

SPECIFICATION

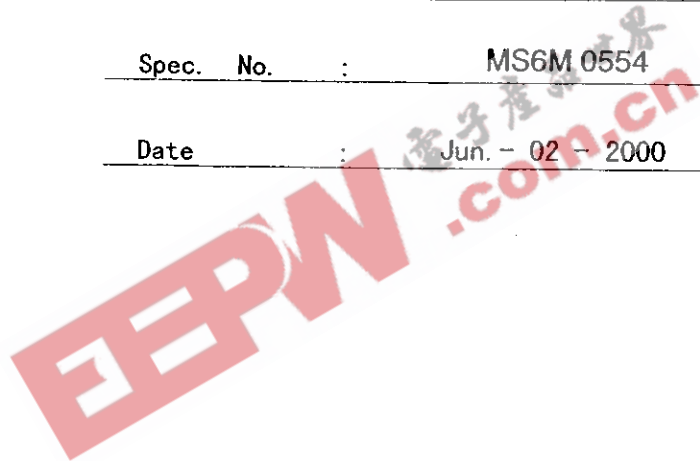
Device Name : IGBT Module

Type Name : 7MBR35SB120-01

Spec. No. : MS6M 0554

Date : Jun. - 02 - 2000

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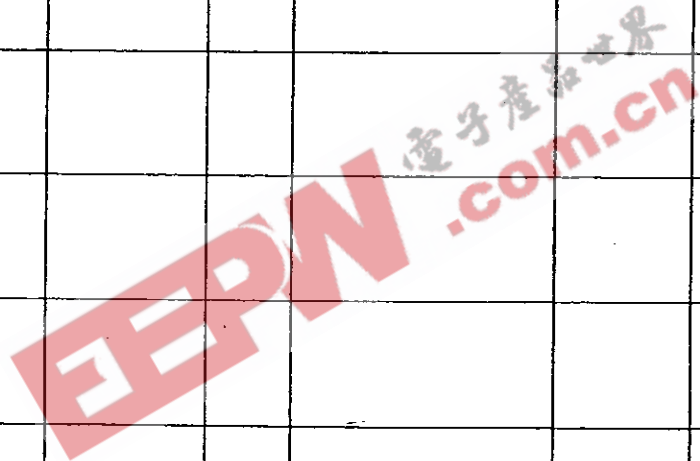
Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.		
DRAWN	Jun. - 2 - '00	T. Kobayashi	<i>[Signature]</i>	DWG. NO.	MS6M 0554	1 / 10
CHECKED	June - 2 - 00	S. Matsumoto				Q

Revised Records

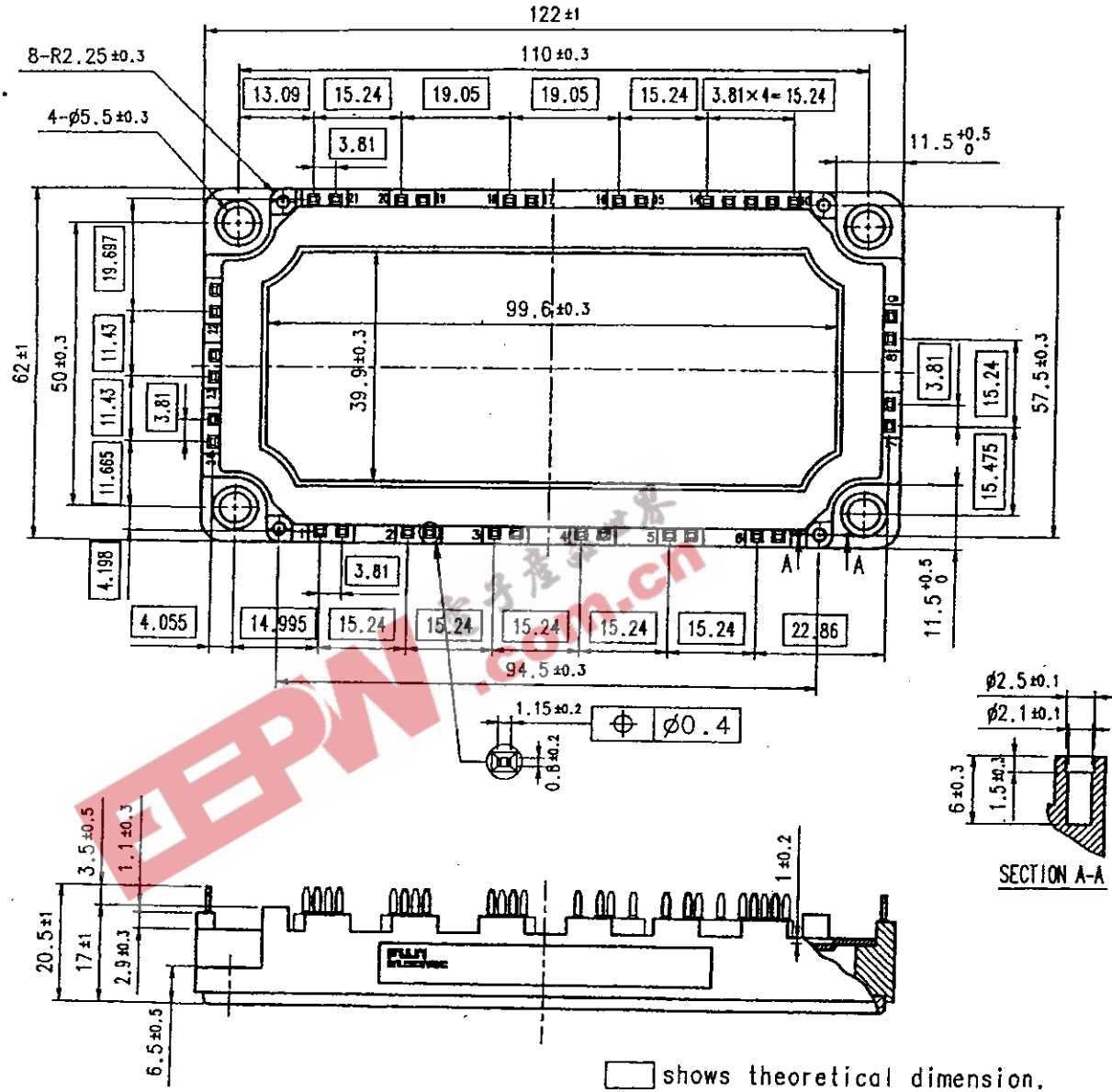
Date	Classification	Ind.	Content	Applied date	Drawn	Checked	Approved
Jun-2-'60	enactment	—	—	Issued date	—	S. Ikeda	T. Miyasaka
Jun-14-'60	Revision	a	Revised type MISS (P5/10)		J. Kobayashi	S. Ikeda	T. Miyasaka

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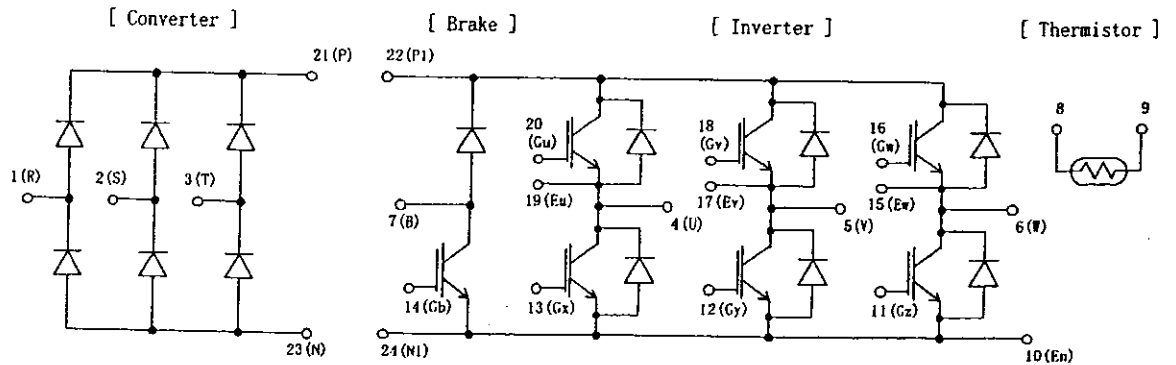
7MBR35SB120-01

1. Outline Drawing (Unit : mm)



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2. Equivalent circuit



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3. Absolute Maximum Ratings (at Tc= 25C unless otherwise specified)

Items		Symbols	Conditions	Maximum Ratings	Units	
Inverter	Collector-Emitter voltage	VCES		1200	V	
	Gate-Emitter voltage	VGES		+20	V	
	Collector current	Ic	Continuous	Tc=25C	50	A
				Tc=80C	35	
		Icp	1ms	Tc=25C	100	A
				Tc=80C	70	
-Ic			35	A		
Collector Power Dissipation	Pc	1 device	240	W		
Brake	Collector-Emitter voltage	VCES		1200	V	
	Gate-Emitter voltage	VGES		+20	V	
	Collector current	Ic	Continuous	Tc=25C	35	A
				Tc=80C	25	
		Icp	1ms	Tc=25C	70	A
				Tc=80C	50	
Collector Power Dissipation	Pc	1 device	180	W		
Repetitive peak reverse Voltage(Diode)	VRRM		1200	V		
Converter	Repetitive peak reverse Voltage	VRRM		1600	V	
	Average Output Current	Io	50Hz/60Hz sine wave	35	A	
	Surge Current (Non-Repetitive)	IFSM	Tj=150C,10ms	360	A	
	I ² t (Non-Repetitive)	I ² t	half sine wave	648	A ² s	
	Junction temperature	Tj		150	C	
Storage temperature	Tstg		-40~ +125	C		
Isolation voltage	between terminal and copper base ^{(*)1}	Viso	AC : 1min.	2500	V	
	between thermistor and others ^{(*)2}			2500	V	
Mounting Screw Torque ^{(*)3}				3.5	Nm	

(*1) All terminals should be connected together when isolation test will be done.

(*2) 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.

(*3) Recommendable Value : 2.5~3.5 Nm (M5)

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4. Electrical characteristics (at Tj= 25C unless otherwise specified)

Items	Symbols	Conditions	Characteristics			Units		
			min.	typ.	Max.			
Inverter	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 1200 V		1.0	mA		
	Gate-Emitter leakage current	IGES	VCE = 0 V, VGE = +20 V		200	nA		
	Gate-Emitter threshold voltage	VGE(th)	VCE = 20 V, Ic = 35 mA		5.5	7.2	8.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, chip			2.1		V
			Ic = 35 A, terminal			2.25	2.7	
	Input capacitance	Cies	VGE = 0 V, VCE = 10 V f = 1 MHz		4200		pF	
	Turn-on time	ton	Vcc = 600 V		0.35	1.2	us	
		tr	Ic = 35 A		0.25	0.6		
		tr(φ)	VGE = +15 V		0.1			
	Turn-off time	toff	RG = 33 ohm		0.45	1.0		
tf				0.08	0.3			
Forward on voltage	VF	IF = 35 A, chip			2.3		V	
		terminal			2.45	3.3		
Reverse recovery time	trr	IF = 35 A				350	ns	
Brake	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 1200 V		1.0	mA		
	Gate-Emitter leakage current	IGES	VCE = 0 V, VGE = +20 V		200	nA		
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, chip			2.1		V
			Ic = 25 A, terminal			2.25	2.7	
	Turn-on time	ton	Vcc = 600 V		0.35	1.2	us	
		tr	Ic = 25 A		0.25	0.6		
	Turn-off time	toff	VGE = +15 V		0.45	1.0		
tf		RG = 51 ohm		0.08	0.3			
Reverse current	IRRM	VR = 1200 V				1.0	mA	
Converter	Forward on voltage	VFM	IF = 35 A, chip			1.1		V
			terminal			1.2	1.5	
Reverse current	IRRM	VR = 1600 V				1.0	mA	
Thermistor	Resistance	R	T = 25C		5000		ohm	
			T = 100C		465	495		520
B value	B	T = 25/50C		3305	3375	3450	K	

5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			0.52	C/W
		Inverter FWD			0.90	
		Brake IGBT			0.69	
		Converter Diode			0.75	
Contact Thermal resistance	Rth(c-f)	with Thermal Compound (*)		0.05		C/W

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

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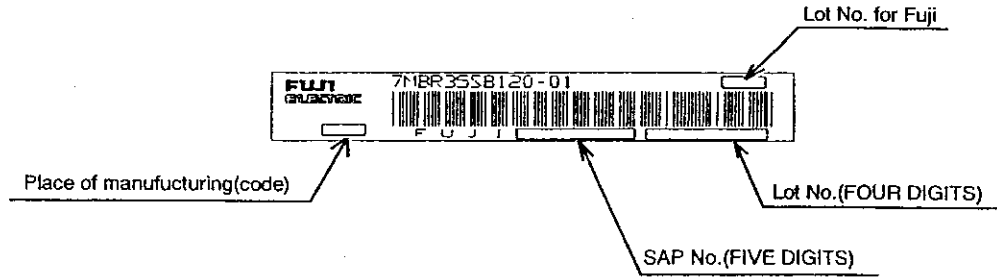
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6. Indication on module



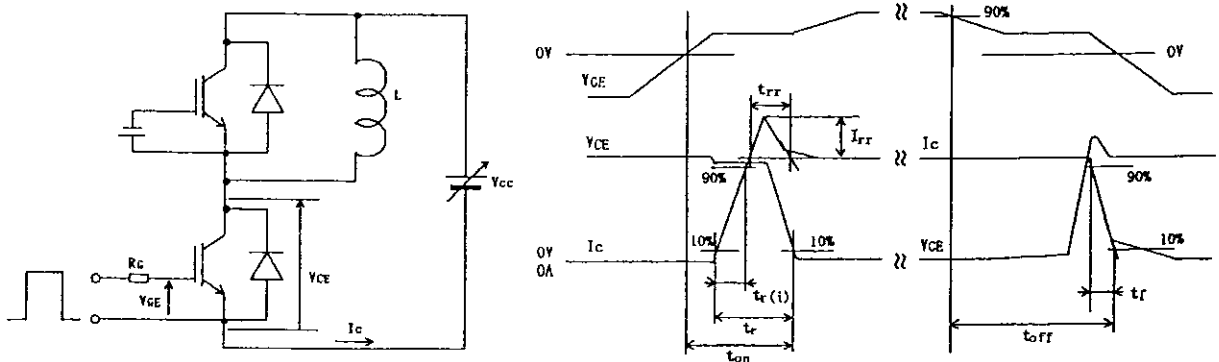
7. Applicable category

This specification is applied to Power Integrated Module named 7MBR35SB120-01 .

8. Storage and transportation notes

- The module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75% .
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
- Avoid exposure to corrosive gases and dust.
- Avoid excessive external force on the module.
- Store modules with unprocessed terminals.
- Do not drop or otherwise shock the modules when transporting.
- Please connect adequate fuse or protector of circuit between three-phase line and this product to prevent the equipment from causing secondary destruction.

9. Definitions of switching time



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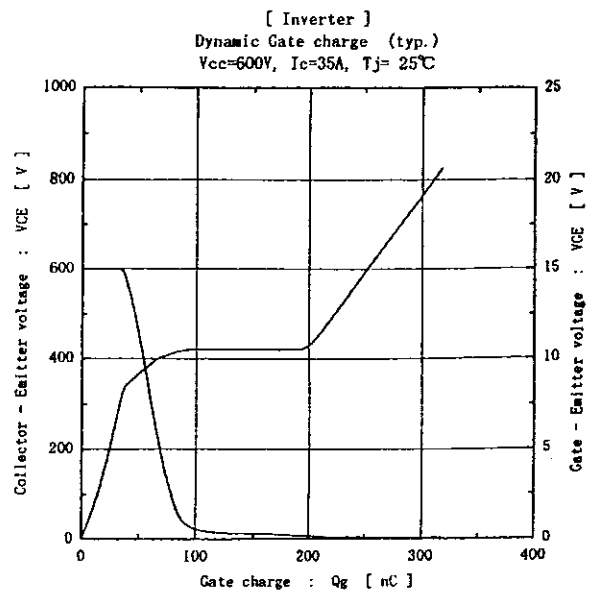
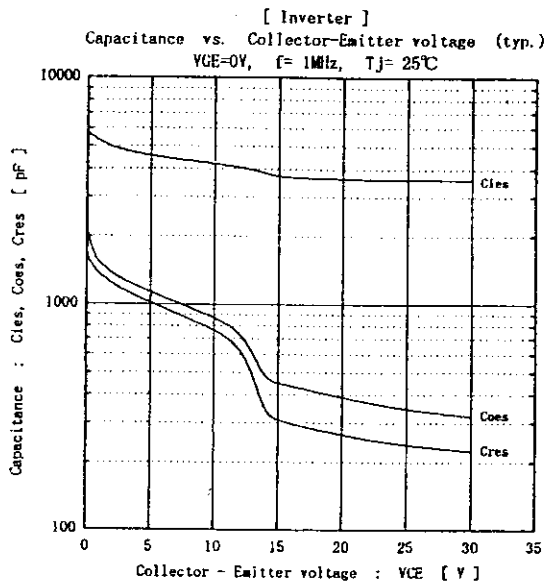
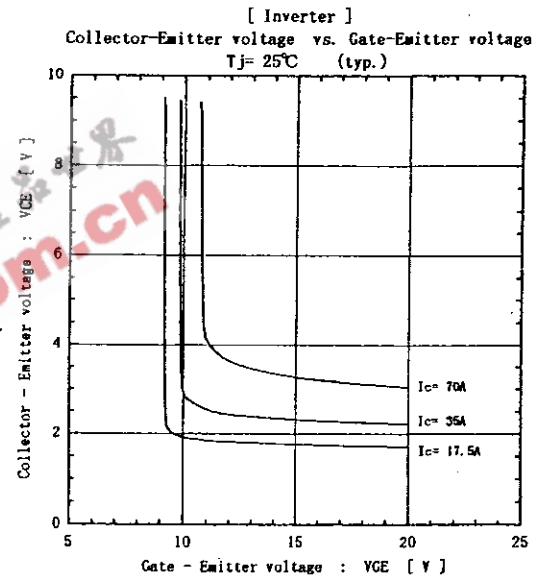
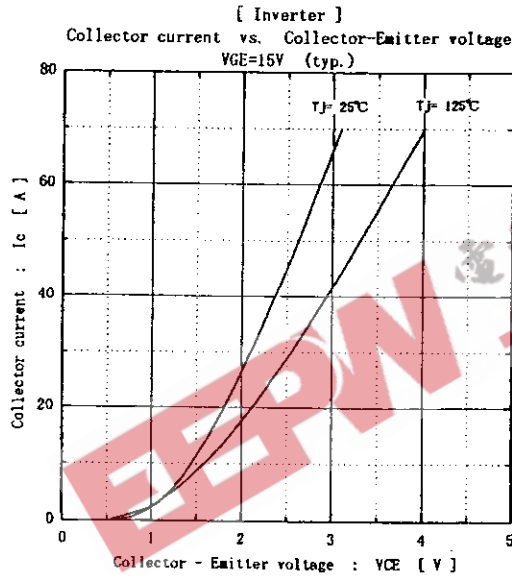
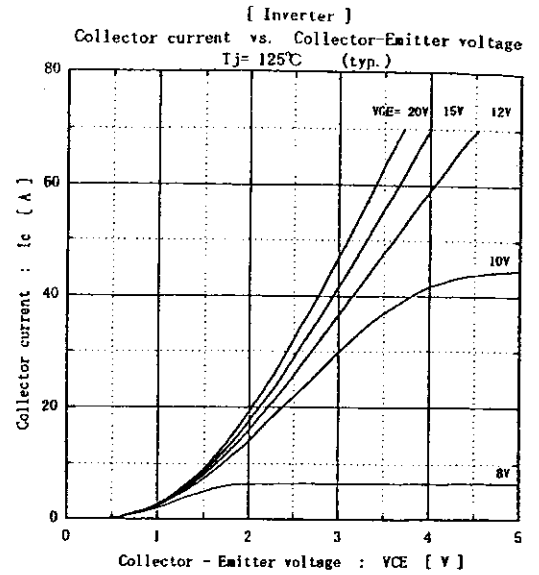
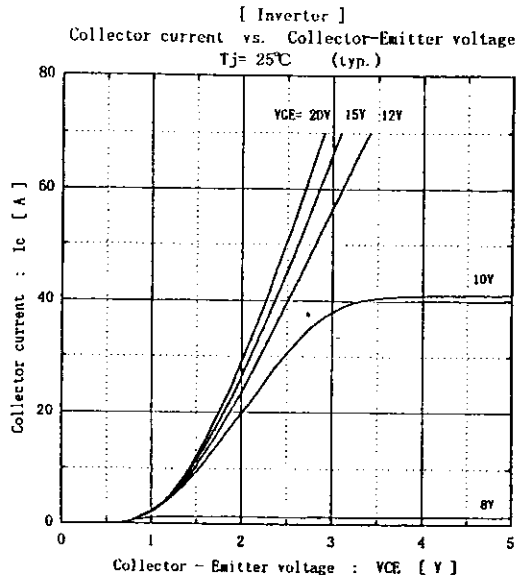
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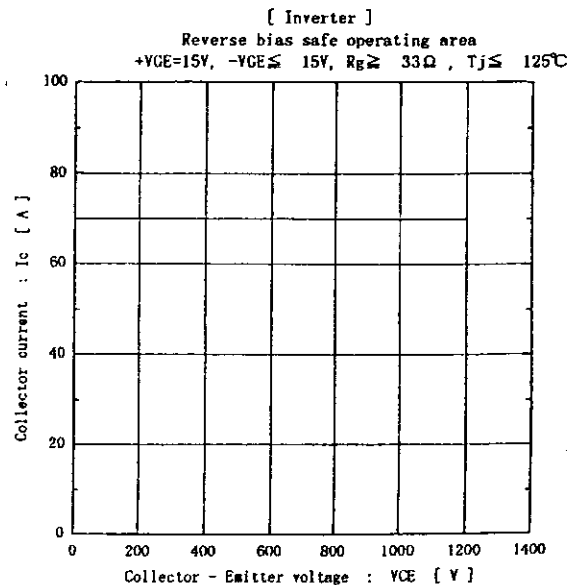
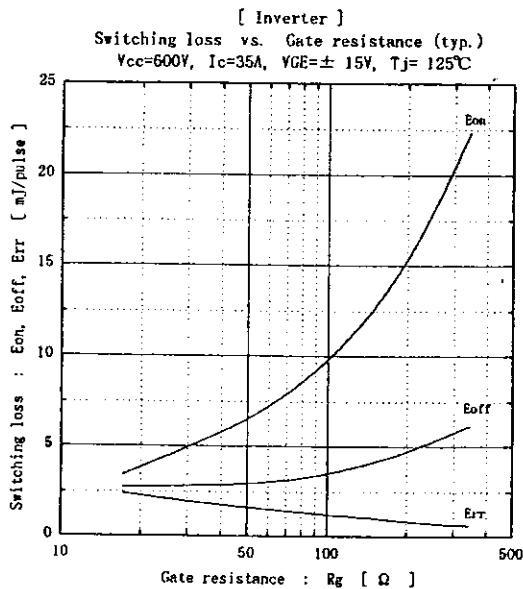
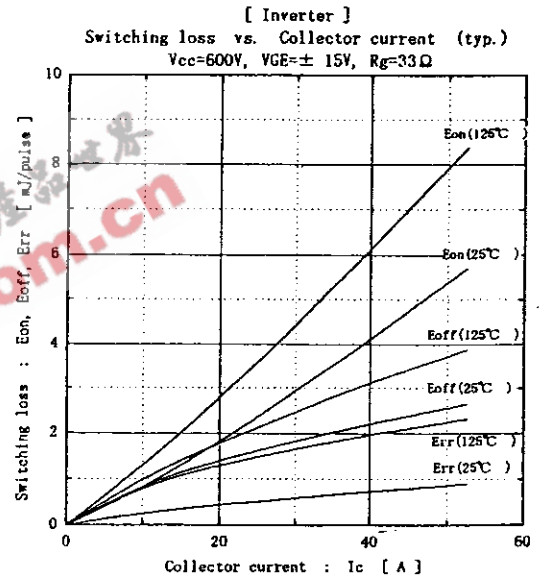
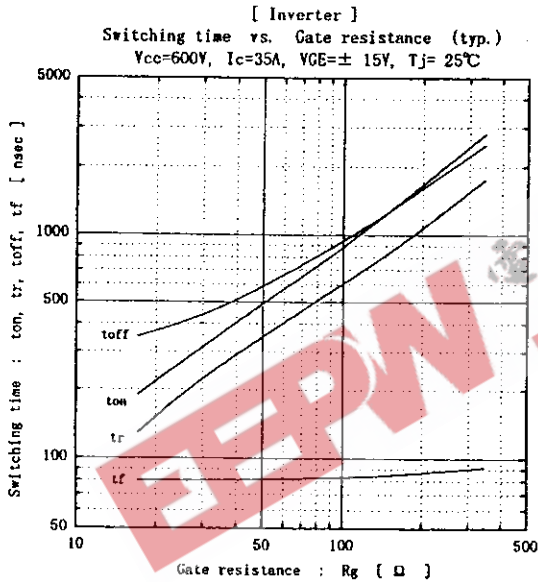
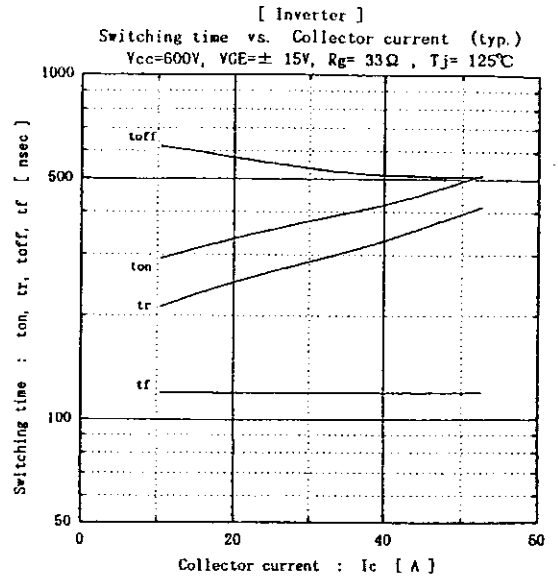
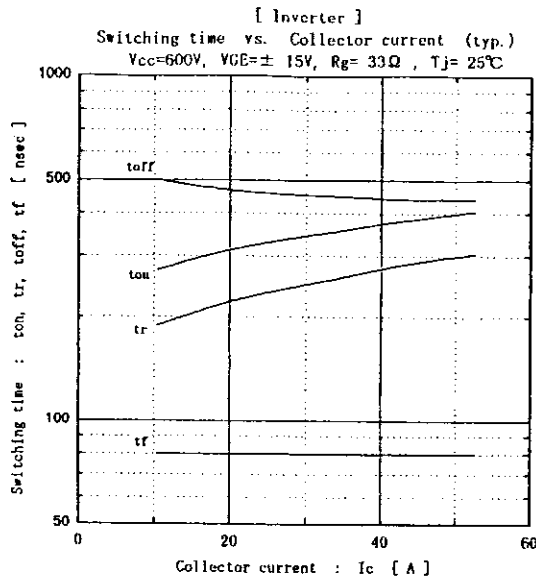
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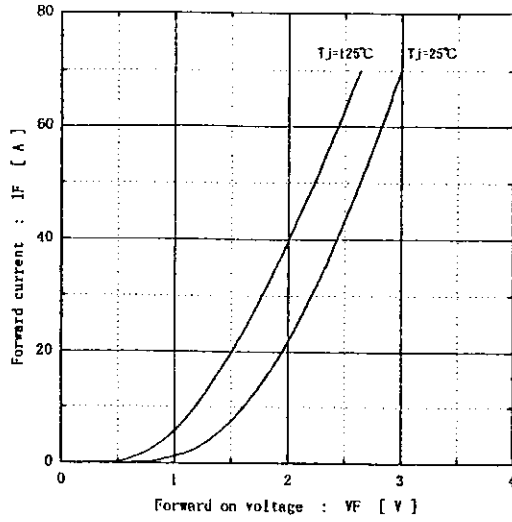
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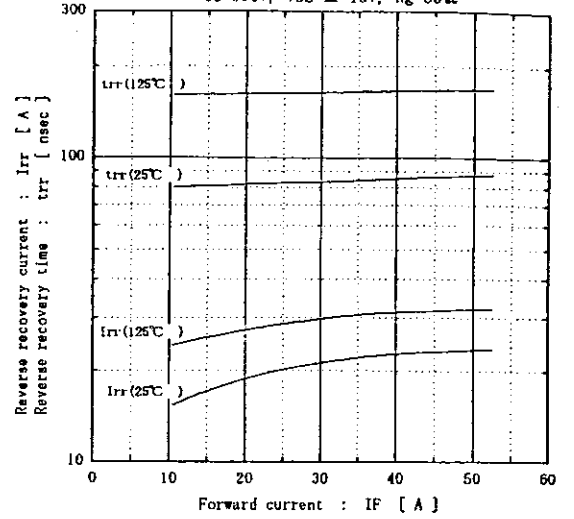
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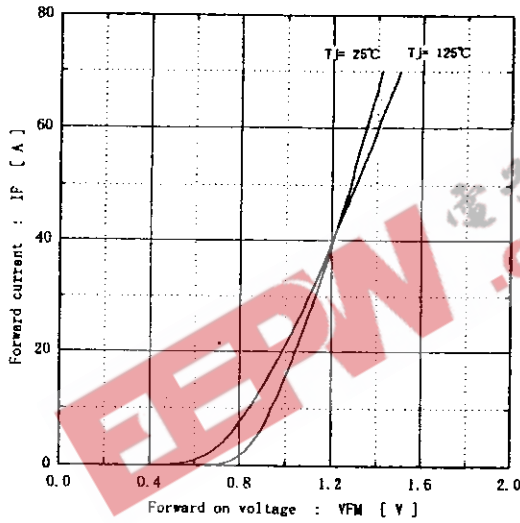
[Inverter]
Forward current vs. Forward on voltage (typ.)



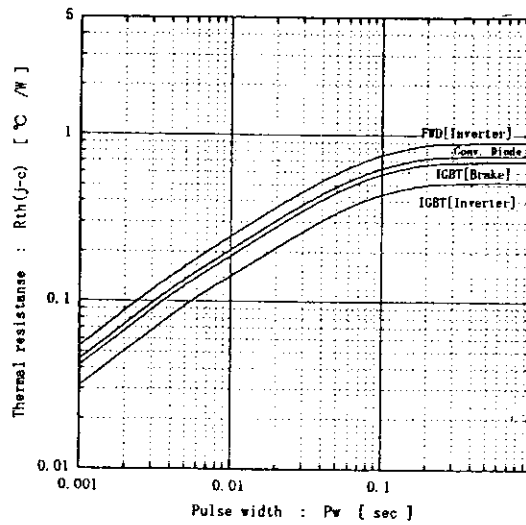
[Inverter]
Reverse recovery characteristics (typ.)
Vcc=600V, VGE=± 15V, Rg=33Ω



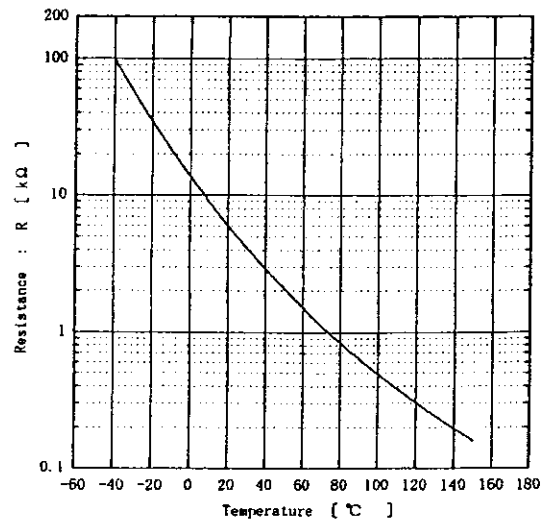
[Converter]
Forward current vs. Forward on voltage (typ.)



Transient thermal resistance



[Thermistor]
Temperature characteristic (typ.)



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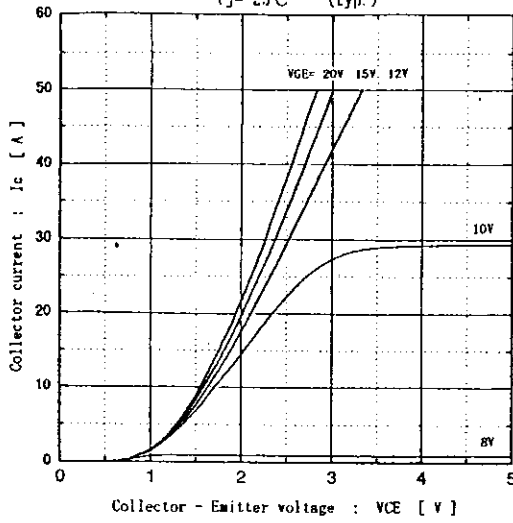
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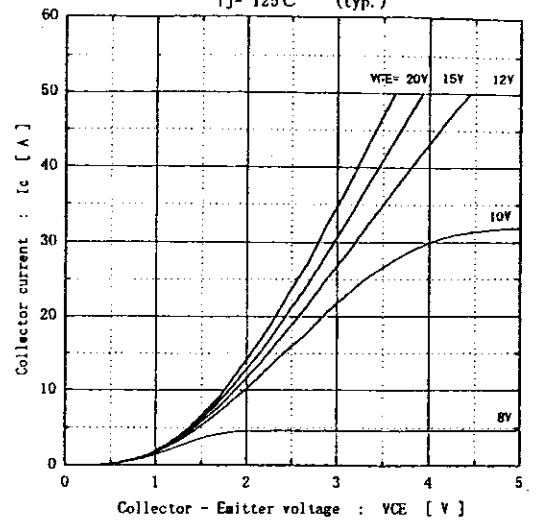
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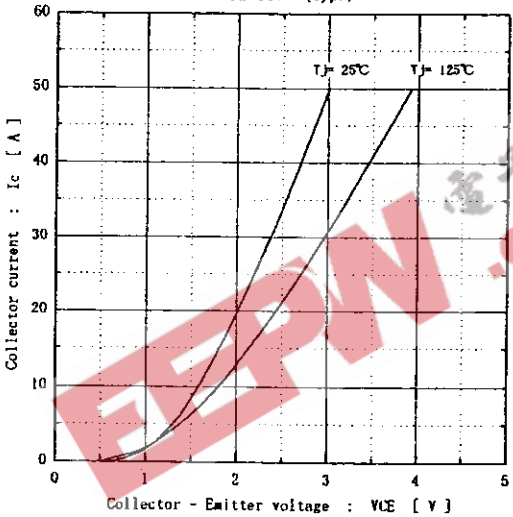
[Brake]
Collector current vs. Collector-Emittor voltage
 $T_j = 25^\circ\text{C}$ (typ.)



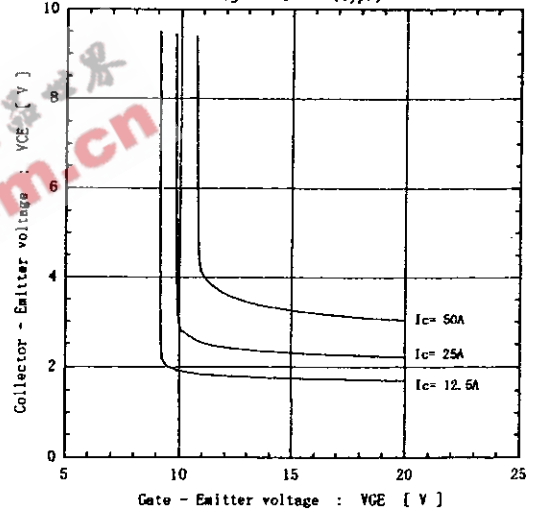
[Brake]
Collector current vs. Collector-Emittor voltage
 $T_j = 125^\circ\text{C}$ (typ.)



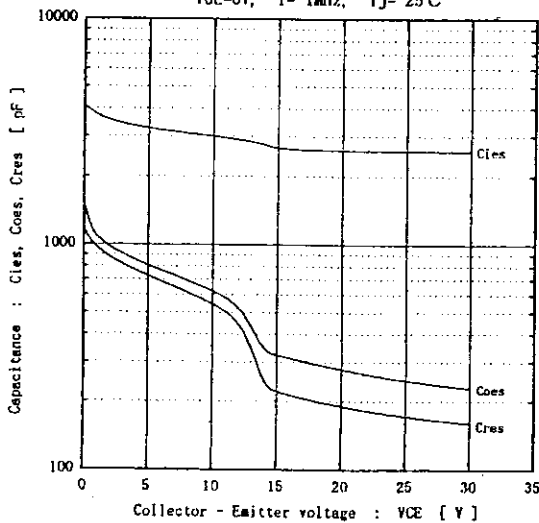
[Brake]
Collector current vs. Collector-Emittor voltage
 $V_{GE} = 15\text{V}$ (typ.)



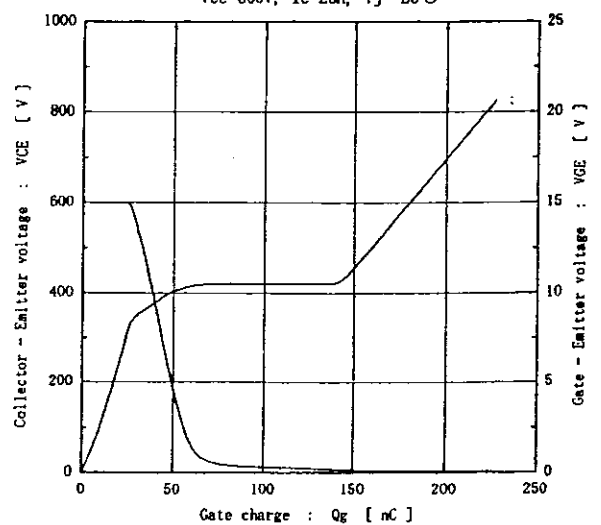
[Brake]
Collector-Emittor voltage vs. Gate-Emittor voltage
 $T_j = 25^\circ\text{C}$ (typ.)



[Brake]
Capacitance vs. Collector-Emittor voltage (typ.)
 $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$



[Brake]
Dynamic Gate charge (typ.)
 $V_{CC} = 600\text{V}$, $I_c = 25\text{A}$, $T_j = 25^\circ\text{C}$



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