UMW NTMS4816NR2G

30V N-Channel MOSFET

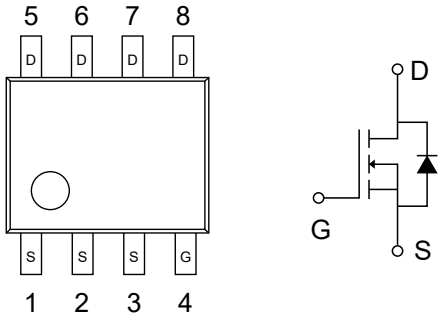
1.Features

- $V_{DS\ (V)}$=30V
- I_D=11A
- $R_{DS(ON)}$<10mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<16mΩ(V_{GS}=4.5V)
- Low Capacitance to Minimize Driver Losses
- Low $R_{DS(ON)}$ to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses

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	A
		T_A=70°C		7.2	
Power Dissipation $R_{\theta JA}$ (Note 1)	Steady State	T_A=25°C	P_D	1.37	W
Continuous Drain Current $R_{\theta JA}$ (Note 2)	Steady State	T_A=25°C	I_D	6.8	A
		T_A=70°C		5.4	
Power Dissipation $R_{\theta JA}$ (Note 2)	Steady State	T_A=25°C	P_D	0.78	W
Continuous Drain Current $R_{\theta JA}$ t ≤ 10 s (Note 1)	Steady State	T_A=25°C	I_D	11	A
		T_A=70°C		8.8	
Power Dissipation $R_{\theta JA}$, t ≤ 10 s(Note 1)	Steady State	T_A=25°C	P_D	2.04	W
Pulsed Drain Current	Steady State	T_A=25°C,T_P=10μs	I_{DM}	33	A

Operating Junction and Storage Temperature	T_J,T_{STG}	-55 to 150	°C
Source Current (Body Diode)	I_S	2.7	A
Single Pulse Drain−to−Source Avalanche Energy(T_J=25°C, V_{DD}=30V, V_{GS}=10 V, I_L=12.5Apk, L=1mH, R_G=25 Ω)	E_{AS}	78	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}	91.5	°C/W
Junction−to−Ambient – t≤10s(Note 1)		61.3	°C/W
Junction−to−Foot (Drain)	R_{thJF}	22.5	°C/W
Junction−to−Ambient – Steady State (Note 2)	R_{thJA}	159.5	°C/W

1. Surfacemounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq[1 oz] including traces).
2. Surfacemounted on FR4 board using the minimum recommended pad size.

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	$V_{(BR)DSS}/T_J$				26		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V	T_J=25°C			1	μA
		V_{DS}=24V	T_J=100°C			10	μA
Gate−to−Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V				±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA		1.5		3	V
ON CHARACTERISTICS							
Negative Threshold Temperature Coefficient	$V_{GS(th)}/T_J$				6		mV/°C
Drain−to−Source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=9A			8.2	10	mΩ
		V_{GS}=4.5V, I_D=7.2A			12.7	16	mΩ
Forward Transconductance	g_{FS}	V_{DS}=1.5V, I_D=9A			26		S
CHARGES, CAPACITANCES AND GATE RESISTANCE							
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz			1060		pF
Output Capacitance	C_{oss}				220		pF
Reverse Transfer Capacitance	C_{rss}				126		pF
Total Gate Charge	$Q_{g(TOT)}$	V_{GS}=4.5V, V_{DS}=15V, I_D=9A			9.2		nC
Threshold Gate Charge	$Q_{g(TH)}$				2.4		nC
Gate−to−Source Charge	Q_{gs}				4.4		nC
Gate−to−Drain Charge	Q_{gd}				3.8		nC
Total Gate Charge	$Q_{g(TOT)}$	V_{GS}=10V, V_{DS}=15V, I_D=9A			18.3		nC

SWITCHING CHARACTERISTICS						
Turn−On Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V I_D=1A, R_g=6Ω		8		ns
Rise Time	t_r			3.8		ns
Turn−Off Delay Time	$t_{D(off)}$			21.6		ns
Fall Time	t_f			8		ns
DRAIN−SOURCE DIODE CHARACTERISTICS						
Forward Diode Voltage	V_{SD}	V_{GS}=0V I_S=2.7A	T_J=25°C	0.75	1	V
			T_J=125°C	0.55		V
Reverse Recovery Time	t_{rr}	V_{GS}=0V, d_{IS}/d_t=100A/μs I_S=2.7A		20		ns
Charge Time	t_a			9		ns
Discharge Time	t_b			11		ns
Reverse Recovery Charge	Q_{rr}			9		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			1.5	2.3	Ω

3. Pulse Test: pulse width = 300 μs, duty cycle ≤ 2%.

4. Switching characteristics are independent of operating junction temperatures.

6.1Typical Characterisitics

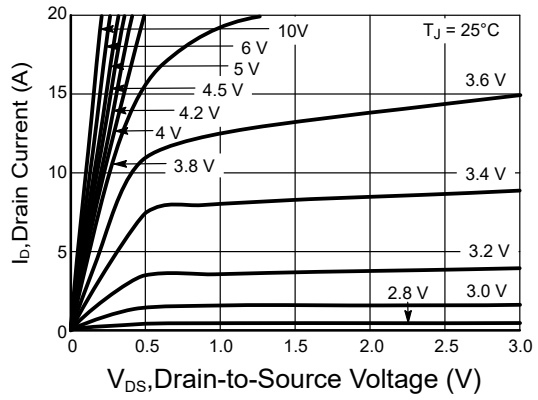


Figure 1: Output Characteristics

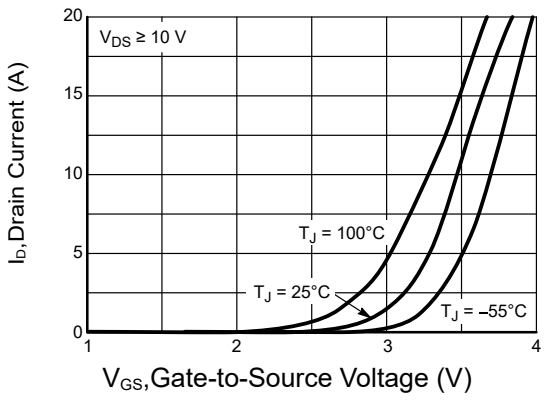


Figure 2: Transfer Characteristics

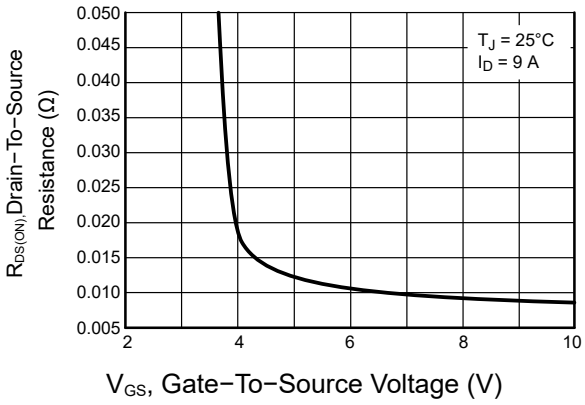


Figure 3: On-Resistance vs. Gate−to−Source Voltage

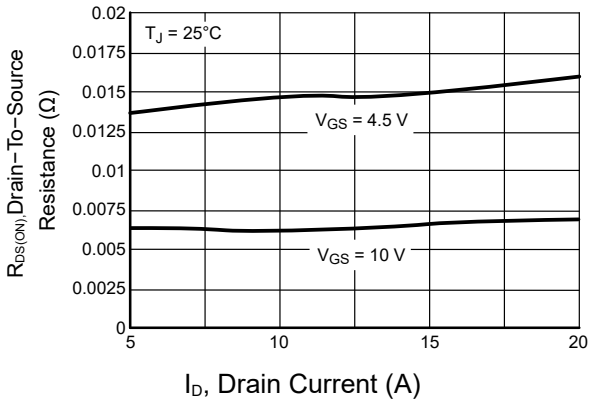


Figure 4: On−Resistance vs. Drain Current and Gate Voltage

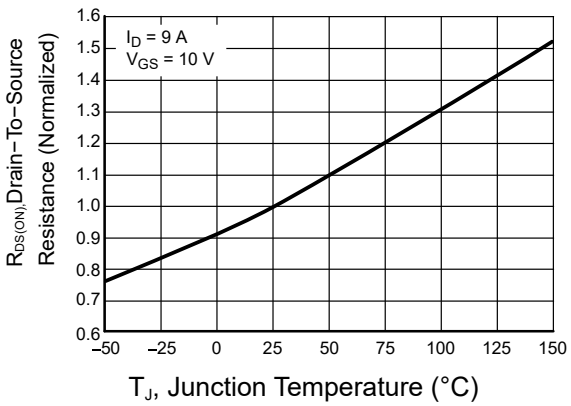


Figure 5: On−Resistance Variation with Temperature

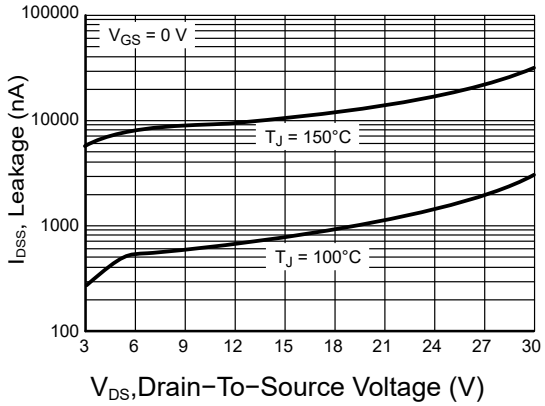


Figure 6: Drain−to−Source Leakage Current vs. Voltage

6.2Typical Characterisitics

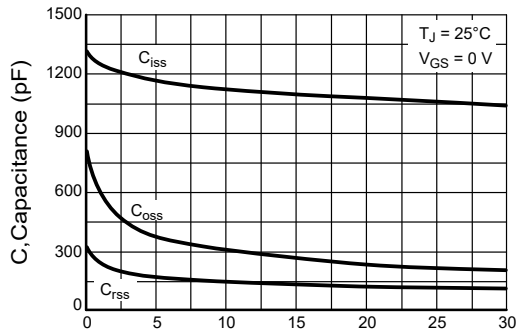


Figure 7: Capacitance Variation

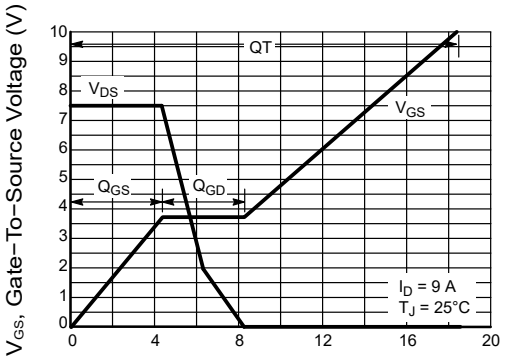


Figure 8: Gate−To−Source and Drain−To−Source Voltage vs. Total Charge

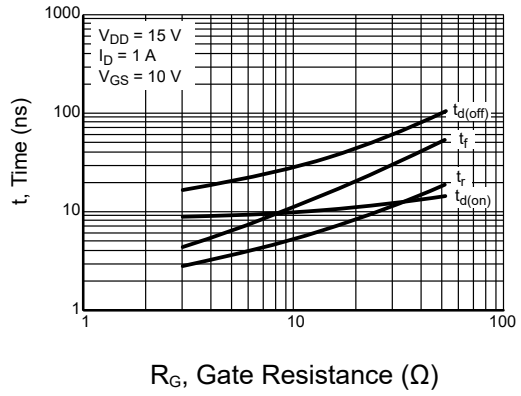


Figure 9: Resistive Switching Time Variation vs. Gate Resistance

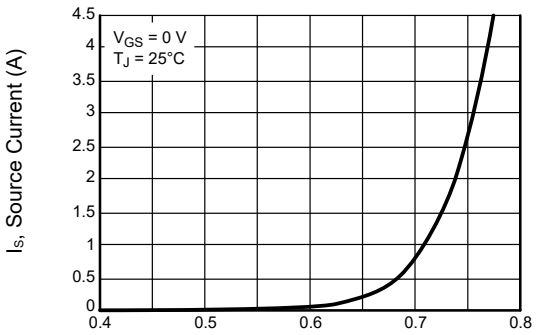


Figure 10: Diode Forward Voltage vs. Current

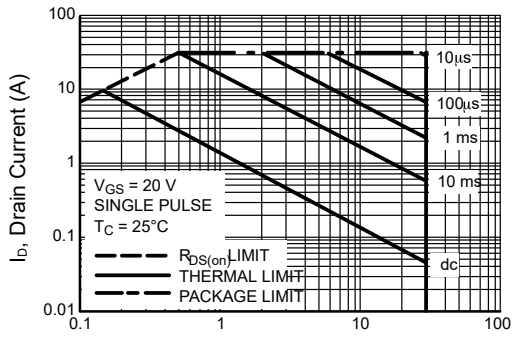


Figure 11: Maximum Rated Forward Biased Safe Operating Area

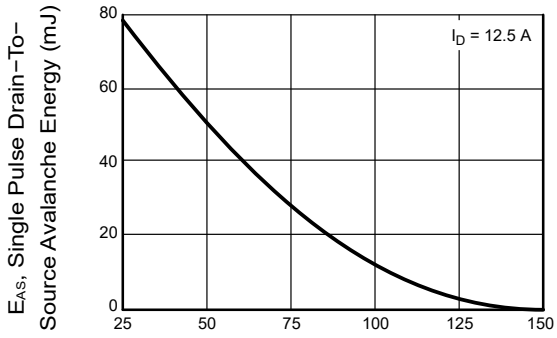
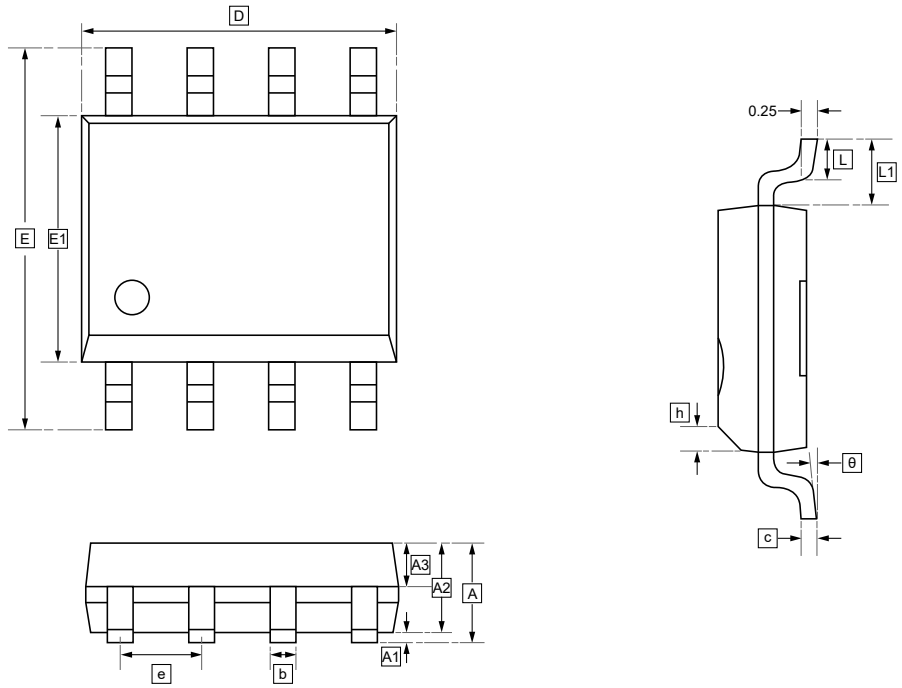


Figure 12: Maximum Avalanche Energy vs. Starting Junction Temperature

7.SOP-8 Package Outline Dimensions

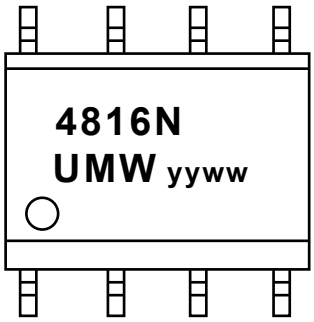


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.80	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.00	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 NTMS4816NR2G	SOP-8	3000	Tape and reel

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