UMW SI2318A

40V N-Channel MOSFET

1.Description

The SI2318A 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.

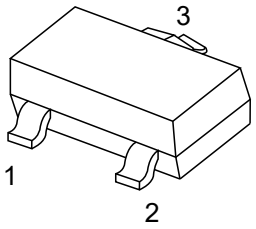
2.Features

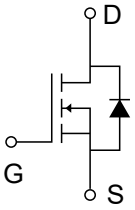
- $V_{DS(V)}$=40V
- I_D=5.6A
- $R_{DS(ON)}$<36mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<46mΩ(V_{GS}=4.5V)

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	Maximum	Units
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C=25°C	I_D	5.6	A
	T_C=70°C		4.5	
	T_A=25°C		4.3[b,c]	
	T_A=70°C		3.5[b,c]	
Pulsed Drain Current		I_{DM}	20	
Power Dissipation	T_C=25°C	P_D	2.1	W
	T_C=70°C		1.3	W
	T_A=25°C		1.25[b,c]	W
	T_A=70°C		0.8[b,c]	W

Thermal Resistance.Junction- to-Ambient	R_{thJA}	100	°C/W
Thermal Resistance.Junction-to-Foot	R_{thJF}	60	
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to 150	

Notes:

a. Package limited

b. Surface Mounted on 1" x 1" FR4 board.

c. t = 5 s.

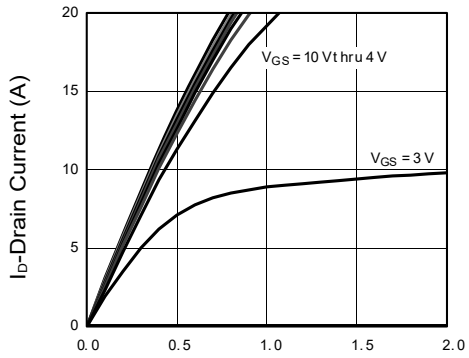
d. Maximum under steady state conditions is 130°C/W.

5.Electrical Characteristics T_A= 25°C

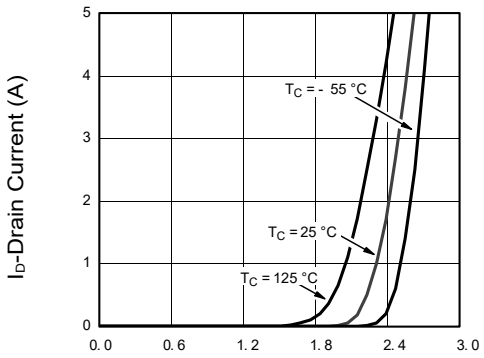
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V			1	μA
		V_{DS}=10V,V_{GS}=0V,T_J=70°C			10	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2		2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=4.7A			36	mΩ
		V_{GS}=4.5V, I_D=3.9A			46	
On state drain current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}≥5V	20			A
Forward Transconductance	g_{FS}	V_{DS}=20V, I_D=4.3A		17		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz		340		pF
Output Capacitance	C_{oss}			60		
Reverse Transfer Capacitance	C_{rss}			30		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	0.6		6.6	Ω
Total Gate Charge	Q_g	V_{GS}=20V, V_{DS}=10V, I_D=4.3A		5.8	9	nC
		V_{GS}=20V, V_{DS}=4.5V, I_D=4.3A		2.9	6	
Gate Source Charge	Q_{gs}			1.1		
Gate Drain Charge	Q_{gd}			0.9		
Turn-On DelayTime	$t_{D(on)}$	V_{DD}=20V, R_G=1Ω, R_L=5.7Ω, V_{GEN}=4.5V, I_D=3.5A		12	20	ns
Turn-On Rise Time	t_r			50	75	
Turn-Off DelayTime	$t_{D(off)}$			10	20	
Turn-Off Fall Time	t_f			8	16	
Turn-On DelayTime	$t_{D(on)}$	V_{DD}=20V, R_G=1Ω, R_L=5.7Ω, V_{GEN}=10V, I_D=3.5A		7	14	ns
Turn-On Rise Time	t_r			20	30	
Turn-Off DelayTime	$t_{D(off)}$			14	21	
Turn-Off Fall Time	t_f			8	16	

Body Diode Reverse Recovery Time	t_{rr}	I_F=3.5A, dI_F/dt=100A/μs T_J=25°C		15	23	ns
Body Diode Reverse Recovery Charge	Q_{rr}			7	14	ns
Reverse Recovery Fall Time	t_a			11		ns
Reverse Recovery Rise Time	t_b			4		ns
Maximum Body-Diode Continuous Current	I_S	T_C=25°C			1.75	A
Pulse Diode Forward Current	I_{SM}				20	A
Diode Forward Voltage	V_{SD}	I_S=3.5A, V_{GS}=0V			1.2	V

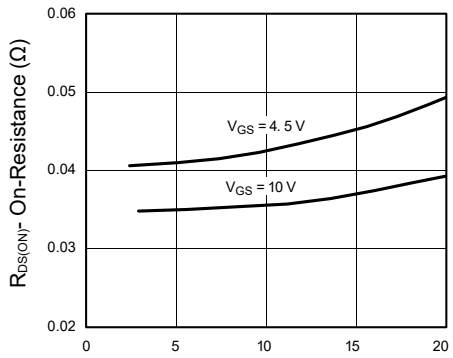
6.1Typical Characterisitics



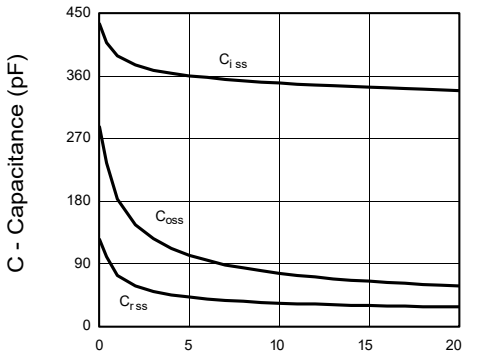
Output Characteristics



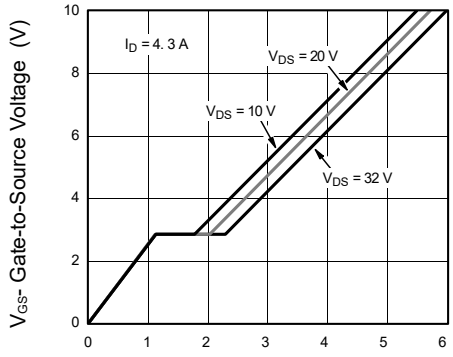
Transfer Characteristics



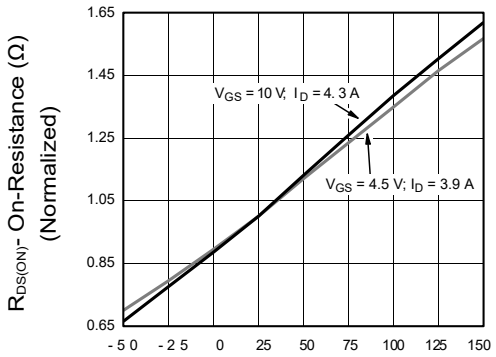
On-Resistance vs. Drain Current



Capacitance

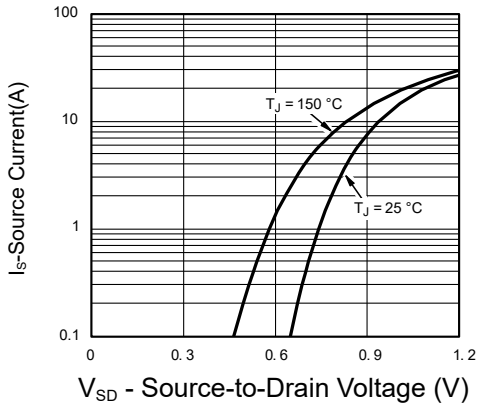


Gate Charge

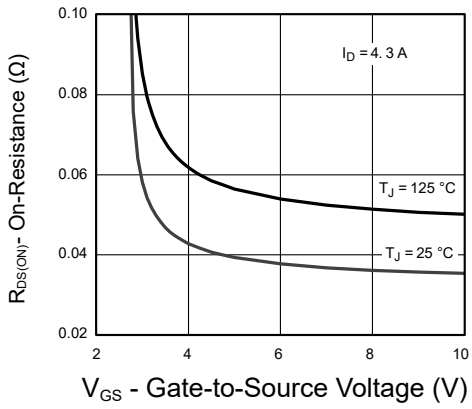


On-Resistance vs. Junction Temperature

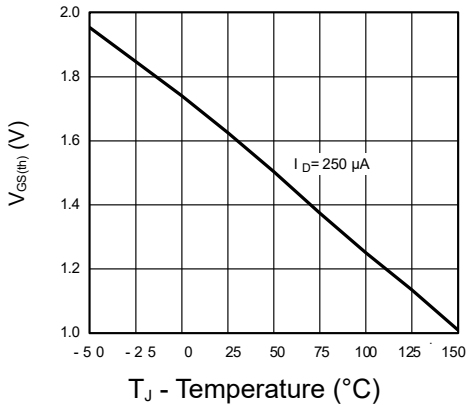
6.2Typical Characterisitics



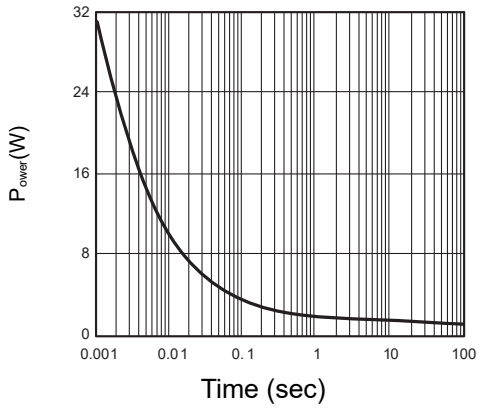
Source-Drain Diode Forward Voltage



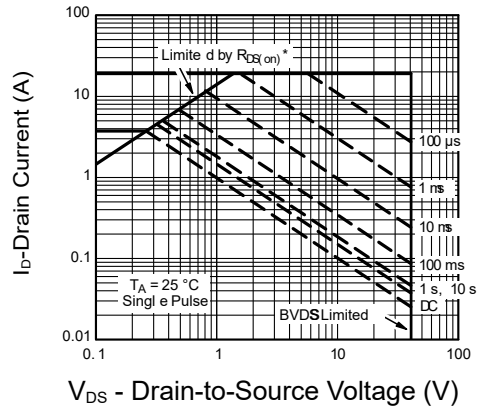
On-Resistance vs. Gate-to-Source Voltage



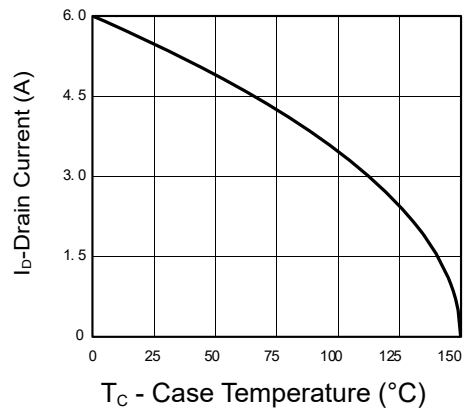
Threshold Voltage



Single Pulse Power

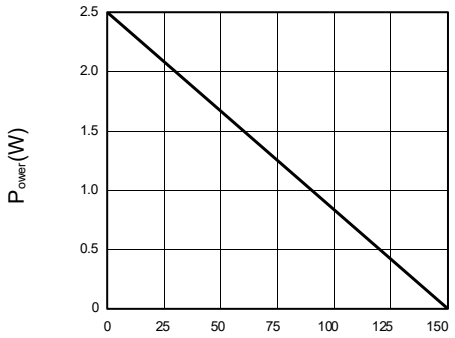


* V_{GS}>minimum V_{GS} at which $R_{DS(ON)}$ is specified
Safe Operating Area, Junction-to-Ambient

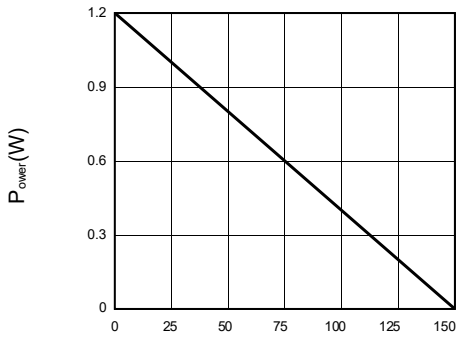


Current Derating

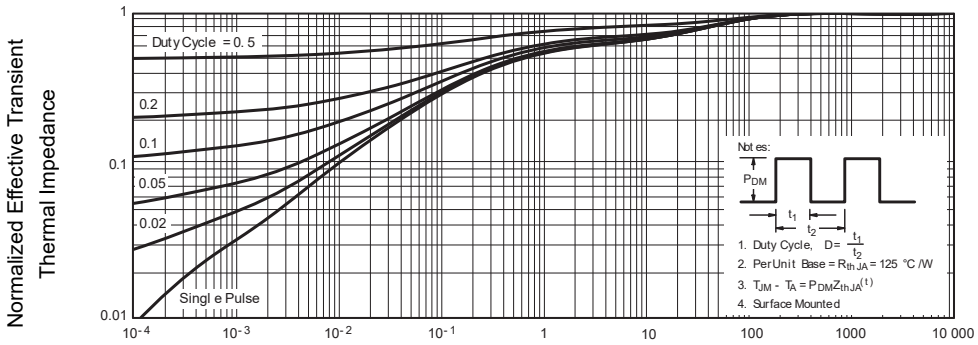
6.2Typical Characterisitics



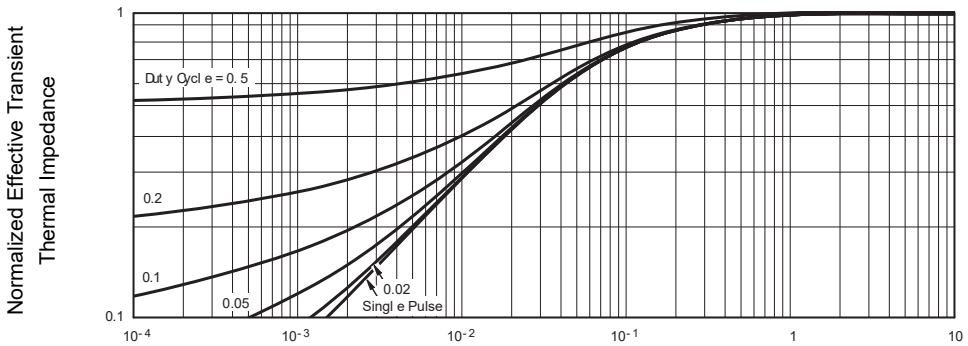
Power Derating, Junction-to-Foot



Power Derating, Junction-to-Ambient

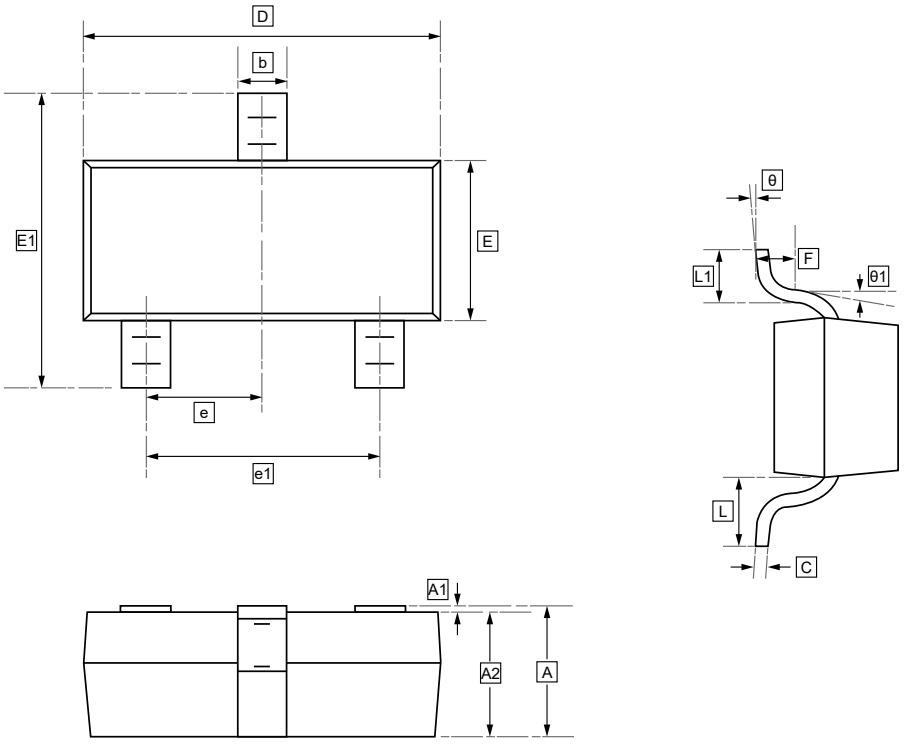


Normalized Thermal Transient Im pedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

7.SOT-23 Package Outline Dimensions

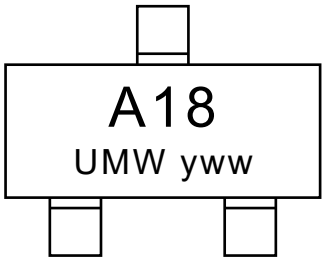


DIMENSIONS (mm are the original dimensions)

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 SI2318A	SOT-23	3000	Tape and reel

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