

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.

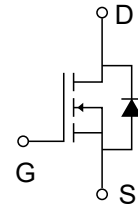
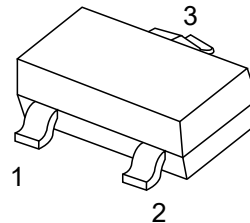
2.Features

- $V_{DS(V)}=30V$
- $R_{DS(ON)}=27m\Omega$ (TYP.) @ $V_{GS}=10V$
- $R_{DS(ON)}=36m\Omega$ (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 $T_A=25^{\circ}C$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current $T_J=150^{\circ}C$ *1	$T_A=25^{\circ}C$	I_D	3.6	A
	$T_A=70^{\circ}C$		3	
Pulsed Drain Current		I_{DM}	16	
Power Dissipation *1	$T_A=25^{\circ}C$	P_D	1.25	W
	$T_A=70^{\circ}C$		0.8	
Thermal Resistance.Junction- to-Ambient	$t \leq 5$ sec	R_{thJA}	100	$^{\circ}C/W$
	Steady State		130	
Junction Temperature		T_J	150	$^{\circ}C$
Storage Temperature Range		T_{STG}	-55 to 150	

*1.Surface Mounted on FR4 Board, $t \leq 5$ sec



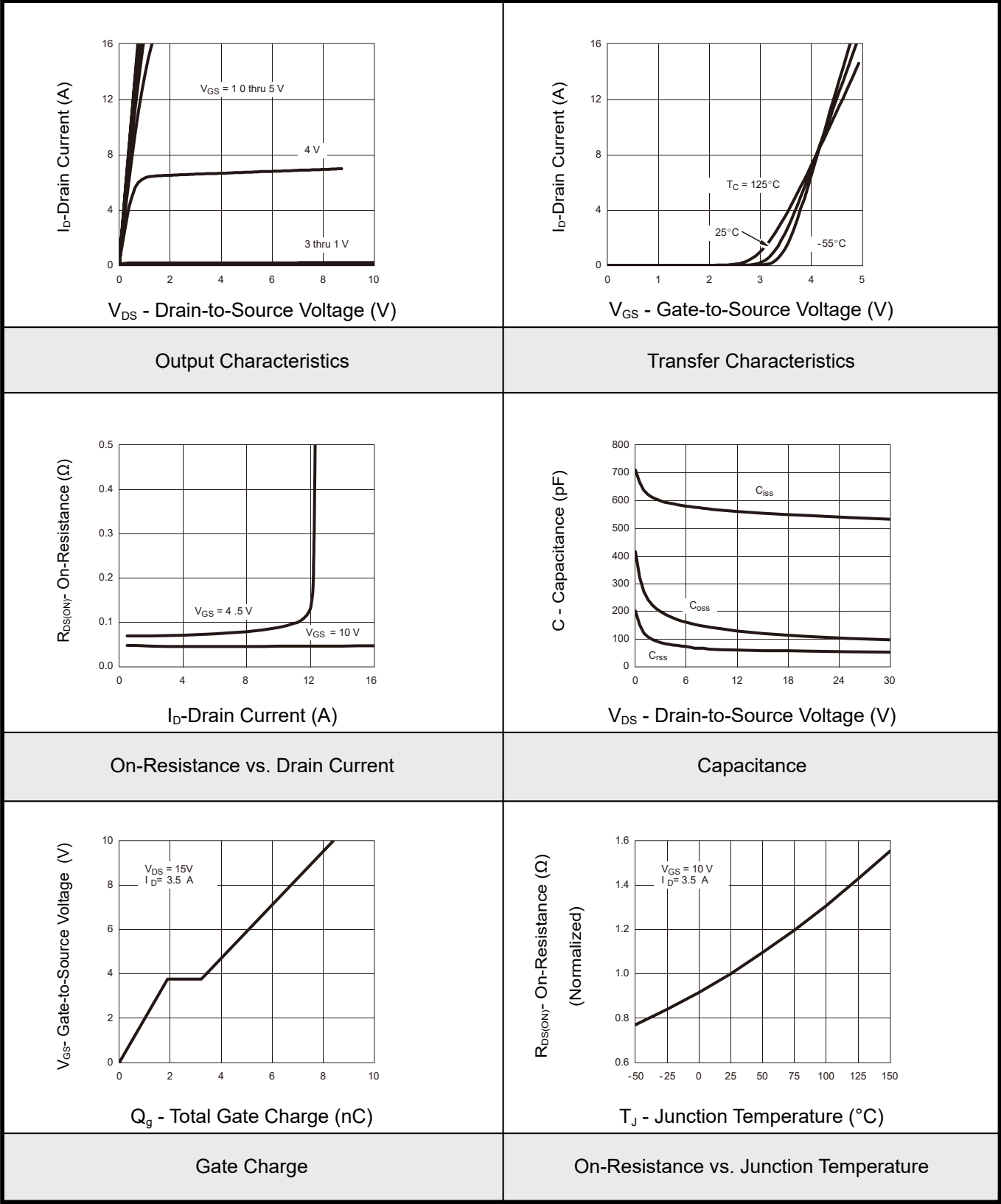
5. Electrical Characteristics $T_A = 25^\circ\text{C}$

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

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

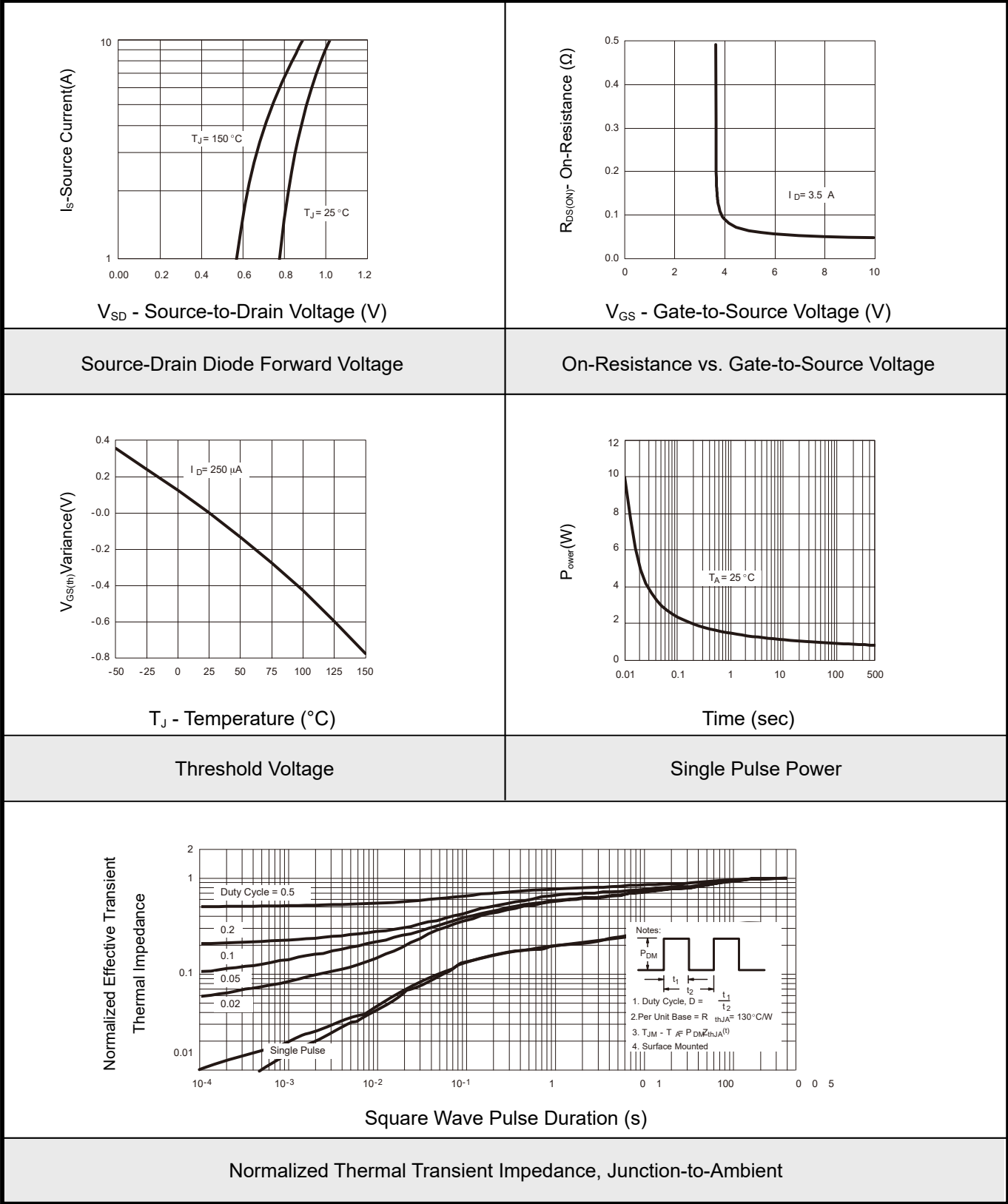


6.1Typical Characteristics



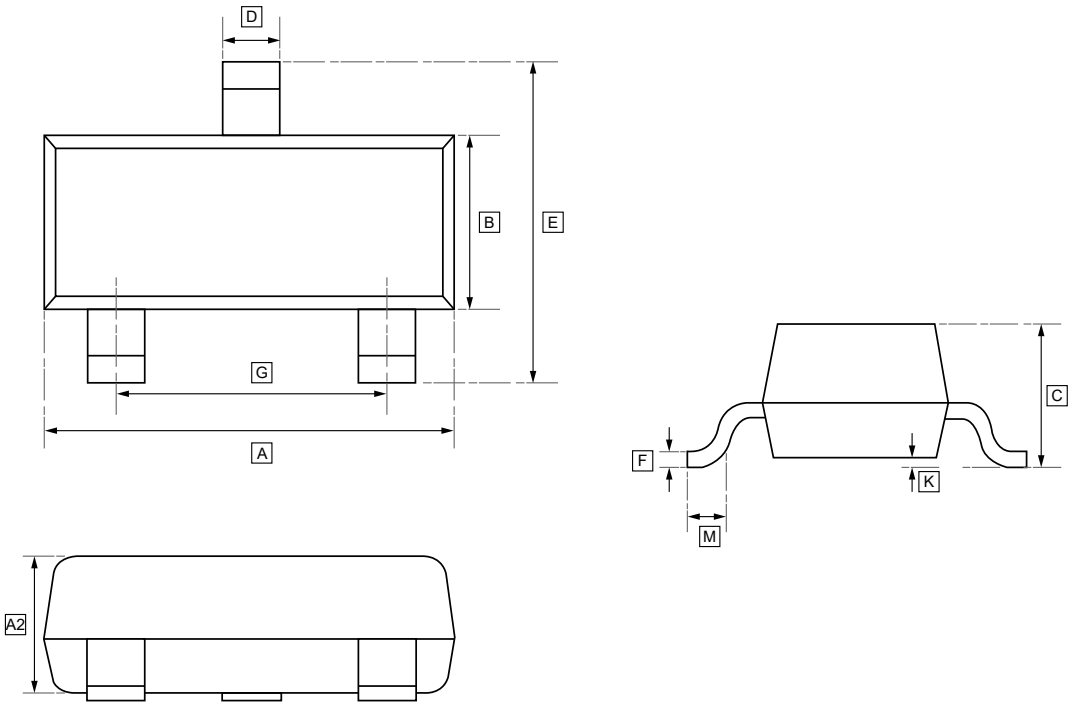


6.2Typical Characteristics





7.SOT-23 Package Outline Dimensions

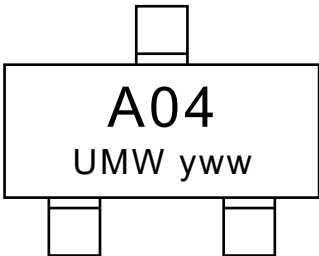


DIMENSIONS (mm are the original dimensions)

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



9.Disclaimer

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