



VMDSEMI

VUSB003R11ANA

Datasheet



VMDSEMI

General Description

Symbol

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
30V	110mΩ@10V	1.4A
	135mΩ@4.5V	

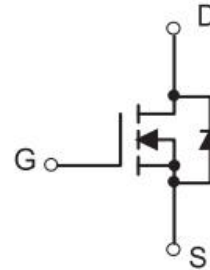


Figure 1 Symbol of VUSB003R11ANA

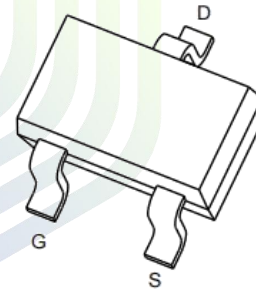
Features

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

Application

- Load Switch
- Power Management

Package Type



SOT-23

Figure 2 Package Type of VUSB003R11ANA

Ordering Information

Product Name	Package
VUSB003R11ANA	SOT-23

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{Note1}	I_D	1.4	A
Pulsed Drain Current ^{Note2}	I_{DM}	6.0	A
Total Power Dissipation ^{Note4}	P_D	1.25	W
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 to 150	$^{\circ}\text{C}$

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient ^{Note5}	$R_{\theta JA}$		100		$^{\circ}\text{C/W}$

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110mΩ, 30V, N-Channel Power MOSFET
VUSB003R11ANA
Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D = 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 = 1.0A		74	110	mΩ
		V _{GS} = 4.5V, I _D = 1.0A		103	135	
Forward tranconductance	g _{FS}	V _{DS} = 5V, I _D = 1.0A	3			S
Dynamic Characteristics						
Input Capacitance	C _{ISS}	V _{DS} =15V		100		pF
Output Capacitance	C _{OSS}	V _{GS} =0V		17		pF
Reverse Transfer Capacitance	C _{RSS}	f=1MHz		12		pF
Total gate charge	Q _g	V _{DS} =15V		5		nC
Gate-source charge	Q _{gs}	V _{GS} =10V		1		
Gate-drain charge	Q _{gd}	I _D = 1.0A		1.5		
Gate Resistance	R _g	f = 1MHz,open drain		12		Ω
Switching Parameters						
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V		3.5		ns
Turn-on Rise Time	t _r	V _{GS} = 10V		1.5		
Turn-off Delay Time	t _{d(off)}	R _L =15Ω		12		
Turn-off Fall Time	t _f	R _G =3Ω		2		
Source - Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V _{SD}	V _{GS} = 0V, I _S = 1.0A			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 3: Transfer Characteristics

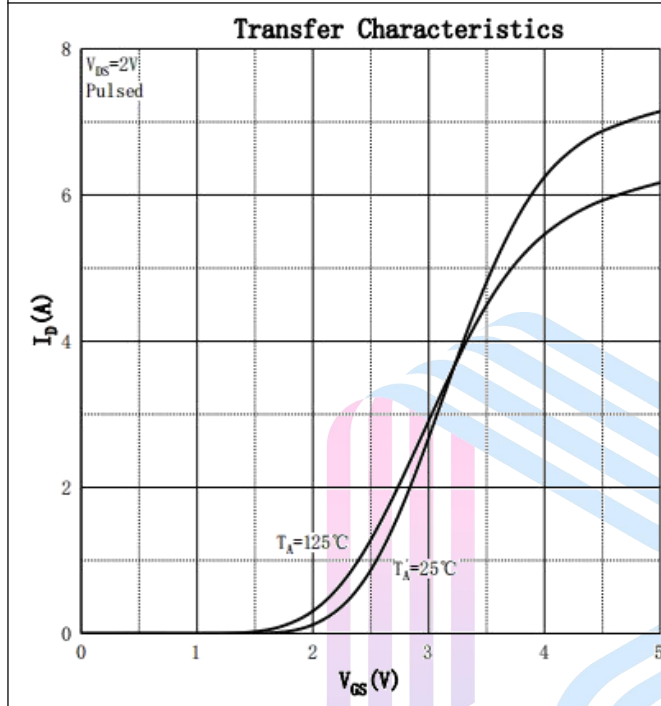


Figure 4: Output Characteristics

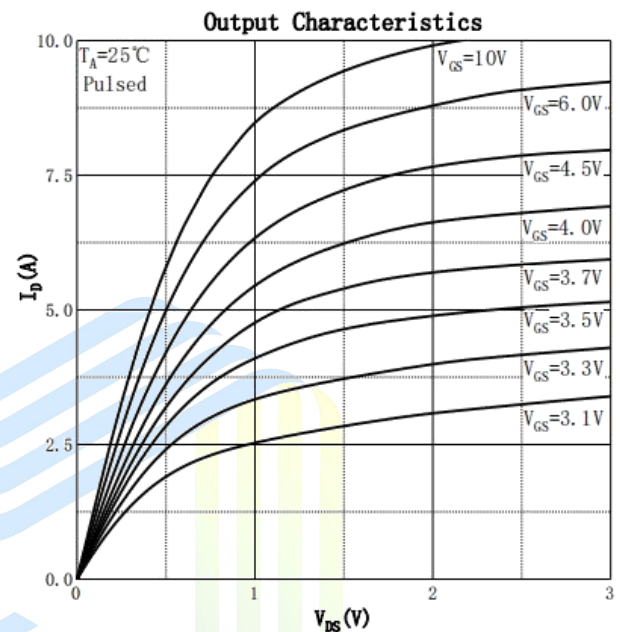


Figure 5: On-Resistance vs. Drain Current

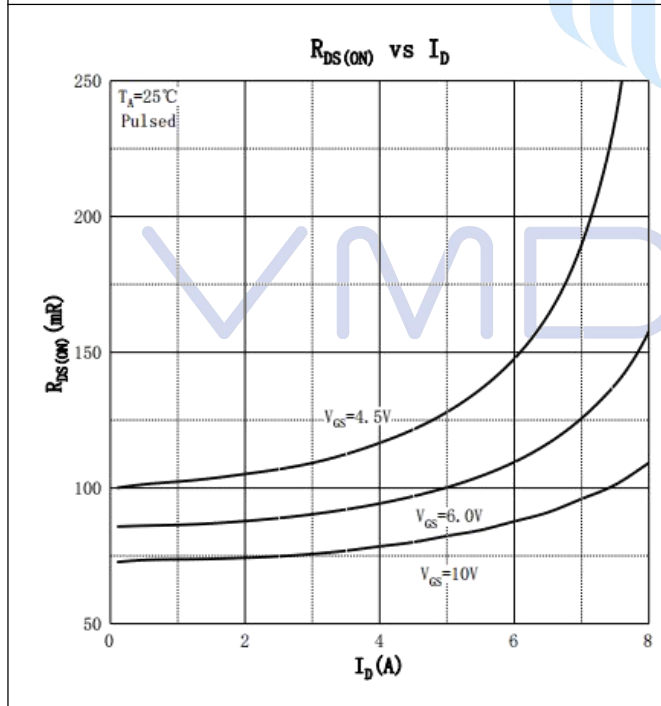


Figure 6: On-Resistance vs. Gate Voltage

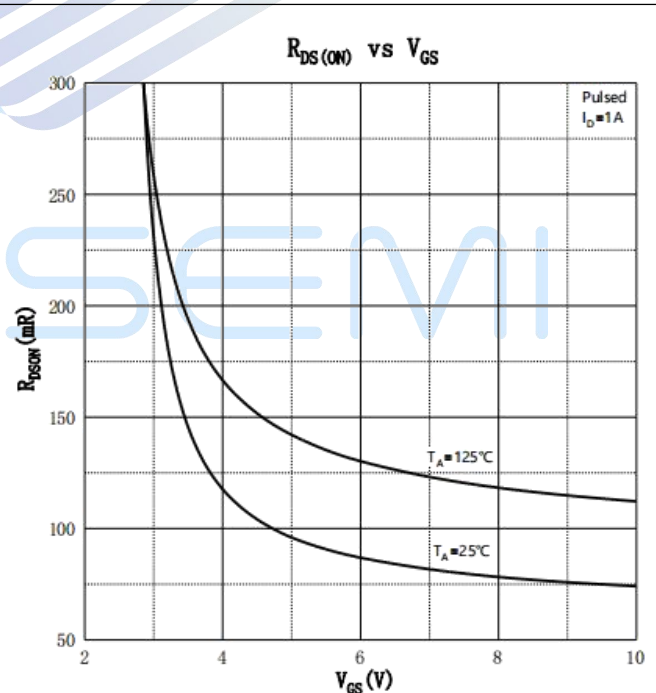
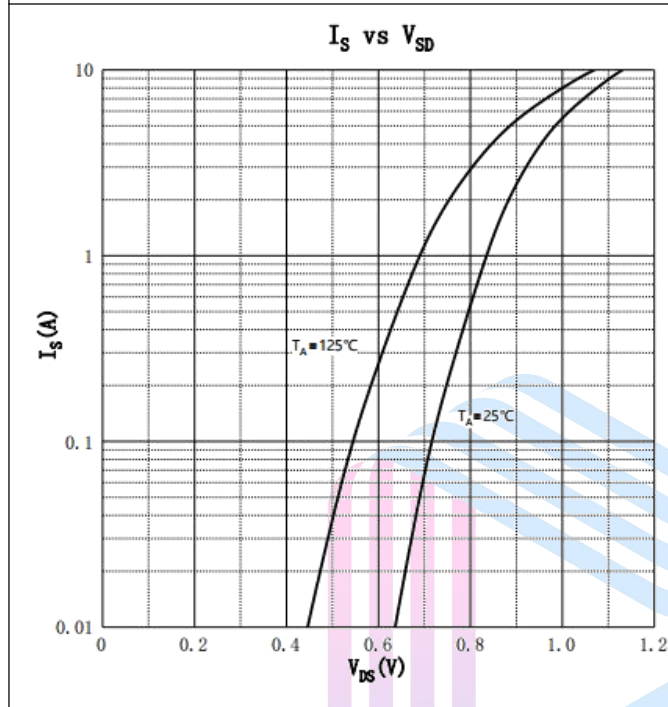
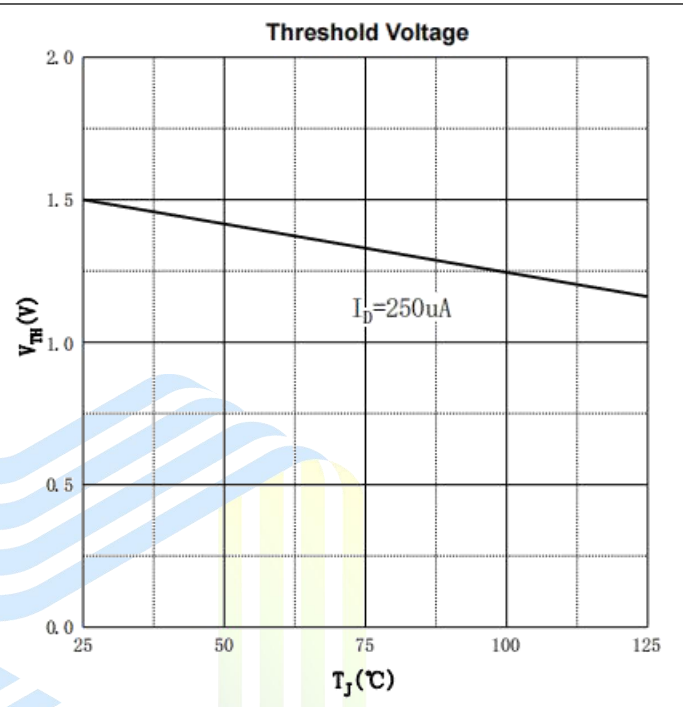
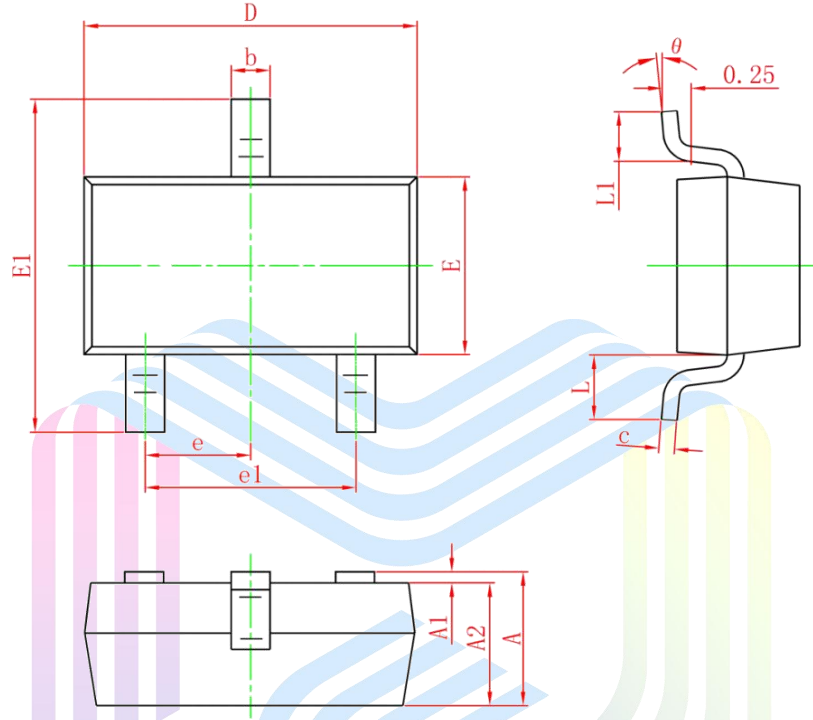


Figure 7: Body Diode Characteristics

Figure 8: Threshold Voltage


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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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