UMW AO4423

-30V P-Channel MOSFET

1.Features

- V_{DS}=-30V
- I_D =-13.5A
- $R_{DS(ON)}$ =11mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$ =15mΩ(V_{GS}=-4.5V)

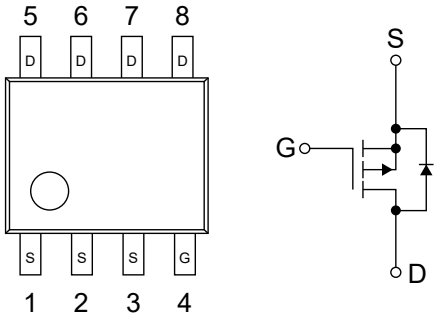
2.Applications

- Load Switch
- Notebook Adaptor Switch

3.Pinning information

Pin	Symbol	Description
4	G	GATE
1,2,3	S	SOURCE
5,6,7,8	D	DRAIN

SOP-8



4.Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous DrainCurrent (T_J = 150 °C)	T_C=25°C	I_D	-13.5	A
	T_C=70°C		-11.9	
	T_A=25°C		-10.9[a,b]	
	T_A=70°C		-8.6[a,b]	
Pulsed Drain Current		I_{DM}	-50	
Continuous Source-Drain Diode Current	T_C=25°C	I_S	-4.1	
	T_A=25°C		-2.2[a,b]	
Avalanche Current	L = 0.1 mH	I_{AS}	-20	
Single-Pulse Avalanche Energy		E_{AS}	20	mJ

Maximum Power Dissipation	T_C=25°C	P_D	5	W
	T_C=70°C		3.2	
	T_A=25°C		2.7[a,b]	
	T_A=70°C		1.7[a,b]	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

5.Thermal resist ance rating

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient [a,c]	t ≤ 10s	R_{thJA}	38	46	°C/W
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJF}	20	25	°C/W

Notes:

a. Surface mounted on 1" x 1" FR4 board.

b. t=10s.

c. Maximum under Steady State conditions is 85 °C/W.

d. Based on T_C=25 °C.

6.Specifications (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{DS}=0V, I_D=-250μA	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D=-250μA		-34		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			5.3		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.4		-2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±25V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	μA
		V_{DS}=-30V,V_{GS}=0V,T_J=55°C			-5	
On-State Drain Current[a]	$I_{D(ON)}$	V_{DS}≥10V, V_{GS}=-10V	-30			A
Drain-Source On-State Resistance[a]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-10A		11		mΩ
		V_{GS}=-4.5V, I_D=-8A		15		
Forward Transconductance[a]	g_{FS}	V_{DS}=-10V, I_D=-10A		28		S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		2550		pF
Output Capacitanc	C_{oss}			455		
Reverse Transfer Capacitance	C_{rss}			390		
Total Gate Charge	Q_g	V_{DS}=-15V, V_{GS}=-10V		57	86	nC
		I_D=-10A		29.5	45	
Gate Source Charge	Q_{gs}	V_{DS}=-15V, V_{GS}=-4.5V		8		
Gate Drain Charge	Q_{gd}	I_D=-10A		22		
Gate Resistance	R_g	f=1MHz	0.5	2.2	4.4	Ω
Turn-On DelayTime	$t_{D(on)}$	V_{DD} =-15V, R_L=1.5Ω		13	25	ns
Rise Time	t_r	I_D≅-10A, V_{GEN}=-10V		12	24	
Turn-Off DelayTime	$t_{D(off)}$	R_g=1Ω		40	70	
Fall Time	t_f			9	18	

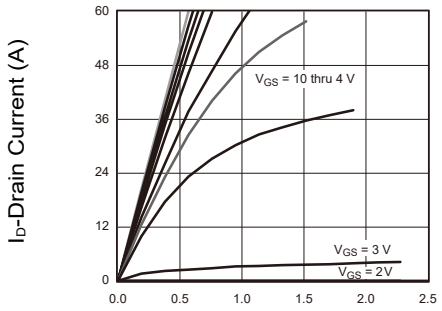
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=-15V, R_L=1.5Ω I_D≅-10V,V_{GEN}=-4.5V R_g=1Ω		48	80	ns
Rise Time	t_r			92	160	ns
Turn-Off Delay Time	$t_{D(off)}$			34	60	ns
Fall Time	t_f			19	35	ns
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C=25°C			-4.1	A
Pulse Diode Forward Current	I_{SM}				-60	A
Body Diode Voltage	V_{SD}	I_S=-3A, V_{GS}=0V		-0.75	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=-10A, dI/dt=100A/μs T_J=25°C		27	45	ns
Body Diode Reverse Recovery Charge	Q_{rr}			16	27	nC
Reverse Recovery Fall Time	t_a			12		ns
Reverse Recovery Rise Time	t_b			15		ns

Notes:

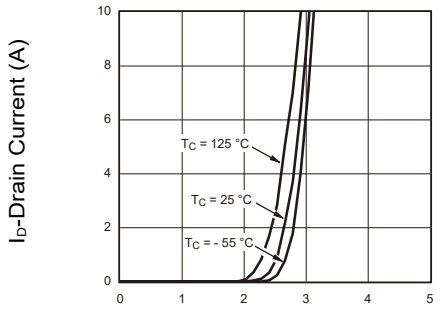
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

b. Guaranteed by design, not subject to production testing.

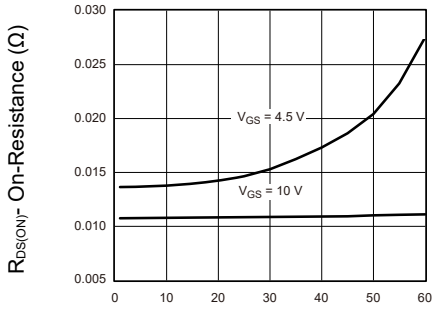
7.1Typical characteristic 25 °C, unless otherwise noted



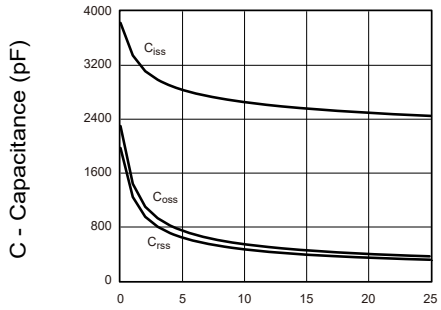
Output Characteristics



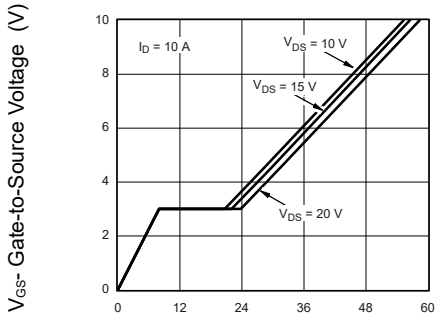
Transfer Characteristics



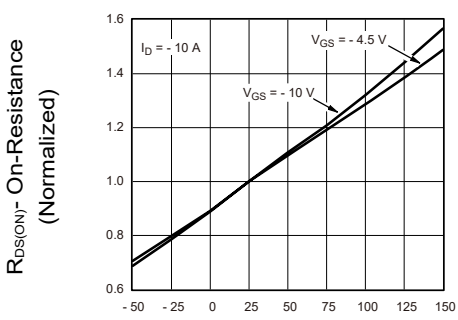
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

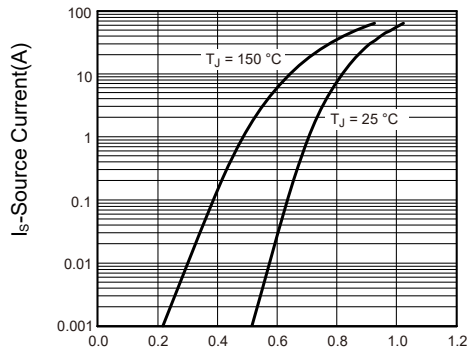


Gate Charge

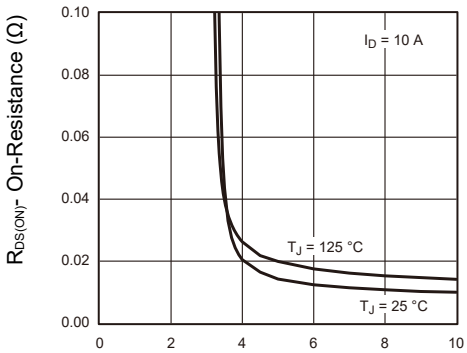


On-Resistance vs. Junction Temperature

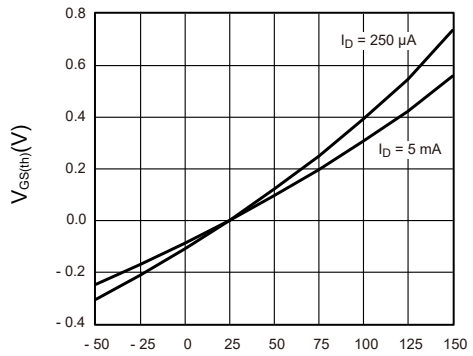
7.2Typical characteristic 25 °C, unless otherwise noted



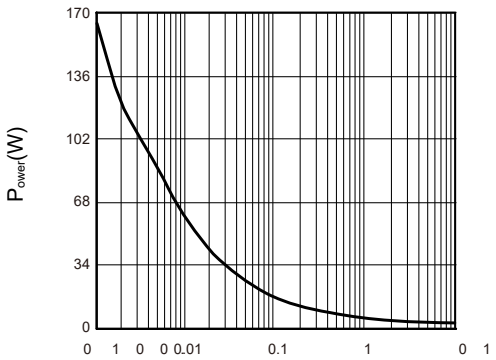
Source-Drain Diode Forward Voltage



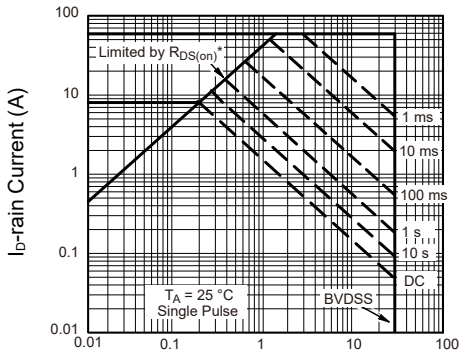
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

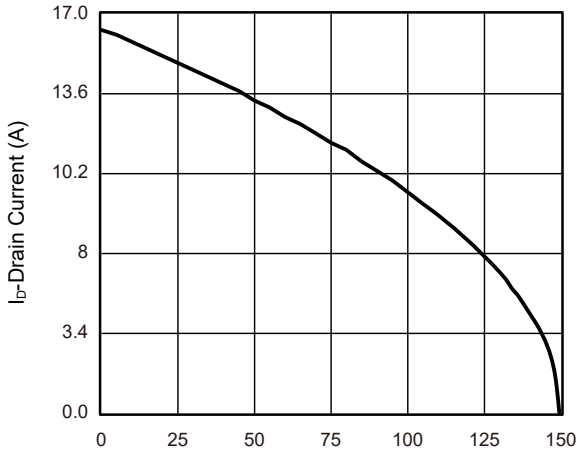


Single Pulse Power, Junction-to-Ambient

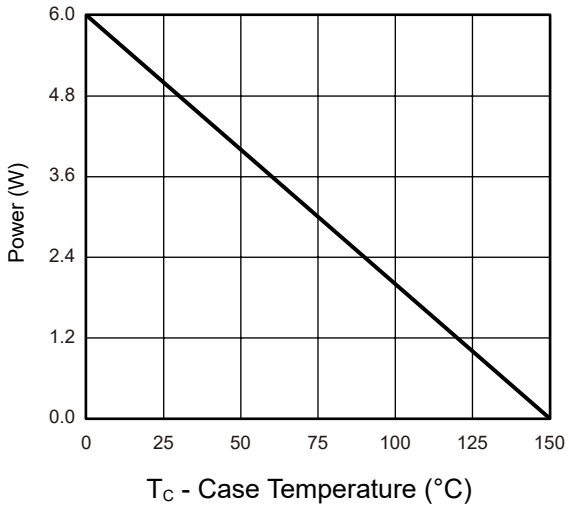


Safe Operating Area, Junction-to-Ambient

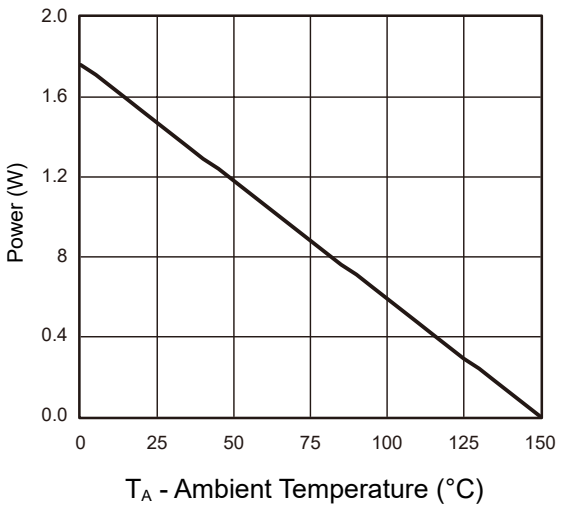
7.3Typical characteristic 25 °C, unless otherwise noted



Current Derating*



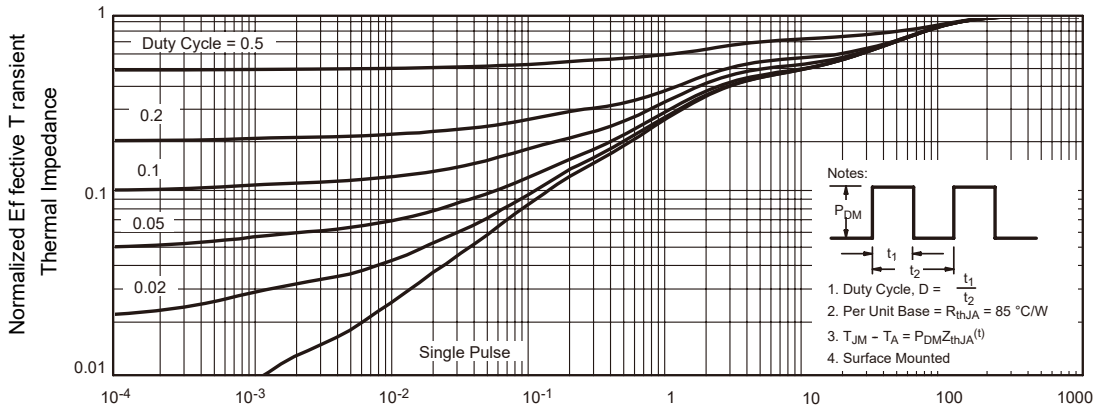
Power Derating, Junction-to-Foot



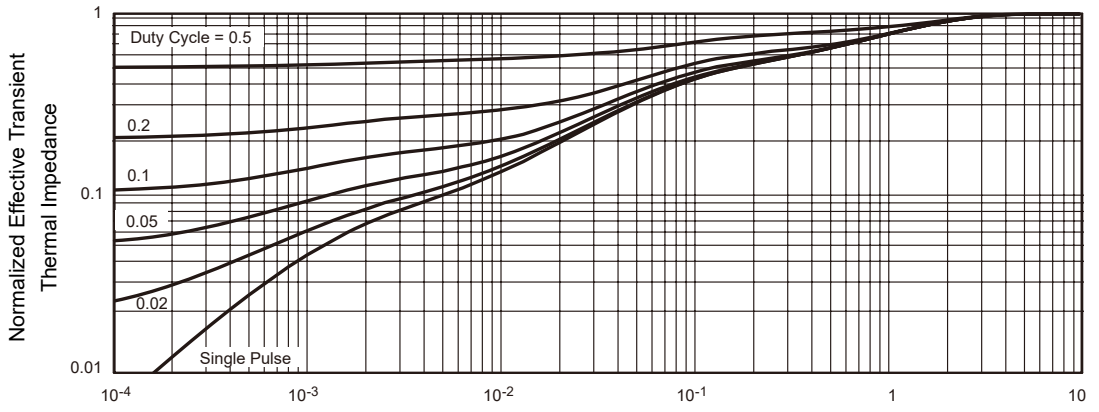
Power Derating, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upperdissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the packagelimit.

7.4Typical characteristic 25 °C, unless otherwise noted

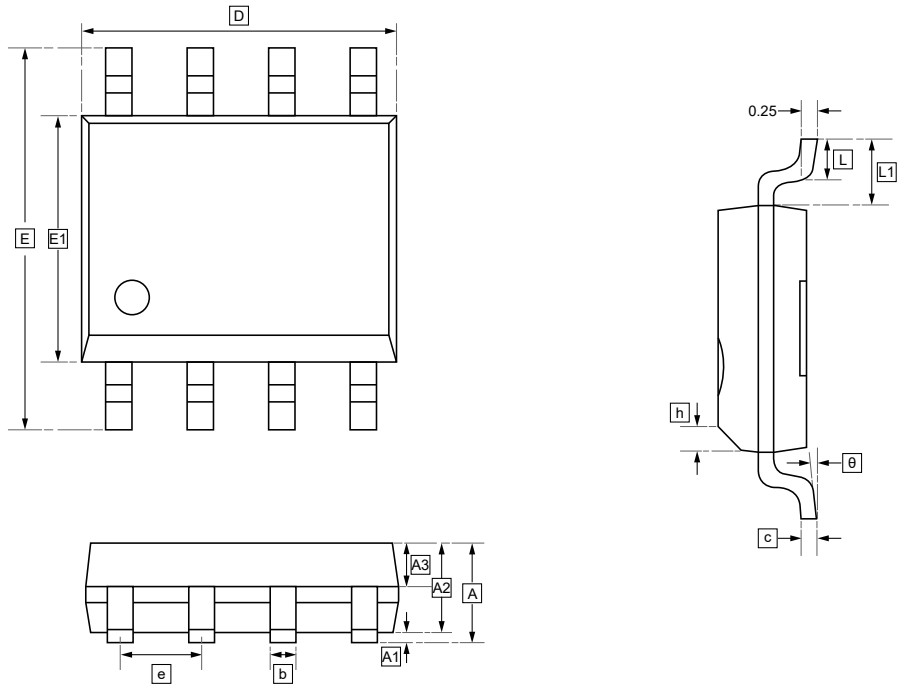


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

8.SOP-8 Package Outline Dimensions

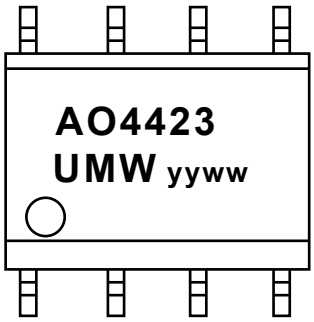


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.80	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.00	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW AO4423	SOP-8	3000	Tape and reel

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