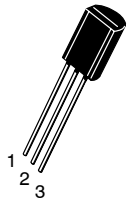
One Watt High Current Transistors

PNP Silicon

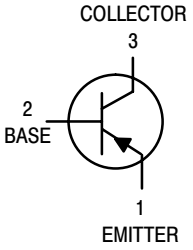
MPSW51
MPSW51A*

*ON Semiconductor Preferred Device

- **These devices are available in Pb−free package(s). Specifications herein apply to both standard and Pb−free devices. Please see our website at www.onsemi.com for specific Pb−free orderable part numbers, or contact your local ON Semiconductor sales office or representative.**



CASE 29−10, STYLE 1
TO−92 (TO−226AE)



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°C Derate above 25°C		P_D	1.0 8.0	Watts 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)	 MPSW51 MPSW51A	$V_{(BR)CEO}$	 −30 −40	 — —	Vdc
Collector − Base Breakdown Voltage (I_C = −100 μAdc, I_E = 0)	 MPSW51 MPSW51A	$V_{(BR)CBO}$	 −40 −50	 — —	Vdc
Emitter − Base Breakdown Voltage (I_E = −100 μAdc, 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	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 ON Semiconductor 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				
DC Current Gain (I_C = −10 mAdc, V_{CE} = −1.0 Vdc) (I_C = −100 mAdc, V_{CE} = −1.0 Vdc) (I_C = −1000 mAdc, V_{CE} = −1.0 Vdc)	h_{FE}	 55 60 50	 — — —	—
Collector − Emitter Saturation Voltage (I_C = −1000 mAdc, I_B = −100 mAdc)	$V_{CE(sat)}$	—	−0.7	Vdc
Base − Emitter On Voltage (I_C = −1000 mAdc, V_{CE} = −1.0 Vdc)	$V_{BE(on)}$	—	−1.2	Vdc
SMALL−SIGNAL CHARACTERISTICS				
Current−Gain − Bandwidth Product (I_C = −50 mAdc, V_{CE} = −10 Vdc, f = 20 MHz)	f_T	50	—	MHz
Output Capacitance (V_{CB} = −10 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	—	30	pF

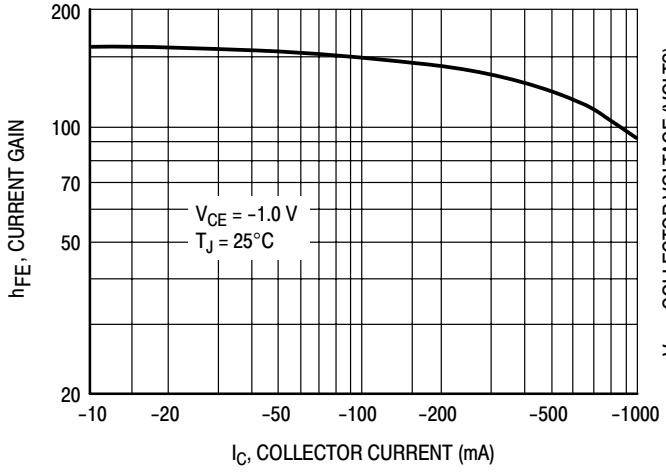


Figure 1. DC Current Gain

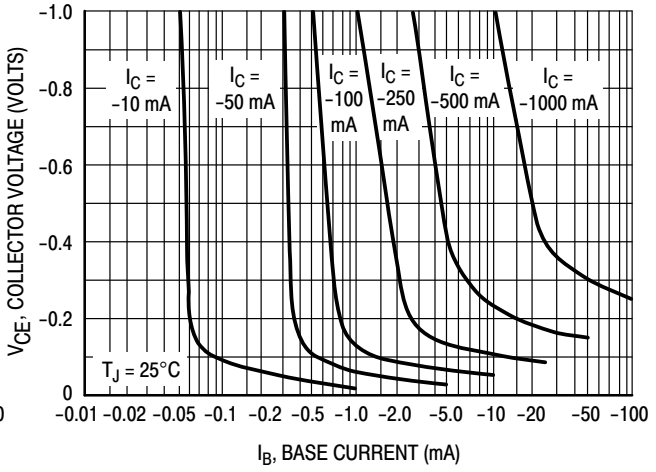


Figure 2. Collector Saturation Region

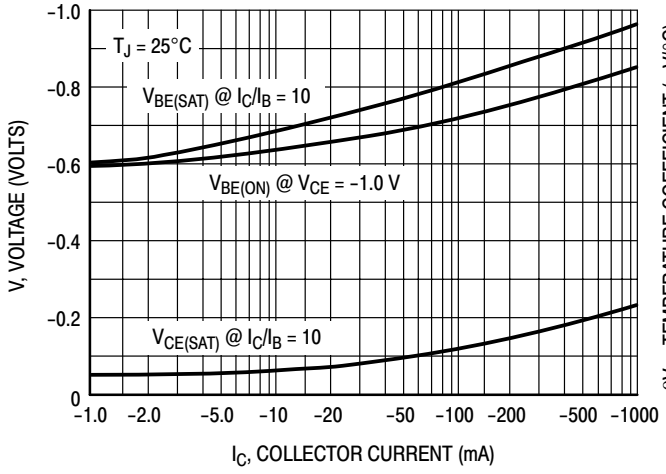


Figure 3. "ON" Voltages

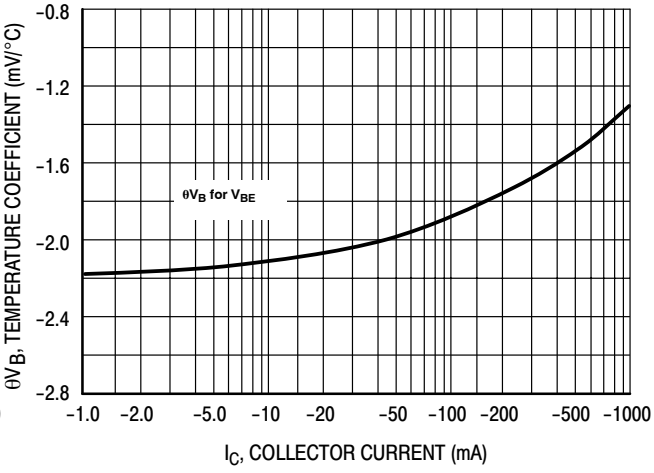


Figure 4. Temperature Coefficient

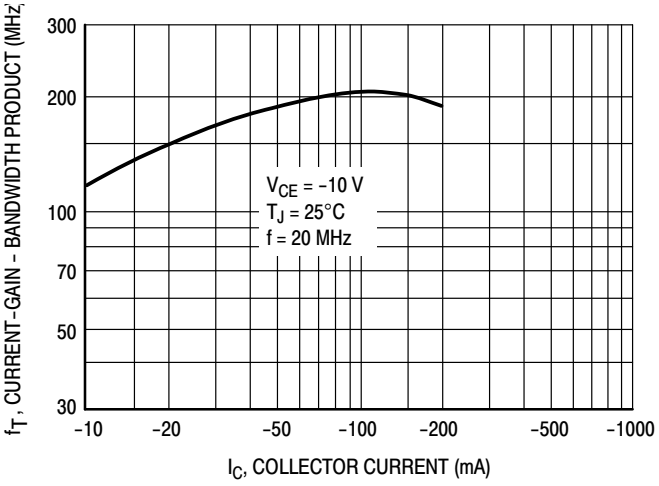


Figure 5. Current Gain — Bandwidth Product

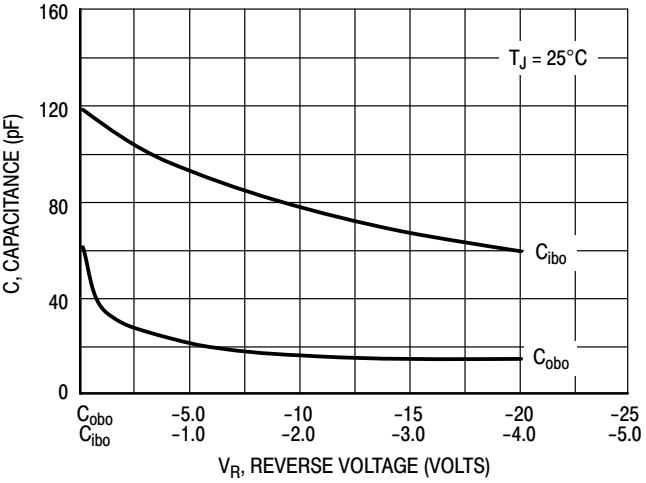


Figure 6. Capacitance

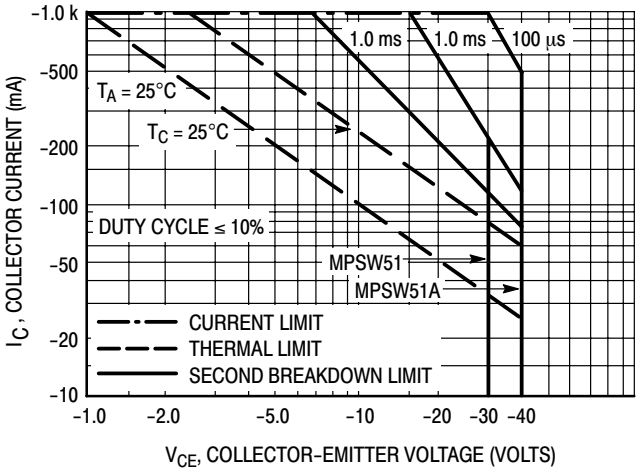
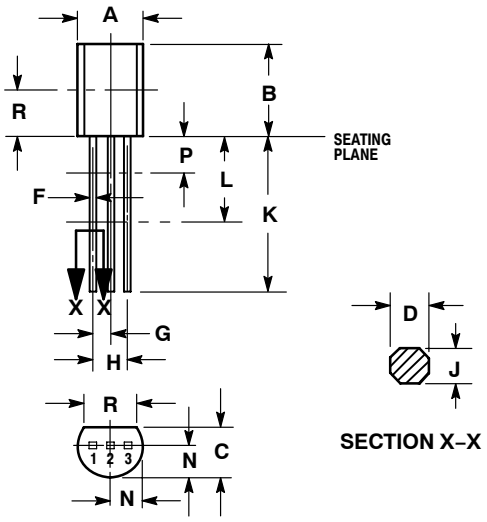


Figure 7. Active Region — Safe Operating Area

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 MIMIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	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:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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