MG150HF12TLC2



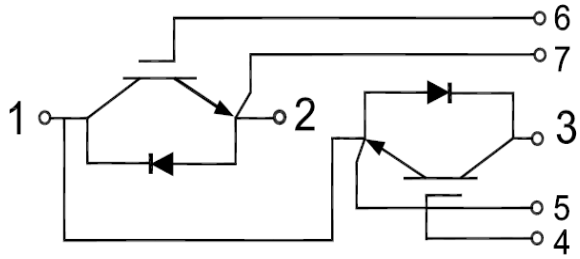
IGBT Modules

V_{CES}	1200V
I_C	150A

Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)
- Soft switching welding machine

Circuit



Features

- Low $V_{CE(sat)}$ with Trench technology
- Vce(sat) with positive temperature coefficient
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance
- 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℃	150	A
Repetitive Peak Collector Current	I_{CRM}	t_p=1ms	300	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25℃	±20	V
Total Power Dissipation	P_{tot}	T_c=25℃ T_{vjmax}=175℃	833	W

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C=4mA,T_{vj}=25℃	5.2	5.9	6.4	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=150A,V_{GE}=15V, T_{vj}=25℃		1.85		V
		I_C=150A,V_{GE}=15V, T_{vj}=125℃		2.05		
Gate Charge	Q_G			1.56		uC
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE} =0V, f=1MHz,T_{vj}=25℃		11.0		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=150A V_{CE}=600V V_{GE}=±15V R_G=4.7Ω T_{vj}=25℃		196		ns
Rise Time	t_r			57		ns
Turn-off Delay Time	$t_{d(off)}$			263		ns
Fall Time	t_f			126		ns
Energy Dissipation During Turn-on Time	E_{on}			18		mJ
Energy Dissipation During Turn-off Time	E_{off}			7.9		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C=150A V_{CE}=600V V_{GE}=±15V R_G=4.7Ω T_{vj}=150℃		202		ns
Rise Time	t_r			69		ns
Turn-off Delay Time	$t_{d(off)}$			304		ns
Fall Time	t_f			191		ns
Energy Dissipation During Turn-on Time	E_{on}			24.6		mJ
Energy Dissipation During Turn-off Time	E_{off}			10.6		mJ
SC Data	I_{sc}	t_p≤10us,V_{GE}=15V, T_{vj}=150℃,V_{CC}=900V, V_{CEM}≤1200V		890		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		150	A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	300	A

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=150A,T_{vj}=25℃		1.90	2.40	V
		I_F=150A,T_{vj}=125℃		1.75		
Recovered Charge	Q_{rr}	I_F=150A V_R=600V -di$_F$/dt =2000A/us T_{vj}=25℃		8.6		uC
Peak Reverse Recovery Current	I_{rr}			48		A
Reverse Recovery Energy	E_{rec}			2.7		mJ
Recovered Charge	Q_{rr}	I_F=150A V_R=600V -di$_F$/dt =2000A/us T_{vj}=150℃		23.4		uC
Peak Reverse Recovery Current	I_{rr}			70		A
Reverse Recovery Energy	E_{rec}			8.2		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			0.18	K/W
		per Diode			0.31	
Thermal Resistance Case-to Sink	$R_{\theta CS}$	Conductive grease applied		0.035		K/W
Module ElectrodesTorque	M_t	Recommended(M6)	3.0		5.0	N·m
Module-to-SinkTorque	M_s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			315		g

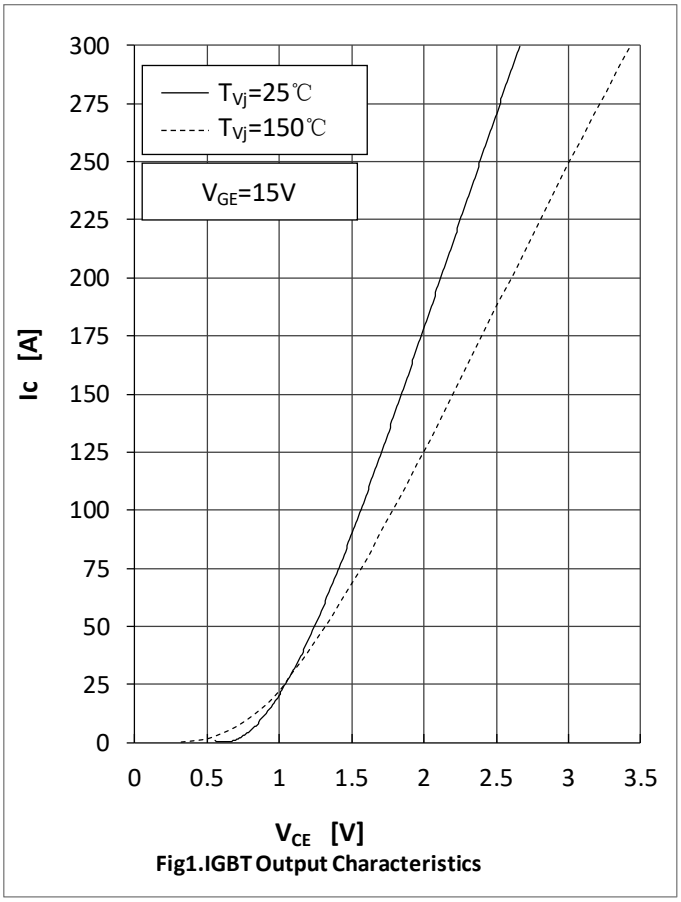


Fig1.IGBT Output Characteristics

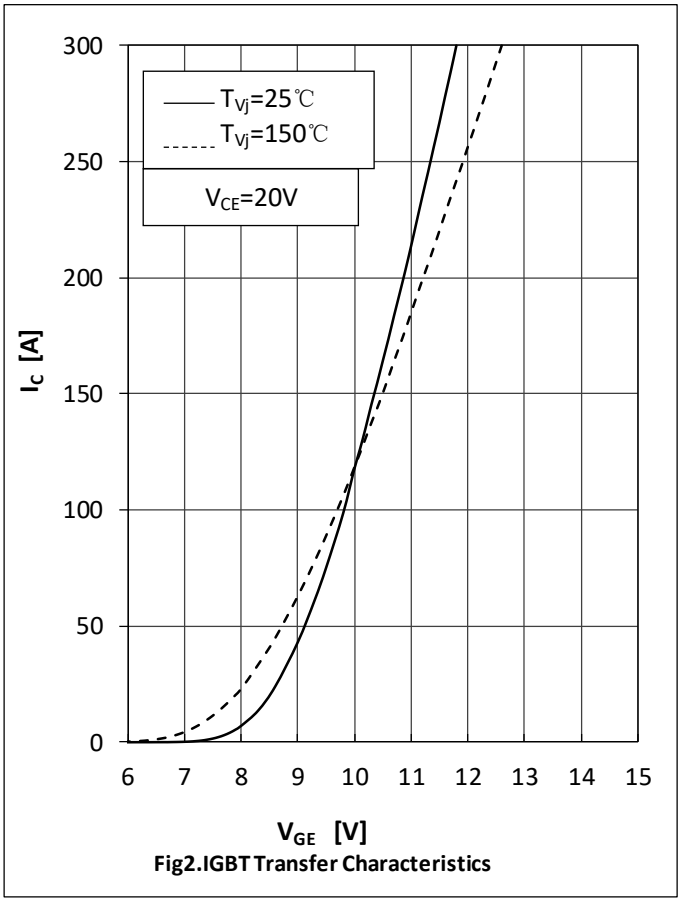


Fig2.IGBT Transfer Characteristics

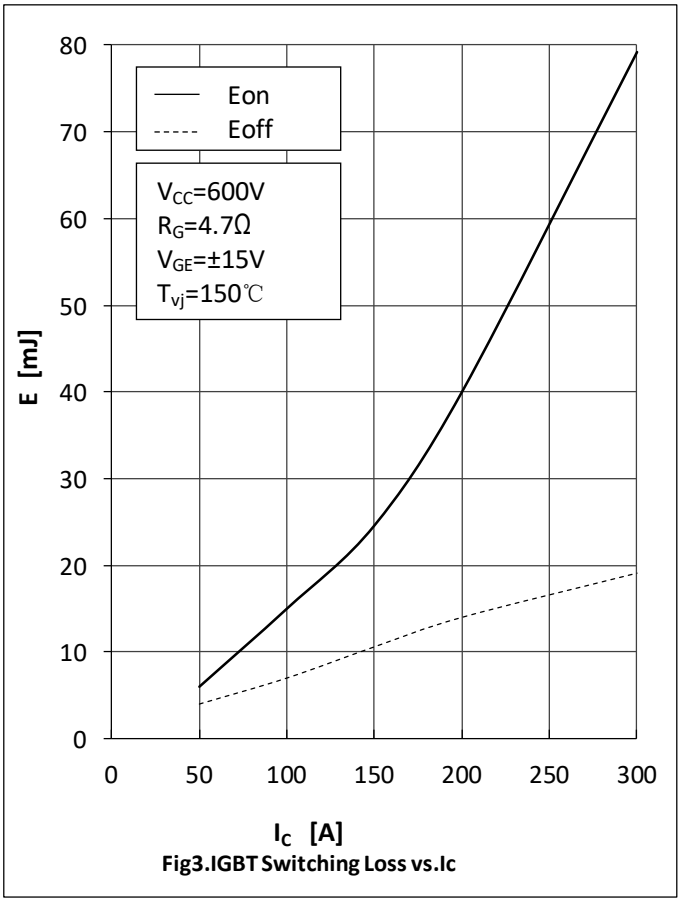


Fig3.IGBT Switching Loss vs.Ic

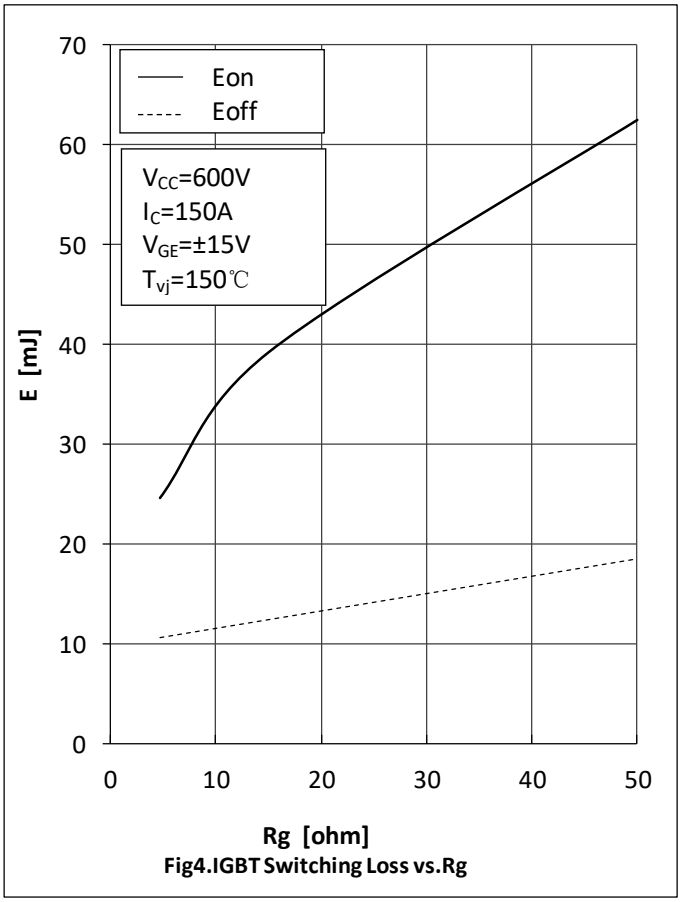


Fig4.IGBT Switching Loss vs.Rg

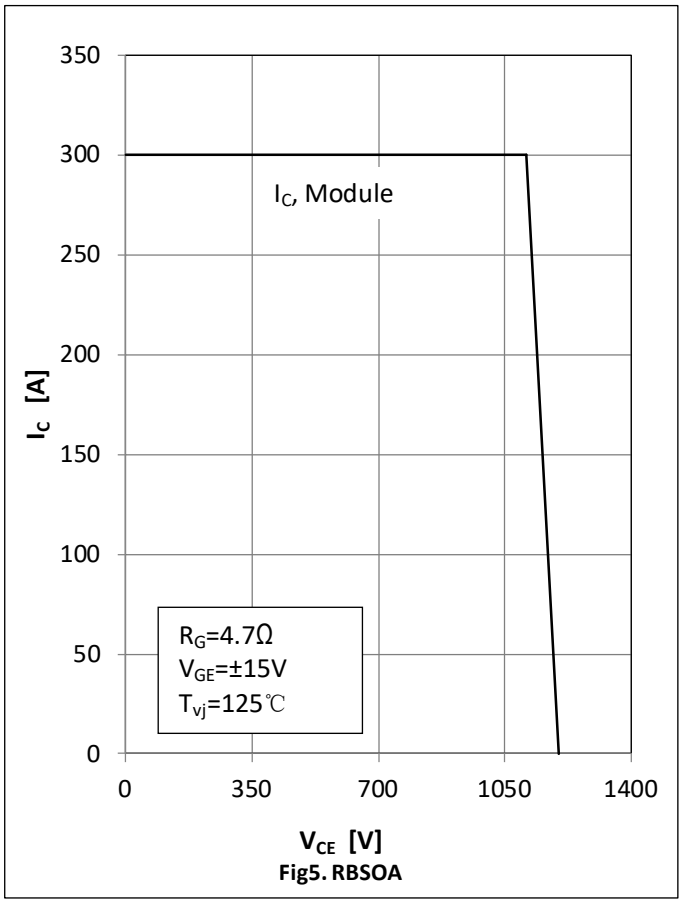


Fig5. RBSOA

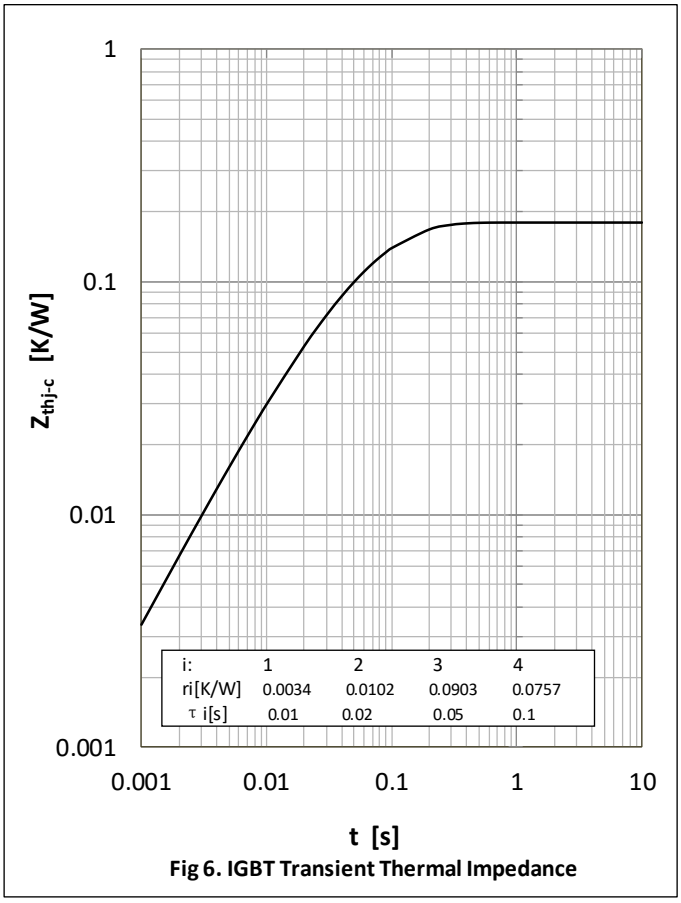


Fig 6. IGBT Transient Thermal Impedance

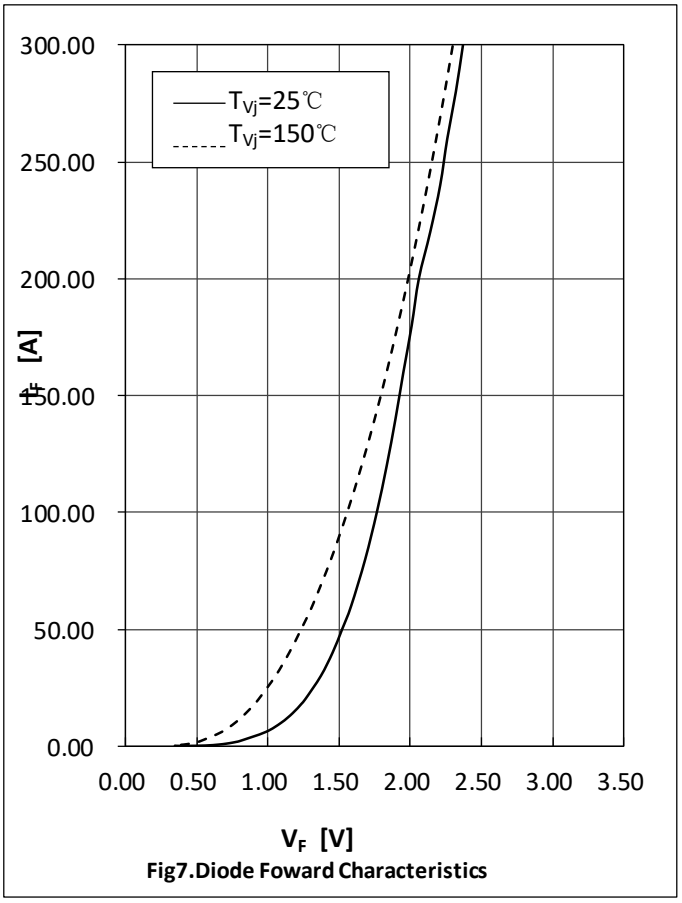


Fig7.Diode Foward Characteristics

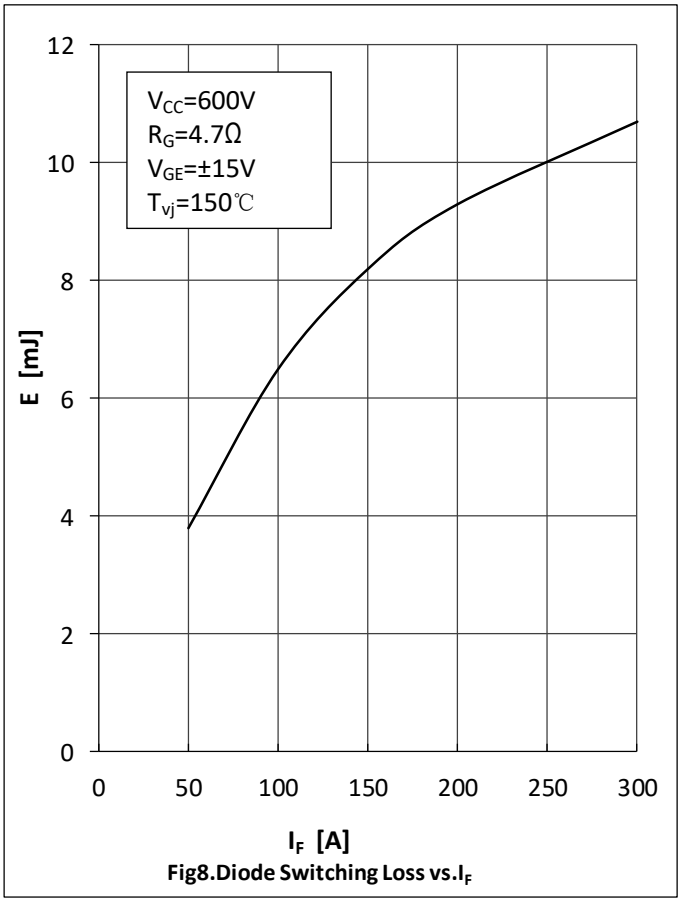


Fig8.Diode Switching Loss vs.I_F

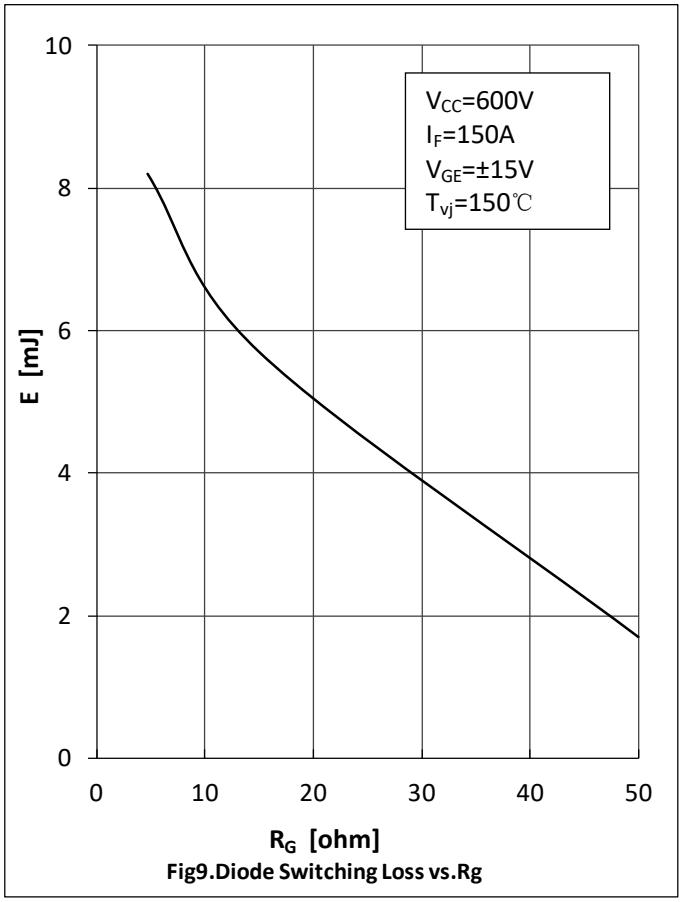


Fig9.Diode Switching Loss vs.Rg

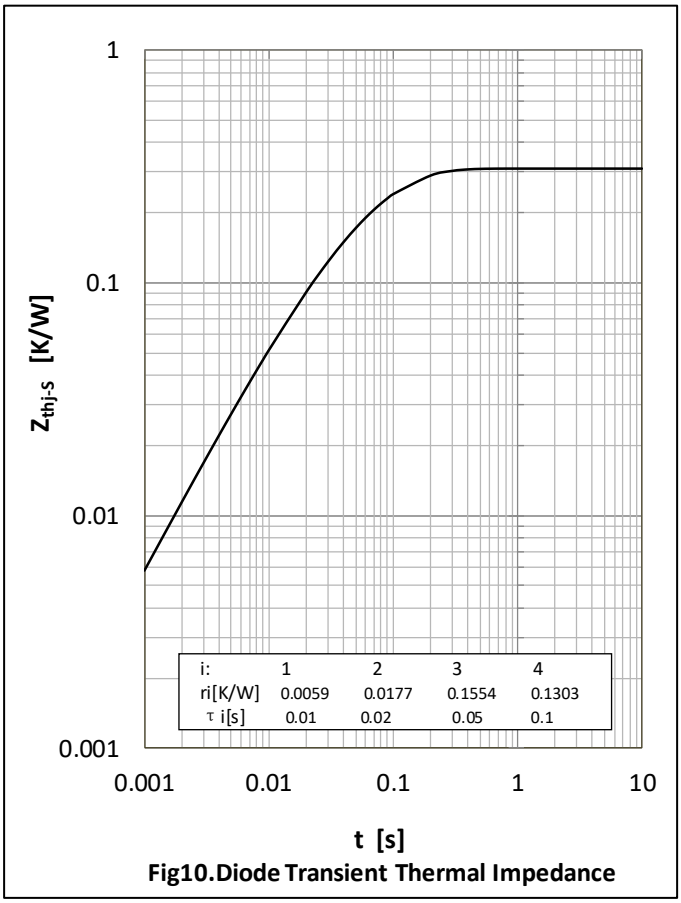
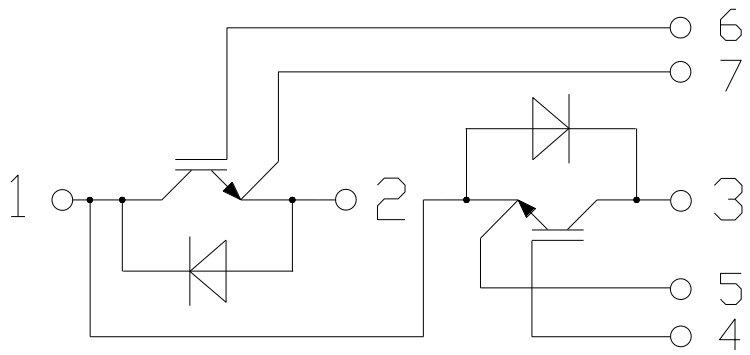


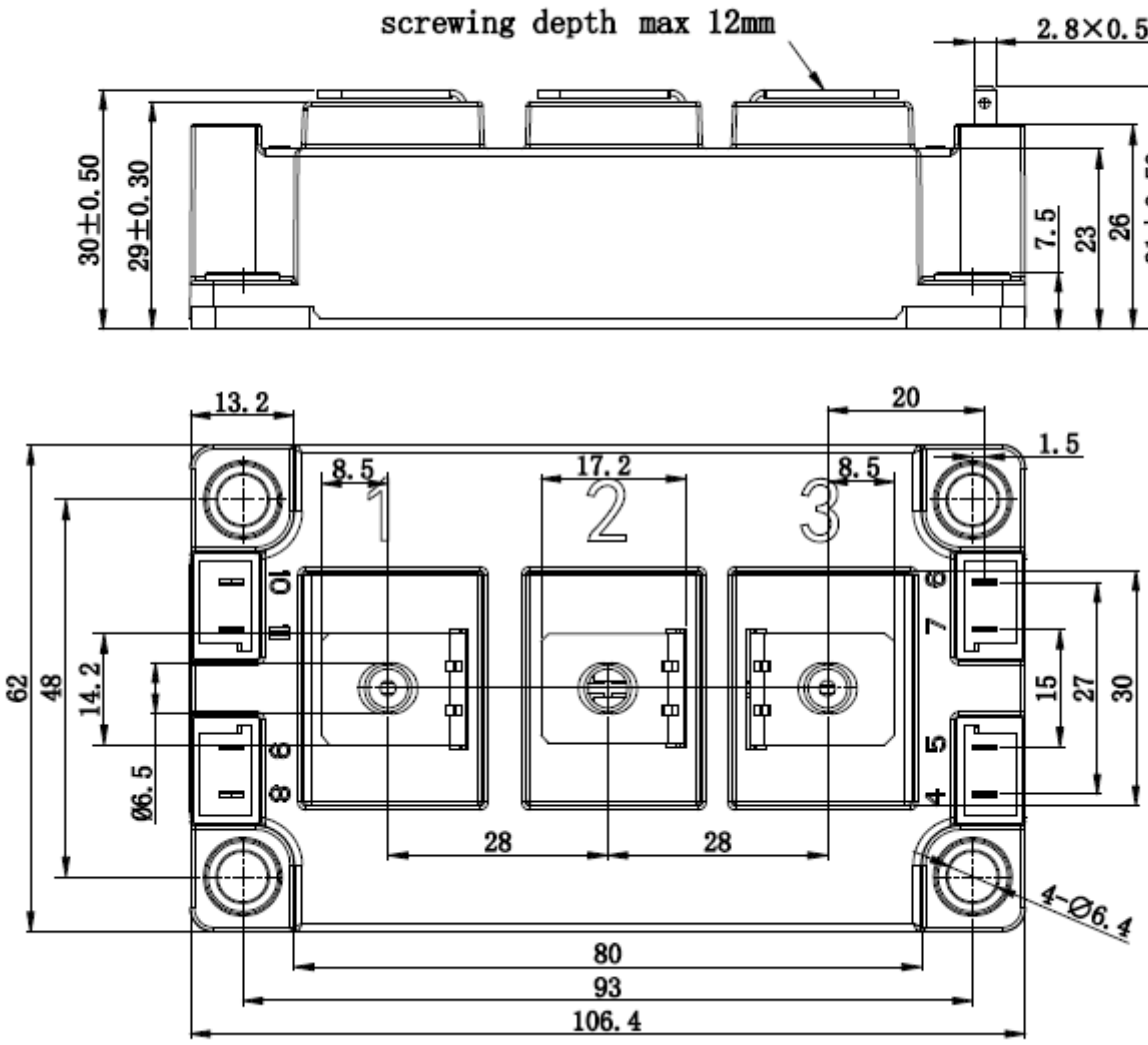
Fig10.Diode Transient Thermal Impedance

- **Circuit Diagram**



- **Package Outline Information**

Dimensions in Millimeters



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