VUSG002R52APA

Datasheet

520mΩ, -20V, P-Channel Power MOSFET VUSG002R52APA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-20V	520mΩ@-4.5V	-0.66A
	780mΩ@-2.5V	
	1100mΩ@-1.8V	

Symbol

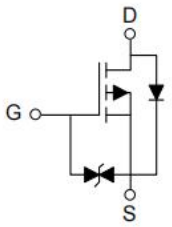
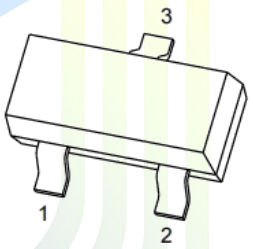


Figure 1 Symbol of VUSG002R52APA

Features

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- ESD Protected

Package Type



1. GATE
2. SOURCE
3. DRAIN

SOT-323

Figure 2 Package Type of VUSG002R52APA

Application

- Load Switching
- Low Current Inverters
- Low Current DC/DC Converters

Ordering Information

Product Name	Package
VUSG002R52APA	SOT-323

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}	±12	V
Continuous Drain Current[Note1]	I_D	-0.66	A
Pulsed Drain Current [Note2]	I_{DM}	-2.0	
Total Power Dissipation[Note4]	P_D	0.3	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]	$R_{\theta JA}$		416		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	I_{GSS}	V_{GS} = ±10V, V_{DS}= 0V			±10	uA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.4	-0.7	-1.0	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D= -0.5A		400	520	mΩ
		V_{GS}=-2.5V, I_D= -0.3A		570	780	
		V_{GS}=-1.8V, I_D= -0.12A		810	1100	
Forward Transconductance[Note3]	g_{FS}	V_{DS}=-5V, I_D= -0.4A		1		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=-10V		79		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		15		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		13		pF
Total Gate Charge	Q_g	V_{DS}=-10V		2.26		nC
Gate-Source Charge	Q_{gs}	V_{GS}=-4.5V		0.45		
Gate-Drain Charge	Q_{gd}	I_D= -0.2A		0.24		
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -10V		8		ns
Turn-on Rise Time	t_r	V_{GS}= -4.5V		5.5		
Turn-off Delay Time	$t_{d(off)}$	R_L=50Ω		30		
Turn-off Fall Time	t_f	R_G=3Ω		17		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= -0.5A			-1.2	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 ≤ 300μs, 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 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

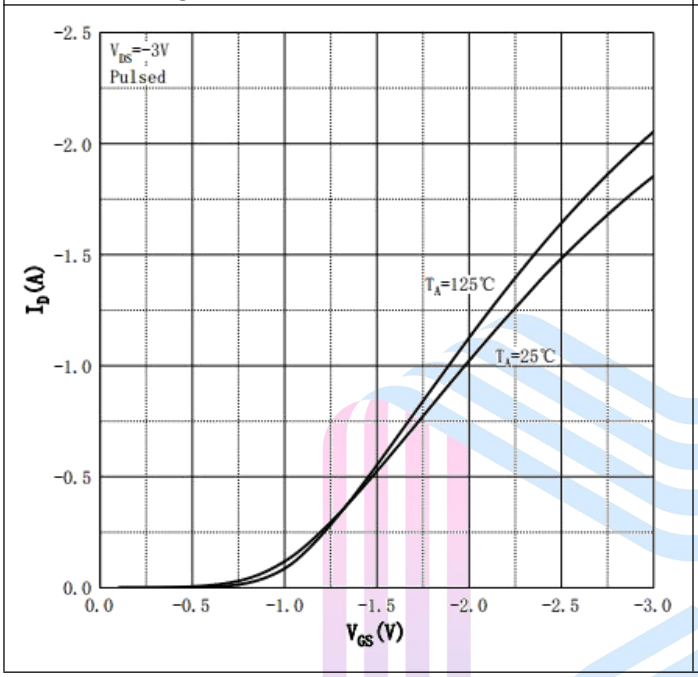


Figure 4: Output Characteristics

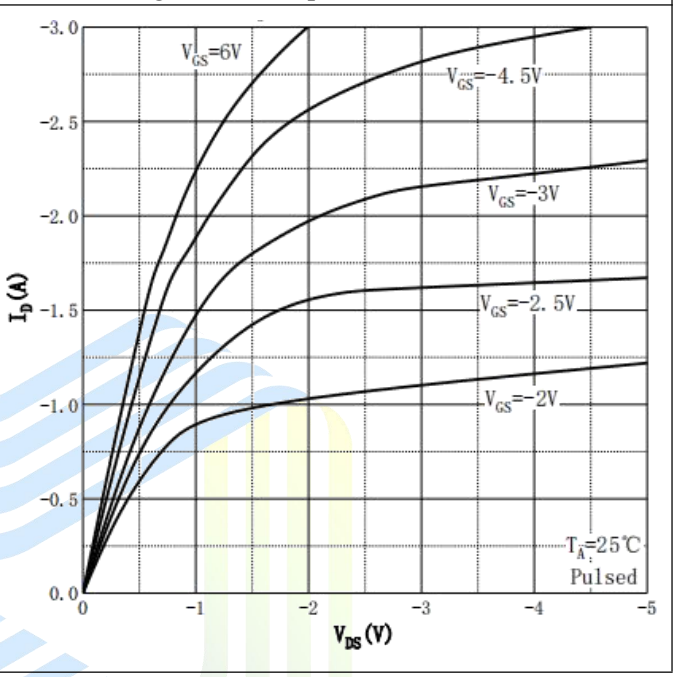


Figure 5: On-Resistance vs. Drain Current

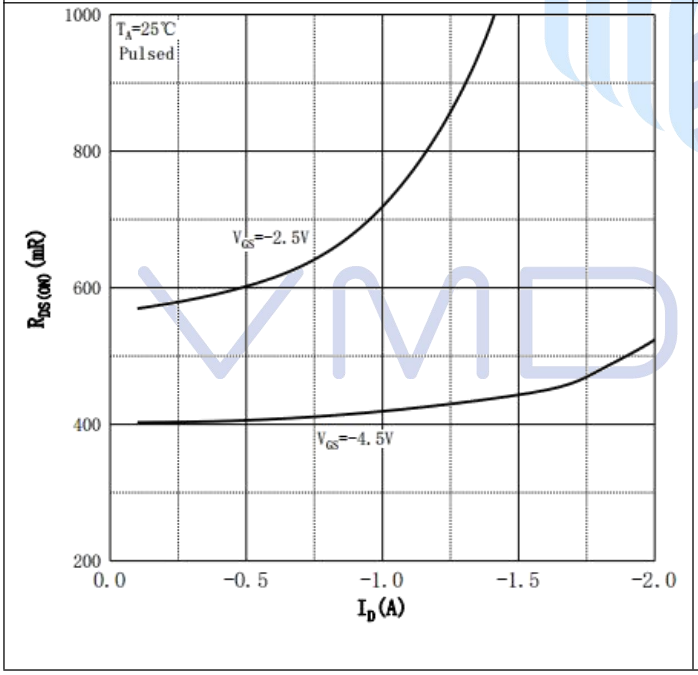


Figure 6: On-Resistance vs. Gate Voltage

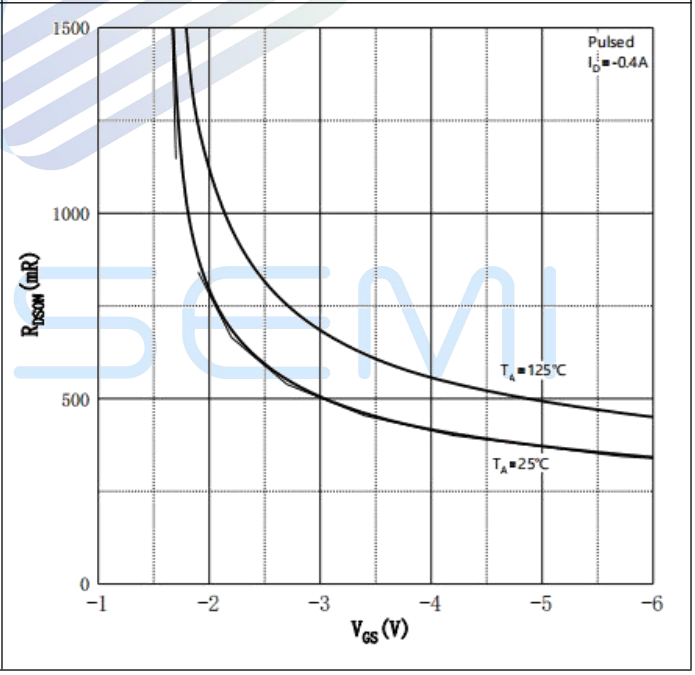


Figure 7: Body Diode Characteristics

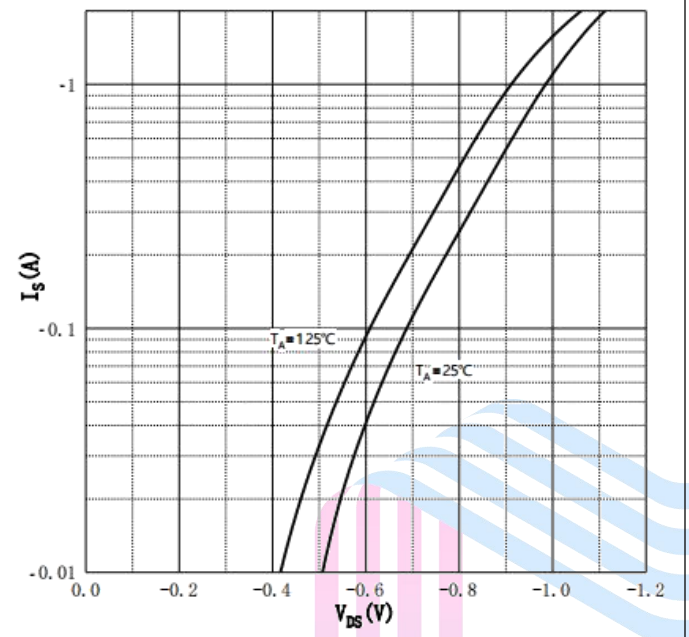
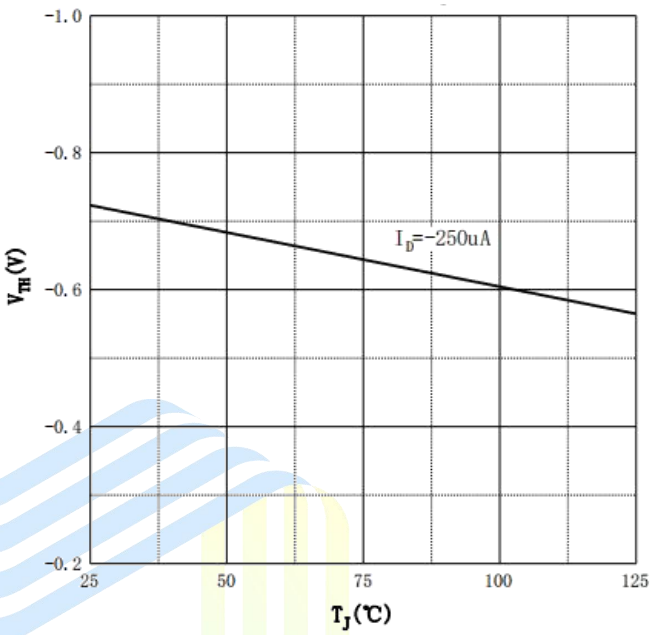
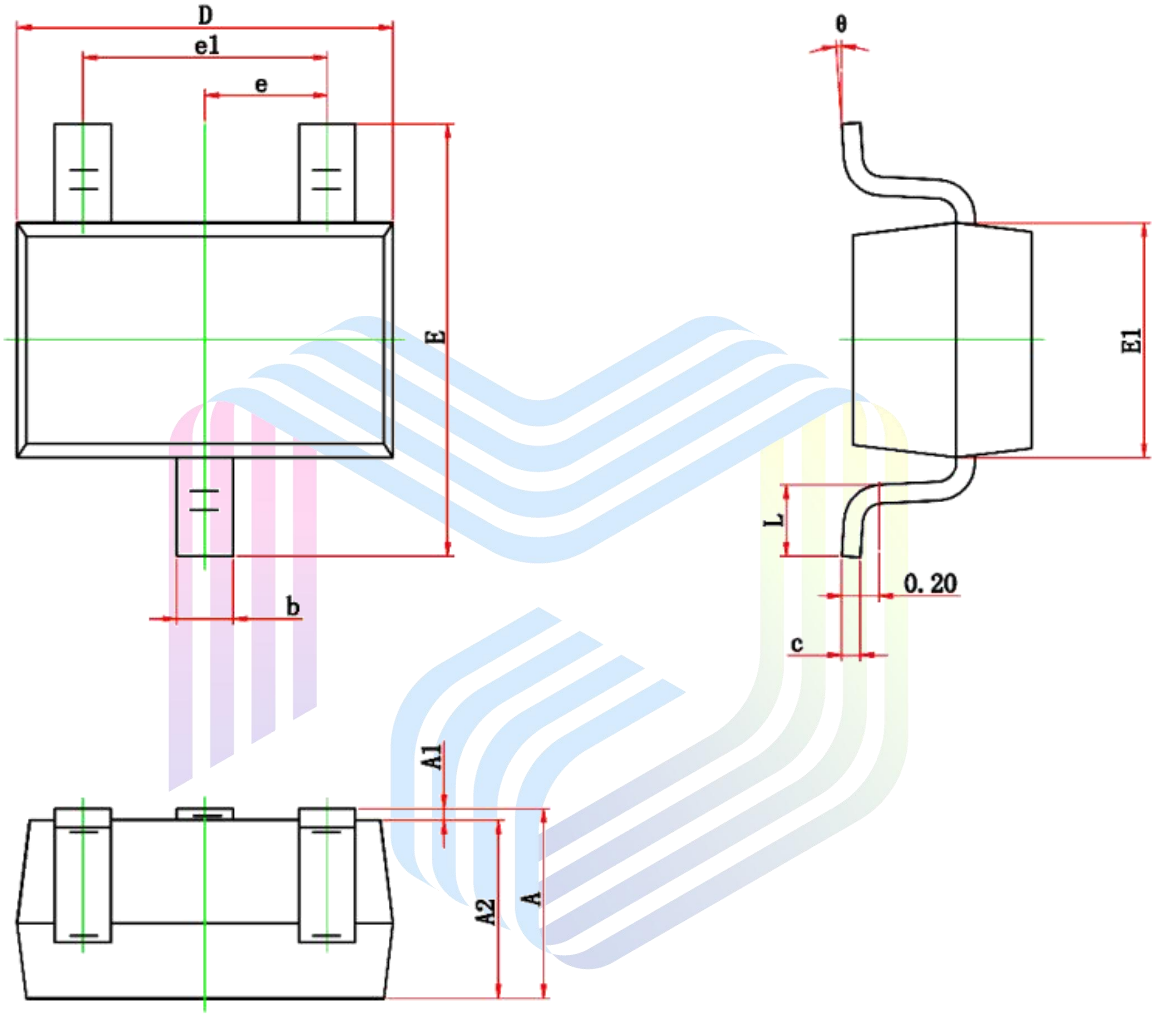


Figure 8: Threshold Voltage



Mechanical Dimensions:

SOT-323 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.050	0.150	0.002	0.006
D	1.900	2.200	0.075	0.087
E	2.000	2.450	0.079	0.096
E1	1.150	1.350	0.045	0.053
e	0.650TYP.		0.026TYP.	
e1	1.200	1.400	0.047	0.055
L	0.200	0.460	0.008	0.018
θ	0°	8°	0°	8°

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