UMW FDV305N

20V N-Channel MOSFET

1.Description

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

2.Features

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

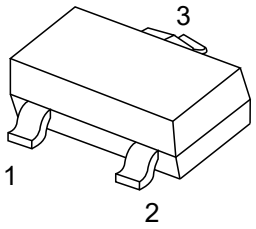
3.Applications

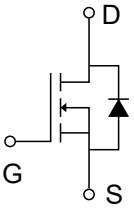
- Load switch
- Battery protection
- Power managemen

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

6.Electrical Characteristics (T_A=25°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_{IF}/d_t=100A/μs		2.2		nC

Notes:

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

7.1Typical Characterisitics

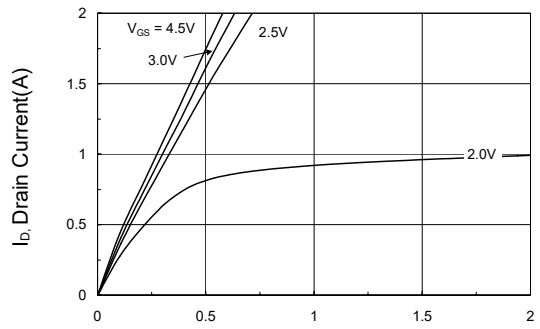


Figure 1: On-Region Characteristics.

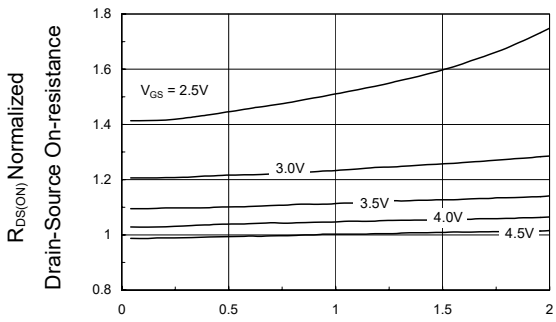


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

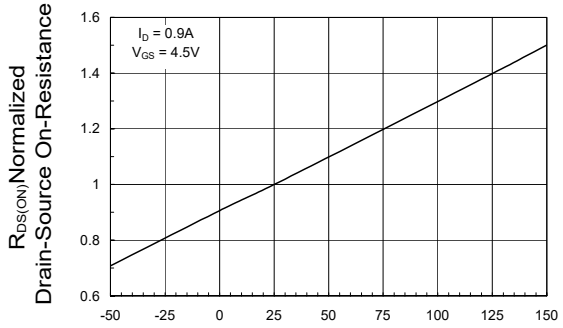


Figure 3: On-Resistance Variation with Temperature.

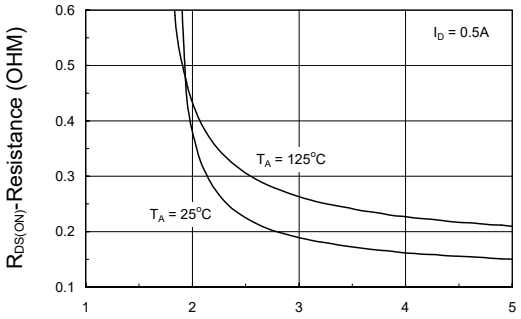


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

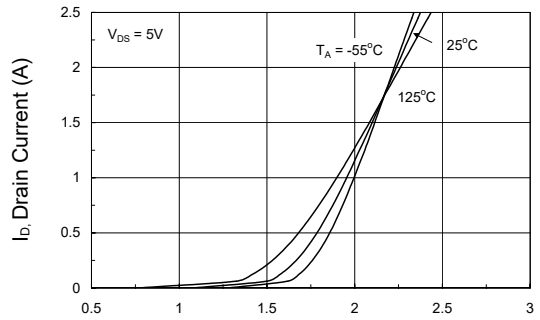


Figure 5: Transfer Characteristics.

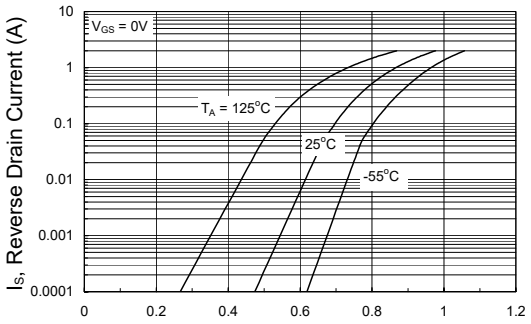


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.

7.2Typical Characterisitics

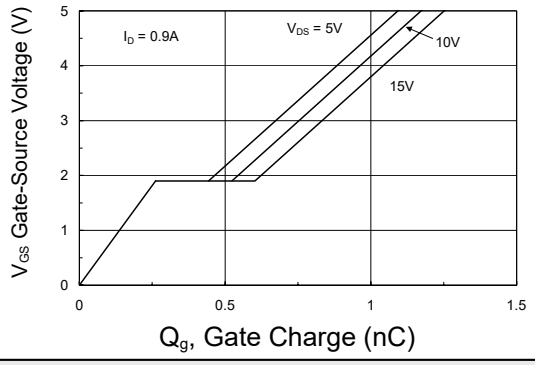


Figure 7: Gate-Charge Characteristics

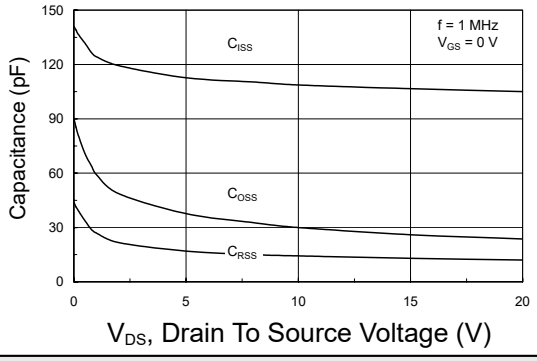


Figure 8: Capacitance Characteristics

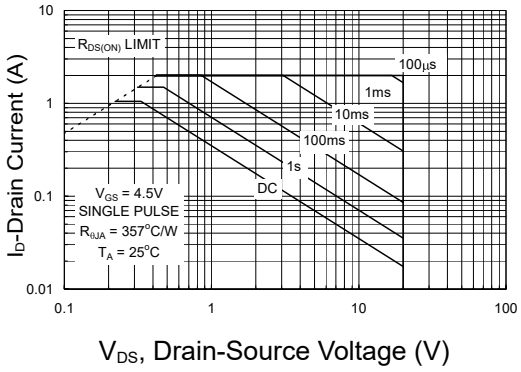


Figure 9: Maximum Safe Operating Area.

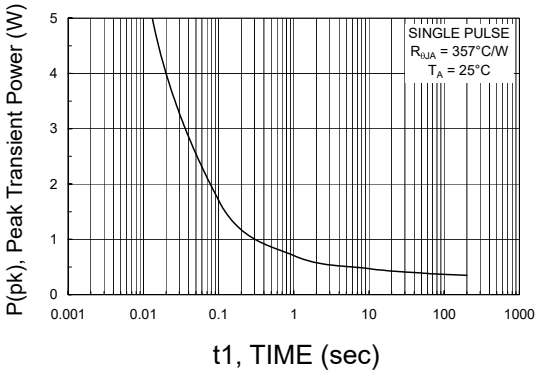


Figure 10: Single Pulse Maximum Power Dissipation.

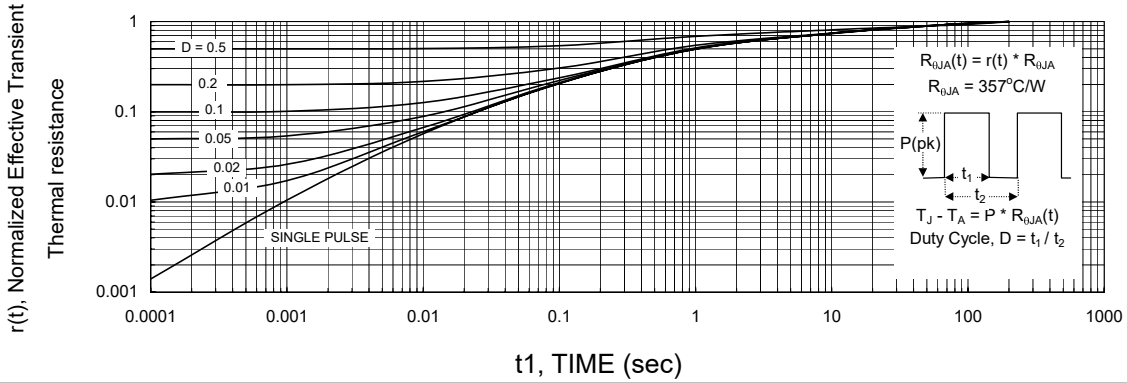
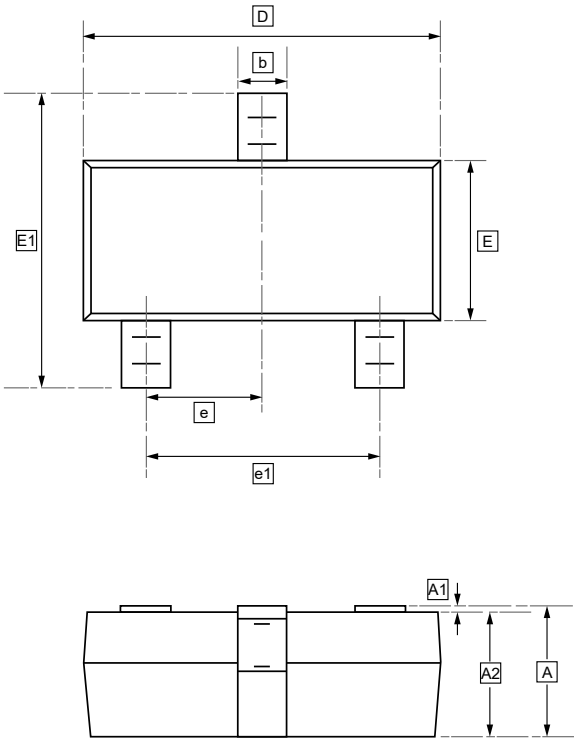


Figure 11. Transient Thermal Response Curve.

8.SOT-23 Package Outline Dimensions

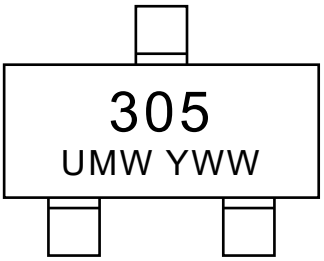


DIMENSIONS (mm are the original dimensions)

Symbol	A	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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