

PRODUCT FEATURES

- ☐ IGBT CHIP(1700V Trench+Field Stop technology)
- ☐ Low turn-off losses, short tail current
- ☐ $V_{CE(sat)}$ 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-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	$T_C=100^{\circ}\text{C}$, $T_{Jmax}=175^{\circ}\text{C}$	150	A
I_{CM}	Repetitive Peak Collector Current	$tp=1\text{ms}$	300	
P_{tot}	Power Dissipation Per IGBT	$T_C=25^{\circ}\text{C}$, $T_{Jmax}=175^{\circ}\text{C}$	1136	W

Diode-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		150	A
I_{FRM}	Repetitive Peak Forward Current	$tp=1\text{ms}$	300	
I^2t		$T_J=125^{\circ}\text{C}$, $t=10\text{ms}$, $V_R=0\text{V}$	5000	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

MMG150D170B6TC

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 =6mA	5.0	5.7	6.5	V
V _{CE(sat)}	Collector Emitter Saturation Voltage	I _C =150A, V _{GE} =15V, T _J =25℃		2.05	2.60	
		I _C =150A, V _{GE} =15V, T _J =125℃		2.45		
		I _C =150A, V _{GE} =15V, T _J =150℃		2.55		
I _{CES}	Collector Leakage Current	V _{CE} =1700V, V _{GE} =0V, T _J =25℃			100	μA
I _{GES}	Gate Leakage Current	V _{CE} =0V,V _{GE} =±20V, T _J =25℃	-400		400	nA
R _{Gint}	Integrated Gate Resistor			2.9		Ω
Q _G	Gate Charge	V _{GE} =0V...15V		1.0		μC
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =100kHz		14.1		nF
C _{oes}	Output Transfer Capacitance			1		nF
C _{res}	Reverse Transfer Capacitance			0.45		nF
t _{d(on)}	Turn on Delay Time	V _{CC} =900V,I _C =150A R _G =4.8Ω, V _{GE} =±15V, Inductive Load	T _J =25℃	75		ns
			T _J =125℃	85		ns
			T _J =150℃	90		ns
t _r	Rise Time		T _J =25℃	70		ns
			T _J =125℃	75		ns
			T _J =150℃	80		ns
t _{d(off)}	Turn off Delay Time		T _J =25℃	405		ns
			T _J =125℃	450		ns
			T _J =150℃	460		ns
t _f	Fall Time	T _J =25℃	370		ns	
		T _J =125℃	520		ns	
		T _J =150℃	550		ns	
E _{on}	Turn on Energy	T _J =25℃	64.5		mJ	
		T _J =125℃	82.5		mJ	
		T _J =150℃	86.0		mJ	
E _{off}	Turn off Energy	T _J =25℃	28.2		mJ	
		T _J =125℃	35.0		mJ	
		T _J =150℃	39.0		mJ	
I _{SC}	Short Circuit Current	tpsc≤10μs , V _{GE} =15V T _J =150℃,V _{CC} =1000V		590		A
R _{thJC}	Junction to Case Thermal Resistance （ Per IGBT ）				0.132	K /W

MMG150D170B6TC

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 =150A , V _{GE} =0V, T _J =25℃		1.85	2.4	V
		I _F =150A , V _{GE} =0V, T _J =125℃		2.00		
		I _F =150A , V _{GE} =0V, T _J =150℃		2.00		
t _{rr}	Reverse Recovery Time	I _F =150A , V _R =900V dI _F /dt=-2200A/μs T _J =25℃		590		ns
Q _{RR}	Reverse Recovery Charge			28		μC
I _{RRM}	Max. Reverse Recovery Current			112.6		A
E _{rec}	Reverse Recovery Energy			9		mJ
t _{rr}	Reverse Recovery Time	I _F =150A , V _R =900V dI _F /dt=-2000A/μs T _J =125℃		843		ns
Q _{RR}	Reverse Recovery Charge			43		μC
I _{RRM}	Max. Reverse Recovery Current			113.3		A
E _{rec}	Reverse Recovery Energy			16.1		mJ
t _{rr}	Reverse Recovery Time	I _F =150A , V _R =900V dI _F /dt=-1900A/μs T _J =150℃		1100		ns
Q _{RR}	Reverse Recovery Charge			45		μC
I _{RRM}	Max. Reverse Recovery Current			116		A
E _{rec}	Reverse Recovery Energy			20.1		mJ
R _{thJCD}	Junction to Case Thermal Resistance （ Per Diode ）				0.24	K /W

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	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

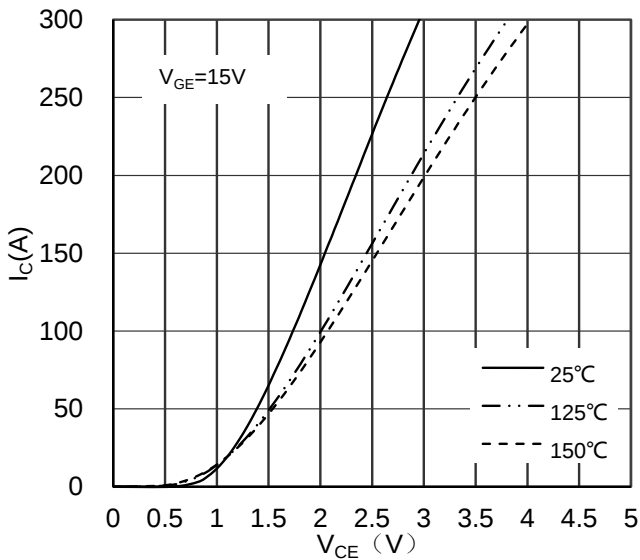


Figure 1. Typical Output Characteristics IGBT

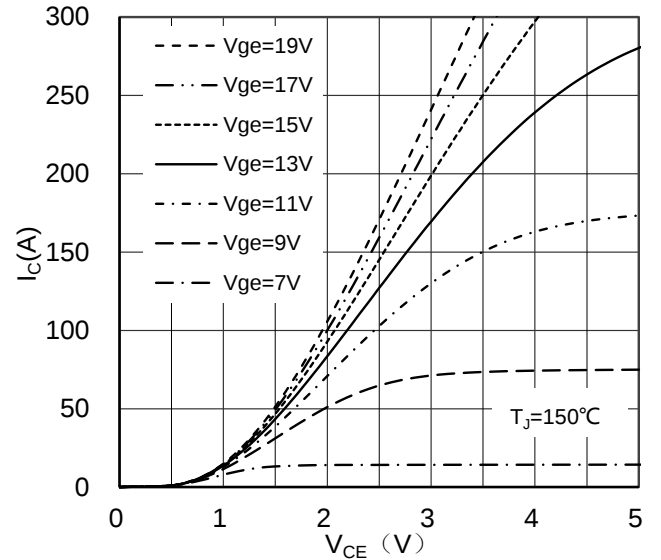


Figure 2. Typical Output Characteristics IGBT

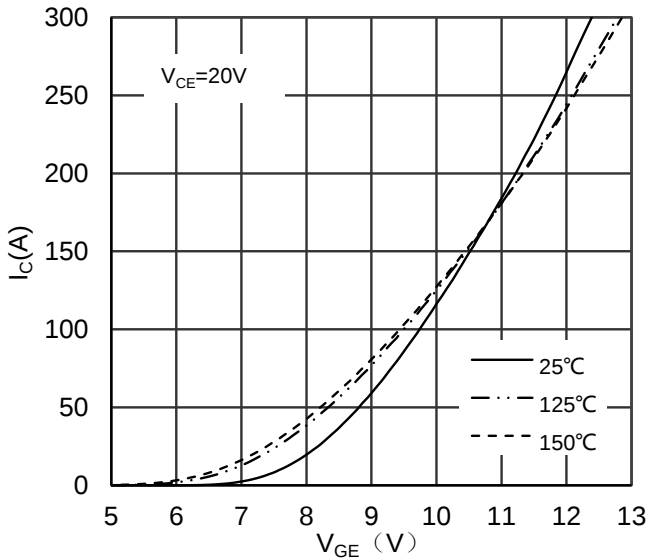


Figure 3. Typical Transfer characteristics IGBT

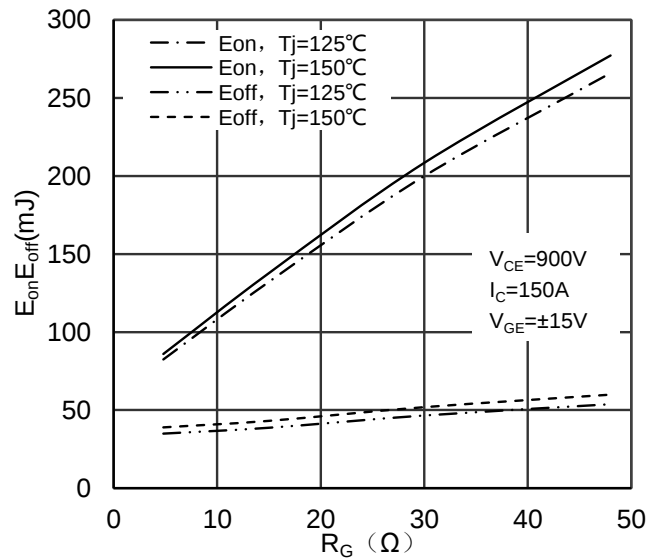


Figure 4. Switching Energy vs Gate Resistor IGBT

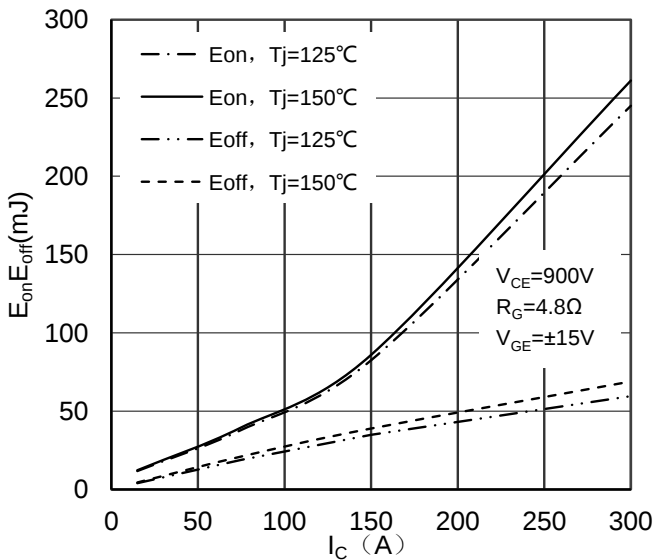


Figure 5. Switching Energy vs Collector Current IGBT

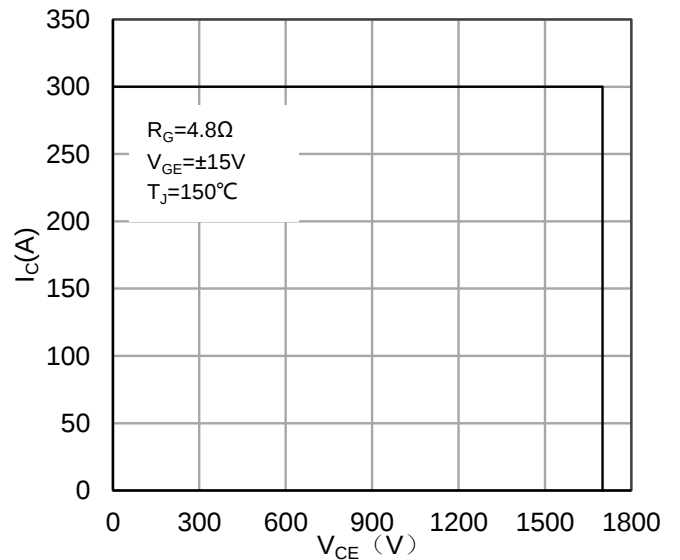


Figure 6. Reverse Bias Safe Operating Area IGBT

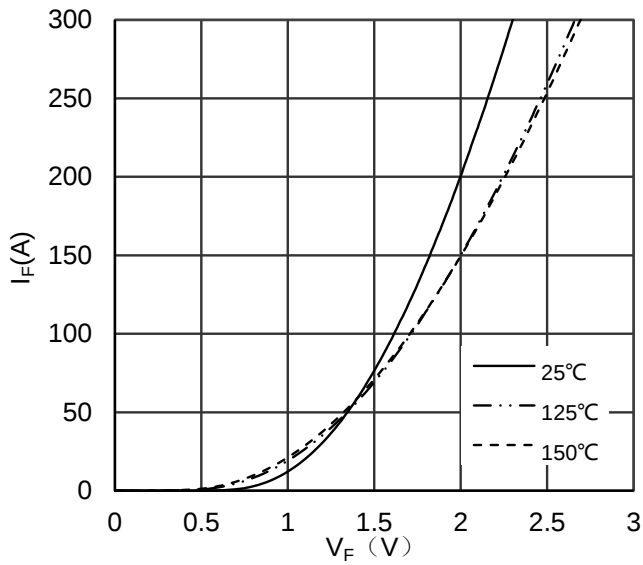


Figure 7. Diode Forward Characteristics Diode

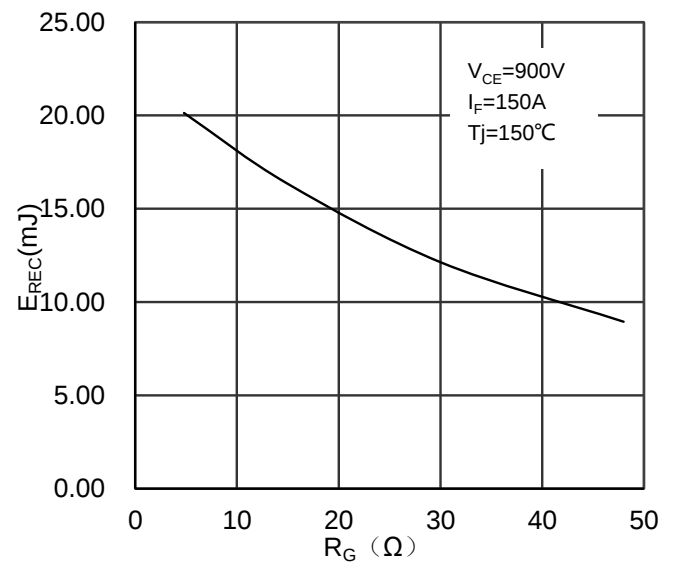


Figure 8. Switching Energy vs Gate Resistor Diode

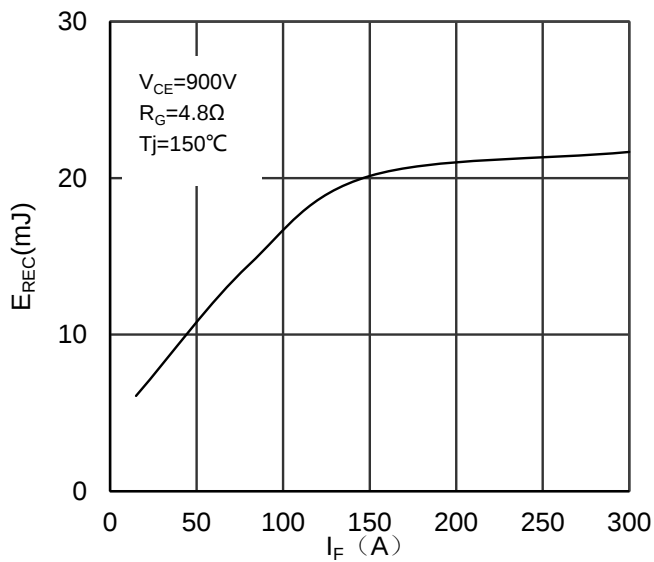


Figure 9. Switching Energy vs Forward Current Diode

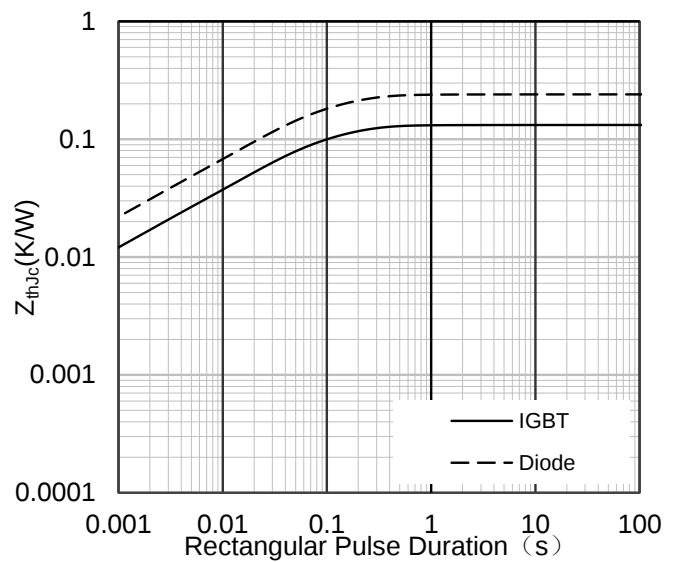


Figure 10. Transient Thermal Impedance of Diode and IGBT

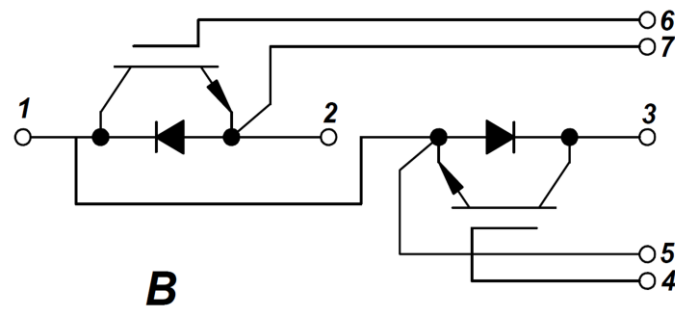


Figure 11. Circuit Diagram

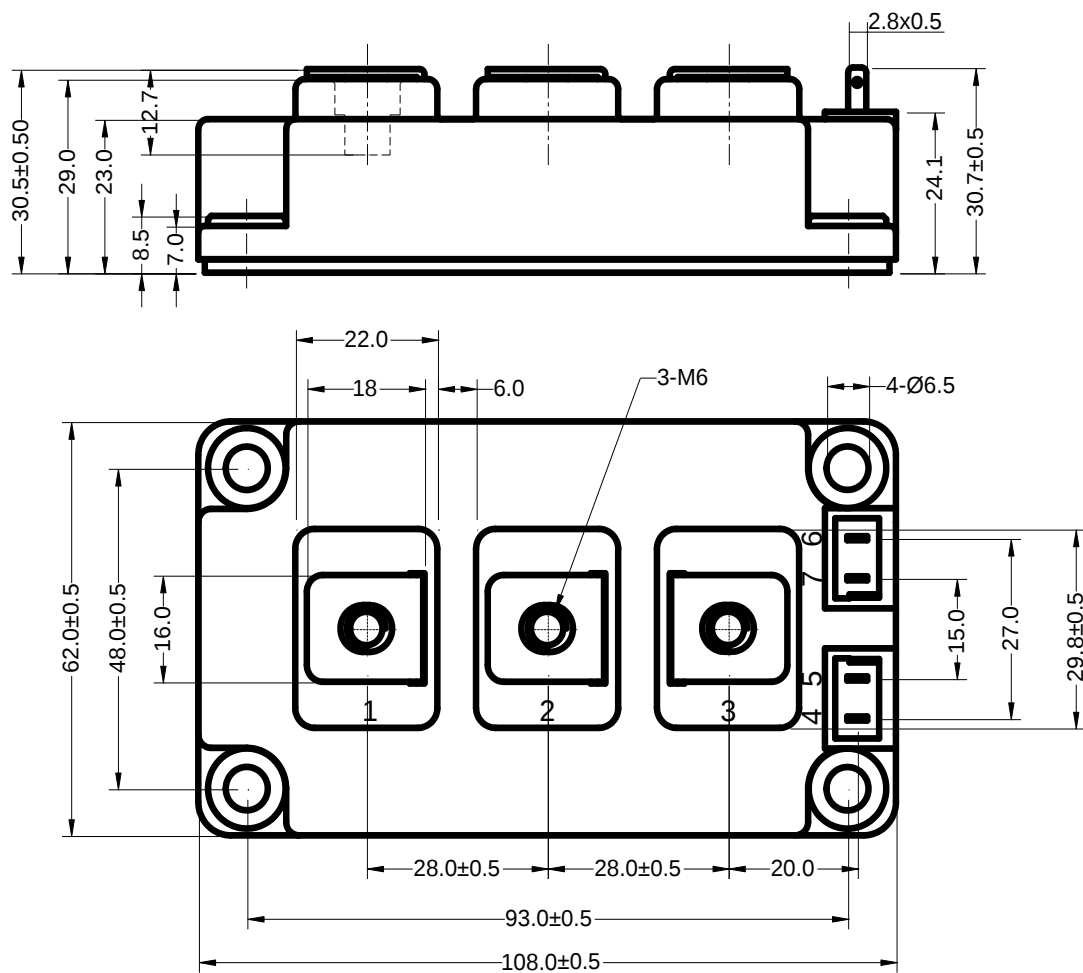


Figure 12. Package Outline