

NVMFD5C462N

Power MOSFET

40 V, 5.4 mΩ, 70 A, Dual N-Channel

Features

- Small Footprint (5x6 mm) for Compact Design
- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Q_G and Capacitance to Minimize Driver Losses
- NVMFD5C462NWF – Wettable Flank Option for Enhanced Optical Inspection
- 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)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V _{DSS}	40	V
Gate-to-Source Voltage			V _{GS}	±20	V
Continuous Drain Current R _{θJC} (Notes 1, 2, 3)	Steady State	T _C = 25°C	I _D	70	A
		T _C = 100°C		49	
Power Dissipation R _{θJC} (Notes 1, 2)	Steady State	T _C = 25°C	P _D	50	W
		T _C = 100°C		25	
Continuous Drain Current R _{θJA} (Notes 1, 2, 3)	Steady State	T _A = 25°C	I _D	17.6	A
		T _A = 100°C		12.5	
Power Dissipation R _{θJA} (Notes 1 & 2)	Steady State	T _A = 25°C	P _D	3.2	W
		T _A = 100°C		1.6	
Pulsed Drain Current	T _A = 25°C, t _p = 10 μs		I _{DM}	298	A
Operating Junction and Storage Temperature			T _J , T _{stg}	−55 to + 175	°C
Source Current (Body Diode)			I _S	41.7	A
Single Pulse Drain-to-Source Avalanche Energy (T _J = 25°C, I _{L(pk)} = 5 A)			E _{AS}	146	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			T _L	260	°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 – Steady State	$R_{\theta JC}$	3	$^\circ\text{C/W}$
Junction-to-Ambient – Steady State (Note 2)	$R_{\theta JA}$	47	

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. Surface-mounted on FR4 board using a 650 mm², 2 oz. Cu pad.
3. Maximum current for pulses as long as 1 second is higher but is dependent on pulse duration and duty cycle.

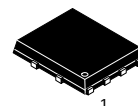
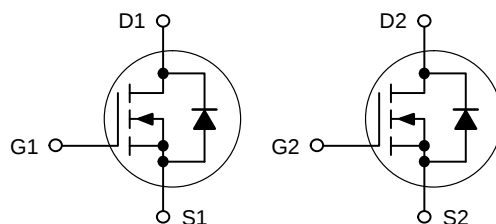


ON Semiconductor®

www.onsemi.com

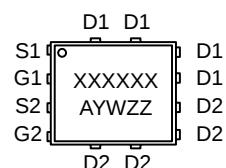
$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
40 V	5.4 mΩ @ 10 V	70 A

Dual N-Channel



DFN8 5x6
(S08FL)
CASE 506BT

MARKING DIAGRAM



XXXXXX = 5C462N (NVMFD5C462N)
or 462NWF (NVMFD5C462NWF)

A = Assembly Location
Y = Year
W = Work Week
ZZ = Lot Traceability

ORDERING INFORMATION

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

NVMFD5C462N

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
-----------	--------	----------------	-----	-----	-----	------

OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	40			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$			23		mV/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 40\text{ V}$	$T_J = 25\text{ }^\circ\text{C}$		10	μA
			$T_J = 125^\circ\text{C}$		100	
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = 20\text{ V}$			100	nA

ON CHARACTERISTICS (Note 4)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\text{ }\mu\text{A}$	2.5		3.5	V
Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$			-6.5		mV/ $^\circ\text{C}$
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 25\text{ A}$		4.5	5.4	m Ω

CHARGES, CAPACITANCES & GATE RESISTANCE

Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1\text{ MHz}, V_{DS} = 25\text{ V}$		1020		pF
Output Capacitance	C_{OSS}			550		
Reverse Transfer Capacitance	C_{RSS}			21		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 10\text{ V}, V_{DS} = 32\text{ V}, I_D = 25\text{ A}$		16		nC
Threshold Gate Charge	$Q_{G(TH)}$			3.0		
Gate-to-Source Charge	Q_{GS}			5.0		
Gate-to-Drain Charge	Q_{GD}			2.8		
Plateau Voltage	V_{GP}			4.8		V

SWITCHING CHARACTERISTICS (Note 5)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 10\text{ V}, V_{DS} = 32\text{ V}, I_D = 25\text{ A}, R_G = 1.0\text{ }\Omega$		12		ns
Rise Time	t_r			30		
Turn-Off Delay Time	$t_{d(OFF)}$			26		
Fall Time	t_f			10		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V},$ $I_S = 25\text{ A}$	$T_J = 25^{\circ}\text{C}$		0.86	1.2	V
			$T_J = 125^{\circ}\text{C}$		0.75		
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s},$ $I_S = 25\text{ A}$			29		ns
Charge Time	t_a				14		
Discharge Time	t_b				14		
Reverse Recovery Charge	Q_{RR}				12		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. Pulse Test: pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

5. Switching characteristics are independent of operating junction temperatures.

TYPICAL CHARACTERISTICS

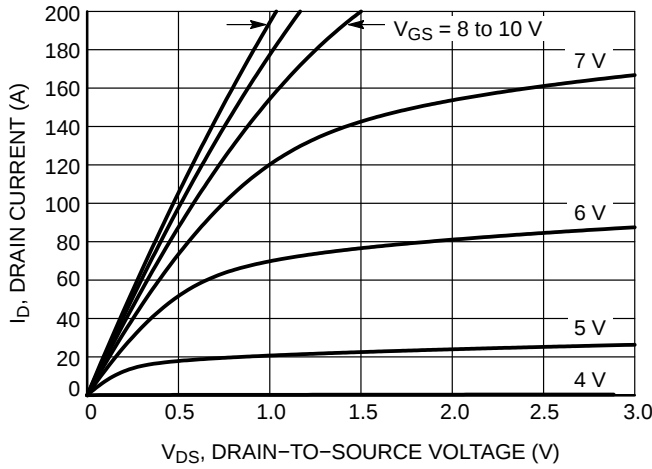


Figure 1. On-Region Characteristics

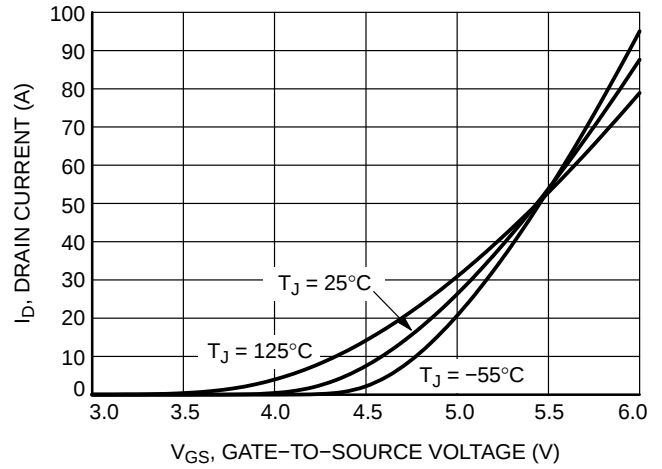


Figure 2. Transfer Characteristics

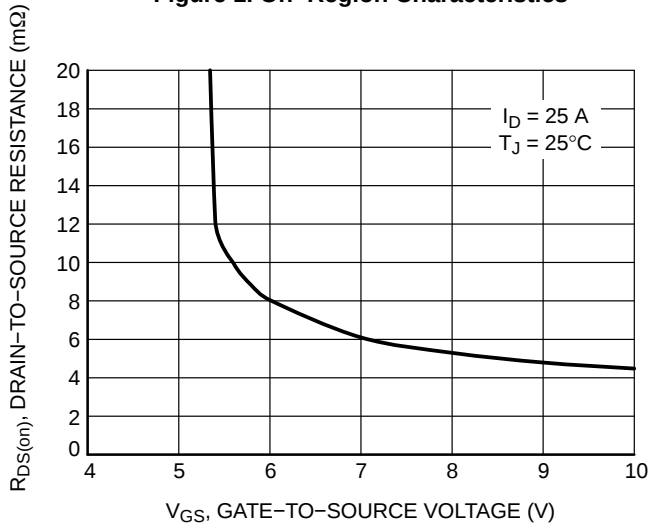


Figure 3. On-Resistance vs. Gate-to-Source Voltage

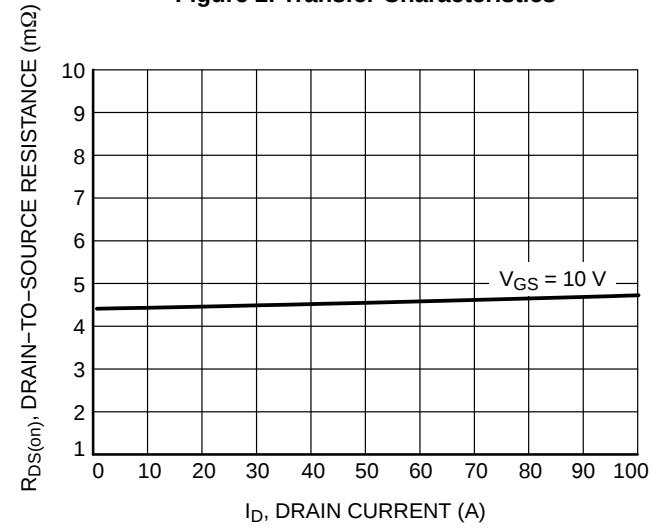


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

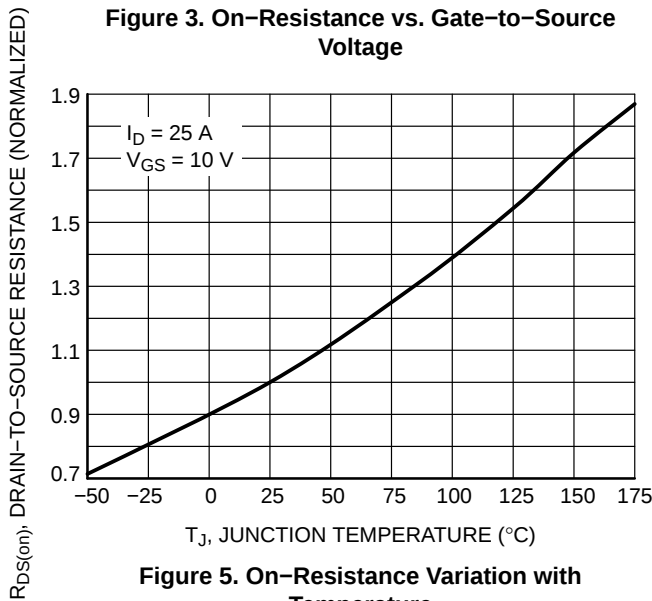


Figure 5. On-Resistance Variation with Temperature

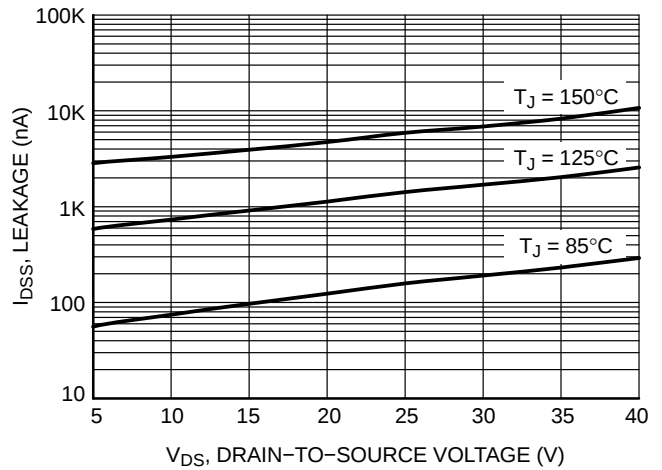


Figure 6. Drain-to-Source Leakage Current vs. Voltage

TYPICAL CHARACTERISTICS

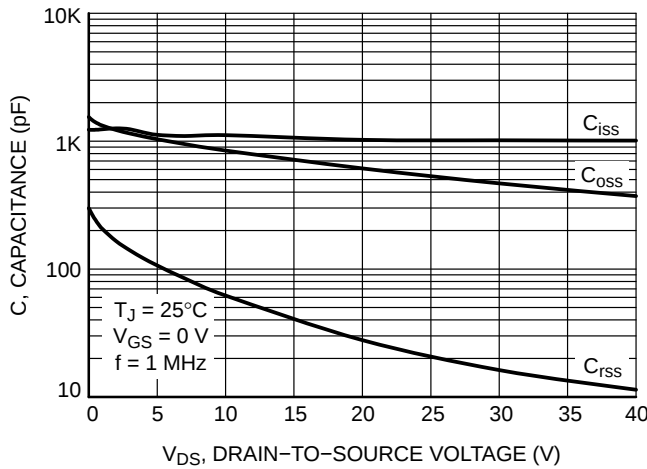


Figure 7. Capacitance Variation

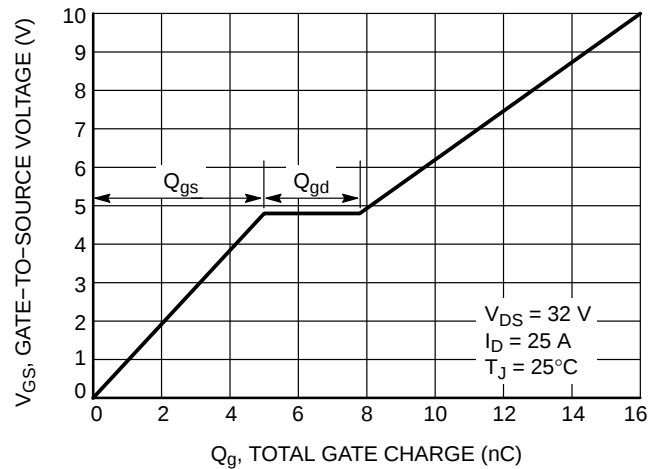


Figure 8. Gate-to-Source vs. Total Charge

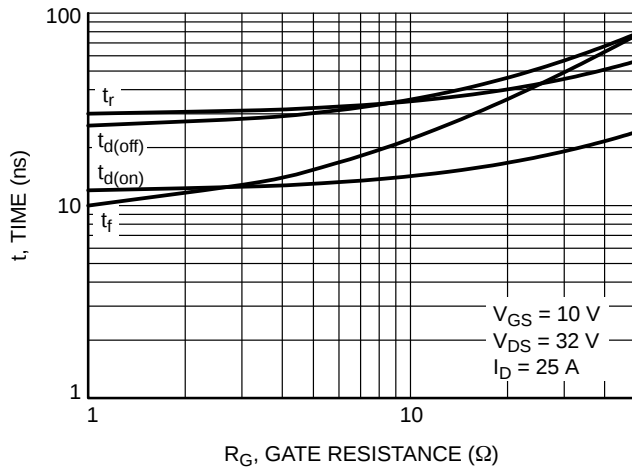


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

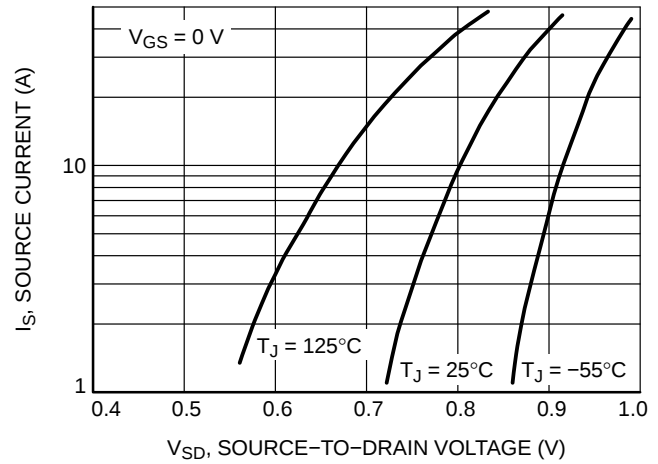


Figure 10. Diode Forward Voltage vs. Current

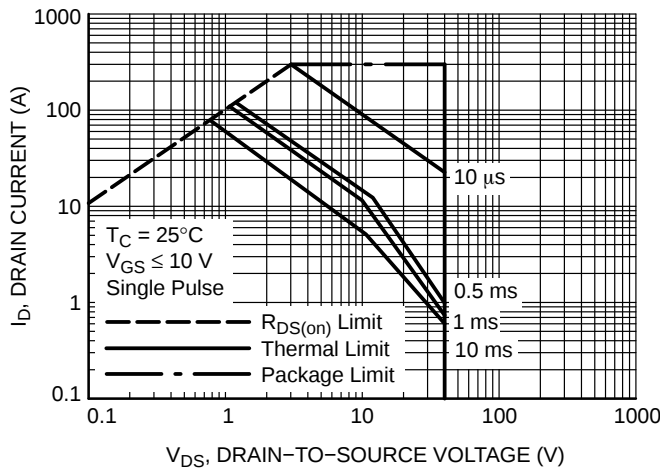


Figure 11. Maximum Rated Forward Biased Safe Operating Area

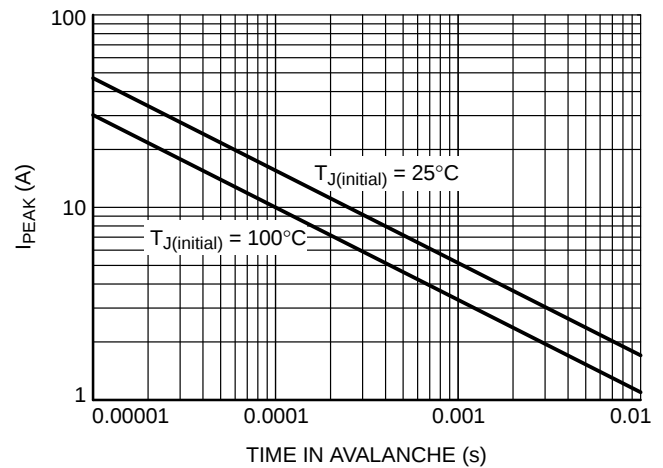


Figure 12. Maximum Drain Current vs. Time in Avalanche

NVMFD5C462N

TYPICAL CHARACTERISTICS

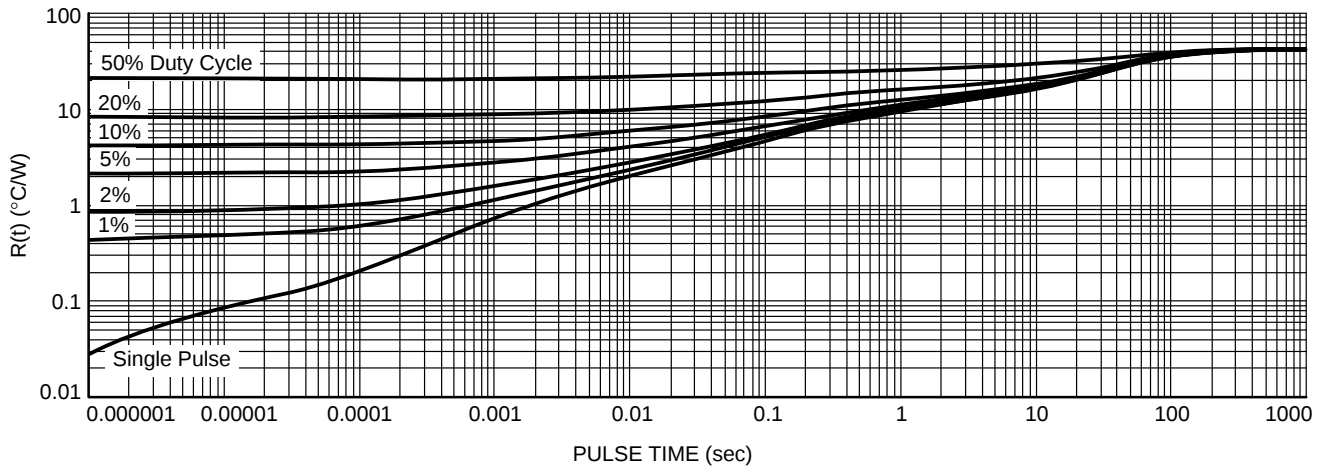


Figure 13. Thermal Response

DEVICE ORDERING INFORMATION

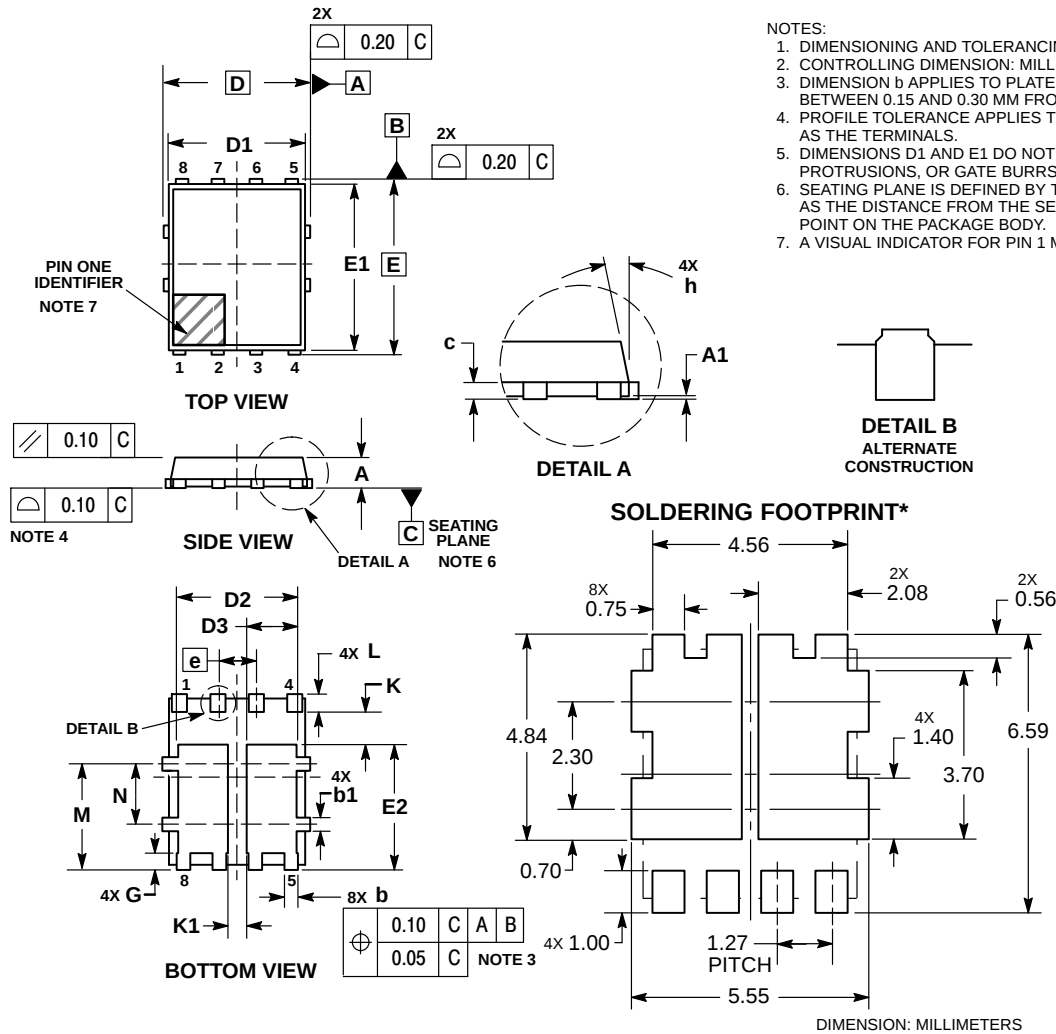
Device	Marking	Package	Shipping [†]
NVMFD5C462NT1G	5C462N	DFN8 (Pb-Free)	1500 / Tape & Reel
NVMFD5C462NWFT1G	462NWF	DFN8 (Pb-Free, Wettable Flanks)	1500 / Tape & Reel

[†]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.

NVMFD5C462N

PACKAGE DIMENSIONS

DFN8 5x6, 1.27P Dual Flag (SO8FL-Dual) CASE 506BT ISSUE E



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM THE TERMINAL TIP.
 4. PROFILE TOLERANCE APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
 5. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
 6. SEATING PLANE IS DEFINED BY THE TERMINALS. A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.
 7. A VISUAL INDICATOR FOR PIN 1 MUST BE LOCATED IN THIS AREA.

DIM	MIN	MAX	MAX
A	0.90	---	1.10
A1	---	---	0.05
b	0.33	0.42	0.51
b1	0.33	0.42	0.51
c	0.20	---	0.33
D	5.15 BSC		
D1	4.70	4.90	5.10
D2	3.90	4.10	4.30
D3	1.50	1.70	1.90
E	6.15 BSC		
E1	5.70	5.90	6.10
E2	3.90	4.15	4.40
e	1.27 BSC		
G	0.45	0.55	0.65
h	---	---	12 °
K	0.51	---	---
K1	0.56	---	---
L	0.48	0.61	0.71
M	3.25	3.50	3.75
N	1.80	2.00	2.20

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

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marketing.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor 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 ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor 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 ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor 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 ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

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

For additional information, please contact your local Sales Representative

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А