



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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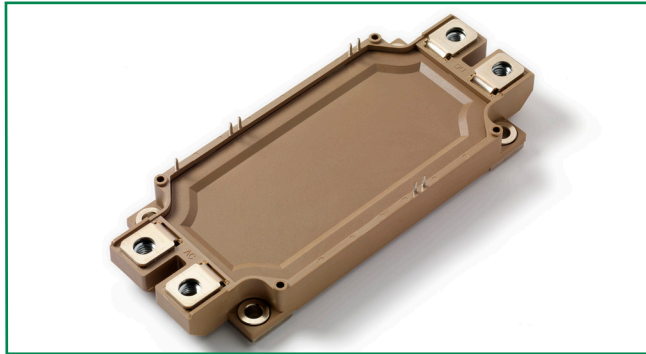
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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



MG12225WB-BN2MM

RoHS



**Features**

- IGBT<sup>3</sup> 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<sub>j</sub> = 25°C, unless otherwise specified)**

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
T <sub>Jmax</sub>	Max. Junction Temperature				150	°C
T <sub>Jop</sub>	Operating Temperature		-40		125	°C
T <sub>stg</sub>	Storage Temperature		-40		125	°C
V <sub>isol</sub>	Insulation Test Voltage	AC, t=1min		3000		V
CTI	Comparative Tracking Index		250			
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<sub>j</sub> = 25°C, unless otherwise specified)**

Symbol	Parameters	Test Conditions	Values	Unit
<b>IGBT</b>				
V <sub>CES</sub>	Collector - Emitter Voltage	T <sub>j</sub> =25°C	1200	V
V <sub>GES</sub>	Gate - Emitter Voltage		±20	V
I <sub>C</sub>	DC Collector Current	T <sub>C</sub> =25°C	325	A
		T <sub>C</sub> =80°C	225	A
I <sub>CM</sub>	Repetitive Peak Collector Current	t <sub>p</sub> =1ms	450	A
P <sub>tot</sub>	Power Dissipation Per IGBT		1050	W
<b>Diode</b>				
V <sub>RRM</sub>	Repetitive Reverse Voltage	T <sub>J</sub> =25°C	1200	V
I <sub>F(AV)</sub>	Average Forward Current	T <sub>C</sub> =25°C	225	A
		T <sub>C</sub> =80°C	160	A
I <sub>FRM</sub>	Repetitive Peak Forward Current	t <sub>p</sub> =1ms	450	A
I <sup>2</sup> t		T <sub>J</sub> =125°C, t=10ms, V <sub>R</sub> =0V	9100	A <sup>2</sup> s

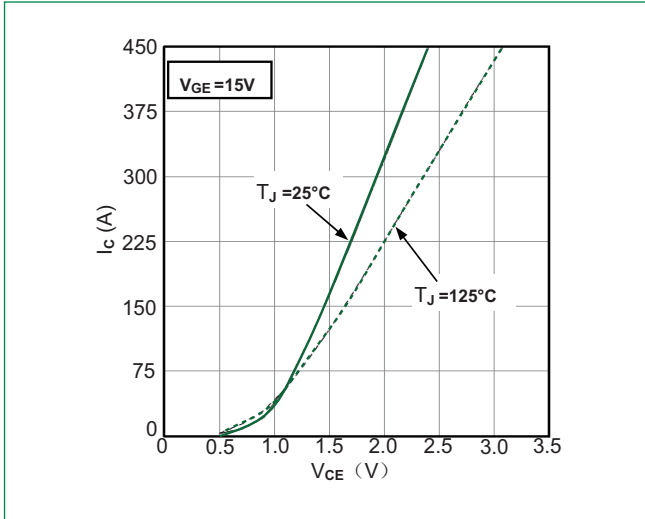
### Electrical and Thermal Specifications ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
<b>IGBT</b>						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=9\text{mA}$	5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	$I_C=225\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		1.7		V
		$I_C=225\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		2.0		V
$I_{ICES}$	Collector Leakage Current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			1	mA
		$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$			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			3.3		$\Omega$
$Q_{ge}$	Gate Charge	$V_{CE}=600\text{V}, I_C=225\text{A}, V_{GE}=\pm 15\text{V}$		2.1		$\mu\text{C}$
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		16		nF
$C_{res}$	Reverse Transfer Capacitance			0.75		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=600\text{V}$ $I_C=225\text{A}$ $R_G=3.3\Omega$ $V_{GE}=\pm 15\text{V}$ Inductive Load	$T_J=25^\circ\text{C}$		160	ns
			$T_J=125^\circ\text{C}$		170	ns
$t_r$	Rise Time		$T_J=25^\circ\text{C}$		45	ns
			$T_J=125^\circ\text{C}$		50	ns
$t_{d(off)}$	Turn - off Delay Time		$T_J=25^\circ\text{C}$		460	ns
			$T_J=125^\circ\text{C}$		530	ns
$t_f$	Fall Time		$T_J=25^\circ\text{C}$		100	ns
			$T_J=125^\circ\text{C}$		150	ns
$E_{on}$	Turn - on Energy		$T_J=25^\circ\text{C}$		9	mJ
			$T_J=125^\circ\text{C}$		13.5	mJ
$E_{off}$	Turn - off Energy	$T_J=25^\circ\text{C}$		22.5	mJ	
		$T_J=125^\circ\text{C}$		33	mJ	
$I_{SC}$	Short Circuit Current	$t_{psc} \leq 10\mu\text{s}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}, V_{CC}=900\text{V}$		900		A
$R_{thJC}$	Junction-to-Case Thermal Resistance (Per IGBT)				0.12	K/W
<b>Diode</b>						
$V_F$	Forward Voltage	$I_F=225\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.65		V
		$I_F=225\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.6		V
$t_{RR}$	Reverse Recovery Time	$I_F=225\text{A}, V_R=600\text{V}$ $di_F/dt=-3600\text{A}/\mu\text{s}$ $T_J=125^\circ\text{C}$		200		ns
$I_{RRM}$	Max. Reverse Recovery Current			180		A
$E_{rec}$	Reverse Recovery Energy			18		mJ
$R_{thJCD}$	Junction-to-Case Thermal Resistance (Per Diode)				0.2	K/W

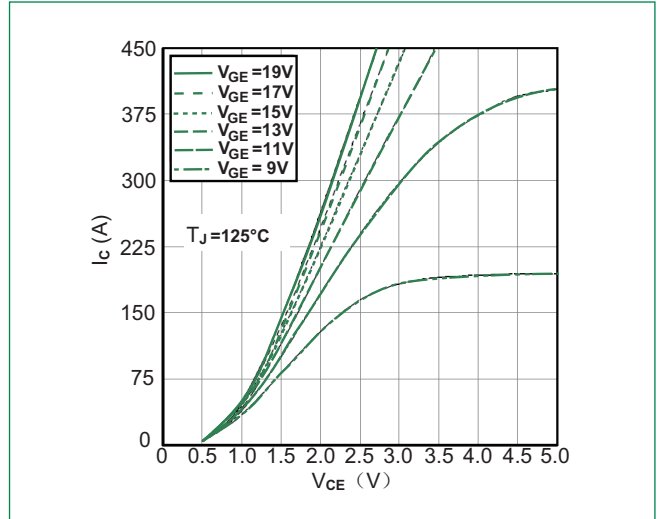
### NTC Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

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

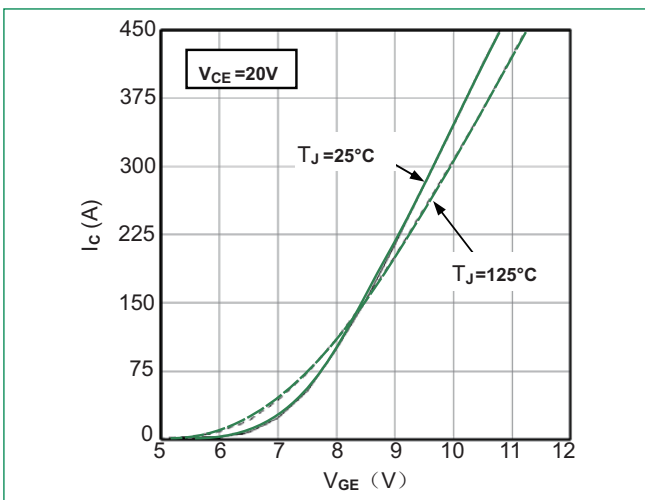
**Figure 1: Typical Output Characteristics for IGBT Inverter**



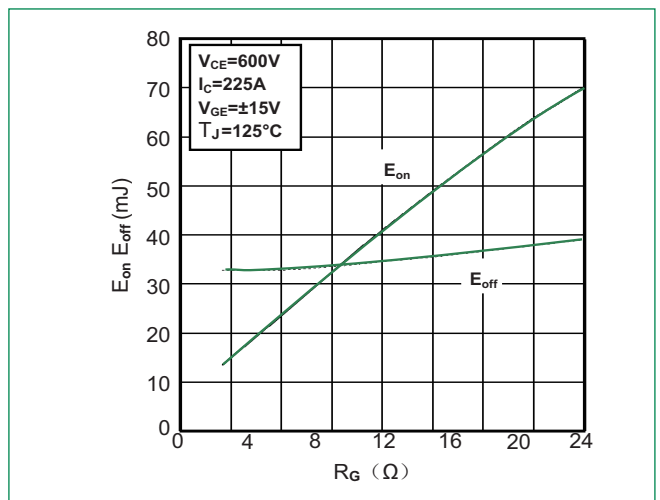
**Figure 2: Typical Output Characteristics for IGBT Inverter**



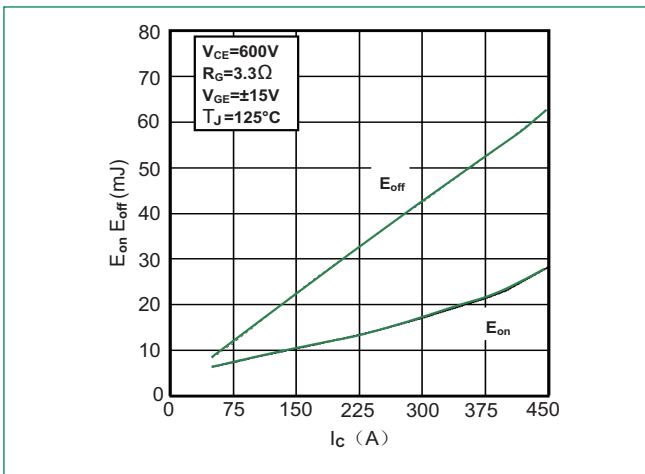
**Figure 3: Typical Transfer Characteristics for IGBT Inverter**



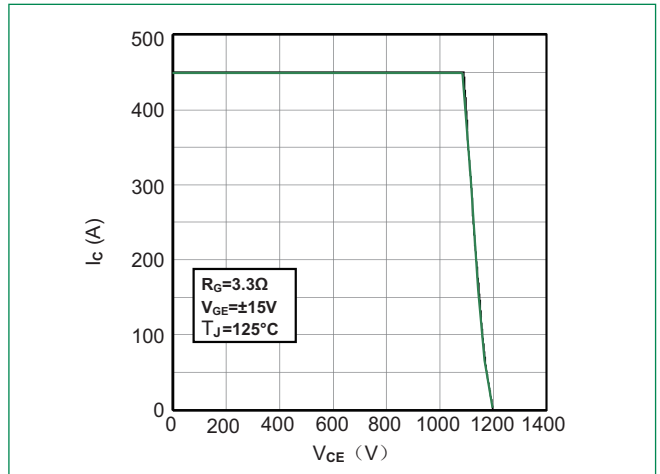
**Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter**



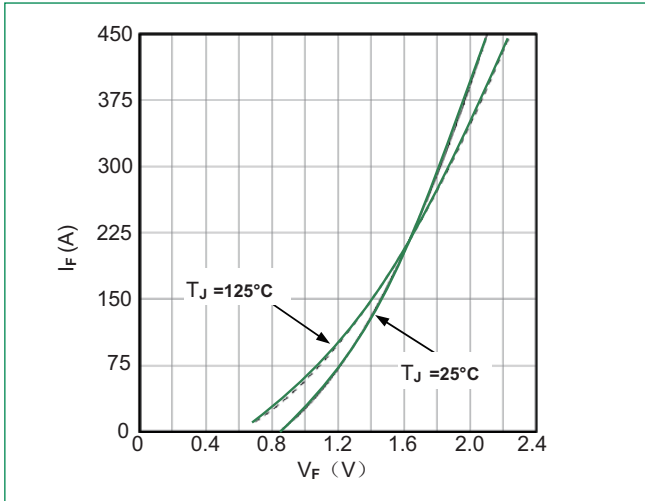
**Figure 5: Switching Energy vs. Collector Current for IGBT Inverter**



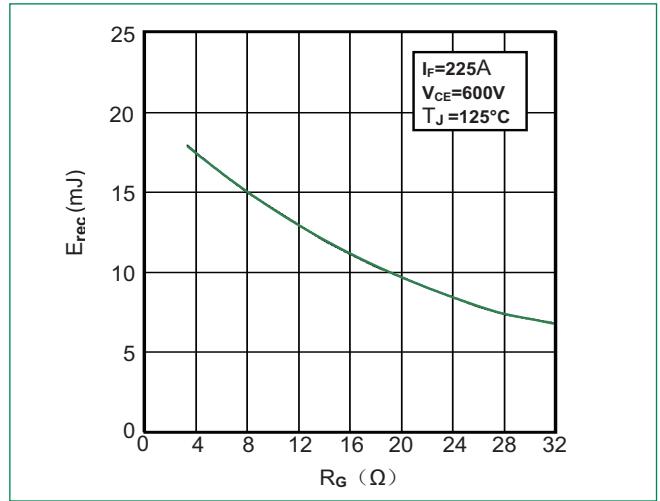
**Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter**



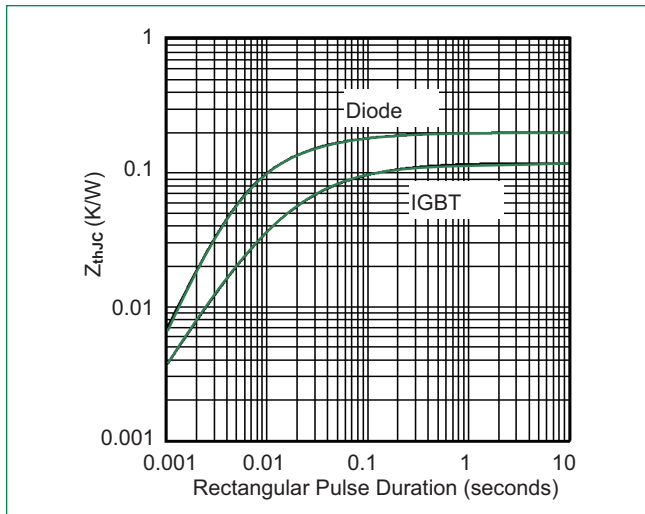
**Figure 7: Diode Forward Characteristics for Diode Inverter**



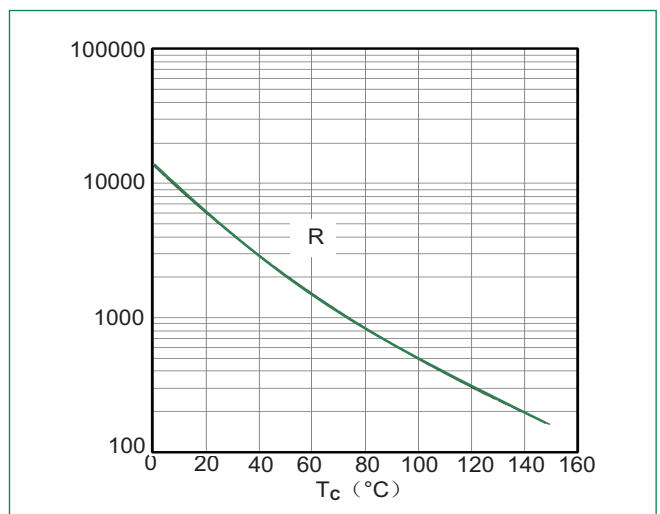
**Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter**



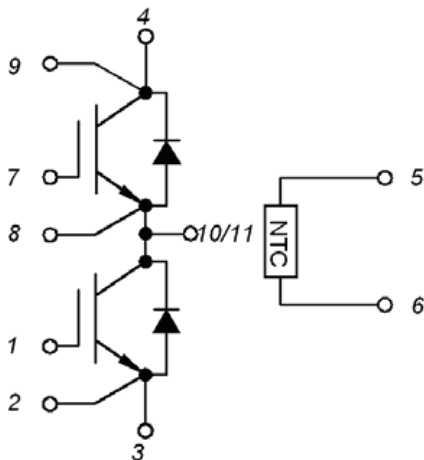
**Figure 9: Transient Thermal Impedance of Diode and IGBT Inverter**



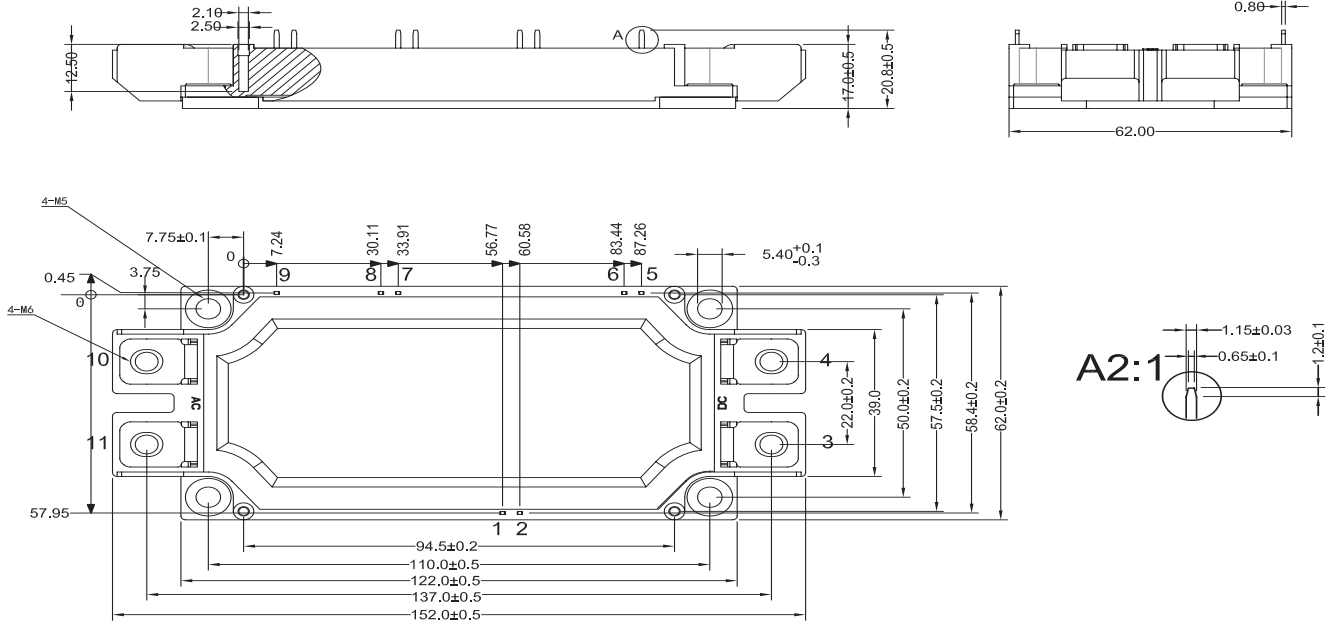
**Figure 10: NTC Characteristics**



### Circuit Diagram



### Dimensions-Package WB

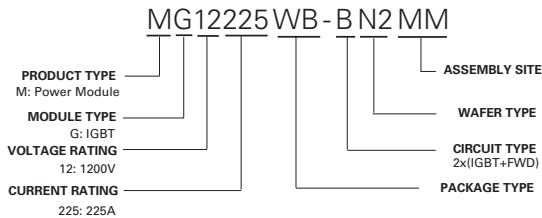


The foot pins are in gold / nickel coating

### Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG12225WB-BN2MM	MG12225WB-BN2MM	350g	Bulk Pack	60

### Part Numbering System



### Part Marking System

