

IGBT MODULE (S series) 1400V / 15A / PIM



■ Features

- Low $V_{CE(sat)}$
- Compact Package
- P.C. Board Mount Module
- Converter Diode Bridge Dynamic Brake Circuit

■ Applications

- Inverter for Motoe 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}			1400	V
	Gate-Emitter voltage	V _{GES}			±20	V
	Collector current	I _C	Continuous	T _C =25°C	25	A
				T _C =75°C	15	
		I _{CP}	1ms	T _C =25°C	50	A
				T _C =75°C	30	
-I _C			15	A		
Collector power dissipation		P _C	1 device		110	W
Brake	Collector-Emitter voltage	V _{CES}			1400	V
	Gate-Emitter voltage	V _{GES}			±20	V
	Collector current	I _C	Continuous	T _C =25°C	25	A
				T _C =75°C	15	
		I _{CP}	1ms	T _C =25°C	50	A
				T _C =75°C	30	
	Collector power dissipation		P _C	1 device		110
Repetitive peak reverse voltage		V _{R_{RRM}}			1400	V
Converter	Repetitive peak reverse voltage	V _{R_{RRM}}			1600	V
	Average output current	I _O	50Hz/60Hz sine wave		15	A
	Surge current (Non-Repetitive)	I _{FSM}	T _J =150°C, 10ms		155	A
	I ² t (Non-Repetitive)	I ² t	half sine wave		120	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)

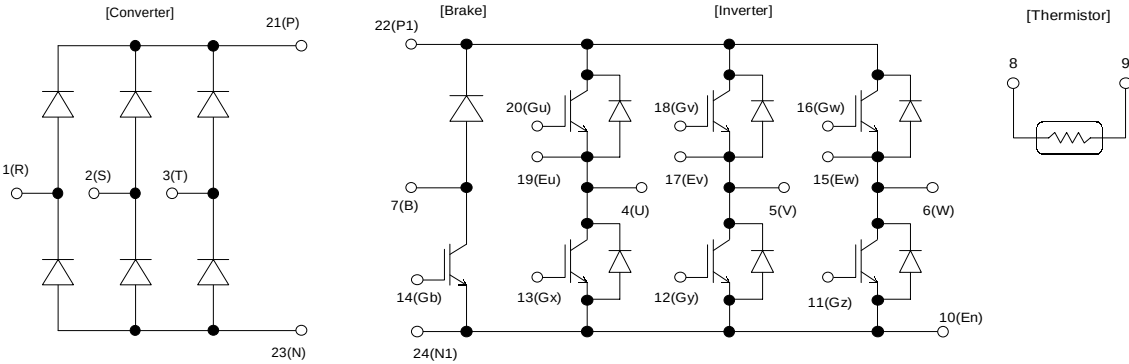
Item		Symbol	Condition		Characteristics			Unit
					Min.	Typ.	Max.	
Inverter	Zero gate voltage collector current	ICES	VCE=1400V, VGE=0V				1.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				0.2	μA
	Gate-Emitter threshold voltage	VGE(th)	VCE=20V, Ic=15mA		5.5	7.2	8.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE=15V, Ic=15A	chip		2.2		V
				terminal		2.25	2.7	
	Input capacitance	Cies	VGE=0V, VCE=10V, f=1MHz			1800		pF
	Turn-on time	ton	VCC=800V Ic=15A VGE=±15V			0.35	1.2	μs
		tr				0.25	0.6	
		tr(i)				0.1		
	Turn-off	toff	RG=82Ω			0.45	1.0	
		tf				0.08	0.3	
	Forward on voltage	VF	IF=15A	chip		2.4		V
terminal					2.45	3.3		
Reverse recovery time of FRD	trr	IF=15A				0.35	μs	
Brake	Zero gate voltage collector current	ICES	VCES=1400V, VGE=0V				1.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				0.2	μA
	Collector-Emitter saturation voltage	VCE(sat)	Ic=15A, VGE=15V	chip		2.2		V
				terminal		2.3	2.7	
	Turn-on time	ton	VCC=800V Ic=15A			0.35	1.2	μs
		tr				0.25	0.6	
	Turn-off time	toff	VGE=±15V RG=82 Ω			0.45	1.0	
		tf				0.08	0.3	
Reverse current	IRRM	VR=1400V				1.0	mA	
Converter	Forward on voltage	VFM	IF=15A	chip		1.1	V	
				terminal		1.2		1.5
	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

● Thermal resistance Characteristics

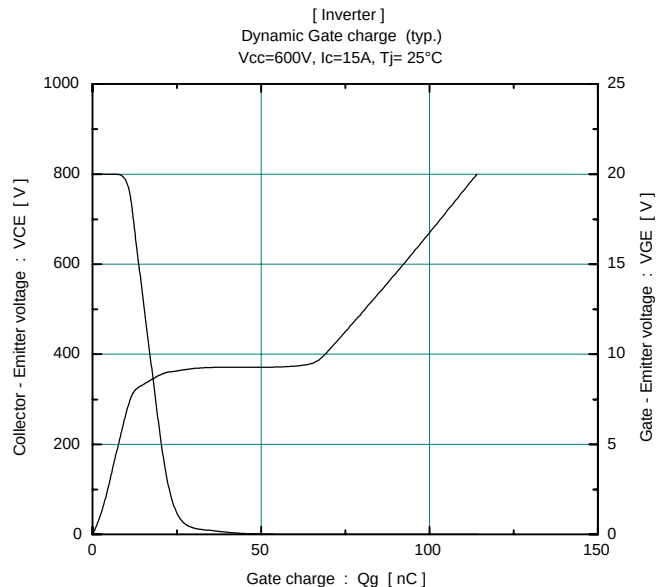
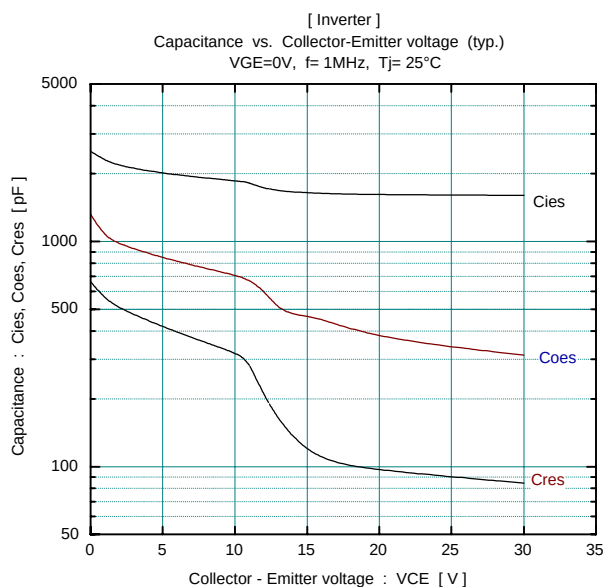
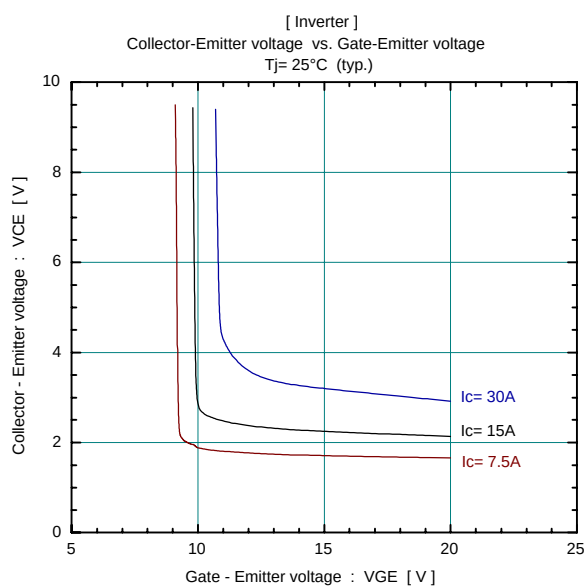
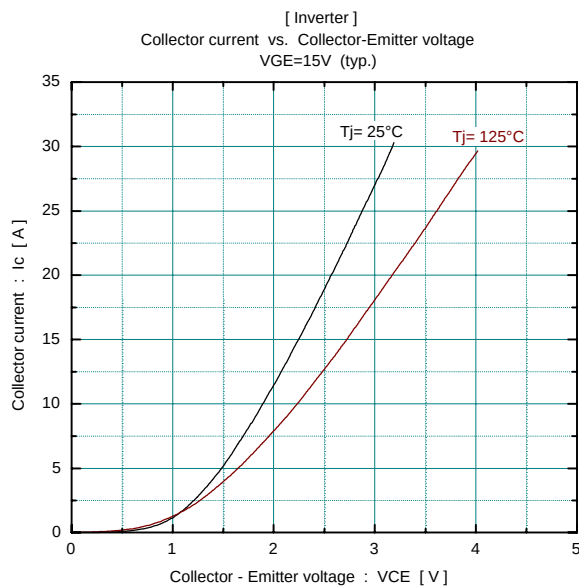
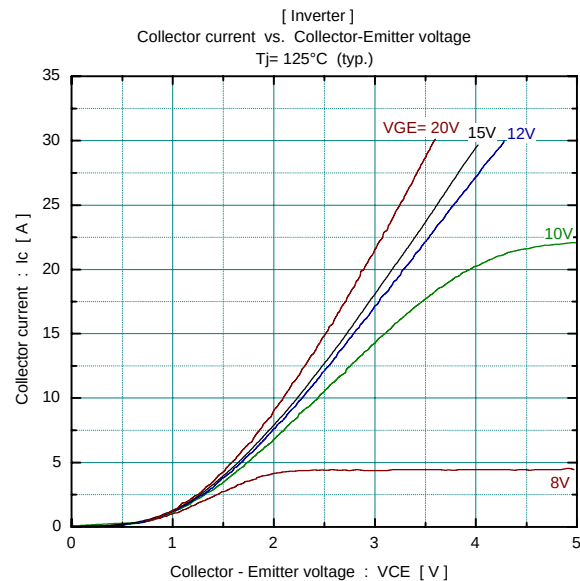
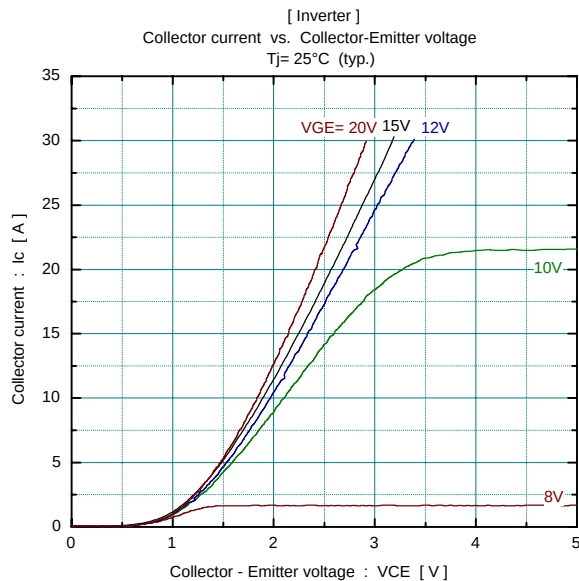
Item	Symbol	Condition	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			1.14	°C/W
		Inverter FWD			1.85	
		Brake IGBT			1.14	
		Converter Diode			1.30	
Contact thermal resistance *	Rth(c-f)	With thermal compound		0.05		

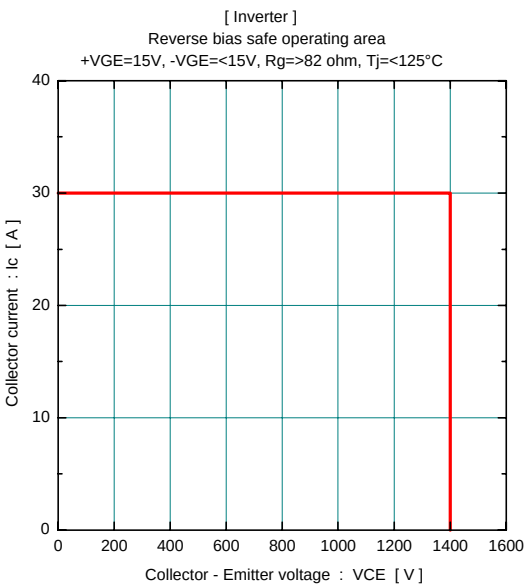
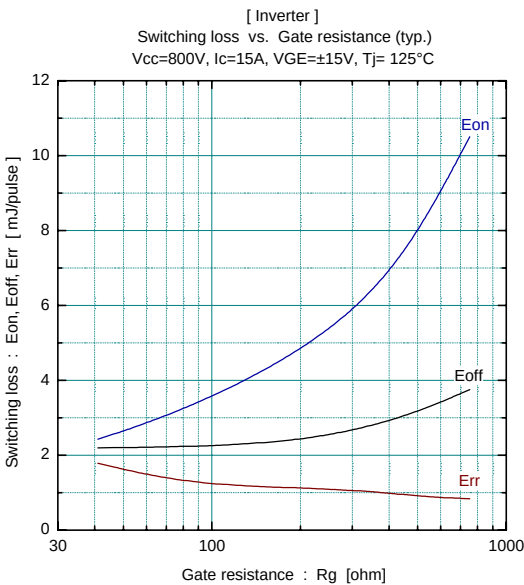
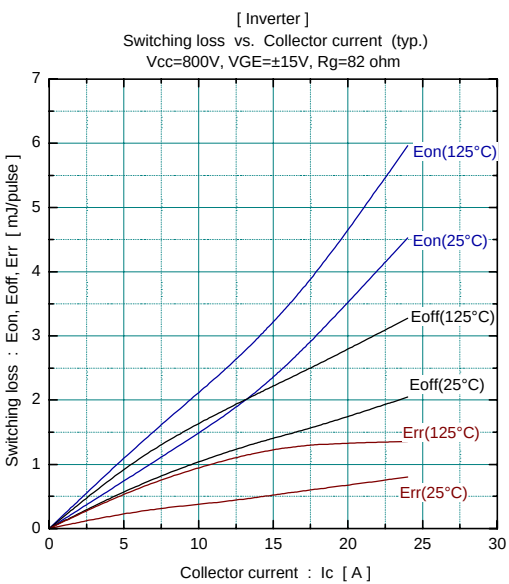
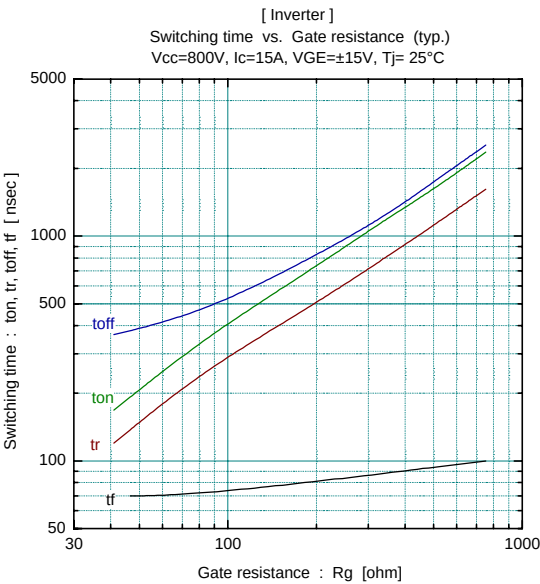
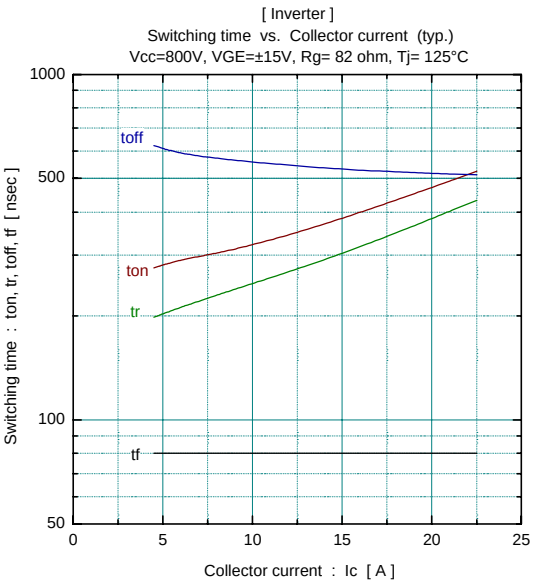
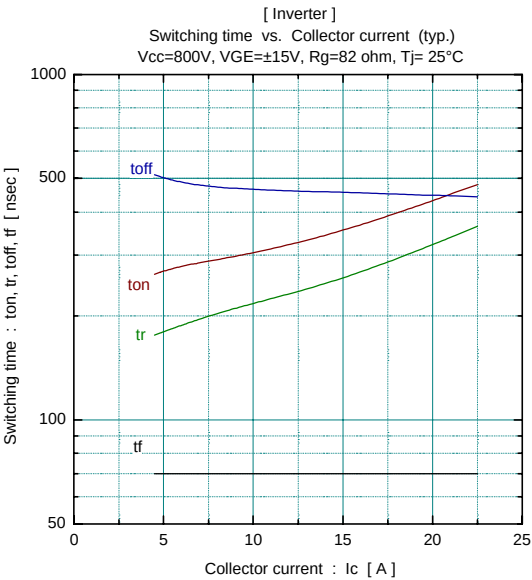
* This is the value which is defined mounting on the additional cooling fin with thermal compound

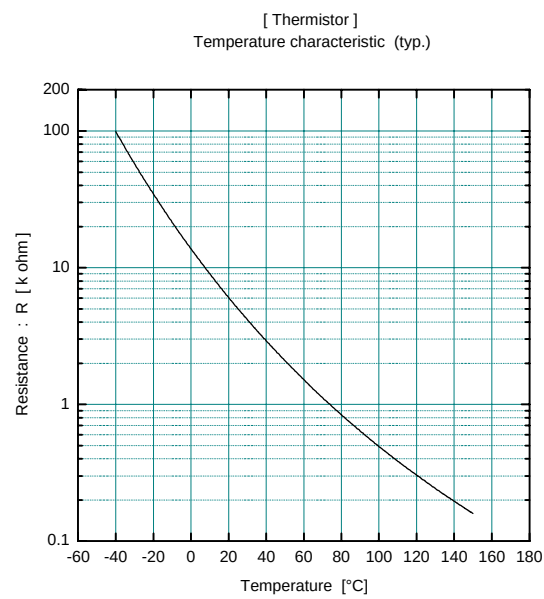
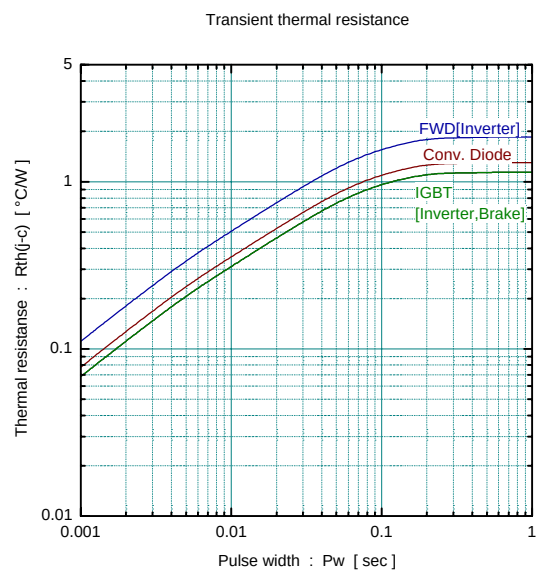
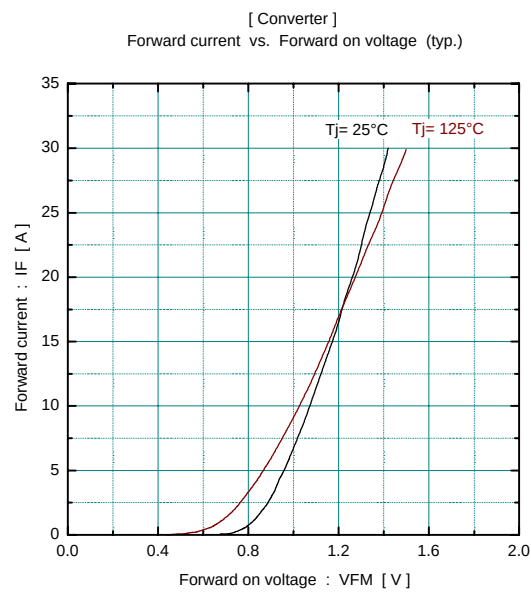
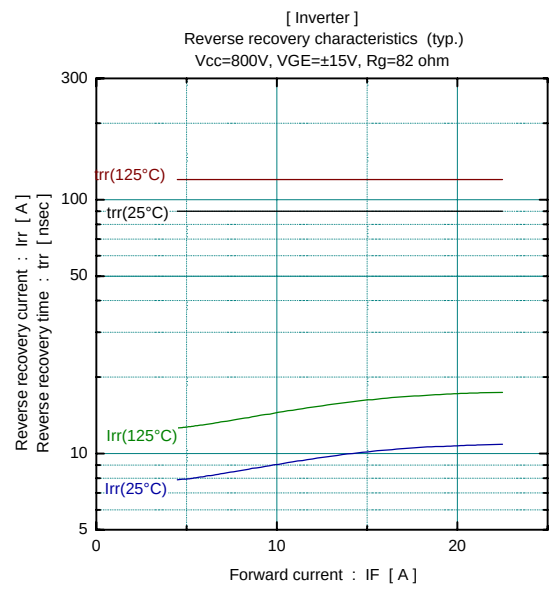
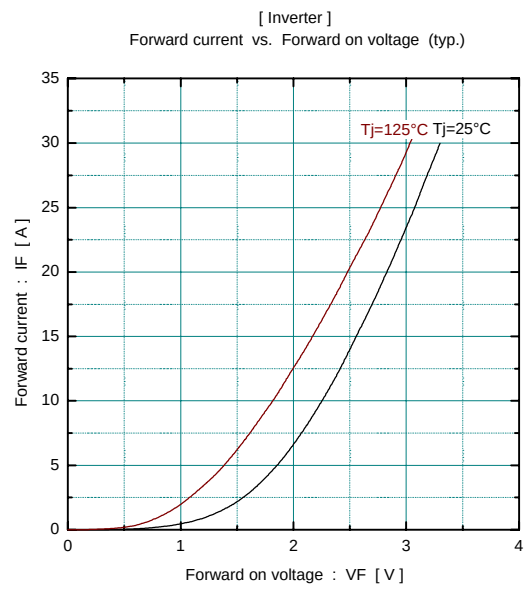
■ Equivalent Circuit Schematic

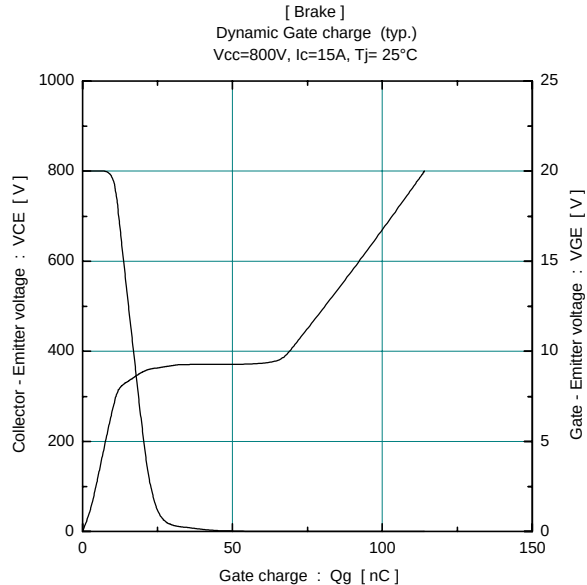
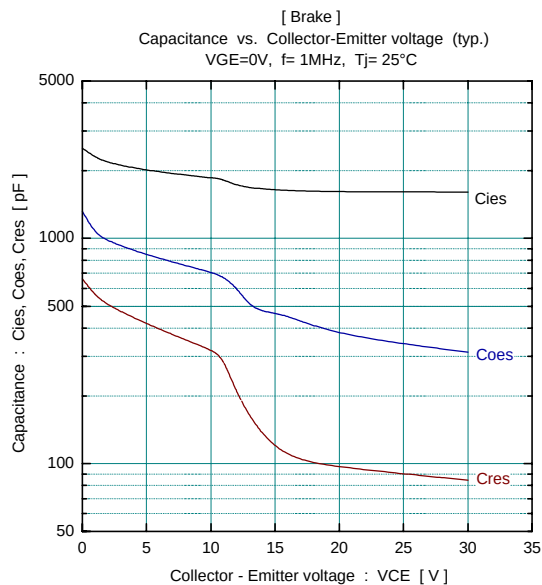
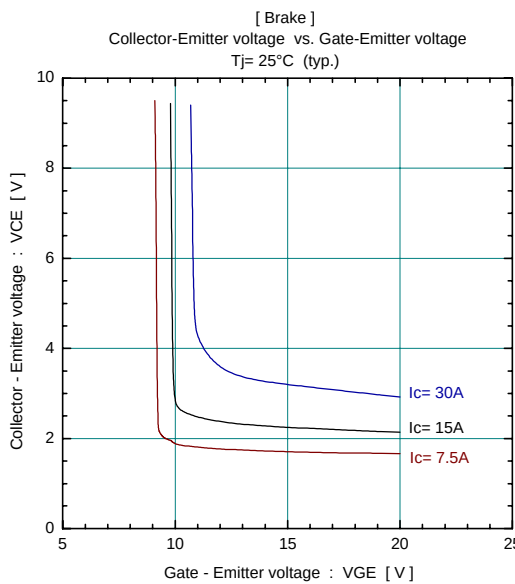
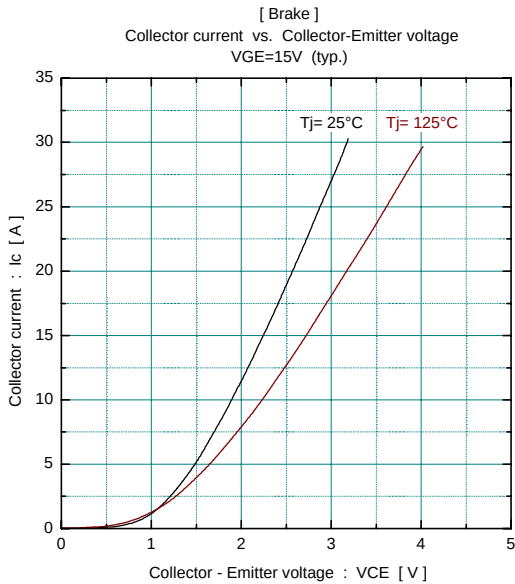
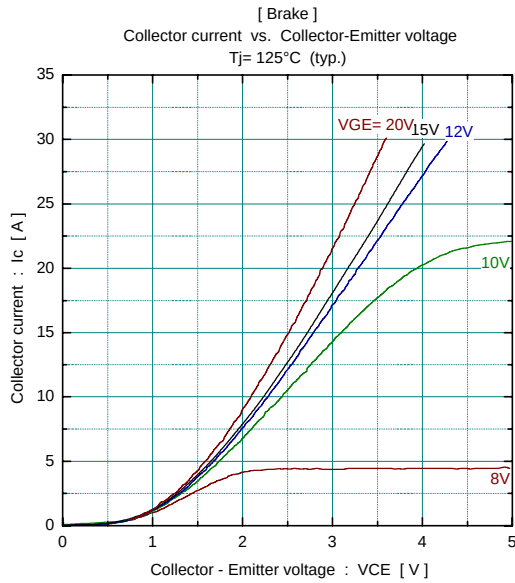
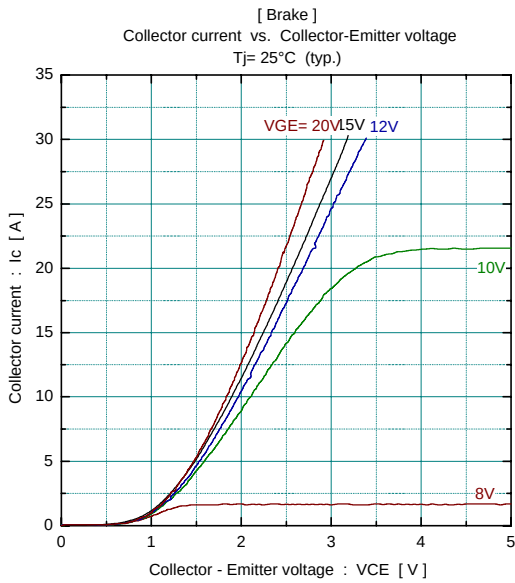


■ Characteristics (Representative)









■ Outline Drawings, mm

mass : 180g

