

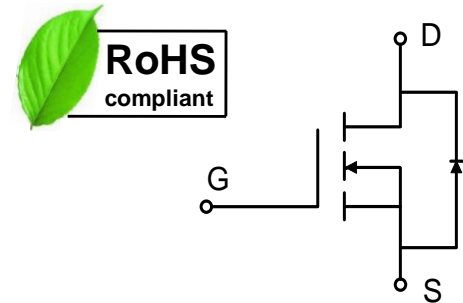
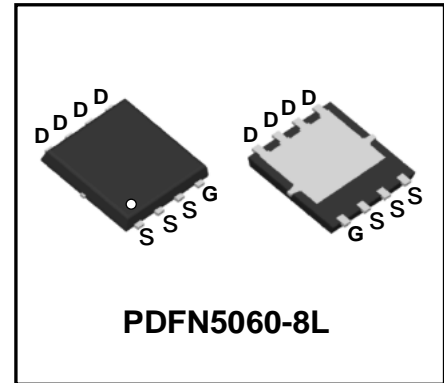
## 30V N-Channel Enhancement Mode Power MOSFET

### Description

WMB90N03T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

### Features

- $V_{DS} = 30V$ ,  $I_D = 90A$   
 $R_{DS(on)} < 3.0m\Omega @ V_{GS} = 10V$   
 $R_{DS(on)} < 6.0m\Omega @ V_{GS} = 4.5V$
- Low  $R_{DS(on)}$
- 100% EAS Guaranteed
- Low Gate Charge
- RoHs and Halogen-Free Compliant



### Applications

- Load Switch
- PWM Application

### Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current@10V <sup>1,6</sup>	$I_D$	$T_C=25^\circ C$	90
		$T_C=100^\circ C$	60
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	360	A
Single Pulse Avalanche Energy <sup>3</sup>	<b>EAS</b>	400	mJ
Total Power Dissipation <sup>4</sup>	$P_D$	45	W
Avalanche Current	$I_{AS}$	40	A
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-Case <sup>1</sup>	$R_{\theta JC}$	2.8	$^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V
Gate-body Leakage Current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$T_J=25^\circ\text{C}$ $V_{DS} = 30V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.7	2.5	V
Drain-Source On-Resistance <sup>2</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$	-	2.5	3.0	m $\Omega$
		$V_{GS} = 4.5V, I_D = 20A$	-	4.6	6.0	
Forward Transconductance	$g_{fs}$	$V_{DS} = 5V, I_D = 10A$	21	-	-	S
<b>Dynamic Characteristics</b>						
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	-	2.18	-	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$	-	3300	-	pF
Output Capacitance	$C_{oss}$		-	505	-	
Reverse Transfer Capacitance	$C_{rss}$		-	420	-	
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{GS} = 10V, V_{DS} = 15V, I_D = 30A$	-	68	-	nC
Gate-Source Charge	$Q_{gs}$		-	11.7	-	
Gate-Drain Charge	$Q_{gd}$		-	16.7	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V, R_G = 1.8\Omega, I_D = 60A$	-	10.6	-	nS
Rise Time	$t_r$		-	116	-	
Turn-Off Delay Time	$t_{d(off)}$		-	24	-	
Fall Time	$t_f$		-	58	-	
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$I_S = 20A, V_{GS} = 0V$	-	-	1.2	V
Continuous Source Current <sup>1,5,6</sup>	$I_S$	$V_G=V_D=0V$ , Force Current	-	-	90	A
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 60A, di/dt = 100A/\mu s$	-	55	-	nS
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	108	-	nC

## Notes:

- The data tested by surface mounted on a 1 inch<sup>2</sup> 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  $V_{DD}=25V, V_{GS}=10V, R_G=25\Omega, L=0.5mH, I_{AS}=40A$ .
- The power dissipation is limited by 150 $^\circ\text{C}$  junction temperature
- The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.
- The maximum current rating is package limited.

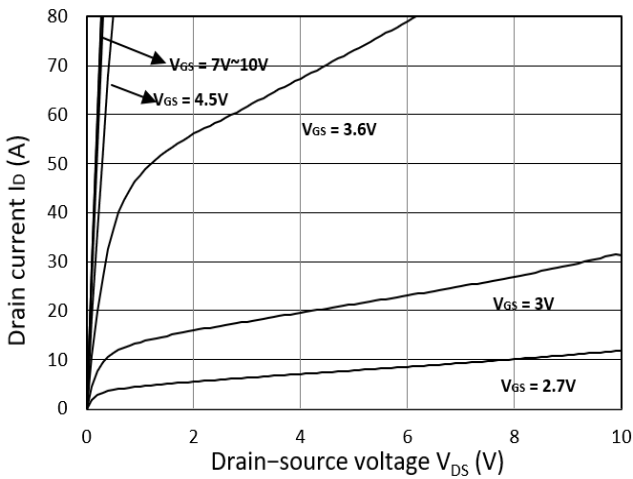


Figure 1. Output Characteristics

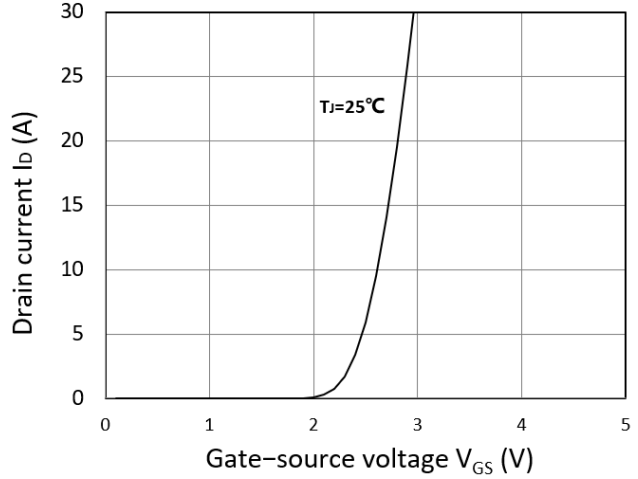


Figure 2. Transfer Characteristics

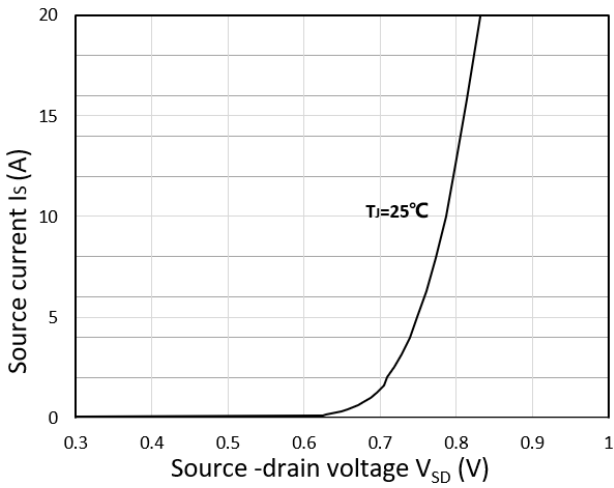


Figure 3. Forward Characteristics of Reverse

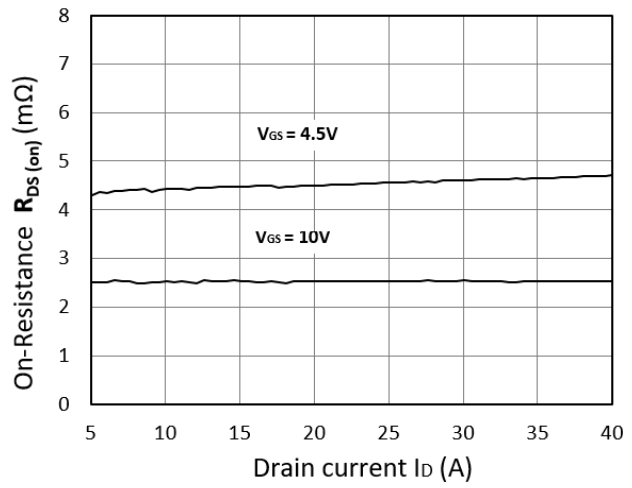


Figure 4.  $R_{DS(ON)}$  vs.  $I_D$

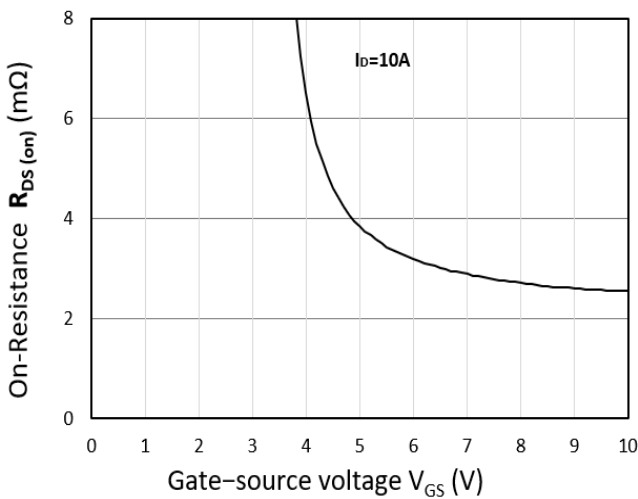


Figure 5.  $R_{DS(ON)}$  vs.  $V_{GS}$

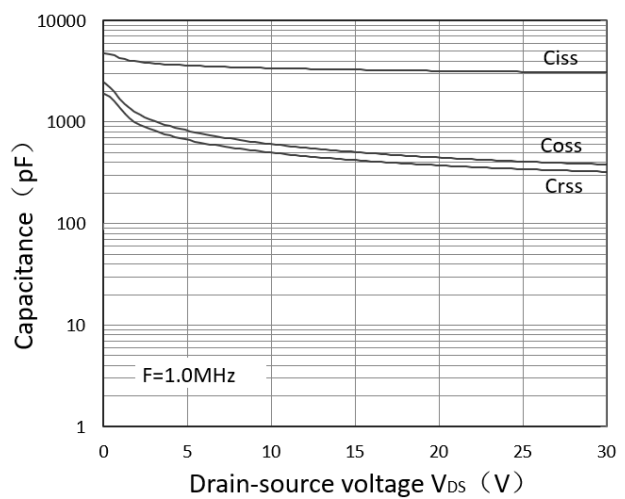


Figure 6. Capacitance Characteristics

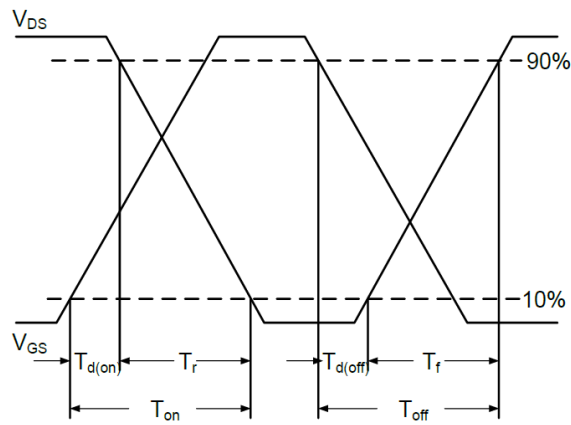


Figure 7. Switching Time Waveform

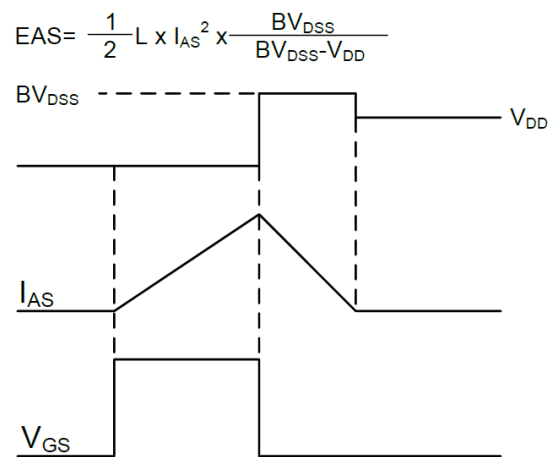
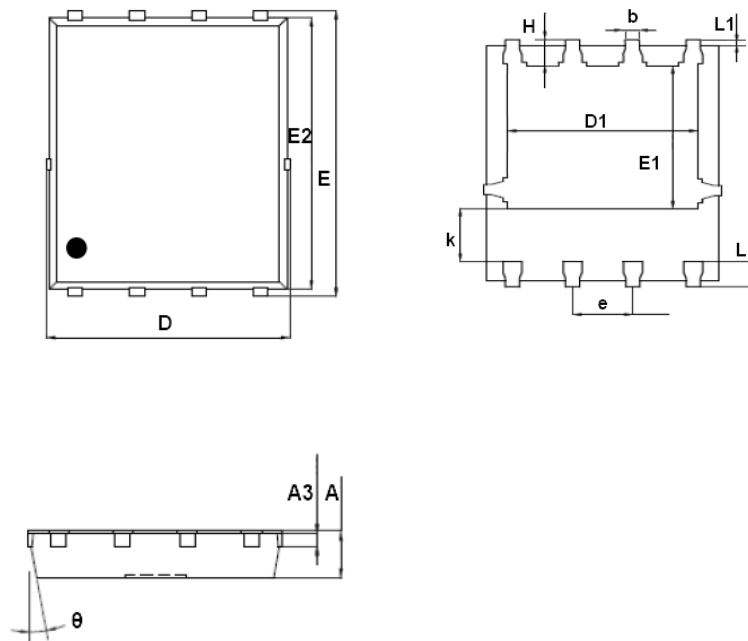


Figure 8. Unclamped Inductive Switching Waveform

## Mechanical Dimensions for PDFN5060-8L



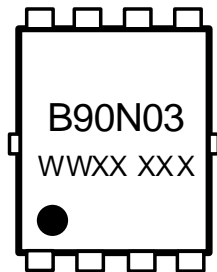
## COMMON DIMENSIONS

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	3.30	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
$\theta$	0°	12°

## Ordering Information

Part	Package	Marking	Packing method
WMB90N03T1	PDFN5060-8L	B90N03	Tape and Reel

## Marking Information



B90N03 = 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.

 © is registered trademarks of Wayon Corporation.

## 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.