

MPSW05, MPSW06

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/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°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

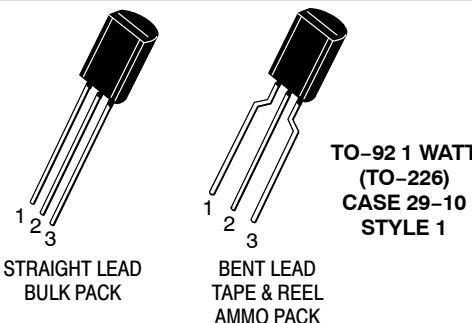
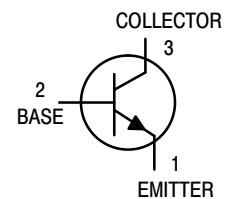
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	$^\circ\text{C/W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

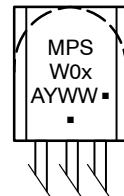


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MARKING DIAGRAM



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 [†]
MPSW05G	TO-92 (Pb-Free)	5000 Units/Bulk
MPSW06G	TO-92 (Pb-Free)	5000 Units/Bulk
MPSW06RLRA	TO-92	2000/Tape & Reel
MPSW06RLRAG	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 Specifications 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.

MPSW05, MPSW06

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 ($V_{\text{CE}} = 40 \text{ Vdc}$, $I_B = 0$) ($V_{\text{CE}} = 60 \text{ Vdc}$, $I_B = 0$)	I_{CES} MPSW05 MPSW06	– –	0.5 0.5	μA_dc
Collector Cutoff Current ($V_{\text{CB}} = 40 \text{ Vdc}$, $I_E = 0$) ($V_{\text{CB}} = 60 \text{ Vdc}$, $I_E = 0$)	I_{CBO} MPSW05 MPSW06	– –	0.1 0.1	μA_dc
Emitter Cutoff Current ($V_{\text{EB}} = 3.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	0.1	μA_dc

ON CHARACTERISTICS (Note 1)

DC Current Gain ($I_C = 50 \text{ mA}_\text{dc}$, $V_{\text{CE}} = 1.0 \text{ Vdc}$) ($I_C = 250 \text{ mA}_\text{dc}$, $V_{\text{CE}} = 1.0 \text{ Vdc}$)	h_{FE}	80 60	–	–
Collector – Emitter Saturation Voltage ($I_C = 250 \text{ mA}_\text{dc}$, $I_B = 10 \text{ mA}_\text{dc}$)	$V_{\text{CE}(\text{sat})}$	–	0.4	Vdc
Base – Emitter Saturation Voltage ($I_C = 250 \text{ mA}_\text{dc}$, $V_{\text{CE}} = 5.0 \text{ Vdc}$)	$V_{\text{BE}(\text{sat})}$	–	1.2	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current – Gain – Bandwidth Product ($I_C = 200 \text{ mA}_\text{dc}$, $V_{\text{CE}} = 5.0 \text{ Vdc}$, $f = 20 \text{ MHz}$)	f_T	50	–	MHz
Output Capacitance ($V_{\text{CB}} = 10 \text{ V}$, $f = 1.0 \text{ MHz}$)	C_{obo}	–	12	pF

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

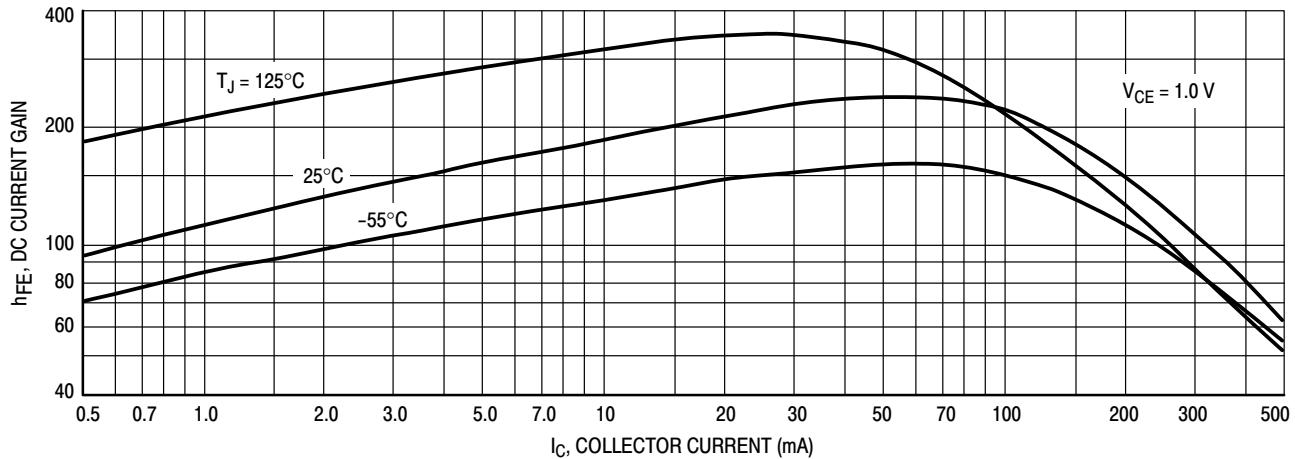


Figure 1. DC Current Gain

MPSW05, MPSW06

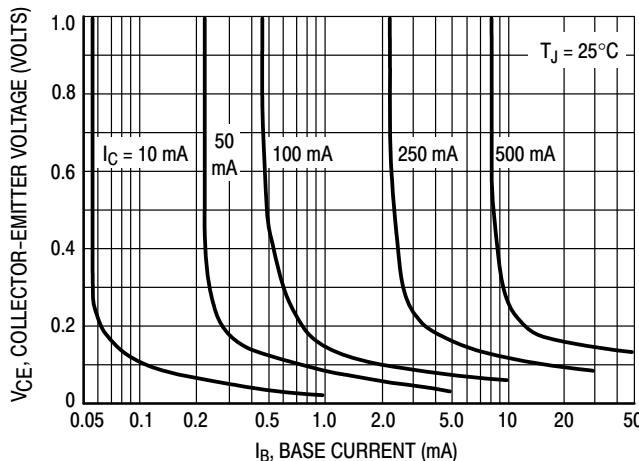


Figure 2. Collector Saturation Region

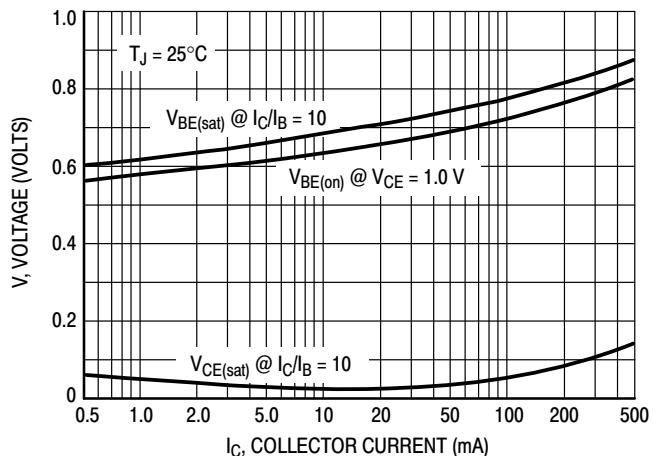


Figure 3. "On" Voltages

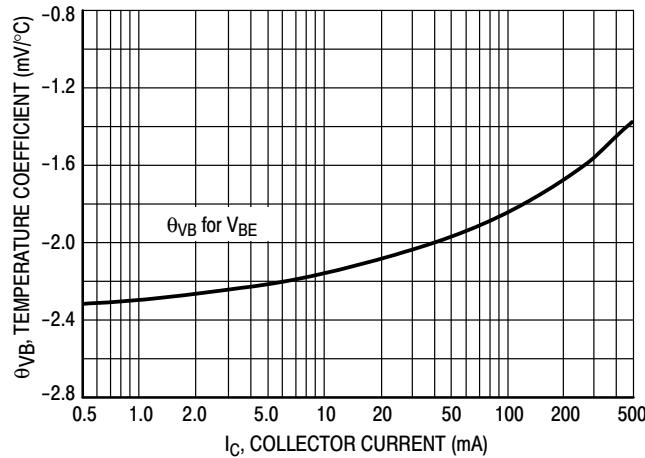


Figure 4. Base-Emitter Temperature Coefficient

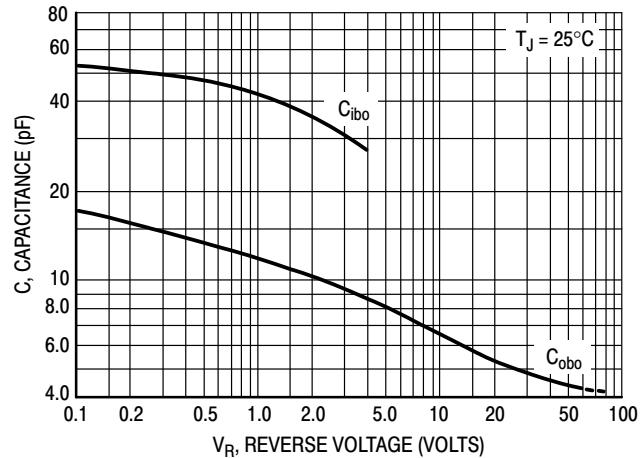


Figure 5. Capacitance

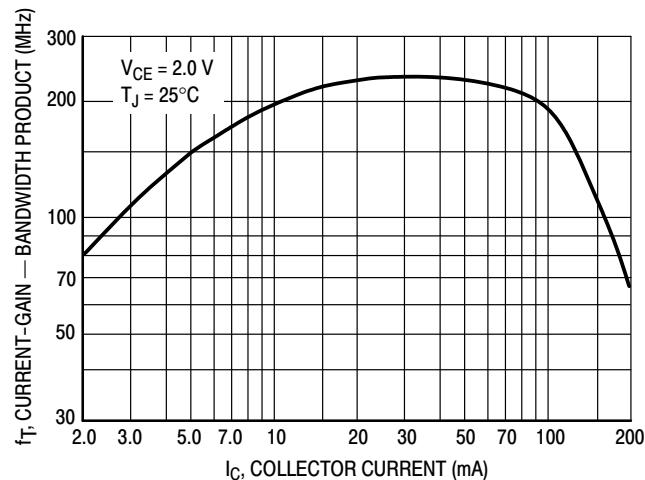


Figure 6. Current-Gain - Bandwidth Product

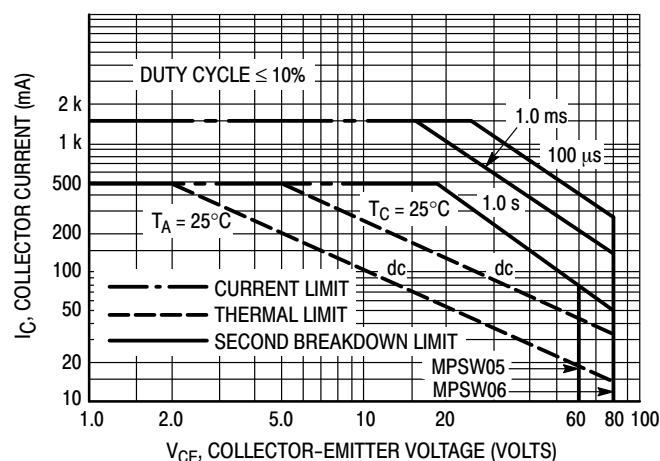
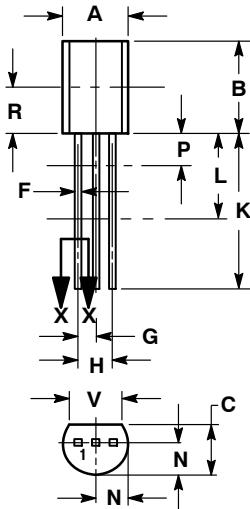


Figure 7. Active Region - Safe Operating Area

MPSW05, MPSW06

PACKAGE DIMENSIONS

TO-92 (TO-226) 1 WATT CASE 29-10 ISSUE O



STRAIGHT LEAD
BULK PACK

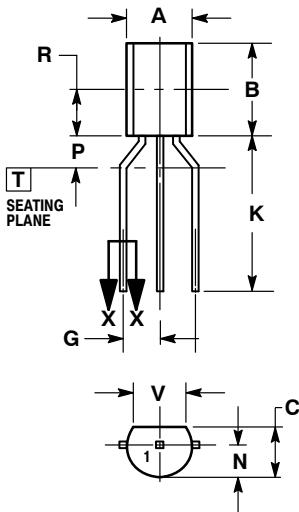
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION 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	0.46	0.53
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	0.018	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	---
V	0.135	---	3.43	---

STYLE 1:
1. Emitter
2. Base
3. Collector

SECTION X-X



BENT LEAD
TAPE & REEL
AMMO PACK

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
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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	0.46	0.53
G	0.094	0.102	2.40	2.80
J	0.018	0.024	0.46	0.61
K	0.500	---	12.70	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.135	---	3.43	---
V	0.135	---	3.43	---

SECTION X-X

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