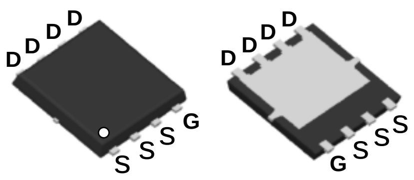
WMB52N06T1

60V N-Channel Enhancement Mode Power MOSFET

Description

WMB52N06T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

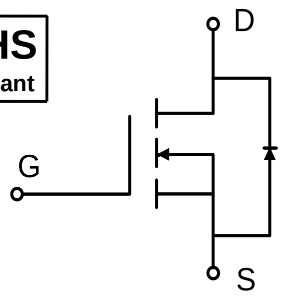


PDFN5060-8L

Features

- V_{DS} = 60V, I_D = 52A
  $R_{DS(on)}$ < 12mΩ @ V_{GS} = 10V
  $R_{DS(on)}$ < 15mΩ @ V_{GS} = 4.5V
- Green Device Available
- 100% EAS Guaranteed
- Low Gate Charge
- Advanced High Cell Density Trench Technology

RoHS compliant



Applications

- Power Management Switches
- Synchronous Rectification for AC/DC Quick Charger

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V[1]	T_C=25℃	I_D	52	A
	T_C=70℃		41	
Pulsed Drain Current[2]		I_{DM}	120	A
Single Pulse Avalanche Energy[3]		EAS	72.2	mJ
Avalanche Current		I_{AS}	38	A
Total Power Dissipation[4]	T_C=25℃	P_D	62.5	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]	$R_{\theta JA}$	62	°C/W
Thermal Resistance from Junction-to-Case[1]	$R_{\theta JC}$	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	60	-	-	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} = 48V, 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 = 30A	-	8.7	12	mΩ
			V_{GS} = 4.5V, I_D = 15A	-	10.5	15	
Forward Transconductance		g_{fs}	V_{DS} = 5V, I_D = 30A	-	42	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = 15V, V_{GS} =0V, f =1MHz	-	2750	-	pF
Output Capacitance		C_{oss}		-	210	-	
Reverse Transfer Capacitance		C_{rss}		-	146	-	
Switching Characteristics							
Gate Resistance		R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	1.5	-	Ω
Total Gate Charge		Q_g	V_{GS} = 4.5V,V_{DS} = 48V, I_D= 15A	-	53.3	-	nC
Gate-Source Charge		Q_{gs}		-	10.5	-	
Gate-Drain Charge		Q_{gd}		-	9.9	-	
Turn-On Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} = 30V, R_G = 3.3Ω, I_D= 15A	-	10.4	-	nS
Rise Time		t_r		-	9.2	-	
Turn-Off Delay Time		$t_{d(off)}$		-	63	-	
Fall Time		t_f		-	4.8	-	
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	-	-	52	A
Body Diode Reverse Recovery Time		t_{rr}	I_F = 15A, dI/dt = 100A/μs	-	18	-	nS
Body Diode Reverse Recovery Charge		Q_{rr}		-	14	-	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}=38A

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.

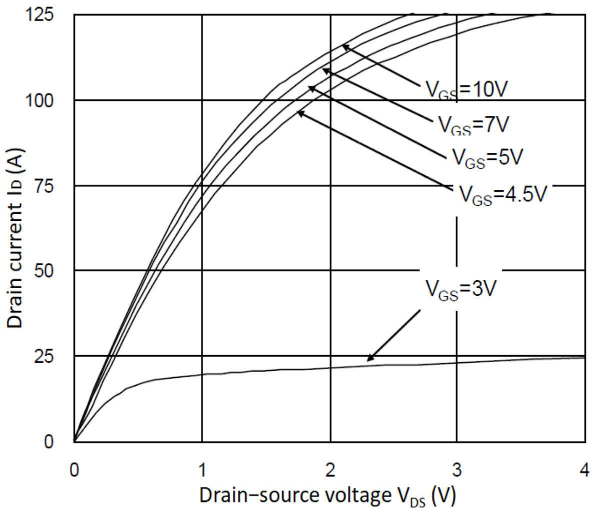


Figure 1. Output Characteristics

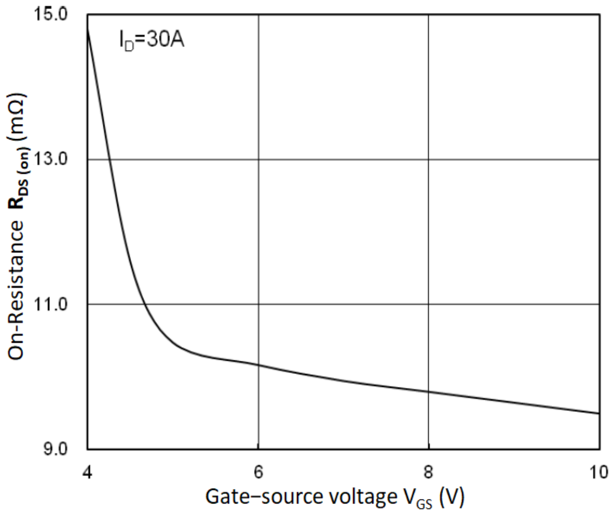


Figure 2. $R_{DS(on)}$ vs. V_{GS}

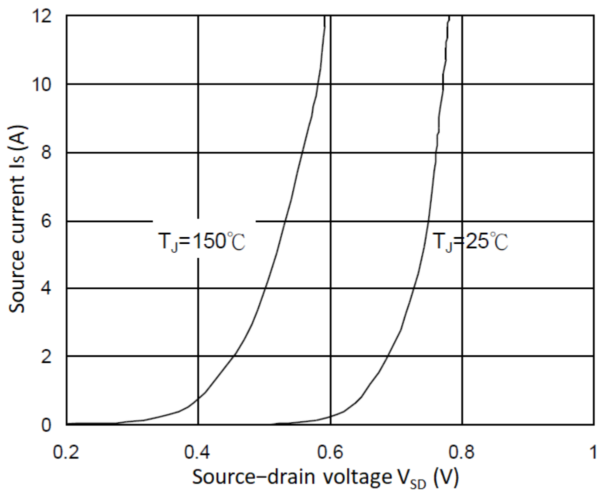


Figure 3. Forward Characteristics of Reverse

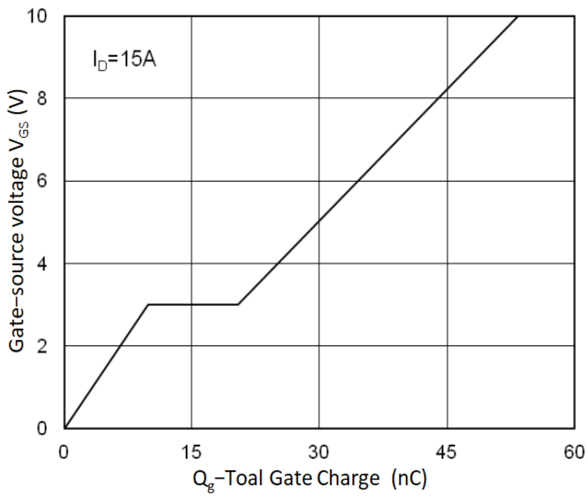


Figure 4.Gate Charge Characteristics

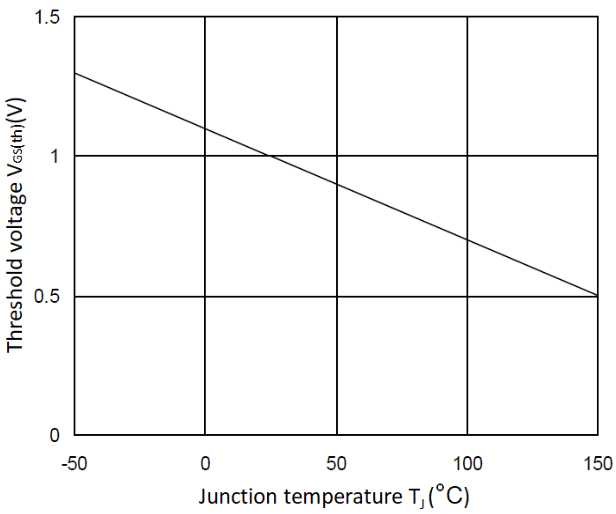


Figure 5. Normalized V_{GSth} vs. T_J

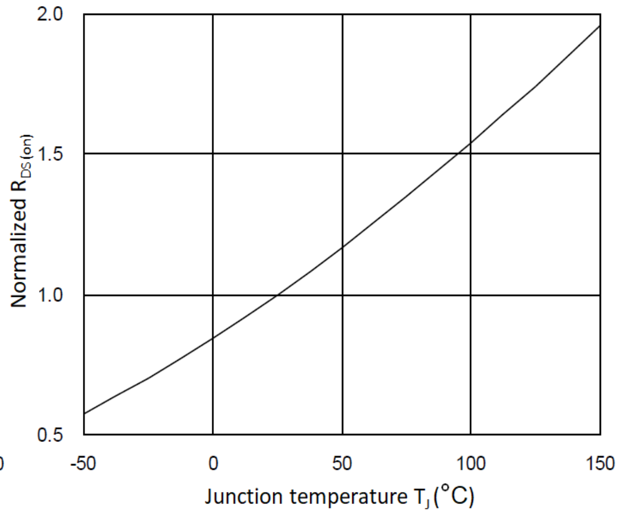


Figure 6. Normalized $R_{DS(on)}$ vs. T_J

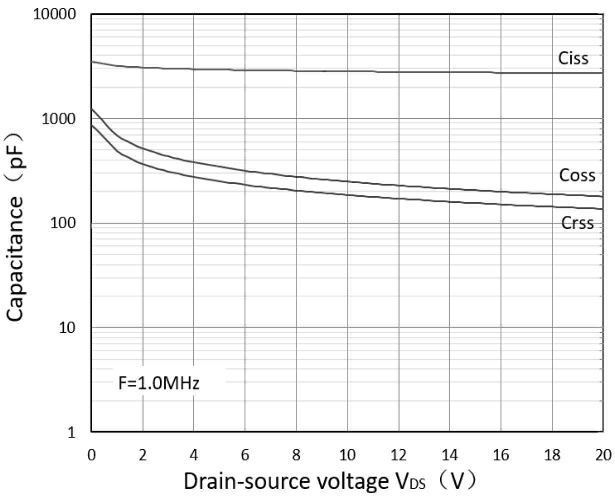


Figure 7. Capacitance Characteristics

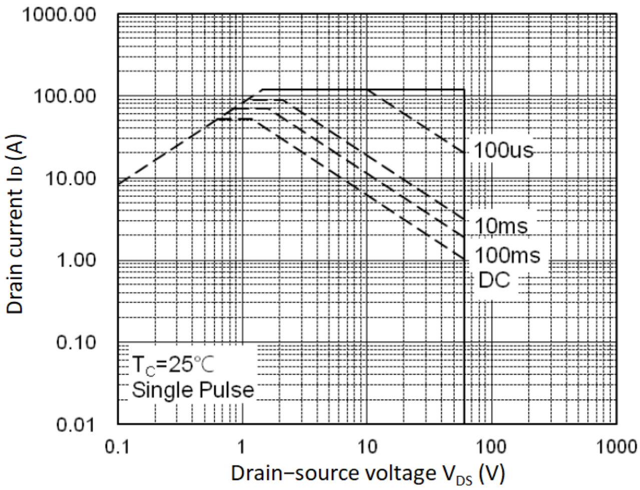


Figure 8. Safe Operating Area

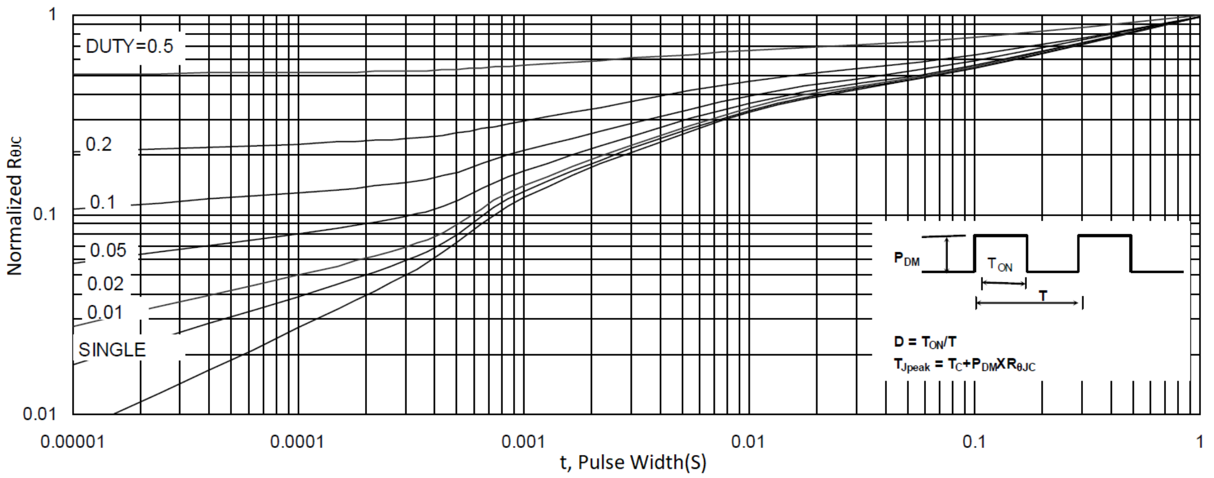


Figure 9. Normalized Maximum Transient Thermal Impedance

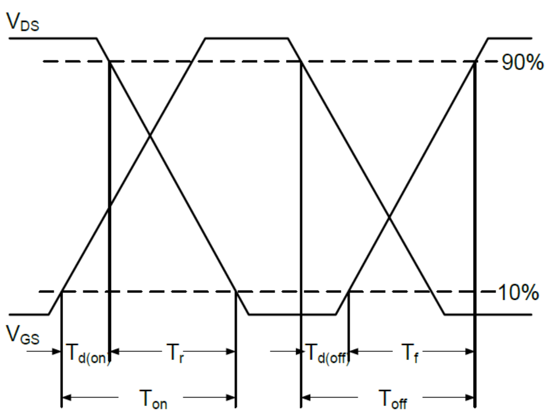


Figure 10. Switching Time Waveform

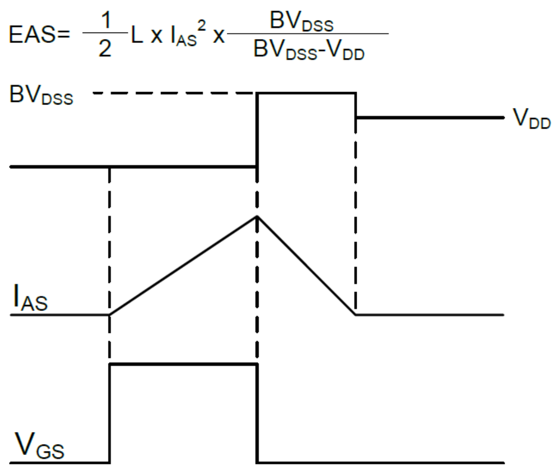
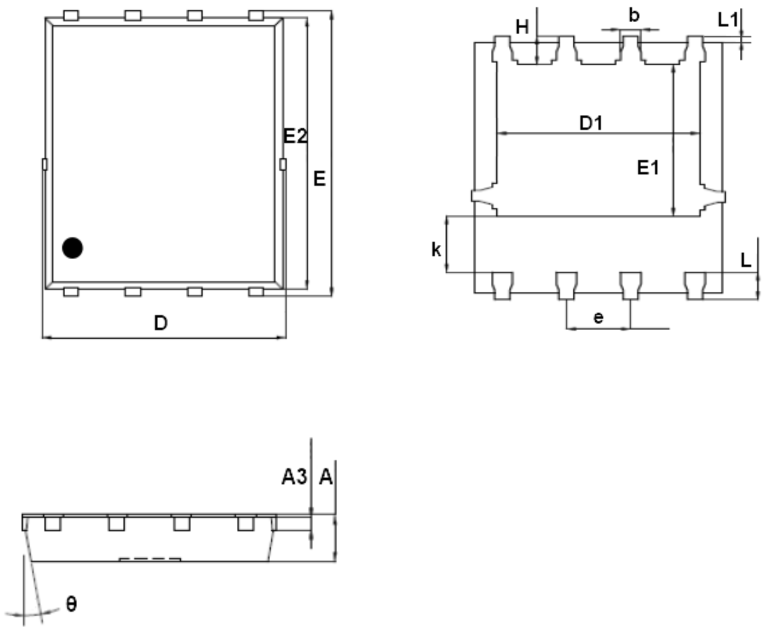


Figure 11. Unclamped Inductive Switching

Waveform

Mechanical Dimensions for PDFN5060-8L



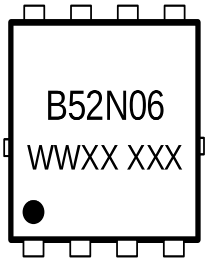
COMMON DIMENSIONS

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
WMB52N06T1	PDFN5060-8L	B52N06	Tape and Reel

Marking Information



B52N06 = Device code

WWXX XXX= Date code

Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201207
Tel: 86-21-50310888 Fax: 86-21-50757680 Email: market@way-on.com
WAYON website: **http://www.way-on.com**
For additional information, please contact your local Sales Representative.

Disclaimer

WAYON reserves the right to make changes without further notice to any Products herein to improve reliability, function, or design. The Products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any Product can reasonably be expected to result in a personal injury. The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. WAYON does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Products or technical information described in this document.