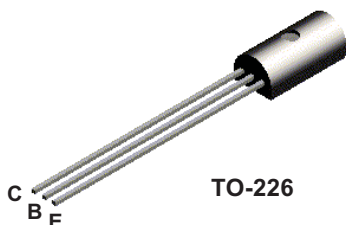


# **TN5415A**



## **PNP High Voltage Amplifier**

This device is designed for use as high voltage drivers requiring collector currents to 100 mA. Sourced from Process 76. See MPSA92 for characteristics.

### **Absolute Maximum Ratings\***

TA = 25°C unless otherwise noted

| Symbol                            | Parameter                                        | Value       | Units |
|-----------------------------------|--------------------------------------------------|-------------|-------|
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 200         | V     |
| V <sub>CBO</sub>                  | Collector-Base Voltage                           | 200         | V     |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | 4.0         | V     |
| I <sub>C</sub>                    | Collector Current - Continuous                   | 100         | mA    |
| T <sub>J</sub> , T <sub>stg</sub> | Operating and Storage Junction Temperature Range | -55 to +150 | °C    |

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### **NOTES:**

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### **Thermal Characteristics**

TA = 25°C unless otherwise noted

| Symbol           | Characteristic                                | Max            | Units      |
|------------------|-----------------------------------------------|----------------|------------|
|                  |                                               | <b>TN5415A</b> |            |
| P <sub>D</sub>   | Total Device Dissipation<br>Derate above 25°C | 1.0<br>8.0     | W<br>mW/°C |
| R <sub>θJC</sub> | Thermal Resistance, Junction to Case          | 125            | °C/W       |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient       | 50             | °C/W       |

# PNP High Voltage Amplifier

(continued)

TN5415A

## Electrical Characteristics

TA = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Max | Units |
|--------|-----------|-----------------|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-------|

### OFF CHARACTERISTICS

|               |                                      |                                                           |     |    |               |
|---------------|--------------------------------------|-----------------------------------------------------------|-----|----|---------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage* | $I_C = 50 \text{ mA}$ , $I_B = 0$                         | 200 |    | V             |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage     | $I_C = 100 \text{ }\mu\text{A}$ , $I_E = 0$               | 200 |    | V             |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage       | $I_E = 100 \text{ }\mu\text{A}$ , $I_C = 0$               | 4.0 |    | V             |
| $I_{CBO}$     | Collector Cutoff Current             | $V_{CB} = 175 \text{ V}$                                  |     | 50 | $\mu\text{A}$ |
| $I_{CEX}$     | Collector Cutoff Current             | $V_{CE} = 200 \text{ V}$ , $V_{BE} = 1.5 \text{ V (rev)}$ |     | 50 | $\mu\text{A}$ |
| $I_{CEO}$     | Collector Cutoff Current             | $V_{CE} = 150 \text{ V}$                                  |     | 50 | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter Cutoff Current               | $V_{EB} = 4.0 \text{ V}$ , $I_C = 0$                      |     | 20 | $\mu\text{A}$ |

### ON CHARACTERISTICS\*

|               |                                      |                                                 |    |     |   |
|---------------|--------------------------------------|-------------------------------------------------|----|-----|---|
| $h_{FE}$      | DC Current Gain                      | $V_{CE} = 10 \text{ V}$ , $I_C = 50 \text{ mA}$ | 30 | 150 |   |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 50 \text{ mA}$ , $I_B = 5.0 \text{ mA}$  |    | 2.5 | V |
| $V_{BE(on)}$  | Base-Emitter On Voltage              | $I_C = 50 \text{ mA}$ , $V_{CE} = 10 \text{ V}$ |    | 1.5 | V |

### SMALL SIGNAL CHARACTERISTICS

|                   |                           |                                                                                                                                                            |           |     |          |
|-------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|----------|
| $C_{ob}$          | Output Capacitance        | $V_{CB} = 10 \text{ V}$ , $f = 1.0 \text{ MHz}$                                                                                                            |           | 15  | pF       |
| $C_{ib}$          | Input Capacitance         | $V_{EB} = 5.0 \text{ V}$ , $f = 1.0 \text{ MHz}$                                                                                                           |           | 75  | pF       |
| $h_{fe}$          | Small-Signal Current Gain | $I_C = 5.0 \text{ mA}$ , $V_{CE} = 10 \text{ V}$ ,<br>$f = 5.0 \text{ MHz}$<br>$I_C = 5.0 \text{ mA}$ , $V_{CE} = 10 \text{ V}$ ,<br>$f = 1.0 \text{ kHz}$ | 3.0<br>25 |     |          |
| $R_{\theta(hie)}$ | Input Resistance          | $V_{CE} = 10 \text{ V}$ , $I_C = 5.0 \text{ mA}$                                                                                                           |           | 300 | $\Omega$ |
| $IS / I_b$        | Safe Operating Area       | $V_{CE} = 100 \text{ V}$ , $t = 100 \text{ mS}$                                                                                                            | 100       |     | mA       |

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