

# MJD32C

## Low voltage PNP power transistor

#### Datasheet – production data

### Features

- Surface-mounting TO-252 power package in tape and reel
- Complementary to the NPN type MJD31C

## Application

 General purpose linear and switching equipment

## 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



Order code	Marking	Package	Packaging
MJD32CT4	MJD32C	DPAK	Tape and reel

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This is information on a product in full production.

# 1 Electrical ratings

Table 2.	Absolute m	aximum	ratings
	Absolute III	axiiiiaiii	raungs

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-base voltage ( $I_E = 0$ )	-100	V
V <sub>CEO</sub>	Collector-emitter voltage $(I_B = 0)$	-100	V
V <sub>EBO</sub>	Emitter-base voltage ( $I_{C} = 0$ )	-5	V
Ι <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 $T_c = 25 \ ^{\circ}C$	15	W
T <sub>STG</sub>	Storage temperature	-65 to 150	°C
Τ <sub>J</sub>	Max. operating junction temperature	150	°C

#### Table 3. Thermal data

Symbol	Parameter	Value	Unit
R <sub>thJC</sub>	Thermal resistance junction-case max	8.3	°C/W
R <sub>thJPCB</sub> <sup>(1)</sup>	Thermal resistance junction-pcb max	50	°C/W

1. When mounted on FR-4 board of 1 inch<sup>2</sup>, 2 oz Cu.



## 2 Electrical characteristics

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

Symbol	Parameter	Test con	ditions	Min.	Тур.	Max.	Unit
I <sub>CES</sub>	Collector cut-off current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = - 100 V			-	-20	μA
I <sub>CEO</sub>	Collector cut-off current (I <sub>B</sub> = 0)	V <sub>CB</sub> = - 60 V			-	-50	μA
I <sub>EBO</sub>	Emitter cut-off current (I <sub>C</sub> = 0)	V <sub>EB</sub> = - 5 V			-	-0.1	mA
V <sub>CEO(sus)</sub> <sup>(1)</sup>	Collector-emitter sustaining voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = - 30 mA		-100	-		v
V <sub>CE(sat)</sub> <sup>(1)</sup>	Collector-emitter saturation voltage	I <sub>C</sub> = - 3 A	l <sub>B</sub> = - 375 mA		-	-1.2	v
V <sub>BE(on)</sub> <sup>(1)</sup>	Base-emitter on voltage	I <sub>C</sub> = - 3 A	$V_{CE} = -4 V$		-	-1.8	V
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = - 1 A I <sub>C</sub> = - 3 A	V <sub>CE</sub> = - 4 V V <sub>CE</sub> = - 4 V	25 10	-	50	

 Table 4.
 Electrical characteristics

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

## 2.1 Electrical characteristic (curves)









hre  $T_{J}=150 \,^{\circ}\text{C}$   $T_{J}=25 \,^{\circ}\text{C}$   $T_{J}=-40 \,^{\circ}\text{C}$   $V_{CE}=-4V$   $V_{CE}=-4V$ 

Figure 6. Collector-emitter saturation

 $h_{FE} = 10$ 

T<sub>J</sub> =25 °C

– V<sub>CE (sat)</sub> (V)

1

0.1

0.01

0.01



1

 $T_1 = -40$  °C

T<sub>J</sub> =150 °C

DG17470

- |<sub>c</sub> (A)





Figure 8. Base-emitter on voltage

0.1

Figure 9. Resistive load switching time (on)





(off) DG17510 t (n s)  $V_{CC} = -30V$  $h_{FE} = 10$ V<sub>BE(off)</sub>=4.3V  $-I_{B(on)} = I_{B(off)}$ ts 1000 t<sub>f</sub> 100 10 L 0 0.5 1 1.5 2 2.5 - I<sub>C</sub> (A)

Figure 10. Resistive load switching time (off)

### 2.2 Test circuits





- 1. Fast electronic switch
- 2. Non-inductive resistor





Figure 12. Inductive load switching test circuit

- 1. Fast electronic switch
- 2. Non-inductive resistor
- 3. Fast recovery rectifier



## 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK<sup>®</sup> is an ST trademark.



Table 5. DF	PAK (TO-252) mechanical data

Dim.	mm					
	Min.	Тур.	Max.			
A	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		1.50			
L1		2.80				
L2		0.80				
L4	0.60		1			
R		0.20				
V2	<b>0</b> °		<b>8</b> °			









Таре			Reel			
Dim	mm		Dim	mm		
	Min.	Max.		Min.	Max.	
A0	6.8	7	А		330	
B0	10.4	10.6	В	1.5		
B1		12.1	С	12.8	13.2	
D	1.5	1.6	D	20.2		
D1	1.5		G	16.4	18.4	
E	1.65	1.85	Ν	50		
F	7.4	7.6	Т		22.4	
K0	2.55	2.75				
P0	3.9	4.1		Base qty.	2500	
P1	7.9	8.1		Bulk qty.	2500	
P2	1.9	2.1				
R	40					
Т	0.25	0.35				
W	15.7	16.3				

 Table 6.
 DPAK (TO-252) tape and reel mechanical data

### Figure 14. DPAK footprint<sup>(a)</sup>



a. All dimensions are in millimeters

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# 4 Revision history

#### Table 7.Document revision history

Date	Revision	Changes
25-Jun-2007	1	Initial release.
09-Nov-2009	2	Updated package mechanical data.
14-Jan-2010	3	Modified Table 3 on page 2.
04-Jun-2012	4	Updated: mechanical data



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