UMW AO3414A

N-Channel Enhancement MOSFET

1.Description

The AO3414A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

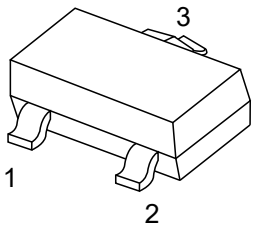
2.Features

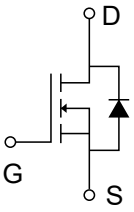
- $V_{DS\ (V)}$=20V
- I_D=4.2A(V_{GS}=4.5V)
- $R_{DS(ON)}$<26mΩ(V_{GS}=4.5V)
- $R_{DS(ON)}$<36mΩ(V_{GS}=2.5V)
- $R_{DS(ON)}$<57mΩ(V_{GS}=1.8V)

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}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current *1	T_A=25°C	I_D	4.2	A
	T_A=70°C		3.2	
Pulsed Drain Current *2		I_{DM}	15	
Power Dissipation *1	T_A=25°C	P_D	1.4	W
	T_A=70°C		0.9	
Themal Resistance. Junction-to-Ambient *1		R_{thJA}	125	°C/W
Themal Resistance. Junction-to-Case		R_{thJC}	80	°C/W
Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

* 1The value of $R_{\theta JA}$ is measured with the device mounted on 1in ^{2} FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C

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	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V, V_{GS}=0V			1	μA
		V_{DS}=16V, V_{GS}=0V, T_J=55°C			5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.4	0.6	1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4.2A		23	26	mΩ
		V_{GS}=2.5V, I_D=3.7A		32	36	
		V_{GS}=1.8V, I_D=3.2A		48	57	
On state drain current	$I_{D(ON)}$	V_{GS}=4.5V, V_{DS}=5V	15			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=4.2A		11		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		436		pF
Output Capacitance	C_{oss}			66		pF
Reverse Transfer Capacitance	C_{rss}			44		pF
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		3		Ω
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=10V I_D=4.2A		6.2		nC
Gate Source Charge	Q_{gs}			1.6		nC
Gate Drain Charge	Q_{gd}			0.5		nC
Turn-On DelayTime	$t_{D(on)}$	V_{GS}=4.5V, V_{DS}=10V R_L=2.7Ω, R_{GEN}=6Ω		5.5		ns
Turn-On Rise Time	t_r			6.3		ns
Turn-Off DelayTime	$t_{D(off)}$			40		ns
Turn-Off Fall Time	t_f			12.7		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F=4A, dI/dt=100A/μs		12.3		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=4A, dI/dt=100A/μs		3.5		nC
Maximum Body-Diode Continuous Current	I_S				2	A
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.76	1	V

6.1 Typical Characterisitics

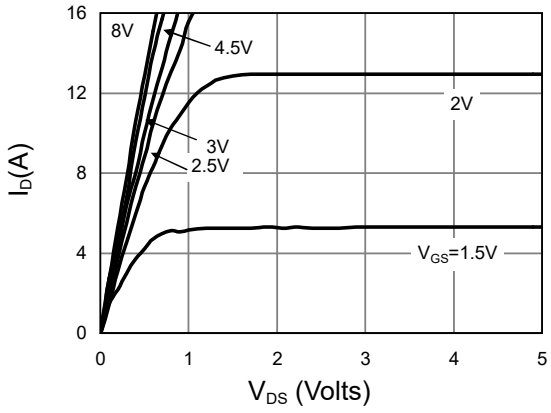


Fig 1: On-Region Characteristics

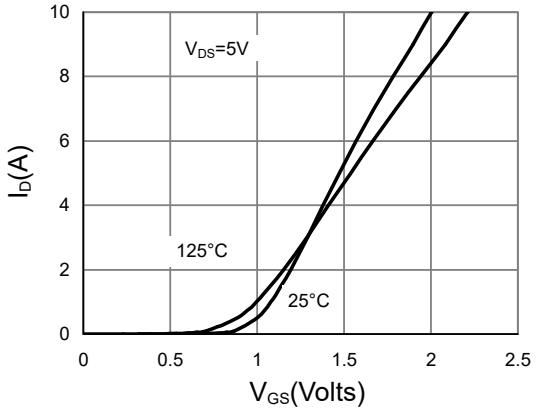


Figure 2: Transfer Characteristics

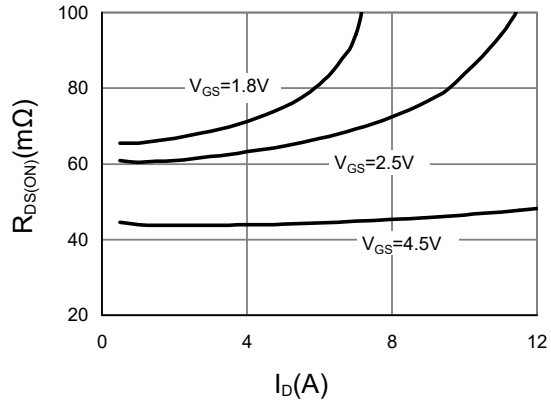


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

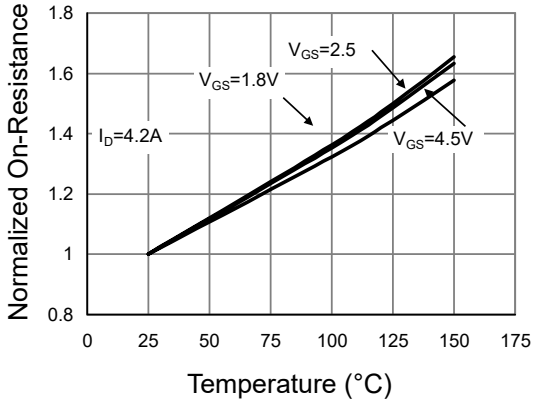


Figure 4: On-Resistance vs. Junction Temperature

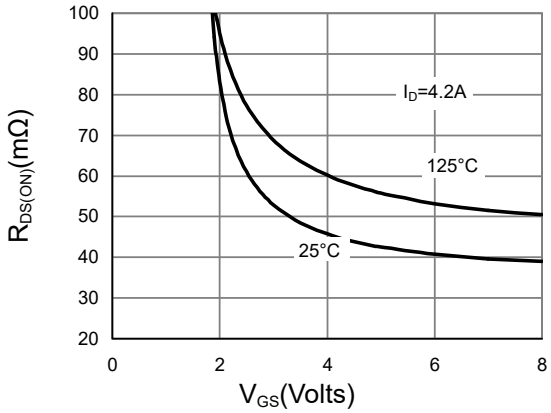


Figure 5: On-Resistance vs. Gate-Source Voltage

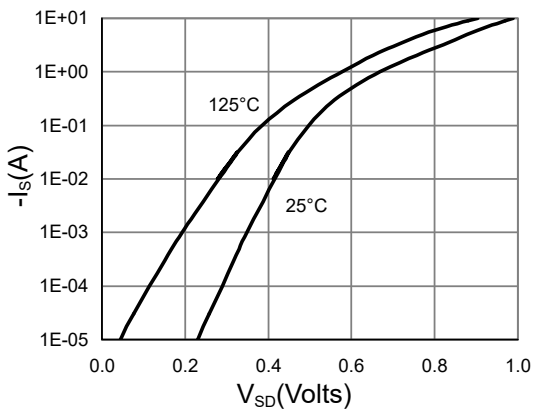


Figure 6: Body-Diode Characteristics

6.2 Typical Characterisitics

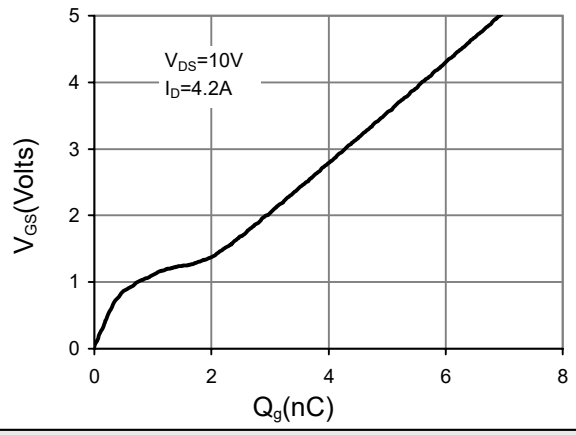


Figure 7: Gate-Charge Characteristics

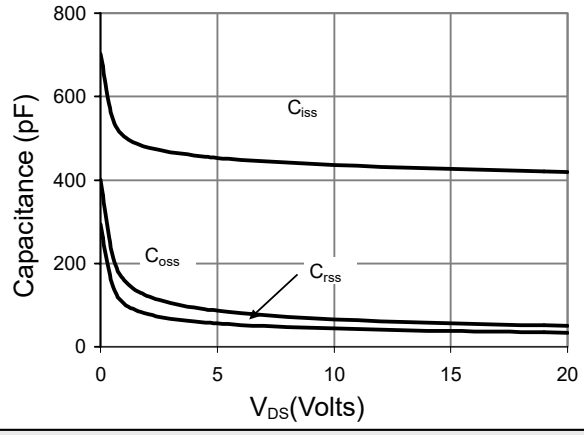


Figure 8: Capacitance Characteristics

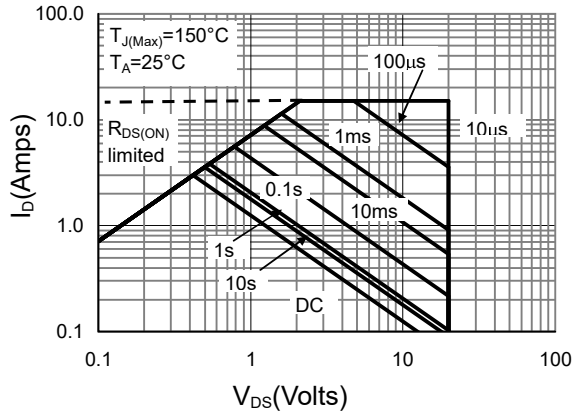


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

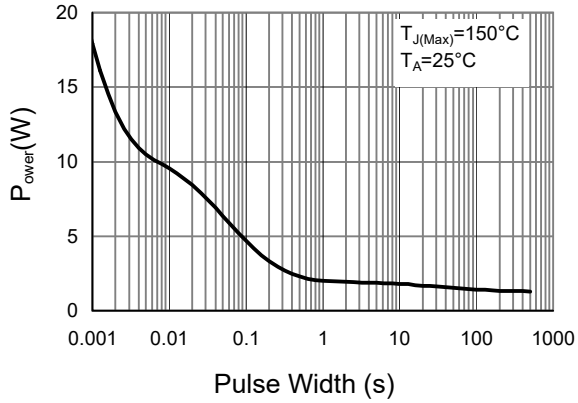


Figure 10: Single Pulse Power Rating Junction-to -Ambient (Note E)

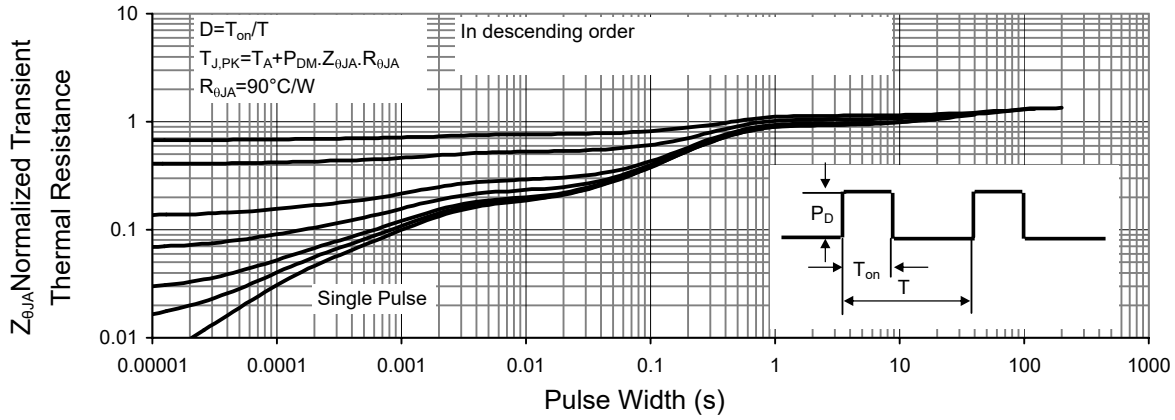
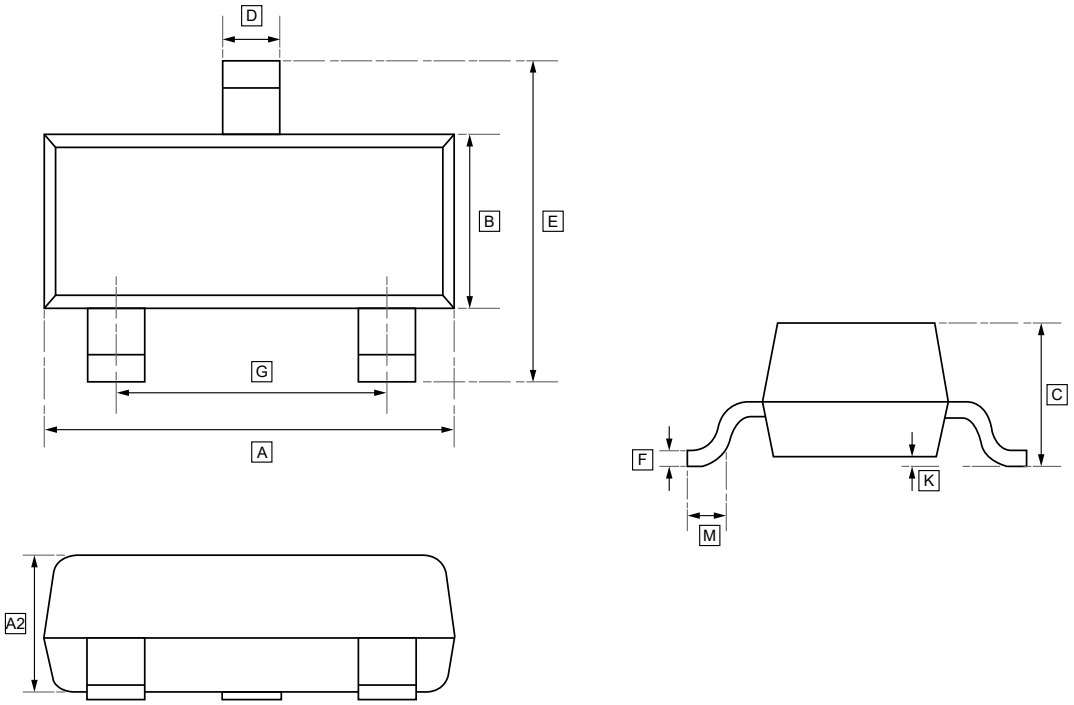


Figure 11: Normalized Maximum Transient Thermal Impedance

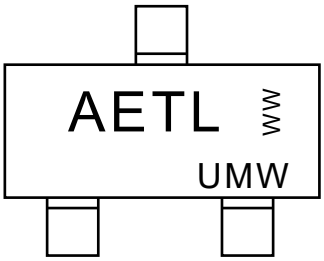
7.SOT-23 Package Outline Dimensions



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



ww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW AO3414A	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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