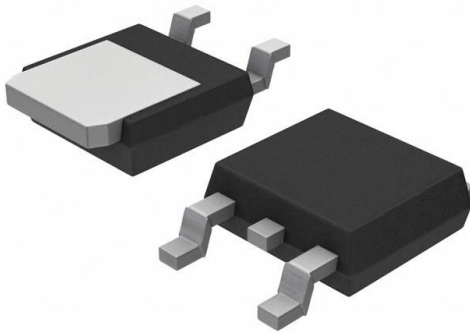


NTD5862N-1G Datasheet

www.digi-electronics.com



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

DiGi Electronics Part Number	NTD5862N-1G-DG
Manufacturer	onsemi
Manufacturer Product Number	NTD5862N-1G
Description	MOSFET N-CH 60V 98A DPAK
Detailed Description	N-Channel 60 V 98A (Tc) 115W (Tc) Surface Mount DPAK



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

NTD5862N-1G

Series:

-

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

60 V

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

10V

Vgs(th) (Max) @ Id:

4V @ 250 μ A

Vgs (Max):

\pm 20V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

DPAK

Base Product Number:

NTD58

Manufacturer:

onsemi

Product Status:

Obsolete

Technology:

MOSFET (Metal Oxide)

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

98A (Tc)

Rds On (Max) @ Id, Vgs:

5.7mOhm @ 45A, 10V

Gate Charge (Qg) (Max) @ Vgs:

82 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

6000 pF @ 25 V

Power Dissipation (Max):

115W (Tc)

Mounting Type:

Surface Mount

Package / Case:

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

Environmental & Export classification

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

NTD5862N, NTP5862N

MOSFET – Power, N-Channel

60 V, 98 A, 5.7 mΩ



ON Semiconductor®

www.onsemi.com

Features

- Low $R_{DS(on)}$
- High Current Capability
- 100% Avalanche Tested
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
60 V	5.7 mΩ @ 10 V	98 A

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

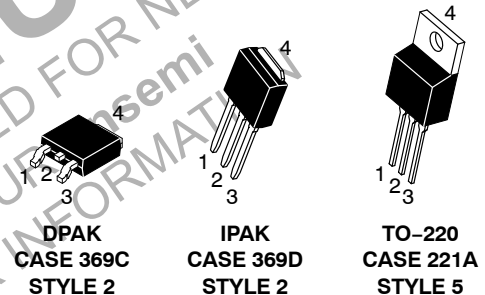
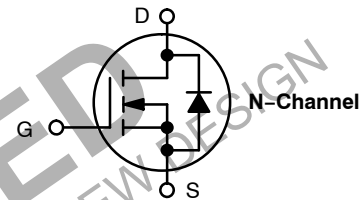
Parameter	Symbol	Value	Unit	
Drain-to-Source Voltage	V_{DSS}	60	V	
Gate-to-Source Voltage – Continuous	V_{GS}	± 20	V	
Gate-to-Source Voltage – Non-Repetitive ($t_p < 10 \mu\text{s}$)	V_{GS}	± 30	V	
Continuous Drain Current ($R_{\theta JC}$) (Note 1)	Steady State	$T_C = 25^\circ\text{C}$	I_D 98	A
		$T_C = 100^\circ\text{C}$	69	
Power Dissipation ($R_{\theta JC}$)		$T_C = 25^\circ\text{C}$	P_D 115	W
Pulsed Drain Current	$t_p = 10 \mu\text{s}$	I_{DM}	335	A
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$	
Source Current (Body Diode)	I_S	96	A	
Single Pulse Drain-to-Source Avalanche Energy ($L = 0.3 \text{ mH}$)	E_{AS}	205	mJ	
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	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.

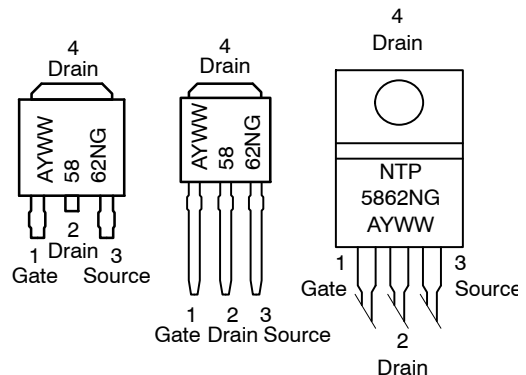
THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case (Drain)	$R_{\theta JC}$	1.3	$^\circ\text{C}/\text{W}$
Junction-to-Ambient – Steady State (Note 2)	$R_{\theta JA}$	37	

1. Limited by package to 50 A continuous.
2. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [2 oz] including traces).



MARKING DIAGRAMS & PIN ASSIGNMENT



A = Assembly Location*
 Y = Year
 WW = Work Week
 5862N = Device Code
 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.

NTD5862N, NTP5862N**ELECTRICAL CHARACTERISTICS** ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	60			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$			47		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 60\text{ V}$	$T_J = 25^\circ\text{C}$		1.0	μA
			$T_J = 150^\circ\text{C}$		100	
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA

ON CHARACTERISTICS (Note 3)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\ \mu\text{A}$	2.0		4.0	V
Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$			-9.7		mV/°C
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 45\text{ A}$		4.4	5.7	m Ω
Forward Transconductance	gFS	$V_{DS} = 15\text{ V}, I_D = 10\text{ A}$		18		S

CHARGES, CAPACITANCES AND GATE RESISTANCES

Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = 25\text{ V}$	5050	6000	pF
Output Capacitance	C_{oss}		500	600	
Reverse Transfer Capacitance	C_{rss}		300	420	
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 10\text{ V}, V_{DS} = 48\text{ V}, I_D = 45\text{ A}$	82		nC
Threshold Gate Charge	$Q_{G(TH)}$		5.2		
Gate-to-Source Charge	Q_{GS}		24		
Gate-to-Drain Charge	Q_{GD}		27		
Gate Resistance	R_G		0.6		

SWITCHING CHARACTERISTICS (Note 4)

Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DD} = 48\text{ V}, I_D = 45\text{ A}, R_G = 2.5\ \Omega$	18		ns
Rise Time	t_r		70		
Turn-Off Delay Time	$t_{d(off)}$		35		
Fall Time	t_f		60		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 45\text{ A}$	$T_J = 25^\circ\text{C}$	0.9	1.2	V
			$T_J = 100^\circ\text{C}$	0.75		
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}, I_S = 45\text{ A}$	38		ns	
Charge Time	t_a		20			
Discharge Time	t_b		18			
Reverse Recovery Charge	Q_{RR}		40			nC

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

4. Switching characteristics are independent of operating junction temperatures.

NTD5862N, NTP5862N

TYPICAL CHARACTERISTICS

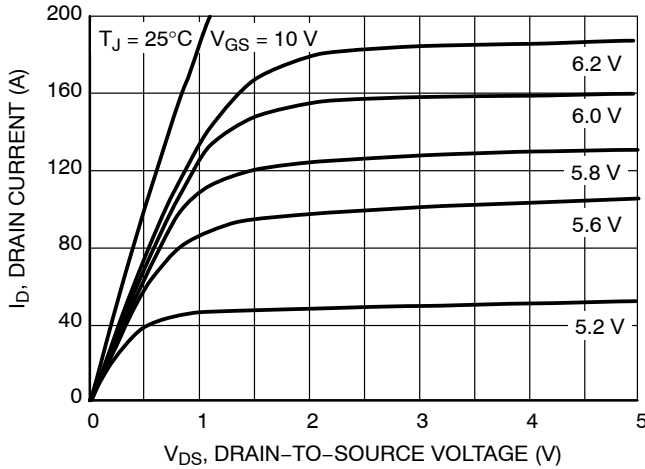


Figure 1. On-Region Characteristics

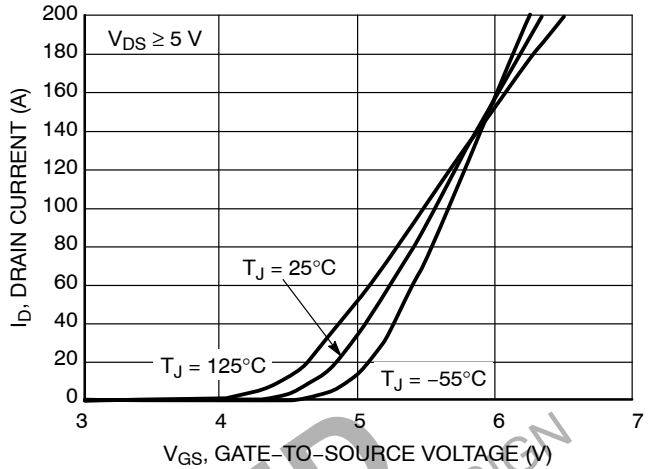


Figure 2. Transfer Characteristics

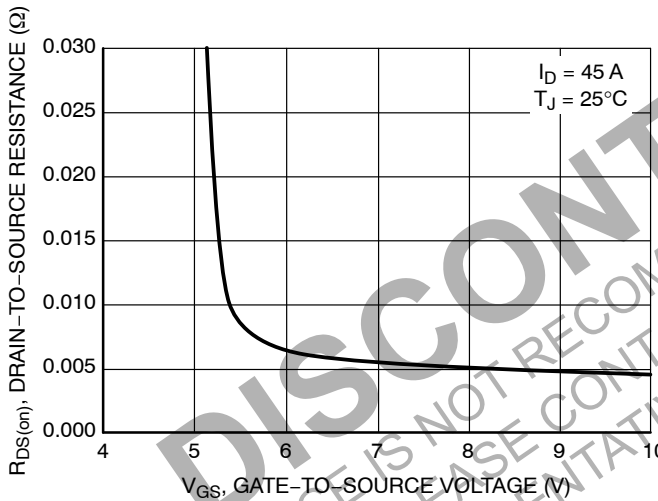


Figure 3. On-Resistance vs. Gate Voltage

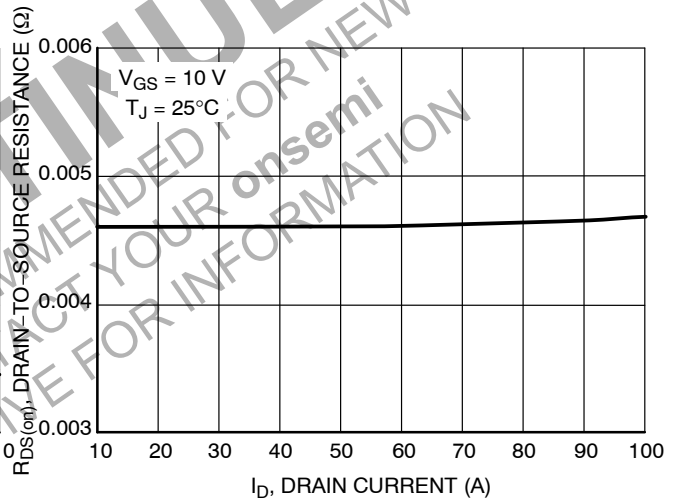


Figure 4. On-Resistance vs. Drain Current

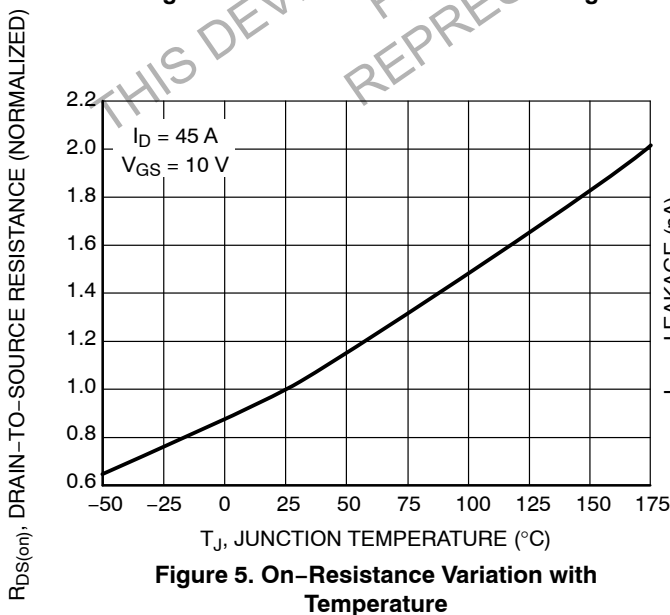


Figure 5. On-Resistance Variation with Temperature

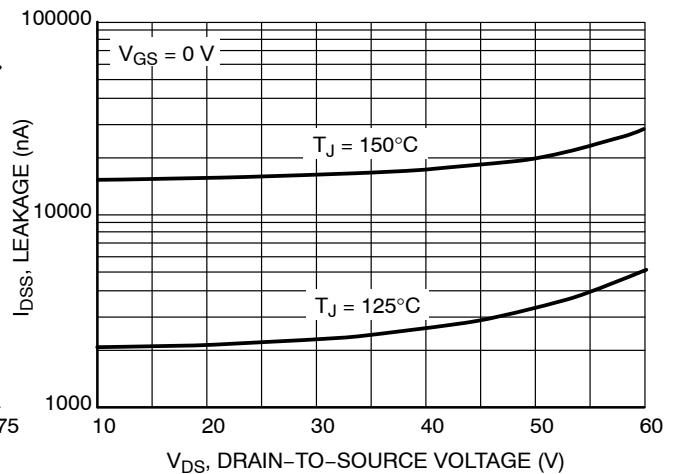


Figure 6. Drain-to-Source Leakage Current vs. Voltage

NTD5862N, NTP5862N

TYPICAL CHARACTERISTICS

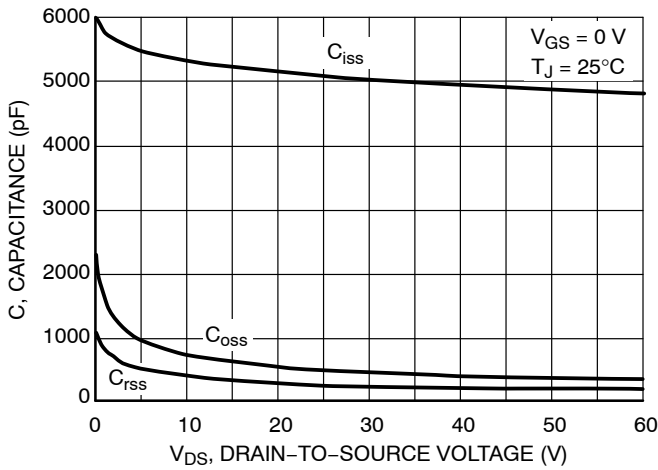


Figure 7. Capacitance Variation

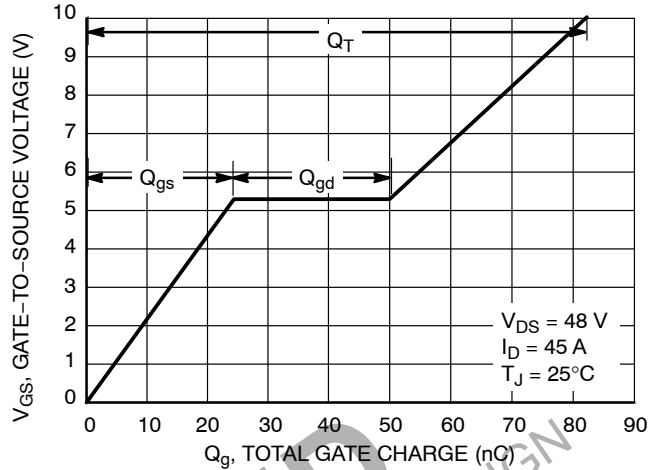


Figure 8. Gate-to-Source vs. Total Charge

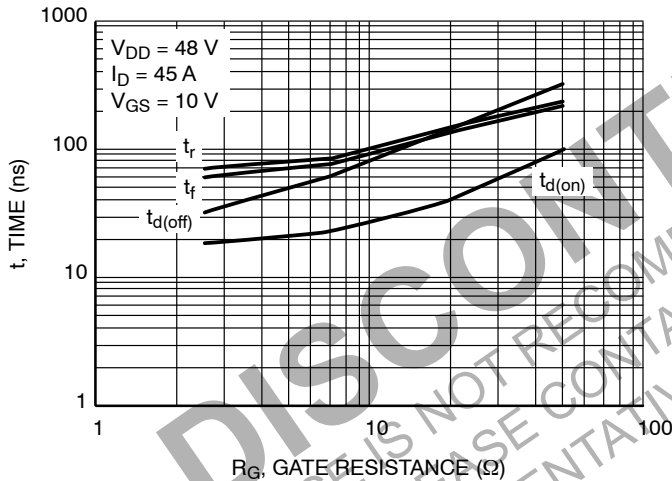


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

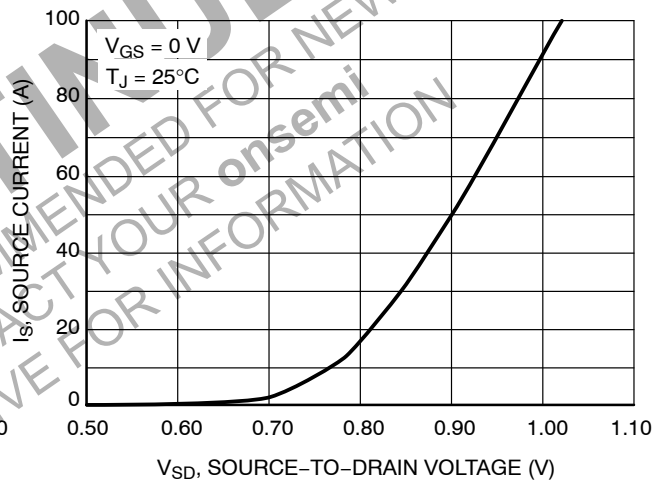


Figure 10. Diode Forward Voltage vs. Current

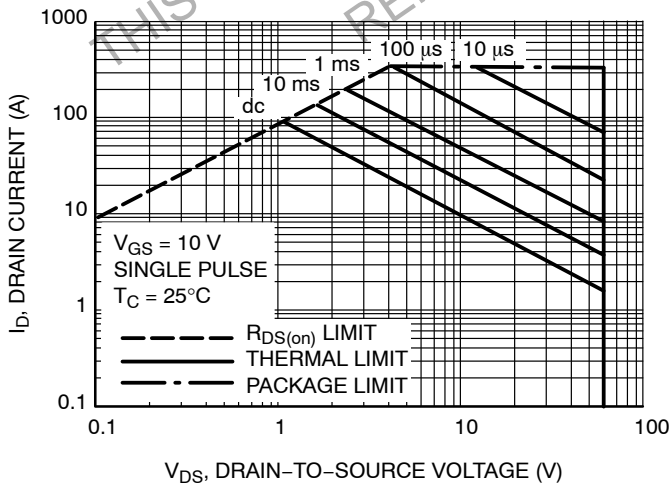


Figure 11. Maximum Rated Forward Biased Safe Operating Area

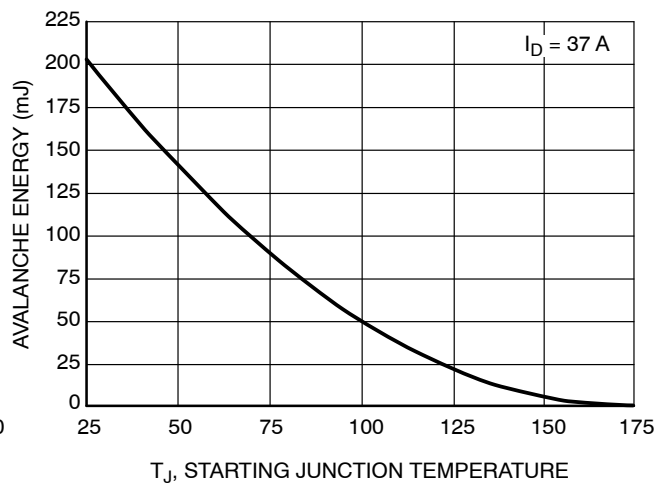


Figure 12. Maximum Avalanche Energy versus Starting Junction Temperature

NTD5862N, NTP5862N

TYPICAL CHARACTERISTICS

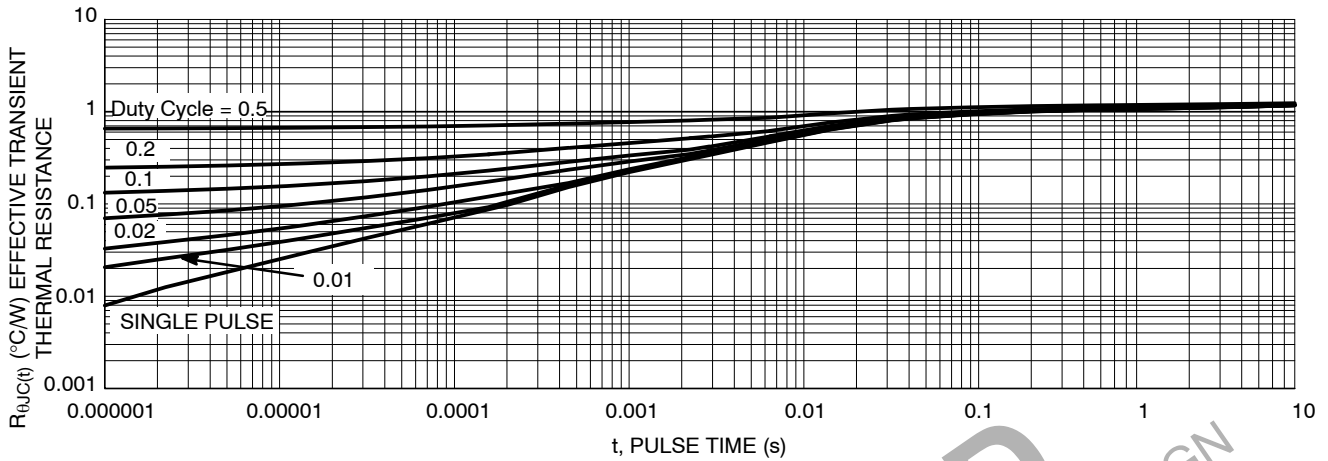


Figure 13. Thermal Response

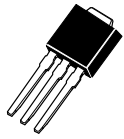
ORDERING INFORMATION

Order Number	Package	Shipping [†]
NTD5862N-1G	IPAK (Straight Lead) (Pb-Free)	75 Units / Rail
NTD5862NT4G	DPAK (Pb-Free)	2500 / Tape & Reel
NTP5862NG	TO-220 (Pb-Free)	50 Units / Rail

[†]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.



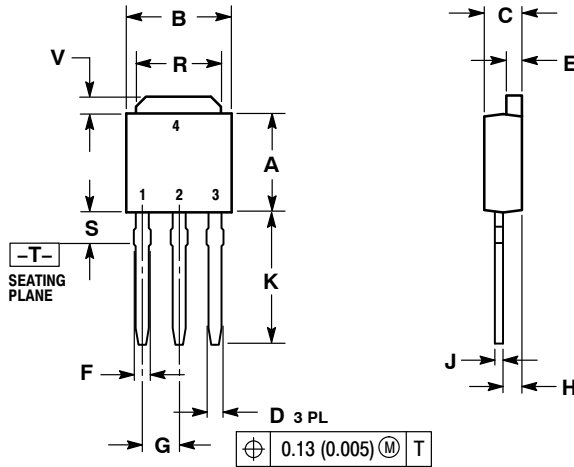
**MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS**



**DPAK INSERTION MOUNT
CASE 369
ISSUE O**

DATE 02 JAN 2000

SCALE 1:1



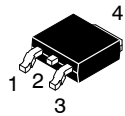
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.250	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	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
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	0.175	0.215	4.45	5.46
S	0.050	0.090	1.27	2.28
V	0.030	0.050	0.77	1.27

- | | | | | | |
|--|---|---|--|--|--|
| <p>STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR</p> | <p>STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN</p> | <p>STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE</p> | <p>STYLE 4:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE</p> | <p>STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE</p> | <p>STYLE 6:
PIN 1. MT1
2. MT2
3. GATE
4. MT2</p> |
|--|---|---|--|--|--|

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DESCRIPTION:	DPAK INSERTION MOUNT	PAGE 1 OF 1

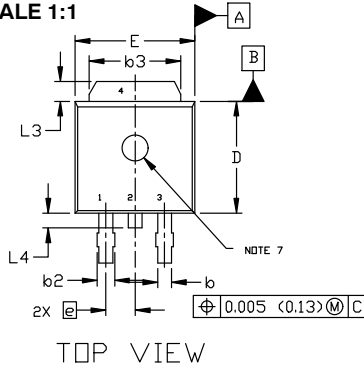
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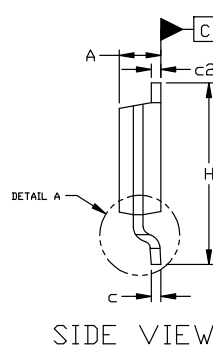
DPAK (SINGLE GAUGE)
CASE 369C
ISSUE G

DATE 31 MAY 2023

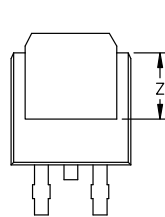
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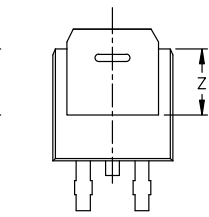
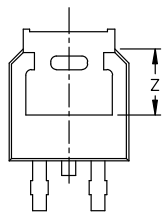
TOP VIEW



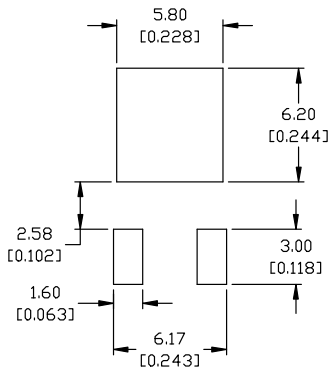
SIDE VIEW



BOTTOM VIEW



ALTERNATE
CONSTRUCTIONS
BOTTOM VIEW



RECOMMENDED MOUNTING FOOTPRINT*

*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERM/D.

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

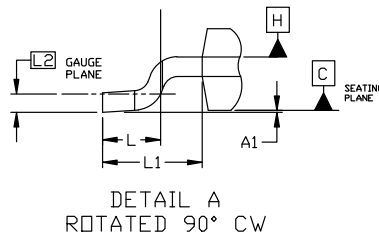
STYLE 10:

- PIN 1. CATHODE
- 2. ANODE
- 3. CATHODE
- 4. ANODE

NOTES:

1. DIMENSIONING AND TOLERANCING ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3, AND Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
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.

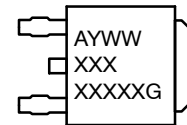
DIM	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.028	0.045	0.72	1.14
b3	0.180	0.215	4.57	5.46
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090	BSC	2.29	BSC
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.114	REF	2.90	REF
L2	0.020	BSC	0.51	BSC
L3	0.035	0.050	0.89	1.27
L4	---	0.040	---	1.01
Z	0.155	---	3.93	---



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.

DOCUMENT NUMBER:	98AON10527D	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	DPAK (SINGLE GAUGE)	PAGE 1 OF 1

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TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we stricly control the quality of products and services. Welcome your RFQ to

Email: Info@DiGi-Electronics.com



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