

GT150FF120A8H

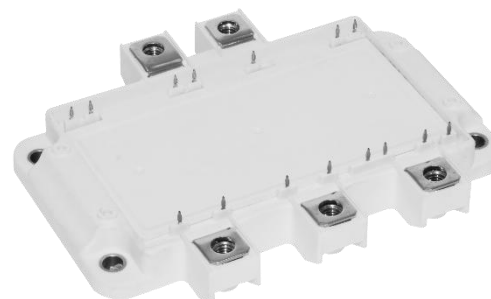
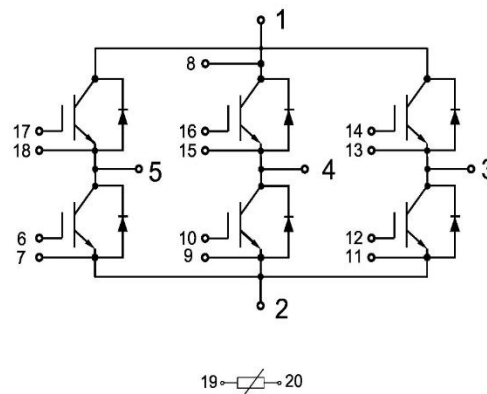
IGBT Module

Features:

- $V_{CES}=1200V$ $I_C=150A$ Trench & Field Stop IGBT Module
- Short Circuit Capability
- Low Saturation Voltage
- 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



Type	Package	Marking
GT150FF120A8H	A8	GT150FF120A8H

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}	$T_C=90^\circ C$	150	A
		$T_C=25^\circ C$	300	A
I_{CM}	Peak Collector Current Repetitive	T_p limited by T_{Jmax}	300	A
P_D	Maximum Power Dissipation (IGBT)	$T_C=25^\circ C, T_{Jmax}=175^\circ C$	950	W

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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	$I_C=5.7\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.8	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	1.71	2.10	V
			$T_J=125^\circ\text{C}$	2.12		V
			$T_J=175^\circ\text{C}$	2.29		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	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^\circ\text{C}$			600	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		17.00		nF
C_{oes}	Output Capacitance			2.10		nF
C_{res}	Reverse Transfer Capacitance			0.18		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=150A,$ $R_{Gon}=3.3\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		169		ns
			$T_J=125^{\circ}C$		179		
			$T_J=175^{\circ}C$		183		
t_r	Rise Time		$T_J=25^{\circ}C$		81		ns
			$T_J=125^{\circ}C$		87		
			$T_J=175^{\circ}C$		92		
$t_{d(off)}$	Turn-off Delay Time		$T_J=25^{\circ}C$		242		ns
			$T_J=125^{\circ}C$		278		
			$T_J=175^{\circ}C$		295		
t_f	Fall Time	$T_J=25^{\circ}C$		194		ns	
		$T_J=125^{\circ}C$		249			
		$T_J=175^{\circ}C$		284			
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=150A,$ $R_{Gon}=3.3\Omega, V_{GE}=\pm 15V,$ $di/dt=1300A/\mu s(T_J=175^{\circ}C)$ Inductive Load	$T_J=25^{\circ}C$		19		mJ
		$T_J=125^{\circ}C$		24			
		$T_J=175^{\circ}C$		28			



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E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =150A, R _{Goff} =3.3Ω, V _{GE} =±15V, du/dt=5300V/μs(T _J =175°C) Inductive Load	T _J =25°C		11		mJ
			T _J =125°C		14		
			T _J =175°C		16		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		0.98		uC
R _{G (int)}	Internal Gate Resistance		T _J =25°C		4.0		Ω
T _{SC}	V _{CC} =600V, V _{GE} =±15V, T _J =175°C ^{note1}					10	us
R _{θJC}	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.157	°C/W
R _{θCS}	IGBT Thermal Resistance: Case-to-Sink (per IGBT) (per IGBT, λ _{grease} = 1 W/(m · K))				0.097		°C/W

note1: Short circuit withstand time cannot exceed 10us 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		150	A
I _{FM}	Diode Maximum Forward Current	tp=1ms	300	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 =150A	T _J =25°C		1.71	2.20	V
			T _J =125°C		1.84		
			T _J =175°C		1.81		
t _{rr}	Reverse Recovery Time	I _F =150A, -diF/dt=1200A/μs(T _J =175°C), V _R =600V, V _{GE} =-15V	T _J =25°C		328		ns
			T _J =125°C		452		
			T _J =175°C		562		
I _{rr}	Peak Reverse Recovery Current		T _J =25°C		62		A
			T _J =125°C		68		
			T _J =175°C		70		
Q _{rr}	Reverse Recovery Charge		T _J =25°C		12.6		μC
			T _J =125°C		19.6		
			T _J =175°C		24.6		



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E _{rec}	Reverse Recovery Energy	I _F =150A, -diF/dt=1200A/μs(T _J =175°C), V _R =600V, V _{GE} =-15V	T _J =25°C		4.2		mJ
			T _J =125°C		7.0		
			T _J =175°C		9.1		
R _{θJC}	Diode Thermal Resistance: Junction-to-Case (per Diode)					0.326	°C/W
R _{θCS}	Diode Thermal Resistance: Case-to-Sink (per Diode, λ _{grease} = 1 W/(m • K))				0.203		°C/W

Internal NTC-Thermistor Characteristics

Symbol	Conditions	Min.	Typ.	Max.	Units.
R_{25}	$T_C=25^\circ C$		5		k Ω
$\Delta R/R$	$T_C=100^\circ C$, $R_{100}=465\Omega$	-5		+5	%
P_{25}	$T_C=25^\circ C$			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)	RMS, f=50Hz, 60s	2500			V
T_J	Maximum Junction Temperature		-40		175	$^\circ C$
T_{JOP}	Maximum Operating Junction Temperature Range ^{note2}		-40		150	$^\circ C$
T_{stg}	Storage Temperature		-40		125	$^\circ C$
CTI	Comparative Tracking Index		200			
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

note2: $T_{JOP} > 150^\circ C$ is only allowed for operation at overload conditions.

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Ordering Information Table

Device code	G	T	150	FF	120	A8	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Field Stop Trench Gate IGBT
- ③ - Rated Current (150=150A)
- ④ - Circuit Configuration:FF (Full Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

Characteristic diagram

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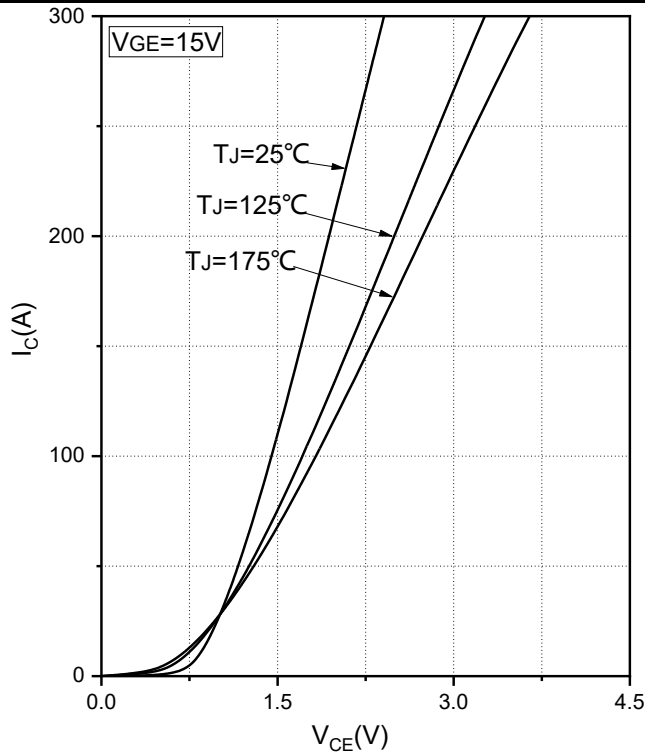


Fig.1 Typical Saturation Voltage Characteristics

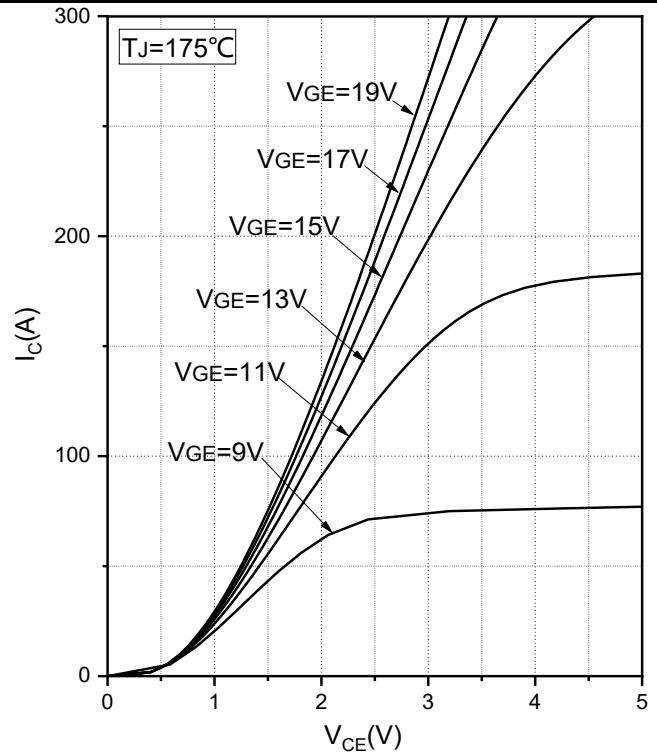


Fig.2 Typical Output Characteristics

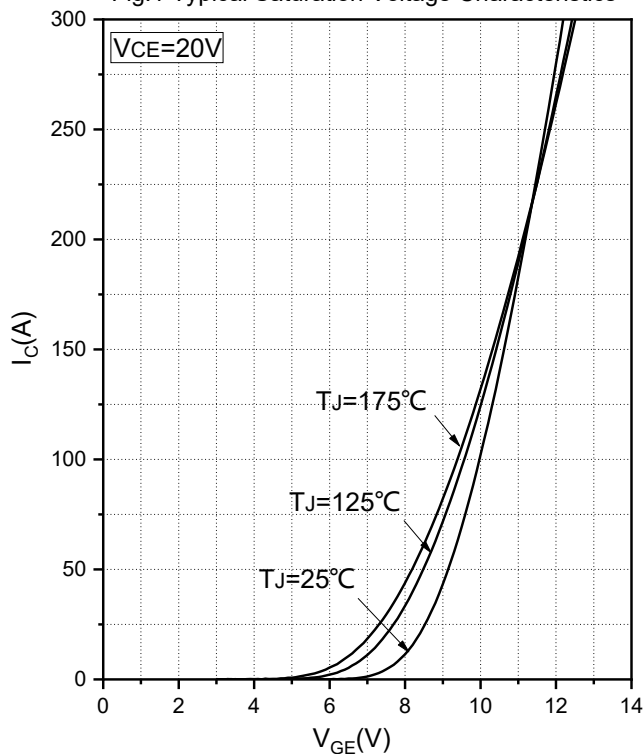


Fig.3 Transfer Characteristic

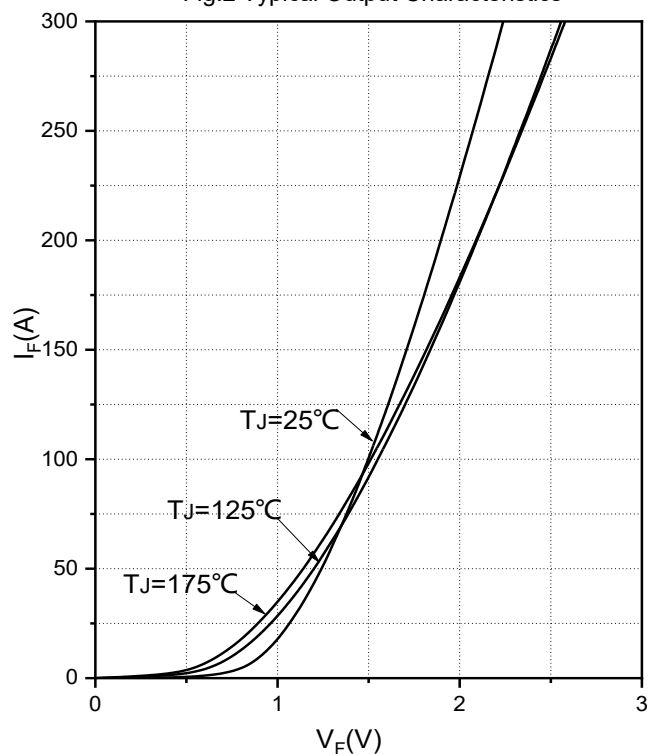


Fig.4 Forward Characteristics of Diode

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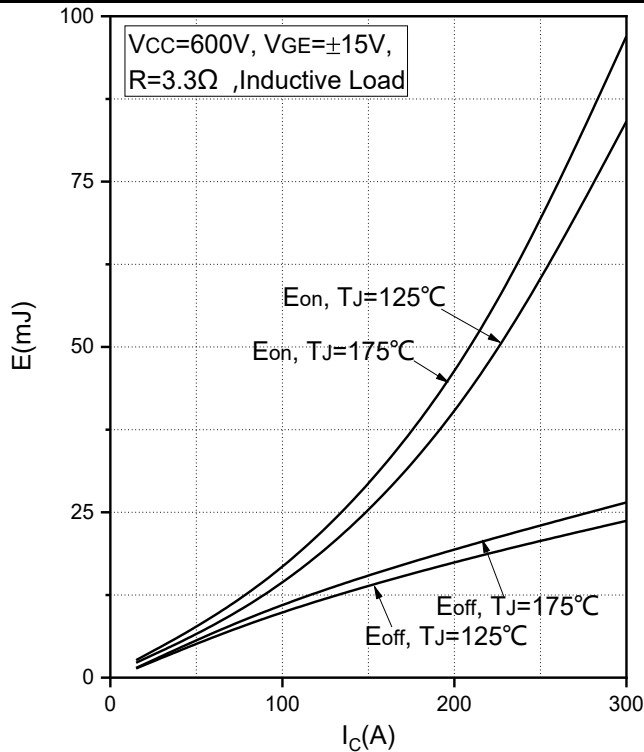


Fig.5 Typical Switching Loss vs. Collector Current

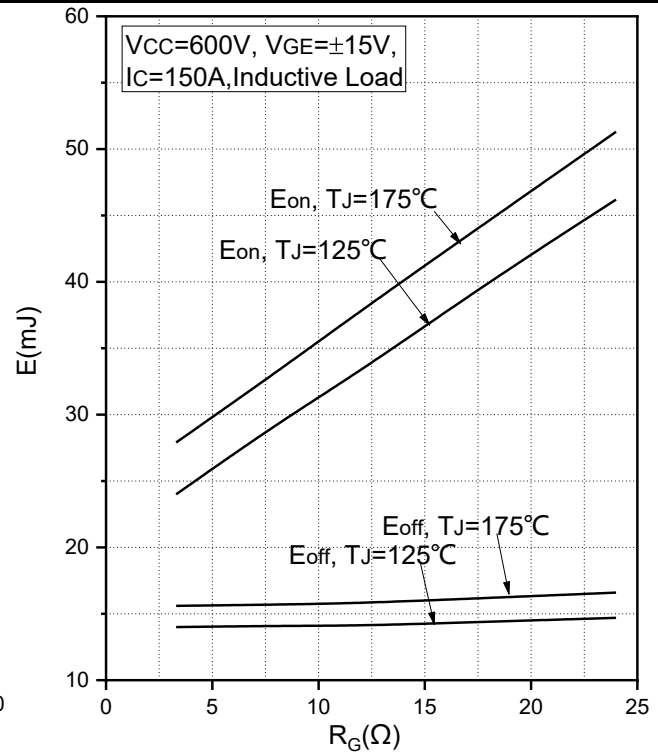


Fig.6 Typical Switching Loss vs. Gate Resistance

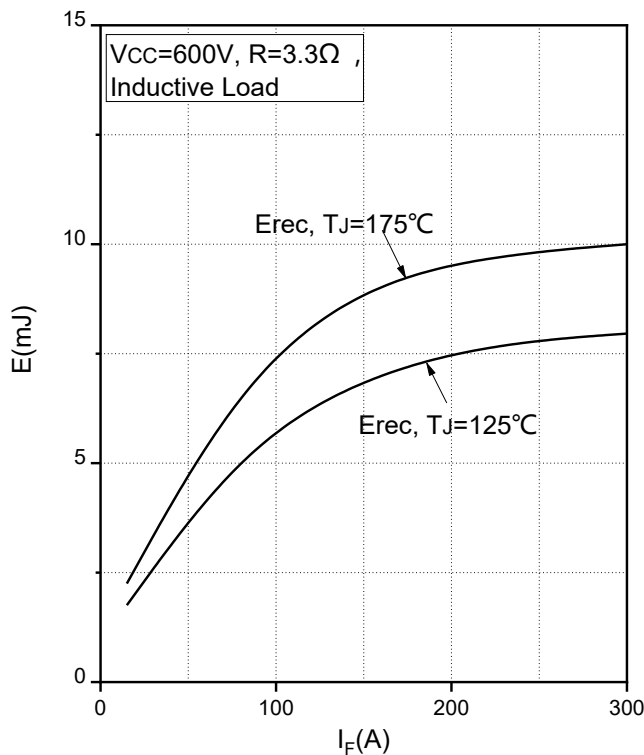


Fig.7 Typical Switching Loss vs. Forward Current

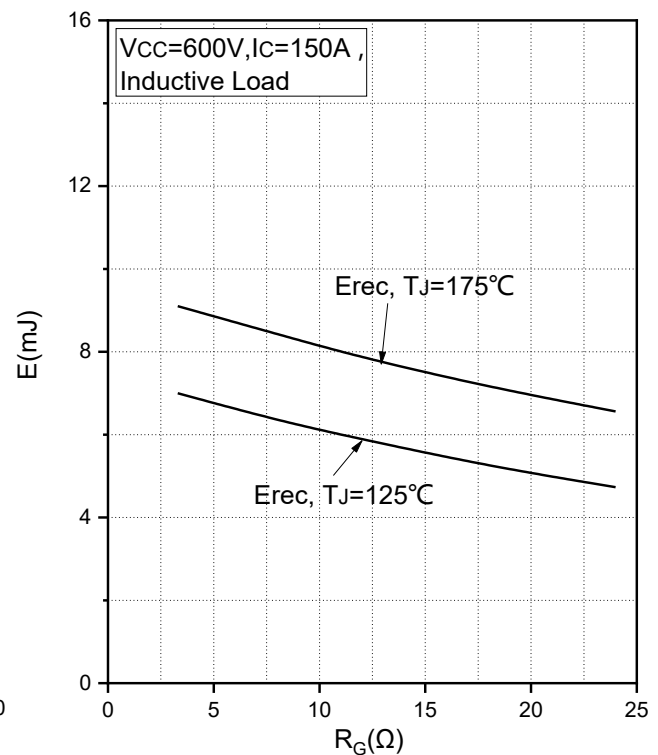


Fig.8 Typical Switching Loss vs. Gate Resistance

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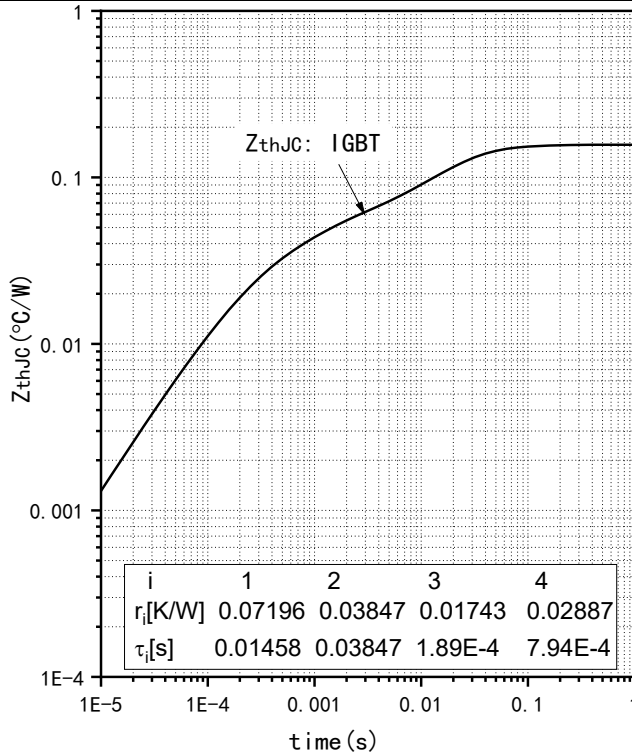


Fig.9 Transient Thermal Impedance (IGBT)

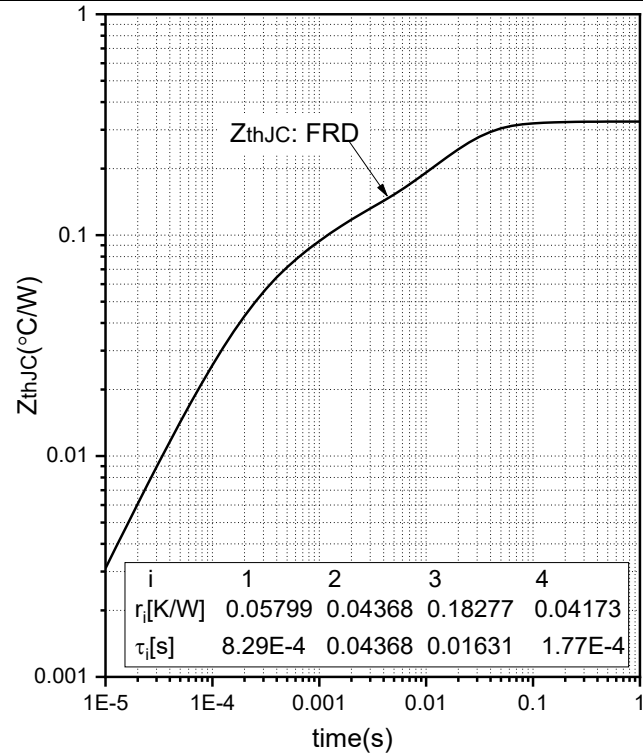


Fig.10 Transient Thermal Impedance (Diode)

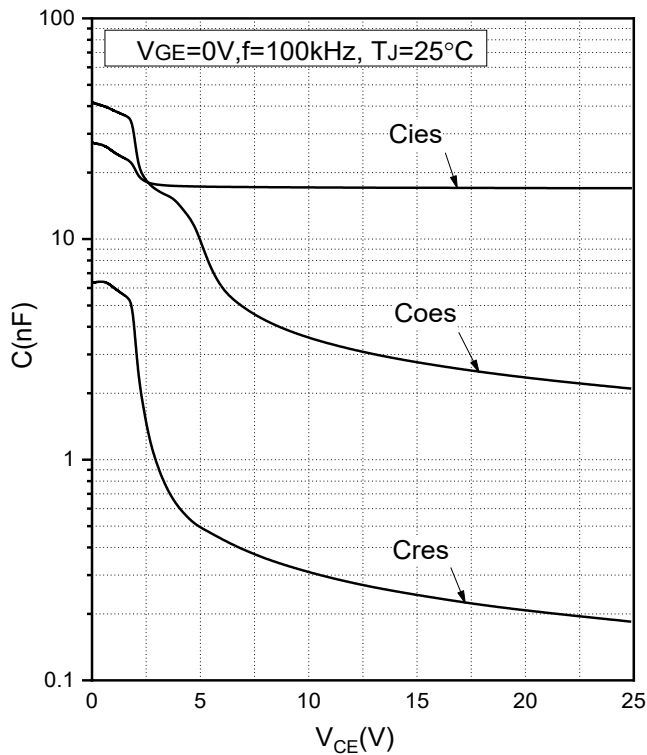


Fig.11 Capacitance Characteristics

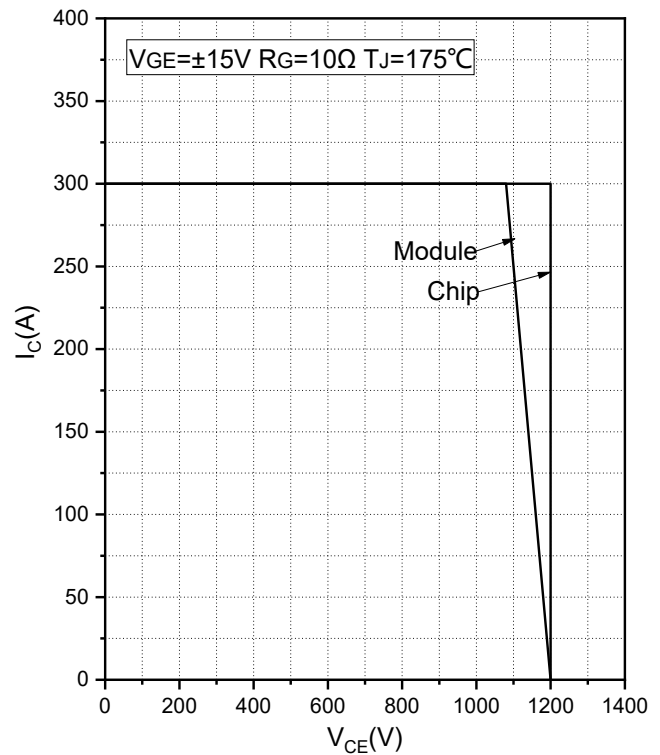


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

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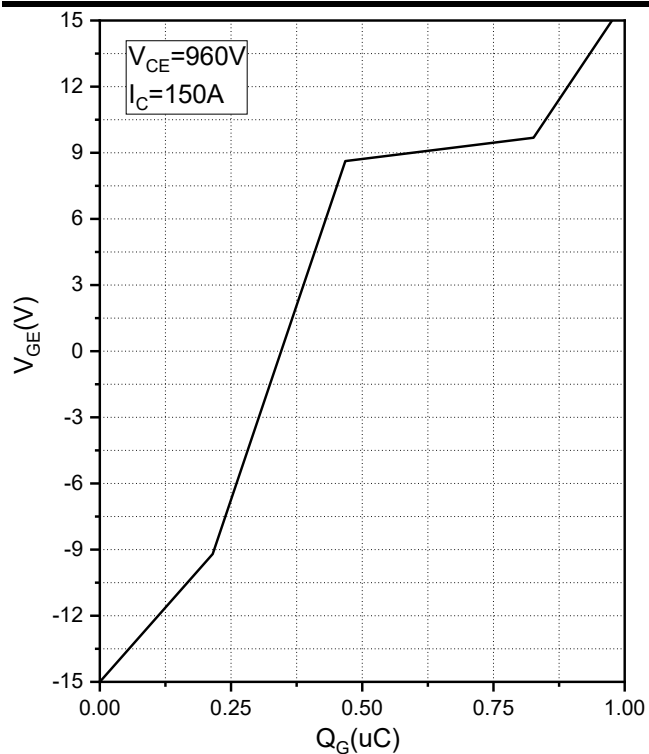


Fig.13 Gate Charge Characteristics

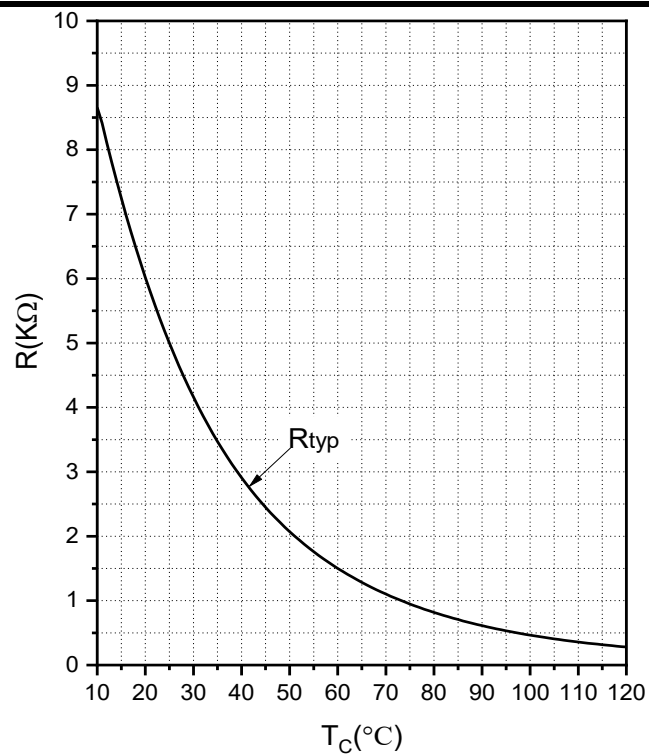


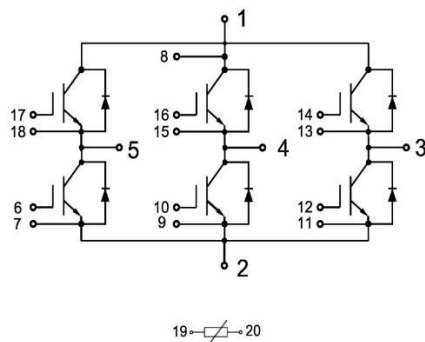
Fig.14 NTC Temperature Characteristics



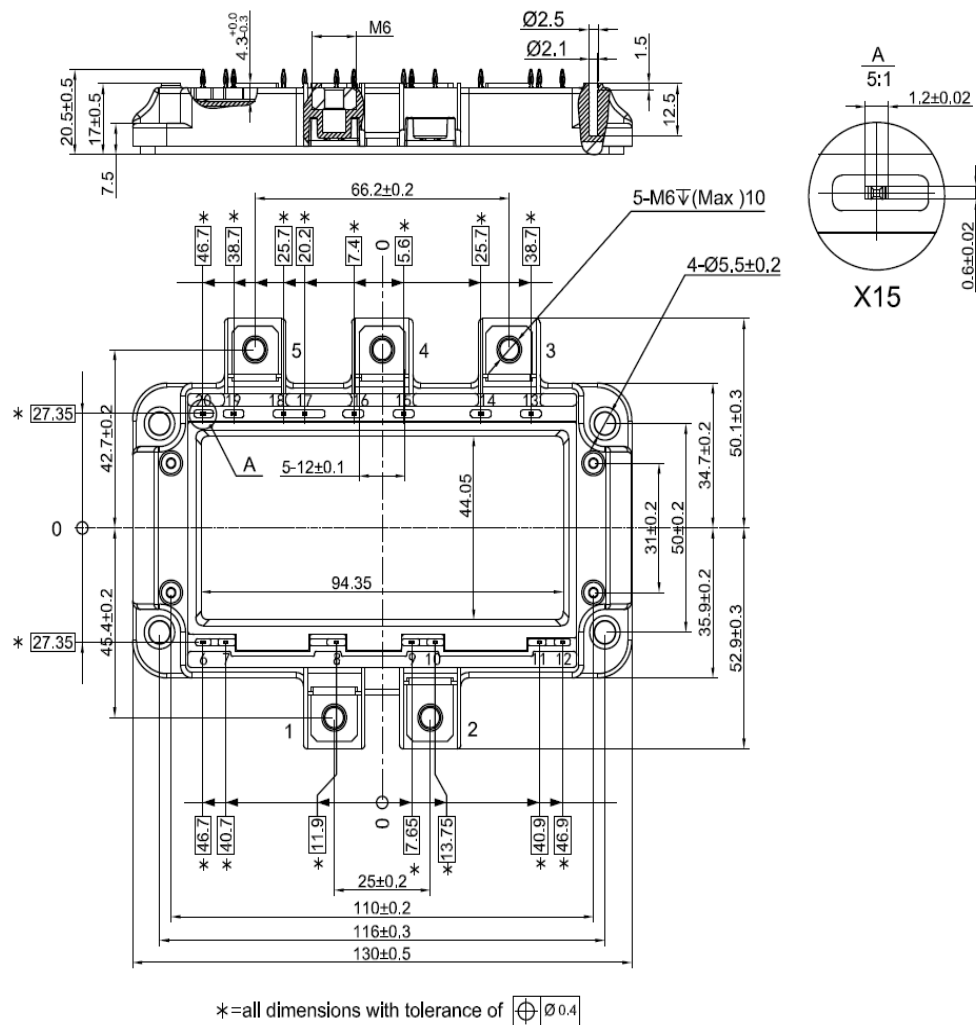
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Internal Circuit:



Package Outline (Unit: mm):





Revision	Notes
A	Fina Datasheet Initial Release

Announcement

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