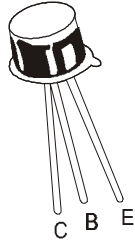


PNP SILICON PLANAR TRANSISTORS

**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			μA
Collector Cut off Current	I_{CEX}	$V_{CE}=25\text{V}, V_{BE}=0, T_a=150^\circ\text{C}$		<10		μA
		$V_{CE}=35\text{V}, V_{BE}=0, T_a=150^\circ\text{C}$			<10	μA
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			μA
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

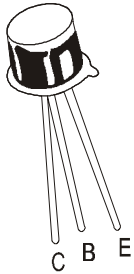
*ONLY BCY78/79 **ONLY BCY77

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PNP SILICON PLANAR TRANSISTORS

BCY77, BCY78
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TO-18
Metal Can Package



ELECTRICAL CHARACTERISTICS (T_a=25°C unless specified otherwise)

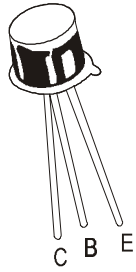
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
Collector Emitter Saturation Voltage	V _{CE (sat)}	I _C =10mA, I _B =0.25mA			0.25	V	
		**I _C =50mA, I _B =1.25mA			0.80	V	
		*I _C =100mA, I _B =2.5mA			0.80	V	
Base Emitter Saturation Voltage	V _{BE (sat)}	I _C =10mA, I _B =0.25mA	0.60		0.85	V	
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

DYNAMIC CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Noise Figure	NF	I _C =0.2mA, V _{CE} =5V, R _g =2kΩ, f=1kHz, B=200Hz			6	dB
Transition frequency	f _T	I _C =10mA, V _{CE} =5V, f=100MHz		180		MHz
Collector Base Capacitance	C _{cbo}	V _{CB} =10V, I _E =0, f=1MHz			7	pF
Emitter Base Capacitance	C _{ebo}	V _{EB} =0.5V, I _C =0, f=1MHz			15	pF

*ONLY BCY78/79 **ONLY BCY77

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ELECTRICAL CHARACTERISTICS (T_a=25°C unless specified otherwise)

SMALL SIGNAL CHARACTERISTICS

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

SWITCHING TIMES

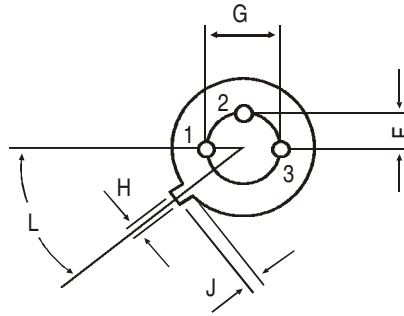
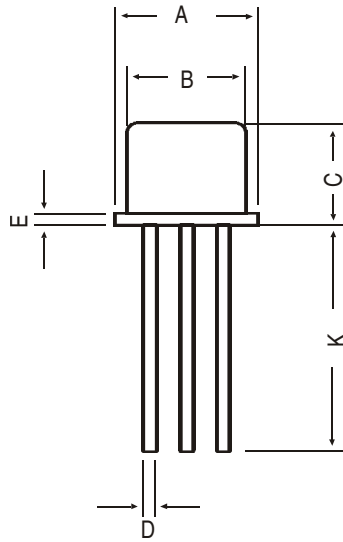
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
Delay Time	t _d	BCY77/78/79 I _C =10mA, I _{B1} =I _{B2} =1mA, V _{BB} =3.6V, R ₁ =R ₂ =5kΩ, R _L =990Ω		35		ns	
Rise Time	t _r			50		ns	
Turn on Time	t _{on}				150	ns	
Storage Time	t _s			400		ns	
Fall Time	t _f			80		ns	
Turn off Time	t _{off}				800	ns	
Delay Time	t _d		BCY78/79 I _C =100mA, I _{B1} =I _{B2} =10mA, V _{BB} =5V, R ₁ =500 Ω, R ₂ =700Ω, R _L =98Ω		5.0		ns
Rise Time	t _r				50		ns
Turn on Time	t _{on}					150	ns
Storage Time	t _s				250		ns
Fall Time	t _f			200		ns	
Turn off Time	t _{off}			800	ns		
Delay Time	t _d	BCY77 I _C =50mA, I _{B1} =I _{B2} =5mA, V _{BB} =4.7V, R ₁ =1kΩ, R ₂ =1.3kΩ, R _L =195Ω		15		ns	
Rise Time	t _r			50		ns	
Turn on Time	t _{on}				150	ns	
Storage Time	t _s			300		ns	
Fall Time	t _f			150		ns	
Turn off Time	t _{off}			800	ns		

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**BCY77, BCY78
BCY79**

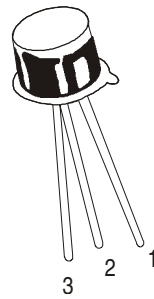
**TO-18
Metal Can Package**

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

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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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