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.

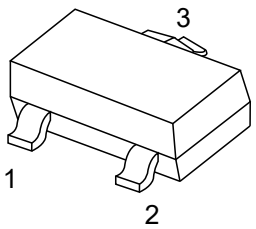
2.Features

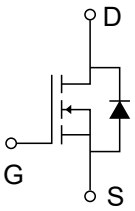
- $V_{DS(V)}$=30V
- $R_{DS(ON)}$=27mΩ (TYP.) @ V_{GS}=10V
- $R_{DS(ON)}$=36mΩ (TYP.) @ V_{GS}=4.5V

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	

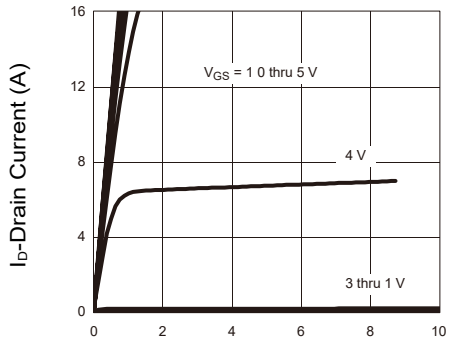
*1.Surface Mounted on FR4 Board,.t ≤ 5 sec

5.Electrical Characteristics T_A= 25°C

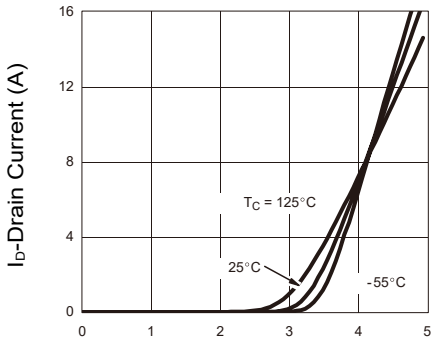
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=250μA, V_{GS}=0V	30			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1		3	V
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			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		9	20	ns
	t_r	V_{GEN}=-10V, R_G=6Ω		7.5	18	
Turn-off time	$t_{D(off)}$			17	35	
	t_f			5.2	12	

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

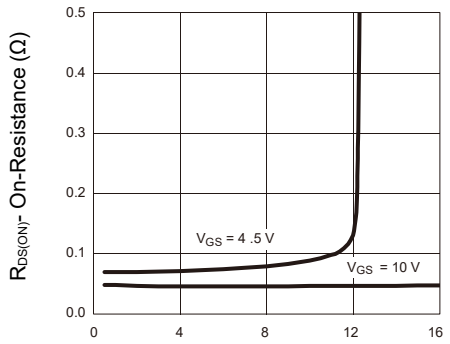
6.1Typical Characterisitics



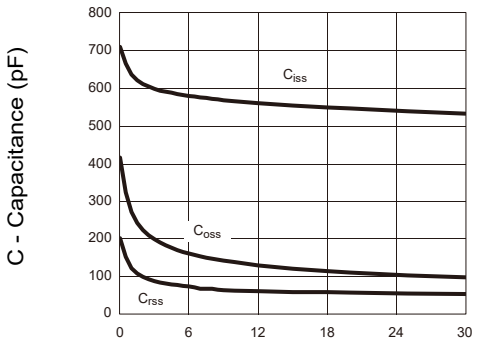
Output Characteristics



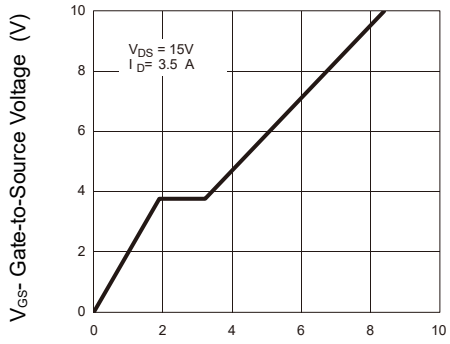
Transfer Characteristics



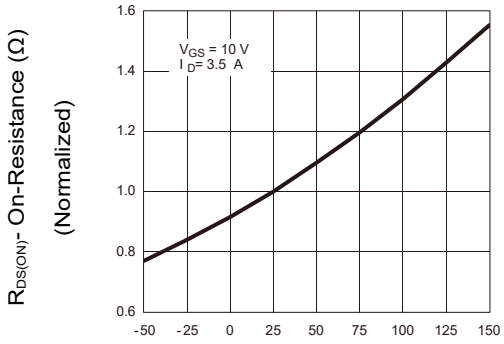
On-Resistance vs. Drain Current



Capacitance

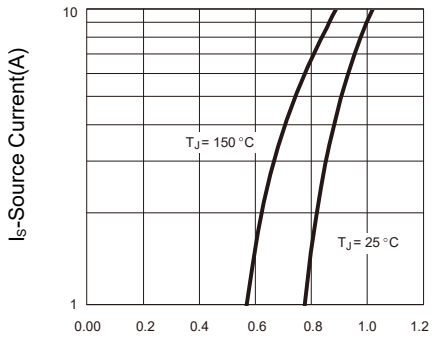


Gate Charge



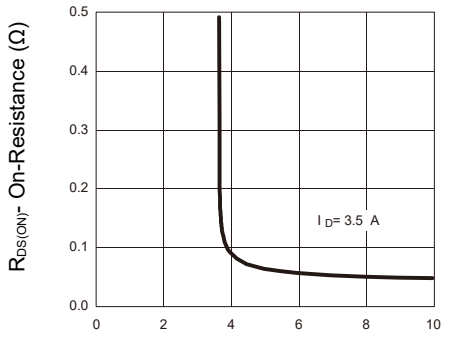
On-Resistance vs. Junction Temperature

6.2Typical Characterisitics



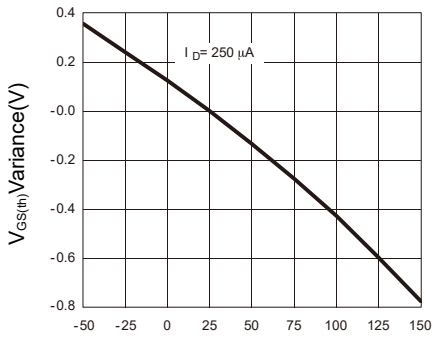
V_{SD} - Source-to-Drain Voltage (V)

Source-Drain Diode Forward Voltage



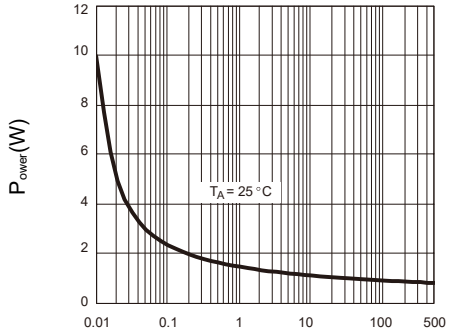
V_{GS} - Gate-to-Source Voltage (V)

On-Resistance vs. Gate-to-Source Voltage



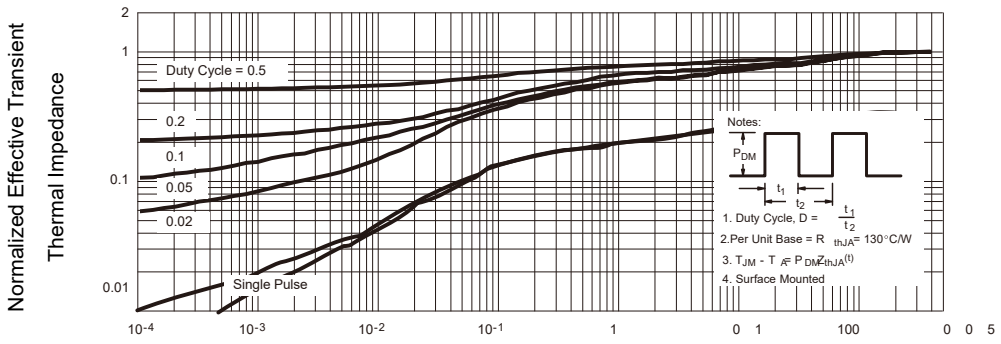
T_J - Temperature (°C)

Threshold Voltage



Time (sec)

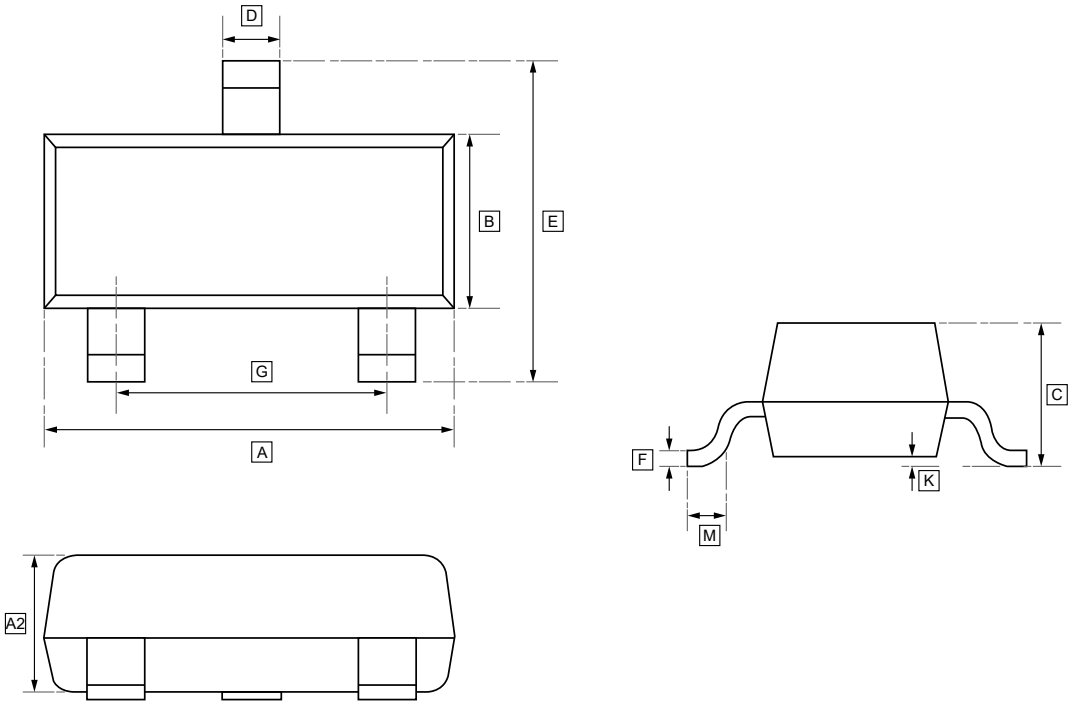
Single Pulse Power



Square Wave Pulse Duration (s)

Normalized Thermal Transient Impedance, Junction-to-Ambient

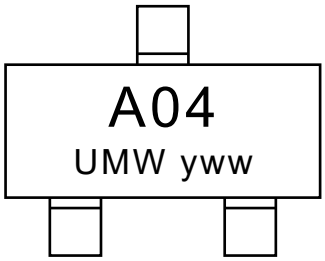
7.SOT-23 Package Outline Dimensions



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 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.

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