

# MPS4124

## Amplifier Transistor

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

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

#### THERMAL CHARACTERISTICS

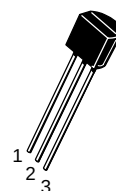
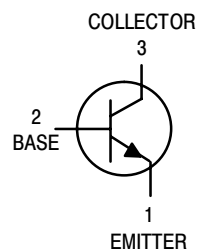
| Characteristic                          | Symbol          | Max  | Unit               |
|-----------------------------------------|-----------------|------|--------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 200  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case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

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.



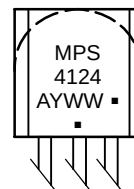
ON Semiconductor®

<http://onsemi.com>



TO-92  
CASE 29-11  
STYLE 1

#### MARKING DIAGRAM



MPS4124 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device       | Package            | Shipping <sup>†</sup> |
|--------------|--------------------|-----------------------|
| MPS4124      | TO-92              | 5000 Units/Box        |
| MPS4124G     | TO-92<br>(Pb-Free) | 5000 Units/Box        |
| MPS4124RLRA  | TO-92              | 2000/Tape & Reel      |
| MPS4124RLRAG | TO-92<br>(Pb-Free) | 2000/Tape & Reel      |

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MPS4124

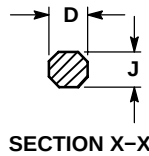
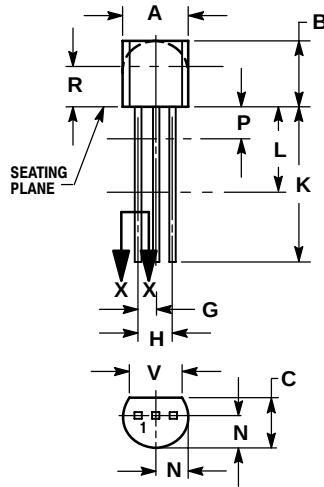
## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic                                                                                                                   | Symbol        | Min       | Max      | Unit |
|----------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|----------|------|
| <b>OFF CHARACTERISTICS</b>                                                                                                       |               |           |          |      |
| Collector – Emitter Breakdown Voltage<br>( $I_C = 1.0\text{ mA}$ , $I_B = 0$ )                                                   | $V_{(BR)CEO}$ | 25        | –        | Vdc  |
| Collector – Base Breakdown Voltage<br>( $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ )                                              | $V_{(BR)CBO}$ | 30        | –        | Vdc  |
| Emitter – Base Breakdown Voltage<br>( $I_C = 0$ , $I_E = 10\text{ }\mu\text{A}$ )                                                | $V_{(BR)EBO}$ | 5.0       | –        | Vdc  |
| Collector Cutoff Current<br>( $V_{CB} = 20\text{ V}$ , $I_E = 0$ )                                                               | $I_{CBO}$     | –         | 50       | nAdc |
| Emitter Cutoff Current<br>( $V_{EB} = 3.0\text{ V}$ , $I_C = 0$ )                                                                | $I_{EBO}$     | –         | 50       | nAdc |
| <b>ON CHARACTERISTICS</b>                                                                                                        |               |           |          |      |
| DC Current Gain<br>( $I_C = 2.0\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ )<br>( $I_C = 50\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ )     | $h_{FE}$      | 120<br>60 | 360<br>– | –    |
| Collector – Emitter Saturation Voltage<br>( $I_C = 50\text{ mA}$ , $I_B = 5.0\text{ mA}$ )                                       | $V_{CE(sat)}$ | –         | 0.3      | Vdc  |
| Base – Emitter Saturation Voltage<br>( $I_C = 50\text{ mA}$ , $I_B = 5.0\text{ mA}$ )                                            | $V_{BE(sat)}$ | –         | 0.95     | Vdc  |
| <b>SMALL – SIGNAL CHARACTERISTICS</b>                                                                                            |               |           |          |      |
| Current – Gain – Bandwidth Product<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 20\text{ V}$ , $f = 100\text{ MHz}$ )                   | $f_T$         | 170       | –        | MHz  |
| Output Capacitance<br>( $V_{CB} = 5.0\text{ V}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )                                             | $C_{ob}$      | –         | 4.0      | pF   |
| Input Capacitance<br>( $V_{EB} = 0.5\text{ V}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )                                              | $C_{ib}$      | –         | 13.5     | pF   |
| Small-Signal Current Gain<br>( $I_C = 2.0\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ , $f = 1.0\text{ kHz}$ )                          | $h_{fe}$      | 120       | 480      | –    |
| Noise Figure<br>( $I_C = 100\text{ }\mu\text{A}$ , $V_{CE} = 5.0\text{ V}$ , $R_S = 1.0\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ ) | NF            | –         | 5.0      | dB   |

# MPS4124

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-11  
ISSUE AL



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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  | 0.021 | 0.407       | 0.533 |
| 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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