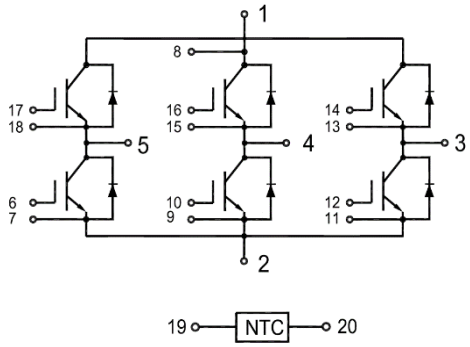
GT200FF120A8H
IGBT Module

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：

- High Power Converters
- UPS Systems
- Motor Drives

IGBT, Inverter
Maximum Rated Values (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=100℃	200	A
		T_C=25℃	400	A
I_{CM}	Repetitive Peak Collector Current	tp=1ms	400	A
P_D	Maximum Power Dissipation per IGBT	T_C=25℃ T_{Jmax}=175℃	1260	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=7.6mA, V_{CE}=V_{GE}, T_J=25℃		5.0	5.9	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=200A, V_{GE}=15V	T_J=25℃		1.65	2.10	V
			T_J=125℃		2.00		V
			T_J=150℃		2.00		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℃				200	nA
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f=100kHz			23.44		nF
C_{oes}	Output Capacitance				3.05		nF
C_{res}	Reverse Transfer Capacitance				0.26		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	VCC=600V, IC=200A, R_{Gon}=4.7Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		488		ns
			T_J=125℃		508		
			T_J=150℃		515		
t_r	Rise Time		T_J=25℃		117		ns
			T_J=125℃		134		
			T_J=150℃		136		
$t_{d(off)}$	Turn-off Delay Time	VCC=600V, IC=200A, R_{Goff}=4.7Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		444		ns
			T_J=125℃		474		
			T_J=150℃		480		
t_f	Fall Time		T_J=25℃		176		ns
			T_J=125℃		213		
			T_J=150℃		217		
E_{on}	Turn-on Switching Loss	VCC=600V, IC=200A, R_{Gon}=4.7Ω, V_{GE}=±15V, di/dt=1204A/μs (T_J=150℃) Inductive Load	T_J=25℃		16.0		mJ
			T_J=125℃		22.9		
			T_J=150℃		27.2		

E_{off}	Turn-off Switching Loss	VCC=600V, IC=200A, R_{Goff}=4.7Ω, V_{GE}=±15V, du/dt=3656V/μs (T_J=150℃) Inductive Load	T_J=25℃		10.1		mJ
			T_J=125℃		15.7		
			T_J=150℃		17.4		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		1.56		μC
R_g	Internal Gate Resistance		T_J=25℃		2.9		Ω
RBSOA	IC=400A, V_{CC}=1050V, Vp=1200V, R_{Goff}=4.7Ω, V_{GE}=+15V to 0V, T_J=150°C			Trapezoid			
SC Data	VCC=600V, t_p=10us, R_{Gon}=4.7Ω, R_{Goff}=4.7Ω, V_{GE}=+/-15V, T_J=125℃				1100		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case (per IGBT)					0.119	℃/W

Diode, Reverse

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℃		1.65		V
			T_J=125℃		1.75		
			T_J=150℃		1.70		
t_{rr}	Reverse Recovery Time	I_F=200A, -diF/dt=1635A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		223		ns
			T_J=125℃		450		
			T_J=150℃		523		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		119		A
			T_J=125℃		144		
			T_J=150℃		150		

Q_{rr}	Reverse Recovery Charge	I_F=200A, -diF/dt=1635A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		15.95		μC
			T_J=125℃		32.36		
			T_J=150℃		37.32		
E_{rec}	Reverse Recovery Energy		T_J=25℃		5.3		mJ
			T_J=125℃		11.5		
			T_J=150℃		13.0		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per Diode)					0.193	℃/W

Internal NTC-Thermistor Characteristics

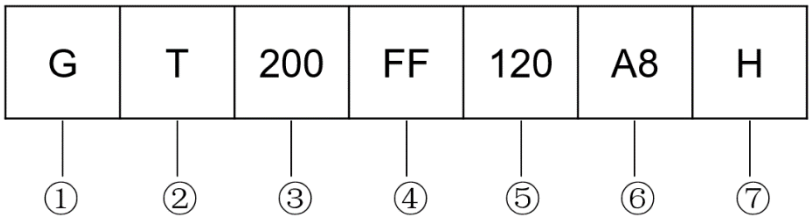
R_{25}	T_C=25℃	5		kΩ
△R/R	T_C=100℃, R_{100} =465Ω		±5	%
P_{25}	T_C=25℃	10		mW
$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$	3380		K
$B_{25/80}$	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$	3440		K
$B_{25/100}$	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298.15K))]$	3545		K

Module

Symbol	Description		Min.	Typ.	Max.	Units
V_{ISO}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 30S		4500		V
Internal Isolation				Al_2O_3		
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
M	Power Terminals Screw:M6		3.0		6.0	N·m
M	Mounting Screw:M5		3.0		6.0	N·m
G	Weight			390		g

Ordering Information Table

Device code



① - IGBT Module
② - Field Stop Trench Gate IGBT
③ - Rated Current (200=200A)
④ - Circuit Configuration (FF=Full Bridge)
⑤ - Rated Voltage (120=1200V)
⑥ - Package Type
⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

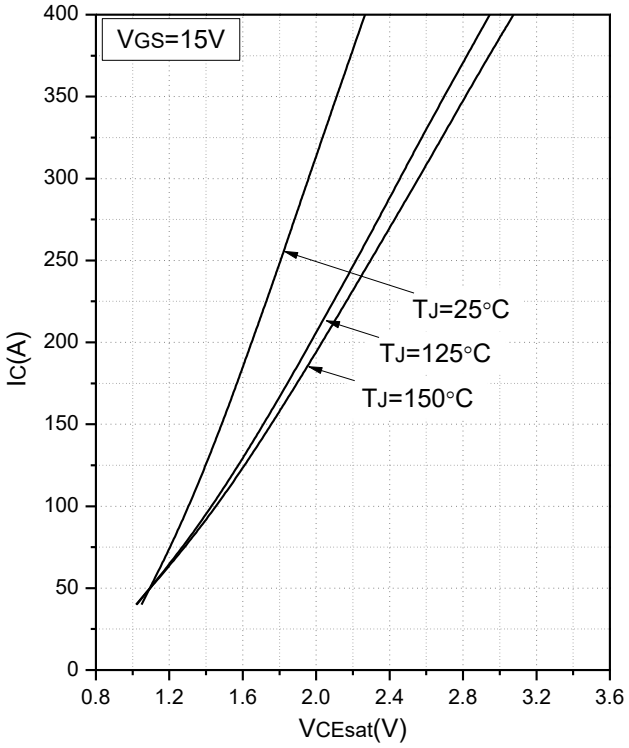


Fig.1 Typical Saturation Voltage Characteristics

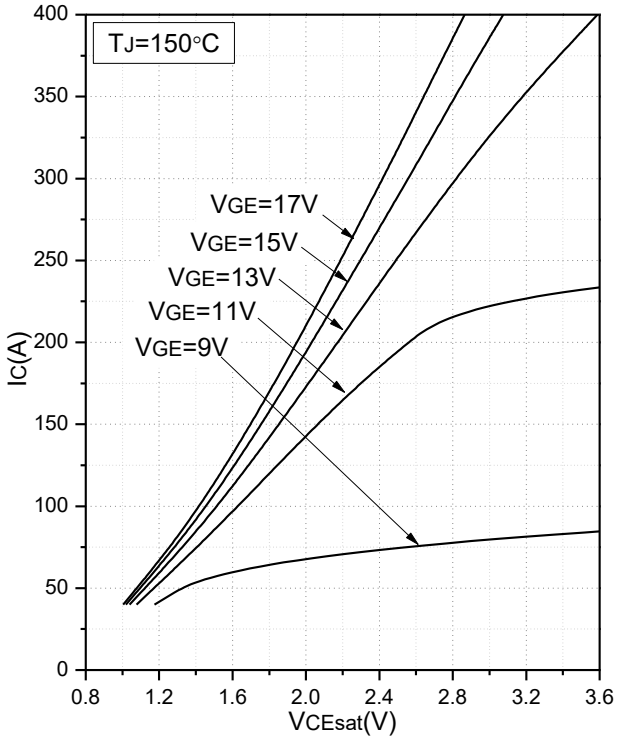


Fig.2 Typical Output Characteristics

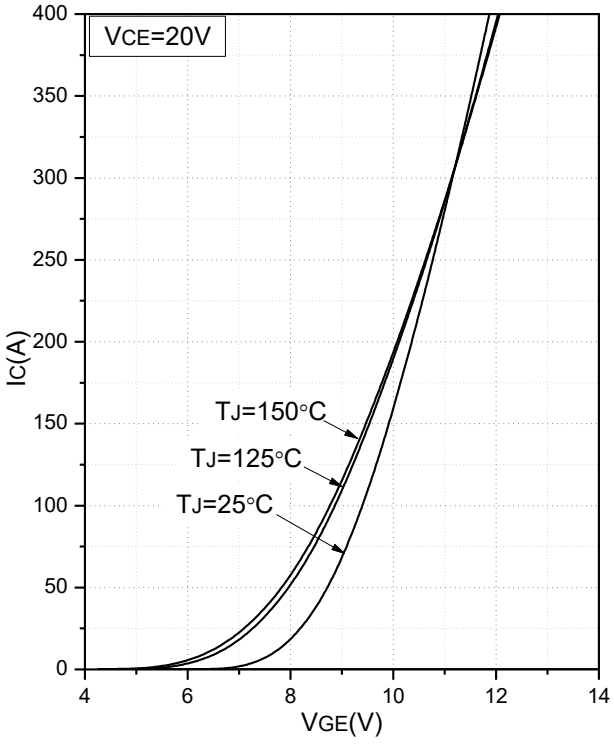


Fig.3 Transfer Characteristic

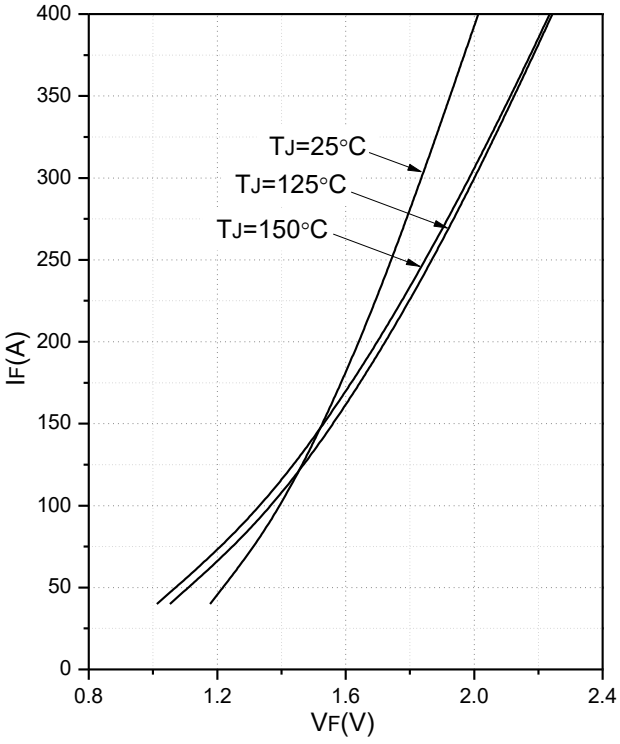


Fig.4 Forward Characteristics of Diode

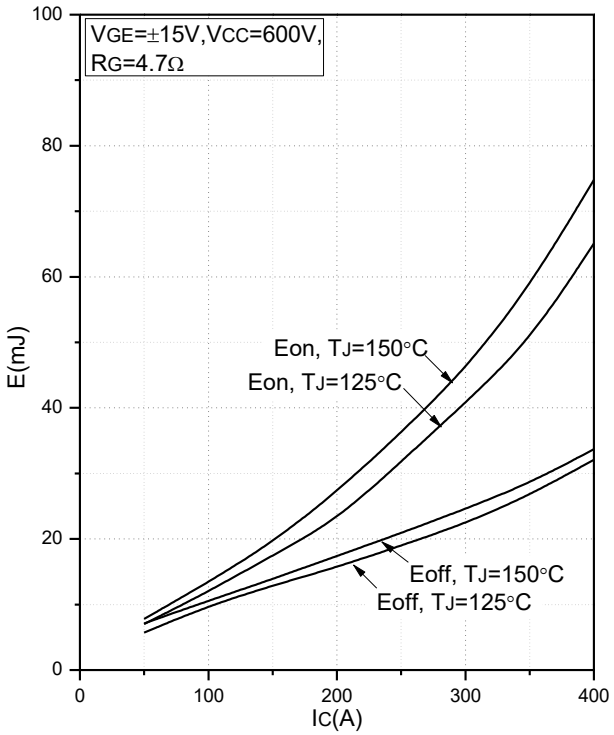


Fig.5 Typical Switching Loss vs. Collector Current

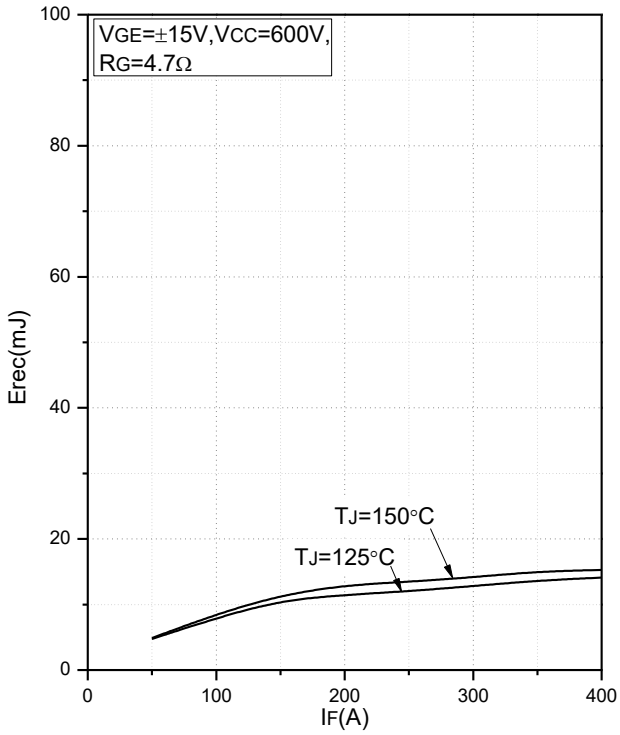


Fig.6 Typical Switching Loss vs. Forward Current

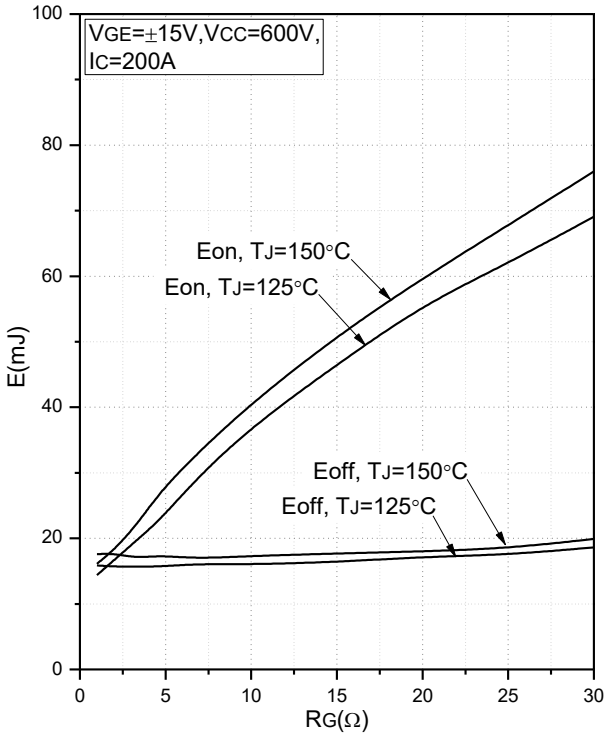


Fig.7 Typical Switching Loss vs. Gate Resistance

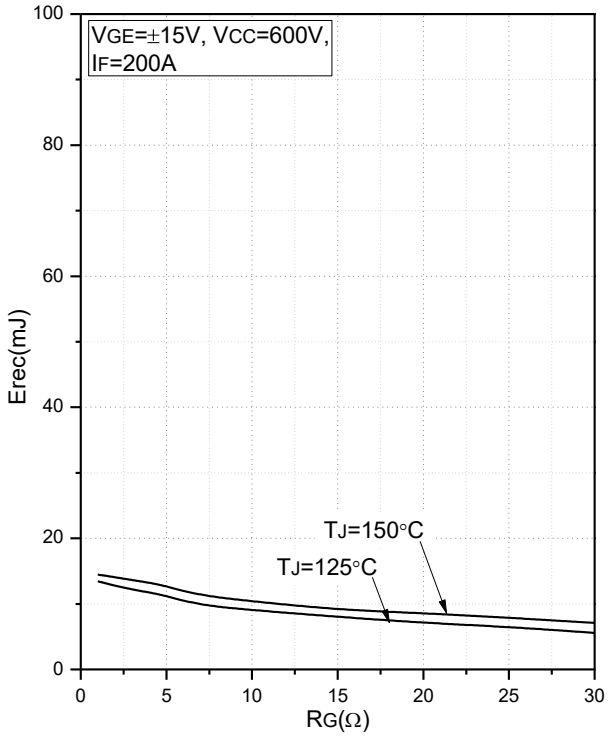


Fig.8 Typical Switching Loss vs. Gate Resistance

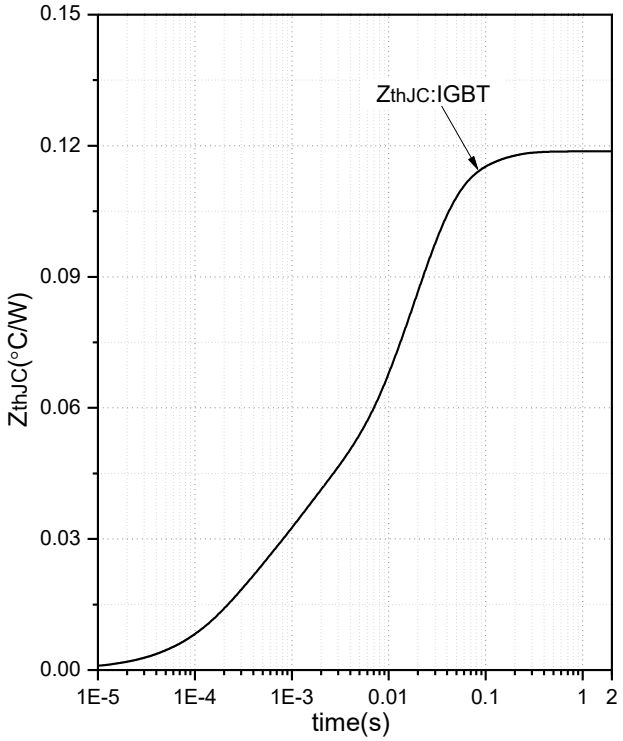


Fig.9 Transient Thermal Impedance (IGBT)

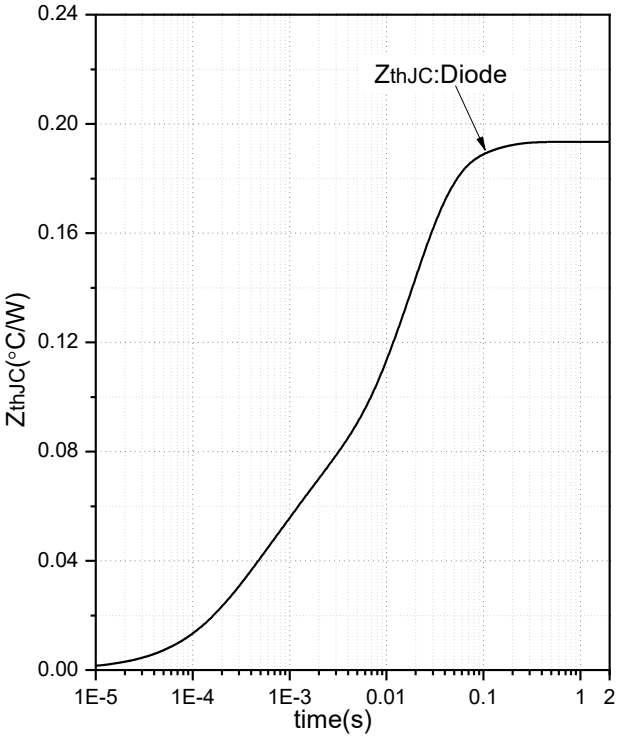


Fig.10 Transient Thermal Impedance (Diode)

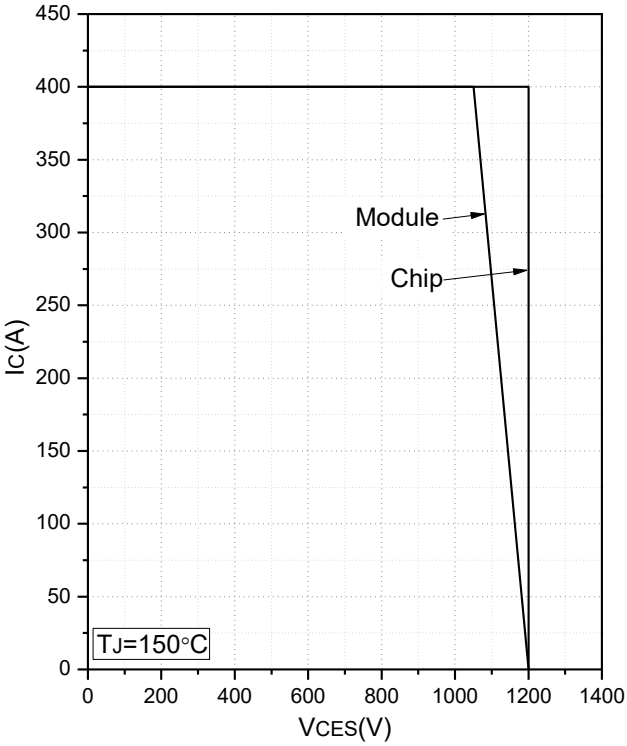


Fig.11 Reverse Bias Safe Operation Area (RBSOA)

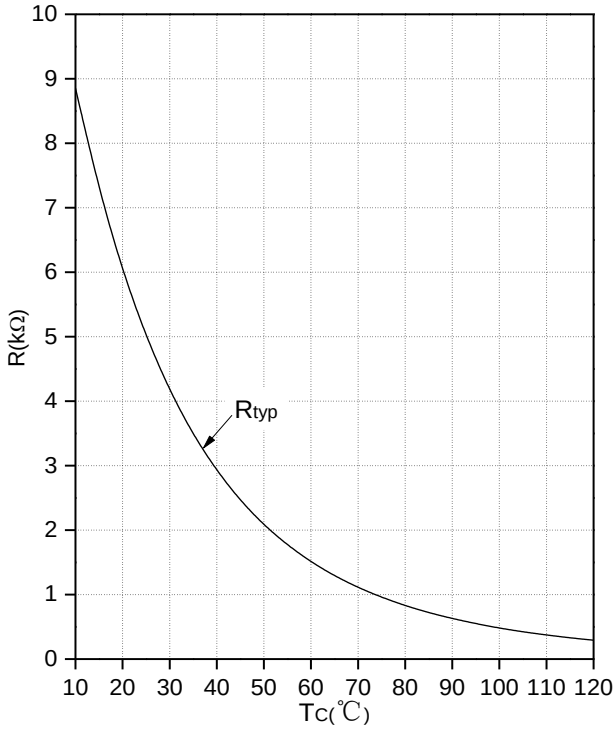


Fig.12 NTC Temperature Characteristics

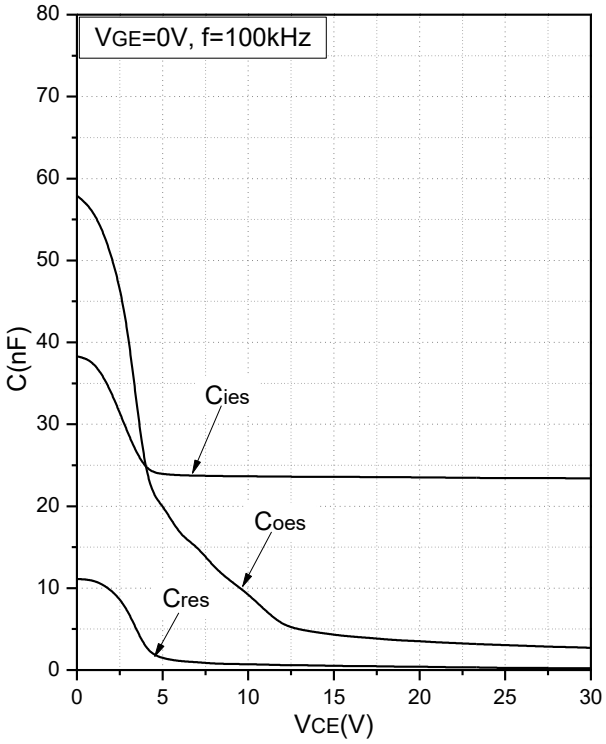
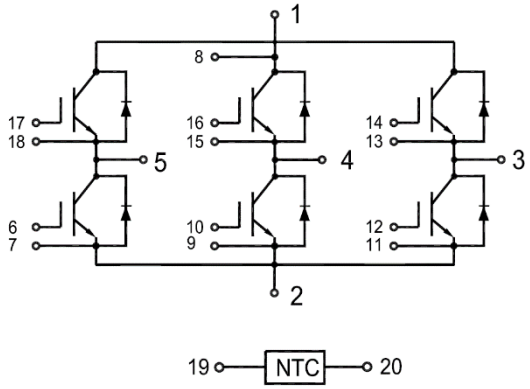
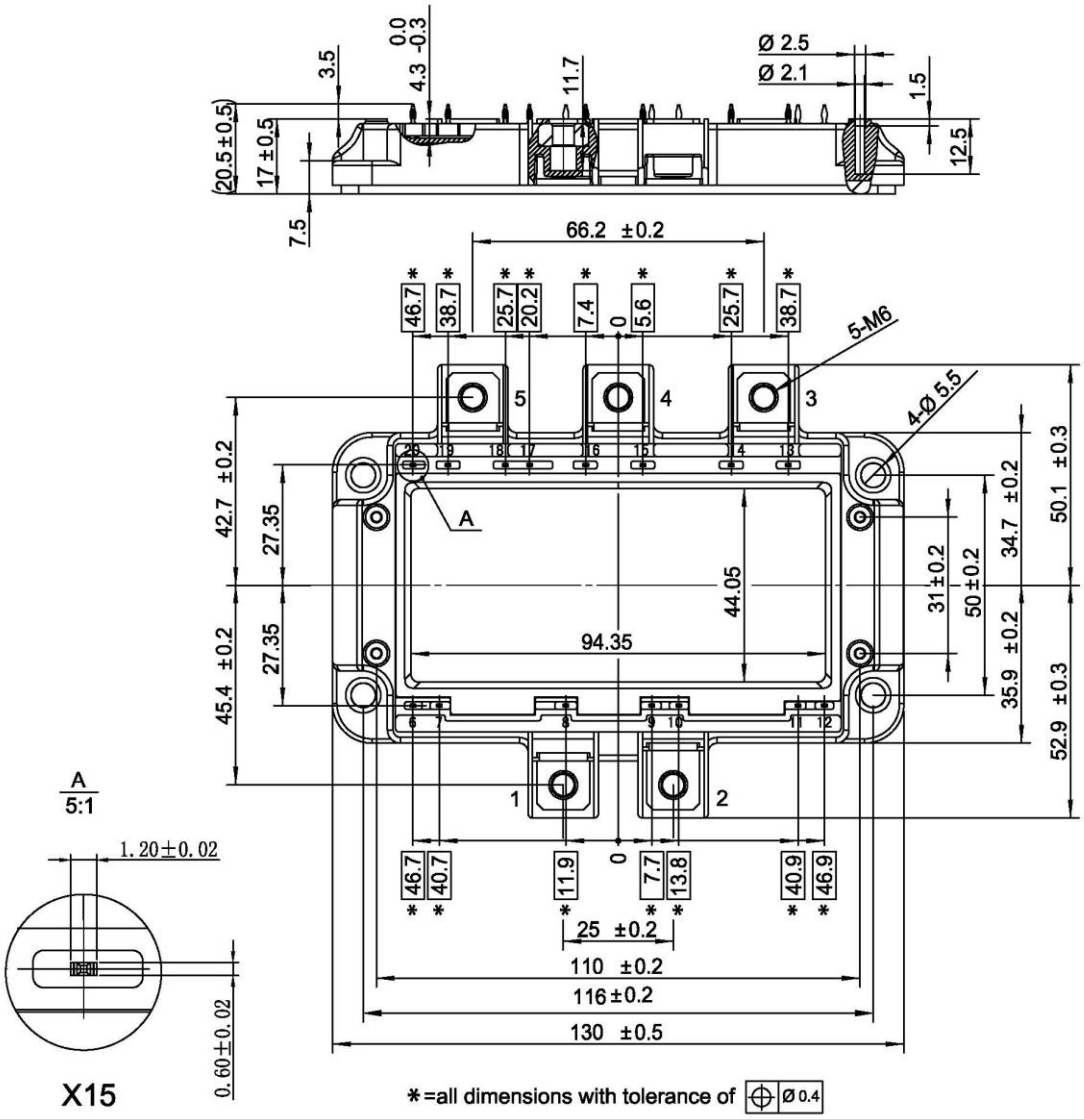


Fig.13 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):



Date	Revision	Notes
03/01/2024	01	Initial Release
03/13/2024	02	Add Value “$R_{g\ Internal}$”
04/01/2024	A	Updated Electrical Performance Parameters

Announcement

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