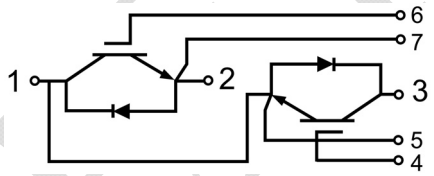
GF150HF120T2VH
GF150CC120T2VH
GF150CE120T2VH
IGBT Module

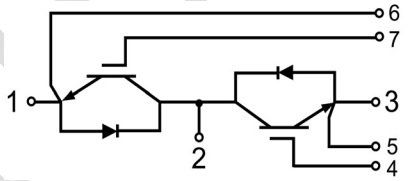
Features:

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

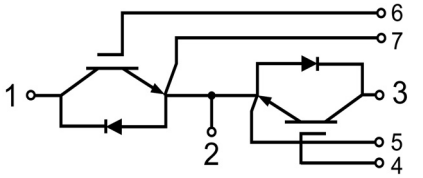
Circuit Diagram



HF



CC



CE

Applications:

- UPS、SMPS
- Welding Machine、Cutting Machine
- Induction Heating、Plating Power Supply

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℃	300	A
I_{CM}	Repetitive Pulse Collector Current	T_J=150℃	300	A
t_{sc}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per Leg	T_C=25℃ T_{Jmax}=150℃	1470	W

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=2mA, V_{CE}=V_{GE}		5.0	5.6	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=150A, V_{GE}=15V	T_J=25℃		3.25	3.60	V
			T_J=125℃		4.05		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=100kHz			13.4		nF
C_{oes}	Output Capacitance				1.24		nF
C_{oes}	Reverse Transfer Capacitance				0.54		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=150A, R_{Gon}=6.8Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		639		ns
			T_J=125℃		620		
t_r	Rise Time		T_J=25℃		126		ns
			T_J=125℃		123		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V, I_C=150A, R_{Goff}=6.8Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		619		ns
			T_J=125℃		624		
t_f	Fall Time		T_J=25℃		150		ns
			T_J=125℃		177		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=150A, R_{Gon}=6.8Ω, V_{GE}=±15V, di/dt=1040A/μs(T_J=125℃) Inductive Load	T_J=25℃		12.4		mJ
			T_J=125℃		15.4		
E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=150A, R_{Goff}=6.8Ω, V_{GE}=±15V, du/dt=4140V/μs(T_J=125℃) Inductive Load	T_J=25℃		7.2		mJ
			T_J=125℃		9.5		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		1.81		μC
$R_{g\ internal}$	Internal Gate Resistor		T_J=25℃		1.25		Ω
RBSOA	Reverse Bias Safe Operation Area	I_C=300A, V_{CC}=1050V, Vp=1200V, R_G=6.8Ω, V_{GE}=+15V to 0V, T_J=150℃		Trapezoid			
I_{SC}	Vcc=600V, t_p=10us, V_{GE}=+/-15V, R_G=6.8Ω, T_J=125℃				1566		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case					0.085	℃/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	150	A
I_{FM}	Diode Maximum Forward Current	300	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=150A, V_{GE}=15V	T_J=25℃		2.40		V
			T_J=125℃		2.50		
t_{rr}	Reverse Recovery Time	I_F=150A, di/dt =1540A/μs(T_J=125℃), V_{rr}=600V, V_{GE}= -15V	T_J=25℃		172		ns
			T_J=125℃		365		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		65.6		A
			T_J=125℃		90.6		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		6.54		μC
			T_J=125℃		14.7		
E_{rec}	Reverse Recovery Energy		T_J=25℃		1.96		mJ
			T_J=125℃		5.16		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case					0.205	℃/W

Module

Symbol	Description		Min.	Typ.	Max.	Units
V_{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1minute	2500			V
L_{sCE}	Stray Inductance Module			20		nH
T_J	Maximum Junction Temperature				150	℃
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)				0.03	℃/W
T	Power Terminals Screw:M6		3.0		5.0	N·m
T	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			300		g

Ordering Information Table

Device code

G	F	150	HF	120	T2V	H
①	②	③	④	⑤	⑥	⑦

① - IGBT Module
② - NPT, Fast IGBT
③ - Rated Current (150=150A)
④ - Circuit Configuration: HF(Half Bridge)
CC(Common Collector)
CE(Common Emitter)
⑤ - Rated Voltage (120=1200V)
⑥ - Package Type
⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

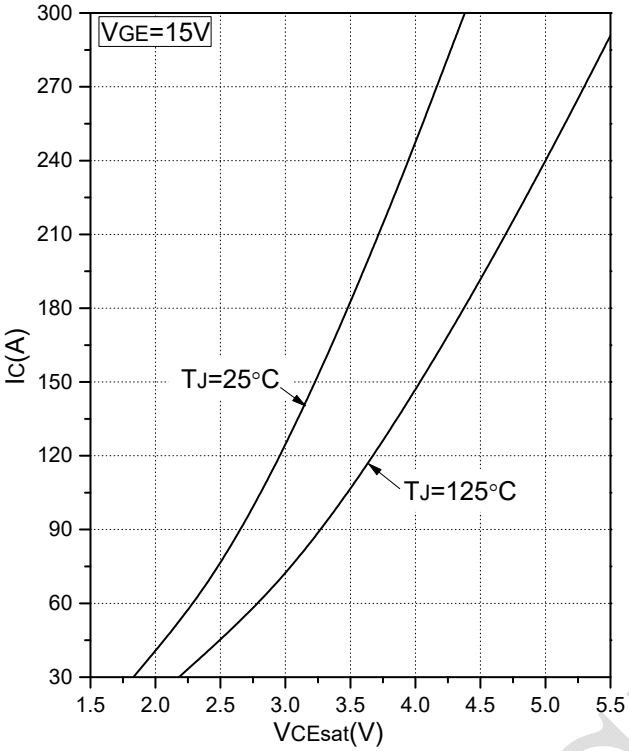


Fig.1 Typical Saturation Voltage Characteristics

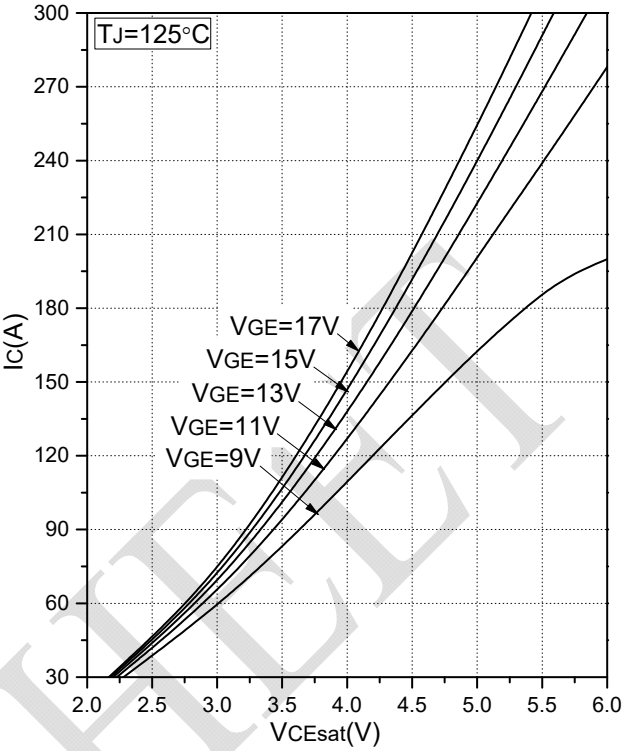


Fig.2 Typical Output Characteristics

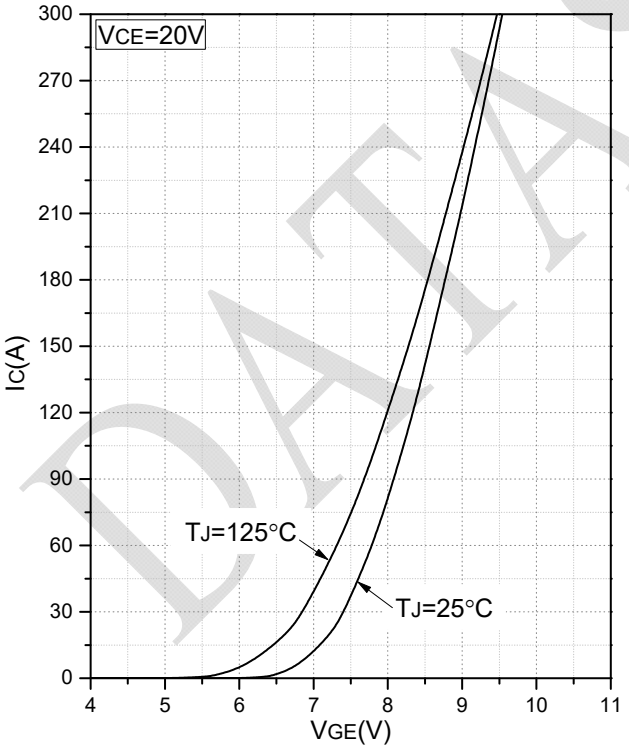


Fig.3 Transfer Characteristic

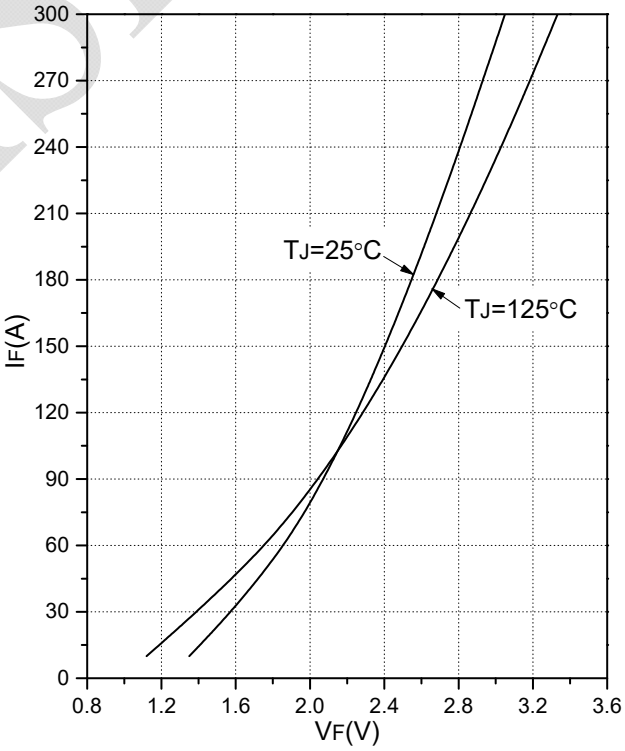


Fig.4 Forward Characteristics of Diode

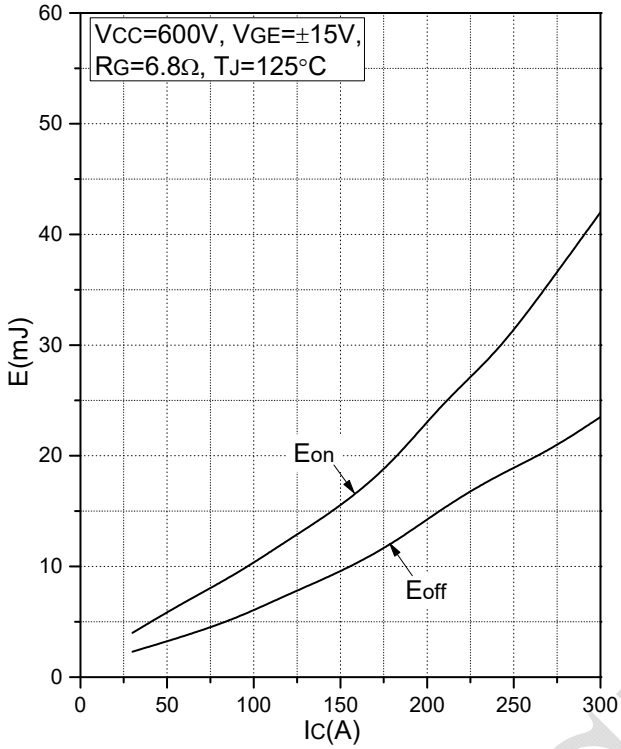


Fig.5 Typical Switching Loss vs. Collector Current

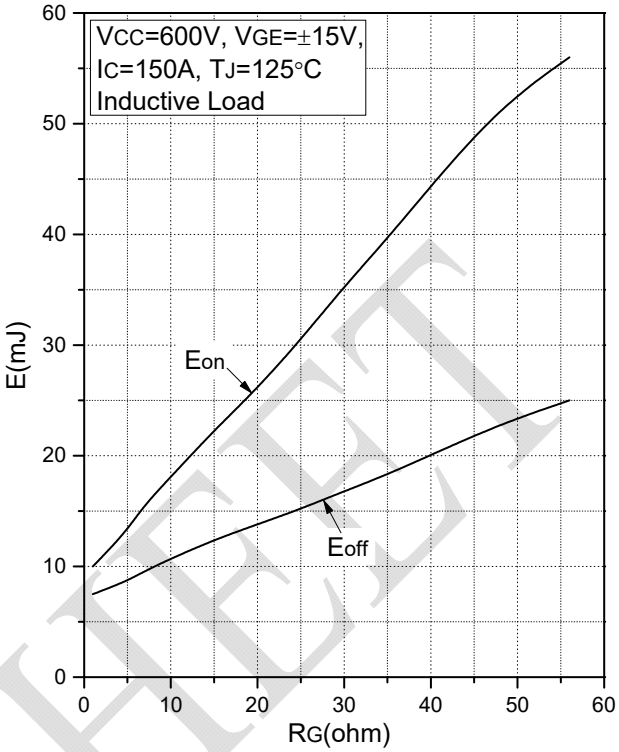


Fig.6 Typical Switching Loss vs. Gate Resistance

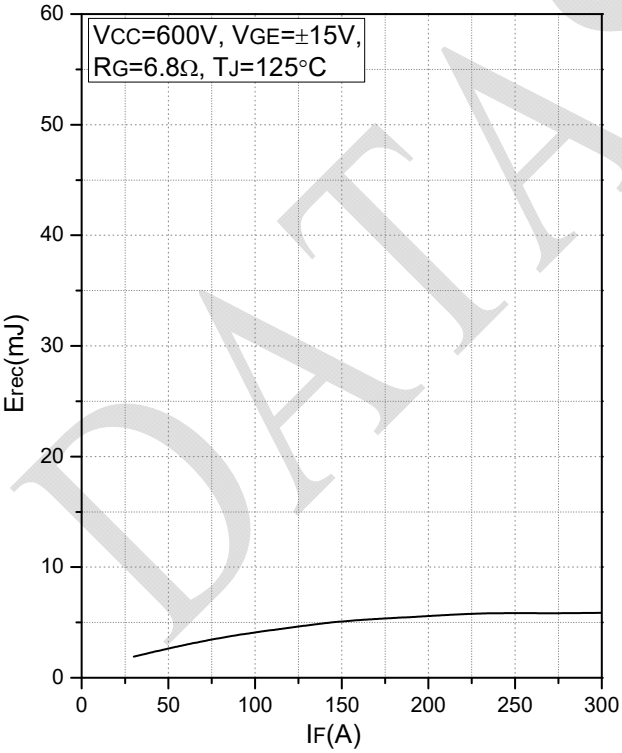


Fig.7 Typical Switching Loss vs. Forward Current

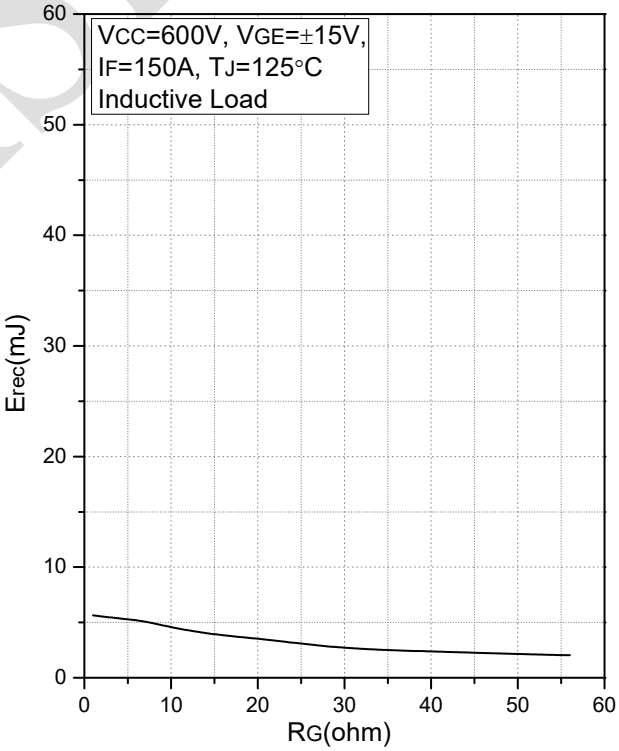


Fig.8 Typical Switching Loss vs. Gate Resistance

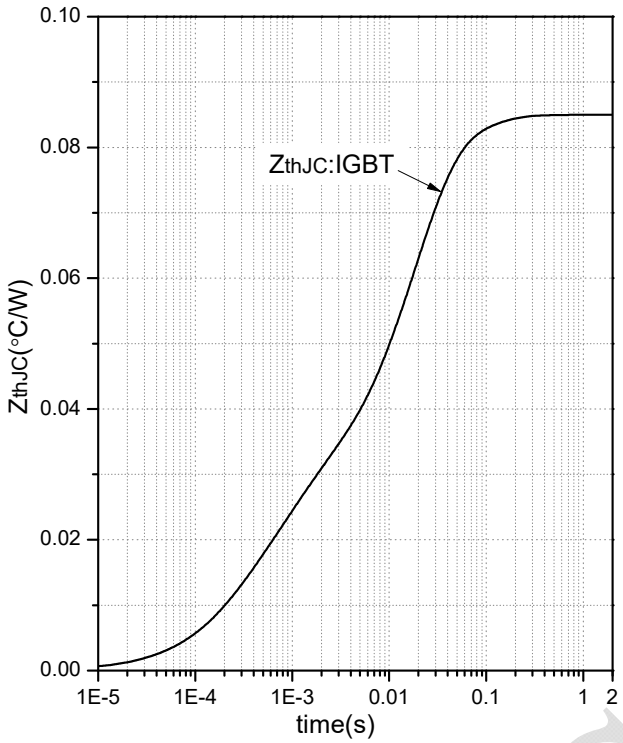


Fig.9 Transient Thermal Impedance (IGBT)

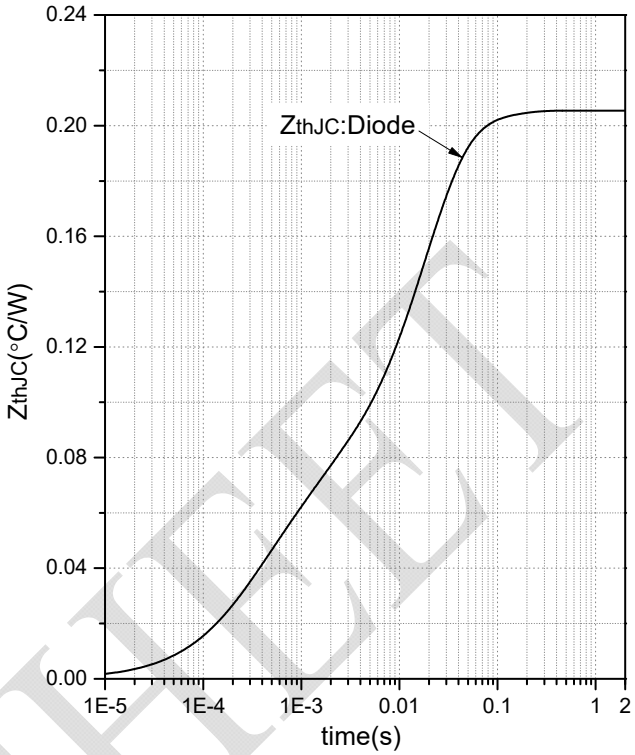


Fig.10 Transient Thermal Impedance (Diode)

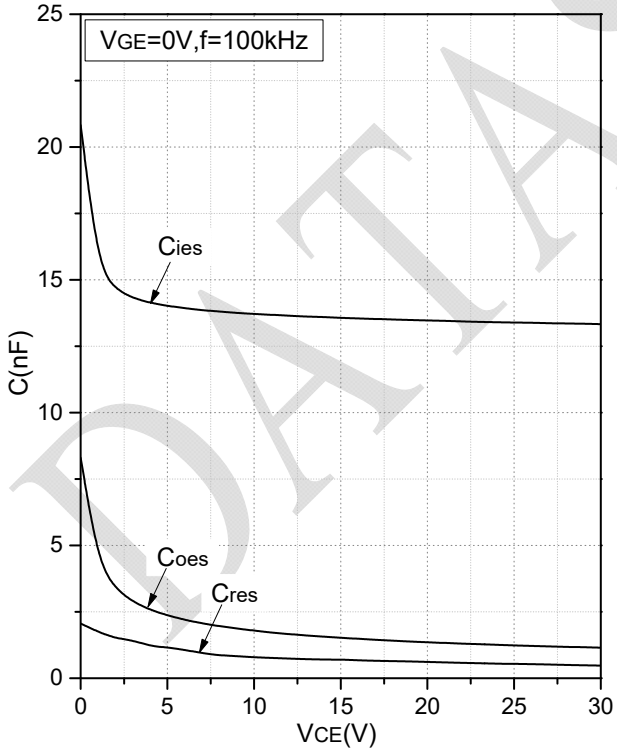


Fig.11 Capacitance Characteristics

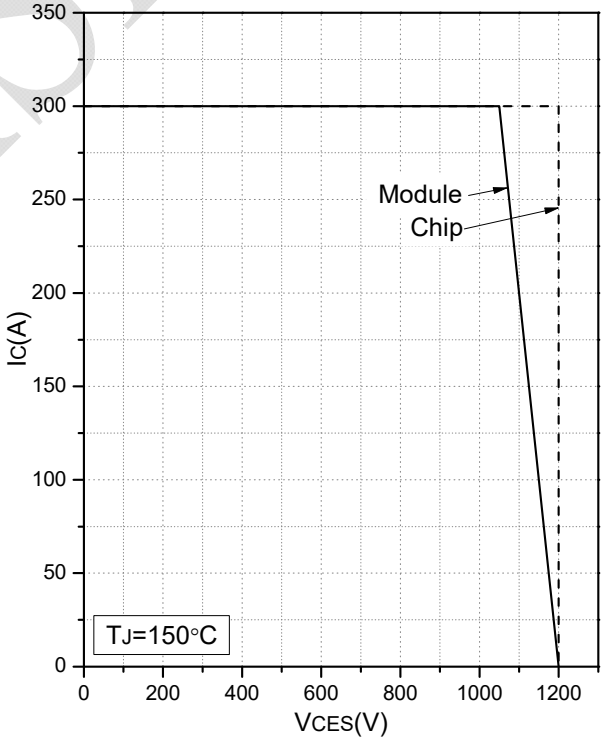
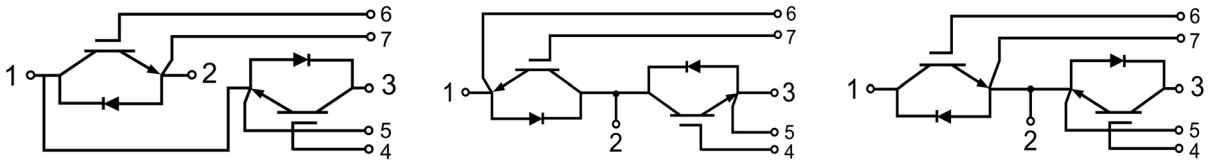


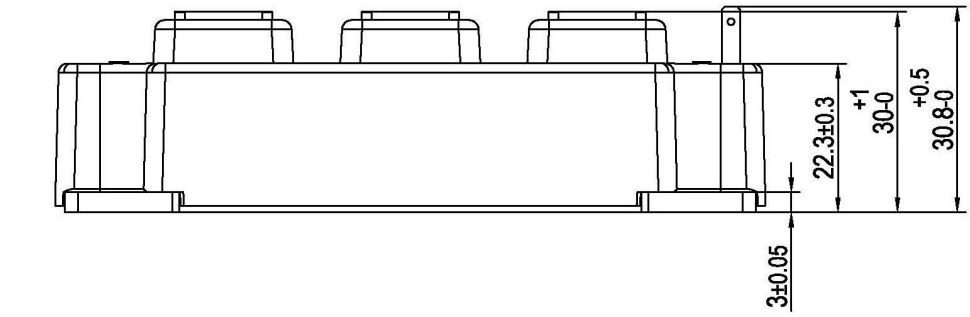
Fig.12 Reverse Bias Safe Operation Area (RBSOA)

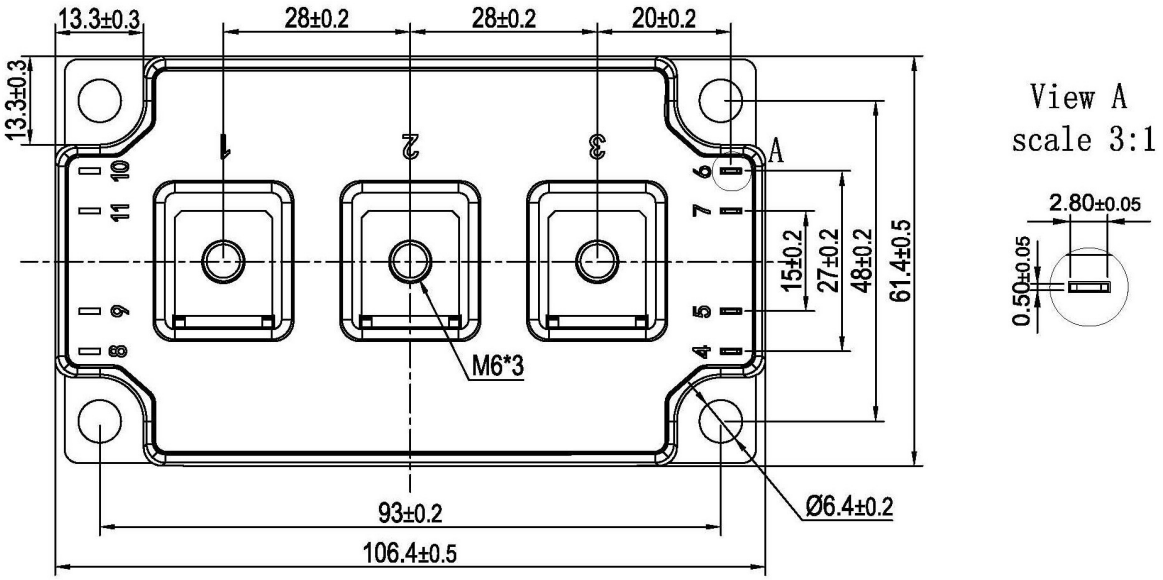
Internal Circuit



HF CC CE

Package Outline (Unit: mm):





View A
scale 3:1

Date	Revision	Notes
02/22/2022	A	Final Version

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