

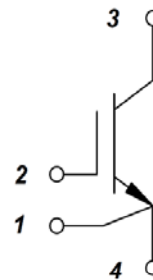
## PRODUCT FEATURES

- High short circuit capability, self limiting short circuit current
- IGBT CHIP(T4 Fast Trench+Field Stop technology)
- $V_{CE(sat)}$  with positive temperature coefficient
- Fast switching and short tail current
- Popular SOT-227 Package



## APPLICATIONS

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



## IGBT

### ABSOLUTE MAXIMUM RATINGS

$T_C=25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter/Test Conditions		Values	t
$V_{CES}$	Collector Emitter Voltage	$T_J=25^{\circ}\text{C}$	1200	V
$V_{GES}$	Gate Emitter Voltage		$\pm 20$	
$I_C$	DC Collector Current	$T_C=25^{\circ}\text{C}$	150	A
		$T_C=95^{\circ}\text{C}$	100	
$I_{CM}$	Repetitive Peak Collector Current	$t_p=1\text{ms}$	200	
$P_{tot}$	Power Dissipation Per IGBT		550	W

### MODULE CHARACTERISTICS

$T_C=25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter/Test Conditions		Values	t
$T_{Jmax}$	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

**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

## IGBT ELECTRICAL CHARACTERISTICS

$T_C = 25^\circ\text{C}$  unless otherwise specified

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	t
$V_{GE(th)}$	Gate Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=4\text{mA}$	5.4	6.0	6.5	
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C=100\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		2.1	2.5	V
		$I_C=100\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		2.5		
$I_{CES}$	Collector Leakage Current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			1	mA
		$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$			10	mA
$I_{GES}$	Gate Leakage Current	$V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=125^\circ\text{C}$	-400		400	nA
$R_{gint}$	Integrated Gate Resistor			7.5		$\Omega$
$Q_g$	Gate Charge	$V_{CE}=600\text{V}, I_C=100\text{A}, V_{GE}=15\text{V}$		0.47		$\mu\text{C}$
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		6.2		nF
$C_{res}$	Reverse Transfer Capacitance			0.35		nF
$t_{d(on)}$	Turn on Delay Time	$V_{CC}=600\text{V}, I_C=100\text{A}$ $R_G=7.5\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		150	ns
			$T_J=125^\circ\text{C}$		160	ns
$t_r$	Rise Time		$T_J=25^\circ\text{C}$		65	ns
			$T_J=125^\circ\text{C}$		70	ns
$t_{d(off)}$	Turn off Delay Time	$V_{CC}=600\text{V}, I_C=100\text{A}$ $R_G=7.5\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		400	ns
			$T_J=125^\circ\text{C}$		450	ns
$t_f$	Fall Time		$T_J=25^\circ\text{C}$		40	ns
			$T_J=125^\circ\text{C}$		60	ns
$E_{on}$	Turn on Energy	$V_{CC}=600\text{V}, I_C=100\text{A}$ $R_G=7.5\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=125^\circ\text{C}$		11.5	mJ
			$T_J=150^\circ\text{C}$		12.5	mJ
$E_{off}$	Turn off Energy		$T_J=125^\circ\text{C}$		5.5	mJ
			$T_J=150^\circ\text{C}$		6.0	mJ
$I_{sc}$	Short Circuit Current	$t_{psc} \leq 10\mu\text{s}, V_{GE}=15\text{V}$ $T_J=125^\circ\text{C}, V_{CC}=600\text{V}$		400		A
$R_{thJC}$	Junction to Case Thermal Resistance ( Per IGBT )				0.27	K/W

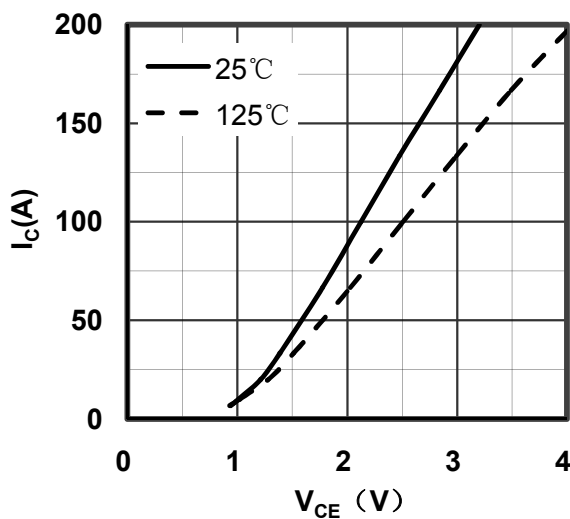


Figure 1. Typical Output Characteristics IGBT

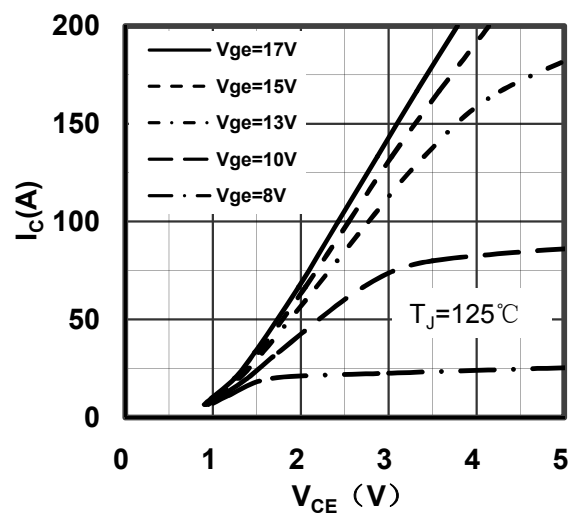


Figure 2. Typical Output Characteristics IGBT

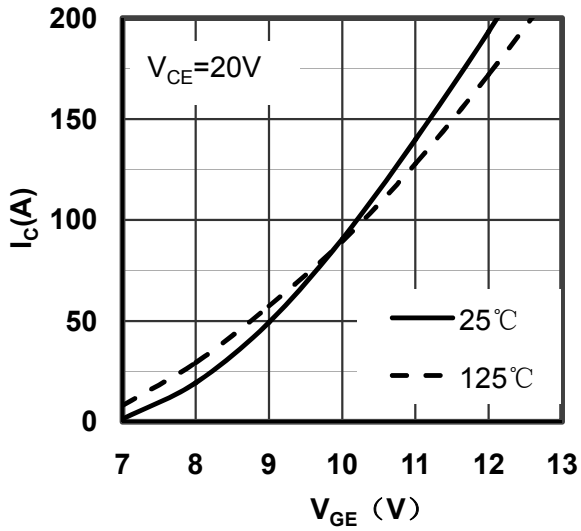


Figure 3. Typical Transfer characteristics IGBT

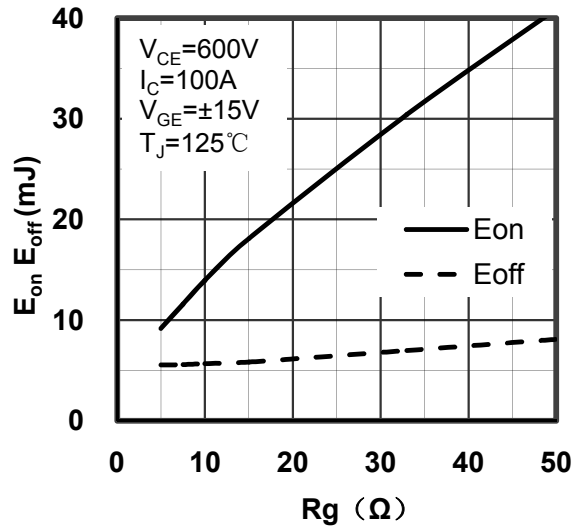


Figure 4. Switching Energy vs Gate Resistor IGBT

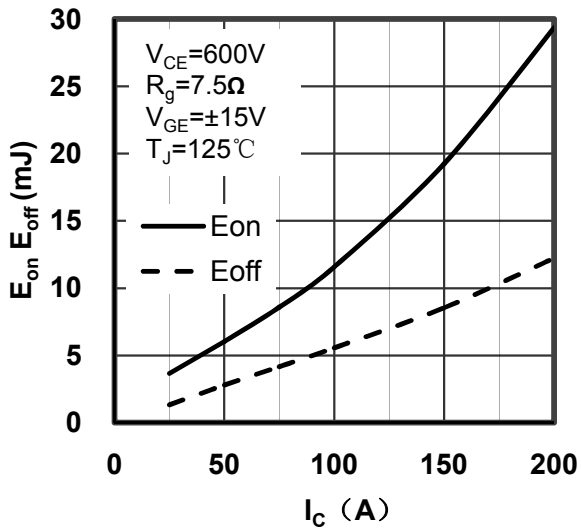


Figure 5. Switching Energy vs Collector Current IGBT

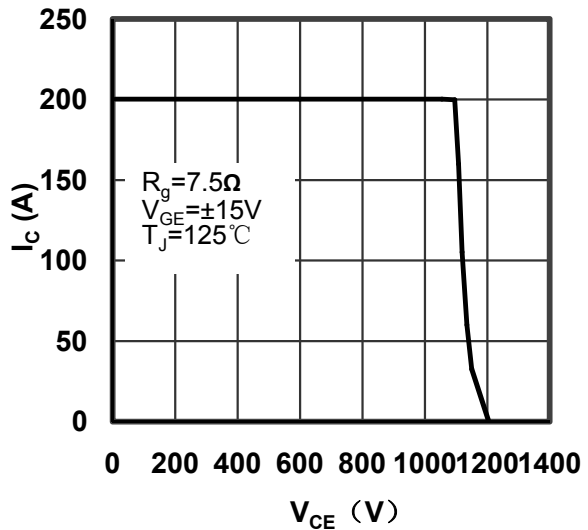


Figure 6. Reverse Biased Safe Operating Area IGBT

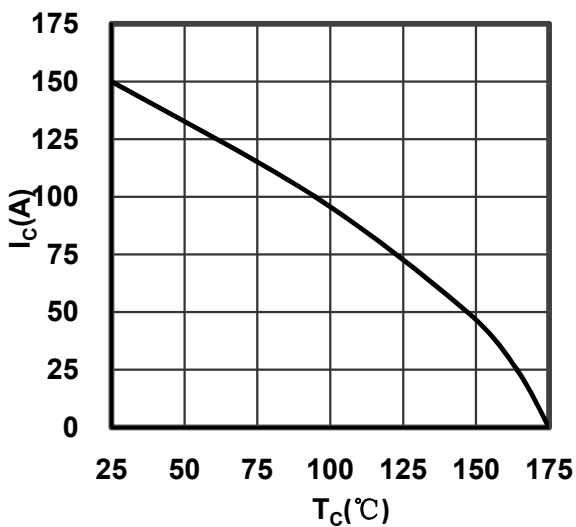


Figure 7. Collector Current vs Case temperature

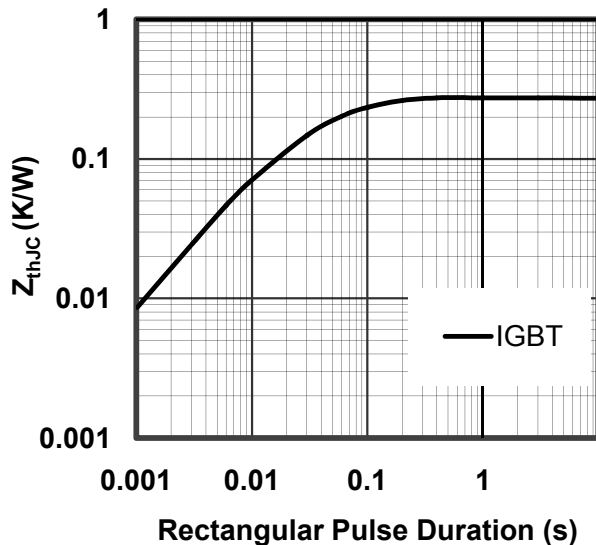
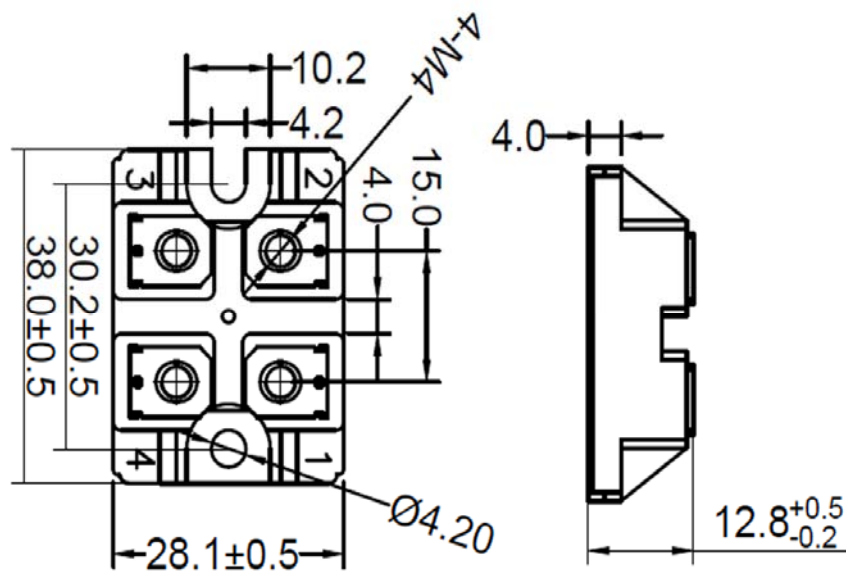


Figure 8. Transient Thermal Impedance of IGBT



Dimensions in (mm)  
Figure 9. Package Outline