

MJD44E3

Preferred Device

Darlington Power Transistor

DPAK For Surface Mount Applications

Designed for general purpose power and switching output or driver stages in applications such as switching regulators, converters, and power amplifiers.

Features

- Electrically Similar to Popular D44E3 Device
- High DC Gain – 1000 Min @ 5.0 Adc
- Low Sat. Voltage – 1.5 V @ 5.0 Adc
- Compatible With Existing Automatic Pick and Place Equipment
- Epoxy Meets UL 94 V-0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B > 8000 V
Machine Model, C > 400 V
- Pb-Free Package is Available

MAXIMUM RATINGS

| Rating | Symbol | Max | Unit |
|---|----------------|---------------|-----------|
| Collector-Emitter Voltage | V_{CEO} | 80 | Vdc |
| Emitter-Base Voltage | V_{EB} | 7 | Vdc |
| Collector Current – Continuous | I_C | 10 | Adc |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 20 0.16 | W W/°C |
| Total Power Dissipation (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.75 0.014 | W W/°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-Case | $R_{\theta JC}$ | 6.25 | °C/W |
| Thermal Resistance, Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | 71.4 | °C/W |
| Lead Temperature for Soldering | T_L | 260 | °C |

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.

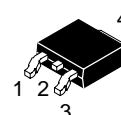
1. These ratings are applicable when surface mounted on the minimum pad sizes recommended.



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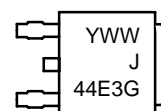
<http://onsemi.com>

NPN DARLINGTON SILICON POWER TRANSISTORS 10 AMPERES 80 VOLTS, 20 WATTS



DPAK
CASE 369C
STYLE 1

MARKING DIAGRAM



Y = Year
WW = Work Week
J44E3 = Device Code
G = Pb-Free Package

ORDERING INFORMATION

| Device | Package | Shipping† |
|------------|-------------------|------------------|
| MJD44E3T4 | DPAK | 2500/Tape & Reel |
| MJD44E3T4G | DPAK (Pb-Free) | 2500/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.

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

MJD44E3

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

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

OFF CHARACTERISTICS

| | | | | | |
|--|-----------|---|---|----|---------------|
| Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}, V_{BE} = 0$) | I_{CES} | - | - | 10 | μA |
| Emitter Cutoff Current ($V_{EB} = 7 \text{ Vdc}$) | I_{EBO} | - | - | 1 | μA |

ON CHARACTERISTICS

| | | | | | |
|---|----------------------|------|---|----------|-----|
| Collector-Emitter Saturation Voltage ($I_C = 5 \text{ Adc}, I_B = 10 \text{ mAdc}$) ($I_C = 10 \text{ Adc}, I_B = 20 \text{ mAdc}$) | $V_{CE(\text{sat})}$ | - | - | 1.5 2 | Vdc |
| Base-Emitter Saturation Voltage ($I_C = 5 \text{ Adc}, I_B = 10 \text{ mAdc}$) | $V_{BE(\text{sat})}$ | - | - | 2.5 | Vdc |
| DC Current Gain ($V_{CE} = 5 \text{ Vdc}, I_C = 5 \text{ Adc}$) | h_{FE} | 1000 | - | - | - |

DYNAMIC CHARACTERISTICS

| | | | | | |
|---|----------|---|---|-----|----|
| Collector Capacitance ($V_{CB} = 10 \text{ Vdc}, f_{\text{test}} = 1 \text{ MHz}$) | C_{cb} | - | - | 130 | pF |
|---|----------|---|---|-----|----|

SWITCHING TIMES

| | | | | | |
|---|-------------|---|-----|---|---------------|
| Delay and Rise Times ($I_C = 10 \text{ Adc}, I_{B1} = 20 \text{ mAdc}$) | $t_d + t_r$ | - | 0.6 | - | μs |
| Storage Time ($I_C = 10 \text{ Adc}, I_{B1} = I_{B2} = 20 \text{ mAdc}$) | t_s | - | 2 | - | μs |
| Fall Time ($I_C = 10 \text{ Adc}, I_{B1} = I_{B2} = 20 \text{ mAdc}$) | t_f | - | 0.5 | - | μs |

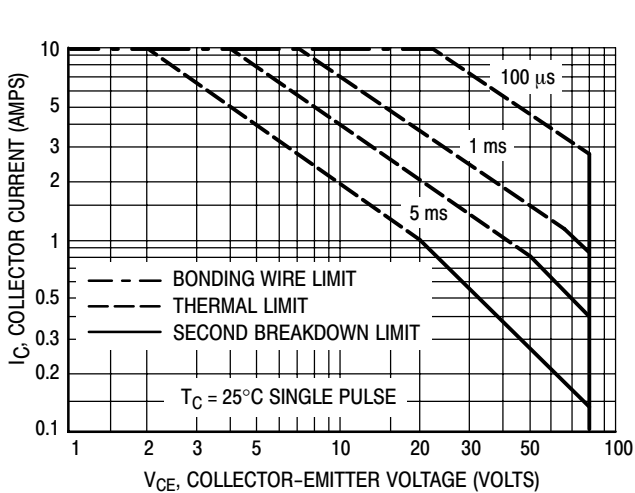


Figure 1. Maximum Forward Bias Safe Operating Area

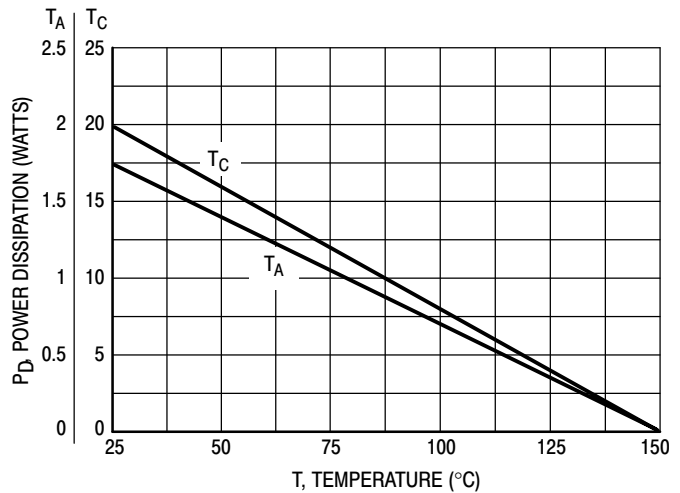
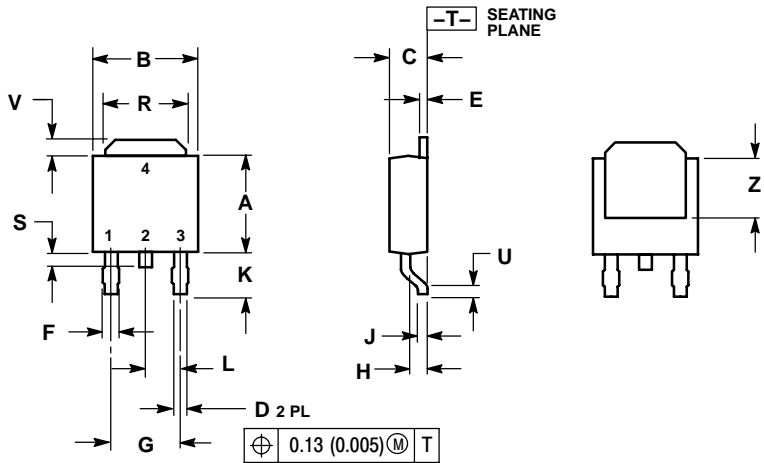


Figure 2. Power Derating

MJD44E3

PACKAGE DIMENSIONS

DPAK
CASE 369C-01
ISSUE 0



NOTES:

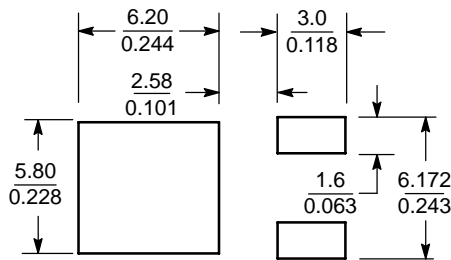
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.235 | 0.245 | 5.97 | 6.22 |
| B | 0.250 | 0.265 | 6.35 | 6.73 |
| C | 0.086 | 0.094 | 2.19 | 2.38 |
| D | 0.027 | 0.035 | 0.69 | 0.88 |
| E | 0.018 | 0.023 | 0.46 | 0.58 |
| F | 0.037 | 0.045 | 0.94 | 1.14 |
| G | 0.180 BSC | | 4.58 BSC | |
| H | 0.034 | 0.040 | 0.87 | 1.01 |
| J | 0.018 | 0.023 | 0.46 | 0.58 |
| K | 0.102 | 0.114 | 2.60 | 2.89 |
| L | 0.090 BSC | | 2.29 BSC | |
| R | 0.180 | 0.215 | 4.57 | 5.45 |
| S | 0.025 | 0.040 | 0.63 | 1.01 |
| U | 0.020 | --- | 0.51 | --- |
| V | 0.035 | 0.050 | 0.89 | 1.27 |
| Z | 0.155 | --- | 3.93 | --- |

STYLE 1:

1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

SOLDERING FOOTPRINT*



SCALE 3:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*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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