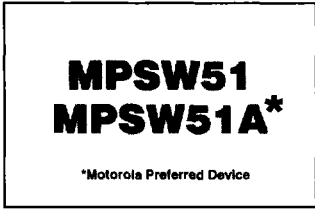
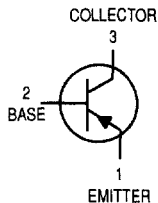


# One Watt High Current Transistors

## PNP Silicon



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage MPSW51 MPSW51A	$V_{CEO}$	-30 -40	Vdc
Collector-Base Voltage MPSW51 MPSW51A	$V_{CBO}$	-40 -50	Vdc
Emitter-Base Voltage	$V_{EBO}$	-5.0	Vdc
Collector Current -- Continuous	$I_C$	-1000	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 8.0	Watts 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	$^\circ\text{C}$

### 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
----------------	--------	-----	-----	------

### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = -1.0$ mAdc, $I_E = 0$ )	MPSW51 MPSW51A	$V_{(BR)CEO}$	-30 -40	— —	Vdc
Collector-Base Breakdown Voltage ( $I_C = -100$ $\mu\text{Adc}$ , $I_E = 0$ )	MPSW51 MPSW51A	$V_{(BR)CBO}$	-40 -50	— —	Vdc
Emitter-Base Breakdown Voltage ( $I_E = -100$ $\mu\text{Adc}$ , $I_C = 0$ )		$V_{(BR)EBO}$	-5.0	—	Vdc
Collector Cutoff Current ( $V_{CB} = -30$ Vdc, $I_E = 0$ ) ( $V_{CB} = -40$ Vdc, $I_E = 0$ )	MPSW51 MPSW51A	$I_{CBO}$	— —	-0.1 -0.1	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = -3.0$ 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 Motorola recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
<b>ON CHARACTERISTICS</b>				
DC Current Gain (I <sub>C</sub> = -10 mA, V <sub>CE</sub> = -1.0 Vdc) (I <sub>C</sub> = -100 mA, V <sub>CE</sub> = -1.0 Vdc) (I <sub>C</sub> = -1000 mA, V <sub>CE</sub> = -1.0 Vdc)	h <sub>FE</sub>	55 60 50	— — —	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = -1000 mA, I <sub>B</sub> = -100 mA)	V <sub>CE(sat)</sub>	—	-0.7	Vdc
Base-Emitter On Voltage (I <sub>C</sub> = -1000 mA, V <sub>CE</sub> = -1.0 Vdc)	V <sub>BE(on)</sub>	—	-1.2	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current-Gain - Bandwidth Product (I <sub>C</sub> = -50 mA, V <sub>CE</sub> = -10 Vdc, f = 20 MHz)	f <sub>T</sub>	50	—	MHz
Output Capacitance (V <sub>CB</sub> = -10 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>obo</sub>	—	30	pF

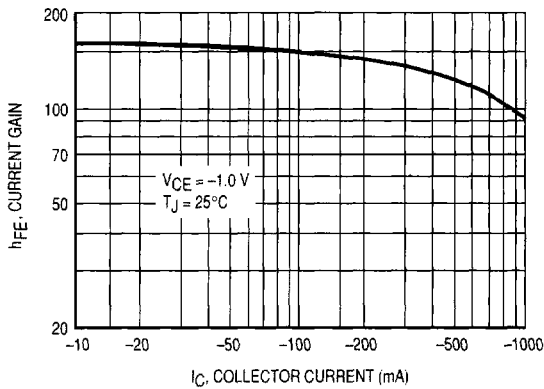


Figure 1. DC Current Gain

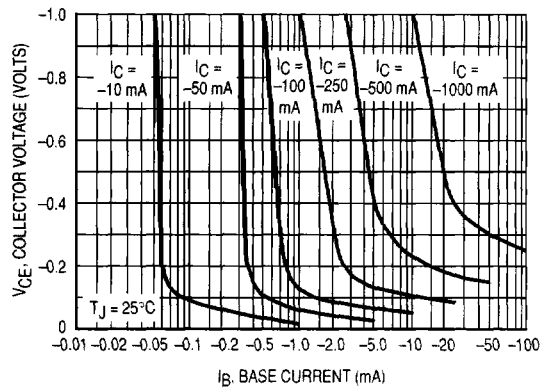


Figure 2. Collector Saturation Region

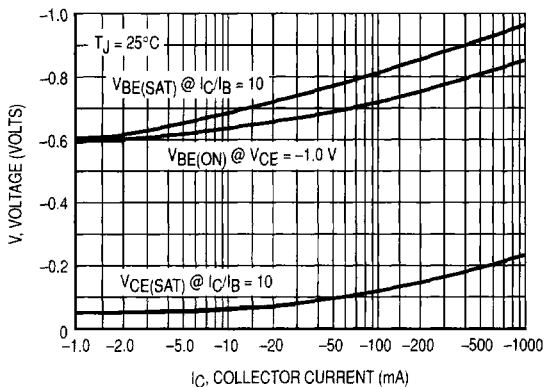


Figure 3. "ON" Voltages

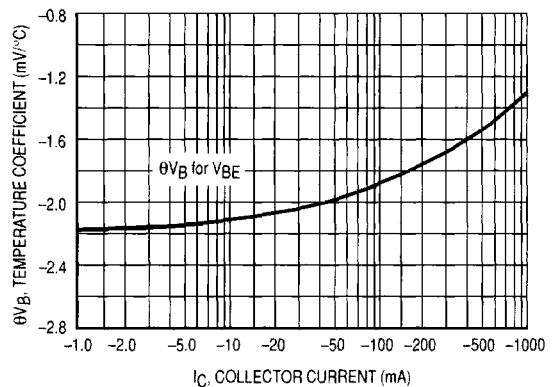
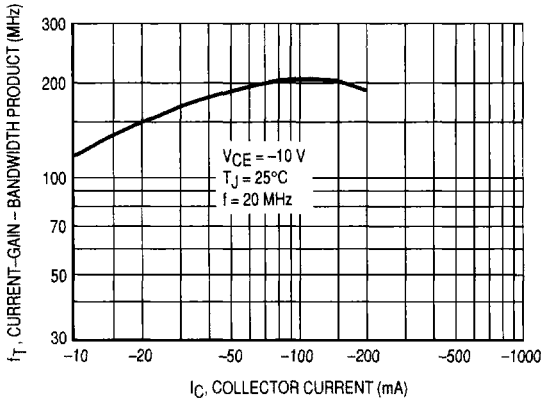
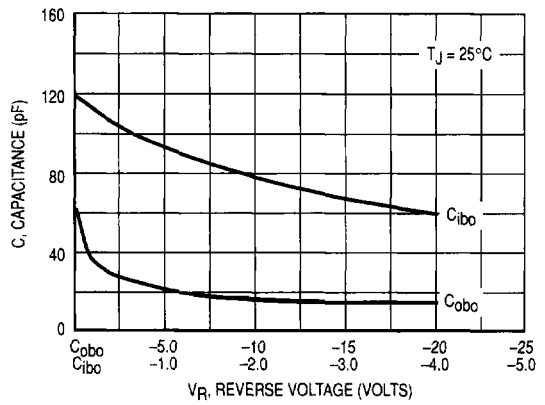


Figure 4. Temperature Coefficient

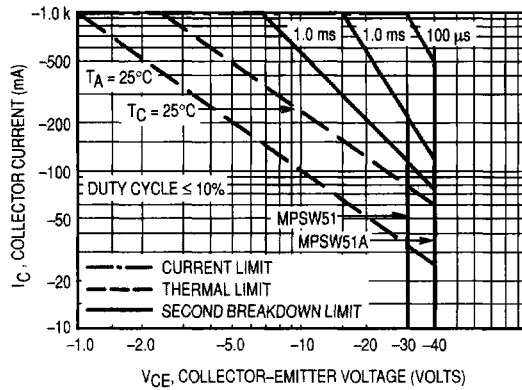
**MPSW51 MPSW51A**



**Figure 5. Current Gain — Bandwidth Product**



**Figure 6. Capacitance**



**Figure 7. Active Region — Safe Operating Area**