MG300HF12LEC2

RoHS COMPLIANT



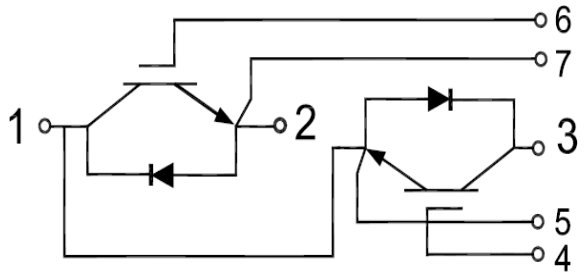
IGBT Modules

V_{CES}	1200V
I_C	300A

Applications

- High frequency drivers
- Solar inverters
- UPS (Uninterruptible Power Supplies)
- Electric welding machine

Circuit



Features

- High speed IGBT in NPT technology
- Low switching losses
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance
- Maximum junction temperature 150℃

● 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℃	300	A
Repetitive Peak Collector Current	I_{CRM}	t_p=1ms	600	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25℃	±20	V
Total Power Dissipation	P_{tot}	T_C=25℃ T_{vjmax}=150℃	1388	W

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C=12mA,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=300A,V_{GE}=15V, T_{vj}=25℃		3.3		V
		I_C=300A,V_{GE}=15V, T_{vj}=125℃		4.0		
		I_C=300A,V_{GE}=15V, T_{vj}=150℃		4.2		
Gate Charge	Q_G			3.4		uC
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE}=0V, f=1MHz,T_{vj}=25℃		19.3		nF
Reverse Transfer Capacitance	C_{res}			1.2		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=300A V_{CE}=600V V_{GE}=±15V R_G=2Ω T_{vj}=25℃		77		ns
Rise Time	t_r			60		ns
Turn-off Delay Time	$t_{d(off)}$			332		ns
Fall Time	t_f			40		ns
Energy Dissipation During Turn-on Time	E_{on}			23.2		mJ
Energy Dissipation During Turn-off Time	E_{off}			8.5		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C=300A V_{CE}=600V V_{GE}=±15V R_G=2Ω T_{vj}=150℃		87		ns
Rise Time	t_r			62		ns
Turn-off Delay Time	$t_{d(off)}$			356		ns
Fall Time	t_f			50		ns
Energy Dissipation During Turn-on Time	E_{on}			33.6		mJ
Energy Dissipation During Turn-off Time	E_{off}			11.4		mJ
SC Data	I_{sc}	t_p≤10us,V_{GE}=15V, T_{vj}=150℃,V_{CC}=600V, V_{CEM}≤1200V		2000		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		300	A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	600	A

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=300A,T_{vj}=25℃		2.05		V
		I_F=300A,T_{vj}=125℃		1.90		
		I_F=300A,T_{vj}=150℃		1.80		
Recovered Charge	Q_{rr}	I_F=300A V_R=600V -di_F/dt =3800A/us T_{vj}=25℃		21.6		uC
Peak Reverse Recovery Current	I_{rr}			150		A
Reverse Recovery Energy	E_{rec}			8.0		mJ
Recovered Charge	Q_{rr}	I_F=300A V_R=600V -di_F/dt =3800A/us T_{vj}=150℃		49.6		uC
Peak Reverse Recovery Current	I_{rr}			222		A
Reverse Recovery Energy	E_{rec}			18.9		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}				150	℃
Operating Junction Temperature	$T_{vj\ op}$		-40		125	℃
Storage Temperature	T_{stg}		-40		125	℃
Stray inductance module	L_{sCE}			20		nH
Module Lead Resistance, terminals - chip	$R_{CC'+EE'}$			0.7		mΩ
Thermal Resistance Junction-to Case	$R_{\theta JC}$	per IGBT			0.09	K/W
		per Diode			0.14	
Thermal Resistance Case-to Sink	$R_{\theta CS}$	Conductive grease applied		0.012	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

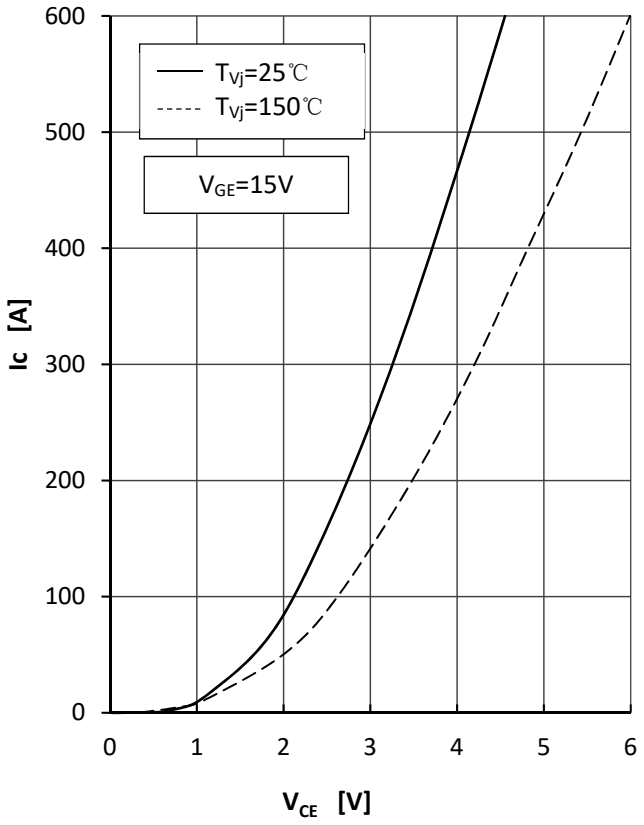


Fig1.IGBT Output Characteristics

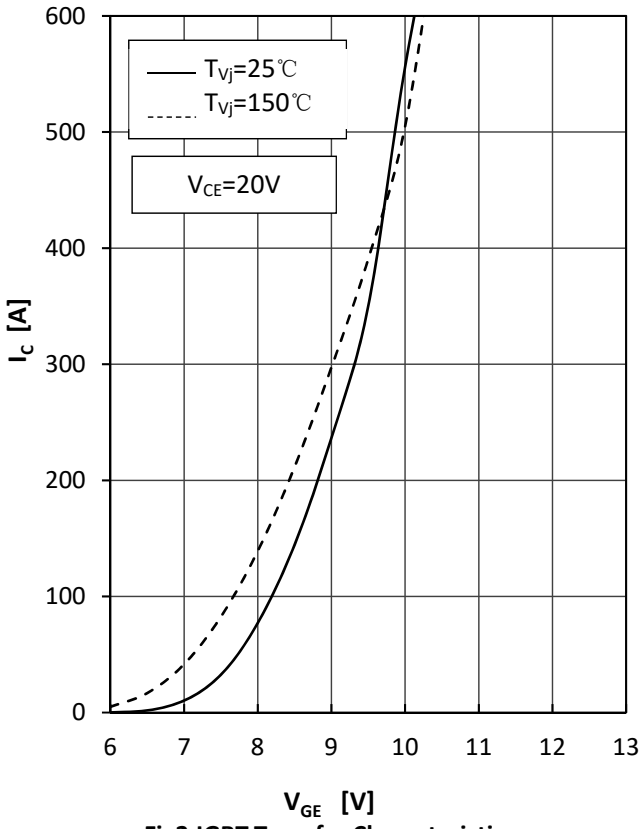


Fig2.IGBT Transfer Characteristics

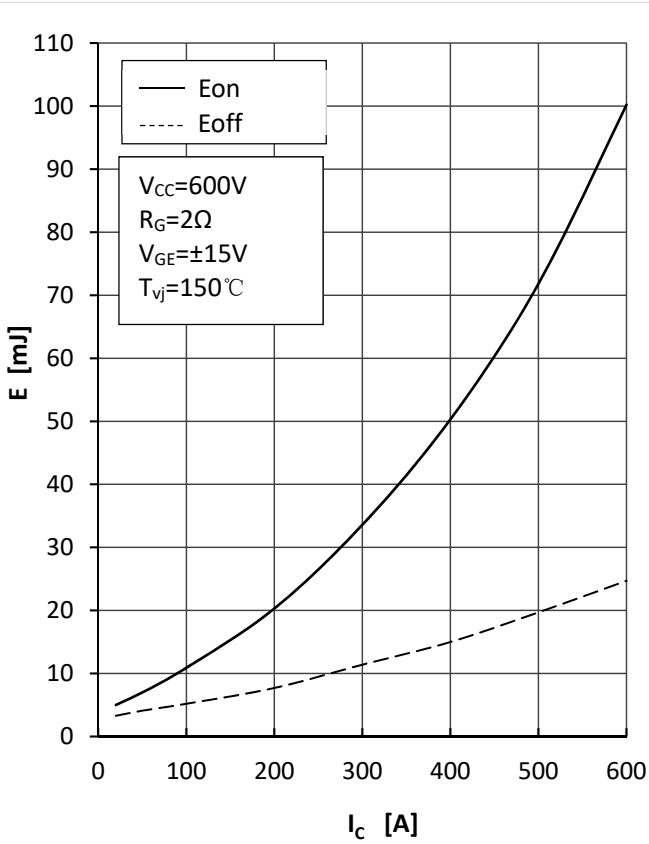


Fig3.IGBT Switching Loss vs.Ic

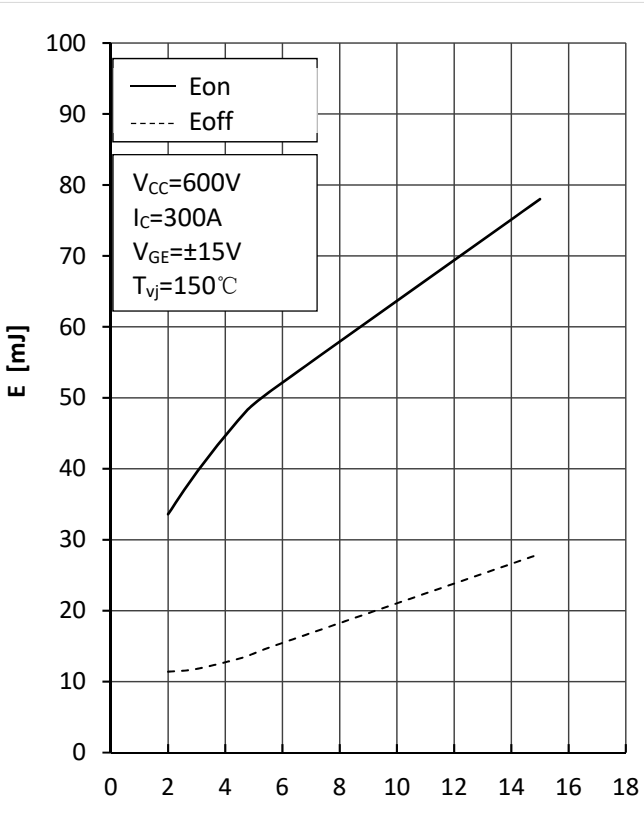


Fig4.IGBT Switching Loss vs.Rg

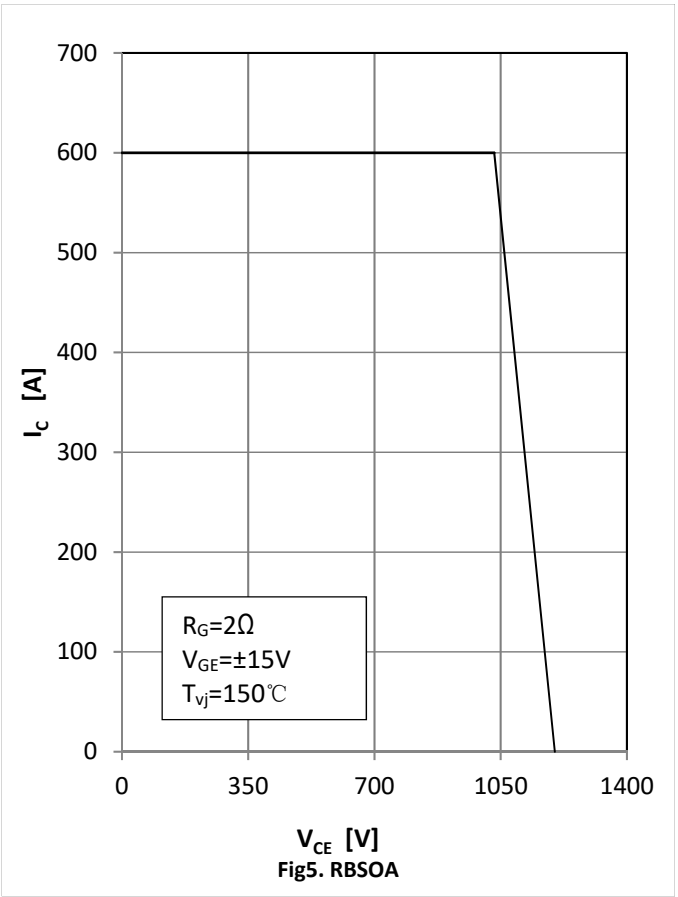


Fig5. RBSOA

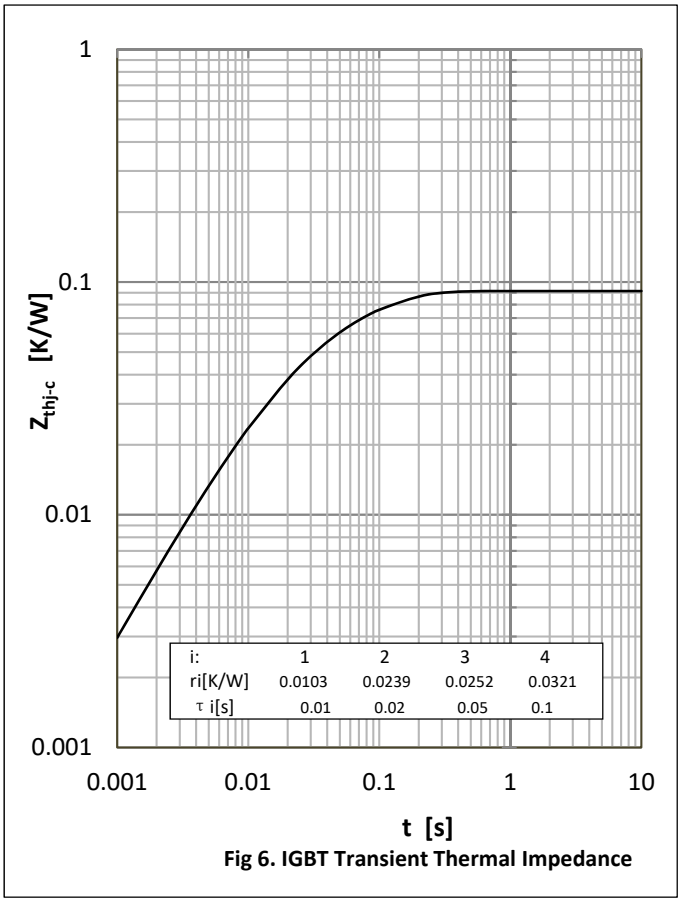


Fig 6. IGBT Transient Thermal Impedance

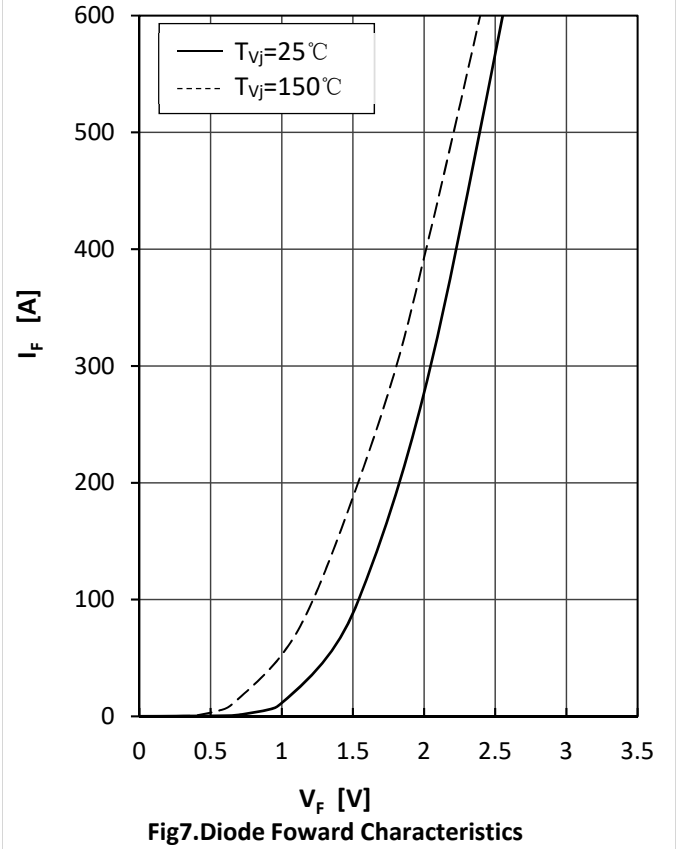


Fig7.Diode Foward Characteristics

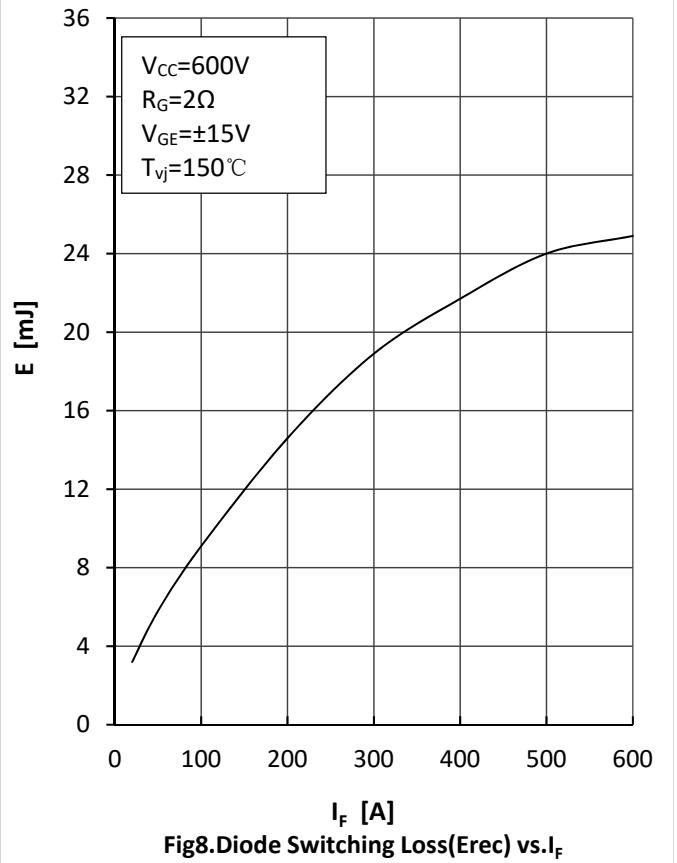


Fig8.Diode Switching Loss(Erec) vs.I_F

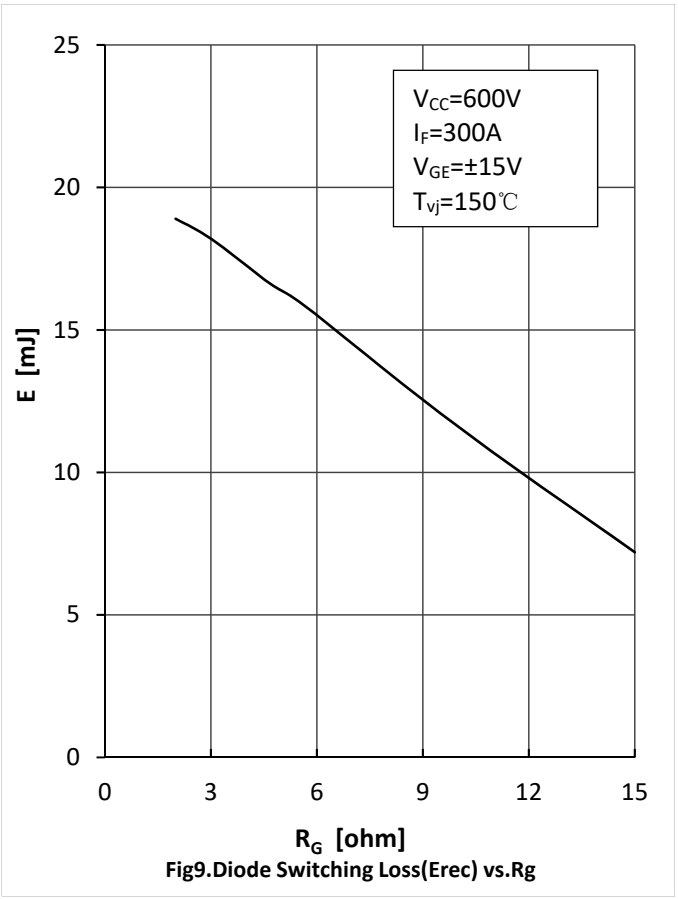


Fig9.Diode Switching Loss(Erec) vs.Rg

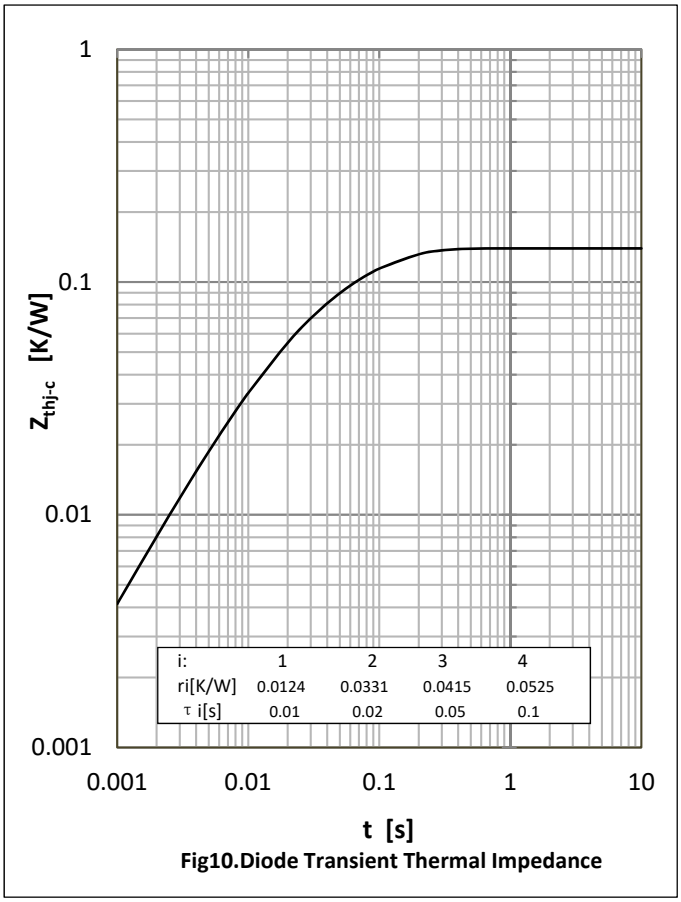
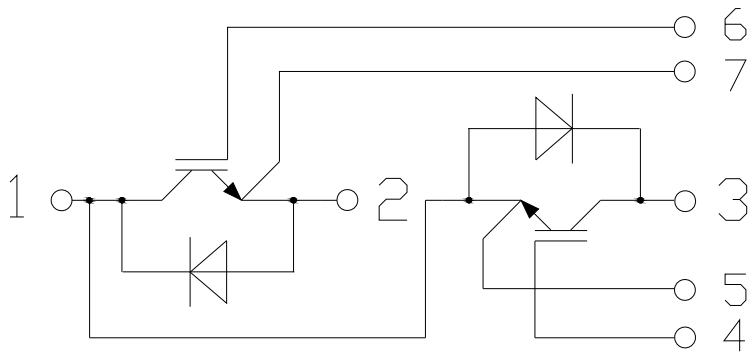


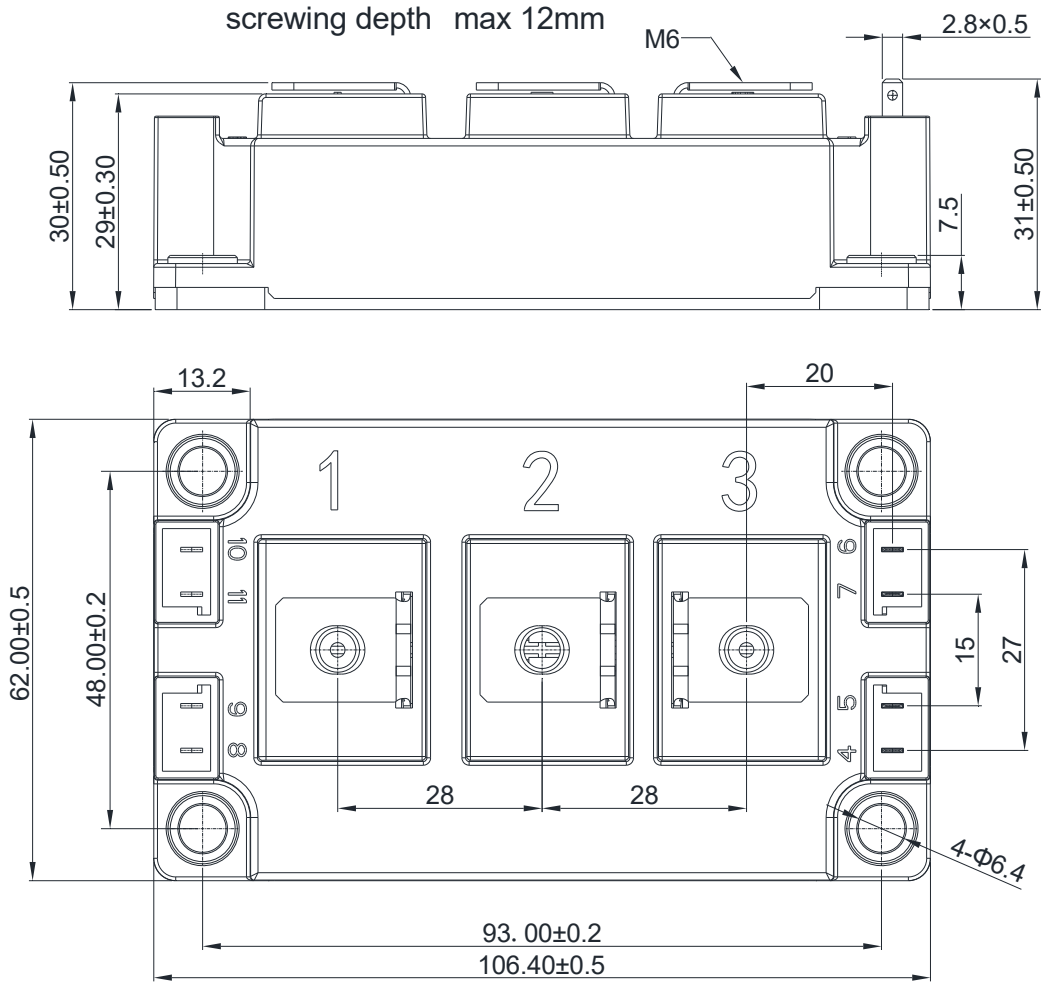
Fig10.Diode Transient Thermal Impedance

- Circuit Diagram



- **Package Outline Information**

Dimensions in Millimeters



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