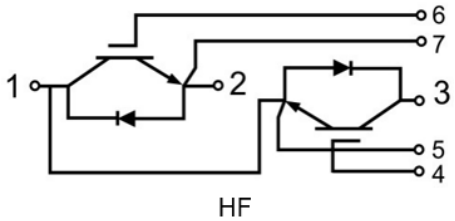
GT300HF120T2VH
GT300CE120T2VH
IGBT Module

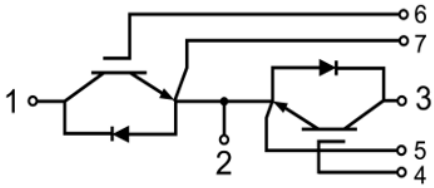
Features：

- 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

Circuit Diagram



HF



CE

Applications：

- Welding
- HEV Inverter
- Industrial Motor Drives
- UPS

IGBT, Inverter
Maximum Rated Values of IGBT

V_{CES}	Collector-Emitter Blocking Voltage	T_J=25℃	1200	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C=100℃	300	A
		T_C=25℃	600	A
I_{CM}	Repetitive Peak Collector Current	tp=1ms	600	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C=25℃ T_{Jmax}=175℃	1950	W

Electrical Characteristics of IGBT

Static Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=12mA, V_{CE}=V_{GE}, T_J=25℃		5.0	6.2	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=300A, V_{GE}=15V	T_J=25℃		2.50	2.90	V
			T_J=125℃		3.40		V
			T_J=150℃		3.60		
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=100KHz, T_J=25℃			25.30		nF
C_{oes}	Output Capacitance				1.73		nF
C_{res}	Reverse Transfer Capacitance				1.08		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=300A, R_{Gon} =4.7Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		533		ns
			T_J=125℃		527		
			T_J=150℃		521		
t_r	Rise Time		T_J=25℃		165		ns
			T_J=125℃		170		
			T_J=150℃		173		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}= 600V, I_C=300A, R_{Goff}=4.7Ω, V_{GE}= ±15V, Inductive Load	T_J=25℃		226		ns
			T_J=125℃		227		
			T_J=150℃		227		
t_f	Fall Time		T_J=25℃		115		ns
			T_J=125℃		145		
			T_J=150℃		152		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=300A, R_{Gon}=4.7Ω, V_{GE}= ±15V, di/dt=1520A/μs(T_J=150℃), Inductive Load	T_J=25℃		24.7		mJ
			T_J=125℃		36.0		
			T_J=150℃		43.7		

E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=300A, R_{Goff}=4.7Ω, V_{GE}=±15V, du/dt=7900V/μs(T_J=150℃), Inductive Load	T_J=25℃		13.4		mJ
			T_J=125℃		18.2		
			T_J=150℃		19.6		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		1159		nC
$R_{g\ internal}$	Internal Gate Resistance		T_J=25℃		0.5		Ω
RBSOA	I_C=600A, V_{CC}=1050V, Vp=1200V, R_{Goff}=4.7Ω, V_{GE}=+15V to 0V, T_J =150°C			Trapezoid			
SCSOA	V_{CC}=600V, V_{GE}=15V, T_J=150℃			10			μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case					0.077	℃/W

Diode, Inverter
Maximum Rated Values of Diode

V_{RRM}	Repetitive Peak Reverse Voltage	T_J=25℃	1200	V
I_F	Diode Continuous Forward Current		300	A
I_{FM}	Diode Maximum Forward Current	tp=1ms	600	A

Electrical Characteristics of Diode

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=300A	T_J=25℃		1.80		V
			T_J=125℃		2.00		
			T_J=150℃		2.00		
t_{rr}	Reverse Recovery Time	I_F=300A, -diF/dt =1775A/μs(T_J=150℃), V_{rr}=600V, V_{GE}=-15V	T_J=25℃		387		ns
			T_J=125℃		633		
			T_J=150℃		726		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		134		A
			T_J=125℃		159		
			T_J=150℃		166		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		24.9		μC
			T_J=125℃		45.7		
			T_J=150℃		53.3		

E_{rec}	Reverse Recovery Energy	I_F =300A, -diF/dt =1775A/μs(T_J=150℃), V_{rr}=600V, V_{GE}=-15V	T_J=25℃		9.1		mJ
			T_J=125℃		16.2		
			T_J=150℃		18.9		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case					0.131	℃/W

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage(All Terminals Shorted)	f=50Hz, 1minute, 30s	4500			V
L_{SCE}	Stray Inductance Module			20		nH
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+150	℃
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)				0.03	℃/W
T	Power Terminals Screw:M6		2.5		5.0	N·m
T	Mounting Screw:M6		3.0		6.0	N·m
G	Weight			300		g

Ordering Information Table

Device code

G	T	300	HF	120	T2V	H
①	②	③	④	⑤	⑥	⑦

①-IGBT Module
②-Trench, Low Switching Losses IGBT
③-Rated Current (300=300A)
④-Circuit Configuration (HF=Half Bridge)
(CE=Common Emitter)
⑤-Rated Voltage (120=1200V)
⑥-Package Type
⑦-Test Level (Pass the Important Reliability Test-Industrial Grade)

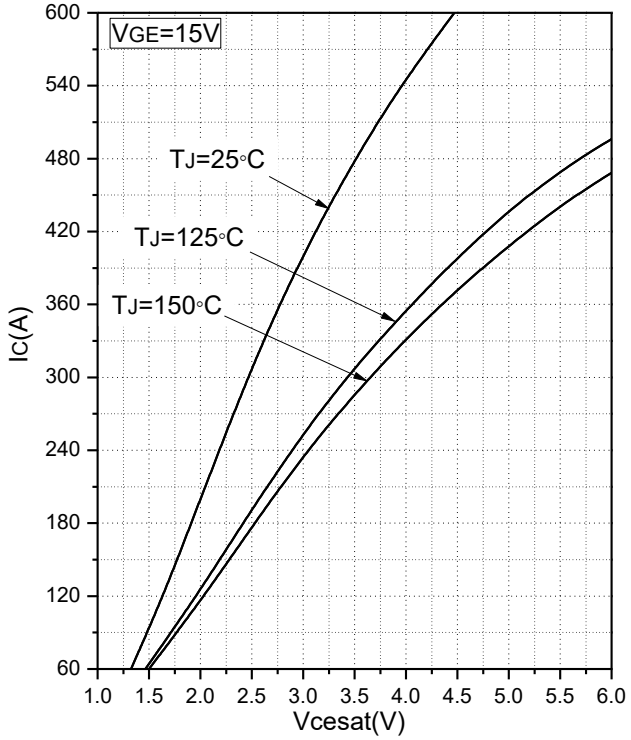


Fig.1 Typical Saturation Voltage Characteristics

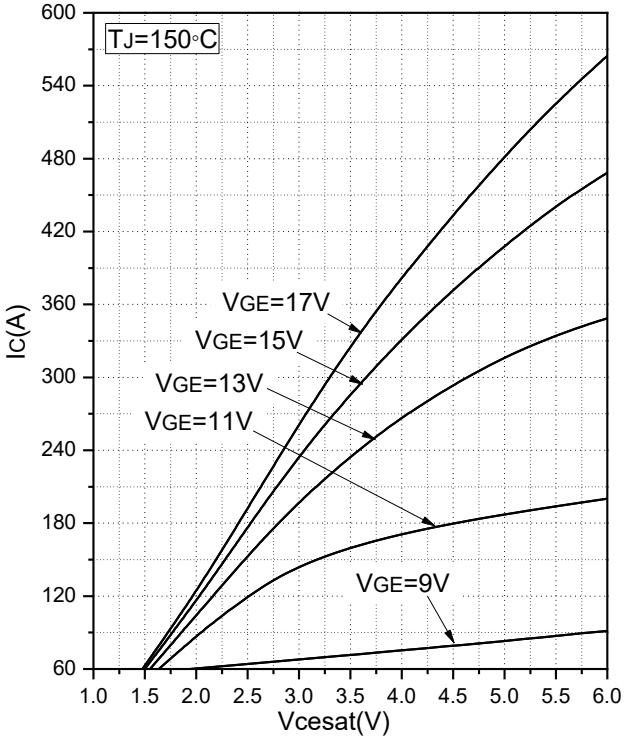


Fig.2 Typical Output Characteristics

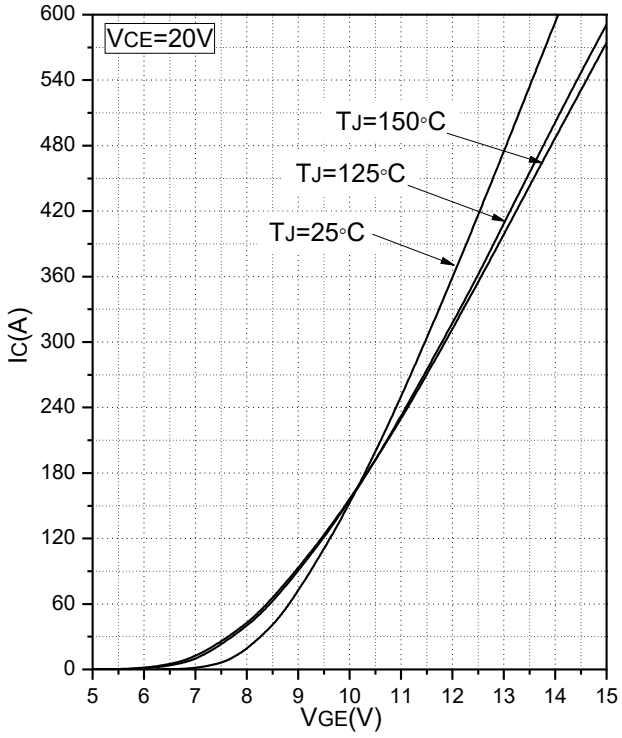


Fig.3 Transfer Characteristic

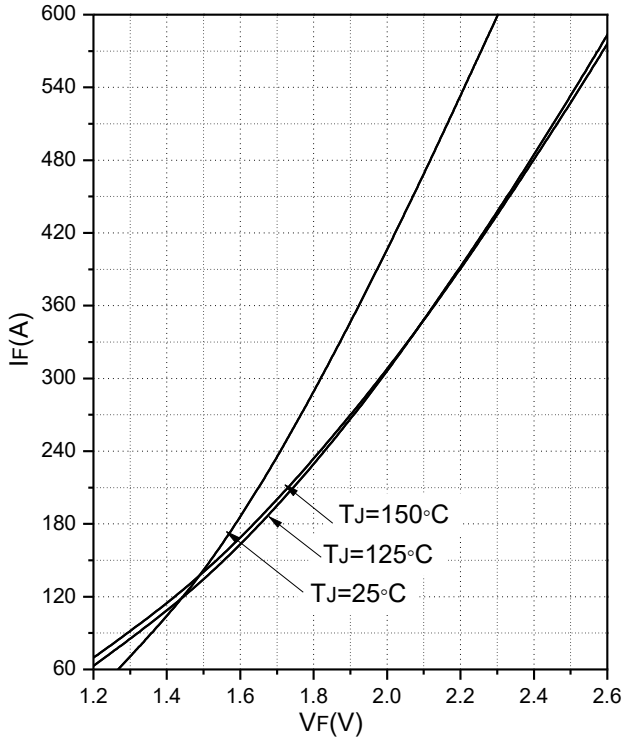


Fig.4 Forward Characteristics of Diode

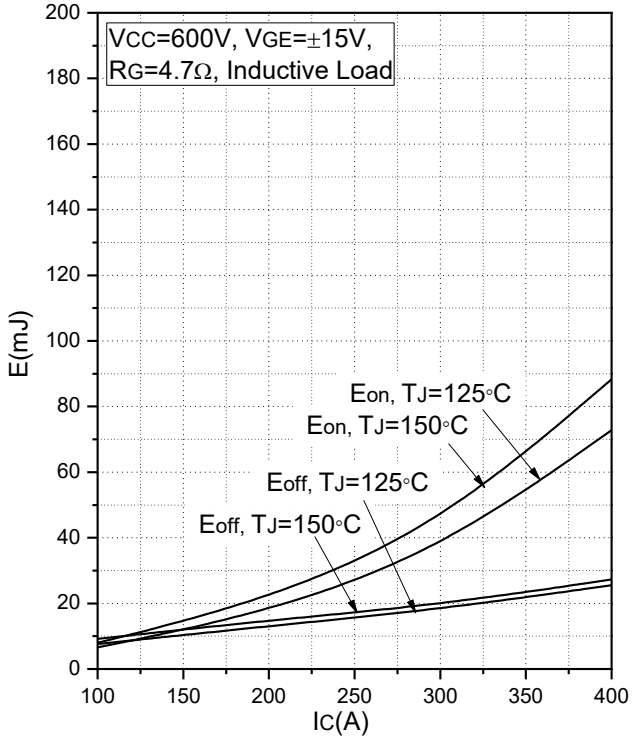


Fig.5 Typical Switching Loss vs. Collector Current

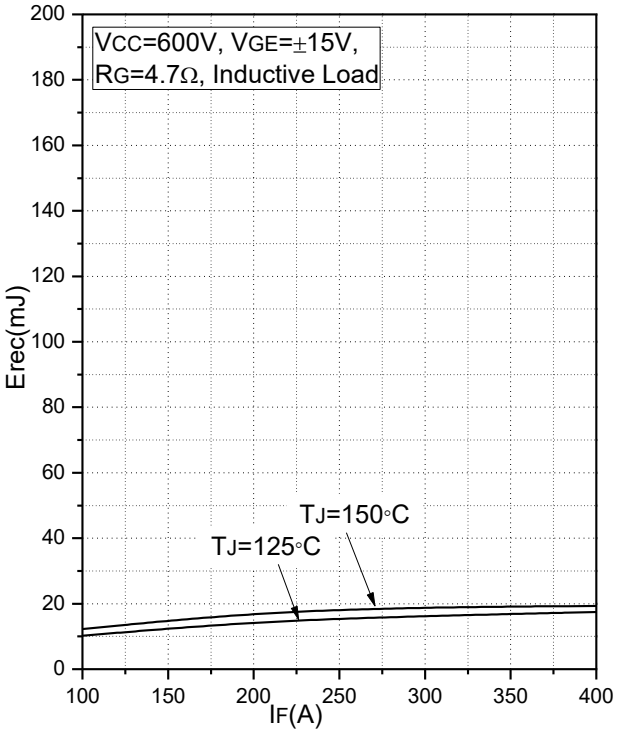


Fig.6 Typical Switching Loss vs. Forward Current

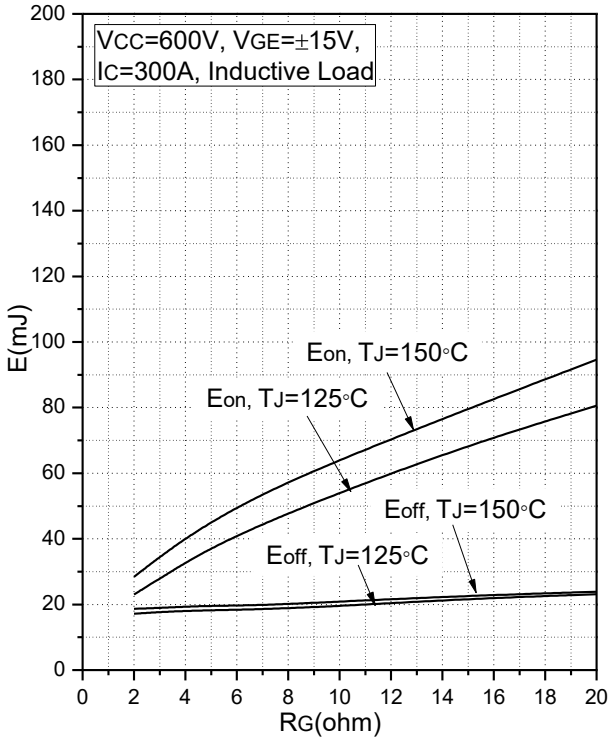


Fig.7 Typical Switching Loss vs. Gate Resistance

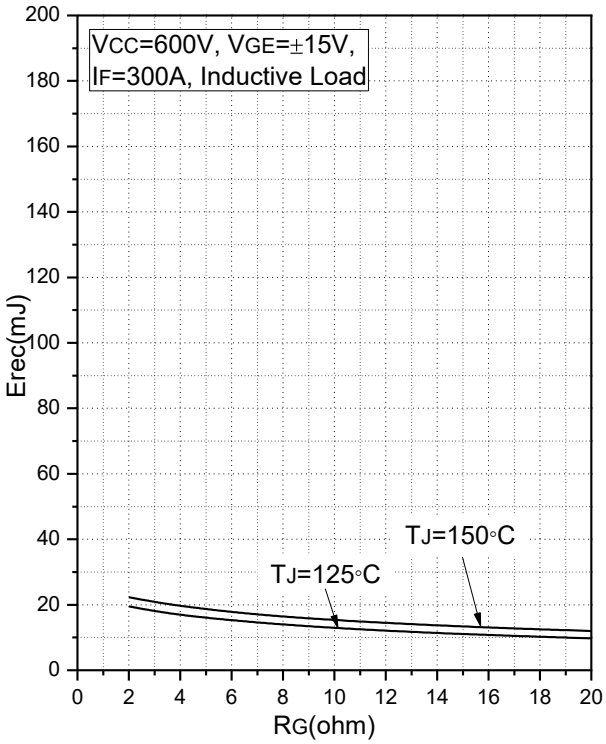


Fig.8 Typical Switching Loss vs. Gate Resistance

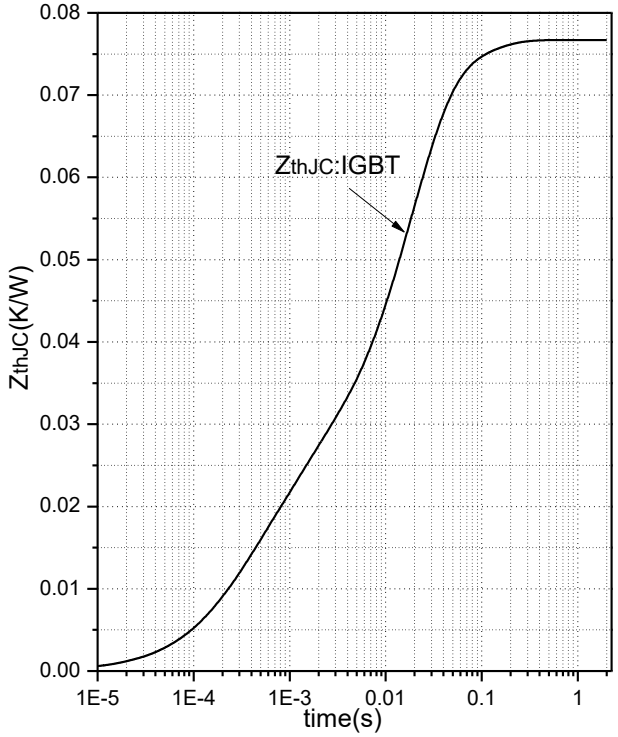


Fig.9 Transient Thermal Impedance (IGBT)

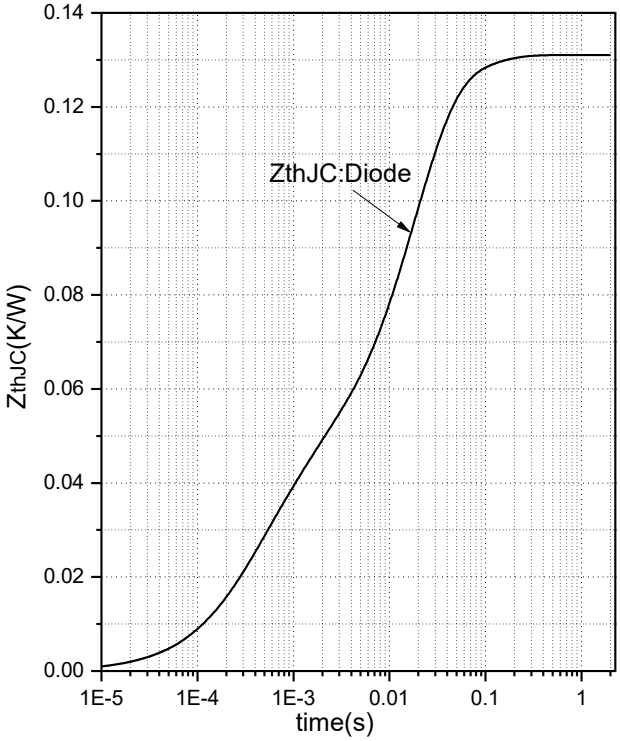


Fig.10 Transient Thermal Impedance (Diode)

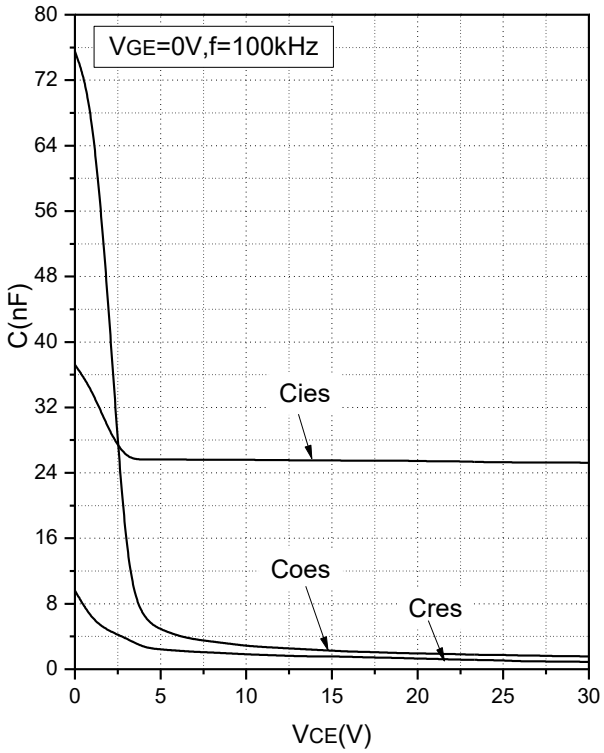


Fig.11Capacitance Characteristics

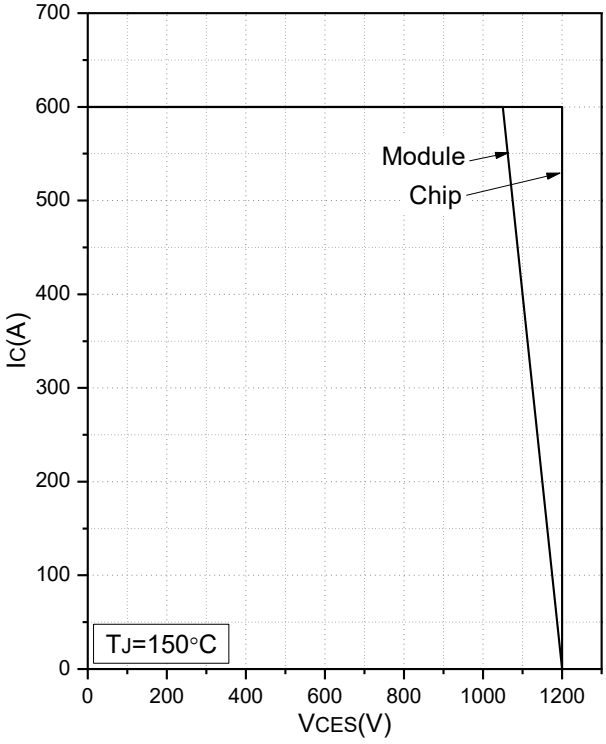
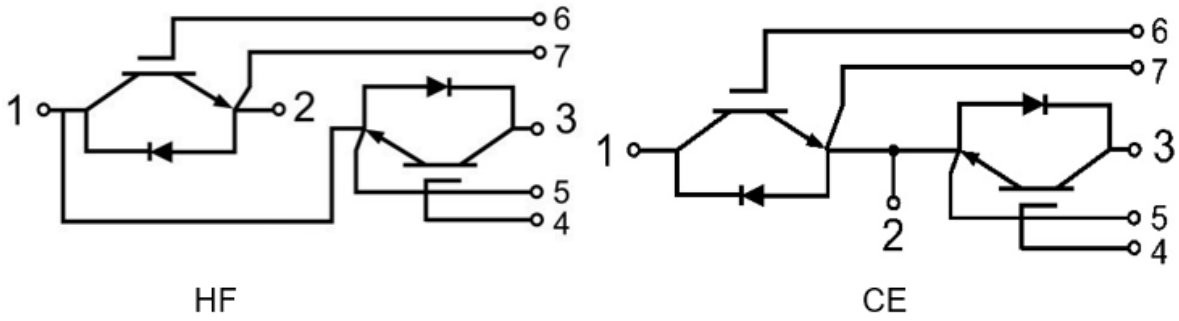
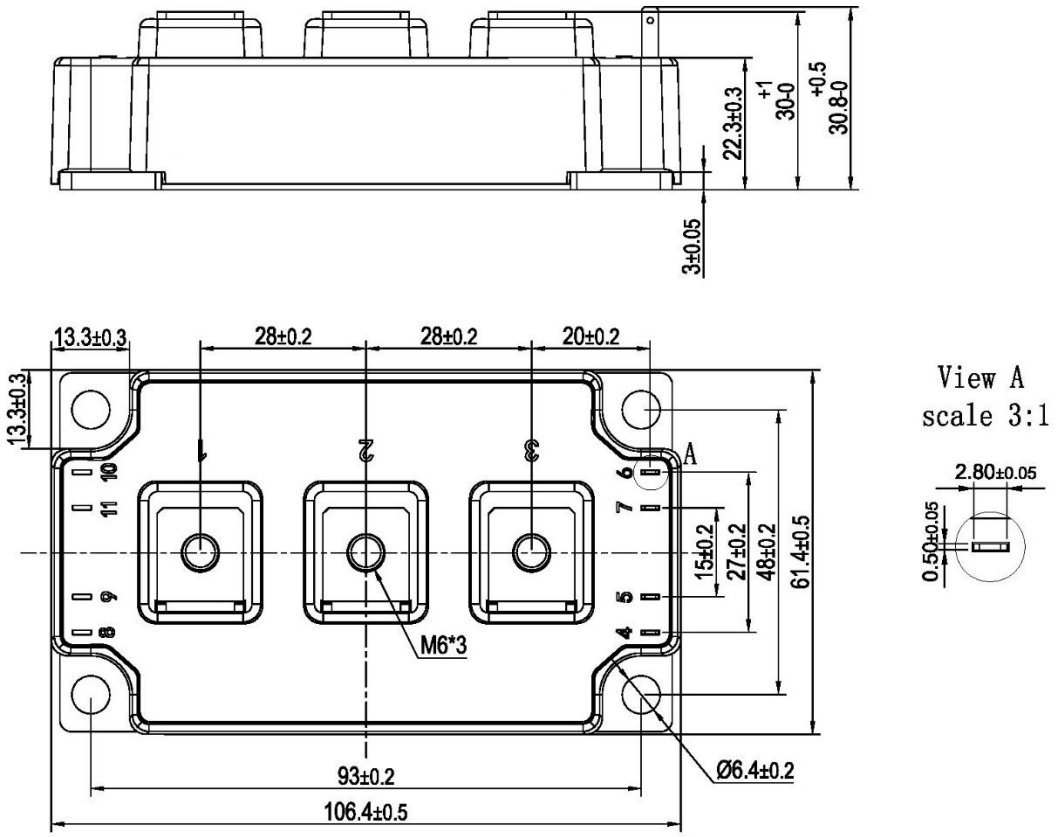


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

Internal Circuit



Package Outline (Unit: mm):



Date	Revision	Notes
04/26/2022	01	Initial Release

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