UMW SI2312A

20V N-Channel MOSFET

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.

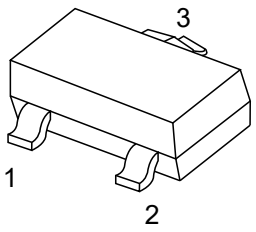
2.Features

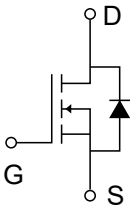
- $V_{DS(V)}$=20V
- I_D=6A
- $R_{DS(ON)}$<26mΩ(V_{GS}=4.5V)
- $R_{DS(ON)}$<33mΩ(V_{GS}=2.5V)
- $R_{DS(ON)}$<50mΩ(V_{GS}=1.8V)

3.Pinning information

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

SOT-23





4.Absolute Maximum Ratings T_A= 25°C

Parameter		Symbol	Max	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current	T_C=25°C	I_D	6[a]	A
	T_C=70°C		5[b,c]	
Pulsed Drain Current		I_{DM}	15	
Avalanche Current	L=0.1mH	I_{AS}	15	
Single Avalanche Energy		E_{AS}	11.25	mJ
Power Dissipation	T_C=25°C	P_D	1.25	W
	T_A=70°C		0.8	

Thermal Resistance.Junction- to-Ambient	t≤5 sec	R_{thJA}	100	°C/W
	Steady State		166	
Thermal Resistance.Junction-to-Foot		R_{thJF}	50	
Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	

Notes:

a. Package limited

b. Surface Mounted on 1" x 1" FR4 board.

c. t = 5 s.

d. Maximum under steady state conditions is 125 °C/W.

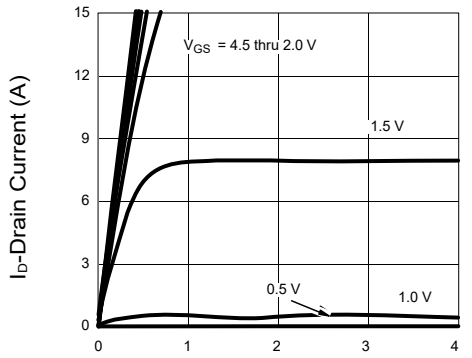
e. Based on T_C = 25 °C.

5.Electrical Characteristics T_A= 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
		V_{DS}=20V, V_{GS}=0V, T_A=70°C			75	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.45	0.65	0.85	V
On-State Drain Current *1	$I_{D(ON)}$	V_{DS}≥10V, V_{GS}=4.5V	15			A
Static Drain-Source On-Resistance *1	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=5A			26	mΩ
		V_{GS}=2.5V, I_D=4.5A			33	
		V_{GS}=1.8V, I_D=4A			50	
Forward Transconductance	g_{FS}	V_{DS}=15V, I_D=5A		40		S
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=10V, I_D=5A		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=1A, V_{DS}=10V V_{GEN}=4.5V R_L=10Ω, R_G=6Ω		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=1A, dI/dt=100A/μs		13	25	
Maximum Body-Diode Continuous Current	I_S				1	A
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.8	1.2	V

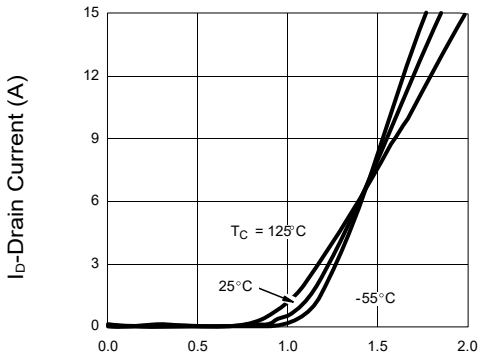
*1 Pulse test: PW ≤ 300u s duty cycle≤ 2%.

6.1Typical Characterisitics



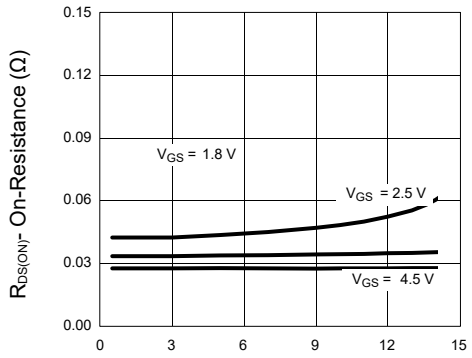
V_{DS} - Drain-to-Source Voltage (V)

Output Characteristics



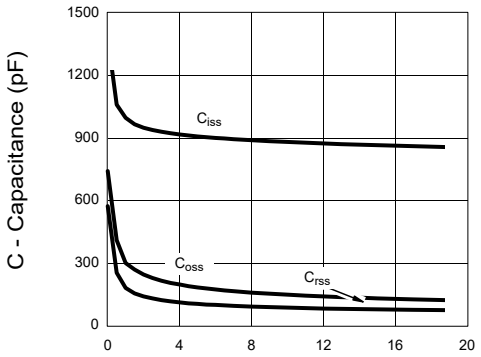
V_{GS} - Gate-to-Source Voltage (V)

Transfer Characteristics



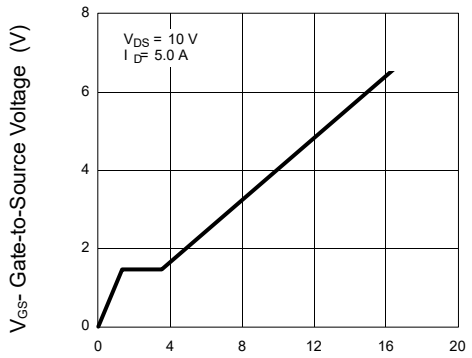
I_D-Drain Current (A)

On-Resistance vs. Drain Current



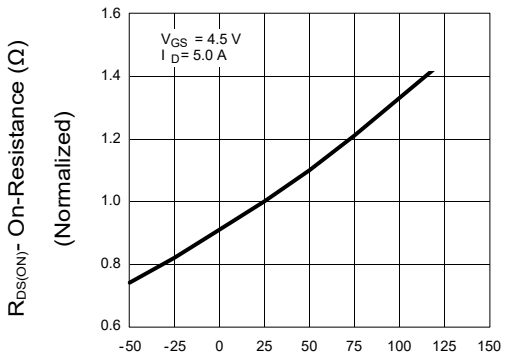
V_{DS} - Drain-to-Source Voltage (V)

Capacitance



Q_g - Total Gate Charge (nC)

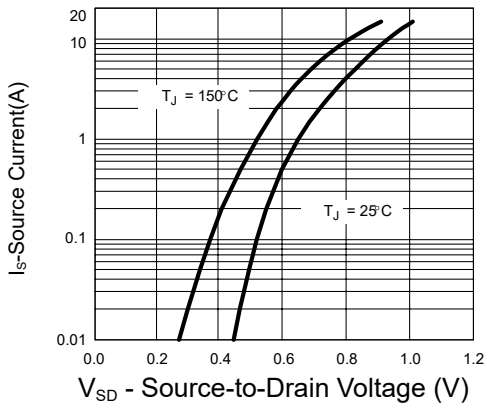
Gate Charge



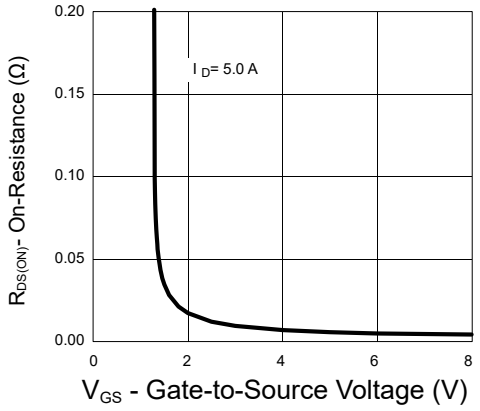
T_J - Junction Temperature (°C)

On-Resistance vs. Junction Temperature

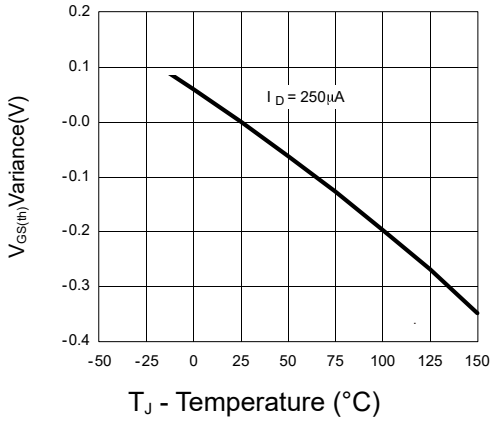
6.2Typical Characterisitics



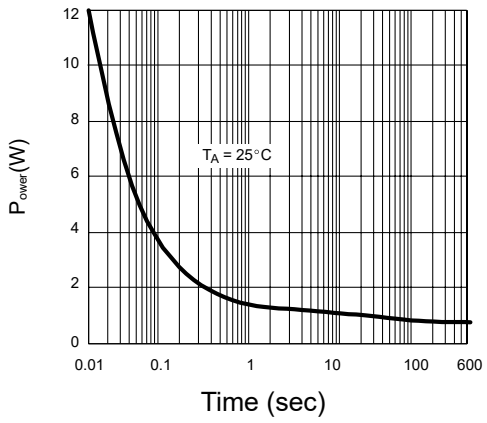
Source-Drain Diode Forward Voltage



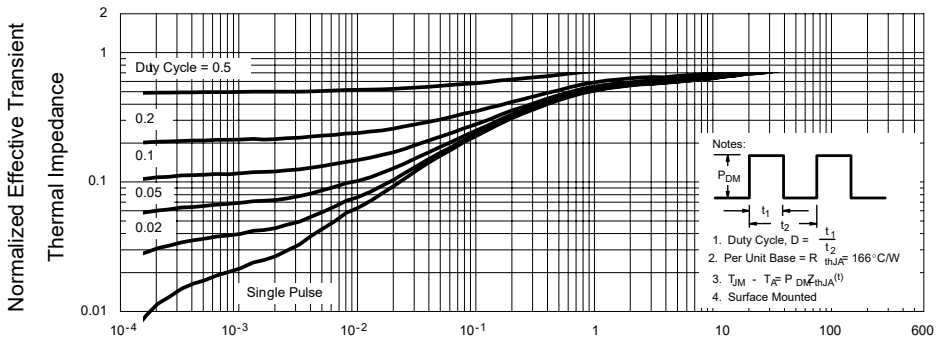
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

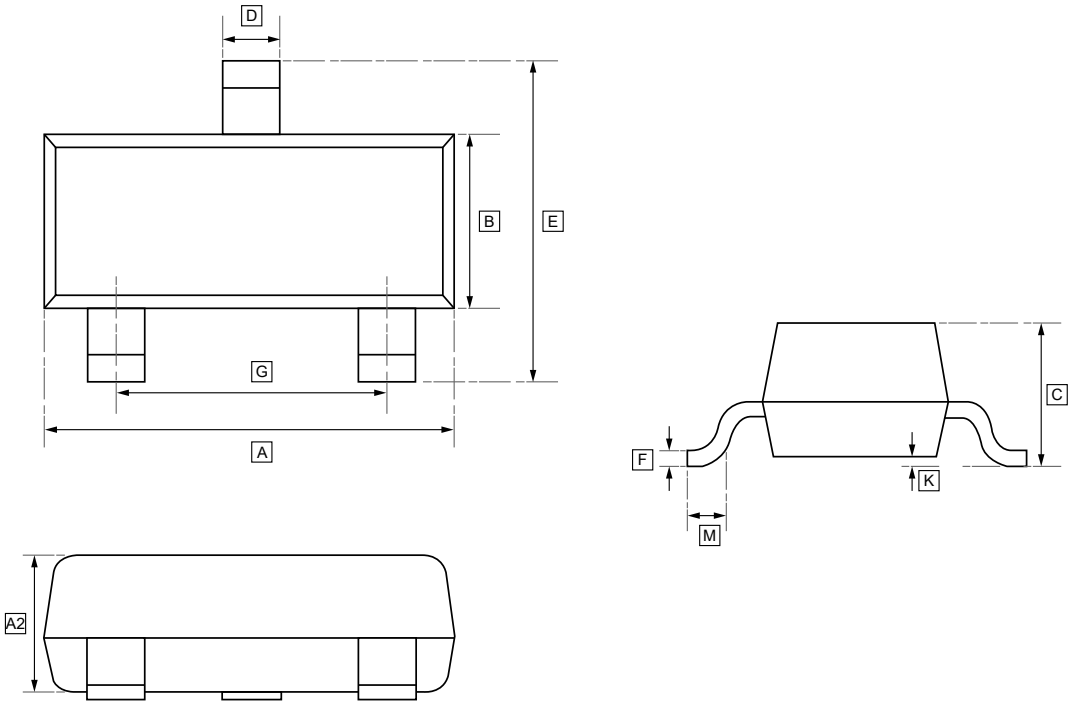


Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

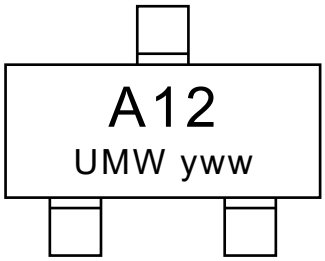
7.SOT-23 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	G	K	M	A2	F
Min	2.80	1.20	0.90	0.32	2.25	1.80	0.00	0.30	0.95	0.095
Max	3.04	1.40	1.10	0.55	2.55	2.00	0.10	-	1.05	0.115

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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