VUTD004R030NA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
40V	3.0mΩ@10V	130A
	4.4mΩ@4.5V	

Symbol

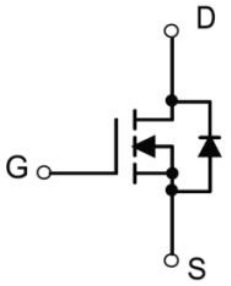


Figure 1 Symbol of VUTD004R030NA

Features

- Excellent $R_{DS(on)}$ and Low Gate Charge
- Trench Technology Power MOSFET
- Low Gate Resistance
- 100% UIS Tested

Package Type

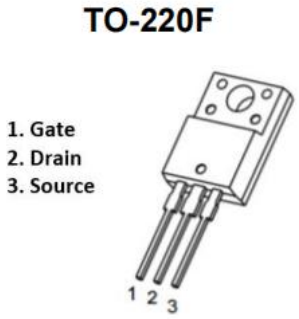


Figure 2 Package Type of VUTD004R030NA

Application

- DC/DC Converter
- Power Switching Application

Ordering Information

Product Name	Package
VUTD004R030NA	TO-220F

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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current Note1	T_C= 25 ºC	I_D	130	A
Pulsed Drain Current Note2		I_{DM}	350	A
Single Pulsed Avalanche Current Note3		I_{AS}	50	A
Single Pulsed Avalanche Energy Note3		E_{AS}	625	mJ
Total Power Dissipation Note5	T_C= 25 ºC	P_D	56	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-Case	$R_{\theta JC}$		2.2		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	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 32V, V_{GS}=0V			1	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	1.0	1.7	3.0	V
Static Drain-Source On-Resistance[Note4]	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 30A		2.3	3.0	mΩ
		V_{GS}= 4.5V, I_D= 10A		2.9	4.4	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=20V		9653		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		666		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		660		pF
Gate resistance	R_g	f=1MHz,Open drain		1.13		Ω
Switching Parameters						
Total Gate Charge	Q_g	V_{DS}=20V		30.1		nC
Gate-source Charge	Q_{gs}	V_{GS}=10V		5.2		
Gate-drain Charge	Q_{gd}	I_D= 30A		9.8		
Turn-on Delay Time	$t_{d(on)}$	V_{DS}= 15V		12.3		ns
Turn-on Rise Time	t_r	V_{GS}= 10V		6.5		
Turn-off Delay Time	$t_{d(off)}$	I_D= 15A		48		
Turn-off Fall Time	t_f	R_G=3.3Ω		9.2		
Diode Characteristics						
Diode Forward Voltage [Note4]	V_{DS}	V_{GS}=0V, I_S= 10A			1.2	V

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.E_{AS} condition: V_{DD} = 25V,V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.

4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

Typical Performance Characteristics

Figure 3: Transfer Characteristics

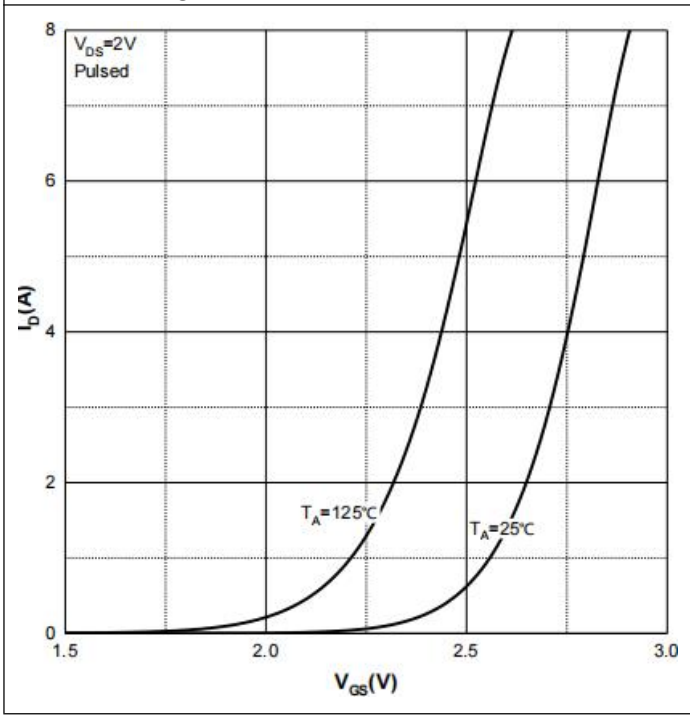


Figure 4: Output Characteristics

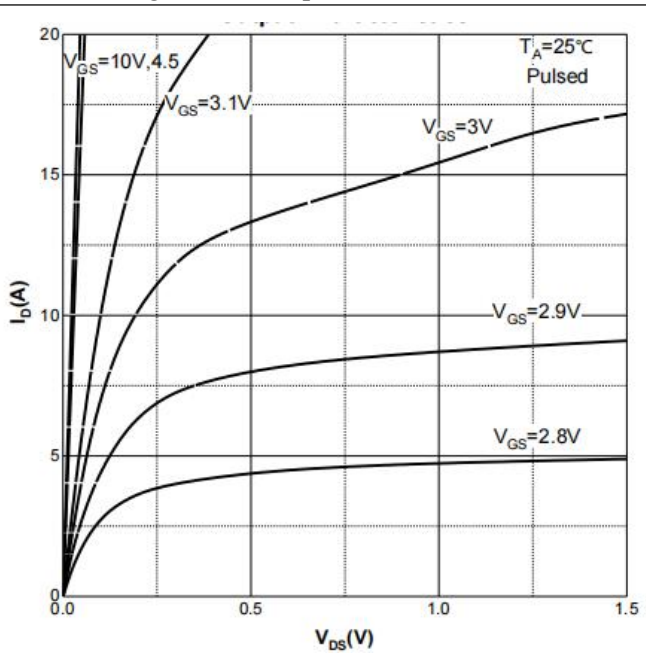


Figure 5: On-Resistance vs. Drain Current

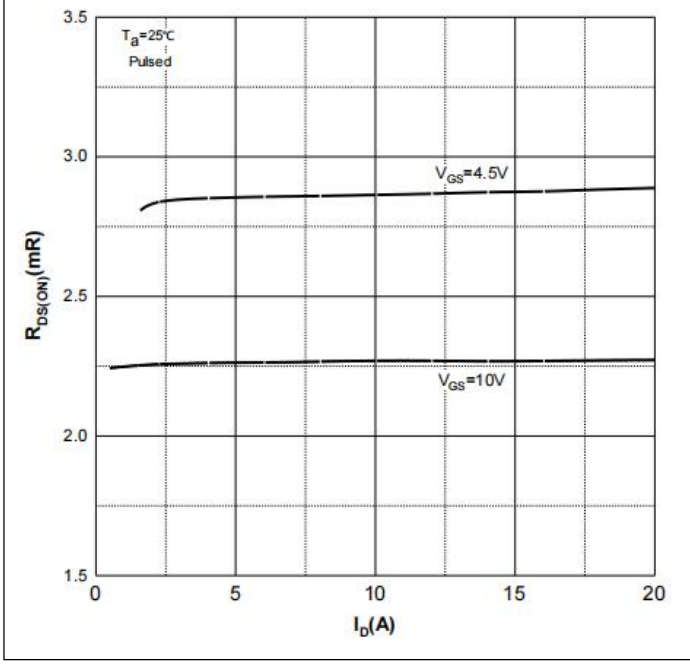


Figure 6: On-Resistance vs. Gate Voltage

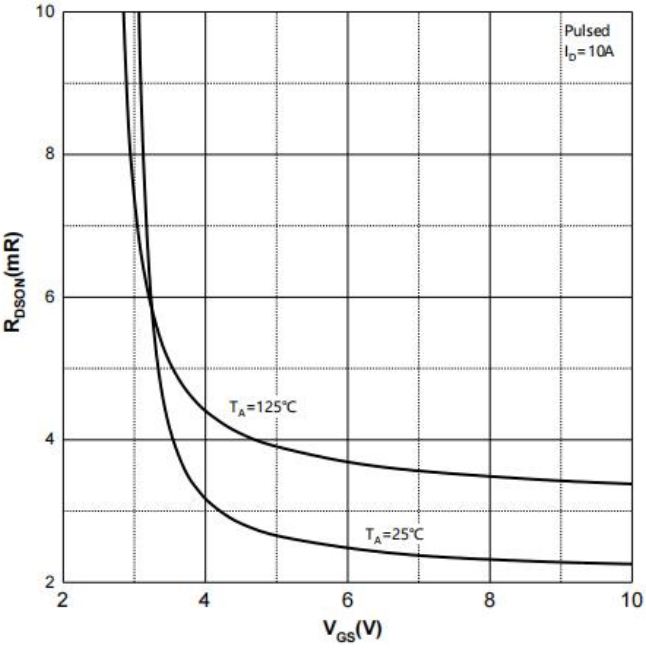


Figure 7: Body Diode Characteristics

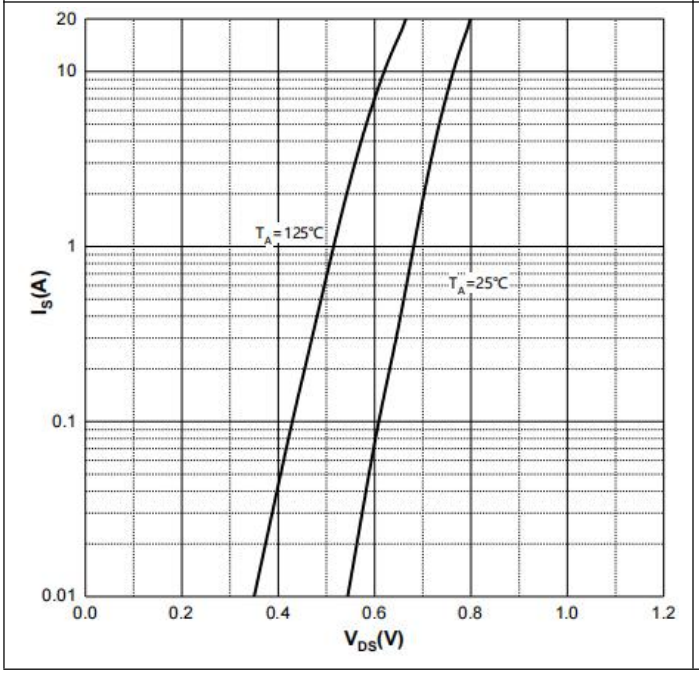


Figure 8: Threshold Voltage

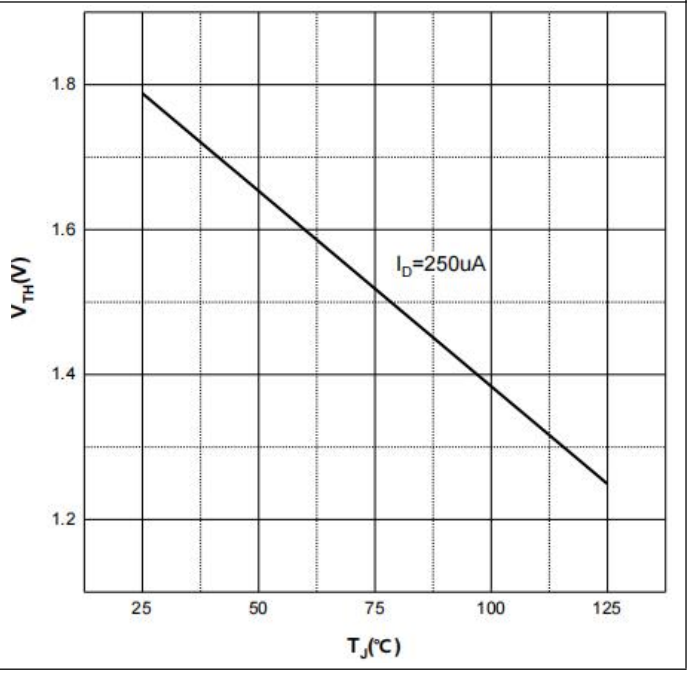


Figure 9: Capacitance vs V_{DS}

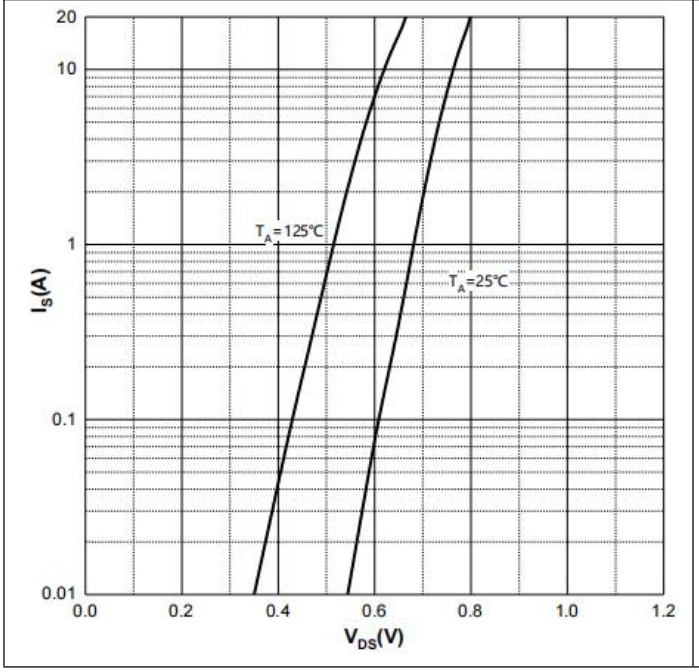


Figure 10: Maximum Forward Biased Safe Operating Area

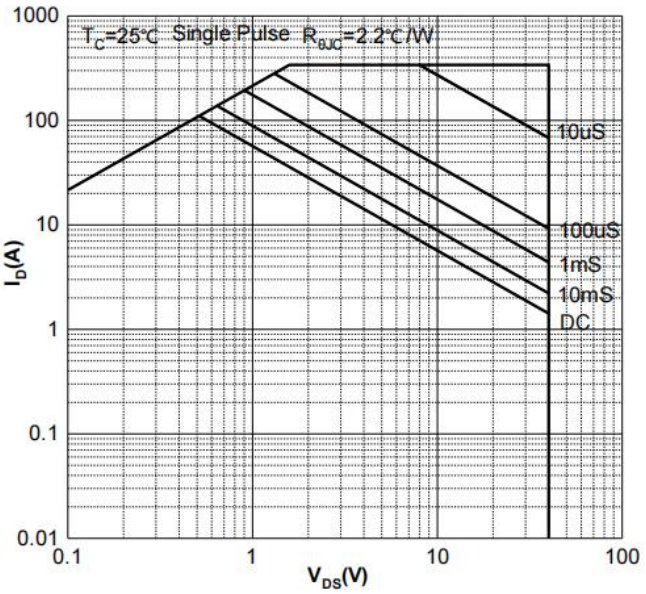
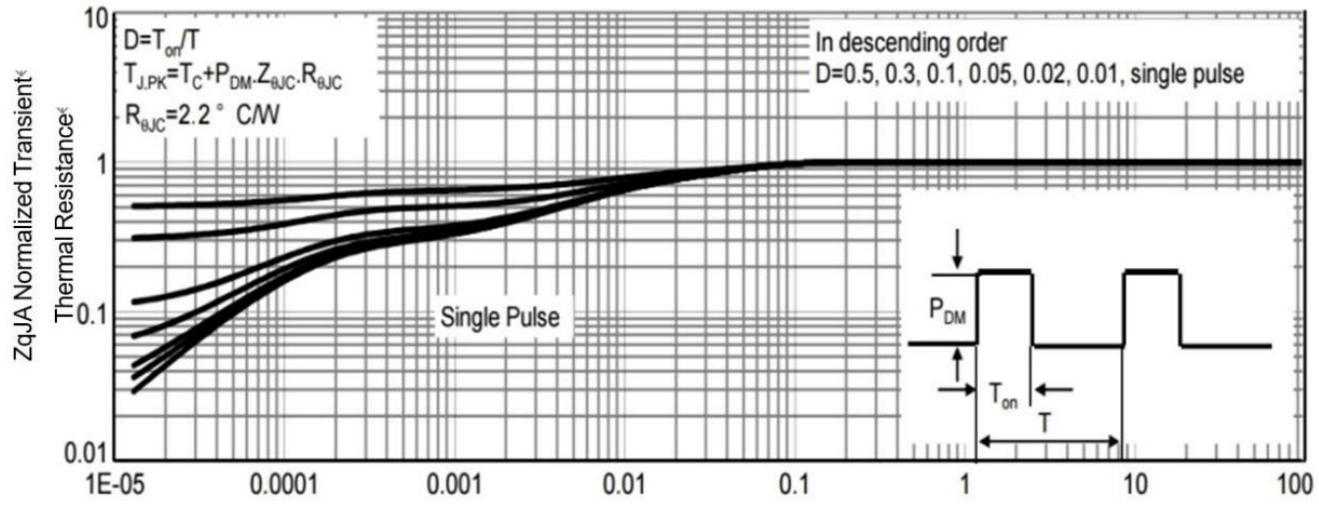
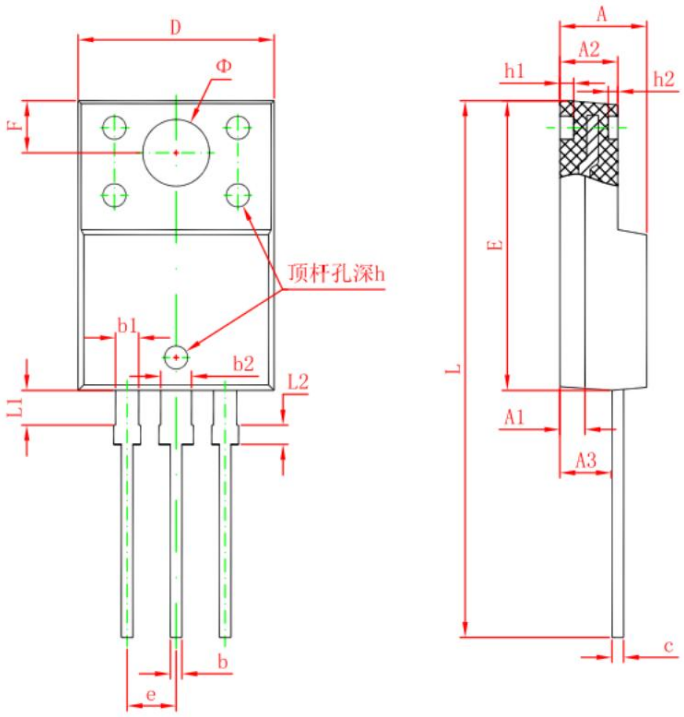


Figure 11: Max. transient thermal impedance



Mechanical Dimensions:

TO-220F Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.700	0.169	0.185
A1	1.300 REF.		0.051 REF.	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.500	0.750	0.020	0.030
b1	1.100	1.350	0.043	0.053
b2	1.500	1.750	0.059	0.069
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP.		0.100 TYP.	
F	2.700 REF.		0.106 REF.	
Φ	3.500 REF.		0.138 REF.	
h	0.000	0.300	0.000	0.012
h1	0.800 REF.		0.031 REF.	
h2	0.500 REF.		0.020 REF.	
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	0.900	1.100	0.035	0.043

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Via-Media Semiconductor Limited Company

http://www.vmdsemi.com

Main Sites:

- **Headquarters**

Hangzhou Via-Media Semiconductor Co., LTD.
1305-1306, Building 71, No. 90, Wensan Road, Xihu District, Hangzhou, Zhejiang Province, P.R. China
Tel: +86-0571-8515 0563

- **Chengdu Office**

Chengdu Winhi Semiconductor Co., LTD.
Floor 15, Building 5, No. 171, Hele 2nd Street, Chengdu, Sichuan Province, P.R. China
Tel: +86-028-8505 0771

- **Shanghai**

Shanghai R&D Center.
1506~1508, Xinyin Building, 888 Yishan Road, Shanghai, P.R of China
Tel: +86- 021-54201999

- **Shenzhen**

Shenzhen Sales Center.
17B, No.1 Phoenix Building, 2008 Shennan Road, Shenzhen, P.R of China
Tel: +86-0755- 82570682

- **Xi'an**

Xi'an R&D Center
1703B, Building A, Greenland Center, Jinye Road, High-Tech Zone, Xi'an, Shaanxi, P.R of China