



VMDSEMI

VUSB005R25BNA

Datasheet



VMDSEMI

General Description
Symbol

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
50V	2.5Ω@10V	0.3A
	3.0Ω@4.5V	
	4.5Ω@2.5V	

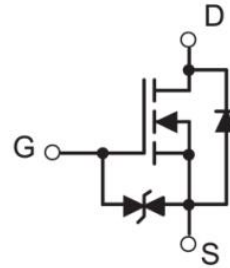


Figure 1 Symbol of VUSB005R25BNA

Features

- Excellent $R_{DS(on)}$
- Trench Technology Power MOSFET
- Low Gate Charge
- ESD Protected

Application

- Load Switch
- Interfacing

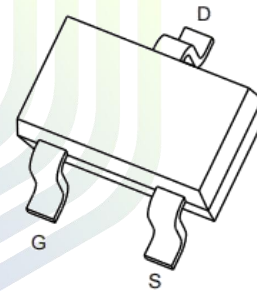
Package Type

SOT-23

Figure 2 Package Type of VUSB005R25BNA

Ordering Information

Product Name	Package
VUSB005R25BNA	SOT-23

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	50	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ^{Note1,4}	I_D	0.3	A
Pulsed Drain Current ^{Note2}	I_{DM}	1.2	
Total Power Dissipation ^{Note4,5}	P_D	0.35	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}	$R_{\theta JA}$		357		°C/W



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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	50			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 2	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	0.9	1.5	V
Static Drain-Source On-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=10V, I_D=0.3A$		0.92	2.5	Ω
		$V_{GS}=4.5V, I_D=0.2A$		0.98	3.0	
		$V_{GS}=2.5V, I_D=0.01A$		1.2	4.5	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=15V$		30		pF
Output Capacitance	C_{OSS}	$V_{GS}=0V$		5.2		pF
Reverse Transfer Capacitance	C_{RSS}	$f=1MHz$		3.3		pF
Gate Resistance	R_g	$f=1MHz, \text{open drain}$		157		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=5V$		15		ns
Turn-on Rise Time	t_r	$V_{GS}=5V$		35		
Turn-off Delay Time	$t_{d(off)}$	$I_D=10mA$		80		
Turn-off Fall Time	t_f	$R_G=10\Omega, R_L=500\Omega$		80		
Source - Drain 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.
- 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 $T_{J(MAX)} = 150^\circ\text{C}$.
- 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

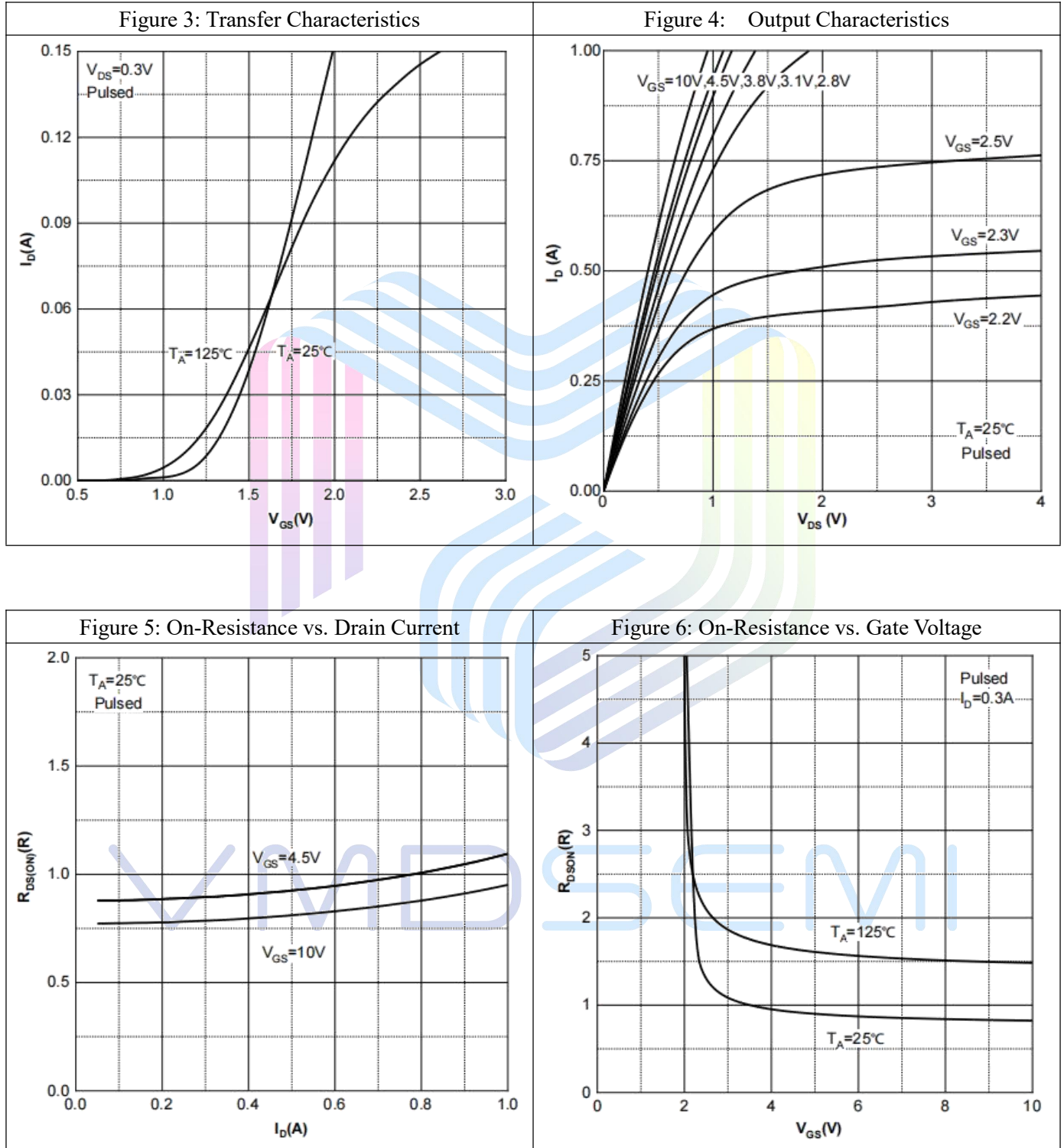
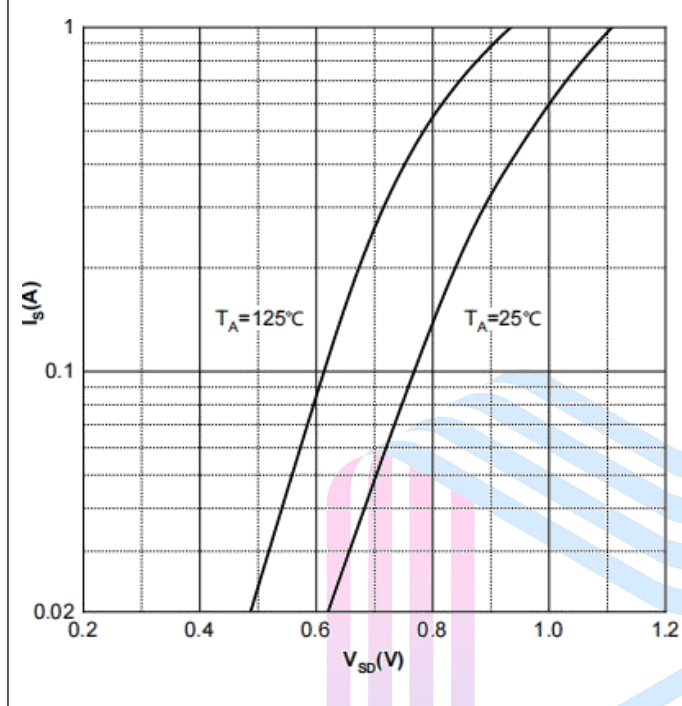
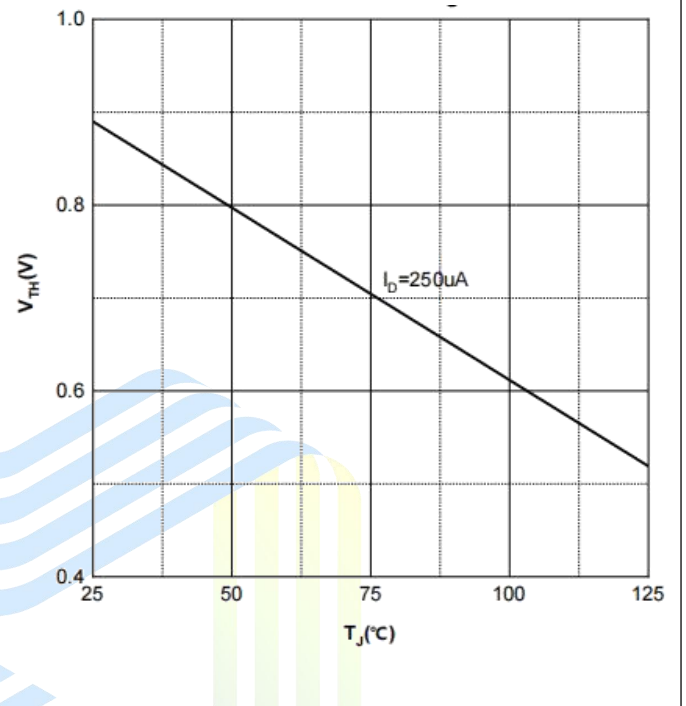
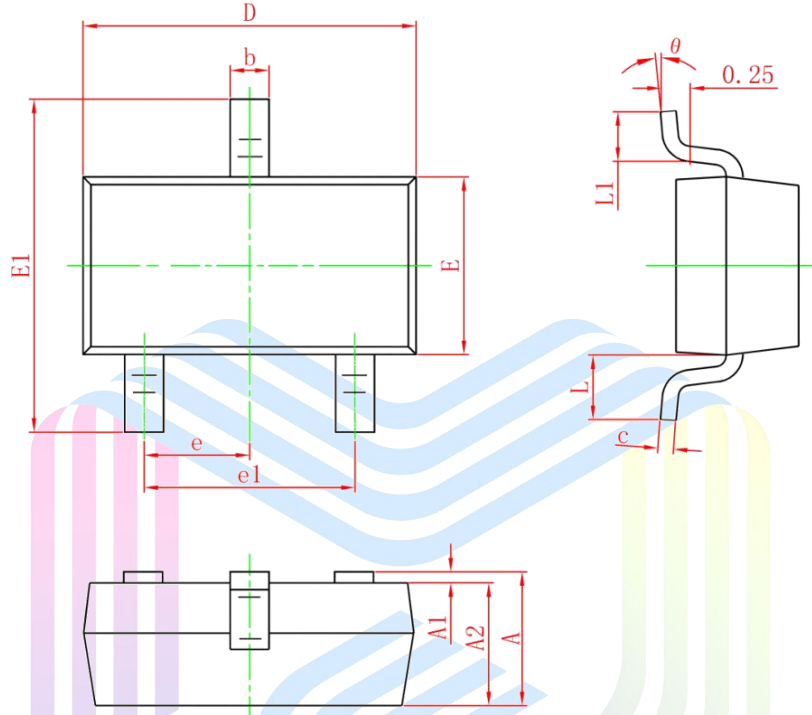


Figure 7: Body Diode Characteristics

Figure 8: Threshold Voltage


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Mechanical Dimensions:
SOT-23 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0	0.100	0	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.150	1.500	0.045	0.059
E1	2.250	2.650	0.089	0.104
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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