MMG50J120UZ

1200V 50A IGBT Module

April 2015 **Version 01** **RoHS Compliant**

PRODUCT FEATURES

☐ High Short Circuit Capability

☐ Free wheeling diodes with fast and soft reverse recovery

☐ $V_{CE(sat)}$ with positive temperature coefficient

☐ Ultra Low Loss,High Ruggedness

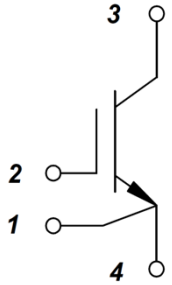
☐ Popular SOT-227 Package

APPLICATIONS

☐ Invertor Convertor

☐ Welder SMPS and UPS

☐ Induction Heating



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℃	80	A
		T_C=80℃	50	
I_{CM}	Repetitive Peak Collector Current	tp=1ms	100	
P_{tot}	Power Dissipation Per IGBT		416	W

MODULE CHARACTERISTICS

T_C=25°C unless otherwise specified

Symbol	Parameter/Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature		150	°C
T_{Jop}	Operating Temperature		-40~125	
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=2mA		5.0	6.2	7.0	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	I_C=50A, V_{GE}=15V, T_J=25℃			1.8	2.4	V
		I_C=50A, V_{GE}=15V, T_J=125℃			2.0		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=125℃				10	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V,V_{GE}=±15V, T_J=25℃		-400		400	nA
R_{gint}	Integrated Gate Resistor				10		Ω
Q_g	Gate Charge	V_{CE}=600V, I_C=50A , V_{GE}=±15V			0.6		μC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			4.29		nF
C_{res}	Reverse Transfer Capacitance				200		pF
$t_{d(on)}$	Turn on Delay Time	V_{CC}=600V,I_C=50A R_G =15Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		230		ns
			T_J=125℃		260		ns
t_r	Rise Time		T_J=25℃		60		ns
			T_J=125℃		60		ns
$t_{d(off)}$	Turn off Delay Time	V_{CC}=600V,I_C=50A R_G =15Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		480		ns
			T_J=125℃		550		ns
t_f	Fall Time		T_J=25℃		60		ns
			T_J=125℃		75		ns
E_{on}	Turn on Energy	V_{CC}=600V,I_C=50A R_G =15Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		4.5		mJ
			T_J=125℃		6		mJ
E_{off}	Turn off Energy		T_J=25℃		3.8		mJ
			T_J=125℃		5.5		mJ
I_{SC}	Short Circuit Current	tpsc≤10μS , V_{GE}=15V T_J=125℃,V_{CC}=900V			270		A
R_{thJC}	Junction to Case Thermal Resistance （Per IGBT）					0.3	K /W

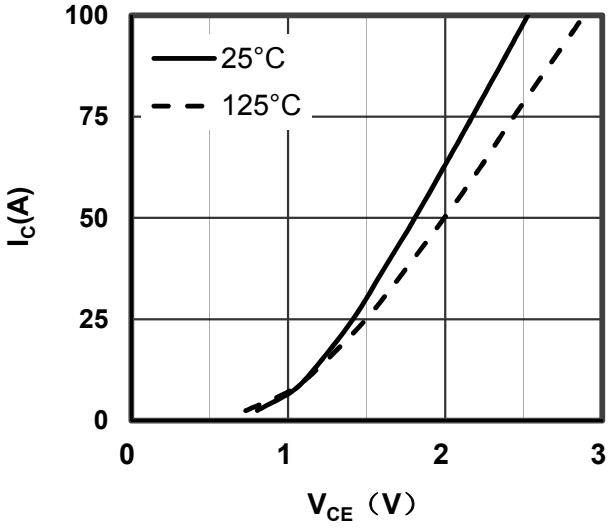


Figure 1. Typical Output Characteristics IGBT

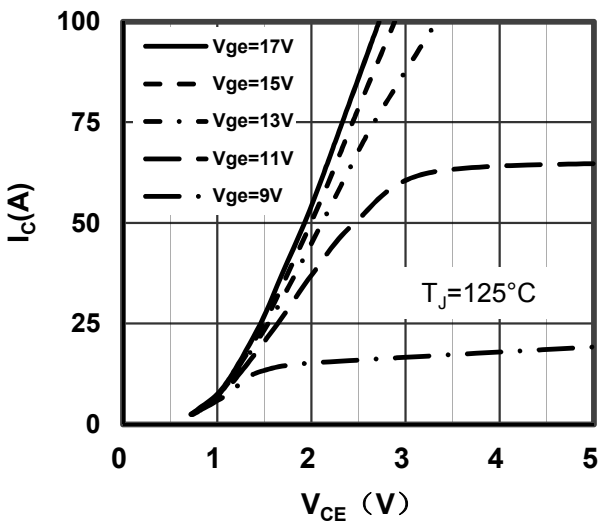


Figure 2. Typical Output Characteristics IGBT

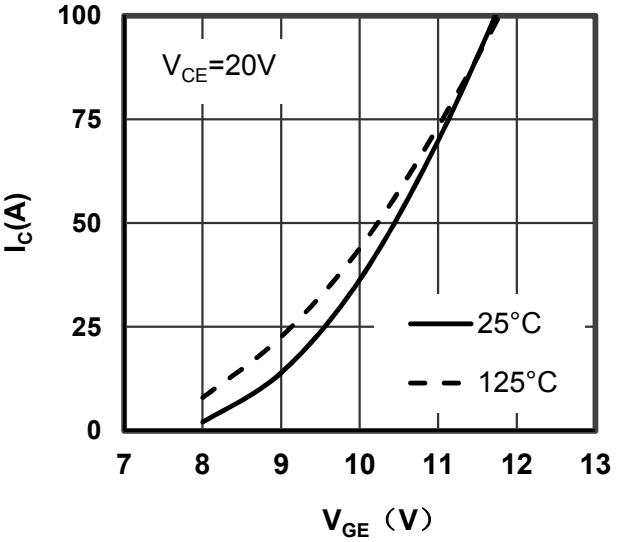


Figure 3. Typical Transfer characteristics IGBT

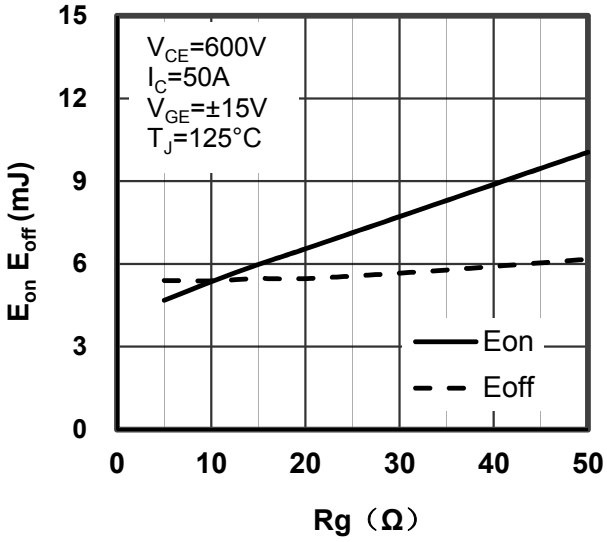


Figure 4. Switching Energy vs Gate Resistor IGBT

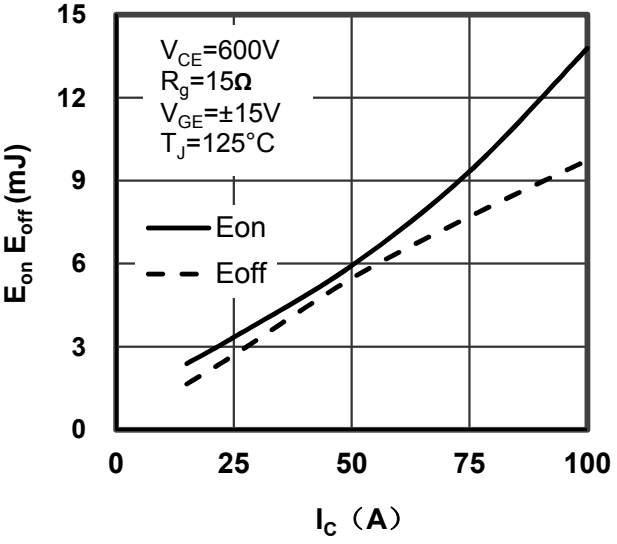


Figure 5. Switching Energy vs Collector Current IGBT

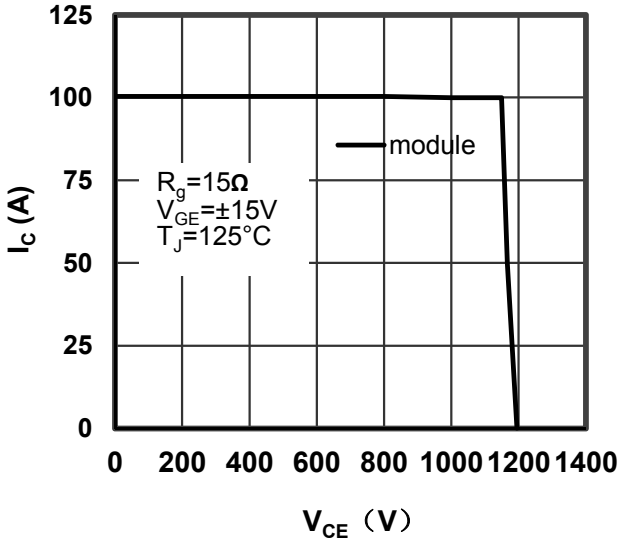


Figure 6. Reverse Biased Safe Operating Area IGBT

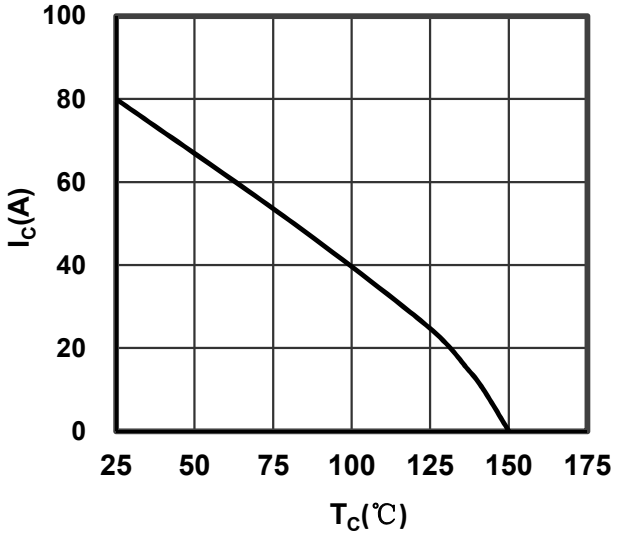


Figure 7. Collector Current vs Case temperature

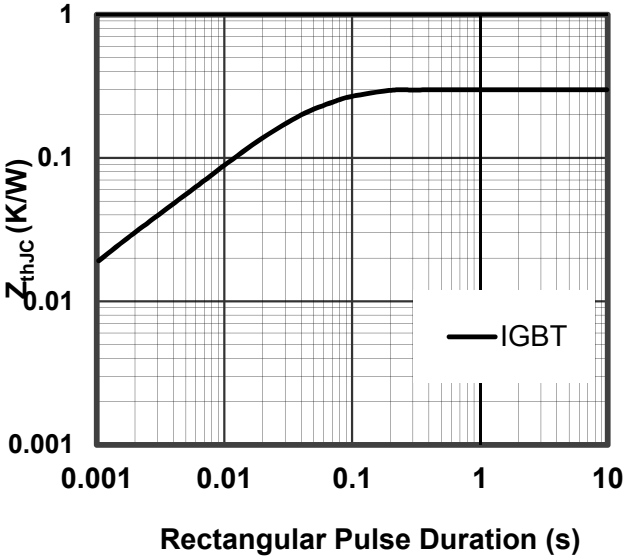
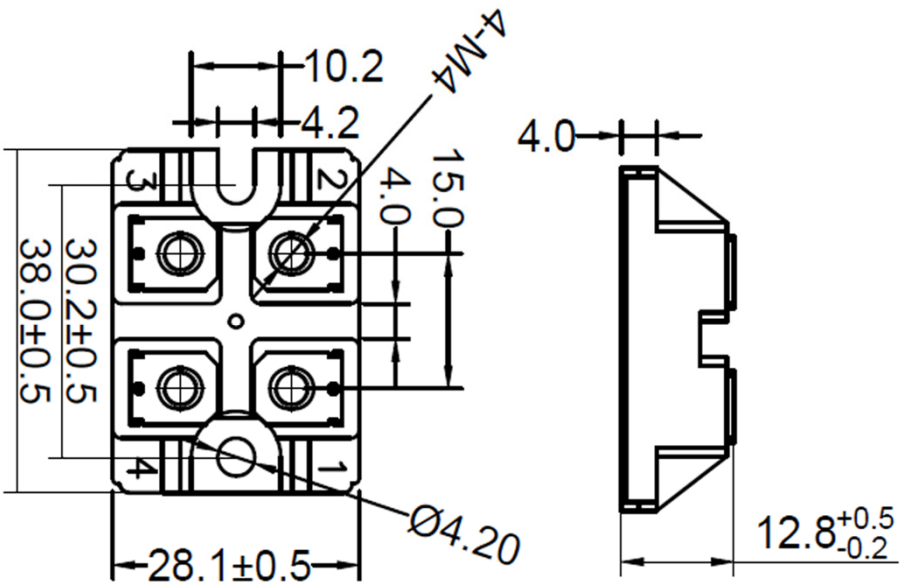


Figure 8. Transient Thermal Impedance of IGBT



Dimensions in (mm)
Figure 9. Package Outline