

IGBT MODULE (S series) 1200V / 10A / 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	15	A
				T _C =80°C	10	
		I _{CP}	1ms	T _C =25°C	30	A
				T _C =80°C	20	
		-I _C		10	A	
Collector power dissipation	P _C	1 device		75	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	15	A
				T _C =80°C	10	
		I _{CP}	1ms	T _C =25°C	30	A
				T _C =80°C	20	
	Collector power dissipation	P _C	1 device		75	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		10	A
	Surge current (Non-Repetitive)	I _{FSM}	T _j =150°C, 10ms half sine wave		105	A
	I ² t (Non-Repetitive)	I ² t			55	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 (T_j=25°C unless otherwise specified)

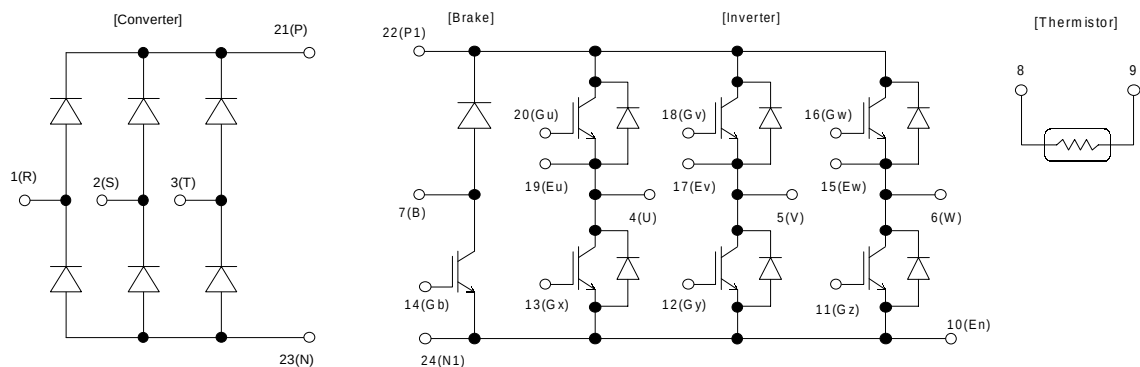
Item		Symbol	Condition	Characteristics			Unit
				Min.	Typ.	Max.	
Inverter	Zero gate voltage collector current	I _{CES}	V _{CE} =1200V, V _{GE} =0V			1.0	mA
	Gate-Emitter leakage current	I _{GES}	V _{CE} =0V, V _{GE} =±20V			0.2	μA
	Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} =20V, I _C =10mA	5.5	7.2	8.5	V
	Collector-Emitter saturation voltage	V _{CE(sat)}	V _{GE} =15V, I _C =10A chip		2.1		V
			terminal		2.15	2.6	
	Input capacitance	C _{ies}	V _{GE} =0V, V _{CE} =10V, f=1MHz		1200		pF
	Turn-on time	t _{on}	V _{CC} =600V		0.35	1.2	μs
		t _r	I _C =10A		0.25	0.6	
		t _{r(i)}	V _{GE} =±15V		0.1		
	Turn-off	t _{off}	R _G =120Ω		0.45	1.0	
		t _f			0.08	0.3	
Brake	Forward on voltage	V _F	I _F =10A chip		2.3		V
			terminal		2.35	3.2	
	Reverse recovery time of FRD	t _{rr}	I _F =10A			0.35	μs
	Zero gate voltage collector current	I _{CES}	V _{CE} =1200V, V _{GE} =0V			1.0	mA
	Gate-Emitter leakage current	I _{GES}	V _{CE} =0V, V _{GE} =±20V			0.2	μA
	Collector-Emitter saturation voltage	V _{CE(sat)}	I _C =10A, V _{GE} =15V chip		2.1		V
			terminal		2.2	2.6	
	Turn-on time	t _{on}	V _{CC} =600V		0.35	1.2	μs
		t _r	I _C =10A		0.25	0.6	
	Turn-off time	t _{off}	V _{GE} =±15V		0.45	1.0	
		t _f	R _G =120 Ω		0.08	0.3	
Converter	Reverse current	I _{RRM}	V _R =1200V			1.0	mA
	Forward on voltage	V _{FM}	I _F =10A chip		1.1		V
			terminal		1.2	1.5	
Thermistor	Reverse current	I _{RRM}	V _R =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

● Thermal resistance Characteristics

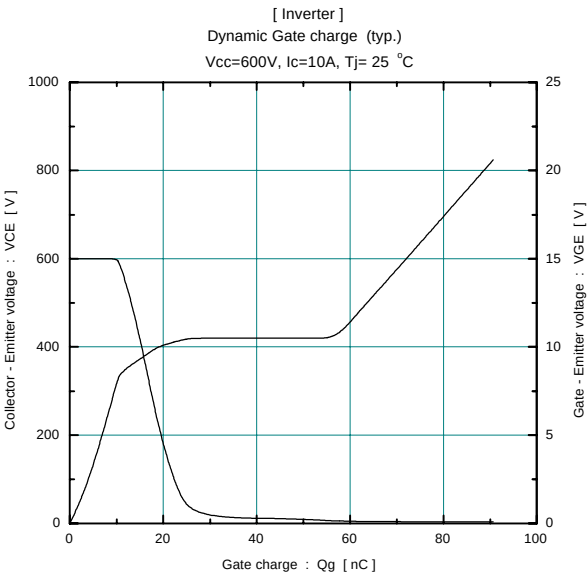
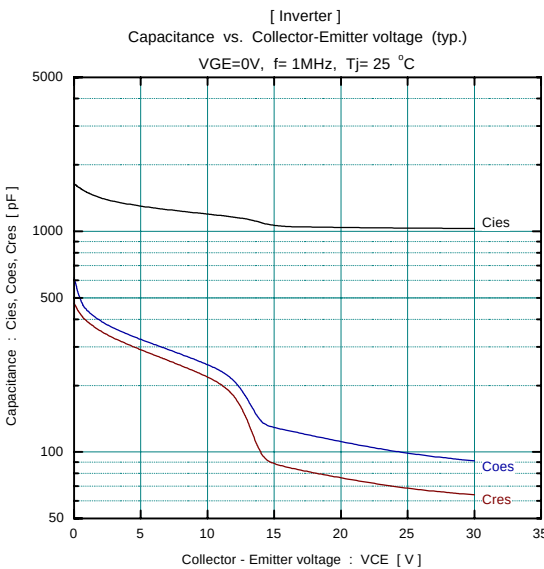
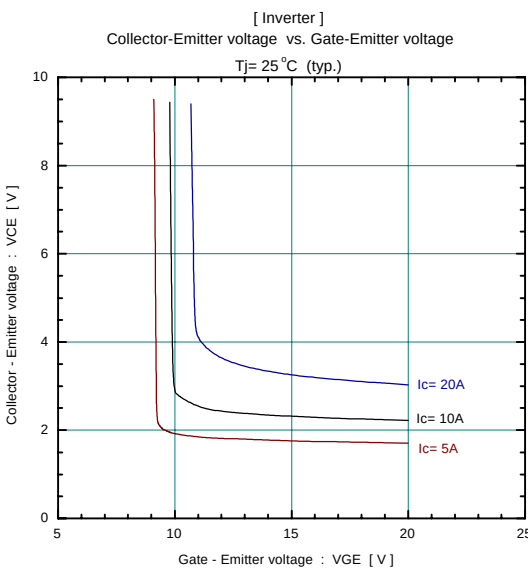
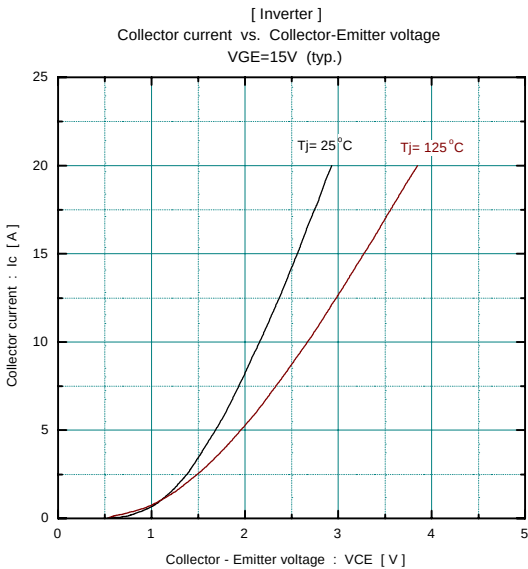
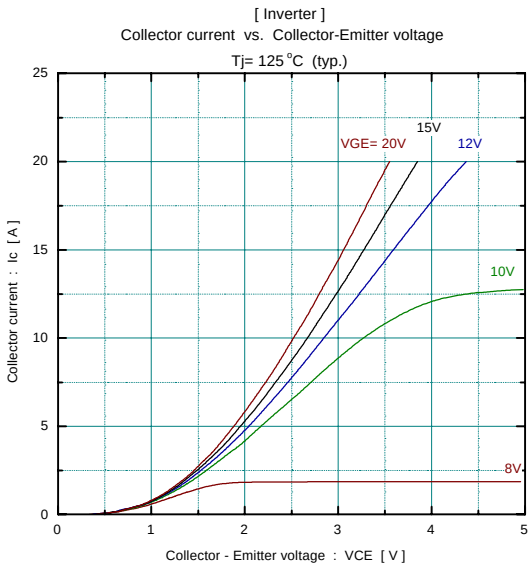
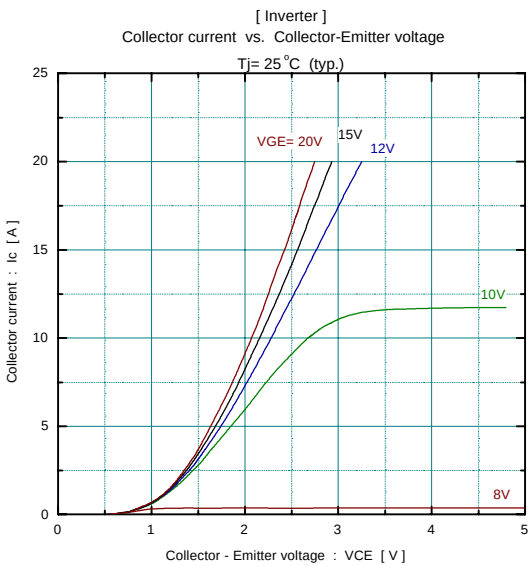
Item		Symbol	Condition	Characteristics			Unit
				Min.	Typ.	Max.	
Thermal resistance (1 device)		R _{th(j-c)}	Inverter IGBT			1.67	°C/W
			Inverter FWD			2.78	
			Brake IGBT			1.67	
			Converter Diode			1.85	
Contact thermal resistance *		R _{th(c-f)}	With thermal compound		0.05		

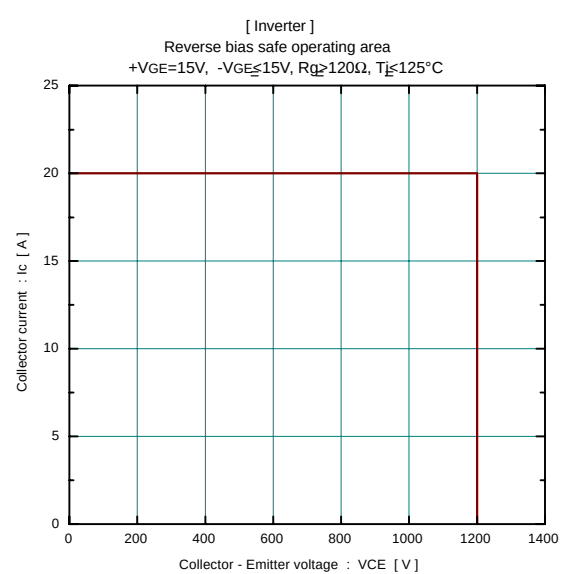
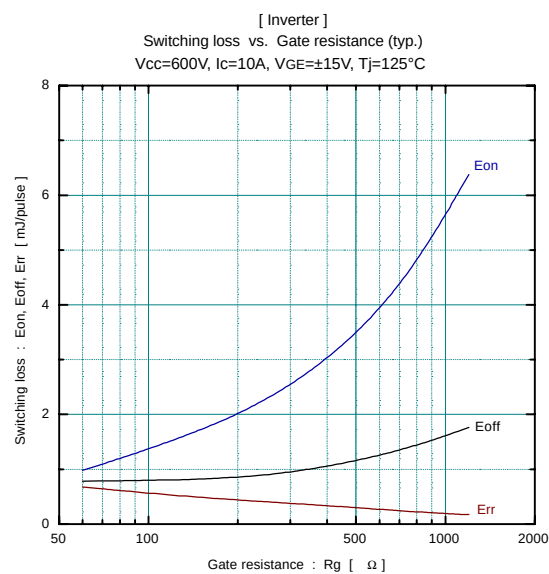
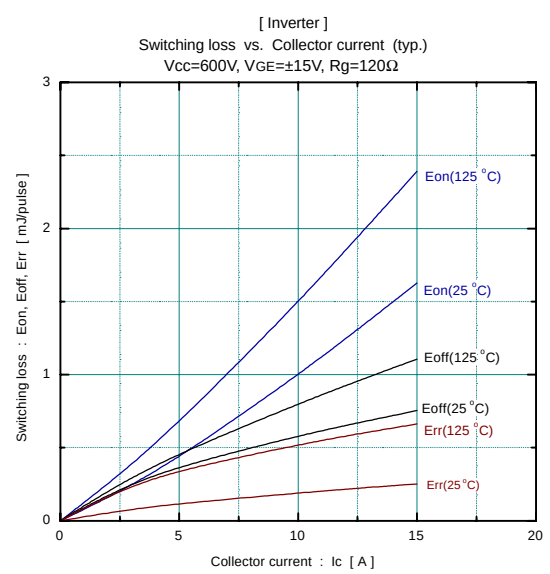
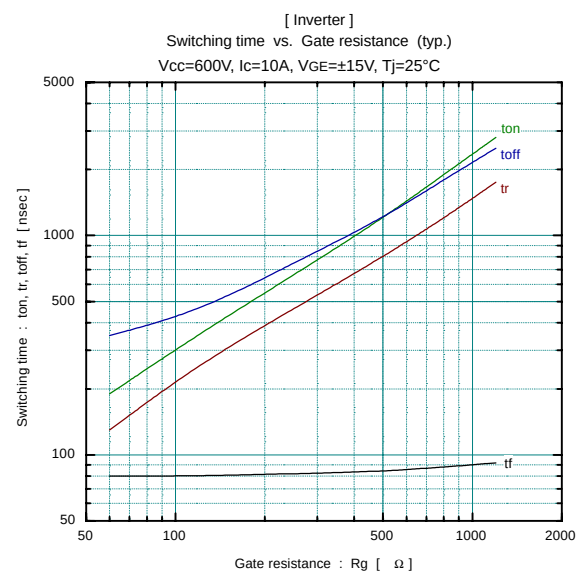
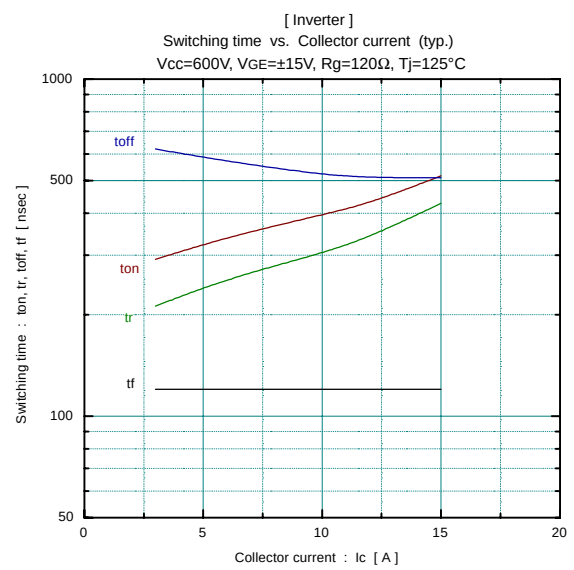
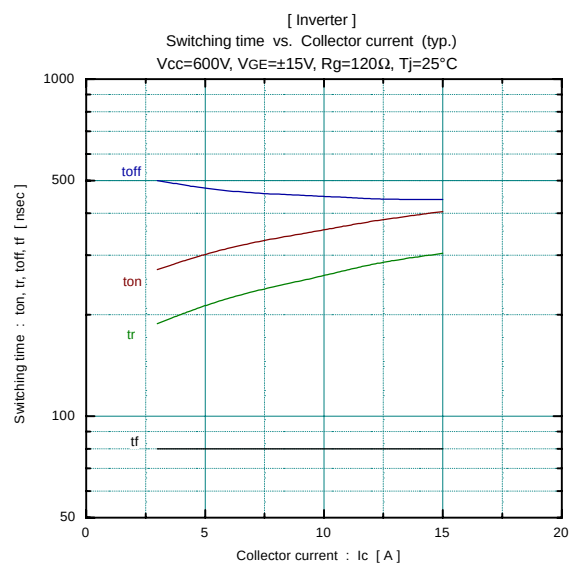
* This is the value which is defined mounting on the additional cooling fin with thermal compound

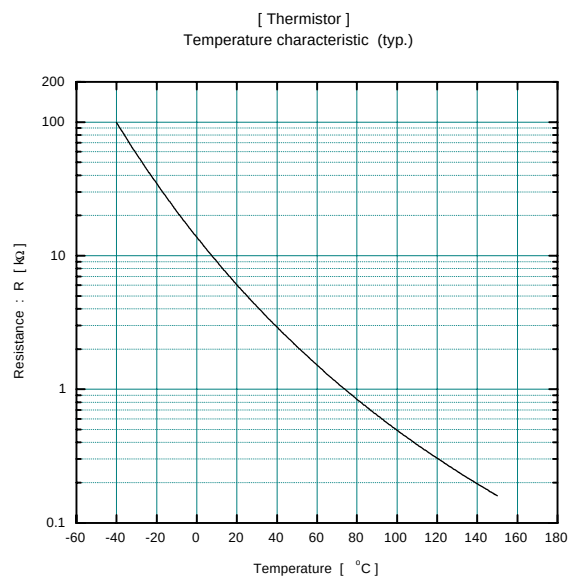
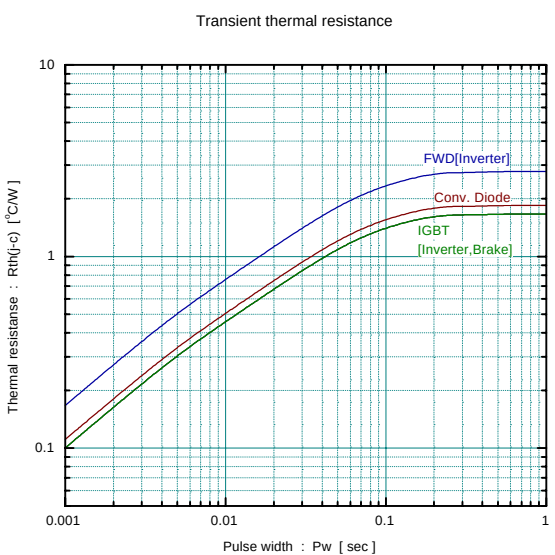
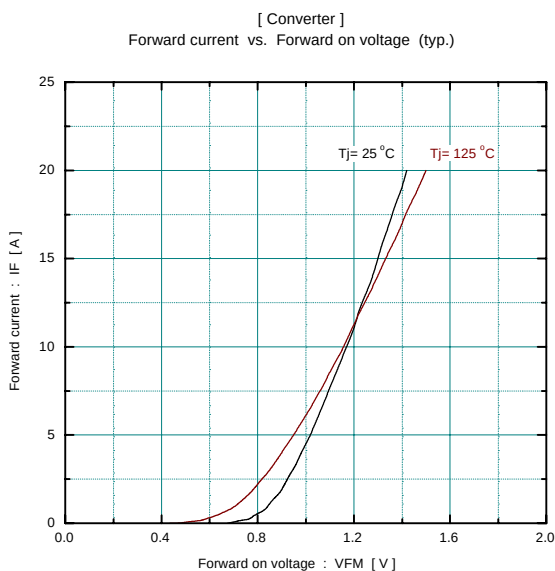
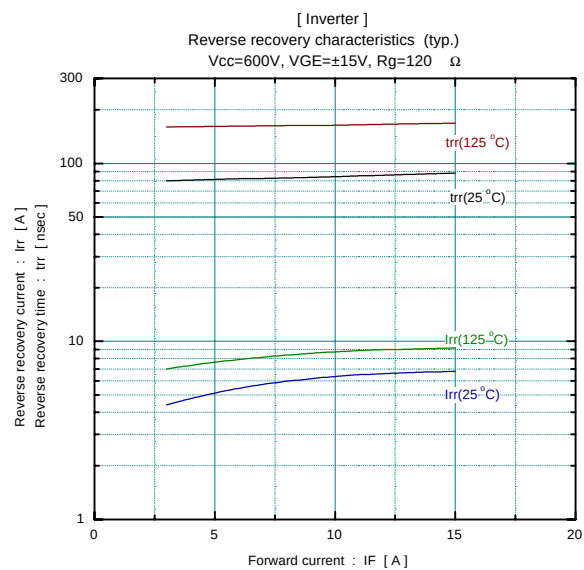
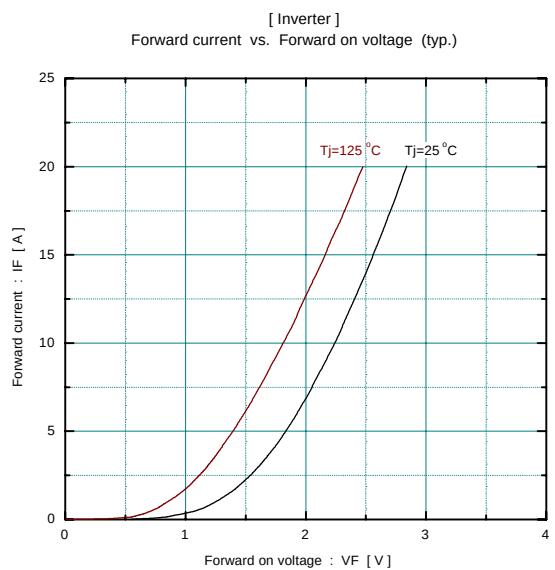
■ Equivalent Circuit Schematic

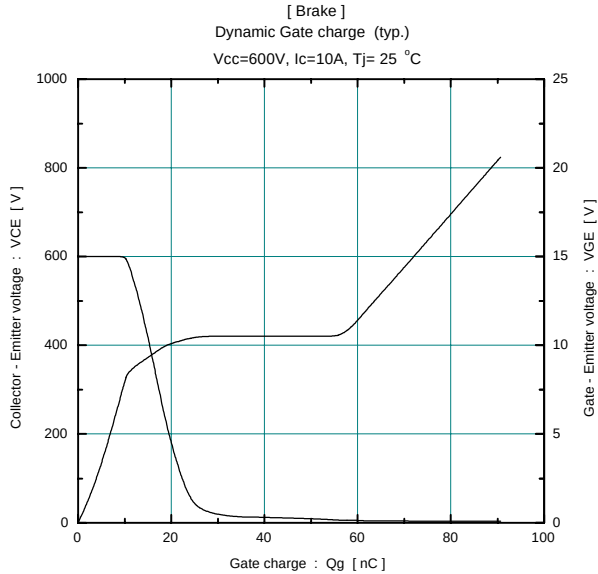
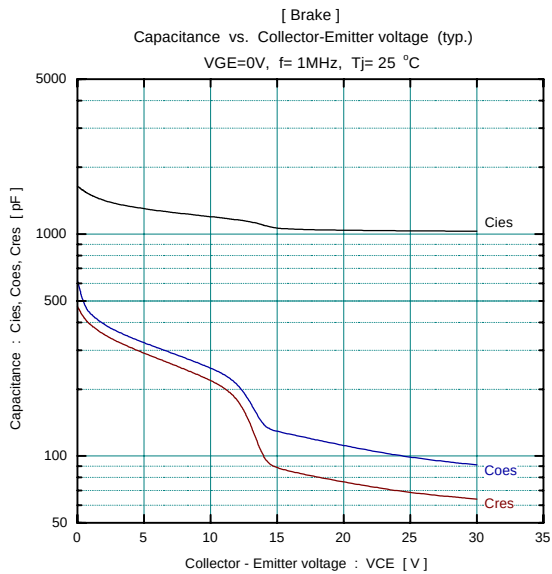
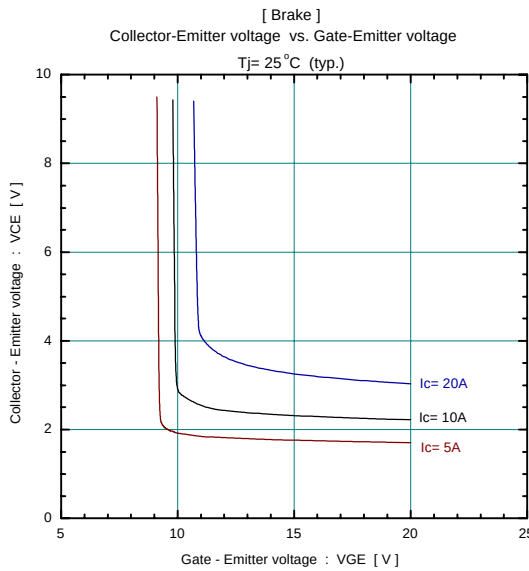
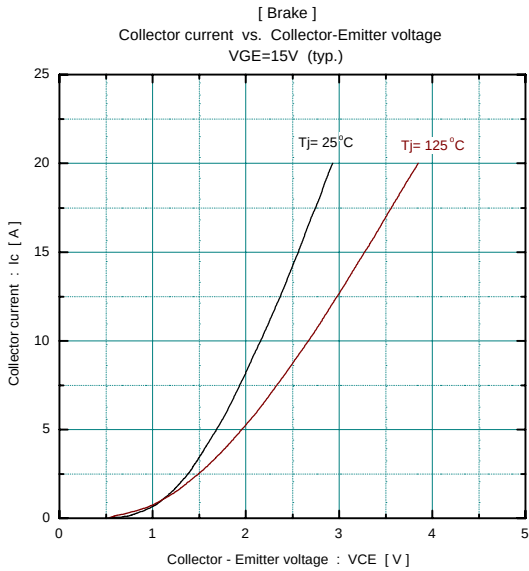
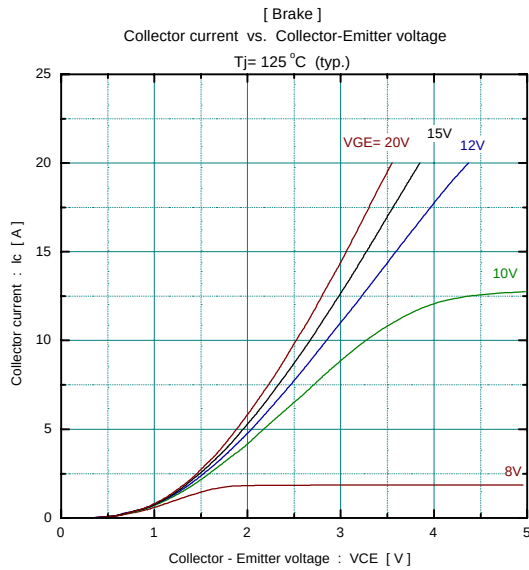
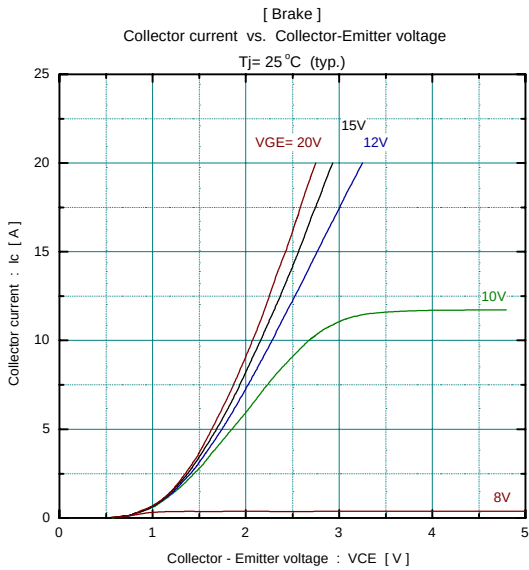


■ Characteristics (Representative)









■ Outline Drawings, mm

