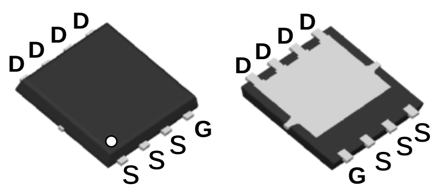
WMB58N03T1

30V N-Channel Enhancement Mode Power MOSFET



PDFN5060-8L

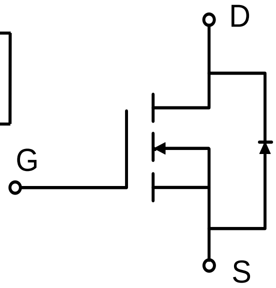
Description

WMB58N03T1 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 = 58A
  $R_{DS(on)}$ < 8.5mΩ @ V_{GS} = 10 V
  $R_{DS(on)}$ < 14mΩ @ V_{GS} = 4.5V
- Low $R_{DS(on)}$
- Low Gate Charge
- 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	58	A
	T_C=100℃		38	
	T_A=25℃		12	
	T_A=70℃		9.6	
Pulsed Drain Current[2]		I_{DM}	115	A
Single Pulse Avalanche Energy[3]		EAS	57.8	mJ
Avalanche Current		I_{AS}	34	A
Total Power Dissipation[4]	T_C=25℃	P_D	46	W
	T_A=25℃		2	
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]	$R_{θJA}$	62	°C/W
Thermal Resistance from Junction-to-Case[1]	$R_{θJC}$	2.7	°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	1.7	2.5	V
Drain-Source On-Resistance[2]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	-	6.7	8.5	mΩ
			V_{GS} = 4.5V, I_D = 15A	-	9	14	
Forward Transconductance		g_{fs}	V_{DS} = 5V, I_D = 30A	-	38	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 15V, V_{GS} =0V, f =1MHz	-	1100	-	pF
Output Capacitance		C_{oss}		-	163	-	
Reverse Transfer Capacitance		C_{rss}		-	131	-	
Switching Characteristics							
Gate Resistance		R_g	V_{DS} = 0V, V_{GS} = 0V, f =1MHz	-	2.5	-	Ω
Total Gate Charge		Q_g	V_{GS} = 4.5V,V_{DS} = 15V, I_D= 15A	-	12.6	-	nC
Gate-Source Charge		Q_{gs}		-	4.2	-	
Gate-Drain Charge		Q_{gd}		-	5.1	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} = 15V, R_G = 3.3Ω, I_D= 15A	-	4.6	-	nS
Rise Time		t_r		-	12.2	-	
Turn-Off Delay Time		$t_{d(off)}$		-	26.6	-	
Fall Time		t_f		-	8	-	
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	-	-	58	A
Reverse Recovery Time		t_{rr}	I_F=30A , dI/dt=100A/μs	-	9.2	-	nS
Reverse Recovery Charge		Q_{rr}		-	2	-	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}=34A
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.

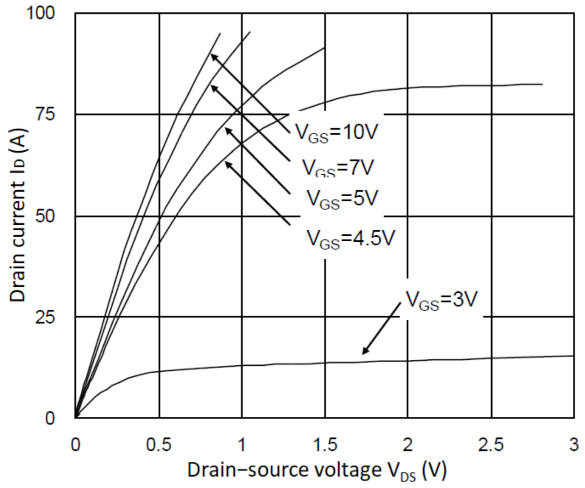


Figure 1. Typical Output Characteristics

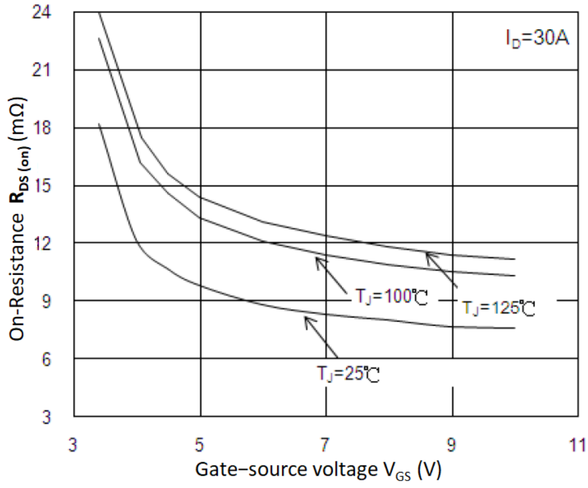


Figure 2. $R_{DS(on)}$ vs. V_{GS}

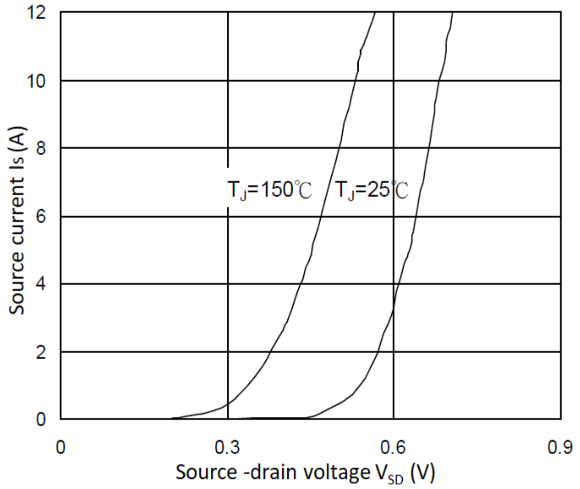


Figure 3. Forward Characteristics Of Reverse

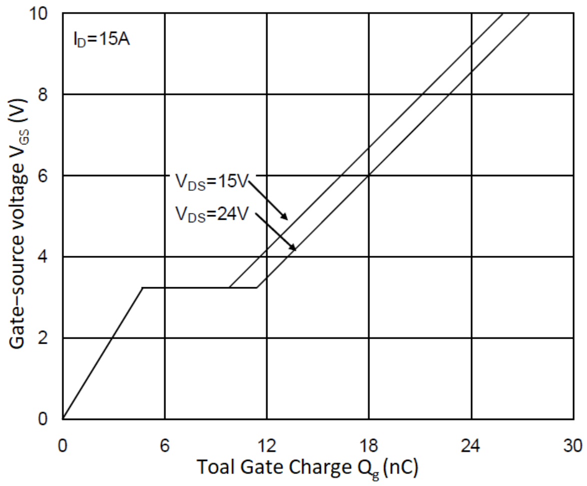


Figure 4. Gate Charge Characteristics

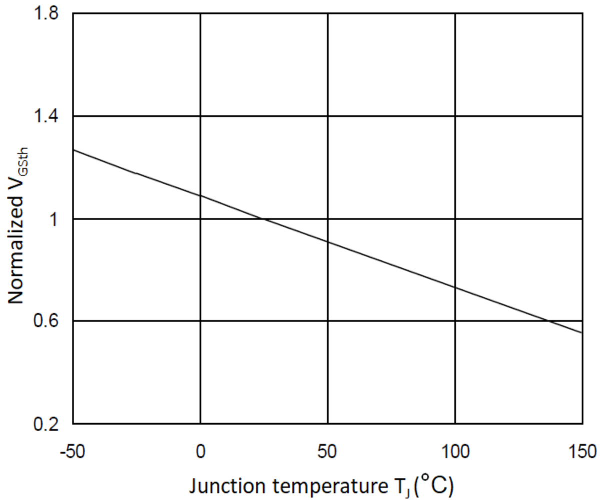


Figure 5. Normalized $V_{GS(th)}$ vs. T_J

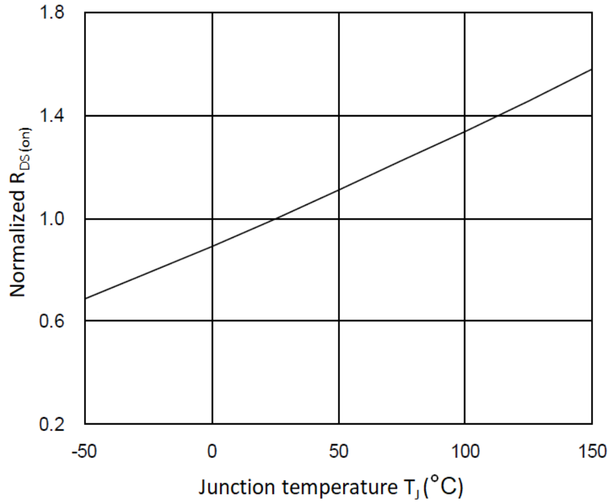


Figure 6. Normalized $R_{DS(ON)}$ vs. T_J

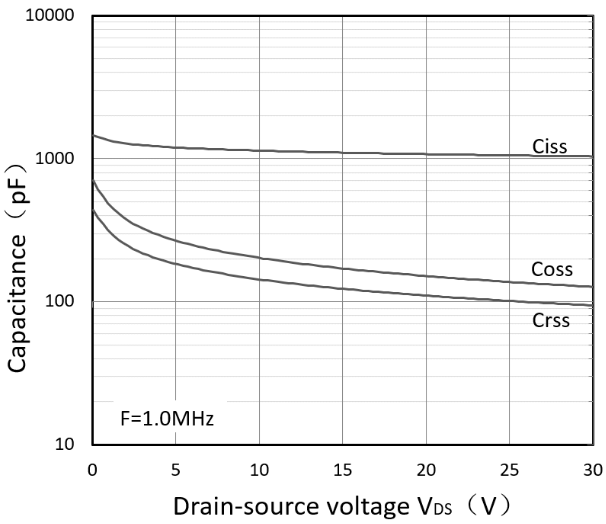


Figure 7. Capacitance Characteristics

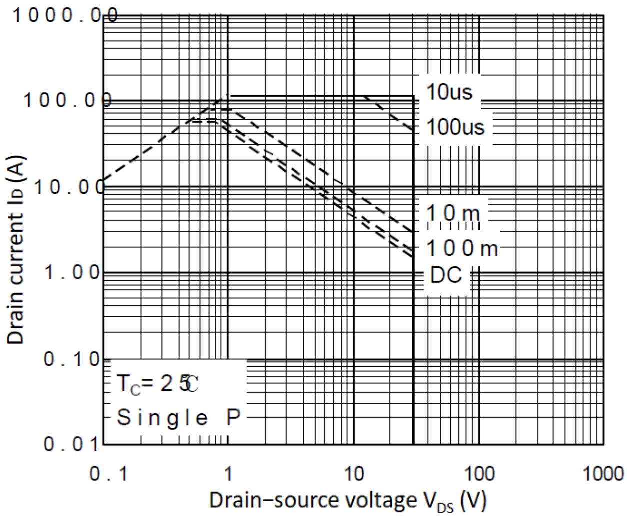


Figure 8. Safe Operating Area

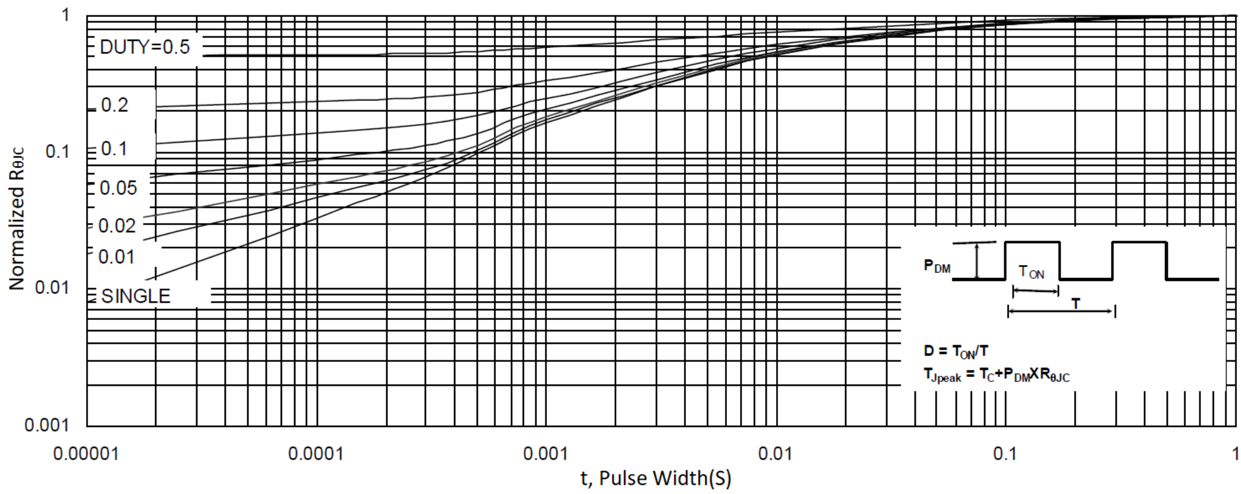


Figure 9. Normalized Maximum Transient Thermal Impedance

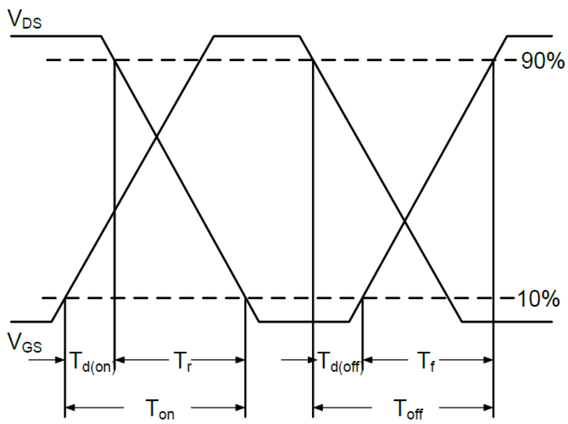


Figure 10.Switching Time Waveform

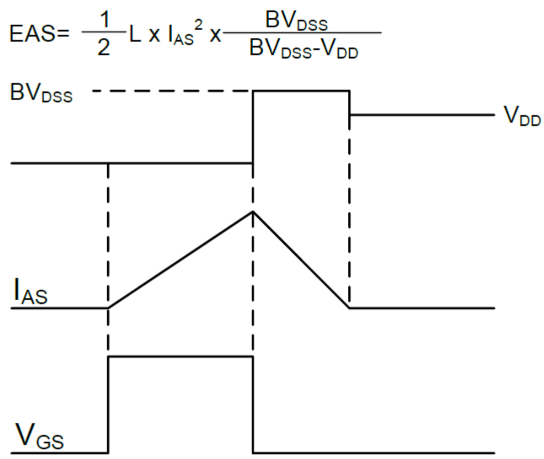
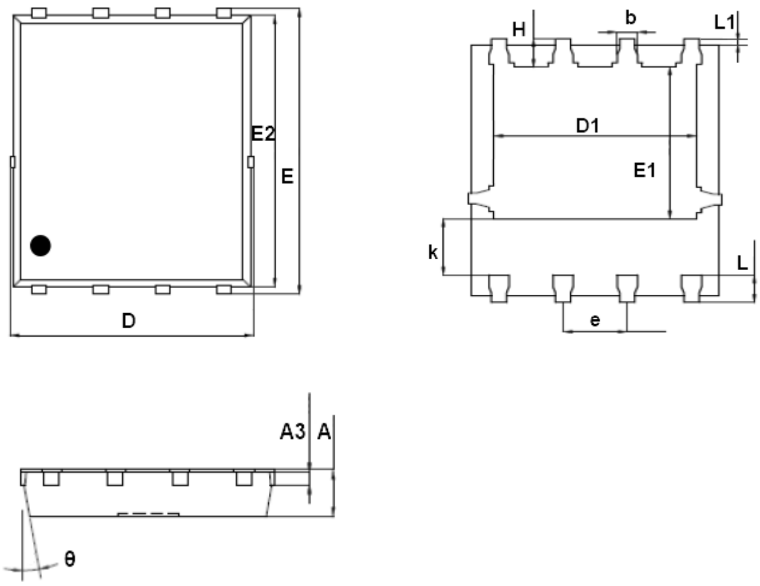


Figure 11.Unclamped Inductive Switching Waveform

Mechanical Dimensions for PDFN5060-8L



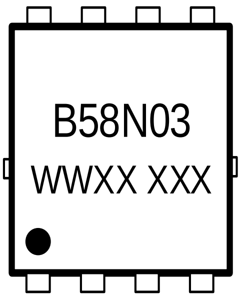
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	0.90	1.17
A3	0.20	0.35
D	4.80	5.40
E	5.90	6.15
D1	3.61	4.31
E1	3.3	3.78
E2	5.65	5.85
k	1.10	-
b	0.30	0.51
e	1.27BSC	
L	0.38	0.71
L1	0.05	0.36
H	0.38	0.61
θ	0°	12°

Ordering Information

Part	Package	Marking	Packing method
WMB58N03T1	PDFN5060-8L	B58N03	Tape and Reel

Marking Information



B58N03 = Device code

WWXX XXX= Date code

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