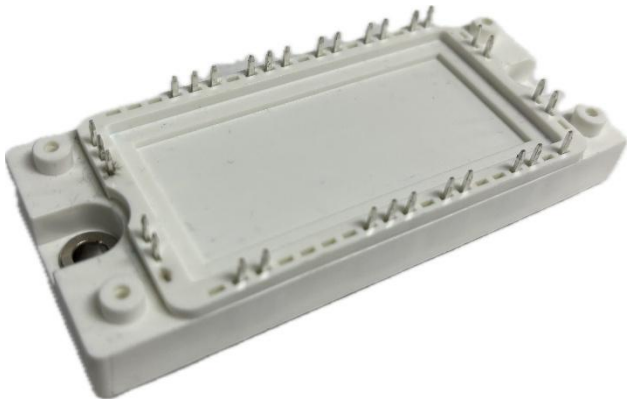
MG150RB16E1A

COMPLIANT RoHS



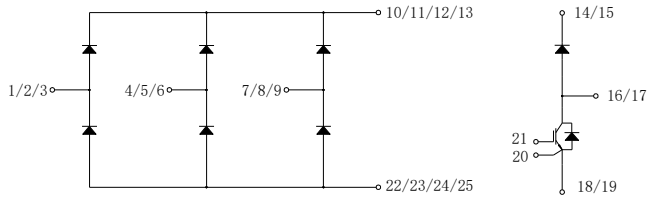
Rectifier/ Brake-chopper Modules

V_{CES}	1600V
I_F	150A

Applications

- Input bridge rectifier
- AC and DC motor control
- Power supply

Circuit



Features

- Low forward voltage drop
- Small temperature coefficient
- High surge capacity
- Low inductance
- Isolated copper baseplate using DBC technology

Diode- rectifier Characteristics

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	T_{vj}=25℃	1600	V
Average output Current 50/60Hz, sine wave	$I_{F(AV)}$	T_C=100℃	150	A
Surge Forward Current	I_{FSM}	V_R=0V,t_p=10ms,T_{vj}=25℃	1900	A
I^2t-value	I^2t	V_R=0V,t_p=10ms,T_{vj}=25℃	18050	A^2s

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_F	I_F=150A,T_{vj}=25℃		1.15		V
		I_F=150A,T_{vj}=150℃		1.11		
Reverse Current	I_R	T_{vj}=150℃,V_R=1600V			2	mA

● IGBT-brake-chopper

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	V_{GE}=0V, I_C=1mA, T_{vj}=25℃	1200	V
Continuous Collector Current	I_C	T_C=100℃, T_{vjmax}=175℃	100	A
Repetitive Peak Collector Current	I_{CRM}	t_p=1ms	200	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25℃	±20	V
Total Power Dissipation	P_{tot}	T_C=25℃ T_{vjmax}=175℃	442	W

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C=1.7mA,T_{vj}=25℃	5.2	5.9	6.4	V
Collector-Emitter Cut-off Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V, T_{vj}=25℃			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=100A,V_{GE}=15V, T_{vj}=25℃		1.50		V
		I_C=100A,V_{GE}=15V, T_{vj}=150℃		1.66		
Gate Charge	Q_G			1.01		uC
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE}=0V, f=1MHz, T_{vj}=25℃		12.7		nF
Reverse Transfer Capacitance	C_{res}			0.065		nF
Gate-Emitter leakage current	I_{GES}	V_{CE}=0V, V_{GE}=20V,T_{vj} =25℃			400	nA
Turn-on Delay Time	$t_{d(on)}$	I_C=100A V_{CE}=600V V_{GE}=±15V R_G=3.6Ω T_{vj}=25℃		195		ns
Rise Time	t_r			31		ns
Turn-off Delay Time	$t_{d(off)}$			306		ns
Fall Time	t_f			201		ns
Energy Dissipation During Turn-on Time	E_{on}			5.96		mJ
Energy Dissipation During Turn-off Time	E_{off}			8.09		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C=100A V_{CE}=600V V_{GE}=±15V R_G =3.6Ω T_{vj}=150℃		205		ns
Rise Time	t_r			36		ns
Turn-off Delay Time	$t_{d(off)}$			384		ns
Fall Time	t_f			339		ns
Energy Dissipation During Turn-on Time	E_{on}			10.4		mJ
Energy Dissipation During Turn-off Time	E_{off}			11.7		mJ
SC Data	I_{sc}	t_p≤8us,V_{GE}=15V,T_{vj}=150℃, V_{CC}=600V,V_{CEM}≤1200V		450		A

Diode-Brake-Chopper

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	T_{vj}=25℃	1200	V
Continuous DC Forward Current	I_F		15	A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	30	A

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=15A,T_{vj}=25℃		2.5	2.6	V
		I_F=15A,T_{vj}=150℃		2.4		
Recovered Charge	Q_{rr}	I_F=15A V_R=600V -di_F/dt =1700A/us T_{vj}=25℃		1.25		uC
Peak Reverse Recovery Current	I_{rr}			13		A
Reverse Recovery Energy	E_{rec}			0.44		mJ
Recovered Charge	Q_{rr}	I_F=15A V_R=600V -di_F/dt =1700A/us T_{vj}=150℃		2.58		uC
Peak Reverse Recovery Current	I_{rr}			21		A
Reverse Recovery Energy	E_{rec}			0.98		mJ

● Diode -Chopper-Reverse

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	T_{vj}=25℃	1200	V
Continuous DC Forward Current	I_F		50	A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	100	A

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=50A,T_{vj}=25℃		1.98	2.6	V
		I_F=50A,T_{vj}=150℃		1.73		
Recovered Charge	Q_{rr}	I_F=50A V_R=600V -di$_F$/dt =1000A/us T_{vj}=25℃		2.19		uC
Peak Reverse Recovery Current	I_{rr}			17		A
Reverse Recovery Energy	E_{rec}			0.8		mJ
Recovered Charge	Q_{rr}	I_F=50A V_R=600V -di$_F$/dt=1000A/us T_{vj}=150℃		6.31		uC
Peak Reverse Recovery Current	I_{rr}			27		A
Reverse Recovery Energy	E_{rec}			2.34		mJ

Module Characteristics T_C=25°C unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation Voltage	V_{isol}	t=1min,f=50Hz	4000			V
Maximum Junction Temperature	T_{jmax}				175	℃
Operating Junction Temperature	$T_{vj\ op}$		-40		150	℃
Storage Temperature	T_{stg}		-40		125	℃
Thermal Resistance Junction to Case	$R_{\theta JC}$	per Diode-rectifier			0.353	K/W
		per Diode-brake -chopper			2.14	
		per IGBT-brake-chopper			0.339	
		per Diode-chopper-reverse			0.8	
Thermal Resistance Case to Sink	$R_{\theta CS}$	per Module		0.009		K/W
Module-to-Sink Torque	Ms		3.0		6.0	N·m
Weight of Module	G			180		g

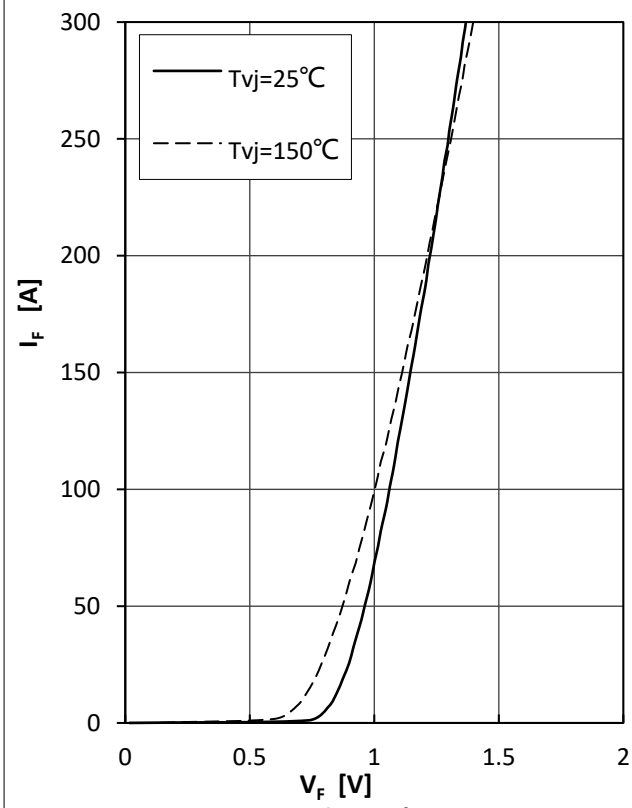


Fig1.Diode-Rectifier
Foward Characteristics

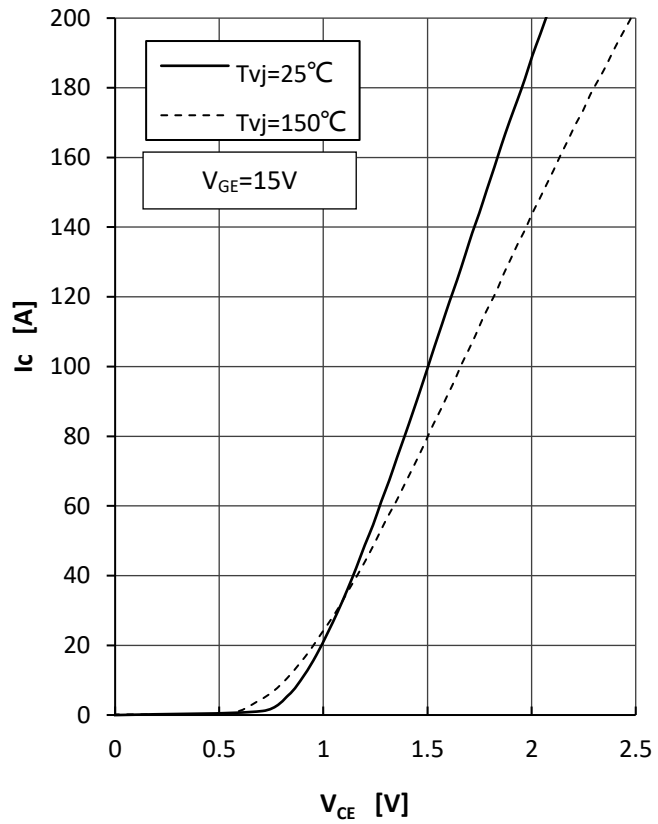


Fig2.IGBT-brake-chopper Output Characteristics

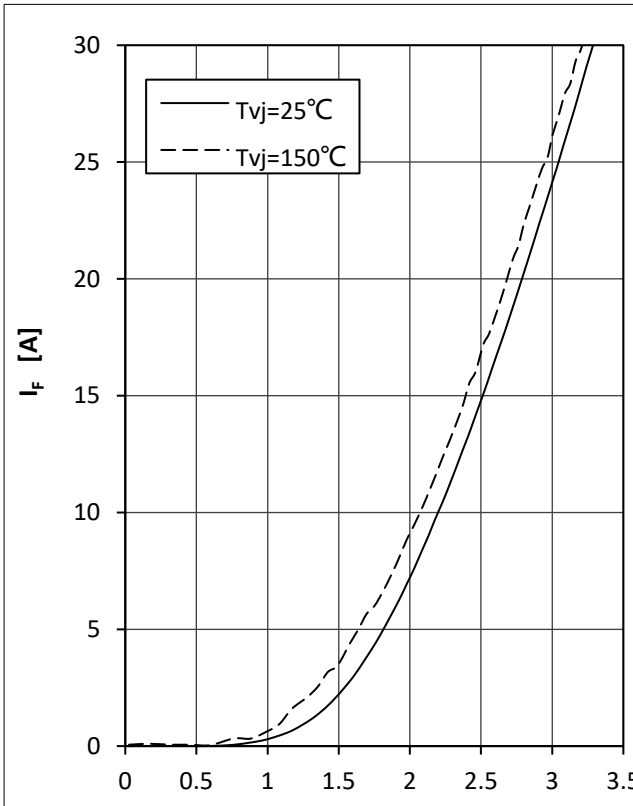


Fig3.Diode-Brake-Chopper
Foward Characteristics

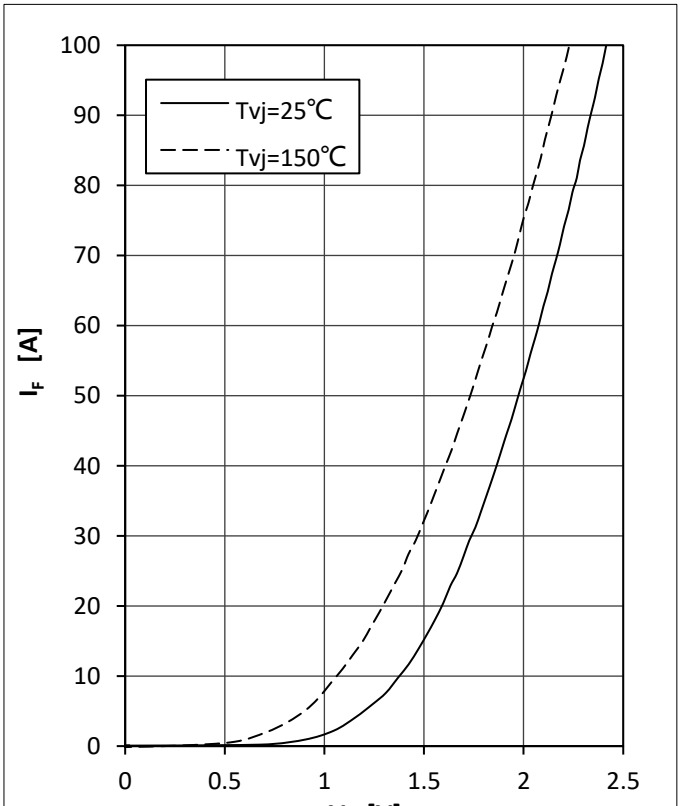
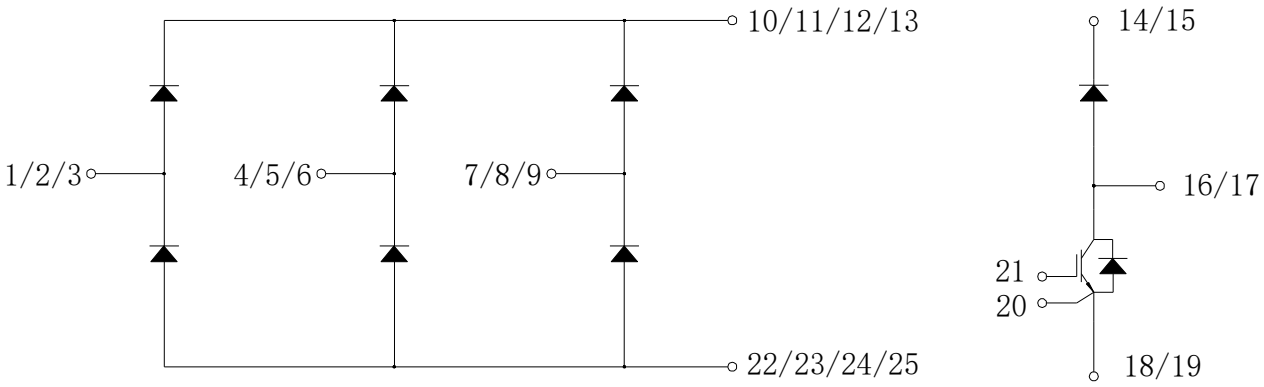
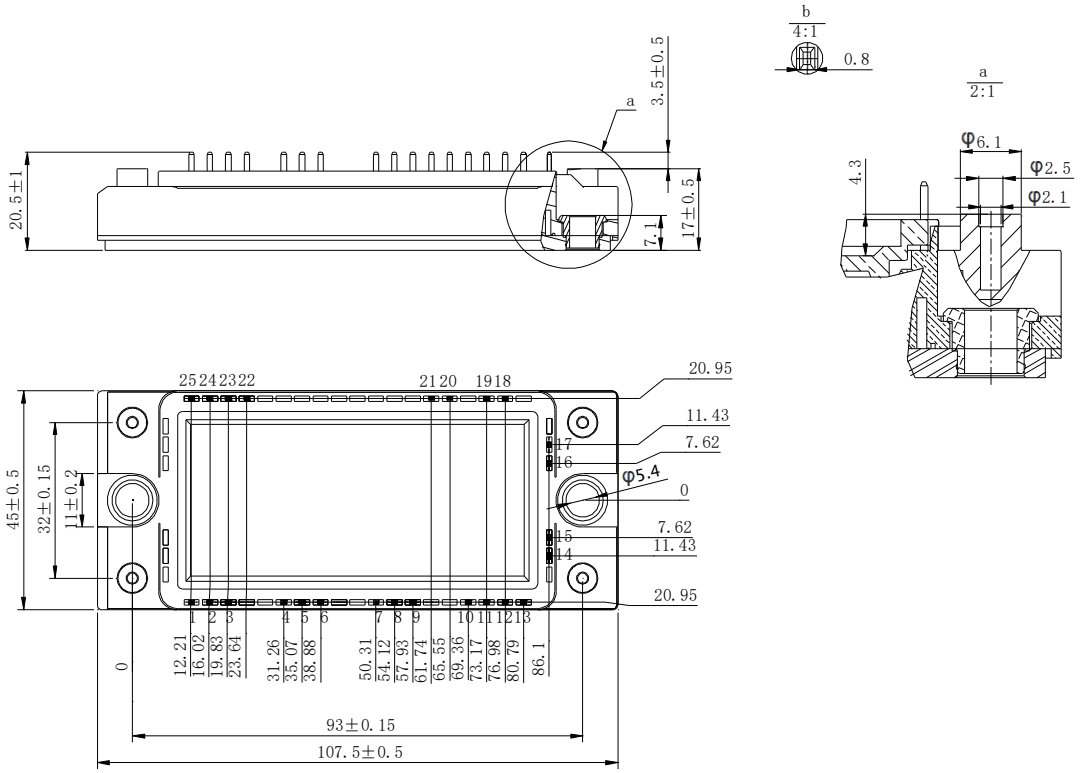


Fig4.Diode -Chopper-Reverse
Foward Characteristics

Circuit Diagram



Package Outline Information



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IGBTs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.

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