



Micro Commercial Components

Micro Commercial Components
 20736 Marilla Street Chatsworth
 CA 91311
 Phone: (818) 701-4933
 Fax: (818) 701-4939

2N2222
2N2222A

Features

- High current (max.800mA)
- Low voltage (max.40V)
- Lead Free Finish/RoHS Compliant(Note 1) ("P" Suffix designates RoHS Compliant. See ordering information)

Maximum Ratings

| Symbol | Rating | Rating | Unit |
|------------------|--------------------------------|-------------|------|
| V _{CEO} | Collector-Emitter Voltage | 2N2222 | 30 |
| | | 2N2222A | 40 |
| V _{CBO} | Collector-Base Voltage | 2N2222 | 60 |
| | | 2N2222A | 75 |
| V _{EBO} | Emitter-Base Voltage | 2N2222 | 5.0 |
| | | 2N2222A | 6.0 |
| I _C | Collector Current (DC) | 800 | mA |
| I _{CM} | Peak Collector Current | 800 | mA |
| I _{BM} | Peak Base Current | 200 | mA |
| T _J | Operating Junction Temperature | -55 to +150 | °C |
| T _{STG} | Storage Temperature | -55 to +150 | °C |

Thermal Characteristics

| Symbol | Rating | Max | Unit |
|------------------|---|-----|------|
| P _{Tot} | Total power Dissipation | 500 | mW |
| | T _A ≤ 25°C | 1.2 | W |
| | T _C ≤ 25°C | | |
| R _{JC} | Thermal Resistance, Junction to Case | 146 | K/W |
| R _{JA} | Thermal Resistance, Junction to Ambient | 350 | K/W |

Electrical Characteristics @ 25°C Unless Otherwise Specified

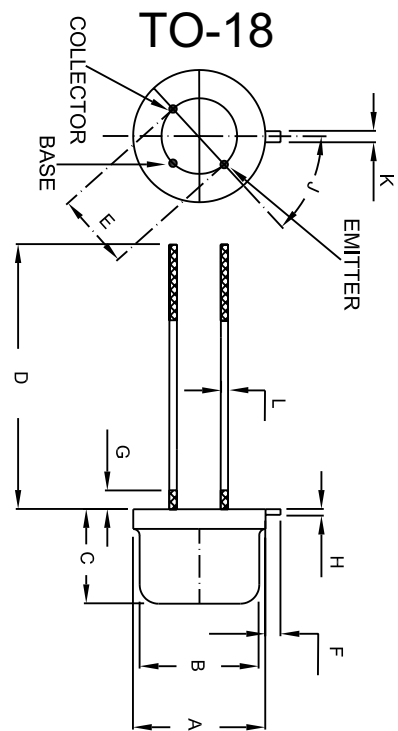
| Symbol | Parameter | Min | Max | Units |
|--------|-----------|-----|-----|-------|
|--------|-----------|-----|-----|-------|

OFF CHARACTERISTICS

| | | | | | |
|------------------|--|---------|-----|-----|------|
| I _{CBO} | Collector cut-off current (V _{CB} =50Vdc, I _E =0) | 2N2222 | --- | 10 | nAdc |
| | (V _{CB} =50Vdc, I _E =0, T _A =150°C) | | --- | 10 | uAdc |
| | (V _{CB} =60Vdc, I _E =0) | 2N2222A | --- | 10 | nAdc |
| | (V _{CB} =60Vdc, I _E =0, T _A =150°C) | | --- | 10 | uAdc |
| I _{EBO} | Emitter Cut-off current (I _C =0, V _{EB} =3Vdc) | | --- | 10 | nAdc |
| h _{FE} | DC Current Gain (I _C =0.1mAdc, V _{CE} =10Vdc) | | 35 | | |
| | (I _C =1.0mAdc, V _{CE} =10Vdc) | | 50 | | |
| | (I _C =10mAdc, V _{CE} =10Vdc) | | 75 | | |
| | (I _C =150mAdc, V _{CE} =1.0Vdc)* | | 50 | | |
| | (I _C =150mAdc, V _{CE} =10Vdc)* | | 100 | 300 | |
| h _{FE} | DC Current Gain (I _C =500mAdc, V _{CE} =10Vdc) * | 2N2222 | 30 | --- | |
| | | 2N2222A | 40 | --- | |

Notes:1.High Temperature Solder Exemption Applied, see EU Directive Annex 7.

NPN Switching Transistors



| DIM | INCHES | | MM | | NOTE |
|-----|--------|------|-------|-------|------|
| | MIN | MAX | MIN | MAX | |
| A | .209 | .230 | 5.309 | 5.842 | Φ |
| B | .178 | .195 | 4.521 | 4.953 | Φ |
| C | .170 | .210 | 4.318 | 5.334 | |
| D | .50 | ---- | 12.7 | ---- | |
| E | .100 | | 2.54 | | ΦTYP |
| F | .028 | .048 | .7112 | 1.219 | |
| G | ---- | .050 | ---- | 1.27 | |
| H | .009 | .031 | 0.229 | 0.787 | |
| J | 44° | 46° | 44° | 46° | |
| K | .036 | .046 | 0.914 | 1.168 | |
| L | .016 | .021 | 0.406 | 0.533 | |

2N2222, 2N2222A

| Symbol | Parameter | Min | Max | Units | |
|----------------------------|---|---------|-----|-------|------|
| ON CHARACTERISTICS* | | | | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage ⁸ ($I_C=150\text{mA}$, $I_B=15\text{mA}$) ($I_C=500\text{mA}$, $I_B=50\text{mA}$) | 2N2222 | --- | 400 | mVdc |
| | | | --- | 1.6 | Vdc |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage* ($I_C=150\text{mA}$, $I_B=15\text{mA}$) ($I_C=500\text{mA}$, $I_B=50\text{mA}$) | 2N2222A | --- | 300 | mVdc |
| | | | --- | 1.0 | Vdc |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage * ($I_C=150\text{mA}$, $I_B=15\text{mA}$) ($I_C=500\text{mA}$, $I_B=50\text{mA}$) | 2N2222 | --- | 1.3 | Vdc |
| | | | --- | 2.6 | Vdc |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage* ($I_C=150\text{mA}$, $I_B=15\text{mA}$) ($I_C=500\text{mA}$, $I_B=50\text{mA}$) | 2N2222A | 0.6 | 1.2 | Vdc |
| | | | --- | 2.0 | Vdc |

SMALL-SIGNAL CHARACTERISTICS

| | | | | | |
|----------|---|---------|-----|-----|-----|
| C_{OB} | Output Capacitance ($V_{CB}=10\text{Vdc}$, $I_E=I_E=0$, $f=1.0\text{MHz}$) | | --- | 8.0 | pF |
| f_T | Transition Frequency ($V_{CE}=20\text{Vdc}$, $I_C=20\text{mA}$, $f=100\text{MHz}$) | 2N2222 | 250 | --- | MHz |
| | | 2N2222A | 300 | --- | MHz |
| NF | Noise Figure ($V_{CE}=5.0\text{Vdc}$, $I_C=200\mu\text{A}$, $R_s=2.0\text{KOHM}$, $f=1.0\text{kHz}$, $B=200\text{Hz}$) | 2N2222A | --- | 4.0 | dB |

SWITCHING CHARACTERISTICS

| | | | | | |
|-------|--------------|--|-----|-----|----|
| T_d | Delay Time | $I_{CON}=150\text{mA}$, $I_{BON}=15\text{mA}$, $I_{B(off)}=15\text{mA}$ | --- | 10 | ns |
| t_r | Rise Time | | --- | 25 | ns |
| t_s | Storage Time | | --- | 200 | ns |
| t_f | Fall Time | | --- | 60 | ns |

* Pulse Test: $t_p \leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$



Micro Commercial Components

Ordering Information

| | |
|------------------|-----------------|
| Device | Packing |
| (Part Number)-BP | Bulk;100pcs/Box |

*****IMPORTANT NOTICE*****

Micro Commercial Components Corp. reserves the right to make changes without further notice to any product herein to make corrections, modifications, enhancements, improvements, or other changes. *Micro Commercial Components Corp.* does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold *Micro Commercial Components Corp.* and all the companies whose products are represented on our website, harmless against all damages.

*****APPLICATIONS DISCLAIMER*****

Products offer by *Micro Commercial Components Corp.* are not intended for use in Medical, Aerospace or Military Applications.