UMW FDN360P

-30V P-Channel MOSFET

1.Description

These devices are well suited for low voltage and battery powered applications where low in-line power loss and fast switching are required.

2.1Features

- $V_{DS(V)}$=-30V
- I_D=-2A
- $R_{DS(ON)}$<80mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<125mΩ(V_{GS}=-4.5V)

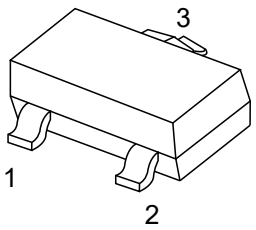
2.2Features

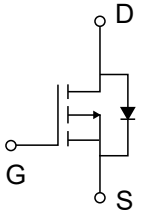
- High power version of industry Standard SOT-23 package
- High performance trench technology for extremely low $R_{DS(ON)}$
- Low gate charge (6.2 nC typical)
- higher power handling capability

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)

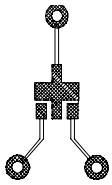
Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	-30	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current – Continuous (Note 1a)	I_D	-2	A
– Pulsed		-10	
Power Dissipation for Single Operation (Note 1a)	P_D	0.5	W
(Note 1b)		0.46	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 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.T_A=25°C unless otherwise specified

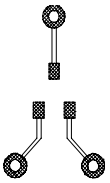
Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-30			V
Breakdown Voltage Temp. Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I_D=-250μA Referenced to 25°C		-22		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	μA
		V_{DS}=-24V,V_{GS}=0V,T_J=55°C			-10	
Gate - Body Leakage, Forward	I_{GSSF}	V_{GS}=20V, V_{DS}=0V			100	nA
Gate - Body Leakage, Reverse	I_{GSSR}	V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1	-1.9	-3	V
Gate Threshold Voltage Temp. Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I_D=-250μA Referenced to 25°C		4		mV/°C
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-2A		63	80	mΩ
		V_{GS}=-4.5V, I_D=-1.5A		100	125	
On-State Drain Current	$I_{D(ON)}$	V_{GS}=-10V, V_{DS}=-5V	-10			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-2A		5		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		298		pF
Output Capacitance	C_{oss}			83		pF
Reverse Transfer Capacitance	C_{rss}			39		pF
SWITCHING CHARACTERISTICS (Note 2)						
Turn - On Delay Time	$t_{D(on)}$	V_{DD}=-15V, I_D=-1A V_{GS}=-10V, R_{GEN}=6Ω		6	12	ns
Turn - On Rise Time	t_r			13	23	ns
Turn - Off Delay Time	$t_{D(off)}$			11	20	ns
Turn - Off Fall Time	t_f			6	12	ns

Total Gate Charge	Q_g	V_{DS}=-15V, I_D=-3.6A V_{GS}=-10V		6.2	9	nC
Gate-Source Charge	Q_{gs}			1		nC
Gate-Drain Charge	Q_{gd}			1.2		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)		-0.8	-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 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%

6.1Typical Characterisitics

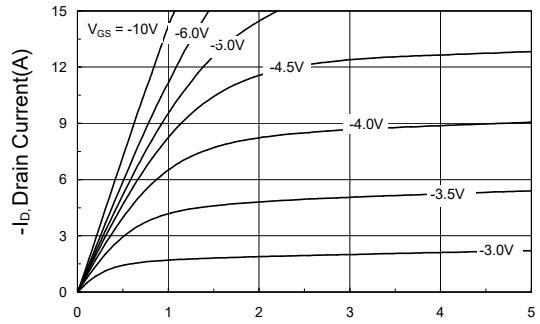


Figure 1: On-Region Characteristics.

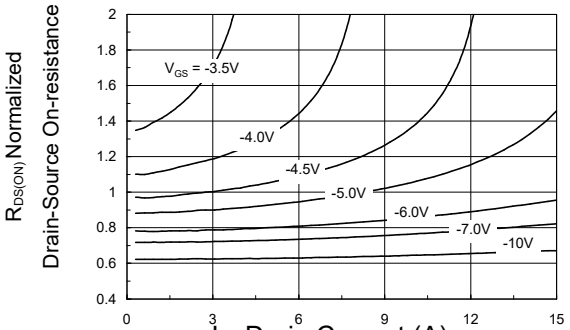


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

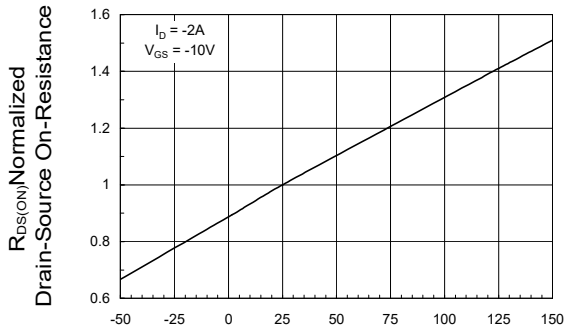


Figure 3: On-Resistance Variation with Temperature.

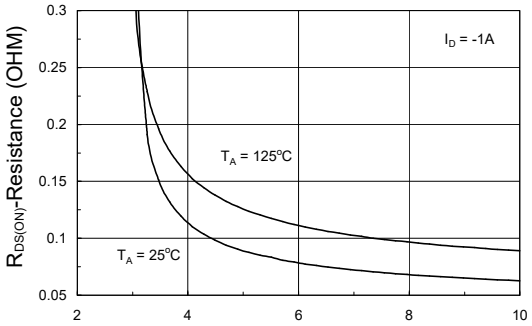


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

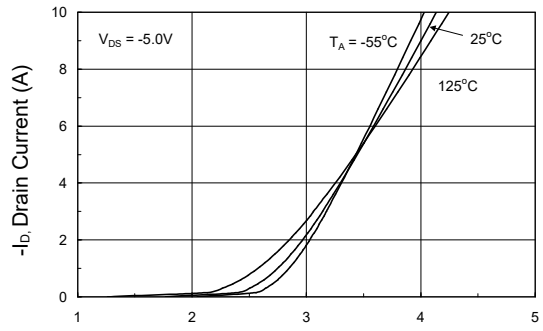


Figure 5: Transfer Characteristics.

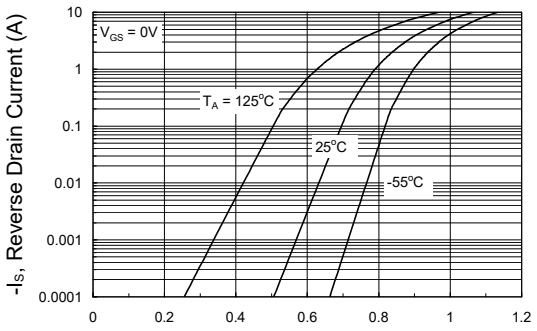


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.

6.2Typical Characterisitics

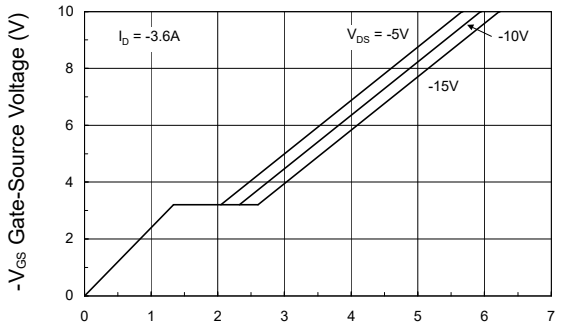


Figure 7: Gate-Charge Characteristics

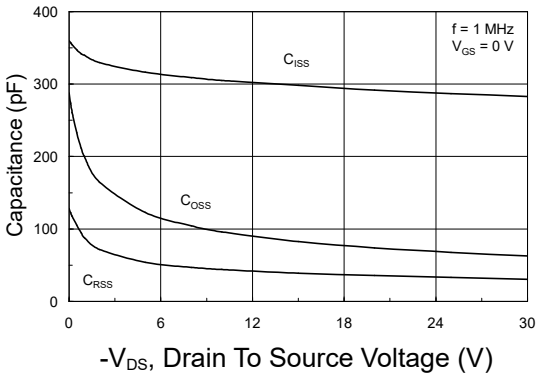


Figure 8: Capacitance Characteristics

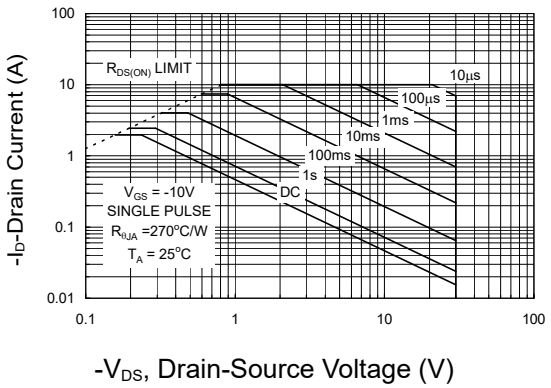


Figure 9: Maximum Safe Operating Area.

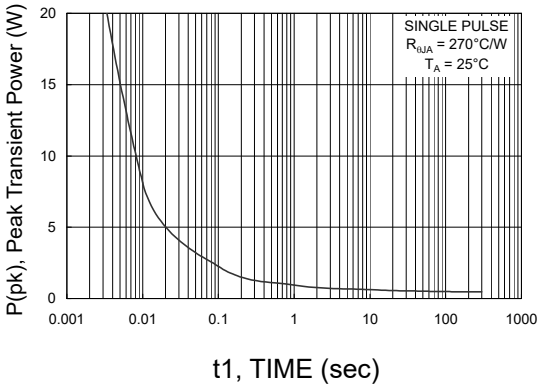


Figure 10: Single Pulse Maximum Power Dissipation.

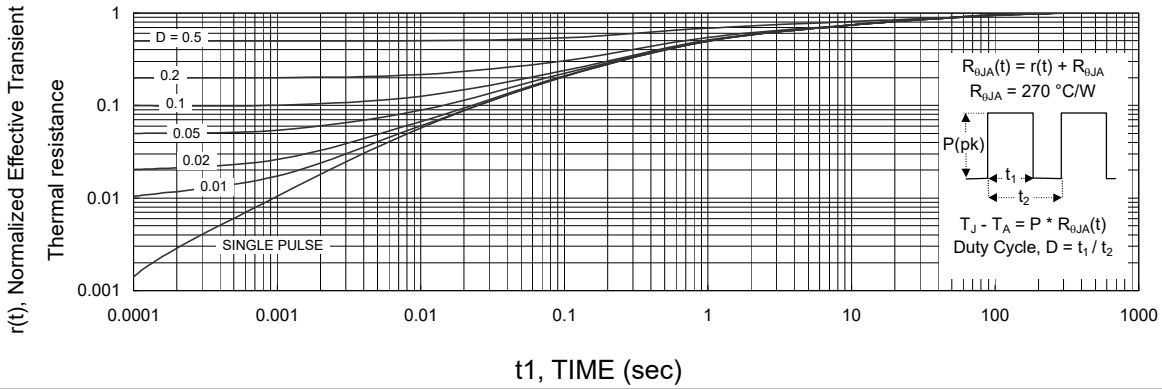
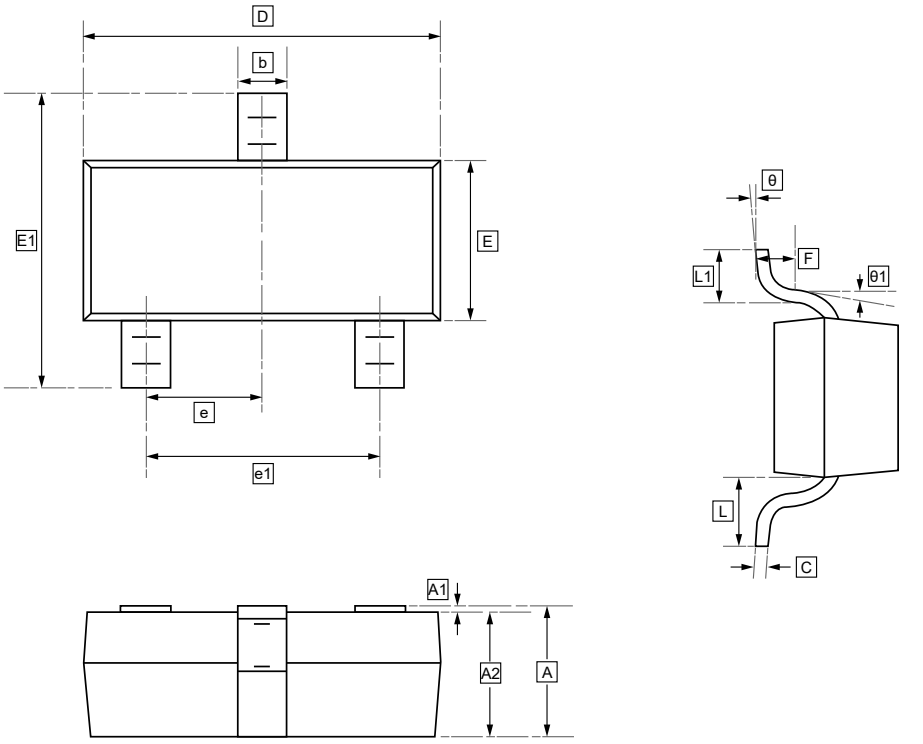


Figure 11. Transient Thermal Response Curve.

7.SOT-23 Package Outline Dimensions

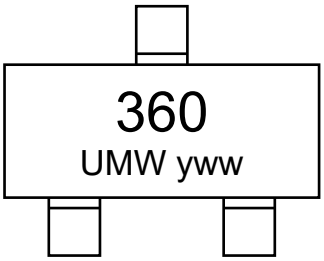


DIMENSIONS (mm are the original dimensions)

Symbol	A	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 FDN360P	SOT-23	3000	Tape and reel

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