MPSA92, MPSA93

High Voltage Transistors

PNP Silicon

ON Semiconductor®

http://onsemi.com

Features

- Pb−Free Packages are Available*

MAXIMUM RATINGS

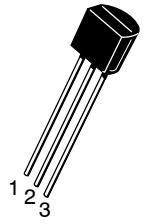
Rating	Symbol	Value	Unit
Collector − Emitter Voltage MPSA93 MPSA92	V_{CEO}	 −200 −300	Vdc
Collector − Base Voltage MPSA93 MPSA92	V_{CBO}	 −200 −300	Vdc
Emitter − Base Voltage	V_{EBO}	−5.0	Vdc
Collector Current − Continuous	I_C	−500	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	 625 5.0	 mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	 1.5 12	 W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

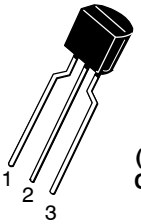
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	83.3	°C/W

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.

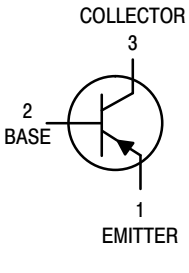


STRAIGHT LEAD
BULK PACK

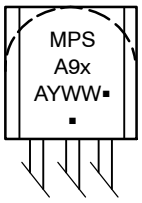


BENT LEAD
TAPE & REEL
AMMO PACK

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.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage (Note 1)		$V_{(BR)CEO}$			Vdc
(I_C = –1.0 mAdc, I_B = 0)	MPSA92		–300	–	
	MPSA93		–200	–	
Collector – Base Breakdown Voltage		$V_{(BR)CBO}$			Vdc
(I_C = –100 μAdc, I_E = 0)	MPSA92		–300	–	
	MPSA93		–200	–	
Emitter – Base Breakdown Voltage		$V_{(BR)EBO}$	–5.0	–	Vdc
(I_E = –100 μAdc, I_C = 0)					
Collector Cutoff Current		I_{CBO}			μAdc
(V_{CB} = –200 Vdc, I_E = 0)	MPSA92		–	–0.25	
(V_{CB} = –160 Vdc, I_E = 0)	MPSA93		–	–0.25	
Emitter Cutoff Current		I_{EBO}	–	–0.1	μAdc
(V_{EB} = –3.0 Vdc, I_C = 0)					
ON CHARACTERISTICS (Note 1)					
DC Current Gain		h_{FE}			–
(I_C = –1.0 mAdc, V_{CE} = –10 Vdc)	All Types		25	–	
(I_C = –10 mAdc, V_{CE} = –10 Vdc)	All Types		40	–	
(I_C = –30 mAdc, V_{CE} = –10 Vdc)	MPSA92		25	–	
	MPSA93		25	–	
Collector – Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = –20 mAdc, I_B = –2.0 mAdc)	MPSA92		–	–0.5	
	MPSA93		–	–0.4	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$	–	–0.9	Vdc
(I_C = –20 mAdc, I_B = –2.0 mAdc)					
SMALL–SIGNAL CHARACTERISTICS					
Current – Gain – Bandwidth Product		f_T	50	–	MHz
(I_C = –10 mAdc, V_{CE} = –20 Vdc, f = 100 MHz)					
Collector–Base Capacitance		C_{cb}			pF
(V_{CB} = –20 Vdc, I_E = 0, f = 1.0 MHz)	MPSA92		–	6.0	
	MPSA93		–	8.0	

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

ORDERING INFORMATION

Device	Package	Shipping†
MPSA92G	TO−92 (Pb−Free)	5000 Units / Box
MPSA92RL1G	TO−92 (Pb−Free)	2000 / Tape & Reel
MPSA92RLRA	TO−92	2000 / Tape & Reel
MPSA92RLRAG	TO−92 (Pb−Free)	2000 / Tape & Reel
MPSA92RLRMG	TO−92 (Pb−Free)	2000 / Ammo Pack
MPSA92RLRPG	TO−92 (Pb−Free)	2000 / Ammo Pack
MPSA92ZL1G	TO−92 (Pb−Free)	2000 / Ammo Pack
MPSA93G	TO−92 (Pb−Free)	5000 Units / Box
MPSA93RLRMG	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.

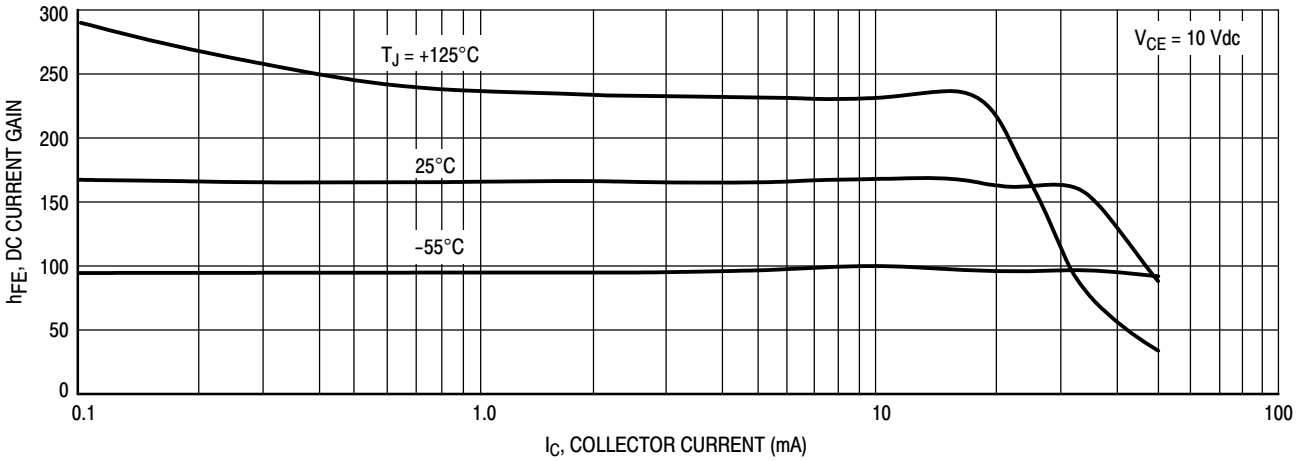


Figure 1. DC Current Gain

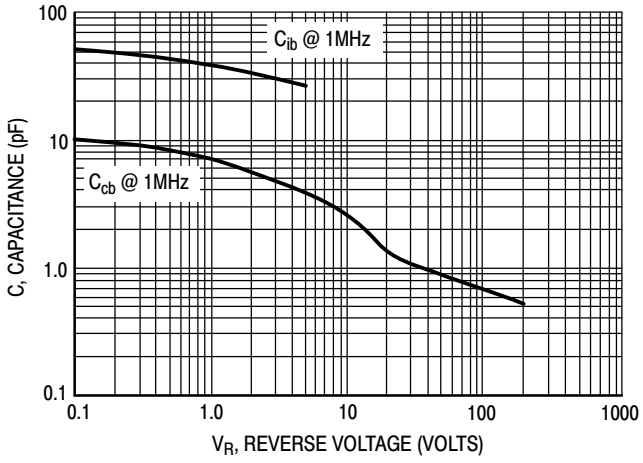


Figure 2. Capacitance

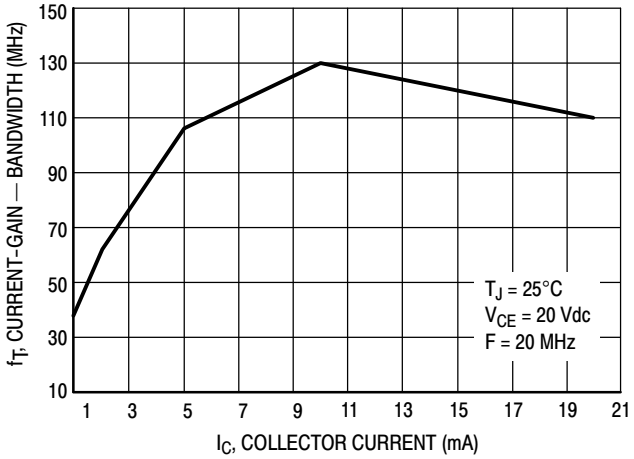
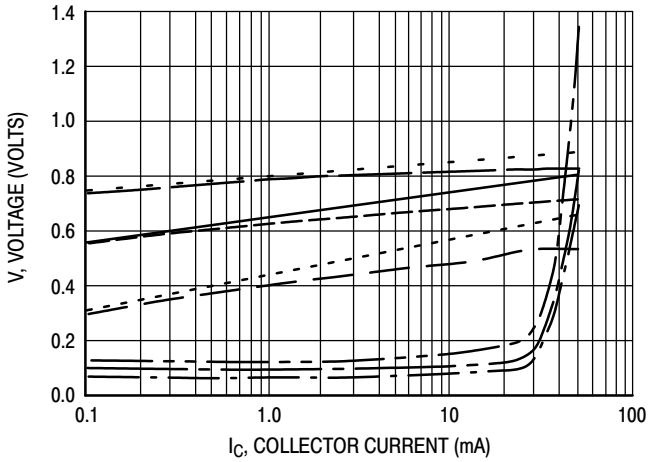


Figure 3. Current−Gain − Bandwidth



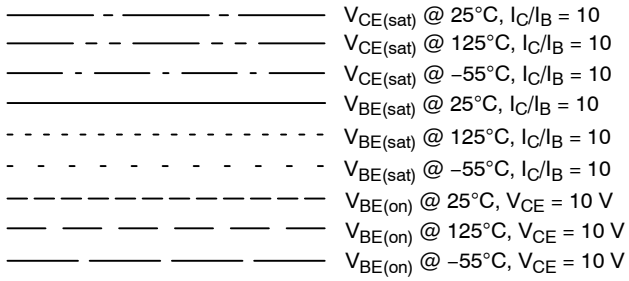


Figure 4. "ON" Voltages

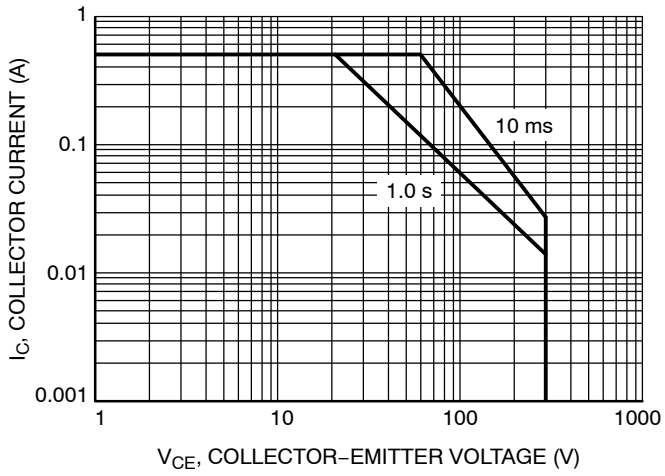
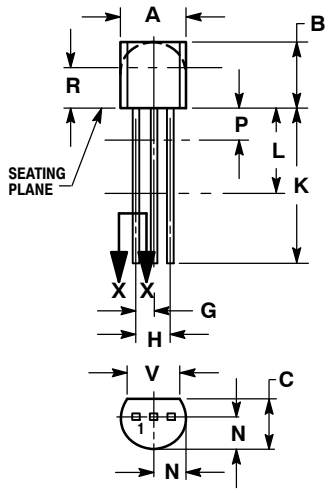


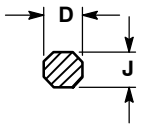
Figure 5. Safe Operating Area

PACKAGE DIMENSIONS

TO−92 (TO−226)
CASE 029−11
ISSUE AM



STRAIGHT LEAD
BULK PACK

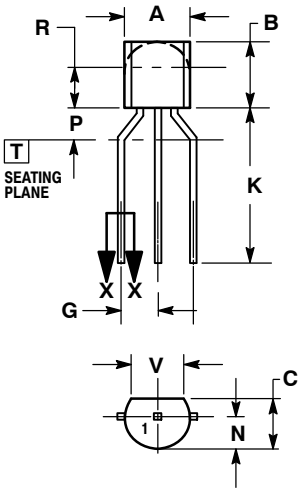


SECTION X−X

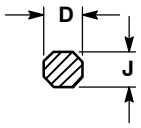
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	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 14:
PIN 1. EMITTER
2. COLLECTOR
3. BASE



BENT LEAD
TAPE & REEL
AMMO PACK



SECTION X−X

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
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
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

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
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5773−3850

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative