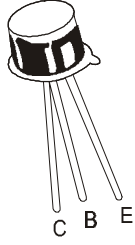


**PNP SILICON PLANAR TRANSISTORS**

**BCY77, BCY78  
BCY79**

**TO-18  
Metal Can Package**



**Low Noise Audio Amplifier input stages and Driver Applications**

**Complementary BCY57/58/59**

**ABSOLUTE MAXIMUM RATINGS**

DESCRIPTION	SYMBOL	BCY77	BCY78	BCY79	UNIT
Collector Emitter Voltage	$V_{CEO}$	60	32	45	V
Collector Emitter Voltage	$V_{CES}$	60	32	45	V
Emitter Base Voltage	$V_{EBO}$	5	5	5	V
Collector Current Continuous	$I_C$	100	200	200	mA
Base Current	$I_B$	50	50	50	mA
Power Dissipation @ $T_a=25^\circ\text{C}$	$P_D$	0.39			W
Power Dissipation @ $T_c=45^\circ\text{C}$	$P_D$	1.00			W
Operating and Storage Junction Temperature Range	$T_j, T_{stg}$	- 65 to +200			$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

Junction to Ambient in free air	$R_{th(j-a)}$	450	K/W
Junction to Case	$R_{th(j-c)}$	150	K/W

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

DESCRIPTION	SYMBOL	TEST CONDITION	BCY77	BCY78	BCY79	UNIT
Collector Emitter Voltage	$V_{CEO}$	$I_C=2\text{mA}, I_B=0$	>60	>32	>45	V
Collector Emitter Voltage	$V_{CES}$	$I_C=10\mu\text{A}, V_{BE}=0$	>60	>32	>45	V
Emitter Base Voltage	$V_{EBO}$	$I_E=1\mu\text{A}, I_C=0$	>5	>5	>5	V
Collector Cut off Current	$I_{CES}$	$V_{CE}=V_{CE\text{ max}}, V_{BE}=0$	<100	<100	<100	nA
		$V_{CE}=50\text{V}, V_{BE}=0$	<20			nA
		$V_{CE}=25\text{V}, V_{BE}=0$		<20		nA
		$V_{CE}=35\text{V}, V_{BE}=0$			<20	nA
		$V_{CE}=60\text{V}, V_{BE}=0, T_a=150^\circ\text{C}$	<10			$\mu\text{A}$
Collector Cut off Current	$I_{CEX}$	$V_{CE}=25\text{V}, V_{BE}=0, T_a=150^\circ\text{C}$		<10		$\mu\text{A}$
		$V_{CE}=35\text{V}, V_{BE}=0, T_a=150^\circ\text{C}$			<10	$\mu\text{A}$
Collector Cut off Current	$I_{CEX}$	$V_{CE}=V_{CE\text{ max}}, V_{BE}=0.2\text{V}, T_a=100^\circ\text{C}$	<20			$\mu\text{A}$
Emitter Cut off Current	$I_{EBO}$	$V_{EB}=4\text{V}, I_C=0$	<20			nA
Base Emitter on Voltage	$V_{BE(ON)}$	$I_C=10\mu\text{A}, V_{CE}=5\text{V}$	Typ 0.55			V
		$I_C=2\text{mA}, V_{CE}=5\text{V}$	0.6 - 0.75			V
		$I_C=10\text{mA}, V_{CE}=1\text{V}$	Typ 0.68			V
		** $I_C=50\text{mA}, V_{CE}=1\text{V}$	Typ 0.72			V
		* $I_C=100\text{mA}, V_{CE}=1\text{V}$	Typ 0.75			V

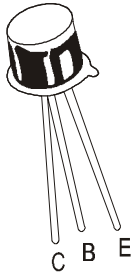
**\*ONLY BCY78/79    \*\*ONLY BCY77**

BCY77\_79Rev\_4 050707E

PNP SILICON PLANAR TRANSISTORS

BCY77, BCY78  
BCY79

TO-18  
Metal Can Package



ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
Collector Emitter Saturation Voltage	V <sub>CE (sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0.25mA			0.25	V	
		**I <sub>C</sub> =50mA, I <sub>B</sub> =1.25mA			0.80	V	
		*I <sub>C</sub> =100mA, I <sub>B</sub> =2.5mA			0.80	V	
Base Emitter Saturation Voltage	V <sub>BE (sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0.25mA	0.60		0.85	V	
		**I <sub>C</sub> =50mA, I <sub>B</sub> =1.25mA	0.70		1.20	V	
		*I <sub>C</sub> =100mA, I <sub>B</sub> =2.5mA	0.70		1.20	V	
DC Current Gain	h <sub>FE</sub>	I <sub>C</sub> =10μA, V <sub>CE</sub> =5V		140			
		<b>Group-7</b>					
		<b>Group-8</b>	30				
		<b>Group-9</b>	40				
		<b>Group-10 Only BCY78/79</b>	100				
		I <sub>C</sub> =2mA, V <sub>CE</sub> =5V				630	
		<b>BCY77/78/79</b>	120				
<b>Group-7</b>	120			220			
<b>Group-8</b>	180			310			
<b>Group-9</b>	250			460			
<b>Group-10 Only BCY78/79</b>	380			630			
I <sub>C</sub> =10mA, V <sub>CE</sub> =1V	<b>BCY77/78/79 &amp; Group-7,</b>	<b>Group-8</b>	80				
			120		400		
			160		630		
<b>Group-9</b>	240		1000				
*I <sub>C</sub> =100mA, V <sub>CE</sub> =1V	<b>BCY77/78/79 &amp; Group-7</b>	<b>Group-8</b>	40				
			45				
			60				
<b>Group-9</b>	60						
**I <sub>C</sub> =50mA, V <sub>CE</sub> =1V	<b>BCY77/78/79 &amp; Group-7</b>	<b>Group-8</b>	40				
			45				
			60				
<b>Group-9</b>	60						

DYNAMIC CHARACTERISTICS

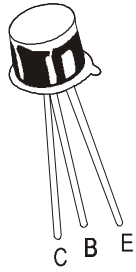
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Noise Figure	NF	I <sub>C</sub> =0.2mA, V <sub>CE</sub> =5V, R <sub>g</sub> =2kΩ, f=1kHz, B=200Hz			6	dB
Transition frequency	f <sub>T</sub>	I <sub>C</sub> =10mA, V <sub>CE</sub> =5V, f=100MHz		180		MHz
Collector Base Capacitance	C <sub>cbo</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz			7	pF
Emitter Base Capacitance	C <sub>ebo</sub>	V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=1MHz			15	pF

\*ONLY BCY78/79    \*\*ONLY BCY77

BCY77\_79Rev\_4 050707E

PNP SILICON PLANAR TRANSISTORS

BCY77, BCY78  
BCY79



TO-18  
Metal Can Package

ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless specified otherwise)

SMALL SIGNAL CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Small Signal Current Gain	h <sub>fe</sub>	I <sub>C</sub> =2mA, V <sub>CE</sub> =5V, f=1kHz				
		<b>BCY77/78/79</b>	125		700	
		<b>Group-7</b>	125		250	
		<b>Group-8</b>	175		350	
		<b>Group-9</b>	250		500	
		<b>Group-10 Only BCY78/79</b>	350		700	
Input Impedance	h <sub>ie</sub>	I <sub>C</sub> =2mA, V <sub>CE</sub> =5V, f=1kHz				
		<b>Group-7</b>	1.6		4.5	kΩ
		<b>Group-8</b>	2.5		6.0	kΩ
		<b>Group-9</b>	3.2		8.5	kΩ
		<b>Group-10 Only BCY78/79</b>		7.5		
Voltage Feedback Ratio	h <sub>re</sub>	I <sub>C</sub> =2mA, V <sub>CE</sub> =5V, f=1kHz				
		<b>Group-7</b>		1.5		x10 <sup>-4</sup>
		<b>Group-8</b>		2.0		x10 <sup>-4</sup>
		<b>Group-9</b>		2.0		x10 <sup>-4</sup>
		<b>Group-10 Only BCY78/79</b>		3.0		x10 <sup>-4</sup>
Output Admittance	h <sub>oe</sub>	I <sub>C</sub> =2mA, V <sub>CE</sub> =5V, f=1kHz				
		<b>Group-7</b>			30	μS
		<b>Group-8</b>			50	μS
		<b>Group-9</b>			60	μS
		<b>Group-10 Only BCY78/79</b>			100	μS

SWITCHING TIMES

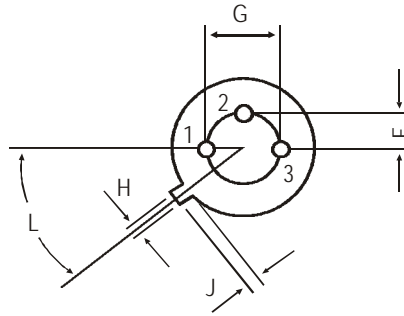
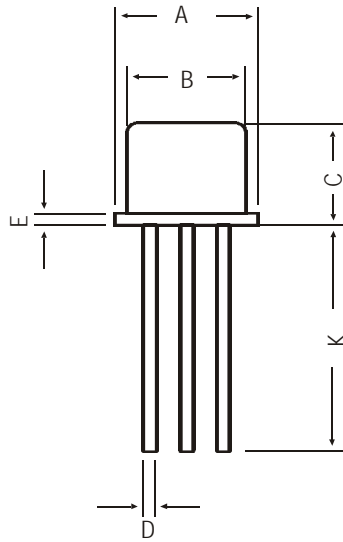
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
Delay Time	t <sub>d</sub>	<b>BCY77/78/79</b> I <sub>C</sub> =10mA, I <sub>B1</sub> =I <sub>B2</sub> =1mA, V <sub>BB</sub> =3.6V, R <sub>1</sub> =R <sub>2</sub> =5kΩ, R <sub>L</sub> =990Ω		35		ns	
Rise Time	t <sub>r</sub>			50		ns	
Turn on Time	t <sub>on</sub>				150	ns	
Storage Time	t <sub>s</sub>			400		ns	
Fall Time	t <sub>f</sub>			80		ns	
Turn off Time	t <sub>off</sub>				800	ns	
Delay Time	t <sub>d</sub>		<b>BCY78/79</b> I <sub>C</sub> =100mA, I <sub>B1</sub> =I <sub>B2</sub> =10mA, V <sub>BB</sub> =5V, R <sub>1</sub> =500 Ω, R <sub>2</sub> =700Ω, R <sub>L</sub> =98Ω		5.0		ns
Rise Time	t <sub>r</sub>				50		ns
Turn on Time	t <sub>on</sub>					150	ns
Storage Time	t <sub>s</sub>				250		ns
Fall Time	t <sub>f</sub>			200		ns	
Turn off Time	t <sub>off</sub>			800	ns		
Delay Time	t <sub>d</sub>	<b>BCY77</b> I <sub>C</sub> =50mA, I <sub>B1</sub> =I <sub>B2</sub> =5mA, V <sub>BB</sub> =4.7V, R <sub>1</sub> =1kΩ, R <sub>2</sub> =1.3kΩ, R <sub>L</sub> =195Ω		15		ns	
Rise Time	t <sub>r</sub>			50		ns	
Turn on Time	t <sub>on</sub>				150	ns	
Storage Time	t <sub>s</sub>			300		ns	
Fall Time	t <sub>f</sub>			150		ns	
Turn off Time	t <sub>off</sub>			800	ns		

BCY77\_79Rev\_4 050707E

**BCY77, BCY78  
BCY79**

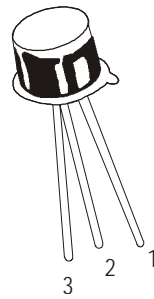
**TO-18  
Metal Can Package**

**TO-18 Metal Can Package**



All dimensions in mm.

DIM	MIN	MAX
A	5.24	5.84
B	4.52	4.97
C	4.31	5.33
D	0.40	0.53
E	—	0.76
F	—	1.27
G	—	2.97
H	0.91	1.17
J	0.71	1.21
K	12.70	—
L	45 DEG	



**PIN CONFIGURATION**

1. EMITTER
2. BASE
3. COLLECTOR

**Component Disposal Instructions**

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

**Packing Detail**

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-18	1K/polybag	350 gm/1K pcs	3" x 7.5" x 7.5"	5K	17" x 15" x 13.5"	80K	34 kgs

BCY77\_79Rev\_4 050707E

**Disclaimer**

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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Continental Device India Limited

C-120 Naraina Industrial Area, New Delhi 110 028, India.  
Telephone + 91-11-2579 6150, 4141 1112 Fax + 91-11-2579 5290, 4141 1119  
email@cdil.com www.cdilsemi.com