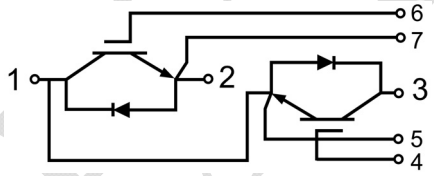
GF300HF120T2NH
GF300CC120T2NH
GF300CE120T2NH
IGBT Module

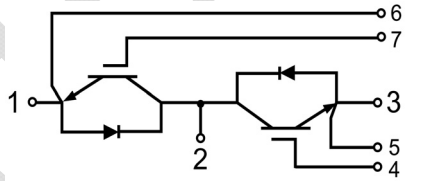
Features:

- Non Punch Through (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

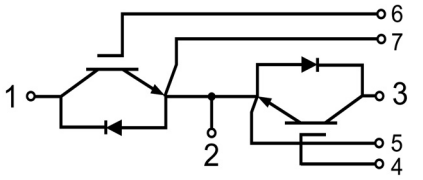
Circuit Diagram



HF



CC



CE

Applications:

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

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=80℃	300	A
		T_C=25℃	600	A
I_{CM}	Repetitive Peak Collector Current	T_J=150℃	600	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per leg	T_C=25℃ T_{Jmax}=150℃	2600	W

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

Static Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=12mA, V_{CE}=V_{GE}		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=300A, V_{GE}=15V	T_J=25℃		3.30	3.65	V
			T_J=125℃		4.15		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℃				300	nA
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f=100kHz			23.5		nF
C_{oes}	Output Capacitance				1.96		nF
C_{res}	Reverse Transfer Capacitance				1.04		nF

Switching Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V,I_C=300A, R_{Gon}=4.7Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		896		ns
			T_J=125℃		910		
t_r	Rise Time		T_J=25℃		182		ns
			T_J=125℃		177		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V,I_C=300A, R_{Goff}=4.7Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		835		ns
			T_J=125℃		871		
t_f	Fall Time		T_J=25℃		92		ns
			T_J=125℃		118		
E_{on}	Turn-on Switching Loss	V_{CC}=600V,I_C=300A, R_{Gon}=4.7Ω,V_{GE}=±15V, di/dt=1450A/μs(T_J=125℃), Inductive Load	T_J=25℃		23.4		mJ
			T_J=125℃		30.9		
E_{off}	Turn-off Switching Loss	V_{CC}=600V,I_C=300A, R_{Goff}=4.7Ω,V_{GE}=±15V, du/dt=3200V/μs(T_J=125℃), Inductive Load	T_J=25℃		23.0		mJ
			T_J=125℃		26.8		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		2.96		μC
$R_{g\ internal}$	Internal Gate Resistor		T_J=25℃		2.3		Ω
RBSOA	I_C=600A,V_{CC}=1050V,V_p=1200V,R_G=4.7Ω, V_{GE}=+15V to 0V, T_J=125℃			Trapezoid			
I_{SC}	Vcc=600V,t_p=10us,V_{GE}=+/-15V,R_G=6.8Ω,T_J=125℃				2660		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case					0.048	℃/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	300	A
I_{FM}	Diode Maximum Forward Current	600	A

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

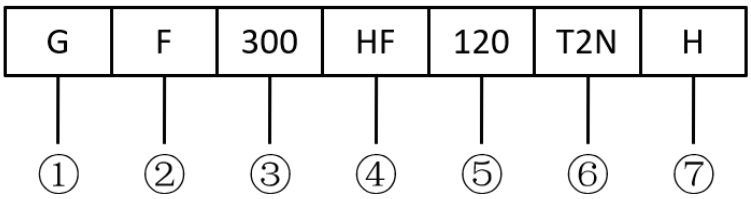
Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=300A, V_{GE}=15V	T_J=25℃		2.85	3.15	V
			T_J=125℃		3.05		
t_{rr}	Reverse Recovery Time	I_F=300A, di/dt=1850A/μs (T_J=125℃), V_{rr}=600V, V_{GE}=-15V	T_J=25℃		156		ns
			T_J=125℃		288		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		106		A
			T_J=125℃		150		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		10.0		μC
			T_J=125℃		21.7		
E_{rec}	Reverse Recovery Energy		T_J=25℃		3.9		mJ
			T_J=125℃		8.0		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case					0.129	℃/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			14		nH
T_J	Maximum Junction Temperature				150	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+125	℃
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



① - IGBT Module
② - NPT, Fast IGBT
③ - Rated Current (300=300A)
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)

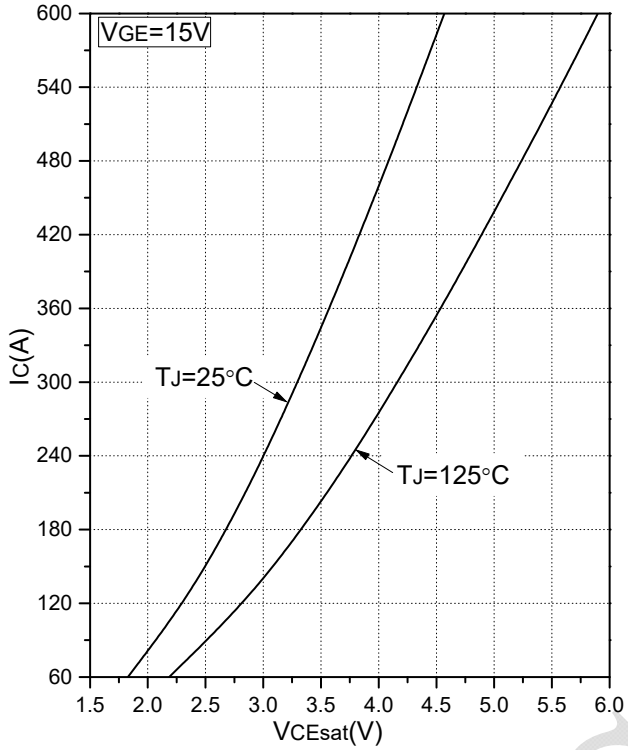


Fig.1 Typical Saturation Voltage Characteristics

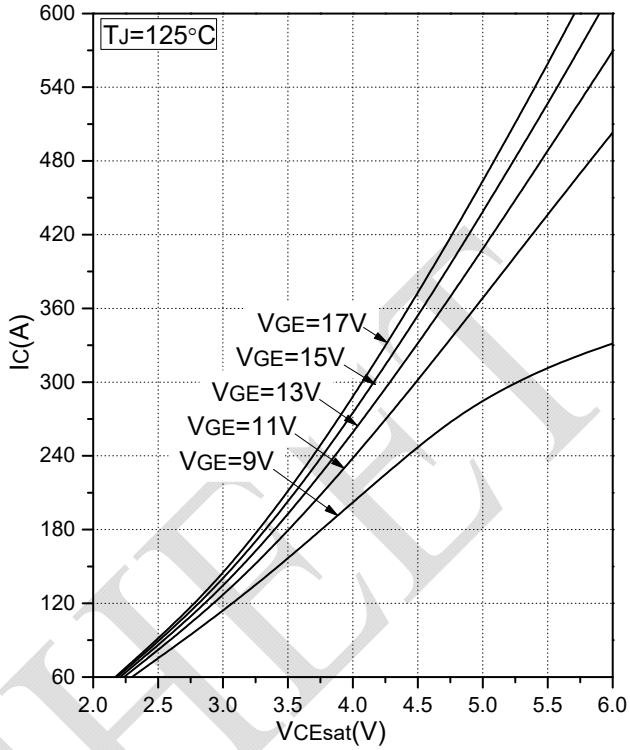
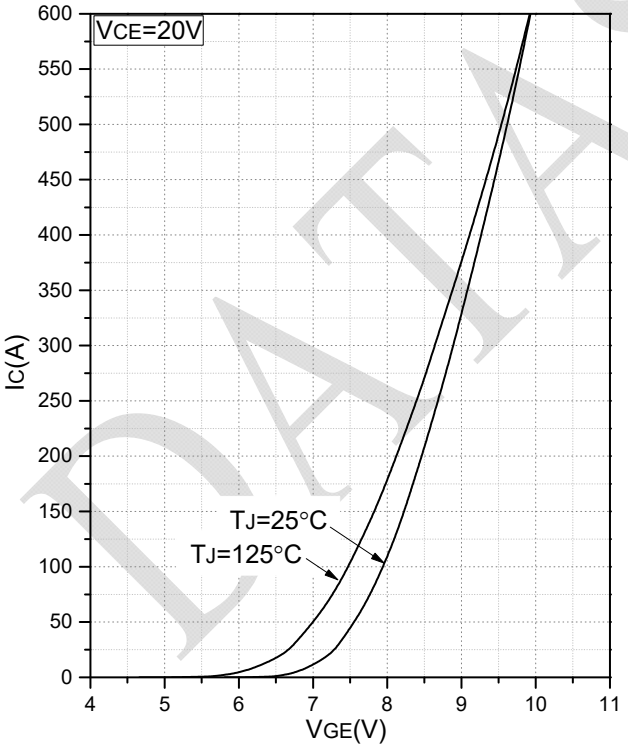


Fig.2 Typical Output Characteristics



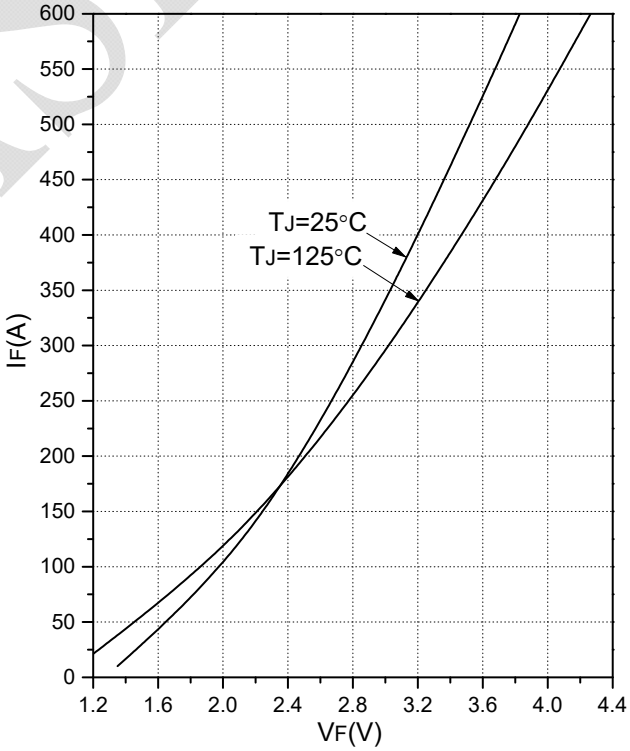


Fig.3 Transfer CharacteristicFig.4Forward Characteristics of Diode

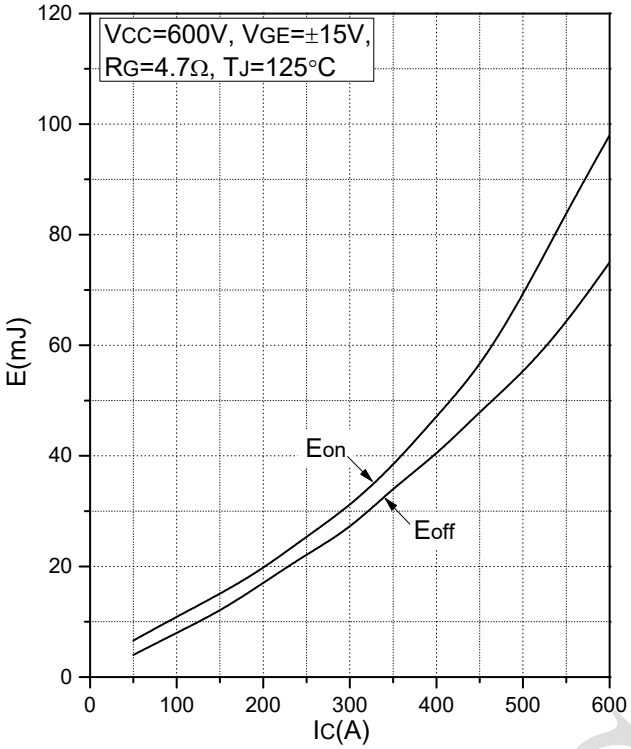


Fig.5 Typical Switching Loss vs. Collector Current

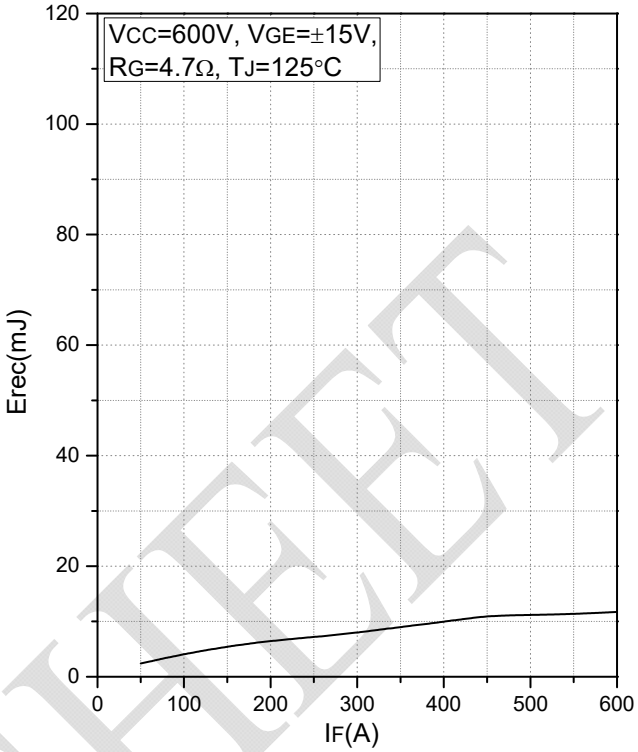


Fig.6 Typical Switching Loss vs. Forward Current

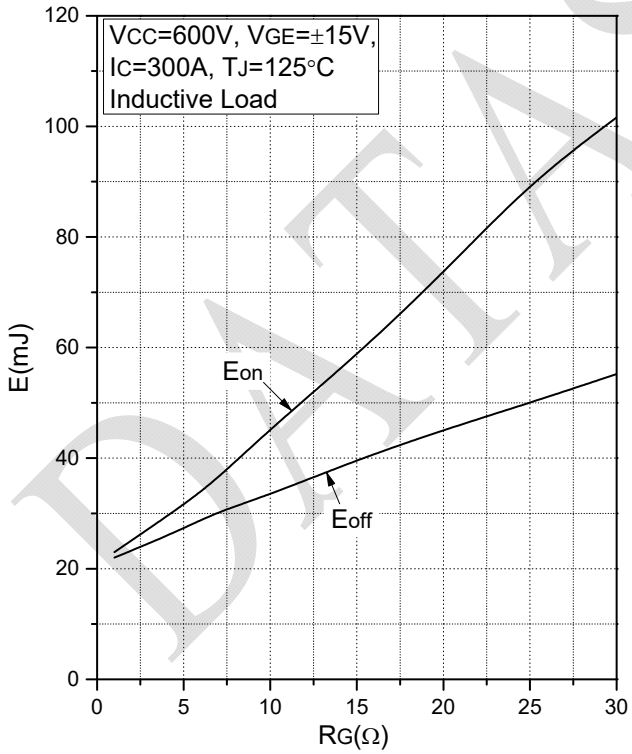


Fig.7 Typical Switching Loss vs. Gate Resistance

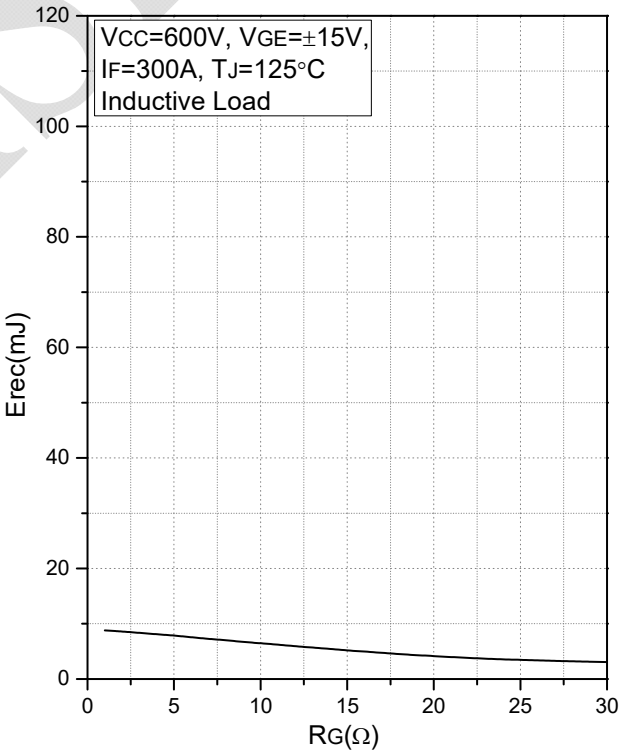
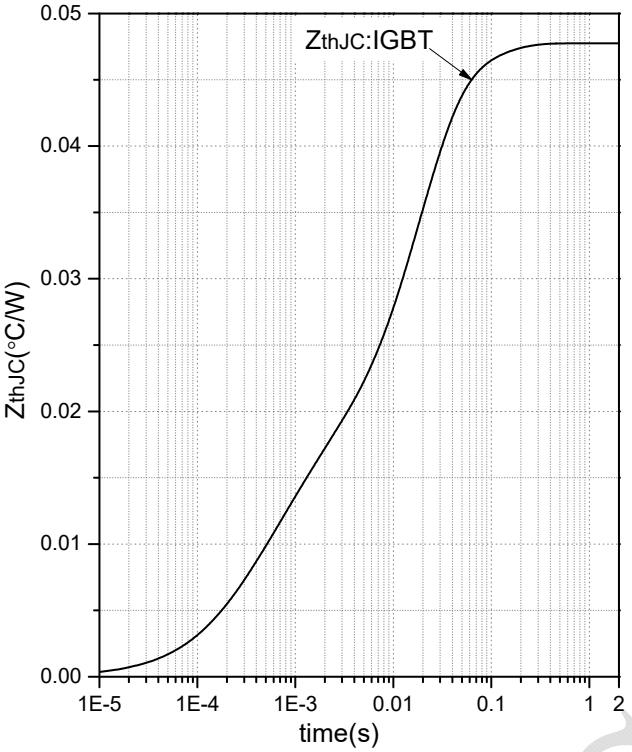


Fig.8Typical Switching Loss vs. Gate Resistance



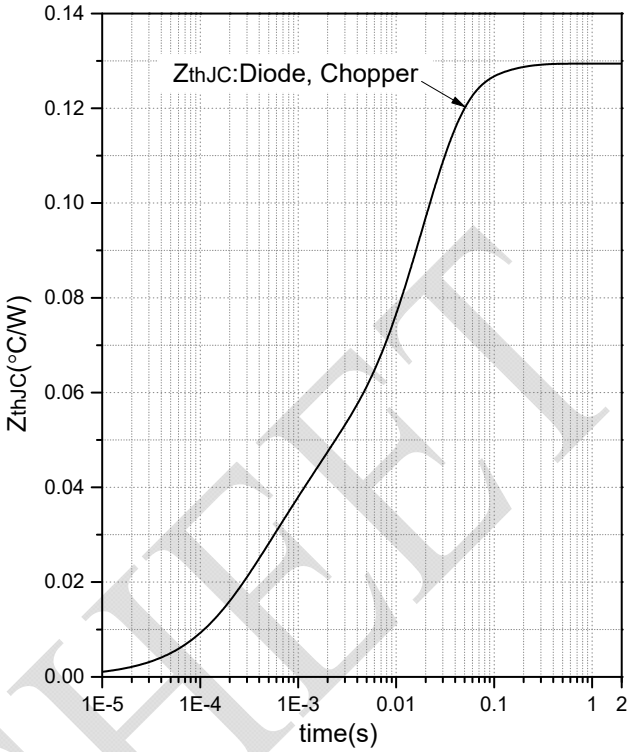
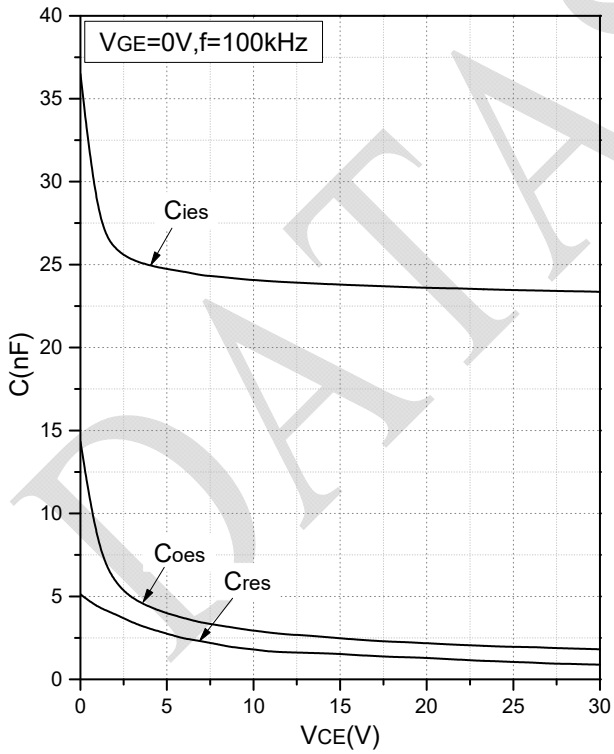


Fig.9 Transient Thermal Impedance(IGBT)Fig.10Transient Thermal Impedance(Diode)



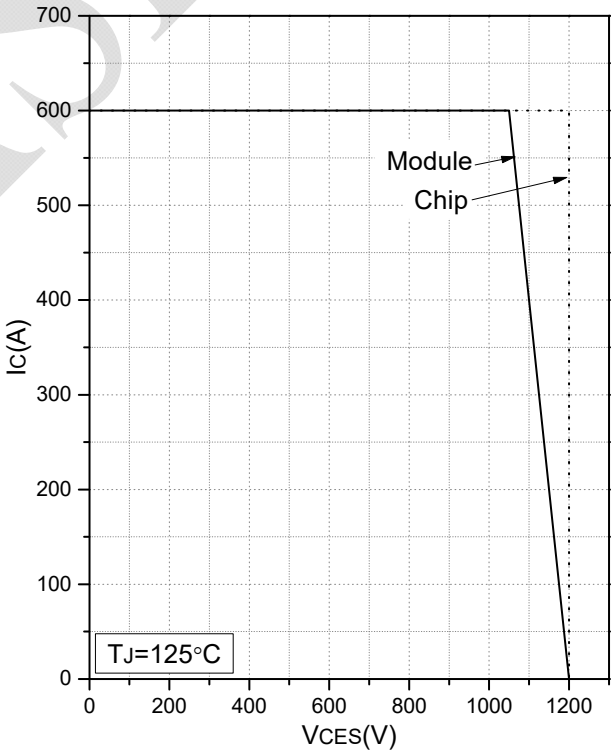
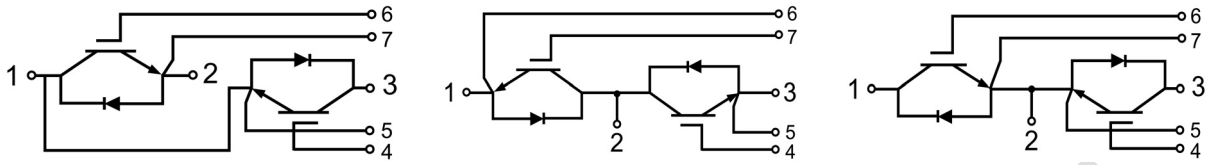


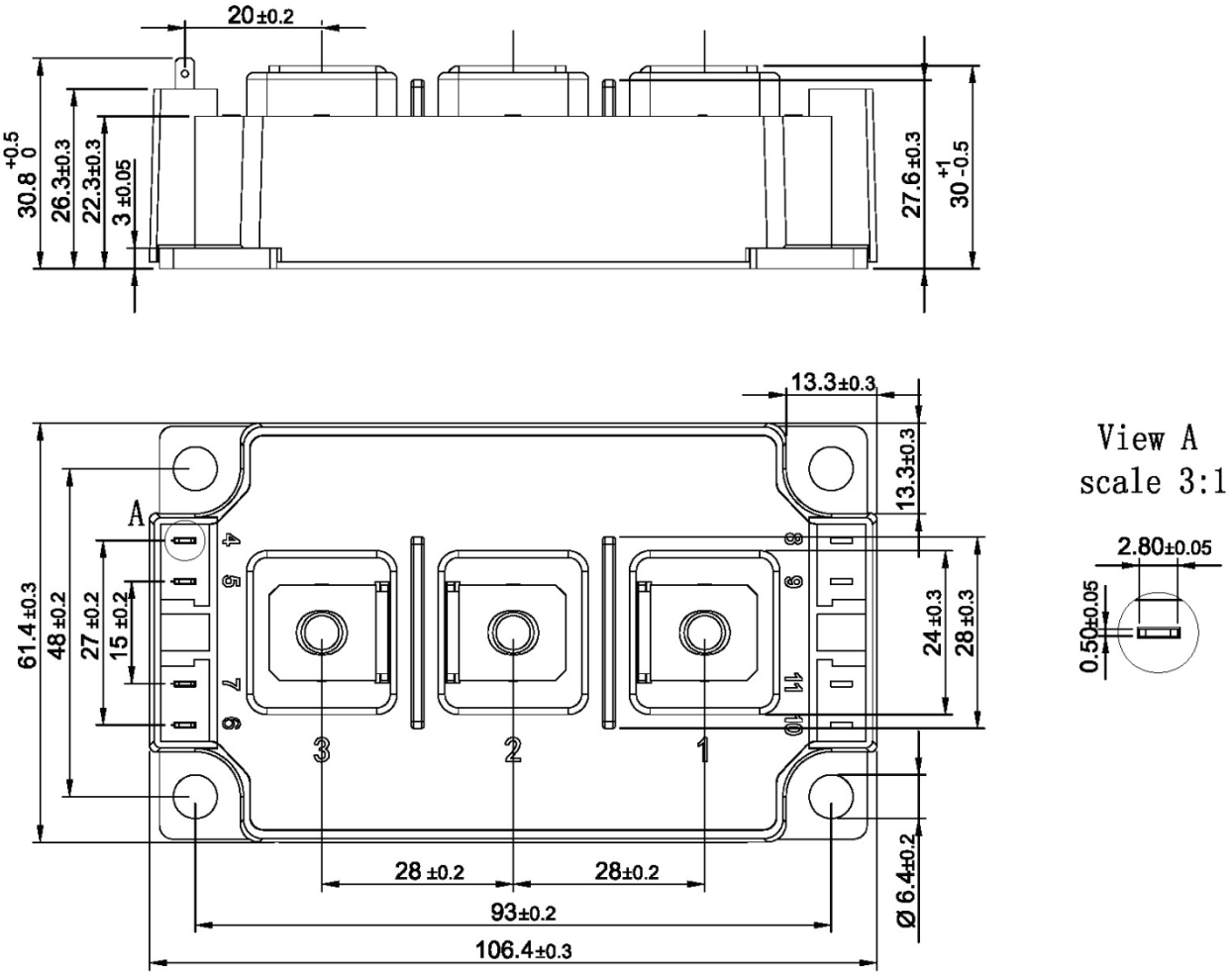
Fig.11Capacitance CharacteristicsFig.12 Reverse Bias Safe Operation Area (RBSOA)

Internal Circuit



HF CC CE

Package Outline (Unit: mm):



Date	Revision	Notes
02/23/2022	A	Final Version

Announcements

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.

The datasheet with “REV.” + “Arabic numerals” is based on engineering data for initial reference purpose only.

The released datasheet would be issued with “REV.” + “alphabet characters”.