UMW NTMS4916NR2G

30V N-Channel MOSFET

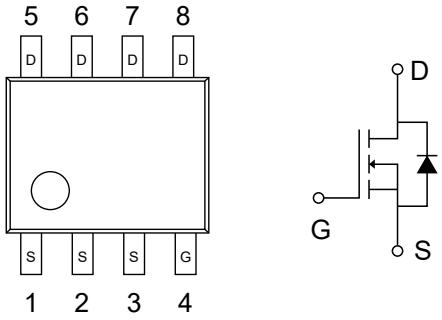
1.Features

- $V_{DS\ (V)}$=30V
- I_D=11.6A
- $R_{DS(ON)}$<6.75mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<9mΩ(V_{GS}=4.5V)
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses
- Optimized for 5V, 12V Gate Drives
- These Devices are Pb-Free, Halogen Free/ BFR Free and are RoHS Compliant

2.Pinning information

Pin	Symbol	Description
4	G	GATE
1,2,3	S	SOURCE
5,6,7,8	D	DRAIN

SOP-8



3.Absolute Maximum Ratings T_J=25°C unless otherwise noted

Parameter			Symbol	Maximum	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	
Continuous Drain Current $R_{\theta JA}$ (Note 1)	Steady State	T_A=25°C	I_D	9.4	A
		T_A=70°C		7.5	
Power Dissipation $R_{\theta JA}$ (Note 1)	Steady State	T_A=25°C	P_D	1.3	W
Continuous Drain Current $R_{\theta JA}$ (Note 2)	Steady State	T_A=25°C	I_D	7.8	A
		T_A=70°C		6.2	
Power Dissipation $R_{\theta JA}$ (Note 2)	Steady State	T_A=25°C	P_D	0.89	W
Continuous Drain Current $R_{\theta JA}$ t ≤ 10 s (Note 1)	Steady State	T_A=25°C	I_D	11.6	A
		T_A=70°C		9.3	
Power Dissipation $R_{\theta JA}$, t ≤ 10 s(Note 1)	Steady State	T_A=25°C	P_D	1.98	W
Pulsed Drain Current	Steady State	T_A=25°C,T_P=10μs	I_{DM}	145	A

Operating Junction and Storage Temperature	T_J,T_{STG}	-55 to 150	°C
Source Current (Body Diode)	I_S	2.5	A
Single Pulse Drain−to−Source Avalanche Energy(T_J=25°C, V_{DD}=30V, V_{GS}=10 V, I_L=9Apk, L=1mH, R_G=25 Ω)	E_{AS}	40.5	mJ
Lead Temperature for Soldering Purposes (1/8” from case for 10 s)	T_L	260	°C

4.Thermal Resistance Rating

Parameter	Symbol	Value	Units
Junction−to−Ambient – Steady State (Note 1)	R_{thJA}	96	°C/W
Junction−to−Ambient – t≤10s(Note 1)		63	°C/W
Junction−to−Foot (Drain)	R_{thJF}	24.5	°C/W
Junction−to−Ambient – Steady State (Note 2)	R_{thJA}	141	°C/W

5.Electrical Characteristics T_J=25°C

Parameter	Symbol	Conditions		Min	Typ	Max	Units
OFF CHARACTERISTICS							
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=250μA, V_{GS}=0V		30			V
Drain−to−Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$				16		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=4.5V, V_{DS}=30V	T_J=25°C			1	μA
			T_J=125°C			10	μA
Gate−to−Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V				±100	nA
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA		1.1	1.2	2.5	V
Negative Threshold Temperature Coefficient	$V_{GS(th)}/T_J$				5		mV/°C
Drain−to−Source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A			6.75	9	mΩ
		V_{GS}=4.5V, I_D=10A			9	12	mΩ
Forward Transconductance	g_{FS}	V_{DS}=1.5V, I_D=7.5A			23		S
CHARGES, CAPACITANCES AND GATE RESISTANCE							
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=4.5V, f=1MHz			1376		pF
Output Capacitance	C_{oss}				401		pF
Reverse Transfer Capacitance	C_{rss}				205		pF
Total Gate Charge	$Q_{g(TOT)}$	V_{GS}=4.5V, V_{DS}=15V, I_D=7.5A			15		nC
Threshold Gate Charge	$Q_{g(TH)}$				2.44		nC
Gate−to−Source Charge	Q_{gs}				4		nC
Gate−to−Drain Charge	Q_{gd}				6.5		nC
Total Gate Charge	$Q_{g(TOT)}$	V_{GS}=10V, V_{DS}=15V, I_D=7.5A			28		nC

SWITCHING CHARACTERISTICS (Note 4)							
Turn−On Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V I_D=1A, R_g=6Ω			9.4		ns
Rise Time	t_r				7.4		ns
Turn−Off Delay Time	$t_{D(off)}$				32		ns
Fall Time	t_f				15.6		ns
DRAIN−SOURCE DIODE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	V_{GS}=0V, I_S=2A	T_J=25°C		0.74	1	V
			T_J=125°C		0.57		V
Reverse Recovery Time	t_{rr}	V_{GS}=0V, d_{IS}/d_t=100A/μs I_S=2A			30.7		ns
Charge Time	t_a				14.3		ns
Discharge Time	t_b				16.4		ns
Reverse Recovery Charge	Q_{rr}				20		nC
PACKAGE PARASITIC VALUES							
Source Inductance	L_S	T_A=25°C			0.66		nH
Drain Inductance	L_D				0.2		nH
Gate Inductance	L_G				1.5		nH
Gate Resistance	R_G				0.77		Ω

6.1Typical Characterisitics

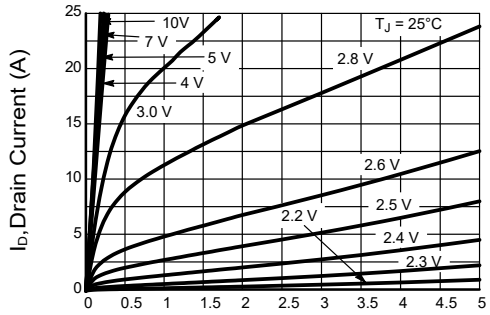


Figure 1: Output Characteristics

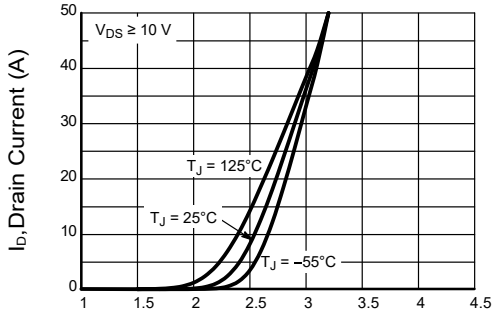


Figure 2: Transfer Characteristics

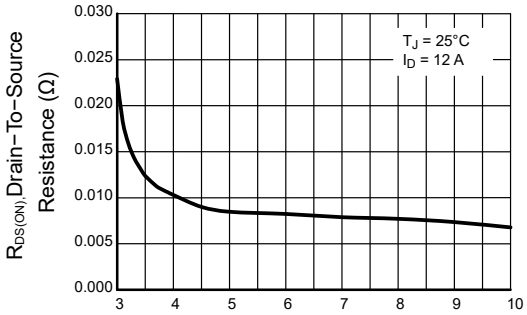


Figure 3: On-Resistance vs. Gate−to−Source Voltage

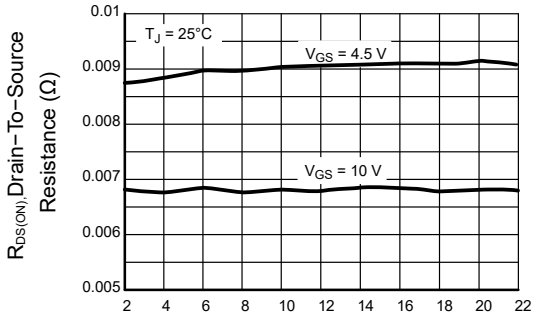


Figure 4: On−Resistance vs. Drain Current and Gate Voltage

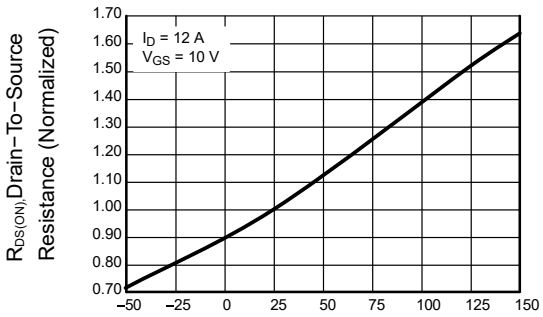


Figure 5: On−Resistance Variation with Temperature

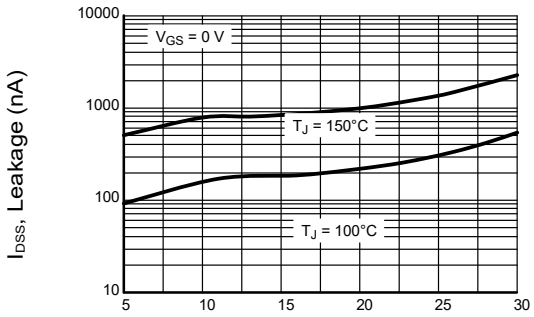


Figure 6: Drain−to−Source Leakage Current vs. Voltage

6.2Typical Characterisitics

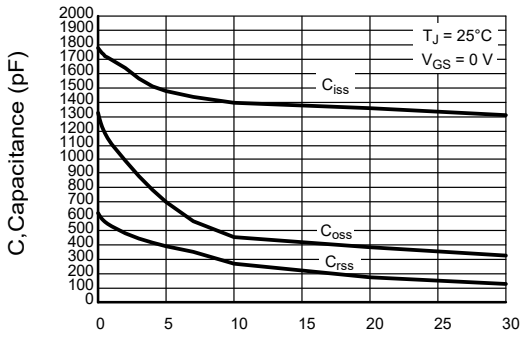


Figure 7: Capacitance Variation

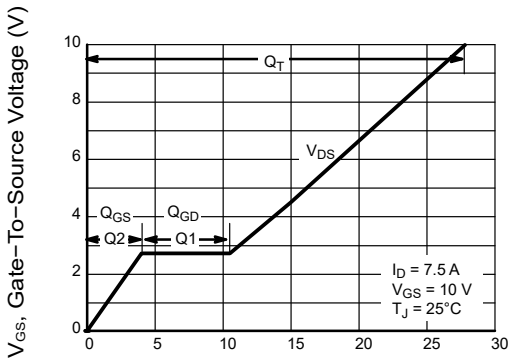


Figure 8: Gate−To−Source and Drain−To−Source Voltage vs. Total Charge

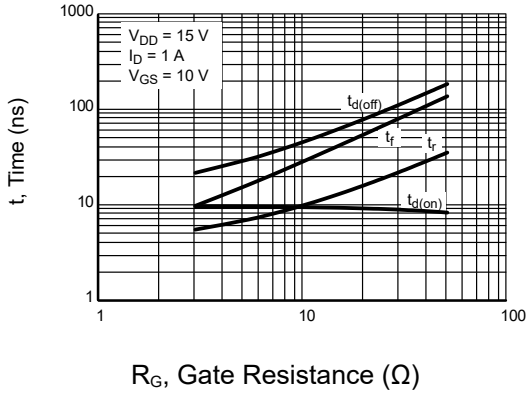


Figure 9: Resistive Switching Time Variation vs. Gate Resistance

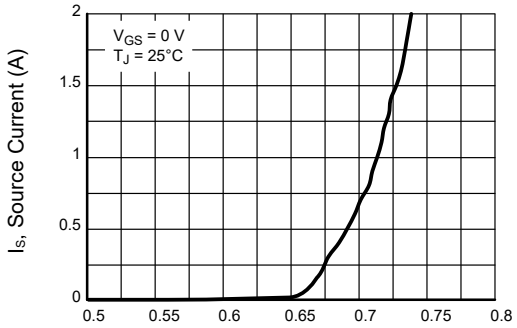


Figure 10: Diode Forward Voltage vs. Current

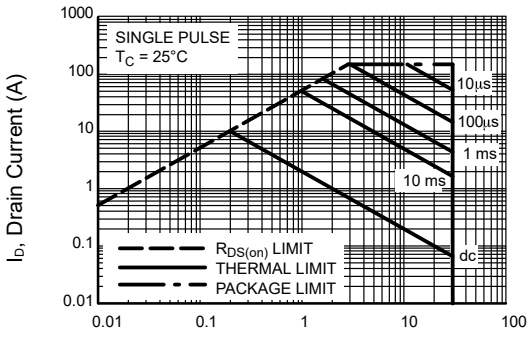


Figure 11: Maximum Rated Forward Biased Safe Operating Area

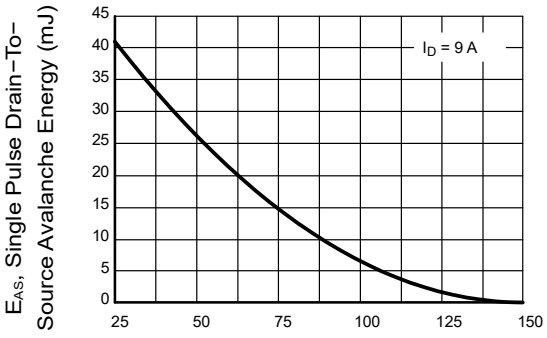
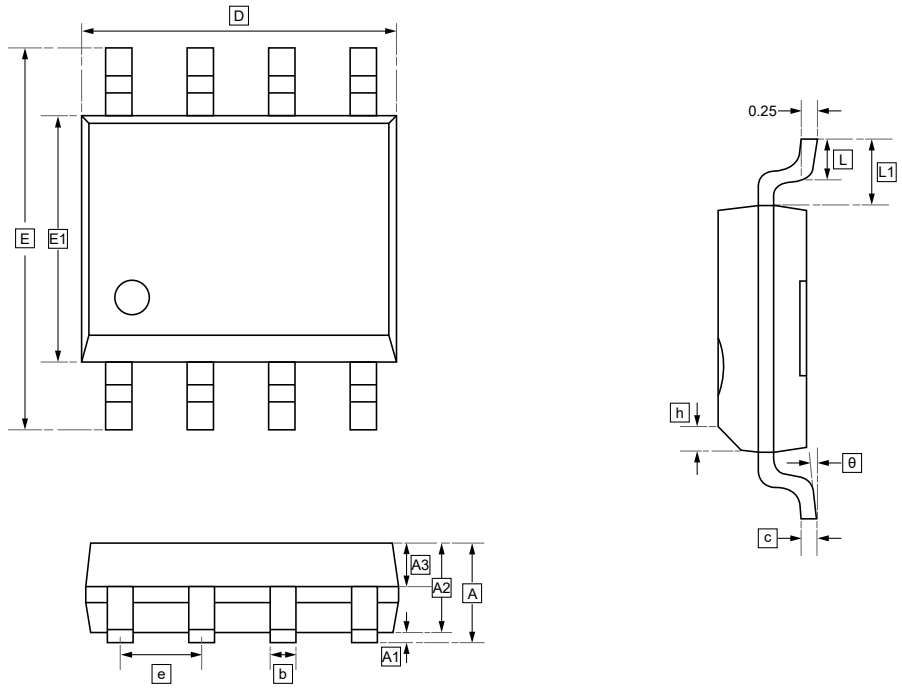


Figure 12: Maximum Avalanche Energy vs. Starting Junction Temperature

7.SOP-8 Package Outline Dimensions

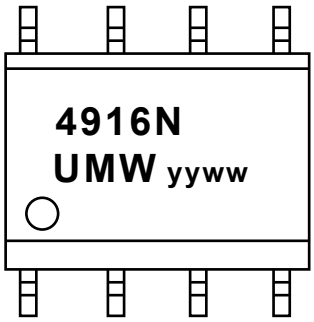


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.70	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.10	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°

8.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW NTMS4916NR2G	SOP-8	3000	Tape and reel

9.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.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.