UMW FDN304P

-20V 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 managementapplications.

2.Features

- $V_{DS(V)}$=-20V
- I_D=-2.4A
- $R_{DS(ON)}$<52mΩ(V_{GS}=-4.5V)
- $R_{DS(ON)}$<70mΩ(V_{GS}=-2.5V)
- $R_{DS(ON)}$<100mΩ(V_{GS}=-1.8V)

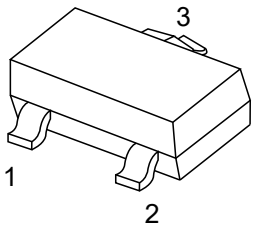
3.Application

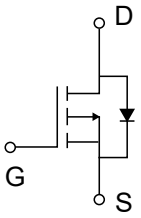
- Battery protection
- Load switch
- Battery management

4.Pinning information

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

SOT-23





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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±8	V
Continuous Drain Current	I_D	-2.4	A
Pulsed Drain Curren	I_{DM}	-10	A
Power Dissipation	P_D	1.1	W
Thermal Resistance from Junction to Ambient (t≤10s)	$R_{\theta JA}$	250	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~+150	°C

6.Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250μA	-20			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4		-1.5	V
Gate-source leakage	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-1	μA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-2.4A		36	52	mΩ
		V_{GS}=-2.5V, I_D=-2A		47	70	mΩ
		V_{GS}=-1.8V, I_D=-1.8A		65	100	mΩ
Forward transconductance	g_{FS}	V_{DS}=-4.5V, I_D=-2.4A		12		S
Diode forward voltage	V_{SD}	I_S=-1A, V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz		1312		pF
Output Capacitance	C_{oss}			240		pF
Reverse Transfer Capacitance	C_{rss}			106		pF
Total gate charge	Q_g	V_{DS}=-10V, V_{GS}=-4.5V I_D=-2.4A		12		nC
Gate-source charge	Q_{gs}			2		nC
Gate-drain charge	Q_{gd}			2		nC
Gate resistance	R_g	f=1MHz	0.5		3.2	Ω
Switchingbtr						
Turn-on delay time	$t_{D(on)}$	V_{DS}=-10V, R_L=3.5Ω, I_D≈-1A V_{GEN}=-4.5V, R_G=3Ω		15		ns
Rise time	t_r			15		ns
Turn-off delay time	$t_{D(off)}$			40		ns
Fall time	t_f			25		ns
Drain-source body diode characteristicstr						
Continuous Source-Drain Diode Current	I_S	T_C=25°C			-1.2	A
Pulsed Diode forward Curren	I_{SM}				-10	A

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 10 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

7.1 Typical Characterisitics

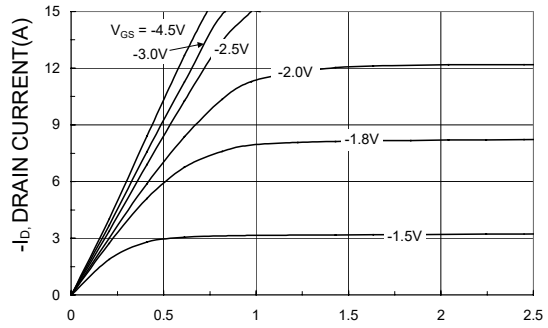


Figure 1: On-Region Characteristics.

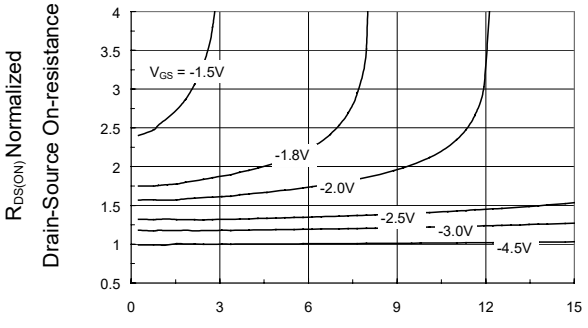


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

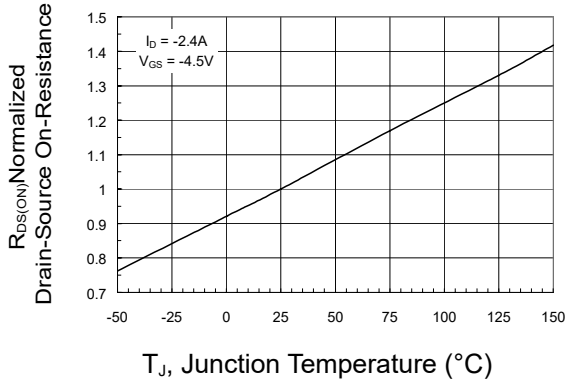


Figure 3: On-Resistance Variation with Temperature.

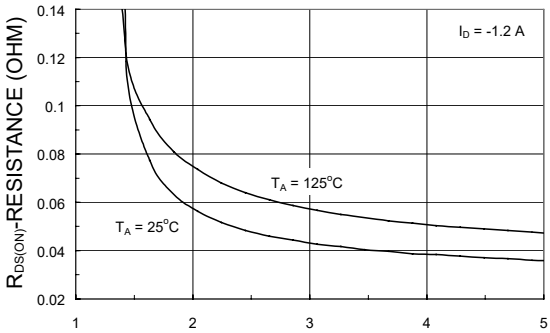


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

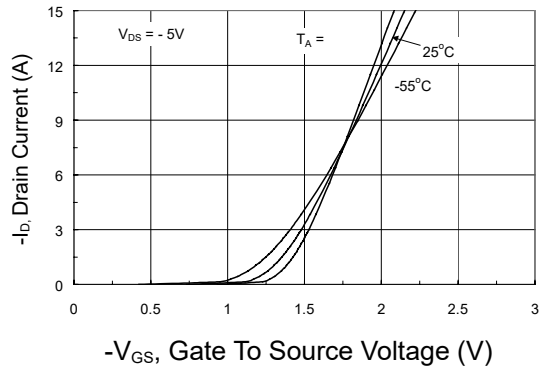


Figure 5: Transfer Characteristics.

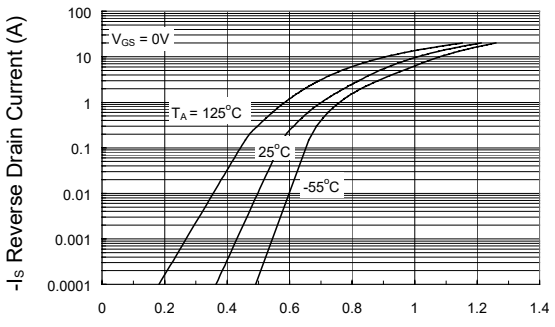


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.

7.2 Typical Characterisitics

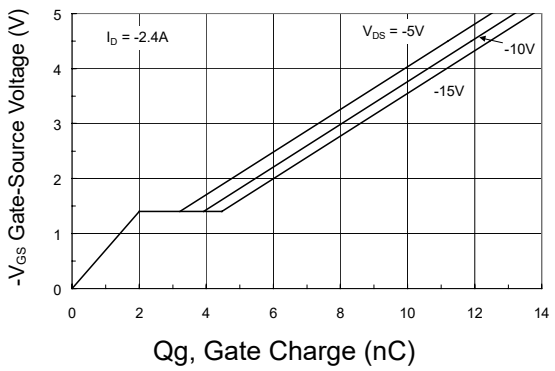


Figure 7: Gate-Charge Characteristics

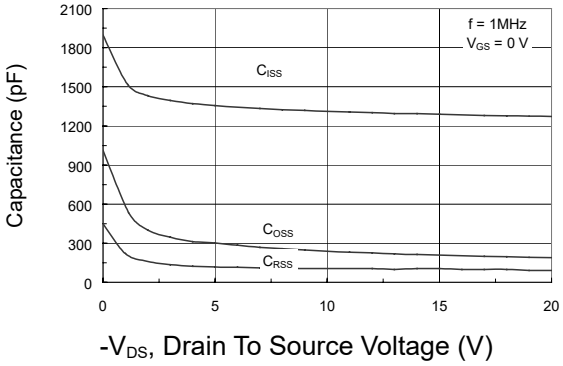


Figure 8: Capacitance Characteristics

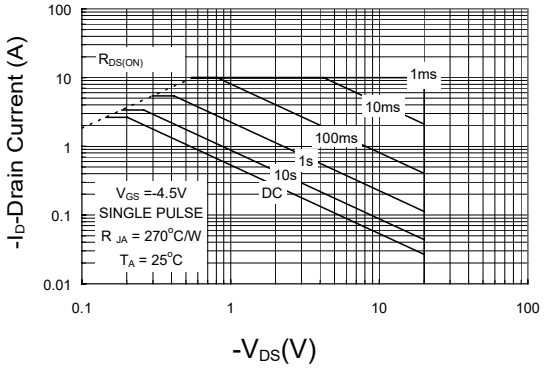


Figure 9: Maximum Safe Operating Area.

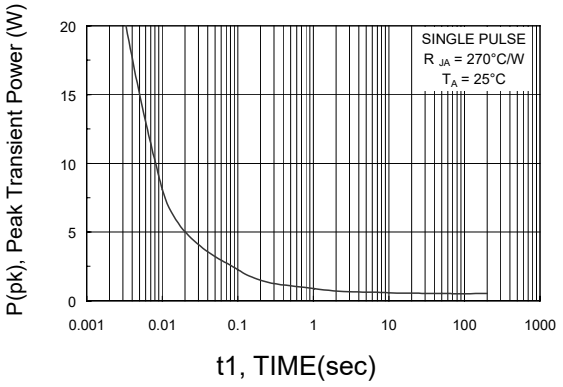


Figure 10: Single Pulse Maximum Power Dissipation.

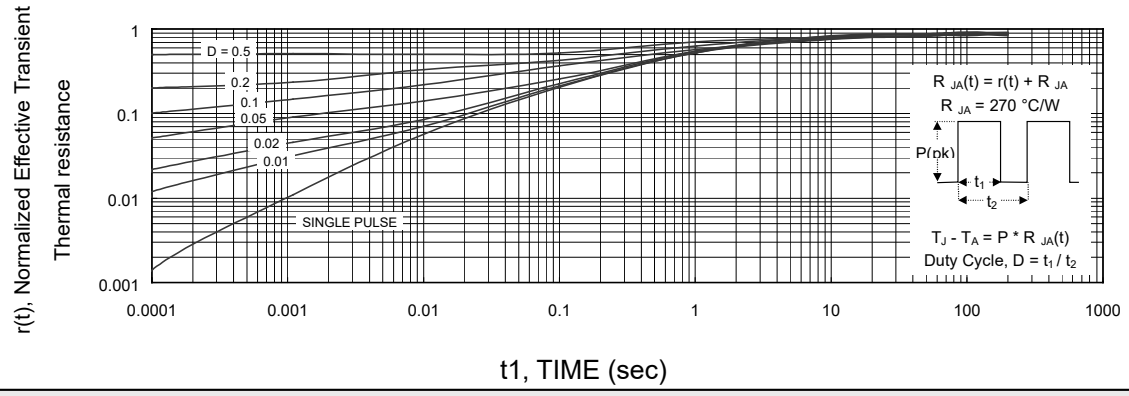
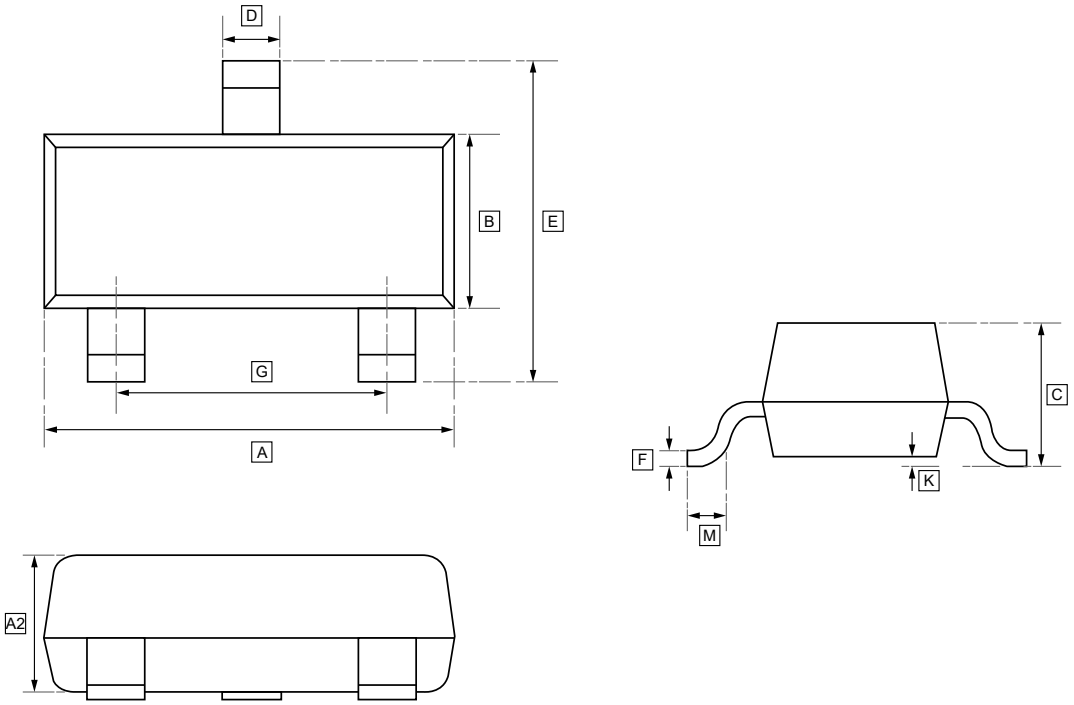


Figure 11. Transient Thermal Response Curve.

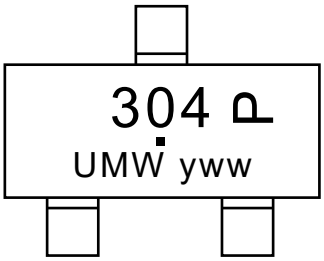
8.SOT-23 Package Outline Dimensions



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

9.Ordering Information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDN304P	SOT-23	3000	Tape and reel

10.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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