

# DATA SHEET



## **2N6427** NPN Darlington transistor

Product specification  
File under Discrete Semiconductors, SC04

1997 Jul 04

# NPN Darlington transistor

2N6427

## FEATURES

- High current (max. 500 mA)
- Low voltage (max. 30 V)
- High DC current gain (min. 10000).

## APPLICATIONS

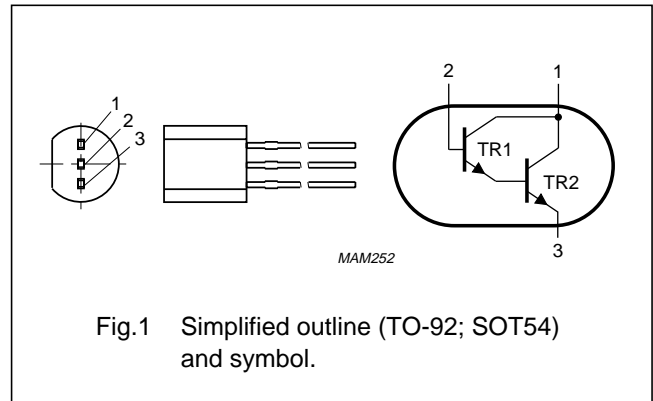
- General purpose
- High gain amplification.

## DESCRIPTION

NPN Darlington transistor in a TO-92; SOT54 plastic package.

## PINNING

PIN	DESCRIPTION
1	collector
2	base
3	emitter



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	40	V
$V_{CES}$	collector-emitter voltage	$V_{BE} = 0$	–	30	V
$I_C$	collector current		–	500	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	–	625	mW
$h_{FE}$	DC current gain	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	10000	100000	
$f_T$	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	125	–	MHz

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**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	40	V
$V_{CES}$	collector-emitter voltage	$V_{BE} = 0$	–	30	V
$V_{EBO}$	emitter-base voltage	open collector	–	10	V
$I_C$	collector current (DC)		–	500	mA
$I_{CM}$	peak collector current		–	800	mA
$I_B$	base current (DC)		–	200	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 1	–	625	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	200	K/W

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

**CHARACTERISTICS** $T_{amb} = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0$ ; $V_{CB} = 30\text{ V}$	–	100	nA
		$I_E = 0$ ; $V_{CB} = 30\text{ V}$ ; $T_j = 150\text{ °C}$	–	10	$\mu\text{A}$
$I_{CES}$	collector cut-off current	$V_{BE} = 0$ ; $I_B = 0$ ; $V_{CE} = 30\text{ V}$	–	100	nA
$I_{EBO}$	emitter cut-off current	$I_C = 0$ ; $V_{EB} = 10\text{ V}$	–	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}$ ; note 1			
		$I_C = 10\text{ mA}$	10000	100000	
		$I_C = 100\text{ mA}$	20000	200000	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 50\text{ mA}$ ; $I_B = 0.5\text{ mA}$ ; note 1	–	1.2	V
		$I_C = 500\text{ mA}$ ; $I_B = 0.5\text{ mA}$ ; note 1	–	1.5	V
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 500\text{ mA}$ ; $I_B = 0.5\text{ mA}$ ; note 1	–	2	V
$V_{BEon}$	base-emitter on-state voltage	$I_C = 50\text{ mA}$ ; $V_{CE} = 5\text{ V}$	–	1.75	V
$f_T$	transition frequency	$I_C = 10\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $f = 100\text{ MHz}$	125	–	MHz

**Note**

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup>
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT54		TO-92	SC-43		97-02-28

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**DEFINITIONS**

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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**NOTES**

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**NOTES**

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