Watertown, MA
Microsemi
Progress Powered by Technology

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# 2N2222A

**75 Volts**
**0.8 Amps**

**NPN**
**BIPOLAR**
**TRANSISTOR**

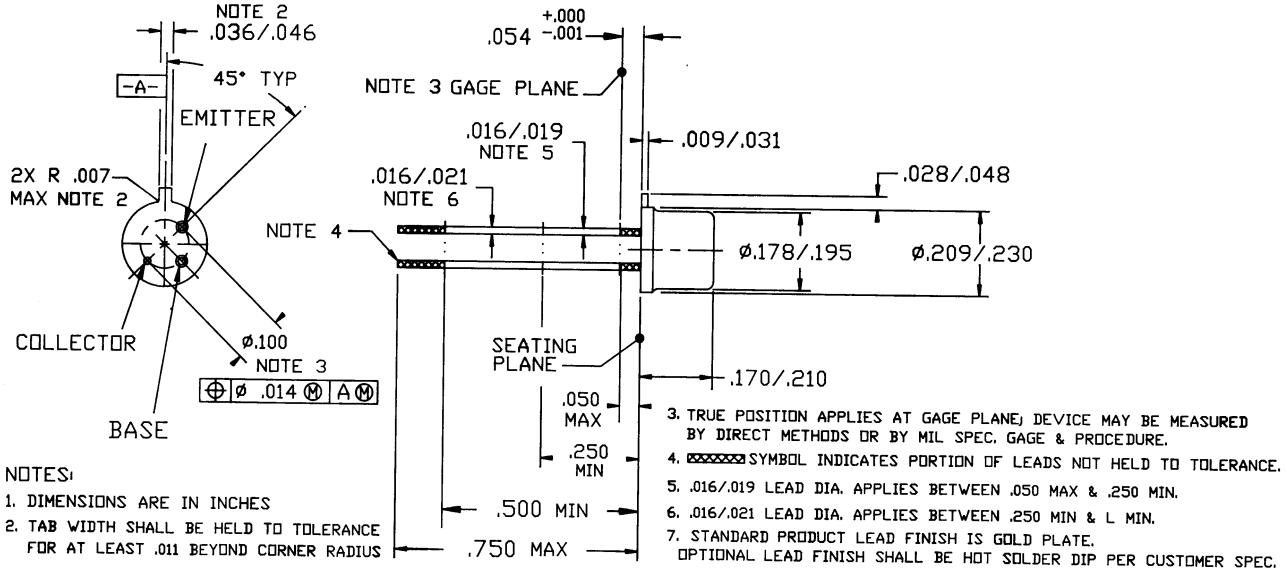
## Features

- Meets MIL-S-19500/255
- Collector-Base Voltage 75
- Collector Current: 800mA
- Fast Switching 335 nS

## Maximum Ratings

| RATING | SYMBOL | MAX. | UNIT |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | | Vdc |
| Collector-Base Voltage | $V_{CBO}$ | 75 | Vdc |
| Emitter-Base Voltage | $V_{EBO}$ | 6.0 | Vdc |
| Collector Current | $I_C$ | 800 | mAdc |
| Total Device Dissipation @ $T_A = 25^oC$<br>Derate above $25^oC$ | $P_D$ | 0.5<br>2.85 | Watt<br>$mW/^oC$ |
| Total Device Dissipation @$T_C = 25^oC$<br>Derate above $25^oC$ | $P_D$ | 1.8<br>10.3 | Watt<br>$mW/^oC$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 350 | $^oC/W$ |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 97 | $^oC/W$ |
| Operating Temperature Range | $T_J$ | -65 to + 200 | $^oC$ |
| Storage Temperature Range | $T_{STG}$ | -65 to + 200 | $^oC$ |

## Mechanical Outline



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## Electrical Parameters ($T_A$ @ 25°C unless otherwise specified)

| CHARACTERISTICS | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| **Off Characteristics** | | | | | |
| Collector-Emitter Breakdown Voltage<br>($I_C$ = 10 mAdc, $I_B$ = 0) | $BV_{CE0}$ | 50 | | -- | Vdc |
| Collector-Emitter Breakdown Voltage<br>($I_C$ = 10 μAdc, $I_E$ = 0) | $BV_{CBO}$ | 75 | | -- | Vdc |
| Emitter-Base Breakdown Voltage<br>($I_E$ = 10 μAdc, $I_C$ = 0) | $BV_{EBO}$ | 6.0 | | -- | Vdc |
| Collector to emitter Cutoff Current<br>($V_{CE}$ = 30 Vdc) | $I_{CES}$ | -- | | 50 | nAdc |
| Collector to base Cutoff Current<br>($V_{CE}$ = 60 Vdc) | I | -- | | 10 | nAdc |
| D.C. Current Gain<br>($I_C$ = 0.1 mAdc, $V_{CE}$ = 10 Vdc)<br>($I_C$ = 1.0 mAdc, $V_{CE}$ = 10 Vdc)<br>($I_C$ = 10 mAdc, $V_{CE}$ = 10 Vdc)(1)<br>($I_C$ = 10 mAdc, $V_{CE}$ = 10 Vdc, $T_A$ = -55°C)(1)<br>($I_C$ = 150 mAdc, $V_{CE}$ = 10 Vdc)(1)<br>($I_C$ = 500 mAdc, $V_{CE}$ = 10 Vdc)(1) | $h_{FE}$ | <br>50<br>75<br>100<br>35<br>100<br>30 | | <br>--<br>325<br>--<br>--<br>300<br>-- | |
| Collector-Emitter Saturation Voltage(1)<br>($I_C$ = 150 mAdc, $I_B$ = 15 mAdc)<br>($I_C$ = 500 mAdc, $I_B$ = 50 mAdc) | $V_{CE(Sat)}$ | <br>--<br>-- | | <br>0.3<br>1.0 | Vdc |
| Base-Emitter Saturation Voltage(1)<br>($I_C$ = 150 mAdc, $I_B$ = 15 mAdc)<br>($I_C$ = 500 mAdc, $I_B$ = 50 mAdc) | $V_{BE(Sat)}$ | <br>0.6<br>-- | | <br>1.2<br>2.0 | Vdc |
| Current Gain-Bandwidth Product(2)<br>($I_C$ = 20 mAdc, $V_{CE}$ = 20 Vdc, f = 100MHz) | $f_T$ | <br>250 | | <br>-- | Mhz |
| Output Capacitance(3)<br>($V_{CB}$ = 10 Vdc, $I_E$ = 0, 100kHz ≤ f ≤ 1MHz | $C_{OBO}$ | <br>-- | | <br>8.0 | pf |
| Input Capacitance<br>($V_{EB}$ = 0.5 Vdc, $I_C$ = 0, 100kHz ≤ f ≤ 1MHz) | $C_{IBO}$ | <br>-- | | <br>25 | pf |
| Switching Characteristics<br>Delay Time: ($V_{CC}$ = 30 Vdc, $V_{BE(off)}$ = -0.5 Vdc,<br>Rise Time: $I_C$ = 150 mAdc, $I_{B1}$ = 15 mAdc)(Figure 12)<br><br>Storage Time: ($V_{CC}$ = 30 Vdc, $I_C$ = 150 mAdc,<br>Fall Time: $I_{B1}$ = $I_{B2}$ = 15 mAdc) | $t_{ON}$<br>$t_d$<br>$t_r$<br>$t_{off}$<br>$t_S$<br>$t_f$ | <br>--<br>--<br><br><br>--<br>-- | | <br>10<br>25<br><br><br>225<br>60 | ns |