VUDD1P2R180PA

Datasheet

18mΩ, -12V, P-Channel Power MOSFET VUDD1P2R180PA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-12V	18mΩ@-4.5V	-16A
	27mΩ@-2.5V	

Symbol

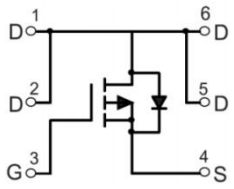


Figure 1 Symbol of VUDD1P2R180PA

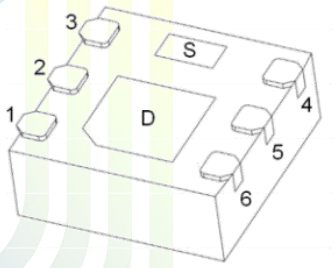
Features

- Trench FET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

Package Type



DFN2X2-6L

Figure 2 Package Type of VUDD1P2R180PA

Ordering Information

Product Name	Package
VUDD1P2R180PA	DFN2X2-6L

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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	-12	V
Gate-Source Voltage		V_{GSS}	±10	V
Continuous Drain Current[Note1]		I_D	-16	A
Pulsed Drain Current [Note2]		I_{DM}	-65	
Total Power Dissipation[Note4]	T_A= 25 ºC	P_D	2.5	W
Total Power Dissipation[Note4]	T_C= 25 ºC		18	
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[Note5]	$R_{\theta JA}$		50		ºC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		6.9		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	-12			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -12V, V_{GS}=0V			-1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±10V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.4	-0.7	-1	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D= -6.7A		12	18	mΩ
		V_{GS}=-2.5V, I_D= -4.2A		14	27	
Forward Transconductance[Note3]	g_{FS}	V_{DS}=-10V, I_D= -6.7A		40		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=-6V		1658		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		354		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		341		pF
Total Gate Charge	Q_g	V_{DS}=-6V		18	23	nC
Gate-Source Charge	Q_{gs}	V_{GS}=-4.5V		3		
Gate-Drain Charge	Q_{gd}	I_D= -5A		4.7		
Gate Resistance	Rg	f = 1MHz, Open drain		45		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -6V		33	40	ns
Turn-on Rise Time	t_r	V_{GS}= -4.5V		31	40	
Turn-off Delay Time	$t_{d(off)}$	R_L=6Ω		58	75	
Turn-off Fall Time	t_f	R_G=1Ω, I_D= -4A		26	35	
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{DS}	V_{GS}=0V, I_S= -2A		-0.82	-1.2	V
Continuous Source Current	I_S	T_C=25 ºC			-16	A
Pulsed Source Current	I_{SM}				-48	

Notes :

1.The maximum current rating is limited by package.And device mounted on a large heatsink.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C, t≤ 10S.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

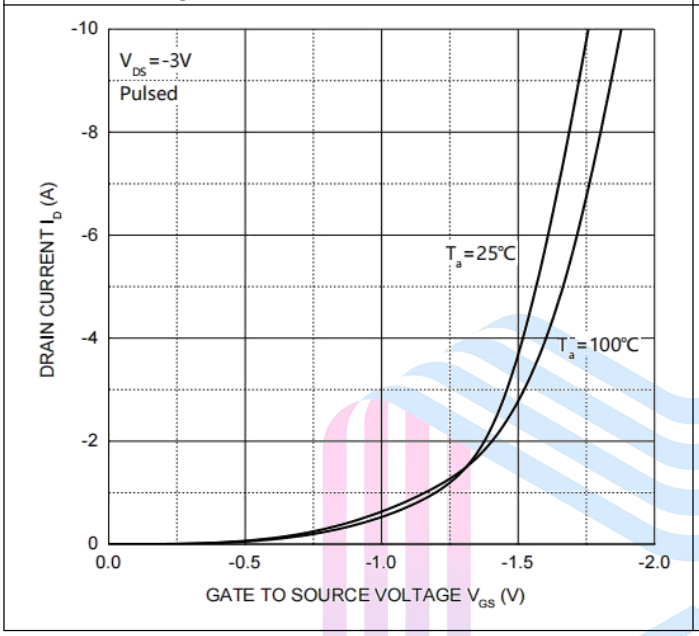


Figure 4: Output Characteristics

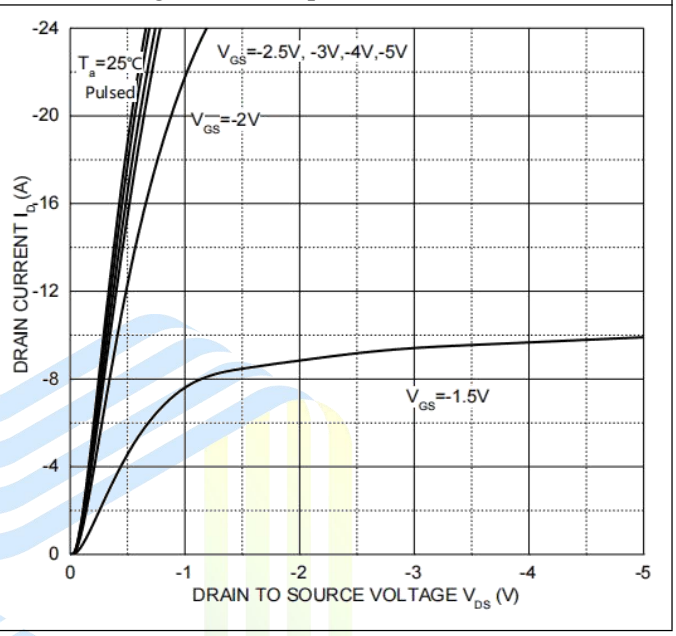


Figure 5: On-Resistance vs. Drain Current

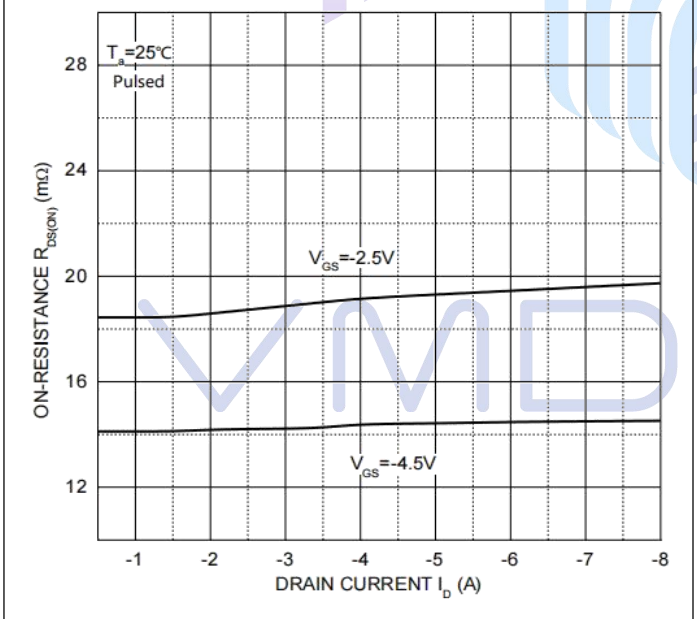


Figure 6: On-Resistance vs. Gate Voltage

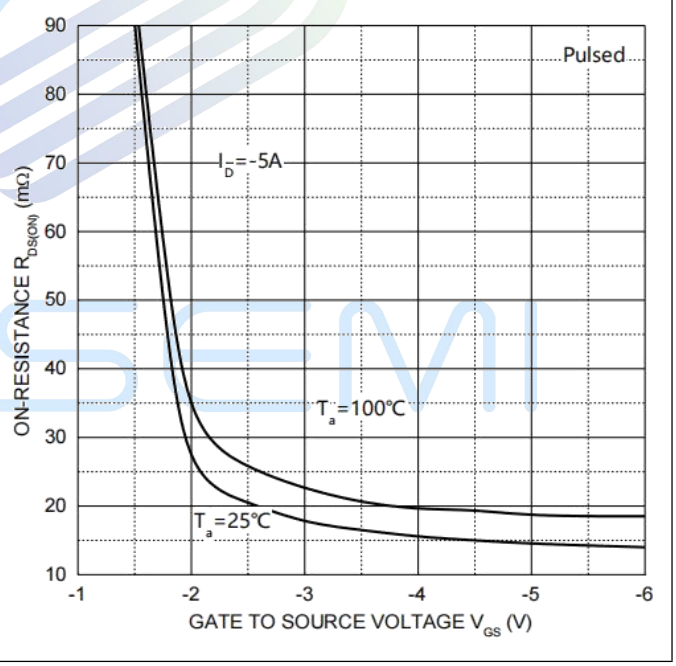


Figure 7: Body Diode Characteristics

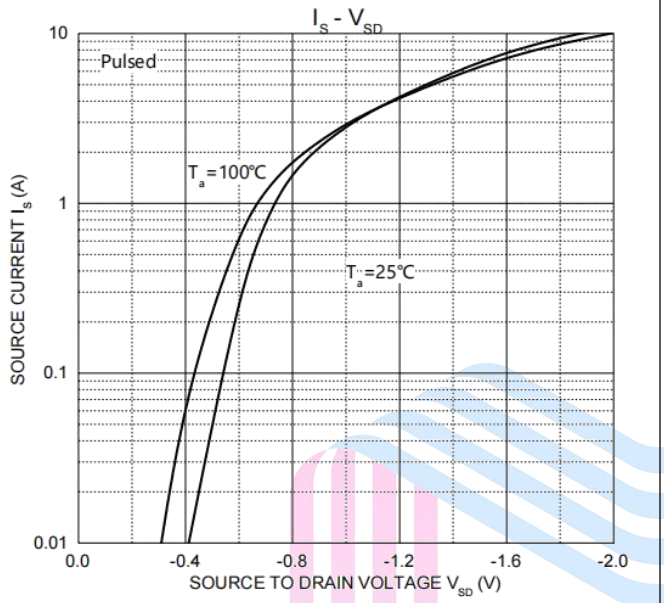
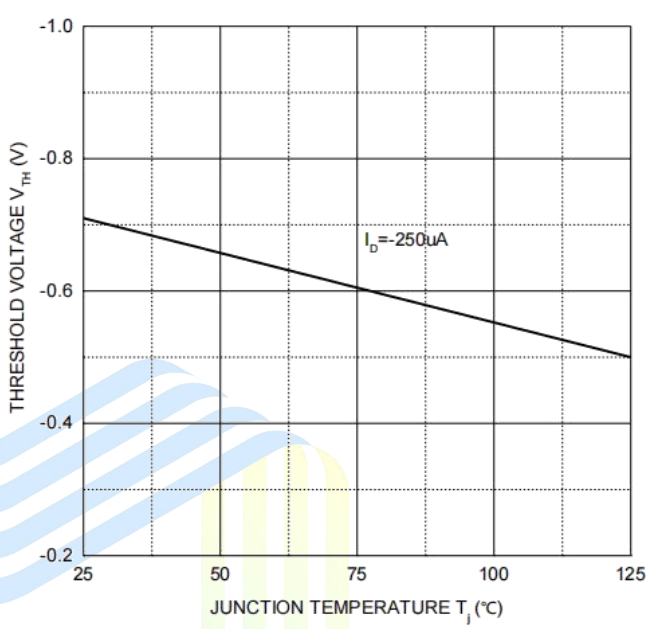
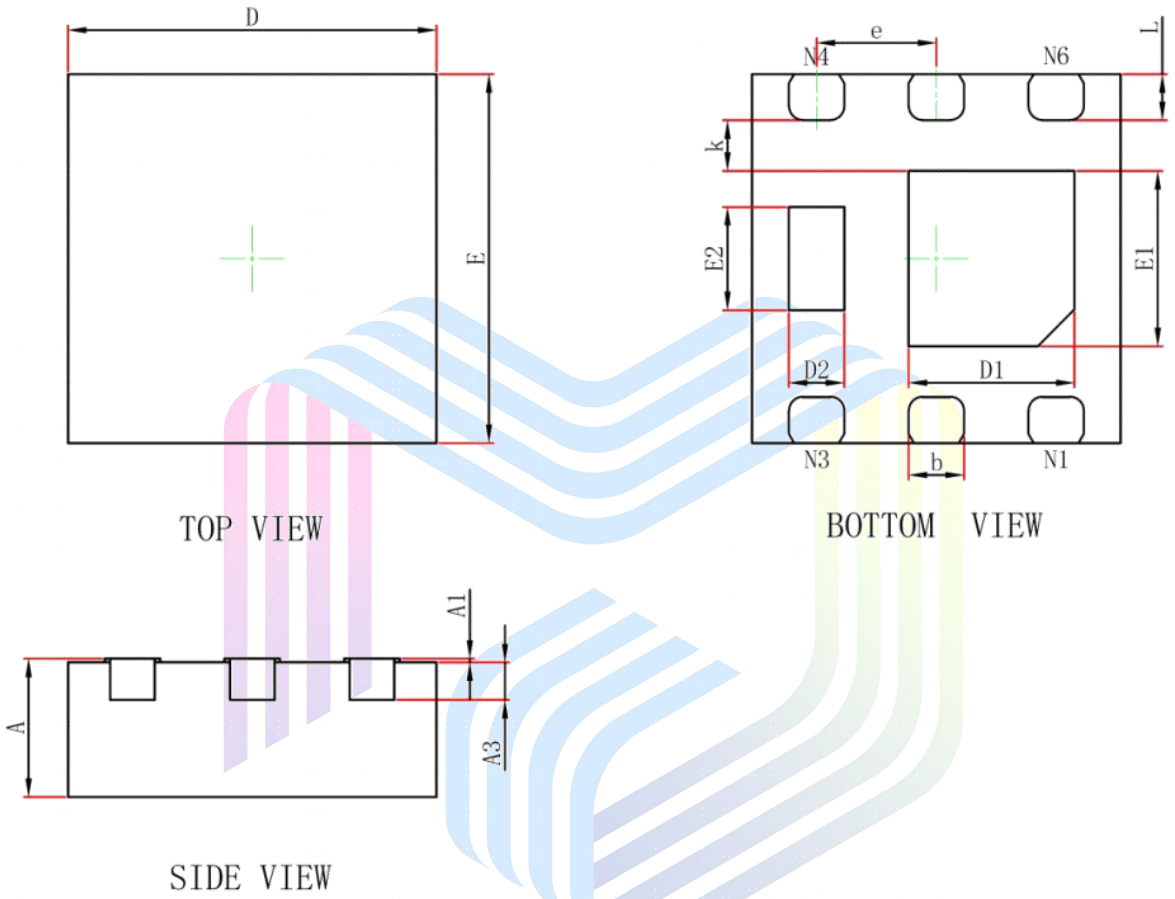


Figure 8: Threshold Voltage



Mechanical Dimensions:

DFN2X2-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0	0.050	0	0.002
A3	2.03REF		0.008REF	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN		0.008MIN	
b	0.250	0.350	0.010	0.014
e	0.65BSC		0.026TYP	
L	0.174	0.326	0.007	0.013

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