

# MPSA63, MPSA64

MPSA64 is a Preferred Device

## Darlington Transistors

### PNP Silicon

#### Features

- These are Pb-Free Devices\*

#### 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        | mAdc                       |
| Total Device Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 625<br>5.0  | mW<br>mW/ $^\circ\text{C}$ |
| Total Device Dissipation<br>@ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.5<br>12   | W<br>mW/ $^\circ\text{C}$  |
| Operating and Storage Junction<br>Temperature Range                                       | $T_J, T_{stg}$ | -55 to +150 | $^\circ\text{C}$           |

#### THERMAL CHARACTERISTICS

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

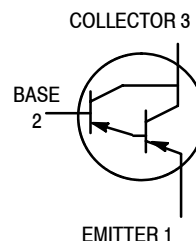
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

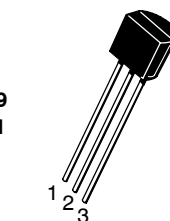


ON Semiconductor®

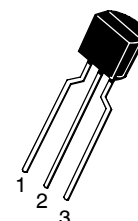
<http://onsemi.com>



TO-92  
CASE 29  
STYLE 1

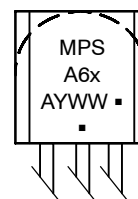


STRAIGHT LEAD  
BULK PACK



BENT LEAD  
TAPE & REEL  
AMMO PACK

#### MARKING DIAGRAM



xx = 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.

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

# MPSA63, MPSA64

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

### OFF CHARACTERISTICS

|                                                                                       |               |     |      |      |
|---------------------------------------------------------------------------------------|---------------|-----|------|------|
| Collector-Emitter Breakdown Voltage<br>( $I_C = -100\ \mu\text{Adc}$ , $V_{BE} = 0$ ) | $V_{(BR)CES}$ | -30 | -    | Vdc  |
| Collector Cutoff Current<br>( $V_{CB} = -30\ \text{Vdc}$ , $I_E = 0$ )                | $I_{CBO}$     | -   | -100 | nAdc |
| Emitter Cutoff Current<br>( $V_{EB} = -10\ \text{Vdc}$ , $I_C = 0$ )                  | $I_{EBO}$     | -   | -100 | nAdc |

### ON CHARACTERISTICS (Note 1)

|                                                                                                  |                                                          |                      |        |      |     |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------|--------|------|-----|
| DC Current Gain<br>(I <sub>C</sub> = -10 mAdc, V <sub>CE</sub> = -5.0 Vdc)                       | MPSA63                                                   | h <sub>FE</sub>      | 5,000  | -    | -   |
|                                                                                                  | MPSA64                                                   |                      | 10,000 | -    |     |
|                                                                                                  | (I <sub>C</sub> = -100 mAdc, V <sub>CE</sub> = -5.0 Vdc) | MPSA63               | 10,000 | -    |     |
|                                                                                                  |                                                          | MPSA64               | 20,000 | -    |     |
| Collector-Emitter Saturation Voltage<br>(I <sub>C</sub> = -100 mAdc, I <sub>B</sub> = -0.1 mAdc) |                                                          | V <sub>CE(sat)</sub> | -      | -1.5 | Vdc |
| Base-Emitter On Voltage<br>(I <sub>C</sub> = -100 mAdc, V <sub>CE</sub> = -5.0 Vdc)              |                                                          | V <sub>BE(on)</sub>  | -      | -2.0 | Vdc |

### SMALL-SIGNAL CHARACTERISTICS

|                                                                                                                                  |       |     |   |     |
|----------------------------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|
| Current-Gain — Bandwidth Product (Note 2)<br>( $I_C = -100\ \text{mAdc}$ , $V_{CE} = -5.0\ \text{Vdc}$ , $f = 100\ \text{MHz}$ ) | $f_T$ | 125 | - | MHz |
|----------------------------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|

1. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ ; Duty Cycle  $\leq 2.0\%$ .
2.  $f_T = |h_{fe}| \cdot f_{\text{test}}$ .

## ORDERING INFORMATION

| Device      | Package            | Shipping <sup>†</sup> |
|-------------|--------------------|-----------------------|
| MPSA63G     | TO-92<br>(Pb-Free) | 5000 Units / Bulk     |
| MPSA63RLRAG | TO-92<br>(Pb-Free) | 2000 / Tape & Reel    |
| MPSA64G     | TO-92<br>(Pb-Free) | 5000 Units / Bulk     |
| MPSA64RLRAG | TO-92<br>(Pb-Free) | 2000 / Tape & Reel    |
| MPSA64RLRMG | TO-92<br>(Pb-Free) | 2000 / Ammo Pack      |

<sup>†</sup>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.

# MP5A63, MP5A64

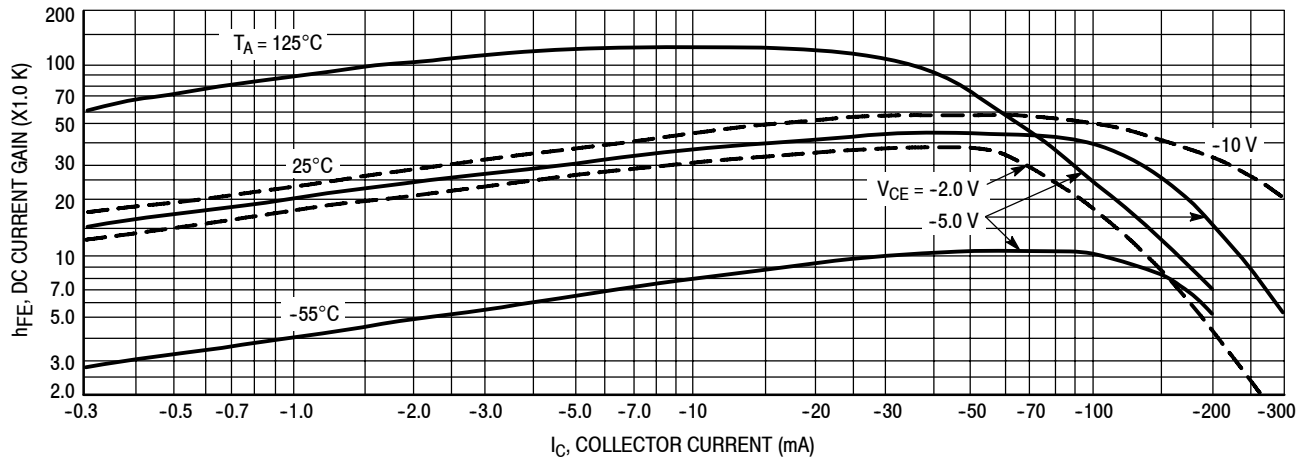


Figure 1. DC Current Gain

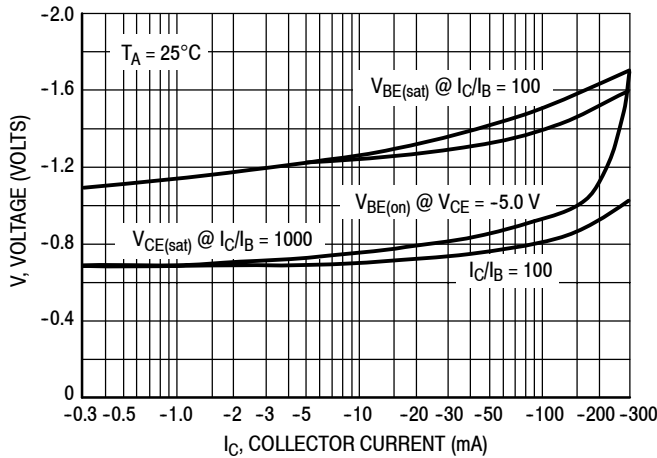


Figure 2. "On" Voltage

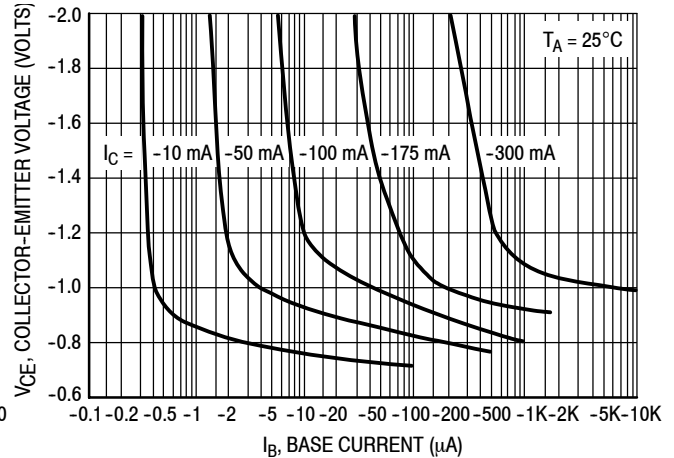


Figure 3. Collector Saturation Region

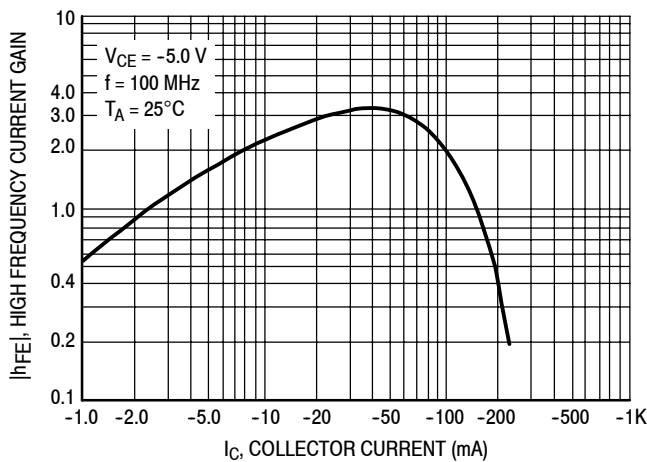


Figure 4. High Frequency Current Gain

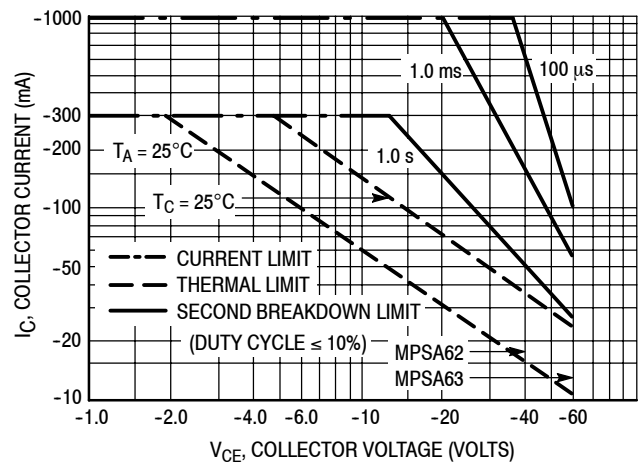
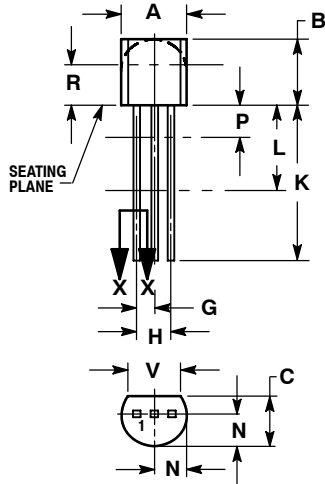


Figure 5. Active Region, Safe Operating Area

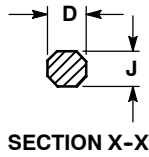
# MPSA63, MPSA64

## PACKAGE DIMENSIONS

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



STRAIGHT LEAD  
BULK PACK

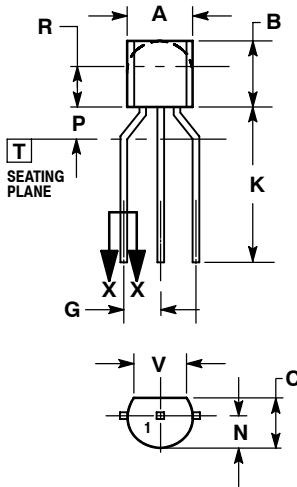


SECTION X-X

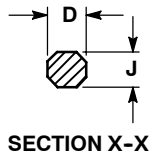
### NOTES:

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        | ---   |



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.

| 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:

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

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