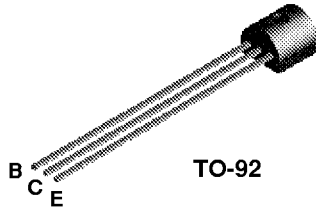


**2N3416  
2N3417**



**NPN General Purpose Amplifier**

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300 mA. Sourced from Process 10. See PN100A for characteristics.

**Absolute Maximum Ratings\***

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	50	V
V <sub>CBO</sub>	Collector-Base Voltage	50	V
V <sub>EBO</sub>	Emitter-Base Voltage	5.0	V
I <sub>C</sub>	Collector Current - Continuous	500	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°C

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**NOTES:**

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

**Thermal Characteristics**

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		2N3416 / 2N3417	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	83.3	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	200	°C/W

# NPN General Purpose Amplifier

(continued)

## Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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### OFF CHARACTERISTICS

V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage*	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0	50		V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = 10 μA, I <sub>E</sub> = 0	50		V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0	5.0		V
I <sub>CBO</sub>	Collector-Cutoff Current	V <sub>CB</sub> = 25 V, I <sub>E</sub> = 0 V <sub>CB</sub> = 18 V, I <sub>E</sub> = 0, T <sub>A</sub> = 100°C		100 15	nA μA
I <sub>EBO</sub>	Emitter-Cutoff Current	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0		100	nA

### ON CHARACTERISTICS\*

h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> = 4.5 V, I <sub>C</sub> = 2.0 mA <b>2N3416</b> <b>2N3417</b>	75 180	225 540	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 50 mA, I <sub>B</sub> = 3.0 mA		0.3	V
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 50 mA, I <sub>B</sub> = 3.0 mA	0.6	1.3	V

### SMALL SIGNAL CHARACTERISTICS

h <sub>fe</sub>	Small-Signal Current Gain	I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 4.5 V, f = 1.0 kHz <b>2N3416</b> <b>2N3417</b>	75 180		
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\*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

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