

7MBR50SA060

IGBT Modules

IGBT MODULE (S series)

600V / 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}	600	V
	Gate-Emitter voltage	V_{GES}	± 20	V
	Collector current	I_C Continuous	50	A
		I_{CP} 1ms	100	A
		$-I_C$	50	A
	Collector power dissipation	P_C 1 device	200	W
Brake	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
	Collector power dissipation	P_C 1 device	120	W
Converter	Repetitive peak reverse voltage	V_{RRM}	600	V
	Repetitive peak reverse voltage	V_{RRM}	800	V
	Average output current	I_O 50Hz/60Hz sine wave	50	A
	Surge current (Non-Repetitive)	I_{FSM} $T_j=150^{\circ}\text{C}$, 10ms	350	A
	I^2t (Non-Repetitive)	I^2t half sine wave	613	A^2s
	Operating junction temperature	T_j	+150	$^{\circ}\text{C}$
	Storage temperature	T_{stg}	-40 to +125	$^{\circ}\text{C}$
	Isolation between terminal and copper base *2	V_{iso} 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 (Tj=25°C unless otherwise specified)

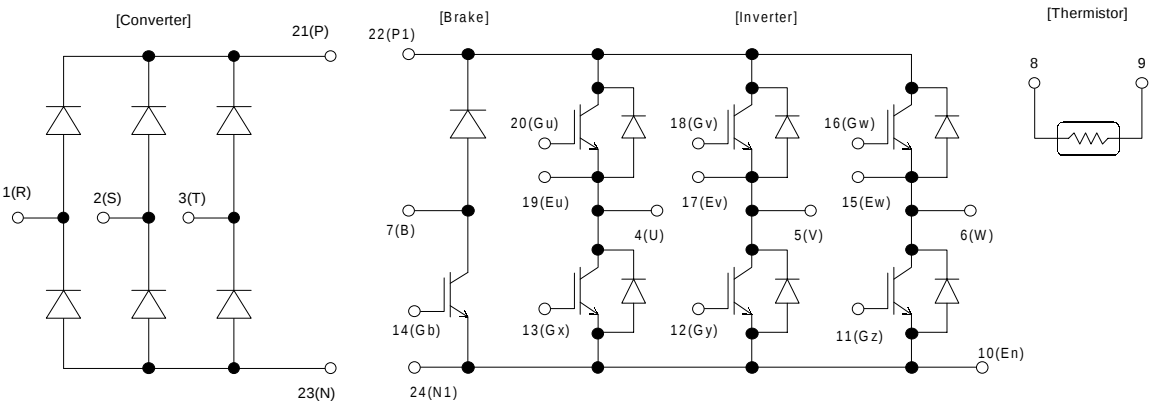
Item		Symbol	Condition		Characteristics			Unit
					Min.	Typ.	Max.	
Inverter	Zero gate voltage collector current	ICES	VCE=600V, VGE=0V				1.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				0.2	μA
	Gate-Emitter threshold voltage	VGE(th)	VCE=20V, Ic=50mA		5.5	7.8	8.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE=15V, Ic=50A	chip		1.8		V
				terminal		1.95	2.4	
	Input capacitance	Cies	VGE=0V, VCE=10V, f=1MHz			5000		pF
	Turn-on time	ton	VCC=300V Ic=50A VGE=±15V			0.45	1.2	μs
		tr				0.25	0.6	
		tr(i)				0.08		
	Turn-off	toff	RG=51Ω			0.40	1.0	
		tf				0.05	0.35	
	Forward on voltage	VF	IF=50A	chip		1.75		V
terminal					1.9	2.6		
Reverse recovery time of FRD	trr	IF=50A				0.3	μs	
Brake	Zero gate voltage collector current	ICES	VCES=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=30A, VGE=15V	chip		1.8		V
				terminal		1.95	2.4	
	Turn-on time	ton	VCC=300V Ic=30A			0.45	1.2	μs
		tr				0.25	0.6	
	Turn-off time	toff	VGE=±15V RG=82Ω			0.40	1.0	
		tf				0.05	0.35	
Reverse current	IRRM	VR=600V				1.0	mA	
Converter	Forward on voltage	VFM	IF=50A	chip		1.1	V	
				terminal		1.2		1.5
Thermistor	Reverse current	IRRM	VR=800V				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

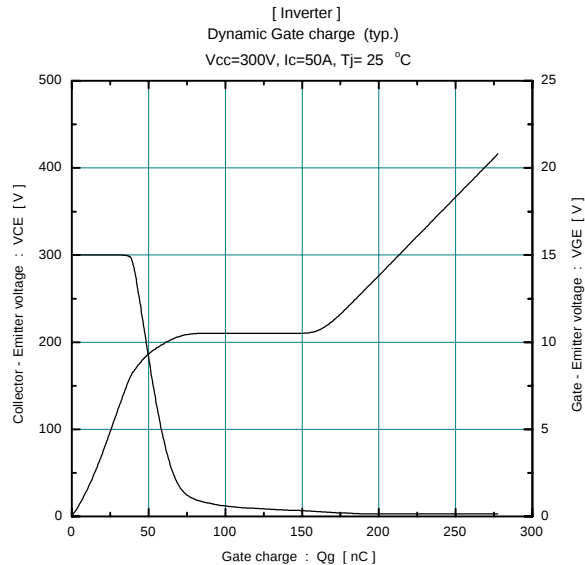
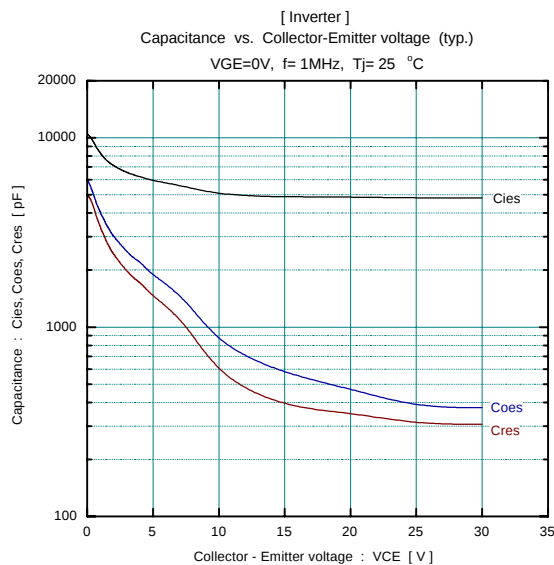
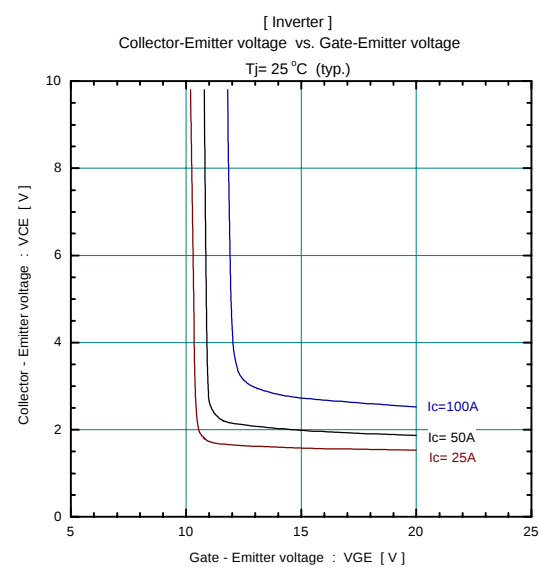
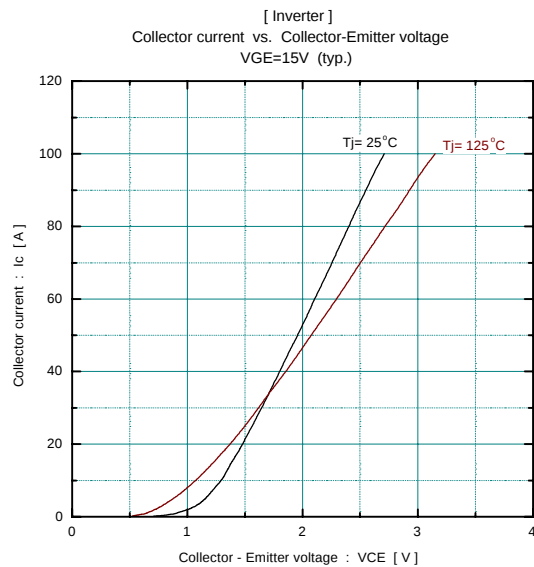
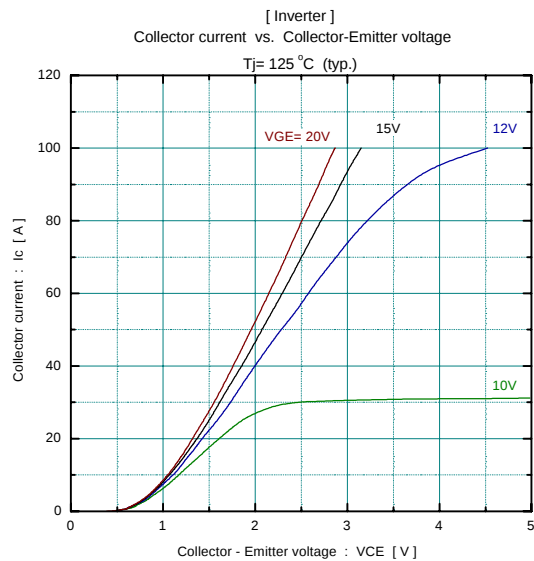
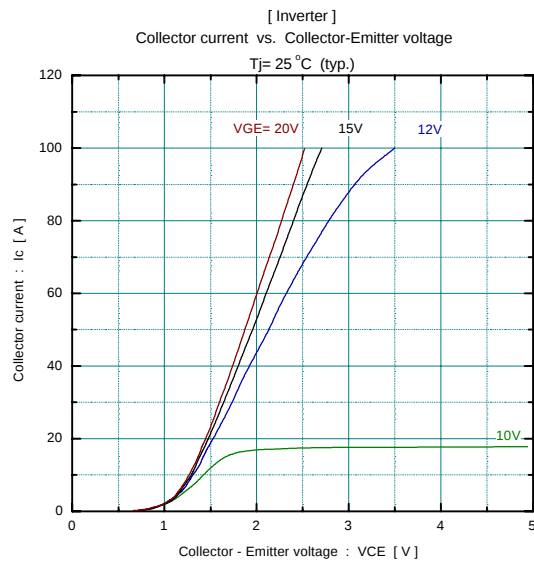
Item	Symbol	Condition	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			0.63	°C/W
		Inverter FWD			1.33	
		Brake IGBT			1.04	
		Converter Diode			0.90	
Contact thermal resistance *	Rth(c-f)	With thermal compound		0.05		

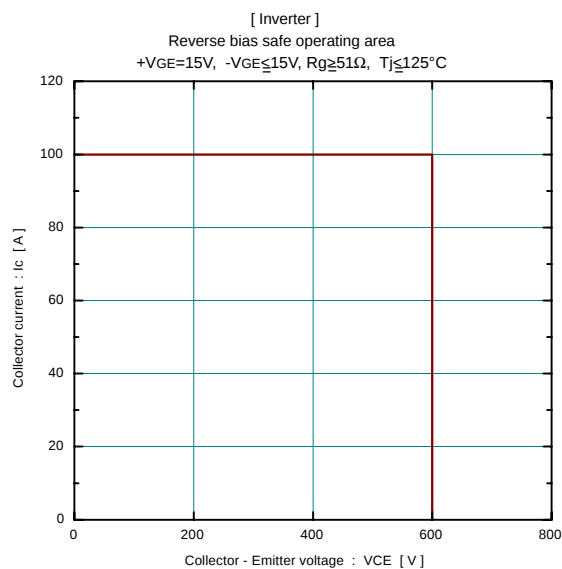
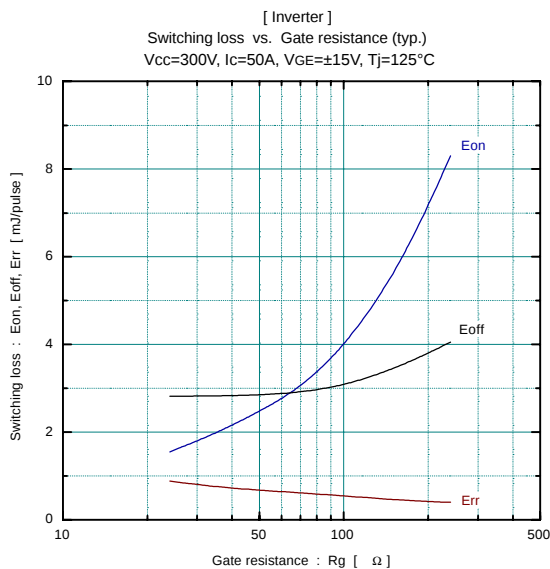
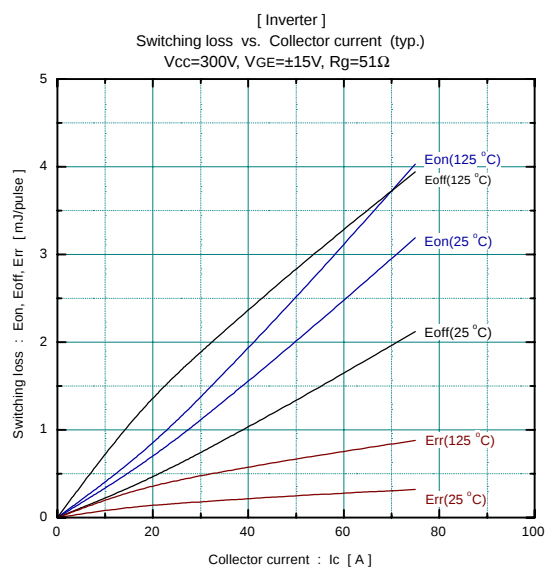
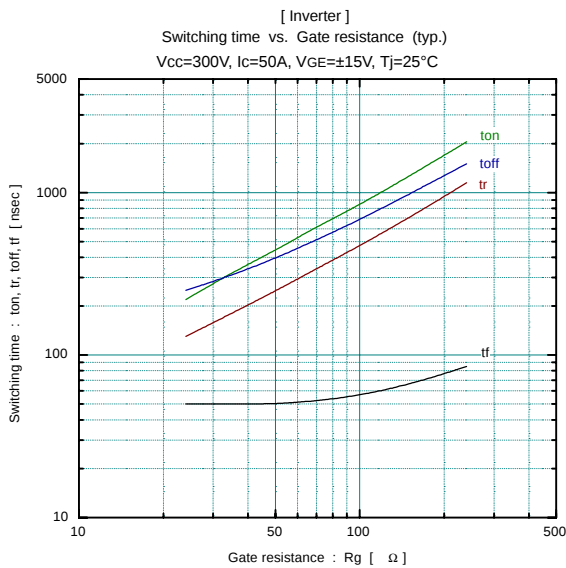
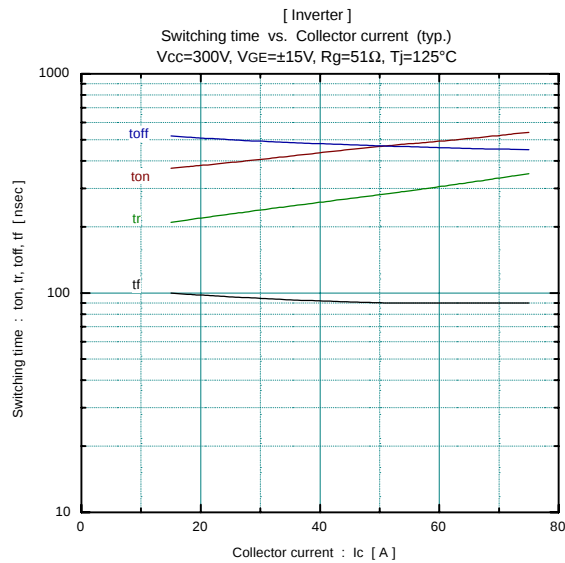
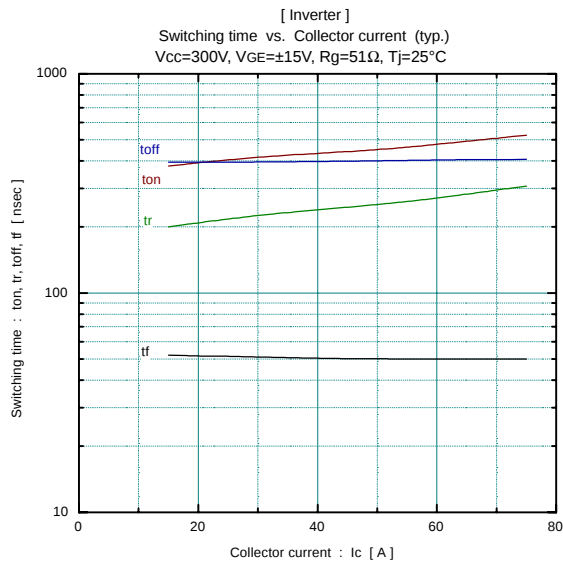
* This is the value which is defined mounting on the additional cooling fin with thermal compound

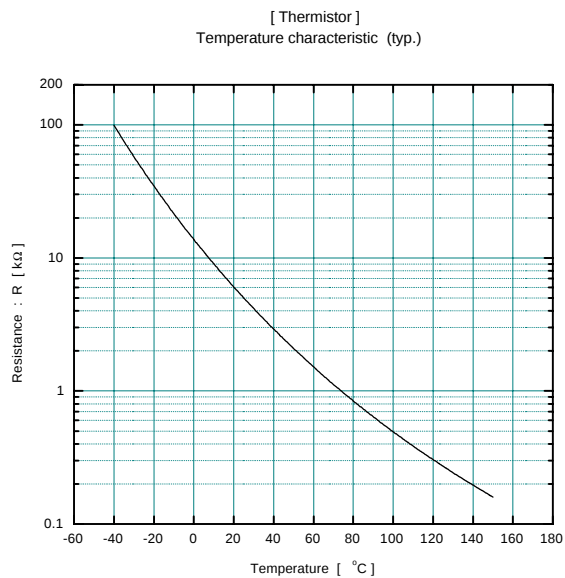
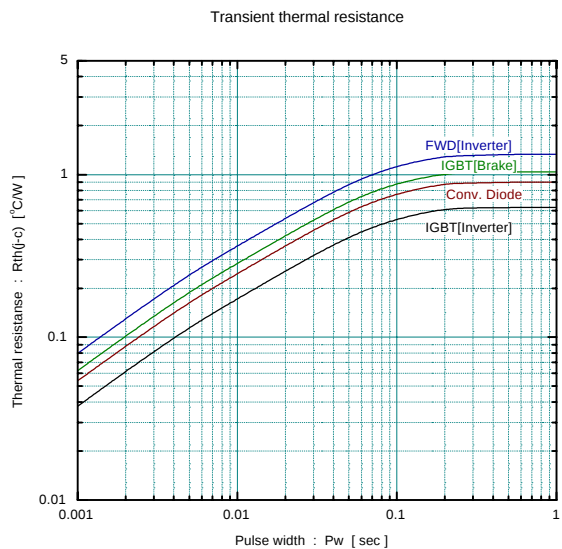
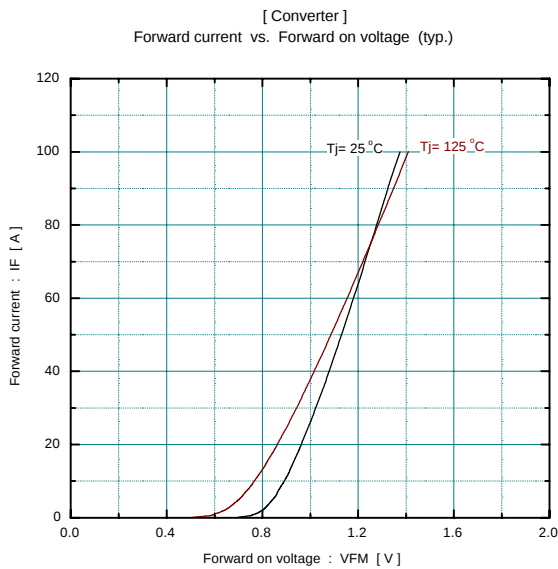
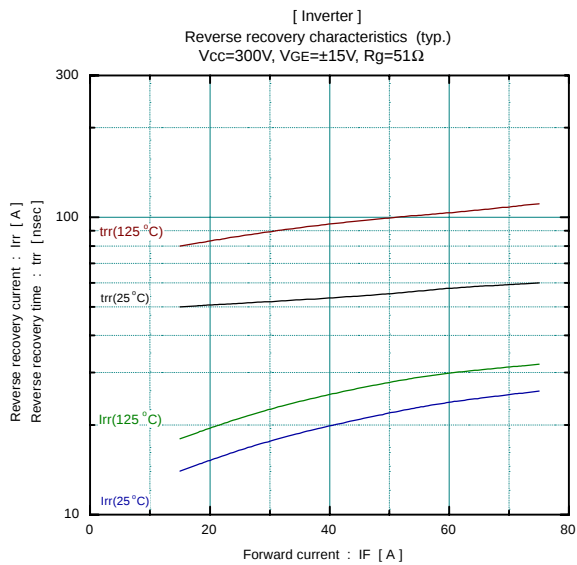
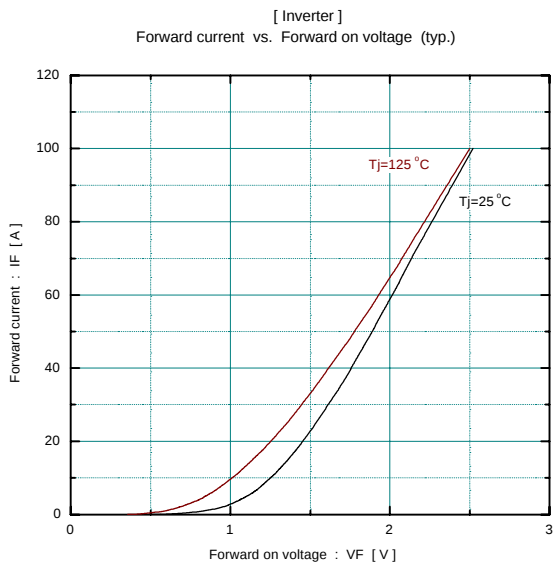
■ Equivalent Circuit Schematic

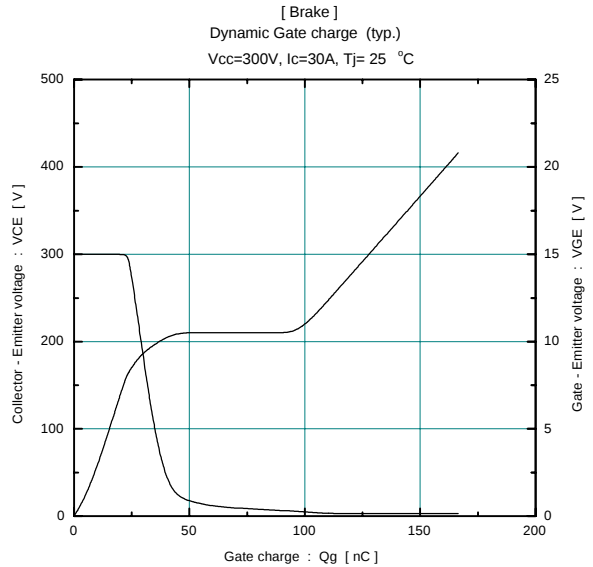
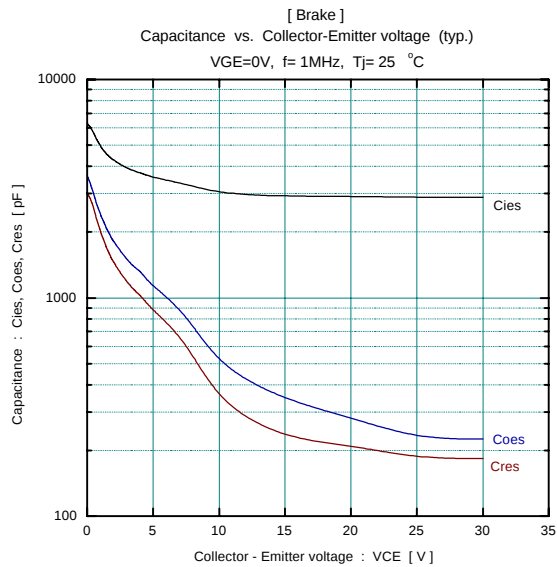
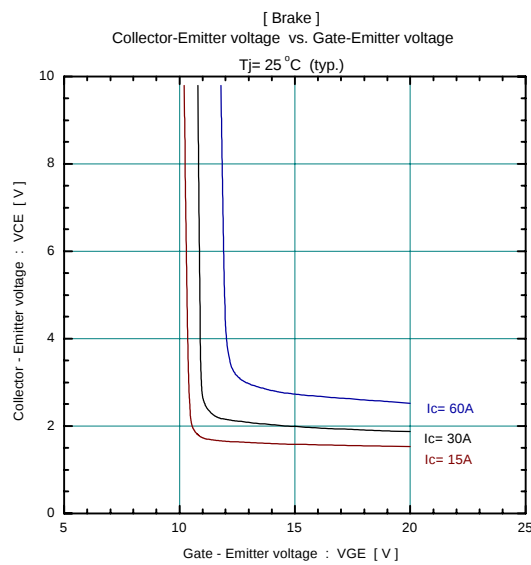
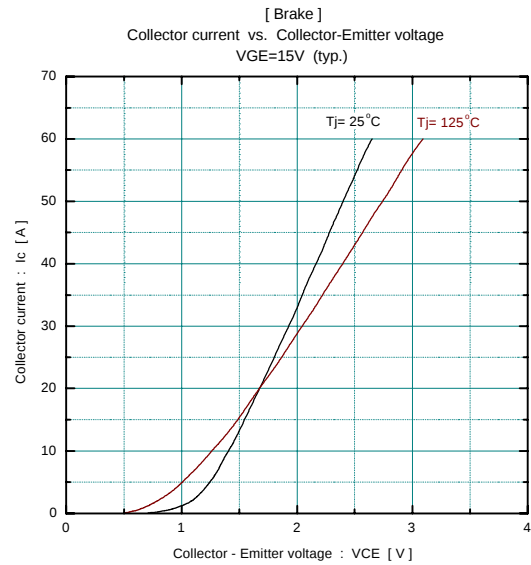
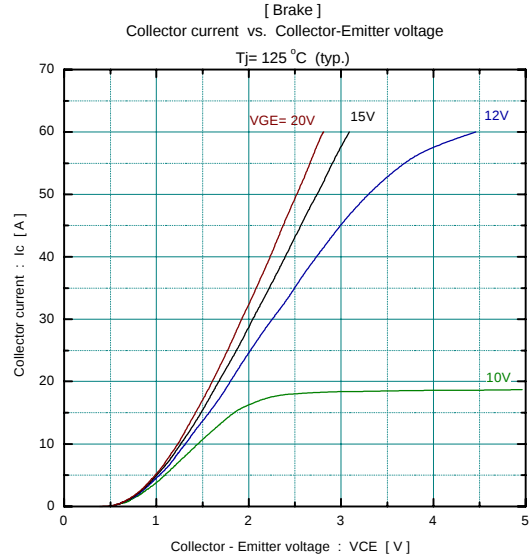
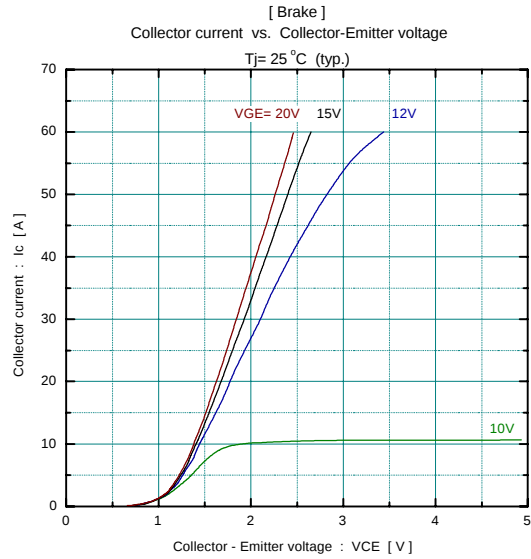


■ Characteristics (Representative)









■ Outline Drawings, mm

