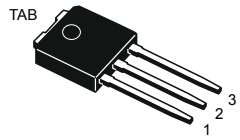
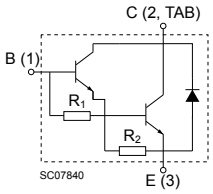
MJD122-1

Datasheet

Low voltage NPN power Darlington transistor



IPAK



NPN: R_1 = 7 kΩ, R_2 = 70 Ω

Features

- Low collector-emitter saturation voltage
- Monolithic Darlington configuration with integrated antiparallel collector-emitter diode

Application

- Linear and switching industrial equipment

Description

This device is manufactured in planar technology with “base island” layout and monolithic Darlington configuration.

Product status links
MJD122-1

Product summary	
Order code	MJD122-1
Marking	MJD122
Polarity	NPN
Package	IPAK
Packing	Tube

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-emitter voltage (I_B = 0 A)	100	V
V_{CBO}	Collector-base voltage (I_E = 0 A)		V
V_{EBO}	Emitter-base voltage (I_C = 0 A)	5	V
I_C	Collector current	8	A
I_{CM}	Collector peak current	16	A
I_B	Base current	120	mA
P_{TOT}	Total power dissipation at T_C = 25 °C	20	W
T_{stg}	Storage temperature range	-65 to 150	°C
T_J	Operating junction temperature range		

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance, junction-to-case	6.25	°C/W

2 Electrical characteristics

T_C = 25°C unless otherwise specified.

Table 3. Electrical characteristics

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

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

2.1 Electrical characteristics (curves)

Figure 1. Safe operating area

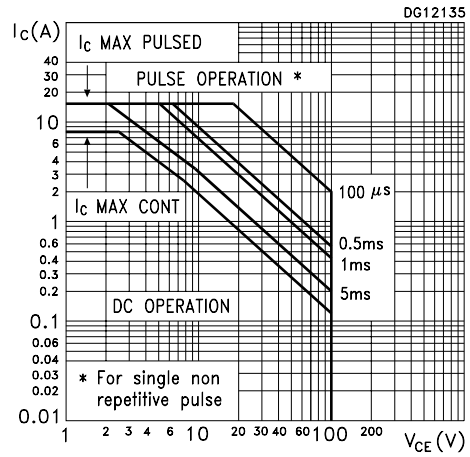


Figure 2. Derating curve

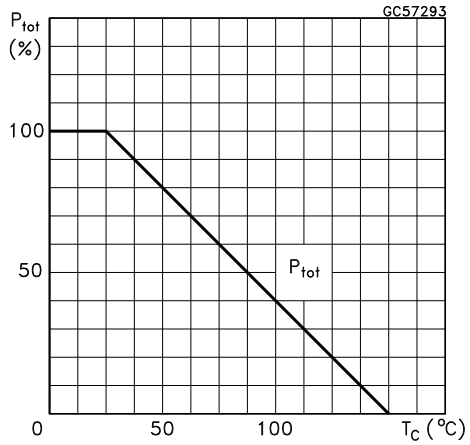


Figure 3. DC current gain

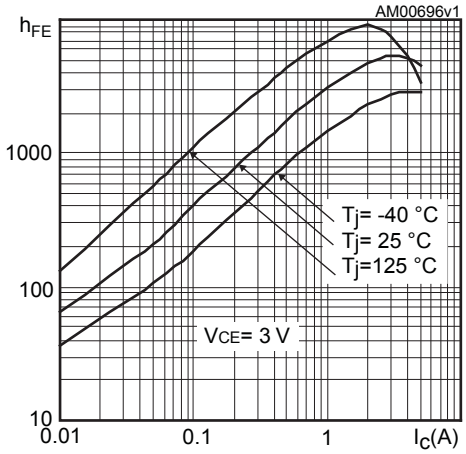


Figure 4. Collector-emitter saturation voltage

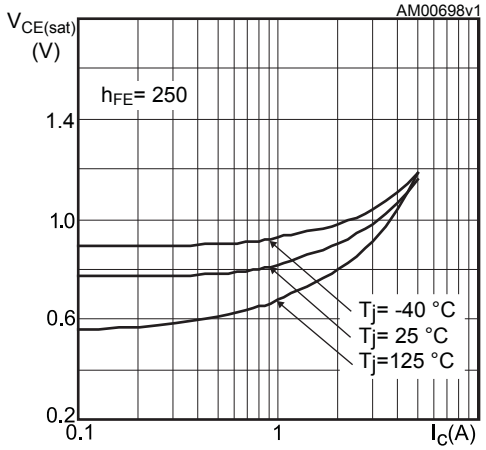


Figure 5. Base-emitter saturation voltage

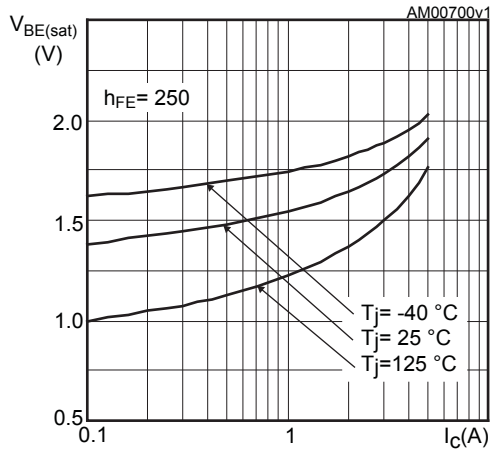


Figure 6. Base-emitter on voltage

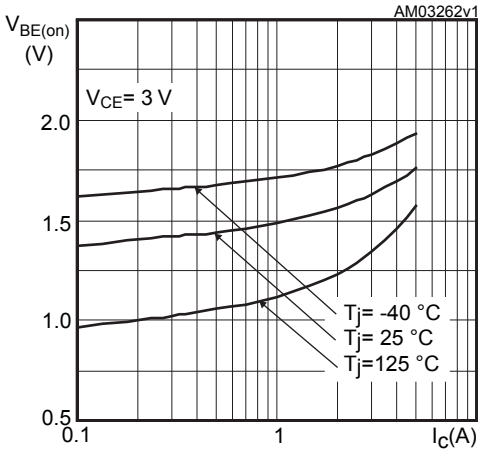


Figure 7. Resistive load switching time (on)

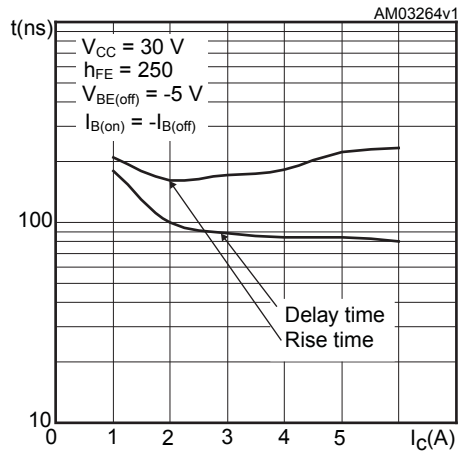


Figure 8. Resistive load switching time (off)

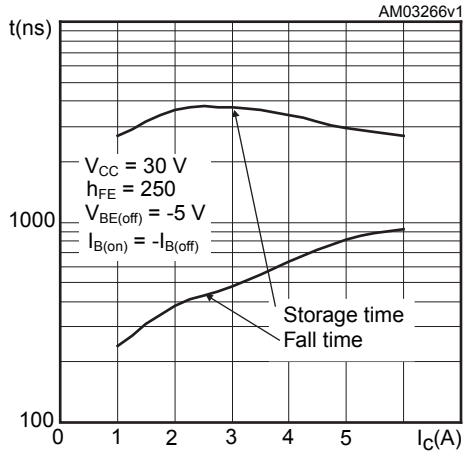
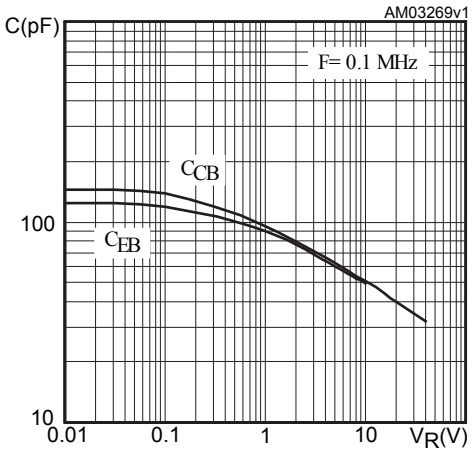
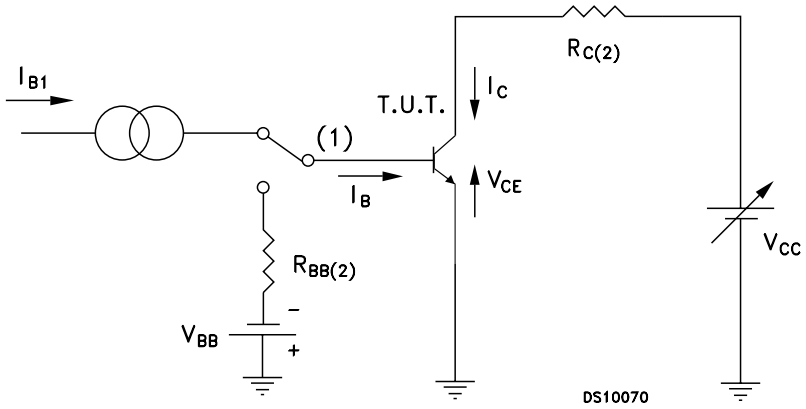


Figure 9. Capacitance characteristics



3 Test circuits

Figure 10. **Resistive load switching test circuit**



Note: (1) Fast electronic switch.

Note: (2) Non-inductive resistor.

4 Package information

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 product status are available at: www.st.com. ECOPACK is an ST trademark.

4.1 IPAK (TO-251) type A package information

Figure 11. IPAK (TO-251) type A package outline

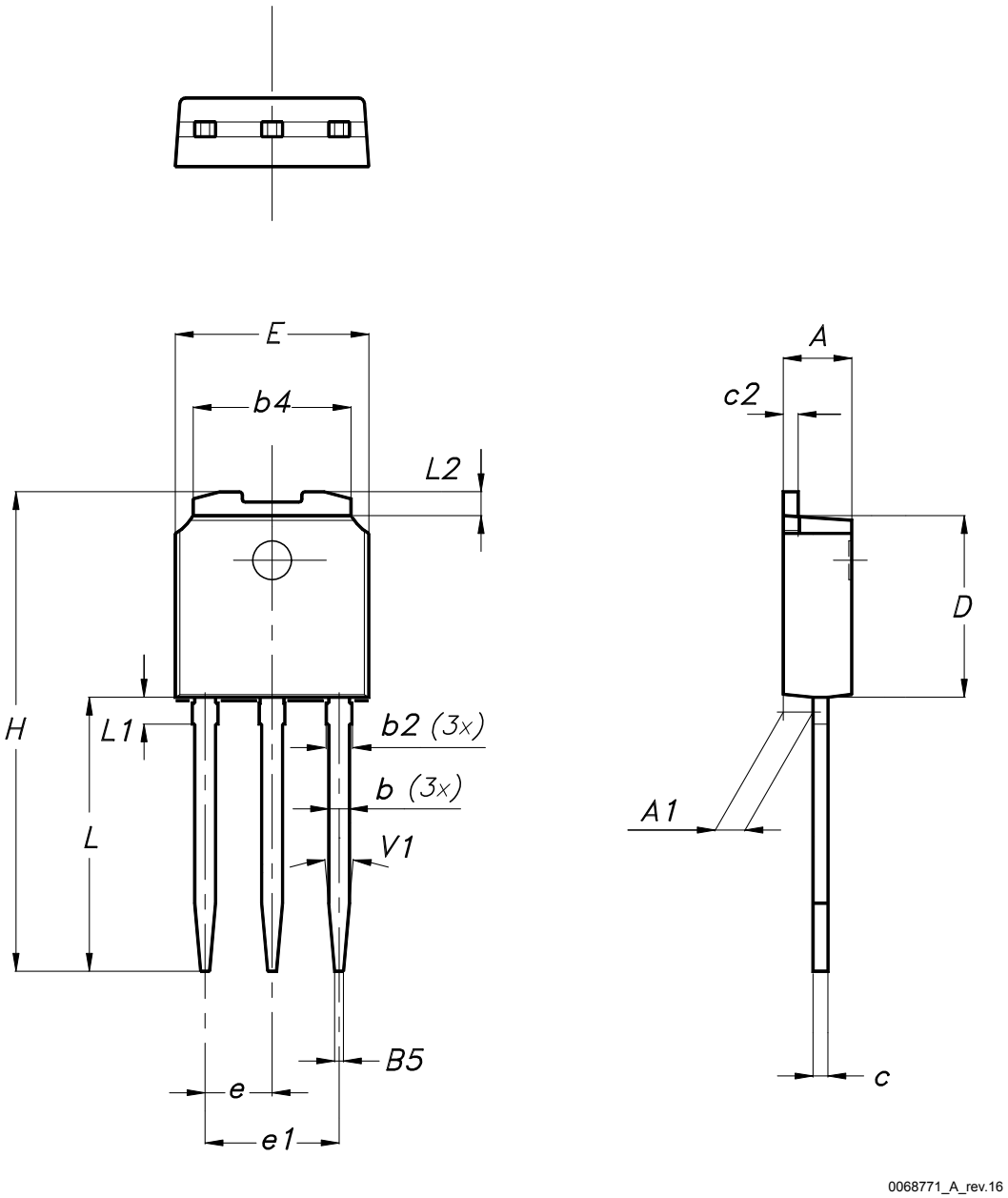


Table 4. **IPAK (TO-251) type A package mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A	2.20		2.40
A1	0.90		1.10
b	0.64		0.90
b2			0.95
b4	5.20		5.40
B5		0.30	
c	0.45		0.60
c2	0.48		0.60
D	6.00		6.20
E	6.40		6.60
e		2.28	
e1	4.40		4.60
H		16.10	
L	9.00		9.40
L1	0.80		1.20
L2		0.80	1.00
V1		10°	

Revision history

Table 5. **Document revision history**

Date	Revision	Changes
30-Apr-2025	1	First release.
16-Jun-2025	2	Updated. Table 3. Electrical characteristics.

Contents

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