



Micro Commercial Components



Micro Commercial Components  
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# 2N4401

## NPN General Purpose Amplifier

### Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Capable of 625mWatts of Power Dissipation
- Halogen free available upon request by adding suffix "-HF"
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking: Type number
- Operating Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C

### Electrical Characteristics @ 25°C Unless Otherwise Specified

| Symbol | Parameter | Min | Max | Units |
|--------|-----------|-----|-----|-------|
|--------|-----------|-----|-----|-------|

#### OFF CHARACTERISTICS

|               |                                                                   |     |     |         |
|---------------|-------------------------------------------------------------------|-----|-----|---------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage*<br>( $I_C=1.0mA$ , $I_B=0$ ) | 40  |     | Vdc     |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage<br>( $I_C=0.1mA$ , $I_E=0$ )     | 60  |     | Vdc     |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage<br>( $I_E=0.1mA$ , $I_C=0$ )       | 6.0 |     | Vdc     |
| $I_{BL}$      | Base Cutoff Current<br>( $V_{CE}=35Vdc$ , $V_{BE}=0.4Vdc$ )       |     | 0.1 | $\mu A$ |
| $I_{CEX}$     | Collector Cutoff Current<br>( $V_{CE}=35Vdc$ , $V_{BE}=0.4Vdc$ )  |     | 0.1 | $\mu A$ |

#### ON CHARACTERISTICS

|               |                                                                                                                                                                                                          |                             |             |     |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------|-----|
| $h_{FE}$      | DC Current Gain*<br>( $I_C=0.1mA$ , $V_{CE}=1.0Vdc$ )<br>( $I_C=1.0mA$ , $V_{CE}=1.0Vdc$ )<br>( $I_C=10mA$ , $V_{CE}=1.0Vdc$ )<br>( $I_C=150mA$ , $V_{CE}=1.0Vdc$ )<br>( $I_C=500mA$ , $V_{CE}=1.0Vdc$ ) | 20<br>40<br>80<br>100<br>40 | 300         |     |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage<br>( $I_C=150mA$ , $I_B=15mA$ )<br>( $I_C=500mA$ , $I_B=50mA$ )                                                                                                     |                             | 0.4<br>0.75 | Vdc |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage<br>( $I_C=150mA$ , $I_B=15mA$ )<br>( $I_C=500mA$ , $I_B=50mA$ )                                                                                                          | 0.75                        | 0.95<br>1.2 | Vdc |

#### SMALL-SIGNAL CHARACTERISTICS

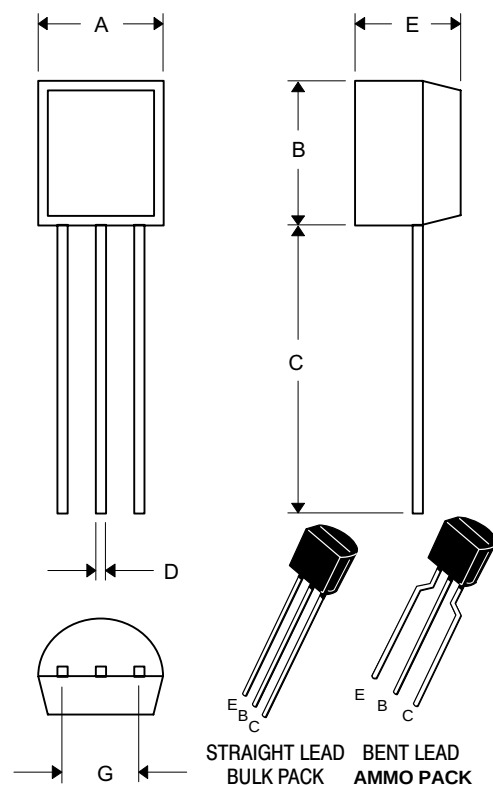
|          |                                                                                |     |      |     |
|----------|--------------------------------------------------------------------------------|-----|------|-----|
| $f_T$    | Current Gain-Bandwidth Product<br>( $I_C=20mA$ , $V_{CE}=10Vdc$ , $f=100MHz$ ) | 250 |      | MHz |
| $C_{cb}$ | Collector-Base Capacitance<br>( $V_{CB}=5.0Vdc$ , $I_E=0$ , $f=100kHz$ )       |     | 6.5  | pF  |
| $C_{eb}$ | Emitter-Base Capacitance<br>( $V_{BE}=0.5Vdc$ , $I_C=0$ , $f=100kHz$ )         |     | 30.0 | pF  |

#### SWITCHING CHARACTERISTICS

|       |              |                                      |     |    |
|-------|--------------|--------------------------------------|-----|----|
| $t_d$ | Delay Time   | ( $V_{CC}=30Vdc$ , $V_{BE}=0.2Vdc$ ) | 15  | ns |
| $t_r$ | Rise Time    | ( $I_C=150mA$ , $I_B=15mA$ )         | 20  | ns |
| $t_s$ | Storage Time | ( $V_{CC}=30Vdc$ , $I_C=150mA$ )     | 225 | ns |
| $t_f$ | Fall Time    | ( $I_{B1}=I_{B2}=15mA$ )             | 30  | ns |

\*Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$

### TO-92



STRAIGHT LEAD BULK PACK BENT LEAD AMMO PACK

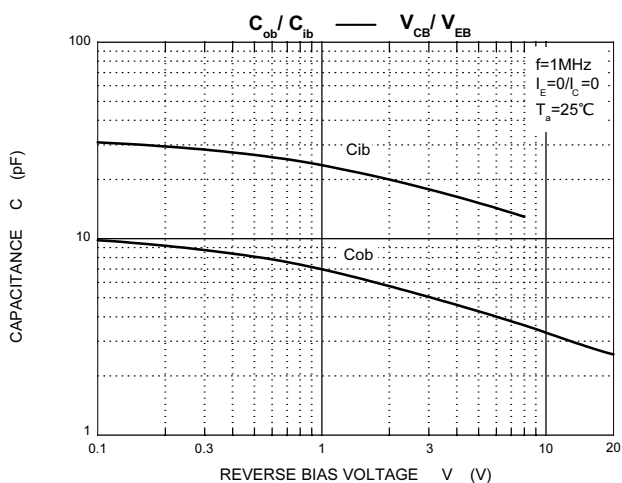
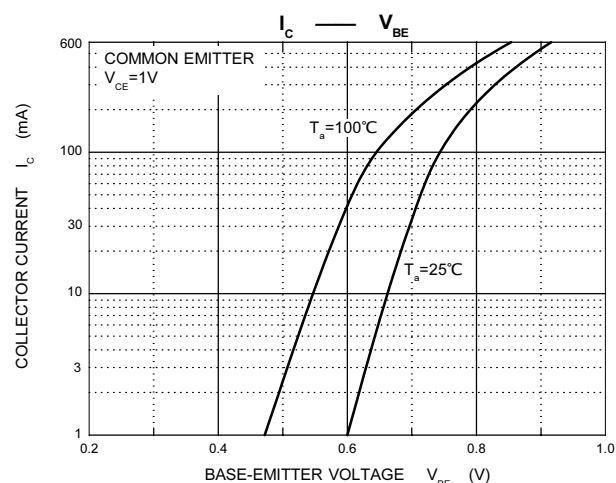
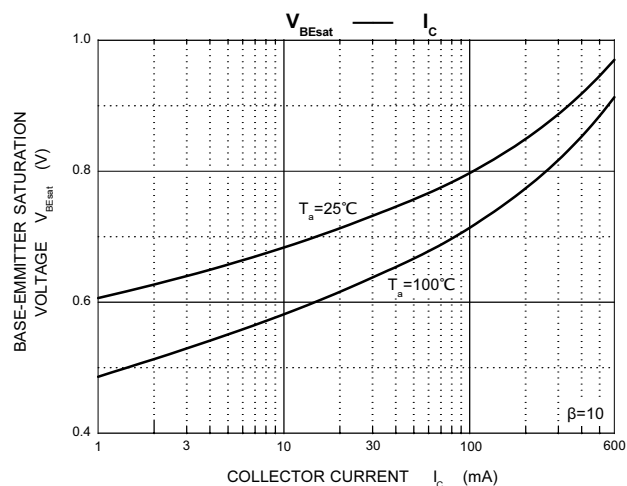
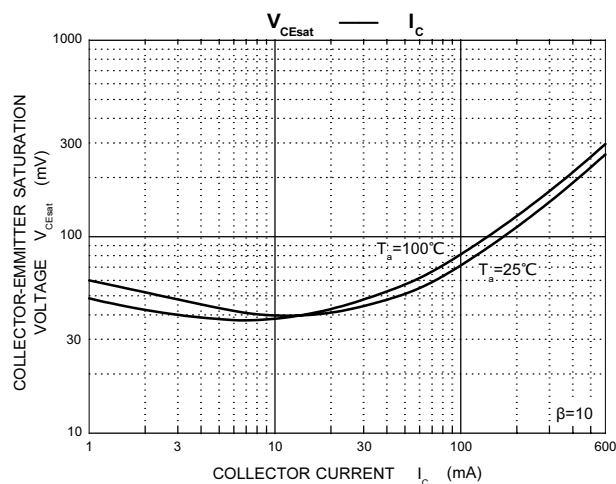
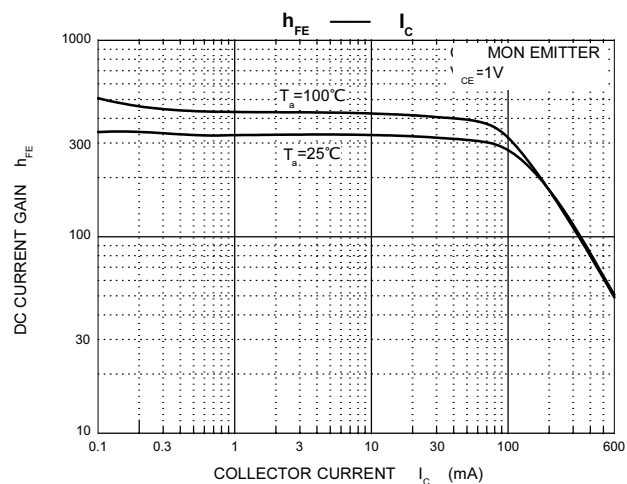
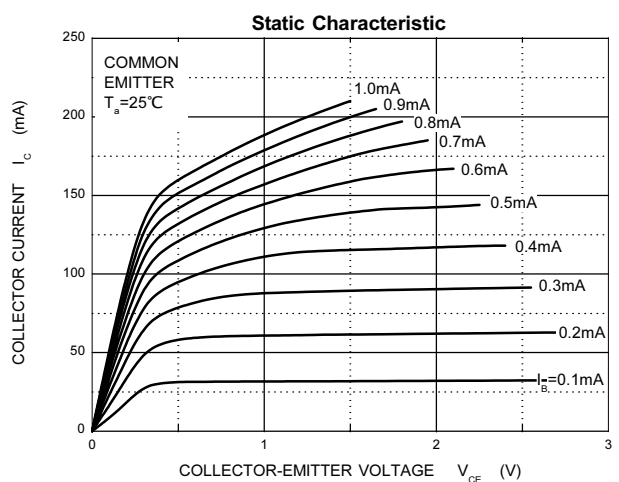
#### DIMENSIONS

| DIM | INCHES |      | MM    |      | NOTE          |
|-----|--------|------|-------|------|---------------|
|     | MIN    | MAX  | MIN   | MAX  |               |
| A   | .175   | .185 | 4.45  | 4.70 |               |
| B   | .175   | .185 | 4.45  | 4.70 |               |
| C   | .500   | ---  | 12.70 | ---  |               |
| D   | .016   | .020 | 0.41  | 0.63 |               |
| E   | .135   | .145 | 3.43  | 3.68 |               |
| G   | .095   | .105 | 2.42  | 2.67 | Straight Lead |
|     | .173   | .220 | 4.40  | 5.60 | Bent Lead     |

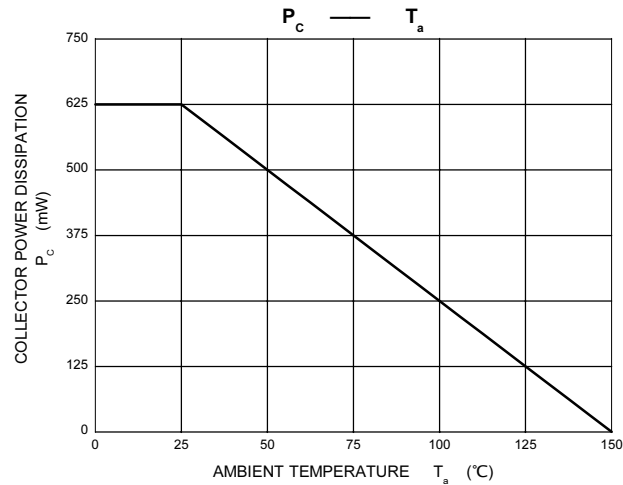
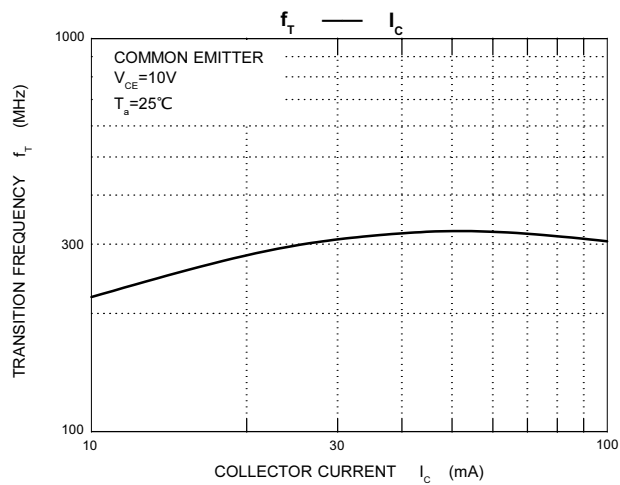
\* For ammo packing detailed specification, click here to visit our website of product packaging for details.

[www.mccsemi.com](http://www.mccsemi.com)

# 2N4401



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## Ordering Information :

| Device         | Packing                     |
|----------------|-----------------------------|
| Part Number-AP | Ammo Packing: 20Kpcs/Carton |
| Part Number-BP | Bulk: 100Kpcs/Carton        |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-AP-HF

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