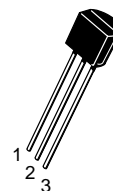
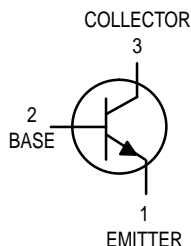


Amplifier Transistors

NPN Silicon

MPS4123
MPS4124



CASE 29-04, STYLE 1
 TO-92 (TO-226AA)

MAXIMUM RATINGS

| Rating | Symbol | MPS4123 | MPS4124 | Unit |
|---|----------------|-------------|---------|----------------------------|
| Collector–Emitter Voltage | V_{CE} | 30 | 25 | Vdc |
| Collector–Base Voltage | V_{CB} | 40 | 30 | Vdc |
| Emitter–Base Voltage | V_{EB} | 5.0 | | Vdc |
| Collector Current — Continuous | I_C | 200 | | mAdc |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 | 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 | 12 | W mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | –55 to +150 | | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|------|---------------------------|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

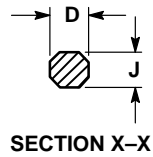
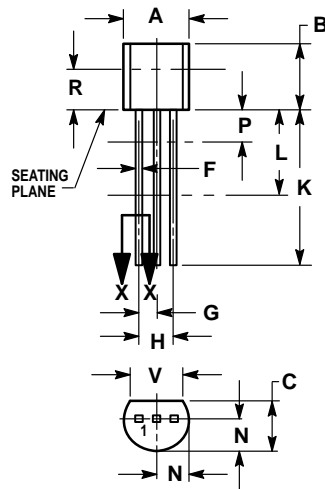
| | | | | | |
|---|--------------------|---------------|----------|----|------|
| Collector–Emitter Breakdown Voltage ($I_C = 1.0\text{ mA}$, $I_B = 0$) | MPS4123 MPS4124 | $V_{(BR)CEO}$ | 30 25 | — | Vdc |
| Collector–Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$, $I_E = 0$) | MPS4123 MPS4124 | $V_{(BR)CBO}$ | 40 30 | — | Vdc |
| Emitter–Base Breakdown Voltage ($I_C = 0$, $I_E = 10\text{ }\mu\text{A}$) | | $V_{(BR)EBO}$ | 5.0 | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 20\text{ V}$, $I_E = 0$) | | I_{CBO} | — | 50 | nAdc |
| Emitter Cutoff Current ($V_{EB} = 3.0\text{ V}$, $I_C = 0$) | | I_{EBO} | — | 50 | nAdc |



MPS4123 MPS4124**ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

| Characteristic | | Symbol | Min | Max | Unit |
|--|--|---------------|-----------------------|----------------------|------|
| ON CHARACTERISTICS | | | | | |
| DC Current Gain ($I_C = 2.0\text{ mA}$, $V_{CE} = 1.0\text{ V}$) ($I_C = 50\text{ mA}$, $V_{CE} = 1.0\text{ V}$) | MPS4123 MPS4124 MPS4123 MPS4124 | h_{FE} | 50 120 25 60 | 150 360 — — | — |
| Collector–Emitter Saturation Voltage ($I_C = 50\text{ mA}$, $I_B = 5.0\text{ mA}$) | | $V_{CE(sat)}$ | — | 0.3 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = 50\text{ mA}$, $I_B = 5.0\text{ mA}$) | | $V_{BE(sat)}$ | — | 0.95 | Vdc |
| SMALL–SIGNAL CHARACTERISTICS | | | | | |
| Current–Gain — Bandwidth Product ($I_C = 10\text{ mA}$, $V_{CE} = 20\text{ V}$, $f = 100\text{ MHz}$) | MPS4123 MPS4124 | f_T | 100 170 | — — | MHz |
| Output Capacitance ($V_{CB} = 5.0\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | | C_{ob} | — | 4.0 | pF |
| Input Capacitance ($V_{EB} = 0.5\text{ V}$, $I_C = 0$, $f = 1.0\text{ MHz}$) | MPS4123 MPS4124 | C_{ib} | — — | 14 13.5 | pF |
| Small–Signal Current Gain ($I_C = 2.0\text{ mA}$, $V_{CE} = 1.0\text{ V}$, $f = 1.0\text{ kHz}$) | MPS4123 MPS4124 | h_{fe} | 50 120 | 200 480 | — |
| Noise Figure ($I_C = 100\text{ }\mu\text{A}$, $V_{CE} = 5.0\text{ V}$, $R_S = 1.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$) | MPS4123 MPS4124 | NF | — — | 6.0 5.0 | dB |

PACKAGE DIMENSIONS



SECTION X-X

**CASE 029-04
(TO-226AA)
ISSUE AD**


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K. MINIMUM LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.45 | 5.20 |
| B | 0.170 | 0.210 | 4.32 | 5.33 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.016 | 0.022 | 0.41 | 0.55 |
| F | 0.016 | 0.019 | 0.41 | 0.48 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.015 | 0.020 | 0.39 | 0.50 |
| K | 0.500 | — | 12.70 | — |
| L | 0.250 | — | 6.35 | — |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | — | 0.100 | — | 2.54 |
| R | 0.115 | — | 2.93 | — |
| V | 0.135 | — | 3.43 | — |

STYLE 1:

1. PIN 1. EMITTER
2. BASE
3. COLLECTOR

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