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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

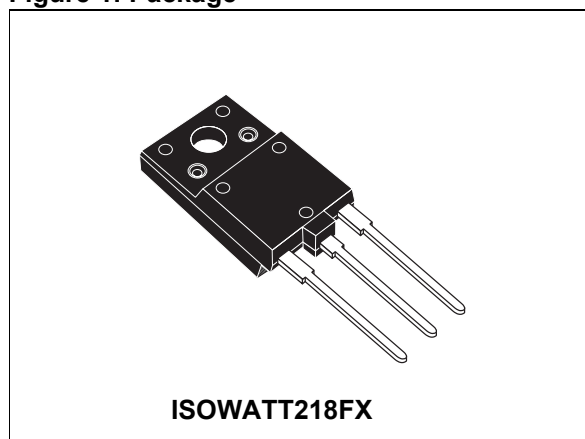


Figure 2: Internal Schematic Diagram

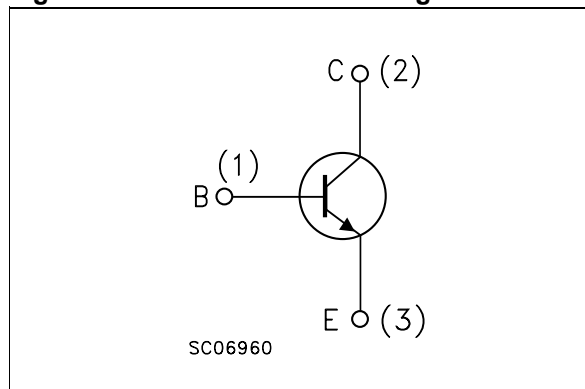


Table 1: Order Code

Part Number	Marking	Package	Packaging
ST2310FX	2310FX	ISOWATT218FX	TUBE

ST2310FX

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	$^{\circ}\text{C/W}$

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 ($V_{BE} = 0$)	$V_{CE} = 1500\text{ V}$ $V_{CE} = 1500\text{ V}$ $T_J = 125\text{ }^{\circ}\text{C}$			1 2	mA 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	$I_C = 1\text{ A}$ $V_{CE} = 5\text{ V}$ $I_C = 7\text{ A}$ $V_{CE} = 1\text{ V}$ $I_C = 7\text{ A}$ $V_{CE} = 5\text{ V}$	6.5	25 5.5	9.5	
t_s	Storage Time	$I_C = 6\text{ A}$ $f_h = 64\text{ KHz}$ $I_{B(on)} = 1\text{ A}$ $V_{BE(off)} = -2.5\text{ V}$		2.3	3	μs
t_f	Fall Time	$L_{BB(off)} = 1.3\text{ }\mu\text{H}$ (see figure 14)		0.16	0.35	μs

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

ST2310FX

Figure 3: Safe Operating Area

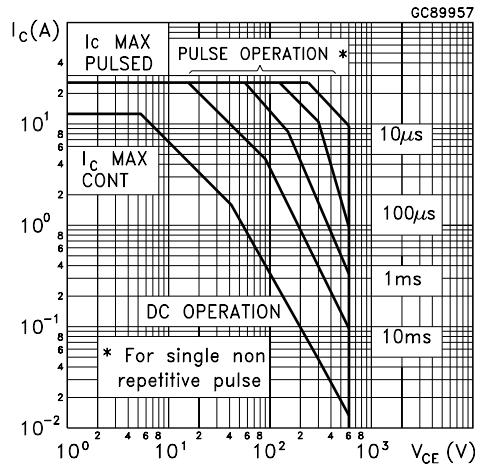


Figure 4: Derating Curve

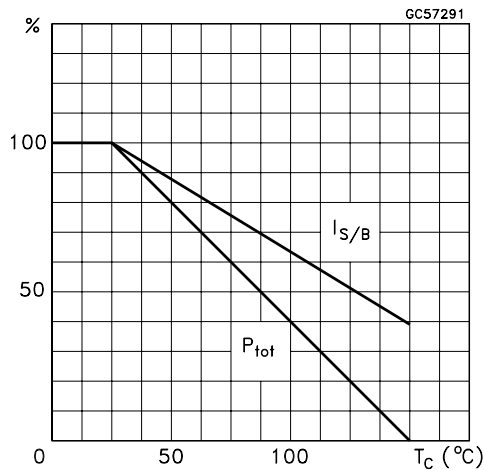


Figure 5: Collector-Emitter Saturation Voltage

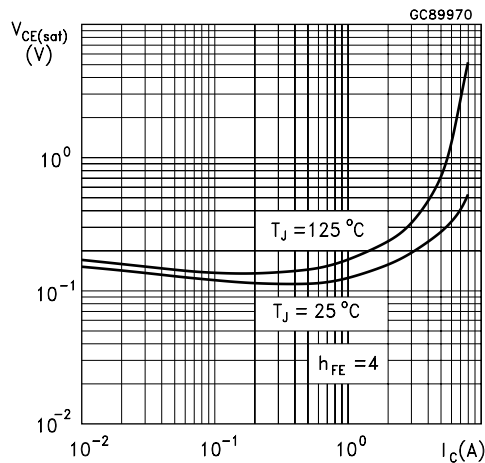


Figure 6: Thermal Impedance

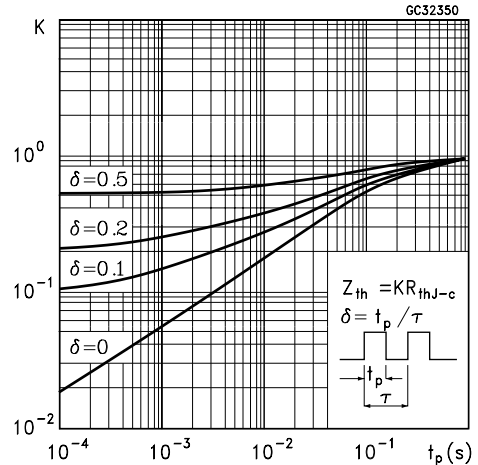


Figure 7: Output Characteristics

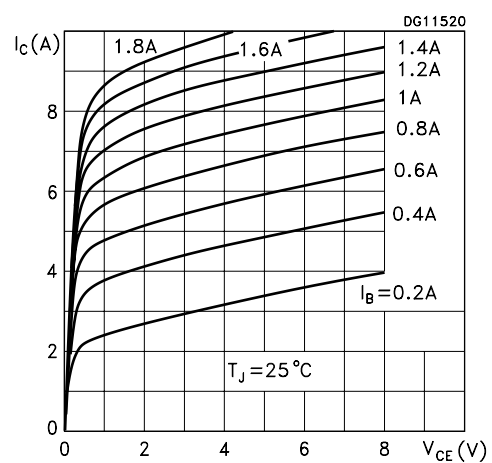
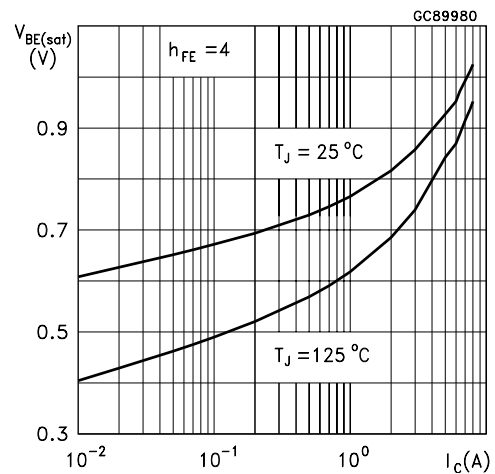


Figure 8: Base-Emitter Saturation Voltage



ST2310FX

Figure 9: DC Current Gain

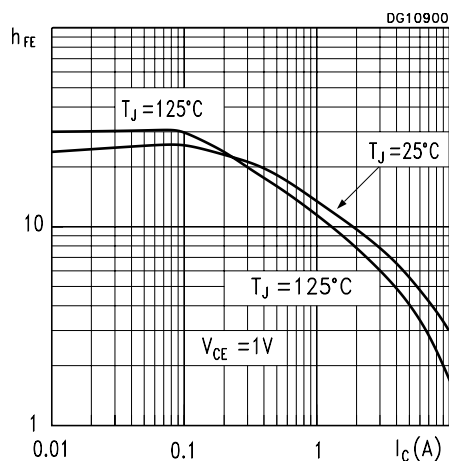


Figure 10: Power Losses

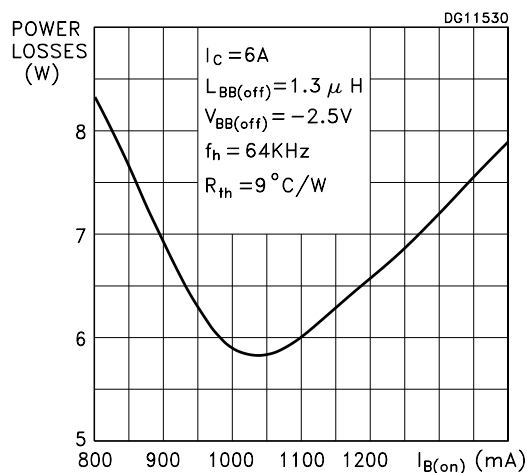


Figure 11: Reverse Biased Safe Operating Area

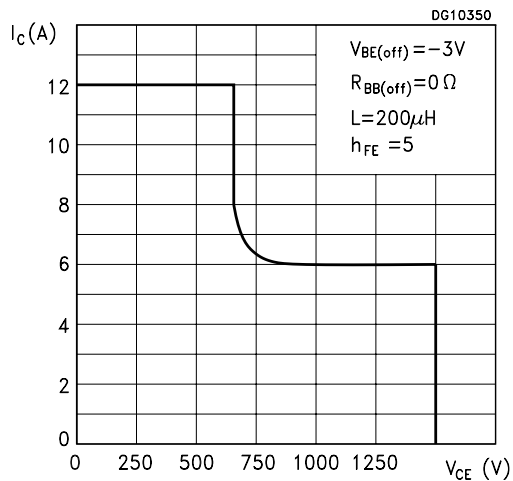


Figure 12: DC Current Gain

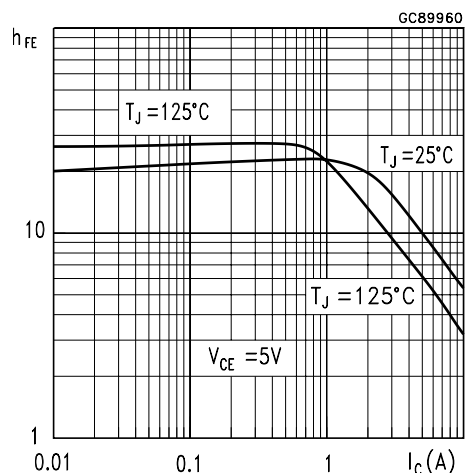
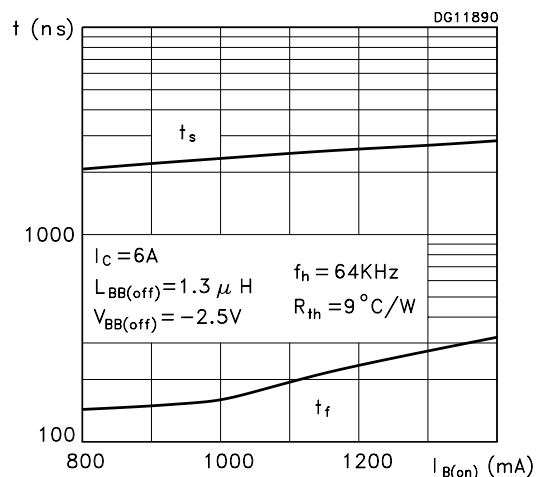
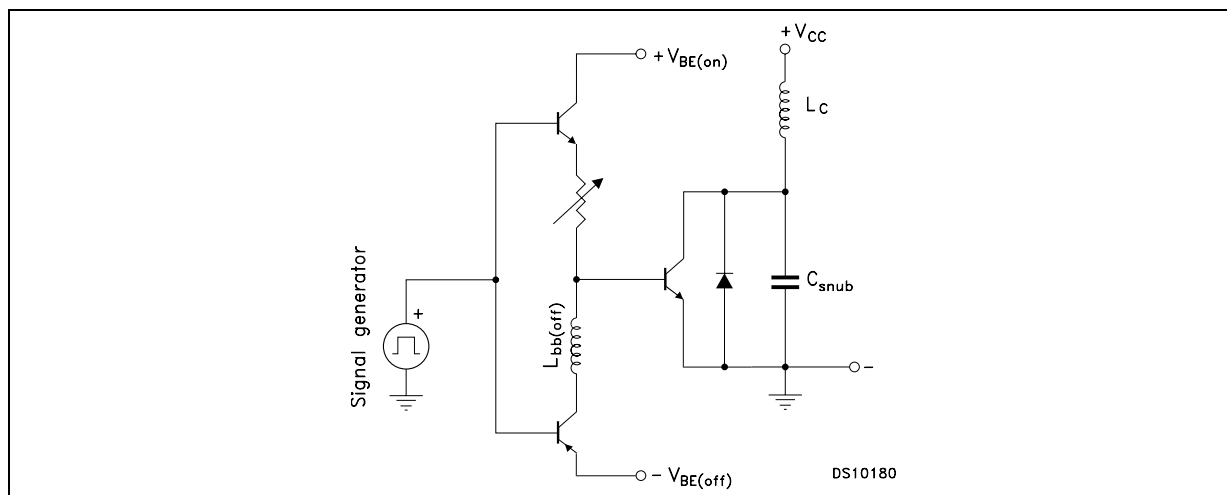


Figure 13: Switching Time Inductive Load



ST2310FX

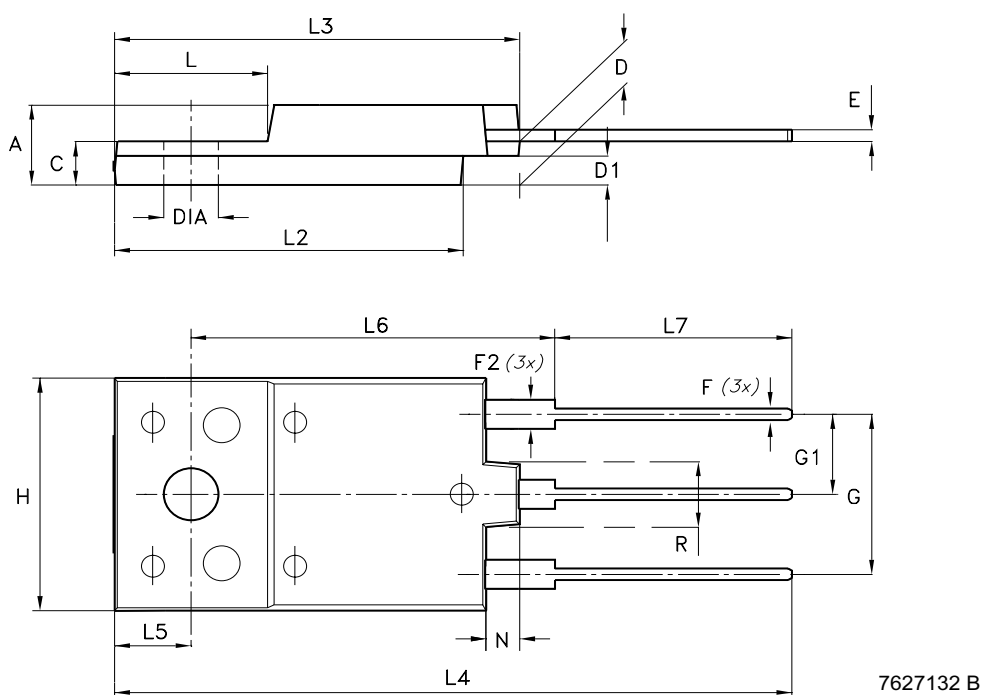
Figure 14: Inductive Load Switching test Circuit



ST2310FX

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



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ST2310FX

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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