



# SOLID STATE INC.

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## 2N4150

### NPN SILICON HIGH POWER TRANSISTORS

#### DIFFUSED SILICON PLANAR PASSIVATED TRANSISTORS

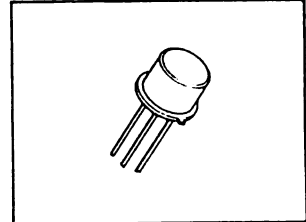
These devices are designed for use in high current switching applications. The latest technologies are used to offer the highest degree of reliability.

#### 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  $-65^{\circ}\text{C}$  to  $200^{\circ}\text{C}$   
 Operating Junction Temperature  $+200^{\circ}\text{C}$   
 Lead Temperature (soldering, 60 second time limit)  $+300^{\circ}\text{C}$

##### Maximum Power Dissipation

Total Dissipation at  $100^{\circ}\text{C}$  Case Temperature **5 Watts**  
 (1) See Safe Operating Curves for derating  
 Linear derating factor **50 mW/°C**

##### Maximum Voltages and Current

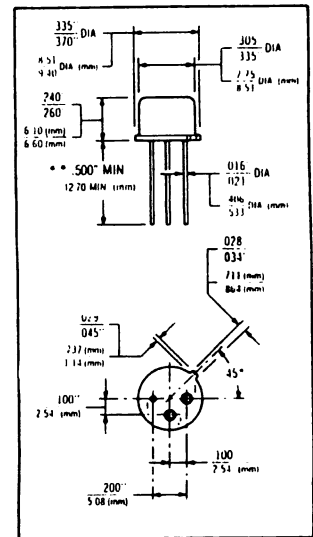
$V_{CEO}$  Collector to Emitter Voltage **80 Volts**  
 $V_{CBO}$  Collector to Base Voltage **100 Volts**  
 $V_{EBO}$  Emitter to Base Voltage **5 Volts**  
 $I_C$  Continuous Collector Current **10 Amps**

#### MECHANICAL CHARACTERISTICS

Case: TO-39

Leads:

1. Emitter
2. Base
3. Collector



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

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

\* JEDEC registered data. † Pulse conditions: Width = 300 $\mu\text{s}$ ; Duty Cycle  $\leq 2\%$  (measured using Kelvin connections).

### DYNAMIC CHARACTERISTICS\*

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	2N4150		
			MIN	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	$\mu$ Sec
Pulse Fall Time	$t_f$	See Circuit #1		200	nSec
Collector Base Capacitance	$C_{obo}$	$V_{CB} = 10V, I_E = 0, f = 1 \text{ MHz}$		350	pF
High Frequency Small Signal	$ h_{fe} $	$I_C = 200\text{mA}, V_{CE} = 10V, f = 10\text{MHz}$	1.5		

\*JEDEC registered data.

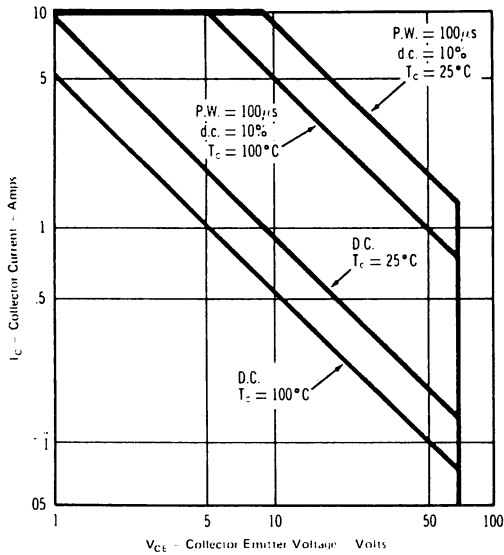


Figure 1—Maximum Safe Operation Region

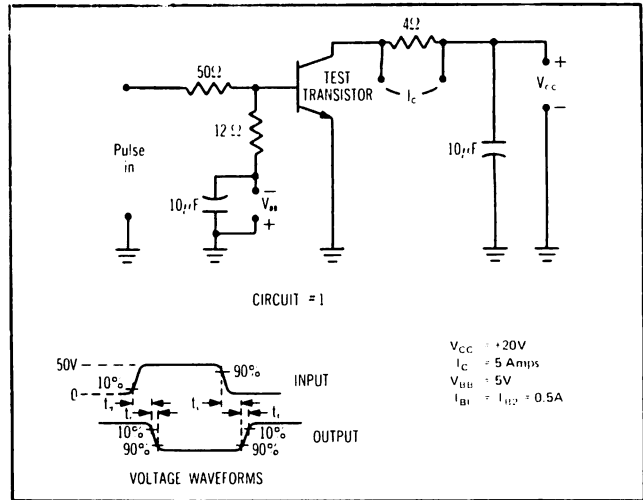


Figure 2—Pulse Response Measurement Circuit

### TYPICAL CHARACTERISTICS

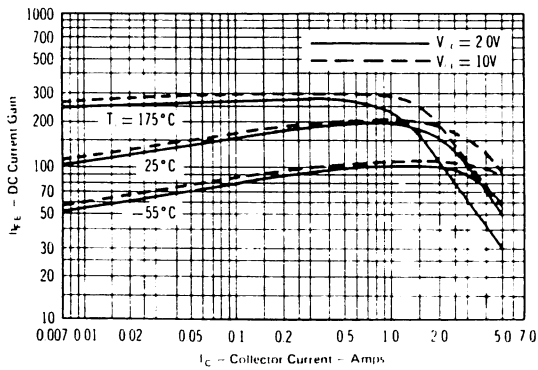


Figure 3—Static Forward Current Transfer Ratio

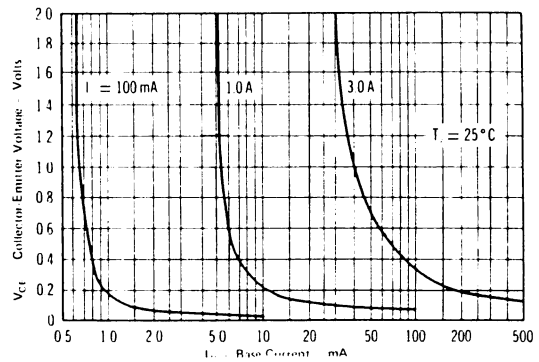


Figure 4—Collector Saturation Region