

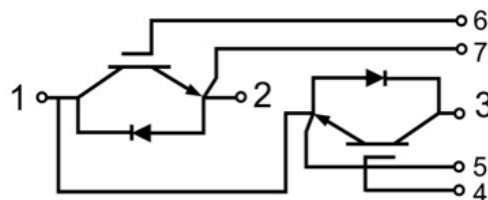
GT200HF120T2VH

IGBT Module

Circuit Diagram

Features:

- $V_{CES}=1200V$ $I_C=200A$ Trench & Field Stop IGBT Module
- Short Circuit Capability
- Low Switching Loss
- 100% RBSOA Tested($2 \times I_C$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- High Power Converters
- Motor Drives
- UPS Systems
- Wind Turbines



Type	Package	Marking
GT200HF120T2VH	T2V	GT200HF120T2VH

IGBT, Inverter

Maximum Rated Values ($T_C=25^\circ C$ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_C	Continuous Collector Current Limited by T_{Jmax}	$T_C=90^\circ C$	200	A
		$T_C=25^\circ C$	400	A
I_{CM}	Peak Collector Current Repetitive	T_p limited by T_{Jmax}	400	A
P_D	Maximum Power Dissipation (IGBT)	$T_C=25^\circ C, T_{Jmax}=175^\circ C$	1400	W

GT200HF120T2VH

IGBT Module Datasheet



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	$I_C=7.6\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.9	7.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=200\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	1.66	2.00	V
			$T_J=125^{\circ}\text{C}$	2.03		V
			$T_J=175^{\circ}\text{C}$	2.21		V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=1200\text{V}$, $T_J=25^{\circ}\text{C}$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			250	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		23.05		nF
C_{oes}	Output Capacitance			1.10		nF
C_{res}	Reverse Transfer Capacitance			0.25		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=200A,$ $R_{Gon}=1\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		135		ns
			$T_J=125^{\circ}C$		144		
			$T_J=175^{\circ}C$		148		
t_r	Rise Time		$T_J=25^{\circ}C$		30.2		ns
			$T_J=125^{\circ}C$		38.4		
			$T_J=175^{\circ}C$		41.6		
$t_{d(off)}$	Turn-off Delay Time		$T_J=25^{\circ}C$		234		ns
			$T_J=125^{\circ}C$		266		
			$T_J=175^{\circ}C$		280		
t_f	Fall Time	$T_J=25^{\circ}C$		184		ns	
		$T_J=125^{\circ}C$		244			
		$T_J=175^{\circ}C$		273			
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=200A,$ $R_{Gon}=1\Omega, V_{GE}=\pm 15V,$ $di/dt=3800A/\mu s(T_J=175^{\circ}C)$ Inductive Load	$T_J=25^{\circ}C$		15.0		mJ
		$T_J=125^{\circ}C$		21.4			
		$T_J=175^{\circ}C$		26.3			



GT200HF120T2VH

IGBT Module Datasheet

E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =200A, R _{Goff} =1Ω, V _{GE} =±15V, du/dt=4900V/μs(T _J =175°C) Inductive Load	T _J =25°C		14.4		mJ
			T _J =125°C		18.2		
			T _J =175°C		20.2		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		1.33		μC
R _{G (int)}	Internal Gate Resistance		T _J =25°C		2.5		Ω
T _{SC}	V _{CC} =600V, V _{GE} =±15V, T _J =175°C ^{note1}					10	μs
R _{θJC}	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.107	°C/W
R _{θCS}	IGBT Thermal Resistance: Case-to-Sink (per IGBT) (per IGBT, λ _{grease} = 1 W/(m · K))				0.046		°C/W

note1: Short circuit withstand time cannot exceed 10μs under specified condition

Diode, Inverter

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

V _{RRM}	Repetitive Peak Reverse Voltage	T _J =25°C	1200	V
I _F	Diode Continuous Forward Current		200	A
I _{FM}	Diode Maximum Forward Current	t _p =1ms	400	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =200A	T _J =25°C		1.56	1.87	V
			T _J =125°C		1.62		
			T _J =175°C		1.65		
t _{rr}	Reverse Recovery Time	I _F =200A, -diF/dt=3700A/μs(T _J =175°C), V _R =600V, V _{GE} =-15V	T _J =25°C		305		ns
			T _J =125°C		470		
			T _J =175°C		557		
I _{rr}	Peak Reverse Recovery Current		T _J =25°C		168		A
			T _J =125°C		152		
			T _J =175°C		144		
Q _{rr}	Reverse Recovery Charge		T _J =25°C		18.7		μC
			T _J =125°C		30.6		
			T _J =175°C		40.8		

GT200HF120T2VH

IGBT Module Datasheet



E _{rec}	Reverse Recovery Energy	I _F =200A, -diF/dt=3700A/μs(T _J =175°C), V _R =600V, V _{GE} =-15V	T _J =25°C		6.5		mJ
			T _J =125°C		12.3		
			T _J =175°C		15.9		
R _{θJC}	Diode Thermal Resistance: Junction-to-Case (per Diode)					0.218	°C/W
R _{θCS}	Diode Thermal Resistance: Case-to-Sink (per Diode, λ _{grease} = 1 W/(m • K))				0.093		°C/W

Module

Symbol	Description	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted) RMS, f=50Hz, 60s		2500		V
T _J	Maximum Junction Temperature	-40		175	°C
T _{JOP}	Maximum Operating Junction Temperature Range ^{note2}	-40		150	°C
T _{stg}	Storage Temperature	-40		125	°C
CTI	Comparative Tracking Index		200		
T	Power Terminals Screw:M6	3		5	N·m
T	Mounting Screw:M6	3		6	N·m
G	Weight		300		g

note2: T_{JOP}> 150°C is only allowed for operation at overload conditions.

Ordering Information Table

Device code	G	T	200	HF	120	T2V	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Field Stop Trench Gate 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)



Characteristic diagram

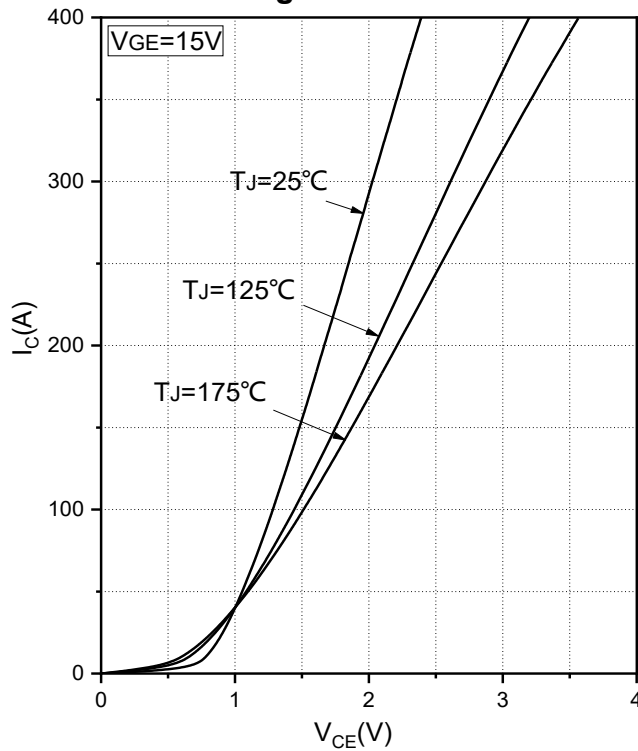


Fig.1 Typical Saturation Voltage Characteristics

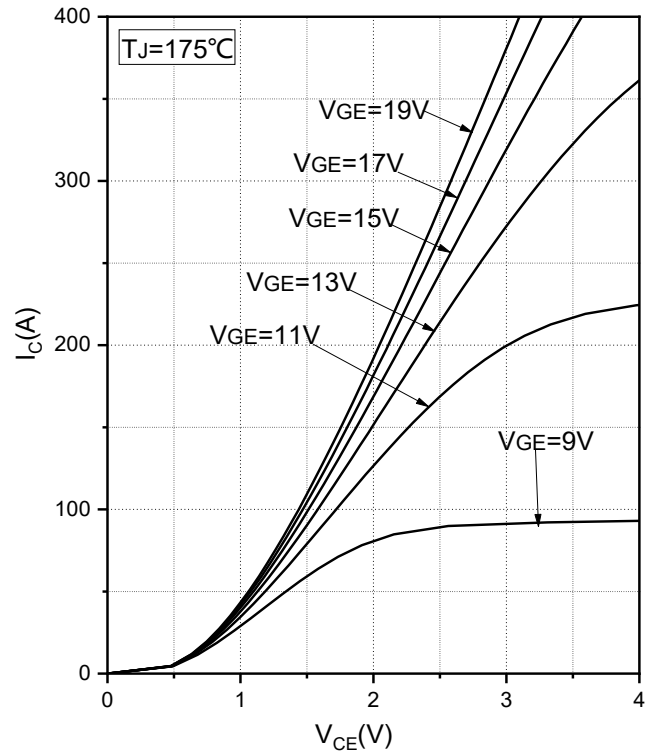


Fig.2 Typical Output Characteristics

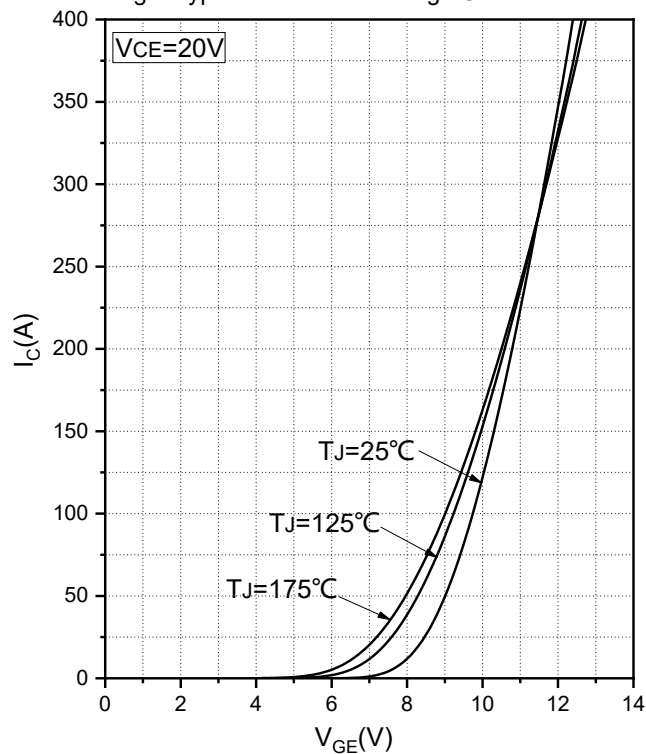


Fig.3 Transfer Characteristic

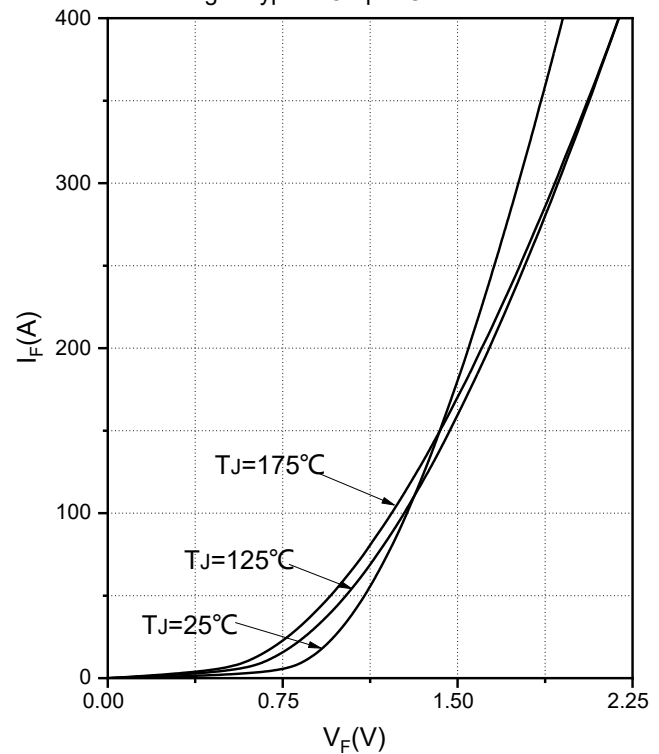


Fig.4 Forward Characteristics of Diode

GT200HF120T2VH

IGBT Module Datasheet

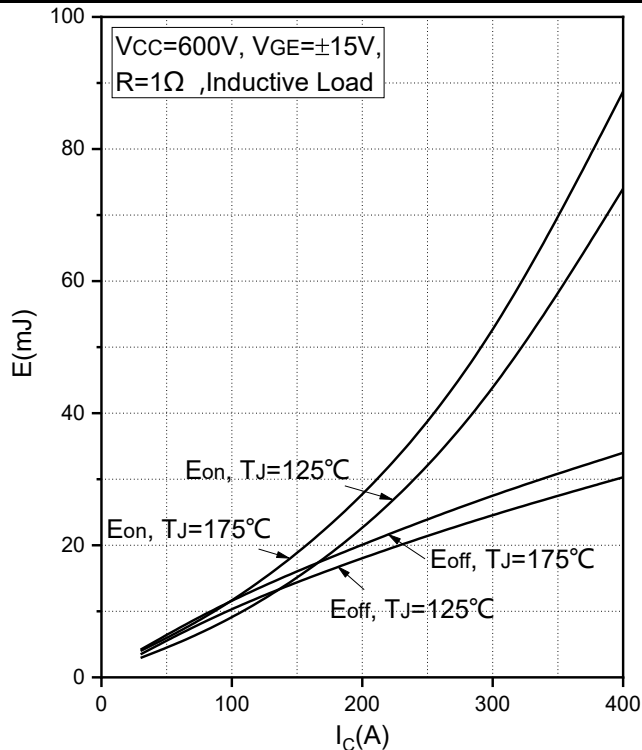


Fig.5 Typical Switching Loss vs. Collector Current

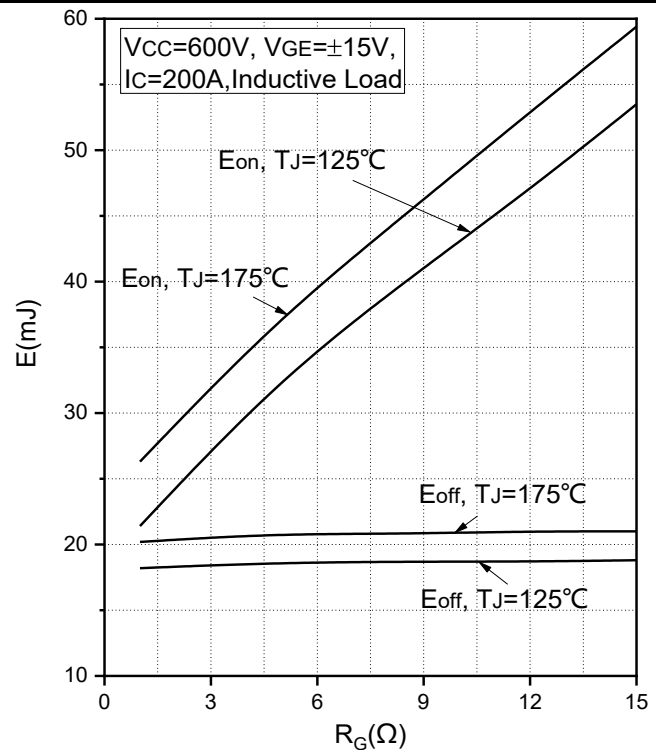


Fig.6 Typical Switching Loss vs. Gate Resistance

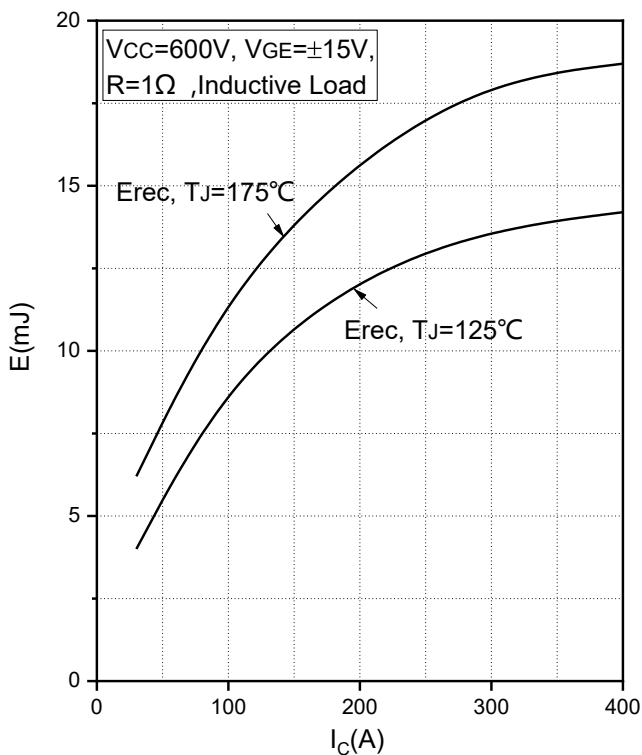


Fig.7 Typical Switching Loss vs. Forward Current

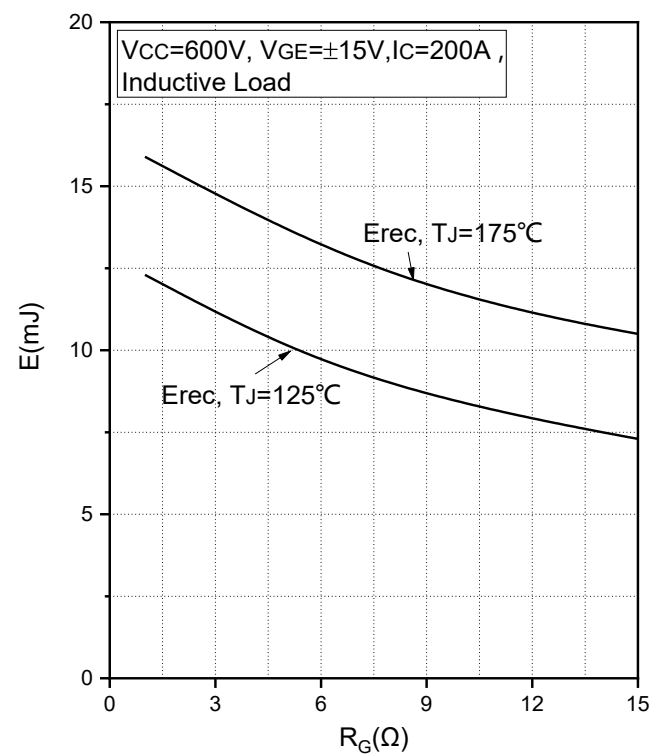


Fig.8 Typical Switching Loss vs. Gate Resistance

GT200HF120T2VH

IGBT Module Datasheet

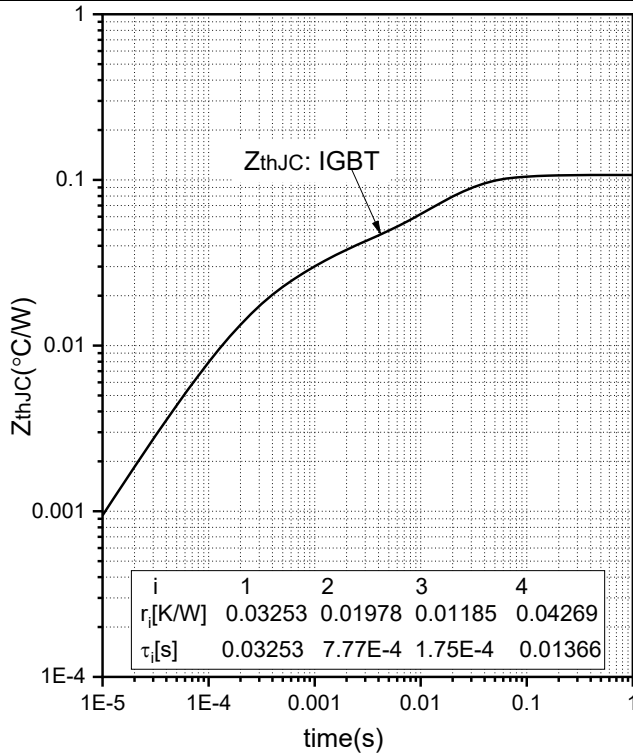


Fig.9 Transient Thermal Impedance (IGBT)

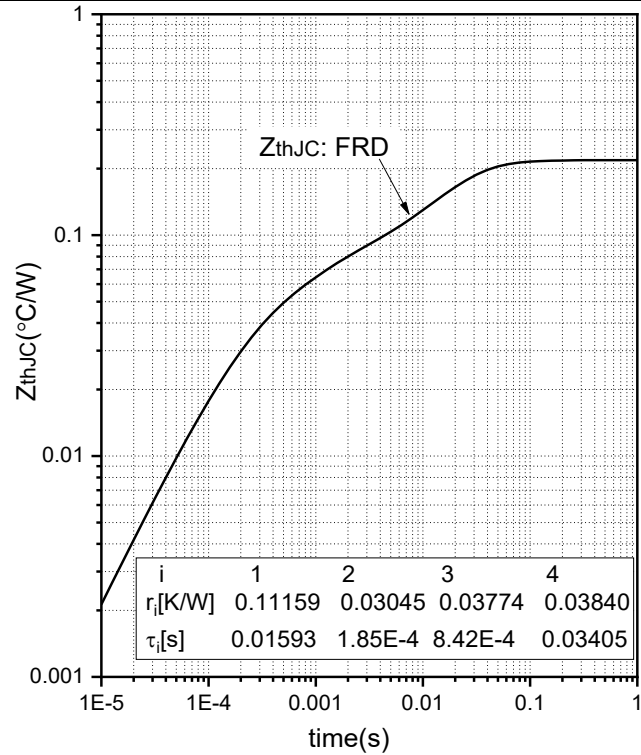


Fig.10 Transient Thermal Impedance (Diode)

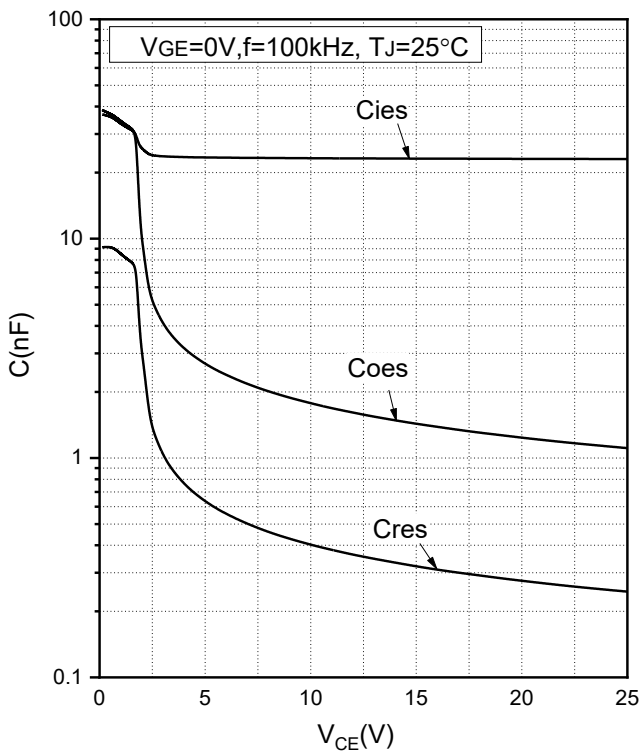


Fig.11 Capacitance Characteristics

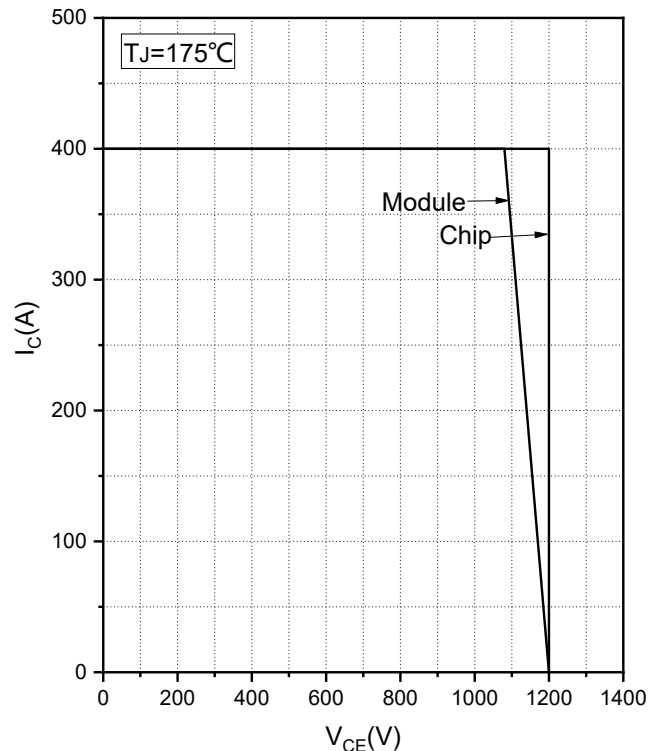


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

GT200HF120T2VH

IGBT Module Datasheet

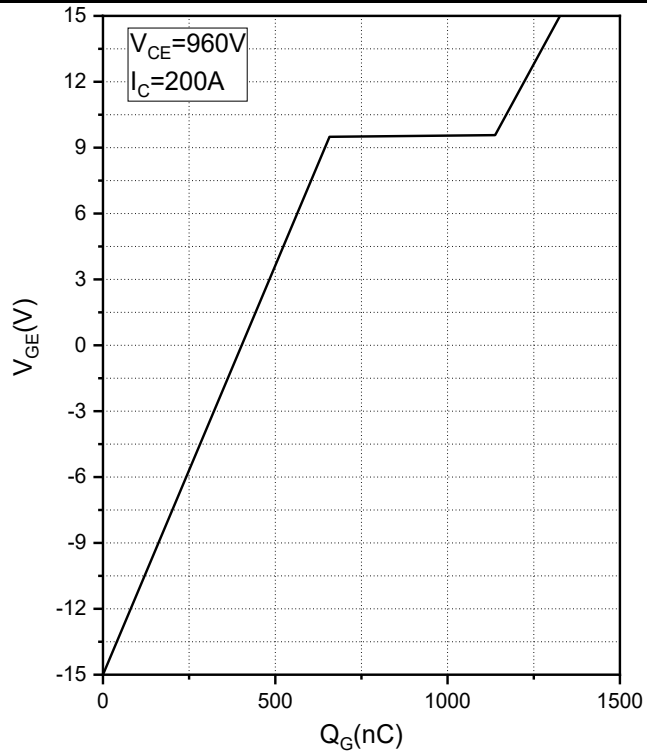


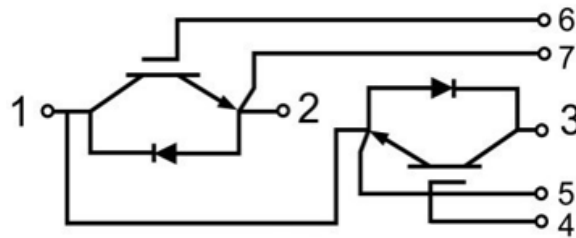
Fig.13 Gate Charge Characteristics

GT200HF120T2VH

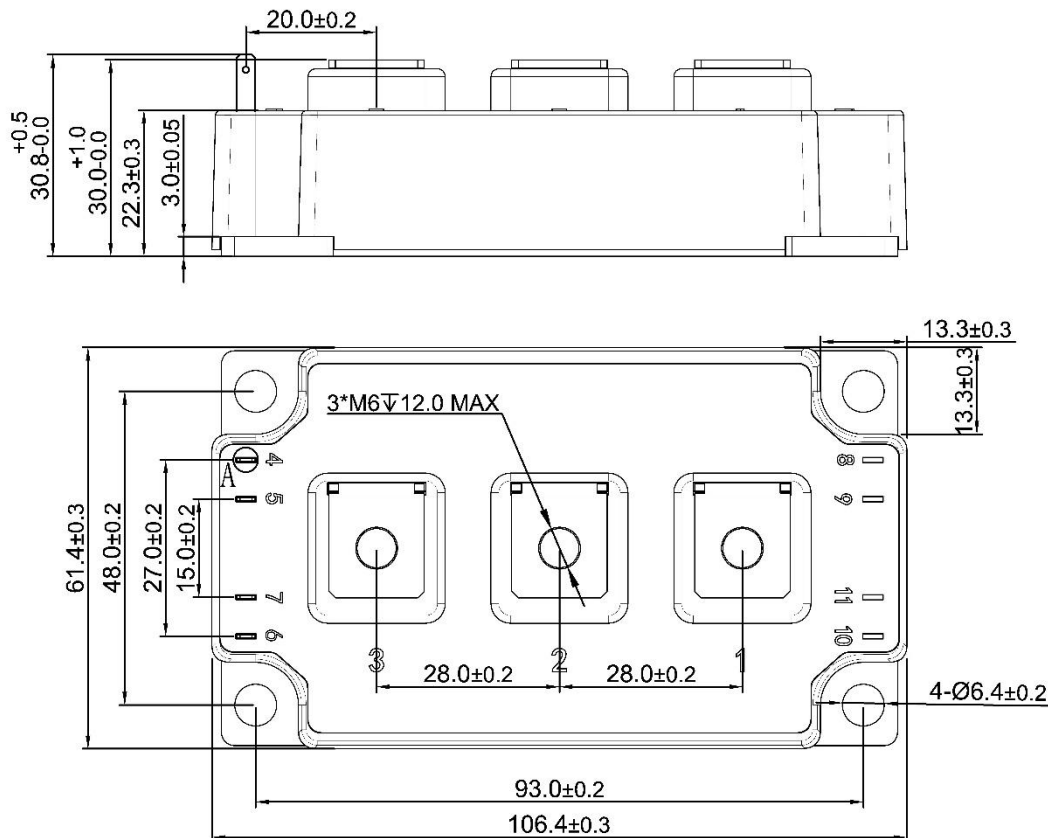
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Internal Circuit:



Package Outline (Unit: mm):



View A
scale 3:1

GT200HF120T2VH

IGBT Module Datasheet



Revision	Notes
A	Fina Datasheet Initial Release

Announcement

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