UMW 30P03D

-30V P-Channel MOSFET

1.Description

The uses advanced trench technology to provide excellent $R_{DS(ON)}$,low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

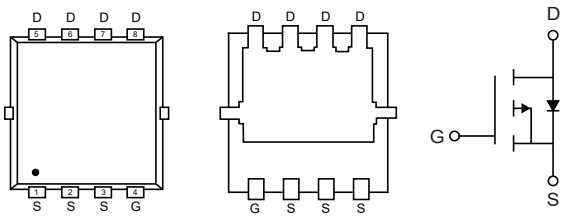
2.Features

- $V_{DS\ (V)}$=-30V
- I_D=-30A
- $R_{DS(ON)}$<11mΩ(V_{GS}=10V)

3.Pinning information

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

PDFN3*3



4.Absolute Maximum Ratings T_C= 25°C

Parameter		Symbol	10s	Steady State	Units
Drain-Source Voltage		V_{DS}	-30		V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current, V_{GS}=-10V[1]	T_C=25°C	I_D	-30		A
	T_C=100°C		-27		
	T_A=25°C		-14.3	-9	
	T_A=70°C		-11.4	-7.2	
Pulsed Drain Current [2]		I_{DM}	-130		
Single Pulse Avalanche Energy [3]		E_{AS}	125		mJ
Avalanche Current		I_{AS}	-50		A
Total Power Dissipation [4]	T_C=25°C	P_D	37		W
Total Power Dissipation [4]	T_A=25°C	P_D	4.2	1.67	W
Storage Temperature Range		T_{STG}	-55 to 150		°C
Junction Temperature Range		T_J	-55 to 150		°C

5.Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	75	°C/W
Thermal Resistance Junction-Ambient[1] (t ≤10s)		30	°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	3.36	°C/W

6.T_J=25°C unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0V	-30			V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=-1mA,Reference to 25°C		-0.0232		V/°C
Static Drain-to-Source On-Resistance [2]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-30A			11	mΩ
		V_{GS}=-4.5V, I_D=-15A			20	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.2		-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA		4.6		mV/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V, T_J=25°C			-1	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=55°C			-5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-30A		30		S
Gate Resistance	R_g	V_{DS}=0V, V_{GS}=0V, f=1MHz		9		Ω
Total Gate Charge (-4.5V)	Q_g	V_{DS}=-15V, V_{GS}=-4.5V, I_D=-15A		22		nC
Gate-Source Charge	Q_{gs}			8.7		nC
Gate-Drain Charge	Q_{gd}			7.2		nC
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=-15V, V_{GS}=-10V, R_G=3.3Ω, I_D=-15A		8		ns
Rise Time	t_r			73.7		ns
Turn-Off Delay Time	$t_{D(off)}$			61.8		ns
Fall Time	t_f			24.4		ns
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		2215		pF
Output Capacitance	C_{oss}			310		pF
Reverse Transfer Capacitance	C_{rss}			237		pF
Continuous Source Current [1,5]	I_S	V_G=V_D=0V, Force Current			-42	A
Pulsed Source Current [2,5]	I_{SM}				-130	A
Diode Forward Voltage [2]	V_{SD}	V_{GS}=0V, I_S=-1A, T_J=25°C			-1	V
Reverse Recovery Time	t_{rr}	I_F=-15A, dI/dt=100A/μs, T_J=25°C		19		ns
Reverse Recovery Charge	Q_{rr}			9		nC

Note :

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

3.The E_{AS} data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-50A.

4.The power dissipation is limited by 150°C junction temperature.

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

7.1Typical Characterisitics

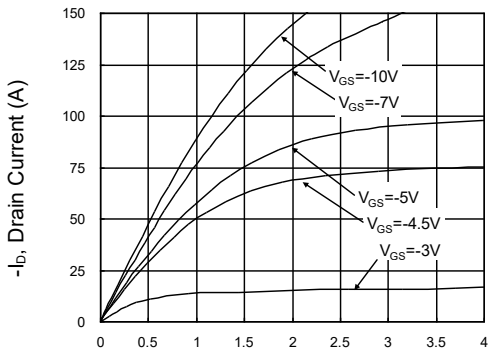


Figure 1: Typical Output Characteristics.

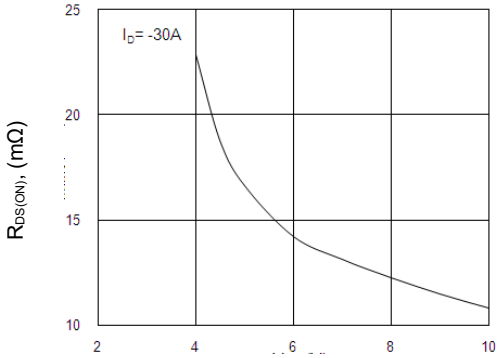


Figure 2: On-Resistance vs. G-S Voltage.

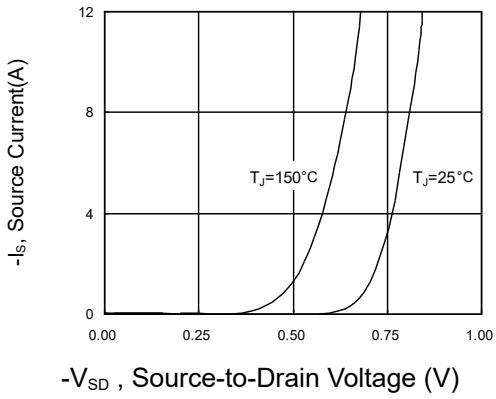


Figure 3: Forward Characteristics of Reverse.

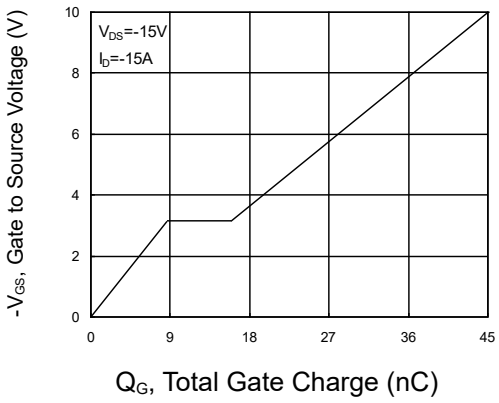


Figure 4: Gate-charge Characteristics.

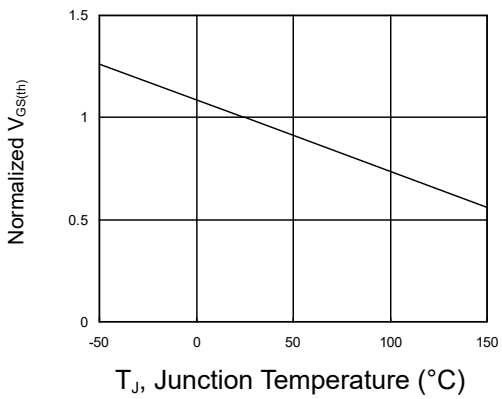


Figure 5: Normalized $V_{GS(th)}$ vs. T_J.

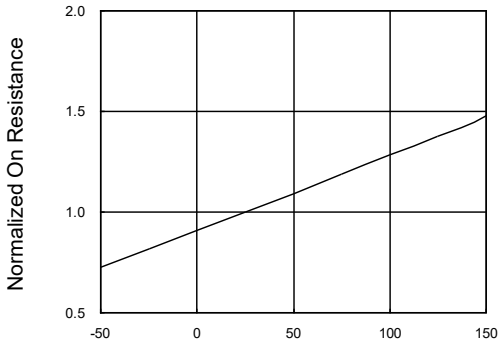


Figure 6: Normalized $R_{DS(ON)}$ vs. T_J.

7.2Typical Characterisitics

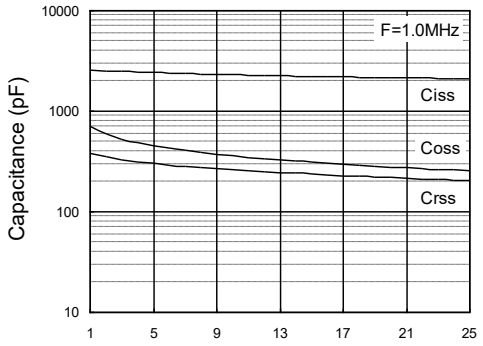


Figure 7: Capacitance.

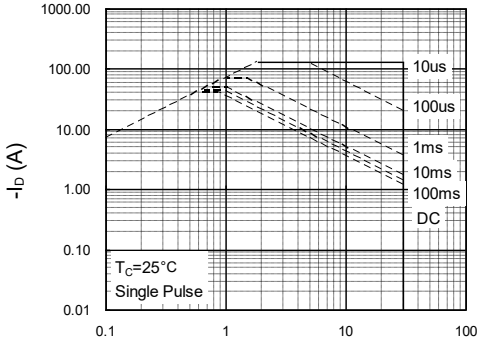


Figure 8: Safe Operating Area.

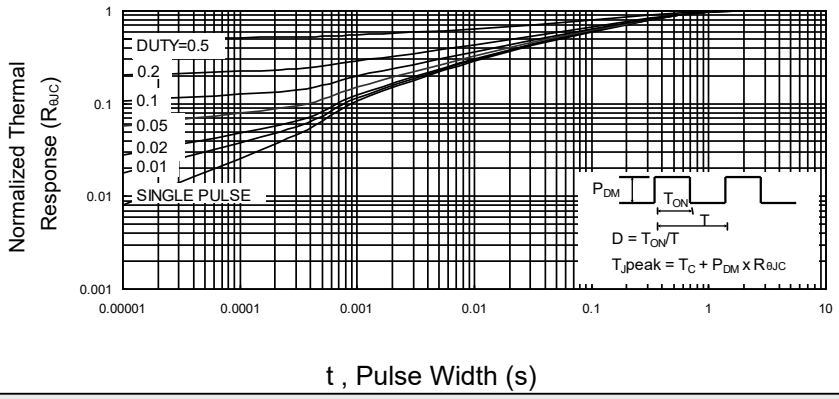


Figure 9: Normalized Maximum Transient Thermal Impedance.

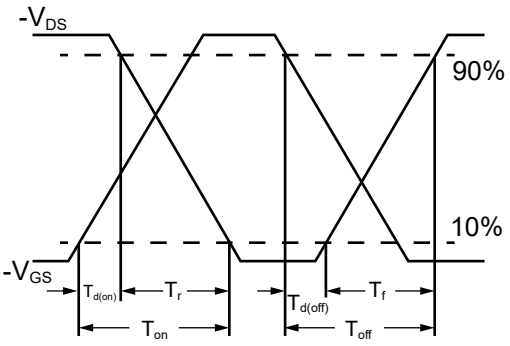


Figure 10: Switching Time Waveform

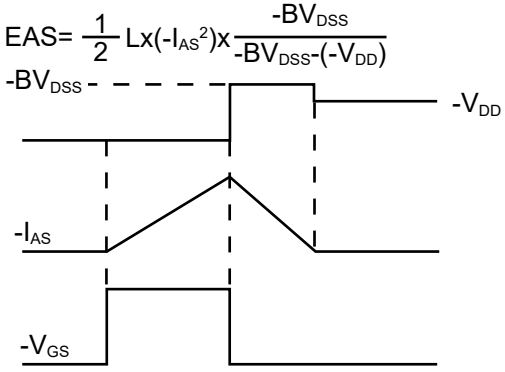
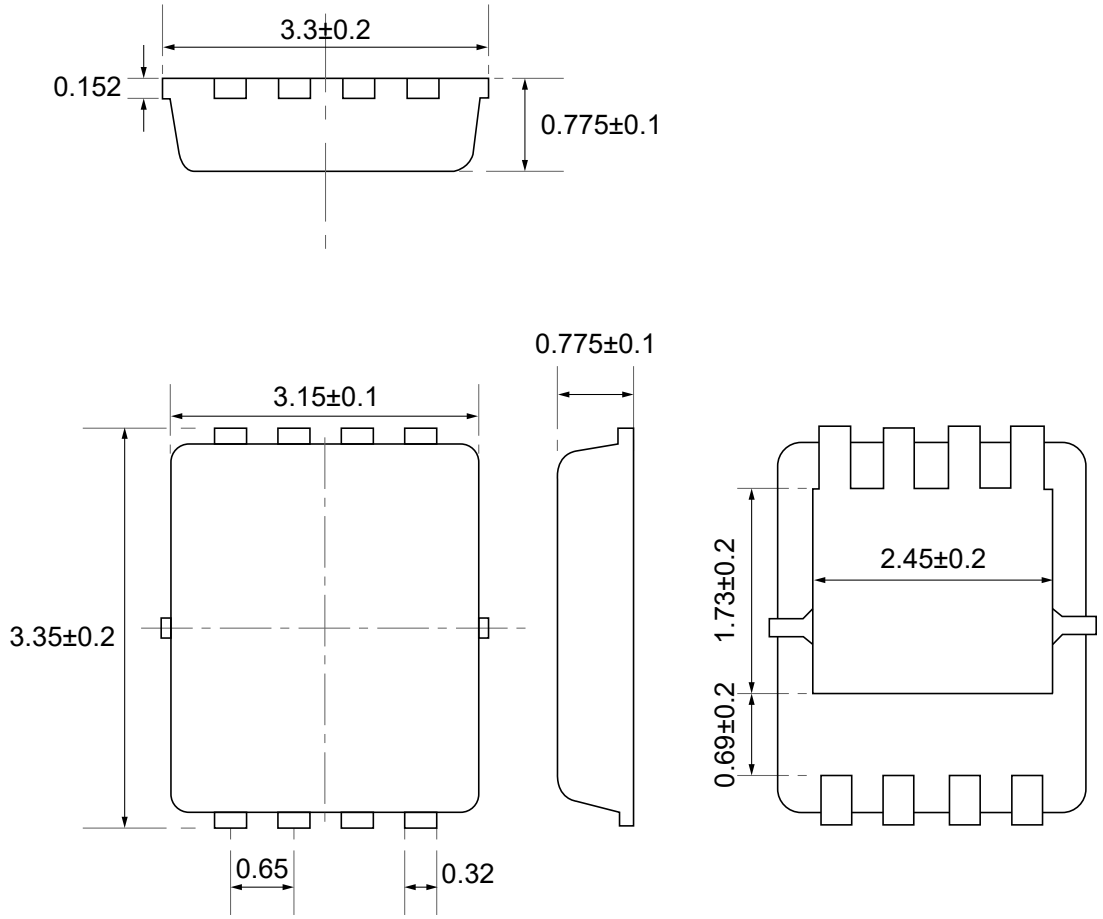
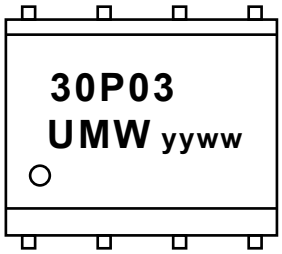


Figure 11: Unclamped Inductive Waveform

8.PDFN-8 Package Outline Dimensions



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW 30P03D	DFN3x3-8L	5000	Tape and reel

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