



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

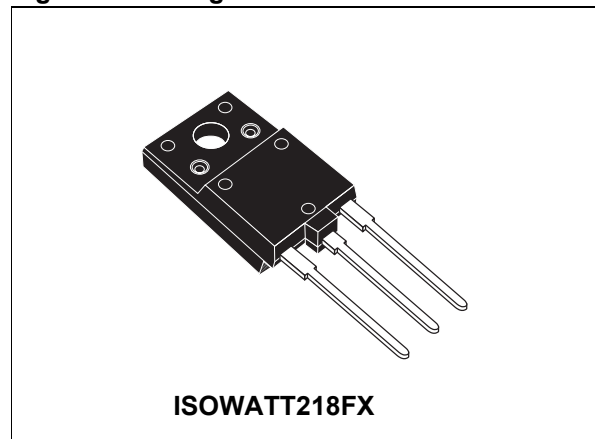


Figure 2: Internal Schematic Diagram

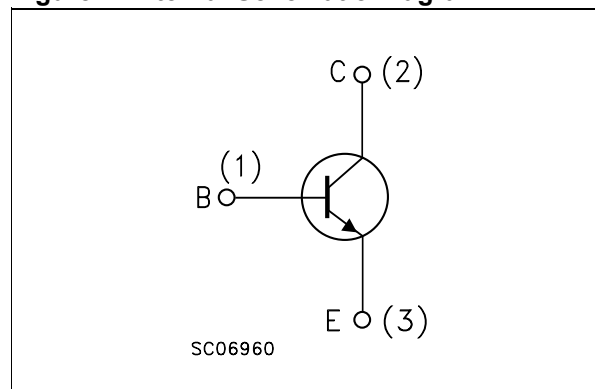


Table 1: Order Code

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	Value	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	INDUCTIVE LOAD Storage Time	$I_C = 6\text{ A}$ $f_h = 64\text{ KHz}$				
t_f	Fall Time	$I_{B(on)} = 1\text{ A}$ $V_{BE(off)} = -2.5\text{ V}$		2.3	3	μs
		$L_{BB(off)} = 1.3\text{ }\mu\text{H}$ (see figure 14)		0.16	0.35	μs

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

Figure 3: Safe Operating Area

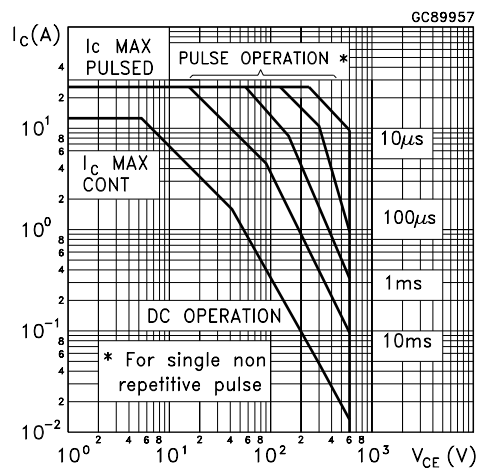


Figure 4: Derating Curve

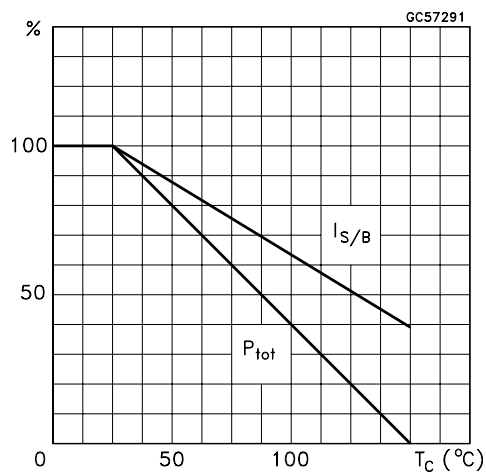


Figure 5: Collector-Emitter Saturation Voltage

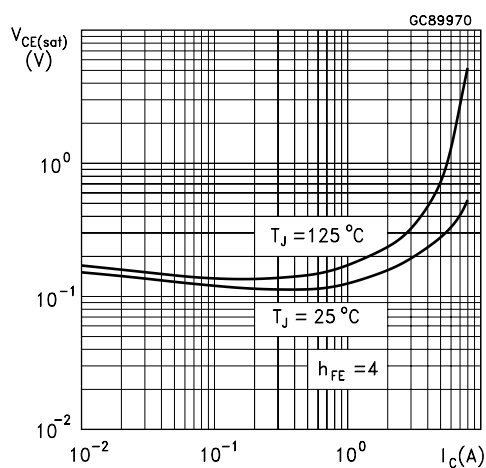


Figure 6: Thermal Impedance

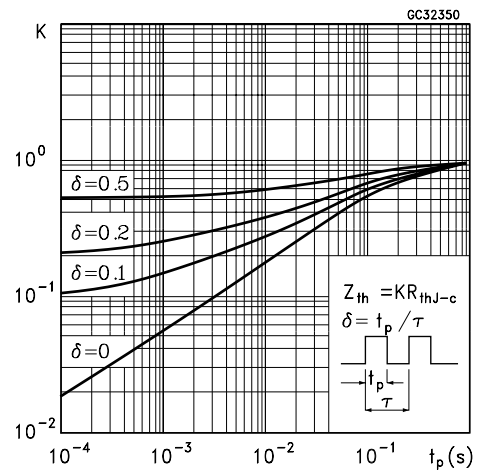


Figure 7: Output Characteristics

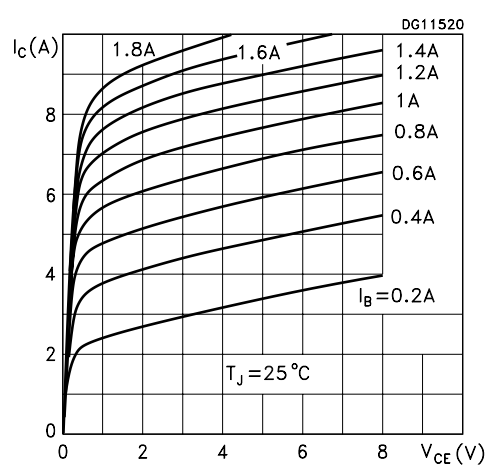


Figure 8: Base-Emitter Saturation Voltage

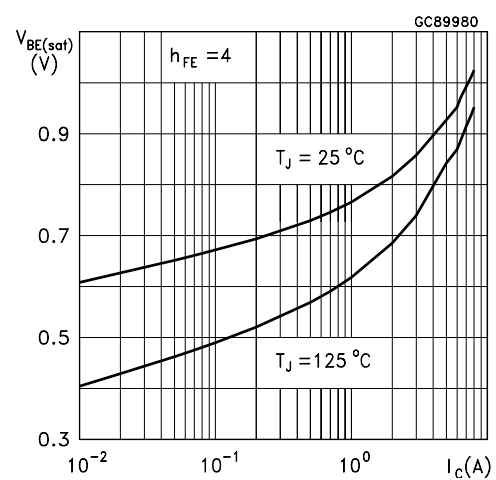


Figure 9: DC Current Gain

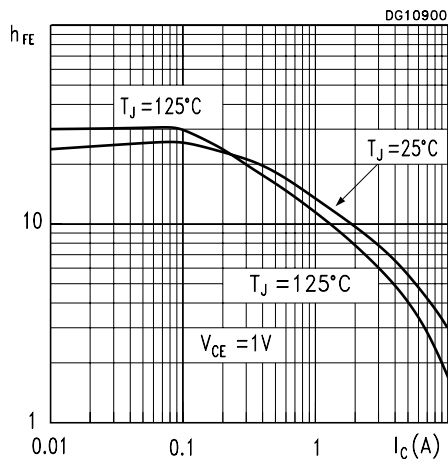


Figure 10: Power Losses

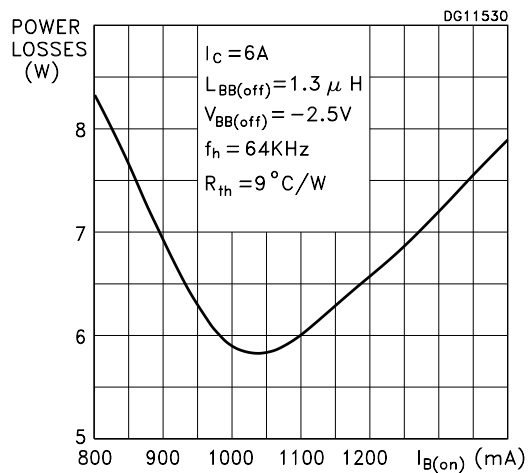


Figure 11: Reverse Biased Safe Operating Area

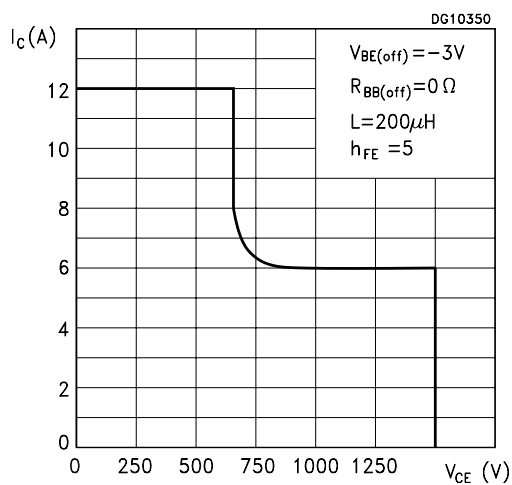


Figure 12: DC Current Gain

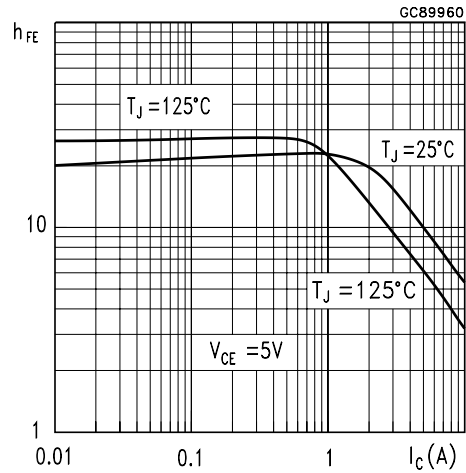


Figure 13: Switching Time Inductive Load

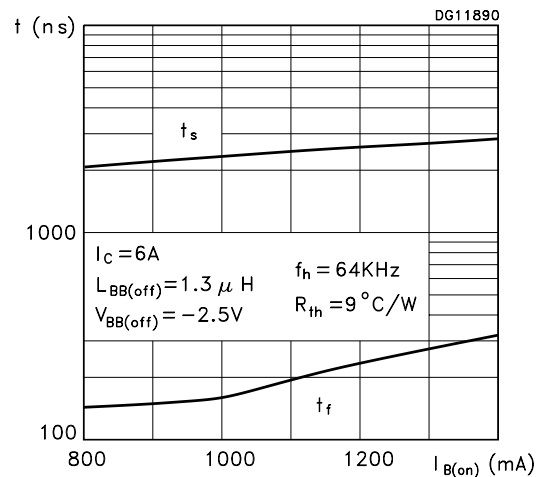
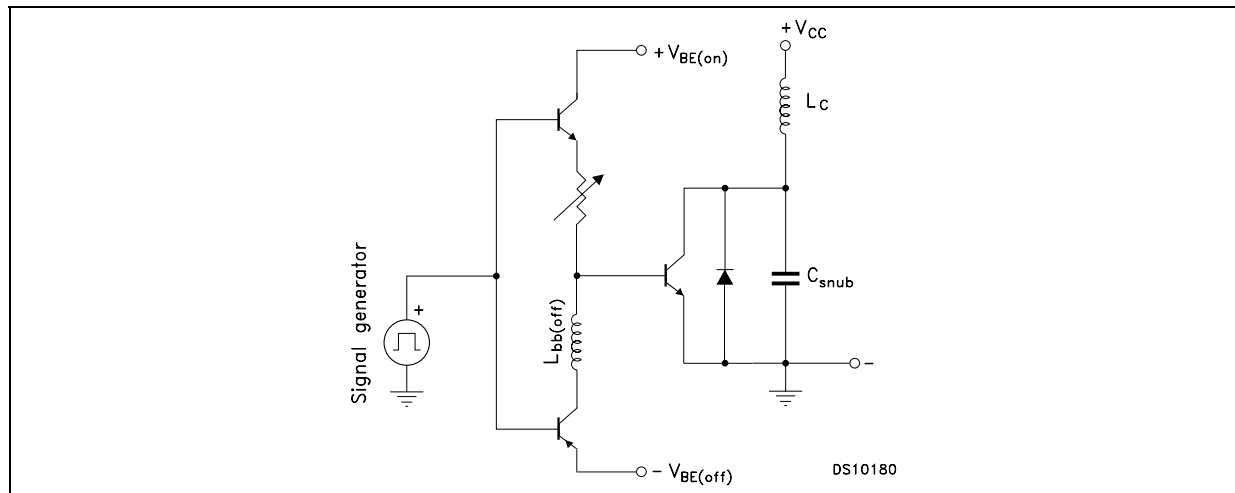


Figure 14: Inductive Load Switching test Circuit



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

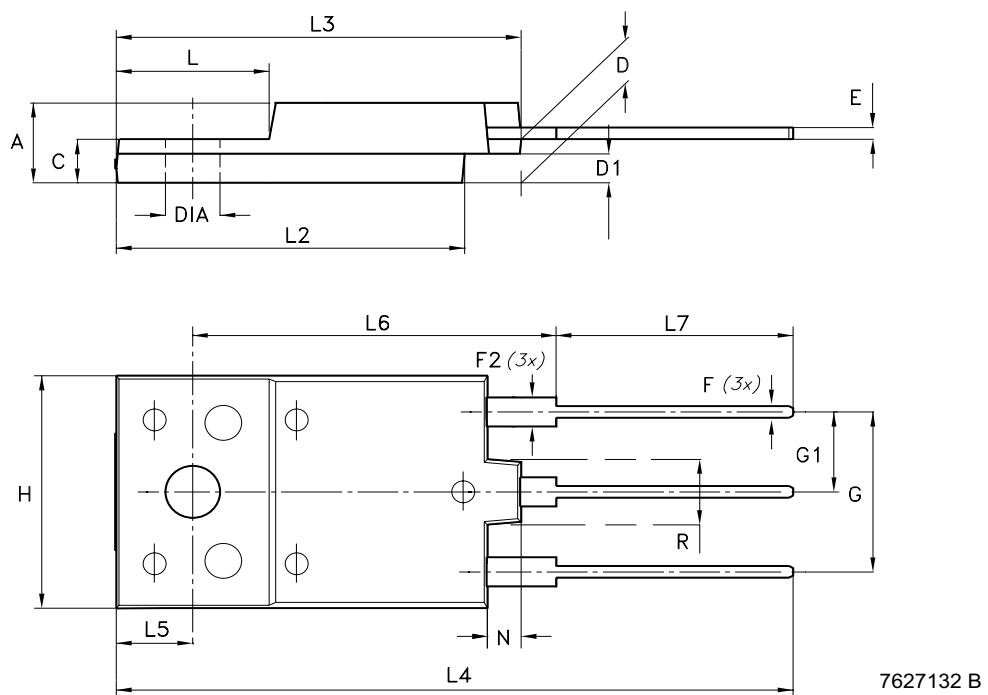


Table 5: Revision History

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

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. Specifications 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 registered trademark of STMicroelectronics
All other names are the property of their respective owners

© 2005 STMicroelectronics - All Rights Reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America
www.st.com