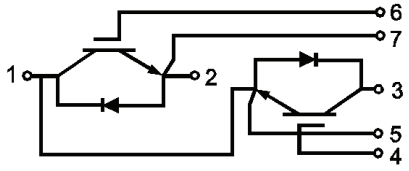
GT200HF120T2VH

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



Applications：

- Welding
- HEV Inverter
- Industrial Motor Drives
- UPS

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℃	200	A
		T_C=25℃	400	A
I_{CM}	Repetitive Peak Collector Current	T_J=150℃	400	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per leg	T_C=25℃ T_{Jmax}=150℃	1202	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=3mA, V_{CE}=V_{GE}		5.0	5.7	6.7	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=200A, V_{GE}=15V	T_J=25℃		2.20		V
			T_J=125℃		2.90		V
			T_J=150℃		3.10		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=100kHz			17.27		nF
C_{oes}	Output Capacitance				1.16		nF
C_{res}	Reverse Transfer Capacitance				0.52		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=200A, R_{Gon}=4.7Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		270		ns
			T_J=125℃		282		
			T_J=150℃		269		
t_r	Rise Time		T_J=25℃		99		ns
			T_J=125℃		110		
			T_J=150℃		115		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V, I_C=200A, R_{Goff}=4.7Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		192		ns
			T_J=125℃		202		
			T_J=150℃		195		
t_f	Fall Time		T_J=25℃		134		ns
			T_J=125℃		156		
			T_J=150℃		160		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=200A, R_{Gon}=4.7Ω, V_{GE}=±15V, di/dt=1495A/μs (T_J=150℃), Inductive Load	T_J=25℃		13.2		mJ
			T_J=125℃		21.9		
			T_J=150℃		27.5		

E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=200A, R_{Goff}=4.7Ω, V_{GE}=±15V, du/dt=8094V/μs (T_J=150℃), Inductive Load	T_J=25℃		8.0		mJ
			T_J=125℃		11.2		
			T_J=150℃		13.1		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		0.81		μC
$R_{g\ internal}$	Internal Gate Resistance		T_J=25℃		1.5		Ω
RBSOA	I_C=400A, V_{CC}=1050V, V_p=1200V, R_{Goff}=4.7Ω, V_{GE}=+15V to 0V, T_J=150°C			Trapezoid			
I_{SC}	V_{CC}=600V, V_{GE}=±15V, R_{Gon}=4.7Ω, R_{Goff}=4.7Ω, tp=10us, T_J=125℃				694		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.104	℃/W

Maximum Rated Values of Diode (T_C=25℃ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	200	A
I_{FM}	Diode Maximum Forward Current	400	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=200A	T_J=25℃		2.35		V
			T_J=125℃		2.45		
			T_J=150℃		2.40		
t_{rr}	Reverse Recovery Time	I_F=200A, -di_F/dt=1875A/μs (T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		154		ns
			T_J=125℃		342		
			T_J=150℃		375		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		91		A
			T_J=125℃		131		
			T_J=150℃		128		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		8.29		μC
			T_J=125℃		21.26		
			T_J=150℃		22.72		

E_{rec}	Reverse Recovery Energy	I_F=200A, -diF/dt=1875A/μs (T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		2.6		mJ
			T_J=125℃		6.7		
			T_J=150℃		6.9		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case (per Diode)					0.166	℃/W

Module

Symbol	Description		Min.	Typ.	Max.	Units
V_{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 30s		4500		V
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		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	200	HF	120	T2V	H
①	②	③	④	⑤	⑥	⑦

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

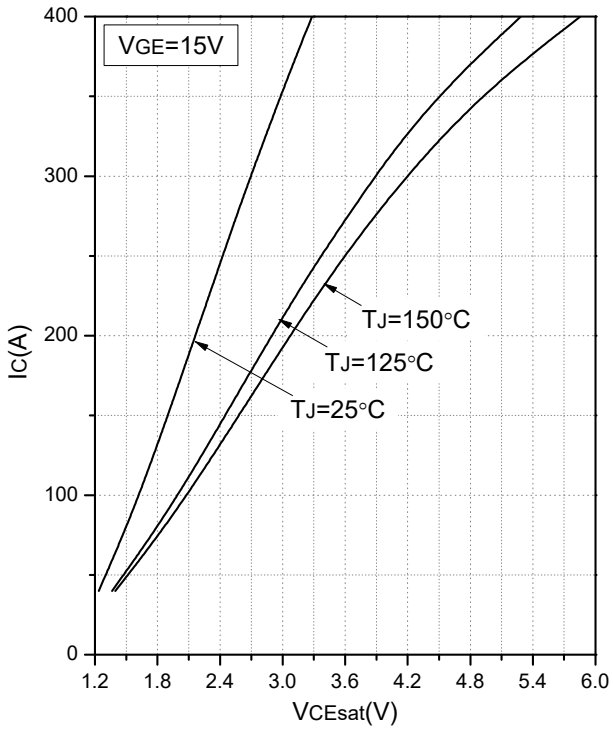


Fig.1 Typical Saturation Voltage Characteristics

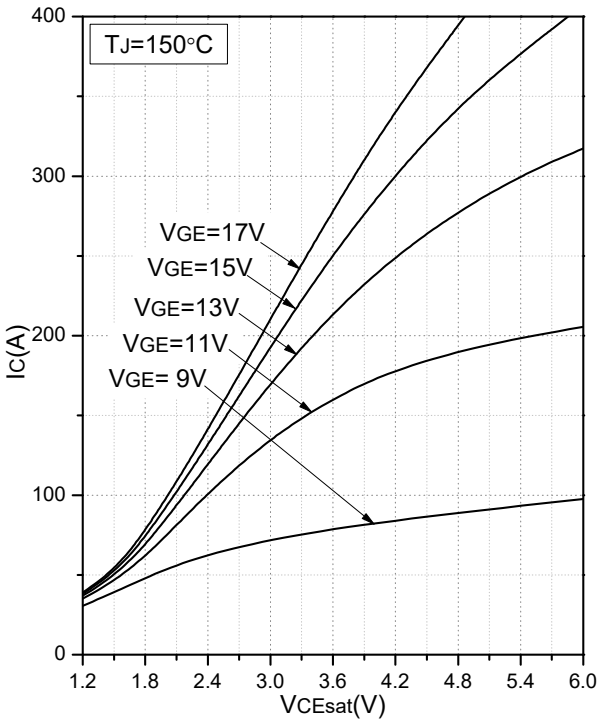


Fig.2 Typical Output Characteristics

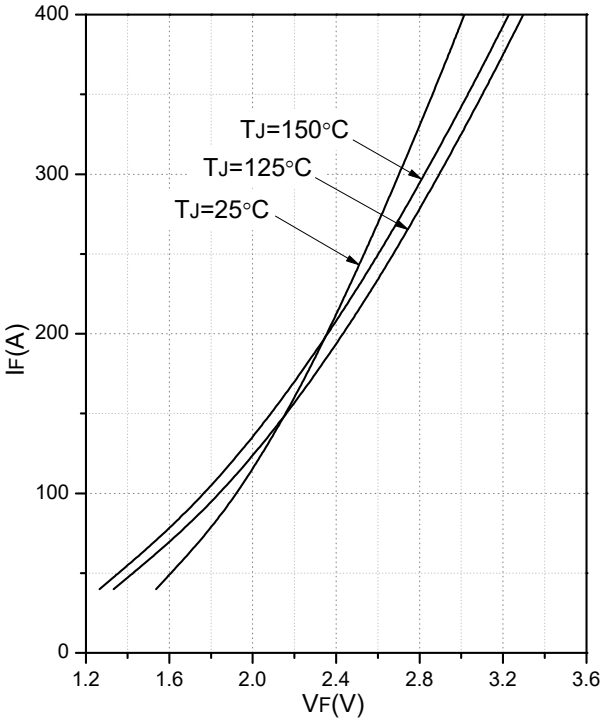


Fig.3 Forward Characteristics of Diode

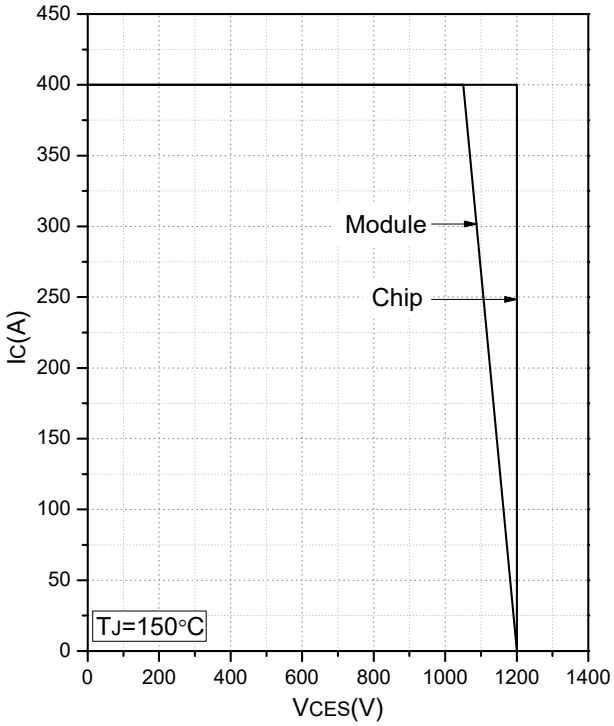


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

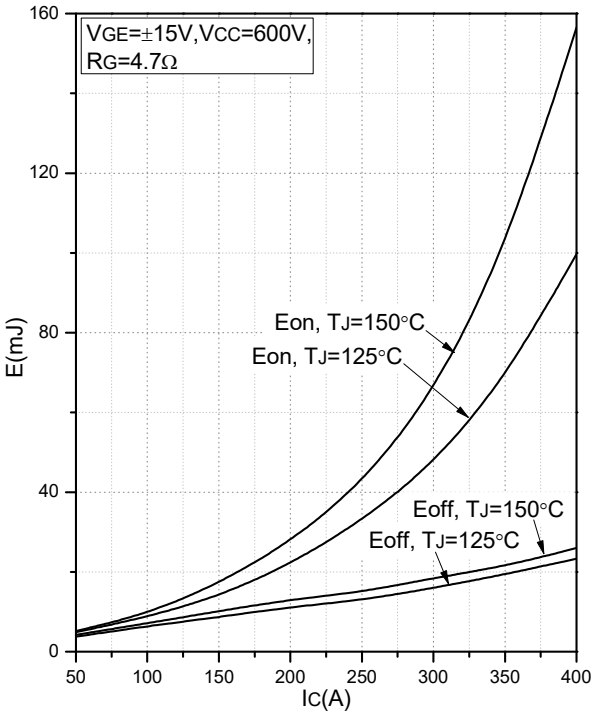


Fig.5 Typical Switching Loss vs. Collector Current

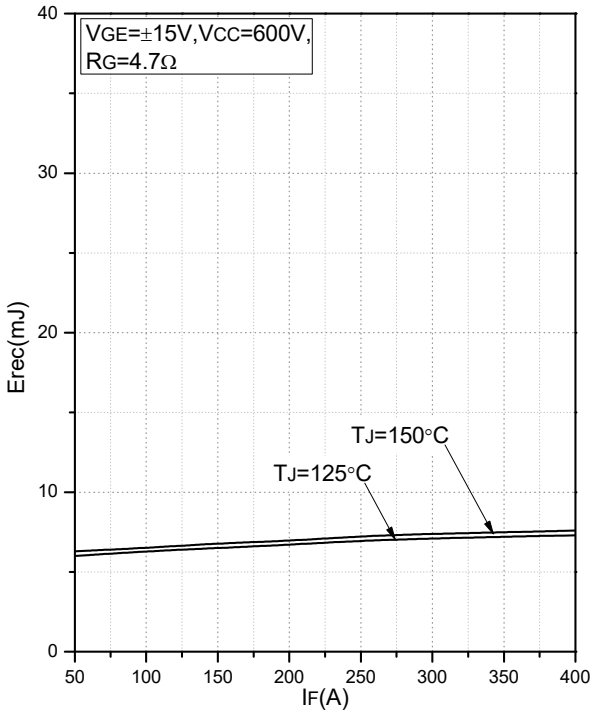


Fig.6 Typical Switching Loss vs. Forward Current

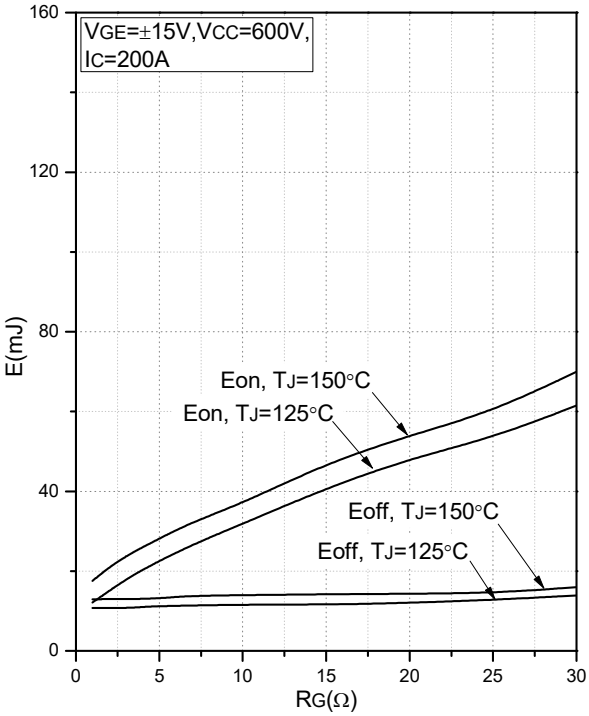


Fig.7 Typical Switching Loss vs. Gate Resistance

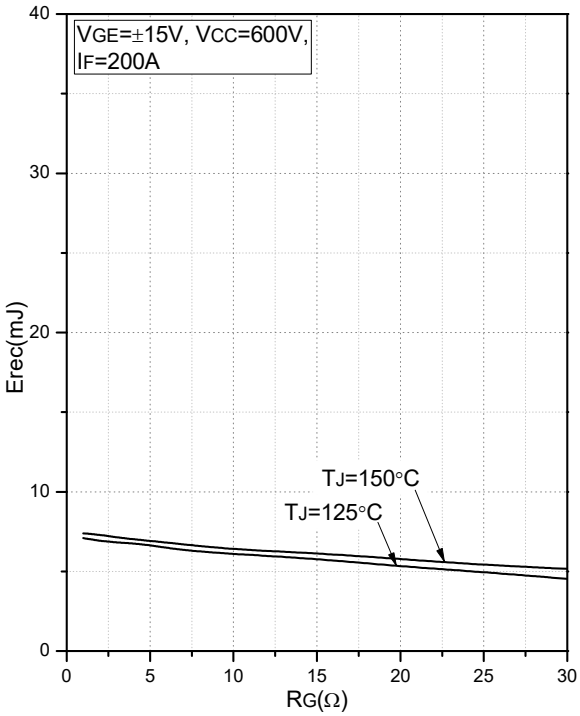


Fig.8 Typical Switching Loss vs. Gate Resistance

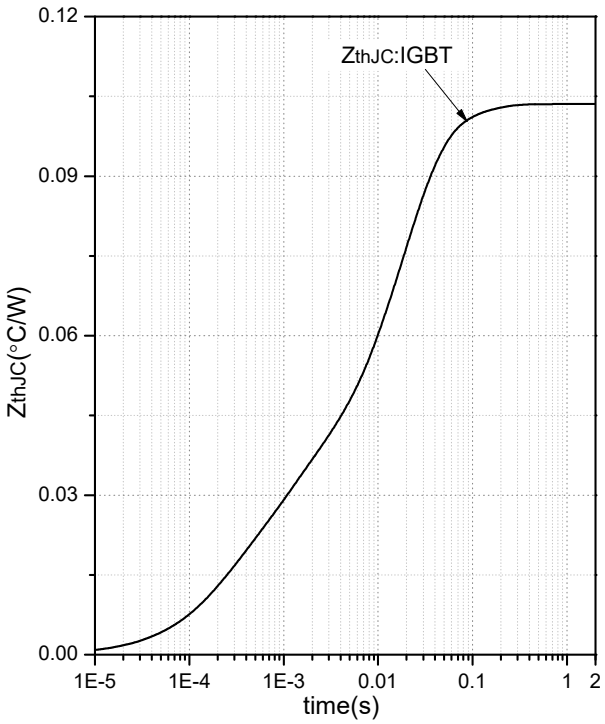


Fig.9 Transient Thermal Impedance (IGBT)

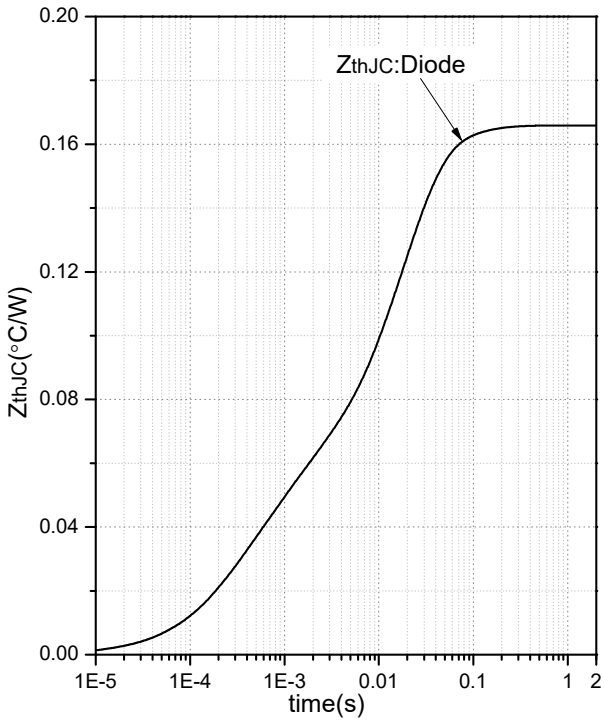


Fig.10 Transient Thermal Impedance (Diode)

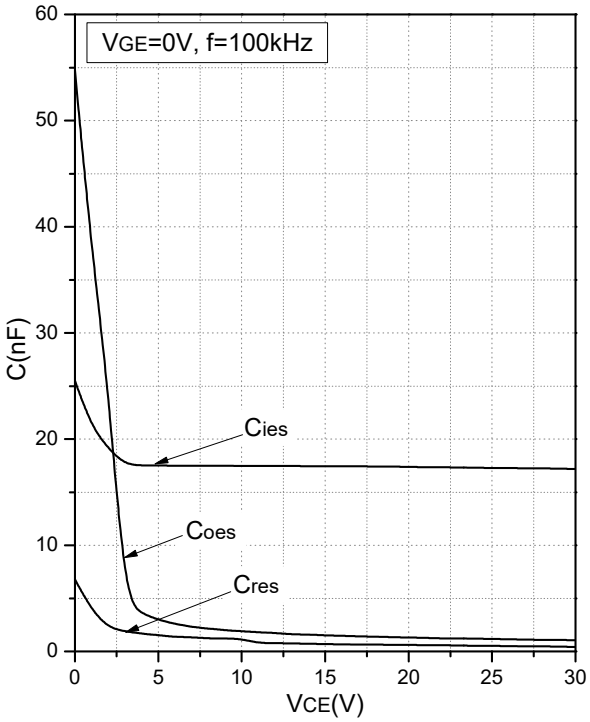
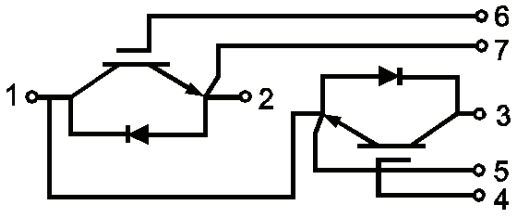
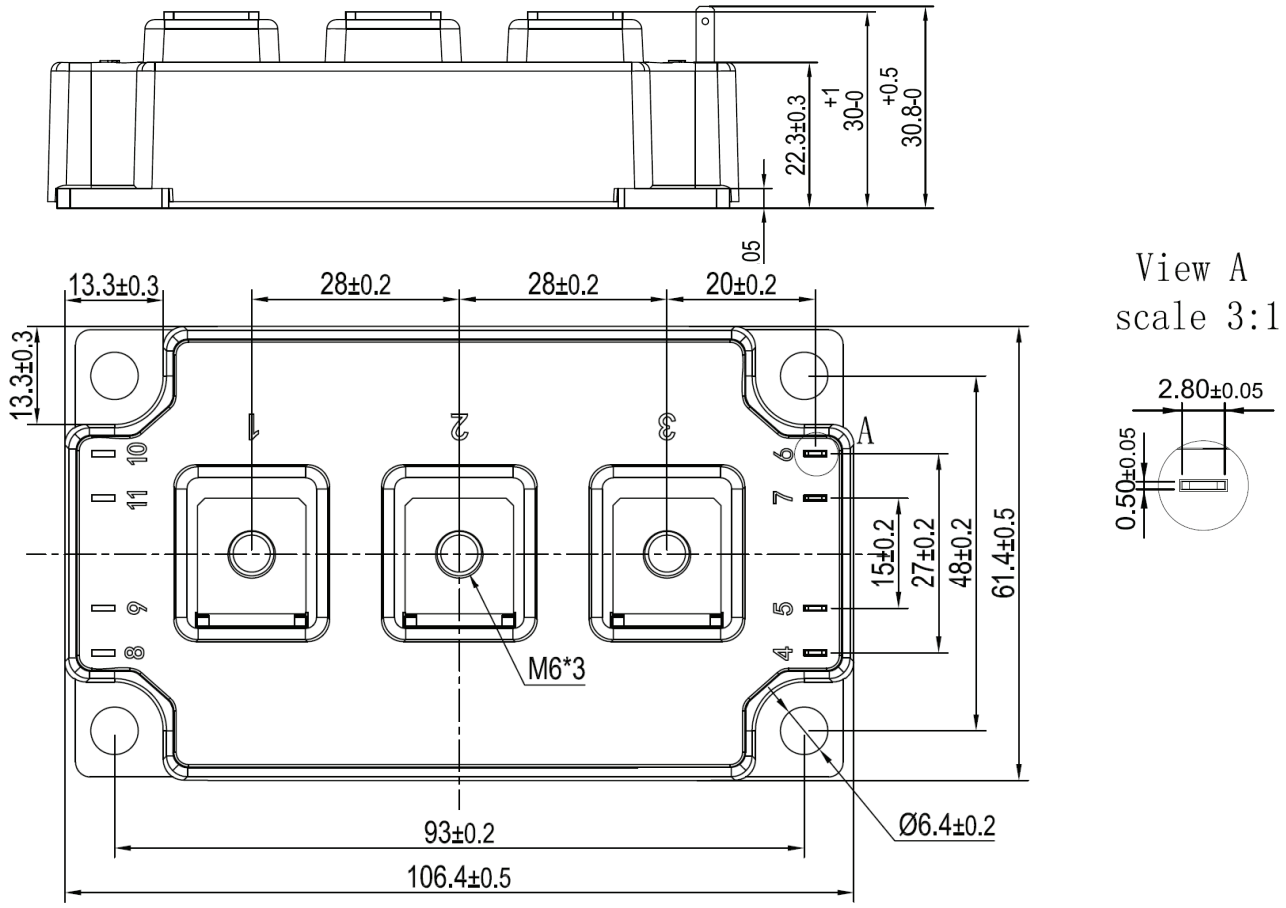


Fig.11 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):



Date	Revision	Notes
09/18/2023	A	Final Version

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