

1.Description

The UMW SI2312A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

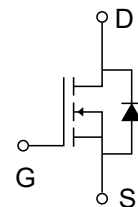
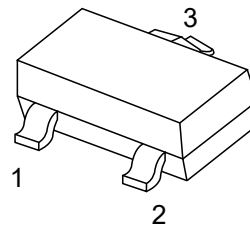
2.Features

- $V_{DS(V)}=20V$
- $I_D=6A(V_{GS}=4.5V)$
- $R_{DS(ON)}<26m\Omega(V_{GS}=4.5V)$
- $R_{DS(ON)}<33m\Omega(V_{GS}=2.5V)$
- $R_{DS(ON)}<50m\Omega(V_{GS}=1.8V)$

3.Pinning information

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

SOT-23



4.Absolute Maximum Ratings $T_A=25^{\circ}C$

Parameter		Symbol	Maximum		Units
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	±8		
Continuous Drain Current *1	T _C =25°C	I _D	6	5	A
	T _C =70°C		5	4	
Pulsed Drain Current *2		I _{DM}	15		
Avalanche Current *2	L=0.1mH	I _{AS}	15		
Single Avalanche Energy		E _{AS}	11.25		mJ
Power Dissipation *1	T _C =25°C	P _D	1.25	0.75	W
	T _A =70°C		0.8	0.48	



Thermal Resistance.Junction- to-Ambient *1	t≤5 sec	R _{thJA}	100	°C/W
	Steady State		166	
Thermal Resistance.Junction-to-Foot		R _{thJF}	50	°C
Junction Temperature		T _J	150	
Storage Temperature Range		T _{STG}	-55 to 150	

*1 Surface Mounted on 1" x 1" FR4 Board.

*2 Pulse width limited by maximum junction temperature.



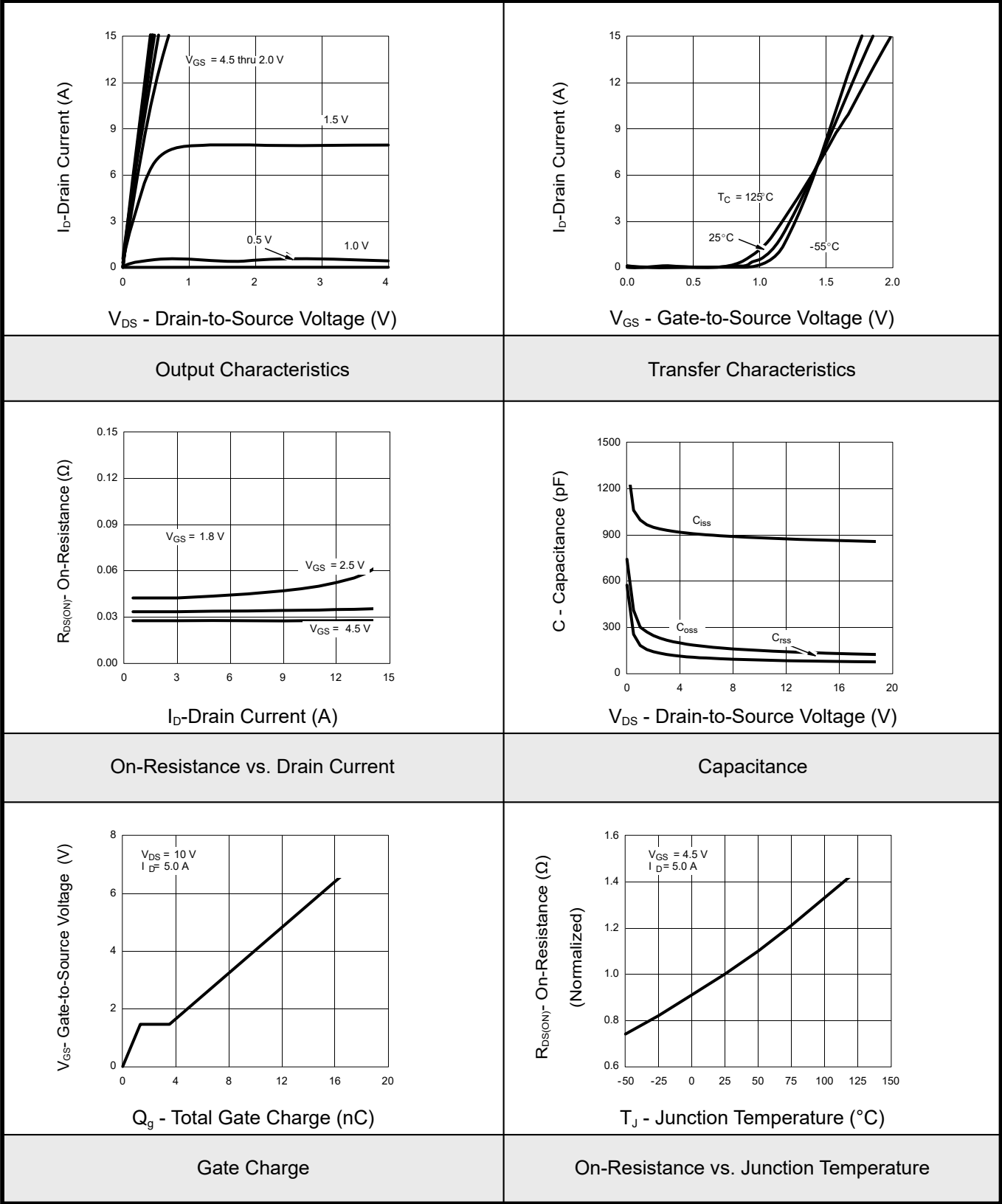
5. Electrical Characteristics $T_A = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{DSS}	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{V}$, $V_{GS} = 0\text{V}$			1	μA
		$V_{DS} = 20\text{V}$, $V_{GS} = 0\text{V}$, $T_A = 70^\circ\text{C}$			75	
Gate-Body leakage current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 8\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	0.45	0.65	0.85	V
On-State Drain Current *1	$I_{D(ON)}$	$V_{DS} \geq 10\text{V}$, $V_{GS} = 4.5\text{V}$	15			A
Static Drain-Source On-Resistance *1	$R_{DS(ON)}$	$V_{GS} = 4.5\text{V}$, $I_D = 5\text{A}$			26	m Ω
		$V_{GS} = 2.5\text{V}$, $I_D = 4.5\text{A}$			33	
		$V_{GS} = 1.8\text{V}$, $I_D = 4\text{A}$			50	
Forward Transconductance	g_{FS}	$V_{DS} = 15\text{V}$, $I_D = 5\text{A}$		40		S
Total Gate Charge	Q_g	$V_{GS} = 4.5\text{V}$, $V_{DS} = 10\text{V}$, $I_D = 5\text{A}$		11.2	14	nC
Gate Source Charge	Q_{gs}			1.4		
Gate Drain Charge	Q_{gd}			2.2		
Turn-On DelayTime	$t_{D(on)}$	$I_D = 1\text{A}$, $V_{DS} = 10\text{V}$ $V_{GEN} = 4.5\text{V}$ $R_L = 10\Omega$, $R_G = 6\Omega$		15	25	ns
Turn-On Rise Time	t_r			40	60	
Turn-Off DelayTime	$t_{D(off)}$			48	70	
Turn-Off Fall Time	t_f			31	45	
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 1\text{A}$, $dI/dt = 100\text{A}/\mu\text{s}$		13	25	
Maximum Body-Diode Continuous Current	I_S				1	A
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$		0.8	1.2	V

*1 Pulse test: $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.

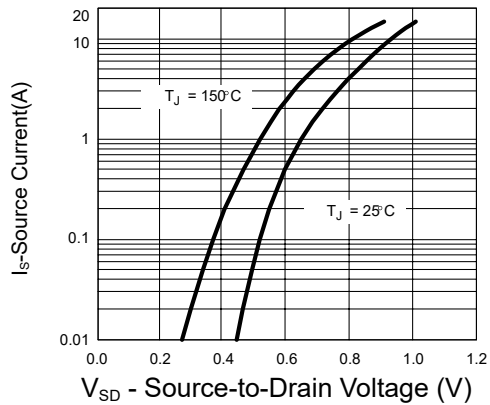


6.1Typical Characterisitics

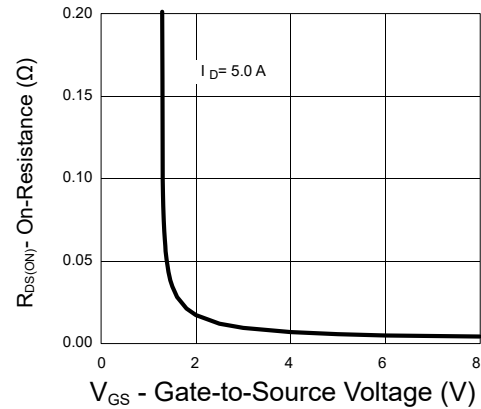




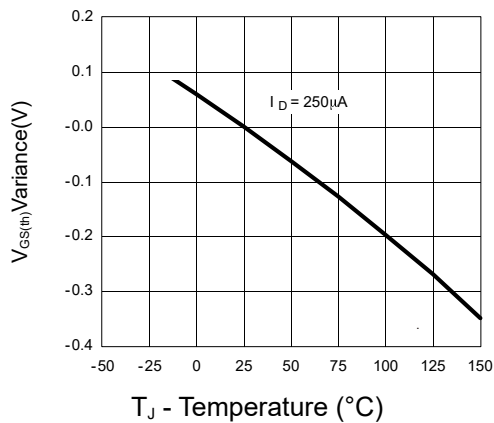
6.2 Typical Characteristics



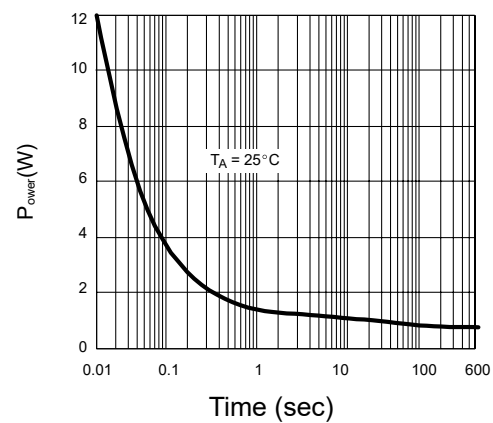
Source-Drain Diode Forward Voltage



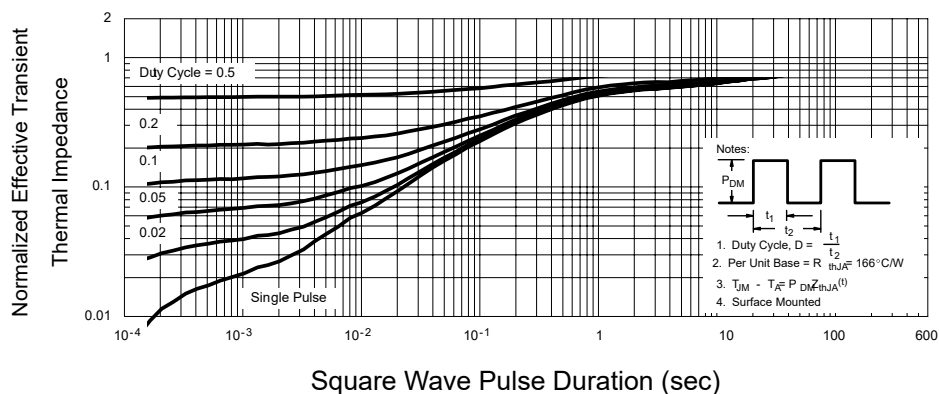
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



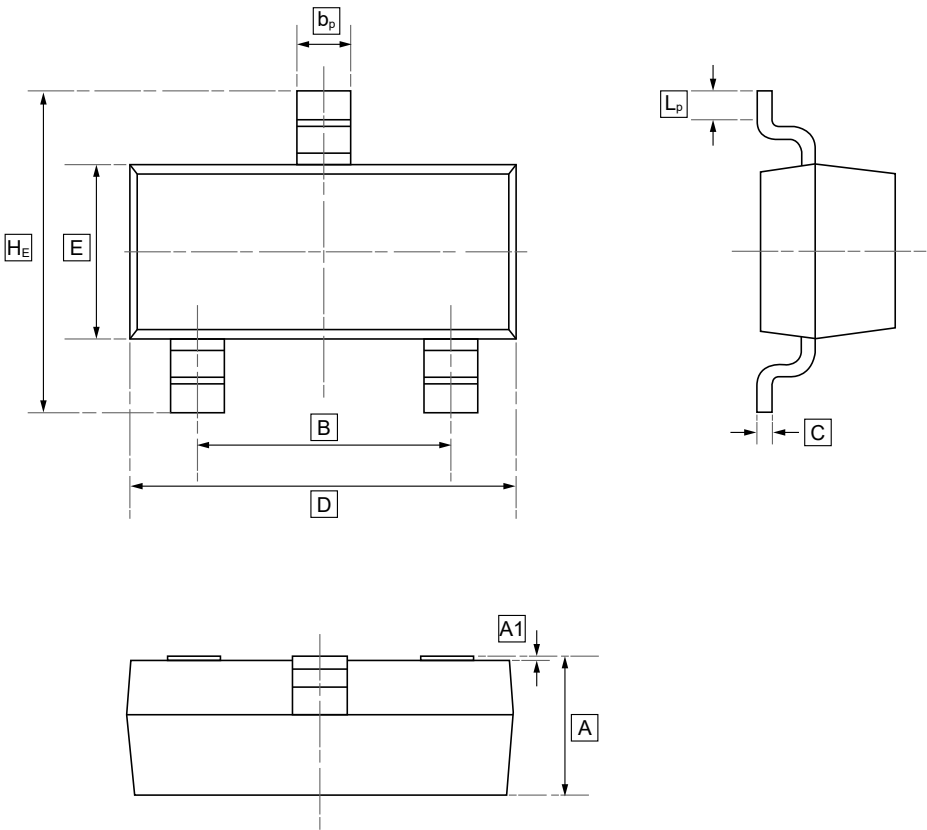
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



7.SOT-23 Package Outline Dimensions

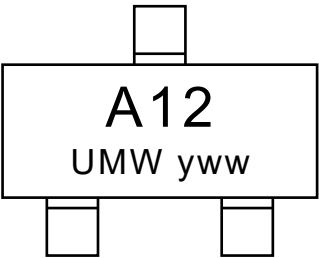


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	b _p	C	D	E	H _E	A1	L _p
Min	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20
Max	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50



8.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW SI2312A	SOT-23	3000	Tape and reel



9.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.

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