

# MPSA92, MPSA93

MPSA92 is a Preferred Device

## High Voltage Transistors

### PNP Silicon



**ON Semiconductor®**

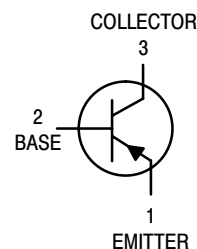
<http://onsemi.com>

#### MAXIMUM RATINGS

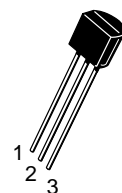
Rating	Symbol	Value	Unit
Collector–Emitter Voltage MPSA93 MPSA92	$V_{CEO}$	–200 –300	Vdc
Collector–Base Voltage MPSA93 MPSA92	$V_{CBO}$	–200 –300	Vdc
Emitter–Base Voltage	$V_{EBO}$	–5.0	Vdc
Collector Current – Continuous	$I_C$	–500	mA <sub>dc</sub>
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 12	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	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

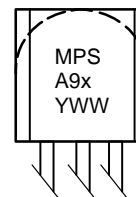


**STYLE 1**  
**MPSA92, MPSA93**



**TO-92**  
**CASE 29**  
**STYLES 1, 14**

#### MARKING DIAGRAM



MPSA9 = Specific Device Code  
x = 2 or 2  
Y = Year  
W = Work Week

#### ORDERING INFORMATION

Device	Package	Shipping
MPSA92	TO-92	5000 Units/Box
MPSA92RLRA	TO-92	2000/Tape & Reel
MPSA92RLRE	TO-92	2000/Tape & Reel
MPSA92RLRM	TO-92	2000/Ammo Pack
MPSA92RLRP	TO-92	2000/Ammo Pack
MPSA93	TO-92	5000 Units/Box
MPSA93RLRA	TO-92	2000/Tape & Reel
MPSA93RLRM	TO-92	2000/Ammo Pack

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

# MPSA92, MPSA93

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage (Note 1) (I <sub>C</sub> = –1.0 mA <sub>dc</sub> , I <sub>B</sub> = 0)	MPSA92 MPSA93	V <sub>(BR)CEO</sub>	–300 –200	– –	V <sub>dc</sub>
Collector–Base Breakdown Voltage (I <sub>C</sub> = –100 μA <sub>dc</sub> , I <sub>E</sub> = 0)	MPSA92 MPSA93	V <sub>(BR)CBO</sub>	–300 –200	– –	V <sub>dc</sub>
Emitter–Base Breakdown Voltage (I <sub>E</sub> = –100 μA <sub>dc</sub> , I <sub>C</sub> = 0)		V <sub>(BR)EBO</sub>	–5.0	–	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = –200 V <sub>dc</sub> , I <sub>E</sub> = 0) (V <sub>CB</sub> = –160 V <sub>dc</sub> , I <sub>E</sub> = 0)	MPSA92 MPSA93	I <sub>CBO</sub>	– –	–0.25 –0.25	μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = –3.0 V <sub>dc</sub> , I <sub>C</sub> = 0)		I <sub>EBO</sub>	–	–0.1	μA <sub>dc</sub>
<b>ON CHARACTERISTICS (Note 1)</b>					
DC Current Gain (I <sub>C</sub> = –1.0 mA <sub>dc</sub> , V <sub>CE</sub> = –10 V <sub>dc</sub> ) (I <sub>C</sub> = –10 mA <sub>dc</sub> , V <sub>CE</sub> = –10 V <sub>dc</sub> )  (I <sub>C</sub> = –30 mA <sub>dc</sub> , V <sub>CE</sub> = –10 V <sub>dc</sub> )	All Types All Types  MPSA92 MPSA93	h <sub>FE</sub>	25 40  25 25	– –  – –	–
Collector–Emitter Saturation Voltage (I <sub>C</sub> = –20 mA <sub>dc</sub> , I <sub>B</sub> = –2.0 mA <sub>dc</sub> )	MPSA92 MPSA93	V <sub>CE(sat)</sub>	– –	–0.5 –0.4	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = –20 mA <sub>dc</sub> , I <sub>B</sub> = –2.0 mA <sub>dc</sub> )		V <sub>BE(sat)</sub>	–	–0.9	V <sub>dc</sub>
<b>SMALL–SIGNAL CHARACTERISTICS</b>					
Current–Gain – Bandwidth Product (I <sub>C</sub> = –10 mA <sub>dc</sub> , V <sub>CE</sub> = –20 V <sub>dc</sub> , f = 100 MHz)		f <sub>T</sub>	50	–	MHz
Collector–Base Capacitance (V <sub>CB</sub> = –20 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)	MPSA92 MPSA93	C <sub>cb</sub>	– –	6.0 8.0	pF

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

# MPSA92, MPSA93

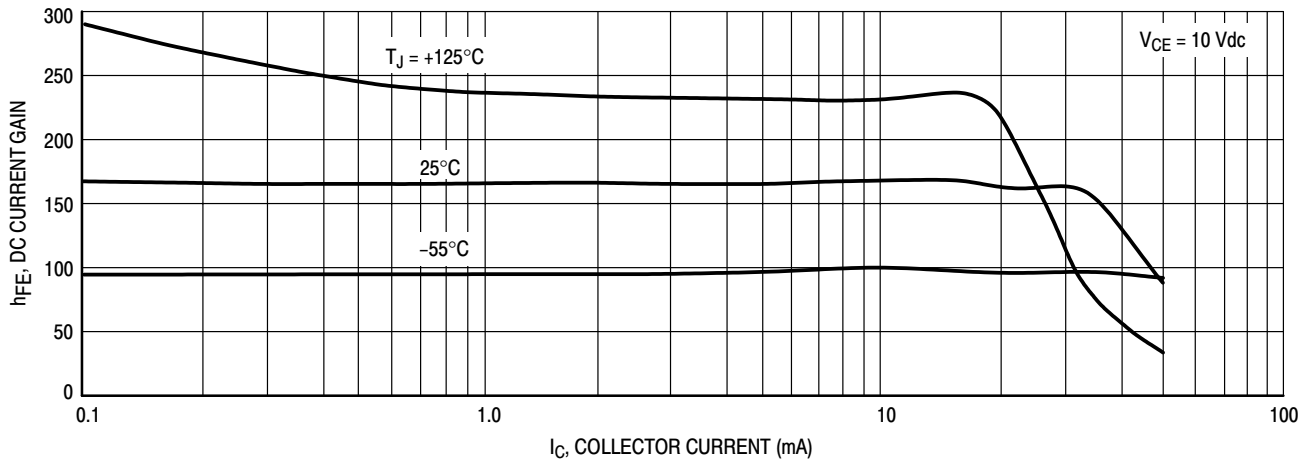


Figure 1. DC Current Gain

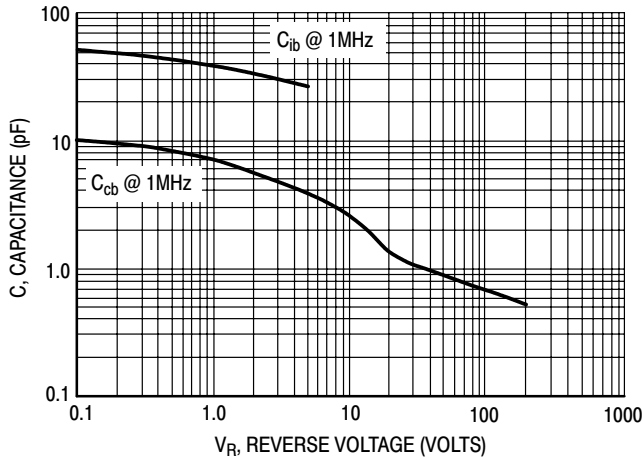


Figure 2. Capacitance

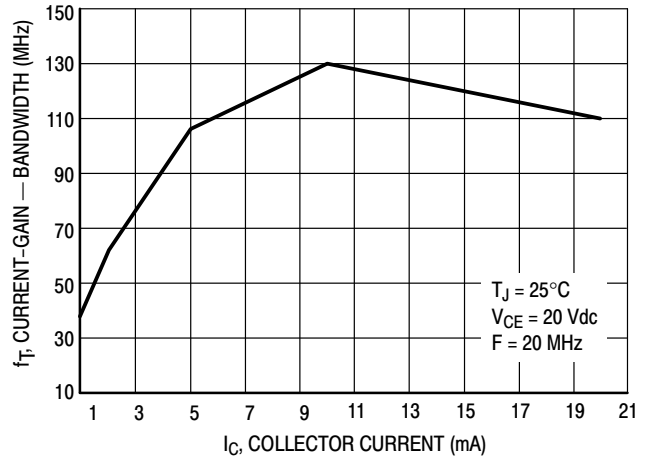


Figure 3. Current-Gain - Bandwidth

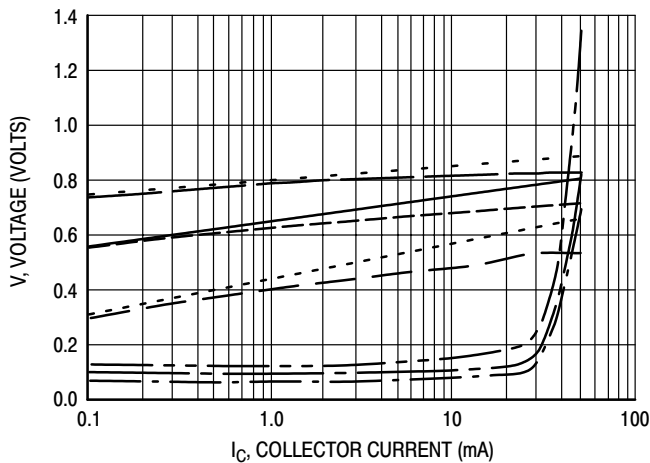


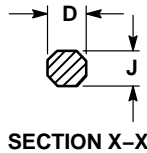
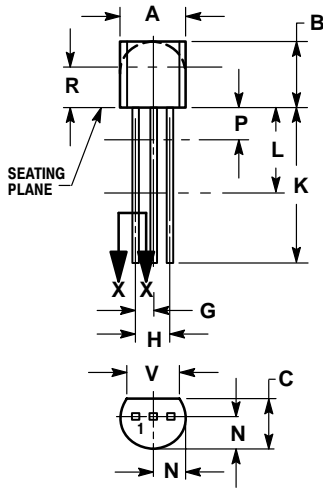
Figure 4. "ON" Voltages

- $V_{CE(sat)}$  @  $25^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @  $125^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @  $-55^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $25^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $125^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $-55^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(on)}$  @  $25^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$  @  $125^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$  @  $-55^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$

# MPSA92, MPSA93

## PACKAGE DIMENSIONS

TO-92  
TO-226AA  
CASE 29-11  
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. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
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	0.115	---	2.93	---
V	0.135	---	3.43	---

**STYLE 1:**

- PIN 1. EMITTER
2. BASE
3. COLLECTOR

**STYLE 14:**

- PIN 1. EMITTER
2. COLLECTOR
3. BASE

**ON Semiconductor** and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer.

### PUBLICATION ORDERING INFORMATION

**Literature Fulfillment:**

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada

**JAPAN:** ON Semiconductor, Japan Customer Focus Center  
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051  
**Phone:** 81-3-5773-3850

**ON Semiconductor Website:** <http://onsemi.com>

For additional information, please contact your local Sales Representative.

This datasheet has been download from:

[www.datasheetcatalog.com](http://www.datasheetcatalog.com)

Datasheets for electronics components.