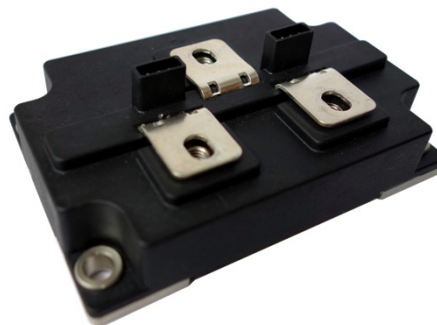


PRODUCT FEATURES

- ☐ $R_{DS(ON).typ}=1.8m\Omega@V_{GS}=10V$
- ☐ 175°C junction temperature
- ☐ Low Gate Charge Minimize Switching Loss
- ☐ Fast Recovery body Diode
- ☐ 20K Ω Gate Protected Resistance Inside

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
MMN600DB015B	150V	600A	2.1m Ω	175°C	MMN600DB015B	NDB

ABSOLUTE MAXIMUM RATINGS

$T_C=25^\circ C$ unless otherwise specified

Symbol	Parameter/Test Conditions		Values	Unit
V_{DSS}	Drain Source Voltage	$T_J=25^\circ C$	150	V
V_{GSS}	Gate Source Voltage		± 20	
I_D	Continuous Drain Current	$T_C=25^\circ C$	850	A
		$T_C=100^\circ C$	600	
I_{DM}	Pulsed Drain Current at $V_{GS}=10V$	Limited by T_{Jmax}	1700	
P_D	Maximum Power Dissipation		1500	W

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		0.1	K/W
T_{Jmax}	Max. Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-40~125	
Torque	to heatsink	Recommended (M5)	2.5~5	Nm
	to terminal	Recommended (M5)	2.5~5	
Weight			240	g

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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	$V_{GS}=0V, I_D=600\mu A$	150			V
$R_{DS(ON)}$	Drain Source ON Resistance	$V_{GS}=10V, I_D=600A$		1.8	2.1	m Ω
I_{DSS}	Drain Source Leakage Current	$V_{DS}=150V, V_{GS}=0V$			2	mA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=1.6mA$	3	4	5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V(\text{module})$	-2		2	mA
Q_g	Total Gate Charge	$V_{DD}=75V, I_D=300A, V_{GS}=10V$		850		nC
Q_{gs}	Gate Source Charge			210		nC
Q_{gd}	Gate Drain Charge			320		nC
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=300A$		496		S
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		60		nF
C_{oss}	Output Capacitance			4.7		nF
C_{rss}	Reverse Transfer Capacitance			0.95		nF
$t_{d(on)}$	Turn on Delay Time	$V_{DD}=75V, I_D=300A, R_G=5\Omega, V_{GS}=15V$ (Inductive Load)	$T_J=25^\circ\text{C}$	230		ns
t_r	Rise Time			350		ns
$t_{d(off)}$	Turn off Delay Time			600		ns
t_f	Fall Time			310		ns
E_{on}	Turn on Energy			TBD		mJ
E_{off}	Turn off Energy			TBD		mJ

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				600	A
I_{SDM}	Pulse Source Drain Current	Limited by T_{Jmax}			1200	A
V_{SD}	Forward Voltage	$I_S=300A, V_{GS}=0V$		1.0	1.2	V
t_{rr}	Reverse Recovery time	$I_F=300A, V_{GS}=0V$		150		ns
Q_{rr}	Reverse Recovery Charge	$di_F/dt=-650A/\mu s$		6500		nC

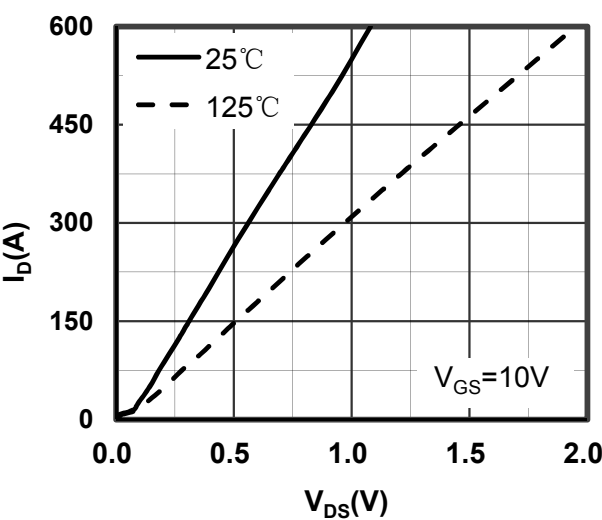


Figure 1. Typical Output Characteristics

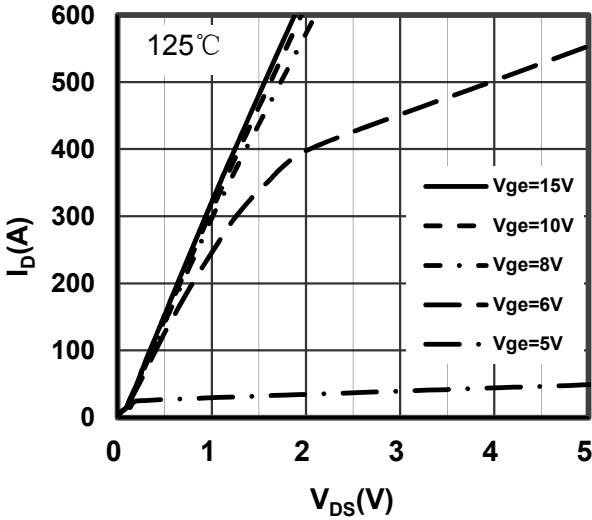


Figure 2. Typical Output Characteristics

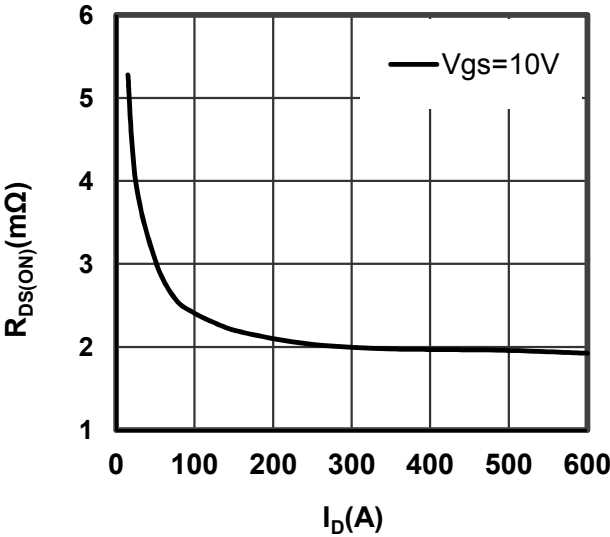


Figure 3. Drain-Source ON Resistance vs I_D

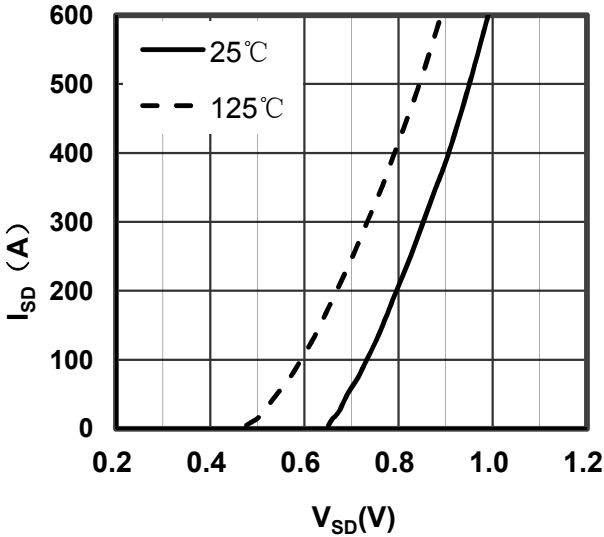


Figure 4. Source-Drain Voltage

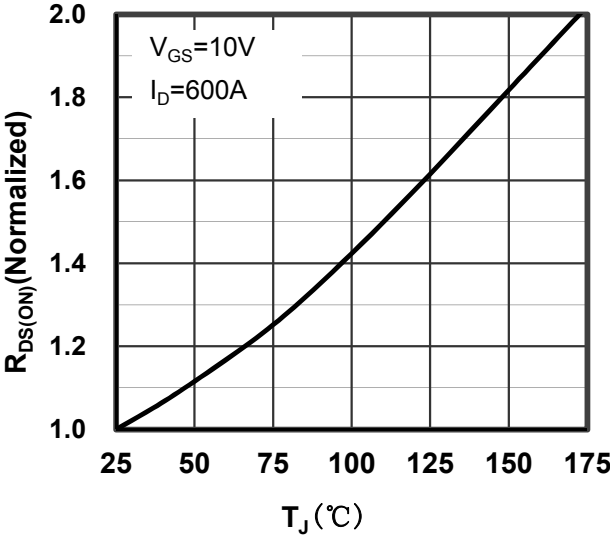


Figure 5. Drain-Source ON Resistance vs Junction Temperature

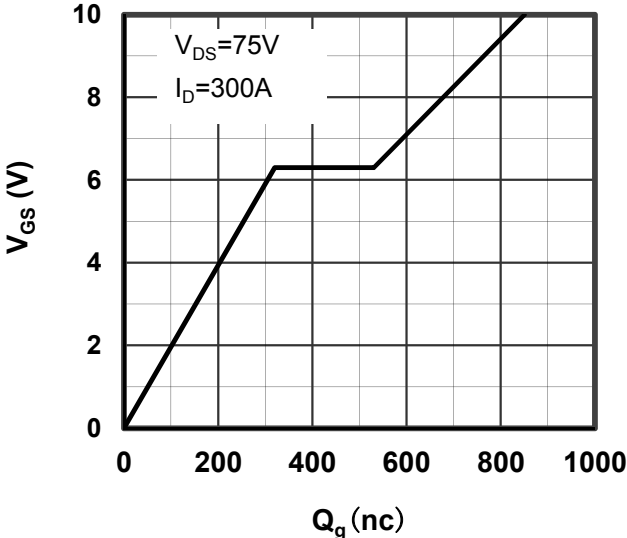


Figure 6. Gate Charge characteristics₃

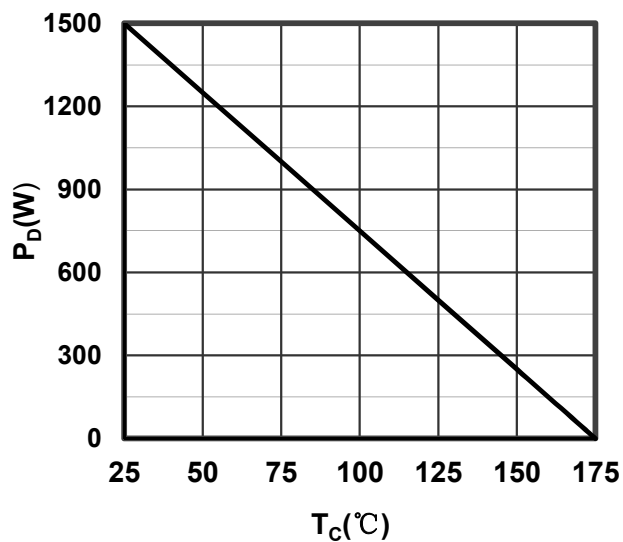


Figure 7. Maximum Power Dissipation vs Case Temperature

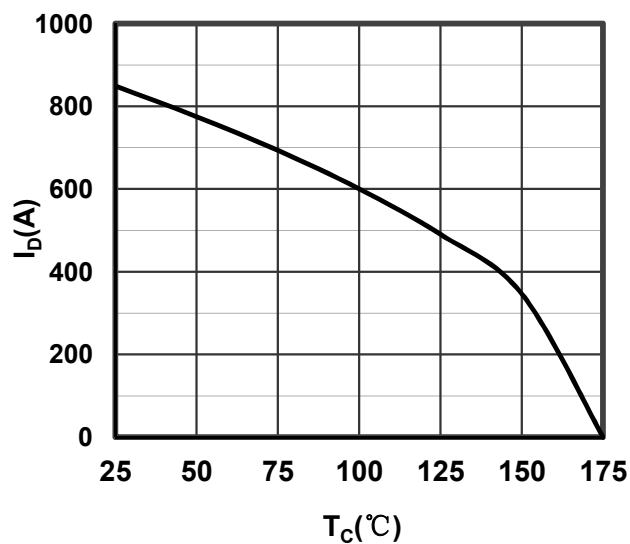


Figure 8. Maximum Continuous Drain Current vs Case Temperature

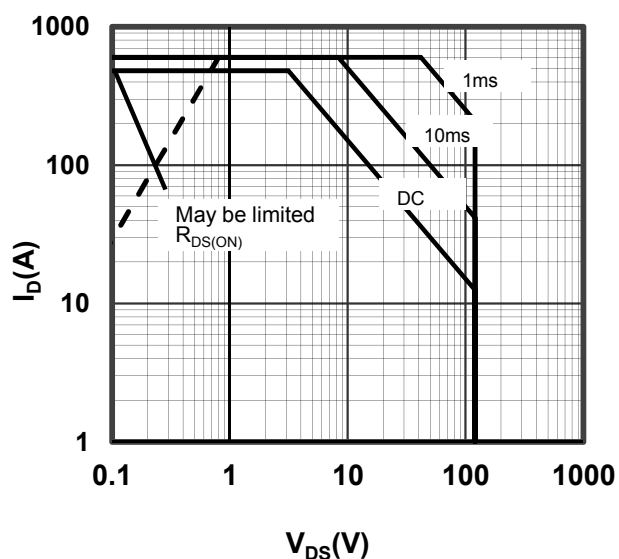


Figure 9. Maximum Forward Safe Operation Area

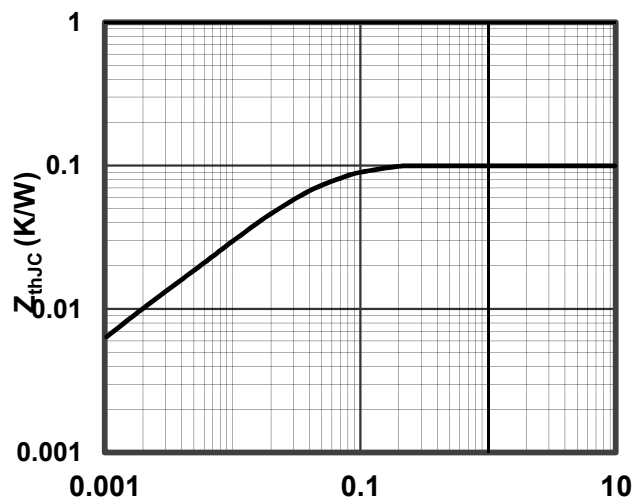


Figure 10. Transient Thermal Impedance

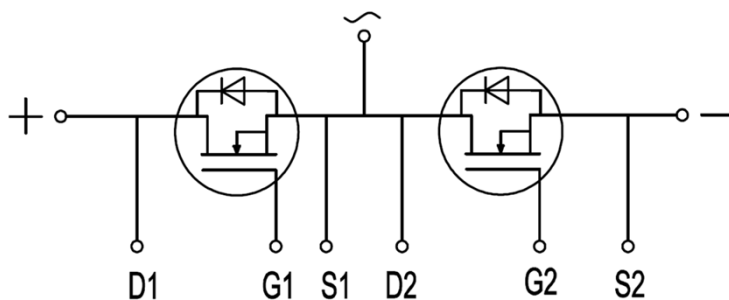


Figure 11. Circuit Diagram

