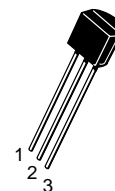
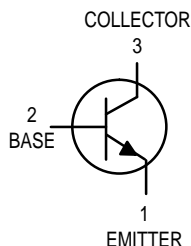


# Amplifier Transistors

## 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 $25^\circ\text{C}$	$P_D$	625	5.0	mW mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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
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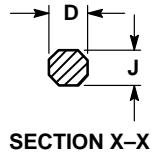
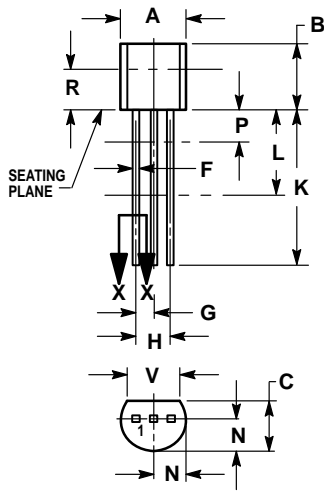
### OFF CHARACTERISTICS

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 ( $I_C = 10 \mu\text{A}, I_E = 0$ )	MPS4123 MPS4124	$V_{(BR)CBO}$	40 30	— —	Vdc
Emitter–Base Breakdown Voltage ( $I_C = 0, I_E = 10 \mu\text{A}$ )		$V_{(BR)EBO}$	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
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 2.0\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ )	MPS4123	$h_{FE}$	50	150	—
	MPS4124		120	360	
( $I_C = 50\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ )	MPS4123		25	—	
	MPS4124		60	—	
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
<b>SMALL–SIGNAL CHARACTERISTICS</b>					
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



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:

- PIN 1. EMITTER
2. BASE
3. COLLECTOR

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