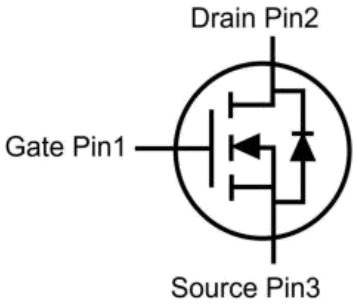
VUTL008R120NA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
80V	12mΩ@10V	68A
	14mΩ@4.5V	

Symbol



Symbol of VUTL008R120NA

Features

- Low $R_{DS(ON)}$
- Enhance Mode
- High conversion efficiency
- Pb-free lead plating; RoHS compliant
- Fast Switching

Package Type

TO-252

Package Type of VUTL008R120NA

Application

- Motor driver
- High Power inverter system
- Switched mode power supply

Ordering Information

Product Name	Package
VUTL008R120NA	TO-252

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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	80	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	T_C=25ºC	I_D	68	A
Continuous Drain Current	T_A=70ºC		44	A
Pulsed Drain Current[Note1]	T_C=25ºC	$I_{D.pulse}$	260	A
Continuous Diode Forward Current	T_C=25ºC	I_S	68	A
Max Power Dissipation	T_A=25ºC	P_D	83	W
Avalanche Energy, Single Pulse [Not 2]		E_{AS}	156	mJ
Operation and storage temperature		T_J,T_{STG}	-55 to 175	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{θJC}$	-	1.8	-	ºC/W
Thermal Resistance, Junction-to-Ambient	$R_{θJA}$	-	50	-	

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	80	-	-	V
Zero Gate Voltage Drain Current T_J= 25 ºC	I_{DSS}	V_{DS}=80V, V_{GS}=0V	-	-	1	uA
Zero Gate Voltage Drain Current T_J= 125 ºC		V_{DS}=80V, V_{GS}=0V	-	-	100	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	1.3	-	2.5	V
Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=50A	-	9	12	mΩ
		V_{GS}=4.5V, I_D=20A	-	11	14	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=20V	-	3280	-	pF
Output Capacitance	C_{OSS}	V_{GS}=0V	-	195	-	pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz	-	130	-	pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V	-	24	-	ns
Rise Time	t_r	I_D=4A	-	112	-	
Turn-off Delay Time	$t_{d(off)}$	R_G=6.8Ω	-	51	-	
Fall Time	t_f	V_{GS}=10V	-	105	-	
Gate Charge Characteristics						
Gate to Source Charge	Q_{gs}	V_{GS}=10V	-	10	-	nC
Gate to Drain Charge	Q_{gd}	V_{DS}=50V	-	14	-	
Gate Charge Total	Q_g	I_D=4A	-	80	-	
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}=40A	-	0.88	1.2	V
Reverse Recovery Time	t_{rr}	I_{SD}=4A V_{GS}=0V T_J= 25 ºC di/dt=100A/us	-	33	-	ns
Reverse Recovery Charge	Q_{rr}		-	42	-	nC

Notes:

1. Repetitive rating; pulse width limited by max. junction temperature.
2. Limited by TJmax,starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 25A, V_{GS} =10V
3. Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Performance Characteristics

Figure 1: Typ. Output Characteristics

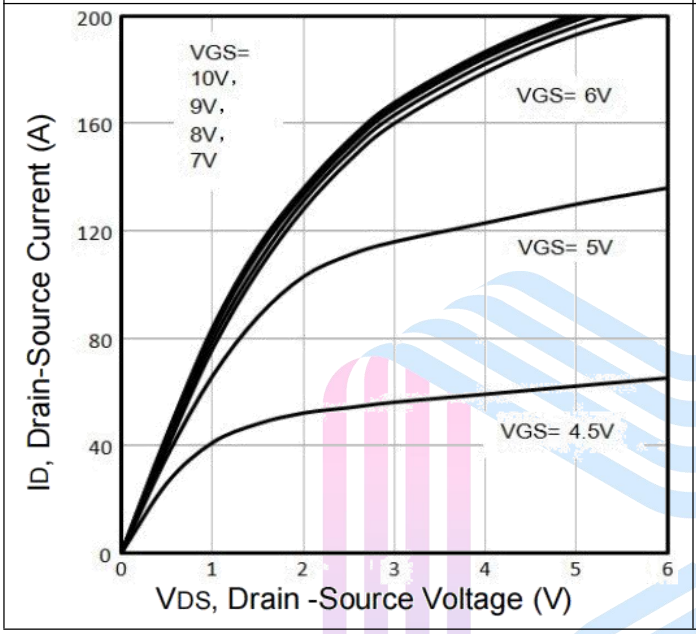


Figure 2: Normalized Threshold Voltage Vs. Temperature

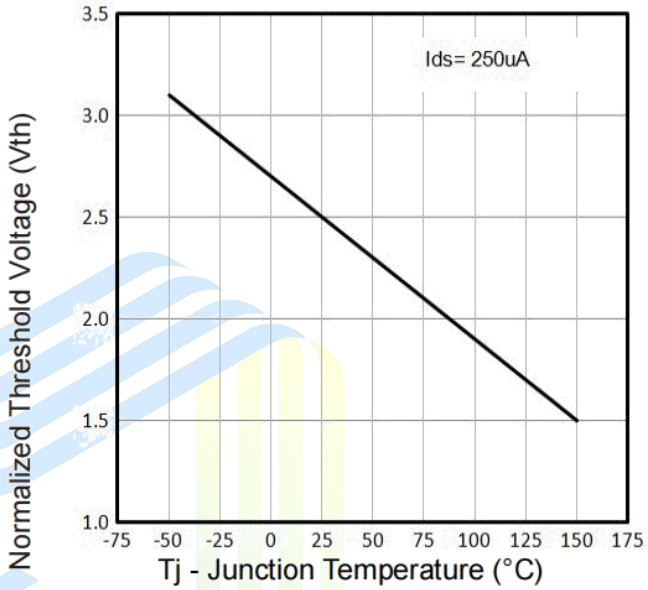


Figure 3: Normalized On-State Resistance

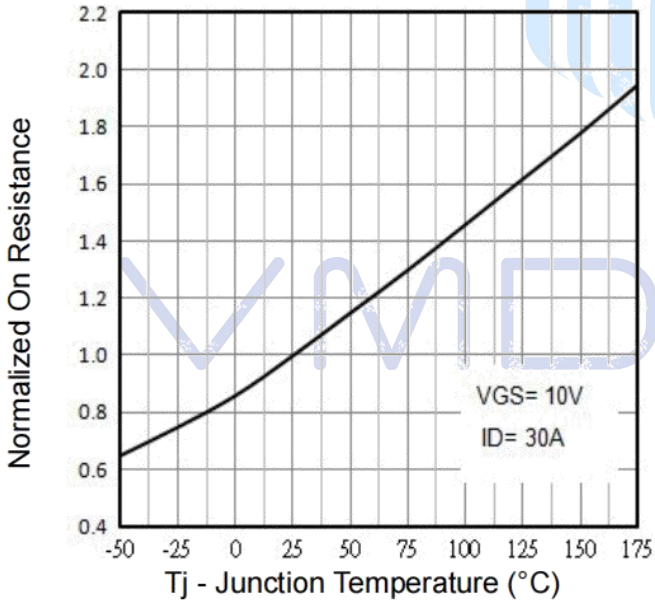


Figure 4: Typ. Transfer Characteristics

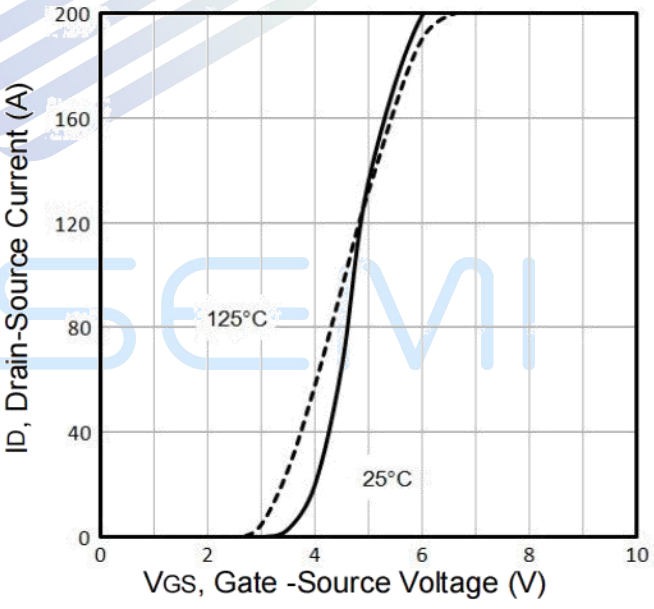


Figure 5: Maximum Safe Operating Area

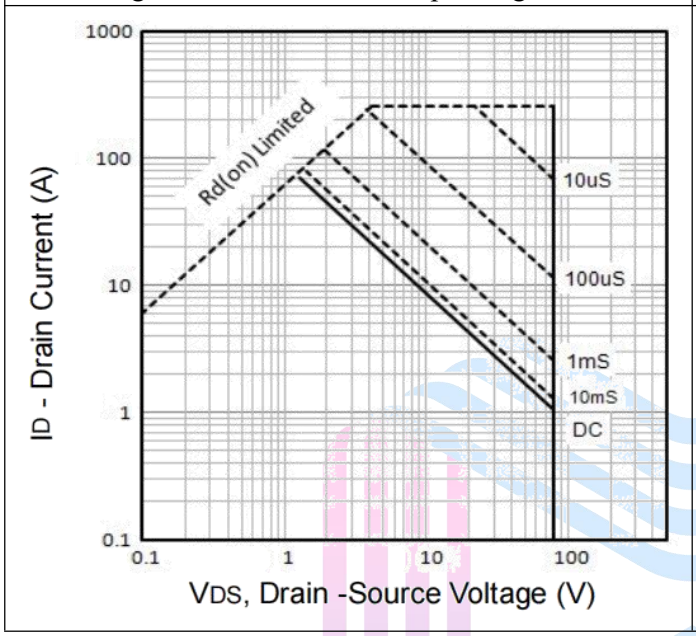


Figure 6: Forward Characteristics of Body Diode

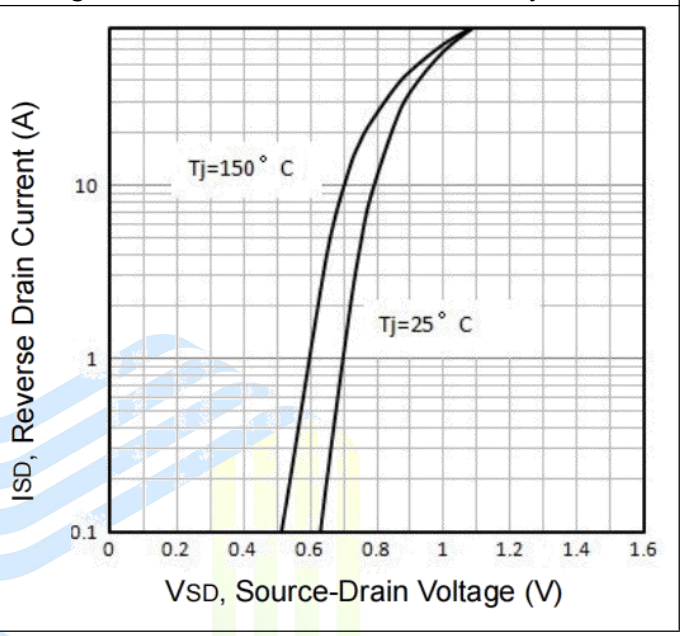


Figure 7: Capacitance Vs. Drain-Source Voltage

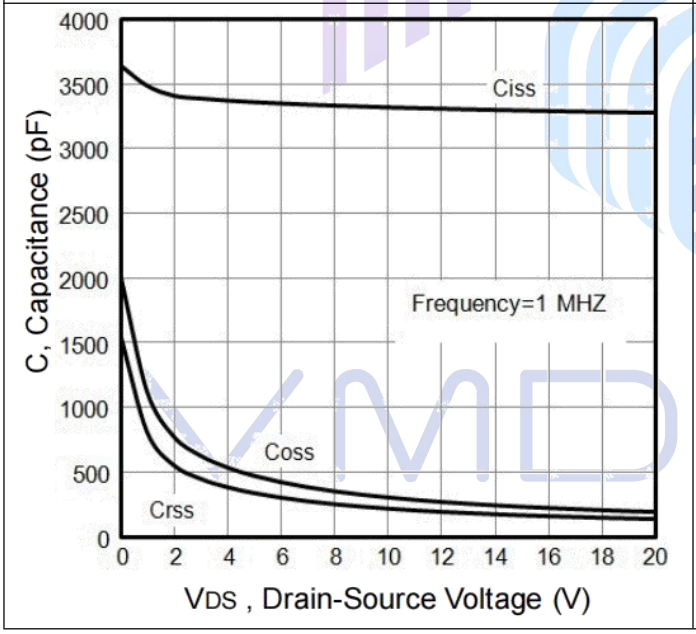


Figure 8: Gate Charge Vs. Gate-Source Voltage

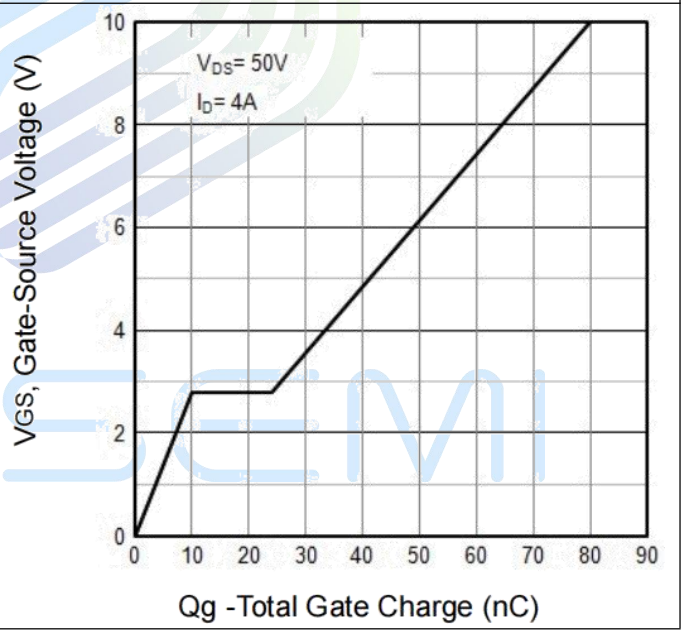
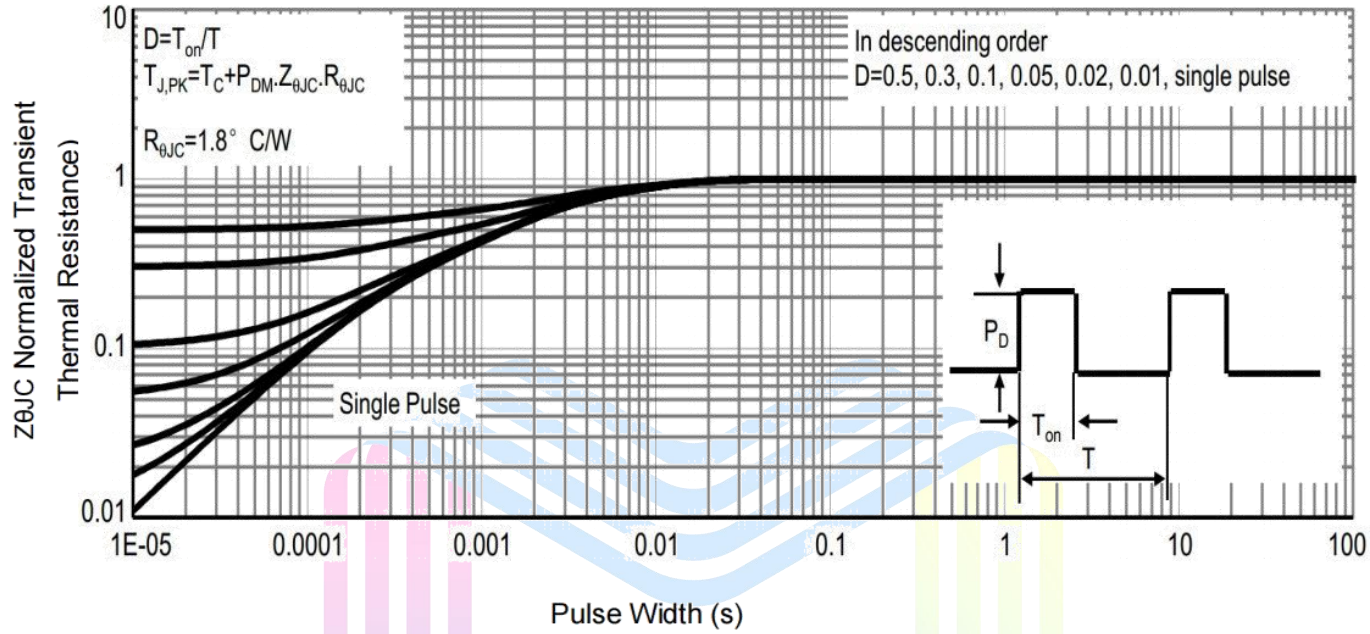
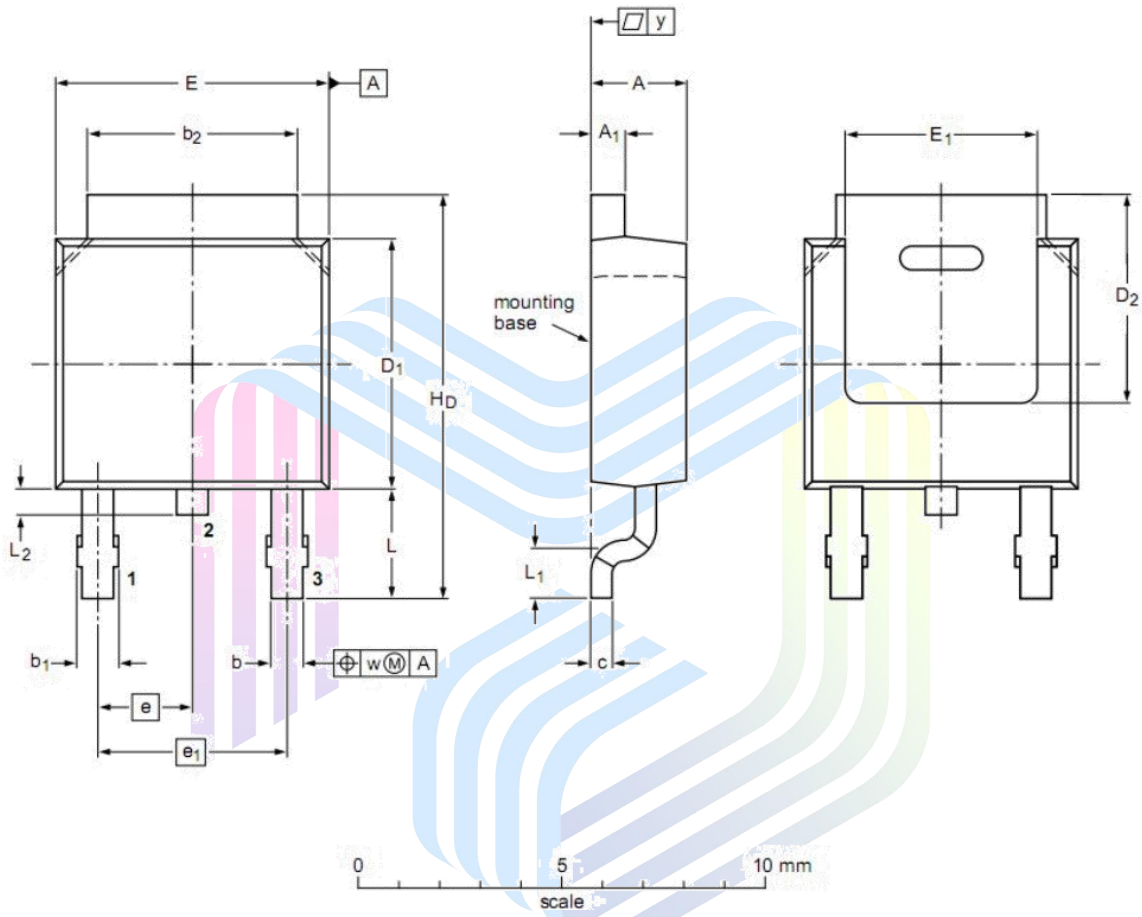


Figure 9: Normalized Maximum Transient Thermal Impedance



Mechanical Dimensions

Package Information TO-252



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	2.20	2.30	2.38
A_1	0.46	0.50	0.63
b	0.64	0.76	0.89
b_1	0.77	0.85	1.14
b_2	5.00	5.33	5.46
c	0.458	0.508	0.558
D_1	5.98	6.10	6.223
D_2	5.21	--	--
E	6.40	6.60	6.731
E_1	4.40	--	--
e	2.286 BSC		
e_1	--	4.57	--
H_D	9.40	10.00	10.40
L	2.743 REF		
L_1	1.40	1.52	1.77
L_2	0.50	0.80	1.01
w	--	0.20	--
y	--	--	0.20

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