

# 1MBI600S-120

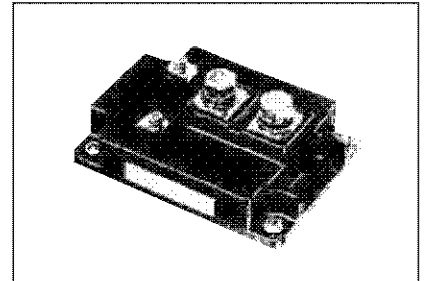
## IGBT MODULE (S series) 1200V / 600A / 1 in one package

### ■ Features

- High speed switching
- Voltage drive
- Low Inductance module structure

### ■ Applications

- Inverter for Motor Drive
- AC and DC Servo Drive Amplifier
- Uninterruptible Power Supply
- Industrial machines, such as Welding machines



### ■ Maximum Ratings and Characteristics

#### ● Absolute Maximum Ratings (at Tc=25°C unless otherwise specified)

Items	Symbols	Conditions	Maximum ratings	Units	
Collector-Emitter voltage	V <sub>CEs</sub>		1200	V	
Gate-Emitter voltage	V <sub>GEs</sub>		±20	V	
Collector current	I <sub>c</sub>	Continuous	T <sub>c</sub> =25°C	900	A
			T <sub>c</sub> =80°C	600	
	I <sub>c</sub> pulse	1ms	T <sub>c</sub> =25°C	1800	
			T <sub>c</sub> =80°C	1200	
	-I <sub>c</sub>			600	
-I <sub>c</sub> pulse	1ms		1200		
Collector power dissipation	P <sub>c</sub>	1 device	4150	W	
Junction temperature	T <sub>j</sub>		150	°C	
Storage temperature	T <sub>stg</sub>		-40 to +125	°C	
Isolation voltage (*1)	V <sub>iso</sub>	AC : 1min	2500	V	
Screw torque	Mounting (*2)		4.5	N·m	
	Terminals (*2)		11.0		
	Terminals (*2)		1.7		

Note \*1: All terminals should be connected together when isolation test will be done.

Note \*2: Recommendable value : Mounting : 4.0±0.5 N·m (M6), Terminal : 10.0±1.0 N·m (M8), 1.5±0.2 N·m (M4)

#### ● Electrical characteristics (at T<sub>j</sub>= 25°C unless otherwise specified)

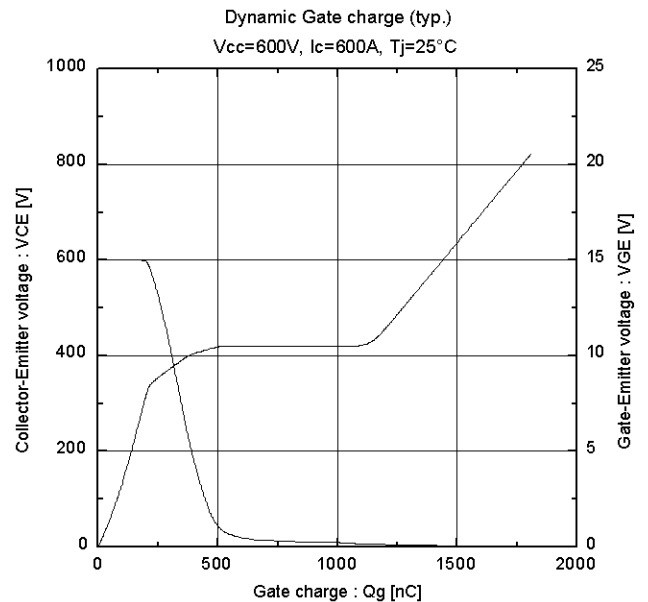
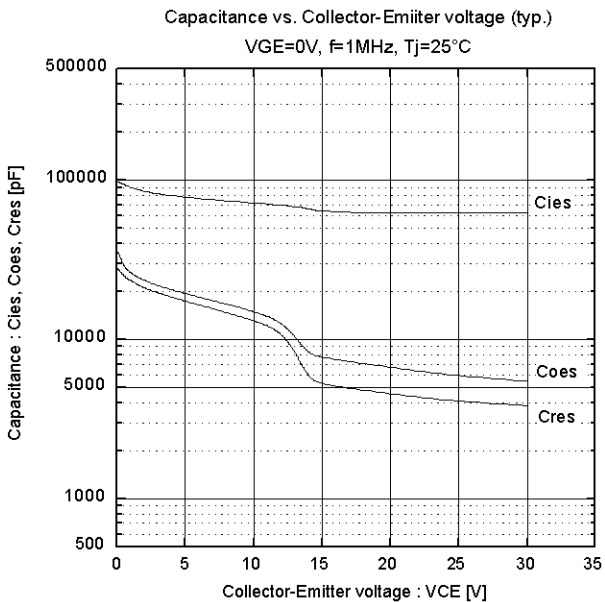
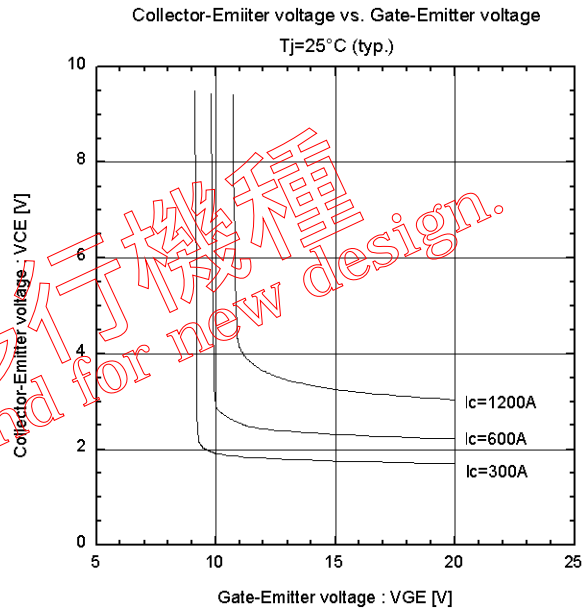
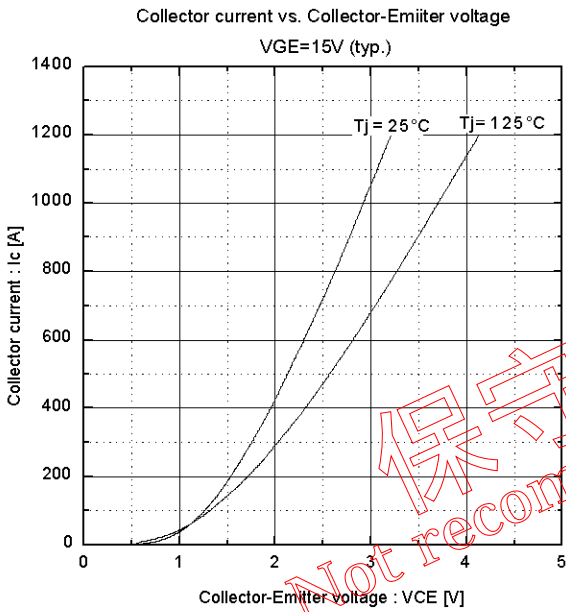
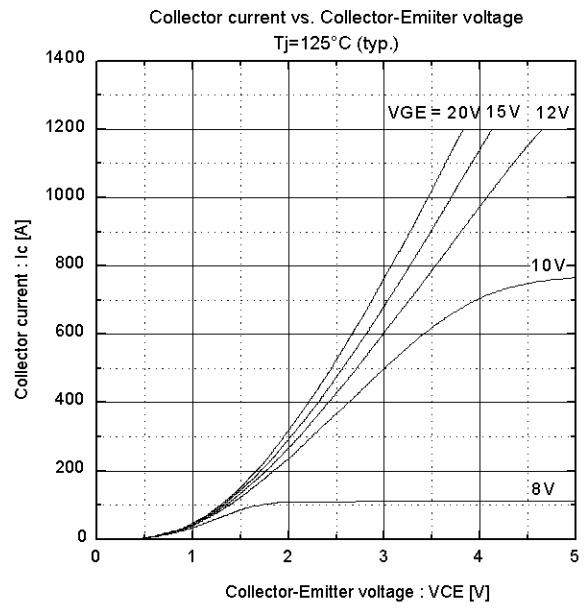
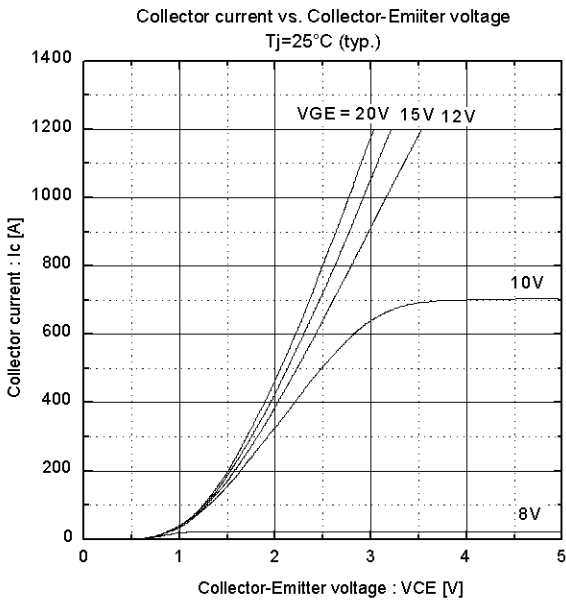
Items	Symbols	Conditions	Characteristics			Units	
			min.	typ.	max.		
Zero gate voltage collector current	I <sub>CEs</sub>	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 1200V	-	-	2.0	mA	
Gate-Emitter leakage current	I <sub>GEs</sub>	V <sub>CE</sub> = 0V, V <sub>GE</sub> = ±20V	-	-	1.6	µA	
Gate-Emitter threshold voltage	V <sub>GE(th)</sub>	V <sub>CE</sub> = 20V, I <sub>c</sub> = 600mA	5.5	7.2	8.5	V	
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	V <sub>GE</sub> = 15V I <sub>c</sub> = 600A	T <sub>j</sub> =25°C	-	2.3	2.6	V
			T <sub>j</sub> =125°C	-	2.8	-	
Input capacitance	C <sub>ies</sub>	V <sub>GE</sub> = 0V	-	72000	-	pF	
Output capacitance	C <sub>oes</sub>	V <sub>CE</sub> = 10V	-	15000	-		
Reverse transfer capacitance	C <sub>res</sub>	f = 1MHz	-	13200	-		
Turn-on time	ton	V <sub>CE</sub> = 600V I <sub>c</sub> = 600A	-	0.8	1.2	µs	
	tr		-	0.25	0.6		
	tr (i)		V <sub>GE</sub> = ±15V	-	0.1		-
Turn-off time	toff	R <sub>θ</sub> = 1.5Ω	-	0.7	1.0	µs	
	tf		-	0.1	0.3		
Forward on voltage	V <sub>f</sub>	I <sub>f</sub> = 600A	T <sub>j</sub> =25°C	-	2.8	3.4	V
			T <sub>j</sub> =125°C	-	2.4	-	
Reverse recovery time	trr	I <sub>f</sub> = 600A	-	-	0.35	µs	

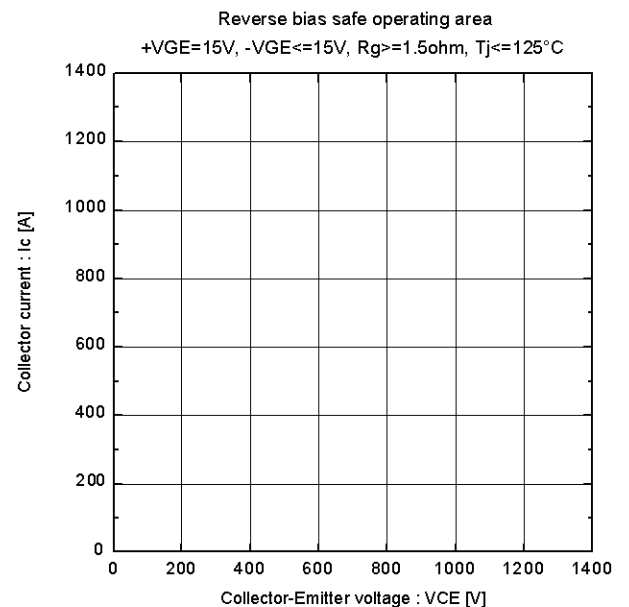
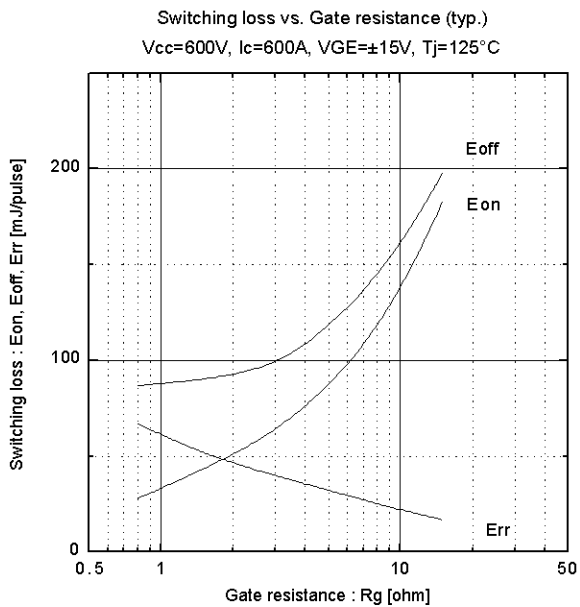
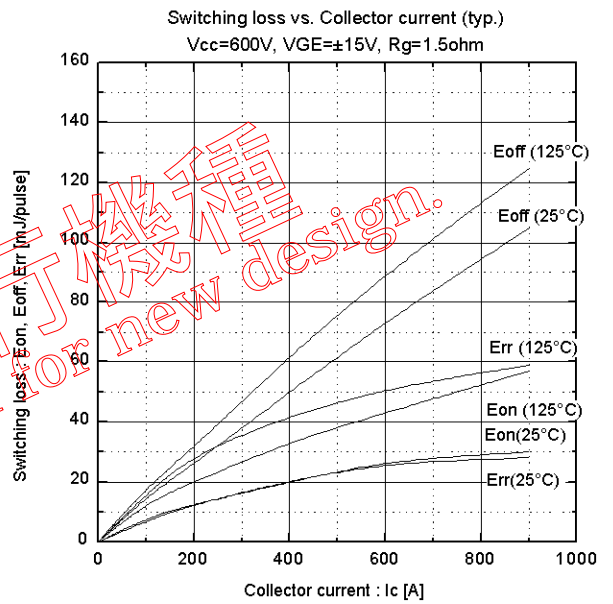
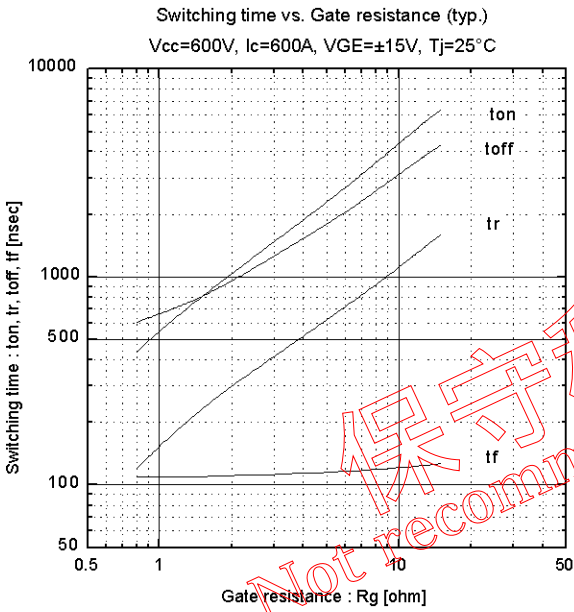
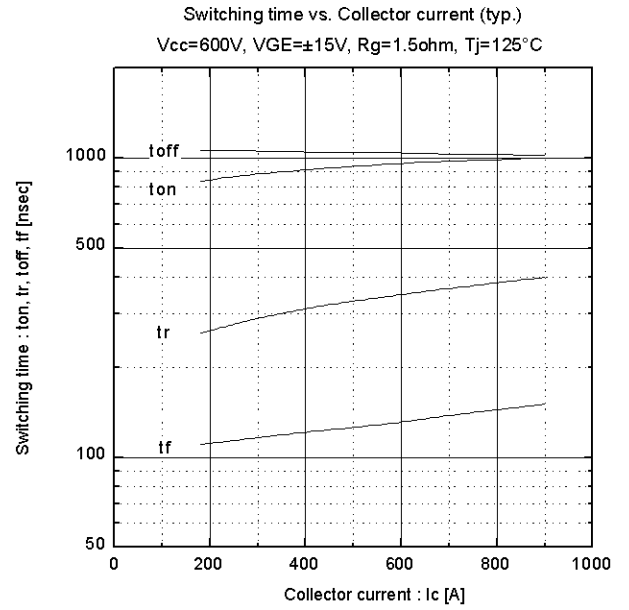
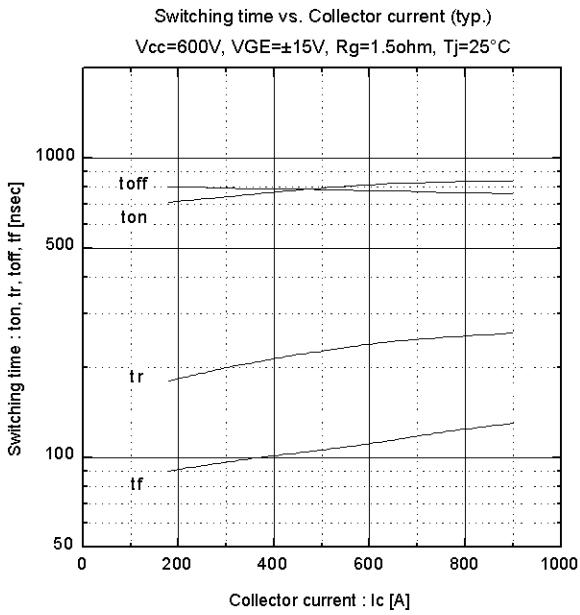
#### ● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	R <sub>th(j-c)</sub>	IGBT	-	-	0.03	°C/W
		FWD	-	-	0.06	
Contact thermal resistance	R <sub>th(c-f)</sub>	with Thermal Compound (*3)	-	0.0063	-	°C/W

Note \*3: This is the value which is defined mounting on the additional cooling fin with thermal compound.

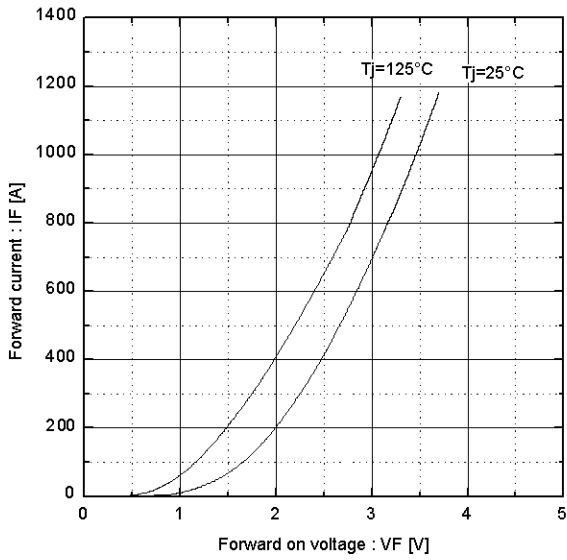
■ Characteristics (Representative)



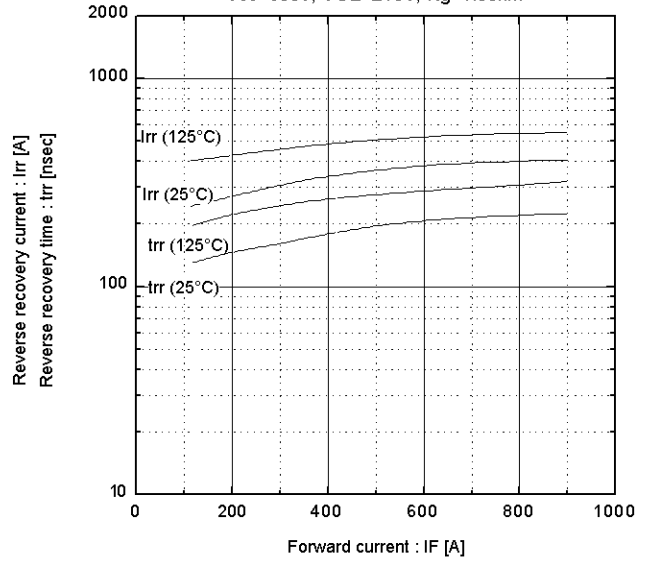


保守移行機種  
 Not recommend for new design.

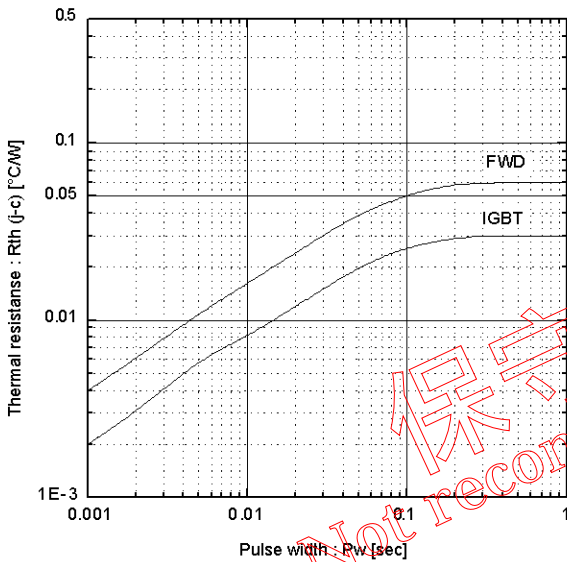
Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)  
Vcc=600V, VGE=±15V, Rg=1.5ohm

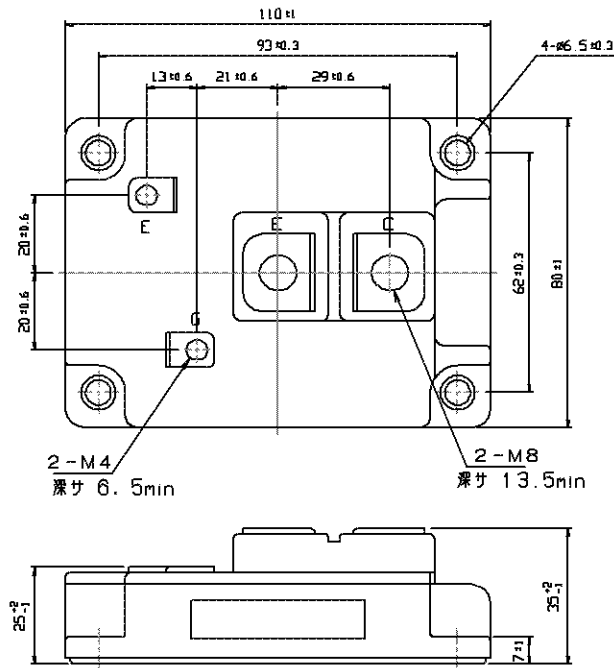


Transient thermal resistance

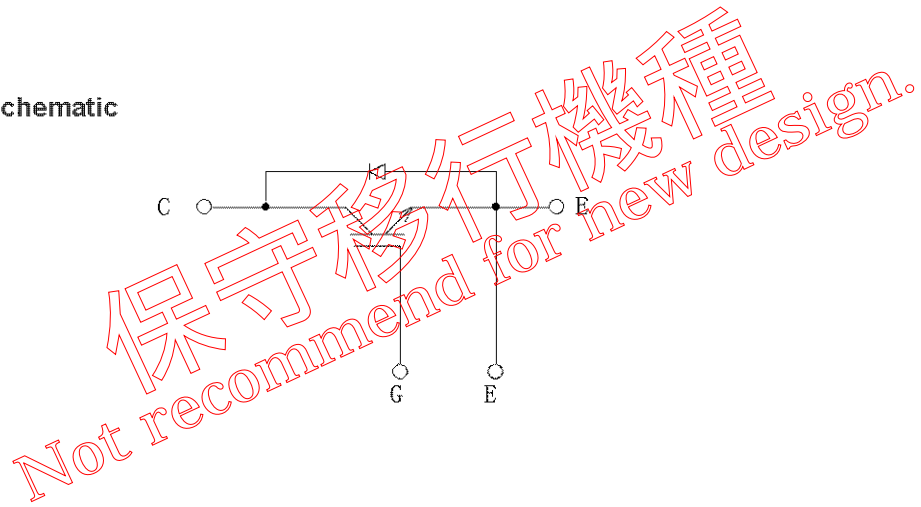


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Not recommend for new design.

■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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