# NPN Darlington Power Transistor

# NJD35N04G, NJVNJD35N04G, NJVNJD35N04T4G

This high voltage power Darlington has been specifically designed for inductive applications such as Electronic Ignition, Switching Regulators and Motor Control.

### Features

- Exceptional Safe Operating Area
- High $V_{CE}$; High Current Gain
- NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free Devices*

### Benefits

- Reliable Performance at Higher Powers
- Designed for Inductive Loads
- Very Low Current Requirements

### Applications

- Internal Combustion Engine Ignition Control
- Switching Regulators
- Motor Controls
- Light Ballast
- Photo Flash

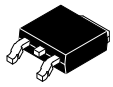
### MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Emitter Sustaining Voltage | $V_{CEO}$ | 350 | Vdc |
| Collector-Base Breakdown Voltage | $V_{CBO}$ | 700 | Vdc |
| Collector-Emitter Breakdown Voltage | $V_{CES}$ | 700 | Vdc |
| Emitter-Base Voltage | $V_{EBO}$ | 5.0 | Vdc |
| Collector Current<br>Continuous<br>Peak | <br>$I_C$<br>$I_{CM}$ | <br>4.0<br>8.0 | Adc |
| Base Current | $I_B$ | 0.5 | Adc |
| Total Power Dissipation<br>@ $T_C$ = 25 °C<br>Derate above 25 °C | $P_D$ | <br>45<br>0.36 | <br>W<br>W/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | −65 to +150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

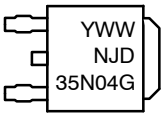
* For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**DARLINGTON POWER TRANSISTORS 4 AMPERES 350 VOLTS 45 WATTS**



**DPAK3**
**CASE 369C**
**STYLE 1**

### MARKING DIAGRAM




Y = Year
WW = Work Week
NJD35N04 = Device Code
G = Pb-Free Device

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| NJD35N04G | DPAK3 (Pb-Free) | 75 Units / Rail |
| NJD35N04T4G | DPAK3 (Pb-Free) | 2,500 / Tape & Reel |
| NJVNJD35N04T4G | DPAK3 (Pb-Free) | 2,500 / Tape & Reel |

**DISCONTINUED** (Note 1)

| | | |
|---|---|---|
| NJVNJD35N04G | DPAK3 (Pb-Free) | 75 Units / Rail |

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

1. **DISCONTINUED:** This device is not available. Please contact your **onsemi** representative for information. The most current information on this device may be available on www.onsemi.com.

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## THERMAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance<br>Junction-to-Case<br>Junction-to-Ambient | <br>$R_{\theta JC}$<br>$R_{\theta JA}$ | <br>2.78<br>71.4 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_C$ = 25 °C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector-Emitter Sustaining Voltage<br>($I_C$ = 10 mA, L = 10 mH) | $V_{CEO(sus)}$ | <br>350 | <br>– | <br>– | V |
| Collector Cutoff Current ($V_{CE}$ = 500 V)<br>($I_B$ = 0) ($V_{CE}$ = 500 V, $T_C$ = 125 °C) | $I_{CES}$ | –<br>– | –<br>– | 50<br>250 | μA |
| Collector Cutoff Current ($V_{CE}$ = 250 V)<br>($I_B$ = 0) ($V_{CE}$ = 200 V, $T_C$ = 125 °C) | $I_{CEO}$ | –<br>– | –<br>– | 50<br>250 | μA |
| Emitter Cutoff Current ($V_{BE}$ = 5.0 Vdc) | $I_{EBO}$ | – | – | 5.0 | μA |
| **ON CHARACTERISTICS** | | | | | |
| Collector-Emitter Saturation Voltage<br>($I_C$ = 2.0 A, $I_B$ = 20 mA)<br>($I_C$ = 2.0 A, $I_B$ = 20 mA 125 °C) | $V_{CE(sat)}$ | <br>–<br>– | <br>–<br>– | <br>1.5<br>1.5 | V |
| Base-Emitter Saturation Voltage<br>($I_C$ = 2.0 A, $I_B$ = 20 mA)<br>($I_C$ = 2.0 A, $I_B$ = 20 mA 125 °C) | $V_{BE(sat)}$ | <br>–<br>– | <br>–<br>– | <br>2.0<br>2.0 | V |
| Base-Emitter On Voltage<br>($I_C$ = 2.0 A, $V_{CE}$ = 2.0 V)<br>($I_C$ = 2.0 A, $V_{CE}$ = 2.0 V 125 °C) | $V_{BE(on)}$ | <br>–<br>– | <br>–<br>– | <br>2.0<br>2.0 | V |
| DC Current Gain<br>($I_C$ = 2.0 A, $V_{CE}$ = 2.0 V)<br>($I_C$ = 4.0 A, $V_{CE}$ = 2.0 Vdc) | $h_{FE}$ | <br>2000<br>300 | <br>–<br>– | <br>–<br>– | – |
| **DYNAMIC CHARACTERISTICS** | | | | | |
| Current-Gain – Bandwidth Product<br>($I_C$ = 2.0 A, $V_{CE}$ = 10 V, f = 1.0 MHz) | $f_T$ | <br>90 | <br>– | <br>– | MHz |
| Output Capacitance<br>($V_{CB}$ = 10 V, $I_E$ = 0, f = 0.1 MHz) | $C_{ob}$ | <br>– | <br>60 | <br>– | pF |
| **SWITCHING CHARACTERISTICS** | | | | | |
| $V_{CC}$ = 12 V, $V_{clamp}$ = 250 V, L = 4 mH<br>$I_C$ = 2 A, $I_{B1}$ = 20 mA, $I_{B2}$ = –20 mA | $t_s$<br>$t_f$ | –<br>– | 18<br>0.8 | –<br>– | μSec |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

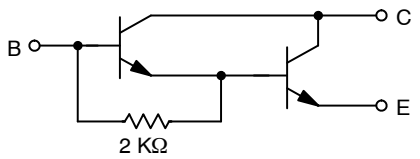



**Figure 1. Darlington Circuit Schematic**



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## TYPICAL CHARACTERISTICS

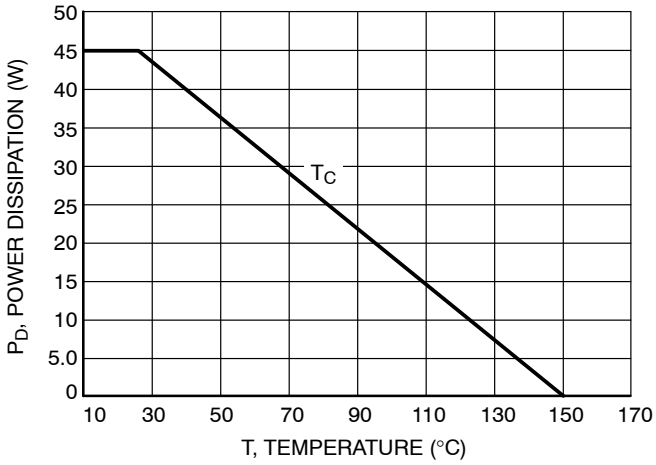



**Figure 2. Power Derating**

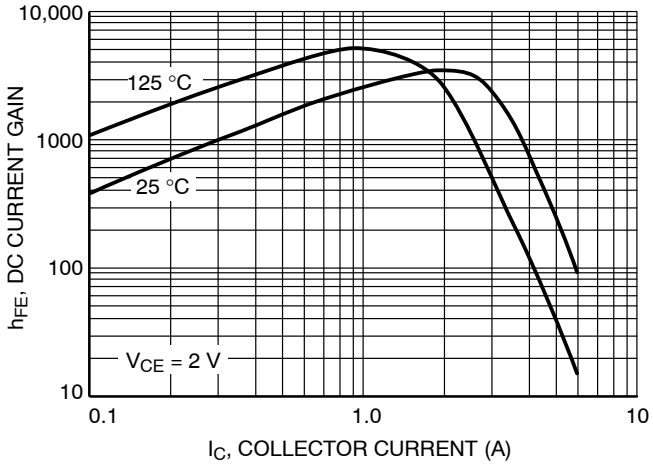



**Figure 3. DC Current Gain**

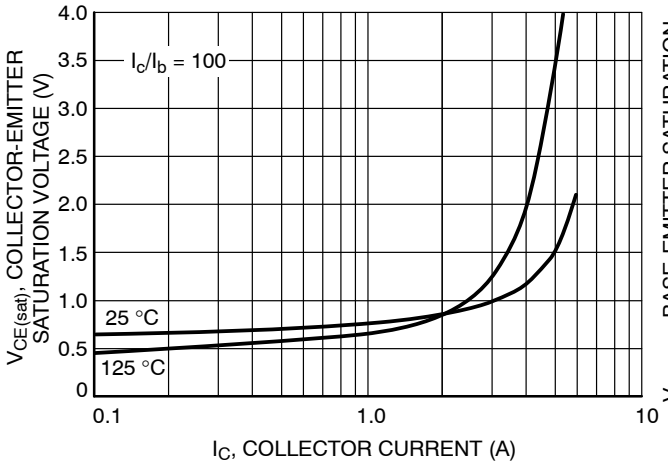



**Figure 4. Collector-Emitter Saturation Voltage**

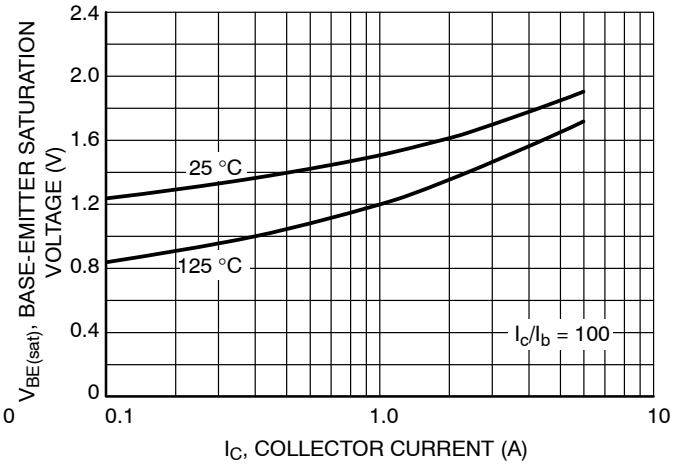



**Figure 5. Base-Emitter Saturation Voltage**

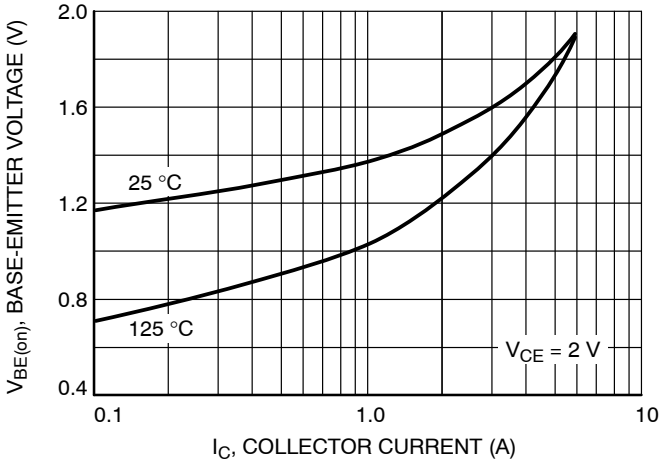



**Figure 6. Base-Emitter Voltage**

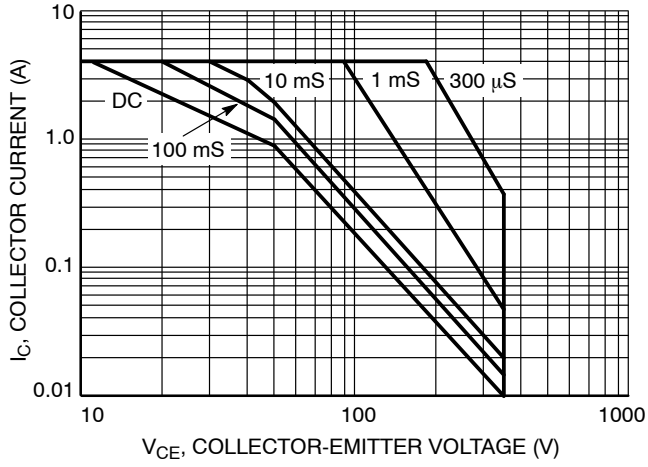



**Figure 7. Forward Bias Safe Operating Area (FBSOA)**



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## REVISION HISTORY

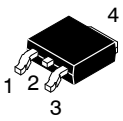
| Revision | Description of Changes | Date |
|---|---|---|
| 6 | Document rebranded to **onsemi** format. OPN NJVNJD35N04G marked as discontinued. | 2/5/2026 |

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



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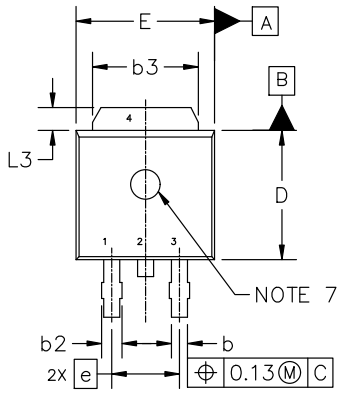
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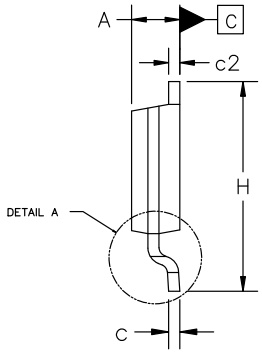

**DPAK−3 6.10x6.54x2.28, 2.29P**
CASE 369C
ISSUE K

DATE 14 MAY 2026

**SCALE 1:1**

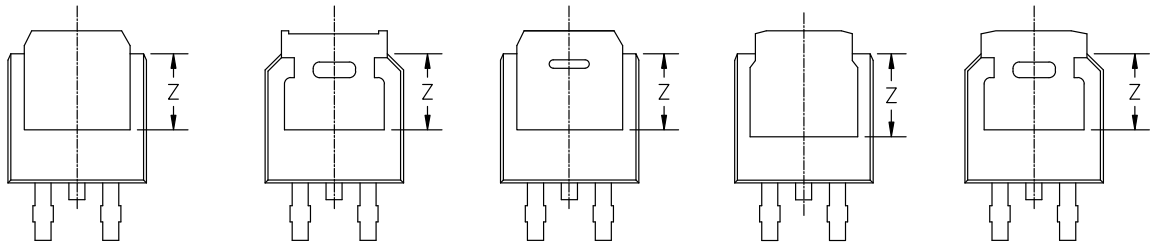



TOP VIEW




SIDE VIEW

| MILLIMETERS | | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| A | 2.18 | 2.28 | 2.38 |
| A1 | 0.00 | −−− | 0.13 |
| b | 0.63 | 0.76 | 0.89 |
| b2 | 0.72 | 0.93 | 1.14 |
| b3 | 4.57 | 5.02 | 5.46 |
| c | 0.46 | 0.54 | 0.61 |
| c2 | 0.46 | 0.54 | 0.61 |
| D | 5.97 | 6.10 | 6.22 |
| E | 6.35 | 6.54 | 6.73 |
| e | 2.29 BSC | | |
| H | 9.40 | 9.91 | 10.41 |
| L | 1.40 | 1.59 | 1.78 |
| L1 | 2.90 REF | | |
| L2 | 0.51 BSC | | |
| L3 | 0.89 | −−− | 1.27 |
| L4 | −−− | −−− | 1.01 |
| Z | 3.93 | −−− | −−− |

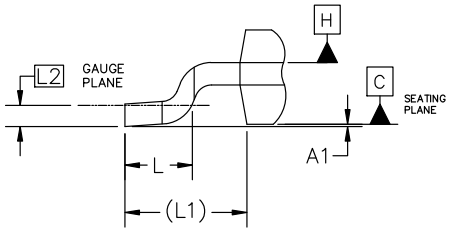



BOTTOM VIEW

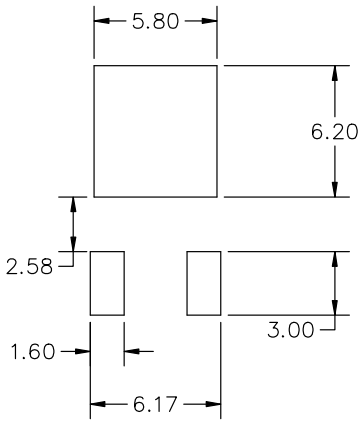
ALTERNATE CONSTRUCTIONS

NOTES:

1. DIMENSIONING AND TOLERANCING ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3, AND Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.
7. OPTIONAL MOLD FEATURE.




DETAIL A
ROTATED 90° CW




RECOMMENDED MOUNTING FOOTPRINT*

*FOR ADDITIONAL INFORMATION ON OUR PB−FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ONSEMI SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

| | | |
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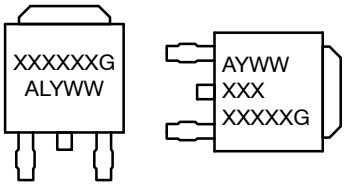


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**DPAK−3 6.10x6.54x2.28, 2.29P**
CASE 369C
ISSUE K

DATE 13 MAY 2026

## GENERIC MARKING DIAGRAM*




**IC** **Discrete**

| | |
|---|---|
| XXXXXX | = Device Code |
| A | = Assembly Location |
| L | = Wafer Lot |
| Y | = Year |
| WW | = Work Week |
| G | = Pb−Free Package |

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 4:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

STYLE 6:
PIN 1. MT1
2. MT2
3. GATE
4. MT2

STYLE 7:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 8:
PIN 1. N/C
2. CATHODE
3. ANODE
4. CATHODE

STYLE 9:
PIN 1. ANODE
2. CATHODE
3. RESISTOR ADJUST
4. CATHODE

STYLE 10:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE




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