



ST1802FH

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

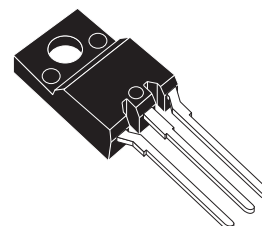
- NEW Fully Plastic TO-220 for HIGH VOLTAGE APPLICATIONS
- NEW SERIES, ENHANCED PERFORMANCE
- EASY MOUNTING
- HIGH VOLTAGE CAPABILITY ($> 1500\text{ V}$)
- HIGH SWITCHING SPEED
- TIGHTER h_{fe} CONTROL
- IMPROVED RUGGEDNESS
- FULLY MOLDED INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING
- CREEPAGE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

APPLICATIONS:

- HORIZONTAL DEFLECTION FOR COLOR TVs UP TO 21 INCHES

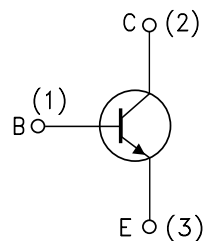
DESCRIPTION

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



TO-220FH

INTERNAL SCHEMATIC DIAGRAM



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 $T_c = 25\text{ }^\circ\text{C}$ | 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 | $^\circ\text{C}$ |

ST1802FH

THERMAL DATA

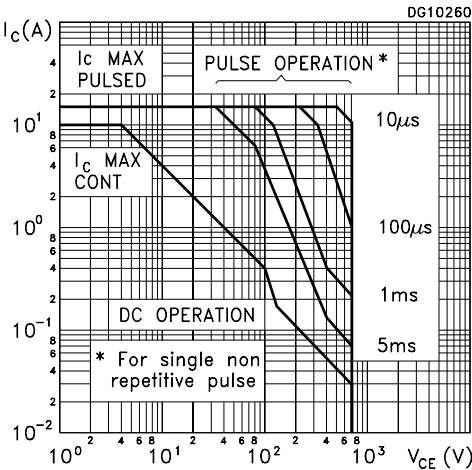
| | | | | |
|-----------------------|----------------------------------|-----|-------|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 3.125 | °C/W |
|-----------------------|----------------------------------|-----|-------|------|

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

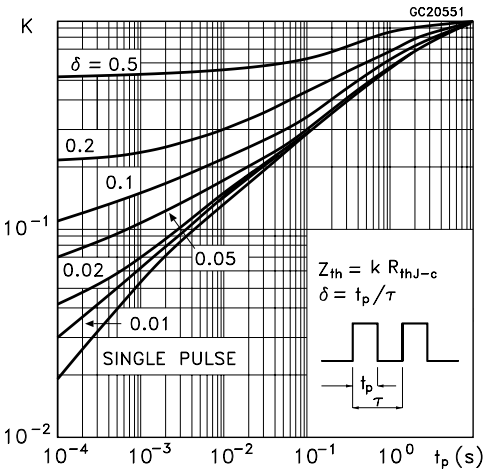
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|---|--|------|------------|----------|----------|
| I _{CES} | Collector Cut-off Current (V _{BE} = 0) | V _{CE} = 1500 V V _{CE} = 1500 V T _C = 125 °C | | | 1 2 | mA mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 7 V | | | 1 | mA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 100 mA L = 25 mH | 600 | | | 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 | | | 5 1.5 | V V |
| V _{BE(sat)*} | Base-Emitter Saturation Voltage | I _C = 4.5 A I _B = 1 A | | | 1.2 | V |
| h _{FE} * | DC Current Gain | I _C = 1 A V _{CE} = 5 V I _C = 5 A V _{CE} = 1 V I _C = 5 A V _{CE} = 5 V | 4 | 25 4.5 | 9 | |
| t _s t _f | INDUCTIVE LOAD Storage Time Fall Time | I _C = 4 A I _{Bon(END)} = 1 A L _B = 5 μH V _{BB(off)} = -2.5 V f = 16 KHz (see figure 1) | | 2.6 0.2 | 4 0.6 | μs μs |

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

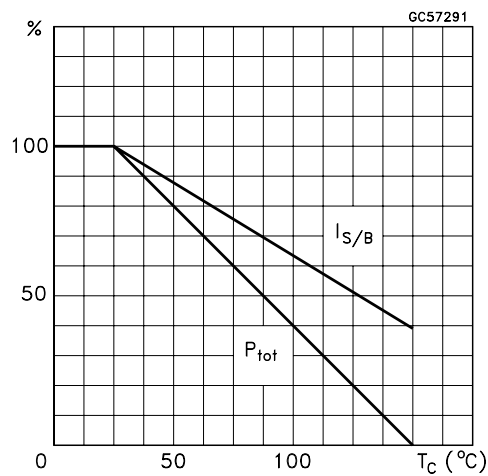
Safe Operating Area



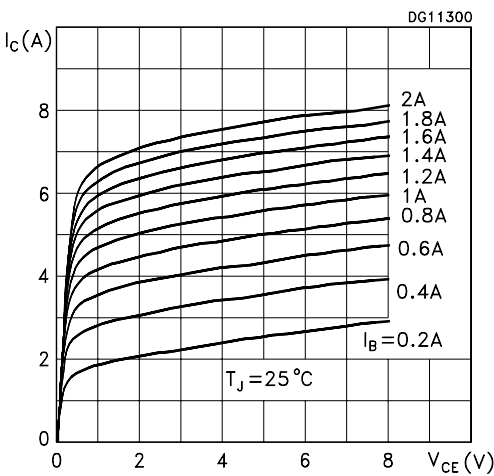
Thermal Impedance



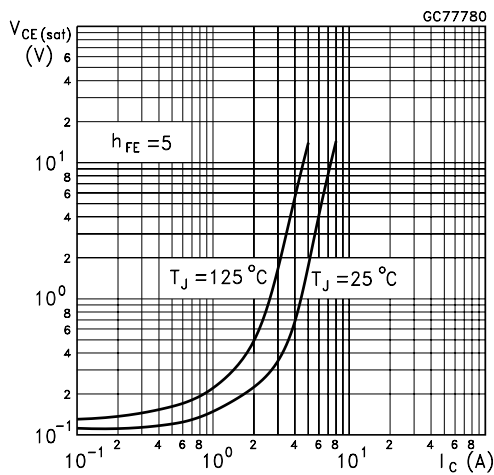
Derating Curve



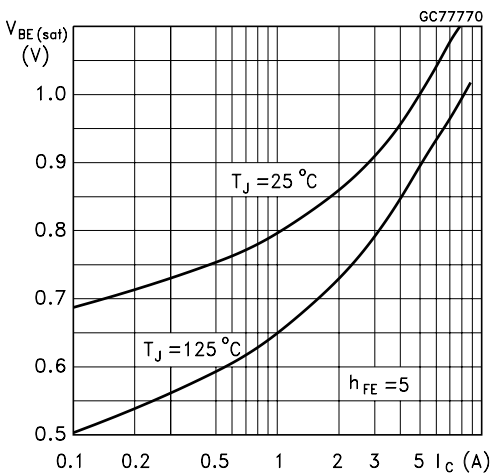
Output Characteristics



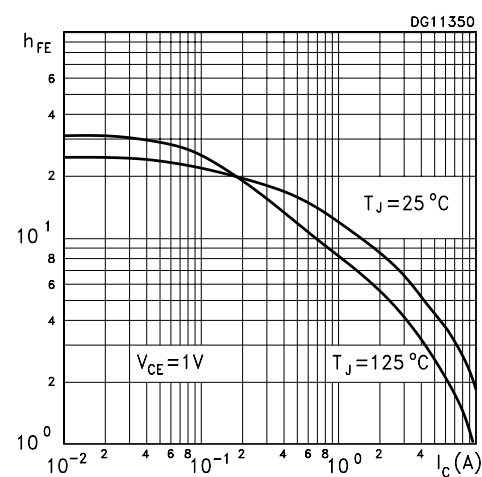
Collector Emitter Saturation Voltage



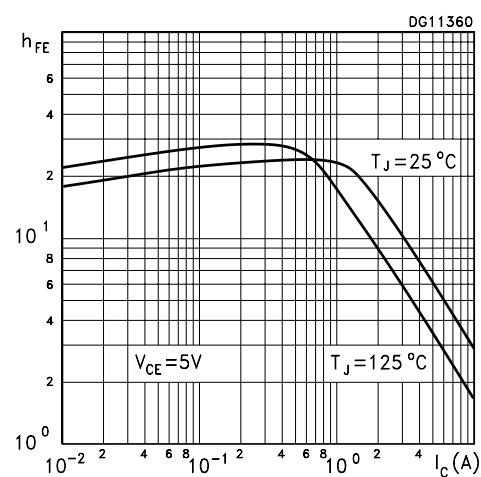
Base Emitter Saturation Voltage



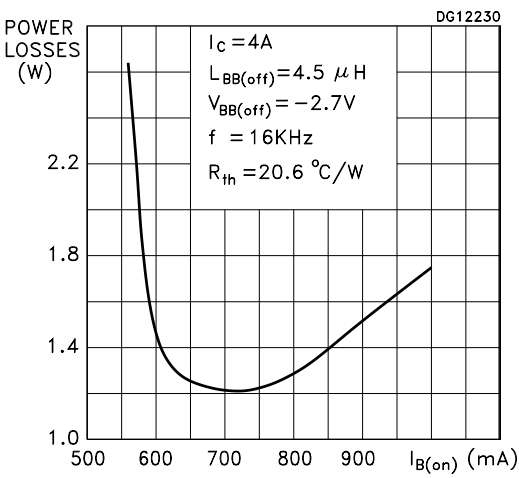
DC Current Gain



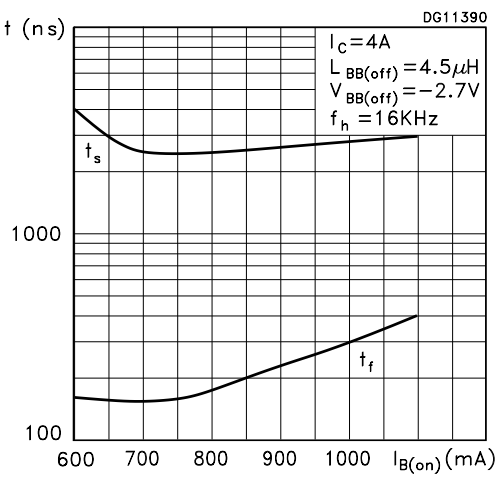
DC Current Gain



Power Losses At 16 KHz



Switching Time Inductive Load



Reverse Biased SOA

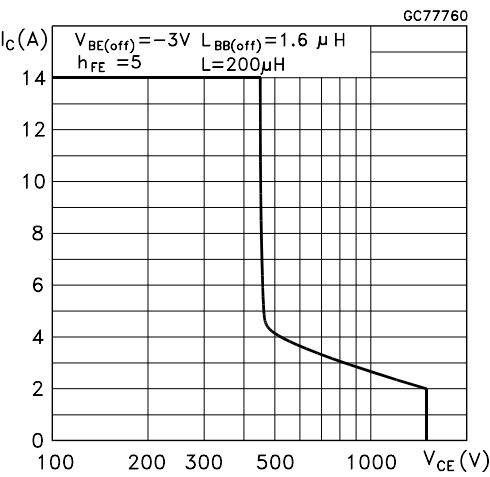
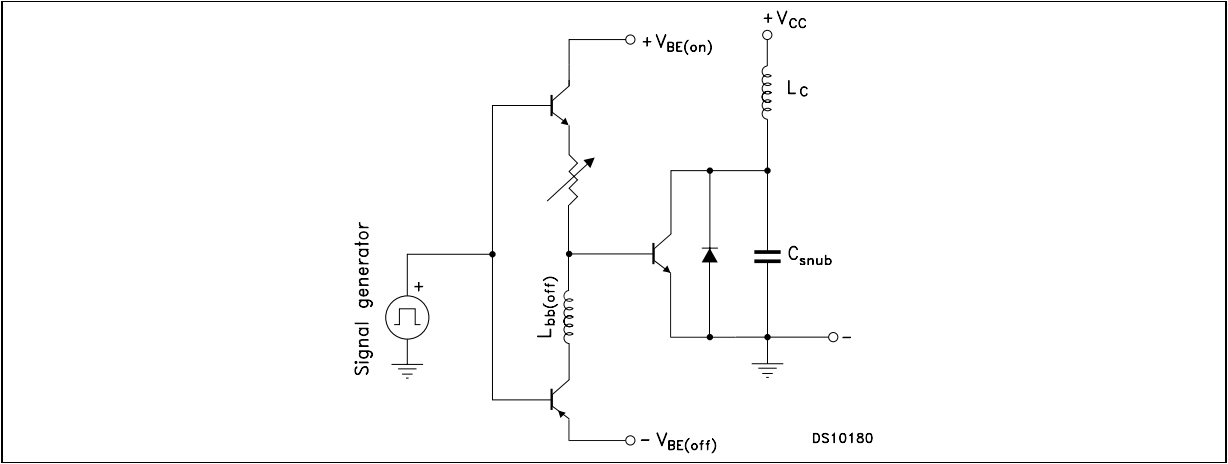
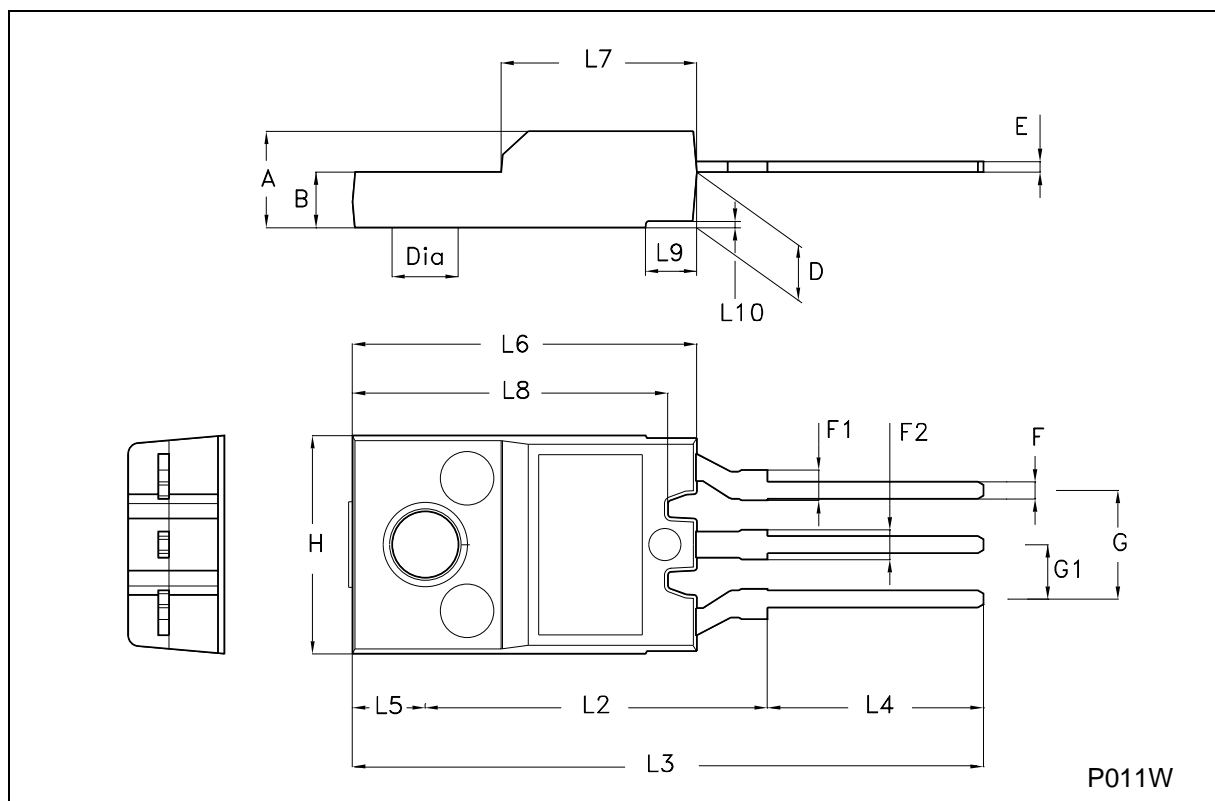


Figure 1: Inductive Load Switching Test Circuit.



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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