



E502650

**Features**

- Low  $V_{CE(sat)}$  With SPT Technology
- $V_{CE(sat)}$  With Positive Temperature Coefficient
- Including Fast & Soft Recovery Anti-parallel FWD
- High Short Circuit Capability(10us)
- Low Inductance Module Structure
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

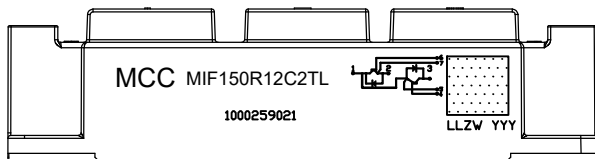
**Applications**

- Inverter for Motor Drive
- AC and DC Servo Driver Amplifier
- UPS(Uninterruptible Power Supplies)
- Soft Switching Welding Machine

**Maximum Ratings**

Parameter	Symbol	Rating	Unit	
Collector-Emitter Voltage@ $V_{GE}=0V, I_C=1mA, T_{vj}=25^{\circ}C$	$V_{CES}$	1200	V	
Continuous Collector Current @ $T_C=100^{\circ}C$	$I_C$	150	A	
Peak Collector Current @ $T_p=1ms$	$I_{CRM}$	300	A	
Gate-Emitter Voltage@ $T_{vj}=25^{\circ}C$	$V_{GE}$	$\pm 20$	V	
Isolation Voltage @ $f=50Hz, t=1min$	$V_{iso}$	2500(Min)	V	
Weight of Module	G	315	g	
Module Electrodes Torque:M6	$M_t$	3~5	N*m	
Module-to-Sink Torque :M6	$M_s$	3~5	N*m	
Total Power Dissipation (IGBT-Inverter)	$T_C=25^{\circ}C$	$P_{tot}$	833	W
	$T_{vjmax}=175^{\circ}C$			

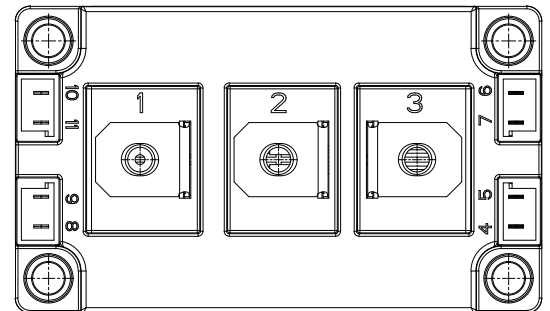
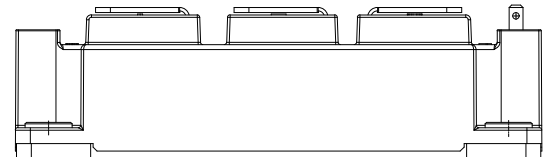
**Module Marking**



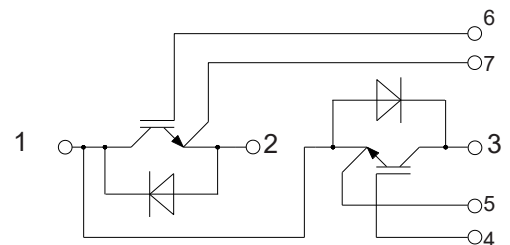
Marking Code Contents:  
 Logo: MCC  
 Product Number:MIF150R12C2TL  
 Trace Code: 10 Digits  
 Circuit Diagram  
 2D Code format: Data Matrix

**IGBT Modules**  
**1200V 150A**

C2



Circuit Diagram



**Electrical Characteristics of IGBT @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=4mA, T_{vj}=25^{\circ}C$	5.2	5.9	6.4	V	
Collector-Emiter Cut-off Current	$I_{CES}$	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1.0	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=150A, T_{vj}=25^{\circ}C$		1.85		V	
		$V_{GE}=15V, I_C=150A, T_{vj}=125^{\circ}C$		2.05			
Gate Charge	$Q_G$			1.56		uC	
Input Capacitance	$C_{ies}$	$V_{CE}=25V, V_{GE}=0V, f=1MHz, T_{vj}=25^{\circ}C$		11		nF	
Reverse Transfer Capacitance	$C_{res}$			0.5			
Gate Emitter Leakage Current	$I_{GES}$	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA	
Turn-On Delay Time	$t_{d(on)}$	$V_{CE}=600V, I_C=150A, V_{GE}=\pm 15V, R_G=4.7\Omega, T_{vj}=25^{\circ}C$		196		ns	
Rise Time	$t_r$			57			
Turn-Off Delay Time	$t_{d(off)}$			263			
Fall Time	$T_f$			126			
Energy Dissipation During Turn-on Time	$E_{on}$			18			mJ
Energy Dissipation During Turn-off Time	$E_{off}$		7.9				
Turn-On Delay Time	$t_{d(on)}$	$V_{CE}=600V, I_C=150A, V_{GE}=\pm 15V, R_G=4.7\Omega, T_{vj}=150^{\circ}C$		202		ns	
Rise Time	$t_r$			69			
Turn-Off Delay Time	$t_{d(off)}$			304			
Fall Time	$T_f$			191			
Energy Dissipation During Turn-on Time	$E_{on}$			24.6			mJ
Energy Dissipation During Turn-off Time	$E_{off}$			10.6			
SC data	$I_{sc}$	$T_P \leq 10\mu s, V_{GE}=15V, T_{vj}=150^{\circ}C, V_{CC}=900, V_{CEM} \leq 1200V$		890		A	

**Electrical Characteristics of DIODE @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$	$T_{vj}=25^{\circ}C$	1200	V
Continuous DC Forward Current	$I_F$		150	A
Repetitive Peak Forward Current	$I_{FRM}$	$t_p=1ms$	300	A

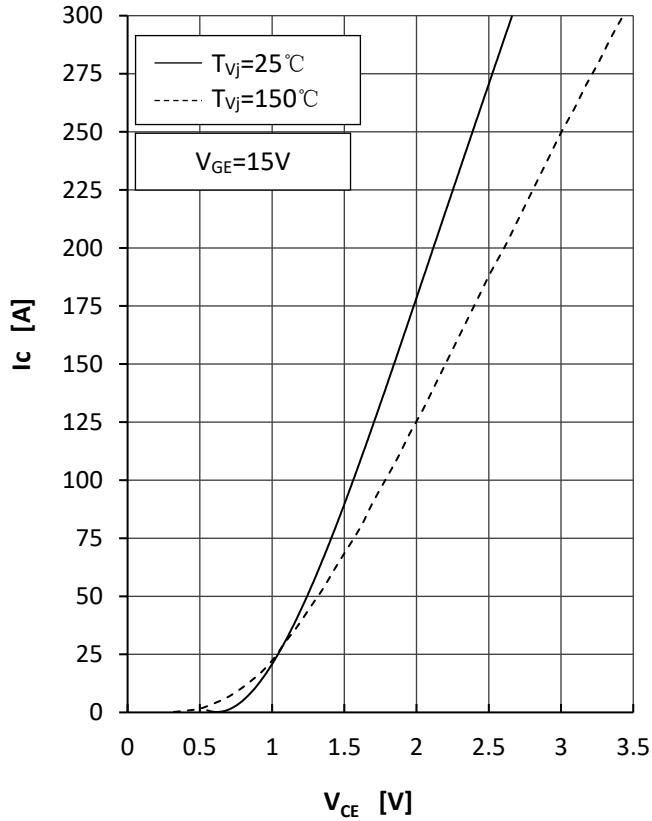
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Voltage	$V_F$	$I_F=150A, T_{vj}=25^{\circ}C$		1.9	2.4	V
		$I_F=150A, T_{vj}=125^{\circ}C$		1.75		
Recovered Charge	$Q_{rr}$	$I_F=150A$ $V_R=600V$		8.6		$\mu C$
Peak Reverse Recovery Current	$I_{rr}$	$-diF/dt = 2000A/us$		48		A
Reverse Recovery Energy	$E_{rec}$	$T_{vj}=25^{\circ}C$		2.7		mJ
Recovered Charge	$Q_{rr}$	$I_F=150A$ $V_R=600V$		23.4		$\mu C$
Peak Reverse Recovery Current	$I_{rr}$	$-diF/dt = 2000A/us$		70		A
Reverse Recovery Energy	$E_{rec}$	$T_{vj}=150^{\circ}C$		8.2		mJ

**Module Characteristics**

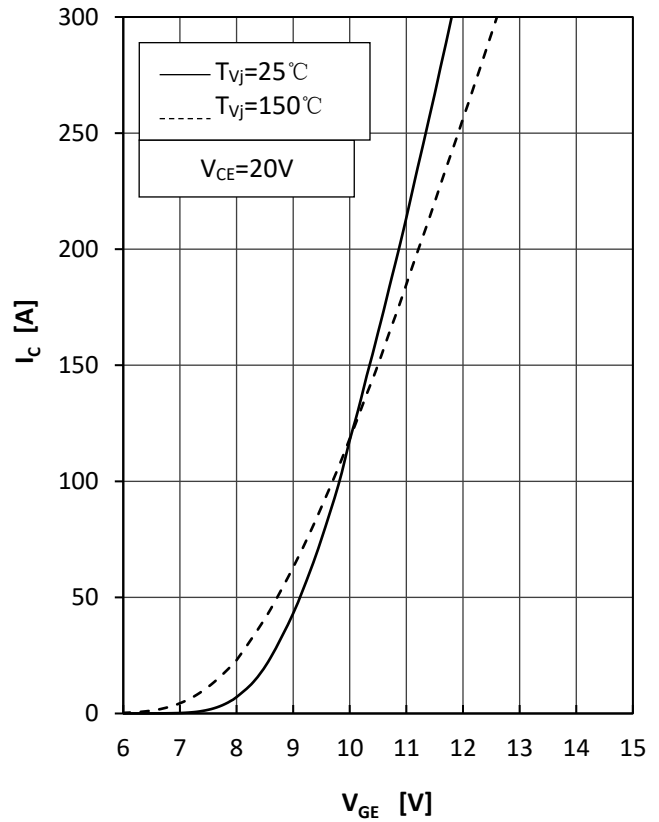
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Isolation Voltage	$V_{isol}$	$t=1min, f=50Hz$	2500			V
Maximum Junction Temperature	$T_{jmax}$				175	$^{\circ}C$
Operating Junction Temperature	$T_{vj op}$		-40		150	$^{\circ}C$
Storage Temperature	$T_{stg}$		-40		125	$^{\circ}C$
Thermal Resistance Junction 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

**Curve Characteristics**

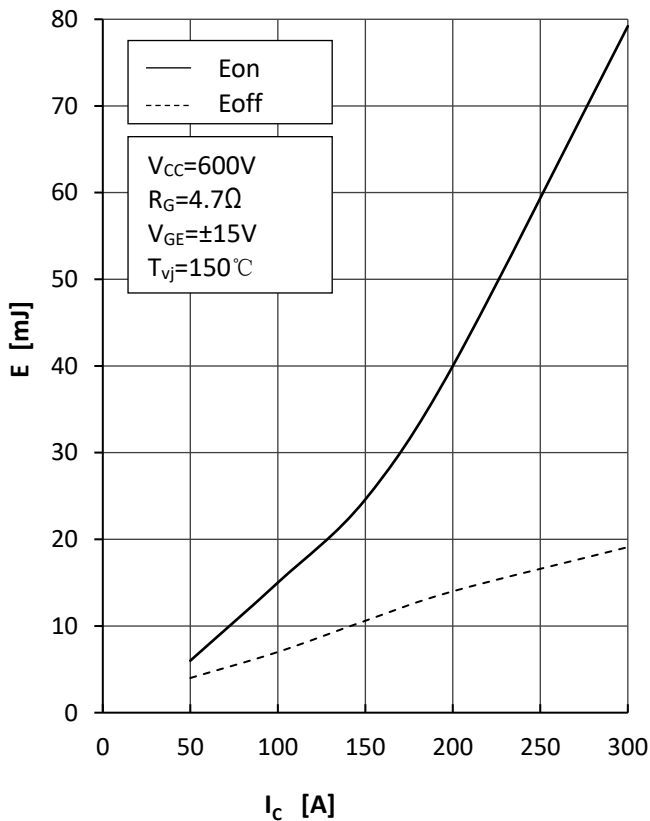
**Fig1.IGBT Output Characteristics**



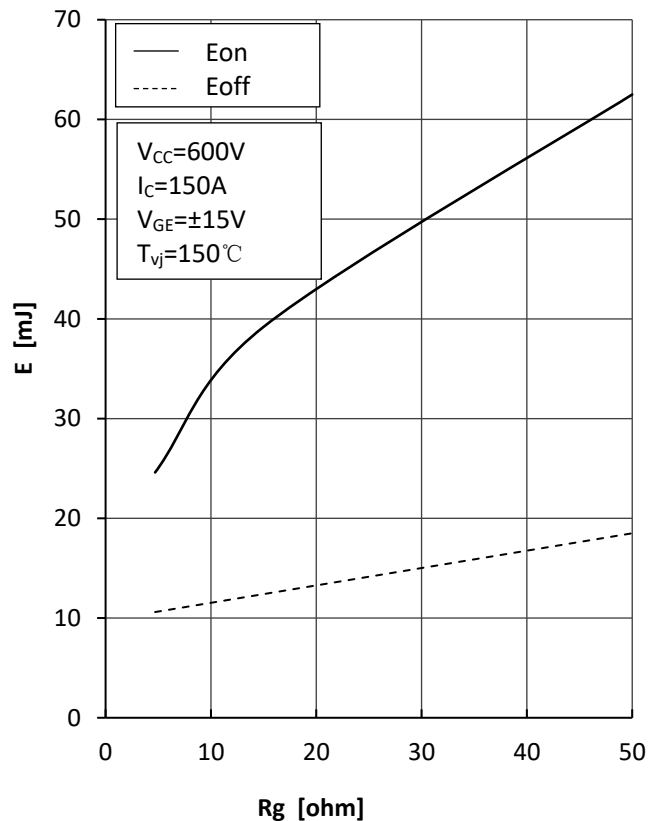
**Fig2. IGBT Transfer Characteristics**



**Fig3.IGBT Switching Loss vs.Ic**



**Fig4.IGBT Switching Loss vs.Rg**



Curve Characteristics

Fig5. RBSOA

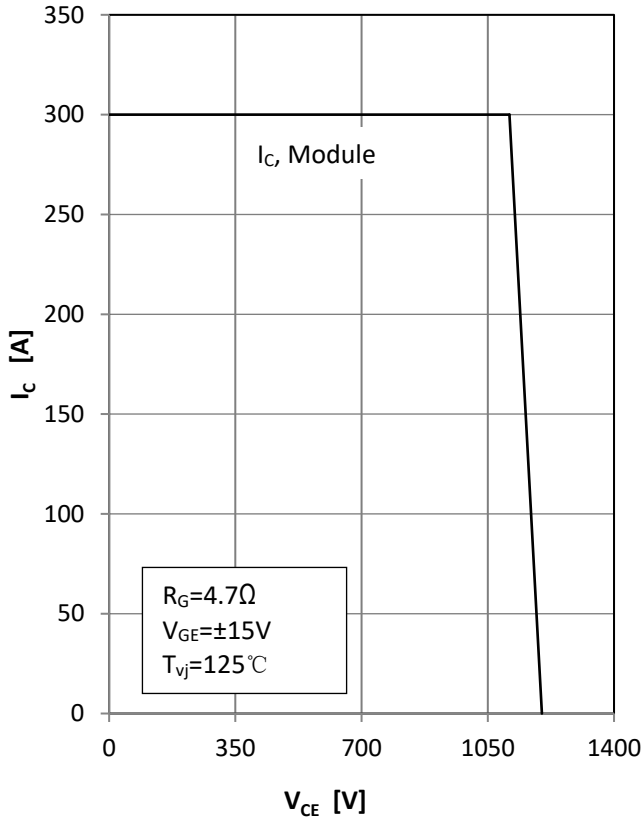


Fig 6. IGBT Transient Thermal Impedance

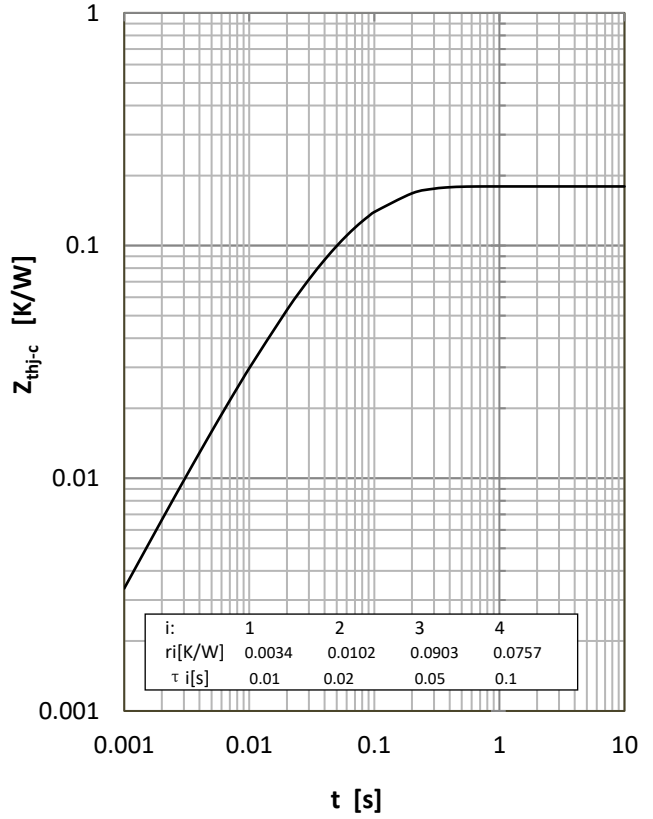


Fig7. Diode Foward Characteristics

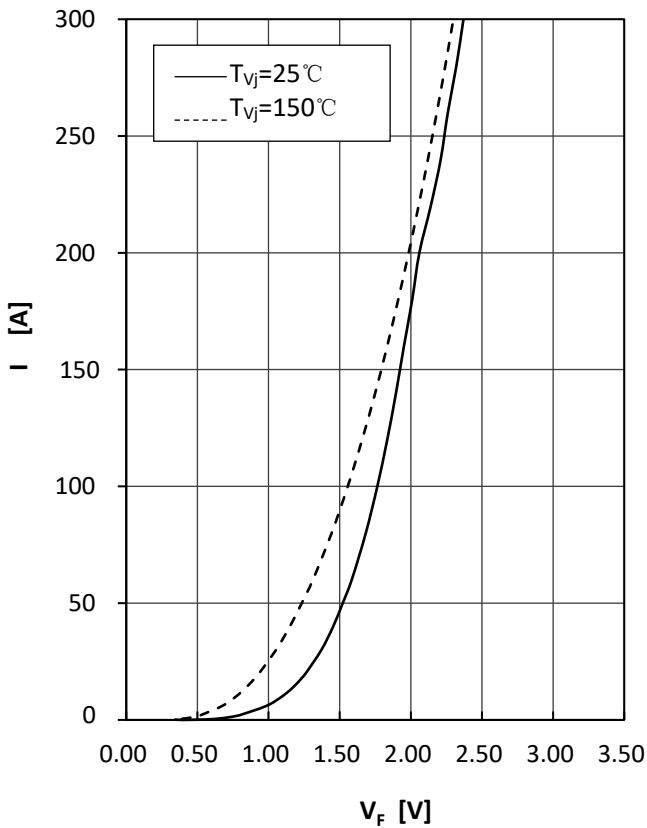
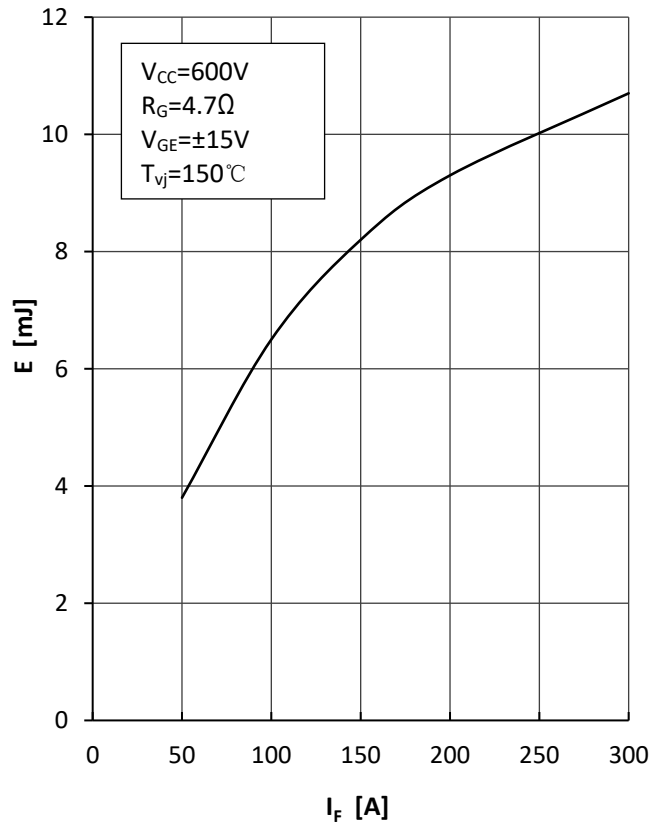


Fig8. Diode Switching Loss( $E_{rec}$ ) vs.  $I_F$



Curve Characteristics

Fig9.Diode Switching Loss( $E_{rec}$ ) vs. $R_g$

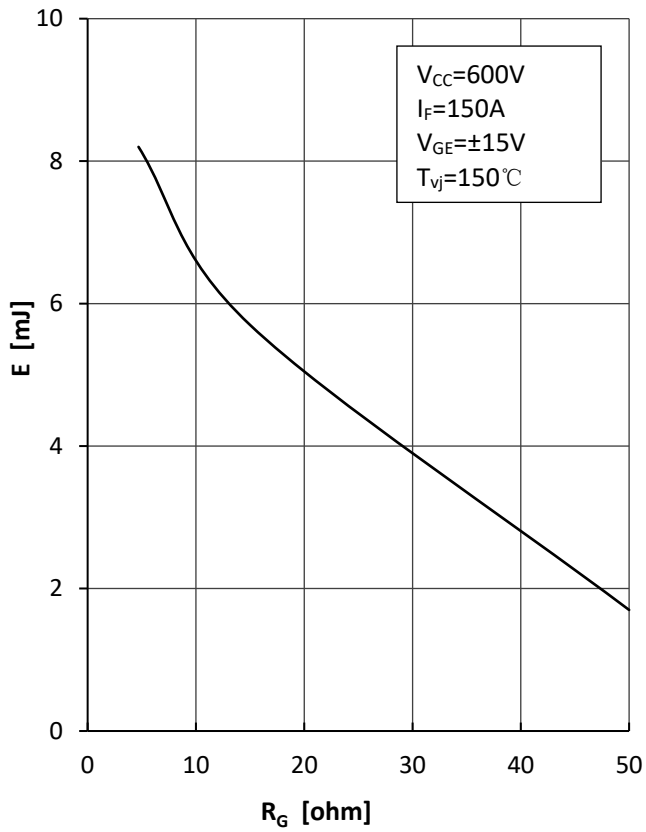
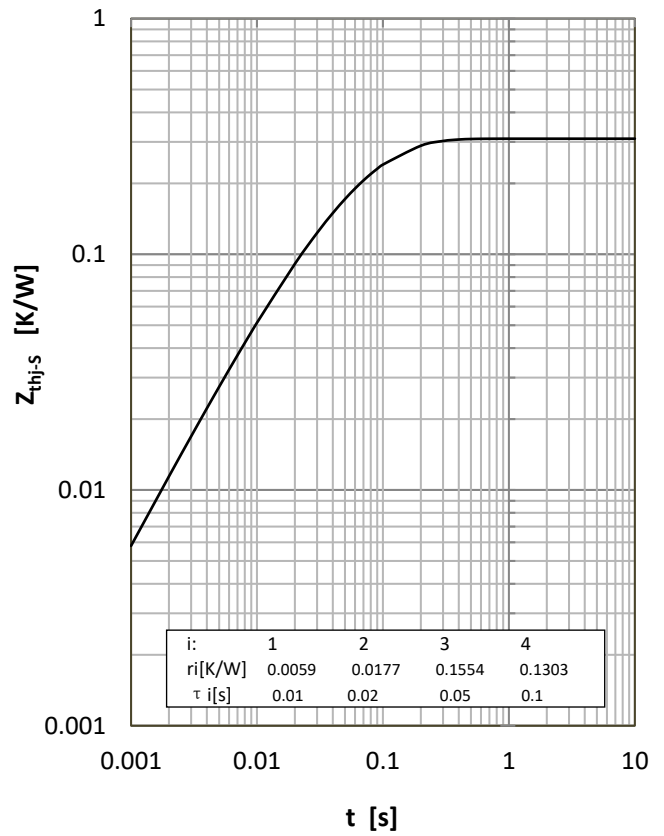


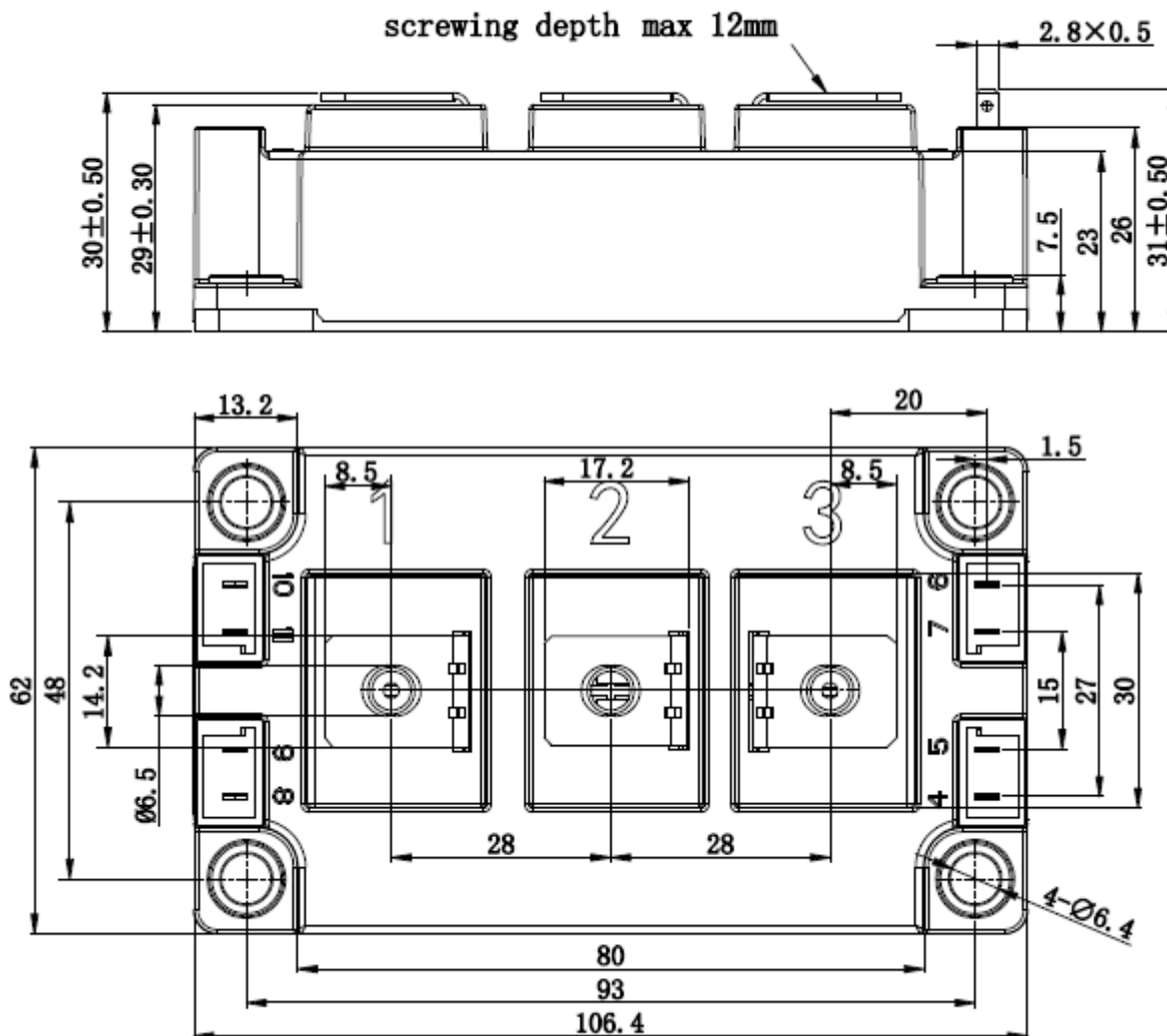
Fig10.Diode Transient Thermal Impedance



Package Dimensions

**C2**

Dimensions in Millimeters



## Ordering Information

Device	Packing
Part Number-BP	Bulk: 6pcs/Box ; 30pcs/Ctn

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