

NPN power Darlington transistor

Features

- Monolithic Darlington transistor with integrated antiparallel collector-emitter diode
- Very high DC current gain

Applications

- Electronic ignition
- AC-DC motor control
- Alternator regulator

Description

The 2STP535FP is a planar NPN power transistor in monolithic Darlington configuration mounted in TO-220FP fully isolated package.

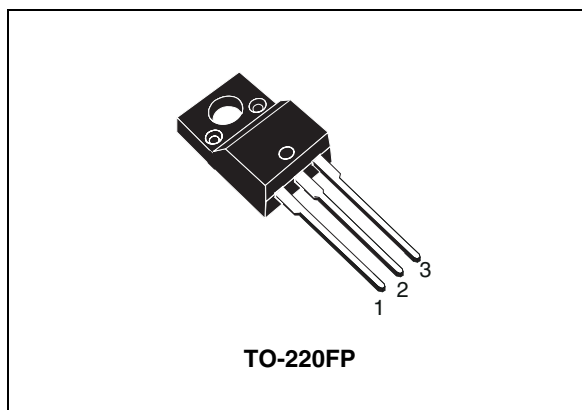


Figure 1. Internal schematic diagram

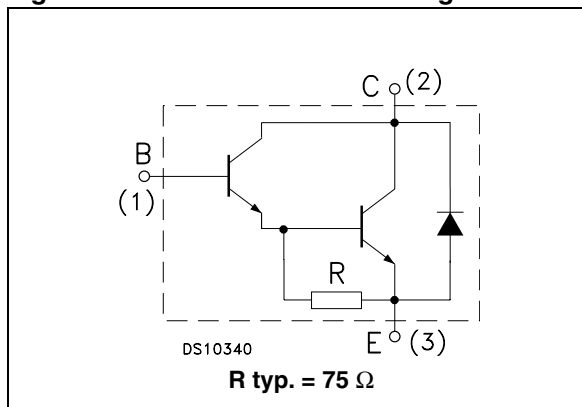


Table 1. Device summary

Order code	Marking	Package	Packaging
2STP535FP	2STP535FP	TO-220FP	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$)	180	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	180	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
I_C	Collector current	8	A
I_{CM}	Collector peak current ($t_p < 5$ ms)	15	A
I_B	Base current	1	A
P_{tot}	Total dissipation at $T_c \leq 25$ °C	37	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
$R_{thj-case}$	Thermal resistance junction-case max	3.4	°C/W

2 Electrical characteristics

($T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector cut-off current ($I_{\text{B}} = 0$)	$V_{\text{CE}} = 180\text{ V}$			50	μA
I_{CBO}	Collector-base cut-off current ($I_{\text{E}} = 0$)	$V_{\text{CB}} = 180\text{ V}$			50	μA
I_{EBO}	Emitter-base cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 5\text{ V}$			100	μA
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 30\text{ mA}$	180			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 3\text{ A}$ $I_{\text{B}} = 6\text{ mA}$ $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 80\text{ mA}$			2 2.5	V V
$V_{\text{BE(on)}}^{(1)}$	Base-emitter (on) voltage	$I_{\text{C}} = 8\text{ A}$ $V_{\text{CE}} = 4\text{ V}$			2.8	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 3\text{ A}$ $V_{\text{CE}} = 4\text{ V}$ $I_{\text{C}} = 8\text{ A}$ $V_{\text{CE}} = 4\text{ V}$	1000 200		20000	
$V_{\text{F}}^{(1)}$	Diode forward voltage	$I_{\text{F}} = 10\text{ A}$			2.8	V

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

2.1 Electrical characteristics (curves)

Figure 2. Collector-emitter saturation voltage ($h_{FE} = 500$)

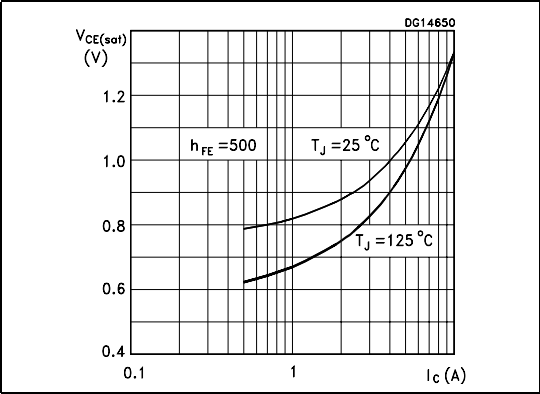


Figure 3. Collector-emitter saturation voltage ($h_{FE} = 100$)

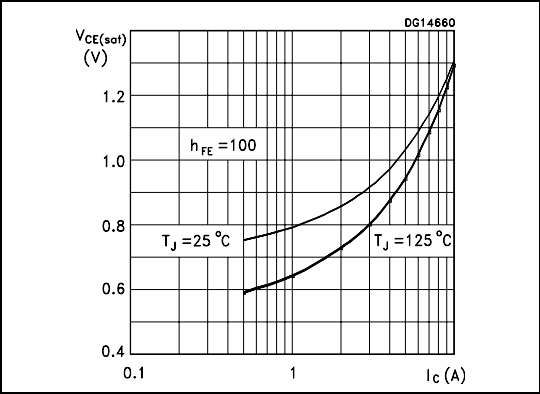
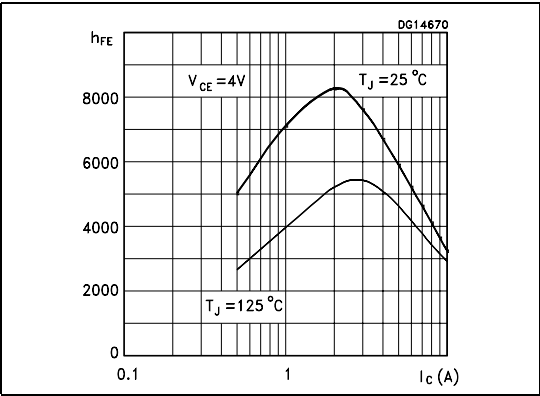


Figure 4. DC current gain

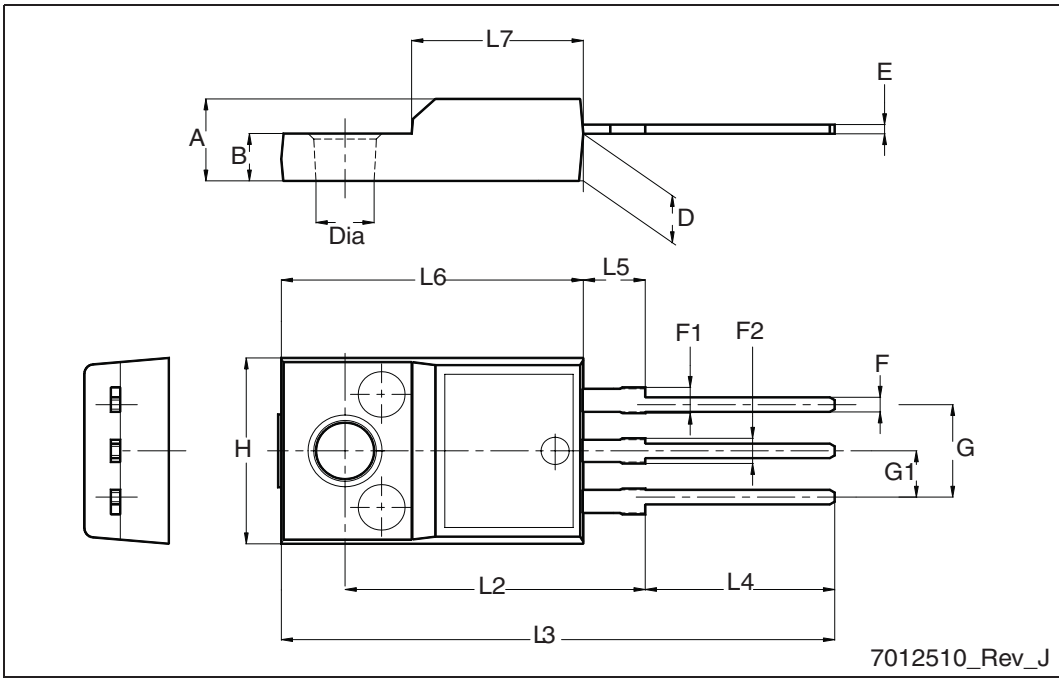


3 **Package mechanical data**

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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		1.5
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



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
17-Aug-2009	1	Initial release

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