

IGBT MODULE (S series) 1200V / 50A / PIM



■ Features

- Low $V_{CE(sat)}$
- Compact package
- P.C. board mount
- Converter diode bridge, Dynamic brake circuit

■ Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

■ Maximum ratings and characteristics

● Absolute maximum ratings ($T_c=25^\circ\text{C}$ unless without specified)

Item		Symbol	Condition		Rating	Unit
Inverter	Collector-Emitter voltage	V _{CES}			1200	V
	Gate-Emitter voltage	V _{GES}			±20	V
	Collector current	I _C	Continuous	T _C =25°C	75	A
				T _C =80°C	50	
		I _{CP}	1ms	T _C =25°C	150	A
				T _C =80°C	100	
	-I _C			50	A	
Collector power dissipation	P _C	1 device		360	W	
Brake	Collector-Emitter voltage	V _{CES}			1200	V
	Gate-Emitter voltage	V _{GES}			±20	V
	Collector current	I _C	Continuous	T _C =25°C	35	A
				T _C =80°C	25	
		I _{CP}	1ms	T _C =25°C	70	A
				T _C =80°C	50	
	Collector power dissipation	P _C	1 device		180	W
Repetitive peak reverse voltage	V _{R_{RRM}}			1200	V	
Converter	Repetitive peak reverse voltage	V _{R_{RRM}}			1600	V
	Average output current	I _O	50Hz/60Hz sine wave		50	A
	Surge current (Non-Repetitive)	I _{FSM}	T _J =150°C, 10ms half sine wave		520	A
	I ² t (Non-Repetitive)	I ² t			1352	A ² s
Operating junction temperature		T _J			+150	°C
Storage temperature		T _{stg}			-40 to +125	°C
Isolation voltage	between terminal and copper base *2	V _{iso}	AC : 1 minute		AC 2500	V
	between thermistor and others *3				AC 2500	
Mounting screw torque					3.5 * ₁	N·m

*1 Recommendable value : 2.5 to 3.5 N·m (M5)

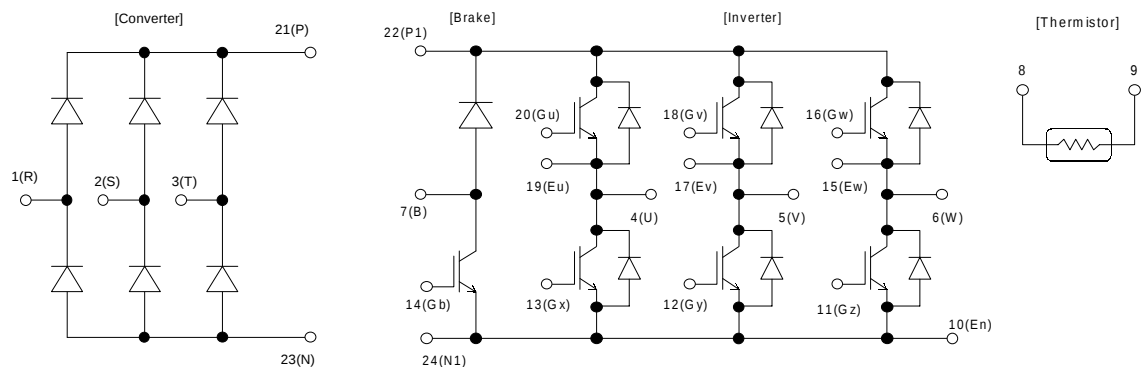
*2 All terminals should be connected together when isolation test will be done.

*3 Terminal 8 and 9 should be connected together. Terminal 1 to 7 and 10 to 24 should be connected together and shorted to copper base.

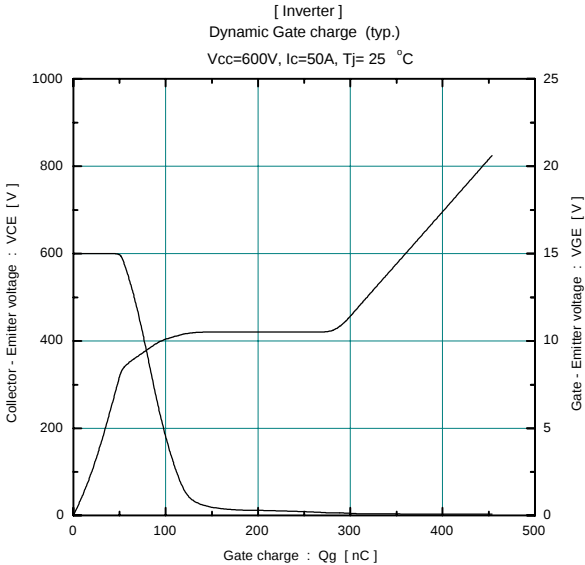
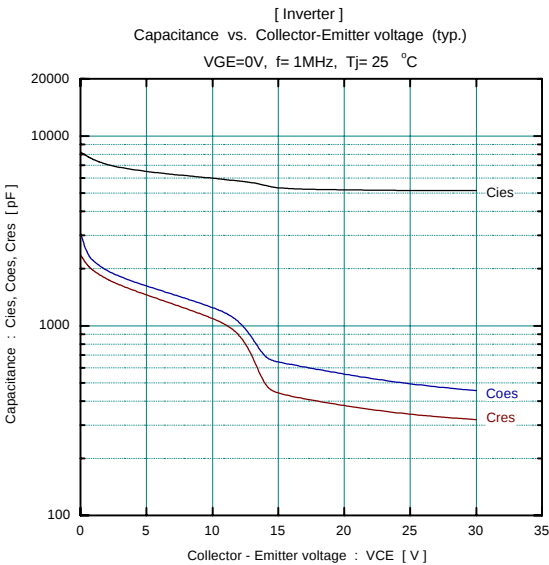
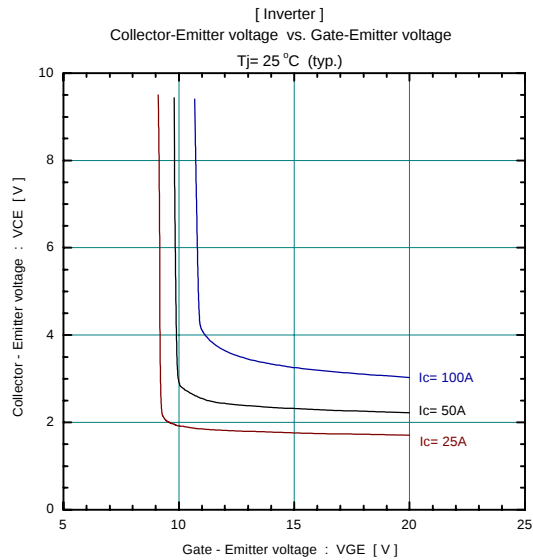
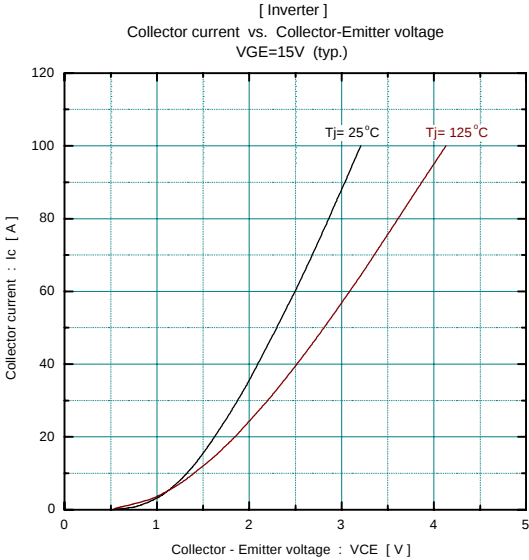
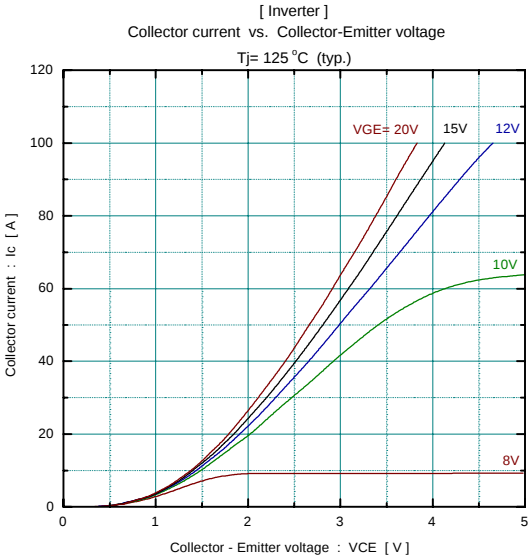
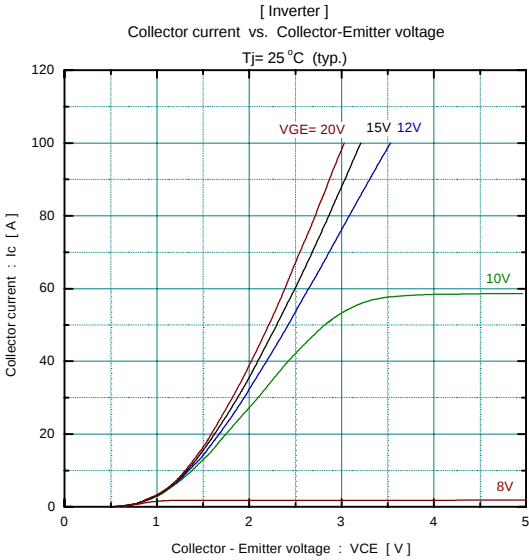
● Electrical characteristics (Tj=25°C unless otherwise specified)									
Item		Symbol	Condition		Characteristics			Unit	
					Min.	Typ.	Max.		
Inverter	Zero gate voltage collector current	ICES	VCE=1200V, VGE=0V				1.0	mA	
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				0.2	μA	
	Gate-Emitter threshold voltage	VGE(th)	VCE=20V, IC=50mA		5.5	7.2	8.5	V	
	Collector-Emitter saturation voltage	VCE(sat)	VGE=15V, IC=50A	chip		2.1	V		
				terminal		2.3		2.7	
	Input capacitance	Cies	VGE=0V, VCE=10V, f=1MHz			6000		pF	
	Turn-on time	ton	VCC=600V IC=50A VGE=±15V			0.35	1.2	μs	
		tr				0.25	0.6		
		tr(i)				0.1			
	Turn-off	toff	RG=24Ω			0.45	1.0		
		tf				0.08	0.3		
Forward on voltage	VF	IF=50A	chip		2.3		V		
			terminal		2.5	3.3			
Reverse recovery time of FRD	trr	IF=50A				0.35	μs		
Brake	Zero gate voltage collector current	ICES	VCES=1200V, VGE=0V				1.0	mA	
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				0.2	μA	
	Collector-Emitter saturation voltage	VCE(sat)	IC=25A, VGE=15V	chip		2.1	V		
				terminal		2.25		2.7	
	Turn-on time	ton	VCC=600V IC=25A			0.35	1.2	μs	
		tr				0.25	0.6		
	Turn-off time	toff	VGE=±15V RG=51Ω			0.45	1.0		
		tf				0.08	0.3		
Reverse current	IRRM	VR=1200V				1.0	mA		
Converter	Forward on voltage	VFM	IF=50A	chip		1.1	V		
				terminal		1.2		1.5	
Thermistor	Reverse current	IRRM	VR=1600V				1.0	mA	
	Resistance	R	T=25°C			5000		Ω	
			T=100°C		465	495	520		
	B value	B	T=25/50°C		3305	3375	3450	K	

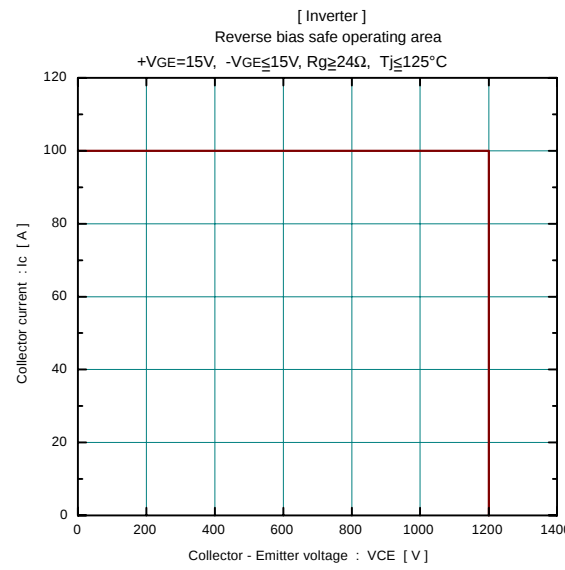
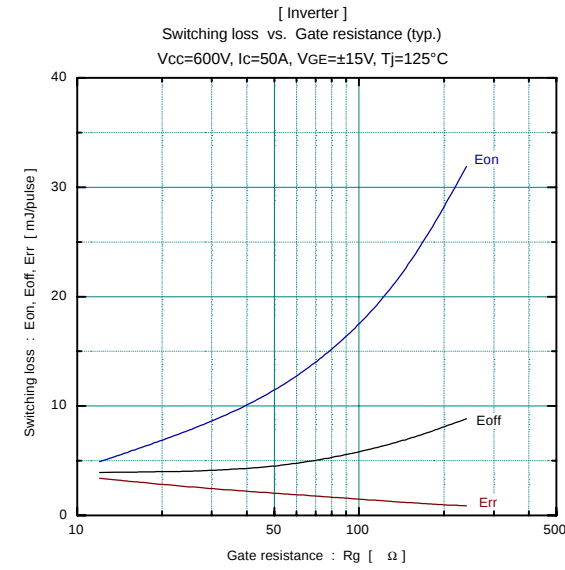
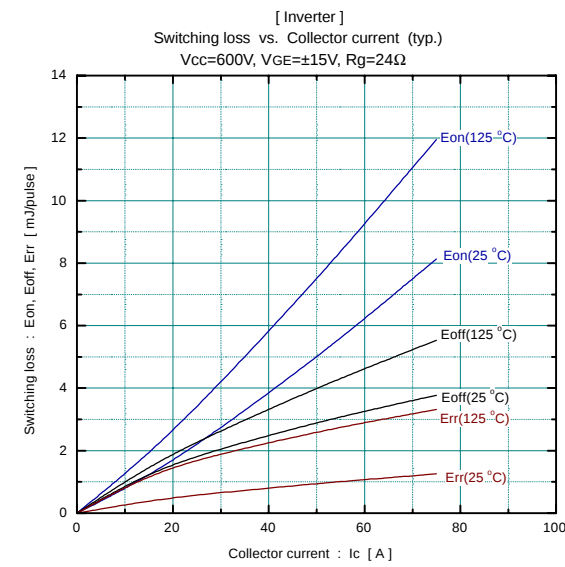
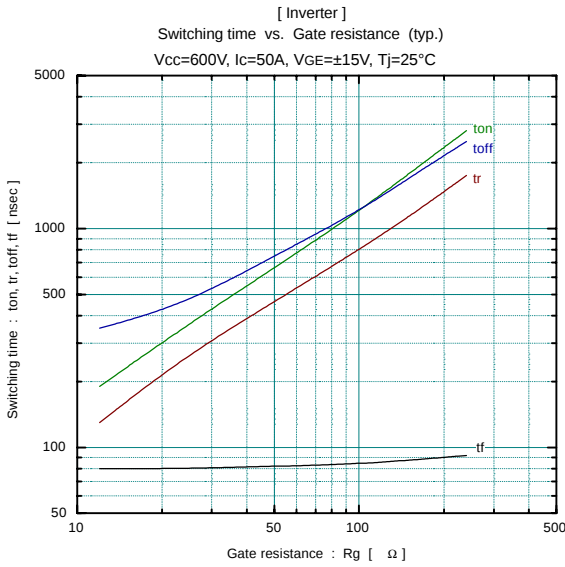
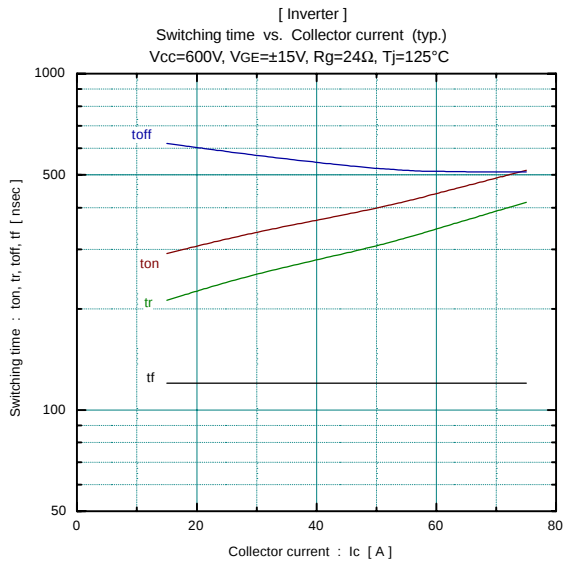
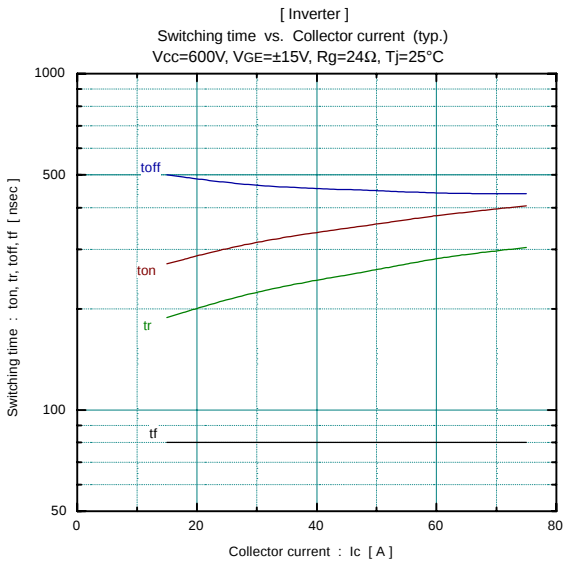
Item	Symbol	Condition	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			0.35	°C/W
		Inverter FWD			0.75	
		Brake IGBT			0.69	
		Converter Diode			0.50	
Contact thermal resistance *	Rth(c-f)	With thermal compound		0.05		

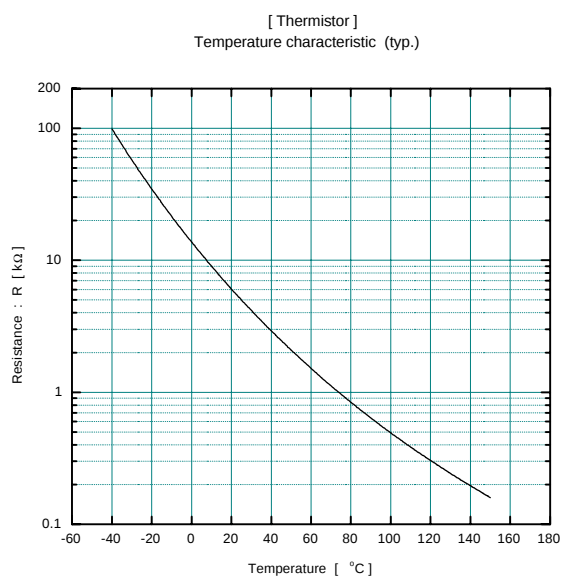
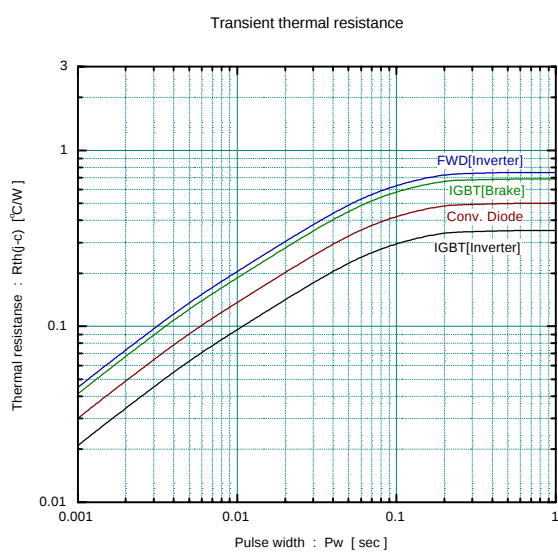
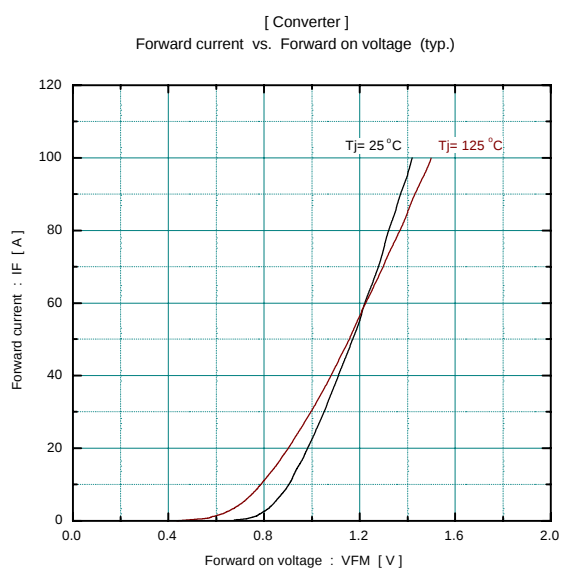
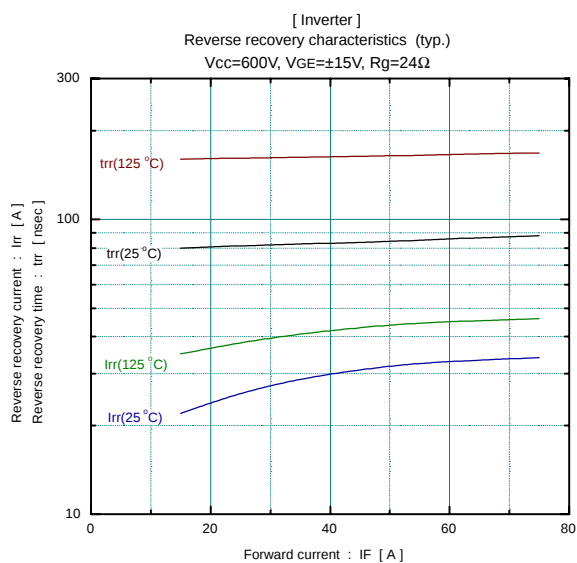
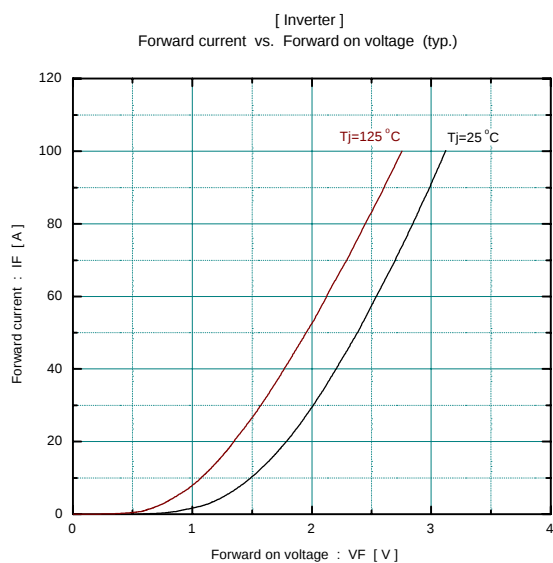
■ Equivalent Circuit Schematic

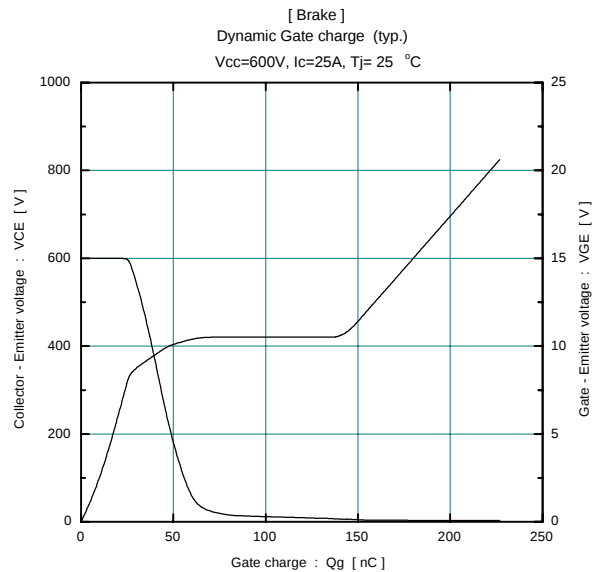
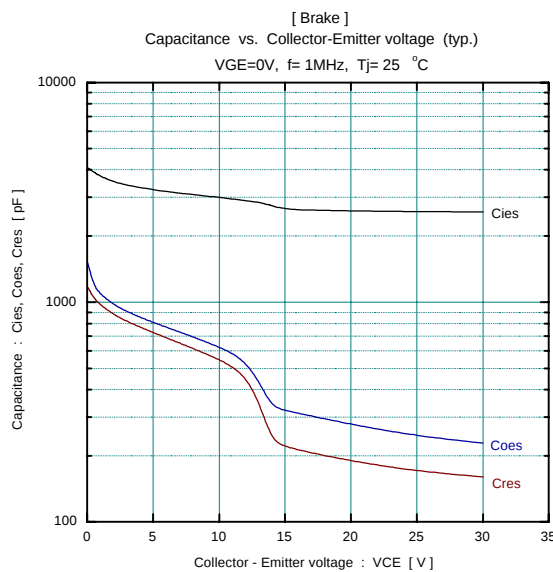
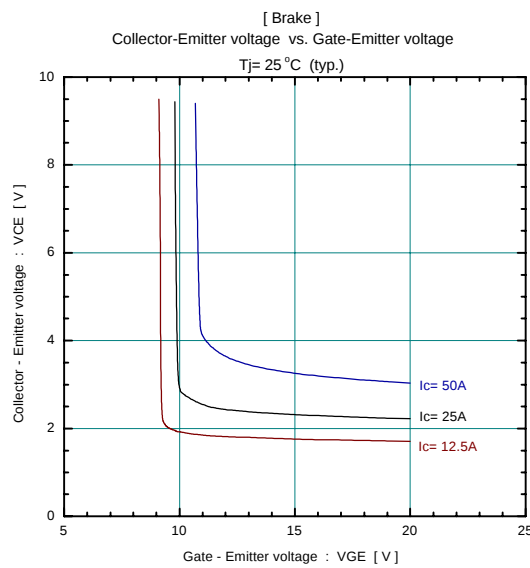
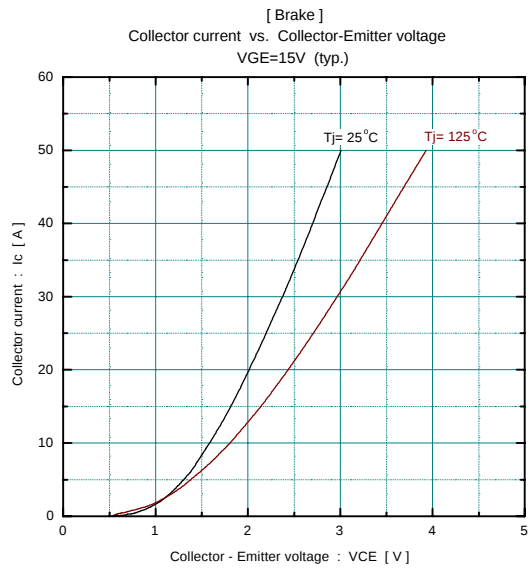
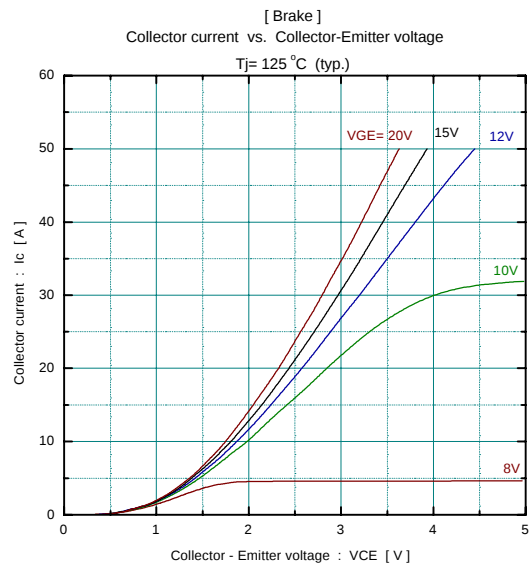
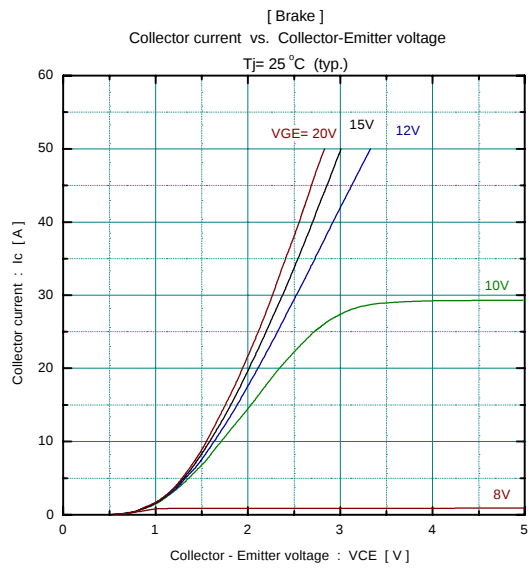


■ Characteristics (Representative)

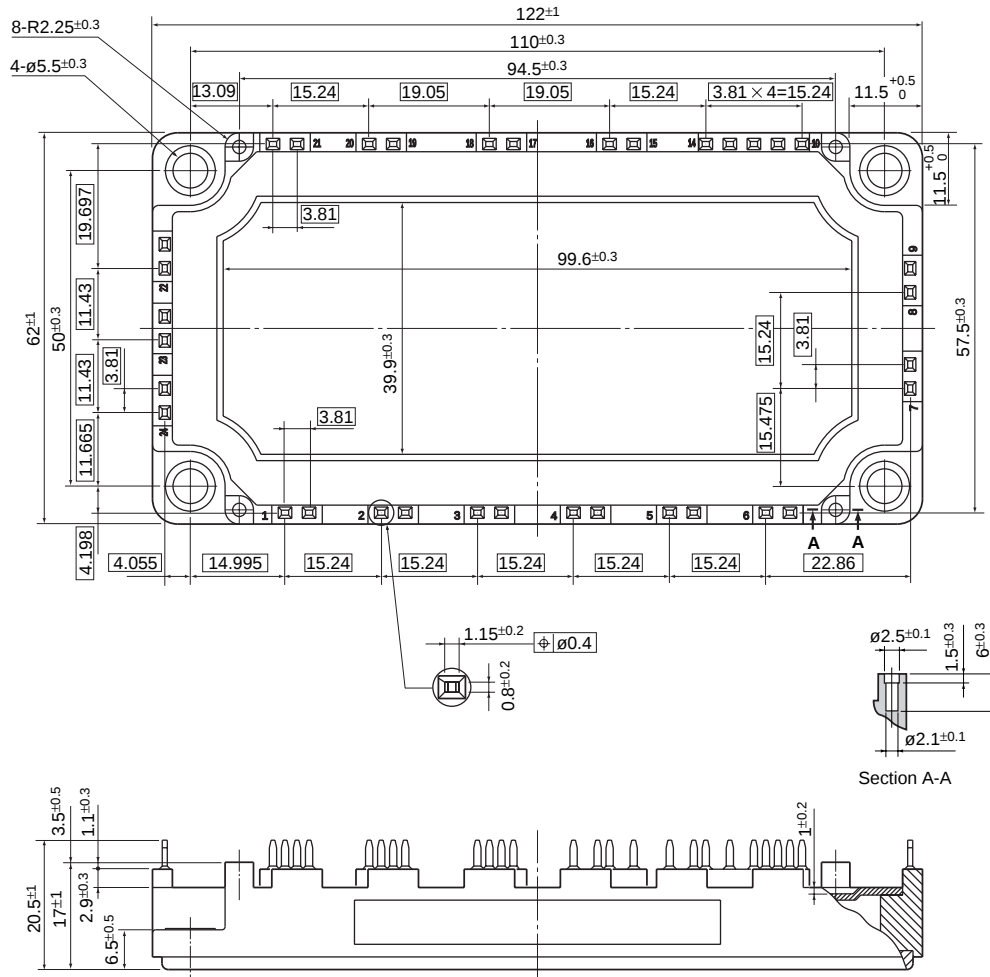








■ Outline Drawings, mm



☐ Shows theory dimensions