

# Central<sup>TM</sup> Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors

www.centrasemi.com

BCY78, VII, VIII, IX, X  
BCY79, VII, VIII, IX, X

PNP SILICON TRANSISTOR

JEDEC TO-18 CASE

**DESCRIPTION**

The CENTRAL SEMICONDUCTOR BCY78, BCY79 Series types are Silicon PNP Epitaxial Planar Transistors, mounted in a hermetically sealed metal case, designed for low noise amplifier and switching applications.

**MAXIMUM RATINGS** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

|                                               | SYMBOL         | BCY78       | BCY79 | UNITS              |
|-----------------------------------------------|----------------|-------------|-------|--------------------|
| Collector-Base Voltage                        | $V_{CBO}$      | 32          | 45    | V                  |
| Collector-Emitter Voltage                     | $V_{CEO}$      | 32          | 45    | V                  |
| Emitter-Base Voltage                          | $V_{EBO}$      | 5.0         |       | V                  |
| Collector Current                             | $I_C$          | 100         |       | mA                 |
| Collector Current (Peak)                      | $I_{CM}$       | 200         |       | mA                 |
| Base Current (Peak)                           | $I_{BM}$       | 200         |       | mA                 |
| Power Dissipation                             | $P_D$          | 340         |       | mW                 |
| Power Dissipation( $T_C=25^\circ\text{C}$ )   | $P_D$          | 1.0         |       | W                  |
| Operating and Storage<br>Junction Temperature | $T_J, T_{stg}$ | -65 to +200 |       | $^\circ\text{C}$   |
| Thermal Resistance                            | $\theta_{JA}$  | 450         |       | $^\circ\text{C/W}$ |
| Thermal Resistance                            | $\theta_{JC}$  | 150         |       | $^\circ\text{C/W}$ |

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

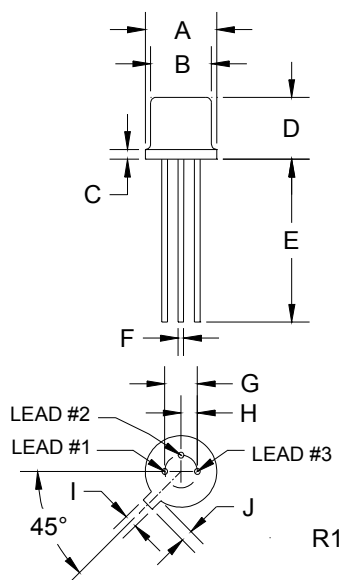
| SYMBOL        | TEST CONDITIONS                                         | MIN  | MAX  | UNITS         |
|---------------|---------------------------------------------------------|------|------|---------------|
| $I_{CBO}$     | $V_{CB} = \text{Rated } V_{CBO}$                        |      | 15   | nA            |
| $I_{CBO}$     | $V_{CB} = \text{Rated } V_{CBO}, T_A=150^\circ\text{C}$ |      | 10   | $\mu\text{A}$ |
| $I_{EBO}$     | $V_{EB}=5.0\text{V}$                                    |      | 20   | nA            |
| $BV_{CBO}$    | $I_C=10\mu\text{A}$ (BCY78)                             | 32   |      | V             |
| $BV_{CBO}$    | $I_C=10\mu\text{A}$ (BCY79)                             | 45   |      | V             |
| $BV_{CEO}$    | $I_C=2.0\text{mA}$ (BCY78)                              | 32   |      | V             |
| $BV_{CEO}$    | $I_C=2.0\text{mA}$ (BCY79)                              | 45   |      | V             |
| $BV_{EBO}$    | $I_E=1.0\mu\text{A}$                                    | 5.0  |      | V             |
| $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=250\mu\text{A}$                   |      | 0.25 | V             |
| $V_{CE(SAT)}$ | $I_C=100\text{mA}, I_B=2.5\text{mA}$                    |      | 0.80 | V             |
| $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=250\mu\text{A}$                   | 0.60 | 0.85 | V             |
| $V_{BE(SAT)}$ | $I_C=100\text{mA}, I_B=2.5\text{mA}$                    | 0.70 | 1.20 | V             |
| $V_{BE(ON)}$  | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$                  | 0.60 | 0.75 | V             |

| SYMBOL   | TEST CONDITIONS                         | BCY78-VII<br>BCY79-VII |     | BCY78-VIII<br>BCY79-VIII |     | BCY78-IX<br>BCY79-IX |     | BCY78-X<br>BCY79-X |      |
|----------|-----------------------------------------|------------------------|-----|--------------------------|-----|----------------------|-----|--------------------|------|
|          |                                         | MIN                    | MAX | MIN                      | MAX | MIN                  | MAX | MIN                | MAX  |
| $h_{FE}$ | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ | 140 TYP                |     | 30                       |     | 40                   |     | 100                |      |
| $h_{FE}$ | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$  | 120                    | 220 | 180                      | 310 | 250                  | 460 | 380                | 630  |
| $h_{FE}$ | $V_{CE}=1.0\text{V}, I_C=10\text{mA}$   | 80                     |     | 120                      | 400 | 160                  | 630 | 240                | 1000 |
| $h_{FE}$ | $V_{CE}=1.0\text{V}, I_C=100\text{mA}$  | 40                     |     | 45                       |     | 60                   |     | 60                 |      |

(SEE REVERSE SIDE)

ELECTRICAL CHARACTERISTICS Continued

| <u>SYMBOL</u> | <u>TEST CONDITIONS</u>                                       | <u>MIN</u> | <u>TYP</u> | <u>MAX</u> | <u>UNITS</u> |
|---------------|--------------------------------------------------------------|------------|------------|------------|--------------|
| $f_T$         | $V_{CE}=5.0V, I_C=10mA, f=100MHz$                            | 100        |            |            | MHz          |
| $C_{ob}$      | $V_{CB}=10V, I_E=0, f=1.0MHz$                                |            |            | 7.0        | pF           |
| $C_{ib}$      | $V_{EB}=0.5V, I_C=0, f=1.0MHz$                               |            |            | 15         | pF           |
| NF            | $V_{CE}=5.0V, I_C=200\mu A, R_S=2k\Omega, f=1.0kHz, B=200Hz$ |            |            | 10         | dB           |
| $t_{on}$      | $V_{CC}=3.0V, I_C=10mA, I_{B1}=-I_{B2}=1.0mA$                |            |            | 100        | ns           |
| $t_d$         | $V_{CC}=3.0V, I_C=10mA, I_{B1}=-I_{B2}=1.0mA$                |            |            | 50         | ns           |
| $t_r$         | $V_{CC}=3.0V, I_C=10mA, I_{B1}=-I_{B2}=1.0mA$                |            |            | 50         | ns           |
| $t_{off}$     | $V_{CC}=3.0V, I_C=10mA, I_{B1}=-I_{B2}=1.0mA$                |            |            | 700        | ns           |
| $t_s$         | $V_{CC}=3.0V, I_C=10mA, I_{B1}=-I_{B2}=1.0mA$                |            |            | 600        | ns           |
| $t_f$         | $V_{CC}=3.0V, I_C=10mA, I_{B1}=-I_{B2}=1.0mA$                |            |            | 100        | ns           |
| $t_{on}$      | $V_{CC}=10V, I_C=100mA, I_{B1}=-I_{B2}=10mA$                 |            |            | 100        | ns           |
| $t_d$         | $V_{CC}=10V, I_C=100mA, I_{B1}=-I_{B2}=10mA$                 |            |            | 35         | ns           |
| $t_r$         | $V_{CC}=10V, I_C=100mA, I_{B1}=-I_{B2}=10mA$                 |            |            | 65         | ns           |
| $t_{off}$     | $V_{CC}=10V, I_C=100mA, I_{B1}=-I_{B2}=10mA$                 |            |            | 400        | ns           |
| $t_s$         | $V_{CC}=10V, I_C=100mA, I_{B1}=-I_{B2}=10mA$                 |            |            | 300        | ns           |
| $t_f$         | $V_{CC}=10V, I_C=100mA, I_{B1}=-I_{B2}=10mA$                 |            |            | 100        | ns           |

TO-18 PACKAGE - MECHANICAL OUTLINE

| SYMBOL  | INCHES |       | MILLIMETERS |      |
|---------|--------|-------|-------------|------|
|         | MIN    | MAX   | MIN         | MAX  |
| A (DIA) | 0.209  | 0.230 | 5.31        | 5.84 |
| B (DIA) | 0.178  | 0.195 | 4.52        | 4.95 |
| C       | -      | 0.030 | -           | 0.76 |
| D       | 0.170  | 0.210 | 4.32        | 5.33 |
| E       | 0.500  | -     | 12.70       | -    |
| F (DIA) | 0.016  | 0.019 | 0.41        | 0.48 |
| G (DIA) | 0.100  |       | 2.54        |      |
| H       | 0.050  |       | 1.27        |      |
| I       | 0.036  | 0.046 | 0.91        | 1.17 |
| J       | 0.028  | 0.048 | 0.71        | 1.22 |

TO-18 (REV: R1)

## Lead Code

1. Emitter
2. Base
3. Collector

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