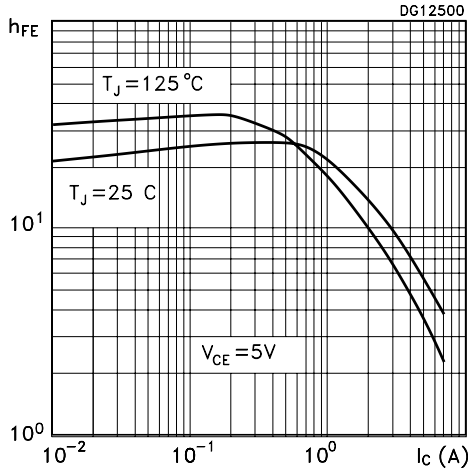
Derating Curve



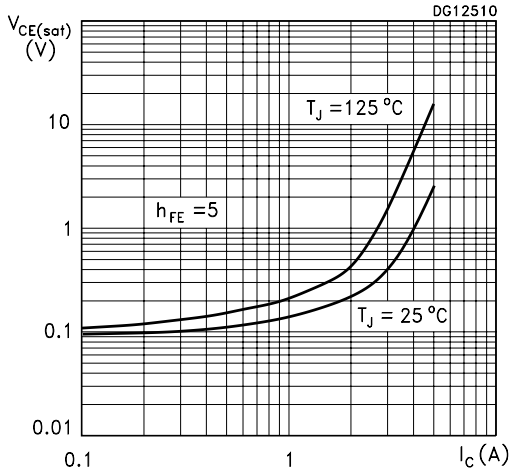
DC Current Gain



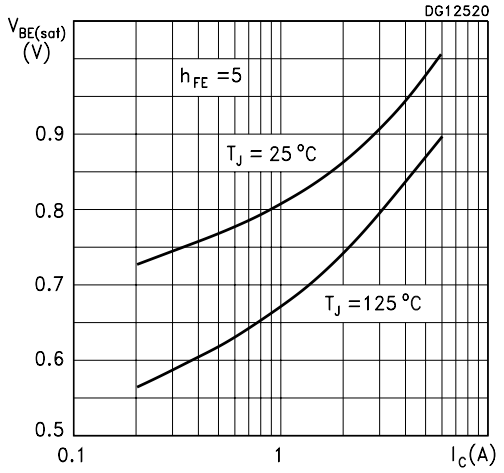
DC Current Gain



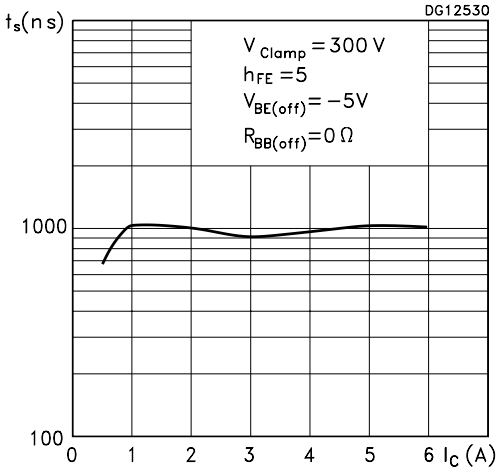
Collector-Emitter Saturation Voltage



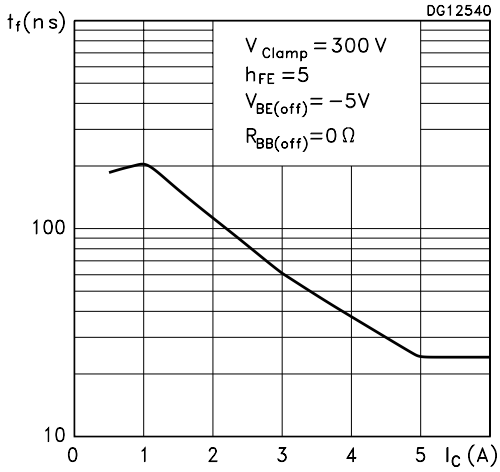
Base-Emitter Saturation Voltage



Inductive Load Storage Time



Inductive Load Fall Time



Reverse Biased Safe Operating Area

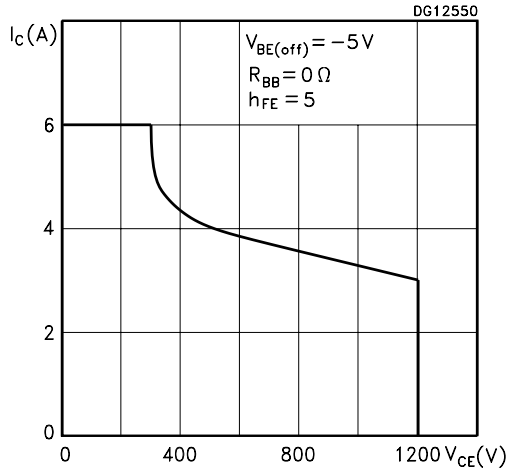


Figure 1: Inductive Load Switching Test Circuit

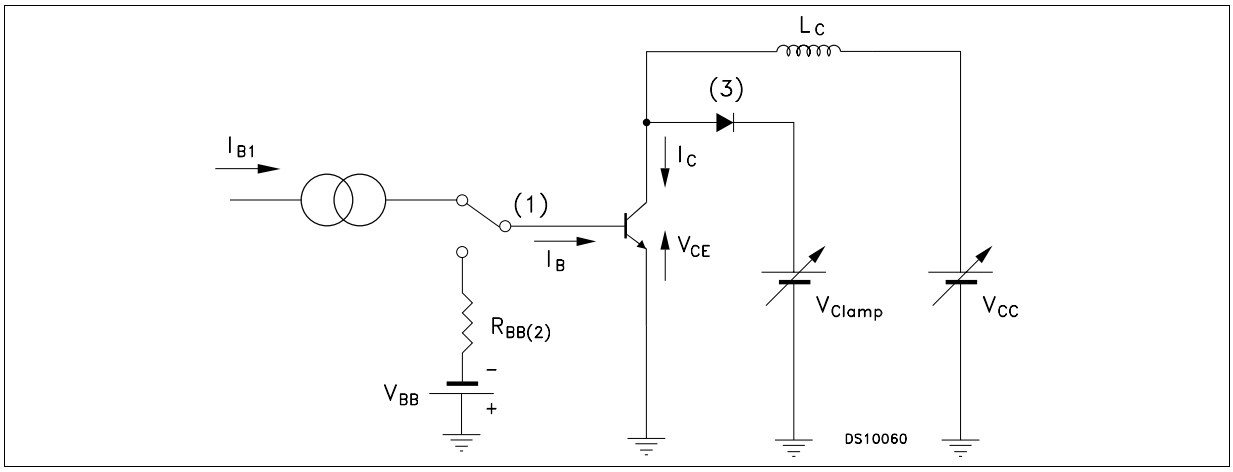


Figure 2: Resistive Load Switching Test Circuit

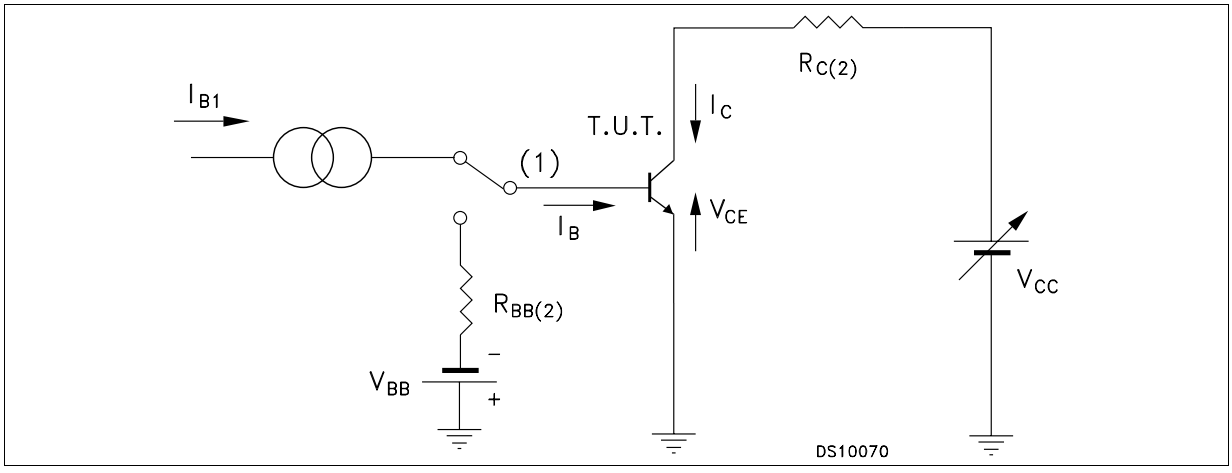
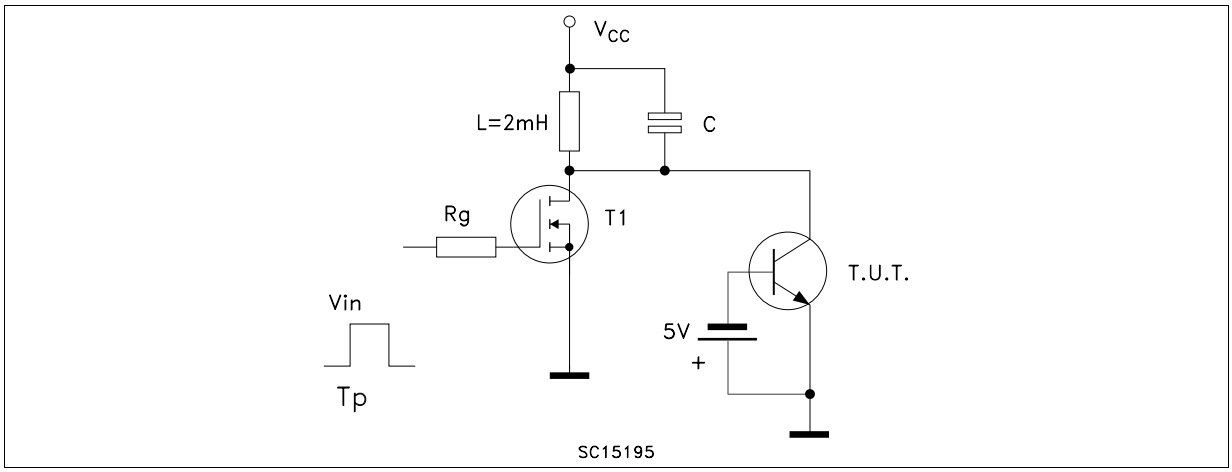
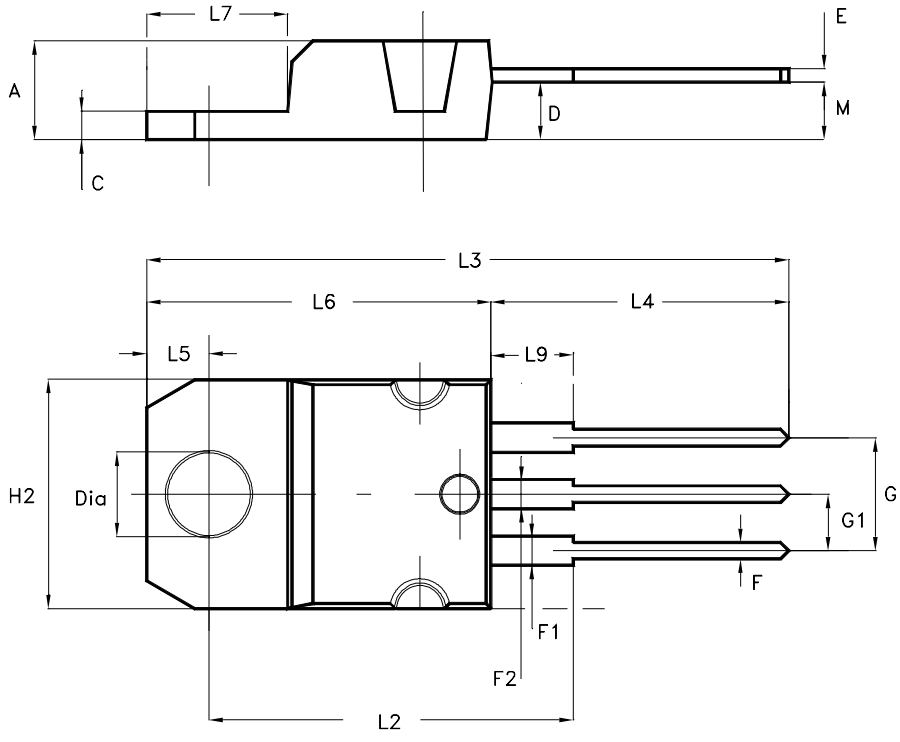


Figure 3: Energy Rating Test Circuit



TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.052
D	2.40		2.72	0.094		0.107
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		0.202
G1	2.40		2.70	0.094		0.106
H2	10.00		10.40	0.394		0.409
L2		16.40			0.645	
L4	13.00		14.00	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.20		6.60	0.244		0.260
L9	3.50		3.93	0.137		0.154
M		2.60			0.102	
DIA.	3.75		3.85	0.147		0.151



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