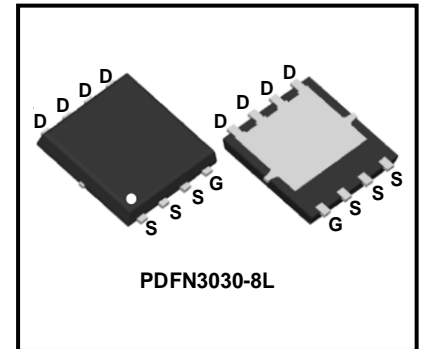


30V N-Channel Enhancement Mode Power MOSFET

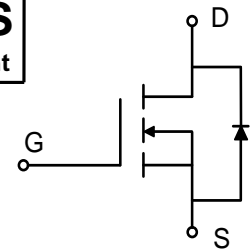
Description

WMQ052N03LG2 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

- $V_{DS} = 30V$, $I_D = 31A$
 $R_{DS(on)} < 5.2m\Omega @ V_{GS} = 10V$
 $R_{DS(on)} < 8.5m\Omega @ V_{GS} = 4.5V$
- Low $R_{DS(on)}$
- Low Gate Charge
- 100% EAS Guaranteed
- RoHS and Halogen-Free Compliant



Applications

- Power Management in Switches
- DC/DC Converter

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C=25^\circ C$	I_D	31	A
	$T_C=100^\circ C$		25	
Pulsed Drain Current ²		I_{DM}	98	A
Single Pulse Avalanche Energy ³		EAS	51.2	mJ
Avalanche Current		I_{AS}	32	A
Total Power Dissipation ⁴	$T_C=25^\circ C$	P_D	24.5	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ¹	$R_{\theta JA}$	61	$^\circ C/W$
Thermal Resistance from Junction-to-Case ¹	$R_{\theta JC}$	5.1	$^\circ C/W$

Electrical Characteristics $T_c = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V	
Gate-body Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA	
Zero Gate Voltage Drain Current	$T_J=25^\circ\text{C}$	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1	μA
	$T_J=55^\circ\text{C}$			-	-	5	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.8	2.4	V	
Drain-Source on-Resistance ²	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 12A$	-	4	5.2	m Ω	
		$V_{GS} = 4.5V, I_D = 8A$	-	6.2	8.5		
Forward Transconductance ²	g_{fs}	$V_{DS} = 5V, I_D = 20A$	-	68	-	S	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$	-	1035	-	μF	
Output Capacitance	C_{oss}		-	575	-		
Reverse Transfer Capacitance	C_{rss}		-	41	-		
Switching Characteristics							
Gate Resistance	R_G	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$	-	2.1	-	Ω	
Total Gate Charge	Q_g	$V_{GS} = 10V, V_{DS} = 15V, I_D = 20A$	-	11.8	-	nC	
Gate-Source Charge	Q_{gs}		-	4.5	-		
Gate-Drain Charge	Q_{gd}		-	6	-		
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 15V, R_G = 3\Omega, I_D = 20A$	-	10	-	nS	
Rise Time	t_r		-	21	-		
Turn-off Delay Time	$t_{d(off)}$		-	22	-		
Fall Time	t_f		-	45	-		
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²	V_{SD}	$I_S = 1A, V_{GS} = 0V$	-	-	1.0	V	
Continuous Source Current ^{1,5}	I_S	$V_G = V_D = 0V$, Force Current	-	-	31	A	

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=32A$
- The power dissipation is limited by 150°C junction temperature
- The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

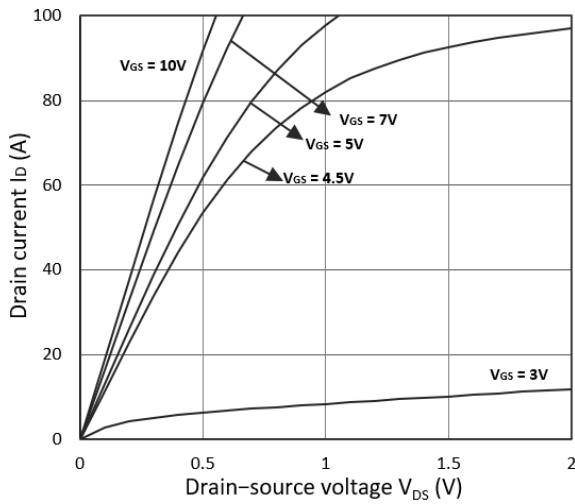


Figure 1. Output Characteristics

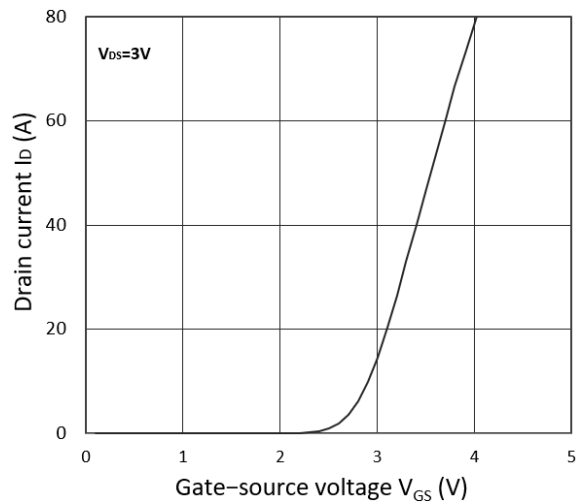


Figure 2. Transfer Characteristics

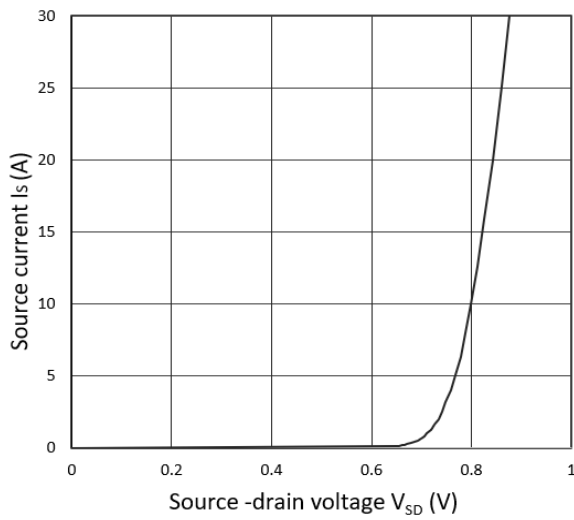


Figure 3. Forward Characteristics of Reverse

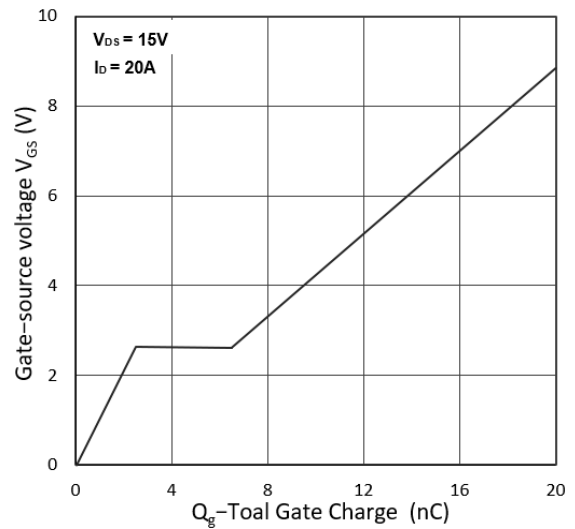


Figure 4. Gate Charge Characteristics

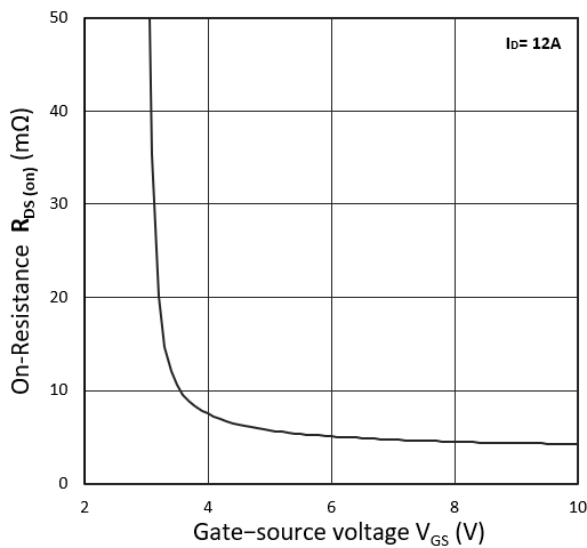


Figure 5. $R_{DS(on)}$ vs. V_{GS}

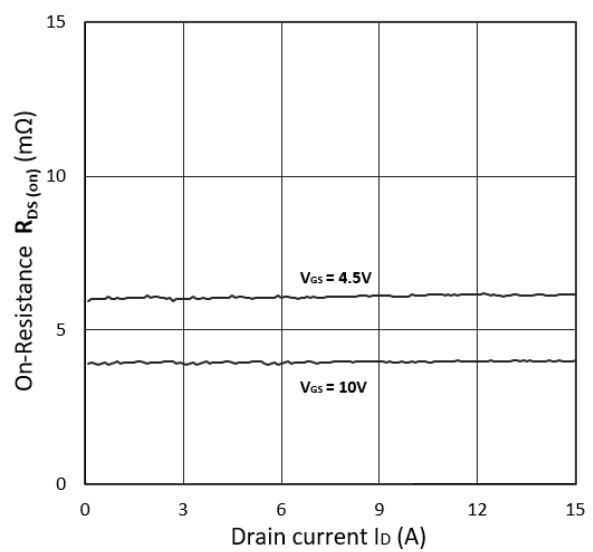


Figure 6. $R_{DS(on)}$ vs. I_D

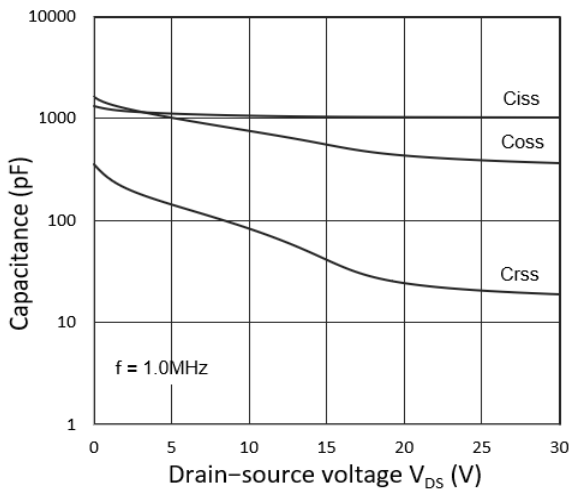


Figure 7. Capacitance Characteristics

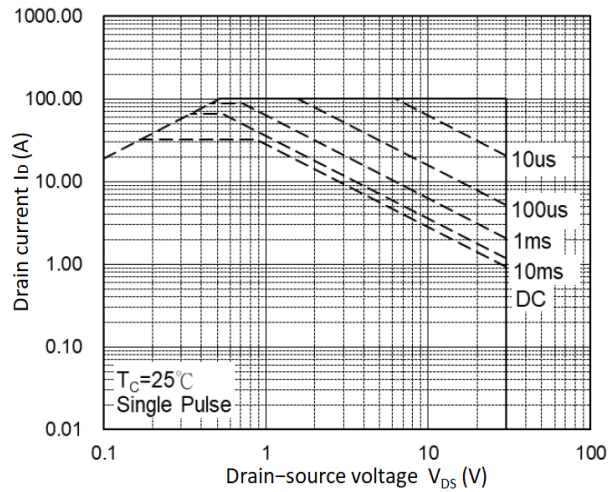


Figure 8. Safe Operating Area

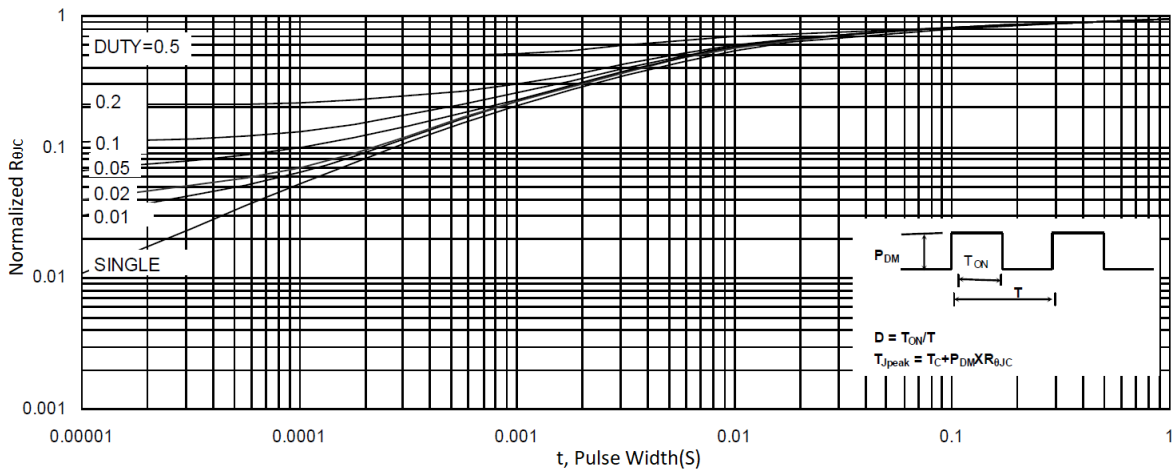


Figure 9. Normalized Maximum Transient Thermal Impedance

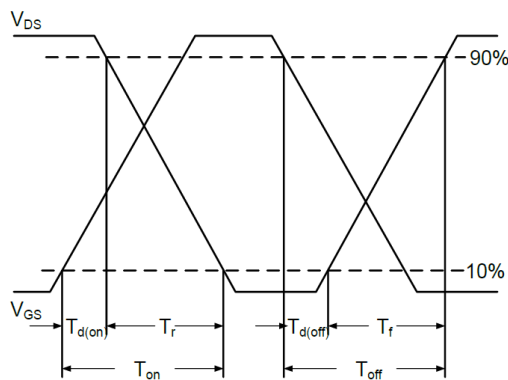


Figure 10. Switching Time Waveform

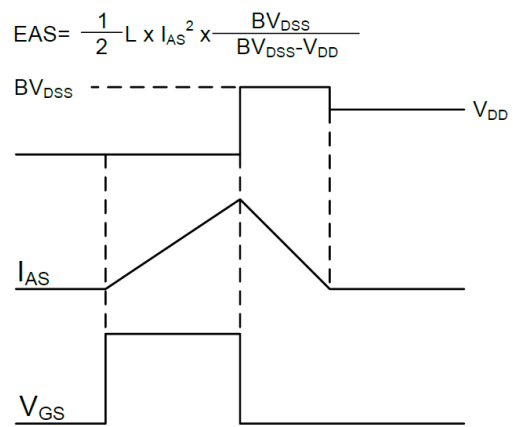
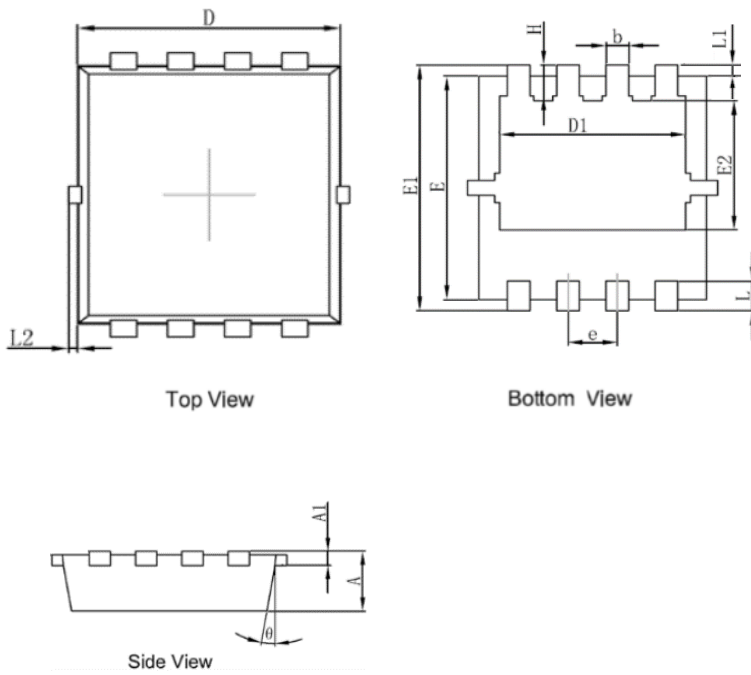


Figure 11. Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

Mechanical Dimensions for PDFN3030-8L



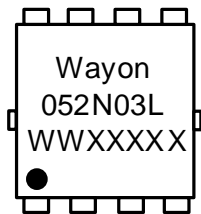
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	0.70	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	1.54	2.20
b	0.20	0.40
e	0.60	0.70
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
WMQ052N03LG2	PDFN3030-8L	052N03L	Tape and Reel

Marking Information



052N03L = Device code

WWXXXXX= Date code

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WAYON website: <http://www.way-on.com>

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