

UMW SVT078R0ND

General Description

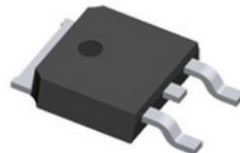
These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent $R_{DS(on)}$ and low gate charge. Which accords with the RoHS standard.

Features

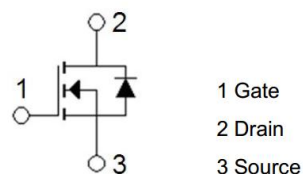
- $V_{DS} = 68V, I_D = 88A$
 $R_{DS(on)}, 6.3m\Omega$ (Typ) @ $V_{GS} = 10V$
- Low On-Resistance
- Low gate charge
- Fast switching
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test

Application

- Power switching applications
- DC-DC converters
- UPS power supply



TO-252(DPAK) top view



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
SVT078R0ND	SVT078R0ND	TO-252	330mm	12mm	2500

Absolute Maximum Ratings(TA=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	68	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ^{Note3}	TC=25°C	I_D	88	A
	TC=100°C		61	A
Drain Current-Pulsed ^{Note1}		I_{DM}	292	A
Avalanche Energy ^{Note4}		E_{AS}	550	mJ
Maximum Power Dissipation	TC=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

Thermal Resistance

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

Electrical Characteristics(TJ=25℃ unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250uA	68	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =68V, V _{GS} =0V	-	-	1.0	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	2.5	3.0	3.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =30A	-	6.3	7.5	mΩ

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz	-	4100	-	pF
Output Capacitance	C _{oss}		-	323	-	
Reverse Transfer Capacitance	C _{rss}		-	242	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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	-	
Turn-Off Delay Time	T _{d(off)}		-	74.3	-	
Fall Time	t _f		-	70.4	-	
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	-	
Gate to Drain"Miller"Charge	Q _{gd}		-	26.4	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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/us	-	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%.

Typical characteristics diagrams

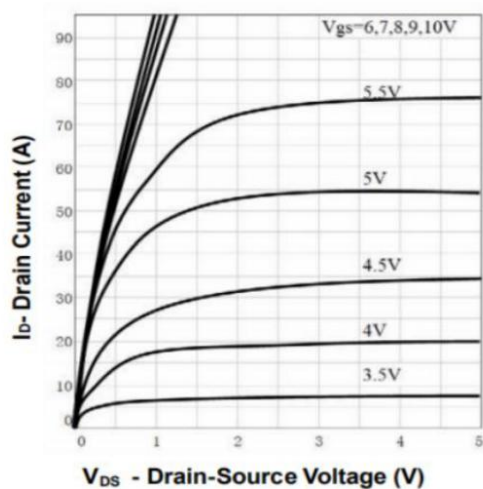


Fig 1. Output Characteristics

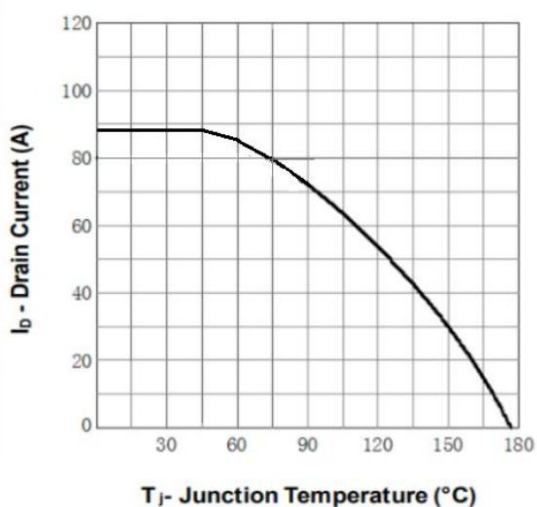


Fig 2. Drain Current

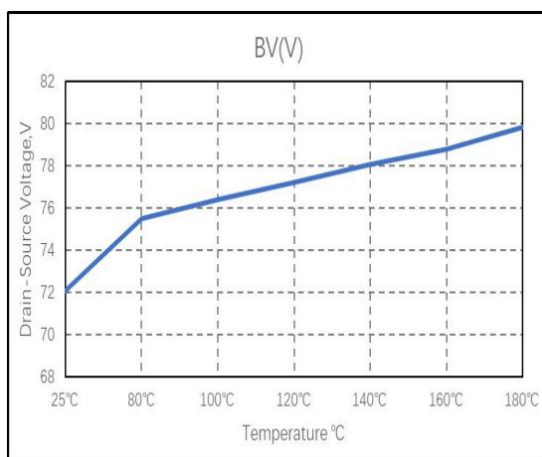


Fig 3 BVDSS vs Junction Temperature

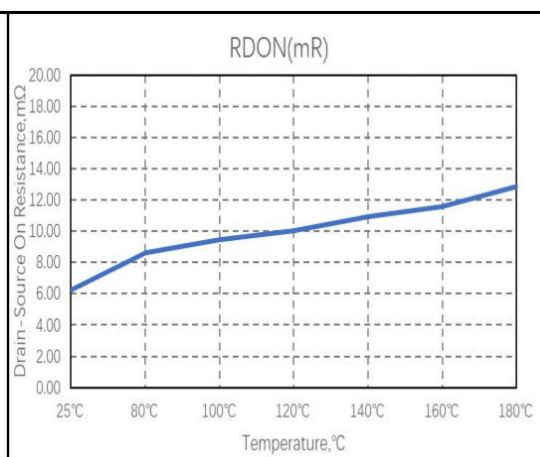


Fig 4 RDS(on) vs Junction Temperature

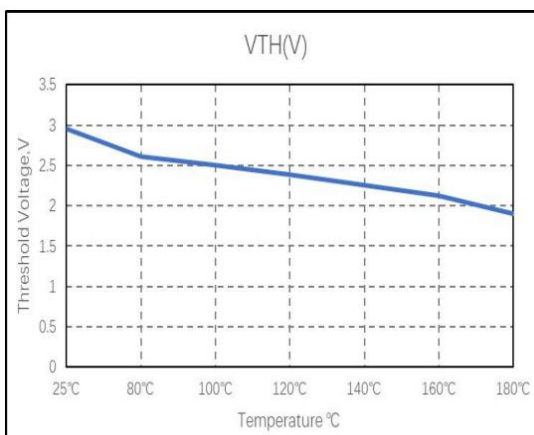


Fig 5 VTH vs Junction Temperature

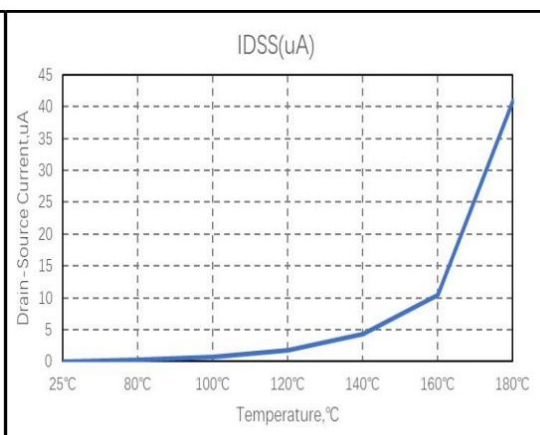


Fig 6 IDSS vs Junction Temperature

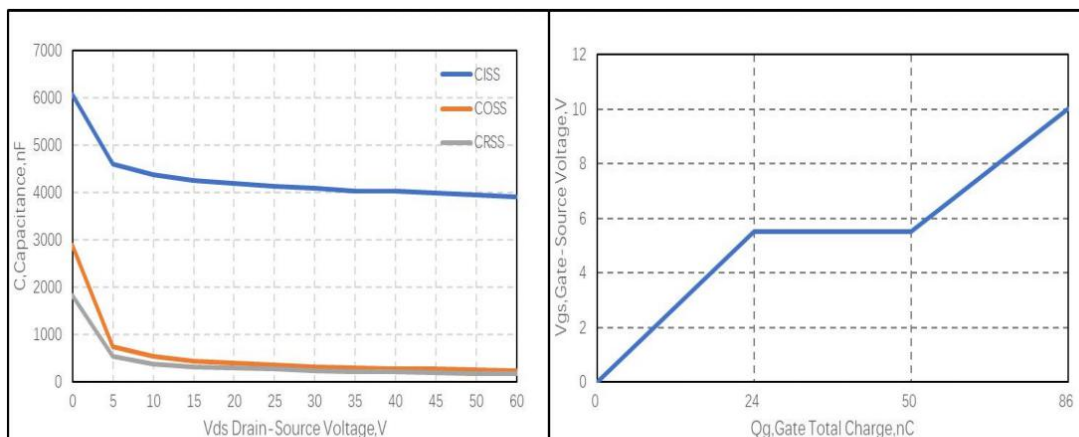


Fig 7 Capacitances vs Vds

Fig 8 Gate Charge

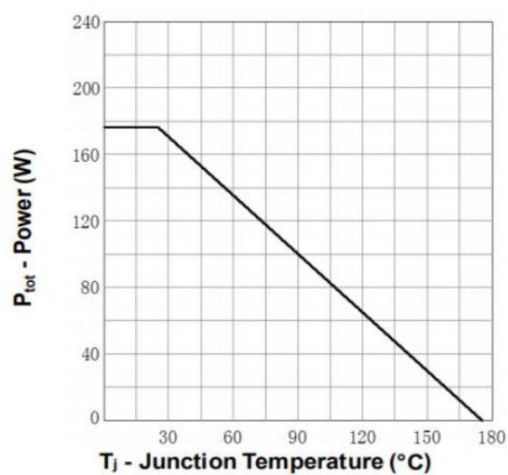


Fig 9. Power Dissipation

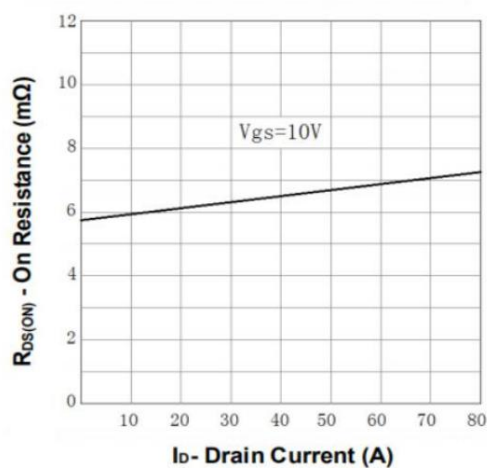


Fig 10. Drain-Source On Resistance

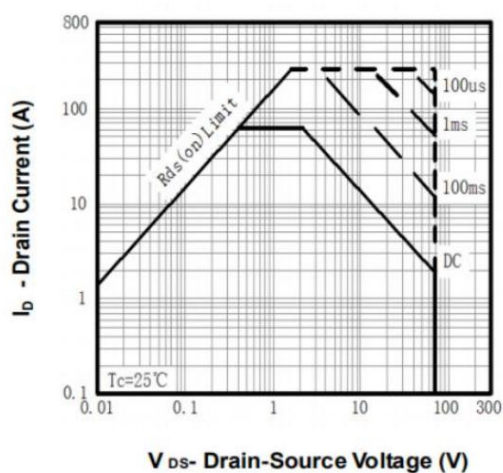


Fig 11. Safe Operation Area

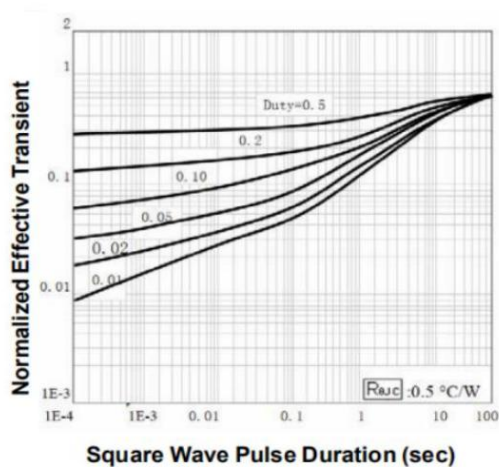
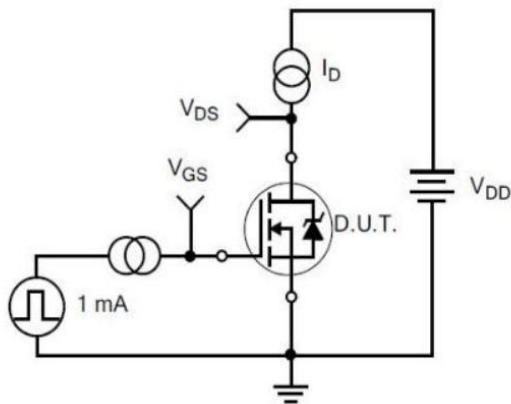
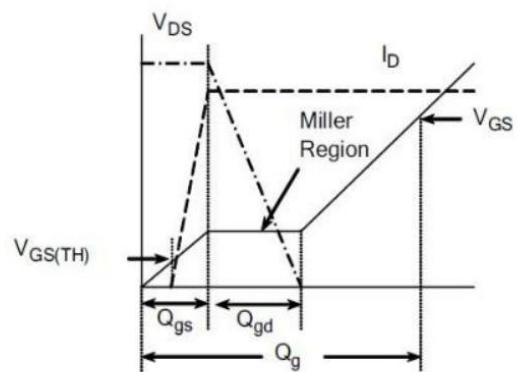


Fig 12. Thermal Transient Impedance

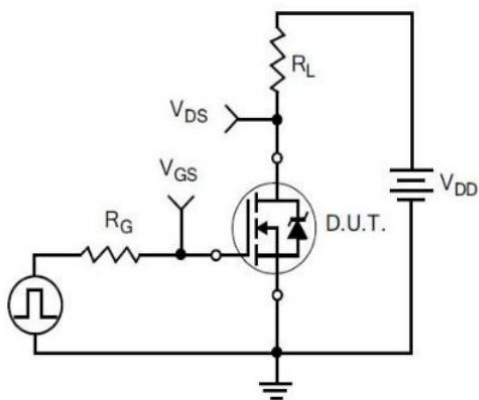
Typical Test Circuit and Waveform



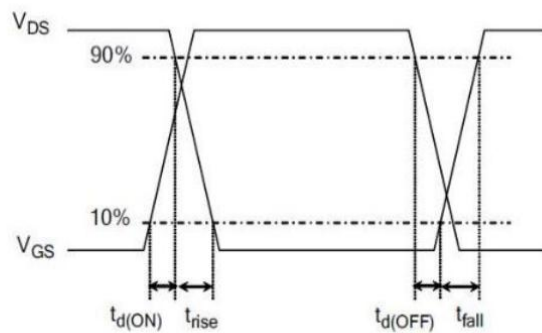
1) Gate Charge Test Circuit



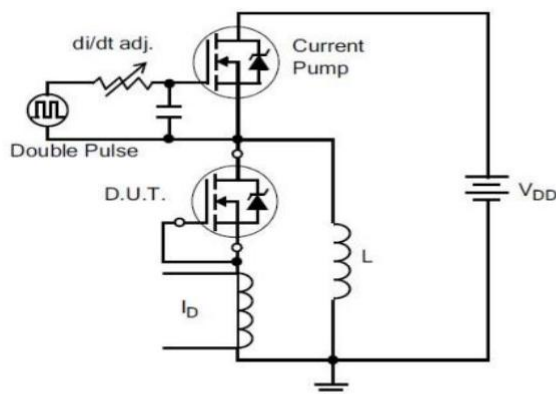
2) Gate Charge Waveform



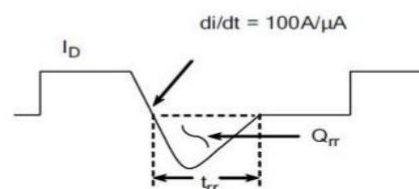
3) Resistive Switching Test Circuit



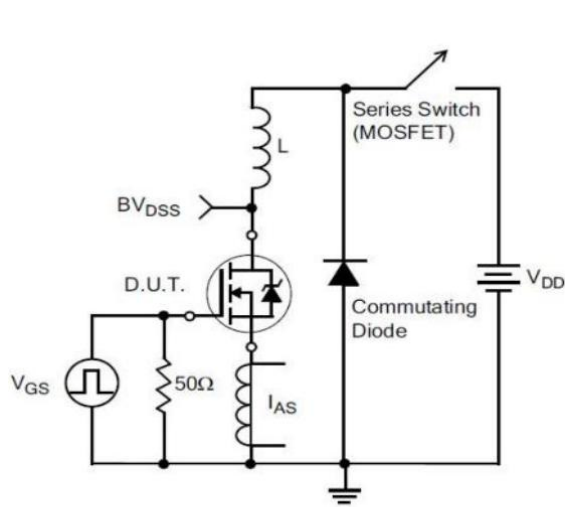
4) Resistive Switching Waveforms



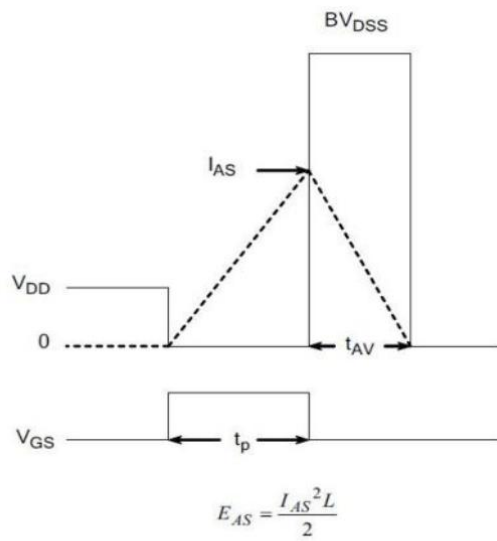
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform

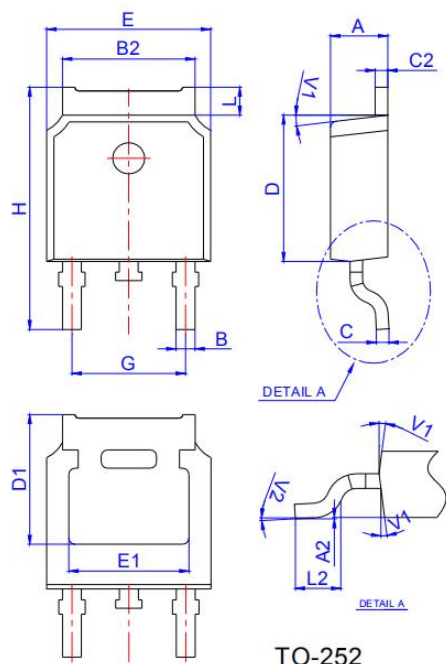


7) . Unclamped Inductive Switching Test Circuit



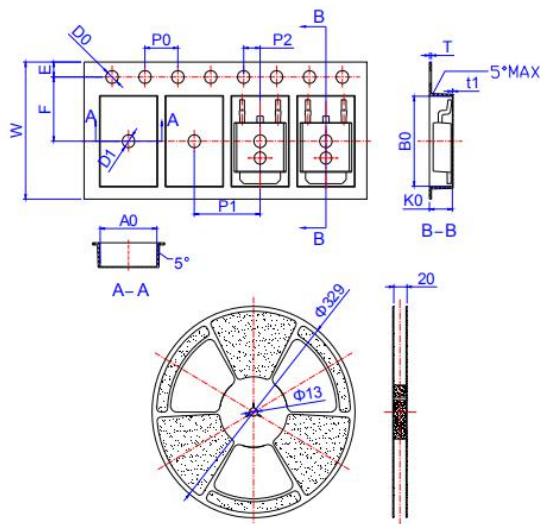
8) Unclamped Inductive Switching Waveforms

Package Mechanical Data



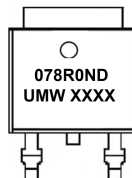
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW SVT078R0ND	TO-252	2500	Tape and reel