

60V N-Channel Enhancement Mode Power MOSFET

Description

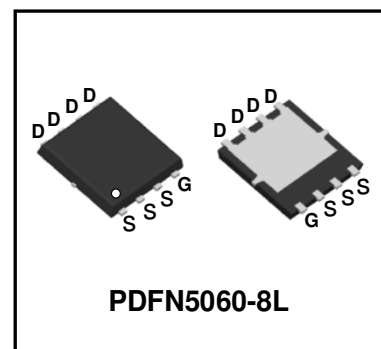
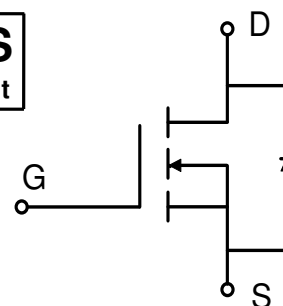
WMB025N06HG2 uses Wayon's 2nd generation power trench MOSFET technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance. This device is well suited for high efficiency fast switching performance.

Features

- $V_{DS} = 60V$, $I_D = 160A$
 $R_{DS(on)} < 3.2m\Omega$ @ $V_{GS} = 10V$
- Low $R_{DS(on)}$
- Low Gate Charge
- 100% EAS Guaranteed

Applications

- DC/DC Converter
- Synchronous Rectification

RoHS
compliantAbsolute Maximum Ratings ($T_c = 25^\circ C$, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source voltage		V_{DS}	60	V
Gate-Source voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_c = 25^\circ C$	I_D	160	A
	$T_c = 100^\circ C$		100	
Pulsed Drain Current ⁴		I_{DM}	640	A
Single Pulse Avalanche Energy ³		EAS	320	mJ
Total Power Dissipation	$T_c = 25^\circ C$	P_D	112	W
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-Ambient ¹	$R_{\theta JA}$	56	$^\circ C/W$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	1.12	$^\circ C/W$

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	60	-	-	V
Gate-Body Leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V	-	-	1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source on-Resistance ²	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	2.5	3.2	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 30V, V _{GS} =0V, f =1MHz	-	4683	-	pF
Output Capacitance	C _{oss}		-	1192	-	
Reverse Transfer Capacitance	C _{rss}		-	69	-	
Switching Characteristics						
Gate Resistance	R _g	V _{DS} =0V , V _{GS} =0V , f=1MHz	-	2.2	-	Ω
Total Gate Charge	Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D =50A	-	96	-	nC
Gate-Source Charge	Q _{gs}		-	19.5	-	
Gate-Drain Charge	Q _{gd}		-	12.1	-	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DS} =30V, R _G = 2Ω, I _D = 25A	-	20.8	-	nS
Rise Time	t _r		-	5.2	-	
Turn-off Delay Time	t _{d(off)}		-	78.8	-	
Fall Time	t _f		-	24.9	-	
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	-	-	160	A
Reverse Recovery Time	t _{rr}	I _F = 20A, dI _F /dt=100A/μs	-	67	-	nS
Reverse Recovery Charge	Q _{rr}		-	72	-	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 $V_{DD}=30V, V_{GS}=10V, L=0.4mH, I_{AS}=40A$
4. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

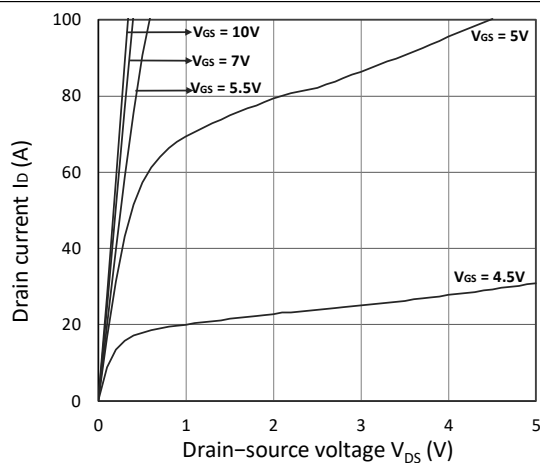


Figure 1. Output Characteristics

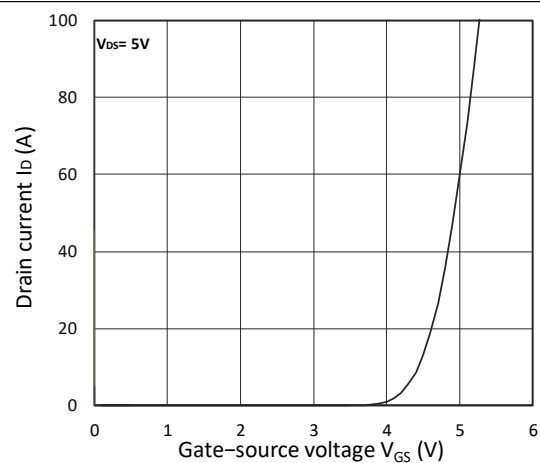


Figure 2. Transfer Characteristics

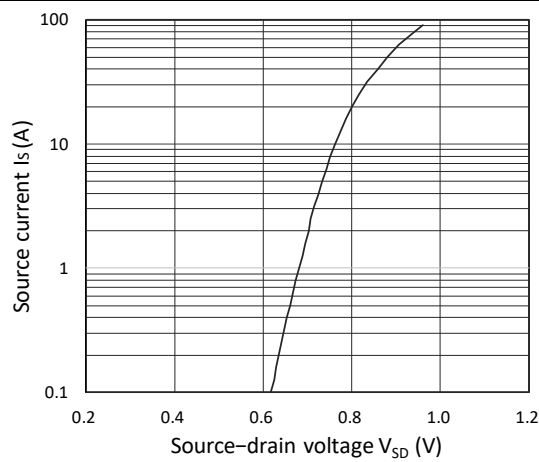
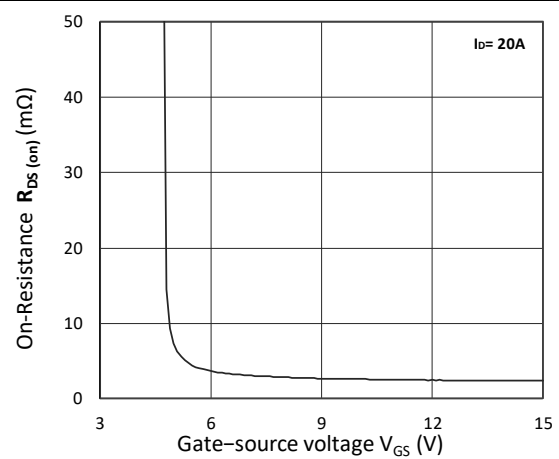
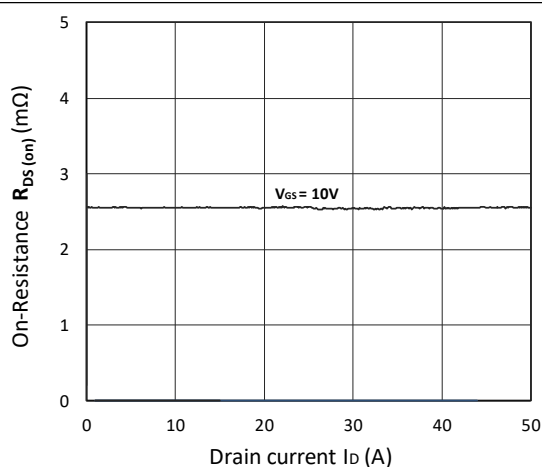
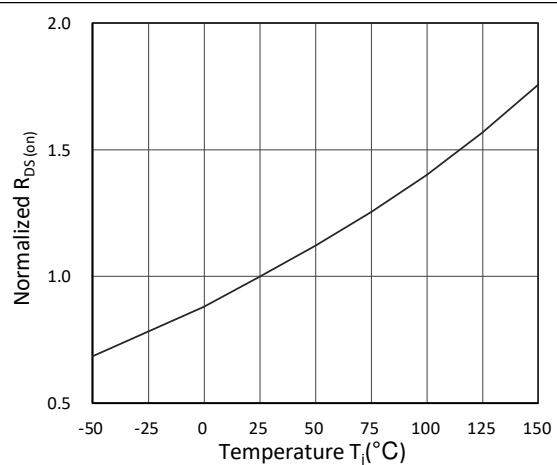


Figure 3. Forward Characteristics of Reverse

Figure 4. $R_{DS(on)}$ vs. V_{GS} Figure 5. $R_{DS(on)}$ vs. I_D Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

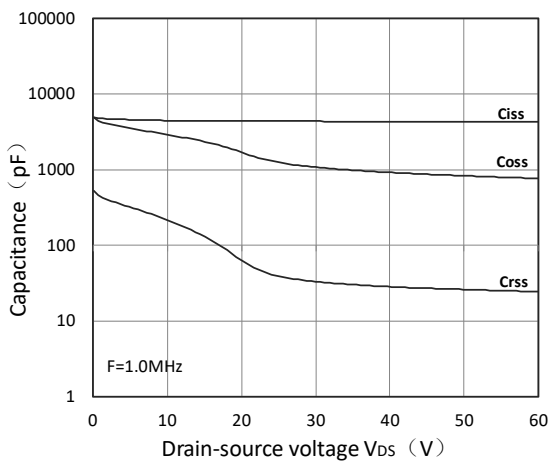


Figure 7. Capacitance Characteristics

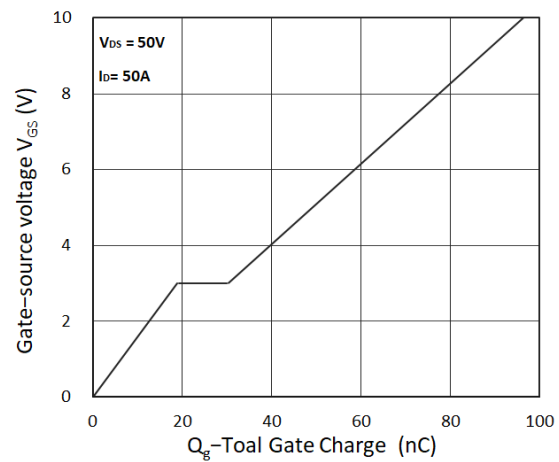


Figure 8. Gate Charge Characteristics

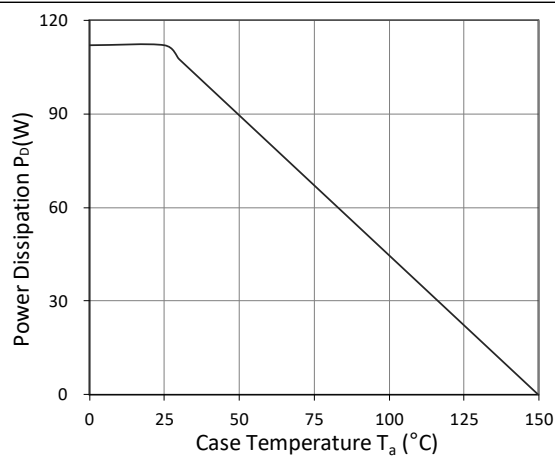


Figure 9. Power Dissipation

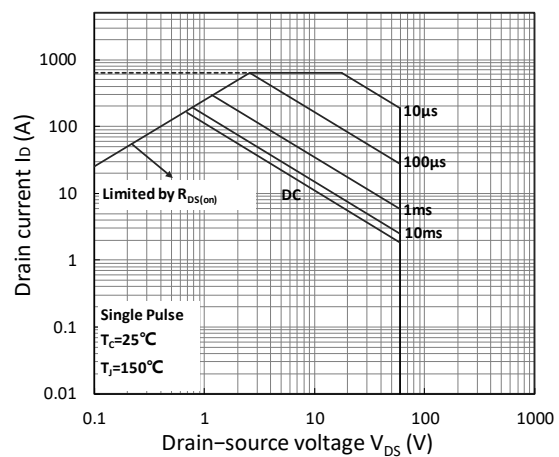


Figure 10. Safe Operating Area

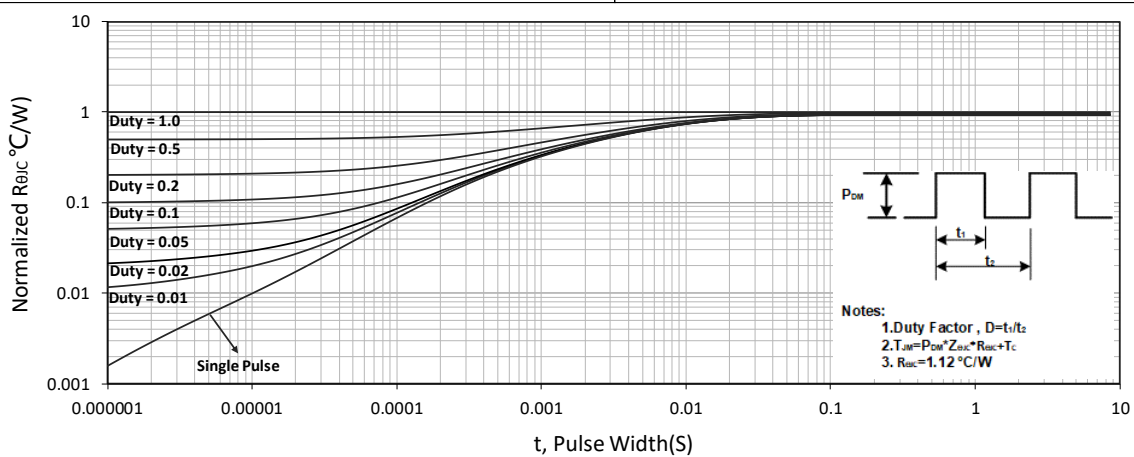


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

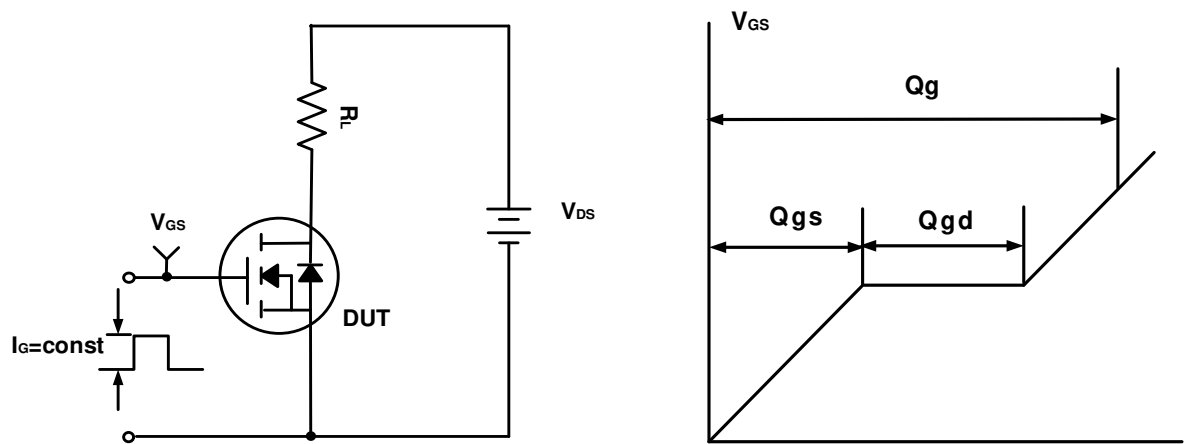


Figure A. Gate Charge Test Circuit & Waveforms

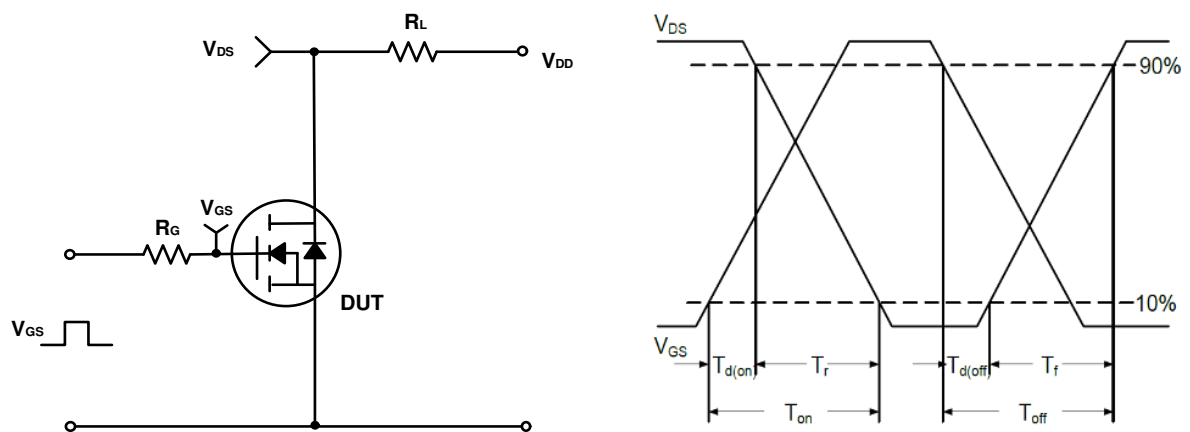


Figure B. Switching Test Circuit & Waveforms

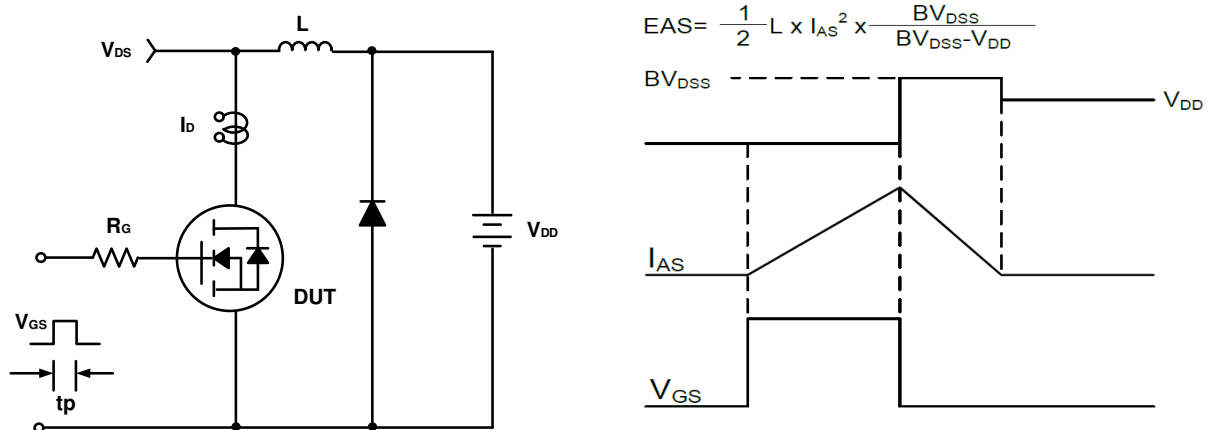
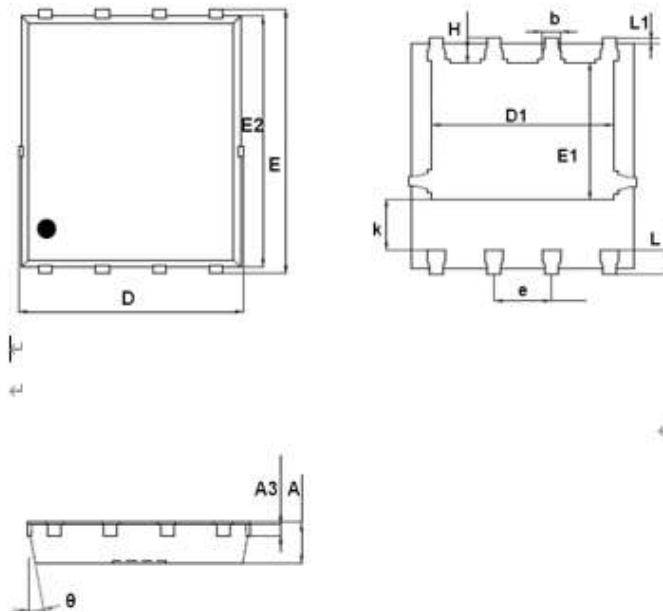


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for PDFN5060-8L



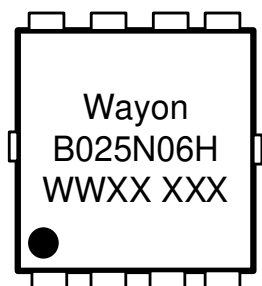
COMMON DIMENSIONS

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	5.50	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	0.71
θ	0°	12°

Ordering Information

Part	Package	Marking	Packing method
WMB025N06HG2	PDFN5060-8L	B025N06H	Tape and Reel

Marking Information



WMB025N06HG2 = Device code

WWXX XXX= Date code

Contact Information

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