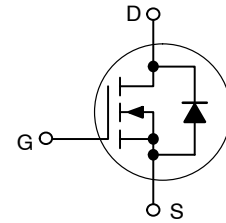


Features

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



N-Channel

MAXIMUM RATINGS ($T_J = 25^\circ C$ unless otherwise stated)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V_{DSS}	30	V
Gate-to-Source Voltage			V_{GS}	± 20	V
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	1.30	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)		$T_A = 25^\circ C$	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	$T_A = 25^\circ C, t_p = 10 \mu s$		I_{DM}	145	A
Operating Junction and Storage Temperature			T_J, T_{stg}	-55 to 150	$^\circ C$
Source Current (Body Diode)			I_S	2.5	A
Single Pulse Drain-to-Source Avalanche Energy ($T_J = 25^\circ C, V_{DD} = 30 V, V_{GS} = 10 V, I_L = 9 A_{pk}, L = 1.0 mH, R_G = 25 \Omega$)			E_{AS}	40.5	mJ
Lead Temperature for Soldering Purposes ($1/8''$ from case for 10 s)			T_L	260	$^\circ C$

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	96	$^\circ C/W$
Junction-to-Ambient – $t \leq 10 s$ (Note 1)	$R_{\theta JA}$	63	
Junction-to-Foot (Drain)	$R_{\theta JF}$	24.5	
Junction-to-Ambient – Steady State (Note 2)	$R_{\theta JA}$	141	

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
OFF CHARACTERISTICS							
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V	
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$			16		mV/°C	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 30\text{ V}$	$T_J = 25^\circ\text{C}$		1.0	μA	
			$T_J = 125^\circ\text{C}$		10		
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA	
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/°C	
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 12\text{ A}$		6.75	9	m Ω	
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		9.0	12		
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}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = 25\text{ V}$		1376		pF	
Output Capacitance	C_{oss}			401			
Reverse Transfer Capacitance	C_{rss}			205			
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			
Gate-to-Source Charge	Q_{GS}			4			
Gate-to-Drain Charge	Q_{GD}			6.5			
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	$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 15\text{ V}, I_D = 1.0\text{ A}, R_G = 6.0\ \Omega$		9.4		ns	
Rise Time	t_r			7.4			
Turn-Off Delay Time	$t_{d(off)}$			32			
Fall Time	t_f			15.6			
DRAIN-SOURCE DIODE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 2.0\text{ A}$	$T_J = 25^\circ\text{C}$		0.740	1.0	V
			$T_J = 125^\circ\text{C}$		0.570		
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}, I_S = 2.0\text{ A}$		30.7		ns	
Charge Time	t_a			14.3			
Discharge Time	t_b			16.4			
Reverse Recovery Charge	Q_{RR}			20			nC
PACKAGE PARASITIC VALUES							
Source Inductance	L_S	$T_A = 25^\circ\text{C}$		0.66		nH	
Drain Inductance	L_D			0.2			
Gate Inductance	L_G			1.5			
Gate Resistance	R_G			0.77			Ω

TYPICAL PERFORMANCE CURVES

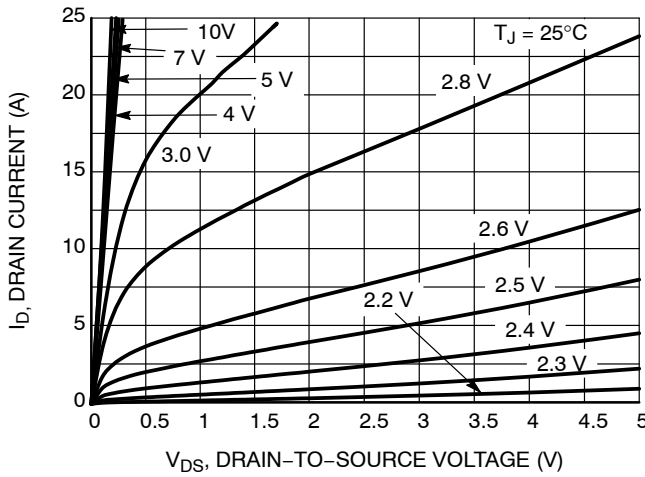


Figure 1. On-Region Characteristics

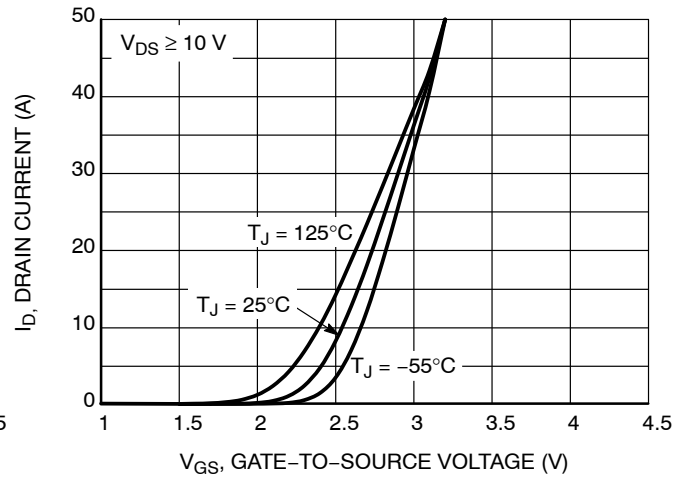


Figure 2. Transfer Characteristics

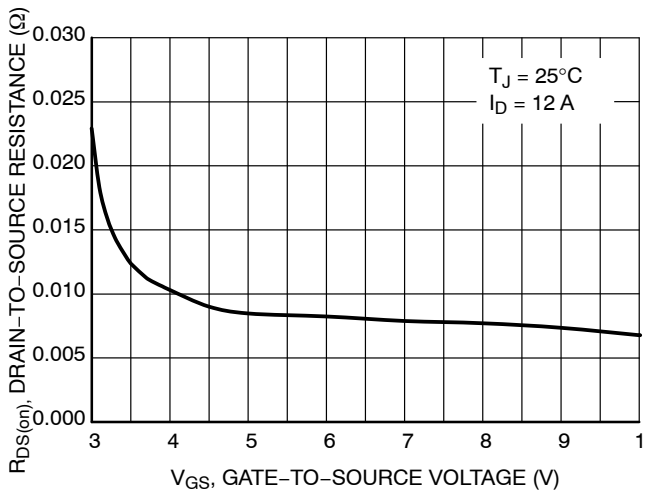


Figure 3. On-Resistance vs. Gate-to-Source Voltage

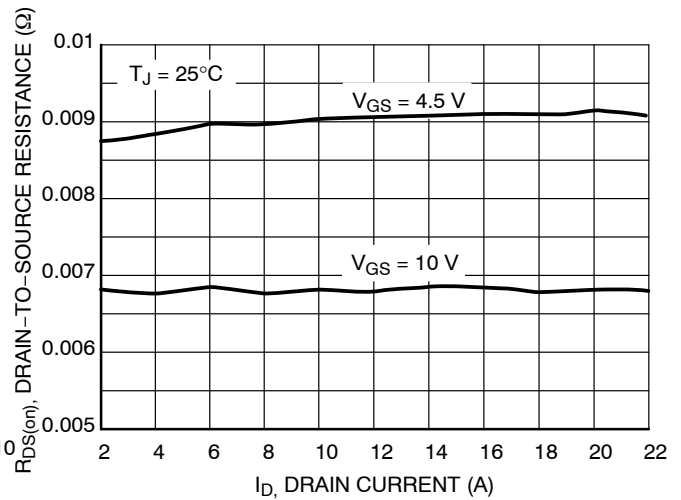


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

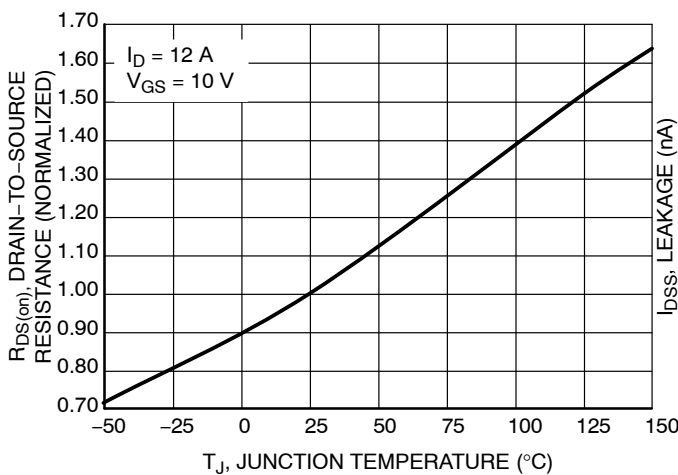


Figure 5. On-Resistance Variation with Temperature

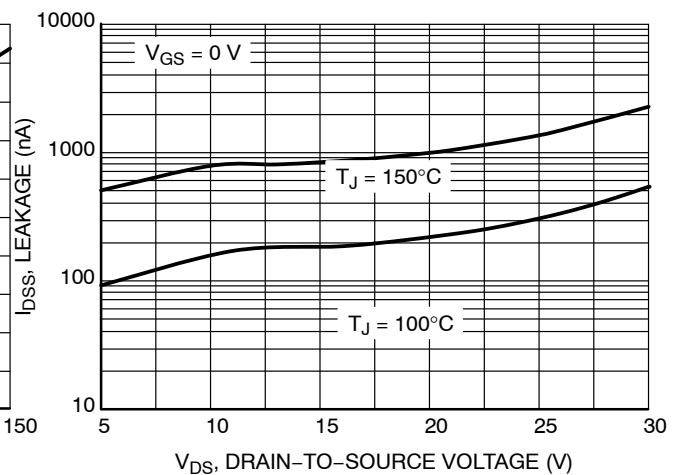


Figure 6. Drain-to-Source Leakage Current vs. Voltage

TYPICAL PERFORMANCE CURVES

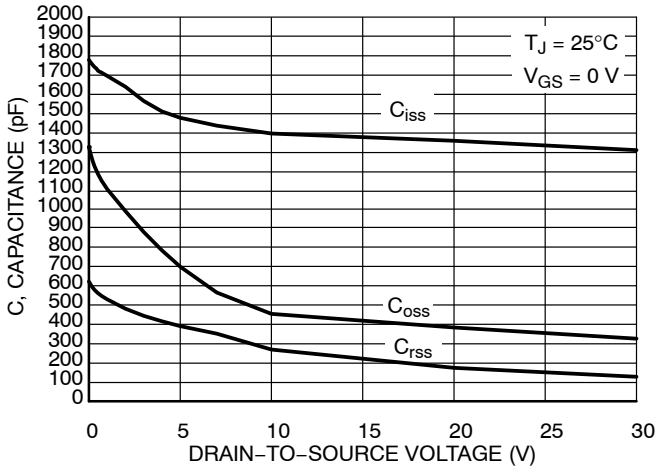


Figure 7. Capacitance Variation

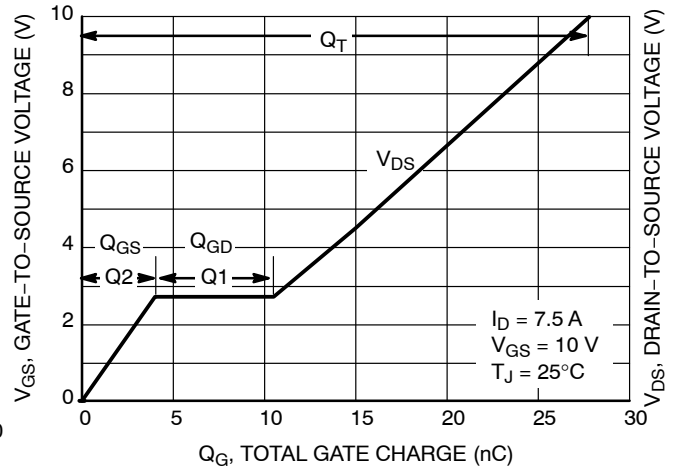


Figure 8. Gate-To-Source and Drain-To-Source Voltage vs. Total Charge

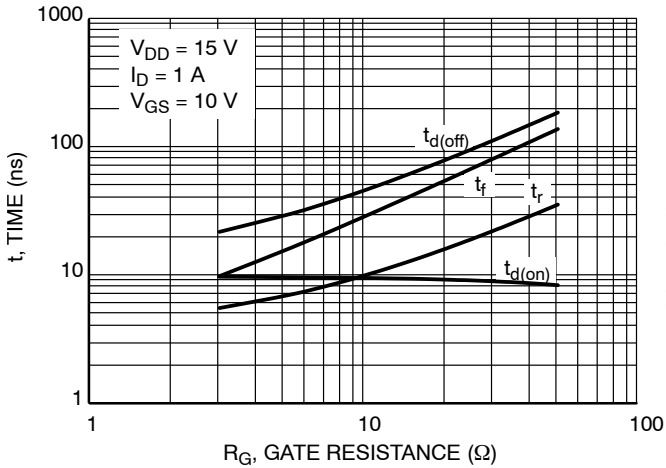


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

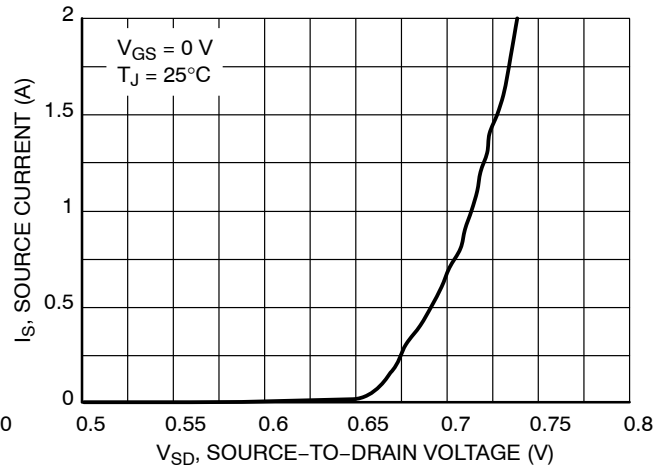


Figure 10. Diode Forward Voltage vs. Current

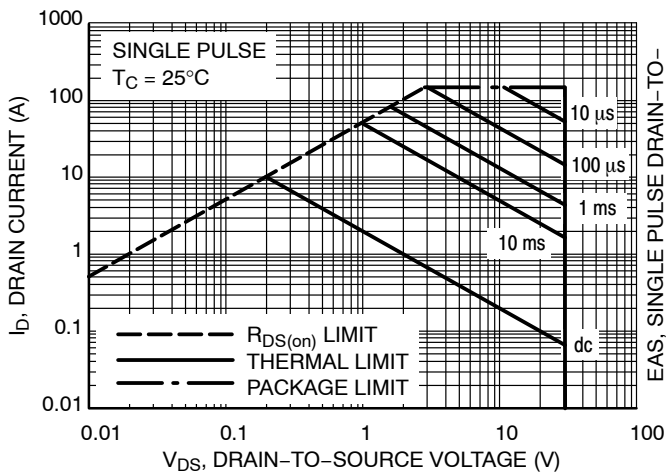


Figure 11. Maximum Rated Forward Biased Safe Operating Area

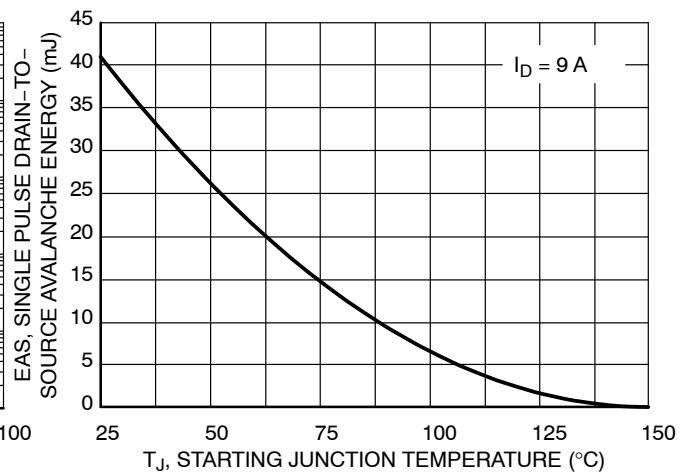
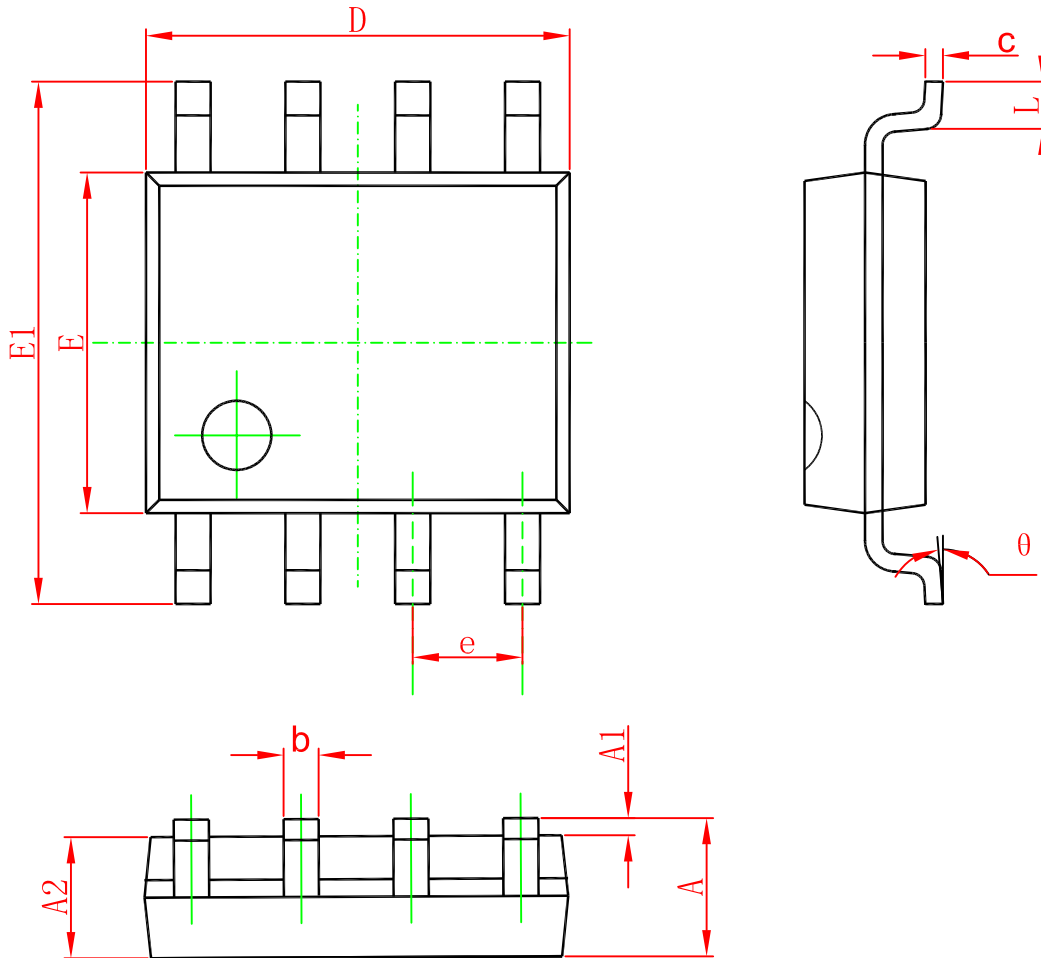


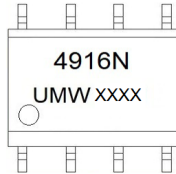
Figure 12. Maximum Avalanche Energy vs. Starting Junction Temperature

Package Mechanical Data SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW NTMS4916NR2G	SOP-8	3000	Tape and reel

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