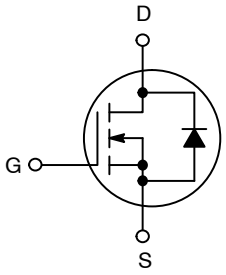
MOSFET - Power, Single N-Channel, D²PAK

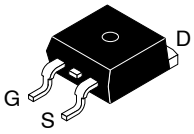
650 V, 82 mΩ, 40 A

NVB082N65S3F

$V_{(BR)DSS}$	$R_{DS(ON)}$ MAX	I_D MAX
650 V	82 mΩ @ 10 V	40 A



N−CHANNEL MOSFET



D²PAK−3
TO−263
CASE 418AJ

Description

SUPERFET® III MOSFET is ON Semiconductor's brand−new high voltage super−junction (SJ) MOSFET family that is utilizing charge balance technology for outstanding low on−resistance and lower gate charge performance. This advanced technology is tailored to minimize conduction loss, provide superior switching performance, and withstand extreme dv/dt rate.

Consequently, SUPERFET III MOSFET is very suitable for the various power system for miniaturization and higher efficiency. SUPERFET III FRFET® MOSFET's optimized reverse recovery performance of body diode can remove additional component and improve system reliability.

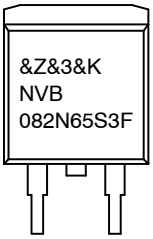
Features

- 700 V @ T_J = 150°C
- Typ. $R_{DS(on)}$ = 64 mΩ
- Ultra Low Gate Charge (Typ. Q_g = 81 nC)
- Low Effective Output Capacitance (Typ. $C_{oss(eff.)}$ = 722 pF)
- 100% Avalanche Tested
- Qualified with AEC−Q101
- These Devices are Pb−Free and are RoHS Compliant

Typical Applications

- Automotive On Board Charger
- Automotive DC/DC Converter for HEV

MARKING DIAGRAM



&Z	= Assembly Plant Code
&3	= Data Code (Year & Week)
&K	= Lot
NVB082N65S3F	= Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

© Semiconductor Components Industries, LLC, 2018

Table 1. ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise stated)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain−to−Source Voltage		650	V
V_{GS}	Gate−to−Source Voltage	− DC	±30	V
		− AC (f > 1 Hz)	±30	
I_D	Drain Current	− Continuous (T_C = 25°C)	40	A
		− Continuous (T_C = 100°C)	25.5	
I_{DM}	Drain Current	− Pulsed (Note 1)	100	W
E_{AS}	Single Pulse Avalanche Energy (Note 2)		510	mJ
I_{AS}	Avalanche Current		4.8	A
E_{AR}	Repeated Avalanche Energy (Note 1)		3.13	mJ
dv/dt	MOSFET dv/dt		100	V/ns
	Peak Diode Recovery dv/dt (Note 3)		50	
P_D	Power Dissipation	T_C = 25°C	313	W
		− Derate Above 25°C	2.5	W/°C
T_J, T_{stg}	Operating Junction and Storage Temperature		−55 to 150	°C
T_L	Maximum Lead Temperature for Soldering, 1/8″ from Case for 5 Seconds		300	°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. Repetitive rating: pulse−width limited by maximum junction temperature.
2. IAS = 4.8 A, RG = 25 Ω, starting T_J = 25°C.
3. ISD ≤ 20 A, di/dt ≤ 200 A/_s, V_{DD} ≤ 400 V, starting T_C = 25°C.

Table 2. THERMAL RESISTANCE RATINGS

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction−to−Case, Max.	0.40	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction−to−Ambient, Max.	40	

Share Feedback
Your Opinion Matters

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
BV_{DSS}	Drain–to–Source Breakdown Voltage	V_{GS} = 0 V, I_D = 1 mA, T_J = 25°C	650	–	–	V
		V_{GS} = 0 V, I_D = 10 mA, T_J = 150°C	700	–	–	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	I_D = 20 mA, Referenced to 25°C	–	0.7	–	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V	–	–	10	μA
		V_{DS} = 520 V, T_C = 125°C	–	175	–	μA
I_{GSS}	Gate–to–Body Leakage Current	V_{DS} = 0 V, V_{GS} = ±30 V	–	–	±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 1 mA	3.0	–	5.0	V
$R_{DS(on)}$	Static Drain–to–Source On Resistance	V_{GS} = 10 V, I_D = 20 A	–	64	82	mΩ
g_{FS}	Forward Transconductance	V_{GS} = 20 V, I_D = 20 A	–	24	–	S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 400 V, V_{GS} = 0 V, f = 1 MHz	–	3410	–	pF
C_{oss}	Output Capacitance		–	70	–	pF
$C_{oss(eff.)}$	Effective Output Capacitance	V_{DS} = 0 to 400 V, V_{GS} = 0 V	–	722	–	pF
$C_{oss(er.)}$	Energy Related Output Capacitance	V_{DS} = 0 to 400 V, V_{GS} = 0 V	–	126	–	pF
$Q_{g(total)}$	Total Gate Charge at 10 V	V_{DS} = 400 V, I_D = 20 A, V_{GS} = 10 V (Note 4)	–	81	–	nC
Q_{gs}	Gate–to–Source Gate Charge		–	24	–	nC
Q_{gd}	Gate–to–Drain “Miller” Charge		–	32	–	nC
ESR	Equivalent Series Resistance	F = 1 MHz	–	1.9	–	Ω
SWITCHING CHARACTERISTICS, V_{GS} = 10 V						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 400 V, I_D = 20 A, V_{GS} = 10 V, R_G = 4.7 Ω (Note 4)	–	31	–	ns
t_r	Rise Time		–	29	–	ns
$t_{d(off)}$	Turn-Off Delay Time		–	76	–	ns
t_f	Fall Time		–	16	–	ns
SOURCE–DRAIN DIODE CHARACTERISTICS						
I_S	Maximum Continuous Source–to–Drain Diode Forward Current		–	–	40	A
I_{SM}	Maximum Pulsed Source–to–Drain Diode Forward Current		–	–	100	A
V_{SD}	Source–to–Drain Diode Forward Voltage	V_{GS} = 0 V, I_{SD} = 20 A	–	–	1.3	V
t_{rr}	Reverse–Recovery Time	V_{GS} = 0 V, I_{SD} = 20 A, dI_F/dt = 100 A/μs	–	108	–	ns
Q_{rr}	Reverse–Recovery Charge		–	410	–	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.

4. Essentially independent of operating temperature typical characteristics.

Share Feedback
Your Opinion Matters

TYPICAL CHARACTERISTICS

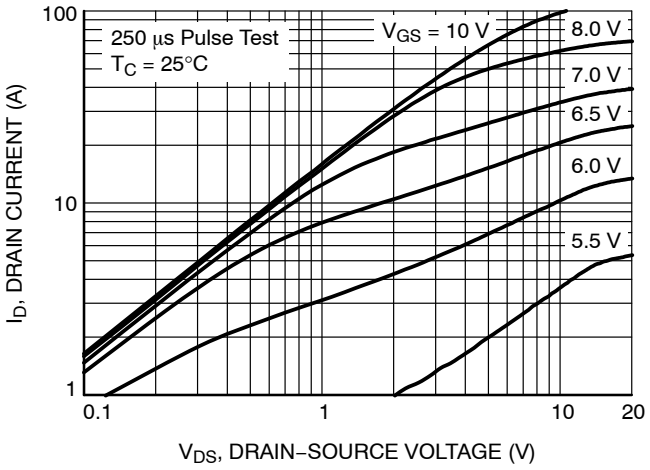


Figure 1. On−Region Characteristics 25°C

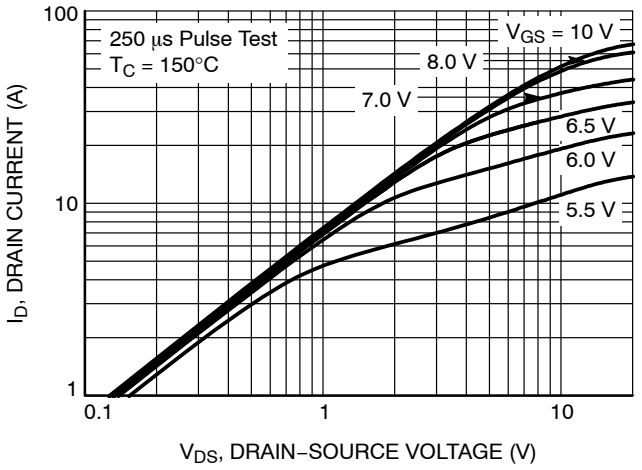


Figure 2. On−Region Characteristics 150°C

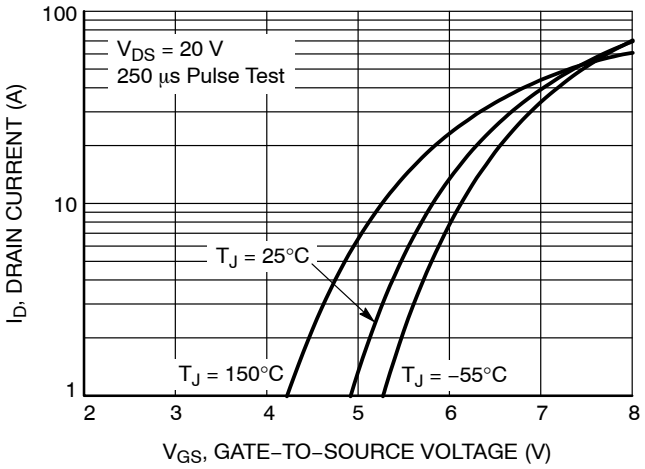


Figure 3. Transfer Characteristics

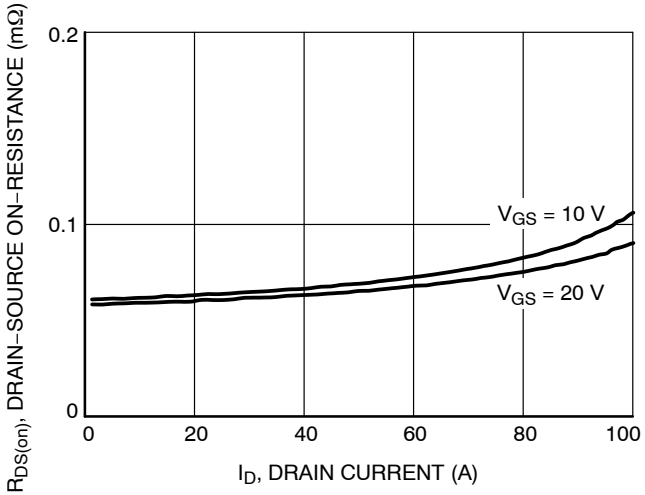


Figure 4. On−Resistance Variation vs. Drain Current and Gate Voltage

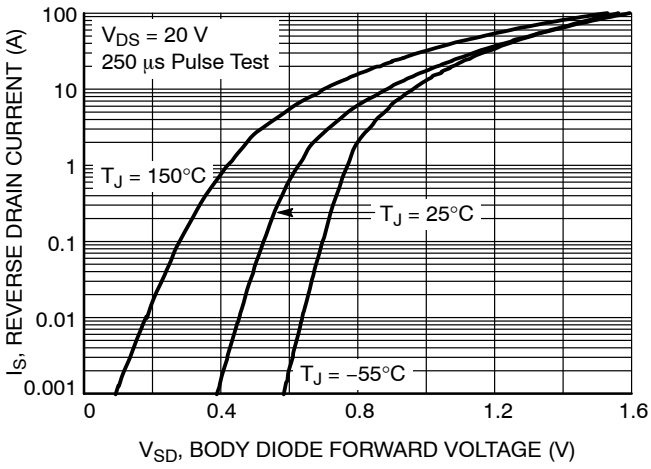


Figure 5. Body Diode Forward Voltage Variation vs. Source Current and Temperature

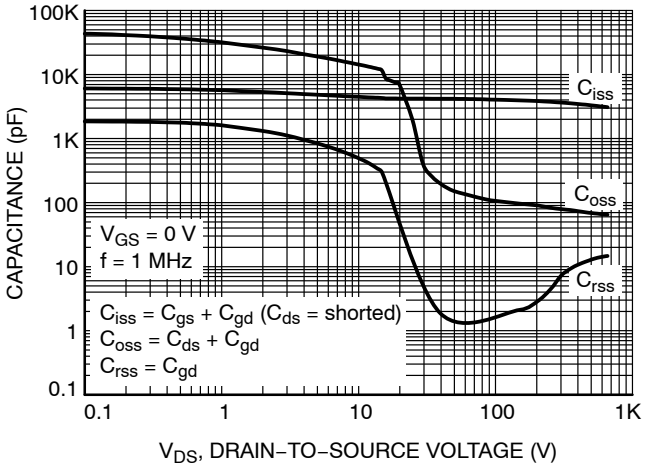


Figure 6. Capacitance Characteristics

Share Feedback
Your Opinion Matters

TYPICAL CHARACTERISTICS

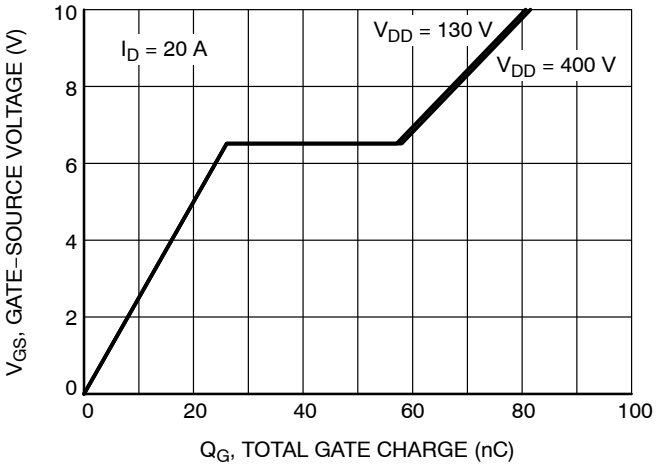


Figure 7. Gate Charge Characteristics

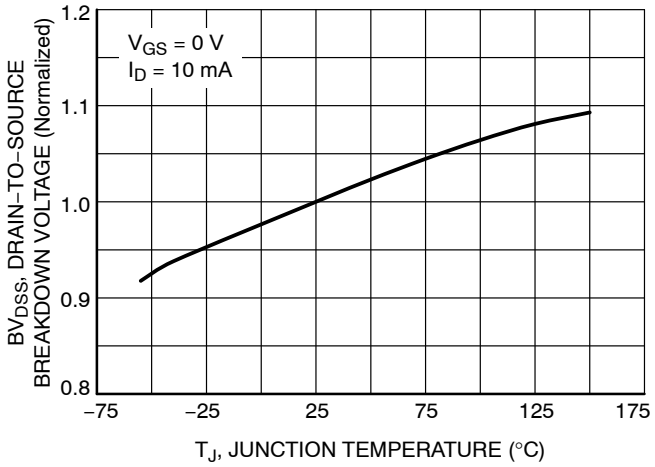


Figure 8. Breakdown Voltage Variation vs. Temperature

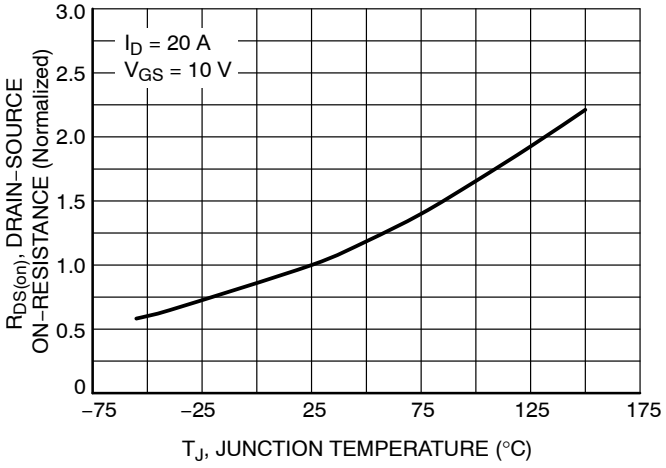


Figure 9. On−Resistance Variation vs. Temperature

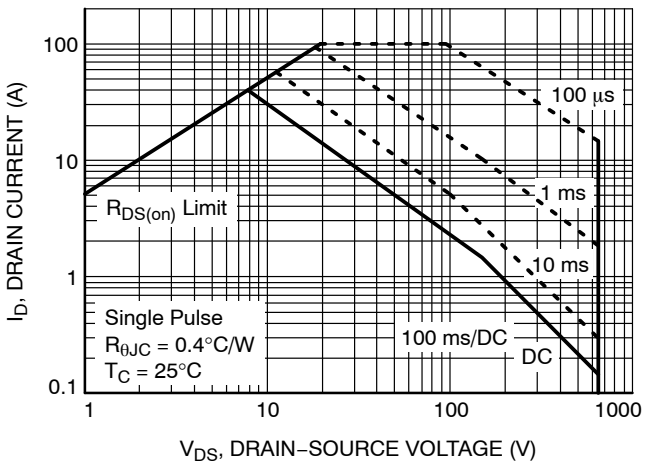


Figure 10. Maximum Safe Operating Area

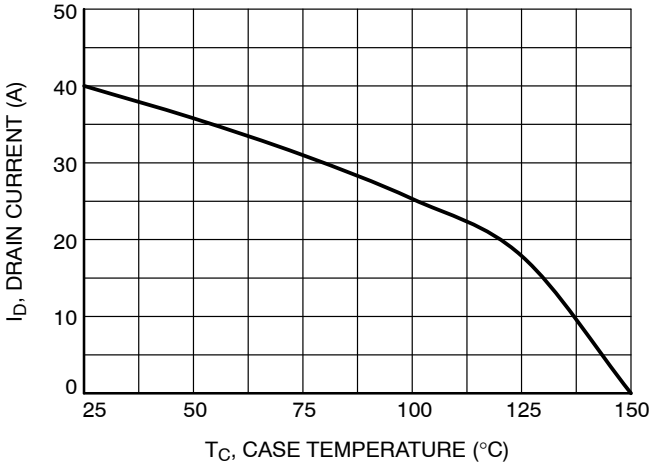


Figure 11. Maximum Drain Current vs. Case Temperature

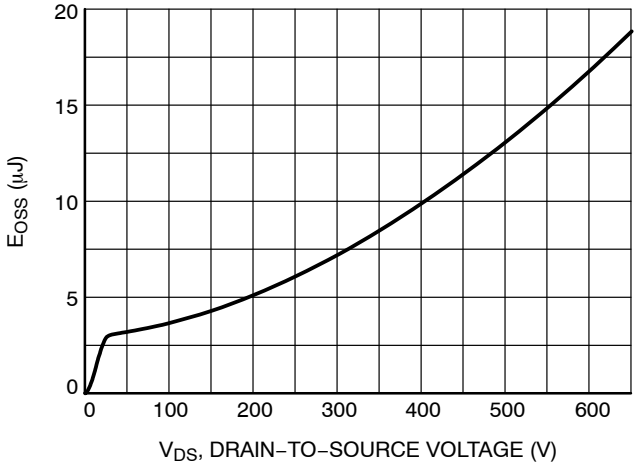


Figure 12. E_{OSS} vs. Drain−to−Source Voltage

Share Feedback
Your Opinion Matters

TYPICAL CHARACTERISTICS

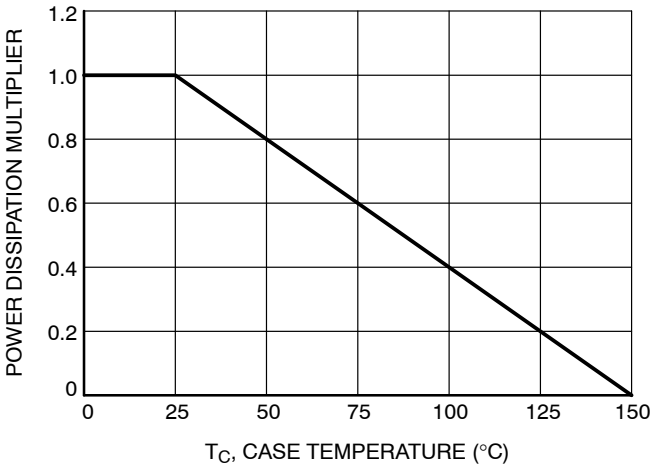


Figure 13. Normalized Power Dissipation vs. Case Temperature

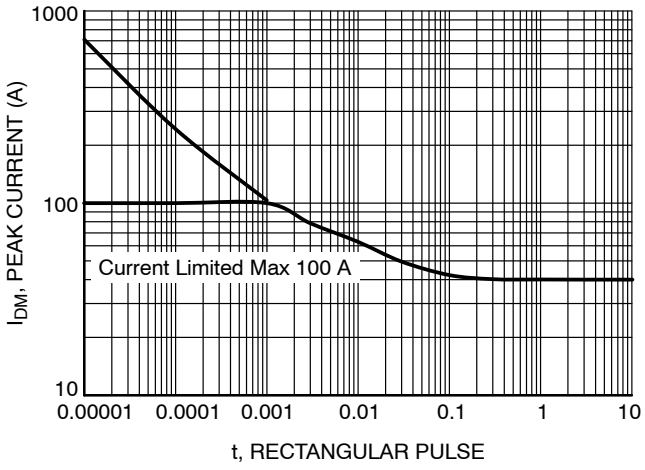


Figure 14. Peak Current Capability

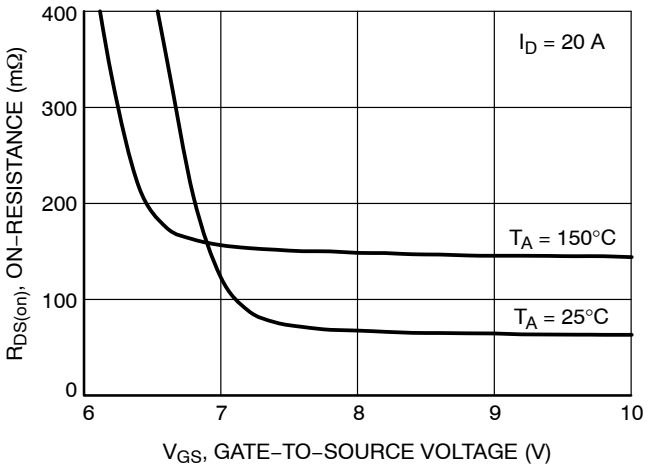


Figure 15. $R_{DS(on)}$ vs. Gate Voltage

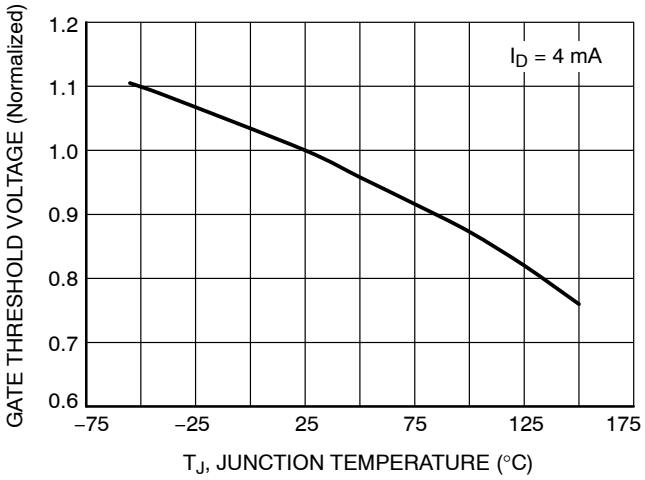


Figure 16. Normalized Gate Threshold Voltage vs. Temperature

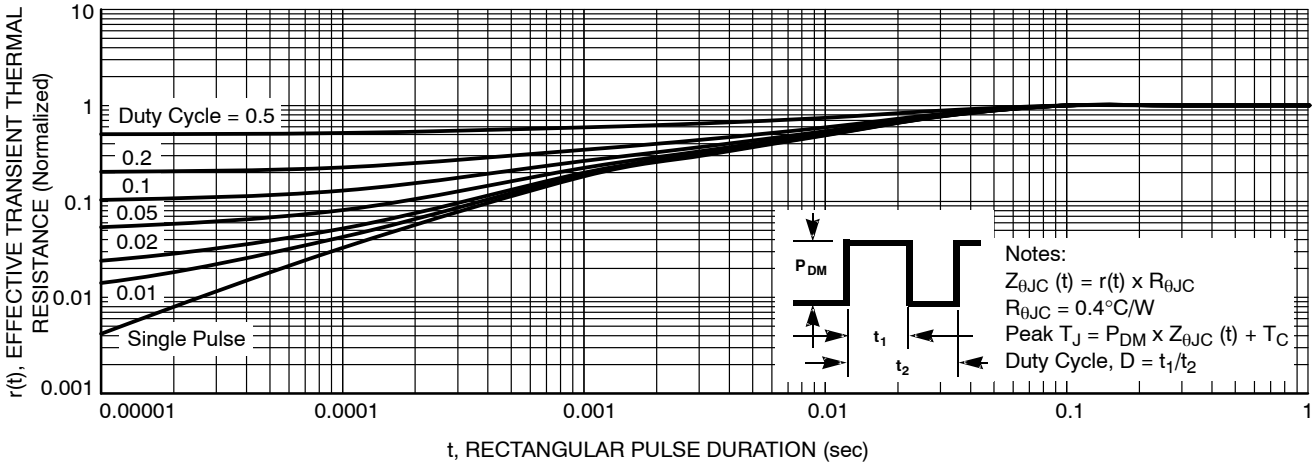


Figure 17. Transient Thermal Response

Share Feedback
Your Opinion Matters

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Marking	Package	Packing Method	Reel Size	Tape Width	Quantity
NVB082N65S3F	NVB082N65S3F	D^2PAK	Tape & Reel†	330 mm	24 mm	800 Units

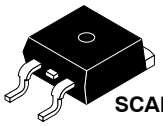
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

SUPERFET and FRFET are registered trademarks of Semiconductor Components Industries, LLC.

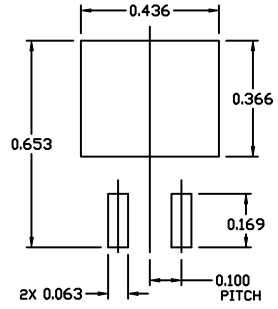
Share Feedback
Your Opinion Matters

D²PAK–3 (TO–263, 3–LEAD)
CASE 418AJ
ISSUE F

DATE 11 MAR 2021



SCALE 1:1



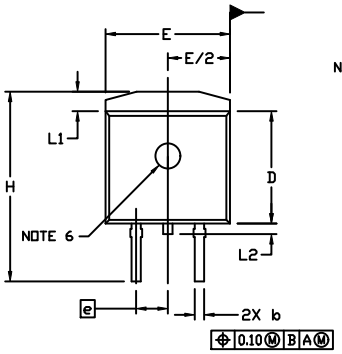
RECOMMENDED
MOUNTING FOOTPRINT

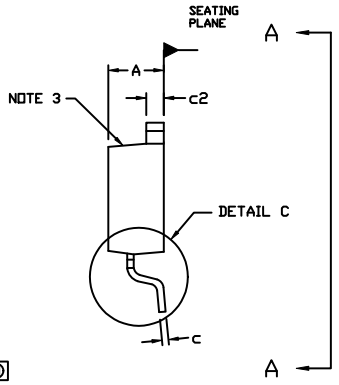
* For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

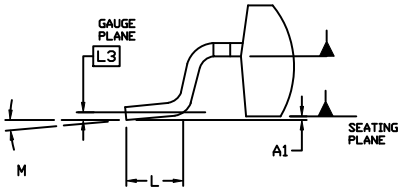
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: INCHES
3. CHAMFER OPTIONAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
5. THERMAL PAD CONTOUR IS OPTIONAL WITHIN DIMENSIONS E, L1, D1, AND E1.
6. OPTIONAL MOLD FEATURE.
7. ①, ② … OPTIONAL CONSTRUCTION FEATURE CALL OUTS.

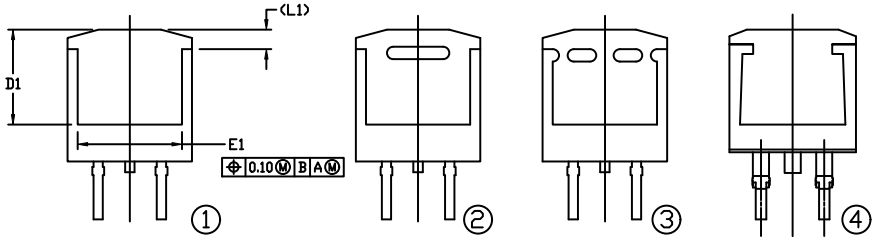
	INCHES		MILLIMETERS	
DIM	MIN.	MAX.	MIN.	MAX.
A	0.160	0.190	4.06	4.83
A1	0.000	0.010	0.00	0.25
b	0.020	0.039	0.51	0.99
c	0.012	0.029	0.30	0.74
c2	0.045	0.065	1.14	1.65
D	0.330	0.380	8.38	9.65
D1	0.260	---	6.60	---
E	0.380	0.420	9.65	10.67
E1	0.245	---	6.22	---
e	0.100 BSC		2.54 BSC	
H	0.575	0.625	14.60	15.88
L	0.070	0.110	1.78	2.79
L1	---	0.066	---	1.68
L2	---	0.070	---	1.78
L3	0.010 BSC		0.25 BSC	
M	0°	8°	0°	8°







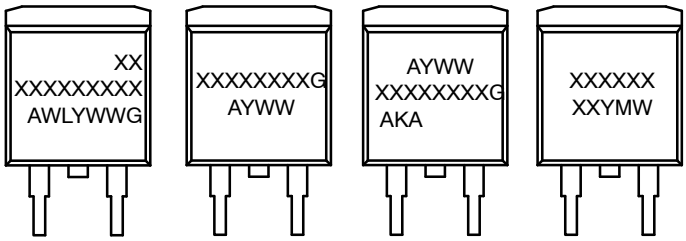
DETAIL C
TIP LEADFORM
ROTATED 90° CW



VIEW A–A

VIEW A–A
OPTIONAL CONSTRUCTIONS

GENERIC MARKING DIAGRAMS*



IC **Standard** **Rectifier** **SSG**

XXXXXX = Specific Device Code
A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
W = Week Code (SSG)
M = Month Code (SSG)
G = Pb–Free Package
AKA = Polarity Indicator

*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:	**98AON56370E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**D²PAK–3 (TO–263, 3–LEAD)**	**PAGE 1 OF 1**

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.

© Semiconductor Components Industries, LLC, 2011

onsemi, , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as−is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

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

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.