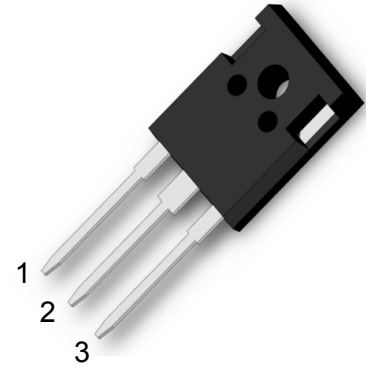


PRODUCT FEATURES

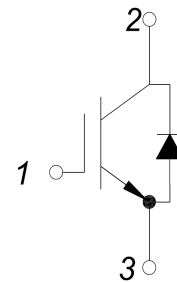
- 1350V Reverse conducting IGBT with monolithic body diode
- $V_{CE(sat)}$ with positive temperature coefficient
- Low switching losses
- Low EMI



APPLICATIONS

- HInductive cooking
- Inverterized microwave ovens
- Resonant converters
- Soft switching applications

1.Gate
2.Collector
3.Emitter



Type	V_{CES}	I_C	$V_{CE(sat)}$ $T_J=25^\circ C$	T_{Jmax}	Marking	Package
MM20G3R135B	1350V	20A	1.6V	175°C	MM20G3R135B	TO-247

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	$T_C=25^\circ C$	A	
		$T_C=100^\circ C$		
I_{Cpuls}	Pulsed collector current, tp limited by T_{Jmax}	60		
P_{tot}	Power Dissipation Per IGBT	333	W	
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ C$	V	
$I_{F(AV)}$	Average Forward Current	$T_C=100^\circ C$	A	
I_{Fpuls}	Diode pulsed current, tp limited by T_{Jmax}	60		
T_{Jmax}	Max. Junction Temperature	175	°C	
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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MM20G3R135B

IGBT

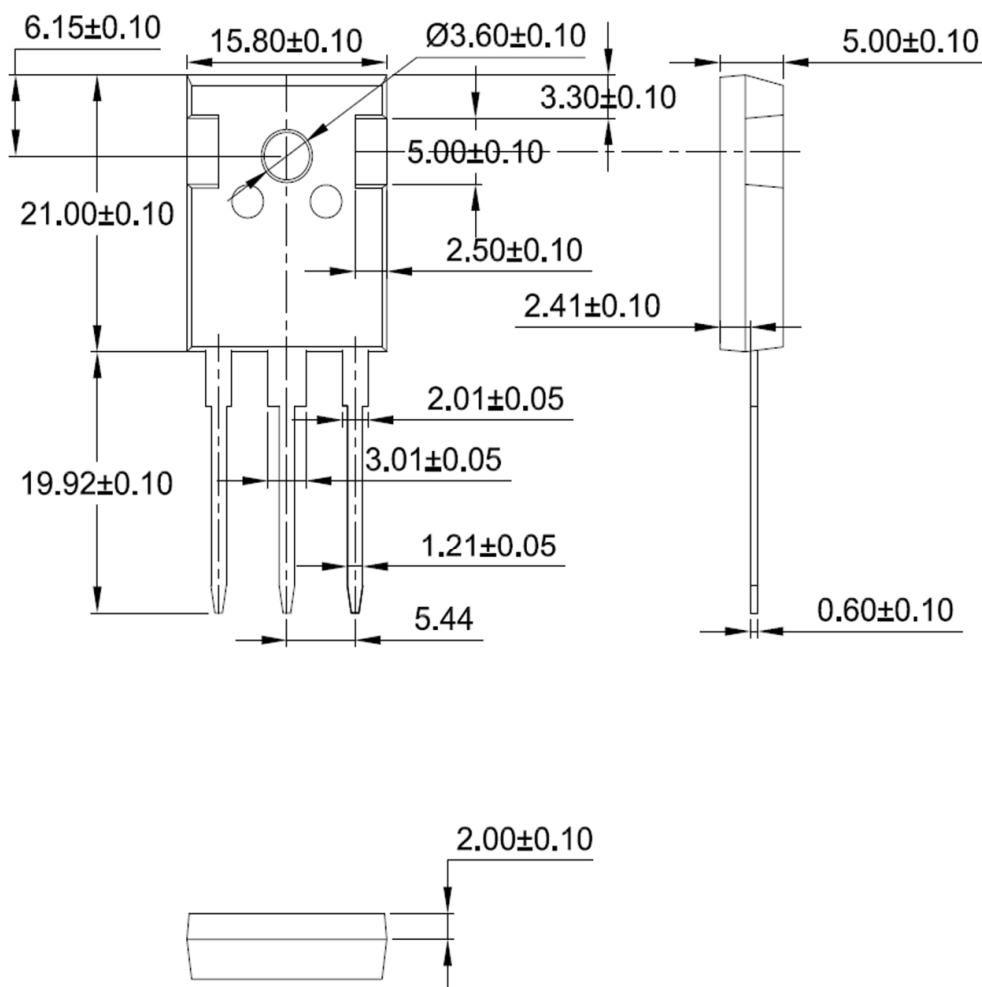
ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
$V_{GE(th)}$	Gate Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=0.5\text{mA}$	5.1	5.8	6.4	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C=20\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		1.6	1.8	
		$I_C=20\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		1.8		
		$I_C=20\text{A}, V_{GE}=15\text{V}, T_J=175^\circ\text{C}$		1.9		
I_{CES}	Collector Leakage Current	$V_{CE}=1350\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			100	μA
		$V_{CE}=1350\text{V}, V_{GE}=0\text{V}, T_J=175^\circ\text{C}$			2.5	mA
I_{GES}	Gate Leakage Current	$V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=25^\circ\text{C}$	-100		100	nA
R_{gint}	Integrated Gate Resistor			none		Ω
Q_g	Gate Charge	$V_{CE}=600\text{V}, I_C=20\text{A}, V_{GE}=15\text{V}$		0.195		μC
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		1.65		nF
C_{res}	Reverse Transfer Capacitance				50	
$t_{d(on)}$	Turn on Delay Time	$V_{CC}=600\text{V}, I_C=20\text{A}$ $R_G=20\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		70	ns
			$T_J=125^\circ\text{C}$		110	ns
t_r	Rise Time	$V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		50	ns
			$T_J=125^\circ\text{C}$		60	ns
$t_{d(off)}$	Turn off Delay Time	$V_{CC}=600\text{V}, I_C=20\text{A}$ $R_G=20\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		250	ns
			$T_J=125^\circ\text{C}$		350	ns
t_f	Fall Time	$V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		80	ns
			$T_J=125^\circ\text{C}$		100	ns
E_{on}	Turn on Energy	$V_{CC}=600\text{V}, I_C=20\text{A}$ $R_G=20\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		2	mJ
			$T_J=125^\circ\text{C}$		2.4	mJ
E_{off}	Turn off Energy	$V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		1.1	mJ
			$T_J=125^\circ\text{C}$		1.4	mJ
R_{thJC}	Junction to Case Thermal Resistance (Per IGBT)				0.45	K/W

Body Diode

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=20\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.6	1.8	V
		$I_F=20\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.73		
		$I_F=20\text{A}, V_{GE}=0\text{V}, T_J=175^\circ\text{C}$		1.8		
R_{thJCD}	Junction to Case Thermal Resistance (Per Diode)				0.45	K/W



Dimensions in (mm)
Package Outline