UMW FDN359AN

30V N-Channel MOSFET

1.Description

This N-Channel Logic Level MOSFET is produced using advanced PowerTrench process that has been especially tailored to minimize on-state resistance and yet maintain superior switching performance.

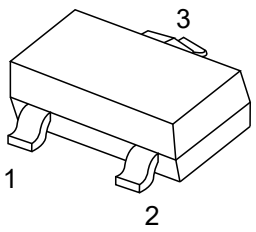
2.Features

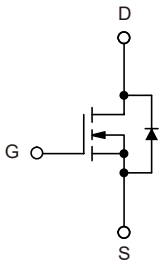
- $V_{DS(V)}$=30V
- I_D=2.7A
- $R_{DS(ON)}$<46mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<60mΩ(V_{GS}=4.5V)

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)

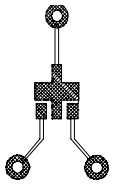
Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current – Continuous (Note 1a)	I_D	2.7	A
– Pulsed		15	
Power Dissipation for Single Operation (Note 1a)	P_D	0.5	W
(Note 1b)		0.46	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 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

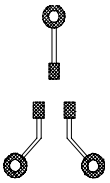
Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=250μA Referenced to 25°C		23		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	μA
		T_J=55°C			10	μA
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	1.6	3	V
Gate Threshold Voltage Temp. Coefficient	$\Delta V_{GS(th)}/T_J$	I_D=250μA Referenced to 25°C		-4		mV/°C
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.7A		37	46	mΩ
		V_{GS}=4.5V, I_D=2.4A		49	60	
On-State Drain Current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}=5V	15			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=2.7A		9.5		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=10V, f=1MHz		480		pF
Output Capacitance	C_{oss}			120		pF
Reverse Transfer Capacitance	C_{rss}			45		pF
SWITCHING CHARACTERISTICS (Note 2)						
Turn - On Delay Time	$t_{D(on)}$	V_{DD}=5V, I_D=1A V_{GS}=4.5V, R_{GEN}=6Ω		6	12	ns
Turn - On Rise Time	t_r			13	24	ns
Turn - Off Delay Time	$t_{D(off)}$			15	27	ns
Turn - Off Fall Time	t_f			4	10	ns

Total Gate Charge	Q_g	V_{DS}=10V, I_D=2.7A V_{GS}=5V		5	7	nC
Gate-Source Charge	Q_{gs}			1.4		nC
Gate-Drain Charge	Q_{gd}			1.6		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)		0.65	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

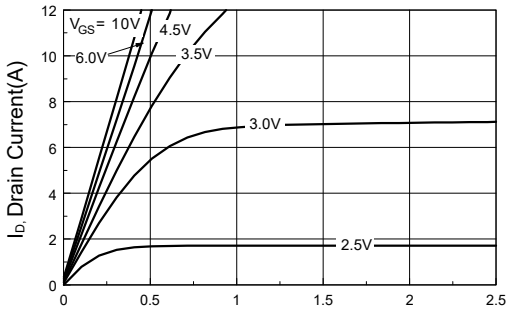


Figure 1: On-Region Characteristics.

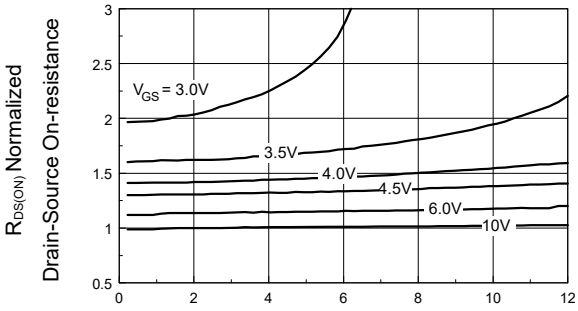


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

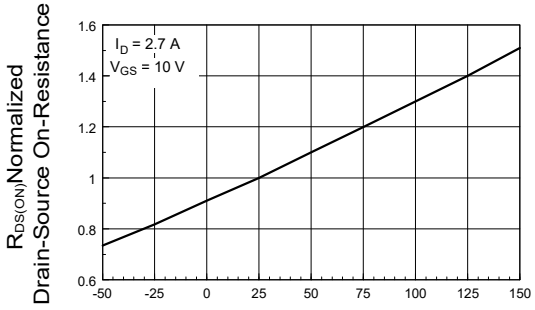


Figure 3: On-Resistance Variation with Temperature.

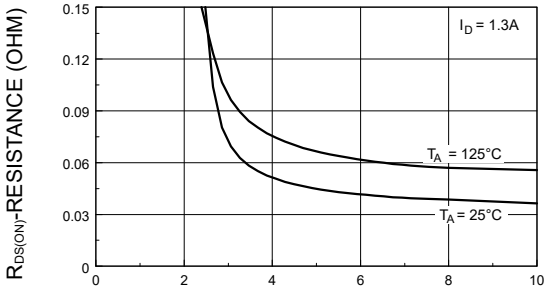


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

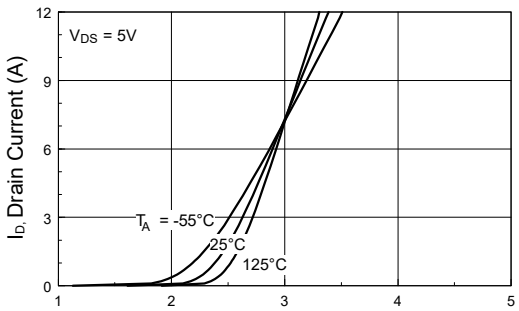


Figure 5: Transfer Characteristics.

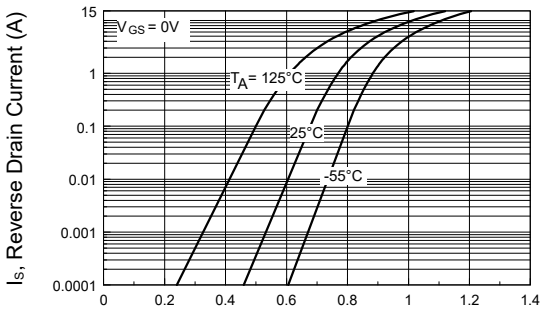


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.

6.2Typical Characterisitics

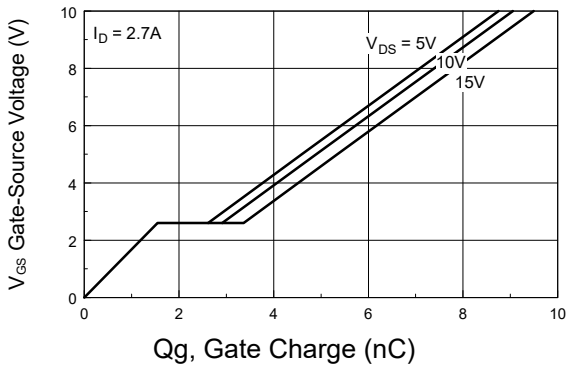


Figure 7: Gate-Charge Characteristics

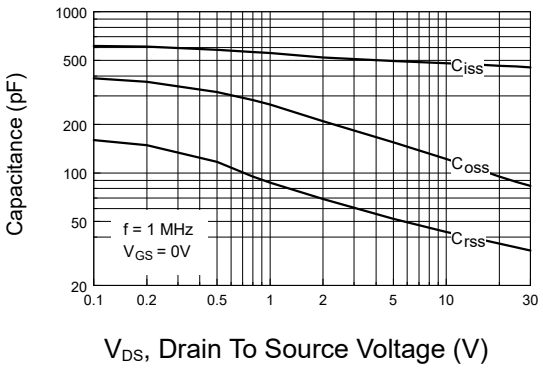


Figure 8: Capacitance Characteristics

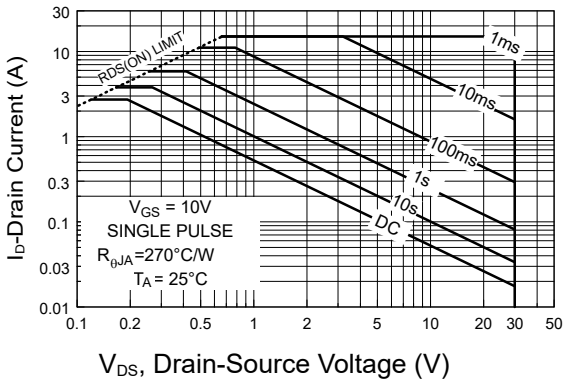


Figure 9: Maximum Safe Operating Area.

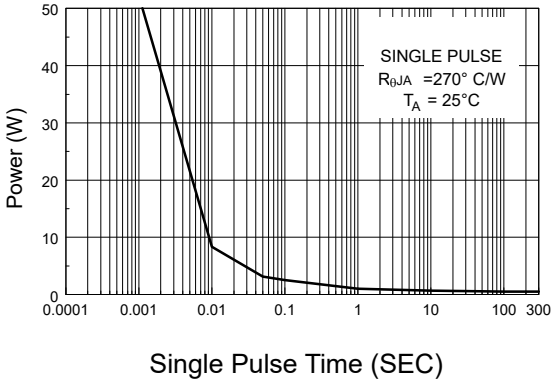


Figure 10: Single Pulse Maximum Power Dissipation.

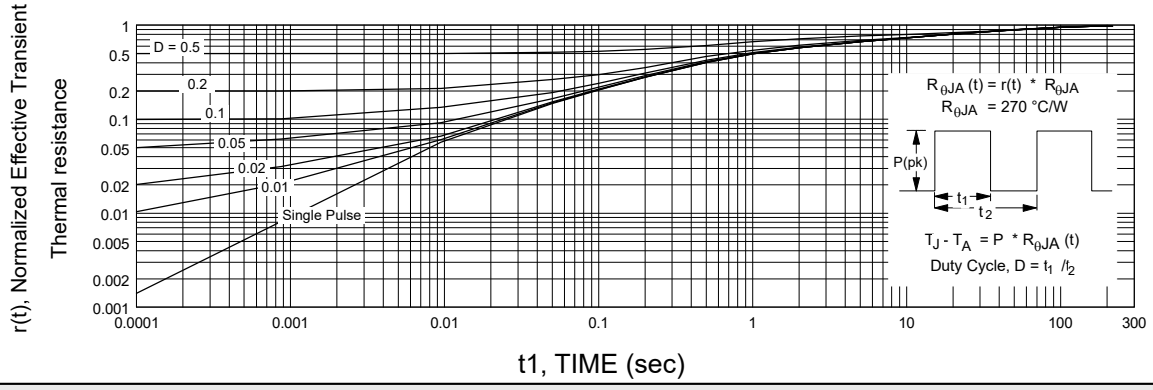
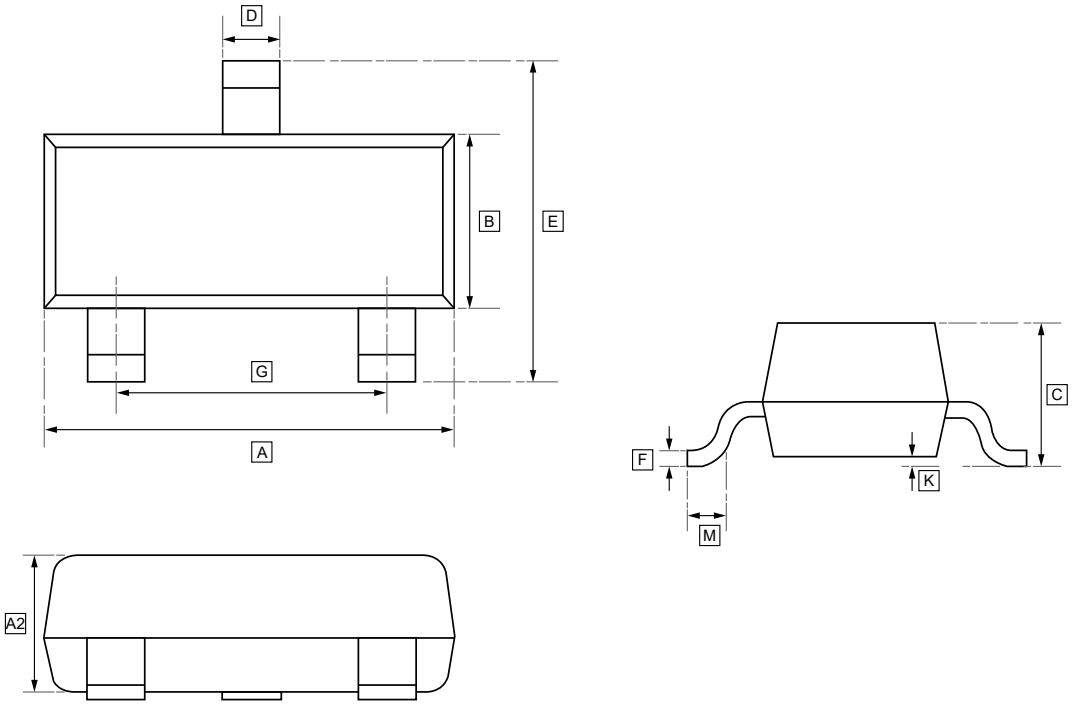


Figure 11. Transient Thermal Response Curve.

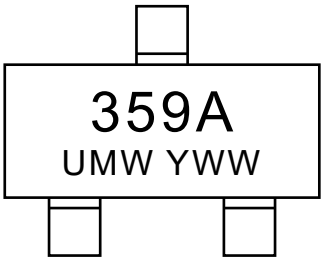
7.SOT-23 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	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 FDN359AN	SOT-23	3000	Tape and reel

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