Micro Commercial Components

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# 2N3416

## NPN General Purpose Amplifier

## Features

- This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300mA
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0and MSL rating 1
- Marking: Type Number
- Lead Free Finish/Rohs Compliant ("P"Suffix designates Compliant. See ordering information)

## Maximum Ratings*

| Symbol | Rating | Rating | Unit |
|---|---|---|---|
| $V_{CEO}$ | Collector-Emitter Voltage | 50 | V |
| $V_{CBO}$ | Collector-Base Voltage | 50 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 5.0 | V |
| $I_C$ | Collector Current, Continuous | 500 | mA |
| $T_J$ | Operating Junction Temperature | -55 to +150 | $^{O}$C |
| $T_{STG}$ | Storage Temperature | -55 to +150 | $^{O}$C |

## Thermal Characteristics

| Symbol | Rating | Max | Unit |
|---|---|---|---|
| $P_D$ | Total Device Dissipation<br>Derate above 25$^{O}$C | 625<br>5.0 | mW<br>mW/$^{O}$C |
| $R_{JC}$ | Thermal Resistance, Junction to Case | 83.3 | $^{O}$C/W |
| $R_{JA}$ | Thermal Resistance, Junction to Ambient | 200 | $^{O}$C/W |

## Electrical Characteristics @ 25ºC Unless Otherwise Specified

| Symbol | Parameter | Min | Max | Units |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage*<br>($I_C$=10mAdc, $I_B$=0) | 50 | --- | Vdc |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage<br>($I_C$=10ì Adc, $I_E$=0) | 50 | --- | Vdc |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage<br>($I_E$=10ì Adc, $I_C$=0) | 5.0 | --- | Vdc |
| $I_{CBO}$ | Collector Cutoff Current<br>($V_{CB}$=25Vdc, $I_E$=0.4Vdc)<br>($V_{CB}$=18Vdc, $I_E$=0, $T_A$=100$^{O}$C) | ---<br>-- | 100<br>15 | nAdc<br>uAdc |
| $I_{EBO}$ | Emitter Cutoff Current<br>($V_{EB}$=5.0Vdc, $I_C$=0) | --- | 100 | nAdc |

* 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.

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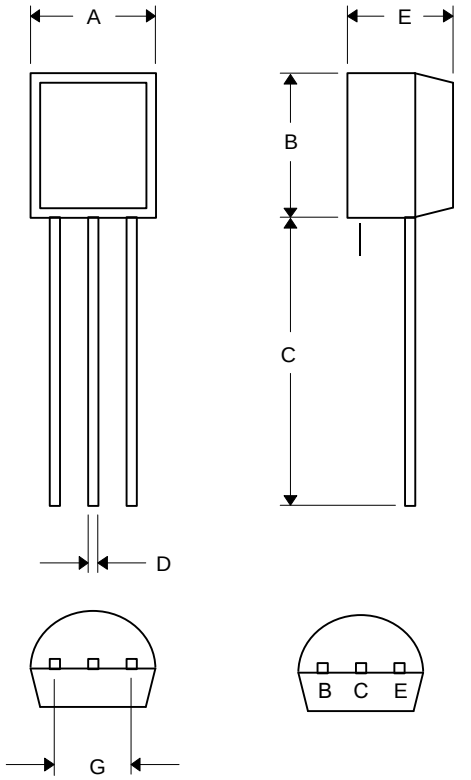


| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| | INCHES | | MM | | |
| DIM | MIN | MAX | MIN | MAX | NOTE |
| A | .170 | .190 | 4.33 | 4.83 | |
| B | .170 | .190 | 4.30 | 4.83 | |
| C | .550 | .590 | 13.97 | 14.97 | |
| D | .010 | .020 | 0.36 | 0.56 | |
| E | .130 | .160 | 3.30 | 3.96 | |
| G | .096 | .104 | 2.44 | 2.64 | |

| Symbol | Parameter | Min | Max | Units |
|---|---|---|---|---|
| **ON CHARACTERISTICS*** | | | | |
| $h_{FE}$ | DC Current Gain ($V_{CE}$=4.5Vdc, $I_C$=2.0mAdc) | 75 | 225 | --- |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage ($I_C$=50mAdc, $I_B$=3.0mAdc) | --- | 0.3 | Vdc |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage ($I_C$=150mAdc, $I_B$=15mAdc) | 0.6 | 1.3 | Vdc |
| **SMALL-SIGNAL CHARACTERISTICS** | | | | |
| $h_{fe}$ | Small-Signal Current Gain ($I_C$=2.0mAdc, $V_{CE}$=4.5Vdc, f=1.0KHz) | 75 | --- | --- |

* Pulse Test: Pulse Width<300us, Duty Cycle<2.0%

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## Ordering Information

| Device | Packing |
|---|---|
| (Part Number)-AP | Ammo Packing;2Kpcs/AmmoBox |
| (Part Number)-BP | Bulk;1Kpcs/Bag |