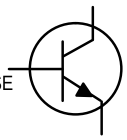
MOTOROLA
SEMICONDUCTOR TECHNICAL DATA

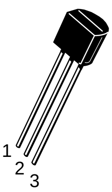
Order this document
MPS918/D

Amplifier Transistors
NPN Silicon

MPS918*
MPS3563

*Motorola Preferred Device





CASE 29–04, STYLE 1
TO–92 (TO–226AA)

MAXIMUM RATINGS

Rating	Symbol	MPS918	MPS3563	Unit
Collector–Emitter Voltage	V_{CEO}	15	12	Vdc
Collector–Base Voltage	V_{CBO}	30	30	Vdc
Emitter–Base Voltage	V_{EBO}	3.0	2.0	Vdc
Collector Current — Continuous	I_C	50		mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	350 2.8		mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	0.85 6.8		Watts 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	$R_{\theta JA}$(1)	357	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	147	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage(2) (I_C = 3.0 mAdc, I_B = 0)	 MPS918 MPS3563	$V_{(BR)CEO}$	 15 12	 — —	Vdc
Collector–Base Breakdown Voltage (I_C = 1.0 μAdc, I_E = 0) (I_C = 100 μAdc, I_E = 0)	 MPS918 MPS3563	$V_{(BR)CBO}$	 30 30	 — —	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	 MPS918 MPS3563	$V_{(BR)EBO}$	 3.0 2.0	 — —	Vdc
Collector Cutoff Current (V_{CB} = 15 Vdc, I_E = 0)	 MPS918 MPS3563	I_{CBO}	 — —	 10 50	nAdc

1. $R_{\theta JA}$ is measured with the device soldered into a typical printed circuit board.
2. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 1.0%.

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

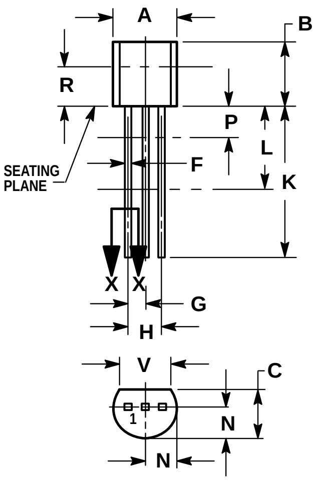
MOTOROLA

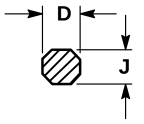
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS					
DC Current Gain(2)		h_{FE}			—
(I_C = 3.0 mAdc, V_{CE} = 1.0 Vdc)	MPS918		20	—	
(I_C = 8.0 mAdc, V_{CE} = 10 Vdc)	MPS3563		20	200	
Collector–Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc)	MPS918	$V_{CE(sat)}$	—	0.4	Vdc
Base–Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc)	MPS918	$V_{BE(sat)}$	—	1.0	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain — Bandwidth Product(2)		f_T			MHz
(I_C = 4.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	MPS918		600	—	
(I_C = 8.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	MPS3563		600	1500	
Output Capacitance		C_{obo}			pF
(V_{CB} = 0 Vdc, I_E = 0, f = 1.0 MHz)	MPS918		—	3.0	
(V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	MPS918		—	1.7	
(V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	MPS3563		—	1.7	
Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	MPS918	C_{ibo}	—	2.0	pF
Small–Signal Current Gain (I_C = 8.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	MPS3563	h_{fe}	20	250	—
Noise Figure (I_C = 1.0 mAdc, V_{CE} = 6.0 Vdc, R_S = 400 kΩ, f = 60 MHz)	MPS918	NF	—	6.0	dB
FUNCTIONAL TEST					
Common–Emitter Amplifier Power Gain		G_{pe}			dB
(I_C = 6.0 mAdc, V_{CB} = 12 Vdc, f = 200 MHz)	MPS918		15	—	
(I_C = 8.0 mAdc, V_{CE} = 10 Vdc, f = 200 MHz) (G_{fd} + G_{re} < –20 dB)	MPS3563		14	—	
Power Output (I_C = 8.0 mAdc, V_{CB} = 15 Vdc, f = 500 MHz)	MPS918	P_{out}	30	—	mW
Oscillator Collector Efficiency (I_C = 8.0 mAdc, V_{CB} = 15 Vdc, P_{out} = 30 mW, f = 500 MHz)	MPS918	η	25	—	%

2. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 1.0%.

PACKAGE DIMENSIONS





SECTION X–X

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.

	INCHES		MILLIMETERS	
DIM	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	—

CASE 029–04
(TO–226AA)
ISSUE AD

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

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