

BCY58, VII, VIII, IX, X  
BCY59, VII, VIII, IX, X

SILICON  
NPN TRANSISTORS



TO-18 CASE



www.centrasemi.com

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR BCY58 and BCY59 series types are silicon NPN epitaxial planar transistors, mounted in a hermetically sealed metal case, designed for low noise amplifier and switching applications.

**MARKING: FULL PART NUMBER**

| MAXIMUM RATINGS: ( $T_A=25^\circ\text{C}$ unless otherwise noted) | SYMBOL         | BCY58 | BCY59       | UNITS              |
|---|----------------|-------|-------------|--------------------|
| Collector-Base Voltage  | $V_{CB0}$      | 32    | 45          | V                  |
| Collector-Emitter Voltage   | $V_{CEO}$      | 32    | 45          | V                  |
| Emitter-Base Voltage  | $V_{EBO}$      |       | 7.0         | V                  |
| Continuous Collector Current                                      | $I_C$          |       | 100         | mA                 |
| Peak Collector Current  | $I_{CM}$       |       | 200         | mA                 |
| Peak Base Current   | $I_{BM}$       |       | 200         | mA                 |
| Power Dissipation   | $P_D$          |       | 340         | mW                 |
| Power Dissipation ( $T_C=25^\circ\text{C}$ )                      | $P_D$          |       | 1.0         | W                  |
| Operating and Storage 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         |
|---------------|---|------|------|---------------|
| $I_{CBO}$     | $V_{CB}=\text{Rated } V_{CB0}$                        |      | 10   | nA            |
| $I_{CBO}$     | $V_{CB}=\text{Rated } V_{CB0}, T_A=150^\circ\text{C}$ |      | 10   | $\mu\text{A}$ |
| $I_{EBO}$     | $V_{EB}=5.0\text{V}$                                  |      | 10   | nA            |
| $BV_{CBO}$    | $I_C=10\mu\text{A}$ (BCY58)                           | 32   |      | V             |
| $BV_{CBO}$    | $I_C=10\mu\text{A}$ (BCY59)                           | 45   |      | V             |
| $BV_{CEO}$    | $I_C=2.0\text{mA}$ (BCY58)                            | 32   |      | V             |
| $BV_{CEO}$    | $I_C=2.0\text{mA}$ (BCY59)                            | 45   |      | V             |
| $BV_{EBO}$    | $I_E=1.0\mu\text{A}$                                  | 7.0  |      | V             |
| $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=250\mu\text{A}$                 |      | 0.35 | V             |
| $V_{CE(SAT)}$ | $I_C=100\text{mA}, I_B=2.5\text{mA}$                  |      | 0.70 | V             |
| $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=250\mu\text{A}$                 | 0.60 | 0.85 | V             |
| $V_{BE(SAT)}$ | $I_C=100\text{mA}, I_B=2.5\text{mA}$                  | 0.75 | 1.20 | V             |

|          |   | BCY58-VII |     |     | BCY58-VIII |     | BCY58-IX |     | BCY58-X |      |
|----------|---|-----------|-----|-----|------------|-----|----------|-----|---------|------|
|          |   | MIN       | TYP | MAX | MIN        | MAX | MIN      | MAX | MIN     | MAX  |
| $h_{FE}$ | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ | -         | 20  | -   | 20         | -   | 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      | -    |

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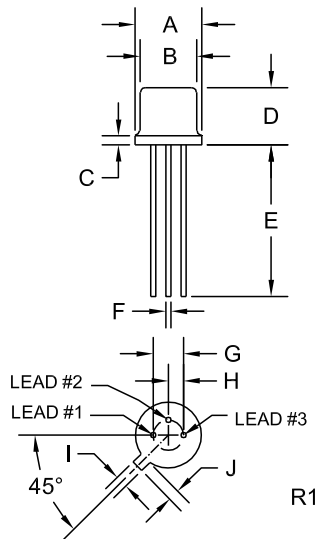
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**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

| SYMBOL    | TEST CONDITIONS  | MIN | TYP | MAX | UNITS |
|-----------|--|-----|-----|-----|-------|
| $f_T$     | $V_{CE}=5.0\text{V}$ , $I_C=10\text{mA}$ , $f=100\text{MHz}$   | 150 |     |     | MHz   |
| $C_{ob}$  | $V_{CB}=10\text{V}$ , $I_E=0$ , $f=1.0\text{MHz}$  |     |     | 5.0 | pF    |
| $C_{ib}$  | $V_{EB}=0.5\text{V}$ , $I_C=0$ , $f=1.0\text{MHz}$   |     |     | 15  | pF    |
| NF        | $V_{CE}=5.0\text{V}$ , $I_C=0.2\text{mA}$ , $R_S=2.0\text{k}\Omega$ , $f=1.0\text{kHz}$ , $B=200\text{Hz}$ |     |     | 10  | dB    |
| $t_{on}$  | $V_{CC}=10\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$                                     |     | 85  | 150 | ns    |
| $t_d$     | $V_{CC}=10\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$                                     |     | 35  |     | ns    |
| $t_r$     | $V_{CC}=10\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$                                     |     | 50  |     | ns    |
| $t_{off}$ | $V_{CC}=10\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$                                     |     | 450 | 800 | ns    |
| $t_s$     | $V_{CC}=10\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$                                     |     | 400 |     | ns    |
| $t_f$     | $V_{CC}=10\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1.0\text{mA}$                                     |     | 80  |     | ns    |
| $t_{on}$  | $V_{CC}=10\text{V}$ , $I_C=100\text{mA}$ , $I_{B1}=I_{B2}=10\text{mA}$                                     |     | 55  | 150 | ns    |
| $t_d$     | $V_{CC}=10\text{V}$ , $I_C=100\text{mA}$ , $I_{B1}=I_{B2}=10\text{mA}$                                     |     | 5.0 |     | ns    |
| $t_r$     | $V_{CC}=10\text{V}$ , $I_C=100\text{mA}$ , $I_{B1}=I_{B2}=10\text{mA}$                                     |     | 50  |     | ns    |
| $t_{off}$ | $V_{CC}=10\text{V}$ , $I_C=100\text{mA}$ , $I_{B1}=I_{B2}=10\text{mA}$                                     |     | 450 | 800 | ns    |
| $t_s$     | $V_{CC}=10\text{V}$ , $I_C=100\text{mA}$ , $I_{B1}=I_{B2}=10\text{mA}$                                     |     | 250 |     | ns    |
| $t_f$     | $V_{CC}=10\text{V}$ , $I_C=100\text{mA}$ , $I_{B1}=I_{B2}=10\text{mA}$                                     |     | 20  |     | ns    |

**TO-18 CASE - MECHANICAL OUTLINE**



| SYMBOL  | DIMENSIONS |       |             |      |
|---------|------------|-------|-------------|------|
|         | 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

**MARKING:**  
FULL PART NUMBER

R2 (8-November 2013)