

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.

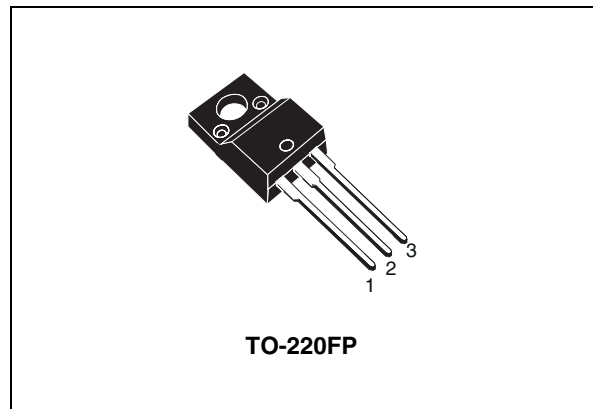


Figure 1. Internal schematic diagrams

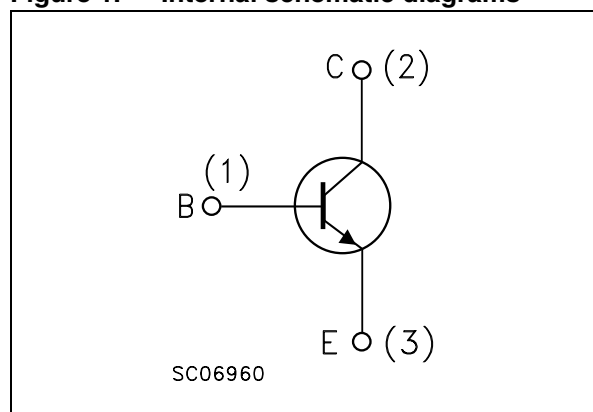


Table 1. Device summary

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_{CBO}	Collector cut-off current ($I_{\text{E}} = 0$)	$V_{\text{CE}} = 80\text{ V}$			0.1	μA
I_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 5\text{ V}$			0.1	μA
$V_{(\text{BR})\text{CEO}}^{(1)}$	Collector-emitter breakdown voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 10\text{ mA}$	80			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 3\text{ A}$ $I_{\text{B}} = 300\text{ mA}$			1	V
$V_{\text{BE(on)}}^{(1)}$	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_{T}	Transition frequency	$I_{\text{C}} = 50\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$		120		MHz
C_{CBO}	Collector-base capacitance ($I_{\text{E}} = 0$)	$V_{\text{CB}} = 10\text{ V}$ $f = 1\text{ MHz}$		20		pF
t_{on} t_{off}	Resistive load Turn-on time Turn-off time	$I_{\text{C}} = 1.5\text{ A}$, $V_{\text{CC}} = 10\text{ V}$ $I_{\text{B(on)}} = - I_{\text{B(off)}} = 150\text{ mA}$		60 450		ns ns

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

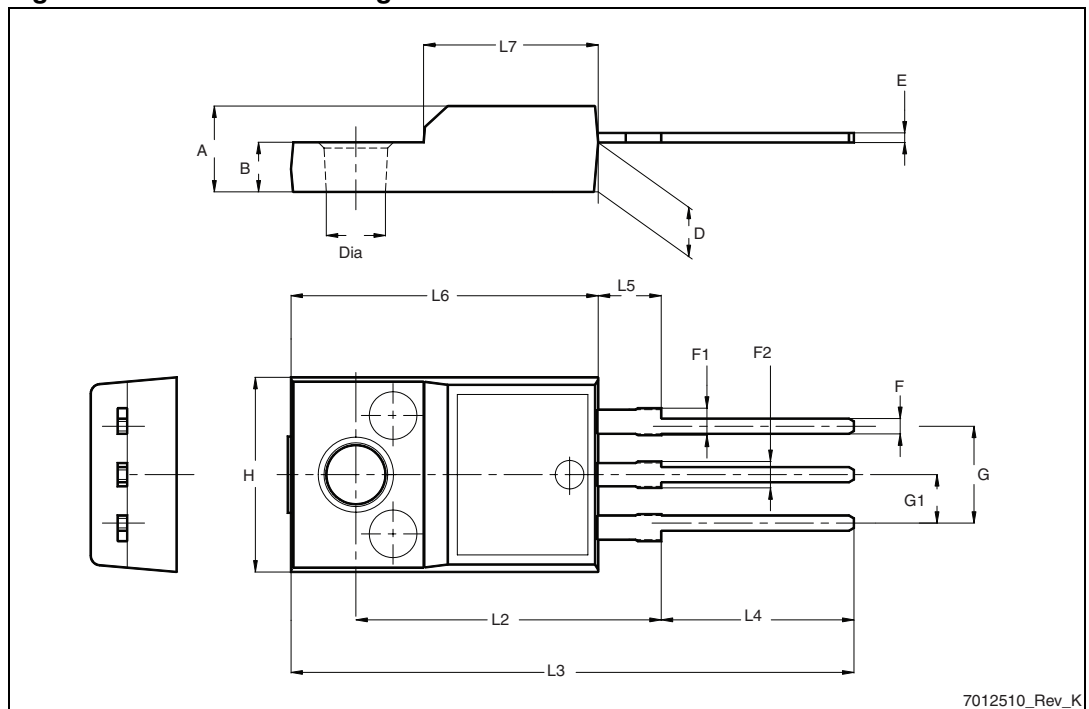
3 Package mechanical data

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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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