VUDE1P2R120PA

Datasheet

12mΩ, -12V, P-Channel Power MOSFET VUDE1P2R120PA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-12V	12mΩ@-4.5V	-27A
	13mΩ@-3.7V	
	14mΩ@-2.5V	
	19mΩ@-1.8V	

Symbol

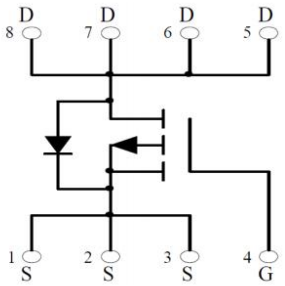
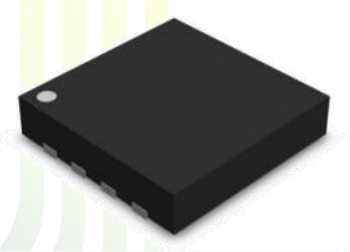


Figure 1 Symbol of VUDE1P2R120PA

Features

- High cell density trenched P-ch MOSFETs
- Super low gate charge
- Advanced high cell density Trench technology

Package Type



DFN3X3-8L

Figure 2 Package Type of VUDE1P2R120PA

Application

- Load Switch
- Battery protection applications

Ordering Information

Product Name	Package
VUDE1P2R120PA	DFN3X3-8L

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	-27	A
Pulsed Drain Current [Note2]	I_{DM}	-81	
Total Power Dissipation[Note4]	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[Note5]	$R_{\theta JA}$		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	-12	-19	-20	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	-1.0	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D= -10A		8	12	mΩ
		V_{GS}=-3.7V, I_D= -10A		9	13	
		V_{GS}=-2.5V, I_D= -8A		10	14	
		V_{GS}=-1.8V, I_D= -6A		15	19	
Forward Transconductance[Note3]	g_{FS}	V_{DS}=-5V, I_D= -10A	5			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=-6V		3850		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		970		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		1000		pF
Total Gate Charge	Q_g	V_{DS}=-6V		42		nC
Gate-Source Charge	Q_{gs}	V_{GS}=-4.5V		6.9		
Gate-Drain Charge	Q_{gd}	I_D= -5A		10.8		
Gate Resistance	Rg	f = 1MHz, Open drain			15	Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -6V		20		ns
Turn-on Rise Time	t_r	V_{GS}= -4.5V		15		
Turn-off Delay Time	$t_{d(off)}$	R_L=6Ω		45		
Turn-off Fall Time	t_f	R_G=1Ω, I_D= -4A		22		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{DS}	V_{GS}=0V, I_S= -10A		-0.8	-1.2	V
Continuous Source Current	I_S	T_C=25 ºC			-27	A
Pulsed Source Current	I_{SM}				-80	

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

Typical Performance Characteristics

Figure 3: Transfer Characteristics

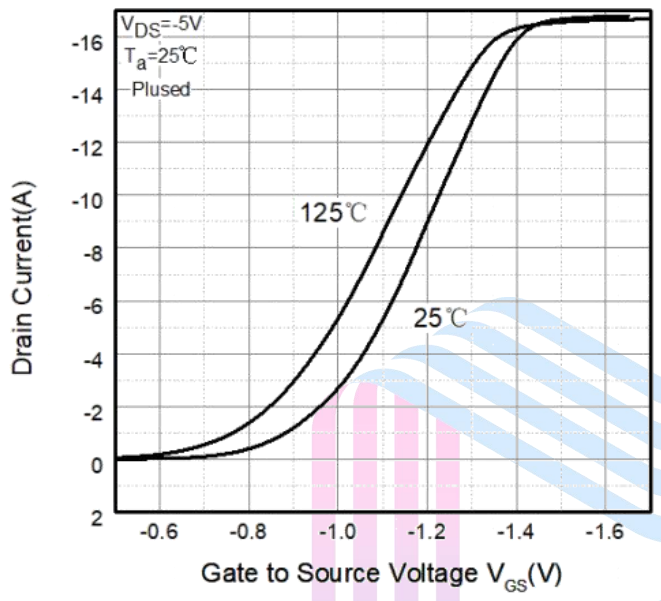


Figure 4: Output Characteristics

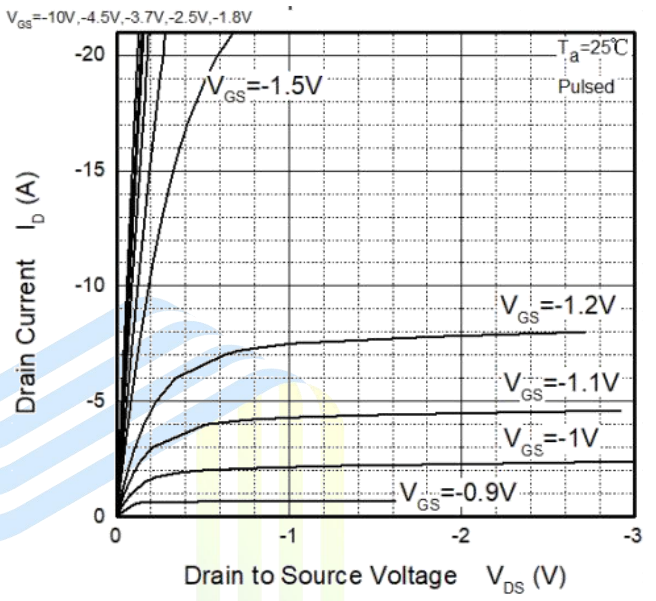


Figure 5: On-Resistance vs. Drain Current

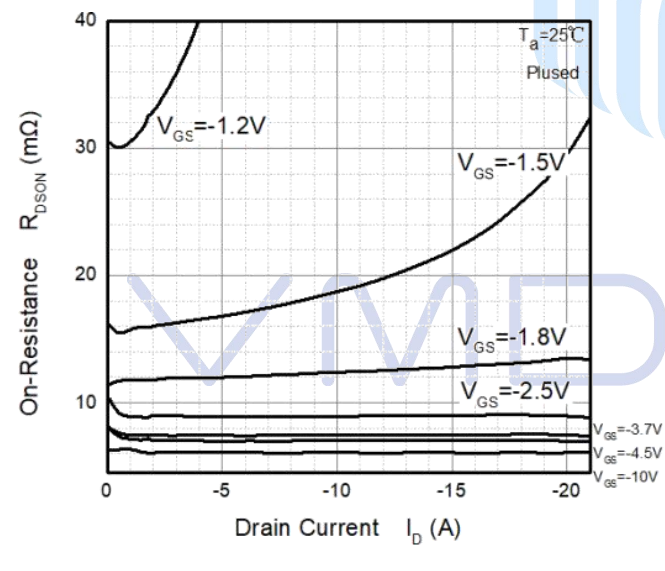


Figure 6: On-Resistance vs. Gate Voltage

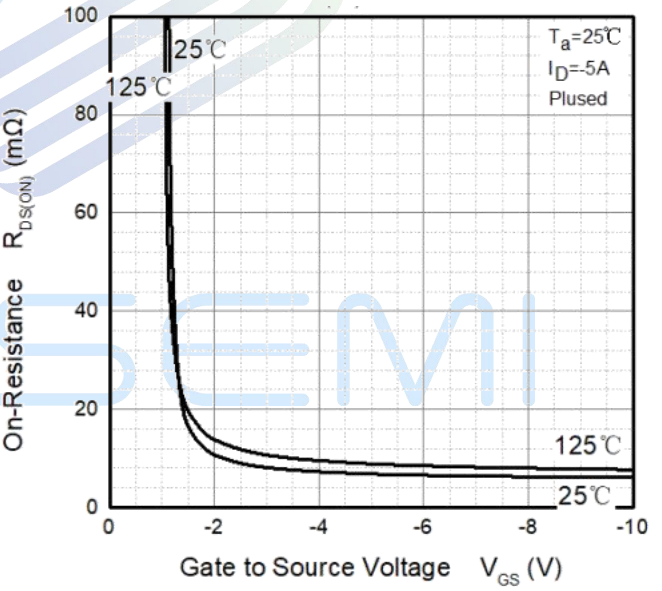


Figure 7: Body Diode Characteristics

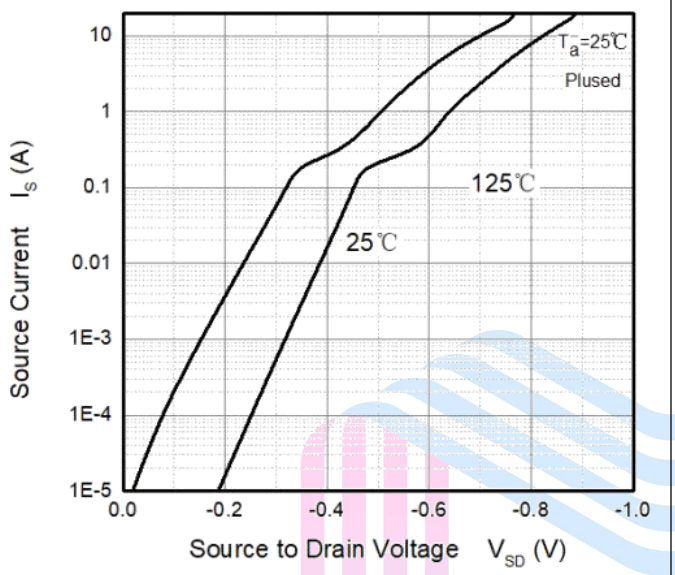
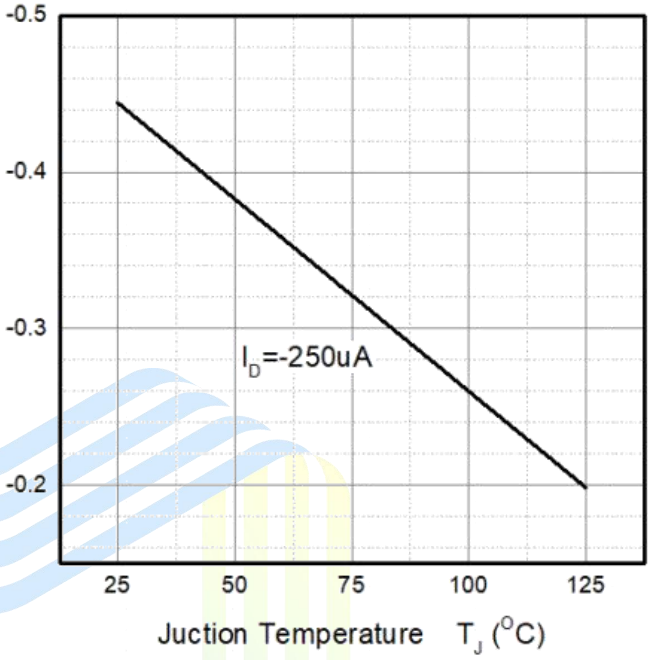
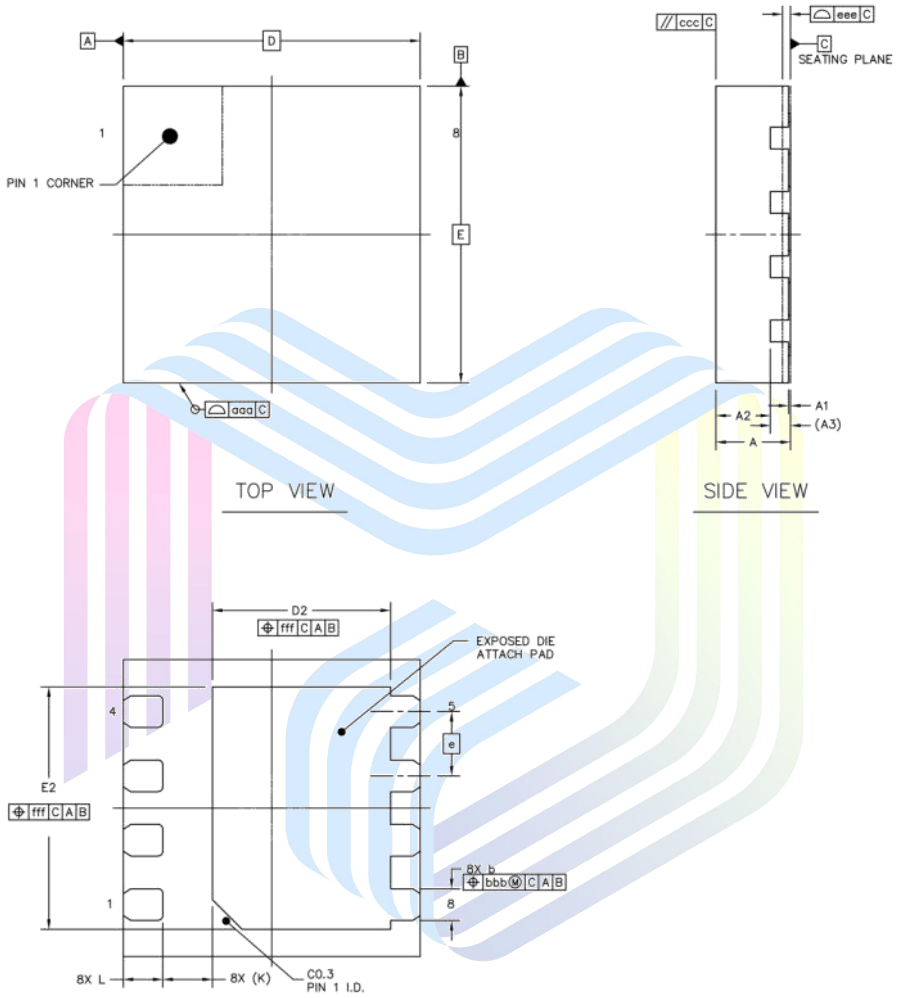


Figure 8: Threshold Voltage



Mechanical Dimensions:

DFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.550TYP		0.022TYP	
A3	0.203REF		0.008REF	
b	0.270	0.370	0.011	0.015
D	3.000BSC		0.118BSC	
E	3.000BSC		0.118BSC	
e	0.650BSC		0.026BSC	
D2	1.700	1.900	0.067	0.075
E2	2.350	2.550	0.093	0.100
L	0.300	0.500	0.012	0.020
K	0.500REF		0.020REF	
aaa	0.100TYP		0.004TYP	
ccc	0.100TYP		0.004TYP	
eee	0.080TYP		0.003TYP	
bbb	0.100TYP		0.004TYP	
fff	0.100TYP		0.004TYP	

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