



# THE DATASHEET OF MPSW56RLRA



# MPSW55, MPSW56

## One Watt Amplifier Transistors

### PNP Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit	
Collector - Emitter Voltage	MPSW55 MPSW56	$V_{CEO}$	-60 -80	Vdc
Collector - Base Voltage	MPSW55 MPSW56	$V_{CBO}$	-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	$^\circ\text{C}/\text{W}$

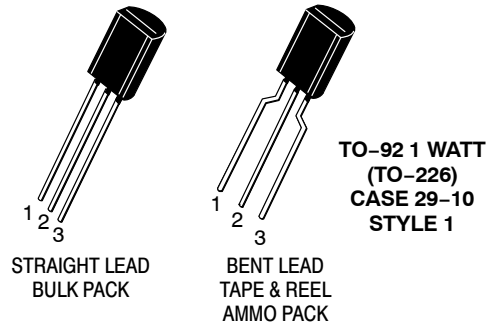
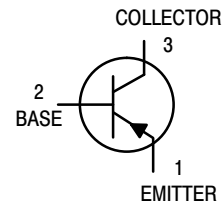
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

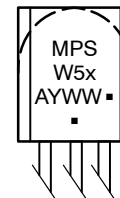


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#### MARKING DIAGRAM



- 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†
MPSW55G	TO-92 (Pb-Free)	5000 Units/Bulk
MPSW55RLRAG	TO-92 (Pb-Free)	2000/Tape & Reel
MPSW56RLRP	TO-92	2000/Ammo Pack
MPSW56RLRPG	TO-92 (Pb-Free)	2000/Ammo Pack

†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.

# MPSW55, MPSW56

## 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) ( $I_C = -1.0\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	-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 ( $V_{CE} = -40\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = -60\text{ Vdc}$ , $I_B = 0$ )	$I_{CES}$	-	-0.5 -0.5	$\mu\text{A}$
Collector Cutoff Current ( $V_{CB} = -40\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = -60\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	-	-0.1 -0.1	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = -3.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	-	-0.1	$\mu\text{A}$
<b>ON CHARACTERISTICS<sup>(1)</sup></b>				
DC Current Gain ( $I_C = -50\text{ mA}$ , $V_{CE} = -1.0\text{ Vdc}$ ) ( $I_C = -250\text{ mA}$ , $V_{CE} = -1.0\text{ Vdc}$ )	$h_{FE}$	100 50	- -	-
Collector - Emitter Saturation Voltage ( $I_C = -250\text{ mA}$ , $I_B = -10\text{ mA}$ )	$V_{CE(sat)}$	-	-0.5	Vdc
Base - Emitter On Voltage ( $I_C = -250\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ )	$V_{BE(on)}$	-	-1.2	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current - Gain — Bandwidth Product ( $I_C = -250\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ , $f = 20\text{ MHz}$ )	$f_T$	50	-	MHz
Output Capacitance ( $V_{CB} = -10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$C_{obo}$	-	15	pF

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

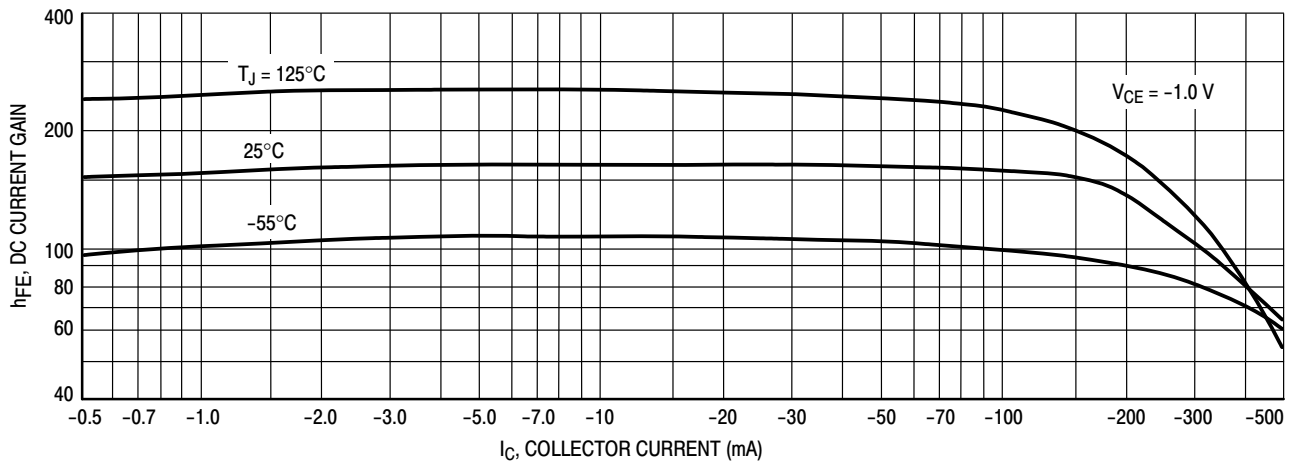


Figure 1. DC Current Gain

# MPSW55, MPSW56

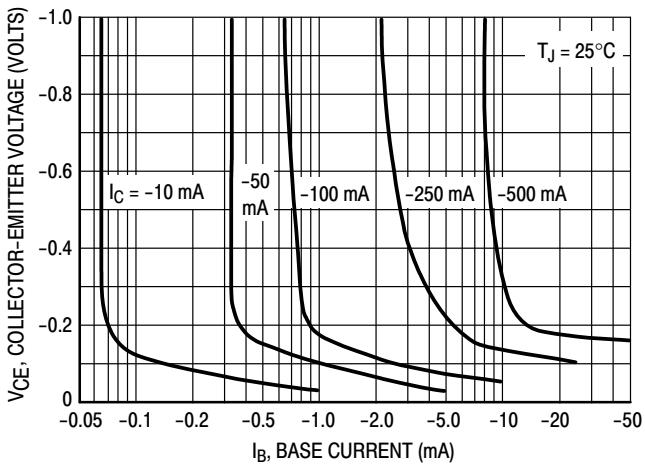


Figure 2. Collector Saturation Region

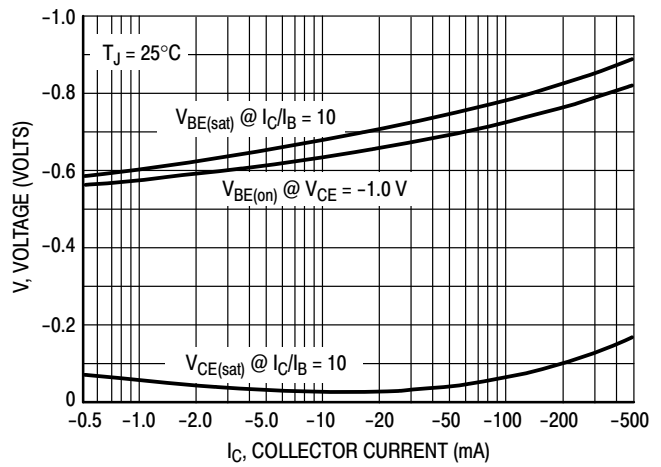


Figure 3. "On" Voltages

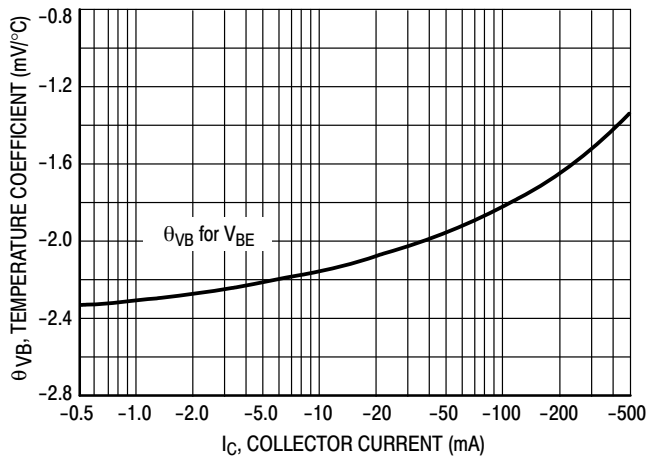


Figure 4. Base-Emitter Temperature Coefficient

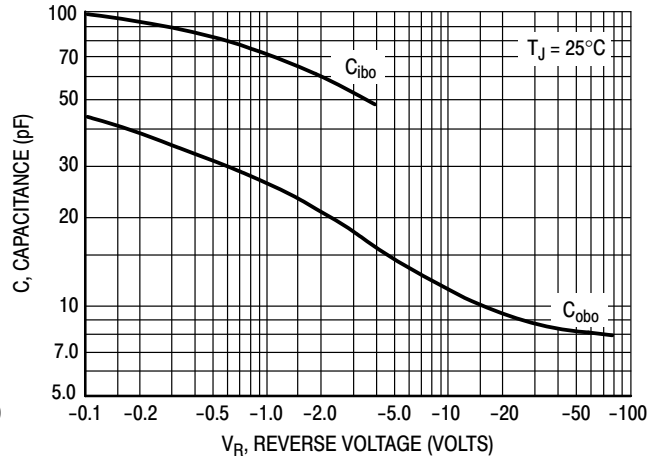


Figure 5. Capacitance

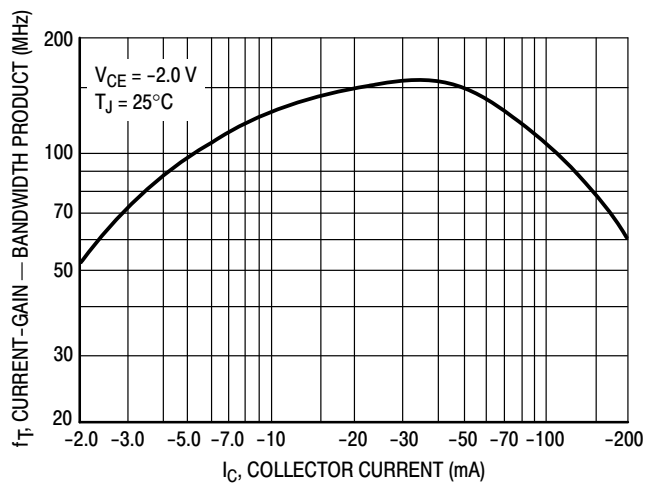


Figure 6. Current-Gain — Bandwidth Product

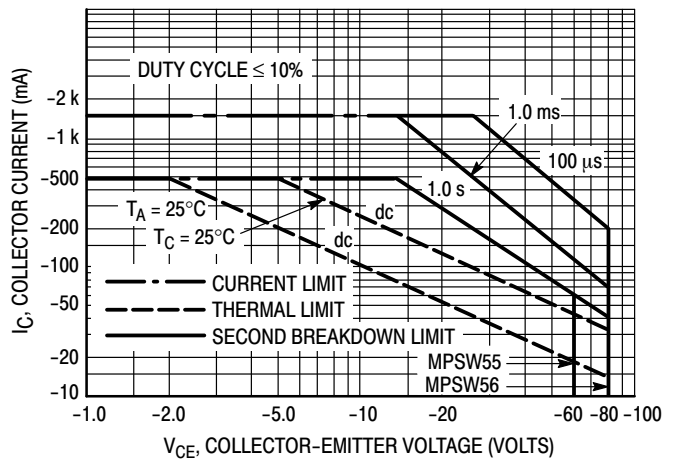
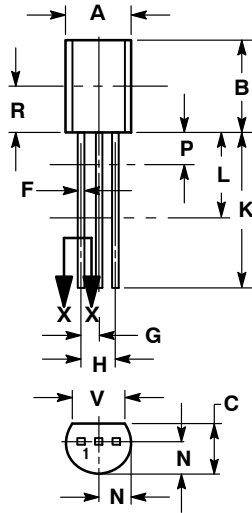


Figure 7. Active Region — Safe Operating Area

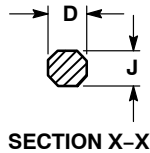
# MPSW55, MPSW56

## PACKAGE DIMENSIONS

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



STRAIGHT LEAD  
BULK PACK



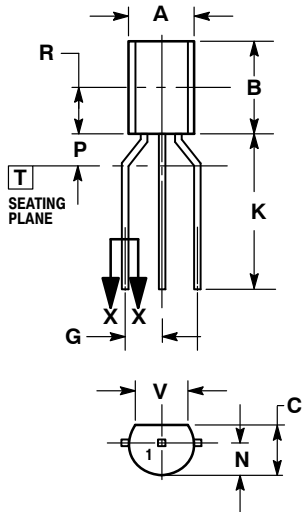
SECTION X-X

NOTES:

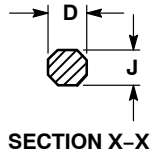
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION 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:  
PIN 1. EMITTER  
2. BASE  
3. COLLECTOR



BENT LEAD  
TAPE & REEL  
AMMO PACK



SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
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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	---

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