

PIM/Built-in converter with thyristor and brake (S series) 600V / 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}	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
Thyristor	Repetitive peak reverse voltage(Diode)	V_{RRM}	600	V	
	Repetitive peak off-state voltage	V_{DRM}	800	V	
	Repetitive peak reverse voltage	V_{RRM}	800	V	
	Average on-state current	$I_{T(AV)}$	50Hz/60Hz sine wave	50	A
	Surge On-state current (Non-Repetitive)	I_{TSM}	$T_j=125^\circ\text{C}$, 10ms half sine wave	563	A
Junction temperature	T_{jw}		125	$^\circ\text{C}$	
Converter	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	525	A
	$I_{\rho t}$ (Non-Repetitive)	$I_{\rho t}$	half sine wave	1378	A^2s
Junction temperature (except Thyristor)	T_j		+150	$^\circ\text{C}$	
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$	
Isolation between terminal and copper base *2 voltage between thermistor and others *3	V_{iso}	AC : 1 minute	AC 2500	V	
			AC 2500	V	
Mounting screw torque			1.7 *1	Nm	

*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)

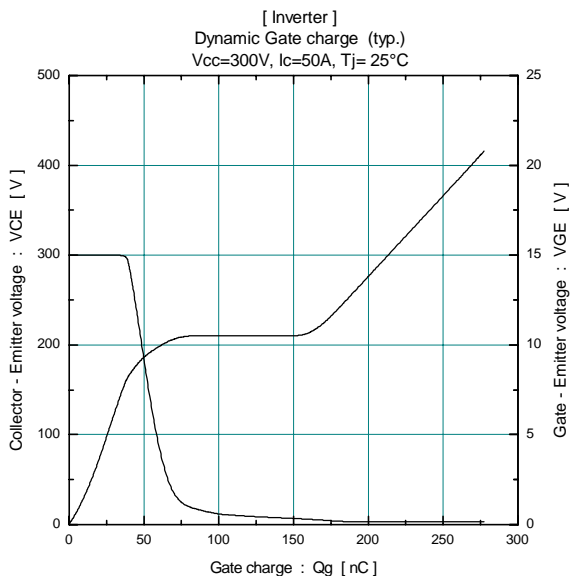
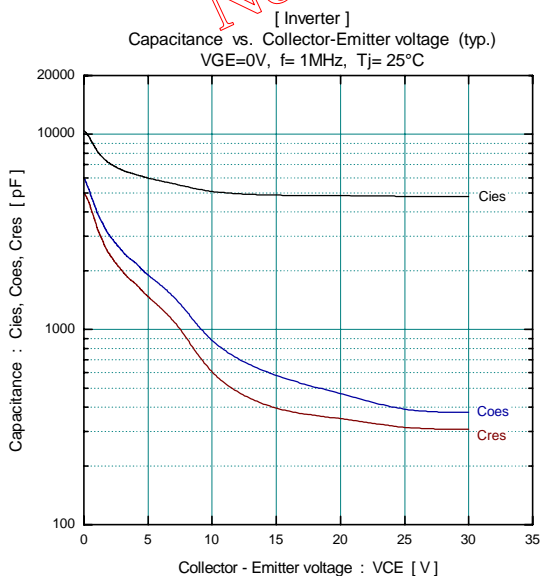
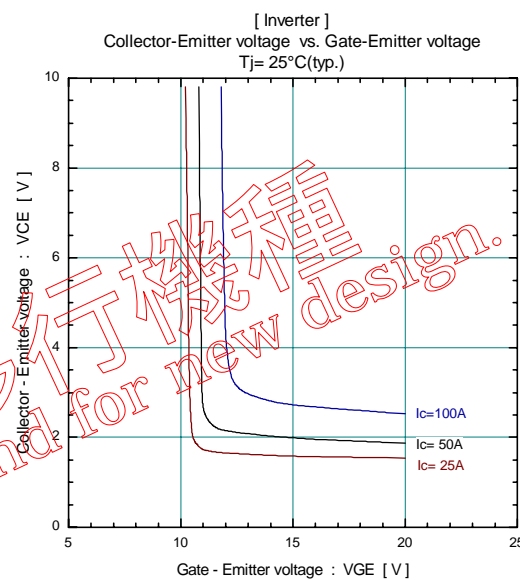
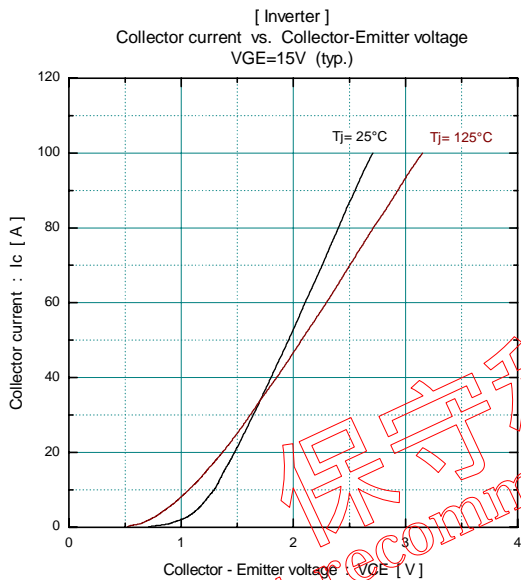
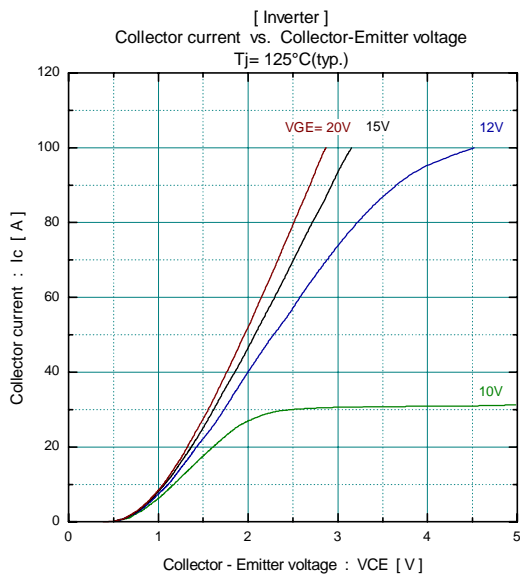
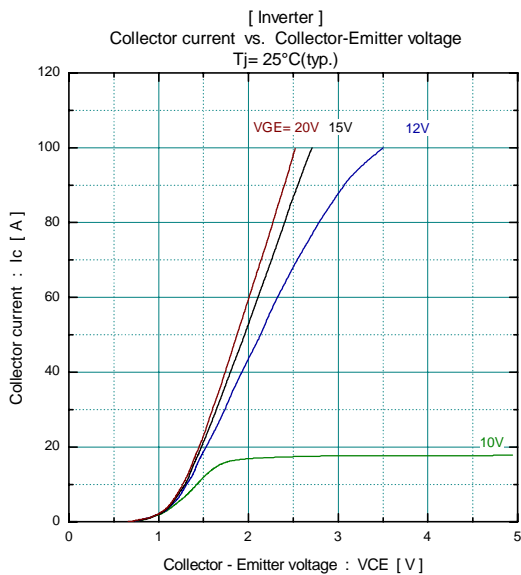
Item	Symbol	Condition	Characteristics			Unit			
			Min.	Typ.	Max.				
Inverter	Zero gate voltage collector current	ICES	V _{CE} =600V, V _{GE} =0V			150	μA		
	Gate-Emitter leakage current	IGES	V _{CE} =0V, V _{GE} =±20V			200	nA		
	Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} =20V, I _c =50mA			5.5	7.8	8.5	V
	Collector-Emitter saturation voltage	V _{CE(sat)}	V _{GE} =15V, I _c =50A	chip	1.8		V		
				terminal	1.95			2.4	
	Input capacitance	C _{ies}	V _{GE} =0V, V _{CE} =10V, f=1MHz			5000		pF	
	Turn-on time	ton	V _{CC} =300V			0.45	1.2	μs	
		tr	I _c =50A			0.25	0.6		
	Turn-off	toff	V _{GE} =±15V			0.40	1.0		
		tf	R _G =51Ω			0.05	0.35		
Forward on voltage	V _F	I _F =50A	chip	1.75		V			
			terminal	1.9			2.6		
Reverse recovery time of FRD	t _{rr}	I _F =50A			300		ns		
Brake	Zero gate voltage collector current	ICES	V _{CE} =600V, V _{GE} =0V			150	μA		
	Gate-Emitter leakage current	IGES	V _{CE} =0V, V _{GE} =±20V			200	nA		
	Collector-Emitter saturation voltage	V _{CE(sat)}	I _c =30A, V _{GE} =15V	chip	1.8		V		
				terminal	1.95			2.4	
	Turn-on time	ton	V _{CC} =300V			0.45	1.2	μs	
		tr	I _c =30A			0.25	0.6		
	Turn-off time	toff	V _{GE} =±15V			0.40	1.0		
		tf	R _G =82Ω			0.05	0.35		
	Reverse current	I _{RRM}	V _R =600V			150		μA	
	off-state current	I _{DM}	V _{DM} =800V			1.0		mA	
Thyristor	Reverse current	I _{RRM}	V _{RM} =800V			1.0		mA	
	Gate trigger current	I _{GT}	V _D =6V, I _T =1A			100		mA	
	Gate trigger voltage	V _{GT}	V _D =6V, I _T =1A			2.5		V	
	On-state voltage	V _{TM}	I _{TM} =50A	chip	1.2		V		
				terminal	1.3				
Converter	Forward on voltage	V _{FM}	I _F =50A	chip	1.1		V		
		terminal		1.2		1.5			
	Reverse current	I _{RRM}	V _R =800V			150		μA	
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

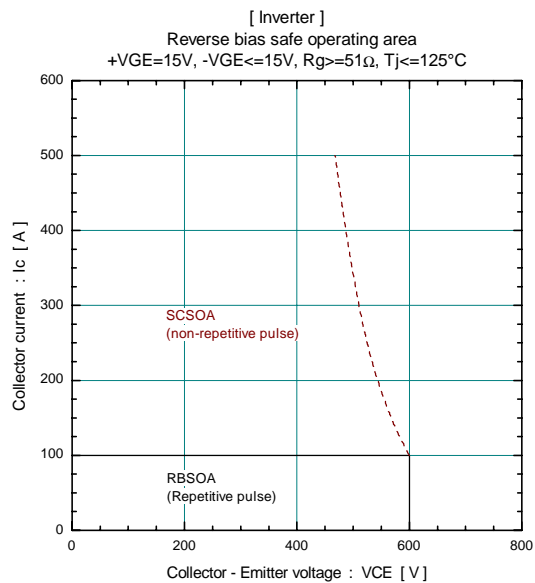
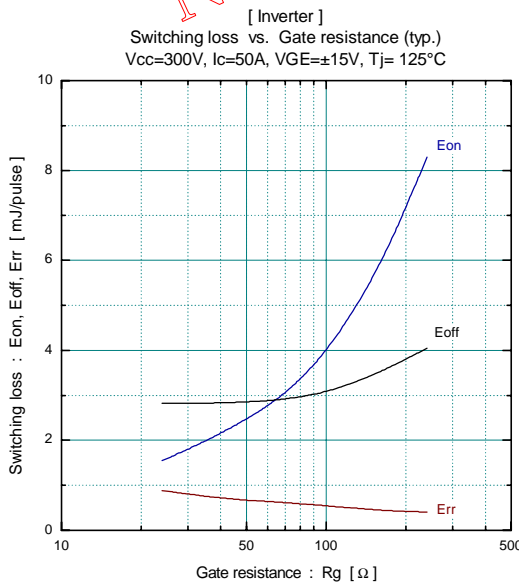
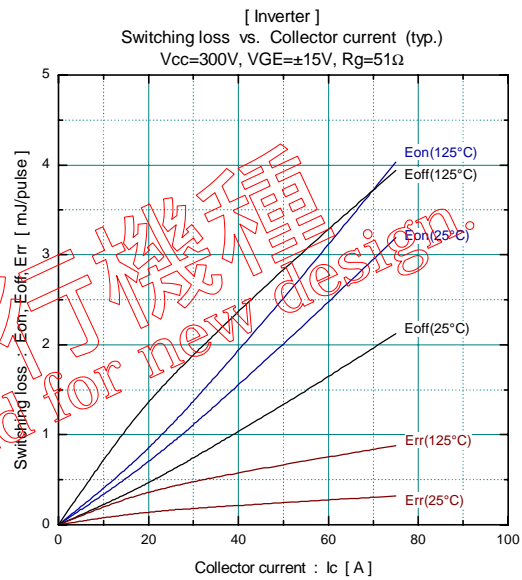
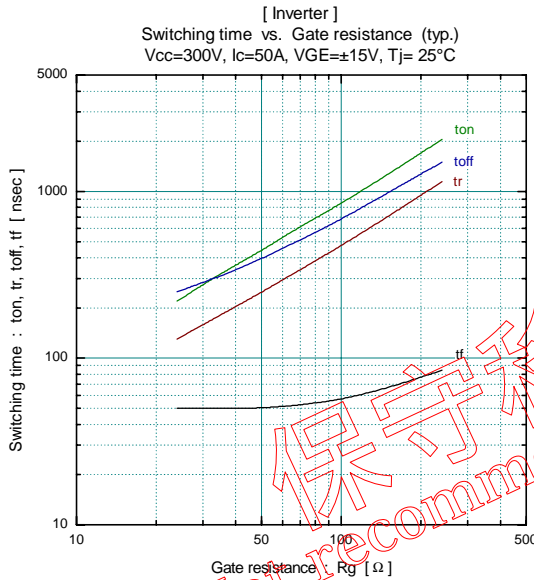
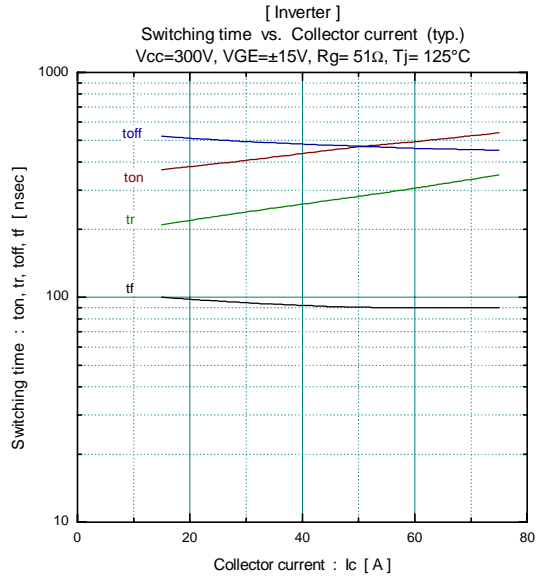
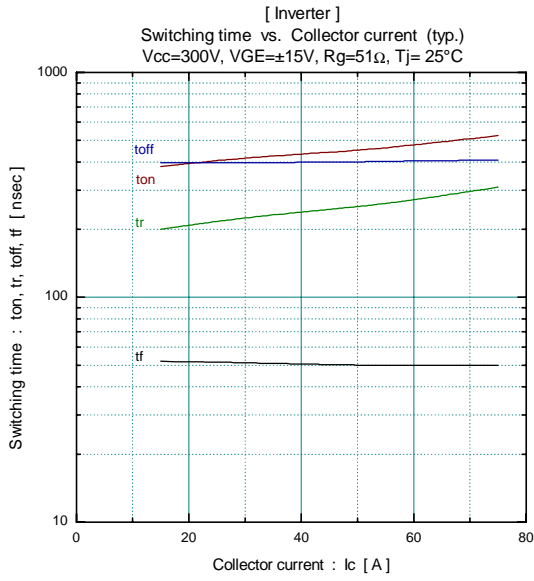
Item	Symbol	Condition	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance (1 device)	R _{th(j-c)}	Inverter IGBT			0.63	°C/W
		Inverter FWD			1.33	
		Brake IGBT			1.04	
		Thyristor			1.00	
		Converter Diode			0.90	
Contact thermal resistance *	R _{th(c-f)}	With thermal compound		0.05		

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

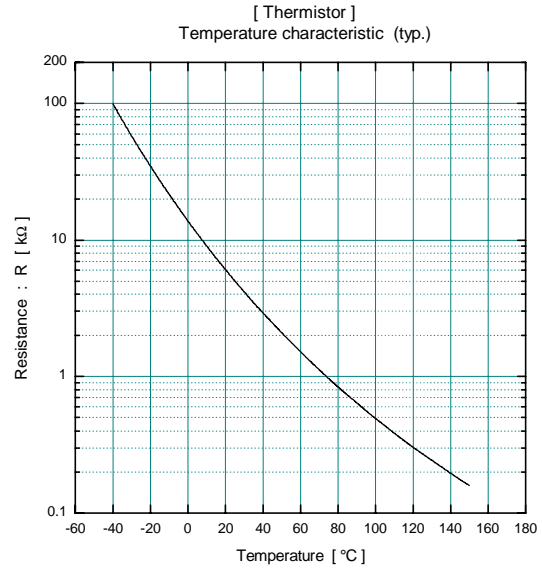
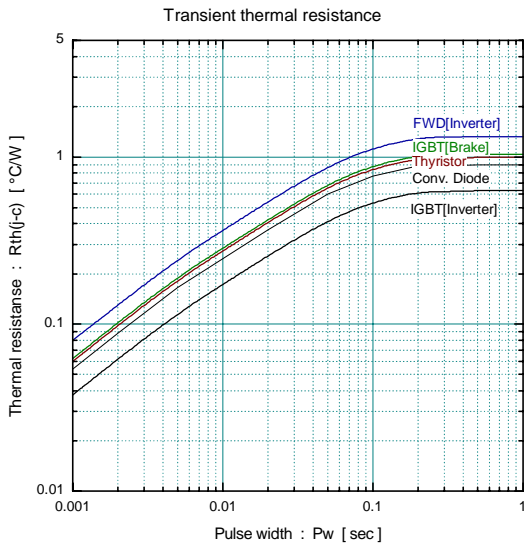
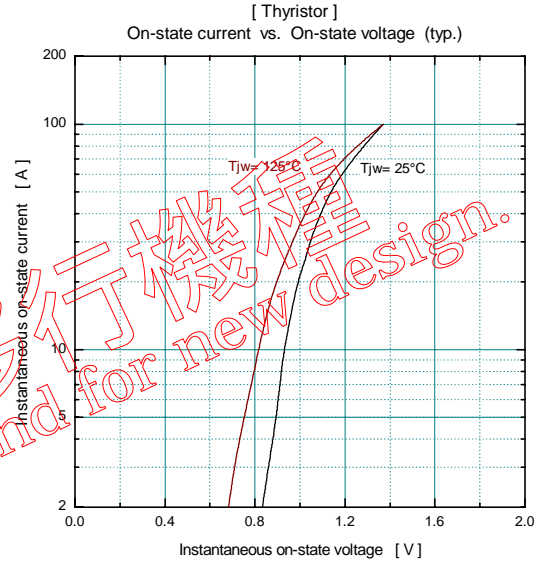
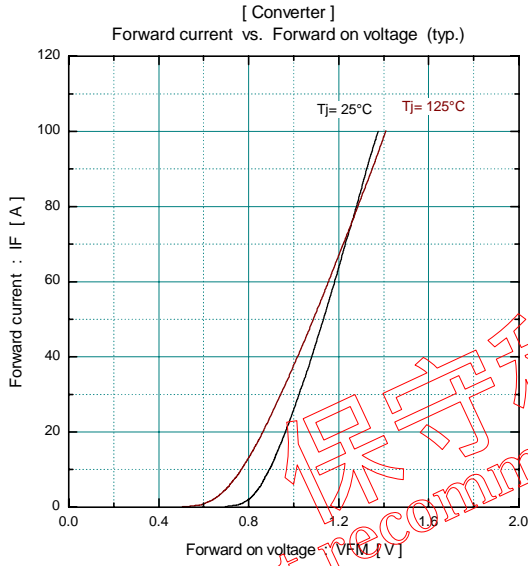
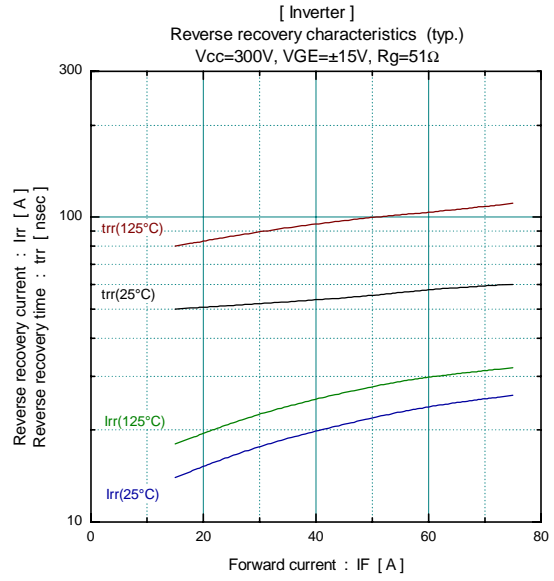
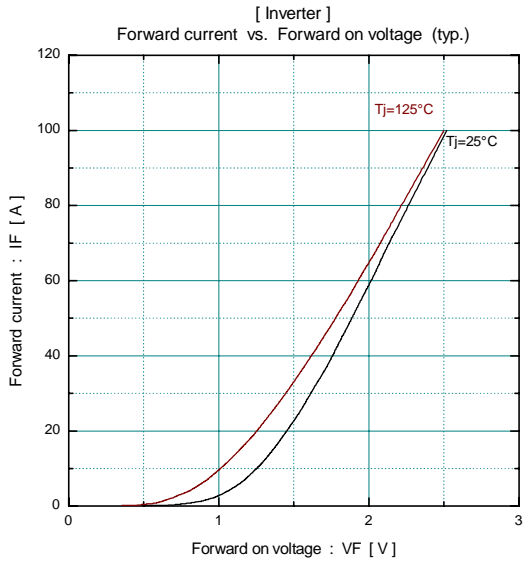
■ Characteristics (Representative)



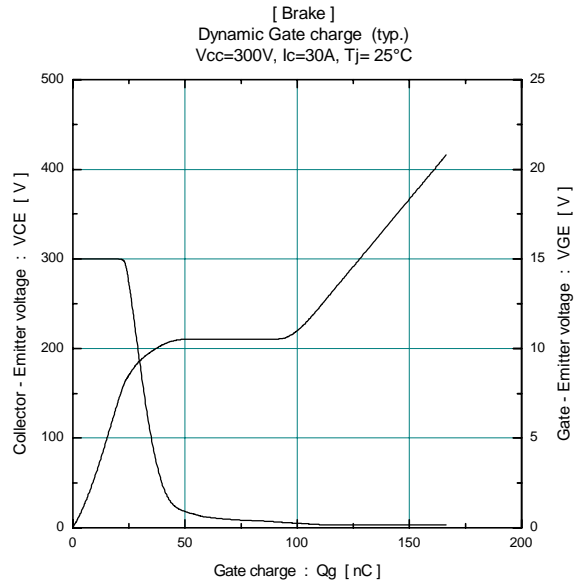
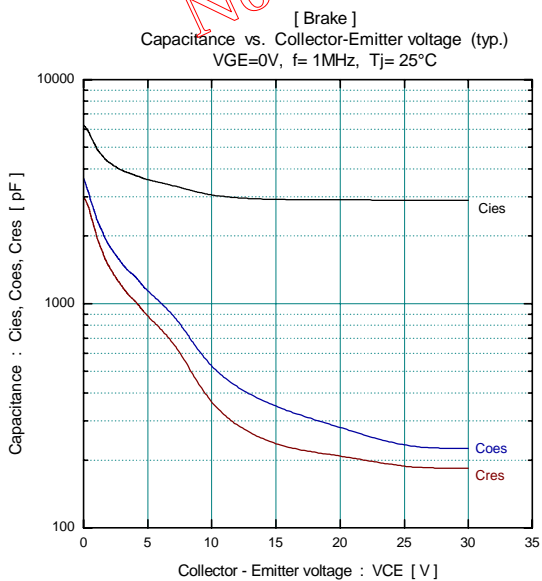
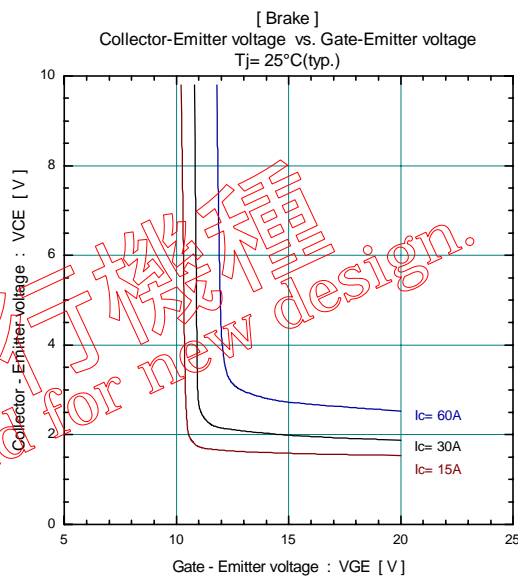
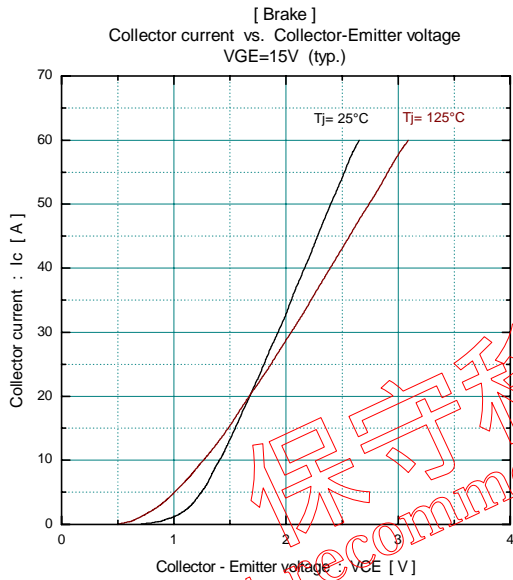
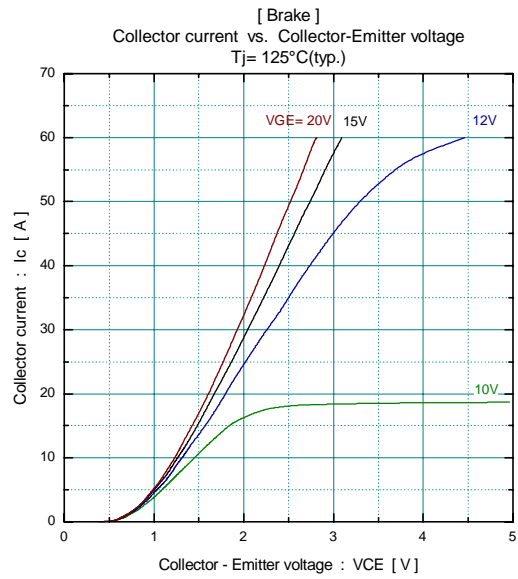
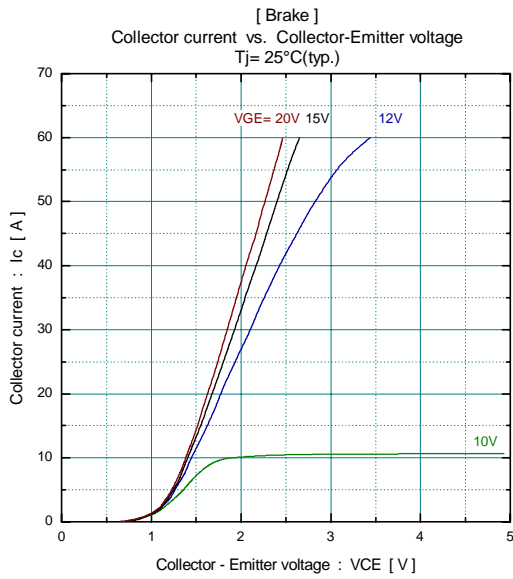
保守移行機種
Not recommend for new design.



保守移行機種
 Not recommend for new design

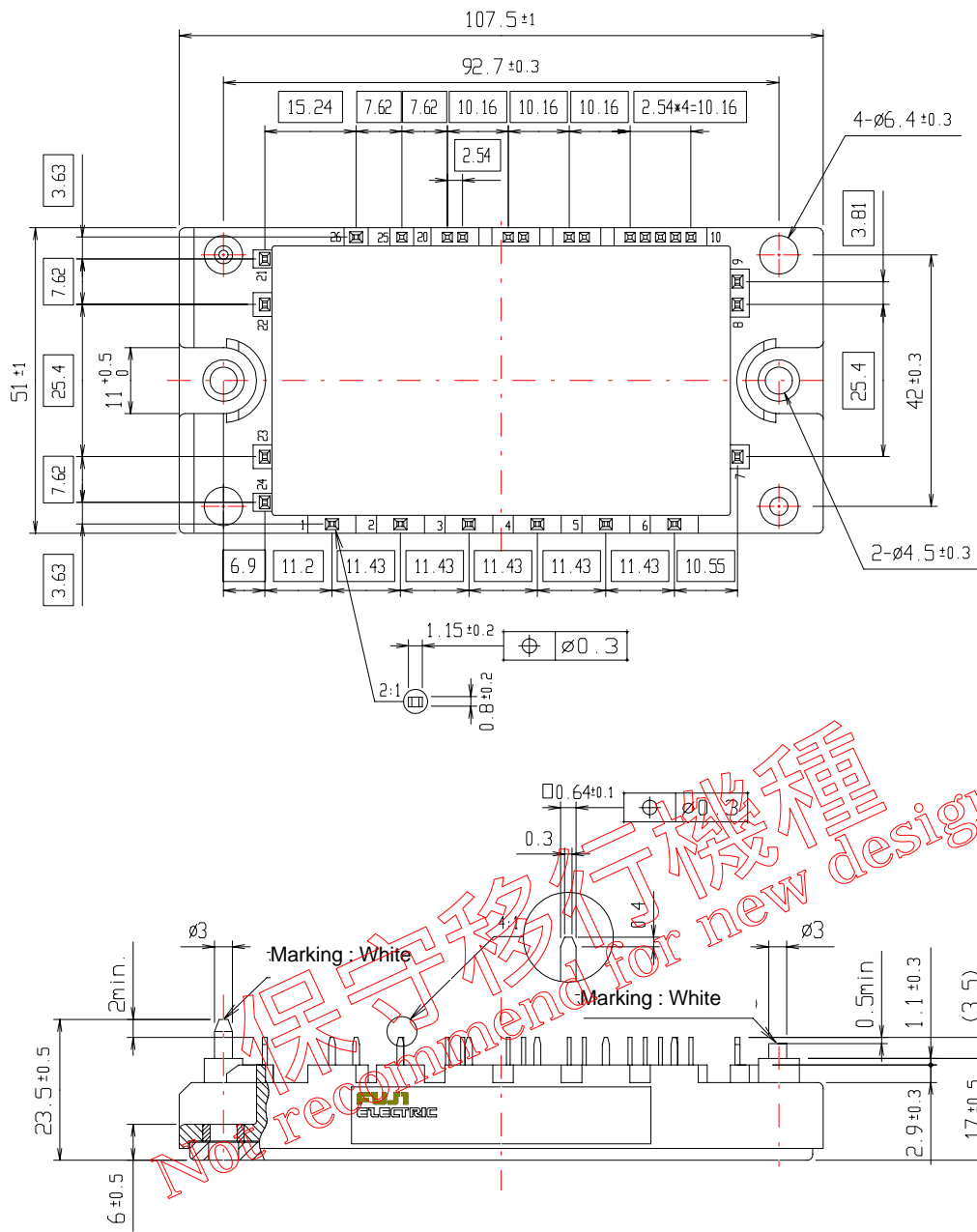


保守移行機種
Not recommended for new design.



保守移行機構
Not recommend for new design.

Outline Drawings, mm



Equivalent Circuit Schematic

