

Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[STMicroelectronics](#)

[ST13007DFP](#)

For any questions, you can email us directly:

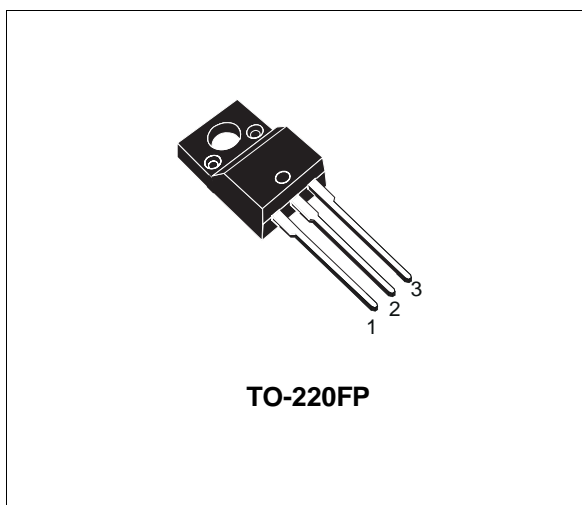
sales@integrated-circuit.com



ST13007DFP

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- IMPROVED SPECIFICATION:
 - LOWER LEAKAGE CURRENT
 - TIGHTER GAIN RANGE
 - DC CURRENT GAIN PRESELECTION
 - TIGHTER STORAGE TIME RANGE
- HIGH VOLTAGE CAPABILITY
- INTEGRATED FREE-WHEELING DIODE
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERIZED AT 125 °C
- LARGE RBSOA
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING



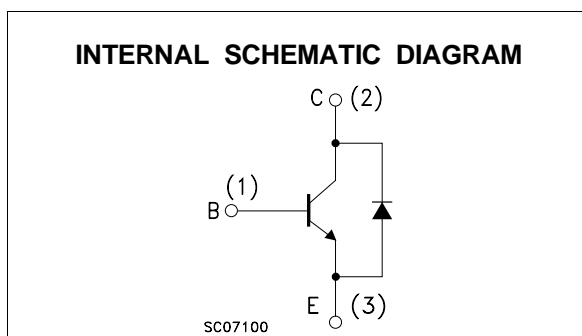
APPLICATIONS

- UP TO 120W ELECTRONIC TRANSFORMERS FOR HALOGEN LAMPS
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

The device is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability.

It uses a Cellular Emitter structure to enhance switching speeds.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|------------|--|------------|------|
| V_{CEV} | Collector-Emitter Voltage ($V_{BE} = -1.5V$) | 700 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | 400 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | 9 | V |
| I_C | Collector Current | 8 | A |
| I_{CM} | Collector Peak Current | 16 | A |
| I_B | Base Current | 4 | A |
| I_{BM} | Base Peak Current | 8 | A |
| P_{tot} | Total Dissipation at $T_c \leq 25\text{ }^\circ\text{C}$ | 36 | W |
| V_{isol} | Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink | 1500 | V |
| T_{stg} | Storage Temperature | -65 to 150 | °C |
| T_j | Max. Operating Junction Temperature | 150 | °C |

ST13007DFP

THERMAL DATA

| | | | | |
|-----------------------|-------------------------------------|-----|------|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 3.47 | °C/W |
| R _{thj-amb} | Thermal Resistance Junction-ambient | Max | 62.5 | °C/W |

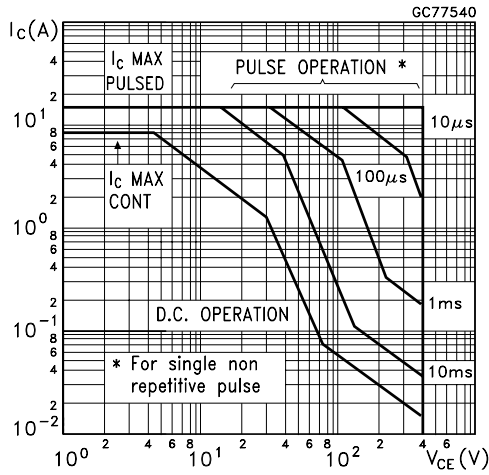
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|---|--|---------|------------|----------------------|------------------|
| I _{CES} | Collector Cut-off Current (V _{BE} = 0) | V _{CE} = 700 V V _{CE} = 700 V T _c = 100 °C | | | 10 0.5 | μA mA |
| I _{CEO} | Collector Cut-off Current (I _B = 0) | V _{CE} = 400 V | | | 100 | μA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 9 V | | | 100 | μA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 10 mA | 400 | | | V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 2 A I _B = 0.4 A I _C = 5 A I _B = 1 A I _C = 8 A I _B = 2 A I _C = 5 A I _B = 1 A T _c = 100 °C | | | 0.8 1.5 2 3 | V V V V |
| V _{BE(sat)*} | Base-Emitter Saturation Voltage | I _C = 2 A I _B = 0.4 A I _C = 5 A I _B = 1 A I _C = 5 A I _B = 1 A T _c = 100 °C | | | 1.2 1.6 1.5 | V V V |
| h _{FE*} | DC Current Gain | I _C = 2 A V _{CE} = 5 V I _C = 5 A V _{CE} = 5 V | 18 8 | | 40 25 | |
| V _f | Diode Forward Voltage | I _C = 3 A | | | 2.5 | V |
| t _s t _f | INDUCTIVE LOAD Storage Time Fall Time | I _C = 5 A V _{CL} = 250 V R _{BB} = 0Ω I _{B1} = 1 A V _{BE(off)} = -5 V L = 200 μH (see figure 1) | | 1.7 90 | 2.3 150 | μs ns |
| t _s t _f | INDUCTIVE LOAD Storage Time Fall Time | I _C = 5 A V _{CL} = 250 V R _{BB} = 0Ω I _{B1} = 1 A V _{BE(off)} = -5 V L = 200 μH T _C = 125 °C (see figure 1) | | 2.2 150 | | μs ns |

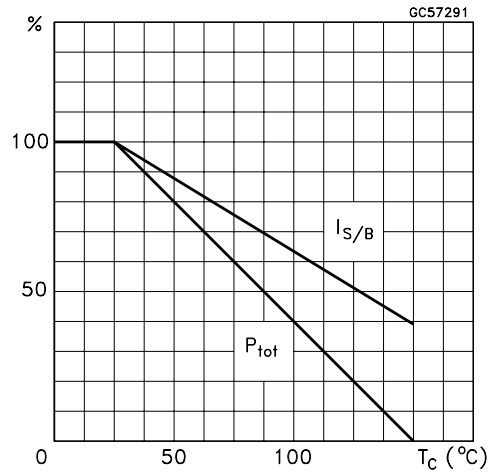
* Pulsed: Pulse duration = 300 μs, duty cycle 2 %.

ST13007DFP

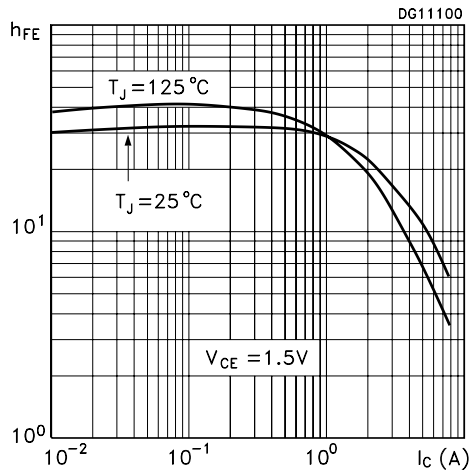
Safe Operating Area



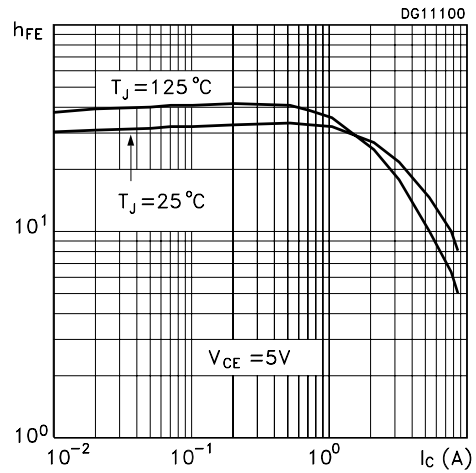
Derating Curve



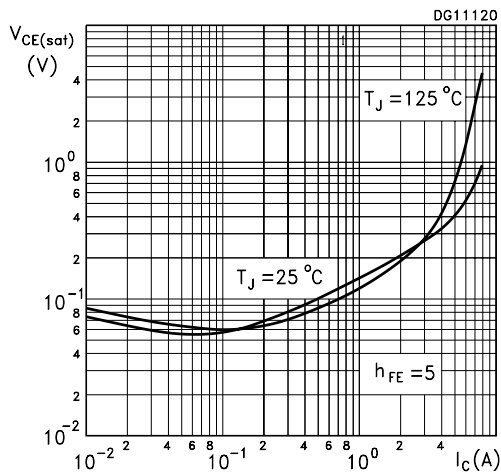
DC Current Gain



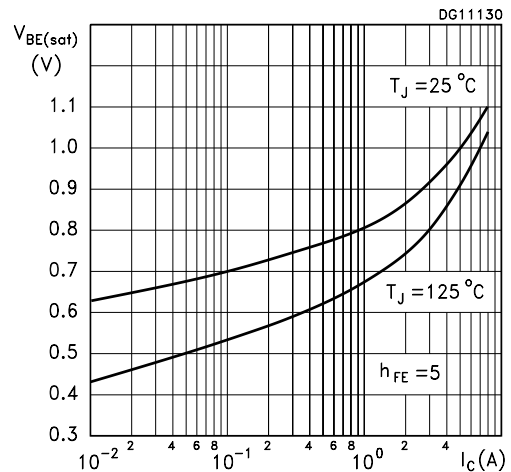
DC Current Gain



Collector Emitter Saturation Voltage

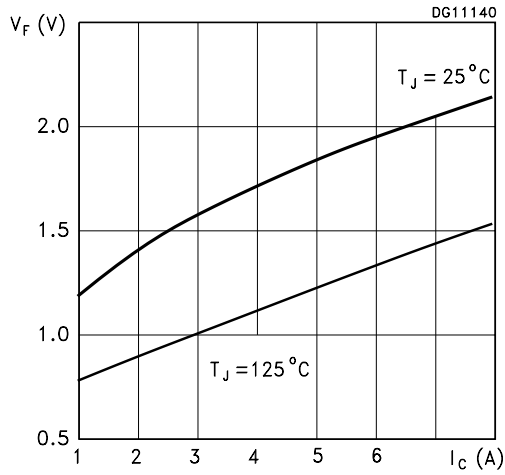


Base Emitter Saturation Voltage

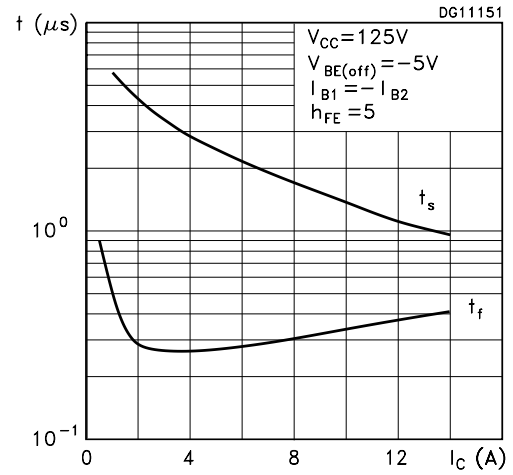


ST13007DFP

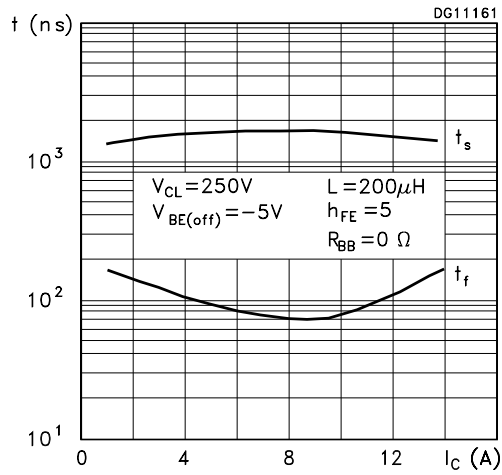
Diode Forward Voltage



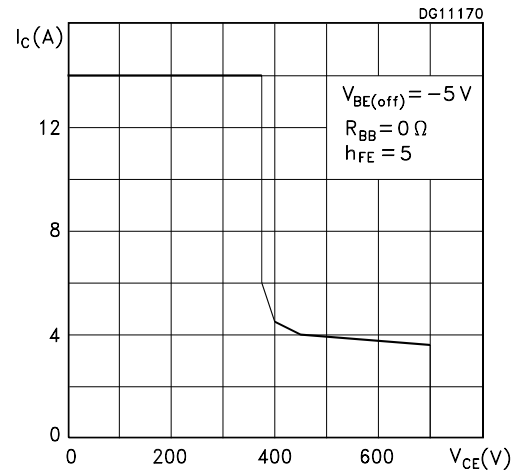
Switching Time Resistive Load



Switching Time Inductive Load



Reverse Biased SOA



ST13007DFP

Figure 1: Inductive Load Switching Test Circuit.

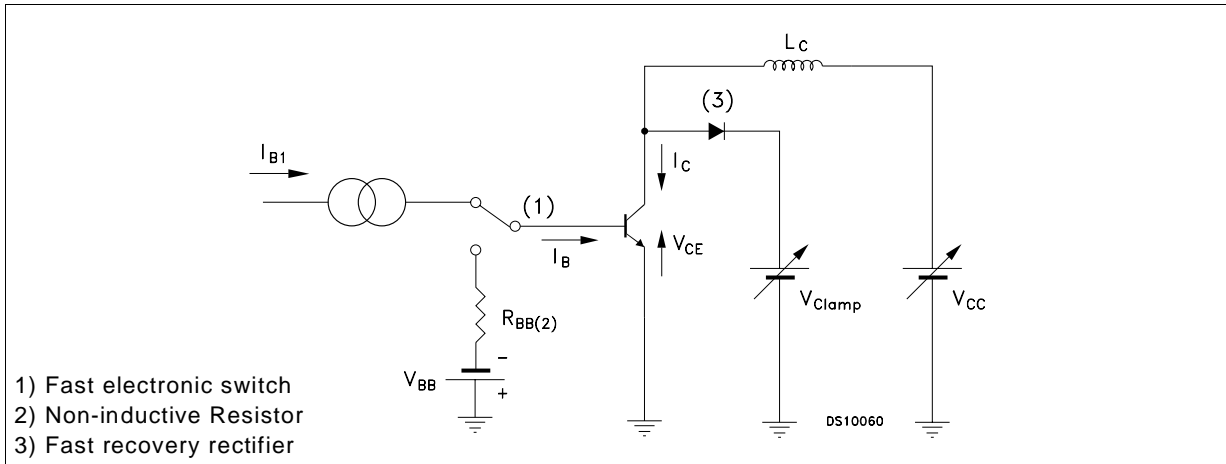
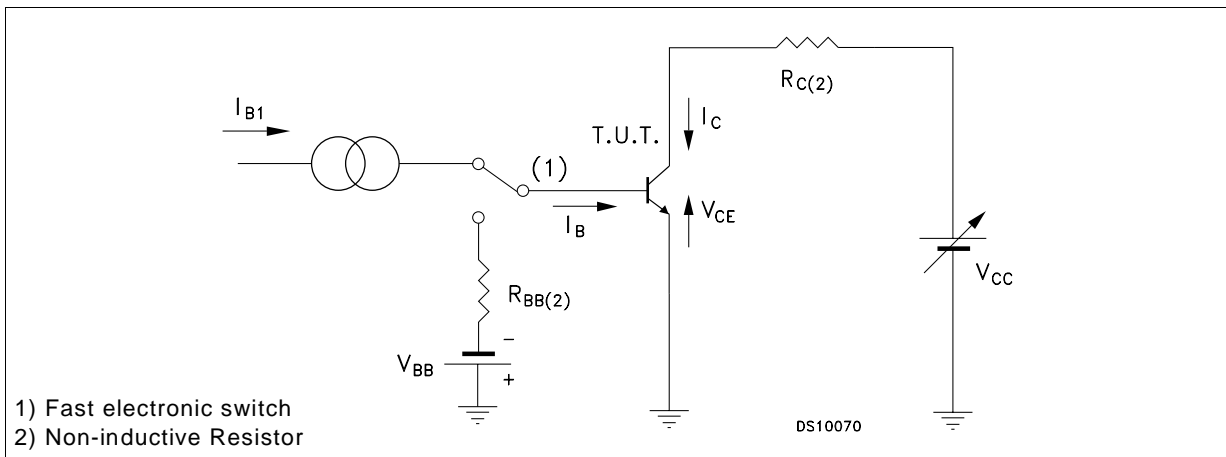


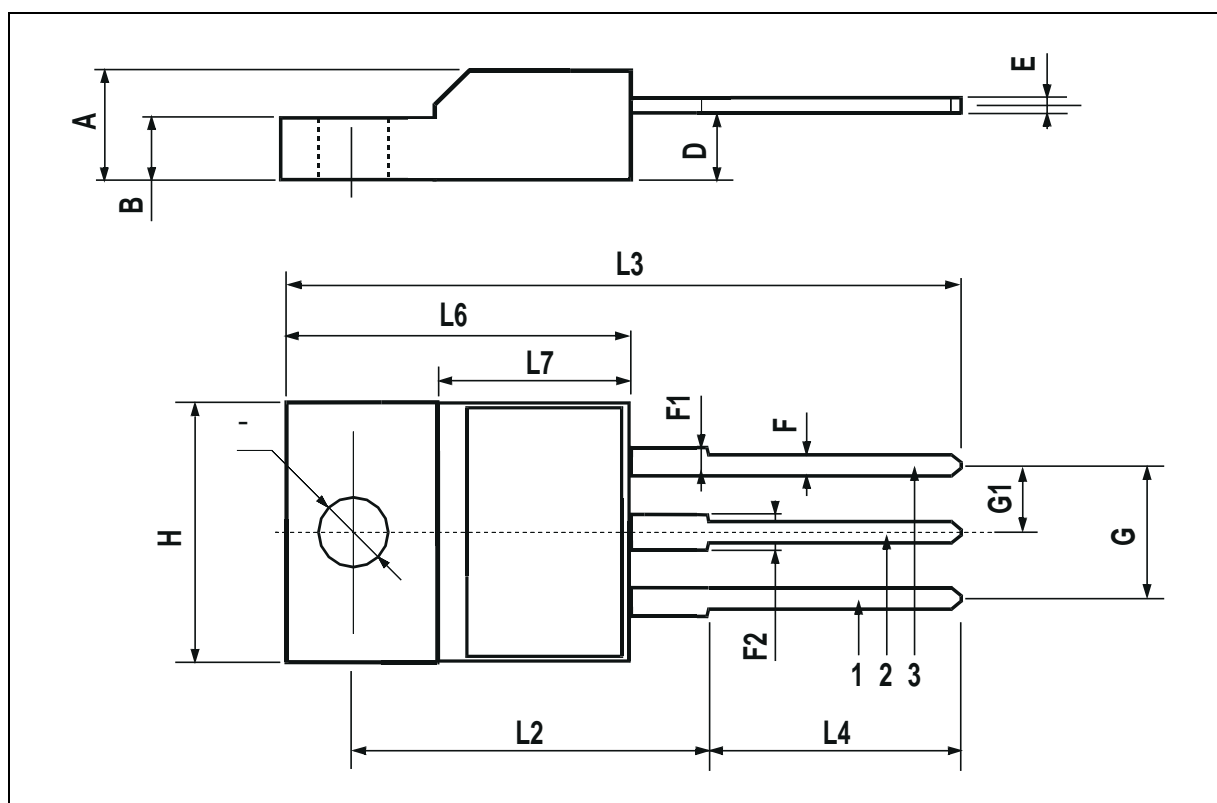
Figure 2: Resistive Load Switching Test Circuit.



ST13007DFP

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 |



ST13007DFP

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 2003 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>