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## BU406D Silicon NPN Transistor Power Amp, High Voltage, Switch TO-220 Type Package

**Description:**

The BU406D is a silicon NPN transistor in a TO-220 type package designed for high-voltage, high-speed horizontal deflection output stages of TVs and CTVs.

**Features:**

- Collector-Emitter Sustaining Voltage:  $V_{CEV} = 330V$  (Min)
- Low saturation Voltage:  $V_{CE(sat)} = 1V$  (Max) @  $I_C = 5A$
- Fast Switching Speed:  $t_f = 0.75\mu s$  (Max)

**Absolute Maximum Ratings:**

|  |                               |
|--|-------------------------------|
| Collector-Emitter Voltage, $V_{CEO}$ .....                   | 200V                          |
| Collector-Emitter Voltage, $V_{CEV}$ .....                   | 400V                          |
| Collector-Base Voltage, $V_{CBO}$ .....                      | 400V                          |
| Emitter-Base Voltage, $V_{EBO}$ .....                        | 6V                            |
| Collector Current, $I_C$                                     |                               |
| Continuous .....   | 7A                            |
| Peak .....   | 10A                           |
| Continuous Base Current, $I_B$ .....                         | 4A                            |
| Total Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ ..... | 60W                           |
| Derate Above $25^\circ C$ .....                              | 480mW/ $^\circ C$             |
| Operating Junction Temperature Range, $T_J$ .....            | $-65^\circ$ to $+150^\circ C$ |
| Storage Temperature Range, $T_{stg}$ .....                   | $-65^\circ$ to $+150^\circ C$ |
| Thermal Resistance, Junction to Case, $R_{thJC}$ .....       | 2.085 $^\circ C/W$            |

**Electrical Characteristics:** ( $T_C = +25^\circ C$  unless otherwise specified)

| Parameter                            | Symbol         | Test Conditions                 | Min | Typ | Max | Unit |
|--------------------------------------|----------------|---------------------------------|-----|-----|-----|------|
| <b>OFF Characteristics</b>           |                |                                 |     |     |     |      |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 100mA, I_B = 0$ , Note 1 | 200 | -   | -   | V    |
| Collector Cutoff Current             | $I_{CEV}$      | $V_{CE} = 400V, V_{BE} = -1.5V$ | -   | -   | 15  | mA   |
| Emitter Cutoff Current               | $I_{EBO}$      | $V_{EB} = 6V, I_C = 0$          | -   | -   | 400 | mA   |

Note 1. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

**Electrical Characteristics (Cont'd):** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

| Parameter                            | Symbol        | Test Conditions  | Min | Typ | Max  | Unit          |
|--------------------------------------|---------------|--|-----|-----|------|---------------|
| <b>ON Characteristics</b> (Note 1)   |               |  |     |     |      |               |
| DC Current Gain                      | $h_{FE}$      | $I_C = 2\text{A}, V_{CE} = 5\text{V}$                                  | -   | 15  | -    |               |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 5\text{A}, I_B = 650\text{mA}$                                  | -   | -   | 1.0  | V             |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 5\text{A}, I_B = 650\text{mA}$                                  | -   | -   | 1.3  | V             |
| Diode Forward Voltage                | $V_F$         | $I_F = 5\text{A}$  | -   | -   | 1.5  | V             |
| <b>Dynamic Characteristics</b>       |               |  |     |     |      |               |
| Current Gain-Bandwidth Product       | $f_T$         | $I_C = 500\text{mA}, V_{CE} = 10\text{V}, f = 1\text{MHz}$             | 10  | -   | -    | MHz           |
| <b>Switching Characteristics</b>     |               |  |     |     |      |               |
| Fall Time                            | $t_f$         | $V_{CC} = 40\text{V}, I_C = 5\text{A}, I_{B\text{end}} = 650\text{mA}$ | -   | -   | 0.75 | $\mu\text{s}$ |

Note 1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

