VUDF003R060NA

Datasheet

General Description

VUDF003R060NA MOSFET is based on unique device design to achieve low $R_{DS(ON)}$,excellent package for heat dissipation.

Symbol

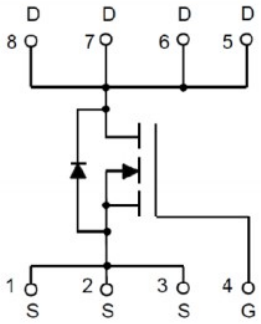
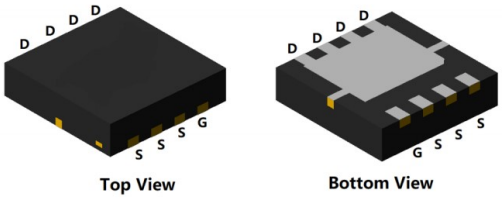


Figure 1 Symbol of VUDF003R060NA

Features

- $R_{DS(ON)\_max}$ = 6.0mΩ@V_{GS} = 10V
- $R_{DS(ON)\_max}$ = 8.0mΩ@V_{GS} = 8V
- Trench Power LV MOSFET technology
- Moisture Sensitivity Level 3
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating

Package Type



DFN3333-8L

Figure 2 Package Type of VUDF003R060NA

Application

- High current load applications
- Load Switch
- Hard switched and high frequency circuits
- Uninterruptible power supply

Ordering Information

Product Name	Package
VUDF003R060NA	DFN3333-8L

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 T_C = 25℃	I_D	50	A
Continuous Drain Current T_C = 100℃		32	A
Pulsed Drain Current[Note1]	I_{DM}	190	A
Total Power Dissipation T_C = 25℃	P_D	25	W
Total Power Dissipation T_C= 100℃		10	W
Single Pulse Avalanche Energy [Note2]	E_{AS}	112.5	mJ
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-Case [Note3]	$R_{\theta JC}$		5		ºC/W

Notes :

1. Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%
2. T_J=25℃, V_{DD}=25V, V_G=10V, L=1mH, IAS=15A
3. $R_{\theta JA}$ is the sum of the junction-to-Case and Case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in^2 pad of 2oz copper.

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	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 15A		3.9	6.0	mΩ
		V_{GS}= 4.5V, I_D= 15A		6.0	8.0	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}= 15V		2191		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		300		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		247		pF
Switching Parameters						
Gate to Source Charge	Q_{gs}	V_{DS}= 15V		8.8		nC
Gate to Drain Charge	Q_{gd}	V_{GS}= 10V		9.2		
Gate Charge Total	Q_g	I_D= 20A		46.3		
Reverse Recovery Charge	Q_{rr}	I_F= 20A		1.6		nC
Reverse Recovery Time	t_{rr}	di/dt=500A/us		11		ns
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 15V		11		ns
Turn-on Rise Time	t_r	V_{GS}= 10V		80		
Turn-off Delay Time	$t_{d(off)}$	R_L=0.75Ω		39		
Turn-off Fall Time	t_f	R_{GEN}=3Ω		92		
Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V, I_S= 20A			1.2	V
Maximum Body-Diode Continuous Current	I_S				50	A

Typical Performance Characteristics

Figure 3: Transfer Characteristics

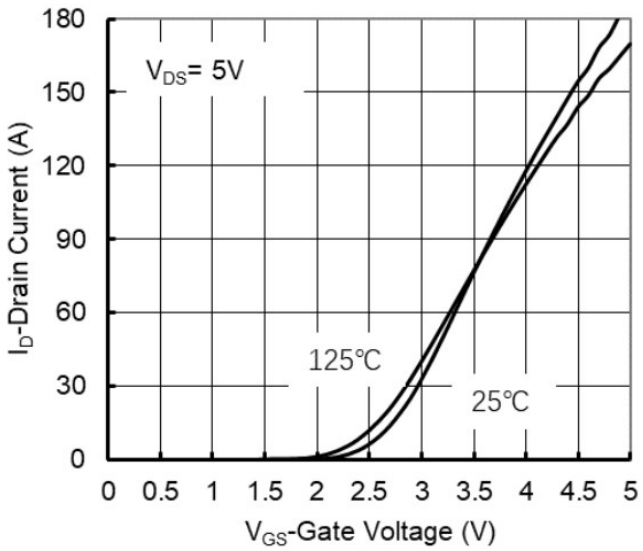


Figure 4: Output Characteristics

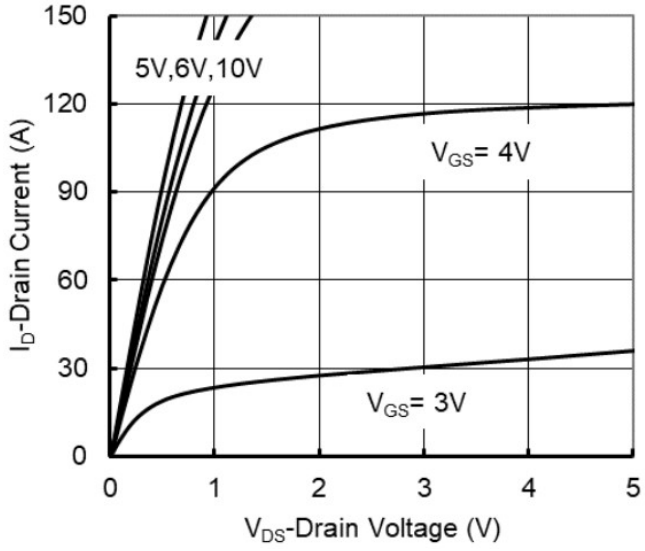


Figure 5: On-Resistance vs. Drain Current and Gate Voltage

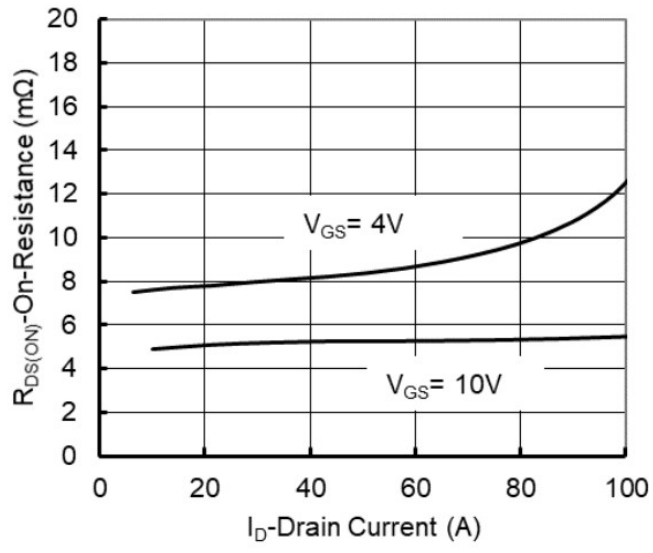


Figure 6: On-Resistance vs. Junction Temperature

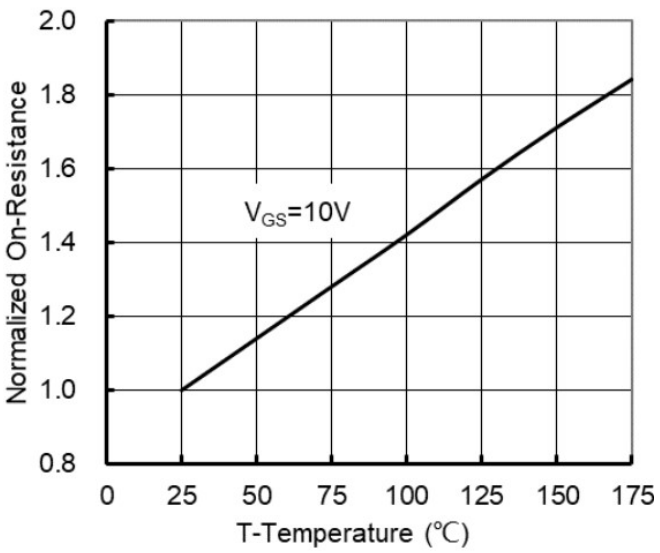


Figure 7: Capacitance Characteristics

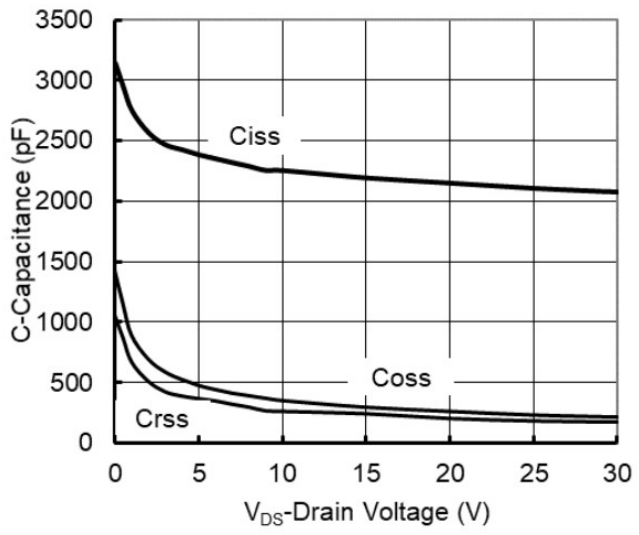


Figure 8: Gate Charge

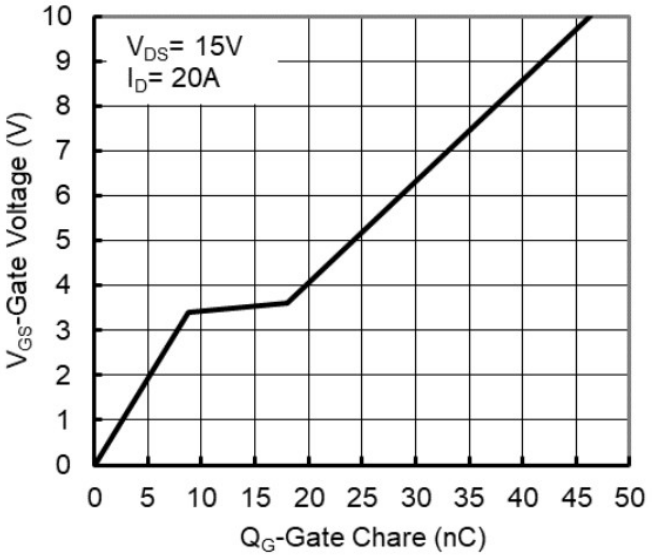


Figure 9: Safe Operation Area

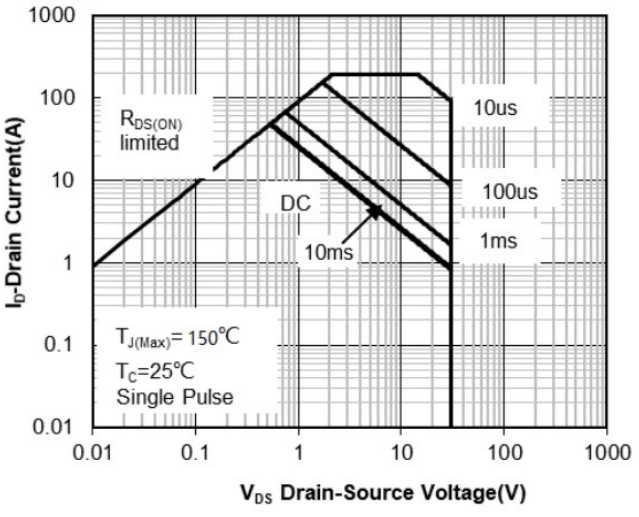


Figure 10: Maximum Continuous Drain Current vs Case Temperature

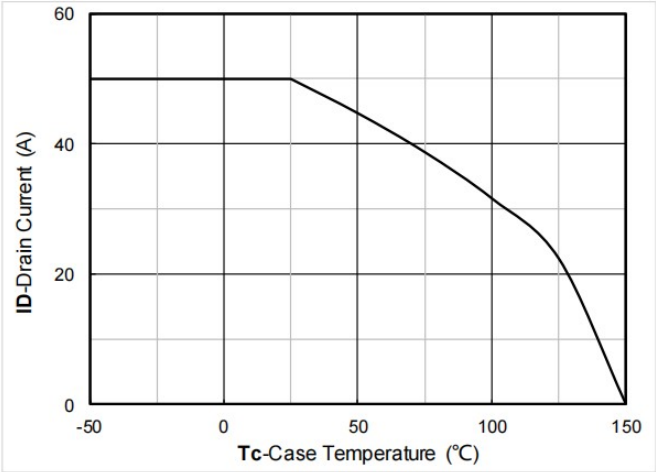
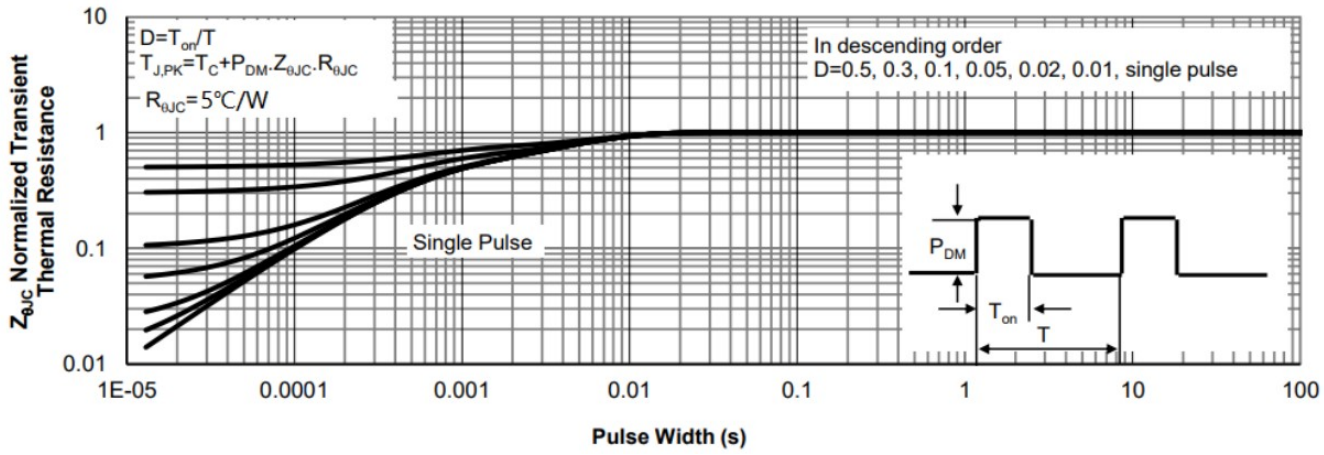
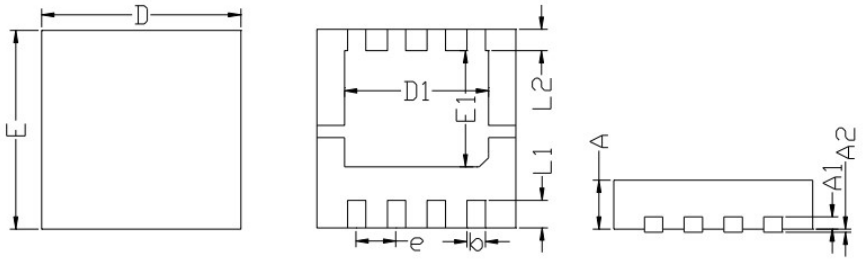


Figure 11: Normalized Maximum Transient Thermal Impedance



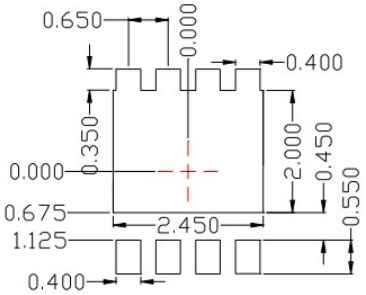
Mechanical Dimensions:



Top View
正面视图

Bottom View
背面视图

Side View
侧面视图



Suggested Solder Pad Layout
Top View

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:+/-0.10mm.
3.The pad layout is for reference purposes only.

Symbol	Dimensions (Unit:mm)		
	Min.	TYP.	Max.
D	3.15	3.25	3.35
E	3.15	3.25	3.35
A	0.70	0.80	0.90
A1	0.20BSC		
A2			0.10
D1	2.20	2.35	2.50
E1	1.80	1.90	2.00
L1	0.35	0.45	0.55
L2	0.35BSC		
b	0.20	0.30	0.40
e	0.65BSC		

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