MMN200H010X

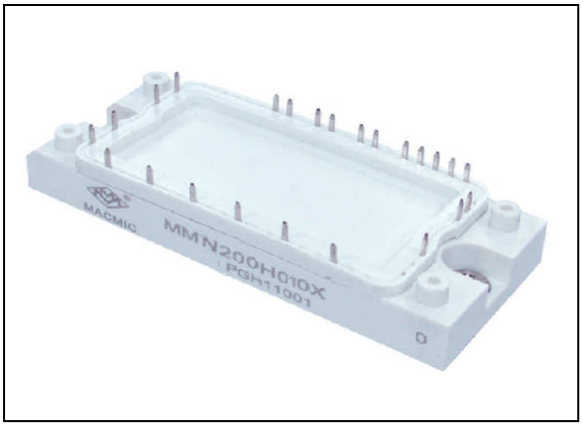
100V 200A MOSFET Module

RoHS Compliant

April 2012 **PRELIMINARY**

FEATURES

- ☐ N-channel,very low on-resistance $R_{DS(on)}$
- ☐ 175℃operating temperature
- ☐ Solderable pins for PCB mounting
- ☐ Temperature sense included



APPLICATIONS

- ☐ AC motor control
- ☐ Motion/servo control
- ☐ Inverter and power supplies

INVERTER SECTOR

ABSOLUTE MAXIMUM RATINGS

T_C=25℃ unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
MOSFET				
V_{DSS}	Drain - Source Voltage	T_{vj}=25℃	100	V
V_{GSS}	Gate - Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	200	A
		T_C=100℃	200	A
$I_{D\ pulse}$	Pulsed Drain Current	T_C=25℃	800	A
E_{AS}	Single Pulse Avalanche Energy	I_D=100A, R_{GS} =25Ω	350	mJ
P_{tot}	Power Dissipation Per MOSFET		275	W
Reverse Diode				
V_{RRM}	Repetitive Reverse Voltage	T_{vj}=25℃	100	V
I_S	Diode continous Forward Current	T_C=25℃	200	A
		T_C=100℃	200	A
$I_{S\ pulse}$	Diode pulse Current	T_C=25℃	800	A

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INVERTER SECTOR

ELECTRICAL AND THERMAL CHARACTERISTICS *T_C=25℃ unless otherwise specified*

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
MOSFET						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=1m A	100			V
$R_{DS(ON)}$	Drain-Source ON Resistance	V_{GS}=10V, I_D=100A (TO 262)			4.5	mΩ
		V_{GS}=10V, I_D=50A (TO 263)			4.2	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}= V_{DS} , I_D=150μA	2.0	2.7	3.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=20V			100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V			10	μA
Q_g	Total Gate Charge	V_{DD}=50V, I_D=200A , V_{GS}=10V		190		nC
Q_{gs}	Gate-Source Charge			60		nC
Q_{gd}	Gate-Drain Charge			35		nC
g_{fs}	Forward Transconductance	I_D=200A		145		S
C_{iss}	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f =1MHz		12.7		nF
C_{oss}	Output Capacitance			2.5		nF
C_{rss}	Reverse Transfer Capacitance			100		pF
$t_{d(on)}$	Turn - on Delay Time	V_{DD}=50V,I_D=100A, R_G =0.8Ω , V_{GS}=10V,		35		ns
t_r	Rise Time			78		ns
$t_{d(off)}$	Turn - off Delay Time			65		ns
t_f	Fall Time			22		ns
$R_{th(ch-c)}$	Thermal resistance,channel to case				0.55	℃/W
Reverse Diode						
V_{SD}	Forward Voltage	I_F=200A , V_{GE}=0V, T_{vj} =25℃		1.0	1.2	V
t_{rr}	Reverse Recovery Time	I_F=200A , V_R=50V di$_F$/dt=-100A/μs T_{vj} =125℃		100		ns
Q_{RRM}	Max. Reverse Recovery Charge			300		nc

NTC AND OTHERS SECTOR

CHARACTERISTIC VALUES *T_C=25℃ unless otherwise specified*

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$R_{25\ NTC}$	Resistance	T_C =25℃		5		KΩ
$B_{25/50\ NTC}$				3375		K
R_1 – R_6	Resistance	T_C =25℃		10		Ω
R_7 – R_{12}	Resistance	T_C =25℃		51		KΩ
D1-D6	Zener diode			±18		V
C	Capacitance			0.9		uF

MODULE CHARACTERISTICS

T_C=25℃ unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$T_{Vj\ max}$	Max. Junction Temperature				175	℃
$T_{Vj\ op}$	Operating Temperature		-40		150	℃
T_{stg}	Storage Temperature		-40		150	℃
V_{isol}	Insulation Test Voltage	AC, t=1min		3000		V
Weight				180		g

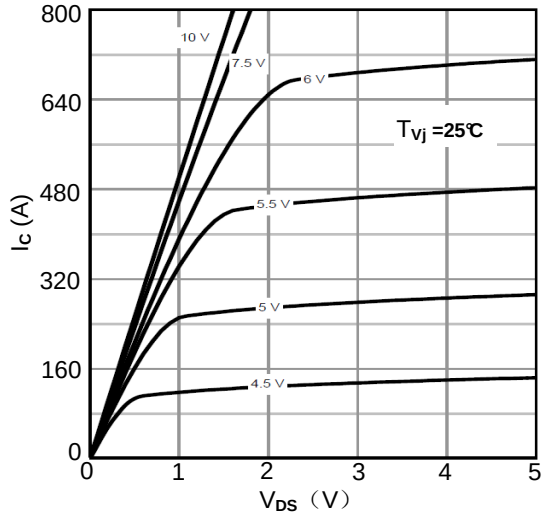


Figure1. Typical Output Characteristics MOSFET

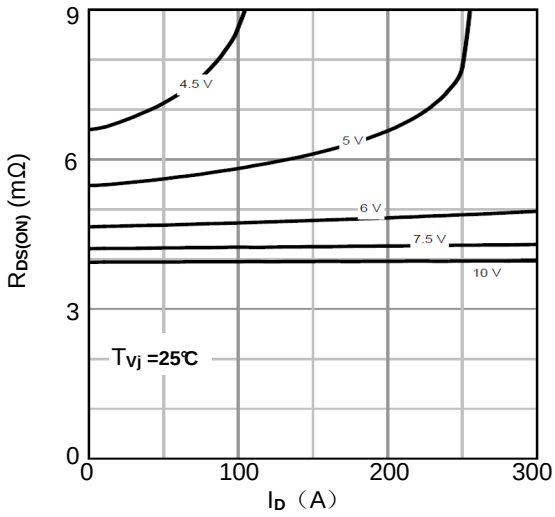


Figure2. Typical Drain-Source ON Resistance-MOSFET

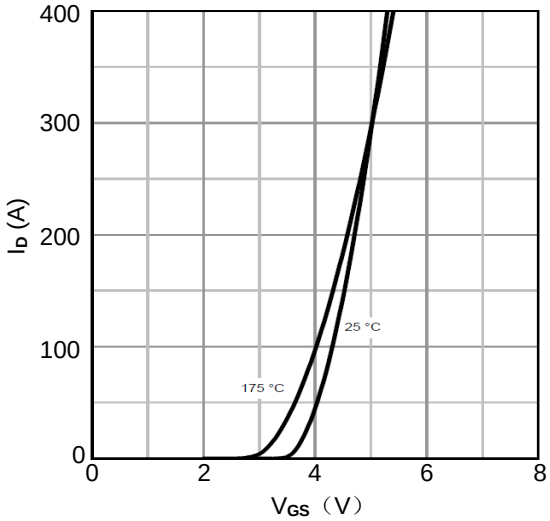


Figure3. Typical Transfer characteristics MOSFET

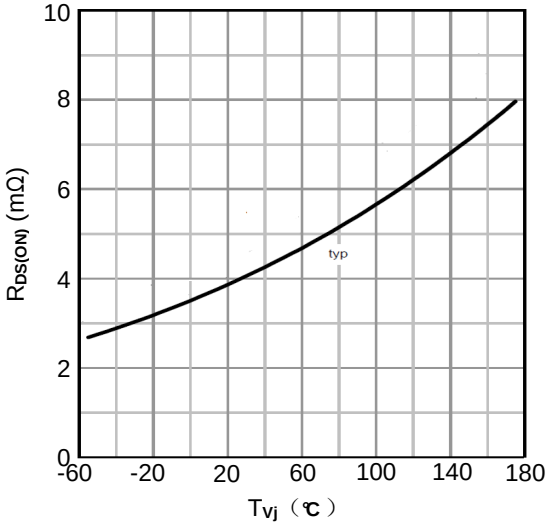


Figure4. Typical Drain-Source ON Resistance-MOSFET

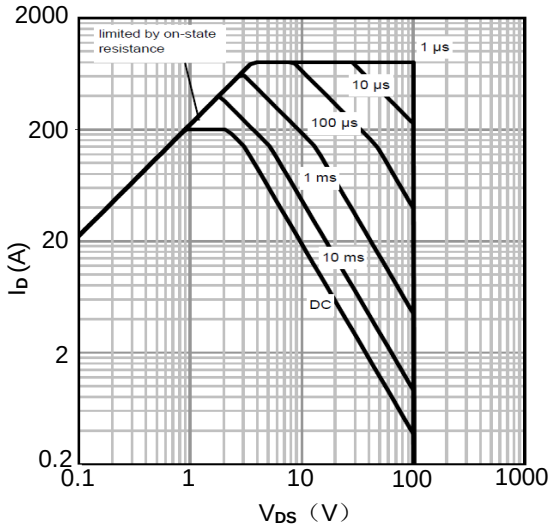


Figure5. Safe Operating Area-MOSFET

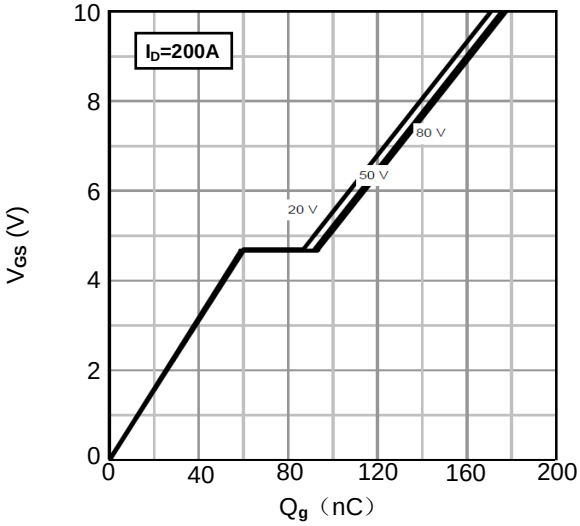


Figure6. Typical Gate Charge-MOSFET

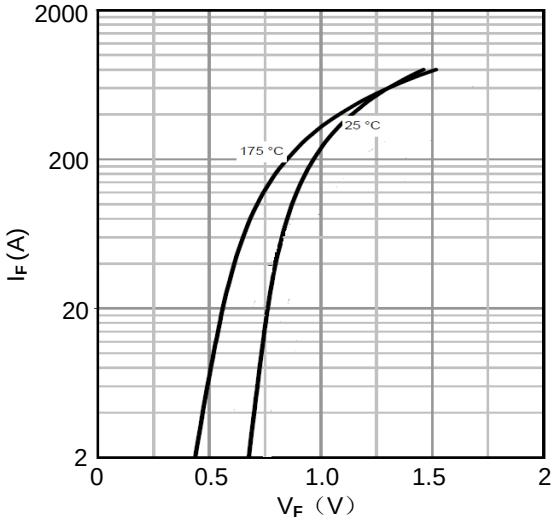


Figure7. Diode Forward Characteristics

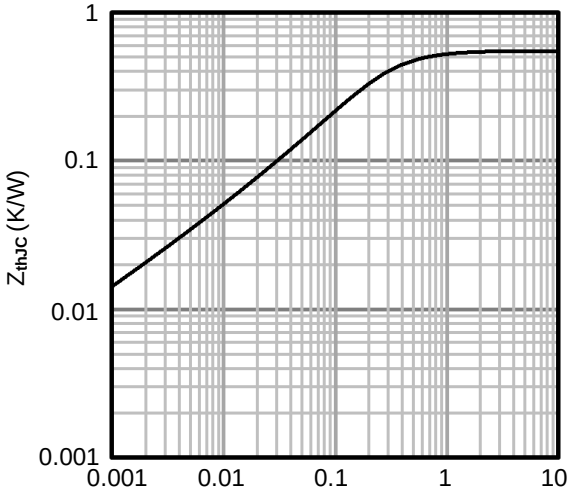


Figure8. Transient Thermal Impedance-MOSFET

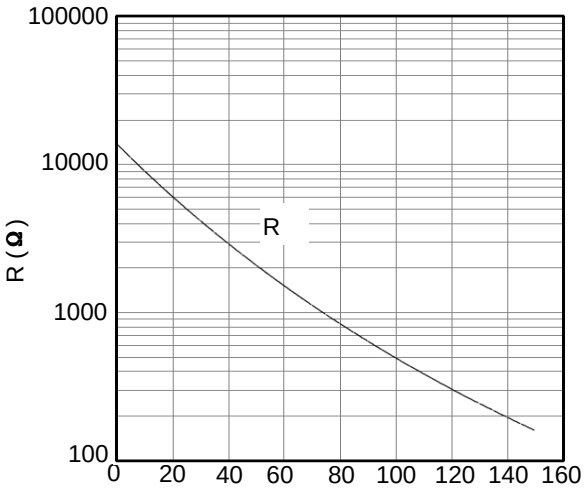


Figure9. NTC Characteristics

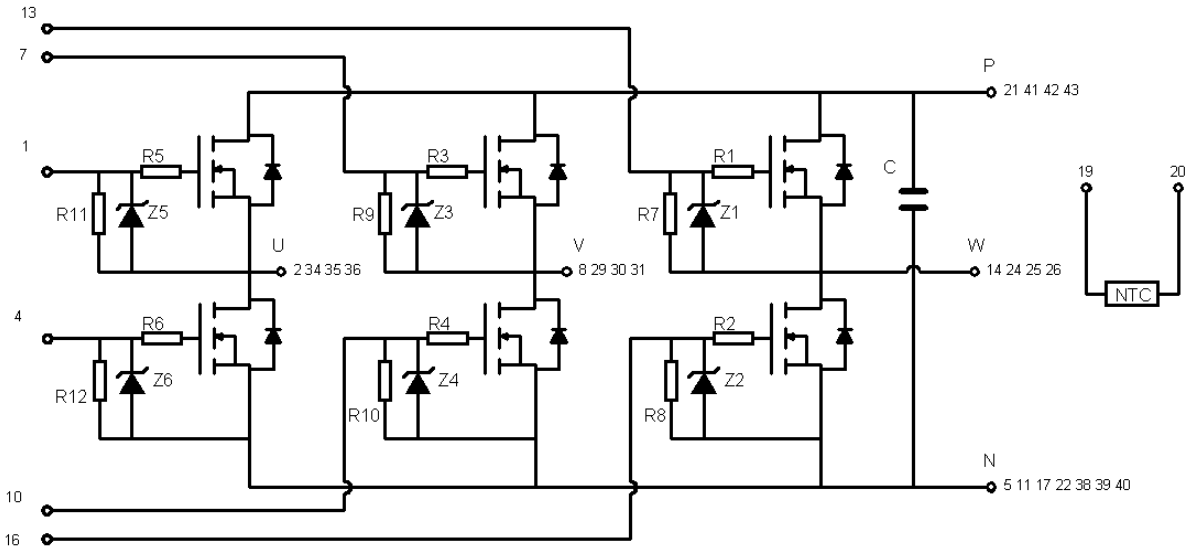
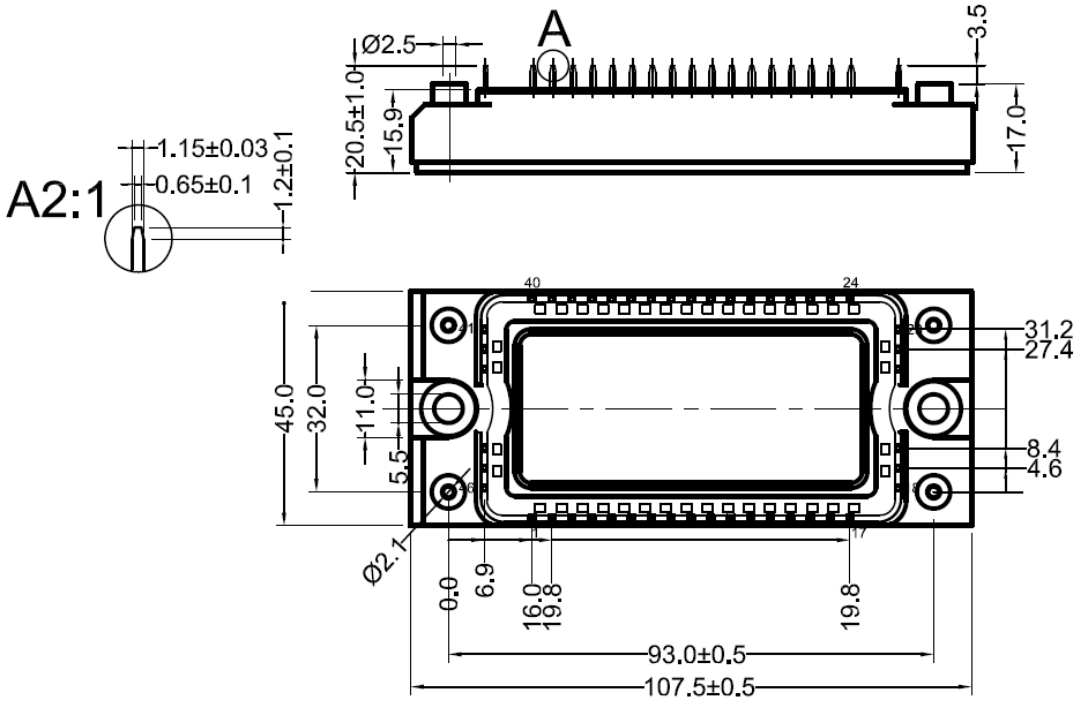


Figure10. Circuit Diagram



Dimensions (mm)
Figure11. Package Outline