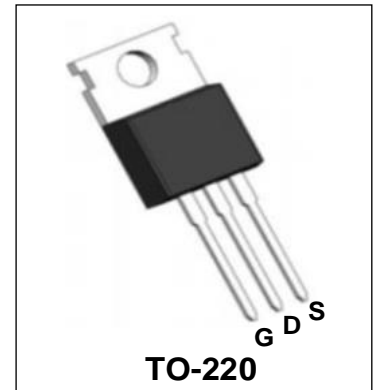


## 60V N-Channel Enhancement Mode Power MOSFET

### Description

WMK025N06HG2 uses Wayon's 2<sup>nd</sup> 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.

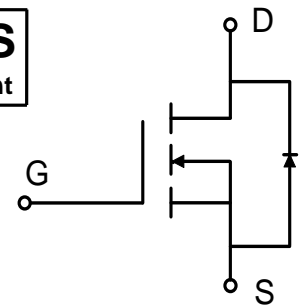


### Features

- $V_{DS} = 60V$ ,  $I_D = 200A$   
 $R_{DS(on)} < 3.2m\Omega @ V_{GS} = 10V$
- Low  $R_{DS(on)}$
- Low Gate Charge
- 100% EAS Guaranteed



**RoHS**  
compliant



### Applications

- Synchronous Rectification
- DC/DC Converter

### Absolute Maximum Ratings (T<sub>c</sub> = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source voltage		$V_{DS}$	60	V
$V_{DS}$ Spike	10 $\mu$ s	$V_{SPIKE}$	68	V
Gate-Source voltage		$V_{GS}$	$\pm 20$	V
$V_{GS}$ Spike	10 $\mu$ s	$V_{SPIKE}$	$\pm 25$	V
Continuous Drain Current	T <sub>c</sub> =25°C	$I_D$	200	A
	T <sub>c</sub> =100°C		126.5	
Pulsed Drain Current <sup>4</sup>		$I_{DM}$	800	A
Single Pulse Avalanche Energy <sup>3</sup>		<b>EAS</b>	320	mJ
Total Power Dissipation	T <sub>c</sub> =25°C	$P_D$	245	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 <sup>1</sup>	$R_{\theta JA}$	32	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	0.51	°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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	-	-	V
Gate-Body Leakage current	$I_{gss}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$	-	-	0.1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-Source on-Resistance <sup>2</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	2.5	3.2	m $\Omega$
<b>Dynamic Characteristics</b>						
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	-	
<b>Switching Characteristics</b>						
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V,$ $f=1MHz$	-	2	-	$\Omega$
Total Gate Charge	$Q_g$	$V_{GS} = 10V, V_{DS} = 50V,$ $I_D=20A$	-	96	-	nC
Gate-Source Charge	$Q_{gs}$		-	19.5	-	
Gate-Drain Charge	$Q_{gd}$		-	12.1	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 30V,$ $R_G = 2\Omega, I_D = 20A$	-	20.8	-	nS
Rise Time	$t_r$		-	5.2	-	
Turn-off Delay Time	$t_{d(off)}$		-	78.8	-	
Fall Time	$t_f$		-	24.9	-	
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$	-	-	1.2	V
Continuous Source Current <sup>1,5</sup>	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	200	A

## Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> 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  $V_{DD}=40V, V_{GS}=10V, L=0.4mH, I_{AS}=40A$
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

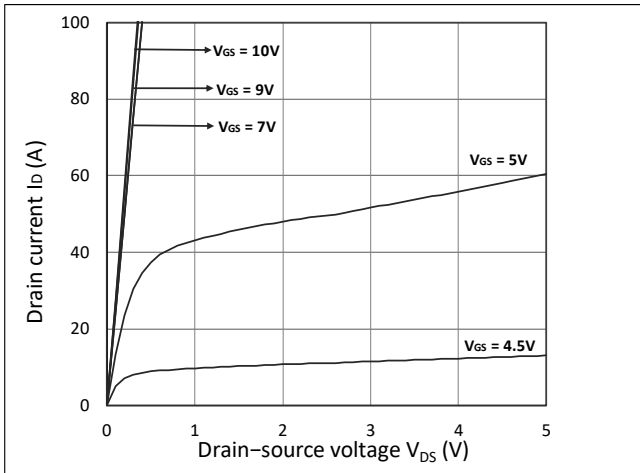


Figure 1. Output Characteristics

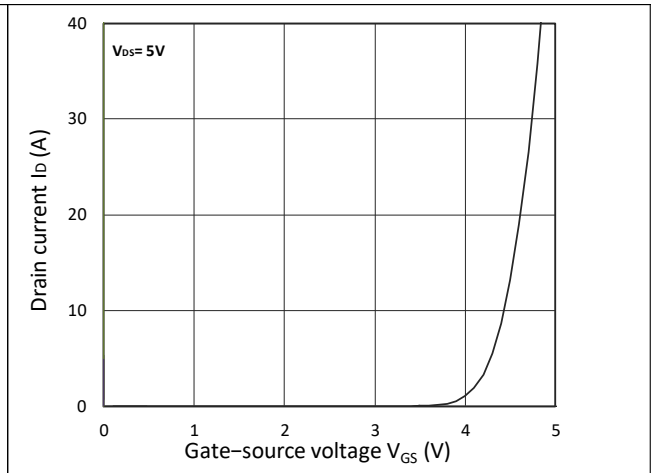


Figure 2. Transfer Characteristics

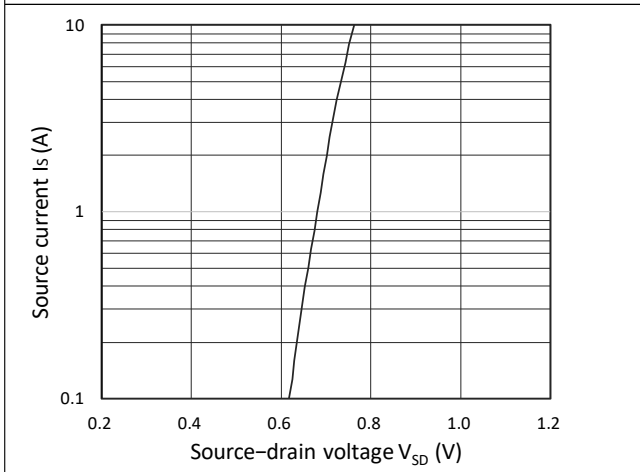


Figure 3. Forward Characteristics of Reverse

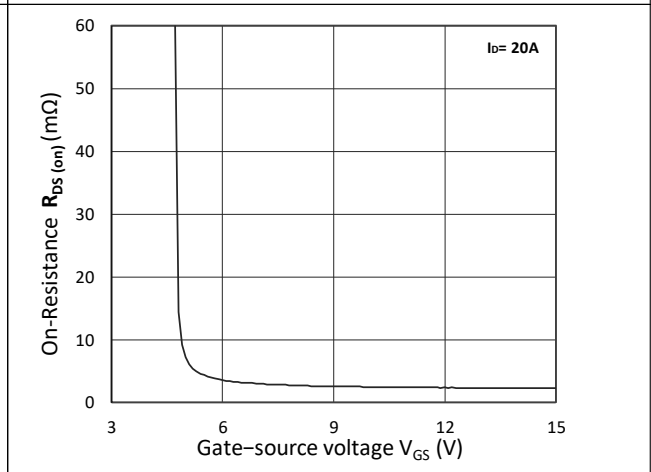


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

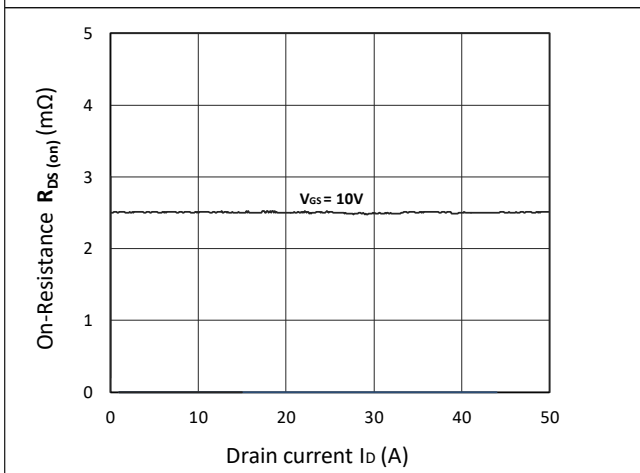


Figure 5.  $R_{DS(ON)}$  vs.  $I_D$

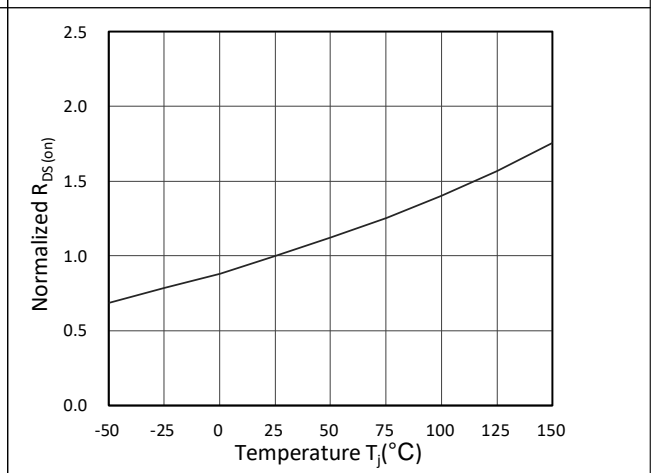


Figure 6. Normalized  $R_{DS(ON)}$  vs. Temperature

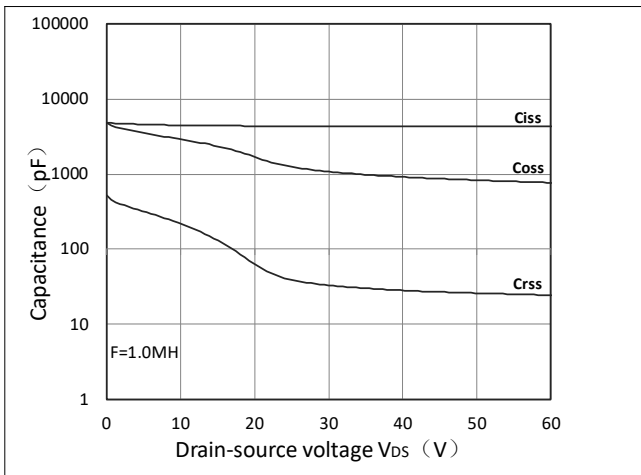


Figure 7. Capacitance Characteristics

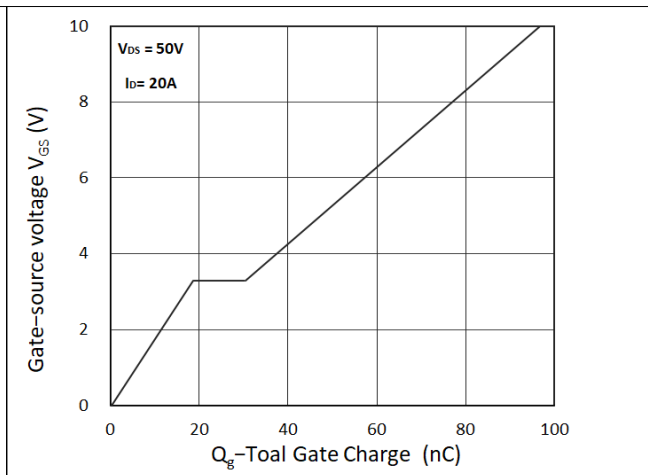


Figure 8. Gate Charge Characteristics

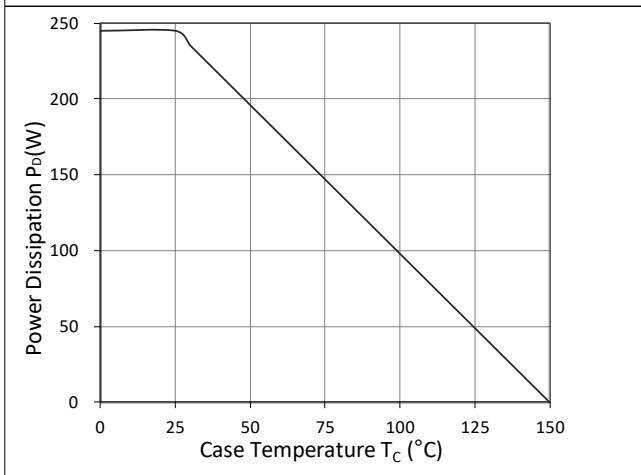


Figure 9. Power Dissipation

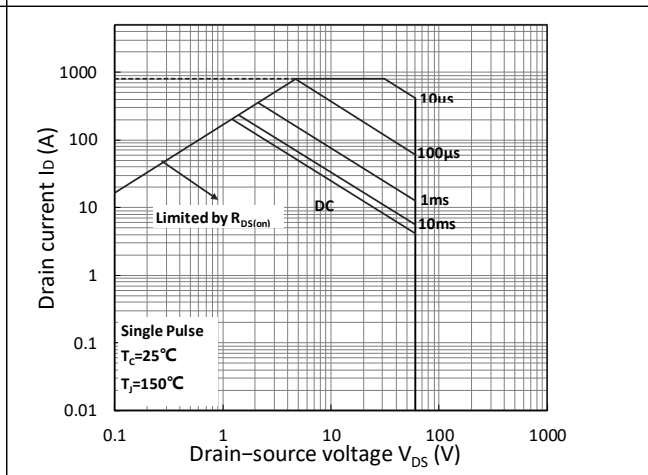


Figure 10. Safe Operating Area

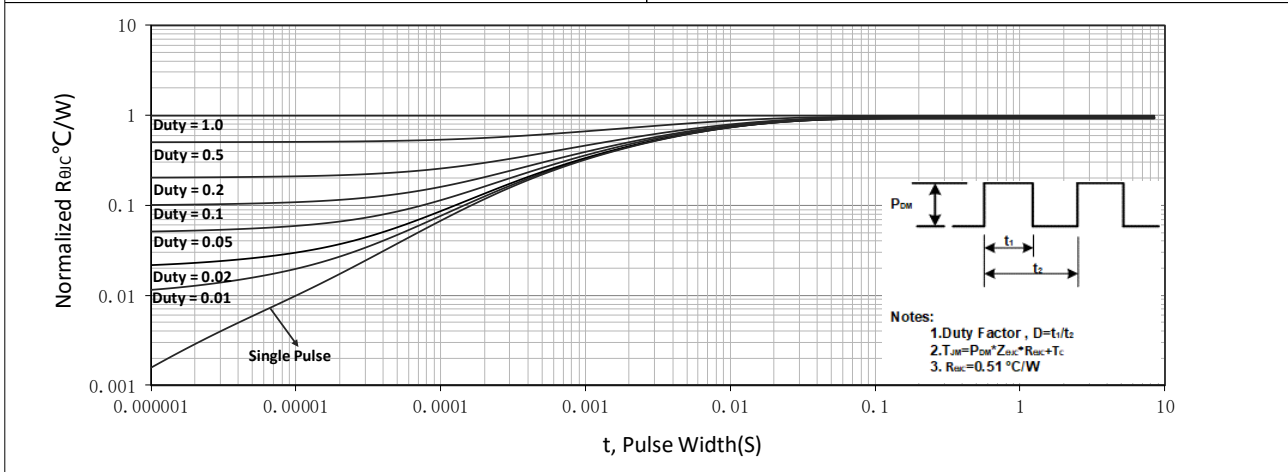


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

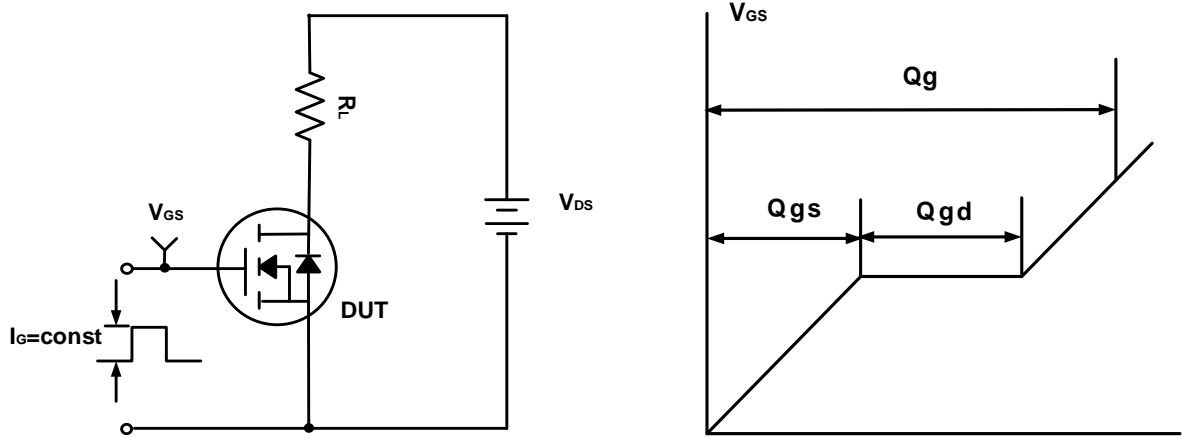


Figure A. Gate Charge Test Circuit & Waveforms



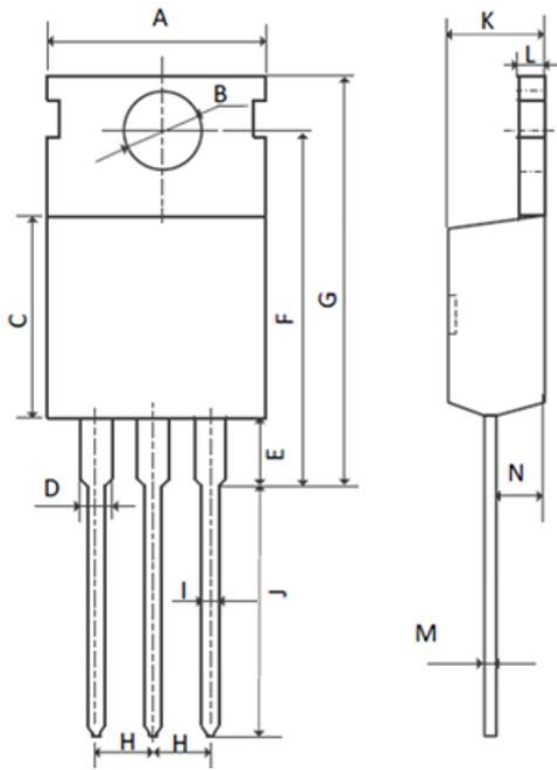
Figure B. Switching Test Circuit & Waveforms



Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TO-220

COMMON DIMENSIONS

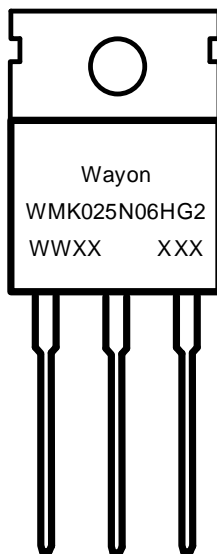


SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60

## Ordering Information

Part	Package	Marking	Packing method
WMK025N06HG2	TO-220	WMK025N06HG2	Tube

## Marking Information



WMK025N06HG2 = Device code

WWXX XXX= Date code

## Contact Information

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