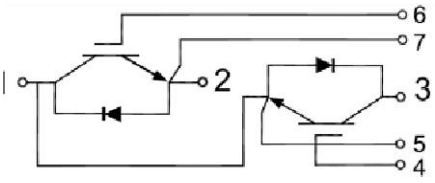
JGT450HF120G2H-F

IGBT Module



Features:

- Trench & Field Stop IGBT
- Short Circuit Rated＞ 10μs
- Low Switching Loss
- 100% RBSOA Tested（2xIc）
- Low Stray Inductance
- Copper Wire Bonding on Power Terminal
- Lead Free, Compliant with RoHS Requirement



Applications:

- Welding
- HEV Inverter
- Industrial Motor Drives
- UPS

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℃	450	A
		T_C=25℃	900	A
I_{CM}	Peak Collector Current Repetitive	T_J=150℃	900	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation (IGBT)	T_C=25℃ T_{Jmax}=150℃	866	W

Electrical Characteristics of IGBT (T_C=25℃unless otherwise specified)

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=17mA, V_{CE}=V_{GE}		5.2	5.8	6.4	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=450A, V_{GE}=15V	T_J=25℃		1.75	2.2	V
			T_J=125℃		2.05		V
			T_J=150℃		2.15		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V, V_{CE}=V_{CES}, T_J=25℃				3	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE}=±20V, V_{CE} =0V, T_J=25℃				300	nA
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V , f =1MHz			110		nF
C_{oes}	Output Capacitance				2.0		nF
C_{res}	Reverse Transfer Capacitance				1.67		nF

Static Characteristics

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V,I_C=450A, R_{Gon} =1Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		320		ns
			T_J=125℃		330		
			T_J=150℃		335		
t_r	Rise Time		T_J=25℃		90		ns
			T_J=125℃		100		
			T_J=150℃		105		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V,I_C=450A, R_{Goff} =1Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		400		ns
			T_J=125℃		430		
			T_J=150℃		440		
t_f	Fall Time		T_J=25℃		180		ns
			T_J=125℃		350		
			T_J=150℃		360		
E_{on}	Turn-on Switching Loss	V_{CC}=600V,I_C=450A, R_{Gon} =1Ω,V_{GE}=±15V, di/dt=2420A/μs (T_J=150℃) Inductive Load	T_J=25℃		20		mJ
			T_J=125℃		34		
			T_J=150℃		40		

E_{off}	Turn-off Switching Loss	V_{CC}=600V,I_C=450A, R_{Goff} =1Ω,V_{GE}= ±15V, du/dt=3120V/μs (T_J=150℃) Inductive Load	T_J=25℃		48		mJ
			T_J=125℃		58		
			T_J=150℃		65		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		3.75		uC
$R_{g\ internal}$	Internal Gate Resistance		T_J=25℃		2.0		Ω
RBSOA	I_C=900A,V_{CC}=1050V,Vp=1200V, R_{Goff} =1Ω, V_{GE}=+15V to 0V, T_J=150°C				Trapezoid		
Isc	SC Data	V_{CC} = 600V, V_{GE} = ±15V, tp=10us$R_{G\ on}$ =6.8Ω, R_{Goff} = 6.8Ω, T_J = 150℃			2700		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case(per leg)				0.141		℃/W

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	450	A
I_{FM}	Diode Maximum Forward Current	900	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F=450A	T_J=25℃		1.9	2.4	V
			T_J=125℃		2.05		
			T_J=150℃		2.1		
I_{rr}	Peak Reverse Recovery Current	I_F=450A, -diF/dt=2680A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		365		A
			T_J=125℃		420		
			T_J=150℃		430		

Q_{rr}	Reverse Recovery Charge	I_F=450A, -diF/dt=2680A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		33		μC
			T_J=125℃		60		
			T_J=150℃		70		
E_{rec}	Reverse Recovery Energy		T_J=25℃		18		mJ
			T_J=125℃		30		
			T_J=150℃		35		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per leg)				0.137		℃/W

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	f =50Hz, 1minute	2500			V
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)			0.01		℃/W
M	Power Terminals Screw:M6		3.0		5.0	N·m
M	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			315		g

Performance Curves

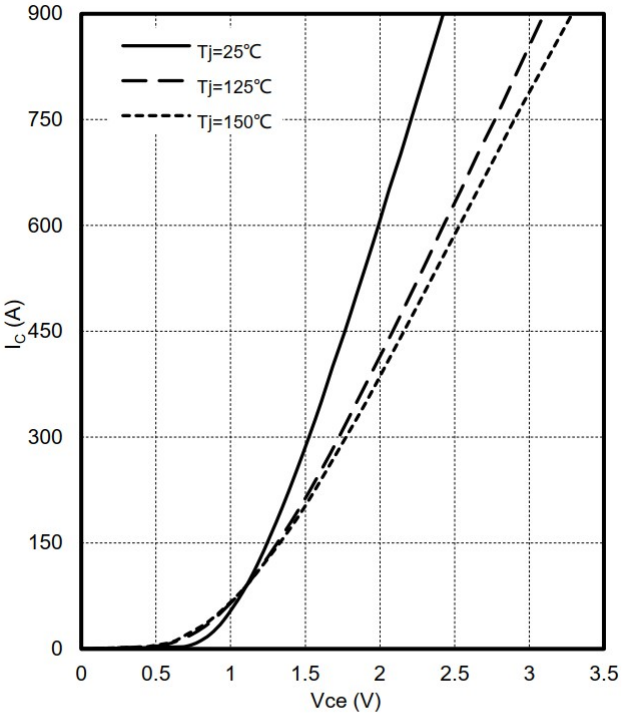


Fig.1 Output characteristic IGBT,
IC=f(Vce),Vge=15V

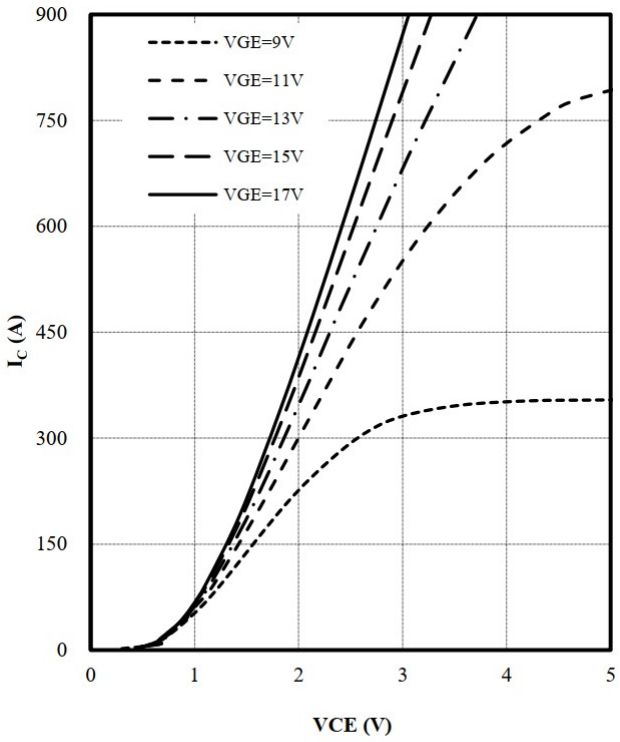


Fig.2 Output characteristic IGBT,
IC=f(Vce),Tj=125℃

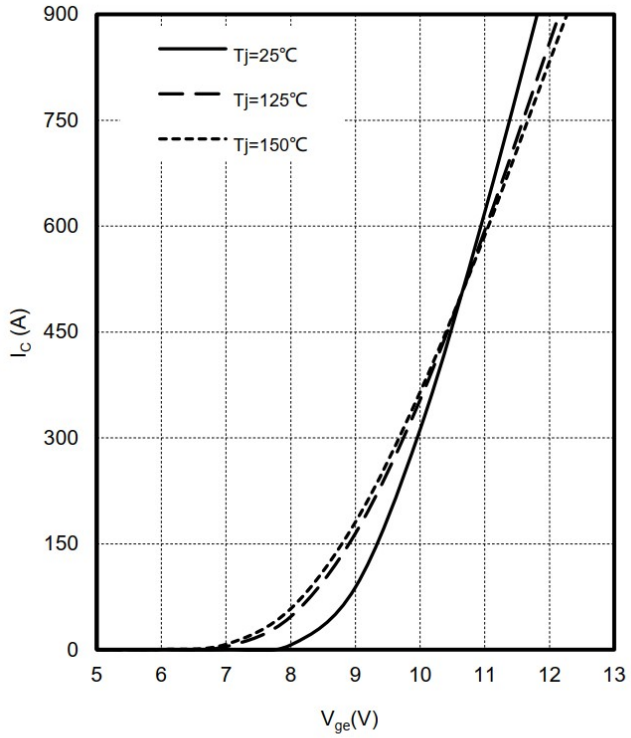


Fig.3 Transfer characteristic IGBT,
Ic=f(Vge),Vce=20V

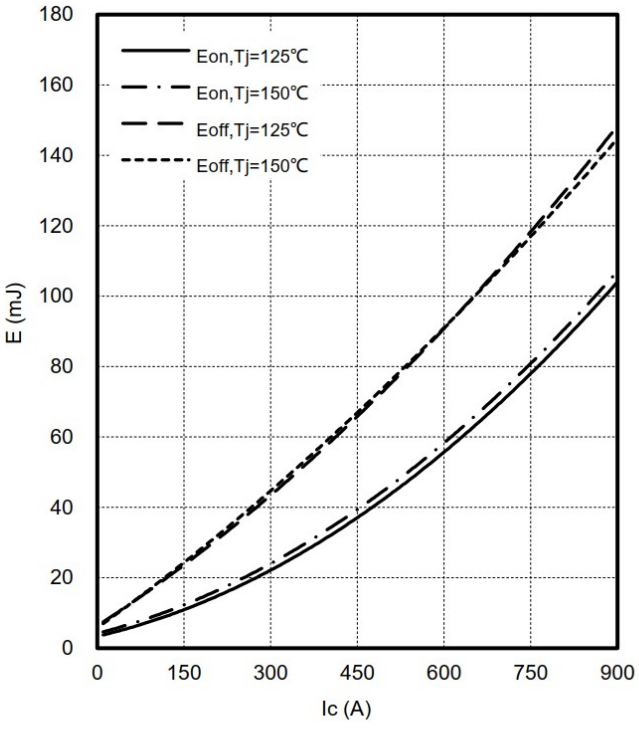


Fig.4 Switching losses IGBT, Eon=f(Ic),Eoff=f(Ic),
Vge=±15V,Rgon=2.1Ω,Rgoff=2.1Ω,Vce=600V

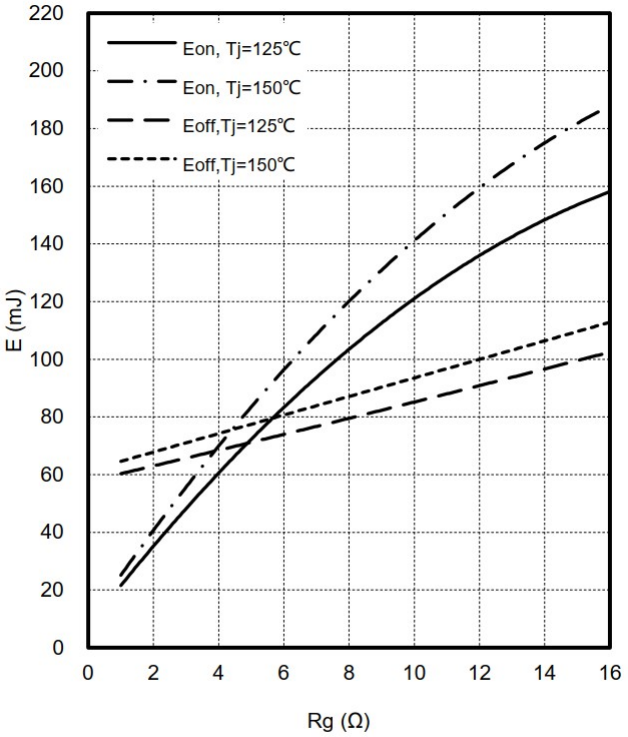


Fig.5 Switching losses IGBT, Eon=f(Rg),Eoff=f(Rg), Vge=±15V,Ic=450A,Vce=600V

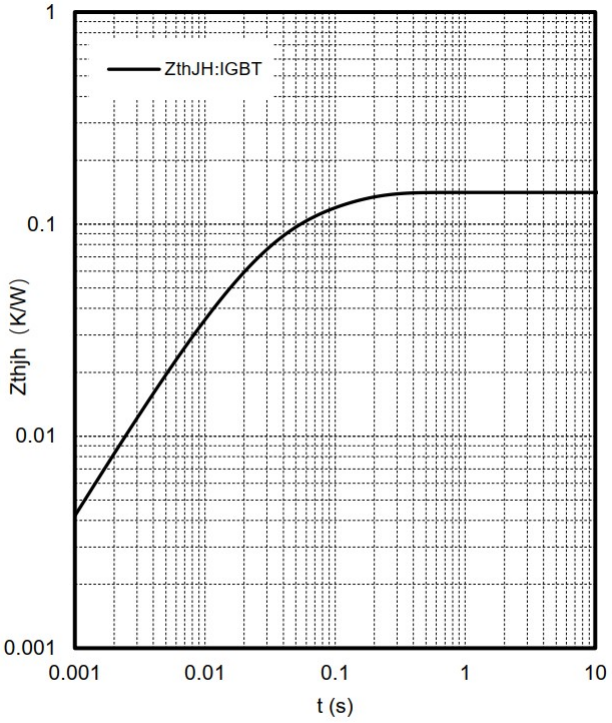


Fig.6 Transient thermal impedance IGBT , Zthjh=f(t)

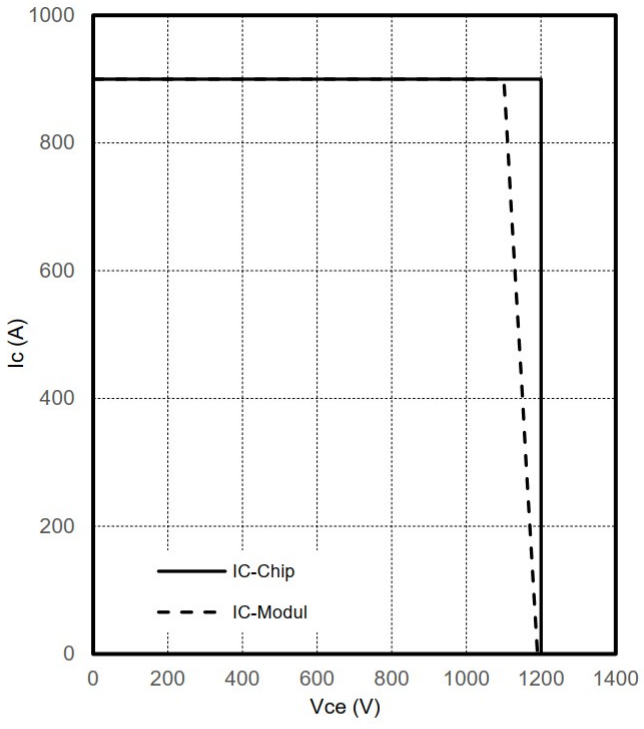


Fig.7 Reverse bias safe operating area IGBT, IC=f(Vce),Vge=±15V,Rgoff=2.1Ω,Tvj=125℃

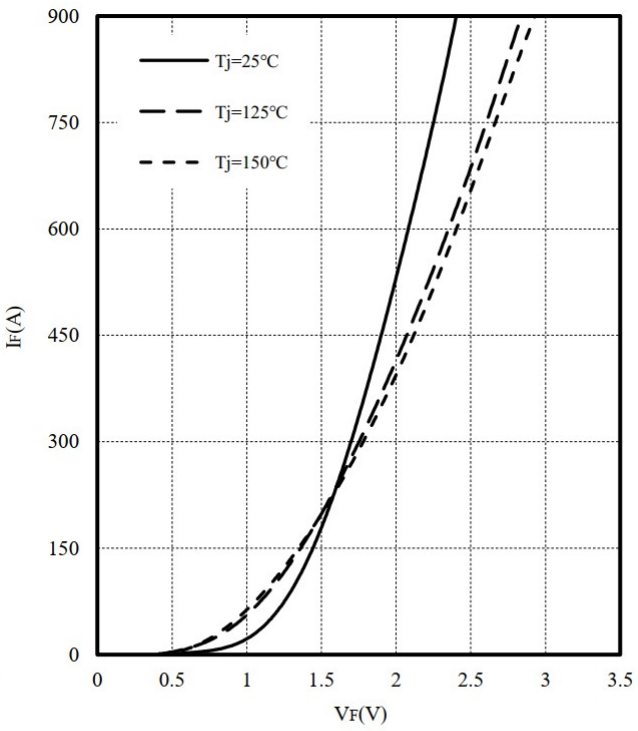


Fig.8 Forward characteristic of Diode, If=f(Vf)

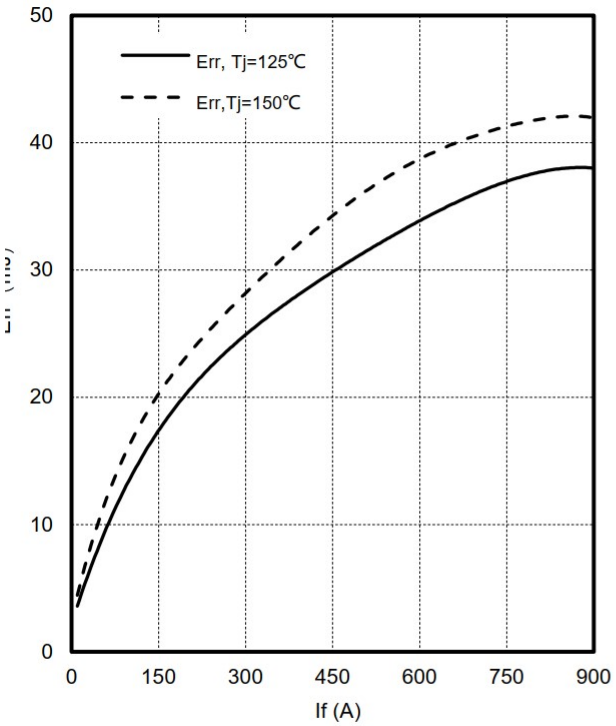


Fig.9 Switching losses Diode,
Err=f(if),Rgon=2.1Ω,Vce=600V

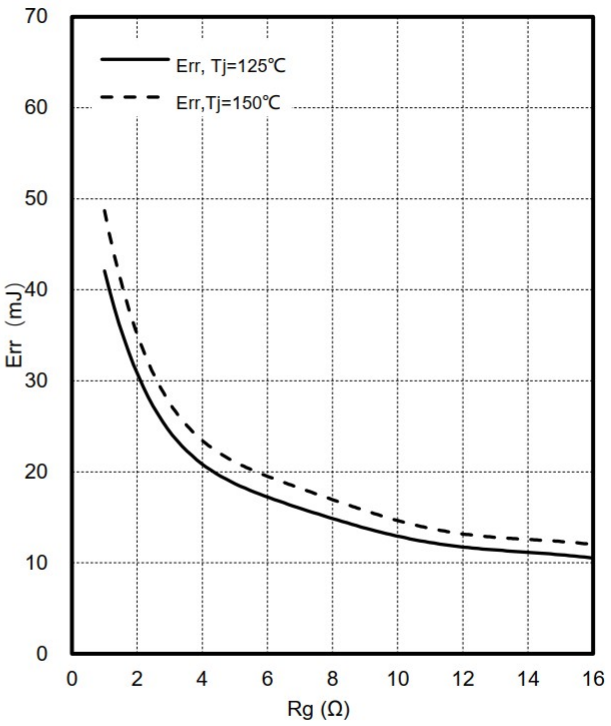


Fig.10 Switching losses Diode,
Err=f(Rg),If=450A,Vce=600V

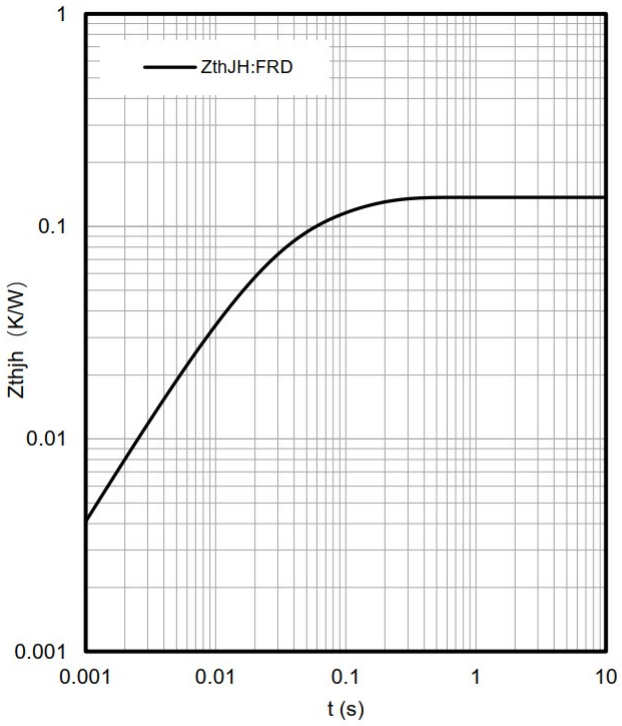
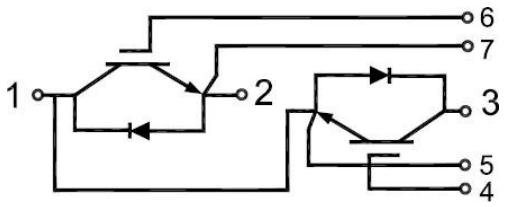
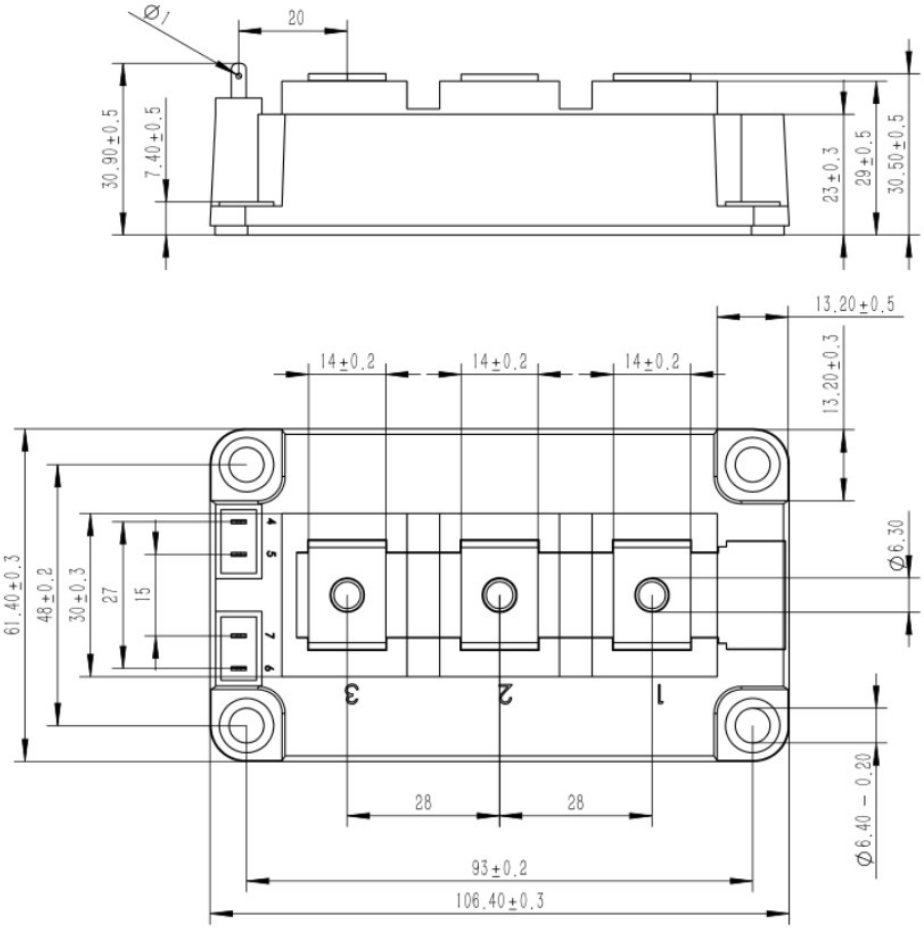


Fig.11 Transient thermal impedance Diode,
Zthjh=f(t)

Internal Circuit:



G2 Package Outline (Unit: mm):



Date	Revision	Notes
07/28/2023	01	Initial Release

Announcement

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