

ST901T STD901T

High voltage NPN Darlington transistor for ignition coil

Features

- High voltage special Darlington structure
- Very rugged bipolar technology
- High DC current gain

Application

 High ruggedness electronic ignition for small engines

Description

The device is a high voltage NPN transistor in monolithic special Darlington configuration designed for applications such as electronic ignition for small engines (scooters, lawnmowers, chainsaws).

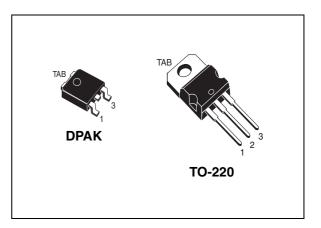


Figure 1. Internal schematic diagram

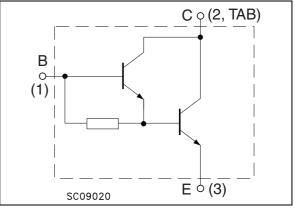


Table 1. Device summary

Order code	Marking	Packages	Packaging
ST901T	901T	TO-220	Tube
STD901T	D901T	DPAK	Tape and reel

Contents

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1 Electrical ratings

Table 2.	Absoluto movimum ratings
Table 2.	Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CES}	Collector-emitter voltage (V _{BE} = 0)	500	V
V _{CEO}	Collector-emitter voltage $(I_B = 0)$	350	V
V _{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
۱ _C	Collector current	4	А
I _{CM}	Collector peak current (tp < 5 ms)	8	А
Ι _Β	Base current	0.5	А
I _{BM}	Base peak current (tp < 5 ms)	2.5	А
P _{tot}	Total dissipation at T_{C} = 25 °C for ST901T	100	W
P _{tot}	Total dissipation at T_{C} = 25 °C for STD901T	35	W
T _{stg}	Storage temperature	-65 to 150	°C
Τ _J	Max. operating junction temperature	150	°C

Table 3.Thermal data

Symbol	Parameter	Value	Unit
R _{thj-case}	Thermal resistance junction-case max for ST901T	1.25	°C/W
R _{thj-case}	Thermal resistance junction-case max for STD901T	3.57	°C/W



2 Electrical characteristics

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

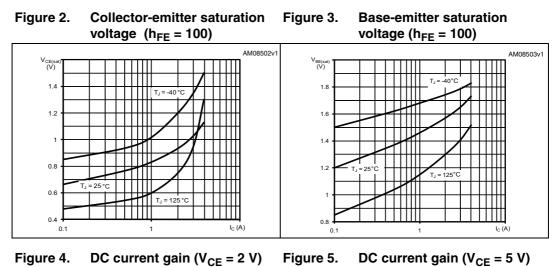
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CES}	Collector cut-off current $(I_E = 0)$	$V_{CE} = 500 V$ $V_{CE} = 500 V T_{case} = 125 °C$			100 500	μA μA
I _{CEO}	Collector cut-off current $(I_B = 0)$	V _{CE} = 350 V V _{CE} = 350 V T _{case} = 125 °C			100 500	μΑ μΑ
I _{EBO}	Emitter cut-off current $(I_{\rm C} = 0)$	V _{EB} = 5 V			10	μA
V _{CEO(sus)} ⁽¹⁾	Collector-emitter sustaining voltage $(I_B = 0)$	I _C = 10 mA	350			V
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	$I_{\rm C} = 2 {\rm A}$ $I_{\rm B} = 20 {\rm mA}$			2	V
V _{BE(sat)} ⁽¹⁾	Base-emitter saturation voltage	$I_{\rm C} = 2 {\rm A}$ $I_{\rm B} = 20 {\rm mA}$			1.8	V
h _{FE}	DC current gain	$ I_C = 2 A \qquad V_{CE} = 2 V \\ I_C = 4 A \qquad V_{CE} = 2 V $	1800 500		3800	
	Functional test	$V_{CC} = 24 \text{ V}$ $V_{clamp} = 350 \text{ V}$ L = 4 mH	4			A
t _s t _f	Inductive load storage time fall time	$ \begin{array}{ll} V_{CC} = 12 \ V & L = 4 \ mH \\ I_{C} = 2 \ A & V_{clamp} = 250 \ V \\ I_{B(on)} = 20 \ mA & V_{BE(off)} = -3 \ V \end{array} $		15 1.5		μs μs

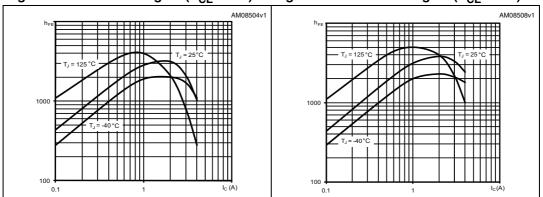
Table 4. Electrical characteristics

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



2.1 Electrical characteristics (curves)







3 Package mechanical data

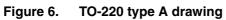
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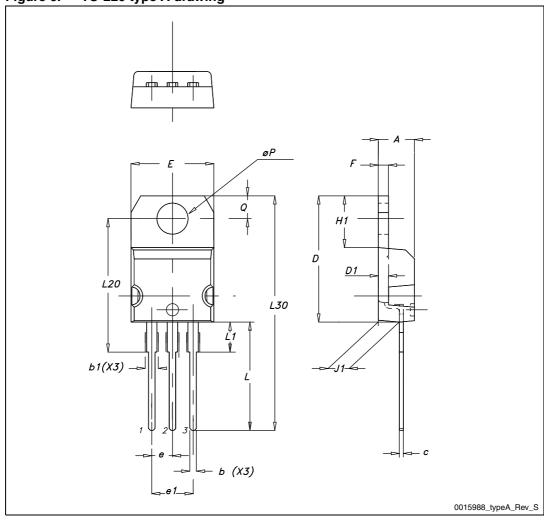


Dim	mm		
Dim.	Min.	Тур.	Max.
А	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
С	0.48		0.70
D	15.25		15.75
D1		1.27	
E	10		10.40
е	2.40		2.70
e1	4.95		5.15
F	1.23		1.32
H1	6.20		6.60
J1	2.40		2.72
L	13		14
L1	3.50		3.93
L20		16.40	
L30		28.90	
ØР	3.75		3.85
Q	2.65		2.95

Table 5.TO-220 type A mechanical data









Dim.		mm	
	Min.	Тур.	Max.
А	2.20		2.40
A1	0.90		1.10
A2	0.03		0.23
b	0.64		0.90
b4	5.20		5.40
с	0.45		0.60
c2	0.48		0.60
D	6.00		6.20
D1		5.10	
E	6.40		6.60
E1		4.70	
е		2.28	
e1	4.40		4.60
Н	9.35		10.10
L	1		
L1		2.80	
L2		0.80	
L4	0.60		1
R		0.20	
V2	0°		8°

Table 6. DPAK (TO-252) mechanical data



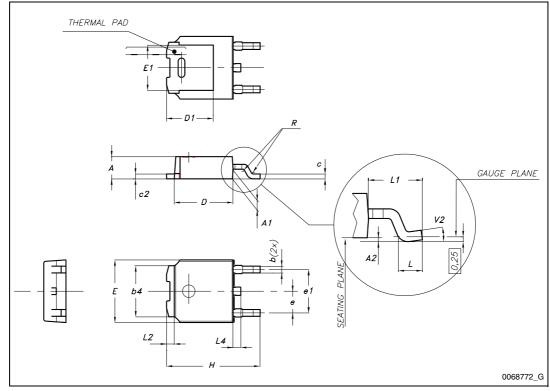


Figure 7. TO-252 (DPAK) drawings



4 Revision history

Table 7.Document revision history

Date	Revision	Changes
14-Oct-2004	1	First release.
15-Jan-2005	2	DC current gain range has been modified.
25-Feb-2005	3	Added four drawings on page 3.
13-Oct-2005	4	Updated package mechanical data
11-Feb-2011	5	Inserted new order code STD901T



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