



THE DATASHEET OF ST2310FX





ST2310FX

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- n NEW SERIES, ENHANCED PERFORMANCE
- n FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING
- n HIGH VOLTAGE CAPABILITY (1500 V)
- n HIGH SWITCHING SPEED
- n TIGHTER h_{fe} CONTROL
- n IMPROVED RUGGEDNESS

APPLICATION

- n HORIZONTAL DEFLECTION FOR MONITORS 17 " AND HIGH END 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.

Figure 1: Package

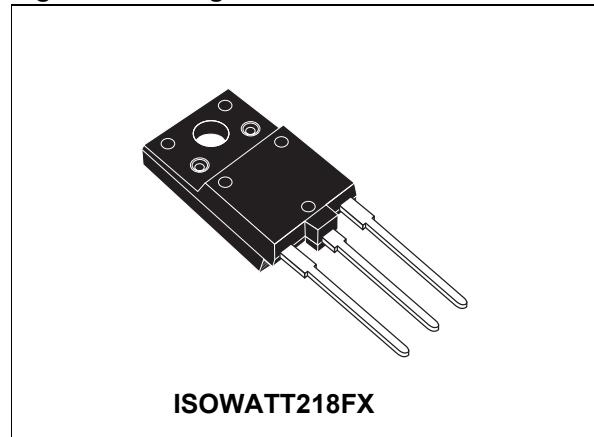


Figure 2: Internal Schematic Diagram

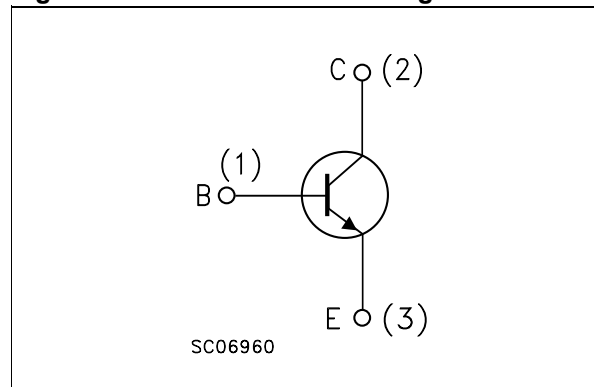


Table 1: Order Code

| Part Number | Marking | Package | Packaging |
|-------------|---------|--------------|-----------|
| ST2310FX | 2310FX | ISOWATT218FX | TUBE |

Table 2: Absolute Maximum Ratings

| Symbol | Parameter | Value | Unit |
|------------|--|------------|------------------|
| V_{CES} | Collector-Emitter Voltage ($V_{BE} = 0$) | 1500 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | 600 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | 7 | V |
| I_C | Collector Current | 12 | A |
| I_{CM} | Collector Peak Current ($t_p < 5ms$) | 25 | A |
| I_B | Base Current | 7 | A |
| P_{tot} | Total Dissipation at $T_C = 25\text{ }^\circ\text{C}$ | 65 | 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 | $^\circ\text{C}$ |

Table 3: Thermal Data

| Symbol | Parameter | Unit |
|----------------|--------------------------------------|------------------------|
| $R_{thj-case}$ | Thermal Resistance Junction-Case Max | 1.9 $^\circ\text{C/W}$ |

Table 4: Electrical Characteristics ($T_{case} = 25\text{ }^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--|--|------|-------------|-----------|--------------------------------|
| I_{CES} | Collector Cut-off Current ($V_{BE} = 0$) | $V_{CE} = 1500\text{ V}$ | | | 1 | mA |
| | | $V_{CE} = 1500\text{ V}$ $T_J = 125\text{ }^\circ\text{C}$ | | | 2 | mA |
| I_{EBO} | Emitter Cut-off Current ($I_C = 0$) | $V_{EB} = 7\text{ V}$ | | | 1 | mA |
| $V_{CE(sus)}^*$ | Collector-Emitter Sustaining Voltage ($I_B = 0$) | $I_C = 100\text{ mA}$ $L = 25\text{ mH}$ | 600 | | | V |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage | $I_C = 7\text{ A}$ $I_B = 1.75\text{ A}$ | | | 3 | V |
| $V_{BE(sat)}^*$ | Base-Emitter Saturation Voltage | $I_C = 7\text{ A}$ $I_B = 1.75\text{ A}$ | | | 1.1 | V |
| h_{FE}^* | DC Current Gain | $I_C = 1\text{ A}$ $V_{CE} = 5\text{ V}$ | | 25 | | |
| | | $I_C = 7\text{ A}$ $V_{CE} = 1\text{ V}$ | | 5.5 | | |
| | | $I_C = 7\text{ A}$ $V_{CE} = 5\text{ V}$ | 6.5 | | 9.5 | |
| t_s t_f | INDUCTIVE LOAD Storage Time Fall Time | $I_C = 6\text{ A}$ $f_h = 64\text{ KHz}$ | | | | |
| | | $I_{B(on)} = 1\text{ A}$ $V_{BE(off)} = -2.5\text{ V}$ $L_{BB(off)} = 1.3\text{ }\mu\text{H}$ (see figure 14) | | 2.3 0.16 | 3 0.35 | μs μs |

* Pulsed: Pulsed duration = 300 μs , duty cycle $\leq 1.5\%$.

Figure 3: Safe Operating Area

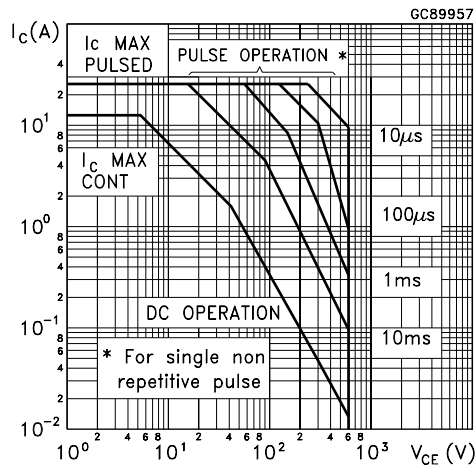


Figure 4: Derating Curve

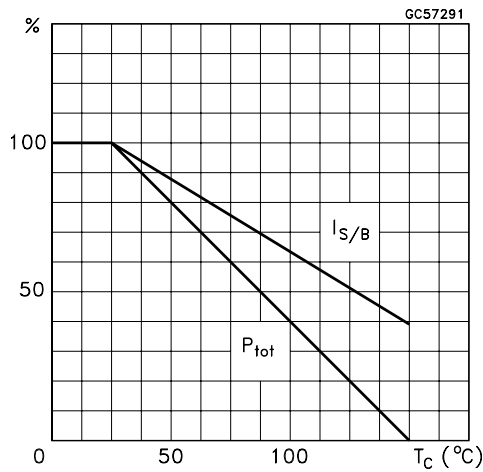


Figure 5: Collector-Emitter Saturation Voltage

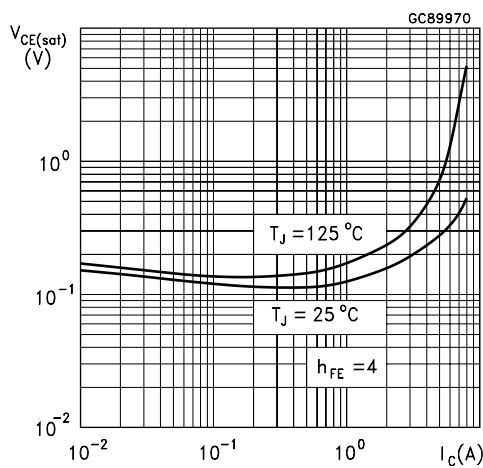


Figure 6: Thermal Impedance

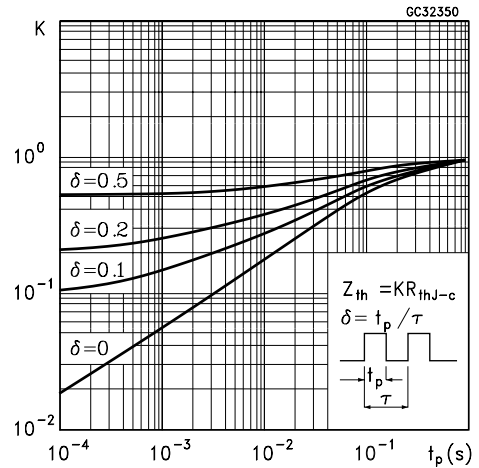


Figure 7: Output Characteristics

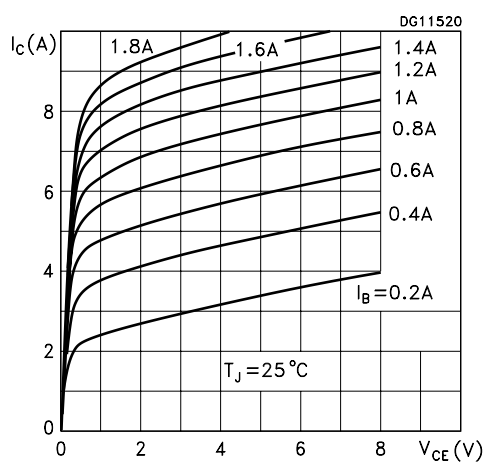


Figure 8: Base-Emitter Saturation Voltage

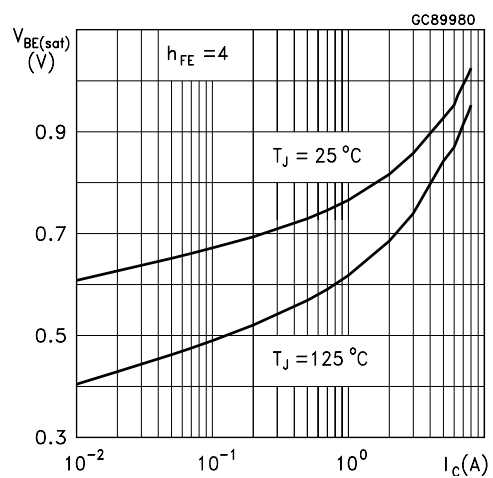


Figure 9: DC Current Gain

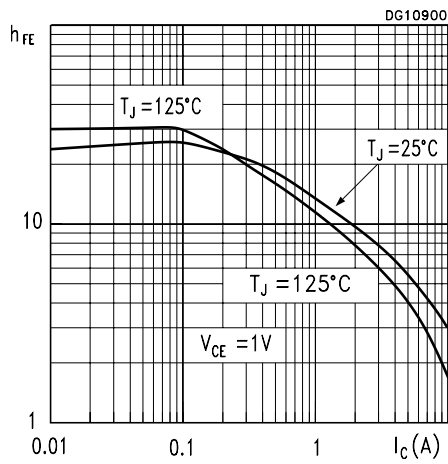


Figure 10: Power Losses

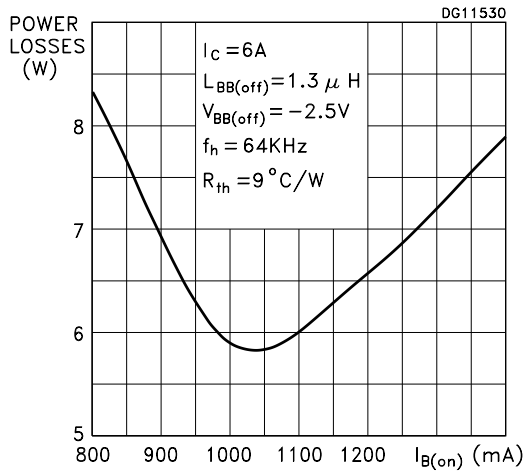


Figure 11: Reverse Biased Safe Operating Area

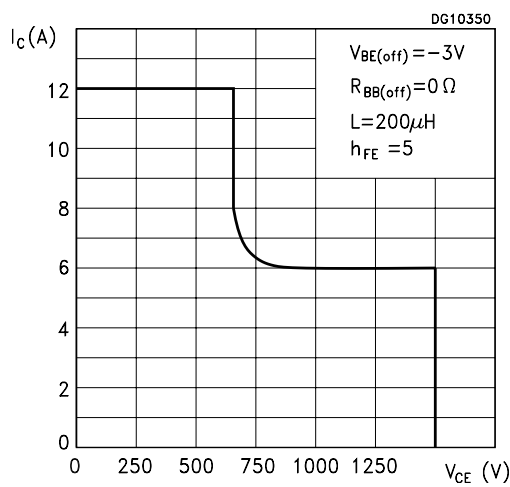


Figure 12: DC Current Gain

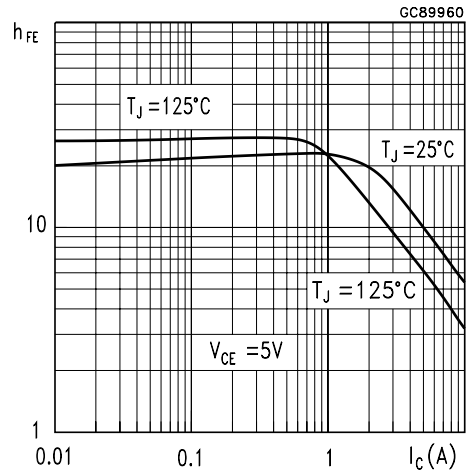


Figure 13: Switching Time Inductive Load

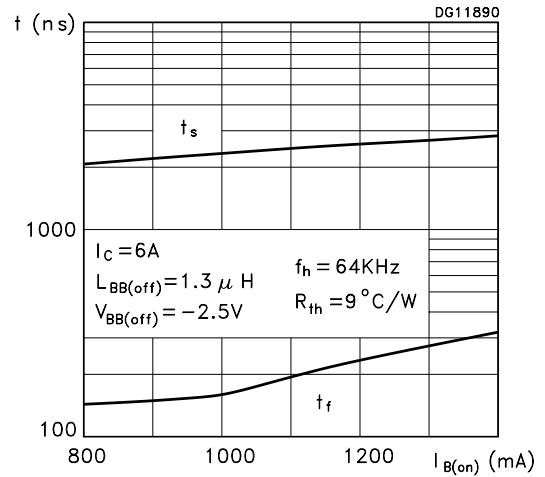
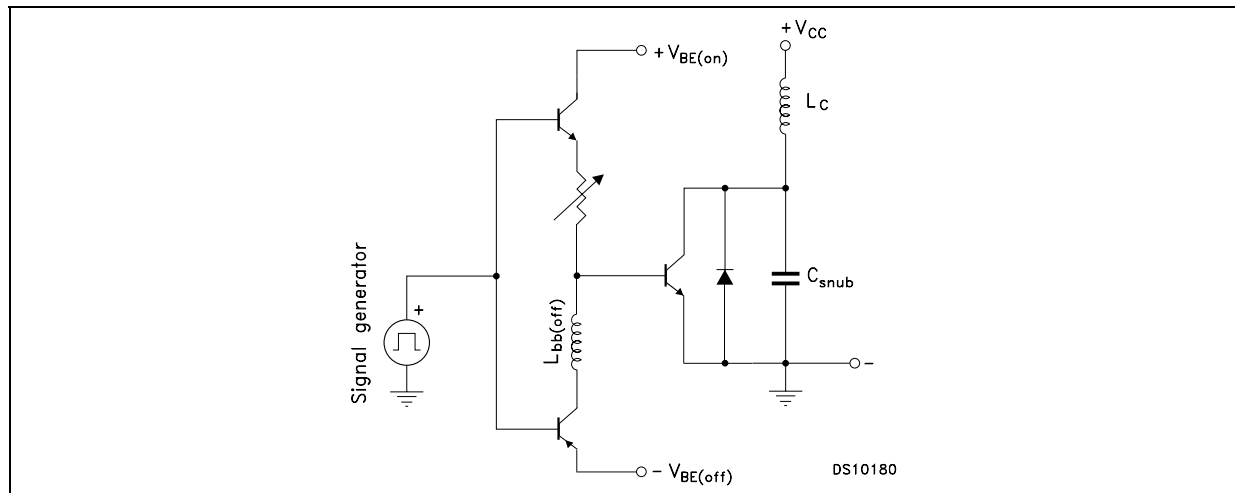


Figure 14: Inductive Load Switching test Circuit



ISOWATT218FX MECHANICAL DATA

| DIM. | mm. | | |
|------|-------|------|-------|
| | MIN. | TYP | MAX. |
| A | 5.30 | | 5.70 |
| C | 2.80 | | 3.20 |
| D | 3.10 | | 3.50 |
| D1 | 1.80 | | 2.20 |
| E | 0.80 | | 1.10 |
| F | 0.65 | | 0.95 |
| F2 | 1.80 | | 2.20 |
| G | 10.30 | | 11.50 |
| G1 | | 5.45 | |
| H | 15.30 | | 15.70 |
| L | 9 | | 10.20 |
| L2 | 22.80 | | 23.20 |
| L3 | 26.30 | | 26.70 |
| L4 | 43.20 | | 44.40 |
| L5 | 4.30 | | 4.70 |
| L6 | 24.30 | | 24.70 |
| L7 | 14.60 | | 15 |
| N | 1.80 | | 2.20 |
| R | 3.80 | | 4.20 |
| Dia | 3.40 | | 3.80 |

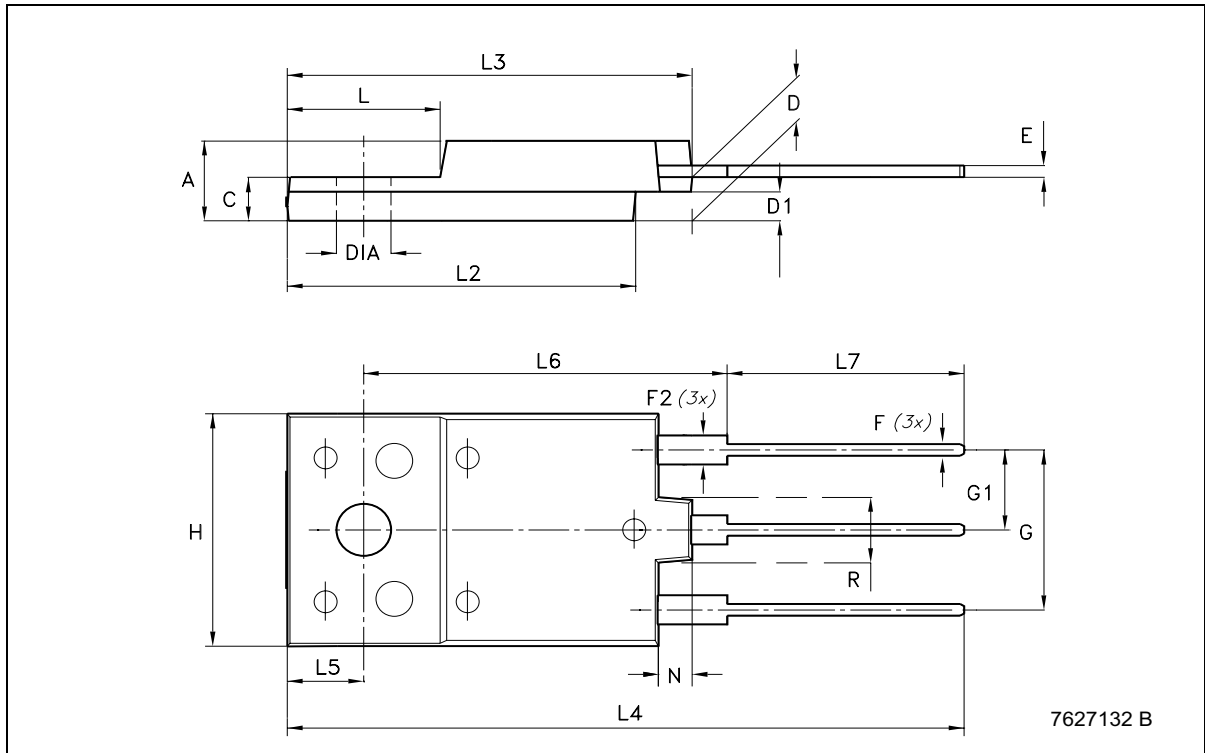


Table 5: Revision History

| Date | Release | Change Designator |
|-------------|----------------|-----------------------------------|
| 01-Jul-2004 | 1 | First Release. |
| 08-Feb-2005 | 2 | Table 1 has been added on page 1. |

ST2310FX

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