VUSP002R380NA

Datasheet

38mΩ, 20V, N-Channel Power MOSFET VUSP002R380NA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
20V	38mΩ@10V	4A
	50mΩ@4.5V	
	80mΩ@2.5V	

Symbol

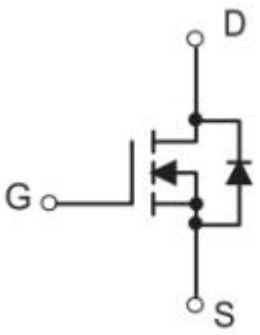
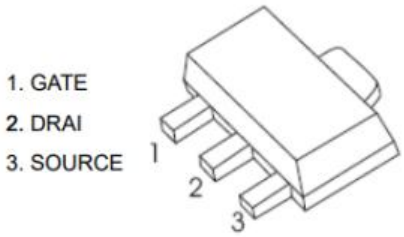


Figure 1 Symbol of VUSP002R380NA

Features

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

Package Type



SOT-89-3L

Figure 2 Package Type of VUSP002R380NA

Application

- DC/DC Converter
- Load Switch

Ordering Information

Product Name	Package
VUSP002R380NA	SOT-89-3L

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	T_A= 25 ºC	I_D	4	A
Pulsed Drain Current Note2		I_{DM}	16	A
Total Power Dissipation Note4	T_A= 25 ºC	P_D	0.48	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	$R_{\theta JA}$		85		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			±100	nA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.4	0.65	1	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 4A		18	38	mΩ
		V_{GS}= 4.5V, I_D= 3A		20	50	
		V_{GS}= 2.5V, I_D= 4A		25	80	
Forward tranconductance[Note3]	g_{FS}	V_{DS}= 4.5V, I_D= 4A	3			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=10V		336		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		78		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		70		pF
Total gate charge	Q_g	V_{DS}=10V		6		nC
Gate-source charge	Q_{gs}	V_{GS}=4.5V		1		nC
Gate-drain charge	Q_{gd}	I_D= 4A		1.7		nC
Gate Resistance	R_g	f=1MHz,open drain		1.6		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 10V		4		ns
Turn-on Rise Time	t_r	V_{GEN}=4.5V		15		
Turn-off Delay Time	$t_{d(off)}$	R_L=2.5Ω		20		
Turn-off Fall Time	t_f	R_{GEN}=3Ω		25		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= 4A			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 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

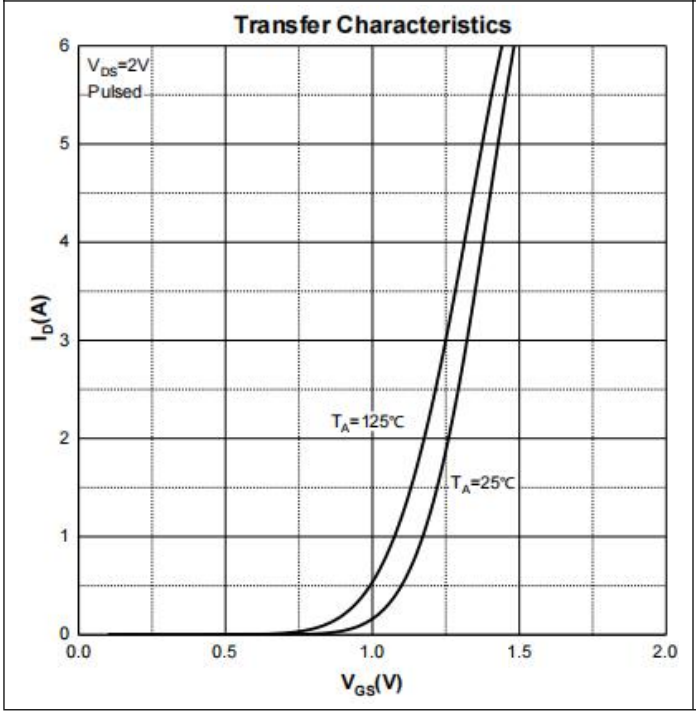


Figure 4: Output Characteristics

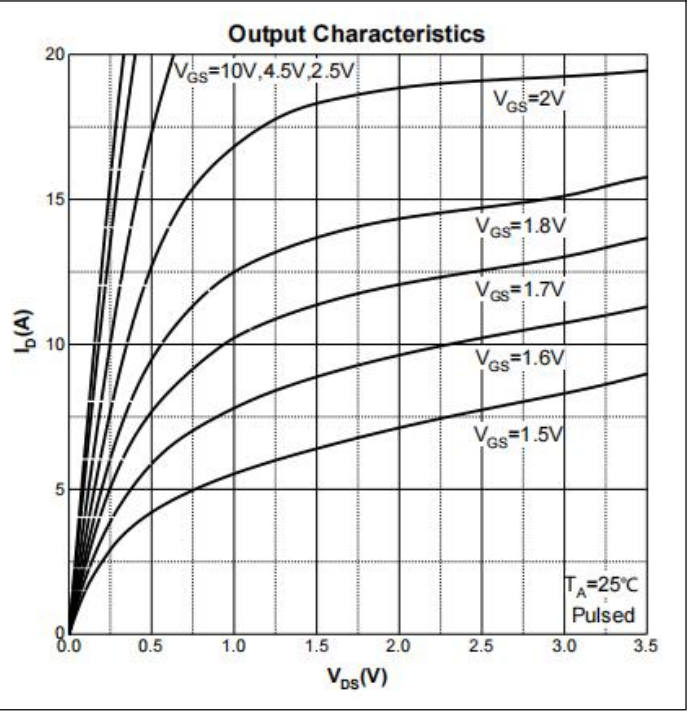


Figure 5: On-Resistance vs. Drain Current

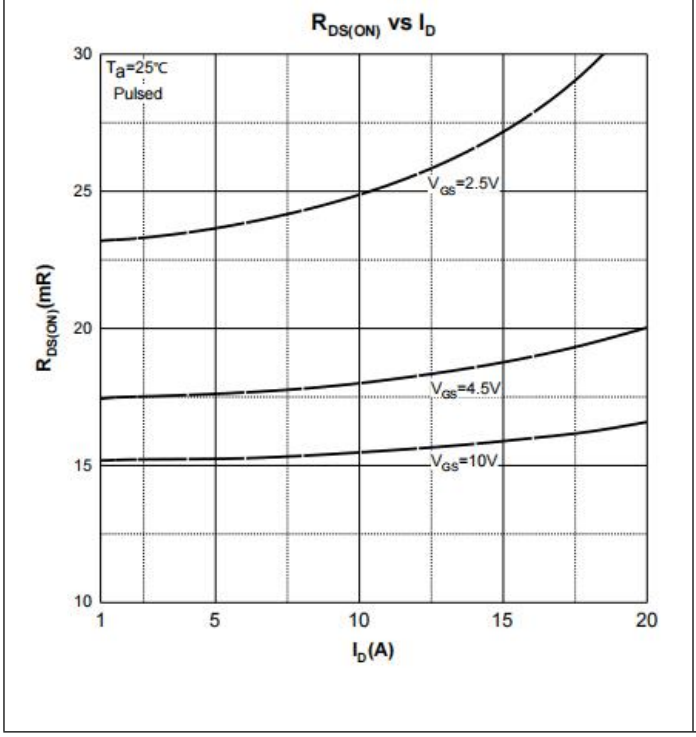


Figure 6: On-Resistance vs. Gate Voltage

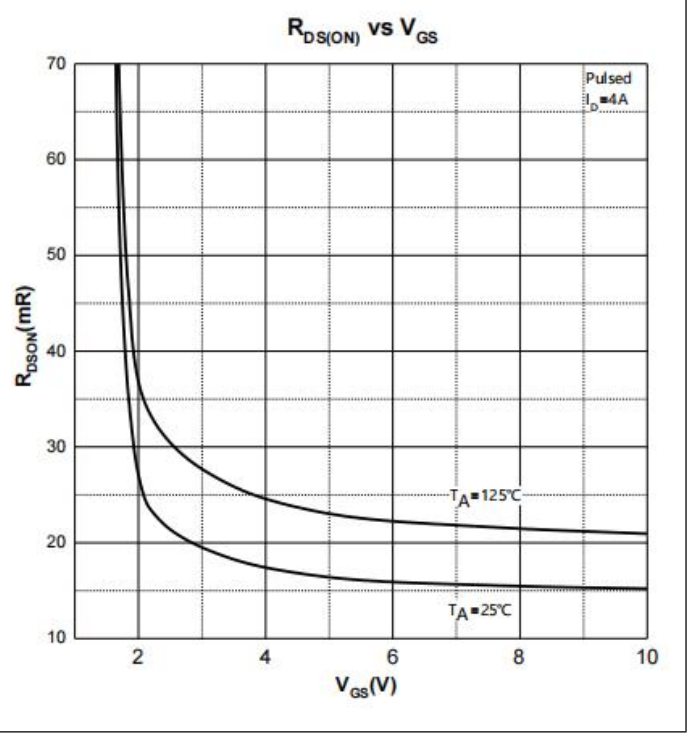
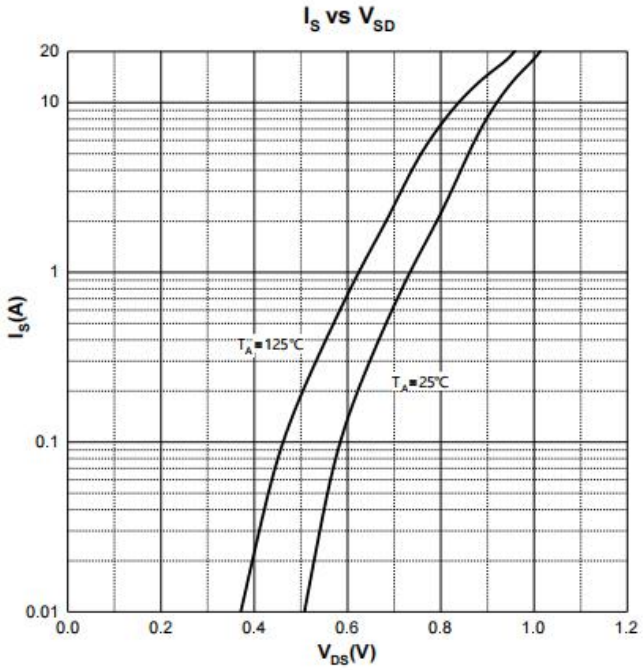
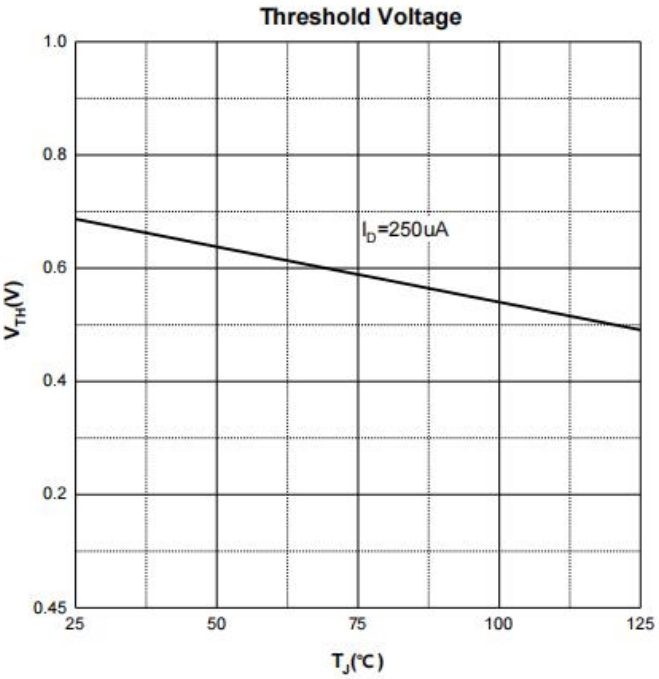


Figure 7: Body Diode Characteristics	Figure 8: Threshold Voltage

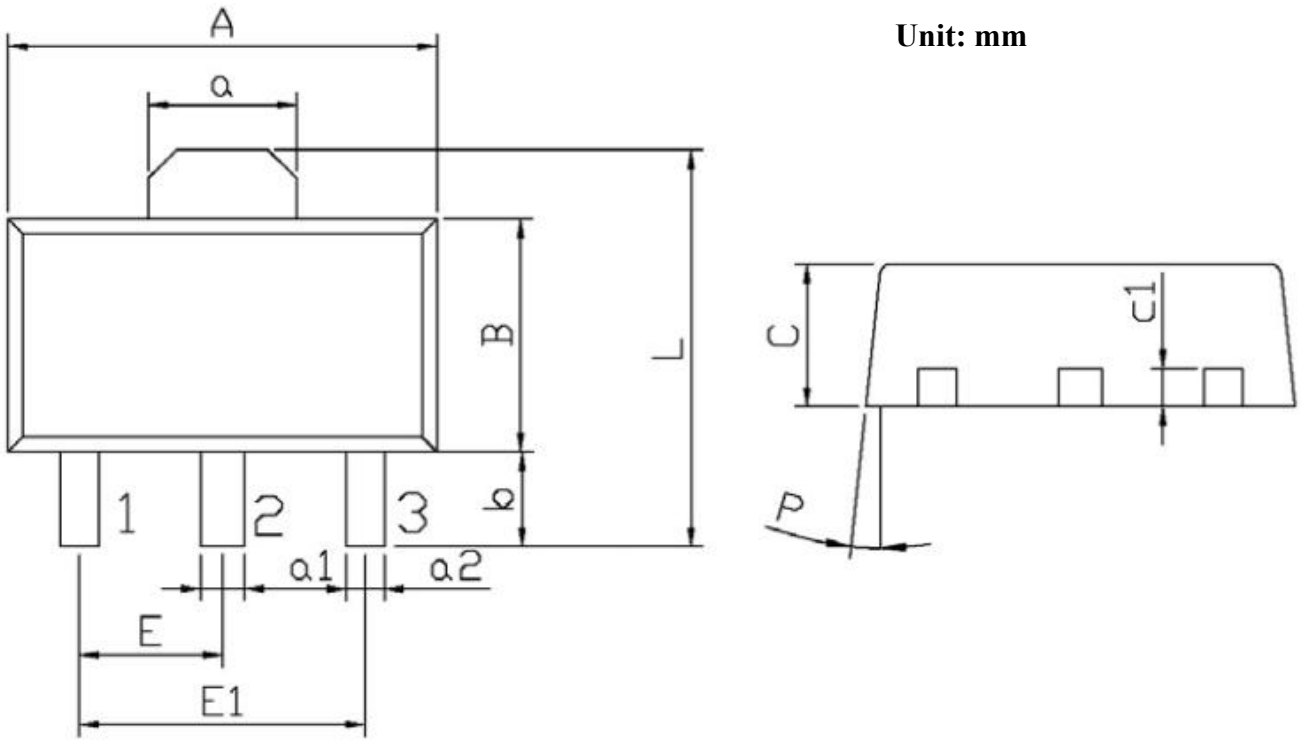




Mechanical Dimensions:

SOT-89-3LPackage Information

Unit: mm



Symbol	Dimensions In Millmeters		Symbol	Dimensions In Millmeters	
	Min	Max		Min	Max
A	4.4	4.7	a1	0.36	0.56
B	2.35	2.65	a2	0.30	0.50
L	3.878	4.478	C	1.40	1.70
a	1.45	1.65	c1	0.35	0.50
E	1.40	1.60	P	6°	
E1	2.80	3.20			
b	0.80	1.20			

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