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.

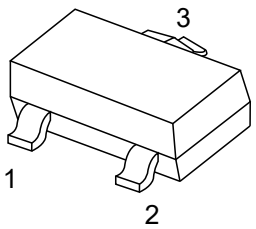
2.Features

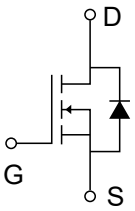
- $V_{DS(V)}$=30V
- $R_{DS(ON)}$=27mΩ (TYP.) @ V_{GS}=10V
- $R_{DS(ON)}$=36mΩ (TYP.) @ V_{GS}=4.5V

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	

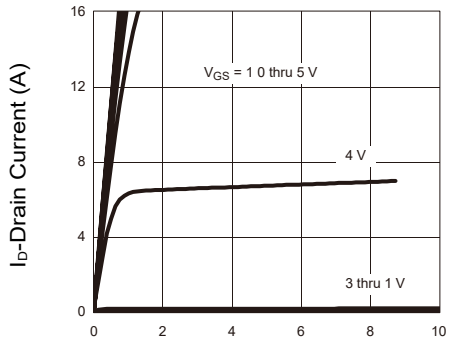
*1.Surface Mounted on FR4 Board,.t ≤ 5 sec

5.Electrical Characteristics T_A= 25°C

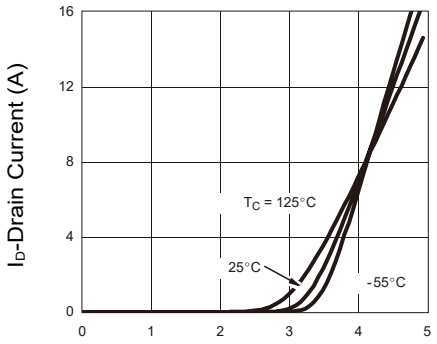
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=250μA, V_{GS}=0V	30			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1		3	V
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			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%.

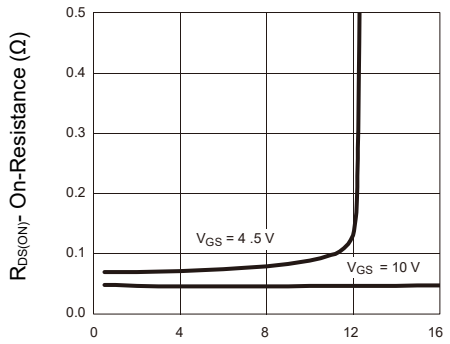
6.1Typical Characterisitics



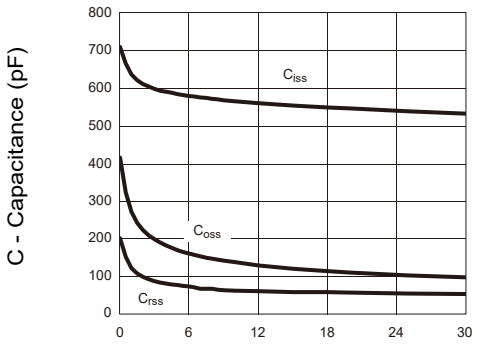
Output Characteristics



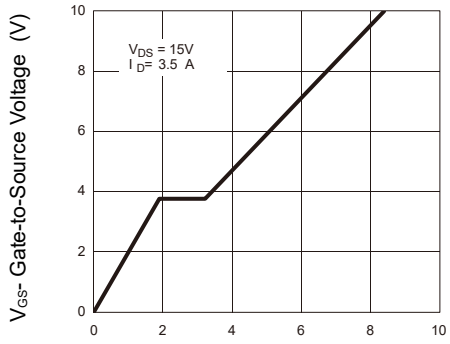
Transfer Characteristics



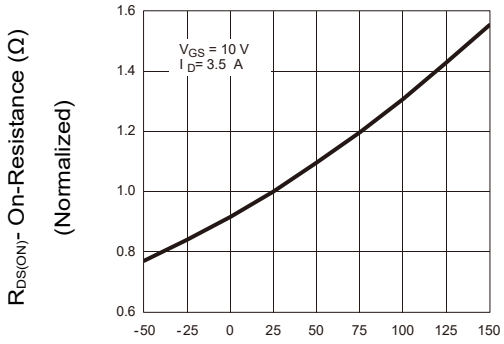
On-Resistance vs. Drain Current



Capacitance

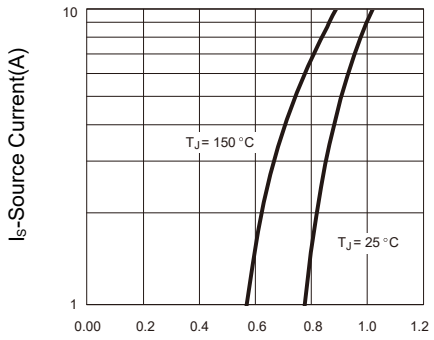


Gate Charge



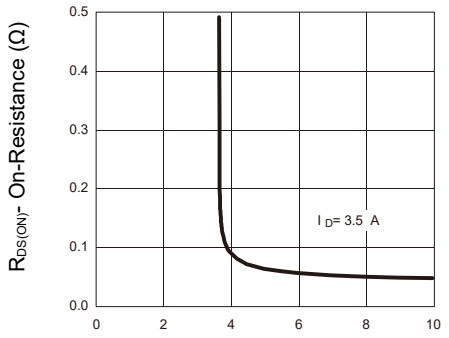
On-Resistance vs. Junction Temperature

6.2Typical Characterisitics



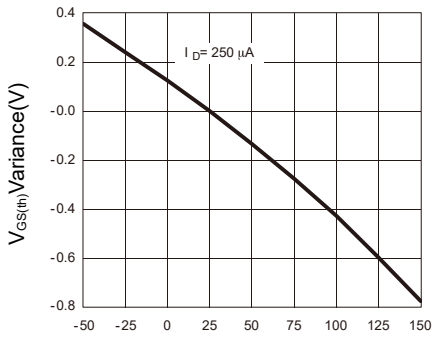
V_{SD} - Source-to-Drain Voltage (V)

Source-Drain Diode Forward Voltage



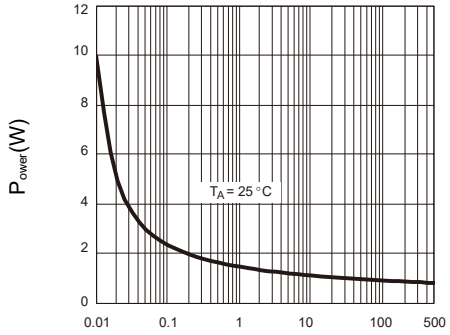
V_{GS} - Gate-to-Source Voltage (V)

On-Resistance vs. Gate-to-Source Voltage



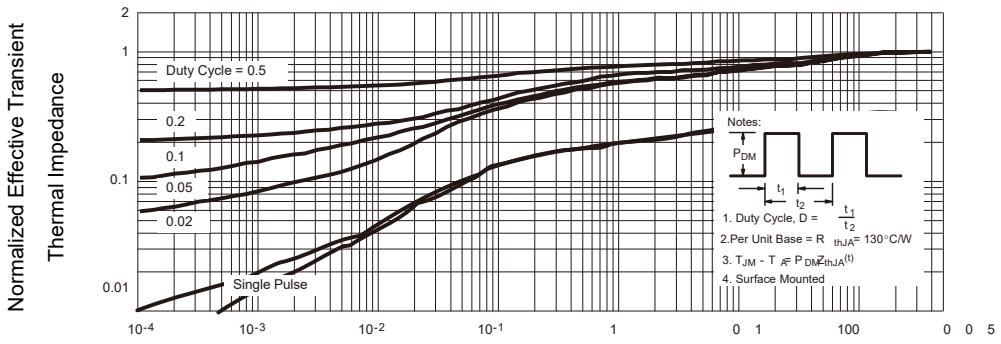
T_J - Temperature (°C)

Threshold Voltage



Time (sec)

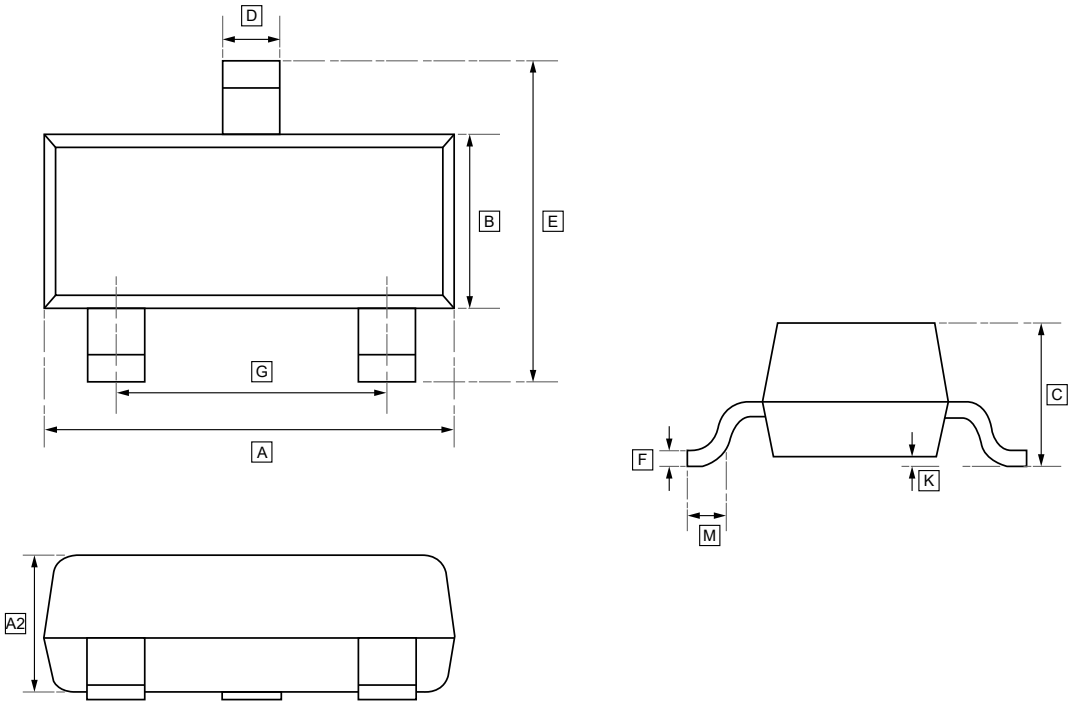
Single Pulse Power



Square Wave Pulse Duration (s)

Normalized Thermal Transient Impedance, Junction-to-Ambient

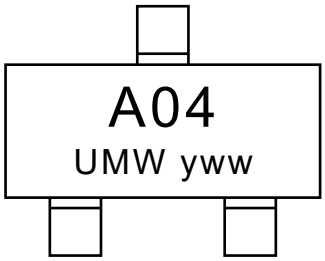
7.SOT-23 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	G	K	M	A2	F
Min	2.85	1.20	0.90	0.40	2.25	1.80	0.00	0.30	0.95	0.095
Max	3.04	1.40	1.10	0.50	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

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