



**Discrete POWER & Signal  
Technologies**

**MPSA18**

## MPSA18



### NPN General Purpose Amplifier

This device is designed for low noise, high gain, applications at collector currents from 1  $\mu$  A to 50 mA. Sourced from Process 07. See 2N5088 for characteristics.

#### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

| Symbol                            | Parameter  | Value       | Units |
|-----------------------------------|--|-------------|-------|
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 45          | V     |
| V <sub>CB0</sub>                  | Collector-Base Voltage                           | 45          | V     |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | 6.5         | 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 |
|------------------|---|--------|-------|
|                  |   | MPSA18 |       |
| P <sub>D</sub>   | Total Device Dissipation<br>Derate above 25°C | 625    | mW    |
|                  |   | 5.0    | mW/°C |
| R <sub>θJC</sub> | Thermal Resistance, Junction to Case          | 83.3   | °C/W  |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient       | 200    | °C/W  |

**NPN General Purpose Amplifier**

(continued)

**Electrical Characteristics**

TA = 25°C unless otherwise noted

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

**OFF CHARACTERISTICS**

|               |                                      |                                  |     |    |    |
|---------------|--------------------------------------|----------------------------------|-----|----|----|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage* | $I_C = 10 \text{ mA}, I_B = 0$   | 45  |    | V  |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage     | $I_C = 100 \mu\text{A}, I_E = 0$ | 45  |    | V  |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage       | $I_E = 10 \mu\text{A}, I_C = 0$  | 6.5 |    | V  |
| $I_{CBO}$     | Collector Cutoff Current             | $V_{CB} = 30 \text{ V}, I_E = 0$ |     | 50 | nA |

**ON CHARACTERISTICS\***

|               |                                      |  |                          |            |        |
|---------------|--------------------------------------|--|--------------------------|------------|--------|
| $h_{FE}$      | DC Current Gain                      | $V_{CE} = 5.0 \text{ V}, I_C = 10 \mu\text{A}$<br>$V_{CE} = 5.0 \text{ V}, I_C = 100 \mu\text{A}$<br>$V_{CE} = 5.0 \text{ V}, I_C = 1.0 \text{ mA}$<br>$V_{CE} = 5.0 \text{ V}, I_C = 10 \text{ mA}$ | 400<br>500<br>500<br>500 | 1500       |        |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$<br>$I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$   |                          | 0.2<br>0.3 | V<br>V |
| $V_{BE(on)}$  | Base-Emitter On Voltage              | $V_{CE} = 5.0 \text{ V}, I_C = 1.0 \text{ mA}$   |                          | 0.7        | V      |

**SMALL SIGNAL CHARACTERISTICS**

|          |                                  |  |     |     |     |
|----------|----------------------------------|--|-----|-----|-----|
| $C_{cb}$ | Collector-Base Capacitance       | $V_{CB} = 5.0 \text{ V}, f = 1.0 \text{ MHz}$  |     | 3.0 | pF  |
| $C_{eb}$ | Emitter-Base Capacitance         | $V_{EB} = 0.5 \text{ V}, f = 1.0 \text{ MHz}$  |     | 6.5 | pF  |
| $f_T$    | Current Gain - Bandwidth Product | $I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$<br>$f = 100 \text{ MHz}$                             | 100 |     | MHz |
| NF       | Noise Figure                     | $V_{CE} = 5.0 \text{ V}, I_C = 100 \mu\text{A},$<br>$R_S = 10 \text{ k}\Omega, f = 1.0 \text{ kHz},$ |     | 1.5 | dB  |

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