

## IGBT MODULE ( P-Series )

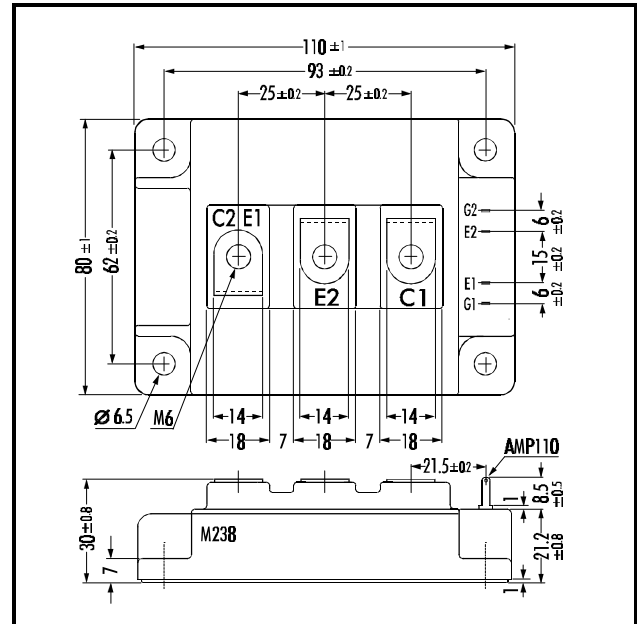
## ■ Outline Drawing

### ■ Features

- Square SC SOA at 10 x I<sub>C</sub>
- Simplified Parallel Connection
- Narrow Distribution of Characteristics
- High Short Circuit Withstand-Capability

### ■ Applications

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



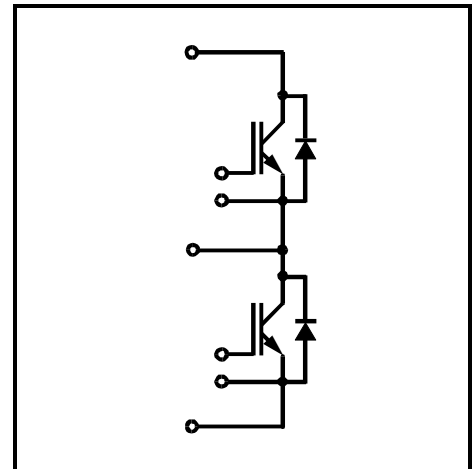
## ■ Maximum Ratings and Characteristics

### • Absolute Maximum Ratings ( T<sub>C</sub>=25°C )

Items	Symbols	Rated Values	Units
Collector-Emitter Voltage	V <sub>CE</sub> S	1400	V
Gate -Emitter Voltage	V <sub>GE</sub> S	± 20	V
Collector Current	I <sub>C</sub>	Continuous T <sub>C</sub> =25°C	400
		Continuous T <sub>C</sub> =80°C	300
	I <sub>C</sub> PULSE	1ms T <sub>C</sub> =25°C	800
		1ms T <sub>C</sub> =80°C	600
		-I <sub>C</sub>	300
	-I <sub>C</sub> PULSE	600	
Max. Power Dissipation	P <sub>C</sub>	2500	W
Operating Temperature	T <sub>j</sub>	+150	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +125	°C
Isolation Voltage	A.C. 1min. V <sub>is</sub>	2500	V
Screw Torque	Mounting *1	3.5	Nm
	Terminals *2	4.5	

Note: \*1:Recommendable Value; 2.5 - 3.5 Nm (M5) or (M6)  
\*2:Recommendable Value; 3.5 - 4.5 Nm (M6)

## ■ Equivalent Circuit

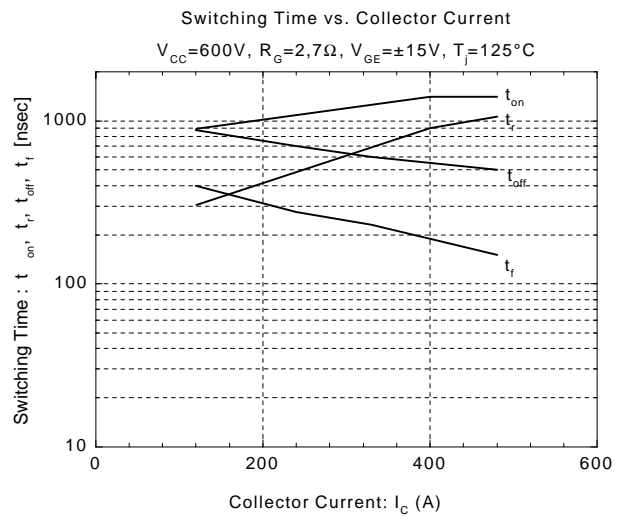
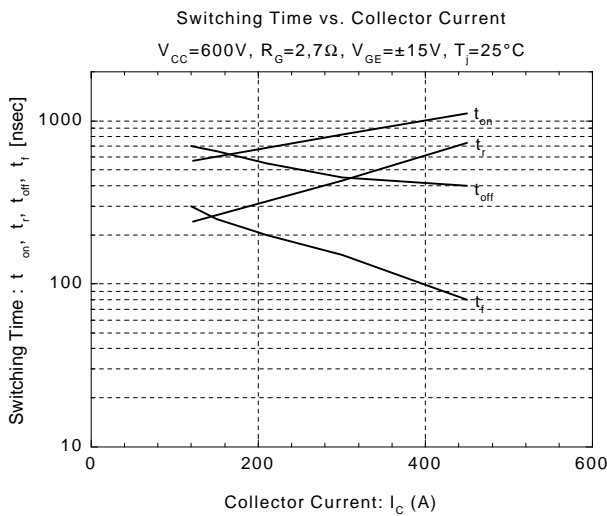
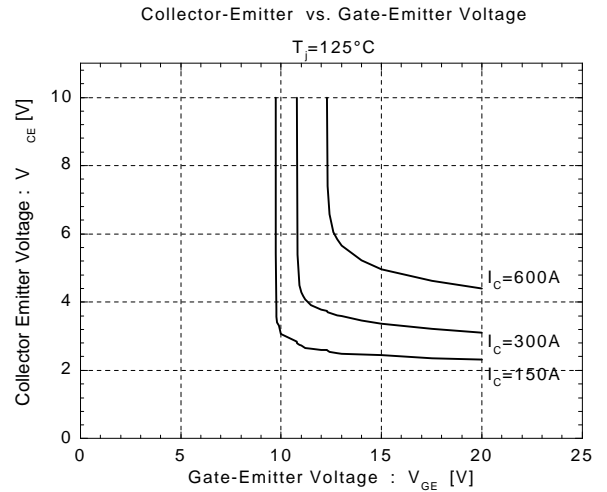
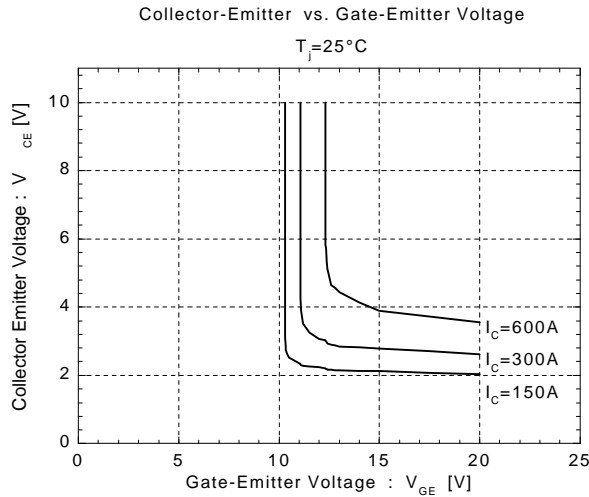
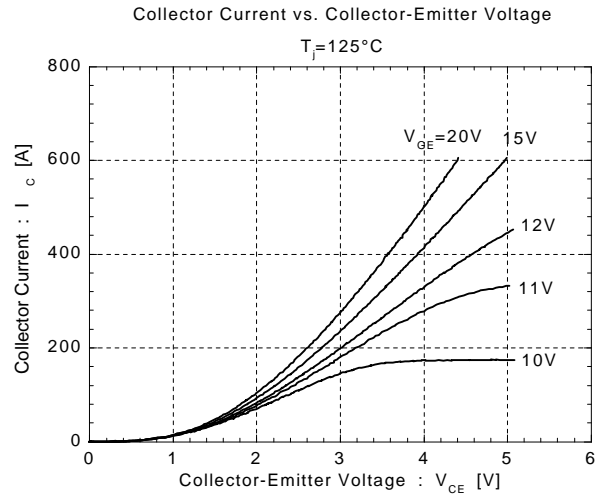
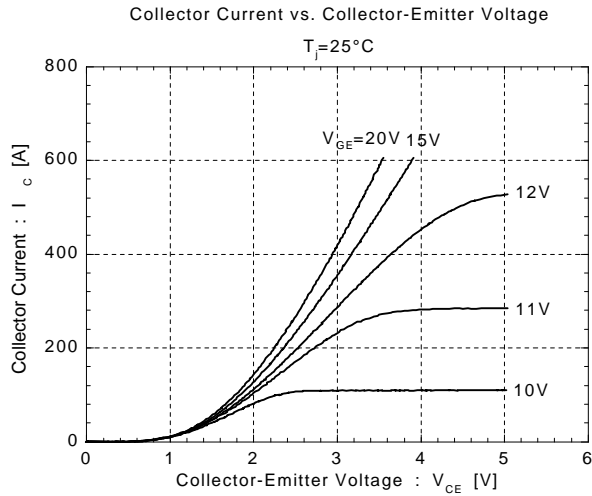


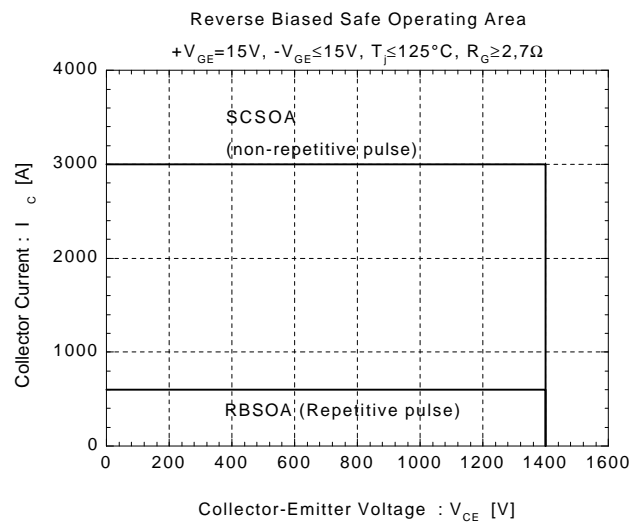
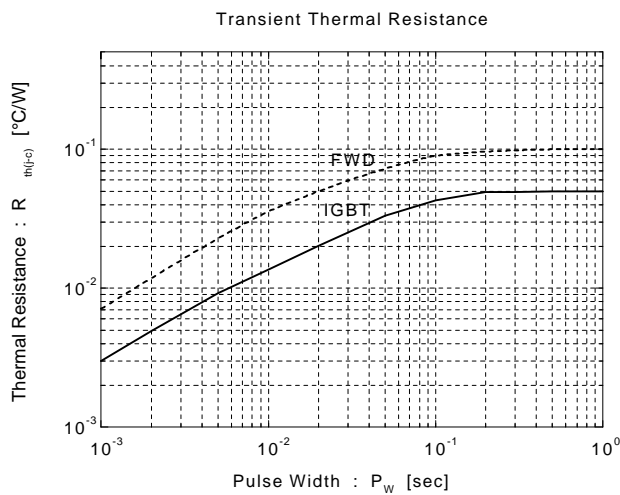
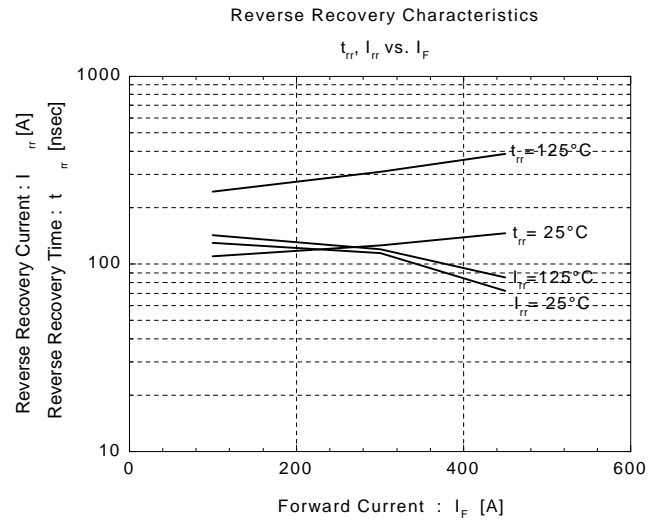
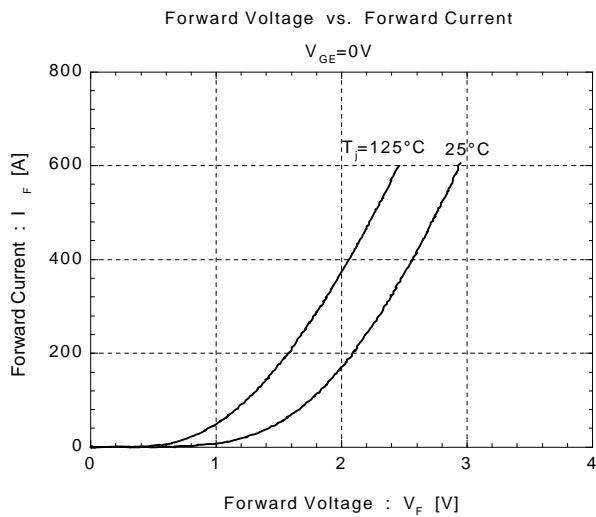
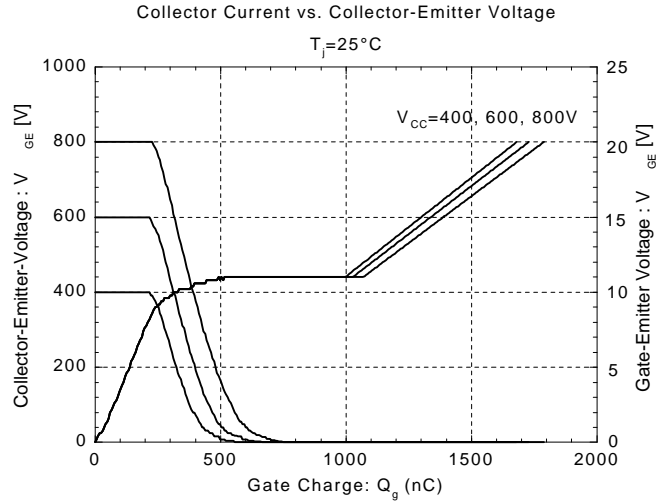
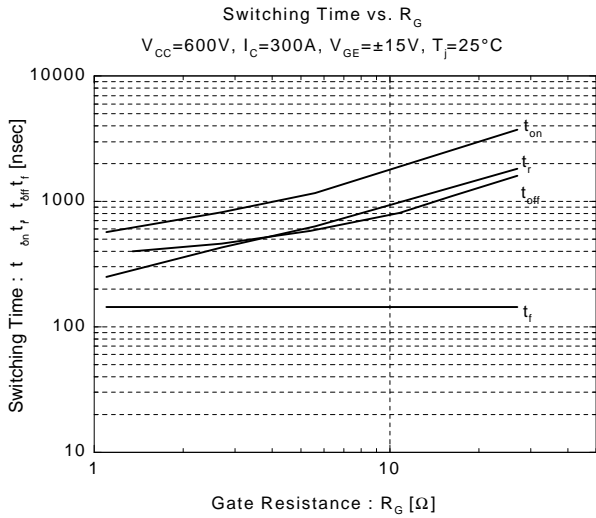
### • Electrical Characteristics ( at T<sub>J</sub>=25°C )

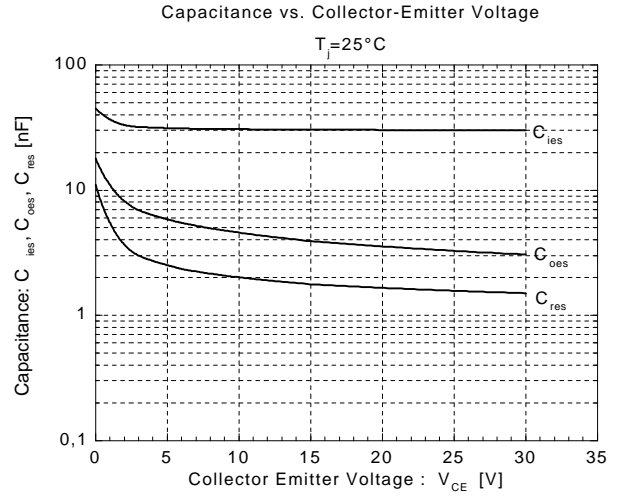
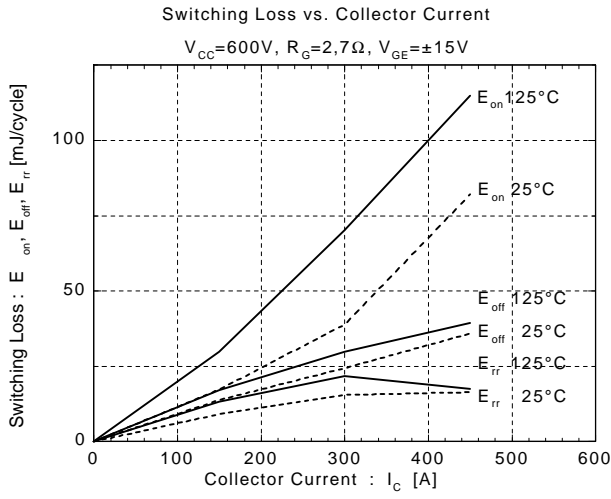
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I <sub>CE</sub> S	V <sub>GE</sub> =0V V <sub>CE</sub> =1400V			3.0	mA
Gate-Emitter Leakage Current	I <sub>GE</sub> S	V <sub>CE</sub> =0V V <sub>GE</sub> =± 20V			600	µA
Gate-Emitter Threshold Voltage	V <sub>GE(th)</sub>	V <sub>GE</sub> =20V I <sub>C</sub> =300mA	6.0	8.0	9.0	V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	T <sub>J</sub> = 25°C V <sub>GE</sub> =15V I <sub>C</sub> =300A		2.7	3.0	V
		T <sub>J</sub> =125°C V <sub>GE</sub> =15V I <sub>C</sub> =300A		3.3		
Input capacitance	C <sub>ies</sub>	V <sub>GE</sub> =0V		30000		pF
Output capacitance	C <sub>oes</sub>	V <sub>CE</sub> =10V		4500		
Reverse Transfer capacitance	C <sub>res</sub>	f=1MHz		2000		
Turn-on Time	t <sub>ON</sub>	V <sub>CC</sub> =600V			1.2	µs
	t <sub>r</sub>	I <sub>C</sub> =300A			0.6	
Turn-off Time	t <sub>OFF</sub>	V <sub>GE</sub> =± 15V			1.0	
	t <sub>f</sub>	R <sub>G</sub> =2.7Ω			0.3	
Diode Forward On-Voltage	V <sub>F</sub>	I <sub>F</sub> =300A V <sub>GE</sub> =0V		2.4	3.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =300A			350	ns

### • Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R <sub>th(j-c)</sub>	IGBT			0.05	°C/W
	R <sub>th(j-e)</sub>	Diode			0.10	
	R <sub>th(c-f)</sub>	With Thermal Compound		0.0167		







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