

MPSA13, MPSA14

MPSA14 is a Preferred Device

Darlington Transistors

NPN Silicon

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|----------------------------|
| Collector–Emitter Voltage | V_{CES} | 30 | Vdc |
| Collector–Base Voltage | V_{CBO} | 30 | Vdc |
| Emitter–Base Voltage | V_{EBO} | 10 | Vdc |
| Collector Current – Continuous | I_C | 500 | mA _{dc} |
| 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 | $^\circ\text{C}$ |

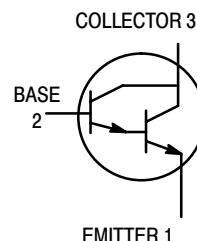
THERMAL CHARACTERISTICS

| 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 | $^\circ\text{C}/\text{mW}$ |

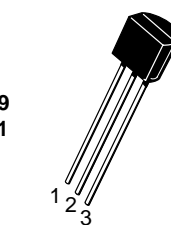
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



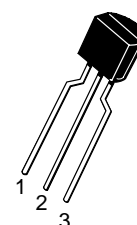
ON Semiconductor®



TO-92
CASE 29
STYLE 1

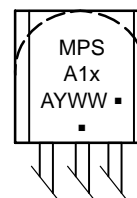


STRAIGHT LEAD
BULK PACK



BENT LEAD
TAPE & REEL
AMMO PACK

MARKING DIAGRAM



- x = 3 or 4
- 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 2 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.

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

MPSA13, MPSA14

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

| Characteristic | Symbol | Min | Max | Unit |
|--|----------------------|-------------------------------------|------------------|------|
| OFF CHARACTERISTICS | | | | |
| Collector–Emitter Breakdown Voltage (I _C = 100 µAdc, I _B = 0) | V _{(BR)CES} | 30 | – | Vdc |
| Collector Cutoff Current (V _{CB} = 30 Vdc, I _E = 0) | I _{CBO} | – | 100 | nAdc |
| Emitter Cutoff Current (V _{EB} = 10 Vdc, I _C = 0) | I _{EBO} | – | 100 | nAdc |
| ON CHARACTERISTICS (Note 1) | | | | |
| DC Current Gain (I _C = 10 mAdc, V _{CE} = 5.0 Vdc) (I _C = 100 mAdc, V _{CE} = 5.0 Vdc) | h _{FE} | 5,000 10,000 10,000 20,000 | – – – – | – |
| Collector–Emitter Saturation Voltage (I _C = 100 mAdc, I _B = 0.1 mAdc) | V _{CE(sat)} | – | 1.5 | Vdc |
| Base–Emitter On Voltage (I _C = 100 mAdc, V _{CE} = 5.0 Vdc) | V _{BE(on)} | – | 2.0 | Vdc |
| SMALL–SIGNAL CHARACTERISTICS | | | | |
| Current–Gain – Bandwidth Product (Note 2) (I _C = 10 mAdc, V _{CE} = 5.0 Vdc, f = 100 MHz) | f _T | 125 | – | MHz |

1. Pulse Test: Pulse Width ≤ 300 µs; Duty Cycle ≤ 2.0%.

2. f_T = |h_{fe}| • f_{test}.

ORDERING INFORMATION

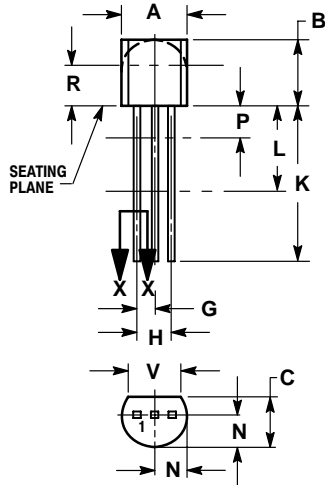
| Device | Package | Shipping [†] |
|-------------|--------------------|-----------------------|
| MPSA13 | TO–92 | 5000 Units / Bulk |
| MPSA13G | TO–92 (Pb–Free) | 5000 Units / Bulk |
| MPSA13RLRA | TO–92 | 2000 / Tape & Reel |
| MPSA13RLRAG | TO–92 (Pb–Free) | 2000 / Tape & Reel |
| MPSA13RLRMG | TO–92 (Pb–Free) | 2000 / Ammo Pack |
| MPSA13RLRPG | TO–92 (Pb–Free) | 2000 / Ammo Pack |
| MPSA13ZL1G | TO–92 (Pb–Free) | 2000 / Ammo Pack |
| MPSA14G | TO–92 (Pb–Free) | 5000 Units / Bulk |
| MPSA14RLRAG | TO–92 (Pb–Free) | 2000 / Tape & Reel |
| MPSA14RLRPG | 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.

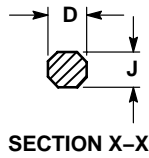
MPSA13, MPSA14

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-11
ISSUE AM



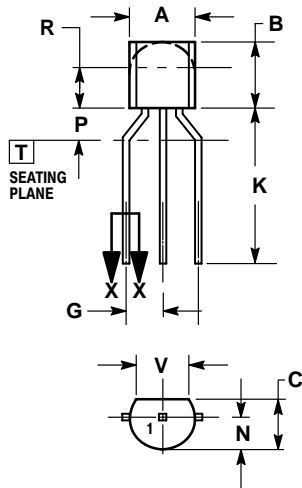
STRAIGHT LEAD
BULK PACK



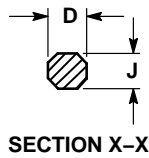
NOTES:

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.

| 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 | --- |



BENT LEAD
TAPE & REEL
AMMO PACK



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 | --- |

STYLE 1:

- PIN 1. EMITTER
- BASE
- COLLECTOR