

# MM1000HF10T2NH

## MOSFET Module

### Preliminary Data

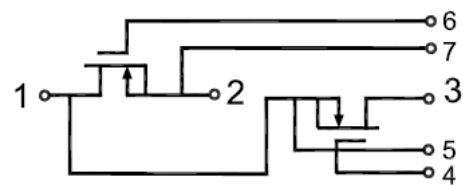
#### Features:

- Improved Gate, Avalanche and Dynamic dv/dt Ruggedness
- Fully Characterized Capacitance and AvalancheSOA
- 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	$\pm 20$	V	
$I_D$	Continuous Drain Current, $V_{GS}=10V$	$T_C = 80^{\circ}\text{C}$	1000	A
		$T_C = 25^{\circ}\text{C}$	1265	A
$I_{DM}$	Peak Drain Current Repetitive	$T_J = 175^{\circ}\text{C}$	2000	A
$I_S$	Continuous Source Current (body diode)	$T_J = 125^{\circ}\text{C}$	1000	A
$I_{SM}$	Peak Source Current Repetitive		2000	A
$P_D$	Maximum Power Dissipation	$T_C = 25^{\circ}\text{C}$ $T_{Jmax}=175^{\circ}\text{C}$	993	W

## Electrical Characteristics of MOSFET ( $T_C=25^\circ\text{C}$ Unless otherwise specified)

### Static characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$I_D = 2.5 \text{ mA}, V_{DS} = V_{GS}$	3.0	3.5	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$I_D = 1000\text{A}, V_{DS} = 10\text{V}$		0.62		m $\Omega$
$I_{DSS}$	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	$V_{GS} = V_{GSS}, V_{DS} = 0\text{V}$ $T_J = 25^\circ\text{C}$			400	nA
$C_{iss}$	Input Capacitance	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V},$ $f = 1\text{MHz}$		76.96		nF
$C_{oss}$	Output Capacitance			5.36		nF
$C_{rss}$	Reverse Transfer Capacitance			2.0		nF

### Switching Characteristics

$Q_g$	Total Gate Charge	$I_D = 1000\text{A}, V_{DS} = 50\text{V},$ $V_{GS} = 10\text{V}$		1200		nC
$Q_{gs}$	Gate-Source Charge			280		nC
$Q_{gd}$	Gate-Drain (Miller) Charge			344		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS} = 65\text{V}, I_D = 600\text{A};$ $R_G = 2.6\Omega; V_{GS} = 10\text{V};$ $T_J = 25^\circ\text{C}$		200		ns
$t_r$	Rise Time			535		ns
$t_{d(off)}$	Turn-off Delay Time			620		ns
$t_f$	Fall Time			700		ns
$R_g$	Internal Gate Resistor			4.7		$\Omega$
$R_{\theta JC}$	MOSFET Thermal Resistance: Junction-To-Case (Per Leg)			0.151		$^\circ\text{C/W}$

## Diode Characteristics ( $T_C=25^\circ\text{C}$ Unless otherwise specified)

$V_{SD}$	Diode Forward Voltage	$I_D = 1000\text{A}$		1.0		V
$t_{rr}$	Reverse Recovery Time	$V_R = 85\text{V},$ $I_F = 600\text{A}$		200		ns
$Q_{rr}$	Reverse Recovery Charge	$di/dt = 400\text{A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$		1.05		$\mu\text{C}$

## Module

Symbol	Description		Min	Typ	Max	Unit
V <sub>iso</sub>	Isolation Voltage(All Terminals Shorted)	f = 50Hz, 1minute	2500			V
T <sub>J</sub>	Maximum Junction Temperature				175	°C
T <sub>JOP</sub>	Maximum Operating Junction Temperature Range		-40		+150	°C
T <sub>stg</sub>	Storage Temperature		-40		+125	°C
R <sub>θCS</sub>	Case-To-Sink (Conductive Grease Applied)			0.1		°C/W
M	Power Terminals Screw:M4		3.0		5.0	N·m
M	Mounting Screw:M5		4.0		6.0	N·m
G	Weight			320		g

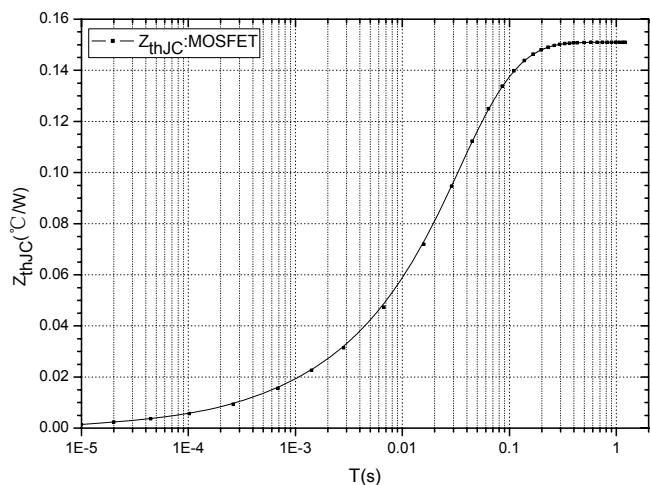


Fig.1 Transient thermal impedance (MOSFET)

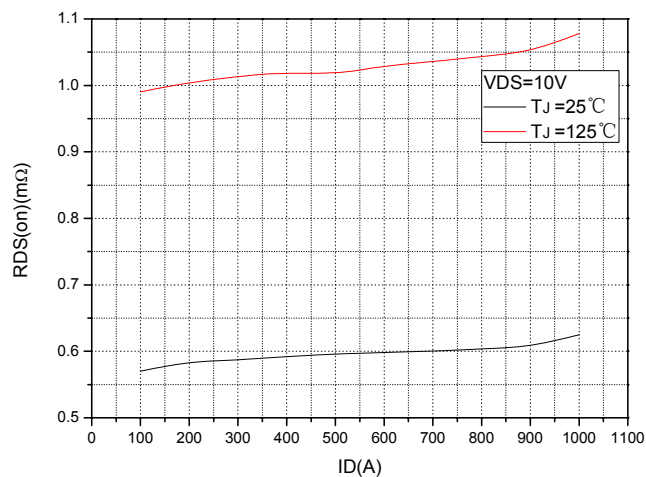


Fig.2 Typical Drain-Source On-Resistance Characteristics

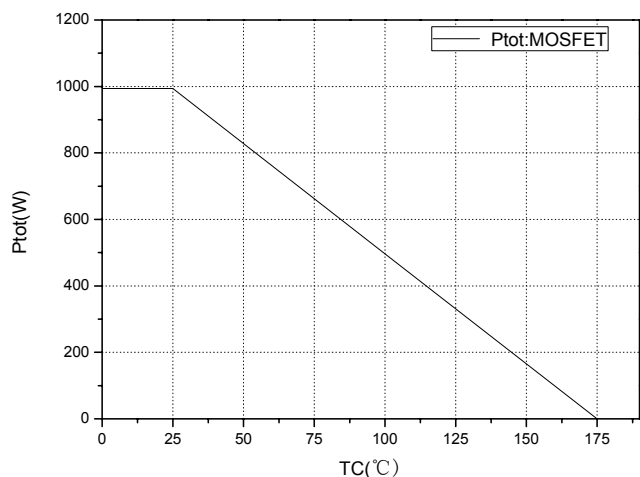


Fig.3 Power dissipation (MOSFET)

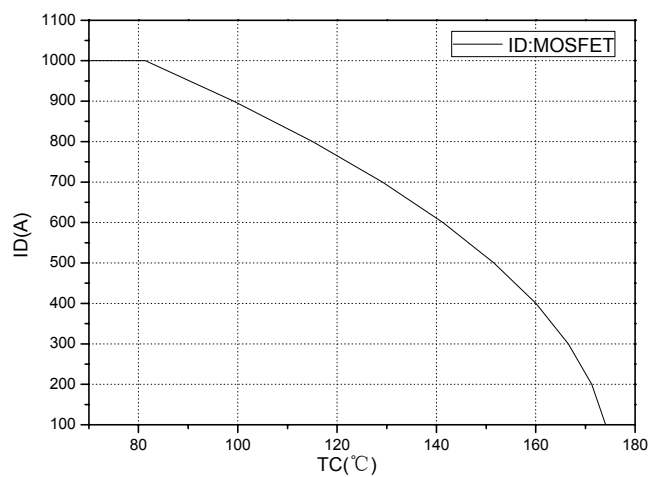
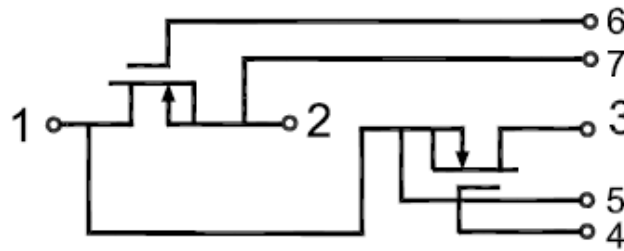
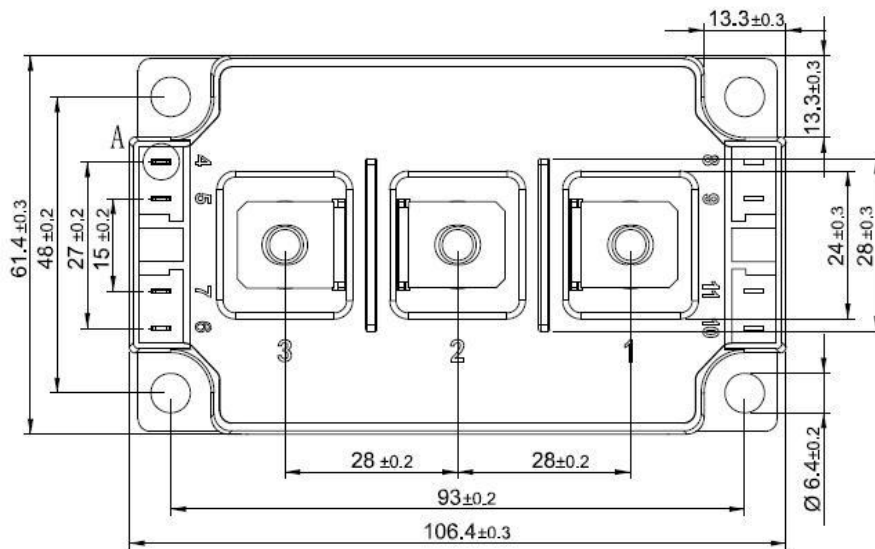
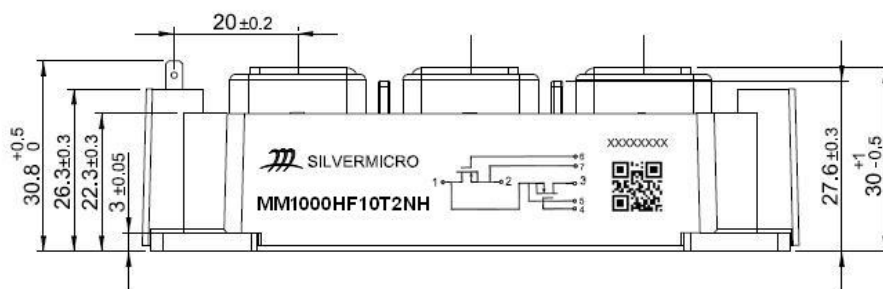


Fig.4 Drain Current (MOSFET)

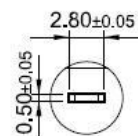
**Internal Circuit:**



**Package Outline (Unit: mm):**



View A  
scale 3:1



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