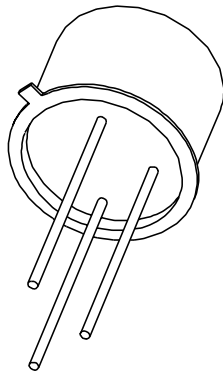


# DATA SHEET



## **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

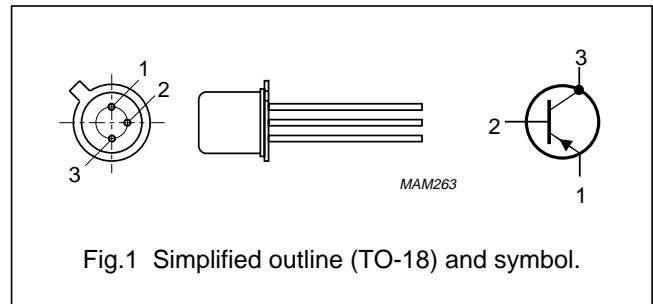


Fig.1 Simplified outline (TO-18) and symbol.

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	BCY70		–	–50	V
	BCY71		–	–45	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	BCY70		–	–40	V
	BCY71		–	–45	V
I <sub>CM</sub>	peak collector current		–	–200	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	–	350	mW
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = –10 mA; V <sub>CE</sub> = –1 V	100	–	
f <sub>T</sub>	transition frequency	I <sub>C</sub> = –10 mA; V <sub>CE</sub> = –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 <sub>CBO</sub>	collector-base voltage	open emitter			
	BCY70		–	–50	V
	BCY71		–	–45	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	BCY70		–	–40	V
	BCY71		–	–45	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	–5	V
I <sub>C</sub>	collector current (DC)		–	–200	mA
I <sub>CM</sub>	peak collector current		–	–200	mA
I <sub>BM</sub>	peak base current		–	–100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	–	350	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	200	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	in free air	500	K/W
R <sub>th j-c</sub>	thermal resistance from junction to case		150	K/W

## PNP general purpose transistors

## BCY70; BCY71

## CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$  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
		$I_E = 0; V_{CB} = -50\text{ V}; T_j = 100\text{ }^\circ\text{C}$	–	–5	$\mu\text{A}$
$I_{CBO}$	collector cut-off current BCY71	$I_E = 0; V_{CB} = -45\text{ V}$	–	–20	nA
		$I_E = 0; V_{CB} = -45\text{ V}; T_j = 100\text{ }^\circ\text{C}$	–	–5	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = -4\text{ V}$	–	–10	nA
		$I_C = 0; V_{EB} = -4\text{ V}; T_j = 100\text{ }^\circ\text{C}$	–	–2	$\mu\text{A}$
		$I_C = 0; V_{EB} = -5\text{ V}$	–	–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
<b>Switching times (between 10% and 90% levels)</b>					
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

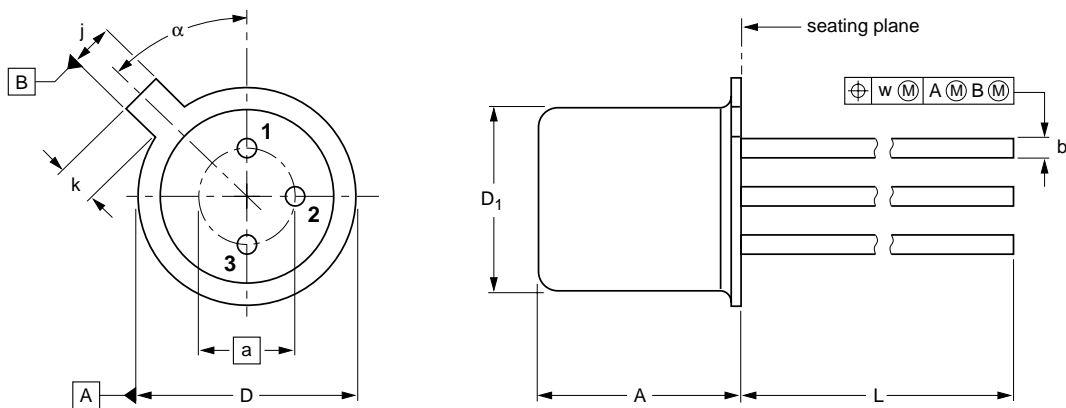
PNP general purpose transistors

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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 <sub>1</sub>	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

BCY70; BCY71

**DEFINITIONS**

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

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PNP general purpose transistors

BCY70; BCY71

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