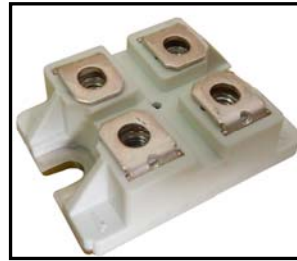


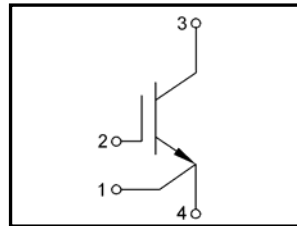
## FEATURES

- Ultra Low Loss
- High Ruggedness
- High Short Circuit Capability
- Positive Temperature Coefficient
- Electrically Isolated by DBC Ceramic
- Popular SOT-227 Package



## APPLICATIONS

- Invertor
- Converter
- Welder
- SMPS and UPS
- Induction Heating



## ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	Test Conditions	Values	Unit
$V_{CES}$	Collector - Emitter Voltage		1200	V
$V_{GES}$	Gate - Emitter Voltage		$\pm 20$	V
$I_C$	DC Collector Current	$T_C=25^{\circ}\text{C}$	150	A
		$T_C=80^{\circ}\text{C}$	105	A
$I_{Cpuls}$	Pulsed Collector Current	$T_C=25^{\circ}\text{C}, t_p=1\text{ms}$	300	A
		$T_C=80^{\circ}\text{C}, t_p=1\text{ms}$	210	A
$P_{tot}$	Power Dissipation		690	W
$T_J$	Junction Temperature Range		-40 to +150	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature Range		-40 to +125	$^{\circ}\text{C}$
$V_{isol}$	Insulation Test Voltage	AC, $t=1\text{min}$	3000	V
$R_{thJC}$	Junction-to-Case Thermal Resistance		0.18	K/W
Torque	Module-to-Sink	Recommended (M4)	0.7~1.1	N · m
Torque	Module Electrodes	Recommended (M4)	0.7~1.1	N · m
Weight			26.5	g

# MMG100J120UZ

## ELECTRICAL CHARACTERISTICS

T<sub>C</sub>=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>GE(th)</sub>	Gate - Emitter Threshold Voltage	V <sub>CE</sub> =V <sub>GE</sub> , I <sub>C</sub> =4mA	5	6.2	7	V
V <sub>CE(sat)</sub>	Collector - Emitter Saturation Voltage	I <sub>C</sub> =100A, V <sub>GE</sub> =15V, T <sub>J</sub> =25°C		1.8		V
		I <sub>C</sub> =100A, V <sub>GE</sub> =15V, T <sub>J</sub> =125°C		2.0		V
I <sub>CES</sub>	Collector Leakage Current	V <sub>CE</sub> =1200V, V <sub>GE</sub> =0V, T <sub>J</sub> =25°C		0.2	0.5	mA
		V <sub>CE</sub> =1200V, V <sub>GE</sub> =0V, T <sub>J</sub> =125°C		3		mA
I <sub>GES</sub>	Gate Leakage Current	V <sub>CE</sub> =0V, V <sub>GE</sub> =±20V	-200		200	nA
Q <sub>ge</sub>	Gate Charge	V <sub>CC</sub> =600V, I <sub>C</sub> =100A, V <sub>GE</sub> =±15V		1050		nC
C <sub>ies</sub>	Input Capacitance	V <sub>CE</sub> =25V, V <sub>GE</sub> =0V, f=1MHz		7.43		nF
C <sub>oes</sub>	Output Capacitance			0.52		nF
C <sub>res</sub>	Reverse Transfer Capacitance			0.34		nF
t <sub>d(on)</sub>	Turn - on Delay Time	V <sub>CC</sub> =600V, I <sub>C</sub> =100A		125		ns
t <sub>r</sub>	Rise Time	R <sub>G</sub> =10 Ω, V <sub>GE</sub> =±15V		60		ns
t <sub>d(off)</sub>	Turn - off Delay Time	T <sub>J</sub> =25°C		420		ns
t <sub>f</sub>	Fall Time	Inductive Load		60		ns
t <sub>d(on)</sub>	Turn - on Delay Time	V <sub>CC</sub> =600V, I <sub>C</sub> =100A		135		ns
t <sub>r</sub>	Rise Time	R <sub>G</sub> =10 Ω, V <sub>GE</sub> =±15V		60		ns
t <sub>d(off)</sub>	Turn - off Delay Time	T <sub>J</sub> =125°C		490		ns
t <sub>f</sub>	Fall Time	Inductive Load		75		ns
E <sub>on</sub>	Turn - on Switching Energy	V <sub>CC</sub> =600V, I <sub>C</sub> =100A, T <sub>J</sub> =25°C		8.6		mJ
		R <sub>G</sub> =10 Ω, T <sub>J</sub> =125°C		12.4		mJ
E <sub>off</sub>	Turn - off Switching Energy	V <sub>GE</sub> =±15V, T <sub>J</sub> =25°C		6.8		mJ
		Inductive Load, T <sub>J</sub> =125°C		10.8		mJ

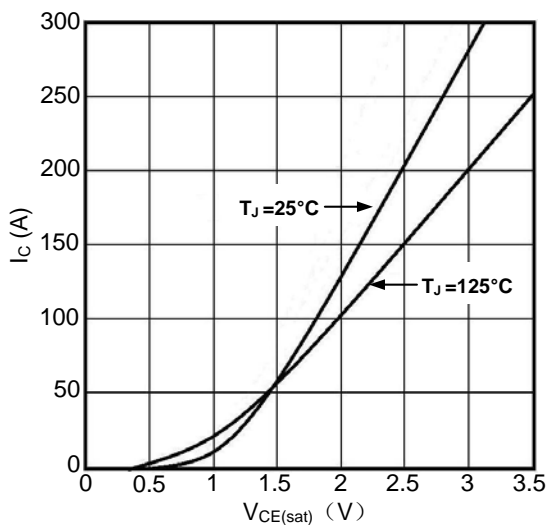


Figure1. Typical Output characteristics

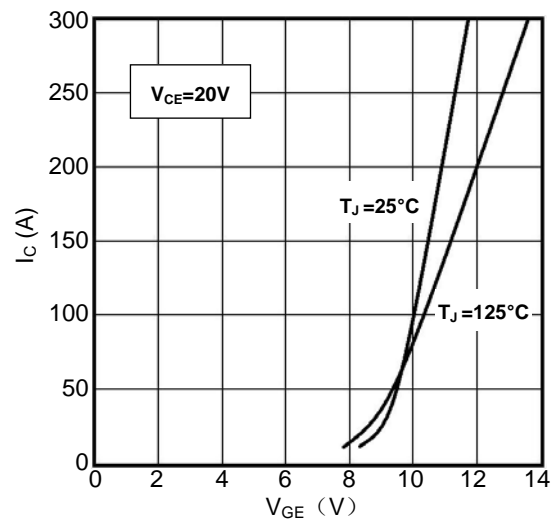


Figure2. Typical Transfer characteristics

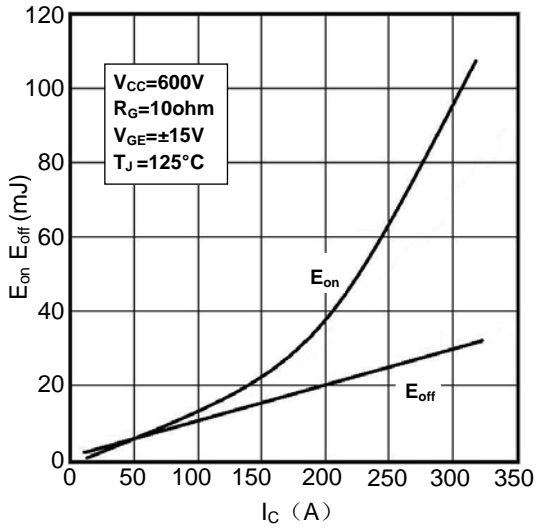


Figure3. Switching Energy vs. Collector Current

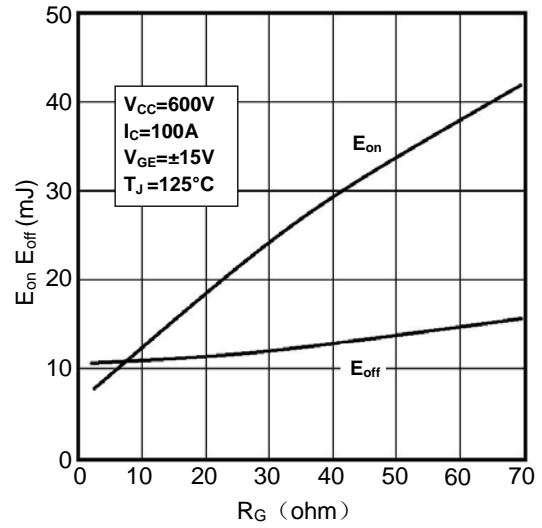


Figure4. Switching Energy vs. Gate Resistor

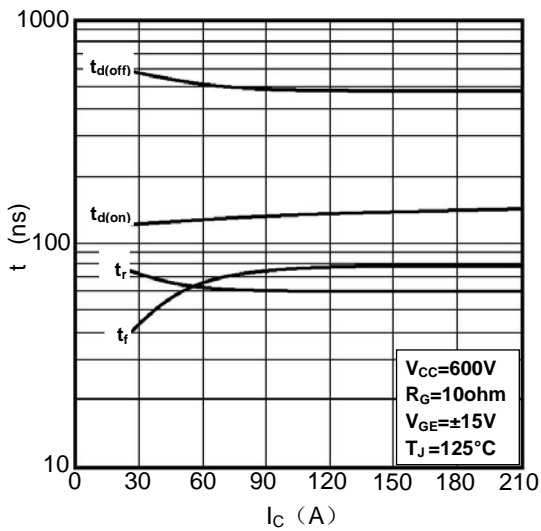


Figure5. Switching Times vs. Collector Current

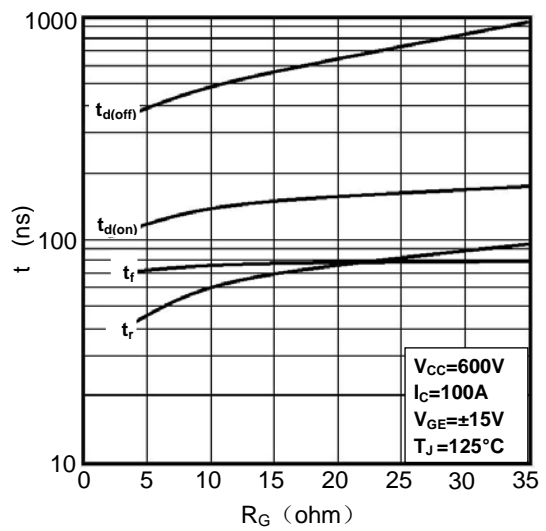


Figure6. Switching Times vs. Gate Resistor

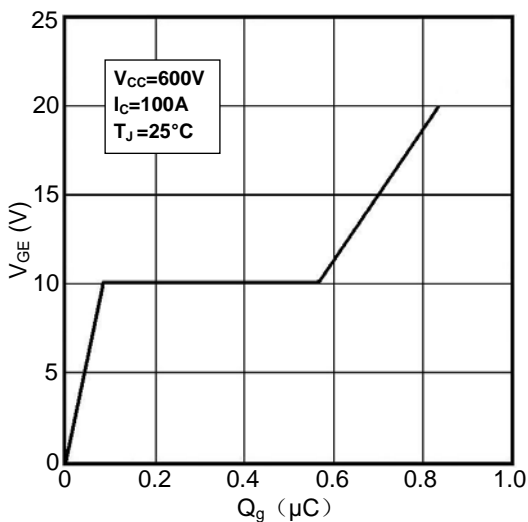


Figure7. Gate Charge characteristics

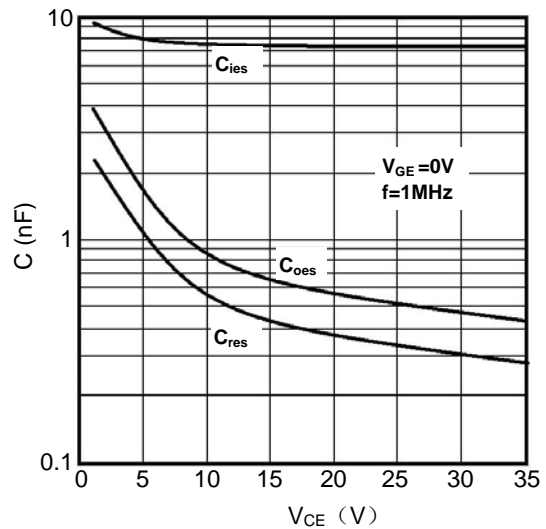


Figure8. Typical Capacitances vs.  $V_{CE}$

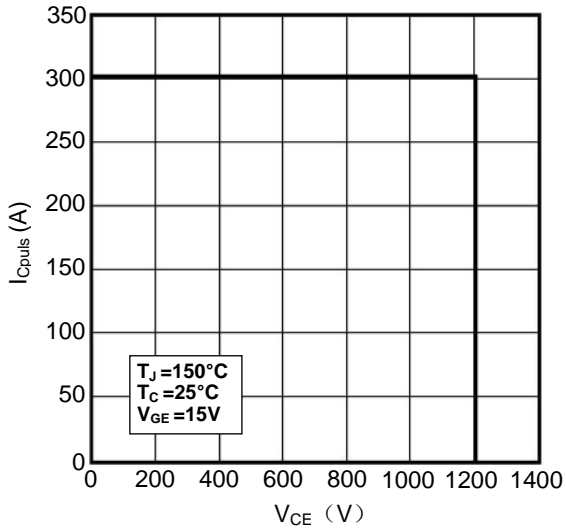


Figure9. Reverse Biased Safe Operating Area

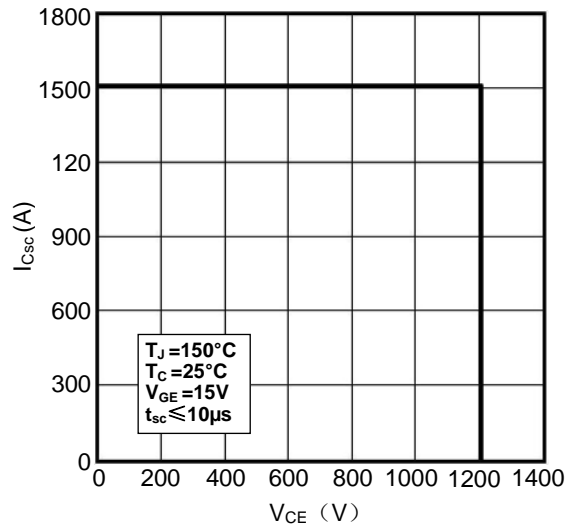


Figure10. Short Circuit Safe Operating Area

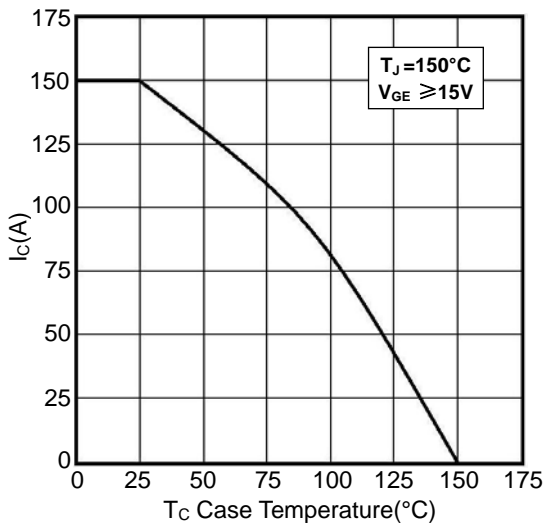


Figure11. Rated Current vs.  $T_C$

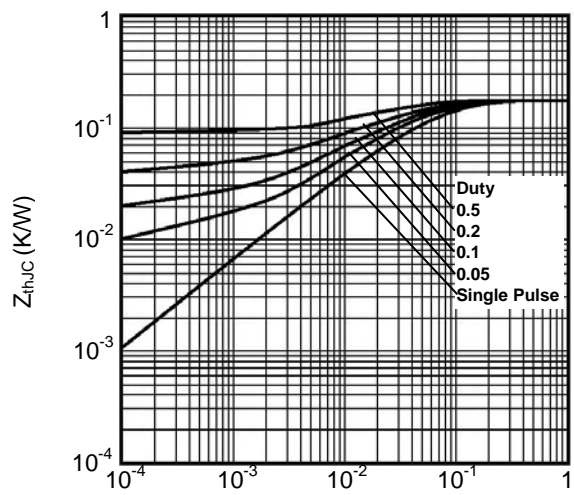
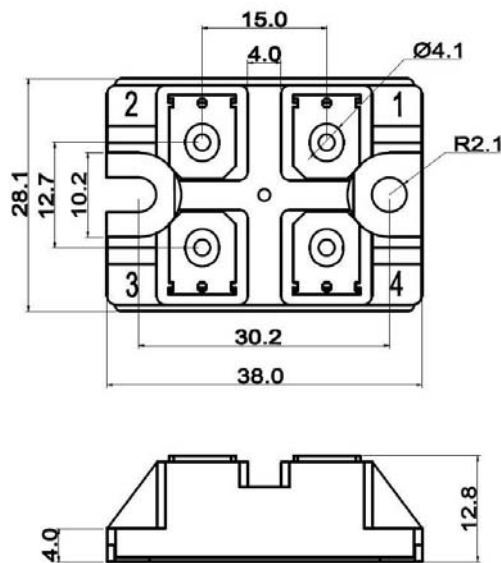


Figure12. Transient Thermal Impedance



Dimensions in mm  
Figure13. Package Outlines