

100V N-Channel Enhancement Mode Power MOSFET

Description

WMB129N10T2 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Features

- $V_{DS} = 100\text{ V}$, $I_D = 129\text{ A}$ (Silicon Limited)
 $R_{DS(on)} < 4.2\text{ m}\Omega$ @ $V_{GS} = 10\text{ V}$
 $R_{DS(on)} < 6\text{ m}\Omega$ @ $V_{GS} = 4.5\text{ V}$
- Green Device Available
- 100% EAS Guaranteed
- Optimized for High Speed Smooth Switching

Applications

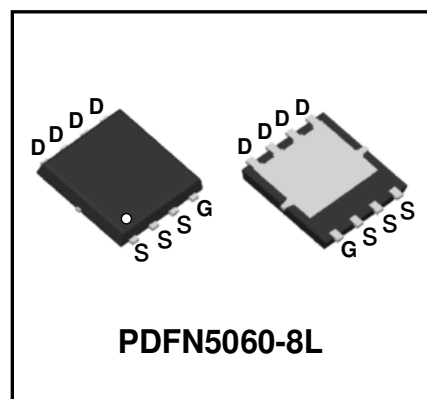
- Power Management Switches
- DC/DC Converter

Absolute Maximum Ratings

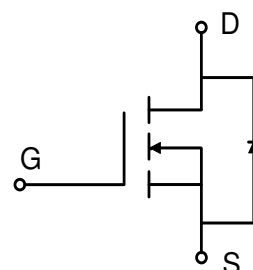
Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹ (Silicon Limited)	$T_C = 25^\circ\text{C}$	I_D	129	A
	$T_C = 100^\circ\text{C}$		80	
Continuous Drain Current ¹ (Package Limited)	$T_C = 25^\circ\text{C}$		60	
Pulsed Drain Current ²		I_{DM}	402	A
Single Pulse Avalanche Energy ³		EAS	101.2	mJ
Avalanche Current		I_{AS}	45	A
Total Power Dissipation ⁴	$T_C = 25^\circ\text{C}$	P_D	127.5	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ¹	$R_{\theta JA}$	49	$^\circ\text{C/W}$
Thermal Resistance from Junction-to-Case ¹	$R_{\theta JC}$	0.98	$^\circ\text{C/W}$



RoHS
compliant



Electrical Characteristics $T_c = 25^\circ\text{C}$, 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	100	-	-	V
Gate-body Leakage Current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.4	1.8	2.4	V
Drain-Source On-Resistance ²		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	3.5	4.2	mΩ
			V _{GS} = 4.5V, I _D = 20A	-	4.8	6	
Forward Transconductance ²		g _{fs}	V _{DS} = 5V, I _D = 20A	-	81	-	S
Dynamic Characteristics							
Input Capacitance		C _{iss}	V _{DS} = 50V, V _{GS} =0V, f =1MHz	-	3875	-	pF
Output Capacitance		C _{oss}		-	920	-	
Reverse Transfer Capacitance		C _{rss}		-	41	-	
Switching Characteristics							
Gate Resistance		R _g	V _{DS} = 0V, V _{GS} =0V, f =1MHz	-	1.2	-	Ω
Total Gate Charge		Q _g	V _{GS} = 4.5V, V _{DD} = 50V, I _D = 20A	-	52	-	nC
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D = 20A	-	91	-	
Gate-Source Charge		Q _{gs}		-	7.9	-	
Gate-Drain Charge		Q _{gd}		-	31.5	-	
Turn-On Delay Time		t _{d(on)}	V _{GS} =10V, V _{DS} = 50V, R _G = 10Ω, I _D = 20A	-	15.3	-	
Rise Time		t _r		-	17.8	-	
Turn-Off Delay Time		t _{d(off)}		-	52.4	-	
Fall Time		t _f		-	23.6	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²		V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current ^{1,5}		I _S	V _G =V _D =0V , Force Current	-	-	129	A
Reverse Recovery Time		t _{rr}	V _R =50V, I _F =20A, dI _F /dt=500A/μs	-	44	-	ns
Reverse Recovery Charge		Q _{rr}		-	212	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=45A$
4. The power dissipation is limited by 150°C 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.

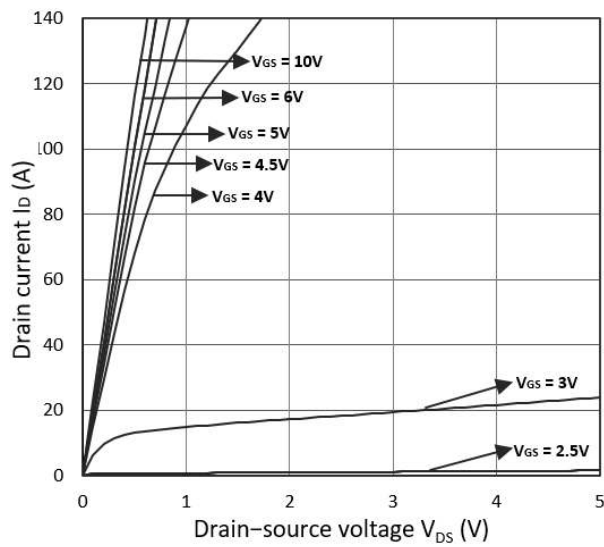


Figure 1. Output Characteristics

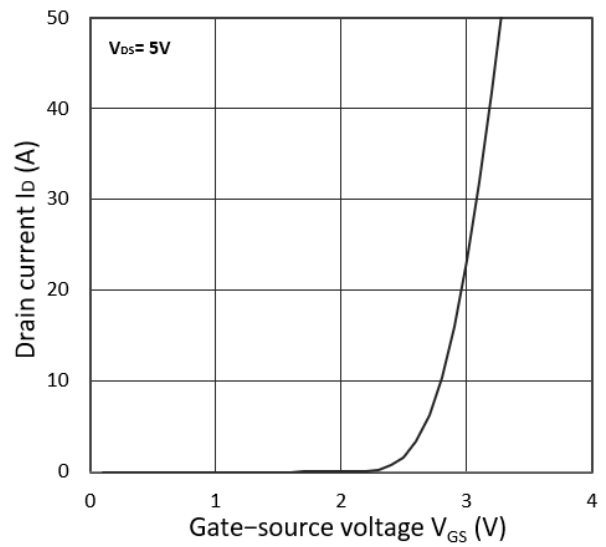


Figure 2. Transfer Characteristics

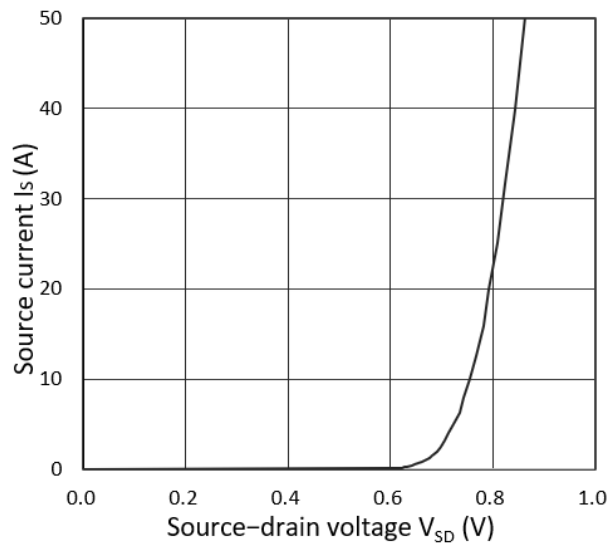


Figure 3. Forward Characteristics of Reverse

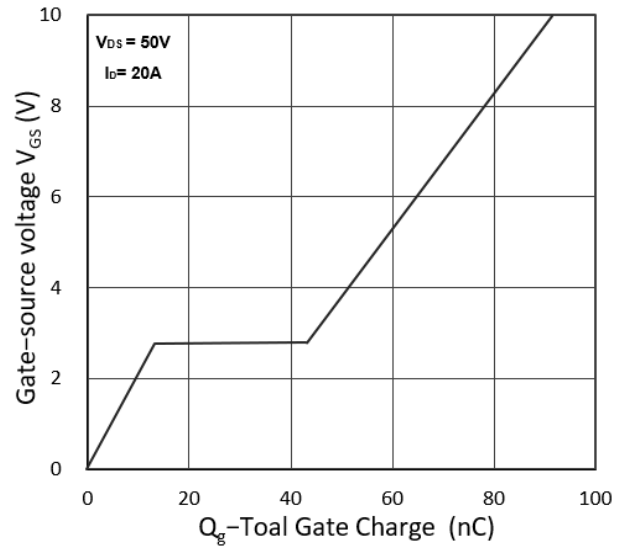
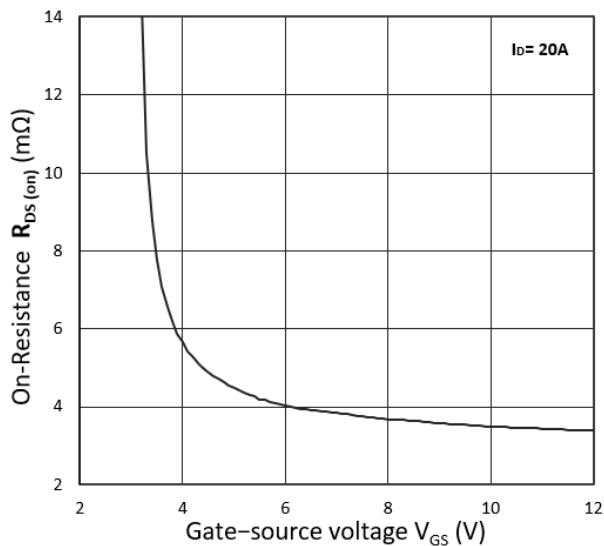
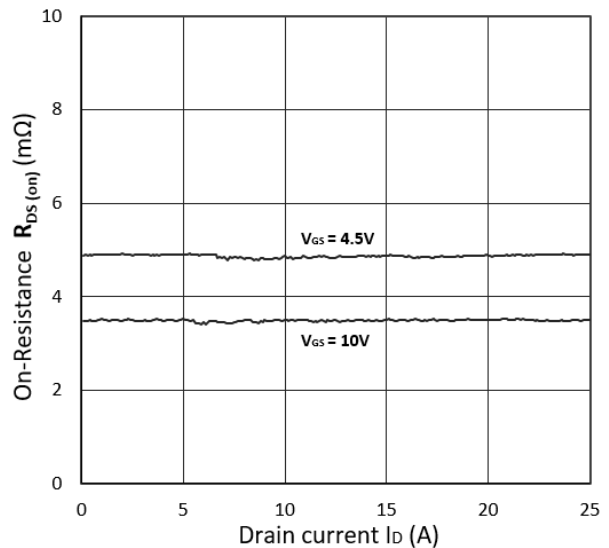


Figure 4. Gate Charge Characteristics

Figure 5. $R_{DS(on)}$ vs. V_{GS} Figure 6. $R_{DS(on)}$ vs. I_D

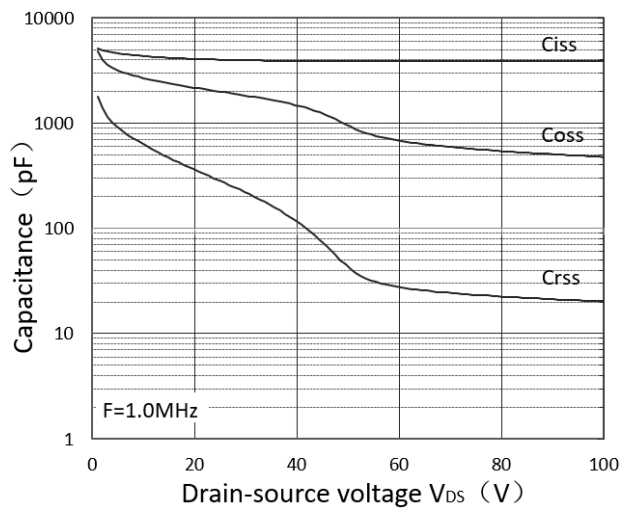


Figure 7. Capacitance Characteristics

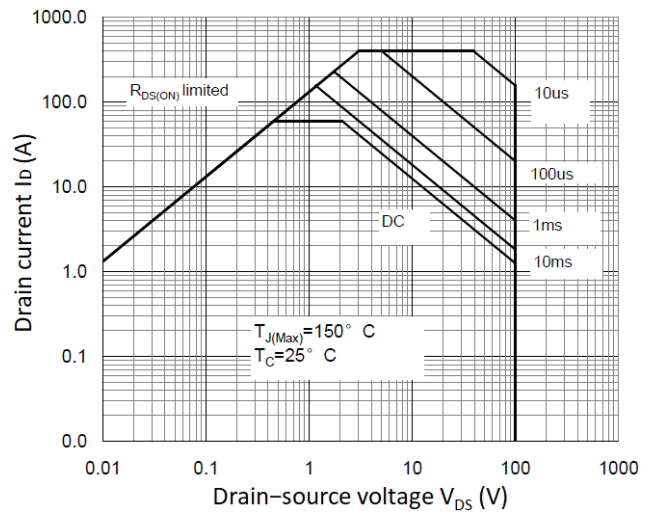


Figure 8. Safe Operating Area

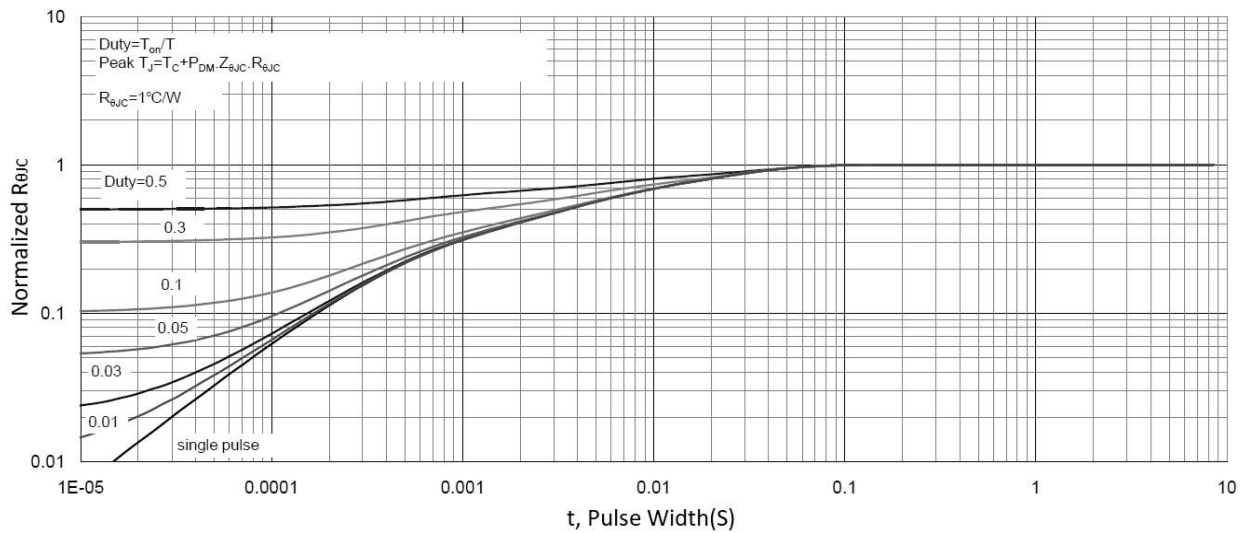


Figure 9. Normalized Maximum Transient Thermal Impedance

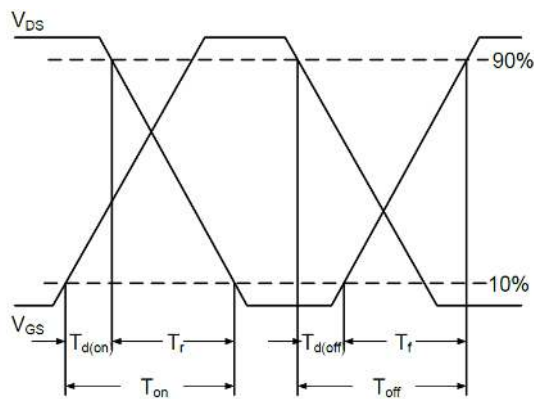
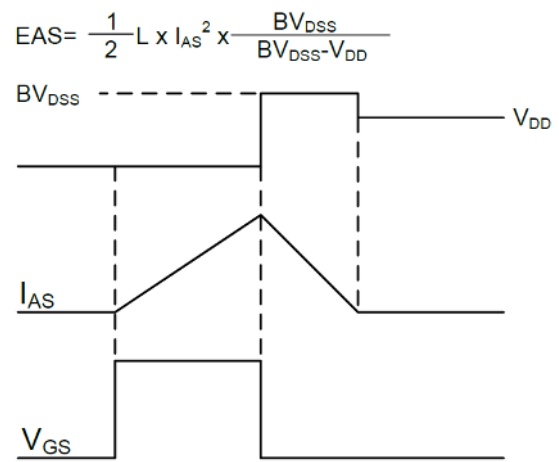
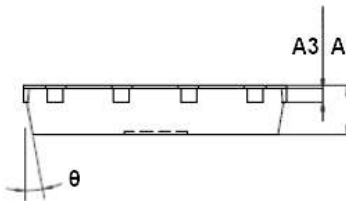
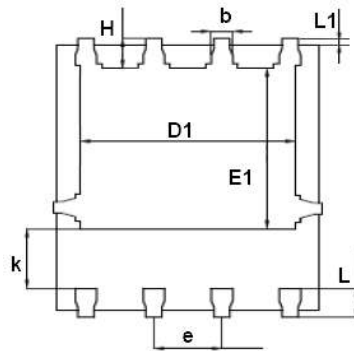
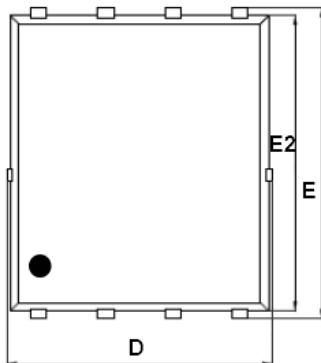


Figure 10. Switching Time Waveform

Figure 11. Unclamped Inductive Switching
Waveform

Mechanical Dimensions for PDFN5060-8L

COMMON DIMENSIONS

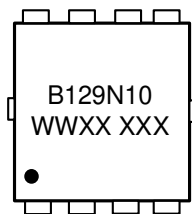


SYMBOL	MM	
	MIN	MAX
A	0.90	1.20
A3	0.15	0.35
D	4.80	5.40
E	5.90	6.35
D1	3.61	4.31
E1	3.30	3.92
E2	5.65	6.06
k	1.10	-
b	0.30	0.51
e	1.27BSC	
L	0.38	0.71
L1	0.05	0.36
H	0.38	0.61
θ	0°	12°

Ordering Information

Part	Package	Marking	Packing method
WMB129N10T2	PDFN5060-8L	B129N10	Tape and Reel

Marking Information



B129N10= 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.

WAYON® 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.