



## ST8812FP

### HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

#### Features

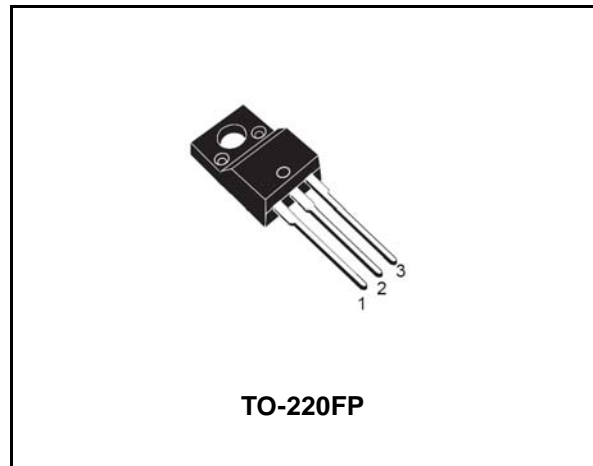
- HIGH VOLTAGE CAPABILITY
- VERY HIGH SWITCHING SPEED
- TIGHT hfe CONTROL
- LARGE R.B.S.O.A.
- FULLY INSULATED PACKAGE U.L. COMPLIANT FOR EASY MOUNTING

#### Applications

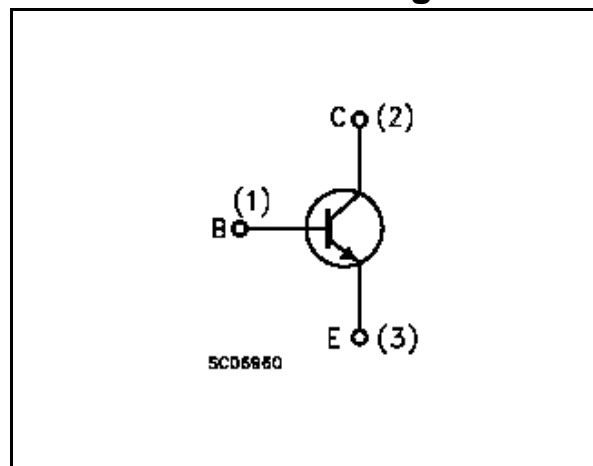
- SWITCH MODE POWER SUPPLIES FOR CRT TV

#### Description

The ST8812FP 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
ST8812FP	ST8812FP	TO-220FP	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 ( $t_P < 5ms$ )	12	A
$I_B$	Base Current	4	A
$P_{TOT}$	Total dissipation at $T_C = 25^\circ C$	36	W
$V_{isol}$	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	1500	V
$T_{STG}$	Storage Temperature	-65 to 150	$^\circ C$
$T_J$	Max. Operating Junction Temperature	150	$^\circ C$

**Table 2. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{thJ-case}$	Thermal Resistance Junction-Case	Max 3.47	$^\circ C/W$

## 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	$I_C = 4A$ $R_{BB} = 0$		1	1.6	$\mu s$
		$V_{Clamp} = 480V$ $V_{BE(off)} = -5V$ $I_{B1} = 0.8A$ $L_C = 220\mu H$ (See <a href="#">Figure 8</a> )		60	120	ns

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

## 2.1 Typical characteristics Test circuit

Figure 1. DC Current Gain

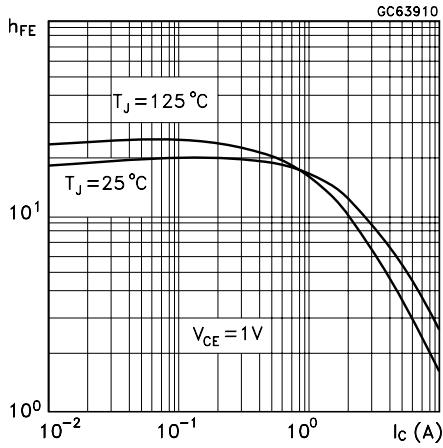


Figure 2. DC Current Gain

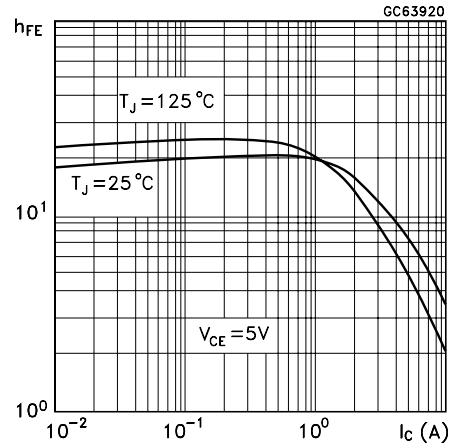


Figure 3. Collector Emitter Saturation Voltage Figure 4. Base Emitter Saturation Voltage

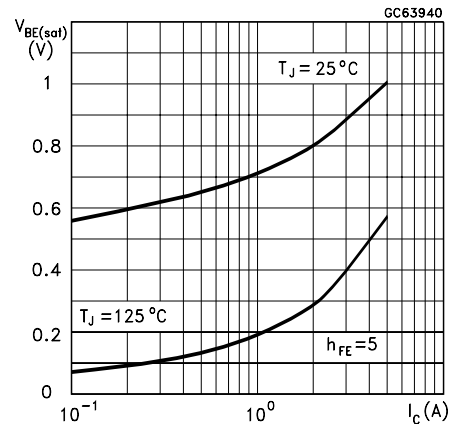
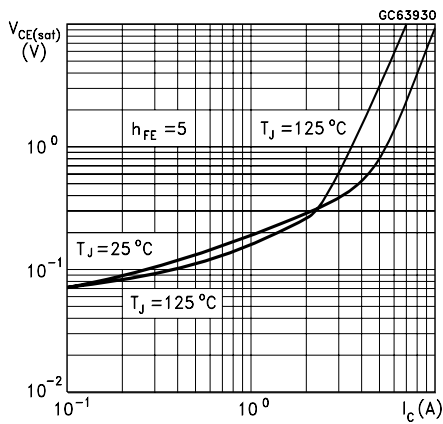


Figure 5. Inductive Load Storage Time

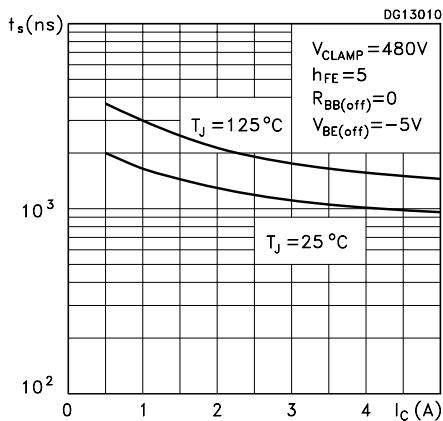


Figure 6. Inductive Load Fall Time

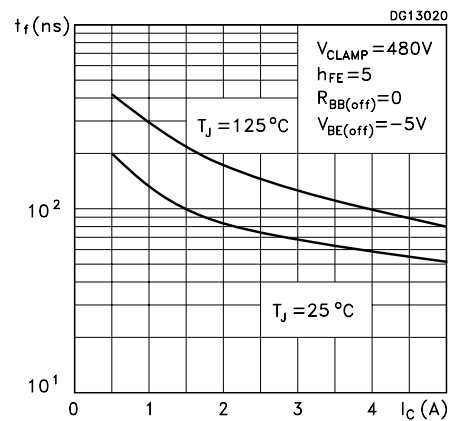
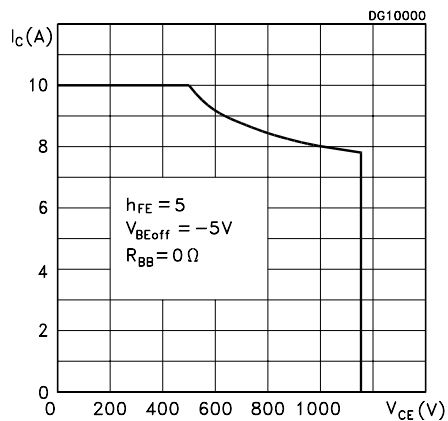
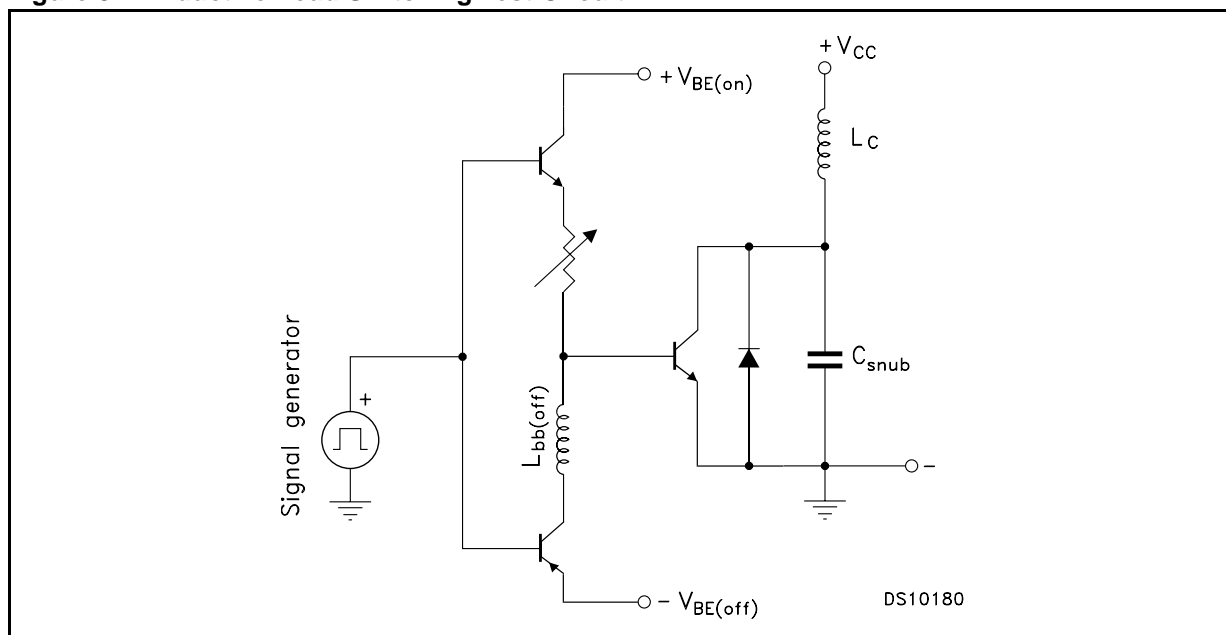


Figure 7. Reverse Biased S.O.A.



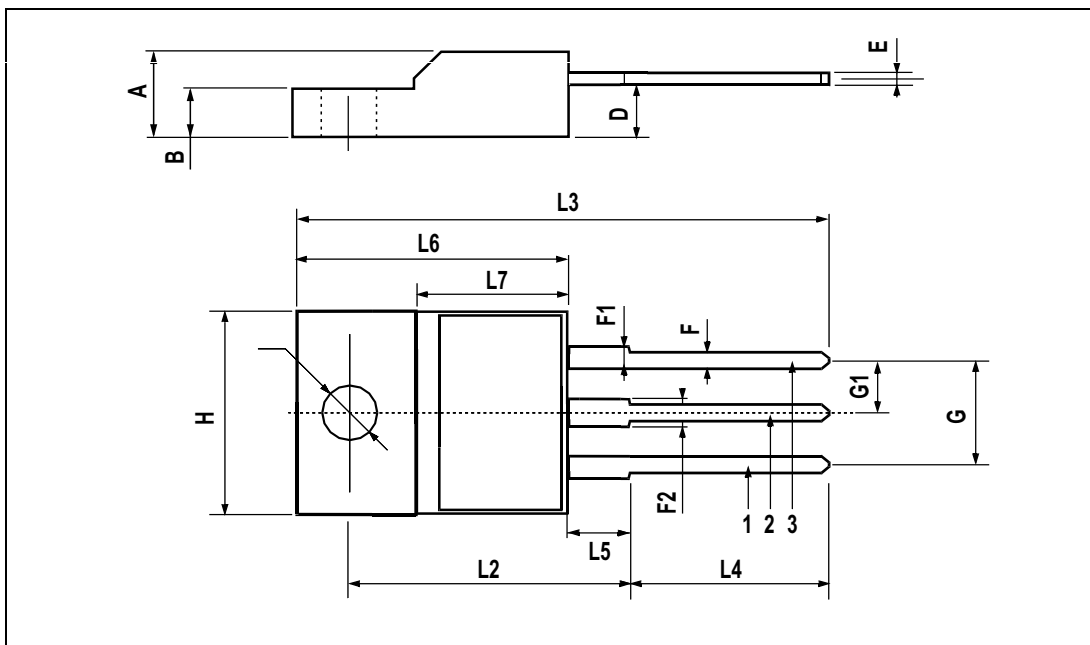
**Figure 8. Inductive Load Switching Test Circuit**

### 3 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK<sup>®</sup> 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).

**TO-220FP MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.45		0.7	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.7	0.045		0.067
F2	1.15		1.7	0.045		0.067
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
H	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	.0385		0.417
L5	2.9		3.6	0.114		0.141
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
∅	3		3.2	0.118		0.126





## 4 Revision History

Date	Revision	Changes
17-Nov-2005	1	Initial release.

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