MMG100J120UZ6TC

MACMIC

1200V 100A IGBT Module

June 2020 Version 01 RoHS Compliant

PRODUCT FEATURES

☐ IGBT CHIP(Trench+Field Stop technology)

☐ Low switching losses

☐ Low saturation voltage and positive temperature coefficient

☐ Fast switching and short tail current

☐ Popular SOT-227 Package

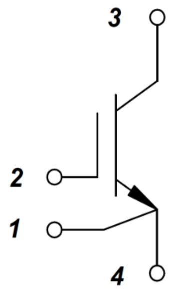
☐ T_{Jmax}=175℃

APPLICATIONS

☐ AC motor control

☐ Motion/servo control

☐ Inverter and power supplies



IGBT

ABSOLUTE MAXIMUM RATINGS(*T_C=25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	T_J=25℃	1200	V
V_{GES}	Gate Emitter Voltage		±20	
I_C	DC Collector Current	T_C=25℃,T_{Jmax}=175℃	147	A
		T_C=95℃,T_{Jmax}=175℃	100	
I_{CM}	Repetitive Peak Collector Current	tp=1ms	200	
P_{tot}	Power Dissipation Per IGBT	T_C=25℃,T_{Jmax}=175℃	515	W

MODULE CHARACTERISTICS *(T_C=25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature		175	°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
Torque	to heatsink	Recommended（M4）	0.7~1.1	Nm
	to terminal	Recommended（M4）	0.7~1.1	Nm
Weight			26.5	g

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ELECTRICAL CHARACTERISTICS *(T_C =25°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=4mA		5.0	6.0	6.5	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	I_C=100A, V_{GE}=15V, T_J=25℃			1.85	2.25	V
		I_C=100A, V_{GE}=15V, T_J=125℃			2.10		V
		I_C=100A, V_{GE}=15V, T_J=150℃			2.15		V
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	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V,V_{GE}=±20V, T_J=25℃		-400		400	nA
R_{gint}	Integrated Gate Resistor				7		Ω
Q_g	Gate Charge	V_{CE}=600V, I_C=100A , V_{GE}=15V			0.53		μC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			7.1		nF
C_{res}	Reverse Transfer Capacitance				300		pF
$t_{d(on)}$	Turn on Delay Time	V_{CC}=600V,I_C=100A R_G =5.1Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		170		ns
			T_J=150℃		190		ns
t_r	Rise Time		T_J=25℃		50		ns
			T_J=150℃		56		ns
$t_{d(off)}$	Turn off Delay Time	V_{CC}=600V,I_C=100A R_G =5.1Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		350		ns
			T_J=150℃		410		ns
t_f	Fall Time		T_J=25℃		100		ns
			T_J=150℃		190		ns
E_{on}	Turn on Energy	V_{CC}=600V,I_C=100A R_G =5.1Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		11.5		mJ
			T_J=150℃		16.2		mJ
E_{off}	Turn off Energy		T_J=25℃		5.6		mJ
			T_J=150℃		9.1		mJ
I_{SC}	Short Circuit Current	tpsc≤10μS , V_{GE}=15V T_J=125°C,V_{CC}=800V			420		A
R_{thJC}	Junction to Case Thermal Resistance （ Per IGBT）					0.29	K /W

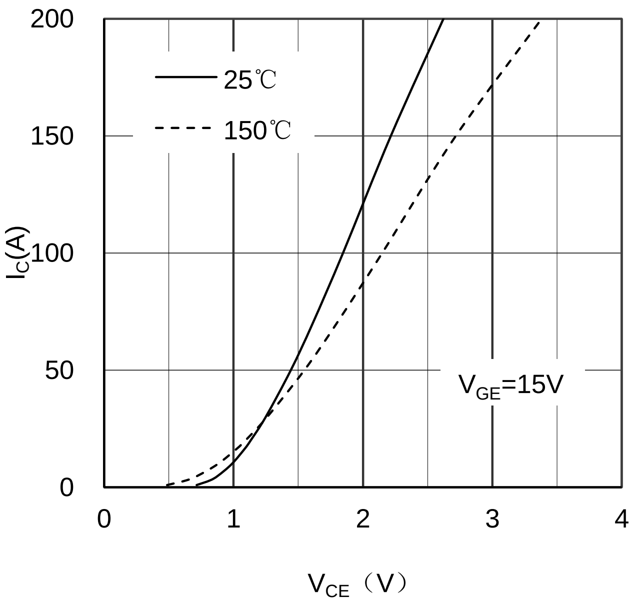


Figure 1. Typical Output Characteristics IGBT

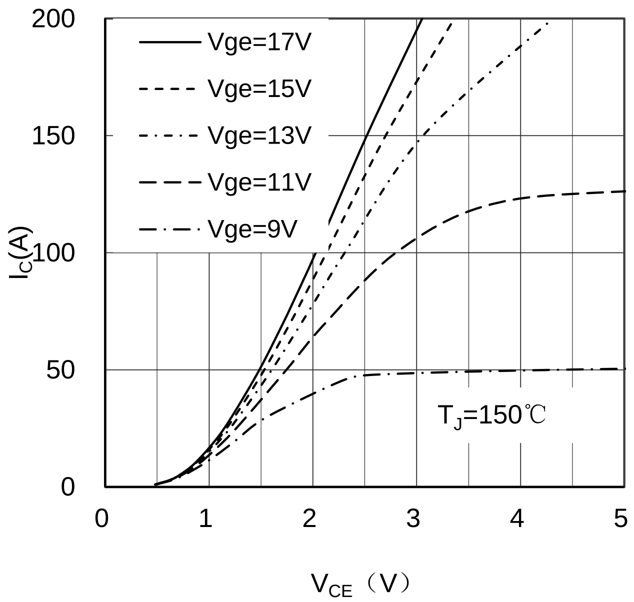


Figure 2. Typical Output Characteristics IGBT

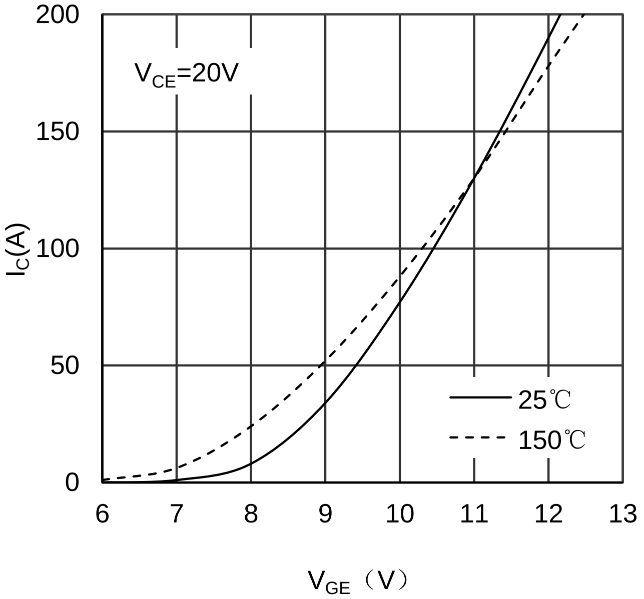


Figure 3. Typical Transfer characteristics IGBT

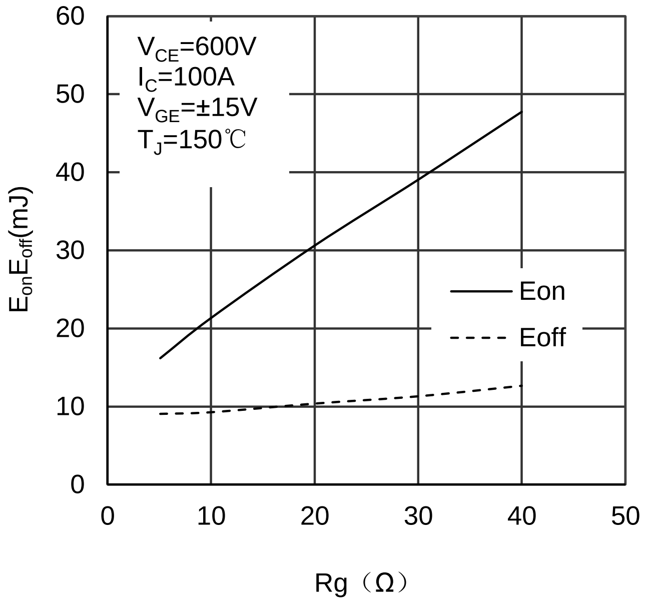


Figure 4. Switching Energy vs Gate Resistor IGBT

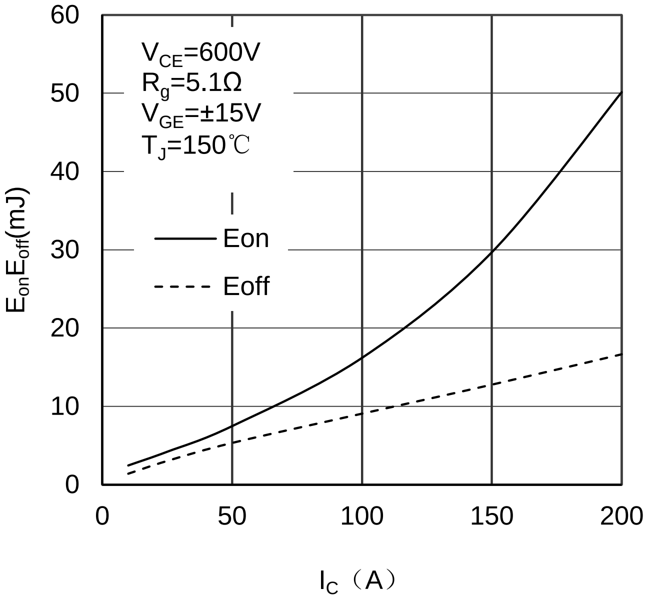


Figure 5. Switching Energy vs Collector Current IGBT

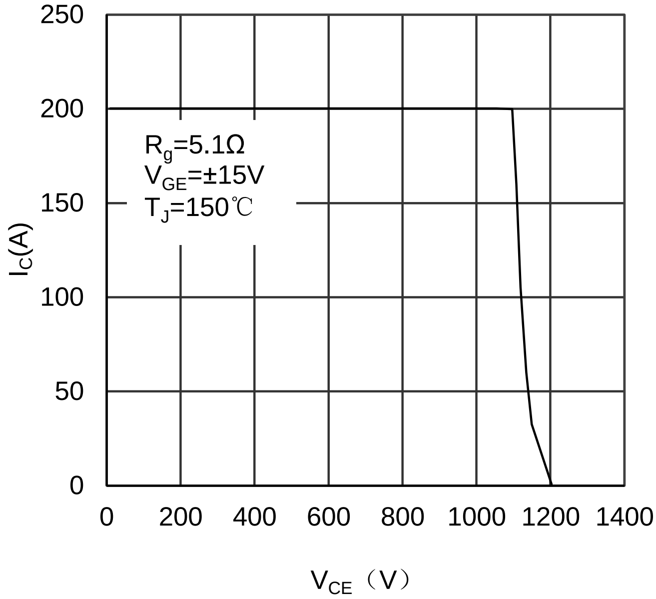


Figure 6. Reverse Biased Safe Operating Area IGBT

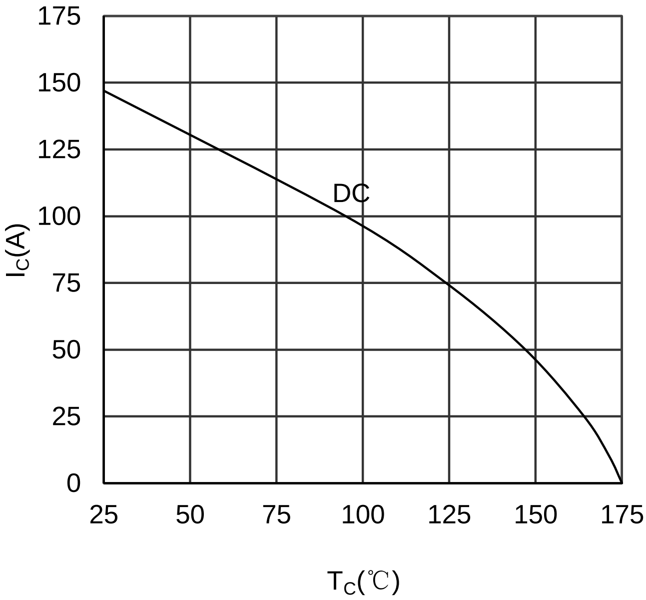


Figure 7. Collector Current vs Case temperature IGBT

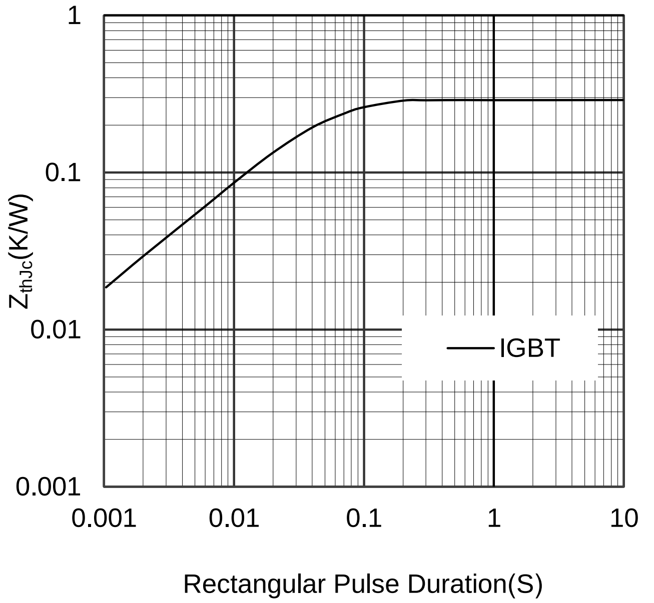
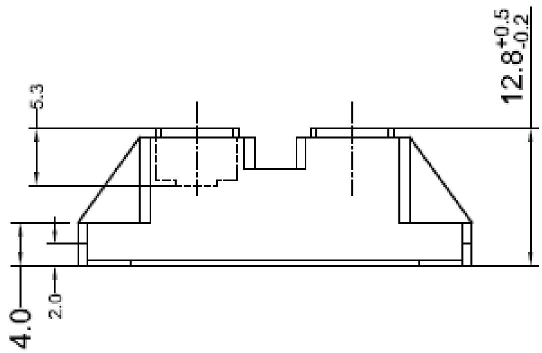
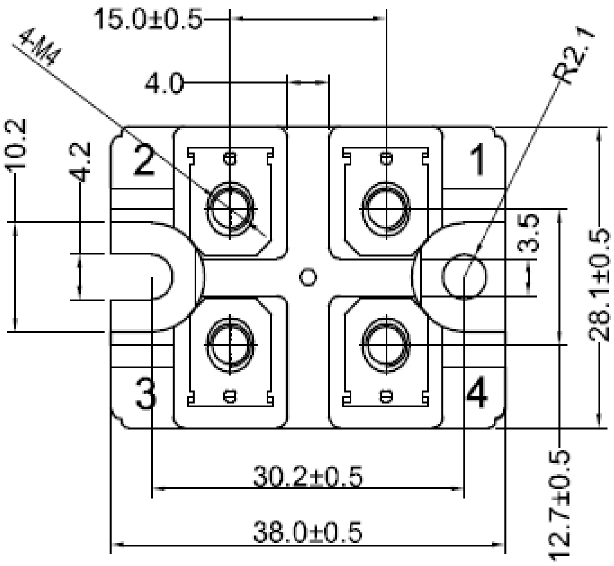


Figure 8. Transient Thermal Impedance of IGBT





Dimensions in (mm)

Figure 9. Package Outline