VUDE003R086PA

Datasheet

13mΩ, -30V, P-Channel Power MOSFET VUDE003R086PA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-30V	8.6mΩ@-10V	-40A
	13mΩ@-4.5V	

Symbol

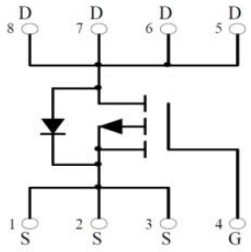
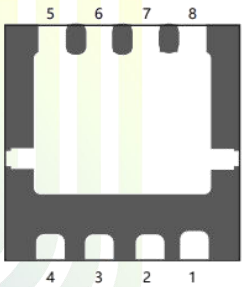


Figure 1 Symbol of VUDE003R086PA

Features

- Trench Technology Power MOSFET
- Low R_{DSON}
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Package Type



DFN3.3X3.3-8L

Figure 2 Package Type of VUDE003R086PA

Application

- Power Switching Application
- Load switch

Ordering Information

Product Name	Package
VUDE003R086PA	DFN3.3X3.3-8L

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}	±25	V
Continuous Drain Current[Note1]	T_C= 25 ºC	I_D	-40	A
Continuous Drain Current[Note1]	T_C= 100 ºC		-28	
Pulsed Drain Current [Note2]		I_{DM}	-128	
Single Pulsed Avalanche Current[Note3]		I_{AS}	-28	
Single Pulsed Avalanche Energy[Note3]		E_{AS}	196	mJ
Total Power Dissipation[Note5]	T_C= 25 ºC	P_D	96	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[Note6]	$R_{\theta JA}$		75		ºC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		1.3		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}= -24V, 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= -5A		6.8	8.6	mΩ
		V_{GS}=-4.5V, I_D= -5A		8.5	13	
Forward Transconductance[Note3]	g_{FS}	V_{DS}=-10V, I_D= -5A	10			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=-15V		3840		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		464		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		441		pF
Total Gate Charge	Q_g	V_{DS}=-15V		60		nC
Gate-Source Charge	Q_{gs}	V_{GS}=-10V		15		
Gate-Drain Charge	Q_{gd}	I_D= -10A		18		
Gate Resistance	Rg	f = 1MHz, Open drain		5.0		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -15V		25		ns
Turn-on Rise Time	t_r	V_{GS}= -10V		11		
Turn-off Delay Time	$t_{d(off)}$	R_L=3Ω		136		
Turn-off Fall Time	t_f	R_G=3Ω		49		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= -5A			-1.2	V

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.E_{AS} condition: V_{DD} = -15V,V_{GS} = - 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.

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

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

6.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

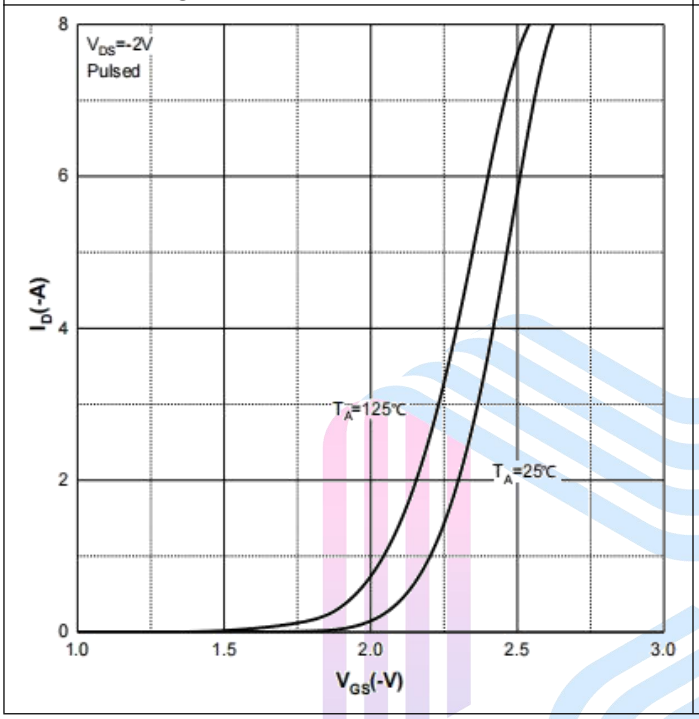


Figure 4: Output Characteristics

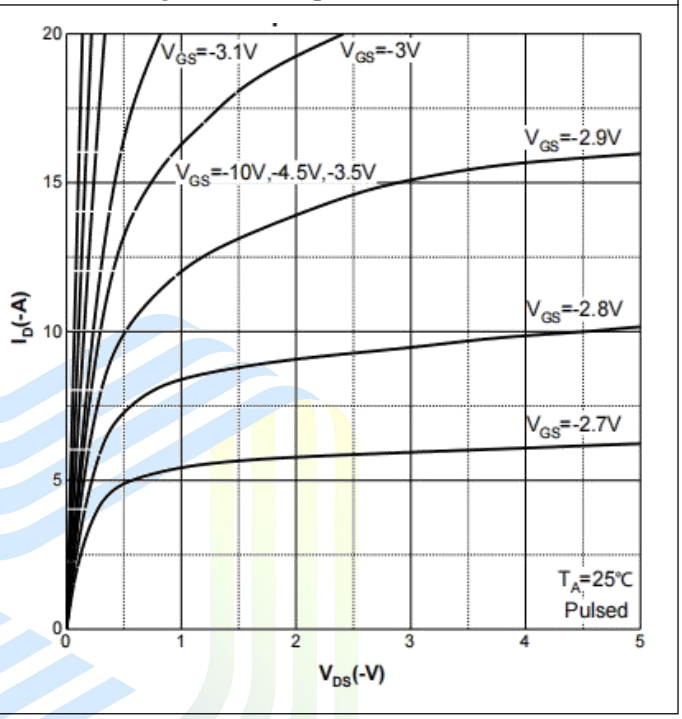


Figure 5: On-Resistance vs. Drain Current

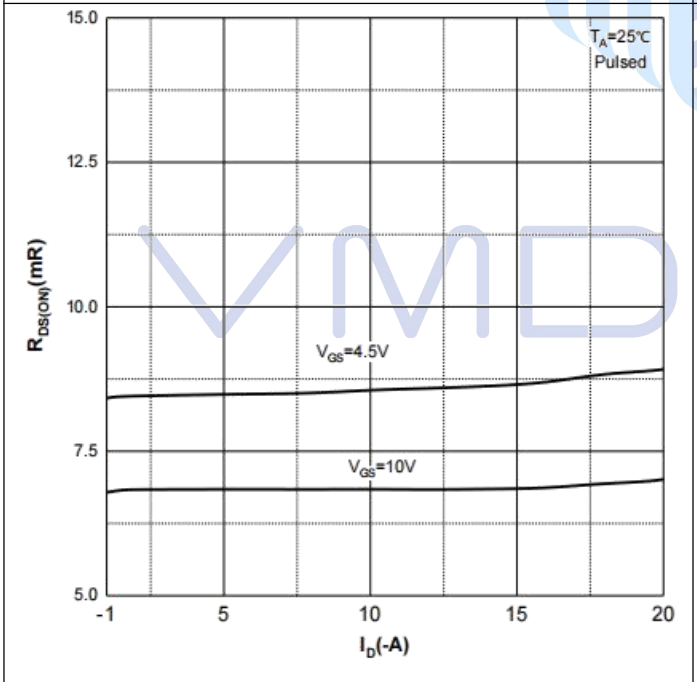


Figure 6: On-Resistance vs. Gate Voltage

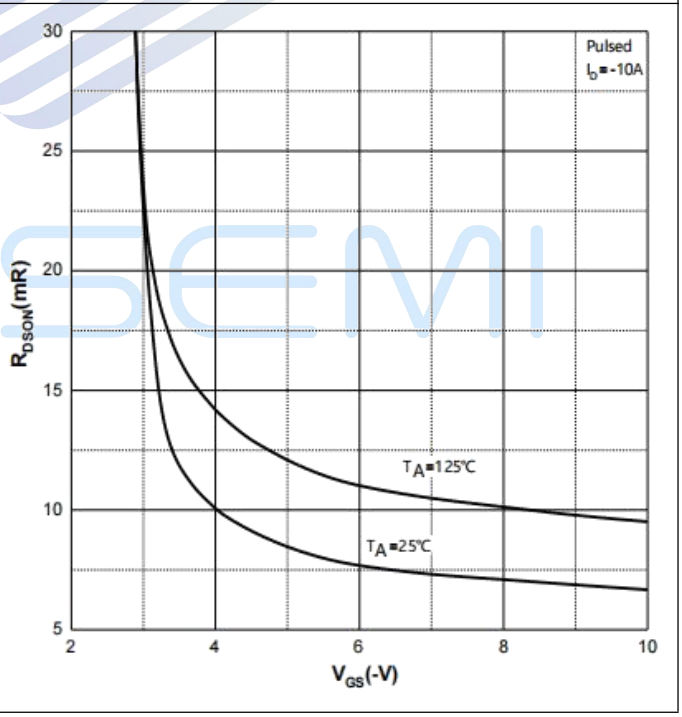


Figure 7: Body Diode Characteristics

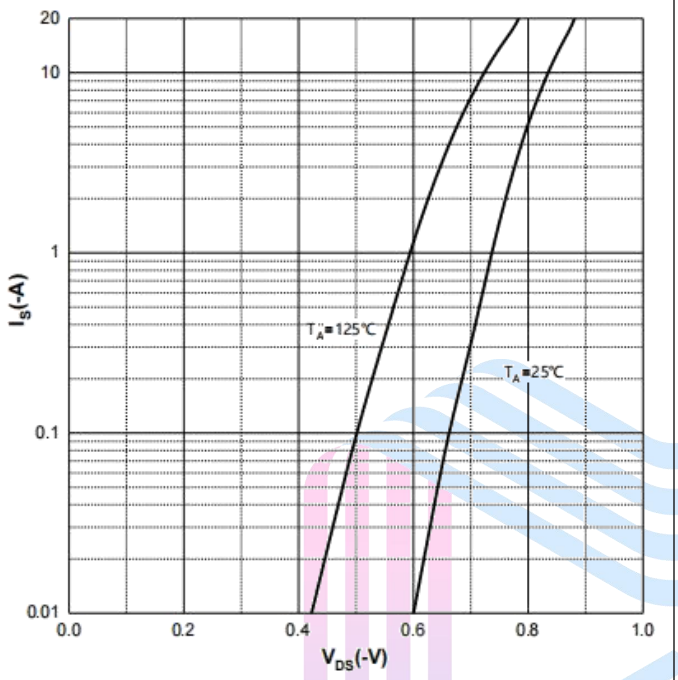


Figure 8: Threshold Voltage

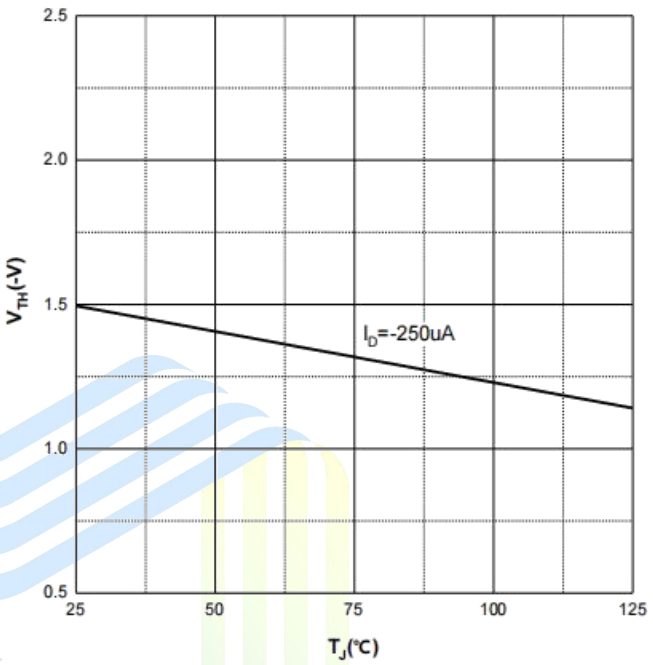


Figure 9: Typical Capacitance

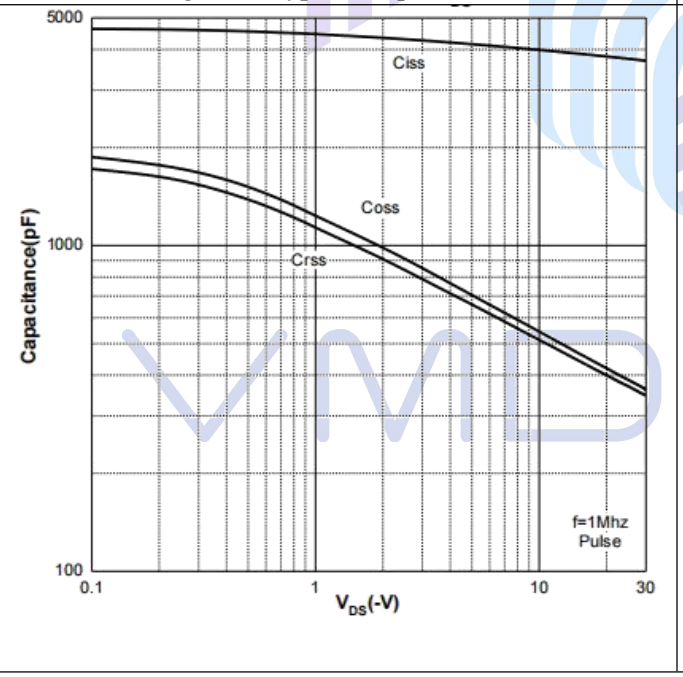


Figure 10: Safe Operation Area

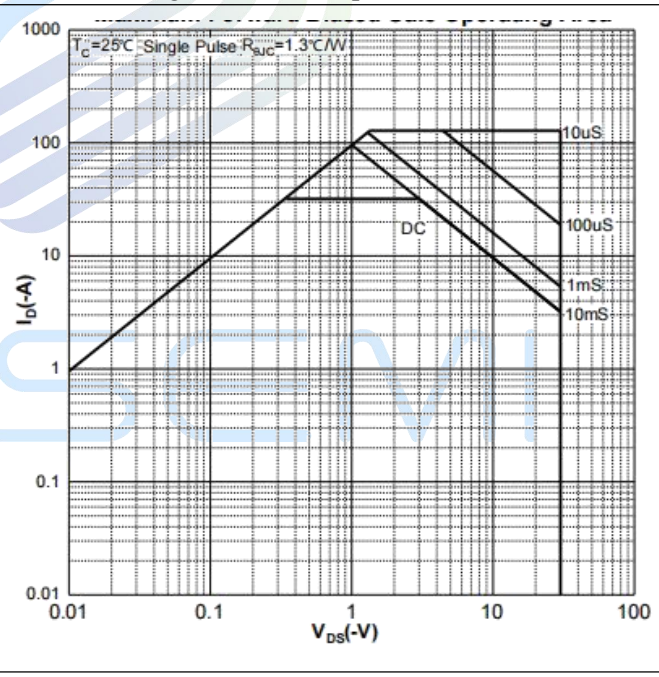
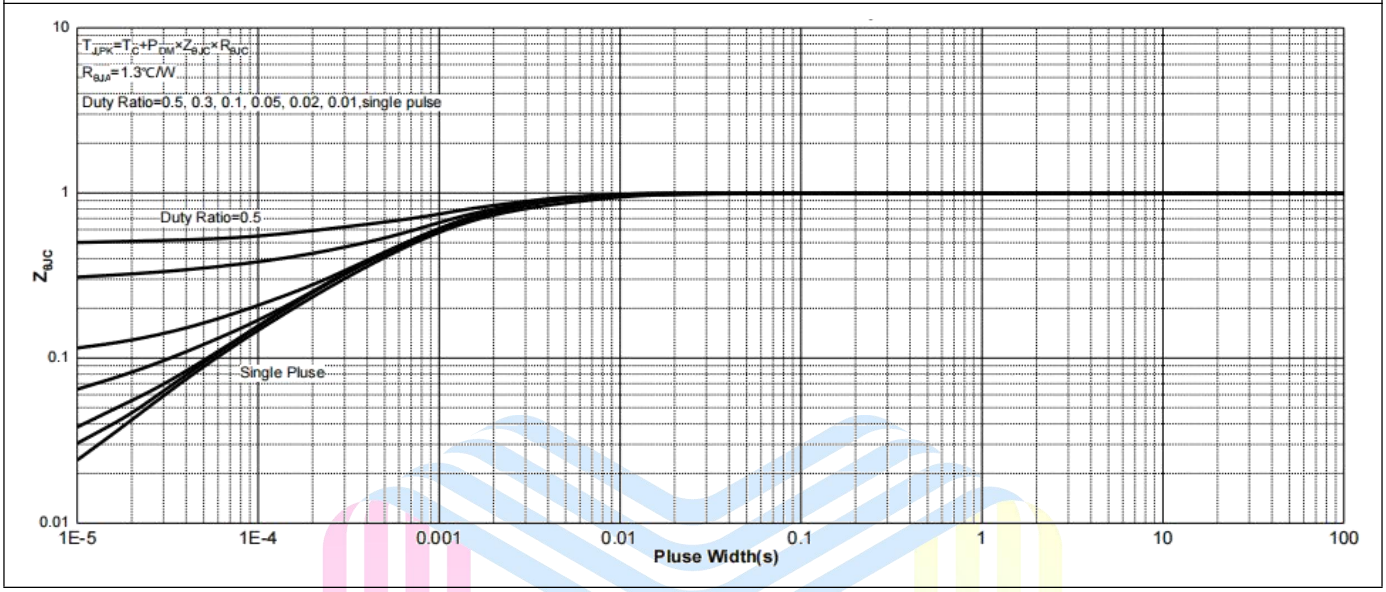


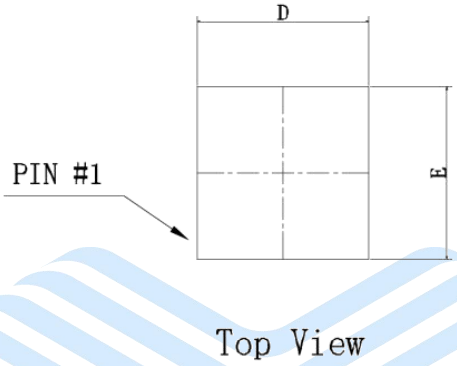
Figure 11: Normalized Maximum Transient Thermal Impedance



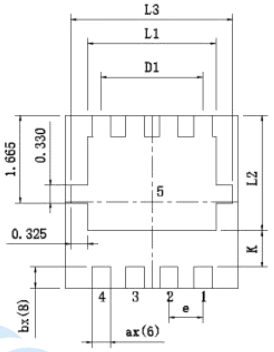
Mechanical Dimensions:

DFN3.3X3.3-8L Package Information

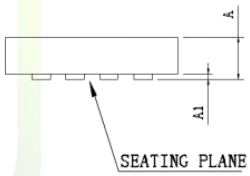
symbol	Dimension in mm		
	MIN	NOM	MAX
A	0.650	0.700	0.750
A1	0.050	0.100	0.150
D	3.200	3.300	3.400
E	3.200	3.300	3.400
D1	--	1.950	--
e	--	0.650	--
ax(6)	0.300	0.350	0.400
bx(8)	0.350	0.400	0.450
L1	2.400	2.450	2.500
L2	2.150	2.200	2.250
L3	3.050	3.100	3.150
K	0.600	0.700	0.800



Top View



Bottom View



Side View

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