VUSB002R570PA

Datasheet

General Description

VUSB002R570PA MOSFET is based on unique device design to achieve low $R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics.

Symbol

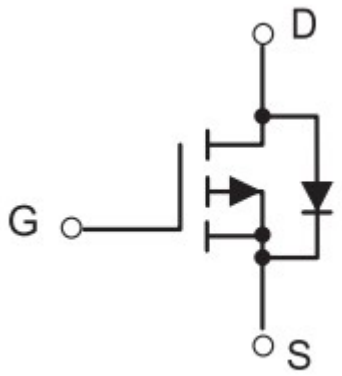


Figure 1 Symbol of VUSB002R570PA

Features

- Trench Technology Power MOSFET
- $R_{DS(ON)\_max}$ = 57.0mΩ@V_{GS} = -4.5V
- Low Gate Charge

Application

- Power switching application
- Load Switch
- DC/DC Converter

Package Type

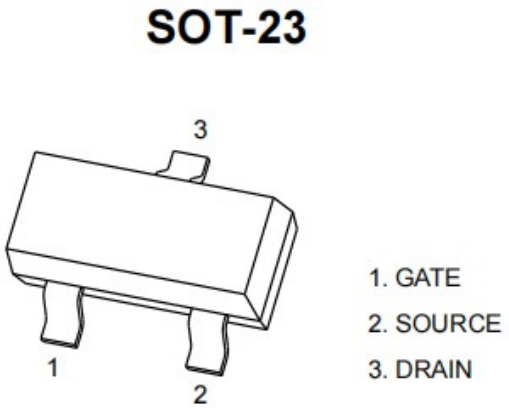


Figure 2 Package Type of VUSB002R570PA

Ordering Information

Product Name	Package
VUSB002R570PA	SOT-23

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current Note1,5 T_A = 25℃	I_D	-3.8	A
Pulsed Drain Current Note2	I_{DM}	-15	A
Max Power Dissipation Note4,5 T_A = 25℃	P_D	1.3	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	$R_{\theta JA}$		96		ºC/W

Electrical Characteristics T_J= 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	Forward	I_{GSSF}	V_{GS} = -12V			100	nA
	Reverse	I_{GSSR}	V_{GS} = 12V			-100	
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.4	-0.7	-1	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}= -4.5V, I_D= -3.3A		35	57	mΩ
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}= -2.5V, I_D= -2.8A		49	76	mΩ
Gate Resistance		Rg	V_{DS}= 0V,V_{GS}= 0V, f=1MHz		25		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}= -10V		1003		pF
Output Capacitance		C_{OSS}	V_{GS}=0V		137		pF
Reverse Transfer Capacitance		C_{RSS}	f=1MHz		123		pF
Turn-on Delay Time		$t_{d(on)}$	V_{DS}= -6V			25	ns
Rise Time		t_r	V_{GS}= -4.5V			55	
Turn-off Delay Time		$t_{d(off)}$	I_D= -1A			90	
Fall Time		t_f	R_G=6.0Ω			60	
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DS}= -10V		1.4		nC
Gate to Drain Charge		Q_{gd}	V_{GS}= -4.5V		3		
Gate Charge Total		Q_g	I_D= -3.3A		11		
Diode Characteristics							
Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}= -1.6A			-1.2	V

Notes :

1.The maximum current rating is limited by package.

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

3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.

5.Device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

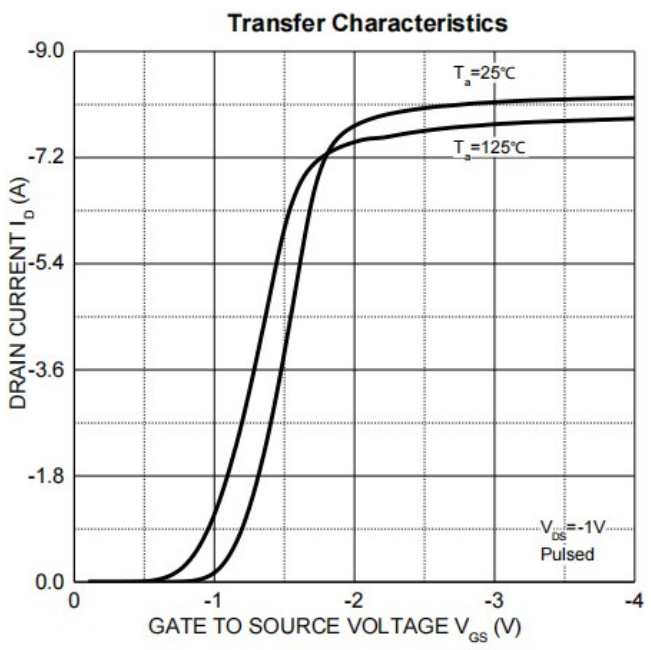


Figure 4: Typ. Output Characteristics

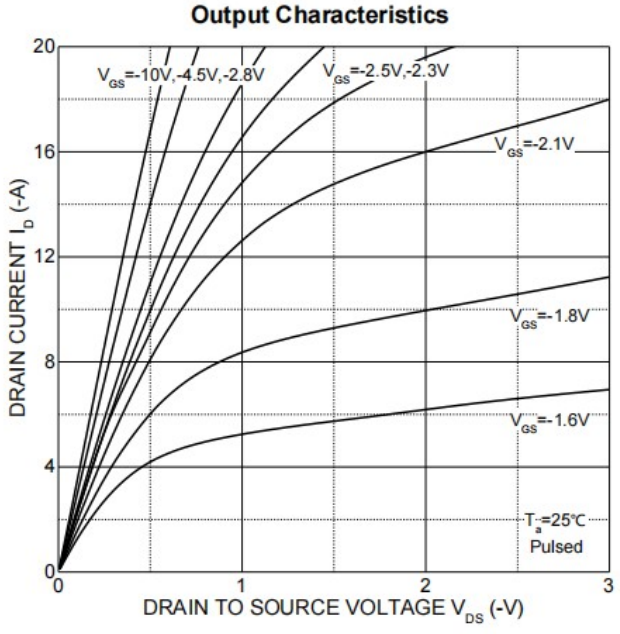


Figure 5: Drain-Source On-State Resistance-I_D

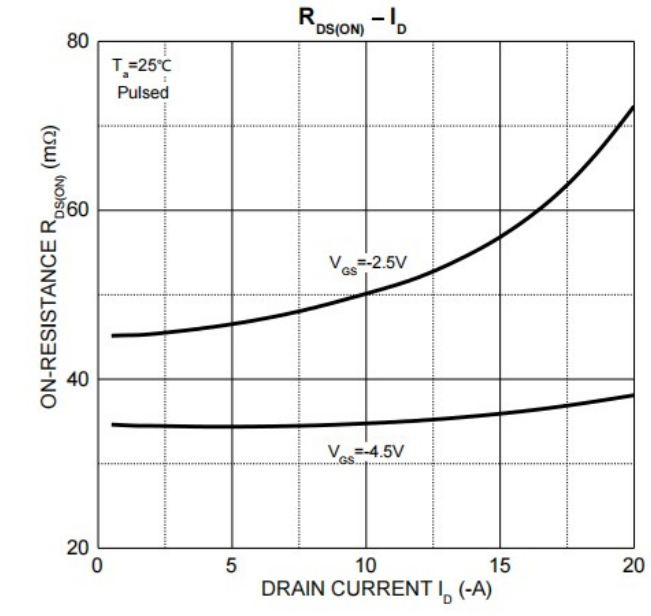


Figure 6: Drain-Source On-State Resistance -V_{GS}

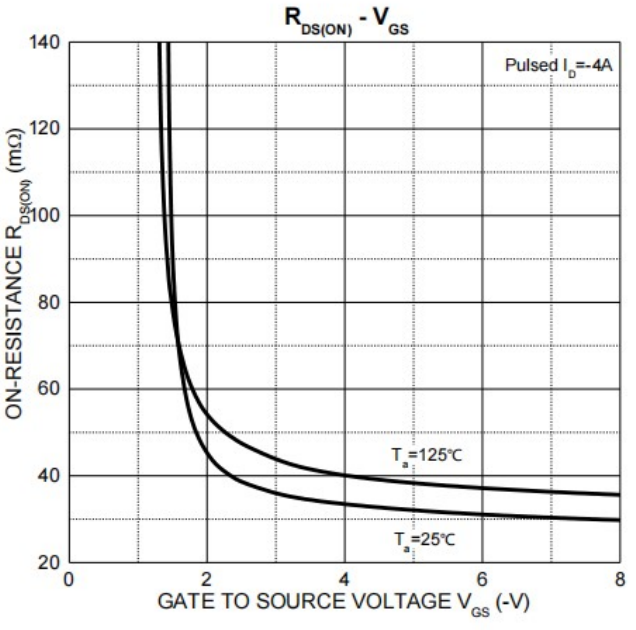
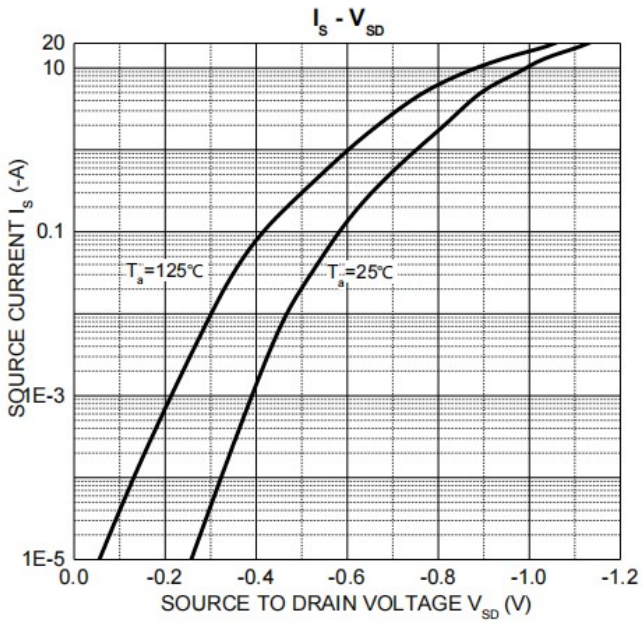
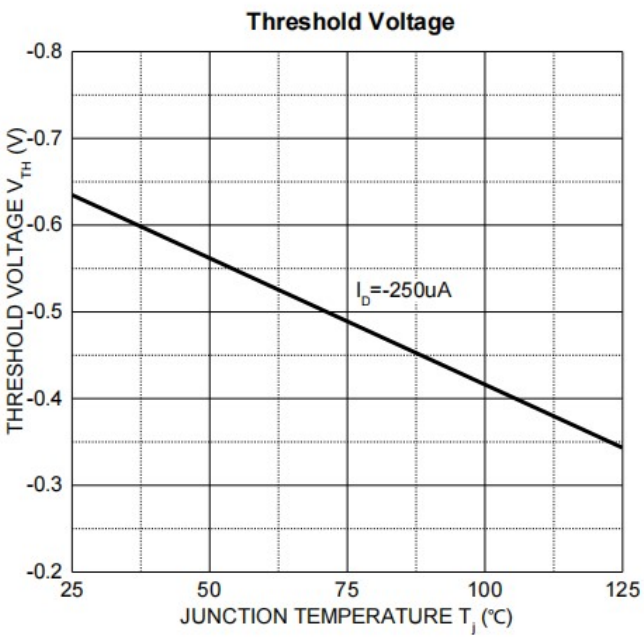
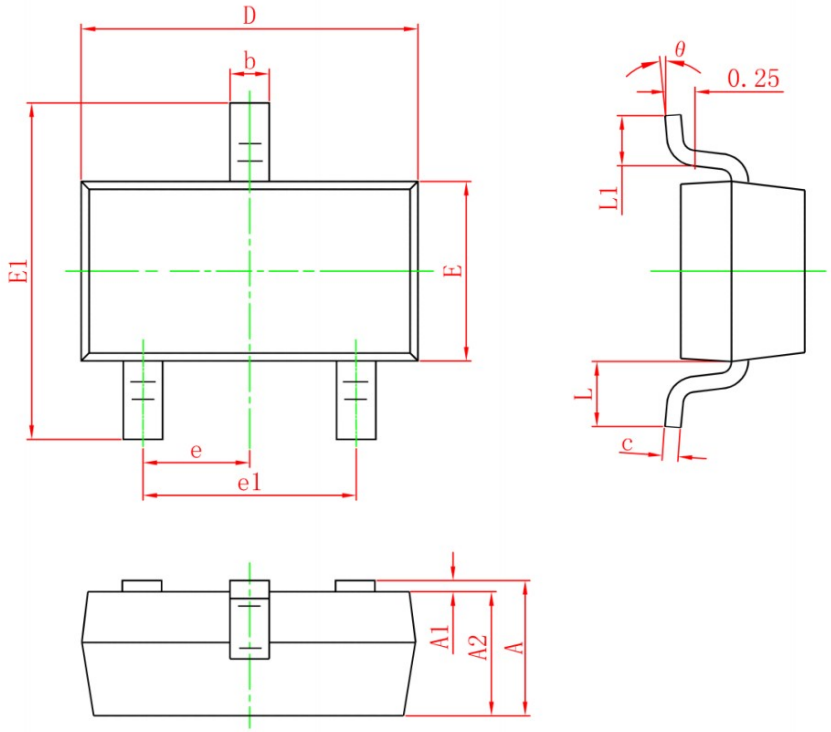


Figure 7: Source Current	Figure 8: Threshold Voltage
	

Mechanical Dimensions:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	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	0.950REF		0.037REF	
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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Via-Media Semiconductor Limited Company

http://www.vmdsemi.com

Main Sites:

- **Headquarters**

Hangzhou Via-Media Semiconductor Co., LTD.
1305-1306, Building 71, No. 90, Wensan Road, Xihu District, Hangzhou, Zhejiang Province, P.R. China
Tel: +86-0571-8515 0563

- **Chengdu Office**

Chengdu Winhi Semiconductor Co., LTD.
Floor 15, Building 5, No. 171, Hele 2nd Street, Chengdu, Sichuan Province, P.R. China
Tel: +86-028-8505 0771

- **Shanghai**

Shanghai R&D Center.
1506~1508, Xinyin Building, 888 Yishan Road, Shanghai, P.R of China
Tel: +86- 021-54201999

- **Shenzhen**

Shenzhen Sales Center.
17B, No.1 Phoenix Building, 2008 Shennan Road, Shenzhen, P.R of China
Tel: +86-0755- 82570682

- **Xi'an**

Xi'an R&D Center
1703B, Building A, Greenland Center, Jinye Road, High-Tech Zone, Xi'an, Shaanxi, P.R of China