



ST2009DHI

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

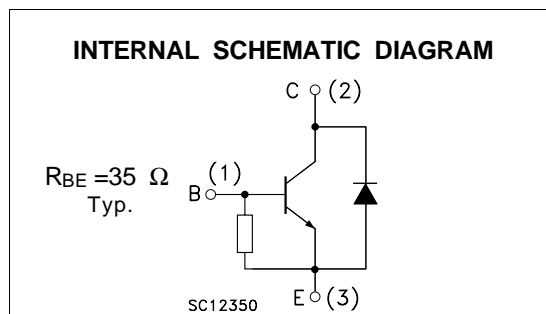
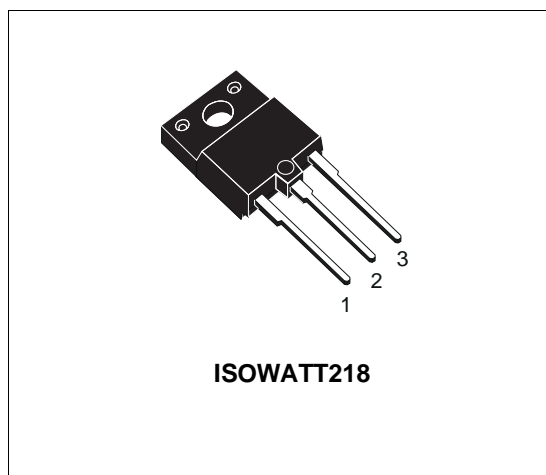
- NEW SERIES, ENHANCED PERFORMANCE
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING
- INTEGRATED FREE WHEELING DIODE
- HIGH VOLTAGE CAPABILITY
- HIGH SWITCHING SPEED
- TIGHTER h_{fe} CONTROL
- IMPROVED RUGGEDNESS

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_{CB0} | Collector-Base Voltage ($I_E = 0$) | 1500 | V |
| V_{CE0} | Collector-Emitter Voltage ($I_B = 0$) | 600 | V |
| V_{EB0} | Emitter-Base Voltage ($I_C = 0$) | 7 | V |
| I_C | Collector Current | 10 | A |
| I_{CM} | Collector Peak Current ($t_p < 5$ ms) | 20 | A |
| I_B | Base Current | 7 | A |
| P_{tot} | Total Dissipation at $T_c = 25^\circ\text{C}$ | 55 | 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

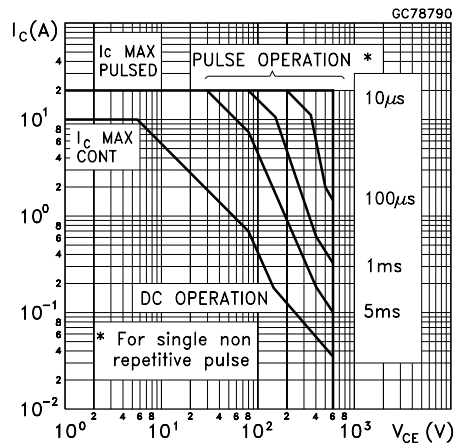
| | | | | |
|----------------|----------------------------------|-----|-----|---------------|
| $R_{thj-case}$ | Thermal Resistance Junction-case | Max | 2.3 | $^{\circ}C/W$ |
|----------------|----------------------------------|-----|-----|---------------|

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

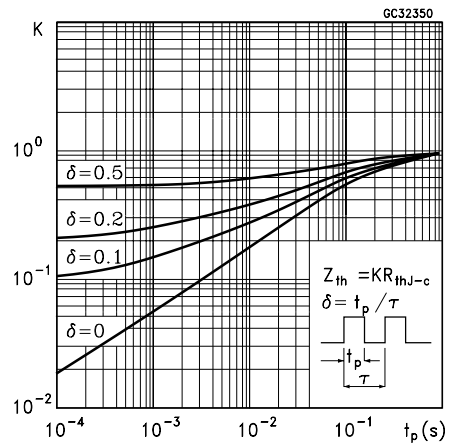
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------|---|--|------|-------------|-------------|--------------------|
| I_{CES} | Collector Cut-off Current ($V_{BE} = 0$) | $V_{CE} = 1500 V$ $V_{CE} = 1500 V$ $T_C = 125^{\circ}C$ | | | 1 2 | mA mA |
| I_{EBO} | Emitter Cut-off Current ($I_C = 0$) | $V_{EB} = 4 V$ | 70 | | 210 | mA |
| $V_{CE(sat)*}$ | Collector-Emitter Saturation Voltage | $I_C = 5 A$ $I_B = 1.25 A$ | | | 1.5 | V |
| $V_{BE(sat)*}$ | Base-Emitter Saturation Voltage | $I_C = 5 A$ $I_B = 1.25 A$ | | | 1.2 | V |
| h_{FE*} | DC Current Gain | $I_C = 1 A$ $V_{CE} = 5 V$ $I_C = 5 A$ $V_{CE} = 1 V$ $I_C = 5.5 A$ $V_{CE} = 5 V$ | 5 | 20 5 | 9 | |
| V_F | Diode Forward Voltage | $I_F = 5 A$ | | 1.5 | 2 | V |
| t_s t_f | INDUCTIVE LOAD Storage Time Fall Time | $I_C = 5 A$ $I_{B(on)(END)} = 1 A$ $L_{BB(off)} = 2 \mu H$ $V_{BE(off)} = -2.5 V$ $f = 32 KHz$ | | 2.6 0.28 | 3.2 0.55 | μs μs |

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

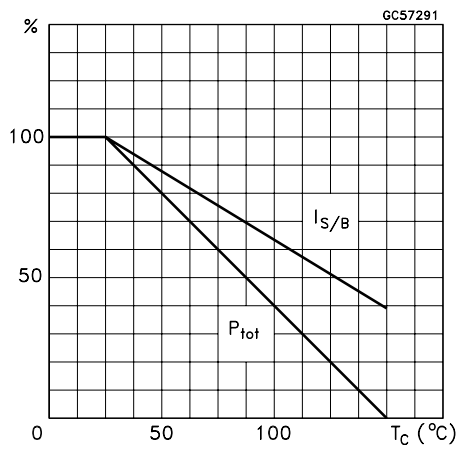
Safe Operating Area



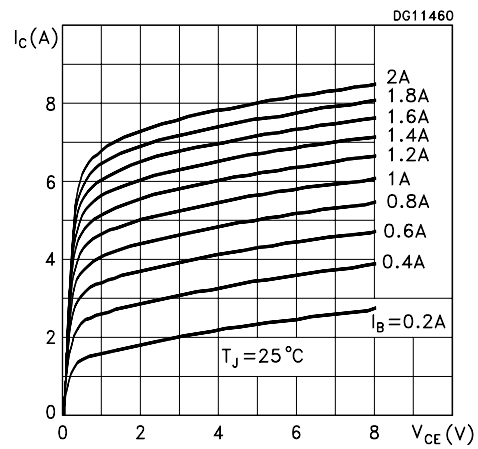
Thermal Impedance



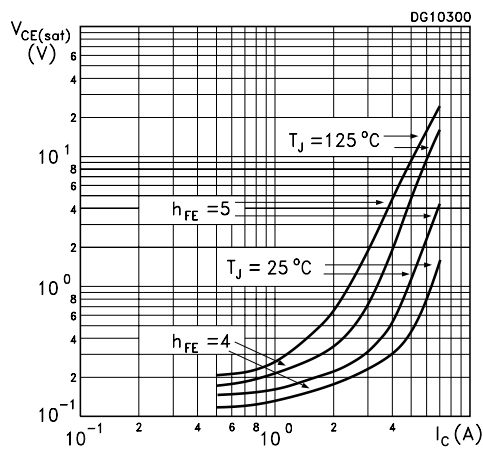
Derating Curve



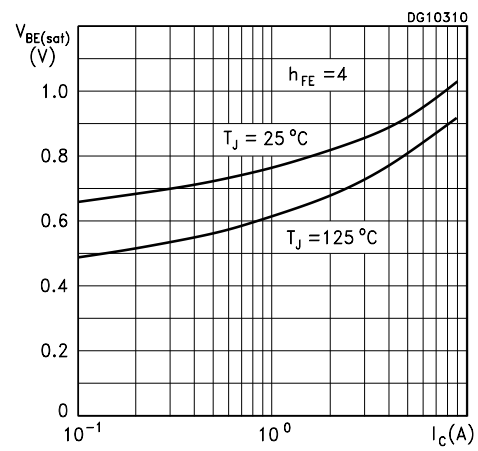
Output Characteristics



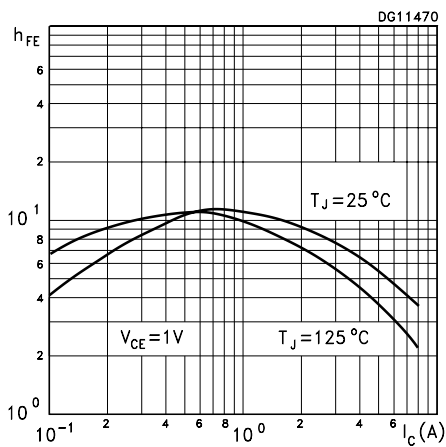
Collector Emitter Saturation Voltage



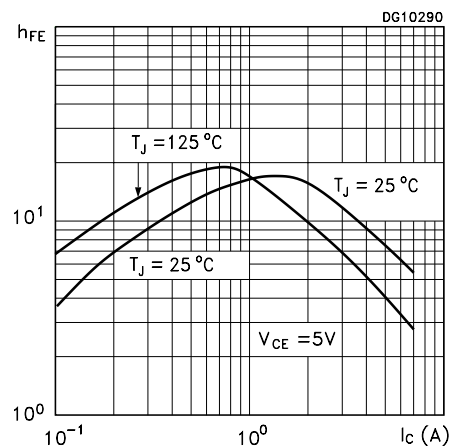
Base Emitter Saturation Voltage



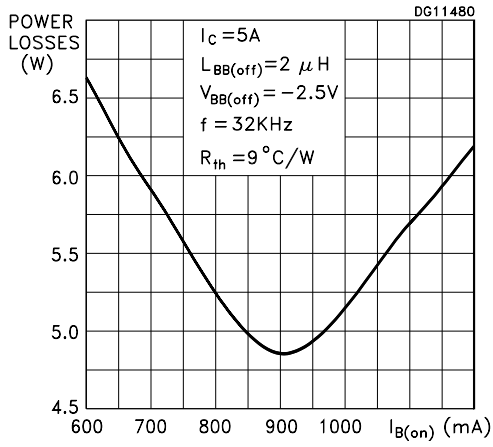
DC Current Gain



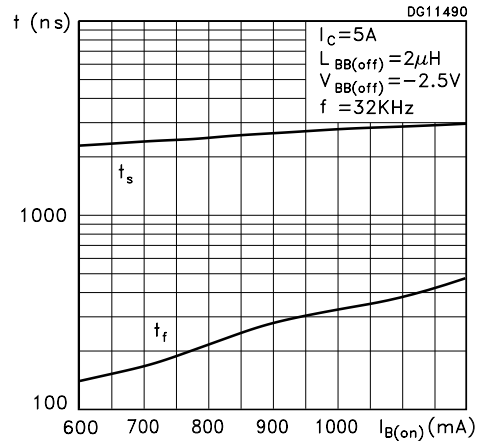
DC Current Gain



Power Losses



Switching Time Inductive Load



RBSOA

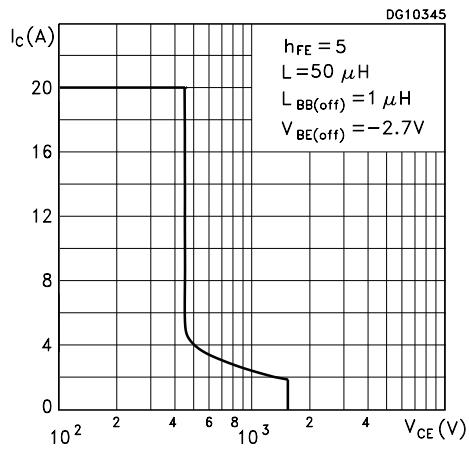
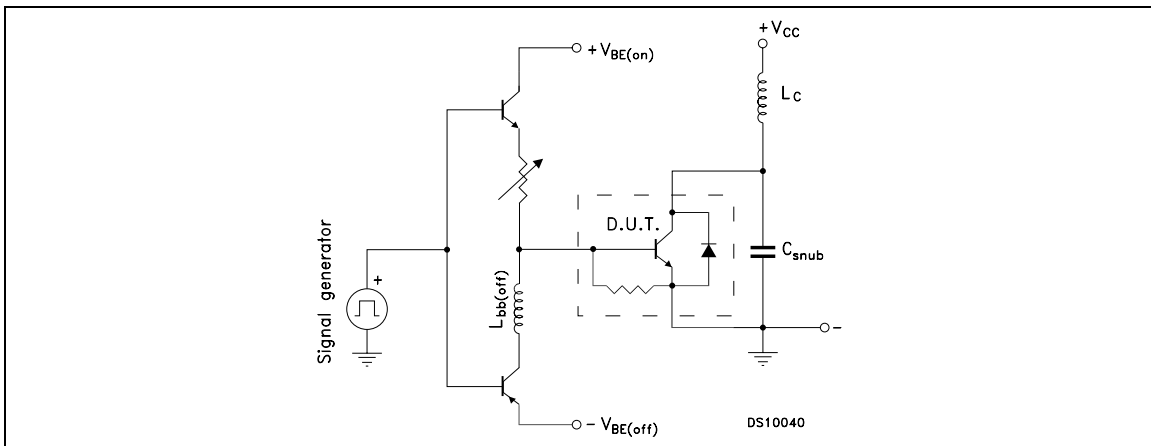
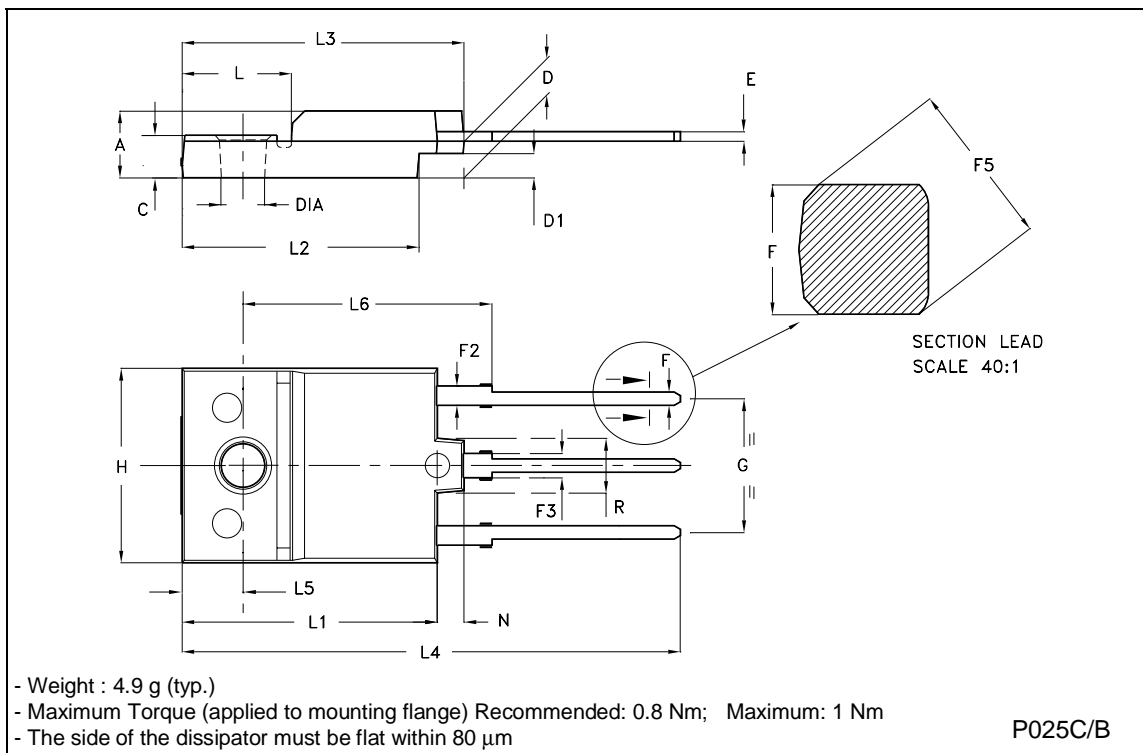


Figure 1: Inductive Load Switching Test Circuit.



ISOWATT218 NARROW LEADS 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 | 0.75 | | 0.95 | 0.030 | | 0.037 |
| F2 | 1.50 | | 1.70 | 0.059 | | 0.067 |
| F3 | 1.90 | | 2.10 | 0.075 | | 0.083 |
| F5 | | | 1.10 | | | 0.043 |
| 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 |



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