



# ST1803DFH

## HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

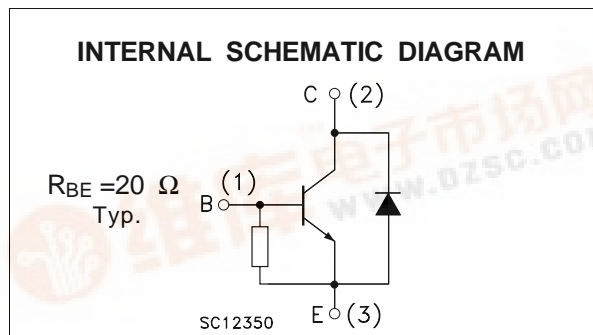
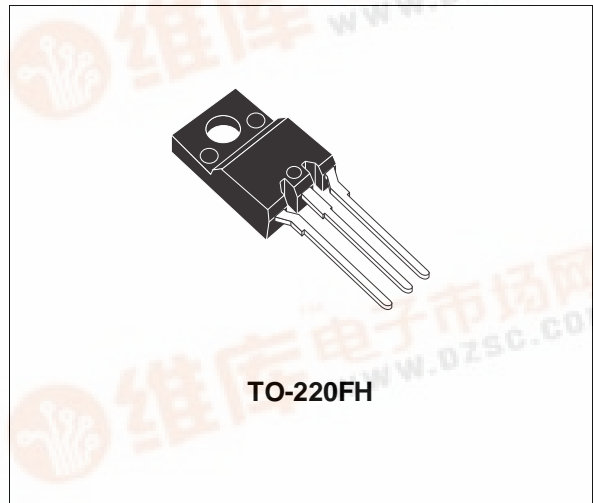
- NEW Fully Plastic TO-220 for HIGH VOLTAGE APPLICATIONS
- NEW SERIES, ENHANCED PERFORMANCE
- INTEGRATED FREE WHEELING DIODE
- HIGH VOLTAGE CAPABILITY (> 1500 V)
- HIGH SWITCHING SPEED
- TIGHTER hfe CONTROL
- IMPROVED RUGGEDNESS
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING
- CREEPAGE DISTANCE PATH > 4 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 ( $t_p < 5$ ms)	15	A
$I_B$	Base Current	4	A
$P_{tot}$	Total Dissipation at $T_c = 25$ °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	°C
$T_j$	Max. Operating Junction Temperature	150	°C



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## THERMAL DATA

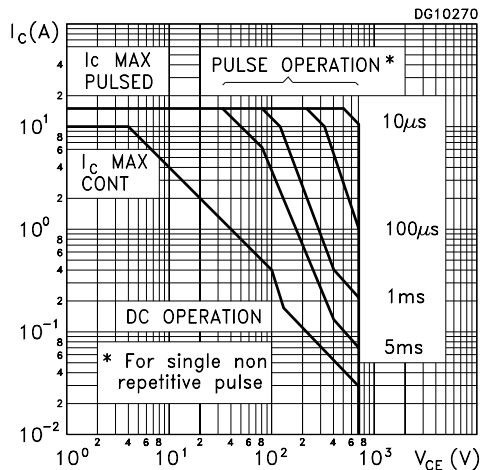
$R_{thj-case}$	Thermal Resistance Junction-case	Max	3.125	$^{\circ}C/W$
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## ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$ unless otherwise specified)

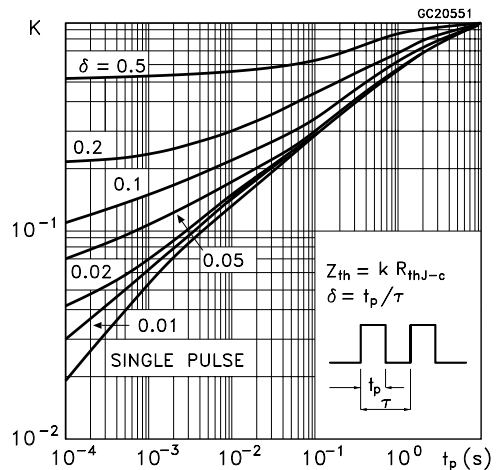
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 1500 V$ $V_{CE} = 1500 V$ $T_j = 125^{\circ}C$			1 2	mA mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 4 V$	130		400	mA
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = 700 mA$	7			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 4 A$ $I_B = 0.8 A$ $I_C = 4 A$ $I_B = 1.2 A$		3	5 1.5	V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 4 A$ $I_B = 0.8 A$			1.2	V
$h_{FE*}$	DC Current Gain	$I_C = 1 A$ $V_{CE} = 5 V$ $I_C = 4.5 A$ $V_{CE} = 1 V$ $I_C = 4.5 A$ $V_{CE} = 5 V$	10 5	15 5	20 9	
$V_F$	Diode Forward Voltage	$I_F = 5 A$		1.5	2	V
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 4 A$ $I_{Bon(END)} = 0.8 A$ $L_B = 5 \mu H$ $V_{BB} = -2.5 V$ $f = 16 KHz$ (see figure 1)		2.7 0.3	4 0.6	$\mu s$ $\mu s$

\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle 1.5 %

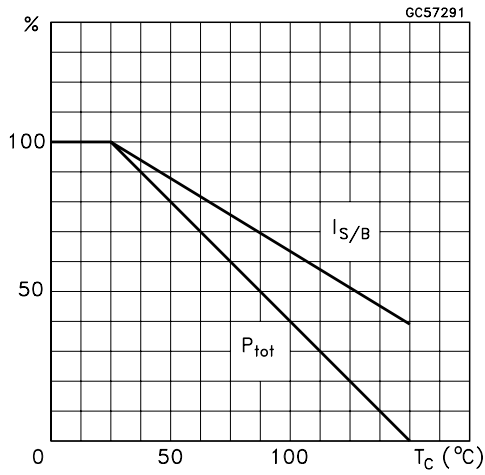
## Safe Operating Area



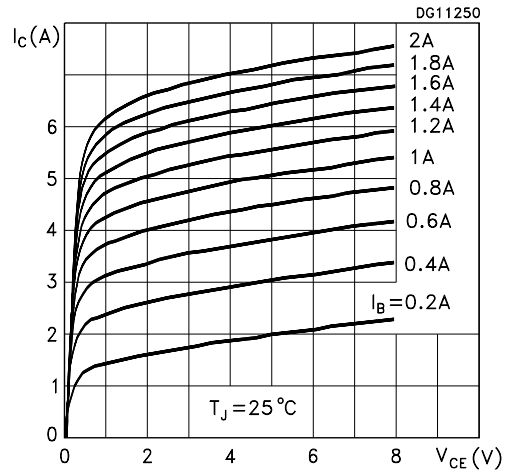
## Thermal Impedance



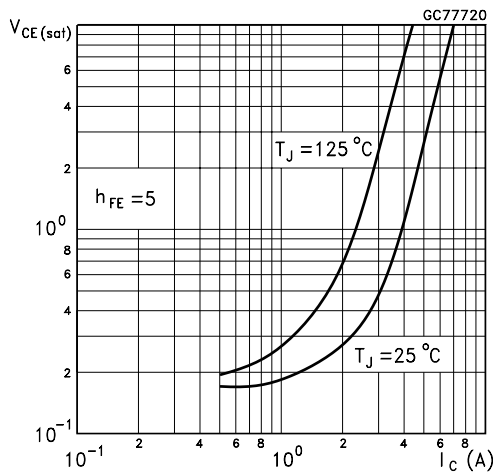
Derating Curve



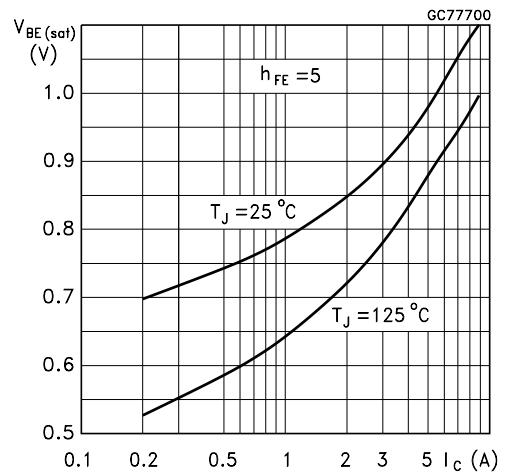
Output Characteristics



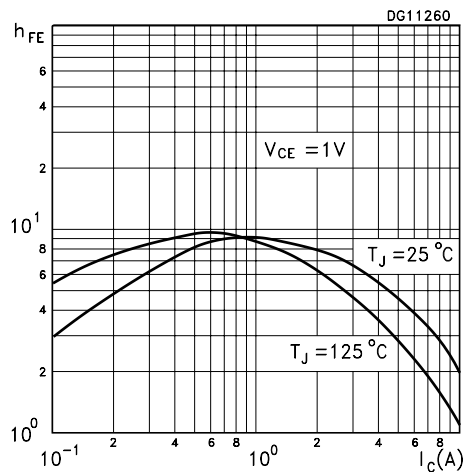
Collector Emitter Saturation Voltage



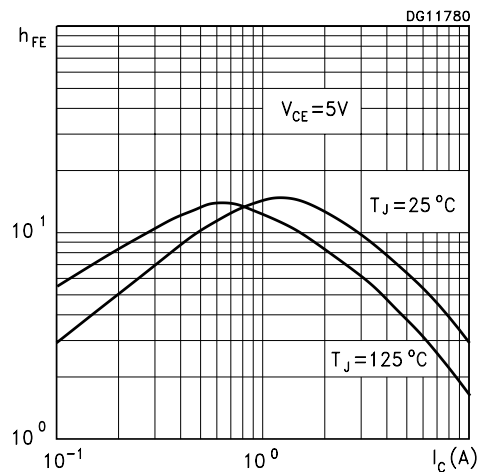
Base Emitter Saturation Voltage



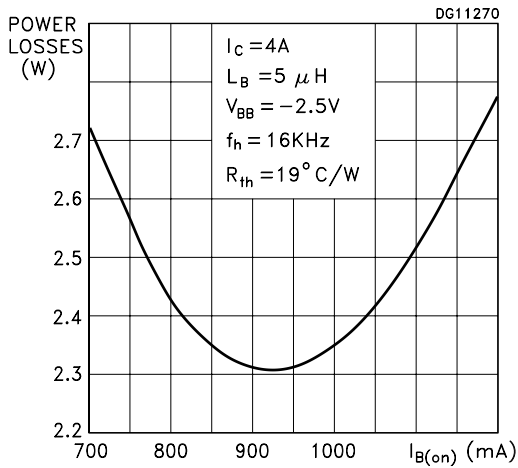
DC Current Gain



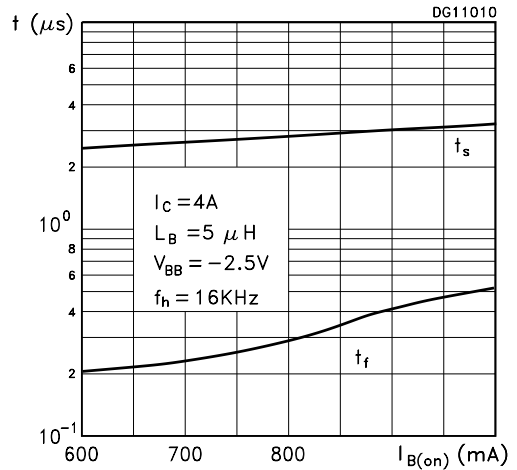
DC Current Gain



Power losses



Switching Time Inductive Load



Reverse Biased SOA

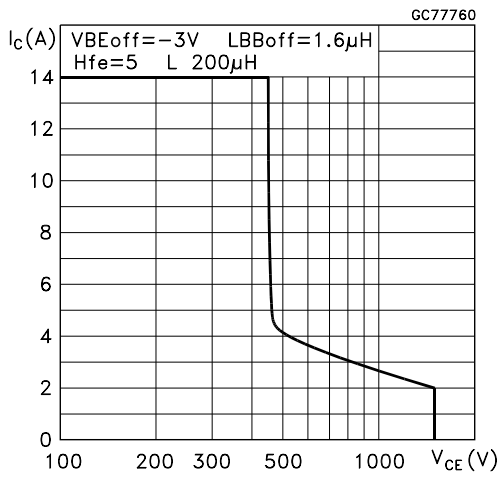
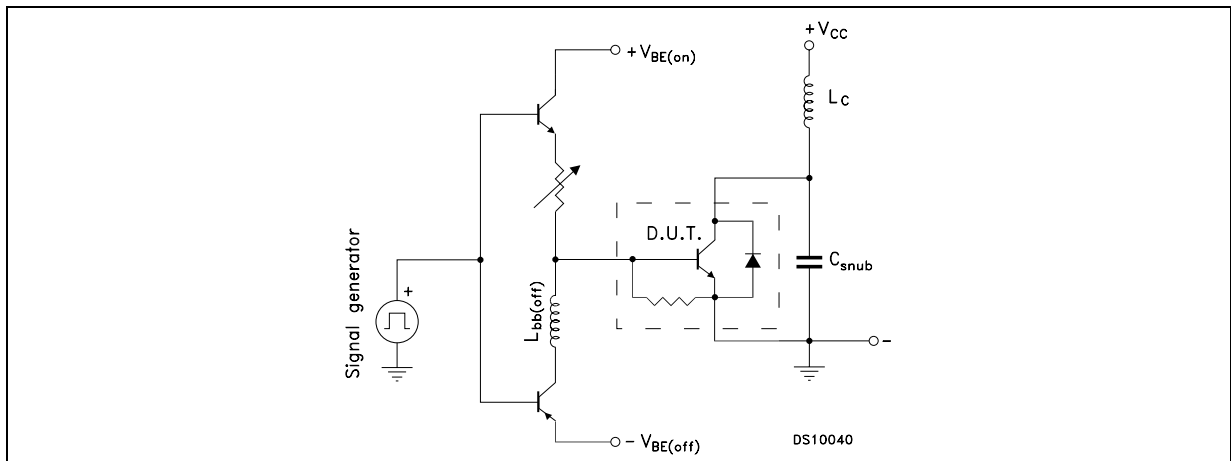
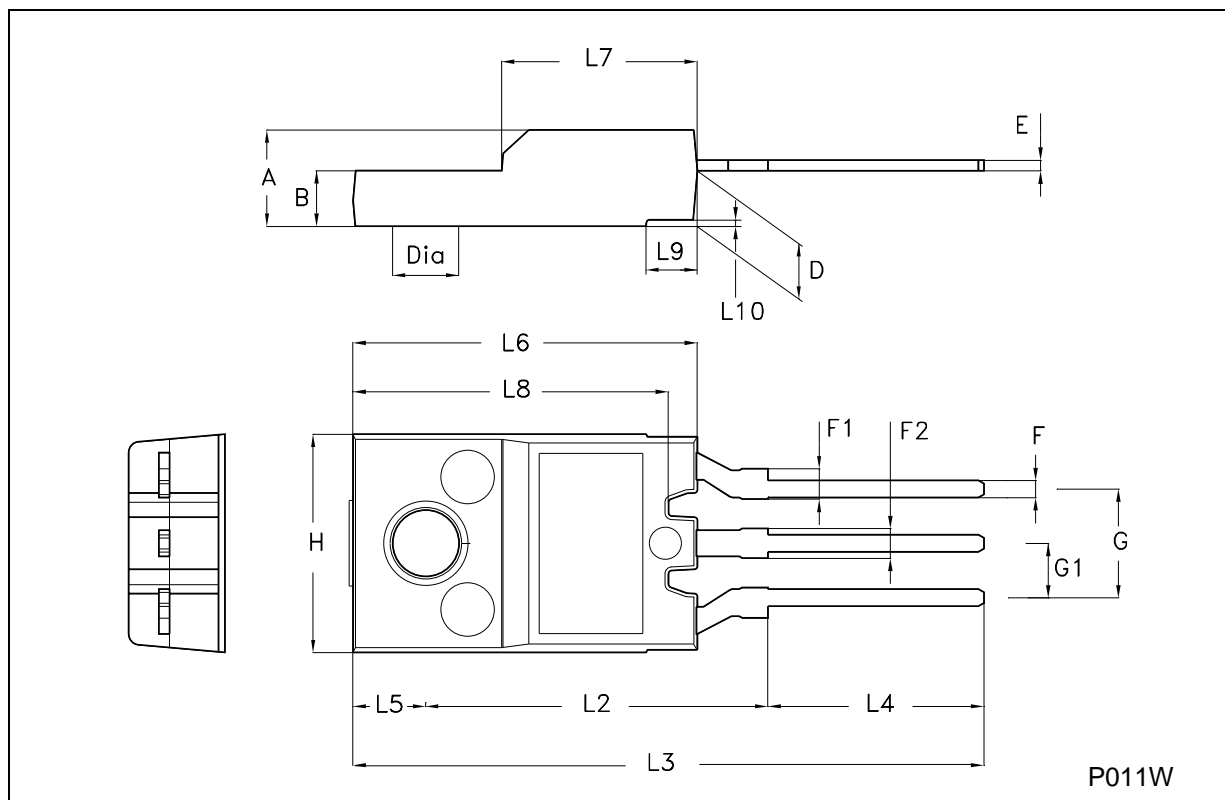


Figure 1: Inductive Load Switching Test Circuit.



**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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