

# ON Semiconductor

## Is Now

# onsemi™

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# MPSA92, MPSA93

## High Voltage Transistors

### PNP Silicon



**ON Semiconductor®**

<http://onsemi.com>

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage MPSA93 MPSA92	V <sub>CEO</sub>	-200 -300	V <sub>dc</sub>
Collector-Base Voltage MPSA93 MPSA92	V <sub>CBO</sub>	-20 0 -30	V <sub>dc</sub>
Emitter-Base Voltage	V <sub>EB0</sub>	0	V <sub>dc</sub>
Collector Current - Continuous	$\bar{i}_c$	-5.0	mA <sub>dc</sub>
Total Device Dissipation @ TA = 25°C Derate above 25°C	P <sub>D</sub>	-50 0	mW mW/°C
Total Device Dissipation @ TC = 25°C Derate above 25°C	P <sub>D</sub>	625 510 12	W mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

#### THERMAL CHARACTERISTICS

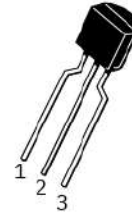
Characteristic	Symbol	Max	Unit
Junction-to-Ambient Thermal Resistance	R <sub>JA</sub>	200	°C/W
Junction-to-Case Thermal Resistance	R <sub>JC</sub>	83.3	°C/W

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.

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

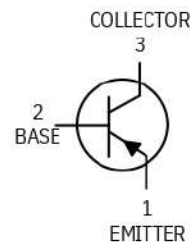


STRAIGHT LEAD  
BULK PACK

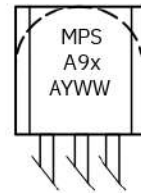


BENT LEAD  
TAPE & REEL  
AMMOPACK

TO-92  
(TO-226AA)  
CASE 29-11



#### MARKING DIAGRAM



x=2 or 3

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 3 of this data sheet.

## MPSA92, MPSA93

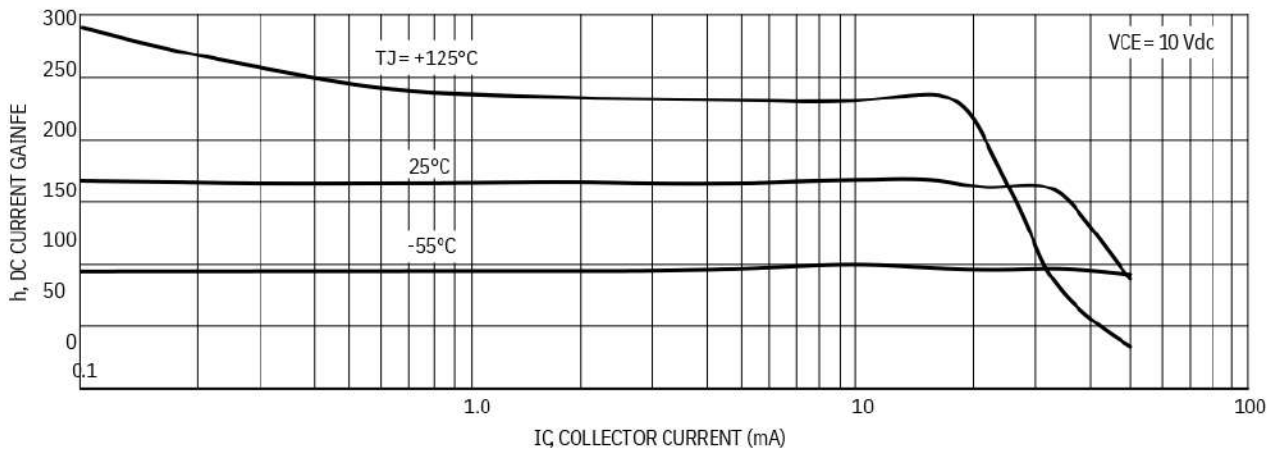
### ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (Note 1) (IC = -1.0 mAdc, IB = 0)	MPSA92 MPSA93	V <sub>(BR)CEO</sub>	-30 0 -20	- - -	Vdc
Collector-Base Breakdown Voltage (IC = -100 Adc, IE = 0)	MPSA92 MPSA93	V <sub>(BR)CBO</sub>	0 -30 0 -20	- - -	Vdc
Emitter-Base Breakdown Voltage (IE = -100 Adc, IC = 0)		V <sub>(BR)EBO</sub>	0 -5.0	- -	Vdc
Collector Cutoff Current (VCB = -200 Vdc, IE = 0) (VCB = -160 Vdc, IE = 0)	MPSA92 MPSA93	ICBO	- -	-0.2 5 -0.2	Adc
Emitter Cutoff Current (VEB = -3.0 Vdc, IC = 0)		IEBO	-	5 -0.1	Adc
<b>ON CHARACTERISTICS (Note 1)</b>					
DC Current Gain (IC = -1.0 mAdc, VCE = -10 Vdc) (IC = -10 mAdc, VCE = -10 Vdc)  (IC = -30 mAdc, VCE = -10 Vdc)	All Types All Types	hFE	2 5 4 0  2 5	- - - -	-
Collector-Emitter Saturation Voltage (IC = -20 mAdc, IB = -2.0 mAdc)	MPSA92 MPSA93 MPSA92 MPSA93	VCE(sat)	2 5 -	-0. 5 -0.	Vdc
Base-Emitter Saturation Voltage (IC = -20 mAdc, IB = -2.0 mAdc)		VBE(sat)	-	4 -0.	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current-Gain - Bandwidth Product (IC = -10 mAdc, VCE = -20 Vdc, f = 100 MHz)		f <sub>T</sub>	50	-	MHz
Collector-Base Capacitance (VCB = -20 Vdc, IE = 0, f = 1.0 MHz)	MPSA92 MPSA93	C <sub>cb</sub>	- -	6. 0 8.	pF
1. Pulse Test: Pulse Width - 300 $\mu$ s, Duty Cycle 2%.					

## MPSA92, MPSA93

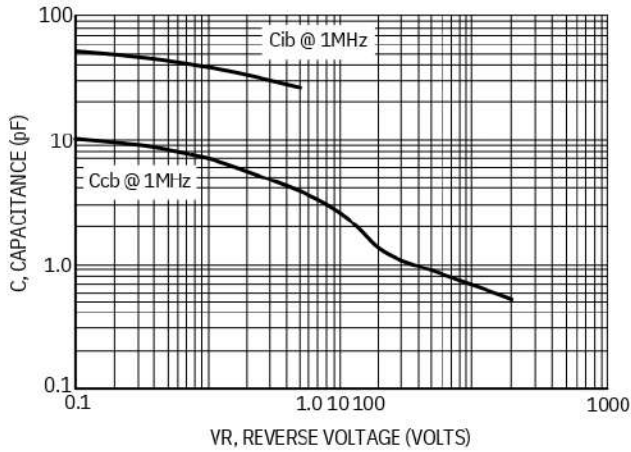
### ORDERING INFORMATION

Device Package Shipping†		
MPSA92GTO-925000 Units / Box (Pb-Free)		
MPSA92RL1GTO-922000 / Tape & Reel (Pb-Free)		
MPSA92RLRATO-922000 / Tape & Reel		
MPSA92RLRAGTO-922000 / Tape & Reel (Pb-Free)		
MPSA92RLRMGTO-922000 / Ammo Pack (Pb-Free)		
MPSA92RLRPGTO-922000 / Ammo Pack (Pb-Free)		
MPSA92ZL1GTO-922000 / Ammo Pack (Pb-Free)		
MPSA93GTO-925000 Units / Box (Pb-Free)		
MPSA93RLRMGTO-922000 / Ammo Pack (Pb-Free)		
†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.		

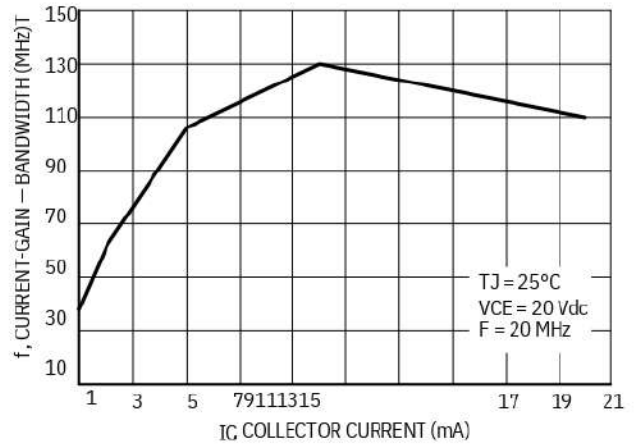


**Figure 1. DC Current Gain**

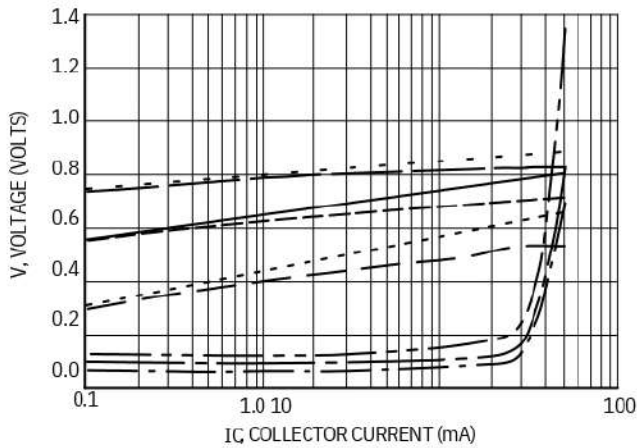
## MPSA92, MPSA93



**Figure 2. Capacitance**

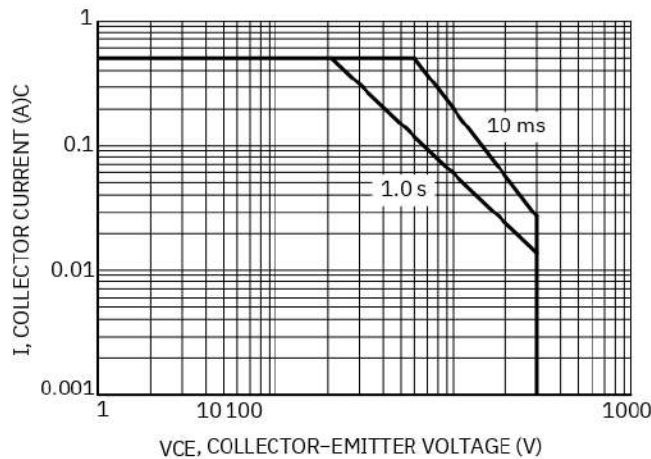


**Figure 3. Current-Gain - Bandwidth**



**Figure 4. "ON" Voltages**

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

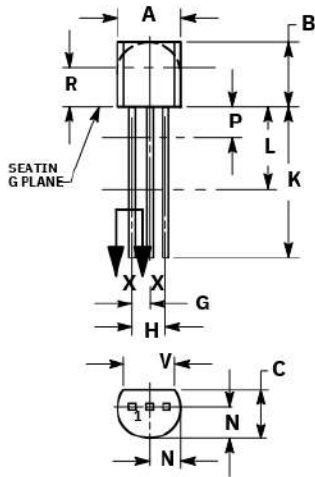


**Figure 5. Safe Operating Area**

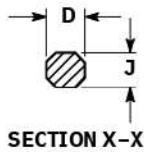
# MPSA92, MPSA93

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 029-11  
ISSUE AM



STRAIGHT LEAD  
BULK PACK



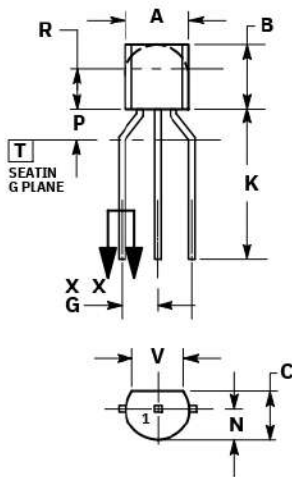
NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.  
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.  
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

INCHES		MILLIMETERS	
DIM	MIN-MAX	DIM	MIN-MAX
A0	1.75 0.205 4.45 5.20		
B0	1.70 0.210 4.32 5.33		
C0	1.25 0.165 3.18 4.19		
D0	0.16 0.021 0.40 0.533		
G0	0.045 0.055 1.15 1.39		
H0	0.095 0.105 2.42 2.66		
J0	0.15 0.020 0.39 0.50		
K0	5.00 --- 12.70 ---		
L0	2.50 --- 6.35 ---		
N0	0.080 0.105 2.04 2.66		
P	--- 0.100 --- 2.54		
R0	1.15 --- 2.93 ---		
V0	1.35 --- 3.43 ---		

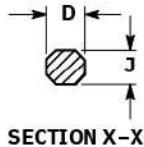
STYLE 14:  
FIN 1. EMITTER  
2. COLLECTOR  
3. BASE

NOTES:  
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.  
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3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.  
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

MILLIMETERS	
DIM	MIN-MAX
A4	4.45 5.20
B4	4.32 5.33
C3	3.18 4.19
D0	0.40 0.54
G2	2.40 2.80
J0	0.39 0.50
K12	7.0 ---
N2	0.4 2.66
P1	5.0 4.00
R2	2.93 ---
V3	3.43 ---



BENT LEAD  
TAPE & REEL  
AMMO PACK



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