

## NPN POWER TRANSISTOR

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

### FEATURES:

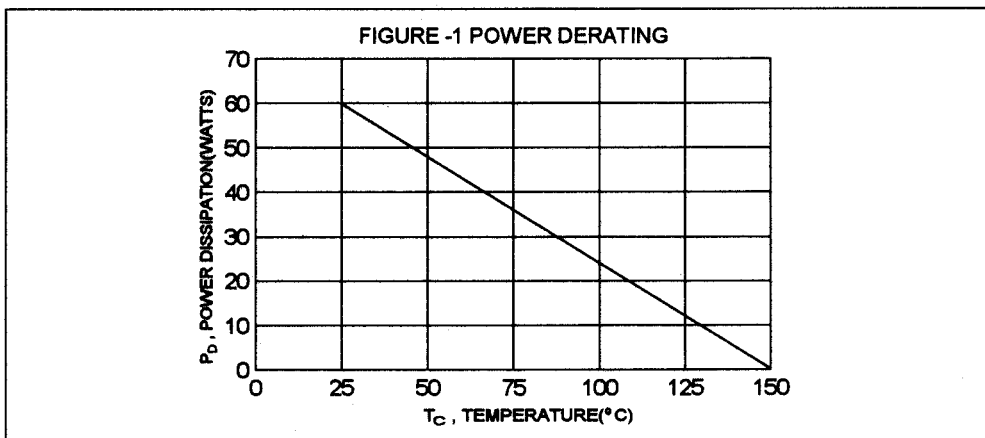
- \* Collector-Emitter Sustaining Voltage -  
 $V_{CEV} = 330 \text{ V (Min.) - BU407}$   
 $= 400 \text{ V (Min.) - BU406}$
- \* Low Saturation Voltage  
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ } I_C = 5.0 \text{ A}$
- \* Fast Switching Speed:  $t_f = 0.75 \text{ us (Max)}$

### MAXIMUM RATINGS

| Characteristic  | Symbol         | BU406        | BU407 | Unit                     |
|---|----------------|--------------|-------|--------------------------|
| Collector-Emitter Voltage   | $V_{CEO}$      | 200          | 150   | V                        |
| Collector-Emitter Voltage   | $V_{CEV}$      | 400          | 330   | V                        |
| Collector-Base Voltage  | $V_{CBO}$      | 400          | 330   | V                        |
| Emitter-Base Voltage  | $V_{EBO}$      | 6.0          |       | V                        |
| Collector Current - Continuous<br>- Peak  | $I_C$          | 7.0<br>10    |       | A                        |
| Base Current - Continuous   | $I_B$          | 4.0          |       | A                        |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 60<br>0.48   |       | W<br>W/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                   | $T_J, T_{STG}$ | - 65 to +150 |       | $^\circ\text{C}$         |

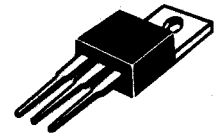
### THERMAL CHARACTERISTICS

| Characteristic                      | Symbol          | Max  | Unit               |
|-------------------------------------|-----------------|------|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 2.08 | $^\circ\text{C/W}$ |

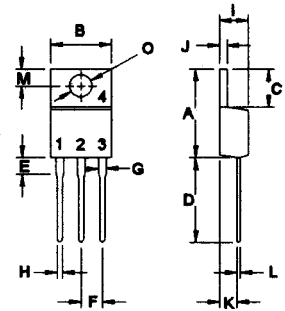


**NPN  
BU406  
BU407**

**7 AMPERE  
POWER  
TRANSISTORS  
150-200 VOLTS  
60 WATTS**



**TO-220**



PIN 1.BASE  
2.COLLECTOR  
3.EMITTER  
4.COLLECTOR(CASE)

| DIM | MILLIMETERS |       |
|-----|-------------|-------|
|     | MIN         | MAX   |
| A   | 14.68       | 15.31 |
| B   | 9.78        | 10.42 |
| C   | 5.01        | 6.52  |
| D   | 13.06       | 14.62 |
| E   | 3.57        | 4.07  |
| F   | 2.42        | 3.66  |
| G   | 1.12        | 1.36  |
| H   | 0.72        | 0.96  |
| I   | 4.22        | 4.98  |
| J   | 1.14        | 1.38  |
| K   | 2.20        | 2.97  |
| L   | 0.33        | 0.55  |
| M   | 2.48        | 2.98  |
| O   | 3.70        | 3.90  |

**ELECTRICAL CHARACTERISTICS** (  $T_c = 25^\circ\text{C}$  unless otherwise noted )

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

**OFF CHARACTERISTICS**

|  |                |            |            |    |
|--|----------------|------------|------------|----|
| Collector - Emitter Sustaining Voltage (1)<br>( $I_C = 100\text{ mA}$ , $I_B = 0$ )<br>BU406<br>BU407                                  | $V_{CEO(sus)}$ | 200<br>150 |            | V  |
| Collector Cutoff Current<br>( $V_{CE} = 400\text{ V}$ , $V_{BE} = 0$ )<br>( $V_{CE} = 330\text{ V}$ , $V_{BE} = 0$ )<br>BU406<br>BU407 | $I_{CES}$      |            | 5.0<br>5.0 | mA |
| Emitter Cutoff Current<br>( $V_{EB} = 6.0\text{ V}$ , $I_C = 0$ )  | $I_{EBO}$      |            | 1.0        | mA |

**ON CHARACTERISTICS (1)**

|   |               |         |     |   |
|---|---------------|---------|-----|---|
| DC Current Gain<br>( $I_C = 2.0\text{ A}$ , $V_{CE} = 5.0\text{ V}$ )                     | $h_{FE}$      | 30(typ) |     |   |
| Collector - Emitter Saturation Voltage<br>( $I_C = 5.0\text{ A}$ , $I_B = 0.5\text{ A}$ ) | $V_{CE(sat)}$ |         | 1.0 | V |
| Base - Emitter Saturation Voltage<br>( $I_C = 5.0\text{ A}$ , $I_B = 0.5\text{ A}$ )      | $V_{BE(sat)}$ |         | 1.2 | V |

**DYNAMIC CHARACTERISTICS**

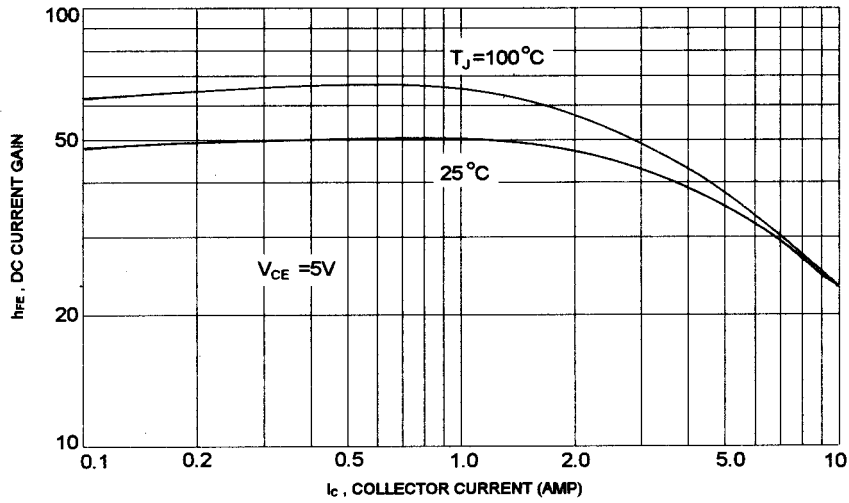
|  |          |         |  |     |
|--|----------|---------|--|-----|
| Current Gain - Bandwidth Product<br>( $I_C = 0.5\text{ A}$ , $V_{CE} = 10\text{ V}$ , $f = 1.0\text{ MHz}$ ) | $f_T$    | 10      |  | MHz |
| Output Capacitance<br>( $V_{CE} = 10\text{ V}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )                          | $C_{ob}$ | 80(typ) |  | pF  |

**SWITCHING CHARACTERISTICS**

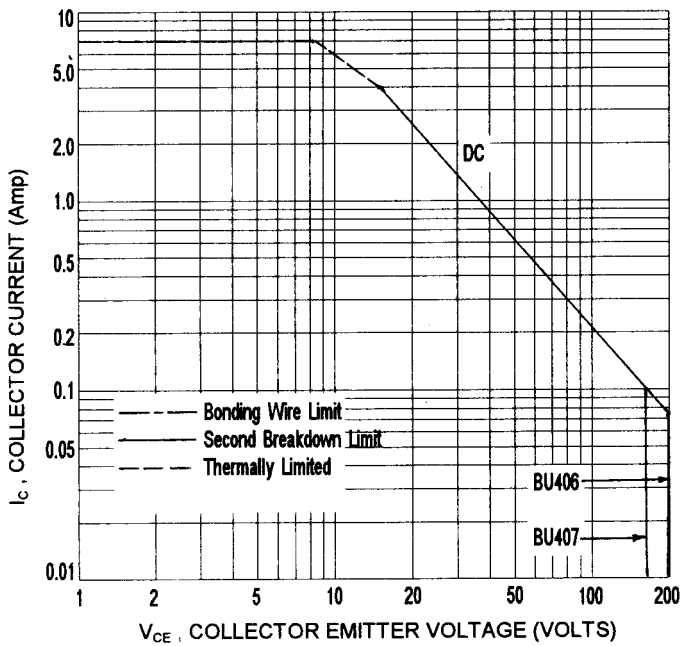
|  |       |  |      |    |
|--|-------|--|------|----|
| Fall Time<br>( $V_{CC} = 40\text{ V}$ , $I_C = 5.0\text{ A}$ , $I_{B1} = -I_{B2} = 0.6\text{ A}$ , $L = 150\text{ uH}$ ) | $t_f$ |  | 0.75 | us |
|--|-------|--|------|----|

(1) Pulse Test: Pulse width  $\leq 300\text{ us}$ , Duty Cycle  $\leq 2.0\%$

DC CURRENT GAIN



ACTIVE-REGION SAFE OPERATING AREA (SOA)



There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is base on  $T_{J(PK)} = 150^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)} \leq 150^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.