MG100HF12LEC1

RoHS COMPLIANT



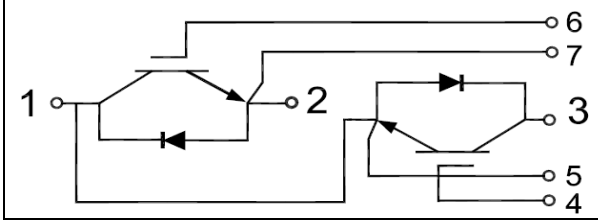
IGBT Modules

V_{CES} 1200V
I_C 100A

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℃	100	A
Repetitive Peak Collector Current	I_{CRM}	t_p=1ms	200	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25℃	±20	V
Total Power Dissipation	P_{tot}	T_C=25℃ T_{vjmax}=150℃	961	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℃	5.0	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=100A,V_{GE}=15V, T_{vj}=25℃		3.1		V
		I_C=100A,V_{GE}=15V, T_{vj}=125℃		3.4		
		I_C=100A,V_{GE}=15V, T_{vj}=150℃		3.5		
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE}=0V, f=1MHz,T_{vj}=25℃		8.89		nF
Reverse Transfer Capacitance	C_{res}			0.61		nF
Gate-Emitter leakage current	I_{GES}	V_{CE}=0 V, V_{GE}=20V,T_{vj}=25℃			400	nA
Turn-on Delay Time	$t_{d(on)}$	I_C=100A V_{CE}=600V V_{GE}=±15V R_G=10Ω T_{vj}=25℃		388		ns
Rise Time	t_r			194		ns
Turn-off Delay Time	$t_{d(off)}$			642		ns
Fall Time	t_f			35		ns
Energy Dissipation During Turn-on Time	E_{on}			24.0		mJ
Energy Dissipation During Turn-off Time	E_{off}			3.9		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C=100A V_{CE}=600V V_{GE}=±15V R_{GO}=10Ω T_{vj}=150℃		353		ns
Rise Time	t_r			168		ns
Turn-off Delay Time	$t_{d(off)}$			692		ns
Fall Time	t_f			72		ns
Energy Dissipation During Turn-on Time	E_{on}			26.0		mJ
Energy Dissipation During Turn-off Time	E_{off}			5.1		mJ
SC Data	I_{sc}	t_p≤10us,V_{GE}=15V,T_{vj}=150℃, V_{cc}=600V,V_{CEM}≤1200V		600		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		100	A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	200	A

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=100A,T_{vj}=25℃		2.00		V
		I_F=100A,T_{vj}=125℃		1.90		
		I_F=100A,T_{vj}=150℃		1.85		
Recovered Charge	Q_{rr}	I_F=100A V_R=600V -di_F/dt =500A/us T_{vj}=25℃		5.2		uC
Peak Reverse Recovery Current	I_{rr}			19		A
Reverse Recovery Energy	E_{rec}			1.4		mJ
Recovered Charge	Q_{rr}	I_F=100A V_R=600V -di_F/dt =500A/us T_{vj}=150℃		11.34		uC
Peak Reverse Recovery Current	I_{rr}			31		A
Reverse Recovery Energy	E_{rec}			3.6		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}				150	℃
Operating Junction Temperature	$T_{vj\ op}$		-40		125	℃
Storage Temperature	T_{stg}		-40		125	℃
Thermal Resistance Junction to Case	$R_{\theta JC}$	per IGBT			0.13	K/W
		per Diode			0.50	
Thermal Resistance Case to Sink	$R_{\theta CS}$	Conductive grease applied		0.05		K/W
Module Electrodes Torque	M_t	Recommended(M5)	2.5		5.0	N·m
Module-to-Sink Torque	M_s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			150		g

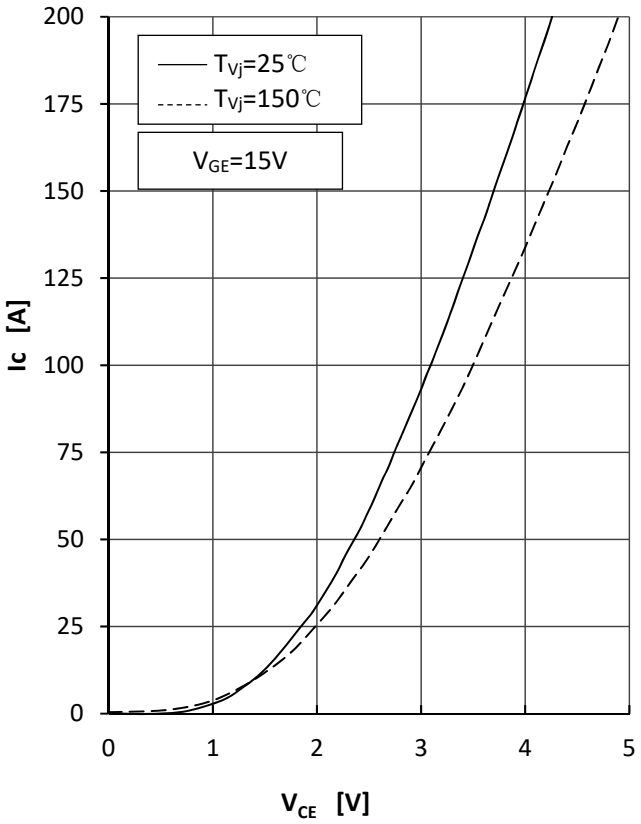


Fig1.IGBT Output Characteristics

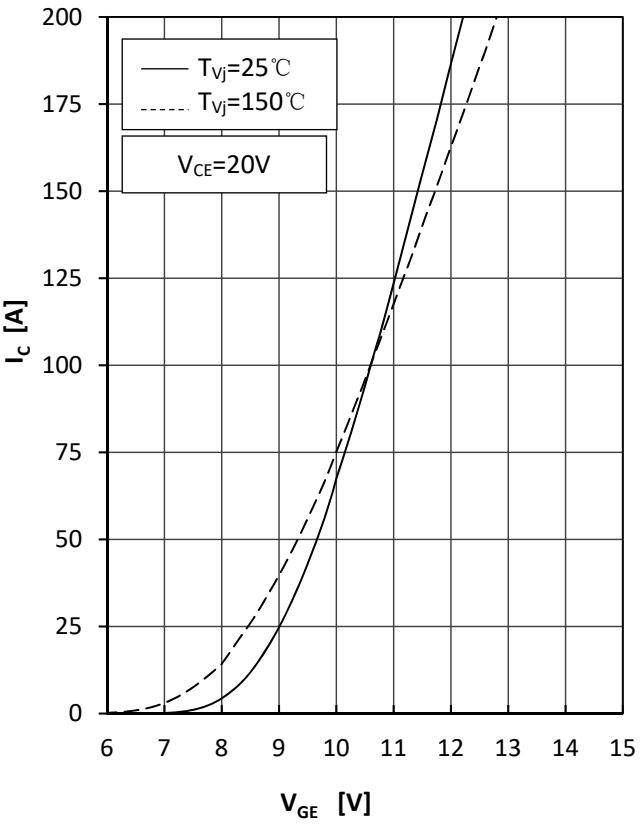


Fig2.IGBT Transfer Characteristics

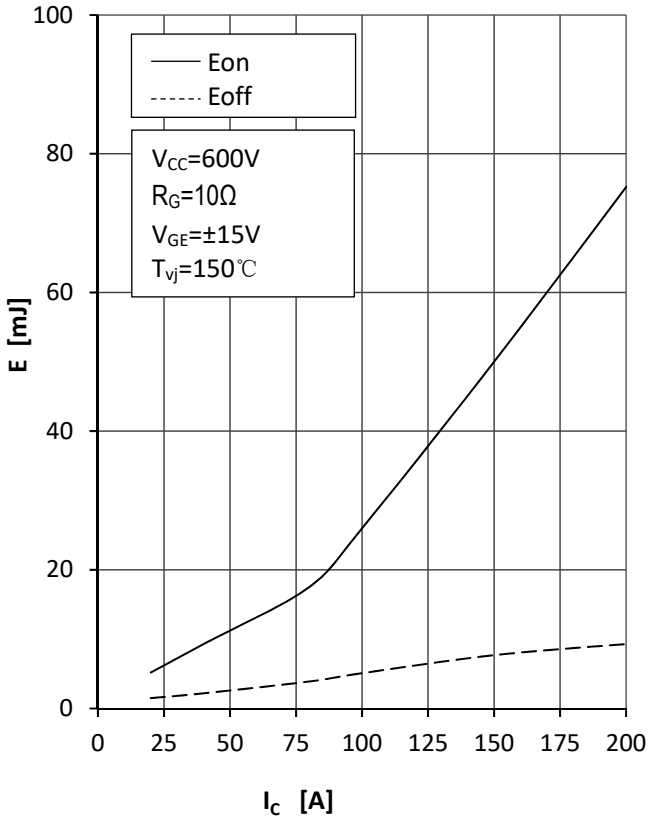


Fig3.IGBT Switching Loss vs.Ic

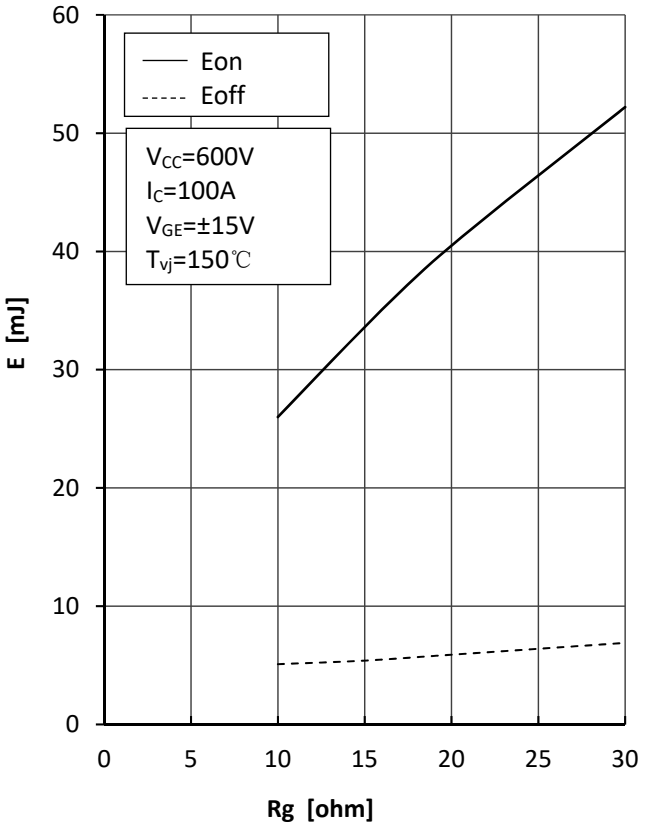


Fig4.IGBT Switching Loss vs.Rg

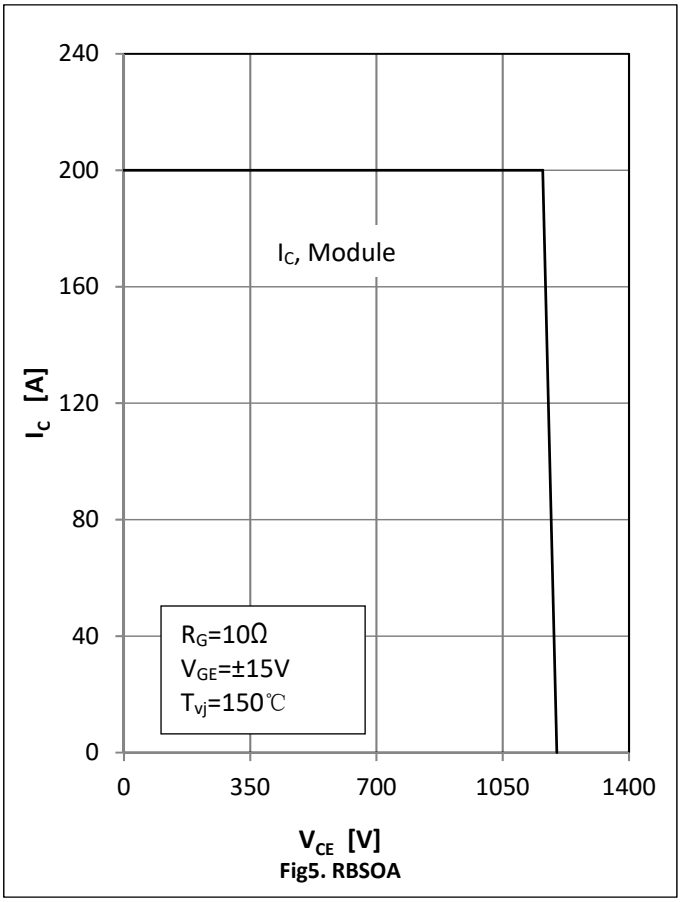


Fig5. RBSOA

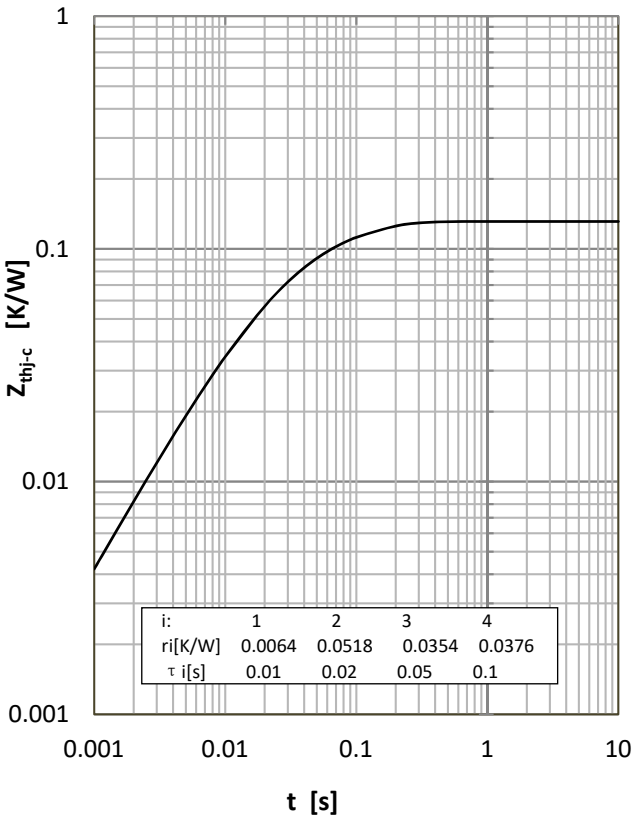


Fig 6. IGBT Transient Thermal Impedance

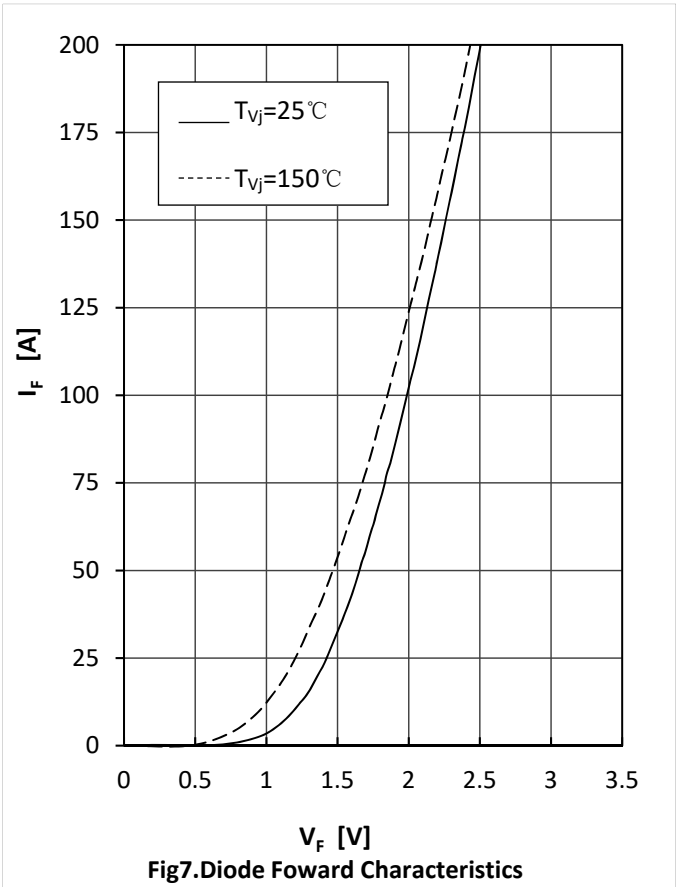


Fig7.Diode Foward Characteristics

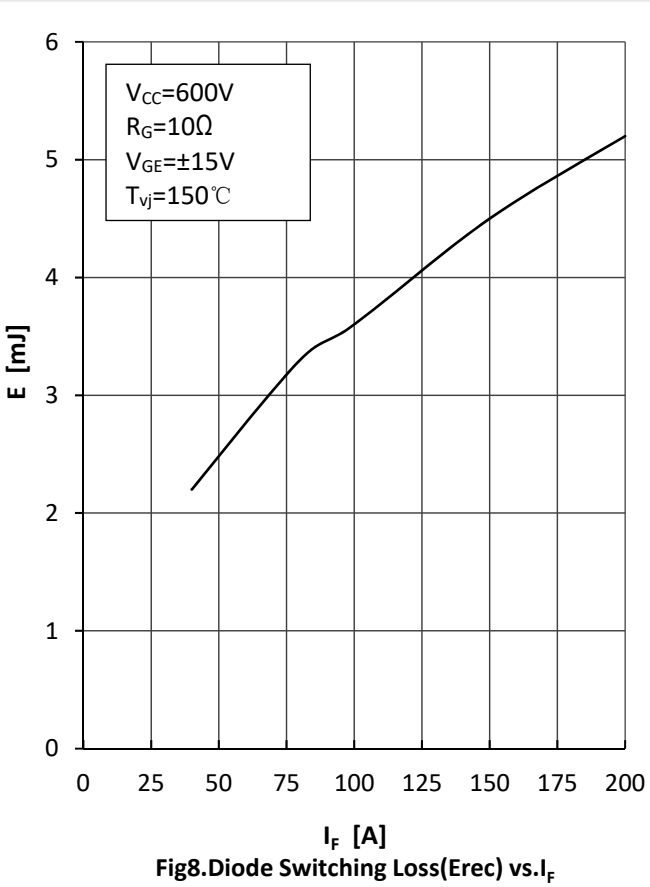


Fig8.Diode Switching Loss(Erec) vs.I_F

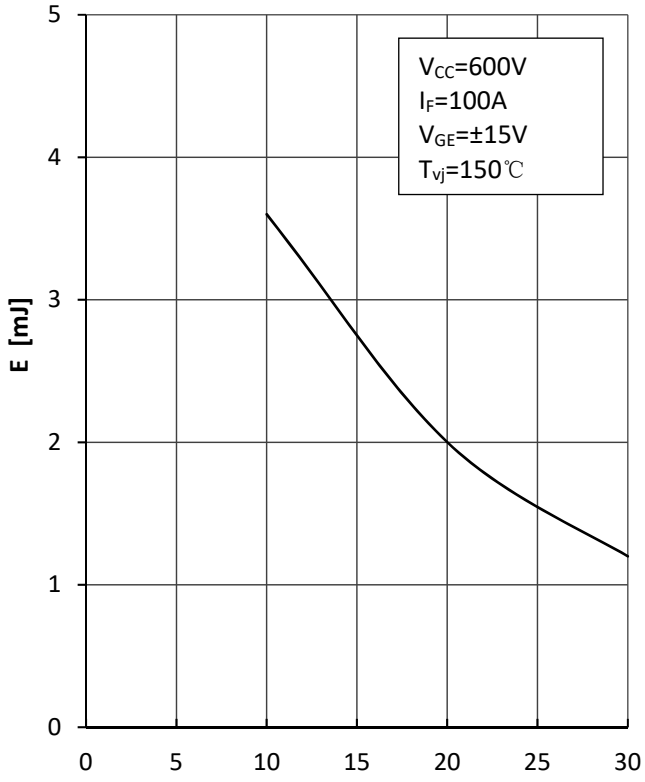


Fig9.Diode Switching Loss(Erec) vs.Rg

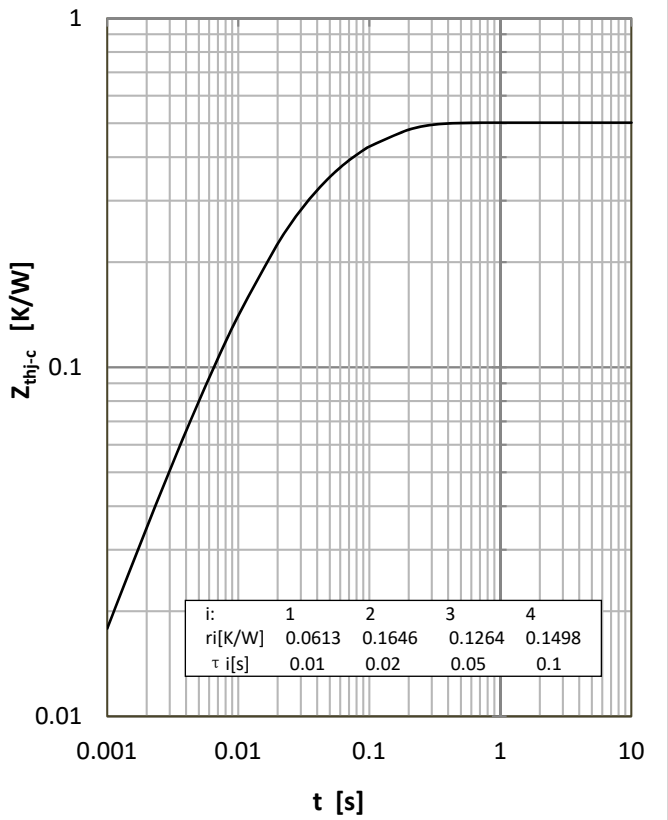
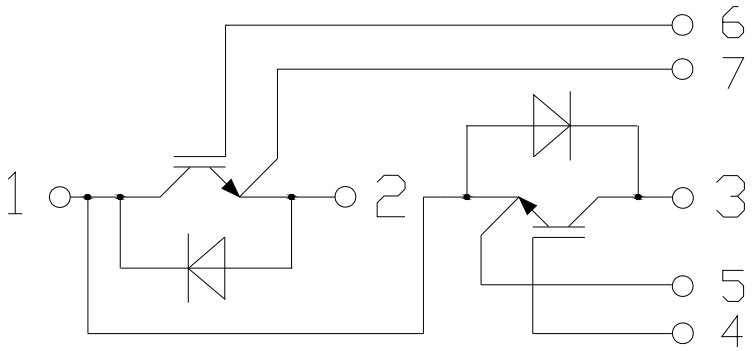


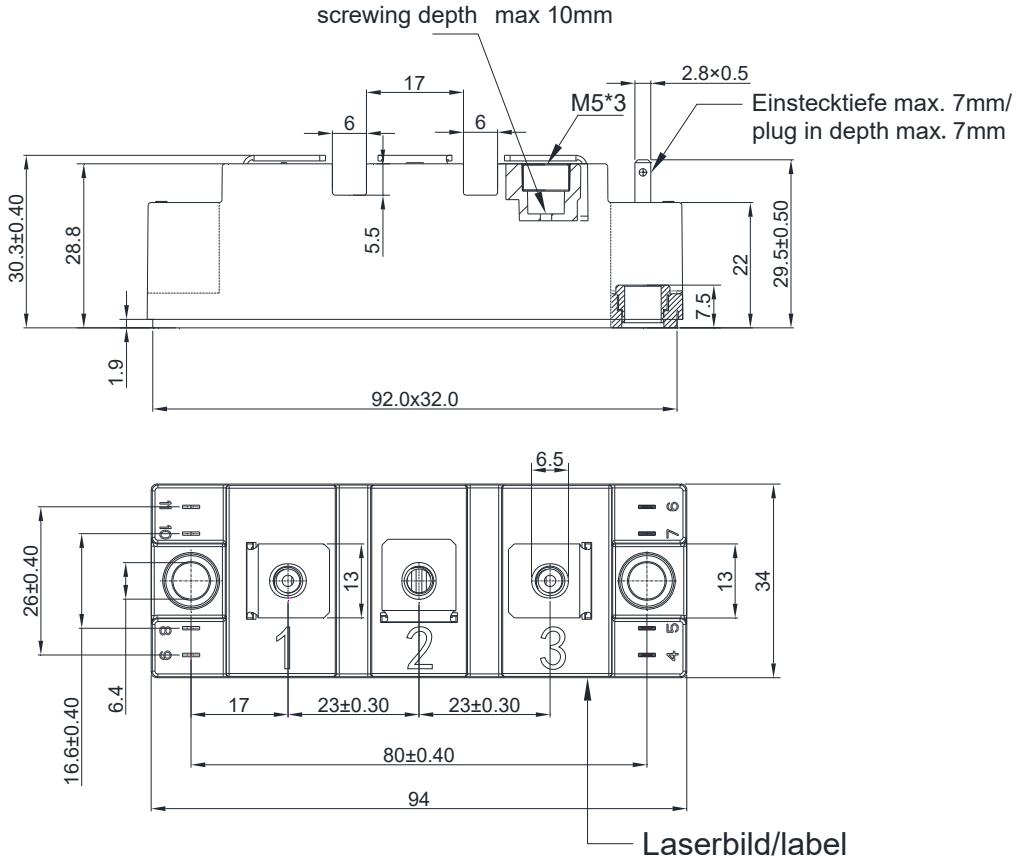
Fig10.Diode Transient Thermal Impedance

- Circuit Diagram



- **Package Outline Information**

Dimensions in Millimeters



Notice

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in STARSEA's terms and conditions of sale for such products, STARSEA assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of STARSEA products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.