

MPSW51, MPSW51A

One Watt High Current Transistors

PNP Silicon

Features

- These Devices are Pb-Free and are RoHS Compliant*

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°C	P_D	1.0 8.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.5 20	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

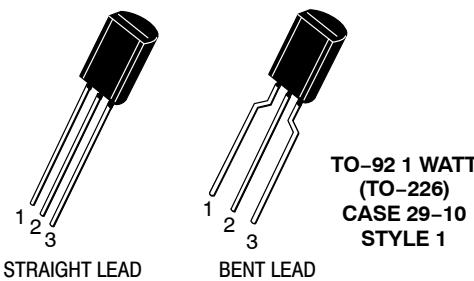
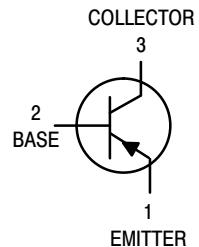
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	$^\circ\text{C/W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

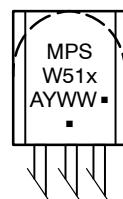


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MARKING DIAGRAM



x = 51A Devices
A = Assembly Location
Y = Year
WW = Work Week
■ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector – Emitter Breakdown Voltage (Note 1) ($I_C = -1.0 \text{ mA DC}$, $I_B = 0$)	MPSW51 MPSW51A	$V_{(\text{BR})\text{CEO}}$ -30 -40	-	Vdc
Collector – Base Breakdown Voltage ($I_C = -100 \mu\text{A DC}$, $I_E = 0$)	MPSW51 MPSW51A	$V_{(\text{BR})\text{CBO}}$ -40 -50	-	Vdc
Emitter – Base Breakdown Voltage ($I_E = -100 \mu\text{A DC}$, $I_C = 0$)		$V_{(\text{BR})\text{EBO}}$ -5.0	-	Vdc
Collector Cutoff Current ($V_{CB} = -30 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = -40 \text{ Vdc}$, $I_E = 0$)	MPSW51 MPSW51A	I_{CBO} - -	-0.1 -0.1	$\mu\text{A DC}$
Emitter Cutoff Current ($V_{EB} = -3.0 \text{ Vdc}$, $I_C = 0$)		I_{EBO} -	-0.1	$\mu\text{A DC}$
ON CHARACTERISTICS				
DC Current Gain ($I_C = -10 \text{ mA DC}$, $V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -100 \text{ mA DC}$, $V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -1000 \text{ mA DC}$, $V_{CE} = -1.0 \text{ Vdc}$)		h_{FE} 55 60 50	-	-
Collector – Emitter Saturation Voltage ($I_C = -1000 \text{ mA DC}$, $I_B = -100 \text{ mA DC}$)		$V_{CE(\text{sat})}$ -	-0.7	Vdc
Base – Emitter On Voltage ($I_C = -1000 \text{ mA DC}$, $V_{CE} = -1.0 \text{ Vdc}$)		$V_{BE(\text{on})}$ -	-1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain – Bandwidth Product ($I_C = -50 \text{ mA DC}$, $V_{CE} = -10 \text{ Vdc}$, $f = 20 \text{ MHz}$)		f_T 50	-	MHz
Output Capacitance ($V_{CB} = -10 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)		C_{obo} -	30	pF

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

ORDERING INFORMATION

Device	Package	Shipping [†]
MPSW51G	TO-92 (Pb-Free)	5000 Units / Bulk
MPSW51AG	TO-92 (Pb-Free)	5000 Units / Bulk
MPSW51RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
MPSW51ARLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
MPSW51ARLRPG	TO-92 (Pb-Free)	2000 / Ammo Pack

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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TYPICAL CHARACTERISTICS

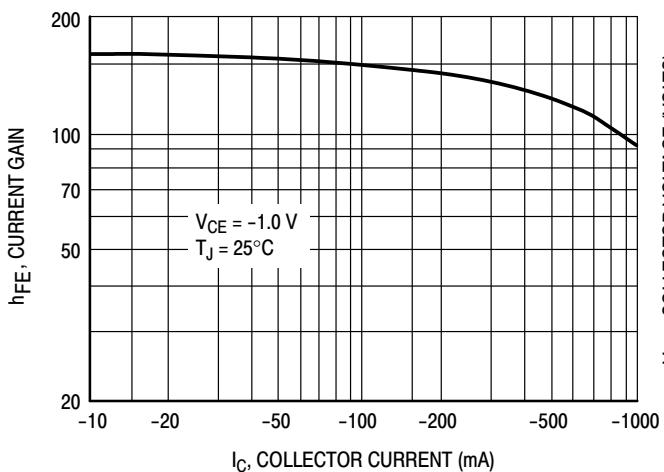


Figure 1. DC Current Gain

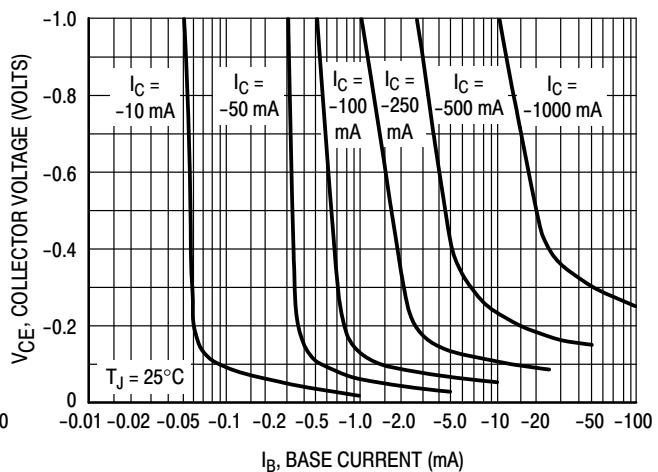


Figure 2. Collector Saturation Region

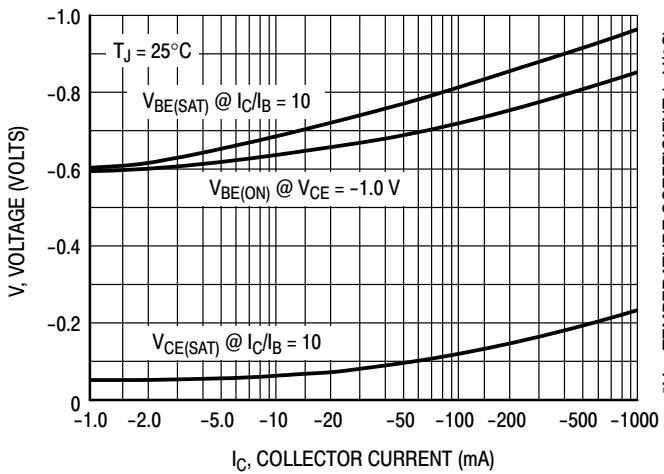


Figure 3. "ON" Voltages

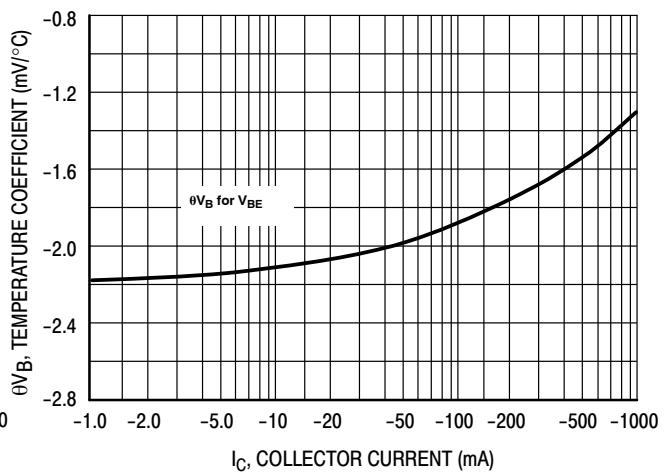


Figure 4. Temperature Coefficient

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TYPICAL CHARACTERISTICS

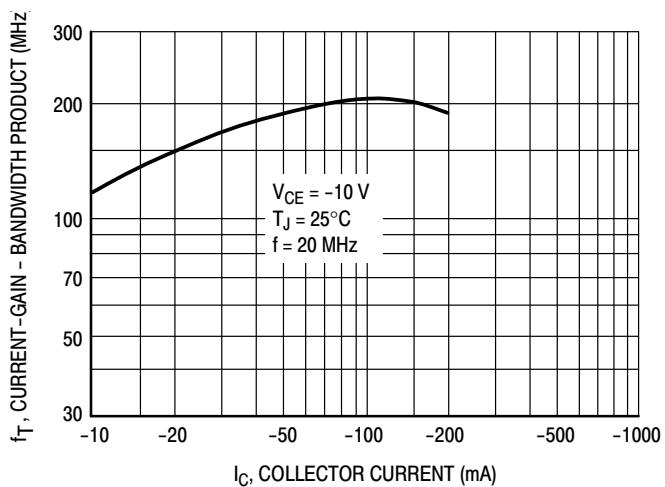


Figure 5. Current Gain — Bandwidth Product

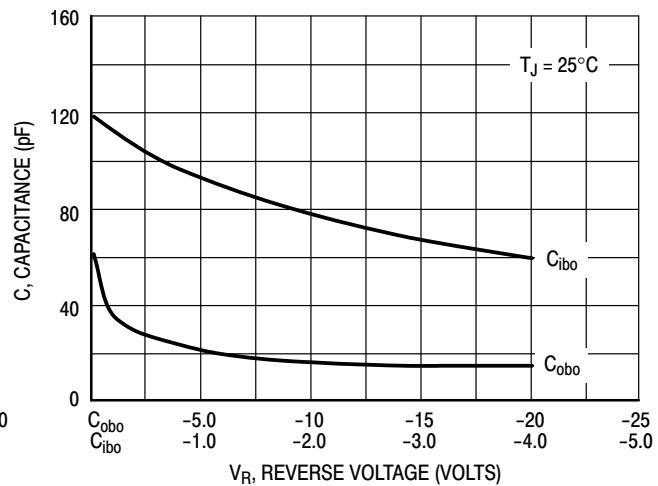


Figure 6. Capacitance

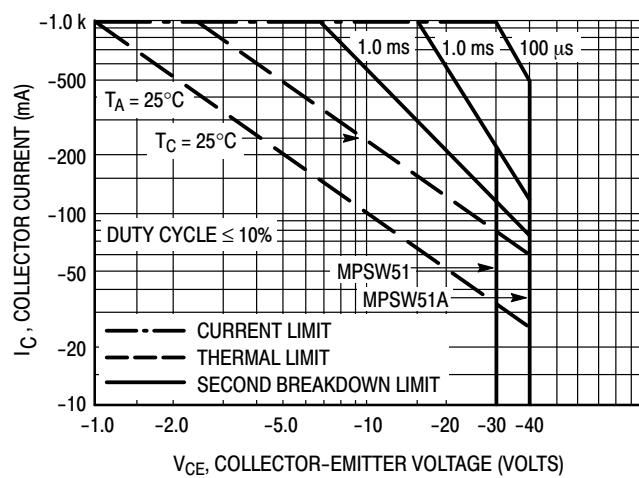
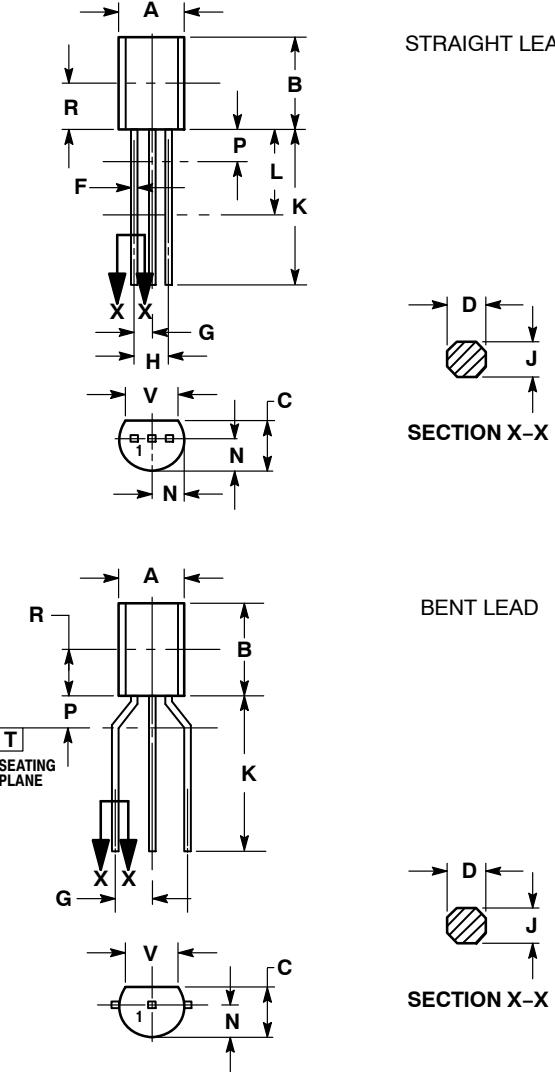


Figure 7. Active Region — Safe Operating Area

MPSW51, MPSW51A

PACKAGE DIMENSIONS

TO-92 (TO-226) 1 WATT CASE 29-10 ISSUE A



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION 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	0.46	0.53
F	0.016	0.019	0.41	0.48
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	---
V	0.135	---	3.43	---

STYLE 1:
1. Emitter
2. Base
3. Collector

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
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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	0.46	0.53
F	0.094	0.102	2.40	2.80
G	0.018	0.024	0.46	0.61
K	0.500	---	12.70	---
L	0.080	0.105	2.04	2.66
N	---	0.100	---	2.54
P	0.135	---	3.43	---
R	0.135	---	3.43	---
V	0.135	---	3.43	---

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