



MOTOROLA SEMICONDUCTORS

P.O. BOX 20912 • PHOENIX, ARIZONA 85036

MPS4123 MPS4124

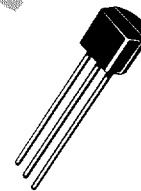
NPN SILICON GENERAL-PURPOSE AMPLIFIER TRANSISTORS

... designed for general-purpose amplifier applications and for complementary circuitry with PNP types MPS4125/4126.

- Amplifier Applications from Audio to >100 MHz
- Wide-Band Audio Noise Figure — MPS4123 = 6.0 dB
MPS4124 = 5.0 dB
- Low-Leakage, High Stability

GENERAL-PURPOSE AMPLIFIER TRANSISTORS

NPN SILICON

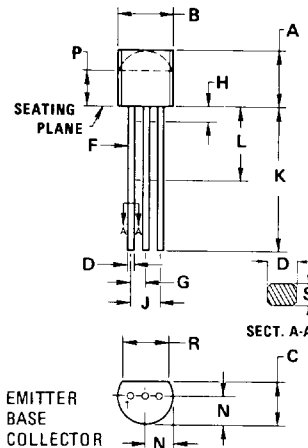


MAXIMUM RATINGS

Rating	Symbol	MPS4123	MPS4124	Unit
Collector-Emitter Voltage	V _{CE}	30	25	V _{dc}
Collector-Base Voltage	V _{CB}	40	30	V _{dc}
Emitter-Base Voltage	V _{EB}	5.0		V _{dc}
Collector Current — Continuous	I _C	2.0		A _{dc}
Total Power Dissipation @ T _A = 25°C Derate above 25°C	P _D	310	2.81	mW mW/°C
Total Power Dissipation @ T _A = 60°C	P _D	210		mW
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +135		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	R _{θJA}	0.357	°C/mW



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

NOTES:

1. CONTOUR OF PACKAGE BEYOND ZONE "P" IS UNCONTROLLED.
2. DIM "F" APPLIES BETWEEN "H" AND "L". DIM "D" & "S" APPLIES BETWEEN "L" & 12.70 mm (0.5") FROM SEATING PLANE. LEAD DIM IS UNCONTROLLED IN "H" & BEYOND 12.70 mm (0.5") FROM SEATING PLANE.


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.32	5.33	0.170	0.210
B	4.44	5.21	0.175	0.205
C	3.18	4.19	0.125	0.165
D	0.41	0.56	0.016	0.022
F	0.41	0.48	0.016	0.019
G	1.14	1.40	0.045	0.055
H	—	2.54	—	0.100
J	2.41	2.67	0.095	0.105
K	12.70	—	0.500	—
L	6.35	—	0.250	—
N	2.03	2.67	0.080	0.105
P	2.92	—	0.115	—
R	3.43	—	0.135	—
S	0.36	0.41	0.014	0.016

All JEDEC dimensions and notes apply.

CASE 29-02
TO-226AA
(TO-92)

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ 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 ($I_C = 10\ \mu\text{A}$, $I_E = 0$)	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
ON CHARACTERISTICS				
DC Current Gain ($I_C = 2.0\text{ mA}$, $V_{CE} = 1.0\text{ V}$)	MPS4123 MPS4124 h_{FE}	50 120	150 360	—
($I_C = 50\text{ mA}$, $V_{CE} = 1.0\text{ V}$)	MPS4123 MPS4124	25 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
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product (2) ($I_C = 10\text{ mA}$, $V_{CE} = 20\text{ V}$, $f = 100\text{ MHz}$)	MPS4123 MPS4124 f_T	150 170	—	MHz
High-Frequency Current Gain ($I_C = 10\text{ mA}$, $V_{CE} = 20\text{ V}$, $f = 100\text{ MHz}$)	MPS4123 MPS4124 $ h_{fe} $	2.5 3.0	—	—
Output Capacitance ($V_{CB} = 5.0\text{ V}$, $I_E = 0$, $f = 100\text{ kHz}$)	C_{ob}	—	4.0	pF
Input Capacitance ($V_{BE} = 0.5\text{ V}$, $I_C = 0$, $f = 100\text{ kHz}$)	C_{ib}	—	8.0	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 ($I_C = 100\ \mu\text{A}$, $V_{CE} = 5.0\text{ V}$, $R_S = 1.0\text{ k}\Omega$, Noise Bandwidth = 10 Hz to 15.7 kHz)	MPS4123 MPS4124 NF	—	6.0 5.0	dB

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