VUPA1P8R030NA

Datasheet

3.0mΩ, 18V, N-Channel Power MOSFET VUPA1P8R030NA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
18V	3.0mΩ@4.5V	50A
	3.1mΩ@3.8V	
	3.2mΩ@3.1V	
	5.0mΩ@2.5V	
	7.0mΩ@1.8V	

Symbol

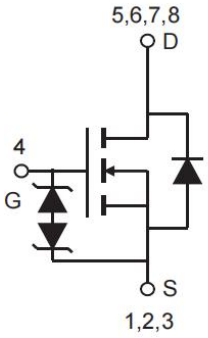
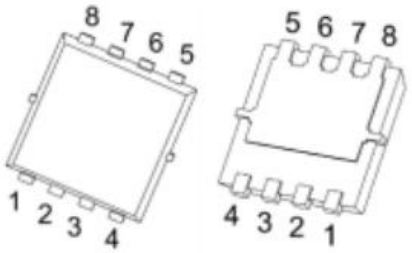


Figure 1 Symbol of VUPA1P8R030NA

Features

- Trench Power MOSFET
- ESD Protected Gate
- Low Gate Charge

Package Type



PDFNWB3.3×3.3-8L

Figure 2 Package Type of VUPA1P8R030NA

Application

- Load / Power Switch
- Battery Switch

Ordering Information

Product Name	Package
VUPA1P8R030NA	PDFNWB3.3X3.3-8L

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	18	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current	I_D	50	A
Pulsed Drain Current Note2	I_{DM}	200	A
Total Power Dissipation Note3	P_D	3	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	$R_{\theta JA}$		42		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	18			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 12V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±8V, V_{DS}= 0V			±10	uA
		V_{GS} = ±4.5V, V_{DS}= 0V			±1	uA
Gate Threshold Voltage[Note4]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.4	0.75	1.0	V
Static Drain-Source On-Resistance[Note4]	$R_{DS(ON)}$	V_{GS}=4.5V, I_D= 15A		2.5	3.0	mΩ
		V_{GS}=3.8V, I_D= 15A		2.6	3.1	
		V_{GS}=3.1V, I_D= 15A		2.7	3.2	
		V_{GS}= 2.5V, I_D= 15A		3.0	5.0	
		V_{GS}= 1.8V, I_D= 15A		4.4	7.0	
Forward tranconductance[Note4]	g_{FS}	V_{DS}= 5V, I_D= 7A	8			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=10V		3048		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		596		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		47		pF
Total Gate Charge	Q_g	V_{DS}=10V		26.5		nC
Gate-Source Charge	Q_{gs}	V_{GS}=4.5V		2.4		
Gate-Drain Charge	Q_{gd}	I_D= 3A		7.6		
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 10V		4.5		ns
Turn-on Rise Time	t_r	V_{GS}= 5V		8.9		
Turn-off Delay Time	$t_{d(off)}$	R_L=1.35Ω		85		
Turn-off Fall Time	t_f	R_{GEN}=3Ω, I_D= 3A		24		
Diode Characteristics						
Diode Forward Voltage [Note4]	V_{SD}	V_{GS}=0V, I_S= 1A			1.0	V
Diode Forward Current	I_S				15	A

Notes :

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

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

3.The power dissipation is limited by 150°C junction temperature

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

Typical Performance Characteristics

Figure 3: Transfer Characteristics

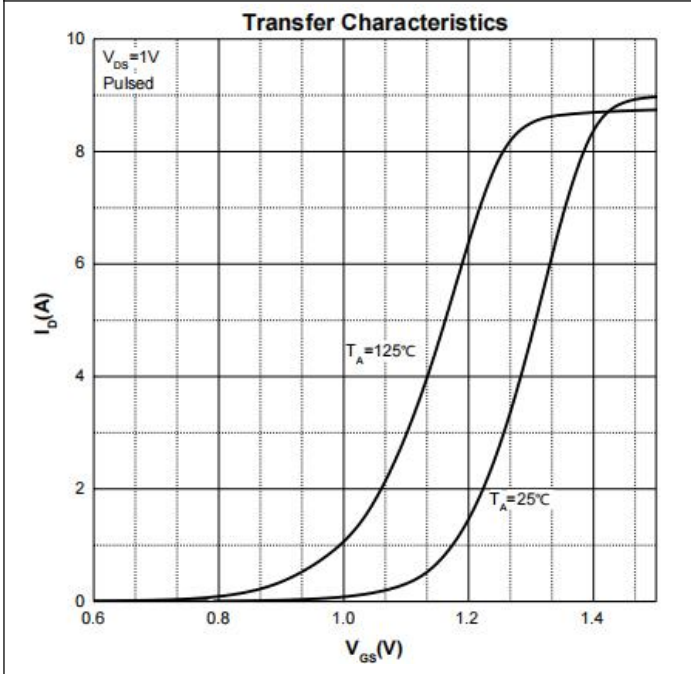


Figure 4: Output Characteristics

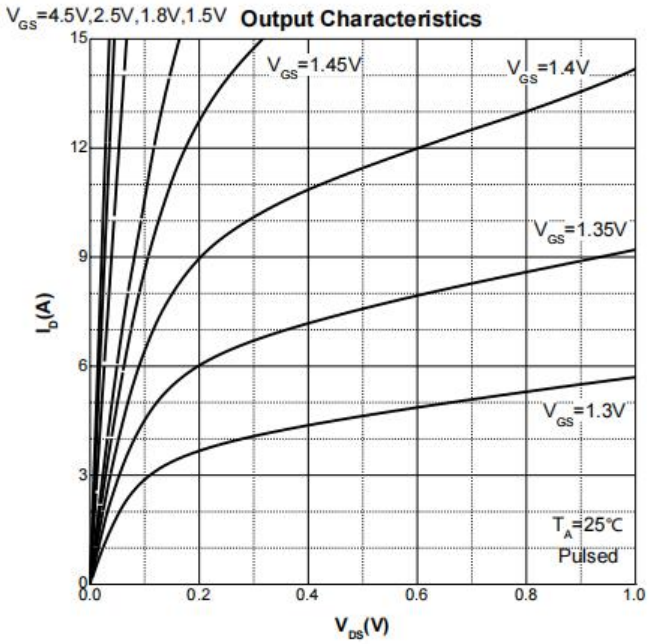


Figure 5: On-Resistance vs. Drain Current

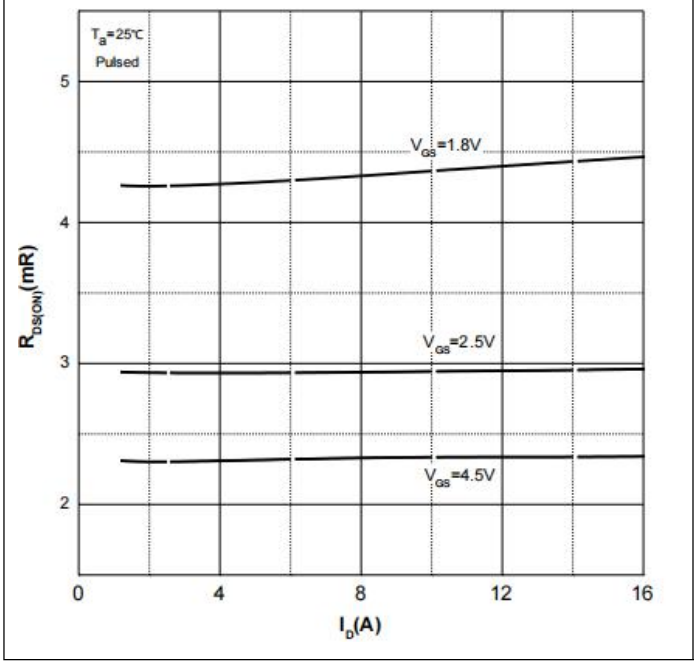


Figure 6: On-Resistance vs. Gate Voltage

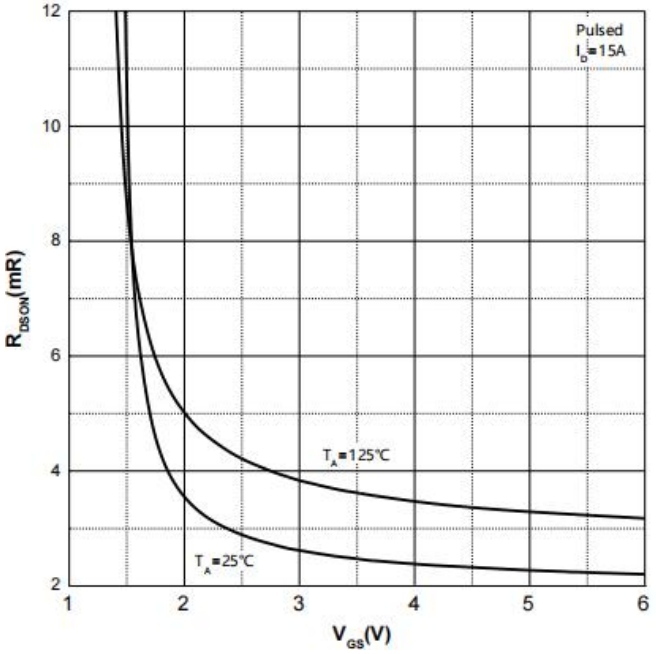


Figure 7: Body Diode Characteristics

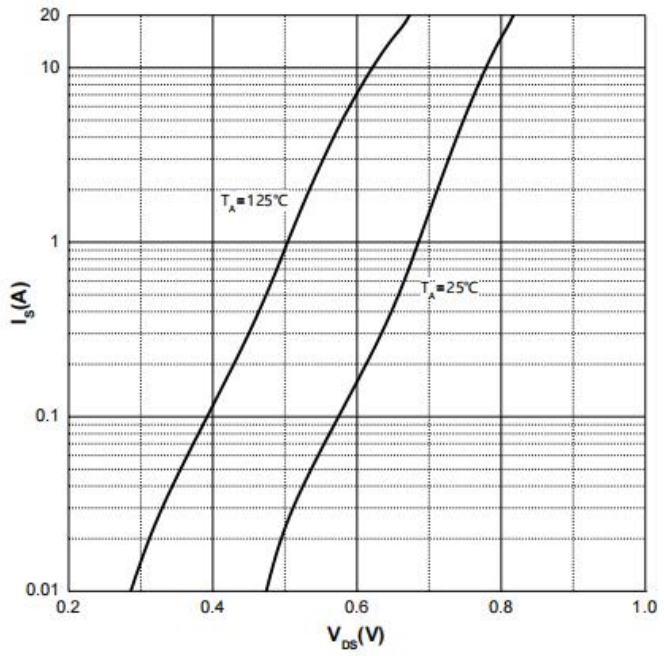


Figure 8: Threshold Voltage

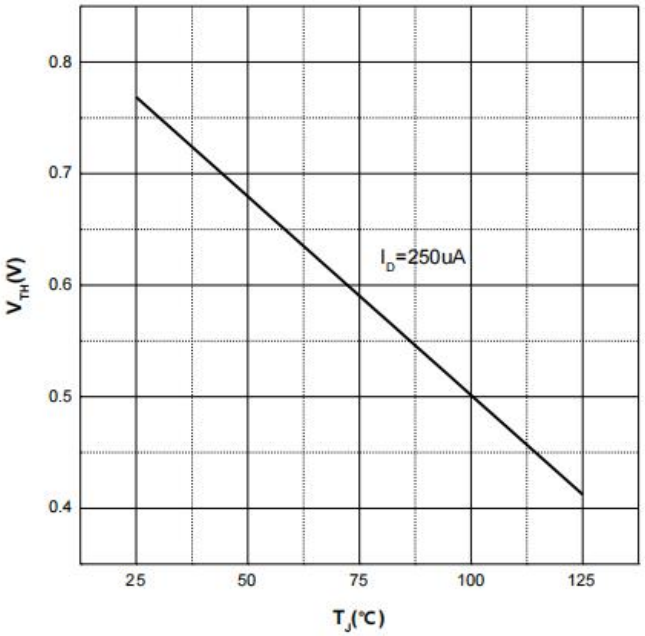
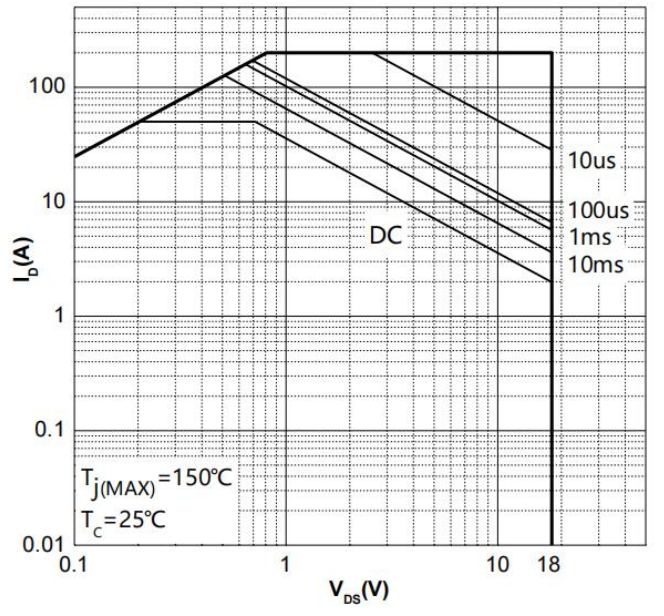
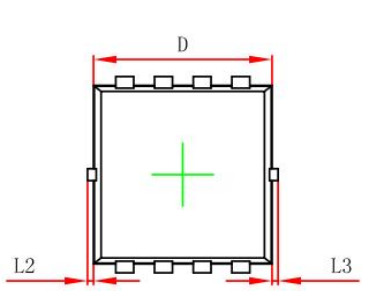


Figure 9: Safe Operating Area

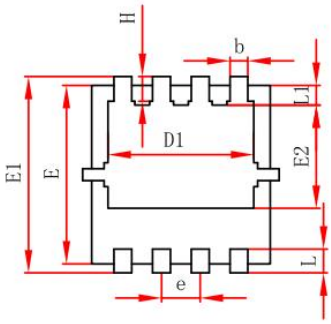


Mechanical Dimensions:

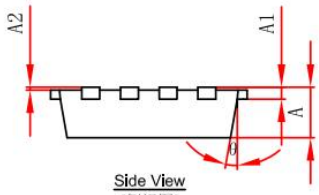
PDFNWB3.3×3.3-8L Package Information



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

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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