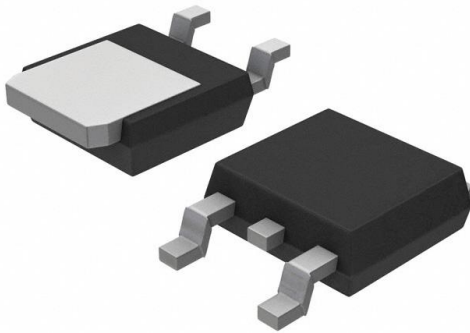


# NTD6600NT4 Datasheet

[www.digi-electronics.com](http://www.digi-electronics.com)



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	NTD6600NT4-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	NTD6600NT4
Description	MOSFET N-CH 100V 12A DPAK
Detailed Description	N-Channel 100 V 12A (Ta) 1.28W (Ta), 56.6W (Tc) Surface Mount DPAK



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

DiGi is a global authorized distributor of electronic components.

## Purchase and inquiry

Manufacturer Product Number:

NTD6600NT4

Series:

-

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

100 V

Drive Voltage (Max Rds On, Min Rds On):

5V

Vgs(th) (Max) @ Id:

2V @ 250µA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

DPAK

Base Product Number:

NTD66

Manufacturer:

onsemi

Product Status:

Obsolete

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

12A (Ta)

Rds On (Max) @ Id, Vgs:

146mOhm @ 6A, 5V

Gate Charge (Qg) (Max) @ Vgs:

20 nC @ 5 V

Input Capacitance (Ciss) (Max) @ Vds:

700 pF @ 25 V

Power Dissipation (Max):

1.28W (Ta), 56.6W (Tc)

Mounting Type:

Surface Mount

Package / Case:

TO-252-3, DPAK (2 Leads + Tab), SC-63

## Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



# ON Semiconductor

## Is Now

The logo for onsemi, featuring the word "onsemi" in a dark teal, lowercase, sans-serif font. The letter "i" is stylized with a white dot and a teal vertical bar. A small orange triangle is positioned above the top right of the "i". A trademark symbol (TM) is located to the right of the logo.

To learn more about onsemi™, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

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# NTD6600N

## Power MOSFET 100 V, 12 A, N-Channel, Logic Level DPAK

### Features

- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Avalanche Energy Specified
- Logic Level
- Pb-Free Packages are Available

### Typical Applications

- PWM Motor Controls
- Power Supplies
- Converters

### MAXIMUM RATINGS (T<sub>C</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>	100	Vdc
Drain-to-Source Voltage (R <sub>GS</sub> = 1.0 MΩ)	V <sub>DGR</sub>	100	Vdc
Gate-to-Source Voltage – Continuous	V <sub>GS</sub>	± 20	Vdc
Drain Current – Continuous @ T <sub>A</sub> = 25°C – Continuous @ T <sub>A</sub> = 100°C – Pulsed (Note 3)	I <sub>D</sub> I <sub>D</sub> I <sub>DM</sub>	12 9.0 44	Adc Apk
Total Power Dissipation Derate above 25°C	P <sub>D</sub>	56.6 0.38	W W/°C
Total Power Dissipation @ T <sub>A</sub> = 25°C (Note 1)		1.76	W
Total Power Dissipation @ T <sub>A</sub> = 25°C (Note 2)		1.28	W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	–55 to +175	°C
Single Pulse Drain-to-Source Avalanche Energy – Starting T <sub>J</sub> = 25°C (V <sub>DD</sub> = 50 Vdc, V <sub>GS</sub> = 5.0 Vdc, I <sub>L</sub> = 12 Apk, L = 1.0 mH, R <sub>G</sub> = 25 Ω)	E <sub>AS</sub>	72	mJ
Thermal Resistance – Junction-to-Case – Junction-to-Ambient (Note 1) – Junction-to-Ambient (Note 2)	R <sub>θJC</sub> R <sub>θJA</sub> R <sub>θJA</sub>	2.65 85 117	°C/W
Maximum Temperature for Soldering Purposes, (1/8" from case for 10 s)	T <sub>L</sub>	260	°C

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.

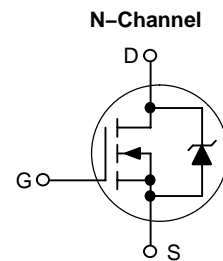
1. When surface mounted to an FR4 board using 0.5 sq in pad size.
2. When surface mounted to an FR4 board using the minimum recommended pad size.
3. Pulse Test: Pulse Width = 10 μs, Duty Cycle = 2%.



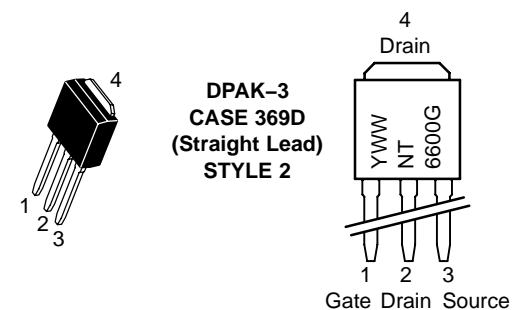
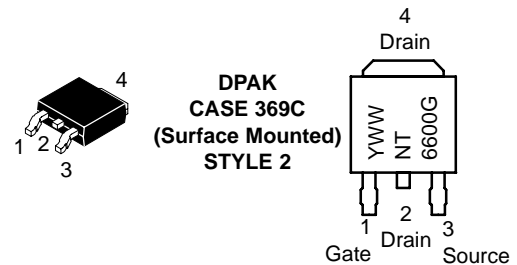
ON Semiconductor®

<http://onsemi.com>

V <sub>(BR)DSS</sub>	R <sub>DS(on)</sub> TYP	I <sub>D</sub> MAX
100 V	118 mΩ @ 5.0 V	12 A



### MARKING DIAGRAMS



Y = Year  
WW = Work Week  
NT6600 = Device Code  
G = Pb-Free Package

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

**NTD6600N****ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Drain-to-Source Breakdown Voltage ( $V_{GS} = 0\text{ Vdc}$ , $I_D = 250\ \mu\text{Adc}$ )	$V_{(BR)DSS}$	100	–	–	Vdc
Zero Gate Voltage Drain Current ( $V_{GS} = 0\text{ Vdc}$ , $V_{DS} = 100\text{ Vdc}$ , $T_J = 25^\circ\text{C}$ ) ( $V_{GS} = 0\text{ Vdc}$ , $V_{DS} = 100\text{ Vdc}$ , $T_J = 125^\circ\text{C}$ )	$I_{DSS}$	–	–	1.0 10	$\mu\text{Adc}$
Gate-Body Leakage Current ( $V_{GS} = \pm 20\text{ Vdc}$ , $V_{DS} = 0$ )	$I_{GSS}$	–	–	$\pm 100$	nAdc

**ON CHARACTERISTICS**

Gate Threshold Voltage $V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{Adc}$ Temperature Coefficient (Negative)	$V_{GS(th)}$	1.0 –	1.5 –4.4	2.0 –	Vdc mV/ $^\circ\text{C}$
Static Drain-to-Source On-State Resistance ( $V_{GS} = 5.0\text{ Vdc}$ , $I_D = 6.0\text{ Adc}$ )	$R_{DS(on)}$	–	118	146	m $\Omega$
Drain-to-Source On-Voltage ( $V_{GS} = 5.0\text{ Vdc}$ , $I_D = 12\text{ Adc}$ )	$V_{DS(on)}$	–	1.5	2.2	Vdc
Forward Transconductance ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 6.0\text{ Adc}$ )	$g_{FS}$	–	10	–	mhos

**DYNAMIC CHARACTERISTICS**

Input Capacitance	$(V_{DS} = 25\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$C_{iss}$	–	463	700	$\mu\text{F}$
Output Capacitance		$C_{oss}$	–	116	225	
Reverse Transfer Capacitance		$C_{rss}$	–	36	75	

**SWITCHING CHARACTERISTICS** (Notes 4 & 5)

Turn-On Delay Time	$(V_{DD} = 80\text{ Vdc}$ , $I_D = 6.0\text{ Adc}$ , $V_{GS} = 5.0\text{ Vdc}$ , $R_G = 9.1\ \Omega$ )	$t_{d(on)}$	–	10.5	20	ns
Rise Time		$t_r$	–	75	140	
Turn-Off Delay Time		$t_{d(off)}$	–	26	40	
Fall Time		$t_f$	–	50	90	
Total Gate Charge	$(V_{DS} = 80\text{ Vdc}$ , $I_D = 6.0\text{ Adc}$ , $V_{GS} = 5.0\text{ Vdc}$ )	$Q_{tot}$	–	11.3	20	nC
Gate-to-Source Charge		$Q_{gs}$	–	1.9	–	
Gate-to-Drain Charge		$Q_{gd}$	–	7.4	–	

**BODY-DRAIN DIODE RATINGS** (Note 4)

Diode Forward On-Voltage $(I_S = 12\text{ Adc}$ , $V_{GS} = 0\text{ Vdc}$ ) $(I_S = 12\text{ Adc}$ , $V_{GS} = 0\text{ Vdc}$ , $T_J = 125^\circ\text{C}$ )	$V_{SD}$	–	0.90 0.80	1.4 –	Vdc
Reverse Recovery Time $(I_S = 12\text{ Adc}$ , $V_{GS} = 0\text{ Vdc}$ , $di_S/dt = 100\text{ A}/\mu\text{s}$ )	$t_{rr}$	–	80	–	ns
	$t_a$	–	50	–	
	$t_b$	–	30	–	
Reverse Recovery Stored Charge	$Q_{RR}$	–	0.240	–	$\mu\text{C}$

4. Indicates Pulse Test: P.W. = 300  $\mu\text{s}$  max, Duty Cycle = 2%.

5. Switching characteristics are independent of operating junction temperature.

**ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
NTD6600N	DPAK	75 Units/Rail
NTD6600N-1	DPAK-3	
NTD6600N-1G	DPAK-3 (Pb-Free)	
NTD6600NT4	DPAK	2500 Tape & Reel
NTD6600NT4G	DPAK (Pb-Free)	

<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.

# NTD6600N

## TYPICAL CHARACTERISTICS

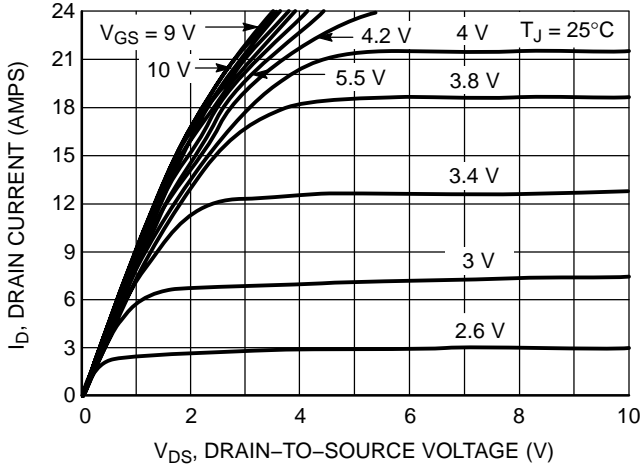


Figure 1. On-Region Characteristics

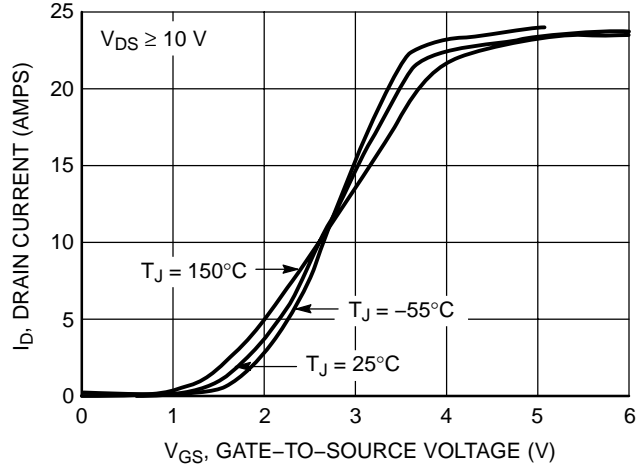


Figure 2. Transfer Characteristics

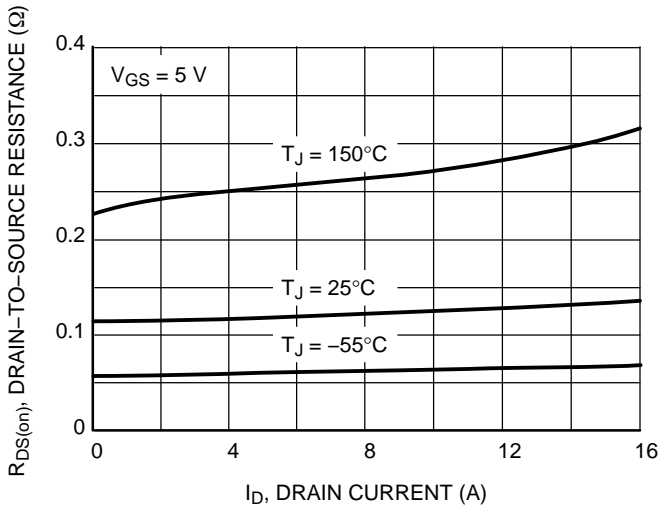


Figure 3. On-Resistance versus Drain Current and Temperature

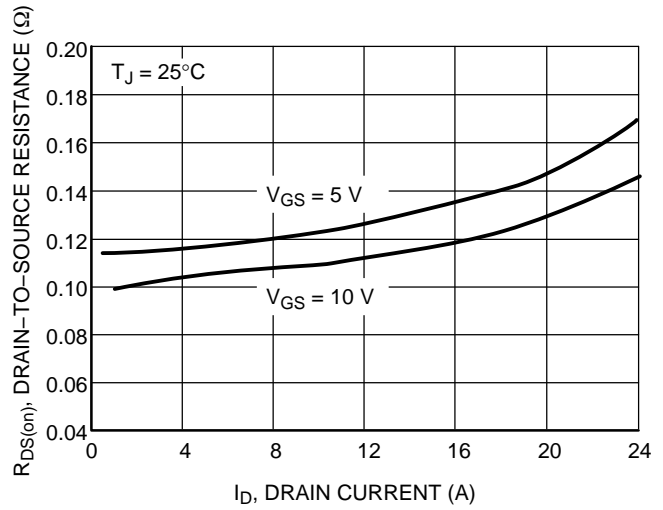


Figure 4. On-Resistance versus Drain Current and Temperature

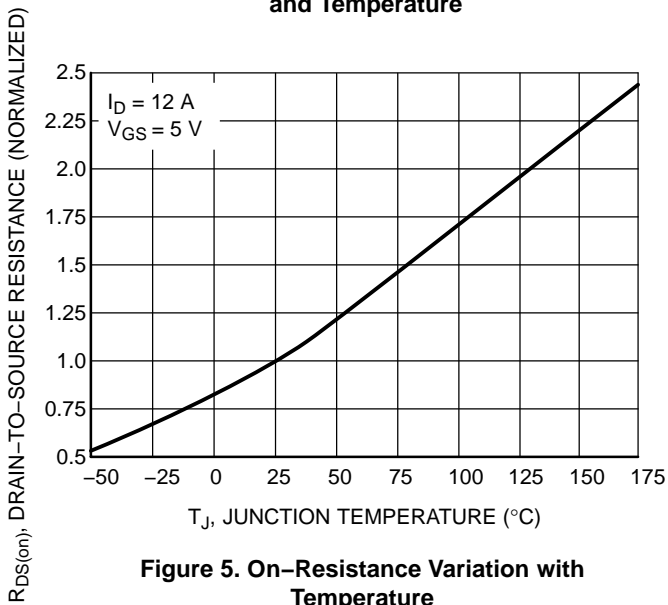


Figure 5. On-Resistance Variation with Temperature

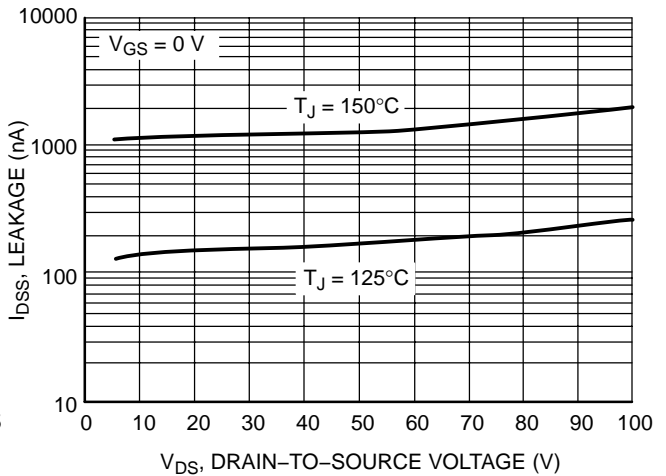


Figure 6. Drain-To-Source Leakage Current versus Voltage

# NTD6600N

## TYPICAL CHARACTERISTICS

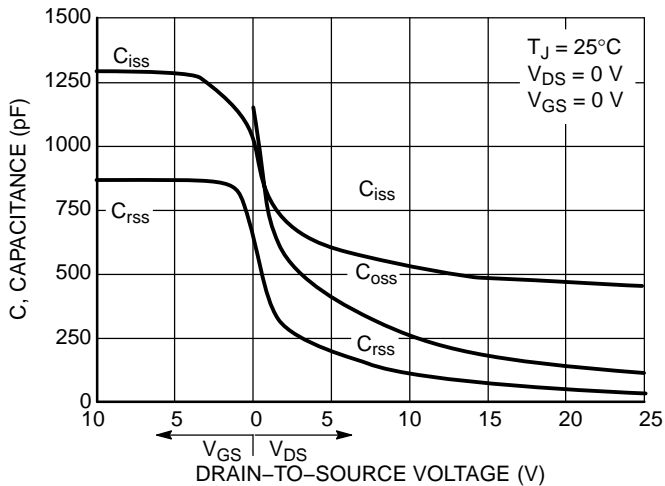


Figure 7. Capacitance Variation

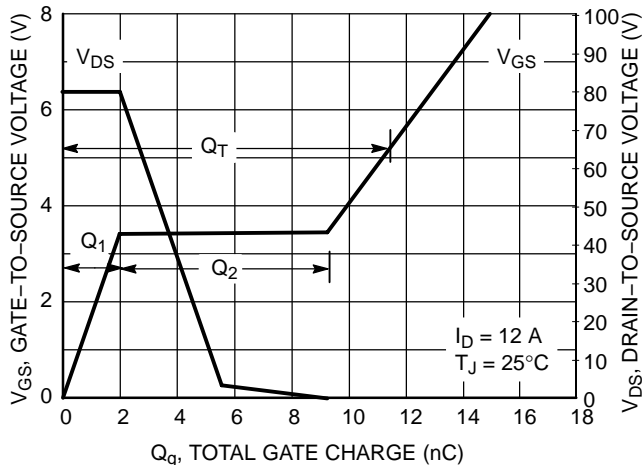


Figure 8. Gate-to-Source and Drain-to-Source Voltage versus Total Charge

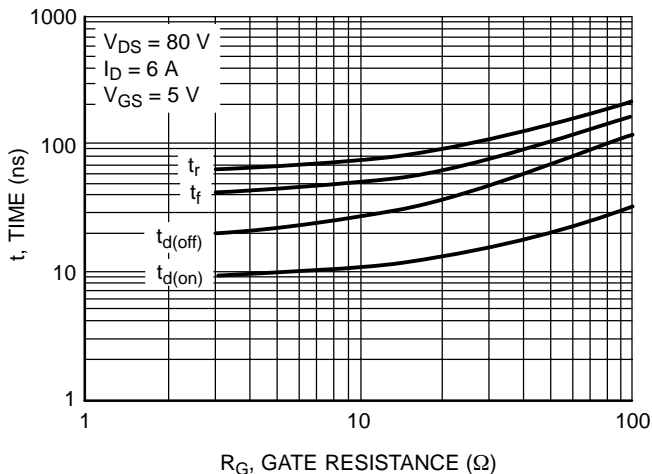


Figure 9. Resistive Switching Time Variation versus Gate Resistance

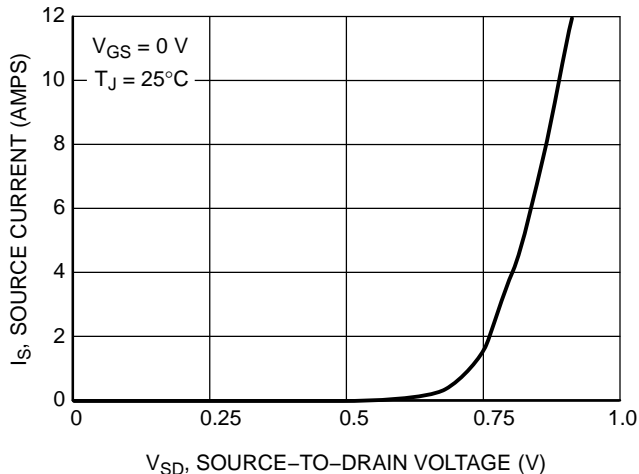


Figure 10. Diode Forward Voltage versus Current

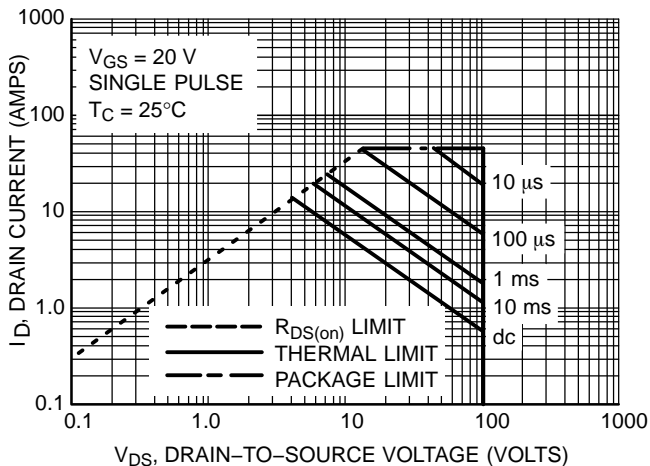


Figure 11. Maximum Rated Forward Biased Safe Operating Area

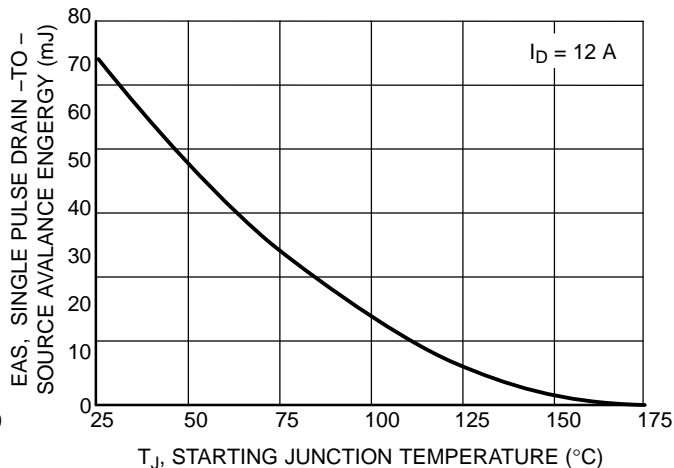
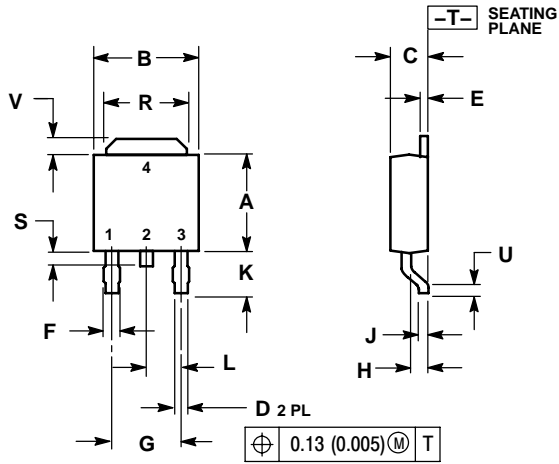


Figure 12. Maximum Avalanche Energy versus Starting Junction Temperature

# NTD6600N

## PACKAGE DIMENSIONS

DPAK  
CASE 369C-01  
ISSUE O

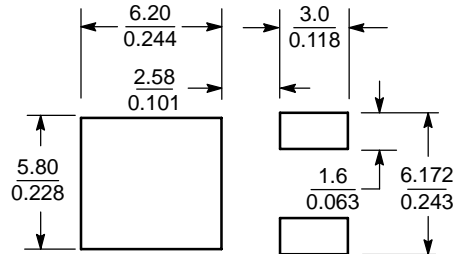


NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

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

### SOLDERING FOOTPRINT\*



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

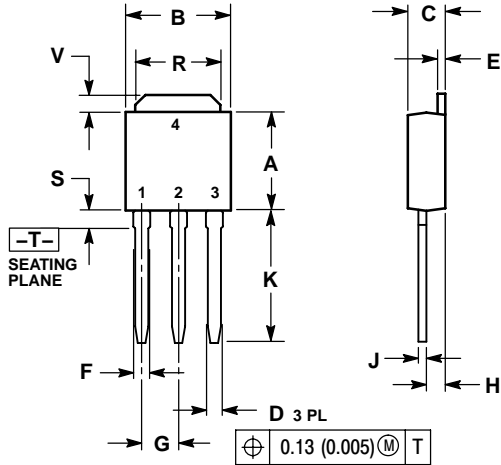
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



# NTD6600N

## PACKAGE DIMENSIONS

DPAK-3  
CASE 369D-01  
ISSUE B



- 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	6.35
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	0.090 BSC		2.29 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.350	0.380	8.89	9.65
R	0.180	0.215	4.45	5.45
S	0.025	0.040	0.63	1.01
V	0.035	0.050	0.89	1.27
Z	0.155	---	3.93	---

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

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**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

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**Order Literature:** <http://www.onsemi.com/orderlit>  
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