

IGBT MODULE

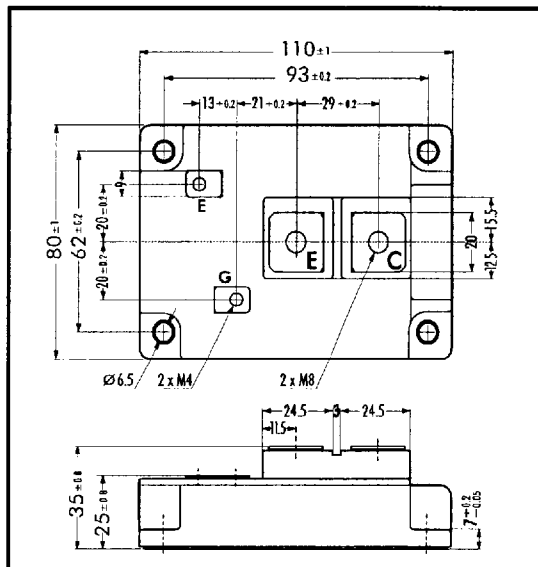
n Outline Drawing

n Features

- *Square RBSOA*
- *Low Saturation Voltage*
- *Less Total Power Dissipation*
- *Improved FWD Characteristic*
- *Minimized Internal Stray Inductance*

n Applications

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



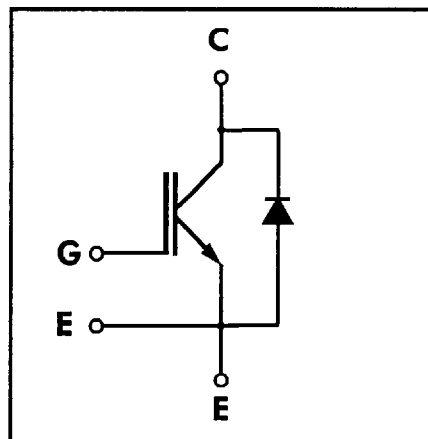
n Maximum Ratings and Characteristics

n Equivalent Circuit

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

Items		Symbols	Ratings	Units
Collector-Emitter Voltage		V_{CES}	1400	V
Gate -Emitter Voltage		V_{GES}	± 20	V
Collector Current	Continuous (25°C / 80°C)	I_C	800 / 600	A
	1ms (25°C / 80°C)	I_C PULSE	1600 / 1200	
	Continuous	$-I_C$	600	
	1ms	$-I_C$ PULSE	1200	
Max. Power Dissipation		P_C	4100	W
Operating Temperature		T_J	+150	°C
Storage Temperature		T_{stg}	-40 -- +125	°C
Isolation Voltage	A.C. 1min.	V_{is}	2500	V
Screw Torque		Mounting *1	4.5	Nm
		Terminals *2	11.0	
		Terminals *3	1.7	

Note: *1:Recommendable Value; 4.0 ± 0.5 Nm (M6)
 *2:Recommendable Value; 10.0 ± 1.0 Nm (M8)
 *3:Recommendable Value; 1.5 ± 0.2 Nm (M4)



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

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0V$ $V_{CE}=1400V$			2.0	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$ $V_{GE}=\pm 20V$			± 0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=600mA$	6.0	8.0	9.0	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=600A$		2.85	3.2	V
Input capacitance	C_{ies}	$V_{GE}=0V$		60		nF
Output capacitance	C_{oes}	$V_{CE}=10V$		9		
Reverse Transfer capacitance	C_{res}	$f=1MHz$		4		
Turn-on Time	t_{ON}	$V_{CC}=600V$		0.75	1.20	μs
	t_r	$I_C=600A$		0.02	0.60	
Turn-off Time	t_{OFF}	$V_{GE}=\pm 15V$		0.65	1.00	
	t_r	$R_G=2.0\Omega$		0.01	0.30	
Diode Forward On-Voltage	V_F	$I_F=600A$ $V_{GE}=0V$			3.4	V
Reverse Recovery Time	t_{rr}	$I_F=600A$, $V_{GE}=-15V$			350	ns

- **Thermal Characteristics**

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			0.03	°C/W
	$R_{th(l-c)}$	Diode			0.06	
	$R_{th(c-f)}$	With Thermal Compound		0.0063		

