

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.

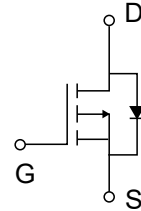
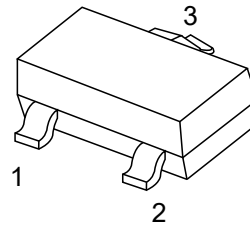
2.Features

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

3.Pinning information

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

SOT-23



4.Maximum ratings ($T_A = 25^\circ C$ 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	$^\circ C$
Thermal Characteristics			
Thermal Resistance, Junction-to-Ambient (Note 1a)	$R_{\theta JA}$	250	$^\circ C/W$
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	75	$^\circ C/W$



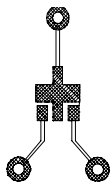
5. Static Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

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	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	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	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	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

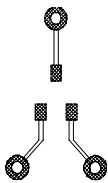


Drain–Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain–Source Diode Forward Current	I_S				-0.42	A
Drain–Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-0.42A$ (Note 2)		-0.6	-1.2	V

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 of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ 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 Characteristics

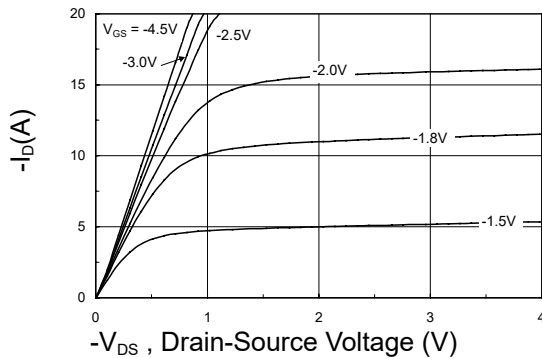


Figure 1: On-Region Characteristics.

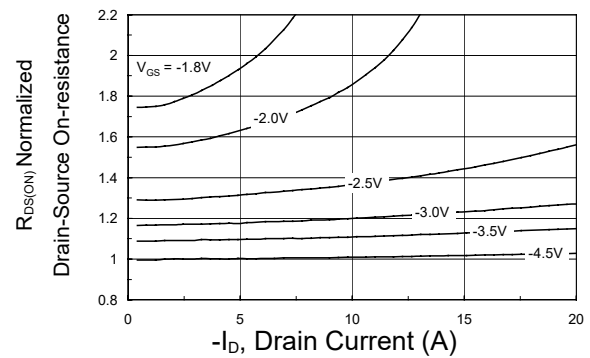


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

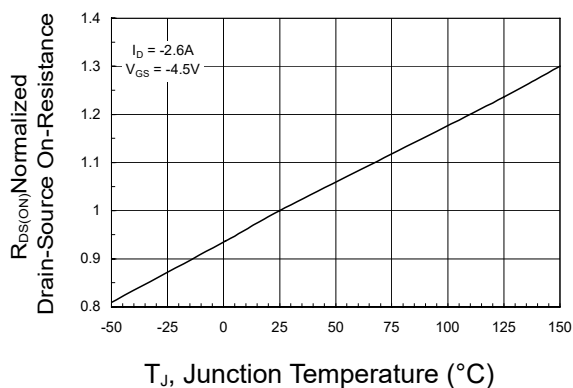


Figure 3: On-Resistance Variation with Temperature.

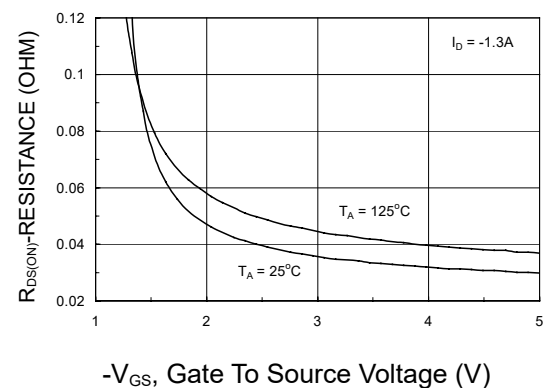


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

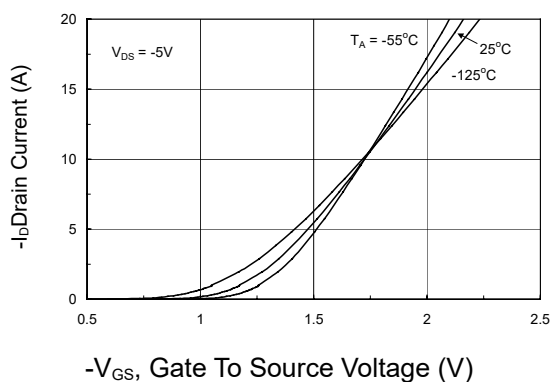


Figure 5: Transfer Characteristics.

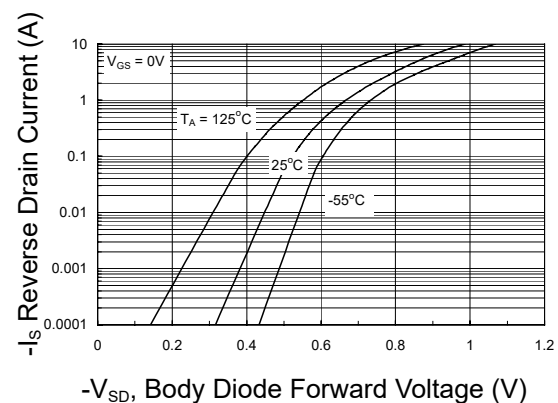


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.



6.2 Typical Characteristics

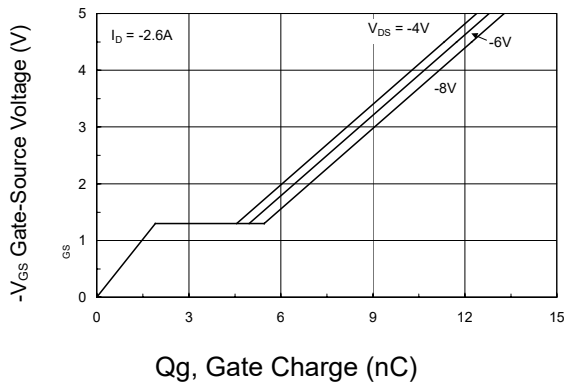


Figure 7: Gate-Charge Characteristics

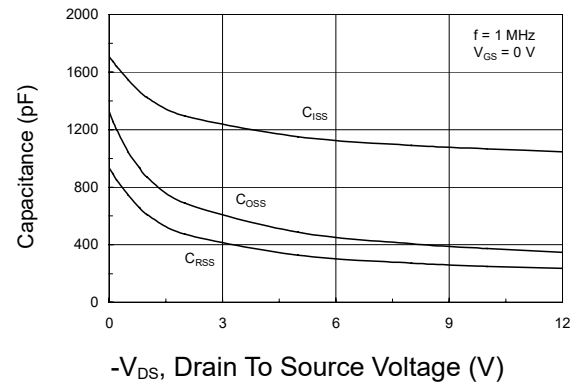


Figure 8: Capacitance Characteristics

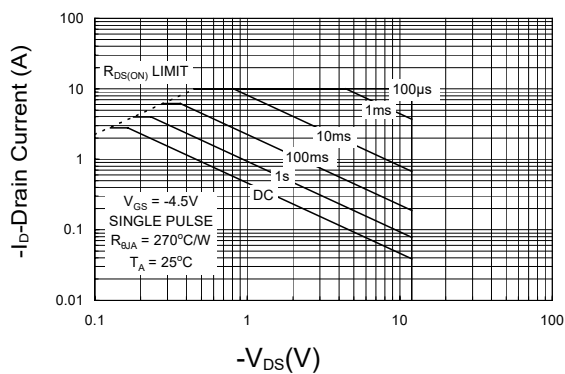


Figure 9: Maximum Safe Operating Area.

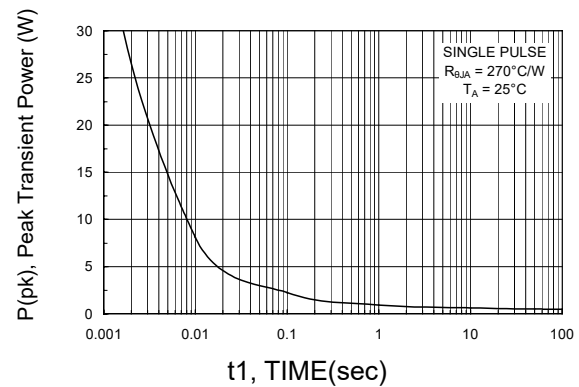


Figure 10: Single Pulse Maximum Power Dissipation.

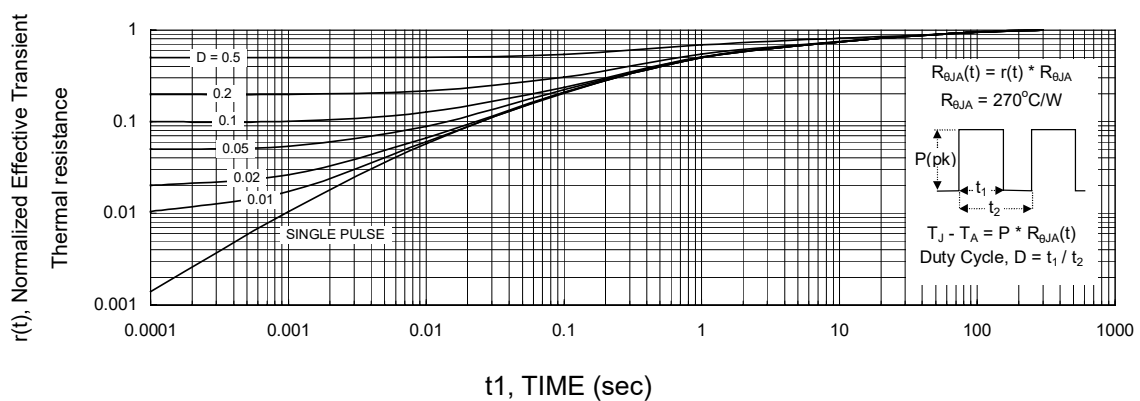
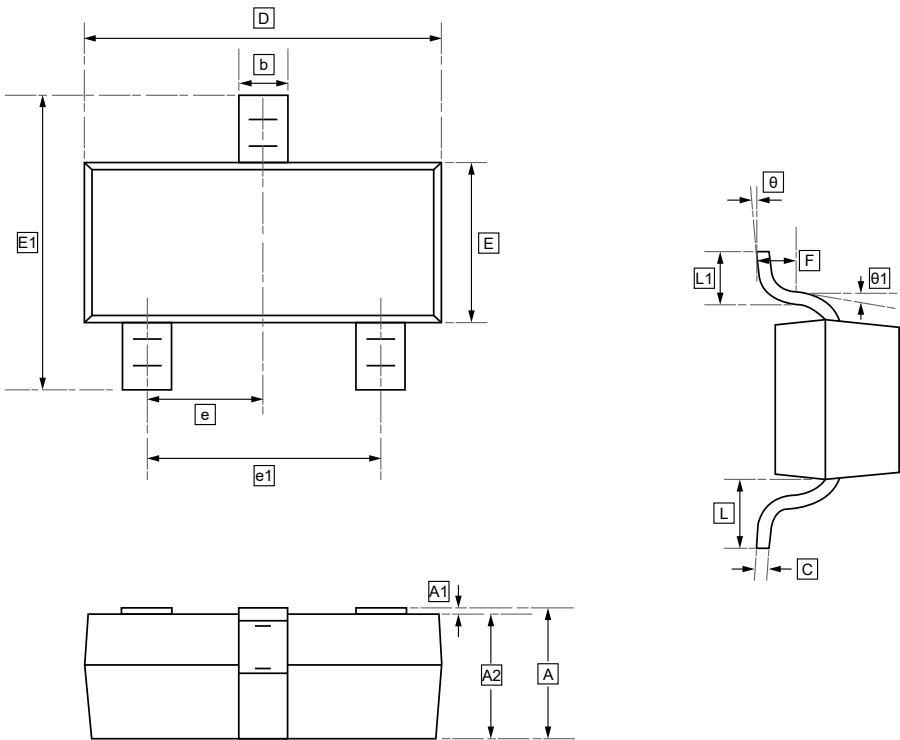


Figure 11. Transient Thermal Response Curve.



7.SOT-23 Package Outline Dimensions



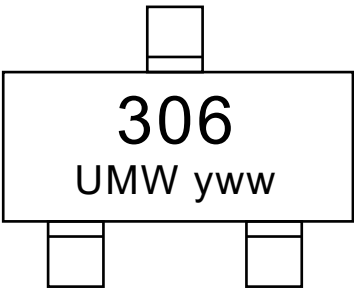
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°



8.Ordering Information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDN306P	SOT-23	3000	Tape and reel



9.Disclaimer

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