


MG06300D-BN4MM



Features

- High short circuit capability, self limiting short circuit current
- $V_{CE(sat)}$ with positive temperature coefficient
- Fast switching and short tail current
- Free wheeling diodes with fast and soft reverse recovery
- Low switching losses

Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E71639

Applications

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

Module Characteristics ($T_c = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
$T_J \text{ max}$	Max. Junction Temperature				175	$^\circ\text{C}$
$T_{J \text{ op}}$	Operating Temperature		-40		150	$^\circ\text{C}$
T_{stg}	Storage Temperature		-40		125	$^\circ\text{C}$
V_{isol}	Insulation Test Voltage	AC, t=1min		3000		V
CTI	Comparative Tracking Index		350			
Torque	Module-to-Sink	Recommended (M6)	3		5	N·m
Torque	Module Electrodes	Recommended (M6)	2.5		5	N·m
Weight				320		g

Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	$T_J=25^\circ\text{C}$	600	V
V_{GES}	Gate - Emitter Voltage		± 20	V
I_C	DC Collector Current	$T_c=25^\circ\text{C}$	400	A
		$T_c=70^\circ\text{C}$	300	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	600	A
P_{tot}	Power Dissipation Per IGBT		940	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	600	V
$I_{\text{F(AV)}}$	Average Forward Current	$T_c=25^\circ\text{C}$	400	A
		$T_c=70^\circ\text{C}$	300	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	600	A
I^2t		$T_J=125^\circ\text{C}$, t=10ms, $V_R=0\text{V}$	8000	A^2s

Life Support Note:

Not Intended for Use in Life Support or Life Saving Applications

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

Electrical and Thermal Specifications ($T_c = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
IGBT						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=4.8\text{mA}$	4.9	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	$I_C=300\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		1.45		V
		$I_C=300\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		1.6		V
I_{CES}	Collector Leakage Current	$V_{CE}=600\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			1	mA
		$V_{CE}=600\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$			5	mA
I_{GES}	Gate Leakage Current	$V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=125^\circ\text{C}$	-400		400	nA
R_{Gint}	Integrated Gate Resistor			1		Ω
Q_{ge}	Gate Charge	$V_{CC}=300\text{V}, I_C=300\text{A}, V_{GE}=\pm 15\text{V}$		3.2		μC
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		19		nF
C_{res}	Reverse Transfer Capacitance			0.57		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=300\text{V}$ $I_C=300\text{A}$ $R_G=2.4\Omega$ $V_{GE}=\pm 15\text{V}$ Inductive Load	$T_J=25^\circ\text{C}$		110	ns
			$T_J=125^\circ\text{C}$		120	ns
t_r	Rise Time		$T_J=25^\circ\text{C}$		50	ns
			$T_J=125^\circ\text{C}$		60	ns
$t_{d(off)}$	Turn - off Delay Time		$T_J=25^\circ\text{C}$		490	ns
			$T_J=125^\circ\text{C}$		520	ns
t_f	Fall Time		$T_J=25^\circ\text{C}$		60	ns
			$T_J=125^\circ\text{C}$		70	ns
E_{on}	Turn - on Energy		$T_J=25^\circ\text{C}$		2.0	mJ
			$T_J=125^\circ\text{C}$		3.1	mJ
E_{off}	Turn - off Energy	$T_J=25^\circ\text{C}$		9	mJ	
		$T_J=125^\circ\text{C}$		12	mJ	
I_{SC}	Short Circuit Current	$t_{psc} \leq 6\mu\text{s}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}, V_{CC}=360\text{V}$		1500		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)				0.16	K/W
Diode						
V_F	Forward Voltage	$I_F=300\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.55		V
		$I_F=300\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.5		V
I_{RRM}	Max. Reverse Recovery Current	$I_F=300\text{A}, V_R=300\text{V}$ $di_F/dt=6500\text{A}/\mu\text{s}$ $T_J=125^\circ\text{C}$		235		A
Q_{rr}	Reverse Recovery Charge			24		μC
E_{rec}	Reverse Recovery Energy			6.2		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)				0.32	K/W

Figure 1: Typical Output Characteristics

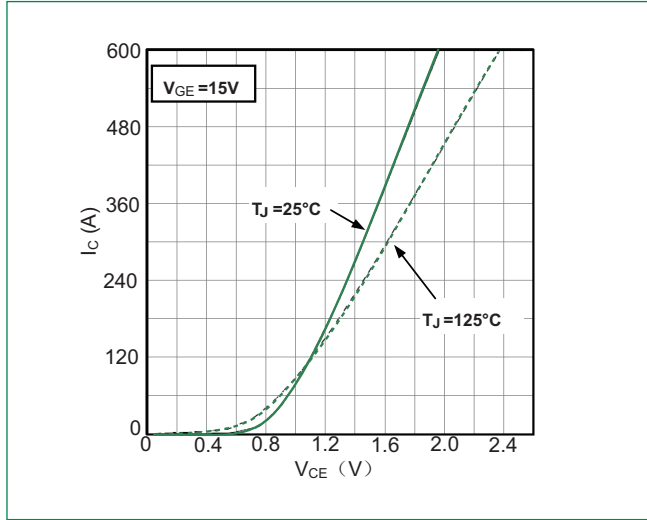


Figure 2: Typical Output characteristics

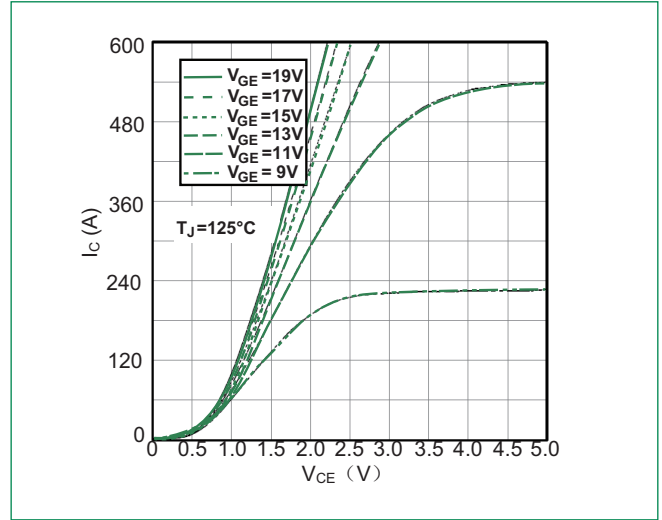


Figure 3: Typical Transfer characteristics

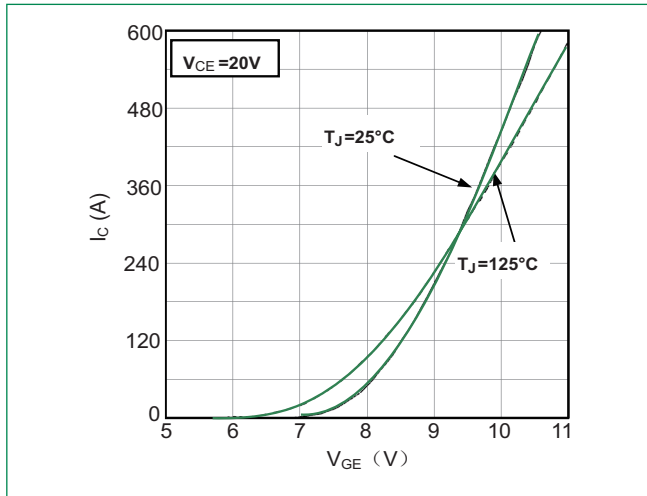


Figure 4: Switching Energy vs. Gate Resistor

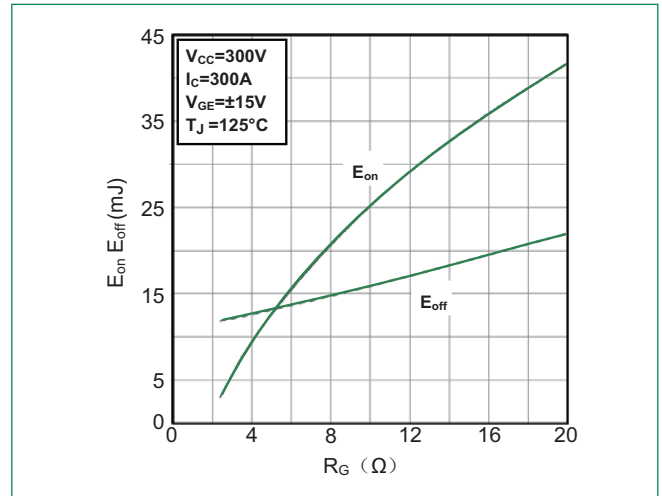


Figure 5: Switching Energy vs. Collector Current

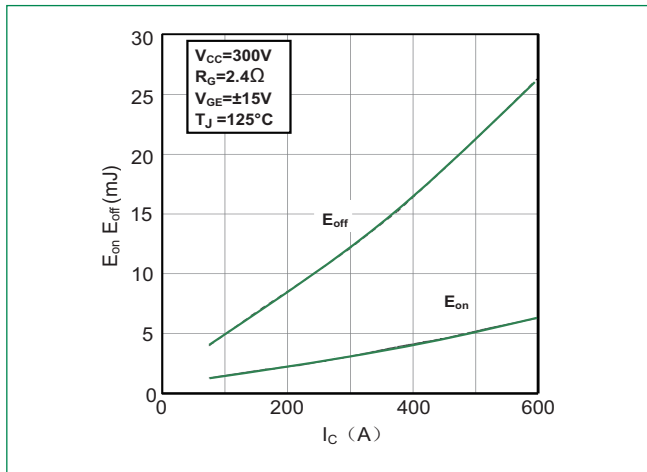


Figure 6: Reverse Biased Safe Operating Area

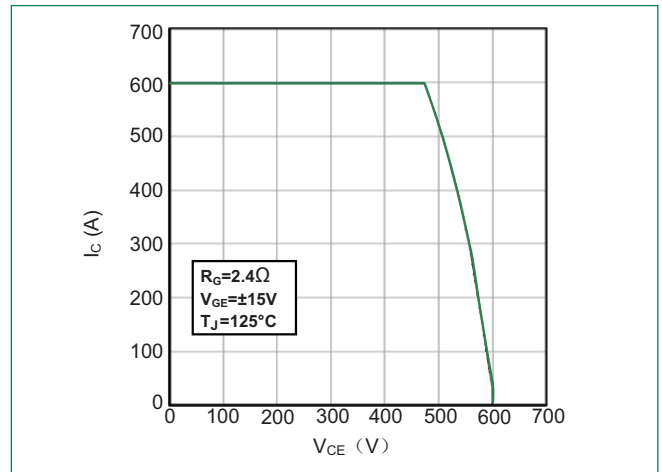


Figure 7: Diode Forward Characteristics

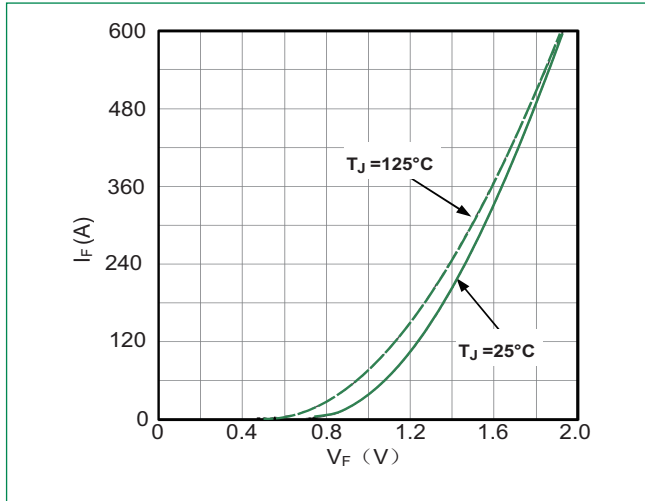


Figure 8: Switching Energy vs. Gate Resistor

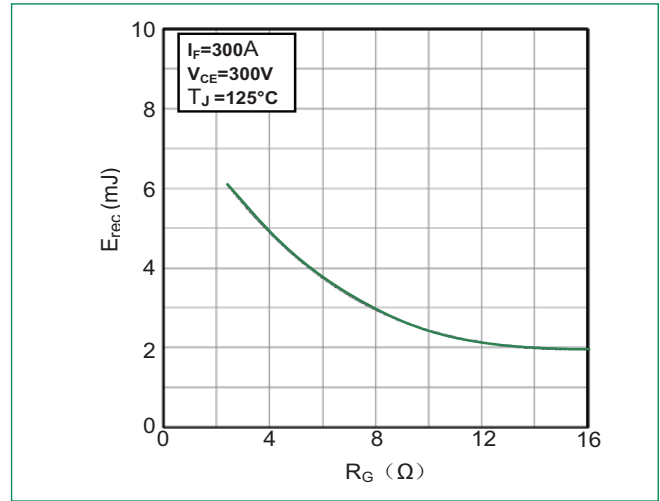


Figure 9: Switching Energy vs. Forward Current

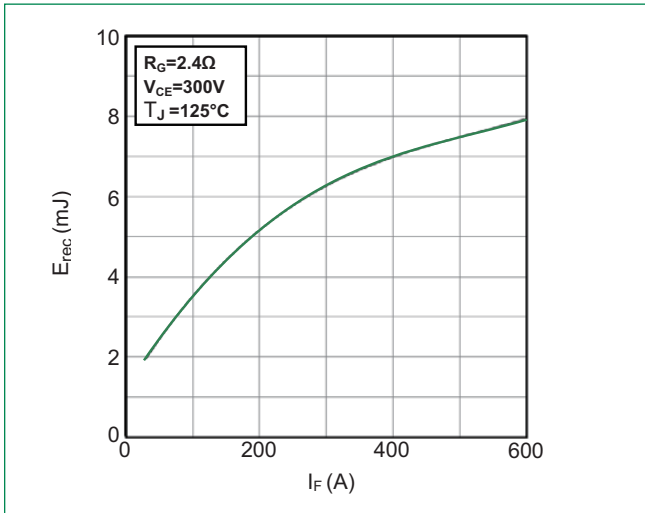
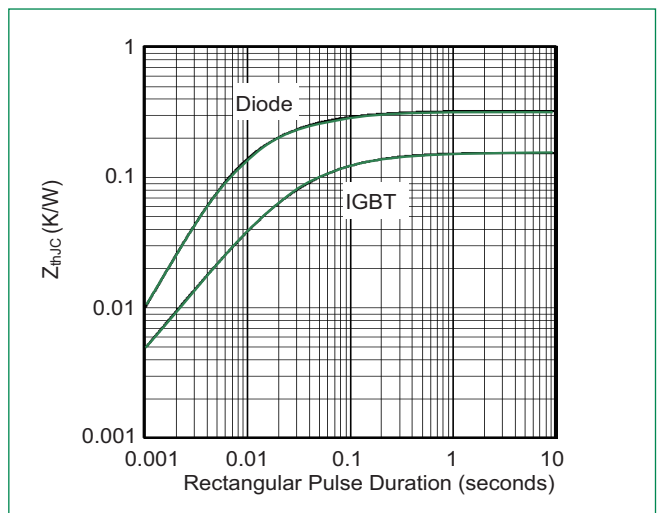
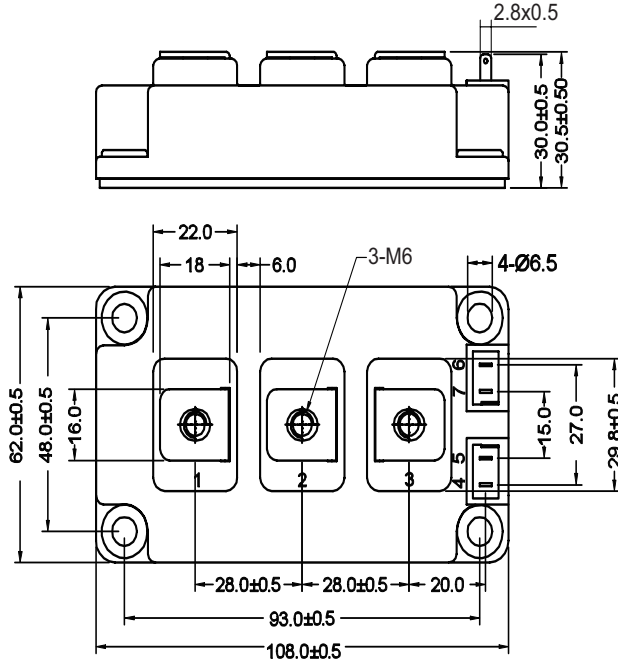


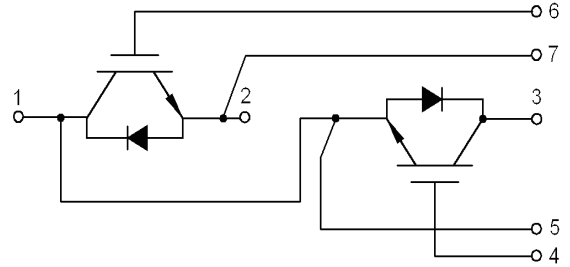
Figure 10: Transient Thermal Impedance



Dimensions-Package D



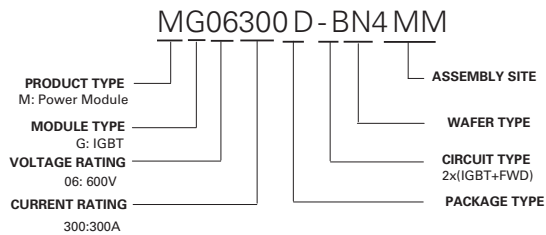
Circuit Diagram



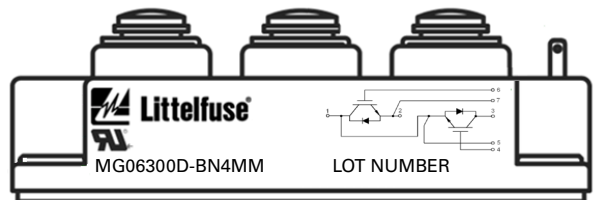
Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG06300D-BN4MM	MG06300D-BN4MM	320g	Bulk Pack	60

Part Numbering System



Part Marking System



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