Features：

- Low V_{CEsat}
- Standard Housing

Typical Applications：

- Motor Drive
- Servo Drive
- Uninterruptible Power Supply System
- Wind Turbines
- High Power Converters

SYMBOL	CHARACTERISTIC	TEST CONDITIONS		VALUE			UNIT
				Min	Type	Max	
V_{CES}	Collector-Emitter voltage	T_j=25°C				1200	V
V_{GES}	Gate-Emitter voltage	T_j=25°C				±20	V
I_C	Collector current	Continuous@ T_C=80°C				450	A
I_{CP}		T_P= 1ms				900	A
P_C	Collector power dissipation	T_j=25°C ,1 device				2100	W
T_{Vjop}	Junction temperature	/		-40		125	℃
T_{stg}	Storage temperature	/		-40		125	℃
V_{iso}	Isolation between terminal and copper base	T_j=25°C , AC：1minute		2500			V
I_{CES}	Zero gate voltage collector current	T_j=25°C ,V_{CE}=1200V，V_{GE}=0V				5.0	mA
I_{GES}	Gate-Emitter leakage current	T_j=25°C ,V_{CE}=0V，V_{GE}=±20V				0.4	μA
$V_{GE(th)}$	Gate-Emitter threshold voltage	T_j=25°C ,V_{CE}=20V，I_C=18mA		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	T_j=25°C ,V_{GE}=15V，I_C=450A			1.70	2.15	V
		T_j=125°C ,V_{GE}=15V，I_C=450A			2.00		V
		T_j=150°C ,V_{GE}=15V，I_C=450A			2.05		V
Q_G	Gate charge	V_{GE}=± 15 V			4.30		μC
R_{Gint}	Internal gate resistor	T_j=25°C			1.7		Ω
C_{ies}	Input capacitance	T_j=25°C ,V_{CE}=25V，V_{GE}=0V，f=1MHz			32.0		nF
C_{res}	Reverse transfer capacitance				1.5		nF
t_{on}	Turn-on time	V_{CC}=600V, I_C=450A, V_{GE}=±15V, R_g=7.5Ω, Inductive load, T_j=150°C			430		ns
t_r	Rise time				120		ns
t_{off}	Turn-off time				900		ns
t_f	Fall time				150		ns
E_{on}	Turn-on energy loss per pulse				95		mJ
E_{off}	Turn-off energy loss per pulse				65		mJ
Isc	Short circuit	T_j=125°C，V_{CC}=900V，V_{GE}≤15V			1800		A
tsc	Short circuit withstand time	T_j=150°C ,V_{CC}=720V,V_{GE}=±15V，R_g=7.5Ω		10			μs
V_F	Forward on voltage	I_F=450A	T_j=25°C		1.65	2.15	V
		I_F=450A	T_j=125°C		1.65		V
		I_F=450A	T_j=150°C		1.62		V
I_{RM}	Peak reverse recovery current	I_F=450A, -diF/dt=7800 A/μs (T_{vj}=125°C), V_R=600V, V_{GE}=-15V, T_j=125°C			405		A
Q_r	Recovered charge				85.0		μC
E_{rec}	Reverse recovery energy	V_{CC}=600V, I_C=450A, Inductive load, T_j=150°C			55		mJ
t_{rr}	Reverse recovery time	I_F=450A	T_j=25°C		750		ns
			T_j=125°C		1100		ns

$R_{th(j-c)}$	Thermal resistance(1 device)	IGBT			0.06	°C /W
		FWD			0.10	°C /W
$R_{th(c-H)}$	Thermal resistance, case to heatsink	per module		0.009		°C /W
R_{25}	Rated resistance	T_C=25°C		5.0		kΩ
△R/R	Deviation of R100	T_C=100°C, R_{100}=493 W	-5		5	%
P_{25}	Power dissipation	T_C=25°C			20	mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298,15\ K))]$		3375		K
$B_{25/80}$	B-value	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298,15\ K))]$		3411		K
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298,15\ K))]$		3433		K
Screw torque	Mounting(M5)	/	2.4		3.0	N·m
	Terminals(M6)	/	3.5		5.0	N·m
W_t	Weight				345	g
Outline	M43					

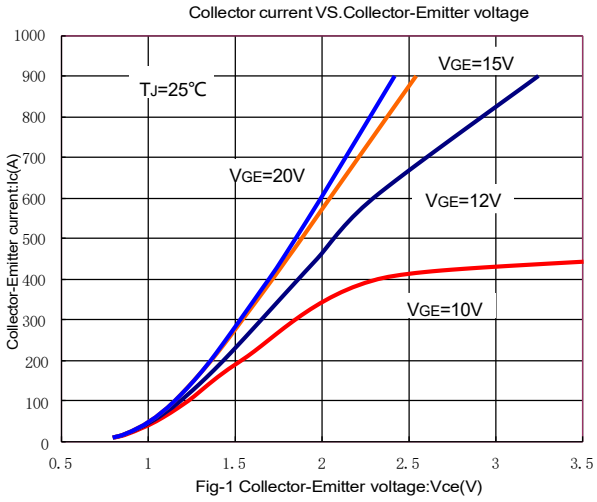


Fig-1 Collector-Emitter voltage:Vce(V)

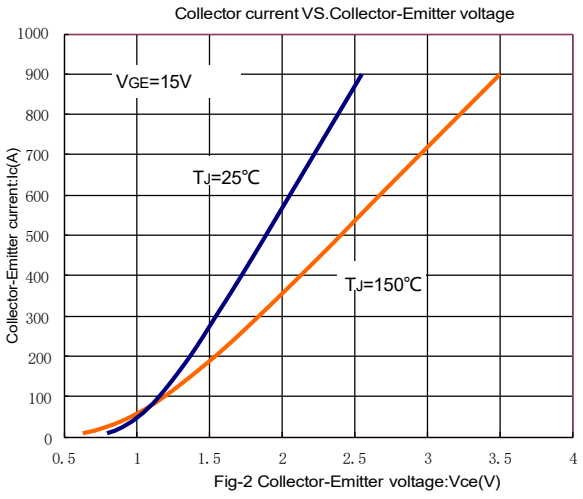


Fig-2 Collector-Emitter voltage:Vce(V)

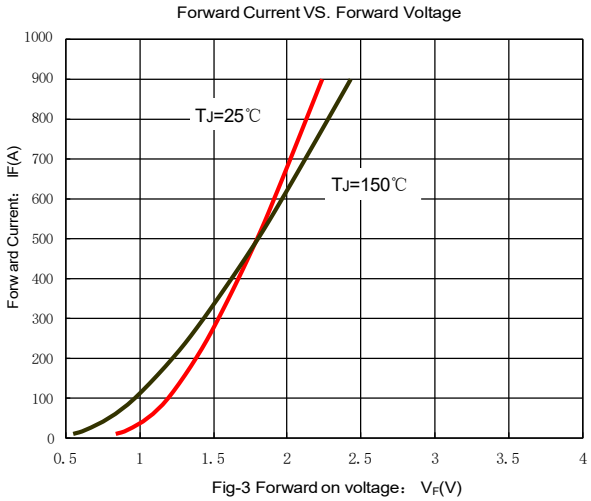


Fig-3 Forward on voltage: V_F(V)

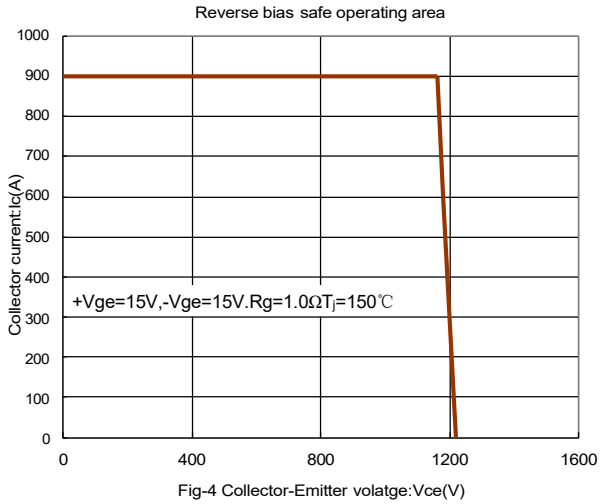
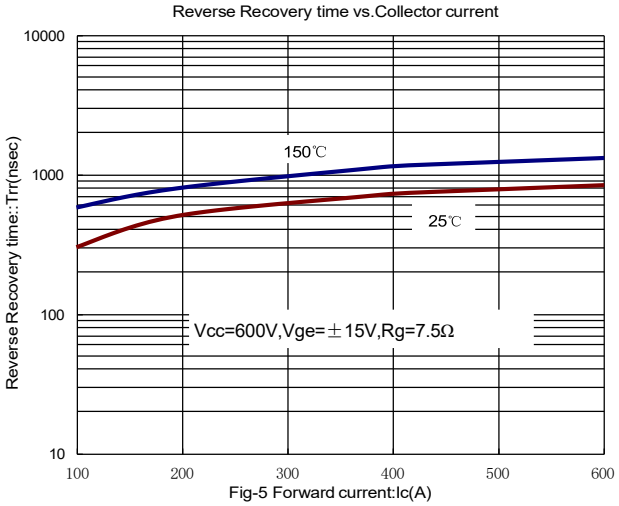
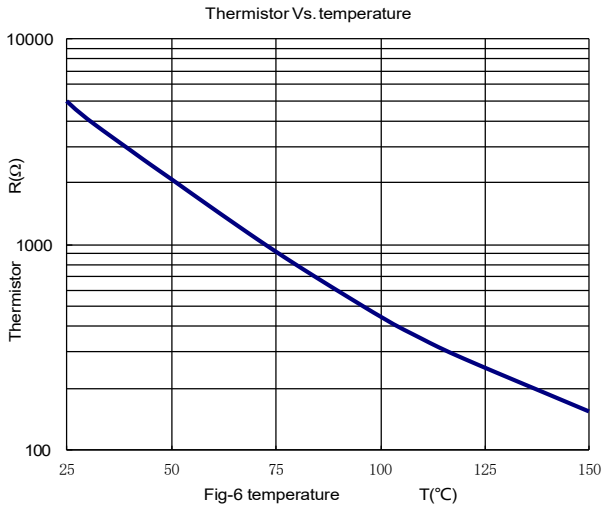
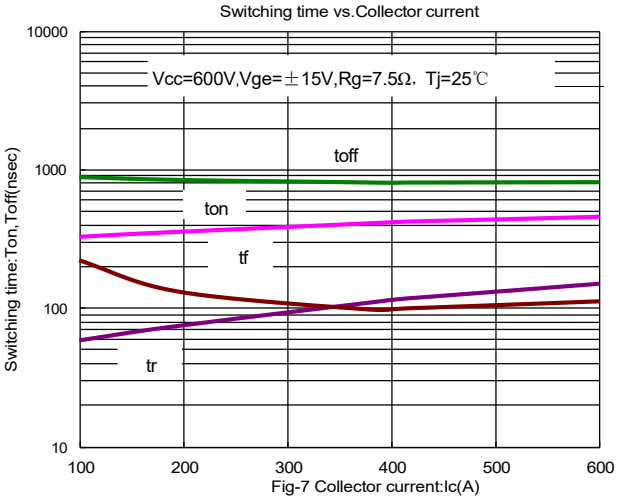
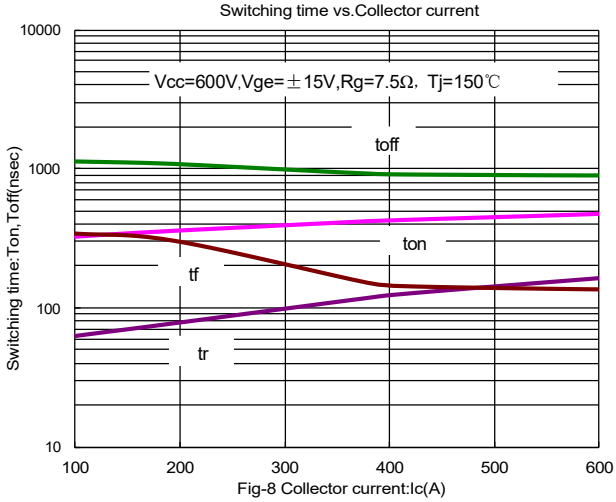


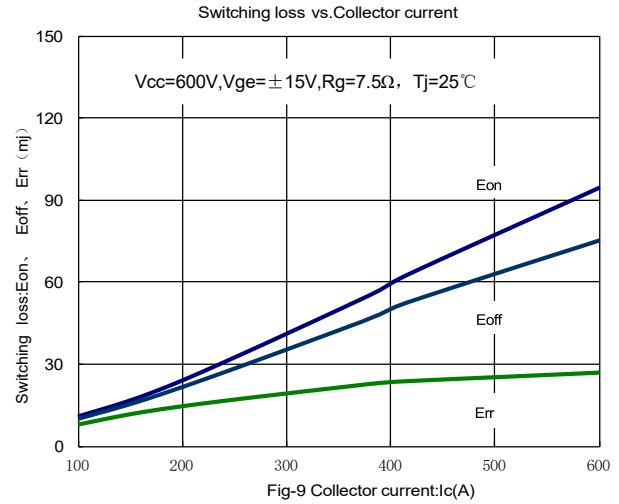
Fig-4 Collector-Emitter volatge:Vce(V)

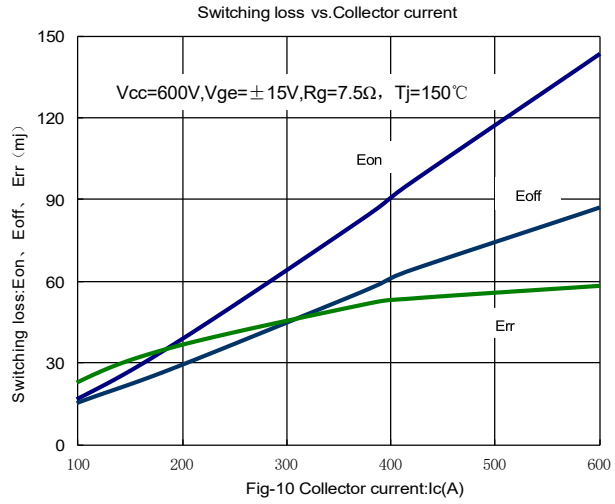

Reverse Recovery time vs.Collector current
Reverse Recovery time:Trr(nsec)
10000
1000
100
10
150℃
25℃
Vcc=600V,Vge=±15V,Rg=7.5Ω
100
200
300
400
500
600
Fig-5 Forward current:Ic(A)


Thermistor Vs. temperature
R(Ω)
Thermistor
10000
1000
100
25
50
75
100
125
150
Fig-6 temperature T(℃)


Switching time vs.Collector current
Switching time:Ton,Toff(nsec)
10000
1000
100
10
Vcc=600V,Vge=±15V,Rg=7.5Ω, Tj=25℃
toff
ton
tf
tr
100
200
300
400
500
600
Fig-7 Collector current:Ic(A)


Switching time vs.Collector current
Switching time:Ton,Toff(nsec)
10000
1000
100
10
Vcc=600V,Vge=±15V,Rg=7.5Ω, Tj=150℃
toff
ton
tf
tr
100
200
300
400
500
600
Fig-8 Collector current:Ic(A)


Switching loss vs.Collector current
Switching loss:Eon、Eoff、Err（mj）
150
120
90
60
30
0
Vcc=600V,Vge=±15V,Rg=7.5Ω, Tj=25℃
Eon
Eoff
Err
100
200
300
400
500
600
Fig-9 Collector current:Ic(A)


Switching loss vs.Collector current
Switching loss:Eon、Eoff、Err（mj）
150
120
90
60
30
0
Vcc=600V,Vge=±15V,Rg=7.5Ω, Tj=150℃
Eon
Eoff
Err
100
200
300
400
500
600
Fig-10 Collector current:Ic(A)

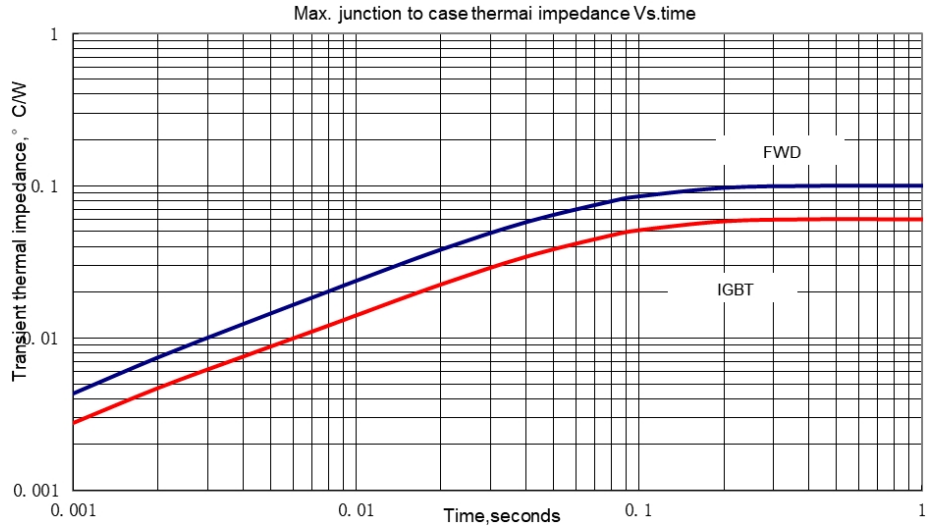
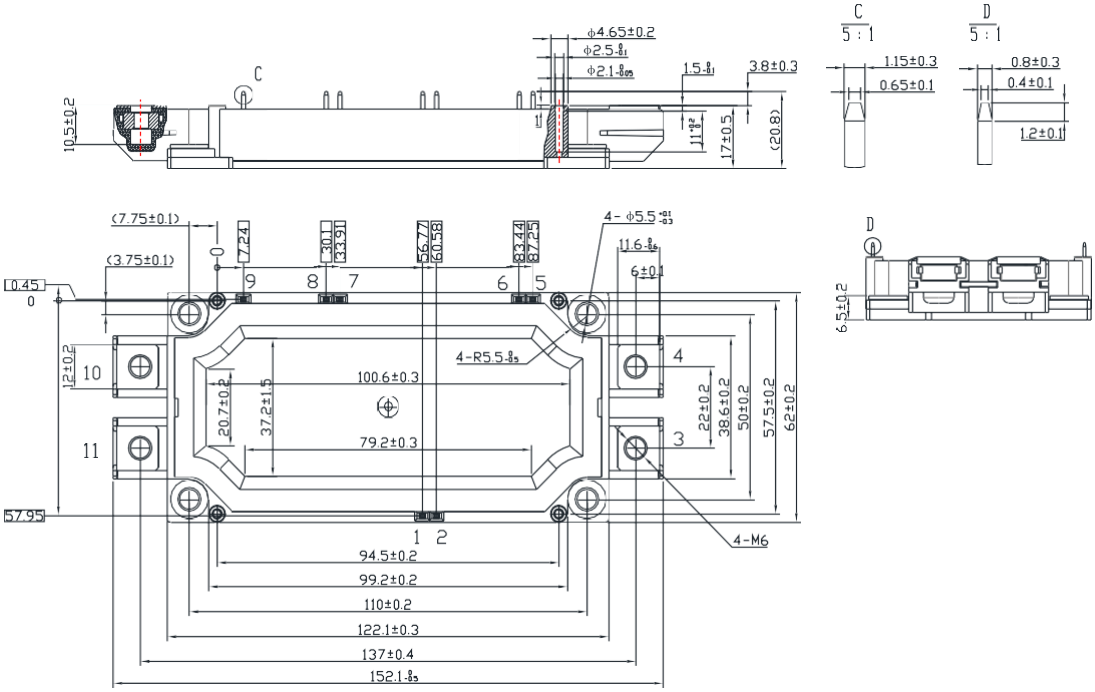
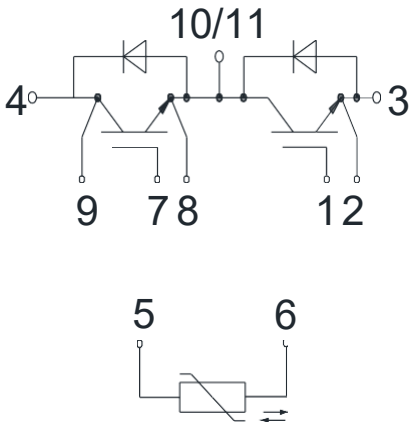


Fig-11

Outline & Circuit Diagram



MD450MB120CS



Unmarked dimensional tolerance：±0.5mm

NIPS reserves the right to change specifications without notice.