



VMDSEMI

VUTL003R040NA

Datasheet



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General Description
Symbol

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
30V	4.0mΩ@10V	110A
	5.8mΩ@4.5V	

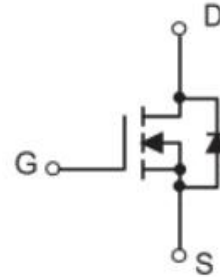
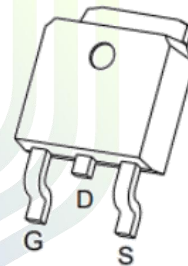


Figure 1 Symbol of VUTL003R040NA

Features

- Excellent package for good heat dissipation
- Low Gate Charge
- Low reverse transfer capacitance
- Fast switching capability
- Avalanche energy specified

Package Type

TO-252-2L
Application

- Power Switch Application
- DC/DC Converter

Figure 2 Package Type of VUTL003R040NA

Ordering Information

Product Name	Package
VUTL003R040NA	TO-252-2L

Absolute Maximum Ratings ($T_A = 25\text{ °C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ^{Note1}	I_D	110	A
Pulsed Drain Current ^{Note2}	I_{DM}	440	
Single Pulsed Avalanche Energy ^{Note3}	E_{AS}	306	mJ
Total Power Dissipation ^{Note5,6}	P_D	70	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		1.8		°C/W

Electrical Characteristics ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage ^{Note4}	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	3.0	V
Static Drain-Source On-Resistance ^{Note4}	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		2.6	4.0	mΩ
		$V_{GS}=4.5V, I_D=20A$		3.8	5.8	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=15V$		5615		pF
Output Capacitance	C_{OSS}	$V_{GS}=0V$		580		pF
Reverse Transfer Capacitance	C_{RSS}	$f=1MHz$		497		pF
Total Gate Charge	Q_g	$V_{DS}=25V$		64.1		nC
Gate-Source Charge	Q_{gs}	$V_{GS}=10V$		8.4		
Gate-Drain Charge	Q_{gd}	$I_D=14A$		22.4		
Gate Resistance	R_g	$f=1MHz, \text{Open drain}$		1.0		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V$		12		ns
Turn-on Rise Time	t_r	$V_{GS}=10V$		36		
Turn-off Delay Time	$t_{d(off)}$	$R_L=0.75\Omega$		49		
Turn-off Fall Time	t_f	$R_G=3\Omega$		12		
Diode Characteristics						
Diode Forward Voltage ^{Note4}	V_{SD}	$V_{GS}=0V, I_S=20A$			1.2	V
Continuous diode forward current	I_S				110	A
Pulsed diode forward current	I_{SM}				440	

Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD}=15V, V_{GS}=10V, L=0.5mH, I_{AS}=35A, R_G=25\Omega$ Starting $T_J=25^\circ C$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)}=150^\circ C$.And device mounted on a large heatsink
- 6.Device mounted on a glass epoxy board of 25.4mmx25.4mmx0.8mmt

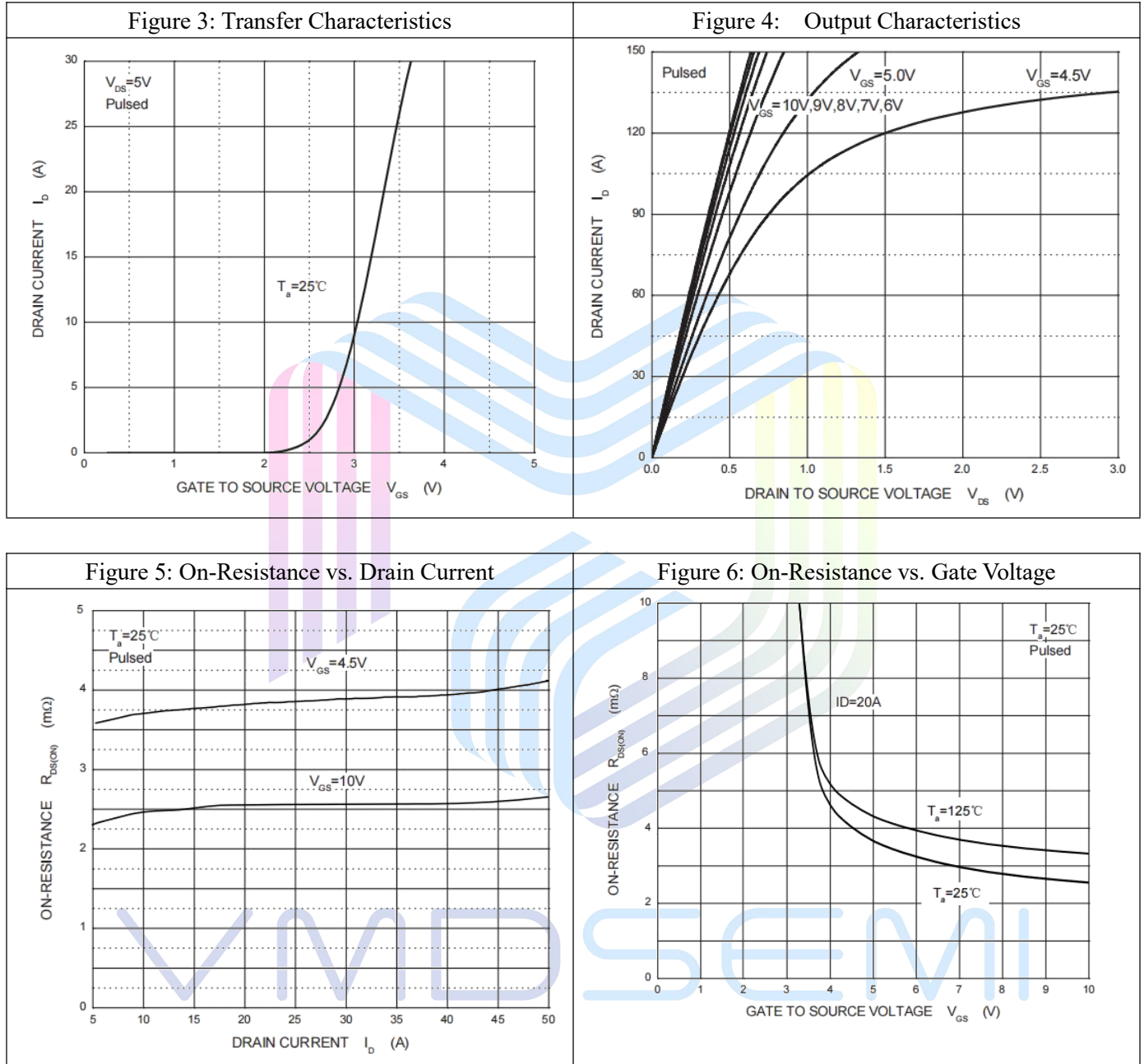
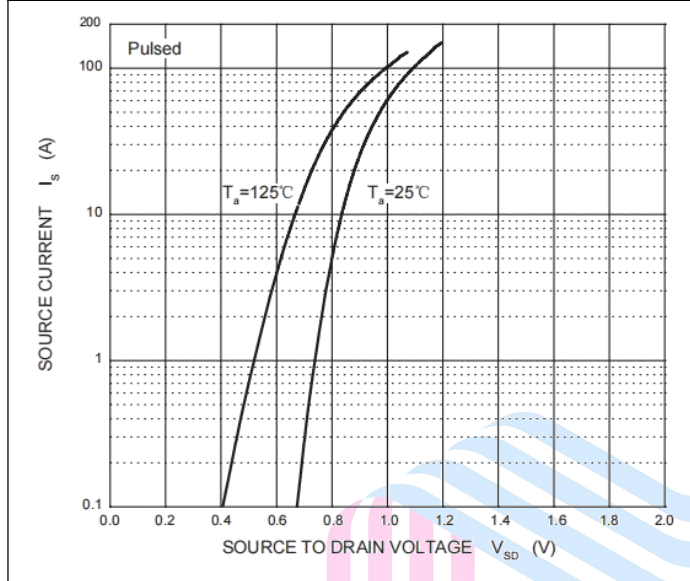
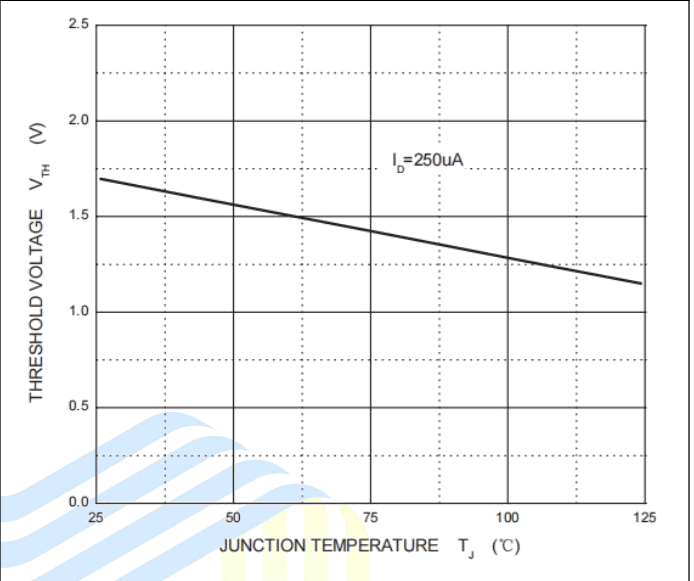
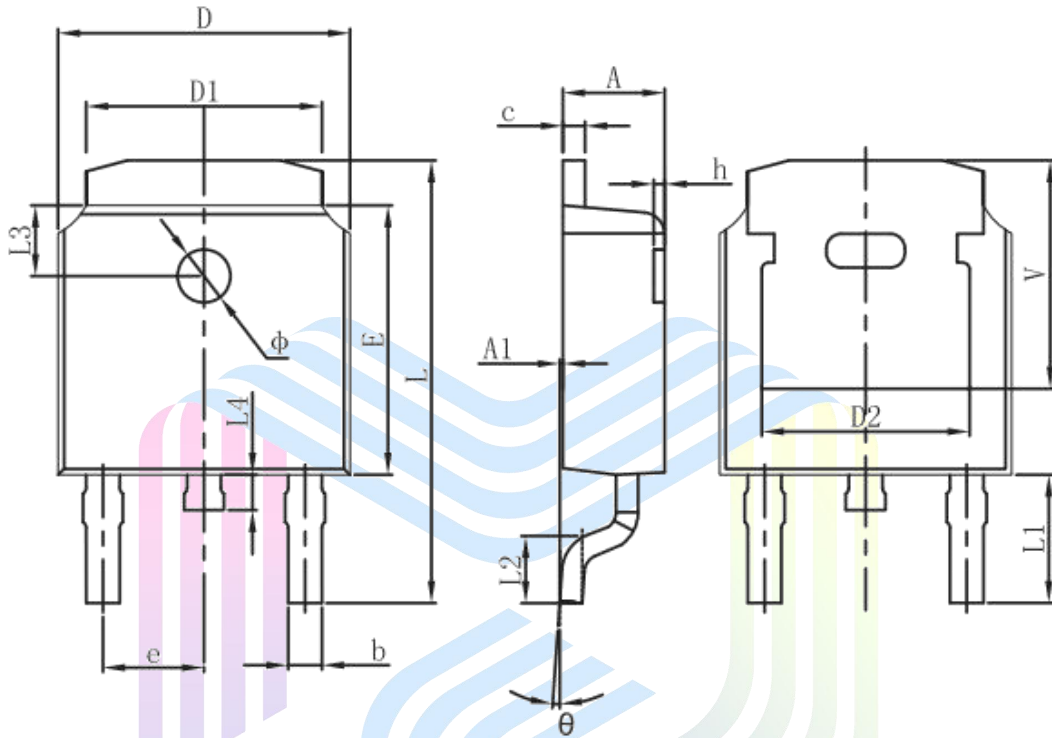
Typical Performance Characteristics


Figure 7: Body Diode Characteristics

Figure 8: Threshold Voltage


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Mechanical Dimensions:
TO-252-2L Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

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