



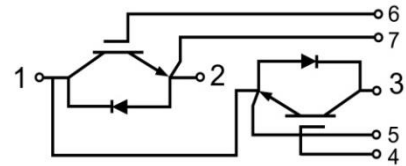
GF200HF120T2VH

IGBT Module

Features:

- Non Punch Through (NPT) Technology
- Short Circuit Rated >10 μ s
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested (2 \times I_c)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Circuit Diagram



Applications:

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

IGBT, Inverter

Maximum Rated Values of IGBT (T_C=25°C 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°C	200	A
		T _C =25°C	400	A
I _{CM}	Repetitive Peak Collector Current	T _J =150°C	400	A
t _{sc}	Short Circuit Withstand Time		>10	μs
P _D	Maximum Power Dissipation per leg	T _C =25°C	1730	W
		T _{Jmax} =150°C		



Electrical Characteristics of IGBT ($T_C=25^\circ\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=8\text{mA}$, $V_{CE}=V_{GE}$		5.0	5.9	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=200\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$		3.15	3.50	V
			$T_J=125^\circ\text{C}$		3.90		V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=V_{CES}$, $T_J=25^\circ\text{C}$				1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^\circ\text{C}$				200	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$			15.2		nF
C_{oes}	Output Capacitance				1.42		nF
C_{res}	Reverse Transfer Capacitance				0.70		nF

Switching Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600\text{V}$, $I_C=200\text{A}$, $R_{Gon}=7.5\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$		563		ns
			$T_J=125^\circ\text{C}$		564		
t_r	Rise Time		$T_J=25^\circ\text{C}$		110		ns
			$T_J=125^\circ\text{C}$		109		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600\text{V}$, $I_C=200\text{A}$, $R_{Goff}=7.5\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$		544		ns
			$T_J=125^\circ\text{C}$		572		
t_f	Fall Time		$T_J=25^\circ\text{C}$		144		ns
			$T_J=125^\circ\text{C}$		159		
E_{on}	Turn-on Switching Loss	$V_{CC}=600\text{V}$, $I_C=200\text{A}$, $R_{Gon}=7.5\Omega$, $V_{GE}=\pm 15\text{V}$, $di/dt=1600\text{A}/\mu\text{s}$ ($T_J=125^\circ\text{C}$), Inductive Load	$T_J=25^\circ\text{C}$		14.6		mJ
			$T_J=125^\circ\text{C}$		17.2		
E_{off}	Turn-off Switching Loss		$T_J=25^\circ\text{C}$		8.4		mJ
			$T_J=125^\circ\text{C}$		11.2		
Q_g	Total Gate Charge	$V_{GE}=+15\text{V}\dots-15\text{V}$		$T_J=25^\circ\text{C}$	2.2		μC
R_g	Gate Resistance			$T_J=25^\circ\text{C}$	2.35		Ω
RBSOA	$I_C=400\text{A}$, $V_{CC}=1050\text{V}$, $V_p=1200\text{V}$, $R_G=7.5\Omega$, $V_{GE}=+15\text{V}$ to 0V , $T_J=125^\circ\text{C}$			Trapezoid			
SC Data	$V_{CC}=600\text{V}$, $t_p=10\mu\text{s}$, $V_{GE}=\pm 15\text{V}$, $R_{Gon}=7.5\Omega$, $R_{Goff}=7.5\Omega$, $T_J=125^\circ\text{C}$			10			μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case					0.072	$^\circ\text{C}/\text{W}$



Diode, Reverse

Maximum Rated Values of Diode ($T_C=25^\circ\text{C}$ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	100	A
I_{FM}	Diode Maximum Forward Current	200	A

Electrical Characteristics of Diode ($T_C=25^\circ\text{C}$ unless otherwise specified)

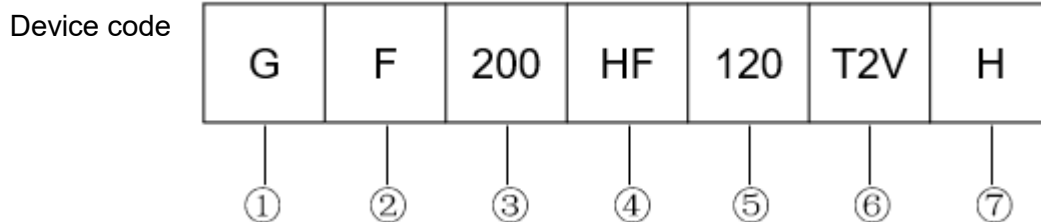
Symbol	Description	Conditions	Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	$I_F=100\text{A}$ $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	2.80		V
			$T_J=125^\circ\text{C}$	2.85		
t_{rr}	Reverse Recovery Time		$T_J=25^\circ\text{C}$	133		ns
			$T_J=125^\circ\text{C}$	175		
I_{rr}	Peak Reverse Recovery Current	$I_F=100\text{A}$, $-di_F/dt=1285\text{A}/\mu\text{s}(T_J=125^\circ\text{C})$, $V_{rr}=600\text{V}$, $V_{GE}=-15\text{V}$	$T_J=25^\circ\text{C}$	51.6		A
			$T_J=125^\circ\text{C}$	68.8		
Q_{rr}	Reverse Recovery Charge		$T_J=25^\circ\text{C}$	4.07		μC
			$T_J=125^\circ\text{C}$	6.84		
E_{rec}	Reverse Recovery Energy		$T_J=25^\circ\text{C}$	1.39		mJ
			$T_J=125^\circ\text{C}$	3.10		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case				0.332	$^\circ\text{C}/\text{W}$



Module

Symbol	Description	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	RMS f=50Hz, 30s		4500	V
L _{sCE}	Stray Inductance Module		20		nH
T _J	Maximum Junction Temperature			150	°C
T _{JOP}	Maximum Operating Junction Temperature Range	-40		+125	°C
T _{stg}	Storage Temperature	-40		+125	°C
CTI	Comparative Tracking Index	200			
R _{ecs}	Case-to-Sink Thermally (Conductive Grease Applied)			0.03	°C/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



- ① - IGBT Module
- ② - NPT, Fast IGBT
- ③ - Rated Current (200=200A)
- ④ -Circuit Configuration (HF=Half Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

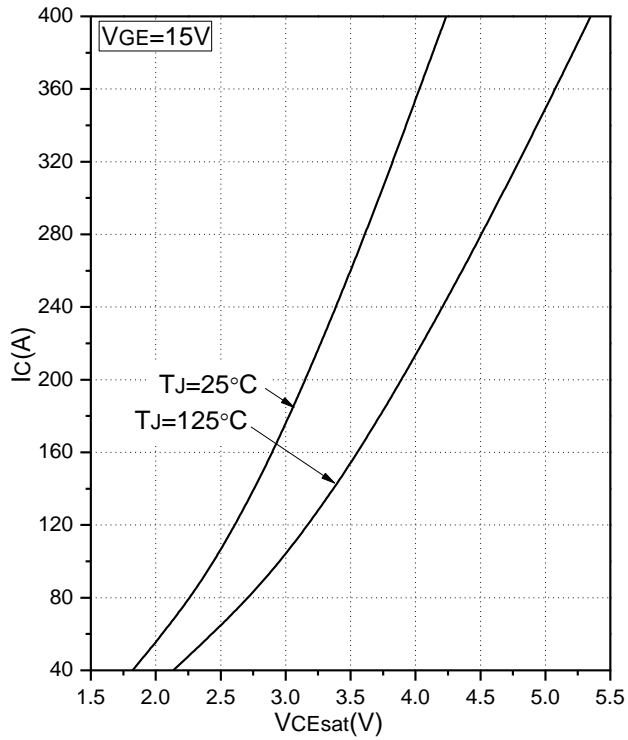


Fig.1 Typical Saturation Voltage Characteristics

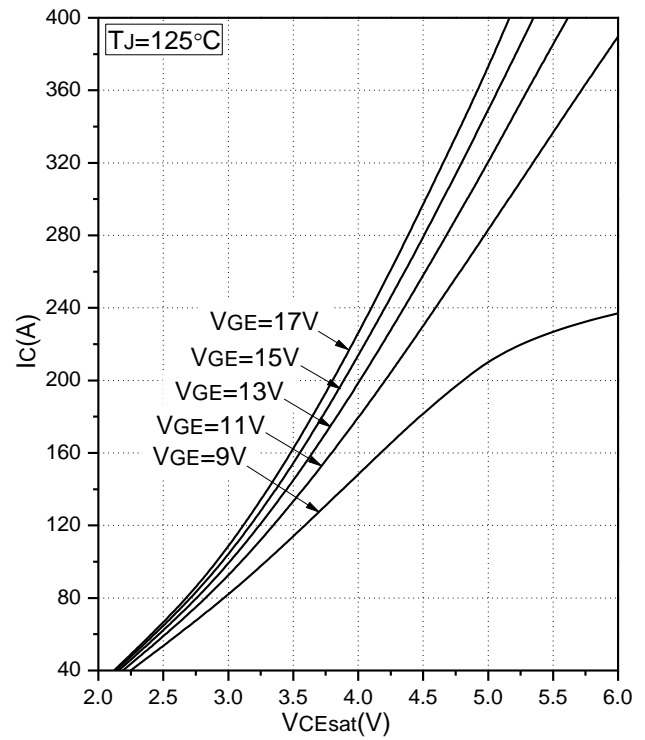


Fig.2 Typical Output Characteristics

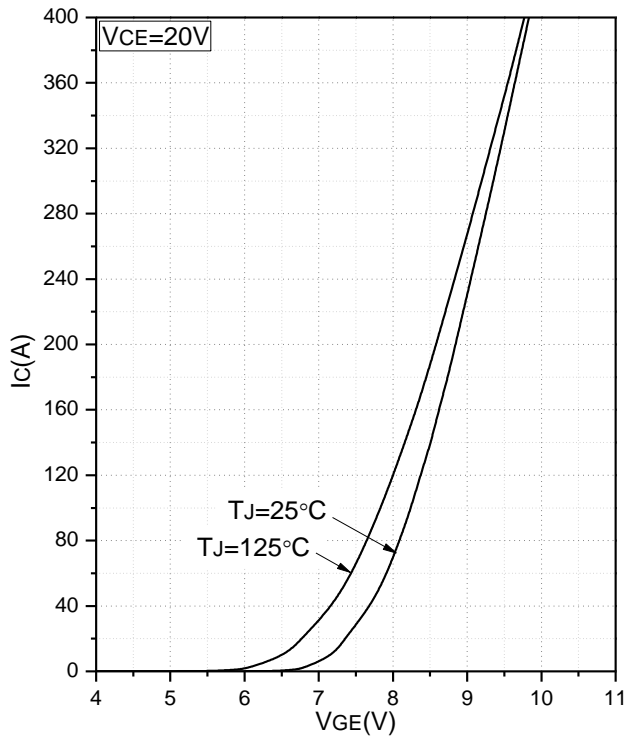


Fig.3 Transfer Characteristic

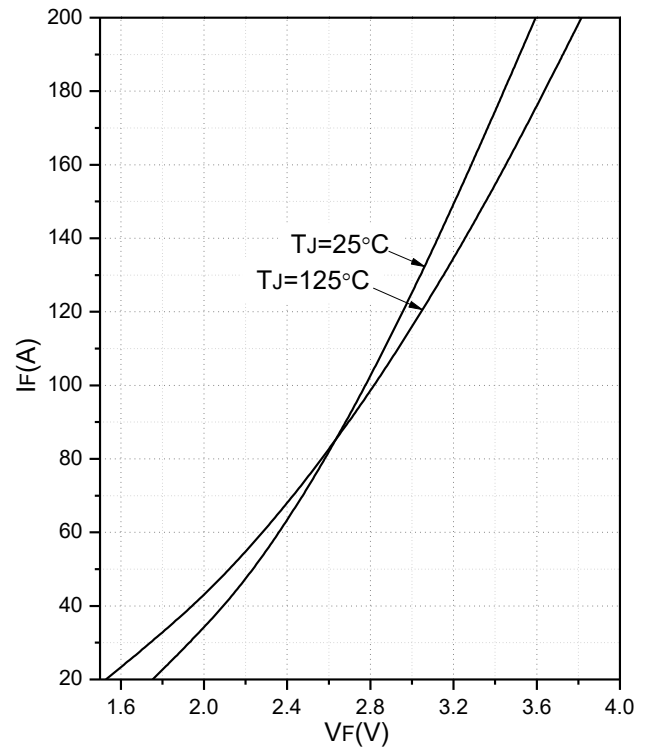


Fig.4 Forward Characteristics of Diode

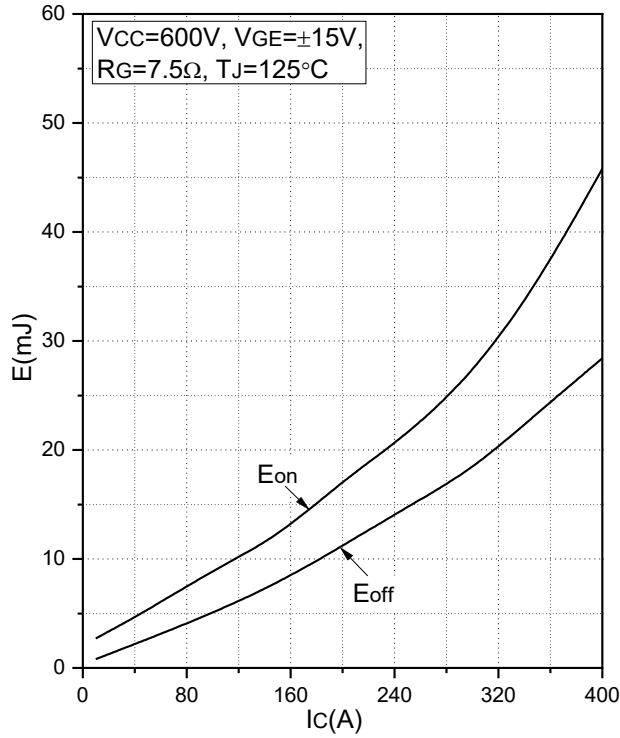


Fig.5 Typical Switching Loss vs. Collector Current

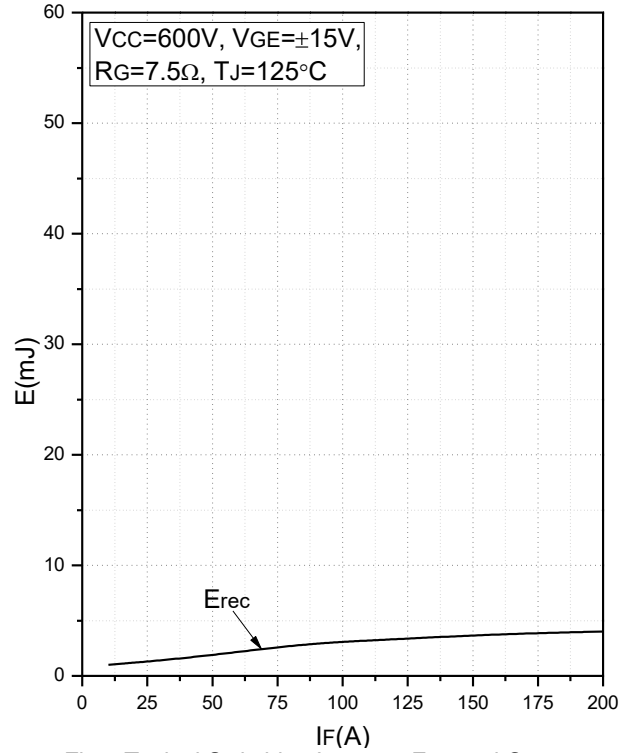


Fig.6 Typical Switching Loss vs. Forward Current

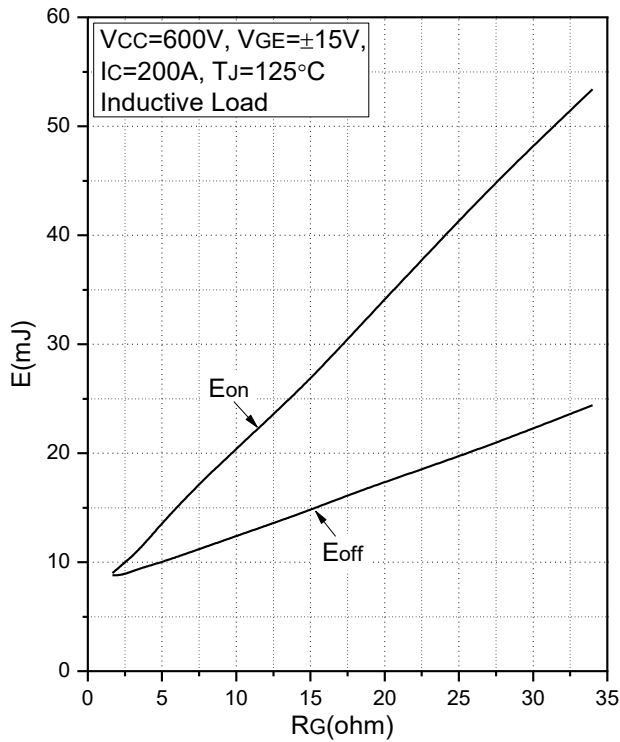


Fig.7 Typical Switching Loss vs. Gate Resistance

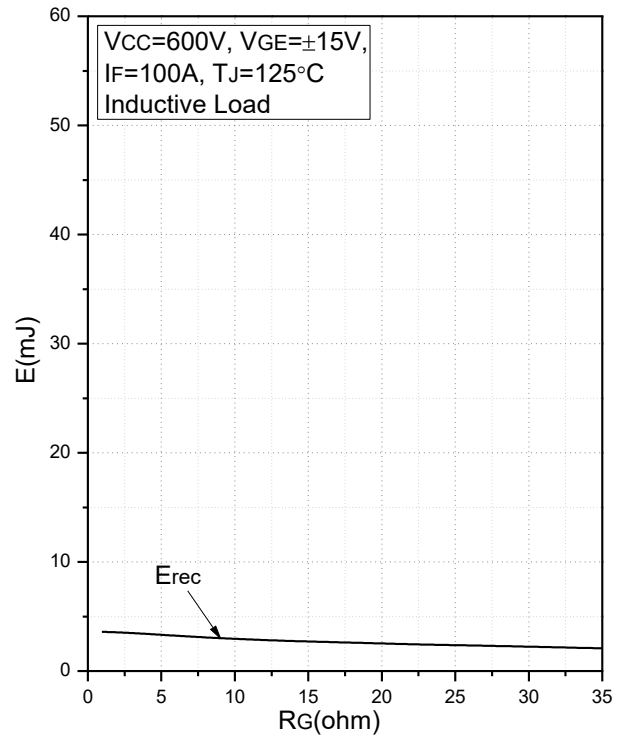


Fig.8 Typical Switching Loss vs. Gate Resistance

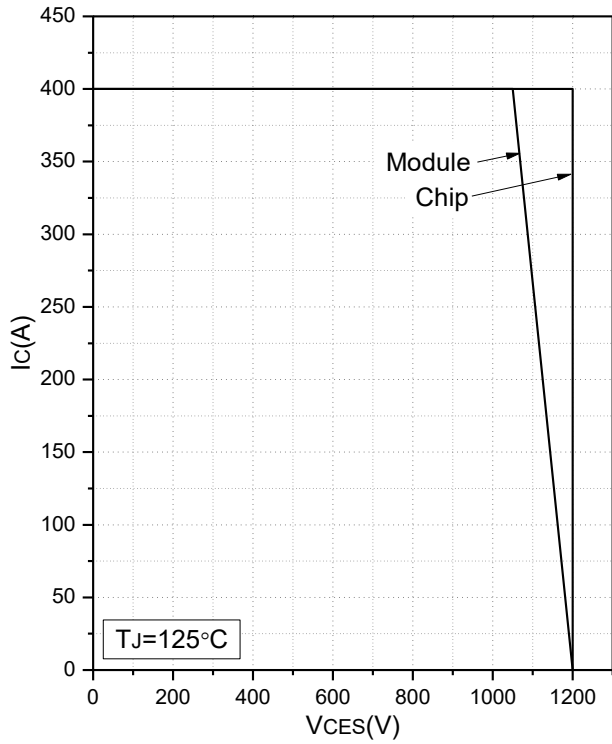


Fig.9 Reverse Bias Safe Operation Area (RBSOA)

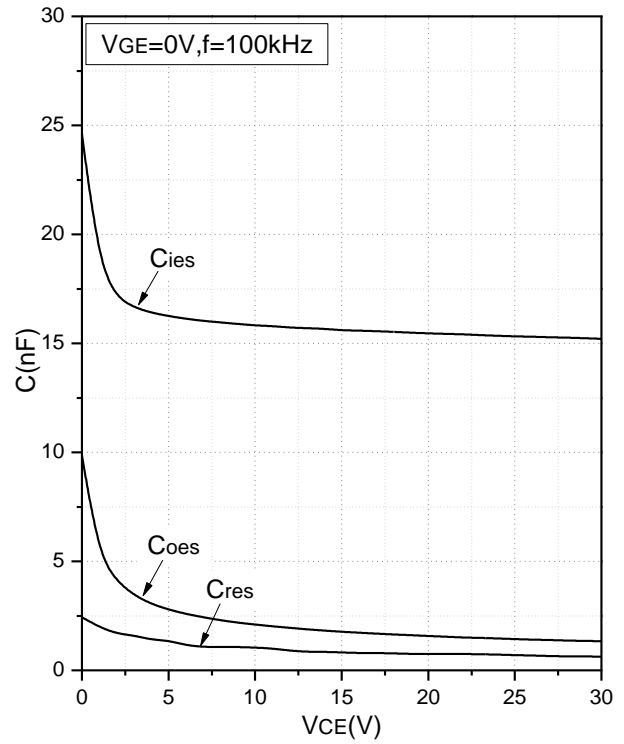


Fig.10 Capacitance Characteristics

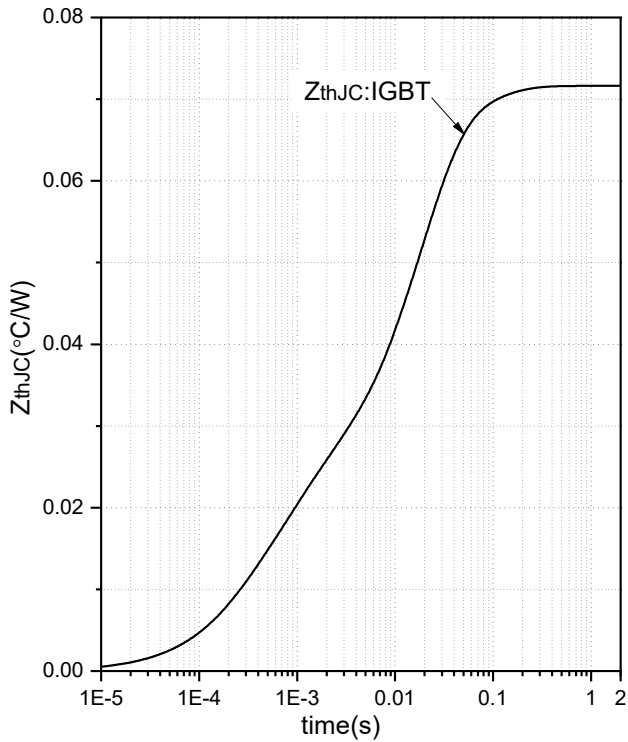


Fig.11 Transient Thermal Impedance (IGBT)

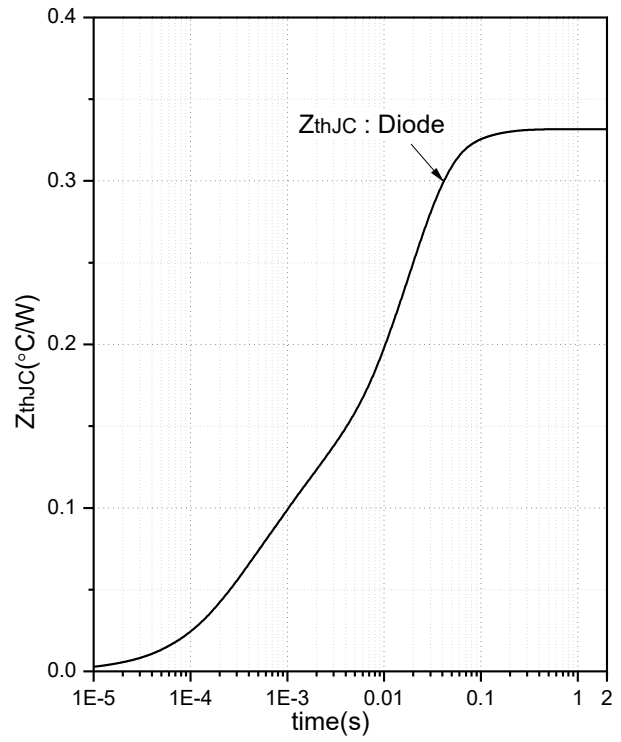
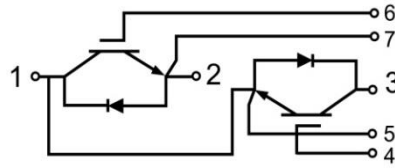


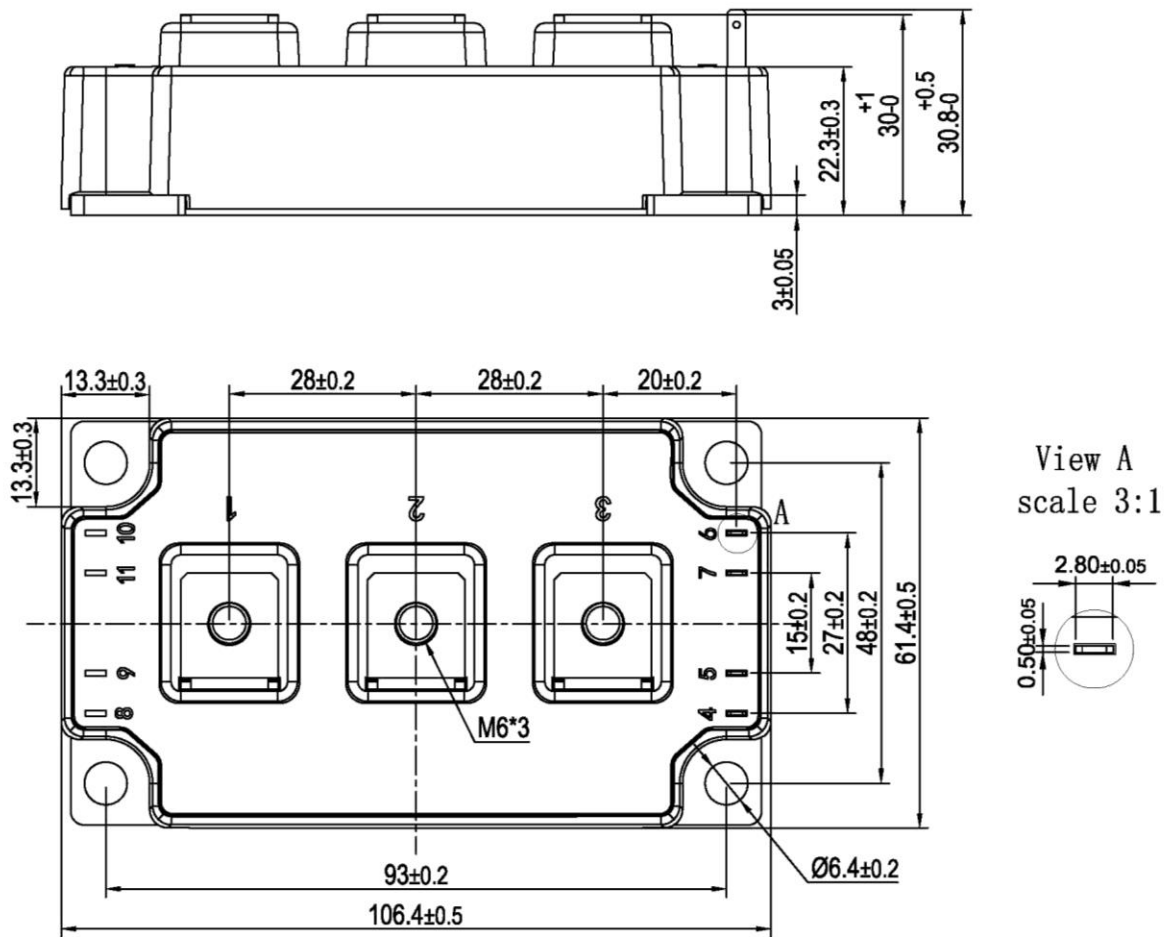
Fig.12 Transient Thermal Impedance (Diode)



Internal Circuit



Package Outline (Unit: mm):





Date	Revision	Notes
08/22/2023	A	Final Version

Announcements

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