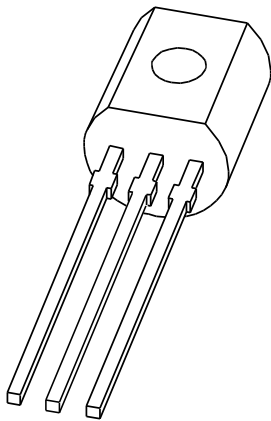


# DATA SHEET



## **BC875; BC877; BC879** NPN Darlington transistors

Product specification  
Supersedes data of 1997 Apr 03  
File under Discrete Semiconductors, SC04

1997 Apr 22

# NPN Darlington transistors

# BC875; BC877; BC879

### FEATURES

- High DC current gain (min. 1000)
- High current (max. 1 A)
- Low voltage (max. 80 V)
- Integrated diode and resistor.

### APPLICATIONS

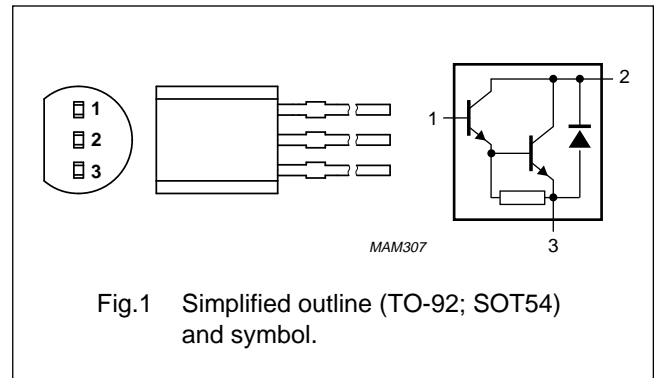
- Relay drivers.

### DESCRIPTION

NPN Darlington transistor in a TO-92; SOT54 plastic package. PNP complements: BC876, BC878, and BC880.

### PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter				
	BC875		–	–	60	V
	BC877		–	–	80	V
$V_{CES}$	collector-emitter voltage	$V_{BE} = 0$				
	BC875		–	–	45	V
	BC877		–	–	60	V
	BC879		–	–	80	V
$I_C$	collector current (DC)		–	–	1	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	–	–	0.83	W
$h_{FE}$	DC current gain	$I_C = 150\text{ mA}; V_{CE} = 10\text{ V}$	1000	–	–	
$f_T$	transition frequency	$I_C = 0.5\text{ A}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	–	200	–	MHz

## NPN Darlington transistors

## BC875; BC877; BC879

**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	BC875		–	60	V
	BC877		–	80	V
	BC879		–	100	V
V <sub>CES</sub>	collector-emitter voltage	V <sub>BE</sub> = 0			
	BC875		–	45	V
	BC877		–	60	V
	BC879		–	80	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	5	V
I <sub>C</sub>	collector current (DC)		–	1	A
I <sub>CM</sub>	peak collector current		–	2	A
I <sub>B</sub>	base current (DC)		–	0.2	A
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	–	0.83	W
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**Note**

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

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	150	K/W

**Note**

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

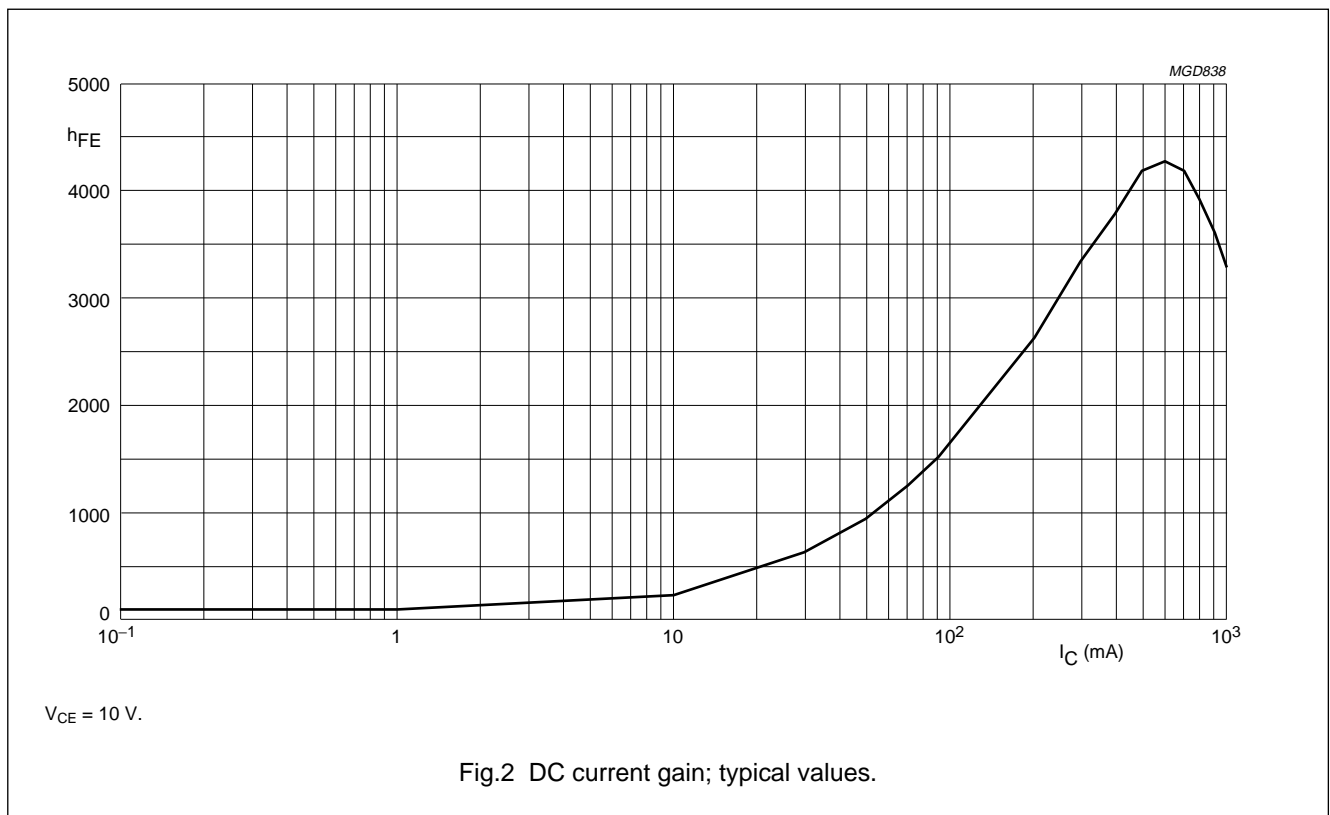
NPN Darlington transistors

BC875; BC877; BC879

**CHARACTERISTICS**

T<sub>j</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>CES</sub>	collector cut-off current BC875 BC877 BC879	V <sub>BE</sub> = 0; V <sub>CE</sub> = 45 V	–	–	50	nA
		V <sub>BE</sub> = 0; V <sub>CE</sub> = 60 V	–	–	50	nA
		V <sub>BE</sub> = 0; V <sub>CE</sub> = 80 V	–	–	50	nA
I <sub>EBO</sub>	emitter cut-off current	I <sub>C</sub> = 0; V <sub>EB</sub> = 4 V	–	–	50	nA
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 150 mA; V <sub>CE</sub> = 10 V; see Fig.2	1000	–	–	
		I <sub>C</sub> = 0.5 A; V <sub>CE</sub> = 10 V; see Fig.2	2000	–	–	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = 0.5 A; I <sub>B</sub> = 0.5 mA	–	–	1.3	V
		I <sub>C</sub> = 1 A; I <sub>B</sub> = 1 mA	–	–	1.8	V
V <sub>BEsat</sub>	base-emitter saturation voltage	I <sub>C</sub> = 1 A; I <sub>B</sub> = 1 mA	–	–	2.2	V
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 0.5 A; V <sub>CE</sub> = 5 V; f = 100 MHz	–	200	–	MHz
<b>Switching times (between 10% and 90% levels)</b>						
t <sub>on</sub>	turn-on time	I <sub>Con</sub> = 500 mA; I <sub>Bon</sub> = 0.5 mA; I <sub>Boff</sub> = –0.5 mA	–	500	–	ns
t <sub>off</sub>	turn-off time		–	1300	–	ns



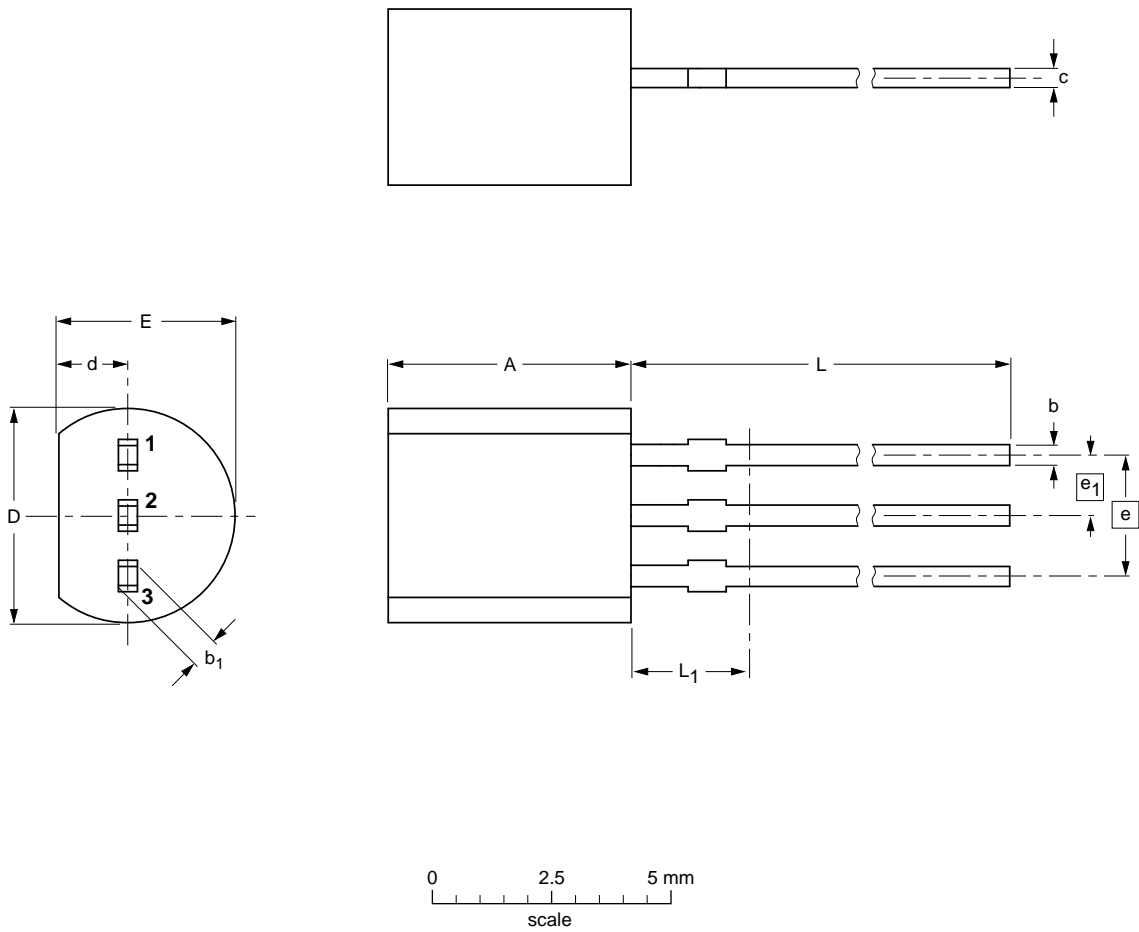
NPN Darlington transistors

BC875; BC877; BC879

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

## NPN Darlington transistors

BC875; BC877; BC879

**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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NPN Darlington transistors

BC875; BC877; BC879

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