

PIM/Built-in converter with thyristor and brake (S series) 1200V / 50A / PIM



■ Features

- Low $V_{CE(sat)}$
- Compact Package
- P.C. Board Mount Module
- 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
Thyristor	Repetitive peak reverse voltage(Diode)	V _{RRM}		1200	V
	Repetitive peak off-state voltage	V _{DRM}		1600	V
	Repetitive peak reverse voltage	V _{RRM}		1600	V
	Average on-state current	I _{T(AV)}	50Hz/60Hz sine wave	50	A
	Surge On-state current (Non-Repetitive)	I _{TSM}	T _j =125°C, 10ms half sine wave	530	A
	Junction temperature	T _{jw}		125	°C
	Converter	Repetitive peak reverse voltage	V _{RRM}		1600
Average output current		I _o	50Hz/60Hz sine wave	50	A
Surge current (Non-Repetitive)		I _{FSM}	T _j =150°C, 10ms	520	A
I ² t (Non-Repetitive)		I ² t	half sine wave	1352	A ² s
Junction temperature (except Thyristor)		T _j		+150	°C
Storage temperature		T _{stg}		-40 to +125	°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				1.7 * ₁	N·m

*1 Recommendable value : 1.3 to 1.7 N·m (M4)

*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 26 should be connected together and shorted to copper base.

● Electrical characteristics (T_j=25°C unless otherwise specified)

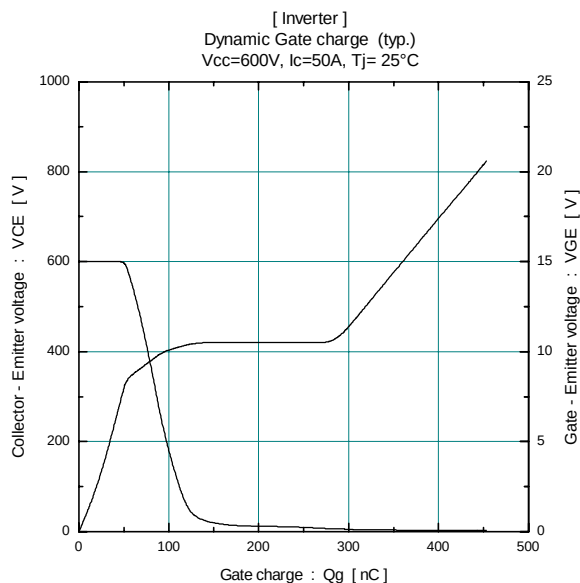
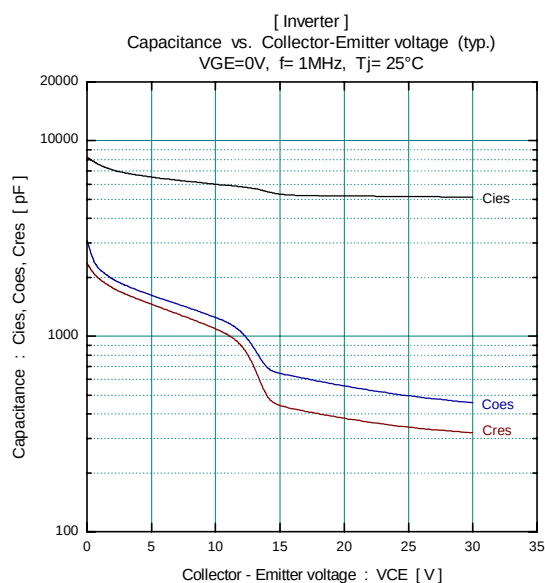
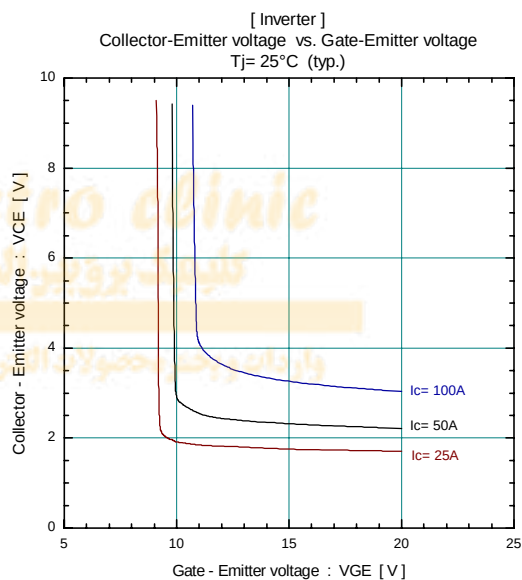
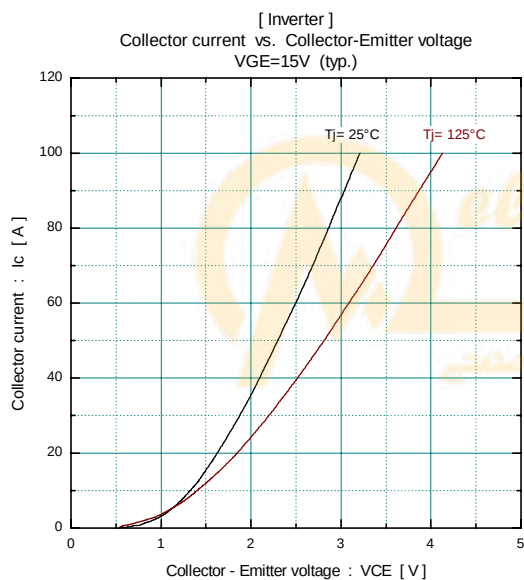
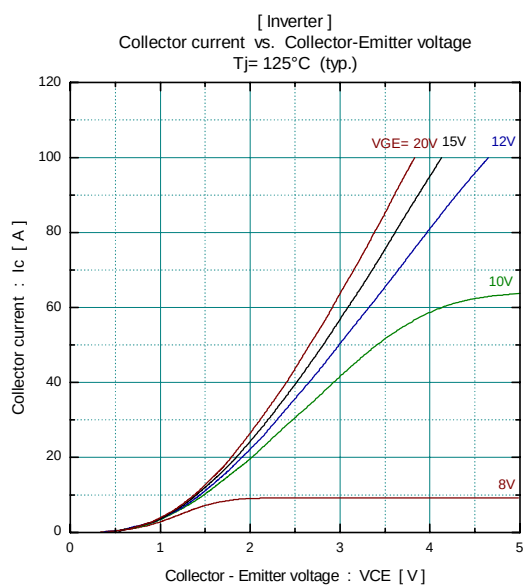
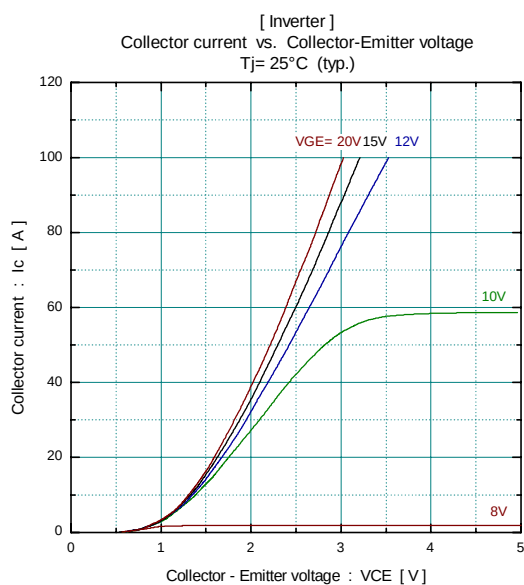
Item		Symbol	Condition		Characteristics			Unit
					Min.	Typ.	Max.	
Inverter	Zero gate voltage collector current	ICES	VCE=1200V, VGE=0V				250	μA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				200	nA
	Gate-Emitter threshold voltage	VGE(th)	VCE=20V, IC=50mA		5.5	7.2	8.5	V
	Collector-Emitter saturation 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 RG=24Ω			0.35	1.2	μs
		tr				0.25	0.6	
	Turn-off	toff				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				350	ns	
Brake	Zero gate voltage collector current	ICES	VCES=1200V, VGE=0V				250	μA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V				200	nA
	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 VGE=±15V RG=51Ω			0.35	1.2	μs
		tr				0.25	0.6	
	Turn-off time	toff				0.45	1.0	
		tf				0.08	0.3	
	Reverse current	IRRM	VR=1200V				250	μA
off-state current	IDM	VDM=1600V				1.0	mA	
Thyristor	Reverse current	IRRM	VRM=1600V				1.0	mA
	Gate trigger current	IGT	VD=6V, IT=1A				100	mA
	Gate trigger voltage	VGT	VD=6V, IT=1A				2.5	V
	On-state voltage	VTM	ITM=50A	chip		1.0	1.15	V
				terminal		1.1		
Converter	Forward on voltage	VFM	IF=50A	chip		1.1		V
				terminal		1.2	1.5	
Thermistor	Reverse current	IRRM	VR=1600V				250	μA
	Resistance	R	T=25°C			5000		Ω
		T=100°C		465	495	520		
	B value	B	T=25/50°C		3305	3375	3450	K

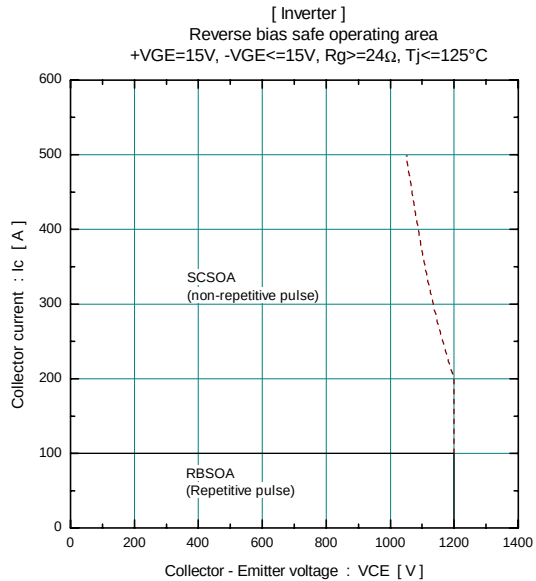
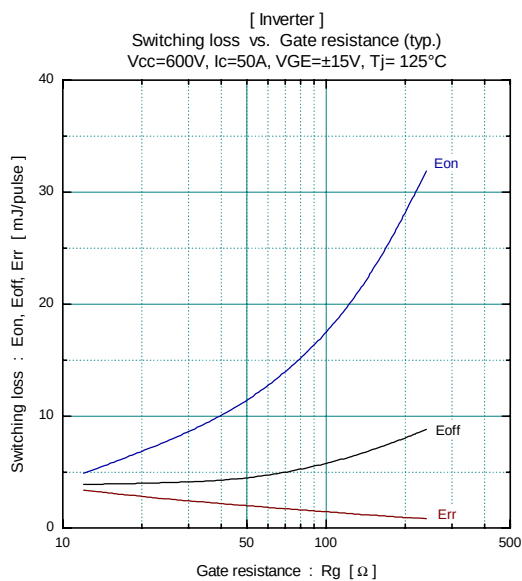
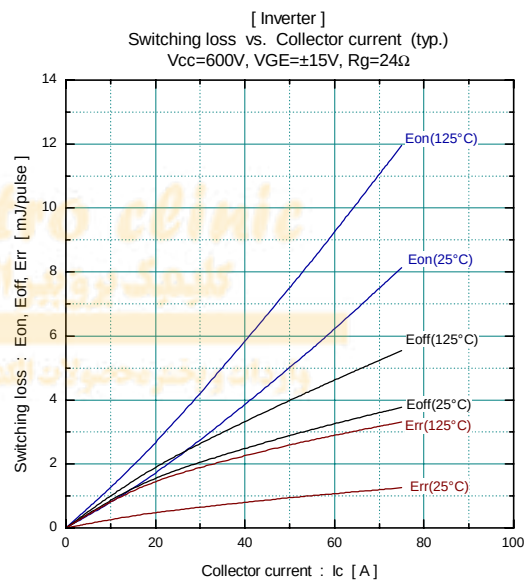
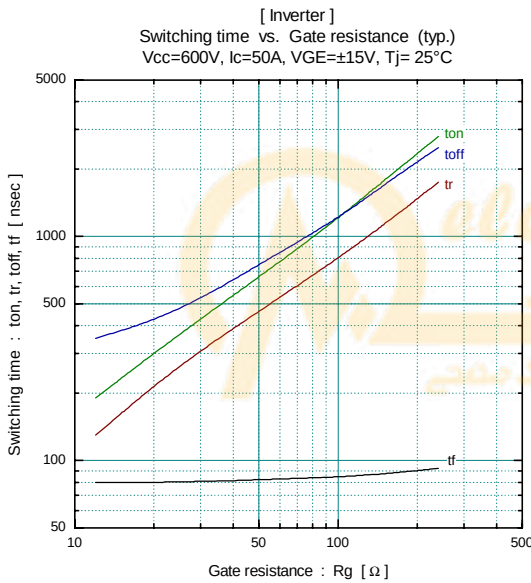
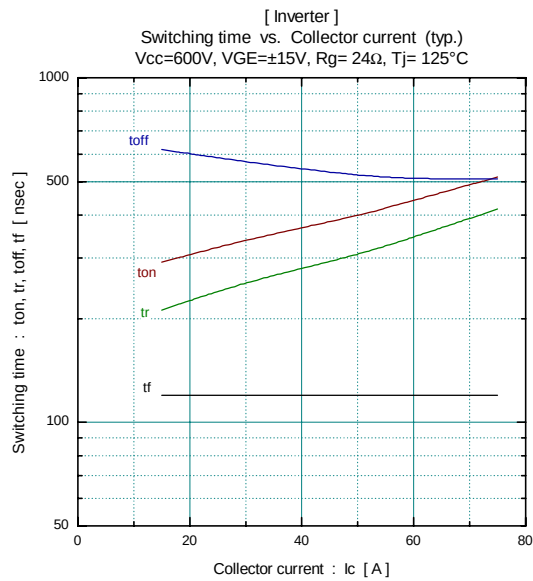
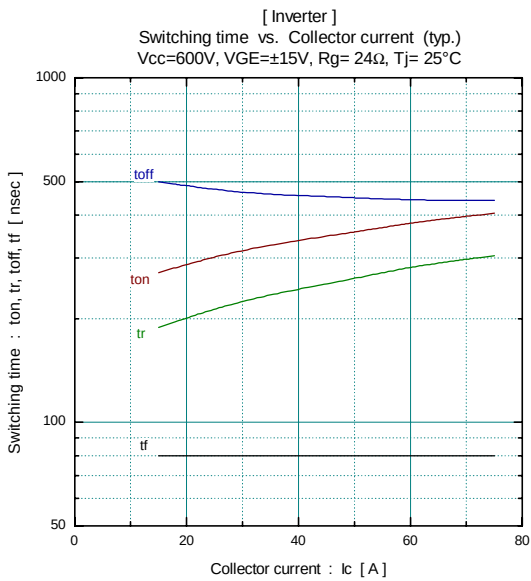
● Thermal resistance Characteristics

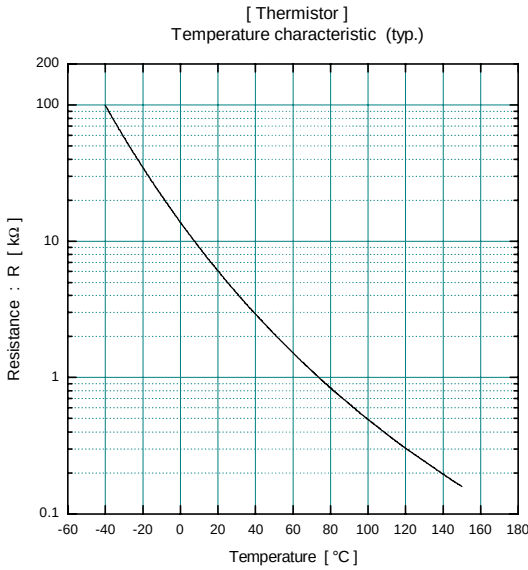
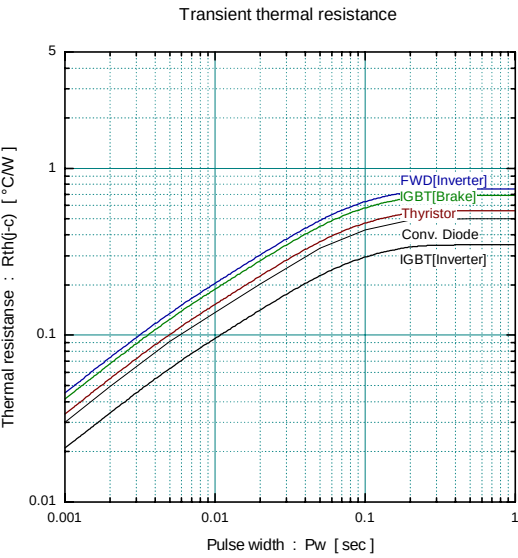
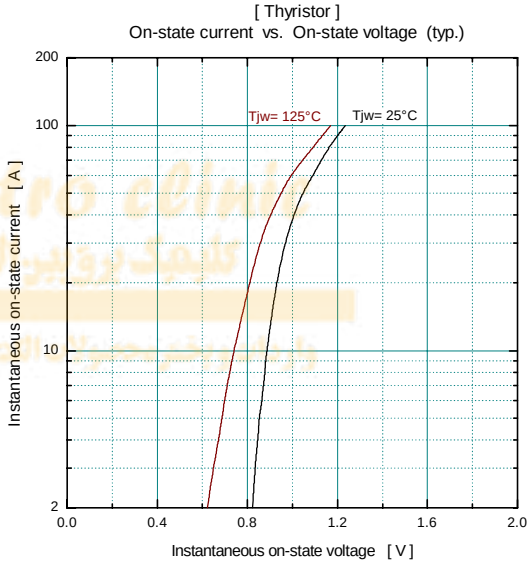
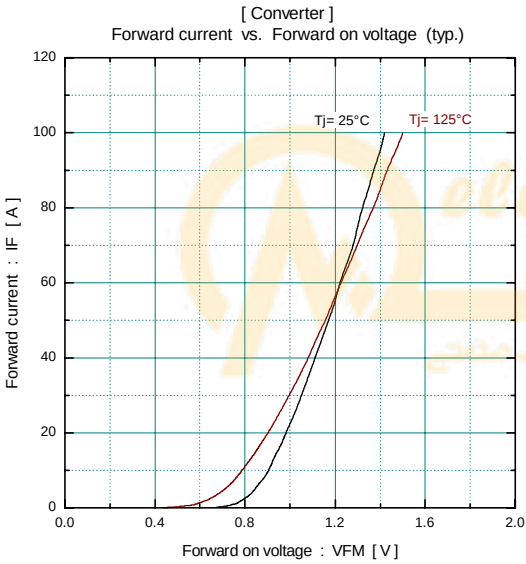
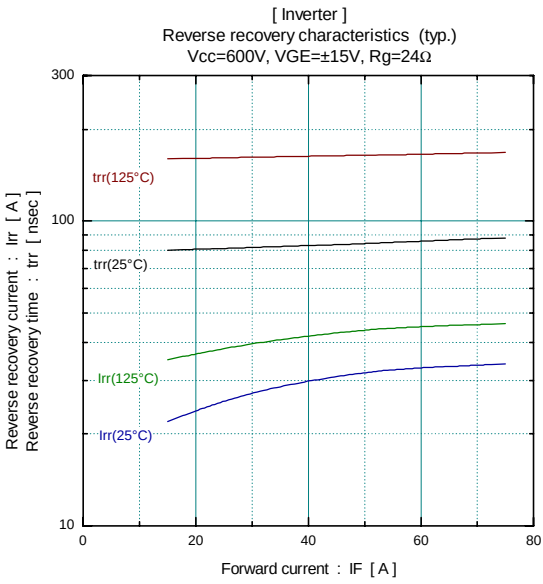
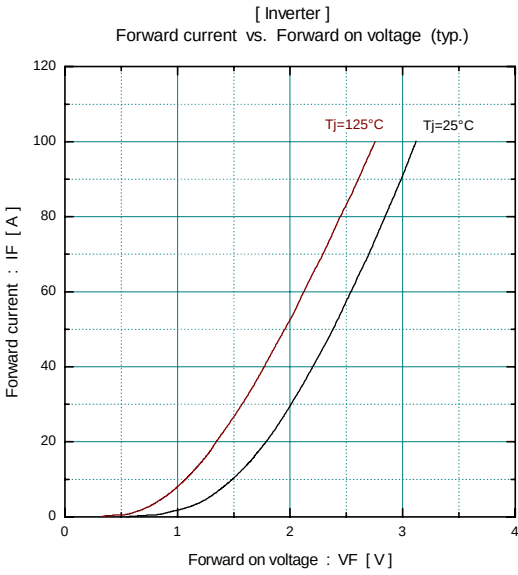
Item		Symbol	Condition	Characteristics			Unit
				Min.	Typ.	Max.	
Thermal resistance (1 device)		R _{th(j-c)}	Inverter IGBT			0.35	°C/W
			Inverter FWD			0.75	
			Brake IGBT			0.69	
			Thyristor			0.56	
			Converter Diode			0.50	
Contact thermal resistance *		R _{th(c-f)}	With thermal compound		0.05		

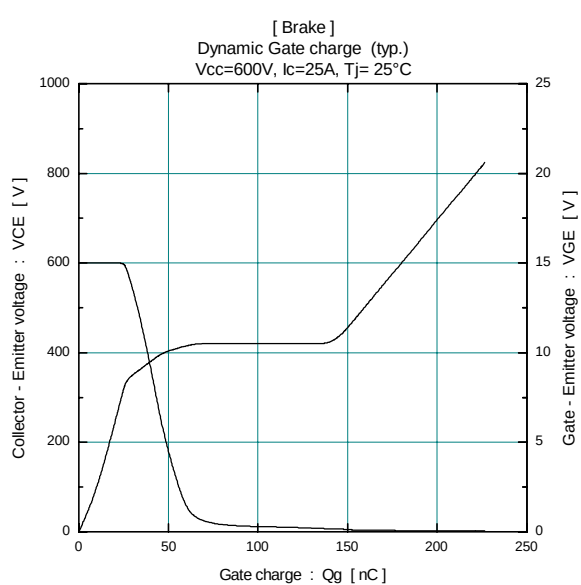
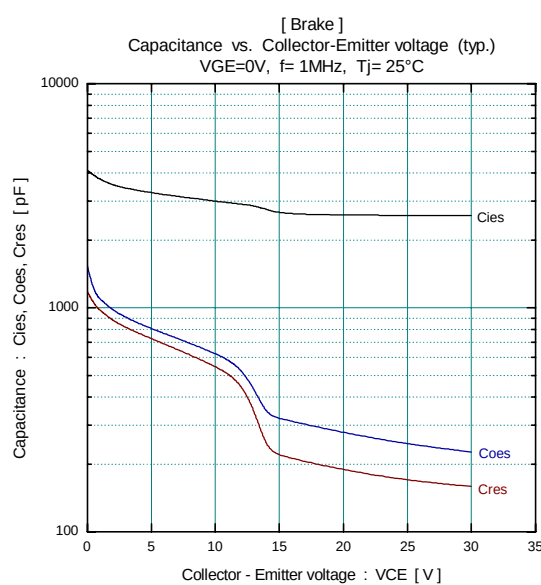
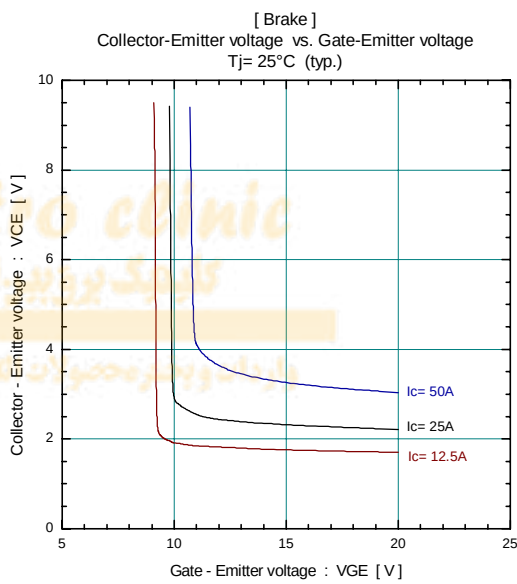
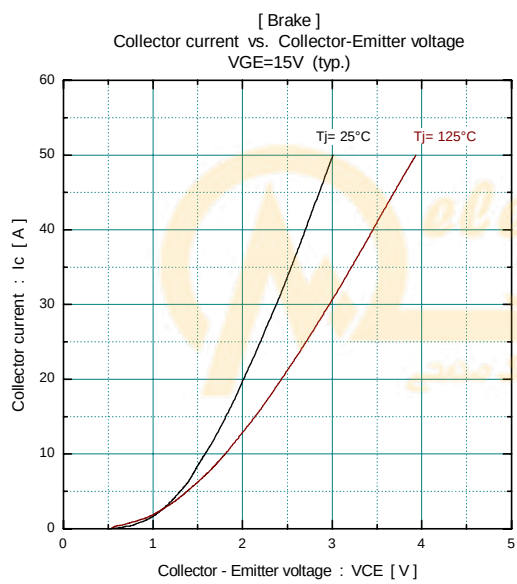
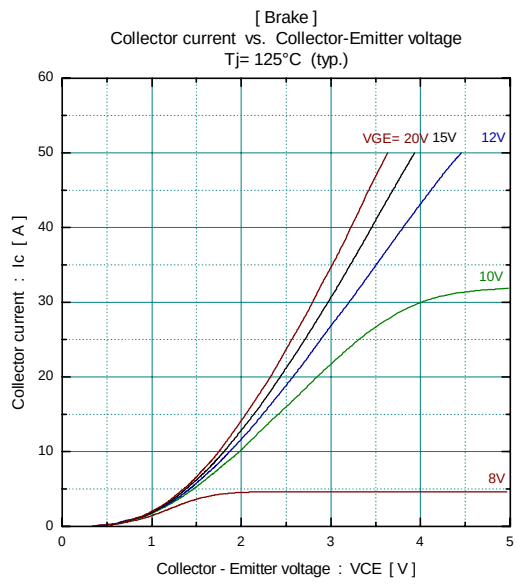
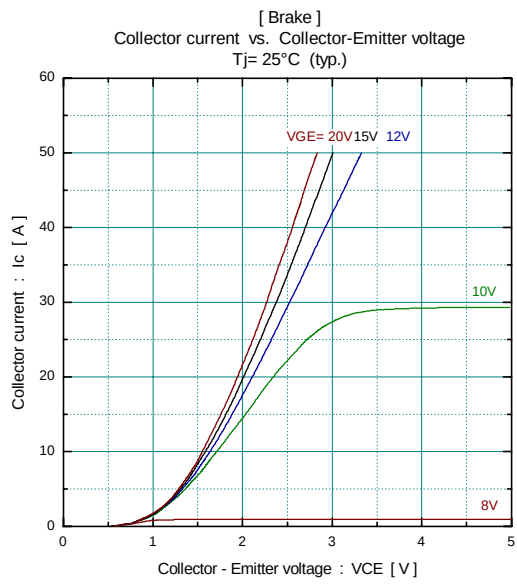
* This is the value which is defined mounting on the additional cooling fin with thermal compound

■ Characteristics (Representative)

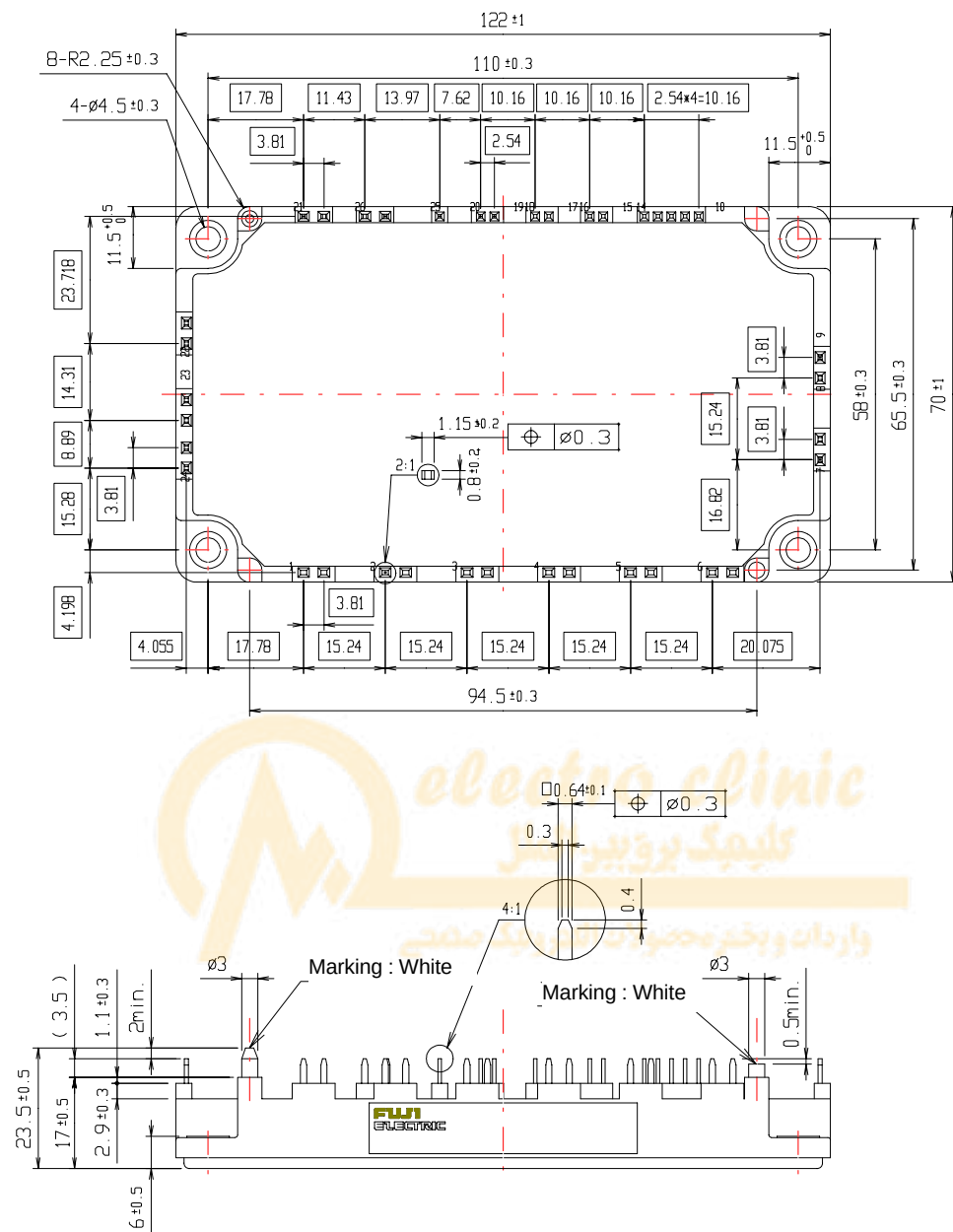








Outline Drawings, mm



Equivalent Circuit Schematic

