MG200HF12TFC2

RoHS COMPLIANT



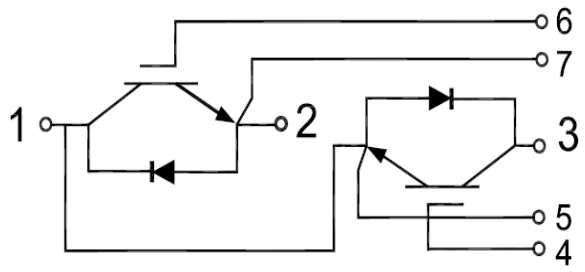
IGBT Modules

V_{CES} 1200V
I_C 200A

Applications

- Motion/servo control
- High frequency switching application
- UPS (Uninterruptible Power Supplies)
- Welding machine

Circuit



Features

- Low V_{CE}(sat) with Trench technology
- Low switching losses especially Eoff
- V_{CE}(sat) with positive temperature coefficient
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance package
- Maximum junction temperature 175℃

● IGBT

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	V_{GE}=0V, I_C=1mA, T_{vj}=25℃	1200	V
Continuous Collector Current	I_C	T_C=100℃	200	A
Repetitive Peak Collector Current	I_{CRM}	t_p=1ms	400	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25℃	±20	V
Total Power Dissipation	P_{tot}	T_C=25℃ T_{vjmax}=175℃	1250	W

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C=8mA,T_{vj}=25℃	5.0	5.8	6.5	V
Collector-Emitter Cut-off Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V,T_{vj}=25℃			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=200A,V_{GE}=15V, T_{vj}=25℃		2.2		V
		I_C=200A,V_{GE}=15V, T_{vj}=125℃		2.5		
		I_C=200A,V_{GE}=15V, T_{vj}=12℃		2.6		
Internal Gate Resistance	R_{Gint}			3.75		Ω
Gate Charge	Q_G			1.2		uC
Input Capacitance	C_{ies}	V_{CE}=25V, V_{GE}=0V, f=1MHz,T_{vj}=25℃		12.8		nF
Reverse Transfer Capacitance	C_{res}			0.5		nF
Gate-Emitter leakage current	I_{GES}	V_{CE}=0V, V_{GE}=20V,T_{vj}=25℃			400	nA
Turn-on Delay Time	$t_{d(on)}$	I_C=200A V_{CE}=600V V_{GE}=±15V R_G=3.9Ω T_{vj}=25℃		103		ns
Rise Time	t_r			54		ns
Turn-off Delay Time	$t_{d(off)}$			305		ns
Fall Time	t_f			99		ns
Energy Dissipation During Turn-on Time	E_{on}			24.0		mJ
Energy Dissipation During Turn-off Time	E_{off}			8.8		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C=200A V_{CE}=600V V_{GE}=±15V R_G=3.9Ω T_{vj}=150℃		108		ns
Rise Time	t_r			57		ns
Turn-off Delay Time	$t_{d(off)}$			341		ns
Fall Time	t_f			181		ns
Energy Dissipation During Turn-on Time	E_{on}			33.8		mJ
Energy Dissipation During Turn-off Time	E_{off}			12.5		mJ
SC Data	I_{sc}	t_p≤10us,V_{GE}=15V, T_{vj}=150℃,V_{CC}=600V, V_{CEM}≤1200V		800		A

Diode

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	T_{vj}=25℃	1200	V
Continuous DC Forward Current	I_F		200	A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	400	A

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=200A,T_{vj}=25℃		1.90		V
		I_F=200A,T_{vj}=125℃		1.75		
		I_F=200A,T_{vj}=150℃		1.65		
Recovered Charge	Q_{rr}	I_F=200A V_R=600V -di_F/dt =2800A/us T_{vj}=25℃		13.4		uC
Peak Reverse Recovery Current	I_{rr}			88		A
Reverse Recovery Energy	E_{rec}			3.9		mJ
Recovered Charge	Q_{rr}	I_F=200A V_R=600V -di_F/dt =2800A/us T_{vj}=150℃		35.84		uC
Peak Reverse Recovery Current	I_{rr}			143		A
Reverse Recovery Energy	E_{rec}			11.6		mJ

Module Characteristics

T_C=25°C unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation Voltage	V_{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	T_{jmax}				175	℃
Operating Junction Temperature	$T_{vj\ op}$		-40		150	℃
Storage Temperature	T_{stg}		-40		125	℃
Thermal Resistance Junction to Case	$R_{\theta JC}$	per IGBT			0.12	K/W
		per Diode			0.20	
Thermal Resistance Case to Sink	$R_{\theta CS}$	Conductive grease applied		0.012	0.035	K/W
Module Electrodes Torque	M_t	Recommended(M6)	3.0		5.0	N·m
Module-to-Sink Torque	M_s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			315		g

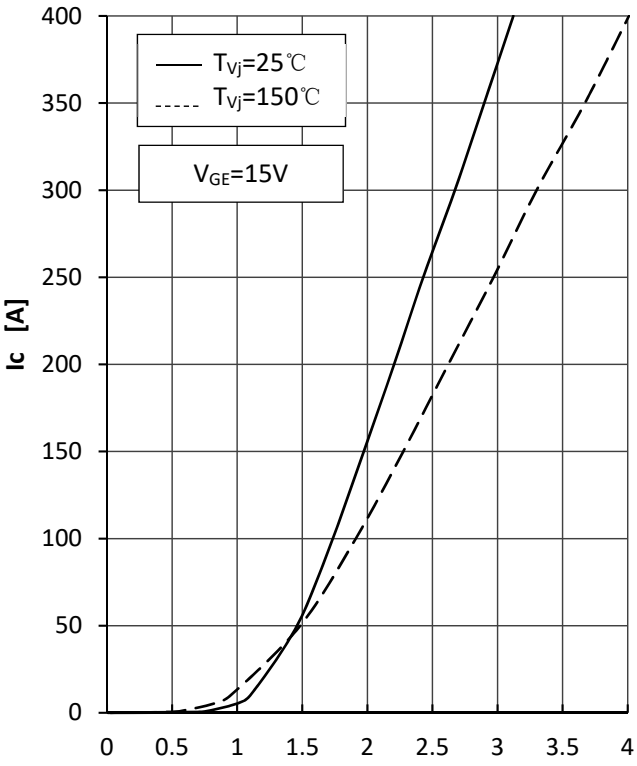


Fig1.IGBT Output Characteristics

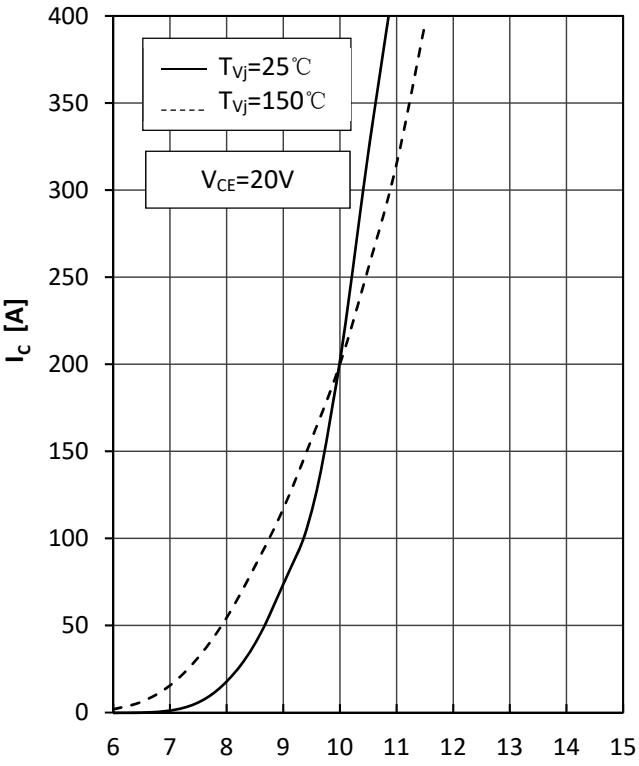


Fig2.IGBT Transfer Characteristics

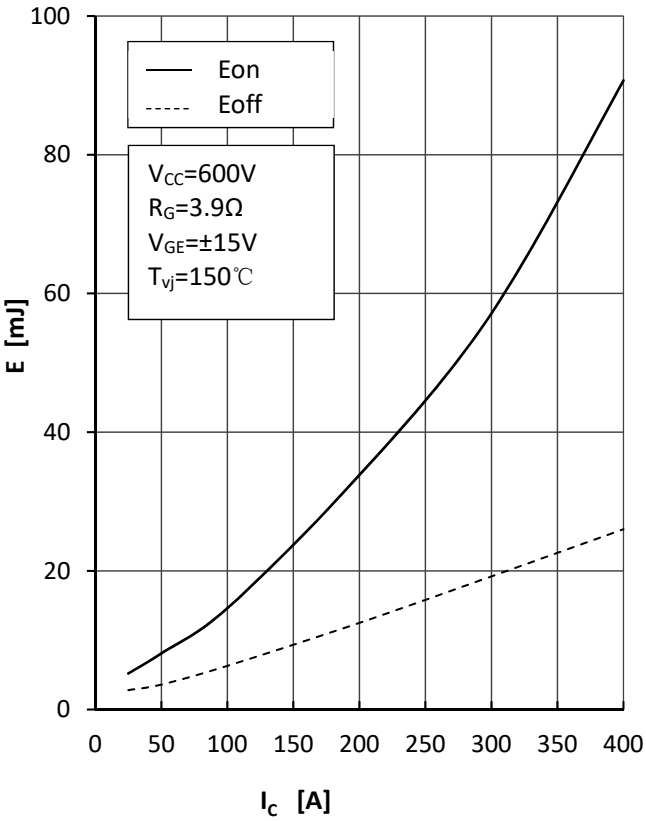


Fig3.IGBT Switching Loss vs.Ic

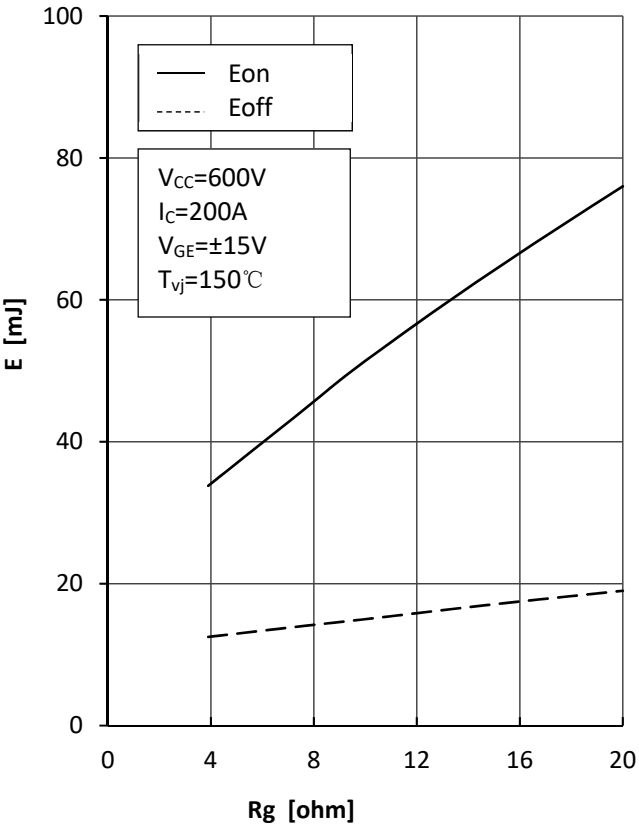


Fig4.IGBT Switching Loss vs.Rg

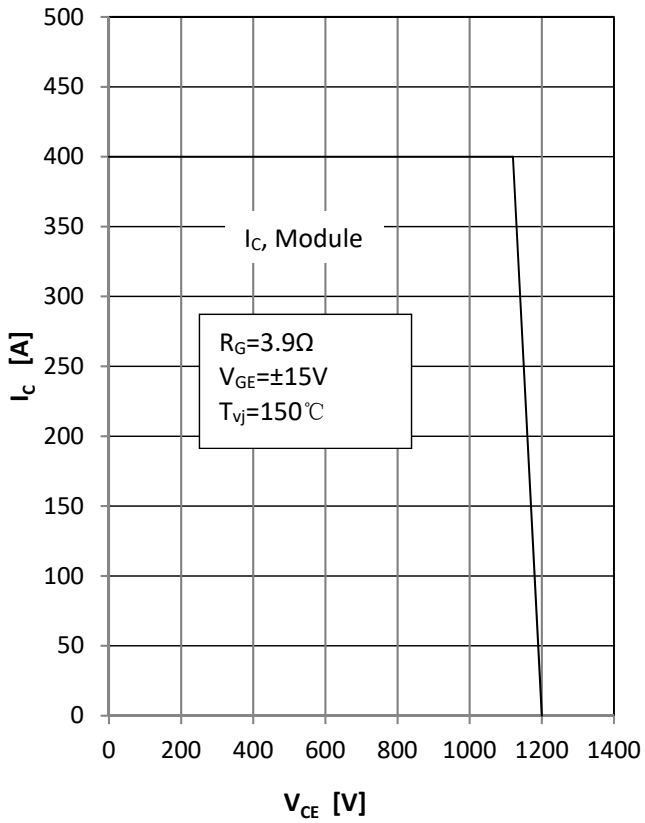


Fig5. RBSOA

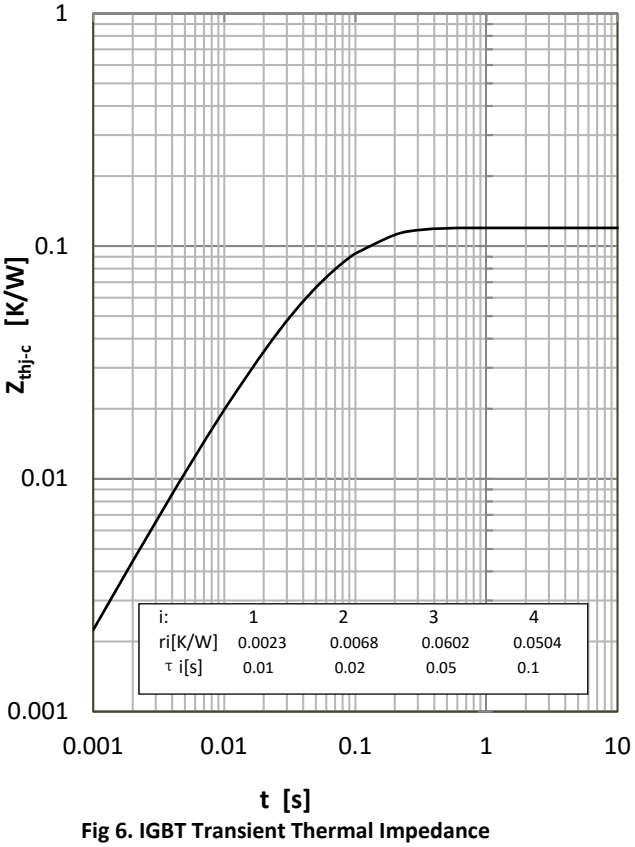


Fig 6. IGBT Transient Thermal Impedance

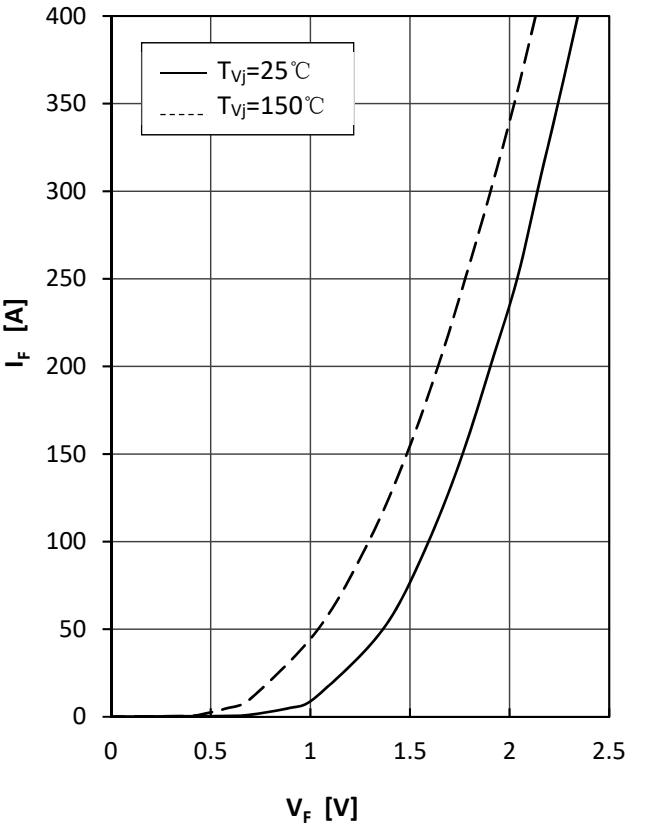


Fig7.Diode Foward Characteristics

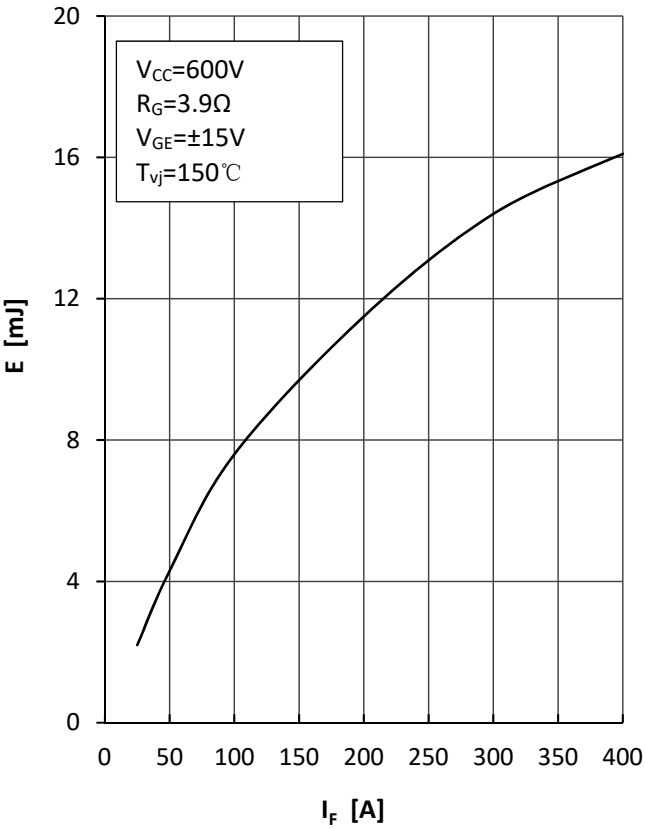


Fig6.Diode Switching Loss(Erec) vs.I_F

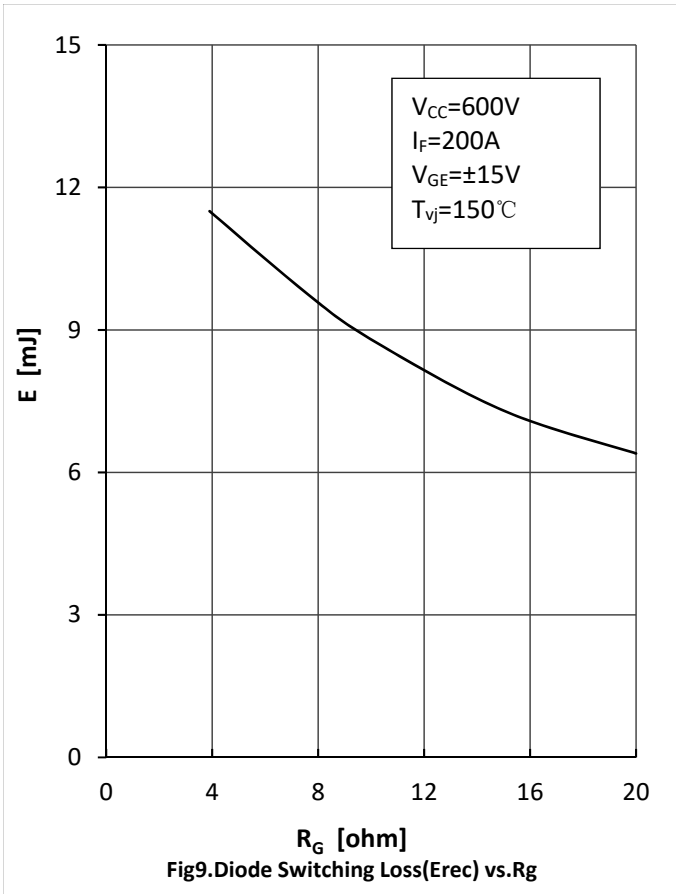


Fig9.Diode Switching Loss(Erec) vs.Rg

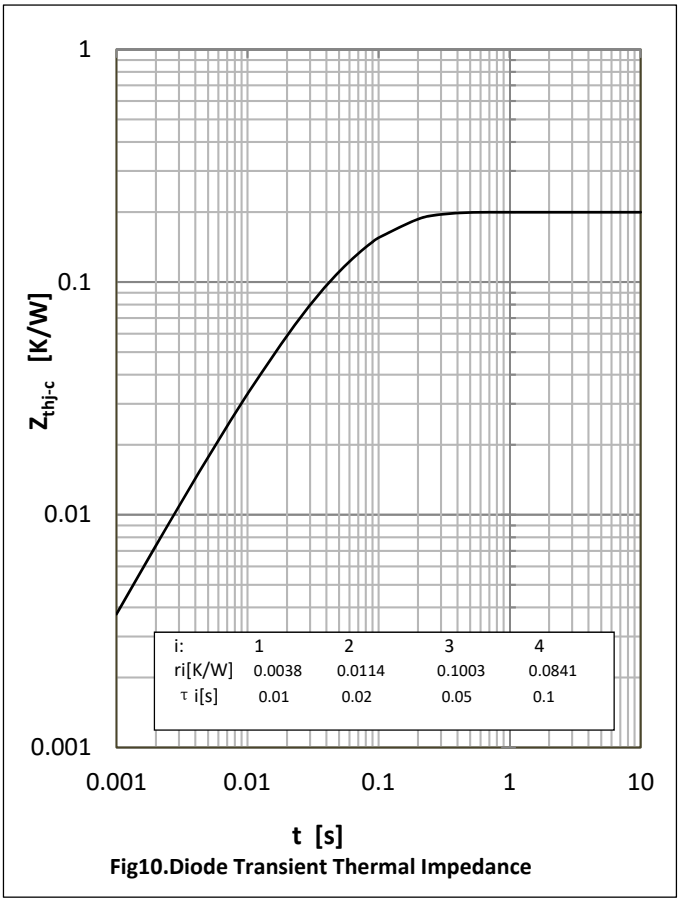
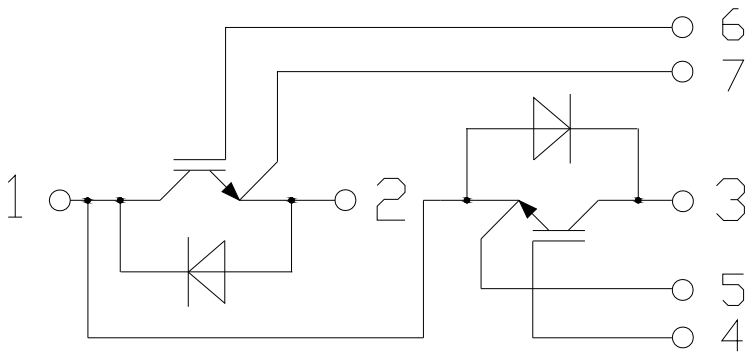


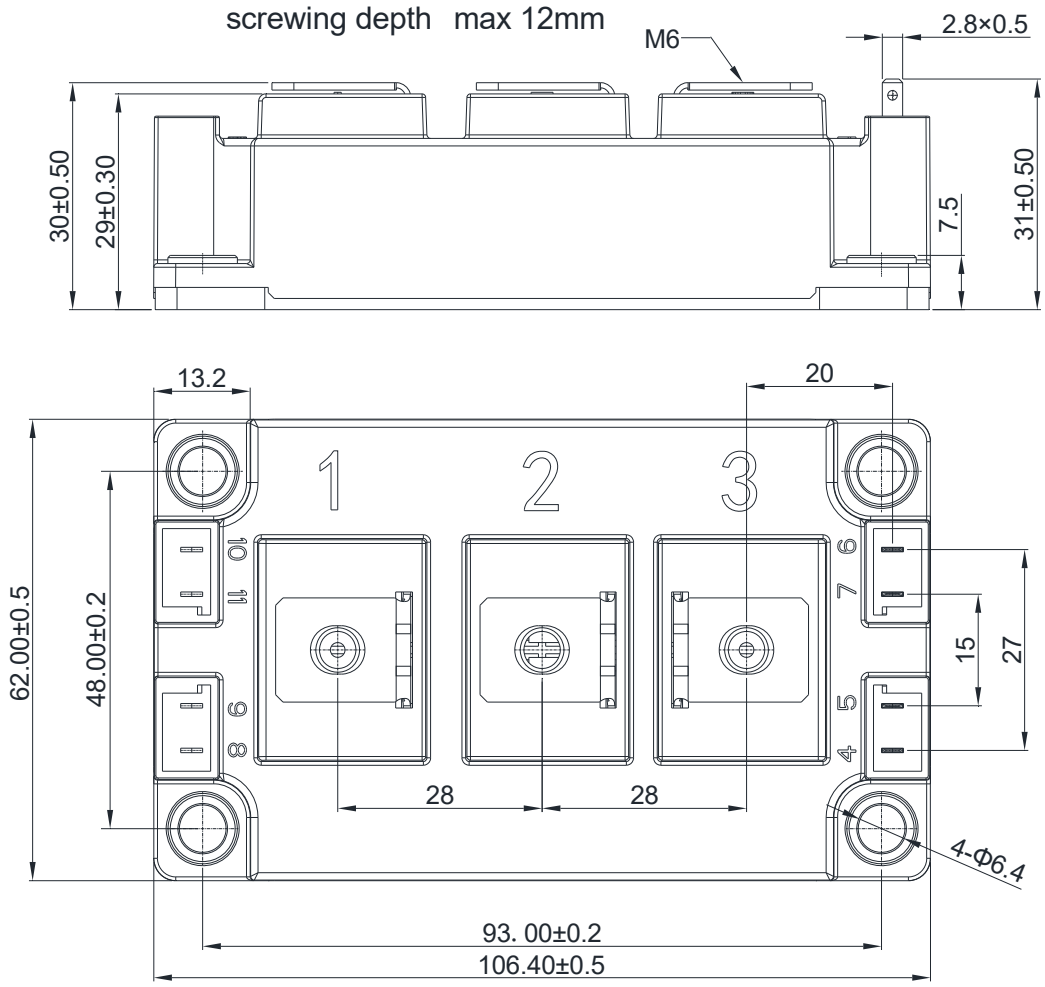
Fig10.Diode Transient Thermal Impedance

- Circuit Diagram



- **Package Outline Information**

Dimensions in Millimeters



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