VUSG002R13APA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
-20V	125mΩ@-4.5V	-1.4A
	140mΩ@-2.5V	
	210mΩ@-1.8V	

Symbol

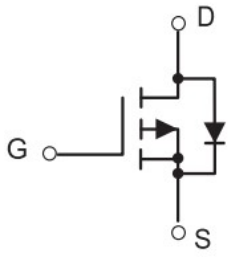
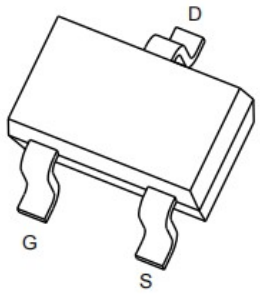


Figure 1 Symbol of VUSG002R13APA

Features

- Leading Trench Technology for Low $R_{DS(on)}$
- Extending Battery Life

Package Type



SOT-323

Figure 2 Package Type of VUSG002R13APA

Application

- High Side Load Switch
- Charging Circuit
- Single Cell Battery Applications

Ordering Information

Product Name	Package
VUSG002R13APA	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}	±10	V
Continuous Drain Current Note1,2	I_D	-1.4	A
Pulsed Drain Current	I_{DM}	-3.0	A
Total Power Dissipation Note1	P_D	0.2	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 Note1,2	$R_{\theta JA}$		625		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} = ±8V, V_{DS}= 0V			±100	nA
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= -1.0A		103	125	mΩ
		V_{GS}= -2.5V, I_D= -0.5A		116	140	
		V_{GS}= -1.8V, I_D= -0.3A		155	210	
Forward tranconductance Note3	g_{FS}	V_{DS}= -10V, I_D= -0.8A		2.7		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}= -10V V_{GS}=0V f=1MHz		321		pF
Output Capacitance	C_{OSS}			55		pF
Reverse Transfer Capacitance	C_{RSS}			45		pF
Switching Parameters						
Total Gate Charge	Q_g	V_{DS}= -10V V_{GS}= -2.5V I_D= -3.0A		3.2		nC
Gate-source Charge	Q_{gs}			0.6		
Gate-drain Charge	Q_{gd}			1.2		
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -4.0V V_{GS}= -4.5V I_D= -1.0A R_G=6.2Ω		5.9		ns
Turn-on Rise Time	t_r			13		
Turn-off Delay Time	$t_{d(off)}$			24		
Turn-off Fall Time	t_f			16		
Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V, I_S= -0.3A			-1.2	V

Notes :

1.$R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR4 board with 1oz. single side copper, in a still air environment with T_A= 25°C.

2.$R_{\theta JA}$ is measured in the steady state

3.Pulse test : Pulse width ≤ 380μs, duty cycle ≤ 2%.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

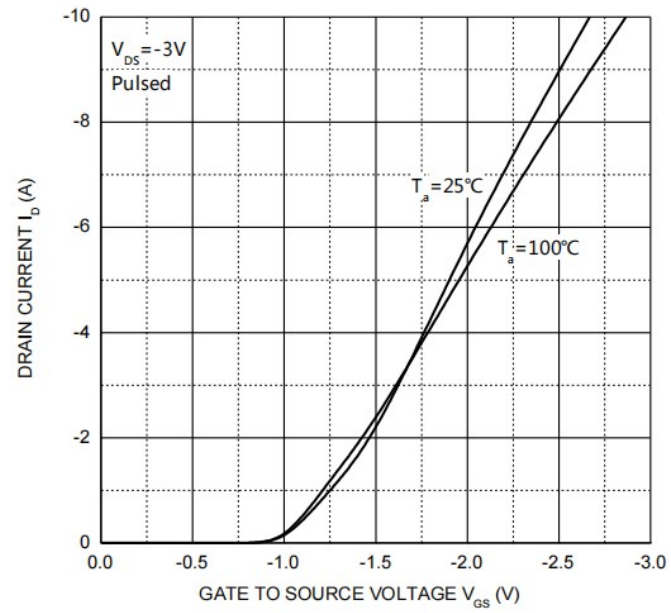


Figure 4: Output Characteristics

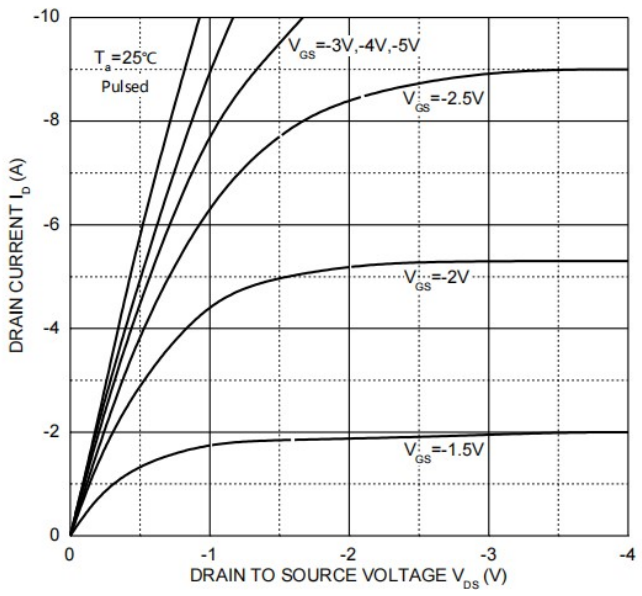


Figure 5: On-Resistance vs. Drain Current

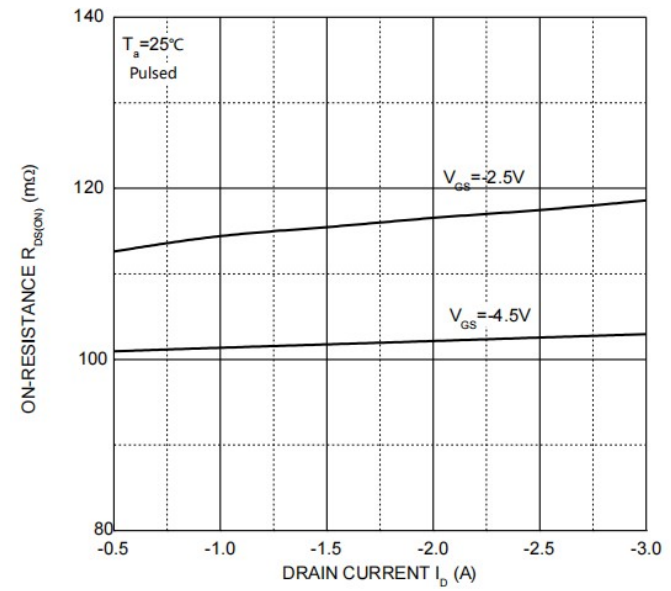


Figure 6: On-Resistance vs. Gate Voltage

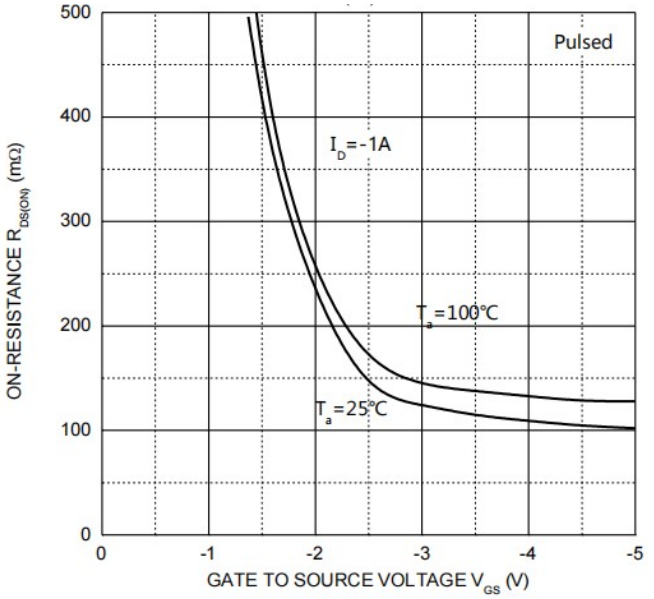


Figure 7: Body Diode Characteristics

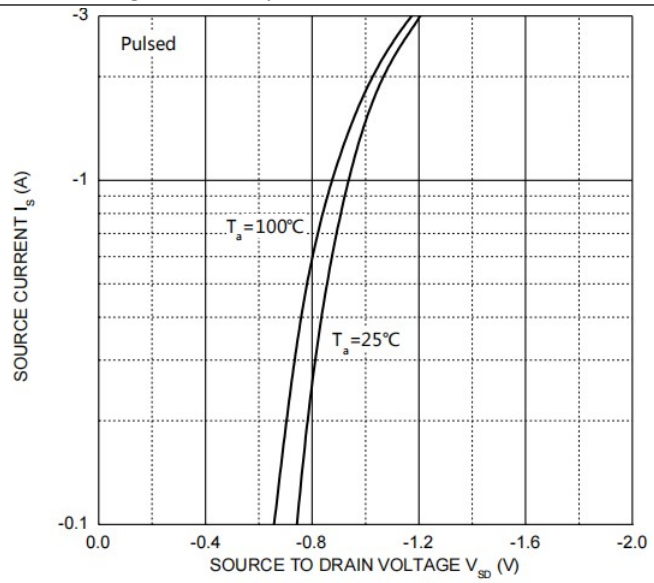
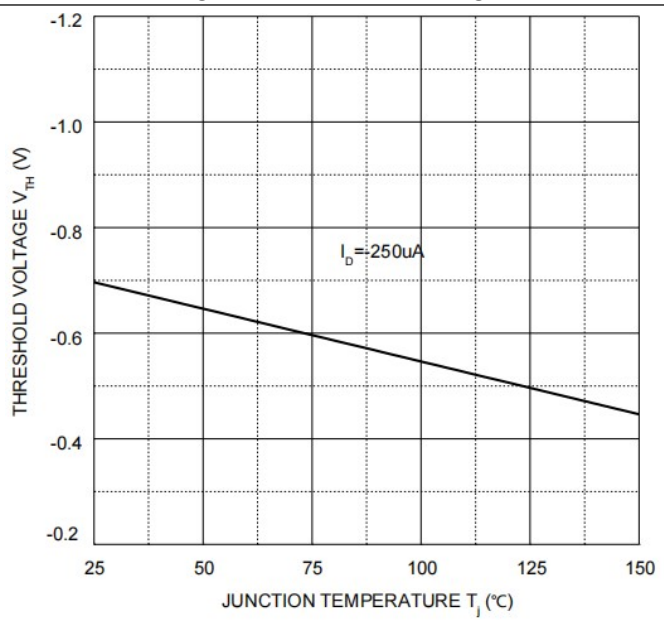
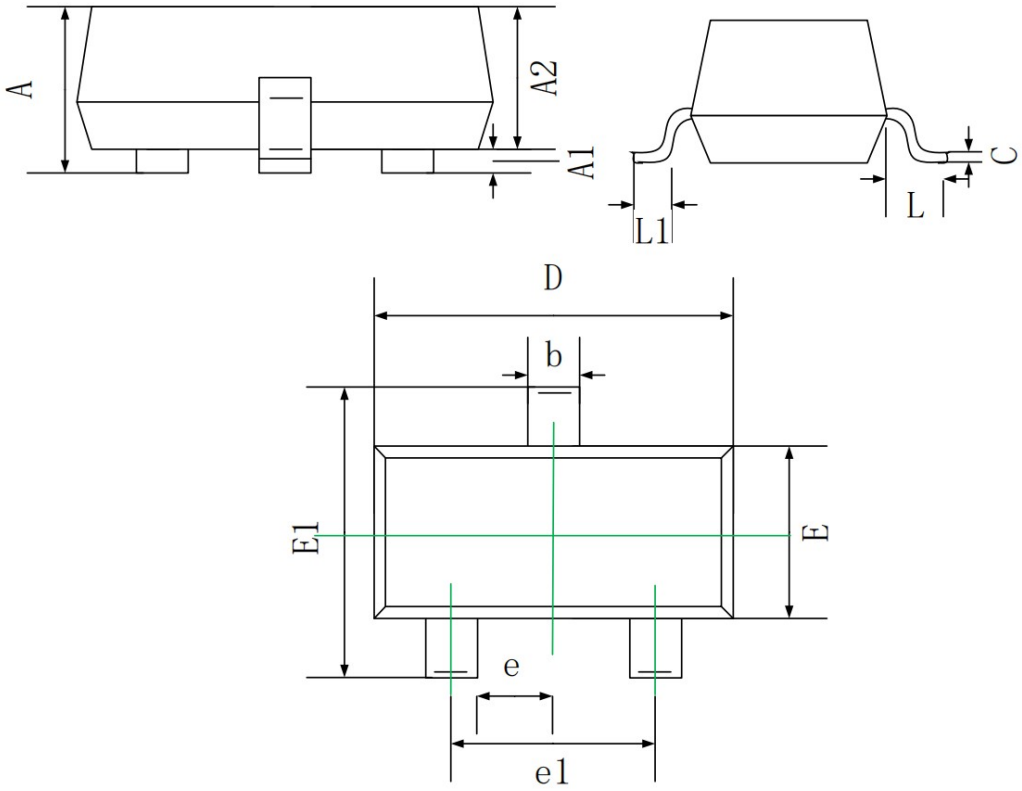


Figure 8: Threshold Voltage



Mechanical Dimensions:

SOT-323 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.00
b	0.30	0.50
c	0.10	0.15
D	2.00	2.20
E	1.15	1.35
E1	2.15	2.40
e	0.650 TYP.	
e1	1.20	1.40
L	0.525 REF.	
L1	0.26	0.46

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