VUPA003R130PA

Datasheet

13mΩ, -30V, P-Channel Power MOSFET VUPA003R130PA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-30V	13mΩ@-10V	-35A
	17mΩ@-6V	
	22mΩ@-4.5V	

Symbol

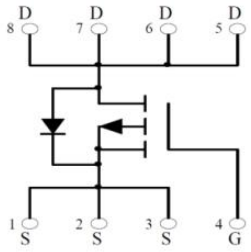
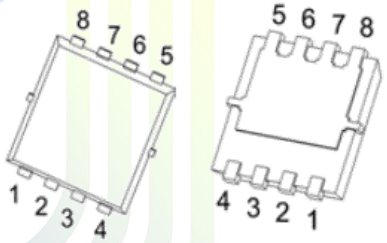


Figure 1 Symbol of VUPA003R130PA

Features

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

Package Type



PDFN3.3X3.3-8L

Figure 2 Package Type of VUPA003R130PA

Application

- Battery protection applications
- Load switch

Ordering Information

Product Name	Package
VUPA003R130PA	PDFN3.3X3.3-8L

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[Note1]	T_C= 25 ºC	I_D	-35	A
Pulsed Drain Current [Note2]		I_{DM}	-105	
Total Power Dissipation[Note4]	T_C= 25 ºC	P_D	30	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]	$R_{\theta JA}$		55		ºC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		4.2		ºC/W

Electrical Characteristics (T_J= 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[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-1.0	-1.5	-3.0	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=-10V, I_D= -12A		8	13	mΩ
		V_{GS}=-6V, I_D= -10A		9.5	17	
		V_{GS}=-4.5V, I_D= -8A		11	22	
Forward Transconductance[Note3]	g_{FS}	V_{DS}=-5V, I_D= -15A		30		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=-15V		3900		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		390		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		340		pF
Total Gate Charge	Q_g	V_{DS}=-15V		62		nC
Gate-Source Charge	Q_{gs}	V_{GS}=-10V		16		
Gate-Drain Charge	Q_{gd}	I_D= -10A		18		
Gate Resistance	Rg	f = 1MHz, Open drain			10	Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -15V		20		ns
Turn-on Rise Time	t_r	V_{GS}= -10V		14		
Turn-off Delay Time	$t_{d(off)}$	R_L=1.25Ω		57		
Turn-off Fall Time	t_f	R_G=3Ω		27		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= -2A			-1.2	V
Continuous Source Current	I_S	V_G=V_D=0V			-35	A
Pulsed Source Current	I_{SM}	Force Current			-105	

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

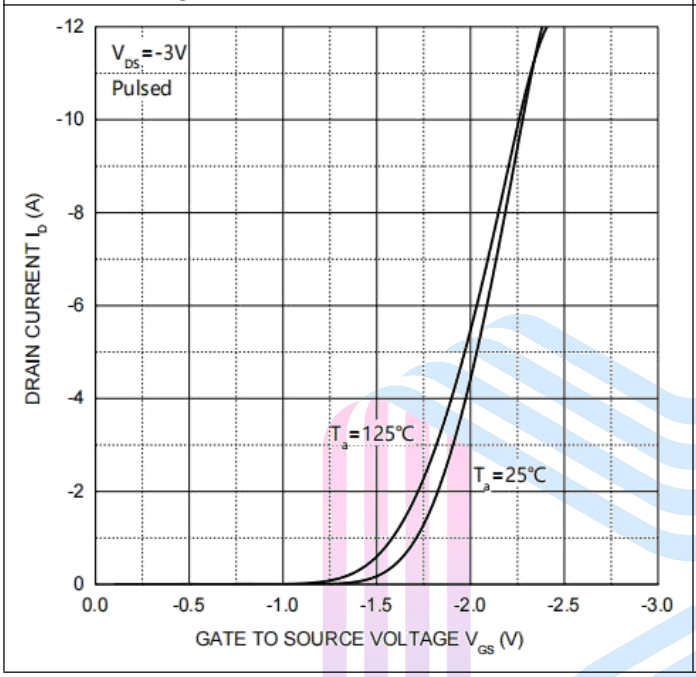


Figure 4: Output Characteristics

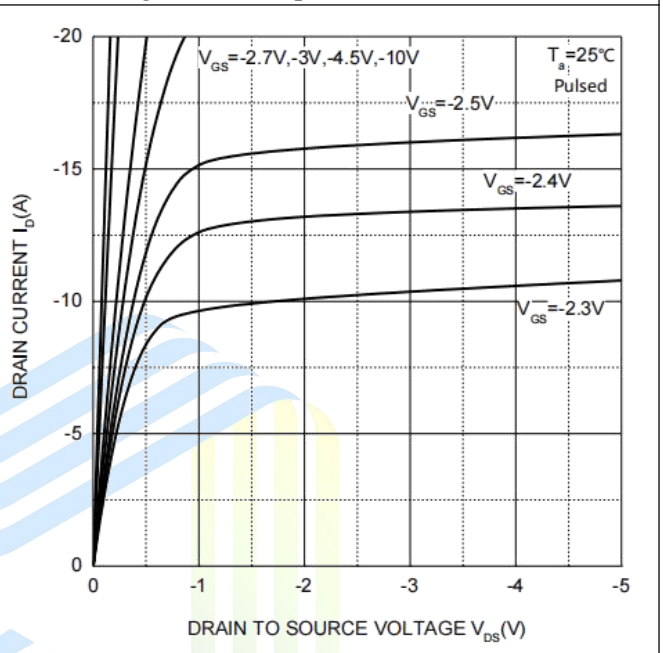


Figure 5: On-Resistance vs. Drain Current

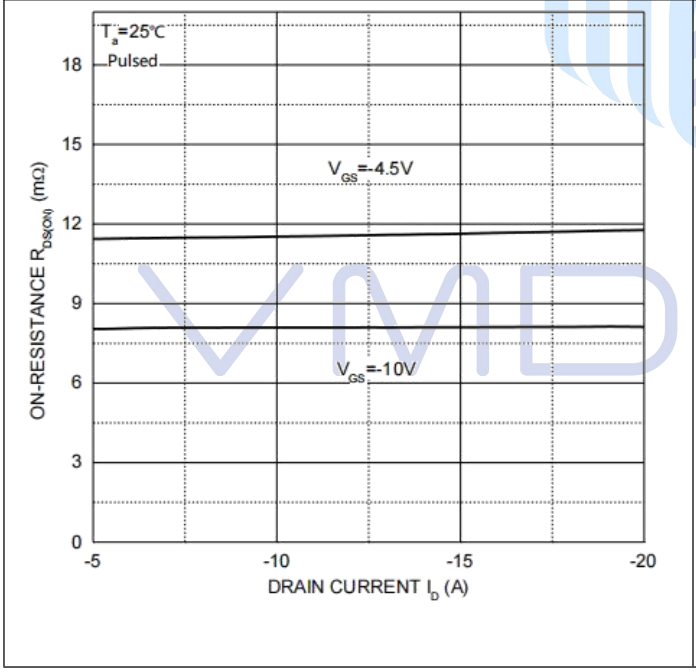


Figure 6: On-Resistance vs. Gate Voltage

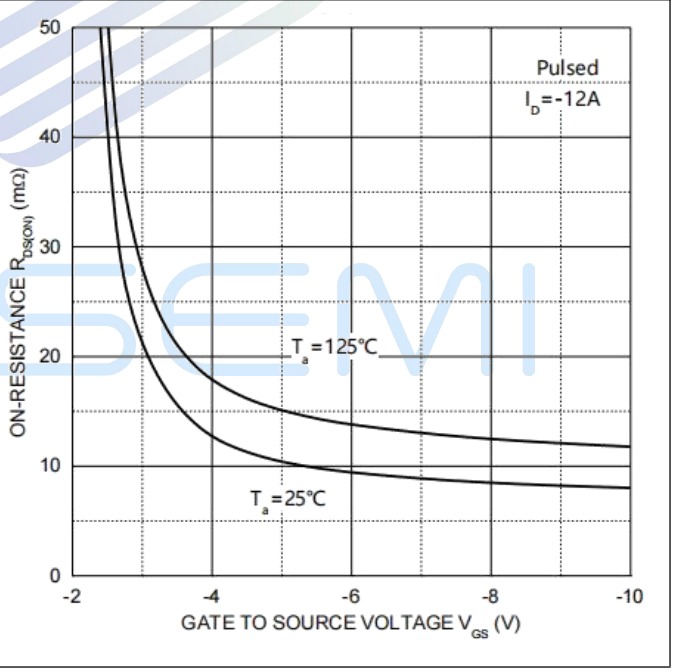


Figure 7: Body Diode Characteristics

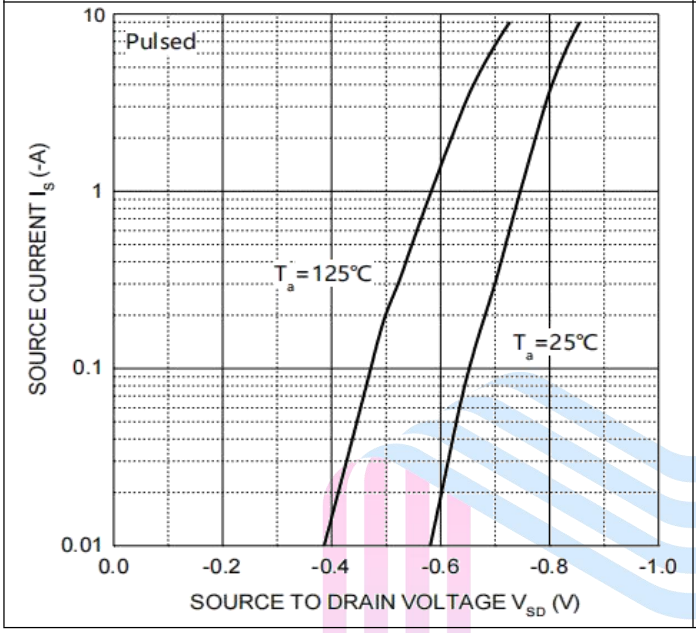
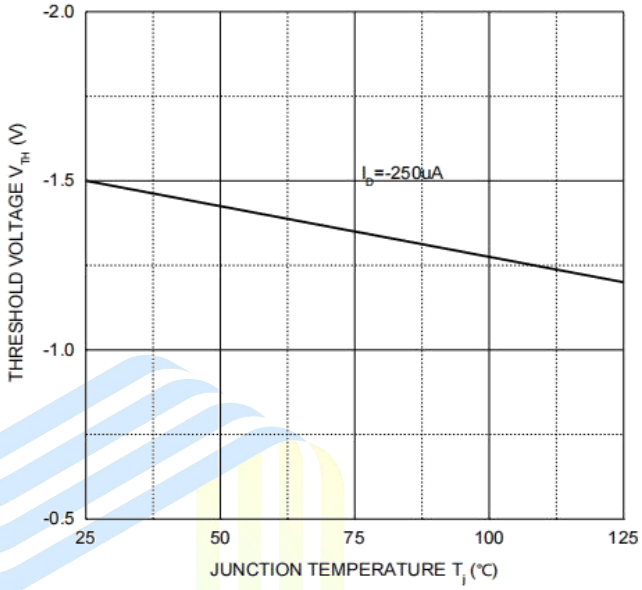
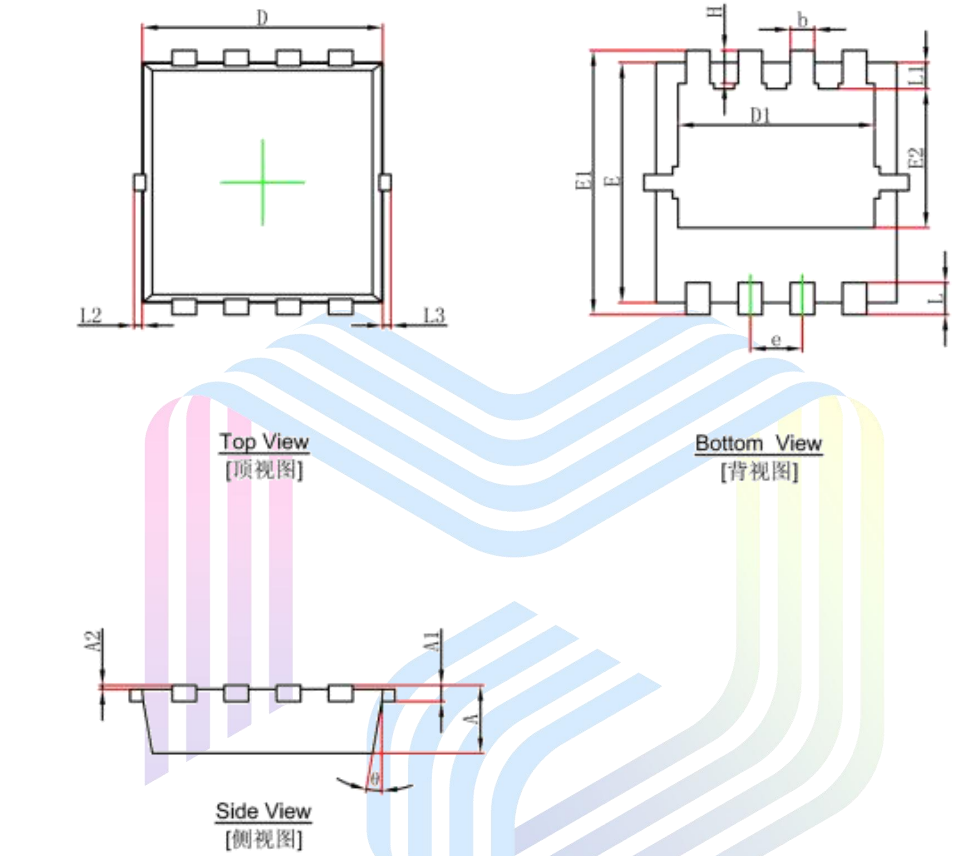


Figure 8: Threshold Voltage



Mechanical Dimensions:

PDFN3.3X3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.152REF		0.006REF	
A2	0.000	0.050	0.000	0.002
D	2.900	3.200	0.114	0.126
D1	2.300	2.600	0.091	0.102
E	2.900	3.200	0.114	0.126
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	0.000	0.100	0.000	0.004
L3	0.000	0.100	0.000	0.004
H	0.315	0.515	0.012	0.020
θ	0°	12°	0°	12°

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