GT50SD120B5H

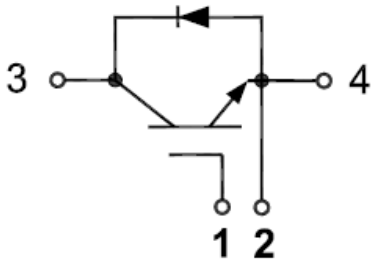
Preliminary Data

IGBT Module

Features：

- Short Circuit Rated>10μs
- Low Saturation Voltage: $V_{CE\ (sat)}$ =1.90 V @ I_C =50A , T_C=25℃
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Applications：



- Welding Machine/ Cutting Machine
- Induction Heating
- SMPS
- UPS

IGBT

Maximum Rated Values(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 = 80℃	50	A
		T_C = 25℃	100	A
I_{CM}	Repetitive Peak Collector Current	T_J = 175℃	100	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=175℃	390	W

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Static characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C = 1 mA, V_{CE} = V_{GE}		5.0	5.5	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C =50A, V_{GE} = 15V	T_J = 25℃		1.90	2.20	V
			T_J = 125℃		2.20		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			6.7		nF
C_{oes}	Output Capacitance				0.38		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 600V,I_C =50A, R_G = 15Ω,V_{GE} = ±15V Inductive Load	T_J = 25℃		240		ns
			T_J = 125℃		235		
t_r	Rise Time		T_J = 25℃		75		ns
			T_J = 125℃		75		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		235		ns
			T_J = 125℃		250		
t_f	Fall Time		T_J = 25℃		165		ns
			T_J = 125℃		280		
E_{on}	Turn-on Switching Loss		T_J = 25℃		3.72		mJ
			T_J = 125℃		4.48		
E_{off}	Turn-off Switching Loss		T_J = 25℃		2.25		mJ
			T_J = 125℃		3.54		
Q_g	Total Gate Charge		T_J = 25℃		390		nC
RBSOA	Reverse Bias Safe Operation Area	I_C=100A,V_{CC}=1050V,Vp=1200V, Rg =15 Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
SCSOA	Short Circuit Safe Operation Area	V_{CC} = 600V, V_{GE} = 15V, T_J = 150℃		10			μs
$R_{\theta JC}$	IGBT Thermal Resistance : Junction-To-Case				0.386		℃/W

SILVERMICRO

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	50	A
I_{FM}	Diode Maximum Forward Current	100	A

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

Symbol	Description	Test conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=50A	T_J = 25℃		1.80	2.10	V
			T_J = 125℃		2.00		
t_{rr}	Reverse Recovery Time	I_F=50A, di/dt =800 A/μs, V_{rr} = 600V, V_{GE} = -15V	T_J = 25℃		95		ns
			T_J = 125℃		112		
I_{rr}	Peak Reverse Recovery Current		T_J = 25℃		30		A
			T_J = 125℃		40		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		4.45		μC
			T_J = 125℃		7.36		
E_{rec}	Reverse Recovery Energy		T_J = 25℃		1.67		mJ
			T_J = 125℃		3.07		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.540		℃/W

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	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)			0.1		℃/W
T	Power Terminals Screw(M4)		0.5		1.5	N·m
T	Mounting Screw(M5)		0.5		1.5	N·m
G	Weight			32		g

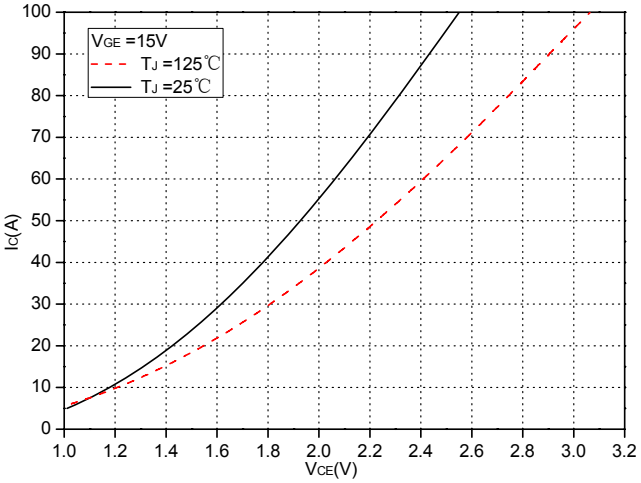


Fig.1 Typical Saturation Voltage Characteristics

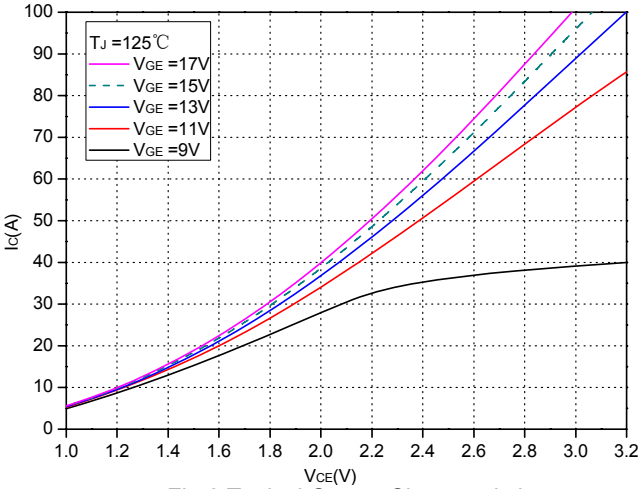


Fig.2 Typical Output Characteristics

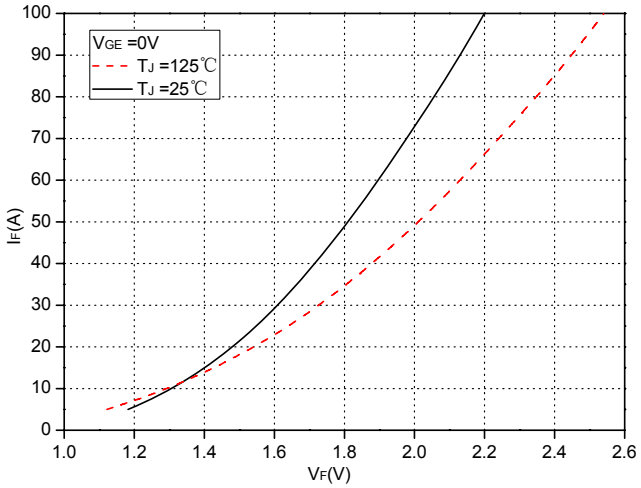


Fig.3 Forward Characteristics of FWD

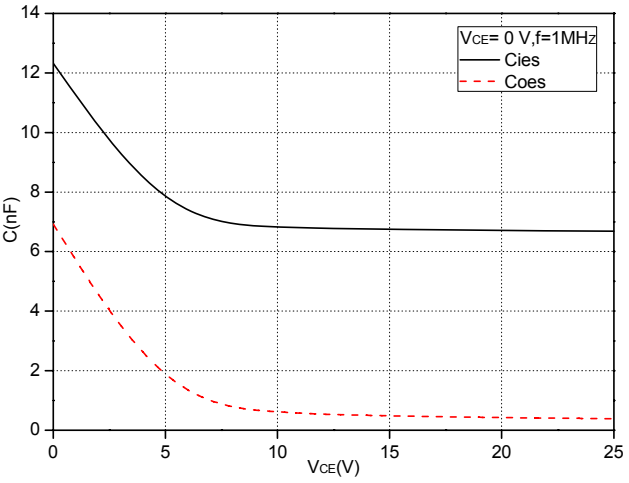


Fig.4 Capacitance Characteristics

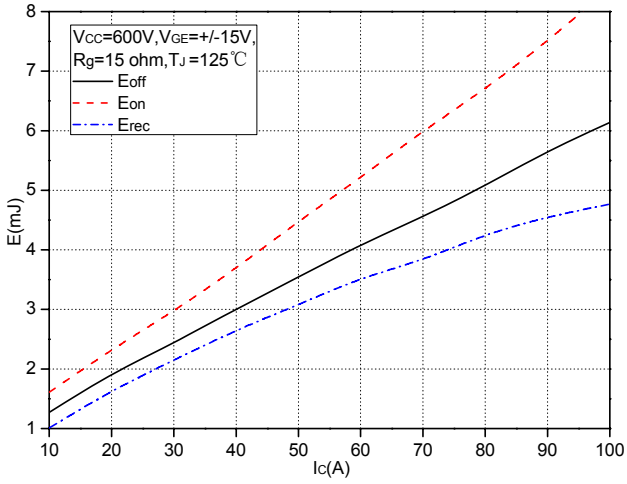


Fig.5 Typical Switching Loss vs. Collector Current

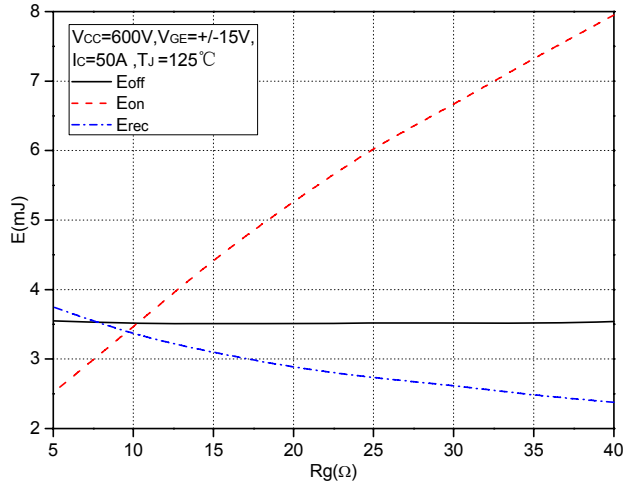


Fig.6 Typical Switching Loss vs. Gate Resistance

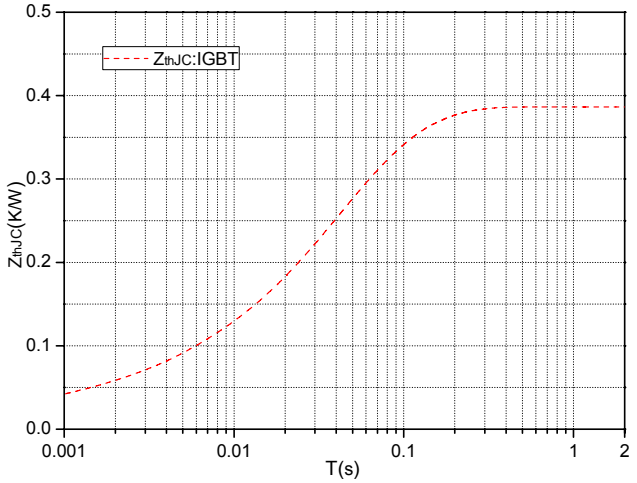


Fig.7 Transient Thermal Impedance (IGBT)

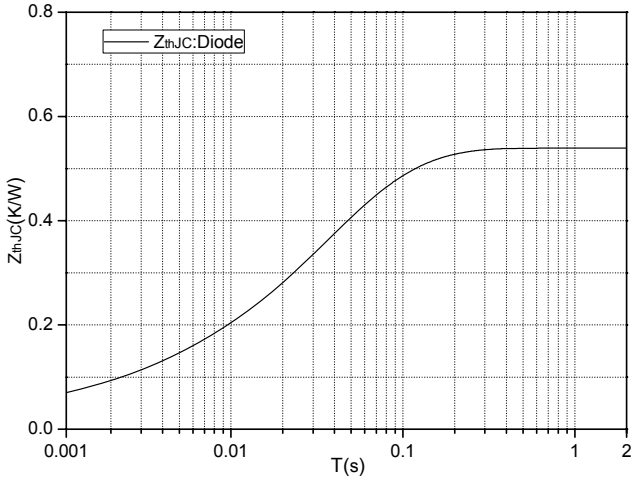


Fig.8 Transient Thermal Impedance (Diode)

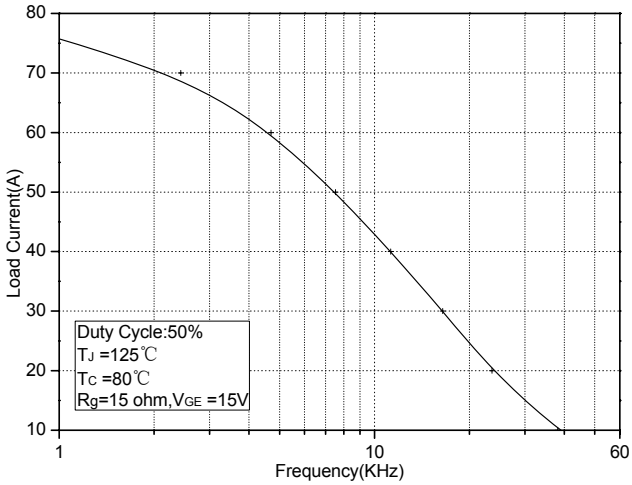


Fig.9 Typical Load Current vs. Frequency

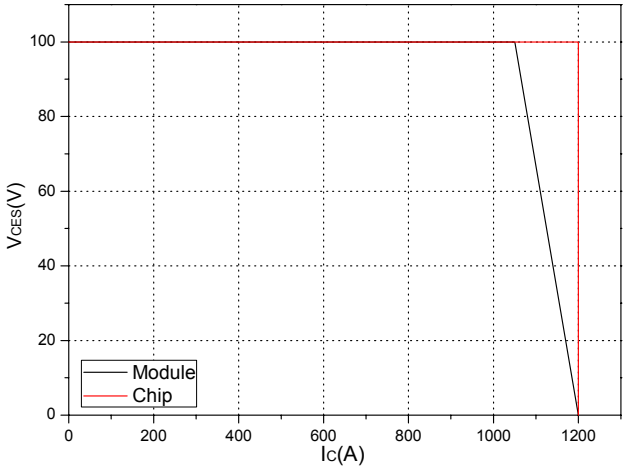
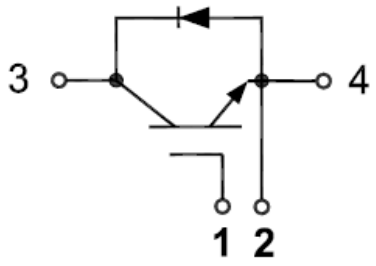
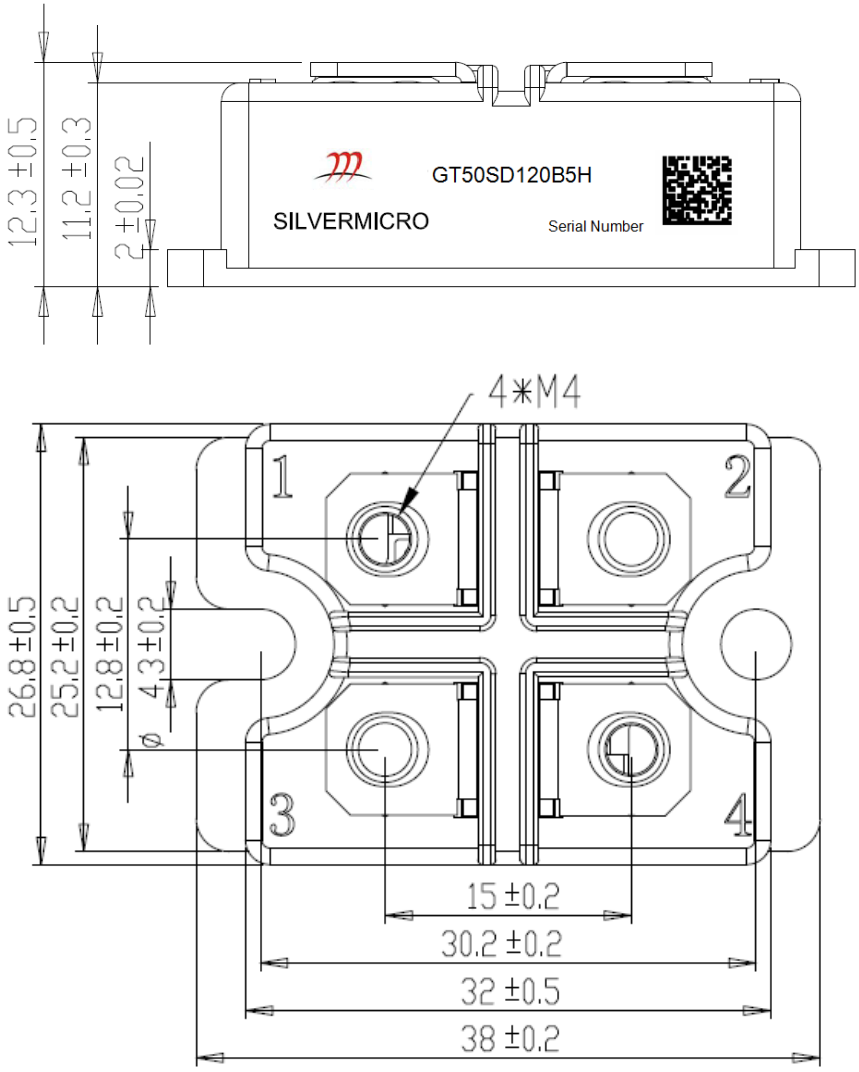


Fig.10 Reverse Bias Safe Operation Area (RBSOA)

Internal Circuit:



Package Outline (Unit: mm):



Announcement

Information in this document is believed to be accurate and reliable. However, NJSME does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to Make Changes

NJSME reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.