

MG17150D-BN4MM



Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E71639

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

- 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
$T_{J(max)}$	Max. Junction Temperature				150	$^\circ\text{C}$
$T_{J op}$	Operating Temperature		-40		125	$^\circ\text{C}$
T_{stg}	Storage Temperature		-40		125	$^\circ\text{C}$
V_{isol}	Insulation Test Voltage	AC, t=1min		4000		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	$T_J=25^\circ\text{C}$	1700	V
V_{GES}	Gate - Emitter Voltage		± 20	V
I_C	DC Collector Current	$T_c=25^\circ\text{C}$	250	A
		$T_c=80^\circ\text{C}$	150	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	300	A
P_{tot}	Power Dissipation Per IGBT		890	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	1700	V
$I_{F(AV)}$	Average Forward Current	$T_c=25^\circ\text{C}$	250	A
		$T_c=80^\circ\text{C}$	150	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	300	A
I^2t		$T_J = 125^\circ\text{C}$, $t=10\text{ms}$, $V_R=0\text{V}$	4200	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.

Power Module

1700V 150A IGBT Module

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 =6.0mA		5.2	5.8	6.4	V
V _{CE(sat)}	Collector - Emitter Saturation Voltage	I _C =150A, V _{GE} =15V, T _J =25°C			2.0	2.45	V
		I _C =150A, 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} =±20V, T _J =125°C		-400		400	nA
R _{Gint}	Intergrated Gate Resistor				4.3		Ω
Q _{ge}	Gate Charge	V _{CE} =900V, I _C =150A , V _{GE} =±15V			1.8		μC
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz			13.6		nF
C _{res}	Reverse Transfer Capacitance				0.45		nF
t _{d(on)}	Turn - on Delay Time	V _{CC} =900V I _C =150A R _G =3.3Ω V _{GE} =±15V Inductive Load	T _J =25°C		380		ns
			T _J =125°C		420		ns
t _r	Rise Time		T _J =25°C		50		ns
			T _J =125°C		60		ns
t _{d(off)}	Turn - off Delay Time		T _J =25°C		700		ns
			T _J =125°C		900		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		33		mJ
			T _J =125°C		48		mJ
E _{off}	Turn - off Energy		T _J =25°C		32		mJ
			T _J =125°C		47		mJ
I _{SC}	Short Circuit Current	t _{psc} ≤10μS , V _{GE} =15V; T _J =125°C, V _{CC} =1000V			600		A
R _{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)					0.14	K/W
Diode							
V _F	Forward Voltage	I _F =150A , V _{GE} =0V, T _J =25°C			1.8	2.2	V
		I _F =150A , V _{GE} =0V, T _J =125°C			1.9		V
I _{RRM}	Max. Reverse Recovery Current	I _F =150A , V _R =900V di _F /dt=-3600A/μs T _J =125°C			240		A
Q _{rr}	Reverse Recovery Charge				72		μC
E _{rec}	Reverse Recovery Energy				41		mJ
R _{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)					0.21	K/W

Figure 1: Typical Output Characteristics

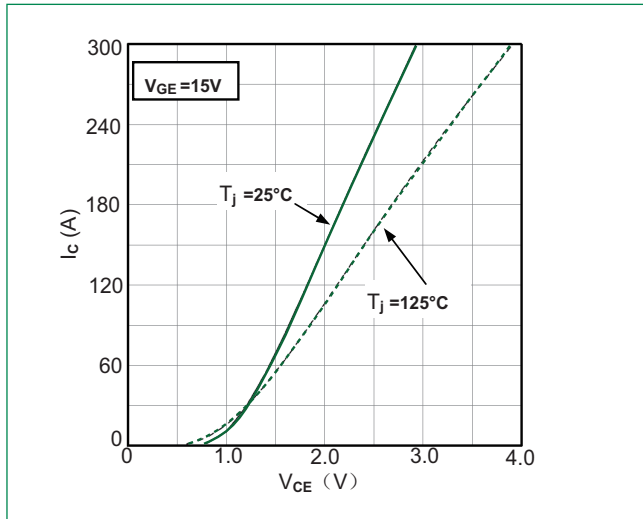


Figure 2: Typical Output Characteristics

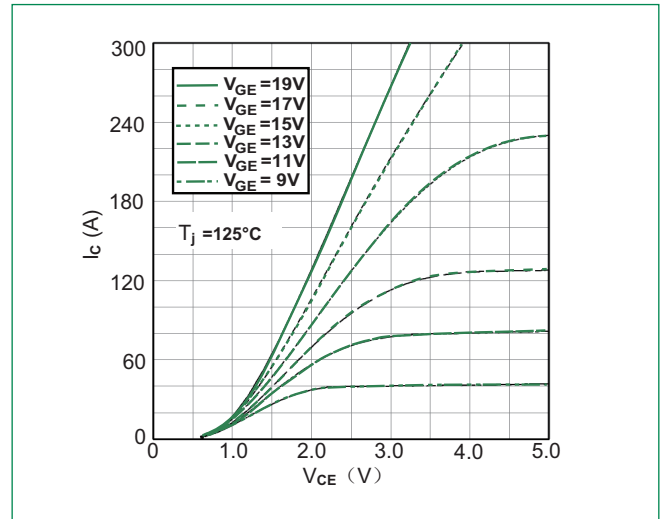


Figure 3: Typical Transfer characteristics

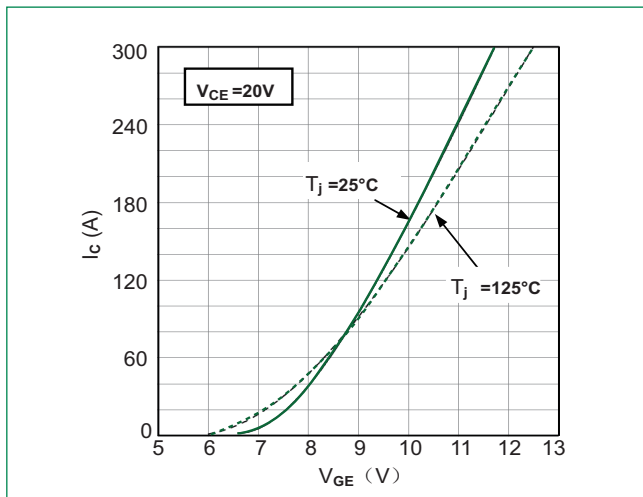


Figure 4: Switching Energy vs. Gate Resistor

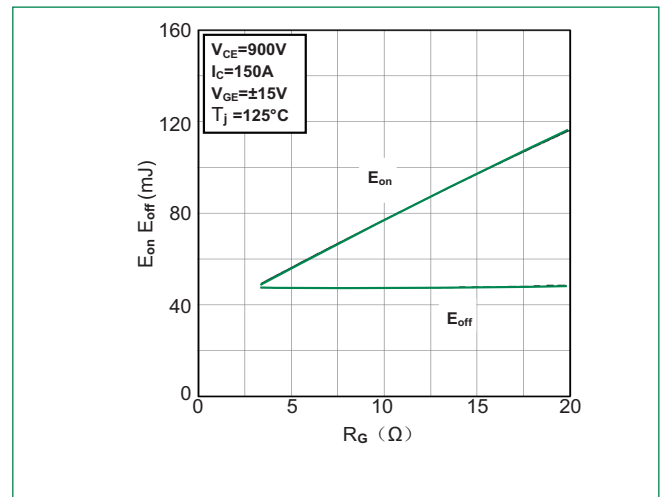


Figure 5: Switching Energy vs. Collector Current

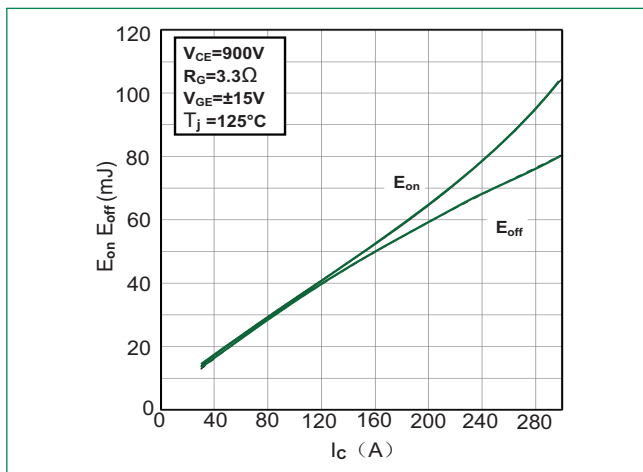


Figure 6: Reverse Biased Safe Operating Area

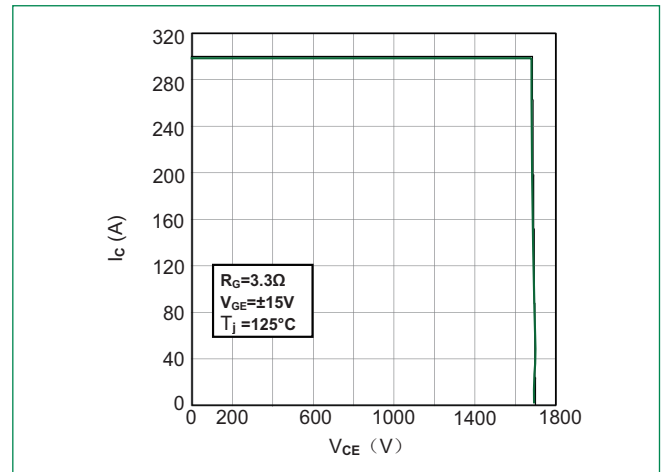


Figure 7: Diode Forward Characteristics

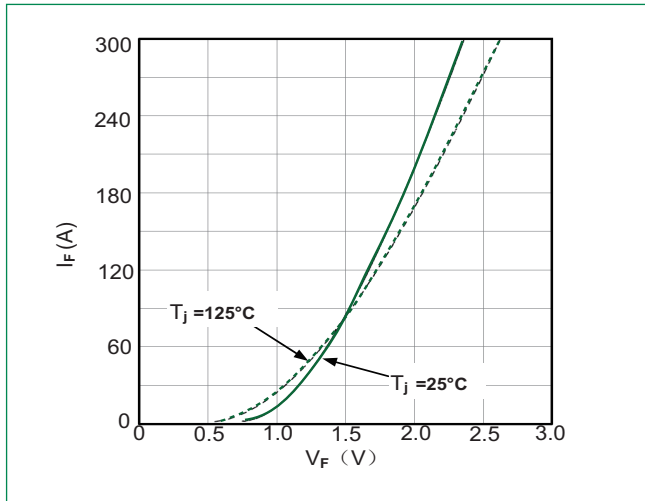


Figure 8: Switching Energy vs. Gate Resistor

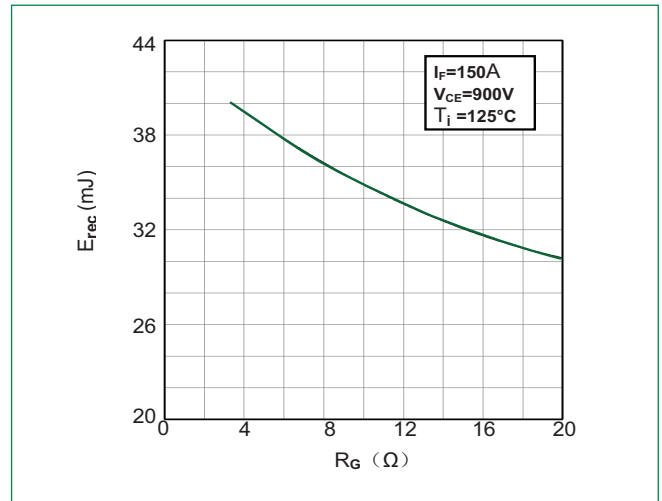


Figure 9: Switching Energy vs. Forward Current

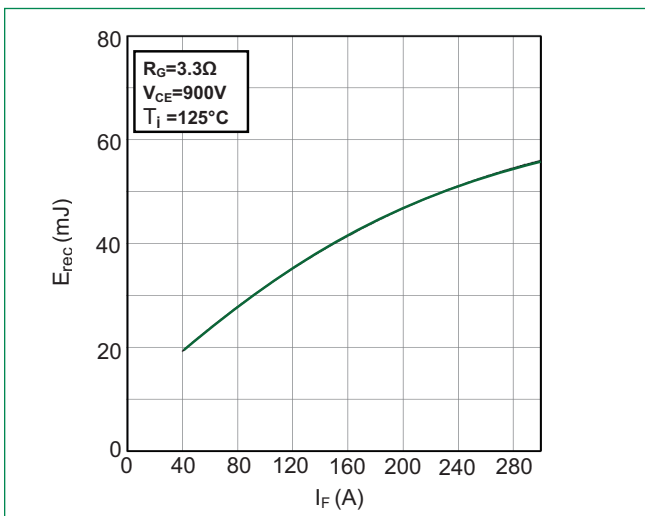
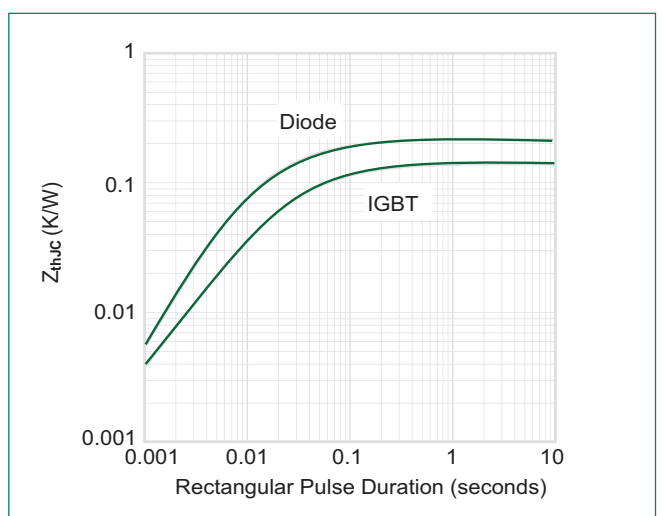
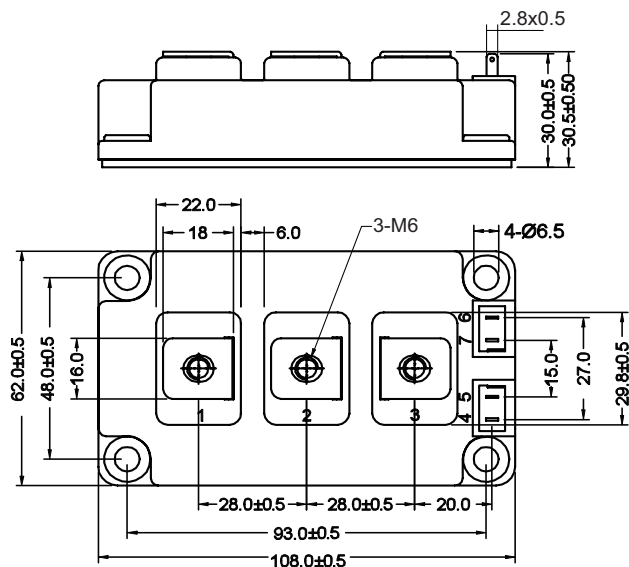


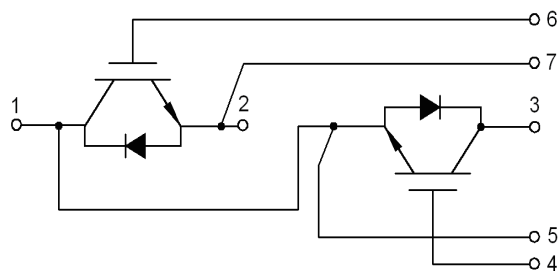
Figure 10: Transient Thermal Impedance of Diode and IGBT



Dimensions-Package D



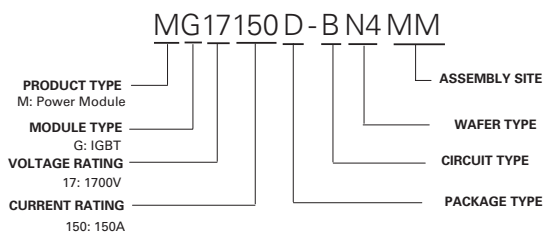
Circuit Diagram



Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG17150D-BN4MM	MG17150D-BN4MM	320g	Bulk Pack	30

Part Numbering System



Part Marking System

