UMW FDN306P

-12V P-Channel MOSFET

1.Description

This P-Channel 1.8V specified MOSFET uses Fairchild's advanced low voltage PowerTrench process. It has been optimized for battery power management applications.

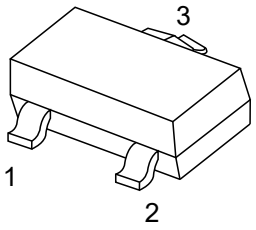
2.Features

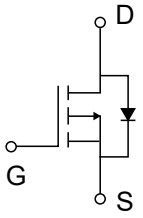
- $V_{DS\ (V)}$=-12V
- I_D=-2.6A
- $R_{DS(ON)}$=40mΩ(V_{GS}=-4.5V)
- $R_{DS(ON)}$=50mΩ(V_{GS}=-2.5V)
- $R_{DS(ON)}$=80mΩ(V_{GS}=-1.8V)

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	S	SOURCE
3	D	DRAIN

SOT-23





4.Maximum ratings (T_A=25°C unless otherwise noted)

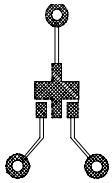
Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	-12	V
Gate-Source Voltage	V_{GSS}	±8	V
Drain Current – Continuous (Note 1a)	I_D	-2.6	A
– Pulsed		-10	
Maximum Power Dissipation(Note 1a)	P_D	0.5	W
(Note 1b)		0.46	
Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	°C
Thermal Characteristics			
Thermal Resistance, Junction-to-Ambient (Note 1a)	$R_{\theta JA}$	250	°C/W
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	75	°C/W

5.Static Electrical Characteristics (T_A= 25°C Unless Otherwise Noted)

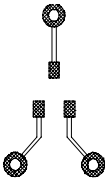
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0V	-12			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta TJ}$	I_D=-250μA Referenced to 25°C		-3		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-10V, V_{GS}=0V			-1	μA
Gate–Body Leakage, Forward	I_{GSSF}	V_{DS}=0V, V_{GS}=8V			100	nA
Gate–Body Leakage, Reverse	I_{GSSR}	V_{DS}=0V, V_{GS}=-8V			-100	nA
On Characteristics (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.6	-1.5	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta TJ}$	I_D=-250μA Referenced to 25°C		25		mV/°C
Static Drain–Source On–Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-2.6A		30	40	mΩ
		V_{GS}=-2.5V, I_D=-2.3A		39	50	
		V_{GS}=-1.8V, I_D=-1.8A		54	80	
On–State Drain Current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}=-5V	-10			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-2.6A		10		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-6V, V_{GS}=0V,f =1MHz		1138		pF
Output Capacitance	C_{oss}			454		pF
Reverse Transfer Capacitance	C_{rss}			302		pF
SWITCHING PARAMETERS (Note 2)						
Turn-On DelayTime	$t_{D(on)}$	V_{DD}=-6V, I_D=-1A V_{GS}=-4.5V, R_{GEN}=6Ω		11	20	ns
Turn-On Rise Time	t_r			10	20	ns
Turn-Off DelayTime	$t_{D(off)}$			38	61	ns
Turn-Off Fall Time	t_f			35	56	ns
Total Gate Charge	Q_g	V_{DS}=-6V, I_D=-2.6A V_{GS}=-4.5V		12	17	nC
Gate–Source Charge	Q_{gs}			2		nC
Gate–Drain Charge	Q_{gd}			3		nC

Drain–Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain–Source Diode Forward Current	I_S				-0.42	A
Drain–Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-0.42A (Note 2)		-0.6	-1.2	V

1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface ofthe drain pins. $R_{\theta JC}$ is guaranteed by design while RθCA is determined by the user's board design.



a) 250°C/W when mounted on a 0.02 in2 pad of 2 oz. copper.



b) 270°C/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

6.1 Typical Characterisitics

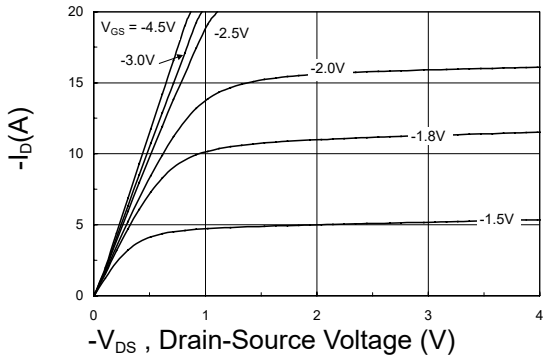


Figure 1: On-Region Characteristics.

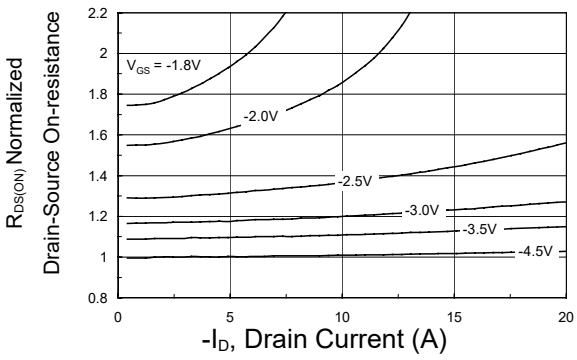


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

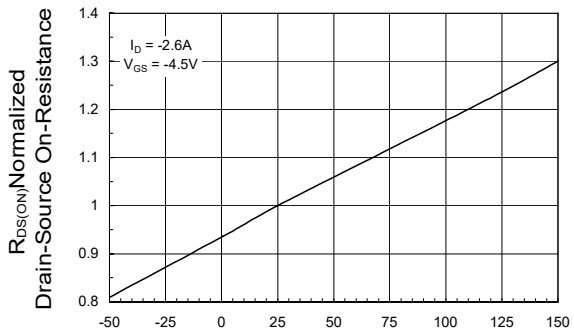


Figure 3: On-Resistance Variation with Temperature.

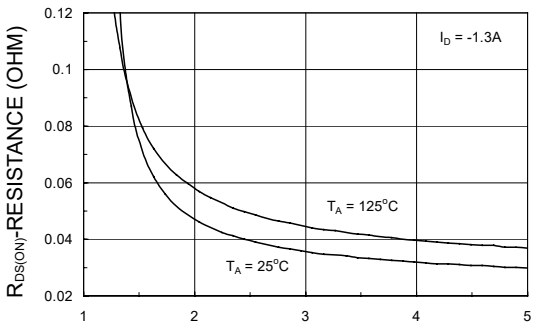


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

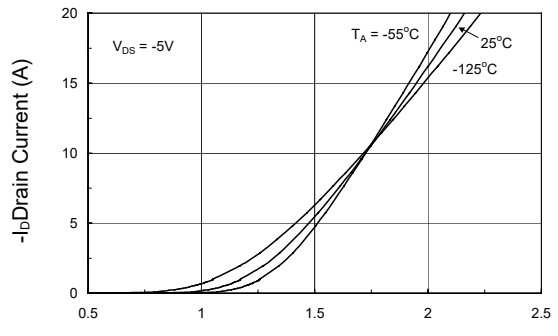


Figure 5: Transfer Characteristics.

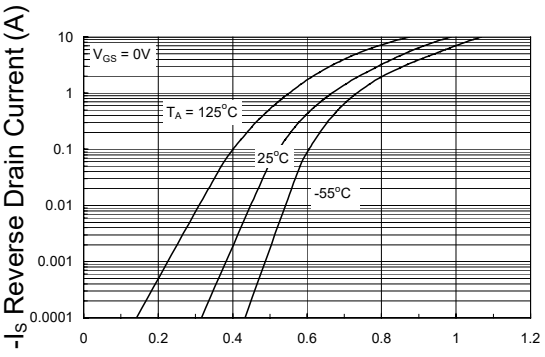


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.

6.2 Typical Characterisitics

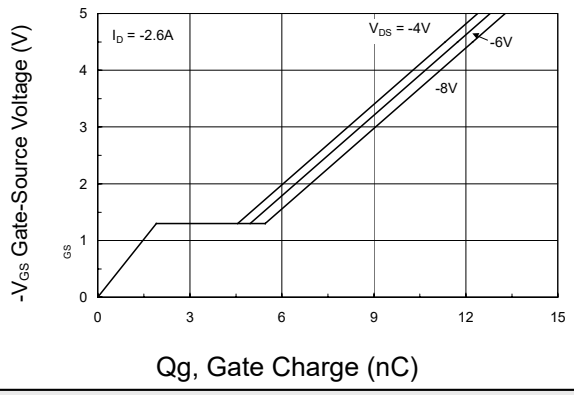


Figure 7: Gate-Charge Characteristics

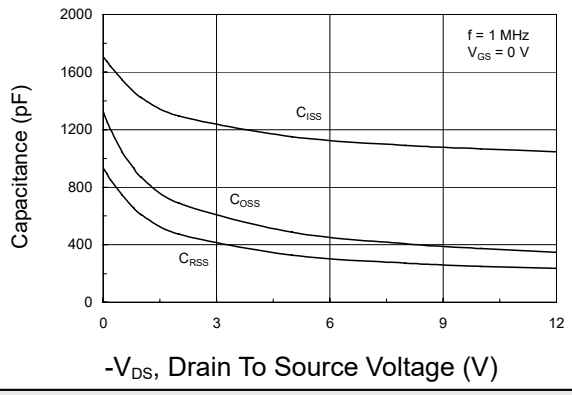


Figure 8: Capacitance Characteristics

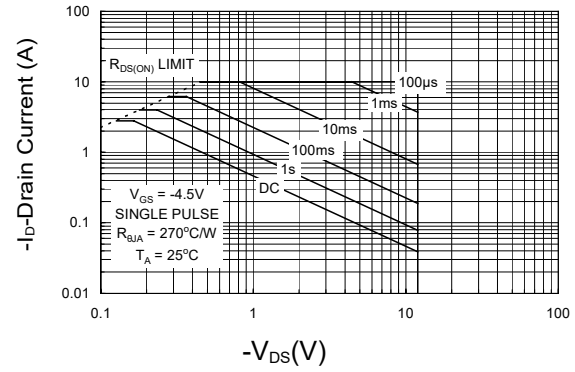


Figure 9: Maximum Safe Operating Area.

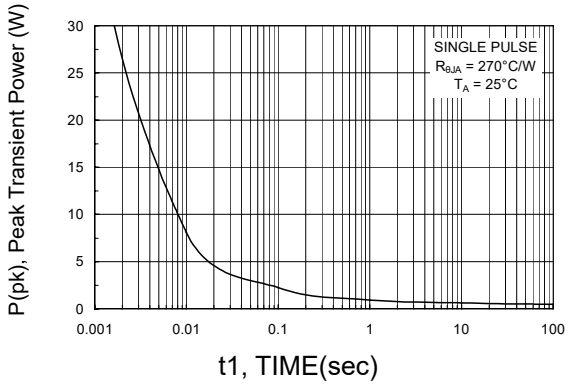


Figure 10: Single Pulse Maximum Power Dissipation.

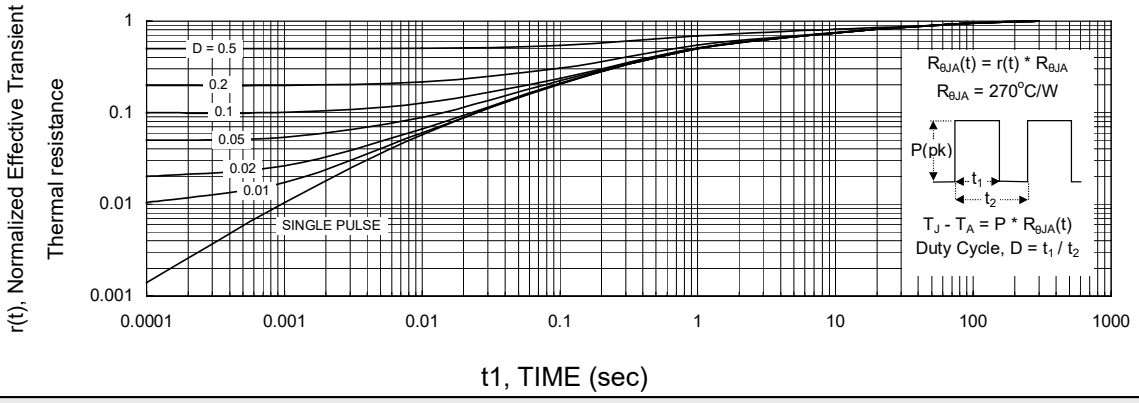
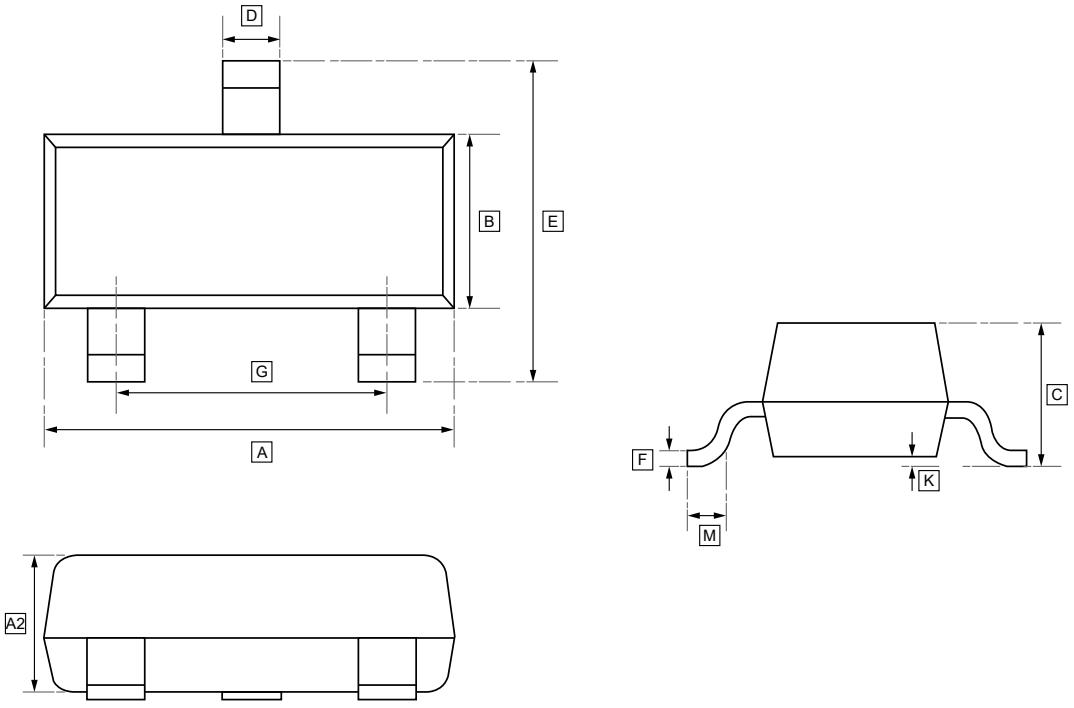


Figure 11. Transient Thermal Response Curve.

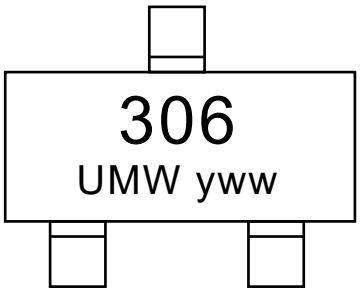
7.SOT-23 Package Outline Dimensions



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



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDN306P	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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