UMW SI2305A

-20V P-Channel MOSFET

1.Description

The SI2305A uses advanced trench technology to provide excellent $R_{DS(ON)}$, and low gate charge. This device is suitable for use as a load switch or in PWM applications.

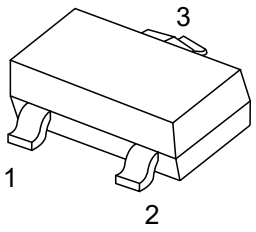
2.Features

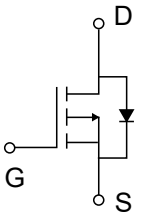
- $V_{DS(V)}$=-20V
- $R_{DS(ON)}$<40mΩ(V_{GS}=-4.5V), I_D=-4.2A
- $R_{DS(ON)}$<60mΩ(V_{GS}=-2.5V), I_D=-3.4A

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

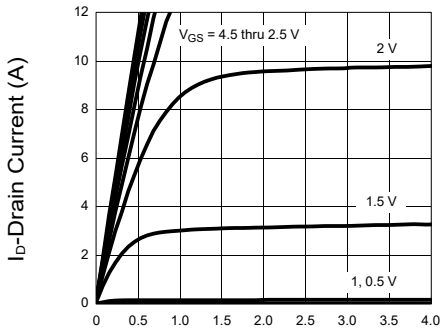
Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_A=25°C	I_D	-4.2	A
	T_A=70°C		-3.4	
Pulsed Drain Current		I_{DM}	-10	
Power Dissipation	T_A=25°C	P_D	1.38	W
	T_A=70°C		0.8	
Thermal Resistance.Junction-to-Ambient		$R_{\theta JA}$	90	°C/W
Operating junction and storage temperature range		T_J,T_{STG}	-55 to 150	°C

5.Electrical Characteristics T_A= 25°C

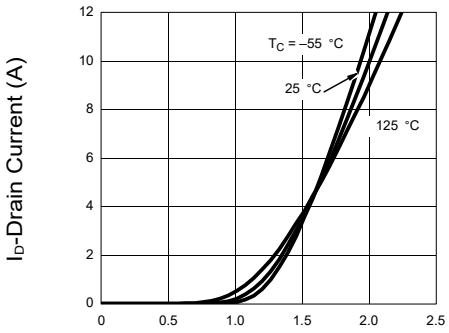
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-10μA, V_{GS}=0V	-20			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.5			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	μA
		V_{DS}=-16V,V_{GS}=0V,T_J=55°C			-10	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4.2A			40	mΩ
		V_{GS}=-2.5V, I_D=-3.4A			60	
On-state drain curren	$I_{D(ON)}$	V_{DS}≤-5V, V_{GS}=-4.5V	-6			A
		V_{DS}≤-5V, V_{GS}=-2.5V	-3			
Forward transconductance	g_{FS}	V_{DS}=-4.5V, I_D=-2.8A		9		S
Input capacitance *	C_{iss}	V_{GS}=0V, V_{DS}=-15V, f=1MHz		740		pF
Output capacitance *	C_{oss}			167		
Reverse transfer capacitance *	C_{rss}			126		
Total gate charge *	Q_g	V_{DS}=-16V V_{GS}=-4.5V I_D=-4.2A		10.6		nC
Gate-source charge *	Q_{gs}			2.32		
Gate-drain charge*	Q_{gd}			3.68		
Turn - On Delay Time	$t_{D(on)}$	V_{DD}=-15V, R_L=3.6Ω I_D=-4.2A V_{GEN}=-10V, R_G=6Ω		5.9		ns
Turn - On Rise Time	t_r			3.6		ns
Turn - Off Delay Time	$t_{D(off)}$			32.4		ns
Turn - Off Fall Time	t_f			2.6		ns
Continuous source current (diode conduction) *	I_S			-1.6		A
Diode forward voltage	V_{SD}	I_S=-1.2A, V_{GS}=0V		-0.8	-1.2	V

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

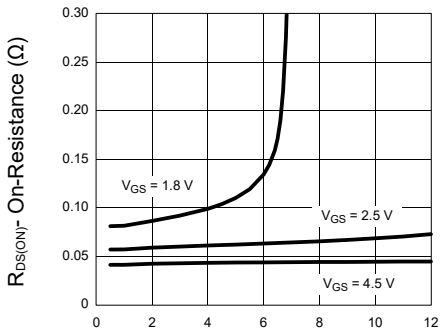
6.1Typical Characterisitics



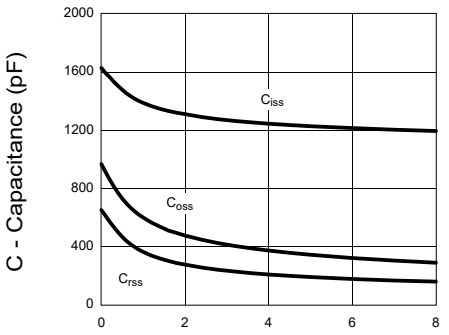
Output Characteristics



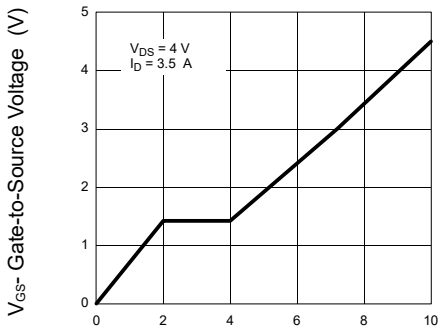
Transfer Characteristics



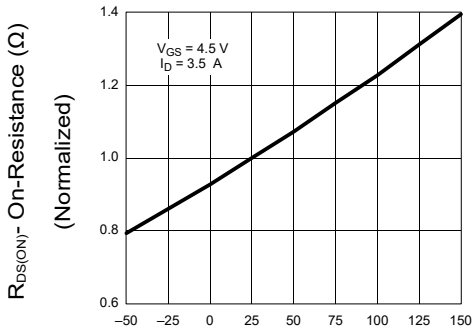
On-Resistance vs. Drain Current



Capacitance

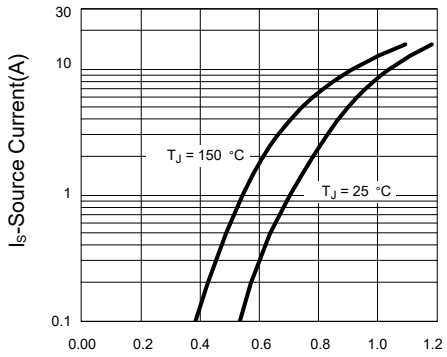


Gate Charge

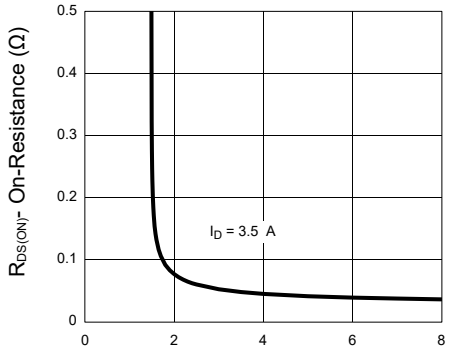


On-Resistance vs. Junction Temperature

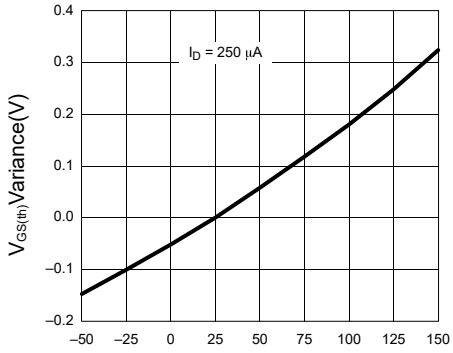
6.2Typical Characterisitics



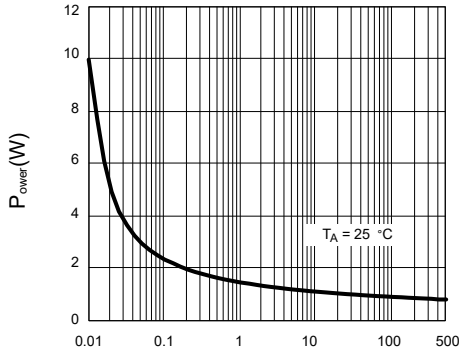
Source-Drain Diode Forward Voltage



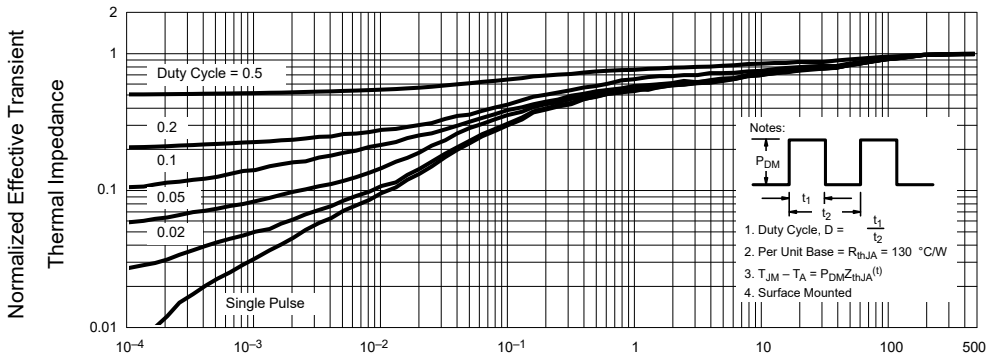
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

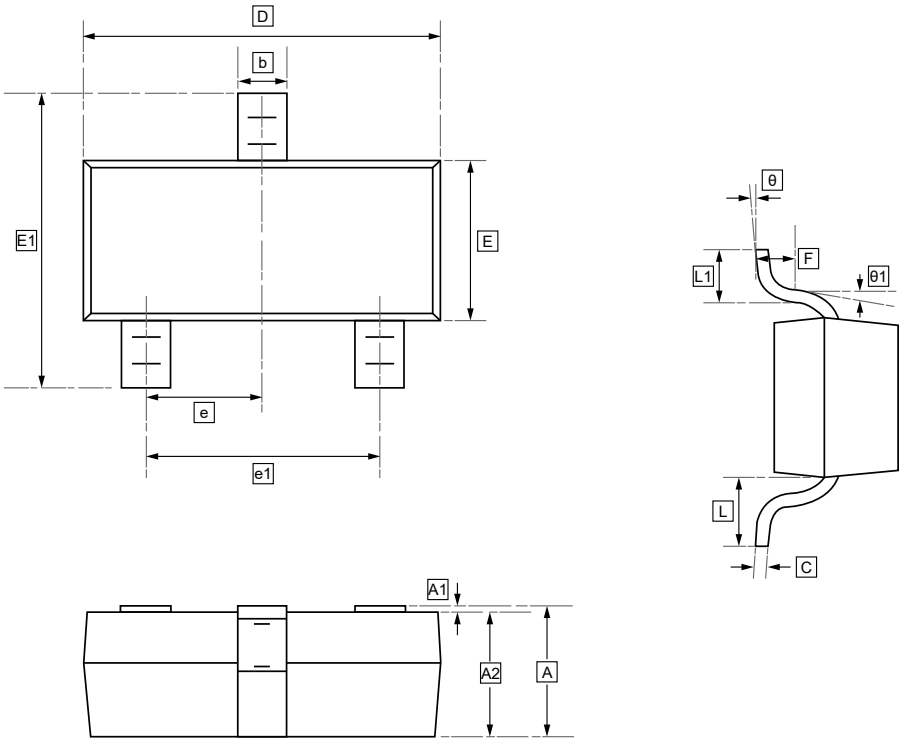


Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

7.SOT-23 Package Outline Dimensions

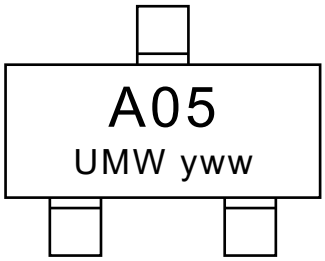


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°

8.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW SI2305A	SOT-23	3000	Tape and reel

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