

# DATA SHEET



## **BCX70 series** NPN general purpose transistors

Product data sheet  
Supersedes data of 1999 Apr 15

2004 Jan 16

# NPN general purpose transistors

# BCX70 series

### FEATURES

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

### APPLICATIONS

- General purpose switching and amplification.

### DESCRIPTION

NPN transistor in a SOT23 plastic package.  
 PNP complements: BCX71 series.

### MARKING

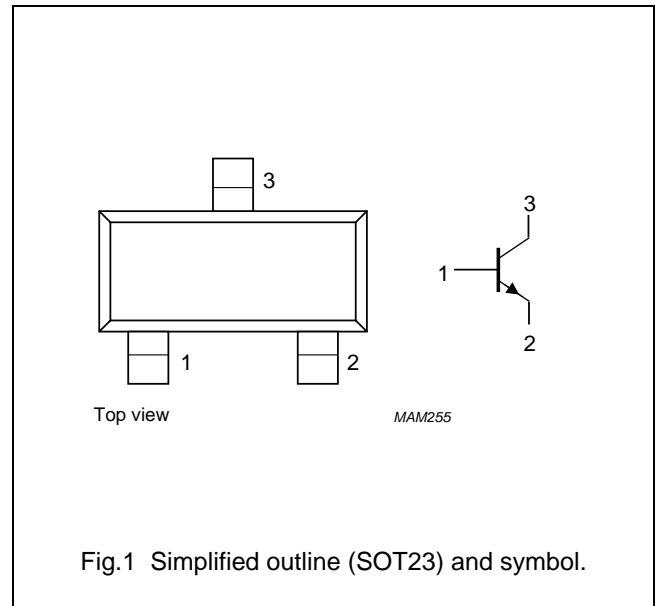
TYPE NUMBER	MARKING CODE <sup>(1)</sup>
BCX70G	AG*
BCX70H	AH*
BCX70J	AJ*
BCX70K	AK*

### Note

- \* = p : Made in Hong Kong.  
 \* = t : Made in Malaysia.  
 \* = W : Made in China.

### PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



### ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BCX70G	-	plastic surface mounted package; 3 leads	SOT23
BCX70H			
BCX70J			
BCX70K			

## NPN general purpose transistors

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**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	45	V
$V_{CEO}$	collector-emitter voltage	open base	–	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	$T_{amb} \leq 25\text{ °C}$	–	250	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	500	K/W

**Note**

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

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**CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = 45\text{ V}$	–	–	20	nA	
		$I_E = 0; V_{CB} = 45\text{ V}; T_{amb} = 150\text{ °C}$	–	–	20	$\mu\text{A}$	
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = 4\text{ V}$	–	–	20	nA	
$h_{FE}$	DC current gain	$I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	–	–	–		
			BCX70G	–	–	–	
			BCX70H	40	–	–	
			BCX70J	30	–	–	
	BCX70K	100	–	–			
	DC current gain	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$	120	–	220		
			BCX70G	180	–	310	
			BCX70H	250	–	460	
			BCX70J	380	–	630	
	BCX70K						
	DC current gain	$I_C = 50\text{ mA}; V_{CE} = 1\text{ V}$	50	–	–		
			BCX70G	70	–	–	
BCX70H			90	–	–		
BCX70J			100	–	–		
BCX70K							
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.25\text{ mA}$	50	–	350	mV	
		$I_C = 50\text{ mA}; I_B = 1.25\text{ mA}$	100	–	550	mV	
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.25\text{ mA}$	600	–	850	mV	
		$I_C = 50\text{ mA}; I_B = 1.25\text{ mA}$	700	–	1050	mV	
$V_{BE}$	base-emitter voltage	$I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$	–	520	–	mV	
		$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$	550	650	750	mV	
		$I_C = 50\text{ mA}; V_{CE} = 1\text{ V}$	–	780	–	mV	
$C_c$	collector capacitance	$I_E = I_E = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$	–	1.7	–	pF	
$C_e$	emitter capacitance	$I_C = I_C = 0; V_{EB} = 0.5\text{ V}; f = 1\text{ MHz}$	–	11	–	pF	
$f_T$	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz};$ note 1	100	250	–	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	6	dB	

**Note**

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

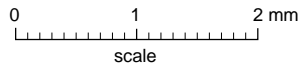
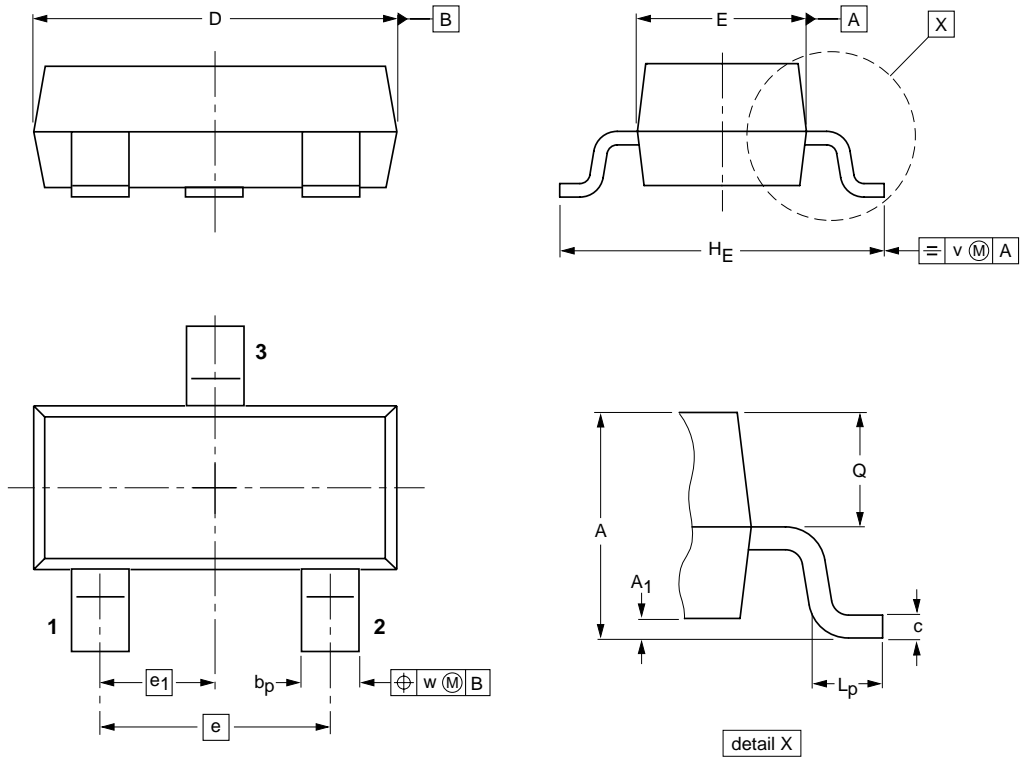
NPN general purpose transistors

BCX70 series

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				04-11-04 06-03-16

NPN general purpose transistors

BCX70 series

DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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# ***NXP Semiconductors***

## **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

## **Contact information**

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