

# ON Semiconductor

## Is Now



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# 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 @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625 5.0	W mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	°C

#### THERMAL CHARACTERISTICS

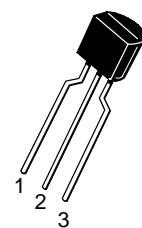
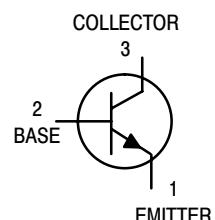
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	°C/W

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.



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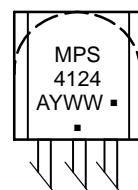
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TO-92  
CASE 29  
STYLE 1

BENT LEAD  
TAPE & REEL  
AMMO PACK

#### MARKING DIAGRAM



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>
MPS4124RLRA	TO-92	2000/Tape & Reel
MPS4124RLRAG	TO-92 (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.

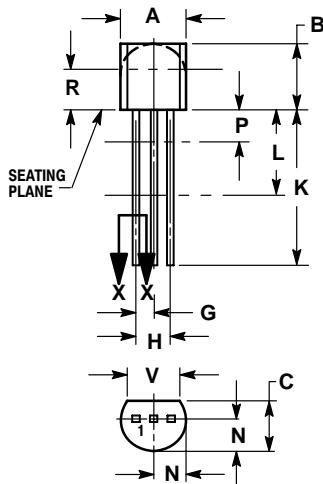
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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

## PACKAGE DIMENSIONS

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

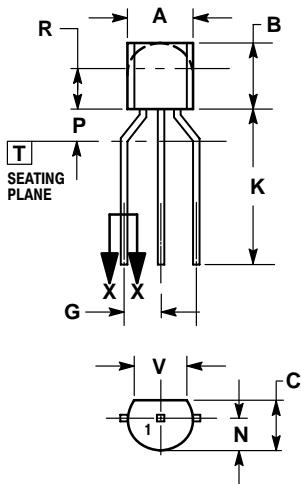
STRAIGHT LEAD BULK PACK

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	---

SECTION X-X



BENT LEAD TAPE &amp; REEL AMMO PACK

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLE 1:  
 1. Emitter  
 2. Base  
 3. Collector

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