# One Watt High Voltage Transistor

## **NPN Silicon**

#### **Features**

• Pb-Free Packages are Available\*

#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V <sub>CEO</sub>	300	Vdc
Collector - Base Voltage	V <sub>CBO</sub>	300	Vdc
Emitter – Base Voltage	V <sub>EBO</sub>	6.0	Vdc
Collector Current - Continuous	Ic	500	mAdc
Total Device Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	1.0 8.0	W mW/°C
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	2.5 20	W mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

#### THERMAL CHARACTERISTICS

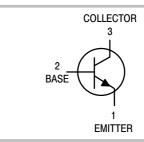
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	°C/W

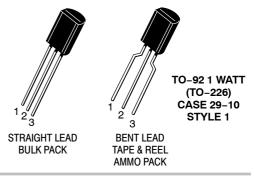
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



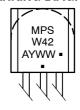
## ON Semiconductor®

#### http://onsemi.com





### **MARKING DIAGRAM**



MPSW42 = Device Code A = Assembly Location

Y = Year
WW = Work Week
Pb-Free Package

(Note: Microdot may be in either location)

## **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
MPSW42	TO-92	5000 Units/Box
MPSW42G	TO-92 (Pb-Free)	5000 Units/Box
MPSW42RLRA	TO-92	2000/Tape & Reel
MPSW42RLRAG	TO-92 (Pb-Free)	2000/Tape & Reel

<sup>†</sup>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.

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

## **ELECTRICAL CHARACTERISTICS** ( $T_A = 25^{\circ}C$ 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 <sub>(BR)</sub> CEO	300	_	Vdc
Collector–Base Breakdown Voltage $(I_C = 100 \mu Adc, I_E = 0)$	V <sub>(BR)CBO</sub>	300	_	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 100 \mu Adc, I_C = 0$ )	V <sub>(BR)EBO</sub>	6.0	_	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 200 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	-	0.1	μAdc
Emitter Cutoff Current (V <sub>EB</sub> = 6.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	-	0.1	μAdc
ON CHARACTERISTICS	·	•		
DC Current Gain	h <sub>FE</sub>	25 40 40	- - -	-
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 20 mAdc, I <sub>B</sub> = 2.0 mAdc)	V <sub>CE(sat)</sub>	-	0.5	Vdc
Base-Emitter Saturation Voltage (I <sub>C</sub> = 20 mAdc, I <sub>B</sub> = 2.0 mAdc)	V <sub>BE(sat)</sub>	-	0.9	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain - Bandwidth Product (I <sub>C</sub> = 10 mAdc, V <sub>CE</sub> = 20 Vdc, f = 20 MHz)	f <sub>T</sub>	50	_	MHz
Collector Capacitance (V <sub>CB</sub> = 20 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>cb</sub>	_	3.0	pF

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

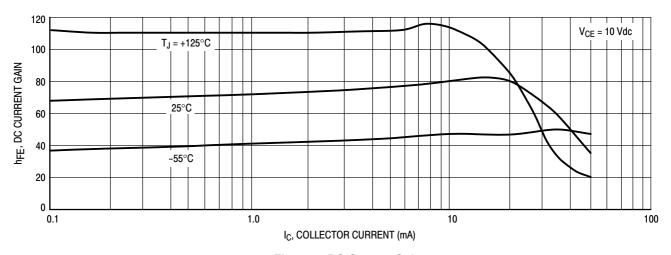


Figure 1. DC Current Gain

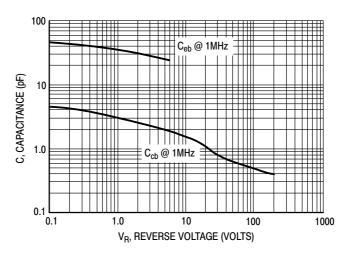


Figure 2. Capacitance

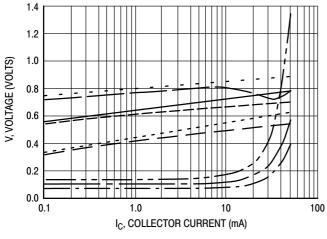
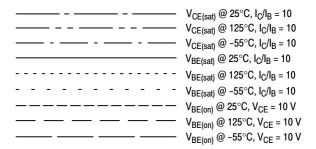
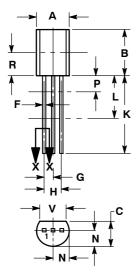


Figure 3. "ON" Voltages



#### PACKAGE DIMENSIONS

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



STRAIGHT LEAD **BULK PACK** 



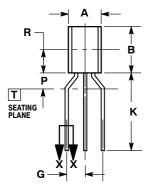
#### NOTES

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1994.
  CONTROLLING DIMENSION: INCHES.
- CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
- DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DI-MENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIN	IETERS	
DIM	MIN	MAX	MIN	MAX	
Α	0.175	0.205	4.44	5.21	
В	0.290	0.310	7.37	7.87	
С	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	
Н	0.095	0.105	2.42	2.66	
ſ	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	
Р		0.100		2.54	
R	0.135		3.43		
٧	0.135		3.43		

STYLE 1: PIN 1. EMITTER

BASE COLLECTOR



**BENT LEAD** TAPE & REEL AMMO PACK



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Α	0.175	0.205	4.44	5.21
В	0.290	0.310	7.37	7.87
С	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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