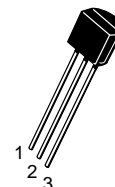
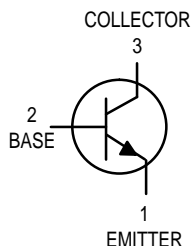


# Amplifier Transistor

## NPN Silicon

**MPS6428**



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

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	50	Vdc
Collector–Base Voltage	$V_{CBO}$	60	Vdc
Emitter–Base Voltage	$V_{EBO}$	6.0	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	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 12	Watts 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 ( $I_C = 1.0 \text{ mAdc}, I_B = 0$ )	$V_{(BR)CEO}$	50	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = 0.1 \text{ mAdc}, I_E = 0$ )	$V_{(BR)CBO}$	60	—	Vdc
Collector Cutoff Current ( $V_{CE} = 30 \text{ Vdc}$ )	$I_{CES}$	—	0.025	$\mu\text{A}$
Collector Cutoff Current ( $V_{CB} = 30 \text{ Vdc}, I_E = 0$ )	$I_{CBO}$	—	0.01	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ Vdc}, I_C = 0$ )	$I_{EBO}$	—	0.01	$\mu\text{A}$

## MPS6428

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

Characteristic	Symbol	Min	Max	Unit
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $V_{CE} = 5.0\text{ Vdc}$ , $I_C = 0.01\text{ mA}$ ) ( $V_{CE} = 5.0\text{ Vdc}$ , $I_C = 0.1\text{ mA}$ ) ( $V_{CE} = 5.0\text{ Vdc}$ , $I_C = 1.0\text{ mA}$ ) ( $V_{CE} = 5.0\text{ Vdc}$ , $I_C = 10\text{ mA}$ )	$h_{FE}$	250 250 250 250	— 650 — —	—
Collector–Emitter Saturation Voltage ( $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ ) ( $I_C = 100\text{ mA}$ , $I_B = 5.0\text{ mA}$ )	$V_{CE(sat)}$	— —	0.2 0.6	Vdc
Base–Emitter On Voltage ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$V_{BE(on)}$	0.56	0.66	Vdc

### SMALL–SIGNAL CHARACTERISTICS

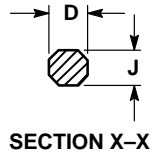
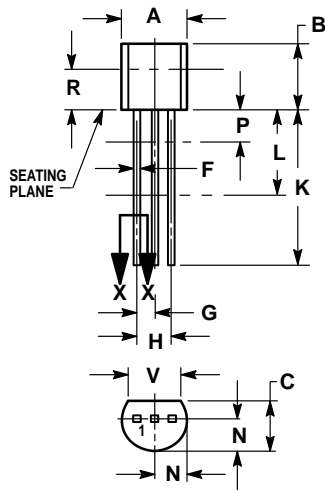
Current–Gain — Bandwidth Product ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ , $f = 100\text{ MHz}$ )	$f_T$	100	700	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{obo}$	—	3.0	pF
Input Capacitance ( $V_{EB} = 0.5\text{ Vdc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ibo}$	—	8.0	pF
Input Impedance ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{ie}$	3.0	30	k $\Omega$
Voltage Feedback Ratio ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{re}$	2.0	20	$\times 10^{-4}$
Small–Signal Current Gain ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{fe}$	200	800	—
Output Admittance ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{oe}$	5.0	50	$\mu\text{mhos}$

### NOISE FIGURE/TOTAL NOISE VOLTAGE CHARACTERISTICS

	NF VT		NF VT		NF VT		Unit	
	Max (1)		Max (2)		Max (3)			
Noise Figure/Voltage ( $V_{CE} = 5.0\text{ V}$ , $I_C = 0.1\text{ mA}$ , $T_A = 25^\circ\text{C}$ )	7.0	18.1	6.0	5700	3.5	4.3	dB	nV

- $R_S = 10\text{ k}\Omega$ , BW = 1.0 Hz,  $f = 100\text{ Hz}$
- $R_S = 50\text{ k}\Omega$ , BW = 15.7 kHz,  $f = 10\text{ Hz}–10\text{ kHz}$
- $R_S = 500\ \Omega$ , BW = 1.0 Hz,  $f = 10\text{ Hz}$

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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