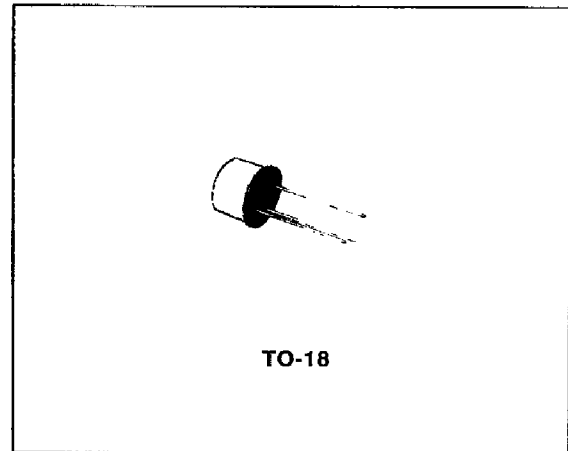


# BCY70 BCY71/BCY72

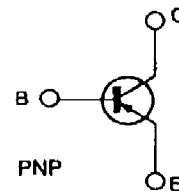
## GENERAL PURPOSE APPLICATIONS

### DESCRIPTION

The BCY70, BCY71 and BCY72 are silicon planar epitaxial PNP transistors in Jedec TO-18 metal case.



### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BCY70	BCY71	BCY72	
V <sub>CBO</sub>	Collector-base Voltage (I <sub>E</sub> = 0)	- 50	- 45	- 25	V
V <sub>CEO</sub>	Collector-emitter Voltage (I <sub>B</sub> = 0)	- 40	- 45	- 25	V
V <sub>EBO</sub>	Emitter-base Voltage (I <sub>C</sub> = 0)	- 5			V
I <sub>CM</sub>	Collector Peak Current	- 200			mA
P <sub>tot</sub>	Total Power Dissipation at T <sub>amb</sub> ≤ 25 °C	350			mW
T <sub>stg</sub> , T <sub>J</sub>	Storage and Junction Temperature	- 65 to 200			°C

\* Pulsed : pulse duration = 300 μs, duty cycle = 1 %.

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### HERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	150	$^{\circ}C/W$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	500	$^{\circ}C/W$

### ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25^{\circ}C$ unless otherwise specified)

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

\* Pulsed : pulse duration = 300  $\mu s$ , duty cycle = 1 %.

### ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
NF	Noise Figure	$I_C = -0.1 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $R_g = 2 \text{ k}\Omega$ $f = 10 \text{ to } 10\,000 \text{ Hz}$ For <b>BCY70</b> and <b>BCY72</b> for <b>BCY71</b>			6 2	dB dB
$h_{ie}$	Input Impedance (for <b>BCY71</b> only)	$I_C = -1 \text{ mA}$ $V_{CE} = -10 \text{ V}$ $f = 1 \text{ kHz}$	2		12	$\text{k}\Omega$
$h_{re}$	Reverse Voltage Ratio (for <b>BCY71</b> only)	$I_C = -1 \text{ mA}$ $V_{CE} = -10 \text{ V}$ $f = 1 \text{ kHz}$			$20 \times 10^{-4}$	
$h_{oe}$	Output Admittance (for <b>BCY71</b> only)	$I_C = -1 \text{ mA}$ $V_{CE} = -10 \text{ V}$ $f = 1 \text{ kHz}$	10		60	$\mu\text{S}$
$t_d$	Delay Time (for <b>BCY70</b> and <b>BCY72</b> only)	$I_C = -10 \text{ mA}$ $V_{EE} = 3 \text{ V}$ $I_{B1} = -1 \text{ mA}$		23	35	ns
$t_r$	Rise Time (for <b>BCY70</b> and <b>BCY72</b> only)	$I_C = -10 \text{ mA}$ $V_{EE} = 3 \text{ V}$ $I_{B1} = -1 \text{ mA}$		25	35	ns
$t_s$	Storage Time (for <b>BCY70</b> and <b>BCY72</b> only)	$I_C = -10 \text{ mA}$ $V_{EE} = 3 \text{ V}$ $I_{B1} = -I_{B2} = -1 \text{ mA}$		270	350	ns
$t_f$	Fall Time (for <b>BCY70</b> and <b>BCY72</b> only)	$I_C = -10 \text{ mA}$ $V_{EE} = 3 \text{ V}$ $I_{B1} = -I_{B2} = -1 \text{ mA}$		50	80	ns
$t_{on}$	Turn-on Time (for <b>BCY70</b> and <b>BCY72</b> only)	$I_C = -10 \text{ mA}$ $V_{EE} = 3 \text{ V}$ $I_{B1} = -1 \text{ mA}$		48	65	ns
$t_{off}$	Turn-off Time (for <b>BCY70</b> and <b>BCY72</b> only)	$I_C = -10 \text{ mA}$ $V_{EE} = 3 \text{ V}$ $I_{B1} = -I_{B2} = -1 \text{ mA}$		320	420	ns

\* Pulsed : pulse duration = 300  $\mu\text{s}$ , duty cycle = 1 %.

### TEST CIRCUIT

Test Circuit for Switching Times.

