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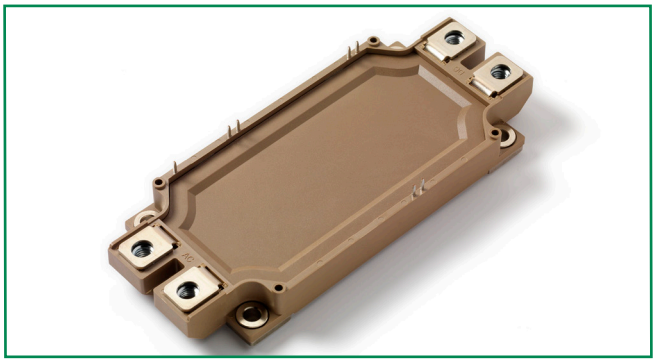
Power Module
1700V 450A IGBT Module

MG17450WB-BN4MM

RoHS



Features

- IGBT³ 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°C, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
$T_{J\,max}$	Max. Junction Temperature				150	°C
$T_{J\,op}$	Operating Temperature		-40		125	°C
T_{stg}	Storage Temperature		-40		125	°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°C, unless otherwise specified)

Symbol	Parameters	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	T_J=25°C	1700	V
V_{GES}	Gate - Emitter Voltage		±20	V
I_C	DC Collector Current	T_C=25°C	600	A
		T_C=80°C	450	A
I_{CM}	Repetitive Peak Collector Current	t_p=1ms	900	A
P_{tot}	Power Dissipation Per IGBT		2250	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	T_J=25°C	1700	V
$I_{F(AV)}$	Average Forward Current	T_C=25°C	450	A
		T_C=80°C	350	A
I_{FRM}	Repetitive Peak Forward Current	t_p=1ms	900	A
I^2t		T_J =125°C, t=10ms, V_R=0V	20000	A^2s

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Electrical and Thermal Specifications (T_J = 25°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=18mA		5.0	5.8	6.4	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	I_C=450A, V_{GE}=15V, T_J=25°C			2.0	2.45	V
		I_C=450A, V_{GE}=15V, T_J=125°C			2.4		V
I_{CES}	Collector Leakage Current	V_{CE}=1700V, V_{GE}=0V, T_J=25°C				3	mA
		V_{CE}=1700V, V_{GE}=0V, T_J=125°C				20	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±15V, T_J=125°C		-400		400	nA
R_{Gint}	Integrated Gate Resistor				1.7		Ω
Q_{ge}	Gate Charge	V_{CE}=900V, I_C=450A , V_{GE}=±15V			5.1		μC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			40.5		nF
C_{res}	Reverse Transfer Capacitance				1.3		nF
$t_{d(on)}$	Turn - on Delay Time	V_{CC}=900V I_C=450A R_G =3.3Ω V_{GE}=±15V Inductive Load	T_J=25°C		280		ns
			T_J=125°C		300		ns
t_r	Rise Time		T_J=25°C		80		ns
			T_J=125°C		100		ns
$t_{d(off)}$	Turn - off Delay Time		T_J=25°C		810		ns
			T_J=125°C		1000		ns
t_f	Fall Time		T_J=25°C		180		ns
			T_J=125°C		300		ns
E_{on}	Turn - on Energy		T_J=25°C		96.5		mJ
			T_J=125°C		140		mJ
E_{off}	Turn - off Energy		T_J=25°C		96		mJ
			T_J=125°C		140		mJ
I_{SC}	Short Circuit Current	t_{psc}≤10μS , V_{GE}=15V; T_J=125°C , V_{CC}=1000V			1800		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)					0.055	K/W
Diode							
V_F	Forward Voltage	I_F=450A, V_{GE}=0V, T_J =25°C			1.8	2.2	V
		I_F=450A, V_{GE}=0V, T_J =125°C			1.9		V
I_{RRM}	Max. Reverse Recovery Current	I_F=450A, V_R=900V di_F/dt=-4500A/μs T_J=125°C			570		A
Q_{rr}	Reverse Recovery Charge				195		μC
E_{rec}	Reverse Recovery Energy				110		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)					0.10	K/W

NTC Characteristics (T_J = 25°C, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
R_{25}	Resistance	T_c=25°C		5		KΩ
$B_{25/50}$				3375		K

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Figure 1: Typical Output Characteristics for IGBT Inverter

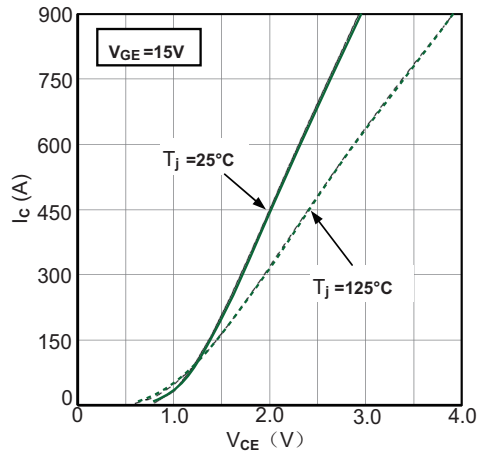

Figure 2: Typical Output Characteristics for IGBT Inverter

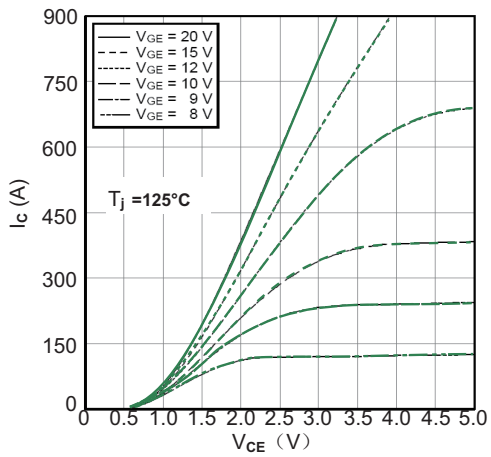

Figure 3: Typical Transfer Characteristics for IGBT Inverter

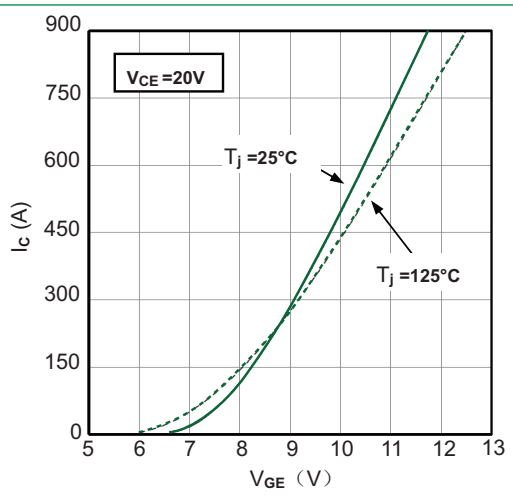

Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter

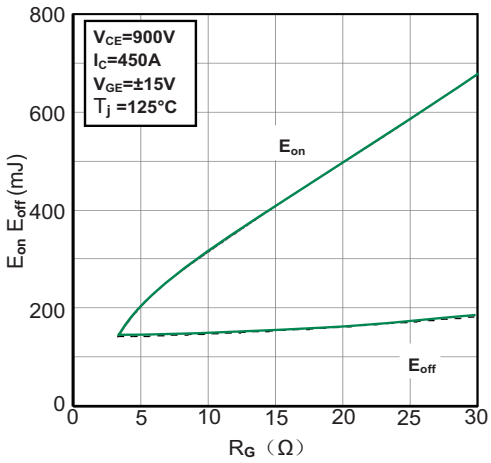

Figure 5: Switching Energy vs. Collector Current for IGBT Inverter

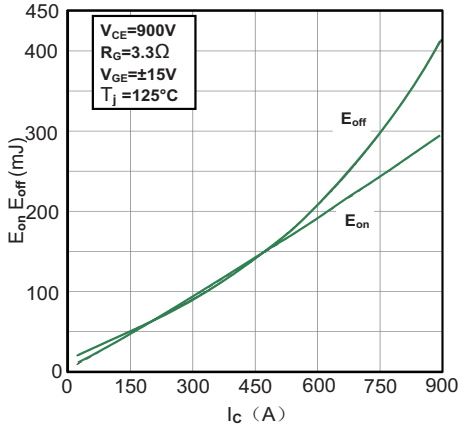

Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter

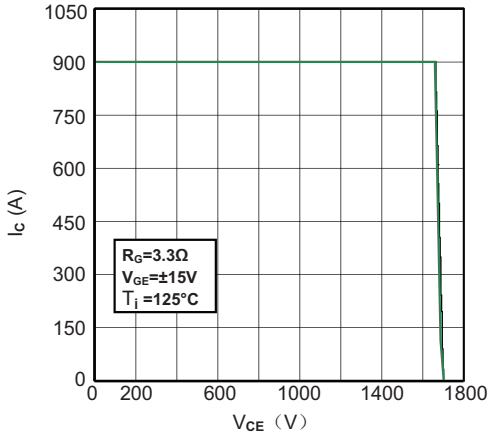

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Figure 7: Diode Forward Characteristics for Diode Inverter

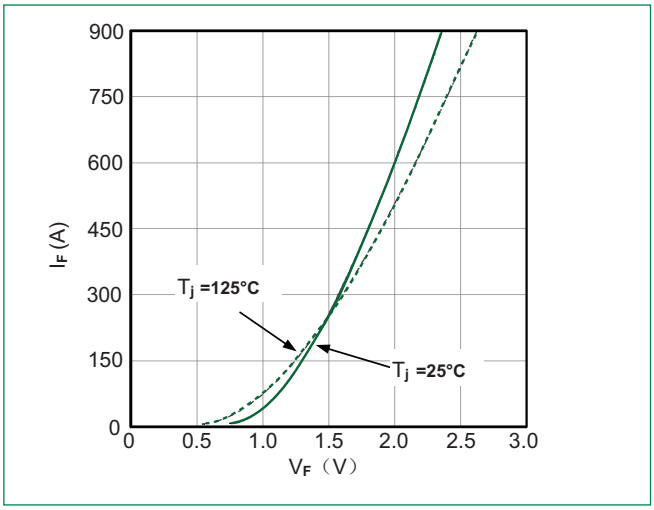


Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter

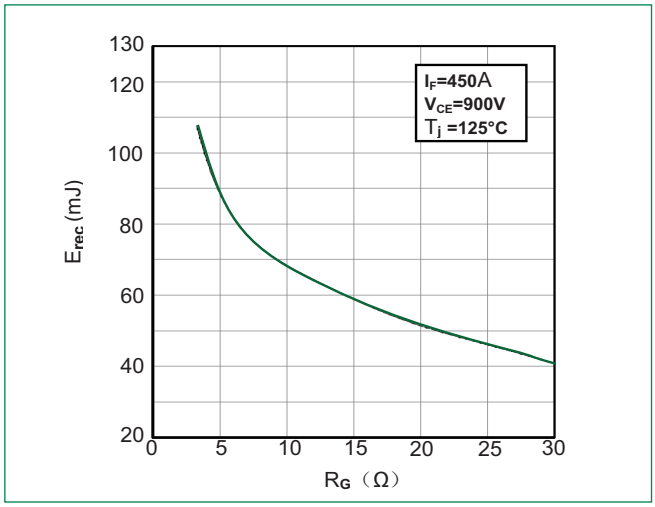


Figure 9: Transient Thermal Impedance of Diode and IGBT Inverter

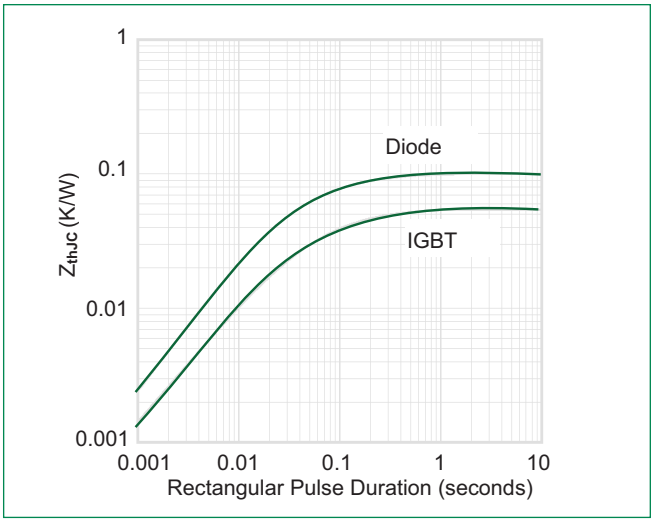
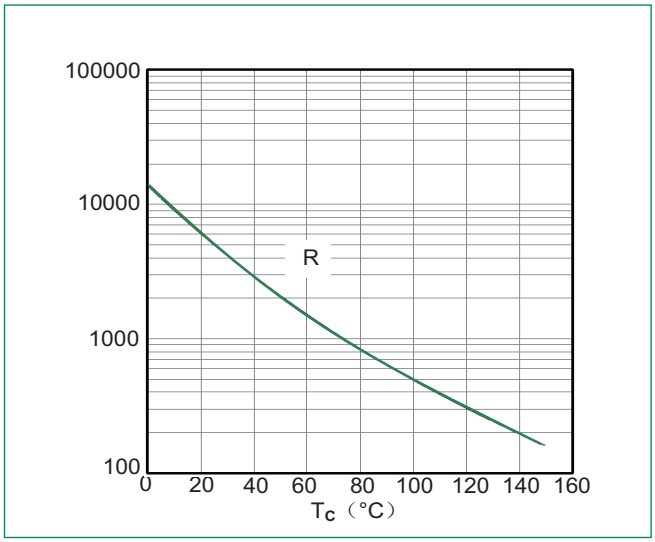
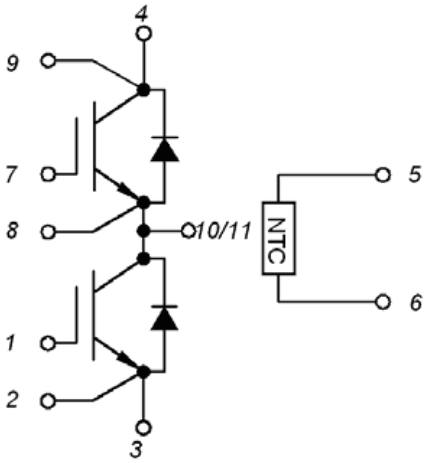


Figure 10: NTC Characteristics



Circuit Diagram



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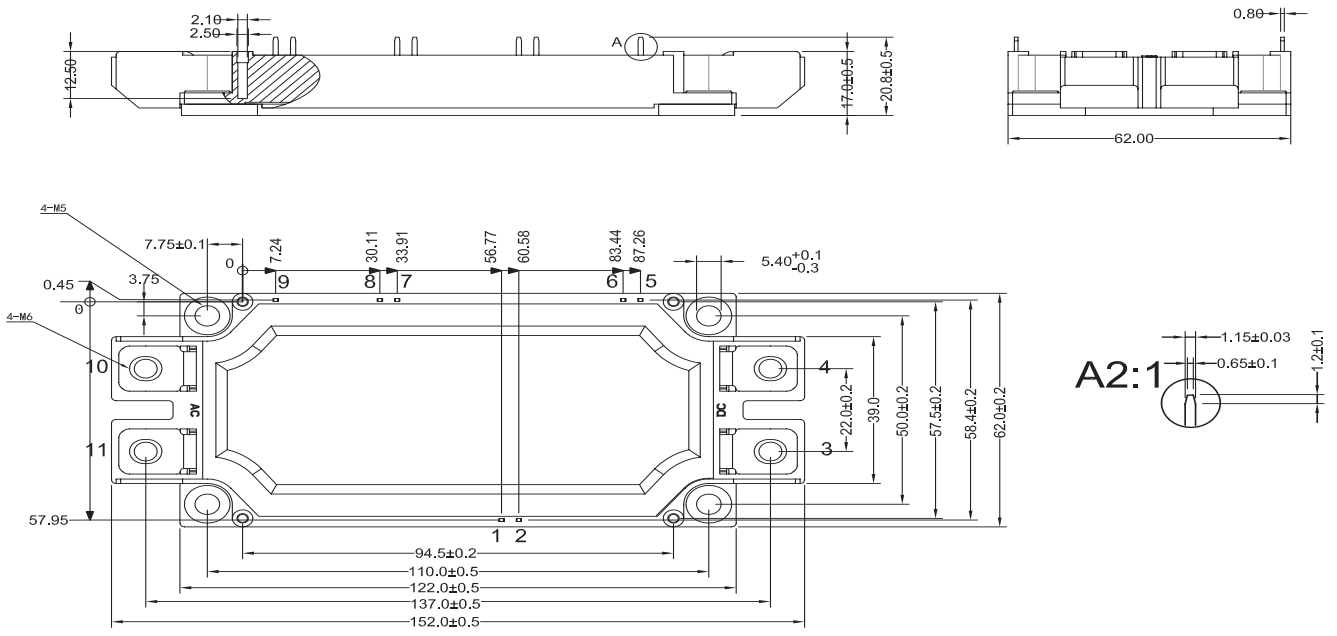
Dimensions-Package WB

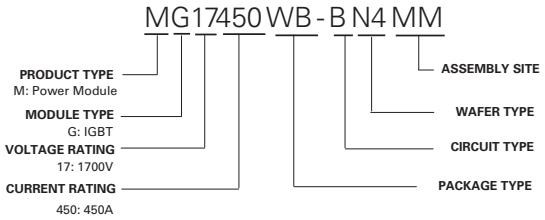


The foot pins are in gold / nickel coating

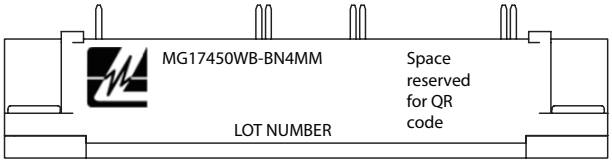
Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG17450WB-BN4MM	MG17450WB-BN4MM	350g	Bulk Pack	20

Part Numbering System



Part Marking System



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