



VMDSEMI

VUPB004R070NA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
40V	7.0mΩ@10V	90A
	10.5mΩ@4.5V	

Symbol

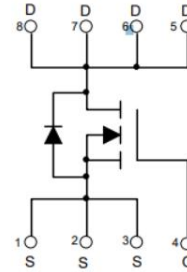
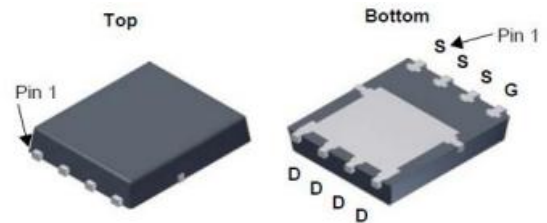


Figure 1 Symbol of VUPB004R070NA

Features

- Excellent $R_{DS(on)}$ and Low Gate Charge
- Trench Technology Power MOSFET
- Low Gate Resistance
- 100% UIS Tested

Package Type



PDFN5X6-8L

Figure 2 Package Type of VUPB004R070NA

Application

- DC/DC Converter
- Power Switching Application

Ordering Information

Product Name	Package
VUPB004R070NA	PDFN5X6-8L

Absolute Maximum Ratings ($T_A = 25\text{ °C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	40	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current ^{Note1}	I_D	90	A
Continuous Drain Current ^{Note6}	I_D	20	A
Pulsed Drain Current ^{Note2}	I_{DM}	180	A
Single Pulsed Avalanche Current ^{Note3}	I_{AS}	40	A
Single Pulsed Avalanche Energy ^{Note3}	E_{AS}	400	mJ
Total Power Dissipation ^{Note5}	P_D	70	W
Total Power Dissipation ^{Note6}	P_D	2.5	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient ^{Note6}	$R_{\theta JA}$		50		°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		1.8		°C/W

Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.5	V
Static Drain-Source On-Resistance ^{Note4}	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$		5.5	7.0	mΩ
		$V_{GS}=4.5V, I_D=10A$		7.0	10.5	
Forward transconductance ^{Note4}	g_{FS}	$V_{DS}=10V, I_D=10A$		12		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=20V$		3163		pF
Output Capacitance	C_{OSS}	$V_{GS}=0V$		240		pF
Reverse Transfer Capacitance	C_{RSS}	$f=1MHz$		214		pF
Gate resistance	R_g	$f=1MHz, \text{Open drain}$		1.59		Ω
Switching Parameters						
Total Gate Charge	Q_g	$V_{DS}=25V$		20		nC
Gate-source Charge	Q_{gs}	$V_{GS}=10V$		9		
Gate-drain Charge	Q_{gd}	$I_D=8A$		11		
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=15V$		15		ns
Turn-on Rise Time	t_r	$V_{GS}=10V$		5		
Turn-off Delay Time	$t_{d(off)}$	$R_L=3\Omega$		50		
Turn-off Fall Time	t_f	$R_{GEN}=3\Omega$		6		
Diode Characteristics						
Diode Forward Voltage ^{Note3}	V_{DS}	$V_{GS}=0V, I_S=10A$			1.2	V

Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 25V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.And device mounted on a large heatsink
- 6.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Performance Characteristics

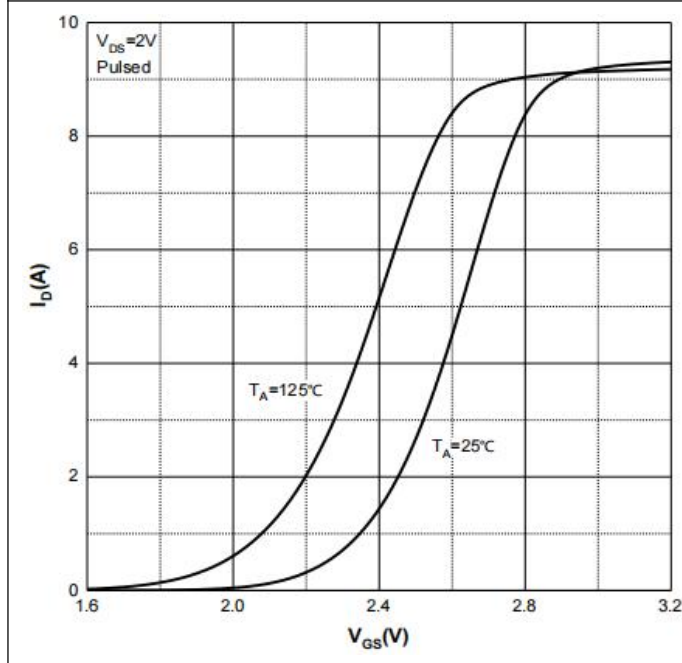
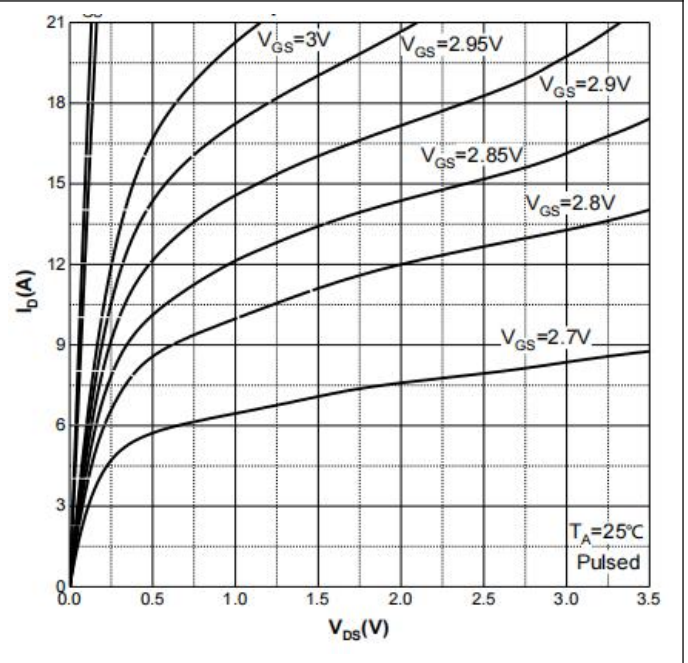
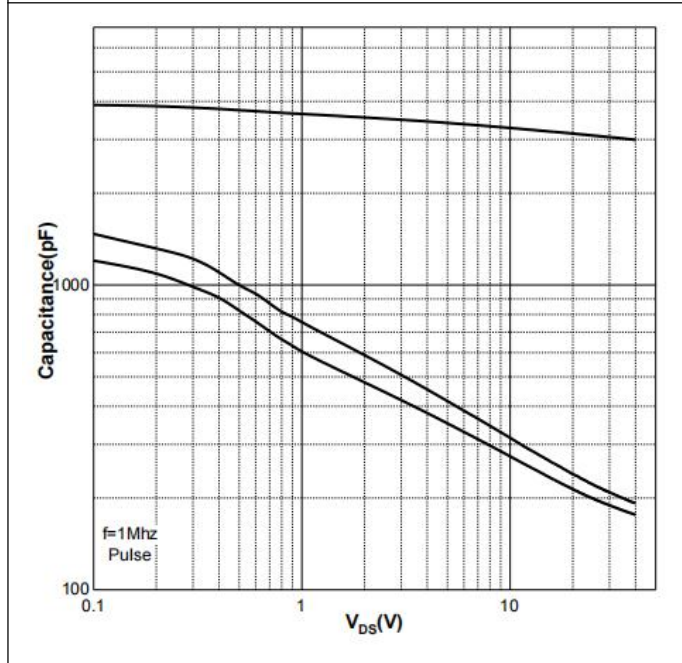
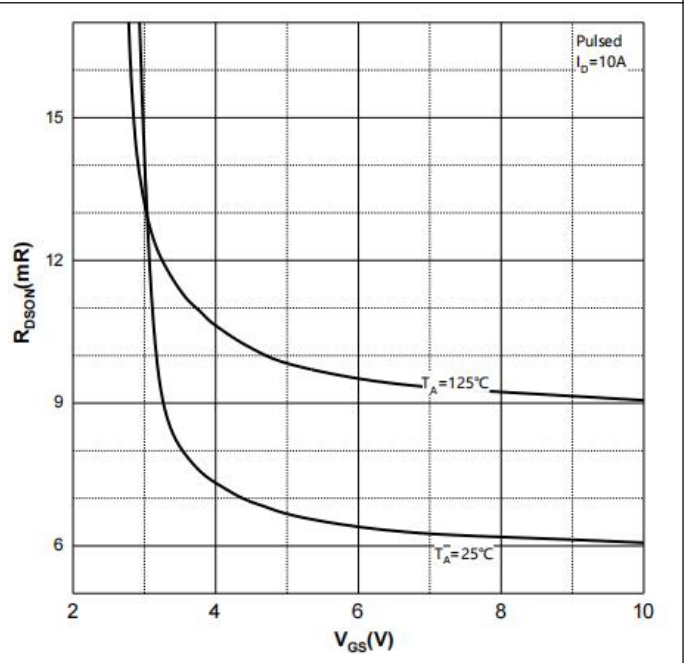
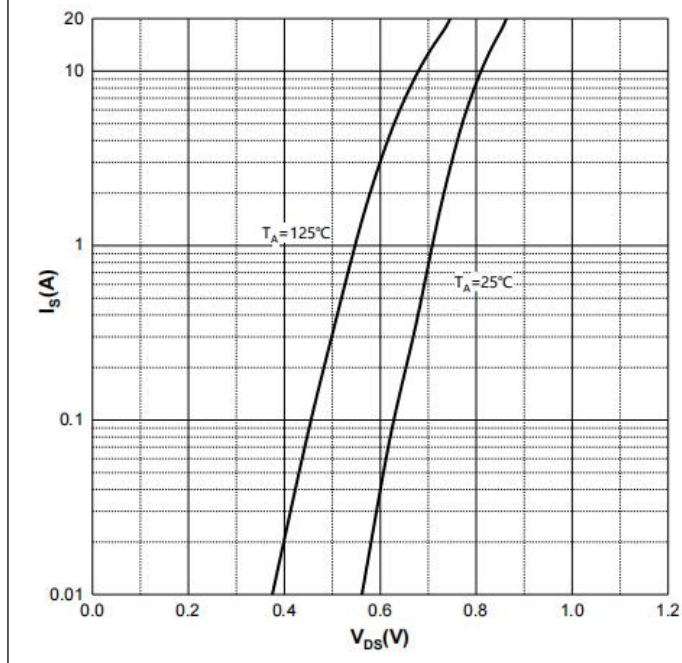
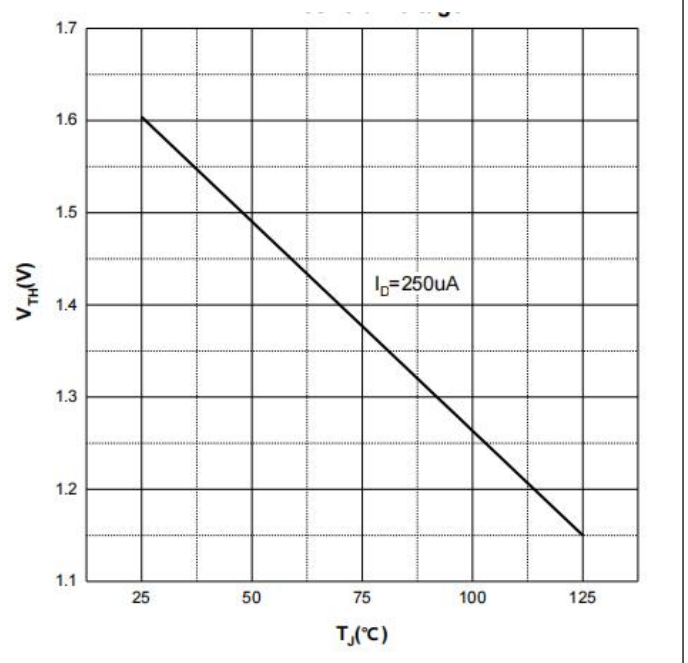
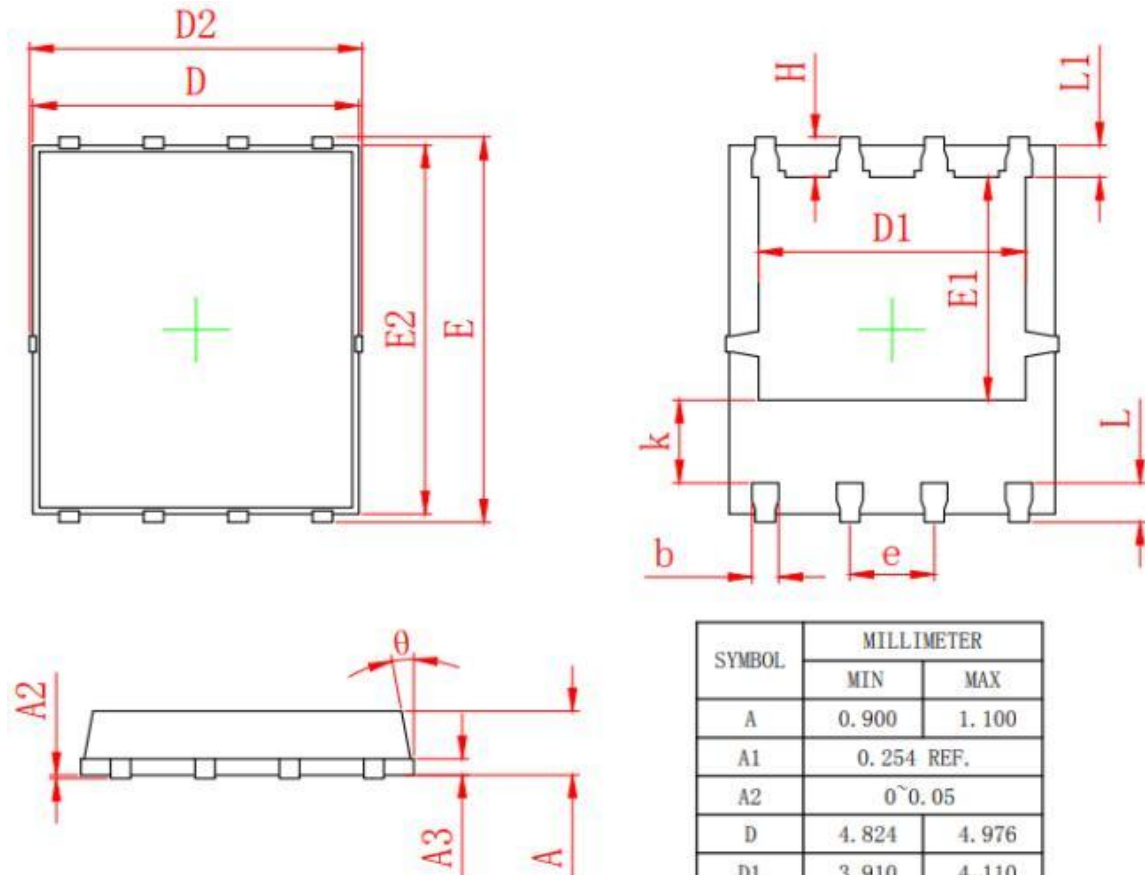
Figure 3: Transfer Characteristics

Figure 4: Output Characteristics

Figure 5: Capacitance

Figure 6: On-Resistance vs. Gate Voltage


Figure 7: Body Diode Characteristics

Figure 8: Threshold Voltage


Mechanical Dimensions:
PDFN5X6-8L Package Information


SYMBOL	MILLIMETER	
	MIN	MAX
A	0.900	1.100
A1	0.254 REF.	
A2	0 [~] 0.05	
D	4.824	4.976
D1	3.910	4.110
D2	4.944	5.076
E	5.924	6.076
E1	3.375	3.575
E2	5.674	5.826
b	0.350	0.450
e	1.270 TYP.	
L	0.534	0.686
L1	0.424	0.576
k	1.190	1.390
H	0.549	0.701
θ	8°	12°

NOTICE

Hangzhou VMD Semiconductor Co., Ltd (VMD) reserves the right to make changes without notice in order to improve reliability, function or design and to discontinue any product or service without notice. Customers should obtain the latest relevant information before orders and should verify that such information is current and complete. All products are sold subject to VMD's terms and conditions supplied at the time of order acknowledgement.

VMD, its affiliates, agents, and employees, and all persons acting on its or their behalf, disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product. VMD disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify VMD's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

VMD warrants performance of its hardware products to the specifications at the time of sale, testing, reliability and quality control are used to the extent VMD deems necessary to support this warrantee. Except where agreed upon by contractual agreement, testing of all parameters of each product is not necessarily performed.

VMD does not assume any liability arising from the use of any product or circuit designs described herein. Customers are responsible for their products and applications using VMD's components. To minimize risk, customers must provide adequate design and operating safeguards.

VMD does not warrant or convey any license to any intellectual property rights either expressed or implied under its patent rights, nor the rights of others. Reproduction of information in VMD's data sheets or data books is permissible only if reproduction is without modification or alteration. Reproduction of this information with any alteration is an unfair and deceptive business practice.

VMD is not responsible or liable for such altered documentation. Resale of VMD's products with statements different from or beyond the parameters stated by VMD for that product or service voids all express or implied warranties for the associated VMD product or service and is an unfair and deceptive business practice.

All Rights Reserved.



Via-Media Semiconductor Limited Company

<http://www.vmdsemi.com>

Main Sites:

- Headquarters

Hangzhou Via-Media Semiconductor Co., LTD.
1305-1306, Building 71, No. 90, Wensan Road, Xihu
District, Hangzhou, Zhejiang Province, P.R. China
Tel: +86-0571-8515 0563

- Shanghai

Shanghai R&D Center.
1506~1508, Xinyin Building, 888 Yishan Road,
Shanghai, P.R of China
Tel: +86- 021-54201999

- Xi'an

Xi'an R&D Center
1703B, Building A, Greenland Center, Jinye Road,
High-Tech Zone, Xi'an, Shaanxi, P.R of China

- Chengdu Office

Chengdu Winhi Semiconductor Co., LTD.
Floor 15, Building 5, No. 171, Hele 2nd Street,
Chengdu, Sichuan Province, P.R. China
Tel: +86-028-8505 0771

- Shenzhen

Shenzhen Sales Center.
17B, No.1 Phoenix Building, 2008 Shennan Road,
Shenzhen, P.R of China
Tel: +86-0755- 82570682