

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°C	P_D	1.0 8.0	W mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.5 20	W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

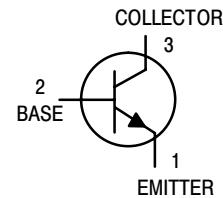
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	°C/W

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.

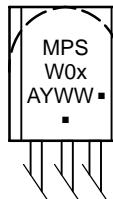
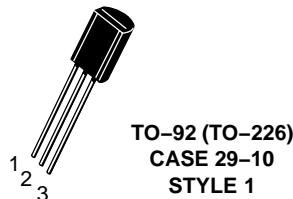
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MARKING DIAGRAM



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.

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

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (Note 1) ($I_C = 1.0 \text{ mA}_\text{dc}$, $I_B = 0$)	$V_{(\text{BR})\text{CEO}}$ MPSW05 MPSW06	60 80	— —	Vdc
Emitter–Base Breakdown Voltage ($I_E = 100 \mu\text{A}_\text{dc}$, $I_C = 0$)	$V_{(\text{BR})\text{EBO}}$	4.0	—	Vdc
Collector Cutoff Current ($V_{CE} = 40 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 60 \text{ Vdc}$, $I_B = 0$)	I_{CES} MPSW05 MPSW06	— —	0.5 0.5	μA_dc
Collector Cutoff Current ($V_{CB} = 40 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$)	I_{CBO} MPSW05 MPSW06	— —	0.1 0.1	μA_dc
Emitter Cutoff Current ($V_{EB} = 3.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	0.1	μA_dc
ON CHARACTERISTICS (Note 1)				
DC Current Gain ($I_C = 50 \text{ mA}_\text{dc}$, $V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 250 \text{ mA}_\text{dc}$, $V_{CE} = 1.0 \text{ Vdc}$)	h_{FE}	80 60	— —	—
Collector–Emitter Saturation Voltage ($I_C = 250 \text{ mA}_\text{dc}$, $I_B = 10 \text{ mA}_\text{dc}$)	$V_{CE(\text{sat})}$	—	0.4	Vdc
Base–Emitter Saturation Voltage ($I_C = 250 \text{ mA}_\text{dc}$, $V_{CE} = 5.0 \text{ Vdc}$)	$V_{BE(\text{sat})}$	—	1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current–Gain – Bandwidth Product ($I_C = 200 \text{ mA}_\text{dc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 20 \text{ MHz}$)	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 $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

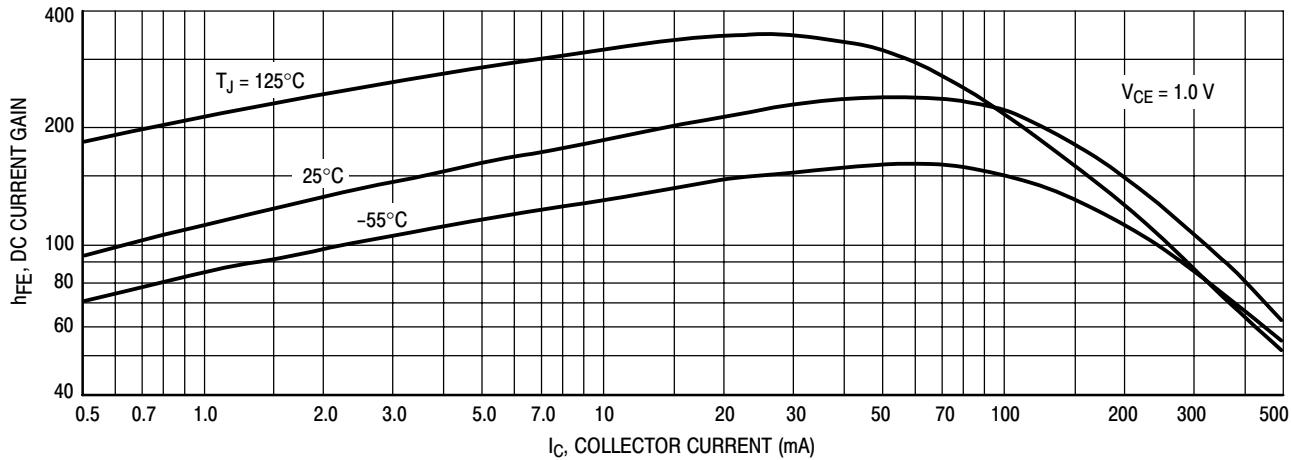


Figure 1. DC Current Gain

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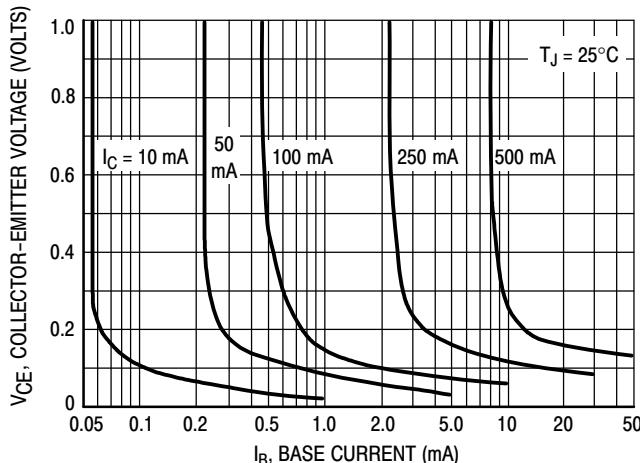


Figure 2. Collector Saturation Region

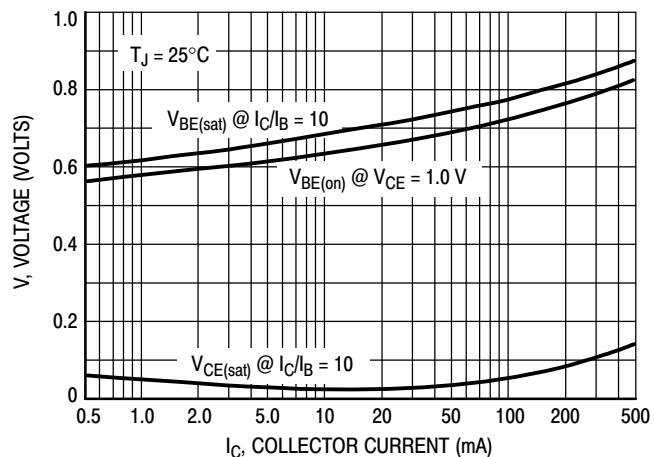


Figure 3. "On" Voltages

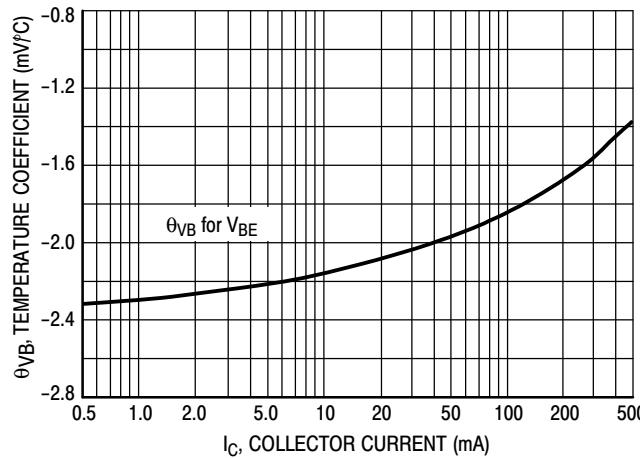


Figure 4. Base-Emitter Temperature Coefficient

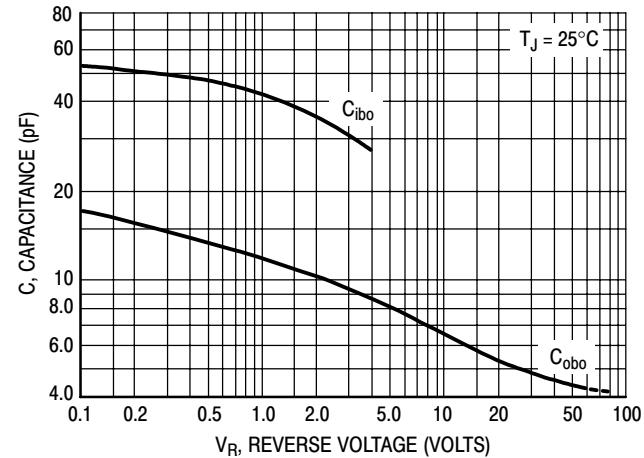


Figure 5. Capacitance

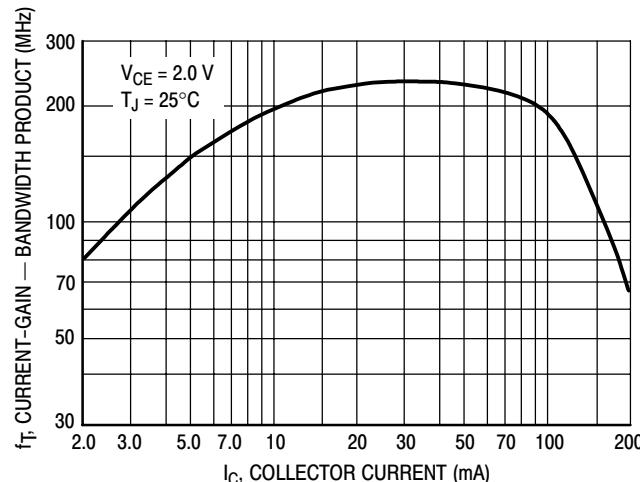


Figure 6. Current-Gain - Bandwidth Product

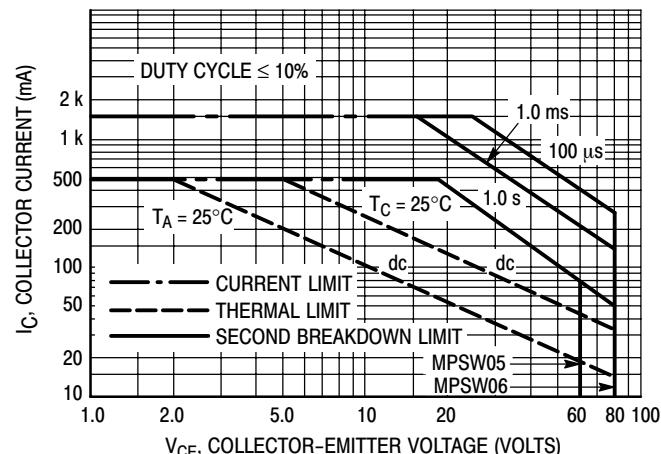
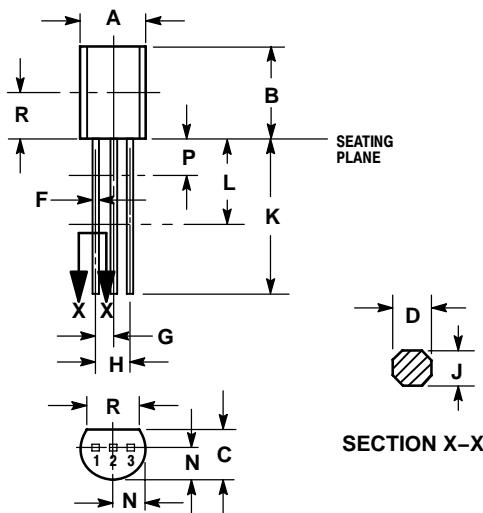


Figure 7. Active Region - Safe Operating Area

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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:

1. Emitter
2. Base
3. Collector

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