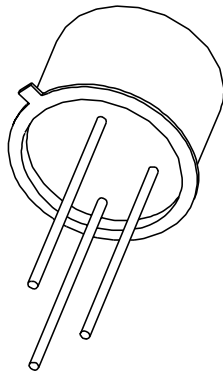


DATA SHEET



BCY70; BCY71 PNP general purpose transistors

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

1997 Jul 11

PNP general purpose transistors

BCY70; BCY71

FEATURES

- Low current (max. 200 mA)
- Low voltage (max. 45 V).

APPLICATIONS

- General purpose industrial applications.

DESCRIPTION

PNP transistor in a TO-18 metal package.

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector, connected to case

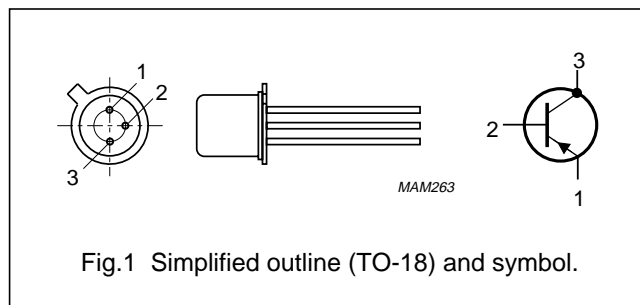


Fig.1 Simplified outline (TO-18) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CBO}	collector-base voltage	open emitter			
	BCY70		–	–50	V
	BCY71		–	–45	V
V _{CEO}	collector-emitter voltage	open base			
	BCY70		–	–40	V
	BCY71		–	–45	V
I _{CM}	peak collector current		–	–200	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	–	350	mW
h _{FE}	DC current gain	I _C = –10 mA; V _{CE} = –1 V	100	–	
f _T	transition frequency	I _C = –10 mA; V _{CE} = –20 V; f = 100 MHz	250	–	MHz

PNP general purpose transistors

BCY70; BCY71

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			
	BCY70		–	–50	V
	BCY71		–	–45	V
V _{CEO}	collector-emitter voltage	open base			
	BCY70		–	–40	V
	BCY71		–	–45	V
V _{EBO}	emitter-base voltage	open collector	–	–5	V
I _C	collector current (DC)		–	–200	mA
I _{CM}	peak collector current		–	–200	mA
I _{BM}	peak base current		–	–100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	–	350	mW
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	200	°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	in free air	500	K/W
R _{th j-c}	thermal resistance from junction to case		150	K/W

PNP general purpose transistors

BCY70; BCY71

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current BCY70	$I_E = 0; V_{CB} = -50\text{ V}$	–	–20	nA
		$I_E = 0; V_{CB} = -50\text{ V}; T_j = 100\text{ °C}$	–	–5	μA
I_{CBO}	collector cut-off current BCY71	$I_E = 0; V_{CB} = -45\text{ V}$	–	–20	nA
		$I_E = 0; V_{CB} = -45\text{ V}; T_j = 100\text{ °C}$	–	–5	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = -4\text{ V}$	–	–10	nA
		$I_C = 0; V_{EB} = -4\text{ V}; T_j = 100\text{ °C}$	–	–2	μA
		$I_C = 0; V_{EB} = -5\text{ V}$	–	–500	nA
h_{FE}	DC current gain	$V_{CE} = -1\text{ V}$			
		$I_C = -10\text{ }\mu\text{A}$	60	–	
		$I_C = -0.1\text{ mA}$	80	–	
		$I_C = -1\text{ mA}$	100	–	
h_{FE}	DC current gain BCY70 BCY71	$I_C = -50\text{ mA}$	45	–	
		$V_{CE} = -1\text{ V}$			
		$I_C = -10\text{ mA}; V_{CE} = -1\text{ V}$	100	–	
			–	500	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	–	–250	mV
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	–	–500	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	–600	–900	mV
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	–	–1.2	V
C_c	collector capacitance	$I_E = I_E = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	–	6	pF
C_e	emitter capacitance	$I_C = I_C = 0; V_{EB} = -1\text{ V}; f = 1\text{ MHz}$	–	8	pF
f_T	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}$	250	–	MHz
F	noise figure BCY70 BCY71	$I_C = -100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 1\text{ k}\Omega;$ $f = 10\text{ Hz to }15.7\text{ kHz}$	–	6	dB
			–	2	dB
Switching times (between 10% and 90% levels)					
BCY70					
t_{on}	turn-on time	$I_{Con} = -10\text{ mA}; I_{Bon} = -1\text{ mA}; I_{Boff} = 1\text{ mA}$	–	65	ns
t_d	delay time		–	35	ns
t_r	rise time		–	35	ns
t_{off}	turn-off time		–	500	ns
t_s	storage time		–	420	ns
t_f	fall time		–	80	ns

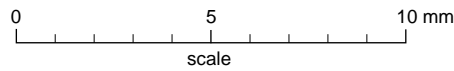
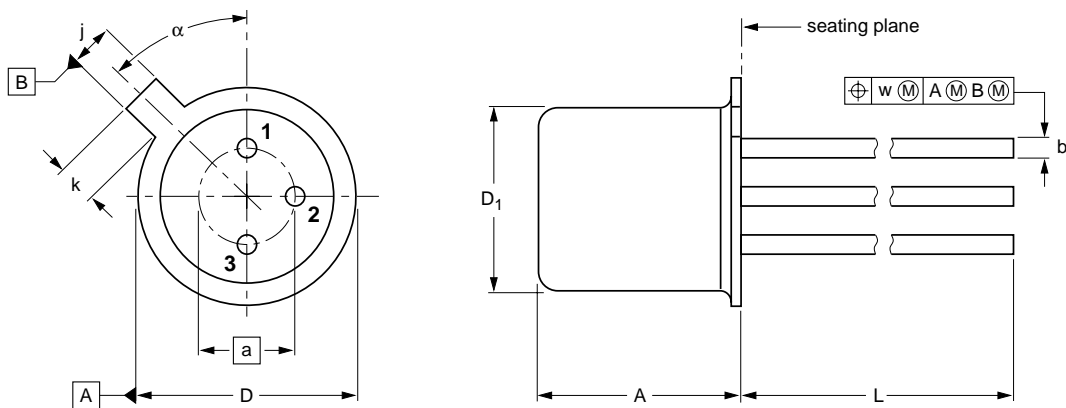
PNP general purpose transistors

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PACKAGE OUTLINE

Metal-can cylindrical single-ended package; 3 leads

SOT18/13



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	a	b	D	D ₁	j	k	L	w	α
mm	5.31 4.74	2.54	0.47 0.41	5.45 5.30	4.70 4.55	1.03 0.94	1.1 0.9	15.0 12.7	0.40	45°

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT18/13	B11/C7 type 3	TO-18				97-04-18

PNP general purpose transistors

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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

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

PNP general purpose transistors

BCY70; BCY71

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