

# MOSFET – Power, P-Channel, DPAK

**-60 V, -12 A**

## NTD2955, NVD2955

This Power MOSFET is designed to withstand high energy in the avalanche and commutation modes. Designed for low-voltage, high-speed switching applications in power supplies, converters, and power motor controls. These devices are particularly well suited for bridge circuits where diode speed and commutating safe operating areas are critical and offer an additional safety margin against unexpected voltage transients.

### Features

- Avalanche Energy Specified
- $I_{DSS}$  and  $V_{DS(on)}$  Specified at Elevated Temperature
- Designed for Low-Voltage, High-Speed Switching Applications and to Withstand High Energy in the Avalanche and Commutation Modes
- NVD and SVD Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

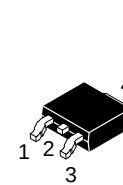
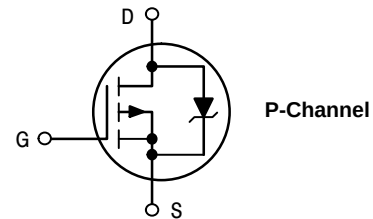
### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Rating                                                                                                                                                                              | Symbol          | Value      | Unit               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|--------------------|
| Drain-to-Source Voltage                                                                                                                                                             | $V_{DSS}$       | -60        | Vdc                |
| Gate-to-Source Voltage                                                                                                                                                              | $V_{GS}$        | $\pm 20$   | Vdc                |
| – Continuous                                                                                                                                                                        | $V_{GSM}$       | $\pm 25$   | Vpk                |
| – Non-repetitive ( $t_p \leq 10$ ms)                                                                                                                                                |                 |            |                    |
| Drain Current                                                                                                                                                                       | $I_D$           | -12        | Adc                |
| – Continuous @ $T_a = 25^\circ\text{C}$                                                                                                                                             | $I_{DM}$        | -18        | Apk                |
| – Single Pulse ( $t_p \leq 10$ ms)                                                                                                                                                  |                 |            |                    |
| Total Power Dissipation @ $T_a = 25^\circ\text{C}$                                                                                                                                  | $P_D$           | 55         | W                  |
| Operating and Storage Temperature Range                                                                                                                                             | $T_J, T_{stg}$  | -55 to 175 | $^\circ\text{C}$   |
| Single Pulse Drain-to-Source Avalanche Energy – Starting $T_J = 25^\circ\text{C}$<br>( $V_{DD} = 25$ Vdc, $V_{GS} = 10$ Vdc, Peak $I_L = 12$ Apk, $L = 3.0$ mH, $R_G = 25 \Omega$ ) | $E_{AS}$        | 216        | mJ                 |
| Thermal Resistance                                                                                                                                                                  | $R_{\theta JC}$ | 2.73       | $^\circ\text{C/W}$ |
| – Junction-to-Case                                                                                                                                                                  | $R_{\theta JA}$ | 71.4       |                    |
| – Junction-to-Ambient (Note 1)                                                                                                                                                      | $R_{\theta JA}$ | 100        |                    |
| – Junction-to-Ambient (Note 2)                                                                                                                                                      |                 |            |                    |
| Maximum Lead Temperature for Soldering Purposes, 1/8 in. from case for 10 seconds                                                                                                   | $T_L$           | 260        | $^\circ\text{C}$   |

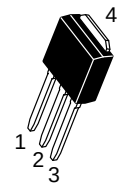
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. When surface mounted to an FR4 board using 1 in pad size (Cu area = 1.127 in<sup>2</sup>).
2. When surface mounted to an FR4 board using the minimum recommended pad size (Cu area = 0.412 in<sup>2</sup>).

| $V_{(BR)DSS}$ | $R_{DS(on)}$ TYP            | $I_D$ MAX |
|---------------|-----------------------------|-----------|
| -60 V         | 155 m $\Omega$ @ -10 V, 6 A | -12 A     |

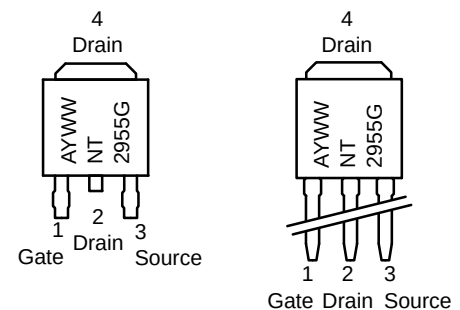


**DPAK**  
**CASE 369C**  
**STYLE 2**



**IPAK**  
**CASE 369D**  
**STYLE 2**

### MARKING DIAGRAMS & PIN ASSIGNMENTS



- A = Assembly Location\*
- NT2955/NV2955 = Specific Device Code (DPAK)
- NT2955 = Specific Device Code (IPAK)
- Y = Year
- WW = Work Week
- G = Pb-Free Package

\* The Assembly Location code (A) is front side optional. In cases where the Assembly Location is stamped in the package, the front side assembly code may be blank.

### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 5.

# NTD2955, NVD2955

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

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

### OFF CHARACTERISTICS

|                                                                                                                                                                                                                                  |               |          |         |             |                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|---------|-------------|-------------------------------|
| Drain-to-Source Breakdown Voltage (Note 3)<br>( $V_{GS} = 0\text{ Vdc}$ , $I_D = -0.25\text{ mA}$ )<br>(Positive Temperature Coefficient)                                                                                        | $V_{(BR)DSS}$ | -60<br>- | -<br>67 | -<br>-      | Vdc<br>mV/ $^{\circ}\text{C}$ |
| Zero Gate Voltage Drain Current<br>( $V_{GS} = 0\text{ Vdc}$ , $V_{DS} = -60\text{ Vdc}$ , $T_J = 25\text{ }^{\circ}\text{C}$ )<br>( $V_{GS} = 0\text{ Vdc}$ , $V_{DS} = -60\text{ Vdc}$ , $T_J = 150\text{ }^{\circ}\text{C}$ ) | $I_{DSS}$     | -<br>-   | -<br>-  | -10<br>-100 | $\mu\text{Adc}$               |
| Gate-Body Leakage Current ( $V_{GS} = \pm 20\text{ Vdc}$ , $V_{DS} = 0\text{ Vdc}$ )                                                                                                                                             | $I_{GSS}$     | -        | -       | -100        | nAdc                          |

### ON CHARACTERISTICS (Note 3)

|                                                                                                                                                                                       |              |           |             |              |                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|-------------|--------------|-------------------------------|
| Gate Threshold Voltage<br>( $V_{DS} = V_{GS}$ , $I_D = -250\text{ }\mu\text{Adc}$ )<br>(Negative Temperature Coefficient)                                                             | $V_{GS(th)}$ | -2.0<br>- | -2.8<br>4.5 | -4.0<br>-    | Vdc<br>mV/ $^{\circ}\text{C}$ |
| Static Drain-Source On-State Resistance<br>( $V_{GS} = -10\text{ Vdc}$ , $I_D = -6.0\text{ Adc}$ )                                                                                    | $R_{DS(on)}$ | -         | 0.155       | 0.180        | $\Omega$                      |
| Drain-to-Source On-Voltage<br>( $V_{GS} = -10\text{ Vdc}$ , $I_D = -12\text{ Adc}$ )<br>( $V_{GS} = -10\text{ Vdc}$ , $I_D = -6.0\text{ Adc}$ , $T_J = 150\text{ }^{\circ}\text{C}$ ) | $V_{DS(on)}$ | -<br>-    | -1.86<br>-  | -2.6<br>-2.0 | Vdc                           |
| Forward Transconductance ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 6.0\text{ Adc}$ )                                                                                                        | $g_{FS}$     | -         | 8.0         | -            | Mhos                          |

### DYNAMIC CHARACTERISTICS

|                              |                                                                                  |           |   |     |     |    |
|------------------------------|----------------------------------------------------------------------------------|-----------|---|-----|-----|----|
| Input Capacitance            | $(V_{DS} = -25\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ ,<br>$F = 1.0\text{ MHz}$ ) | $C_{iss}$ | - | 500 | 750 | pF |
| Output Capacitance           |                                                                                  | $C_{oss}$ | - | 150 | 250 |    |
| Reverse Transfer Capacitance |                                                                                  | $C_{rss}$ | - | 50  | 100 |    |

### SWITCHING CHARACTERISTICS (Notes 3 and 4)

|                     |                                                                                                              |              |   |     |    |    |
|---------------------|--------------------------------------------------------------------------------------------------------------|--------------|---|-----|----|----|
| Turn-On Delay Time  | $(V_{DD} = -30\text{ Vdc}$ , $I_D = -12\text{ A}$ ,<br>$V_{GS} = -10\text{ V}$ , $R_G = 9.1\text{ }\Omega$ ) | $t_{d(on)}$  | - | 10  | 20 | ns |
| Rise Time           |                                                                                                              | $t_r$        | - | 45  | 85 |    |
| Turn-Off Delay Time |                                                                                                              | $t_{d(off)}$ | - | 26  | 40 |    |
| Fall Time           |                                                                                                              | $t_f$        | - | 48  | 90 |    |
| Gate Charge         | $(V_{DS} = -48\text{ Vdc}$ , $V_{GS} = -10\text{ Vdc}$ ,<br>$I_D = -12\text{ A}$ )                           | $Q_T$        | - | 15  | 30 | nC |
|                     |                                                                                                              | $Q_{GS}$     | - | 4.0 | -  |    |
|                     |                                                                                                              | $Q_{GD}$     | - | 7.0 | -  |    |

### DRAIN-SOURCE DIODE CHARACTERISTICS (Note 3)

|                                                                                                                                                                          |          |        |              |           |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|--------------|-----------|---------------|
| Diode Forward On-Voltage<br>( $I_S = 12\text{ Adc}$ , $V_{GS} = 0\text{ V}$ )<br>( $I_S = 12\text{ Adc}$ , $V_{GS} = 0\text{ V}$ , $T_J = 150\text{ }^{\circ}\text{C}$ ) | $V_{SD}$ | -<br>- | -1.6<br>-1.3 | -2.5<br>- | Vdc           |
| Reverse Recovery Time<br>( $I_S = 12\text{ A}$ , $dI_S/dt = 100\text{ A}/\mu\text{s}$ , $V_{GS} = 0\text{ V}$ )                                                          | $t_{rr}$ | -      | 50           | -         | ns            |
|                                                                                                                                                                          | $t_a$    | -      | 40           | -         |               |
|                                                                                                                                                                          | $t_b$    | -      | 10           | -         |               |
| Reverse Recovery Stored Charge                                                                                                                                           | $Q_{RR}$ | -      | 0.10         | -         | $\mu\text{C}$ |

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.

3. Indicates Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

4. Switching characteristics are independent of operating junction temperature.



TYPICAL PERFORMANCE CURVES ( $T_J = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

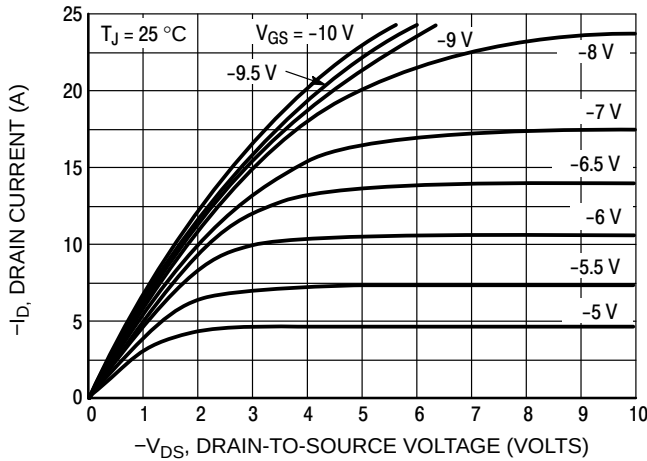


Figure 1. On-Region Characteristics

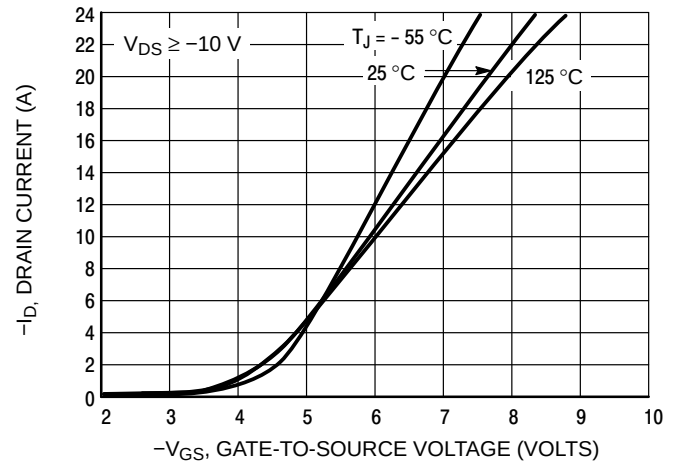


Figure 2. Transfer Characteristics

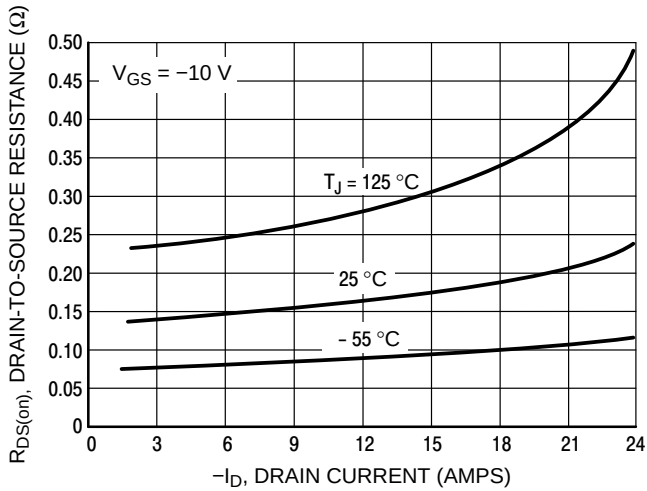


Figure 3. On-Resistance versus Drain Current and Temperature

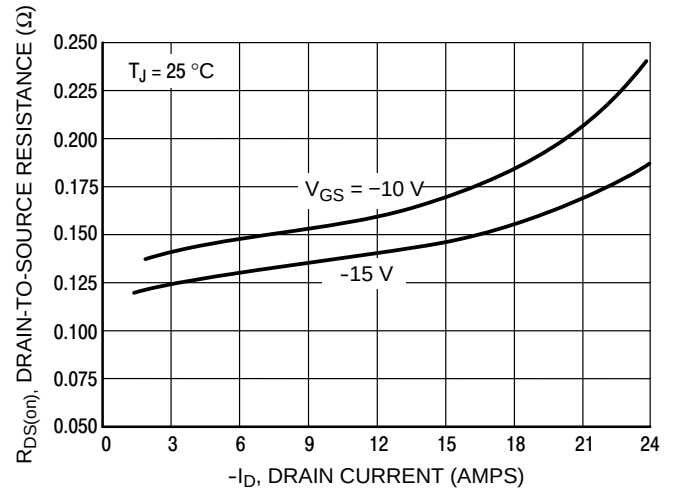


Figure 4. On-Resistance versus Drain Current and Gate Voltage

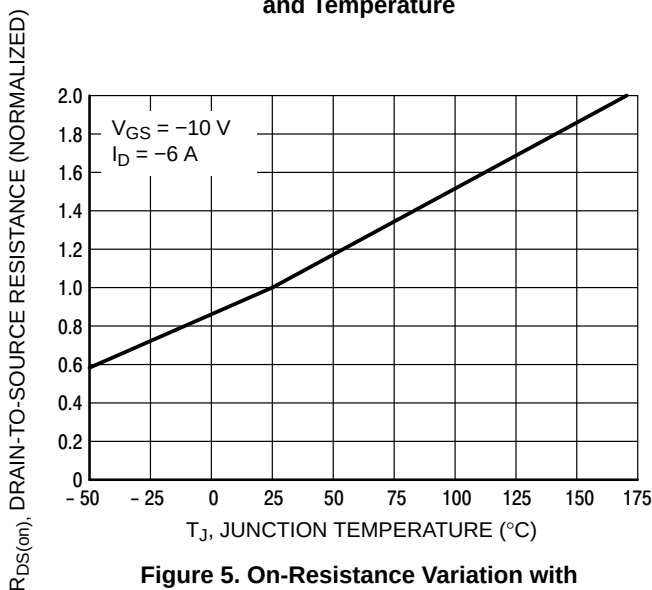


Figure 5. On-Resistance Variation with Temperature

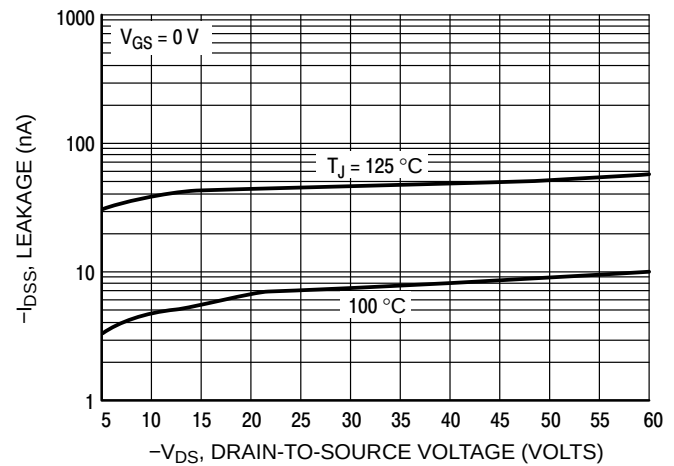


Figure 6. Drain-To-Source Leakage Current versus Voltage

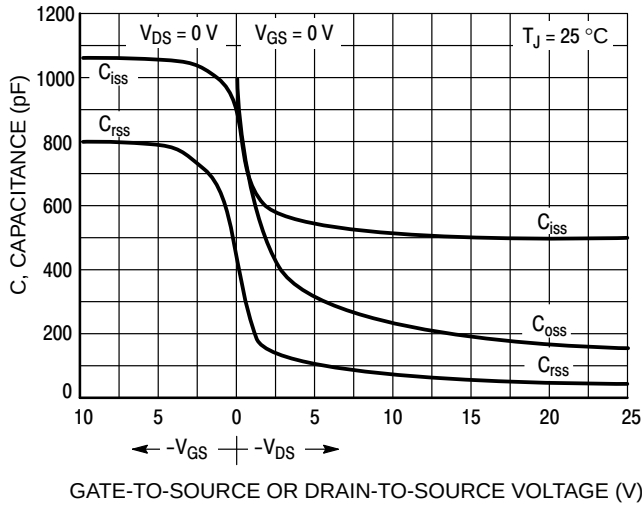


Figure 7. Capacitance Variation

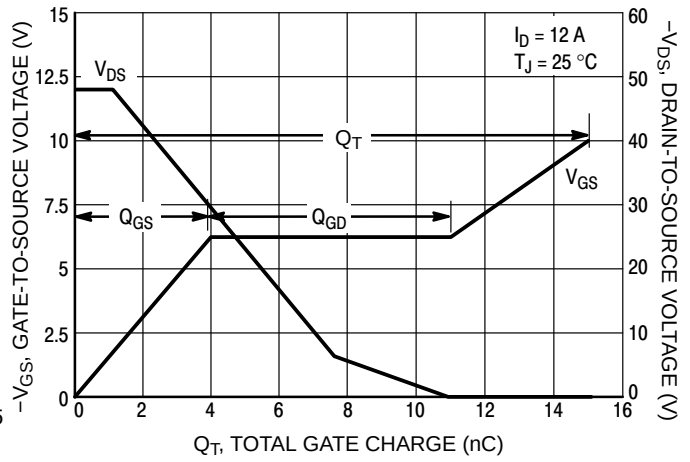


Figure 8. Gate-To-Source and Drain-To-Source Voltage versus Total Charge

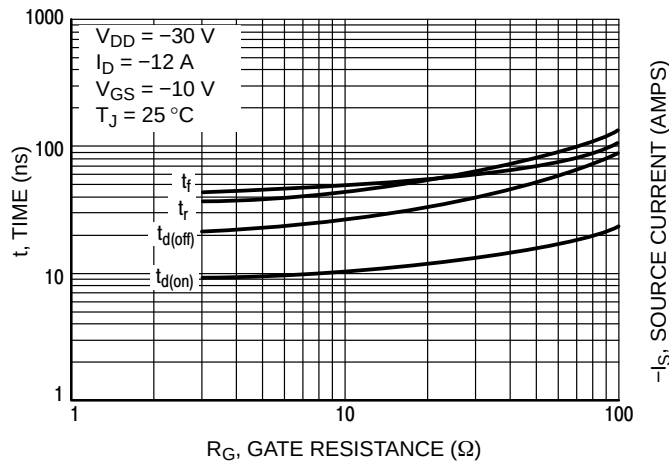


Figure 9. Resistive Switching Time Variation versus Gate Resistance

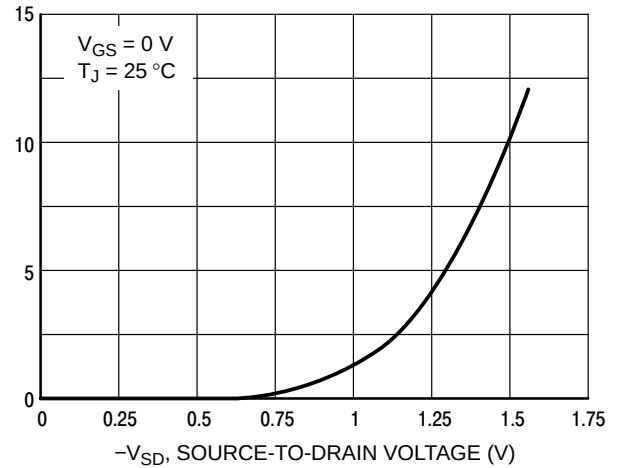


Figure 10. Diode Forward Voltage versus Current

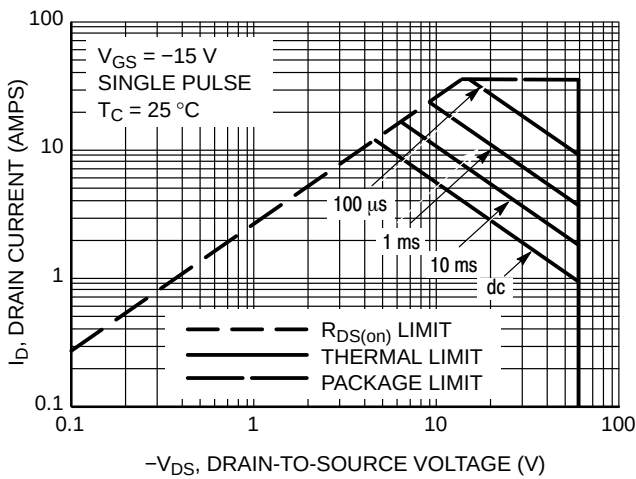


Figure 11. Maximum Rated Forward Biased Safe Operating Area

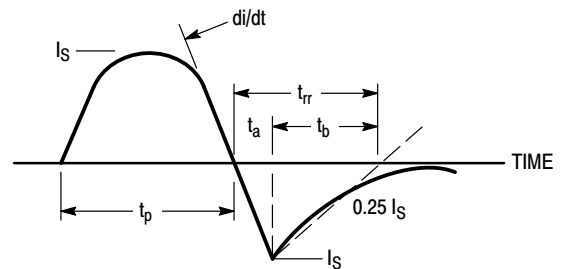


Figure 12. Diode Reverse Recovery Waveform

## NTD2955, NVD2955

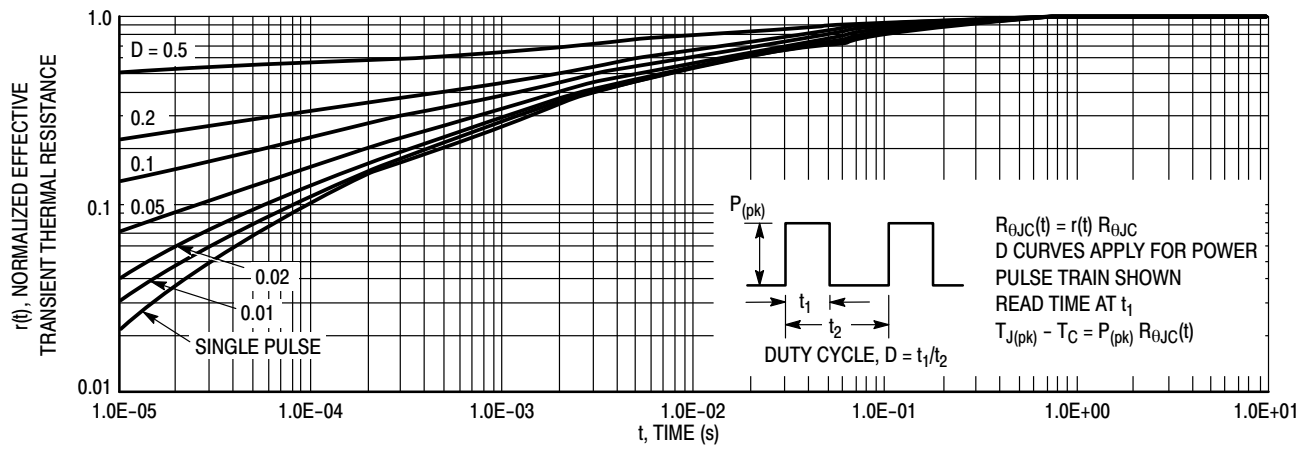


Figure 13. Thermal Response

### ORDERING INFORMATION

| Device      | Package           | Shipping <sup>†</sup> |
|-------------|-------------------|-----------------------|
| NTD2955T4G  | DPAK<br>(Pb-Free) | 2500 / Tape & Reel    |
| SVD2955T4G* | DPAK<br>(Pb-Free) | 2500 / Tape & Reel    |

### DISCONTINUED (Note 5)

|             |                   |                    |
|-------------|-------------------|--------------------|
| NTD2955G    | DPAK<br>(Pb-Free) | 75 Units / Rail    |
| NTD2955-1G  | IPAK<br>(Pb-Free) | 75 Units / Rail    |
| NVD2955T4G* | DPAK<br>(Pb-Free) | 2500 / Tape & Reel |

<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](#).

\* NVD and SVD Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

5. **DISCONTINUED:** These devices are not available. Please contact your **onsemi** representative for information. The most current information on these devices may be available on [www.onsemi.com](http://www.onsemi.com).

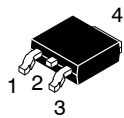
## NTD2955, NVD2955

### REVISION HISTORY

| Revision | Description of Changes                                                                                           | Date      |
|----------|------------------------------------------------------------------------------------------------------------------|-----------|
| 17       | Rebranded the document to <b>onsemi</b> format.<br>NTD2955G, NTD2955-1G, NVD2955T4G OPNs marked as Discontinued. | 4/21/2026 |

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.

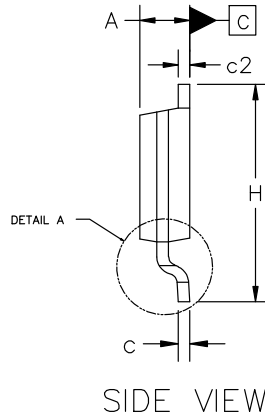
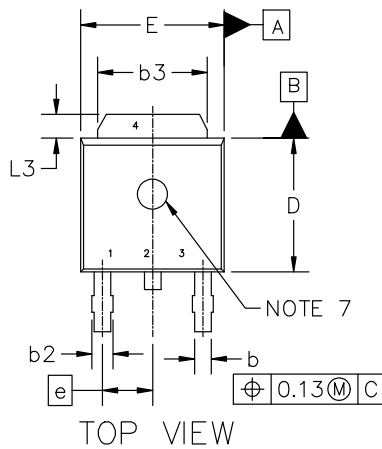




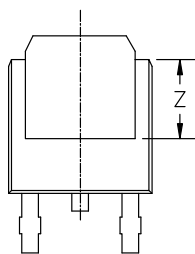
DPAK-3 6.10x6.54x2.28, 2.29P  
CASE 369C  
ISSUE L

DATE 24 AUG 2026

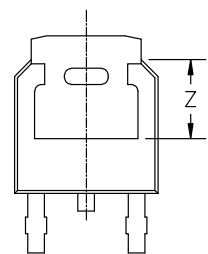
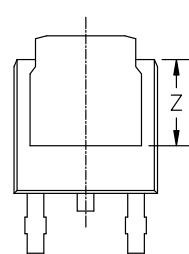
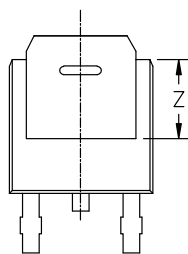
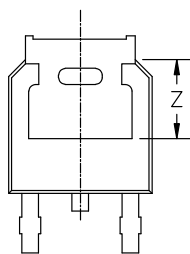
SCALE 1:1



| 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     | ---  | ---   |



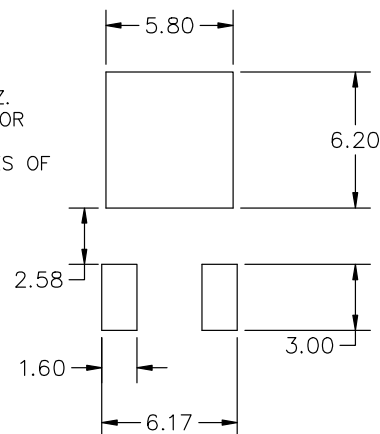
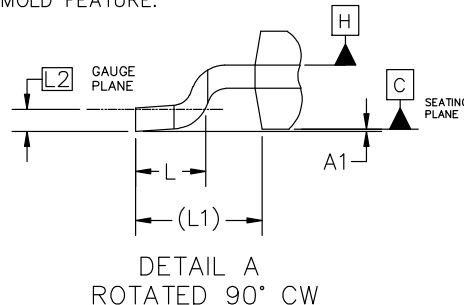
BOTTOM VIEW



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.



RECOMMENDED MOUNTING FOOTPRINT\*  
\*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques reference manual, SOLDERM/D.

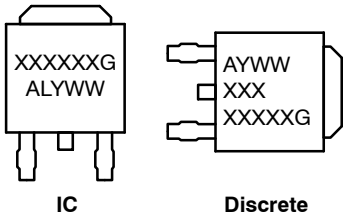
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|------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | DPAK-3 6.10x6.54x2.28, 2.29P | PAGE 1 OF 2                                                                                                                                                                         |

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

DATE 24 AUG 2026

**GENERIC**  
 **MARKING DIAGRAM\***



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.

|                                                                              |                                                                              |                                                                         |                                                                                   |                                                                          |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>STYLE 1:</b><br>PIN 1. BASE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | <b>STYLE 2:</b><br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE<br>4. DRAIN          | <b>STYLE 3:</b><br>PIN 1. ANODE<br>2. CATHODE<br>3. ANODE<br>4. CATHODE | <b>STYLE 4:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. GATE<br>4. ANODE              | <b>STYLE 5:</b><br>PIN 1. GATE<br>2. ANODE<br>3. CATHODE<br>4. ANODE     |
| <b>STYLE 6:</b><br>PIN 1. MT1<br>2. MT2<br>3. GATE<br>4. MT2                 | <b>STYLE 7:</b><br>PIN 1. GATE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | <b>STYLE 8:</b><br>PIN 1. N/C<br>2. CATHODE<br>3. ANODE<br>4. CATHODE   | <b>STYLE 9:</b><br>PIN 1. ANODE<br>2. CATHODE<br>3. RESISTOR ADJUST<br>4. CATHODE | <b>STYLE 10:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. ANODE |

|                         |                                     |                                                                                                                                                                                     |
|-------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>DPAK–3 6.10x6.54x2.28, 2.29P</b> | <b>PAGE 2 OF 2</b>                                                                                                                                                                  |

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