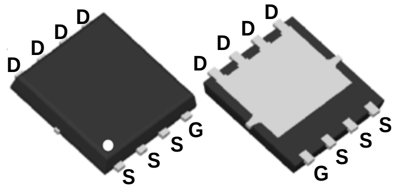
WAYON

WMQ032N04LG2

40V N-Channel Enhancement Mode Power MOSFET



PDFN3030-8L

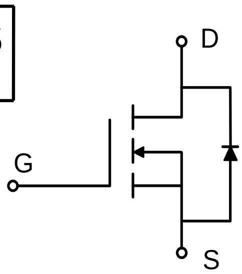
Description

WMQ032N04LG2 uses Wayon's 2nd generation power trench MOSFET technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance. This device is well suited for high efficiency fast switching applications.

Features

- V_{DS} = 40V, I_D = 70A
  $R_{DS(on)}$ < 3.4mΩ @ V_{GS} = 10V
  $R_{DS(on)}$ < 5.5mΩ @ V_{GS} = 4.5V
- Low R_{DS}(on)
- Low Gate Charge
- 100% EAS Guaranteed

RoHS compliant



Applications

- Power Management in Switches
- DC/DC Converter

Absolute Maximum Ratings（T_c = 25°C, unless otherwise noted）

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	70	A
	T_C=100°C		44.3	
Pulsed Drain Current[4]		I_{DM}	280	A
Single Pulse Avalanche Energy[3]		EAS	54.5	mJ
Total Power Dissipation	T_C=25°C	P_D	29	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[1]	$R_{\theta JA}$	54	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	4.3	°C/W

Electrical Characteristics（T_c = 25°C, unless otherwise noted）

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40	-	-	V
Gate-body Leakage Current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V	-	-	1	μA
	T_J=55°C			-	-	5	μA
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
Drain-Source on-Resistance[2]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A	-	2.7	3.4	mΩ
			V_{GS} = 4.5V, I_D = 15A	-	4	5.5	
Forward Transconductance[2]		g_{fs}	V_{DS} = 5V, I_D = 20A	-	89	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 20V, V_{GS} = 0V, f = 1MHz	-	2705	-	pF
Output Capacitance		C_{oss}		-	960	-	
Reverse Transfer Capacitance		C_{rss}		-	55	-	
Switching Characteristics							
Gate Resistance		R_G	V_{DS} = 0V, V_{GS} =0V, f = 1MHz	-	0.8	-	Ω
Total Gate Charge		Q_g	V_{GS} = 4.5V, V_{DS} = 20V, I_D = 20A	-	17.5	-	nC
Gate-Source Charge		Q_{gs}		-	6	-	
Gate-Drain Charge		Q_{gd}		-	4.8	-	
Turn-on Delay Time		$t_{d(on)}$	V_{GS} = 10V, V_{DS} = 20V, R_G = 3Ω, I_D = 20A	-	8.8	-	ns
Rise Time		t_r		-	4.8	-	
Turn-off Delay Time		$t_{d(off)}$		-	30	-	
Fall Time		t_f		-	5.2	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[2]		V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current[1,5]		I_S	V_G = V_D= 0V , Force Current	-	-	70	A
Body Diode Reverse Recovery Time		t_{rr}	V_R = 20V ,I_F = 20A, dI/dt = 100A/μs		20		ns
Body Diode Reverse Recovery Charge		Q_{rr}			58		nC

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
3. The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=33A
4. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

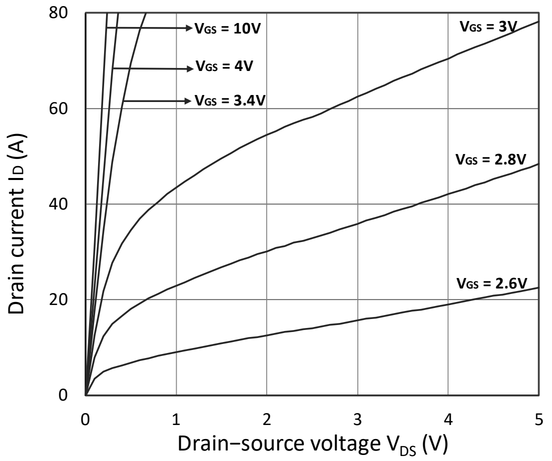


Figure 1. Output Characteristics

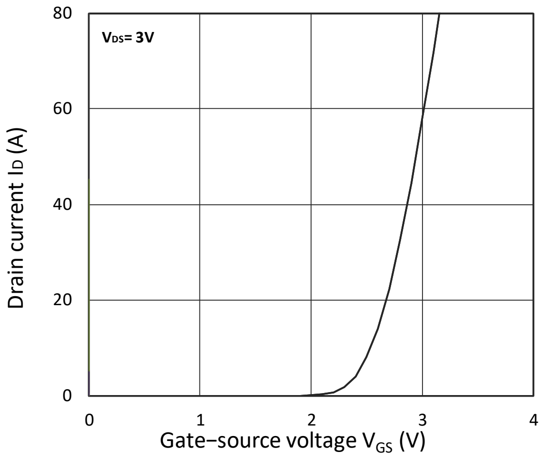


Figure 2. Transfer Characteristics

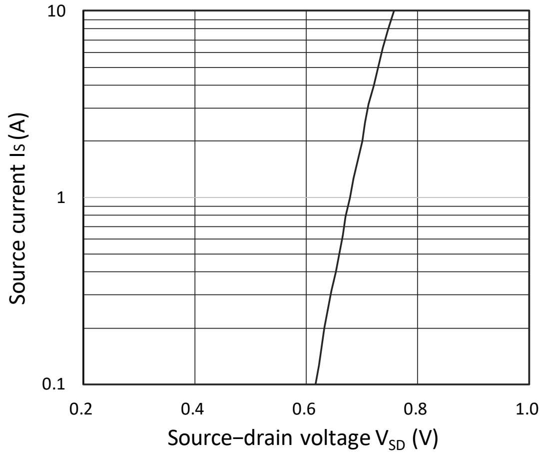


Figure 3. Forward Characteristics of Reverse

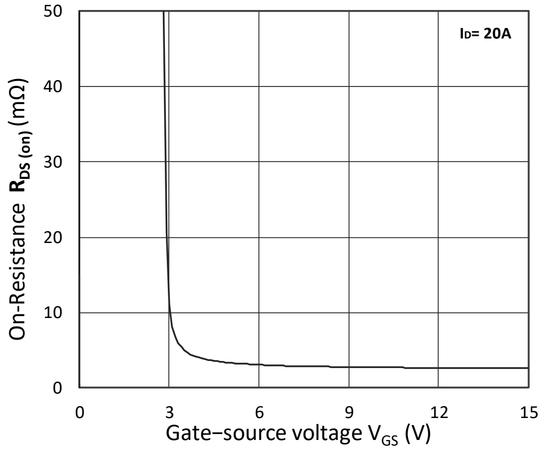


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

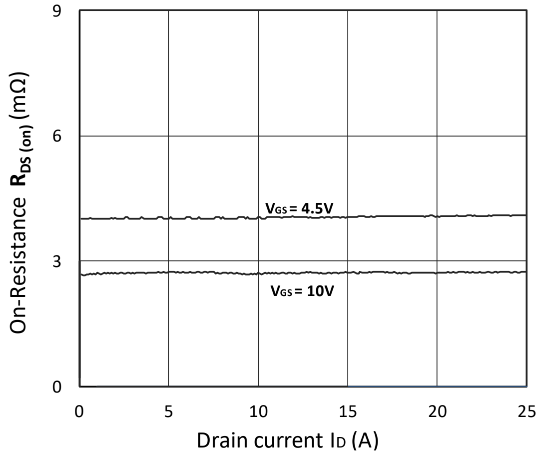


Figure 5. $R_{DS(ON)}$ vs. I_D

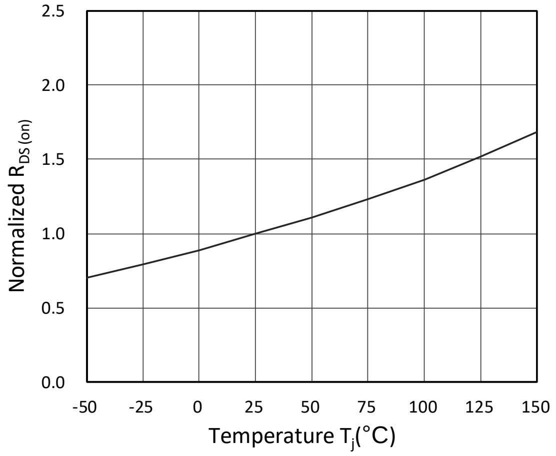


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

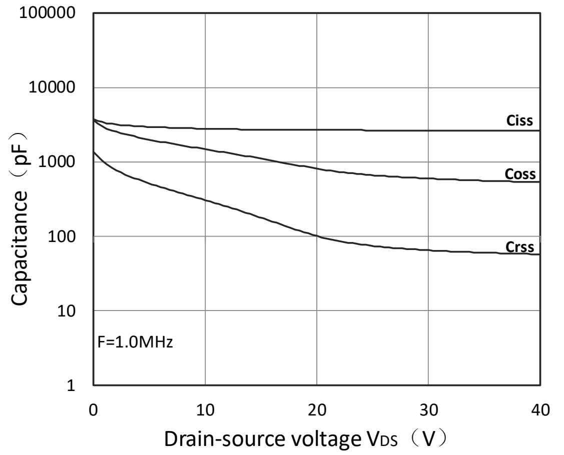


Figure 7. Capacitance Characteristics

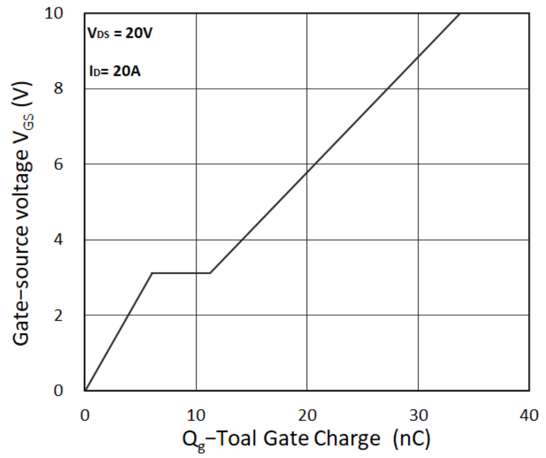


Figure 8. Gate Charge Characteristics

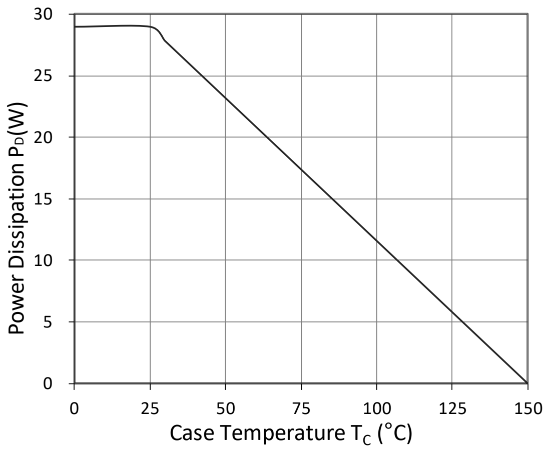


Figure 9. Power Dissipation

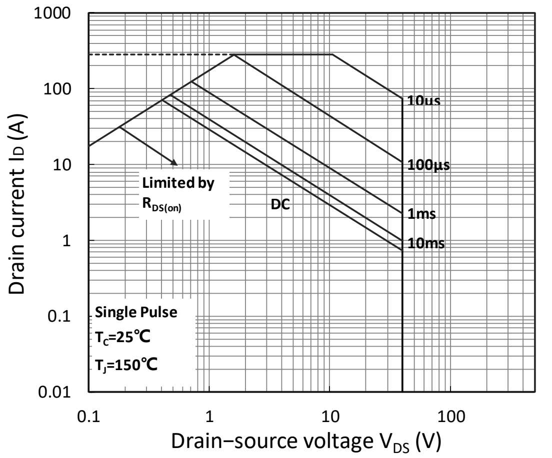


Figure10. Safe Operating Area

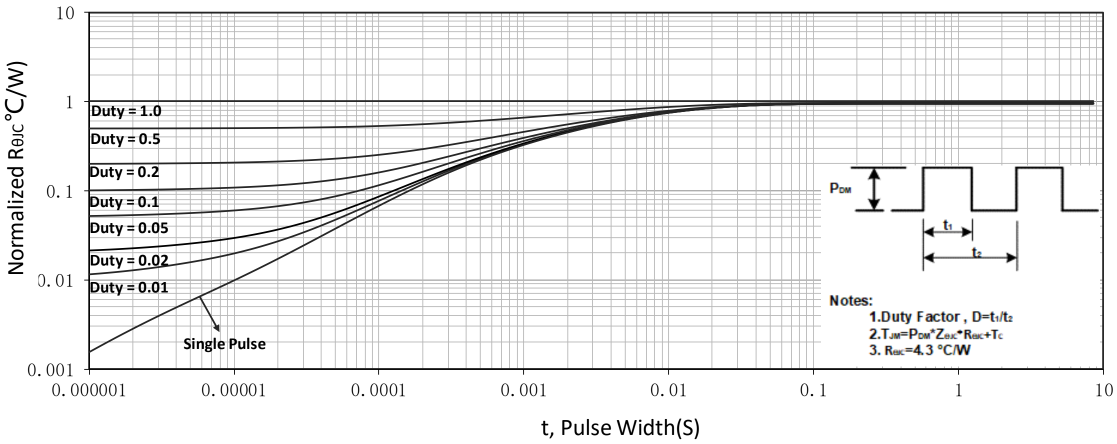


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

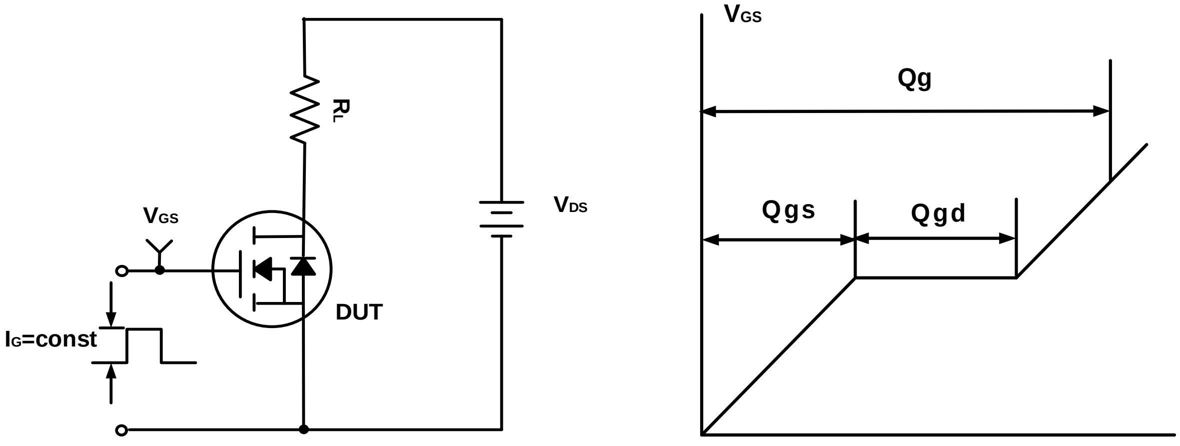


Figure A. Gate Charge Test Circuit & Waveforms

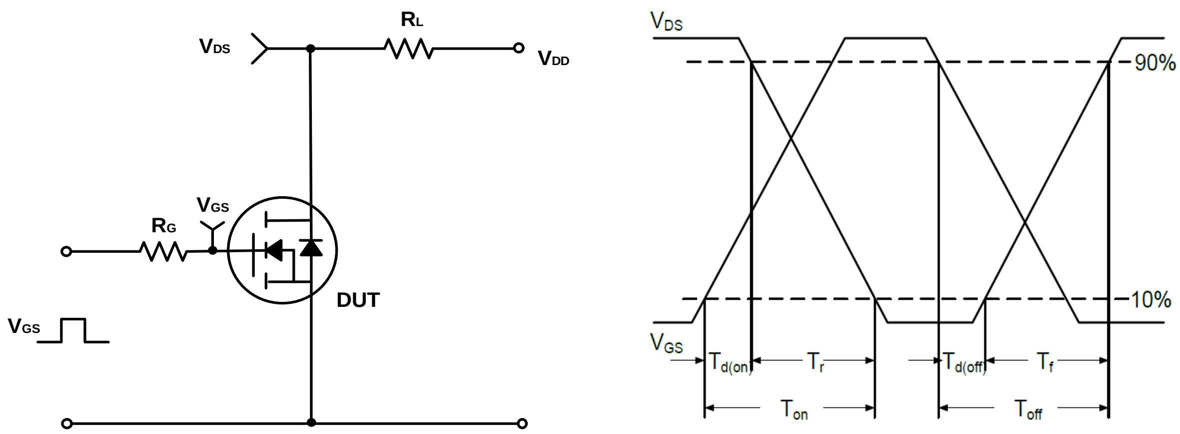


Figure B. Switching Test Circuit & Waveforms

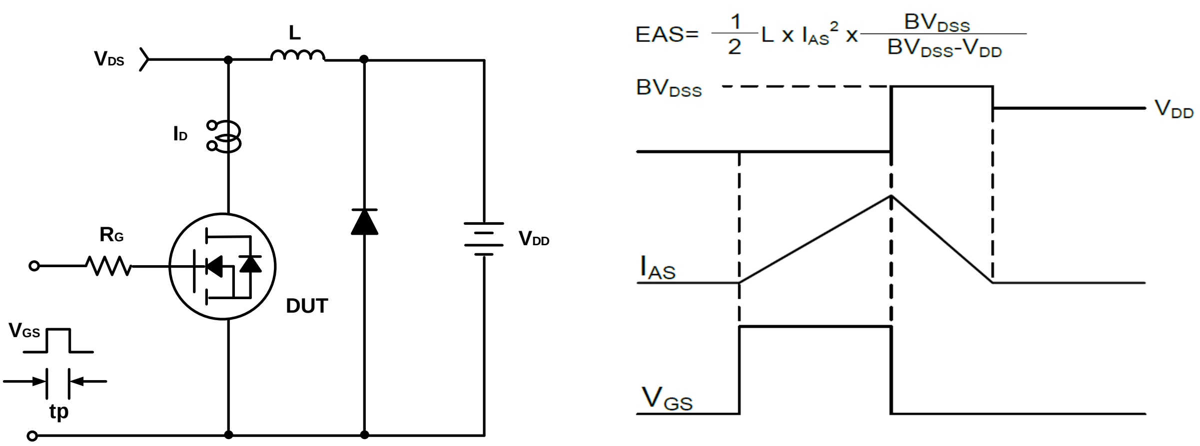
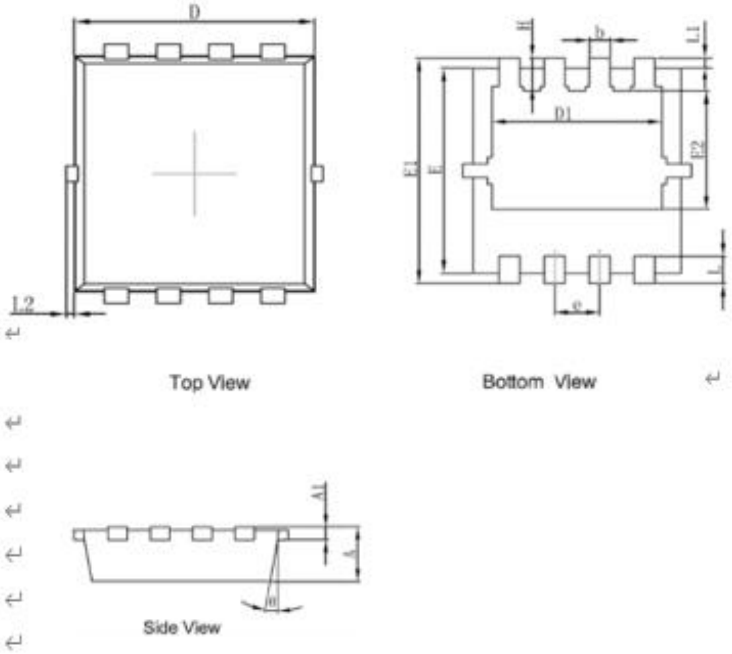


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for PDFN3030-8L



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	0.65	0.90
A1	0.10	0.25
D	2.90	3.25
D1	2.25	2.69
E	2.90	3.20
E1	3.00	3.60
E2	1.35	2.20
b	0.20	0.40
e	0.65BSC	
L	0.15	0.50
L1	0.13BSC	
L2	0.00	0.20
H	0.15	0.65
θ	0°	14°

Ordering Information

Part	Package	Marking	Packing method
WMQ032N04LG2	PDFN3030-8L	032N04L	Tape and Reel

Marking Information

032N04L = Device code

WWXXXXX= Date code

Contact Information

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