

1.Description

This 20V N-Channel MOSFET uses Fairchild's high voltage PowerTrench process. It has been optimized for power management applications.

2.Features

- $V_{DS(V)}=20V$
- $R_{DS(ON)}<154m\Omega(V_{GS}=4.5V)$
- $R_{DS(ON)}<210m\Omega(V_{GS}=2.5V)$

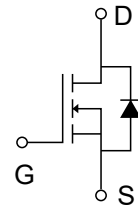
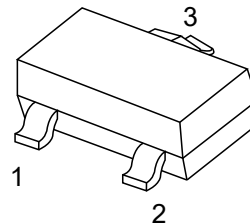
3.Applications

- Load switch
- Battery protection
- Power 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	Value	Units
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current – Continuous – Pulsed	I_D	0.9	A
		2	
Maximum Power Dissipation	P_D	0.35	W
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$
Thermal Characteristics			
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	357	$^{\circ}C/W$



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20			V
Breakdown Voltage Temp. Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		15		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	μA
Gate–Body Leakage, Forward	I _{GSSF}	V _{GS} =12V, V _{DS} =0V			100	μA
Gate–Body Leakage, Reverse	I _{GSSR}	V _{GS} =-12V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.6	1	1.5	V
Gate Threshold Voltage Temp. Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		-3		mV/°C
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =0.9A		110	154	mΩ
		V _{GS} =2.5V, I _D =0.7A		150	210	
On-State Drain Current	I _{D(ON)}	V _{GS} =4.5V, V _{DS} =5V	1			A
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =0.9A		3		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz		109		pF
Output Capacitance	C _{oss}			30		pF
Reverse Transfer Capacitance	C _{rss}			14		pF
SWITCHING CHARACTERISTICS (Note 2)						
Turn - On Delay Time	t _{D(on)}	V _{DD} =10V, I _D =1A V _{GS} =4.5V, R _{GEN} =6Ω		4.5	9	ns
Turn - On Rise Time	t _r			7	14	ns
Turn - Off Delay Time	t _{D(off)}			8	16	ns
Turn - Off Fall Time	t _f			1.4	2.8	ns



Total Gate Charge	Q _g	V _{DS} =10V, I _D =0.9A V _{GS} =4.5V		1.1	1.5	nC
Gate-Source Charge	Q _{gs}			0.26		nC
Gate-Drain Charge	Q _{gd}			0.26		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Current	I _S				0.29	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =0.29A		0.75	1.2	V
Diode Reverse Recovery Time	T _{rr}	I _F =0.9A		7.4		ns
Diode Reverse Recovery Charge	Q _{rr}	d _I F/d _t =100A/μs		2.2		nC

Notes:

1. Pulse Test: Pulse Width $\leq 300\ \mu s$, Duty Cycle $\leq 2.0\%$



7.1 Typical Characteristics

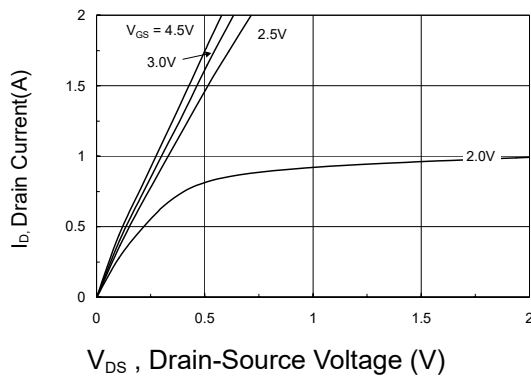


Figure 1: On-Region Characteristics.

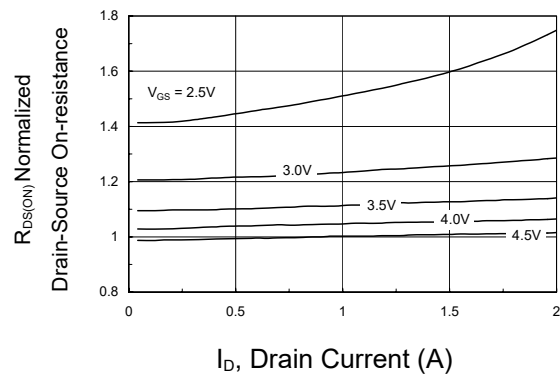


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

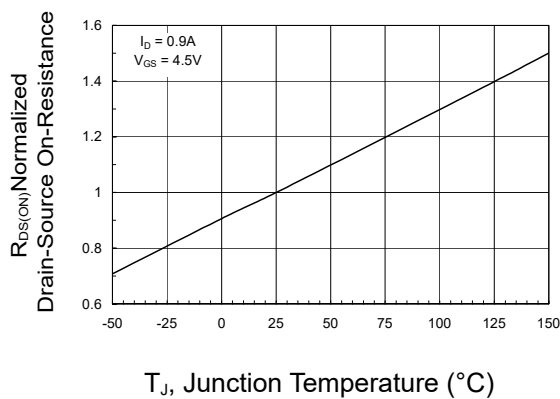


Figure 3: On-Resistance Variation with Temperature.

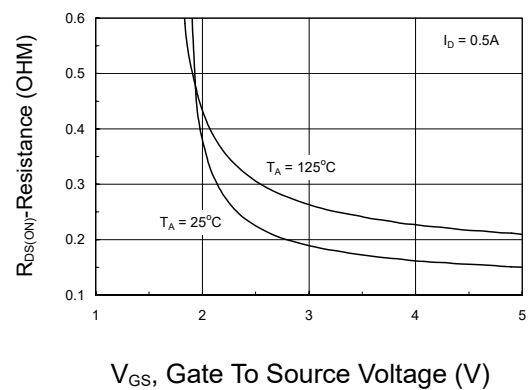


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

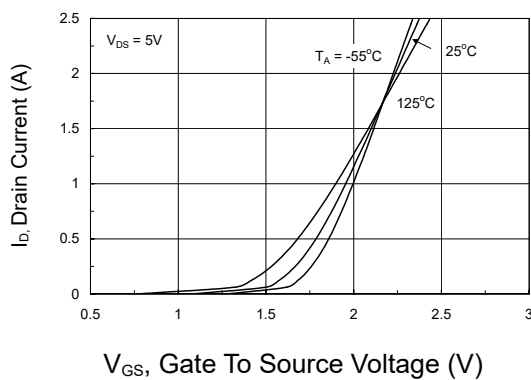


Figure 5: Transfer Characteristics.

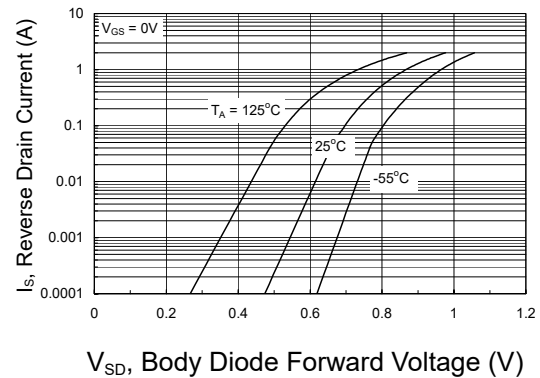


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.



7.2 Typical Characteristics

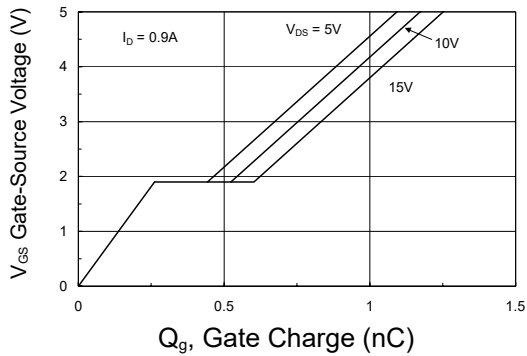


Figure 7: Gate-Charge Characteristics

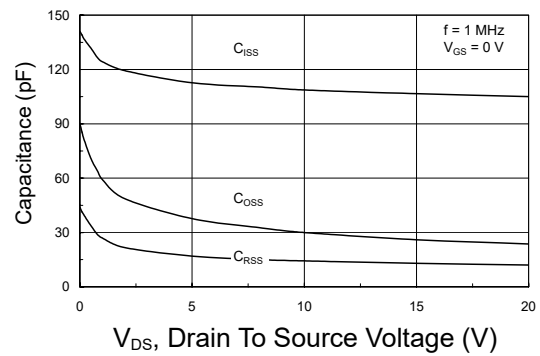


Figure 8: Capacitance Characteristics

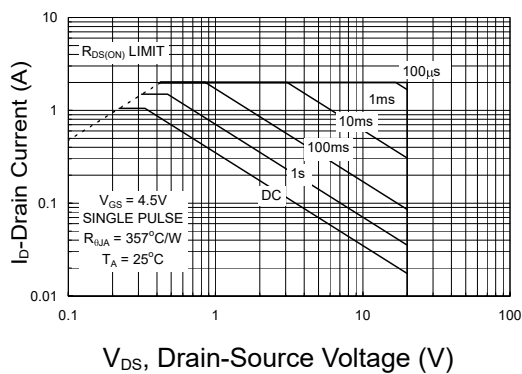


Figure 9: Maximum Safe Operating Area.

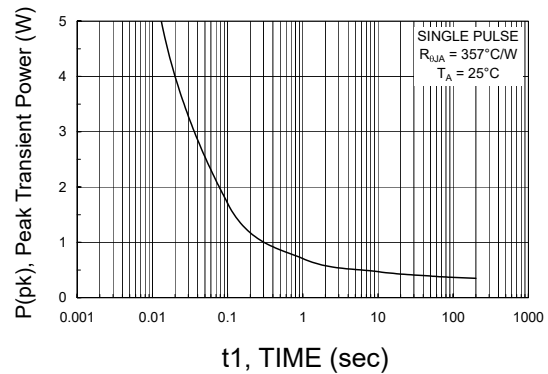


Figure 10: Single Pulse Maximum Power Dissipation.

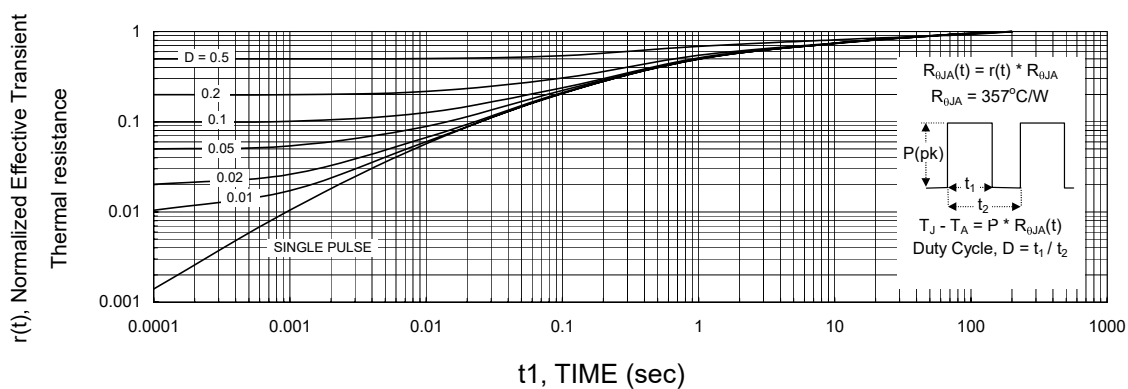
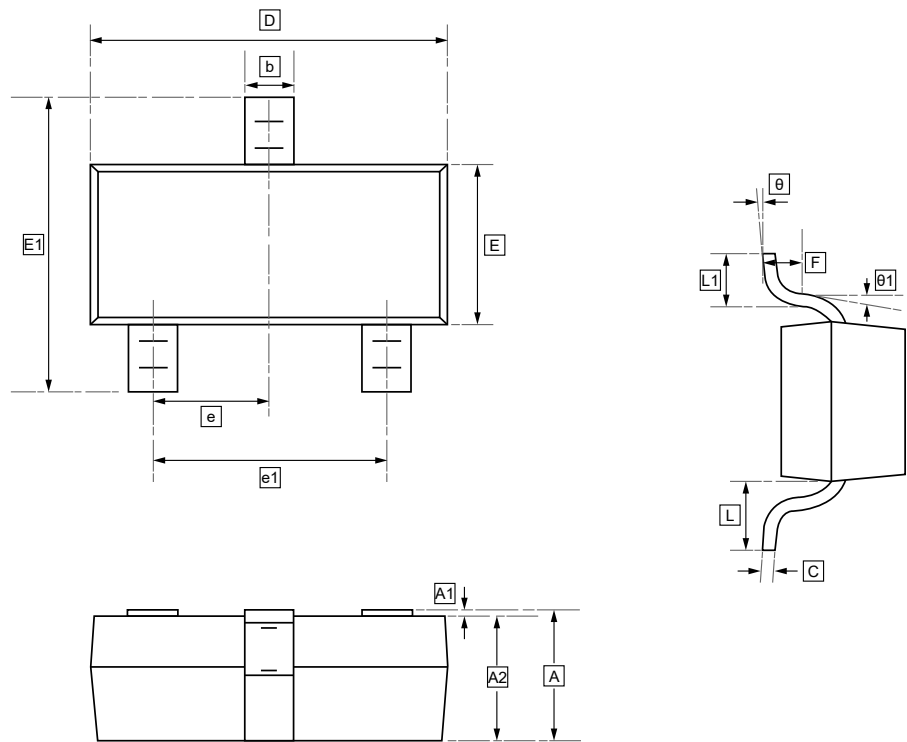


Figure 11: Transient Thermal Response Curve.



8.SOT-23 Package Outline Dimensions



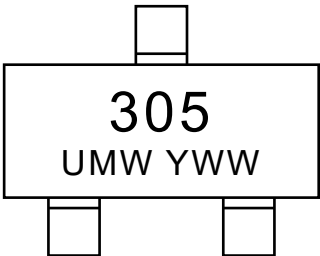
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	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°



9.Ordering information



YWW: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDV305N	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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