



Micro Commercial Components



Micro Commercial Components  
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# MMBT2222AT

## NPN General Purpose Amplifier

### Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Capable of 150mWatts of Power Dissipation
- Operating and Storage Junction Temperatures -55°C to 150°C
- Collector Current: 0.6A
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking:1P

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

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

#### OFF CHARACTERISTICS

|               |  |     |     |      |
|---------------|--|-----|-----|------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage*<br>( $I_C=10mA$ , $I_B=0$ ) | 40  |     | Vdc  |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage<br>( $I_C=10\mu A$ , $I_E=0$ )  | 75  |     | Vdc  |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage<br>( $I_E=10\mu A$ , $I_C=0$ )    | 6.0 |     | Vdc  |
| $I_{CBO}$     | Collector Cut-off Current<br>( $V_{CB}=70Vdc$ , $I_E=0$ )        |     | 100 | nAdc |
| $I_{CEO}$     | Collector Cutoff Current<br>( $V_{CE}=35Vdc$ , $I_B=0$ )         |     | 100 | nAdc |
| $I_{EBO}$     | Emitter Cut-off Current<br>( $V_{EB}=3Vdc$ , $I_C=0$ )           |     | 100 | nAdc |

#### ON CHARACTERISTICS

|               |   |                                   |            |     |
|---------------|---|-----------------------------------|------------|-----|
| $h_{FE}$      | DC Current Gain*<br>( $I_C=0.1mA$ , $V_{CE}=10Vdc$ )<br>( $I_C=1.0mA$ , $V_{CE}=10Vdc$ )<br>( $I_C=10mA$ , $V_{CE}=10Vdc$ )<br>( $I_C=150mA$ , $V_{CE}=10Vdc$ )<br>( $I_C=150mA$ , $V_{CE}=10Vdc$ )<br>( $I_C=500mA$ , $V_{CE}=10Vdc$ ) | 35<br>50<br>75<br>100<br>50<br>40 | 300        |     |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage<br>( $I_C=150mA$ , $I_B=15mA$ )<br>( $I_C=500mA$ , $I_B=50mA$ )  |                                   | 0.3<br>1.0 | Vdc |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage<br>( $I_C=150mA$ , $I_B=15mA$ )<br>( $I_C=500mA$ , $I_B=50mA$ )   |                                   | 1.2<br>2.0 | Vdc |

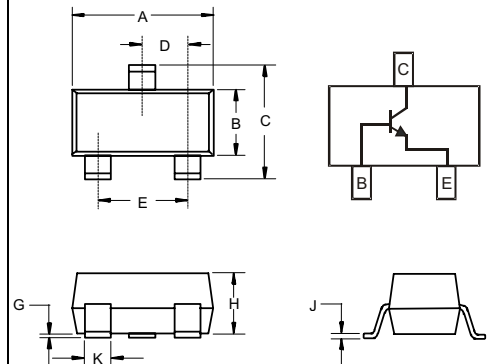
#### SMALL-SIGNAL CHARACTERISTICS

|           |  |     |     |     |
|-----------|--|-----|-----|-----|
| $f_T$     | Current Gain-Bandwidth Product<br>( $I_C=20mA$ , $V_{CE}=20Vdc$ , $f=100MHz$ ) | 300 |     | MHz |
| $C_{obo}$ | Output Capacitance<br>( $V_{CB}=10Vdc$ , $I_E=0$ , $f=100kHz$ )                |     | 8.0 | pF  |

#### SWITCHING CHARACTERISTICS

|       |              |                                      |     |    |
|-------|--------------|--------------------------------------|-----|----|
| $t_d$ | Delay Time   | ( $V_{CC}=30Vdc$ , $V_{BE}=0.5Vdc$ ) | 10  | ns |
| $t_r$ | Rise Time    | $I_C=150mA$ , $I_{B1}=15mA$          | 25  | ns |
| $t_s$ | Storage Time | ( $V_{CC}=30Vdc$ , $I_C=150mA$ )     | 225 | ns |
| $t_f$ | Fall Time    | $I_{B1}=I_{B2}=15mA$                 | 60  | ns |

### SOT-523



| DIM | DIMENSIONS   |      |             |      | NOTE |
|-----|--------------|------|-------------|------|------|
|     | INCHES       |      | MM          |      |      |
|     | MIN          | MAX  | MIN         | MAX  |      |
| A   | .059         | .067 | 1.50        | 1.70 |      |
| B   | .030         | .033 | 0.75        | 0.85 |      |
| C   | .057         | .069 | 1.45        | 1.75 |      |
| D   | .020 Nominal |      | 0.50Nominal |      |      |
| E   | .035         | .043 | 0.90        | 1.10 |      |
| G   | .000         | .004 | .000        | .100 |      |
| H   | .028         | .031 | .70         | 0.80 |      |
| J   | .004         | .008 | .100        | .200 |      |
| K   | .010         | .014 | .25         | .35  |      |

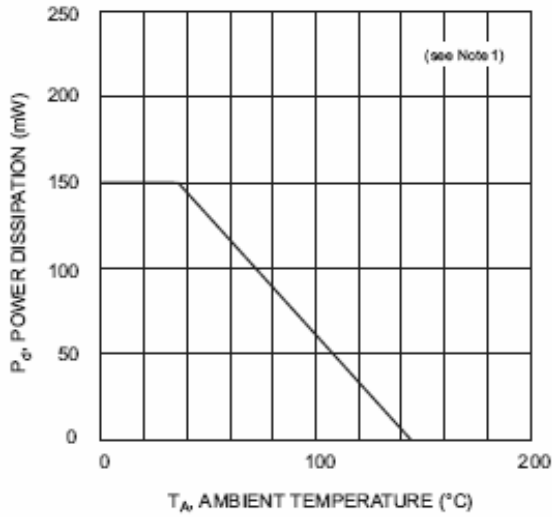


Fig. 1, Power Derating Curve

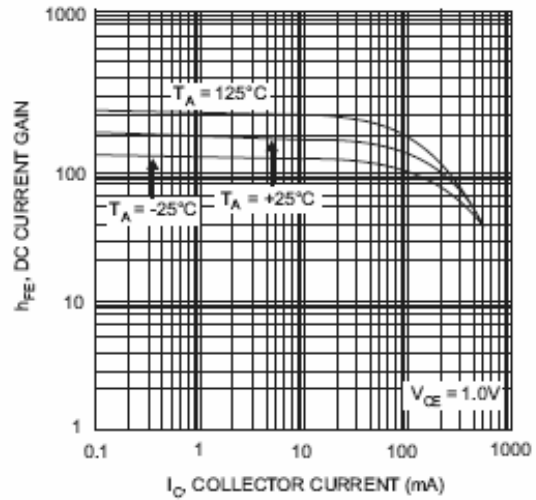


Fig. 2 Typical DC Current Gain vs Collector Current

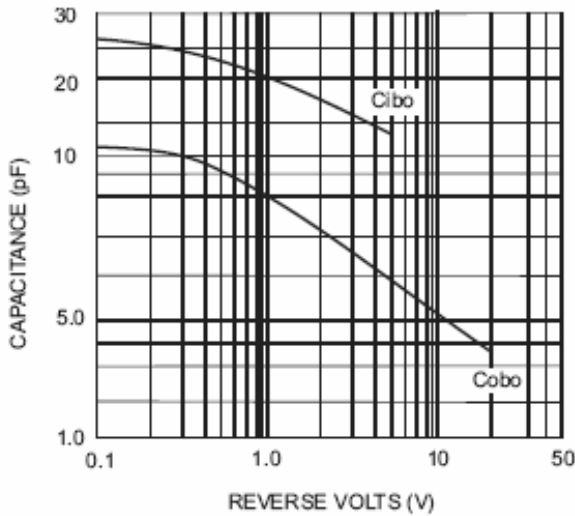


Fig. 3 Typical Capacitance

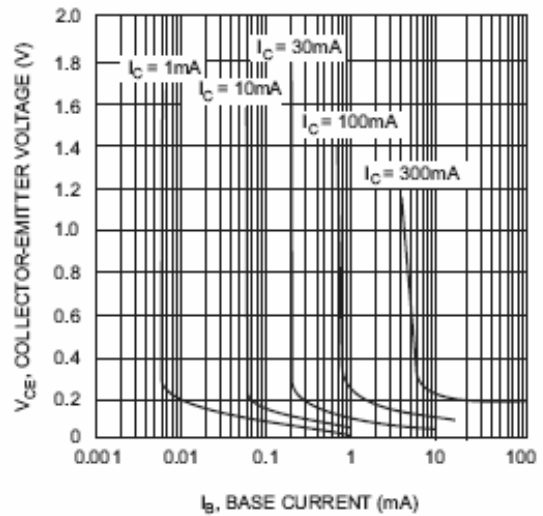


Fig. 4 Typical Collector Saturation Region

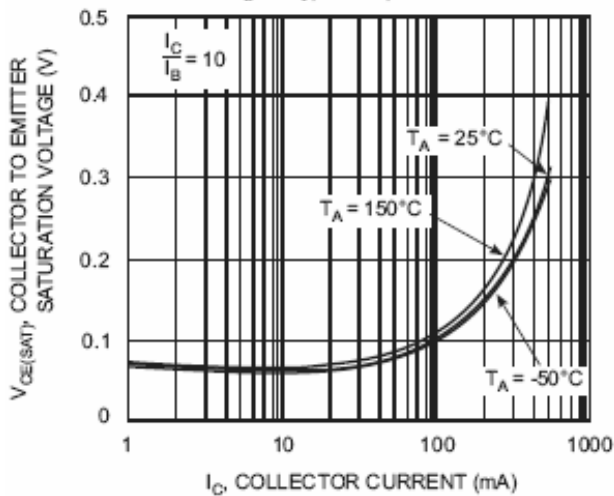


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

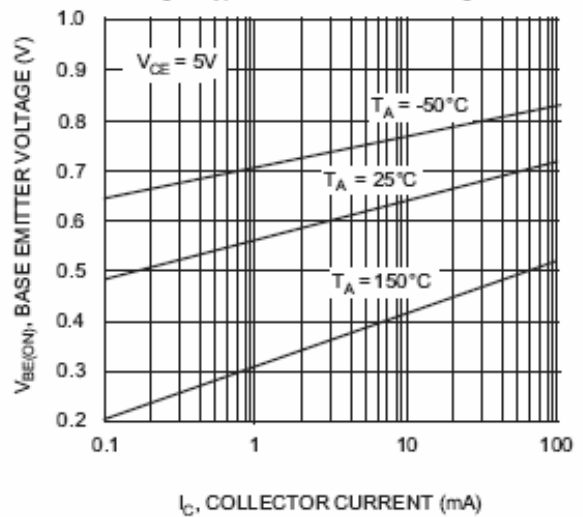


Fig. 6 Base Emitter Voltage vs. Collector Current



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### Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel; 3Kpcs/Reel |

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