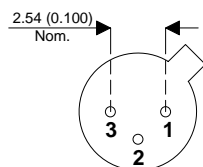
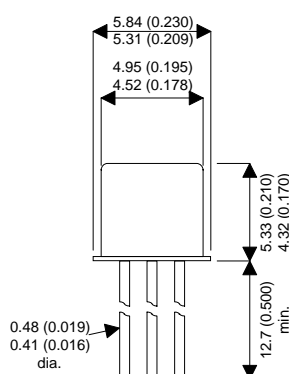


## GENERAL PURPOSE PNP SILICON TRANSISTOR

### MECHANICAL DATA

Dimensions in mm (inches)



### TO18 PACKAGE(TO-206AA)

Underside View

PIN 1 – Emitter    PIN 2 – Base    PIN 3 – Collector

### DESCRIPTION

The BCY70, BCY71 & BCY72 are silicon planar epitaxial PNP transistors in Jedec TO18 metal case.

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise stated)		<b>BCY70</b>	<b>BCY71</b>	<b>BCY72</b>
$V_{CBO}$	Collector - Base Voltage ( $I_E = 0$ )	-50V	-45V	-25V
$V_{CEO}$	Collector - Emitter Voltage ( $I_B = 0$ )	-40V	-45V	-25V
$V_{EBO}$	Emitter - Base Voltage ( $I_C = 0$ )		-5V	
$I_{CM}$	Collector Peak Current		-200mA	
$P_{tot}$	Total Power Dissipation @ $T_{amb} < 25^\circ\text{C}$		350mW	
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range		-65 to +200°C	
<b>THERMAL DATA</b>				
$R_{th-j-Case}$	Thermal Resistance Junction -case		150°C/W max	
$R_{th-j-amb}$	Thermal Resistance Junction -ambient		500°C/W max	

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**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit		
$I_{CES}$ Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = -20\text{V}$ $V_{CE} = -50\text{V}$ <b>BCY70</b>			-10 -500	nA		
	$V_{CE} = -20\text{V}$ $V_{CE} = -45\text{V}$ <b>BCY71</b>			-100 -10	nA $\mu\text{A}$		
	$V_{CE} = -20\text{V}$ $V_{CE} = -25\text{V}$ <b>BCY72</b>			-100 -10	nA $\mu\text{A}$		
	$V_{EB} = -5\text{V}$			-10	$\mu\text{A}$		
$I_{EBO}$ Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = -5\text{V}$			-10	$\mu\text{A}$		
$V_{CE(sat)}^*$ Collector – Emitter Saturation Voltage	$I_C = -10\text{mA}$ $I_B = -1\text{mA}$ $I_C = -50\text{mA}$ $I_B = -5\text{mA}$			-0.25 -0.5	V		
$V_{BE(sat)}^*$ Base – Emitter Saturation Voltage	$I_C = -10\text{mA}$ $I_B = -1\text{mA}$ <b>BCY70 AND BCY71 ONLY</b> $I_C = -50\text{mA}$ $I_B = -5\text{mA}$	-0.6		-0.9 -1.2	V		
$h_{FE}^*$ DC Current Gain	<b>BCY70</b> $I_C = -0.1\text{mA}$ $V_{CE} = -1\text{V}$ $I_C = -1\text{mA}$ $V_{CE} = -1\text{V}$ $I_C = -10\text{mA}$ $V_{CE} = -1\text{V}$ $I_C = -50\text{mA}$ $V_{CE} = -1\text{V}$	40 45 50 15			—		
	<b>BCY71</b> $I_C = -0.01\text{mA}$ $V_{CE} = -1\text{V}$ $I_C = -0.1\text{mA}$ $V_{CE} = -1\text{V}$ $I_C = -1\text{mA}$ $V_{CE} = -1\text{V}$ $I_C = -10\text{mA}$ $V_{CE} = 1\text{V}$ $I_C = -50\text{mA}$ $V_{CE} = -1\text{V}$		60				
	<b>BCY72</b> $I_C = -1\text{mA}$ $V_{CE} = -1\text{V}$ $I_C = -10\text{mA}$ $V_{CE} = -1\text{V}$	40 50		600			
	$I_C = -1\text{mA}$ $V_{CE} = -10\text{V}$ $f = 1\text{KHz}$	100		400			
	$I_C = -0.1\text{mA}$ $V_{CE} = -20\text{V}$ $f = 10.7\text{MHz}$ <b>BCY71</b>	15					
	$I_C = -10\text{mA}$ $V_{CE} = -20\text{V}$ $f = 100\text{MHz}$ <b>BCY70</b> <b>BCY71 and BCY72</b>	250 200					
	$I_C = 0$ $V_{EB} = -1\text{V}$ $f = 1\text{MHz}$			8			
	$I_E = 0$ $V_{CB} = -10\text{V}$ $f = 1\text{MHz}$			6			
	$h_{fe}$ Small Signal Current	$I_C = -1\text{mA}$ $V_{CE} = -10\text{V}$ $f = 1\text{KHz}$	100			400	—
	$f_T$ Transition Frequency	$I_C = -0.1\text{mA}$ $V_{CE} = -20\text{V}$ $f = 10.7\text{MHz}$ <b>BCY71</b> $I_C = -10\text{mA}$ $V_{CE} = -20\text{V}$ $f = 100\text{MHz}$ <b>BCY70</b> <b>BCY71 and BCY72</b>					MHz
$C_{EBO}$ Emitter-Base Capacitance	$I_C = 0$ $V_{EB} = -1\text{V}$ $f = 1\text{MHz}$			8	pF		
$C_{CBO}$ Collector-Base Capacitance	$I_E = 0$ $V_{CB} = -10\text{V}$ $f = 1\text{MHz}$			6			

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**ELECTRICAL CHARACTERISTICS continued** ( $T_A = 25^\circ\text{C}$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
NF Noise Figure	$I_C = -0.1\text{mA}$ $V_{CE} = -5\text{V}$ $R_g = 2\text{K}\Omega$ $f = 10$ to $10000$ Hz <b>BCY70 AND BCY71</b> <b>BCY70</b>			6 2	dB
$h_{ie}$ Input Impedance	$I_C = -1\text{mA}$ $V_{CE} = -10\text{V}$ $f = 1\text{kHz}$ <b>BCY71 ONLY</b>	2		12	$\text{K}\Omega$
$h_{re}$ Reverse Voltage Ratio	$I_C = -1\text{mA}$ $V_{CE} = -10\text{V}$ $f = 1\text{kHz}$ <b>BCY71 ONLY</b>			$20 \times 10^{-4}$	—
$h_{oe}$ Output Admittance	$I_C = -1\text{mA}$ $V_{CE} = -10\text{V}$ $f = 1\text{kHz}$ <b>BCY71 ONLY</b>	10		60	$\mu\text{S}$
$t_d$ Delay Time	$I_C = -10\text{mA}$ $V_{EE} = 3\text{V}$ $I_{B1} = -1\text{mA}$ <b>BCY70 AND BCY72 ONLY</b>		23	35	ns
$t_r$ Rise Time	$I_C = -10\text{mA}$ $V_{EE} = 3\text{V}$ $I_{B1} = -1\text{mA}$ <b>BCY70 AND BCY72 ONLY</b>		25	35	ns
$t_s$ Storage Time	$I_C = -10\text{mA}$ $V_{EE} = 3\text{V}$ $I_{B1} = -I_{B2} = -1\text{mA}$ <b>BCY70 AND BCY72 ONLY</b>		270	350	ns
$t_f$ Fall Time	$I_C = -10\text{mA}$ $V_{EE} = 3\text{V}$ $I_{B1} = -I_{B2} = -1\text{mA}$ <b>BCY70 AND BCY72 ONLY</b>		50	80	ns
$t_{on}$ Turn-on Time	$I_C = -10\text{mA}$ $V_{EE} = 3\text{V}$ $I_{B1} = -1\text{mA}$ <b>BCY70 AND BCY72 ONLY</b>		48	65	ns
$t_{off}$ Turn-Off Time	$I_C = -10\text{mA}$ $V_{EE} = 3\text{V}$ $I_{B1} = -I_{B2} = -1\text{mA}$ <b>BCY70 AND BCY72 ONLY</b>		320	420	ns

**NOTES:**

\* Pulse test:  $t_p \leq 300\mu\text{s}$ ,  $\delta \leq 1\%$