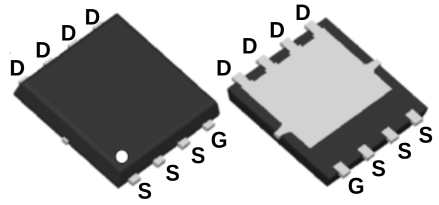
WMQ30N03T2

30V N-Channel Enhancement Mode Power MOSFET

Description

WMQ30N03T2 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

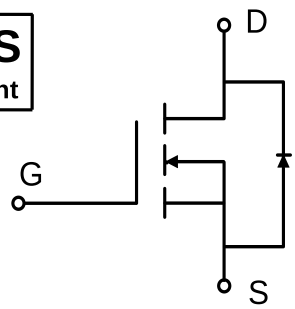


PDFN3030-8L

Features

- V_{DS}= 30 V, I_D = 30 A
  $R_{DS(on)}$ < 6.3mΩ @ V_{GS} = 10 V
  $R_{DS(on)}$ < 9.0mΩ @ V_{GS} = 4.5V
- Green Device Available
- Low Gate Charge
- Advanced High Cell Density Trench Technology
- 100% EAS Guaranteed

RoHS compliant



Applications

- Power Management 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@10V[1]	T_C=25℃	I_D	30	A
	T_C=100℃		24	
	T_A=25℃		20	
	T_A=70℃		15	
Pulsed Drain Current[2]		I_{DM}	100	A
Single Pulse Avalanche Energy[3]		EAS	28.8	mJ
Avalanche Current		I_{AS}	24	A
Total Power Dissipation[4]	T_C=25℃	P_D	24	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]	$R_{\theta JA}$	60	°C/W
Thermal Resistance from Junction-to-Case[1]	$R_{\theta JC}$	5.2	°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	30	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25℃	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V	-	-	1	μA
	T_J=55℃			-	-	5	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.2	-	2.5	V
Drain-Source On-Resistance[2]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A	-	5	6.3	mΩ
			V_{GS} = 4.5V, I_D = 15A	-	8	9.5	
Forward Transconductance		g_{fs}	V_{DS} = 5V, I_D = 30A	-	43	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 15V, V_{GS} =0V, f =1MHz	-	814	-	pF
Output Capacitance		C_{oss}		-	398	-	
Reverse Transfer Capacitance		C_{rss}		-	62	-	
Switching Characteristics							
Gate Resistance		R_g	V_{DS} = 0V, V_{GS} =0V, f =1MHz	-	1.7	-	Ω
Total Gate Charge		Q_g	V_{GS} = 4.5V,V_{DS} = 15V, I_D= 15A	-	8	-	nC
Gate-Source Charge		Q_{gs}		-	2.4	-	
Gate-Drain Charge		Q_{gd}		-	3.2	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} = 15V, R_G = 3.3Ω, I_D= 15A	-	7.1	-	nS
Rise Time		t_r		-	40	-	
Turn-Off Delay Time		$t_{d(off)}$		-	15	-	
Fall Time		t_f		-	6	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[2]		V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1.0	V
Continuous Source Current[1]		I_S	V_G=V_D=0V , Force Current	-	-	24	A
Body Diode Reverse Recovery Time		t_{rr}	I_F = 20A, dI/dt = 100A/μs	-	34	-	nS
Body Diode Reverse Recovery Charge		Q_{rr}		-	15	-	nC

Note :

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}=24A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

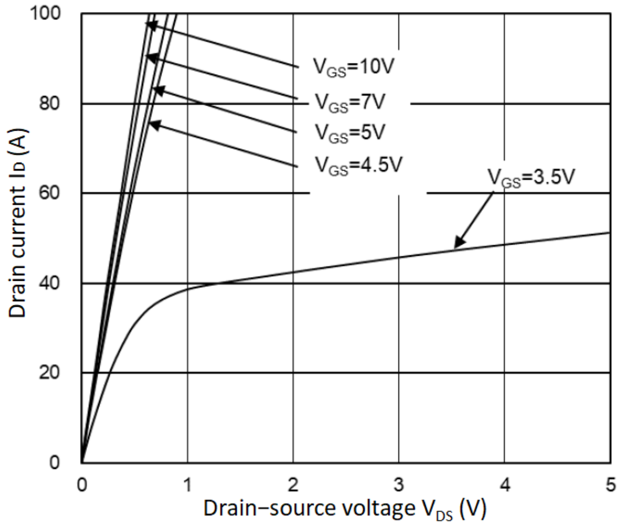


Figure 1. Output Characteristics

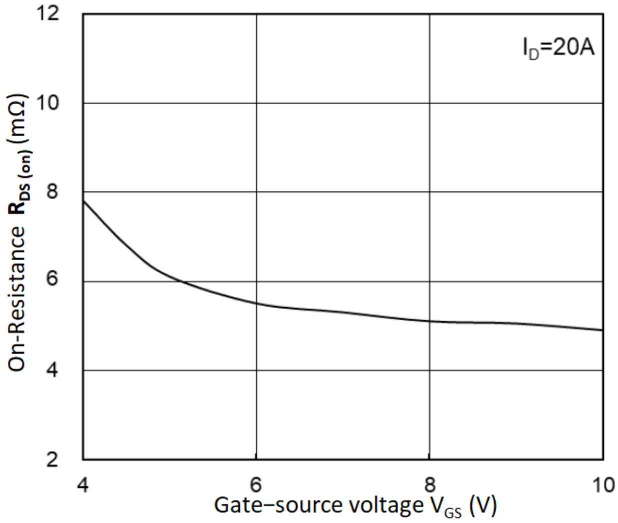


Figure 2. $R_{DS}(on)$ vs. V_{GS}

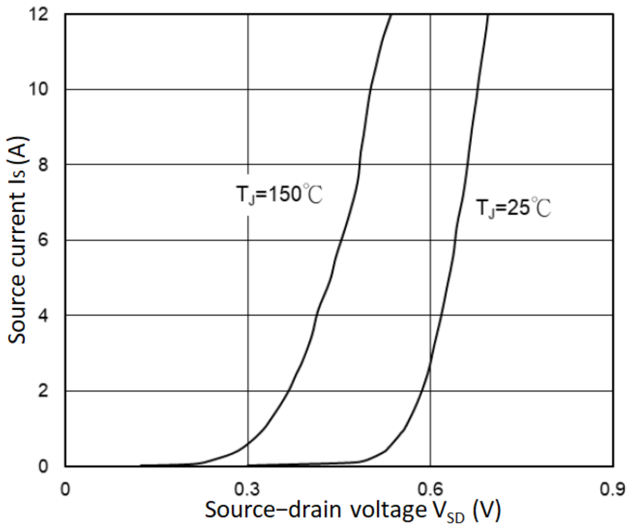


Figure 3. Forward Characteristics of Reverse

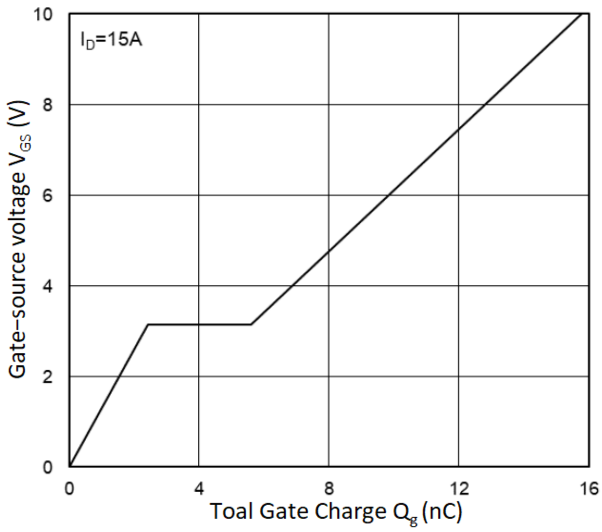


Figure 4. Gate Charge Characteristics

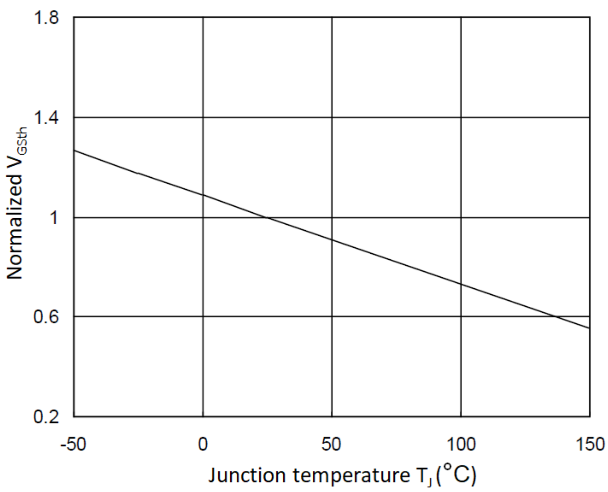


Figure 5. Normalized V_{GSth} vs. T_J

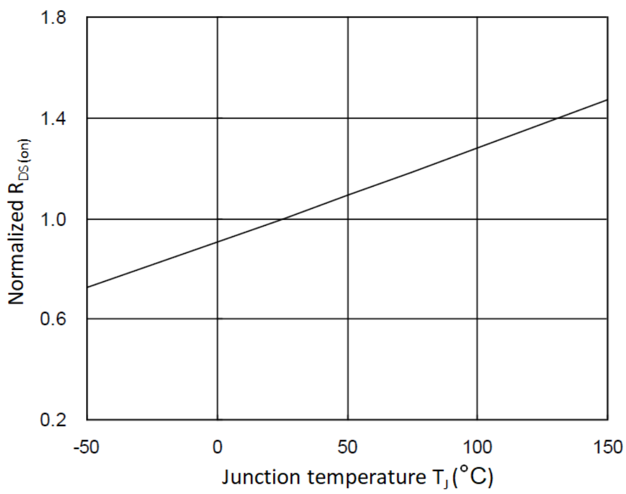


Figure 6. Normalized $R_{DS(on)}$ vs. T_J

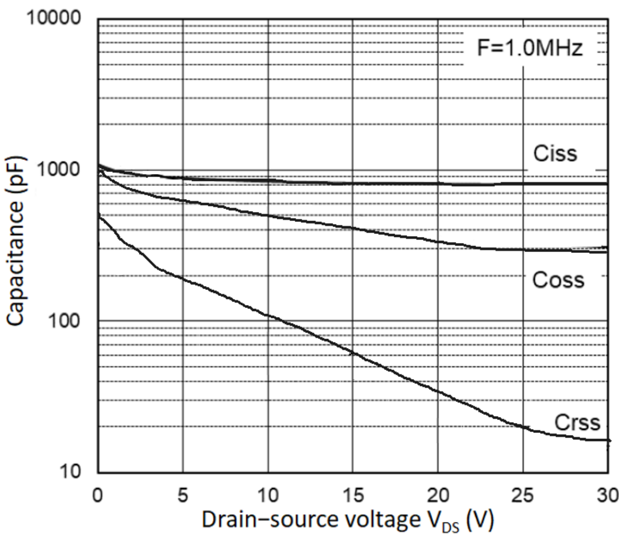


Figure 7. Capacitance Characteristics

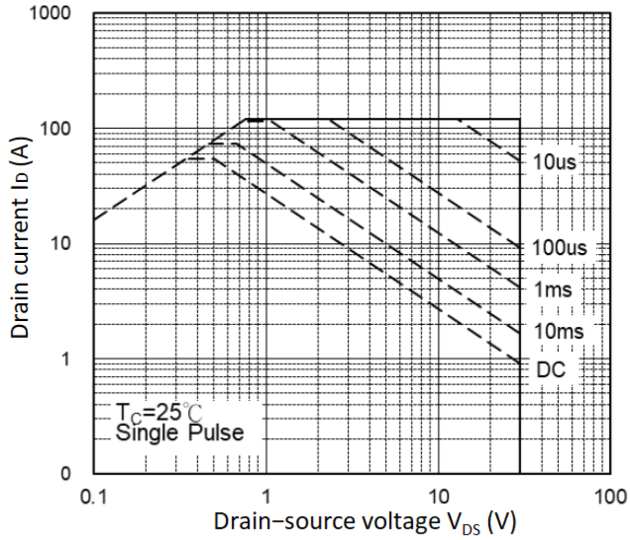


Figure 8. Safe Operating Area

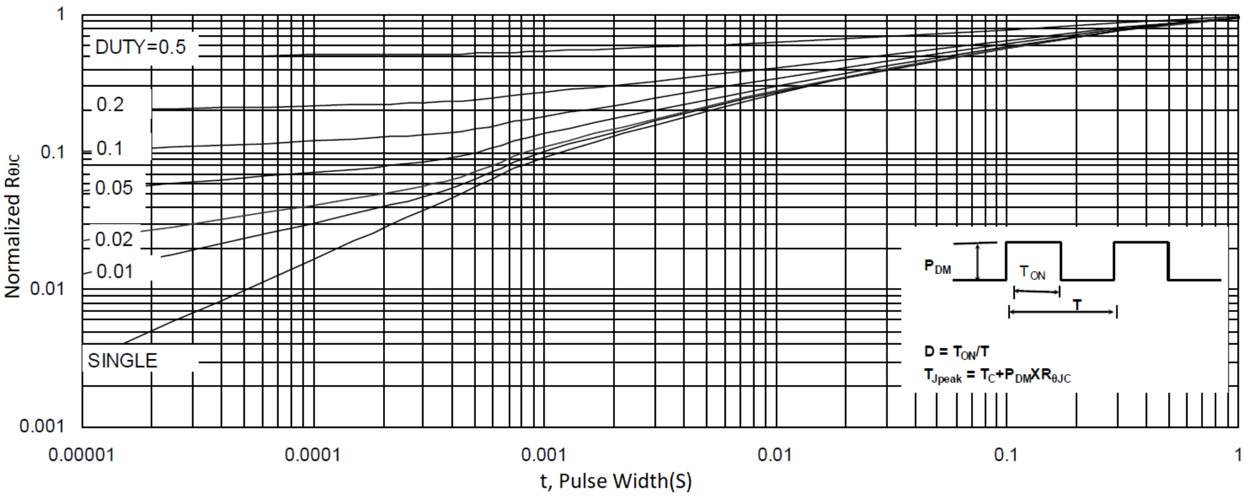


Figure 9. Normalized Maximum Transient Thermal Impedance

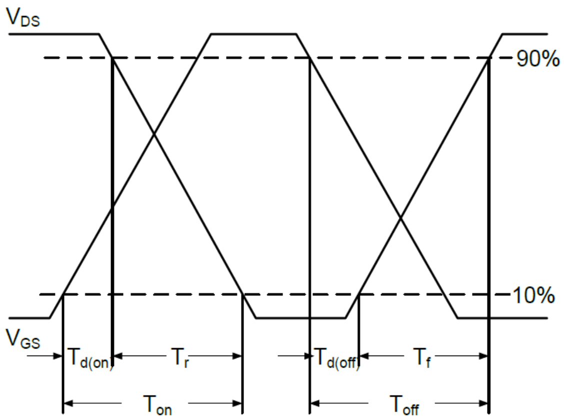


Figure 10. Switching Time Waveform

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

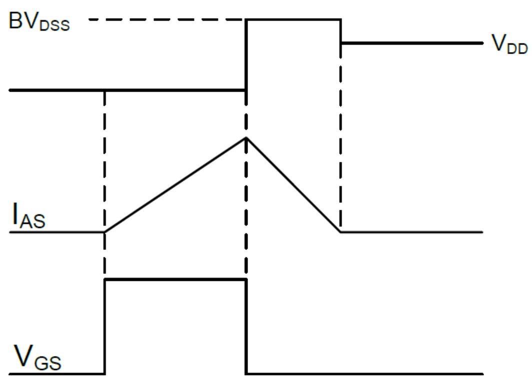
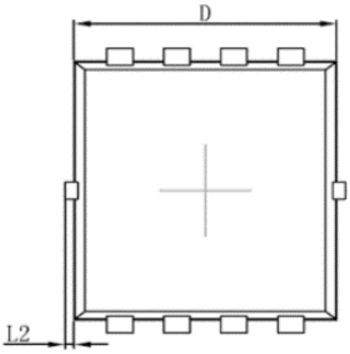
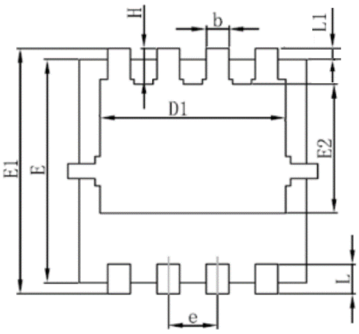


Figure 11. Unclamped Inductive Switching Waveform

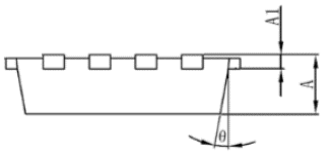
Mechanical Dimensions for PDFN3030-8L



Top View



Bottom View



Side View

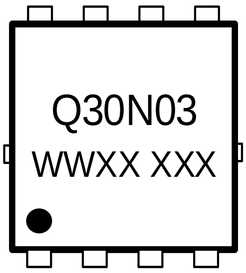
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	0.70	0.85
A1	0.10	0.25
D	2.90	3.25
D1	2.25	2.65
E	2.90	3.20
E1	3.10	3.45
E2	1.54	1.98
b	0.20	0.40
e	0.60	0.70
L	0.30	0.50
L1	0.13BSC	
L2	0.00	0.15
H	0.20	0.65
θ	0°	14°

Ordering Information

Part	Package	Marking	Packing method
WMQ30N03T2	PDFN3030-8L	Q30N03	Tape and Reel

Marking Information



Q30N03 = Device code
WWXX XXX= Date code

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