Features :

- Trench+ Field Stop technology
- Low switching losses
- $V_{CE(sat)}$ with positive temperature coefficient
- Short circuit ruggedness

Typical Applications :

- Motor/ Servo Drives
- Wind Turbines Converters
- PV Inverters
- Energy Storage Converters
- UPS

1 IGBT,Inverter

Symbol	Characteristic	Test Conditions	VALUE			Unit
			Min	Type	Max	
V_{CES}	Collector-Emitter voltage	T_{vj}=25°C			1200	V
V_{GES}	Gate-Emitter voltage	T_{vj}=25°C			±20	V
I_C	Continuous DC collector current	Continuous@T_C=80°C			600	A
I_{CP}	Repetitive peak collector current	T_P=1ms			1200	A
P_{tot}	Total power dissipation	T_j=175°C			2142	W
I_{CES}	Collector-emitter cut-off current	T_{vj}=25°C,V_{CE}=1200V,V_{GE}=0V			0.1	mA
I_{GES}	Gate-emitter leakage current	T_{vj}=25°C,V_{CE}=0V,V_{GE}=±20V			±0.2	μA
$V_{GE(th)}$	Gate threshold voltage	T_{vj}=25°C,V_{CE}=20V,I_C=24mA	5.5	6.1	6.8	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	T_{vj}=25°C,V_{GE}=15V,I_C=600A		1.40	1.80	V
		T_{vj}=125°C,V_{GE}=15V,I_C=600A		1.53		V
		T_{vj}=150°C,V_{GE}=15V,I_C=600A		1.62		V
Q_G	Gate charge	V_{GE}=±15V		5		μC
R_{Gint}	Internal gate resistor	T_{vj}=25°C		2		Ω
C_{ies}	Input capacitance	T_{vj}=25°C,V_{CE}=25V,V_{GE}=0V,f=100kHz		80		nF
C_{res}	Reverse transfer capacitance			1.48		nF
t_{don}	Turn-on Delay time,inductive load	T_{vj}=150°C,V_{CC}=600V,I_C=600A,V_{GE}=±15V, R_g=1.5Ω,Inductive load		408		ns
t_r	Rise time,inductive load			132		ns
t_{doff}	Turn-off Delay time,inductive load			756		ns
t_f	Fall time,inductive load			404		ns
E_{on}	Turn-on energy loss per pulse	I_C=600A,V_{CE}=600V, V_{GE}=±15V, T_{vj}=150°C,R_{Gon}=1.5Ω		53.0		mJ
E_{off}	Turn-off energy loss per pulse			96.7		mJ
I_{SC}	SC data	V_{GE}≤15V,V_{CC}=800V,V_{CEmax}=V_{CES}-L_{sCE}·d_i/d_t, t_P≤10μs,T_{vj}=150°C		2600		A
$R_{th(j-c)}$	Thermal resistance,junction to case	per IGBT			0.07	℃/W
$T_{vj\ op}$	Temperature under switching conditions	/	-40		150	℃

2 Diode,Inverter

Symbol	Characteristic	Test Conditions	VALUE			Unit
			Min	Type	Max	
V_{RRM}	Repetitive peak reverse voltage	T_{vj}=25°C			1200	V
I_F	Continuous DC forward current	/			600	A
I_{FRM}	Repetitive peak forward current	T_P=1ms			1200	A
V_F	Forward voltage	T_{vj}=25°C,I_F=600A		1.30	2.00	V
		T_{vj}=125°C,I_F=600A		1.72		V
		T_{vj}=150°C,I_F=600A		1.75		V
I_{RM}	Peak reverse recovery current	I_F=600A,-d_{iF}/d_t=5300A/μs,V_R=600V, V_{GE}=-15V,T_{Vj}=150°C		700		A
Q_r	Recovered charge			138.9		μC
E_{rec}	Reverse recovery energy			54.9		mJ
$R_{th(j-c)}$	Thermal resistance,junction to case	per diode			0.13	℃/W
$T_{vj\ op}$	Temperature under switching conditions	/	-40		150	℃

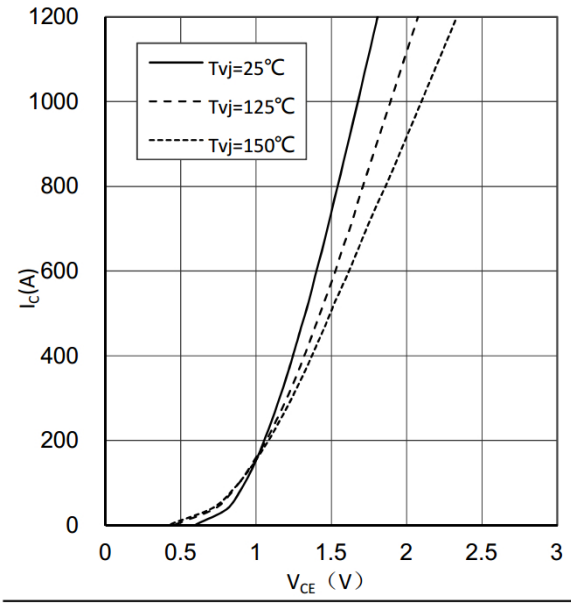
3 Package

Symbol	Characteristic	Test Conditions	VALUE			Unit
			Min	Type	Max	
V_{iso}	Isolation test voltage	T_{vj}=25°C,AC:1minute	4000			V
T_{stg}	Storage temperature	/	-40		125	℃
M	Mounting torque for module(M6)	/	3.0		6.0	N·m
	Terminal connection torque(M6)	/	2.5		5.0	N·m
W_t	Weight			320		g
Outline	M42a					

Output characteristic(typical)

$I_C = f(V_{CE})$

Fig-1

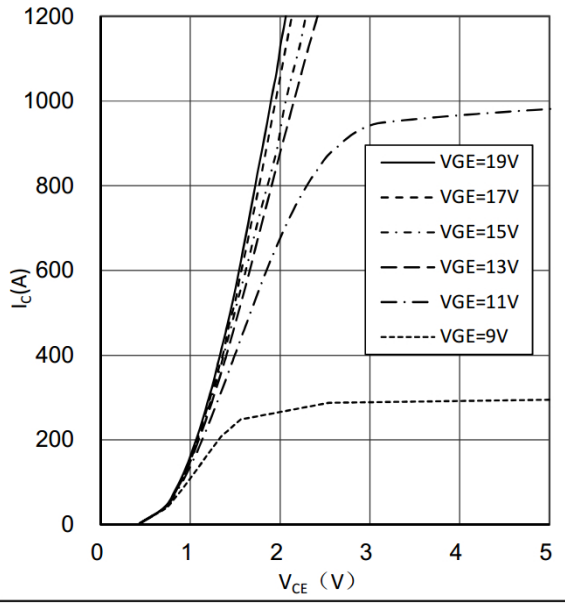


Output characteristic(typical)

$I_C = f(V_{CE})$

T_{vj}= 150°C

Fig-2

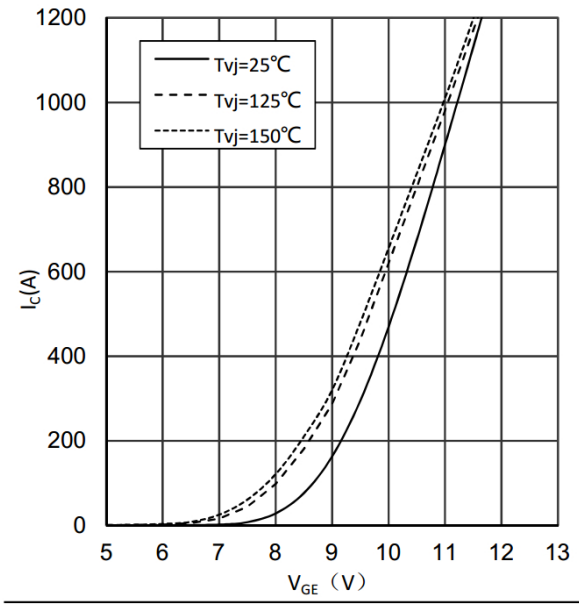


Transfer characteristic(typical)

$I_C = f(V_{GE})$

V_{CE} = 20V

Fig-3

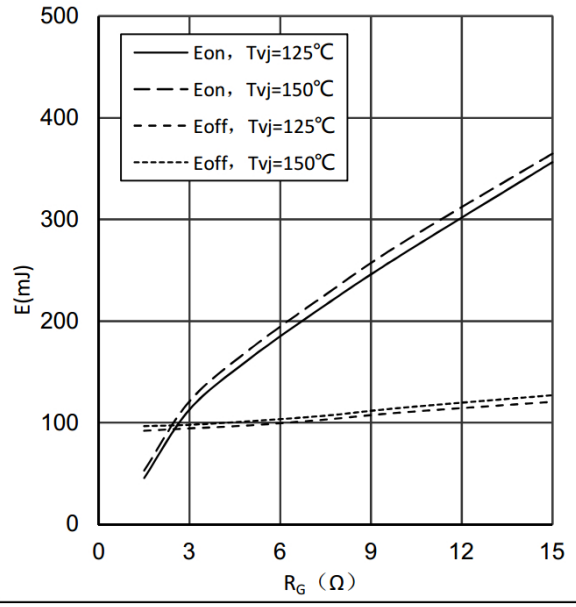


Switching losses IGBT (typical)

$E = f(R_G)$

V_{GE} = ±15V, I_C = 600A, V_{CE} = 600V

Fig-4

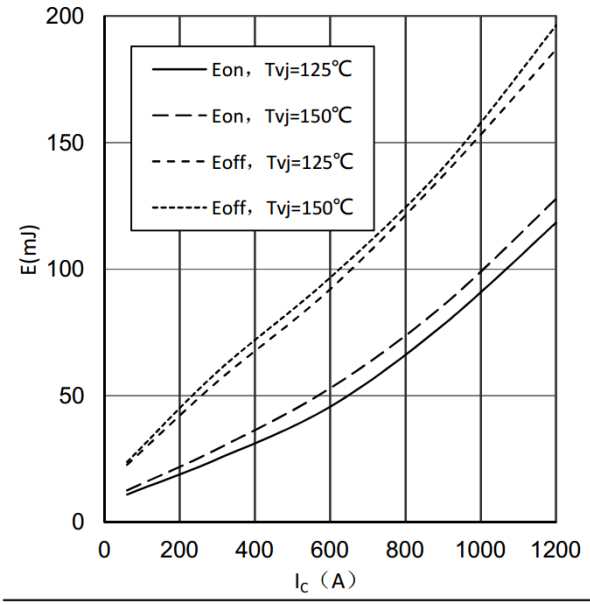


Switching losses IGBT (typical)

$E = f(I_C)$

$V_{GE} = \pm 15V$, $R_G = 1.5\Omega$, $V_{CE} = 600V$

Fig-5

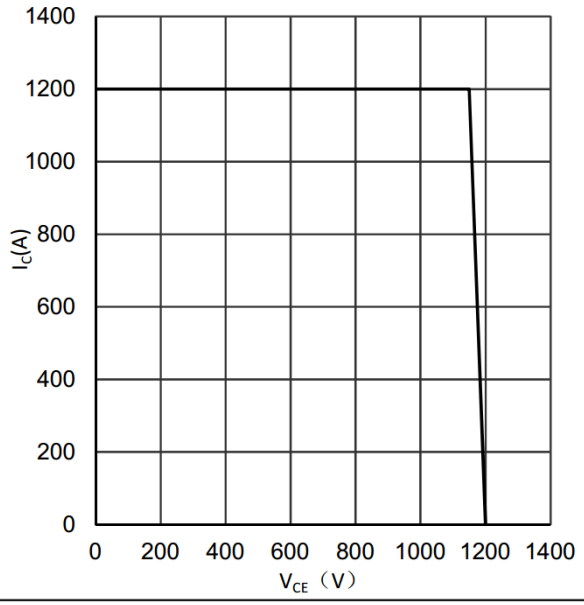


Reverse bias safe operating area(RBSOA)

$I_C = f(V_{CE})$

$V_{GE} = \pm 15V$, $R_{goff} = 5.1\Omega$, $T_{vj} = 150°C$

Fig-6

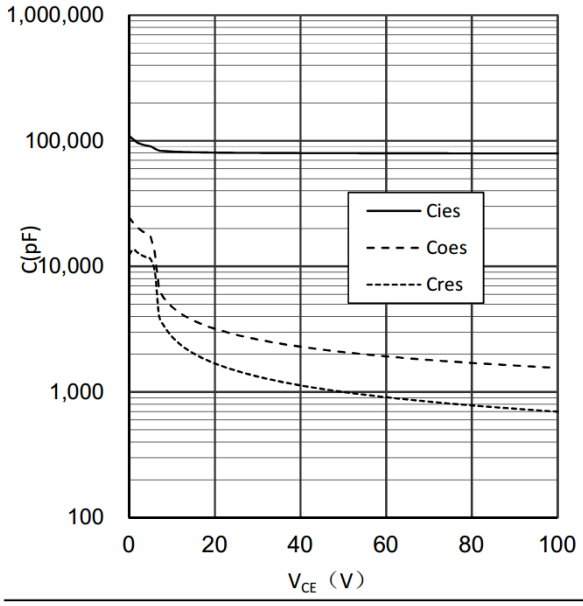


Typical capacitance as a function of collector-emitter voltage

$C = f(V_{CE})$

$f = 100$ kHz, $V_{GE} = 0V$

Fig-7

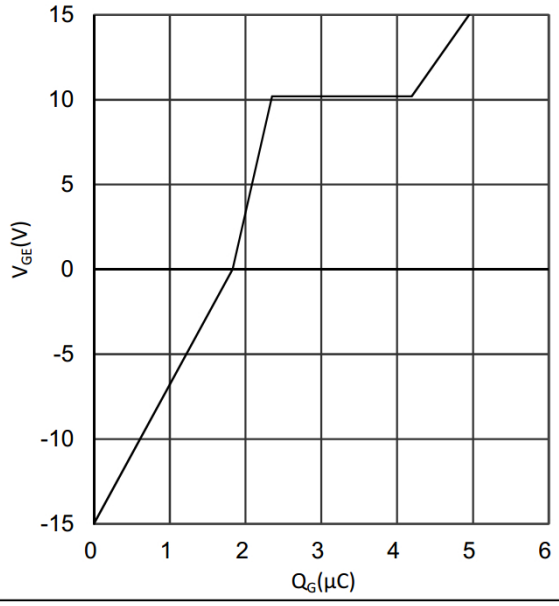


Gate charge (typical)

$V_{GE} = f(Q_G)$

$I_C = 600A$, $V_{CE} = 600V$

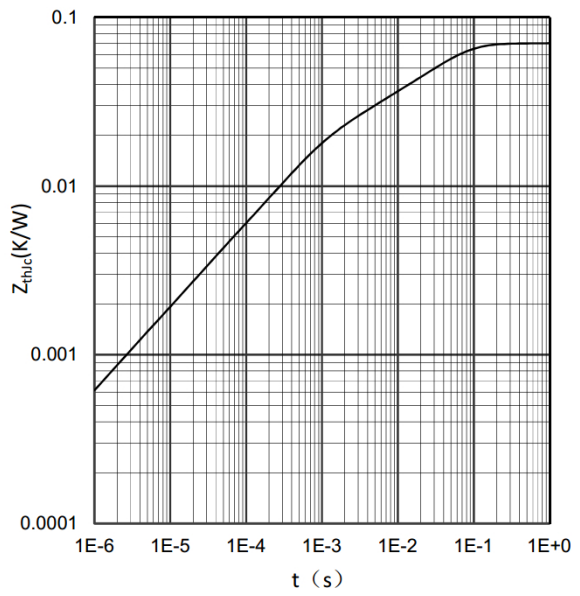
Fig-8



IGBT transient thermal impedance as a function of pulse width

$Z_{th(j-c)} = f(t)$

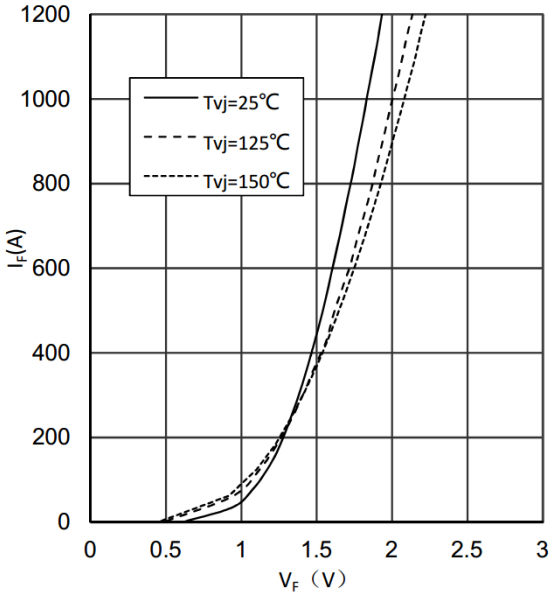
Fig-9



Forward characteristic of Diode (typical)

$I_F = f(V_F)$

Fig-10

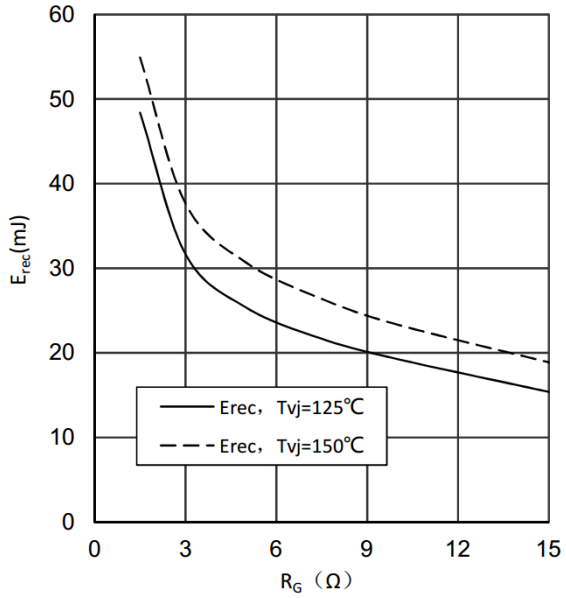


Switching losses Diode(typical)

$E_{rec} = f(R_G)$

I_F = 600A, V_{CE} = 600V

Fig-11

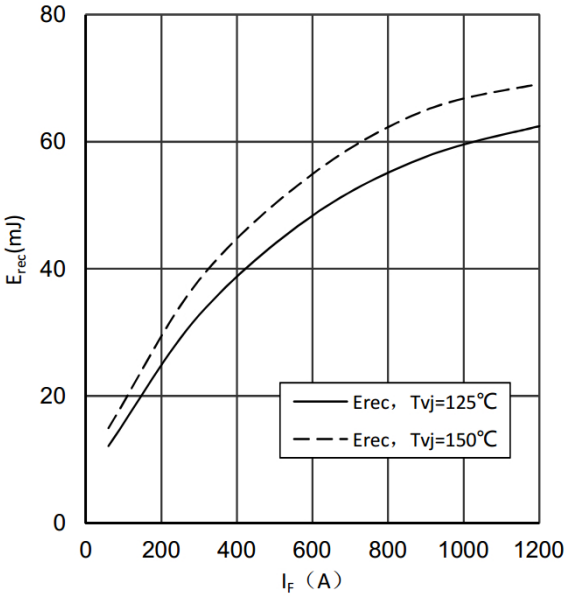


Switching losses Diode(typical)

$E_{rec} = f(I_F)$

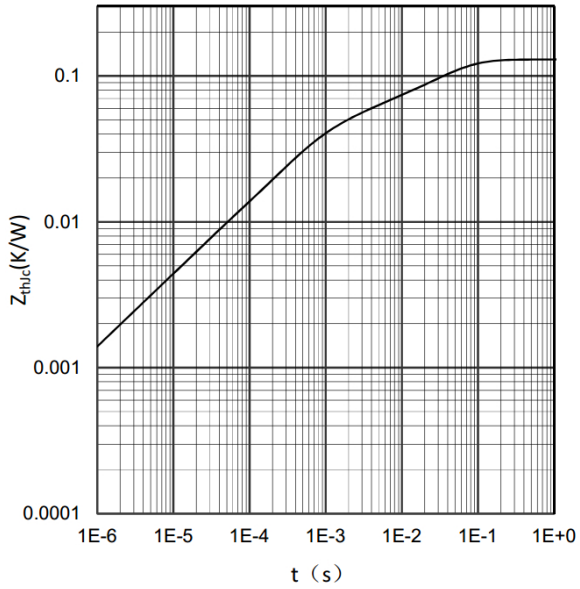
R_G = 1.5Ω, V_{CE} = 600V

Fig-12

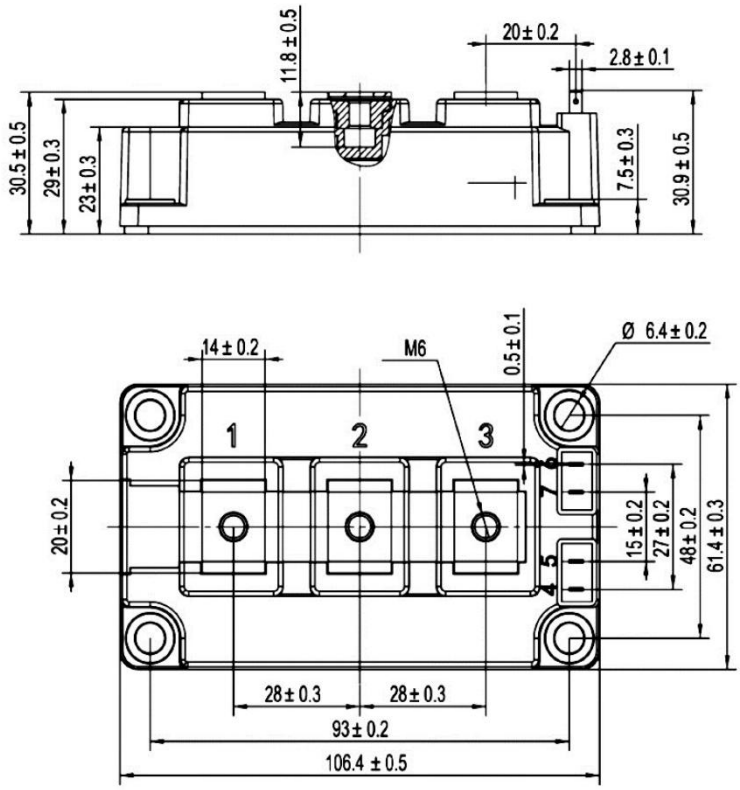


Diode transient thermal impedance as a function of pulse width
$Z_{th(j-c)} = f(t)$

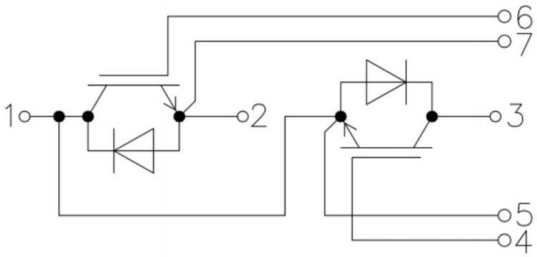
Fig-13



Package outlines & Circuit diagram



MD600MB120S



Unmarked dimensional tolerance：±0.5mm

NIPS reserves the right to change specifications without notice.