



VMDSEMI

VUSC006R400NA

Datasheet



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General Description

Symbol

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
60V	40mΩ@10V	6A
	48mΩ@4.5V	

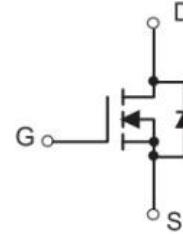


Figure 1 Symbol of VUSC006R400NA

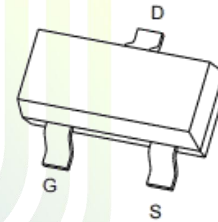
Features

- Trench Technology Power MOSFET
- Low Gate Charge
- Low $R_{DS(ON)}$
- Low Gate Resistance

Application

- Power Switch Application
- Load Switch
- DC/DC Converter

Package Type



SOT-23-3L

Figure 2 Package Type of VUSC006R400NA

Ordering Information

Product Name	Package
VUSC006R400NA	SOT-23-3L

Absolute Maximum Ratings ($T_A = 25\text{ °C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ^{Note1}	I_D	6	A
Pulsed Drain Current ^{Note2}	I_{DM}	24	
Total Power Dissipation ^{Note4}	P_D	1.4	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient ^{Note5}	$R_{\theta JA}$		89		°C/W

Electrical Characteristics ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage ^{Note3}	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	3	V
Static Drain-Source On-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=10V, I_D=4A$		29	40	mΩ
		$V_{GS}=4.5V, I_D=2A$		35	48	
Forward Transconductance ^{Note3}	g_{FS}	$V_{DS}=5V, I_D=5A$		11		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=30V$		974		pF
Output Capacitance	C_{OSS}	$V_{GS}=0V$		62		pF
Reverse Transfer Capacitance	C_{RSS}	$f=1MHz$		53		pF
Total Gate Charge	Q_g	$V_{DS}=30V$		15		nC
Gate-Source Charge	Q_{gs}	$V_{GS}=10V$		2.5		
Gate-Drain Charge	Q_{gd}	$I_D=5A$		5.2		
Gate Resistance	R_g	$f=1MHz, \text{Open drain}$		1.8		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V$		5.6		ns
Turn-on Rise Time	t_r	$V_{GS}=10V$		4.8		
Turn-off Delay Time	$t_{d(off)}$	$R_L=6\Omega$		26		
Turn-off Fall Time	t_f	$R_G=2\Omega$		3.5		
Diode Characteristics						
Diode Forward Voltage ^{Note3}	V_{SD}	$V_{GS}=0V, I_S=0.3A$			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 $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.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 $T_A = 25^\circ\text{C}$.

Typical Performance Characteristics

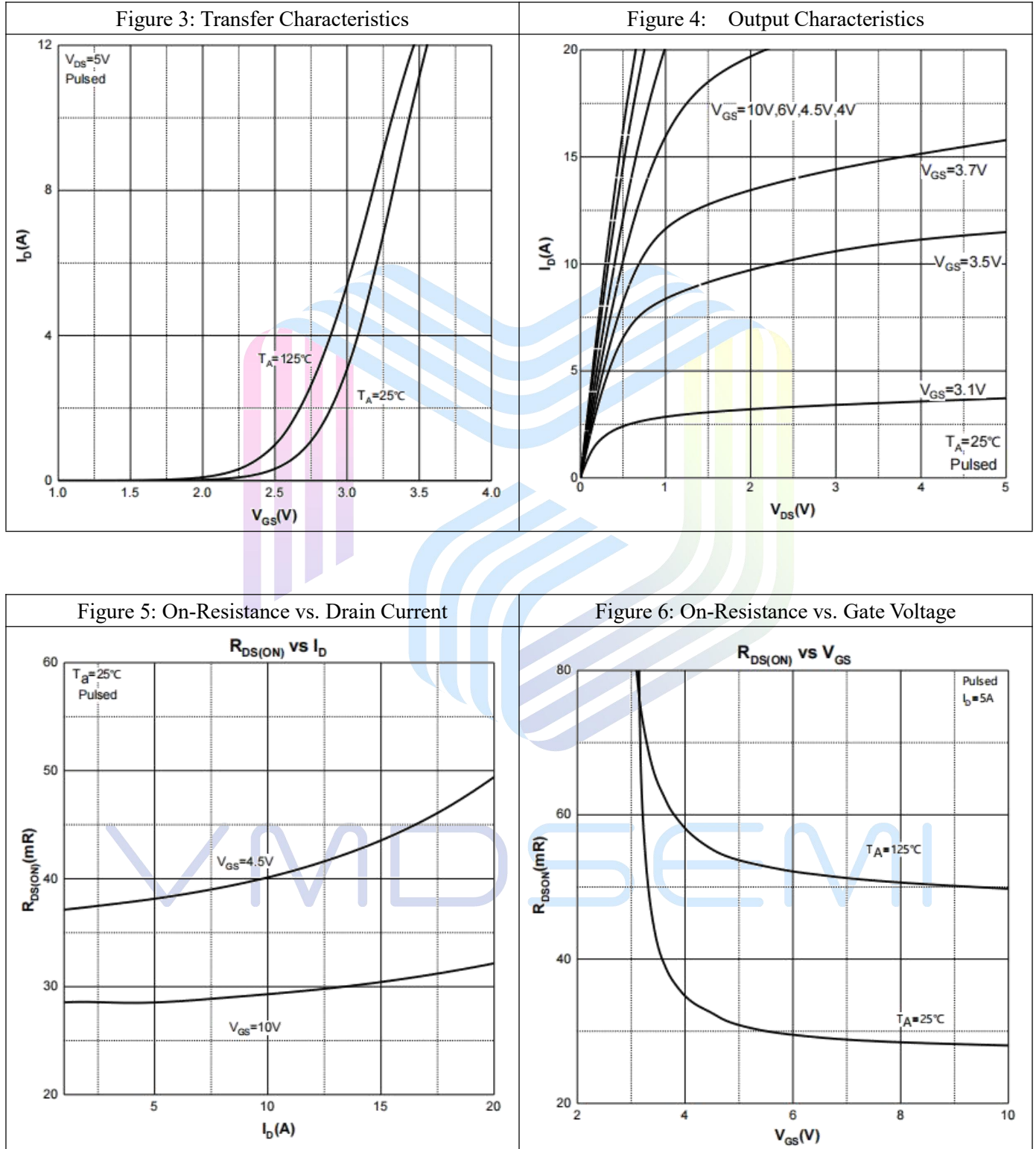
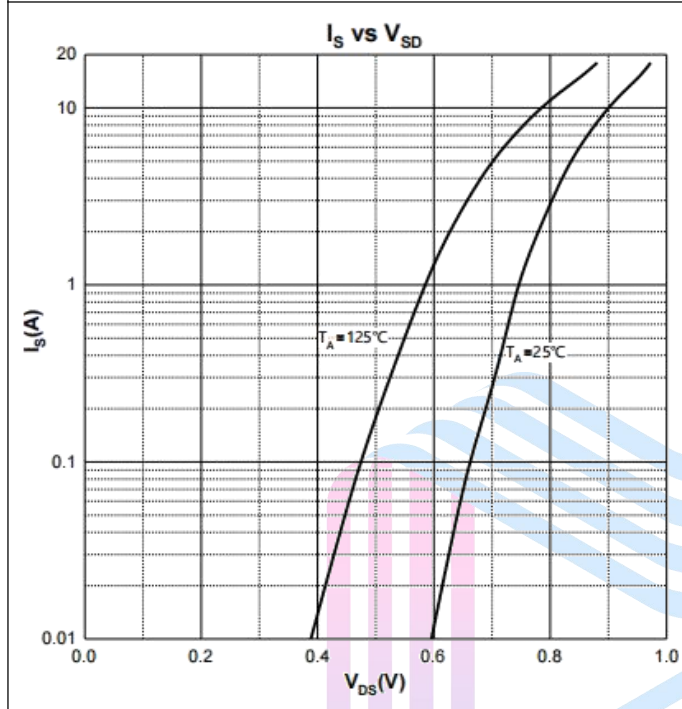
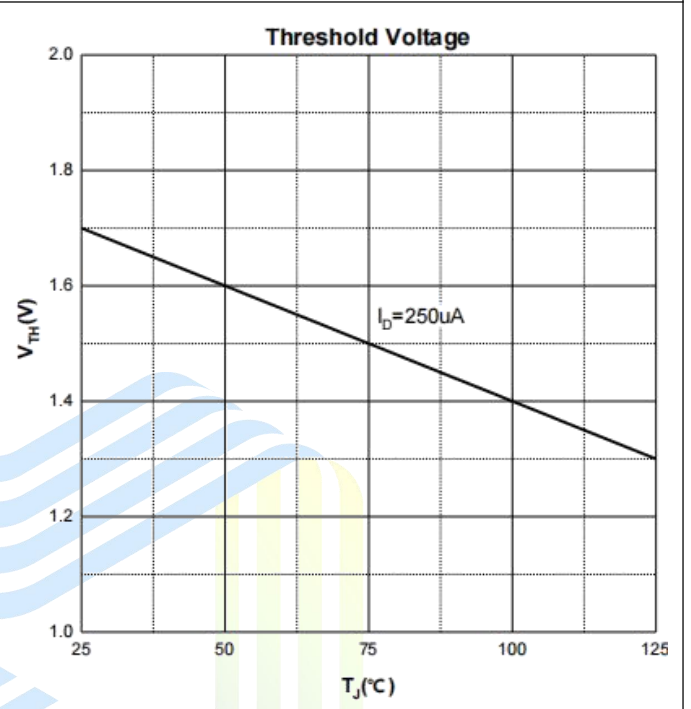
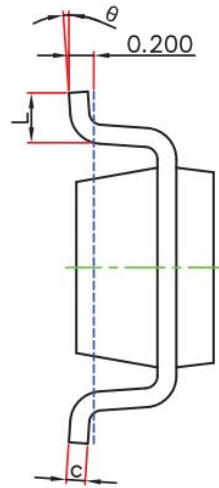
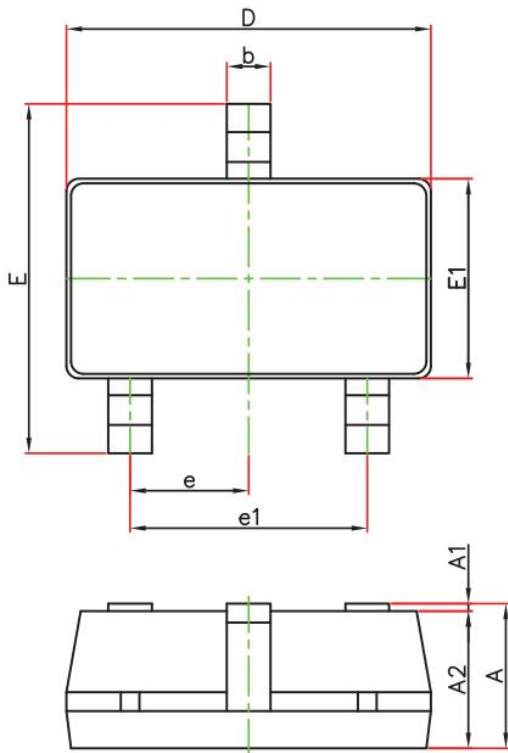


Figure 7: Body Diode Characteristics

Figure 8: Threshold Voltage


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Mechanical Dimensions:
SOT-23-3L Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
K	0°	8°	0°	8°

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