Electrical Features

- Trench/Fieldstop IGBT
- Half-bridge
- Standard package
- High short circuit capability
- Including anti-parallel FWD

Typical Applications

- Frequency converter
- UPS
- Motor Drives

IGBT，Inverter

Maximum Rated Values						
Symbol	Item	Conditions		Rating		Unit
IGBT						
V_{CES}	Collector-emitter voltage	T_{vj}=25°C		1200		V
V_{GES}	Gate-emitter voltage	-		±20		V
I_C	Collector current,DC	T_C=100°C,T_{vj}=175°C		300		A
I_{CRM}	Repetitive peak collector current	t_p=1ms		600		A
t_{SC}	Short circuit withstand time	V_{GE}=15V, V_{CC}=600V, T_{vj}≤150°C		10		μs
P_{tot}	Total power dissipation	T_C=25°C,T_{vj}=175°C		1612		W
Characteristics Values						
Symbol	Item	Conditions		Values		Unit
IGBT				Min.	Typ.	Max.
I_{CES}	Collector-emitter cut-off current	V_{CE}=1200V,V_{GE}=0V,T_{vj}=25°C		-	-	1	mA
I_{GES}	Gate leakage current	V_{CE}=0V,V_{GE}=20V,T_{vj}=25°C		-	-	250	nA
$V_{GE(th)}$	Gate-emitter threshold voltage	I_C=11.5mA,V_{CE}=V_{GE},T_{vj}=25°C		5	5.86	7	V
V_{CEsat}	Collector-emitter saturation voltage	I_C=300A V_{GE}=15V	T_{vj}=25°C	-	1.75	-	V
			T_{vj}=125°C	-	2.08	-	
			T_{vj}=150°C	-	2.13	-	
C_{ies}	Input capacitance	V_{CE}=25V,V_{GE}=0V f=1MHz,T_{vj}=25°C		-	19.4	-	nF
C_{res}	Reverse transfer capacitance			-	0.6	-	
Q_G	Gate charge	V_{CC}=600V, I_C=300A, V_{GE}=15V		-	2.4	-	μC

$t_{d(on)}$	Turn-on delay time	V_{CC}=600V, I_C=300A, V_{GE}=±15V, $R_{G(on)}$=5.1 Ω, $R_{G(off)}$=2 Ω, Inductive load di/dt=3880A/μs (T_{vj}=150°C) du/dt=6555V/μs (T_{vj}=150°C)	T_{vj}=25°C	-	109.6	-	ns
			T_{vj}=125°C	-	262.4	-	
			T_{vj}=150°C	-	263.2	-	
t_r	Rise time		T_{vj}=25°C	-	112	-	
			T_{vj}=125°C	-	111.2	-	
			T_{vj}=150°C	-	112	-	
$t_{d(off)}$	Turn-off delay time		T_{vj}=25°C	-	387.2	-	
			T_{vj}=125°C	-	448.0	-	
			T_{vj}=150°C	-	454.4	-	
t_f	Fall time		T_{vj}=25°C	-	108	-	
			T_{vj}=125°C	-	167.2	-	
			T_{vj}=150°C	-	181	-	
E_{on}	Turn-on energy (per pulse)		T_{vj}=25°C	-	30.67	-	mJ
			T_{vj}=125°C	-	41.6	-	
			T_{vj}=150°C	-	43.8	-	
E_{off}	Turn-off energy (per pulse)		T_{vj}=25°C	-	25.5	-	
			T_{vj}=125°C	-	31.9	-	
			T_{vj}=150°C	-	33	-	
SC data	Short-circuit current	V_{CC}=900V,V_{GE}≤15V, t_P≤10μs	T_{vj}=25°C	-	2299	-	A
			T_{vj}=150°C	-	1914	-	
R_{thJC}	Thermal resistance,junction to case	per IGBT		-	-	0.093	K/W
R_{thCH}	Thermalresistance,case to heatsink	per IGBT/ λgrease=1W/(m·K)		-	0.032	-	K/W
T_{vjop}	Temperature under switching conditions			-40	-	150	°C

Diode，Inverter

Maximum Rated Values

Symbol	Item	Conditions		Rating	Unit
V_{RRM}	Repetitive peak reverse voltage	T_{vj}=25°C		1200	V
I_F	Forward current,DC			300	A
I_{FRM}	Repetitive peak forward current	t_p=1ms		600	A
I^2t	I^2t-value	VR = 0 V, tP = 10 ms,	T_{vj}=25°C	-	A^2s
		VR = 0 V, tP = 10 ms,	T_{vj}=150°C	-	A^2s

Characteristic Values

V_F	Continuous forward voltage	I_F=300A V_{GE}=0V	T_{vj}=25°C	-	2	-	V
			T_{vj}=125°C	-	1.57	-	
			T_{vj}=150°C	-	1.50	-	
I_{RM}	Peak reverse recovery current	V_R=600V I_F=300A di_F/dt=-4339A/μs	T_{vj}=25°C	-	175.5	-	A
			T_{vj}=125°C	-	290.7	-	
			T_{vj}=150°C	-	310.5	-	
t_{rr}	Reverse recovery time		T_{vj}=25°C	-	123.9	-	ns
			T_{vj}=125°C	-	225.8	-	
			T_{vj}=150°C	-	241.2	-	

Q_r	Repetitive peak forward current		T_{vj}=25℃	-	12.29	-	μC
			T_{vj}=125℃	-	45	-	
			T_{vj}=150℃	-	51.8	-	
E_{rec}	Recovered charge		T_{vj}=25℃	-	4.51	-	mJ
			T_{vj}=125℃	-	18.57	-	
			T_{vj}=150℃	-	21.35	-	
R_{thJC}	Thermal resistance, junction to case	per diode		-	-	0.15	K/W
R_{thCH}	Thermalresistance,case to heatsink	per diode/ λgrease=1W/(m·K)		-	0.052	-	K/W
T_{vjop}	Temperature under switching conditions			-40		150	℃

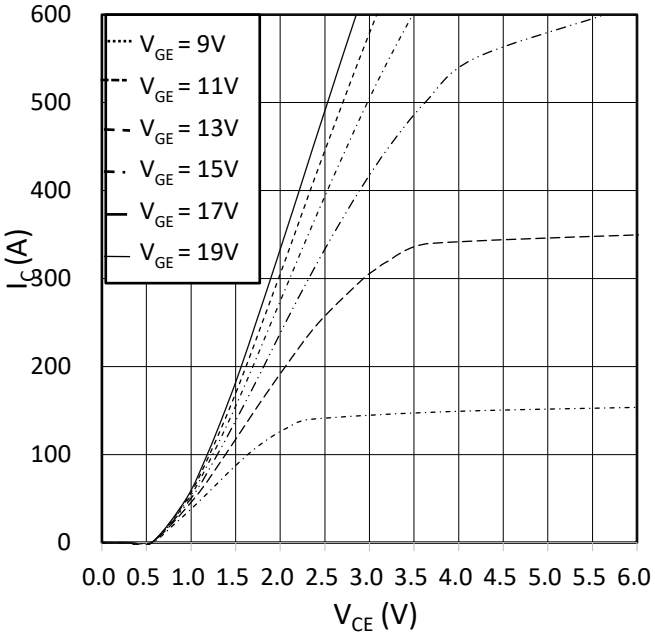
Module

Symbol	Item	Conditions	Rating			Unit
V_{ISOL}	Isolation voltage	Terminals to baseplate，RMS,f=50Hz,t=1min	2500			V
-	Material of module baseplate	-	Cu			-
-	Internal isolation	Basic insulation(class 1, IEC 61140)	Al_2O_3			-
CTI	Comperative tracking index	-	＞200			
Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
M	Mounting torque for module mounting	Screw M6	3.0	-	6.0	Nm
	Terminal connection torque	Screw M6	2.5	-	5.0	Nm
T_{stg}	Storage temperature	-	-40	-	150	℃
RCC'+EE'		TC = 25°C, per switch	-	0.75	-	mΩ
RthCH	Thermal resistance , case to heatsink	λPaste=1W/(m·K)/λgrease=1W/(m·K)	-	-	-	K/W
LsCE	Stray inductance module		-	22	-	nH
ds	Creepage distance	Terminal to terminal	-	23	-	mm
		Terminal to base plate	-	29	-	
da	Clearance	Terminal to terminal	-	11	-	mm
		Terminal to base plate	-	23	-	
m	Weight	-	-	315	-	g

output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$

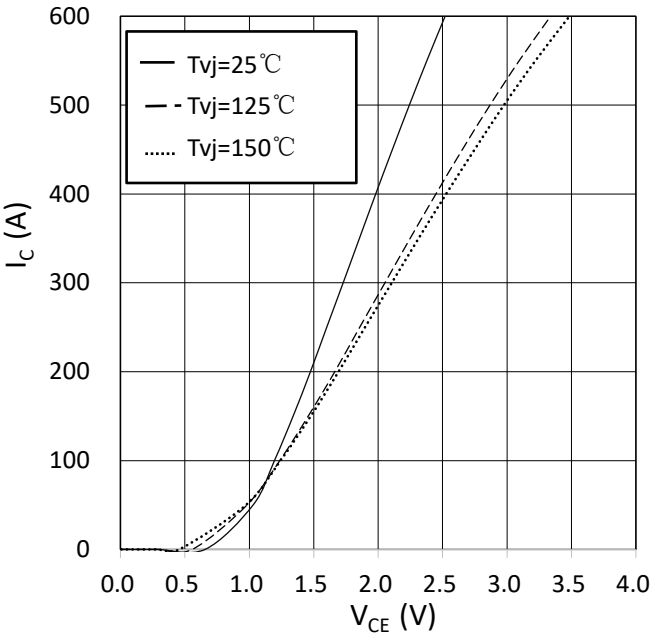
$T_{vj} = 150℃$



output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$

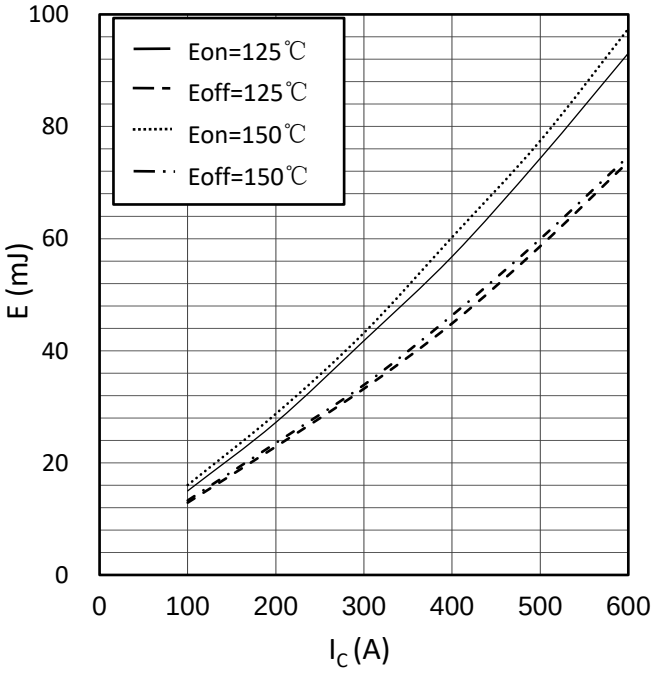
$V_{GE} = 15$ V



switching losses IGBT,Inverter(typical)

$E_{on} = f(I_C)$, $E_{off} = f(I_C)$

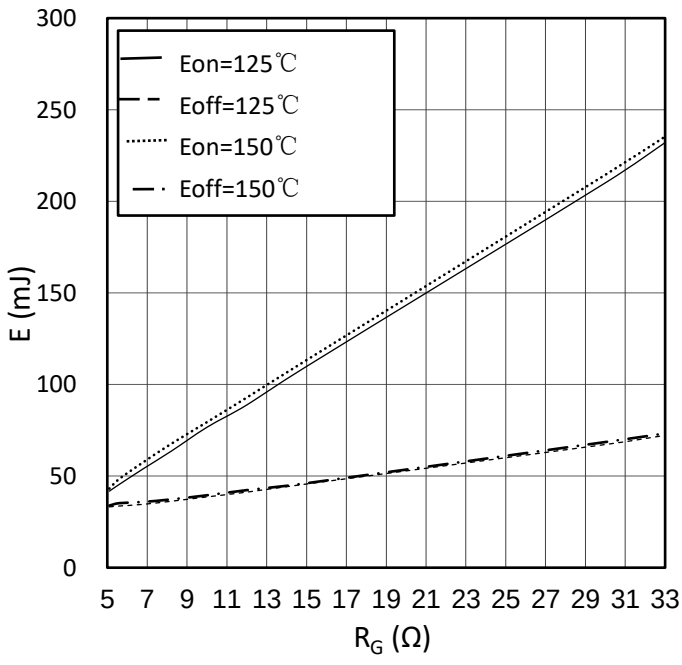
$V_{GE} = \pm 15$V, $R_{Gon} = 5.1\Omega$, $R_{Goff} = 5.1\Omega$, $V_{CE} = 600$V



switching losses IGBT,Inverter(typical)

$E_{on} = f(R_G)$, $E_{off} = f(R_G)$

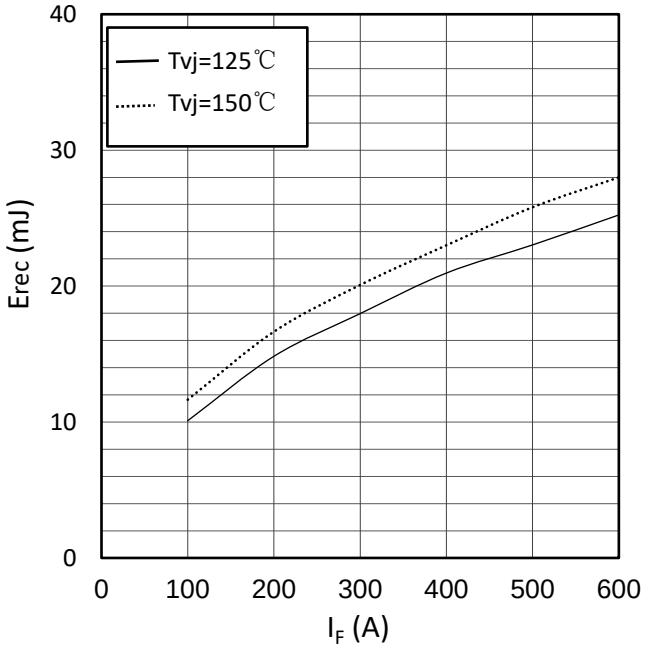
$V_{GE} = \pm 15$V, $I_C = 300$A, $V_{CE} = 600$V



switching losses Diode, Inverter (typical)

$E_{rec} = f(I_F)$

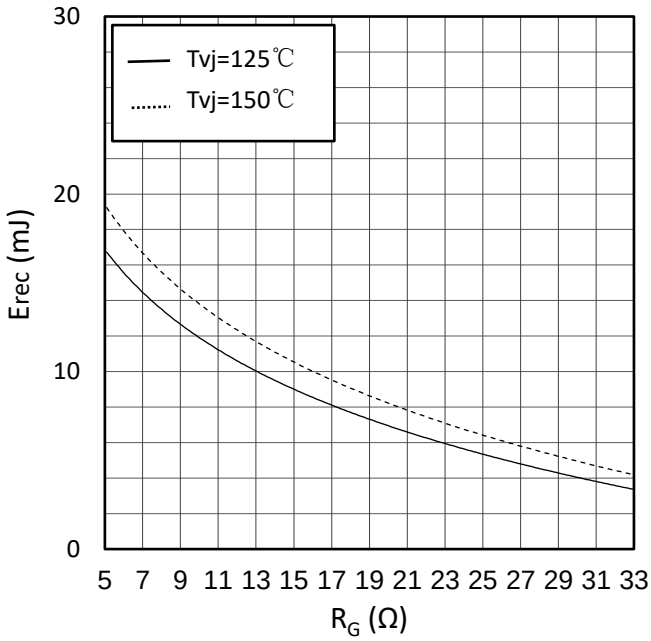
R_{Gon}=5.1Ω, V_{CE}=600V



switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$

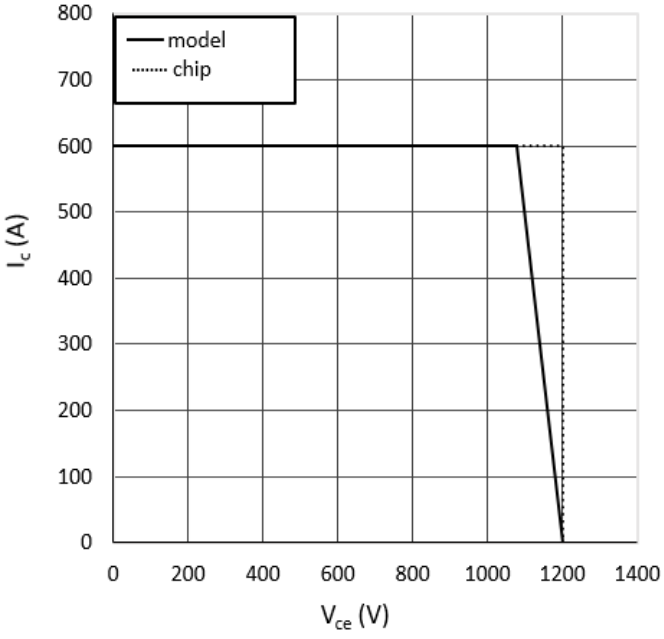
R_{Gon}=5.1Ω, V_{CE}=600V



reverse bias safe operating area IGBT,Inverter (RBSOA)

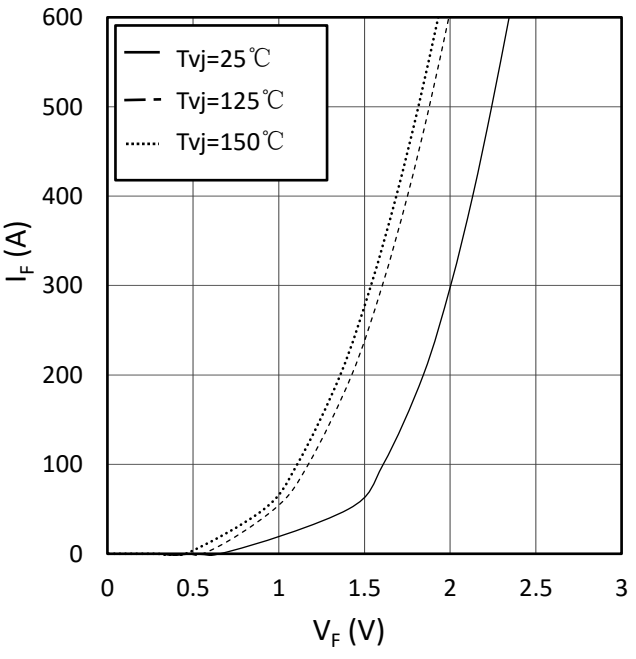
$I_C = f(V_{CE})$

V_{GE} = ±15V, R_{Gon} = 5.1Ω, R_{Goff} = 5.1Ω, T_{vj} = 150℃

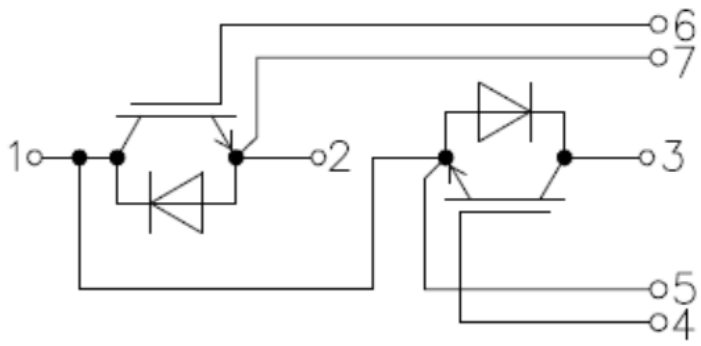


forward characteristic of Diode, Inverter (typical)

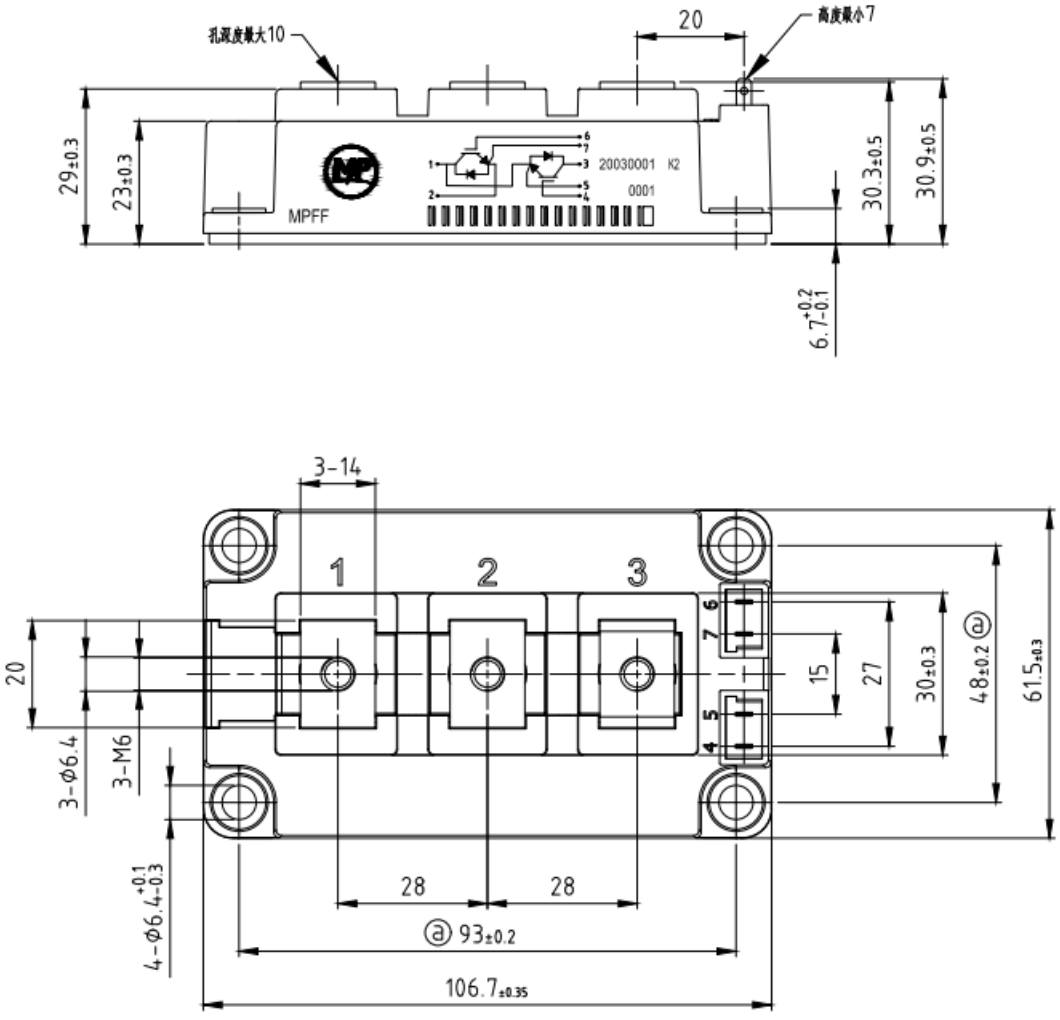
$I_F = f(V_F)$



Circuit diagram headline



Package outlines（Unit：mm）



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序号 Item	日期 Date	变更记录及描述 Change History Description	版本序号 Rev. item	经办人 Responsibility
1	2022.3.01	初版规格书发布，版本为V1.0	2022 3 Ver1.0	马慧明
2	2023.10.19	更新曲线及高温数据，版本为V1.1	2023 10Ver1.1	张成宇