



## ST8812FX

High voltage fast-switching  
NPN Power transistor

### Features

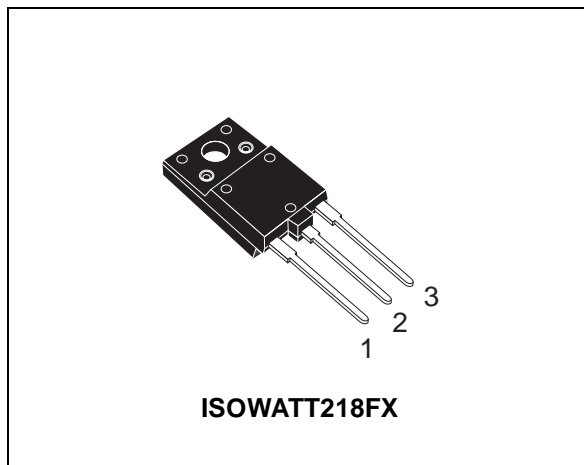
- High voltage capability
- Very high switching speed
- Tight hfe control
- Large R.B.S.O.A.
- Fully insulated Package U.L. compliant for easy mounting

### Applications

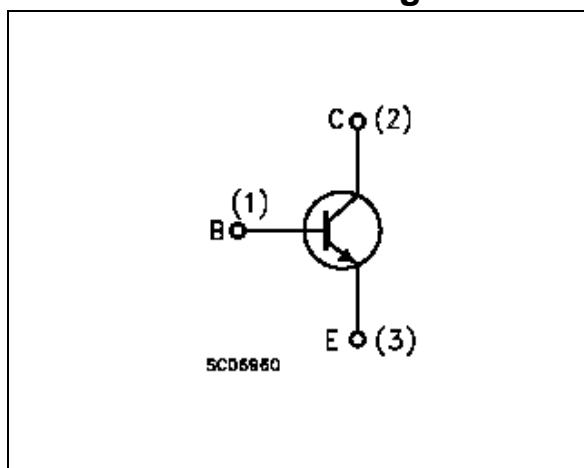
- Switch mode power supplies for crt TV

### Description

The ST8812FX is manufactured using latest Multi Epitaxial Planar technology with high voltage capability. It shows wide R.B.S.O.A. and high switching speed thanks to its Cellular Emitter structure with planar edge termination and deep base diffusion.



### Internal schematic diagram



### Order codes

Part Number	Marking	Package	Packing
ST8812FX	ST8812FX	ISOWATT218FX	TUBE

# 1 Electrical ratings

**Table 1. Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	1150	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	600	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	15	V
$I_C$	Collector Current	7	A
$I_{CM}$	Collector Peak Current ( $t_P < 5\text{ms}$ )	12	A
$I_B$	Base Current	4	A
$P_{TOT}$	Total dissipation at $T_C = 25^\circ\text{C}$	50	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 2. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJ-case}$	Thermal Resistance Junction-Case Max	2.5	$^\circ\text{C/W}$

## 2 Electrical characteristics

( $T_{CASE} = 25^{\circ}C$ ; unless otherwise specified)

**Table 3. Electrical characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 1150V$			1	mA
		$V_{CE} = 1150V$ $T_C = 125^{\circ}C$			2	mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 14V$			1	mA
$V_{CEO(sus)}$ <i>Note: 1</i>	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100mA$	600			V
$V_{CE(sat)}$ <i>Note: 1</i>	Collector-Emitter Saturation Voltage	$I_C = 4A$ $I_B = 0.8A$			3	V
		$I_C = 4A$ $I_B = 1.2A$			1.5	V
$V_{BE(sat)}$ <i>Note: 1</i>	Base-Emitter Saturation Voltage	$I_C = 4A$ $I_B = 0.8A$			1.3	V
$h_{FE}$	DC Current Gain	$I_C = 1A$ $V_{CE} = 5V$		25		
		$I_C = 5A$ $V_{CE} = 1V$		5		
		$I_C = 5A$ $V_{CE} = 5V$	4.5		9	
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 4A$ $R_{BB} = 0$ $V_{Clamp} = 480V$ $V_{BE(off)} = -5V$ $I_{B1} = 0.8A$ $L_C = 220\mu H$ (See <a href="#">Figure 8</a> )		1 60	1.6 120	$\mu s$ ns

*Note: 1 Pulsed duration = 300  $\mu s$ , duty cycle  $\leq 1.5\%$ .*

2.1 Typical characteristics test circuit

Figure 1. DC current gain

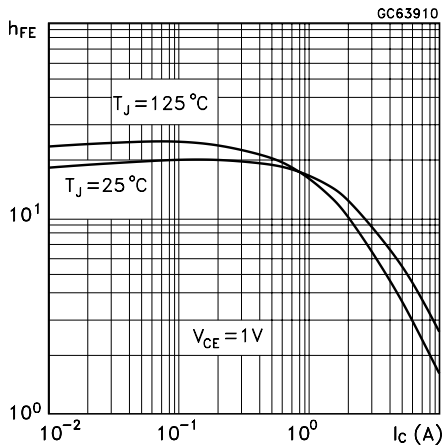


Figure 2. DC current gain

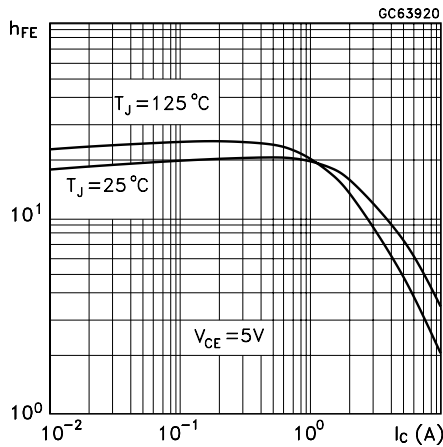


Figure 3. Collector emitter saturation voltage

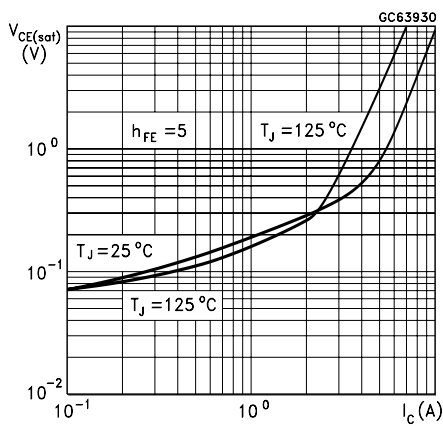


Figure 4. Base emitter saturation voltage

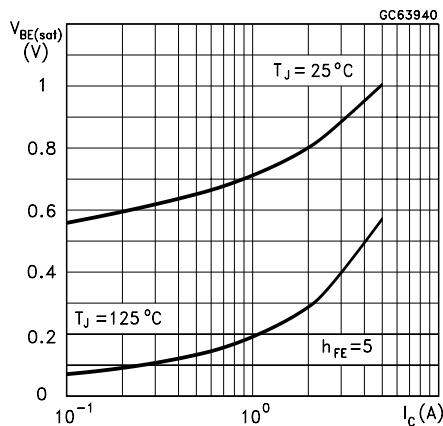


Figure 5. Inductive load storage time

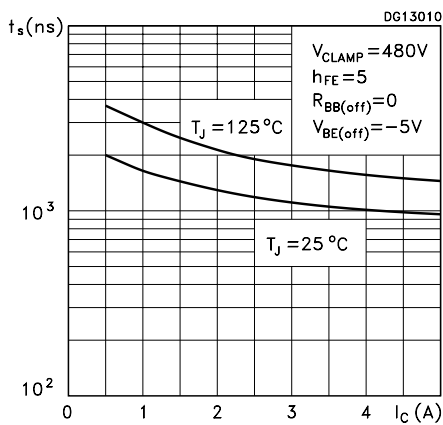


Figure 6. Inductive load fall time

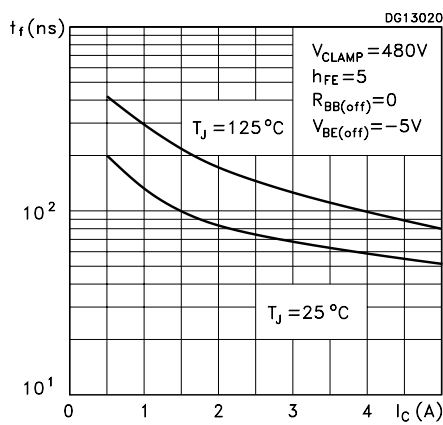
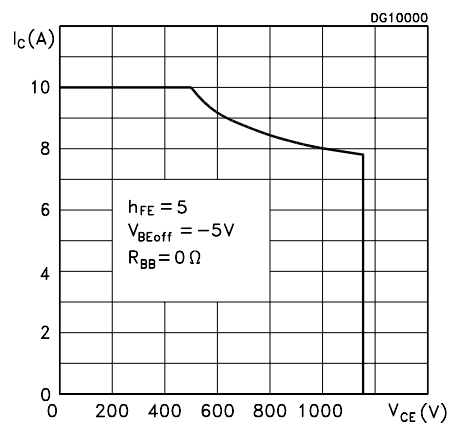
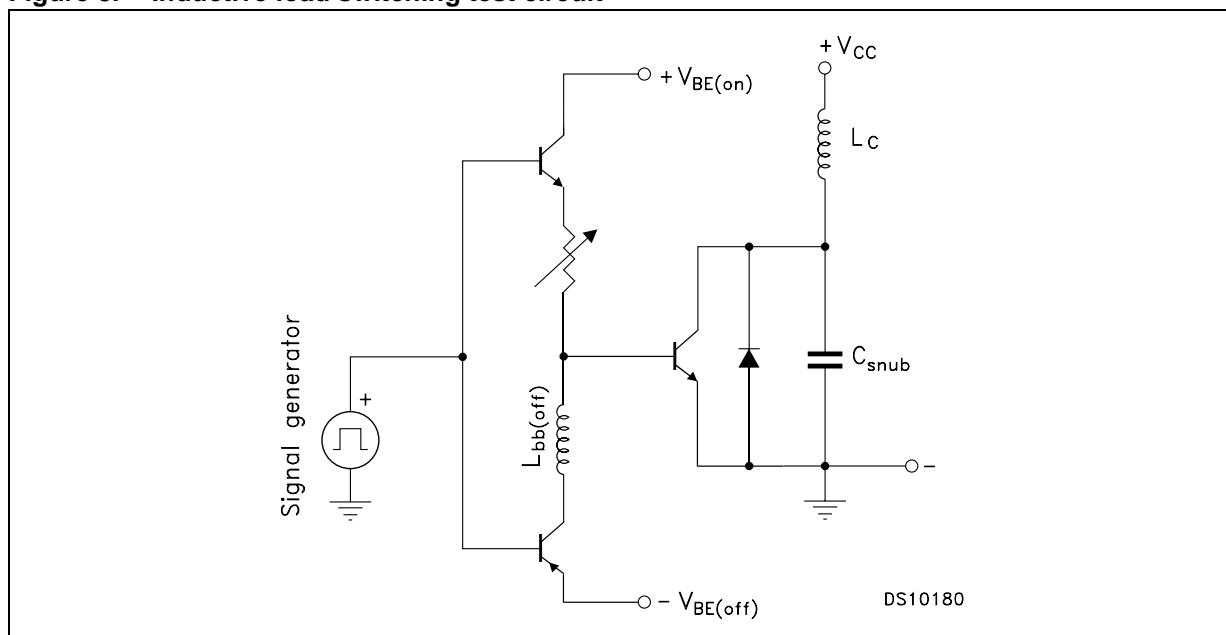


Figure 7. Reverse biased S.O.A.



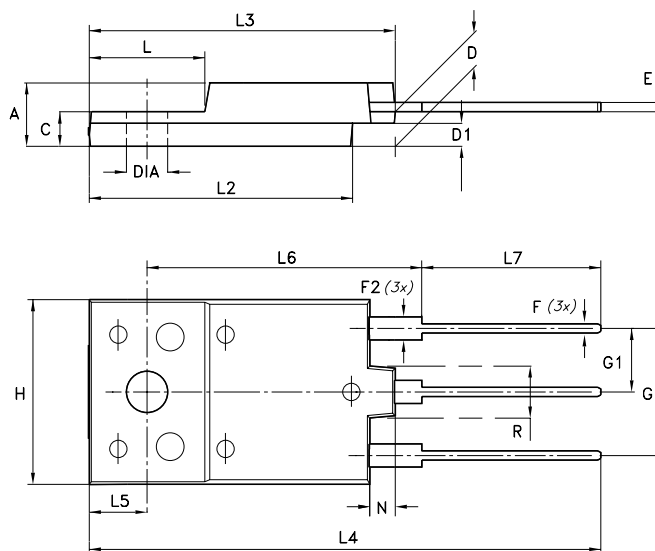
**Figure 8. Inductive load switching test circuit**

### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second Level Interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com).

## ISOWATT218FX MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.30		5.70	0.209		0.224
C	2.80		3.20	0.110		0.126
D	3.10		3.50	0.122		0.138
D1	1.80		2.20	0.071		0.087
E	0.80		1.10	0.031		0.043
F	0.65		0.95	0.026		0.037
F2	1.80		2.20	0.071		0.087
G	10.30		11.50	0.406		0.453
G1		5.45			0.215	
H	15.30		15.70	0.602		0.618
L	9.0		10.20	0.354		0.402
L2	22.80		23.20	0.898		0.913
L3	26.30		26.70	1.035		1.051
L4	43.20		44.40	1.701		1.748
L5	4.30		4.70	0.169		0.185
L6	24.30		24.70	0.957		0.972
L7	14.60		15.00	0.575		0.591
N	1.80		2.20	0.071		0.087
R	3.80		4.20	0.150		0.165
DIA	3.40		3.80	0.134		0.150



- Weight : 5.6 g (typ.)
- Maximum Torque (applied to mounting flange) Recommended: 0.55 Nm; Maximum: 1 Nm
- The side of the dissipator must be flat within 80  $\mu$ m

## 4 Revision History

**Table 4. Revision history**

Date	Revision	Changes
23-Feb-2006	1	Initial release.

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