UMW®

UMW SI2304A

30V N-Channel MOSFET

1.Description

The SI2304A 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.

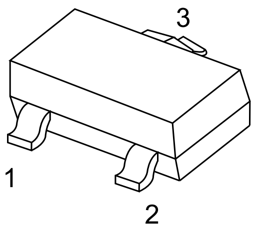
2.Features

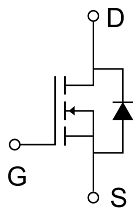
- $V_{DS(V)}$=30V
- $R_{DS(ON)}$=27mΩ (TYP.) @ V_{GS}=10V
- $R_{DS(ON)}$=36mΩ (TYP.) @ V_{GS}=4.5V

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	Rating	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current T_J=150°C *1	T_A=25°C	I_D	3.6	A
	T_A=70°C		3	
Pulsed Drain Current		I_{DM}	16	
Power Dissipation *1	T_A=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		130	
Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	

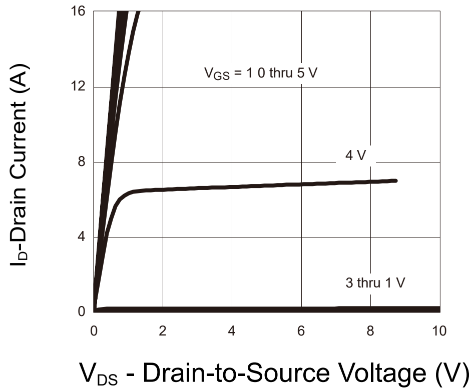
*1.Surface Mounted on FR4 Board,.t ≤ 5 sec

5.Electrical Characteristics T_A= 25°C

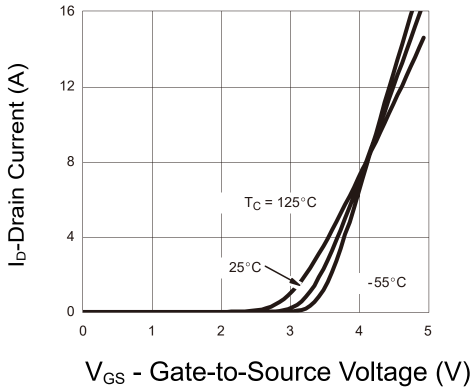
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=250μA, V_{GS}=0V	30			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1		3	V
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			0.5	μA
		V_{DS}=30V, V_{GS}=0V, T_J=55°C			10	
On-state drain current	$I_{D(ON)}$	V_{DS}≥4.5V, V_{GS}=10V	6			A
		V_{DS}≥4.5V, V_{GS}=4.5V	4			A
Drain-sourceon-stateresistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3.5A		27	35	mΩ
		V_{GS}=4.5V, I_D=2.8A		36	46	
Forward transconductance	g_{FS}	V_{DS}=4.5V, I_D=3.5A		6.9		S
Diode forward voltage	V_{SD}	I_S=1.25A, V_{GS}=0V		0.8	1.2	V
gate charge *	Q_g	V_{GS}=5V, V_{DS}=15V, I_D=3.5A		4.2	7	nC
Total gate charge *	Q_{gt}	V_{GS}=10V		8.5	20	nC
Gate-source charge *	Q_{gs}	V_{DS}=15V		1.9		nC
Gate-drain charge*	Q_{gd}	I_D=3.5A		1.35		nC
Gate Resistance	R_g		0.5		2.4	Ω
Input capacitance *	C_{iss}	V_{DS}=15V		555		pF
Output capacitance *	C_{oss}	V_{GS}=0V		120		
Reverse transfer capacitance *	C_{rss}	f=1MHz		60		
Turn-on time	$t_{D(on)}$	V_{DD}=15V, R_L=15Ω, I_D=1A V_{GEN}=-10V, R_G=6Ω		9	20	ns
	t_r			7.5	18	
Turn-off time	$t_{D(off)}$			17	35	
	t_f			5.2	12	

* Pulse test: PW ≤300us duty cycle≤ 2%.

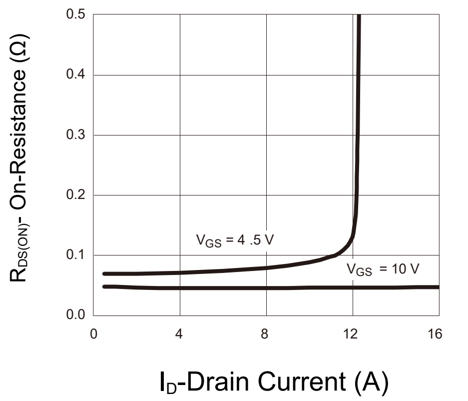
6.1Typical Characterisitics



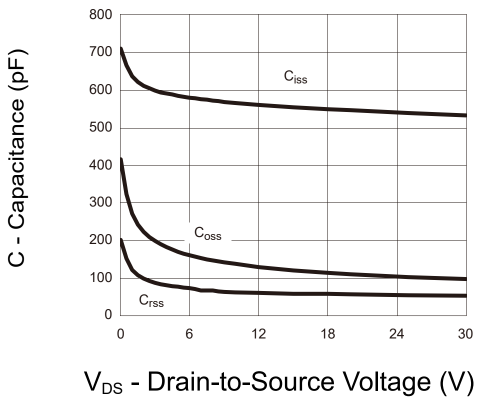
Output Characteristics



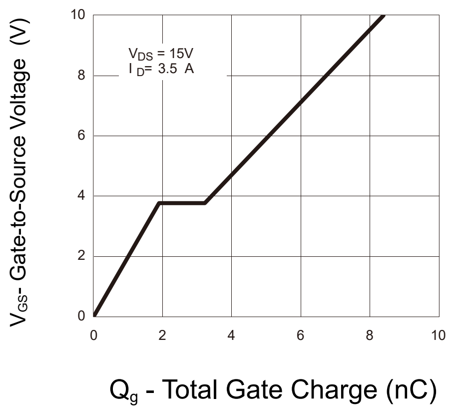
Transfer Characteristics



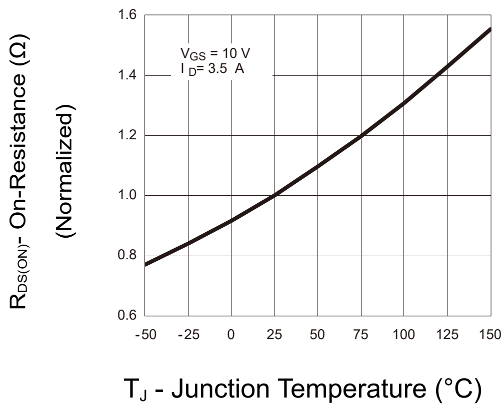
On-Resistance vs. Drain Current



Capacitance

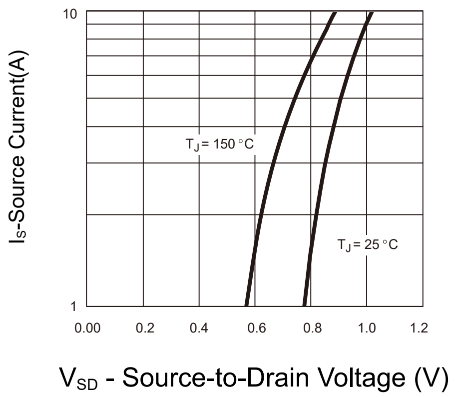


Gate Charge

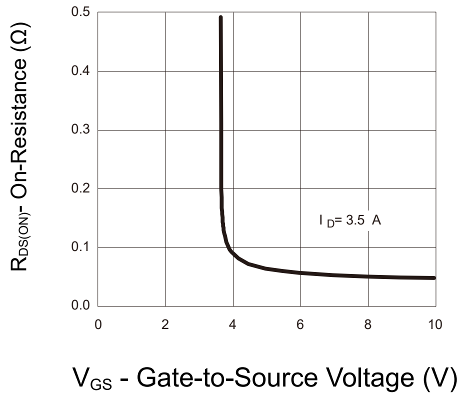


On-Resistance vs. Junction Temperature

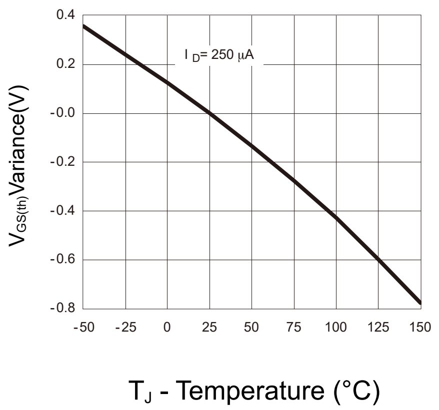
6.2Typical Characterisitics



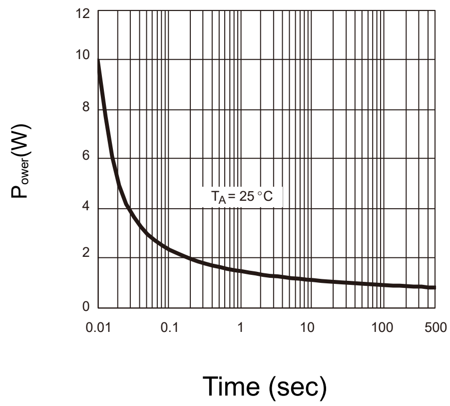
Source-Drain Diode Forward Voltage



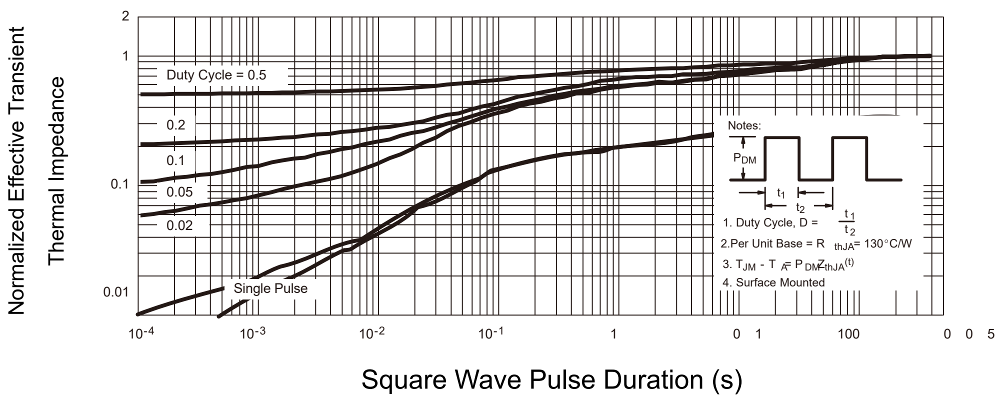
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

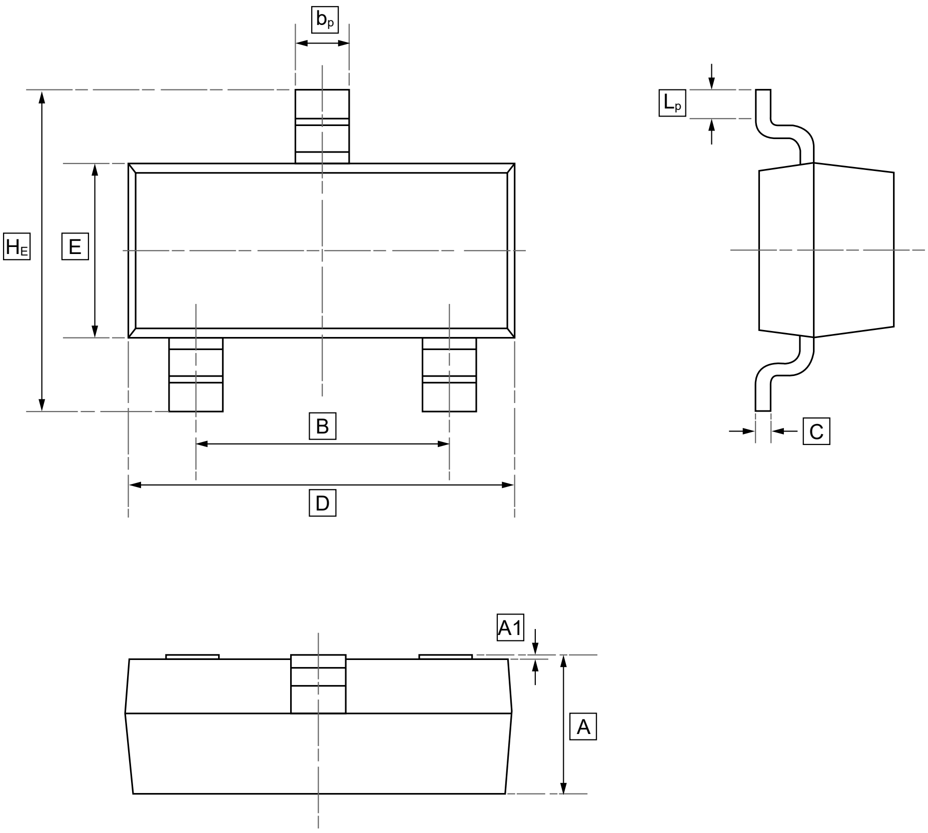


Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

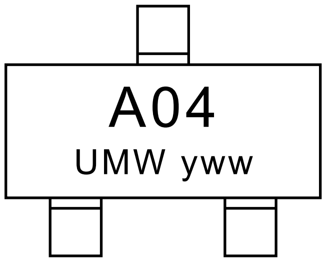
7.SOT-23 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	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 SI2304A	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.

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.