

## IGBT MODULE ( S-Series )

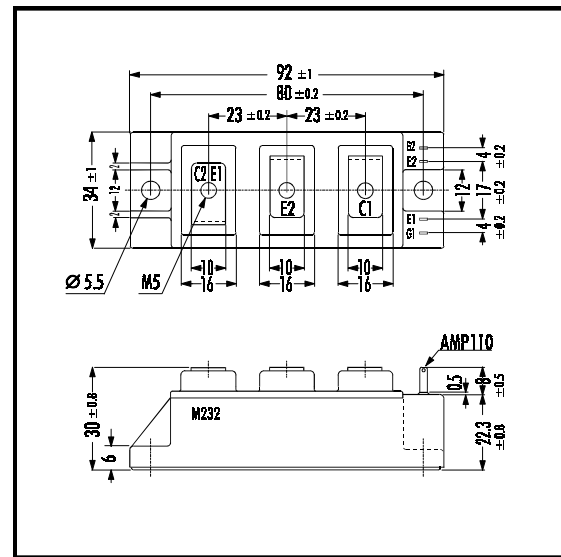
### ■ Features

- NPT-Technology
- Square SC SOA at  $10 \times I_C$
- 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



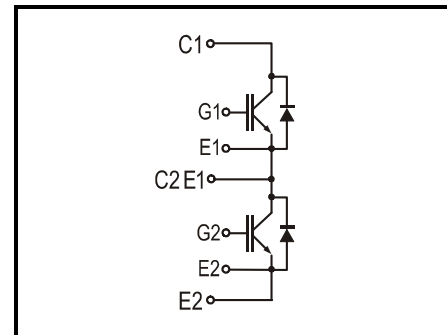
## ■ Maximum Ratings and Characteristics

### • Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ )

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	$I_{C\ PULSE}$		100 / 75
	Continuous		$-I_C$		200 / 150
	1ms		$-I_{C\ PULSE}$		75
Max. Power Dissipation	$P_C$	600	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	3.5			

Note: 1\*: All Terminals should be connected together when isolation test will be done.  
2\*: Recommendable Value; 2.5 ~ 3.5 Nm (M5)

## ■ Equivalent Circuit

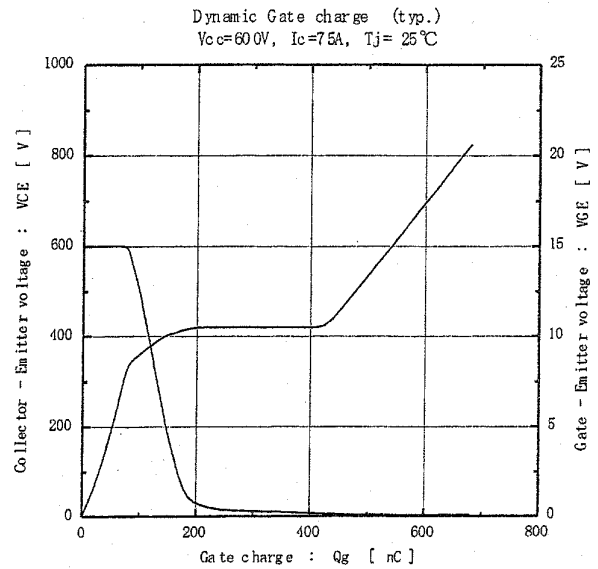
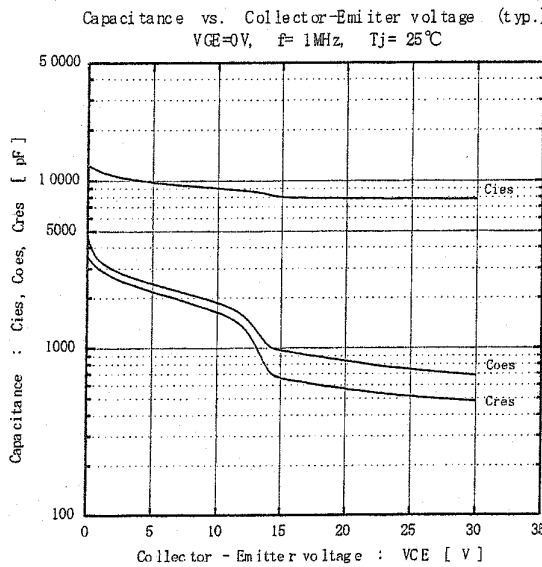
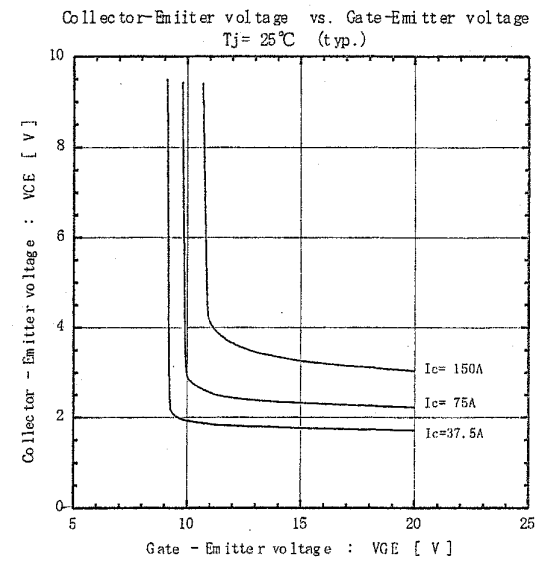
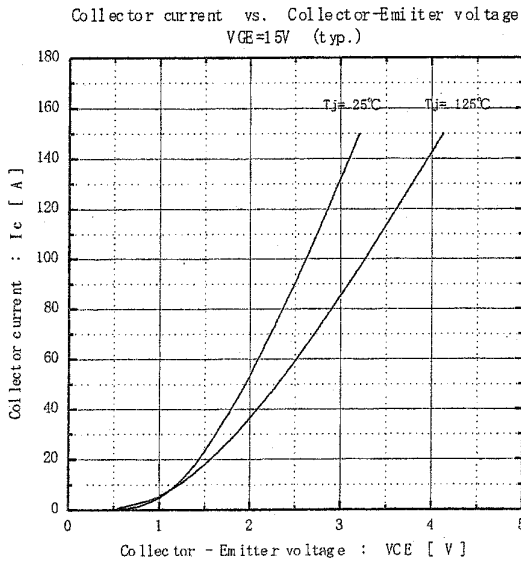
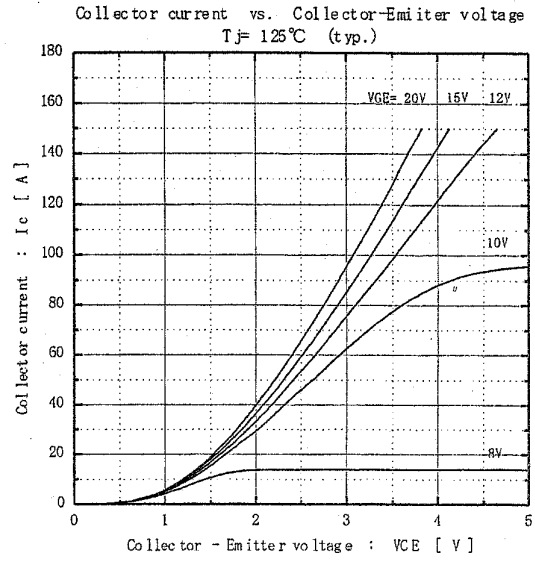
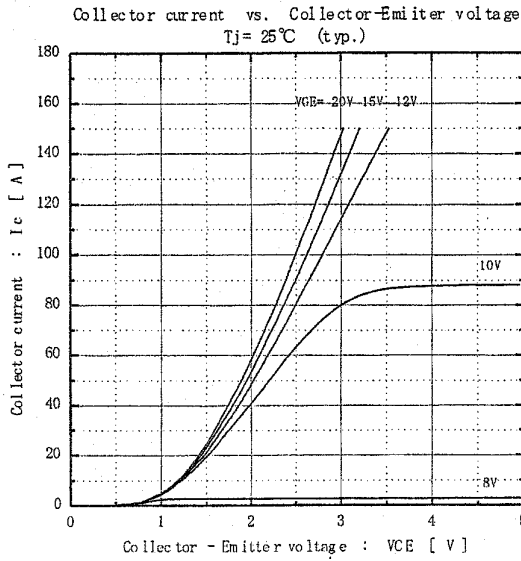


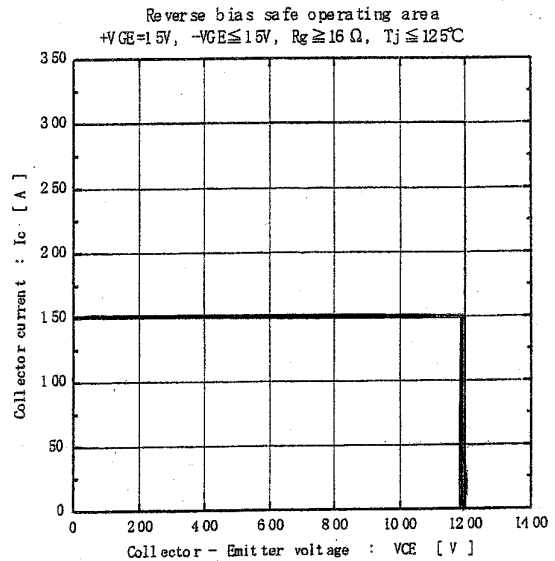
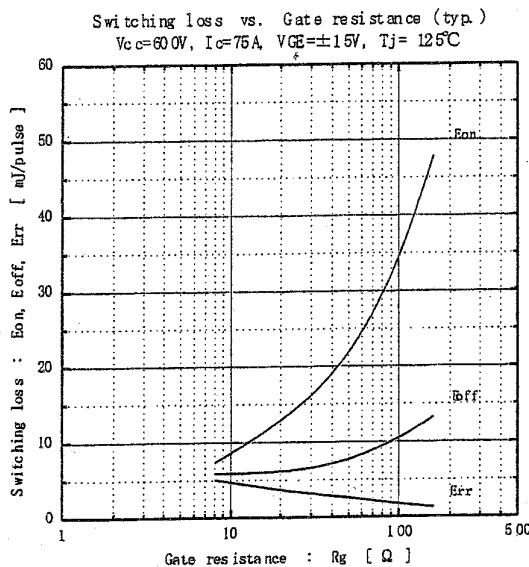
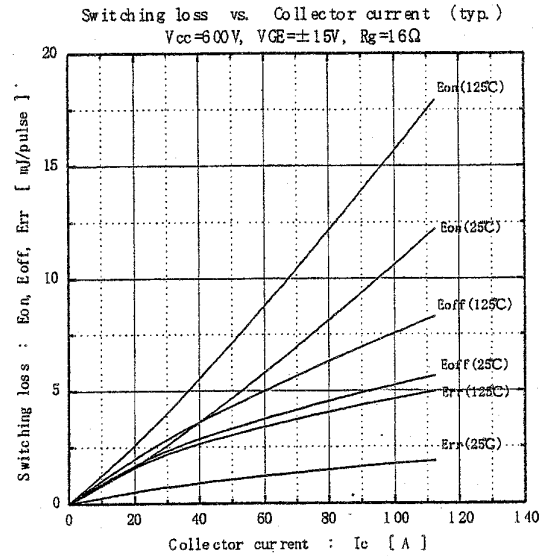
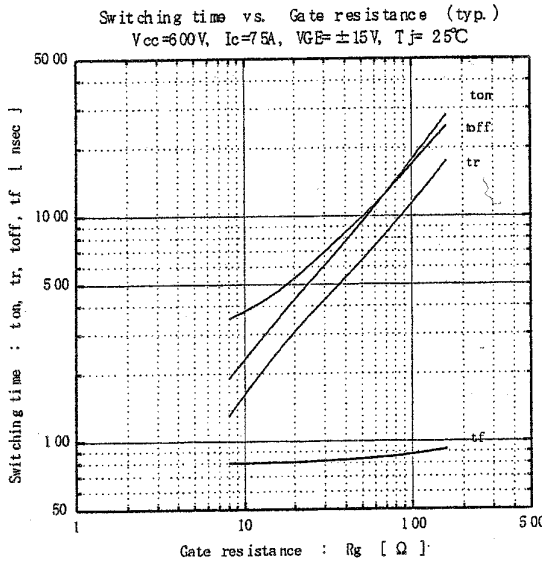
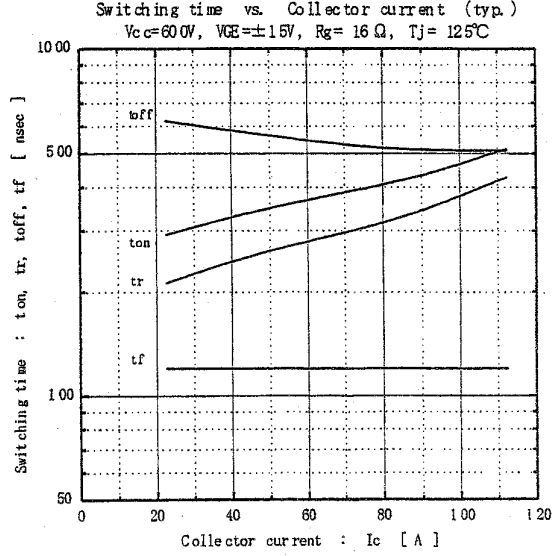
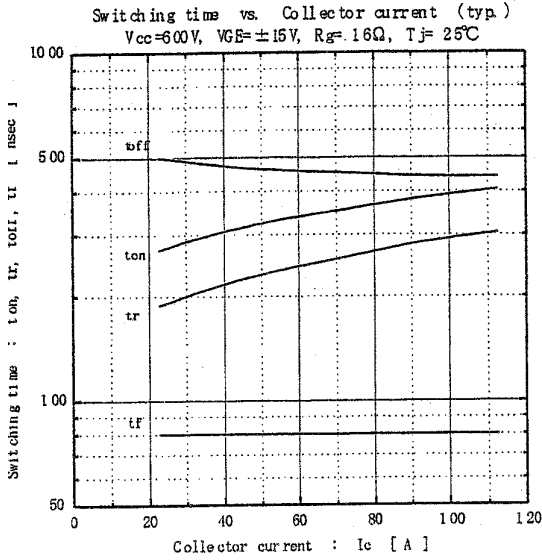
### • Electrical Characteristics ( at $T_j=25^\circ\text{C}$ )

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	$I_{CES}$	$V_{GE}=0V$ $V_{CE}=1200V$			1.0	mA
Gate-Emitter Leakage Current	$I_{GES}$	$V_{CE}=0V$ $V_{GE}=\pm 20V$			200	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=75mA$	5.5	7.2	8.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=75A$		2.3	2.6	
Input Capacitance	$C_{ies}$	$V_{GE}=0V$		9'000		pF
Output Capacitance	$C_{oes}$	$V_{CE}=10V$		1'875		
Reverse Transfer Capacitance	$C_{res}$	$f=1MHz$		1'650		
Turn-on Time	$t_{ON}$	$V_{CC}=600V$ $I_C=75A$ $V_{GE}=\pm 15V$ $R_G=16\Omega$ Inductive Load		0.35	1.2	$\mu\text{s}$
	$t_{R,X}$			0.25	0.6	
	$t_{R,I}$			0.10		
	$t_{OFF}$			0.45	1.0	
Turn-off Time	$t_f$		0.08	0.3		
Diode Forward On-Voltage	$V_F$	$I_F=75A$ ; $V_{GE}=0V$		2.3	3.0	V
Reverse Recovery Time	$t_{rr}$	$I_F=75A$		2.0	350	

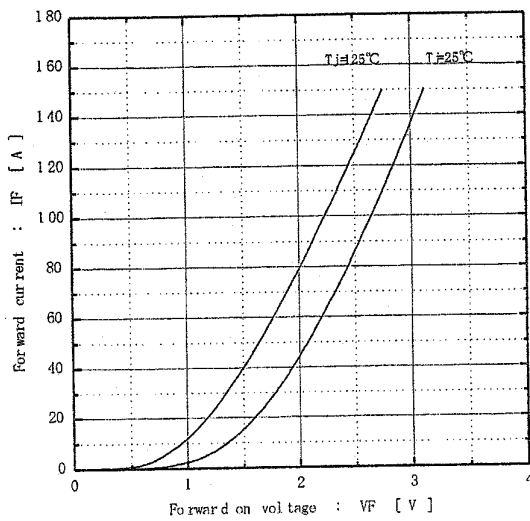
### • Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			0.21	°C/W
	$R_{th(j-e)}$	Diode			0.47	
	$R_{th(c-f)}$	With Thermal Compound		0.05		

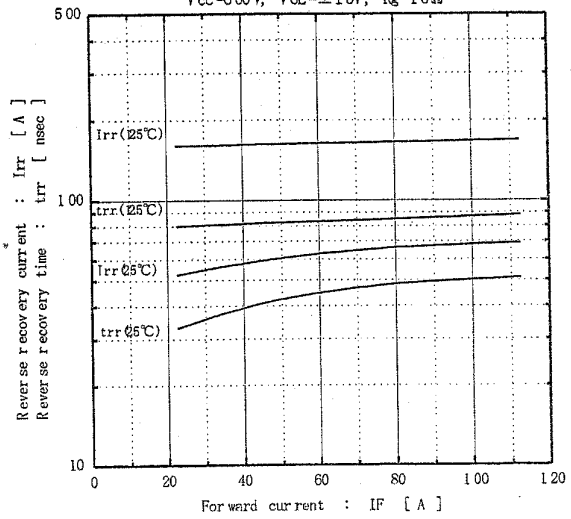




Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)



Transient thermal resistance

