

## TO-252 Plastic-Encapsulate Transistors

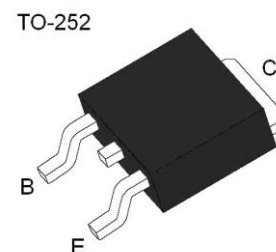
### BU406D NPN

#### Applications

- Designed for use in horizontal deflection output stages of TV's and CRT's

#### Features:

- High voltage:  $BV_{CEO}=400V(\text{min.})$
- High collector-current :  $I_C=7A$
- Low saturation voltage: :  $V_{CE(\text{sat})}=1.0V(\text{Max.})@I_C=5A$



#### Absolute Maximum Ratings (Ta=25°C , unless otherwise noted)

| Parameter                   |         | Symbol     | Value    | Unit |
|-----------------------------|---------|------------|----------|------|
| Collector-base voltage      |         | $BV_{CBO}$ | 400      | V    |
| Collector-emitter voltage   |         | $BV_{CEO}$ | 200      | V    |
| Emitter-base voltage        |         | $BV_{EBO}$ | 6        | V    |
| Collector current (DC)      |         | $I_C$      | 7        | A    |
| Collector current (Pulse)   |         | $I_{CP}$   | 10       | A    |
| Base current                |         | $I_B$      | 4        | A    |
| Collector power dissipation | Ta=25°C | $P_C$      | 1.2      | W    |
|                             | Tc=25°C |            | 60       |      |
| Junction temperature        |         | $T_J$      | 150      | °C   |
| Storage temperature         |         | $T_{stg}$  | -55~+150 | °C   |

#### Thermal characteristics

| Parameter                             | Symbol          | Value | Unit   |
|---------------------------------------|-----------------|-------|--------|
| Thermal resistance,junctionto case    | $R_{\theta JC}$ | 2.08  | °C / W |
| Thermal resistance,junctionto ambient | $R_{\theta JA}$ | 70    | °C / W |

**Electrical Characteristics** (Ta=25°C, unless otherwise noted)

| Parameter                            | Symbol        | Conditions                  | Min | Typ | Max  | Unit    |
|--------------------------------------|---------------|-----------------------------|-----|-----|------|---------|
| Collector-base breakdown voltage     | $BV_{CBO}$    | $I_C = 100\mu A, I_E = 0$   | 400 |     |      | V       |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | $I_C = 1mA, I_B = 0$        | 200 |     |      | V       |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | $I_E = 100\mu A, I_C = 0$   | 6   |     |      | V       |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = 400V, I_E = 0$    |     |     | 1.0  | mA      |
| Collector cut-off current            | $I_{CES}$     | $V_{CE} = 400V, V_{BE} = 0$ |     |     | 5.0  | mA      |
|                                      |               | $V_{CE} = 250V, V_{BE} = 0$ |     |     | 0.1  | mA      |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = 6V, I_C = 0$      |     |     | 1.0  | mA      |
| DC current gain                      | $h_{FE}$      | $V_{CE} = 5V, I_C = 2A$     | 60  |     |      |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 5A, I_B = 0.5A$      |     |     | 1.0  | V       |
| Base -emitter saturation voltage     | $V_{BE(sat)}$ | $I_C = 5A, I_B = 0.5A$      |     |     | 1.2  | V       |
| Transition frequency                 | $f_T$         | $V_{CE} = 10V, I_B = 0.5A$  | 10  |     |      | MHz     |
| Output capacitance                   | $C_{ob}$      | $V_{CB} = 10V, f = 1MHz$    |     | 80  |      | pF      |
| Turn off time                        | $t_{OFF}$     | $I_C = 5A, I_B = 0.5A$      |     |     | 0.75 | $\mu s$ |



## Typical Characteristics

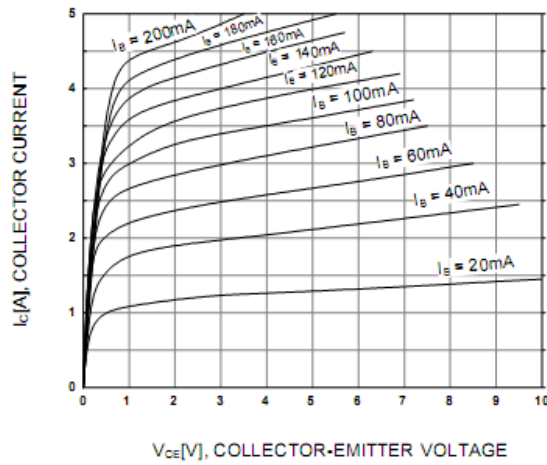


Figure 1. Static Characteristic

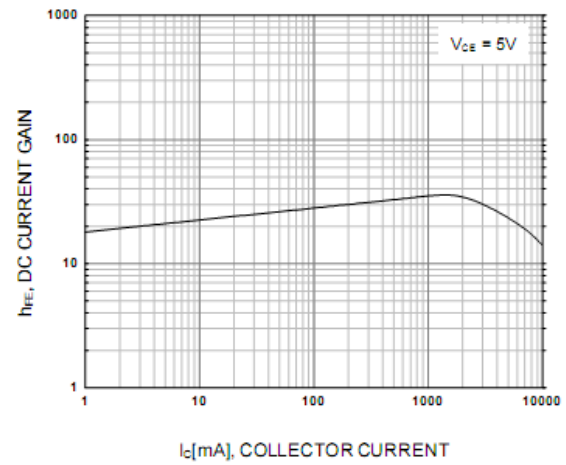


Figure 2. DC current Gain

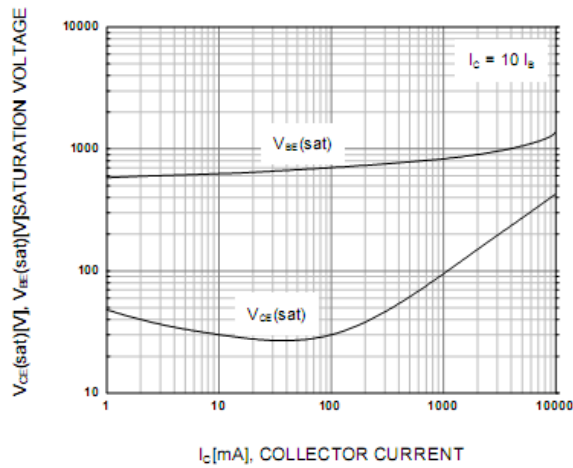


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

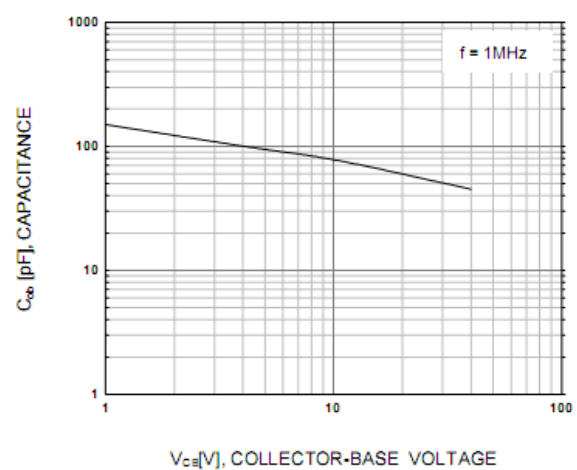


Figure 4. Collector Output Capacitance

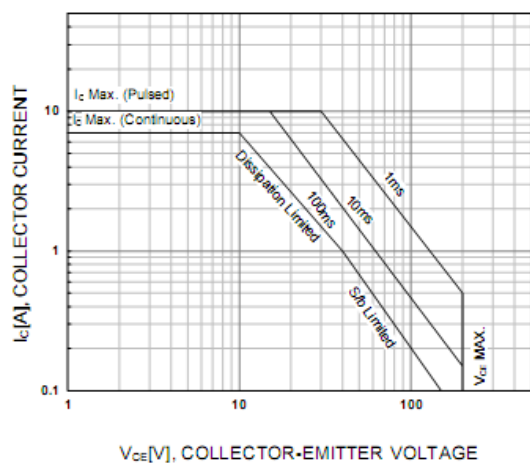


Figure 5. Safe Operating Area

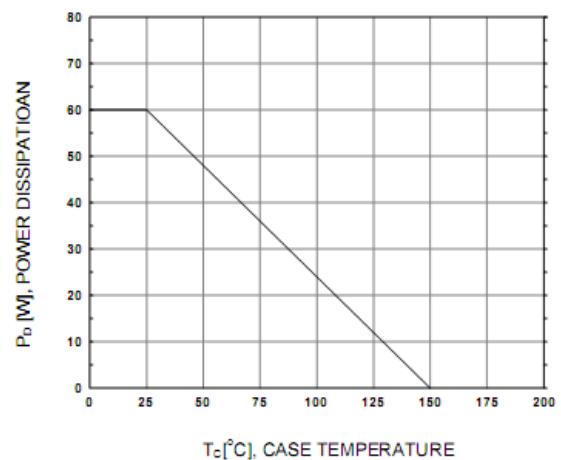


Figure 6. Power Derating

## Package Dimensions

| Dim | Millimeter |       | Inches |       |
|-----|------------|-------|--------|-------|
|     | Min.       | Max.  | Min.   | Max.  |
| A   | 2.20       | 2.50  | 0.087  | 0.094 |
| A1  | 1.00       | 1.40  | 0.039  | 0.055 |
| A2  | 0.00       | 0.15  | 0.000  | 0.006 |
| b   | 0.50       | 0.70  | 0.020  | 0.028 |
| b1  | 0.70       | 0.90  | 0.028  | 0.035 |
| c   | 0.40       | 0.60  | 0.016  | 0.024 |
| c1  | 0.40       | 0.60  | 0.016  | 0.024 |
| D   | 6.20       | 6.70  | 0.244  | 0.264 |
| D1  | 5.10       | 5.50  | 0.201  | 0.217 |
| E   | 5.50       | 6.00  | 0.217  | 0.236 |
| e   | 2.20       | 2.40  | 0.087  | 0.094 |
| e1  | 4.40       | 4.80  | 0.173  | 0.189 |
| L   | 9.70       | 10.40 | 0.382  | 0.409 |
| L1  | 1.40       | 1.70  | 0.055  | 0.063 |
| L2  | 0.60       | 1.20  | 0.024  | 0.047 |