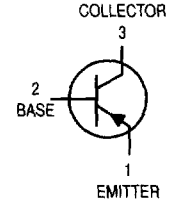
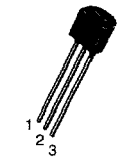
One Watt Amplifier Transistors
PNP Silicon

MPSW55
MPSW56*

*Motorola Preferred Device





CASE 29–05, STYLE 1
TO–92 (TO–226AE)

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°C Derate above 25°C	P_D	1.0 8.0		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	2.5 20		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150		°C

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage[1] (I_C = –1.0 mAdc, I_B = 0)	 MPSW55 MPSW56	$V_{(BR)CEO}$	 –60 –80	 — —	Vdc
Emitter–Base Breakdown Voltage (I_E = –100 µAdc, 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	µAdc
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	µAdc
Emitter Cutoff Current (V_{EB} = –3.0 Vdc, I_C = 0)		I_{EBO}	—	–0.1	µAdc

1. Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%.

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

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

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

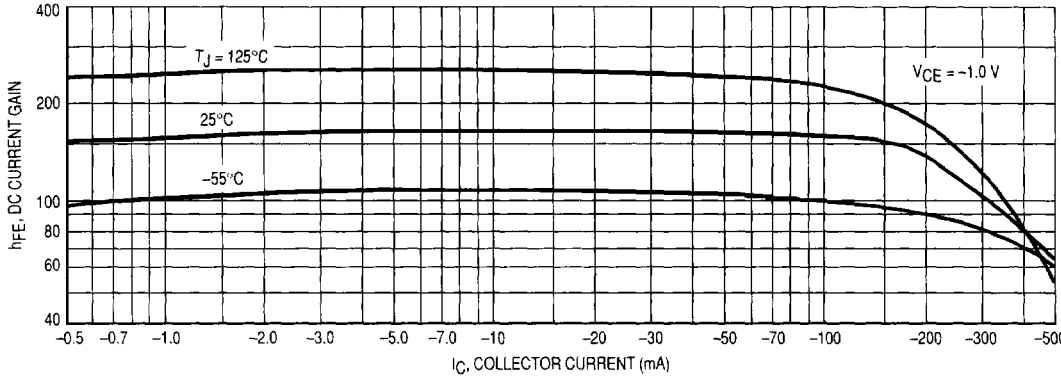


Figure 1. DC Current Gain

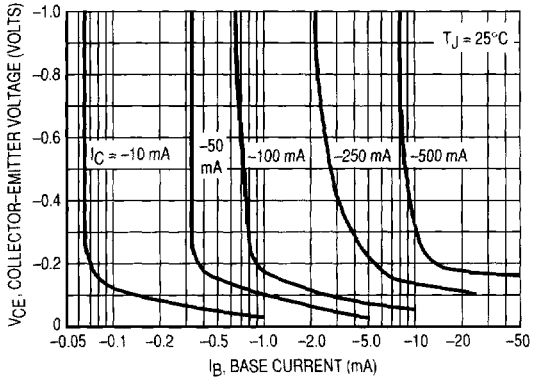


Figure 2. Collector Saturation Region

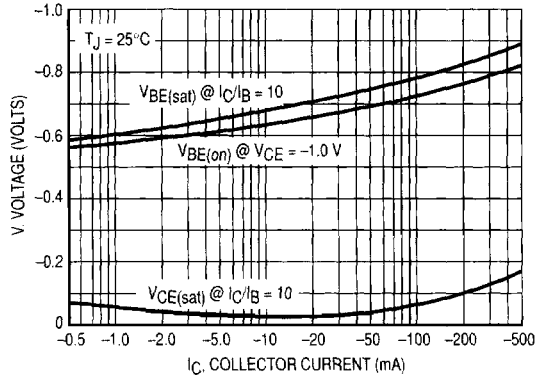


Figure 3. "On" Voltages

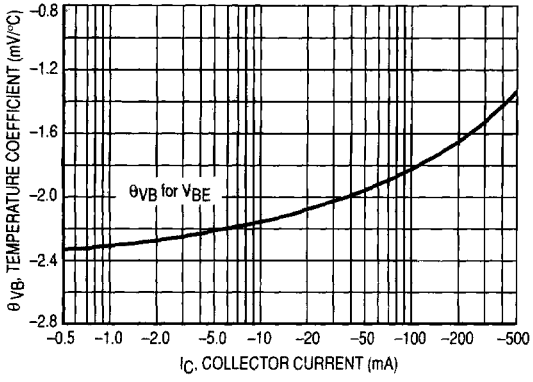


Figure 4. Base–Emitter Temperature Coefficient

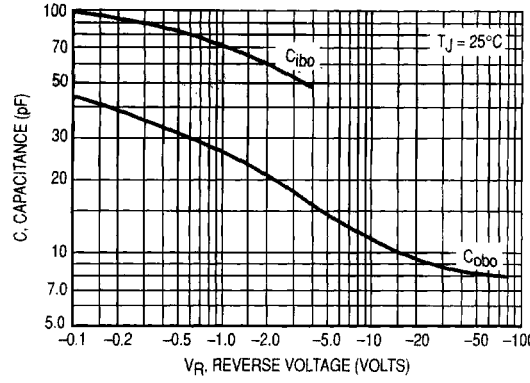


Figure 5. Capacitance

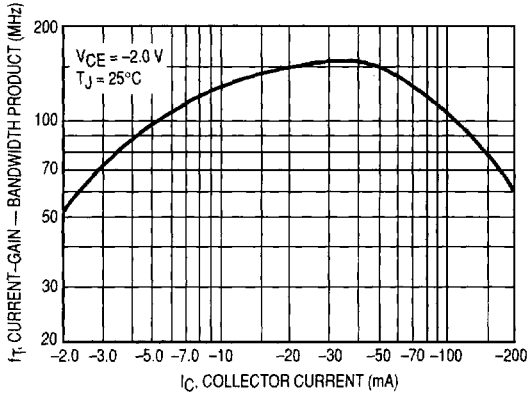


Figure 6. Current–Gain — Bandwidth Product

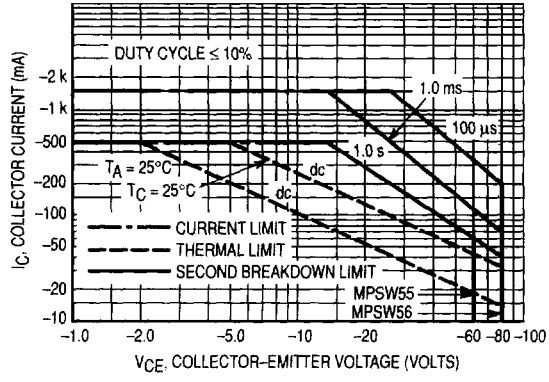


Figure 7. Active Region — Safe Operating Area