

MPSA42, MPSA43

High Voltage Transistors

NPN Silicon



ON Semiconductor®

<http://onsemi.com>

Features

- Pb-Free Packages are Available*

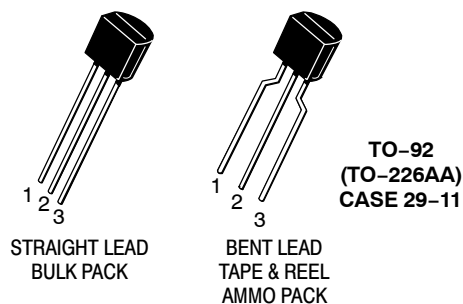
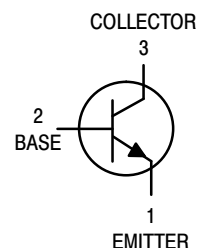
MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|----------------|----------------|----------------------------|
| Collector – Emitter Voltage MPSA43 MPSA42 | V_{CEO} | 200 300 | Vdc |
| Collector – Base Voltage MPSA43 MPSA42 | V_{CBO} | 200 300 | Vdc |
| 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°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | W mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

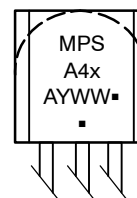
THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------|------|----------------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{mW}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{mW}$ |

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.



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.

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

| Characteristic | | Symbol | Min | Max | Unit |
|--|------------------|----------------------|----------------|-------------|------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Breakdown Voltage (Note 1) (I _C = 1.0 mA _{dc} , I _B = 0) | MPSA42 MPSA43 | V _{(BR)CEO} | 300 200 | – – | V _{dc} |
| Collector–Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E = 0) | MPSA42 MPSA43 | V _{(BR)CBO} | 300 200 | – – | V _{dc} |
| Emitter–Base Breakdown Voltage (I _E = 100 μA _{dc} , I _C = 0) | | V _{(BR)EBO} | 6.0 | – | V _{dc} |
| Collector Cutoff Current (V _{CB} = 200 V _{dc} , I _E = 0) (V _{CB} = 160 V _{dc} , I _E = 0) | MPSA42 MPSA43 | I _{CBO} | – – | 0.1 0.1 | μA _{dc} |
| Emitter Cutoff Current (V _{EB} = 6.0 V _{dc} , I _C = 0) (V _{EB} = 4.0 V _{dc} , I _C = 0) | MPSA42 MPSA43 | I _{EBO} | – – | 0.1 0.1 | μA _{dc} |
| ON CHARACTERISTICS (Note 1) | | | | | |
| DC Current Gain (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc}) (I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc}) (I _C = 30 mA _{dc} , V _{CE} = 10 V _{dc}) | | h _{FE} | 25 40 40 | – – – | – |
| Collector–Emitter Saturation Voltage (I _C = 20 mA _{dc} , I _B = 2.0 mA _{dc}) | MPSA42 MPSA43 | V _{CE(sat)} | – – | 0.5 0.4 | V _{dc} |
| Base–Emitter Saturation Voltage (I _C = 20 mA _{dc} , I _B = 2.0 mA _{dc}) | | V _{BE(sat)} | – | 0.9 | V _{dc} |
| SMALL-SIGNAL CHARACTERISTICS | | | | | |
| Current–Gain – Bandwidth Product (I _C = 10 mA _{dc} , V _{CE} = 20 V _{dc} , f = 100 MHz) | | f _T | 50 | – | MHz |
| Collector–Base Capacitance (V _{CB} = 20 V _{dc} , I _E = 0, f = 1.0 MHz) | MPSA42 MPSA43 | C _{cb} | – – | 3.0 4.0 | pF |

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

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ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------|--------------------|--------------------|
| MPSA42G | TO-92 (Pb-Free) | 5000 Units / Box |
| MPSA42RL1G | TO-92 (Pb-Free) | 2000 / Tape & Reel |
| MPSA42RLRAG | TO-92 (Pb-Free) | 2000 / Tape & Reel |
| MPSA42RLRMG | TO-92 (Pb-Free) | 2000 / Ammo Pack |
| MPSA42RLRPG | TO-92 (Pb-Free) | 2000 / Ammo Pack |
| MPSA42ZL1G | TO-92 (Pb-Free) | 2000 / Ammo Pack |
| MPSA43RLRA | TO-92 | 2000 / Tape & Reel |

†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.

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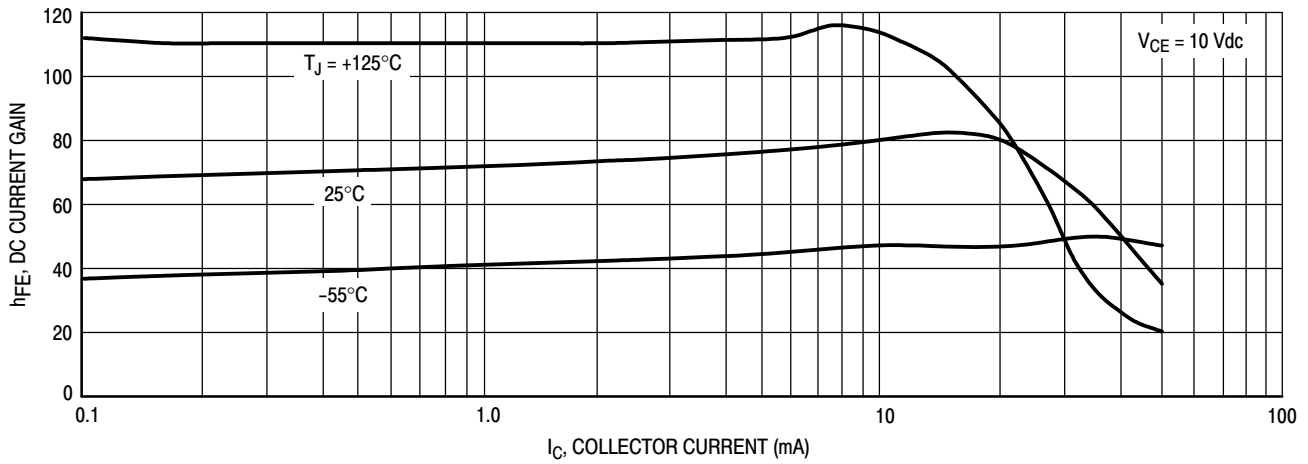


Figure 1. DC Current Gain

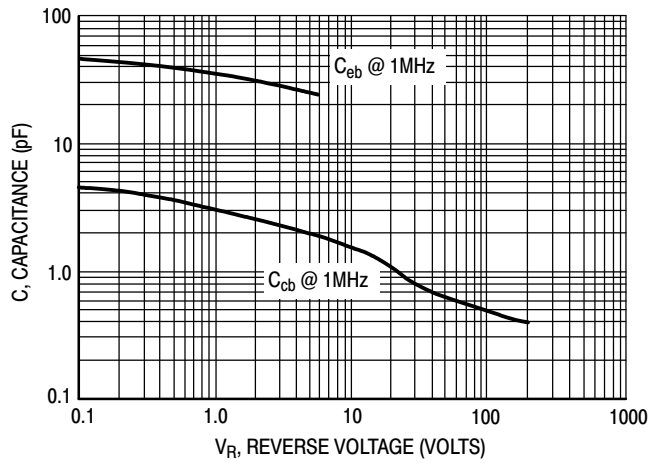


Figure 2. Capacitance

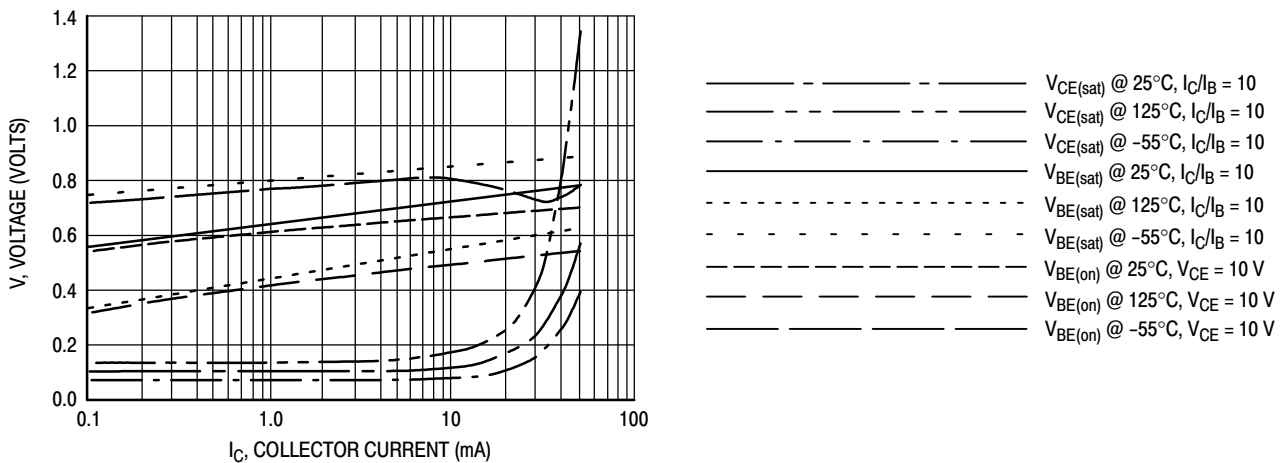


Figure 3. "ON" Voltages

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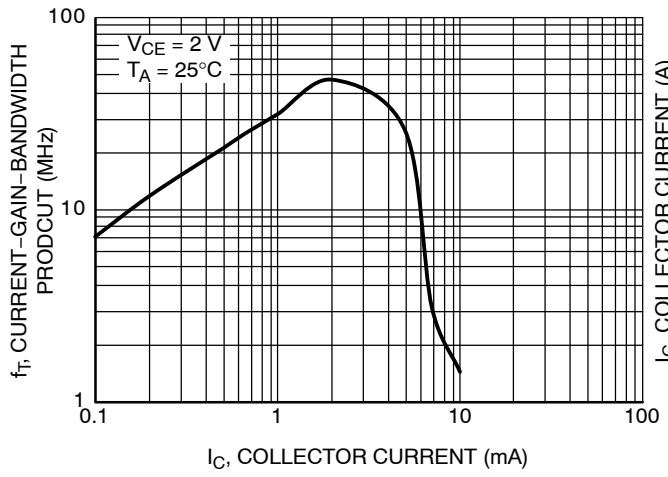


Figure 4. Current-Gain-Bandwidth Product

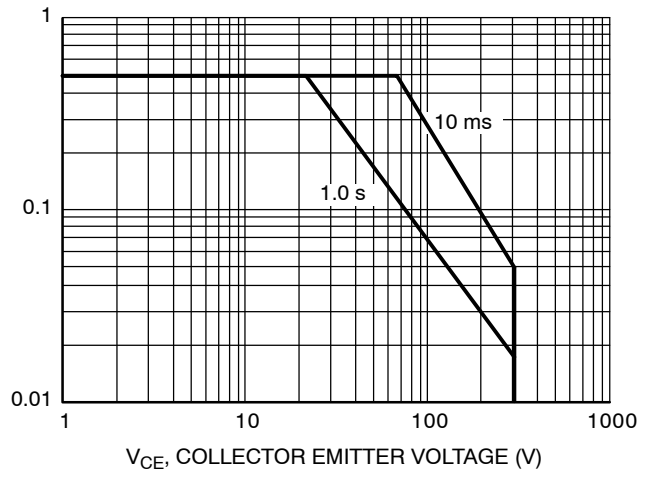
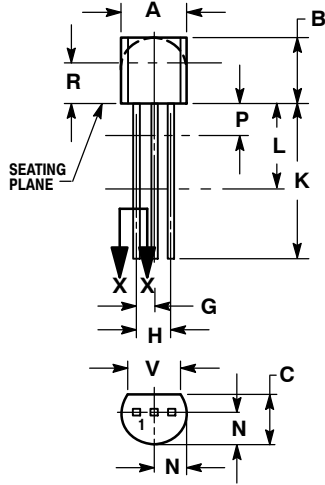


Figure 5. Safe Operating Area

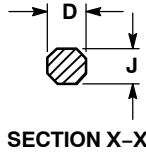
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PACKAGE DIMENSIONS

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

| 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:

1. PIN 1. EMITTER
2. BASE
3. COLLECTOR

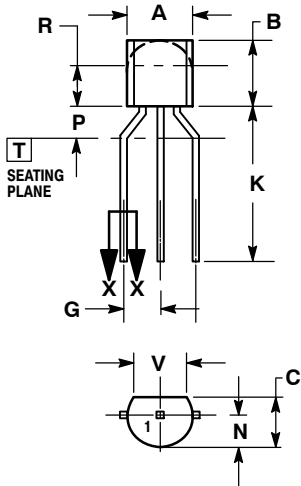
STYLE 14:

1. PIN 1. EMITTER
2. COLLECTOR
3. BASE

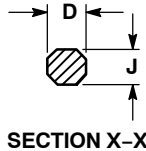
NOTES:

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.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | 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 | --- |



BENT LEAD
TAPE & REEL
AMMO PACK



SECTION X-X

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