UMW SVT078R0ND

68V N-Channel MOSFET

1.Description

These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent $R_{DS(ON)}$ and low gate charge. Which accords with the RoHS standard.

2.1Features

- $V_{DS\ (V)}$=68V
- I_D=88A(V_{GS}=10V)
- $R_{DS(ON)}$=6.3mΩ(V_{GS}=10V)

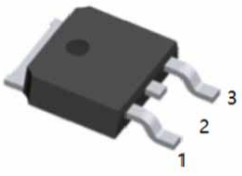
2.2Features

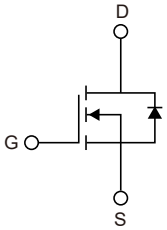
- Fast Switching
- Low ON Resistance(Rdson≤29mΩ)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy test
- 100% ΔV_{DS} test

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-252(DPAK)
top view





4.Absolute Maximum Ratings T_A= 25°C

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	68	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current Note3	T_C=25°C	I_D	88	A
	T_C=100°C		61	
Drain Current-Pulsed Note1		I_{DM}	292	
Avalanche Energy Note4		E_{AS}	550	mJ
Maximum Power Dissipation	T_C=25°C	P_D	167	W
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	-55 to 150	°C

5.Thermal resistance rating

Parameter	Symbol	Typ	Max	Units
Thermal Resistance,Junction to Case-sink	$R_{\theta JC}$		0.9	°C/W
Thermal Resistance,Junction to Ambient	$R_{\theta JA}$		75	°C/W

6.SPECIFICATIONS (T_J= 25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=250μA	68			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=68V, V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	2.5	3	3.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_{DS}=30A		6.3	7.5	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS}=30V, V_{GS}=0V, f=1MHz		4100		pF
Output Capacitance	C_{oss}			323		pF
Reverse Transfer Capacitance	C_{rss}			242		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(on)}$	V_{DS}=30V, I_D=30A V_{GS}=10V, R_{GEN}=6Ω		25.5		ns
Rise Time	t_r			92.9		ns
Turn-Off Delay Time	$t_{D(off)}$			74.3		ns
Fall Time	t_f			70.4		ns
Total Gate Charge at 10V	Q_g	V_{DS}=30V, I_{DS}=20A, V_{GS}=10V		86		nC
Gate to Source Gate Charge	Q_{gs}			24.3		nC
Gate to Drain“Miller”Charge	Q_{gd}			26.4		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{DS}=30A			1.3	V
Reverse Recovery Time	t_{rr}	I_F=50A, di/dt=100A/μs		27.9		nS
Reverse Recovery Charge	Q_{rr}			33.6		nC

Notes:

1: Repetitive rating, pulse width limited by maximum junction temperature.

2: Surface mounted on FR4 Board, t≤10sec.

3: Pulse width ≤ 300μs, duty cycle ≤ 2%.

7.1Typical Characterisitics

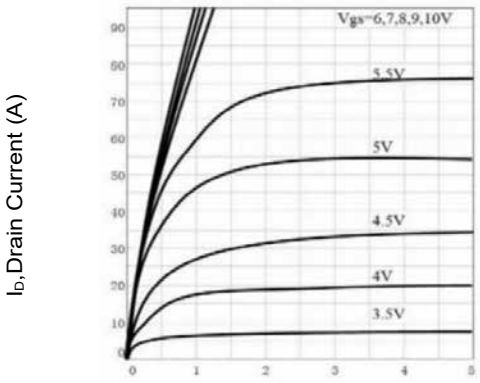


Figure 1: Output Characteristics

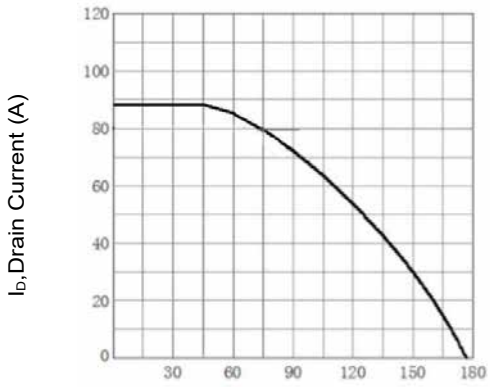


Figure 2: Drain Current

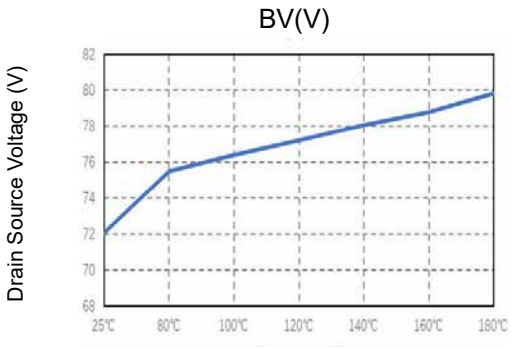


Figure 3: BV_{DSS} vs Junction Temperature

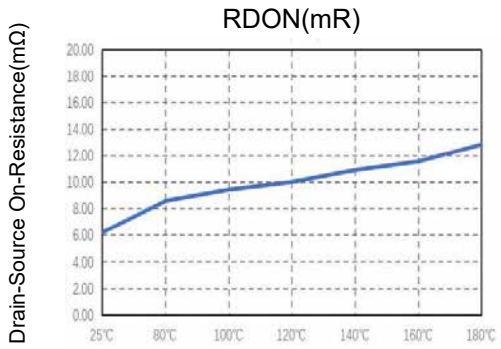


Figure 4: On−Resistance vs. Drain Current and Gate Voltage

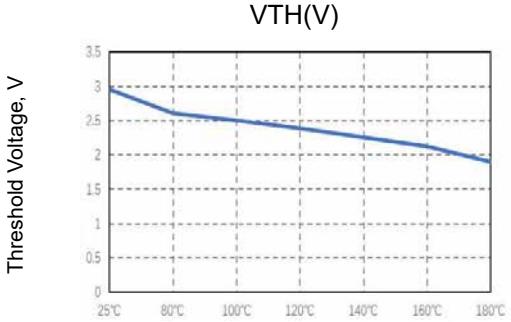


Figure 5: VTH vs Junction Temperature

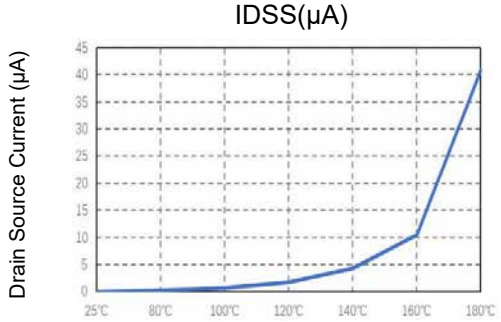


Figure 6: Drain−to−Source Leakage Current vs. Voltage

7.2Typical Characterisitics

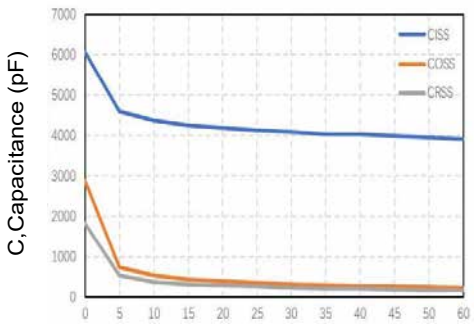


Figure 7: Capacitances vs Vds

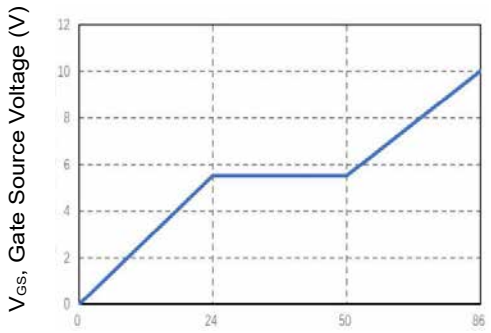


Figure 8: Gate charge

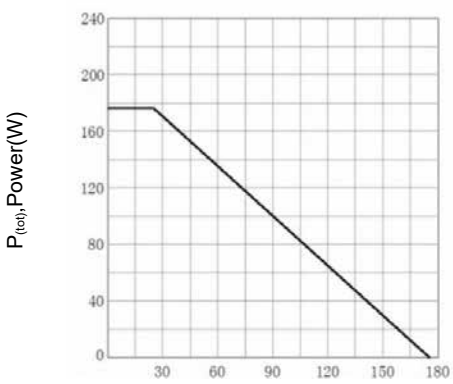


Figure 9: Power Dissipation

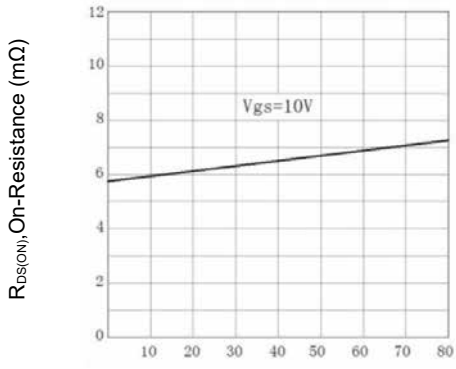


Figure 10: Drain-Source On Resistance

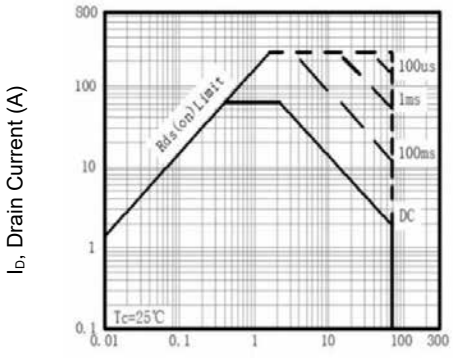


Figure 11: Safe Operating Area

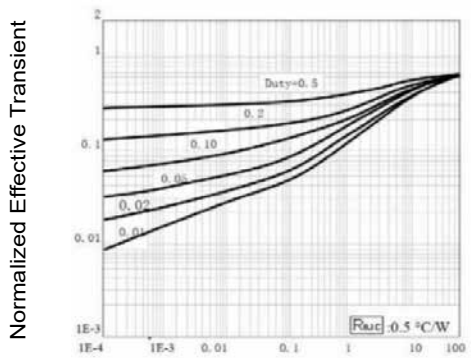


Figure 12: Thermal Transient Impedance

7.3Typical Characterisitics

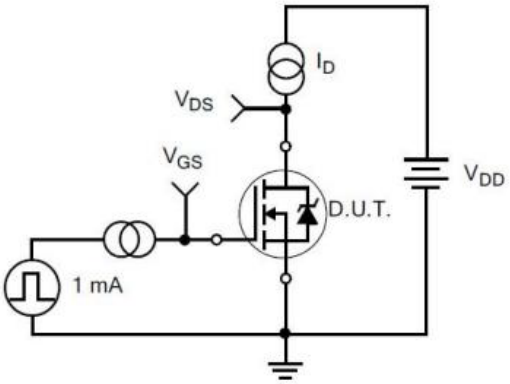


Figure 13: Gate Charge Test Circuit

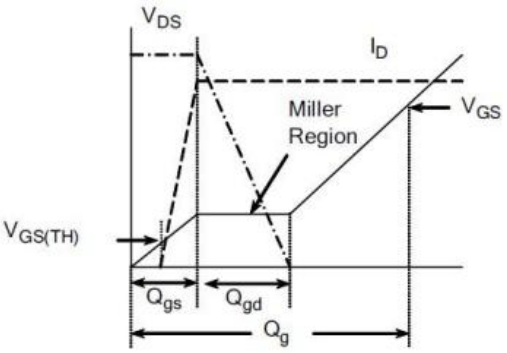


Figure 14: Gate Charge Waveforms

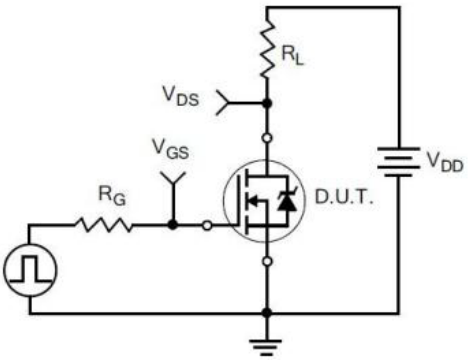


Figure 15: Resistive Switching Test Circuit

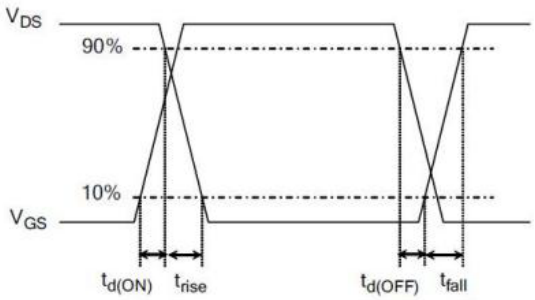


Figure 16: Resistive Switching Waveforms

7.4Typical Characterisitics

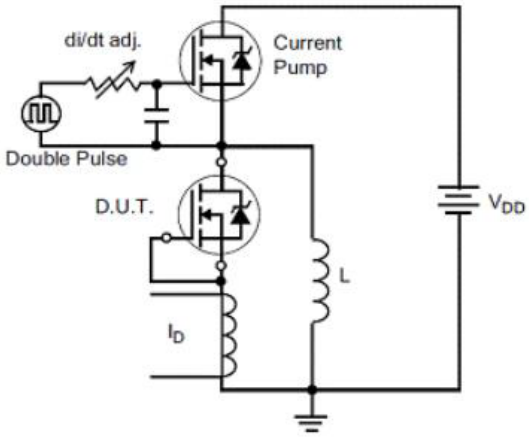


Figure 17: Diode Reverse Recovery Test Circuit

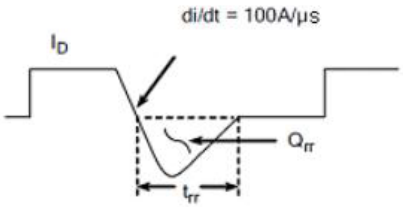


Figure 18: Diode Reverse Recovery Waveform

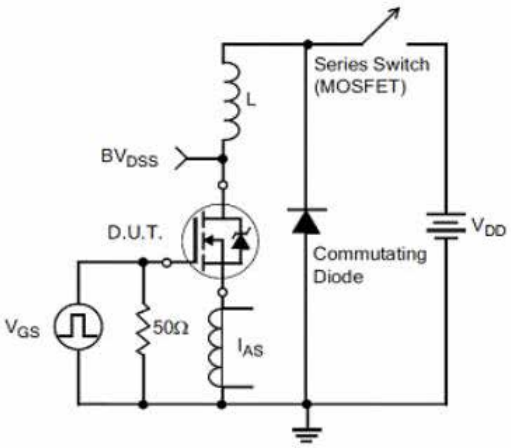


Figure 19: Uncla mped Inductive Swite hing Test Cireuit

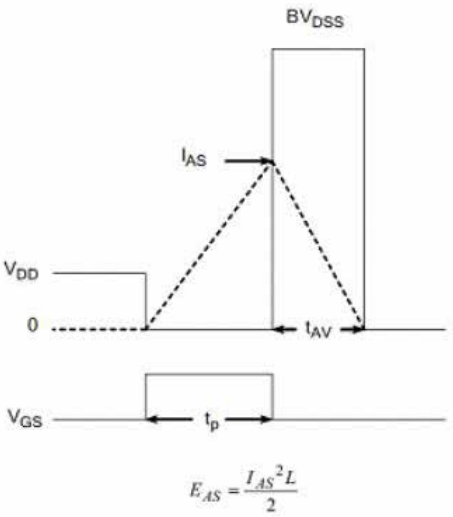
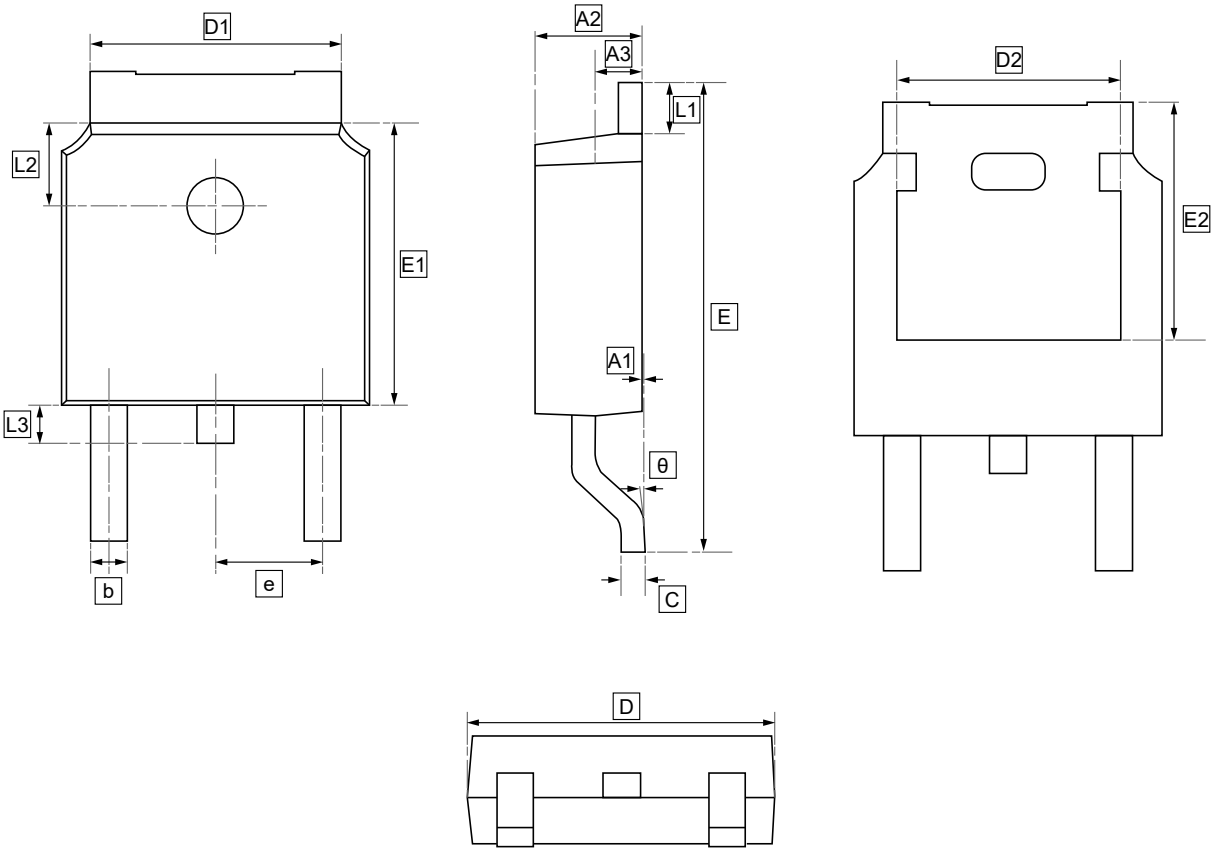


Figure 20: Unclamped Inductive Switching Waveform

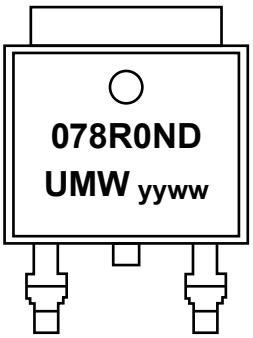
8.TO-252 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38	BSC	1.27	1.90	1.00	8.00

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW SVT078R0ND	TO-252	2500	Tape and reel

10.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.