

## Low voltage NPN power transistor

### Features

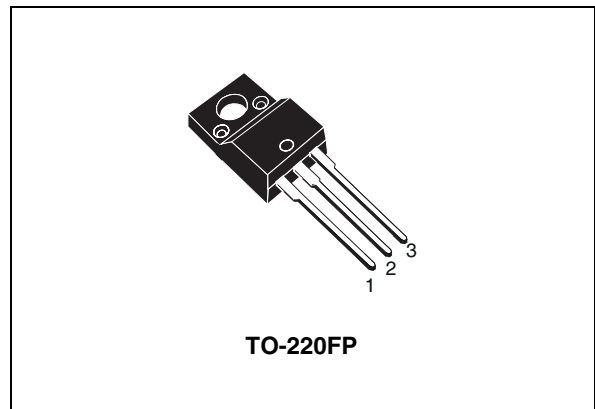
- High current gain characteristic
- Fast switching speed
- Fully insulated package

### Applications

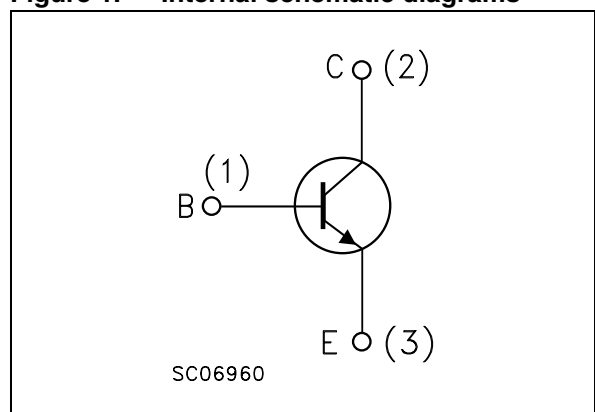
- Printer
- DC-DC converter

### Description

The device is manufactured using new “PB-HCD” (power bipolar high current density) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.



**Figure 1. Internal schematic diagrams**



**Table 1. Device summary**

Order code	Marking	Package	Packaging
2ST1480FP	2ST1480FP	TO-220FP	Tube

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-base voltage ( $I_E = 0$ )	80	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	80	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	5	V
$I_C$	Collector current	5	A
$I_{CM}$	Collector peak current	10	A
$I_B$	Base current	1	A
$P_{TOT}$	Total dissipation at $T_C \leq 25$ °C	25	W
$T_{STG}$	Storage temperature	-65 to 150	°C
$T_J$	Max. operating junction temperature	150	°C

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJC}$	Thermal resistance junction-case Max	5	°C/W

## 2 Electrical characteristics

$T_{\text{case}} = 25\text{ °C}$ ; unless otherwise specified.

**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CE}} = 80\text{ V}$			0.1	$\mu\text{A}$
$I_{\text{EBO}}$	Emitter cut-off current ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 5\text{ V}$			0.1	$\mu\text{A}$
$V_{(\text{BR})\text{CEO}}^{(1)}$	Collector-emitter breakdown voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 10\text{ mA}$	80			V
$V_{\text{CE}(\text{sat})}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 3\text{ A}$ $I_{\text{B}} = 300\text{ mA}$			1	V
$V_{\text{BE}(\text{on})}^{(1)}$	Base-emitter on voltage	$I_{\text{C}} = 3\text{ A}$ $V_{\text{CE}} = 5\text{ V}$			1.5	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 0.5\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 3\text{ A}$ $V_{\text{CE}} = 5\text{ V}$	170 50		290	
$f_{\text{T}}$	Transition frequency	$I_{\text{C}} = 50\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$		120		MHz
$C_{\text{CBO}}$	Collector-base capacitance ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = 10\text{ V}$ $f = 1\text{ MHz}$		20		pF
$t_{\text{on}}$ $t_{\text{off}}$	Resistive load Turn-on time Turn-off time	$I_{\text{C}} = 1.5\text{ A}$ , $V_{\text{CC}} = 10\text{ V}$ $I_{\text{B}(\text{on})} = - I_{\text{B}(\text{off})} = 150\text{ mA}$		60 450		ns ns

1. Pulse test: pulse duration  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

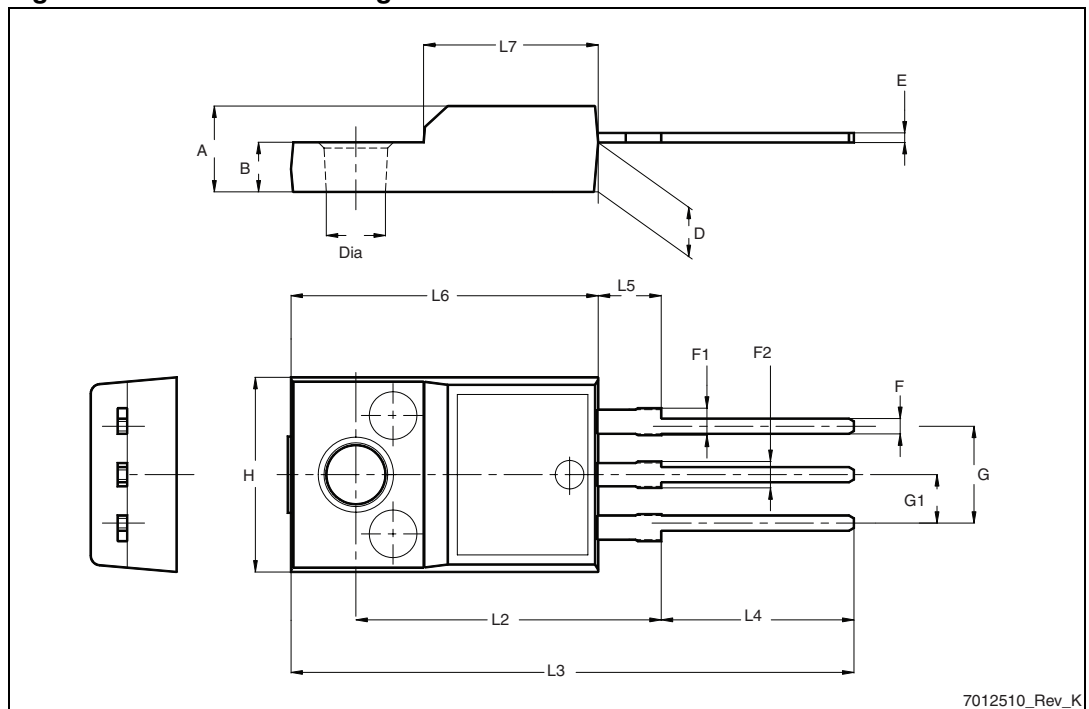
### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

Table 5. TO-220FP mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.4		4.6
B	2.5		2.7
D	2.5		2.75
E	0.45		0.7
F	0.75		1
F1	1.15		1.70
F2	1.15		1.70
G	4.95		5.2
G1	2.4		2.7
H	10		10.4
L2		16	
L3	28.6		30.6
L4	9.8		10.6
L5	2.9		3.6
L6	15.9		16.4
L7	9		9.3
Dia	3		3.2

Figure 2. TO-220FP drawing



## 4 Revision history

**Table 6. Document revision history**

Date	Revision	Changes
03-Dec-2009	1	Initial release.

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