VUSB005R30BNA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
50V	3.0Ω@10V	0.22A
	5.0Ω@4.5V	

Symbol

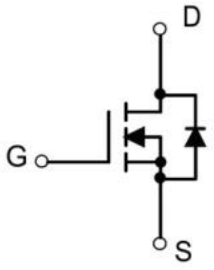


Figure 1 Symbol of VUSB005R30BNA

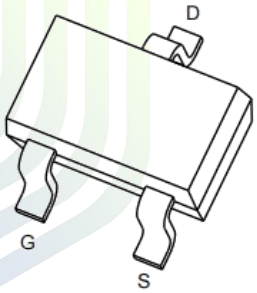
Features

- Rugged and Reliable
- High density cell design
- Extremely low $R_{DS(on)}$

Application

- Direct Logic-Level Interface
- Battery Operated Systems
- Solid-State Relays

Package Type



SOT-23

Figure 2 Package Type of VUSB005R30BNA

Ordering Information

Product Name	Package
VUSB005R30BNA	SOT-23

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	50	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	0.22	A
Total Power Dissipation	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 Note1	$R_{\theta JA}$		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	50			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 50V, V_{GS}=0V			500	nA
	I_{DSS}	V_{DS}= 30V, V_{GS}=0V			100	nA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage[Note2]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.8		1.5	V
Static Drain-Source On-Resistance[Note2]	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 0.22A		1.0	3.0	Ω
		V_{GS}= 4.5V, I_D= 0.22A		1.1	5.0	
Forward tranconductance[Note2]	g_{FS}	V_{DS}= 10V, I_D= 0.22A		0.13		mS
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=25V		26.5		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		12.9		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		5.9		pF
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 30V			5	ns
Turn-on Rise Time	t_r	V_{GS}= 10V			18	
Turn-off Delay Time	$t_{d(off)}$	I_D= 0.29A			36	
Turn-off Fall Time	t_f	R_G=6Ω			14	
Source-Drain Diode characteristics[Note2]						
Diode Forward voltage	V_{SD}	I_S=0.44A, V_{GS} = 0V		1.15	1.4	V

Notes :

1. Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.
2. Pulse Test ; Pulse Width ≤300μs, Duty Cycle ≤2%.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

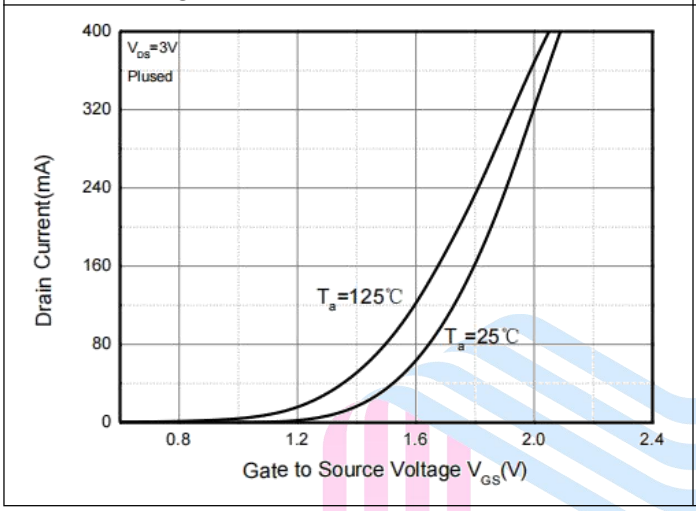


Figure 4: Output Characteristics

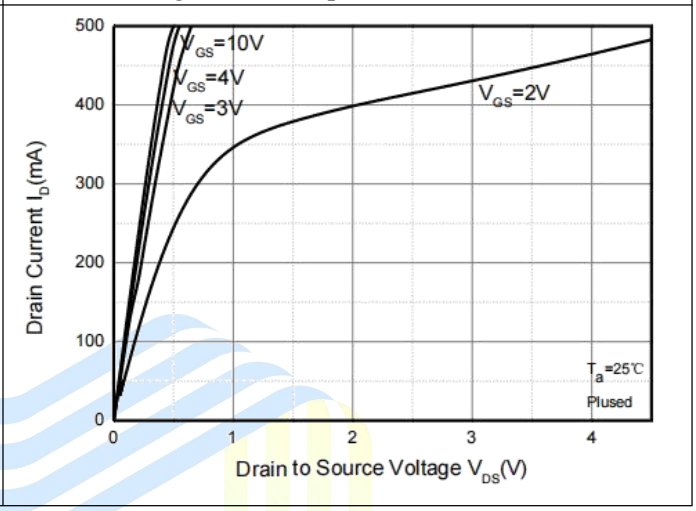


Figure 5: On-Resistance vs. Drain Current

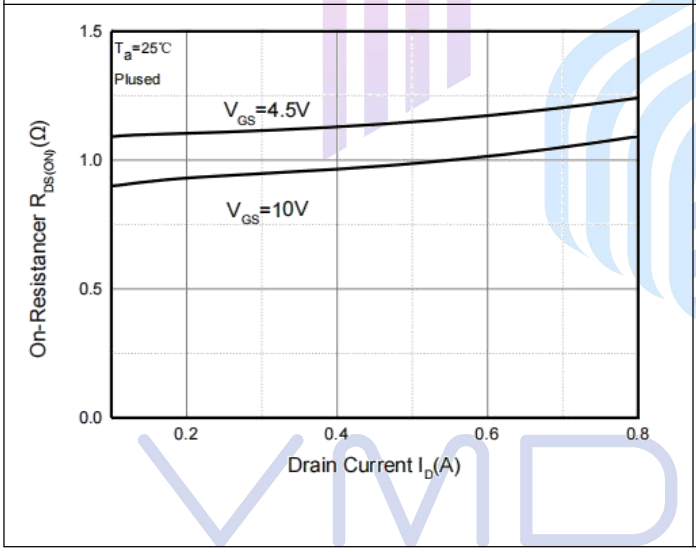


Figure 6: On-Resistance vs. Gate Voltage

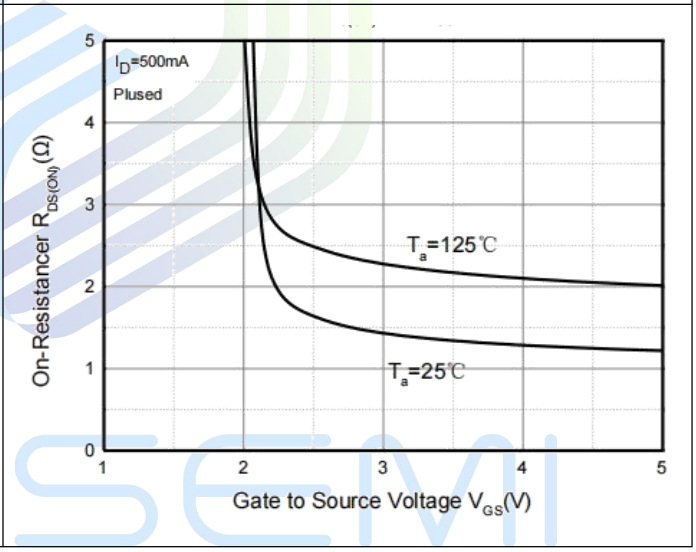


Figure 7: Body Diode Characteristics

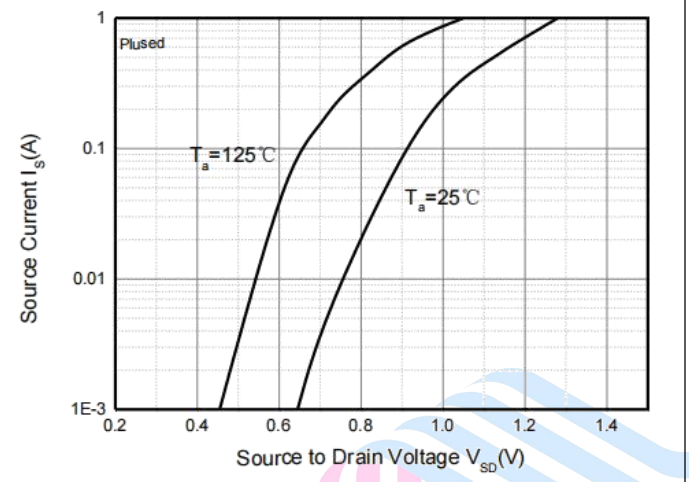
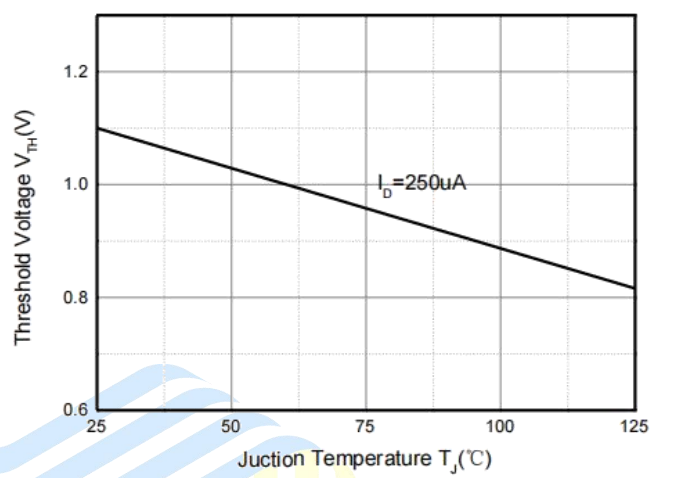
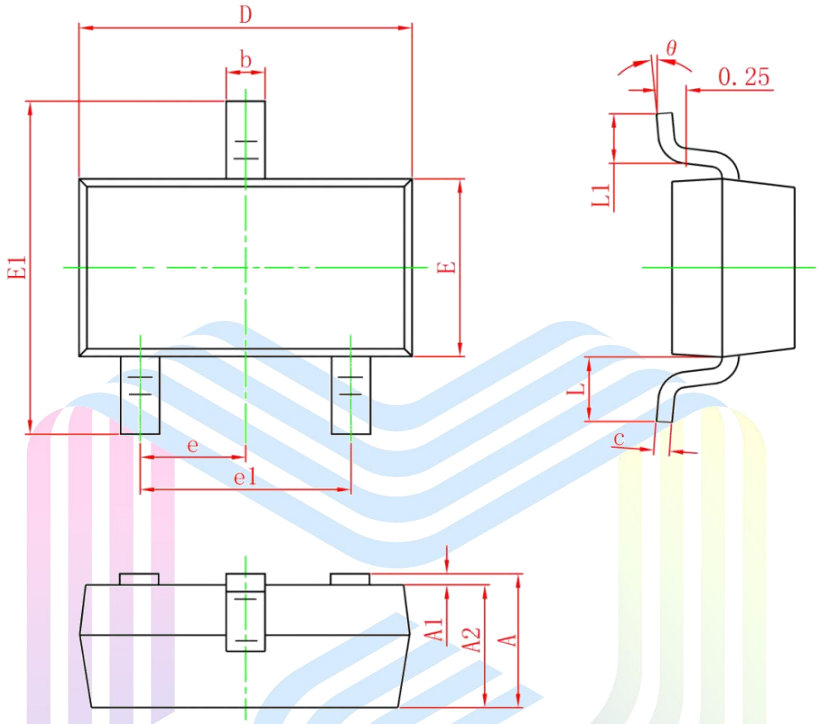


Figure 8: Threshold Voltage



Mechanical Dimensions:

SOT-23 Package Information



Symbol	Dimensions In Millimeters		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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