

MPS918, MPS3563

MPS918 is a Preferred Device

Amplifier Transistors

NPN Silicon

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	mA _{dc}
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	0.85 6.8	W 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 (Note 1)	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to–Case	$R_{\theta JC}$	147	$^\circ\text{C}/\text{W}$

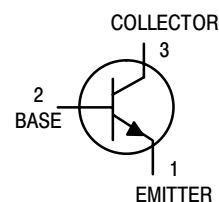
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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

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



ON Semiconductor®

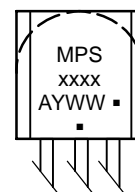
<http://onsemi.com>



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.

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

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

MPS918, MPS3563

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (Note 2) (I _C = 3.0 mA _{dc} , I _B = 0)	MPS918 MPS3563	V _{(BR)CEO}	15 12	– –	V _{dc}
Collector–Base Breakdown Voltage (I _C = 1.0 μA _{dc} , I _E = 0) (I _C = 100 μA _{dc} , I _E = 0)	MPS918 MPS3563	V _{(BR)CBO}	30 30	– –	V _{dc}
Emitter–Base Breakdown Voltage (I _E = 10 μA _{dc} , I _C = 0)	MPS918 MPS3563	V _{(BR)EBO}	3.0 2.0	– –	V _{dc}
Collector Cutoff Current (V _{CB} = 15 V _{dc} , I _E = 0)	MPS918 MPS3563	I _{CBO}	– –	10 50	nA _{dc}

ON CHARACTERISTICS

DC Current Gain (Note 2) (I _C = 3.0 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 8.0 mA _{dc} , V _{CE} = 10 V _{dc})	MPS918 MPS3563	h _{FE}	20 20	– 200	–
Collector–Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	MPS918	V _{CE(sat)}	–	0.4	V _{dc}
Base–Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	MPS918	V _{BE(sat)}	–	1.0	V _{dc}

SMALL–SIGNAL CHARACTERISTICS

Current–Gain – Bandwidth Product (Note 2) (I _C = 4.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 100 MHz) (I _C = 8.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 100 MHz)	MPS918 MPS3563	f _T	600 600	– 1500	MHz
Output Capacitance (V _{CB} = 0 V _{dc} , I _E = 0, f = 1.0 MHz) (V _{CB} = 10 V _{dc} , I _E = 0, f = 1.0 MHz) (V _{CB} = 10 V _{dc} , I _E = 0, f = 1.0 MHz)	MPS918 MPS918 MPS3563	C _{obo}	– – –	3.0 1.7 1.7	pF
Input Capacitance (V _{EB} = 0.5 V _{dc} , I _C = 0, f = 1.0 MHz)	MPS918	C _{ibo}	–	2.0	pF
Small–Signal Current Gain (I _C = 8.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	MPS3563	h _{fe}	20	250	–
Noise Figure (I _C = 1.0 mA _{dc} , V _{CE} = 6.0 V _{dc} , R _S = 400 kΩ, f = 60 MHz)	MPS918	NF	–	6.0	dB

FUNCTIONAL TEST

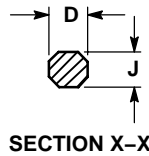
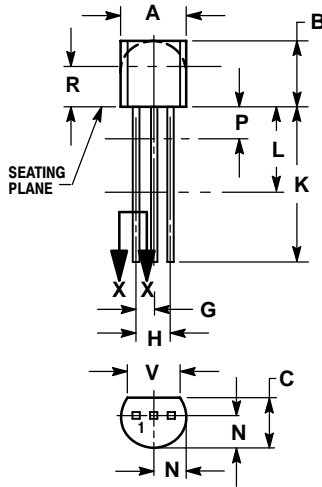
Common–Emitter Amplifier Power Gain (I _C = 6.0 mA _{dc} , V _{CB} = 12 V _{dc} , f = 200 MHz) (I _C = 8.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 200 MHz) (G _{fd} + G _{re} < –20 dB)	MPS918 MPS3563	G _{pe}	15 14	– –	dB
Power Output (I _C = 8.0 mA _{dc} , V _{CB} = 15 V _{dc} , f = 500 MHz)	MPS918	P _{out}	30	–	mW
Oscillator Collector Efficiency (I _C = 8.0 mA _{dc} , V _{CB} = 15 V _{dc} , P _{out} = 30 mW, f = 500 MHz)	MPS918	η	25	–	%

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

MPS918, MPS3563

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.

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	0.021	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:

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

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85062-1312 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
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

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>

For additional information, please contact your
local Sales Representative.