

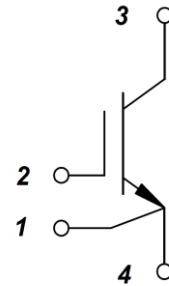
## PRODUCT FEATURES

- 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
- $T_{Jmax}=175^{\circ}C$



## APPLICATIONS

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



## IGBT

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

Symbol	Parameter/Test Conditions	Values	Unit
$V_{CES}$	Collector Emitter Voltage	$T_J=25^{\circ}C$	V
$V_{GES}$	Gate Emitter Voltage		
$I_C$	DC Collector Current	$T_C=25^{\circ}C, T_{Jmax}=175^{\circ}C$	150
		$T_C=100^{\circ}C, T_{Jmax}=175^{\circ}C$	100
$I_{CM}$	Repetitive Peak Collector Current	$t_p=1ms$	200
$P_{tot}$	Power Dissipation Per IGBT	$T_C=25^{\circ}C, T_{Jmax}=175^{\circ}C$	575

### MODULE CHARACTERISTICS ( $T_C=25^{\circ}C$ unless otherwise specified)

Symbol	Parameter/Test Conditions	Values	Unit
$T_{Jmax}$	Max. Junction Temperature	175	$^{\circ}C$
$T_{Jop}$	Operating Temperature	-40~150	
$T_{stg}$	Storage Temperature	-40~125	
$V_{isol}$	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), $t=1minute$	3000
Torque	to heatsink	Recommended (M4)	0.7~1.1
	to terminal	Recommended (M4)	0.7~1.1
Weight			26.5

# MMGT100J120UZ6C

## 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	$V_{CE}=V_{GE}, I_C=4\text{mA}$	5.2	6.0	6.5	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C=100\text{A}, V_{GE}=15\text{V}, T_J=25^{\circ}\text{C}$		1.85	2.25	
		$I_C=100\text{A}, V_{GE}=15\text{V}, T_J=125^{\circ}\text{C}$		2.15		
		$I_C=100\text{A}, V_{GE}=15\text{V}, T_J=150^{\circ}\text{C}$		2.25		
$I_{CES}$	Collector Leakage Current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=25^{\circ}\text{C}$			1	mA
		$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=150^{\circ}\text{C}$			5	mA
$I_{GES}$	Gate Leakage Current	$V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=25^{\circ}\text{C}$	-400		400	nA
$R_{gint}$	Integrated Gate Resistor			10		$\Omega$
$Q_g$	Gate Charge	$V_{CE}=600\text{V}, I_C=100\text{A}, V_{GE}=15\text{V}$		0.52		$\mu\text{C}$
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		14.5		nF
$C_{res}$	Reverse Transfer Capacitance				260	
$t_{d(on)}$	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	$T_J=25^{\circ}\text{C}$	360		ns
			$T_J=150^{\circ}\text{C}$	400		ns
$t_r$	Rise Time	$V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^{\circ}\text{C}$	100		ns
			$T_J=150^{\circ}\text{C}$	115		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	$T_J=25^{\circ}\text{C}$	320		ns
			$T_J=150^{\circ}\text{C}$	400		ns
$t_f$	Fall Time	$V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^{\circ}\text{C}$	120		ns
			$T_J=150^{\circ}\text{C}$	220		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	$T_J=25^{\circ}\text{C}$	18		mJ
			$T_J=150^{\circ}\text{C}$	23		mJ
$E_{off}$	Turn off Energy	$V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^{\circ}\text{C}$	7.0		mJ
			$T_J=150^{\circ}\text{C}$	10.5		mJ
$I_{SC}$	Short Circuit Current	$tpsc \leq 10\mu\text{s}, V_{GE}=15\text{V}$ $T_J=150^{\circ}\text{C}, V_{CC}=600\text{V}$		460		A
$R_{thJC}$	Junction to Case Thermal Resistance (Per IGBT)				0.26	K/W

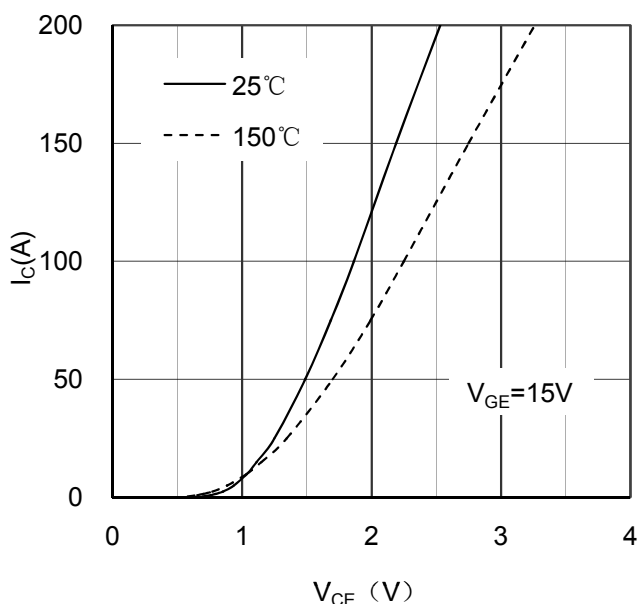


Figure 1. Typical Output Characteristics IGBT

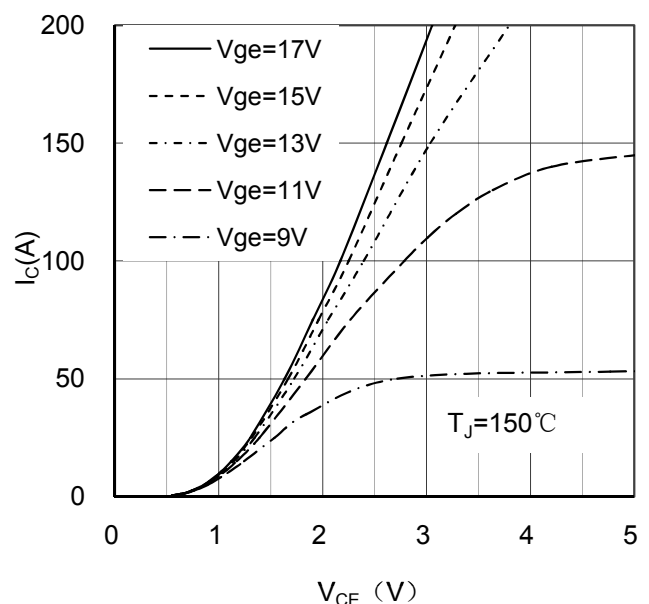


Figure 2. Typical Output Characteristics IGBT

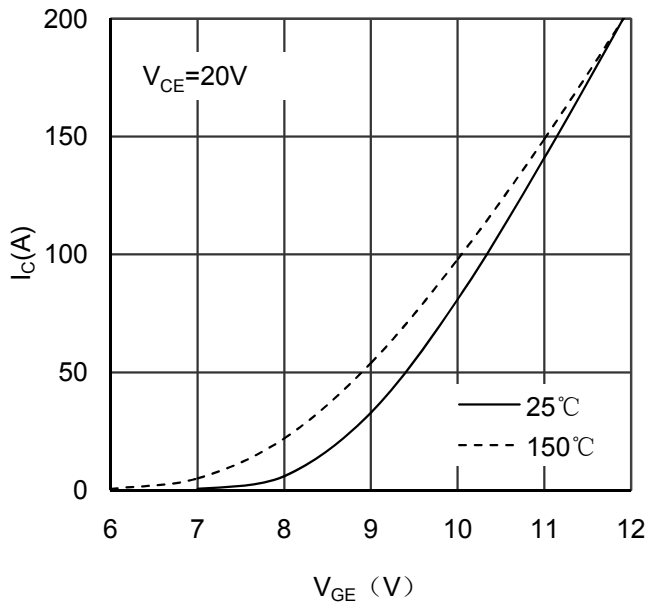


Figure 3. Typical Transfer characteristics IGBT

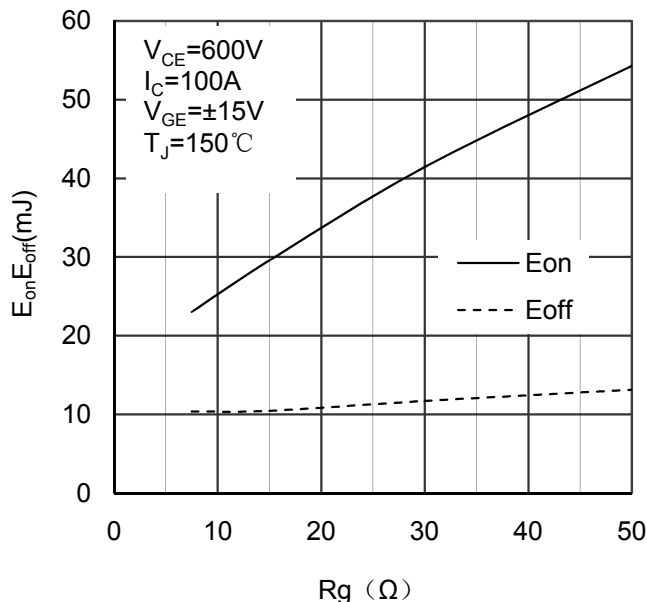


Figure 4. Switching Energy vs Gate Resistor IGBT

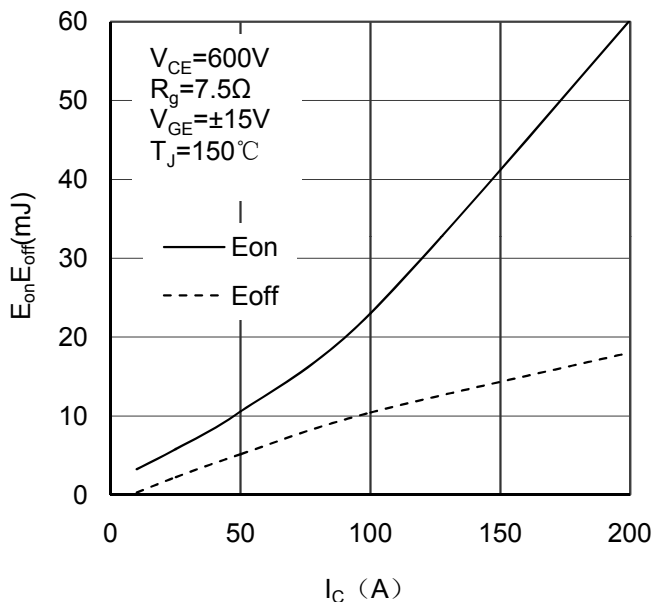


Figure 5. Switching Energy vs Collector Current IGBT

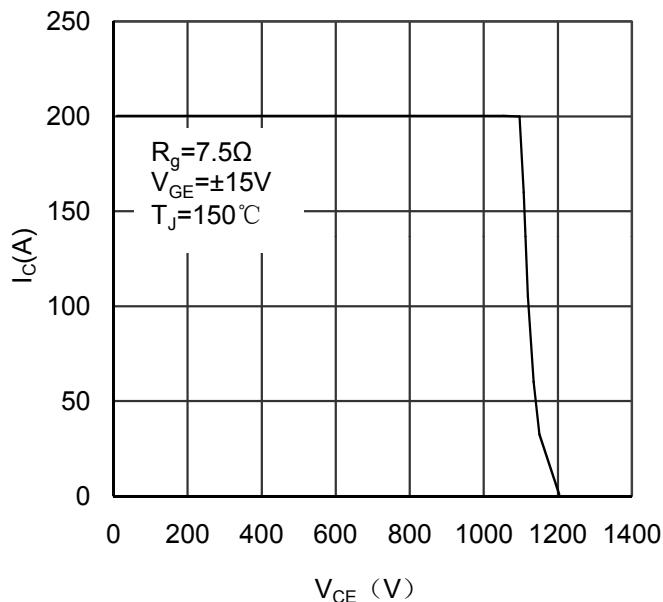


Figure 6. Reverse Biased Safe Operating Area IGBT

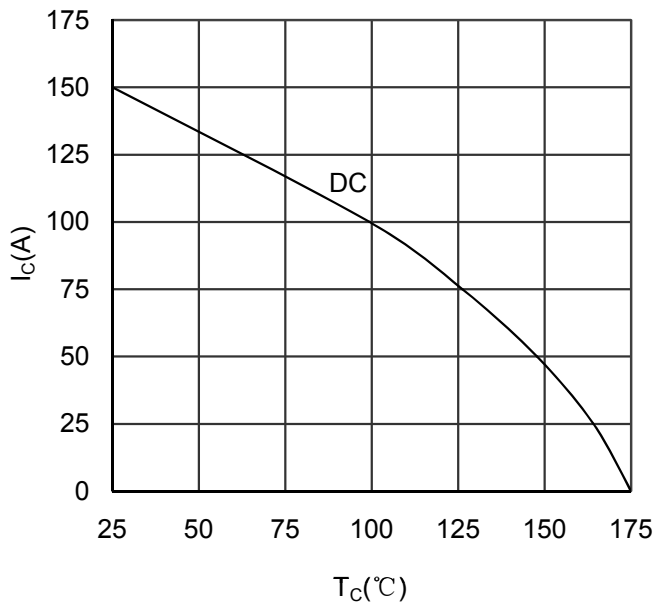


Figure 7. Collector Current vs Case temperature IGBT

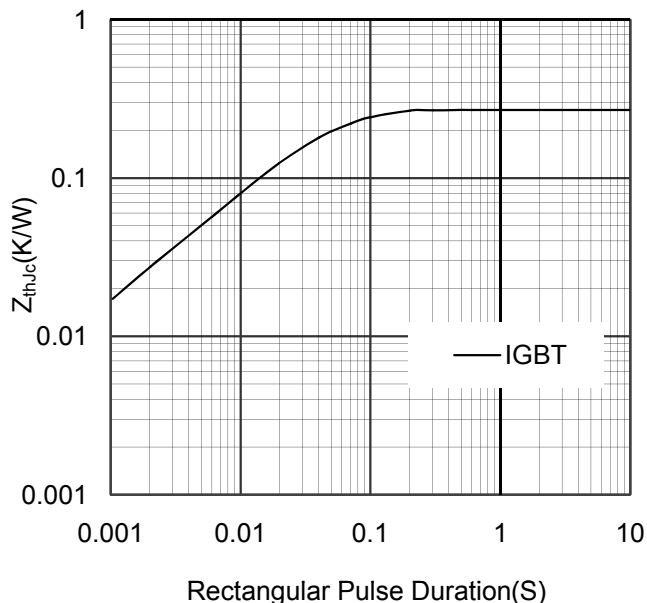
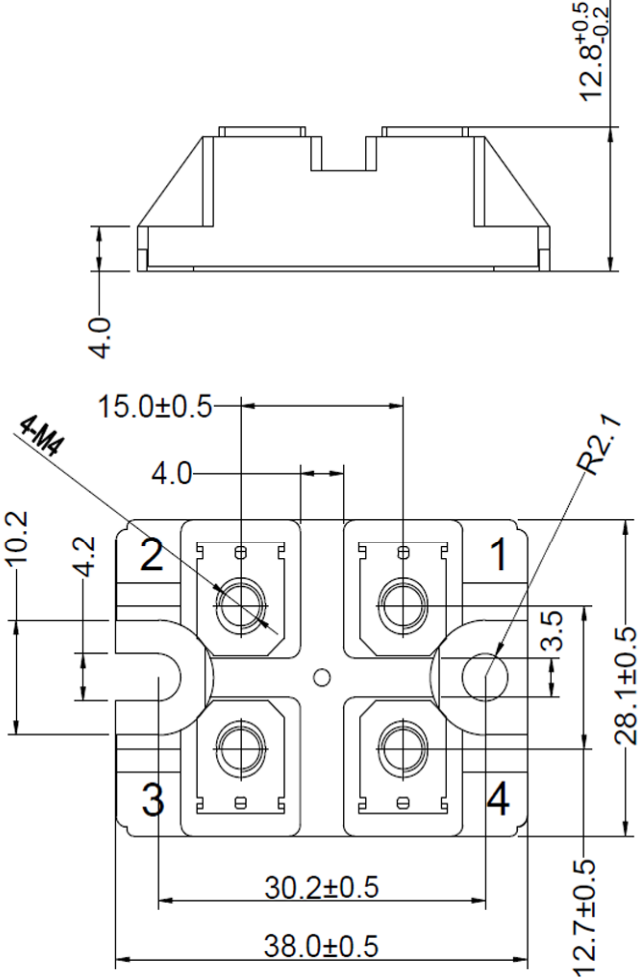


Figure 8. Transient Thermal Impedance of IGBT



Dimensions in (mm)  
Figure 9. Package Outline