PRODUCT FEATURES

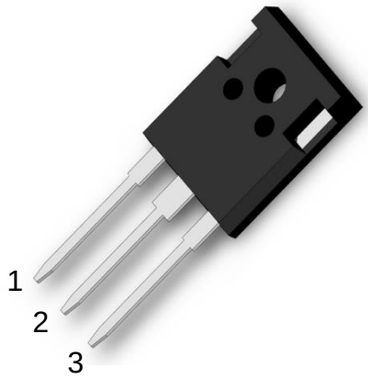
☐ 1350V IGBT chip in trench FS-technology

☐ Low switching losses

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

☐ Fast switching and short tail current

☐ Free wheeling diodes with fast and soft reverse recovery



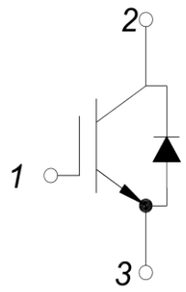
APPLICATIONS

☐ Induction Heating

☐ Soft Switching Application

☐ Inverter

1.Gate
2.Collector
3.Emitter



Type	V_{CES}	I_C	$V_{CE(sat)}$ T_J=25°C	T_{Jmax}	Marking	Package
MM20G3T135B	1350V	20A	1.65V	175°C	MM20G3T135B	TO-247

ABSOLUTE MAXIMUM RATINGS(T_C =25°C unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	T_J=25℃	1350	V
V_{GES}	Gate Emitter Voltage		±20	
I_C	DC Collector Current	T_C=25℃	40	A
		T_C=100℃	20	
I_{Cpuls}	Pulsed collector current,tp limited by T_{Jmax}		60	
P_{tot}	Power Dissipation Per IGBT		268	W
V_{RRM}	Repetitive Reverse Voltage	T_J=25℃	1350	V
$I_{F(AV)}$	Average Forward Current	T_C=100℃	20	A
T_{Jmax}	Max. Junction Temperature		175	℃
T_{Jop}	Operating Temperature		-40~175	
T_{stg}	Storage Temperature		-55~150	
Torque	to heatsink	Recommended（M3）	1.1	Nm
Weight			8	g

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IGBT

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=0.8mA		5.0	5.6	6.5	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	I_C=20A, V_{GE}=15V, T_J=25℃			1.65	2.1	
		I_C=20A, V_{GE}=15V, T_J=125℃			1.9		
		I_C=20A, V_{GE}=15V, T_J=150℃			1.95		
I_{CES}	Collector Leakage Current	V_{CE}=1350V, V_{GE}=0V, T_J=25℃				1	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V,V_{GE}=±20V, T_J=25℃		-200		200	nA
Q_g	Gate Charge	V_{CE}=600V, I_C=20A , V_{GE}=15V			160		nC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			1.9		nF
C_{res}	Reverse Transfer Capacitance				50		pF
$t_{d(on)}$	Turn on Delay Time	V_{CC}=600V,I_C=20A R_G =20Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		24		ns
			T_J=125℃		26		ns
			T_J=150℃		28		ns
t_r	Rise Time		T_J=25℃		18		ns
			T_J=125℃		20		ns
			T_J=150℃		20		ns
$t_{d(off)}$	Turn off Delay Time	V_{CC}=600V,I_C=20A R_G =20Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		200		ns
			T_J=125℃		225		ns
			T_J=150℃		230		ns
t_f	Fall Time		T_J=25℃		100		ns
			T_J=125℃		150		ns
			T_J=150℃		160		ns
E_{on}	Turn on Energy	V_{CC}=600V,I_C=20A R_G =20Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		1.2		mJ
			T_J=125℃		1.75		mJ
			T_J=150℃		1.85		mJ
E_{off}	Turn off Energy		T_J=25℃		1.1		mJ
			T_J=125℃		1.3		mJ
			T_J=150℃		1.4		mJ
R_{thJC}	Junction to Case Thermal Resistance （ Per IGBT）					0.56	K /W

Anti-Parallel Diode

ELECTRICAL CHARACTERISTICS *(T_C=25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=20A , V_{GE}=0V, T_J=25℃		1.8	2.4	V
		I_F=20A , V_{GE}=0V, T_J=125℃		1.7		
		I_F=20A , V_{GE}=0V, T_J=150℃		1.65		
t_{rr}	Reverse Recovery Time	I_F=20A , V_R=600V dI_F/dt=-770A/μs T_J =150℃		300		ns
I_{RRM}	Max. Reverse Recovery Current			30		A
Q_{RR}	Reverse Recovery Charge			4.7		μC
E_{rec}	Reverse Recovery Energy			1.8		mJ
R_{thJCD}	Junction to Case Thermal Resistance （ Per Diode）				2.8	K /W

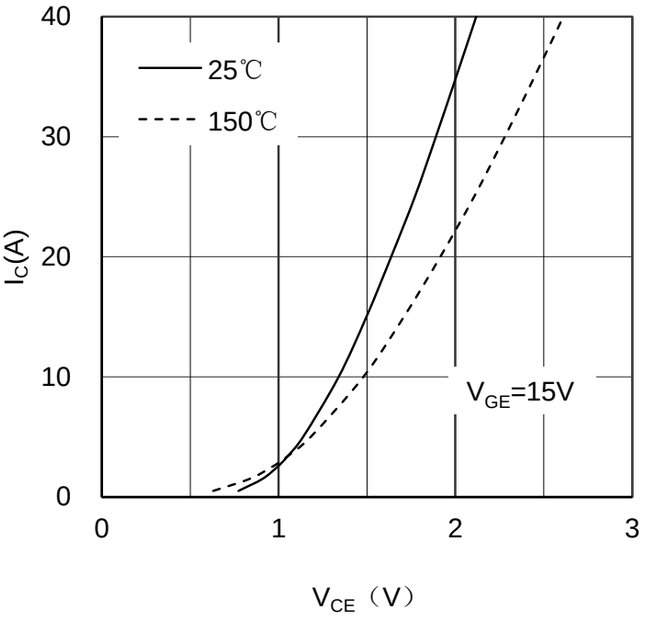


Figure 1. Typical Output Characteristics IGBT

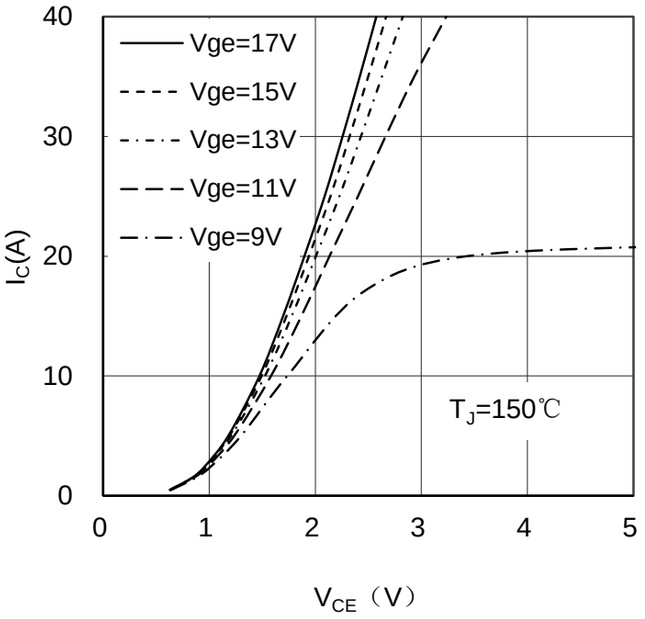


Figure 2. Typical Output Characteristics IGBT

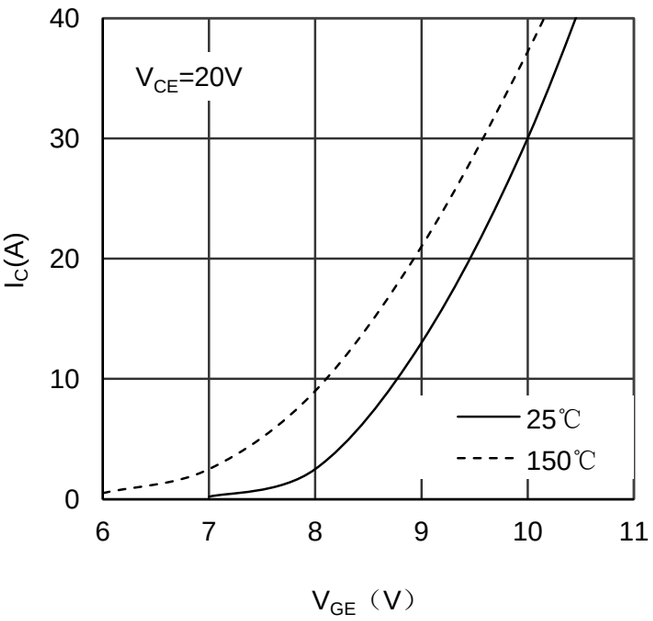


Figure 3. Typical Transfer characteristics IGBT

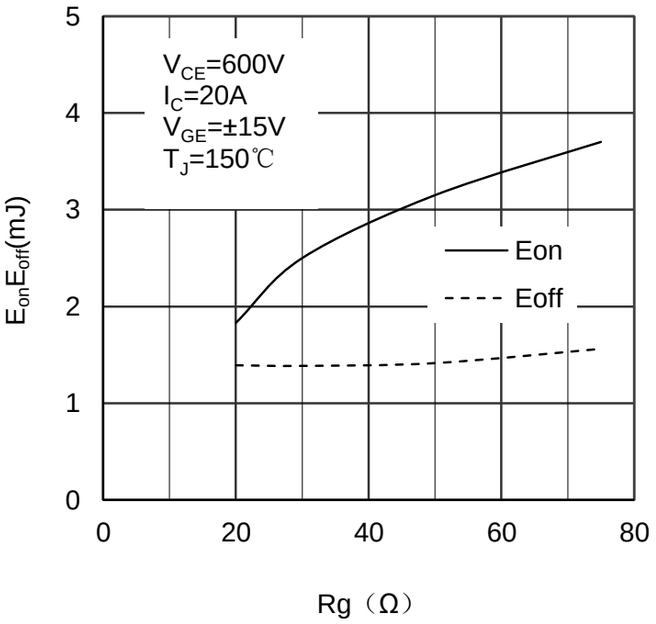


Figure 4. Switching Energy vs Gate Resistor IGBT

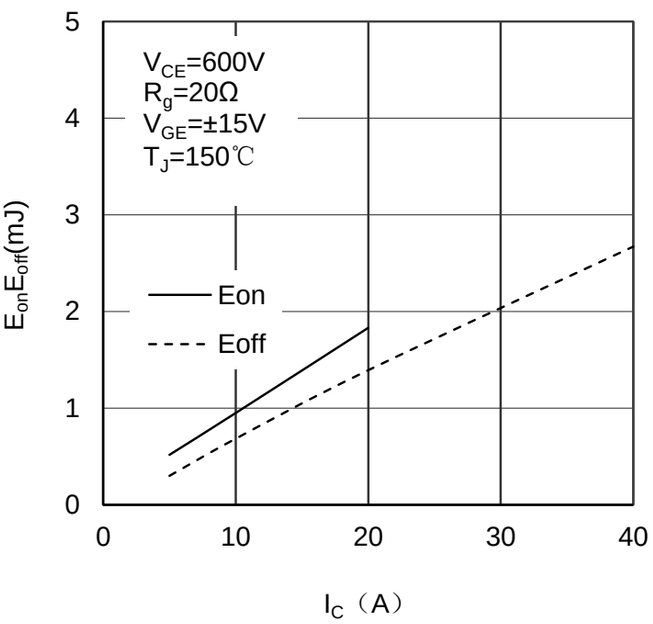


Figure 5. Switching Energy vs Collector Current IGBT

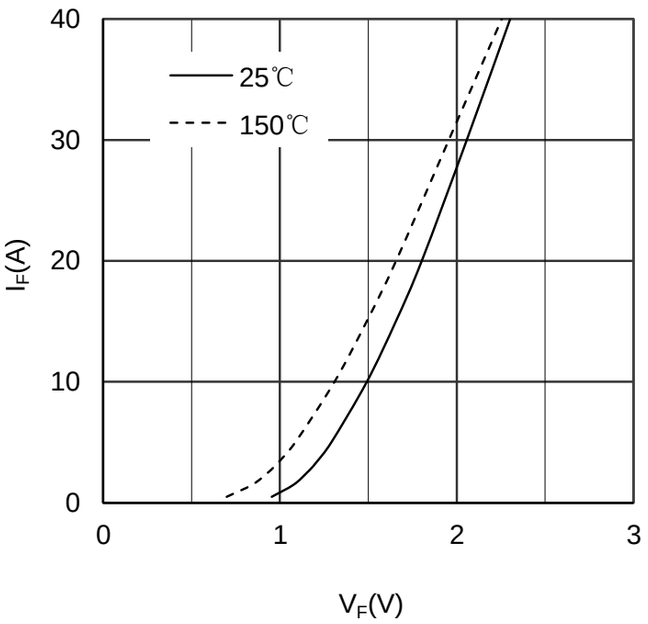


Figure 6. Diode Forward Characteristics Diode

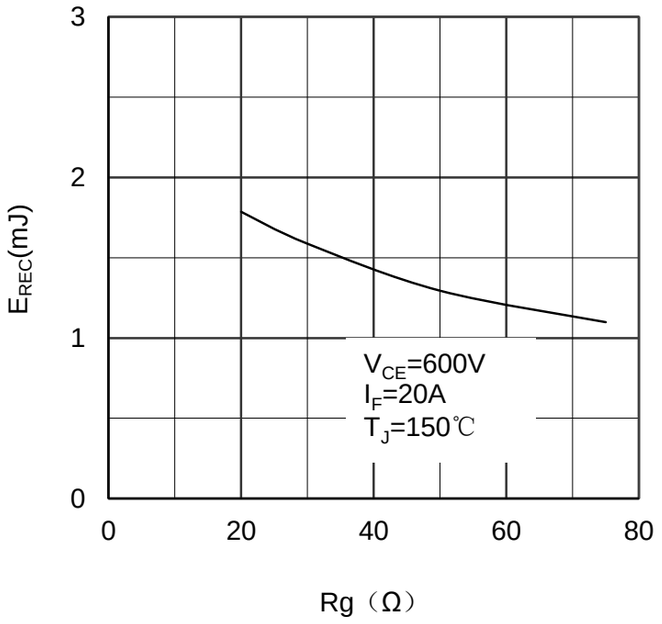


Figure 7. Switching Energy vs Gate Resistor Diode

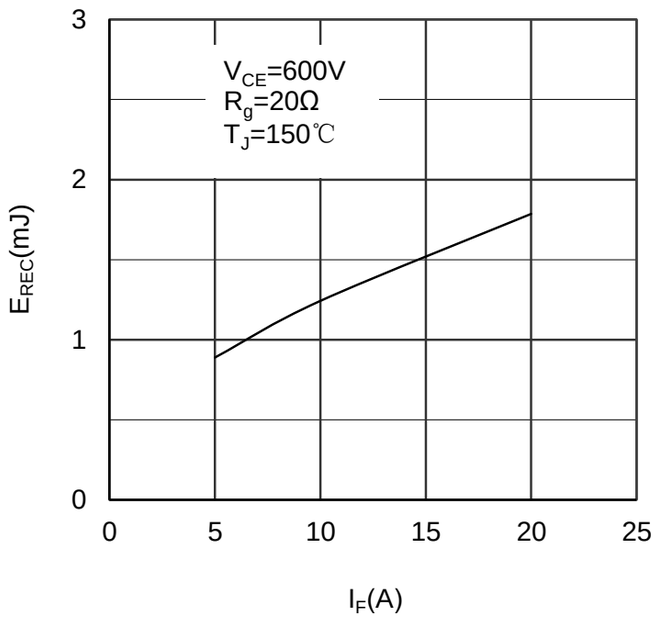


Figure 8. Switching Energy vs Forward Current Diode

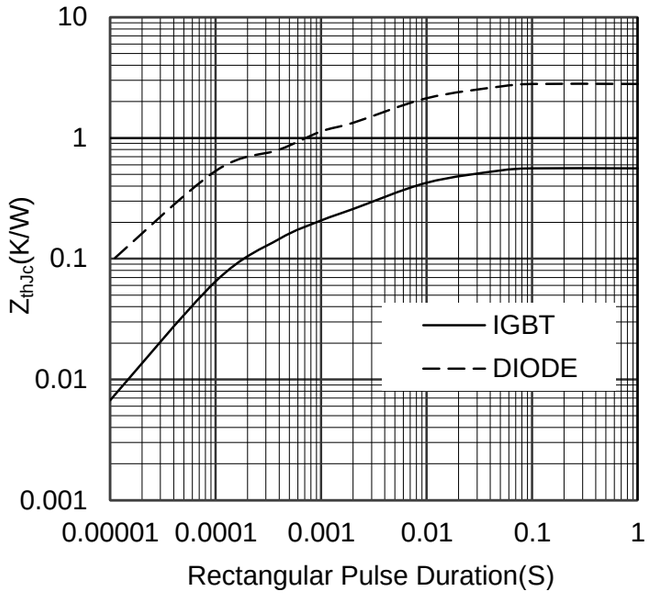
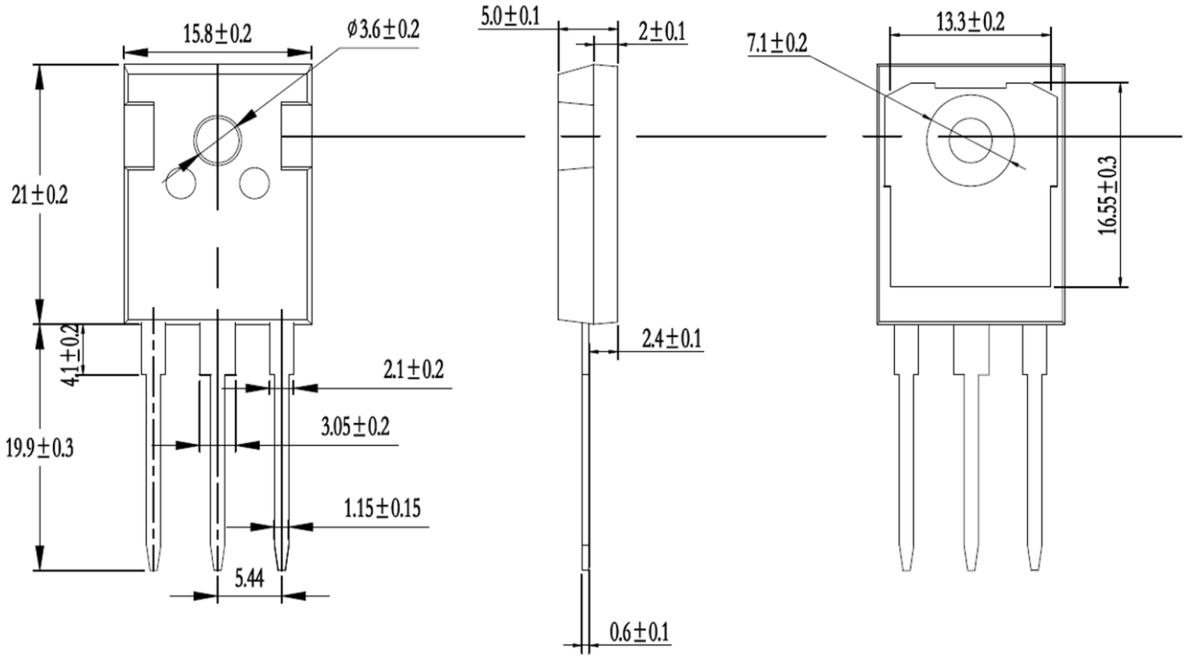


Figure 9. Transient Thermal Impedance of Diode and IGBT



Dimensions in (mm)

Figure 10. Package Outline