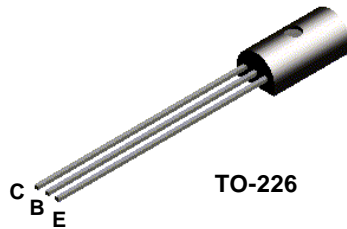


## MPSW06



### NPN General Purpose Amplifier

This device is designed for general purpose amplifier applications at collector currents to 300 mA. Sourced from Process 33. See MPSA06 for characteristics.

#### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

| Symbol                            | Parameter  | Value       | Units |
|-----------------------------------|--|-------------|-------|
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 80          | V     |
| V <sub>CBO</sub>                  | Collector-Base Voltage                           | 80          | V     |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | 4.0         | V     |
| I <sub>C</sub>                    | Collector Current - Continuous                   | 500         | 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 |
|------------------|---|--------|-------|
|                  |   | MPSW06 |       |
| P <sub>D</sub>   | Total Device Dissipation<br>Derate above 25°C | 1.0    | W     |
|                  |   | 8.0    | 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  |

\* Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

\*\* Device mounted on FR-4 PCB 36 mm X 18 mm X 1.5 mm; mounting pad for the collector lead min. 6 cm<sup>2</sup>.

# NPN General Purpose Amplifier

(continued)

MPSW06

## Electrical Characteristics

TA = 25°C unless otherwise noted

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

### OFF CHARACTERISTICS

|               |                                       |   |     |     |               |
|---------------|---------------------------------------|---|-----|-----|---------------|
| $V_{(BR)CEO}$ | Collector-Emitter Sustaining Voltage* | $I_C = 1.0 \text{ mA}, I_B = 0$           | 80  |     | V             |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage        | $I_E = 100 \text{ } \mu\text{A}, I_C = 0$ | 4.0 |     | V             |
| $I_{CEO}$     | Collector-Cutoff Current              | $V_{CE} = 60 \text{ V}, I_B = 0$          |     | 0.1 | $\mu\text{A}$ |
| $I_{CBO}$     | Collector-Cutoff Current              | $V_{CB} = 80 \text{ V}, I_E = 0$          |     | 0.1 | $\mu\text{A}$ |

### ON CHARACTERISTICS

|               |                                      |   |            |      |   |
|---------------|--------------------------------------|---|------------|------|---|
| $h_{FE}$      | DC Current Gain                      | $I_C = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$<br>$I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$ | 100<br>100 |      |   |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 100 \text{ mA}, I_B = 10 \text{ mA}$   |            | 0.25 | V |
| $V_{BE(on)}$  | Base-Emitter On Voltage              | $I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$  |            | 1.2  | V |

### SMALL SIGNAL CHARACTERISTICS

|       |                                  |   |     |  |     |
|-------|----------------------------------|---|-----|--|-----|
| $f_T$ | Current Gain - Bandwidth Product | $I_C = 10 \text{ mA}, V_{CE} = 2.0 \text{ V},$<br>$f = 100 \text{ MHz}$ | 100 |  | MHz |
|-------|----------------------------------|---|-----|--|-----|

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

## Spice Model

NPN (Is=8.324f Xti=3 Eg=1.11 Vaf=100 Bf=12.16K Ne=1.368 Ise=73.27f Ikf=.1096 Xtb=1.5 Br=11.1 Nc=2 Isc=0  
Ikr=0 Rc=.25 Cjc=18.36p Mjc=.3843 Vjc=.75 Fc=.5 Cje=55.61p Mje=.3834 Vje=.75 Tr=72.15n Tf=516.1p Itf=.5  
Vtf=4 Xtf=6 Rb=10)