

PRODUCT FEATURES

- ☐ IGBT CHIP(Trench+Field Stop technology)
- ☐ $V_{CE(sat)}$ with positive temperature coefficient
- ☐ High short circuit capability
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐ Low switching losses

APPLICATIONS

- ☐ High frequency switching application
- ☐ Medical applications
- ☐ Motion/servo control
- ☐ UPS systems



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	$T_J=25^{\circ}\text{C}$	1200	V
V_{GES}	Gate Emitter Voltage		± 20	
I_C	DC Collector Current	$T_C=25^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	300	A
		$T_C=100^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	200	
I_{CM}	Repetitive Peak Collector Current	$tp=1\text{ms}$	400	
P_{tot}	Power Dissipation Per IGBT	$T_C=25^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	1071	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	$T_J=25^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current		200	A
I_{FRM}	Repetitive Peak Forward Current	$tp=1\text{ms}$	400	
I^2t		$T_J=125^{\circ}\text{C}, t=10\text{ms}, V_R=0\text{V}$	11.25	KA^2S

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MMG200D120B6TC

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 =8mA	5.0	5.8	6.5	V
V _{CE(sat)}	Collector - Emitter Saturation Voltage	I _C =200A, V _{GE} =15V, T _J =25℃		1.8	2.25	
		I _C =200A, V _{GE} =15V, T _J =125℃		2.1		
		I _C =200A, V _{GE} =15V, T _J =150℃		2.15		
I _{CES}	Collector Leakage Current	V _{CE} =1200V, V _{GE} =0V, T _J =25℃			1	mA
		V _{CE} =1200V, V _{GE} =0V, T _J =150℃			10	
I _{GES}	Gate Leakage Current	V _{CE} =0V,V _{GE} =±20V, T _J =25℃	-400		400	nA
R _{gint}	Integrated Gate Resistor			3.5		Ω
Q _g	Gate Charge	V _{CE} =600V, I _C =200A , V _{GE} =15V		1.06		μC
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		14.2		nF
C _{res}	Reverse Transfer Capacitance			600		pF
t _{d(on)}	Turn on Delay Time	V _{CC} =600V,I _C =200A R _G =2.7Ω, V _{GE} =±15V, Inductive Load	T _J =25℃		160	ns
			T _J =125℃		180	ns
			T _J =150℃		190	ns
t _r	Rise Time		T _J =25℃		56	ns
			T _J =125℃		60	ns
			T _J =150℃		60	ns
t _{d(off)}	Turn off Delay Time		T _J =25℃		380	ns
			T _J =125℃		430	ns
			T _J =150℃		450	ns
t _f	Fall Time		T _J =25℃		100	ns
			T _J =125℃		180	ns
			T _J =150℃		200	ns
E _{on}	Turn on Energy	T _J =125℃		30	mJ	
		T _J =150℃		33	mJ	
E _{off}	Turn off Energy	T _J =125℃		16.4	mJ	
		T _J =150℃		18.4	mJ	
I _{SC}	Short Circuit Current	tpsc≤10μS , V _{GE} =15V T _J =125℃,V _{CC} =800V		840		A
R _{thJC}	Junction to Case Thermal Resistance (Per IGBT)				0.14	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 =200A , V _{GE} =0V, T _J =25℃		1.75	2.3	V
		I _F =200A , V _{GE} =0V, T _J =125℃		1.5		
		I _F =200A , V _{GE} =0V, T _J =150℃		1.45		
t _{rr}	Reverse Recovery Time	I _F =200A , V _R =600V di _F /dt=-3100A/μs T _J =150℃		580		ns
I _{RRM}	Max. Reverse Recovery Current			200		A
Q _{RR}	Reverse Recovery Charge			47.5		μC
E _{rec}	Reverse Recovery Energy			16.3		mJ
R _{thJCD}	Junction to Case Thermal Resistance （ Per Diode ）				0.2	K /W

MMG200D120B6TC

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=1minute	3000	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

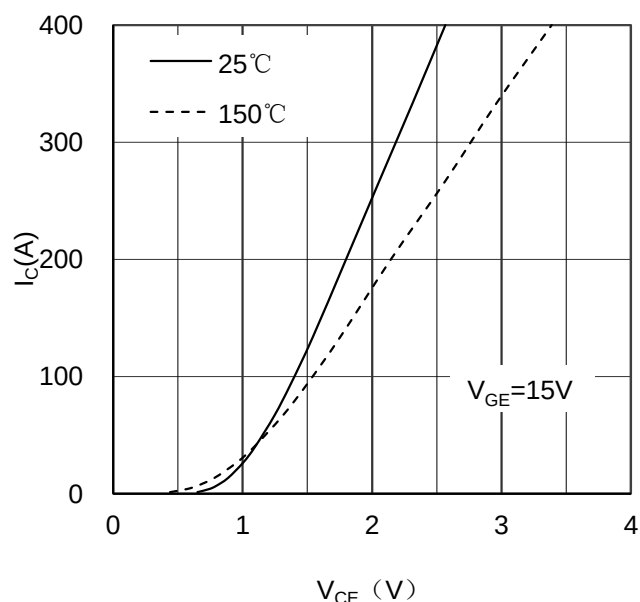


Figure 1. Typical Output Characteristics IGBT-inverter

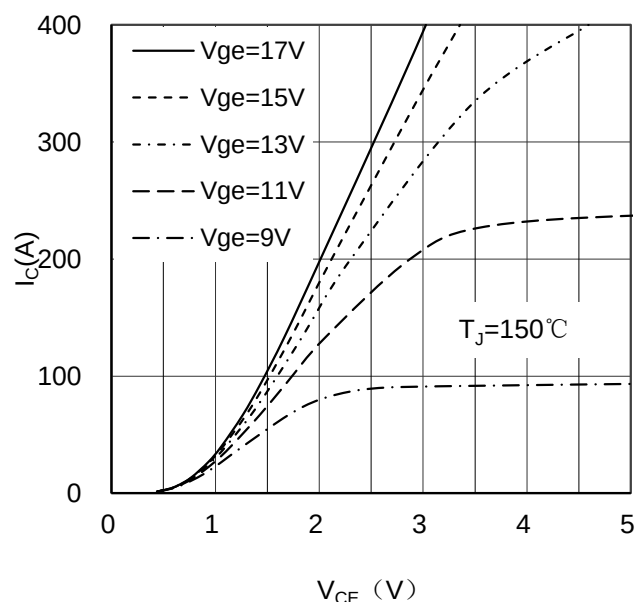


Figure 2. Typical Output Characteristics IGBT-inverter

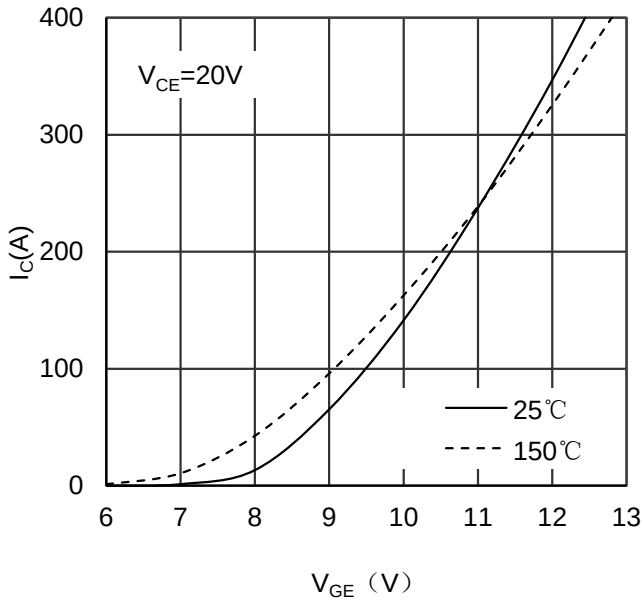


Figure 3. Typical Transfer characteristics IGBT-inverter

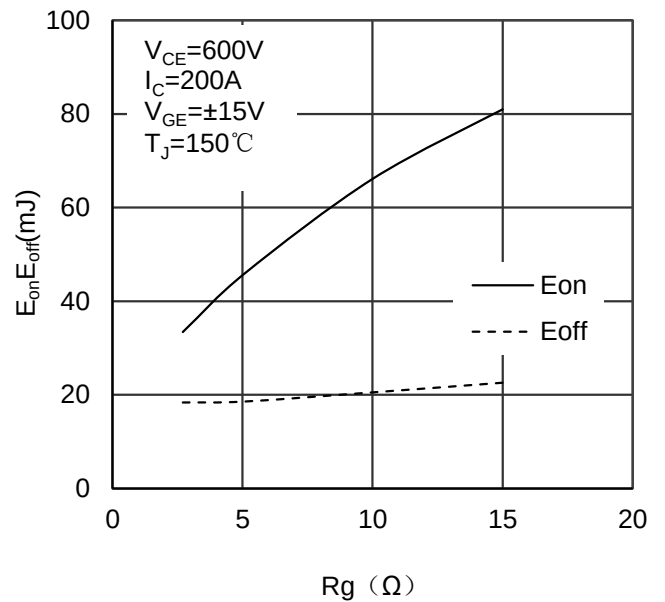


Figure 4. Switching Energy vs Gate Resistor IGBT-inverter

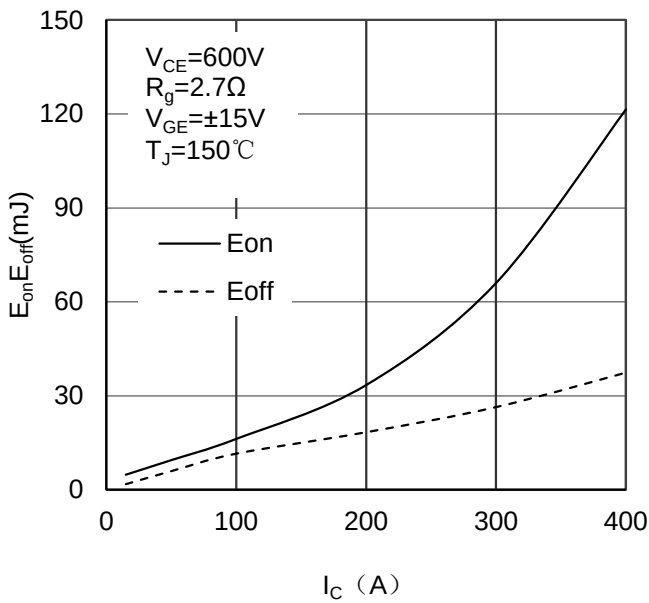


Figure 5. Switching Energy vs Collector Current IGBT-inverter

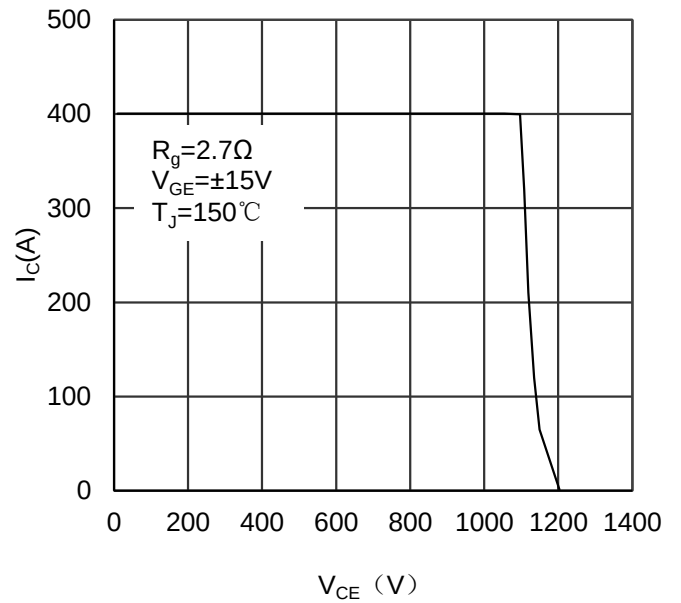


Figure 6. Reverse Biased Safe Operating Area IGBT-inverter

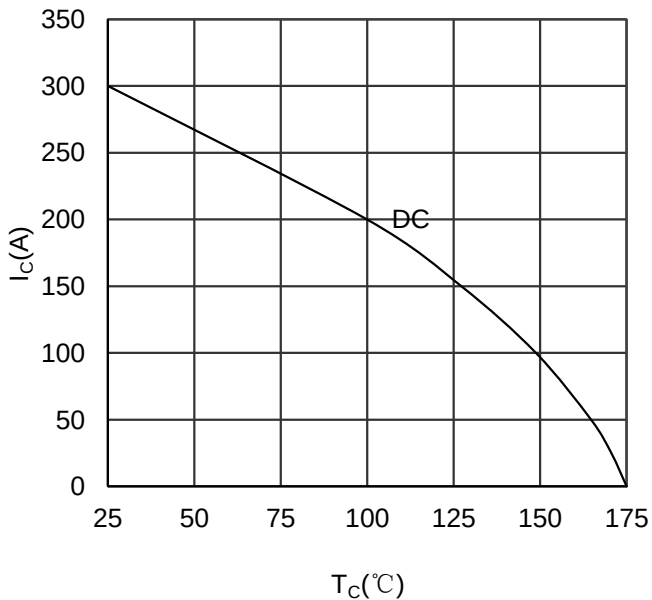


Figure 7. Collector Current vs Case temperature IGBT-inverter

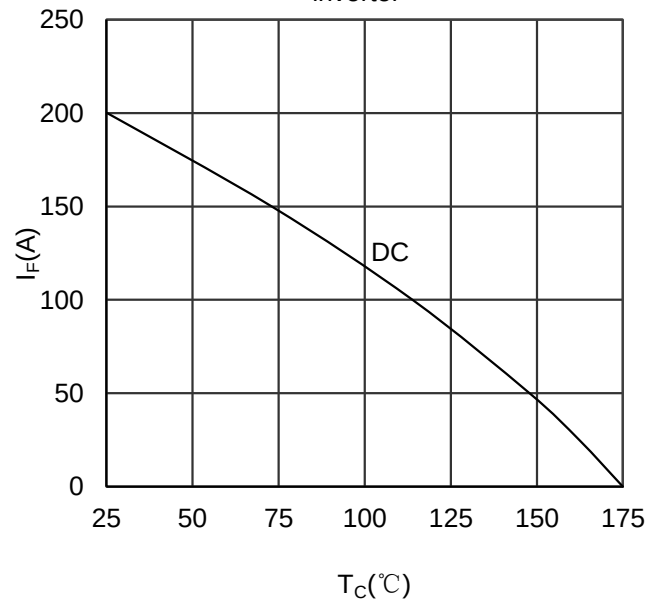


Figure 8. Forward current vs Case temperature Diode-inverter

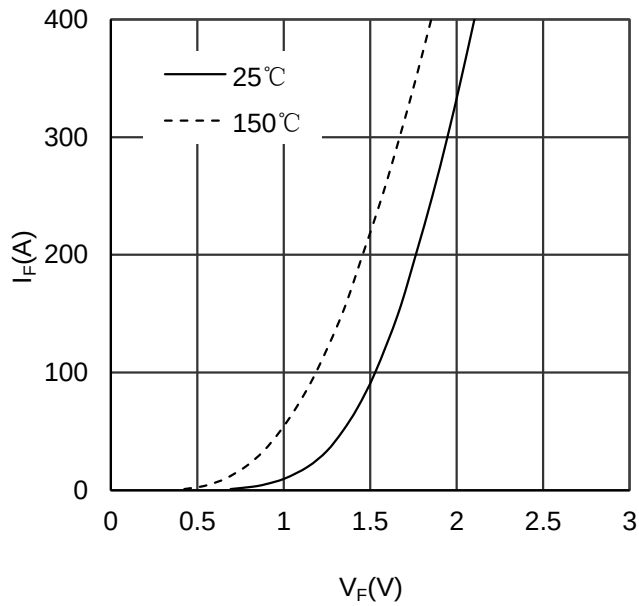


Figure 9. Diode Forward Characteristics Diode -inverter

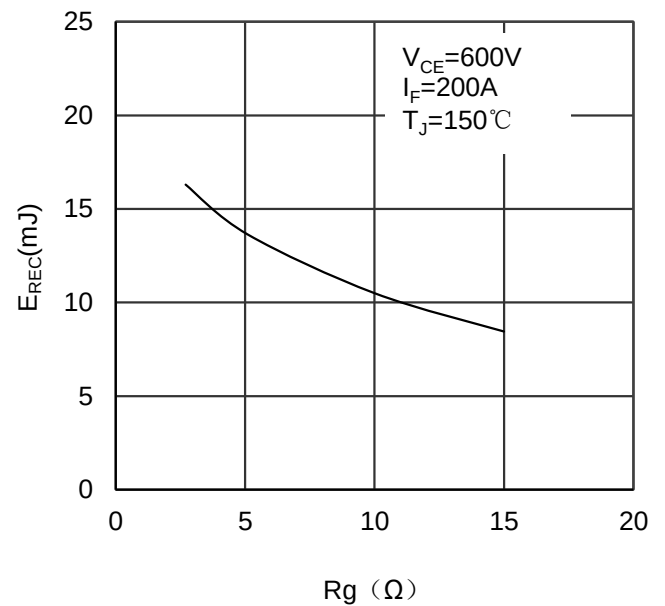


Figure 10. Switching Energy vs Gate Resistor Diode - inverter

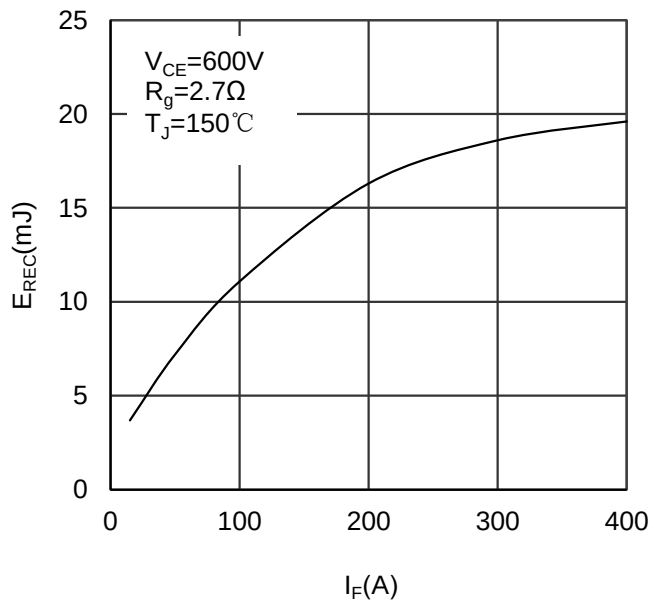


Figure 11. Switching Energy vs Forward Current Diode-inverter

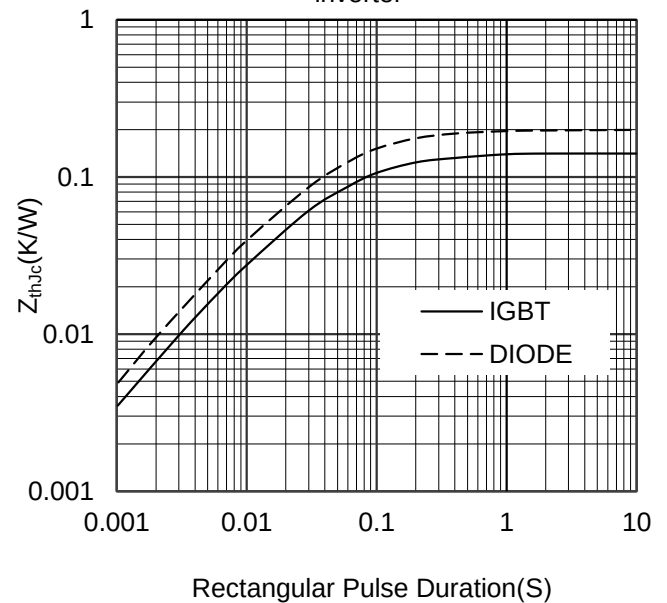


Figure 12. Transient Thermal Impedance of Diode and IGBT-inverter

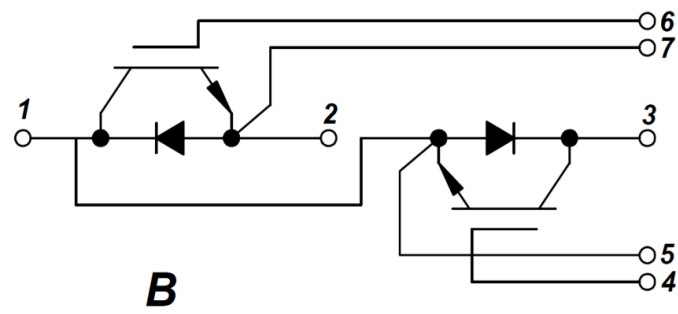


Figure 13. Circuit Diagram

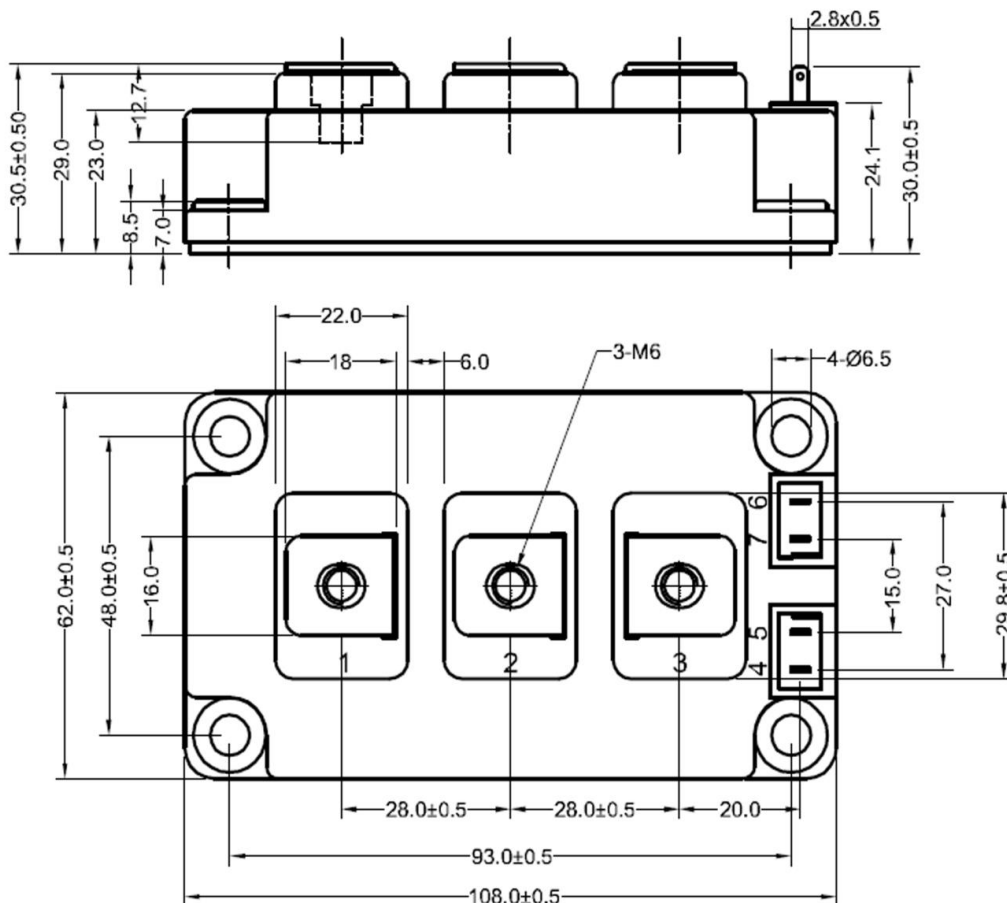


Figure 14. Package Outline