

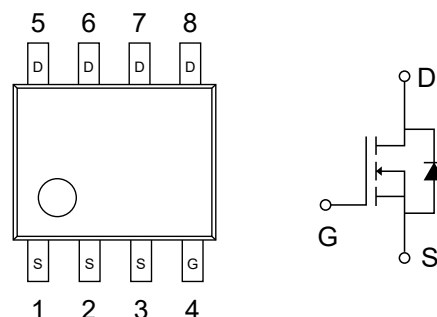
1.Features

- $V_{DS(V)}=30V$
- $I_D=11.6A(V_{GS}=10V)$
- $R_{DS(ON)}<9m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<12m\Omega(V_{GS}=4.5V)$
- 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 $T_J=25^{\circ}C$ 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	$T_A=25^{\circ}C$	I_D	9.4	A
		$T_A=70^{\circ}C$		7.5	
Power Dissipation $R_{\theta JA}$ (Note 1)	Steady State	$T_A=25^{\circ}C$	P_D	1.3	W
Continuous Drain Current $R_{\theta JA}$ (Note 2)	Steady State	$T_A=25^{\circ}C$	I_D	7.8	A
		$T_A=70^{\circ}C$		6.2	
Power Dissipation $R_{\theta JA}$ (Note 2)	Steady State	$T_A=25^{\circ}C$	P_D	0.89	W
Continuous Drain Current $R_{\theta JA}$ $t \leq 10$ s (Note 1)	Steady State	$T_A=25^{\circ}C$	I_D	11.6	A
		$T_A=70^{\circ}C$		9.3	
Power Dissipation $R_{\theta JA}$, $t \leq 10$ s (Note 1)	Steady State	$T_A=25^{\circ}C$	P_D	1.98	W
Pulsed Drain Current	Steady State	$T_A=25^{\circ}C, T_P=10\mu s$	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($T_J=25^{\circ}\text{C}$, $V_{DD}=30\text{V}$, $V_{GS}=10\text{ V}$, $I_L=9\text{A}$ pk, $L=1\text{mH}$, $R_G=25\ \Omega$)	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 – $t \leq 10\text{s}$ (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 $T_J=25^{\circ}\text{C}$

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



6.1 Typical Characteristics

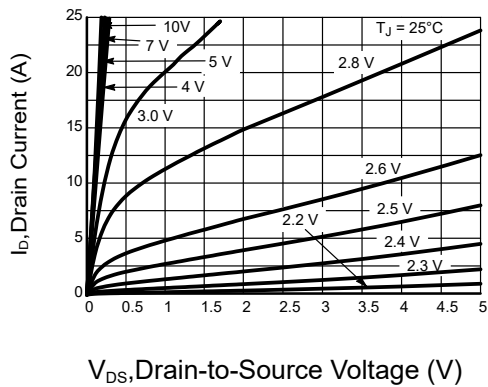


Figure 1: Output Characteristics

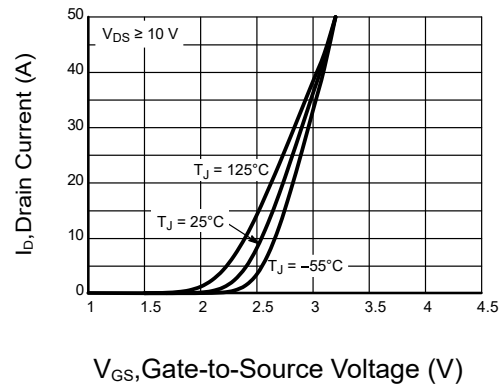


Figure 2: Transfer Characteristics

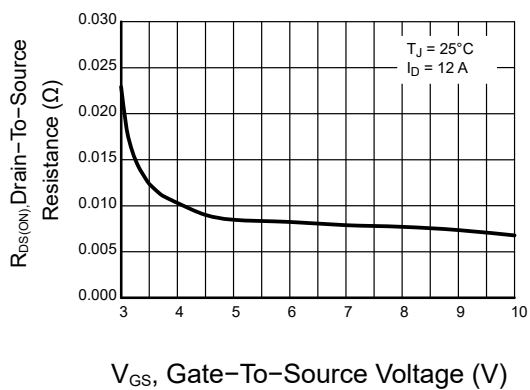


Figure 3: On-Resistance vs. Gate-to-Source Voltage

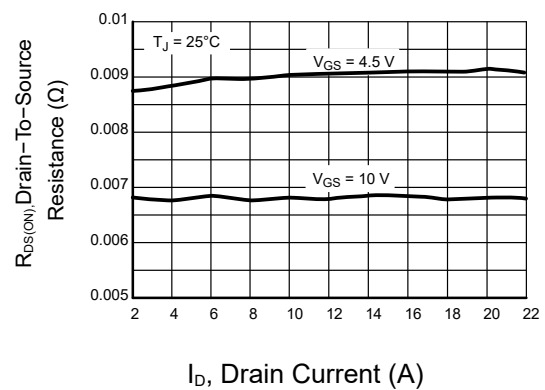


Figure 4: On-Resistance vs. Drain Current and Gate Voltage

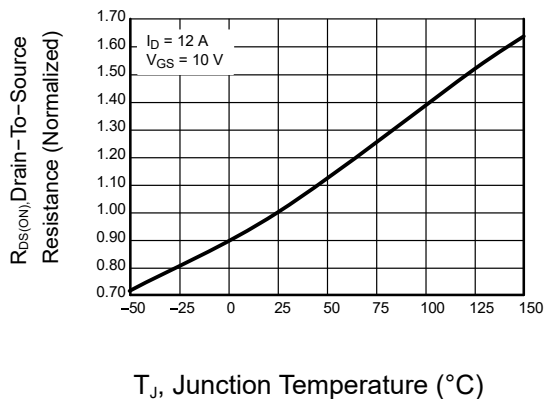


Figure 5: On-Resistance Variation with Temperature

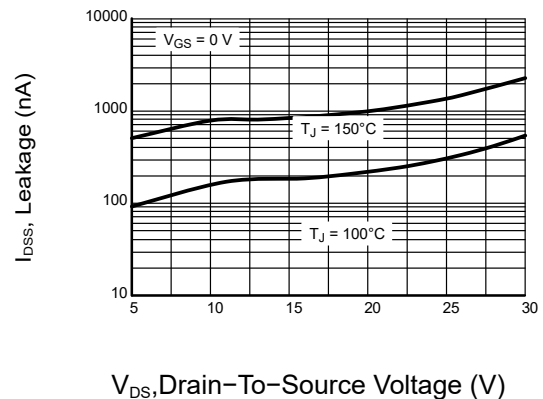


Figure 6: Drain-to-Source Leakage Current vs. Voltage



6.2 Typical Characteristics

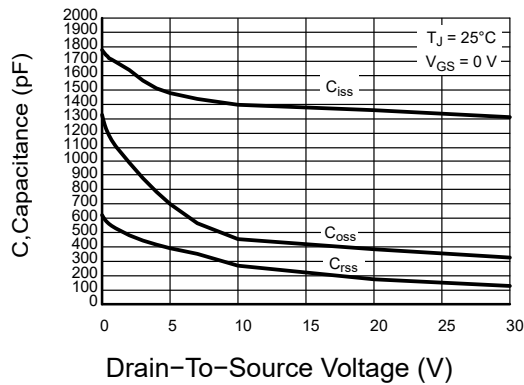


Figure 7: Capacitance Variation

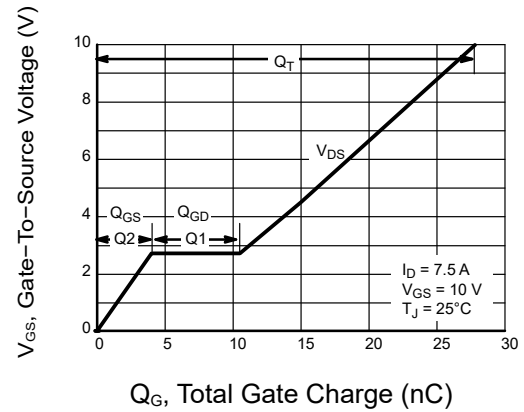


Figure 8: Gate-To-Source and Drain-To-Source Voltage vs. Total Charge

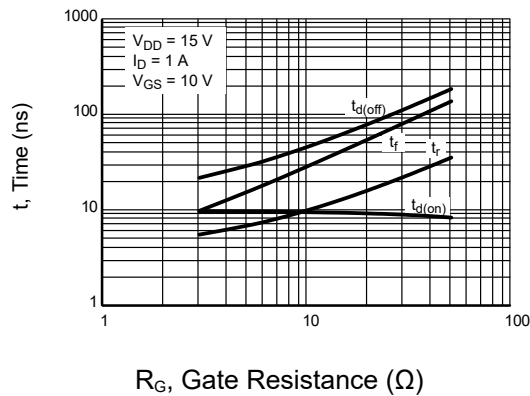


Figure 9: Resistive Switching Time Variation vs. Gate Resistance

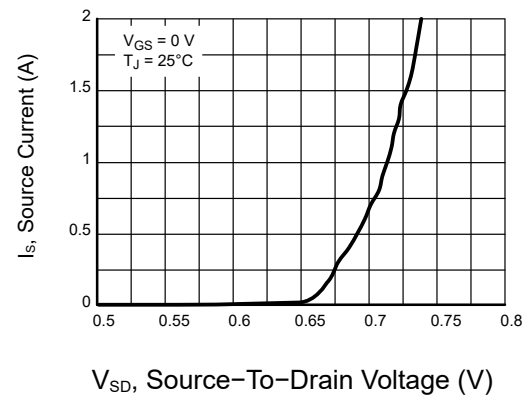


Figure 10: Diode Forward Voltage vs. Current

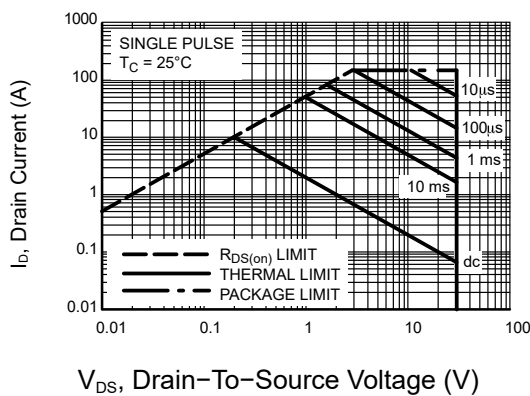


Figure 11: Maximum Rated Forward Biased Safe Operating Area

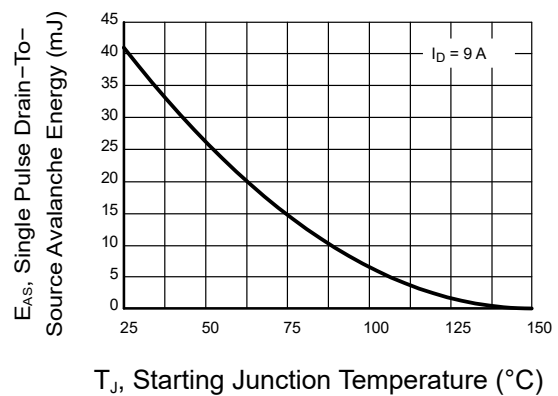
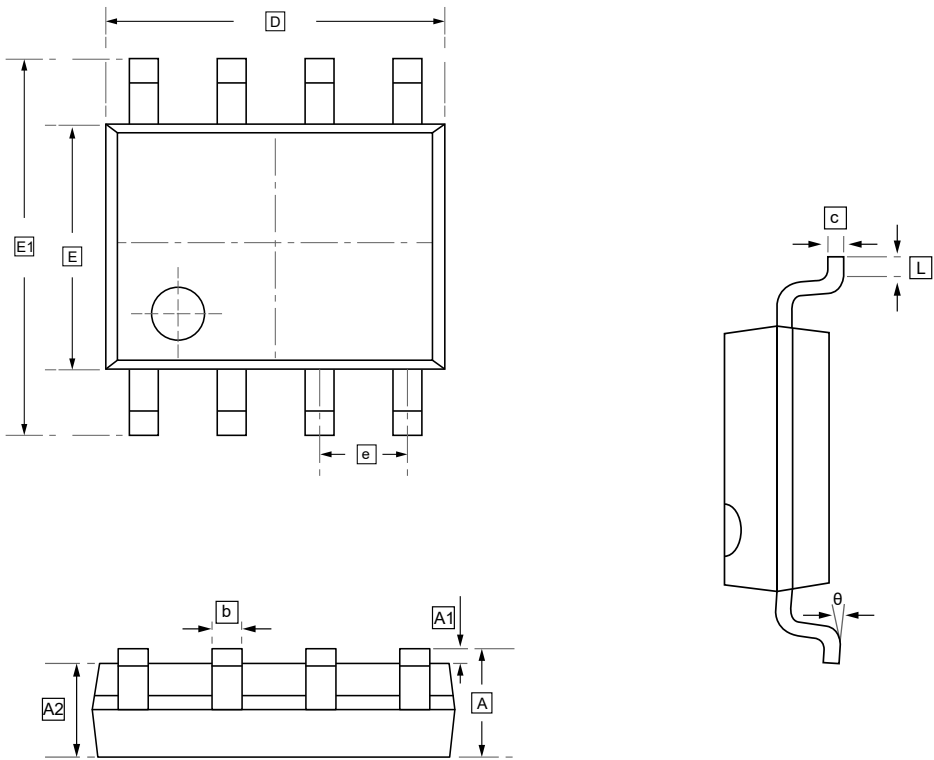


Figure 12: Maximum Avalanche Energy vs. Starting Junction Temperature



7.SOP-8 Package Outline Dimensions

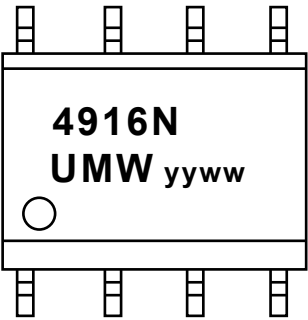


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	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

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