

# MPSW05, MPSW06

MPSW06 is a Preferred Device

## One Watt Amplifier Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	MPSW05 MPSW06 $V_{CEO}$	60 80	Vdc
Collector-Base Voltage	MPSW05 MPSW06 $V_{CBO}$	60 80	Vdc
Emitter-Base Voltage	$V_{EBO}$	4.0	Vdc
Collector Current - Continuous	$I_C$	500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 8.0	W mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	2.5 20	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	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	$^\circ\text{C}/\text{W}$

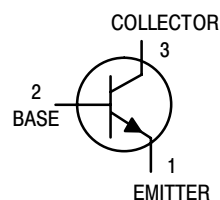
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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

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

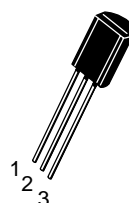


ON Semiconductor®

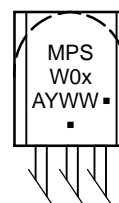
<http://onsemi.com>



#### MARKING DIAGRAM



TO-92 (TO-226)  
CASE 29-10  
STYLE 1



MPSW0x =Device Code  
x = 5 or 6

A =Assembly Location  
Y =Year

WW =Work Week

▪ =Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
MPSW05	TO-92	5,000 Units/Box
MPSW05G	TO-92 (Pb-Free)	5,000 Units/Box
MPSW06	TO-92	5,000 Units/Box
MPSW06G	TO-92 (Pb-Free)	5,000 Units/Box
MPSW06RLRA	TO-92	2,000/Tape & Reel
MPSW06RLRAG	TO-92 (Pb-Free)	2,000/Tape & Reel

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

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

# MPSW05, MPSW06

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Breakdown Voltage (Note 1) ( $I_C = 1.0\text{ mA}$ , $I_B = 0$ )	MPSW05 MPSW06 $V_{(BR)CEO}$	60 80	– –	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 100\text{ }\mu\text{A}$ , $I_C = 0$ )	$V_{(BR)EBO}$	4.0	–	Vdc
Collector Cutoff Current ( $V_{CE} = 40\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 60\text{ Vdc}$ , $I_B = 0$ )	MPSW05 MPSW06 $I_{CES}$	– –	0.5 0.5	$\mu\text{A}$ dc
Collector Cutoff Current ( $V_{CB} = 40\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 60\text{ Vdc}$ , $I_E = 0$ )	MPSW05 MPSW06 $I_{CBO}$	– –	0.1 0.1	$\mu\text{A}$ dc
Emitter Cutoff Current ( $V_{EB} = 3.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	0.1	$\mu\text{A}$ dc
<b>ON CHARACTERISTICS</b> (Note 1)				
DC Current Gain ( $I_C = 50\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ ) ( $I_C = 250\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ )	$h_{FE}$	80 60	– –	–
Collector–Emitter Saturation Voltage ( $I_C = 250\text{ mA}$ , $I_B = 10\text{ mA}$ )	$V_{CE(sat)}$	–	0.4	Vdc
Base–Emitter Saturation Voltage ( $I_C = 250\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$V_{BE(sat)}$	–	1.2	Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>				
Current–Gain – Bandwidth Product ( $I_C = 200\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 20\text{ MHz}$ )	$f_T$	50	–	MHz
Output Capacitance ( $V_{CB} = 10\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{obo}$	–	12	pF

1. Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

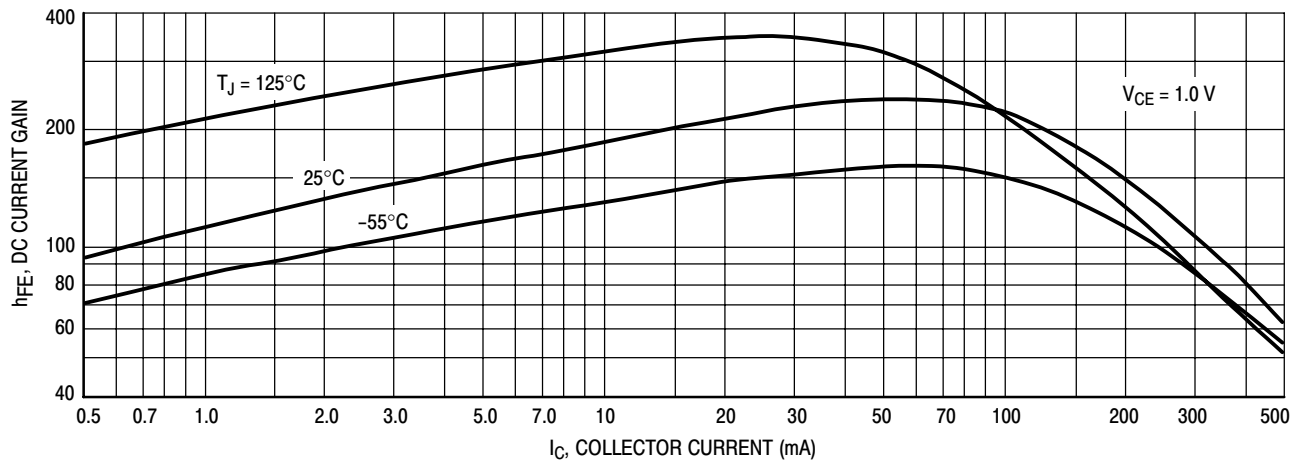


Figure 1. DC Current Gain

# MPSW05, MPSW06

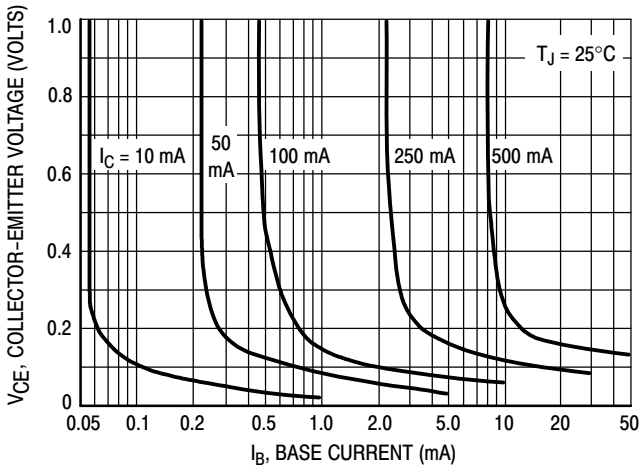


Figure 2. Collector Saturation Region

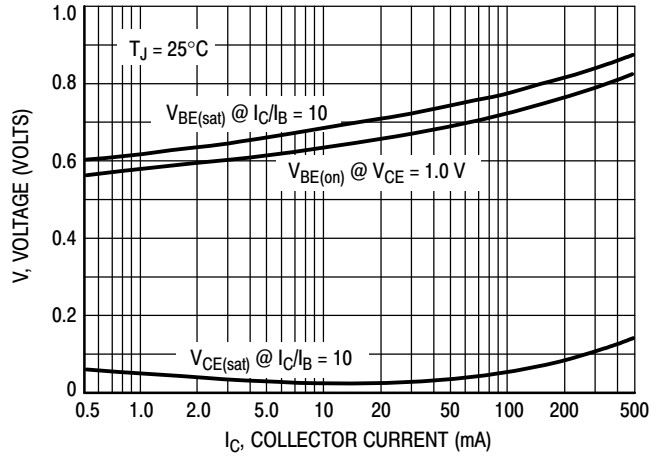


Figure 3. "On" Voltages

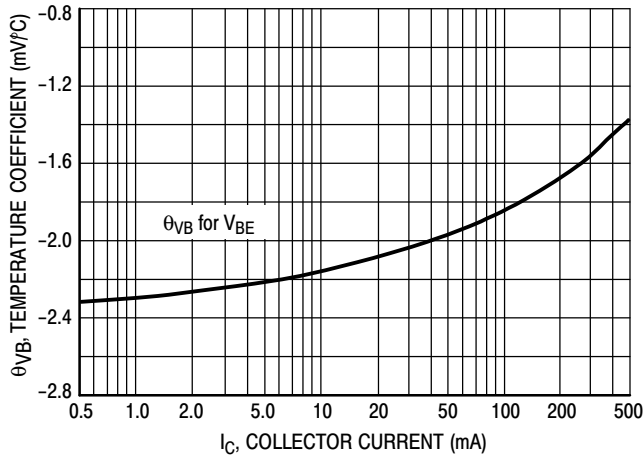


Figure 4. Base-Emitter Temperature Coefficient

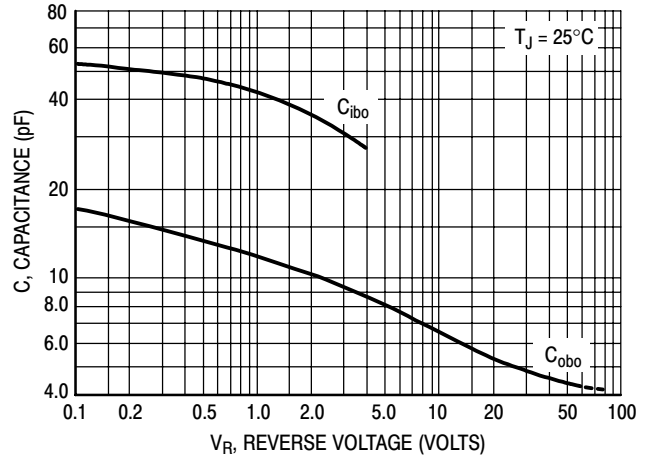


Figure 5. Capacitance

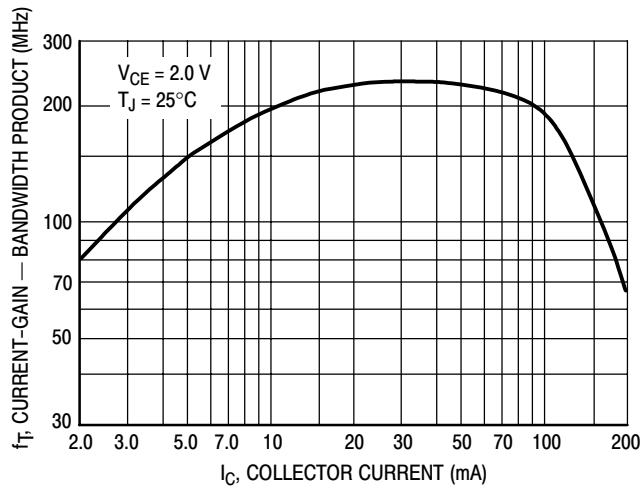


Figure 6. Current-Gain - Bandwidth Product

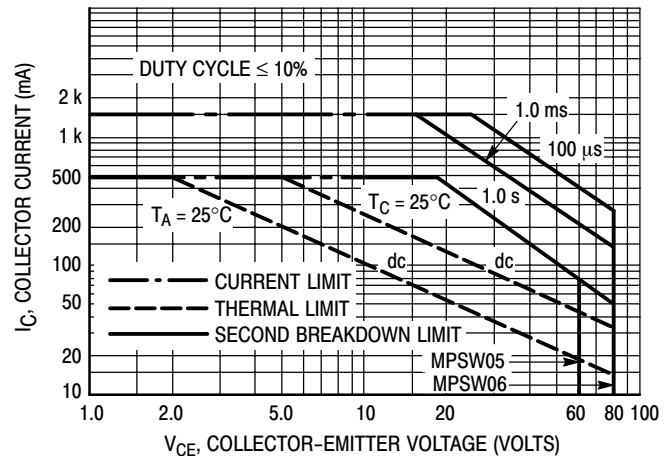
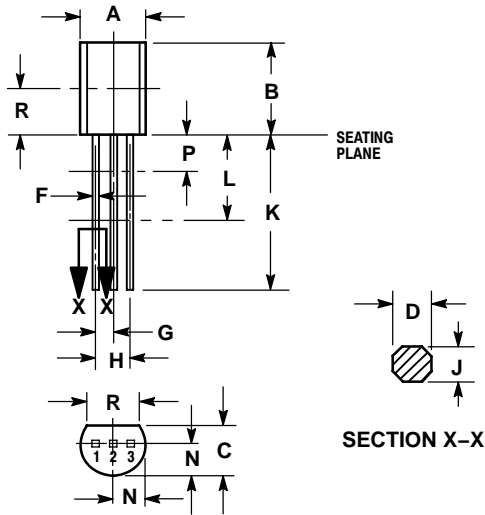


Figure 7. Active Region - Safe Operating Area

# MPSW05, MPSW06

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-10  
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. DIMENSION F APPLIES BETWEEN P AND L. DIMENSIONS 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	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.021	0.457	0.533
F	0.016	0.019	0.407	0.482
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.018	0.024	0.46	0.61
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	0.135	---	3.43	---

### STYLE 1:

- PIN 1. EMITTER
- BASE
- 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 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  
**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.