

# MG17150D-BN4MM Datasheet



DiGi Electronics Part Number	MG17150D-BN4MM-DG
Manufacturer	<a href="#">Littelfuse Inc.</a>
Manufacturer Product Number	MG17150D-BN4MM
Description	IGBT MODULE 1700V 250A 890W D3
Detailed Description	IGBT Module Trench Field Stop Half Bridge 1700 V 250 A 890 W Chassis Mount D3

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## Purchase and inquiry

Manufacturer Product Number:

MG17150D-BN4MM

Series:

-

IGBT Type:

Trench Field Stop

Voltage - Collector Emitter Breakdown (Max):

1700 V

Power - Max:

890 W

Current - Collector Cutoff (Max):

3 mA

Input:

Standard

Operating Temperature:

-40°C ~ 125°C (Tj)

Package / Case:

D-3 Module

Manufacturer:

Littelfuse Inc.

Product Status:

Obsolete

Configuration:

Half Bridge

Current - Collector (Ic) (Max):

250 A

Vce(on) (Max) @ Vge, Ic:

2.45V @ 15V, 150A

Input Capacitance (Cies) @ Vce:

13.6 nF @ 25 V

NTC Thermistor:

No

Mounting Type:

Chassis Mount

Supplier Device Package:

D3

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

ECCN:

EAR99

Moisture Sensitivity Level (MSL):


1 (Unlimited)

HTSUS:

8541.29.0095

**MG17150D-BN4MM**

**Agency Approvals**

AGENCY	AGENCY FILE NUMBER
	E71639

**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**

- 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
<b>IGBT</b>				
$V_{CES}$	Collector - Emitter Voltage	$T_J=25^\circ\text{C}$	1700	V
$V_{GES}$	Gate - Emitter Voltage		$\pm 20$	V
$I_C$	DC Collector Current	$T_c=25^\circ\text{C}$	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
<b>Diode</b>				
$V_{RRM}$	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	$\text{A}^2\text{S}$

Life Support Note:

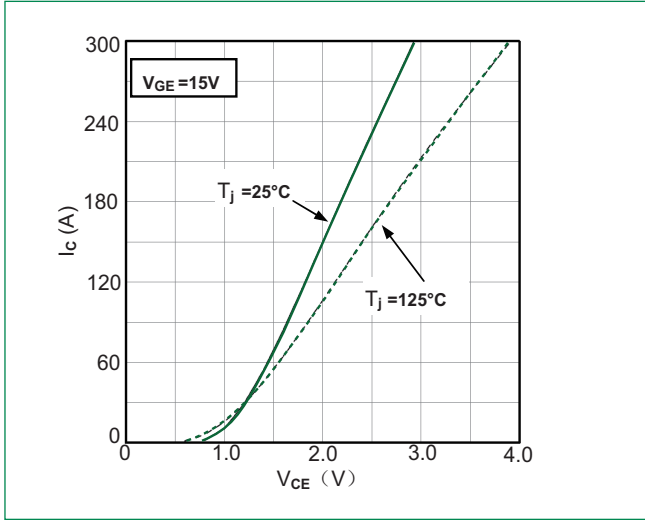
**Not Intended for Use in Life Support or Life Saving Applications**

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

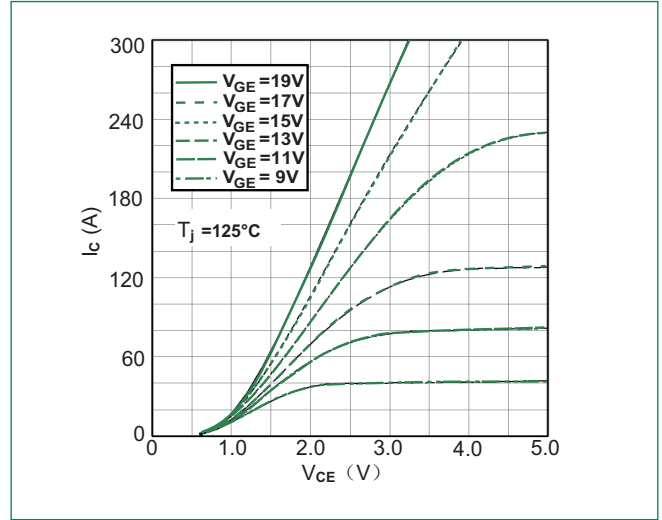
**Electrical and Thermal Specifications ( $T_c = 25^\circ\text{C}$ , unless otherwise specified)**

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
<b>IGBT</b>						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=6.0\text{mA}$	5.2	5.8	6.4	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	$I_C=150\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		2.0	2.45	V
		$I_C=150\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		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	$V_{CE}=0\text{V}, V_{GE}=\pm 20\text{V}, T_J=125^\circ\text{C}$	-400		400	nA
$R_{Gint}$	Intergrated Gate Resistor			4.3		$\Omega$
$Q_{ge}$	Gate Charge	$V_{CE}=900\text{V}, I_C=150\text{A}, V_{GE}=\pm 15\text{V}$		1.8		$\mu\text{C}$
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		13.6		nF
$C_{res}$	Reverse Transfer Capacitance			0.45		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=900\text{V}$ $I_C=150\text{A}$ $R_G=3.3\Omega$ $V_{GE}=\pm 15\text{V}$ Inductive Load	$T_J=25^\circ\text{C}$	380		ns
			$T_J=125^\circ\text{C}$	420		ns
$t_r$	Rise Time		$T_J=25^\circ\text{C}$	50		ns
			$T_J=125^\circ\text{C}$	60		ns
$t_{d(off)}$	Turn - off Delay Time		$T_J=25^\circ\text{C}$	700		ns
			$T_J=125^\circ\text{C}$	900		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		$T_J=25^\circ\text{C}$	33		mJ
			$T_J=125^\circ\text{C}$	48		mJ
$E_{off}$	Turn - off Energy	$T_J=25^\circ\text{C}$	32		mJ	
		$T_J=125^\circ\text{C}$	47		mJ	
$I_{SC}$	Short Circuit Current	$t_{psc}\leq 10\mu\text{S}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}, V_{CC}=1000\text{V}$		600		A
$R_{thJC}$	Junction-to-Case Thermal Resistance (Per IGBT)				0.14	K/W
<b>Diode</b>						
$V_F$	Forward Voltage	$I_F=150\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.8	2.2	V
		$I_F=150\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.9		V
$I_{RRM}$	Max. Reverse Recovery Current	$I_F=150\text{A}, V_R=900\text{V}$		240		A
$Q_{rr}$	Reverse Recovery Charge	$di_f/dt=-3600\text{A}/\mu\text{s}$		72		$\mu\text{C}$
$E_{rec}$	Reverse Recovery Energy	$T_J=125^\circ\text{C}$		41		mJ
$R_{thJCD}$	Junction-to-Case Thermal Resistance (Per Diode)				0.21	K/W

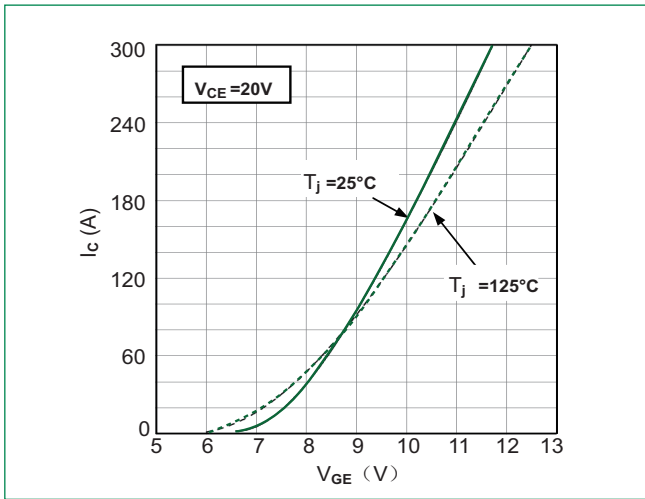
**Figure 1: Typical Output Characteristics**



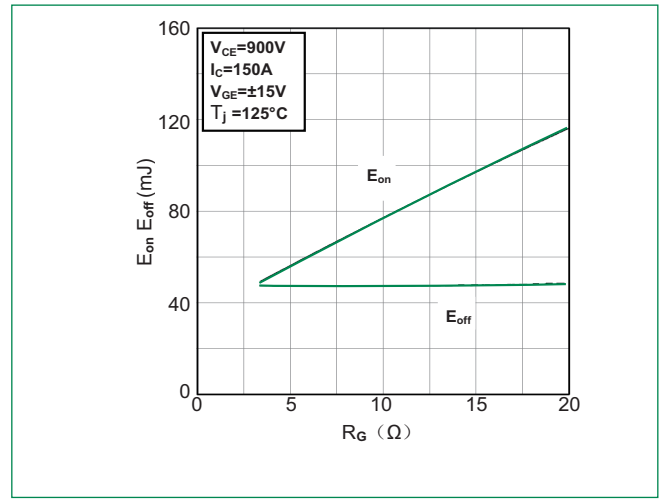
**Figure 2: Typical Output Characteristics**



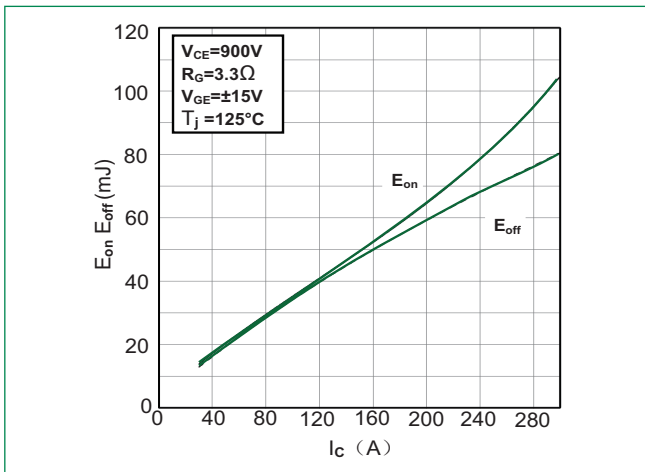
**Figure 3: Typical Transfer characteristics**



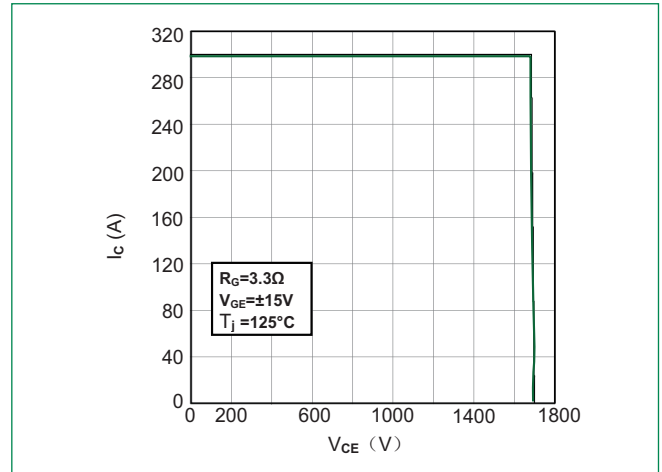
**Figure 4: Switching Energy vs. Gate Resistor**



**Figure 5: Switching Energy vs. Collector Current**



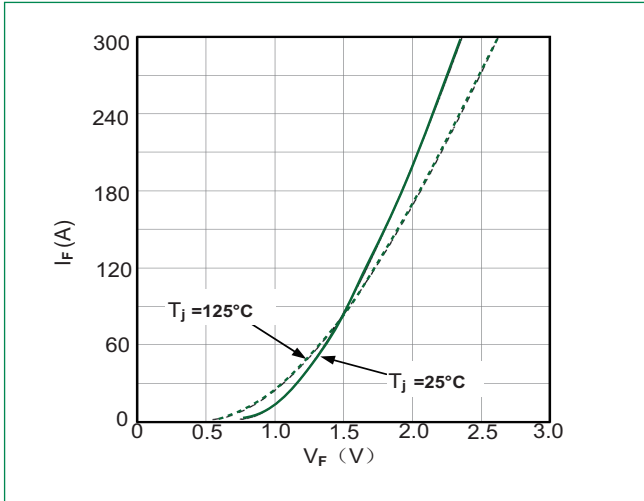
**Figure 6: Reverse Biased Safe Operating Area**



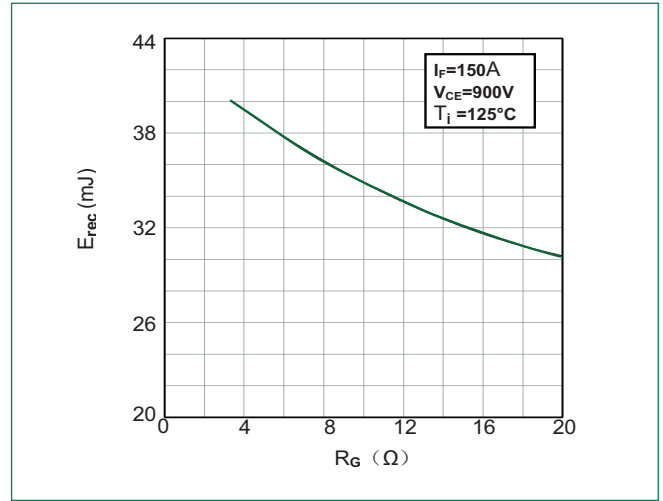
# Power Module

## 1700V 150A IGBT Module

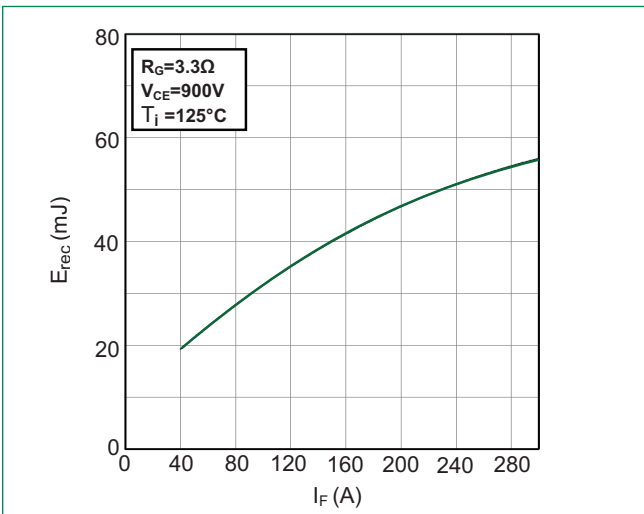
**Figure 7: Diode Forward Characteristics**



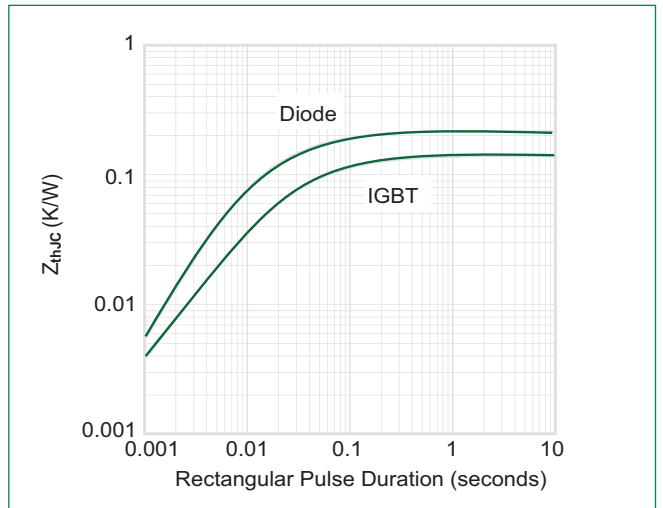
**Figure 8: Switching Energy vs. Gate Resistor**



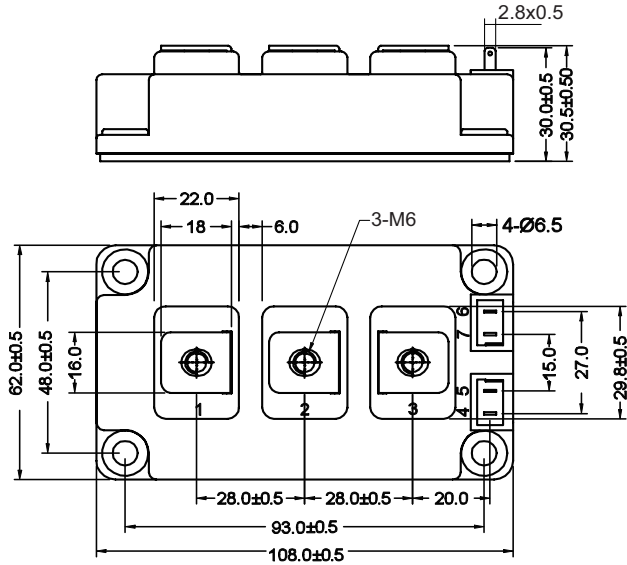
**Figure 9: Switching Energy vs. Forward Current**



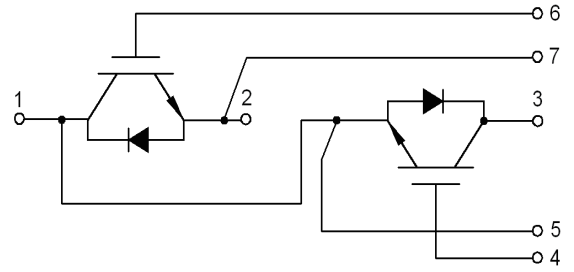
**Figure 10: Transient Thermal Impedance of Diode and IGBT**



**Dimensions-Package D**



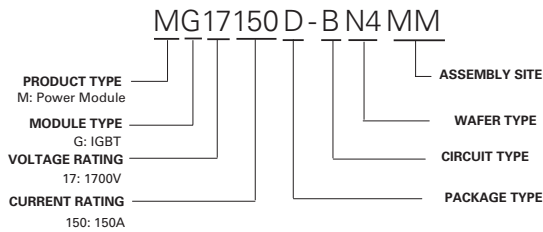
**Circuit Diagram**



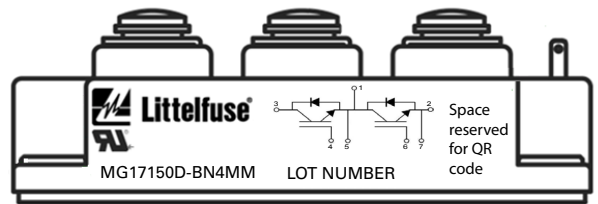
**Packing Options**

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

**Part Numbering System**



**Part Marking System**



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