VUTP006R075NA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
60V	7.5mΩ@10V	120A

Symbol

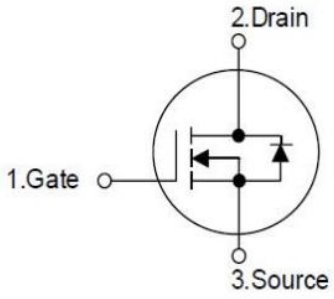


Figure 1 Symbol of VUTP006R075NA

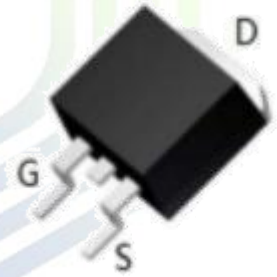
Features

- Low RDS(ON)
- $R_{DS(ON)\_max}$ = 7.5mΩ@V_{GS} = 10V
- Extremely low switching loss

Application

- BMS
- Switched mode power supply
- DC-DC converter
- Solar inverter
- UPS and energy inverter

Package Type



TO-263

Figure 2 Package Type of VUTP006R075NA

Ordering Information

Product Name	Package
VUTP006R075NA	TO-263

Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current Note 1	T_C=25ºC	I_D	120	A
	T_C=100ºC	I_D	78	
Pulsed Drain Current Note 2	T_C=25ºC	I_{DM}	360	A
Max Power Dissipation Note 3	T_C=25ºC	P_D	138	W
	T_C=100ºC	P_D	55	
Avalanche Energy, Single Pulse Note 4		E_{AS}	290	mJ
Operation Junction temperature		T_J	-55 to 175	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	0.9	-	ºC/W
Thermal Resistance, Junction-to-Ambient Note 5	$R_{\theta JA}$	-	44	-	

Notes:

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) P_D is based on max. junction temperature, using junction-case thermal resistance.
4) V_{DS}=48 V,V_{GS}=10 V, L=0.5 mH, starting T_J=25 °C.
5) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 °C.

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	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	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	2	3	4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=60A	-	5.2	7.5	mΩ
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=0V,f=1MHz	-	1.2	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{GS}=0V	-	5646	-	pF
Output Capacitance	C_{OSS}	V_{DS}=25V	-	310	-	pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz	-	224	-	pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V,	-	31.8	-	ns
Rise Time	t_r	I_D=30A,	-	36.4	-	
Turn-off Delay Time	$t_{d(off)}$	V_{GS}=10V,	-	84.6	-	
Fall Time	t_f	R_G=6Ω	-	29.4	-	
Switching Characteristics						
Total Gate Charge	Q_g	V_{GS}=10V,	-	195	-	nC
Gate to Source Charge	Q_{gs}	V_{DS}=30V,	-	53	-	
Gate to Drain Charge	Q_{gd}	I_D=30A	-	47	-	
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=30A	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	I_S=30A di/dt=100A/us	-	41	-	ns
Reverse Recovery Charge	Q_{rr}		-	55	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	2.71	-	A

Typical Performance Characteristics

Figure 3: Typ. Output Characteristics

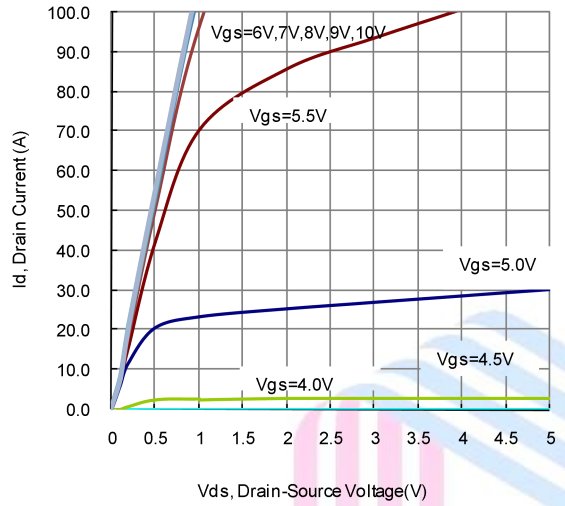


Figure 4: Typ. Transfer Characteristics

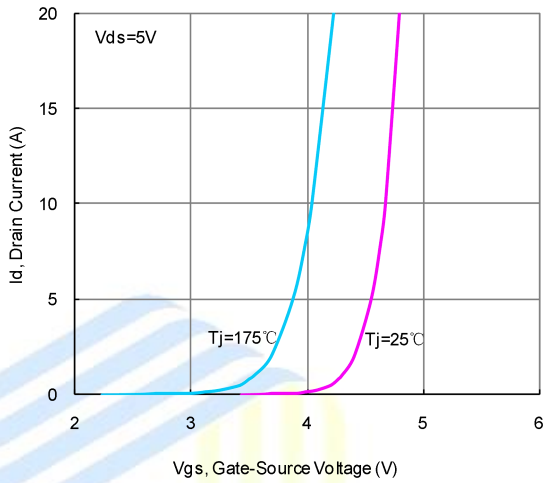


Figure 5: Typical On-Resistance vs. Drain Current

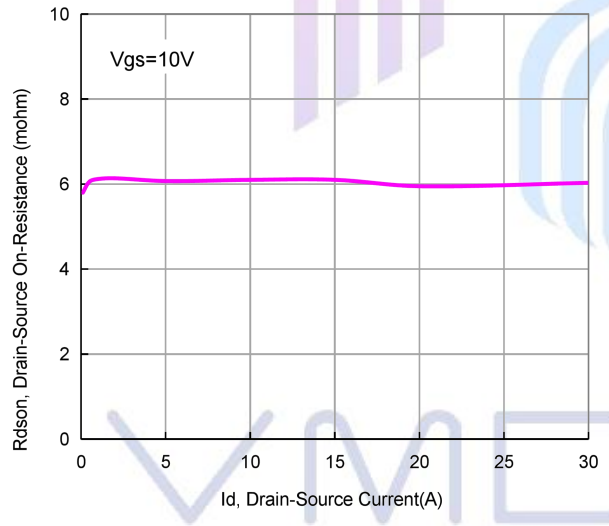


Figure 6: Normalized On-Resistance vs. Temperature

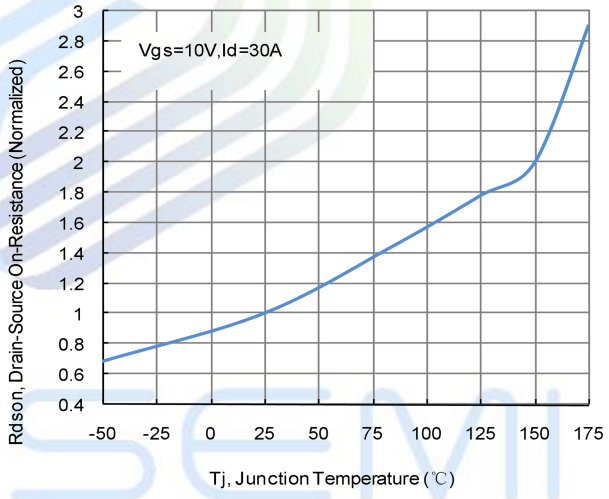


Figure 7: On-Resistance vs.Gate-source voltage

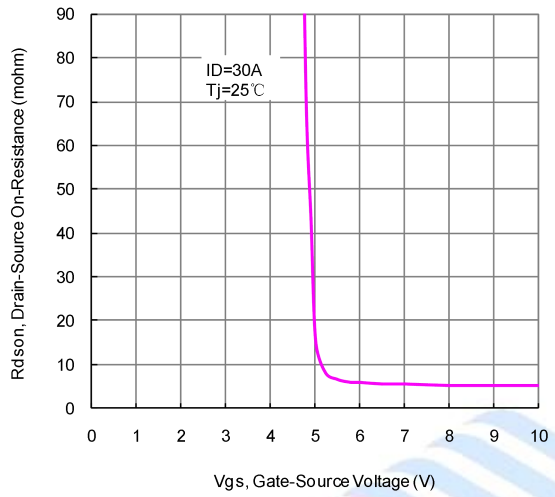


Figure 8: Forward Characteristics of Body Diode

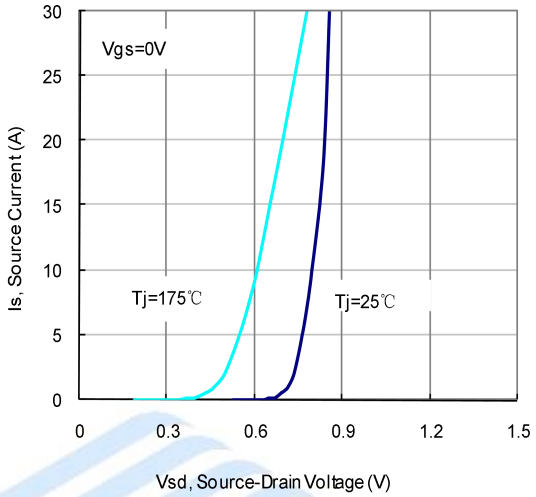


Figure 9: Gate Charge Characteristics

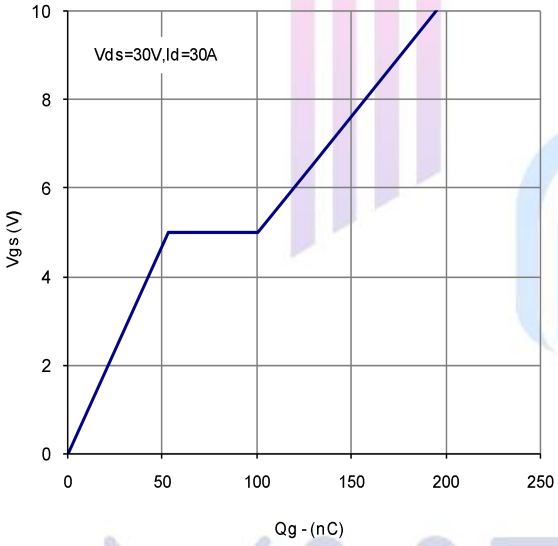


Figure 10: Typ. Capacitances

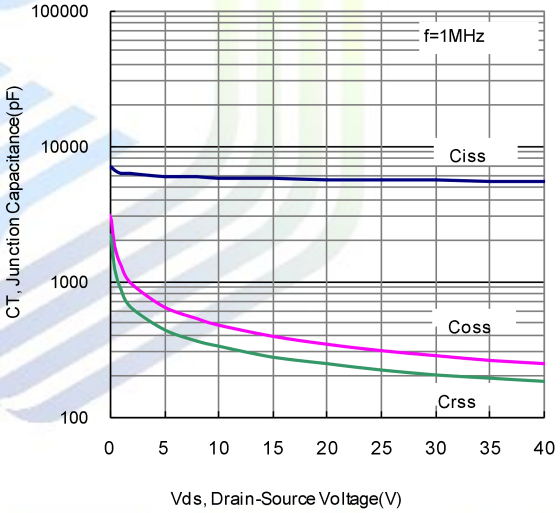


Figure11: Safe Operating Area

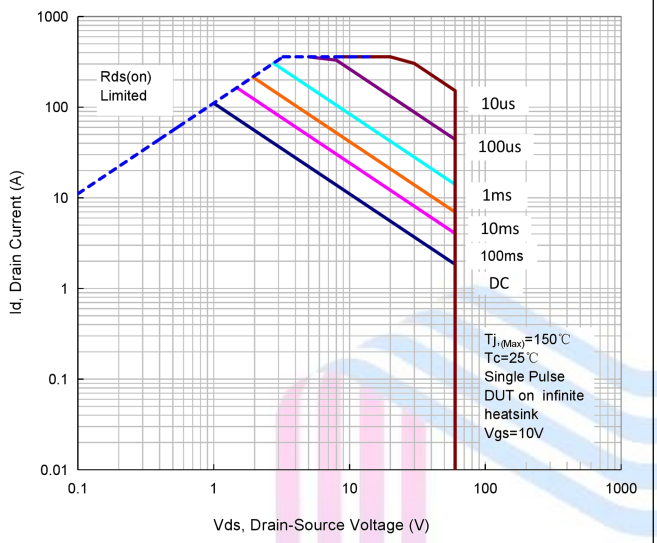


Figure12: Power Dissipation

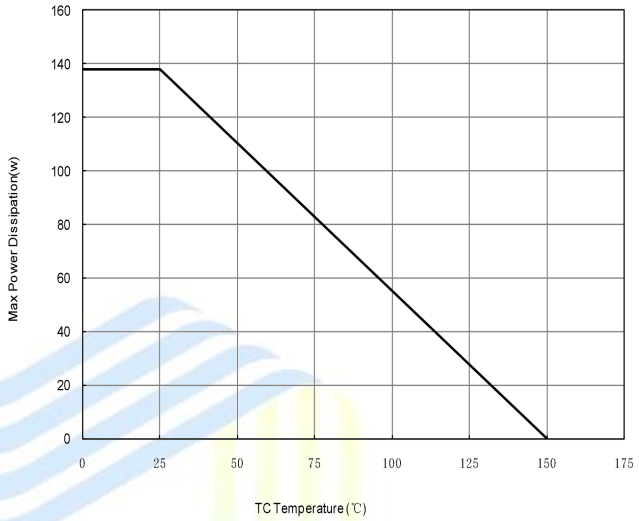


Figure 13: Single pulse power rating, Junction to case

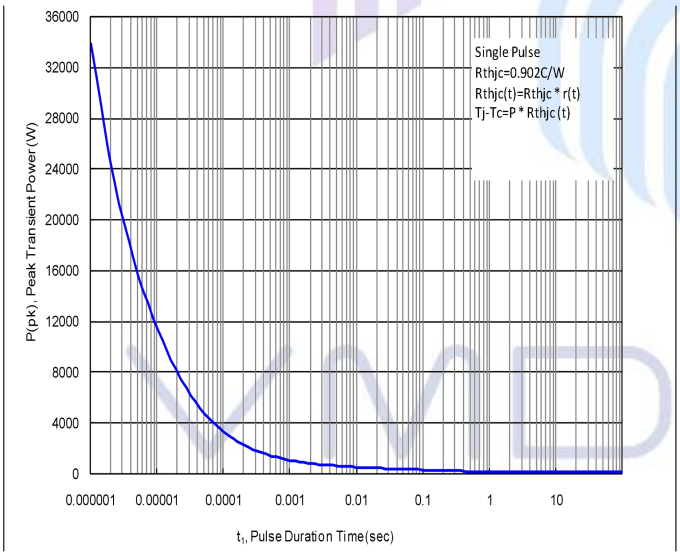
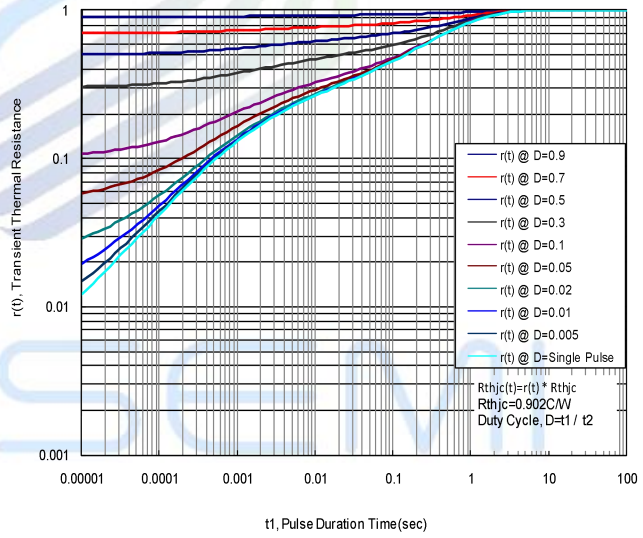
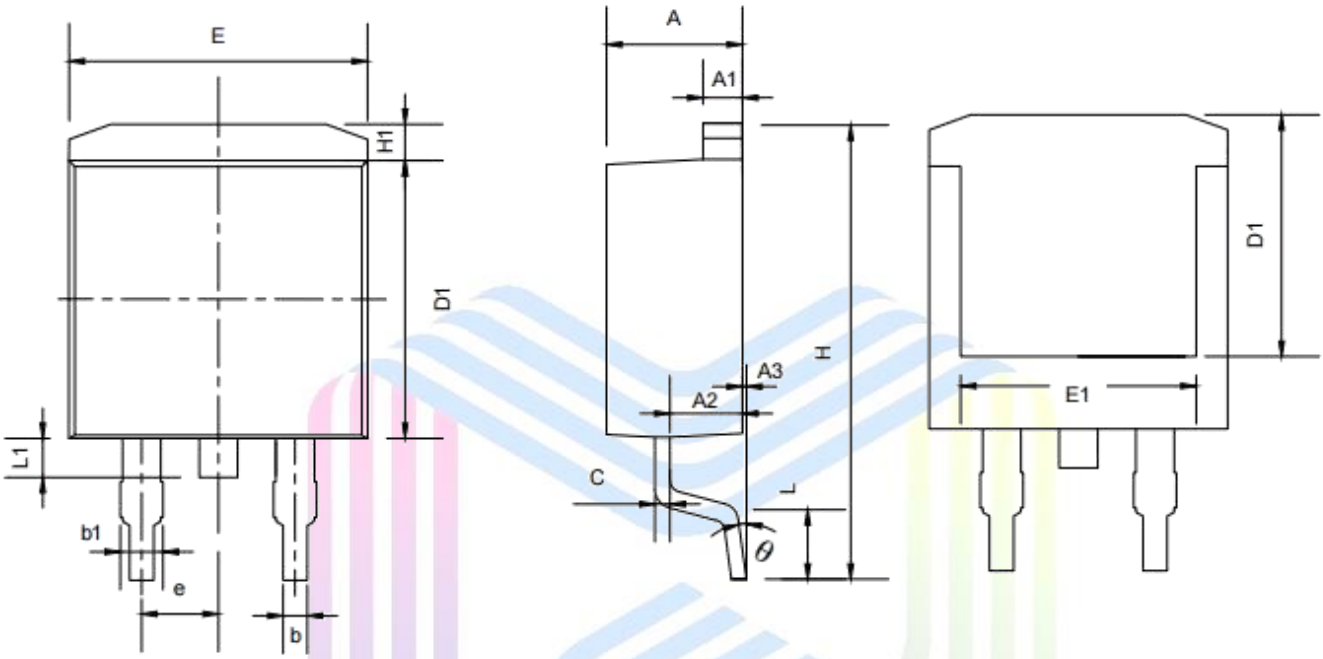


Figure 14: Max transient thermal impedance



Mechanical Dimensions

TO-263 Package Information



SYMBOL	MIN	MAX
A	4.30	4.77
A1	1.20	1.42
A2	2.30	2.89
A3	0.00	0.25
b	0.70	0.96
b1	1.15	1.47
c	0.30	0.60
D	8.50	9.40
D1	6.60	-
E	9.70	10.36
E1	7.06	-
e	2.54BSC	
H	14.70	16.00
H1	1.00	1.47
L	2.00	2.84
L1	1.10	1.70
	0°	9°

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