

2N3724  
2N3725  
2N3725A

**NPN SILICON TRANSISTOR**



**TO-39 CASE**

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

Collector-Base Voltage  
Collector-Emitter Voltage  
Emitter-Base Voltage  
Continuous Collector Current  
Peak Collector Current  
Power Dissipation  
Power Dissipation ( $T_C=25^{\circ}\text{C}$ )  
Operating and Storage Junction Temperature



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**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR 2N3724, 2N3725, 2N3725A types are Silicon NPN Planar Epitaxial Transistors designed for high voltage, high current, high speed switching applications.

**MARKING: FULL PART NUMBER**

| SYMBOL         | 2N3724 | 2N3725      | 2N3725A | UNITS              |
|----------------|--------|-------------|---------|--------------------|
| $V_{CBO}$      | 50     | 80          | 80      | V                  |
| $V_{CEO}$      | 30     | 50          | 50      | V                  |
| $V_{EBO}$      |        | 6.0         |         | V                  |
| $I_C$          |        | 1.2         |         | A                  |
| $I_{CM}$       |        | 1.75        |         | A                  |
| $P_D$          | 0.8    | 0.8         | 1.0     | W                  |
| $P_D$          | 3.5    | 3.5         | 5.0     | W                  |
| $T_J, T_{stg}$ |        | -65 to +200 |         | $^{\circ}\text{C}$ |

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

| SYMBOL        | TEST CONDITIONS                              | 2N3724 |      | 2N3725 |      | 2N3725A |      | UNITS         |
|---------------|----------------------------------------------|--------|------|--------|------|---------|------|---------------|
|               |                                              | MIN    | MAX  | MIN    | MAX  | MIN     | MAX  |               |
| $I_B$         | $V_{CE}=50\text{V}$                          | -      | 10   | -      | -    | -       | -    | $\mu\text{A}$ |
| $I_B$         | $V_{CE}=80\text{V}$                          | -      | -    | -      | 10   | -       | 10   | $\mu\text{A}$ |
| $I_{CBO}$     | $V_{CB}=40\text{V}$                          | -      | 1.7  | -      | -    | -       | -    | $\mu\text{A}$ |
| $I_{CBO}$     | $V_{CB}=40\text{V}, T_A=100^{\circ}\text{C}$ | -      | 120  | -      | -    | -       | -    | $\mu\text{A}$ |
| $I_{CBO}$     | $V_{CB}=60\text{V}$                          | -      | -    | -      | 1.7  | -       | 0.5  | $\mu\text{A}$ |
| $I_{CBO}$     | $V_{CB}=60\text{V}, T_A=100^{\circ}\text{C}$ | -      | -    | -      | 120  | -       | 50   | $\mu\text{A}$ |
| $I_{CES}$     | $V_{CE}=50\text{V}$                          | -      | 10   | -      | -    | -       | -    | $\mu\text{A}$ |
| $I_{CES}$     | $V_{CE}=80\text{V}$                          | -      | -    | -      | 10   | -       | 10   | $\mu\text{A}$ |
| $BV_{CBO}$    | $I_C=10\mu\text{A}$                          | 50     | -    | 80     | -    | 80      | -    | V             |
| $BV_{CES}$    | $I_C=10\mu\text{A}$                          | 50     | -    | 80     | -    | 80      | -    | V             |
| $BV_{CEO}$    | $I_C=10\text{mA}$                            | 30     | -    | 50     | -    | 50      | -    | V             |
| $BV_{EBO}$    | $I_E=10\mu\text{A}$                          | 6.0    | -    | 6.0    | -    | 6.0     | -    | V             |
| $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$          | -      | 0.25 | -      | 0.25 | -       | 0.25 | V             |
| $V_{CE(SAT)}$ | $I_C=100\text{mA}, I_B=10\text{mA}$          | -      | 0.20 | -      | 0.26 | -       | 0.26 | V             |
| $V_{CE(SAT)}$ | $I_C=300\text{mA}, I_B=30\text{mA}$          | -      | 0.32 | -      | 0.40 | -       | 0.40 | V             |
| $V_{CE(SAT)}$ | $I_C=500\text{mA}, I_B=50\text{mA}$          | -      | 0.42 | -      | 0.52 | -       | 0.52 | V             |
| $V_{CE(SAT)}$ | $I_C=800\text{mA}, I_B=80\text{mA}$          | -      | 0.65 | -      | 0.80 | -       | 0.80 | V             |
| $V_{CE(SAT)}$ | $I_C=1.0\text{A}, I_B=100\text{mA}$          | -      | 0.75 | -      | 0.95 | -       | 0.90 | V             |
| $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=1.0\text{mA}$          | -      | 0.76 | -      | 0.76 | -       | 0.76 | V             |
| $V_{BE(SAT)}$ | $I_C=100\text{mA}, I_B=10\text{mA}$          | -      | 0.86 | -      | 0.86 | -       | 0.86 | V             |
| $V_{BE(SAT)}$ | $I_C=300\text{mA}, I_B=30\text{mA}$          | -      | 1.1  | -      | 1.1  | -       | 1.0  | V             |
| $V_{BE(SAT)}$ | $I_C=500\text{mA}, I_B=50\text{mA}$          | 0.80   | 1.1  | 0.80   | 1.1  | 0.80    | 1.1  | V             |
| $V_{BE(SAT)}$ | $I_C=800\text{mA}, I_B=80\text{mA}$          | -      | 1.5  | -      | 1.5  | -       | 1.3  | V             |
| $V_{BE(SAT)}$ | $I_C=1.0\text{A}, I_B=100\text{mA}$          | -      | 1.7  | -      | 1.7  | 0.90    | 1.4  | V             |

R1 (5-December 2010)

2N3724  
2N3725  
2N3725A

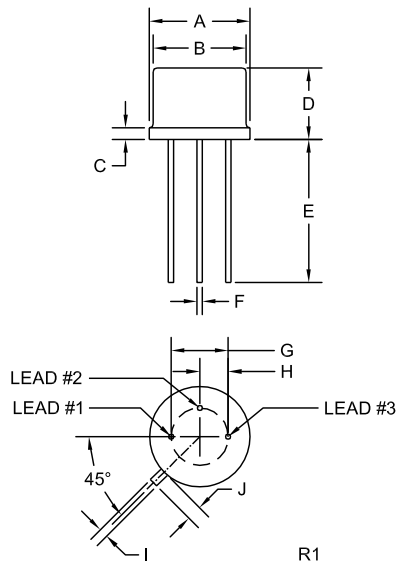
NPN SILICON TRANSISTOR



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

| SYMBOL    | TEST CONDITIONS                                                        | 2N3724 |     | 2N3725 |     | 2N3725A |     | UNITS |
|-----------|------------------------------------------------------------------------|--------|-----|--------|-----|---------|-----|-------|
|           |                                                                        | MIN    | MAX | MIN    | MAX | MIN     | MAX |       |
| $h_{FE}$  | $V_{CE}=1.0\text{V}$ , $I_C=10\text{mA}$                               | 30     | -   | 30     | -   | 30      | -   |       |
| $h_{FE}$  | $V_{CE}=1.0\text{V}$ , $I_C=100\text{mA}$                              | 60     | 150 | 60     | 150 | 60      | 150 |       |
| $h_{FE}$  | $V_{CE}=1.0\text{V}$ , $I_C=300\text{mA}$                              | 40     | -   | 40     | -   | 40      | -   |       |
| $h_{FE}$  | $V_{CE}=1.0\text{V}$ , $I_C=500\text{mA}$                              | 35     | -   | 35     | -   | 35      | -   |       |
| $h_{FE}$  | $V_{CE}=2.0\text{V}$ , $I_C=800\text{mA}$                              | 25     | -   | 20     | -   | 25      | -   |       |
| $h_{FE}$  | $V_{CE}=5.0\text{V}$ , $I_C=1.0\text{A}$                               | 30     | -   | 25     | -   | 25      | -   |       |
| $h_{FE}$  | $V_{CE}=5.0\text{V}$ , $I_C=1.5\text{A}$                               | -      | -   | -      | -   | 20      | -   |       |
| $f_T$     | $V_{CE}=10\text{V}$ , $I_C=50\text{mA}$ , $f=100\text{MHz}$            | 300    | -   | 300    | -   | 300     | -   | MHz   |
| $C_{ob}$  | $V_{CB}=10\text{V}$ , $I_E=0$ , $f=1.0\text{MHz}$                      | -      | 12  | -      | 10  | -       | 10  | pF    |
| $C_{ib}$  | $V_{EB}=0.5\text{V}$ , $I_C=0$ , $f=1.0\text{MHz}$                     | -      | 55  | -      | 55  | -       | 55  | pF    |
| $t_d$     | $V_{CC}=30\text{V}$ , $I_C=500\text{mA}$ , $I_{B1}=50\text{mA}$        | -      | 10  | -      | 10  | -       | 10  | ns    |
| $t_r$     | $V_{CC}=30\text{V}$ , $I_C=500\text{mA}$ , $I_{B1}=50\text{mA}$        | -      | 30  | -      | 30  | -       | 30  | ns    |
| $t_{on}$  | $V_{CC}=30\text{V}$ , $I_C=500\text{mA}$ , $I_{B1}=50\text{mA}$        | -      | 35  | -      | 35  | -       | 35  | ns    |
| $t_s$     | $V_{CC}=30\text{V}$ , $I_C=500\text{mA}$ , $I_{B1}=I_{B2}=50\text{mA}$ | -      | 50  | -      | 50  | -       | 50  | ns    |
| $t_f$     | $V_{CC}=30\text{V}$ , $I_C=500\text{mA}$ , $I_{B1}=I_{B2}=50\text{mA}$ | -      | 25  | -      | 25  | -       | 25  | ns    |
| $t_{off}$ | $V_{CC}=30\text{V}$ , $I_C=500\text{mA}$ , $I_{B1}=I_{B2}=50\text{mA}$ | -      | 60  | -      | 60  | -       | 60  | ns    |
| $t_{on}$  | $V_{CC}=30\text{V}$ , $I_C=1.0\text{A}$ , $I_{B1}=I_{B2}=100\text{mA}$ | -      | -   | -      | -   | -       | 50  | ns    |
| $t_{off}$ | $V_{CC}=30\text{V}$ , $I_C=1.0\text{A}$ , $I_{B1}=I_{B2}=100\text{mA}$ | -      | -   | -      | -   | -       | 50  | ns    |

TO-39 CASE - MECHANICAL OUTLINE



| DIMENSIONS |        |       |             |      |
|------------|--------|-------|-------------|------|
| SYMBOL     | INCHES |       | MILLIMETERS |      |
|            | MIN    | MAX   | MIN         | MAX  |
| A (DIA)    | 0.335  | 0.370 | 8.51        | 9.40 |
| B (DIA)    | 0.315  | 0.335 | 8.00        | 8.51 |
| C          | -      | 0.040 | -           | 1.02 |
| D          | 0.240  | 0.260 | 6.10        | 6.60 |
| E          | 0.500  | -     | 12.70       | -    |
| F (DIA)    | 0.016  | 0.021 | 0.41        | 0.53 |
| G (DIA)    | 0.200  | -     | 5.08        | -    |
| H          | 0.100  | -     | 2.54        | -    |
| I          | 0.028  | 0.034 | 0.71        | 0.86 |
| J          | 0.029  | 0.045 | 0.74        | 1.14 |

TO-39 (REV: R1)

LEAD CODE:

- 1) Emitter
- 2) Base
- 3) Collector

MARKING:

FULL PART NUMBER

R1 (5-December 2010)