

IGBT MODULE (S-Series)

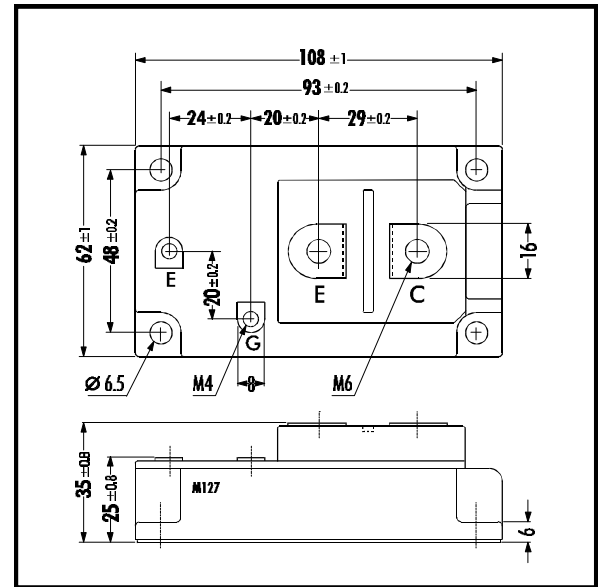
■ Features

- 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

■ Outline Drawing



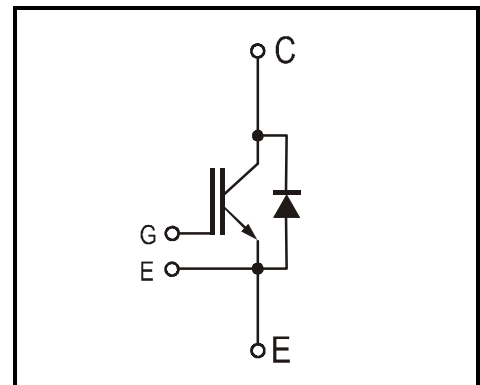
■ Maximum Ratings and Characteristics

• 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	Continuous	25°C / 80°C	I _C	A
	1ms	25°C / 80°C	I _{C PULSE}	
	Continuous		-I _C	
	1ms		-I _{C PULSE}	
Max. Power Dissipation	P _C	1500	W	
Operating Temperature	T _J	+150	°C	
Storage Temperature	T _{stg}	-40 ~ +125		
Isolation Voltage *1	A.C. 1min.	V _{is}	2500	V
Screw Torque	Mounting *2		3.5	Nm
	Terminals *2		4.5	
	Terminals *2		1.7	

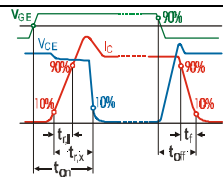
Note: 1*: All Terminals should be connected together when isolation test will be done.
2*: Recommendable Value: Mounting 2.5 - 3.5 Nm (M5) or (M6) ; Terminal 3.5 - 4.5 Nm (M6), 1.3 - 1.7 Nm (M4)

■ Equivalent Circuit



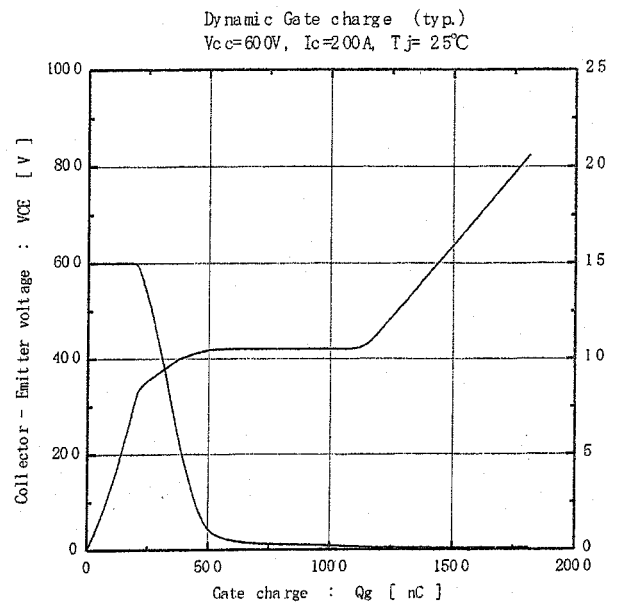
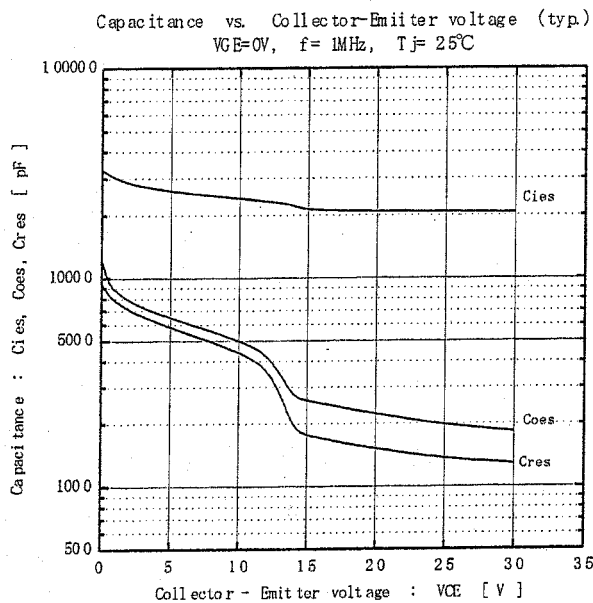
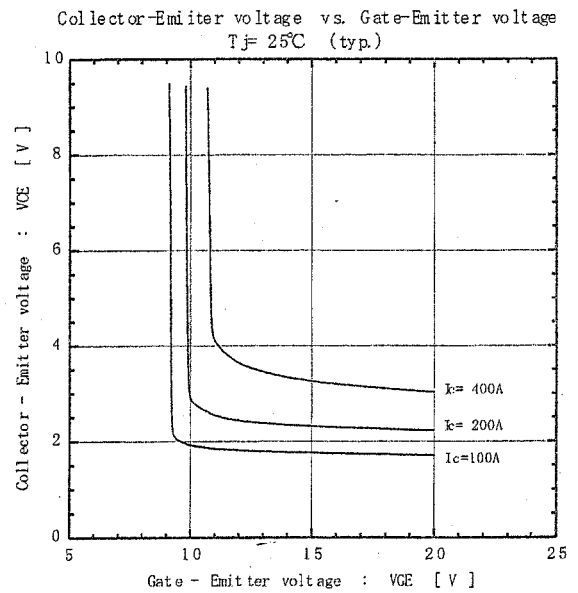
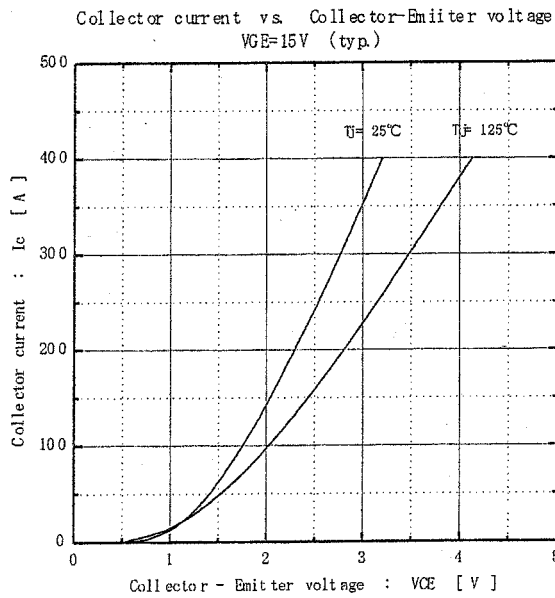
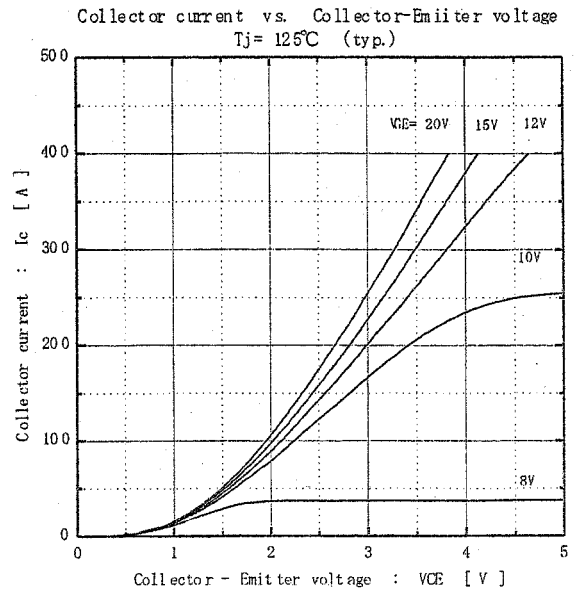
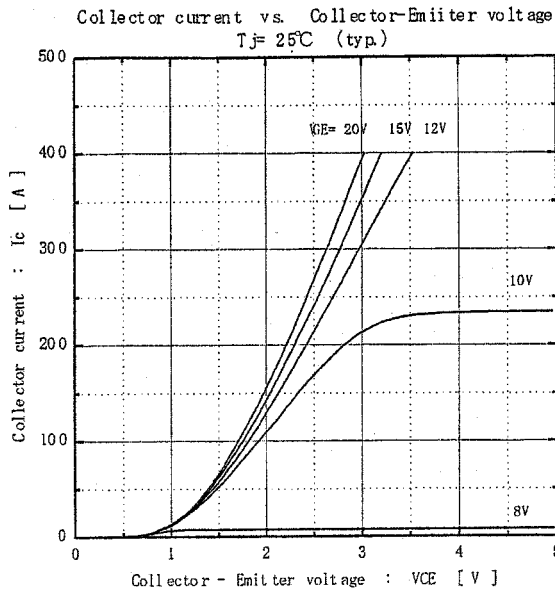
• Electrical Characteristics (at T_J=25°C)

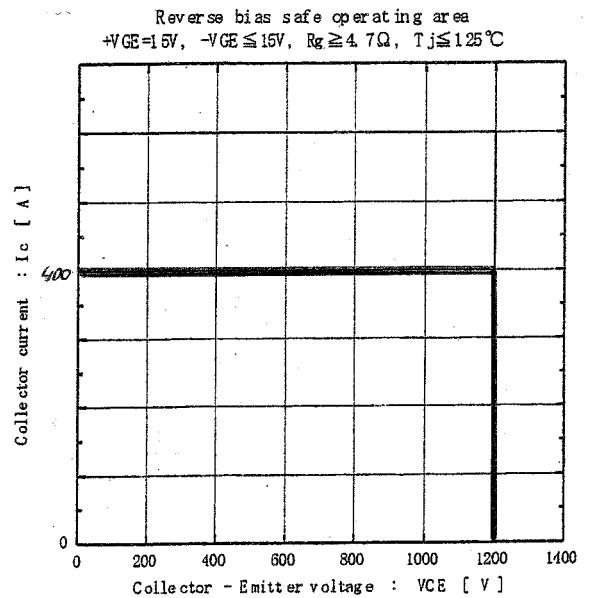
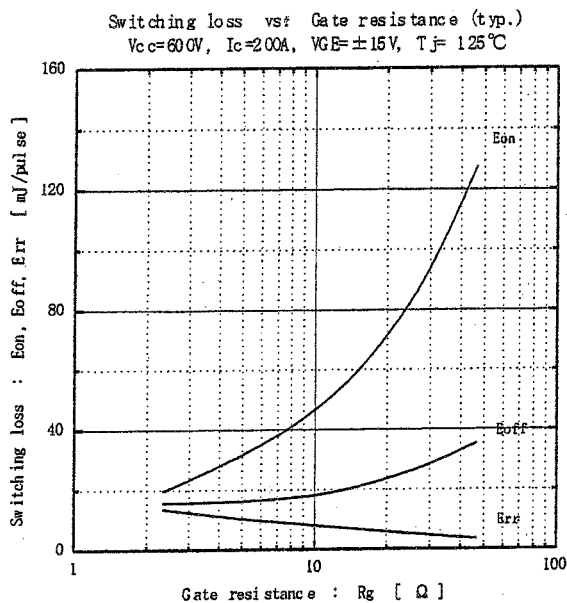
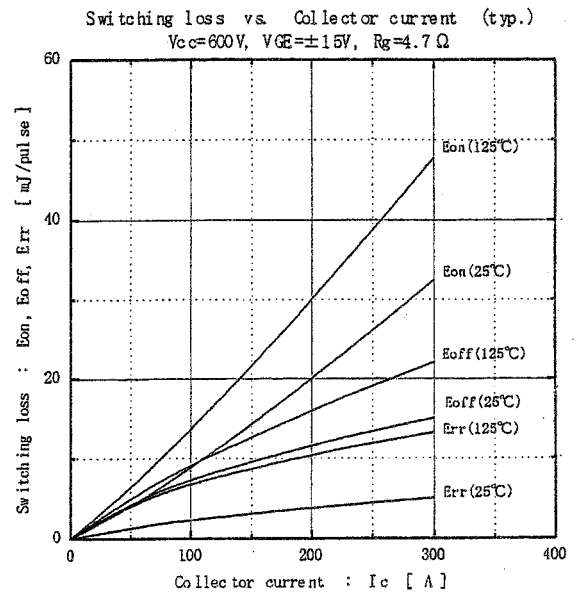
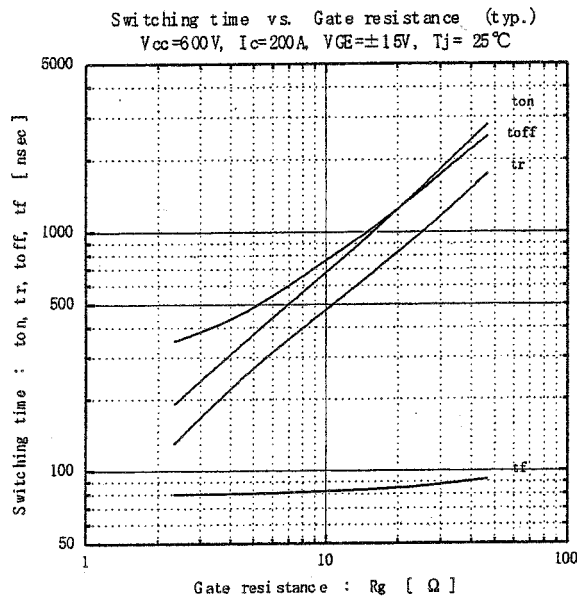
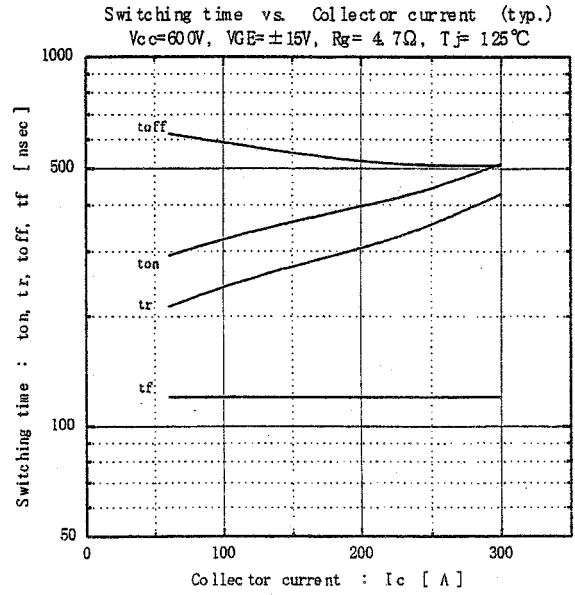
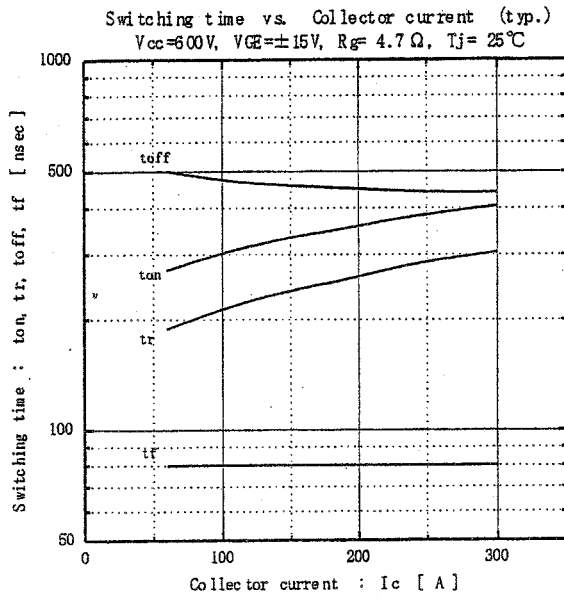
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I _{CES}	V _{GE} =0V V _{CE} =1200V			4.0	mA
Gate-Emitter Leakage Current	I _{GES}	V _{CE} =0V V _{GE} =± 20V			800	nA
Gate-Emitter Threshold Voltage	V _{GE(th)}	V _{GE} =20V I _C =200mA	5.5	7.2	8.5	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V I _C =200A		T _J = 25°C 2.3 T _J = 125°C 2.8	2.6	
Input Capacitance	C _{ies}	V _{GE} =0V		24'000		pF
Output Capacitance	C _{oes}	V _{CE} =10V		5'000		
Reverse Transfer Capacitance	C _{res}	f=1MHz		4'400		
Turn-on Time	t _{ON}	V _{CC} = 600V		0.35	1.2	μs
	t _{r,x}	I _C = 200A		0.25	0.6	
	t _{r,i}	V _{GE} = ±15V		0.10		
Turn-off Time	t _{OFF}	R _G = 4.7Ω		0.45	1.0	μs
	t _f	Inductive Load		0.08	0.3	
Diode Forward On-Voltage	V _F	I _F =200A; V _{GE} =0V		T _J = 25°C 2.3 T _J = 125°C 2.0	3.0	V
Reverse Recovery Time	t _{rr}	I _F =200A			350	ns



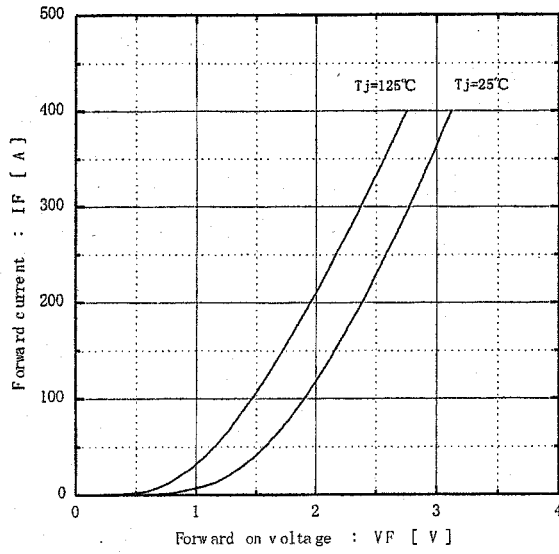
• Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R _{th(j-c)}	IGBT			0.085	°C/W
	R _{th(j-c)}	Diode			0.220	
	R _{th(c-f)}	With Thermal Compound		0.0125		



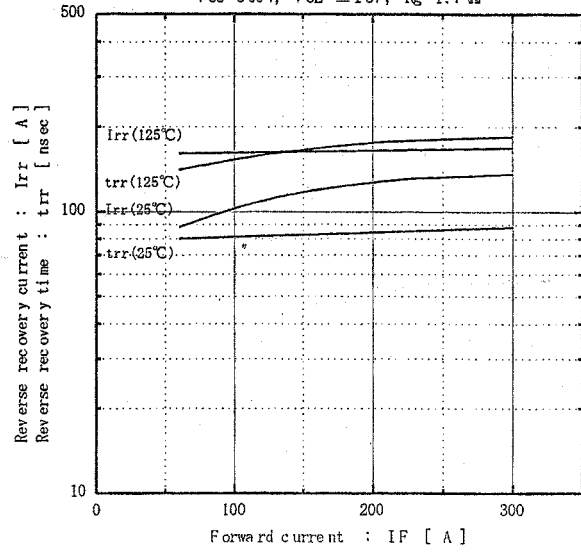


Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)

Vcc=600V, VGE=±1.5V, Rg=4.7Ω



Transient thermal resistance

