

## PRODUCT FEATURES

- Proprietary New Trench Technology
- $R_{DS(ON),typ}=1.5m\Omega@V_{GS}=10V$
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Schottky Diode
- 10K  $\Omega$  Gate Protected Resistance Inside
- Inside the module,each MOSFET chip has a gate resistance:10 $\Omega$



## APPLICATIONS

- High efficiency DC/DC Converters
- ISG EV Products
- UPS inverter

Type	$V_{DS}$	$I_D$	$R_{DS(ON),max}$ $T_J=25^\circ C$	$T_{Jmax}$	Marking	Package
MMN550WB025B	250V	550A	1.75m $\Omega$	175 $^\circ C$	MMN550WB025B	NWB

## ABSOLUTE MAXIMUM RATINGS( $T_C=25^\circ C$ unless otherwise specified)

Symbol	Parameter/Test Conditions	Values	Unit
$V_{DSS}$	Drain - Source Voltage	$T_J=25^\circ C$	V
$V_{GSS}$	Gate - Source Voltage		
$I_D$	Continuous Drain Current	$T_C=25^\circ C, T_{Jmax}=175^\circ C$	690
		$T_C=80^\circ C, T_{Jmax}=175^\circ C$	550
$I_{DM}$	Pulsed Drain Current at $V_{GS}=10V$	Limited by $T_{Jmax}$	1100
$P_D$	Maximum Power Dissipation	$T_C=25^\circ C, T_{Jmax}=175^\circ C$	2500
$E_{AS}$	Single Pulse Avalanche Energy	$V_{DD}=50V, L=1mH$	5000

## THERMAL AND MODULE CHARACTERISTICS ( $T_C=25^\circ C$ unless otherwise specified)

Symbol	Parameter/Test Conditions	Values	Unit
$R_{thJC}$	Thermal resistance, junction to case Per MOSFET	0.06	K/W
$T_{Jmax}$	Max. Junction Temperature	175	$^\circ C$
$T_{STG}$	Storage Temperature Range	-40~125	
$V_{isol}$	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	3000
Torque	to heatsink	Recommended (M5)	2.5~5
	to terminal	Recommended (M6)	3~5
Weight		350	g

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# MMN550WB025B

## MOSFET

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit	
$V_{(BR)DSS}$	Drain Source Breakdown Voltage	$V_{GS}=0V, I_D=12mA$	250			V	
$R_{DS(ON)}$	Drain Source ON Resistance	$V_{GS}=10V, I_D=550A$		1.5	1.75	m $\Omega$	
$I_{DSS}$	Drain Source Leakage Current	$V_{DS}=250V, V_{GS}=0V$			500	$\mu A$	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=3.24mA$	2	3	4	V	
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-400		400	nA	
$R_{gint}$	Integrated Gate Resistor			1.05		$\Omega$	
$Q_g$	Total Gate Charge	$V_{DD}=100V, I_D=300A, V_{GS}=10V$		768		nC	
$Q_{gs}$	Gate Source Charge			264		nC	
$Q_{gd}$	Gate Drain Charge			84		nC	
$C_{iss}$	Input Capacitance			64		nF	
$C_{oss}$	Output Capacitance	$V_{DS}=100V, V_{GS}=0V, f=1MHz$		3.6		nF	
$C_{rss}$	Reverse Transfer Capacitance			48		pF	
$t_{d(on)}$	Turn on Delay Time	$V_{DD}=100V, I_D=250A, R_G=2.7\Omega, V_{GS}=10V$ (Inductive Load)	$T_J=25^\circ\text{C}$		230		ns
$t_r$	Rise Time				140		ns
$t_{d(off)}$	Turn off Delay Time				350		ns
$t_f$	Fall Time				90		ns

### Source-Drain BODY-DIODE CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
$I_{SD}$	Continuous Source Drain Current				690	A
$I_{SDM}$	Pulse Source Drain Current	Limited by $T_{Jmax}$			1100	A
$V_{SD}$	Forward Voltage	$I_S=550A, V_{GS}=0V$		0.9	1.2	V
$t_{rr}$	Reverse Recovery time	$I_F=250A, V_{GS}=0V$ $dI_F/dt=-150A/\mu s$		215		ns
$Q_{RR}$	Reverse Recovery Charge			22.5		$\mu C$

### NTC CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
$R_{25}$	Resistance	$T_C = 25^\circ\text{C}$		5		K $\Omega$
$B_{25/50}$	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298.15 \text{ K}))]$			3375		K

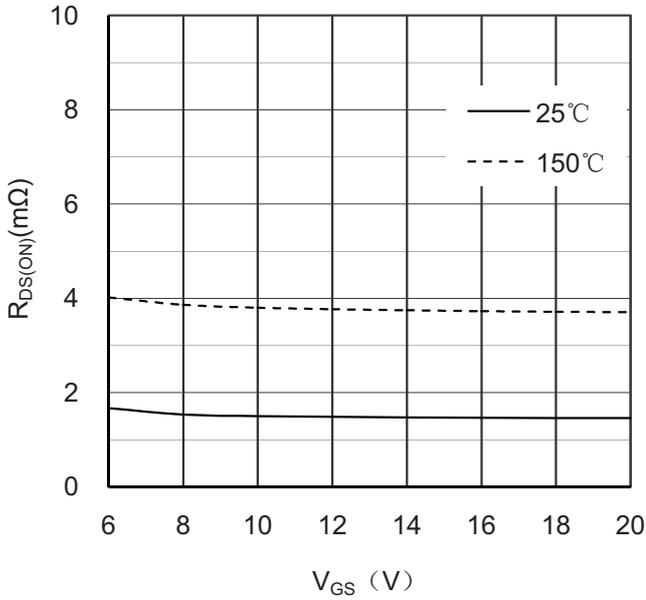


Figure 1. Typical  $R_{DS(on)}$  vs Gate Voltage

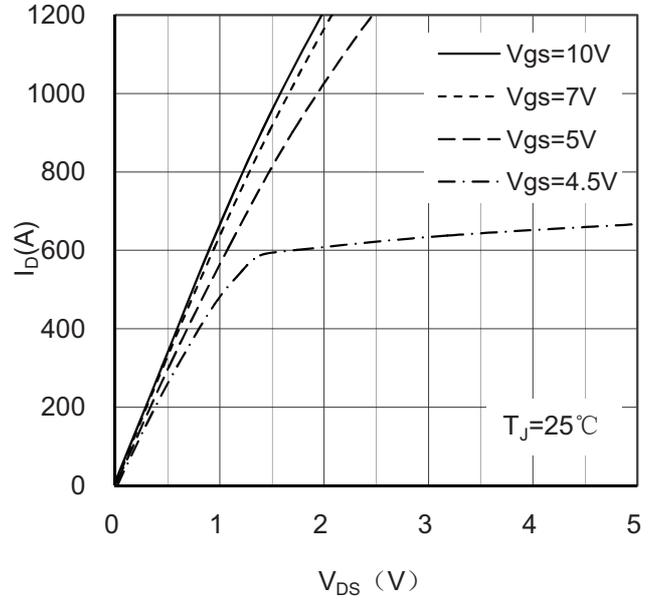


Figure 2. Typical Output Characteristics

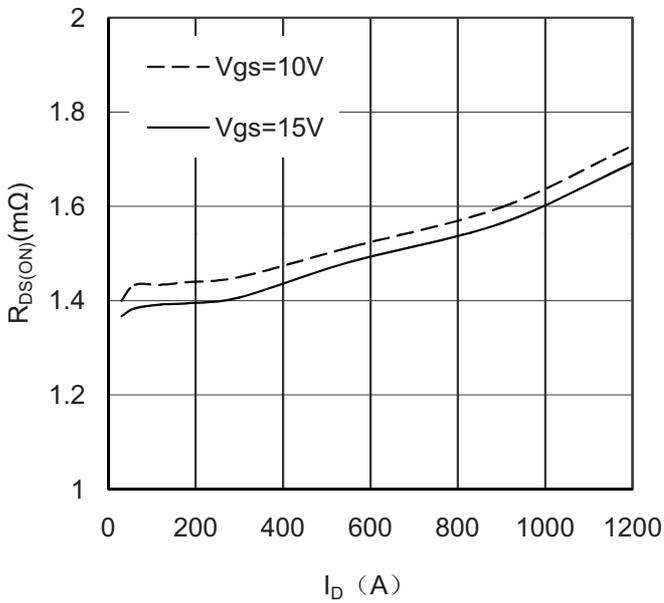


Figure 3. Drain-Source ON Resistance vs  $I_D$

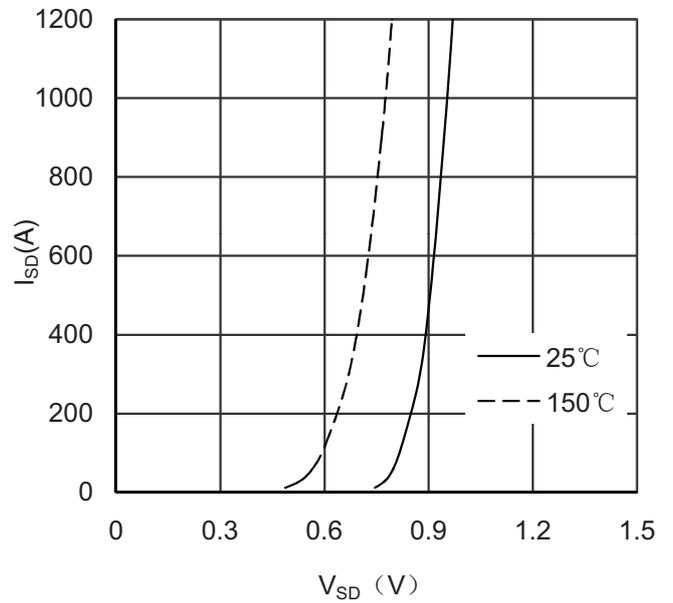


Figure 4. Source-Drain Voltage

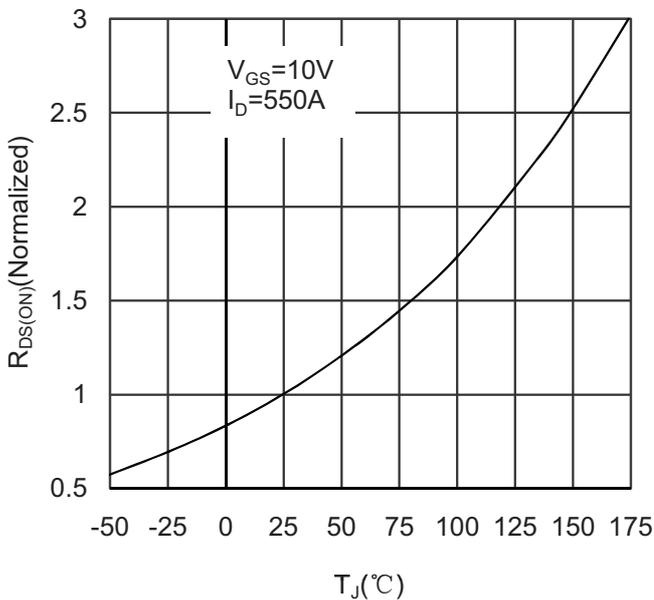


Figure 5. Drain-Source ON Resistance vs Junction Temperature

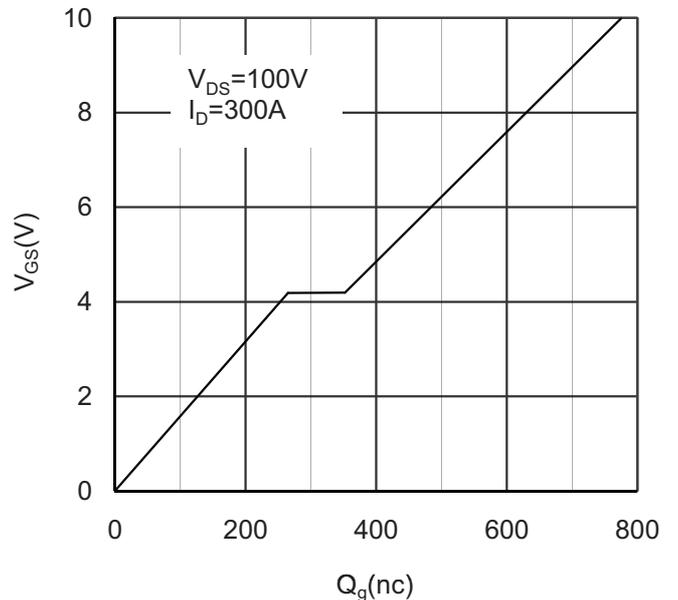


Figure 6. Gate Charge characteristics

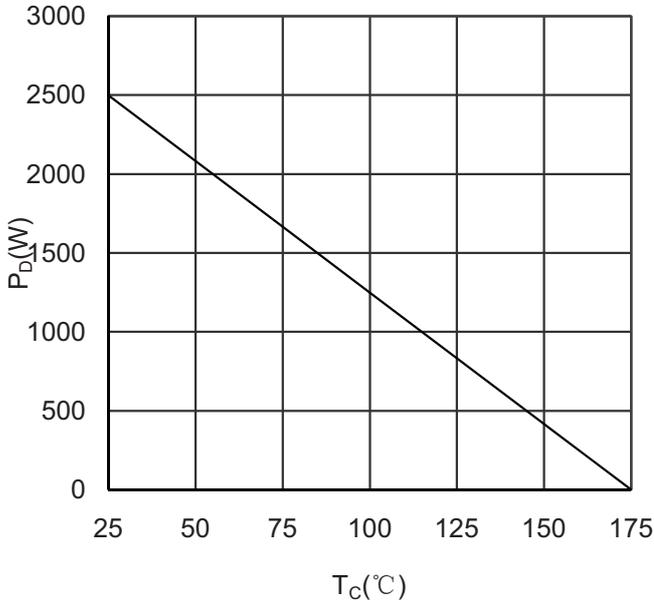


Figure 7. Maximum Power Dissipation vs Case Temperature

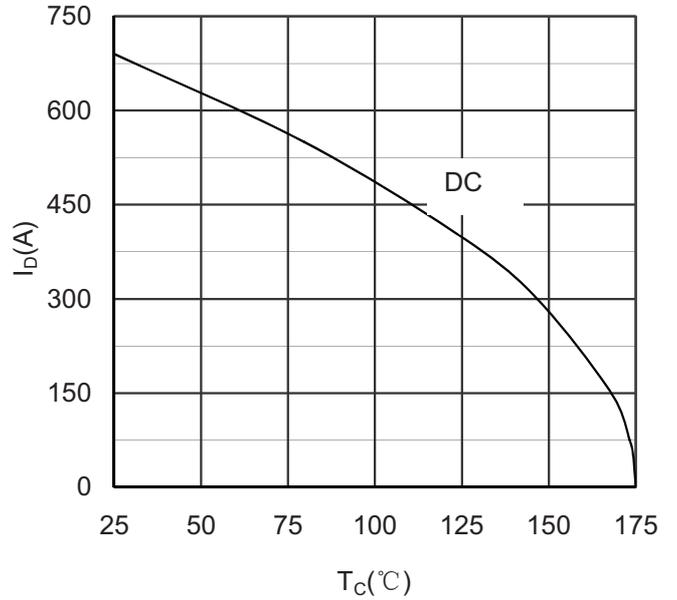


Figure 8. Maximum Continuous Drain Current vs Case Temperature

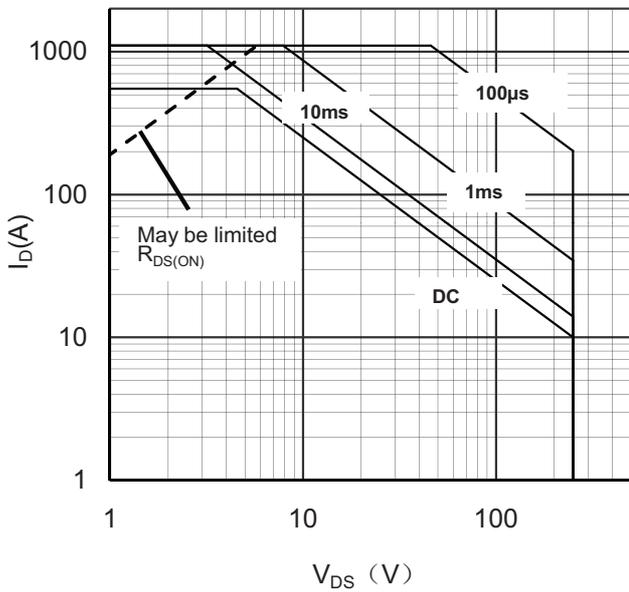


Figure 9. Maximum Forward Safe Operation Area

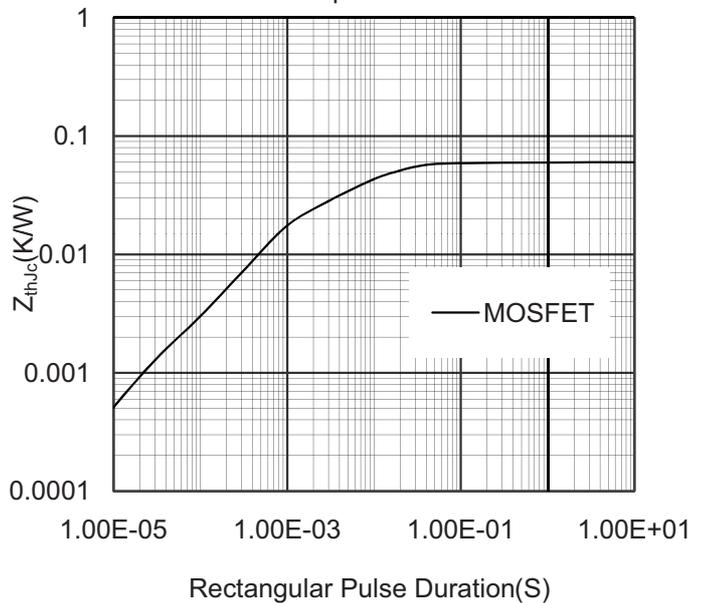


Figure 10. Transient Thermal Impedance

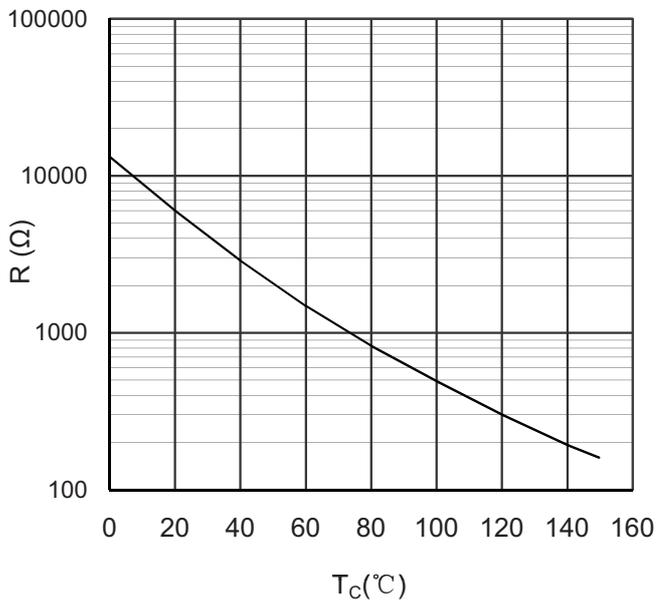


Figure 11. NTC Characteristics

