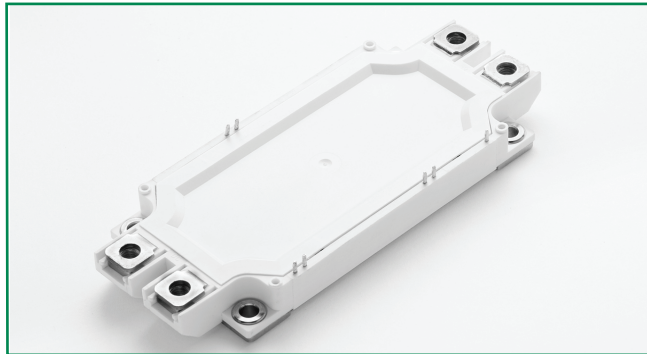


### MG17225WB-BN4MM

RoHS



#### Features

- IGBT<sup>3</sup> CHIP(1700V Trench+Field Stop technology)
- Low turn-off losses, short tail current
- $V_{CE(sat)}$  with positive temperature coefficient
- DIODE CHIP(1700V EMCON 3 technology)
- Free wheeling diodes with fast and soft reverse recovery

#### 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	$^\circ\text{C}$
$T_{Jop}$	Operating Temperature		-40		125	$^\circ\text{C}$
$T_{stg}$	Storage Temperature		-40		125	$^\circ\text{C}$
$V_{isol}$	Insulation Test Voltage	AC, t=1min		3500		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 ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Parameters	Test Conditions	Values	Unit
IGBT				
$V_{CES}$	Collector - Emitter Voltage	$T_J=25^\circ\text{C}$	1700	V
$V_{GES}$	Gate - Emitter Voltage		$\pm 20$	V
$I_C$	DC Collector Current	$T_C=25^\circ\text{C}$	325	A
		$T_C=80^\circ\text{C}$	225	A
$I_{CM}$	Repetitive Peak Collector Current	$t_p=1\text{ms}$	450	A
$P_{tot}$	Power Dissipation Per IGBT		1400	W
Diode				
$V_{RRM}$	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	1700	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^\circ\text{C}$	225	A
		$T_C=80^\circ\text{C}$	160	A
$I_{FRM}$	Repetitive Peak Forward Current	$t_p=1\text{ms}$	450	A
$I^2t$		$T_J = 125^\circ\text{C}$ , t=10ms, $V_R=0\text{V}$	8200	$\text{A}^2\text{s}$

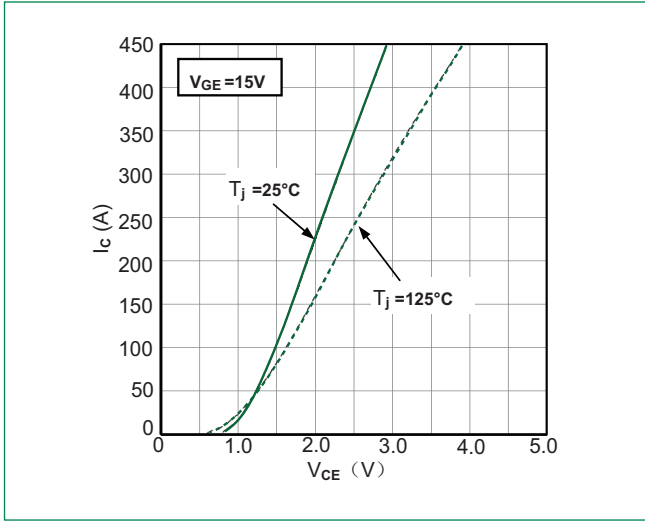
### Electrical and Thermal Specifications ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

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	6.4	V
$V_{CE(sat)}$	Collector - Emitter	$I_C=225\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		2.0	2.45	V
	Saturation Voltage	$I_C=225\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		2.4		V
$I_{CES}$	Collector Leakage Current	$V_{CE}=1700\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			3	mA
		$V_{CE}=1700\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$			20	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			2.8		$\Omega$
$Q_{ge}$	Gate Charge	$V_{CE}=900\text{V}, I_C=225\text{A}, V_{GE}=\pm 15\text{V}$		2.6		$\mu\text{C}$
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		20.5		nF
$C_{res}$	Reverse Transfer Capacitance			0.7		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=900\text{V}$ $I_C=225\text{A}$ $R_G=6.2\Omega$ $V_{GE}=\pm 15\text{V}$ Inductive Load	$T_J=25^\circ\text{C}$	280		ns
			$T_J=125^\circ\text{C}$	300		ns
$t_r$	Rise Time		$T_J=25^\circ\text{C}$	60		ns
			$T_J=125^\circ\text{C}$	75		ns
$t_{d(off)}$	Turn - off Delay Time		$T_J=25^\circ\text{C}$	810		ns
			$T_J=125^\circ\text{C}$	1000		ns
$t_f$	Fall Time		$T_J=25^\circ\text{C}$	180		ns
			$T_J=125^\circ\text{C}$	300		ns
$E_{on}$	Turn - on Energy		$T_J=25^\circ\text{C}$	49.5		mJ
			$T_J=125^\circ\text{C}$	71.5		mJ
$E_{off}$	Turn - off Energy	$T_J=25^\circ\text{C}$	48		mJ	
		$T_J=125^\circ\text{C}$	70.5		mJ	
$I_{SC}$	Short Circuit Current	$t_{psc} < 10\mu\text{s}, V_{GE}=15\text{V}; T_J=125^\circ\text{C}, V_{CC}=1000\text{V}$		900		A
$R_{thJC}$	Junction-to-Case Thermal Resistance (Per IGBT)				0.09	K/W
<b>Diode</b>						
$V_F$	Forward Voltage	$I_F=225\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.8	2.2	V
		$I_F=225\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.9		V
$I_{RRM}$	Max. Reverse Recovery Current	$I_F=225\text{A}, V_R=900\text{V}$ $di_F/dt=-2900\text{A}/\mu\text{s}$ $T_J=125^\circ\text{C}$		285		A
$Q_{rr}$	Reverse Recovery Charge			98		$\mu\text{C}$
$E_{rec}$	Reverse Recovery Energy			54		mJ
$R_{thJCD}$	Junction-to-Case Thermal Resistance (Per Diode)				0.16	K/W

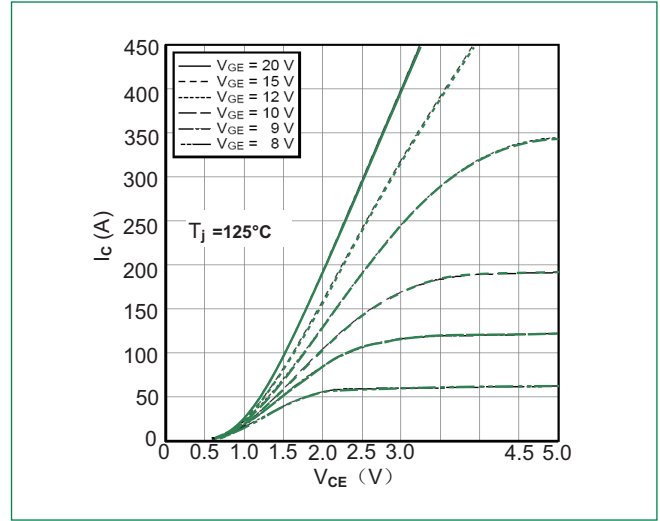
### NTC Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

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

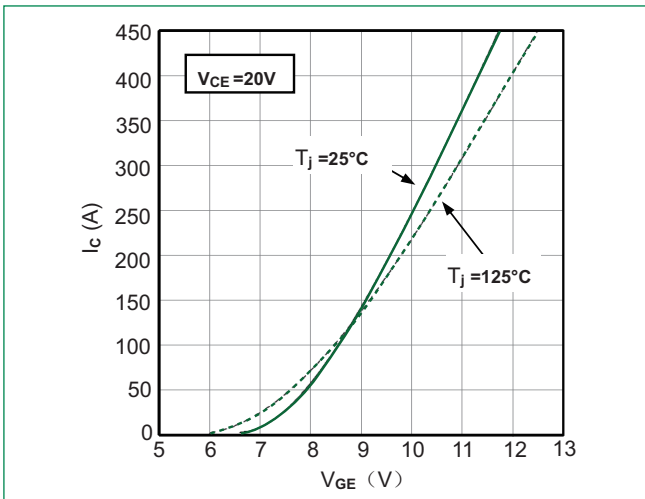
**Figure 1: Typical Output Characteristics for IGBT Inverter**



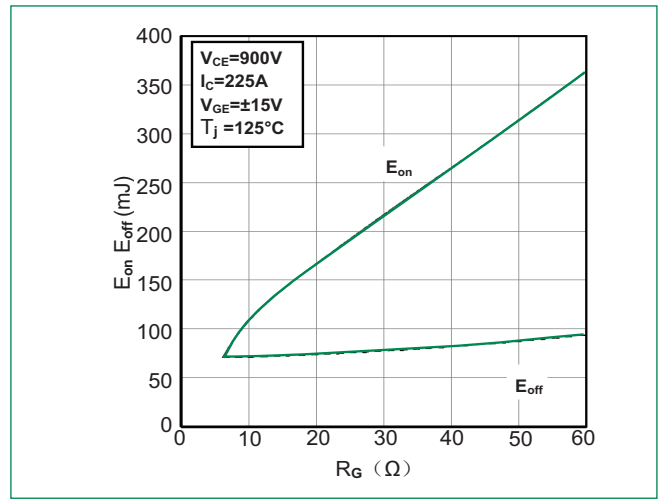
**Figure 2: Typical Output Characteristics for IGBT Inverter**



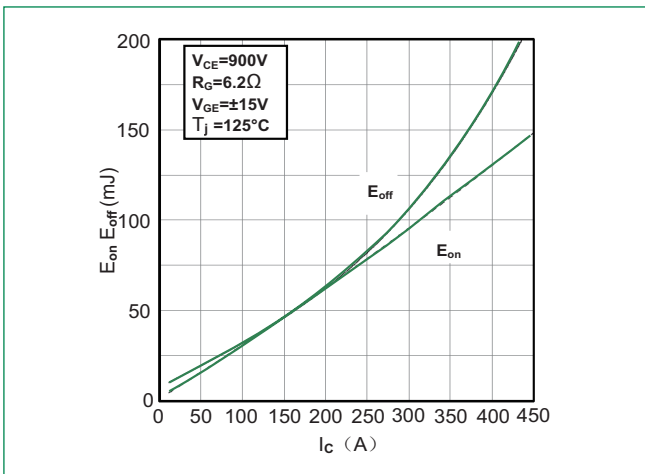
**Figure 3: Typical Transfer Characteristics for IGBT Inverter**



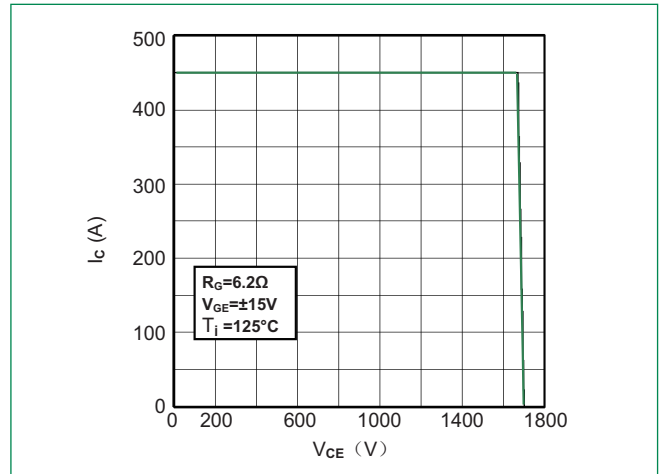
**Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter**



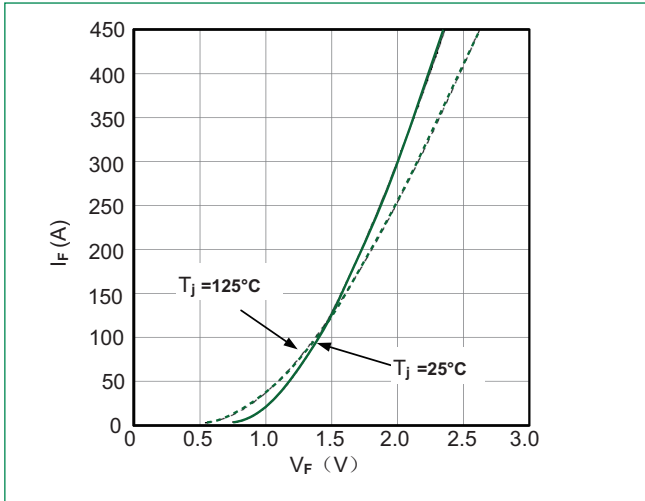
**Figure 5: Switching Energy vs. Collector Current for IGBT Inverter**



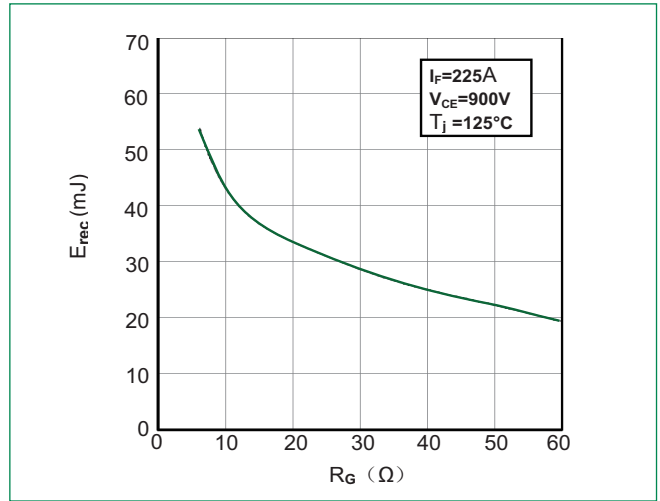
**Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter**



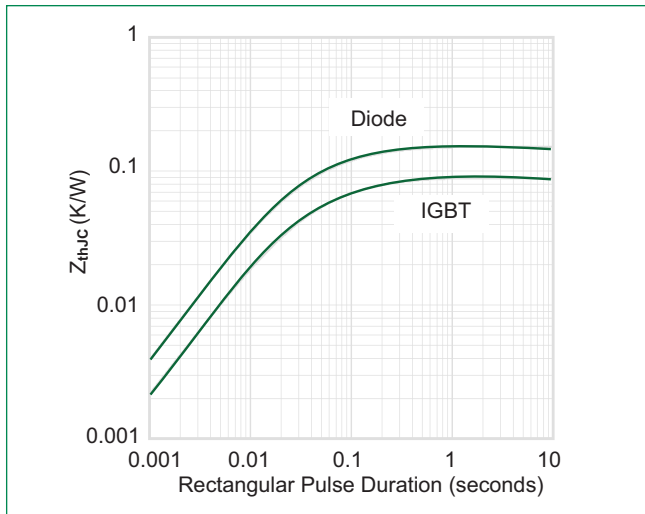
**Figure 7: Diode Forward Characteristics for Diode Inverter**



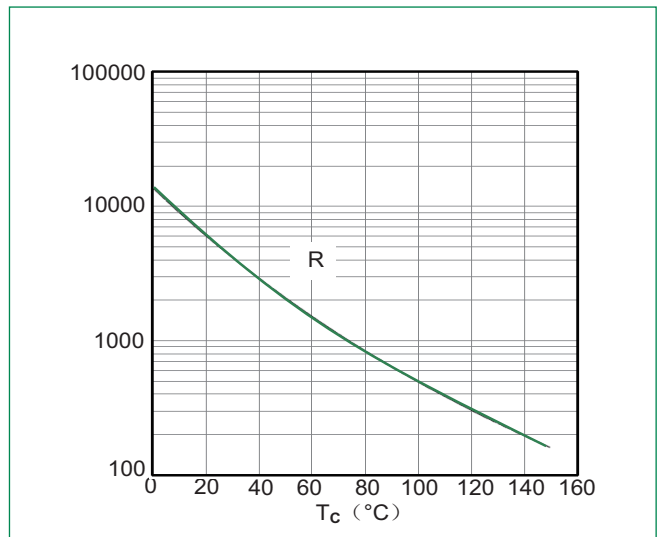
**Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter**



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



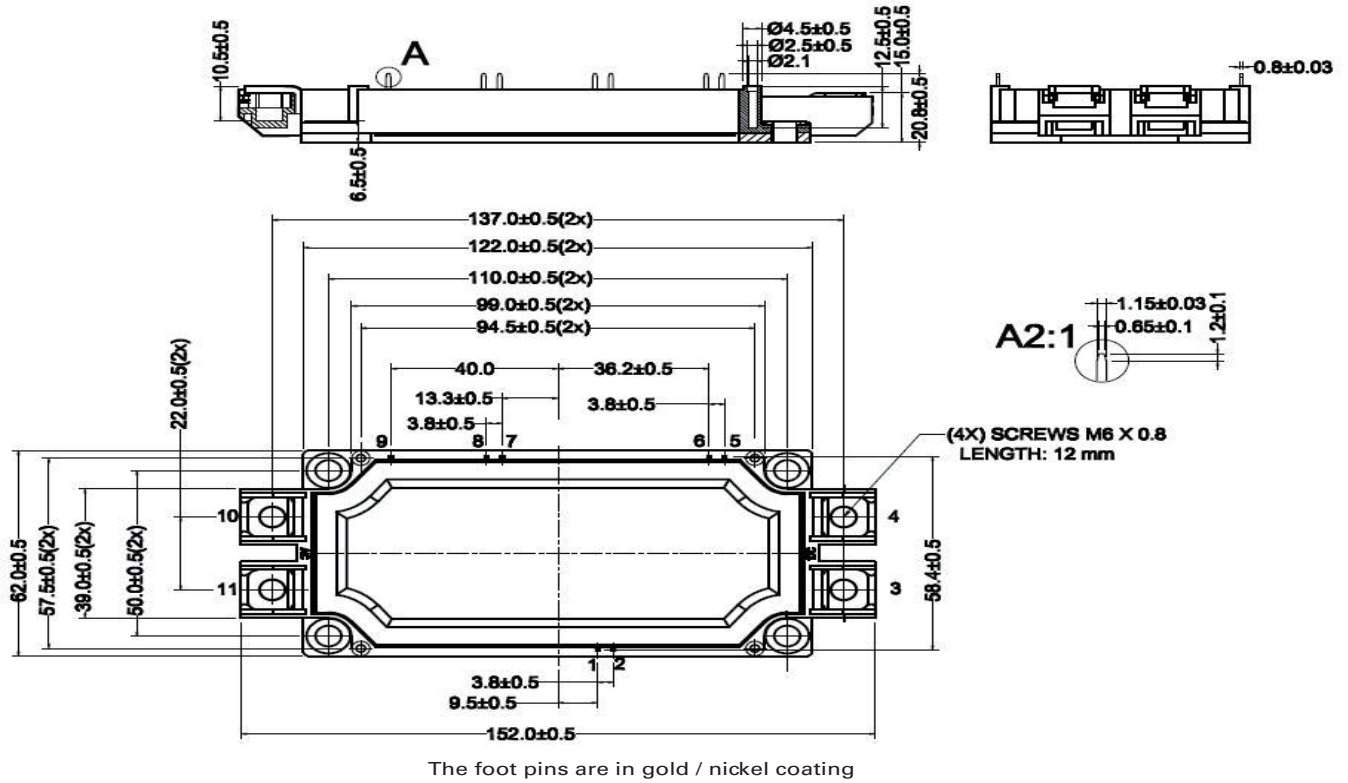
**Figure 10: NTC Characteristics**



### Circuit Diagram



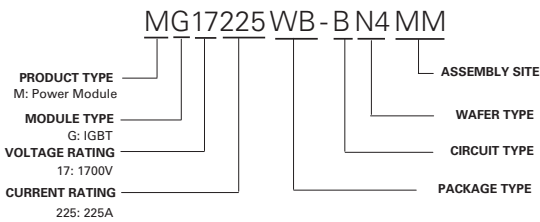
### Dimensions-Package WB



### Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG17225WB-BN4MM	MG17225WB-BN4MM	350g	Bulk Pack	20

### Part Numbering System



### Part Marking System

