SILVERMICRO

GF150HF120A5H

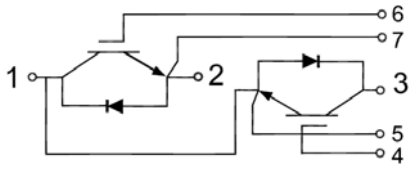
IGBT Module

Features：

- Short Circuit Rated 10μs
- Low Saturation Voltage: $V_{CE\ (sat)}$ = 3.30V @ I_C =150A , 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
- Ultrasonic Device



IGBT, Inverter

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℃,	150	A
		T_C = 25℃	270	A
I_{CM}	Repetitive Peak Collector Current	T_J = 150℃	300	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=150℃	1210	W

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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 = 1 mA, V_{CE} = V_{GE}		4.5	5.0	5.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 150A, V_{GE} = 15V	T_J = 25℃		3.30	3.50	V
			T_J = 125℃		3.80		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℃				400	nA
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V , f ＝1MHz			18.0		nF
C_{oes}	Output capacitance				1.63		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} =600V,I_C = 150A, R_G = 6.2Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		200		ns
			T_J = 125℃		185		
t_r	Rise Time		T_J = 25℃		110		ns
			T_J = 125℃		120		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		510		ns
			T_J = 125℃		540		
t_f	Fall Time		T_J = 25℃		125		ns
			T_J = 125℃		150		
E_{on}	Turn-on Switching Loss		T_J = 25℃		8.4		mJ
			T_J = 125℃		11.3		
E_{off}	Turn-off Switching Loss		T_J = 25℃		5.7		mJ
			T_J = 125℃		8.1		
Q_g	Total Gate Charge		T_J = 25℃		1890		nC
R_G	Internal gate resistor		T_J = 25℃		2.5		Ω
RBSOA	Reverse Bias Safe Operation Area	I_C=300A,V_{CC}=960V,Vp=1200V, Rg = 15Ω, 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				0.10		℃/W

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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	150	A
I_{FM}	Diode Maximum Forward Current	300	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F = 150A , V_{GE} = 0V	T_J = 25℃		2.20		V
			T_J = 125℃		2.40		
I_{rr}	Peak Reverse Recovery Current	I_F = 150A, di/dt = 1700A/μs, V_{rr} = 600V, V_{GE} = -15V	T_J = 25℃		85		A
			T_J = 125℃		120		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		8.0		μC
			T_J = 125℃		13.4		
E_{rec}	Reverse Recovery Energy		T_J = 25℃		3.6		mJ
			T_J = 125℃		6.1		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.24		℃/W

Module

Symbol	Description	Conditions	Min	Typ	Max	Unit
V_{iso}	Isolation Voltage(All Terminals Shorted)	f = 50Hz, 1minute			2500	V
T_J	Maximum Junction Temperature				150	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
$R_{\theta CS}$	Case-To-Sink (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			200		g

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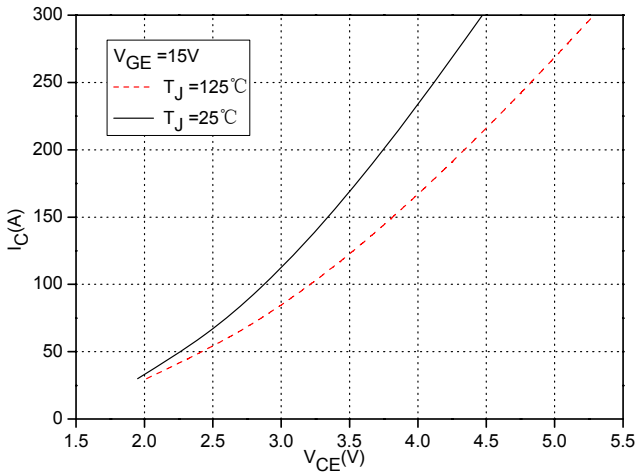

Fig.1Typical Saturation Voltage Characteristics

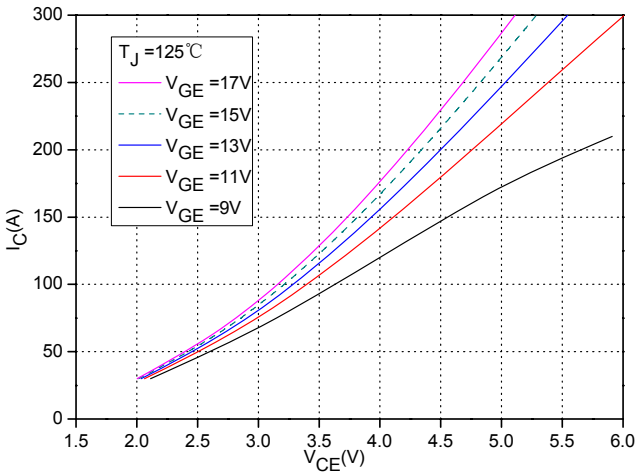

Fig.2 Typical Output Characteristics

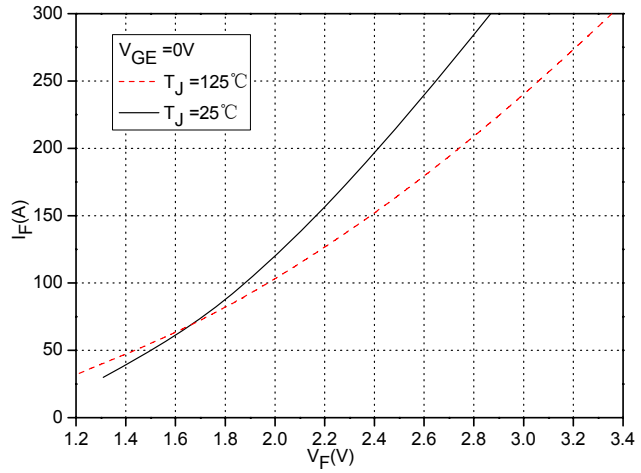

Fig.3 Forward Characteristics of FWD

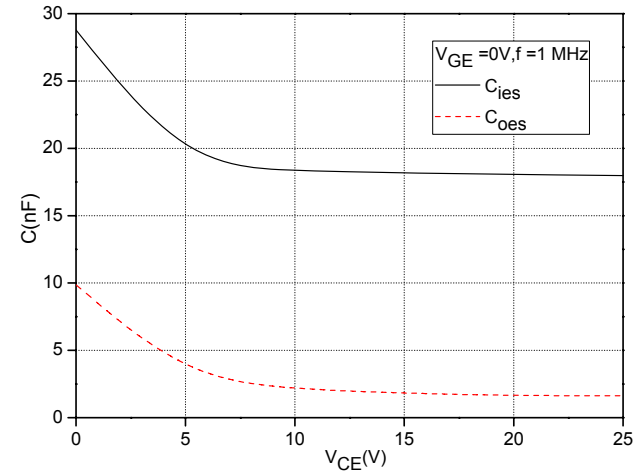

Fig.4 Capacitance Characteristics

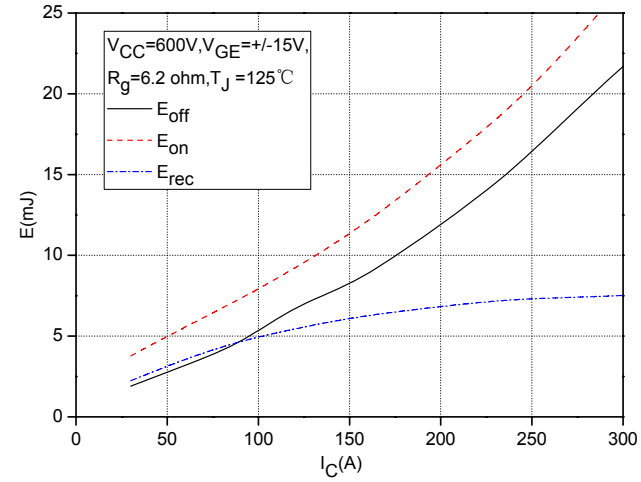

Fig.5Typical Switching Loss vs. Collector Current

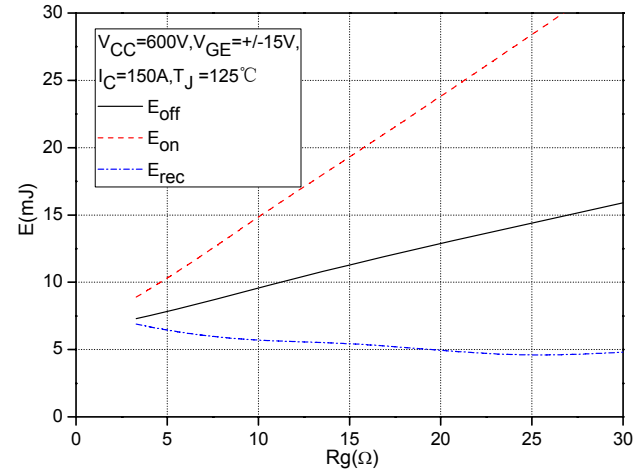

Fig.6Typical Switching Losses vs. Gate Resistance

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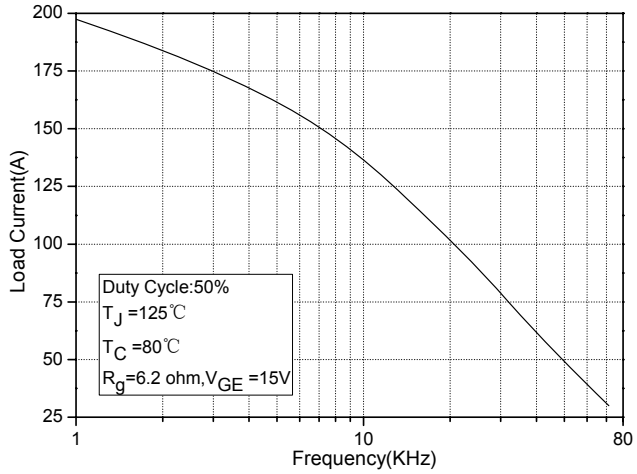

Fig.7Typical Load Current vs. Frequency

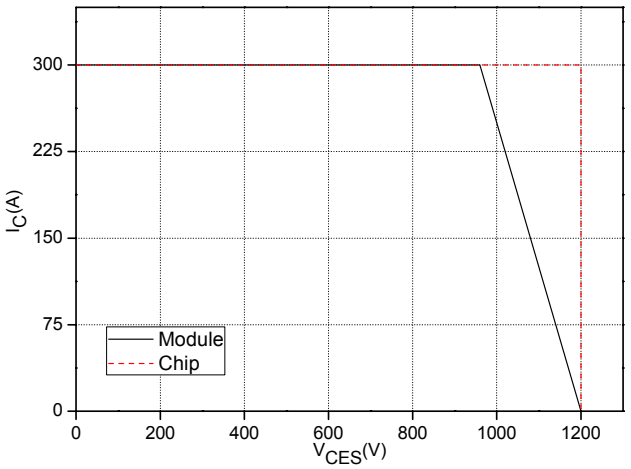

Fig.8 Reverse Bias Safe Operation Area (RBSOA)

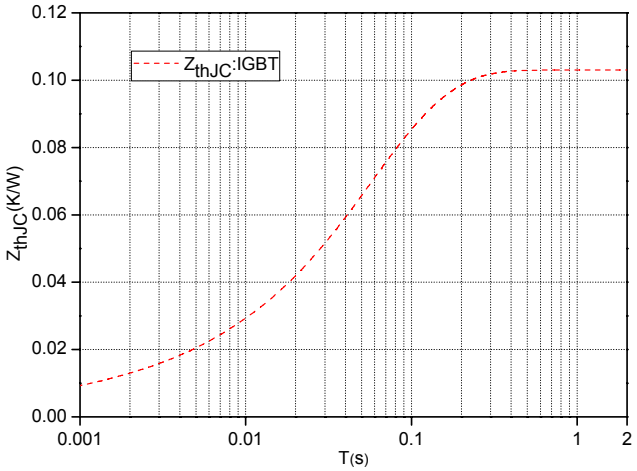

Fig.9Transient thermal impedance (IGBT)

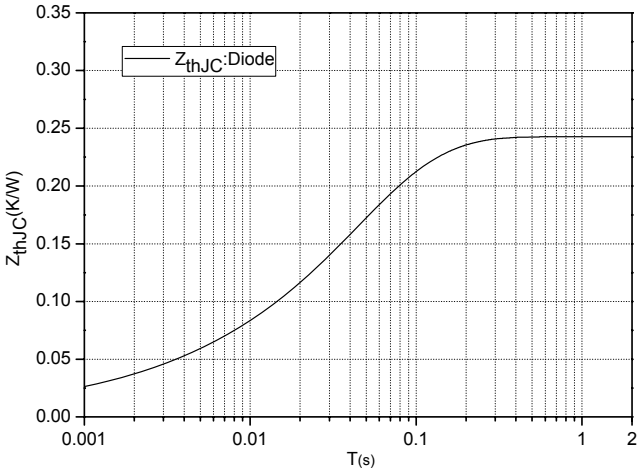

Fig.10Transient thermal impedance (Diode)

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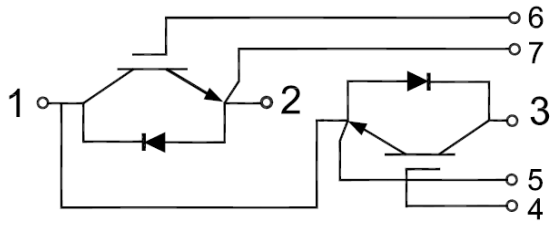
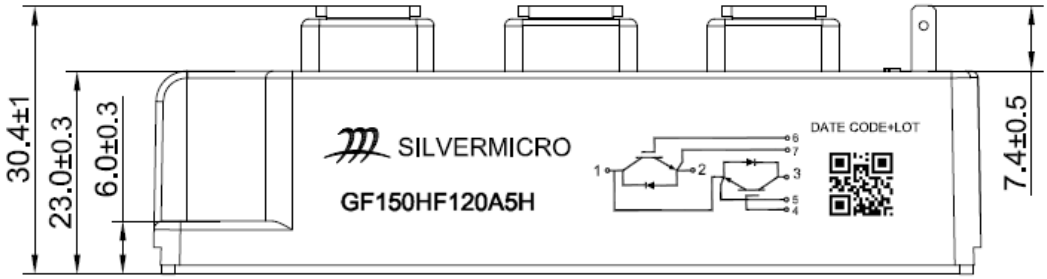
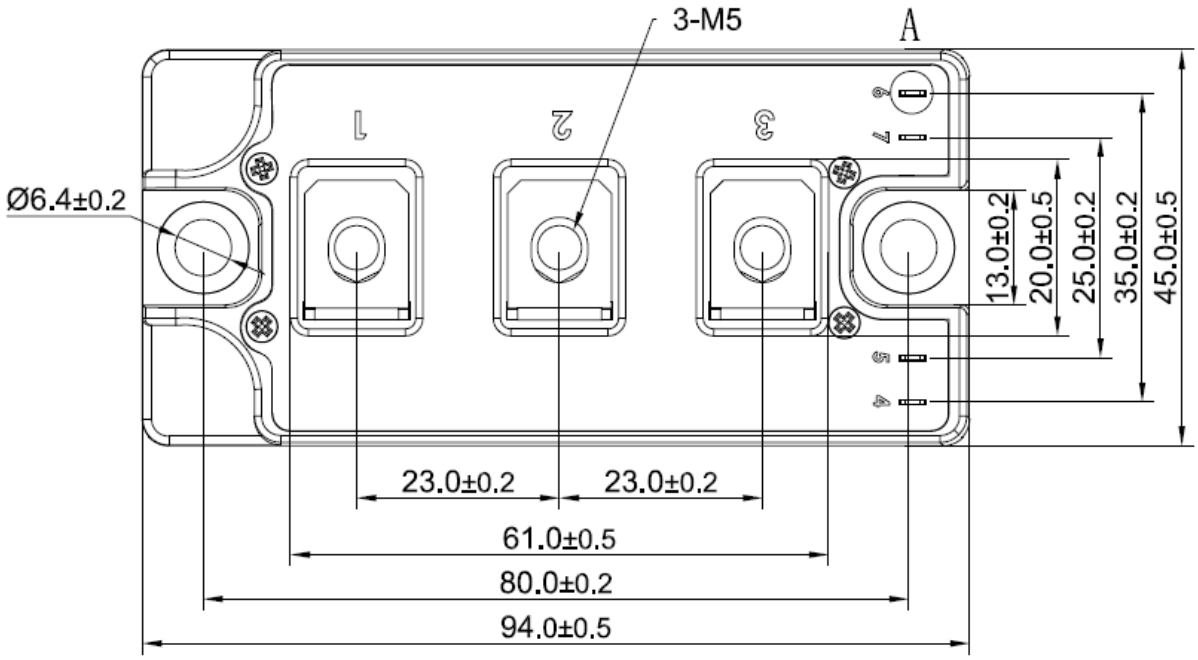
Internal Circuit:



Package Outline (Unit: mm):





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