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			±30	V
I_C	Collector current	Continuous@ T_C=100°C			600	A
I_{CP}		T_P= 1ms			1200	A
P_C	Collector power dissipation	T_j=150°C ,1 device			4050	W
T_j	Junction temperature	/			175	℃
T_{stg}	Storage temperature	/	-40		125	℃
V_{iso}	Isolation between terminal and copper base	T_j=25°C , AC：1minute	3000			V
I_{CES}	Zero gate voltage collector current	T_j=25°C ,V_{CE}=1200V，V_{GE}=0V			1.5	mA
I_{GES}	Gate-Emitter leakage current	T_j=25°C ,V_{CE}=0V，V_{GE}=±20V			±0.5	μA
$V_{GE(th)}$	Gate-Emitter threshold voltage	T_j=25°C ,V_{CE}=20V，I_C=150mA	4.5		8.5	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	T_j=25°C ,V_{GE}=15V，I_C=600A		2.00	2.40	V
		T_j=125°C ,V_{GE}=15V，I_C=600A		2.10		V
		T_j=150°C ,V_{GE}=15V，I_C=600A		2.20		V
Q_G	Gate charge	V_{GE}=± 15 V		4.40		μC
R_{Gint}	Internal gate resistor	T_j=25°C		1.2		Ω
C_{ies}	Input capacitance	T_j=25°C ,V_{CE}=10V，V_{GE}=0V，f=1MHz		66.6		nF
C_{res}	Reverse transfer capacitance			10.4		nF
t_{on}	Turn-on time	T_j=150°C ,V_{CC}=600V，I_C=600A，V_{GE}=±15V，R_g=7.5Ω，Inductive load		800		ns
t_r				120		ns
t_{off}	Turn-off time			1400		ns
t_f				130		ns
E_{on}	Turn-on energy loss per pulse	I_C=600 A, V_{CE}=600 V, L_S=20nH V_{GE}=±15 V, di/dt=5100 A/μs (T_{vj}=150°C) R_{Gon}=7,5Ω		44.0		mJ
E_{off}	Turn-off energy loss per pulse			105.0		mJ
I_{SC}	SC data	V_{GE}≤15 V, V_{CC}=720V, V_{CEmax}=V_{CES}-L_{sCE}·di/dt, t_P≤10μs, T_{vj}=150°C		2400		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	T_j=25°C ,I_F=600A		2.00	2.48	V
		T_j=125°C ,I_F=600A		1.95		V
		T_j=150°C ,I_F=600A		1.90		V

I_{RM}	Peak reverse recovery current	I_F=600 A, -diF/dt=5100 A/μs (T_{vj}=150°C), V_R=600V, V_{GE}=-15V, T_j=150°C		450		A
Q_r	Recovered charge	I_F=600 A, -diF/dt=5100 A/μs (T_{vj}=150°C), V_R=600V, V_{GE}=-15V, T_j=150°C		130		μC
E_{rec}	Reverse recovery energy	I_F=600 A, (T_{vj}=150°C), V_R=600V, V_{GE}=-15V, T_j=150°C		78.0		mJ
t_{rr}	Reverse recovery time	T_j=150°C ,I_F=600A		420		ns
$R_{th(j-c)}$	Thermal resistance(1 device)	IGBT			0.04	℃/W
		FWD			0.07	℃/W
$R_{th(c-f)}$	Contact thermal resistance (1 device)	With thermal compound		0.050		℃/W
R_{25}	Resistance	T_{vj}=25°C		5		kΩ
△R/R	Deviation of R100	T_C=100°C, R_{100}=493Ω	-5		5	%
P_{25}	Power dissipation	T_C=25°C		20		mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298,15K))]$		3375		K
$B_{25/80}$		$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298,15K))]$		3411		K
$B_{25/100}$		$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298,15K))]$		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					

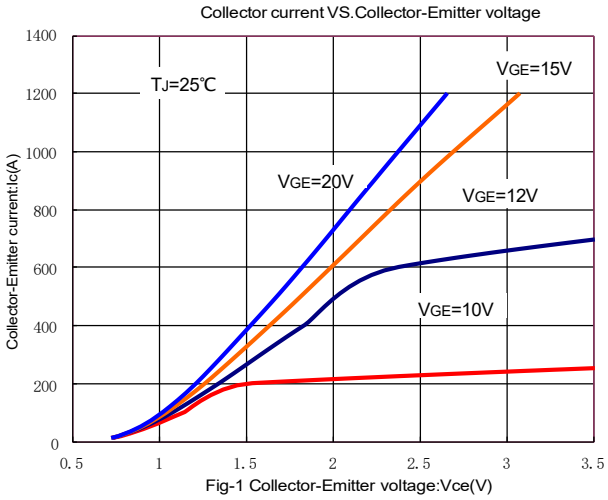


Fig-1 Collector-Emitter voltage:Vce(V)

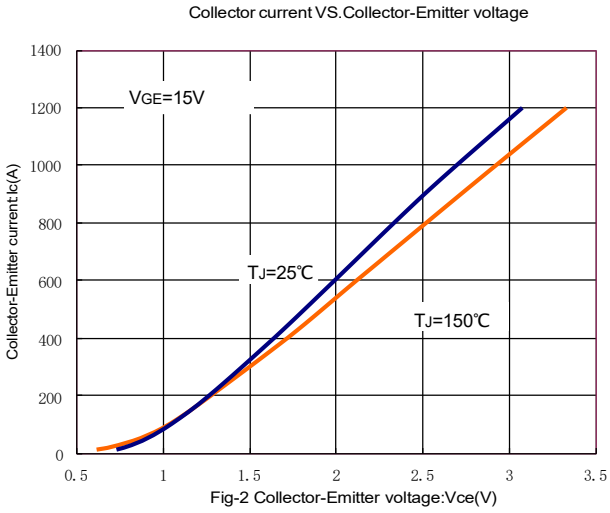


Fig-2 Collector-Emitter voltage:Vce(V)

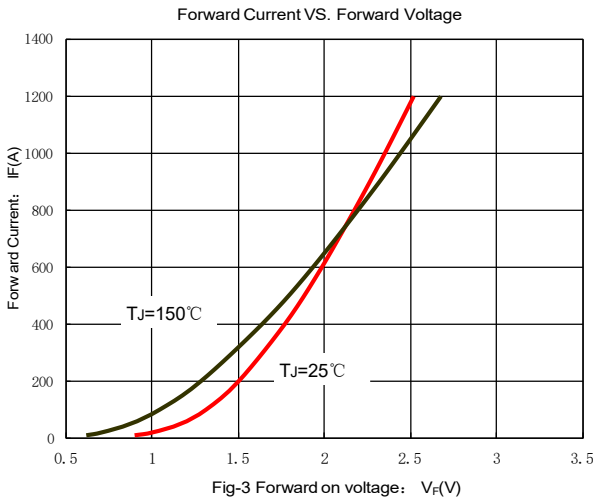


Fig-3 Forward on voltage： V_F(V)

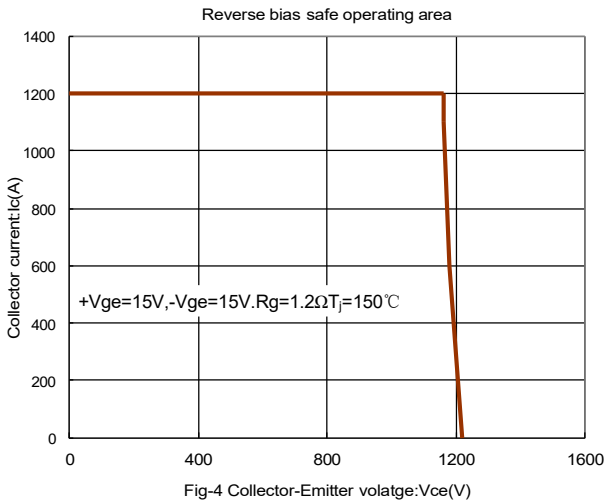
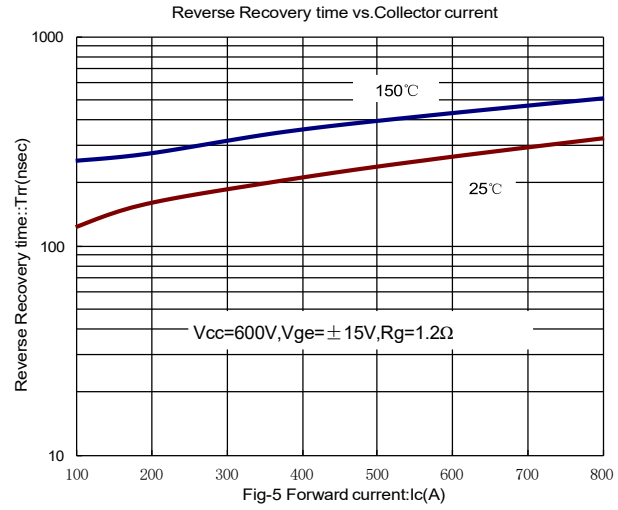
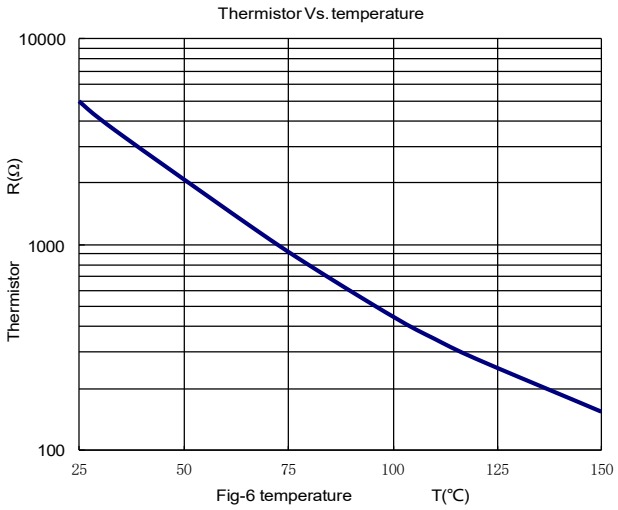
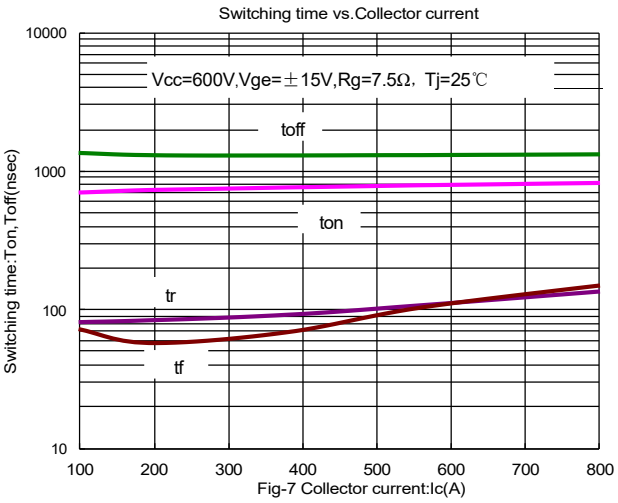
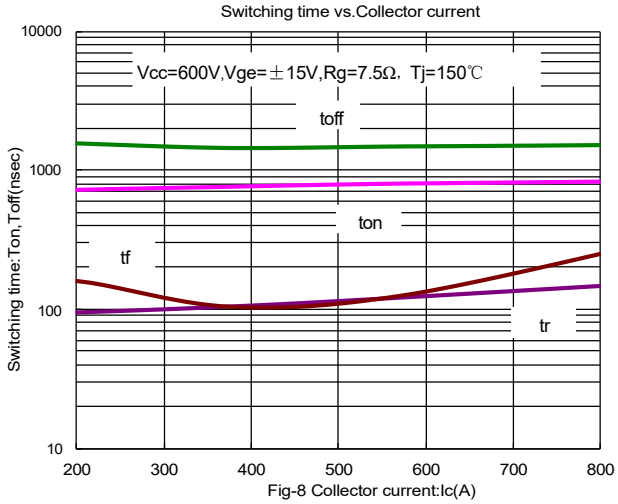


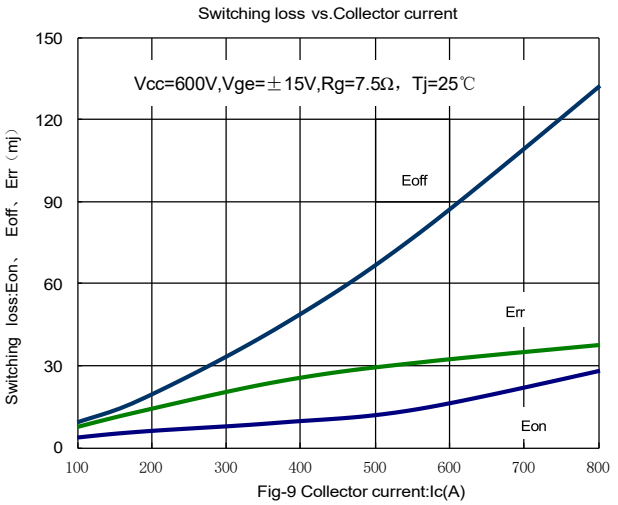
Fig-4 Collector-Emitter volatge:Vce(V)

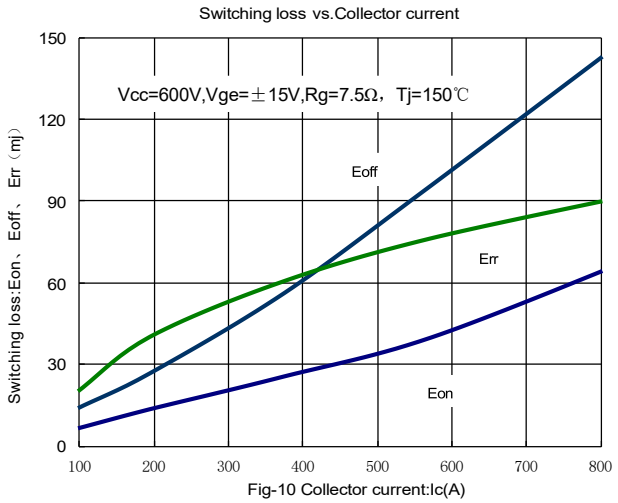

Reverse Recovery time vs.Collector current
1000
100
10
Reverse Recovery time::Trr(nsec)
150℃
25℃
Vcc=600V,Vge=±15V,Rg=1.2Ω
100 200 300 400 500 600 700 800
Fig-5 Forward current:Ic(A)


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


Switching time vs.Collector current
10000
1000
100
10
Switching time:Ton,Toff(nsec)
Vcc=600V,Vge=±15V,Rg=7.5Ω，Tj=25℃
toff
ton
tr
tf
100 200 300 400 500 600 700 800
Fig-7 Collector current:Ic(A)


Switching time vs.Collector current
10000
1000
100
10
Switching time:Ton,Toff(nsec)
Vcc=600V,Vge=±15V,Rg=7.5Ω，Tj=150℃
toff
ton
tf
tr
200 300 400 500 600 700 800
Fig-8 Collector current:Ic(A)


Switching loss vs.Collector current
150
120
90
60
30
0
Switching loss:Eon、Eoff、Err（mj）
Vcc=600V,Vge=±15V,Rg=7.5Ω，Tj=25℃
Eoff
Err
Eon
100 200 300 400 500 600 700 800
Fig-9 Collector current:Ic(A)


Switching loss vs.Collector current
150
120
90
60
30
0
Switching loss:Eon、Eoff、Err（mj）
Vcc=600V,Vge=±15V,Rg=7.5Ω，Tj=150℃
Eoff
Err
Eon
100 200 300 400 500 600 700 800
Fig-10 Collector current:Ic(A)

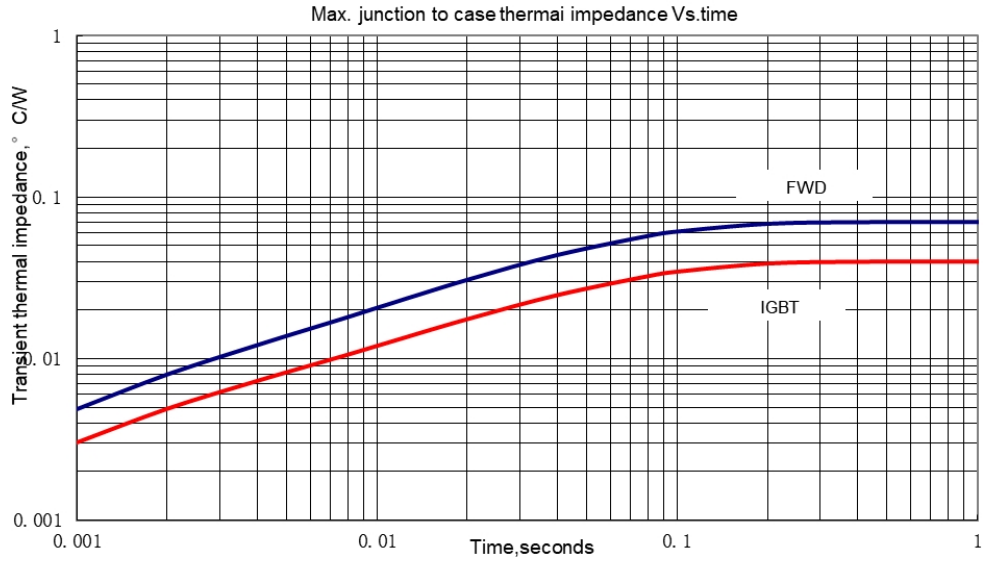
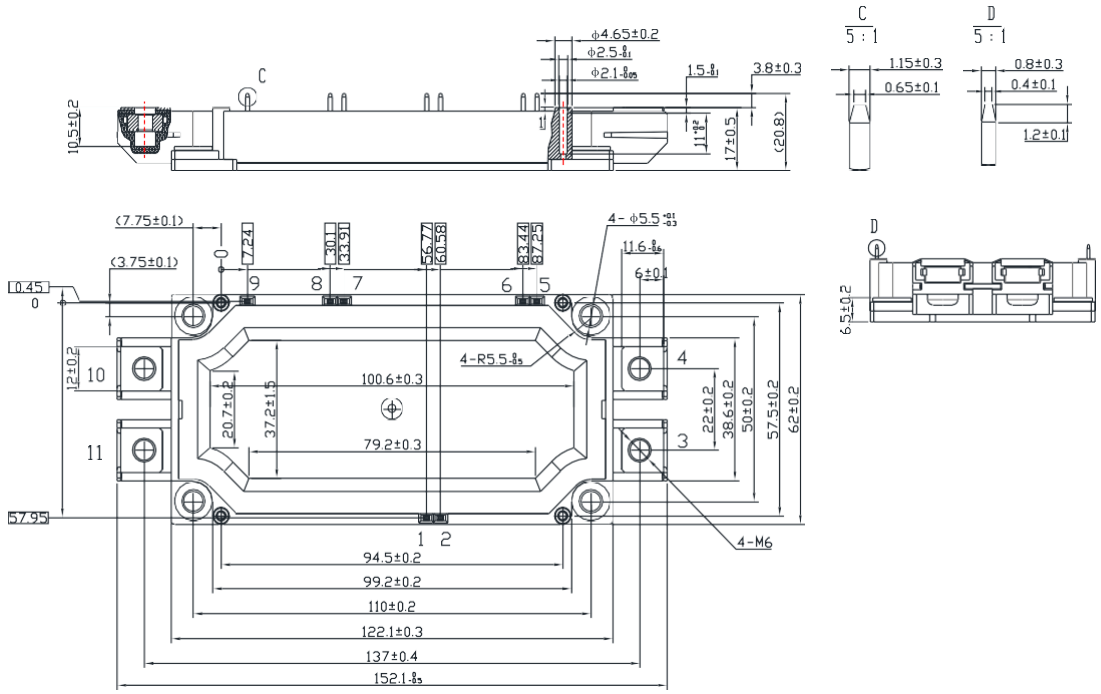
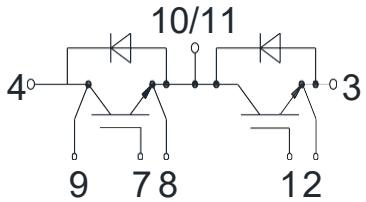


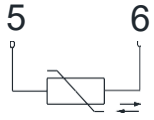
Fig-11

Outline & Circuit Diagram



MD600MB120CS





Unmarked dimensional tolerance：±0.5mm

NIPS reserves the right to change specifications without notice.