

## PRODUCT FEATURES

- $R_{DS(ON),typ}=0.57m\Omega@V_{GS}=10V$
- 175°C operating temperature
- Low Gate Charge Minimize Switching Loss
- Fast Recovery body Diode
- 10K  $\Omega$  Gate Protected Resistance Inside



## APPLICATIONS

- High efficiency DC/DC Converters
- Synchronous Rectifier

Type	$V_{DS}$	$I_D$	$R_{DS(ON),max}$ $T_J=25^\circ C$	$T_{Jmax}$	Marking	Package
MMN1000DB010B	100V	1000A	0.75m $\Omega$	175°C	MMN1000DB010B	NDB

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

Symbol	Parameter/Test Conditions		Values	Unit
$V_{DSS}$	Drain - Source Voltage	$T_J=25^\circ C$	100	V
$V_{GSS}$	Gate - Source Voltage		$\pm 20$	
$I_D$	Continuous Drain Current	$T_C=25^\circ C$	1250	A
		$T_C=80^\circ C$	1000	
$I_{DM}$	Pulsed Drain Current at $V_{GS}=10V$	Limited by $T_{Jmax}$	2000	
$P_D$	Maximum Power Dissipation		1360	W
$E_{AS}$	Single Pulse Avalanche Energy	$V_{DD}=50V, L=1mH$	2500	mJ

## 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		0.11	K/W
$T_{Jmax}$	Max. Junction Temperature		175	°C
$T_{STG}$	Storage Temperature Range		-40~125	
$V_{isol}$	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	3000	V
Torque	to heatsink	Recommended (M5)	2.5~5	Nm
	to terminal	Recommended (M5)	2.5~5	
Weight			240	g

MacMic Science & Technology Co., Ltd.

Add: #18, Hua Shan Zhong Lu, New District, Changzhou City, Jiangsu Province, P. R. of China

# MMN1000DB010B

## 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	$V_{GS}=0V, I_D=1mA$	100			V
$R_{DS(ON)}$	Drain Source ON Resistance	$V_{GS}=10V, I_D=500A(\text{chip})$		0.57	0.75	m $\Omega$
		$V_{GS}=10V, I_D=500A(\text{terminal})$		0.8	0.95	
$I_{DSS}$	Drain Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$			2	mA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=2mA$	2.0		4.0	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-2		2	mA
$R_{gint}$	Integrated Gate Resistor			1.6		$\Omega$
$Q_g$	Total Gate Charge	$V_{DD}=65V, I_D=600A, V_{GS}=10V$		1320		nC
$Q_{gs}$	Gate Source Charge			340		nC
$Q_{gd}$	Gate Drain Charge			450		nC
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		88		nF
$C_{oss}$	Output Capacitance			6.1		nF
$C_{rss}$	Reverse Transfer Capacitance			1.45		nF
$t_{d(on)}$	Turn on Delay Time	$V_{DD}=60V, I_D=200A,$ $R_G=5\Omega, V_{GS}=10V,$ Resistive Load	$T_J=25^\circ\text{C}$		15	ns
$t_r$	Rise Time				38	ns
$t_{d(off)}$	Turn off Delay Time				364	ns
$t_f$	Fall Time				23	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				1250	A
$I_{SDM}$	Pulse Source Drain Current	Limited by $T_{Jmax}$			2000	A
$V_{SD}$	Forward Voltage	$I_S=500A, V_{GS}=0V$		1.0	1.2	V
$t_{rr}$	Reverse Recovery time	$I_F=200A, V_{GS}=0V$		220		ns
$Q_{RR}$	Reverse Recovery Charge	$dI_F/dt=-100A/\mu s$		4400		nC

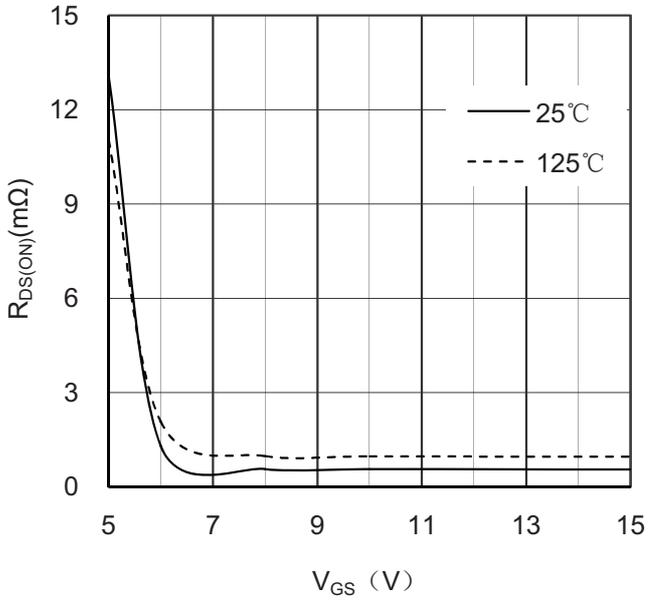


Figure 1. Typical  $R_{DS(ON)}$  vs Gate Voltage

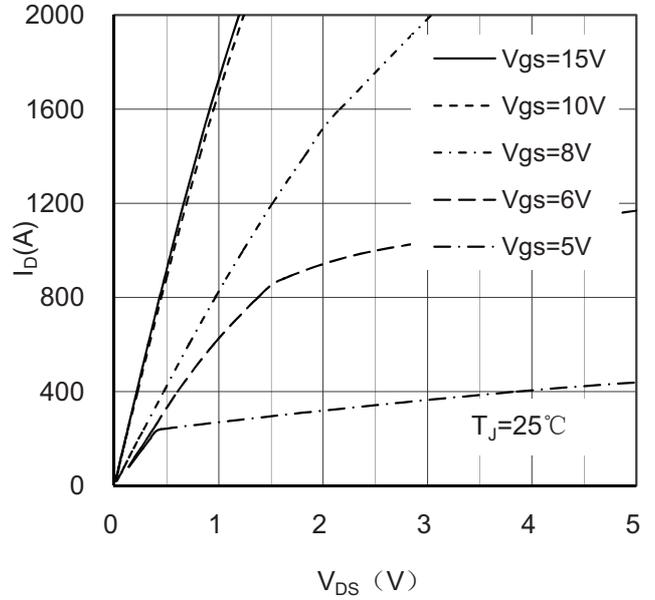


Figure 2. Typical Output Characteristics

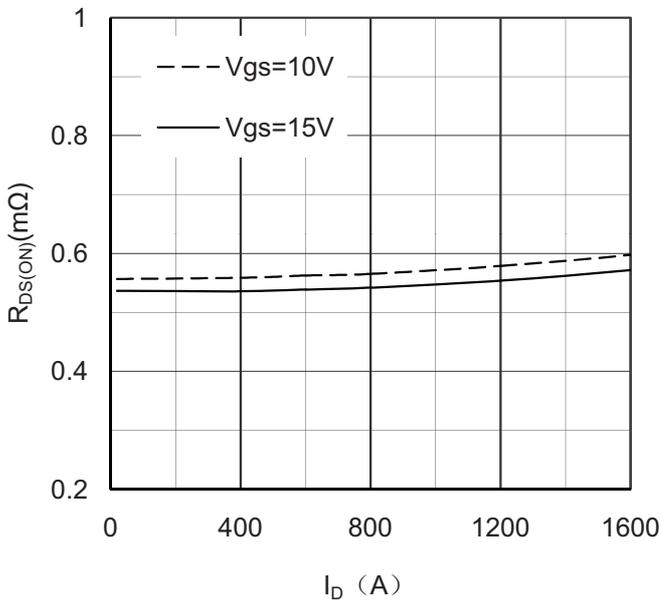


Figure 3. Drain-Source ON Resistance vs  $I_D$

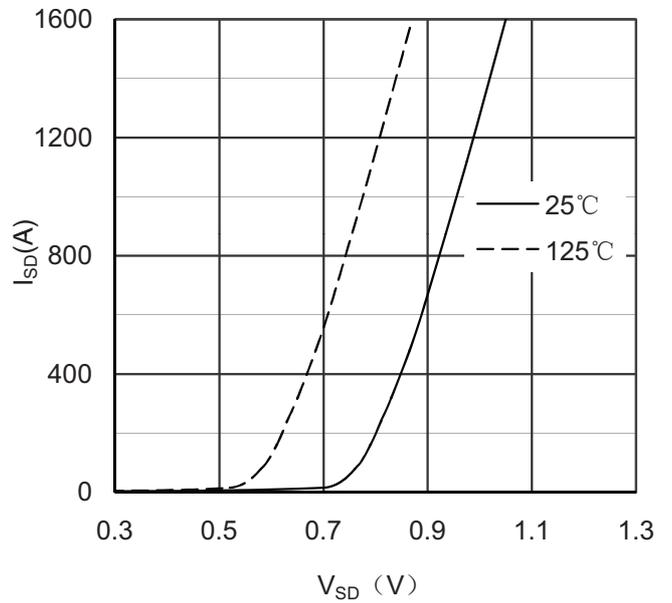


Figure 4. Source-Drain Voltage

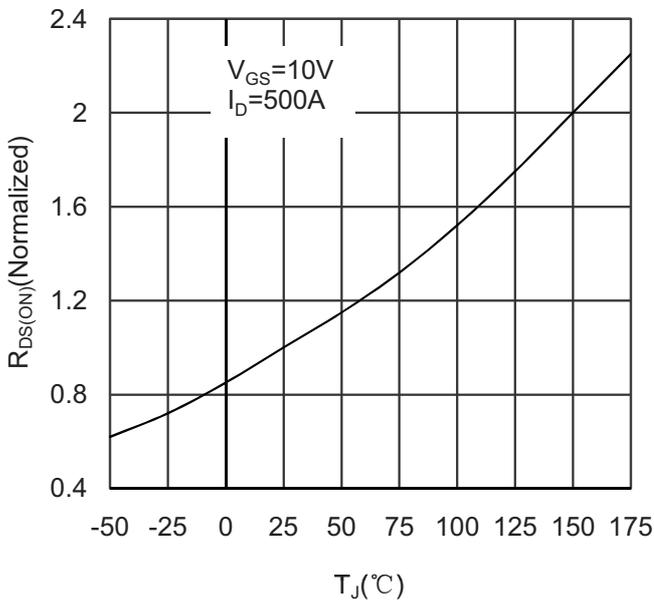


Figure 5. Drain-Source ON Resistance vs Junction Temperature

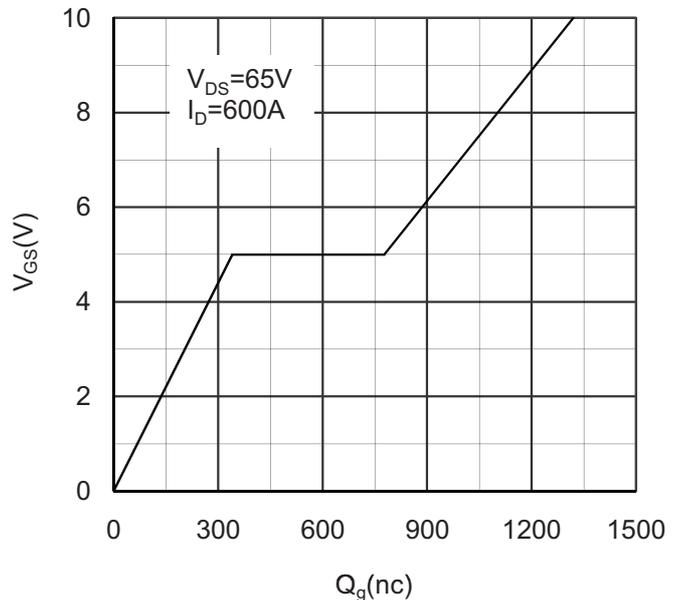


Figure 6. Gate Charge characteristics

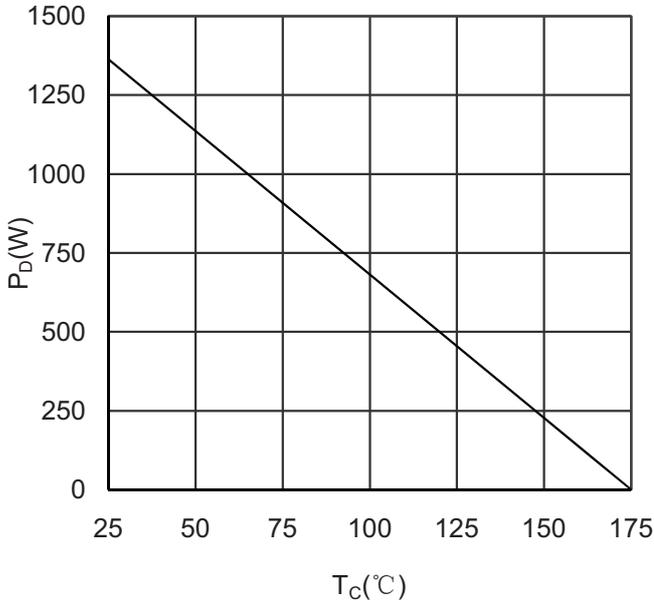


Figure 7. Maximum Power Dissipation vs Case Temperature

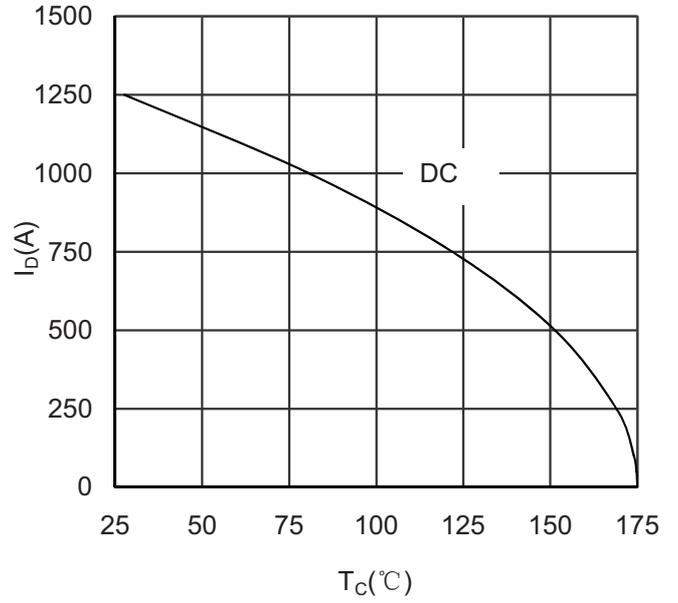


Figure 8. Maximum Continuous Drain Current vs Case Temperature

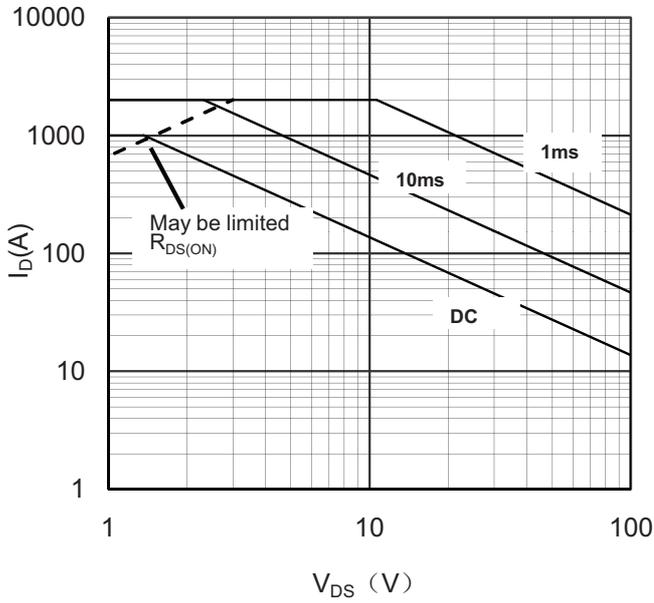


Figure 9. Maximum Forward Safe Operation Area

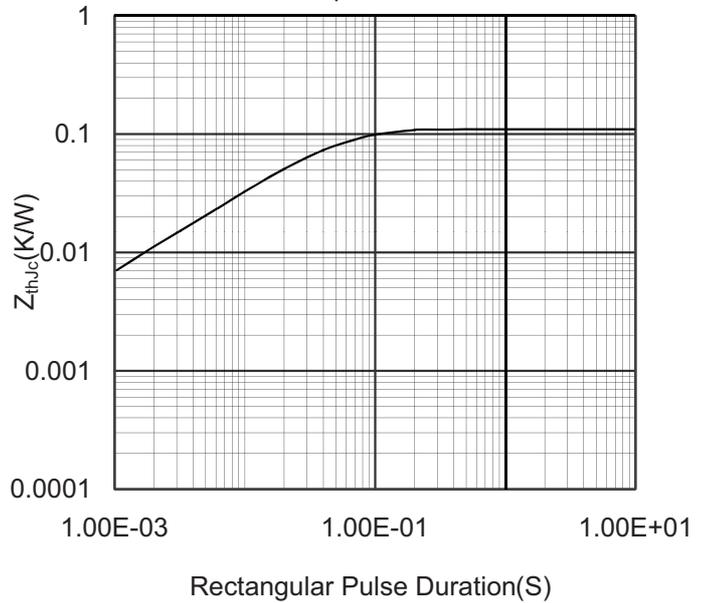


Figure 10. Transient Thermal Impedance

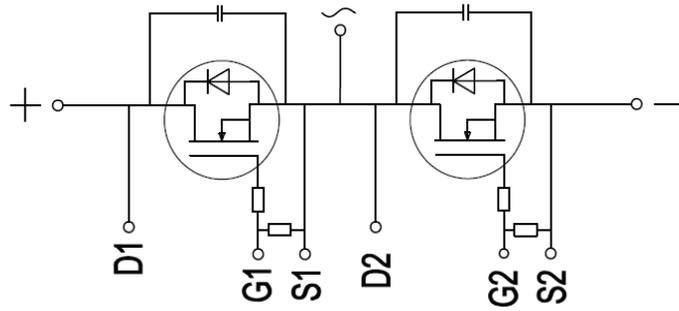
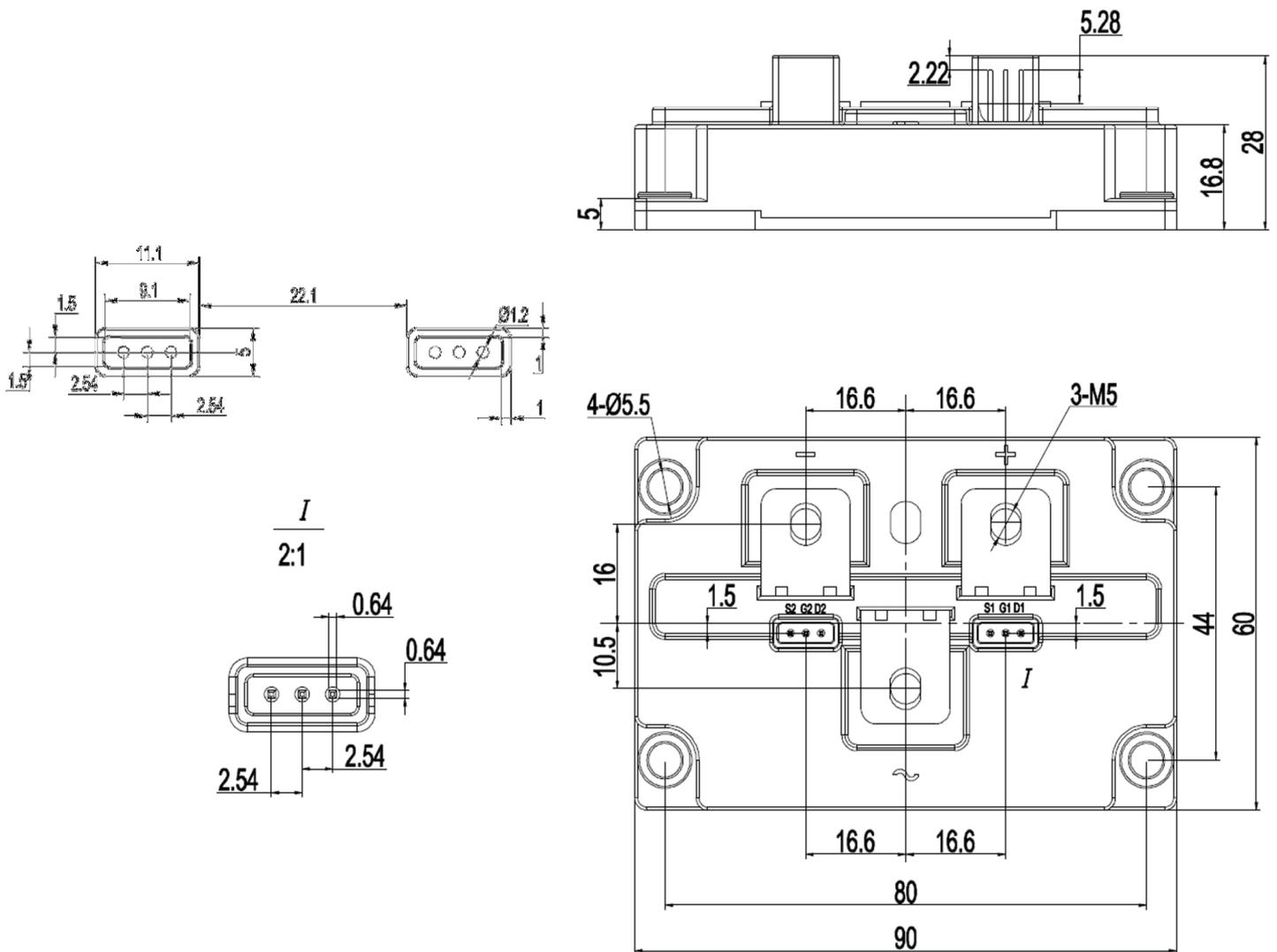


Figure 11. Circuit Diagram



Dimensions in (mm)  
Figure 12. Package Outline