

## Low voltage PNP power transistor

#### **Features**

- NPN type is MJD31C
- Surface-mounting TO-252 power package in tape & reel

#### **Applications**

■ General purpose switching and amplifier

#### **Description**

The device is manufactured in Planar technology with "Base Island" layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage.

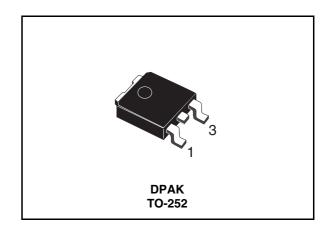


Figure 1. Internal schematic diagram

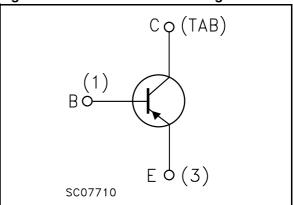


Table 1. Order code

Part number	Marking	Package	Packaging
MJD32CT4	MJD32C	DPAK	Tape & reel

Electrical ratings MJD32C

# 1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-base voltage (I <sub>E</sub> = 0)	-100	V
V <sub>CEO</sub>	Collector-base voltage (I <sub>B</sub> = 0)	-100	V
V <sub>EBO</sub>	Emitter-base voltage (I <sub>C</sub> = 0)	-5	V
I <sub>C</sub>	Collector current	-3	А
I <sub>CM</sub>	Collector peak current	-5	А
Ι <sub>Β</sub>	Base current	-1	А
P <sub>TOT</sub>	Total dissipation at T <sub>c</sub> = 25°C	15	W
T <sub>stg</sub>	Storage temperature	-65 to 150	°C
TJ	Max. operating junction temperature	150	°C

### 2 Electrical characteristics

(T<sub>case</sub> = 25°C unless otherwise specified)

Table 3. Electrical characteristics

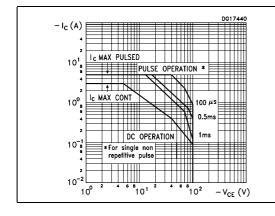
Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
I <sub>CES</sub>	Collector cut-off current (V <sub>BE</sub> = 0)	V <sub>CE</sub> =-100V			-20	μΑ
I <sub>CEO</sub>	Collector cut-off current $(I_B = 0)$	V <sub>CB</sub> =-60V			-50	μΑ
I <sub>EBO</sub>	Emitter cut-off current (I <sub>C</sub> = 0)	V <sub>EB</sub> =-5V			-0.1	mA
V <sub>CEO(sus)</sub> (1)	Collector-emitter sustaining voltage (I <sub>B</sub> = 0)	I <sub>C</sub> =-30mA	-100			V
V <sub>CE(sat)</sub> (1)	Collector-emitter saturation voltage	$I_C = -3A$ $I_B = -375 \text{mA}$			-1.2	V
V <sub>BE(on)</sub> (1)	Base-emitter on voltage	$I_C = -3A$ $V_{CE} = -4V$			-1.8	V
h <sub>FE</sub>	DC current gain	$I_{C}$ =-1A $V_{CE}$ =-4V $I_{C}$ = -3A $V_{CE}$ =-4V			50	

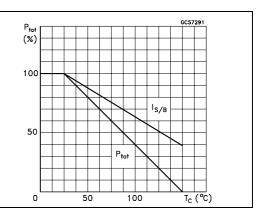
<sup>1.</sup> Note (1) Pulsed duration = 300 ms, duty cycle £1.5%

### 2.1 Electrical characteristic (curves)

Figure 2. Safe operating area

Figure 3. Derating curve





Electrical characteristics MJD32C

Figure 4. DC current gain

Figure 5. DC current gain

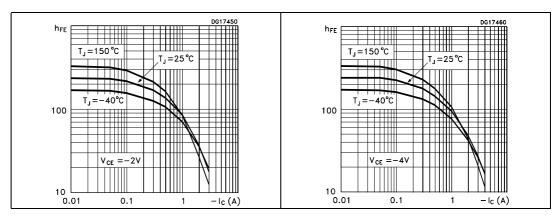


Figure 6. Collector-emitter saturation voltage

Figure 7. Base-emitter saturation voltage

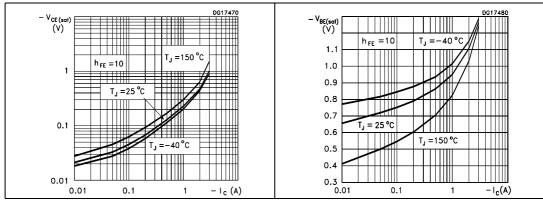
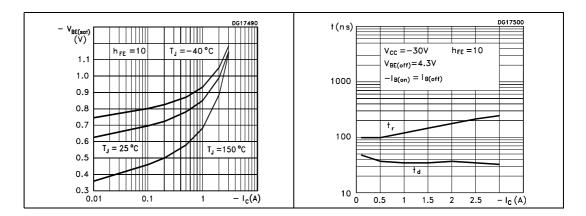


Figure 8. Collector-emitter on voltage Figure 9. Resistive load switching time



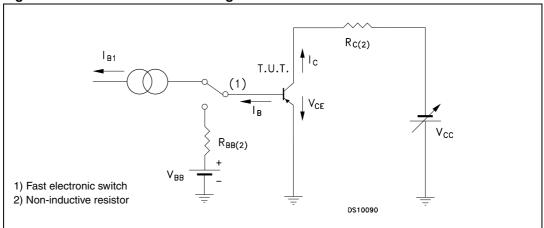
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t(n s)  $V_{CC} = -30V \qquad h_{FE} = 10$   $V_{BE(off)} = 4.3V \qquad -l_{B(on)} = l_{B(off)}$   $t_s$  1000  $t_f$  100  $0 \quad 0.5 \quad 1 \quad 1.5 \quad 2 \quad 2.5 \quad -l_{C}(A)$ 

Figure 10. Resistive load switching time

### 2.2 Test circuits

Figure 11. Resistive load switching test circuit



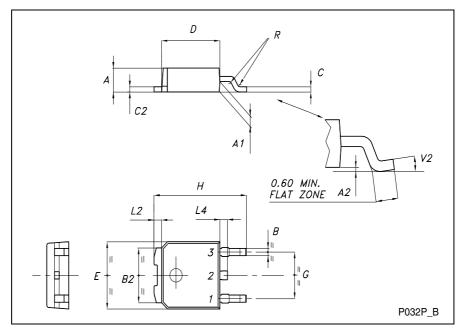
## 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

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#### **TO-252 (DPAK) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
Α	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
В	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
С	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236		0.244
Е	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
Н	9.35		10.10	0.368		0.398
L2		0.8			0.031	
L4	0.60		1.00	0.024		0.039
V2	0°		8°	0°		0°



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Revision history MJD32C

## 4 Revision history

Table 4. Revision history

Date	Revision	Changes
25-Jun-2007	1	Initial release.

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