VUSB002R500PA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-20V	50mΩ@-4.5V	-4A
	60mΩ@-2.5V	
	100mΩ@-1.8V	

Symbol

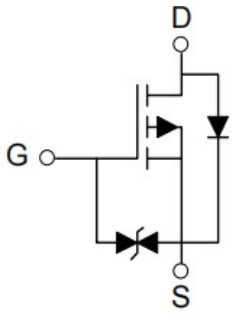
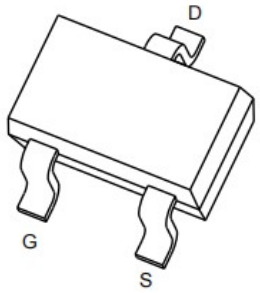


Figure 1 Symbol of VUSB002R500PA

Features

- Excellent RDS(ON), low gate charge,low gate voltages
- Trench Technology Power MOSFET
- ESD Protected

Package Type



SOT-23

Figure 2 Package Type of VUSB002R500PA

Application

- High Side Load Switch
- Load/Power Switching
- Low Current Inverters

Ordering Information

Product Name	Package
VUSB002R500PA	SOT-23

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±10	V
Continuous Drain Current (t≤ 10s)	I_D	-4.0	A
Total Power Dissipation (t≤ 10s)	P_D	0.35	W
Junction Temperature	T_J	150	ºC
Operating Temperature	T_{OPR}	-45 to 125	ºC
Storage Temperature	T_{STG}	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$		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	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -16V, V_{GS}=0V			-1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±10V, V_{DS}= 0V			±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.4	-0.65	-1.0	V
Static Drain-Source On-Resistance[Note1]	$R_{DS(ON)}$	V_{GS}= -4.5V, I_D= -4.0A		33	50	mΩ
		V_{GS}= -2.5V, I_D= -4.0A		45	60	
		V_{GS}= -1.8V, I_D= -2.0A		63	100	
Forward tranconductance[Note2]	g_{FS}	V_{DS}= -5V, I_D= -4.0A	8			S
Dynamic Characteristics [Note3]						
Input Capacitance	C_{ISS}	V_{DS}= -10V		1450		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		205		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		160		pF
Gate resistance	R_g	f=1MHz,Open drain		6.5		Ω
Switching Parameters						
Total Gate Charge	Q_g	V_{DS}= -10V		17.2		nC
Gate-source Charge	Q_{gs}	V_{GS}= -4.5V		1.3		
Gate-drain Charge	Q_{gd}	I_D= -4.0A		4.5		
Turn-on Delay Time[Note3]	$t_{d(on)}$	V_{DS}= -10V		9.5		ns
Turn-on Rise Time[Note3]	t_r	V_{GS}= -4.5V		17		
Turn-off Delay Time[Note3]	$t_{d(off)}$	R_L=2.5Ω		94		
Turn-off Fall Time[Note3]	t_f	R_{GEN}=3.0Ω		35		
Diode Characteristics						
Diode Forward Voltage [Note2]	V_{DS}	V_{GS}=0V, I_S= -1A			-1.0	V

Notes :

1. Repetitive rating,pulse width limited by junction temperature.
2. Pulse Test : Pulse width≦300μs, duty cycle≦2%.
3. These parameters have no way to verify.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

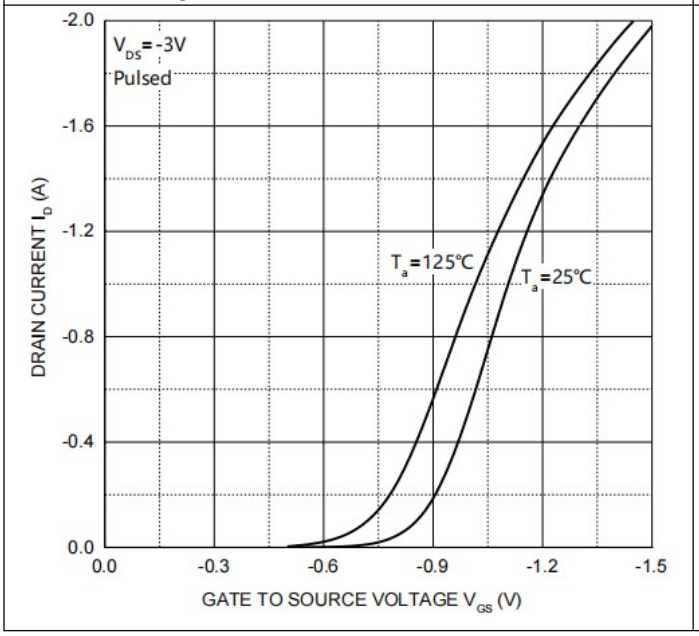


Figure 4: Output Characteristics

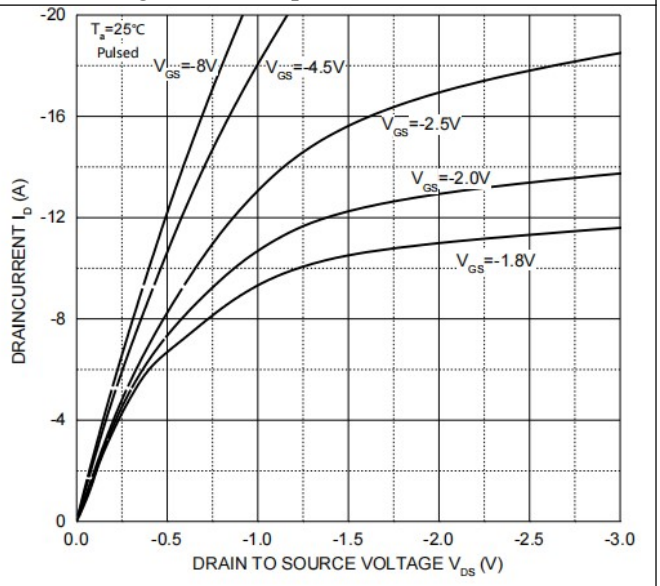


Figure 5: On-Resistance vs. Drain Current

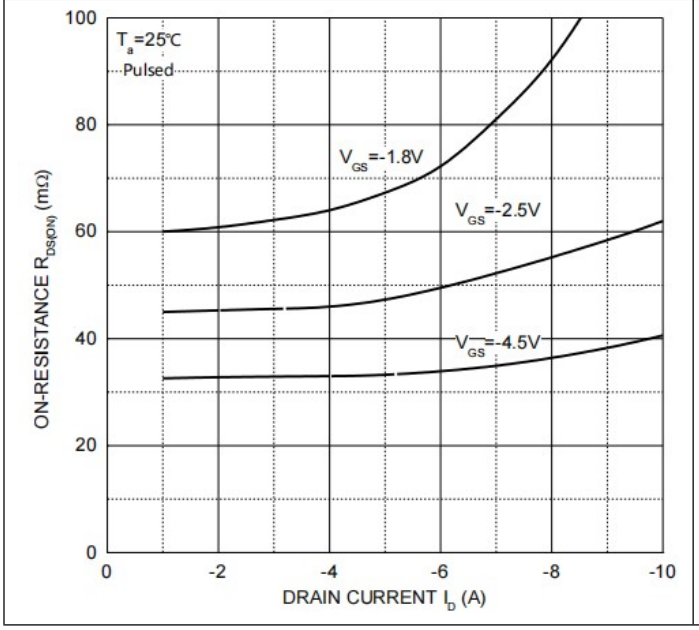


Figure 6: On-Resistance vs. Gate Voltage

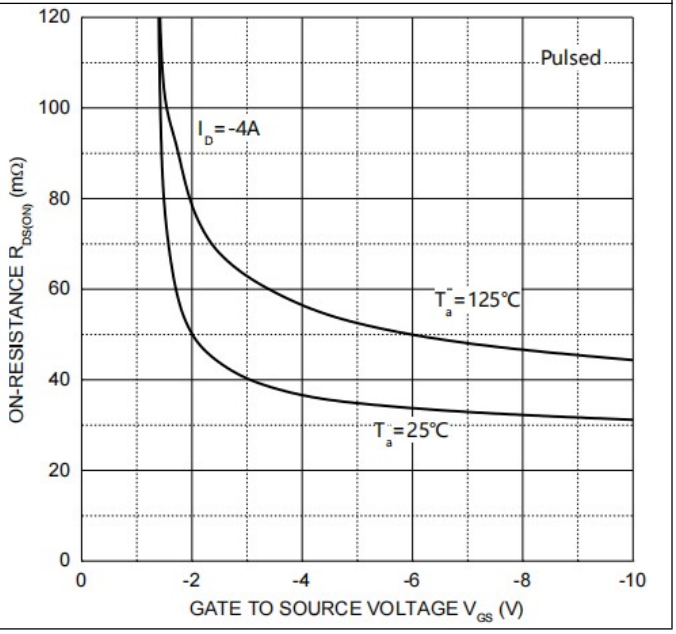


Figure 7: Body Diode Characteristics

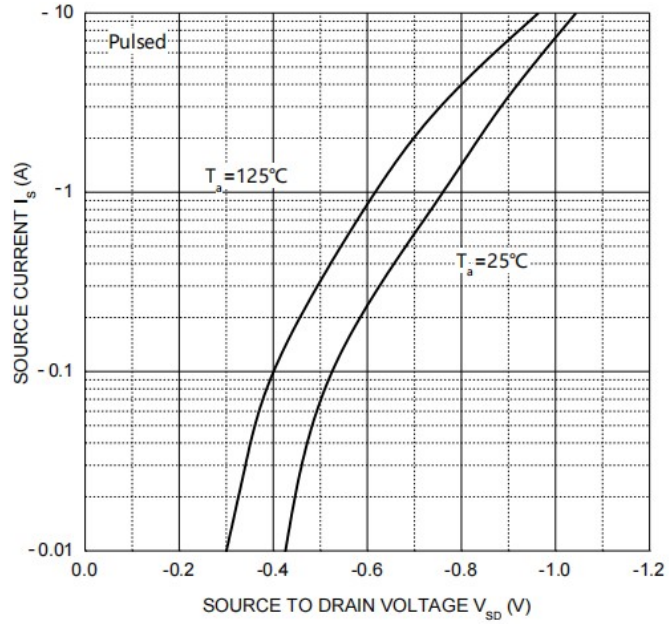
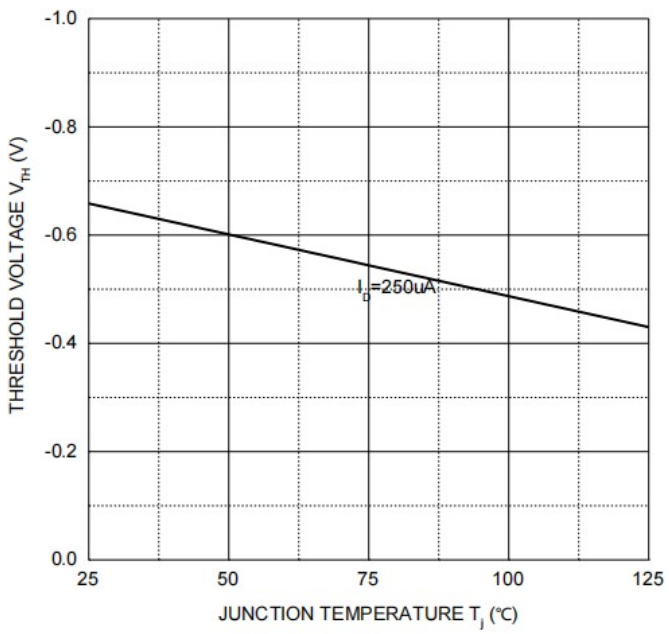
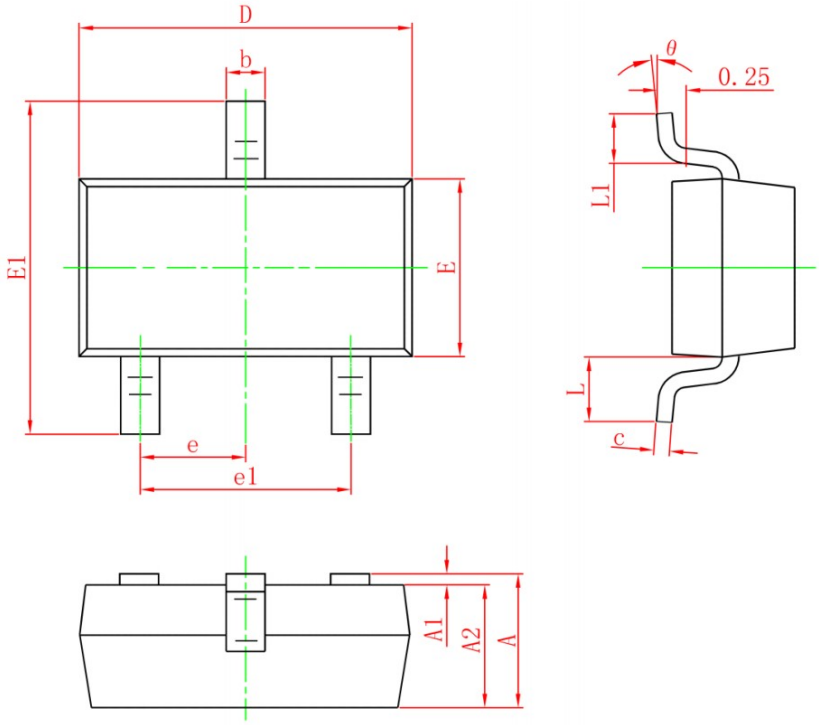


Figure 8: Threshold Voltage



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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