

# One Watt Amplifier Transistors

## PNP Silicon

**MPSW55**  
**MPSW56\***

\*ON Semiconductor Preferred Device

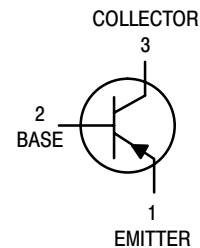
### MAXIMUM RATINGS

Rating	Symbol	MPSW55	MPSW56	Unit
Collector–Emitter Voltage	$V_{CEO}$	-60	-80	Vdc
Collector–Base Voltage	$V_{CBO}$	-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	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	2.5	20	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150		$^\circ\text{C}$

**CASE 29-10, STYLE 1**  
**TO-92 (TO-226AE)**

### 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	$^\circ\text{C}/\text{W}$



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

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = -1.0$ mAdc, $I_B = 0$ )	MPSW55 MPSW56	$V_{(BR)CEO}$	-60 -80	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = -100$ $\mu$ Adc, $I_C = 0$ )		$V_{(BR)EBO}$	-4.0	—	Vdc
Collector Cutoff Current ( $V_{CE} = -40$ Vdc, $I_B = 0$ ) ( $V_{CE} = -60$ Vdc, $I_B = 0$ )	MPSW55 MPSW56	$I_{CES}$	— —	-0.5 -0.5	$\mu$ Adc
Collector Cutoff Current ( $V_{CB} = -40$ Vdc, $I_E = 0$ ) ( $V_{CB} = -60$ Vdc, $I_E = 0$ )	MPSW55 MPSW56	$I_{CBO}$	— —	-0.1 -0.1	$\mu$ Adc
Emitter Cutoff Current ( $V_{EB} = -3.0$ Vdc, $I_C = 0$ )		$I_{EBO}$	—	-0.1	$\mu$ Adc

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

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

# MPSW55 MPSW56

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

Characteristic	Symbol	Min	Max	Unit
<b>ON CHARACTERISTICS<sup>(1)</sup></b>				
DC Current Gain ( $I_C = -50\text{ mAdc}$ , $V_{CE} = -1.0\text{ Vdc}$ ) ( $I_C = -250\text{ mAdc}$ , $V_{CE} = -1.0\text{ Vdc}$ )	$h_{FE}$	100 50	— —	—
Collector–Emitter Saturation Voltage ( $I_C = -250\text{ mAdc}$ , $I_B = -10\text{ mAdc}$ )	$V_{CE(sat)}$	—	-0.5	Vdc
Base–Emitter On Voltage ( $I_C = -250\text{ mAdc}$ , $V_{CE} = -5.0\text{ Vdc}$ )	$V_{BE(on)}$	—	-1.2	Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>				
Current–Gain — Bandwidth Product ( $I_C = -250\text{ mAdc}$ , $V_{CE} = -5.0\text{ Vdc}$ , $f = 20\text{ MHz}$ )	$f_T$	50	—	MHz
Output Capacitance ( $V_{CB} = -10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$C_{obo}$	—	15	pF

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

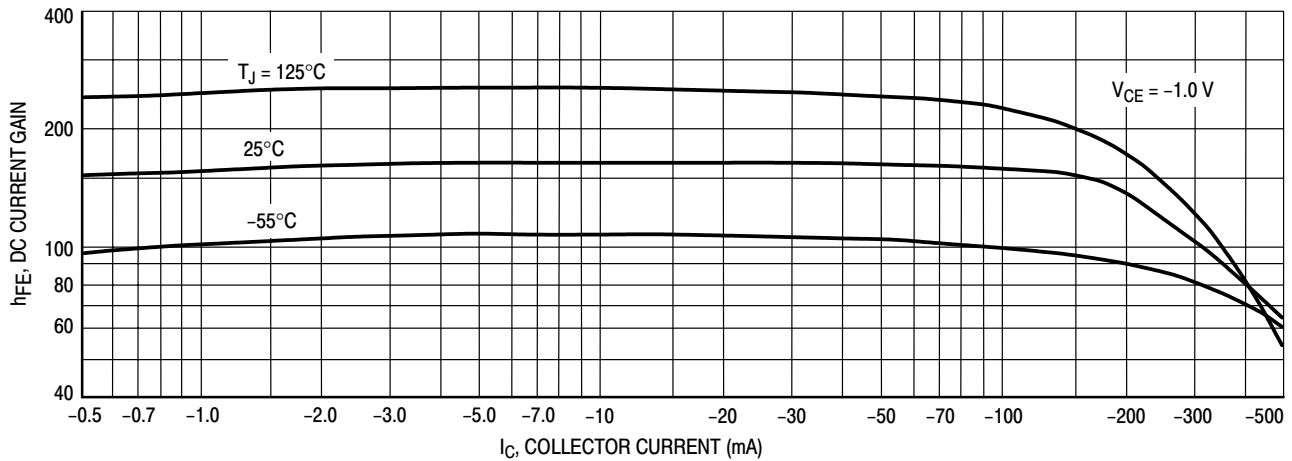


Figure 1. DC Current Gain

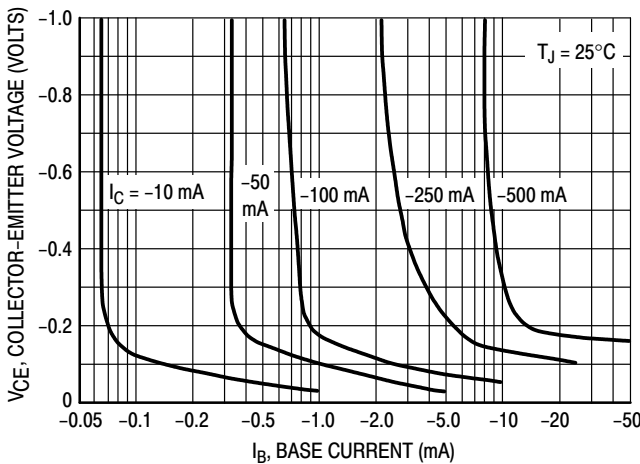


Figure 2. Collector Saturation Region

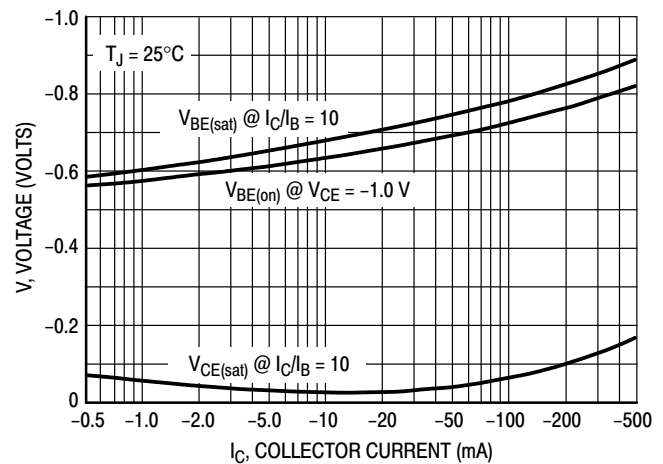


Figure 3. "On" Voltages

# MPSW55 MPSW56

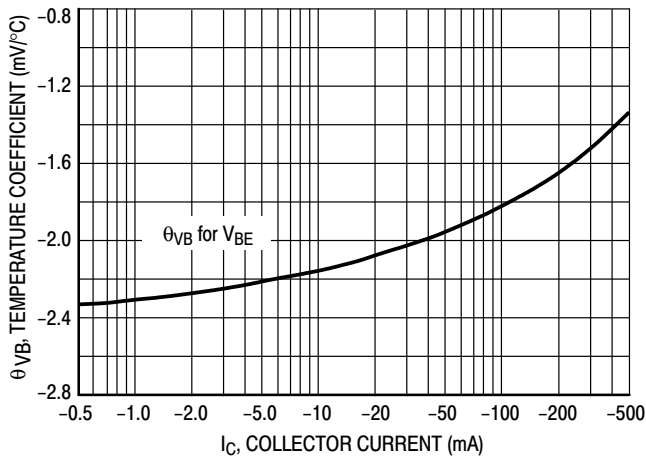


Figure 4. Base-Emitter Temperature Coefficient

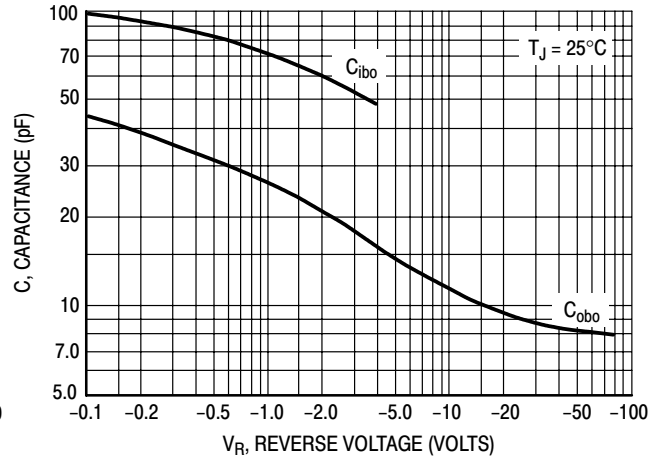


Figure 5. Capacitance

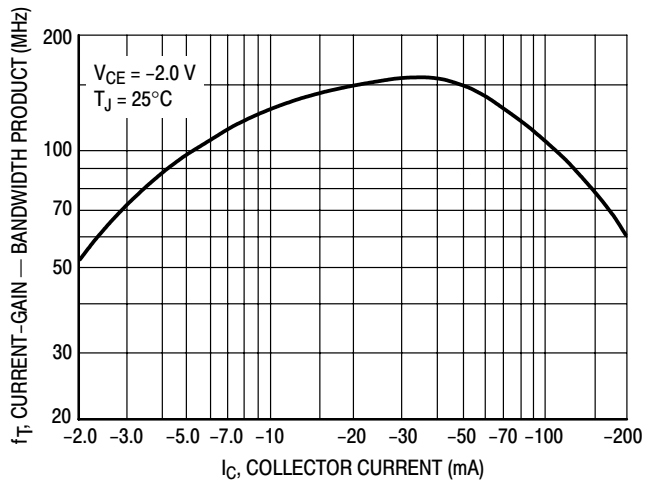


Figure 6. Current-Gain — Bandwidth Product

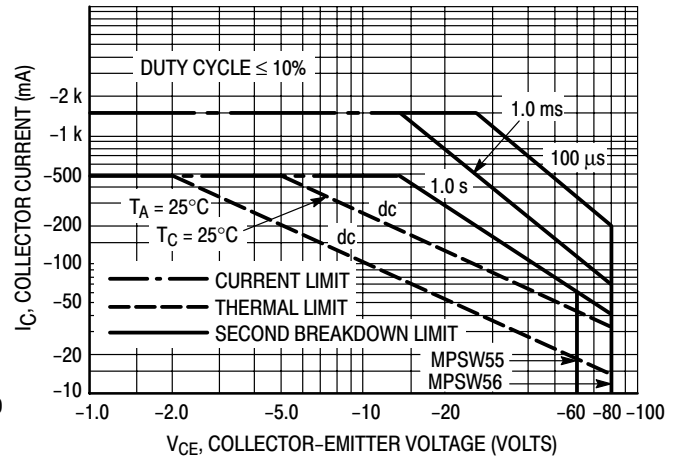
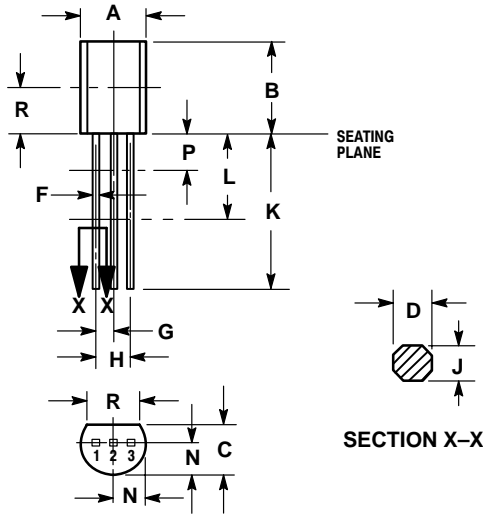


Figure 7. Active Region — Safe Operating Area

# MPSW55 MPSW56

## PACKAGE DIMENSIONS

### TO-92 (TO-226) 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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