# BU406, BU407

# NPN Power Transistors

These devices are high voltage, high speed transistors for horizontal deflection output stages of TV's and CRT's.

### Features

- High Voltage: $V_{CEV}$ = 330 or 400 V
- Fast Switching Speed: $t_f$ = 750 ns (max)
- Low Saturation Voltage: $V_{CE(sat)}$ = 1 V (max) @ 5 A
- Pb−Free Packages are Available*

### MAXIMUM RATINGS

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| Collector−Emitter Voltage | BU406<br>BU407 | $V_{CEO}$ | 200<br>150 | Vdc |
| Collector−Emitter Voltage | BU406<br>BU407 | $V_{CEV}$ | 400<br>330 | Vdc |
| Collector−Base Voltage | BU406<br>BU407 | $V_{CBO}$ | 400<br>330 | Vdc |
| Emitter−Base Voltage | | $V_{EBO}$ | 6 | Vdc |
| Collector Current − Continuous<br>− Peak Repetitive<br>− Peak (10 ms) | | $I_C$ | 7<br>10<br>15 | Adc |
| Base Current | | $I_B$ | 4 | Adc |
| Total Device Dissipation @ $T_C$ = 25°C<br>Derate above 25°C | | $P_D$ | 60<br>0.48 | W<br>W/°C |
| Operating and Storage Junction Temperature Storage | | $T_J$, $T_{stg}$ | −65 to 150 | °C |

### THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction−to−Case | $R_{\theta JC}$ | 2.08 | °C/W |
| Thermal Resistance, Junction−to−Ambient | $R_{\theta JA}$ | 70 | °C/W |
| Maximum Lead Temperature for Soldering Purposes1/8″ from Case for 5 Seconds | $T_L$ | 260 | °C |

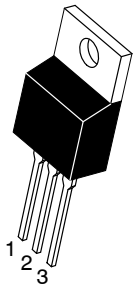
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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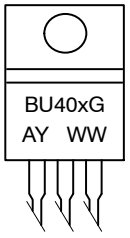
**http://onsemi.com**

## NPN SILICON POWER TRANSISTORS 7 AMPERES − 60 WATTS 150 AND 200 VOLTS




**TO−220AB**
**CASE 221A−09**
**STYLE 1**

### MARKING DIAGRAM




BU40x = Specific Device Code
x = 6 or 7
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

### ORDERING INFORMATION

| Device | Package | Shipping |
|---|---|---|
| BU406 | TO−220AB | 50 Units / Rail |
| BU406G | TO−220AB (Pb−Free) | 50 Units / Rail |
| BU407 | TO−220AB | 50 Units / Rail |
| BU407G | TO−220AB (Pb−Free) | 50 Units / Rail |

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**ELECTRICAL CHARACTERISTICS** ($T_C$ = 25°C unless otherwise noted)

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Collector−Emitter Sustaining Voltage (Note 1)<br>($I_C$ = 100 mAdc, $I_B$ = 0) | BU406<br>BU407 | $V_{CEO(sus)}$ | 200<br>150 | −<br>− | −<br>− | Vdc |
| Collector Cutoff Current<br>($V_{CE}$ = Rated $V_{CEV}$, $V_{BE}$ = 0)<br>($V_{CE}$ = Rated $V_{CEO}$ + 50 Vdc, $V_{BE}$ = 0)<br>($V_{CE}$ = Rated $V_{CEO}$ + 50 Vdc, $V_{BE}$ = 0, $T_C$ = 150°C) | | $I_{CES}$ | <br>−<br>−<br>− | <br>−<br>−<br>− | <br>5<br>0.1<br>1 | mAdc |
| Emitter Cutoff Current<br>($V_{EB}$ = 6 Vdc, $I_C$ = 0) | BU406, BU407 | $I_{EBO}$ | − | − | 1 | mAdc |
| **ON CHARACTERISTICS** (Note 1) | | | | | | |
| Collector−Emitter Saturation Voltage<br>($I_C$ = 5 Adc, $I_B$ = 0.5 Adc) | | $V_{CE(sat)}$ | − | − | 1 | Vdc |
| Base−Emitter Saturation Voltage<br>($I_C$ = 5 Adc, $I_B$ = 0.5 Adc) | | $V_{BE(sat)}$ | − | − | 1.2 | Vdc |
| Forward Diode Voltage<br>($I_{EC}$ = 5 Adc) “D” only | | $V_{EC}$ | − | − | 2 | Volts |
| **DYNAMIC CHARACTERISTICS** | | | | | | |
| Current−Gain − Bandwidth Product<br>($I_C$ = 0.5 Adc, $V_{CE}$ = 10 Vdc, $f_{test}$ = 20 MHz) | | $f_T$ | 10 | − | − | MHz |
| Output Capacitance<br>($V_{CB}$ = 10 Vdc, $I_E$ = 0, f = 1 MHz) | | $C_{ob}$ | − | 80 | − | pF |
| **SWITCHING CHARACTERISTICS** | | | | | | |
| Inductive Load Crossover Time<br>($V_{CC}$ = 40 Vdc, $I_C$ = 5 Adc, $I_{B1}$ = $I_{B2}$ = 0.5 Adc, L = 150 μH) | | $t_c$ | − | − | 0.75 | μs |

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 1%.

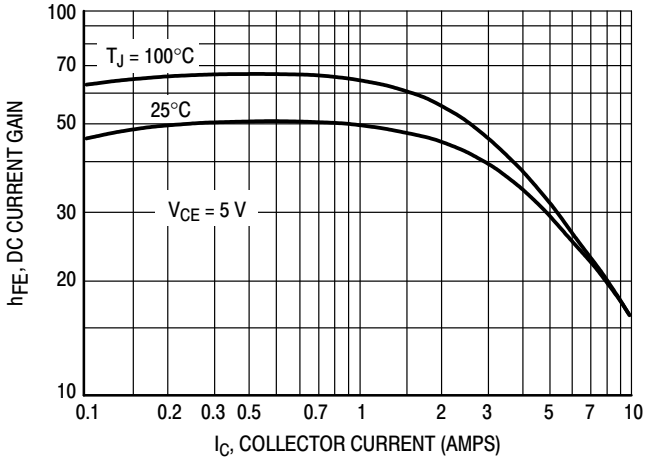



**Figure 1. DC Current Gain**

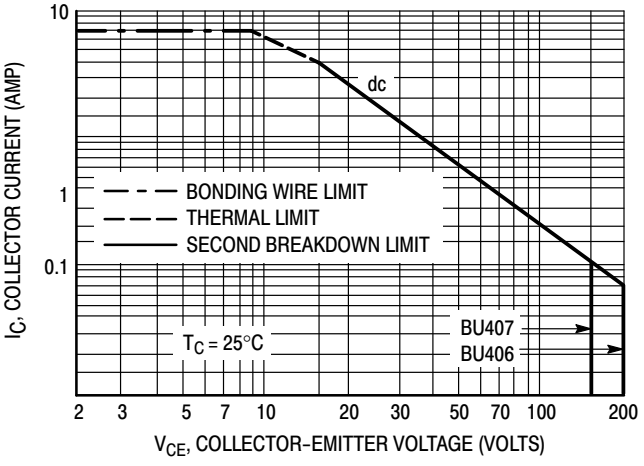
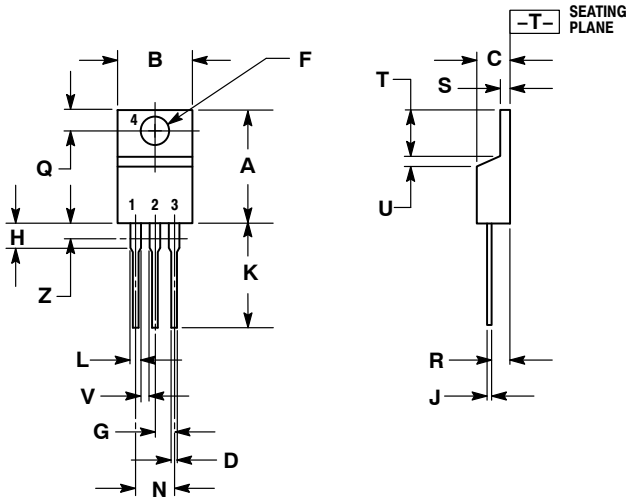



**Figure 2. Maximum Rated Forward Bias Safe Operating Area**

## PACKAGE DIMENSIONS

**TO−220AB**
CASE 221A−09
ISSUE AF




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.161 | 3.61 | 4.09 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.014 | 0.025 | 0.36 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.15 | 1.52 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.15 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | --- | 1.15 | --- |
| Z | --- | 0.080 | --- | 2.04 |

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

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