

MPSW51, MPSW51A

One Watt High Current Transistors

PNP Silicon

Features

- Pb-Free Packages are Available*

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	mA _{dc}
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	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	$^\circ\text{C}/\text{W}$

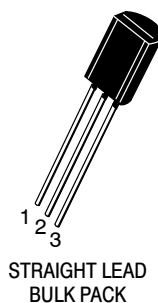
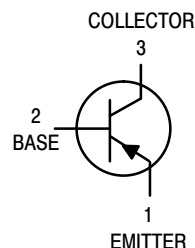
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

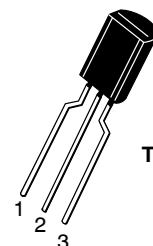


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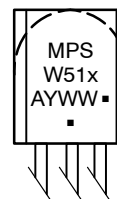
STRAIGHT LEAD
BULK PACK



BENT LEAD
TAPE & REEL
AMMO PACK

TO-92 1 WATT
(TO-226)
CASE 29-10
STYLE 1

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.

MPSW51, MPSW51A

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector – Emitter Breakdown Voltage (Note 1) ($I_C = -1.0\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	-30 -40	– –	Vdc
Collector – Base Breakdown Voltage ($I_C = -100\text{ }\mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	-40 -50	– –	Vdc
Emitter – Base Breakdown Voltage ($I_E = -100\text{ }\mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	-5.0	–	Vdc
Collector Cutoff Current ($V_{CB} = -30\text{ Vdc}$, $I_E = 0$) ($V_{CB} = -40\text{ Vdc}$, $I_E = 0$)	I_{CBO}	– –	-0.1 -0.1	μAdc
Emitter Cutoff Current ($V_{EB} = -3.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	-0.1	μAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = -10\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$) ($I_C = -100\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$) ($I_C = -1000\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$)	h_{FE}	55 60 50	– – –	–
Collector – Emitter Saturation Voltage ($I_C = -1000\text{ mAdc}$, $I_B = -100\text{ mAdc}$)	$V_{CE(sat)}$	–	-0.7	Vdc
Base – Emitter On Voltage ($I_C = -1000\text{ mAdc}$, $V_{CE} = -1.0\text{ Vdc}$)	$V_{BE(on)}$	–	-1.2	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain – Bandwidth Product ($I_C = -50\text{ mAdc}$, $V_{CE} = -10\text{ Vdc}$, $f = 20\text{ MHz}$)	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 $\leq 300\text{ }\mu\text{s}$, 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
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.

MPSW51, MPSW51A

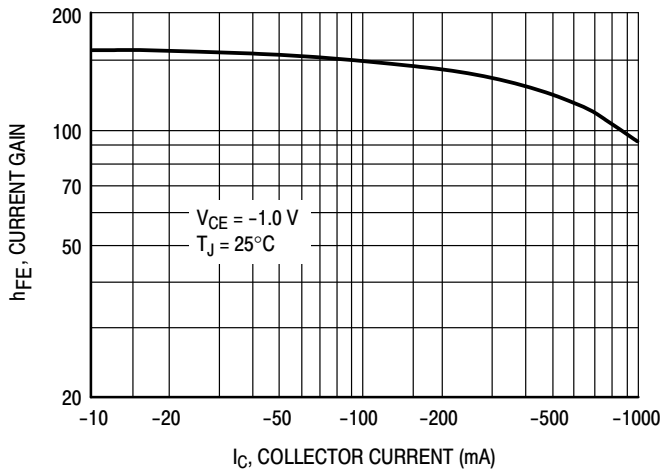


Figure 1. DC Current Gain

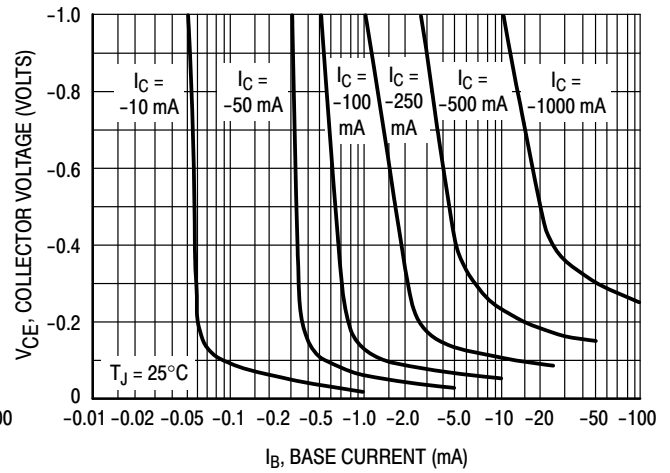


Figure 2. Collector Saturation Region

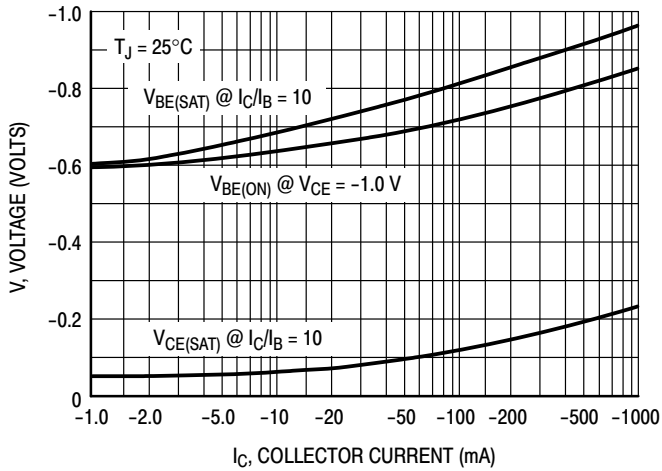


Figure 3. "ON" Voltages

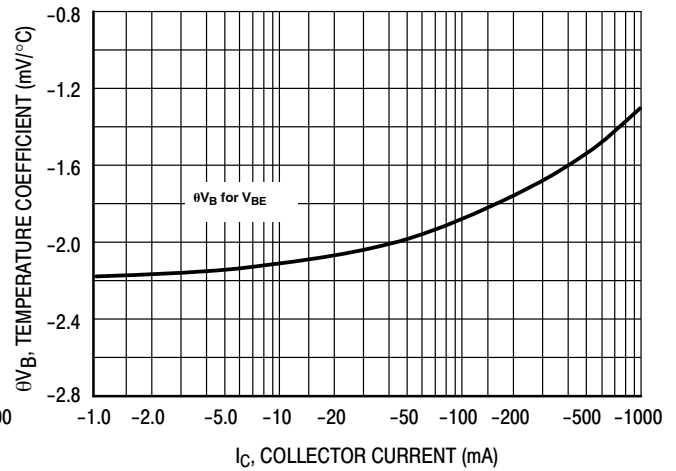


Figure 4. Temperature Coefficient

MPSW51, MPSW51A

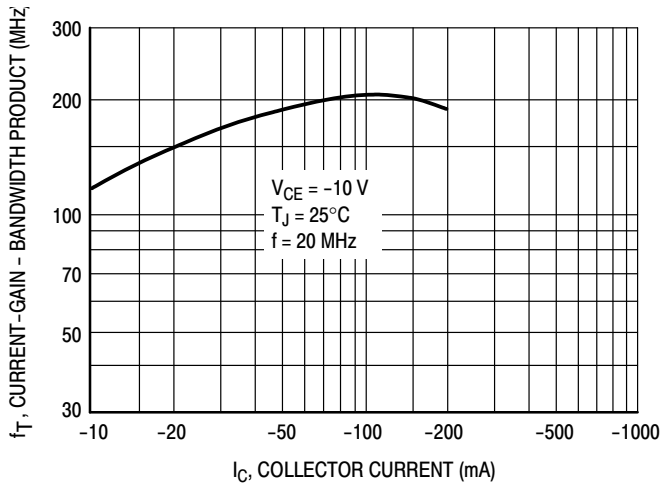


Figure 5. Current Gain — Bandwidth Product

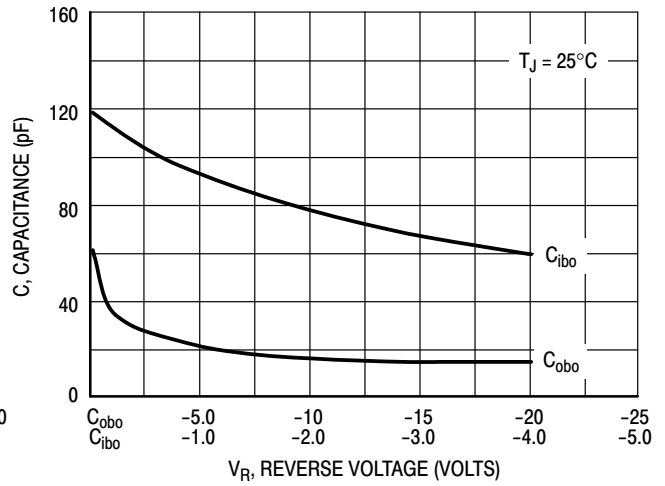


Figure 6. Capacitance

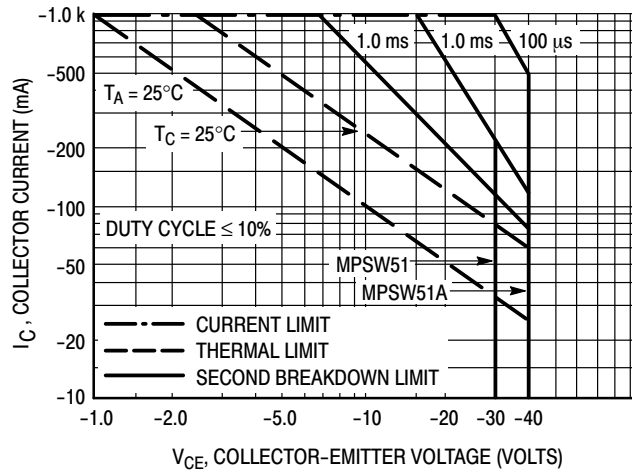
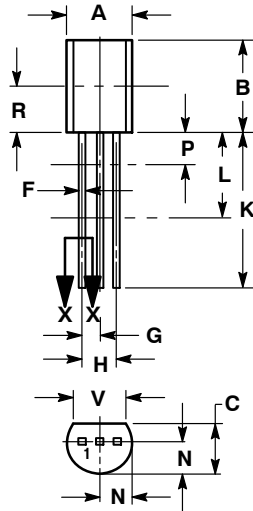


Figure 7. Active Region — Safe Operating Area

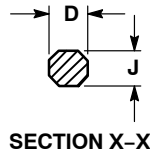
MPSW51, MPSW51A

PACKAGE DIMENSIONS

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



STRAIGHT LEAD
BULK PACK



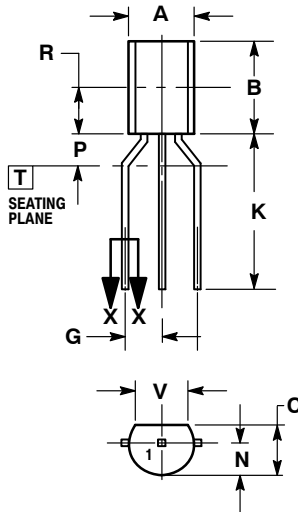
SECTION X-X

NOTES:

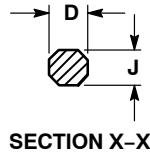
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION 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:
PIN 1. EMITTER
2. BASE
3. COLLECTOR



BENT LEAD
TAPE & REEL
AMMO PACK



SECTION X-X

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	
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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
G	0.094	0.102	2.40	2.80
J	0.018	0.024	0.46	0.61
K	0.500	---	12.70	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.135	---	3.43	---
V	0.135	---	3.43	---

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