

# One Watt Amplifier Transistors

## NPN Silicon

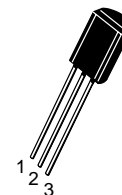
# MPSW05

# MPSW06

MPSW06 is a Preferred Device

### MAXIMUM RATINGS

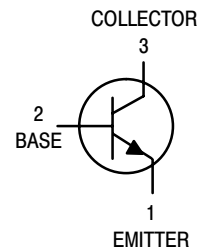
Rating	Symbol	MPSW05	MPSW06	Unit
Collector–Emitter Voltage	$V_{CEO}$	60	80	Vdc
Collector–Base Voltage	$V_{CBO}$	60	80	Vdc
Emitter–Base Voltage	$V_{EBO}$	4.0		Vdc
Collector Current — Continuous	$I_C$	500		mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0		Watt
		8.0		mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	2.5		Watts
		20		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
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = 1.0 \text{ mAdc}, I_B = 0$ )	$V_{(BR)CEO}$	60	—	Vdc
		80	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 100 \mu\text{Adc}, I_C = 0$ )	$V_{(BR)EBO}$	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	$\mu\text{Adc}$
		—	0.5	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CB} = 40 \text{ Vdc}, I_E = 0$ ) ( $V_{CB} = 60 \text{ Vdc}, I_E = 0$ )	$I_{CBO}$	—	0.1	$\mu\text{Adc}$
		—	0.1	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 3.0 \text{ Vdc}, I_C = 0$ )	$I_{EBO}$	—	0.1	$\mu\text{Adc}$

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

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

# MPSW05 MPSW06

## 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 ( $I_C = 50\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ ) ( $I_C = 250\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ )	$h_{FE}$	80 60	— —	—
Collector–Emitter Saturation Voltage ( $I_C = 250\text{ mAdc}$ , $I_B = 10\text{ mAdc}$ )	$V_{CE(sat)}$	—	0.4	Vdc
Base–Emitter Saturation Voltage ( $I_C = 250\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$V_{BE(sat)}$	—	1.2	Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>				
Current–Gain — Bandwidth Product ( $I_C = 200\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 20\text{ MHz}$ )	$f_T$	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  $\leq 2.0\%$ .

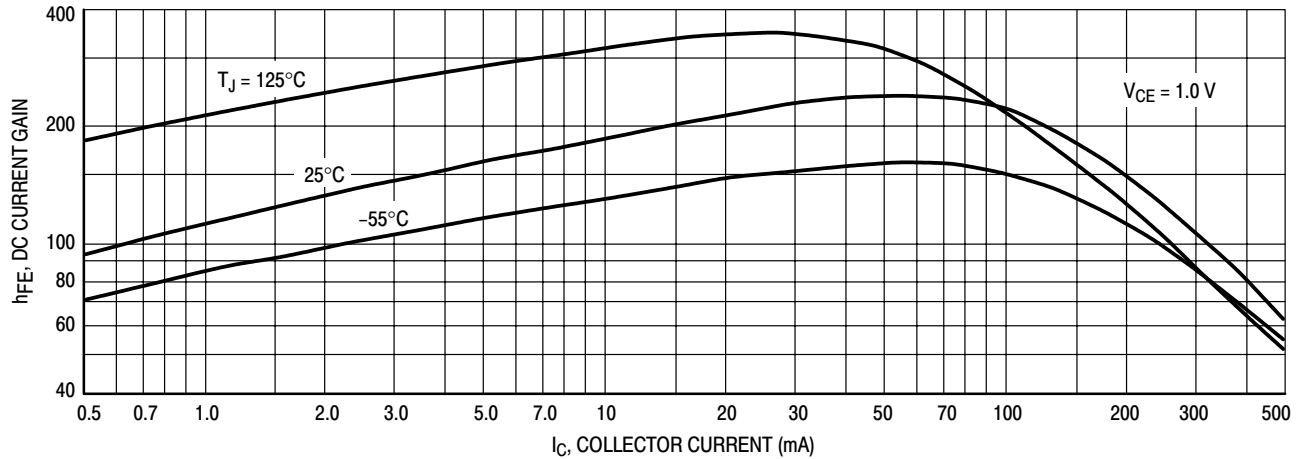


Figure 1. DC Current Gain

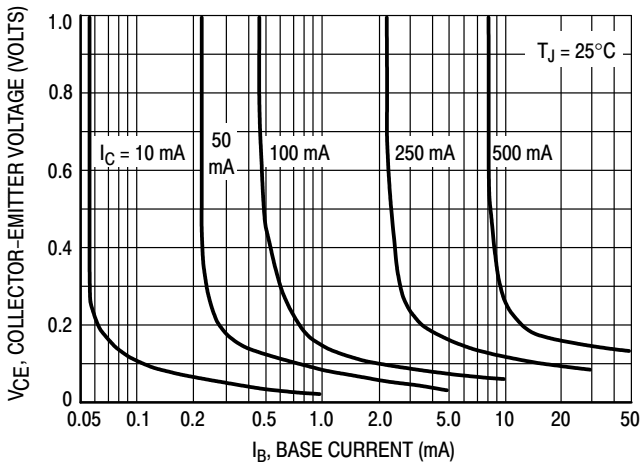


Figure 2. Collector Saturation Region

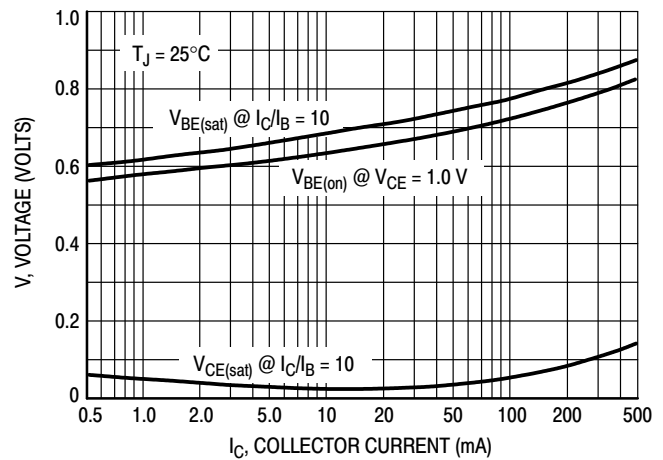


Figure 3. "On" Voltages

# MPSW05 MPSW06

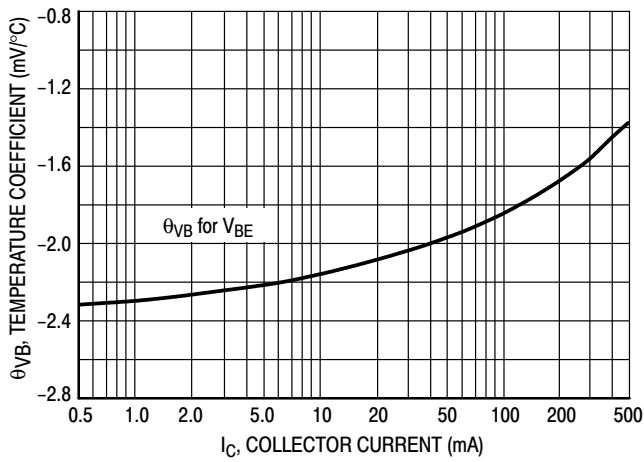


Figure 4. Base-Emitter Temperature Coefficient

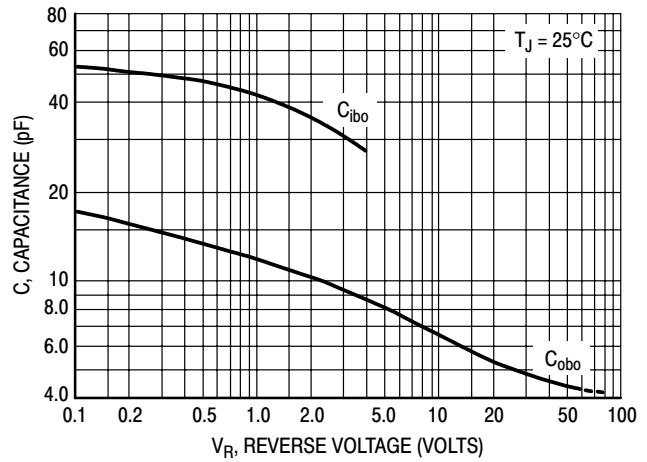


Figure 5. Capacitance

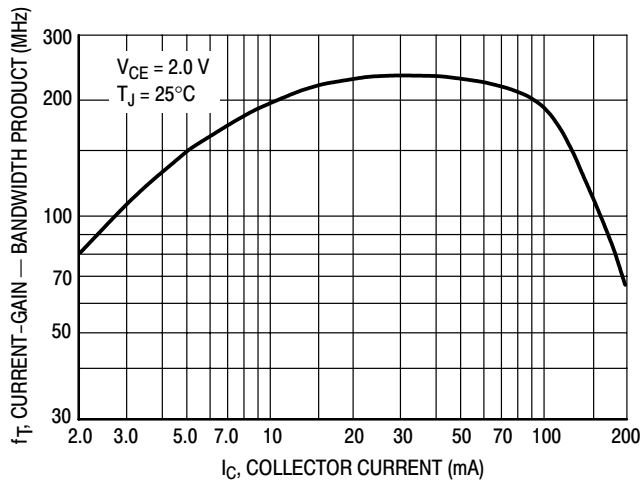


Figure 6. Current-Gain — Bandwidth Product

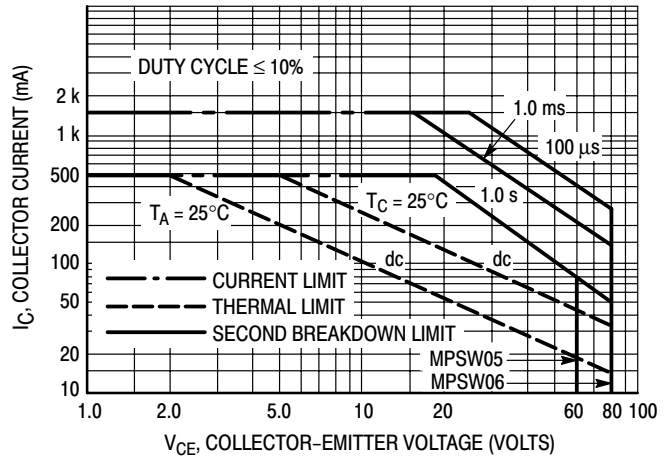


Figure 7. Active Region — Safe Operating Area