

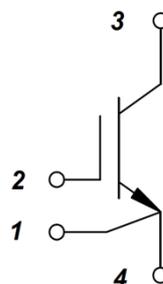
PRODUCT FEATURES

- 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

- Inverter Convertor
- Welder SMPS and UPS
- Induction Heating



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	$T_C = 25^\circ\text{C}$	150	A
		$T_C = 80^\circ\text{C}$	100	
I_{CM}	Repetitive Peak Collector Current	$t_p = 1\text{ms}$	200	
P_{tot}	Power Dissipation Per IGBT		690	W

MODULE CHARACTERISTICS

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

Symbol	Parameter/Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature		150	$^\circ\text{C}$
T_{Jop}	Operating Temperature		-40~125	
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

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	$V_{CE}=V_{GE}, I_C=4\text{mA}$	5.0	6.2	7.0	V	
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C=100\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		1.8	2.4		
		$I_C=100\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		2.0			
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	$V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=25^\circ\text{C}$	-400		400	nA	
R_{gint}	Integrated Gate Resistor			2		Ω	
Q_g	Gate Charge	$V_{CE}=600\text{V}, I_C=100\text{A}, V_{GE}=\pm 15\text{V}$		1.05		μC	
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		7.43		nF	
C_{res}	Reverse Transfer Capacitance				340		pF
$t_{d(on)}$	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	$T_J=25^\circ\text{C}$		100		ns
			$T_J=125^\circ\text{C}$		110		ns
t_r	Rise Time		$T_J=25^\circ\text{C}$		60		ns
			$T_J=125^\circ\text{C}$		60		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	$T_J=25^\circ\text{C}$		420		ns
			$T_J=125^\circ\text{C}$		490		ns
t_f	Fall Time		$T_J=25^\circ\text{C}$		60		ns
			$T_J=125^\circ\text{C}$		75		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	$T_J=25^\circ\text{C}$		6		mJ
			$T_J=125^\circ\text{C}$		7.5		mJ
E_{off}	Turn off Energy		$T_J=25^\circ\text{C}$		7		mJ
			$T_J=125^\circ\text{C}$		10		mJ
I_{sc}	Short Circuit Current	$tp_{sc} \leq 10\mu\text{s}, V_{GE}=15\text{V}$ $T_J=125^\circ\text{C}, V_{CC}=900\text{V}$		470		A	
R_{thJC}	Junction to Case Thermal Resistance (Per IGBT)				0.18	K/W	

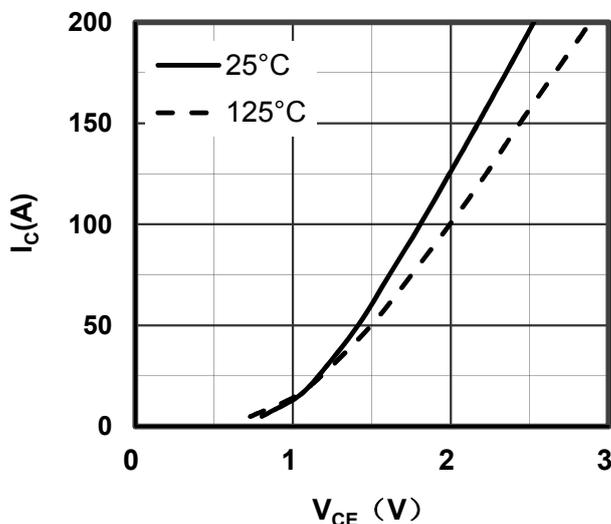


Figure 1. Typical Output Characteristics IGBT

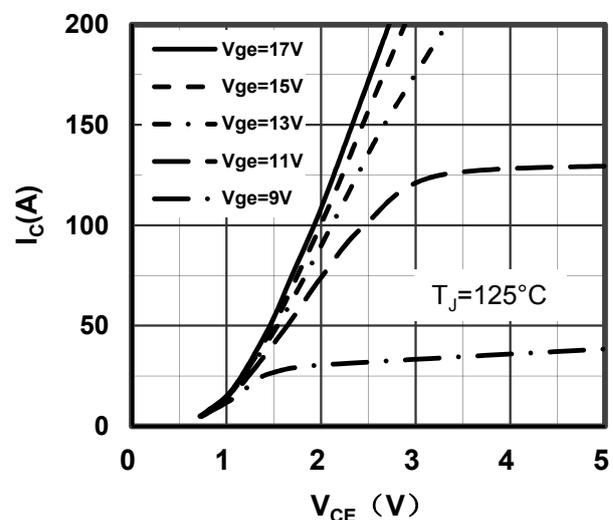


Figure 2. Typical Output Characteristics IGBT

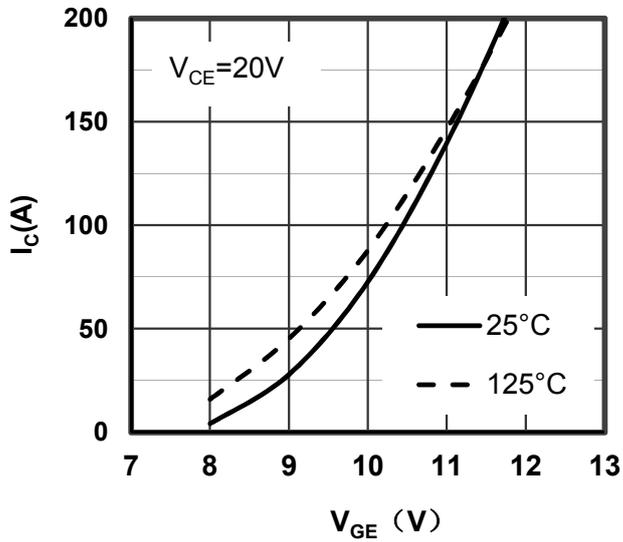


Figure 3. Typical Transfer characteristics IGBT

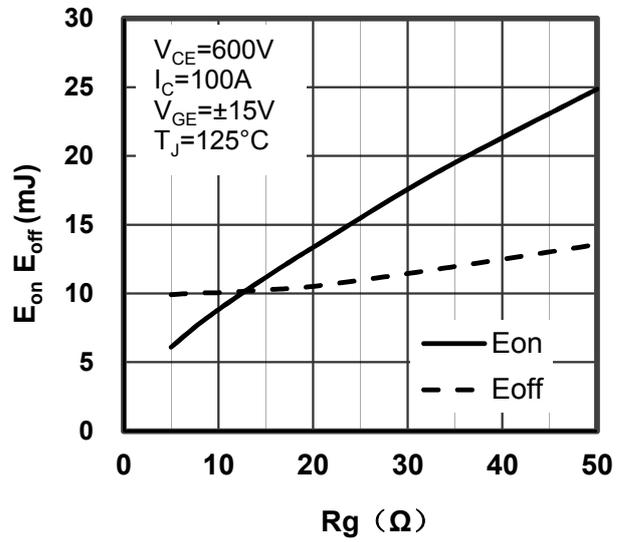


Figure 4. Switching Energy vs Gate Resistor IGBT

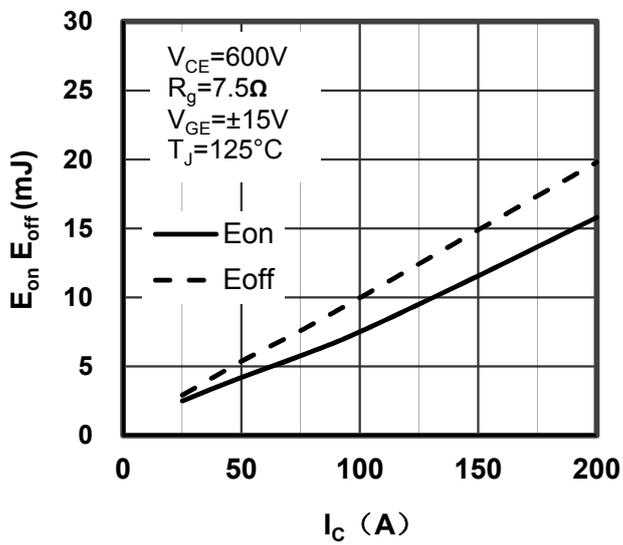


Figure 5. Switching Energy vs Collector Current IGBT

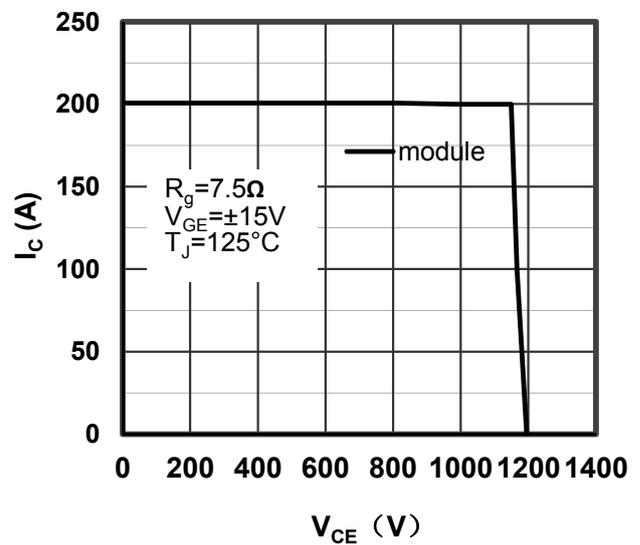


Figure 6. Reverse Biased Safe Operating Area IGBT

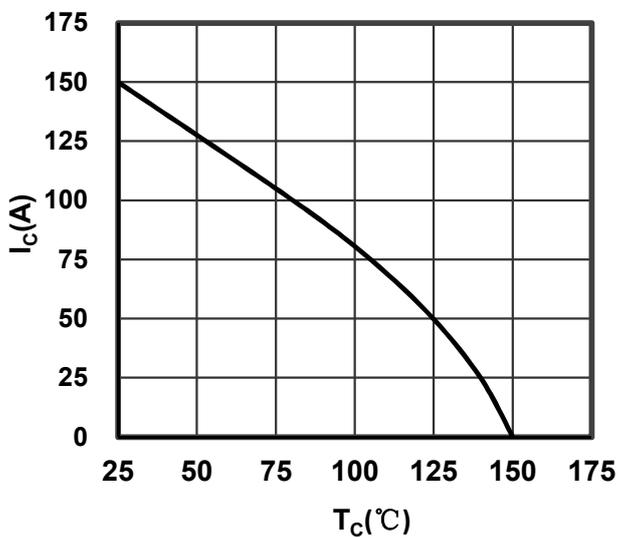


Figure 7. Collector Current vs Case temperature

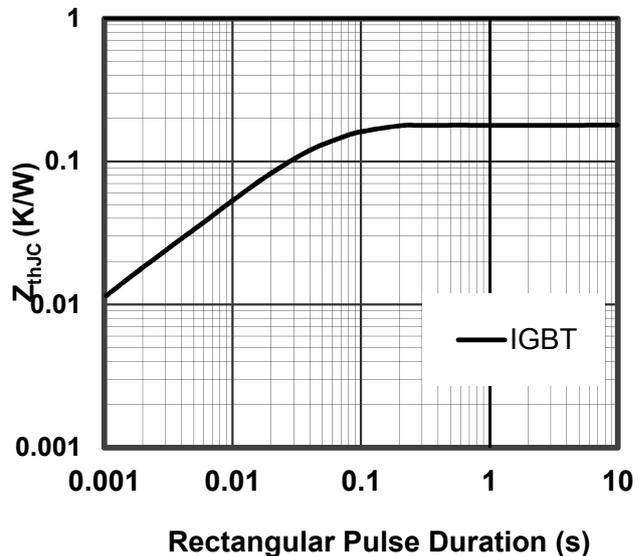
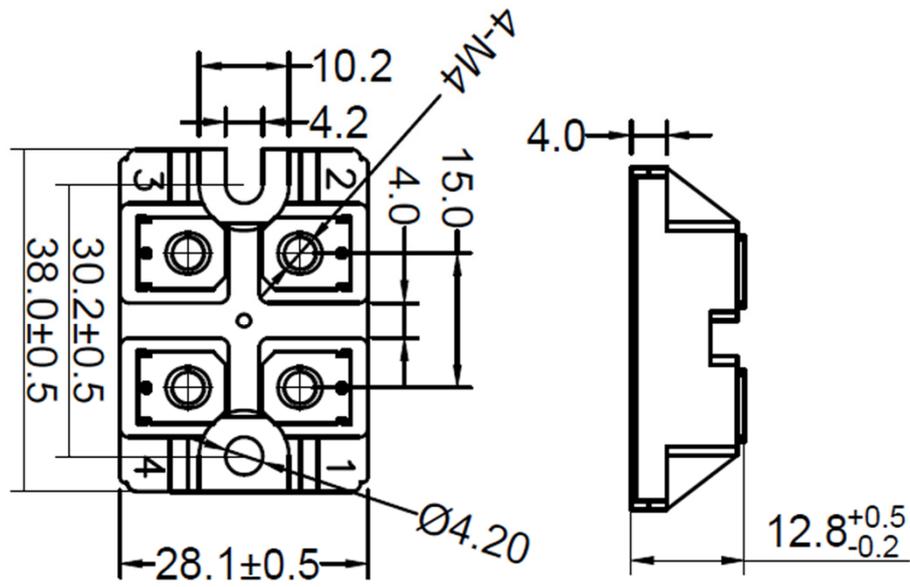


Figure 8. Transient Thermal Impedance of IGBT



Dimensions in (mm)
Figure 9. Package Outline