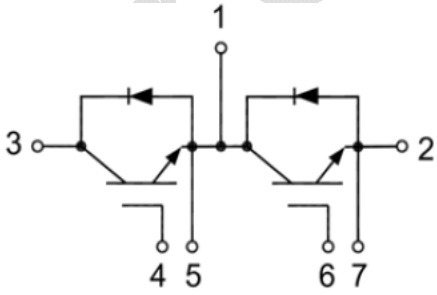
SILVERMICRO

GT100HF120T1H-M
IGBT Module

Features：

- Field Stop Trench Gate IGBT
- Short Circuit Rated>10μs
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications：

- Industrial Inverters
- Servo Applications
- EV And EHV
- Induction Heating
- UPS Systems

IGBT, Inverter
Maximum Rated Values of IGBT(T_C=25℃ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C = 100℃	100	A
		T_C = 25℃	200	A
I_{CM}	Repetitive Peak Collector Current	T_J = 175℃	200	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=175℃	714	W

Electrical Characteristics of IGBT (T_C=25℃ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=1mA, V_{CE}=V_{GE}		5.0	5.5	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=100A, V_{GE}=15V	T_J=25℃		1.70	2.00	V
			T_J=125℃		1.90		V
			T_J=150℃		1.90		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V, V_{CE}=V_{CES}, T_J=25℃				1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE}= ±20V, V_{CE}=0V, T_J=25℃				200	nA
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V , f=1MHz			8.03		nF
C_{oes}	Output Capacitance						nF
C_{res}	Reveres Transfer Capacitance				0.59		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V,I_C=100A, R_{Gon}=1Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		228		ns
			T_J=125℃		250		
			T_J=150℃		254		
t_r	Rise Time		T_J=25℃		63		ns
			T_J=125℃		67		
			T_J=150℃		69		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V,I_C=100A, R_{Goff}=1Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		269		ns
			T_J=125℃		279		
			T_J=150℃		284		
t_f	Fall Time		T_J=25℃		184		ns
			T_J=125℃		291		
			T_J=150℃		317		
E_{on}	Turn-on Switching Loss	V_{CC}=600V,I_C=100A, R_{Gon}=1Ω,V_{GE}=±15V, di/dt=1387A/μs(T_J=150℃), Inductive Load	T_J=25℃		3.1		mJ
			T_J=125℃		4.3		
			T_J=150℃		4.8		

E_{off}	Turn-off Switching Loss	V_{CC}=600V,I_C=100A, R_{Goff}=1Ω,V_{GE}=±15V, du/dt=4448V/μs(T_J=150℃), Inductive Load	T_J=25℃		5.28		mJ
			T_J=125℃		8.33		
			T_J=150℃		9.30		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		745		nC
$R_{g\ internal}$	Internal Gate Resistance		T_J=25℃		7.5		Ω
RBSOA	I_C=200A,V_{CC}=1050V,Vp=1200V, R_{Goff}=1Ω, V_{GE}=+15V to 0V, T_J=150°C			Trapezoid			
SC data	Vcc=600V, tp=10us, Vge=+/-15V, R_{Gon} =1ohm, R_{Goff} =1ohm,Tj=25℃				575		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case				0.21		℃/W

Diode, Inverter

Maximum Rated Values (T_C = 25℃ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	100	A
I_{FM}	Peak FWD Current Repetitive	200	A

Electrical Characteristics of FWD (T_C=25℃ unless otherwise specified)

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F=100A	T_J=25℃		1.70		V
			T_J=125℃		1.80		
			T_J=150℃		1.80		
t_{rr}	Reverse Recovery Time	I_F=100A, -diF/dt =1911A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		260		ns
			T_J=125℃		396		
			T_J=150℃		454		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		92		A
			T_J=125℃		104		
			T_J=150℃		105		

Q_{rr}	Reverse Recovery Charge	I_F=100A, -diF/dt =1911A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		10.2		μC
			T_J=125℃		16.8		
			T_J=150℃		19.2		
E_{rec}	Reverse Recovery Energy		T_J=25℃		4.83		mJ
			T_J=125℃		7.92		
			T_J=150℃		9.13		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.34		℃/W

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	f = 50Hz, 1minute	2500			V
Internal Isolation			Al2O3			
Material of Module Baseplate			Copper			
d_{creep}	Creepage Distance: Terminal to Heatsink			17.0		mm
	Creepage Distance: Terminal to Terminal			20.0		mm
d_{clear}	Clearance: Terminal to Heatsink			17.0		mm
	Clearance: Terminal to Terminal			9.5		mm
L_{SCE}	Stray Inductance Module			30		nH
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)			0.1		℃/W
T	Power Terminals Screw:M5		3.0		5.0	N·m
T	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			135		g

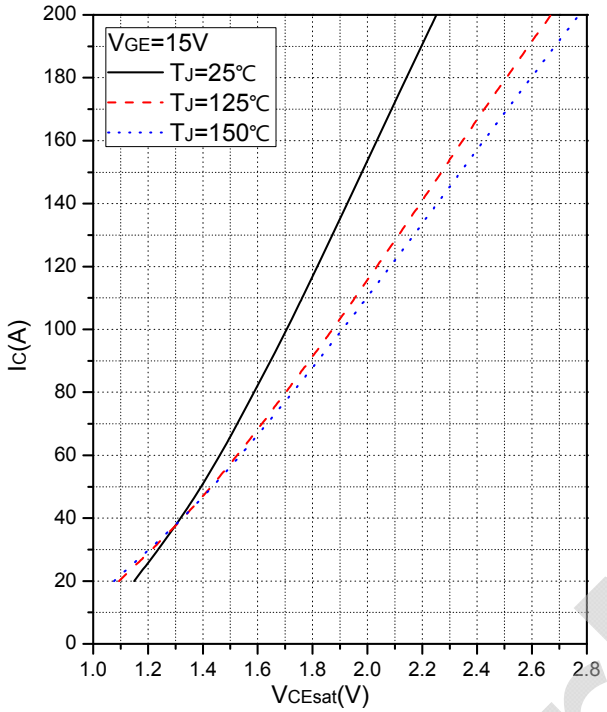


Fig.1 Typical Saturation Voltage Characteristics

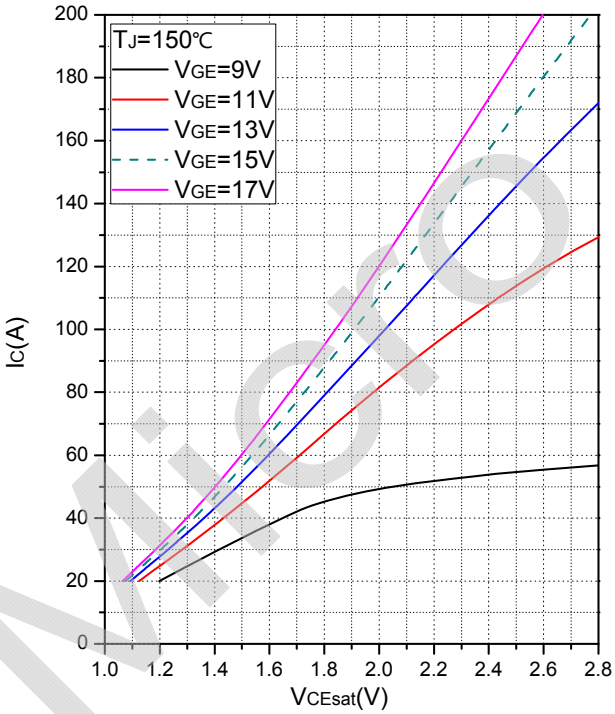


Fig.2 Typical Output Characteristics

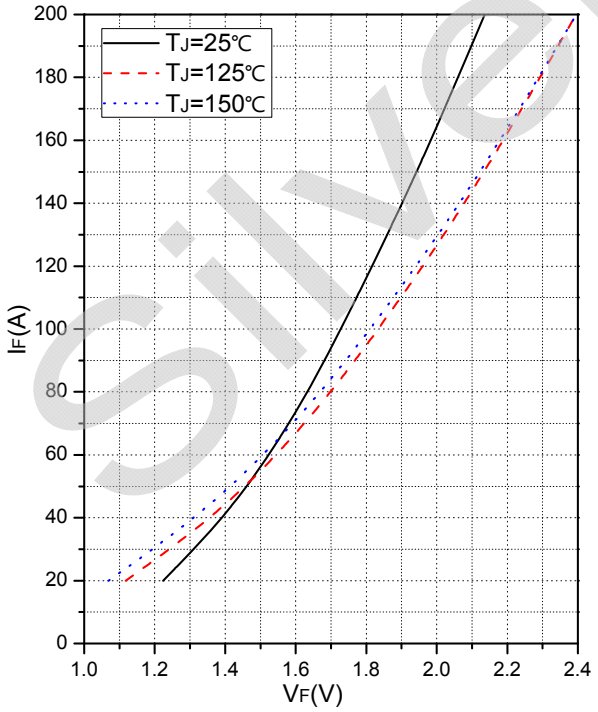


Fig.3 Forward Characteristics of FWD

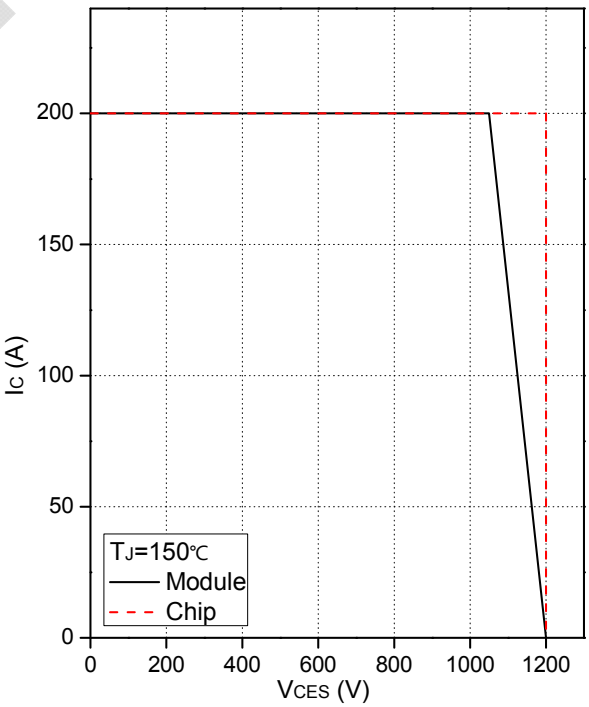


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

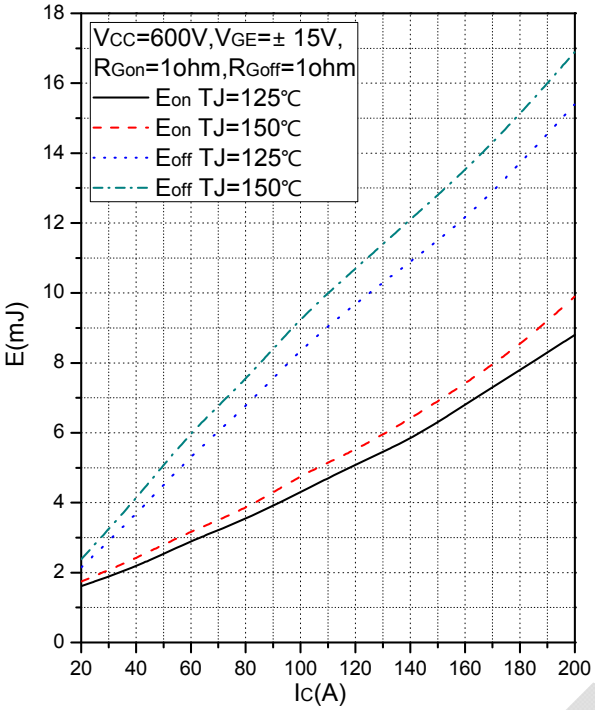


Fig.5 Typical Switching Loss vs. Collector Current

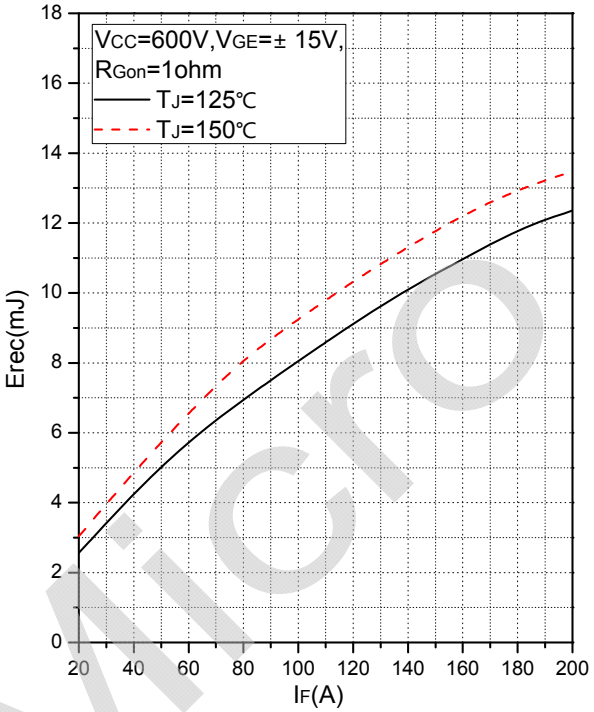


Fig.6 Typical Switching Loss vs. Forward Current

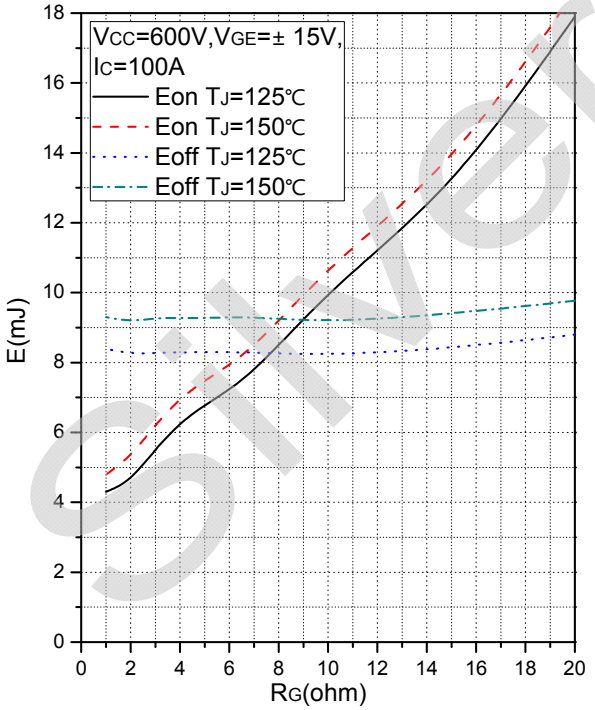


Fig.7 Typical Switching Loss vs. Gate Resistance

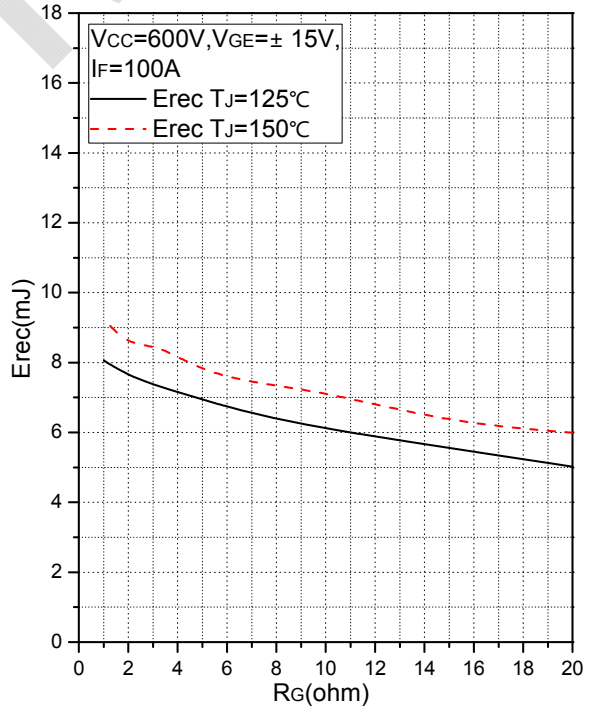


Fig.8 Typical Switching Loss vs. Gate Resistance

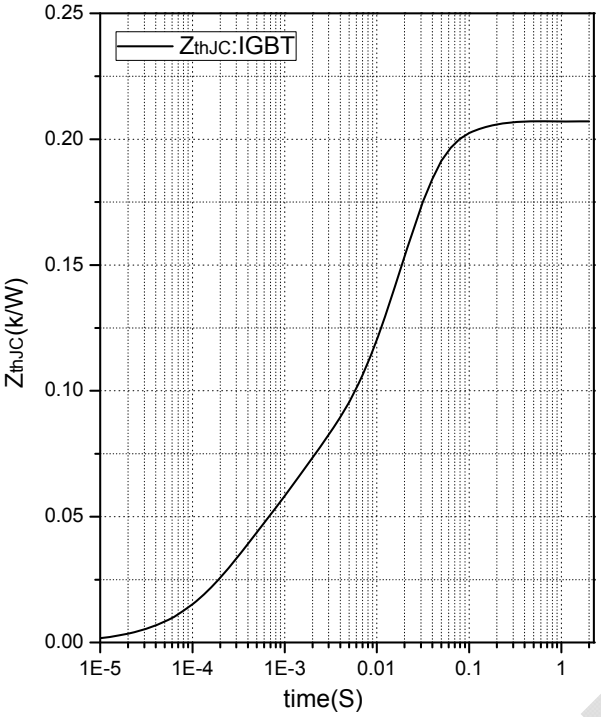


Fig.9 Transient Thermal Impedance

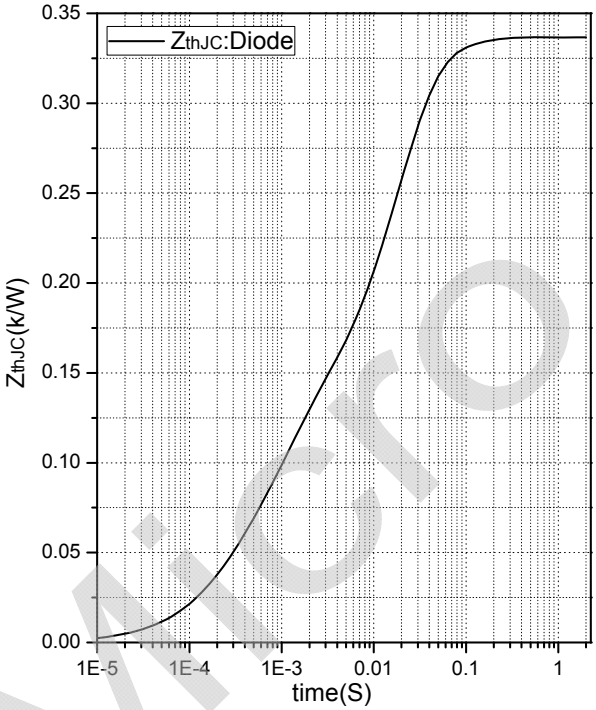


Fig.10 Transient Thermal Impedance

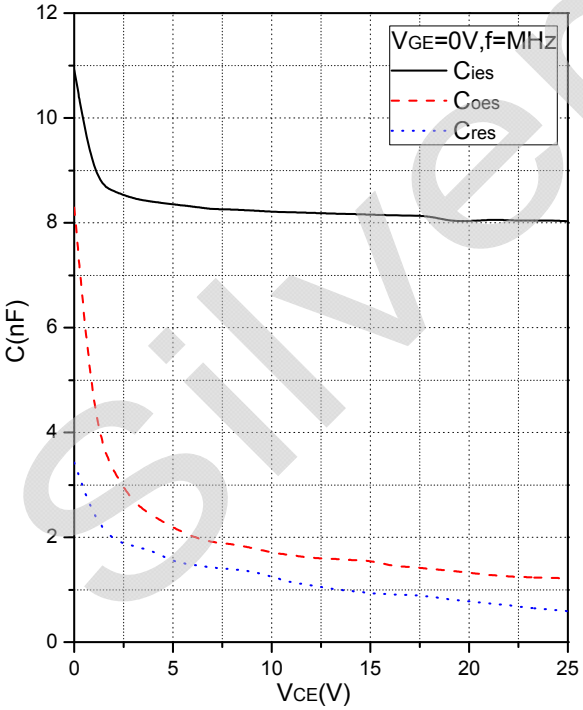
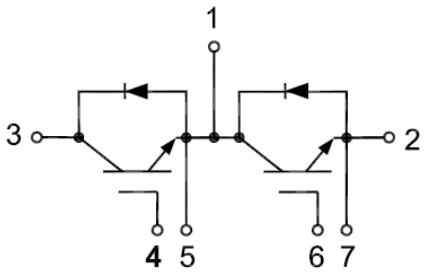
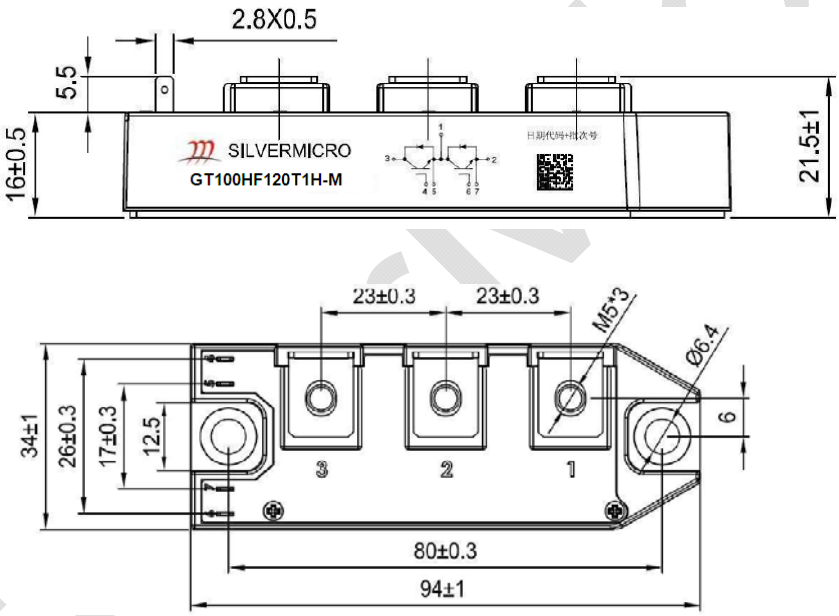


Fig.11 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):



Date	Revision	Notes
04/17/2020	A	Final Version

Announcements

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