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MPS918, MPS3563

MPS918 is a Preferred Device

Amplifier Transistors

NPN Silicon

ON Semiconductor®

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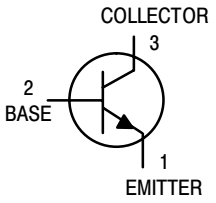
Features

- Pb−Free Packages are Available*



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage MPS918 MPS3563	V_{CEO}	 15 12	Vdc
Collector−Base Voltage MPS918 MPS3563	V_{CBO}	 30 30	Vdc
Emitter−Base Voltage MPS918 MPS3563	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	W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

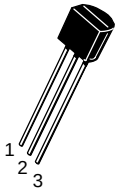
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient (Note 1)	$R_{\theta JA}$	357	°C/W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	147	°C/W

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

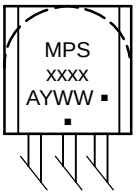
1. $R_{\theta JA}$ is measured with the device soldered into a typical printed circuit board.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MARKING DIAGRAM



TO−92
CASE 29−11
STYLE 1



MPSxxxx = Device Code
xxxx = 918 or 3563
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MPS918	TO−92	5000 Units/Box
MPS918G	TO−92 (Pb−Free)	5000 Units/Box
MPS3563	TO−92	5000 Units/Box
MPS3563G	TO−92 (Pb−Free)	5000 Units/Box
MPS3563RLRA	TO−92	2000/Tape & Reel
MPS3563RLRAG	TO−92 (Pb−Free)	2000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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

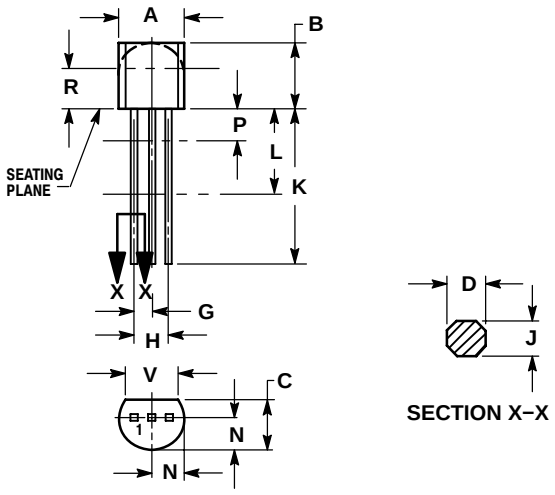
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Breakdown Voltage (Note 2)		$V_{(BR)CEO}$			Vdc
(I_C = 3.0 mAdc, I_B = 0)	MPS918		15	−	
	MPS3563		12	−	
Collector−Base Breakdown Voltage		$V_{(BR)CBO}$			Vdc
(I_C = 1.0 μAdc, I_E = 0)	MPS918		30	−	
(I_C = 100 μAdc, I_E = 0)	MPS3563		30	−	
Emitter−Base Breakdown Voltage		$V_{(BR)EBO}$			Vdc
(I_E = 10 μAdc, I_C = 0)	MPS918		3.0	−	
	MPS3563		2.0	−	
Collector Cutoff Current		I_{CBO}			nAdc
(V_{CB} = 15 Vdc, I_E = 0)	MPS918		−	10	
	MPS3563		−	50	
ON CHARACTERISTICS					
DC Current Gain (Note 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		$V_{CE(sat)}$	−	0.4	Vdc
(I_C = 10 mAdc, I_B = 1.0 mAdc)	MPS918				
Base−Emitter Saturation Voltage		$V_{BE(sat)}$	−	1.0	Vdc
(I_C = 10 mAdc, I_B = 1.0 mAdc)	MPS918				
SMALL−SIGNAL CHARACTERISTICS					
Current−Gain − Bandwidth Product (Note 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		C_{ibo}	−	2.0	pF
(V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	MPS918				
Small−Signal Current Gain		h_{fe}	20	250	−
(I_C = 8.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	MPS3563				
Noise Figure		NF	−	6.0	dB
(I_C = 1.0 mAdc, V_{CE} = 6.0 Vdc, R_S = 400 kΩ, f = 60 MHz)	MPS918				
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)	MPS3563		14	−	
(G_{fd} + G_{re} < −20 dB)					
Power Output		P_{out}	30	−	mW
(I_C = 8.0 mAdc, V_{CB} = 15 Vdc, f = 500 MHz)	MPS918				
Oscillator Collector Efficiency		η	25	−	%
(I_C = 8.0 mAdc, V_{CB} = 15 Vdc, P_{out} = 30 mW, f = 500 MHz)	MPS918				

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

PACKAGE DIMENSIONS

TO−92 (TO−226)
CASE 29−11
ISSUE AL



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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	0.021	0.407	0.533
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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
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Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

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