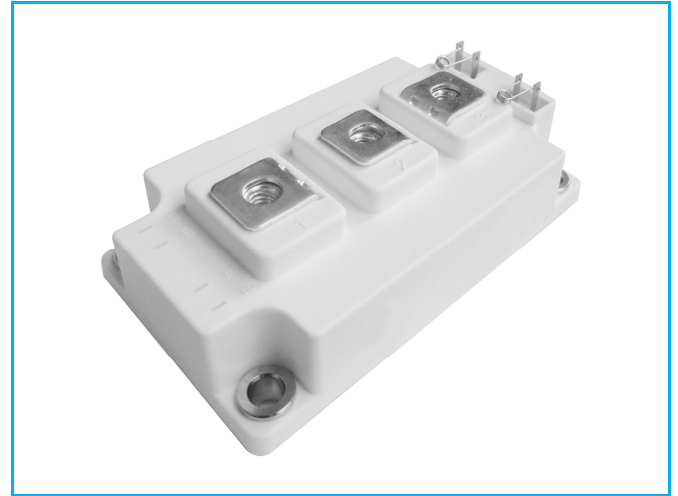


PRODUCT FEATURES

- ☐ High short circuit capability, self limiting short circuit current
- ☐ IGBT CHIP(Trench+Field Stop technology)
- ☐ $V_{CE(sat)}$ with positive temperature coefficient
- ☐ Ultra Low Loss, High Ruggedness
- ☐ Free wheeling diodes with fast and soft reverse recovery

APPLICATIONS

- ☐ AC motor control
- ☐ Motion/servo control
- ☐ Inverter and power supplies
- ☐ Photovoltaic/Fuel cell



IGBT-inverter

ABSOLUTE MAXIMUM RATINGS($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	$T_J=25^{\circ}\text{C}$	1700	V
V_{GES}	Gate Emitter Voltage		± 20	
I_C	DC Collector Current	$T_C=25^{\circ}\text{C}$	460	A
		$T_C=100^{\circ}\text{C}$	300	
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	600	
P_{tot}	Power Dissipation Per IGBT		2000	W

Diode-inverter

ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^{\circ}\text{C}$	1700	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^{\circ}\text{C}$	300	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	600	
I^2t		$T_J=150^{\circ}\text{C}$, $t=10\text{ms}$, $V_R=0\text{V}$	14500	A^2S

MacMic Science & Technology Co., Ltd.

Add: #18, Hua Shan Zhong Lu, New District, Changzhou City, Jiangsu Province, P. R .of China

Tel.: +86-519-85163708 Fax: +86-519-85162291 Post Code: 213022 Website: www.macmicst.com

MMGT300D170B6C

IGBT-inverter

ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit	
V _{GE(th)}	Gate Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =12mA	5.2	5.8	6.4	V	
V _{CE(sat)}	Collector Emitter Saturation Voltage	I _C =300A, V _{GE} =15V, T _J =25℃		2.05	2.5		
		I _C =300A, V _{GE} =15V, T _J =150℃		2.55			
I _{CES}	Collector Leakage Current	V _{CE} =1700V, V _{GE} =0V, T _J =25℃			3	mA	
		V _{CE} =1700V, V _{GE} =0V, T _J =150℃			20	mA	
I _{GES}	Gate Leakage Current	V _{CE} =0V,V _{GE} =±15V, T _J =25℃	-400		400	nA	
R _{gint}	Integrated Gate Resistor			2.5		Ω	
Q _g	Gate Charge	V _{CE} =900V, I _C =300A , V _{GE} =15V		2		μC	
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		44		nF	
C _{res}	Reverse Transfer Capacitance			0.4		nF	
t _{d(on)}	Turn on Delay Time	V _{CC} =900V,I _C =300A R _G =4.7Ω, V _{GE} =±15V, Inductive Load	T _J =25℃	350		ns	
			T _J =150℃	400		ns	
t _r	Rise Time		T _J =25℃	100		ns	
			T _J =150℃	105		ns	
t _{d(off)}	Turn off Delay Time		T _J =25℃	600		ns	
			T _J =150℃	680		ns	
t _f	Fall Time		T _J =25℃	200		ns	
			T _J =150℃	350		ns	
E _{on}	Turn on Energy	V _{CC} =900V,I _C =300A R _G =4.7Ω, V _{GE} =±15V, Inductive Load	T _J =25℃	128		mJ	
			T _J =125℃	155		mJ	
			T _J =150℃	160		mJ	
E _{off}	Turn off Energy		T _J =25℃	55		mJ	
			T _J =125℃	65		mJ	
			T _J =150℃	68		mJ	
I _{SC}	Short Circuit Current		tpsc≤10μS , V _{GE} =15V T _J =125℃,V _{CC} =1000V		2000		A
R _{thJC}	Junction to Case Thermal Resistance （ Per IGBT ）				0.075	K /W	

Diode-inverter

ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V _F	Forward Voltage	I _F =300A , V _{GE} =0V, T _J =25℃		1.8	2.2	V
		I _F =300A , V _{GE} =0V, T _J =150℃		1.85		
t _{rr}	Reverse Recovery Time	I _F =300A , V _R =900V dI _F /dt=-2850A/μs T _J =150℃		1000		ns
I _{RRM}	Max. Reverse Recovery Current			260		A
Q _{RR}	Reverse Recovery Charge			130		μC
E _{rec}	Reverse Recovery Energy			83		mJ
R _{thJCD}	Junction to Case Thermal Resistance （ Per Diode ）				0.15	K /W

MMGT300D170B6C

MODULE CHARACTERISTICS ($T_c=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature		175	$^{\circ}\text{C}$
T_{Jop}	Operating Temperature		-40~150	
T_{stg}	Storage Temperature		-40~125	
V_{isol}	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), $t=1\text{minute}$	4000	V
CTI	Comparative Tracking Index		> 225	
Torque	to heatsink	Recommended (M6)	3~5	Nm
	to terminal	Recommended (M6)	2.5~5	Nm
Weight			300	g

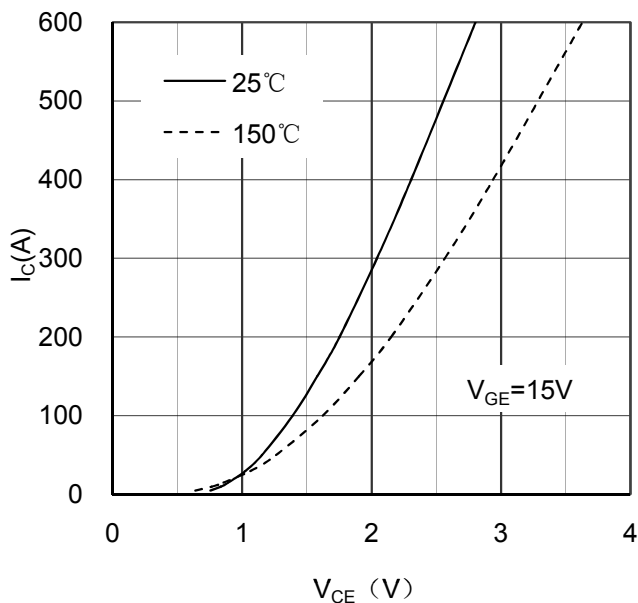


Figure 1. Typical Output Characteristics IGBT-inverter

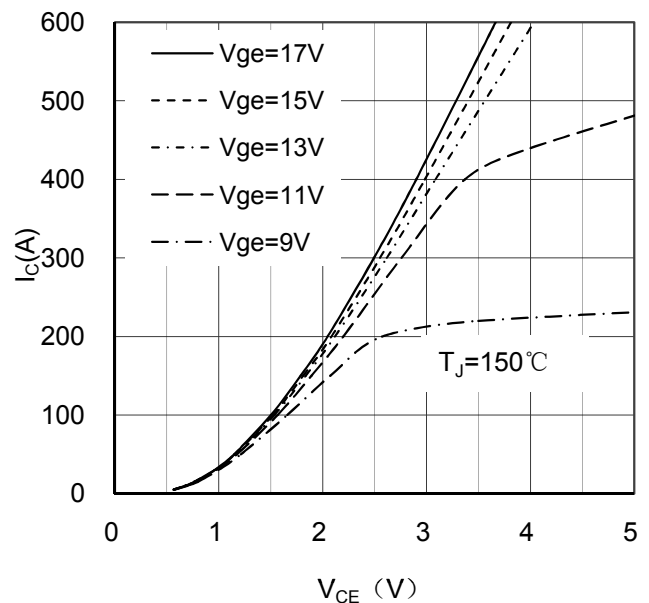


Figure 2. Typical Output Characteristics IGBT-inverter

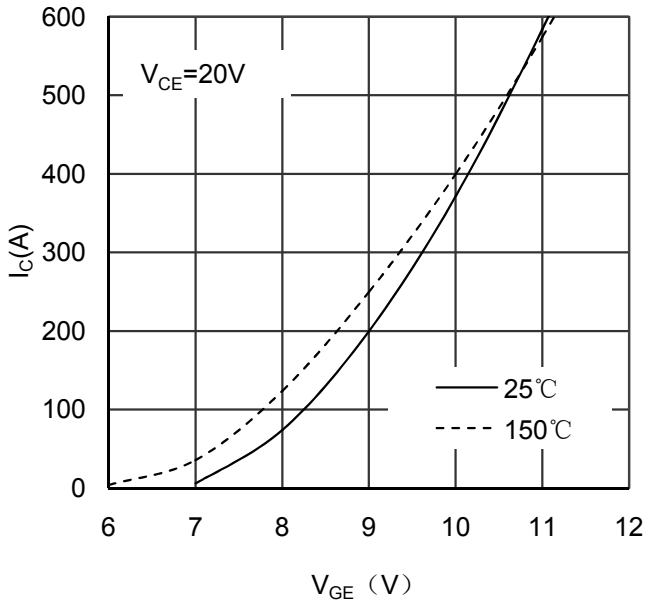


Figure 3. Typical Transfer characteristics IGBT-inverter

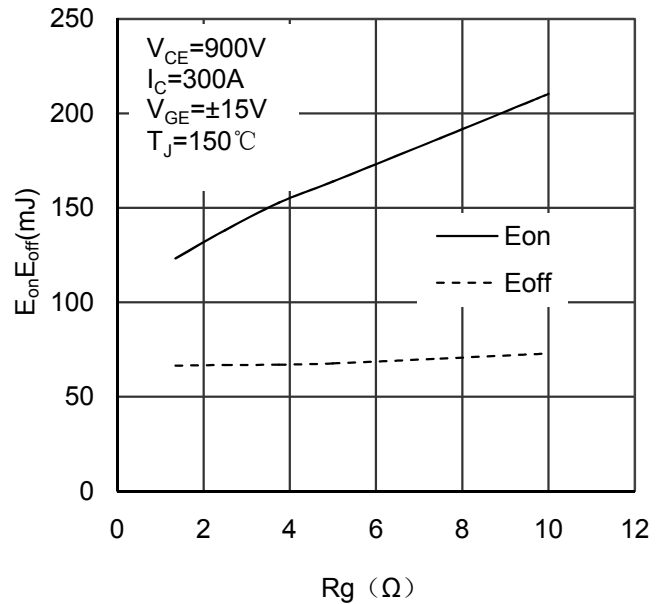


Figure 4. Switching Energy vs Gate Resistor IGBT-inverter

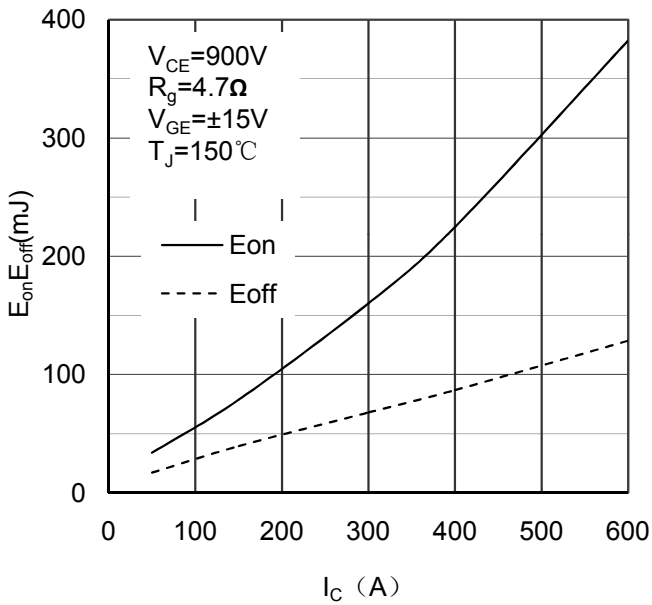


Figure 5. Switching Energy vs Collector Current IGBT-inverter

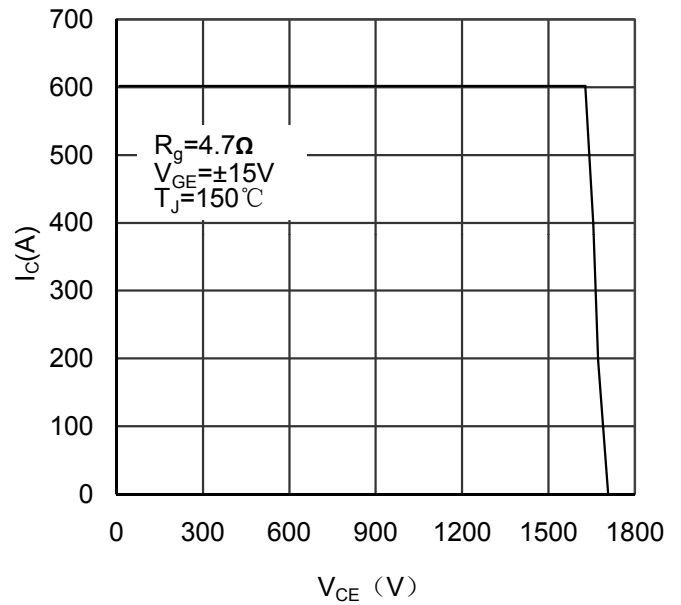


Figure 6. Reverse Biased Safe Operating Area IGBT-inverter

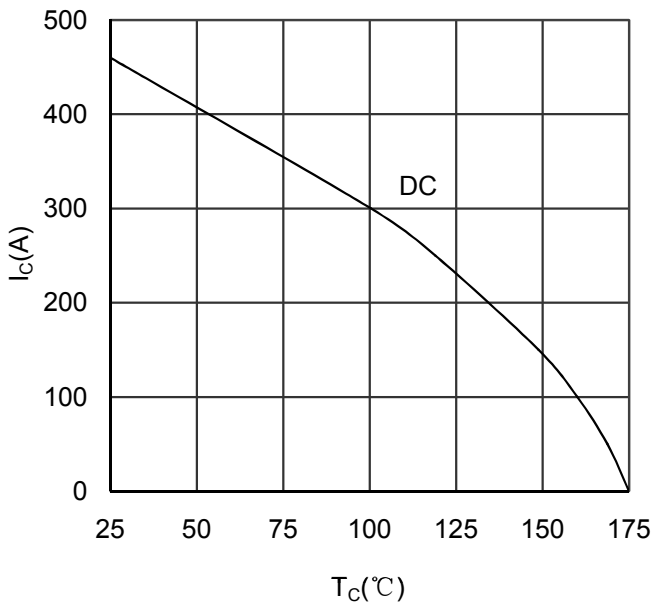


Figure 7. Collector Current vs Case temperature IGBT-inverter

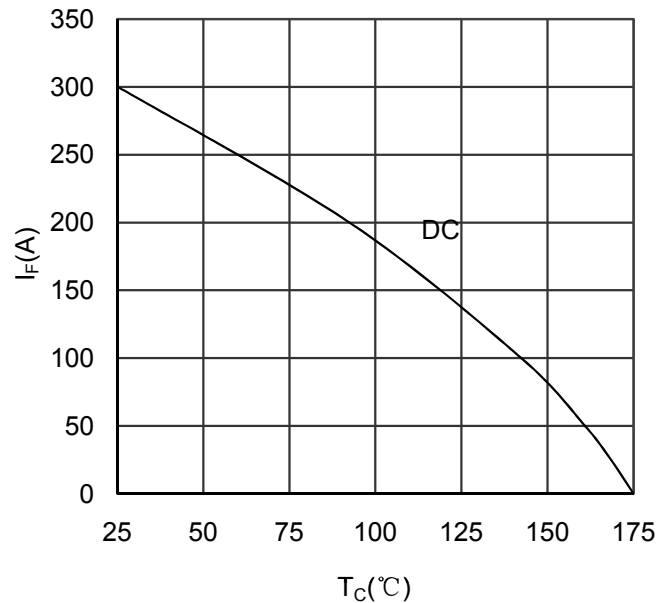


Figure 8. Forward current vs Case temperature Diode-inverter

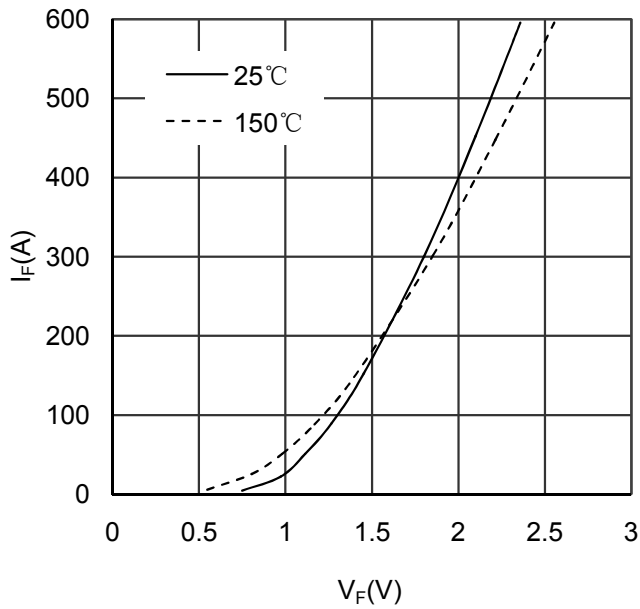


Figure 9. Diode Forward Characteristics Diode -inverter

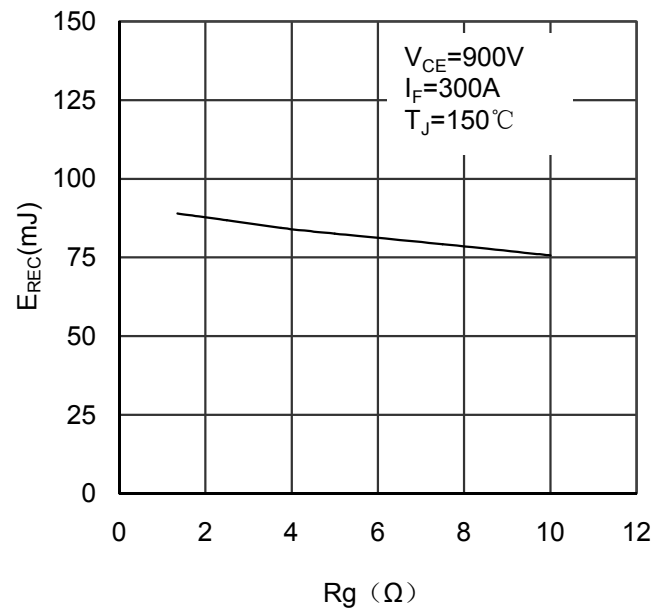


Figure 10. Switching Energy vs Gate Resistor Diode - inverter

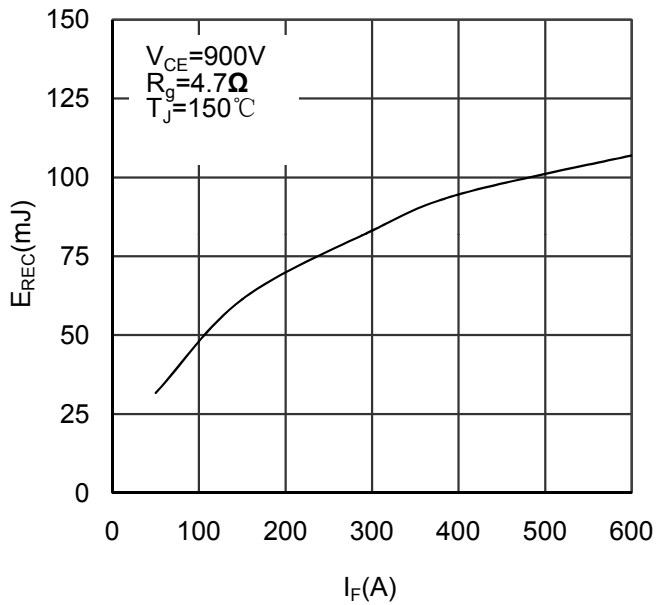


Figure 11. Switching Energy vs Forward Current Diode-inverter

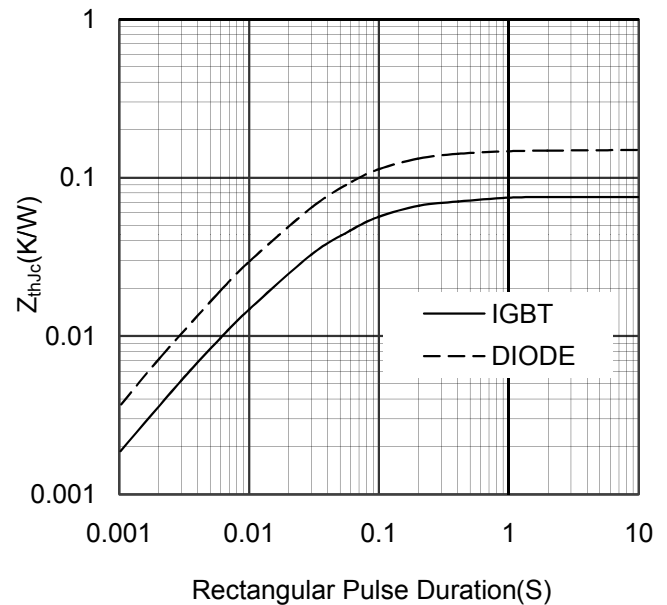


Figure 12. Transient Thermal Impedance of Diode and IGBT-inverter

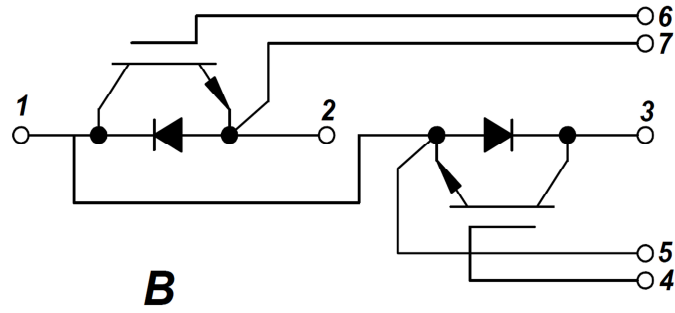
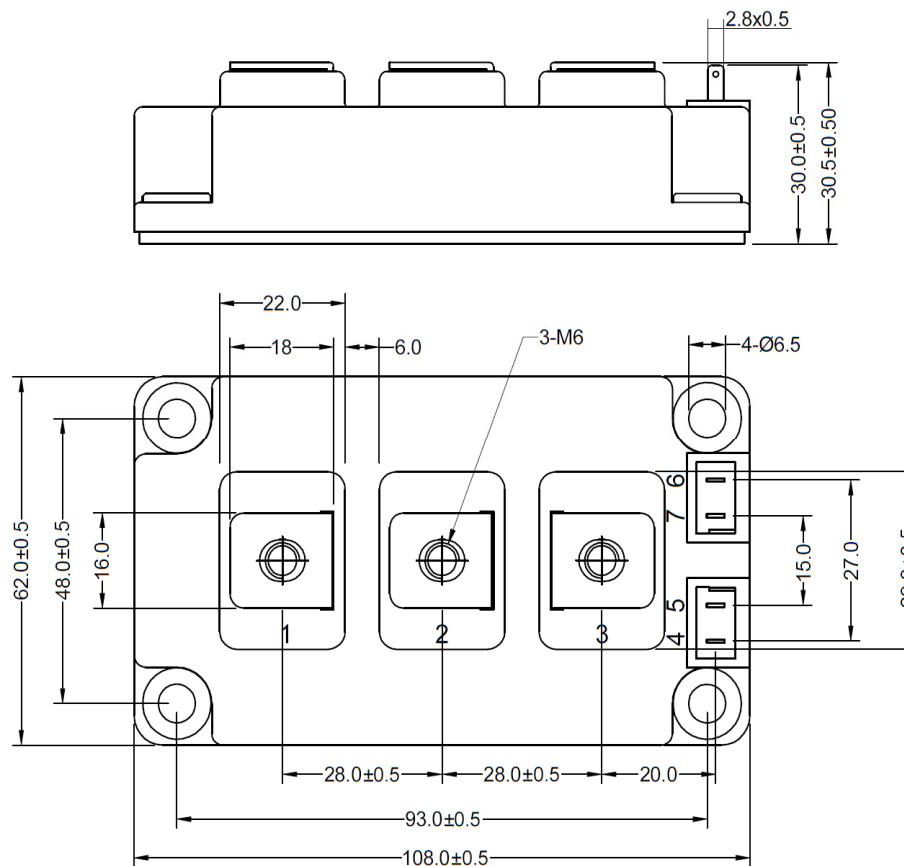


Figure 13. Circuit Diagram



Dimensions in (mm)

Figure 14. Package Outline