



## ST1803DFH

### HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

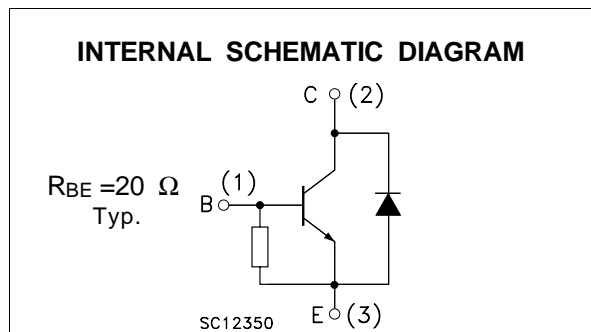
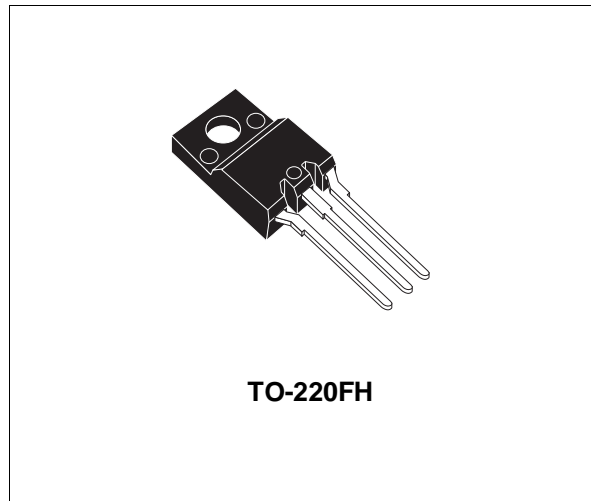
- NEW Fully Plastic TO-220 for HIGH VOLTAGE APPLICATIONS
- NEW SERIES, ENHANCED PERFORMANCE
- INTEGRATED FREE WHEELING DIODE
- HIGH VOLTAGE CAPABILITY ( $> 1500\text{ V}$ )
- HIGH SWITCHING SPEED
- TIGHTER  $h_{fe}$  CONTROL
- IMPROVED RUGGEDNESS
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING
- CREEPAGE DISTANCE PATH  $> 4\text{ mm}$

#### APPLICATIONS:

- HORIZONTAL DEFLECTION FOR COLOR TVS

#### DESCRIPTION

The device is manufactured using Diffused Collector technology for more stable operation Vs base drive circuit variations resulting in very low worst case dissipation.



#### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	1500	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	600	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_C$	Collector Current	10	A
$I_{CM}$	Collector Peak Current ( $t_p < 5\text{ ms}$ )	15	A
$I_B$	Base Current	4	A
$P_{tot}$	Total Dissipation at $T_c = 25\ ^\circ\text{C}$	40	W
$V_{isol}$	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	2500	V
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

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## THERMAL DATA

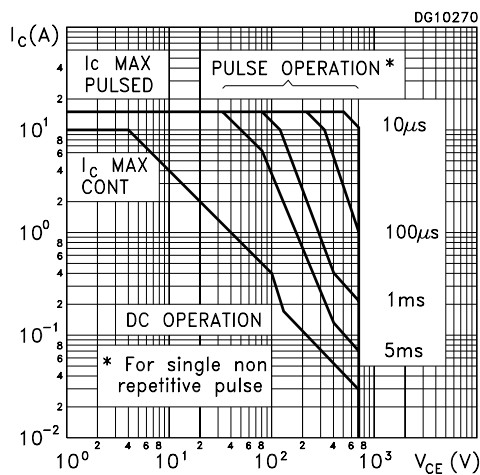
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	3.125	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

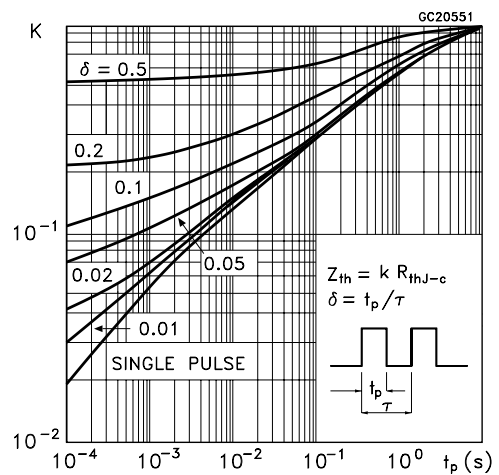
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = 1500 V V <sub>CE</sub> = 1500 V T <sub>j</sub> = 125 °C			1 2	mA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 4 V	130		400	mA
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 700 mA	7			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 4 A I <sub>B</sub> = 0.8 A I <sub>C</sub> = 4 A I <sub>B</sub> = 1.2 A		3	5 1.5	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 4 A I <sub>B</sub> = 0.8 A			1.2	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 1 A V <sub>CE</sub> = 5 V I <sub>C</sub> = 4.5 A V <sub>CE</sub> = 1 V I <sub>C</sub> = 4.5 A V <sub>CE</sub> = 5 V	10 5	15 5	20 9	
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 5 A		1.5	2	V
t <sub>s</sub> t <sub>f</sub>	INDUCTIVE LOAD Storage Time Fall Time	I <sub>C</sub> = 4 A I <sub>Bon(END)</sub> = 0.8 A L <sub>B</sub> = 5 μH V <sub>BB</sub> = -2.5 V f = 16 KHz (see figure 1)		2.7 0.3	4 0.6	μs μs

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

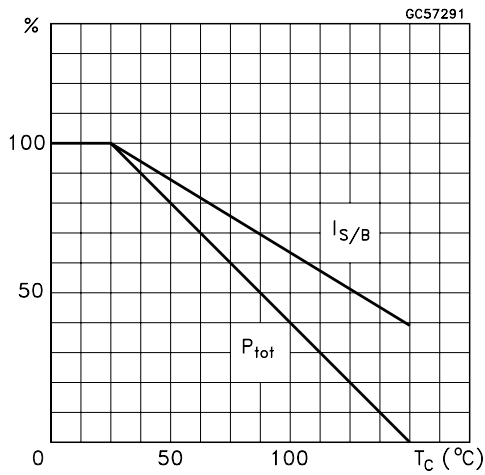
## Safe Operating Area



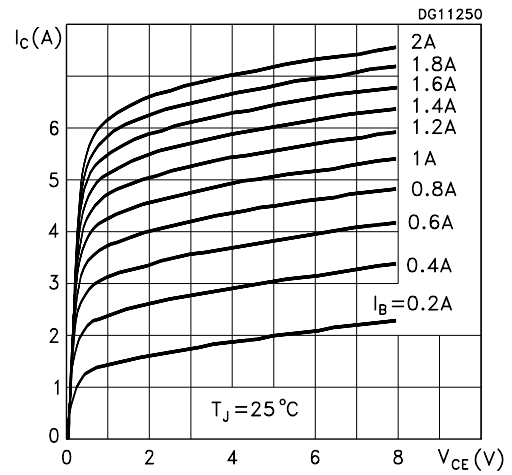
## Thermal Impedance



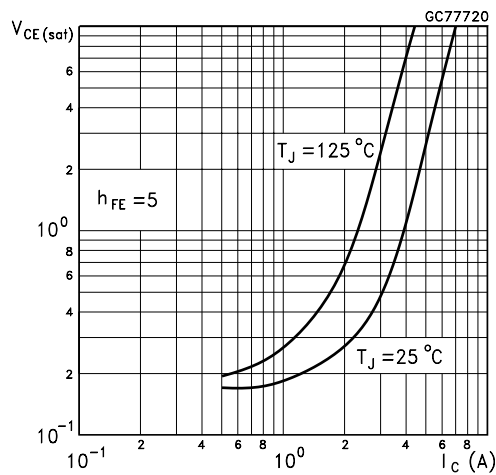
Derating Curve



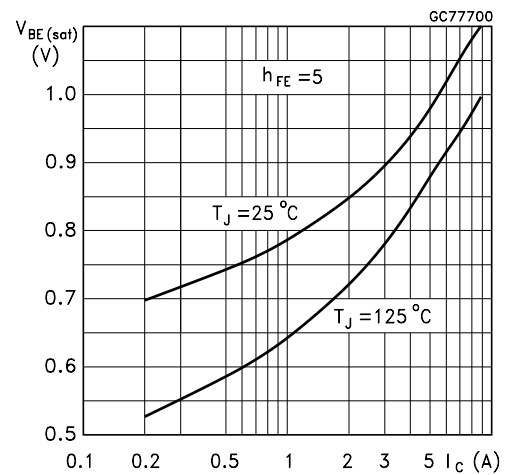
Output Characteristics



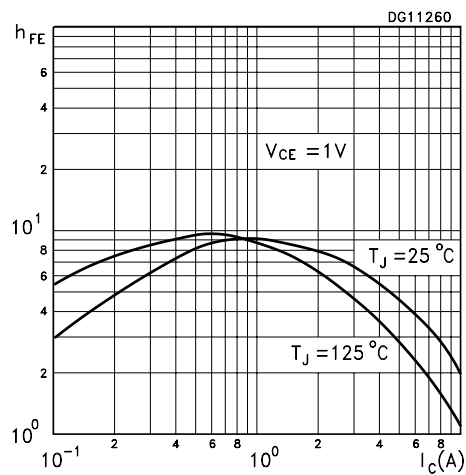
Collector Emitter Saturation Voltage



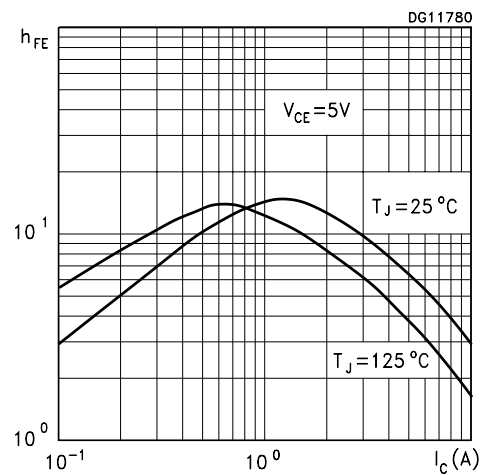
Base Emitter Saturation Voltage



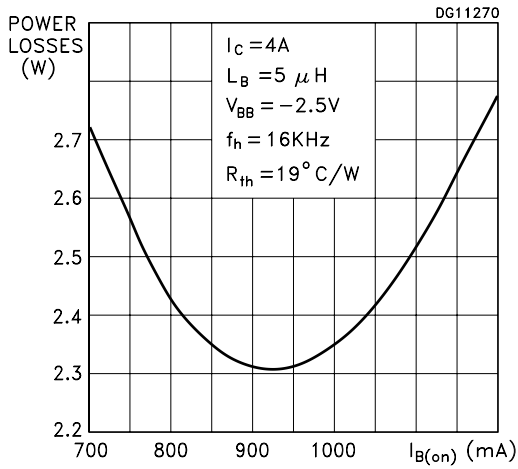
DC Current Gain



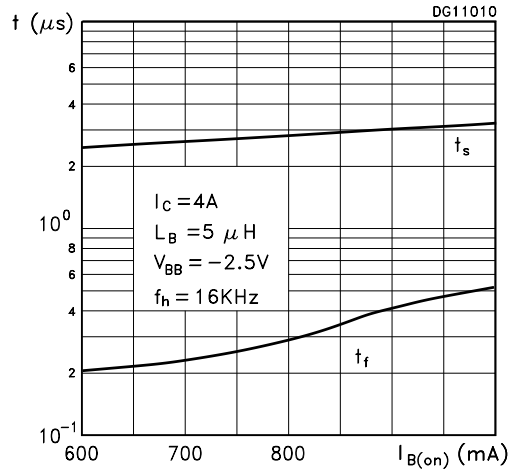
DC Current Gain



Power losses



Switching Time Inductive Load



Reverse Biased SOA

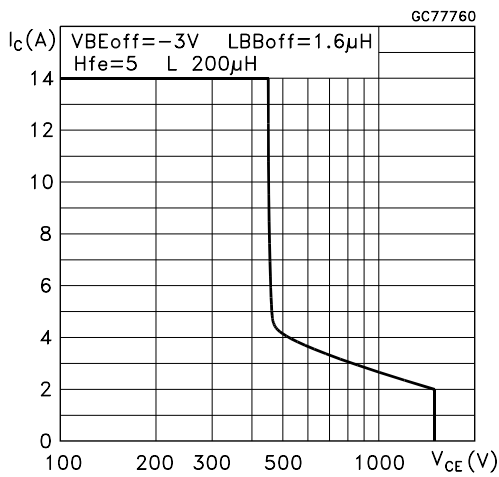
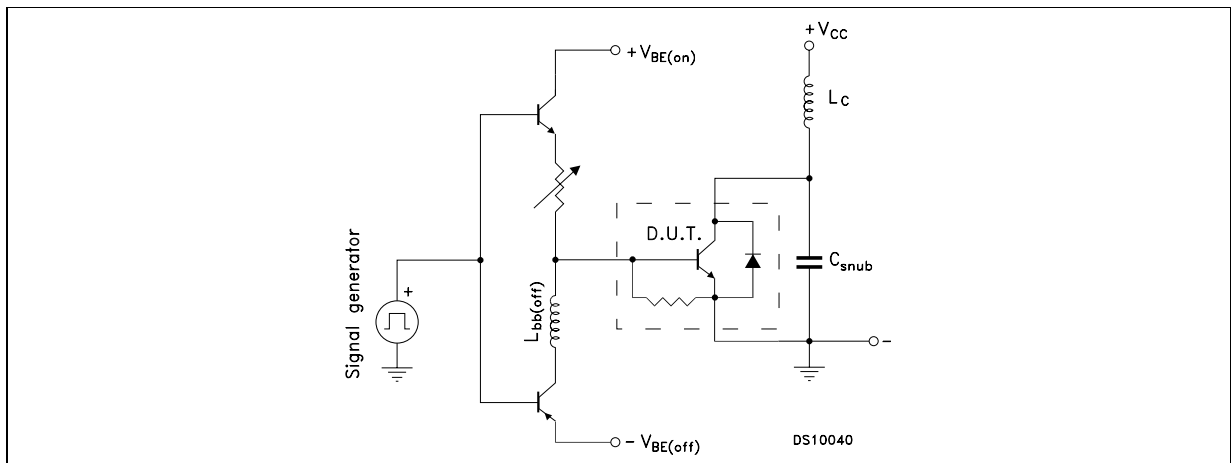
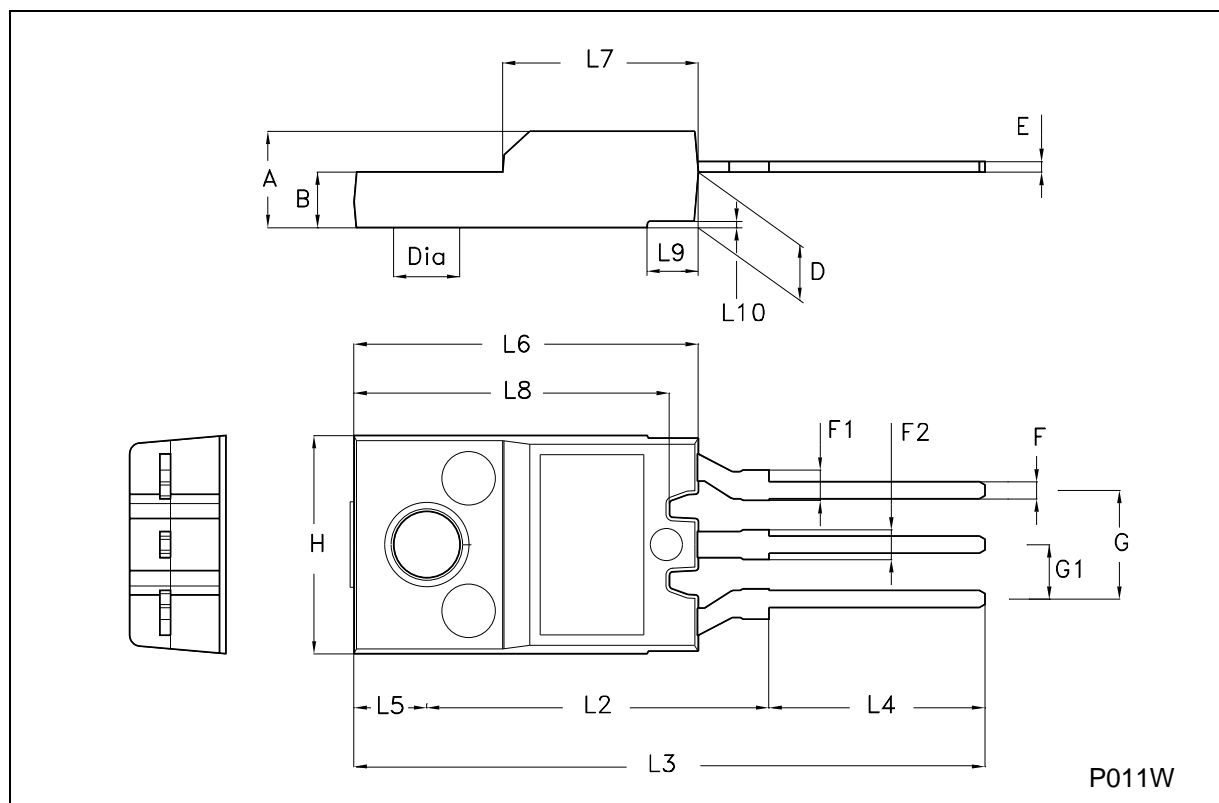


Figure 1: Inductive Load Switching Test Circuit.



**TO-220FH (Fully plastic High voltage) 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	1.3		1.8	0.051		0.070
F2	1.3		1.8	0.051		0.070
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
L5		3.4			0.134	
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
L8	14.5		15	0.570		0.590
L9		2.4			0.094	



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