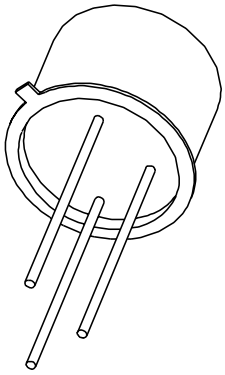
DATA SHEET



BCY70; BCY71
PNP general purpose transistors

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

1997 Jul 11

Philips
Semiconductors

PHILIPS

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

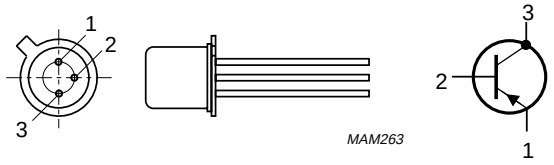


Fig.1 Simplified outline (TO-18) and symbol.

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	$T_{amb} \leq 25$ °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

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	$T_{amb} \leq 25$ °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
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air	500	K/W
$R_{th\ j\text{-}c}$	thermal resistance from junction to case		150	K/W

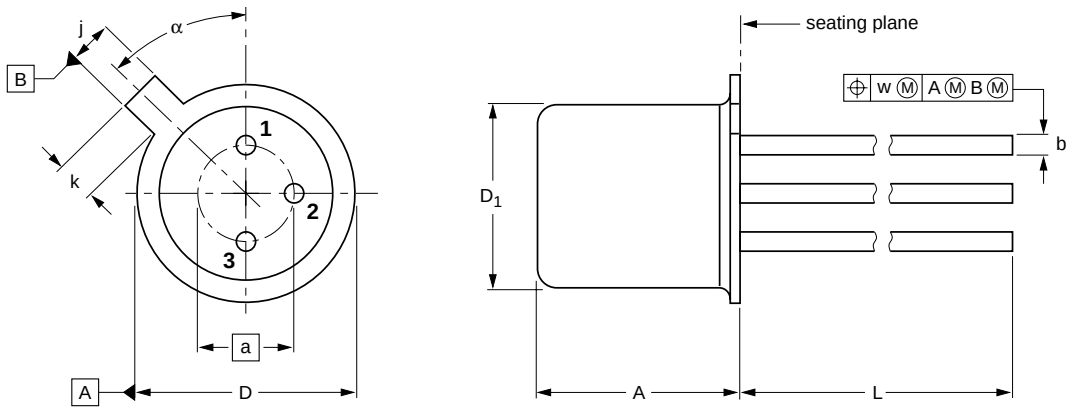
CHARACTERISTICS

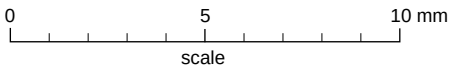
T_j = 25 °C unless otherwise specified.

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

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

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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