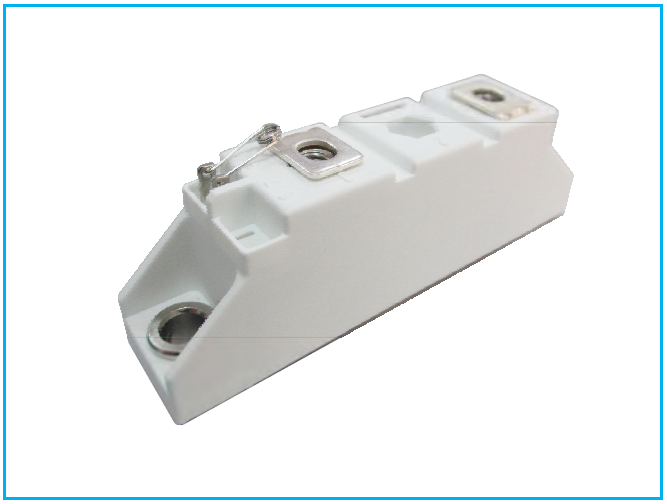
MMN668A010U1

100V 668A N-ch Power MOSFET Module

May 2016 | Preliminary | RoHS Compliant

PRODUCT FEATURES

- ☐ $R_{DS(ON).typ}$=1.1mΩ@V_{GS}=10V
- ☐ 175℃operating temperature
- ☐ Low Gate Charge Minimize Switching Loss
- ☐ Fast Recovery body Diode
- ☐ 20K Ω Gate Protected Resistance Inside
- ☐ Inside the module,each MOSFET chip has a gate resistance:2.2Ω



APPLICATIONS

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

Type	V_{DS}	I_D	$R_{DS(ON).max}$ T_J=25℃	T_{Jmax}	Marking	Package
MMN668A010U1	100V	668A	1.4mΩ	175℃	MMN668A010U1	NA

ABSOLUTE MAXIMUM RATINGS(*T_C=25°C unless otherwise specified*)

Symbol	Parameter/Test Conditions		Values	Unit
V_{DSS}	Drain - Source Voltage	T_J=25℃	100	V
V_{GSS}	Gate - Source Voltage		±20	
I_D	Continuous Drain Current	T_C=25℃	668	A
		T_C=100℃	470	
I_{DM}	Pulsed Drain Current at V_{GS}=10V	Limited by T_{Jmax}	940	
P_D	Maximum Power Dissipation		1071	W
E_{AS}	Single Pulse Avalanche Energy	V_{DD}=50V,L=1mH	3000	mJ

THERMAL AND MODULE CHARACTERISTICS (*T_C=25°C unless otherwise specified*)

Symbol	Parameter/Test Conditions		Values	Unit
R_{thJC}	Thermal resistance,junction to case Per MOSFET		0.14	K/W
T_{Jmax}	Max. Junction Temperature		175	℃
T_{STG}	Storage Temperature Range		-40～125	
Torque	to heatsink	Recommended（M5）	2.5～5	Nm
	to terminal	Recommended（M5）	2.5～5	
Weight			110	g

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MOSFET

ELECTRICAL CHARACTERISTICS *(T_C=25°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=300A(chip)			1.1	1.4	mΩ
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=1mA		2.0		4.0	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V		-2		2	mA
R_{gint}	Integrated Gate Resistor				1.2		Ω
Q_g	Total Gate Charge	V_{DD}=65V, I_D=300A , V_{GS}=10V			660		nC
Q_{gs}	Gate Source Charge				170		nC
Q_{gd}	Gate Drain Charge				225		nC
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f =1MHz			44		nF
C_{oss}	Output Capacitance				3.05		nF
C_{rss}	Reverse Transfer Capacitance				0.73		nF
$t_{d(on)}$	Turn on Delay Time	V_{DD}=50V,I_D=200A, R_G =5Ω, V_{GS}=10V, Resistive Load	T_J=25℃		122		ns
t_r	Rise Time				88		ns
$t_{d(off)}$	Turn off Delay Time				540		ns
t_f	Fall Time				112		ns

Source-Drain BODY-DIODE CHARACTERISTICS *(T_C=25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
I_{SD}	Continuous Source Drain Current				400	A
I_{SDM}	Pulse Source Drain Current	Limited by T_{Jmax}			800	A
V_{SD}	Forward Voltage	I_S=300A , V_{GS}=0V		1.0	1.2	V
t_{rr}	Reverse Recovery time	I_F=200A , V_{GS}=0V dI$_F$/dt=-140A/μs		130		ns
Q_{RR}	Reverse Recovery Charge			800		nC

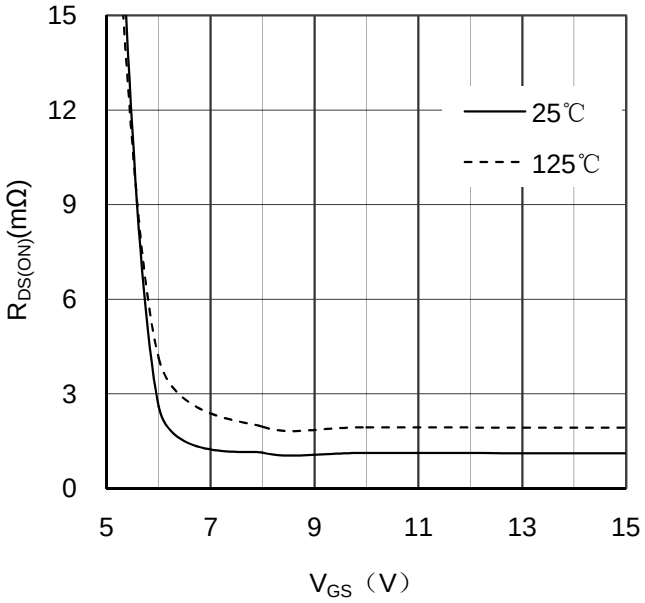


Figure 1. Typical $R_{DS(ON)}$ vs Gate Voltage

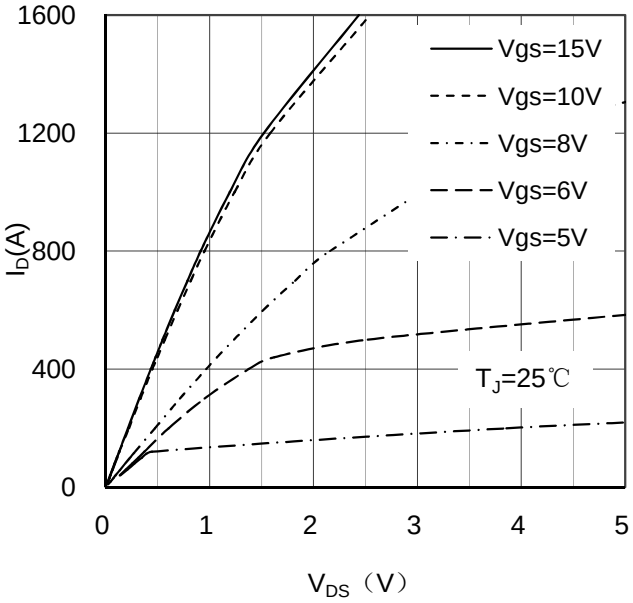


Figure 2. Typical Output Characteristics

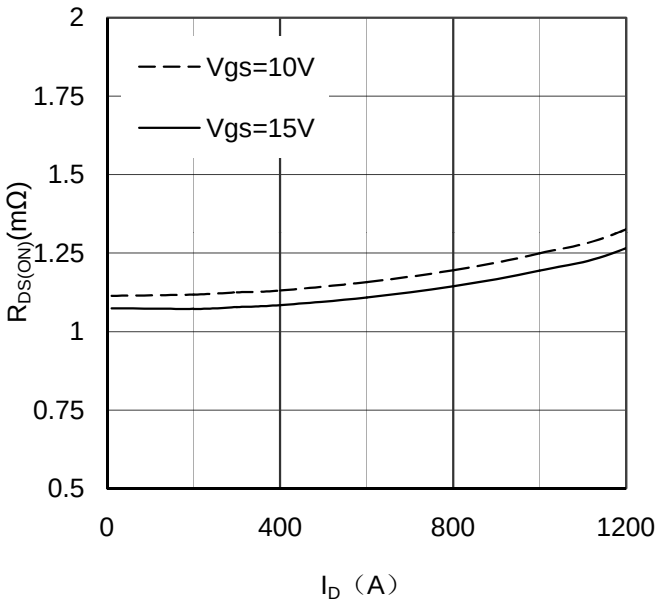


Figure 3. Drain-Source ON Resistance vs I_D

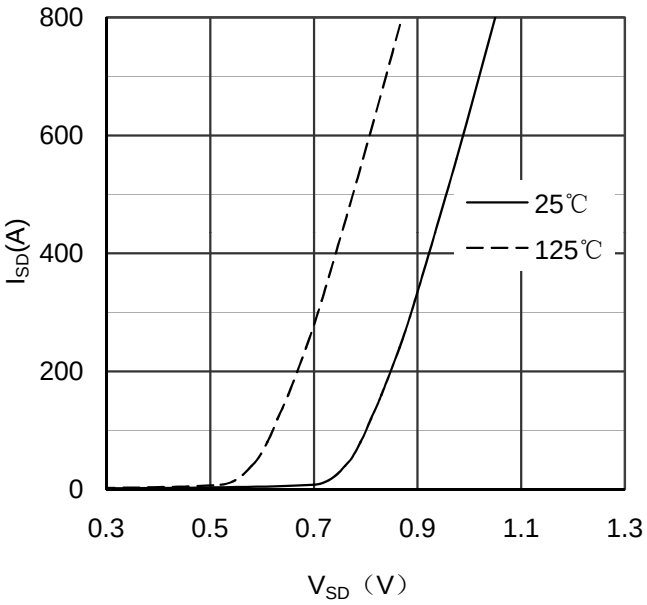


Figure 4. Source-Drain Voltage

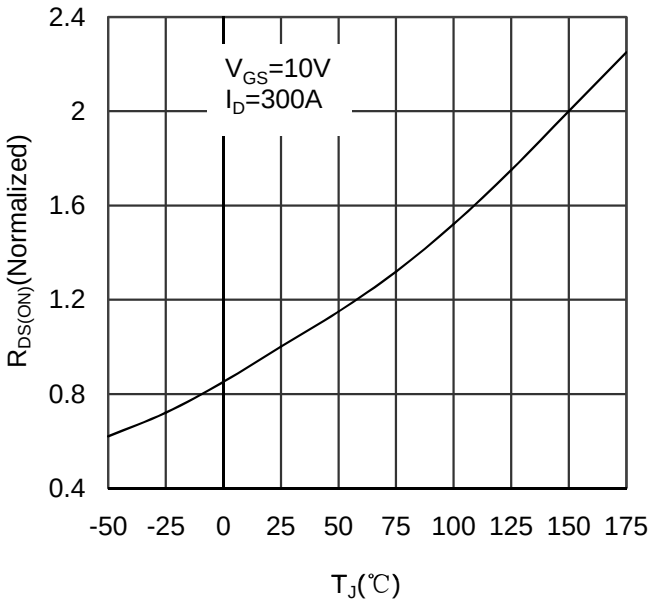


Figure 5. Drain-Source ON Resistance vs Junction Temperature

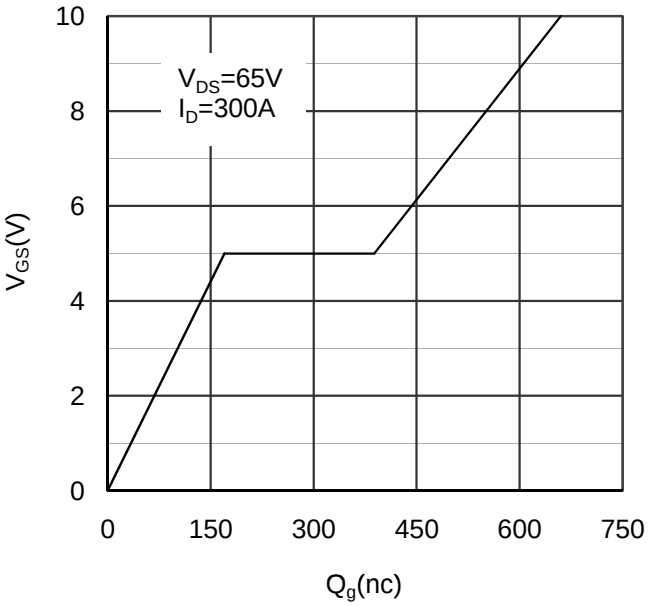


Figure 6. Gate Charge characteristics

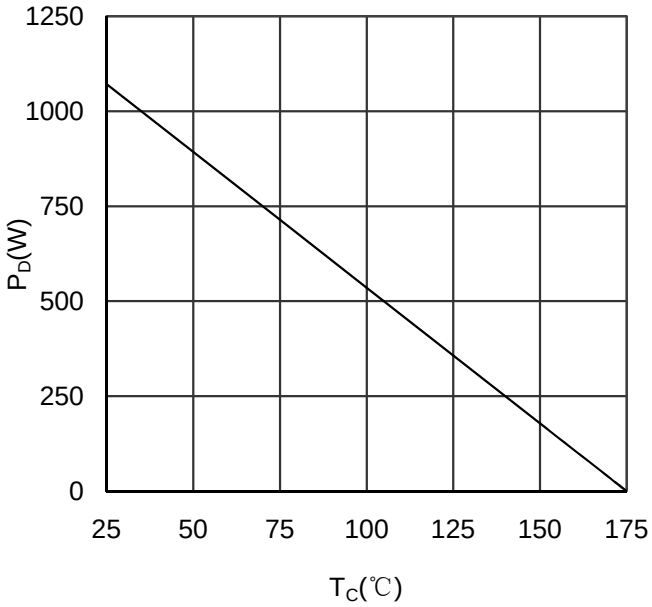


Figure 7. Maximum Power Dissipation vs Case Temperature

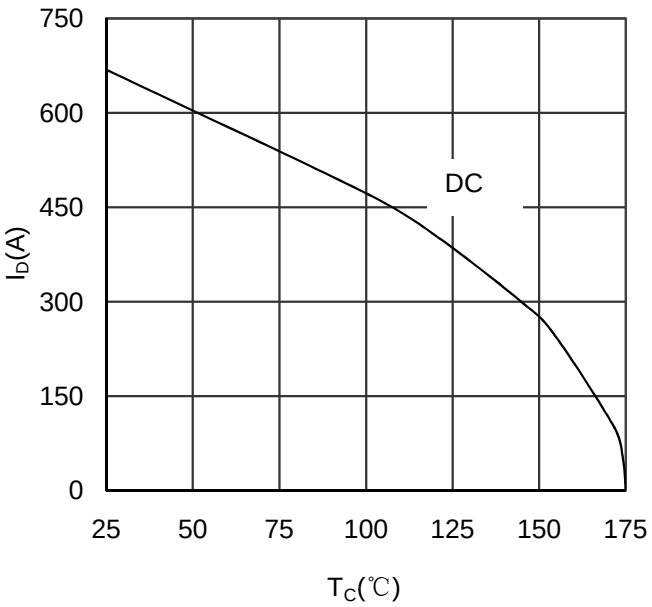


Figure 8. Maximum Continuous Drain Current vs Case Temperature

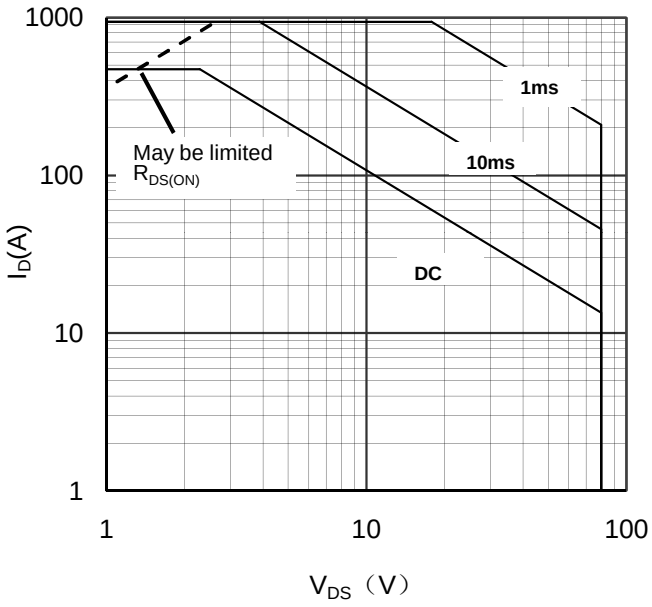


Figure 9. Maximum Forward Safe Operation Area

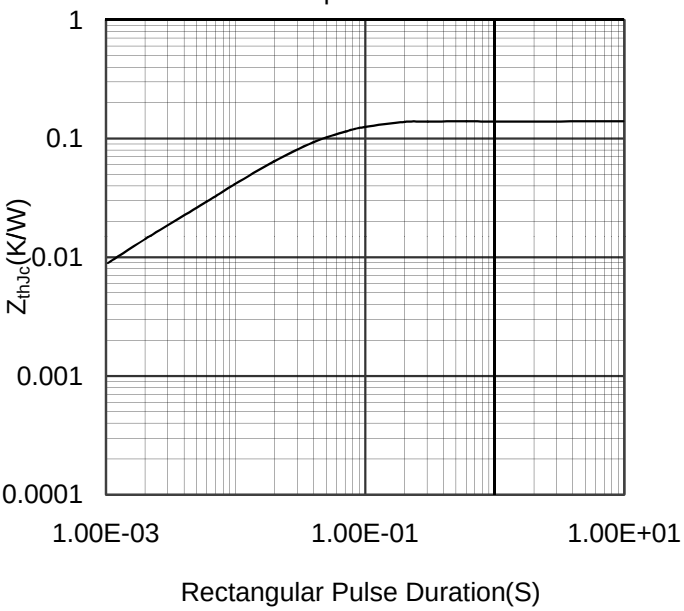


Figure 10. Transient Thermal Impedance

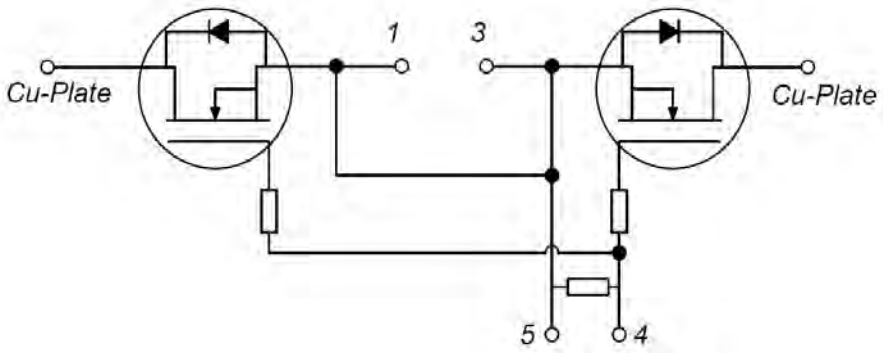
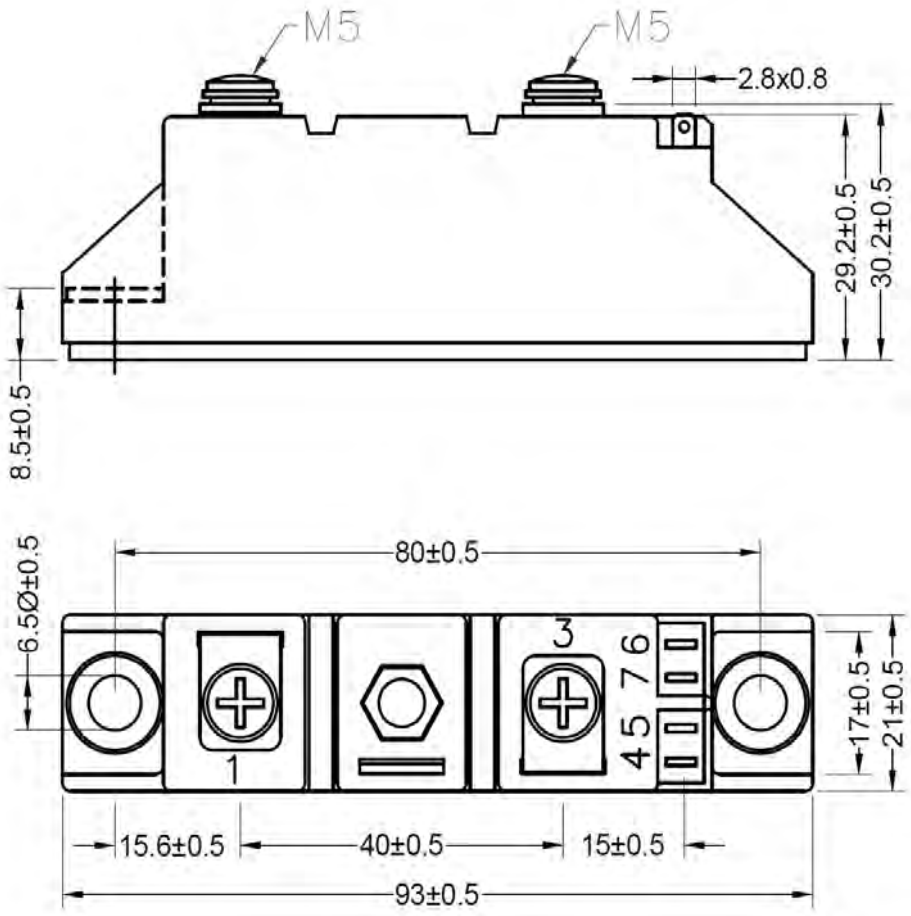


Figure 11. Circuit Diagram



Dimensions in (mm)

Figure 12. Package Outline