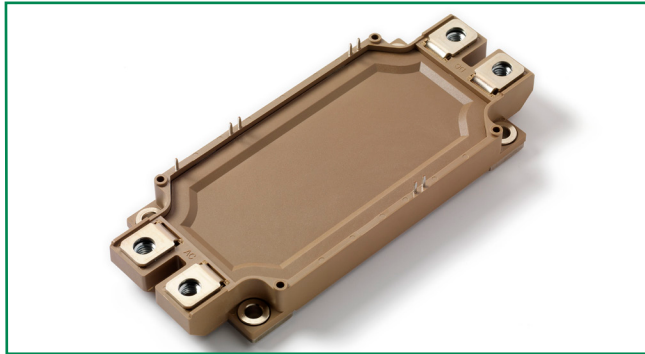


MG12300WB-BN2MM

RoHS



Features

- IGBT³ CHIP(Trench+Field Stop technology)
- Low saturation voltage and positive temperature coefficient
- Fast switching and short tail current
- Free wheeling diodes with fast and soft reverse recovery
- Temperature sense included

Applications

- AC motor control
- Motion/servo control
- Photovoltaic/Fuel cell
- Inverter and power supplies

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

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
$T_{J\max}$	Max. Junction Temperature				150	$^\circ\text{C}$
$T_{J\text{op}}$	Operating Temperature		-40		125	$^\circ\text{C}$
T_{stg}	Storage Temperature		-40		125	$^\circ\text{C}$
V_{isol}	Insulation Test Voltage	AC, t=1min		3000		V
CTI	Comparative Tracking Index		210			
Torque	Module-to-Sink	Recommended (M5)	2.5		5	N·m
Torque	Module Electrodes	Recommended (M6)	3		5	N·m
Weight				350		g

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

Symbol	Parameters	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	$T_J=25^\circ\text{C}$	1200	V
V_{GES}	Gate - Emitter Voltage		± 20	V
I_C	DC Collector Current	$T_C=25^\circ\text{C}$	500	A
		$T_C=80^\circ\text{C}$	300	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	600	A
P_{tot}	Power Dissipation Per IGBT		1400	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	1200	V
$I_{\text{F(AV)}}$	Average Forward Current	$T_C=25^\circ\text{C}$	300	A
		$T_C=80^\circ\text{C}$	180	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	600	A
I^2t		$T_J=125^\circ\text{C}$, t=10ms, $V_R=0\text{V}$	17500	A^2s

Power Module

1200V 300A IGBT Module

Electrical and Thermal Specifications ($T_J = 25^\circ\text{C}$, 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 =12mA	5.0	5.8	6.5	V
V _{CE(sat)}	Collector - Emitter	I _C =300A, V _{GE} =15V, T _J =25°C		1.7		V
	Saturation Voltage	I _C =300A, V _{GE} =15V, T _J =125°C		2.0		V
I _{ICES}	Collector Leakage Current	V _{CE} =1200V, V _{GE} =0V, T _J =25°C			1	mA
		V _{CE} =1200V, V _{GE} =0V, T _J =125°C			5	mA
I _{GES}	Gate Leakage Current	V _{CE} =0V, V _{GE} =±15V, T _J =125°C	-400		400	nA
R _{Gint}	Integrated Gate Resistor			2.5		Ω
Q _{ge}	Gate Charge	V _{CE} =600V, I _C =300A , V _{GE} =±15V		2.7		μC
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		21		nF
C _{res}	Reverse Transfer Capacitance			1.0		nF
t _{d(on)}	Turn - on Delay Time	V _{CC} =600V I _C =300A R _G =2.4Ω V _{GE} =±15V Inductive Load	T _J =25°C		160	ns
			T _J =125°C		170	ns
t _r	Rise Time		T _J =25°C		45	ns
			T _J =125°C		50	ns
t _{d(off)}	Turn - off Delay Time		T _J =25°C		460	ns
			T _J =125°C		530	ns
t _f	Fall Time		T _J =25°C		100	ns
			T _J =125°C		150	ns
E _{on}	Turn - on Energy		T _J =25°C		13	mJ
			T _J =125°C		20	mJ
E _{off}	Turn - off Energy		T _J =25°C		25	mJ
			T _J =125°C		37	mJ
I _{SC}	Short Circuit Current	t _{psc} ≤10μS , V _{GE} =15V; T _J =125°C , V _{CC} =900V		1200		A
R _{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)				0.09	K/W
Diode						
V _F	Forward Voltage	I _F =300A, V _{GE} =0V, T _J =25°C		1.65		V
		I _F =300A, V _{GE} =0V, T _J =125°C		1.6		V
t _{RR}	Reverse Recovery Time	I _F =300A, V _R =600V di _F /dt=-4800A/μs T _J =125°C		225		ns
I _{RRM}	Max. Reverse Recovery Current			255		A
E _{rec}	Reverse Recovery Energy			24		mJ
R _{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)				0.16	K/W

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

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
R_{25}	Resistance	$T_c=25^\circ\text{C}$		5		K Ω
$B_{25/50}$				3375		K

Figure 1: Typical Output Characteristics for IGBT Inverter

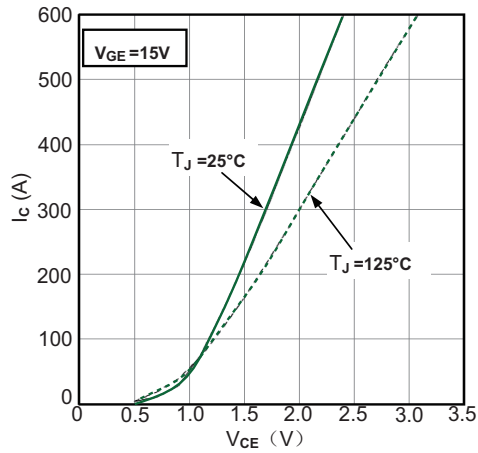


Figure 2: Typical Output Characteristics for IGBT Inverter

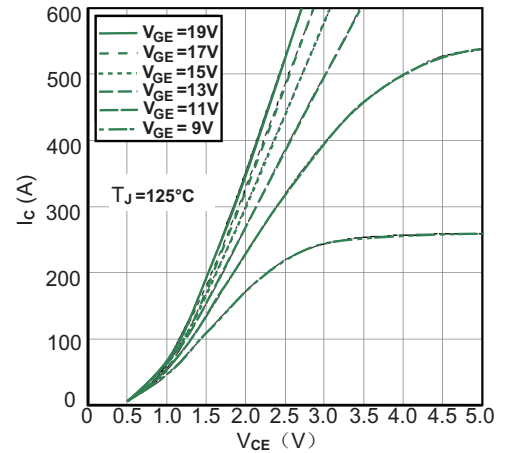


Figure 3: Typical Transfer Characteristics for IGBT Inverter

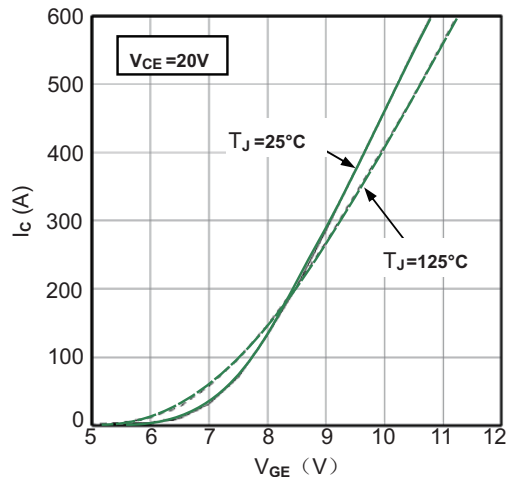


Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter

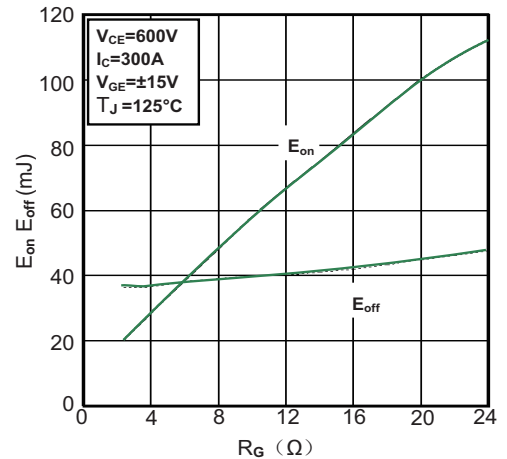


Figure 5: Switching Energy vs. Collector Current for IGBT Inverter

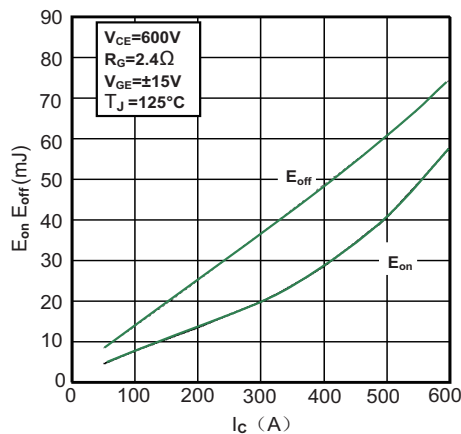


Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter

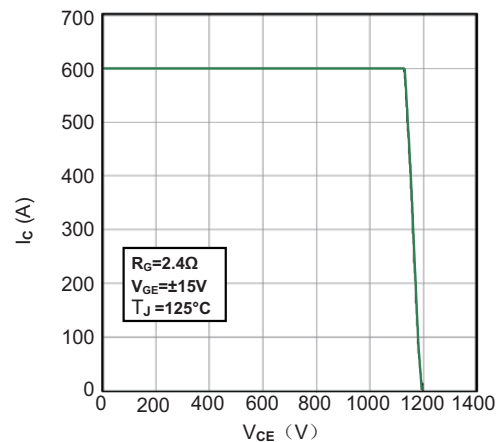


Figure 7: Diode Forward Characteristics for Diode Inverter

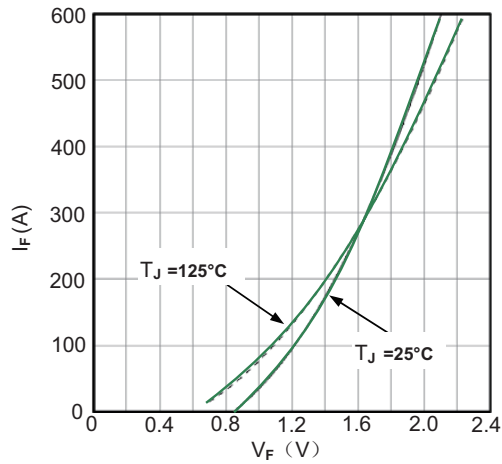


Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter

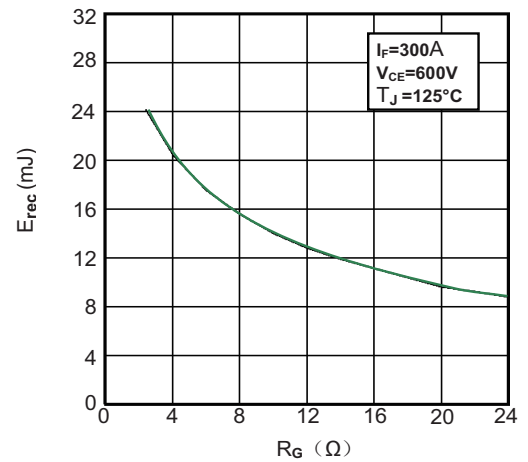


Figure 9: Transient Thermal Impedance of Diode and IGBT Inverter

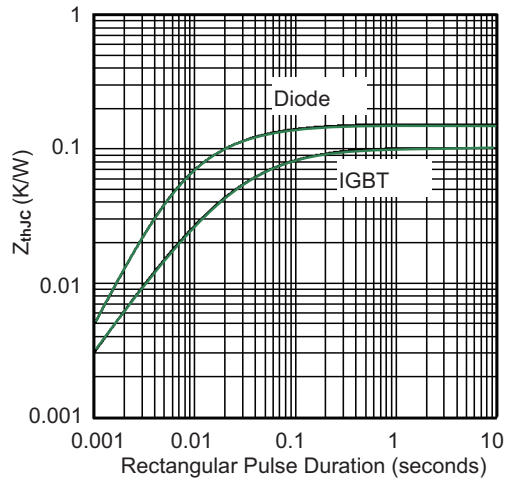
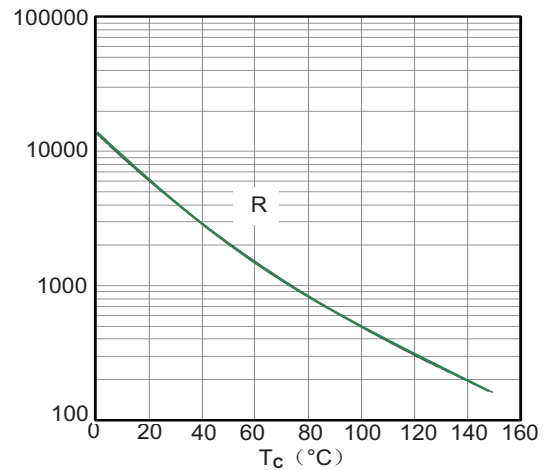
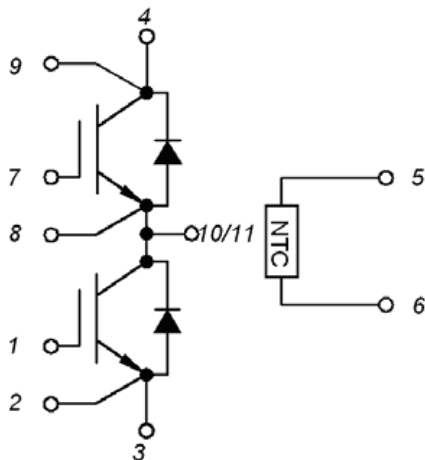


Figure 10: NTC Characteristics



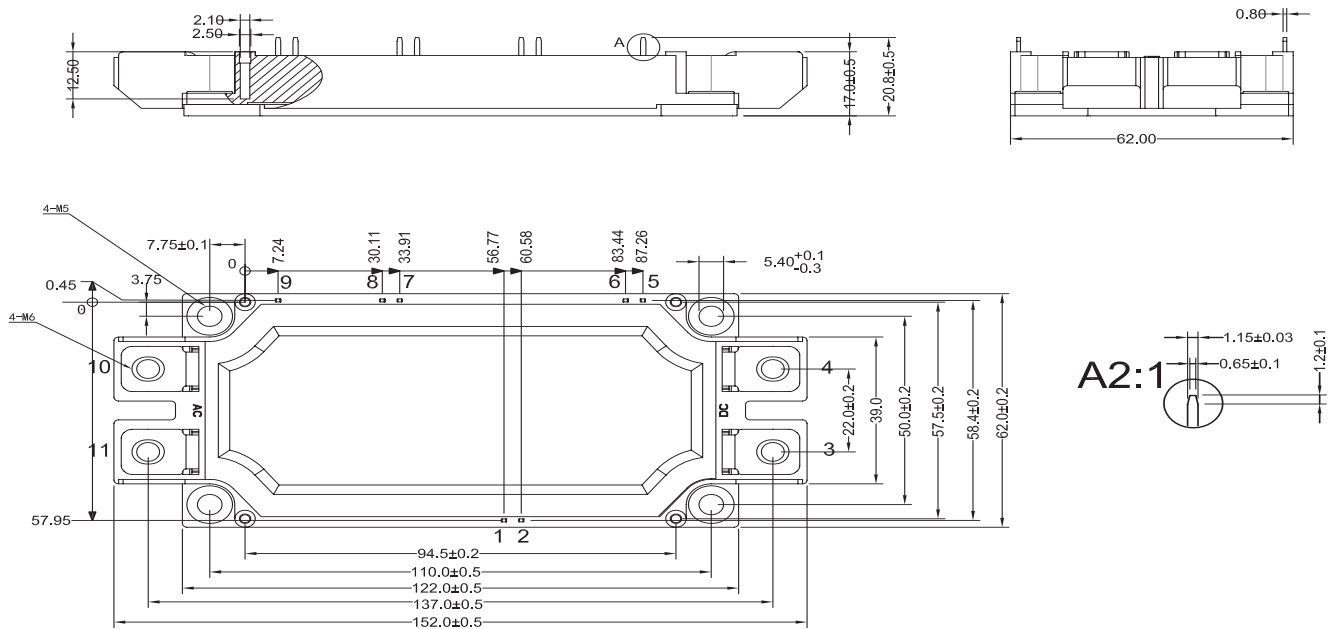
Circuit Diagram



Power Module

1200V 300A IGBT Module

Dimensions-Package WB

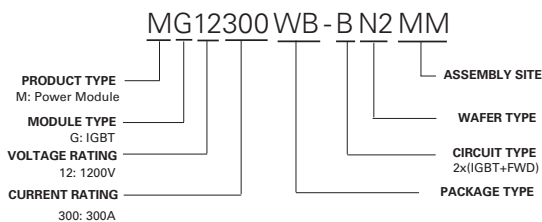


The foot pins are in gold / nickel coating

Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG12300WB-BN2MM	MG12300WB-BN2MM	350g	Bulk Pack	60

Part Numbering System



Part Marking System

