

IGBT MODULE (S series) 600V / 30A / 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}	600	V	
	Gate-Emitter voltage	V _{GES}	±20	V	
	Collector current	I _C	Continuous	30	A
		I _{CP}	1ms	60	A
		-I _C		30	A
Collector power dissipation	P _C	1 device	120	W	
Brake	Collector-Emitter voltage	V _{CES}	600	V	
	Gate-Emitter voltage	V _{GES}	±20	V	
	Collector current	I _C	Continuous	20	A
		I _{CP}	1ms	40	A
	Collector power dissipation	P _C	1 device	80	W
Converter	Repetitive peak reverse voltage	V _{R_{RRM}}	600	V	
	Repetitive peak reverse voltage	V _{R_{RRM}}	800	V	
	Average output current	I _O	50Hz/60Hz sine wave	30	A
	Surge current (Non-Repetitive)	I _{FSM}	T _J =150°C, 10ms	210	A
	I ² t (Non-Repetitive)	I ² t	half sine wave	221	A ² s
Operating junction temperature		T _J	+150	°C	
Storage temperature		T _{stg}	-40 to +125	°C	
Isolation between terminal and copper base *2		AC : 1 minute	AC 2500	V	
voltage between thermistor and others *3			AC 2500	V	
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)

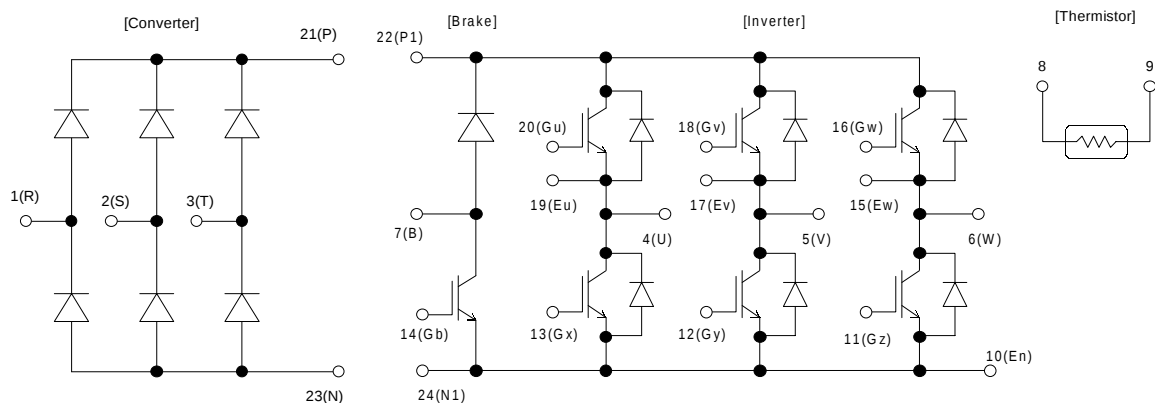
Item		Symbol	Condition		Characteristics			Unit
					Min.	Typ.	Max.	
Inverter	Zero gate voltage collector current	ICES	VCE=600V, VGE=0V				1.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				0.2	μA
	Gate-Emitter threshold voltage	VGE(th)	VCE=20V, IC=30mA		5.5	7.8	8.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE=15V, IC=30A	chip		1.8		V
				terminal		1.95	2.4	
	Input capacitance	Cies	VGE=0V, VCE=10V, f=1MHz			3000		pF
	Turn-on time	ton	VCC=300V			0.45	1.2	μs
		tr	IC=30A			0.25	0.6	
		tr(i)	VGE=±15V			0.08		
	Turn-off	toff	RG=82Ω			0.40	1.0	
		tf				0.05	0.35	
	Forward on voltage	VF	IF=30A	chip		1.8		V
terminal					1.95	2.6		
Reverse recovery time of FRD	trr	IF=30A				0.3	μs	
Brake	Zero gate voltage collector current	ICES	VCE=600V, VGE=0V				1.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				0.2	μA
	Collector-Emitter saturation voltage	VCE(sat)	IC=20A, VGE=15V	chip		1.8		V
				terminal		1.95	2.4	
	Turn-on time	ton	VCC=300V			0.45	1.2	μs
		tr	IC=20A			0.25	0.6	
	Turn-off time	toff	VGE=±15V			0.40	1.0	
		tf	RG=120Ω			0.05	0.35	
Reverse current	IRRM	VR=600V				1.0	mA	
Converter	Forward on voltage	VFM	IF=30A	chip		1.1		V
				terminal		1.2	1.5	
Reverse current	IRRM	VR=800V				1.0	mA	
Thermistor	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

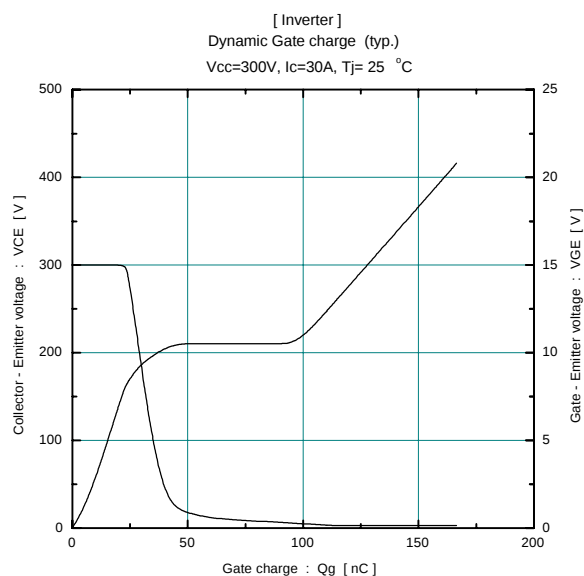
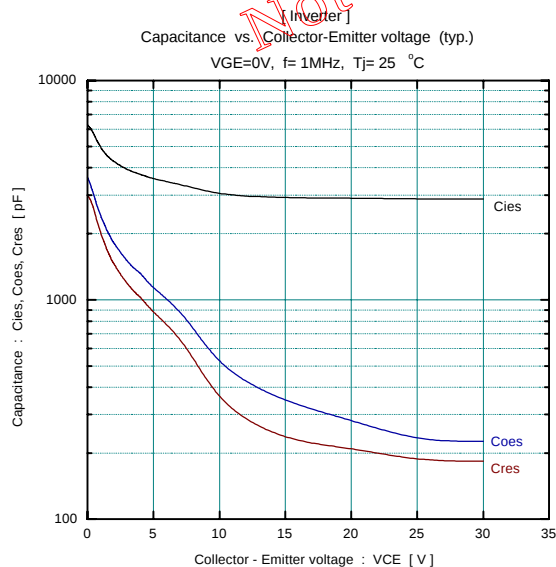
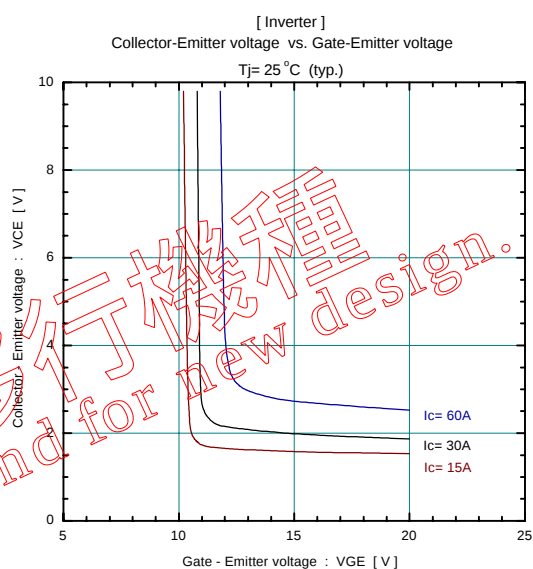
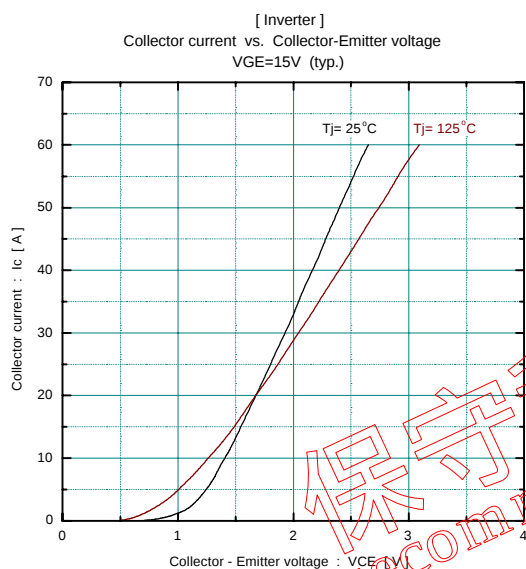
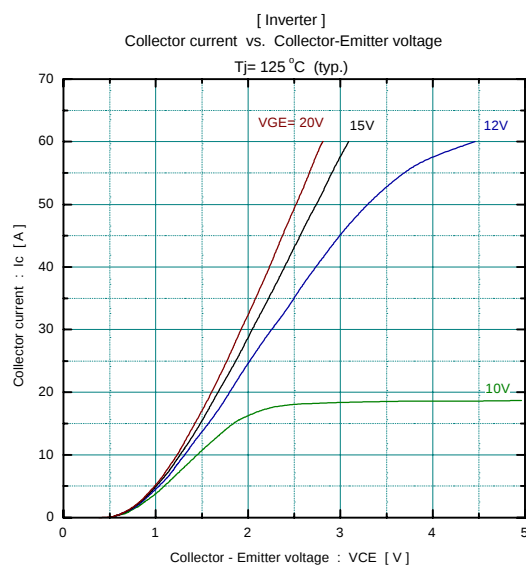
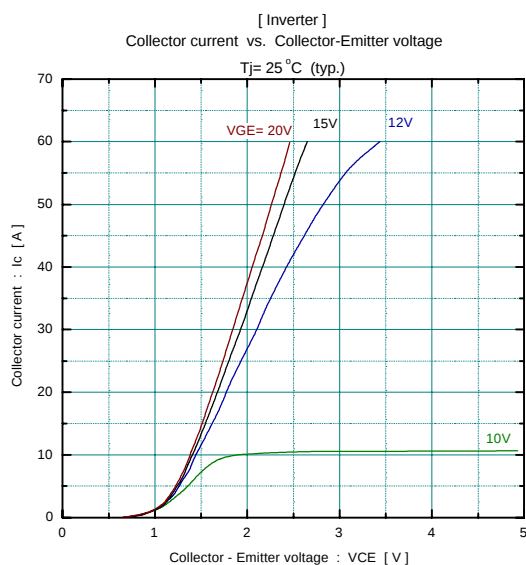
Item	Symbol	Condition	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance (1 device)	R _{th(j-c)}	Inverter IGBT			1.04	°C/W
		Inverter FWD			2.00	
		Brake IGBT			1.56	
		Converter Diode			1.33	
Contact thermal resistance *	R _{th(c-f)}	With thermal compound		0.05		

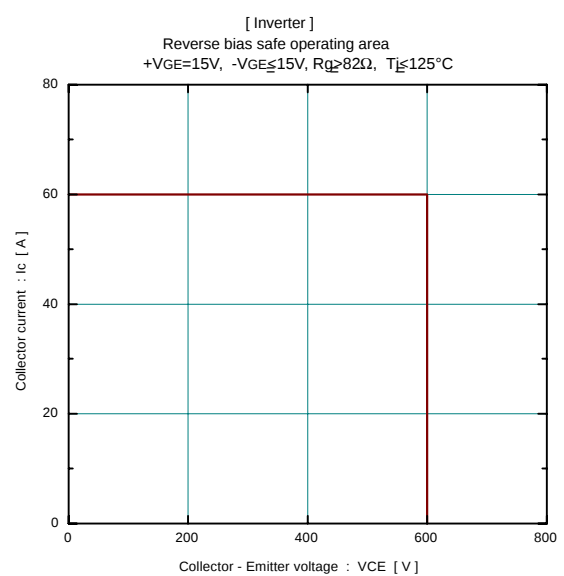
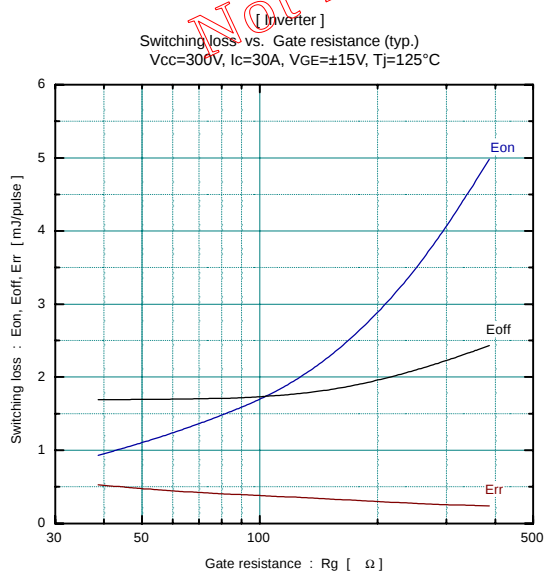
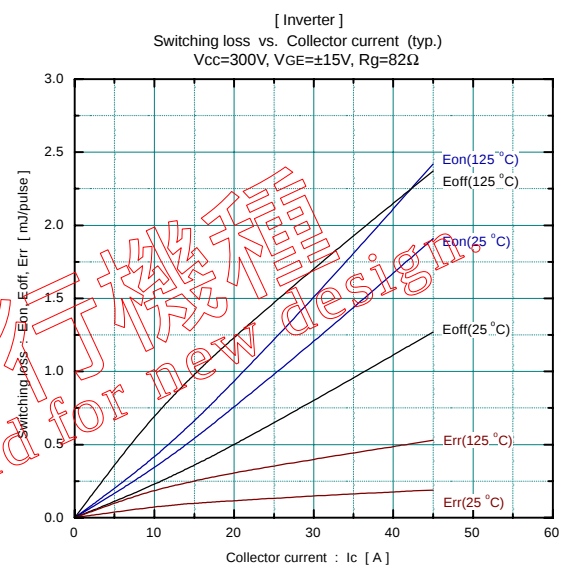
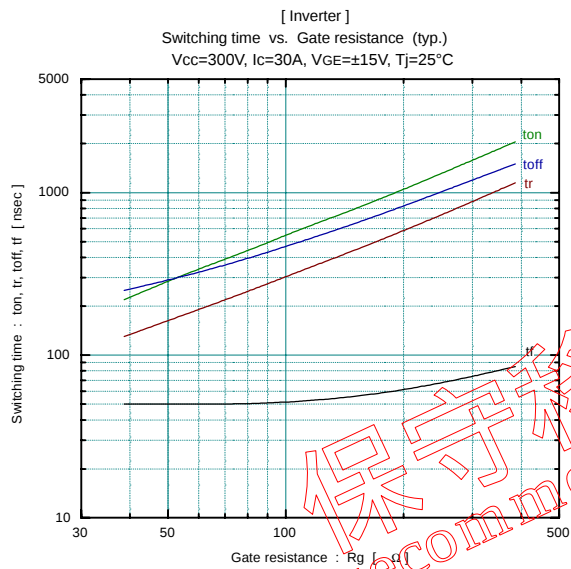
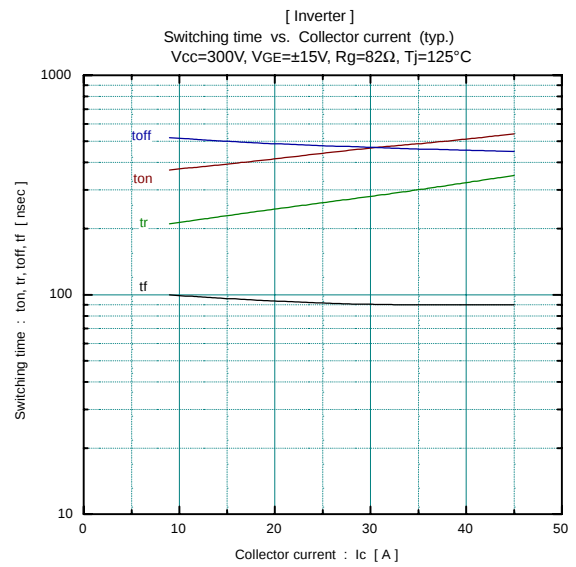
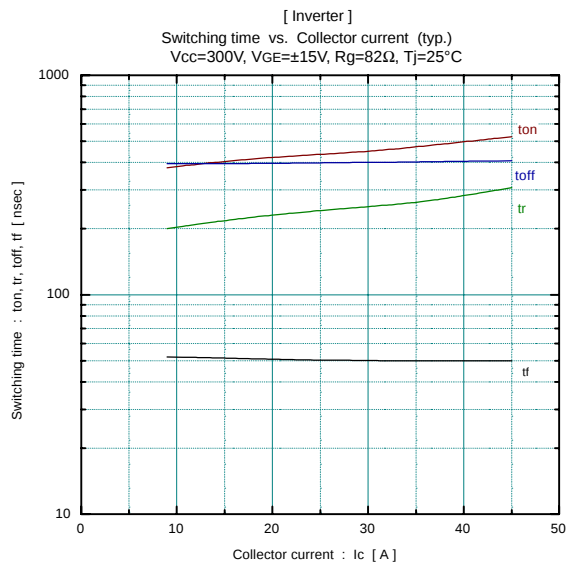
* This is the value which is defined mounting on the additional cooling fin with thermal compound

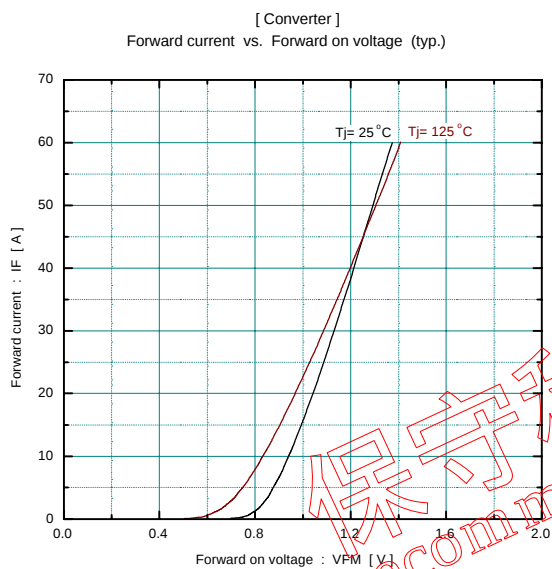
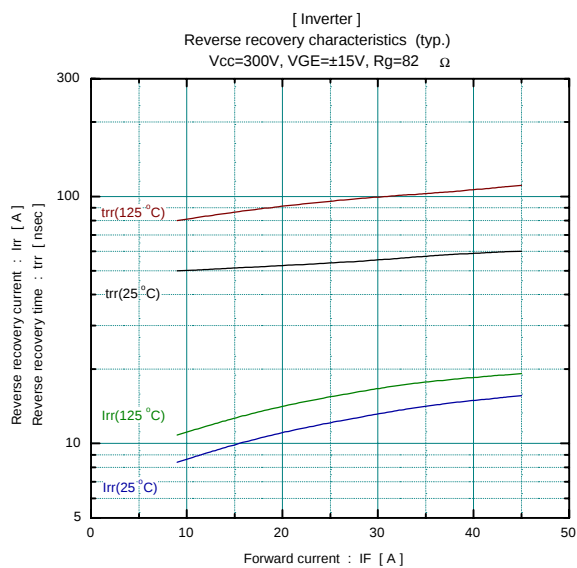
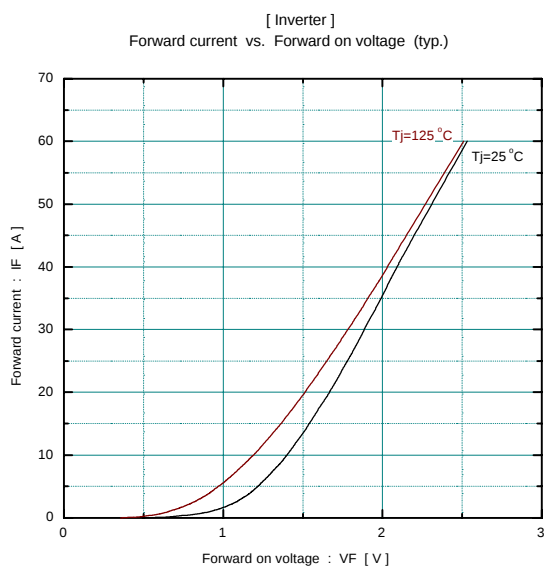
■ Equivalent Circuit Schematic



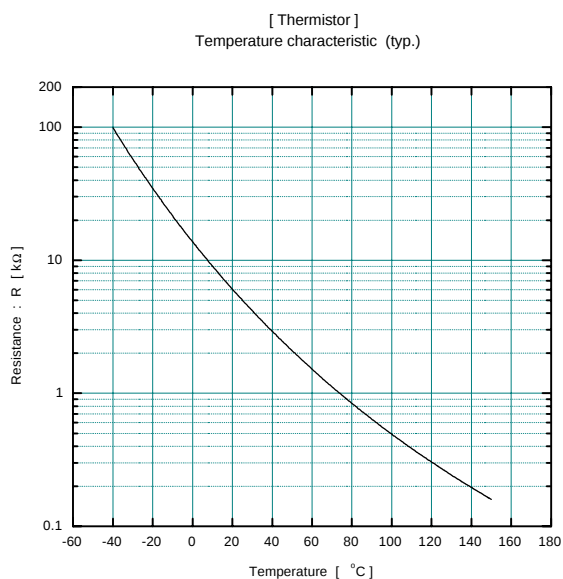
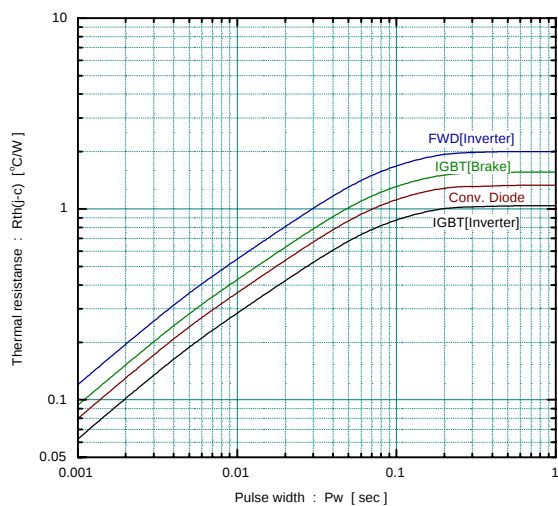
Characteristics (Representative)

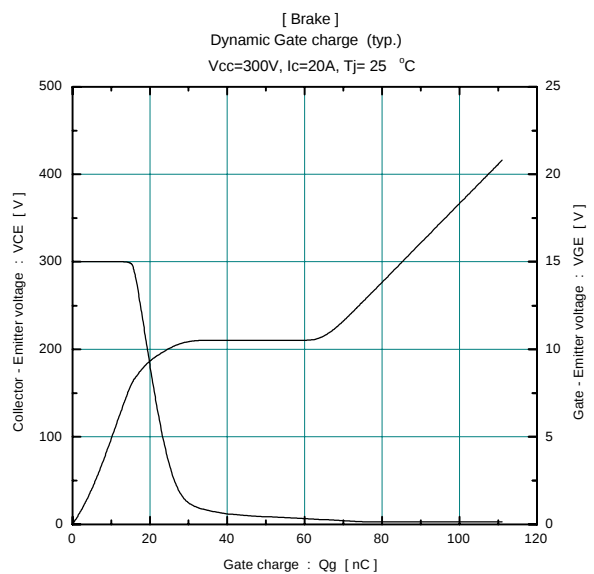
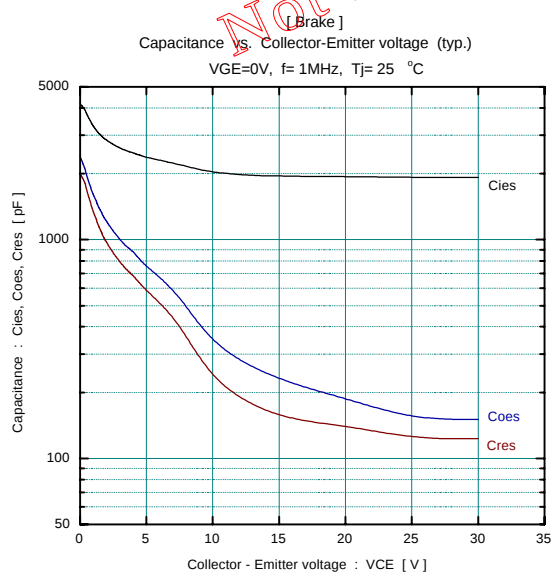
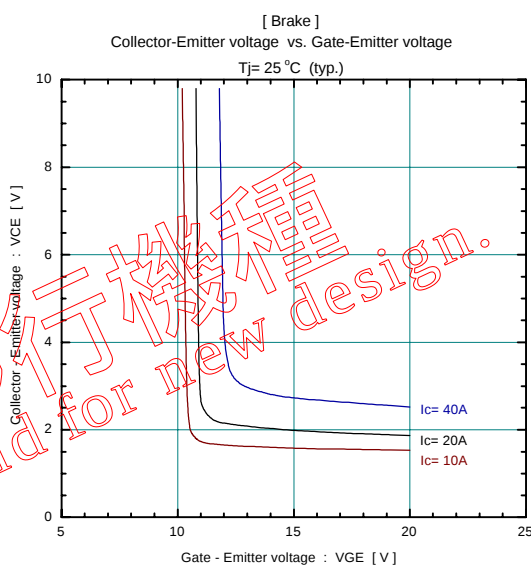
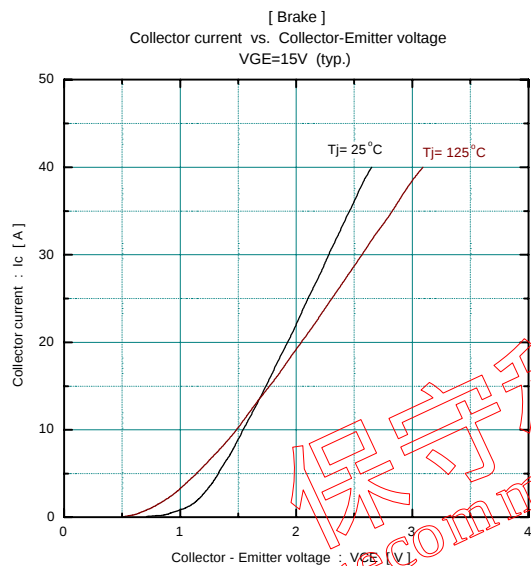
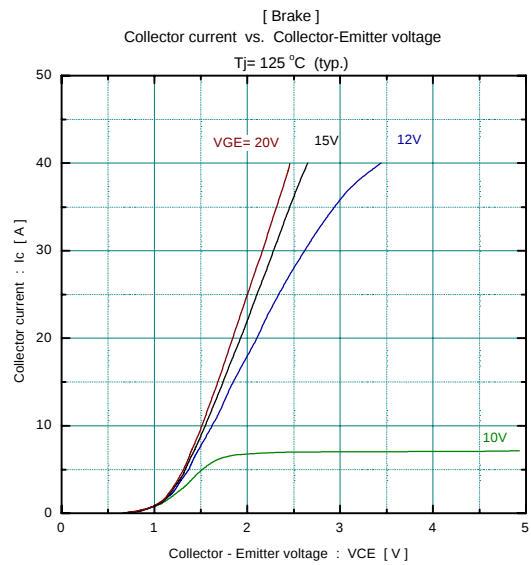
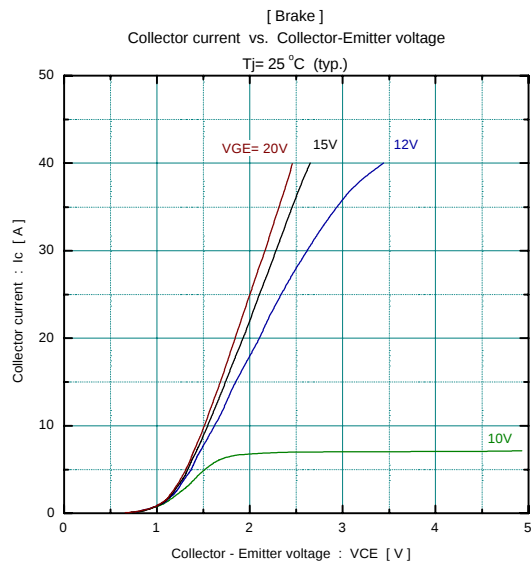






Transient thermal resistance





■ Outline Drawings, mm

