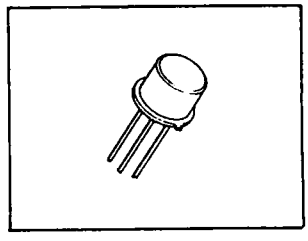
SOLID STATE INC.
46 FARRAND STREET
BLOOMFIELD, NEW JERSEY 07003
www.solidstateinc.com

# 2N4150

## NPN SILICON HIGH POWER TRANSISTORS



### DIFFUSED SILICON PLANAR PASSIVATED TRANSISTORS

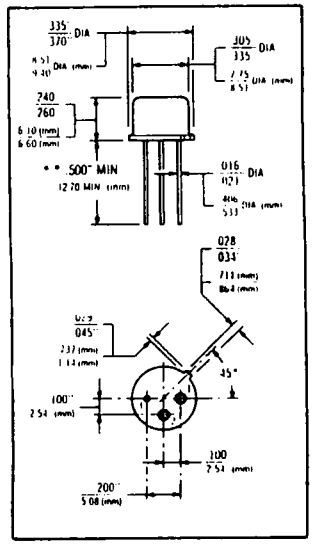
These devices are designed for use in high current switching applications. The latest technologies are used to offer the highest degree of reliability.

### FEATURES

- Low Saturation Voltage
- Fast Switching
- Collector Current: 10 Amps Peak
- Low Leakage Current
- Low Drive Requirement

### APPLICATIONS

- High Speed Switching Regulated Power Supplies
- Converters
- Inverters
- Wide Band Amplifiers



### ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Maximum Temperatures | |
| Storage Temperature | −65°C to 200°C |
| Operating Junction Temperature | +200°C |
| Lead Temperature (soldering, 60 second time limit) | +300°C |
| Maximum Power Dissipation | |
| Total Dissipation at 100°C Case Temperature | 5 Watts |
| (1) See Safe Operating Curves for derating | |
| Linear derating factor | 50 mW/°C |
| Maximum Voltages and Current | 2N4150 |
| $V_{CEO}$ Collector to Emitter Voltage | 80 Volts |
| $V_{CBO}$ Collector to Base Voltage | 100 Volts |
| $V_{EBO}$ Emitter to Base Voltage | 5 Volts |
| $I_C$ Continuous Collector Current | 10 Amps |

### MECHANICAL CHARACTERISTICS

Case: **TO-39**

Leads:
1. Emitter 2. Base 3. Collector

### *ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C unless otherwise noted)

| CHARACTERISTIC | SYMBOL | TEST CONDITIONS | 2N4150 MIN | 2N4150 MAX | UNITS |
|---|---|---|---|---|---|
| Collector Cutoff Current | $I_{CEO}$ | $V_{CE}$=60V, $I_B$ = 0 | | 10 | μAmp |
| Collector Cutoff Current | $I_{CEX}$ | $V_{CE}$=100V, $V_{EB}$ = 0.5V | | 10 | μAmp |
| Collector Cutoff Curent | $I_{CBO}$ | $V_{CB}$=60V, $V_{BE}$ = 0V | | 0.1 | μAmp |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{BE}$=5V, $V_{CE}$= 0V | | 10 | μAmp |
| †DC Current Gain | $h_{FE}$ | $I_C$ = 5A, $V_{CE}$ = 5V | 40 | 120 | |
| | $h_{FE}$ | $I_C$ = 10A, $V_{CE}$ = 5V | 10 | | |
| | $h_{FE}$ | $I_C$ = 1A, $V_{CE}$ = 5V | 50 | | |
| Collector to Base Breakdown Voltage | $BV_{CBO}$ | $I_C$ = 10μA, $I_E$ = 0 | 100 | | Volts |
| Collector to Emitter Breakdown Voltage | $BV_{CEO}$ | $I_C$ = 0.1A, $I_B$ = 0 | 70 | | Volts |
| Emitter to Base Breakdown Voltage | $BV_{EBO}$ | $I_E$ = 10μA, $I_C$ = 0 | 5 | | Volts |
| †Collector Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = 5A, $I_B$ = 0.5A | | 0.6 | Volts |
| | | $I_C$ = 10A, $I_B$ = 1A | | 2.5 | Volts |
| †Base Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 5A, $I_B$ = 0.5A | | 1.5 | Volts |
| | | $I_C$ = 10A, $I_B$ = 1A | | 2.5 | Volts |

*JEDEC registered data. † Pulse conditions: Width = 300μs; Duty Cycle ≤ 2% (measured using Kelvin connections).

## DYNAMIC CHARACTERISTICS*

| CHARACTERISTIC | SYMBOL | TEST CONDITIONS | 2N4150 MIN | 2N4150 MAX | |
|---|---|---|---|---|---|
| Pulse Delay Time | $t_d$ | See Circuit #1 | | – | nSec |
| Pulse Rise Time | $t_r$ | See Circuit #1 | | 200 | nSec |
| Pulse Storage Time | $t_s$ | See Circuit #1 | | 2.0 | μSec |
| Pulse Fall Time | $t_f$ | See Circuit #1 | | 200 | nSec |
| Collector Base Capacitance | $C_{obo}$ | $V_{CB}$ = 10V, $I_E$ = 0, f = 1 MHz | | 350 | pF |
| High Frequency Small Signal | $\|h_{fe}\|$ | $I_C$ = 200mA, $V_{CE}$ = 10V, f = 10MHz | 1.5 | | |

*JEDEC registered data.

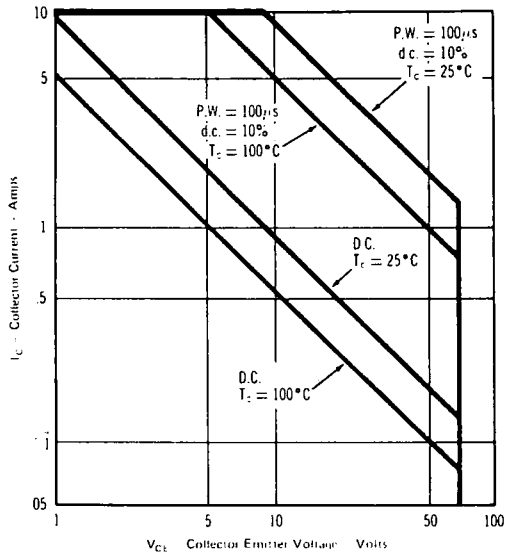



**Figure 1—Maximum Safe Operation Region**

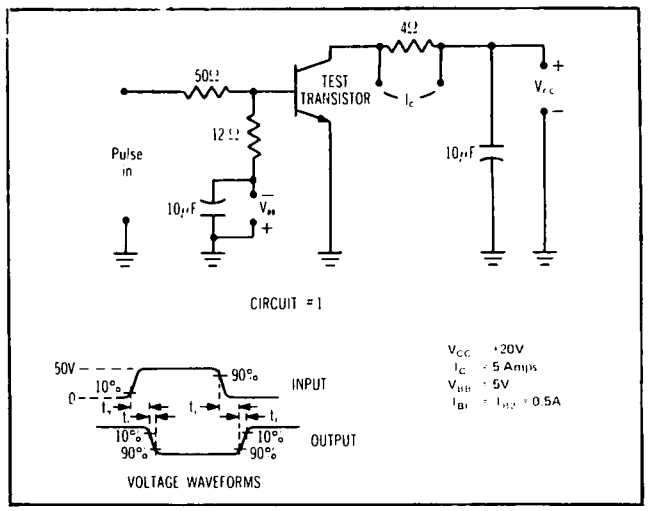



**Figure 2—Pulse Response Measurement Circuit**

## TYPICAL CHARACTERISTICS

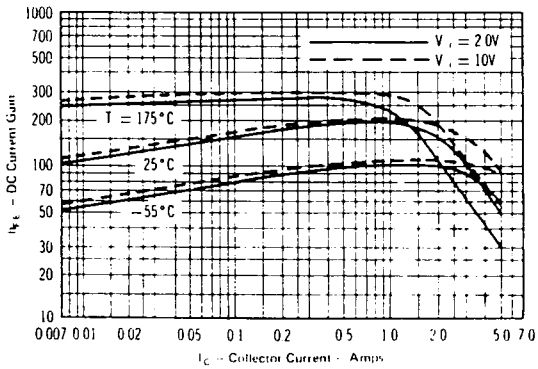



**Figure 3—Static Forward Current Transfer Ratio**

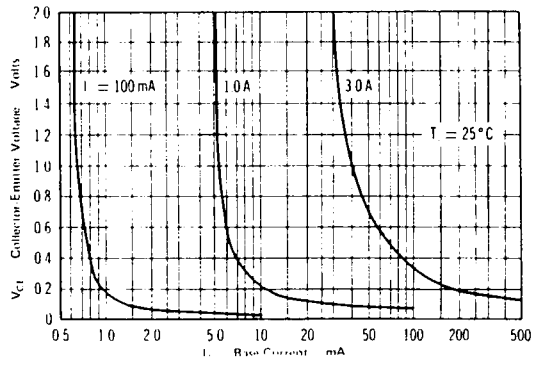



**Figure 4—Collector Saturation Region**