2STP535FP

NPN power Darlington transistor

Features

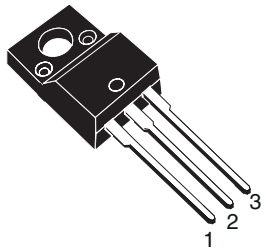
- Monolithic Darlington transistor with integrated antiparallel collector-emitter diode
- Very high DC current gain

Applications

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

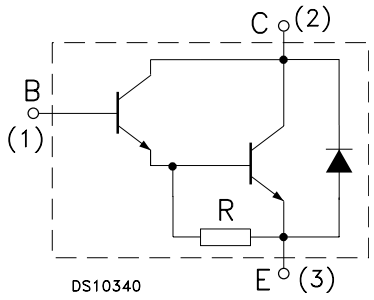
Description

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



TO-220FP

Figure 1. Internal schematic diagram



R typ. = 75 Ω

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
$R_{thj\text{-}case}$	Thermal resistance junction-case max	3.4	°C/W

2 Electrical characteristics

(T_{case} = 25 °C unless otherwise specified)

Table 4. Electrical characteristics

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

1. Pulse test: pulse duration ≤300 µs, duty cycle ≤2 %.

2.1 Electrical characteristics (curves)

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

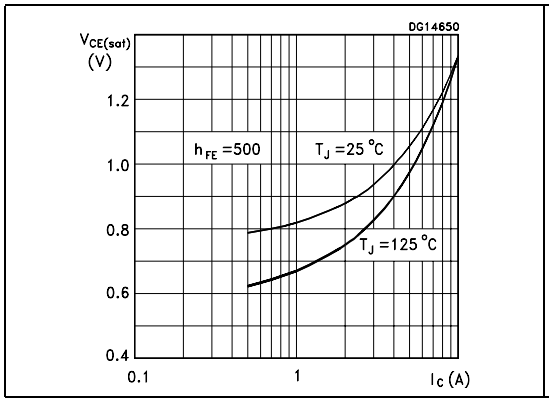


Figure 3. Collector-emitter saturation voltage (h_{FE} = 100)

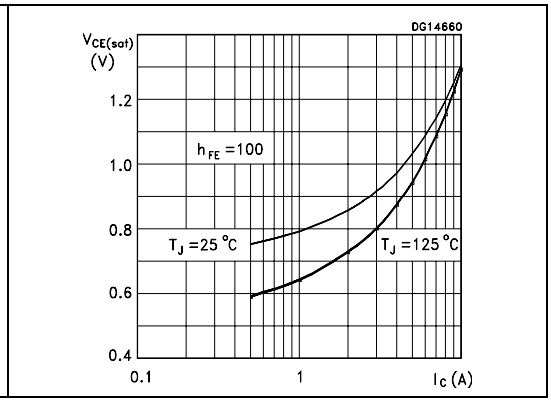
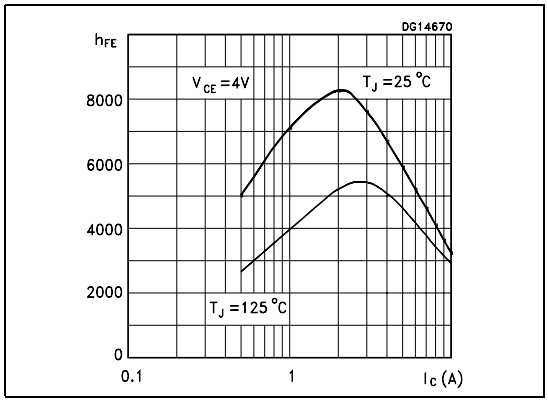


Figure 4. DC current gain

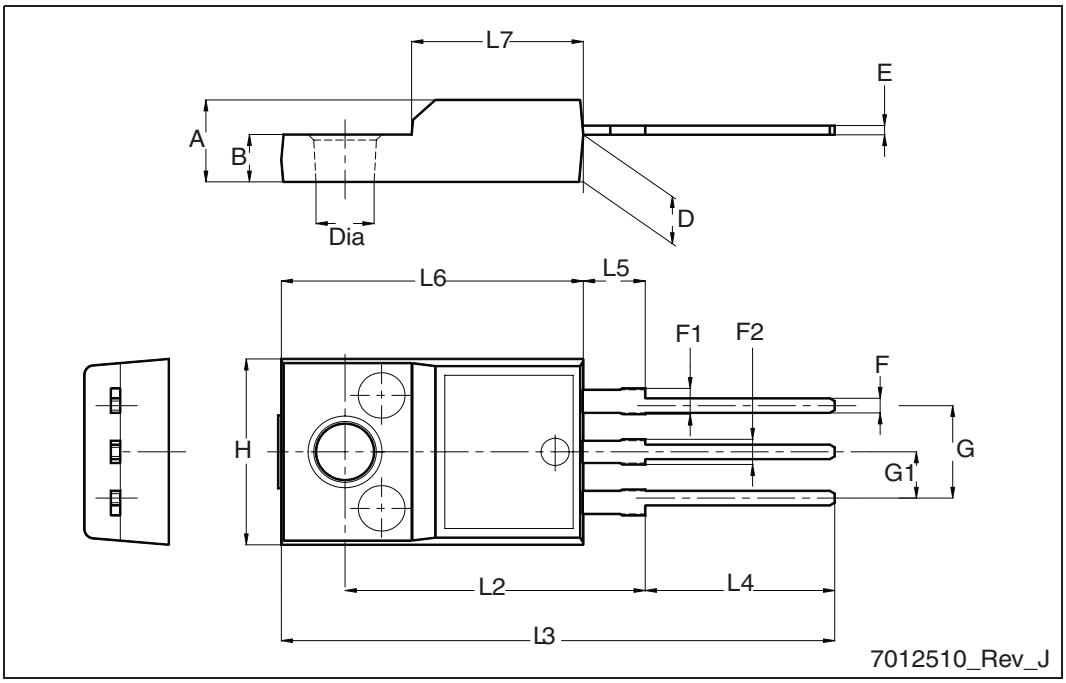


3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and products status are available at: www.st.com. ECOPACK® is an ST trademark.

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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