

IGBT MODULE (Single-in-Line)

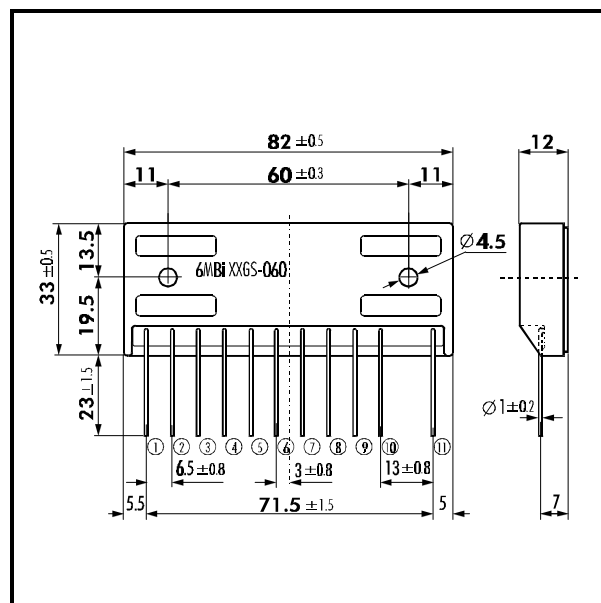
■ Features

- *Square RBSOA*
- *Low Saturation Voltage*
- *Improved FWD Characteristic*
- *Minimized Internal Stray Inductance*

■ Applications

- *High Power Switching*
- *A.C. Motor Controls*
- *D.C. Motor Controls*

■ Outline Drawing



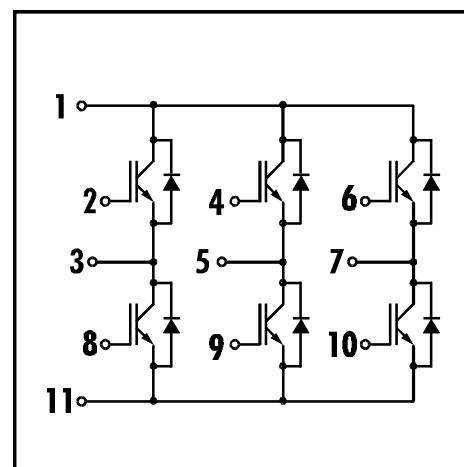
■ Maximum Ratings and Characteristics

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

Items		Symbols	Ratings	Units
Collector-Emitter Voltage		V _{CES}	600	V
Gate -Emitter Voltage		V _{GES}	± 20	V
Collector Current	Continuous	I _C	20	A
	1ms	I _{C PULSE}	40	
	Continuous	-I _C	20	
	1ms	-I _{C PULSE}	40	
Max. Power Dissipation		P _C	70	W
Operating Temperature		T _j	+150	°C
Storage Temperature		T _{stg}	-40 ~ +125	°C
Isolation Voltage	A.C. 1min.	V _{is}	2000	V
Screw Torque		Mounting *1	1.7	Nm

Note: *1:Recommendable Value: 1.3 – 1.7 Nm (M4)

■ Equivalent Circuit



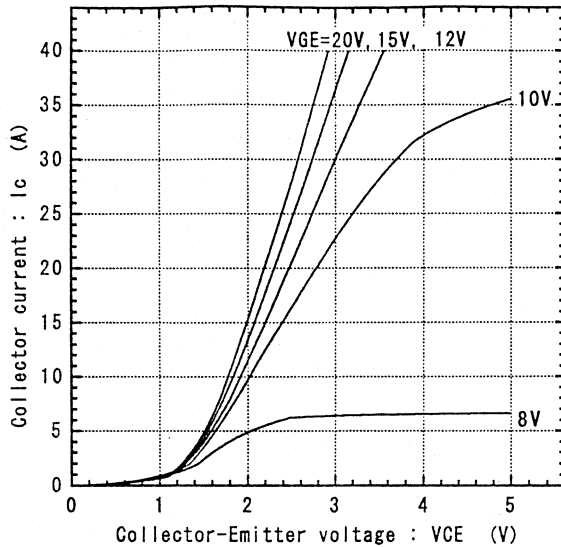
- **Electrical Characteristics** (at $T_j=25^{\circ}\text{C}$)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0V$ $V_{CE}=600V$			1.0	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$ $V_{GE}=\pm 20V$			100	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=10mA$	5.5		8.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=10A$			2.8	V
Input capacitance	C_{ies}	$V_{GE}=0V$		1300		pF
Output capacitance	C_{oes}	$V_{CE}=10V$		300		
Reverse Transfer capacitance	C_{res}	$f=1MHz$		72		
Turn-on Time	t_{ON}	$V_{CC}=300V$			1.2	μs
	t_r	$I_C=20A$			1.0	
Turn-off Time	t_{OFF}	$V_{GE}=\pm 15V$			1.0	
	t_f	$R_G=120\Omega$			0.35	
Diode Forward On-Voltage	V_F	$I_F=20A$ $V_{GE}=0V$			3.0	V
Reverse Recovery Time	t_{rr}	$I_F=20A$			300	ns

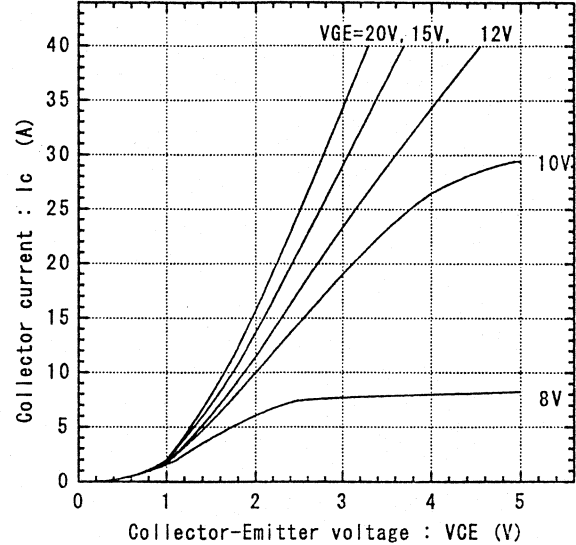
- **Thermal Characteristics**

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			1.79	°C/W
	$R_{th(j-c)}$	Diode			2.50	
	$R_{th(c-f)}$	With Thermal Compound		0.06		

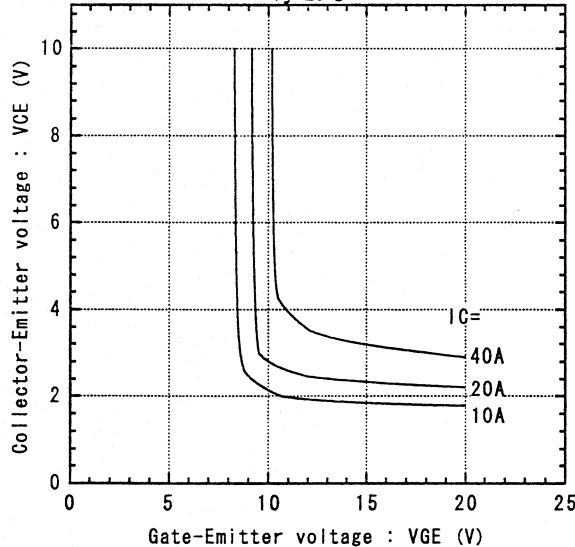
Collector-Emitter voltage vs. Collector current
 $T_j=25^\circ\text{C}$



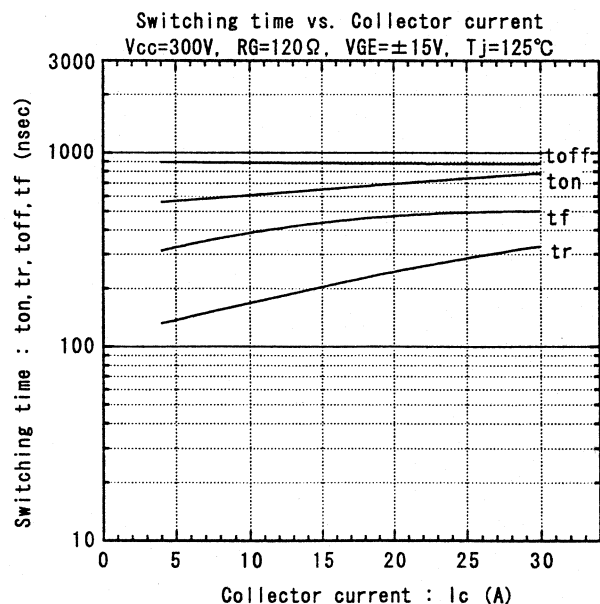
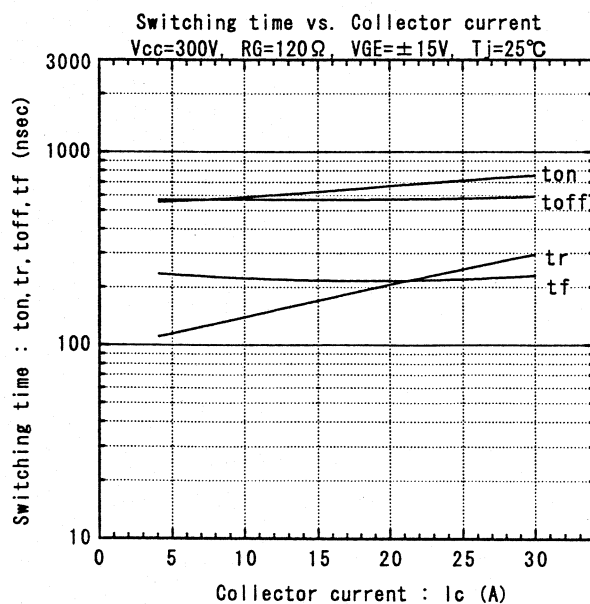
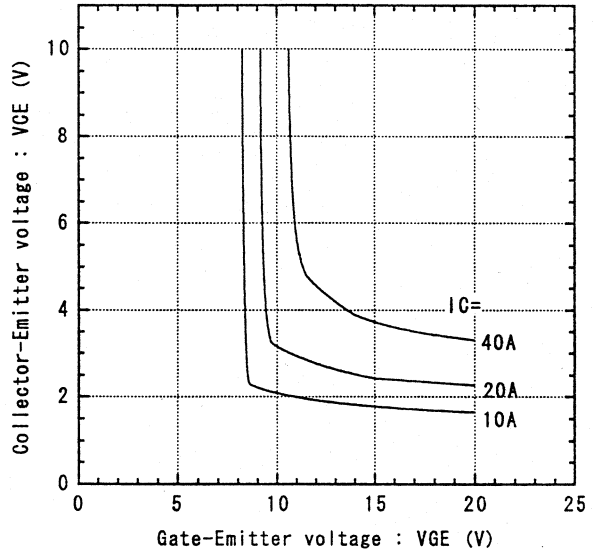
Collector-Emitter voltage vs. Collector current
 $T_j=125^\circ\text{C}$

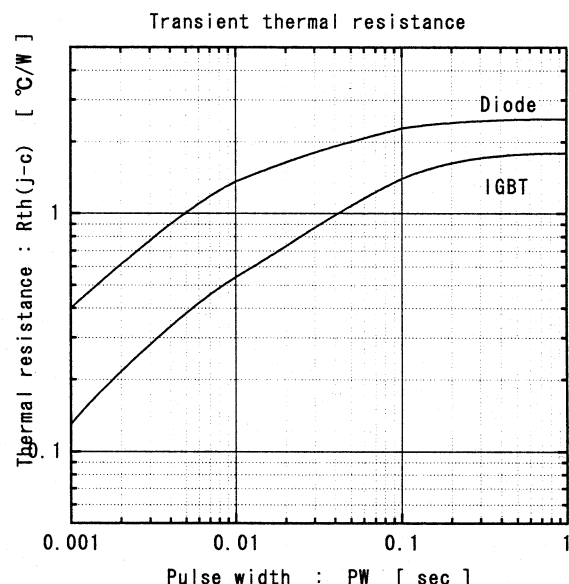
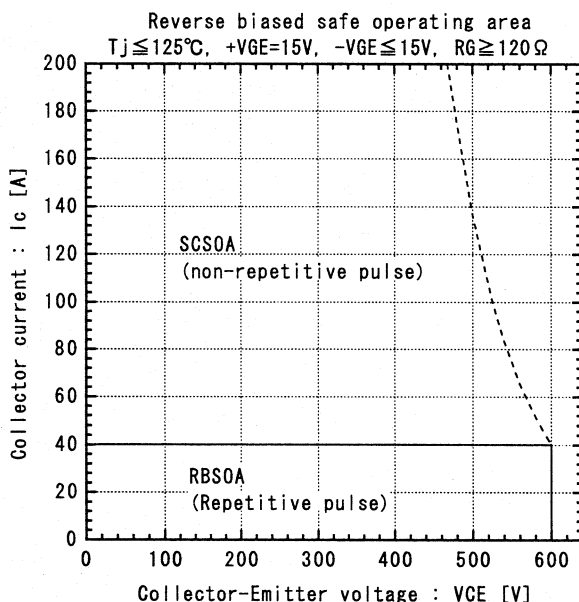
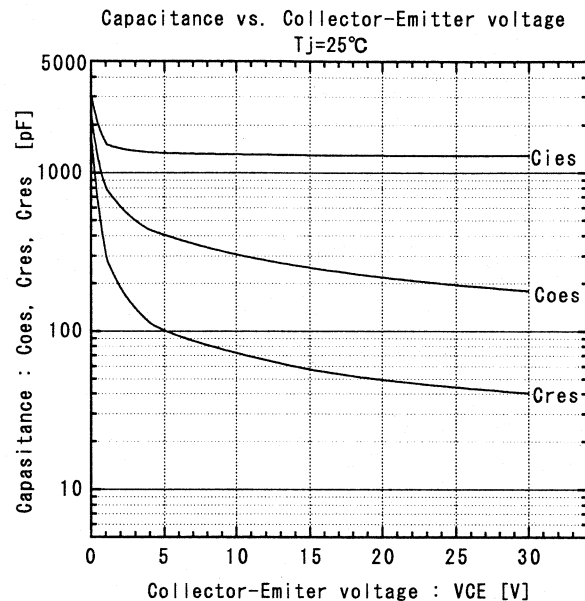
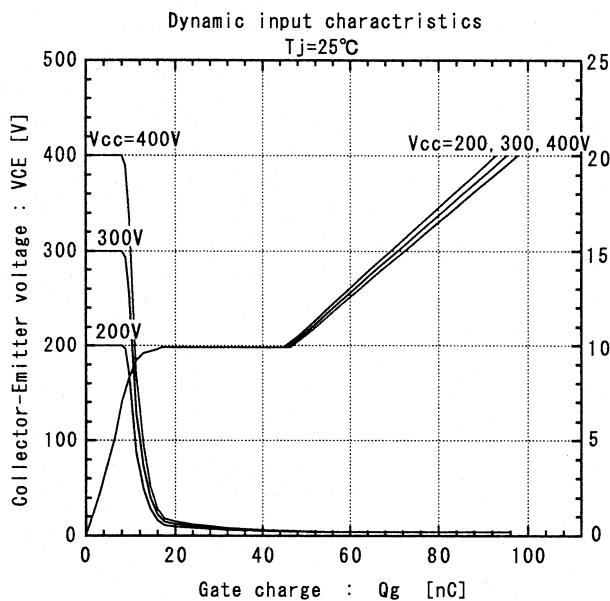
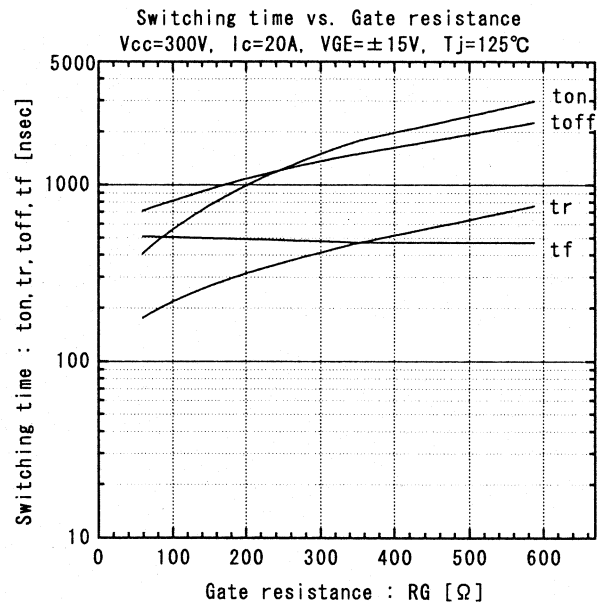
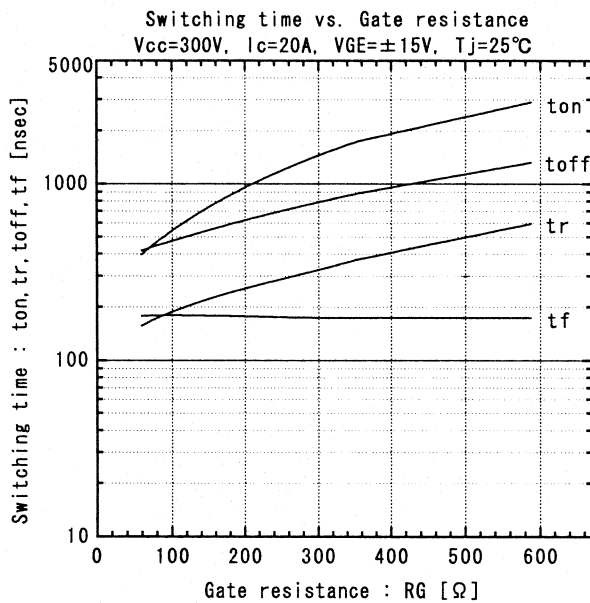


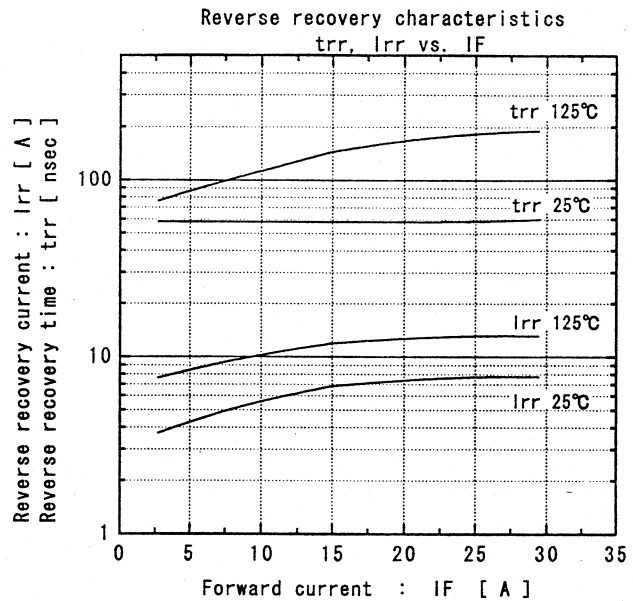
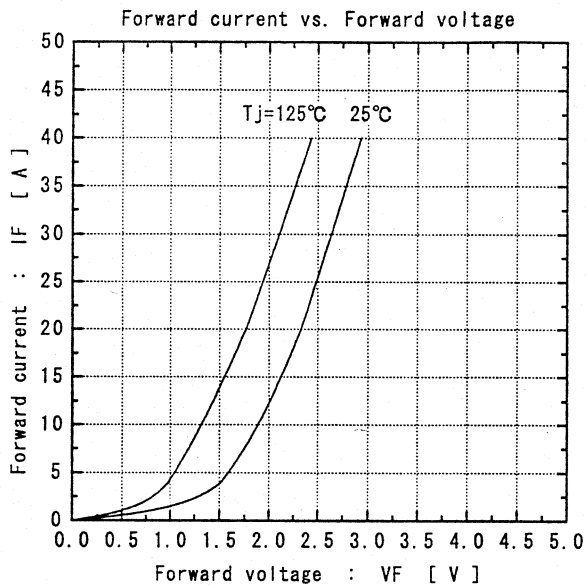
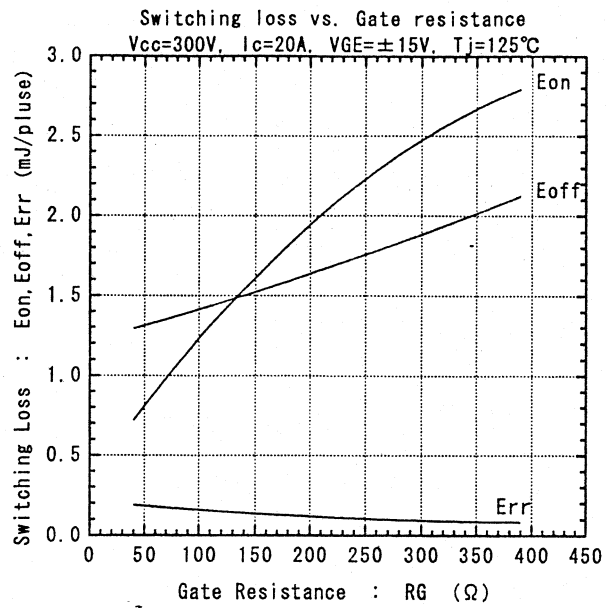
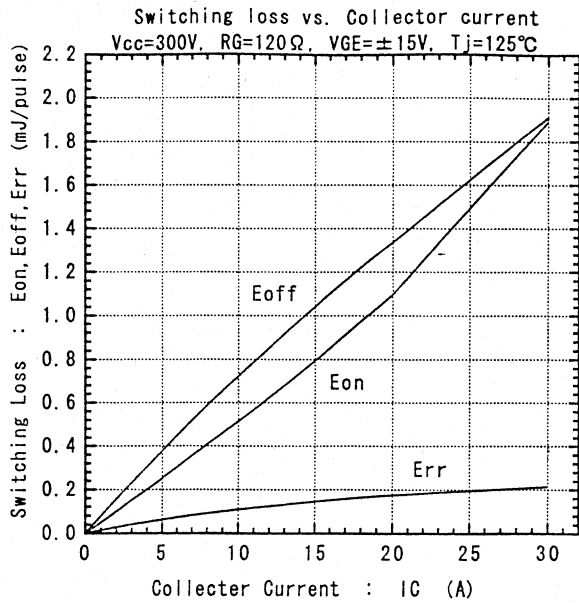
Collector-Emitter vs. Gate-Emitter voltage
 $T_j=25^\circ\text{C}$



Collector-Emitter vs. Gate-Emitter voltage
 $T_j=125^\circ\text{C}$







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