VUSK002R30ANA

Datasheet

General Description

VUSK002R30ANA MOSFET is based on unique device design to achieve low $R_{DS(ON)}$,ESD Protected Up to 2.0KV (HBM).

Symbol

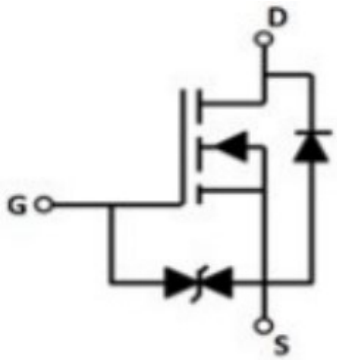


Figure 1 Symbol of VUSK002R30ANA

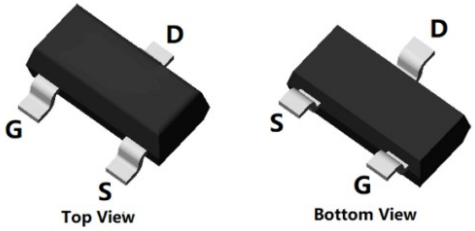
Features

- $R_{DS(ON)\_max}$ = 300.0mΩ@V_{GS} = 4.5V
- $R_{DS(ON)\_max}$ = 400mΩ@V_{GS} = 2.5V
- Trench Power LV MOSFET technology
- High Power and current handing capability

Application

- Load Switch
- Power Management
- Interfacing, Logic switch

Package Type



SOT-523

Figure 2 Package Type of VUSK002R30ANA

Ordering Information

Product Name	Package
VUSK002R30ANA	SOT-523

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	T_A = 25℃@Steady state	I_D	0.5	A
Continuous Drain Current	T_A = 70℃@Steady state		0.4	A
Pulsed Drain Current[Note1]		I_{DM}	3.3	A
Total Power Dissipation	T_A = 25℃	P_D	0.18	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 [Note2]	$R_{\theta JA}$		694		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}= 20V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±10V, V_{DS}= 0V		±2.0	±10	uA
		V_{GS} = ±8V, V_{DS}= 0V		±0.5	±2	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D= 250uA	0.35	0.75	1.1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 4.5V, I_D= 0.5A		220	300	mΩ
		V_{GS}= 2.5V, I_D= 0.4A		290	400	
		V_{GS}= 1.8V, I_D= 0.2A		420	700	
Gate Resistance	R_g	F=1MHz,Open drain		50		Ω
Dynamic Characteristics Note2						
Input Capacitance	C_{ISS}	V_{DS}= 10V		56		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		20		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		2.5		pF
Switching Parameters Note3						
Gate to Source Charge	Q_{gs}	V_{DS}= 10V		0.28		nC
Gate to Drain Charge	Q_{gd}	V_{GS}= 4.5V		0.22		
Gate Charge Total	Q_g	I_D= 0.5A		1.0		
Reverse Recovery Charge	Q_{rr}	I_F= 0.5A		0.4		
Reverse Recovery Time	t_{rr}	di/dt=20A/us		14.4		ns
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 10V		2		
Turn-on Rise Time	t_r	V_{GS}= 4.5V		18.8		
Turn-off Delay Time	$t_{d(off)}$	I_D= 0.5A		10		
Turn-off Fall Time	t_f	R_G=10Ω		23		
Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V, I_S= 0.5A			1.2	V
Maximum Body-Diode Continuous Current	I_S				0.5	A

Notes :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. These parameters have no way to verify.
3. Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

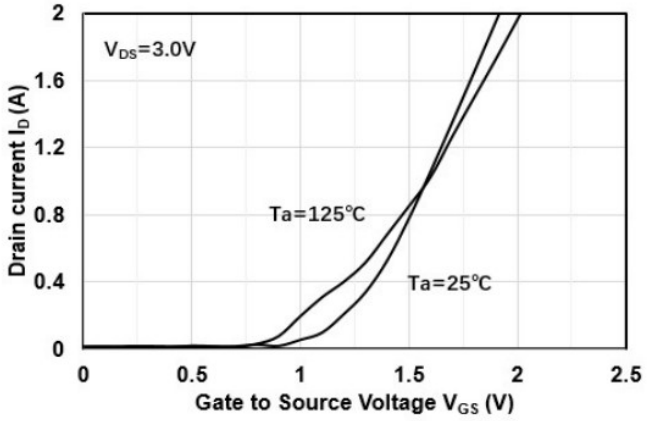


Figure 4: Output Characteristics

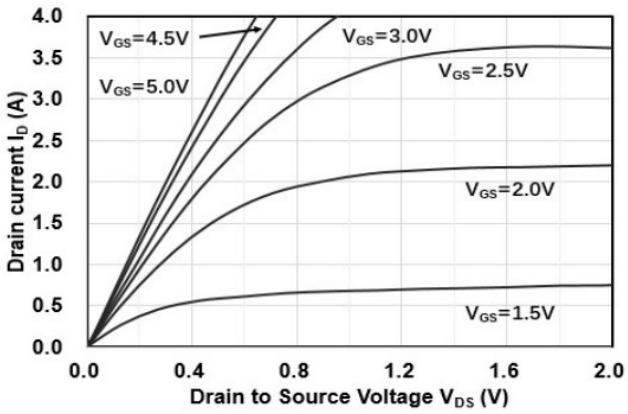


Figure 5: On-Resistance vs. Drain Current and Gate Voltage

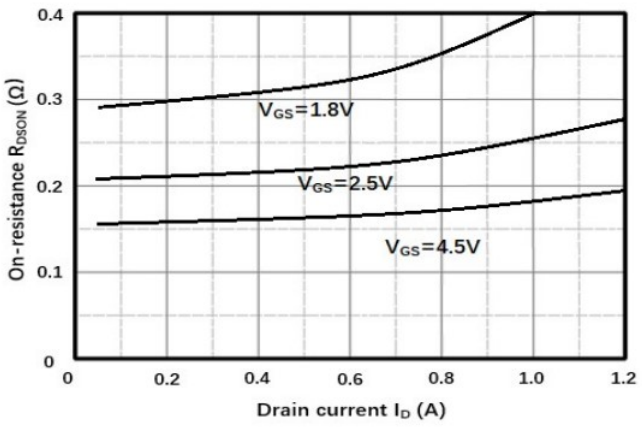


Figure 6: On-Resistance vs. Junction Temperature

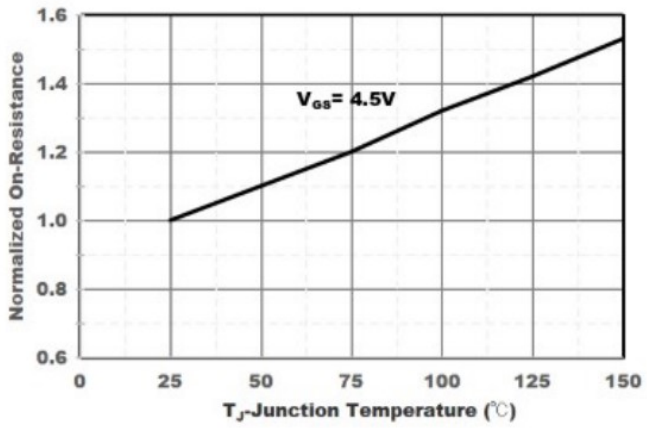


Figure 7: Capacitance Characteristics

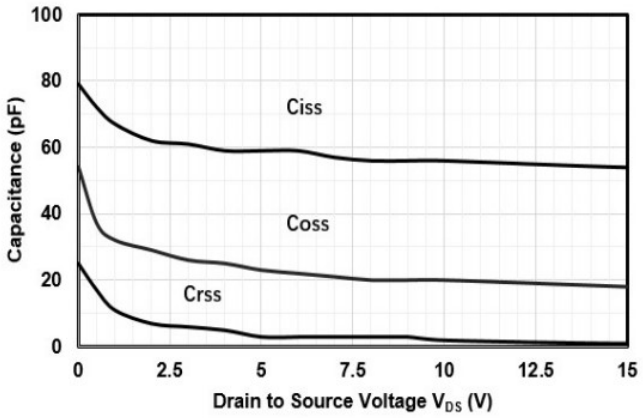


Figure 8: Gate Charge

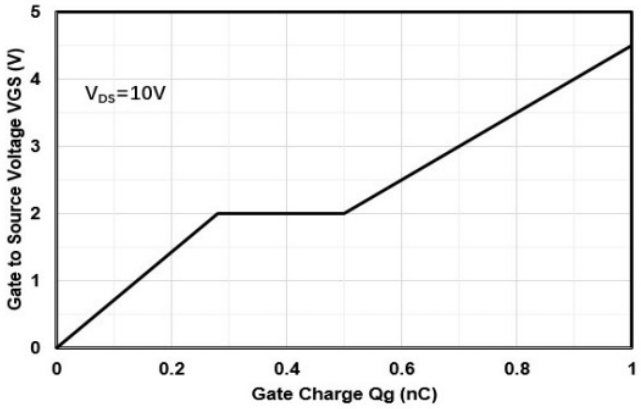


Figure 9: Safe Operation Area

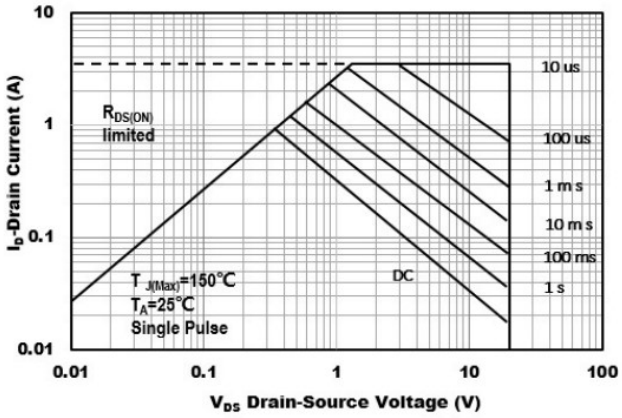
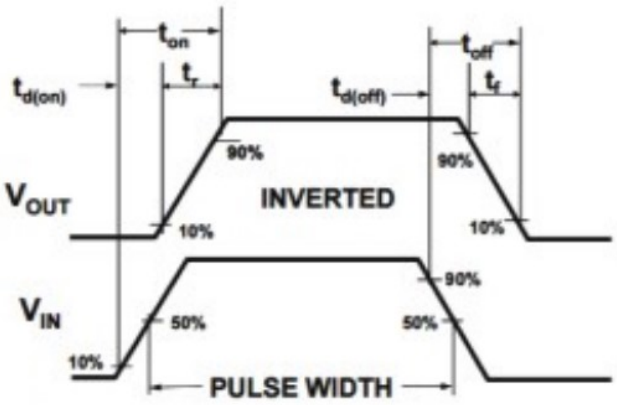
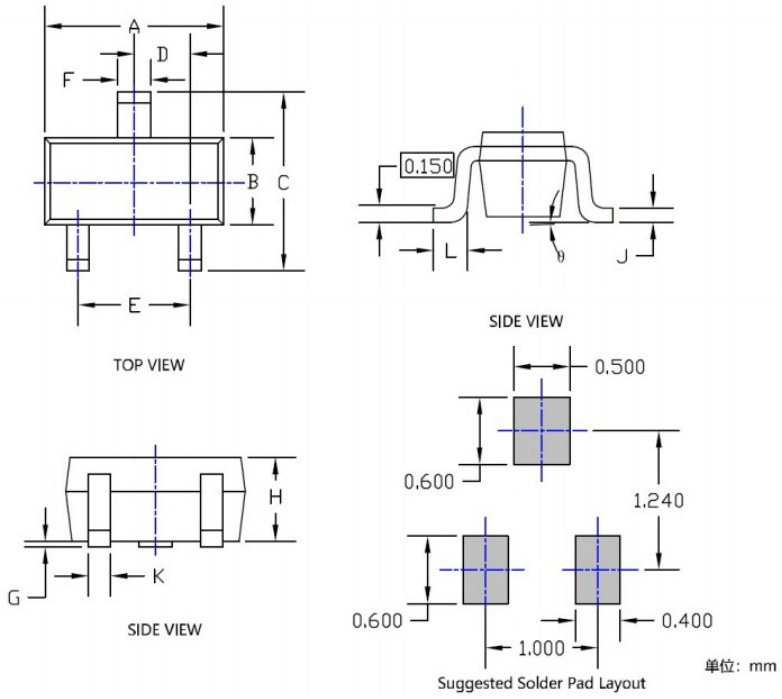


Figure 10: Switching Wave



Mechanical Dimensions:

SOT-523 Package Information



Symbol	Dimensions In Millimeters				Dimensions In Inches		
	Min.	NOM.	Max.		Min.	NOM.	Max.
A	0.059	0.063	0.067		1.500	1.600	1.700
B	0.030	0.031	0.033		0.750	0.800	0.850
C	0.057	0.063	0.069		1.450	1.600	1.750
D	0.020TYP				0.500TYP		
E	0.035	0.039	0.043		0.900	1.000	1.100
F	0.010	0.014	0.018		0.250	0.350	0.450
G	0.000	--	0.004		0.000	--	0.100
H	0.024	0.028	0.031		0.600	0.700	0.800
J	0.004	--	0.008		0.100	--	0.200
K	0.006	0.010	0.014		0.150	0.250	0.350
L	0.010	--	0.018		0.260	--	0.460
θ	0°	--	8°		0°	--	8°

Note:

1. Package body sizes exclude mode flash and gate burrs.
2. Tolerance 0.1mm unless otherwise specified.
3. The pad layout is for reference purposes only.

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