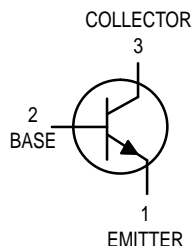


# High Frequency Transistor

## NPN Silicon

**MPS5179**

Motorola Preferred Device



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

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	12	Vdc
Collector–Base Voltage	$V_{CBO}$	20	Vdc
Emitter–Base Voltage	$V_{EBO}$	2.5	Vdc
Collector Current — Continuous	$I_C$	50	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	200 1.14	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300 1.71	mW mW/ $^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Sustaining Voltage ( $I_C = 3.0$ mAdc, $I_B = 0$ )	$V_{CEO(sus)}$	12	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = 0.001$ mAdc, $I_E = 0$ )	$V_{(BR)CBO}$	20	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 0.01$ mAdc, $I_C = 0$ )	$V_{(BR)EBO}$	2.5	—	Vdc
Collector Cutoff Current ( $V_{CB} = 15$ Vdc, $I_E = 0$ ) ( $V_{CB} = 15$ Vdc, $I_E = 0$ , $T_A = 150^\circ\text{C}$ )	$I_{CBO}$	— —	0.02 1.0	$\mu\text{Adc}$

### ON CHARACTERISTICS

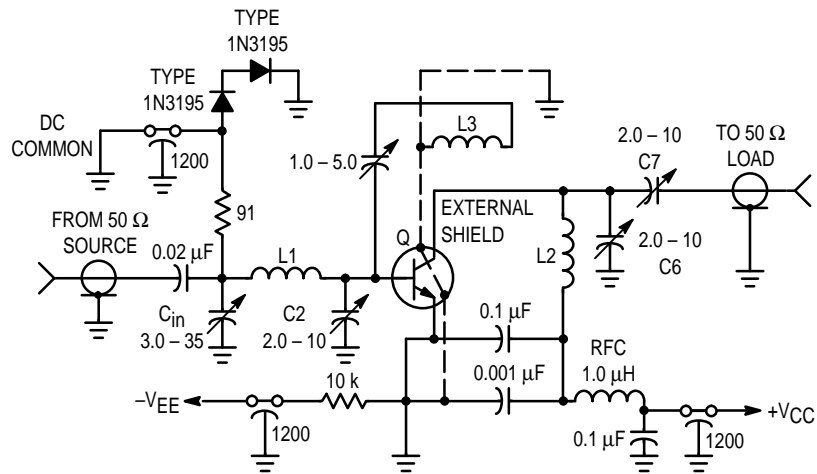
DC Current Gain ( $I_C = 3.0$ mAdc, $V_{CE} = 1.0$ Vdc)	$h_{FE}$	25	250	—
Collector–Emitter Saturation Voltage ( $I_C = 10$ mAdc, $I_B = 1.0$ mAdc)	$V_{CE(sat)}$	—	0.4	Vdc
Base–Emitter Saturation Voltage ( $I_C = 10$ mAdc, $I_B = 1.0$ mAdc)	$V_{BE(sat)}$	—	1.0	Vdc

Preferred devices are Motorola recommended choices for future use and best overall value.

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

Characteristic	Symbol	Min	Max	Unit
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current-Gain — Bandwidth Product <sup>(1)</sup> ( $I_C = 5.0 \text{ mAdc}$ , $V_{CE} = 6.0 \text{ Vdc}$ , $f = 100 \text{ MHz}$ )	$f_T$	900	2000	MHz
Collector-Base Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 0.1 \text{ to } 1.0 \text{ MHz}$ )	$C_{cb}$	—	1.0	pF
Small Signal Current Gain ( $I_C = 2.0 \text{ mAdc}$ , $V_{CE} = 6.0 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{fe}$	25	300	—
Collector Base Time Constant ( $I_E = 2.0 \text{ mAdc}$ , $V_{CB} = 6.0 \text{ Vdc}$ , $f = 31.9 \text{ MHz}$ )	$r_b \cdot C_c$	3.0	14	ps
Noise Figure (See Figure 1) ( $I_C = 1.5 \text{ mAdc}$ , $V_{CE} = 6.0 \text{ Vdc}$ , $R_S = 50 \text{ ohms}$ , $f = 200 \text{ MHz}$ )	NF	—	5.0	dB
Common-Emitter Amplifier Power Gain (See Figure 1) ( $V_{CE} = 6.0 \text{ Vdc}$ , $I_C = 5.0 \text{ mAdc}$ , $f = 200 \text{ MHz}$ )	$G_{pe}$	15	—	dB

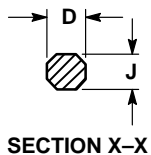
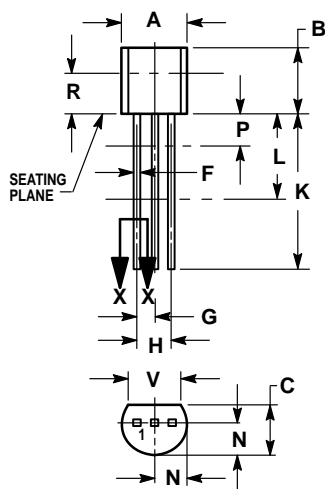
1.  $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.



- L1 1-3/4 Turns, #18 AWG, 0.5" L, 0.5" Diameter
- L2 2 Turns, #16 AWG, 0.5" L, 0.5" Diameter
- L3 2 Turns, #13 AWG, 0.25" L, 0.5" Diameter (Position 1/4" from L2)

**Figure 1. 200 MHz Amplifier Power Gain and Noise Figure Circuit**

## 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:

1. EMITTER
2. BASE
3. COLLECTOR

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**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447 or 602-303-5454

**MFAX:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
**INTERNET:** <http://Design-NET.com>

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,  
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-81-3521-8315

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298


**MOTOROLA**

**MPS5179/D**
