

## IGBT MODULE ( Single-in-Line )

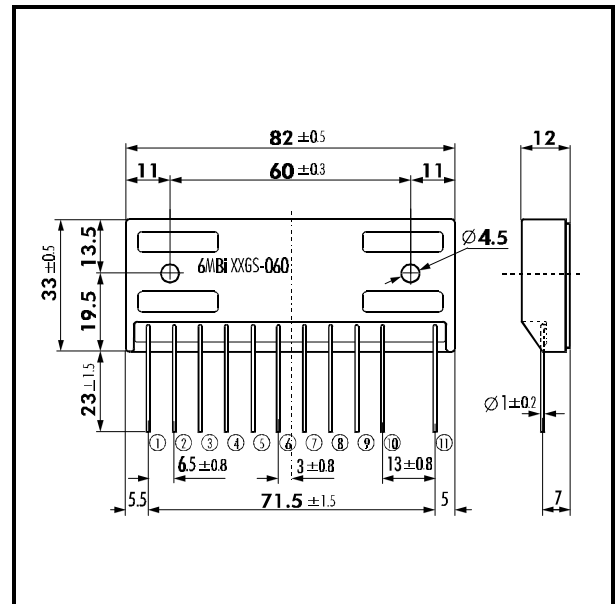
## ■ Outline Drawing

### ■ 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



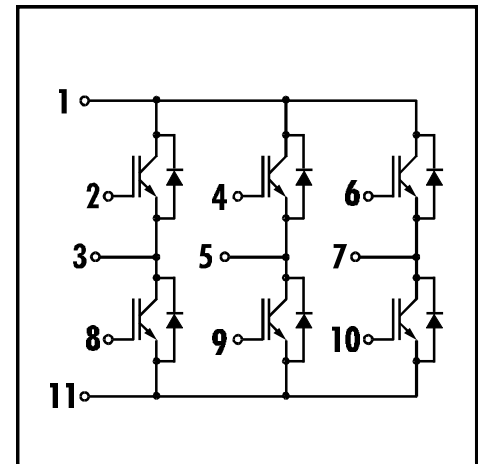
## ■ Maximum Ratings and Characteristics

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

Items	Symbols	Ratings	Units
Collector-Emitter Voltage	$V_{CES}$	600	V
Gate -Emitter Voltage	$V_{GES}$	$\pm 20$	V
Collector Current	Continuous	$I_C$	15
	1ms	$I_C \text{ PULSE}$	30
	Continuous	$-I_C$	15
	1ms	$-I_C \text{ PULSE}$	30
Max. Power Dissipation	$P_C$	60	W
Operating Temperature	$T_j$	+150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +125	$^\circ\text{C}$
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	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=15mA$	5.5		8.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=15A$			2.8	V
Input capacitance	$C_{ies}$	$V_{GE}=0V$		975		pF
Output capacitance	$C_{oes}$	$V_{CE}=10V$		225		
Reverse Transfer capacitance	$C_{res}$	$f=1MHz$		54		
Turn-on Time	$t_{ON}$	$V_{CC}=300V$			1.2	$\mu\text{s}$
	$t_r$	$I_C=15A$			1.0	
Turn-off Time	$t_{OFF}$	$V_{GE}=\pm 15V$			1.0	
	$t_f$	$R_G=150\Omega$			0.35	
Diode Forward On-Voltage	$V_F$	$I_F=15A$ $V_{GE}=0V$			3.0	V
Reverse Recovery Time	$t_{rr}$	$I_F=15A$			300	ns

### • Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(f-c)}$	IGBT			2.08	$^\circ\text{C/W}$
	$R_{th(f-d)}$	Diode			3.00	
	$R_{th(c-f)}$	With Thermal Compound		0.06		