VUSG002R630NA

Datasheet

63mΩ, 20V, N-Channel Power MOSFET VUSG002R630NA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
20V	63mΩ@4.5V	3A
	72mΩ@2.5V	
	89mΩ@1.8V	

Symbol

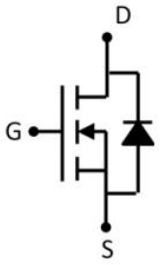
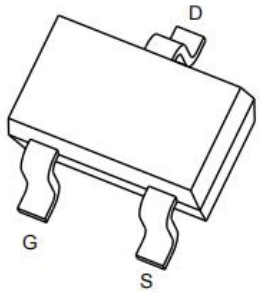


Figure 1 Symbol of VUSG002R630NA

Features

- Excellent $R_{DS(on)}$ and Low Gate Charge
- Trench FET Power MOSFET

Package Type



SOT-323

Figure 2 Package Type of VUSG002R630NA

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Small Portable Electronics

Ordering Information

Product Name	Package
VUSG002R630NA	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	3	A
Pulsed Drain Current[Note2]	I_{DM}	9	A
Total Power Dissipation [Note4]	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[Note5]	$R_{\theta JA}$		819		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} = ±12V, V_{DS}= 0V			±0.1	uA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.4	0.6	1.0	V
Drain-source on-resistance[Note3]	$R_{DS(on)}$	V_{GS}= 4.5V, I_D= 4A		48	63	
		V_{GS}= 2.5V, I_D=2.5A		55	72	
		V_{GS}= 1.8V, I_D= 1.5A		69	89	
Forward tranconductance[Note3]	g_{FS}	V_{DS}= 5V, I_D= 4A	10			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=10V		480		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		85		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		65		pF
Total gate charge	Q_g	V_{DS}=10V		6.8		nC
Gate-source charge	Q_{gs}	V_{GS}=4.5V		1.1		nC
Gate-drain charge	Q_{gd}	I_D= 4A		2.8		nC
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 10V		12		ns
Turn-on Rise Time	t_r	V_{GEN}=4.5V		80		
Turn-off Delay Time	$t_{d(off)}$	R_L=5.5Ω		26		
Turn-off Fall Time	t_f	R_{GEN}=6Ω, I_D= 4A		13		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= 1.0A		0.7	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 PD 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 TA =25°C.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

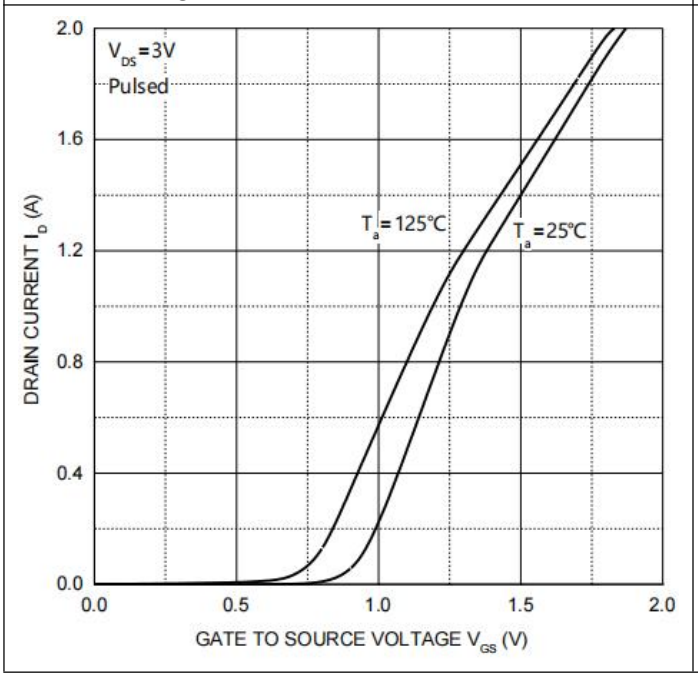


Figure 4: Output Characteristics

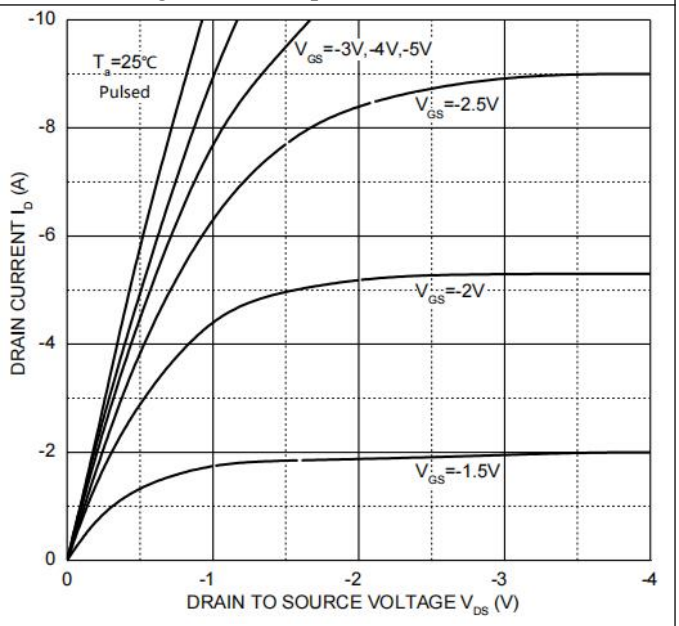


Figure 5: On-Resistance vs. Drain Current

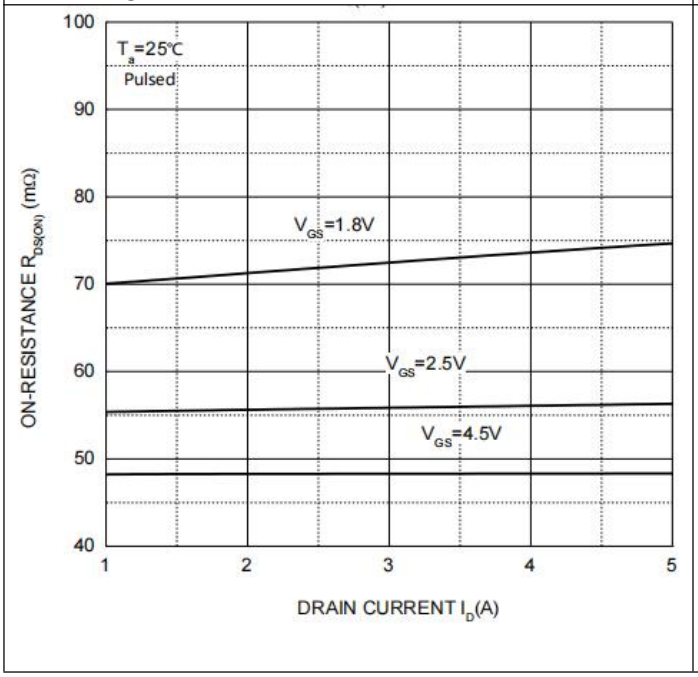


Figure 6: On-Resistance vs. Gate Voltage

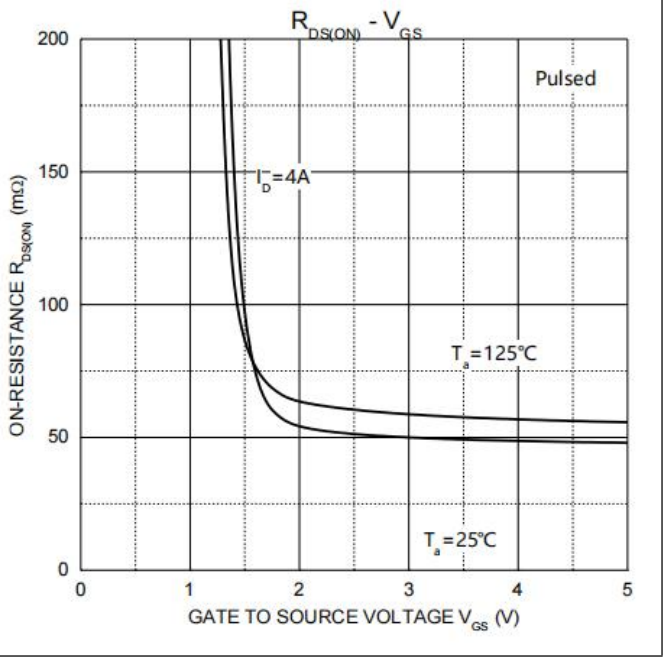


Figure 7: Body Diode Characteristics

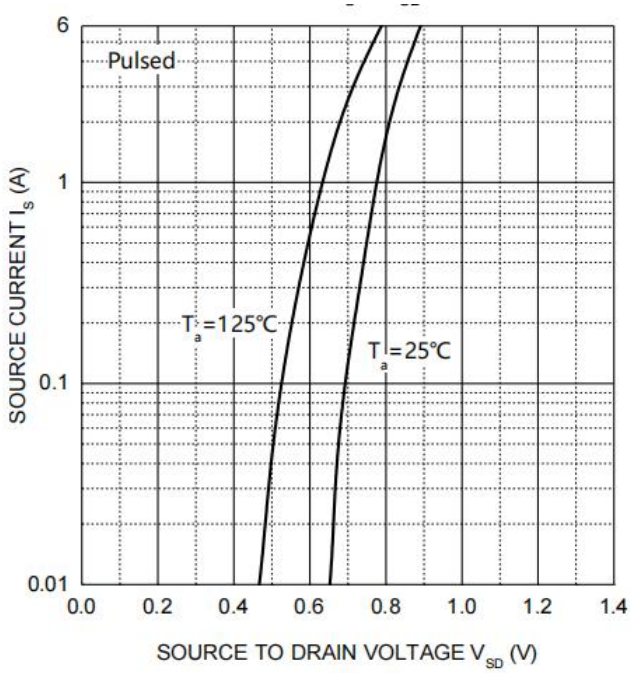
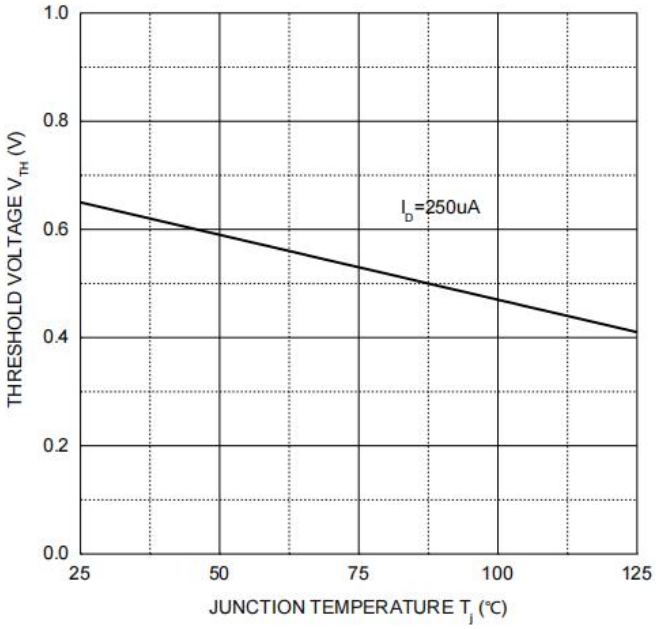
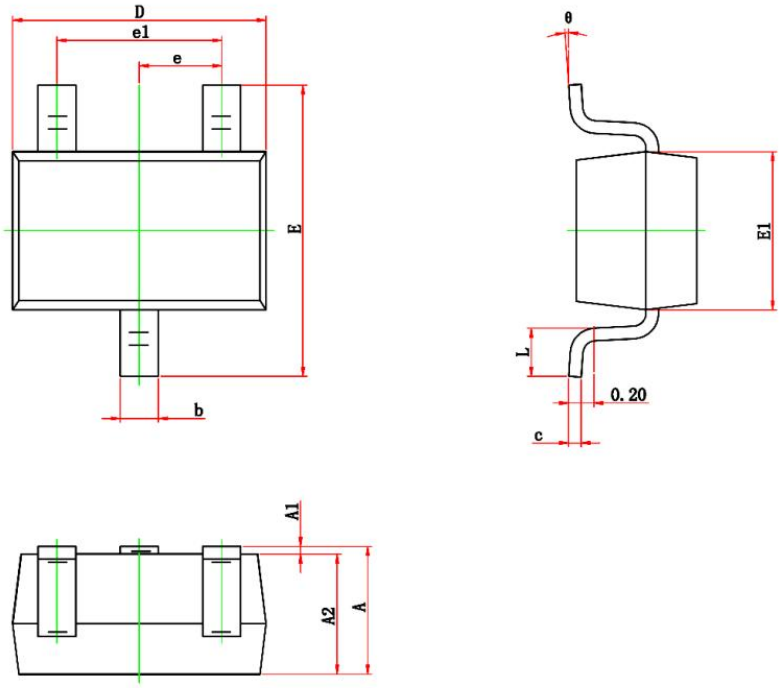


Figure 8: Threshold Voltage



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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