

Messrs. Rockwell Automation

SPECIFICATION

Device Name : IGBT Module

Type Name : 7MBR35SB140-01

Spec. No. : MS6M 0556

Date : Jun. - 02 - 2000

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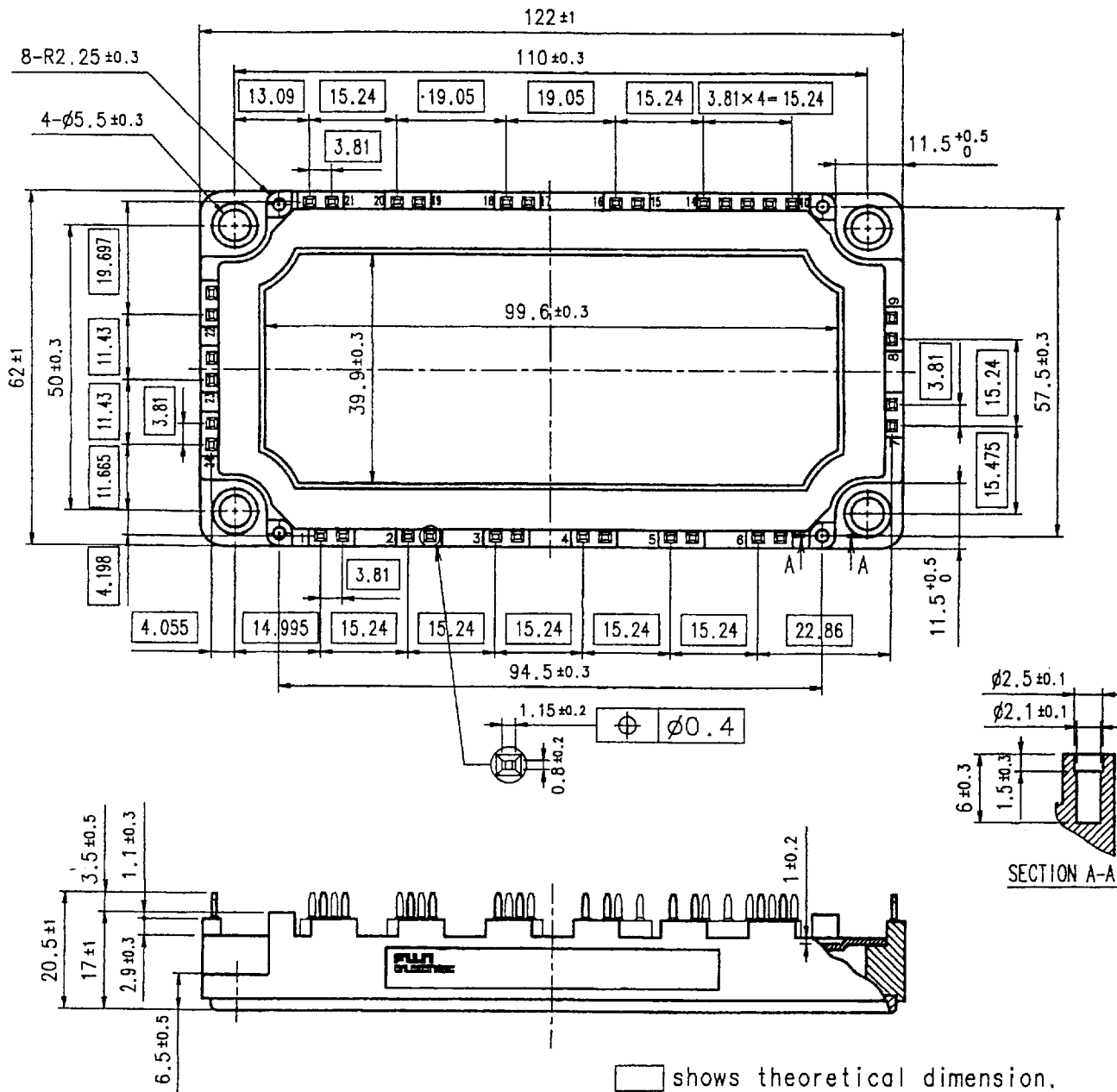
Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.			
DRAWN	Jun. - 2 - '00	<i>J. Kobayashi</i>		DWG NO.	MS6M 0556	1 / 10	α
CHECKED	June - 2 - 00	<i>S. Kato</i>	<i>J. Miyazaki</i>				

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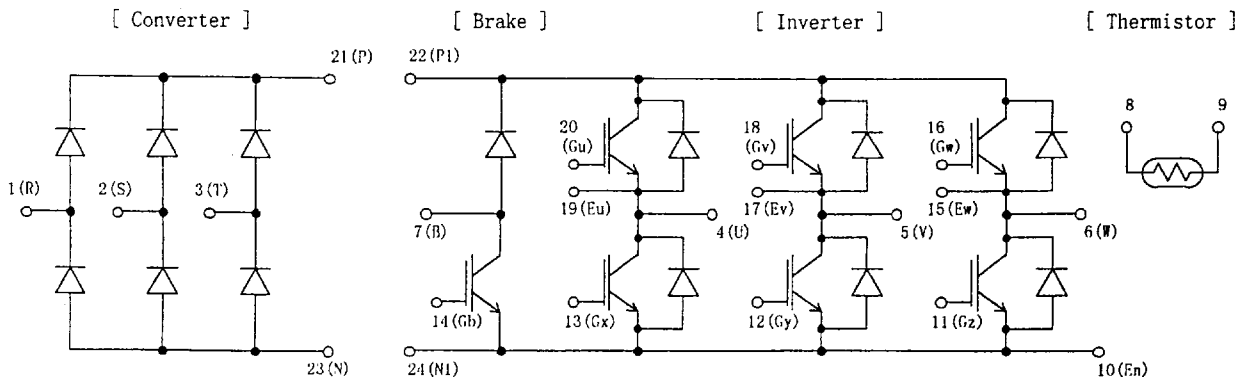
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1. Outline Drawing (Unit : mm)



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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	50	A
				Tc=75C	35	
		Icp	1ms	Tc=25C	100	A
				Tc=75C	70	
-Ic			35	A		
Collector Power Dissipation	Pc	1 device		240	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		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 ^(*) = 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 = 35 mA		5.5	7.2	8.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, chip			2.2		V
			Ic = 35 A, terminal			2.35	2.7	
	Input capacitance	Cies	VGE = 0 V, VCE = 10 V f = 1 MHz		4200		pF	
	Turn-on time	ton	Vcc = 800 V		0.35	1.2	us	
		tr	Ic = 35 A		0.25	0.6		
		tr(0)	VGE = +15 V		0.1			
	Turn-off time	toff	RG = 33 ohm		0.45	1.0	us	
tf				0.08	0.3			
Forward on voltage	VF	IF = 35 A, chip			2.4		V	
		terminal			2.55	3.4		
Reverse recovery time	trr	IF = 35 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, chip			2.2	V	
			Ic = 25 A, 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	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	

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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			0.52	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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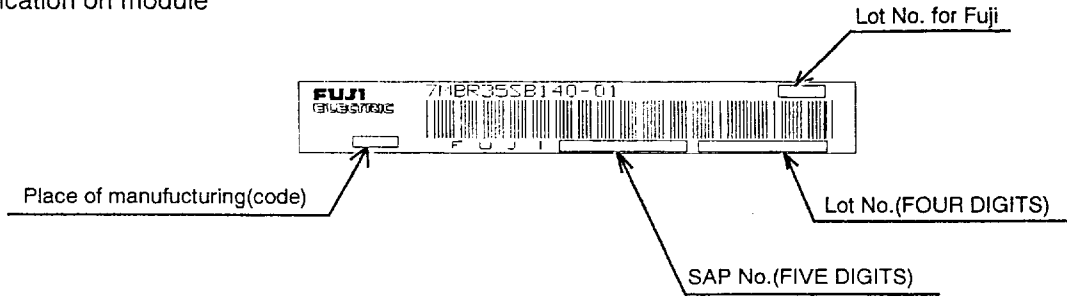
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6. Indication on module



7. Applicable category

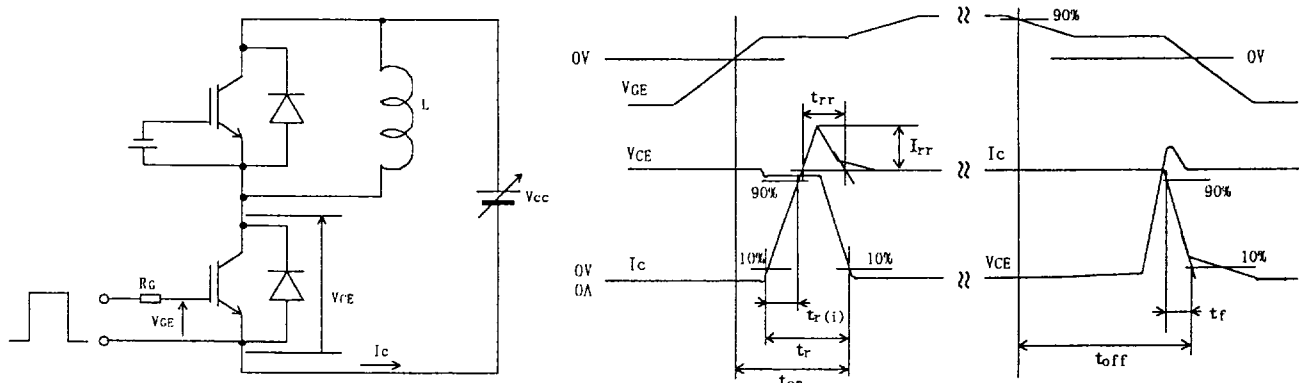
This specification is applied to Power Integrated Module named 7MBR35SB140-01 .

8. Storage and transportation notes

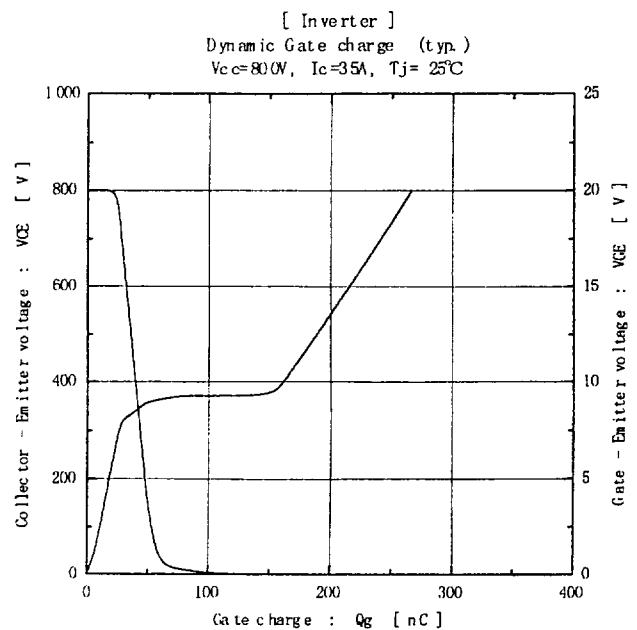
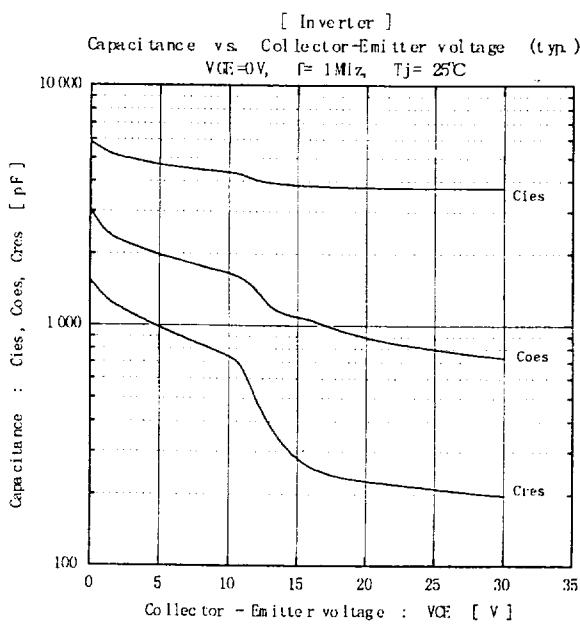
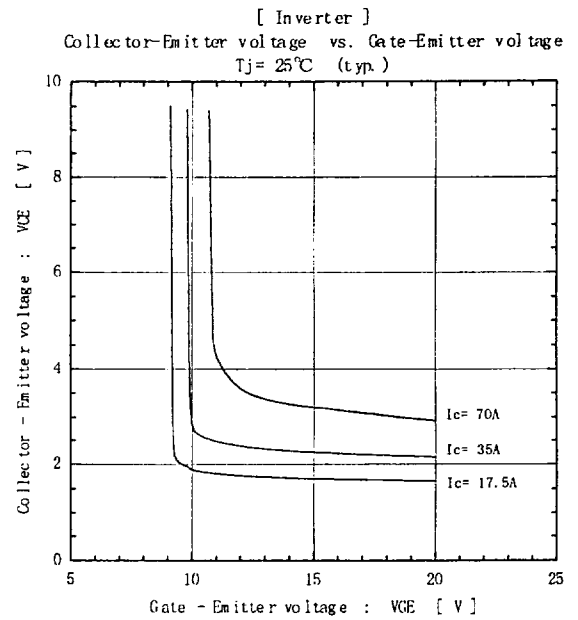
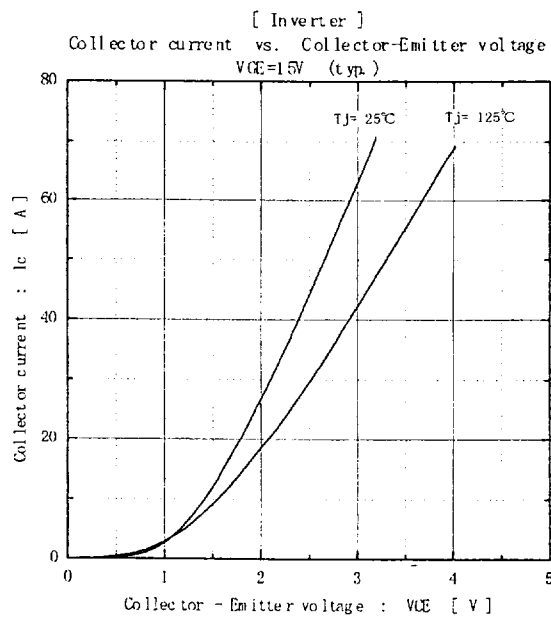
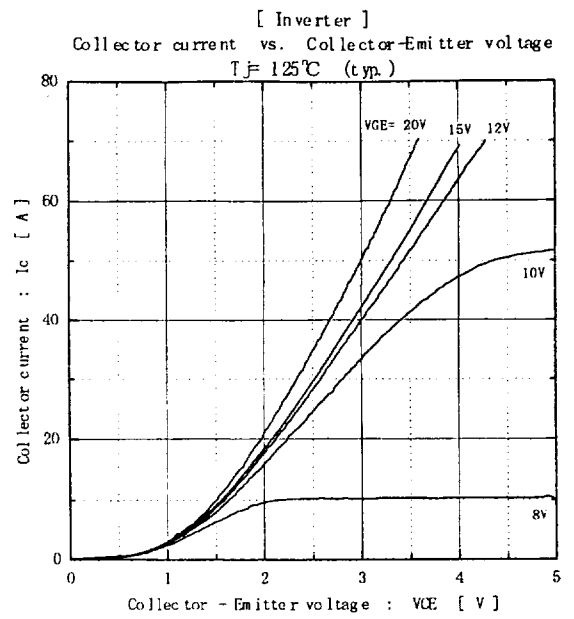
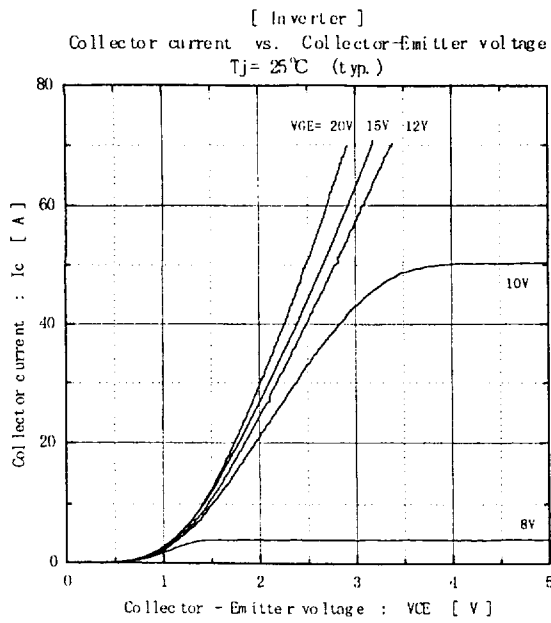
- The module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75% .
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
- Avoid exposure to corrosive gases and dust.
- Avoid excessive external force on the module.
- 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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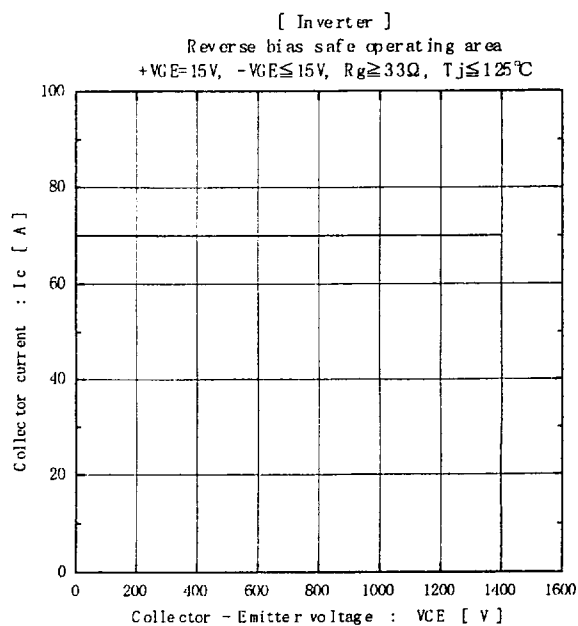
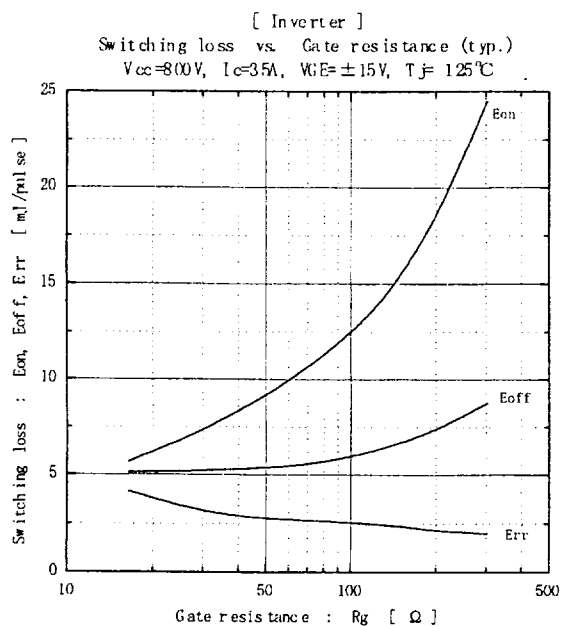
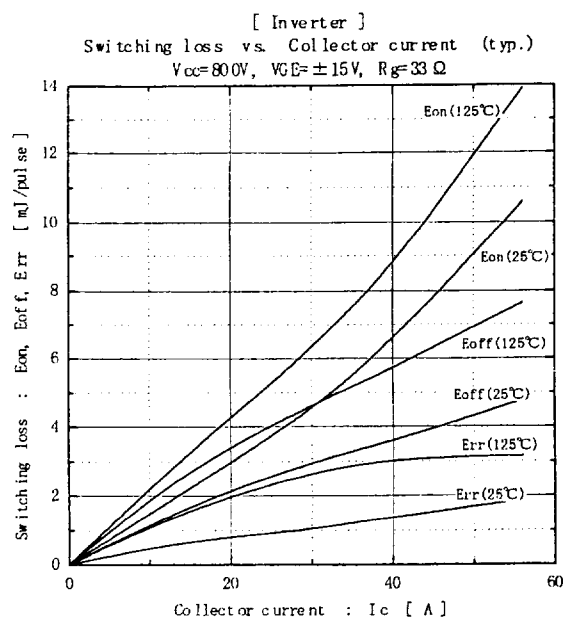
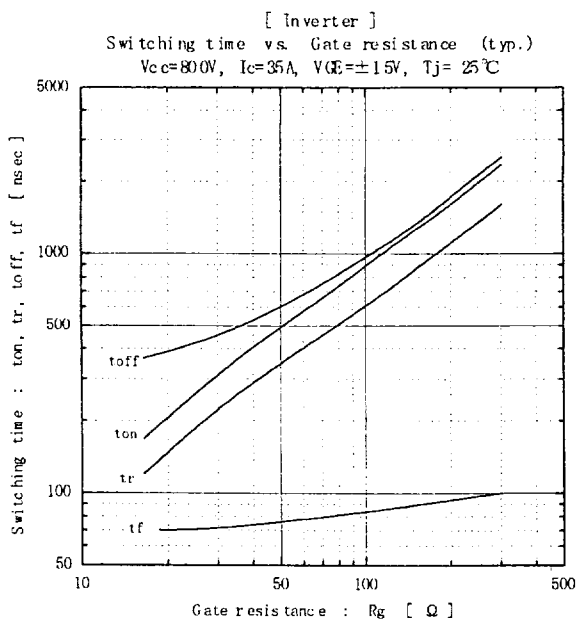
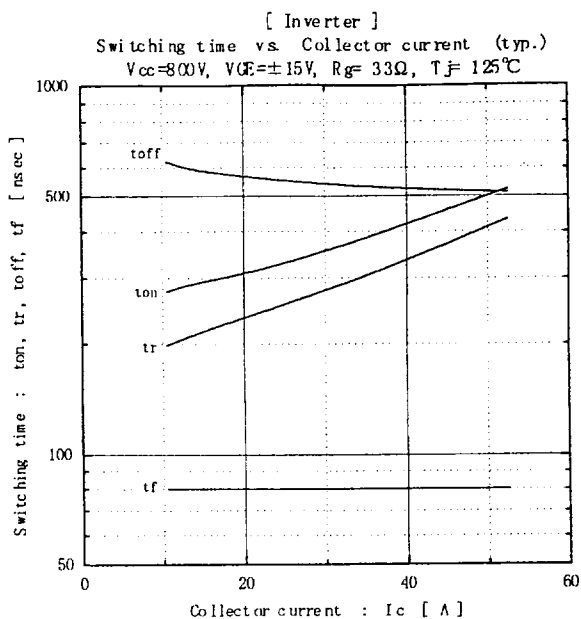
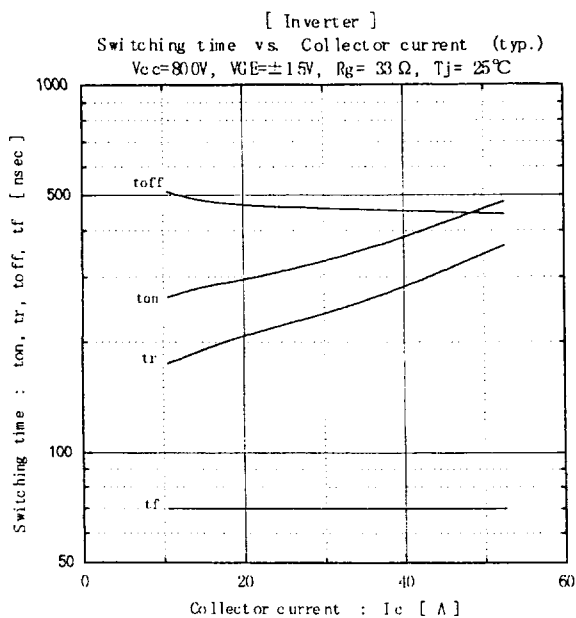
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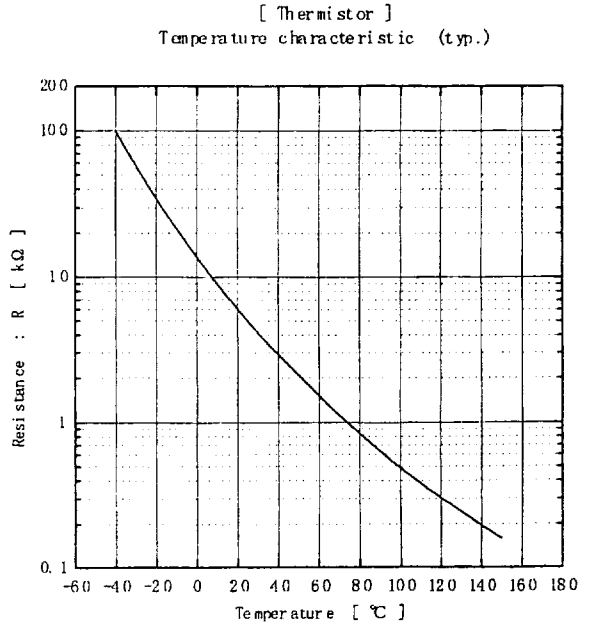
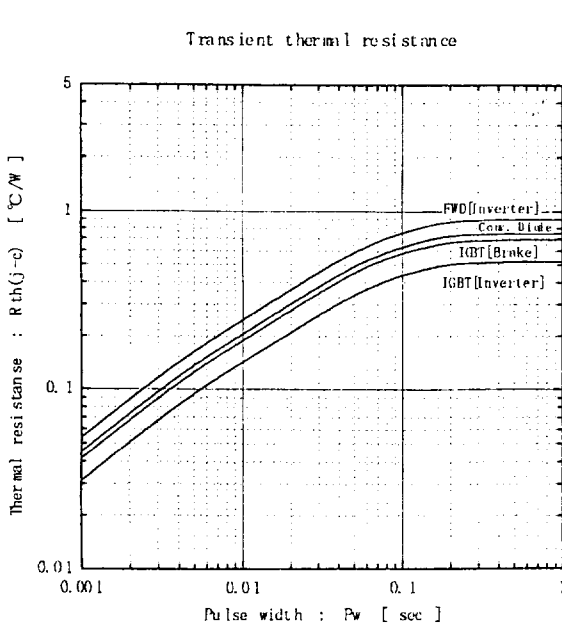
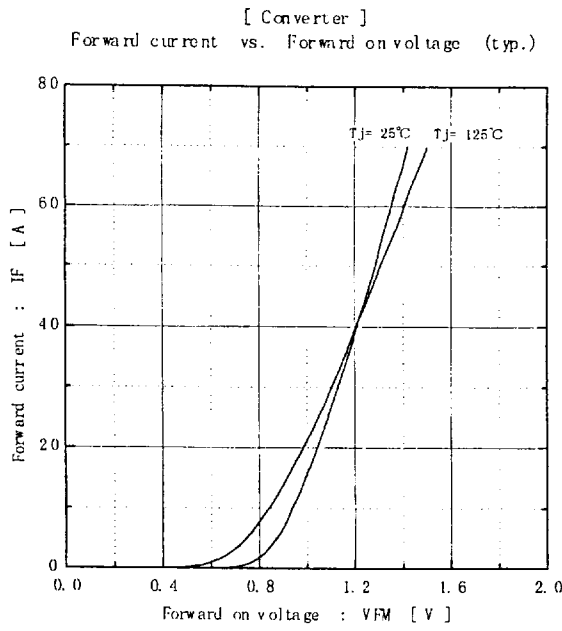
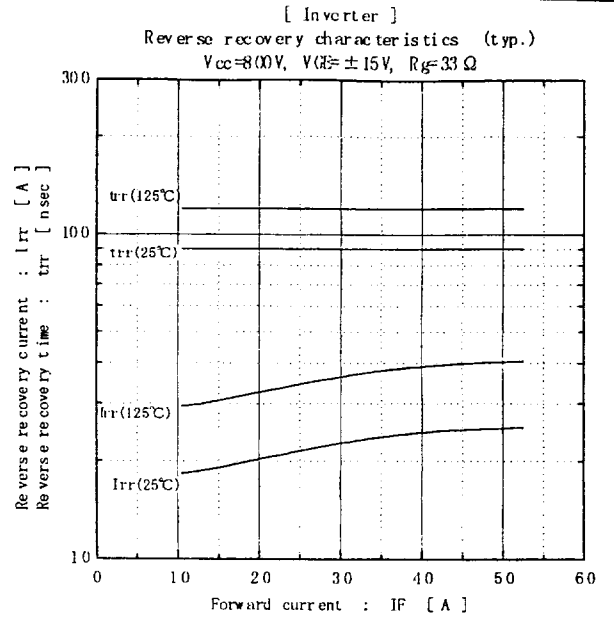
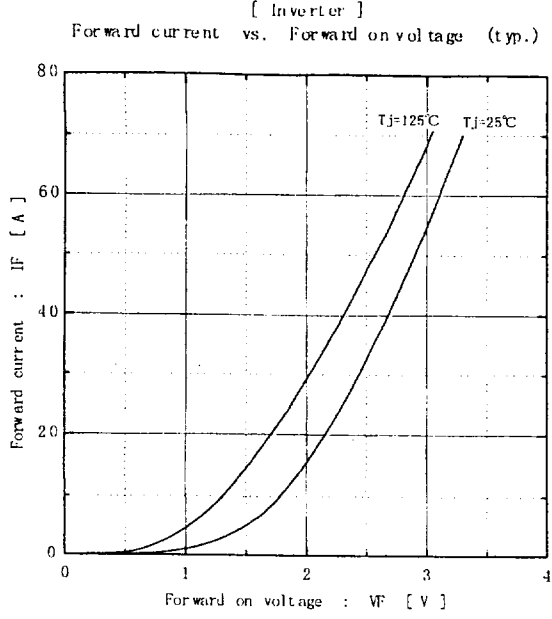
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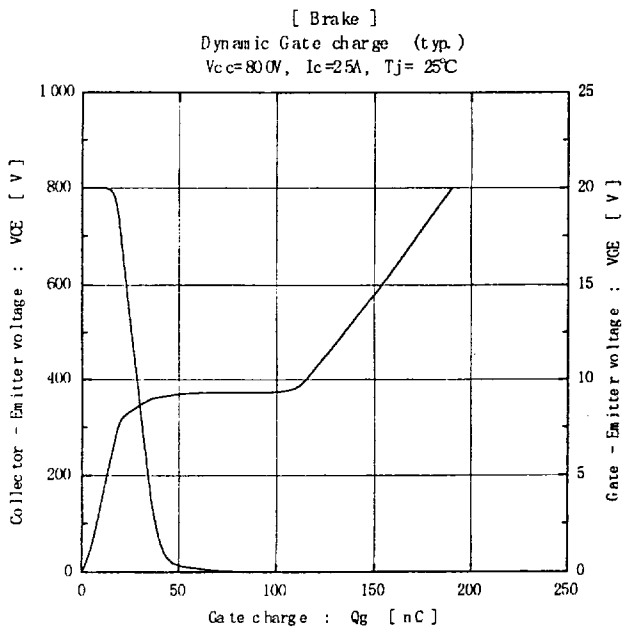
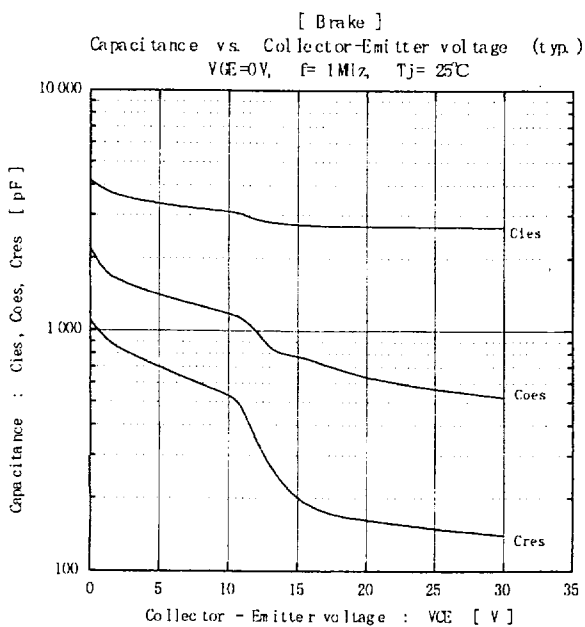
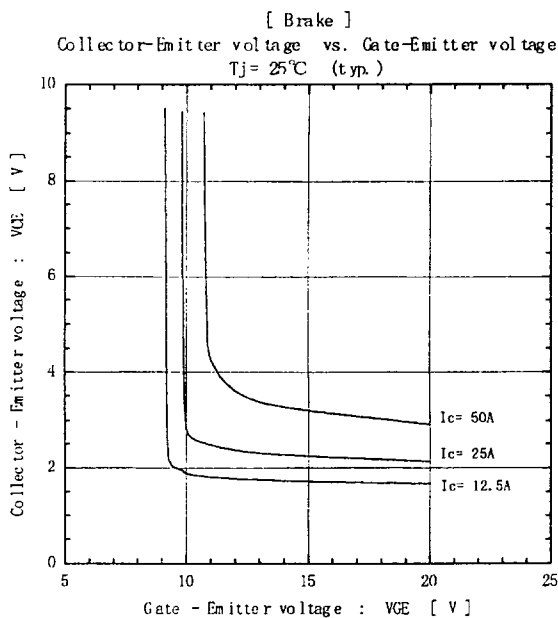
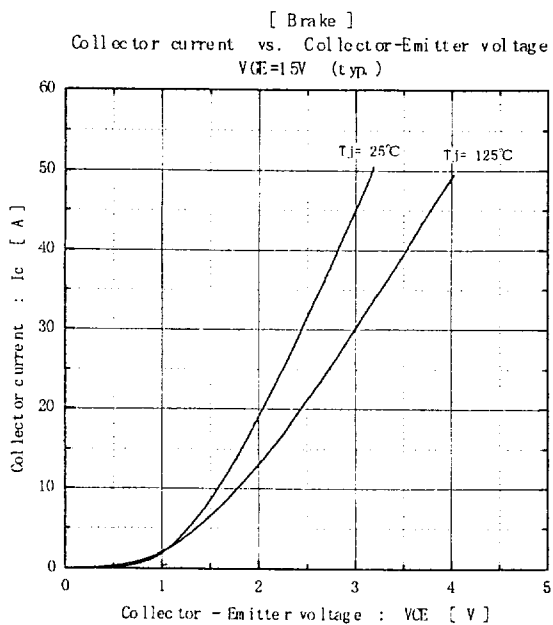
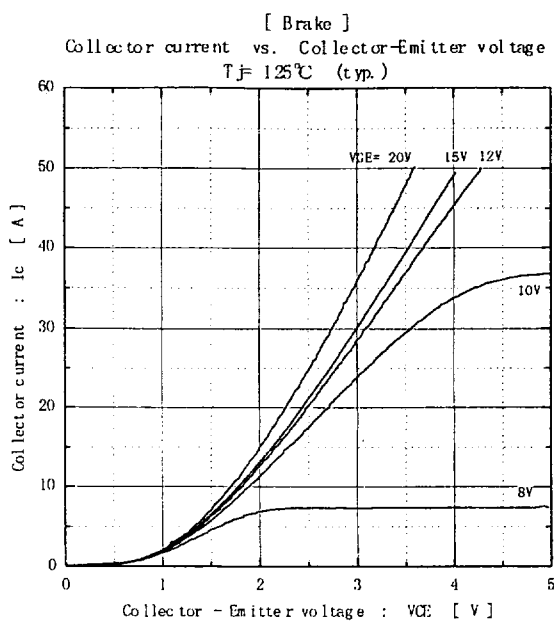
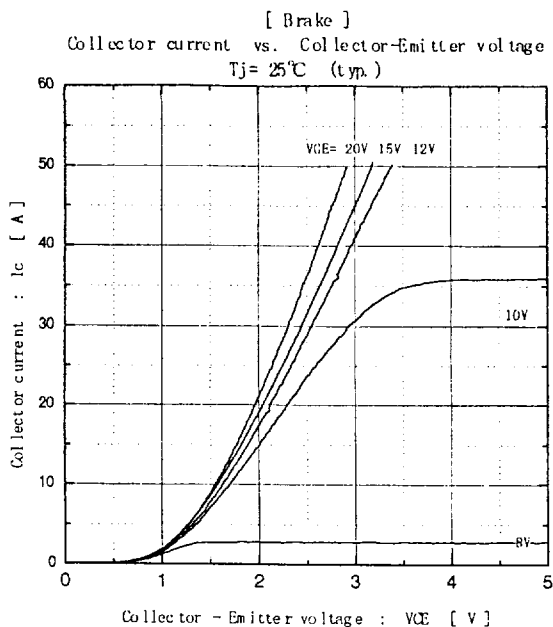
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