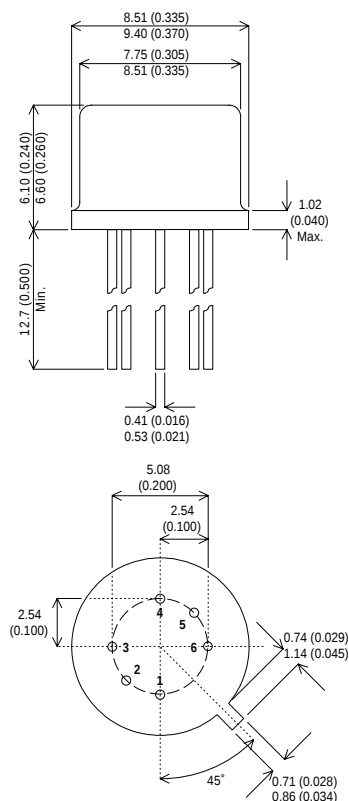


## MECHANICAL DATA

Dimensions in mm (inches)



## DUAL NPN PLANAR TRANSISTORS IN TO77 PACKAGE

### TO-77 PACKAGE

|                     |                     |
|---------------------|---------------------|
| PIN 1 – Collector 1 | PIN 4 – Emitter 2   |
| PIN 2 – Base 1      | PIN 5 – Base 2      |
| PIN 3 – Emitter 1   | PIN 6 – Collector 2 |

## ABSOLUTE MAXIMUM RATINGS

( $T_{amb} = 25^{\circ}\text{C}$  unless otherwise stated)

|           |                                          | EACH SIDE                                                        | TOTAL DEVICE               |
|-----------|------------------------------------------|------------------------------------------------------------------|----------------------------|
| $V_{CBO}$ | Collector – Base Voltage                 | 45V                                                              |                            |
| $V_{CEO}$ | Collector – Emitter Voltage <sup>1</sup> | 45V                                                              |                            |
| $V_{EBO}$ | Emitter – Base Voltage                   | 6V                                                               |                            |
| $I_C$     | Continuous Collector Current             | 30                                                               |                            |
| $P_D$     | Total Device Dissipation                 | $T_{AMB} = 25^{\circ}\text{C}$<br>300mW                          | 500mW                      |
|           |                                          | Derate above $25^{\circ}\text{C}$<br>1.72mW / $^{\circ}\text{C}$ | 2.86W / $^{\circ}\text{C}$ |
| $P_D$     | Total Device Dissipation                 | $T_C = 25^{\circ}\text{C}$<br>750mW                              | 1.5W                       |
|           |                                          | Derate above $25^{\circ}\text{C}$<br>4.3mW / $^{\circ}\text{C}$  | 8.6mW / $^{\circ}\text{C}$ |
| $T_{STG}$ | Storage Temperature Range                | –65 to $200^{\circ}\text{C}$                                     |                            |
| $T_L$     | Lead temperature (Soldering, 10 sec.)    | 300 $^{\circ}\text{C}$                                           |                            |

## NOTES

1. Base – Emitter Diode Open Circuited.

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}\text{C}$  unless otherwise stated)

| Parameter                                               | Test Conditions <sup>1</sup>                                          | Min. | Typ. | Max. | Unit            |
|---------------------------------------------------------|-----------------------------------------------------------------------|------|------|------|-----------------|
| <b>INDIVIDUAL TRANSISTOR CHARACTERISTICS</b>            |                                                                       |      |      |      |                 |
| $V_{(BR)CBO}$ Collector – Base Breakdown Voltage        | $I_C = 10\mu\text{A}$ $I_E = 0$                                       | 45   |      |      | V               |
| $V_{(BR)CEO^*}$ Collector – Emitter Breakdown Voltage   | $I_C = 10\text{mA}$ $I_B = 0$                                         | 45   |      |      |                 |
| $V_{(BR)EBO}$ Emitter – Base Breakdown Voltage          | $I_E = 10\mu\text{A}$ $I_C = 0$                                       | 6    |      |      |                 |
| $I_{CBO}$ Collector Cut-off Current                     | $V_{CB} = 45\text{V}$ $I_E = 0$                                       |      |      | 10   | nA              |
|                                                         | $T_A = 150^{\circ}\text{C}$                                           |      |      | 10   | $\mu\text{A}$   |
| $I_{CEO}$ Collector Cut-off Current                     | $V_{CE} = 5\text{V}$ $I_B = 0$                                        |      |      | 2    | nA              |
| $I_{EBO}$ Emitter Cut-off Current                       | $V_{EB} = 5\text{V}$ $I_C = 0$                                        |      |      | 2    |                 |
| $h_{FE}$ DC Current Gain                                | $V_{CE} = 5\text{V}$ $I_C = 10\mu\text{A}$                            | 60   |      | 240  | —               |
|                                                         | $T_A = -55^{\circ}\text{C}$                                           | 15   |      |      |                 |
|                                                         | $V_{CE} = 5\text{V}$ $I_C = 100\mu\text{A}$                           | 100  |      |      |                 |
|                                                         | $V_{CE} = 5\text{V}$ $I_C = 1\text{mA}$                               | 150  |      |      |                 |
| $V_{BE}$ Base – Emitter Voltage                         | $V_{CE} = 5\text{V}$ $I_C = 100\mu\text{A}$                           |      |      | 0.70 | V               |
| $V_{CE(sat)}$ Collector – Emitter Saturation Voltage    | $I_B = 100\mu\text{A}$ $I_C = 1\text{mA}$                             |      |      | 0.35 |                 |
| $h_{ib}$ Small Signal Common – Base Input Impedance     | $V_{CB} = 5\text{V}$ $I_C = 1\text{mA}$<br>$f = 1\text{kHz}$          | 25   |      | 32   | $\Omega$        |
| $h_{ob}$ Small Signal Common – Base Output Admittance   | $V_{CB} = 5\text{V}$ $I_C = 1\text{mA}$<br>$f = 1\text{kHz}$          |      |      | 1    | $\mu\text{mho}$ |
| $ h_{fe} $ Small Signal Common – Base Current Gain      | $V_{CE} = 5\text{V}$ $I_C = 500\mu\text{A}$<br>$f = 20\text{MHz}$     | 3    |      |      | —               |
| $C_{obo}$ Common – Base Open Circuit Output Capacitance | $V_{CB} = 5\text{V}$ $I_E = 0$<br>$f = 140\text{kHz to } 1\text{MHz}$ |      |      | 6    | pF              |

\* Pulse Test:  $t_p = 300\mu\text{s}$ ,  $\delta \leq 1\%$ .

| Parameter                               | Test Conditions                      | 2N2915                 |                         | 2N2917 |           | Unit |     |    |
|-----------------------------------------|--------------------------------------|------------------------|-------------------------|--------|-----------|------|-----|----|
|                                         |                                      | Min.                   | Typ. Max.               | Min.   | Typ. Max. |      |     |    |
| TRANSISTOR MATCHING CHARACTERISTICS     |                                      |                        |                         |        |           |      |     |    |
| $h_{FE1}$                               | Static Forward Current               | $V_{CE} = 5V$          | $I_C = 100\mu A$        |        |           |      |     |    |
| $h_{FE2}$                               | Gain Balance Ratio                   | See Note 2.            |                         | 0.9    | 1         | 0.8  | 1   | —  |
| $ V_{BE1} - V_{BE2} $                   | Base – Emitter Voltage               | $V_{CE} = 5V$          | $I_C = 100\mu A$        |        | 3         |      | 5   | mV |
|                                         | Differential                         | $V_{CE} = 5V$          | $I_C = 10\mu A$ to 1mA  |        | 5         |      | 10  |    |
| $ \Delta(V_{BE1} - V_{BE2})\Delta T_A $ |                                      | $V_{CE} = 5V$          | $I_C = 100\mu A$        |        |           |      |     | mV |
|                                         | Base – Emitter Voltage               | $T_{A1} = 25^{\circ}C$ | $T_{A2} = -55^{\circ}C$ |        | 0.8       |      | 1.6 |    |
|                                         | Differential Change With Temperature | $V_{CE} = 5V$          | $I_C = 100\mu A$        |        | 1         |      | 2   |    |
|                                         |                                      | $T_{A1} = 25^{\circ}C$ | $T_{A2} = 125^{\circ}C$ |        |           |      |     |    |

**NOTES**

- 1) Terminals not under test are open circuited under all test conditions.
- 2) The lower of the two readings is taken as  $h_{FE1}$ .