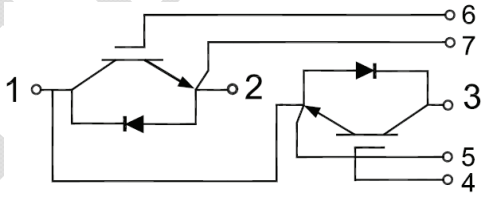
GT300HF170T2VH

IGBT Module

Preliminary Data

Features:

- Field Stop Trench Gate IGBT
- Short Circuit Rated>10μs
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- High Power Converters
- Wind Turbines
- Motor Drives
- UPS Systems

IGBT, Inverter

Maximum Rated Values of IGBT (T_C=25℃unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1700	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C=100℃	300	A
		T_C=25℃	570	A
I_{CM}	Peak Collector Current Repetitive	T_J=175℃	600	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation (IGBT)	T_C=25℃ T_{Jmax}=175℃	2055	W

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

Static Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=12mA, V_{CE}=V_{GE}		4.5	5.5	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=300A, V_{GE}=15V	T_J=25℃		1.80		V
			T_J=125℃		2.20		V
			T_J=150℃		2.30		
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V, V_{CE}=V_{CES}, T_J=25℃				1	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			31.23		nF
C_{oes}	Output Capacitance				1.86		nF
C_{res}	Reveres Transfer Capacitance				0.36		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=900V,I_C=300A, R_{Gon} =2 Ω,V_{GE}= ±15V, Inductive Load	T_J=25℃		0.32		μs
			T_J=125℃		0.33		
			T_J=150℃		0.33		
t_r	Rise Time		T_J=25℃		0.12		μs
			T_J=125℃		0.14		
			T_J=150℃		0.14		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=900V,I_C=300A, R_{Goff} =2 Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		0.27		μs
			T_J=125℃		0.30		
			T_J=150℃		0.30		
t_f	Fall Time		T_J=25℃		0.17		μs
			T_J=125℃		0.29		
			T_J=150℃		0.32		
E_{on}	Turn-on Switching Loss	V_{CC}=900V,I_C=300A, R_{Gon}=2 Ω,V_{GE}= ±15V, Inductive Load di/dt =1550A/μs(T_J=150℃)	T_J=25℃		71.5		mJ
			T_J=125℃		103		
			T_J=150℃		113		

E_{off}	Turn-off Switching Loss	V_{CC}=900V,I_C=300A, R_{Goff}=2 Ω,V_{GE}= ±15V, Inductive Load du/dt =2850V/μs(T_J=150℃)	T_J=25℃		77.5		mJ
			T_J=125℃		104.5		
			T_J=150℃		111.5		
Q_g	Total Gate Charge	V_{GE}=-15V…+15V	T_J=25℃		1.53		uC
RBSOA	I_C=600A,V_{CC}=1620V,Vp=1700V, R_{Goff}=2Ω, V_{GE}=+15V to 0V, T_J=150°C			Trapezoid			
SCSOA	V_{CC}=900V, V_{GE}=15V, T_J=150℃			10			μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case (per leg)				0.073		℃/W

Diode, Inverter

Maximum Rated Values of Diode (T_C=25℃unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1700	V
I_F	Diode Continuous Forward Current	300	A
I_{FM}	Peak FWD Current Repetitive	600	A

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

V_{FM}	Forward Voltage	I_F=300 A	T_J=25℃		2.80		V
			T_J=125℃		3.00		
			T_J=150℃		3.00		
t_{rr}	Reverse Recovery Time	I_F=300A, -di$_F$/dt=1950A/μs(T_J=150℃), V_R=900V, V_{GE}= -15V	T_J=25℃		0.33		μs
			T_J=125℃		0.47		
			T_J=150℃		0.52		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		84.5		A
			T_J=125℃		119		
			T_J=150℃		125		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		19		μC
			T_J=125℃		45.5		
			T_J=150℃		55.5		

E_{rec}	Reverse Recovery Energy	I_F=300A, $-di_F/dt$=1950A/μs(T_J=150℃), V_R=900V, V_{GE}= -15V	T_J=25℃		11		mJ
			T_J=125℃		24.5		
			T_J=150℃		30.5		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per leg)				0.076		℃/W

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f=50Hz, 1minute	2500			V
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)			0.03		℃/W
M	Power Terminals Screw:M6		3.0		5.0	N·m
M	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			300		g

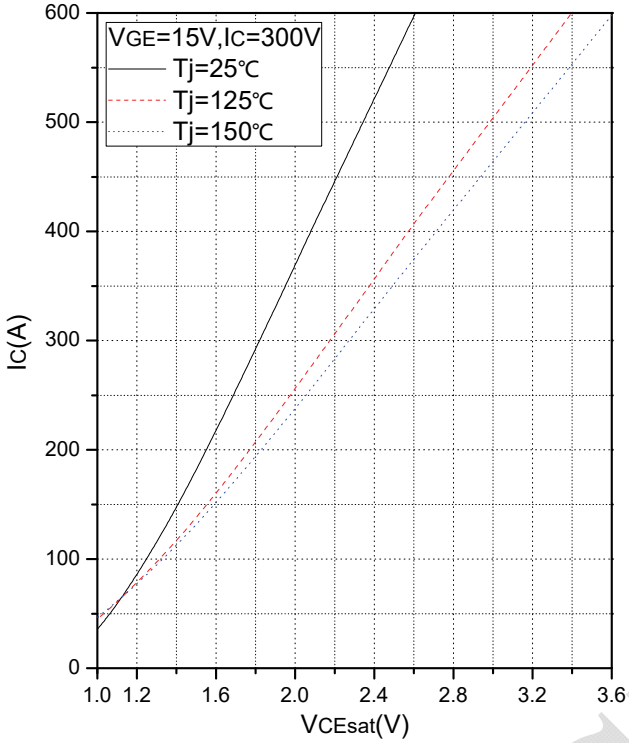


Fig.1 Typical Saturation Voltage Characteristics

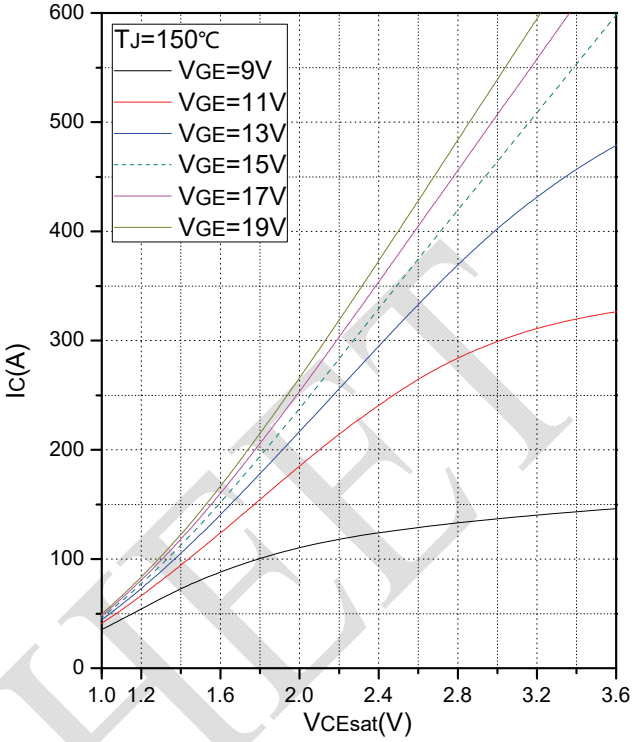


Fig.2 Typical Output Characteristics

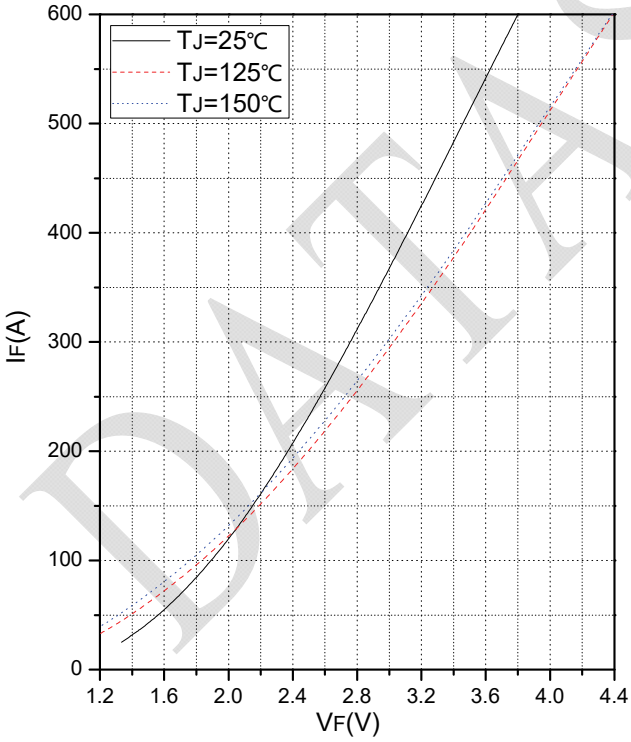


Fig.3 Forward Characteristics of Inverter Diode

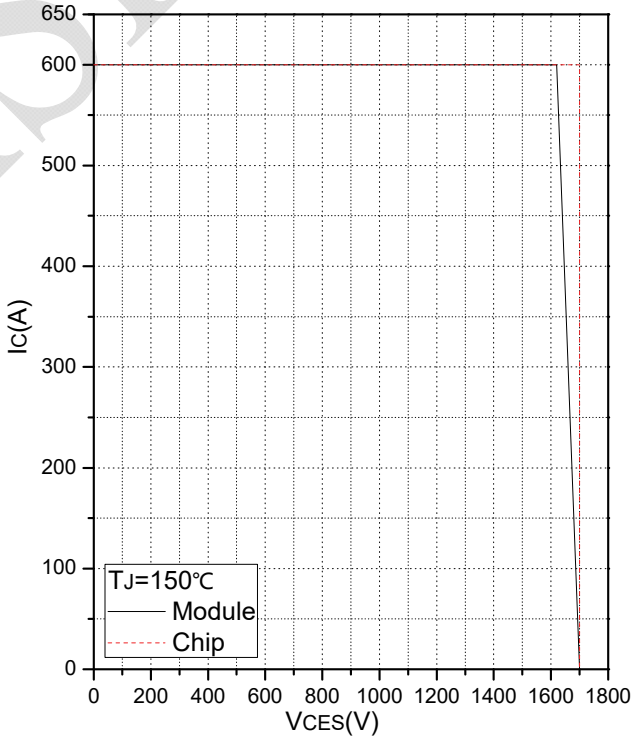


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

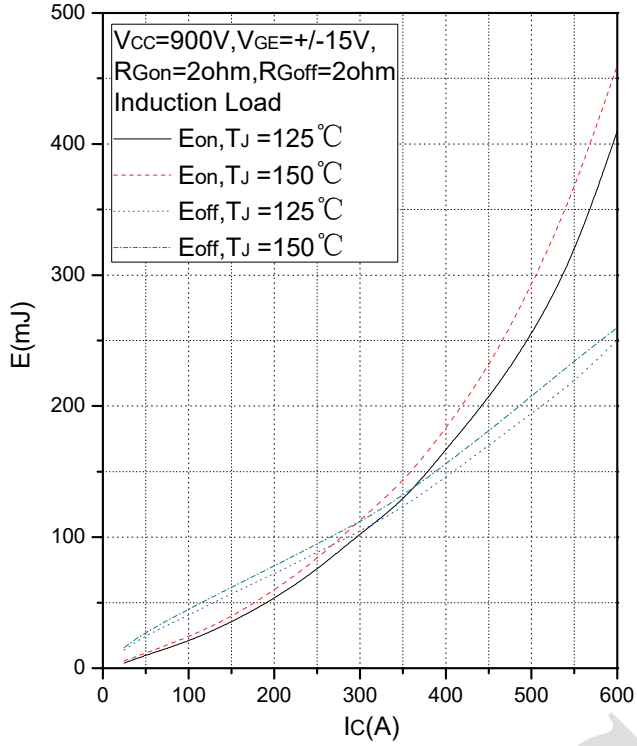


Fig.5 Typical Switching Loss vs. Collector Current

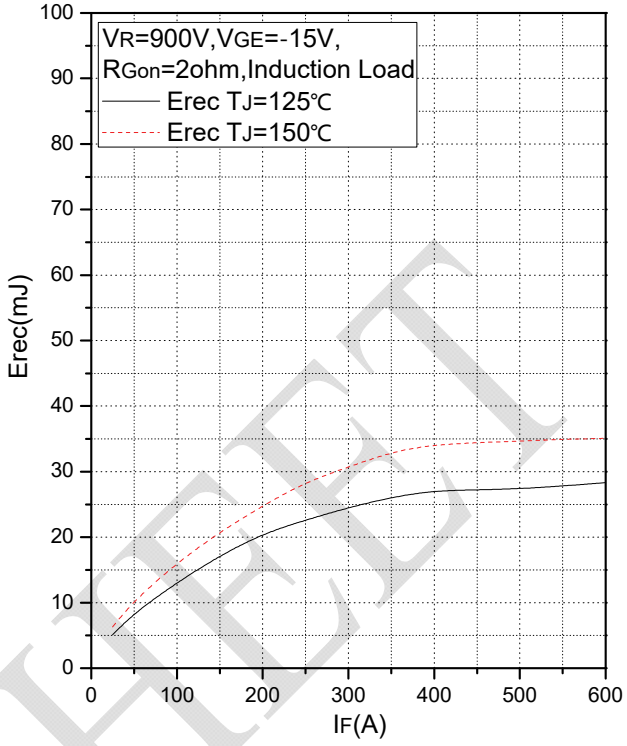


Fig.6 Typical Switching Loss vs. Forward Current

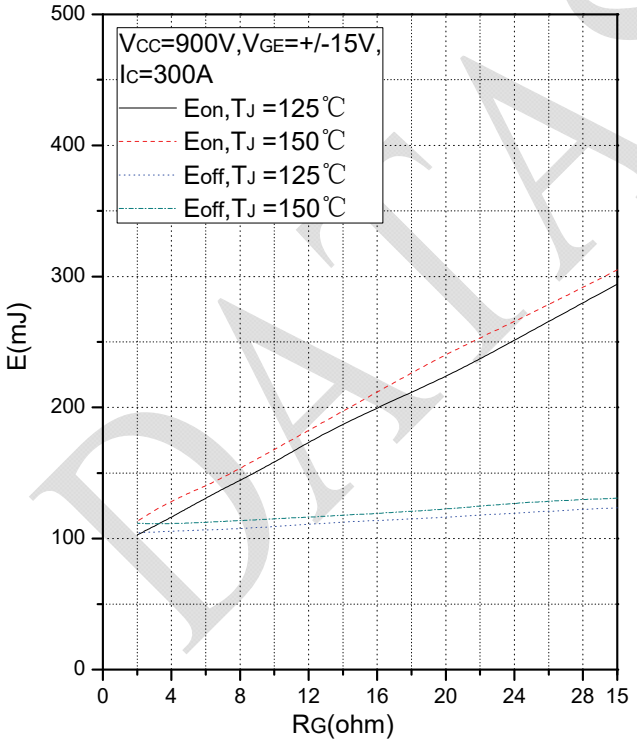


Fig.7 Typical Switching Loss vs. Gate Resistance

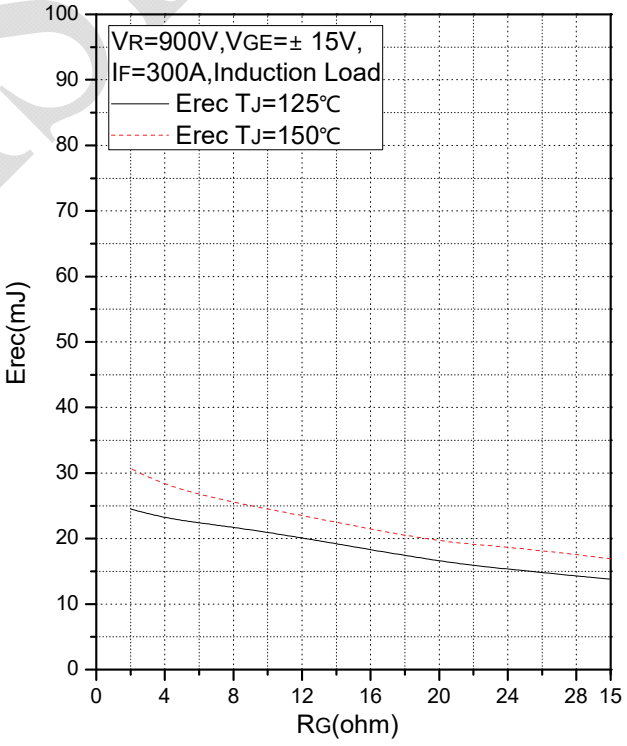


Fig.8 Typical Switching Loss vs. Gate Resistance

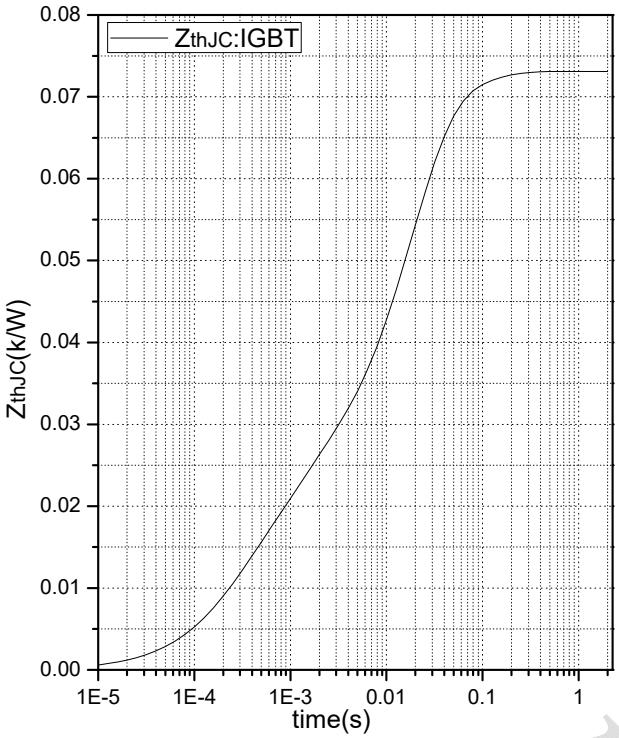


Fig.9 Transient Thermal Impedance (IGBT)

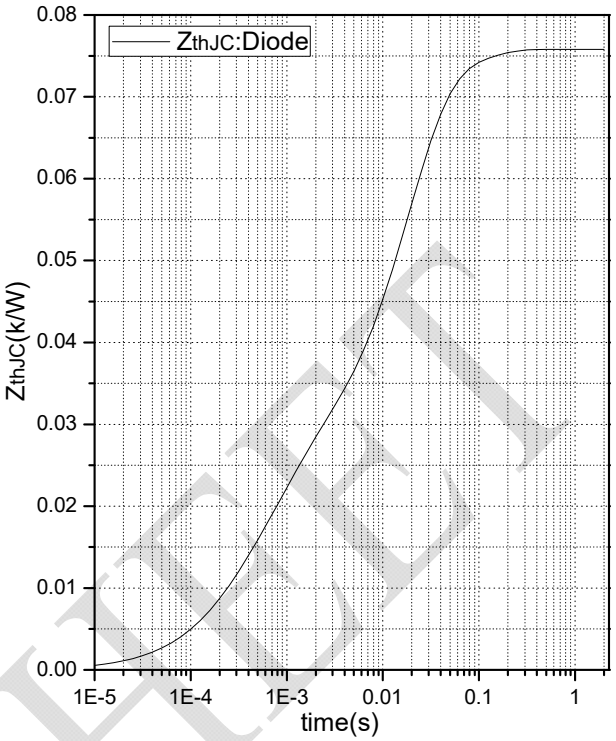
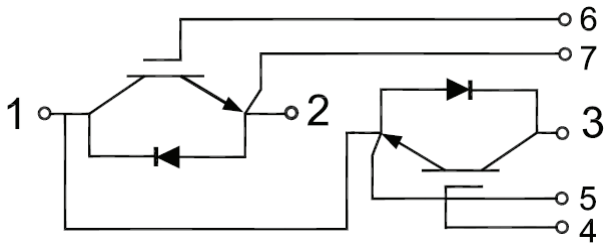
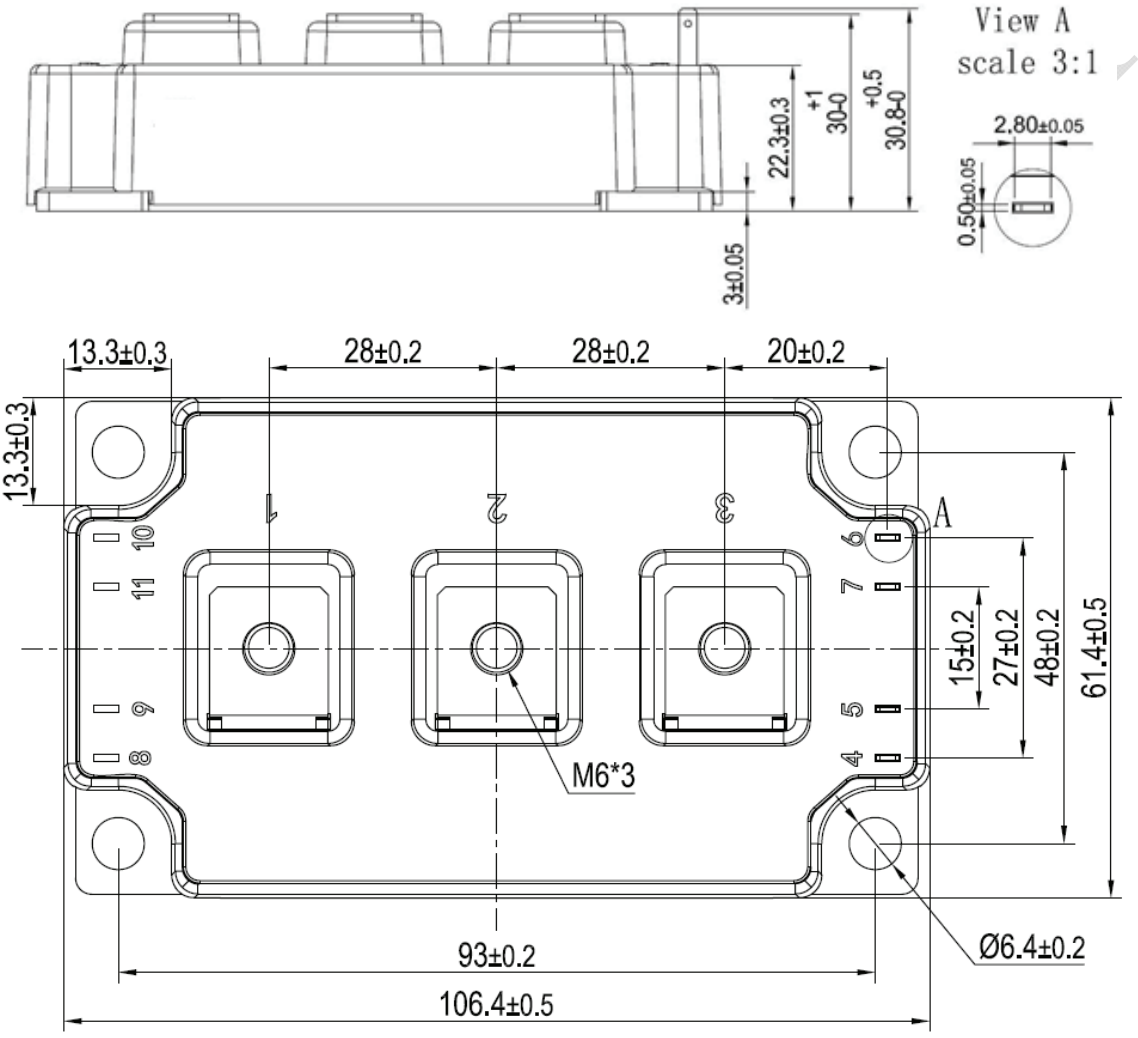


Fig.10 Transient Thermal Impedance (Diode)

Internal Circuit



Package Outline (Unit: mm):



Revision History

Date	Revision	Notes
11/20/2020	01	Initial Release

Announcement

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