

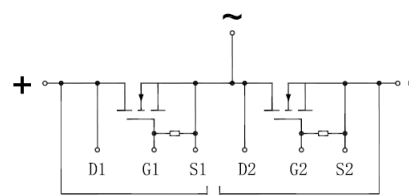


MM1000HF10B1H

MOSFET Module

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



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		Value	Units
V_{DSS}	Drain-Source Blocking Voltage		100	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current, $V_{GS}=10\text{V}$	$T_C = 100^{\circ}\text{C}$	1000	A
		$T_C = 25^{\circ}\text{C}$	1440	A
I_{DM}	Pulsed Drain Current	Pulse width limited by max. junction temperature	2400	A
I_S	Continuous Source Current(Body Diode)		1500	A
I_{SM}	Pulsed Source Current(Body Diode)	Pulse width limited by max. junction temperature	2400	A
P_D	Maximum Power Dissipation	$T_C = 25^{\circ}\text{C}$ $T_{Jmax}=175^{\circ}\text{C}$	2080	W



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

Static Characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$I_D=4\text{mA}$, $V_{DS}=V_{GS}$	2.0	3.2	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$I_D=600\text{A}$, $V_{DS}=10\text{V}$		0.46	0.56	m Ω
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=V_{DSS}$, $V_{GS}=0\text{V}$ $T_J = 25^{\circ}\text{C}$			160	μA
I_{GSS}	Gate- Source Leakage Current	$V_{GS}=V_{GSS}$, $V_{DS}=0\text{V}$ $T_J = 25^{\circ}\text{C}$			1	μA
C_{iss}	Input Capacitance	$V_{DS}=50\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		77		nF
C_{oss}	Output Capacitance			5.4		nF
C_{rss}	Reverse Transfer Capacitance			2.0		nF

Switching Characteristics

Q_g	Total Gate Charge	$I_D=600\text{A}$, $V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$		1200	1680	nC
Q_{gs}	Gate-Source Charge			280		nC
Q_{gd}	Gate-Drain (Miller) Charge			344		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=65\text{V}$, $I_D=600\text{A}$; $R_g=0.33\Omega$; $V_{GS}=10\text{V}$; $T_J=25^{\circ}\text{C}$		200		ns
t_r	Rise Time			536		ns
$t_{d(off)}$	Turn-off Delay Time			624		ns
t_f	Fall Time			704		ns
R_g	Internal Gate Resistor			2.0		Ω
$R_{\theta JC}$	MOSFET Thermal Resistance: Junction-To-Case			0.072		$^{\circ}\text{C}/\text{W}$

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

Symbol	Description	Conditions		Min	Typ	Max	Unit	
V _{SD}	Forward Voltage	I _S =600A, V _{GS} =0V	T _J = 25℃			1.3	V	
t _{rr}	Reverse Recovery Time	I _F =600A, V _R =85V, di/dt =100A/μs,	T _J = 25℃		400	600	ns	
			T _J = 125℃		480	720	ns	
Q _{rr}	Reverse Recovery Charge		T _J = 25℃		0.75	1.12	μC	
			T _J =125℃		1.12	1.68	μC	



Module Internal Resistance Characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
R	R Value			1		MΩ
t _c	Temperature Coefficient	20°C~60°C	-100		+100	ppm/°C

Module Internal Capacitor Characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
C	Capacitor			10		nF
	Tolerance		-10		+10	%

Module

Symbol	Description		Min	Typ	Max	Unit
V _{iso}	Isolation Voltage (All Terminals Shorted)	f = 50Hz, 1minute	2500			V
T _J	Maximum Junction Temperature				175	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+125	°C
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-To-Sink Thermally (Conductive Grease Applied)			0.1		°C/W
M	Power Terminals Screw:M5		3.0		6.0	N·m
M	Mounting Screw:M5		3.0		6.0	N·m
G	Weight			230		g

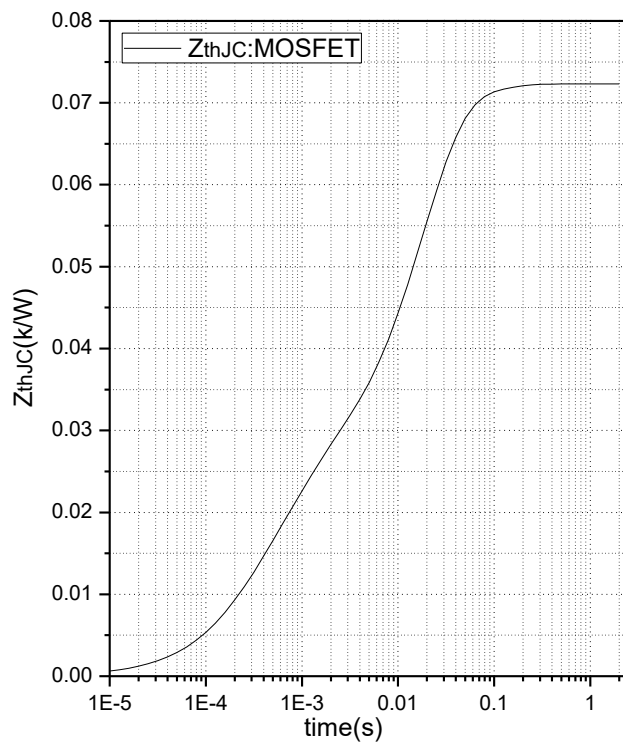
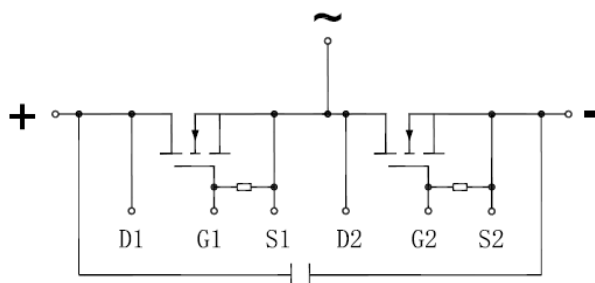
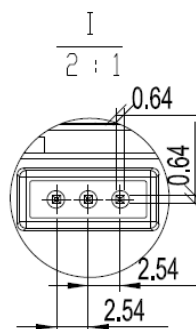
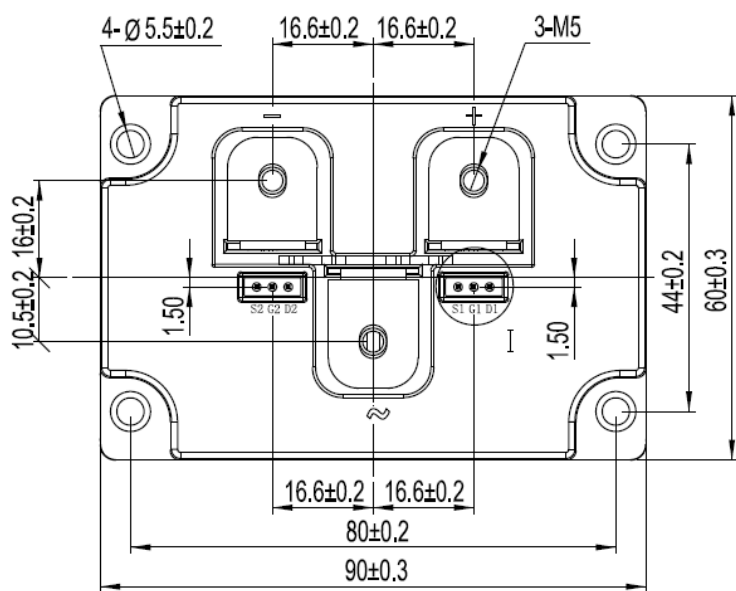
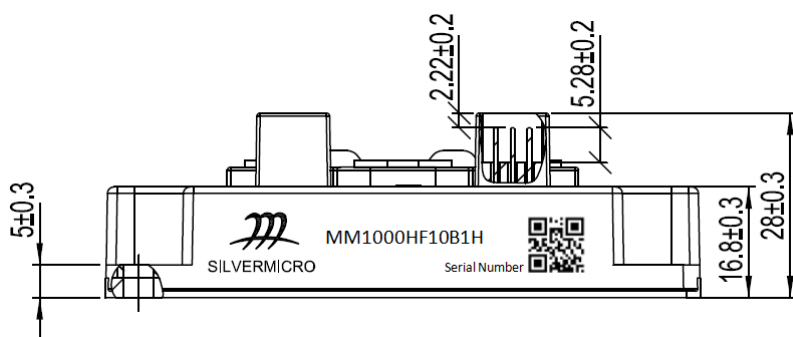


Fig.1 Transient Thermal Impedance (MOSFET)

Internal Circuit:



Package Outline (Unit: mm):





Date	Revision	Notes
11/25/2019	A	Final Version
04/03/2020	B	Revised Circuit Topology

Announcement

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