



MM1000HF10T2NH

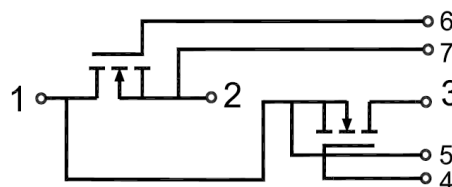
MOSFET Module

Preliminary Data

Features:

- Improved Gate, Avalanche and Dynamic dv/dt Ruggedness
- Fully Characterized Capacitance and Avalanche SOA
- Enhanced Body Diode dV/dt and dI/dt Capability
- Lead-Free, Halogen-Free

Circuit Diagram



Applications:

- Hard Switched and High Frequency Circuits
- Main and Auxiliary AC Drives of Electric Vehicles

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Description		Values	Units
V_{DSS}	Drain-Source Blocking Voltage		100	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current, $V_{GS}=10\text{V}$	$T_C=65^{\circ}\text{C}$	1000	A
		$T_C=25^{\circ}\text{C}$	1225	A
I_{DM}	Pulsed Drain Current	Pulse width limited by max. junction temperature	4900	A
I_S	Continuous Source Current(Body Diode)		1000	A
I_{SM}	Pulsed Source Current(Body Diode)	Pulse width limited by max. junction temperature	4900	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$ $T_{Jmax}=150^{\circ}\text{C}$	1275	W



Electrical Characteristics of MOSFET ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GS(th)}$	Gate Threshold Voltage	$I_D=2\text{mA}$, $V_{DS}=V_{GS}$	2.0	3.1	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$I_D=1000\text{A}$, $V_{DS}=10\text{V}$, $T_J=25^{\circ}\text{C}$		0.48	0.75	m Ω
		$I_D=1000\text{A}$, $V_{DS}=10\text{V}$, $T_J=125^{\circ}\text{C}$		0.77		m Ω
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=V_{DSS}$, $V_{GS}=0\text{V}$ $T_J=25^{\circ}\text{C}$			1	mA
I_{GSS}	Gate- Source Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$ $T_J=25^{\circ}\text{C}$			± 400	nA
C_{iss}	Input Capacitance	$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		54.0		nF
C_{oss}	Output Capacitance			10.4		nF
C_{rss}	Reverse Transfer Capacitance			0.4		nF

Switching Characteristics

Q_g	Total Gate Charge	$I_D=400\text{A}$, $V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$		800		nC
Q_{gs}	Gate-Source Charge			216		nC
Q_{gd}	Gate-Drain (Miller) Charge			208		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=50\text{V}$, $I_D=400\text{A}$, $R_g=0.38\Omega$, $V_{GS}=10\text{V}$, $T_J=25^{\circ}\text{C}$		50		ns
t_r	Rise Time			39		ns
$t_{d(off)}$	Turn-off Delay Time			103		ns
t_f	Fall Time			55		ns
R_g	Internal Resistor			0.9		Ω
$R_{\theta JC}$	MOSFET Thermal Resistance: Junction-to-Case				0.098	$^{\circ}\text{C/W}$

Electrical Characteristics of Body Diode ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{SD}	Forward Voltage	$I_S=400\text{A}$, $V_{GS}=0\text{V}$	$T_J=25^{\circ}\text{C}$		1.0	1.3	V
t_{rr}	Reverse Recovery Time	$I_S=400\text{A}$, $di/dt=800\text{A}/\mu\text{s}$, $T_J=25^{\circ}\text{C}$	$T_J=25^{\circ}\text{C}$		93		ns
Q_{rr}	Reverse Recovery Charge		$T_J=25^{\circ}\text{C}$		1.2		μC



Module Internal Capacitor Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
C	Capacitor		40		nF
	Tolerance	-10		+10	%

Module

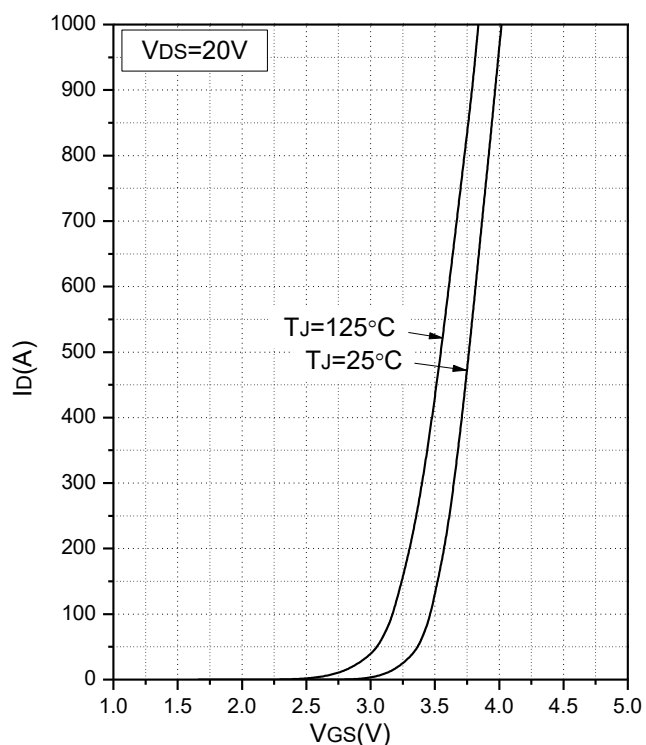
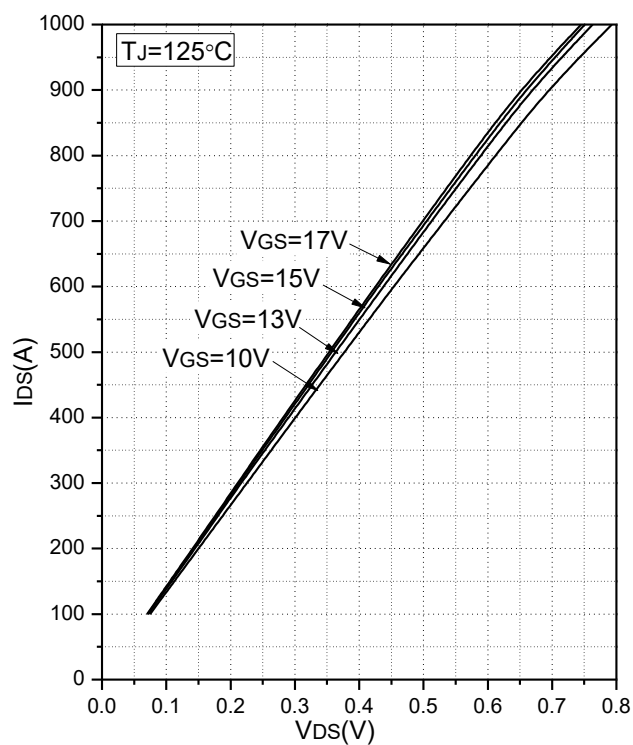
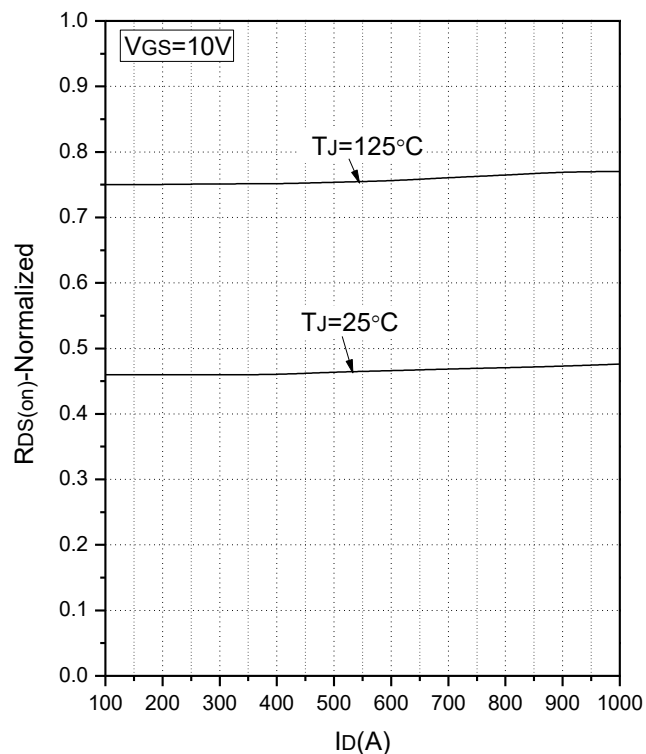
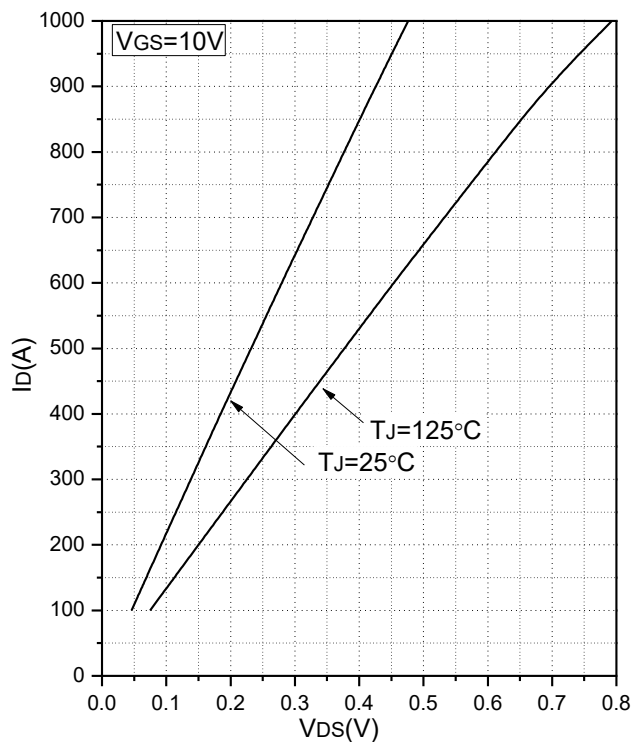
Symbol	Description	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1minute 2500			V
T _J	Maximum Junction Temperature			150	°C
T _{JOP}	Maximum Operating Junction Temperature Range	-40		+150	°C
T _{stg}	Storage Temperature	-40		+125	°C
CTI	Comparative Tracking Index	200			
R _{ecs}	Case-to-Sink Thermally (Conductive Grease Applied)			0.03	°C/W
M	Power Terminals Screw:M6	3.0		5.0	N·m
M	Mounting Screw:M6	4.0		6.0	N·m
G	Weight		300		g

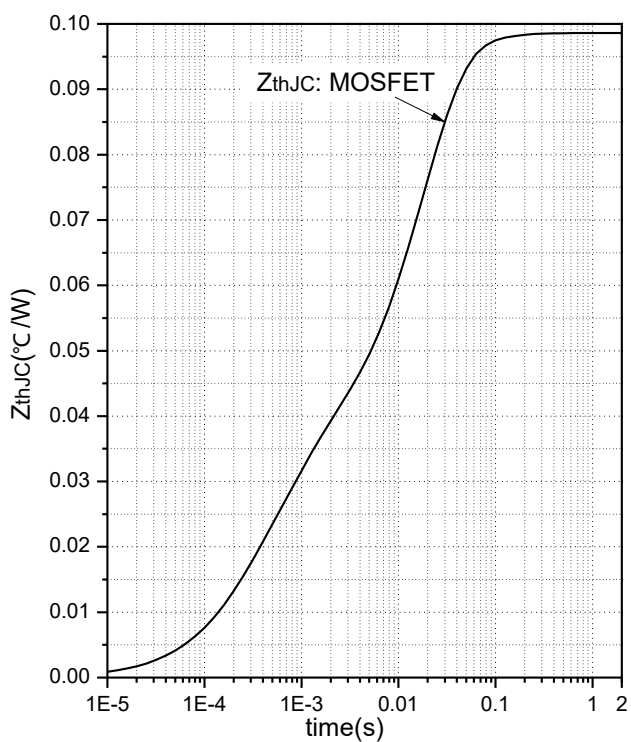
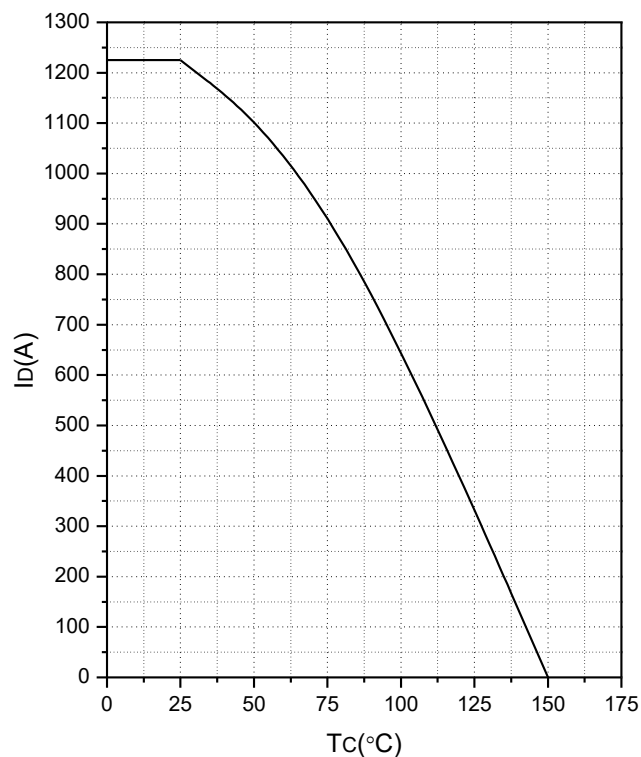
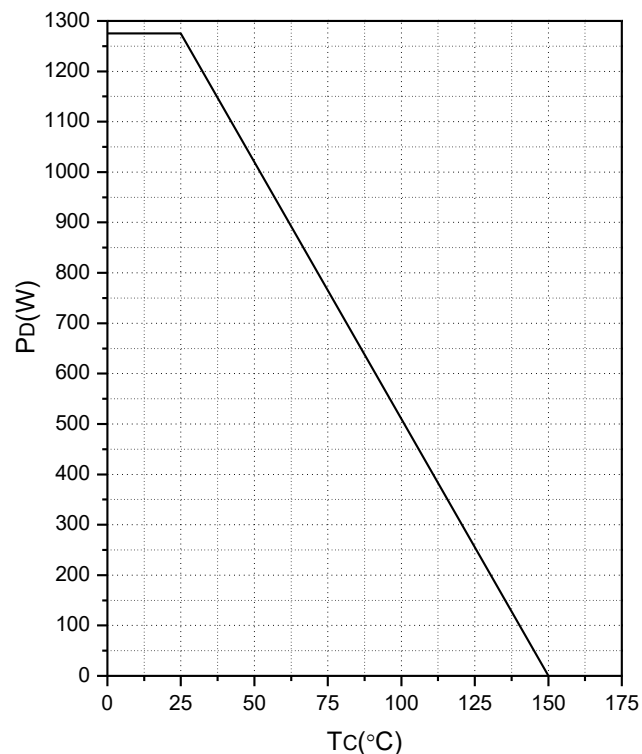
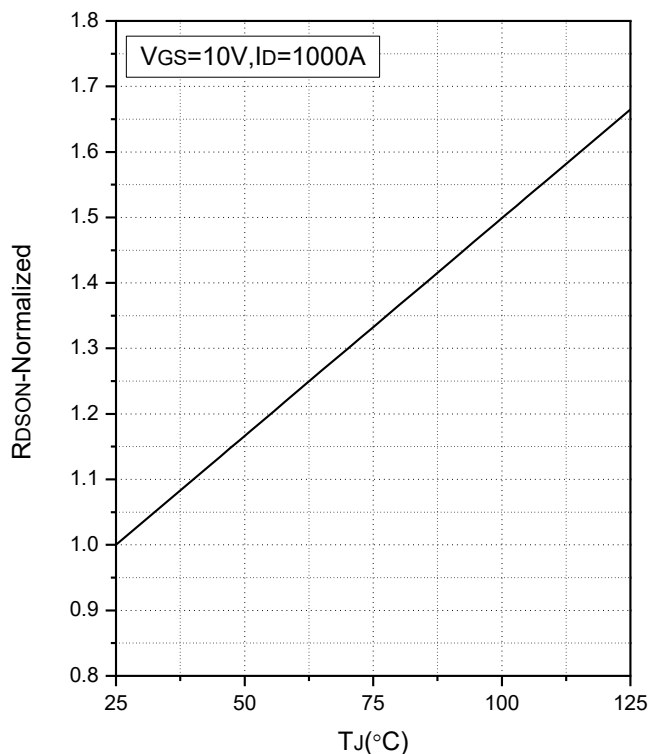
Ordering Information Table

Device code

MM	1000	HF	10	T2N	H
①	②	③	④	⑤	⑥

- ① - MOSFET Module
- ② - Rated Current (1000=1000A)
- ③ - Circuit Configuration (Half Bridge)
- ④ - Rated Voltage (10=100V)
- ⑤ - Package Type
- ⑥ - Test Level (Pass the Important Reliability Test-Industrial Grade)







Revision	Notes
01	Initial Release

Announcement

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The datasheet with “REV.” + “Arabic numerals” is based on engineering data for initial reference purpose only.

The released datasheet would be issued with “REV.” + “alphabet characters”.