

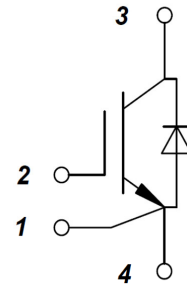
PRODUCT FEATURES

- ☐ IGBT CHIP(Trench+Field Stop technology)
- ☐ Low switching losses
- ☐ Low saturation voltage and positive temperature coefficient
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐ Popular SOT-227 Package



APPLICATIONS

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



IGBT

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	$T_J=25^{\circ}\text{C}$	1200	V
V_{GES}	Gate Emitter Voltage		± 20	
I_C	DC Collector Current	$T_C=25^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	110	A
		$T_C=95^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	75	
I_{CM}	Repetitive Peak Collector Current	$tp=1\text{ms}$	150	
P_{tot}	Power Dissipation Per IGBT	$T_C=25^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	385	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	$T_J=25^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current		75	A
I_{FRM}	Repetitive Peak Forward Current	$tp=1\text{ms}$	150	
I^2t		$T_J=125^{\circ}\text{C}, t=10\text{ms}, V_R=0\text{V}$	880	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

MMG75J120U6TC

IGBT

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 =3mA	5.0	5.8	6.5	V	
V _{CE(sat)}	Collector - Emitter Saturation Voltage	I _C =75A, V _{GE} =15V, T _J =25°C		1.85	2.25		
		I _C =75A, V _{GE} =15V, T _J =125°C		2.15			
		I _C =75A, V _{GE} =15V, T _J =150°C		2.25			
I _{CES}	Collector Leakage Current	V _{CE} =1200V, V _{GE} =0V, T _J =25°C			1	mA	
		V _{CE} =1200V, V _{GE} =0V, T _J =150°C			10		
I _{GES}	Gate Leakage Current	V _{CE} =0V, V _{GE} =±20V, T _J =25°C	-400		400	nA	
R _{gint}	Integrated Gate Resistor			10		Ω	
Q _g	Gate Charge	V _{CE} =600V, I _C =75A , V _{GE} =15V		0.37		μC	
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		5.6		nF	
C _{res}	Reverse Transfer Capacitance			230		pF	
t _{d(on)}	Turn on Delay Time	V _{CC} =600V, I _C =75A R _G =7.5Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		160	ns	
			T _J =125°C		180	ns	
			T _J =150°C		190	ns	
t _r	Rise Time		T _J =25°C		60	ns	
			T _J =125°C		65	ns	
			T _J =150°C		70	ns	
t _{d(off)}	Turn off Delay Time		T _J =25°C		300	ns	
			T _J =125°C		340	ns	
			T _J =150°C		360	ns	
t _f	Fall Time	T _J =25°C		100	ns		
		T _J =125°C		180	ns		
		T _J =150°C		220	ns		
E _{on}	Turn on Energy	V _{CC} =600V, I _C =75A R _G =7.5Ω, V _{GE} =±15V, Inductive Load	T _J =125°C		15	mJ	
			T _J =150°C		16.2	mJ	
E _{off}	Turn off Energy		T _J =125°C		6.2	mJ	
			T _J =150°C		6.6	mJ	
I _{SC}	Short Circuit Current		tpsc≤10μS , V _{GE} =15V T _J =125°C, V _{CC} =800V		290		A
R _{thJC}	Junction to Case Thermal Resistance (Per IGBT)				0.39	K /W	

Diode

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 =75A , V _{GE} =0V, T _J =25°C		2	2.5	V
		I _F =75A , V _{GE} =0V, T _J =125°C		2.05		
		I _F =75A , V _{GE} =0V, T _J =150°C		2.05		
t _{rr}	Reverse Recovery Time	I _F =75A , V _R =600V dI _F /dt=-1000A/μs T _J =150°C		128		ns
I _{RRM}	Max. Reverse Recovery Current			74		A
Q _{RR}	Reverse Recovery Charge			8.6		μC
E _{rec}	Reverse Recovery Energy			3.8		mJ
R _{thJCD}	Junction to Case Thermal Resistance （ Per Diode ）				0.58	K /W

MMG75J120U6TC

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), $t=1\text{minute}$	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

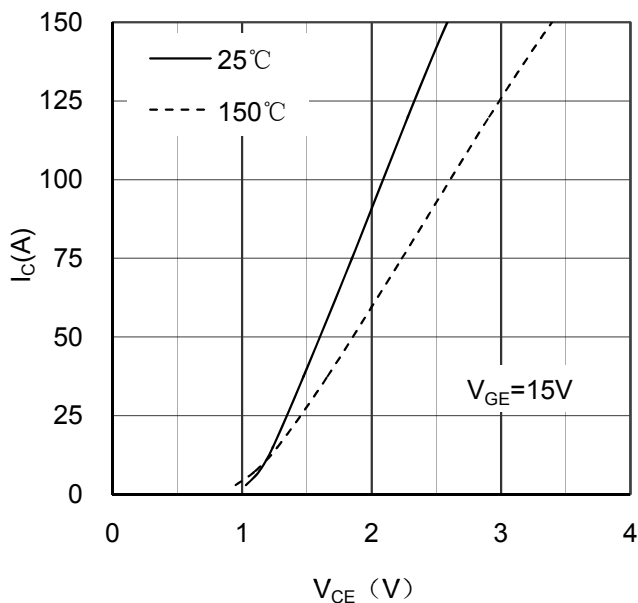


Figure 1. Typical Output Characteristics IGBT

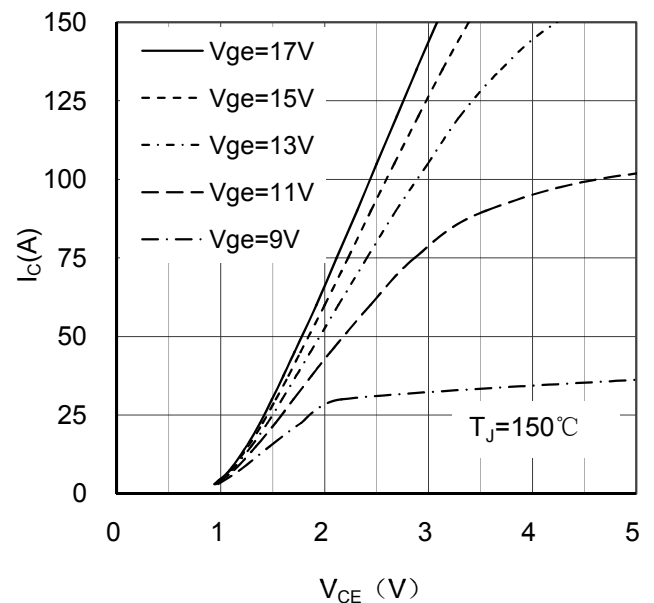


Figure 2. Typical Output Characteristics IGBT

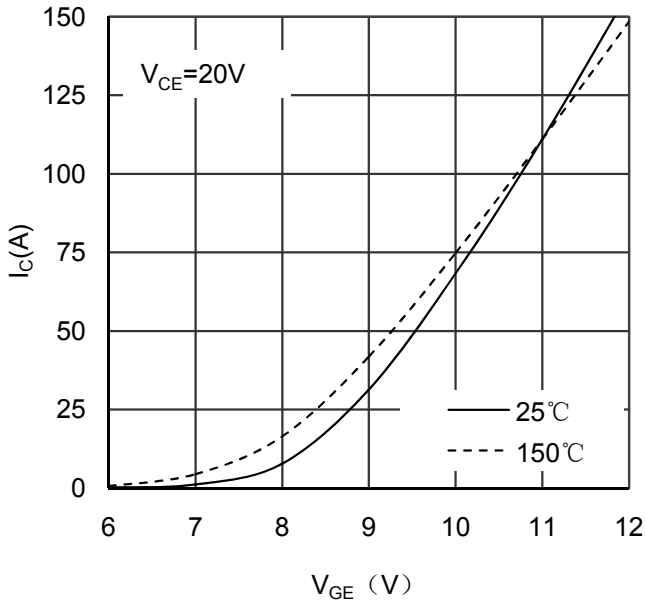


Figure 3. Typical Transfer characteristics IGBT

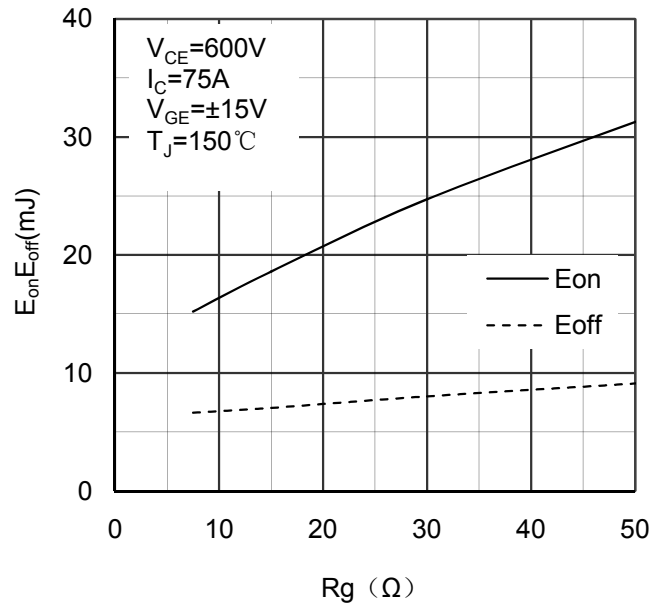


Figure 4. Switching Energy vs Gate Resistor IGBT

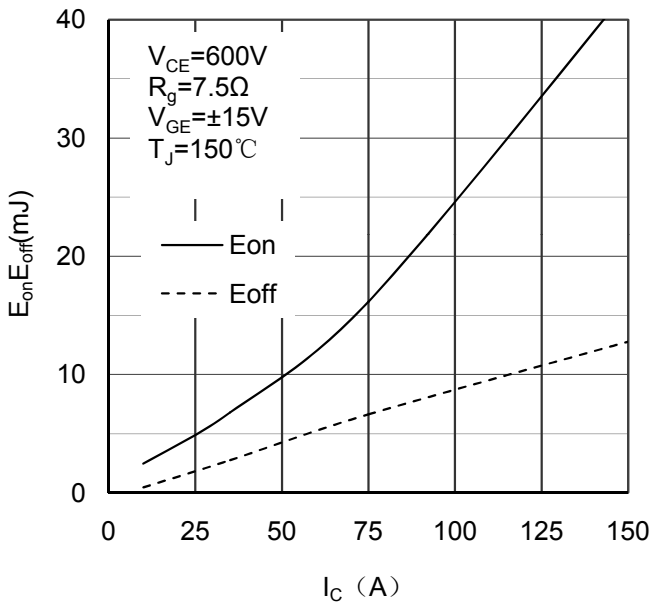


Figure 5. Switching Energy vs Collector Current IGBT

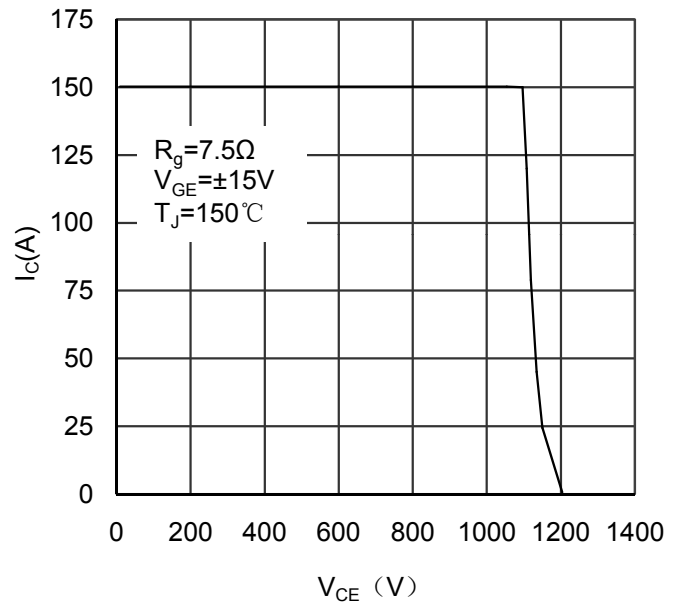


Figure 6. Reverse Biased Safe Operating Area IGBT

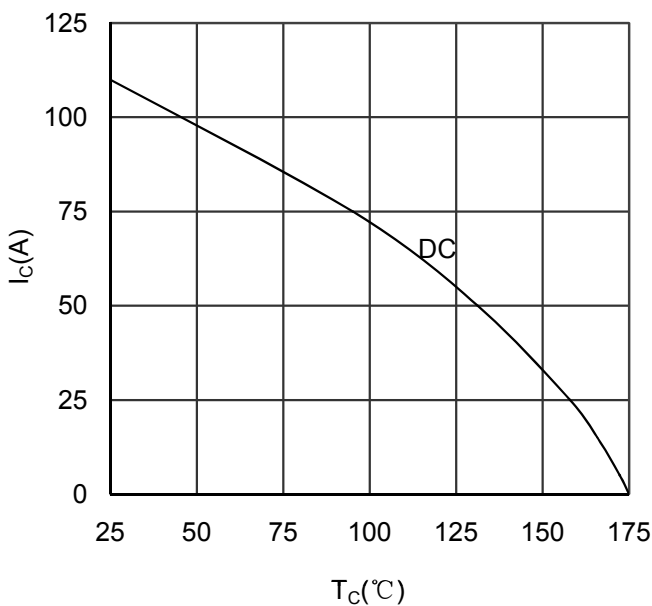


Figure 7. Collector Current vs Case temperature IGBT

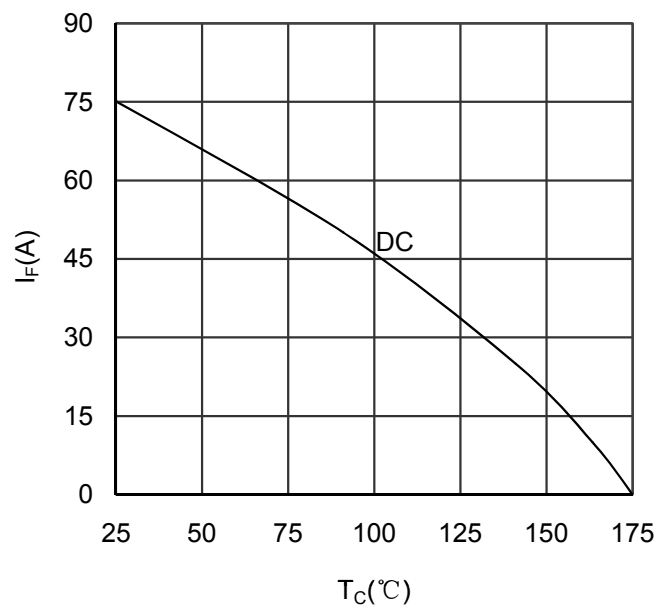


Figure 8. Forward current vs Case temperature Diode

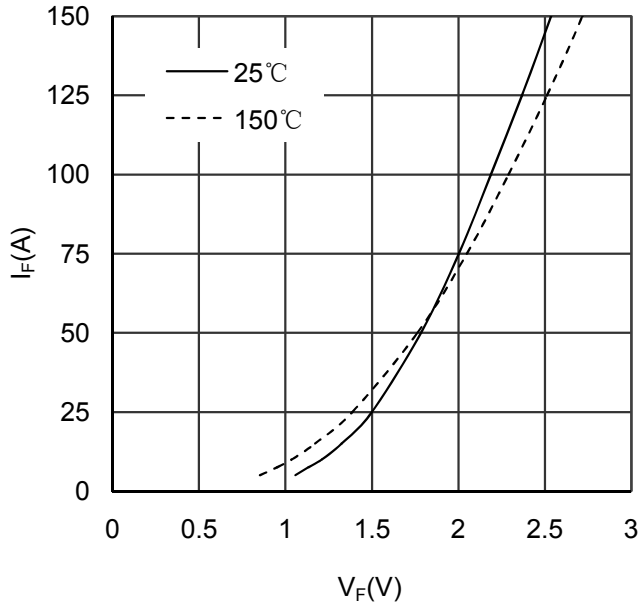


Figure 9. Diode Forward Characteristics Diode

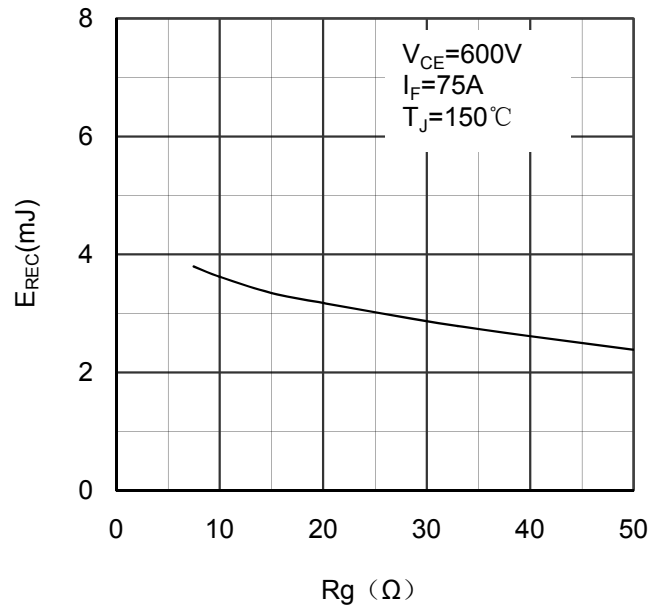


Figure 10. Switching Energy vs Gate Resistor Diode

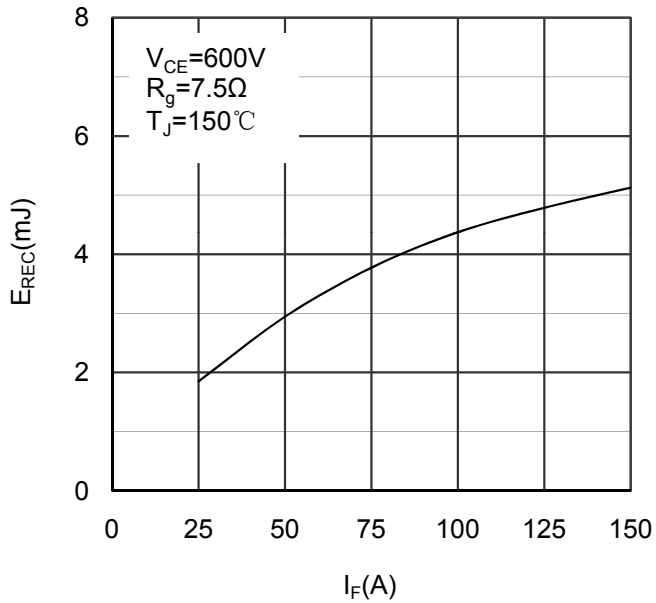


Figure 11. Switching Energy vs Forward Current Diode

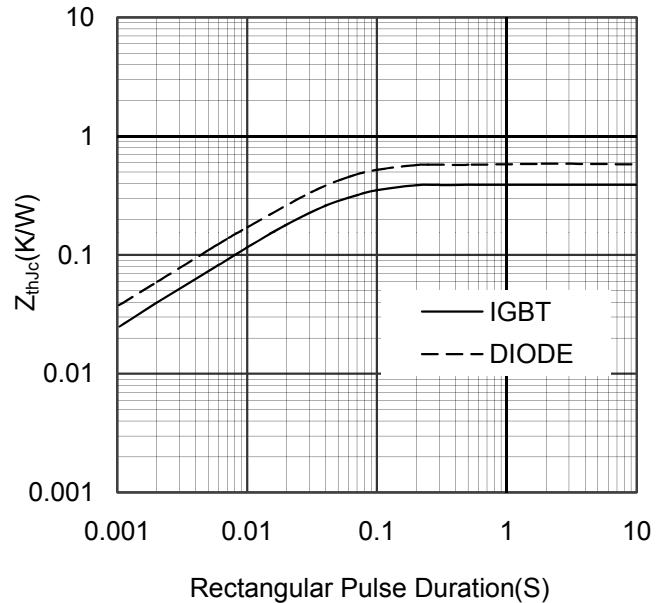


Figure 12. Transient Thermal Impedance of Diode and IGBT

