VUSB010R45BNA

Datasheet

4.5Ω, 100V, N-Channel Power MOSFET VUSB010R45BNA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
100V	4.5Ω@10V	0.17A
	6.0Ω@4.5V	

Symbol

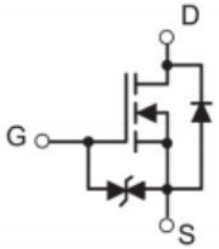
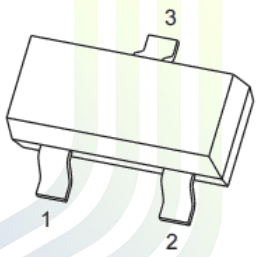


Figure 1 Symbol of VUSB010R45BNA

Features

- Surface Mount Package
- High Density Cell Design for Extremely Low $R_{DS(ON)}$
- Voltage Controlled Small Signal Switch
- Rugged and Reliable
- ESD protected Gate

Package Type



1. GATE
2. SOURCE
3. DRAIN

SOT-23

Figure 2 Package Type of VUSB010R45BNA

Application

- Small Servo Motor Controls
- Power MOSFET Gate Drivers
- Switching Application

Ordering Information

Product Name	Package
VUSB010R45BNA	SOT-23

Absolute Maximum Ratings (T_A= 25 ºC, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current[Note1]	I_D	0.17	A
Pulsed Drain Current [Note2]	I_{DM}	0.51	
Total Power Dissipation[Note4]	P_D	0.35	W
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-Ambient[Note5]	$R_{\theta JA}$		357		ºC/W

Electrical Characteristics (T_A= 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	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 80V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}= 0V			±5	uA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.45	3	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=10V, I_D= 0.17A		3.0	4.5	Ω
		V_{GS}=4.5V, I_D= 0.17A		3.2	6.0	
Forward Transconductance[Note3]	g_{FS}	V_{DS}=10V, I_D= 0.17A		0.47		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=45V		29		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		4		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		2		pF
Total Gate Charge	Q_g	V_{DS}=10V		1.5		nC
Gate-Source Charge	Q_{gs}	V_{GS}=10V		0.16		
Gate-Drain Charge	Q_{gd}	I_D= 0.17A		0.2		
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 30V		7		ns
Turn-on Rise Time	t_r	V_{GS}= 10V		6		
Turn-off Delay Time	$t_{d(off)}$	I_D= 0.17A		10		
Turn-off Fall Time	t_f	R_G=50Ω		9		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= 0.17A		0.8	1.3	V

Notes :

1.The maximum current rating is limited by package.And device mounted on a large heatsink.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.Pulse Test : Pulse Width ≤ 380μs, duty cycle ≤ 2%.

4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

5.Device mounted on 1in2 FR-4 board with 1oz. Copper, in a still air environment with T_A =25°C.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

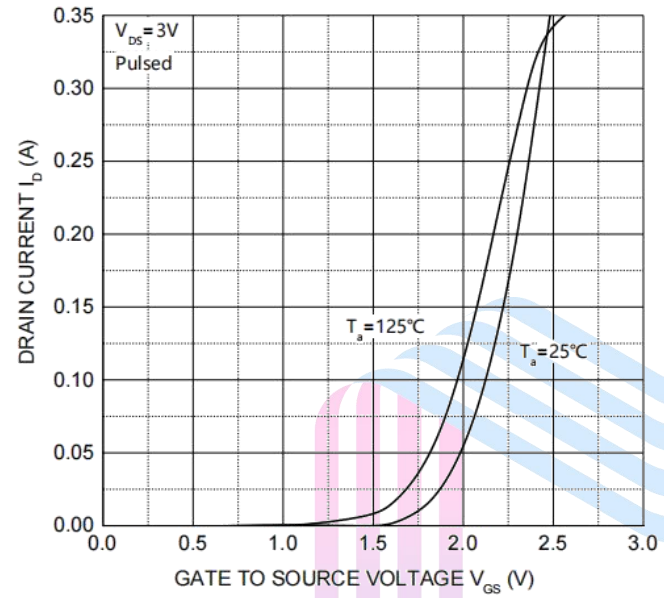


Figure 4: Output Characteristics

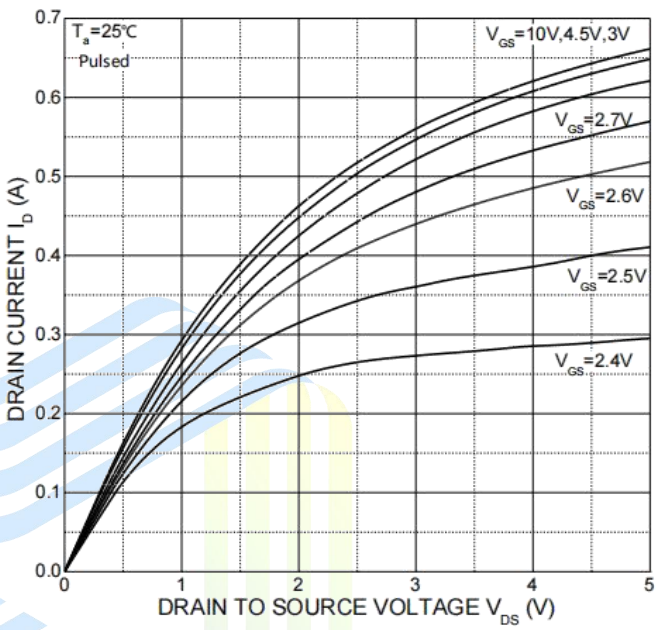


Figure 5: On-Resistance vs. Drain Current

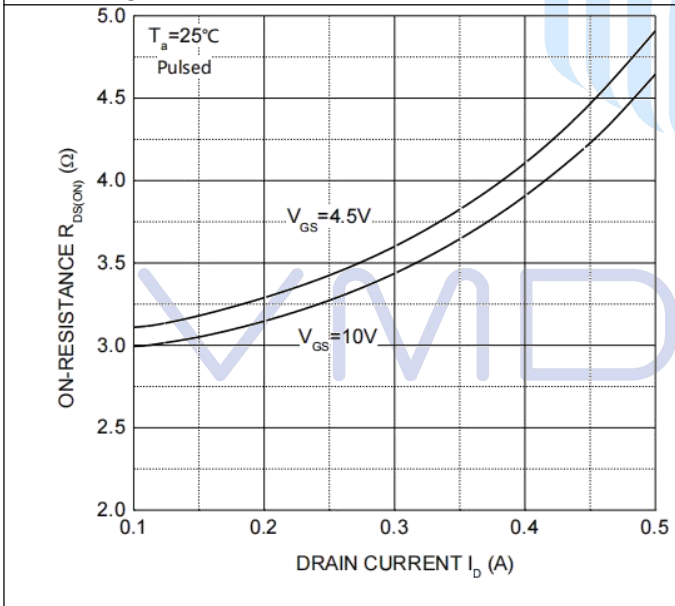


Figure 6: On-Resistance vs. Gate Voltage

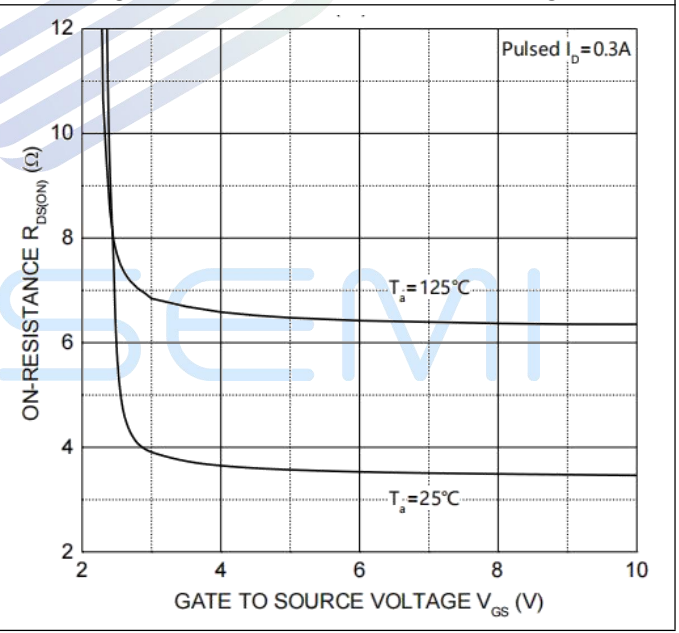


Figure 7: Body Diode Characteristics

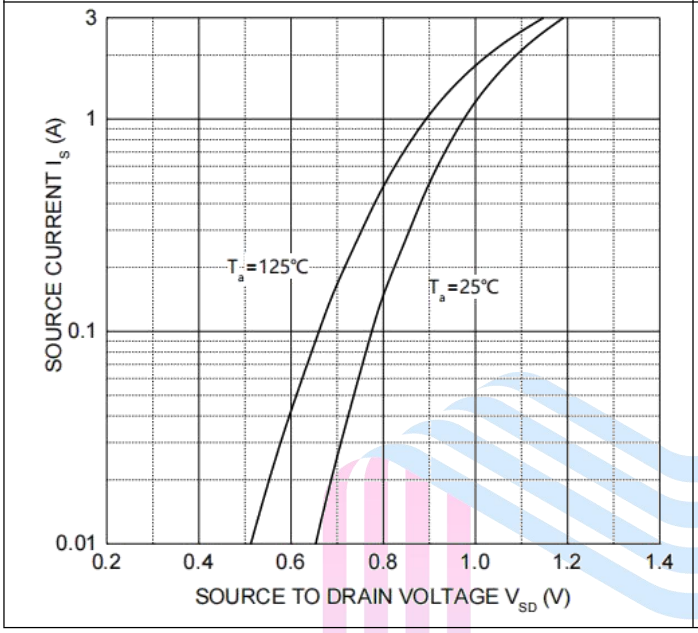
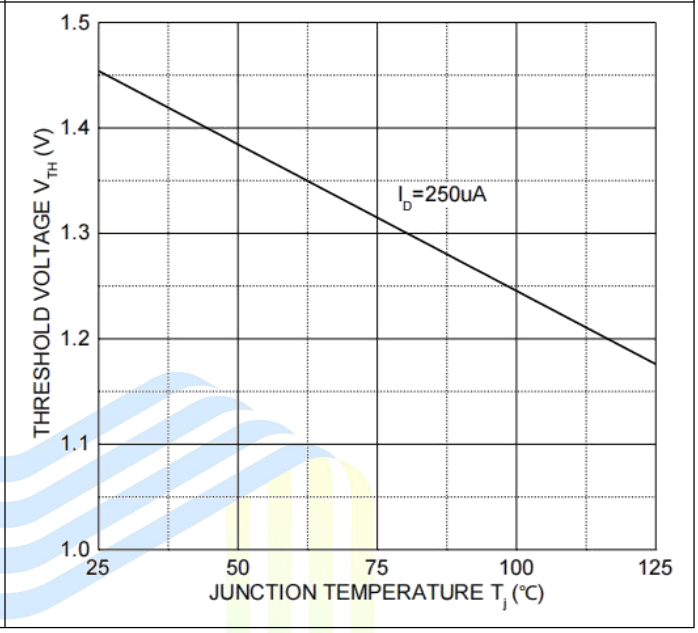
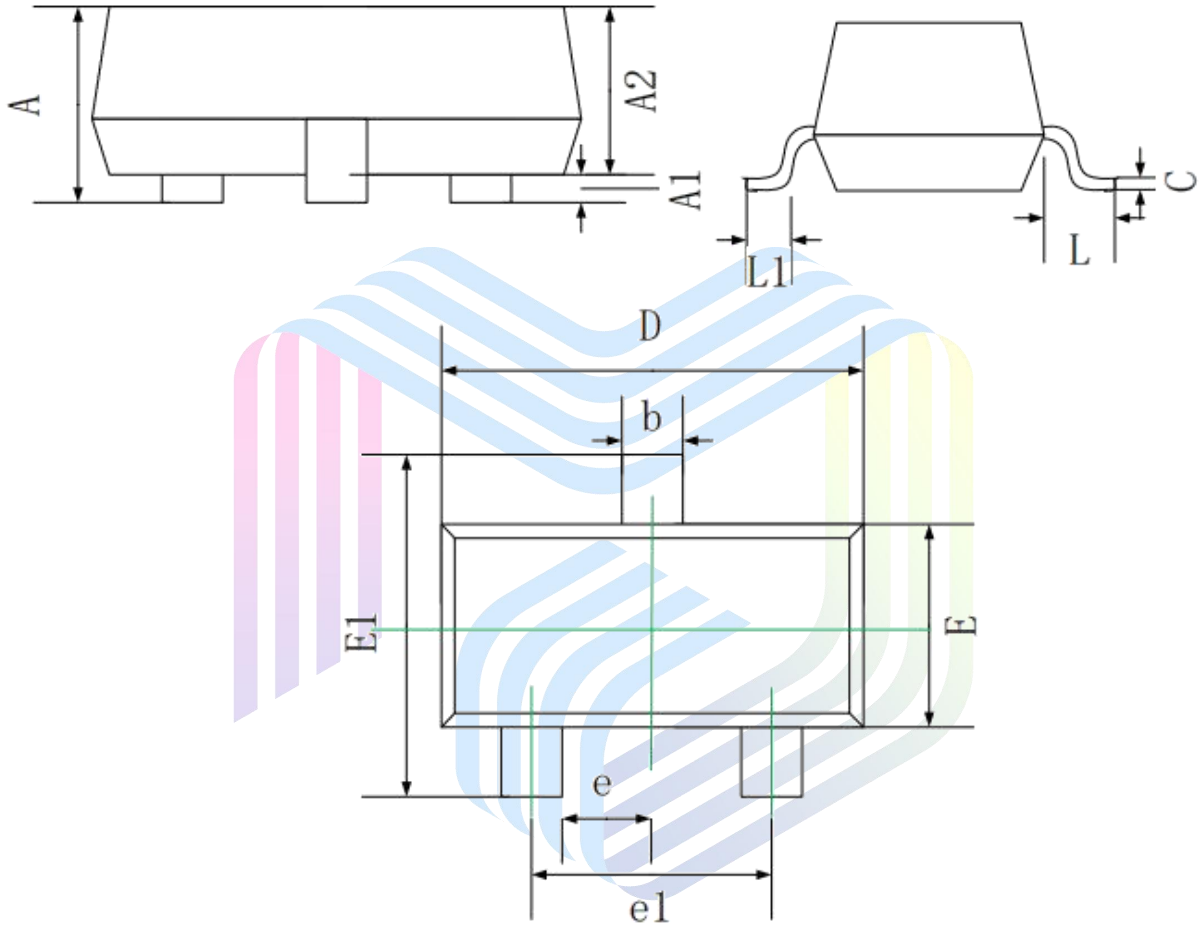


Figure 8: Threshold Voltage



Mechanical Dimensions:

SOT-23 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 REF.	
e1	1.80	2.00
L	0.55 REF.	
L1	0.30	0.50

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