



VMDSEMI

VUSA004R450NA

Datasheet



VMDSEMI

General Description

Symbol

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
40V	45mΩ@10V	5A
	55mΩ@4.5V	

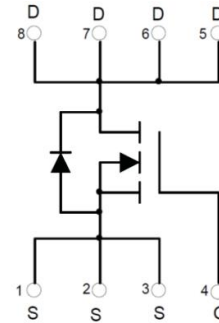


Figure 1 Symbol of VUSA004R450NA

Features

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

Application

- Load Switch
- Power Switch Application

Package Type

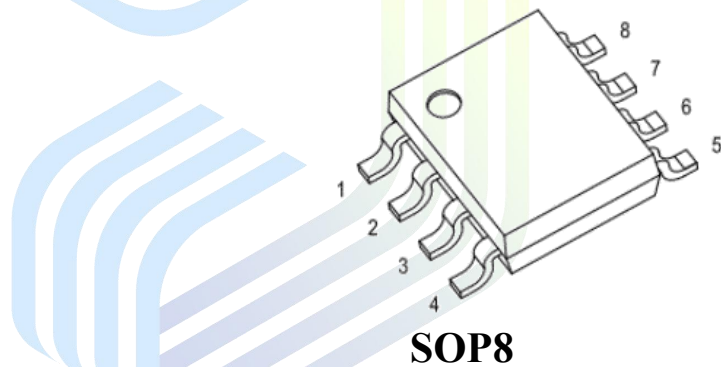


Figure 2 Package Type of VUSA004R450NA

Ordering Information

Product Name	Package
VUSA004R450NA	SOP8

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{Note1}	I_D	5	A
Pulsed Drain Current ^{Note2}	I_{DM}	20	
Total Power Dissipation ^{Note4}	P_D	2	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}	$R_{\theta JA}$		62.5		°C/W



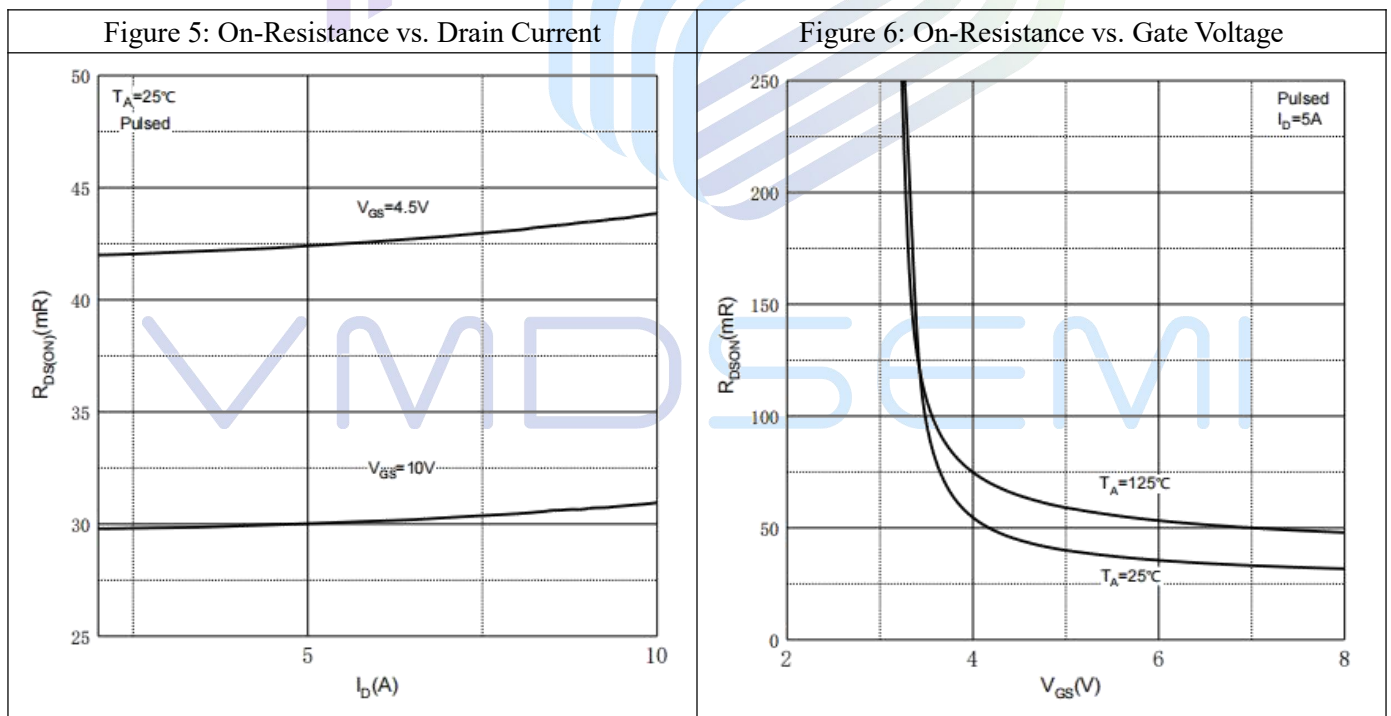
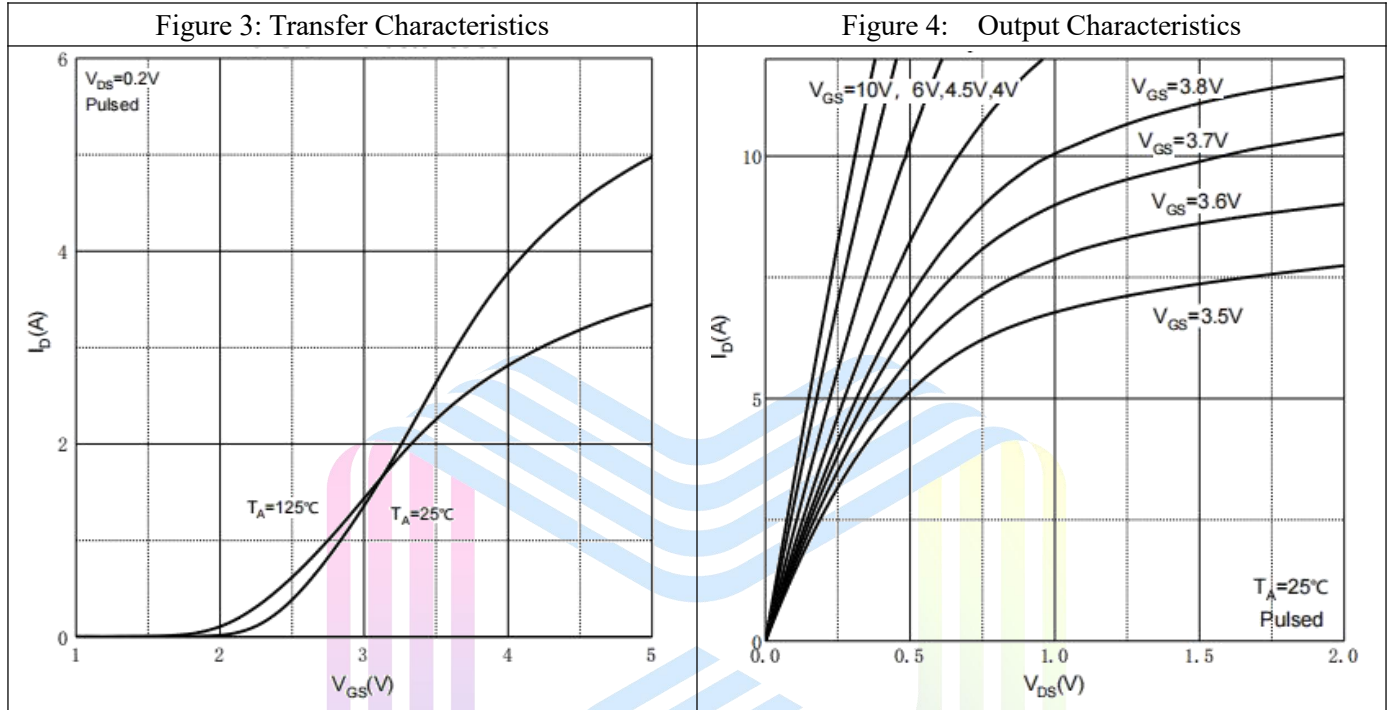
Electrical Characteristics ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

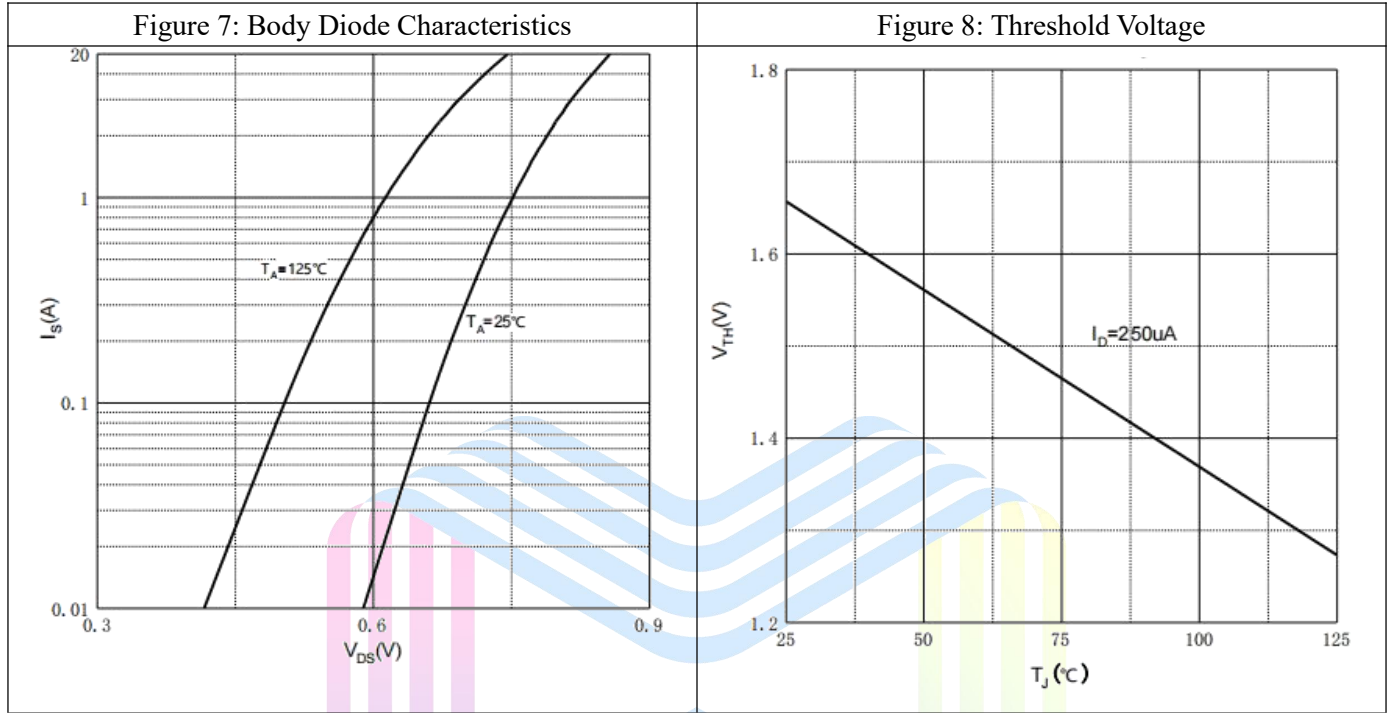
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage ^{Note3}	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	2.5	V
Static Drain-Source On-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$		28	45	mΩ
		$V_{GS}=4.5V, I_D=5A$		44	55	
Forward Transconductance ^{Note3}	g_{FS}	$V_{DS}=5V, I_D=5A$		22		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=20V$		367		pF
Output Capacitance	C_{OSS}	$V_{GS}=0V$		51		pF
Reverse Transfer Capacitance	C_{RSS}	$f=1MHz$		41		pF
Total Gate Charge	Q_g	$V_{DS}=20V$		9.3		nC
Gate-Source Charge	Q_{gs}	$V_{GS}=10V$		2.1		
Gate-Drain Charge	Q_{gd}	$I_D=5A$		1.9		
Gate Resistance	R_g	$f=1MHz, \text{Open drain}$		1.4		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V$		4.5		ns
Turn-on Rise Time	t_r	$V_{GS}=10V$		2.4		
Turn-off Delay Time	$t_{d(off)}$	$R_L=2.6\Omega$		14.8		
Turn-off Fall Time	t_f	$R_G=3\Omega$		2.5		
Diode Characteristics						
Diode Forward Voltage ^{Note3}	V_{SD}	$V_{GS}=0V, I_S=1A$			1.2	V

Notes :

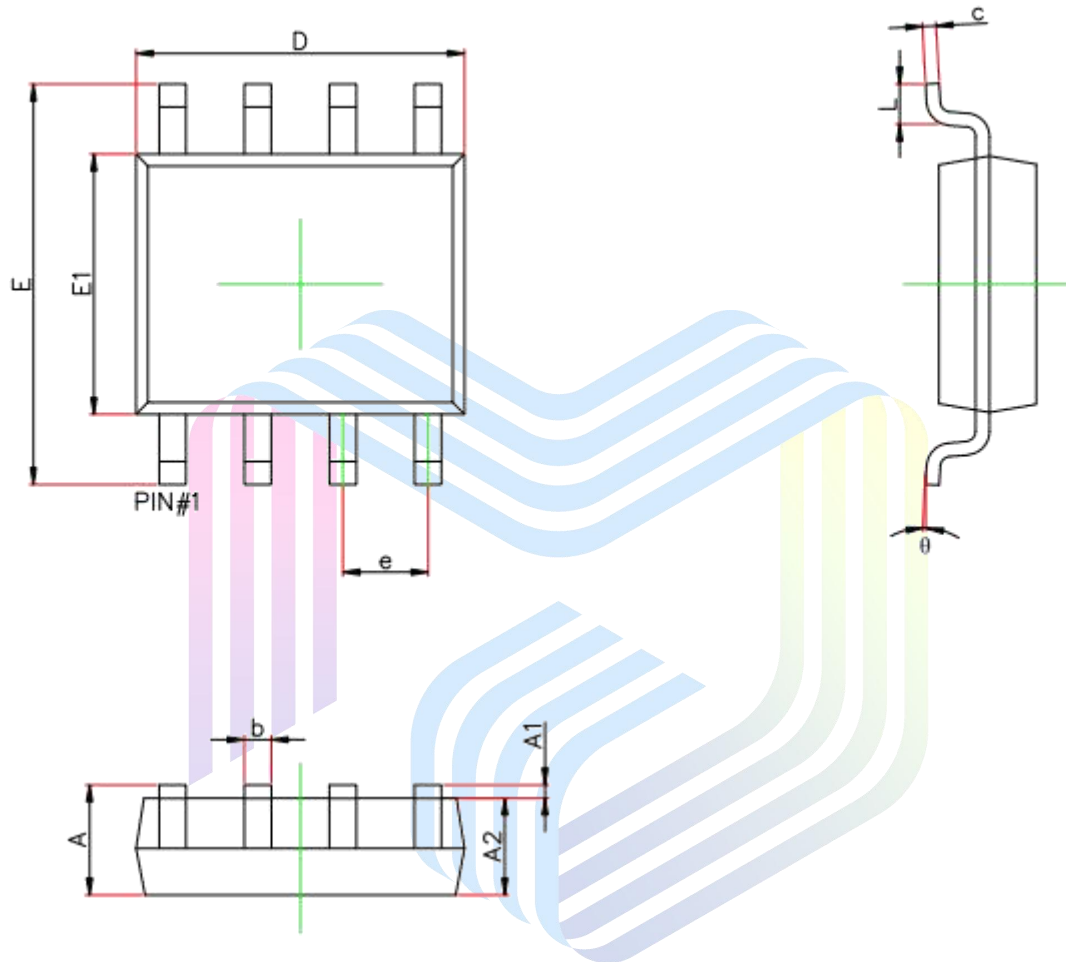
- 1.The maximum current rating is limited by package.And device mounted on a large heatsink.
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.And device mounted on a large heatsink
- 5.Device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Performance Characteristics





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Mechanical Dimensions:
SOP8 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.156	0.250	0.006	0.010
D	4.700	5.100	0.185	0.201
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
L	0.400	1.270	0.016	0.05
θ	0°	8°	0°	8°

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Via-Media Semiconductor Limited Company

<http://www.vmdsemi.com>

Main Sites:

- Headquarters

Hangzhou Via-Media Semiconductor Co., LTD.
1305-1306, Building 71, No. 90, Wensan Road, Xihu
District, Hangzhou, Zhejiang Province, P.R. China
Tel: +86-0571-8515 0563

- Chengdu Office

Chengdu Winhi Semiconductor Co., LTD.
Floor 15, Building 5, No. 171, Hele 2nd Street,
Chengdu, Sichuan Province, P.R. China
Tel: +86-028-8505 0771

- Shanghai

Shanghai R&D Center.
1506~1508, Xinyin Building, 888 Yishan Road,
Shanghai, P.R of China
Tel: +86- 021-54201999

- Shenzhen

Shenzhen Sales office
Room 4A15, Block AB, Tianxiang Building,
Chegongmiao , Futian District, Shenzhen, P.R of China
Tel: +86-0755- 82570682

- Xi'an

Xi'an R&D Center
1703B, Building A, Greenland Center, Jinye Road,
High-Tech Zone, Xi'an, Shaanxi, P.R of China