VUTL006R380NA

Datasheet

38mΩ, 60V, N-Channel Power MOSFET VUTL006R380NA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
60V	38mΩ@10V	20A

Symbol

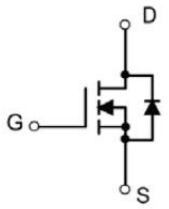
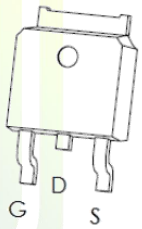


Figure 1 Symbol of VUTL006R380NA

Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

Package Type



TO-252

Figure 2 Package Type of VUTL006R380NA

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible Power Supply

Ordering Information

Product Name	Package
VUTL006R380NA	TO-252

Absolute Maximum Ratings (T_C= 25 ºC, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current[Note1]	I_D	20	A
Pulsed Drain Current [Note2]	I_{DM}	60	
Single Pulse Avalanche Energy[Note6]	E_{AS}	72	mJ
Total Power Dissipation[Note4]	P_D	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]	$R_{\theta JA}$		41.7		ºC/W

Electrical Characteristics (T_C= 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	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 60V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	2	3	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=10V, I_D= 10A		29	38	mΩ
Forward tranconductance[Note3]	g_{FS}	V_{DS}= 6V, I_D=10A	18			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=30V		780		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		52		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		26		pF
Total Gate Charge	Q_g	V_{DS}=30V		17		nC
Gate-Source Charge	Q_{gs}	V_{GS}=10V		4.1		
Gate-Drain Charge	Q_{gd}	I_D=10A		4.5		
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 30V		5		ns
Turn-on Rise Time	t_r	V_{GS}= 10V		2.6		
Turn-off Delay Time	$t_{d(off)}$	R_L=15Ω		17		
Turn-off Fall Time	t_f	R_G=2.5Ω		2.5		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= 1A, T_J= 25 ºC			1.2	V
Continuous Source Current	IS	V_G=V_D=0V,Force Current			20	A

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 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

6.E_{AS} condition: V_{DD}=30V,L=0.5mH, R_G=25Ω , Starting T_J = 25°C

Typical Performance Characteristics

Figure 3: Transfer Characteristics

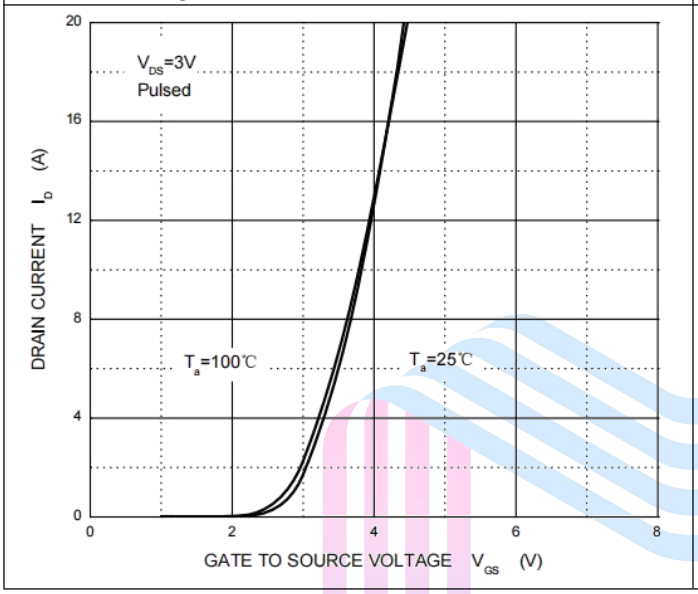


Figure 4: Output Characteristics

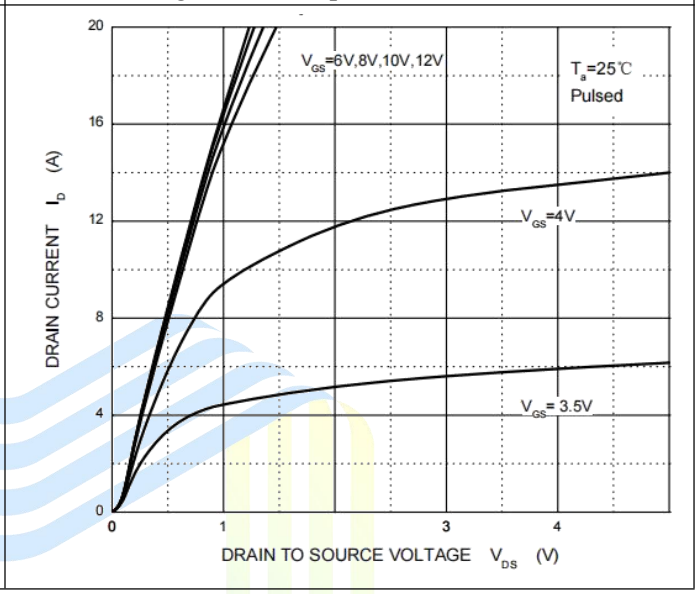


Figure 5: On-Resistance vs. Drain Current

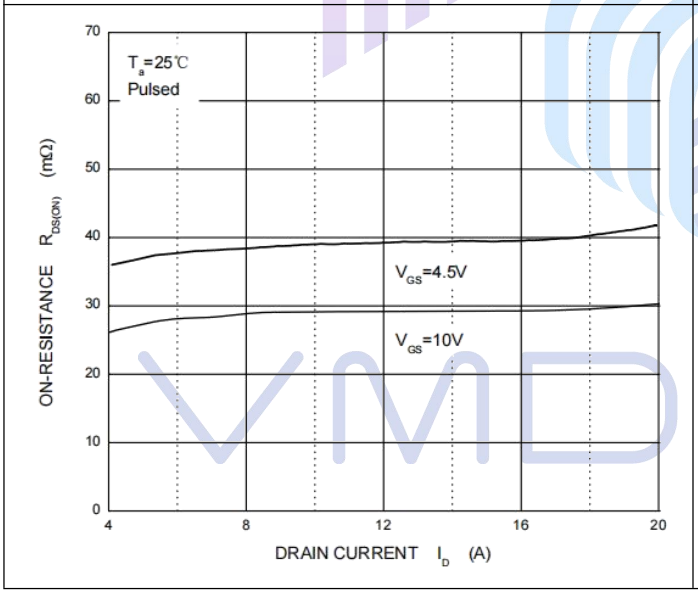


Figure 6: On-Resistance vs. Gate Voltage

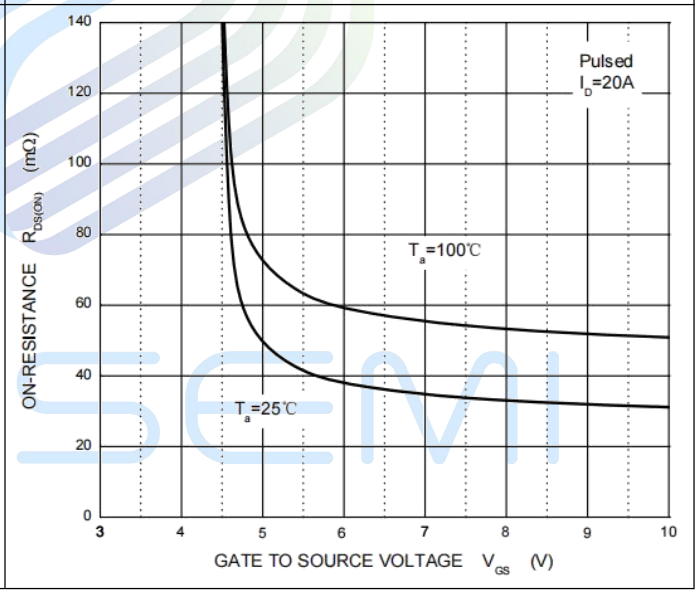


Figure 7: Body Diode Characteristics

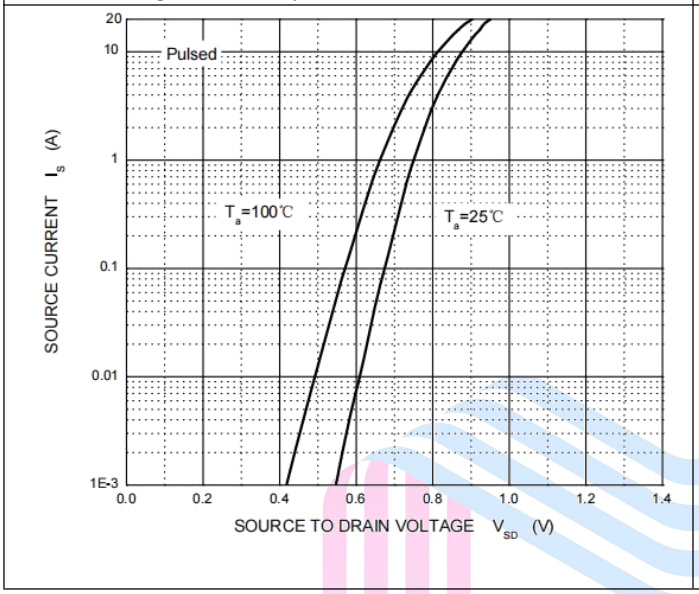
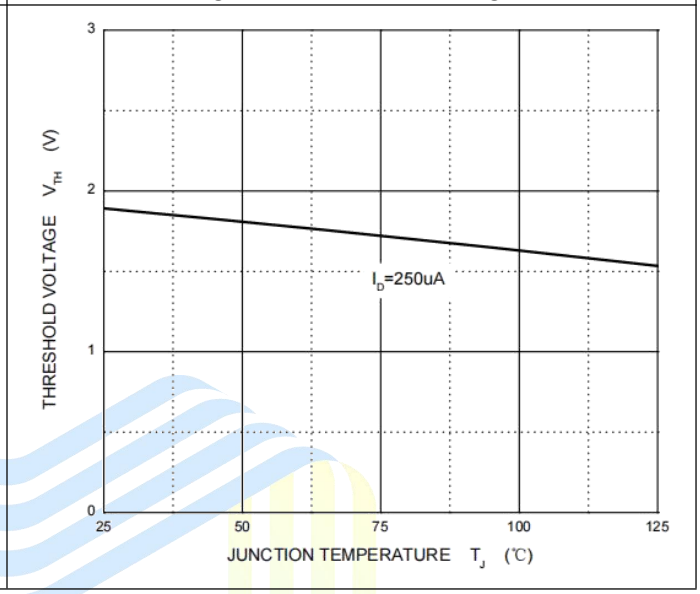
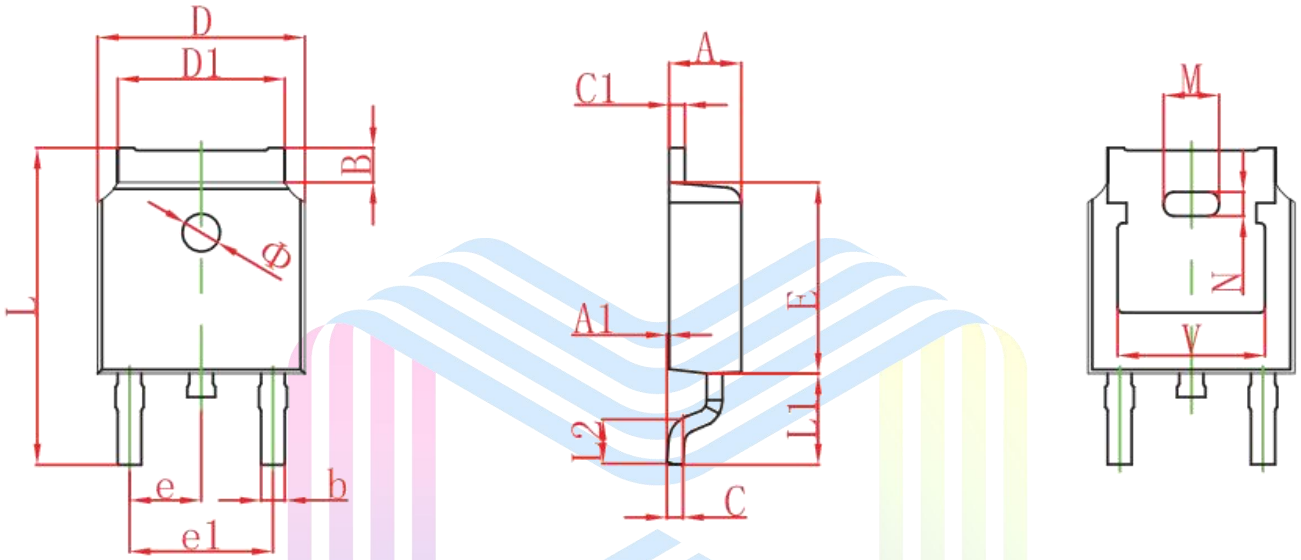


Figure 8: Threshold Voltage



Mechanical Dimensions:

TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778REF.		0.070REF.	
N	0.762REF.		0.018REF.	
L	9.800	10.400	0.386	0.409
L1	2.9REF.		0.114REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
Φ	1.100	1.300	0.043	0.051

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