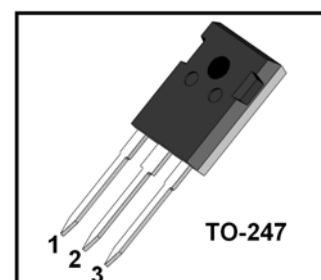


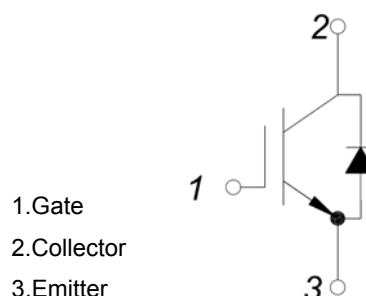
FEATURES

- ☐ Low switching losses
- ☐ Low EMI
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐ $V_{CE(sat)}$ with positive temperature coefficient



APPLICATIONS

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



ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	$T_j=25^{\circ}\text{C}$	1200	V
V_{GES}	Gate - Emitter Voltage		± 20	V
I_C	DC Collector Current	$T_c=25^{\circ}\text{C}$	40	A
		$T_c=100^{\circ}\text{C}$	25	A
I_{Cpuls}	Pulsed collector current, tp limited by $T_{j\max}$		80	A
P_{tot}	Power Dissipation		250	W
Anti-Parallel Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_j=25^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_c=25^{\circ}\text{C}$	10	A
I_{Fpuls}	Diode pulsed current, tp limited by $T_{j\max}$		20	A
$T_{j\max}$	Max. Junction Temperature		-40 to +150	$^{\circ}\text{C}$
T_{jop}	Operating Temperature		-40 to +150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-55 to +125	$^{\circ}\text{C}$
Torque	Module-to-Sink	Recommended (M3)	1.1	N·m
Weight			8.0	g

MM25G120B

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
IGBT						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}$, $I_C=1\text{mA}$	5	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	$I_C=25\text{A}$, $V_{GE}=15\text{V}$, $T_J=25^{\circ}\text{C}$		2.1	2.5	V
		$I_C=25\text{A}$, $V_{GE}=15\text{V}$, $T_J=125^{\circ}\text{C}$		2.5		V
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	$V_{CE}=0\text{V}$, $V_{GE}=\pm 15\text{V}$, $T_J=125^{\circ}\text{C}$	-200		200	nA
Q_{ge}	Gate Charge	$V_{CE}=600\text{V}$, $I_C=25\text{A}$, $V_{GE}=15\text{V}$		0.17		μC
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$		2.27		nF
C_{res}	Reverse Transfer Capacitance			0.15		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=600\text{V}$, $I_C=25\text{A}$, $T_J=25^{\circ}\text{C}$		35		ns
		$R_G=15\Omega$, $T_J=125^{\circ}\text{C}$		40		ns
t_r	Rise Time	$V_{GE}=15\text{V}$, $T_J=25^{\circ}\text{C}$		30		ns
		Inductive Load $T_J=125^{\circ}\text{C}$		35		ns
$t_{d(off)}$	Turn - off Delay Time	$V_{CC}=600\text{V}$, $I_C=25\text{A}$, $T_J=25^{\circ}\text{C}$		200		ns
		$R_G=15\Omega$, $T_J=125^{\circ}\text{C}$		240		ns
t_f	Fall Time	$V_{GE}=15\text{V}$, $T_J=25^{\circ}\text{C}$		100		ns
		Inductive Load $T_J=125^{\circ}\text{C}$		200		ns
E_{on}	Turn - on Energy	$V_{CC}=600\text{V}$, $I_C=25\text{A}$, $T_J=25^{\circ}\text{C}$		1.5		mJ
		$R_G=15\Omega$, $T_J=125^{\circ}\text{C}$		1.9		mJ
E_{off}	Turn - off Energy	$V_{GE}=15\text{V}$, $T_J=25^{\circ}\text{C}$		1.4		mJ
		Inductive Load $T_J=125^{\circ}\text{C}$		2.0		mJ
I_{sc}	Short Circuit Current	$t_{psc}\leq 10\mu\text{s}$, $V_{GE}=15\text{V}$ $T_J=125^{\circ}\text{C}$, $V_{CC}=600\text{V}$		150		A
R_{thJC}	Junction-to-Case Thermal Resistance				0.5	K/W
Anti-Parallel Diode						
V_F	Forward Voltage	$I_F=10\text{A}$, $V_{GE}=0\text{V}$, $T_{vj}=25^{\circ}\text{C}$		1.6	2.0	V
		$I_F=10\text{A}$, $V_{GE}=0\text{V}$, $T_{vj}=125^{\circ}\text{C}$		1.6		V
I_{RRM}	Max. Reverse Recovery Current	$I_F=10\text{A}$, $V_R=600\text{V}$		15		A
Q_{rr}	Reverse Recovery Charge	$di_F/dt=-700\text{A}/\mu\text{s}$		1.8		μC
E_{rec}	Reverse Recovery Energy	$T_{vj}=125^{\circ}\text{C}$		0.9		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance				2.1	K/W

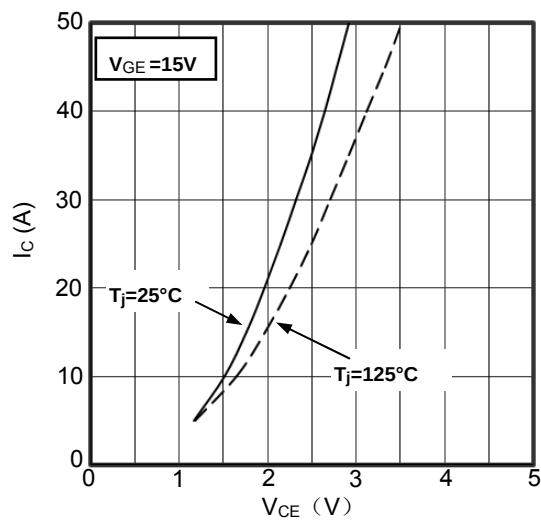


Figure1. Typical Output characteristics

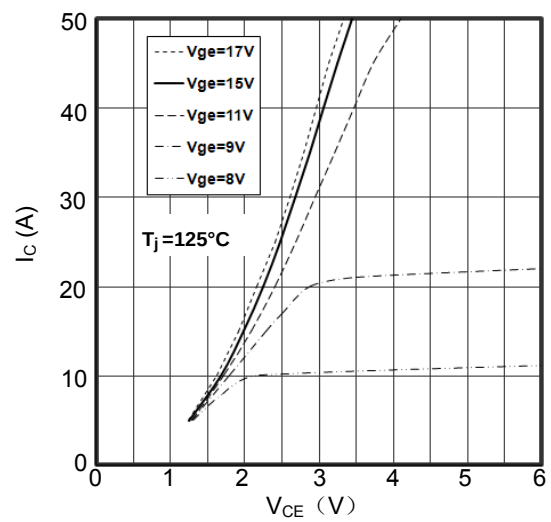


Figure2. Typical Output characteristics

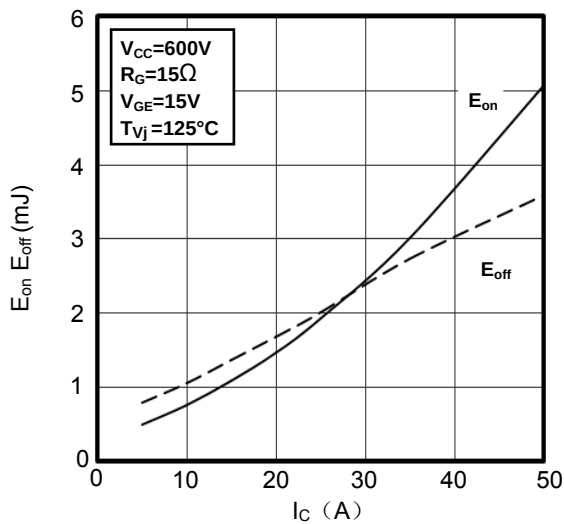


Figure3. Switching Energy vs. Collector Current

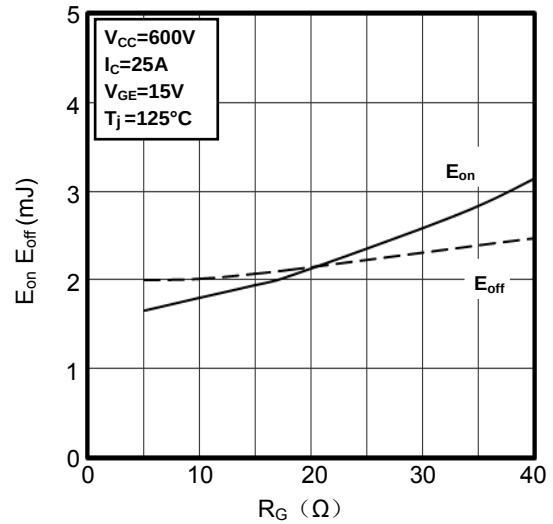


Figure4. Switching Energy vs. Gate Resistor

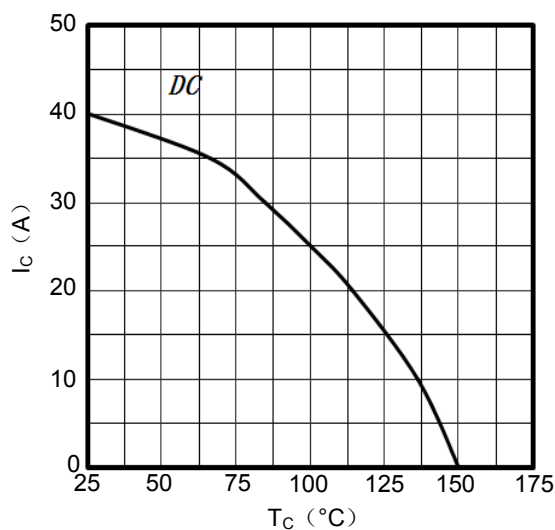


Figure5. IGBT T_C vs. Collector Current

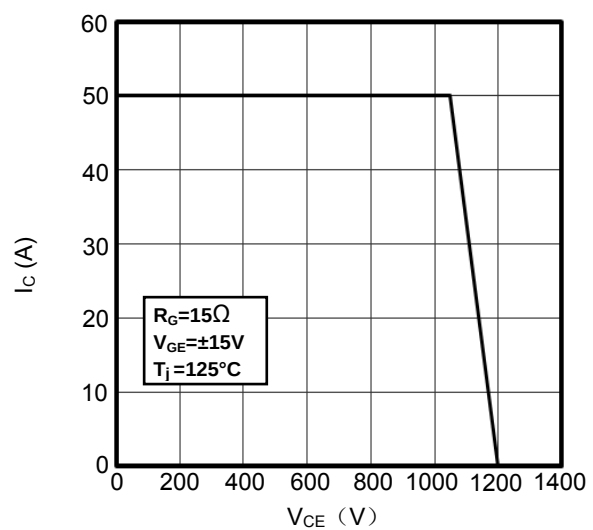


Figure6. Reverse Biased Safe Operating Area

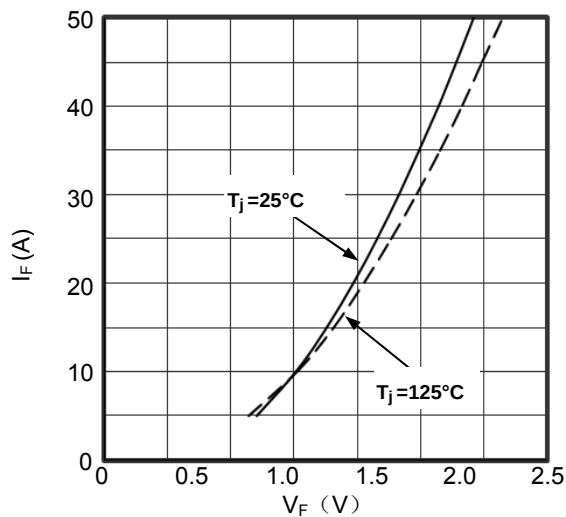


Figure7. Diode Forward Characteristics

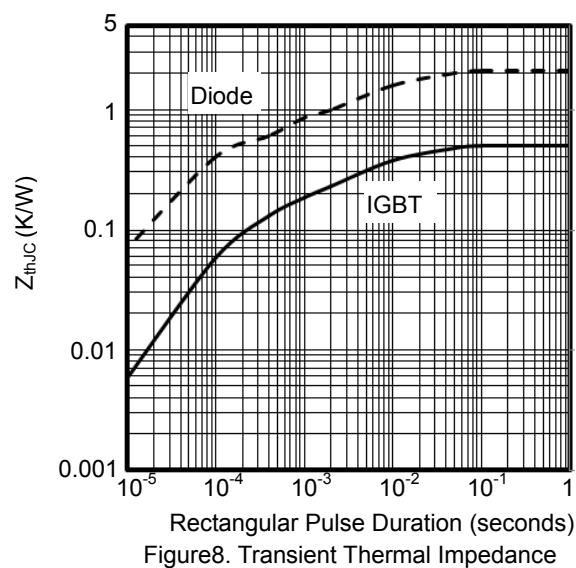


Figure8. Transient Thermal Impedance

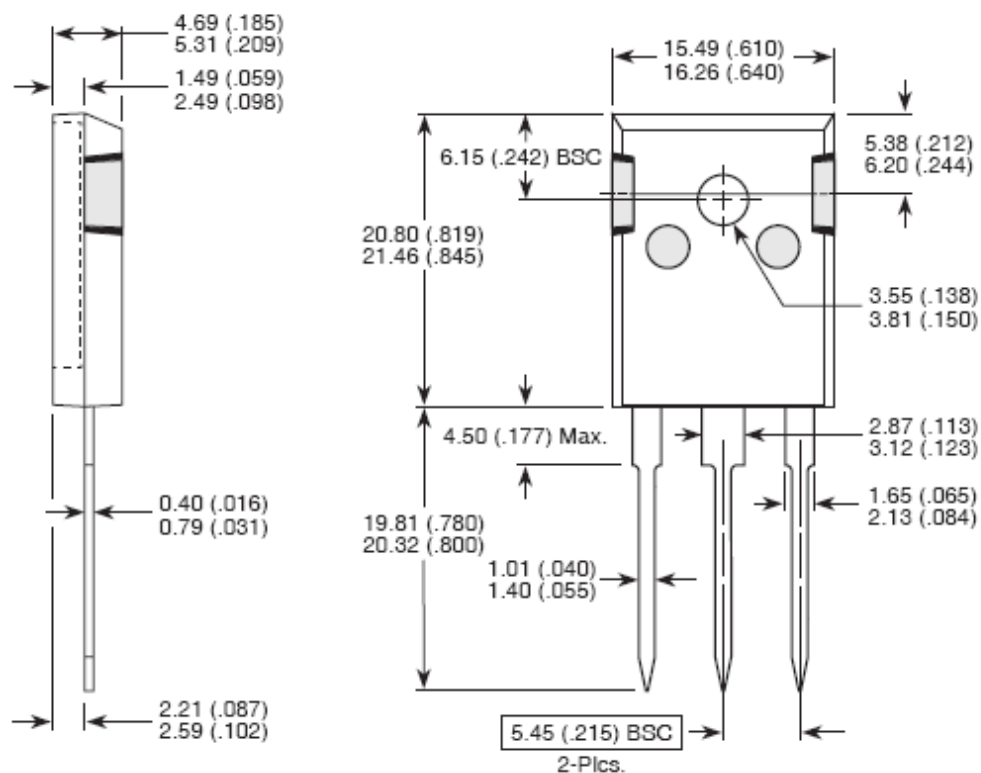


Figure 9. Package Outline