MG150HF065TLC1

RoHS COMPLIANT



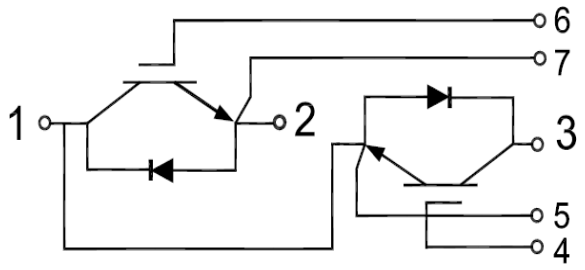
IGBT Modules

V_{CES} 650V
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
- V_{CE}(sat) with positive temperature coefficient
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance
- High short circuit capability(10us)
- Maximum junction temperature 175℃

● IGBT

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	V_{GE}=0V, I_C=4mA, T_{vj}=25℃	650	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℃	450	W

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C=3mA,T_{vj}=25℃	5.0	5.5	6.5	V
Collector-Emitter Cut-off Current	I_{CES}	V_{CE}=650V,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℃		1.45		V
		I_C=150A,V_{GE}=15V, T_{vj}=125℃		1.60		
		I_C=150A,V_{GE}=15V, T_{vj}=150℃		1.65		
Gate Charge	Q_G			0.85		uC
Internal Gate Resistance	R_{gint}			6.15		Ω
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE}=0V, f=1MHz, T_{vj}=25℃		12.05		nF
Reverse Transfer Capacitance	C_{res}			0.30		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}=400V V_{GE}=±15V R_G=4.7Ω T_{vj}=25℃		252.2		ns
Rise Time	t_r			55.0		ns
Turn-off Delay Time	$t_{d(off)}$			334.7		ns
Fall Time	t_f			88.3		ns
Energy Dissipation During Turn-on Time	E_{on}			4.87		mJ
Energy Dissipation During Turn-off Time	E_{off}			4.39		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C=150A V_{CE}=400V V_{GE}=±15V R_G=4.7Ω T_{vj}=125℃		268.8		ns
Rise Time	t_r			59.2		ns
Turn-off Delay Time	$t_{d(off)}$			357.8		ns
Fall Time	t_f			112.6		ns
Energy Dissipation During Turn-on Time	E_{on}			6.70		mJ
Energy Dissipation During Turn-off Time	E_{off}			5.24		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C=150A V_{CE}=400V V_{GE}=±15V R_G=4.7Ω T_{vj}=150℃		271.0		ns
Rise Time	t_r			60.5		ns
Turn-off Delay Time	$t_{d(off)}$			365.4		ns
Fall Time	t_f			119.4		ns
Energy Dissipation During Turn-on Time	E_{on}			7.30		mJ
Energy Dissipation During Turn-off Time	E_{off}			5.44		mJ
SC Data	I_{sc}	T_p≤10us,V_{GE}=15V,T_{vj}=150℃, V_{cc}=400V,V_{CEM}≤650V		978		A

Diode

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	T_{vj}=25℃	650	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℃		1.60		V
		I_F=150A,T_{vj}=125℃		1.40		
		I_F=150A,T_{vj}=150℃		1.35		
Recovered Charge	Q_{rr}	I_F=150A V_R=400V -di_F/dt=2000A/us T_{vj}=25℃		2.15		uC
Peak Reverse Recovery Current	I_{rr}			59.1		A
Reverse Recovery Energy	E_{rec}			0.32		mJ
Recovered Charge	Q_{rr}	I_F=150A V_R=400V -di_F/dt=2000A/us T_{vj}=125℃		5.08		uC
Peak Reverse Recovery Current	I_{rr}			83.2		A
Reverse Recovery Energy	E_{rec}			0.78		mJ
Recovered Charge	Q_{rr}	I_F=150A V_R=400V -di_F/dt=2000A/us T_{vj}=150℃		6.3		uC
Peak Reverse Recovery Current	I_{rr}			92.09		A
Reverse Recovery Energy	E_{rec}			0.98		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			0.33	K/W
		per Diode			0.50	
Thermal Resistance Case to Sink	$R_{\theta CS}$	Conductive grease applied		0.15		K/W
Comparative Tracking Index	CTI		200			
Module Electrodes Torque	M_t	Recommended(M5)	3.0		5.0	N·m
Module to Sink Torque	M_s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			150		g

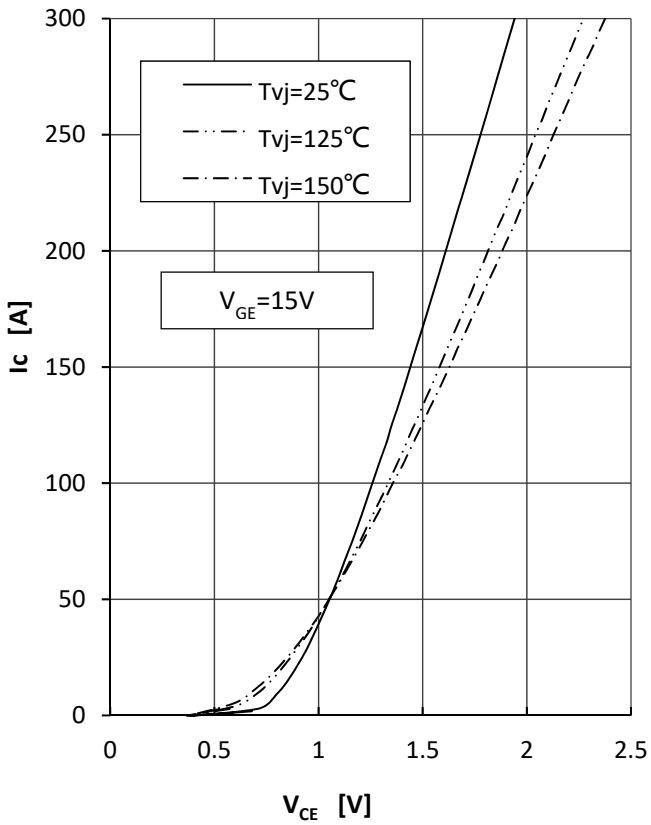


Fig1.IGBT Output Characteristics

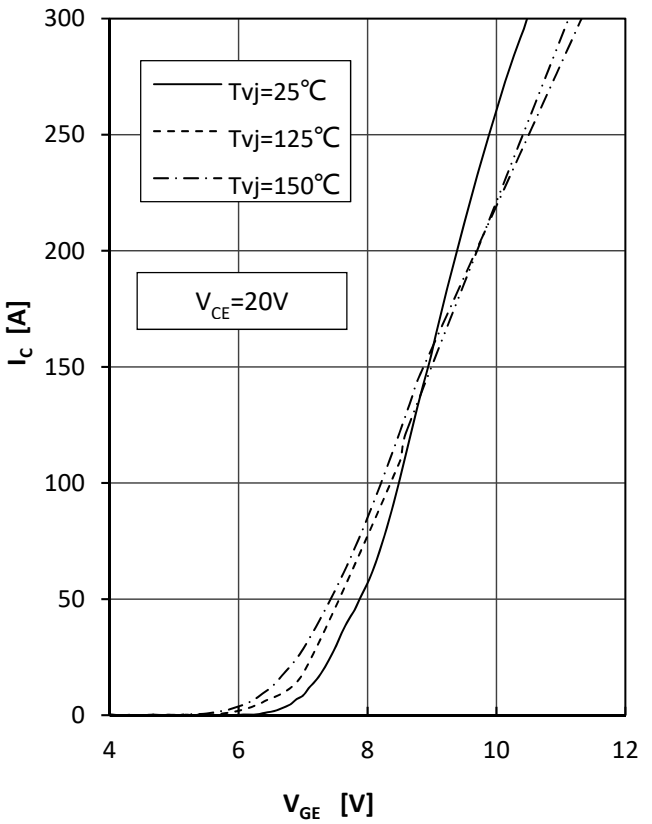


Fig2.IGBT Transfer Characteristics

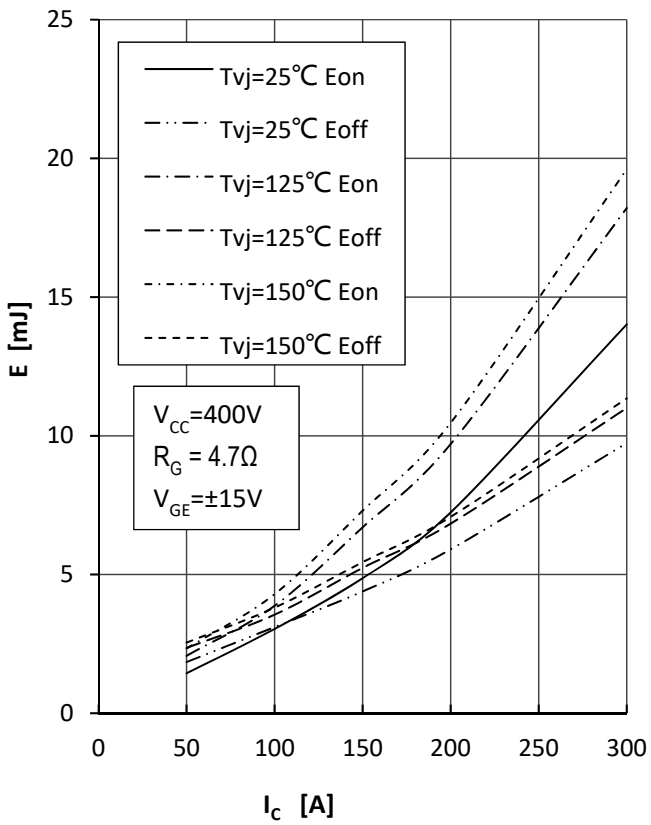


Fig3.IGBT Switching Loss vs.Ic

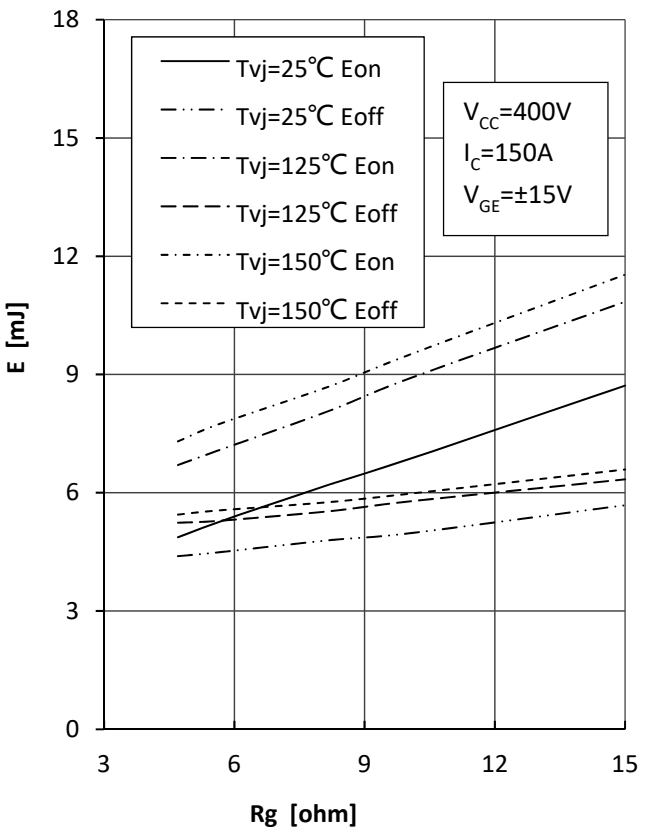


Fig4.IGBT Switching Loss vs.Rg

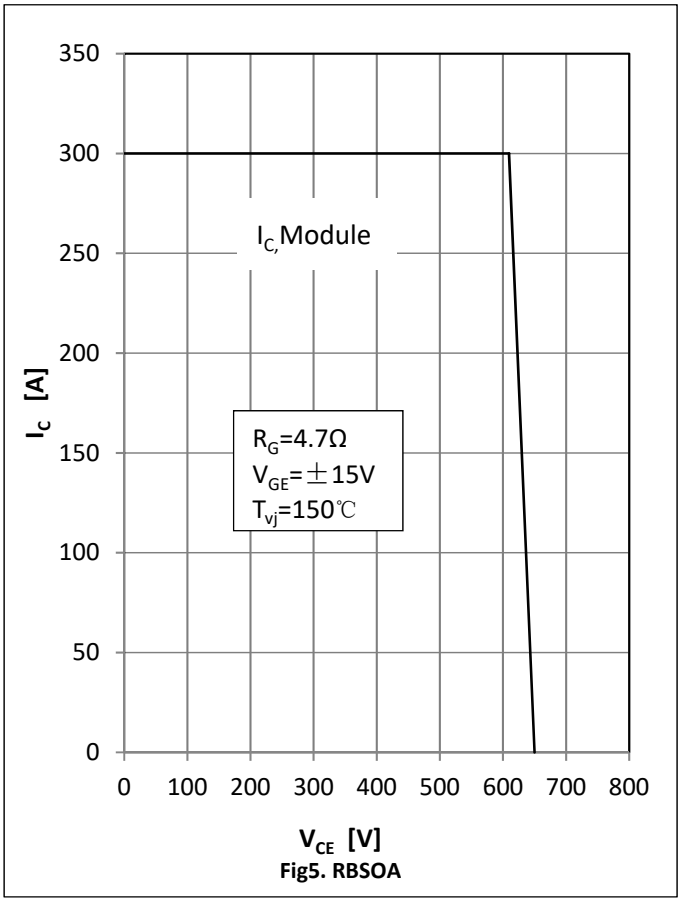


Fig5. RBSOA

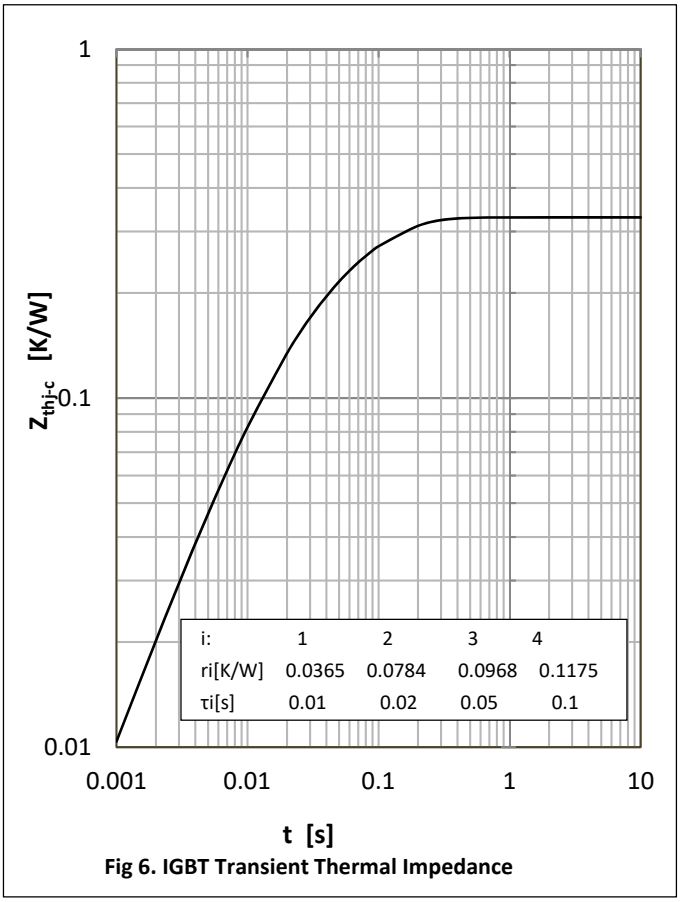


Fig 6. IGBT Transient Thermal Impedance

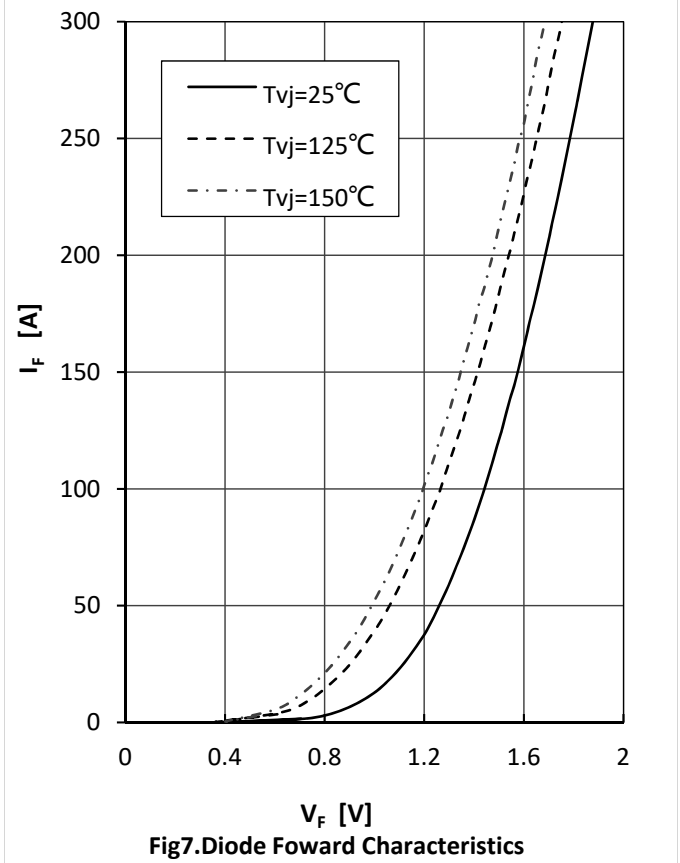


Fig7.Diode Foward Characteristics

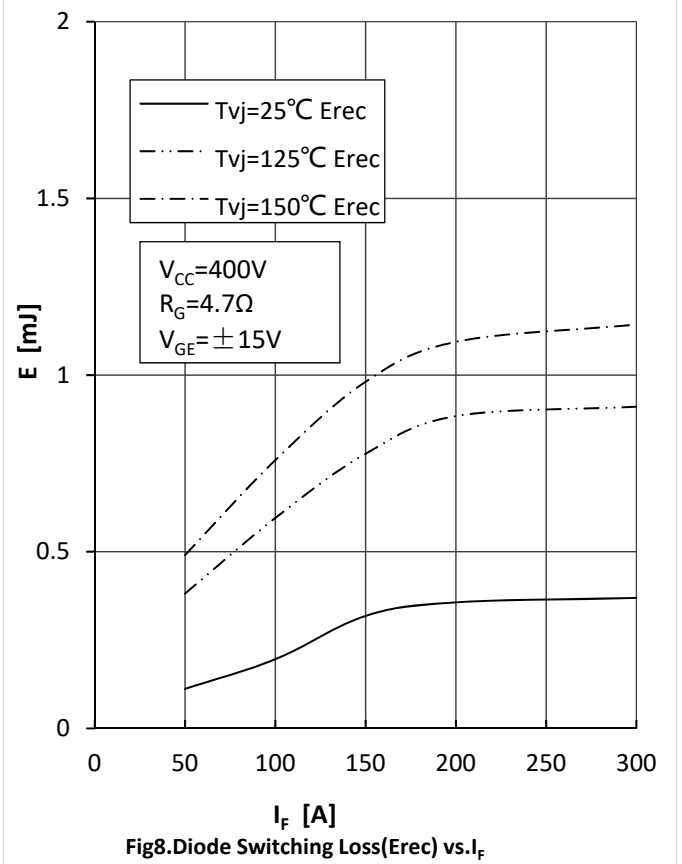


Fig8.Diode Switching Loss(Erec) vs.I_F

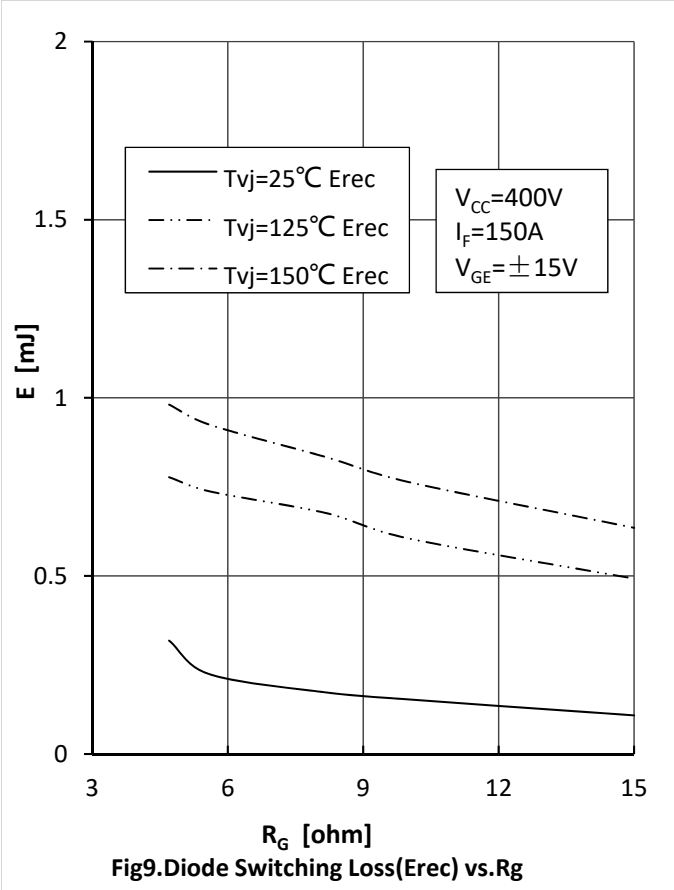


Fig9.Diode Switching Loss(Erec) vs.Rg

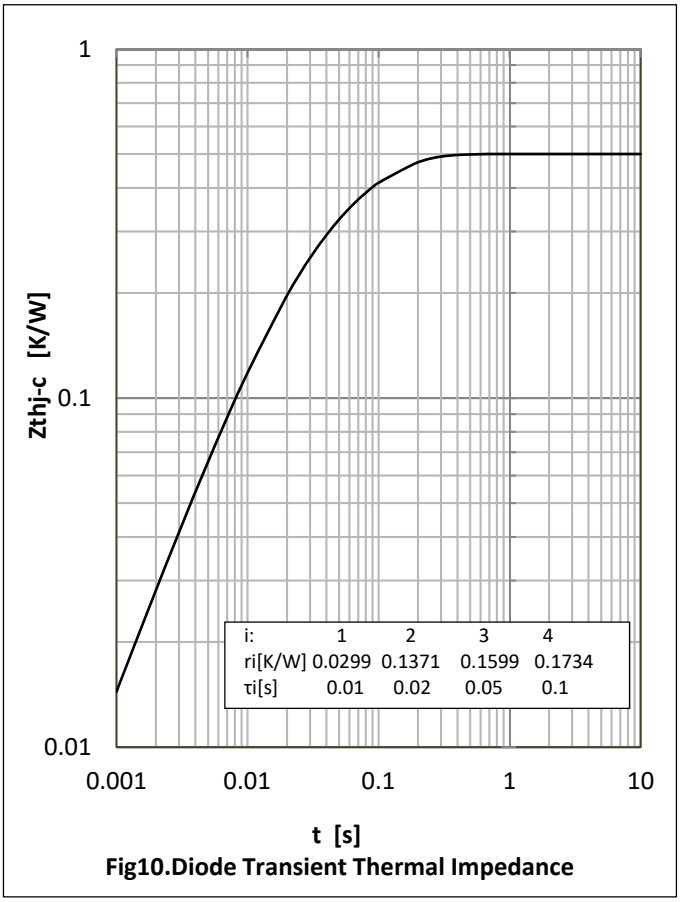
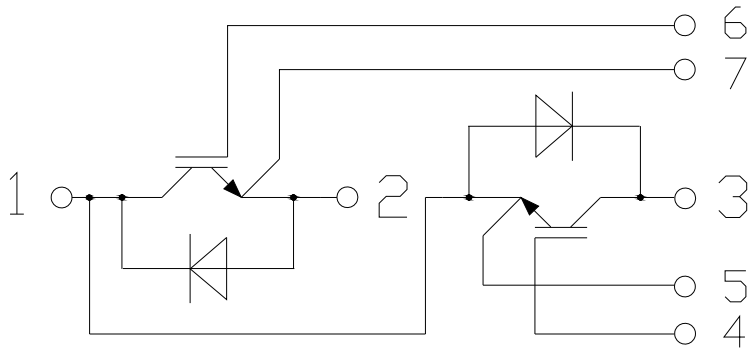


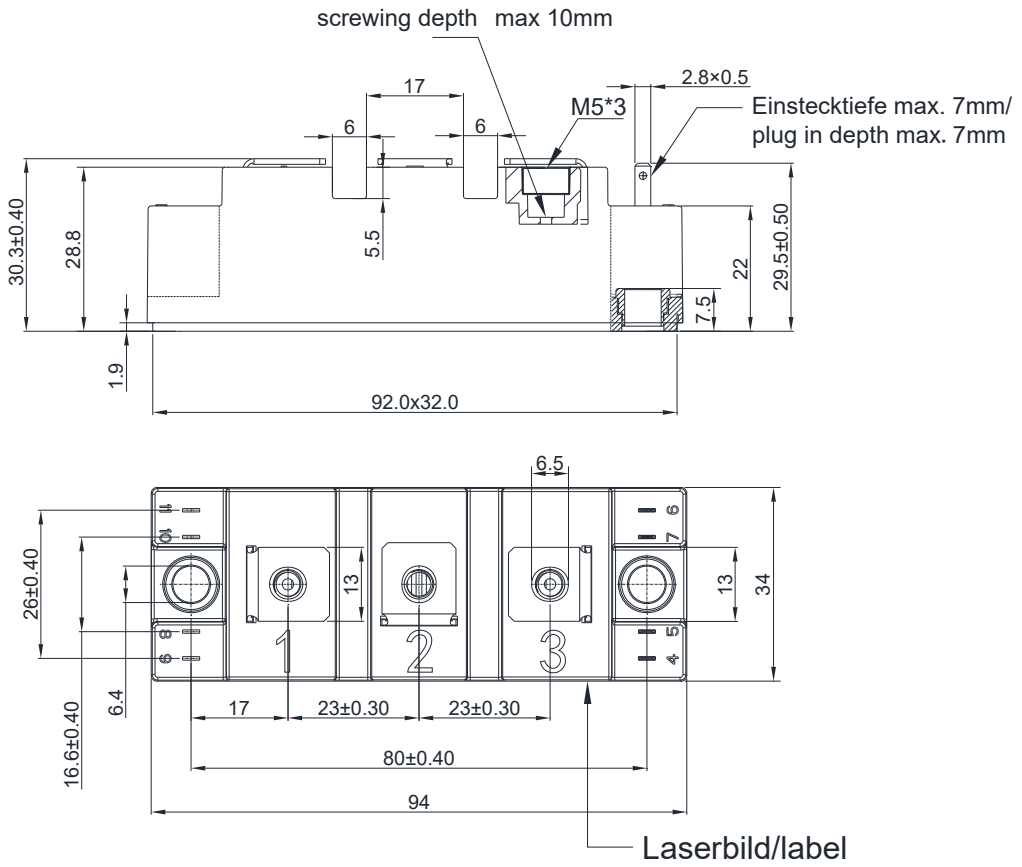
Fig10.Diode Transient Thermal Impedance

Circuit Diagram



● Package Outline Information

Dimensions in Millimeters



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