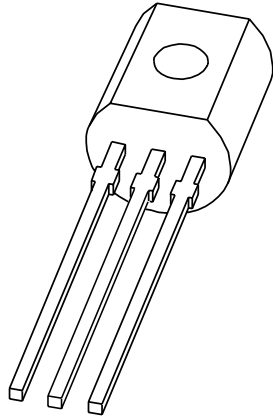


DATA SHEET



MPSA13; MPSA14 NPN Darlington transistors

Product specification
Supersedes data of 1997 Apr 07
File under Discrete Semiconductors, SC04

1997 Apr 24

NPN Darlington transistors

MPSA13; MPSA14

FEATURES

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

APPLICATIONS

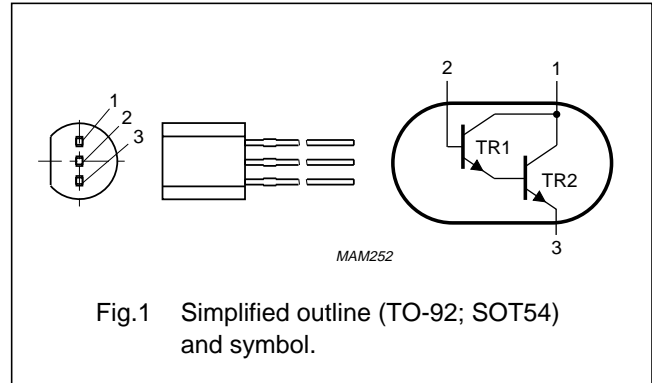
- High gain amplification.

DESCRIPTION

NPN Darlington transistor in a TO-92; SOT54 plastic package. PNP complements: MPSA63 and MPSA64.

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	–	30	V
V_{CES}	collector-emitter voltage	$V_{BE} = 0$	–	30	V
I_C	collector current (DC)		–	500	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	–	500	mW
h_{FE}	DC current gain	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$			
	MPSA13		5000	–	
	MPSA14		10000	–	
f_T	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	125	–	MHz

NPN Darlington transistors

MPSA13; MPSA14

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	–	30	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		–	1	A
I_B	base current (DC)		–	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$; note 1	–	500	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	50	K/W

Note

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

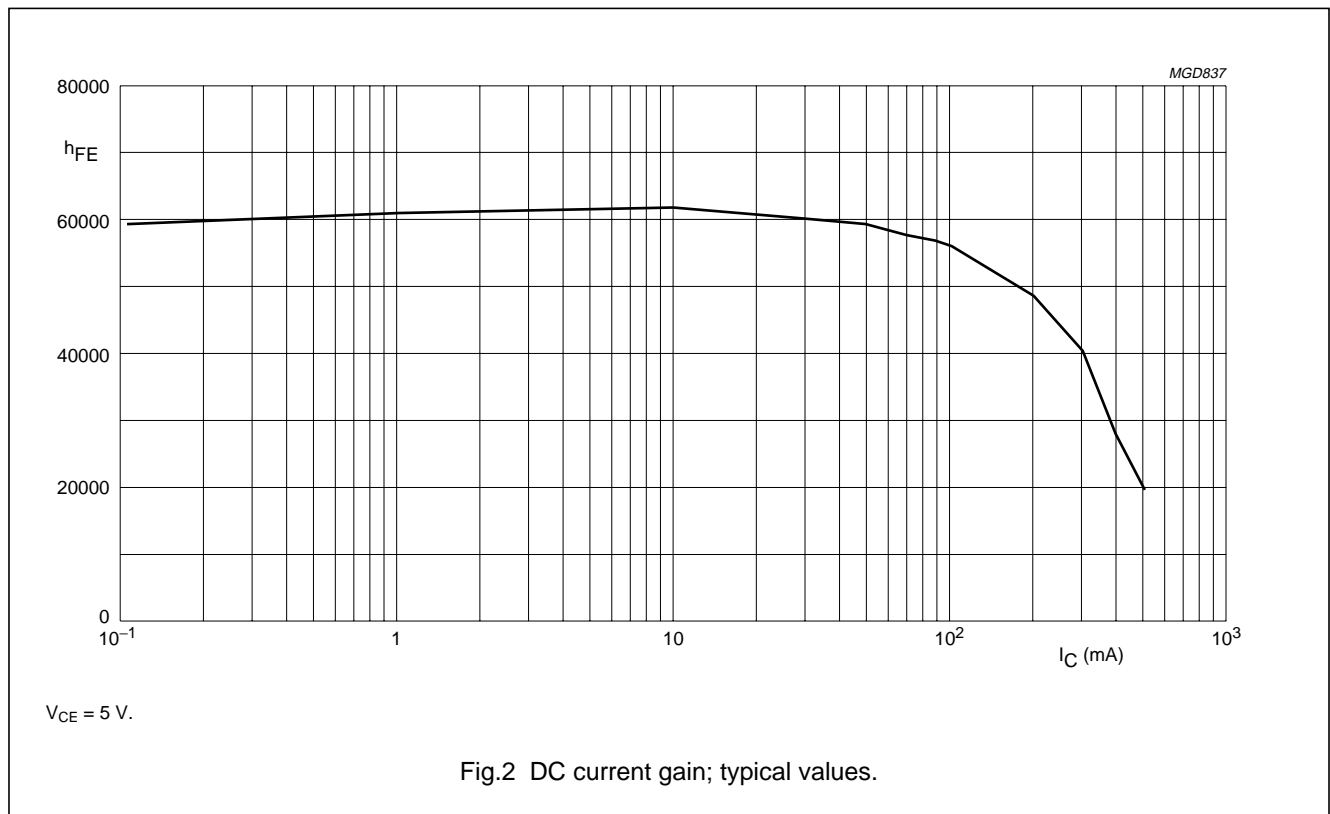
NPN Darlington transistors

MPSA13; MPSA14

CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 30\text{ V}$	–	0.1	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = 10\text{ V}$	–	0.1	μA
h_{FE}	DC current gain MPSA13 MPSA14	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V};$ see Fig.2	5000 10000	– –	
h_{FE}	DC current gain MPSA13 MPSA14	$I_C = 100\text{ mA}; V_{CE} = 5\text{ V};$ see Fig.2	10000 20000	– –	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 100\text{ mA}; I_B = 0.1\text{ mA}$	–	1.5	V
V_{BEsat}	base-emitter saturation voltage	$I_C = 100\text{ mA}; I_B = 0.1\text{ mA}$	–	1.5	V
V_{BEon}	base-emitter on-state voltage	$I_C = 100\text{ mA}; V_{CE} = 5\text{ V}$	–	2	V
f_T	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	125	–	MHz



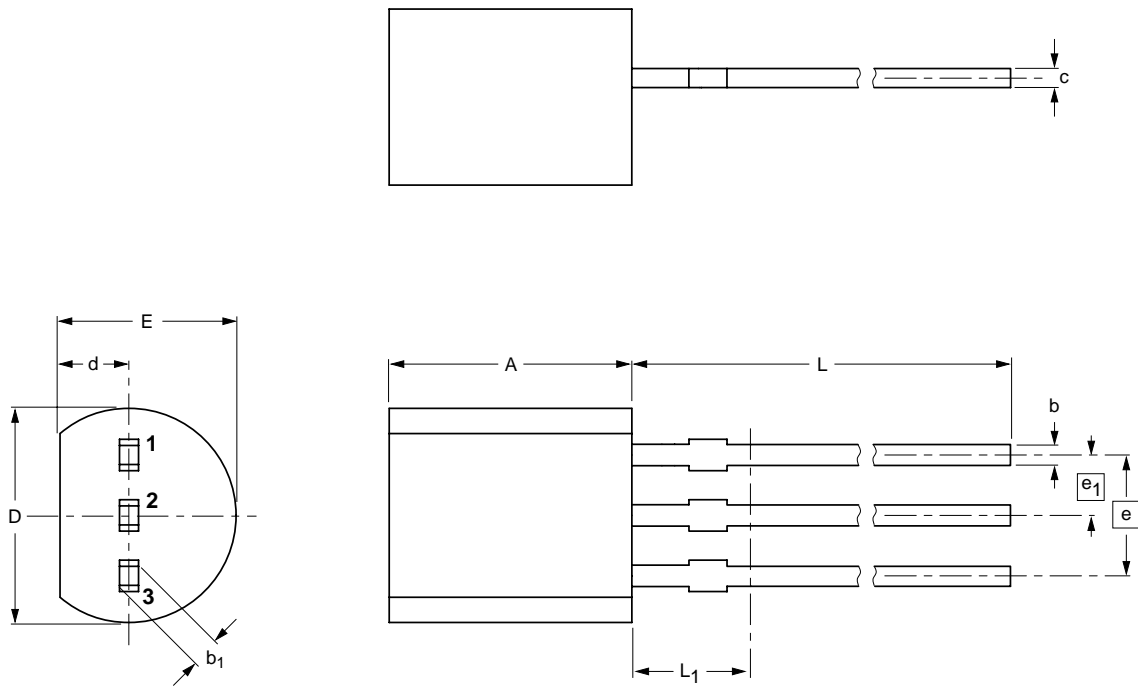
NPN Darlington transistors

MPSA13; MPSA14

PACKAGE OUTLINE

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

SOT54

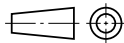


DIMENSIONS (mm are the original dimensions)

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

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

MPSA13; MPSA14

DEFINITIONS

Data Sheet Status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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NPN Darlington transistors

MPSA13; MPSA14

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