

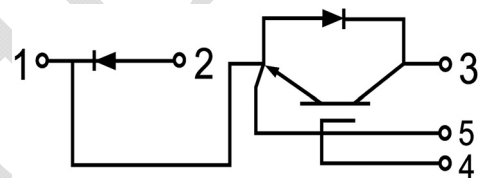


GT300CL120T2VH

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:

- UPS
- Welding Machine

IGBT, Brake-Chopper

Maximum Rated Values(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 = 100 $^{\circ}$ C	300	A
		T _C = 25 $^{\circ}$ C	560	A
I _{CM}	Repetitive Peak Collector Current	T _J = 175 $^{\circ}$ C	600	A
t _{sc}	Short Circuit Withstand Time		>10	μ s
P _D	Maximum Power Dissipation per IGBT	T _C = 25 $^{\circ}$ C T _{Jmax} =175 $^{\circ}$ C	1905	W



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

Static Characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C = 2\text{mA}, V_{CE} = V_{GE}$	5.0	5.5	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 300\text{A}, V_{GE} = 15\text{V}$	$T_J = 25^\circ\text{C}$	1.70		V
			$T_J = 125^\circ\text{C}$	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	$V_{GE} = \pm 20\text{V}, V_{CE} = 0\text{V}, T_J = 25^\circ\text{C}$			400	nA
C_{ies}	Input Capacitance	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		26.4		nF
C_{res}	Reverse Transfer Capacitance			0.30		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 600\text{V}, I_C = 300\text{A}, R_{Gon} = 2\Omega, V_{GE} = \pm 15\text{V},$ Inductive Load	$T_J = 25^\circ\text{C}$	275		ns
			$T_J = 125^\circ\text{C}$	285		
t_r	Rise Time		$T_J = 25^\circ\text{C}$	78.0		ns
			$T_J = 125^\circ\text{C}$	85.0		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC} = 600\text{V}, I_C = 300\text{A}, R_{Goff} = 2\Omega, V_{GE} = \pm 15\text{V},$ Inductive Load	$T_J = 25^\circ\text{C}$	210		ns
			$T_J = 125^\circ\text{C}$	215		
t_f	Fall Time		$T_J = 25^\circ\text{C}$	150		ns
			$T_J = 125^\circ\text{C}$	210		
E_{on}	Turn-on Switching Loss	$V_{CC} = 600\text{V}, I_C = 300\text{A}, R_{Gon} = 2\Omega, V_{GE} = \pm 15\text{V},$ $di/dt = 1700\text{A}/\mu\text{s} (T_J = 125^\circ\text{C}),$ Inductive Load	$T_J = 25^\circ\text{C}$	12.5		mJ
			$T_J = 125^\circ\text{C}$	15.0		
E_{off}	Turn-off Switching Loss		$T_J = 25^\circ\text{C}$	13.5		mJ
			$T_J = 125^\circ\text{C}$	20.5		
Q_g	Total Gate Charge	$V_{GE} = +15\text{V} \dots -15\text{V}$	$T_J = 25^\circ\text{C}$	1370		nC
$R_{g\text{ internal}}$	Internal Gate Resistance		$T_J = 25^\circ\text{C}$	2.5		Ω
RBSOA	Reverse Bias Safe Operation Area	$I_C = 600\text{A}, V_{CC} = 1050\text{V}, V_p = 1200\text{V}, R_{Goff} = 2\Omega, V_{GE} = +15\text{V to } 0\text{V}, T_J = 150^\circ\text{C}$	Trapezoid			
SCSOA	SCSOA	$V_{CC} = 600\text{V}, V_{GE} = 15\text{V}, T_J = 150^\circ\text{C}$	10			μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case			0.079		$^\circ\text{C}/\text{W}$



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

Symbol	Description	Conditions	Min	Typ	Max	Unit
V_{FM}	Forward Voltage	$I_F=200\text{A}$	$T_J=25^\circ\text{C}$	1.60		V
			$T_J=125^\circ\text{C}$	1.70		
			$T_J=150^\circ\text{C}$	1.70		
t_{rr}	Reverse Recovery Time		$T_J=25^\circ\text{C}$	0.32		μs
			$T_J=125^\circ\text{C}$	0.53		
			$T_J=150^\circ\text{C}$	0.56		
I_{rr}	Peak Reverse Recovery Current	$I_F=200\text{A}$, $-di_F/dt = 1855\text{A}/\mu\text{s}(T_J=150^\circ\text{C})$, $V_R = 600\text{V}$, $V_{GE} = -15\text{V}$	$T_J=25^\circ\text{C}$	128		A
			$T_J=125^\circ\text{C}$	144		
			$T_J=150^\circ\text{C}$	150		
Q_{rr}	Reverse Recovery Charge		$T_J=25^\circ\text{C}$	20.7		μC
			$T_J=125^\circ\text{C}$	34.5		
			$T_J=150^\circ\text{C}$	38.8		
E_{rec}	Reverse Recovery Energy		$T_J=25^\circ\text{C}$	8.5		mJ
			$T_J=125^\circ\text{C}$	14.1		
			$T_J=150^\circ\text{C}$	16.5		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per leg)			0.166		$^\circ\text{C}/\text{W}$



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

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	300	A
I_{FM}	Diode Maximum Forward Current	600	A

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

Symbol	Description	Conditions	Min	Typ	Max	Unit
V_{FM}	Forward Voltage	$I_F=300\text{A}$	$T_J=25^\circ\text{C}$	1.80		V
			$T_J=125^\circ\text{C}$	1.80		
			$T_J=150^\circ\text{C}$	1.80		
t_{rr}	Reverse Recovery Time		$T_J=25^\circ\text{C}$	0.41		μs
			$T_J=125^\circ\text{C}$	0.60		
			$T_J=150^\circ\text{C}$	0.64		
I_{rr}	Peak Reverse Recovery Current	$I_F=300\text{A}$, $-di_F/dt=2010\text{A}/\mu\text{s}(T_J=150^\circ\text{C})$, $V_R=600\text{V}$, $V_{GE}=-15\text{V}$	$T_J=25^\circ\text{C}$	150		A
			$T_J=125^\circ\text{C}$	181		
			$T_J=150^\circ\text{C}$	191		
Q_{rr}	Reverse Recovery Charge		$T_J=25^\circ\text{C}$	29.7		μC
			$T_J=125^\circ\text{C}$	50.7		
			$T_J=150^\circ\text{C}$	57.8		
E_{rec}	Reverse Recovery Energy		$T_J=25^\circ\text{C}$	12.9		mJ
			$T_J=125^\circ\text{C}$	22.0		
			$T_J=150^\circ\text{C}$	25.4		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per leg)			0.134		$^\circ\text{C}/\text{W}$



Module

Symbol	Description	Min	Typ	Max	Unit
V _{iso}	Isolation Voltage (All Terminals Shorted)	f = 50Hz, 1minute	2500		V
T _J	Maximum Junction Temperature			150	°C
T _{JOP}	Maximum Operating Junction Temperature Range	-40		+150	°C
T _{stg}	Storage Temperature	-40		+125	°C
CTI	Comparative Tracking Index	200			
R _{ecs}	Case-to-Sink Thermally (Conductive Grease Applied)			0.03	°C/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	T	300	CL	120	T2V	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench IGBT Module
- ③ - Rated Current (300=300A)
- ④ - Circuit Configuration (Chopper, Diode on Lower Side)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

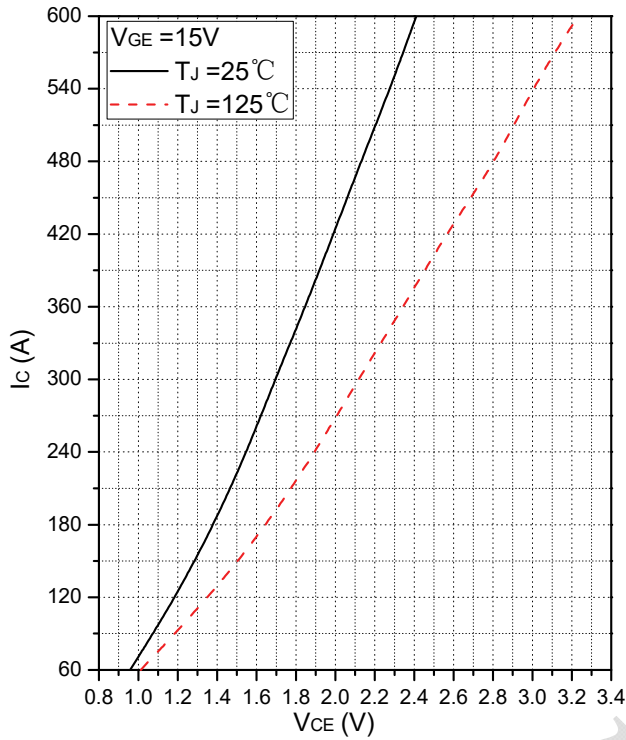


Fig.1 Typical Saturation Voltage Characteristics

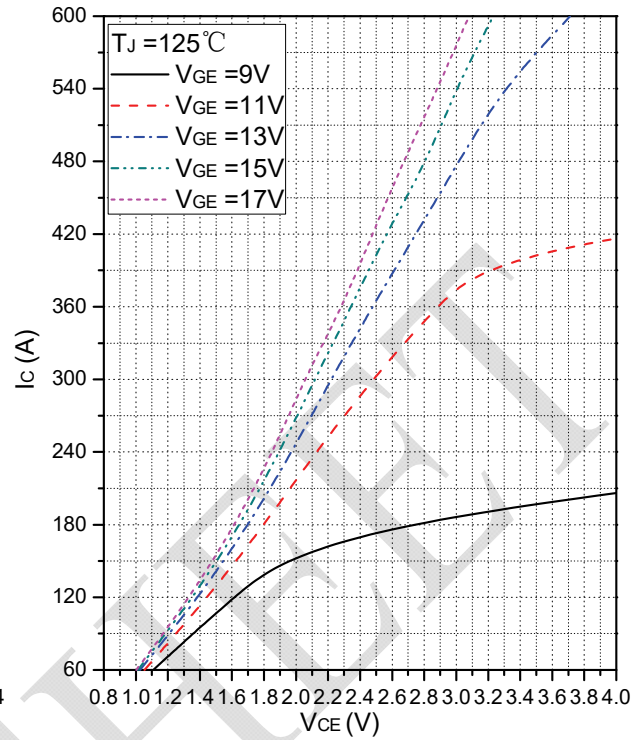


Fig.2 Typical Output Characteristics

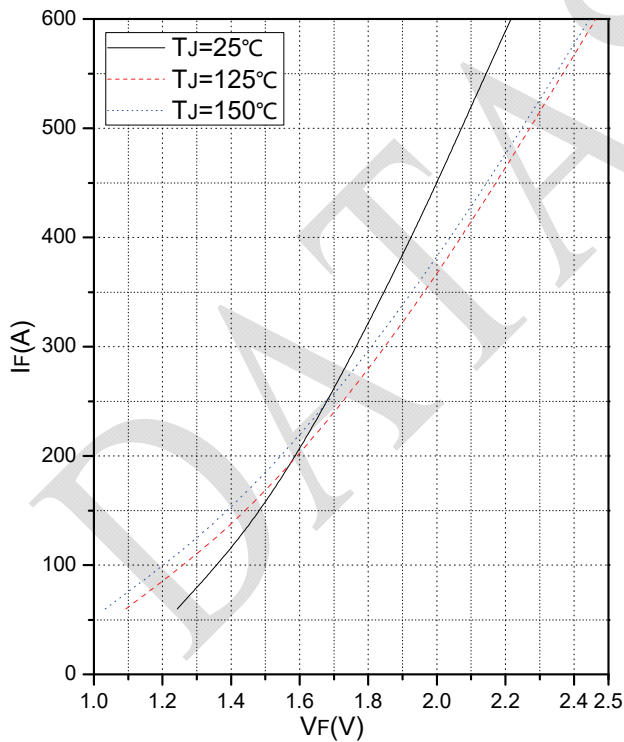


Fig.3 Forward Characteristics of Diode (Brake-Chopper Diode)

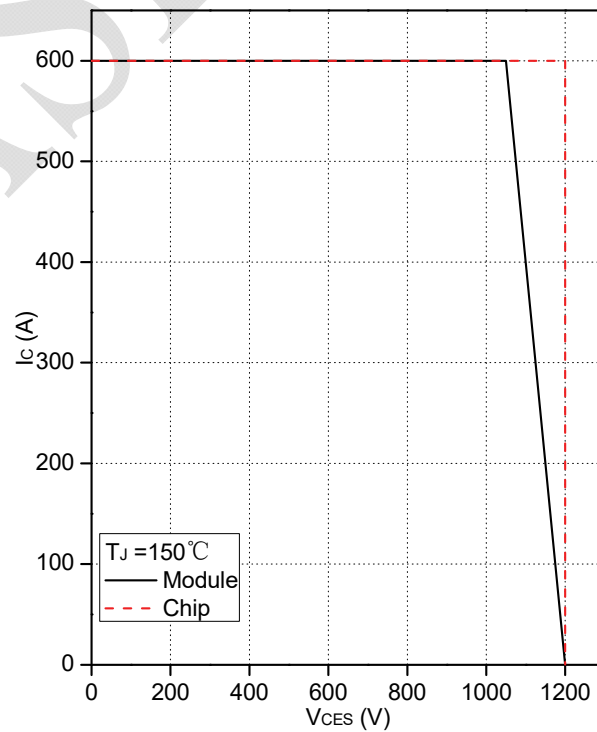


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

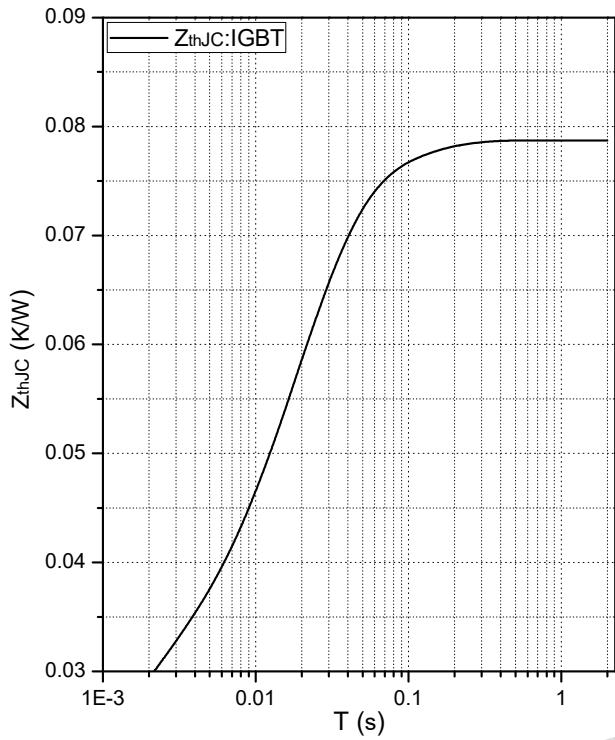


Fig.5 Transient Thermal Impedance (IGBT)

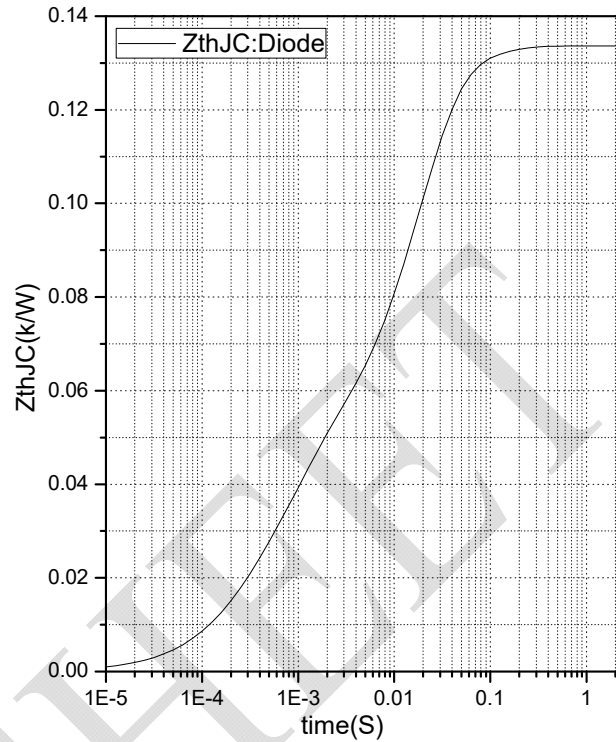


Fig.6 Transient Thermal Impedance (Brake-Chopper Diode)

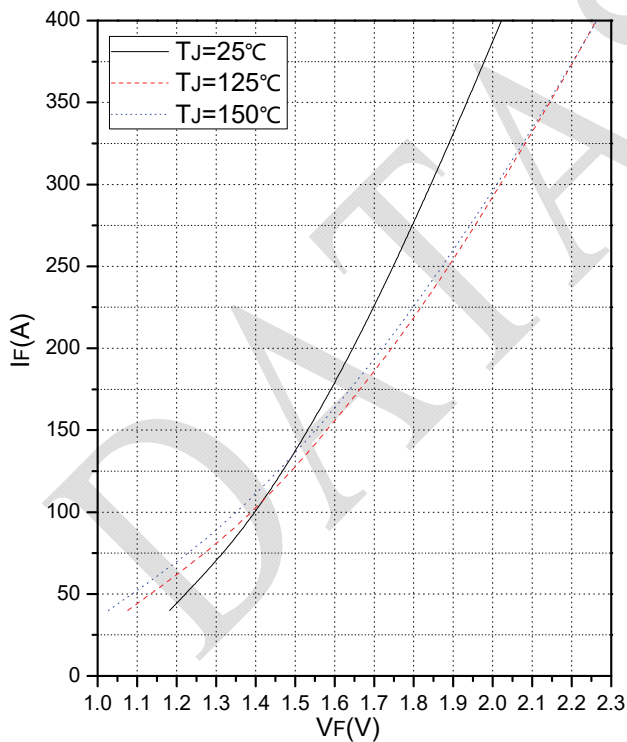


Fig.7 Forward Characteristics of Diode (Reverse)

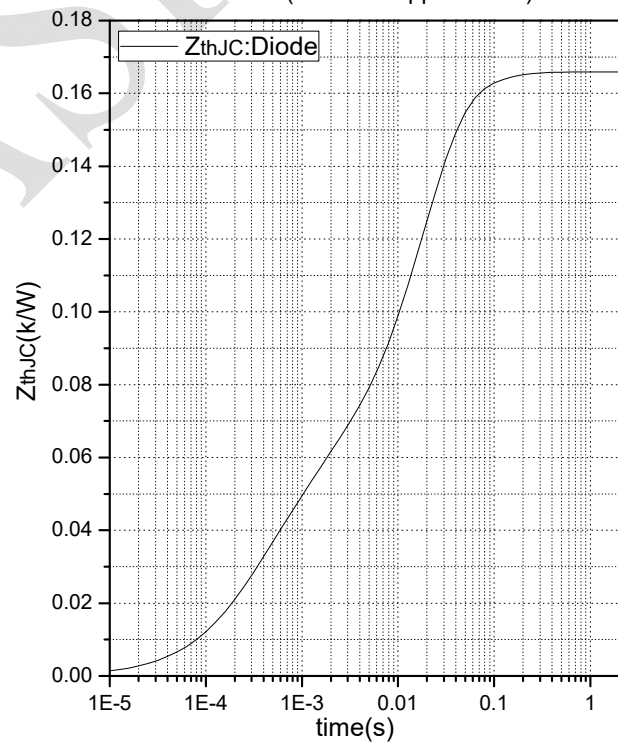
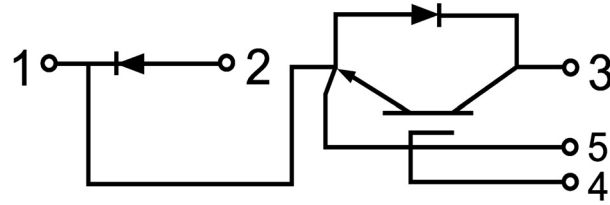


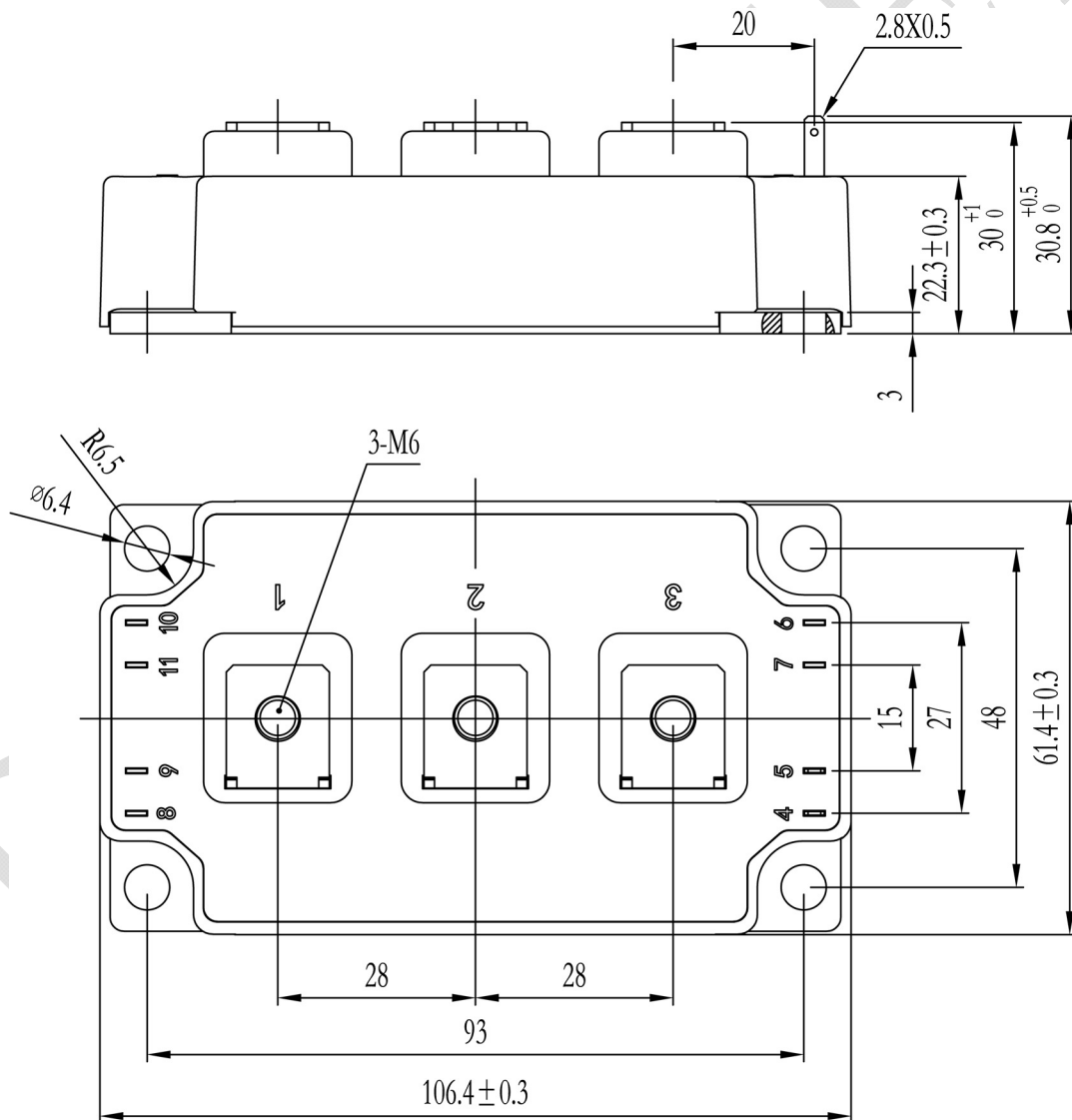
Fig.8 Transient Thermal Impedance (Reverse Diode)



Internal Circuit



Package Outline (Unit: mm):





Date	Revision	Notes
3/17/2021	01	Initial Release

Announcement

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The released datasheet would be issued with "REV." + "alphabet characters".