UMW FDN336P

-20V P-Channel MOSFET

1.Description

This P-Channel 2.5V specified MOSFET has been especially tailored to minimize the on-state resistance and yet maintain low gate charge for superior switching performance.

These devices are well suited for portable electronics applications: load switching and power management,battery c harging circuits and DC/DC conversion.

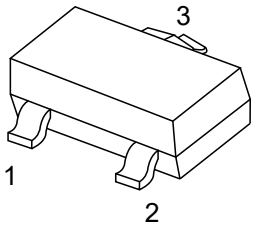
2.Features

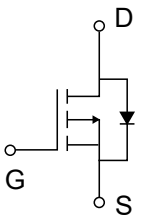
- $V_{DS(V)}$=-20V
- $R_{DS(ON)}$<0.14Ω(V_{GS}=-4.5V)
- $R_{DS(ON)}$<0.16Ω(V_{GS}=-2.5V)

3.Pinning information

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

SOT-23





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

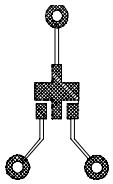
Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±8	V
Drain Current – Continuous (Note 1a)	I_D	-1.3	A
– Pulsed		-10	
Maximum Power Dissipation (Note 1a)	P_D	0.5	W
(Note 1b)		0.46	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	°C
Thermal Characteristics			
Thermal Resistance, Junction-to-Ambient (Note 1a)	$R_{\theta JA}$	250	°C/W
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	75	°C/W

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

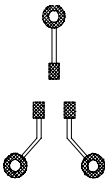
Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20			V
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=-250μA Referenced to 25°C		-16		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-1	μA
		T_J=55°C			-10	μA
Gate - Body Leakage, Forward	I_{GSSF}	V_{GS}=8V, V_{DS}=0V			100	nA
Gate - Body Leakage, Reverse	I_{GSSR}	V_{GS}=-8V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS (Note)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.9	-1.5	V
Gate Threshold Voltage Temp. Coefficient	$\Delta V_{GS(th)}/T_J$	I_D=-250μA Referenced to 25°C		3		mV/°C
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-1.3A		0.084	0.14	Ω
		T_J=25°C		0.18	0.32	
		V_{GS}=-2.5V, I_D=-1.1A		0.11	0.16	
On-State Drain Current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}=-5V	-5			A
Forward Transconductance	g_{FS}	V_{DS}=-4.5V, I_D=-2A		4		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		330		pF
Output Capacitance	C_{oss}			80		pF
Reverse Transfer Capacitance	C_{rss}			35		pF
SWITCHING CHARACTERISTICS (Note)						
Turn - On Delay Time	$t_{D(on)}$	V_{DD}=-5V, I_D=-0.5A V_{GS}=-4.5V, R_{GEN}=6Ω		7	15	ns
Turn - On Rise Time	t_r			12	22	ns
Turn - Off Delay Time	$t_{D(off)}$			16	26	ns
Turn - Off Fall Time	t_f			5	12	ns

Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-2A V_{GS}=-4.5V		3.6	5	nC
Gate-Source Charge	Q_{gs}			0.8		nC
Gate-Drain Charge	Q_{gd}			0.7		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)		-0.7	-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 ofthe 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 in^2 pad of 2oz Cu.



b) 270°C/W when mounted on a 0.001 in^2 pad of 2oz Cu.

Scale 1 : 1 on letter size paper

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

6.1Typical Characterisitics

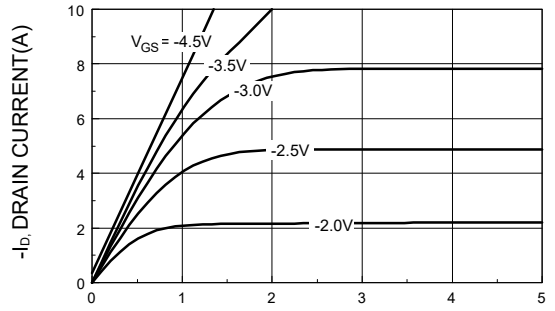


Figure 1: On-Region Characteristics.

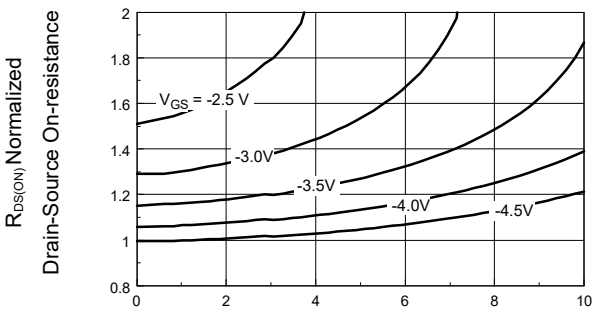


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

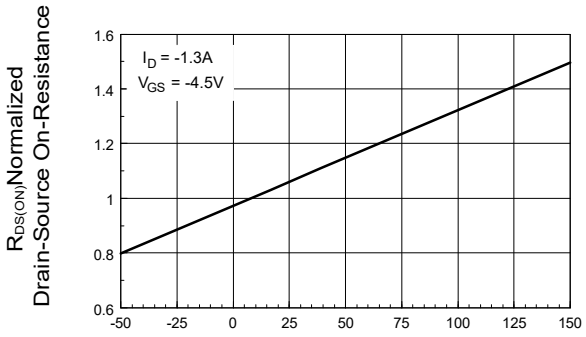


Figure 3: On-Resistance Variation with Temperature.

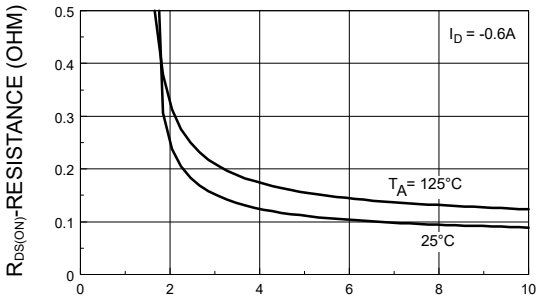


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

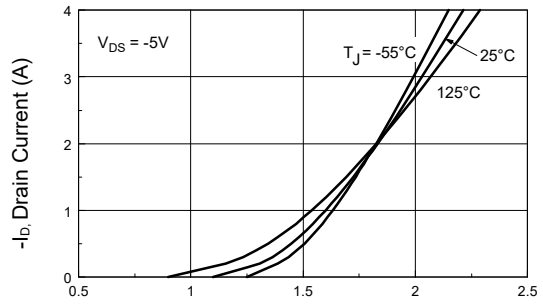


Figure 5: Transfer Characteristics.

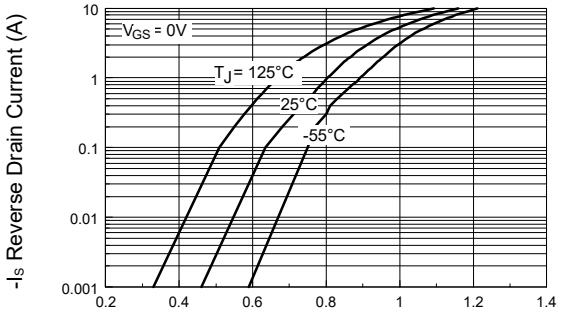


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.

6.2Typical Characterisitics

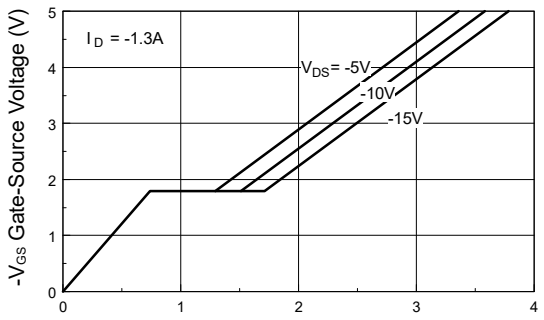


Figure 7: Gate-Charge Characteristics

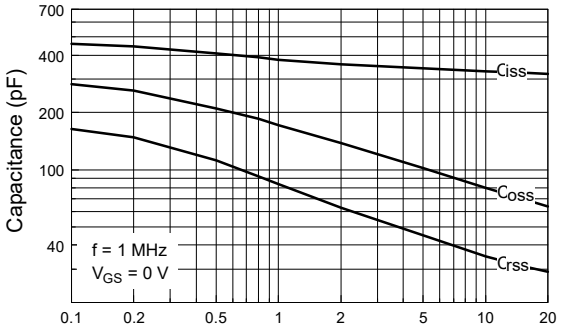


Figure 8: Capacitance Characteristics

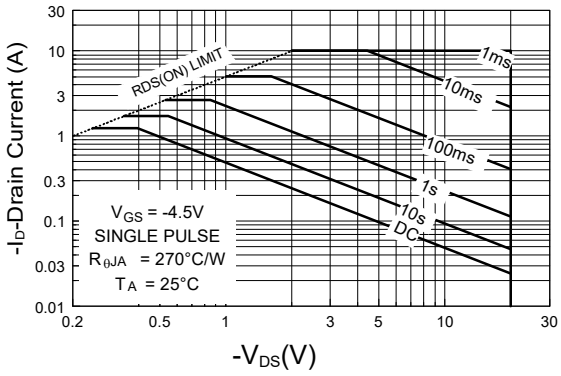


Figure 9: Maximum Safe Operating Area.

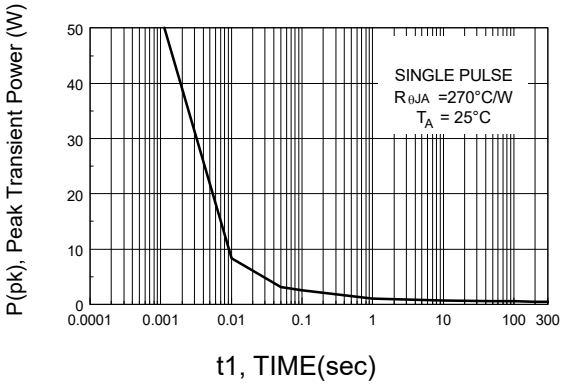


Figure 10: Single Pulse Maximum Power Dissipation.

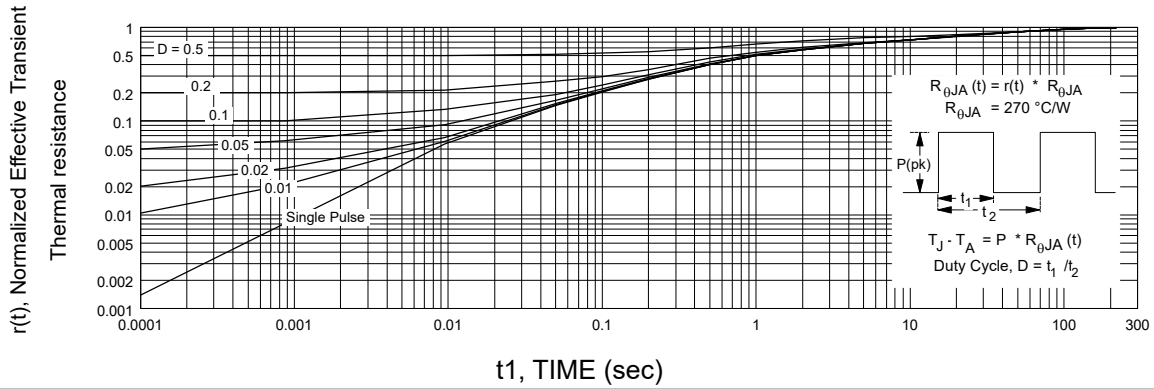
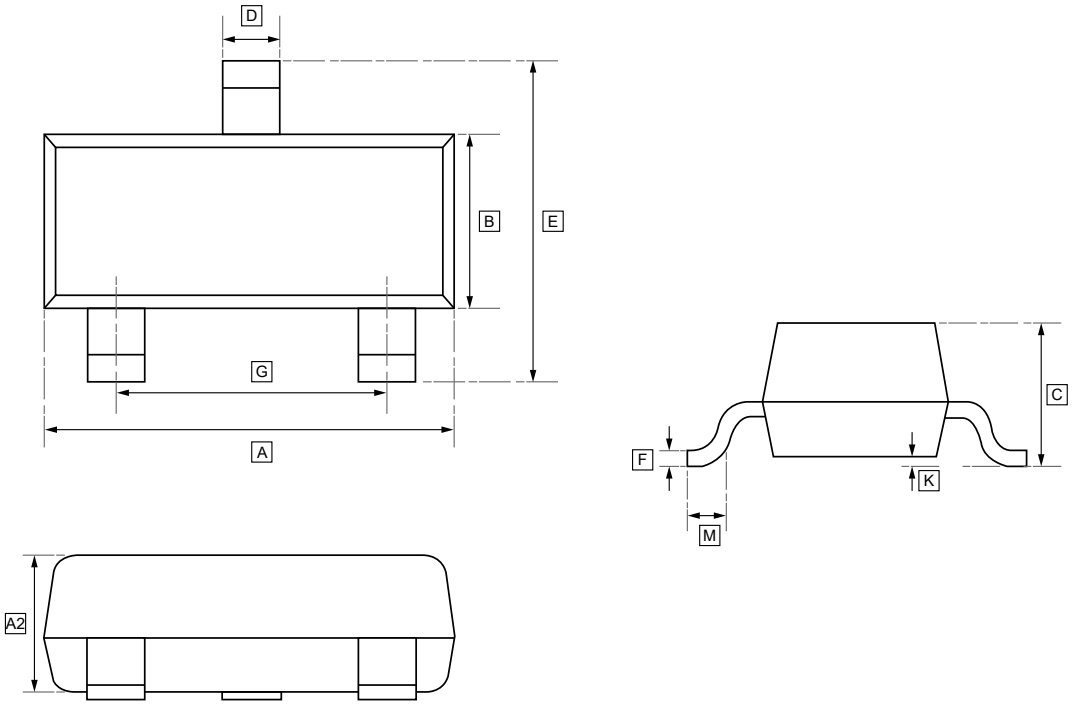


Figure 11. Transient Thermal Response Curve.

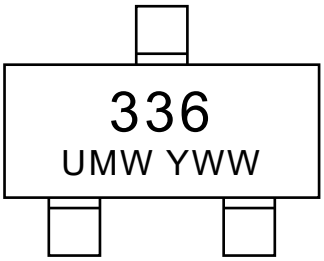
7.SOT-23 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	G	K	M	A2	F
Min	2.85	1.20	0.90	0.40	2.25	1.80	0.00	0.30	0.95	0.095
Max	3.04	1.40	1.10	0.50	2.55	2.00	0.10	-	1.05	0.115

8.Ordering information



YWW: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDN336P	SOT-23	3000	Tape and reel

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