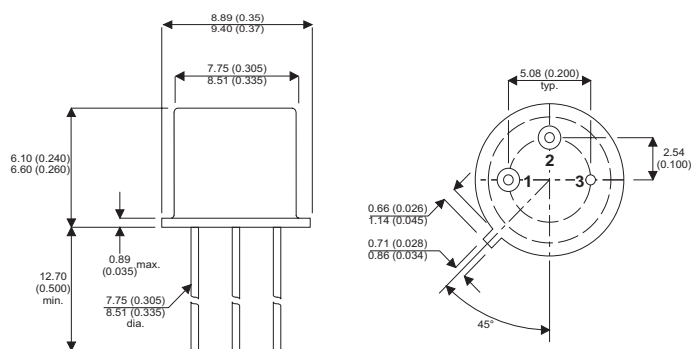


MECHANICAL DATA

Dimensions in mm (inches)



**HIGH SPEED
MEDIUM VOLTAGE
SWITCHES**

DESCRIPTION

The 2N5152 and the 2N5154 are silicon epitaxial planar NPN transistors in jedec TO-39 metal case intended for use in switching applications.

The complementary PNP types are the 2N5151 and 2N5153 respectively

TO-39

Pin 1 – Emitter Pin 2 – Base Pin 3 – Collector

ABSOLUTE MAXIMUM RATINGS

(T_{CASE} = 25°C unless otherwise stated)

| | | 2N5152 | 2N5154 |
|--------------------|--|--------|---------------|
| V _{CBO} | Collector – Base Voltage (I _E = 0) | | 100V |
| V _{CEO} | Collector – Emitter Voltage (I _B = 0) | | 80V |
| V _{EBO} | Emitter – Base Voltage (I _C = 0) | | 6V |
| I _C | Continuous Collector Current | | 5A |
| I _{C(PK)} | Peak Collector Current | | 10A |
| I _B | Base Current | | 1A |
| P _{tot} | Total Dissipation at T _{case} = 25°C | | 1W |
| | T _{case} = 50°C | | 10W |
| | T _{case} = 100°C | | 6.7W |
| T _{stg} | Operating and Storage Temperature Range | | -65 to +200°C |
| T _j | Junction temperature | | 200°C |

ELECTRICAL CHARACTERISTICS FOR 2N5152 ($T_{case} = 25^{\circ}C$ unless otherwise stated)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|--|------|------|------|---------|
| I_{CES} Collector Cut Off Current | $V_{CE} = 60V$ $V_{BE} = 0$ | | | 1 | μA |
| | $V_{CE} = 100V$ $V_{BE} = 0$ | | | 1 | mA |
| I_{CEV} Collector Cut Off Current | $V_{CE} = 60V$ $T_{case} = 150^{\circ}C$ $V_{BE} = -2V$ | | | 500 | μA |
| I_{CEO} Collector Cut Off Current | $V_{CE} = 40V$ $I_B = 0$ | | | 50 | |
| I_{EBO} Emitter Cut Off Current | $V_{EB} = 5V$ $I_C = 0$ | | | 1 | μA |
| | $V_{EB} = 6V$ $I_C = 0$ | | | 1 | mA |
| $V_{CEO(SUS)}$ Collector Emitter Saturation Voltage | $I_C = 100mA$ $I_B = 0$ | 80 | | | V |
| $V_{CE(sat)}$ Collector Emitter Saturation Voltage | $I_C = 2.5A$ $I_B = 250mA$ | | | 0.75 | |
| | $I_C = 5A$ $I_B = 500mA$ | | | 1.5 | |
| $V_{BE(sat)}$ Base Emitter Saturation Voltage | $I_C = 2.5A$ $I_B = 250mA$ | | | 1.45 | |
| | $I_C = 5A$ $I_B = 500mA$ | | | 2.2 | |
| V_{BE} Base Emitter Voltage | $I_C = 2.5A$ $V_{CE} = 5V$ | | | 1.45 | |
| h_{FE} DC Current Gain | $I_C = 50mA$ $V_{CE} = 5V$ | 20 | | | 90 |
| | $I_C = 2.5A$ $V_{CE} = 5V$ | 30 | | | |
| | $I_C = 5A$ $V_{CE} = 5V$ | 20 | | | |
| | $T_{case} = -55^{\circ}C$ $I_C = 2.5A$ $V_{CE} = 5V$ | 15 | | | |
| C_{CBO} Collector Base Capacitance | $I_E = 0$ $V_{CB} = 10V$ $f = 1MHz$ | | | 250 | pF |
| h_{FE} Small Signal Current Gain | $I_C = 0.1A$ $V_{CE} = 5V$ $f = 1KHz$ | 20 | | | |
| | $I_C = 0.5A$ $V_{CE} = 5V$ $f = 20MHz$ | 3 | | | |
| t_{on} Turn On Time | $I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = 0.5A$ | | 0.5 | | μs |
| t_{off} Turn Off Time | $I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = -I_{B2} = 0.5A$ | | 1.3 | | μs |

* Pulse test $t_p = 300\mu s$, $\delta < 2\%$

THERMAL DATA

| | | | |
|---|-----|-----|---------------|
| $R_{thj-case}$ Thermal Resistance Junction-case | Max | 15 | $^{\circ}C/W$ |
| $R_{thj-amb}$ Thermal Resistance Junction-ambient | Max | 175 | $^{\circ}C/W$ |

ELECTRICAL CHARACTERISTICS FOR 2N5154 ($T_{case} = 25^{\circ}C$ unless otherwise stated)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|--|------|------|------|---------|
| I_{CES} Collector Cut Off Current | $V_{CE} = 60V$ $V_{BE} = 0$ | | | 1 | μA |
| | $V_{CE} = 100V$ $V_{BE} = 0$ | | | 1 | mA |
| I_{CEV} Collector Cut Off Current | $V_{CE} = 60V$ $T_{case} = 150^{\circ}C$ $V_{BE} = -2V$ | | | 500 | μA |
| I_{CEO} Collector Cut Off Current | $V_{CE} = 40V$ $I_B = 0$ | | | 50 | |
| I_{EBO} Emitter Cut Off Current | $V_{EB} = 5V$ $I_C = 0$ | | | 1 | μA |
| | $V_{EB} = 6V$ $I_C = 0$ | | | 1 | mA |
| $V_{CEO(SUS)}$ Collector Emitter Saturation Voltage | $I_C = 100mA$ $I_B = 0$ | 80 | | | V |
| $V_{CE(sat)}$ Collector Emitter Saturation Voltage | $I_C = 2.5A$ $I_B = 250mA$ | | | 0.75 | |
| | $I_C = 5A$ $I_B = 500mA$ | | | 1.5 | |
| $V_{BE(sat)}$ Base Emitter Saturation Voltage | $I_C = 2.5A$ $I_B = 250mA$ | | | 1.45 | |
| | $I_C = 5A$ $I_B = 500mA$ | | | 2.2 | |
| V_{BE} Base Emitter Voltage | $I_C = 2.5A$ $V_{CE} = 5V$ | | | 1.45 | |
| h_{FE} DC Current Gain | $I_C = 50mA$ $V_{CE} = 5V$ | 50 | | | 200 |
| | $I_C = 2.5A$ $V_{CE} = 5V$ | 70 | | | |
| | $I_C = 5A$ $V_{CE} = 5V$ | 40 | | | |
| | $T_{case} = -55^{\circ}C$ $I_C = 2.5A$ $V_{CE} = 5V$ | 35 | | | |
| C_{CBO} Collector Base Capacitance | $I_E = 0$ $V_{CB} = 10V$ $f = 1MHz$ | | | 250 | pF |
| h_{FE} Small Signal Current Gain | $I_C = 0.1A$ $V_{CE} = 5V$ $f = 1KHz$ | 50 | | | |
| | $I_C = 0.5A$ $V_{CE} = 5V$ $f = 20MHz$ | 3.5 | | | |
| t_{on} Turn On Time | $I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = 0.5A$ | | 0.5 | | μs |
| t_{off} Turn Off Time | $I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = -I_{B2} = 0.5A$ | | 1.3 | | μs |

* Pulse test $t_p = 300\mu s$, $\delta < 2\%$

THERMAL DATA

| | | | |
|---|-----|-----|---------------|
| $R_{thj-case}$ Thermal Resistance Junction-case | Max | 15 | $^{\circ}C/W$ |
| $R_{thj-amb}$ Thermal Resistance Junction-ambient | Max | 175 | $^{\circ}C/W$ |