

# MPSA42, MPSA43

MPSA42 is a Preferred Device

## High Voltage Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CE0}$	MPSA43	200
		MPSA42	300
Collector–Base Voltage	$V_{CBO}$	MPSA43	200
		MPSA42	300
Emitter–Base Voltage	$V_{EBO}$	6.0	Vdc
Collector Current – Continuous	$I_C$	500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625	mW
		5.0	mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5	W
		12	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	$^\circ\text{C}/\text{mW}$
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{mW}$

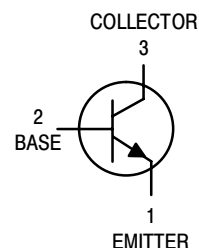
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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

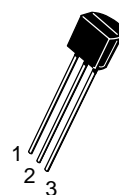


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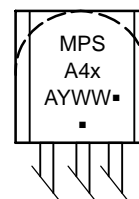
<http://onsemi.com>



#### MARKING DIAGRAM



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



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.

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

# MPSA42, MPSA43

## 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)	MPSA42 MPSA43	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)	MPSA42 MPSA43	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>	6.0	–	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)	MPSA42 MPSA43	I <sub>CBO</sub>	– –	0.1 0.1	μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = 6.0 V <sub>dc</sub> , I <sub>C</sub> = 0) (V <sub>EB</sub> = 4.0 V <sub>dc</sub> , I <sub>C</sub> = 0)	MPSA42 MPSA43	I <sub>EBO</sub>	– –	0.1 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> )		h <sub>FE</sub>	25 40 40	– – –	–
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 20 mA <sub>dc</sub> , I <sub>B</sub> = 2.0 mA <sub>dc</sub> )	MPSA42 MPSA43	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)	MPSA42 MPSA43	C <sub>cb</sub>	– –	3.0 4.0	pF

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

## MPSA42, MPSA43

### ORDERING INFORMATION

Device	Package	Shipping†
MPSA42	TO-92	5000 Units / Box
MPSA42G	TO-92 (Pb-Free)	5000 Units / Box
MPSA42RL1	TO-92	2000 / Tape & Reel
MPSA42RL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
MPSA42RLRA	TO-92	5000 Units / Box
MPSA42RLRAG	TO-92 (Pb-Free)	5000 Units / Box
MPSA42RLRF	TO-92	5000 Units / Box
MPSA42RLRFG	TO-92 (Pb-Free)	5000 Units / Box
MPSA42RLRM	TO-92	2000 / Ammo Pack
MPSA42RLRMG	TO-92 (Pb-Free)	2000 / Ammo Pack
MPSA42RLRP	TO-92	2000 / Ammo Pack
MPSA42RLRPG	TO-92 (Pb-Free)	2000 / Ammo Pack
MPSA42ZL1	TO-92	2000 / Ammo Pack
MPSA42ZL1G	TO-92 (Pb-Free)	2000 / Ammo Pack
MPSA43	TO-92	5000 Units / Box
MPSA43G	TO-92 (Pb-Free)	5000 Units / Box
MPSA43RLRA	TO-92	2000 / Tape & Reel
MPSA43RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
MPSA43ZL1	TO-92	2000 / Ammo Pack
MPSA43ZL1G	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.

# MPSA42, MPSA43

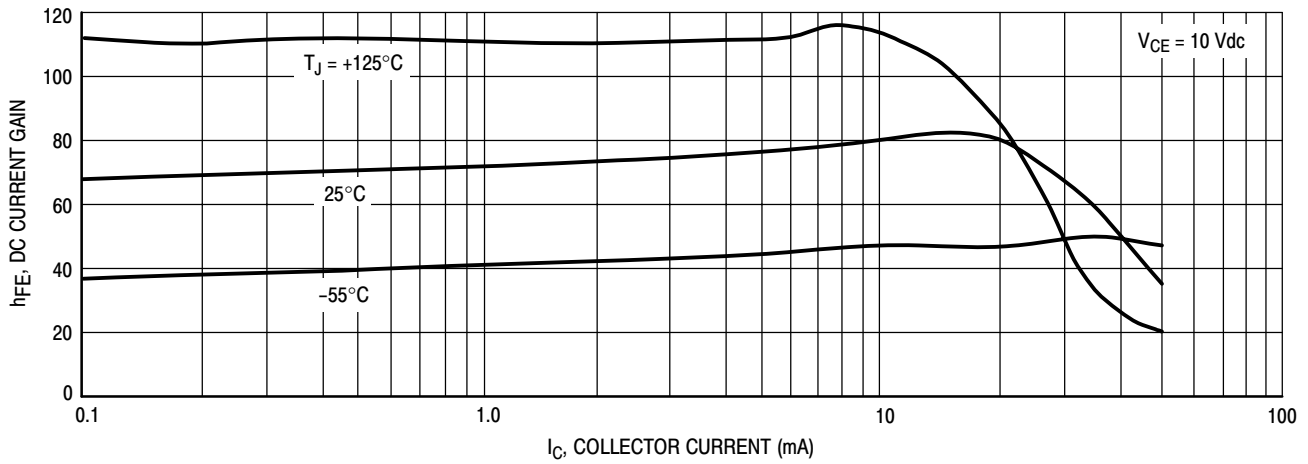


Figure 1. DC Current Gain

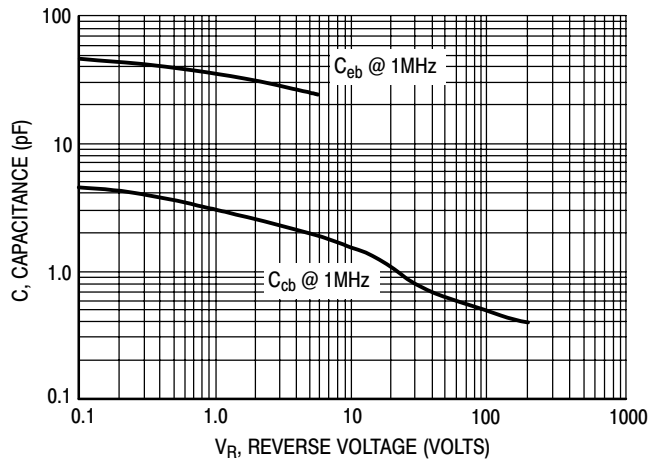


Figure 2. Capacitance

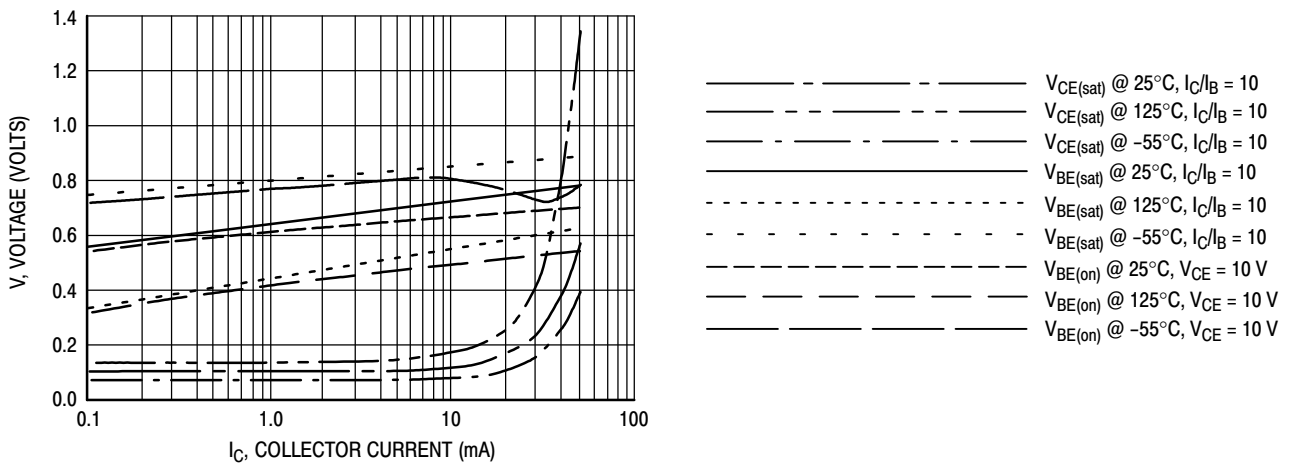
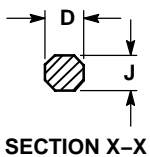
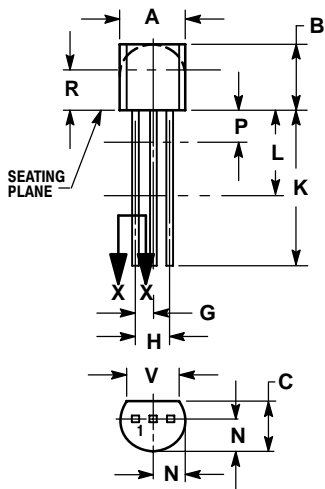


Figure 3. "ON" Voltages

# MPSA42, MPSA43

## 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

# MPSA42, MPSA43

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