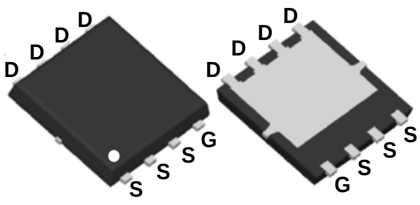
30V P-Channel Enhancement Mode Power MOSFET



PDFN3030-8L

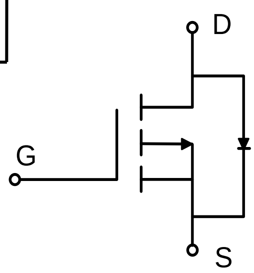
Description

WMQ50P03T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Features

- V_{DS}= -30 V, I_D = -50 A
  $R_{DS(on)}$ < 9mΩ @ V_{GS} = -10 V
  $R_{DS(on)}$ < 14mΩ @ 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
- Battery Protection Application

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	-50	A
	T_C=100℃		-32	
Pulsed Drain Current[2]		I_{DM}	-200	A
Single Pulse Avalanche Energy[3]		EAS	125	mJ
Avalanche Current		I_{AS}	-50	A
Total Power Dissipation[4]	T_C=25℃	P_D	69	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]	$R_{\theta JA}$	65	°C/W
Thermal Resistance from Junction-to-Case[1]	$R_{\theta JC}$	1.8	°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	-1.0	-1.7	-2.5	V
Drain-Source On-Resistance[2]		$R_{DS(on)}$	V_{GS} = -10V, I_D = -20A	-	7.3	9	mΩ
			V_{GS} = -4.5V, I_D = -15A	-	11	14	
Forward Transconductance		g_{fs}	V_{DS} = -5V, I_D = -20A	-	25	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = -15V, V_{GS} =0V, f =1MHz	-	3958	-	pF
Output Capacitance		C_{oss}		-	440	-	
Reverse Transfer Capacitance		C_{rss}		-	341	-	
Switching Characteristics							
Gate Resistance		R_g	V_{DS} = 0V, V_{GS}= 0V, f=1.0MHz	-	3.2	-	Ω
Total Gate Charge		Q_g	V_{GS} = -4.5V,V_{DS} = -15V, I_D= -15A	-	30	-	nC
Gate-Source Charge		Q_{gs}		-	10	-	
Gate-Drain Charge		Q_{gd}		-	10.4	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} = -10V, V_{DD} = -15V, R_G = 3.3Ω, I_D= -15A	-	9.4	-	nS
Rise Time		t_r		-	10.2	-	
Turn-Off Delay Time		$t_{d(off)}$		-	117	-	
Fall Time		t_f		-	24	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[2]		V_{SD}	I_S = -1A, V_{GS} = 0V	-	-	-1	V
Continuous Source Current[1,5]		I_S	V_G=V_D=0V , Force Current	-	-	-50	A
Body Diode Reverse Recovery Time		t_{rr}	I_F = -15A, dI/dt = 100A/µs	-	20	-	nS
Body Diode Reverse Recovery Charge		Q_{rr}		-	9.5	-	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}= -50A

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.

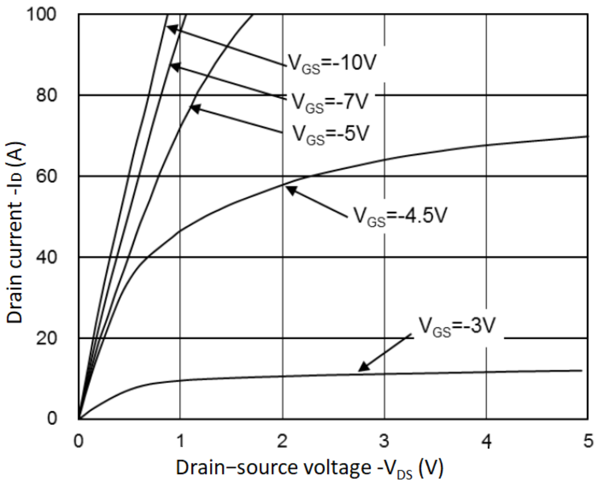


Figure 1. Output Characteristics

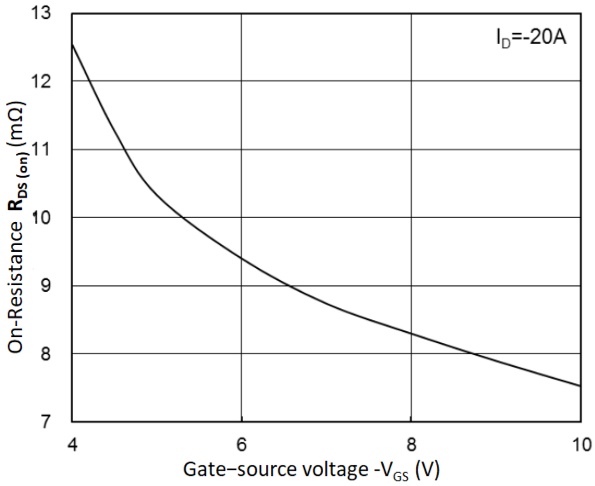


Figure 2. R_{DS}(on) vs. V_{GS}

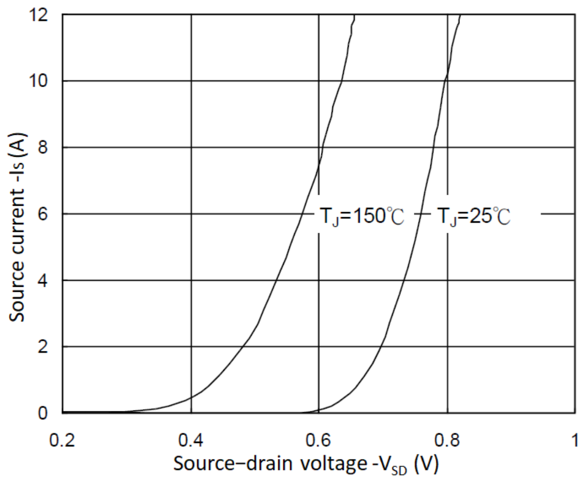


Figure 3. Forward Characteristics of Reverse

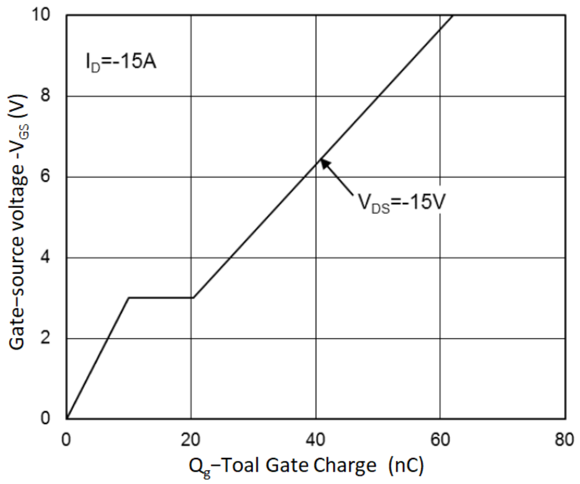


Figure 4. Gate Charge Characteristics

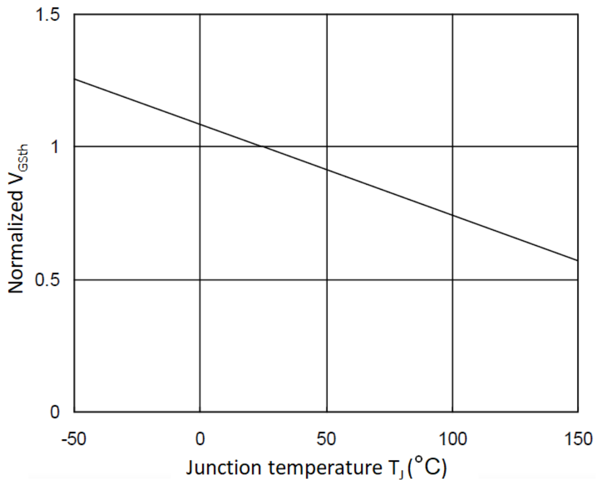


Figure 5. Normalized V_{GSth} vs. T_J

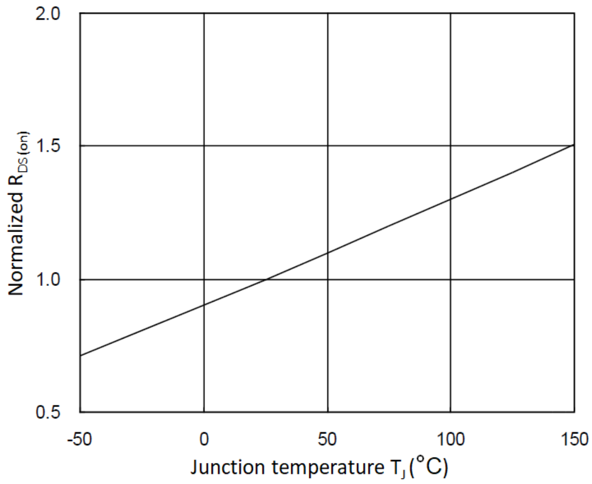


Figure 6. Normalized $R_{DS(on)}$ vs. T_J

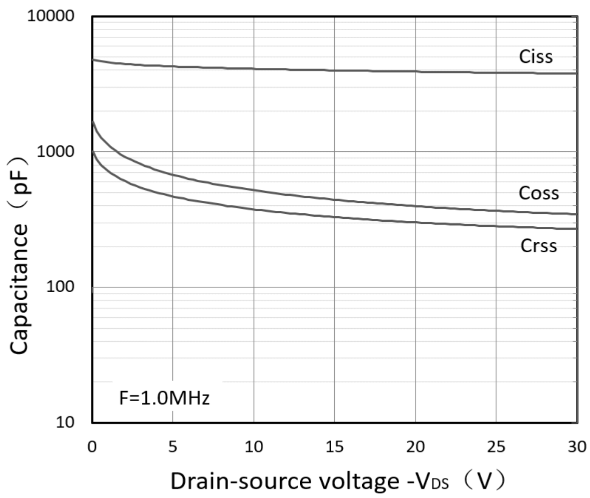


Figure 7. Capacitance Characteristics

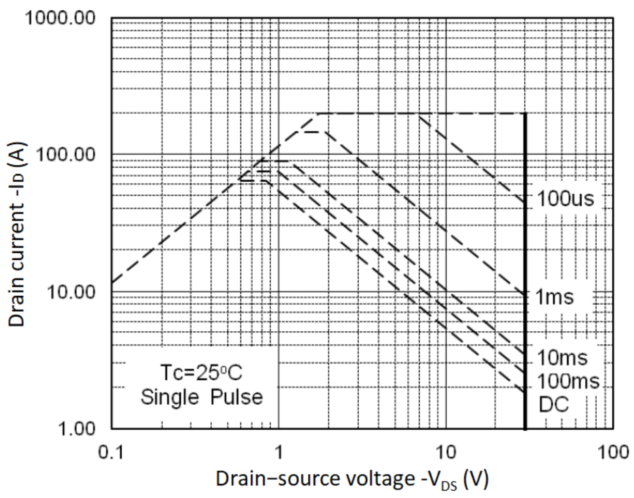


Figure 8. Safe Operating Area

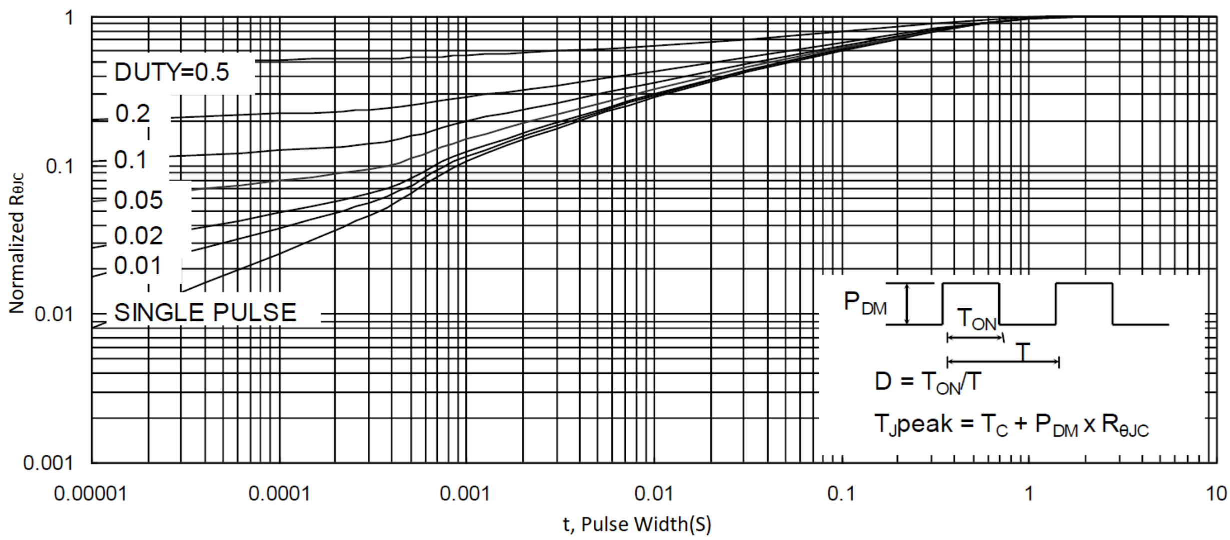


Figure 9. Normalized Maximum Transient Thermal Impedance

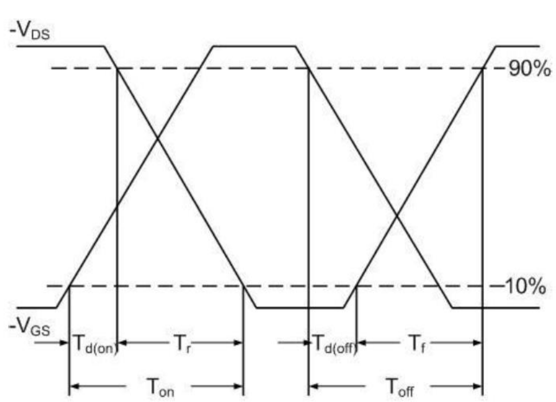


Figure 10. Switching Time Waveform

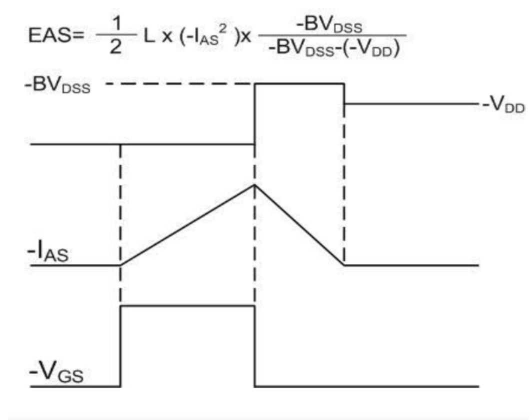
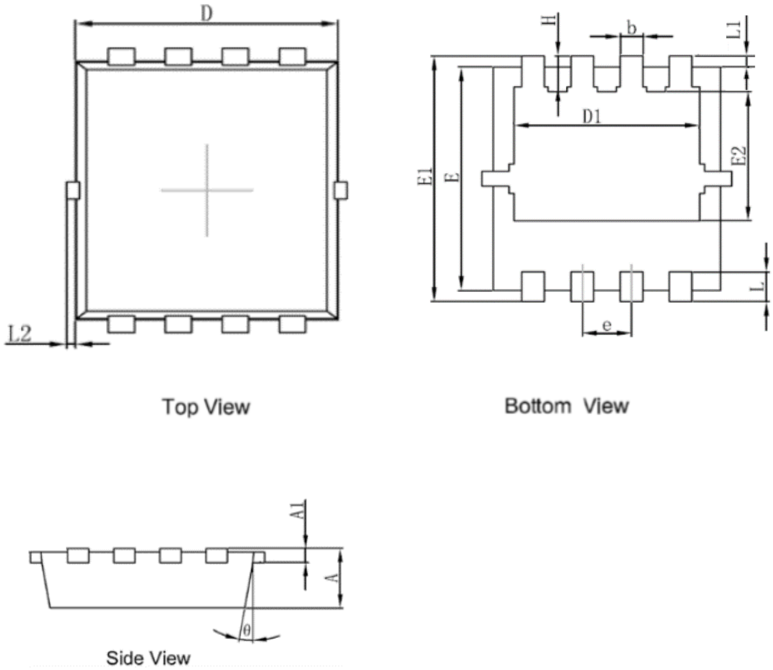


Figure 11. Unclamped Inductive Switching

Waveform

Mechanical Dimensions for PDFN3030-8L



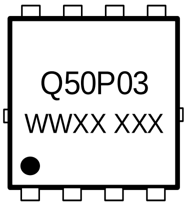
COMMON DIMENSIONS

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
WMQ50P03T1	PDFN3030-8L	Q50P03	Tape and Reel

Marking Information



Q50P03 = Device code

WWXX XXX= Date code

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