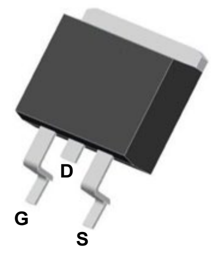
WMM053NV8HGS

85V N-Channel Enhancement Mode Power MOSFET

Description

WMM053NV8HGS uses Wayon's advanced 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 applications.

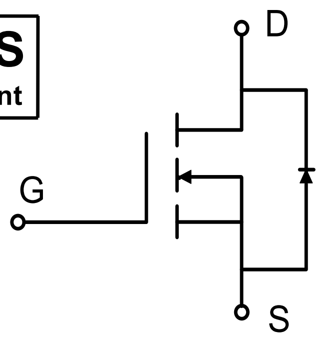


TO-263

Features

- V_{DS}= 85V, I_D = 125A
  $R_{DS(on)}$ < 5.5mΩ @ V_{GS} = 10V
- High Speed Power Switching
- Low Gate Charge
- Low $R_{DS(ON)}$
- 100% EAS Guaranteed

RoHS compliant



Applications

- Battery Management System
- Power Management Switching
- Motor Drive

Absolute Maximum Ratings (Tc = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	85	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	125	A
	T_C=100°C		79	
Pulsed Drain Current[4]		I_{DM}	500	A
Single Pulse Avalanche Energy[3]		EAS	204.8	mJ
Total Power Dissipation[4]	T_C=25°C	P_D	162	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]	$R_{\theta JA}$	58	°C/W
Thermal Resistance from Junction-to-Lead	$R_{\theta JC}$	0.77	°C/W

Electrical Characteristics (Tc = 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	85	-	-	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} = 80V, V_{GS} = 0V	-	-	1	μA
	T_J=100°C			-	-	100	
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	-	4.6	5.5	mΩ
Forward Transconductance[2]		**g_{fs}**	V_{DS} = 5V, I_D =20A	-	55	-	S
Dynamic Characteristics							
Input Capacitance		**C_{iss}**	V_{DS} = 40V, V_{GS} =0V, f =1MHz	-	4645	-	pF
Output Capacitance		**C_{oss}**		-	673	-	
Reverse Transfer Capacitance		**C_{rss}**		-	41	-	
Switching Characteristics							
Gate Resistance		**R_g**	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	1.8	-	Ω
Total Gate Charge		**Q_g**	V_{GS} = 10V, V_{DS} = 40V, I_D= 50A	-	61.3	-	nC
Gate-Source Charge		**Q_{gs}**		-	21	-	
Gate-Drain Charge		**Q_{gd}**		-	11	-	
Turn-on Delay Time		**$t_{d(on)}$**	V_{GS} =10V, V_{DS} = 40V, R_G = 3Ω, I_D= 50A	-	16.5	-	ns
Rise Time		**t_r**		-	51.8	-	
Turn-off Delay Time		**$t_{d(off)}$**		-	37.1	-	
Fall Time		**t_f**		-	8.2	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[2]		**V_{SD}**	I_S = 50A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current[1,5]		**I_S**	V_G = V_D= 0V , Force Current	-	-	125	A
Reverse Recovery Time[2]		**t_{rr}**	I_F=20A, di/dt = 100A/μS	-	69	-	ns
Reverse Recovery Charge[2]		**Q_{rr}**		-	141	-	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 ≤ 300us , duty cycle ≤ 2%

3. The EAS data shows Max. rating . The test condition is V_{DD}=35V, V_{GS}=10V, L=0.4mH, I_{AS}=32A

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.

Typical Characteristics

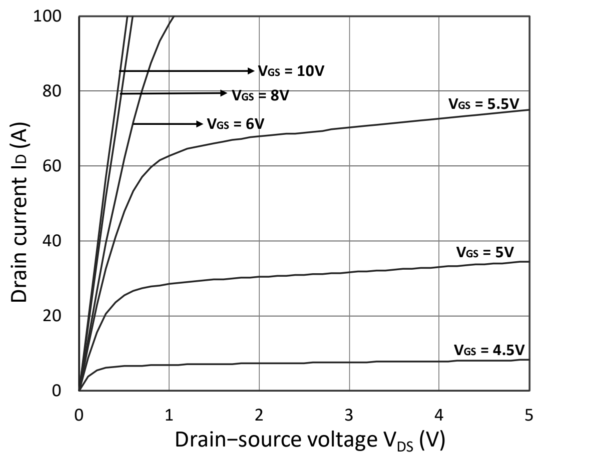


Figure 1. Output Characteristics

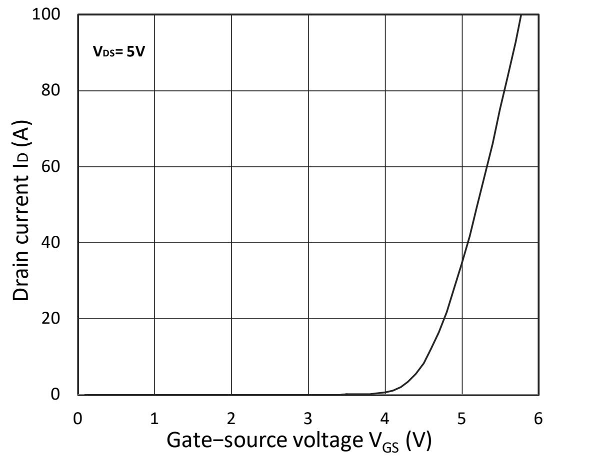


Figure 2. Transfer Characteristics

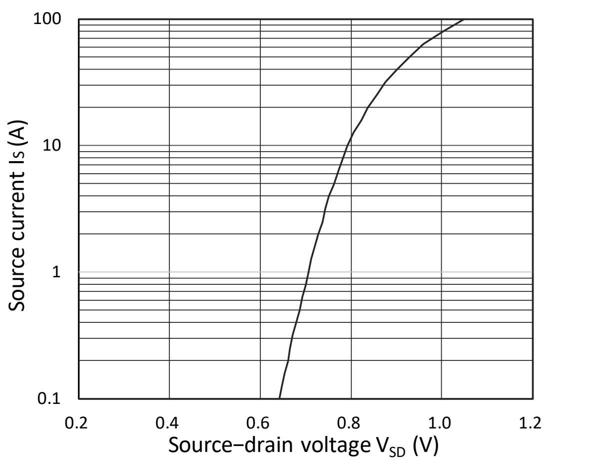


Figure 3. Forward Characteristics of Reverse

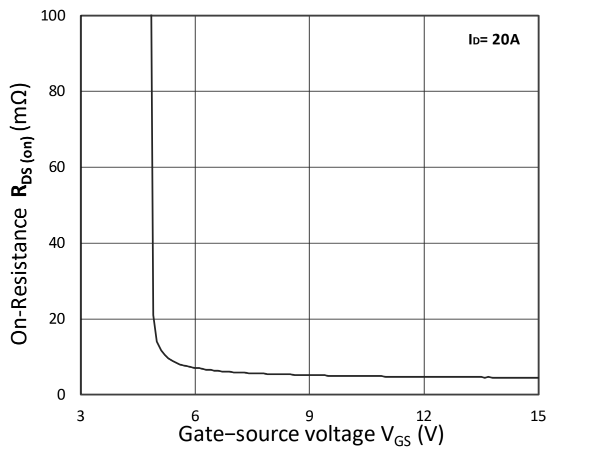


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

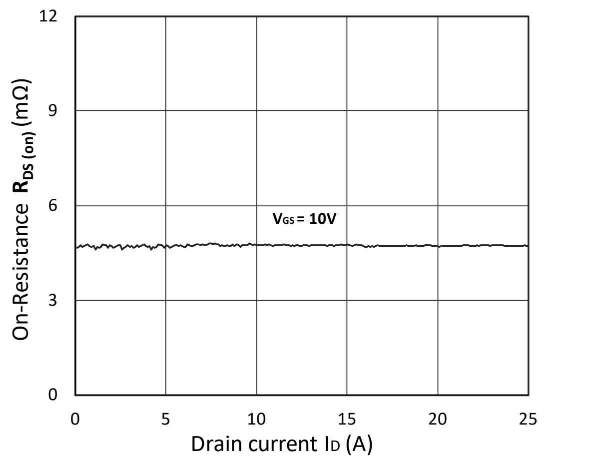


Figure 5. $R_{DS(ON)}$ vs. I_D

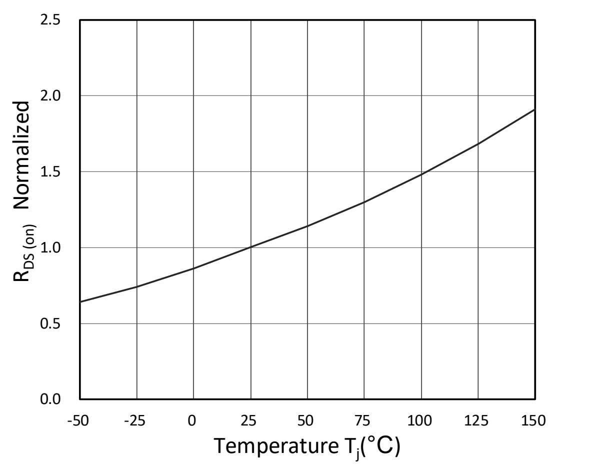


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

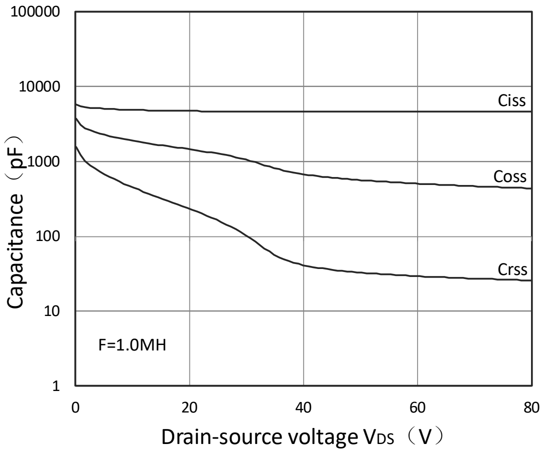


Figure 7. Capacitance Characteristics

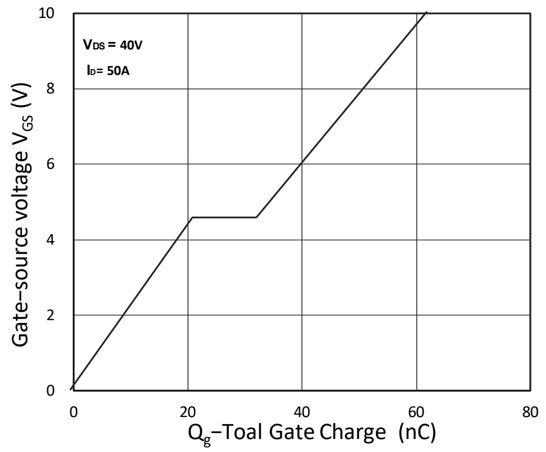


Figure 8. Gate Charge Characteristics

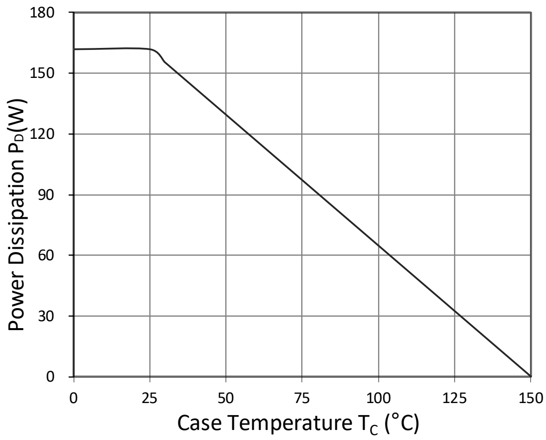


Figure 9. Power Dissipation

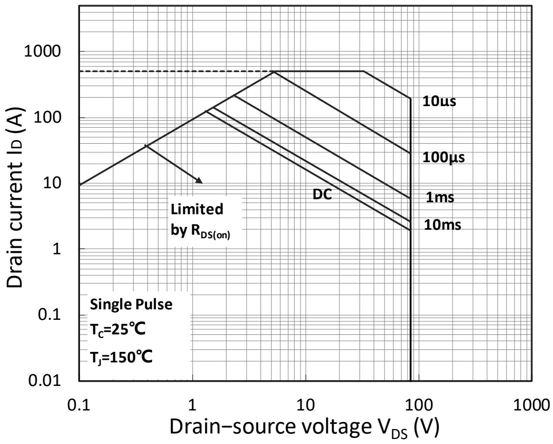


Figure10. Safe Operating Area

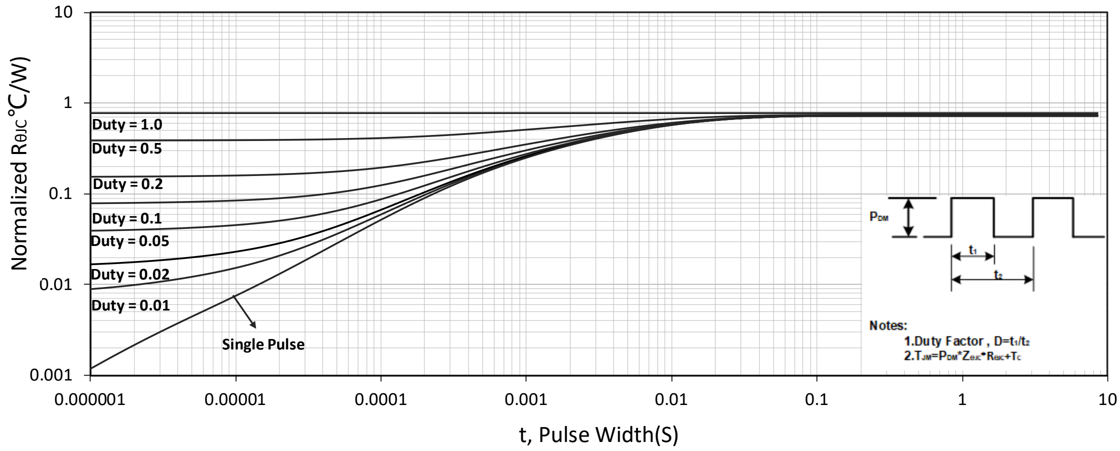


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

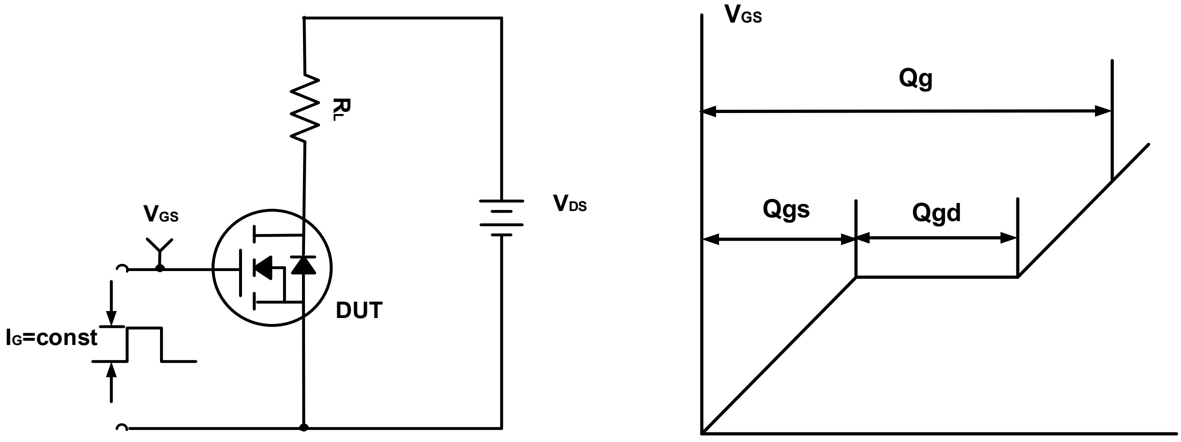


Figure A. Gate Charge Test Circuit & Waveforms

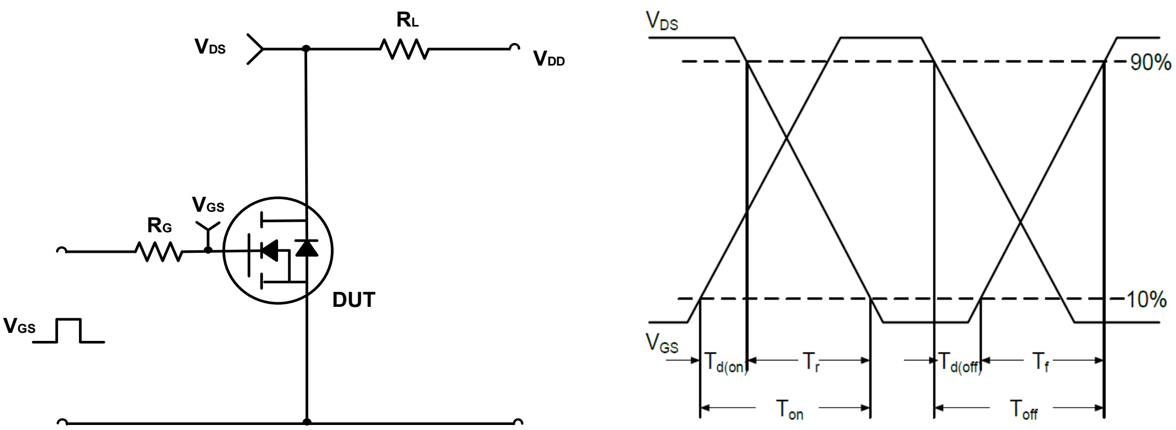


Figure B. Switching Test Circuit & Waveforms

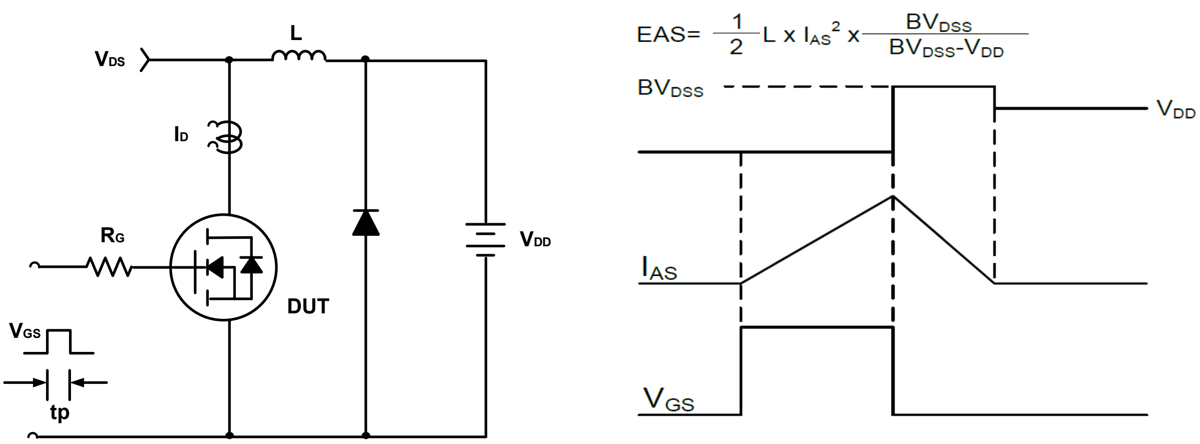
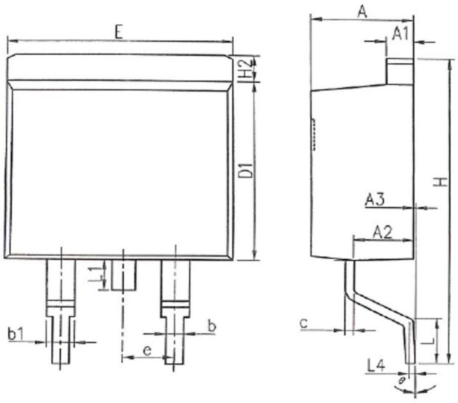
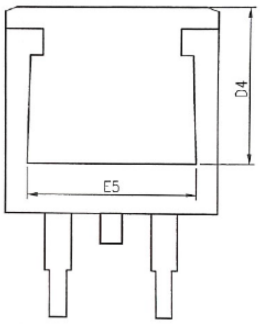


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TO-263





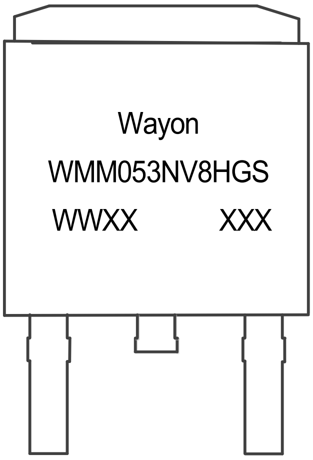
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.37	4.89
A1	1.17	1.42
A2	2.20	2.90
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.28	0.60
D1	8.45	9.30
D4	6.60	-
E	9.80	10.40
E5	7.06	-
e	2.54BSC	
H	14.70	15.70
H2	1.07	1.47
L	2.00	2.80
L1	-	1.75
L4	0.254BSC	
θ	0°	9°

Ordering Information

Part	Package	Marking	Packing method
WMM053NV8HGS	TO-263	WMM053NV8HGS	Tape and Reel

Marking Information



WMM053NV8HGS = 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.

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