

## IGBT MODULE ( S-Series )

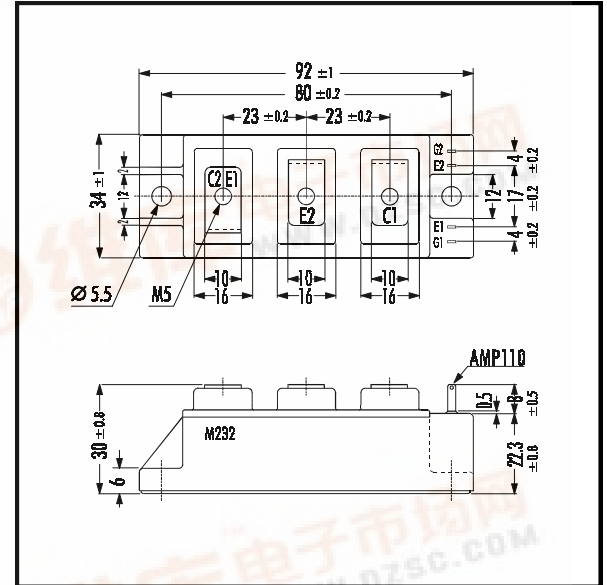
### Features

- 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



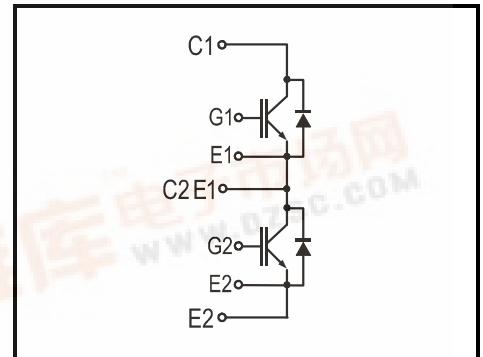
## Maximum Ratings and Characteristics

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

Items	Symbols	Rated Values	Units	
Collector-Emitter Voltage	$V_{CES}$	1200	V	
Gate -Emitter Voltage	$V_{GES}$	$\pm 20$		
Collector Current	Continuous	25°C / 80°C	$I_C$ 100 / 75	A
		1ms	$I_{C PULSE}$ 200 / 150	
	1ms	Continuous	$-I_C$ 75	
		PULSE	$-I_{C PULSE}$ 150	
Max. Power Dissipation	$P_C$	600	W	
Operating Temperature	$T_j$	+150	°C	
Storage Temperature	$T_{stg}$	-40 ~ +125		
Isolation Voltage	A.C. 1min.	$V_{is}$ 2500	V	
Screw Torque				Mounting <sup>*2</sup>
	Terminals <sup>*2</sup>	3.5		

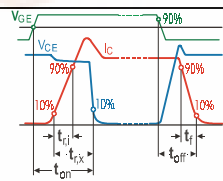
Note: 1\*: All Terminals should be connected together when isolation test will be done.  
2\*: Recommendable Value; 2.5 - 3.5 Nm (M5)

## Equivalent Circuit



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

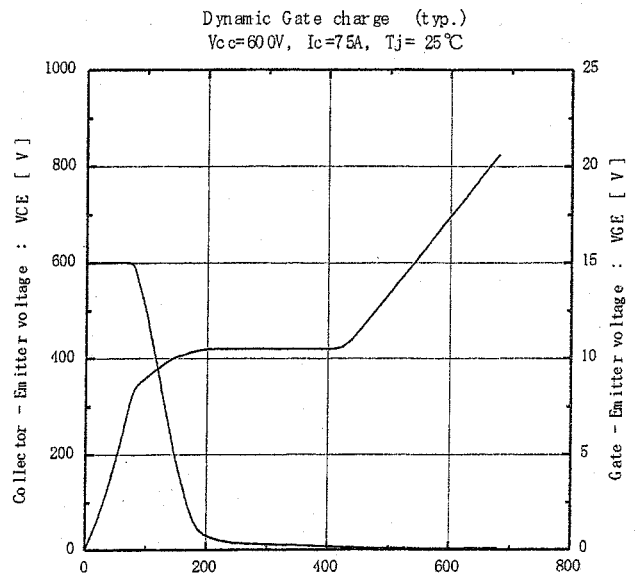
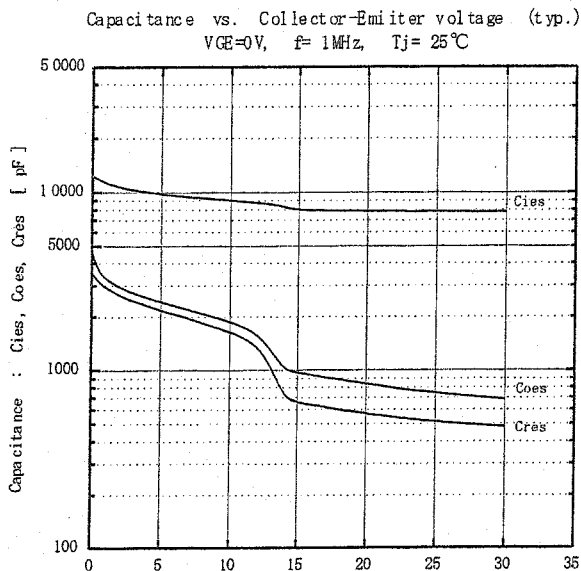
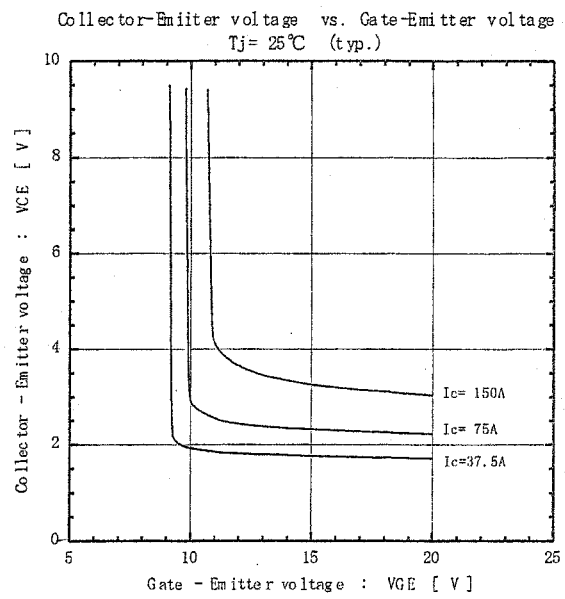
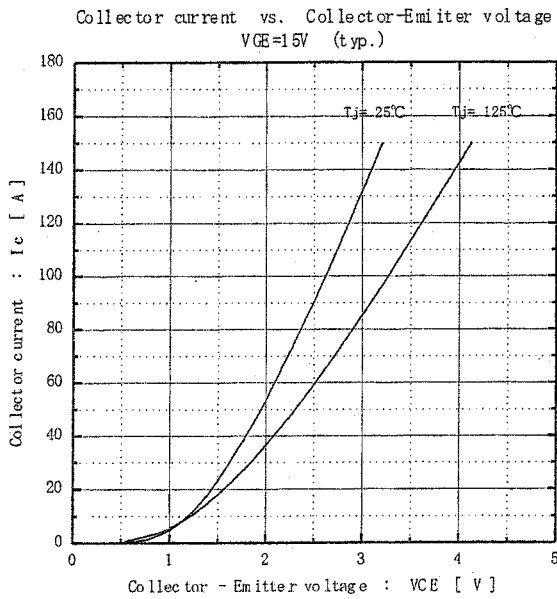
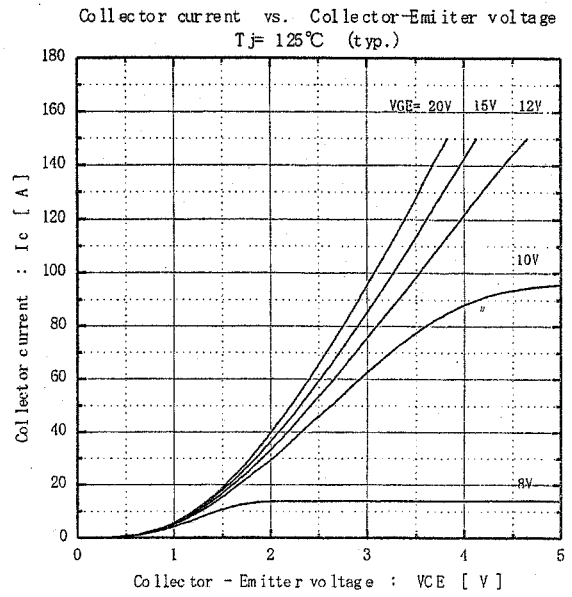
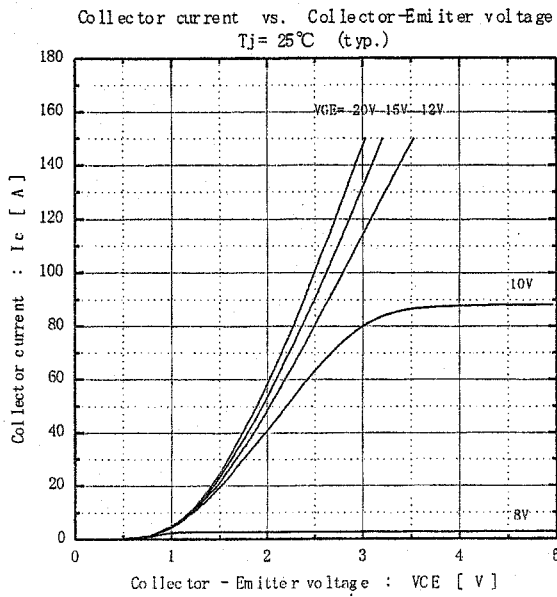
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units	
Zero Gate Voltage Collector Current	$I_{CES}$	$V_{GE}=0V$ $V_{CE}=1200V$			1.0	mA	
Gate-Emitter Leakage Current	$I_{GES}$	$V_{CE}=0V$ $V_{GE}=\pm 20V$			200	nA	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=75mA$	$T_j = 25^\circ\text{C}$	5.5	7.2	8.5	V
			$T_j = 125^\circ\text{C}$		2.3	2.6	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=75A$		2.8		V	
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	$t_{ON}$	$V_{CC}=600V$		0.35	1.2	$\mu\text{s}$	
	$t_{r,x}$	$I_C = 75A$		0.25	0.6		
	$t_{r,i}$	$V_{GE} = \pm 15V$		0.10			
	$t_{OFF}$	$R_G = 16\Omega$		0.45	1.0		
Turn-off Time	$t_f$	Inductive Load		0.08	0.3	$\mu\text{s}$	
Diode Forward On-Voltage	$V_F$	$I_F=75A$ ; $V_{GE}=0V$	$T_j = 25^\circ\text{C}$	2.3	3.0	V	
			$T_j = 125^\circ\text{C}$	2.0			
Reverse Recovery Time	$t_{rr}$	$I_F=75A$			350	ns	

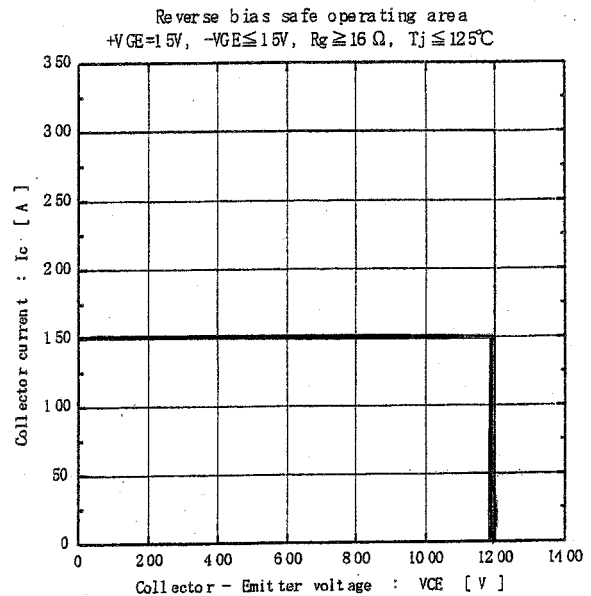
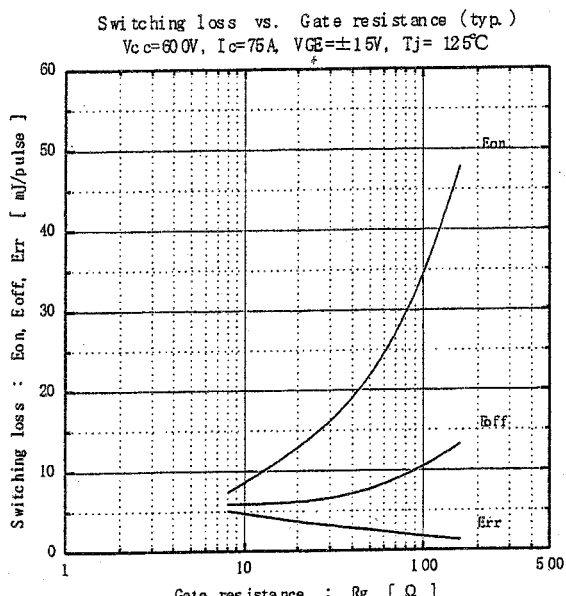
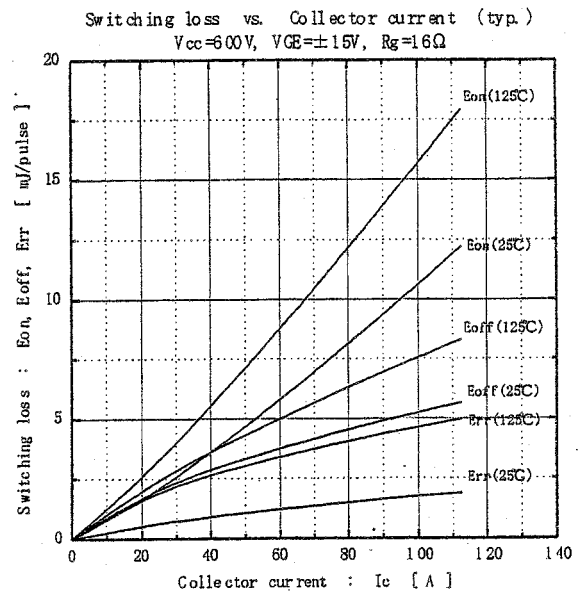
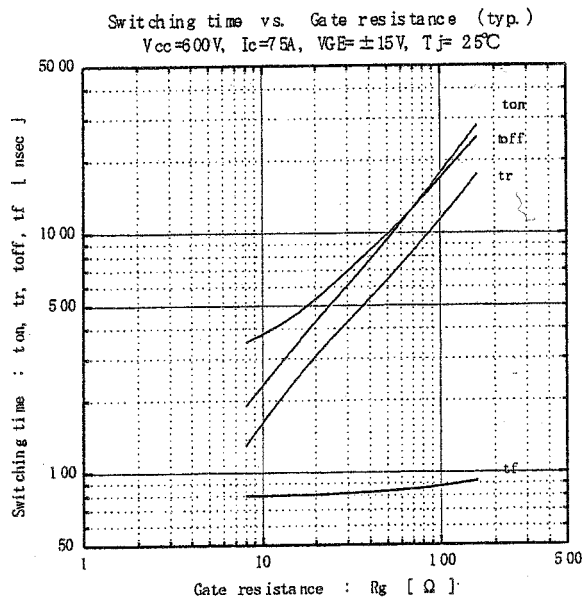
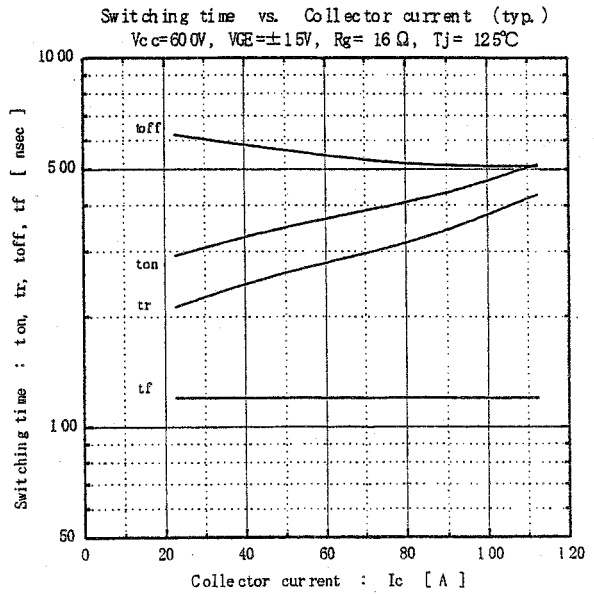
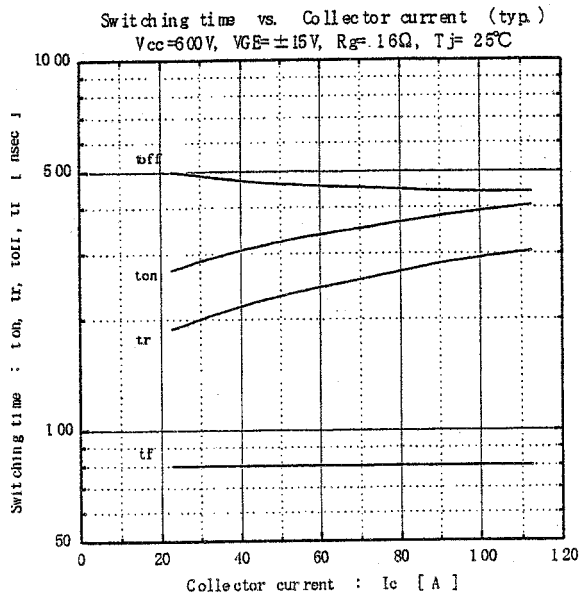


### Thermal Characteristics

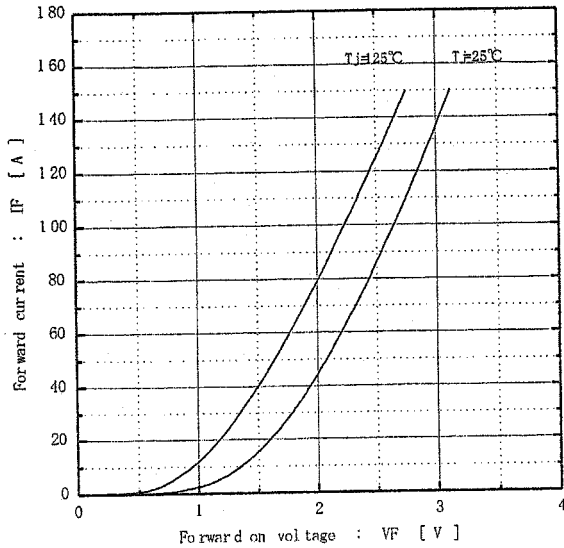
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			0.21	°C/W
	$R_{th(j-e)}$	Diode			0.47	



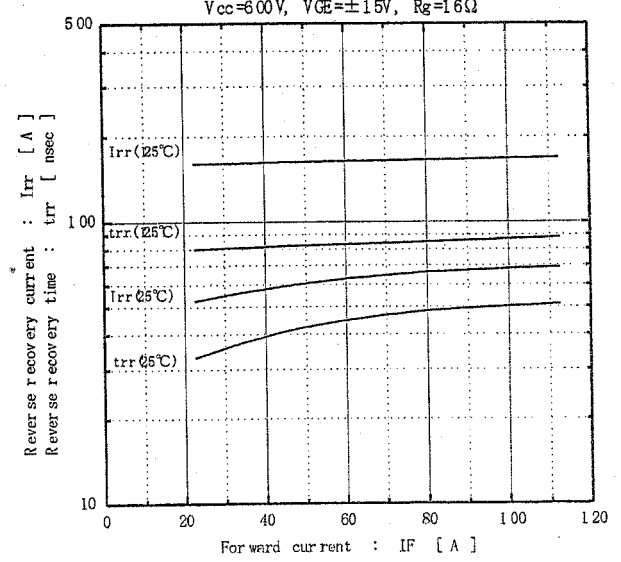




Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)



Transient thermal resistance

