VUPA003R120NA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
30V	12mΩ@10V	20A
	18mΩ@4.5V	

Symbol

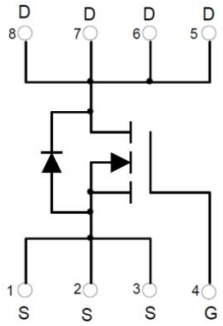
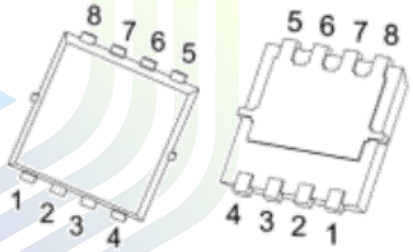


Figure 1 Symbol of VUPA003R120NA

Features

- Low $R_{DS(ON)}$
- Advanced high cell density Trench technology
- Super Low Gate Charge

Package Type



PDFNWB3.3×3.3-8L

Figure 2 Package Type of VUPA003R120NA

Application

- Load / Power Switch
- Battery protection applications

Ordering Information

Product Name	Package
VUPA003R120NA	PDFNWB3.3X3.3-8L

Absolute Maximum Ratings (T_A= 25 ºC, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	20	A
Pulsed Drain Current Note2	I_{DM}	60	A
Single Pulsed Avalanche Energy Note5	E_{AS}	10.5	mJ
Avalanche Current	I_{AS}	14.5	A
Total Power Dissipation Note3	P_D	1.5	W
Junction Temperature	T_J	150	ºC
Storage Temperature	T_{STG}	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient Note1	$R_{\theta JA}$		83.3		ºC/W

Electrical Characteristics (T_A= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= 250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 30V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage[Note4]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.0	1.7	3.0	V
Static Drain-Source On-Resistance[Note4]	$R_{DS(ON)}$	V_{GS}=10V, I_D= 12A		8.5	12	mΩ
		V_{GS}=4.5V, I_D= 10A		12	18	
Forward tranconductance[Note4]	g_{FS}	V_{DS}= 5V, I_D= 10A	5	12		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=15V		1220		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		155		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		144		pF
Total Gate Charge	Q_g	V_{DS}=15V		16		nC
Gate-Source Charge	Q_{gs}	V_{GS}=10V		3		
Gate-Drain Charge	Q_{gd}	I_D= 10A		4.5		
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 15V			10	ns
Turn-on Rise Time	t_r	V_{GS}= 10V			8	
Turn-off Delay Time	$t_{d(off)}$	R_L=1.8Ω			30	
Turn-off Fall Time	t_f	R_{GEN}=1.8Ω			5	
Diode Characteristics						
Diode Forward Voltage [Note4]	V_{SD}	V_{GS}=0V, I_S= 10A T_J= 25ºC		0.82	1.2	V
Diode Forward Current	I_S	V_G=V_D=0V			20	A
Pulsed Source Current	I_{SM}	Force Current			60	A

Notes :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.Pulse Test:Pulse Width < 10us, Duty Cycle < 0.5%.

3.The power dissipation is limited by 150℃ junction temperature

4.Pulse Test : Pulse width≤300μs, duty cycle≤0.5%.

5. E_{AS} Test Condition V_{DD}=15V,V_{GS}=10V,L=0.1mH,I_{AS}=14.5A

Typical Performance Characteristics

Figure 3: Transfer Characteristics

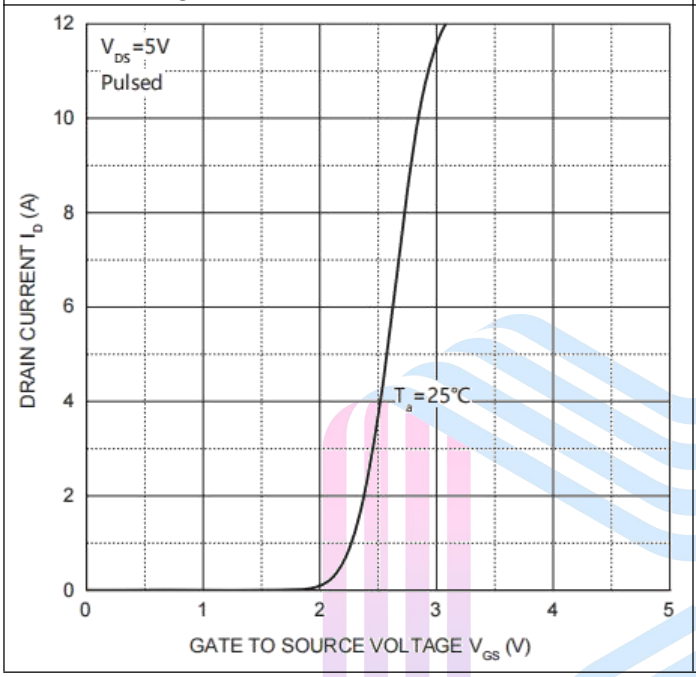


Figure 4: Output Characteristics

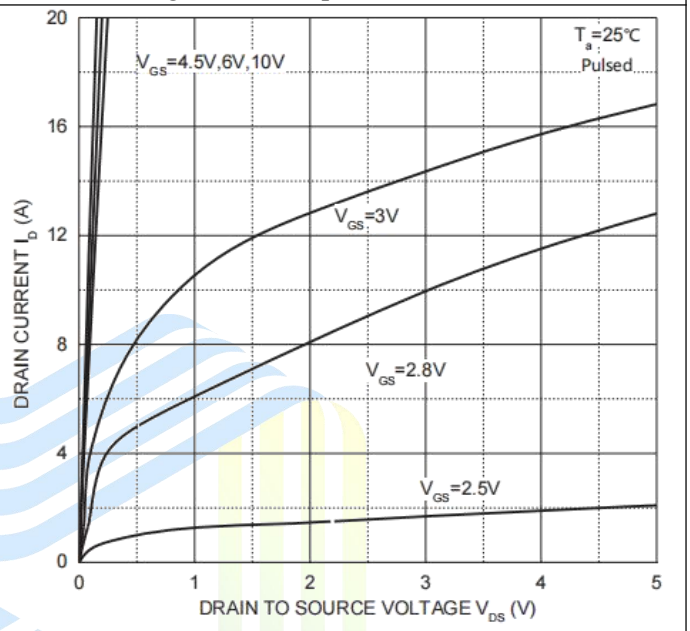


Figure 5: On-Resistance vs. Drain Current

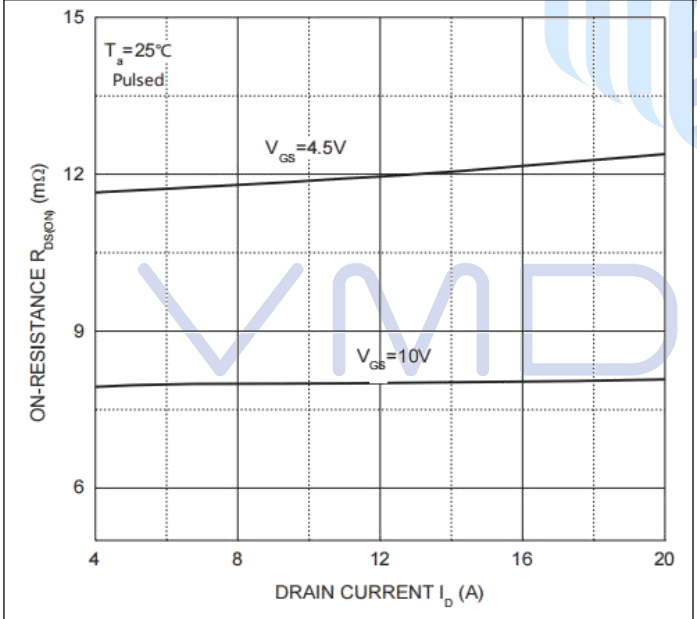


Figure 6: On-Resistance vs. Gate Voltage

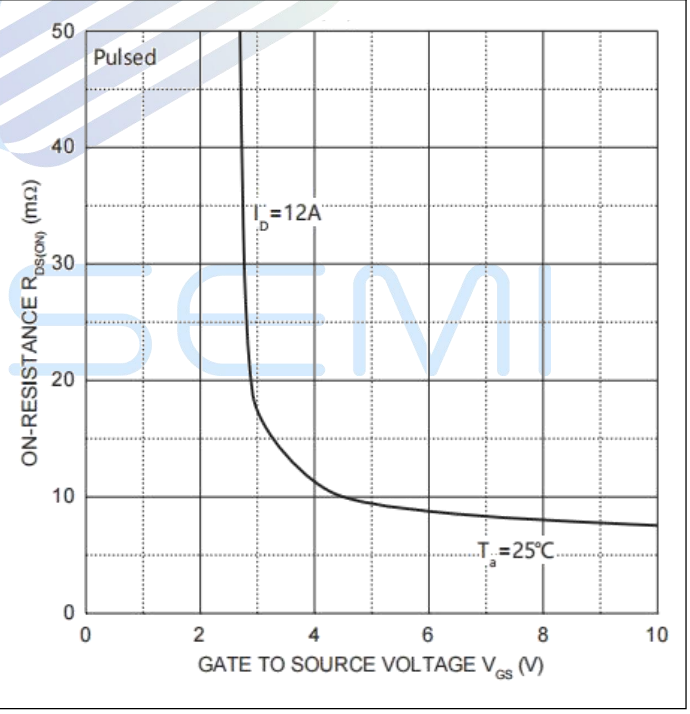


Figure 7: Body Diode Characteristics

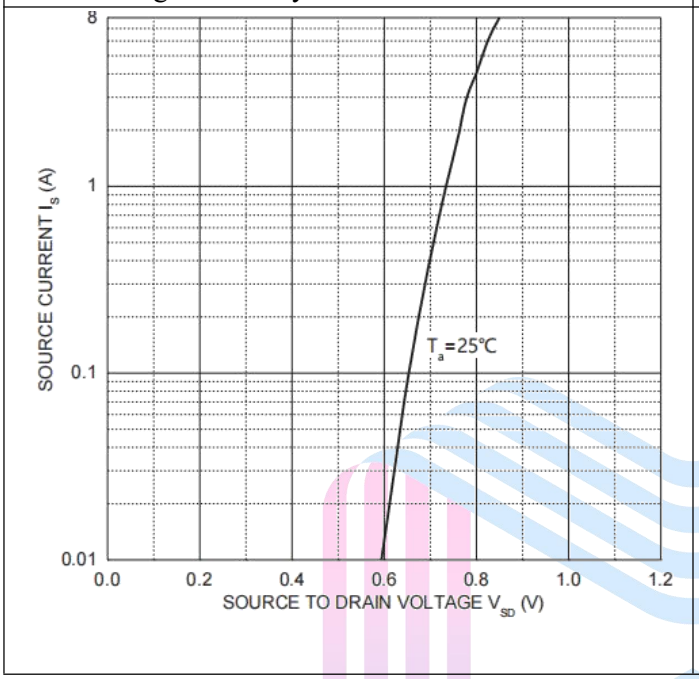
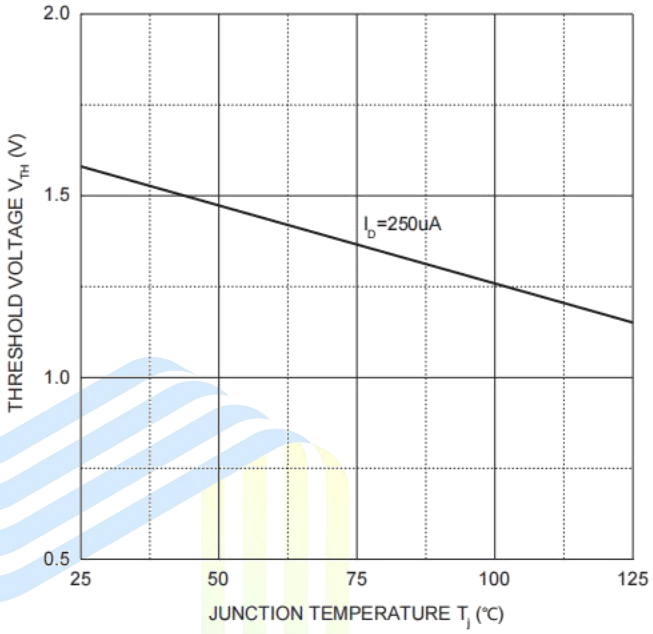
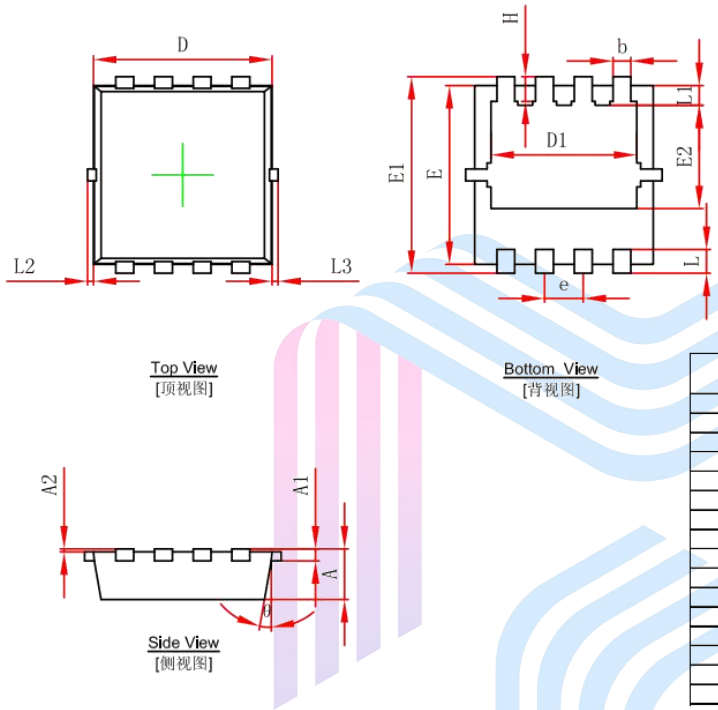


Figure 8: Threshold Voltage



Mechanical Dimensions:

PDFNWB3.3×3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

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