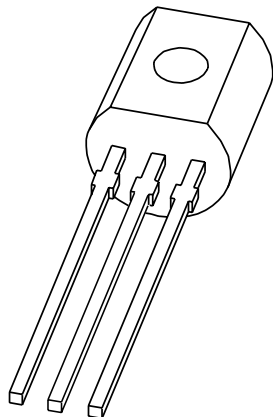


DATA SHEET



JC546; JC547; JC548 NPN general purpose transistors

Product specification
Supersedes data of September 1994
File under Discrete Semiconductors, SC04

1997 Mar 14

NPN general purpose transistors

JC546; JC547; JC548

FEATURES

- Low current max. 100 mA)
- Low voltage (max. 65 V).

APPLICATIONS

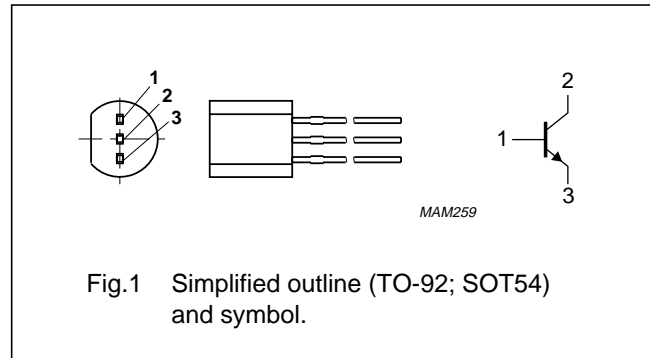
- General purpose switching and amplification, e.g. driver and output stages of audio amplifiers.

DESCRIPTION

NPN transistor in a TO-92; SOT54 plastic package.
PNP complements: JC556, JC557 and JC558.

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	JC546		–	80	V
	JC547		–	50	V
	JC548		–	30	V
V_{CEO}	collector-emitter voltage	open base			
	JC546		–	65	V
	JC547		–	45	V
	JC548		–	30	V
I_{CM}	peak collector current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	–	500	mW
h_{FE}	DC current gain	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$			
	JC546		110	450	
	JC547; JC548		110	800	
f_T	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	100	–	MHz

NPN general purpose transistors

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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			
	JC546		–	80	V
	JC547		–	50	V
	JC548		–	30	V
V_{CEO}	collector-emitter voltage	open-base			
	JC546		–	65	V
	JC547		–	45	V
	JC548		–	30	V
V_{EBO}	emitter-base voltage	open collector			
	JC546; JC547		–	6	V
	JC548		–	5	V
I_C	collector current (DC)		–	100	mA
I_{CM}	peak collector current		–	200	mA
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	–	500	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	0.25	K/mW

Note

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

NPN general purpose transistors

JC546; JC547; JC548

CHARACTERISTICS

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

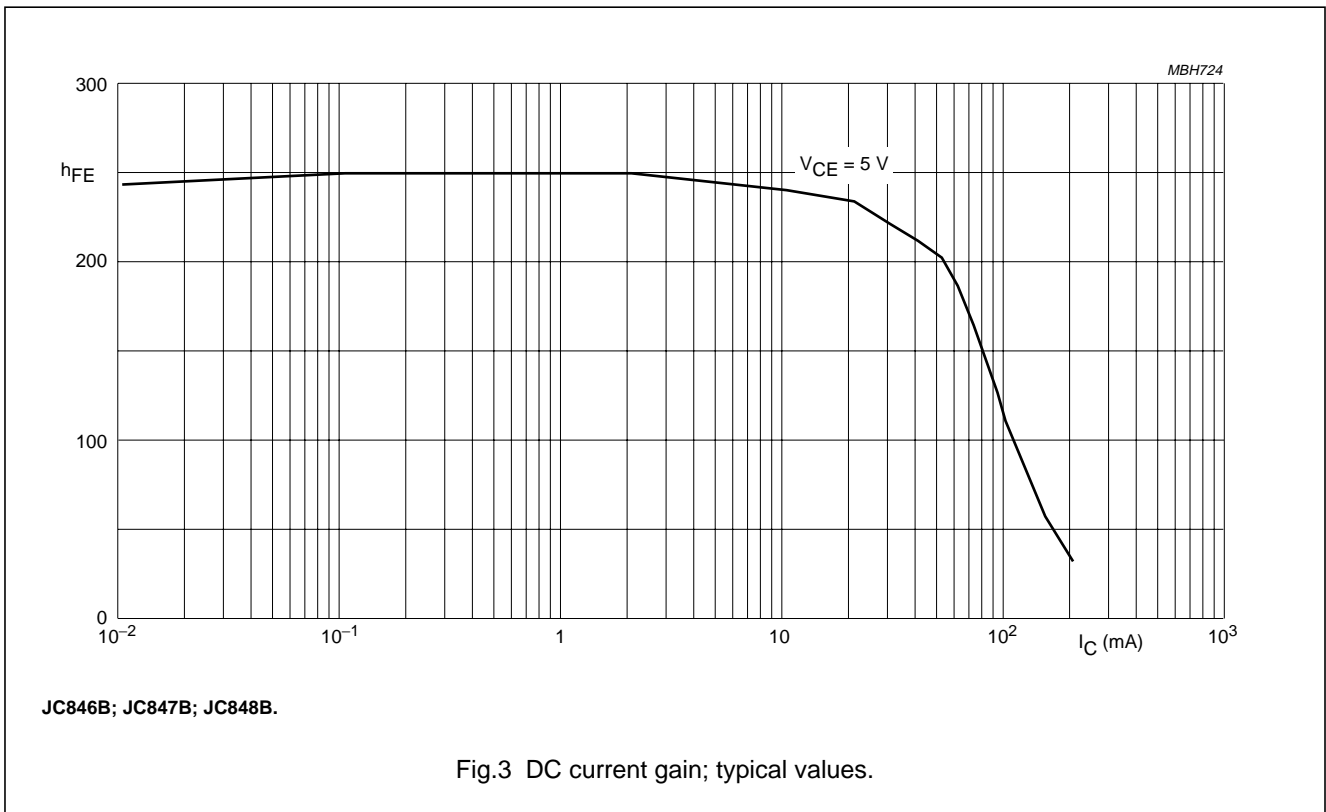
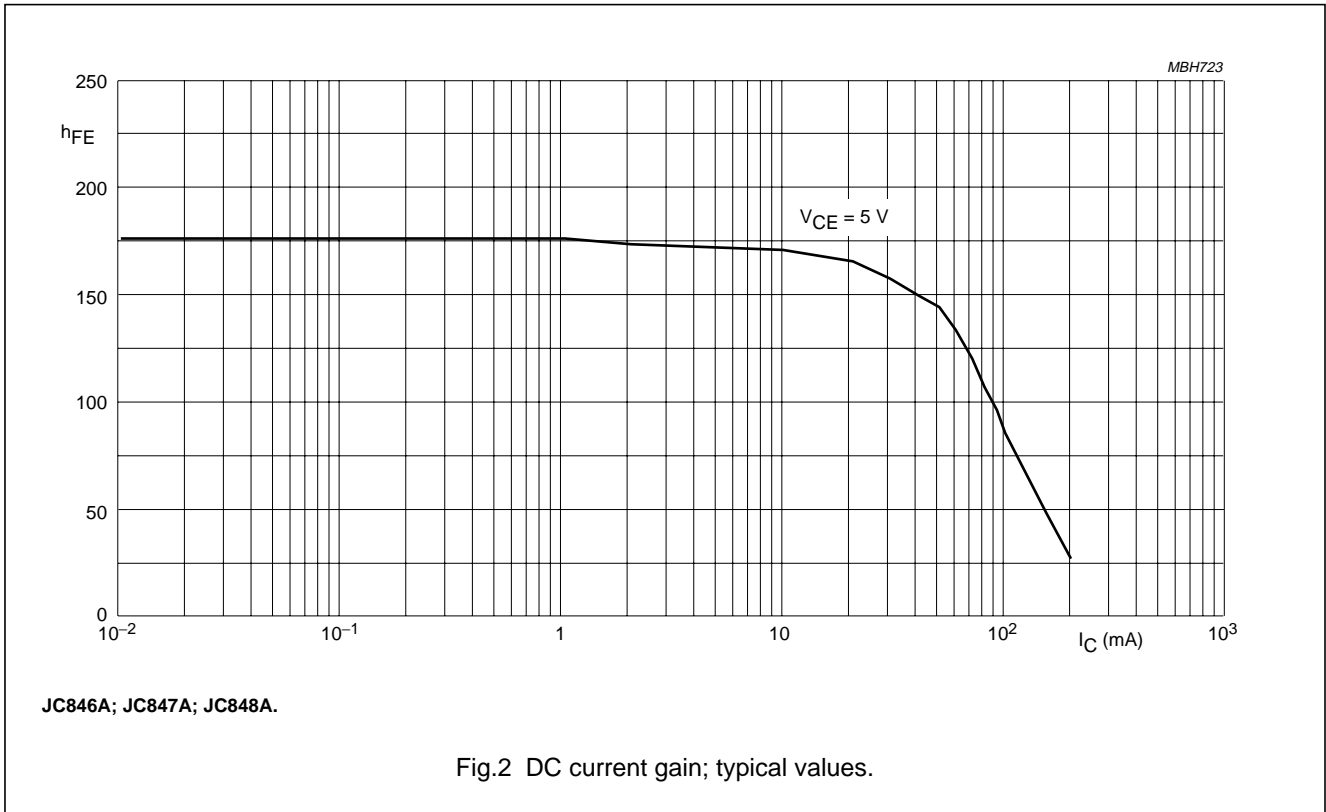
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 30\text{ V}$	–	–	15	nA
		$I_E = 0; V_{CB} = 30\text{ V}; T_j = 150\text{ °C}$	–	–	5	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = 5\text{ V}$	–	–	100	nA
h_{FE}	DC current gain JC546A; JC547A; JC548A JC546B; JC547B; JC548B JC547C; JC548C	$I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V};$ see Figs 2, 3 and 4	–	90	–	
			–	150	–	
			–	270	–	
h_{FE}	DC current gain JC546 JC547; JC548 JC546A; JC547A; JC548A JC546B; JC547B; JC548B JC547C; JC548C	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V};$ see Figs 2, 3 and 4	110	–	450	
			110	–	800	
			110	180	220	
			200	290	450	
			420	520	800	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	–	90	250	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}$	–	200	600	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA};$ note 1	–	700	–	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA};$ note 1	–	900	–	mV
V_{BE}	base-emitter voltage	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V};$ note 2	580	660	700	mV
		$I_C = 10\text{ mA}; V_{CE} = 5\text{ V};$ note 2	–	–	770	mV
C_C	collector capacitance	$I_E = i_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$	–	2.5	–	pF
C_e	emitter capacitance	$I_C = i_c = 0; V_{EB} = 0.5\text{ V}; f = 1\text{ MHz}$	–	11.5	–	pF
f_T	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	100	–	–	MHz
F	noise figure	$I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 1\text{ kHz}; B = 200\text{ Hz}$	–	2	10	dB

Notes

- V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.
- V_{BE} decreases by about 2 mV/K with increasing temperature.

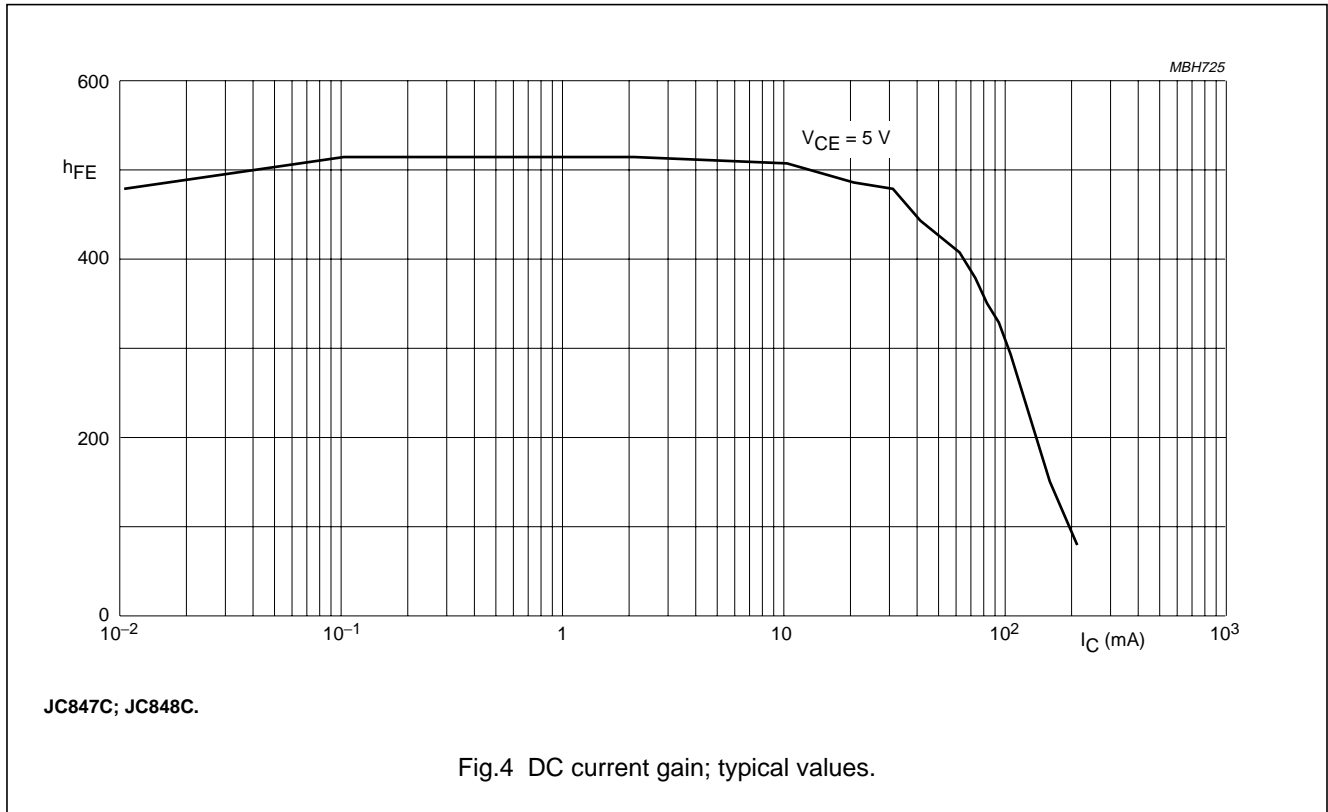
NPN general purpose transistors

JC546; JC547; JC548



NPN general purpose transistors

JC546; JC547; JC548



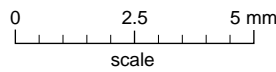
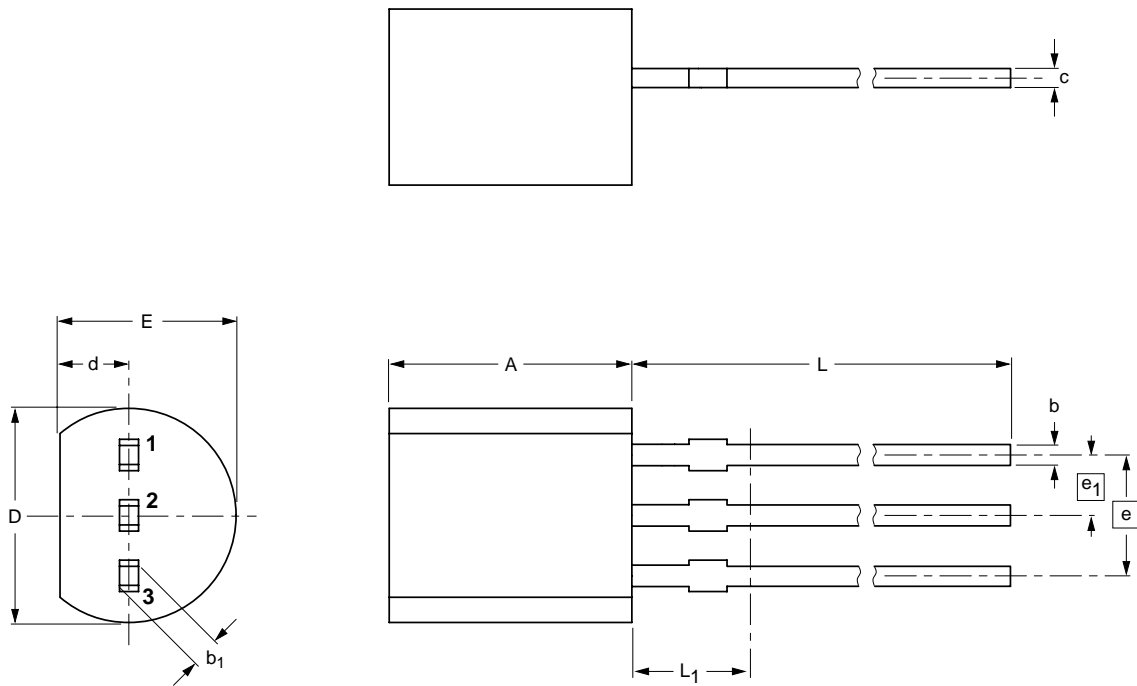
NPN general purpose transistors

JC546; JC547; JC548

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 general purpose transistors

JC546; JC547; JC548

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.	

LIFE SUPPORT APPLICATIONS

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NPN general purpose transistors

JC546; JC547; JC548

NOTES

NPN general purpose transistors

JC546; JC547; JC548

NOTES

NPN general purpose transistors

JC546; JC547; JC548

NOTES

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