

#### **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.

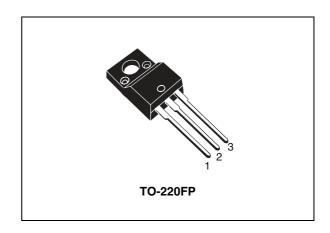


Figure 1. Internal schematic diagram

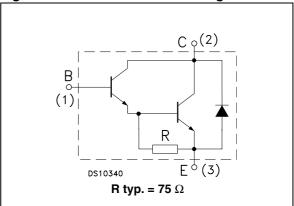


Table 1. Device summary

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

Electrical ratings 2STP535FP

# 1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-base voltage (I <sub>E</sub> = 0)	180	V
V <sub>CEO</sub>	Collector-emitter voltage (I <sub>B</sub> = 0)	180	V
V <sub>EBO</sub>	Emitter-base voltage (I <sub>C</sub> = 0)	5	V
I <sub>C</sub>	Collector current	8	Α
I <sub>CM</sub>	Collector peak current (t <sub>p</sub> < 5 ms)	15	Α
I <sub>B</sub>	Base current	1	Α
P <sub>tot</sub>	Total dissipation at T <sub>c</sub> ≤25 °C	37	W
T <sub>stg</sub>	Storage temperature	-65 to 150	°C
T <sub>J</sub>	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R <sub>thj-case</sub>	Thermal resistance junction-case max		°C/W

### 2 Electrical characteristics

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

Table 4. Electrical characteristics

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

<sup>1.</sup> Pulse test: pulse duration  $\leq$ 300 µs, duty cycle  $\leq$ 2 %.

Electrical characteristics 2STP535FP

## 2.1 Electrical characteristics (curves)

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

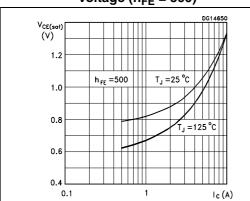


Figure 3. Collector-emitter saturation voltage ( $h_{FE} = 100$ )

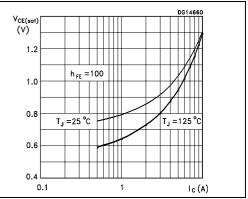
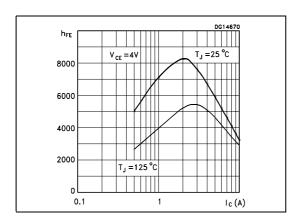


Figure 4. DC current gain

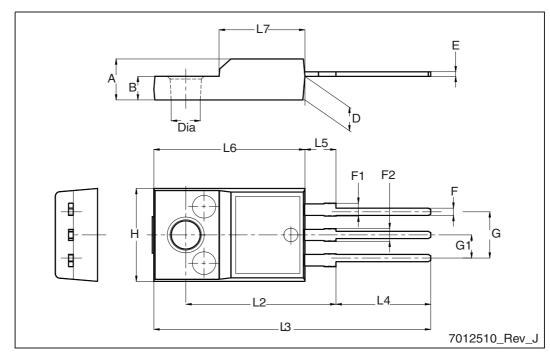


## 3 Package mechanical data

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#### **TO-220FP mechanical data**

Dim.		mm	
Dim.	Min.	Тур.	Max.
А	4.4		4.6
В	2.5		2.7
D	2.5		2.75
E	0.45		0.7
F	0.75	0.75	
F1	1.15		1.70
F2	1.15	15 1.5	
G	4.95		5.2
G1	2.4		2.7
Н	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



2STP535FP Revision history

# 4 Revision history

Table 5. Document revision history

Date	Revision	Changes
17-Aug-2009	1	Initial release

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