

MJD122 MJD127

Complementary power Darlington transistors

Features

- Low collector-emitter saturation voltage
- Integrated antiparallel collector-emitter diode

Applications

■ General purpose linear and switching

Description

The devices are manufactured in planar technology with "base island" layout and monolithic Darlington configuration. The resulting transistors show exceptional high gain performance coupled with very low saturation voltage.

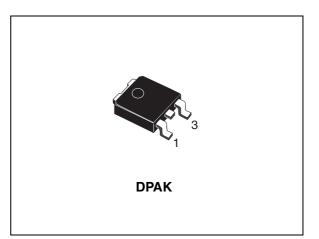


Figure 1. Internal schematic diagrams

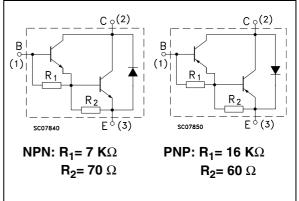


Table 1.	Device	summary
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Order codes	Marking	Polarity	Package	Packaging
MJD122T4	MJD122	NPN	DPAK	Tape and reel
MJD127T4	MJD127	PNP	DFAR	Tape and teel

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1 Electrical ratings

Table 2. Absolute	maximum	ratings
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Symbol	Parameter	Value	
V _{CBO}	Collector-base voltage ($I_E = 0$)	100	V
V_{CEO}	Collector-emitter voltage (I _B = 0)	100	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
Ι _C	Collector current	8	А
I _{CM}	Collector peak current	16	A
Ι _Β	Base current	0.12	А
P _{TOT}	Total dissipation at $T_{case} = 25^{\circ}C$	20	W
T _{stg}	Storage temperature	-65 to 150	°C
Τ _J	Max. operating junction temperature	150	°C

Note: For PNP types voltage and current values are negative.

Table 3.Thermal data

Symbol	Parameter	Value	Unit
R _{thj-c}	Thermal resistance junction-case max.	6.25	°C/W



2 Electrical characteristics

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

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CBO}	Collector cut-off current $(I_E = 0)$	V _{CB} = 100 V		-	10	μA
I _{CEO}	Collector cut-off current $(I_B = 0)$	V _{CE} = 50 V		-	10	μA
I _{EBO}	Emitter cut-off current $(I_{\rm C} = 0)$	V _{EB} = 5 V		-	2	mA
V _{CEO(sus)} ⁽¹⁾	Collector-emitter sustaining voltage $(I_B = 0)$	I _C = 30 mA	100	-		V
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	$I_{C} = 4 A \qquad I_{B} = 16 mA$ $I_{C} = 8 A \qquad I_{B} = 80 mA$		-	2 4	V V
V _{BE(sat)} ⁽¹⁾	Base-emitter saturation voltage	I _C = 8 A I _B = 80 mA		-	4.5	V
V _{BE(on)} ⁽¹⁾	Base-emitter on voltage	$I_{C} = 4 A$ $V_{CE} = 4 V$		-	2.8	V
h _{FE} ⁽¹⁾	DC current gain	$I_{C} = 4A \qquad V_{CE} = 4 V$ $I_{C} = 8 A \qquad V_{CE} = 4 V$	1000 100	-	12000	

 Table 4.
 Electrical characteristics

1. Pulsed duration = 300 $\mu s,$ duty cycle ${\leq}1.5\%$

Note:

For PNP types voltage and current values are negative.



Figure 2.

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2.1 Electrical characteristics (curves)

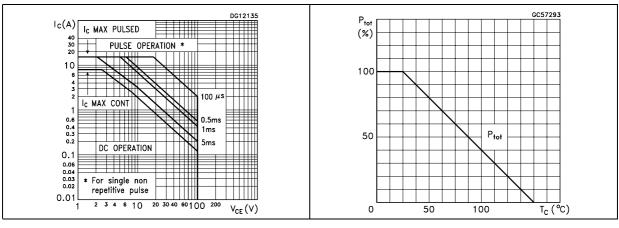


Figure 3.

Figure 4. DC current gain for NPN type

Safe operating area



Derating curve

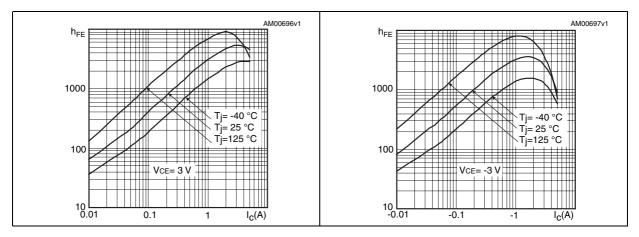
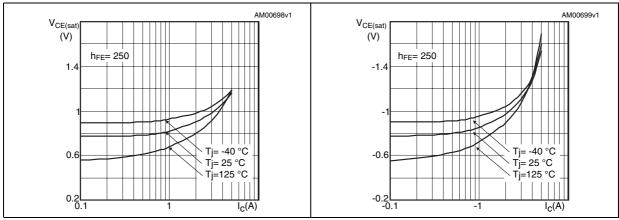


Figure 6. Collector-emitter saturation voltage Figure 7. Collector-emitter saturation voltage for NPN type for PNP type





V_{BE(sat)}

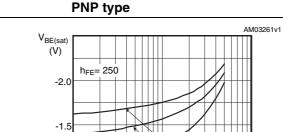
 $I_{C}(A)$

Tj= -40 °C

Tj= 25 °C Tj=125 °C

Figure 8. Base-emitter saturation voltage for Figure 9. Base-emitter saturation voltage for NPN type PNP type

AM00700v1



-1.0

-0.5L -0.1

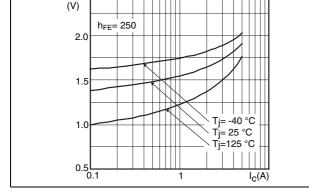


Figure 10. Base-emitter on voltage for NPN type

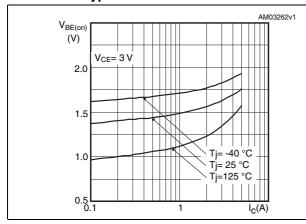


Figure 11. Base-emitter on voltage for PNP type

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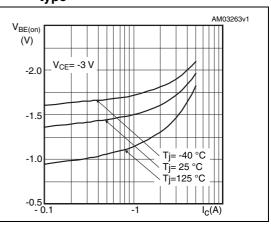


Figure 12. Resistive load switching times for Fi NPN type (on)

Figure 13. Resistive load switching times for PNP type (on)

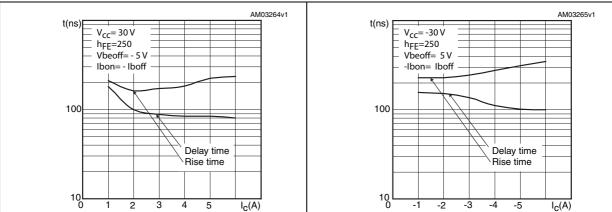




Figure 14. Resistive load switching times for NPN type (off)

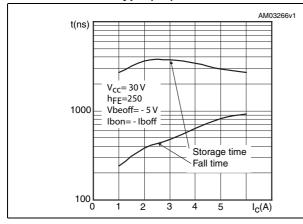




Figure 15. Resistive load switching times for PNP type (off)

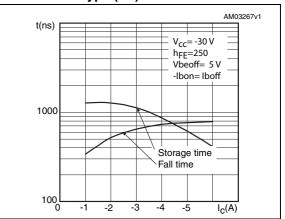
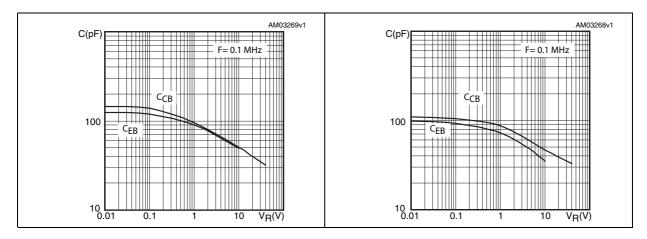


Figure 17. Capacitances for PNP type





3 Test circuits

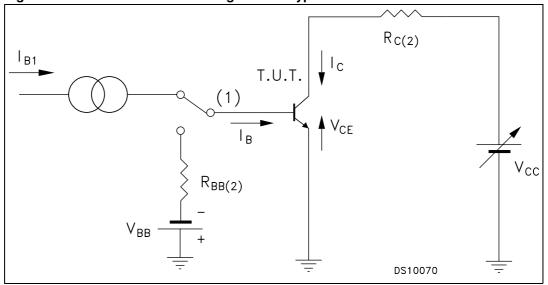
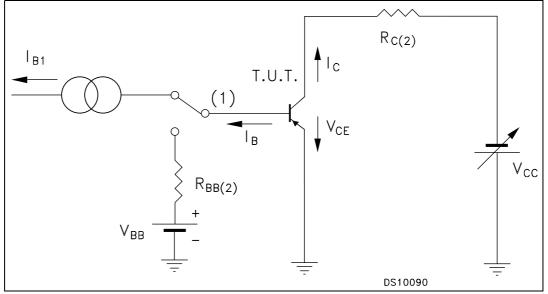


Figure 18. Resistive load switching for NPN type

1. Fast electronic switch

2. Non-inductive resistor

Figure 19. Resistive load switching for PNP type



1. Fast electronic switch

2. Non-inductive resistor



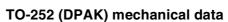
4 Package mechanical data

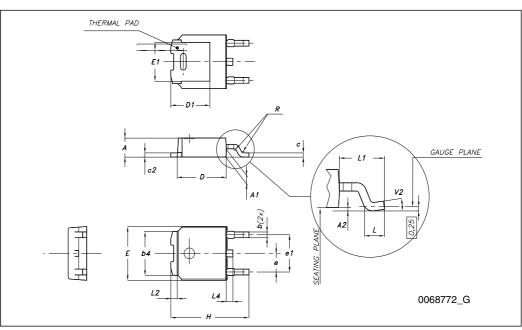
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		mm.	
DIM	min.	typ	max.
A	2.20		2.40
\1	0.90		1.10
A2	0.03		0.23
b	0.64		0.90
b4	5.20		5.40
с	0.45		0.60
c2	0.48		0.60
D	6.00		6.20
D1		5.10	
E	6.40		6.60
E1		4.70	
e		2.28	
e1	4.40		4.60
н	9.35		10.10
L	1		
L1		2.80	
L2		0.80	
L4	0.60		1
R		0.20	
V2	0 °		8 °







5 Revision history

Table 5.Document revision history

Date	Revision	Changes
01-Aug-2002	8	
01-Oct-2007	9	Collector current limits have been improved
03-Oct-2007	10	Package mechanical data updated
21-Apr-2009	11	The device MJD127 has been inserted Section 2.1: Electrical characteristics (curves) has been updated



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