



1MBI 400S-120

1-Pack IGBT
1200V
1x400A

IGBT MODULE (S-Series)

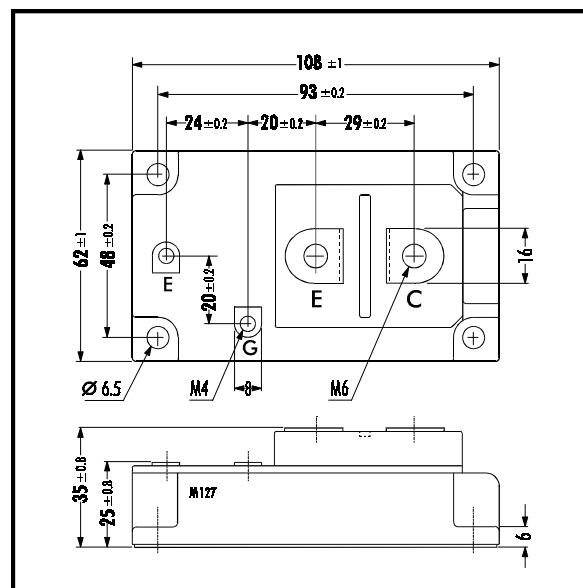
Outline Drawing

Features

- NPT-Technology
- Square SC SOA at 10 x I_C
- High Short Circuit Withstand-Capability
- Small Temperature Dependence of the Turn-Off Switching Loss
- Low Losses And Soft Switching

Applications

- High Power Switching
- A.C. Motor Controls
- D.C. Motor Controls
- Uninterruptible Power Supply



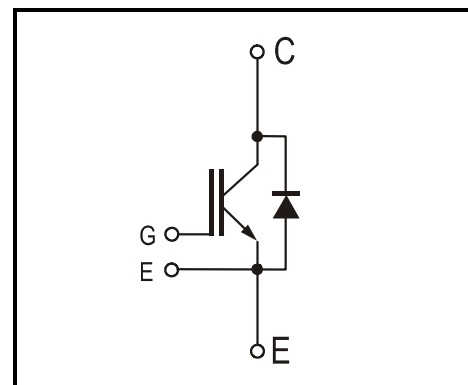
Maximum Ratings and Characteristics

Equivalent Circuit

Absolute Maximum Ratings (T_C=25°C)

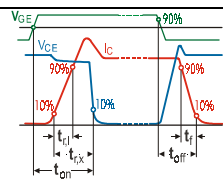
Items	Symbols	Ratings	Units
Collector-Emitter Voltage	V _{CEs}	1200	V
Gate -Emitter Voltage	V _{GES}	± 20	
Collector Current	I _C	600 / 400	A
	I _{C PULSE}	1200 / 800	
	-I _C	400	
	-I _{C PULSE}	800	
Max. Power Dissipation	P _C	3100	W
Operating Temperature	T _i	+150	°C
Storage Temperature	T _{stg}	-40 ~ +125	
Isolation Voltage *1	V _{is}	2500	V
Screw Torque	Mounting *2	3.5	Nm
	Terminals *2	4.5	
	Terminals *2	1.7	

Note: 1*: All Terminals should be connected together when isolation test will be done.
2*: Recommendable Value: Mounting 2.5 – 3.5 Nm (M5) or (M6); Terminal 3.5 – 4.5 Nm (M6), 1.3 – 1.7 Nm (M4)



Electrical Characteristics (at T_J=25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I _{CES}	V _{GE} =0V V _{CE} =1200V			4.0	mA
Gate-Emitter Leakage Current	I _{GES}	V _{CE} =0V V _{GE} =± 20V			800	nA
Gate-Emitter Threshold Voltage	V _{GE(th)}	V _{GE} =20V I _C =400mA	5.5	7.2	8.5	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V I _C =400A		2.3	2.6	
Input Capacitance	C _{ies}	V _{GE} =0V		48'000		pF
Output Capacitance	C _{oes}	V _{CE} =10V		10'000		
Reverse Transfer Capacitance	C _{res}	f=1MHz		8'800		
Turn-on Time	t _{ON}	V _{CC} = 600V		0.35	1.2	μs
	t _{r,x}	I _C = 400A		0.25	0.6	
	t _{r,i}	V _{GE} = ±15V		0.10		
Turn-off Time	t _{OFF}	R _G = 1.8Ω		0.45	1.0	μs
	t _f	Inductive Load		0.08	0.3	
Diode Forward On-Voltage	V _F	I _F =400A; V _{GE} =0V		2.3	3.0	V
Reverse Recovery Time	t _{rr}	I _F =400A		2.0		



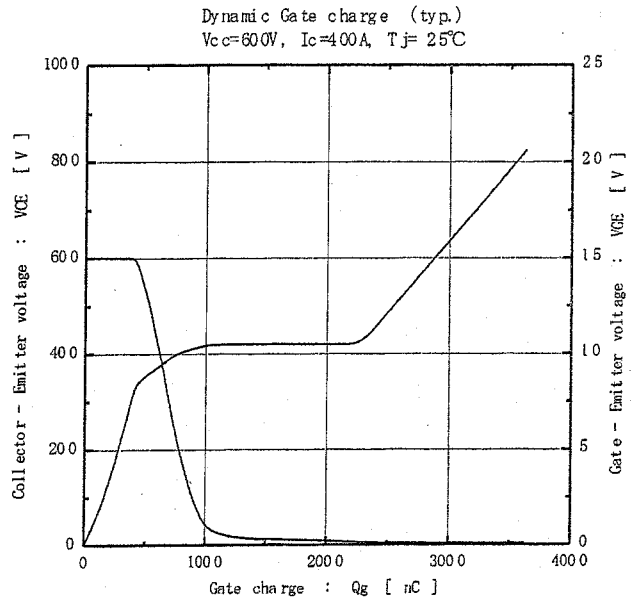
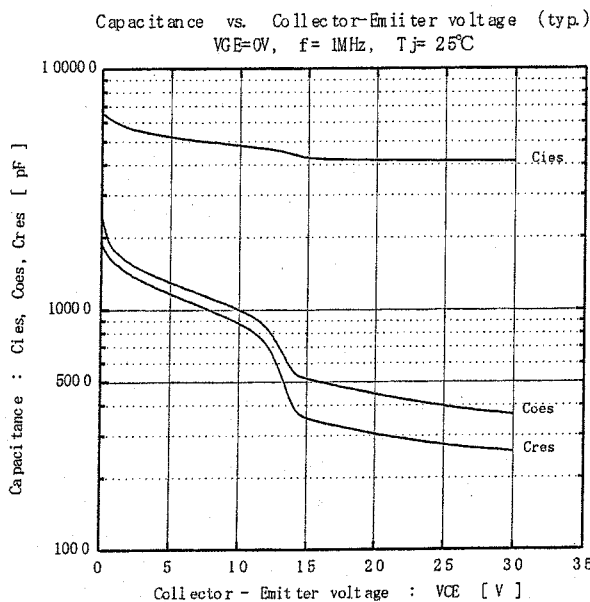
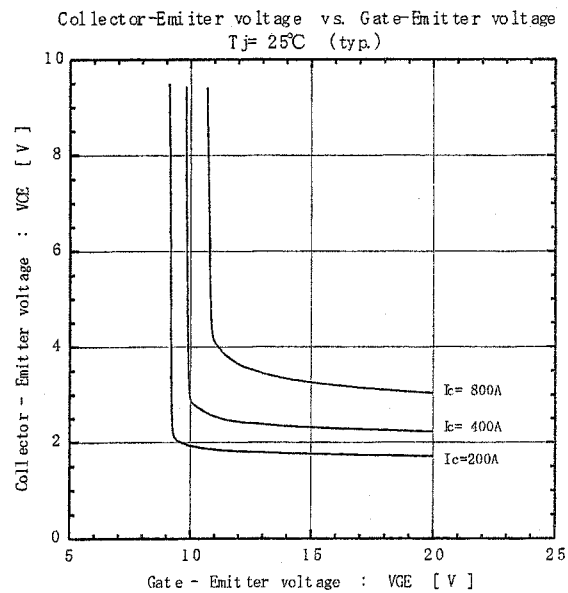
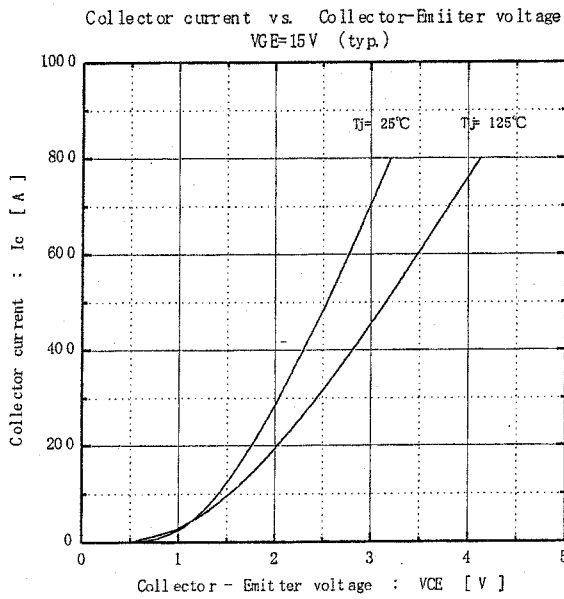
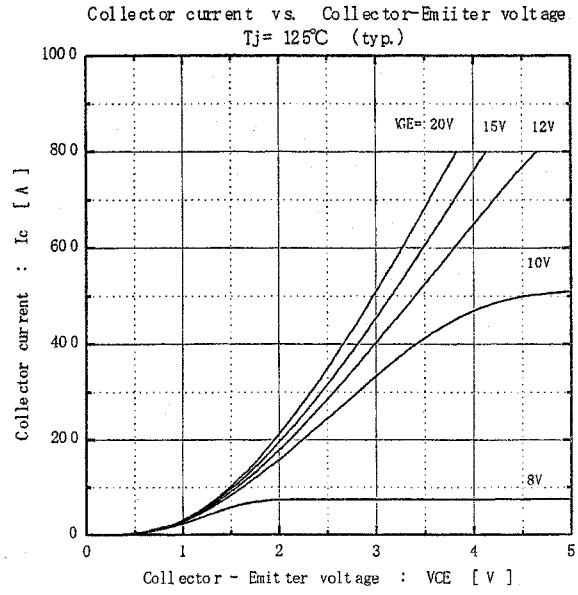
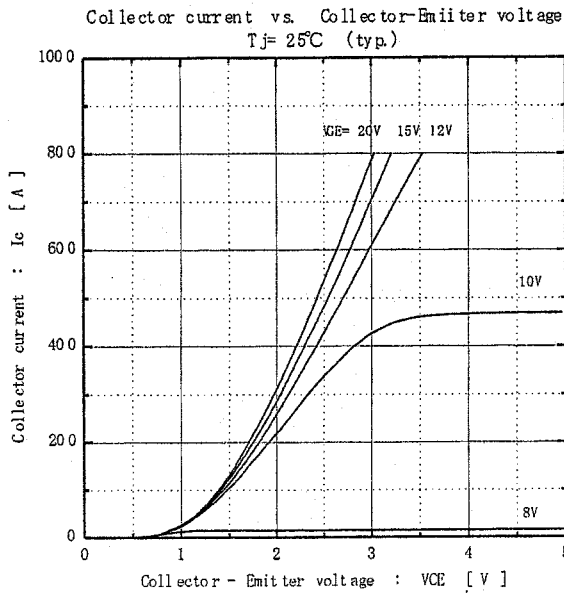
Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R _{th(j-c)}	IGBT			0.04	°C/W
	R _{th(j-c)}	Diode			0.12	
	R _{th(c-f)}	With Thermal Compound		0.0125		



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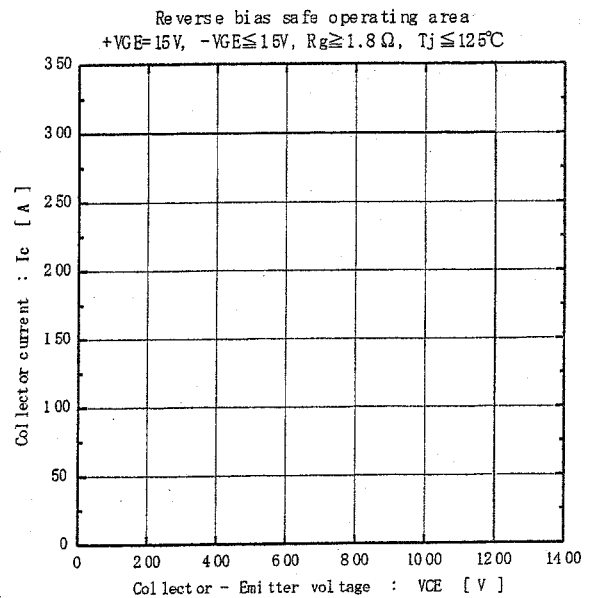
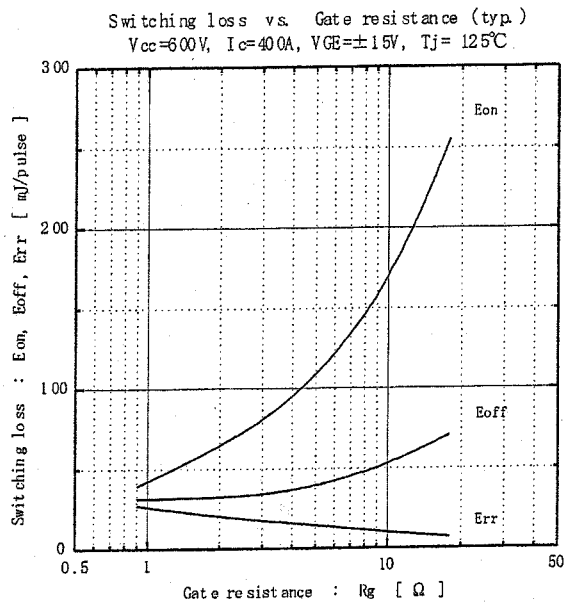
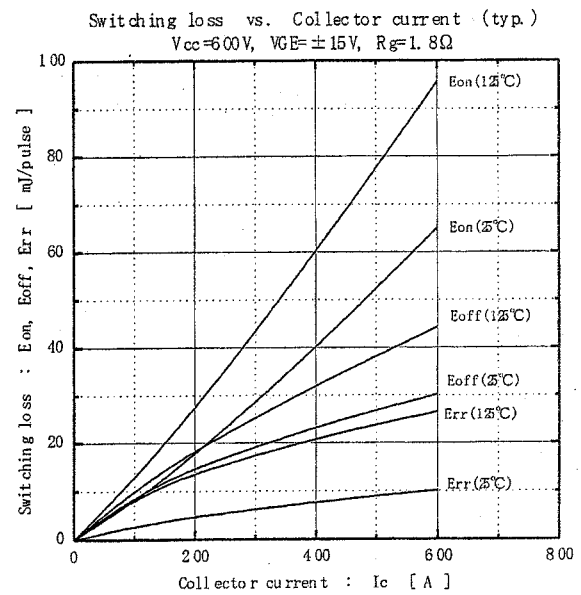
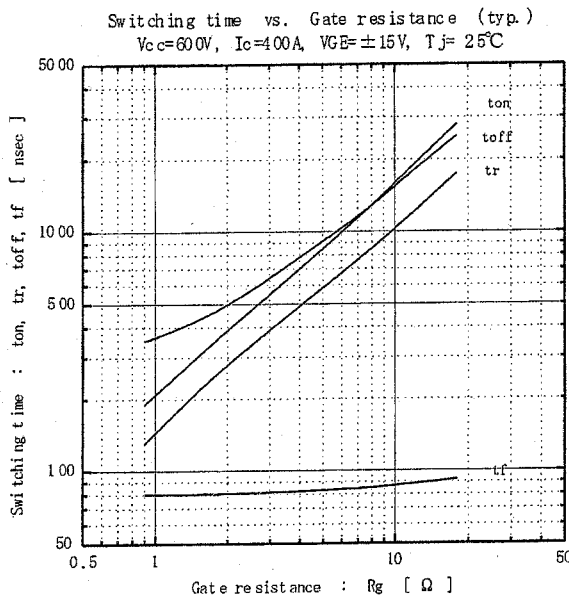
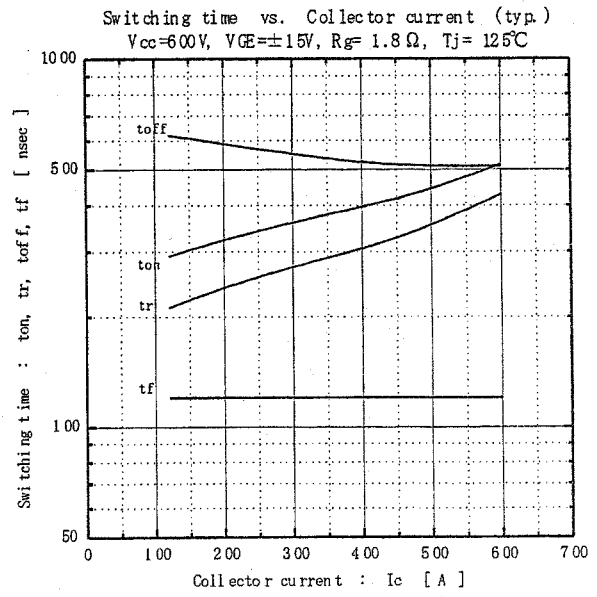
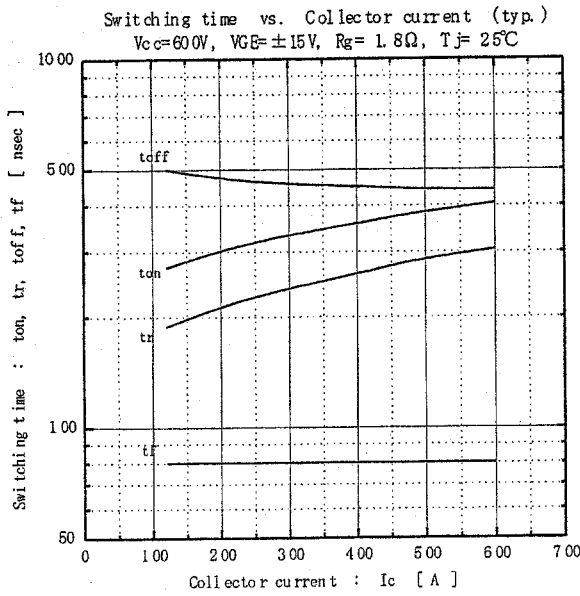
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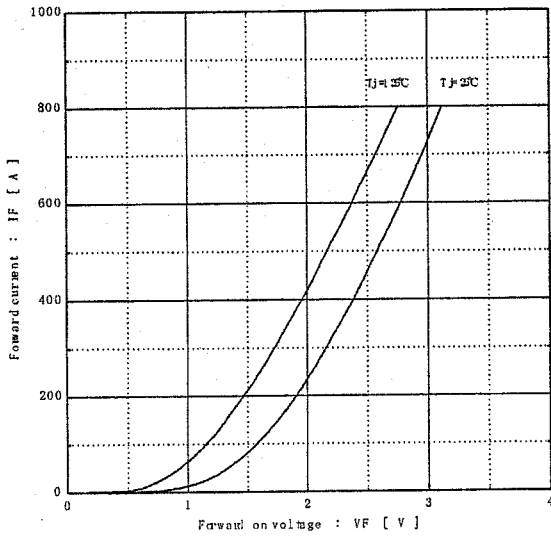




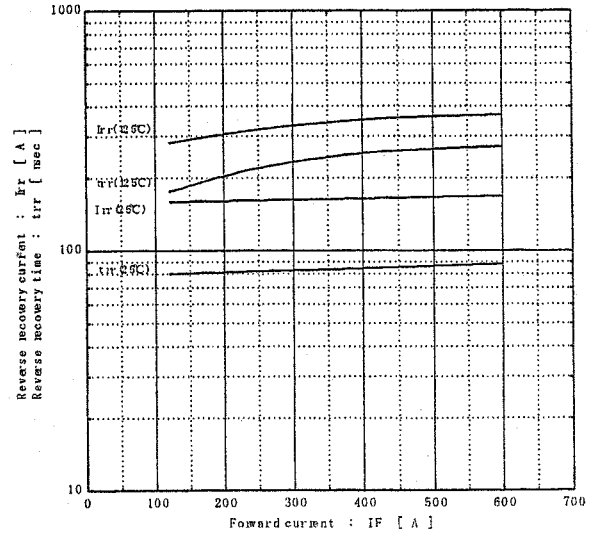
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Forward current vs Forward on voltage (typ)



Reverse recovery characteristics (typ)
 Vcc=600V, VGE±15V, Rg=1.8Ω



Transient thermal resistance

