

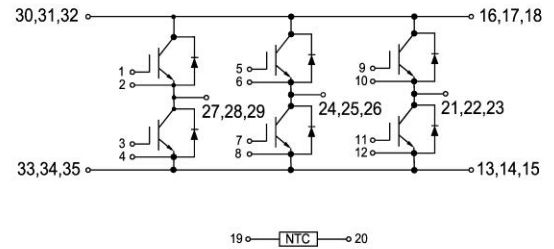


GT100FF120T6H

IGBT Module

Features:

- Field Stop Trench Gate IGBT
- 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



Applications:

- Industrial Inverters
- Servo Applications

IGBT, Inverter

Maximum Rated Values (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 =100°C	100	A
		T _C =25°C	200	A
I _{CM}	Peak Collector Current Repetitive	t _p =1ms	200	A
P _D	Maximum Power Dissipation (IGBT)	T _C =25°C T _{Jmax} =175°C	651	W



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	$I_C=2.4\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.7	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	1.65	1.90	V
			$T_J=125^{\circ}\text{C}$	2.00		V
			$T_J=150^{\circ}\text{C}$	2.10		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	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			200	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		11.46		nF
C_{oes}	Output Capacitance			1.52		nF
C_{res}	Reveres Transfer Capacitance			0.74		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=100A,$ $R_{Gon}=1\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		152		ns
			$T_J=125^{\circ}C$		168		
			$T_J=150^{\circ}C$		172		
t_r	Rise Time		$T_J=25^{\circ}C$		32		ns
			$T_J=125^{\circ}C$		40		
			$T_J=150^{\circ}C$		42		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600V, I_C=100A,$ $R_{Goff}=1\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		302		ns
			$T_J=125^{\circ}C$		348		
			$T_J=150^{\circ}C$		352		
t_f	Fall Time		$T_J=25^{\circ}C$		158		ns
			$T_J=125^{\circ}C$		250		
			$T_J=150^{\circ}C$		250		
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=100A,$ $R_{Gon}=1\Omega, V_{GE}=\pm 15V,$ $di/dt=2061A/\mu s(T_J=150^{\circ}C),$ Inductive Load	$T_J=25^{\circ}C$		2.70		mJ
			$T_J=125^{\circ}C$		4.70		
			$T_J=150^{\circ}C$		5.64		



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =100A, R _{Goff} =1Ω, V _{GE} =±15V, du/dt=5171V/μs(T _J =150°C), Inductive Load	T _J =25°C		7.83		mJ
			T _J =125°C		10.18		
			T _J =150°C		10.81		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		2912		nC
R _{G(int)}	Internal Gate Resistor		T _J =25°C		5		Ω
SCSOA	V _{CC} =600V, V _{GE} =+/-15V, R _{Gon} =1Ω, R _{Goff} =1Ω, T _J =25°C			10			μs
R _{θJC}	Thermal Resistance: Junction-to-Case (per IGBT)					0.230	°C/W

Diode, Inverter

Maximum Rated Values (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		100	A
I _{FM}	Peak FWD Current Repetitive	t _p =1ms	200	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =100A	T _J =25℃		1.65		V
			T _J =125℃		1.80		
			T _J =150℃		1.75		
t _{rr}	Reverse Recovery Time	I _F =100A, -diF/dt=2356A/μs(T _J =150℃), V _R =600V, V _{GE} =-15V	T _J =25℃		138		ns
			T _J =125℃		182		
			T _J =150℃		212		
I _{rr}	Peak Reverse Recovery Current		T _J =25℃		136		A
			T _J =125℃		155		
			T _J =150℃		159		
Q _{rr}	Reverse Recovery Charge		T _J =25℃		10.6		μC
			T _J =125℃		15.4		
			T _J =150℃		17.5		



E _{rec}	Reverse Recovery Energy	I _F =100A, -diF/dt=2356A/μs(T _J =150°C), V _R =600V, V _{GE} =-15V	T _J =25°C		4.98		mJ
			T _J =125°C		6.67		
			T _J =150°C		7.59		
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					0.332	°C/W

Internal NTC-Thermistor Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
R ₂₅	T _C =25°C		5		kΩ
ΔR/R	T _C =100°C, R ₁₀₀ =465Ω	-5		5	%
P ₂₅	T _C =25°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	Conditions	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 60s	2500			V
T _J	Maximum Junction Temperature				175	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+125	°C
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-to-Sink Thermally (Conductive Grease Applied)				0.03	°C/W
T	Power Terminals Screw:M5		3.0		6.0	N·m
G	Weight			300		g



Ordering Information Table

Device code	G	T	100	FF	120	T6	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (100=100A)
- ④ - Circuit Configuration (Full Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

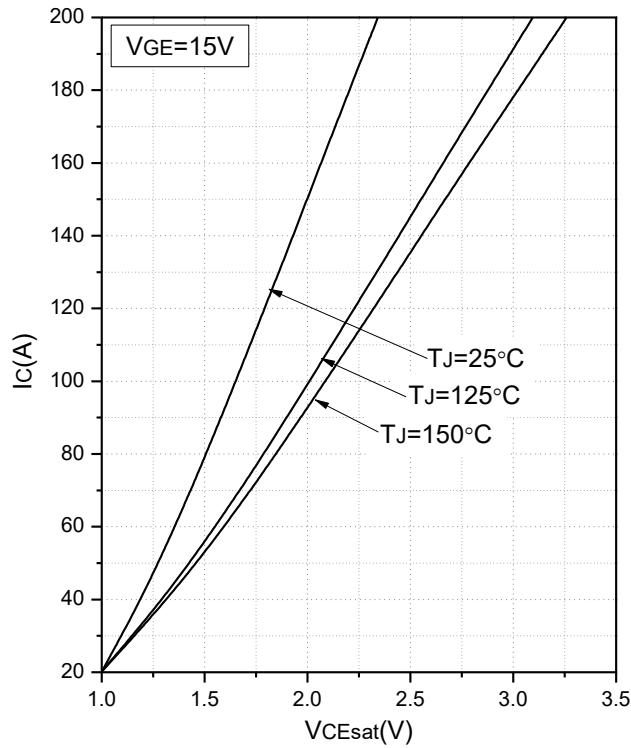


Fig.1 Typical Saturation Voltage Characteristics

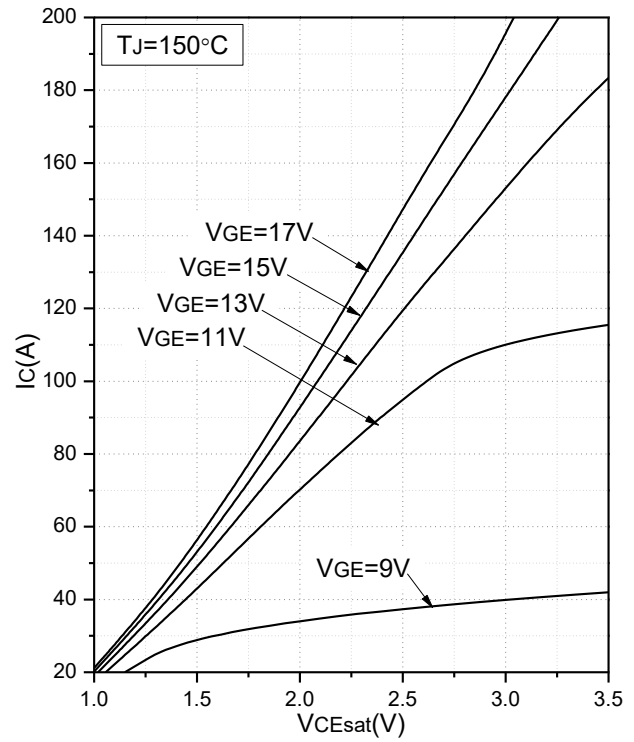


Fig.2 Typical Output Characteristics

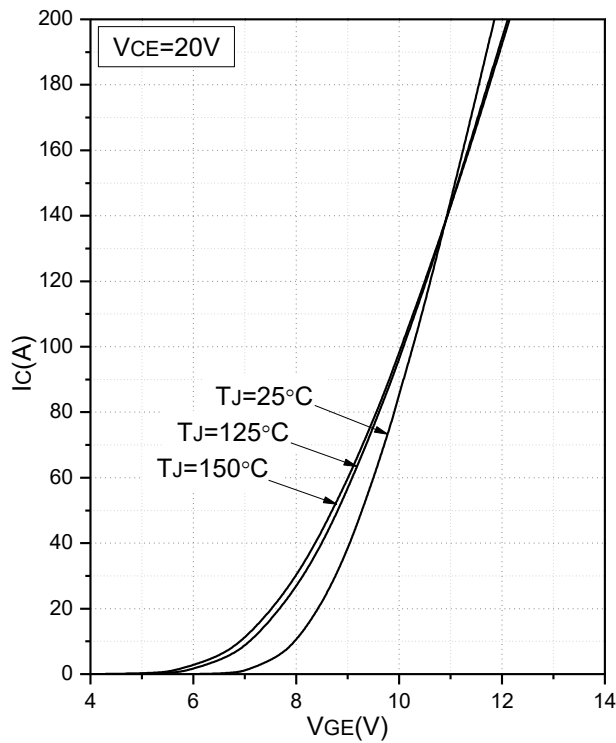


Fig.3 Transfer Characteristics

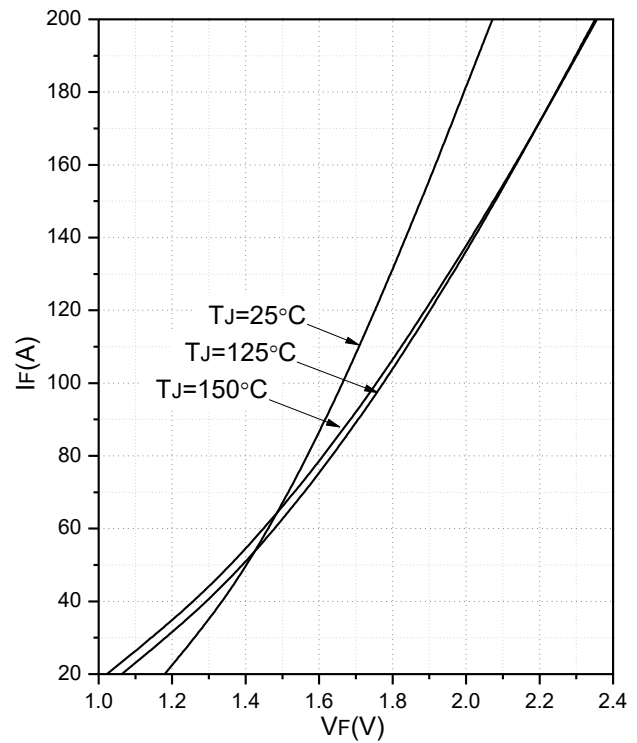


Fig.4 Forward Characteristics of Diode

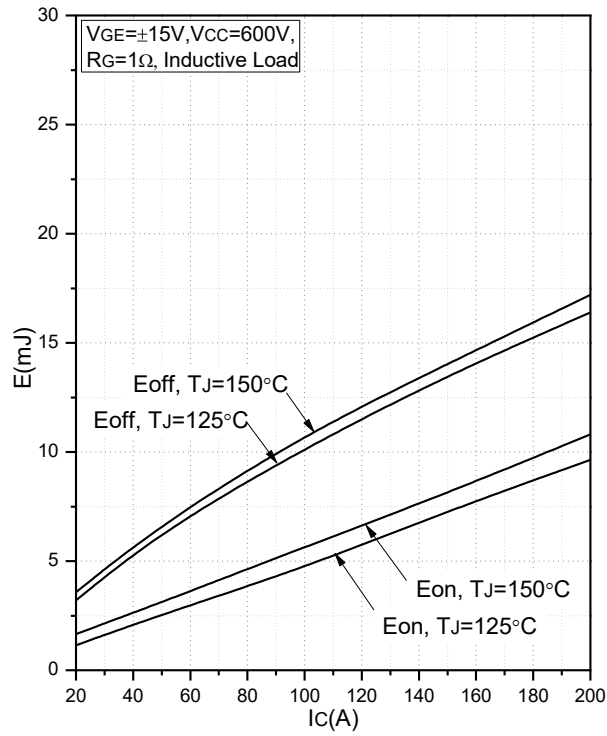


Fig.5 Typical Switching Loss vs. Collector Current

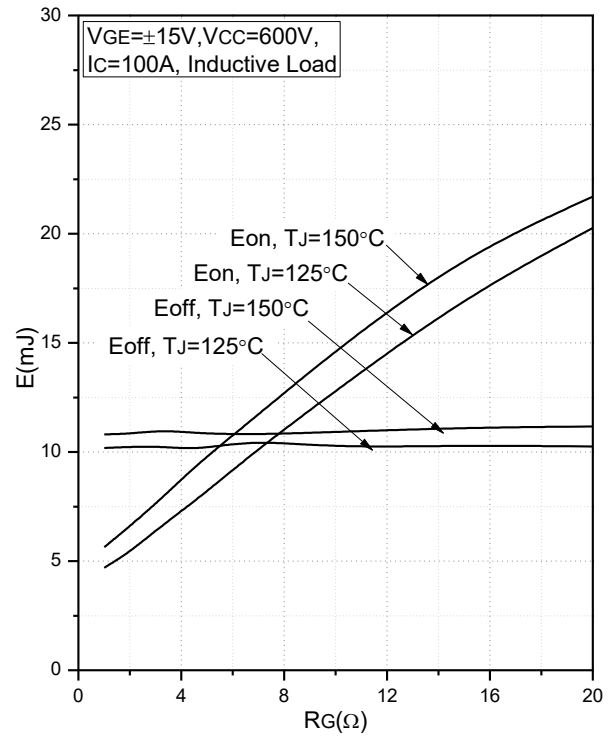


Fig.6 Typical Switching Loss vs. Gate Resistance

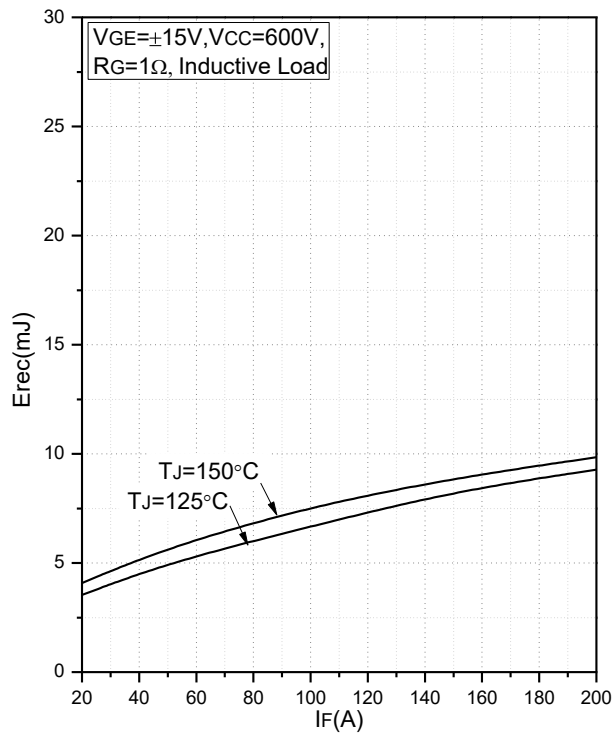


Fig.7 Typical Switching Loss vs. Forward Current

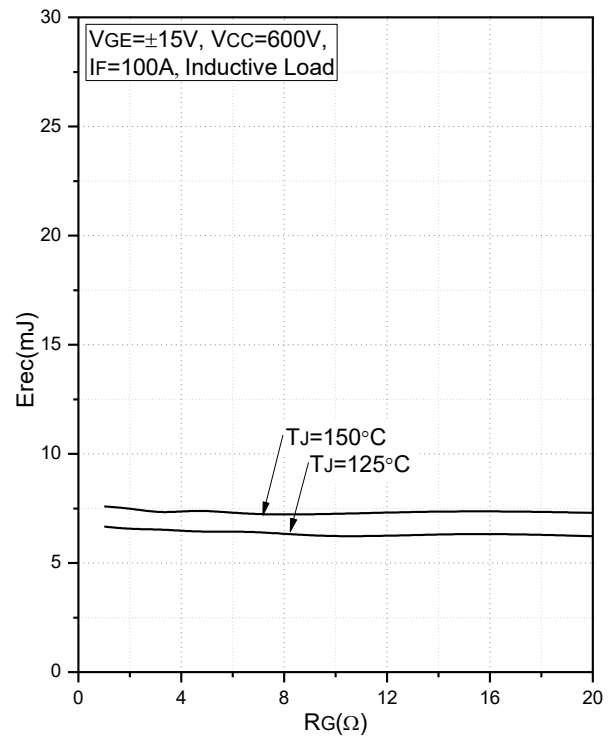
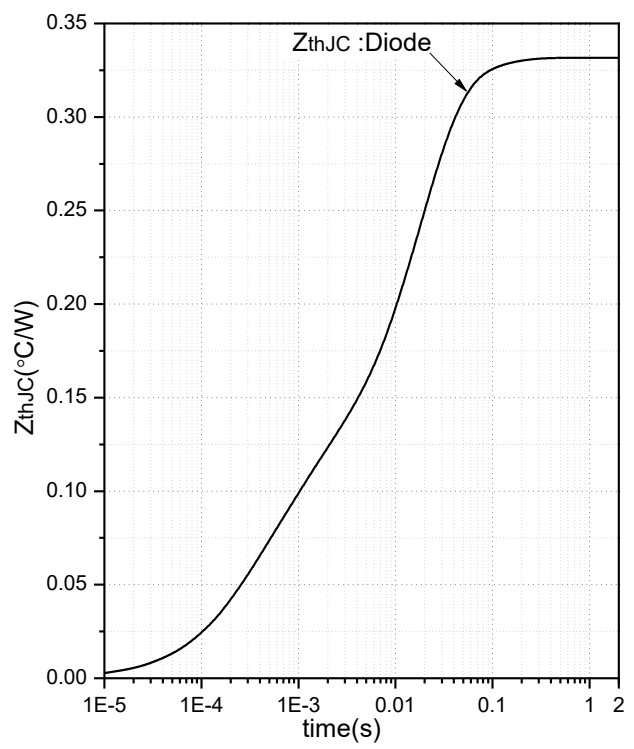
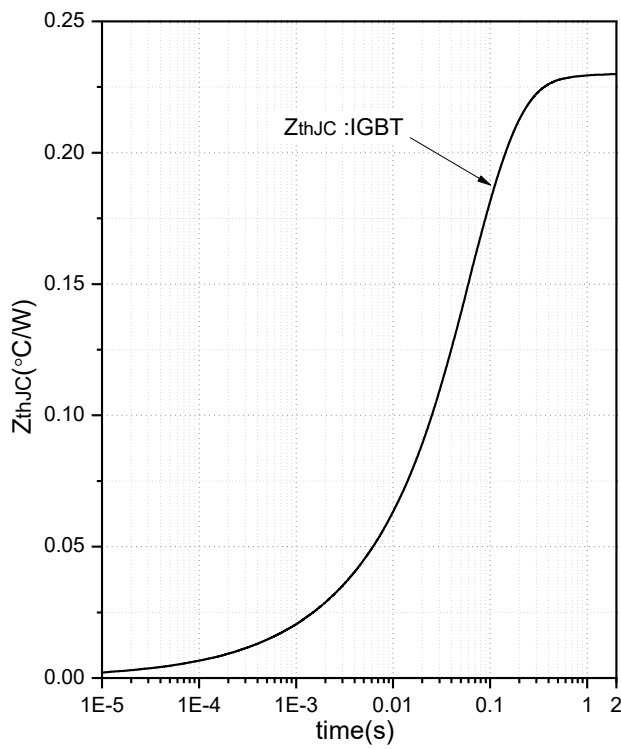
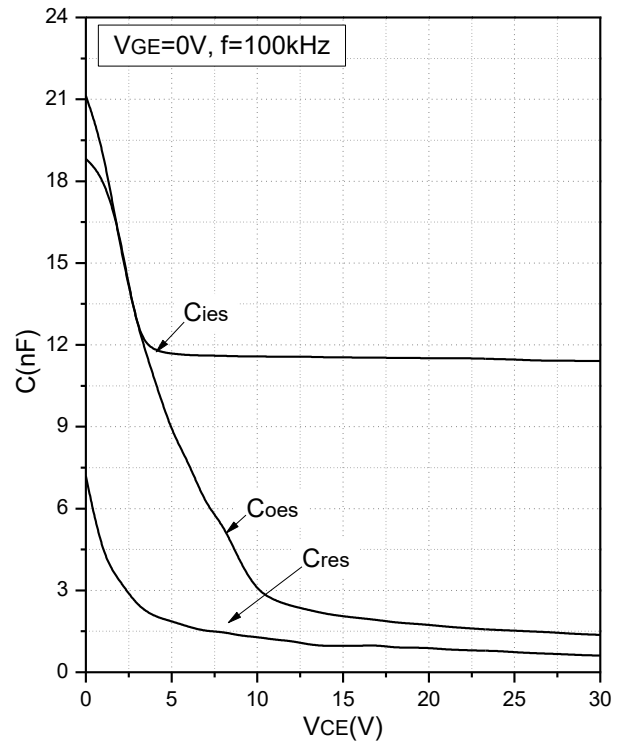
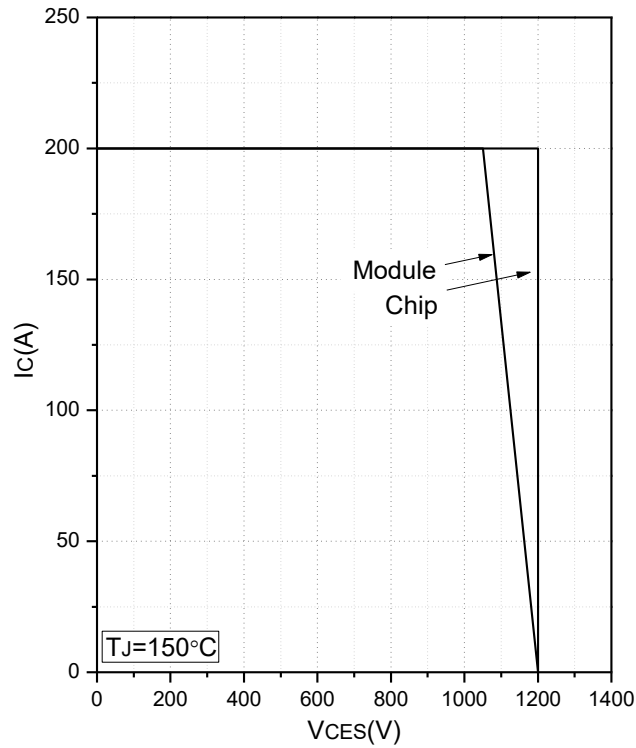


Fig.8 Typical Switching Loss vs. Gate Resistance



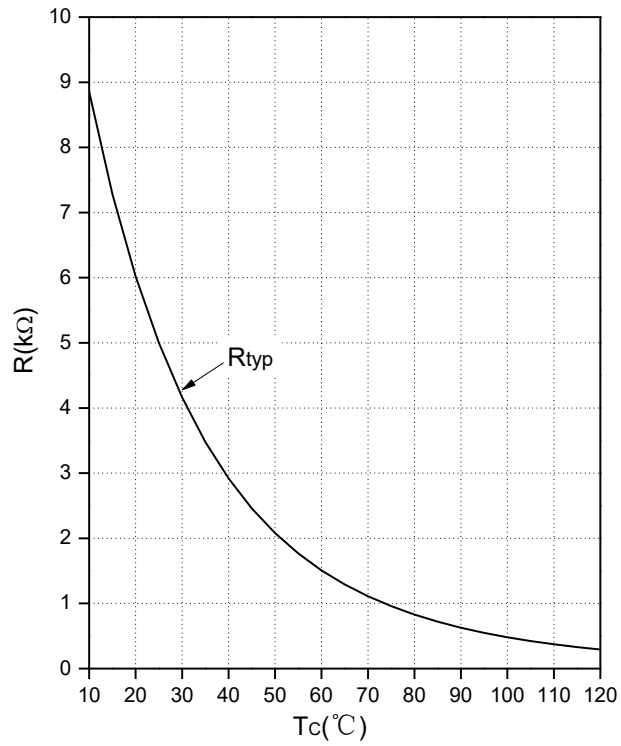
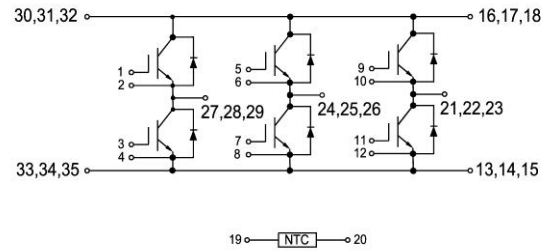


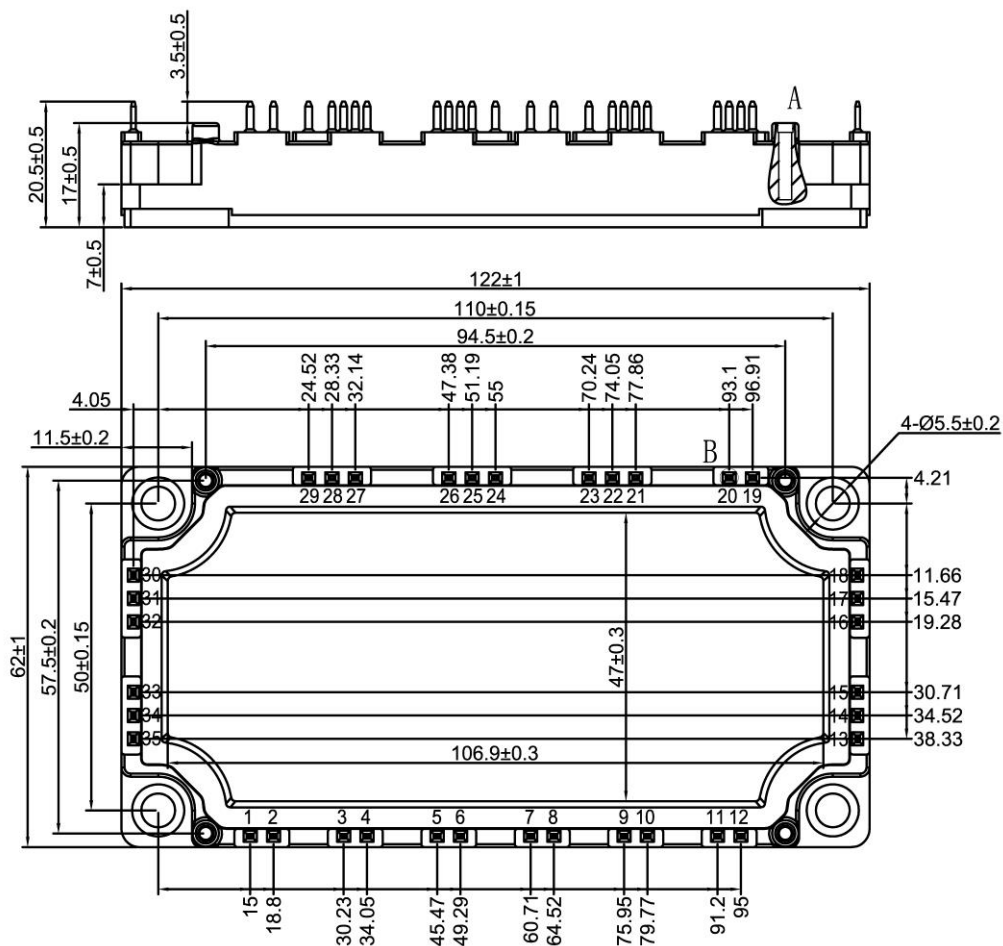
Fig.13 NTC Temperature Characteristics



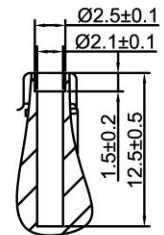
Internal Circuit:



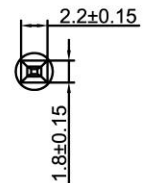
Package Outline (Unit: mm):



View A
scale 3:1



View B
scale 3:1





Revision	Notes
A	Final Version
B	Update IGBT Thermal Resistance

Announcement

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