

PNP general purpose transistors

JC559; JC560

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 45 V).

APPLICATIONS

- General purpose switching and amplification
- Low-noise input stages in tape recorders, hi-fi amplifiers and other audio-frequency equipment.

DESCRIPTION

PNP transistor in a TO-92; SOT54 plastic package.
NPN complements: JC549 and JC550.

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter

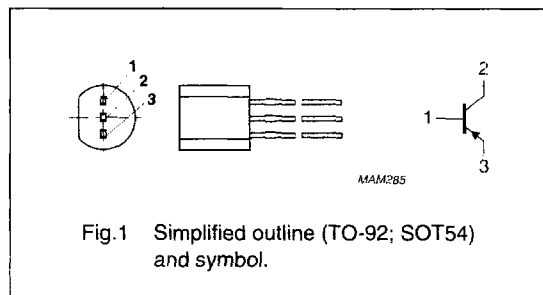


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CB0}	collector-base voltage	open emitter			
	JC559			-30	V
	JC560			-50	V
V_{CEO}	collector-emitter voltage	open base			
	JC559		-	-30	V
	JC560		-	-45	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	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}$	125	800	
f_T	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	100	-	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			
	JC559		-	-30	V
	JC560		-	-50	V
V_{CEO}	collector-emitter voltage	open base			
	JC559		-	-30	V
	JC560		-	-45	V
V_{EBO}	emitter-base voltage	open collector	-	-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	$T_{amb} \leq 25\text{ }^\circ\text{C}$; note 1	-	500	mW
T_{stg}	storage temperature		-65	+150	$^\circ\text{C}$
T_j	junction temperature		-	150	$^\circ\text{C}$
T_{amb}	operating ambient temperature		-65	+150	$^\circ\text{C}$

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	250	K/W

Note

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

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CHARACTERISTICS

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

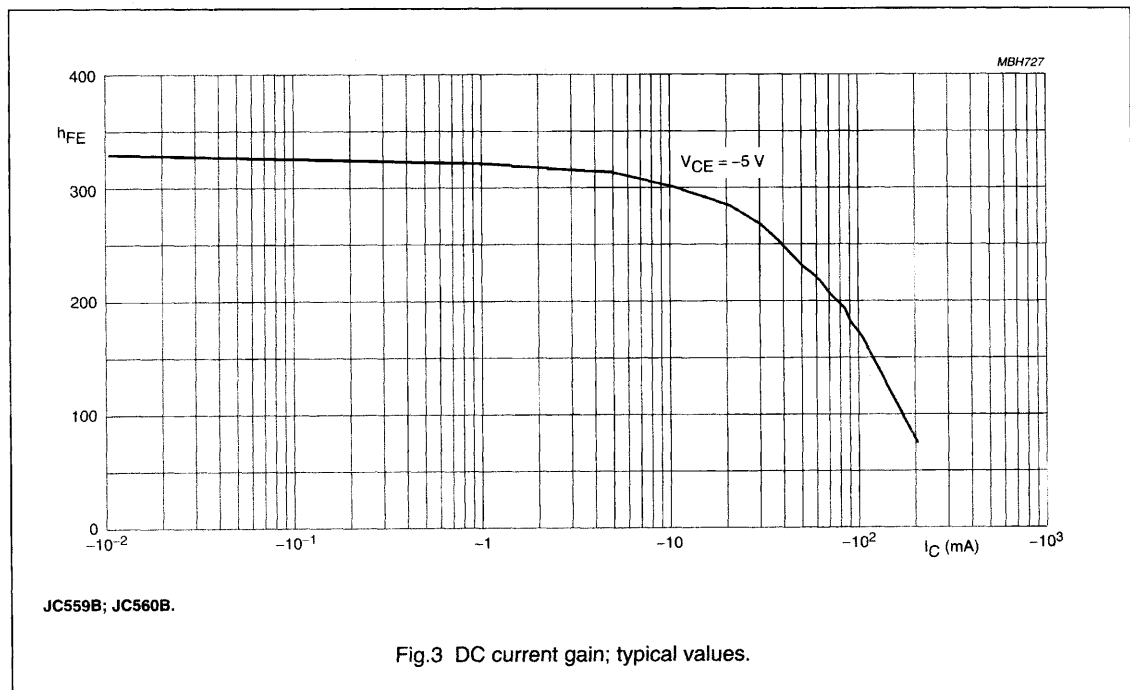
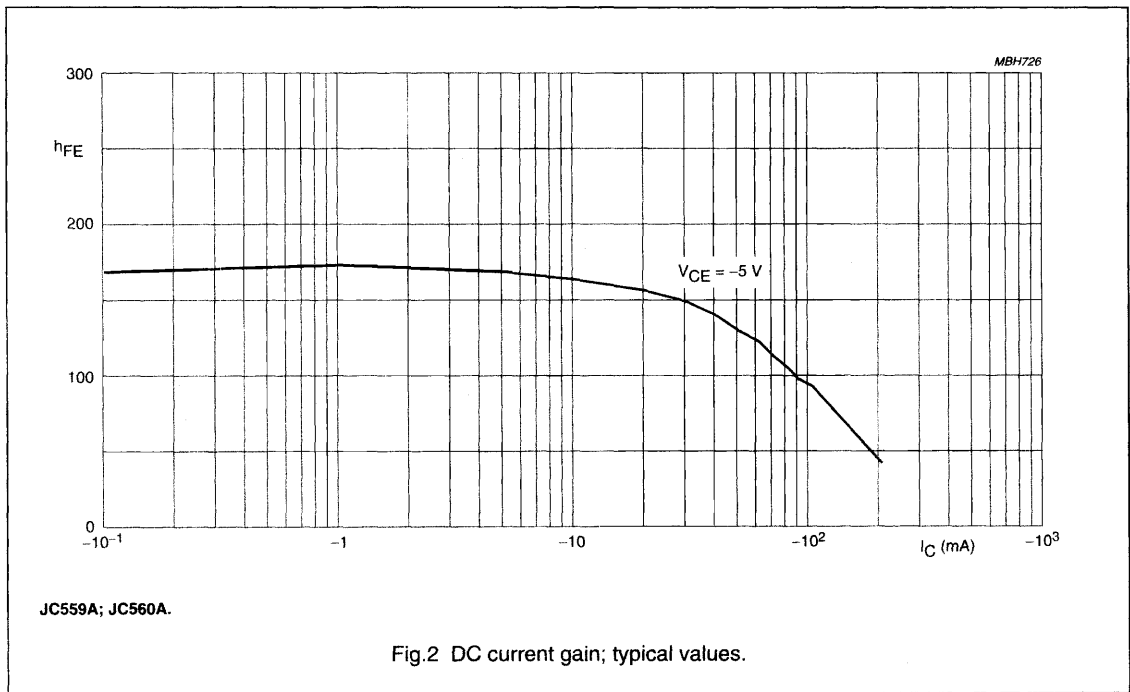
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = -30\text{ V}$	–	–1	–15	nA
		$I_E = 0; V_{CB} = -30\text{ V}; T_j = 150\text{ }^\circ\text{C}$	–	–	–4	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	–	–	–100	nA
h_{FE}	DC current gain JC559; JC560 JC559A; JC560A JC559B; JC560B JC559C; JC560C	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}$ see Figs 2, 3 and 4	125	–	800	
			125	–	250	
			220	–	475	
			420	–	800	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; \text{note 1}$	–	–60	–300	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	–	–180	–650	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; \text{note 1}$	–	–750	–	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	–	–930	–	mV
V_{BE}	base-emitter voltage	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}; \text{note 2}$	–600	–650	–750	mV
		$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; \text{note 2}$	–	–	–820	mV
C_c	collector capacitance	$I_E = I_B = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	–	4	–	pF
C_e	emitter capacitance	$I_C = I_C = 0; V_{EB} = -500\text{ mV}; f = 1\text{ MHz}$	–	12	–	pF
f_T	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	100	–	–	MHz
F	noise figure JC559B; JC560B; JC559C; JC560C	$I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 10\text{ Hz to }15.7\text{ kHz}$	–	–	4	dB
			–	–	4	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.

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