

FEATURES

- Ultra Low Loss
- High Ruggedness
- High Short Circuit Capability
- $V_{CE(sat)}$ With Positive Temperature Coefficient
- With Fast Free-Wheeling Diodes
- Passivation: alpha-si and silicon nitride plus polyimide

APPLICATIONS

- Inverter
- Converter
- Welder
- SMPS and UPS
- Induction Heating



ABSOLUTE MAXIMUM RATINGS

$T_c=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	$V_{GE}=0V, T_{vj} \geq 25^{\circ}\text{C}$	1700	V
V_{GES}	Gate - Emitter Voltage		± 20	V
I_c	DC Collector Current		150	A
I_{CM}	Peak Collector Current	Limited by T_{vjmax}	300	A
P_{tot}	Power Dissipation Per IGBT		625	W
T_{vj}	Junction Temperature Range		-40 to +150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range		-40 to +125	$^{\circ}\text{C}$
V_{isol}	Insulation Test Voltage	AC, $t=1\text{min}$	3000	V
Free-Wheeling Diode				
V_{RRM}	Repetitive Reverse Voltage		1700	V
$I_{F(AV)}$	Average Forward Current	$T_c=25^{\circ}\text{C}$ 180° rect.	150	A
		$T_c=95^{\circ}\text{C}$ 180° rect.	100	A
$I_{F(RMS)}$	RMS Forward Current		210	A
I_{FSM}	Non-Repetitive Surge	$T_{vj}=45^{\circ}\text{C}, V_R=0V, t=10\text{ms}, \text{Sine}$	1100	A
	Forward Current	$T_{vj}=45^{\circ}\text{C}, V_R=0V, t=8.3\text{ms}, \text{Sine}$	1200	A

MIMMG150SR170B

ELECTRICAL CHARACTERISTICS

T_c=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
IGBT						
V _{GE(th)}	Gate - Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =10mA	5.3	5.8	6.3	V
V _{CE(sat)}	Collector - Emitter Saturation Voltage	I _C =150A, V _{GE} =15V, T _{VJ} =25°C		2.30		V
		I _C =150A, V _{GE} =15V, T _{VJ} =125°C		2.65		V
		I _C =150A, V _{GE} =15V, T _{VJ} =150°C		2.75		V
I _{CES}	Collector Leakage Current	V _{CE} =1700V, V _{GE} =0V, T _{VJ} =25°C			0.5	mA
		V _{CE} =1700V, V _{GE} =0V, T _{VJ} =125°C			2.5	mA
		V _{CE} =1700V, V _{GE} =0V, T _{VJ} =150°C			4.0	mA
I _{GES}	Gate Leakage Current	V _{CE} =0V, V _{GE} =±15V, T _{VJ} =125°C	-500		500	nA
Q _{ge}	Gate Charge	V _{CE} =900V, I _C =150A, V _{GE} =±15V		0.9		μC
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f=1MHz		10		nF
C _{oes}	Output Capacitance			0.53		nF
C _{res}	Reverse Transfer Capacitance			0.37		nF
t _{d(on)}	Turn - on Delay Time	V _{CC} =900V, T _{VJ} =25°C		385		ns
		I _C =150A, T _{VJ} =125°C		400		ns
		R _G =16.4 Ω, T _{VJ} =150°C		400		ns
t _r	Rise Time	V _{GE} =±15V, T _{VJ} =25°C		355		ns
		Inductive Load, T _{VJ} =125°C		365		ns
		Inductive Load, T _{VJ} =150°C		365		ns
t _{d(off)}	Turn - off Delay Time	V _{CC} =900V, T _{VJ} =25°C		710		ns
		I _C =150A, T _{VJ} =125°C		810		ns
		R _G =16.4 Ω, T _{VJ} =150°C		840		ns
t _f	Fall Time	V _{GE} =±15V, T _{VJ} =25°C		320		ns
		Inductive Load, T _{VJ} =125°C		365		ns
		Inductive Load, T _{VJ} =150°C		370		ns
E _{on}	Turn - on Switching Energy	V _{CC} =900V, I _C =150A, T _{VJ} =125°C		36		mJ
		R _G =16.4 Ω, T _{VJ} =150°C		42		mJ
E _{off}	Turn - off Switching Energy	V _{GE} =±15V, T _{VJ} =125°C		69		mJ
		Inductive Load, T _{VJ} =150°C		73		mJ
I _{sc}	Short Circuit Current	t _{psc} ≤10μS, V _{GE} =15V, T _{VJ} =150°C V _{CC} =1300V, V _{CEMCHIP} ≤1700V		490		A
Free-Wheeling Diode						
V _F	Forward Voltage	I _F =150A, V _{GE} =0V, T _{VJ} =25°C		2.2		V
		I _F =150A, V _{GE} =0V, T _{VJ} =125°C		2.45		V
I _{RRM}	Max. Reverse Recovery Current	I _F =150A, V _R =1000V		130		A
Q _{rr}	Reverse Recovery Charge	di _F /dt=-1000A/μs		18		μC
E _{rec}	Reverse Recovery Charge	T _{VJ} =125°C		25		mJ

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
R_{thJC}	Junction-to-Case Thermal Resistance	Per IGBT			0.20	K/W
R_{thJD}	Junction-to-Case Thermal Resistance	Per Inverse Diode			0.37	K/W
Torque	Module-to-Sink	Recommended (M6)	3		5	N·m
Torque	Module Electrodes	Recommended (M5)	2.5		5	N·m
Weight				160		g

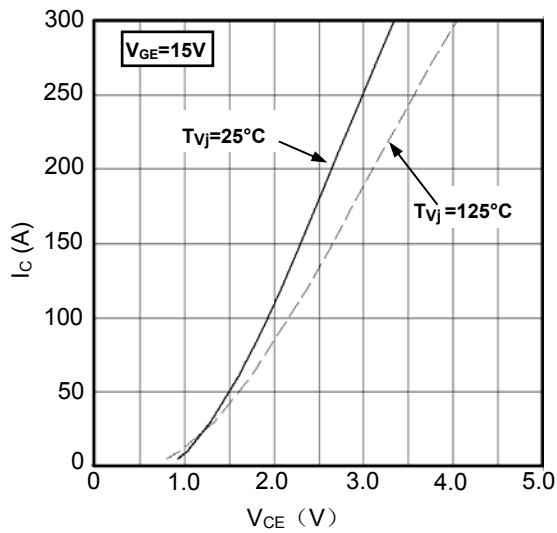


Figure1. Typical Output characteristics

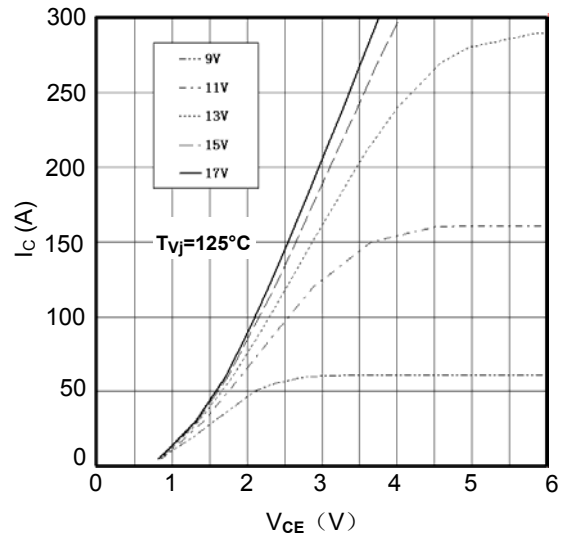


Figure2. Typical Output characteristics

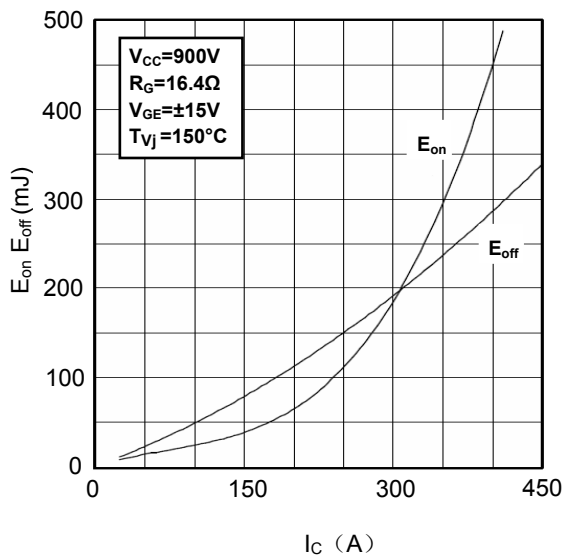


Figure3. Switching Energy vs. Collector Current

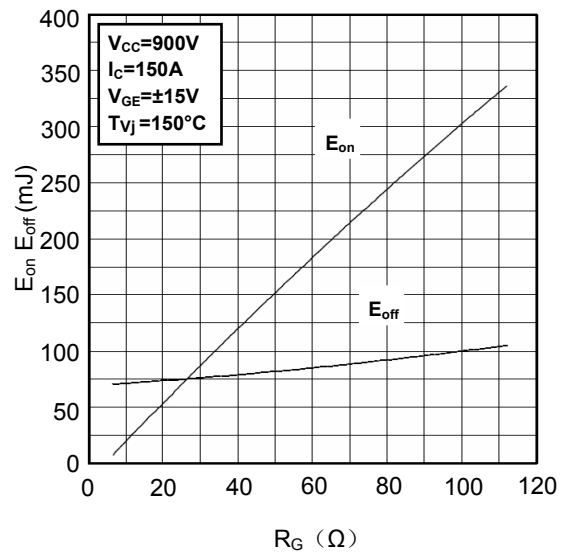


Figure4. Switching Energy vs. Gate Resistor

MIMMG150SR170B

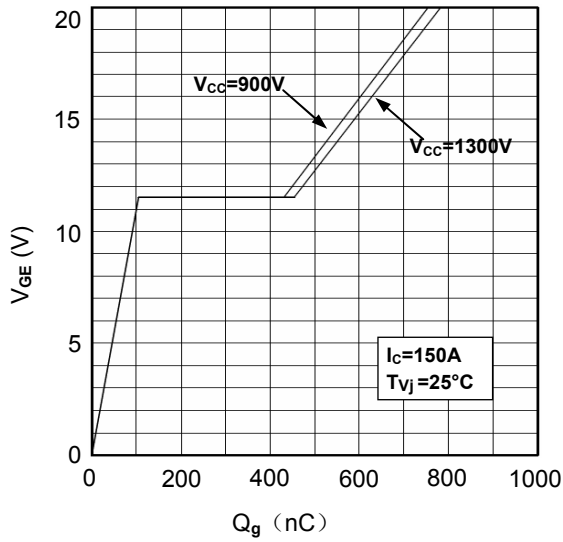


Figure5. Gate Charge characteristics

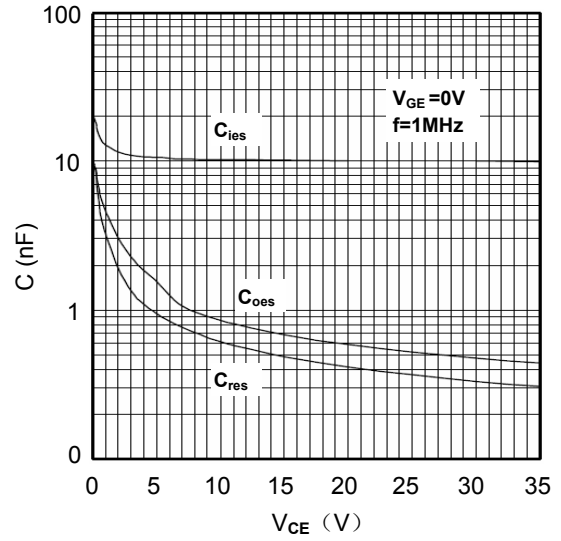


Figure6. Typical Capacitances vs. V_{CE}

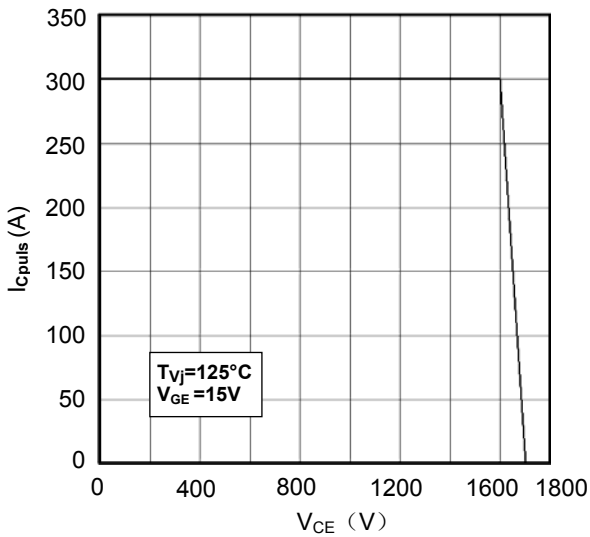


Figure7. Reverse Biased Safe Operating Area

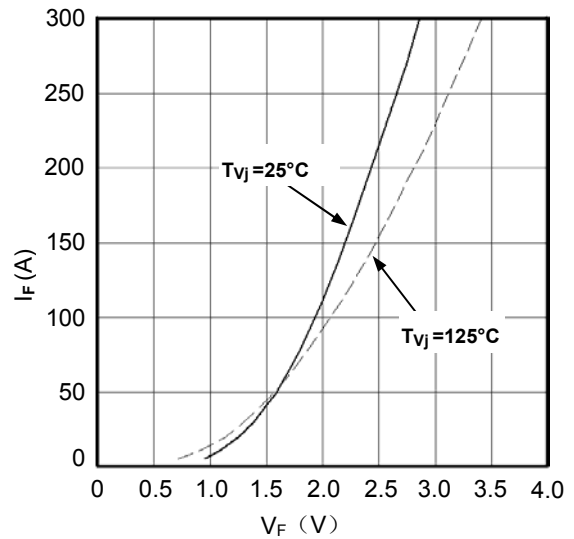


Figure8. Diode Forward Characteristics

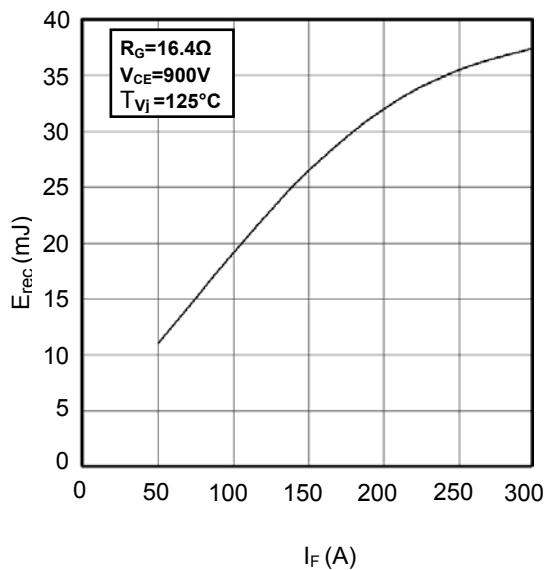


Figure9. Switching Energy vs. I_F

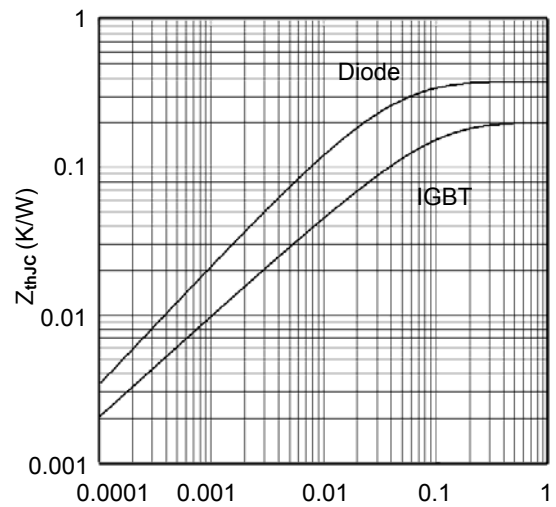


Figure10. Transient Thermal Impedance

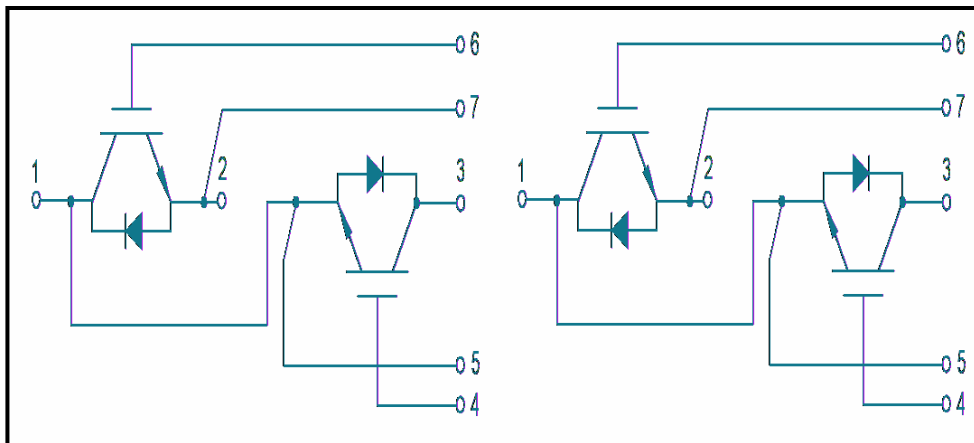
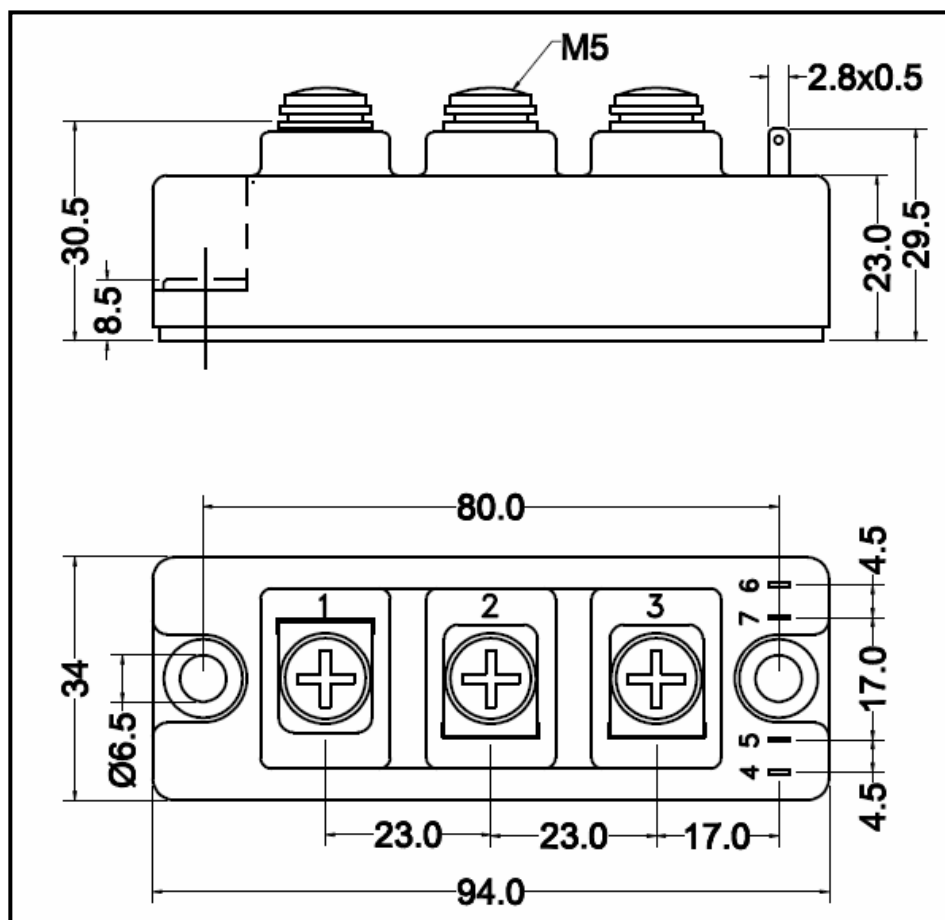


Figure11. Circuit Diagram



Dimensions (mm)
Figure12. Package Outline