



S2000AFI

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

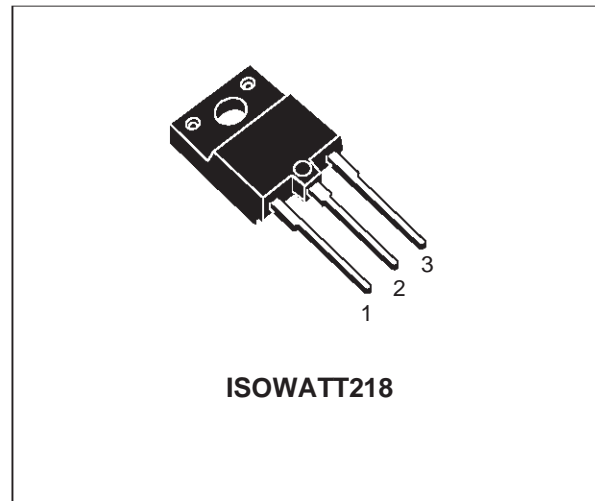
- STMicroelectronics PREFERRED SALESTYPE
- HIGH VOLTAGE CAPABILITY
- U.L. RECOGNISED ISOWATT218 PACKAGE (U.L. FILE # E81734 (N)).

APPLICATIONS:

- HORIZONTAL DEFLECTION FOR COLOUR TV

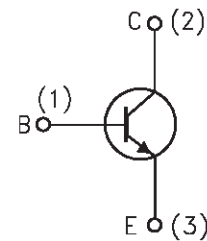
DESCRIPTION

The S2000AFI is manufactured using Multi-epitaxial Mesa technology for cost-effective high performance and uses a Hollow Emitter structure to enhance switching speeds.



ISOWATT218

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|------|
| V_{CES} | Collector-Emitter Voltage ($V_{BE} = 0$) | 1500 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | 700 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | 10 | V |
| I_C | Collector Current | 8 | A |
| I_{CM} | Collector Peak Current ($t_p < 5$ ms) | 15 | A |
| P_{tot} | Total Dissipation at $T_c = 25$ °C | 50 | W |
| T_{stg} | Storage Temperature | -65 to 150 | °C |
| T_j | Max. Operating Junction Temperature | 150 | °C |

S2000AFI

THERMAL DATA

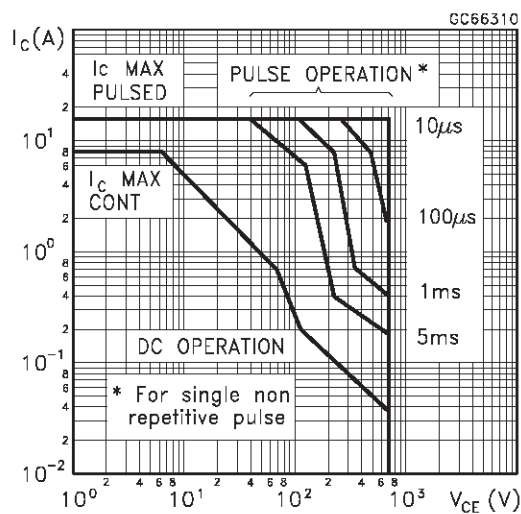
| | | | | |
|-----------------------|----------------------------------|-----|-----|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 2.5 | °C/W |
|-----------------------|----------------------------------|-----|-----|------|

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

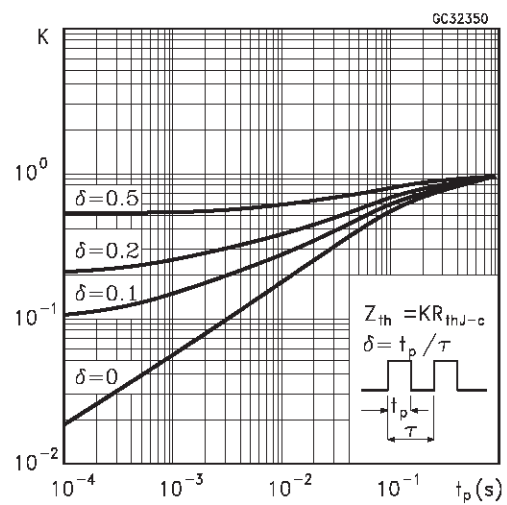
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|---|--|------|-----------|--------|----------|
| I _{CES} | Collector Cut-off Current (V _{BE} = 0) | V _{CE} = 1500 V V _{CE} = 1500 V | | | 1 2 | mA mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 100 | μA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 100 mA | 700 | | | V |
| V _{EBO} | Emitter Base Voltage (I _C = 0) | I _E = 10 mA | 10 | | | V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 4.5 A I _B = 2 A | | | 1 | V |
| V _{BE(sat)*} | Base-Emitter Saturation Voltage | I _C = 4.5 A I _B = 2 A | | | 1.3 | V |
| t _s t _f | INDUCTIVE LOAD Storage Time Fall Time | I _C = 4.5 A h _{FE} = 2.5 V _{CC} = 140 V L _C = 0.9 mH L _B = 3 μH | | 7 0.55 | | μs μs |
| f _T | Transition Frequency | I _C = 0.1 A V _{CE} = 5 V f = 5 MHz | | 7 | | MHz |

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

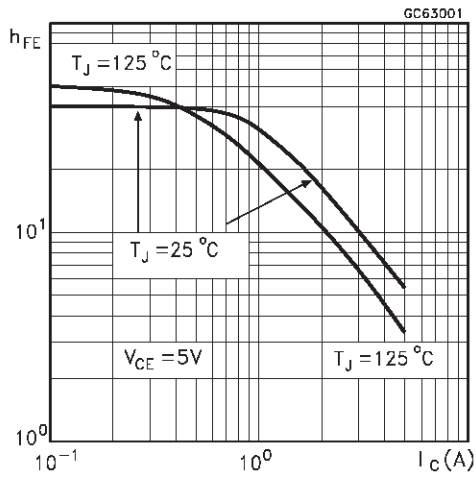
Safe Operating Area.



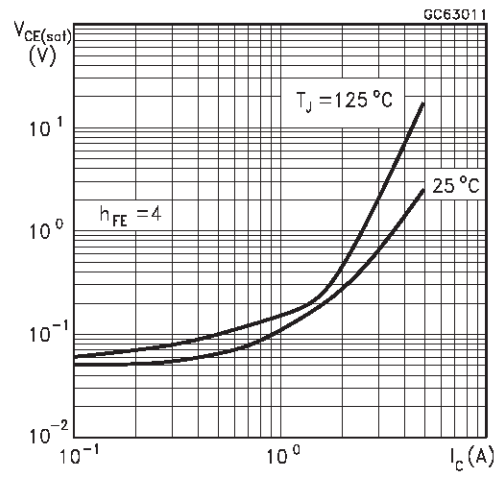
Thermal Impedance



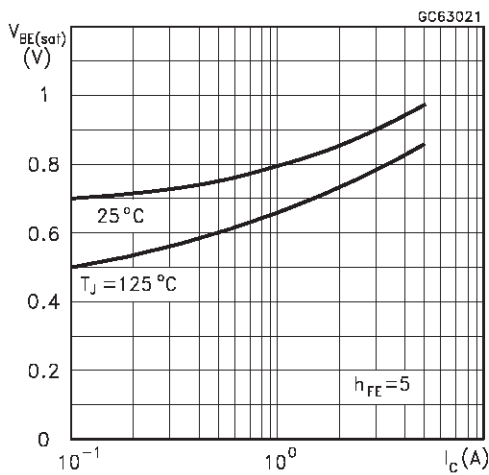
DC Current Gain



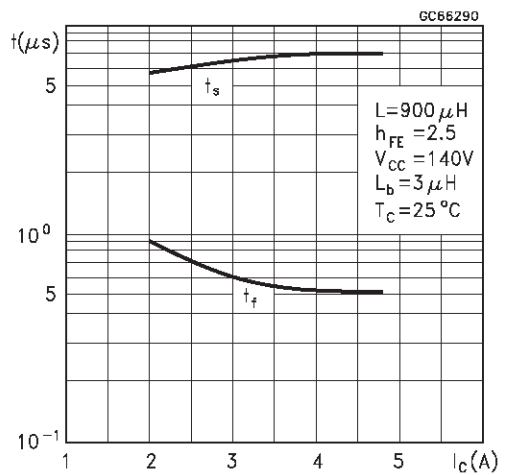
Collector Emitter Saturation Voltage



Base Emitter Saturation Voltage



Switching Time Inductive Load



Switching Time Inductive Load (see figure 1)

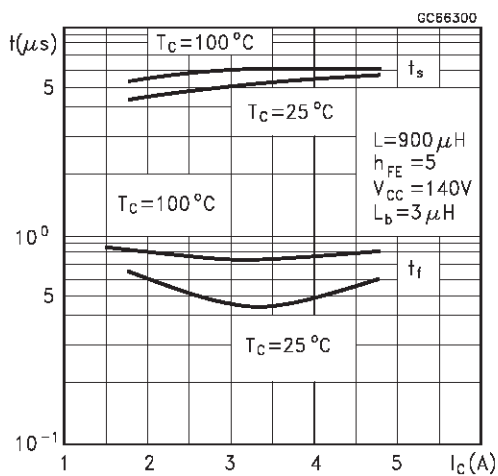
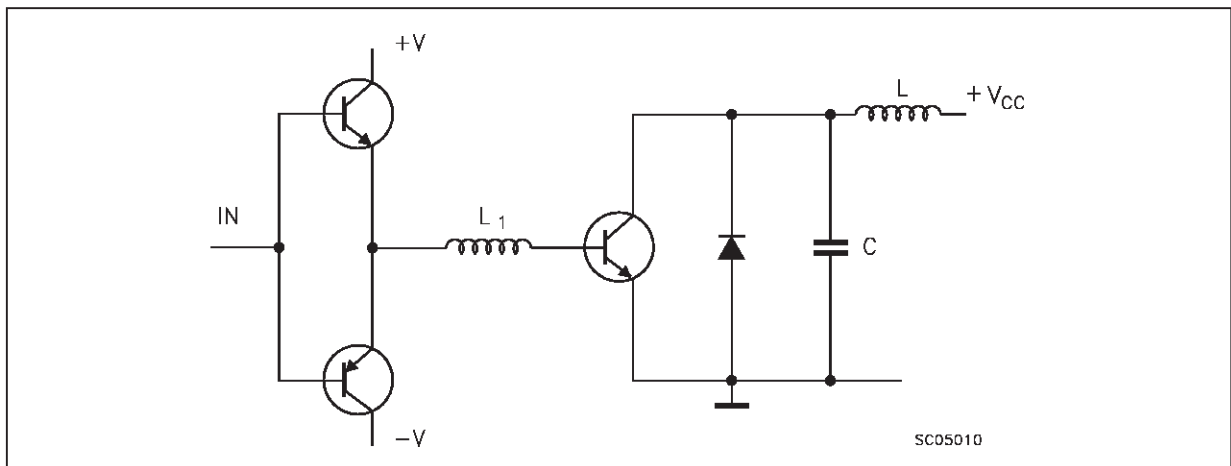
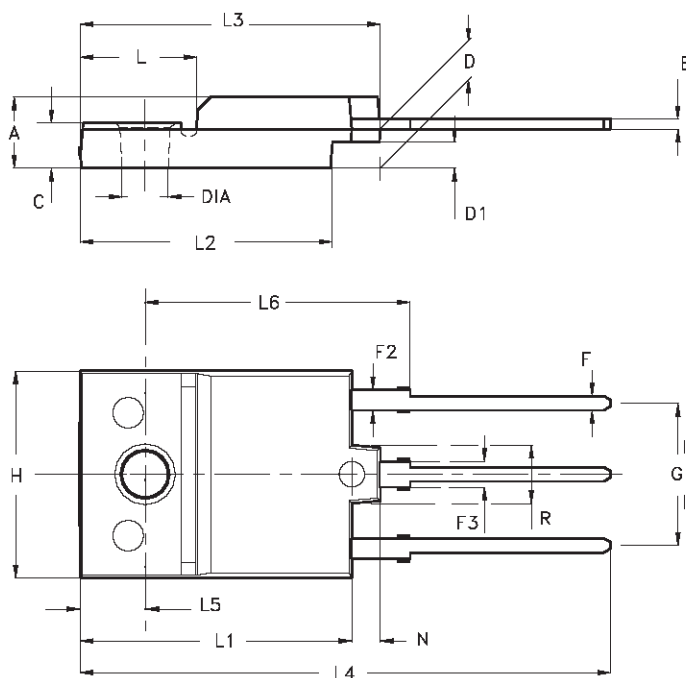


Figure 1: Inductive Load Switching Test Circuit.



ISOWATT218 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 5.35 | | 5.65 | 0.211 | | 0.222 |
| C | 3.30 | | 3.80 | 0.130 | | 0.150 |
| D | 2.90 | | 3.10 | 0.114 | | 0.122 |
| D1 | 1.88 | | 2.08 | 0.074 | | 0.082 |
| E | 0.75 | | 0.95 | 0.030 | | 0.037 |
| F | 1.05 | | 1.25 | 0.041 | | 0.049 |
| F2 | 1.50 | | 1.70 | 0.059 | | 0.067 |
| F3 | 1.90 | | 2.10 | 0.075 | | 0.083 |
| G | 10.80 | | 11.20 | 0.425 | | 0.441 |
| H | 15.80 | | 16.20 | 0.622 | | 0.638 |
| L | | 9 | | | 0.354 | |
| L1 | 20.80 | | 21.20 | 0.819 | | 0.835 |
| L2 | 19.10 | | 19.90 | 0.752 | | 0.783 |
| L3 | 22.80 | | 23.60 | 0.898 | | 0.929 |
| L4 | 40.50 | | 42.50 | 1.594 | | 1.673 |
| L5 | 4.85 | | 5.25 | 0.191 | | 0.207 |
| L6 | 20.25 | | 20.75 | 0.797 | | 0.817 |
| N | 2.1 | | 2.3 | 0.083 | | 0.091 |
| R | | 4.6 | | | 0.181 | |
| DIA | 3.5 | | 3.7 | 0.138 | | 0.146 |



- Weight : 4.9 g (typ.)

- Maximum Torque (applied to mounting flange) Recommended 0.8 Nm; Maximum: 1 Nm

- The side of the dissipator must be flat within 80 μ m

P025C/A

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

© 1999 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>