



GF150CU120T2VH

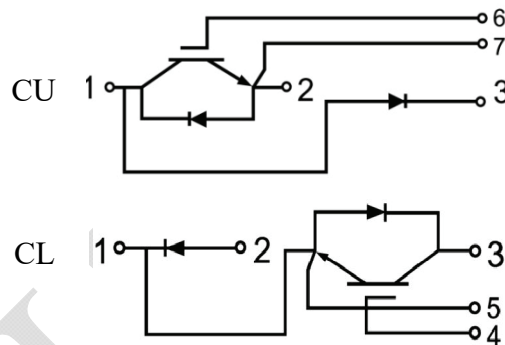
GF150CL120T2VH

IGBT Module

Features:

- Non Punch Through (NPT) Technology
- 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

Circuit Diagram



Applications:

- Welding Machine、Cutting Machine
- Plating Power Supply、Induction Heating
- SMPS、UPS

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

V _{CES}	Collector-Emitter Blocking Voltage		1200	V
V _{GES}	Gate-Emitter Voltage		\pm 20	V
I _C	Continuous Collector Current	T _C =80 $^{\circ}$ C	150	A
		T _C =25 $^{\circ}$ C	230	A
I _{CM}	Repetitive Peak Collector Current	T _J =150 $^{\circ}$ C	300	A
t _{SC}	Short Circuit Withstand Time		>10	μ s
P _D	Maximum Power Dissipation per leg	T _C =25 $^{\circ}$ C T _{Jmax} =150 $^{\circ}$ C	1470	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	$I_C=6\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.6	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	3.25	3.60	V
			$T_J=125^\circ\text{C}$	4.05		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	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^\circ\text{C}$			400	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$		13394		pF
C_{oes}	Output Capacitance			1239		
C_{res}	Reverse Transfer Capacitance			543		

Switching Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units	
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600\text{V}$, $I_C=150\text{A}$, $R_{Gon}=6.8\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	512		ns	
			$T_J=125^\circ\text{C}$	495			
t_r	Rise Time		$T_J=25^\circ\text{C}$	109		ns	
			$T_J=125^\circ\text{C}$	109			
$t_{d(off)}$	Turn-off Delay Time		$T_J=25^\circ\text{C}$	575		ns	
			$T_J=125^\circ\text{C}$	591			
t_f	Fall Time	$T_J=25^\circ\text{C}$	137		ns		
		$T_J=125^\circ\text{C}$	150				
E_{on}	Turn-on Switching Loss	$V_{CC}=600\text{V}$, $I_C=150\text{A}$, $R_{Gon}=6.8\Omega$, $V_{GE}=\pm 15\text{V}$, $di/dt=1040\text{A}/\mu\text{s}$ ($T_J=125^\circ\text{C}$), Inductive Load	$T_J=25^\circ\text{C}$	11.7		mJ	
			$T_J=125^\circ\text{C}$	16			
E_{off}	Turn-off Switching Loss		$T_J=25^\circ\text{C}$	6.9		mJ	
			$T_J=125^\circ\text{C}$	9.1			
Q_g	Total Gate Charge		$V_{GE}=+15\text{V} \dots -15\text{V}$	$T_J=25^\circ\text{C}$	1.8		μC
$R_{g\ internal}$	Internal Gate Resistance			$T_J=25^\circ\text{C}$	1.2		Ω
RBSOA	$I_C=200\text{A}$, $V_{CC}=1050\text{V}$, $V_P=1200\text{V}$, $R_G=6.8\Omega$, $V_{GE}=+15\text{V}$ to 0V , $T_J=150^\circ\text{C}$			Trapezoid			
I_{SC}	$V_{CC}=600\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_{Gon}=6.8\Omega$, $R_{Goff}=6.8\Omega$, $t_p=10\mu\text{s}$, $T_J=125^\circ\text{C}$			950		A	
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case				0.085	$^\circ\text{C}/\text{W}$	



Diode, Reverse

Maximum Rated Values of Diode ($T_C=25^\circ\text{C}$ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	100	A
I_{FM}	Diode Maximum Forward Current	200	A

Electrical Characteristics of Diode ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	$I_F=100\text{A}$	$T_J=25^\circ\text{C}$	2.35		V
			$T_J=125^\circ\text{C}$	2.40		
t_{rr}	Reverse Recovery Time		$T_J=25^\circ\text{C}$	137		ns
			$T_J=125^\circ\text{C}$	272		
I_{rr}	Peak Reverse Recovery Current	$I_F=100\text{A}$, $-diF/dt=1990\text{A}/\mu\text{s}(T_J=125^\circ\text{C})$, $V_{rr}=600\text{V}$, $V_{GE}=-15\text{V}$	$T_J=25^\circ\text{C}$	64.5		A
			$T_J=125^\circ\text{C}$	87.5		
Q_{rr}	Reverse Recovery Charge		$T_J=25^\circ\text{C}$	4.72		μC
			$T_J=125^\circ\text{C}$	10.06		
E_{rec}	Reverse Recovery Energy		$T_J=25^\circ\text{C}$	1.86		mJ
			$T_J=125^\circ\text{C}$	4.43		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case				0.250	$^\circ\text{C}/\text{W}$

Diode, Brake-Chopper

Maximum Rated Values of Diode ($T_C=25^\circ\text{C}$ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	150	A
I_{FM}	Diode Maximum Forward Current	300	A



Electrical Characteristics of Diode ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Description	Conditions	Min.	Typ.	Max.	Units	
V_{FM}	Forward Voltage	$I_F=150\text{A}$	$T_J=25^\circ\text{C}$	2.40		V	
			$T_J=125^\circ\text{C}$		2.50		
t_{rr}	Reverse Recovery Time	$I_F=150\text{A},$ $-di_F/dt=1545\text{A}/\mu\text{s}(T_J=125^\circ\text{C}),$ $V_{rr}=600\text{V},$ $V_{GE}=-15\text{V}$	$T_J=25^\circ\text{C}$	167		ns	
			$T_J=125^\circ\text{C}$		296		
I_{rr}	Peak Reverse Recovery Current		$T_J=25^\circ\text{C}$	65.6		A	
			$T_J=125^\circ\text{C}$		95.3		
Q_{rr}	Reverse Recovery Charge		$T_J=25^\circ\text{C}$	6.50		μC	
			$T_J=125^\circ\text{C}$		13.76		
E_{rec}	Reverse Recovery Energy		$T_J=25^\circ\text{C}$	1.91		mJ	
			$T_J=125^\circ\text{C}$		4.86		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case				0.205	$^\circ\text{C}/\text{W}$	

Module

Symbol	Description	Min.	Typ.	Max.	Units
V_{iso}	Isolation Voltage (All Terminals Shorted)	$f=50\text{Hz}, 1\text{minute}$	2500		V
L_{sCE}	Stray Inductance Module		20		nH
T_J	Maximum Junction Temperature			150	$^\circ\text{C}$
T_{JOP}	Maximum Operating Junction Temperature Range	-40		+125	$^\circ\text{C}$
T_{stg}	Storage Temperature	-40		+125	$^\circ\text{C}$
CTI	Comparative Tracking Index	200			
$R_{\theta CS}$	Case-to-Sink Thermally (Conductive Grease Applied)			0.03	$^\circ\text{C}/\text{W}$
T	Power Terminals Screw:M6	3.0		5.0	N·m
T	Mounting Screw:M6	4.0		6.0	N·m
G	Weight		300		g



Ordering Information Table

Device code

G	F	150	CU	120	T2V	H
①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - NPT, Fast IGBT
- ③ - Rated Current (150=150A)
- ④ - Circuit Configuration CU(Chopper, Diode on High Side)
CL(Chopper, Diode on Low Side)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

DATA SHEET

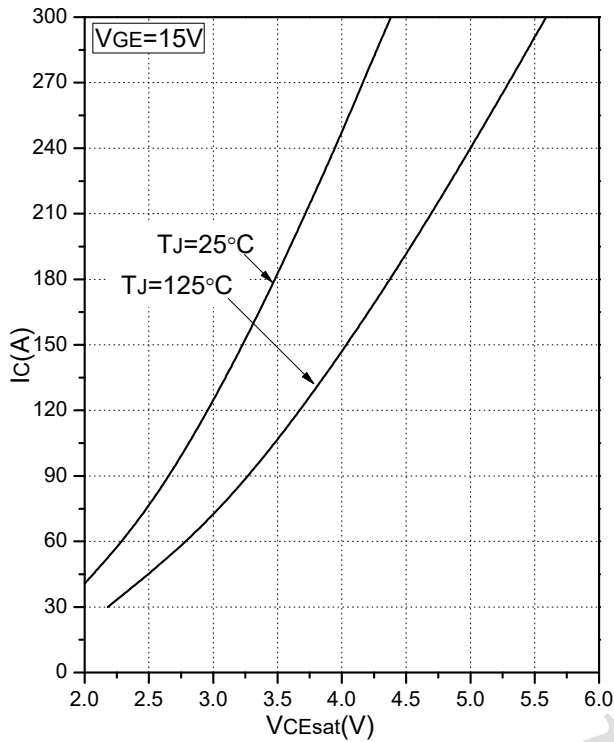


Fig.1 Typical Saturation Voltage Characteristics

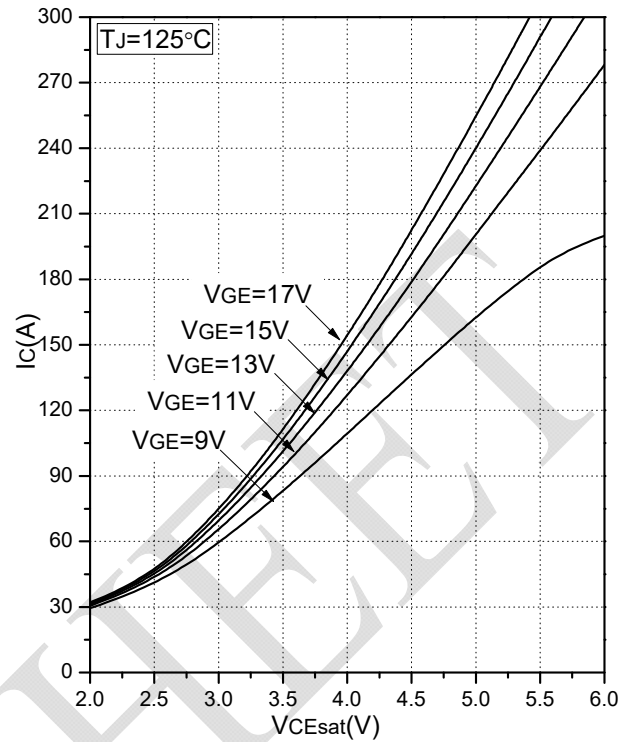


Fig.2 Typical Output Characteristics

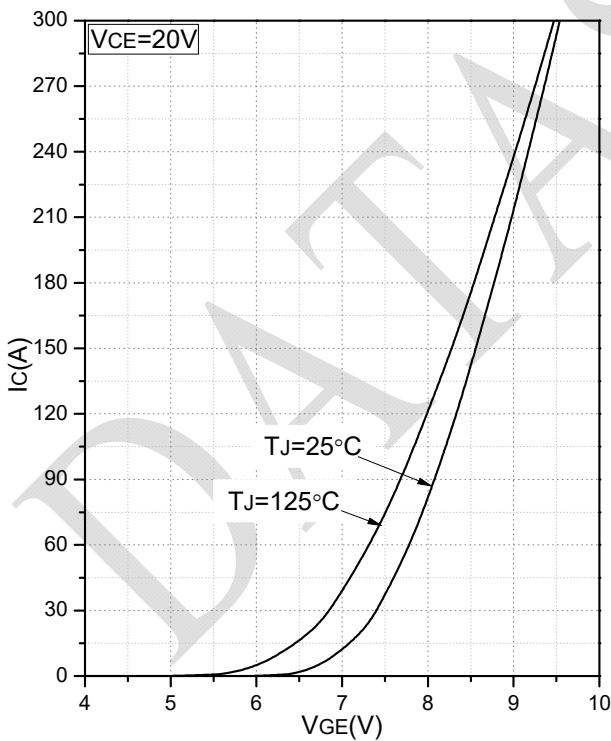


Fig.3 Transfer Characteristic

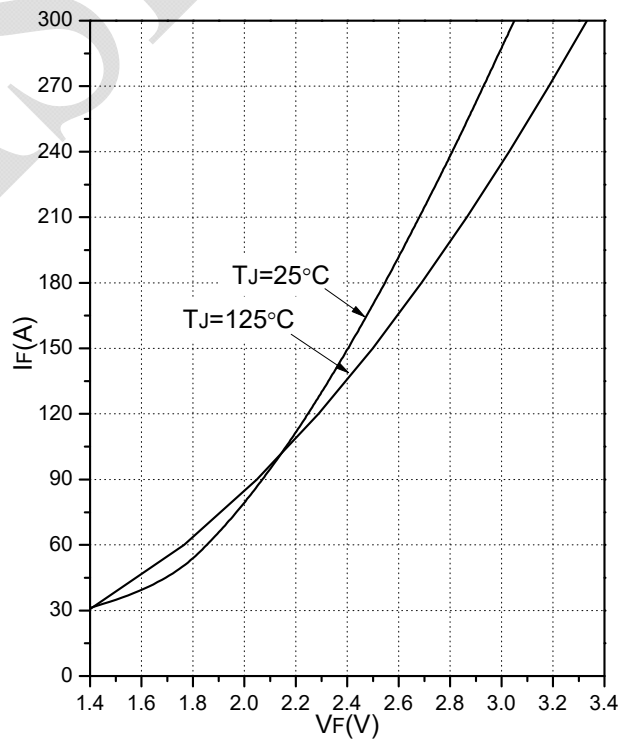


Fig.4 Forward Characteristics of Diode (Brake-Chopper Diode)

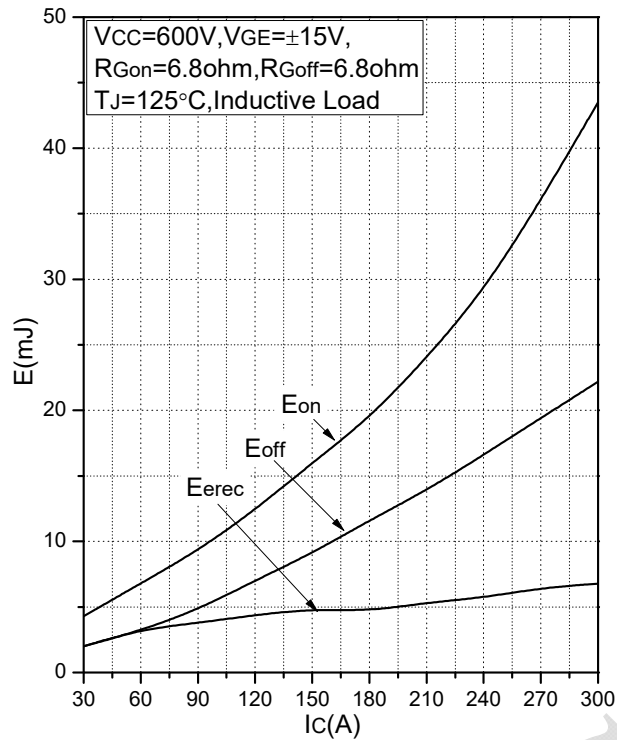


Fig.5 Typical Switching Loss vs. Collector Current

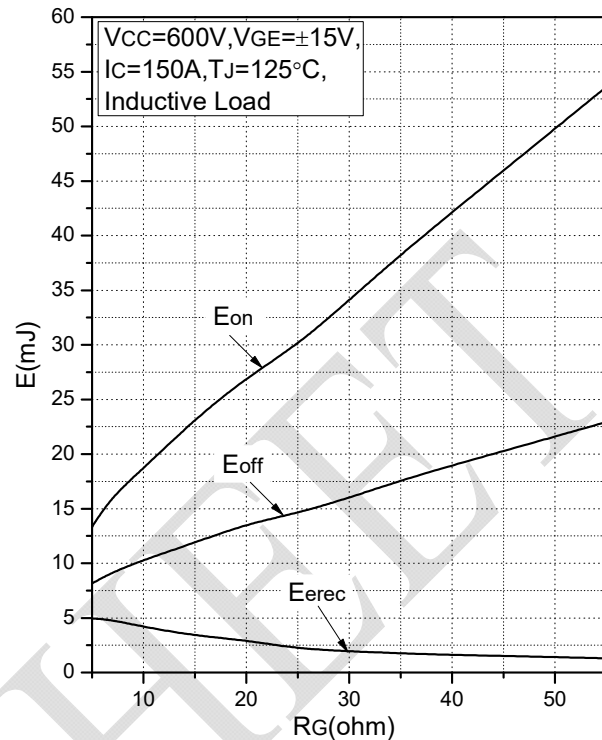


Fig.6 Typical Switching Loss vs. Gate Resistance

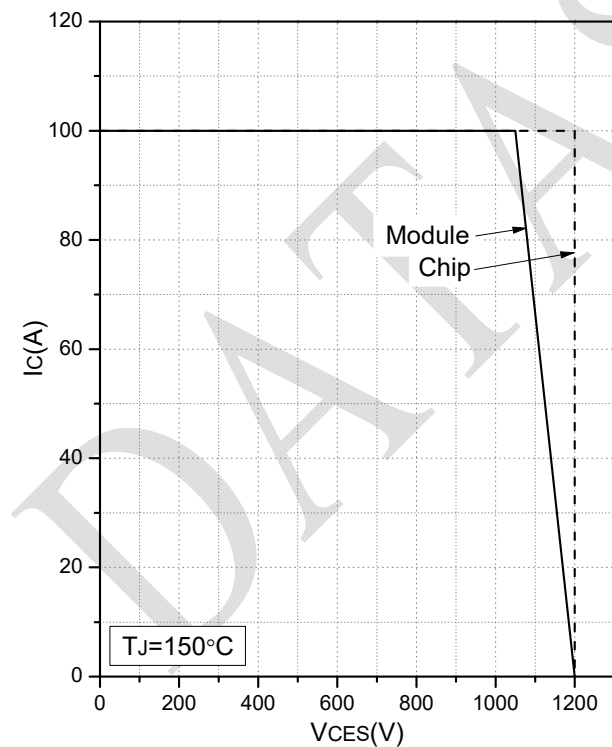


Fig.7 Reverse Bias Safe Operation Area (RBSOA)

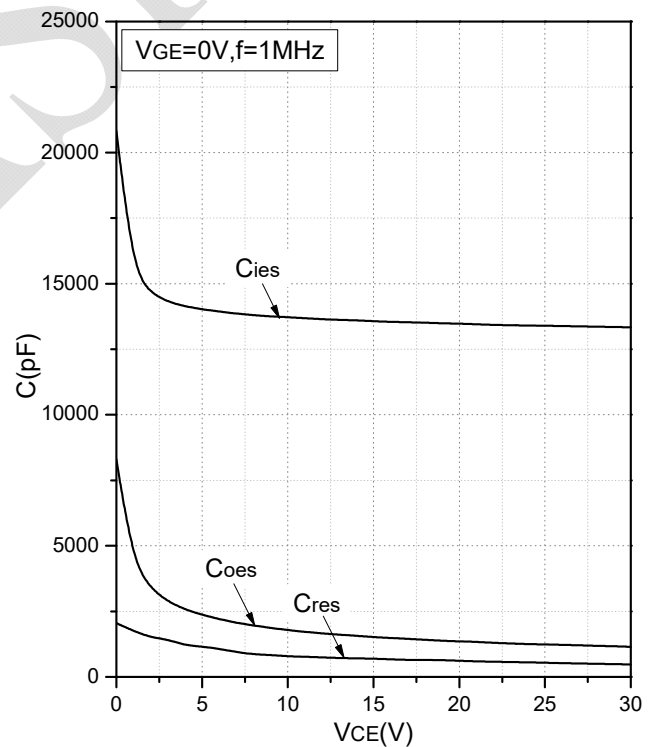


Fig.8 Capacitance Characteristics

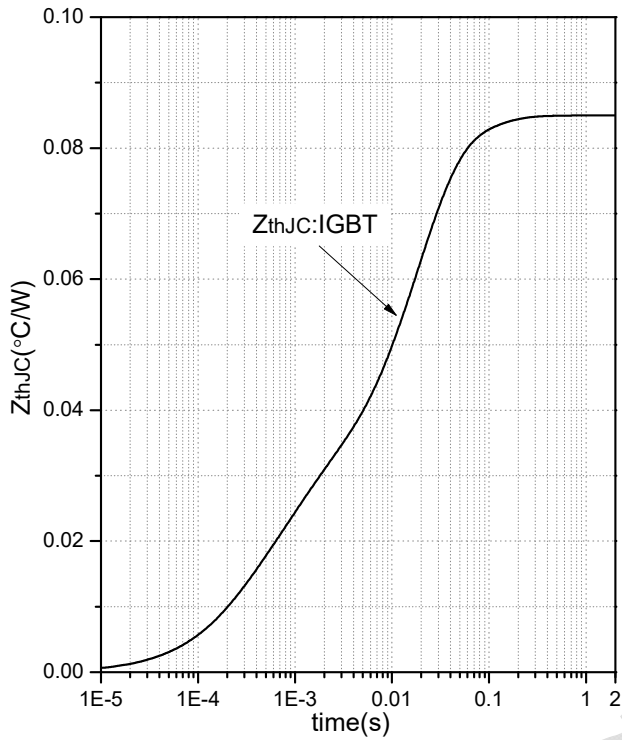


Fig.9 Transient Thermal Impedance (IGBT)

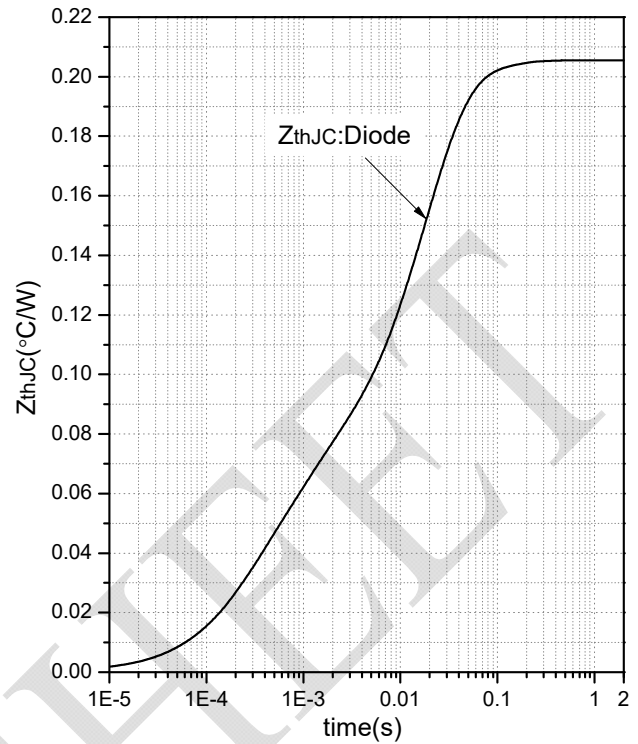


Fig.10 Transient Thermal Impedance (Brake-Chopper Diode)

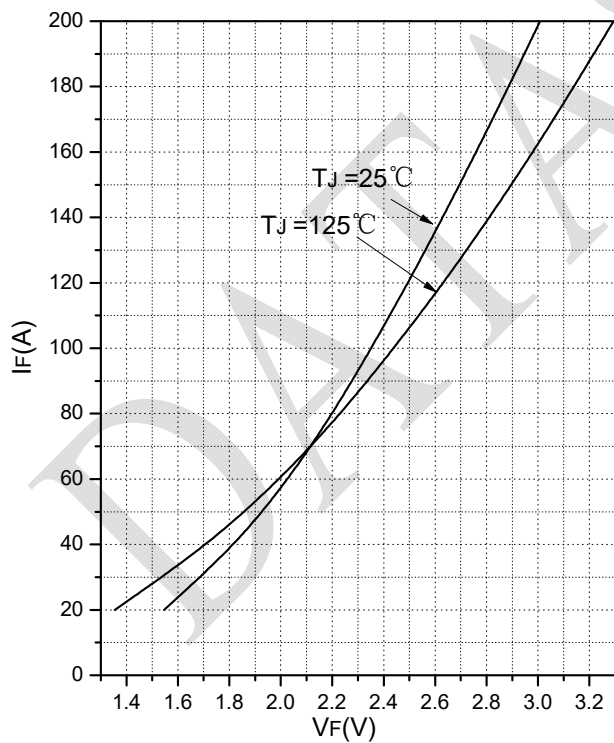


Fig.11 Forward Characteristics of Diode (Reverse Diode)

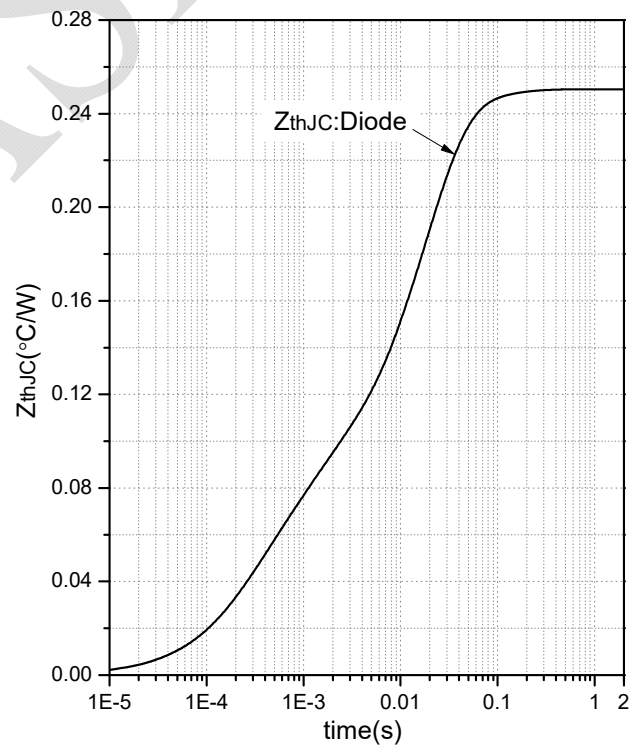
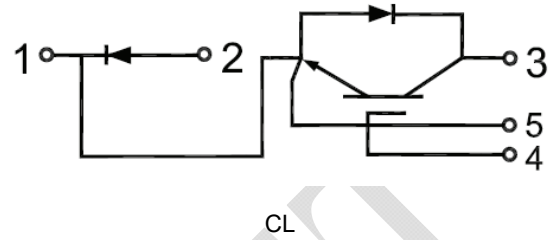
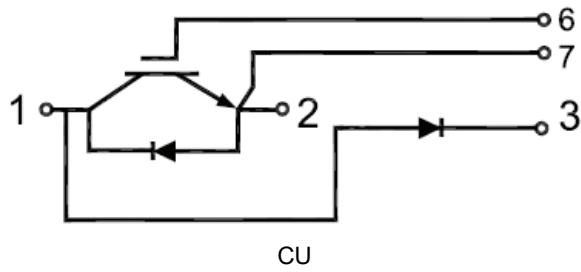


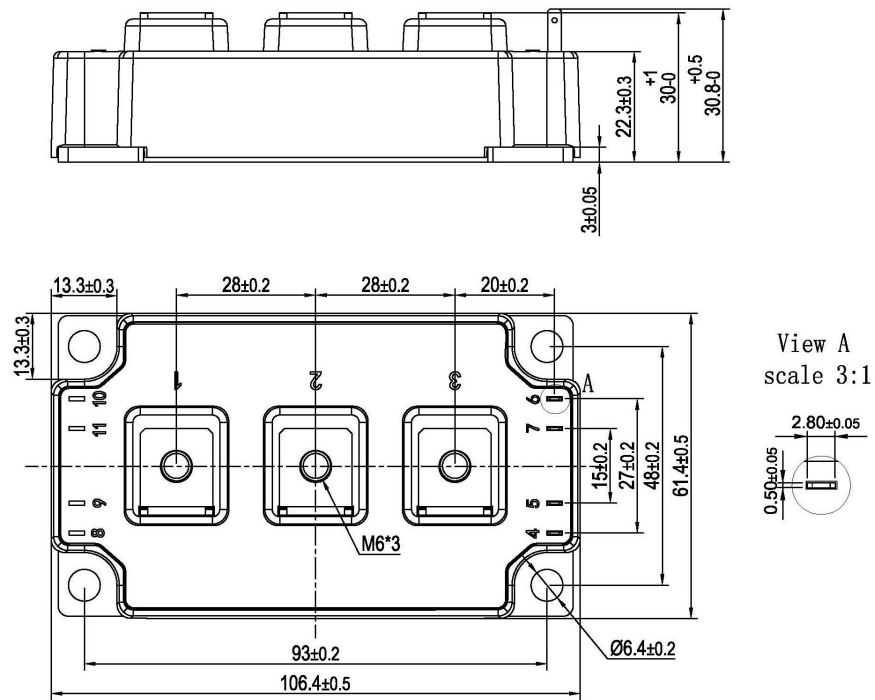
Fig.12 Transient Thermal Impedance (Reverse Diode)



Internal Circuit



Package Outline (Unit: mm):





Date	Revision	Notes
12/02/2021	A	Initial Release.

Announcements

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