

# SPECIFICATION

Device Name : IGBT Module

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Type Name : 7MBR50SB140-01

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Spec. No. : MS6M 0557

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Date : Jun. - 02 - 2000

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Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.				
DRAWN	Jun. - 2 - '00	<i>T. Koyama</i>	<i>T. Miyata</i>	DWG. NO.	MS6M 0557	1 / 10		
CHECKED	June - 2 - 00	<i>S. Mura</i>						

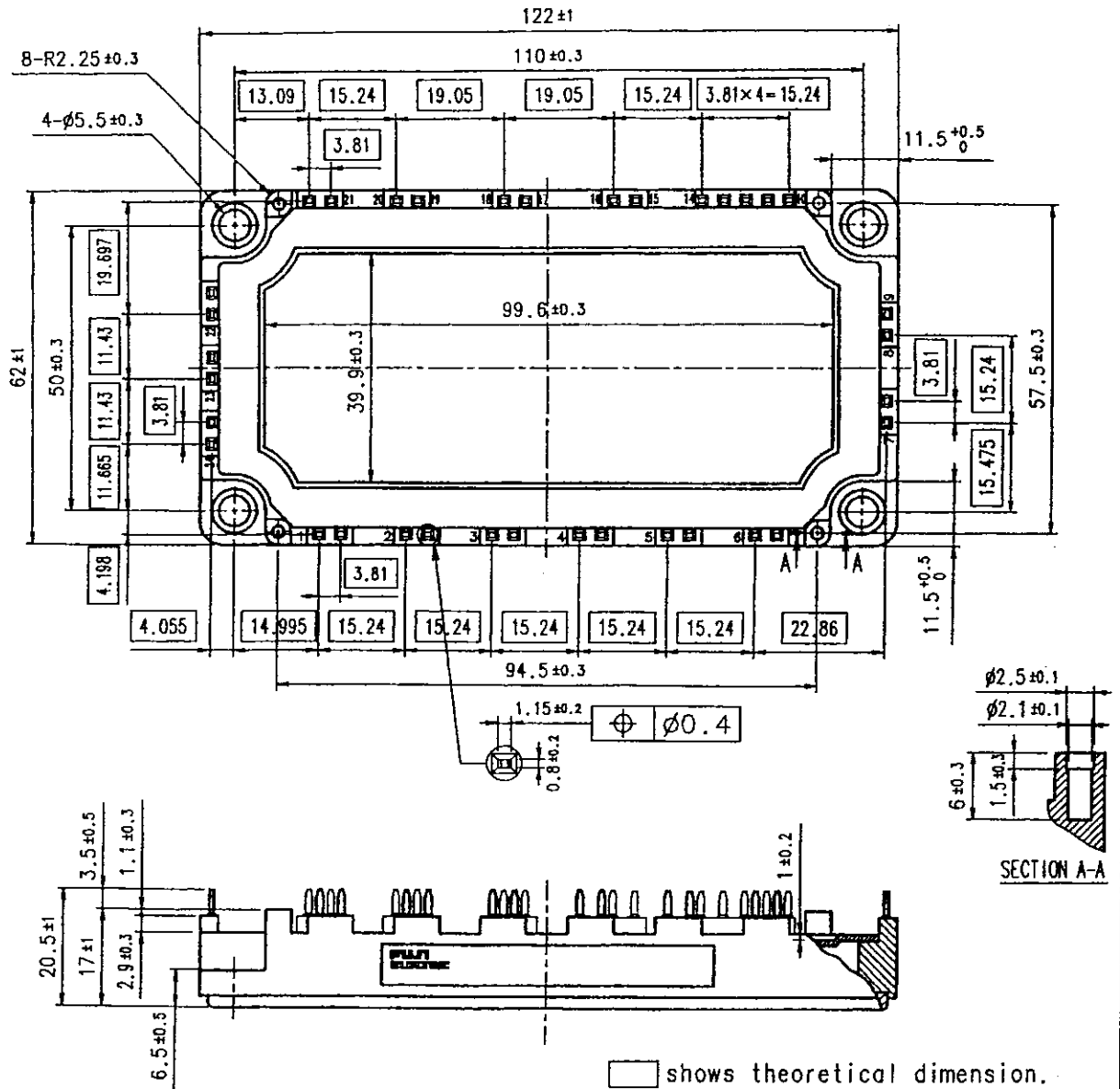
# Revised Records

Date	Classification	Ind.	Content	Applied date	Drawn	Checked	Approved
Jun. -2- '60	enactment	—	—	Issued date	—	S. Nishida	T. Miyasaka
Jun. -14- '60	Revision	A	Revised type miss (P3/10, 5/10)		G. Kobayashi	S. Nishida	T. Miyasaka

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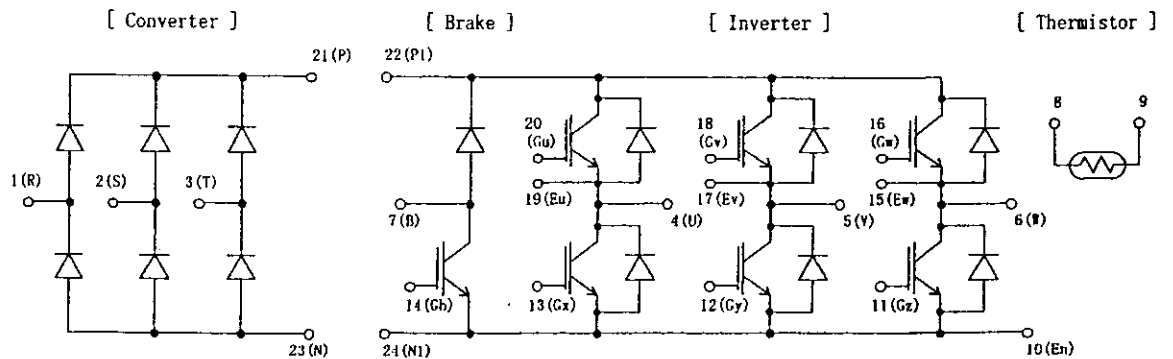
⑦ 7MBR50SB140-01

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		1400	V	
	Gate-Emitter voltage	VGES		+20	V	
	Collector current	Ic	Continuous	Tc=25C	75	A
				Tc=75C	50	
		Icp	1ms	Tc=25C	150	A
				Tc=75C	100	
-Ic			50	A		
Collector Power Dissipation	Pc	1 device		360	W	
Brake	Collector-Emitter voltage	VCES		1400	V	
	Gate-Emitter voltage	VGES		+20	V	
	Collector current	Ic	Continuous	Tc=25C	35	A
				Tc=75C	25	
		Icp	1ms	Tc=25C	70	A
				Tc=75C	50	
Collector Power Dissipation	Pc	1 device		180	W	
Repetitive peak reverse Voltage(Diode)	VRRM			1400	V	
Converter	Repetitive peak reverse Voltage	VRRM		1600	V	
	Average Output Current	Io	50Hz/60Hz sine wave	50	A	
	Surge Current (Non-Repetitive)	IFSM	Tj=150C,10ms	520	A	
	i <sup>2</sup> t (Non-Repetitive)	i <sup>2</sup> t	half sine wave	1352	A <sup>2</sup> s	
Junction temperature	Tj			150	C	
Storage temperature	Tstg			-40~ +125	C	
Isolation voltage	between terminal and copper base <sup>(*)1</sup>	Viso	AC : 1min.	2500	V	
	between thermistor and others <sup>(*)2</sup>			2500		
Mounting Screw Torque <sup>(*)3</sup>				3.5	Nm	

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(\*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  $T_j = 25C$  unless otherwise specified)

Items	Symbols	Conditions	Characteristics			Units		
			min.	typ.	Max.			
Inverter	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 1400 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 = 50 mA	5.5	7.2	8.5	V	
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, Ic = 50 A	chip		2.2		V
				terminal		2.4	2.8	
	Input capacitance	Cies	VGE = 0 V, VCE = 10 V f = 1 MHz		6000		pF	
	Turn-on time	ton	Vcc = 800 V		0.35	1.2	us	
		tr	Ic = 50 A		0.25	0.6		
		tr@	VGE = +15 V		0.1			
	Turn-off time	toff	RG = 24 ohm		0.45	1.0	us	
tf				0.08	0.3			
Forward on voltage	VF	IF = 50 A	chip		2.4	V		
			terminal		2.6		3.4	
Reverse recovery time	trr	IF = 50 A			350	ns		
Brake	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 1400 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, Ic = 25 A	chip		2.2	V	
				terminal		2.35		2.8
	Turn-on time	ton	Vcc = 800 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	us	
tf		RG = 51 ohm		0.08	0.3			
Reverse current	IRRM	VR = 1400 V			1.0	mA		
Converter	Forward on voltage	VF	IF = 50 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	

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5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			0.35	C/W
		Inverter FWD			0.75	
		Brake IGBT			0.69	
		Converter Diode			0.50	
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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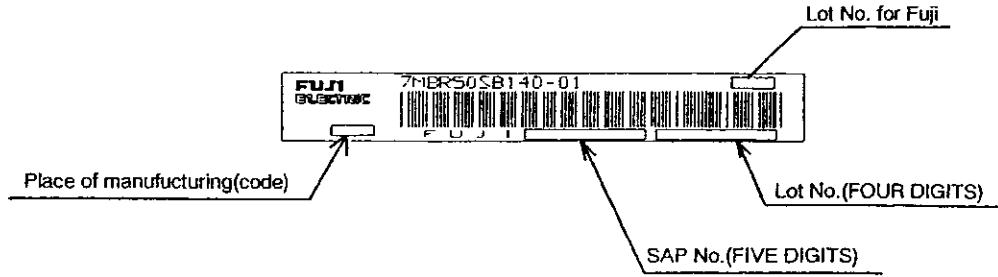
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6. Indication on module



7. Applicable category

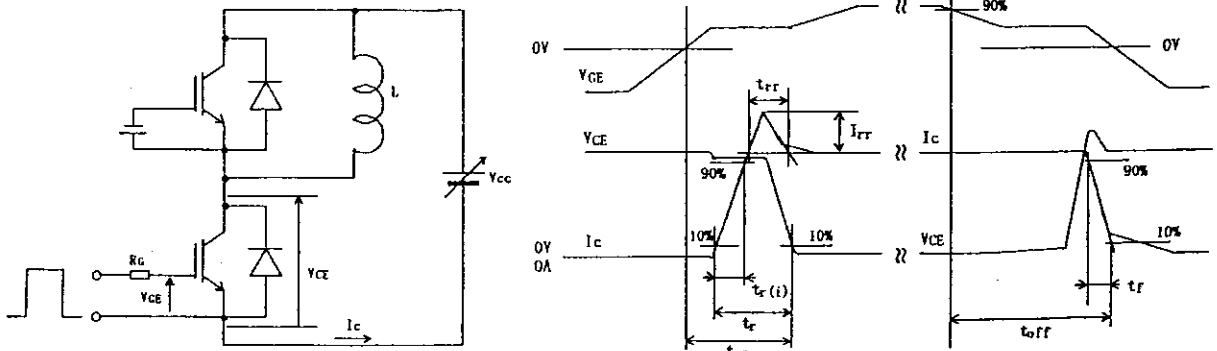
This specification is applied to Power Integrated Module named 7MBR50SB140-01 .

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.

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9. Definitions of switching time



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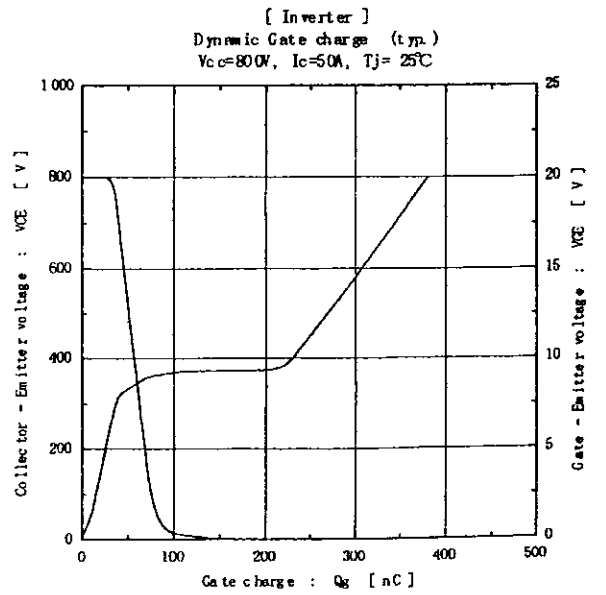
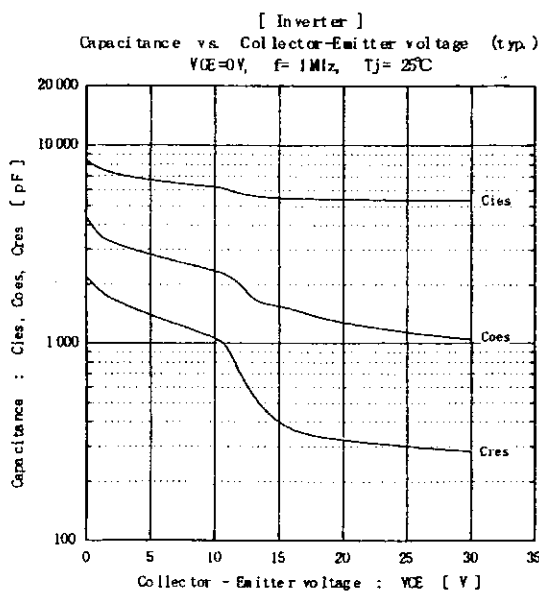
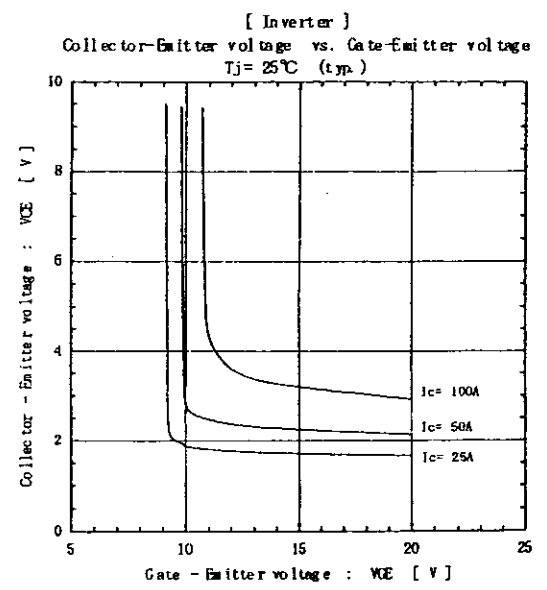
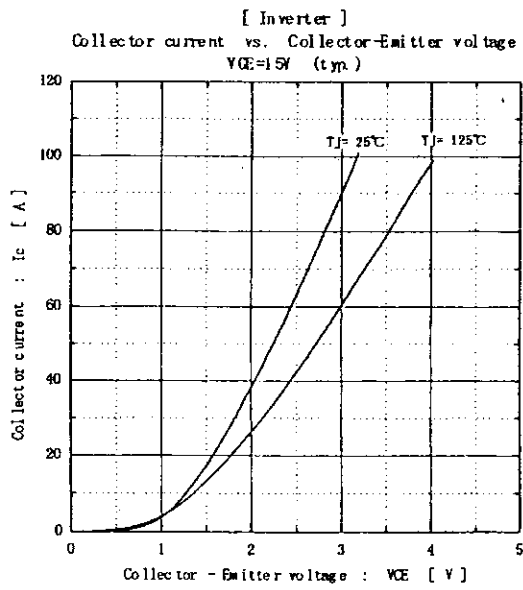
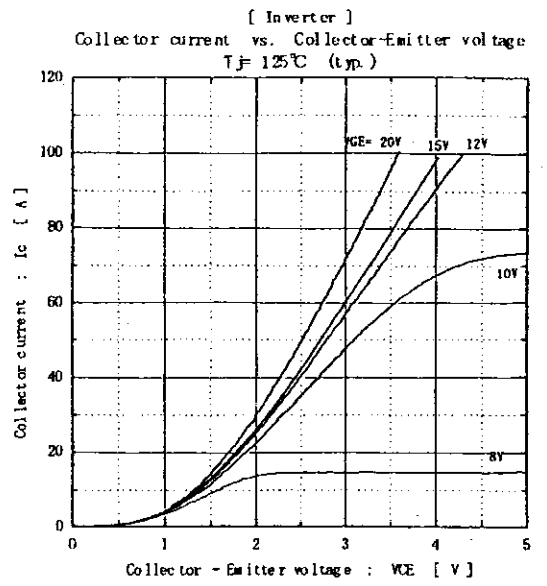
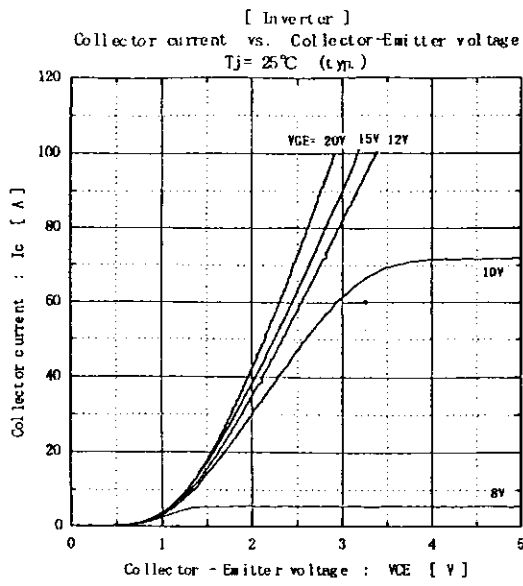
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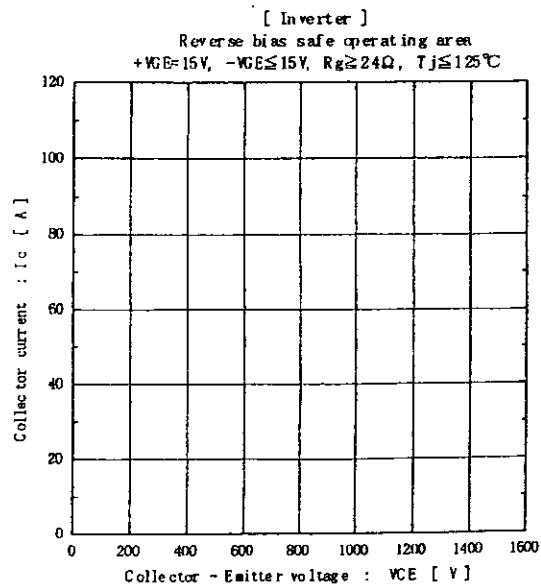
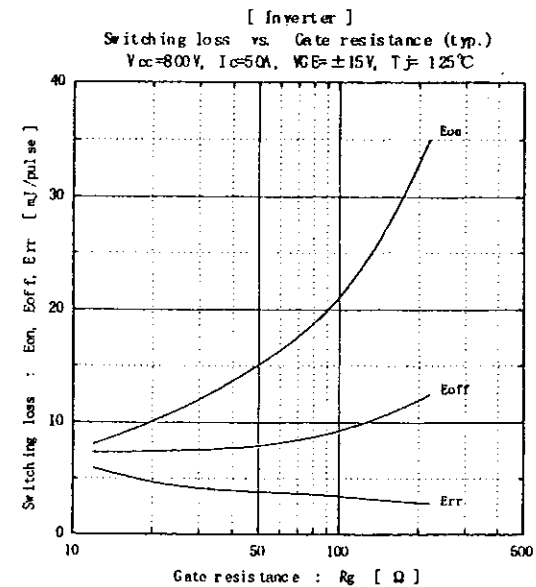
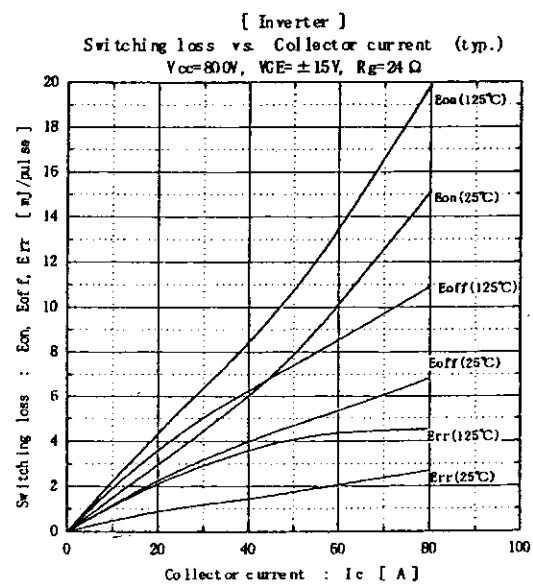
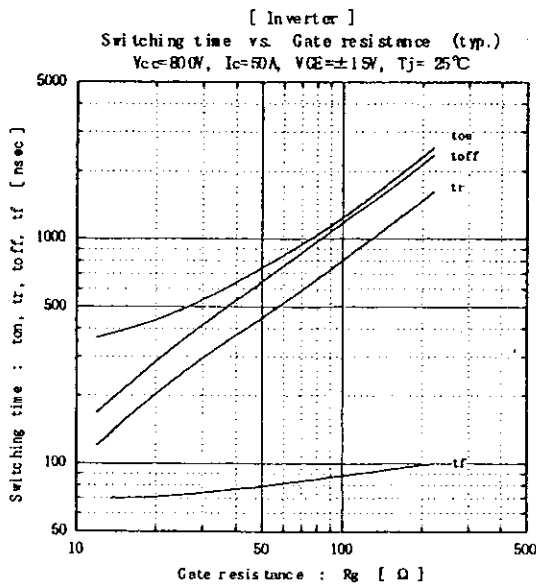
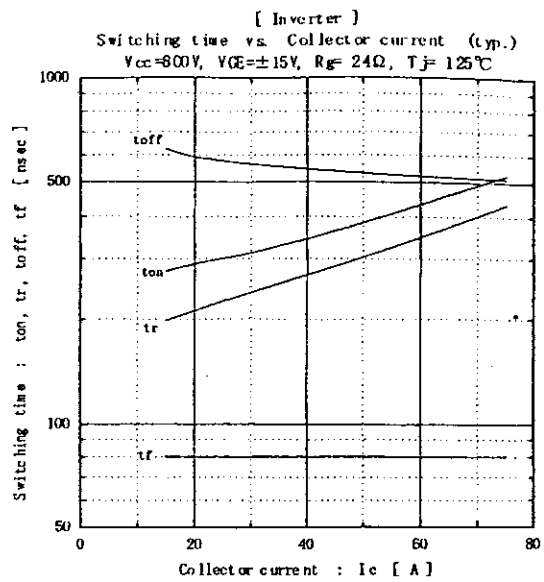
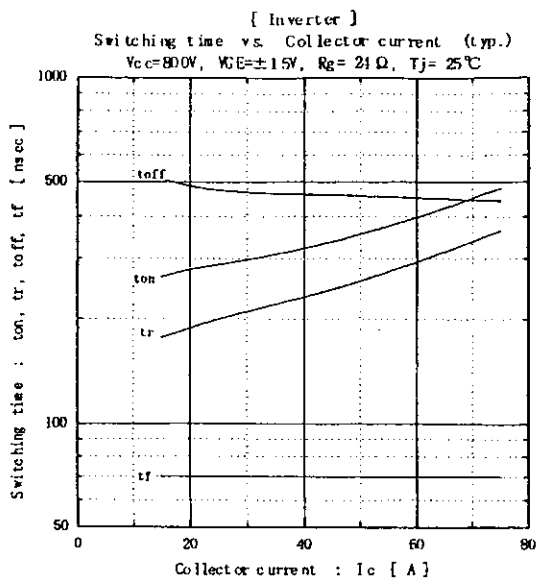
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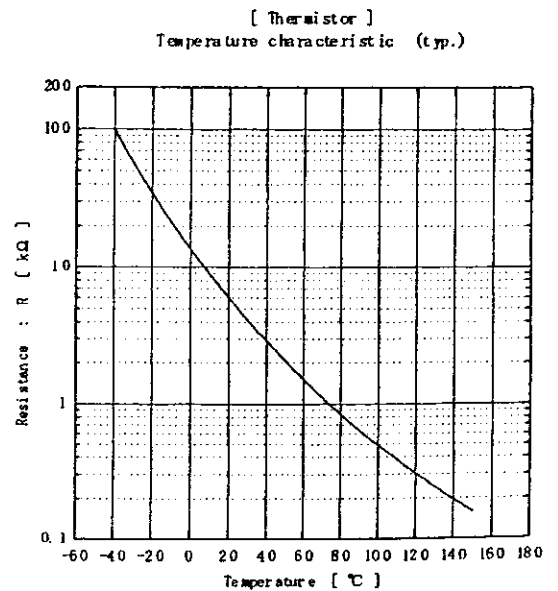
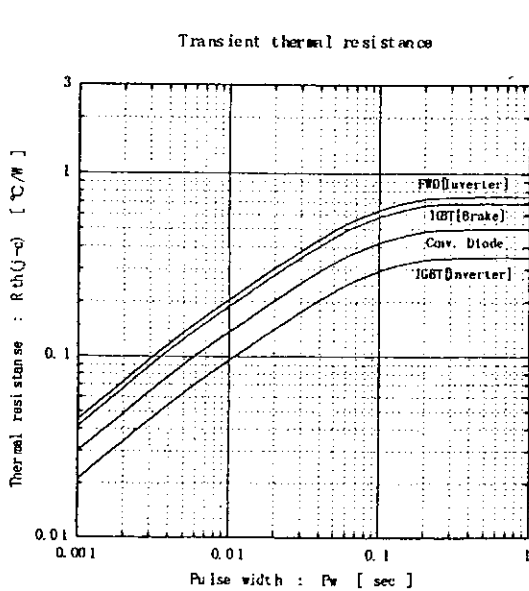
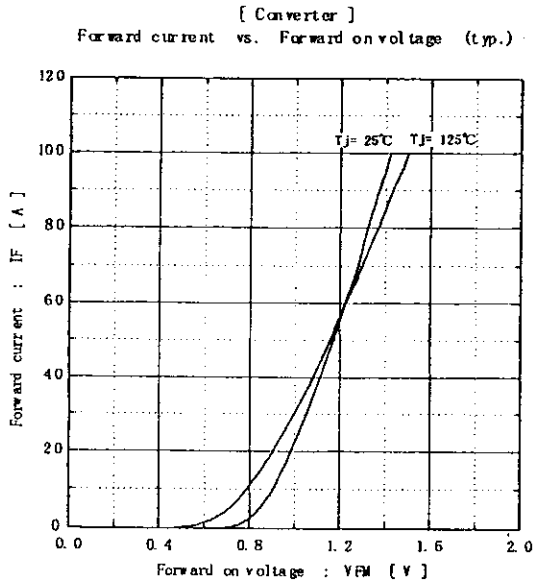
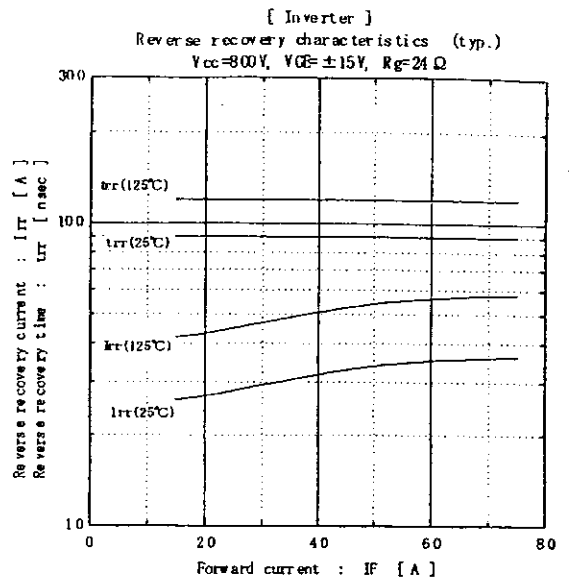
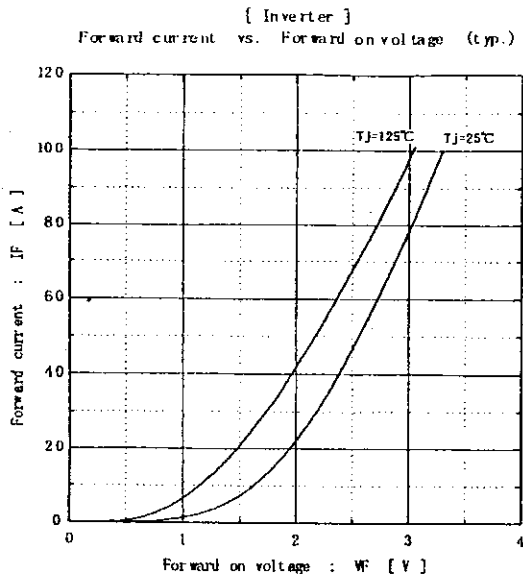
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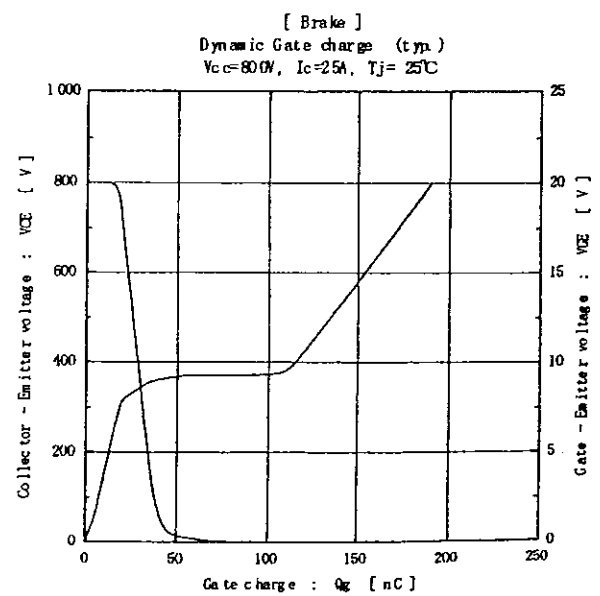
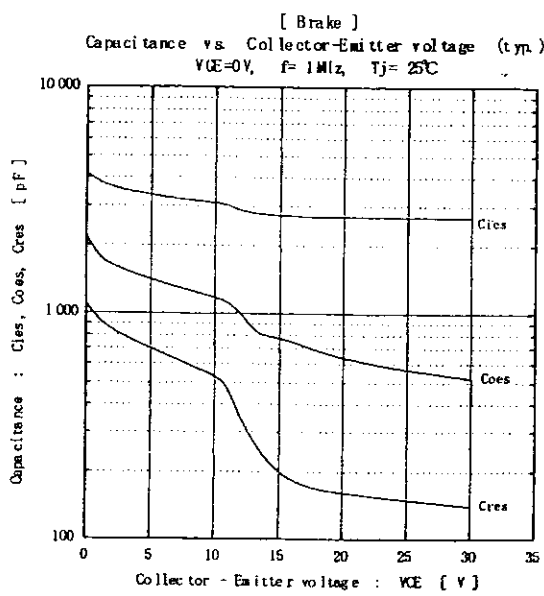
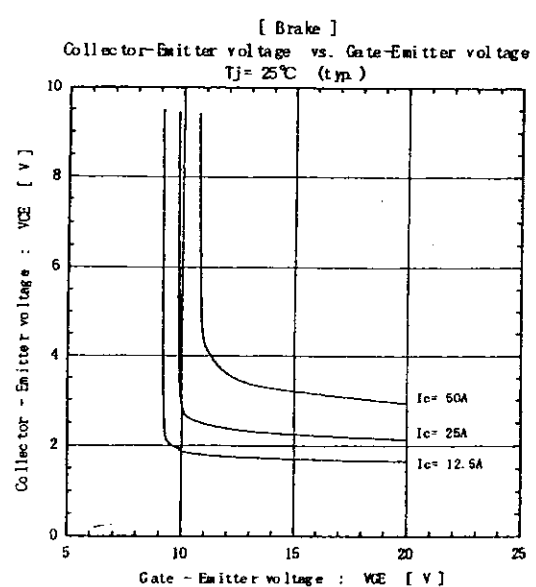
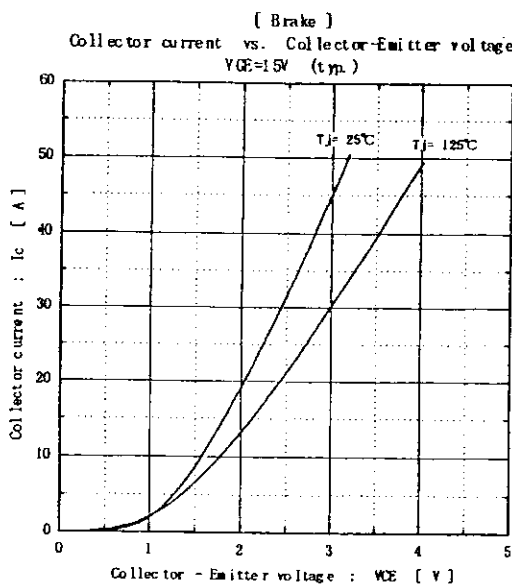
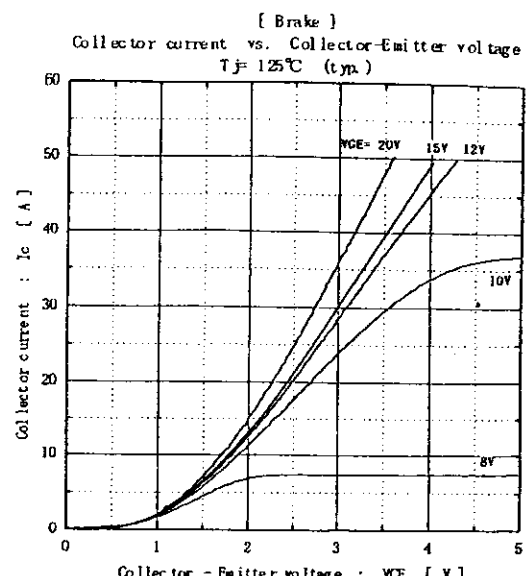
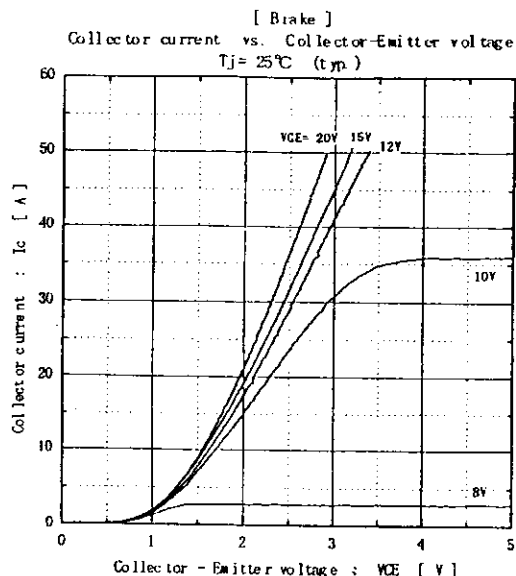
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