

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

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

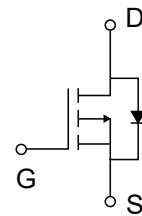
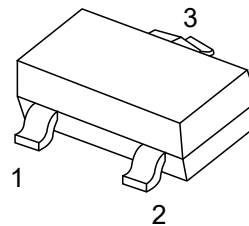
3.Application

- 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 ($T_A = 25^\circ C$ 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 Current	I_{DM}	-10	A
Power Dissipation	P_D	1.1	W
Thermal Resistance from Junction to Ambient ($t \leq 10s$)	$R_{\theta JA}$	250	$^\circ C/W$
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{STG}	-55~+150	$^\circ C$



6. Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4		-1.5	V
Gate-source leakage	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 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	m Ω
		$V_{GS}=-2.5V, I_D=-2A$		47	70	m Ω
		$V_{GS}=-1.8V, I_D=-1.8A$		65	100	m Ω
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	$t_{D(on)}$	$V_{DS}=-10V, R_L=3.5\Omega, I_D\approx 1A$ $V_{GEN}=-4.5V, R_G=3\Omega$		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	$T_C=25^{\circ}C$			-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 $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.



7.1 Typical Characteristics

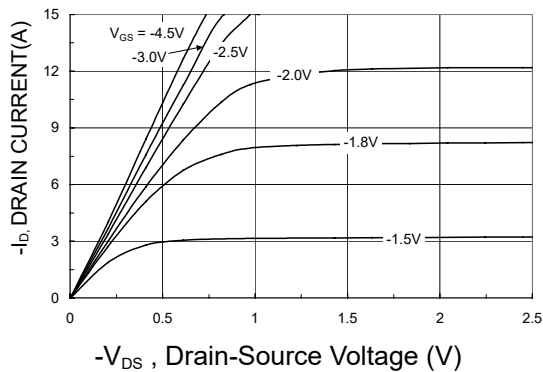


Figure 1: On-Region Characteristics.

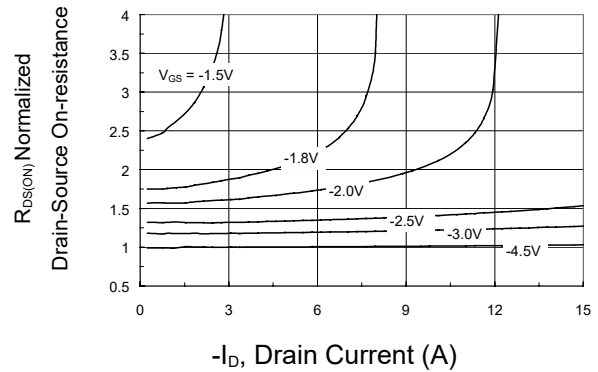


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

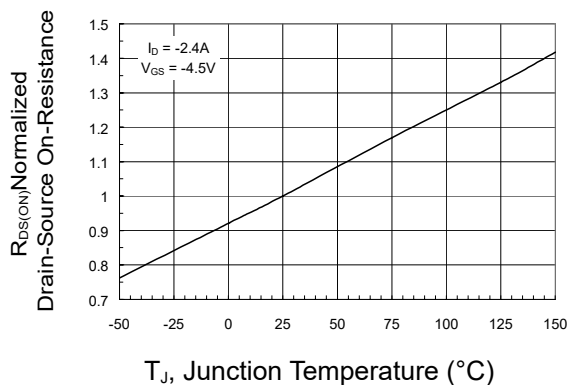


Figure 3: On-Resistance Variation with Temperature.

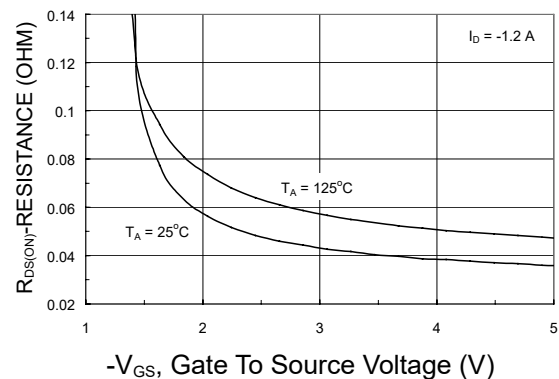


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

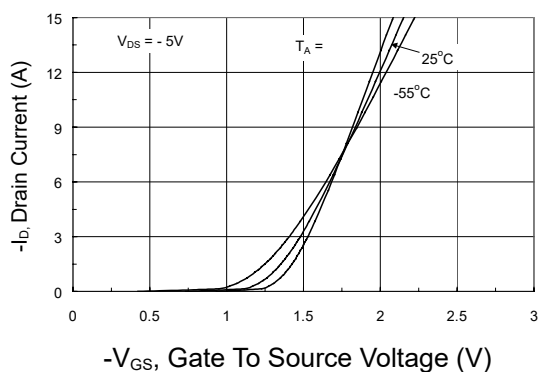


Figure 5: Transfer Characteristics.

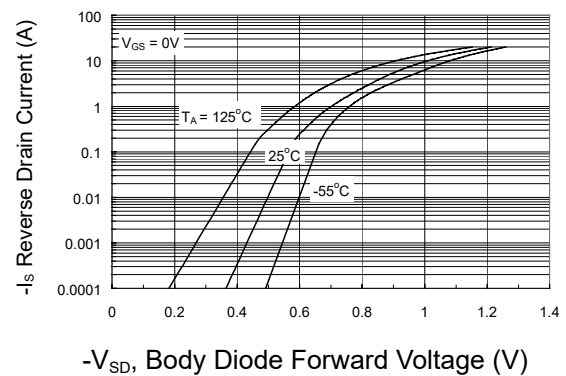


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.



7.2 Typical Characteristics

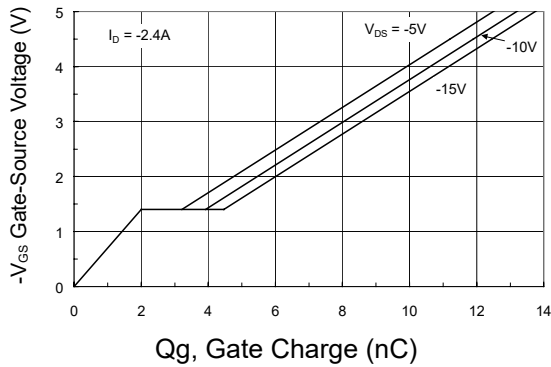


Figure 7: Gate-Charge Characteristics

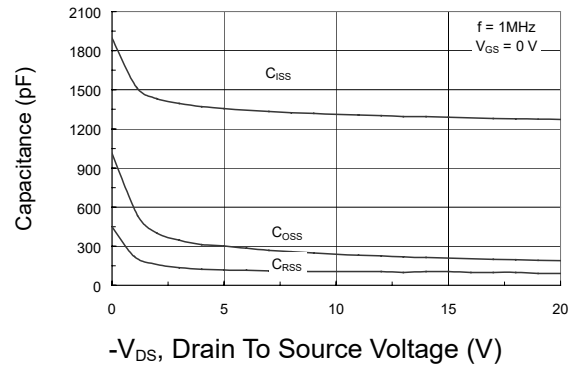


Figure 8: Capacitance Characteristics

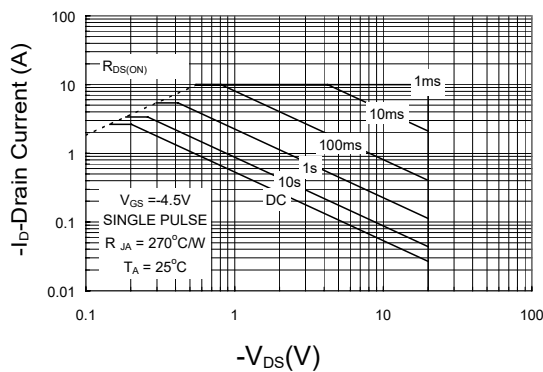


Figure 9: Maximum Safe Operating Area.

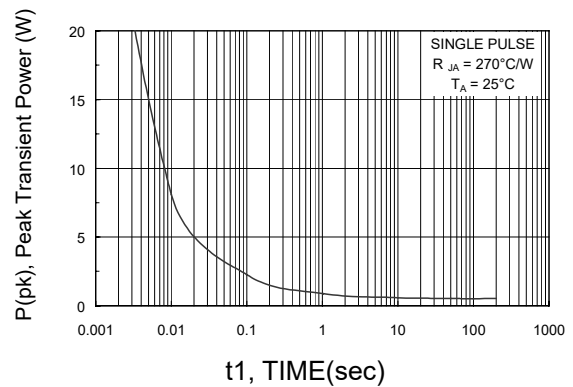


Figure 10: Single Pulse Maximum Power Dissipation.

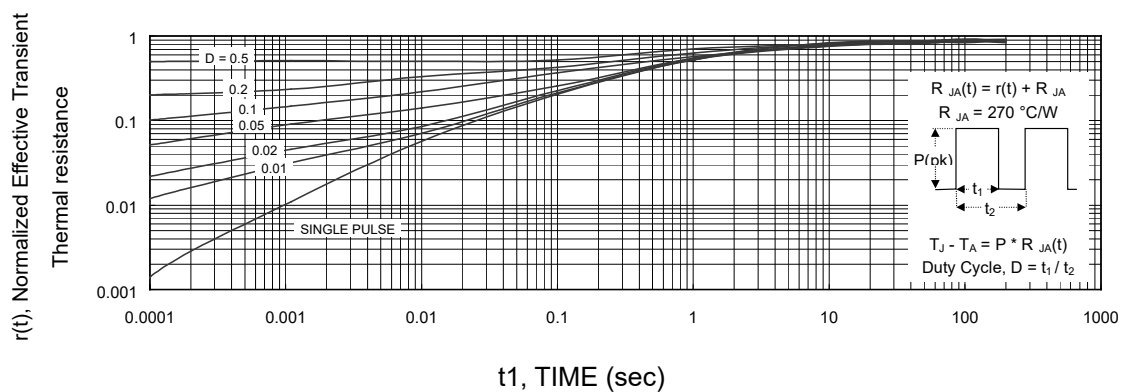
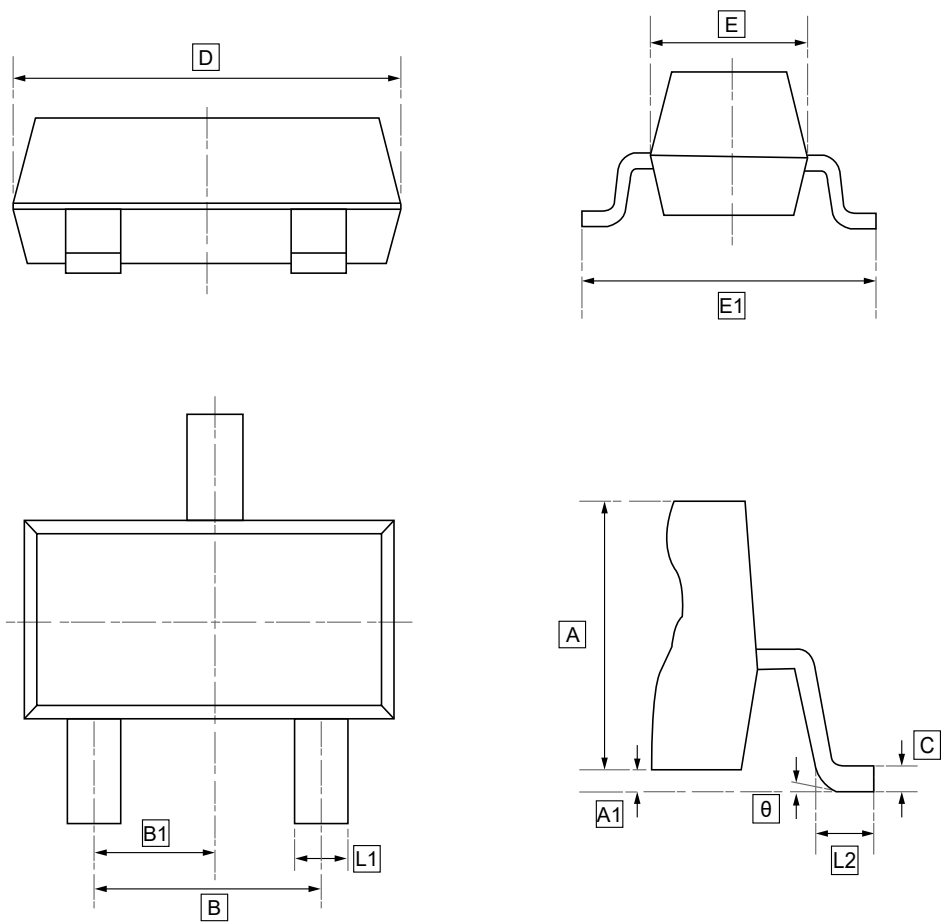


Figure 11. Transient Thermal Response Curve.



8.SOT-23 Package Outline Dimensions

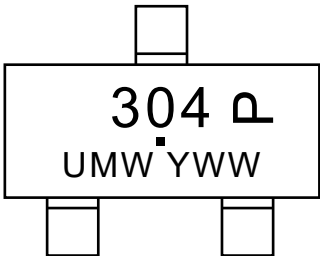


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	L1	L2	C	D	E	E1	B	B1	θ
Min	1.050	0.000	0.300	0.350	0.100	2.820	1.500	2.700	1.800	0.950	0°
Max	1.150	0.100	0.500	0.550	0.200	3.020	1.700	2.900	2.000	TYP	8°



9.Ordering information



YWW: Batch Code

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



10.Disclaimer

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